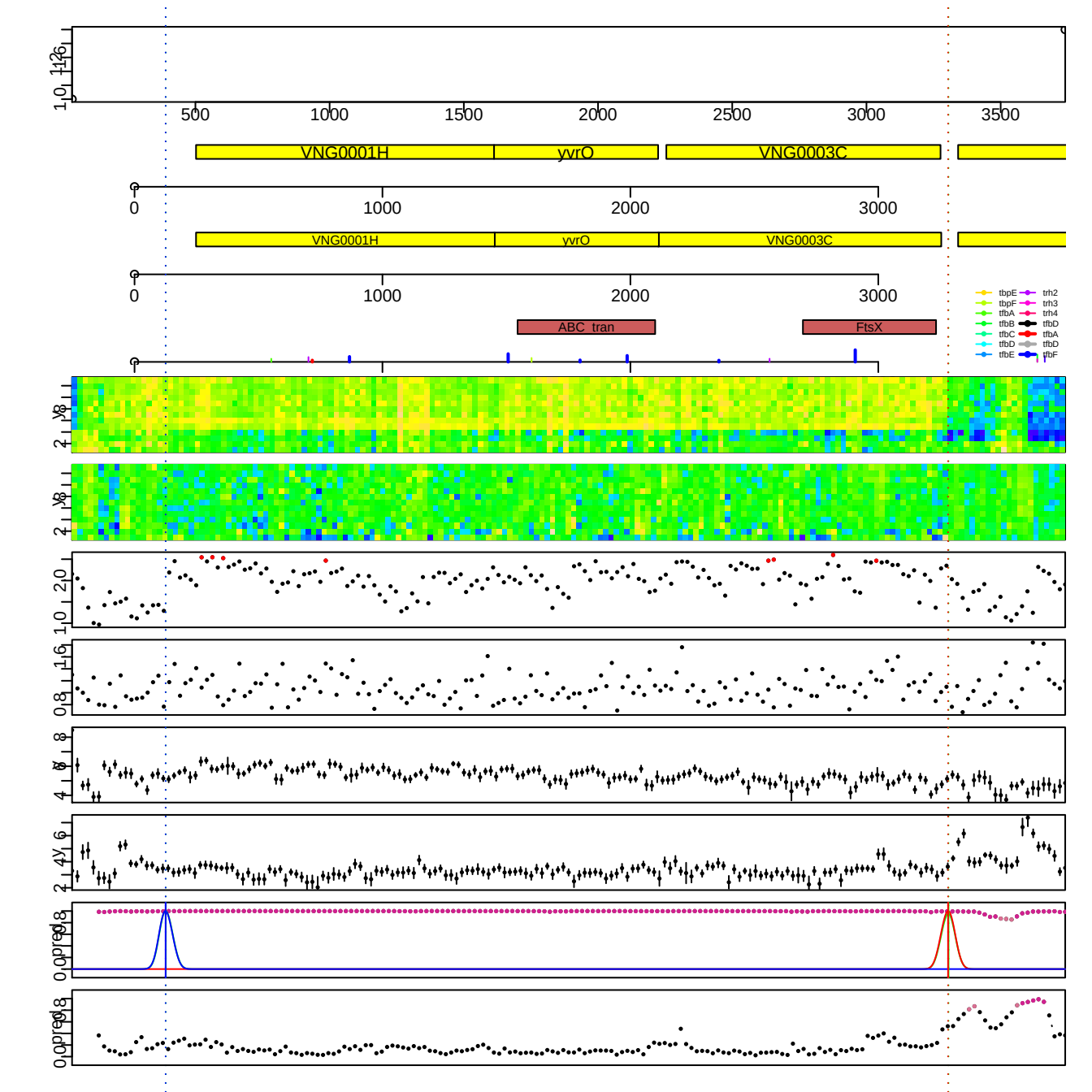
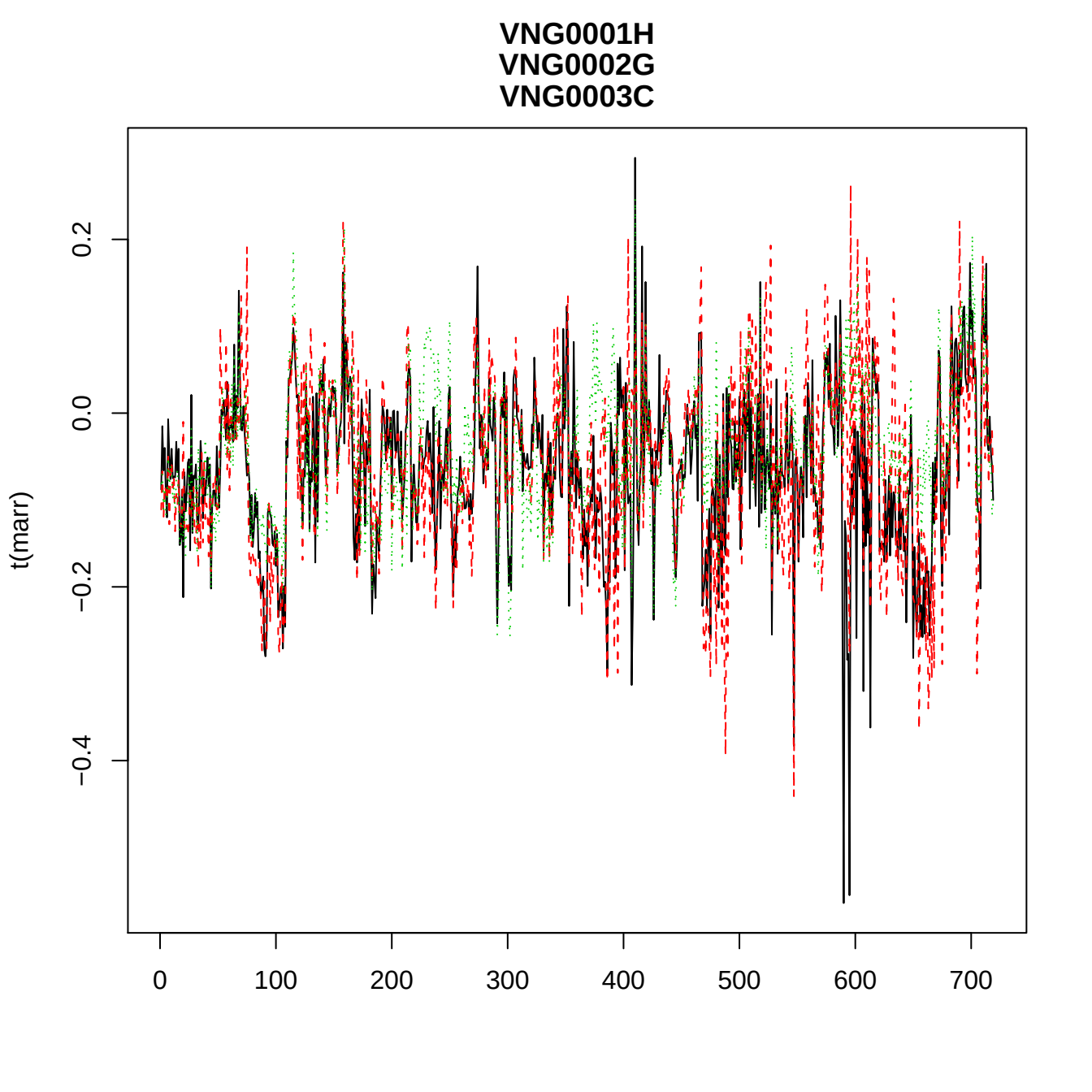

500
1000
1500
2000
2500
3000
3500
VNG0001H
yvrO
VNG0003C
0
1000
2000
3000
ABC_tran
FtsX
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0001H
VNG0002G
VNG0003C
t(marr)
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0.0
−0.2
−0.4
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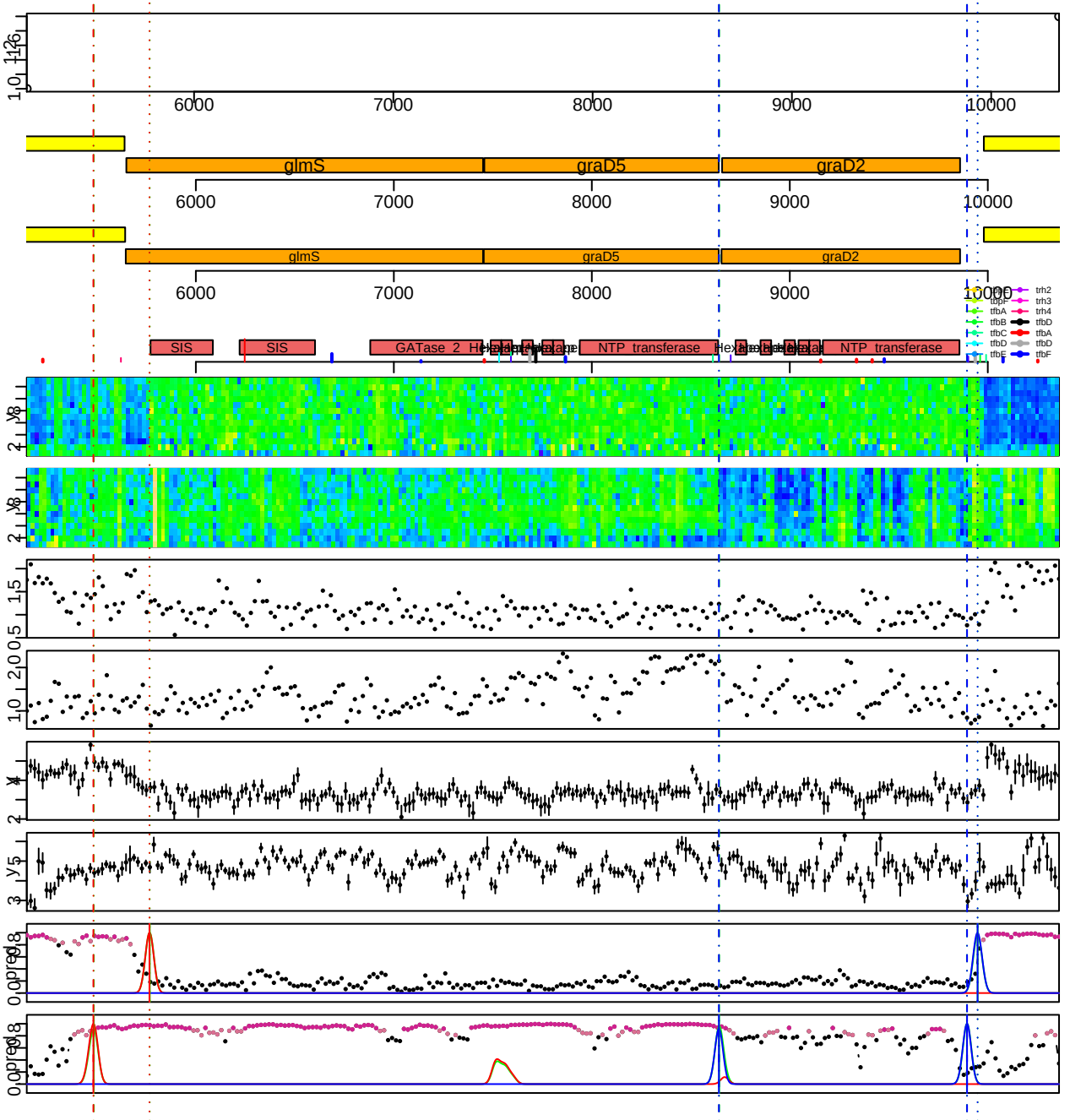
600
700


6000
7000
8000
9000
10000
glmS
graD5
graD2
SIS
SIS
GATase_2
NTP_transferase
NTP_transferase
trh2
trh3
trh4
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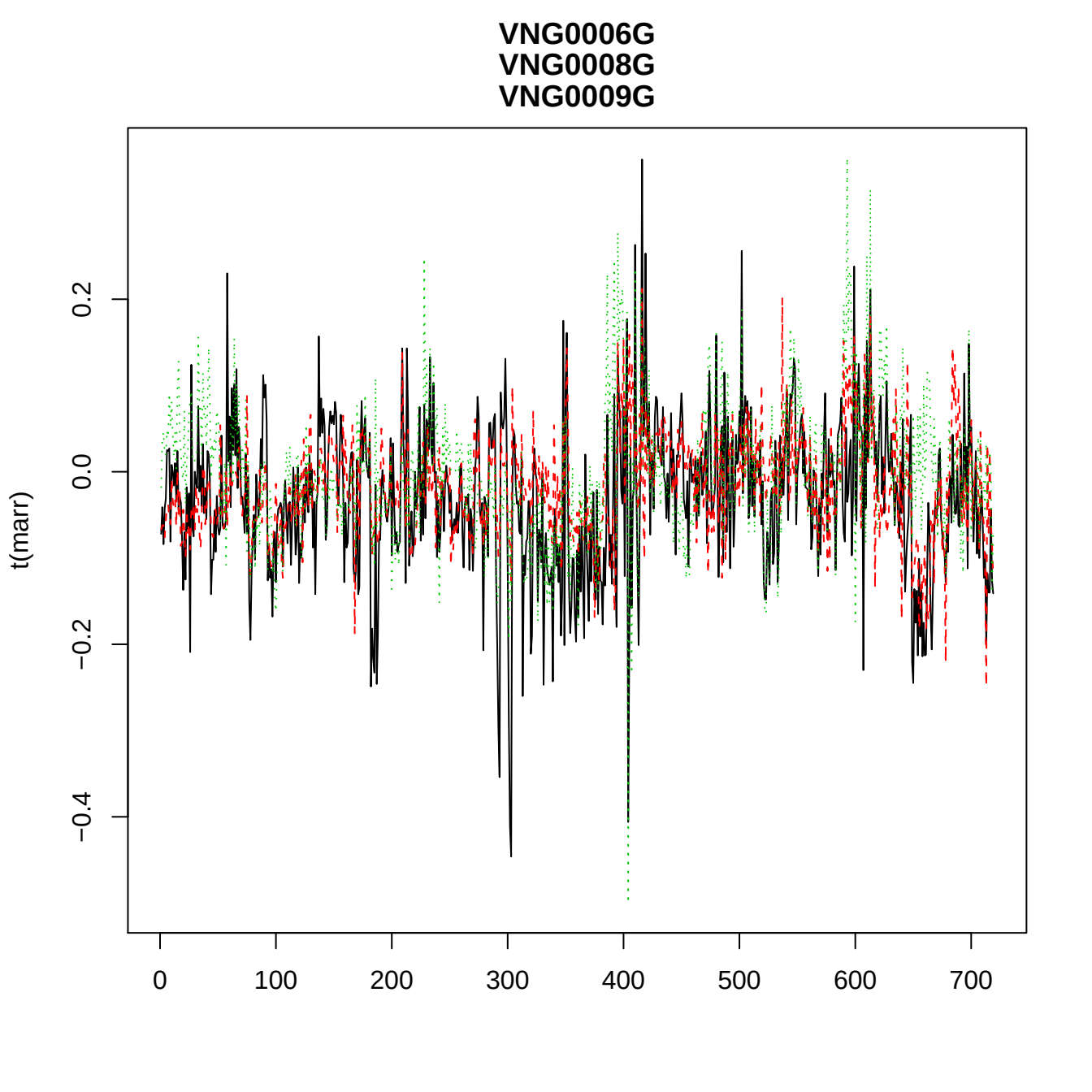
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
pred


VNG0006G
VNG0008G
VNG0009G
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600
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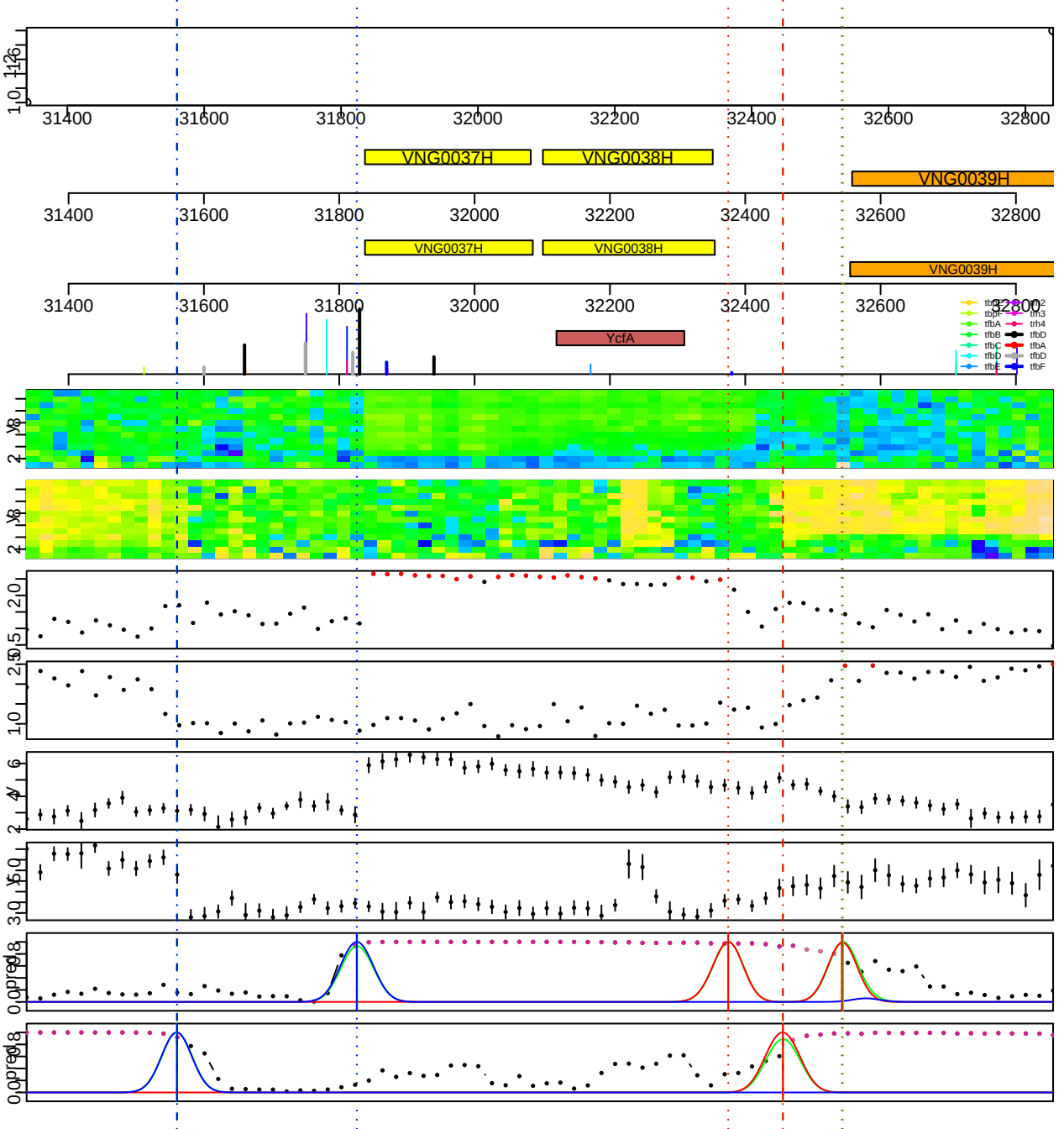
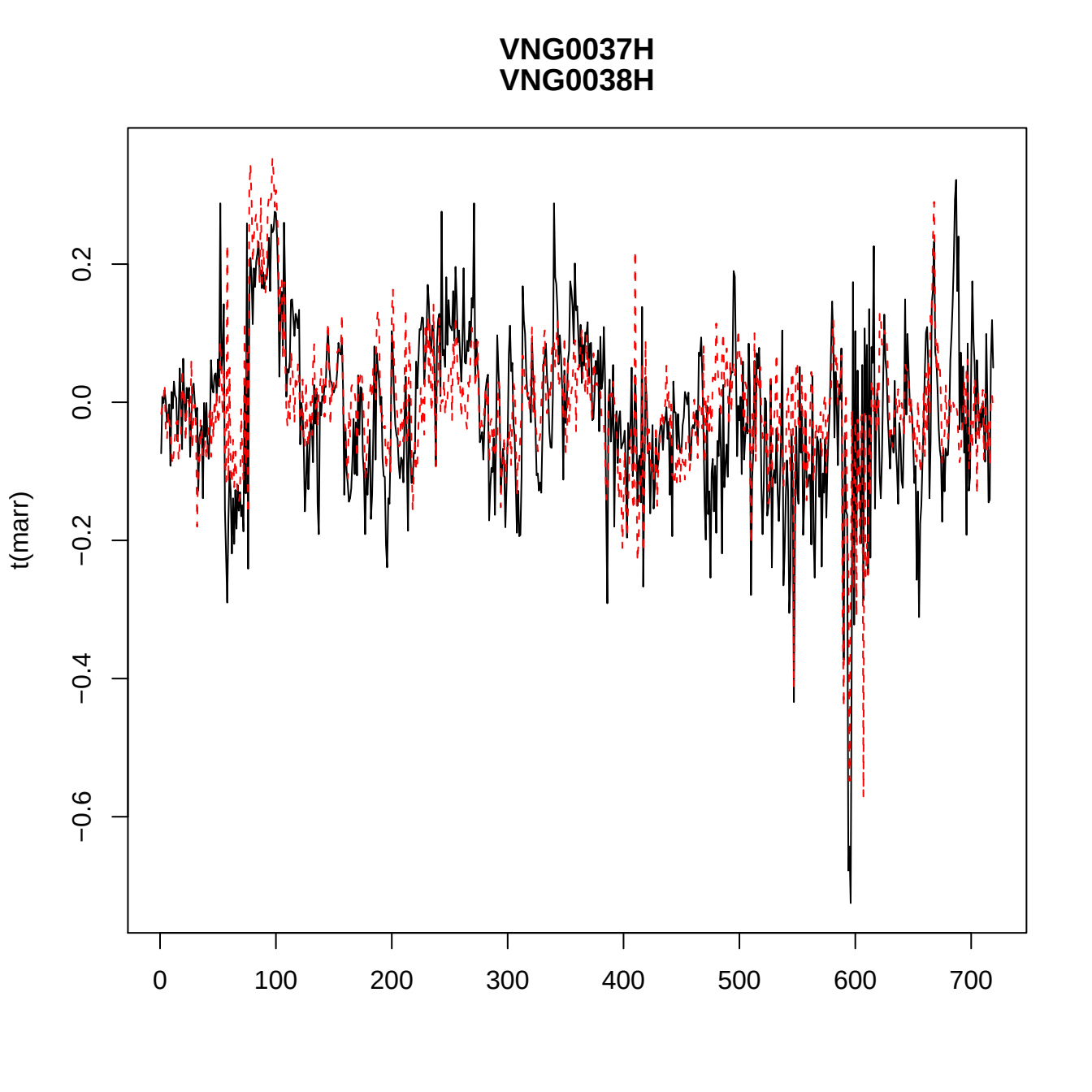

31400
31600
31800
32000
32200
32400
32600
32800
VNG0037H
VNG0038H
VNG0039H
YcfA
tfbG
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0037H
VNG0038H
t(marr)
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−0.4
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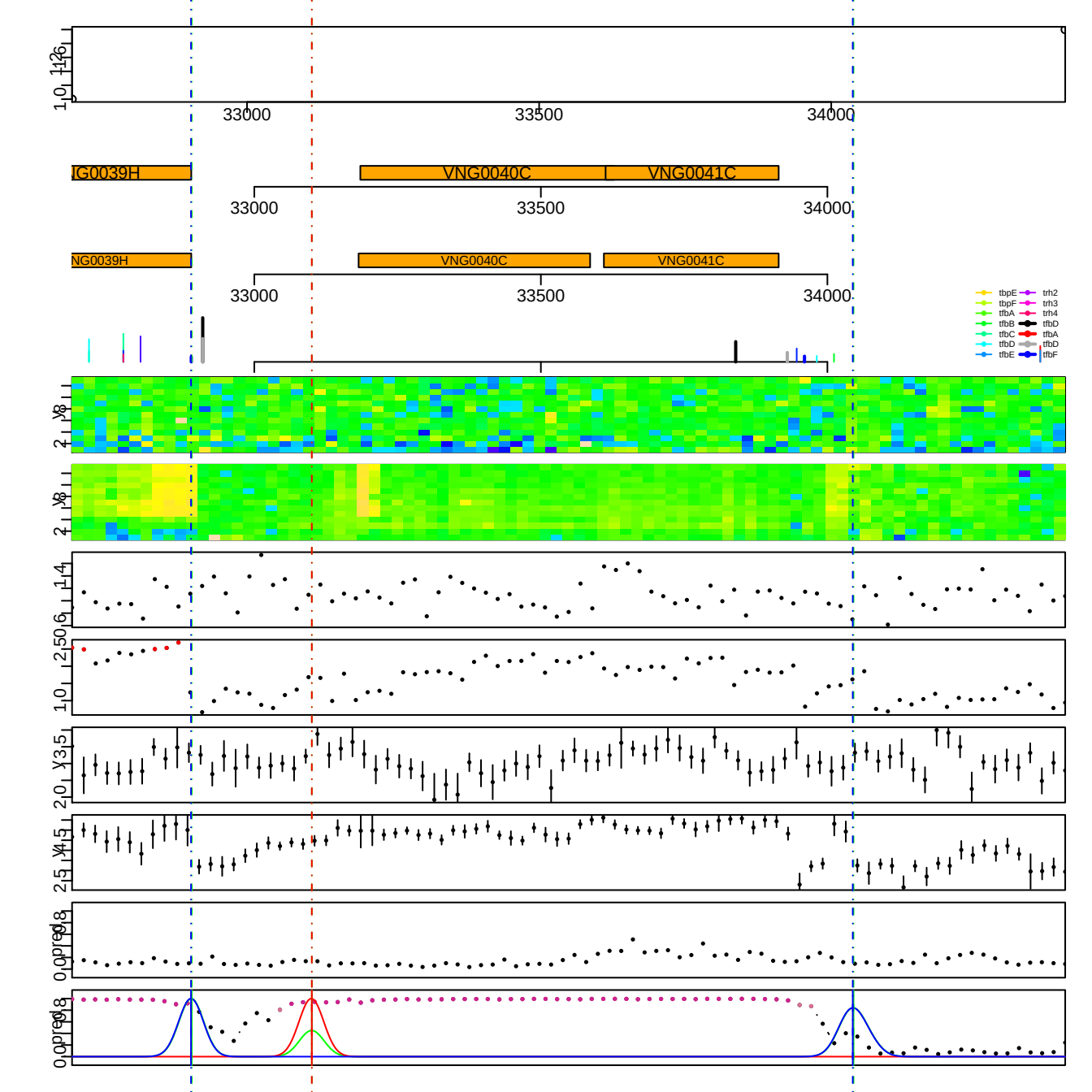
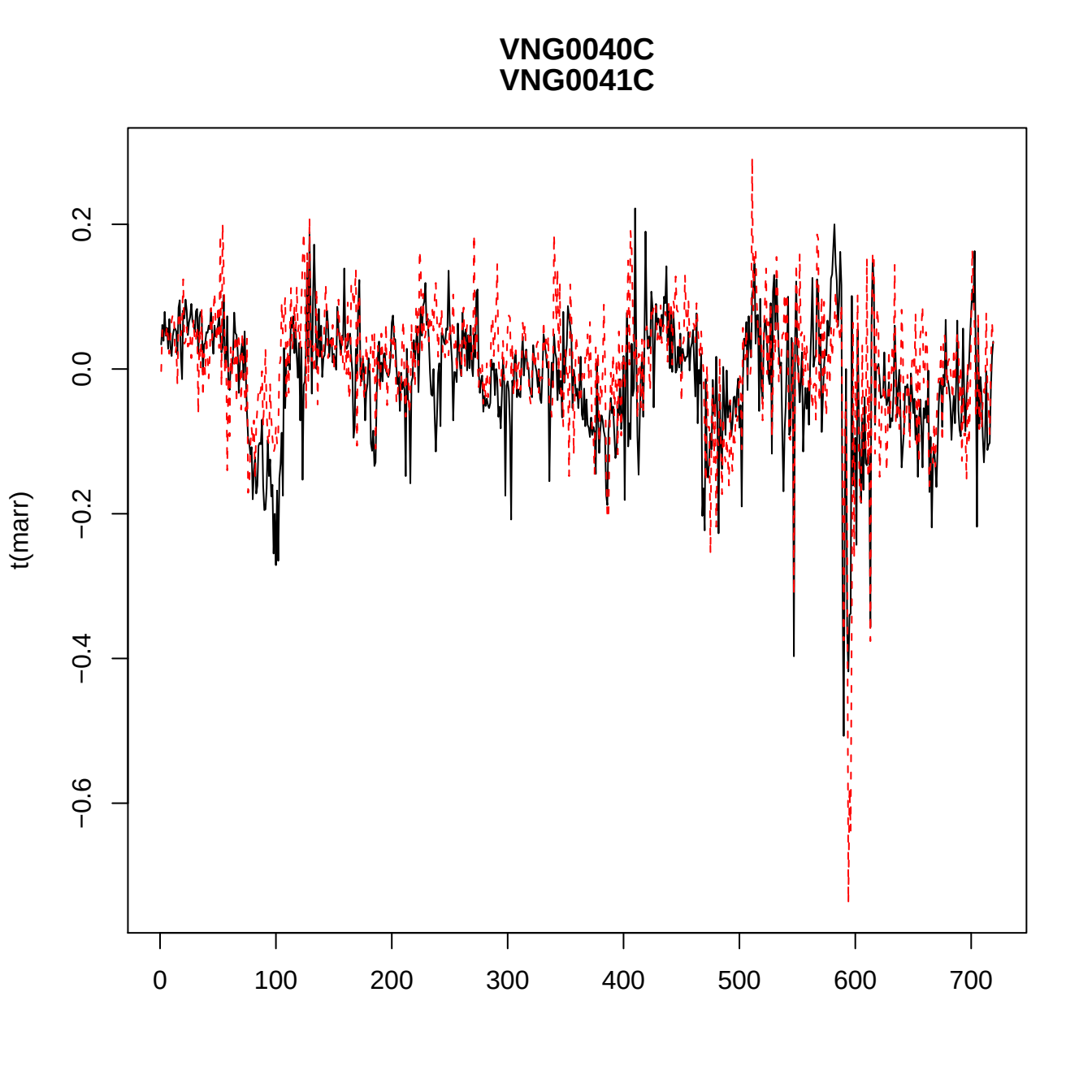
600
700


33000
33500
34000
IG0039H
VNG0040C
VNG0041C
NG0039H
VNG0040C
VNG0041C
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0040C
VNG0041C
t(marr)
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0.0
−0.2
−0.4
−0.6
0
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400
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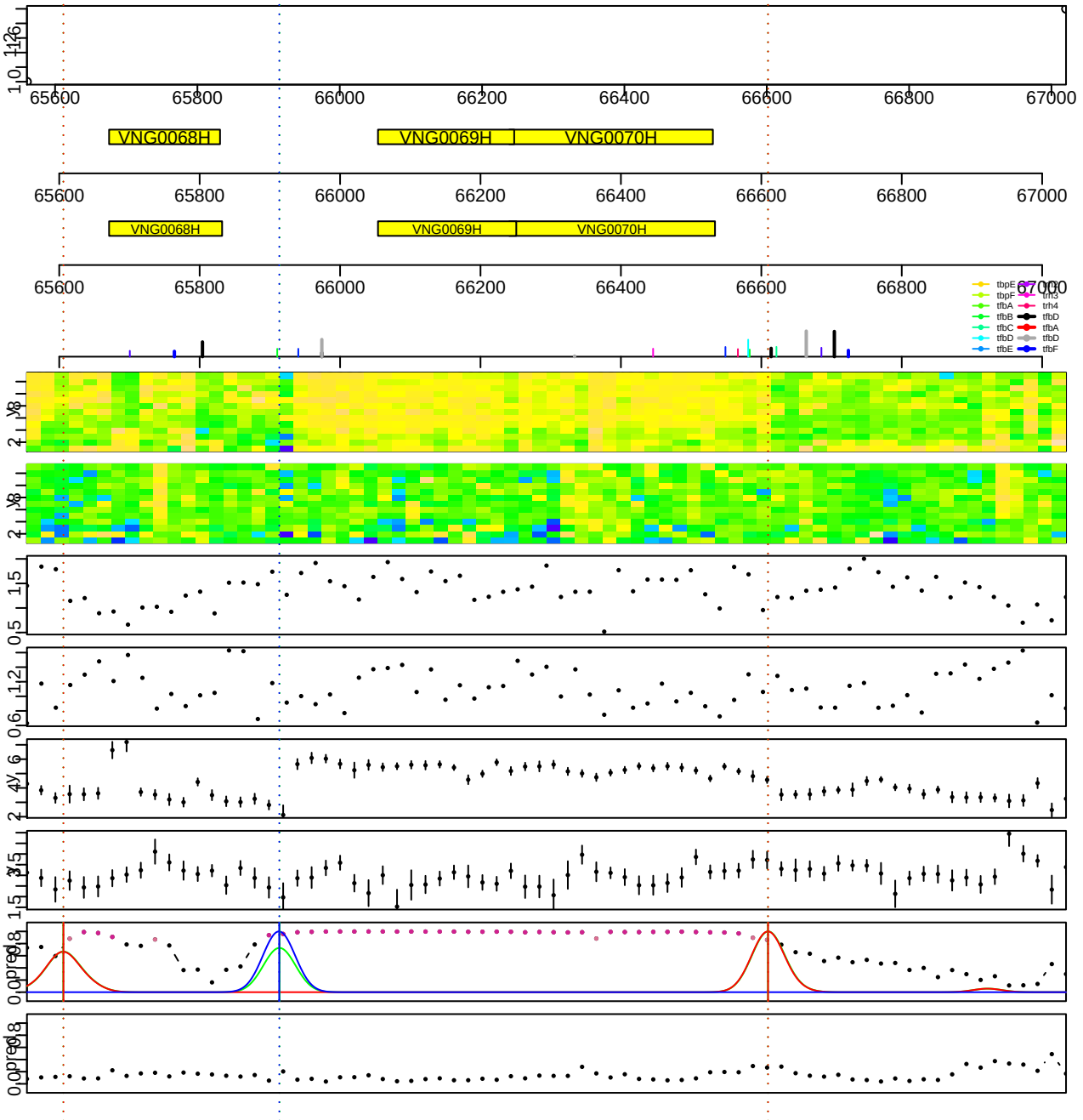
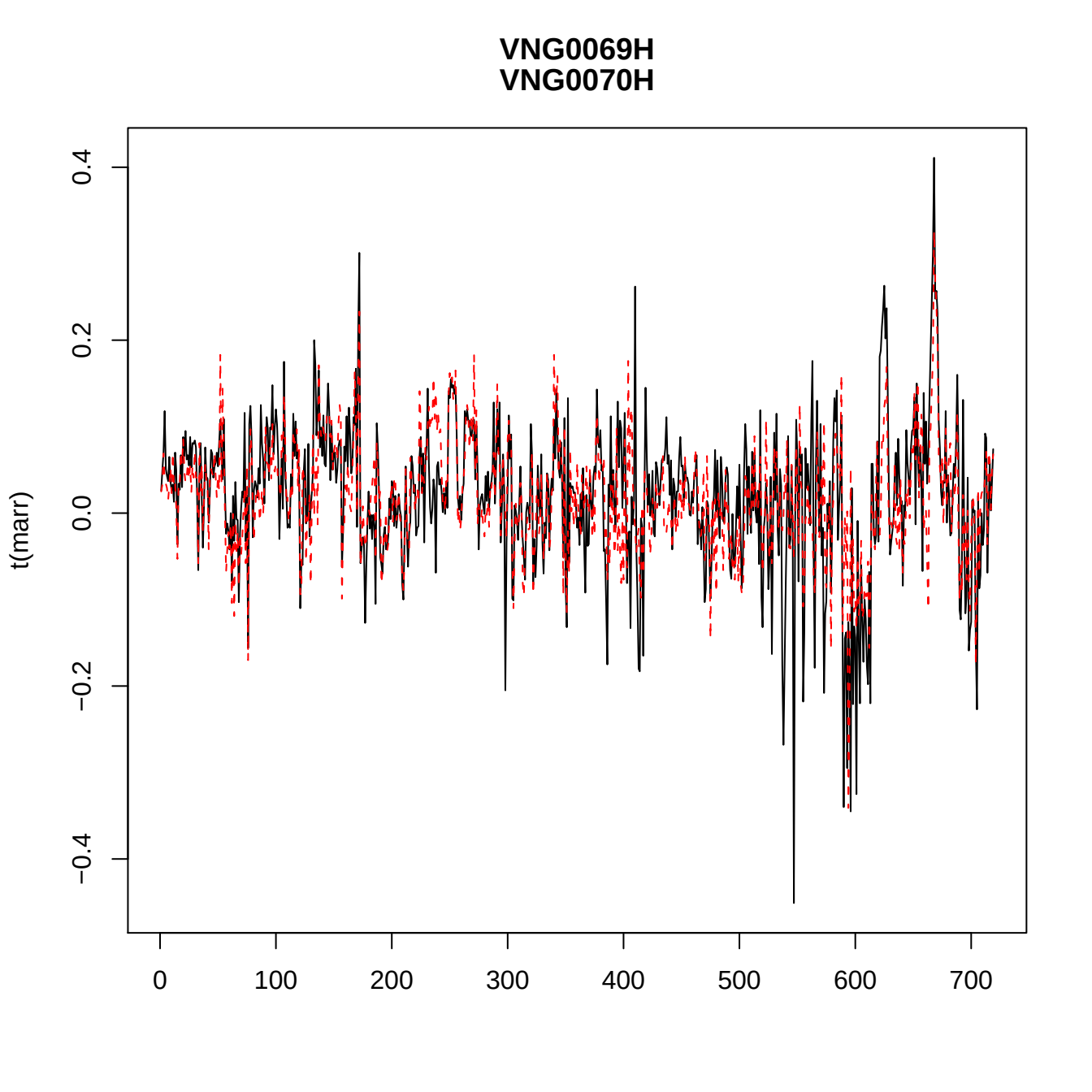
600
700


65600
65800
66000
66200
66400
66600
66800
67000
VNG0068H
VNG0069H
VNG0070H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0069H
VNG0070H
t(marr)
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0.2
0.0
−0.2
−0.4
0
100
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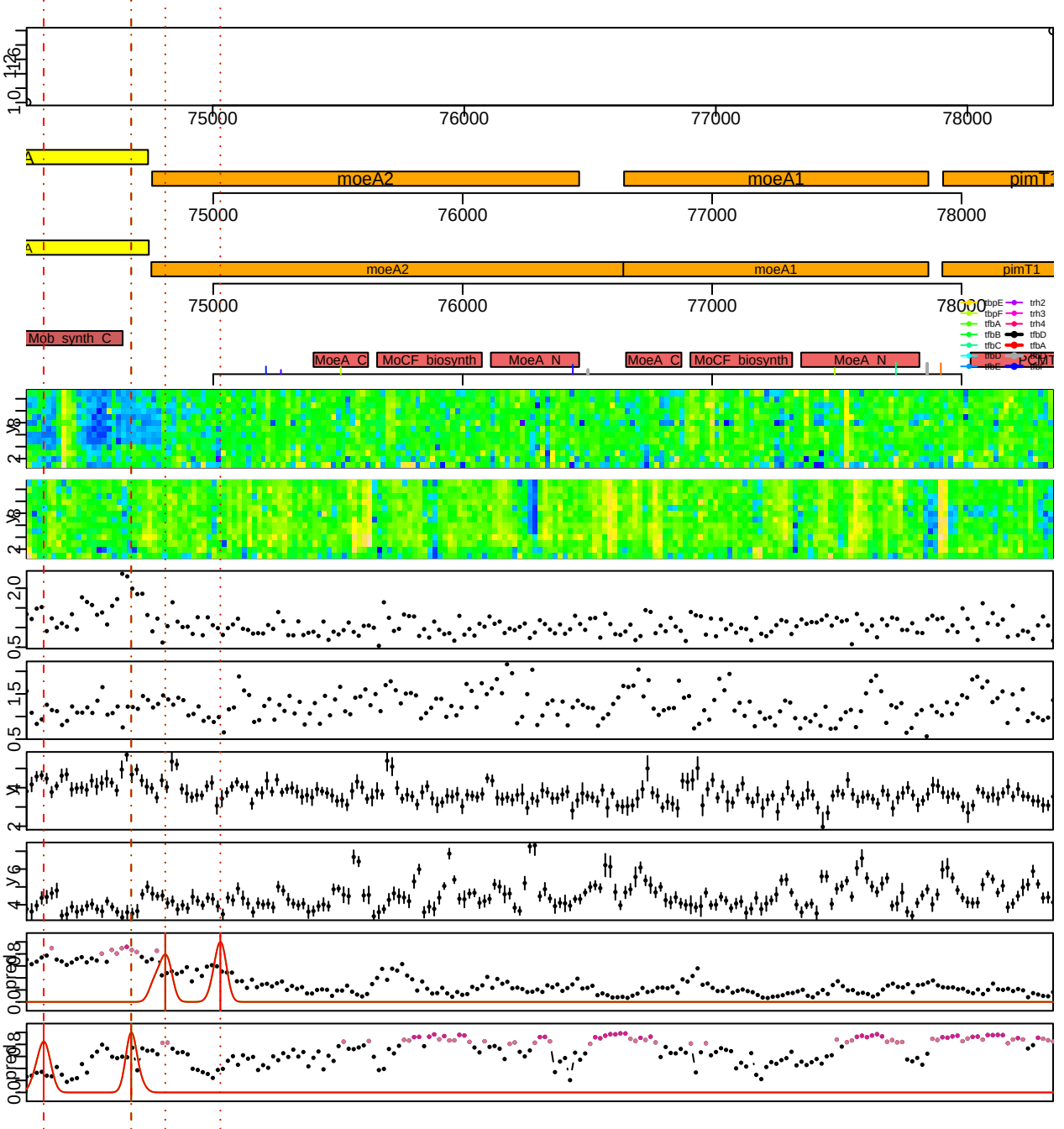
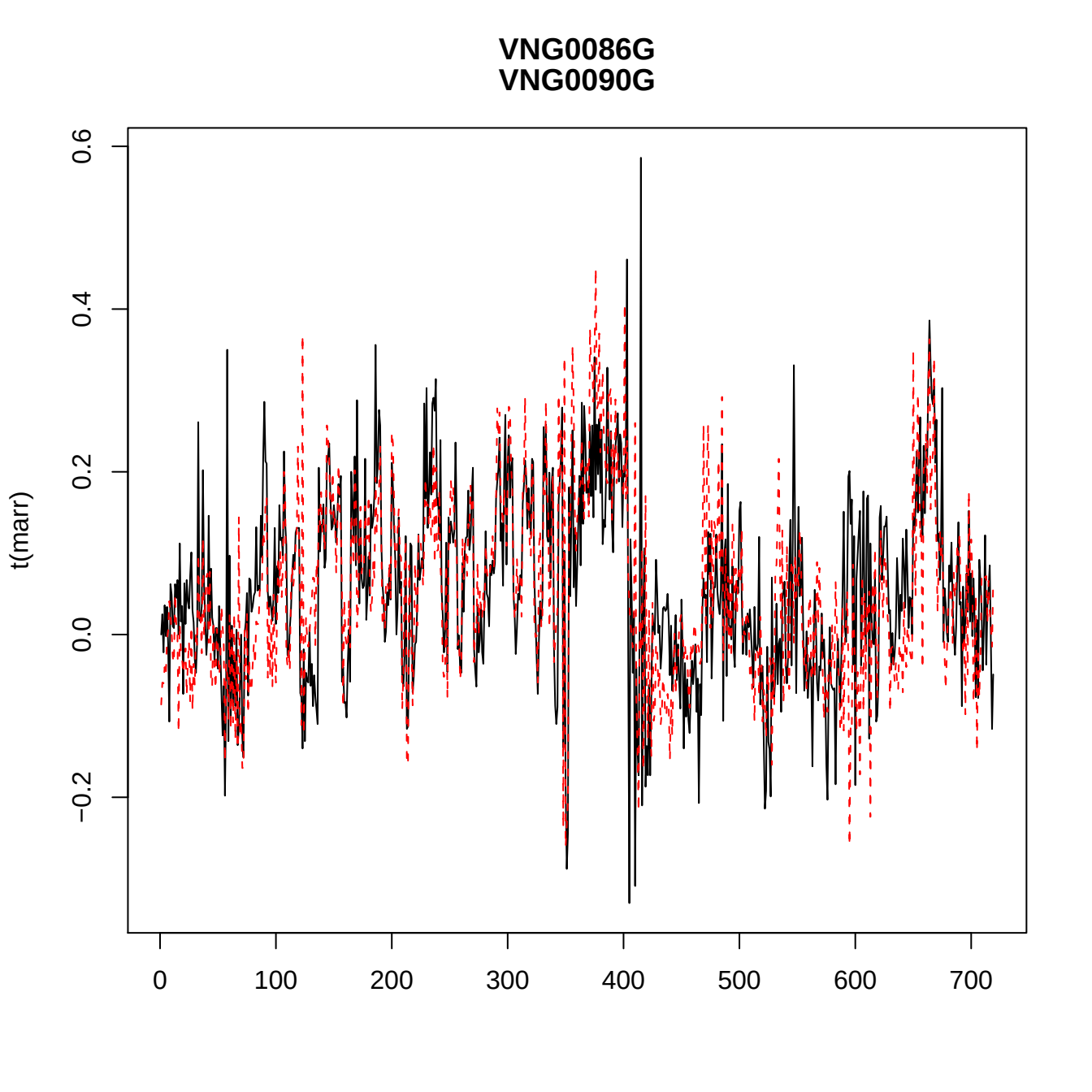
300
400
500
600
700



75000
76000
77000
78000
moeA2
moeA1
pimT1
Mob_synth_C
MoeA_C
MoCF_biosynth
MoeA_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA


VNG0086G
VNG0090G
t(marr)
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0.4
0.2
0.0
−0.2
0
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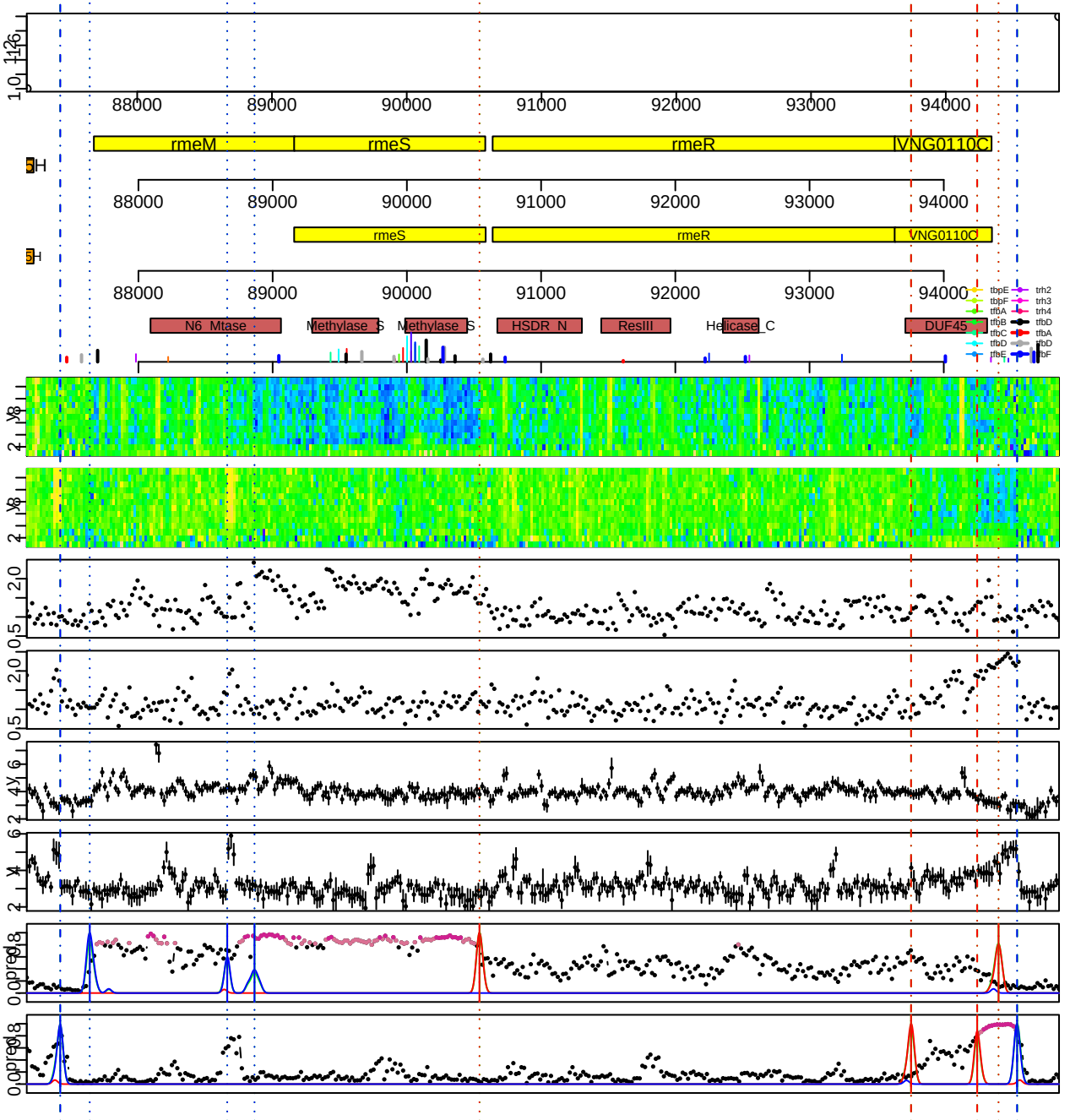
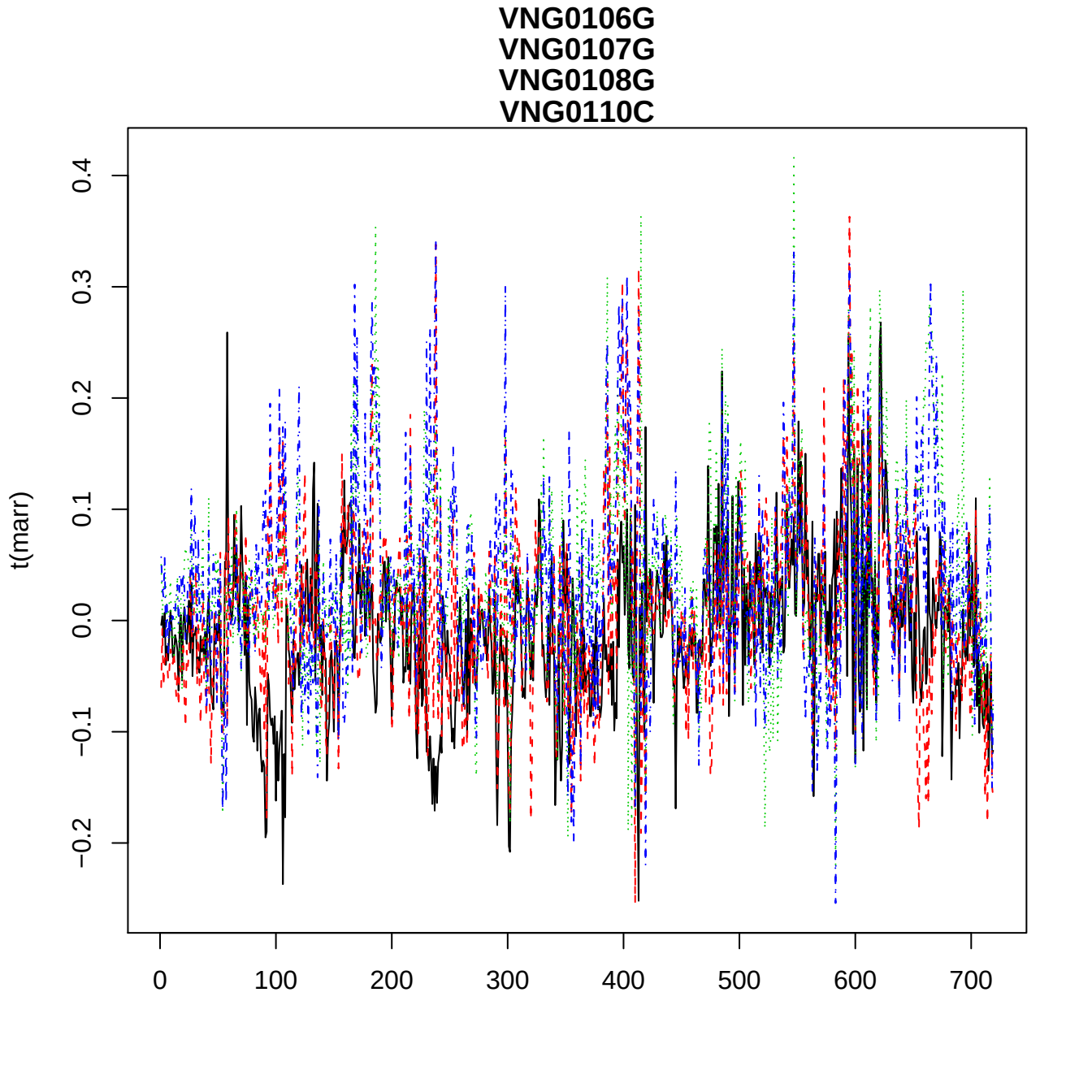
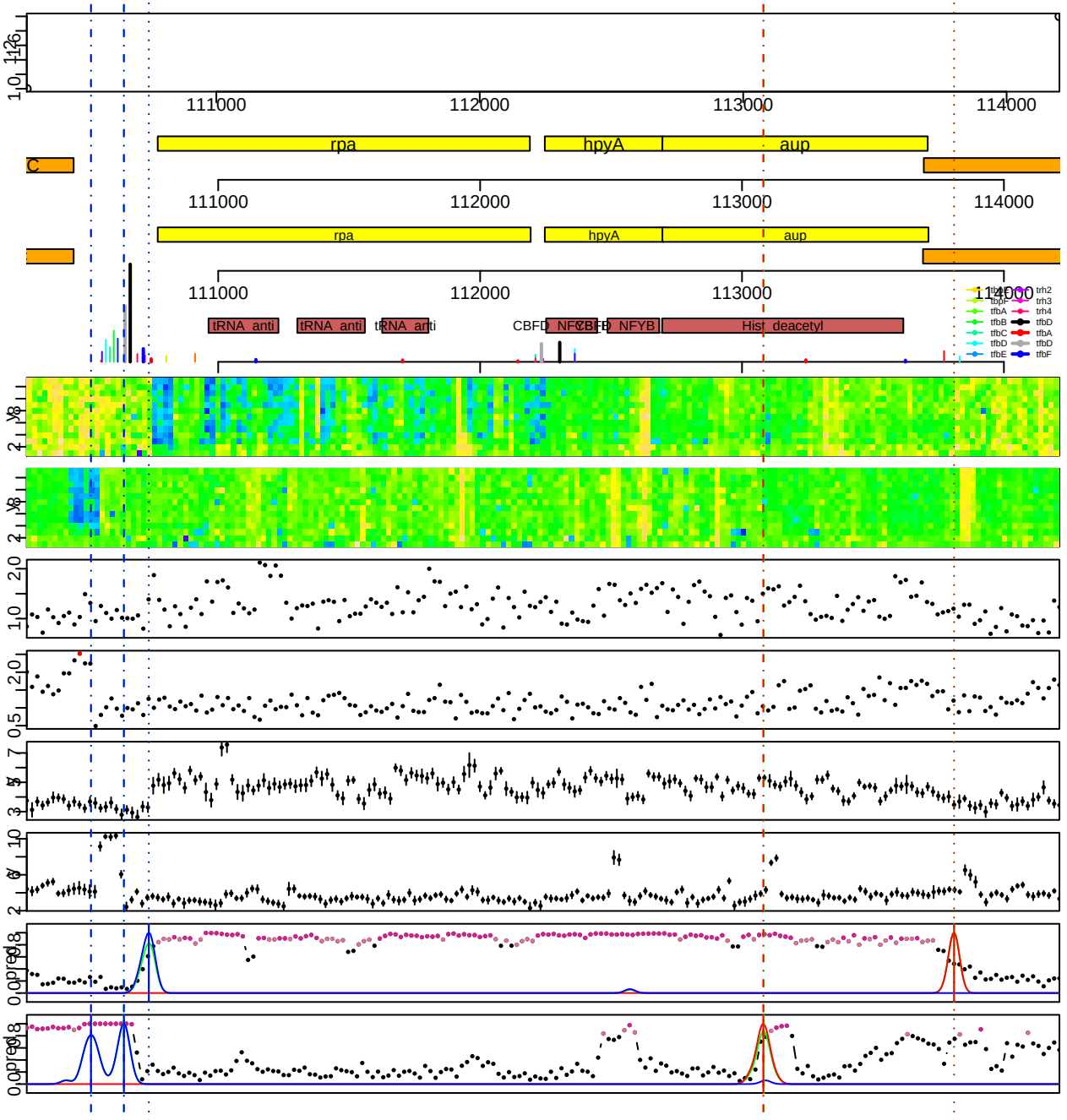
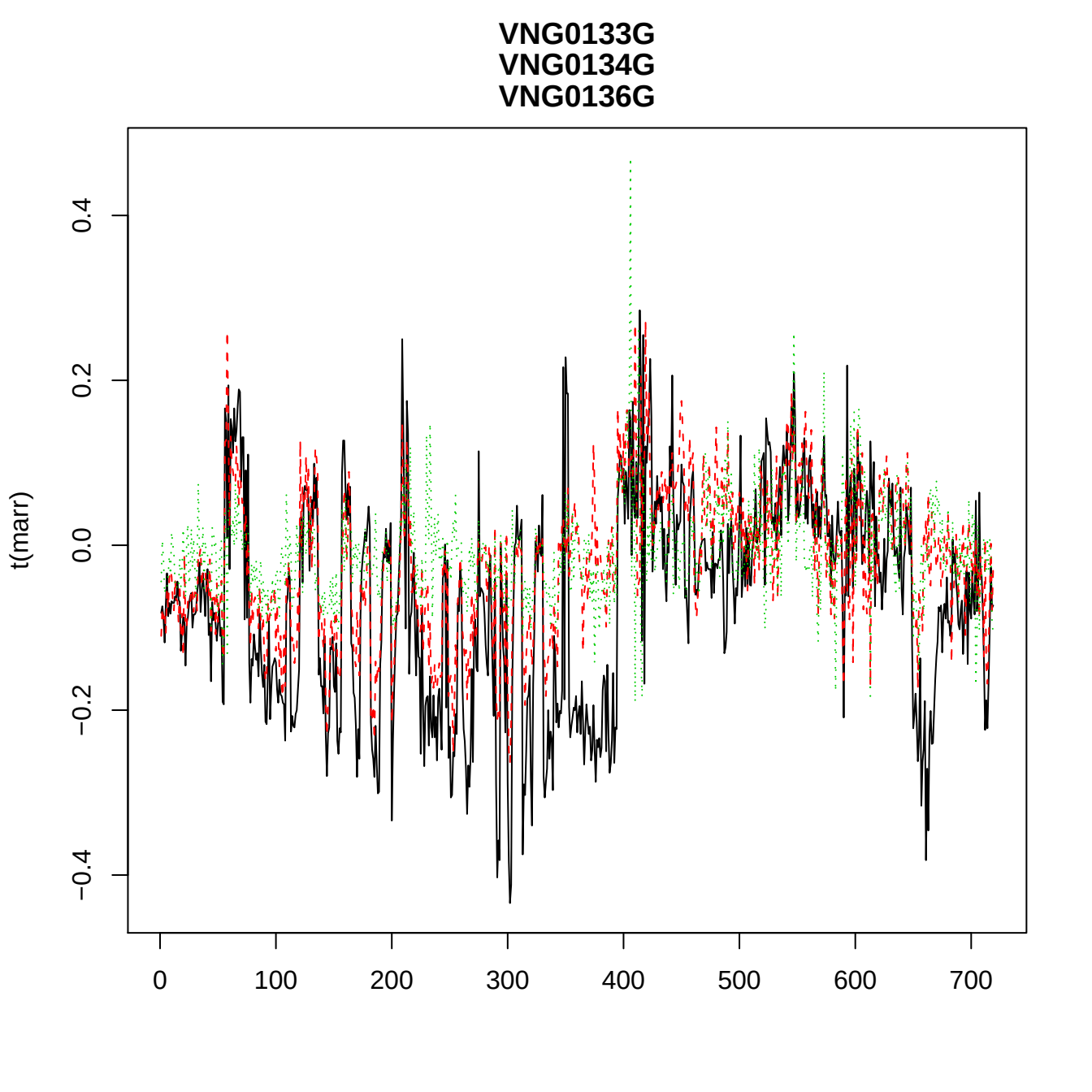
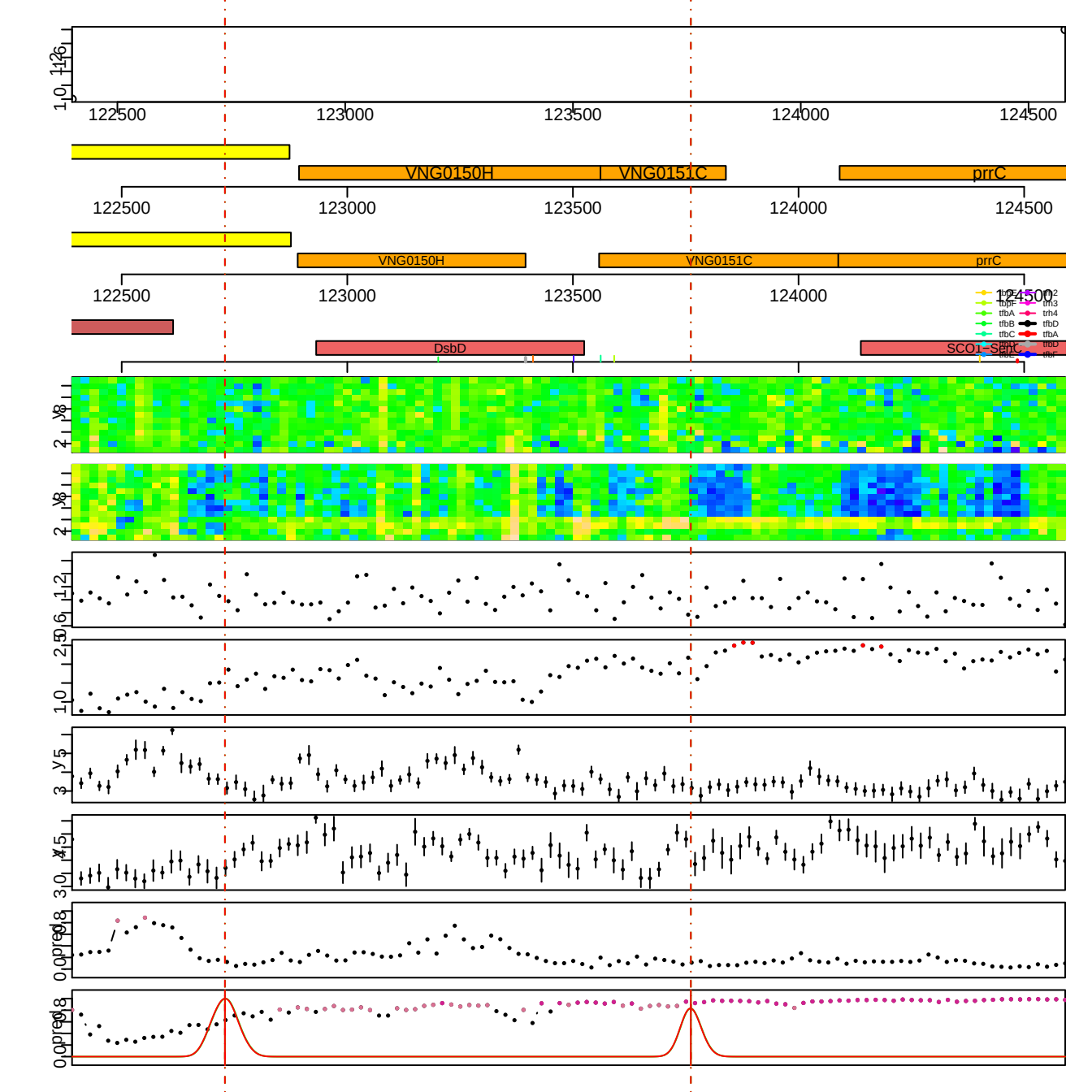
400
500
600
700

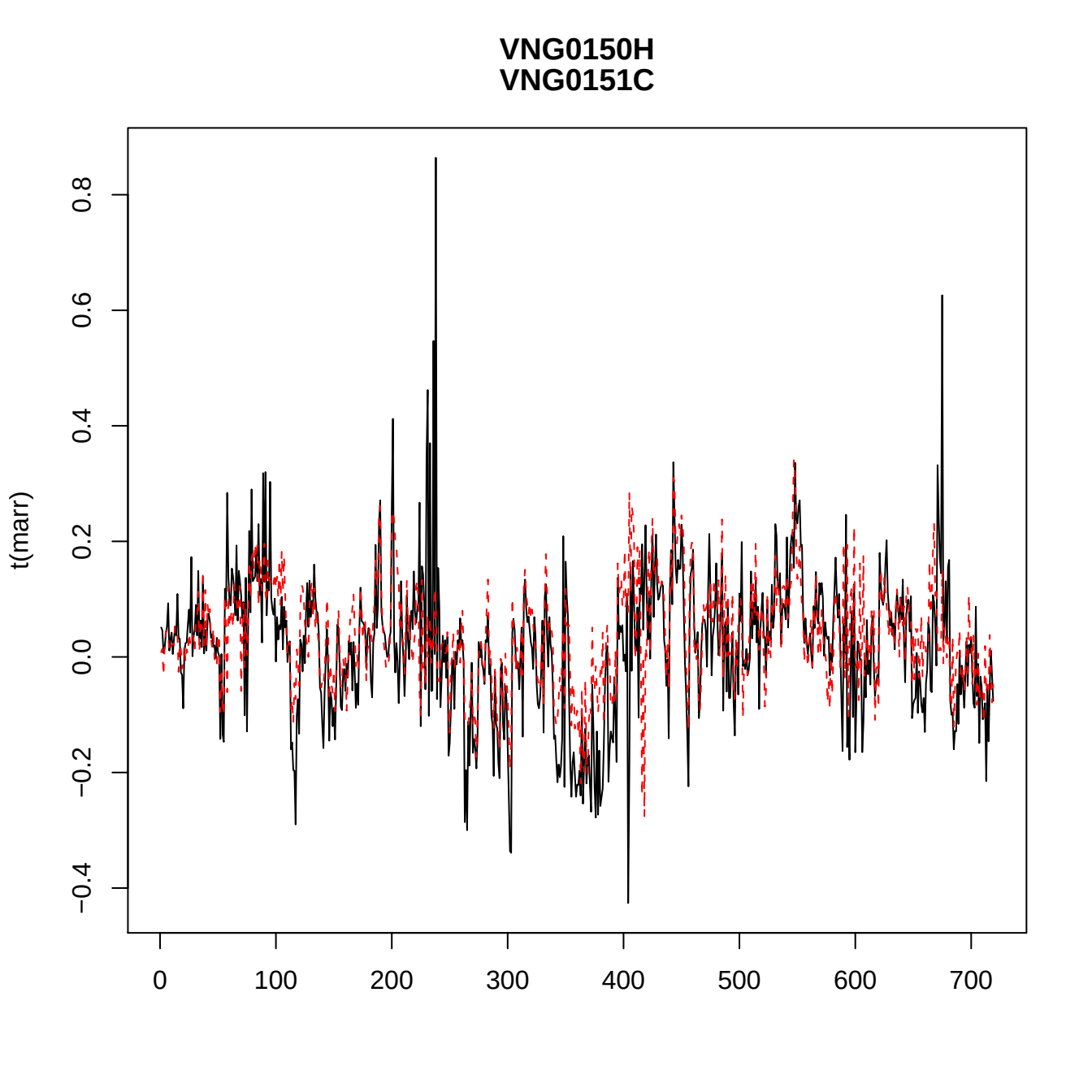

88000
89000
90000
91000
92000
93000
94000
rmeM
rmeS
rmeR
VNG0110C
N6_Mtase
Methylase_S
Methylase_S
HSDR_N
ResIII
Helicase_C
DUF45
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tbF
pred

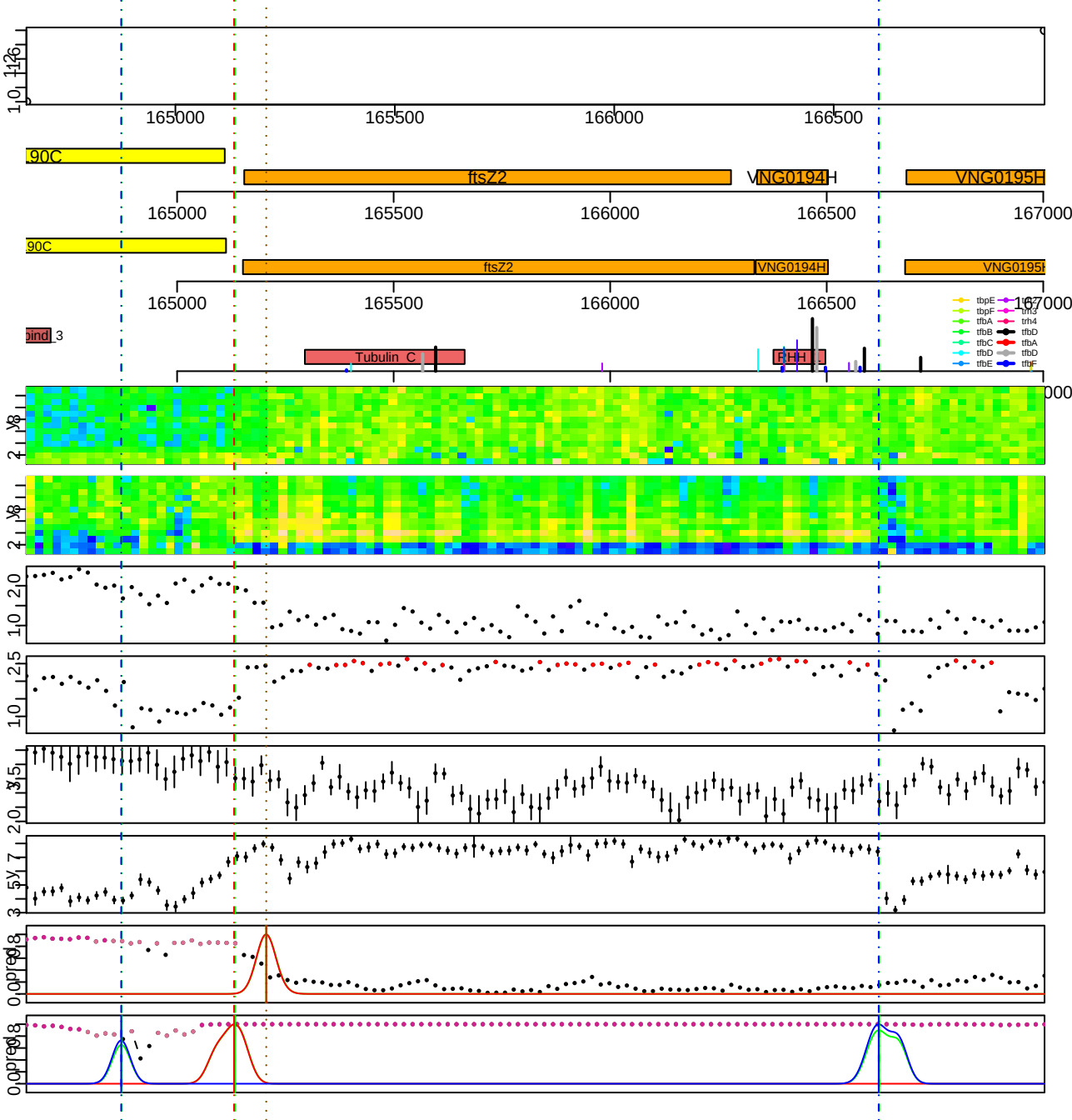

VNG0106G
VNG0107G
VNG0108G
VNG0110C
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

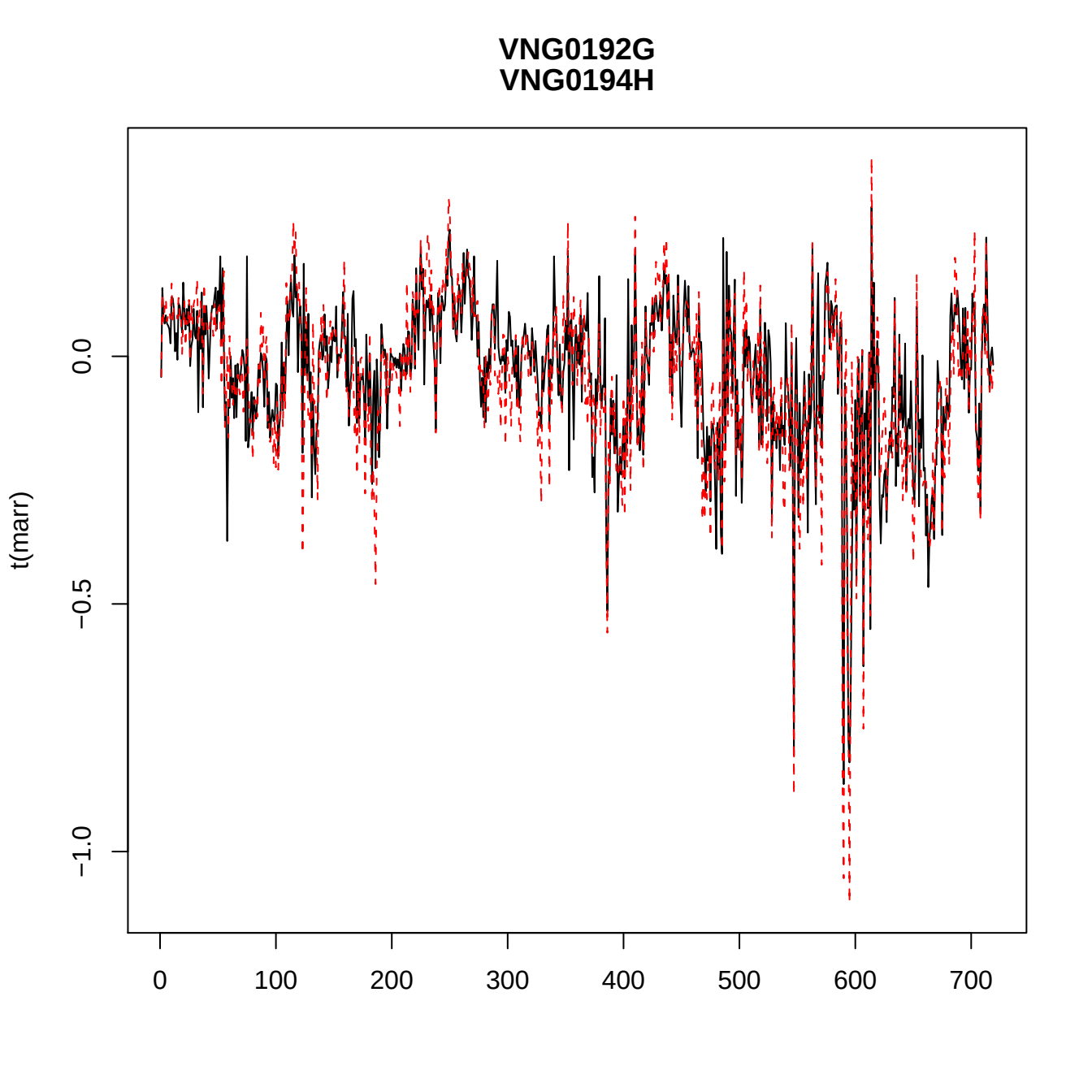

111000
112000
113000
114000
rpa
hpyA
aup
tRNA_anti
tRNA_anti
tRNA_anti
CBFD_NFYB
CBFD_NFYB
Hist_deacetyl
tbfE
tbfF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0133G
VNG0134G
VNG0136G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


122500
123000
123500
124000
124500
VNG0150H
VNG0151C
prrC
DsbD
SCO1-SenC
tbpC
tbpF
tfbA
tfbB
tfbC
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0150H
VNG0151C
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


165000
165500
166000
166500
167000
ftsZ2
VNG0194H
VNG0195H
Tubulin_C
RHH_1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh4
tfbD
tfbA
tfbD
tfbF


VNG0192G
VNG0194H
t(marr)
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−0.5
−1.0
0
100
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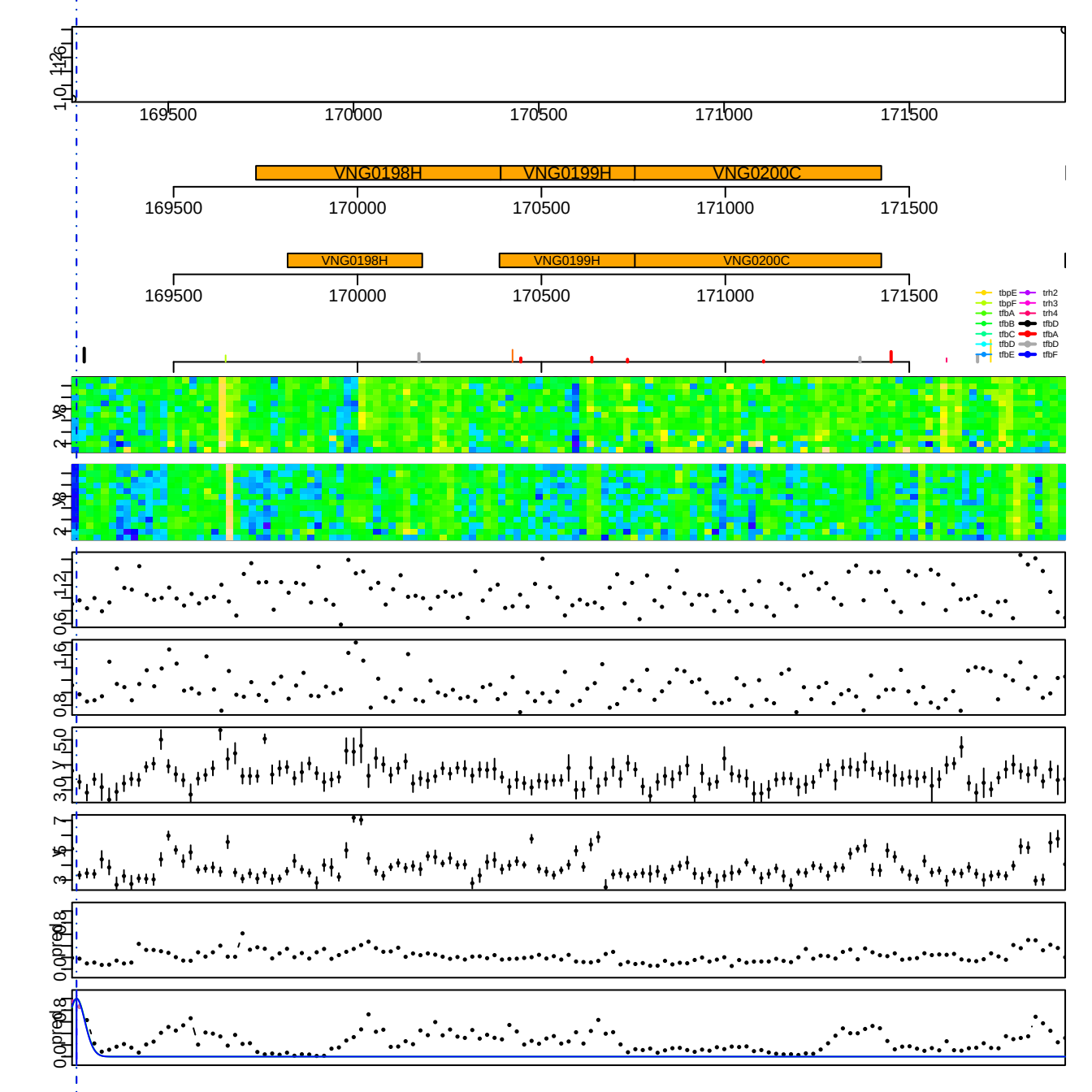
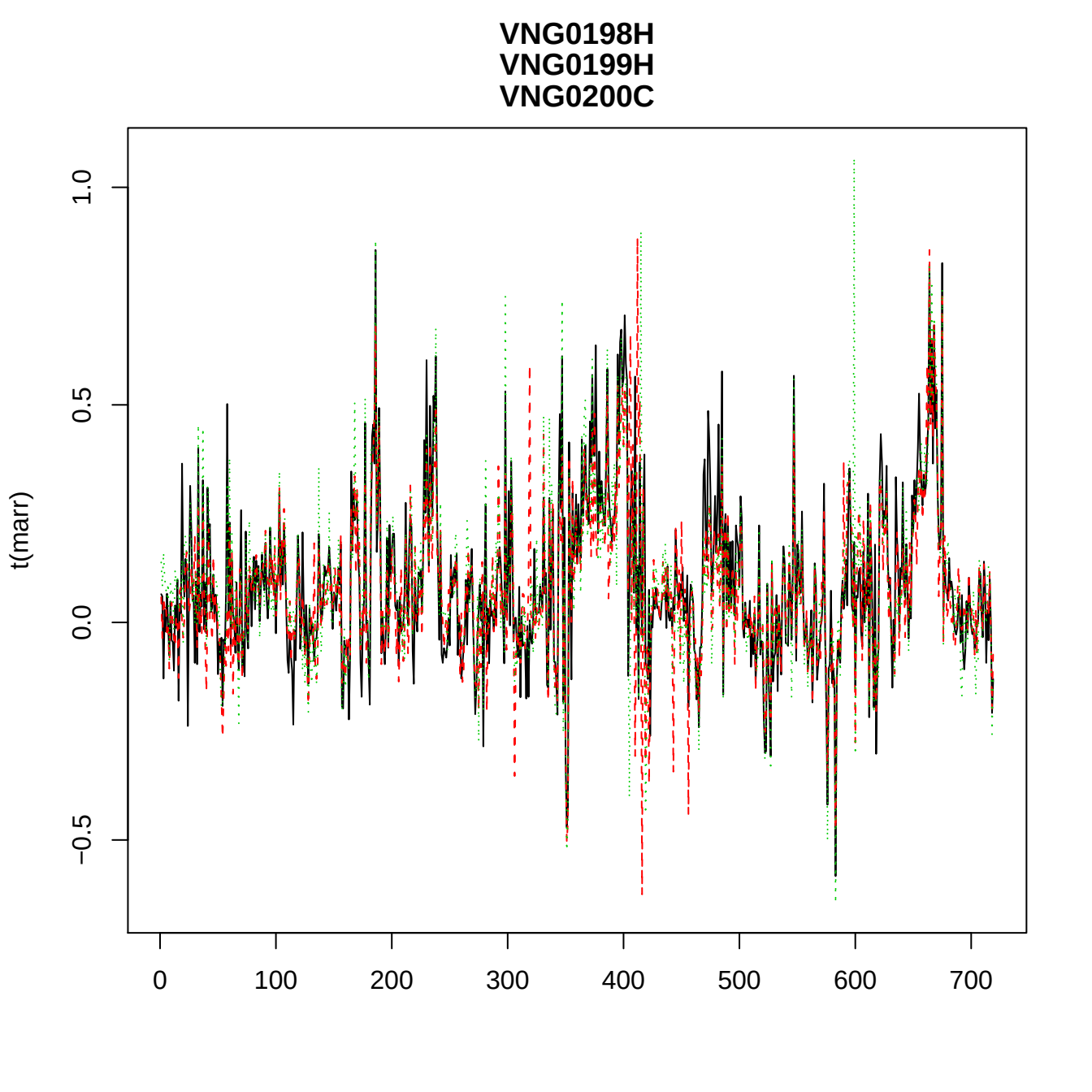
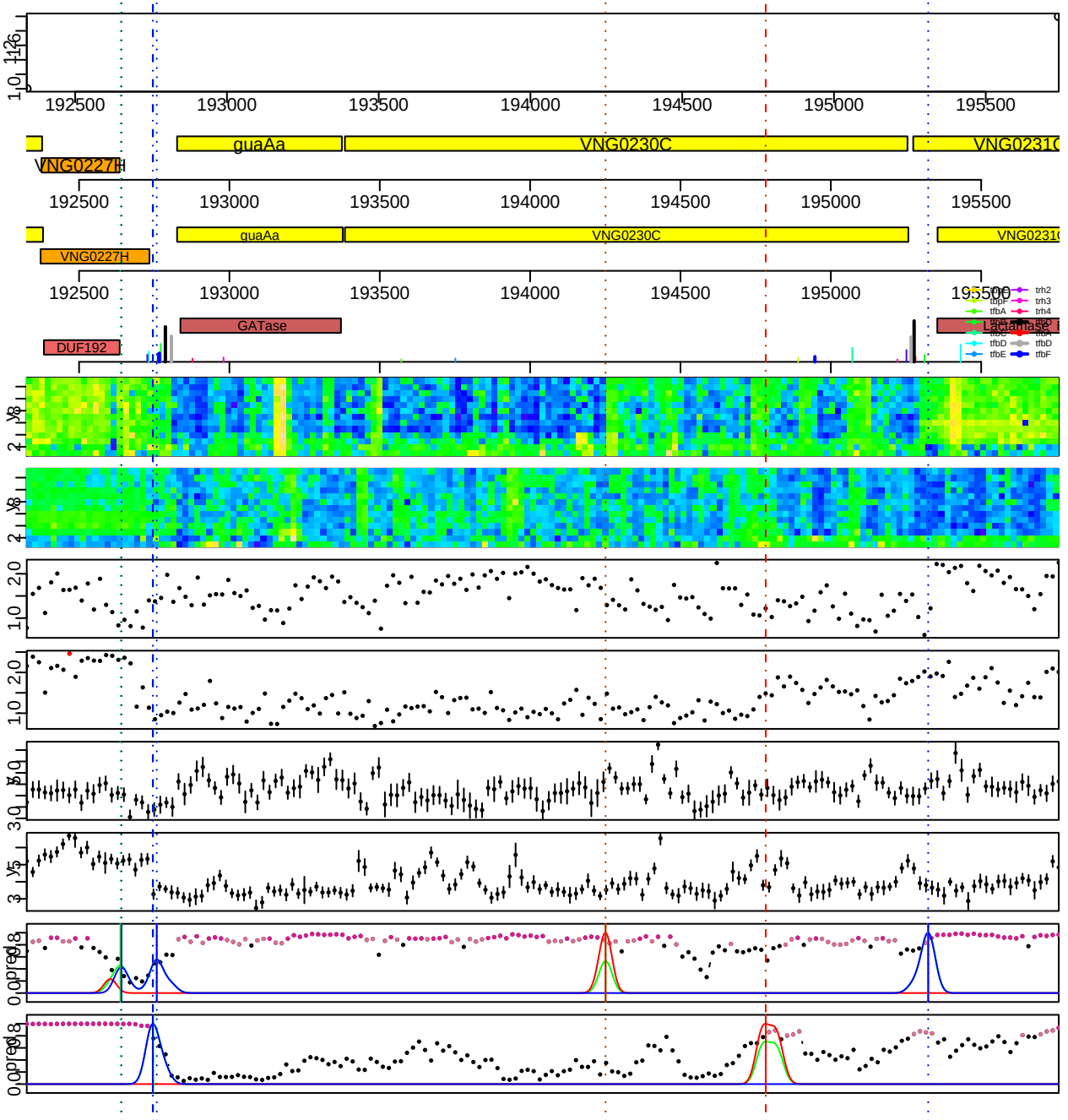
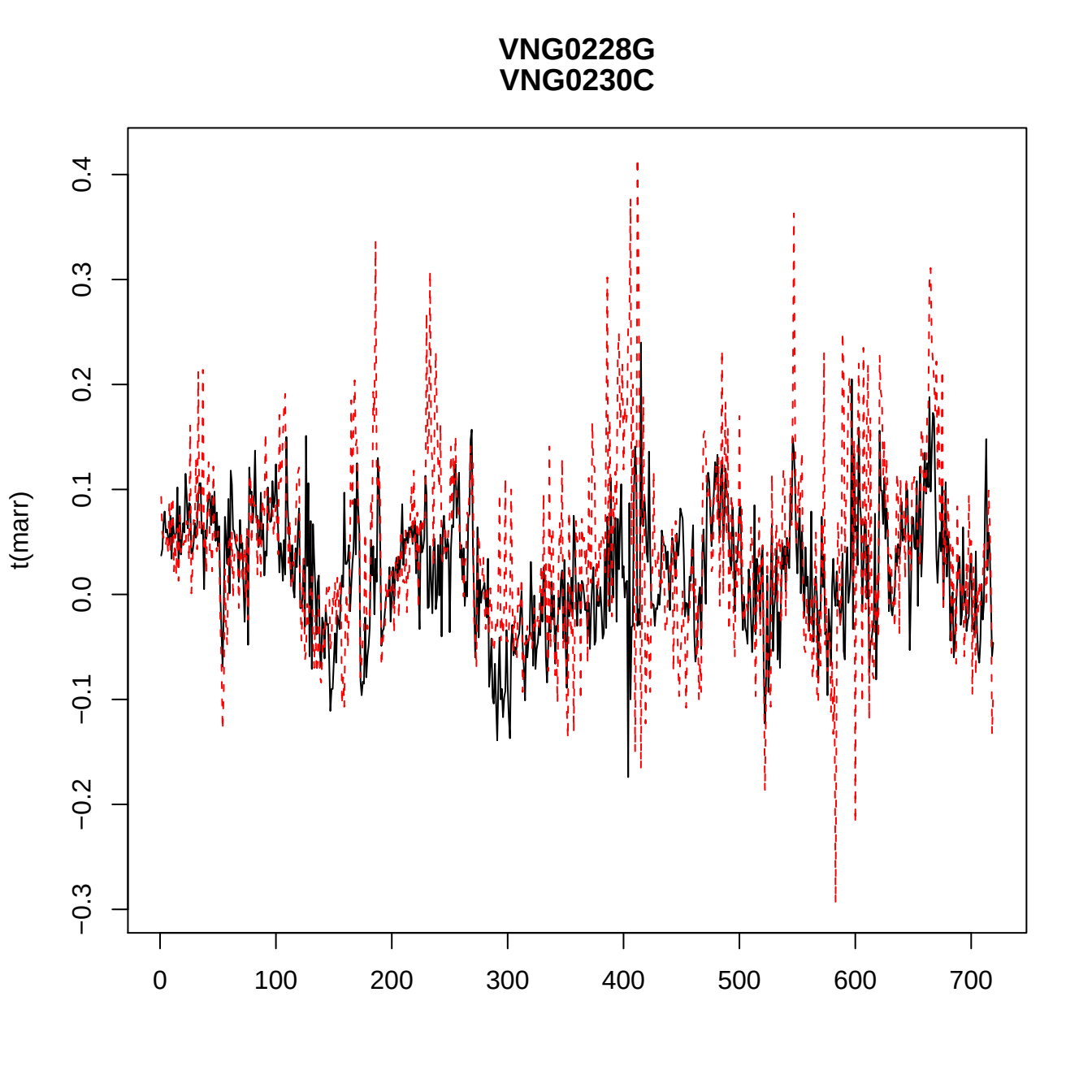
300
400
500
600
700


169500
170000
170500
171000
171500
VNG0198H
VNG0199H
VNG0200C
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0198H
VNG0199H
VNG0200C
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700


192500
193000
193500
194000
194500
195000
195500
guaAa
VNG0230C
VNG0227H
DUF192
GATase
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
pred


VNG0228G
VNG0230C
t(marr)
0.4
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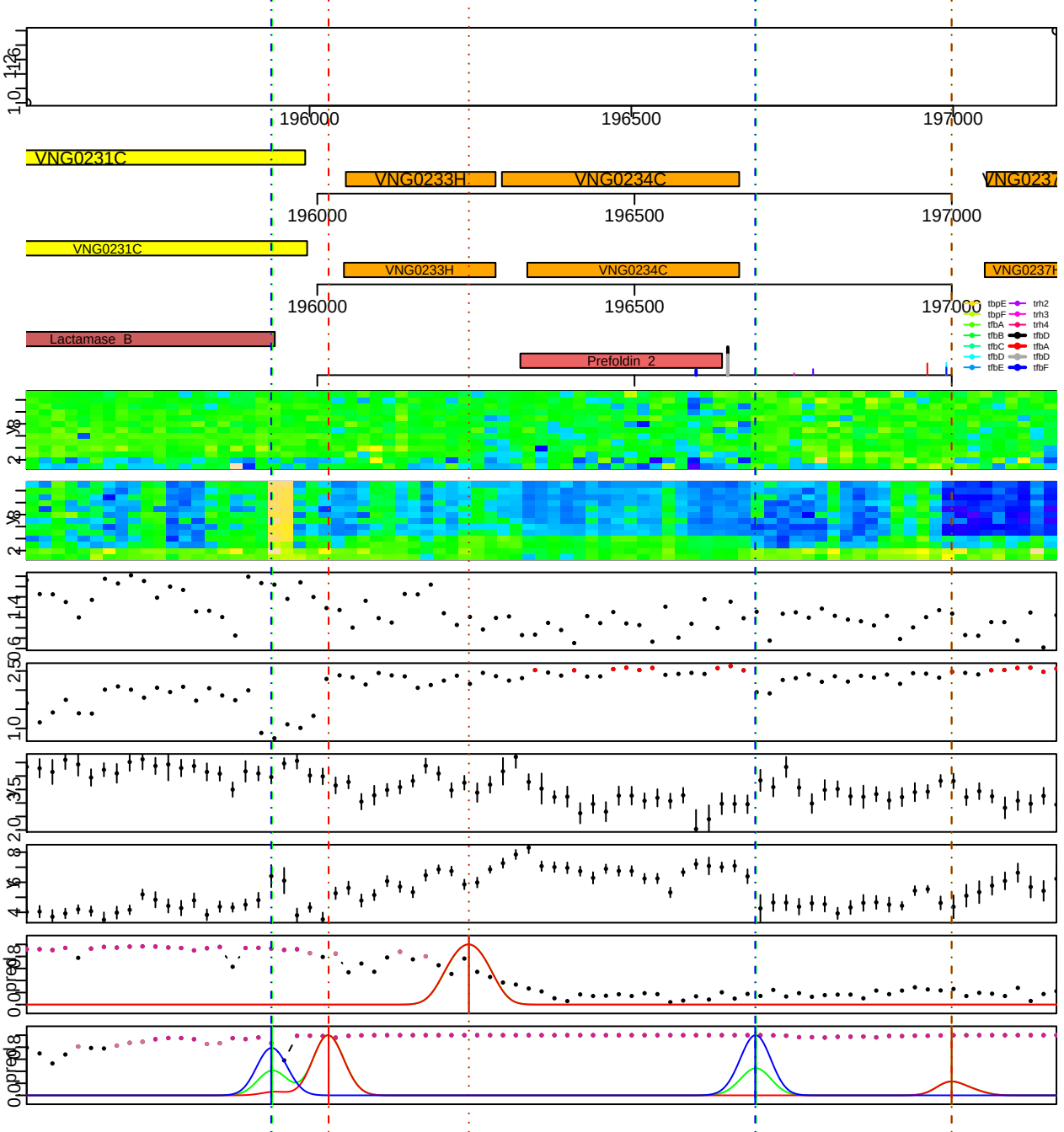
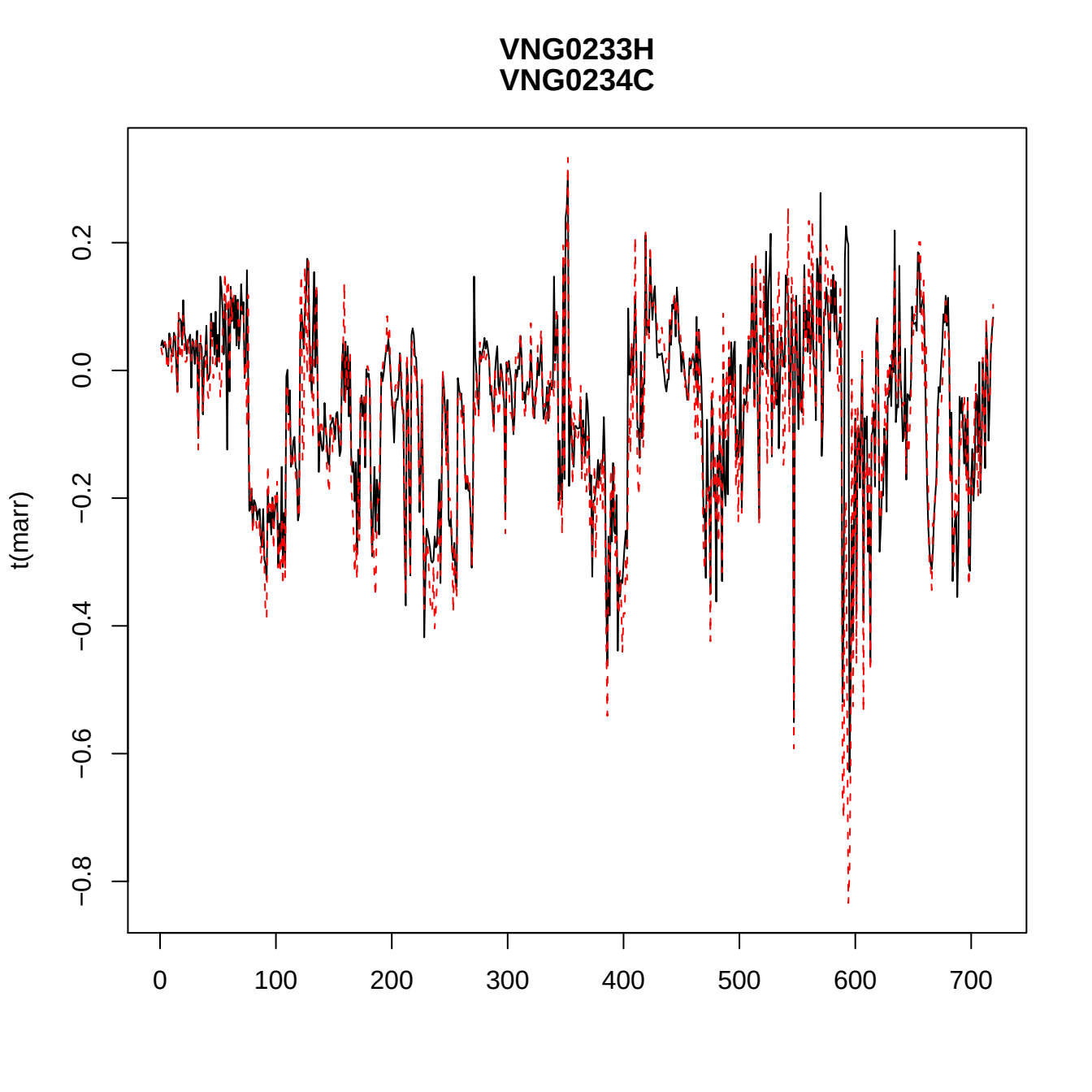
0.2
0.1
0.0
−0.1
−0.2
−0.3
0
100
200
300
400
500
600
700


196000
196500
197000
VNG0231C
VNG0233H
VNG0234C
VNG0237
Lactamase_B
Prefoldin_2
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0233H
VNG0234C
t(marr)
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−0.4
−0.6
−0.8
0
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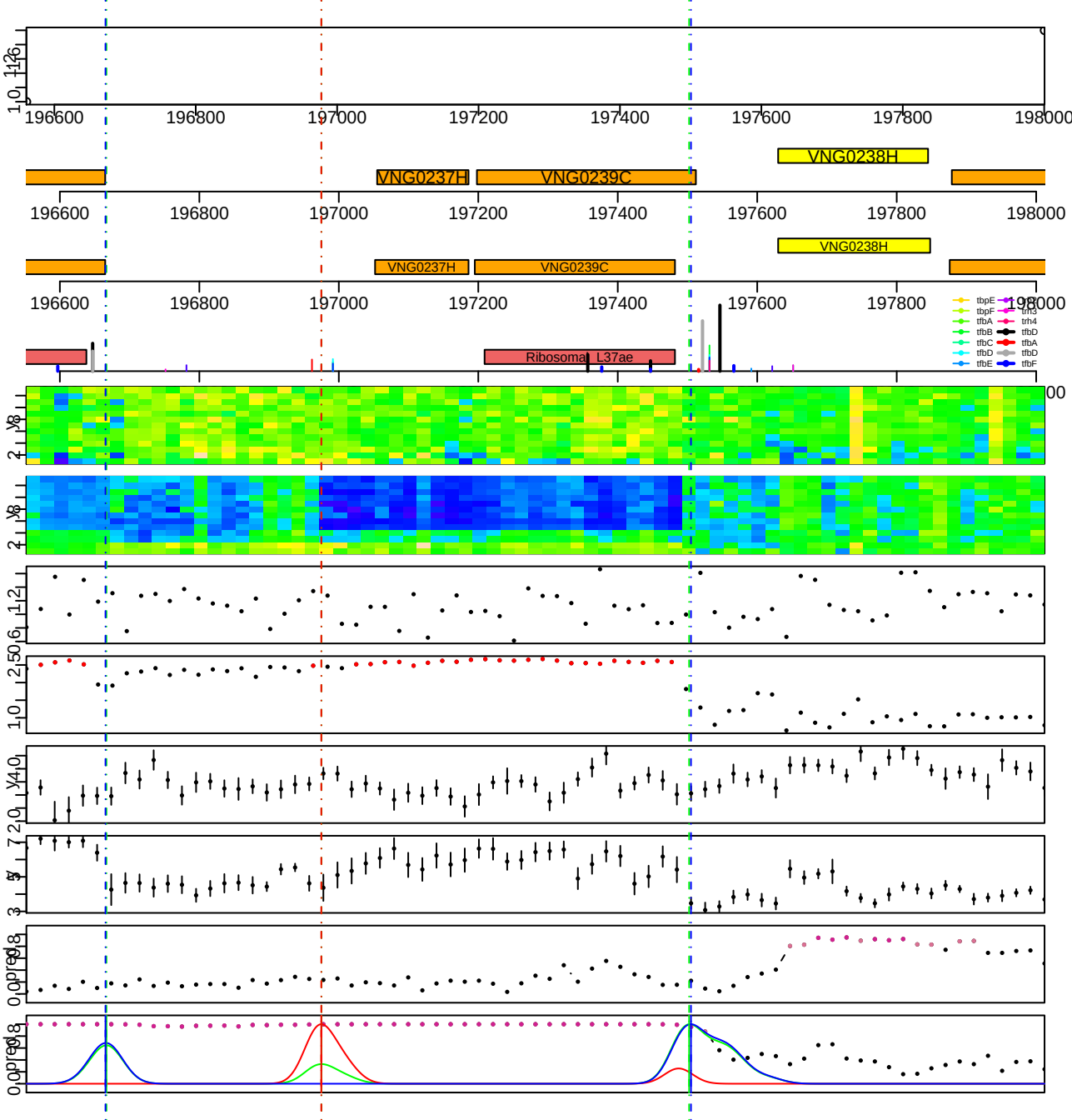
400
500
600
700


196600
196800
197000
197200
197400
197600
197800
198000
VNG0238H
VNG0237H
VNG0239C
Ribosomal_L37ae
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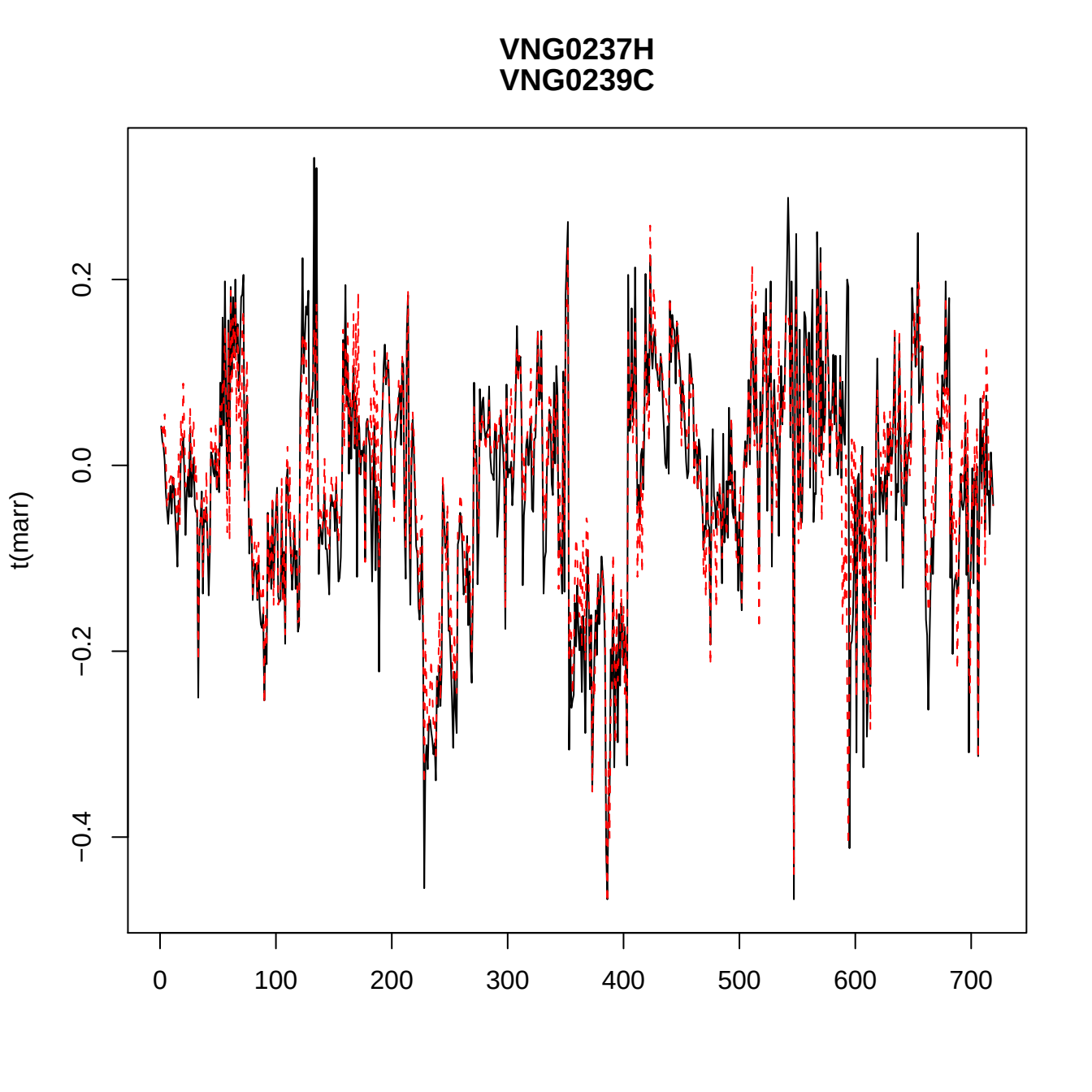
tbpF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0237H
VNG0239C
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−0.4
0
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400
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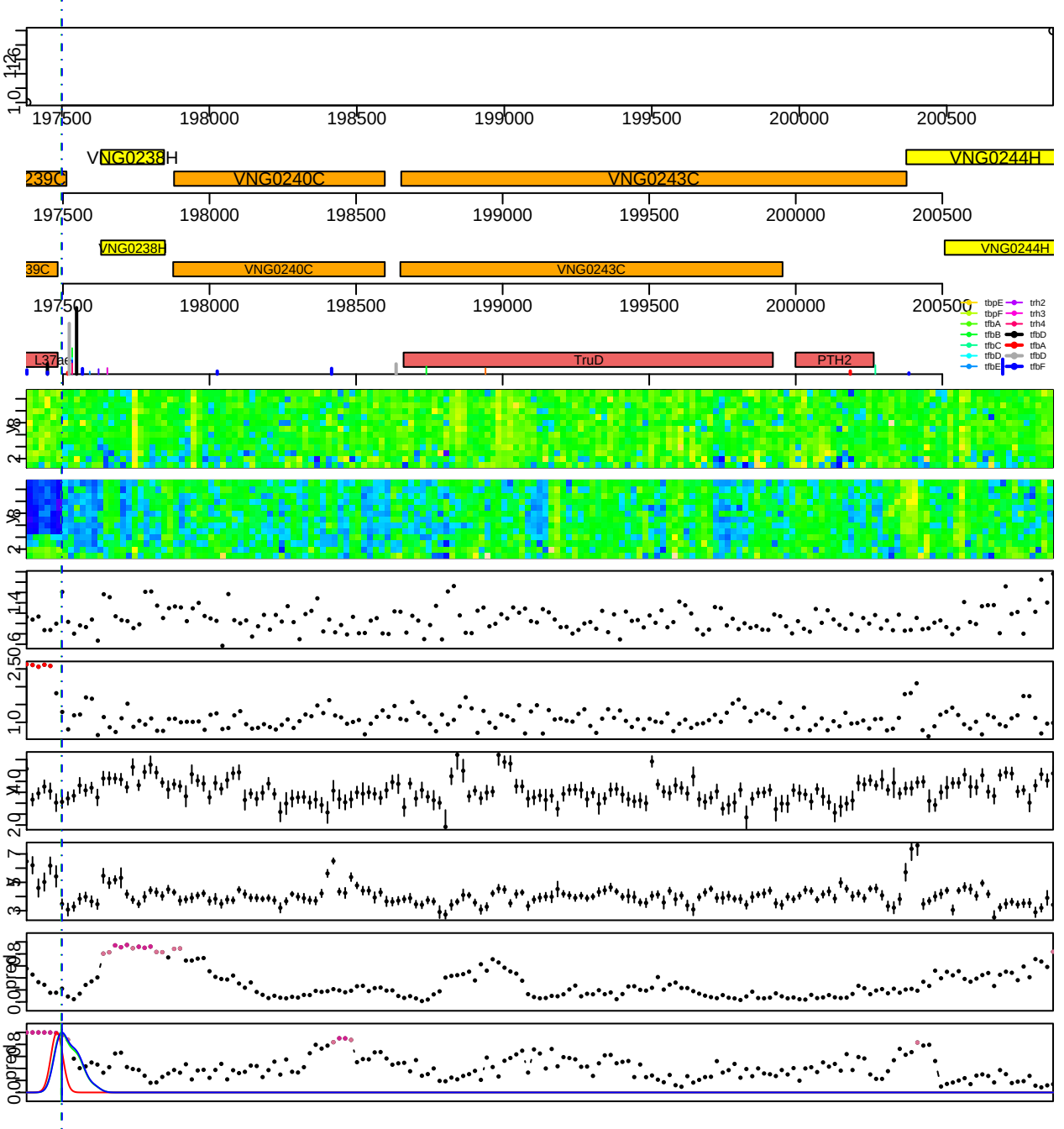
600
700


197500
198000
198500
199000
199500
200000
200500
VNG0238H
VNG0240C
VNG0243C
VNG0244H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
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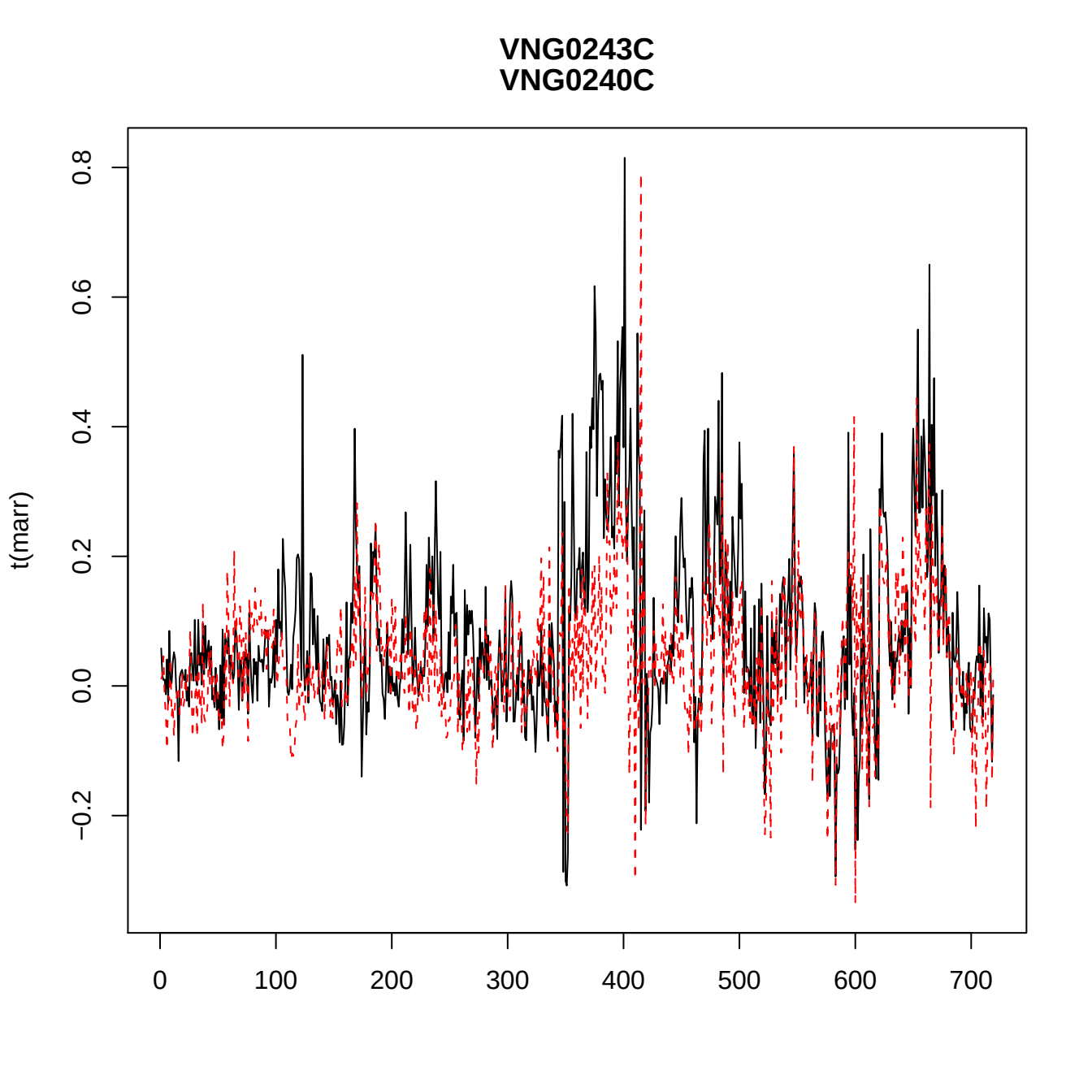
tfbA
tfbD
tfbF
TruD
PTH2


VNG0243C
VNG0240C
t(marr)
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0.6
0.4
0.2
0.0
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0
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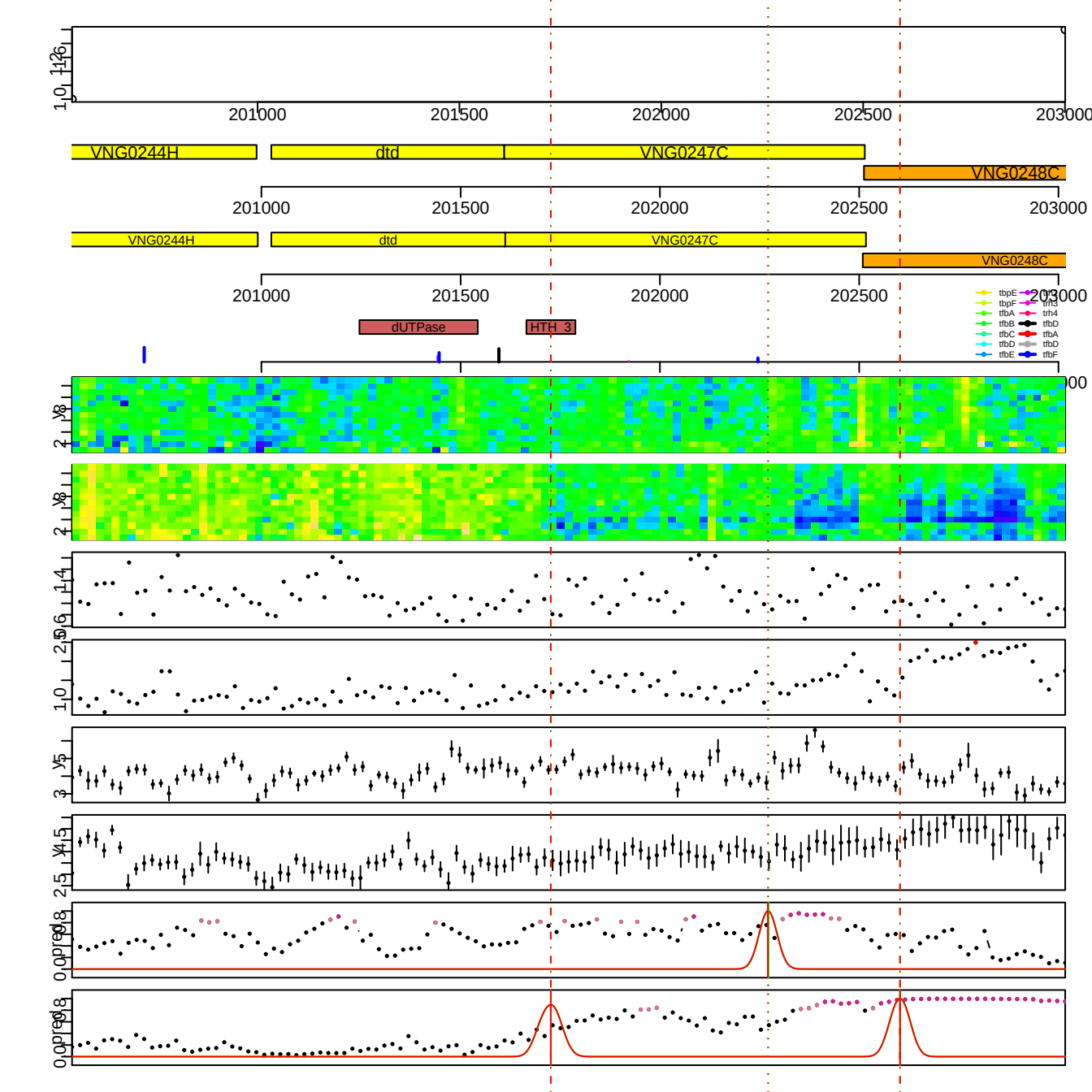
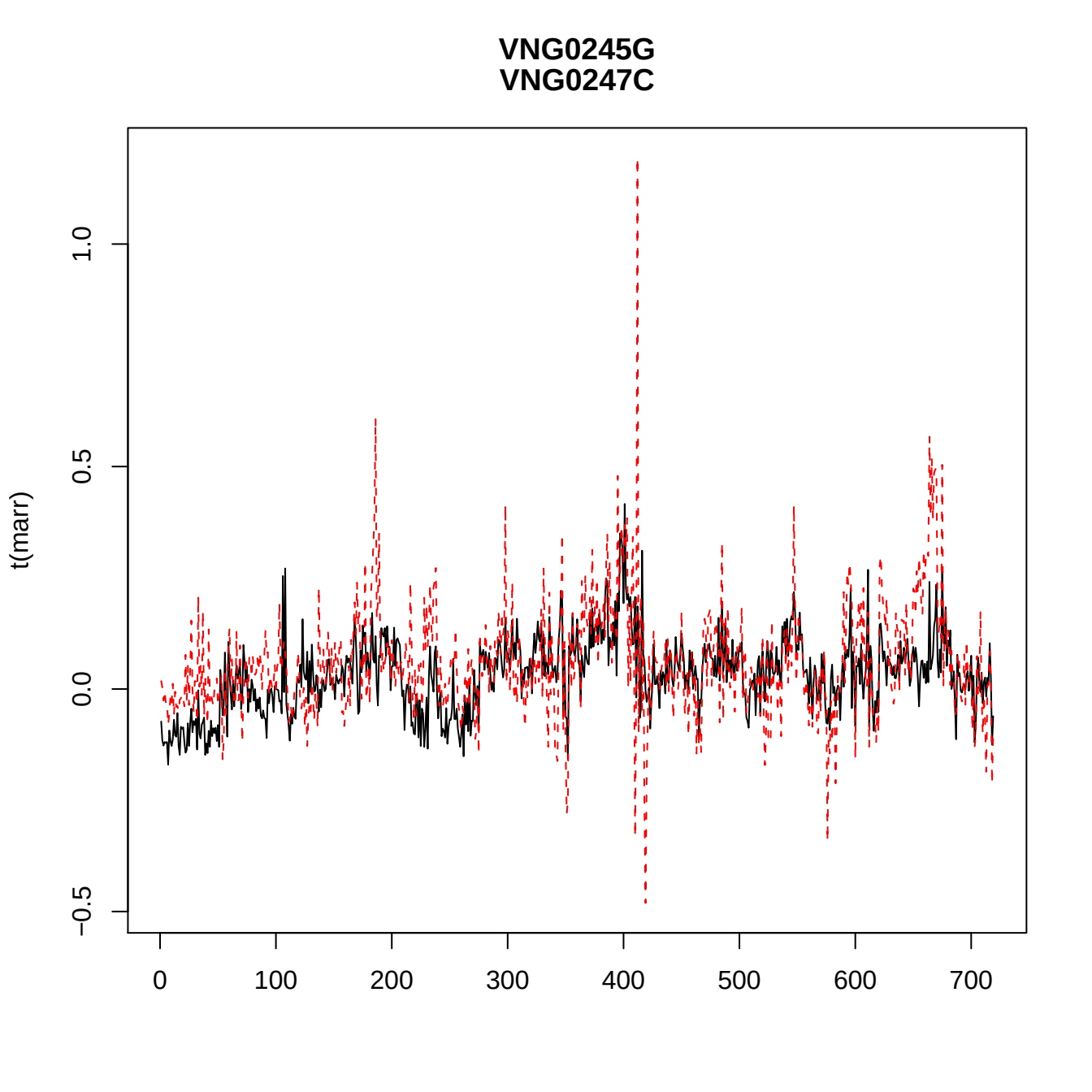
200
300
400
500
600
700


201000
201500
202000
202500
203000
VNG0244H
dtd
VNG0247C
VNG0248C
dUTPase
HTH_3
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0245G
VNG0247C
t(marr)
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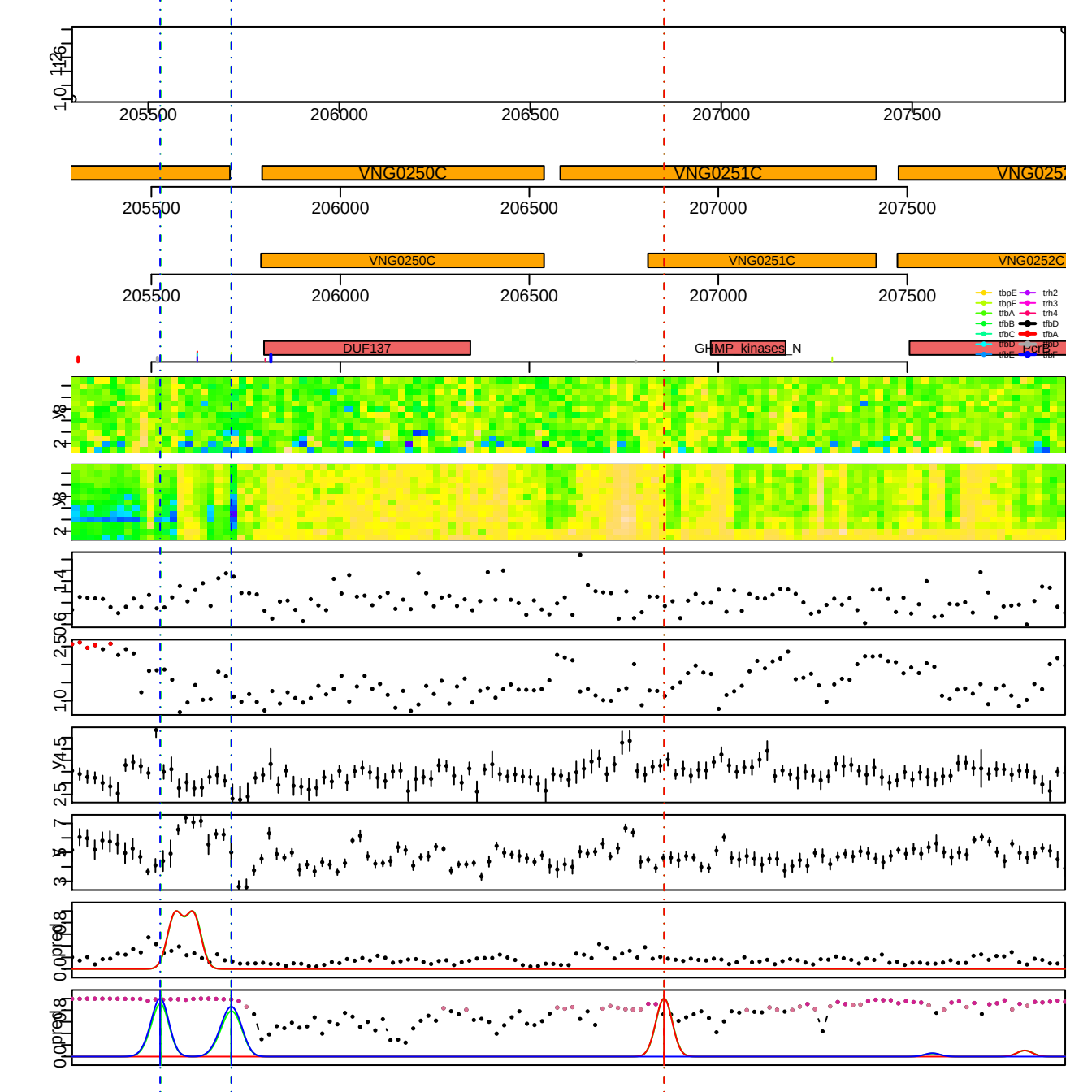
0.5
0.0
−0.5
0
100
200
300
400
500
600
700


205500
206000
206500
207000
207500
VNG0250C
VNG0251C
VNG0252C
DUF137
GHMP_kinases_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
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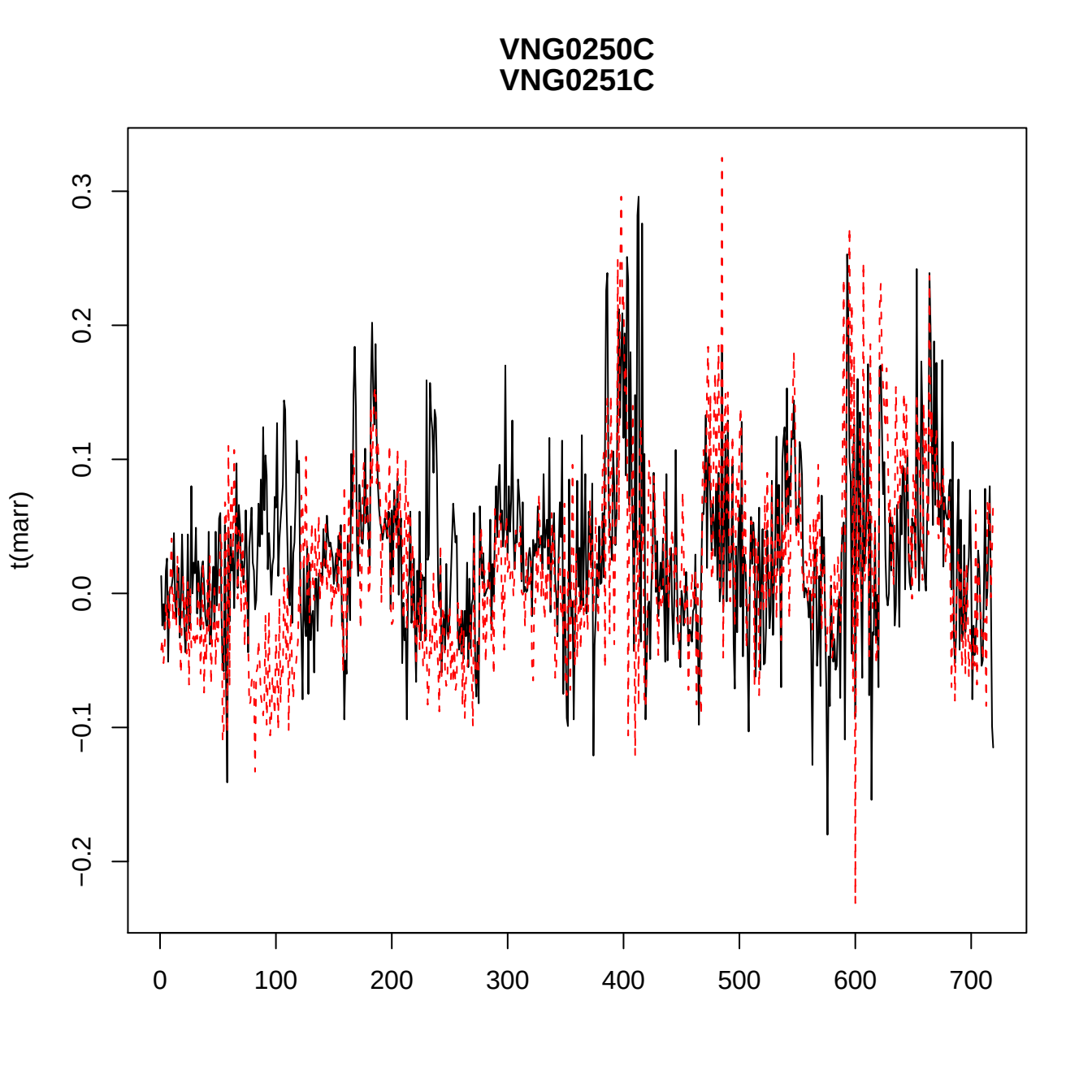
tfbF
PcrB


VNG0250C
VNG0251C
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
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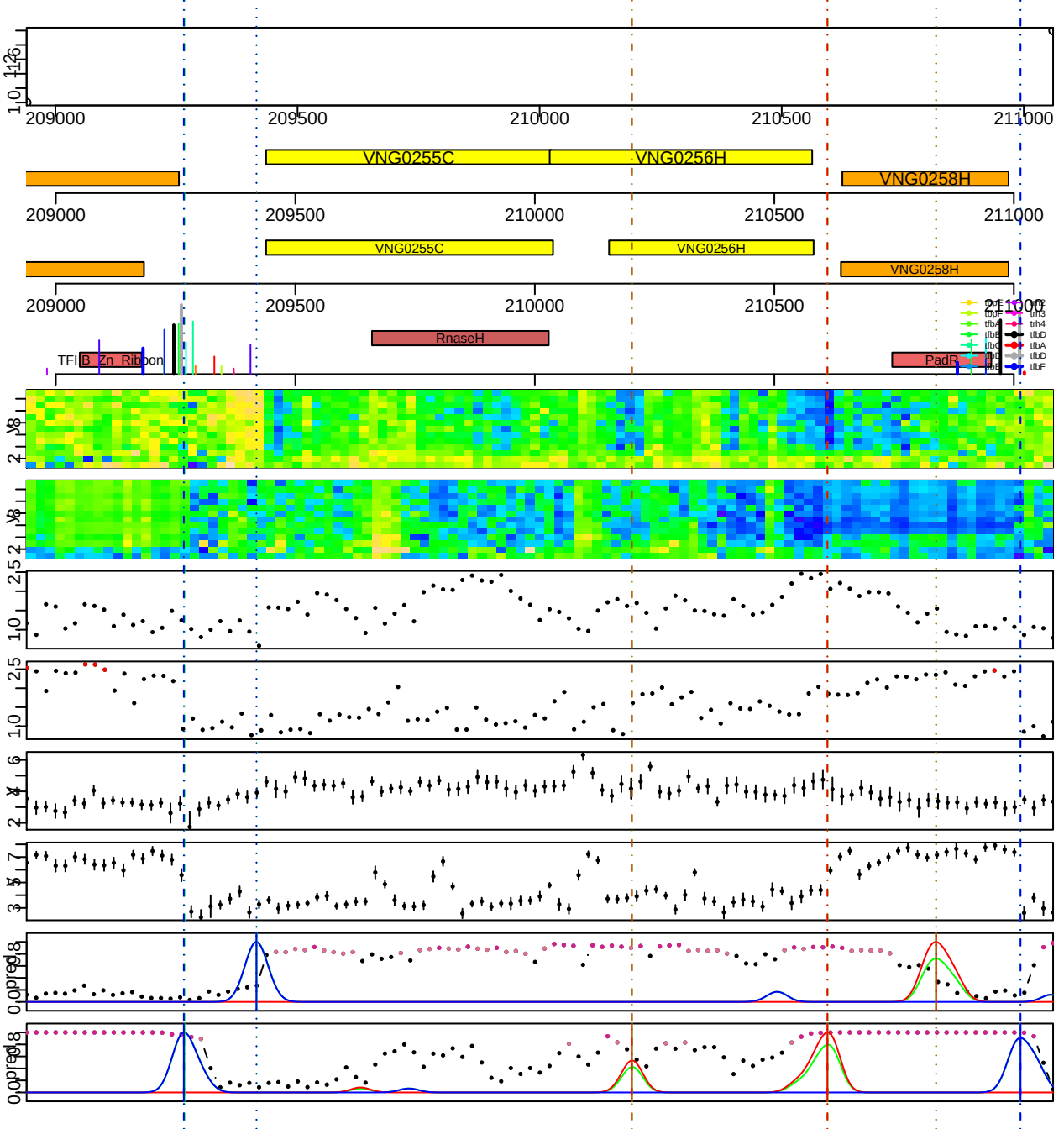
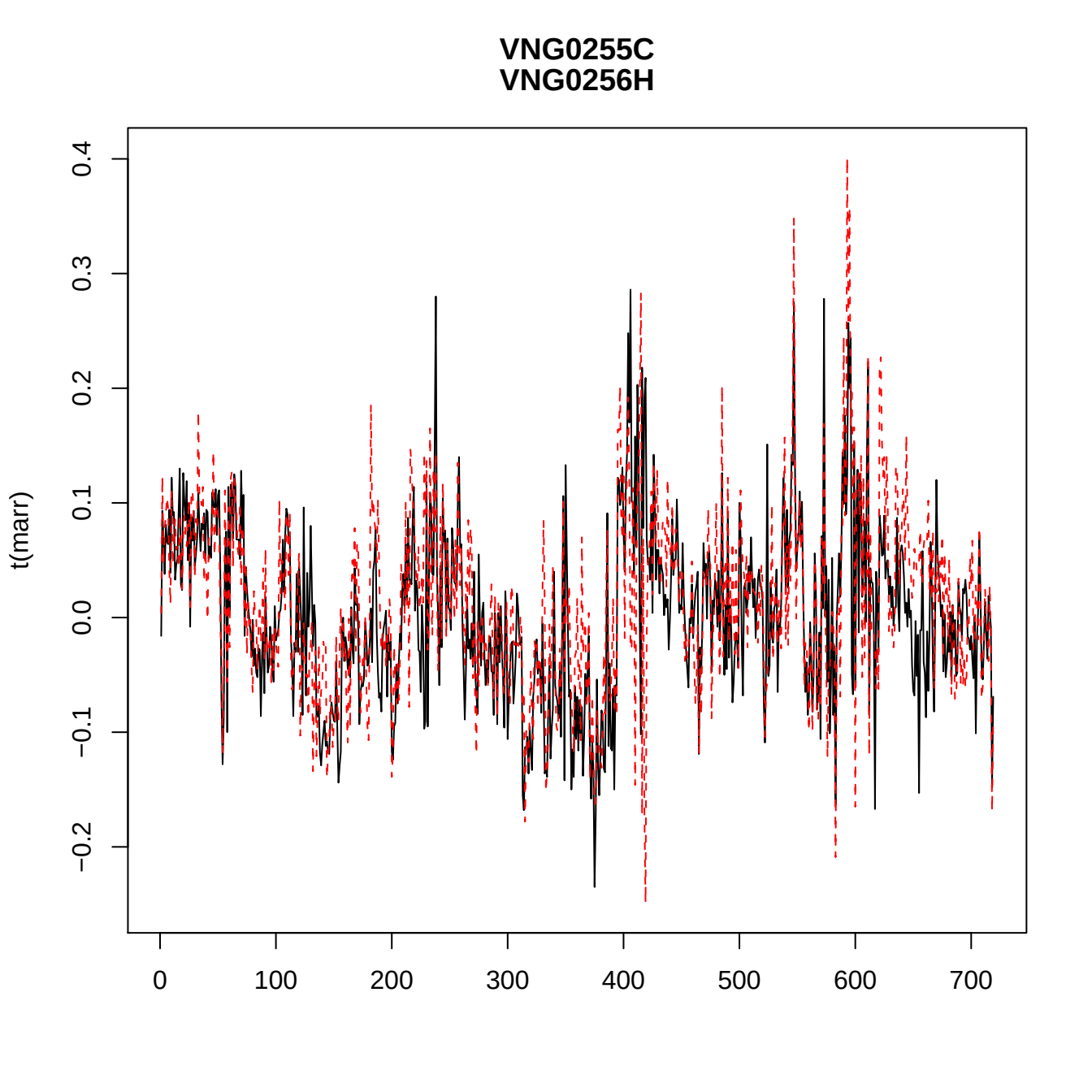
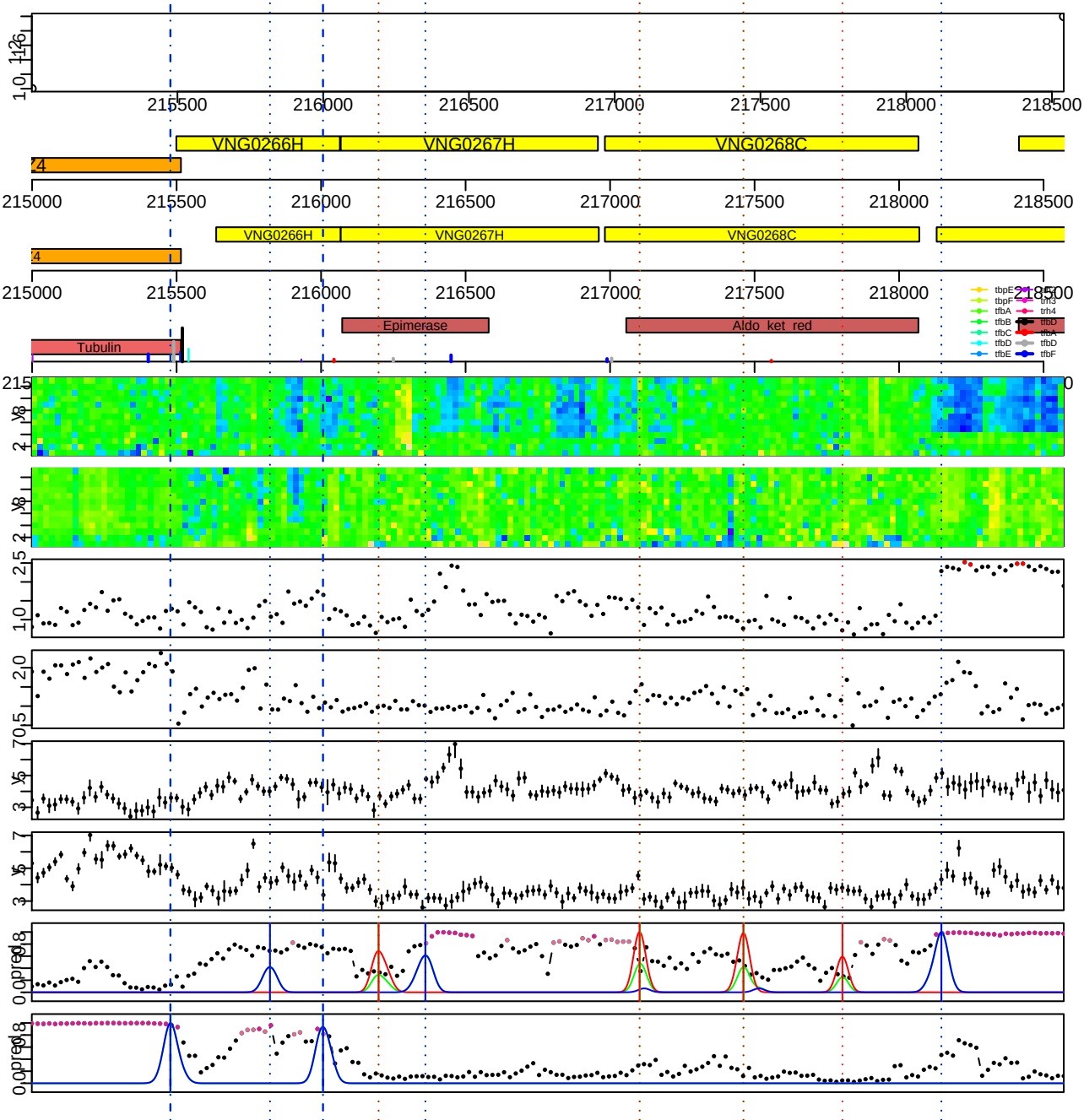
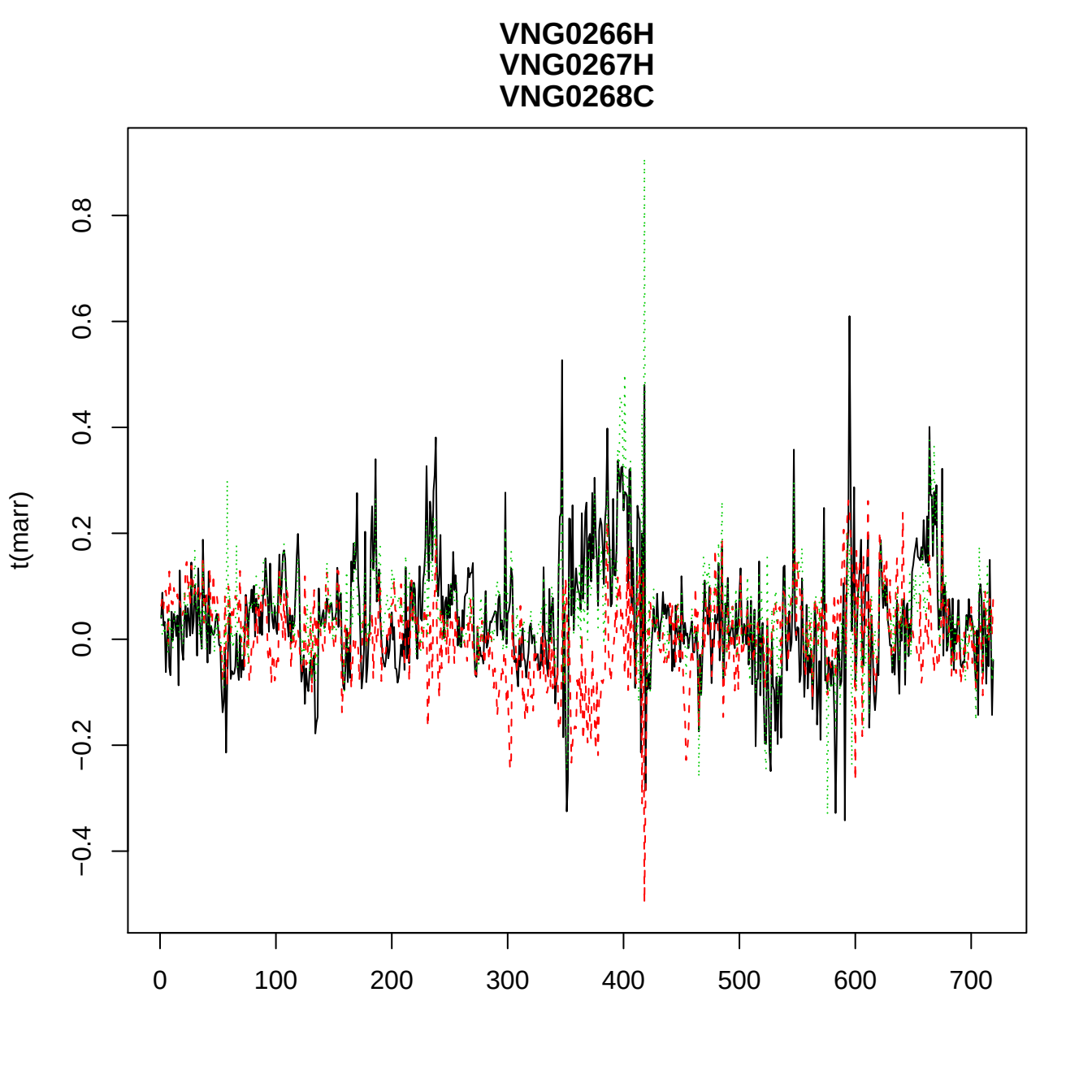
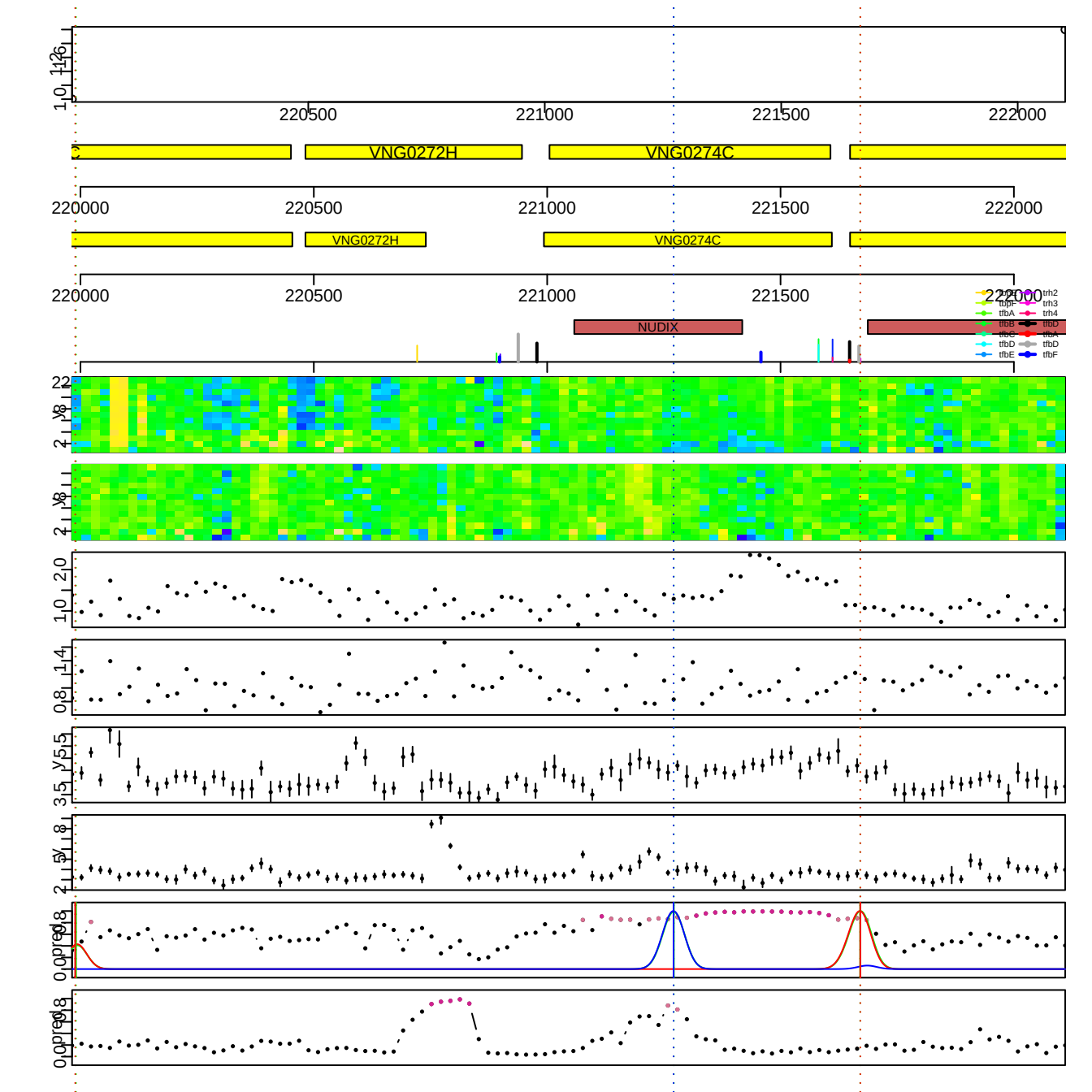
400
500
600
700

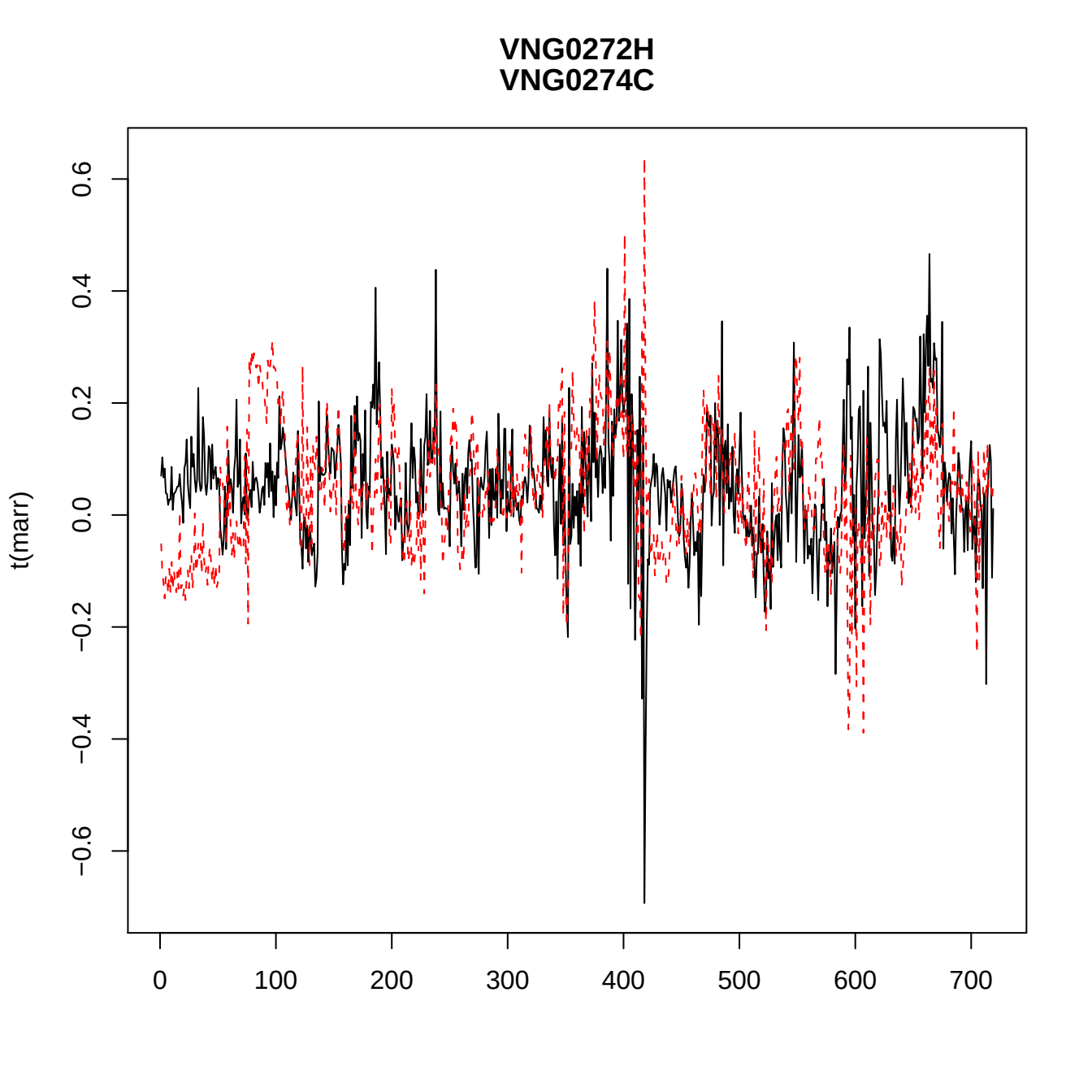

209000
209500
210000
210500
211000
VNG0255C
VNG0256H
VNG0258H
RnaseH
TFIIB_Zn_Ribbon
PadR
tfbF
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

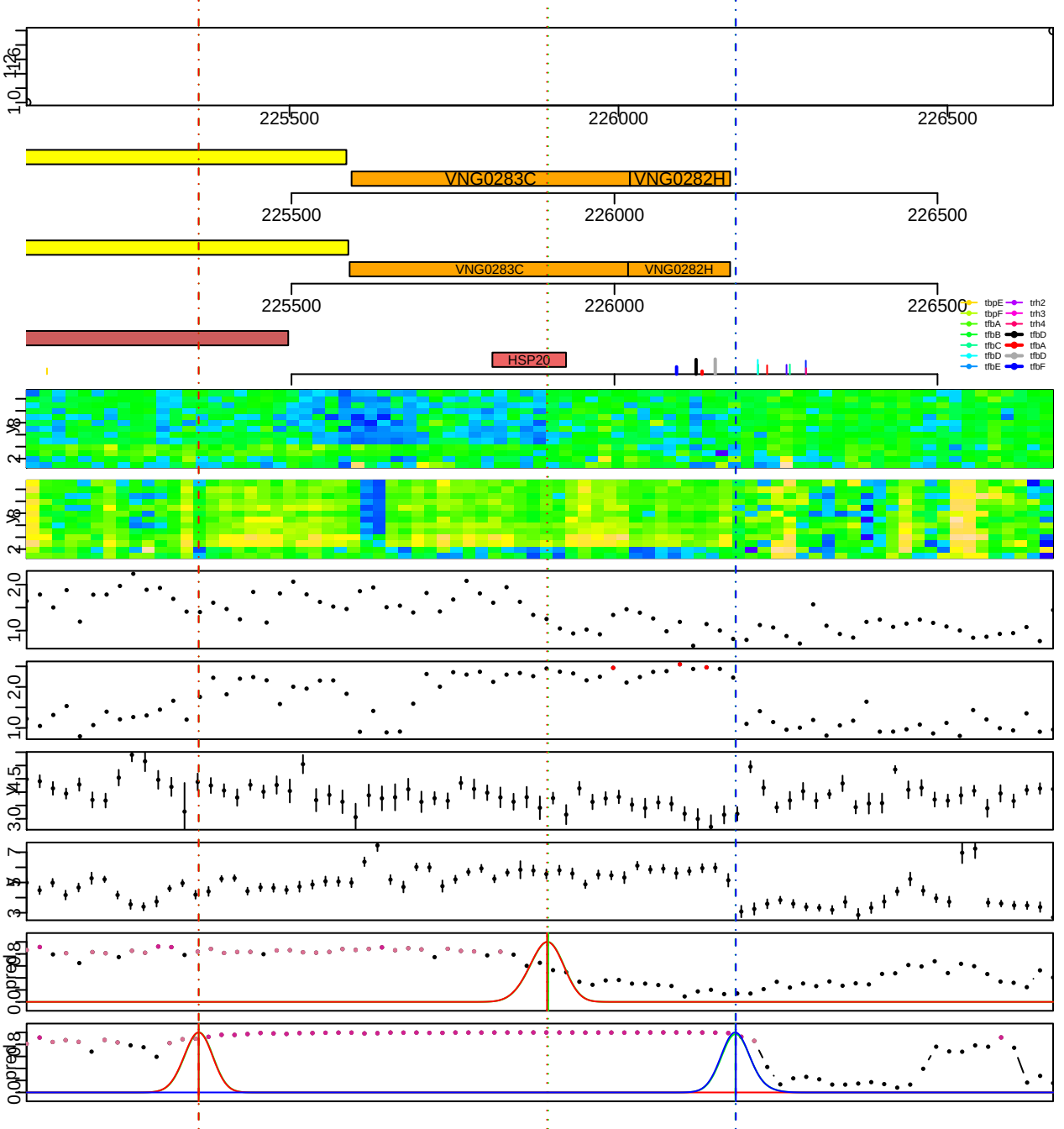

VNG0255C
VNG0256H
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

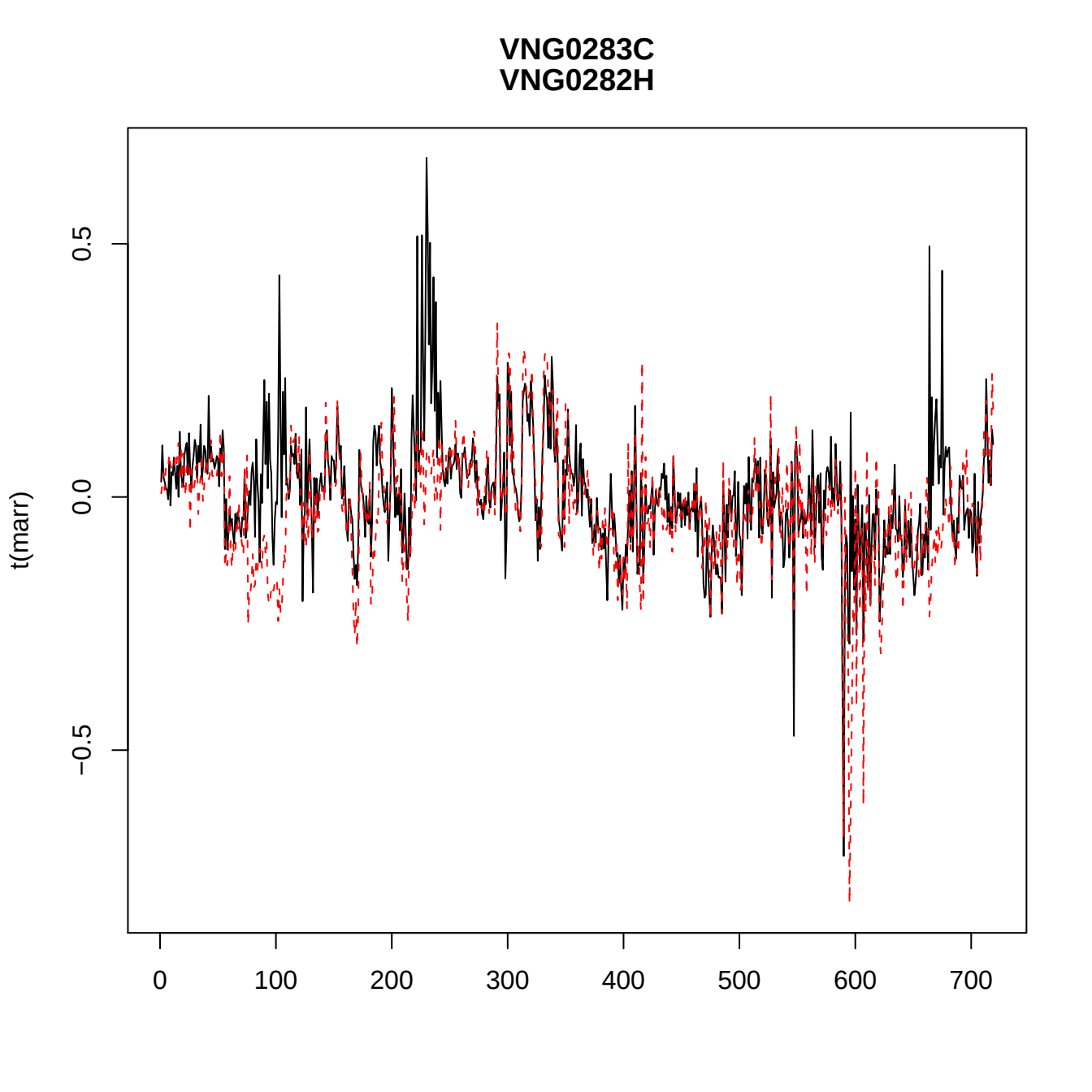

215500
216000
216500
217000
217500
218000
218500
VNG0266H
VNG0267H
VNG0268C
215000
Epimerase
Aldo_ket_red
Tubulin
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
prob


VNG0266H
VNG0267H
VNG0268C
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


220500
221000
221500
222000
VNG0272H
VNG0274C
220000
NUDIX
tbpE
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0272H
VNG0274C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


225500
226000
226500
VNG0283C
VNG0282H
HSP20
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0283C
VNG0282H
t(marr)
0.5
0.0
−0.5
0
100
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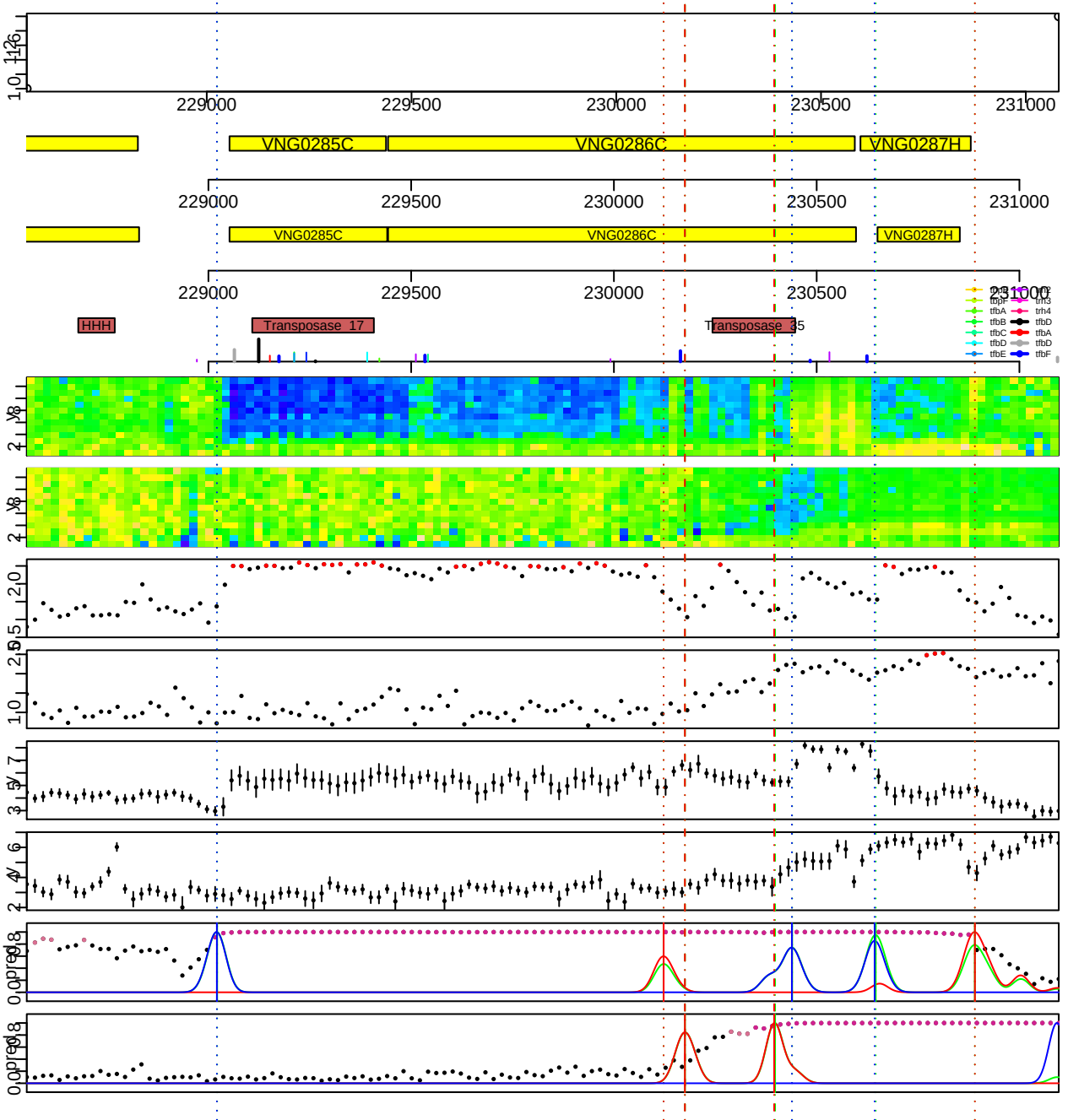
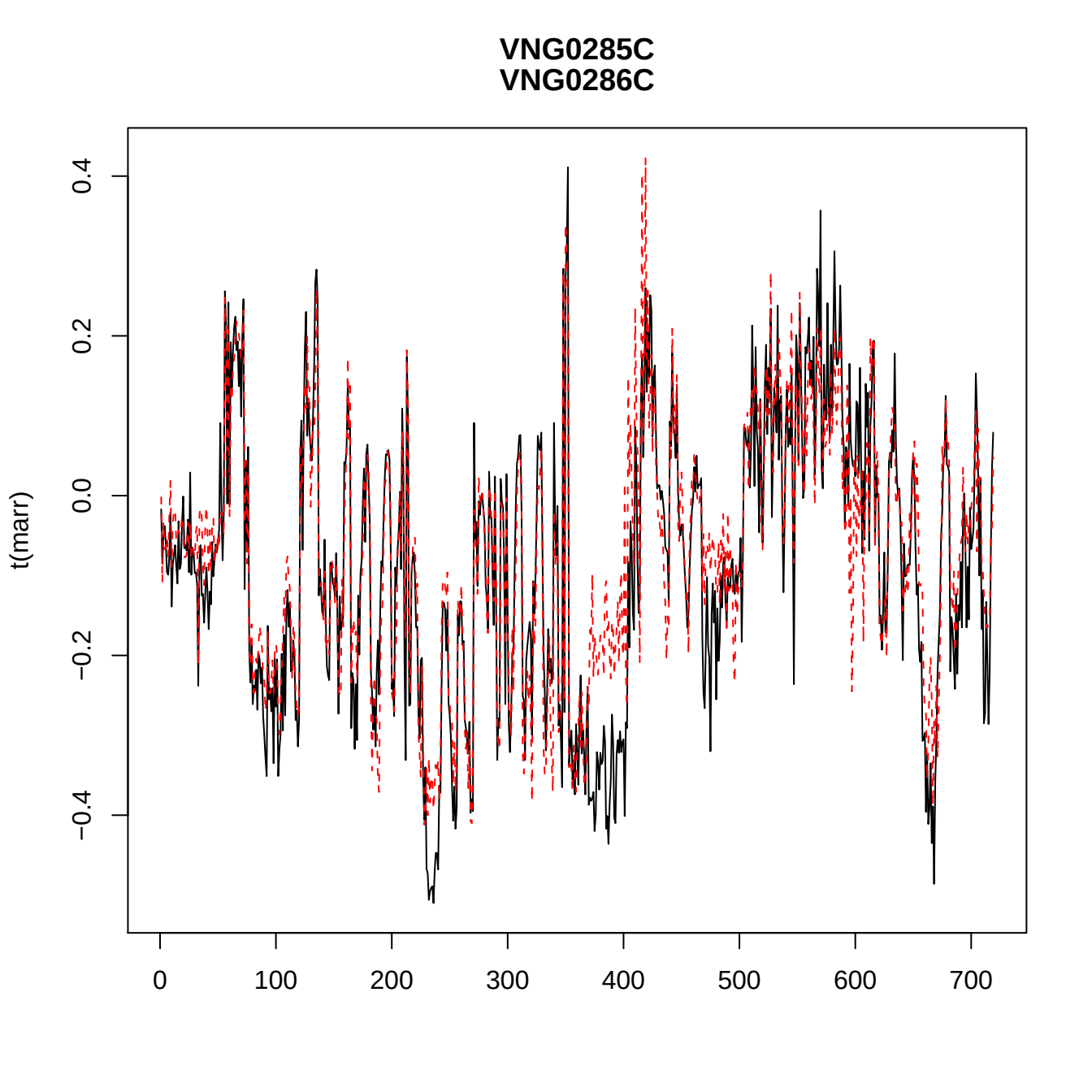
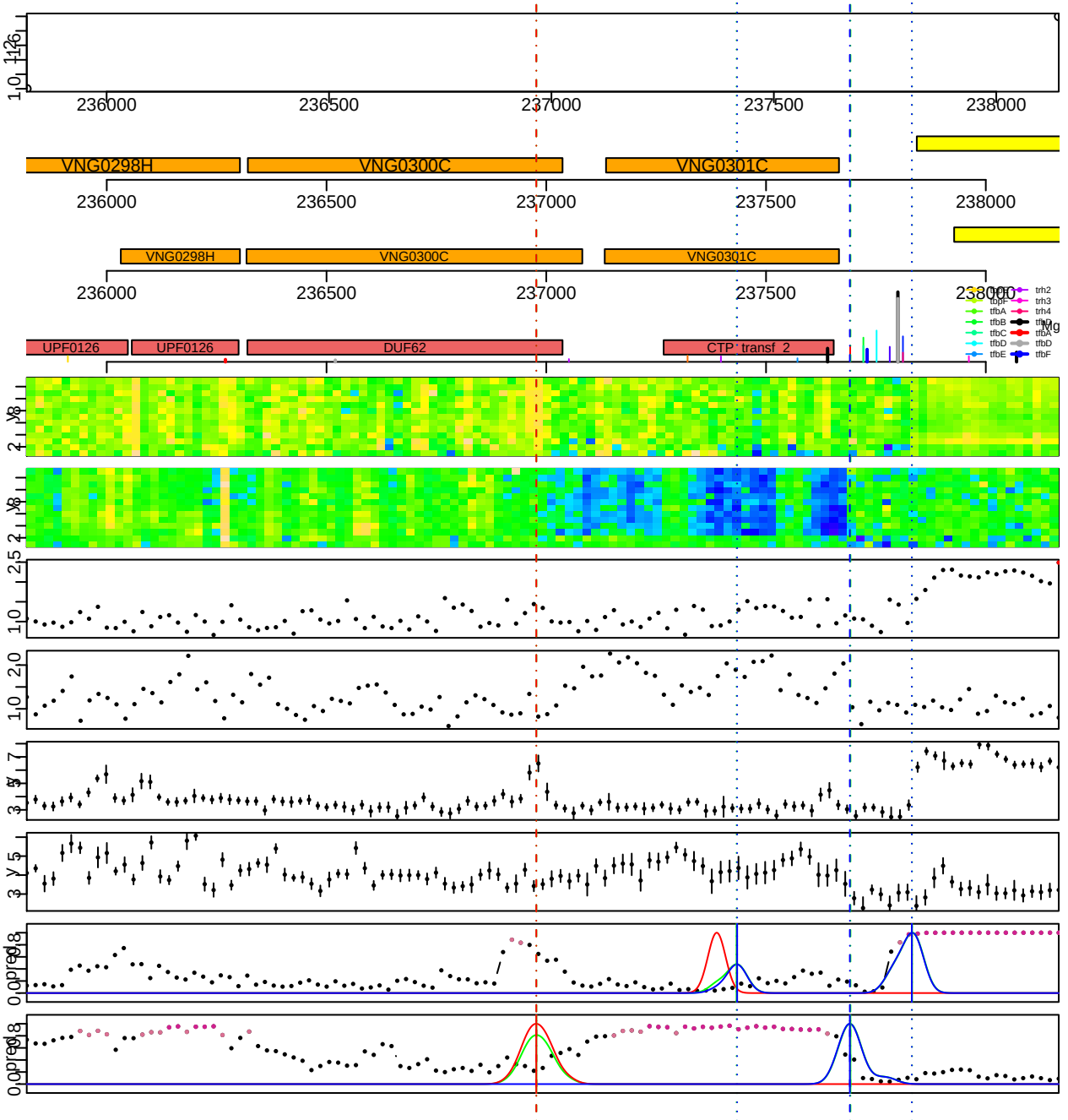
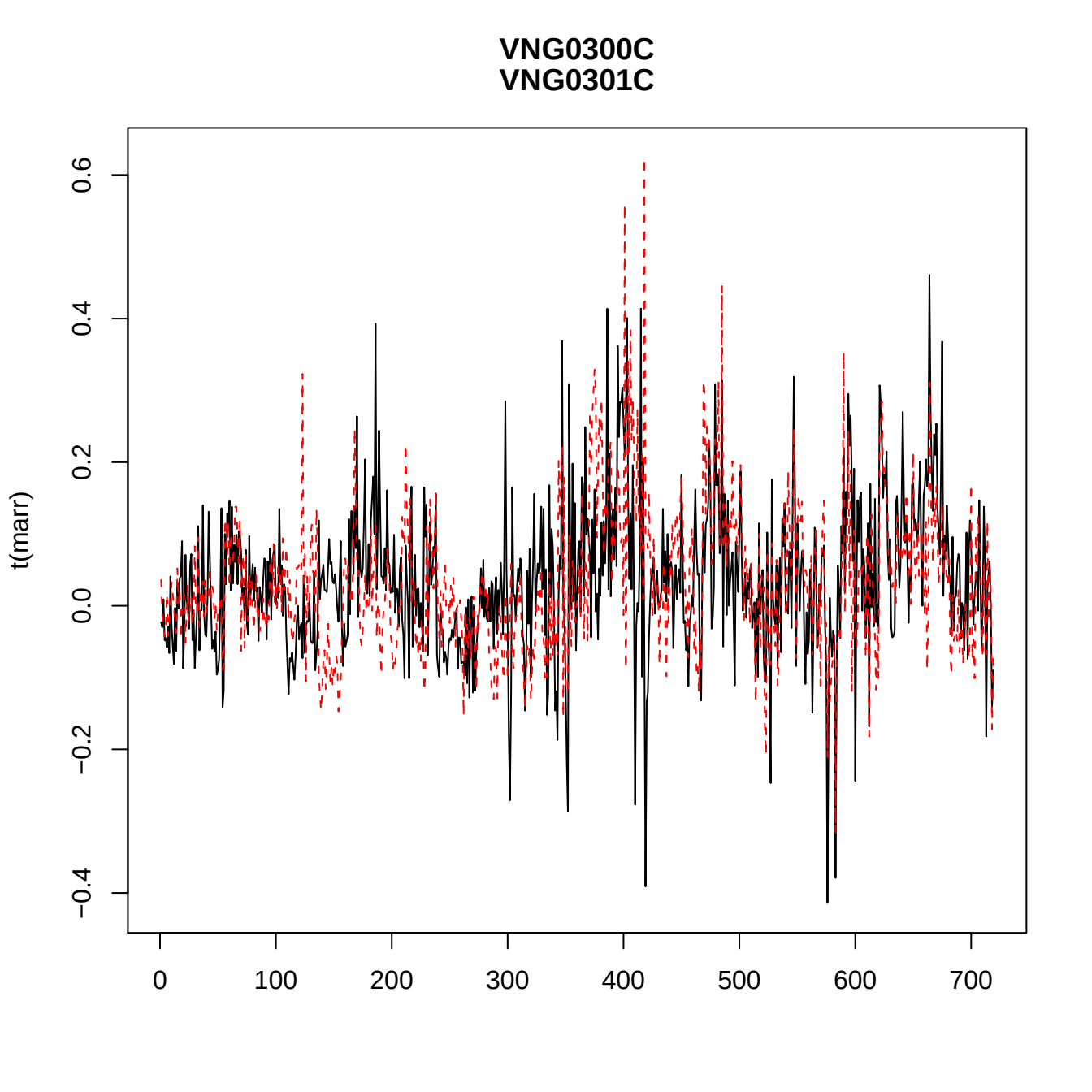
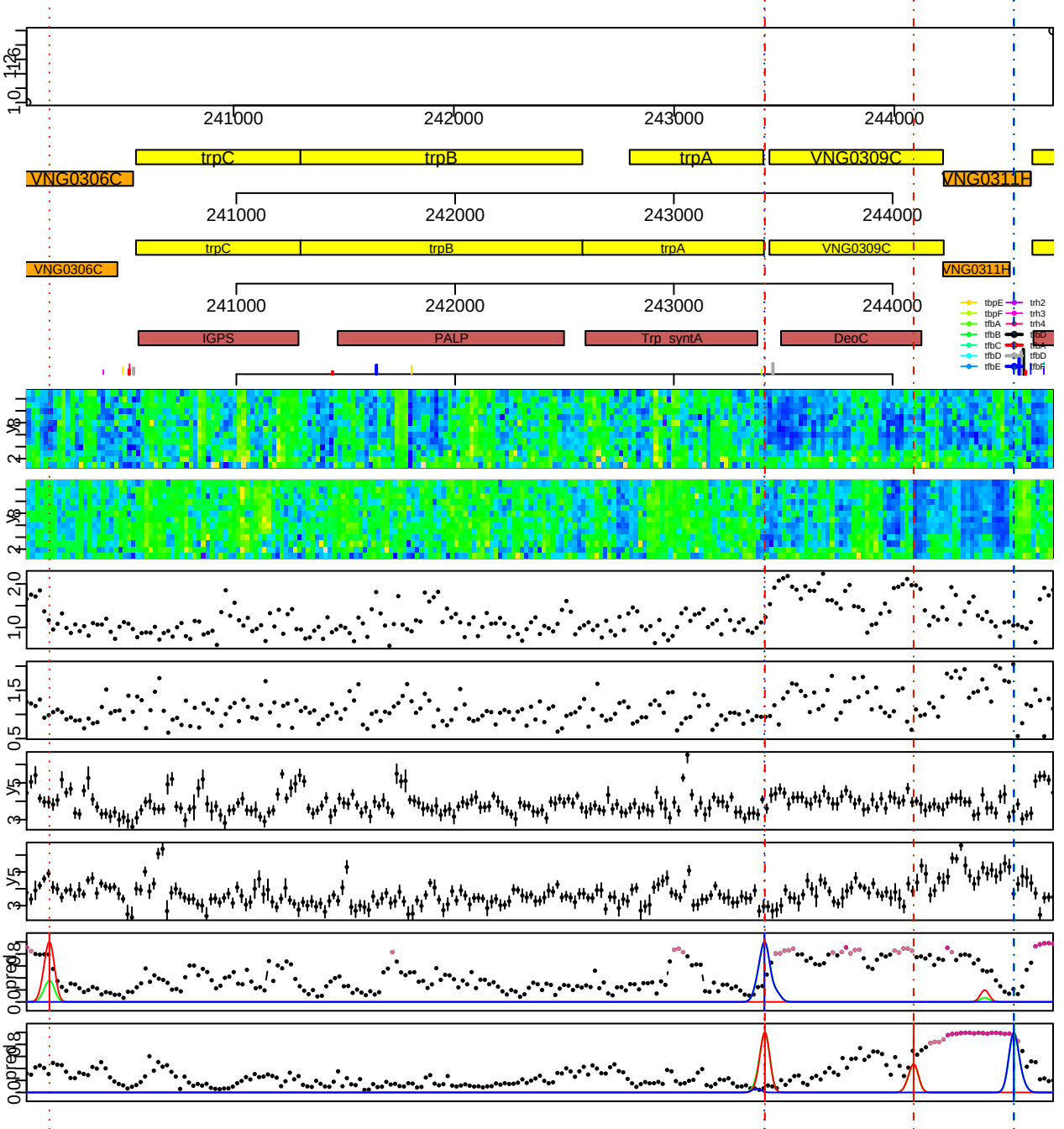
300
400
500
600
700

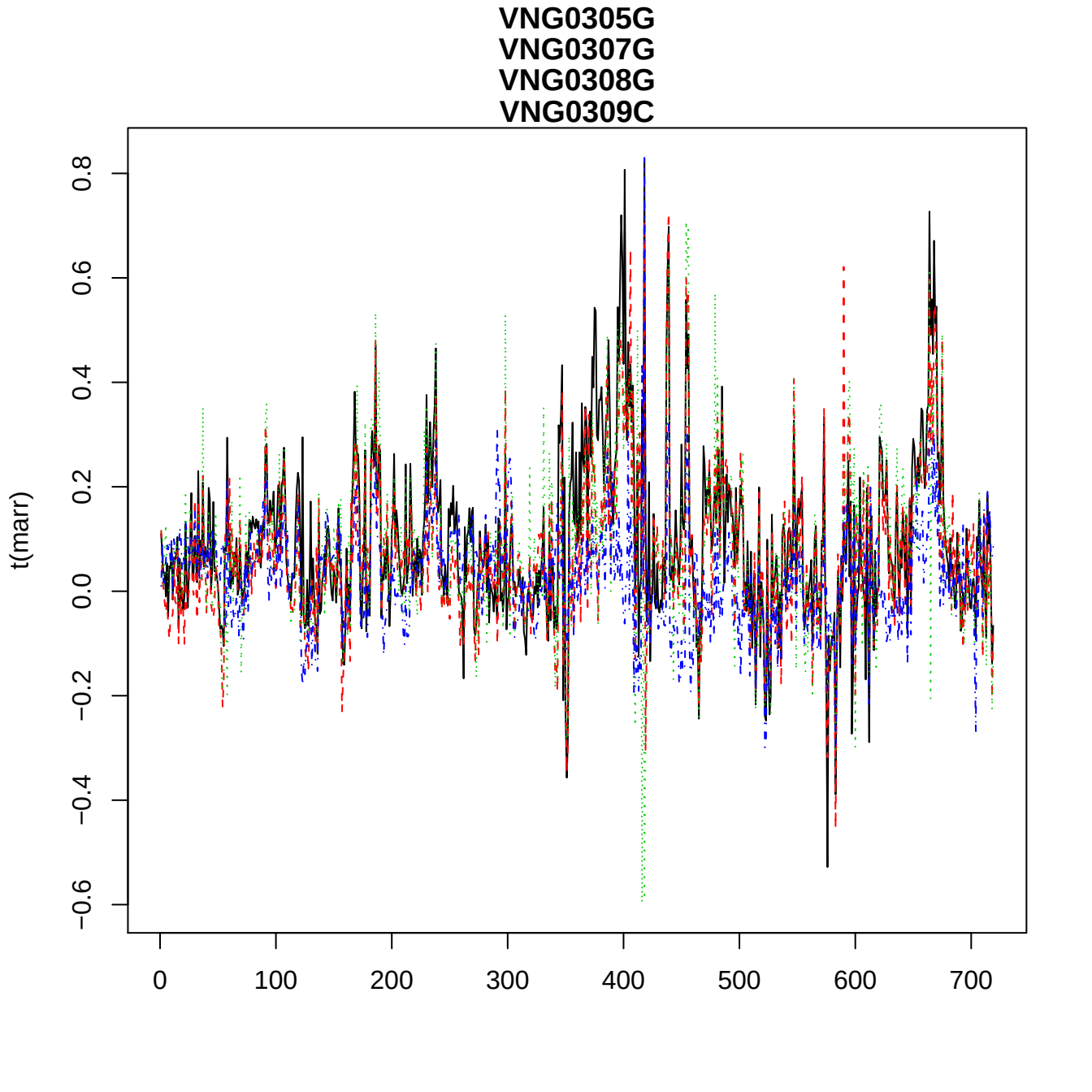

229000
229500
230000
230500
231000
VNG0285C
VNG0286C
VNG0287H
HHH
Transposase 17
Transposase 35
tfbF
trh3
tfbA
trh4
tfbB
tfbD
tfbC
tfbA
tfbD
tfbE
tfbF
pred

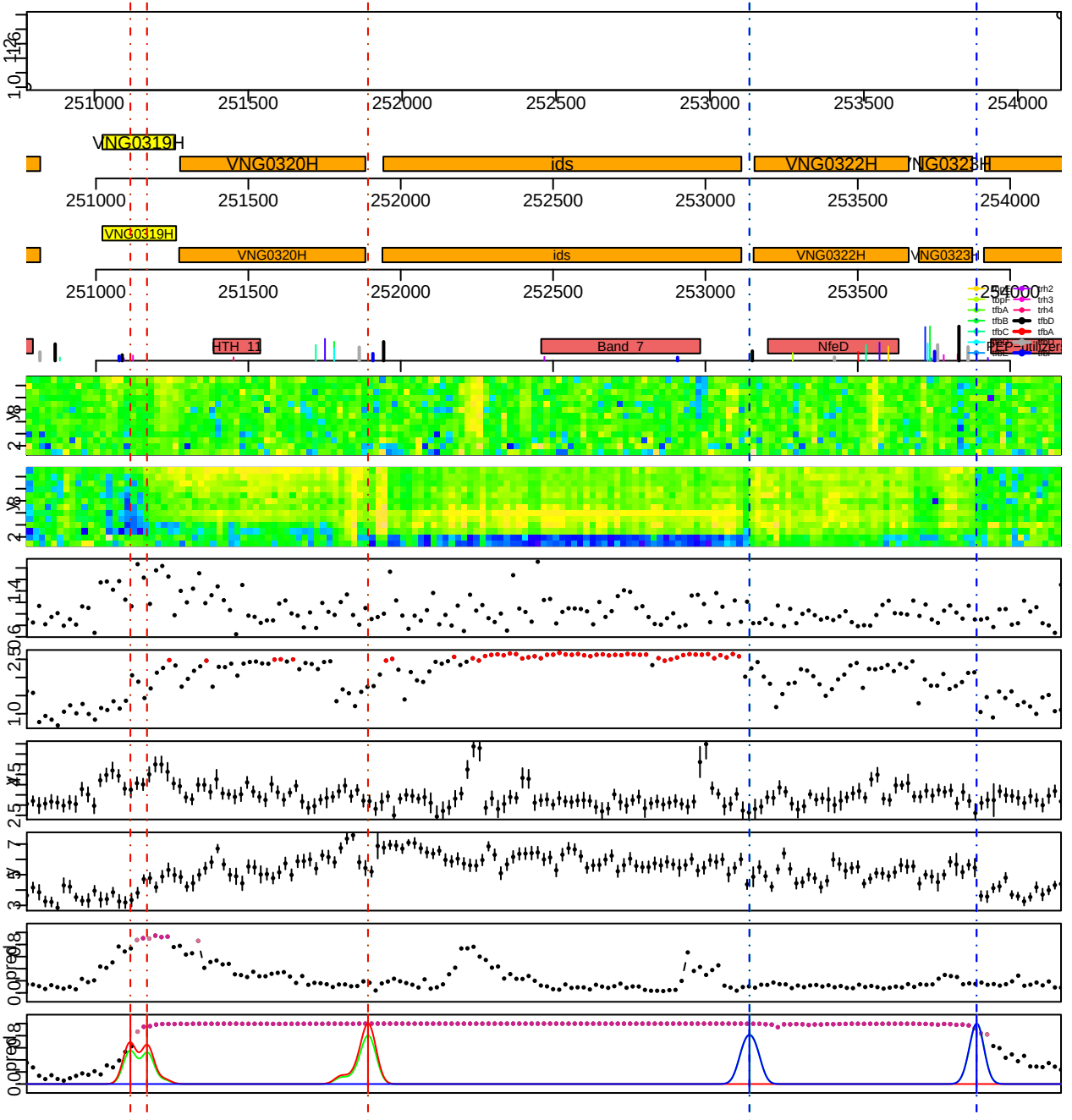

VNG0285C
VNG0286C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

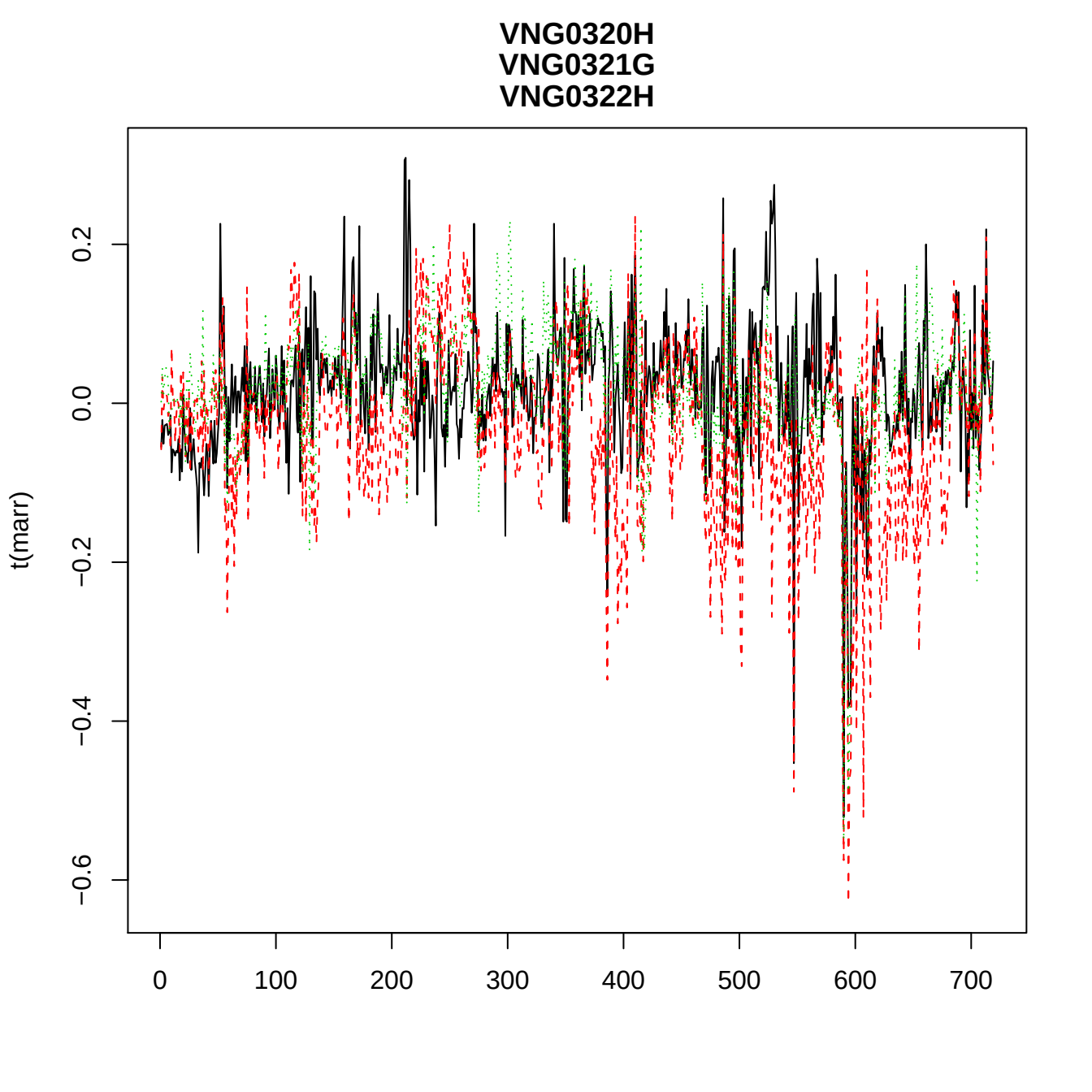

236000
236500
237000
237500
238000
VNG0298H
VNG0300C
VNG0301C
UPF0126
UPF0126
DUF62
CTP_transf_2
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
trh1
tfbA
tfbD
tfbF
lwg

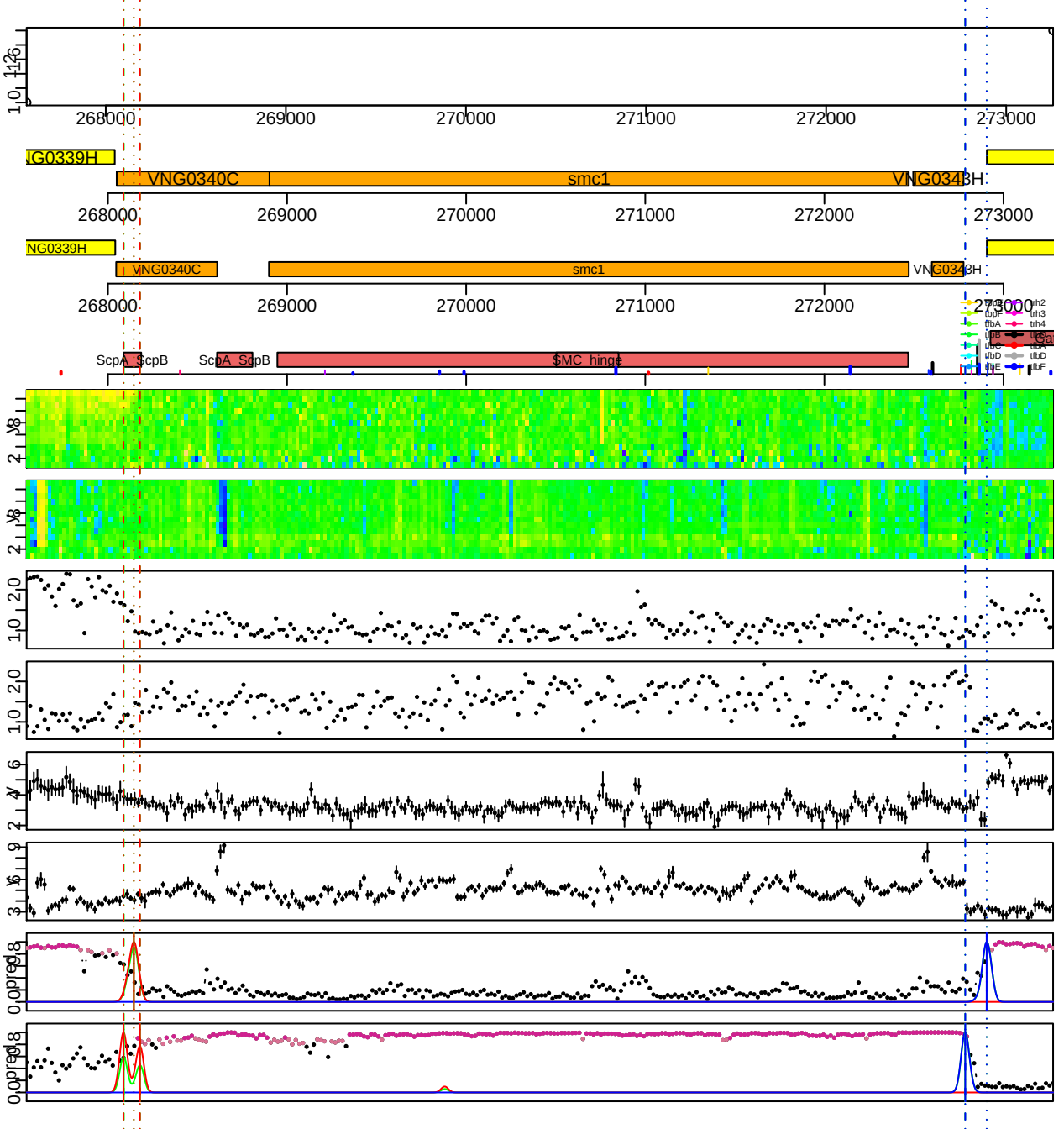

VNG0300C
VNG0301C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


241000
242000
243000
244000
trpC
trpB
trpA
VNG0309C
VNG0306C
VNG0311H
IGPS
PALP
Trp_syntA
DeoC
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbE
pred

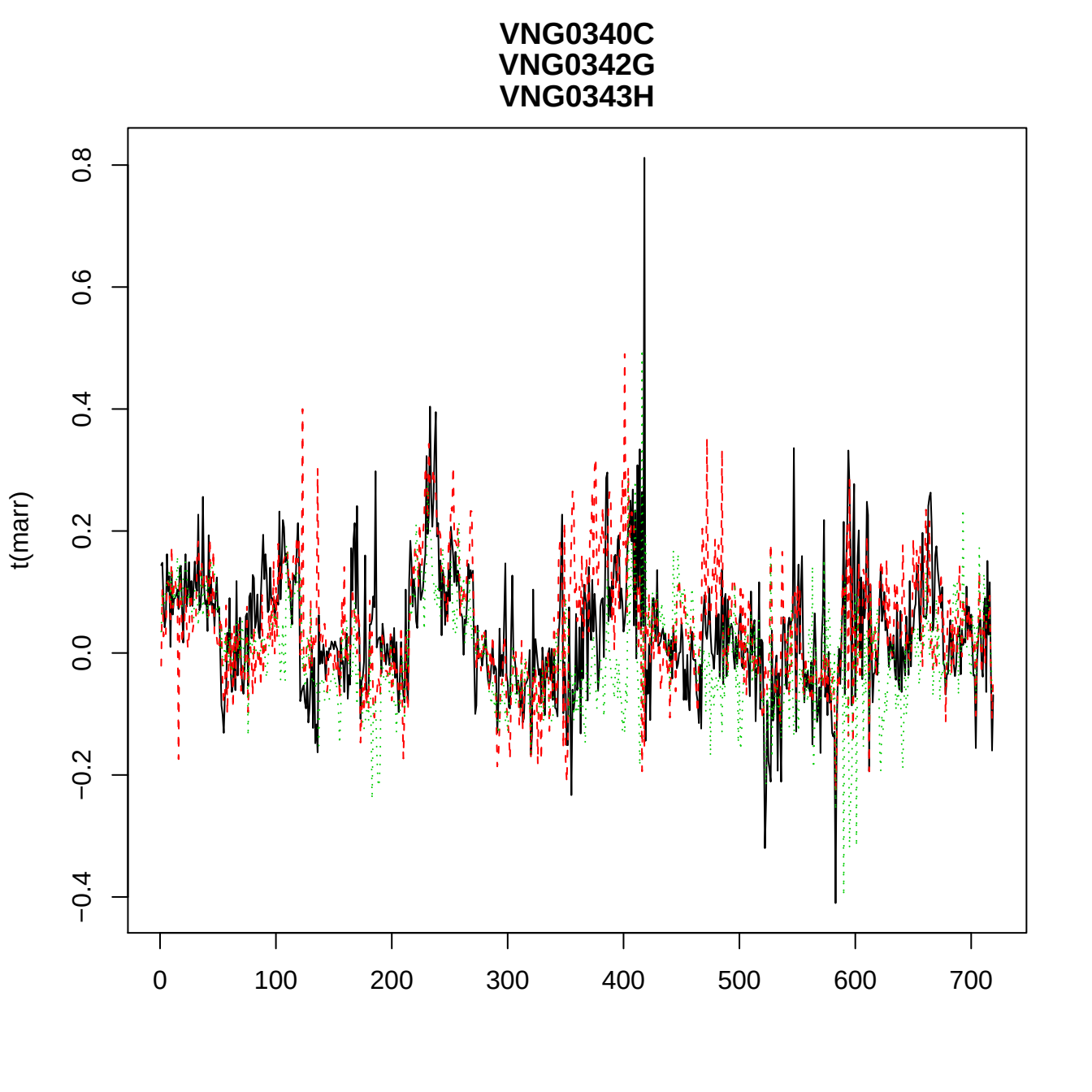

VNG0305G
VNG0307G
VNG0308G
VNG0309C
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


251000
251500
252000
252500
253000
253500
254000
VNG0319H
VNG0320H
ids
VNG0322H
VNG0323H
HTH_11
Band_7
NfeD
PE-utilizer


VNG0320H
VNG0321G
VNG0322H
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700



268000
269000
270000
271000
272000
273000
VNG0340C
smc1
VNG0343H
ScpA_ScpB
SMC_hinge
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF


VNG0340C
VNG0342G
VNG0343H
t(marr)
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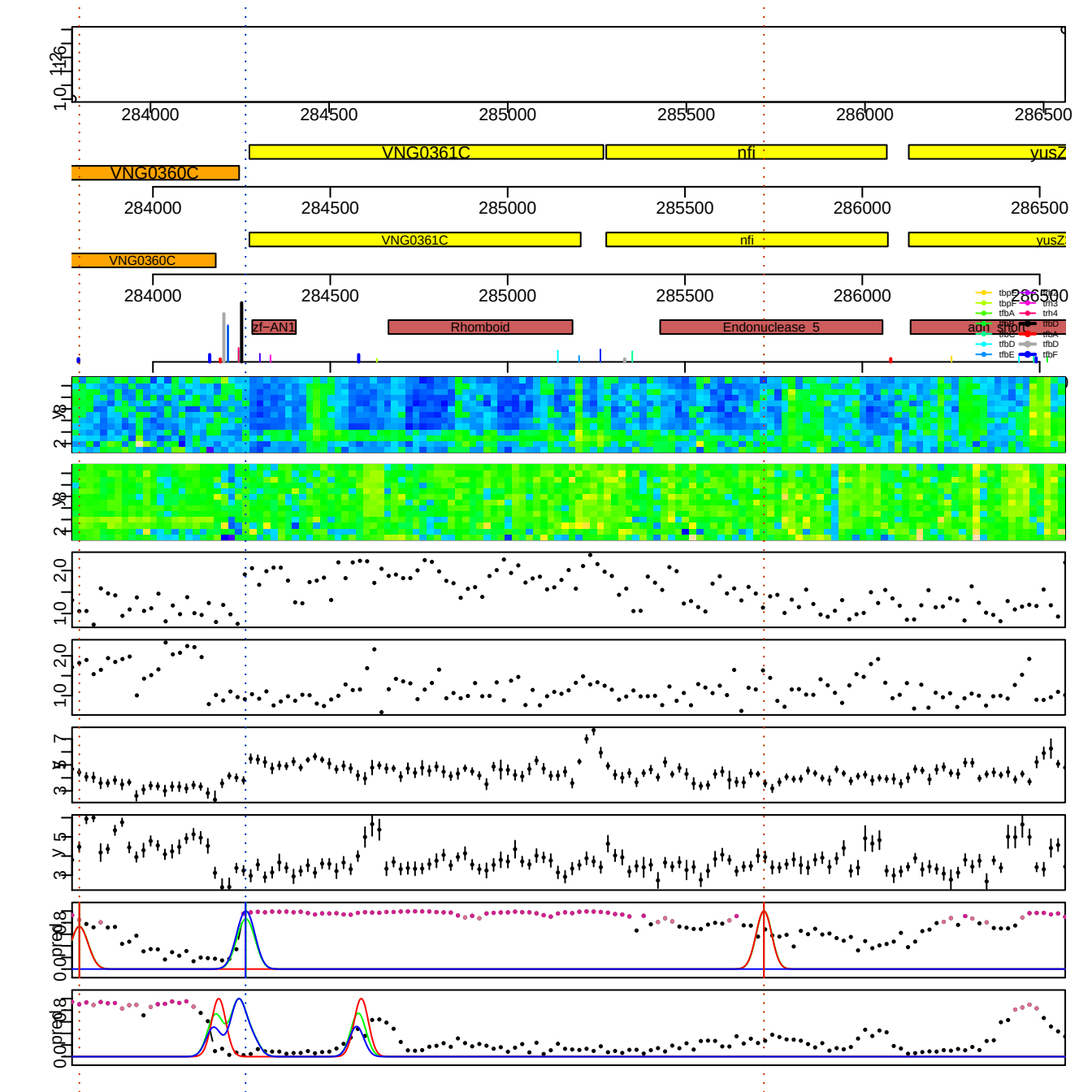
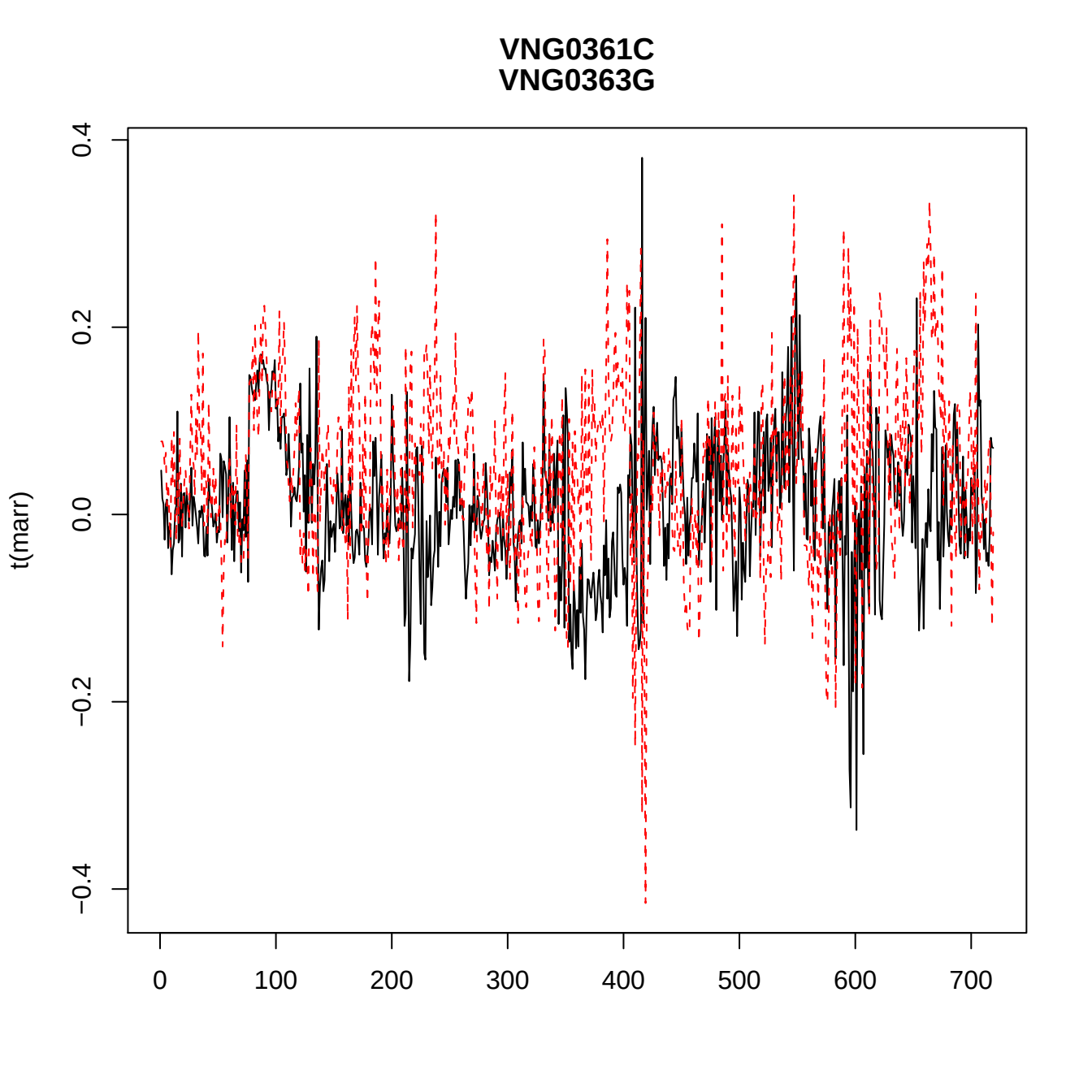
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700



284000
284500
285000
285500
286000
286500
VNG0361C
nfi
yusZ
VNG0360C
zf−AN1
Rhomboid
Endonuclease_5
adn_short
tbpF
tbpF
tfbA
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0361C
VNG0363G
t(marr)
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0.2
0.0
−0.2
−0.4
0
100
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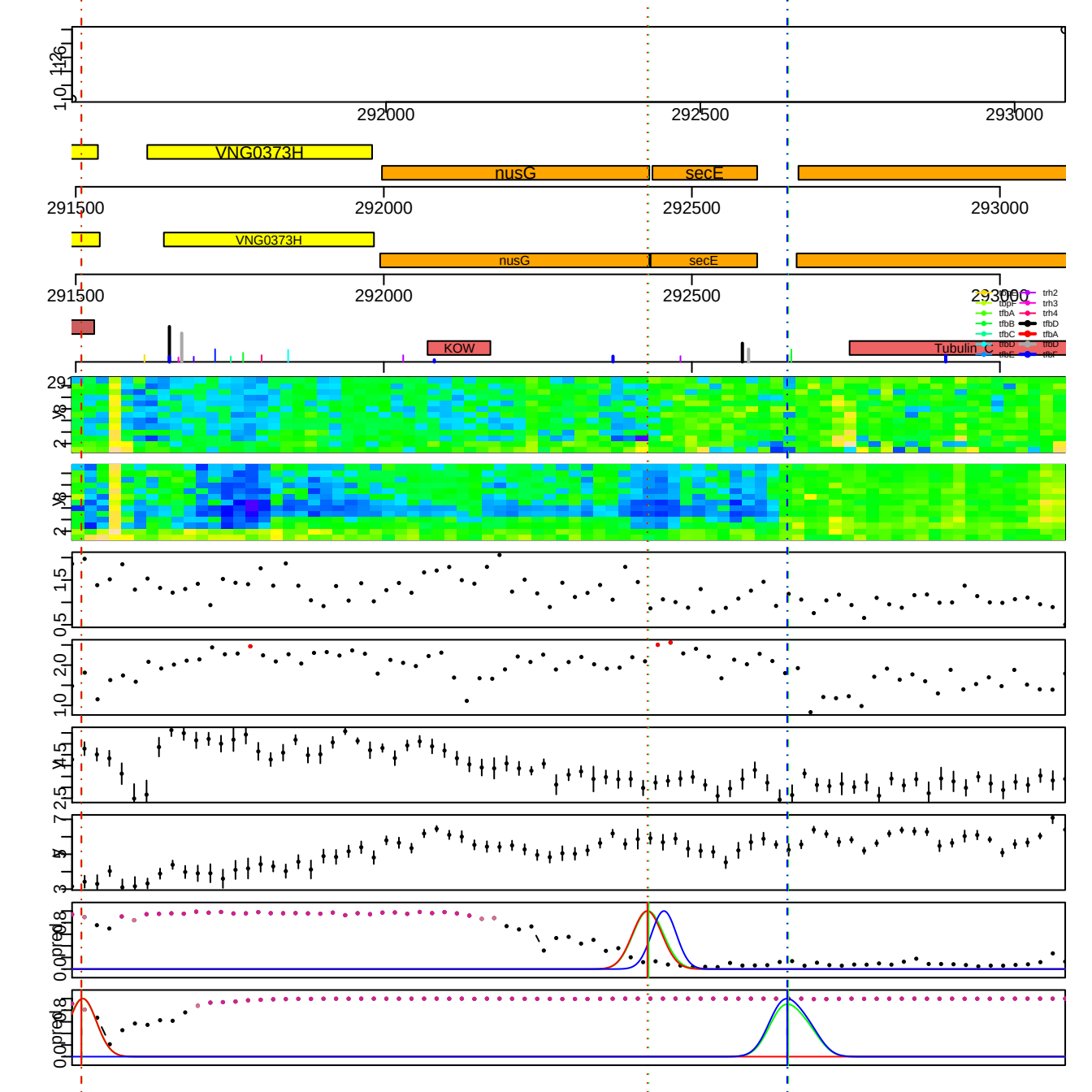
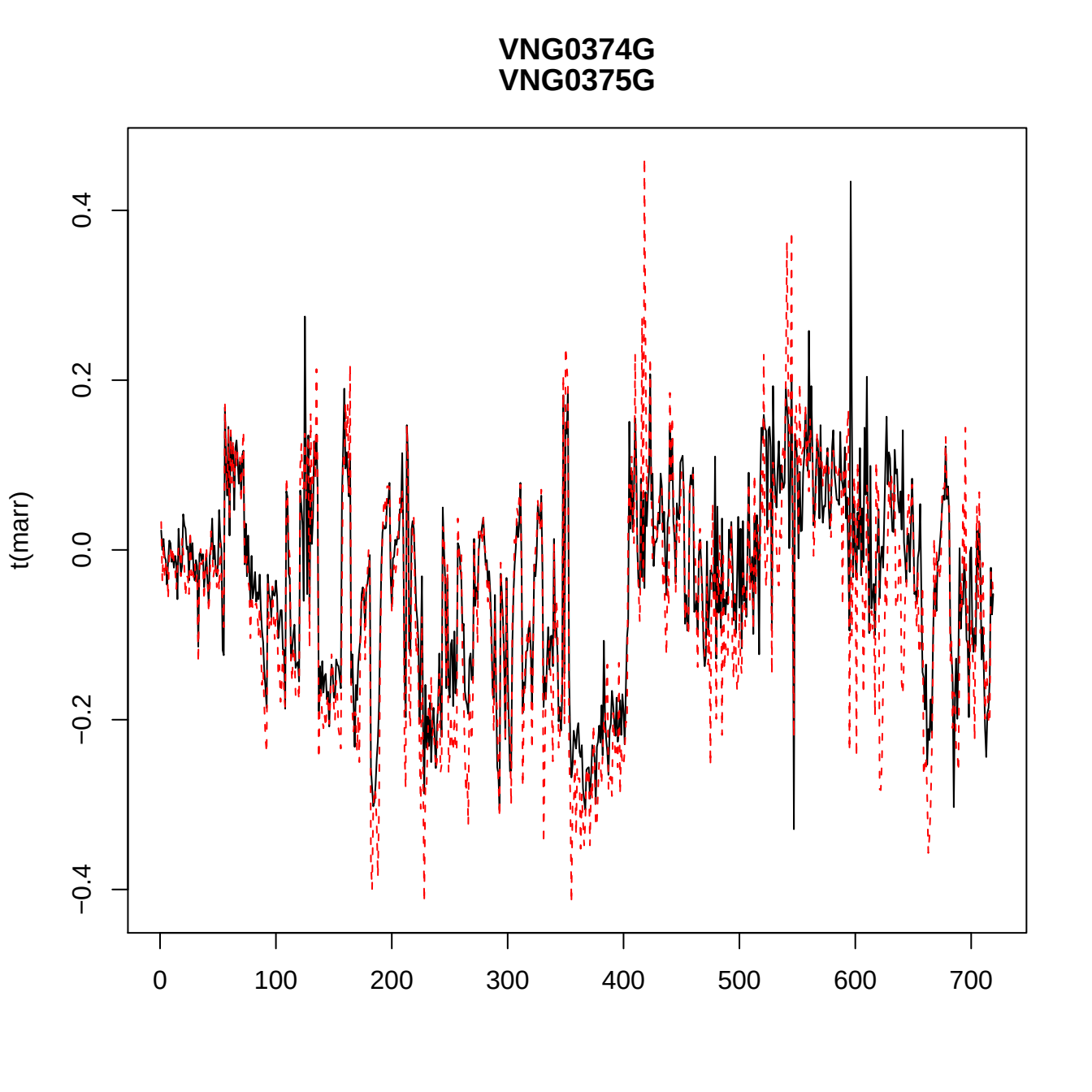
400
500
600
700


292000
292500
293000
VNG0373H
nusG
secE
291500
292000
292500
293000
VNG0373H
nusG
secE
291500
292000
292500
293000
KOW
Tubulin_C
trh2
tbpF
trh3
tfbA
trh4
tfbB
tfbD
tfbC
tfbA
tfbD
tfbD
tfbE
tfbF


VNG0374G
VNG0375G
t(marr)
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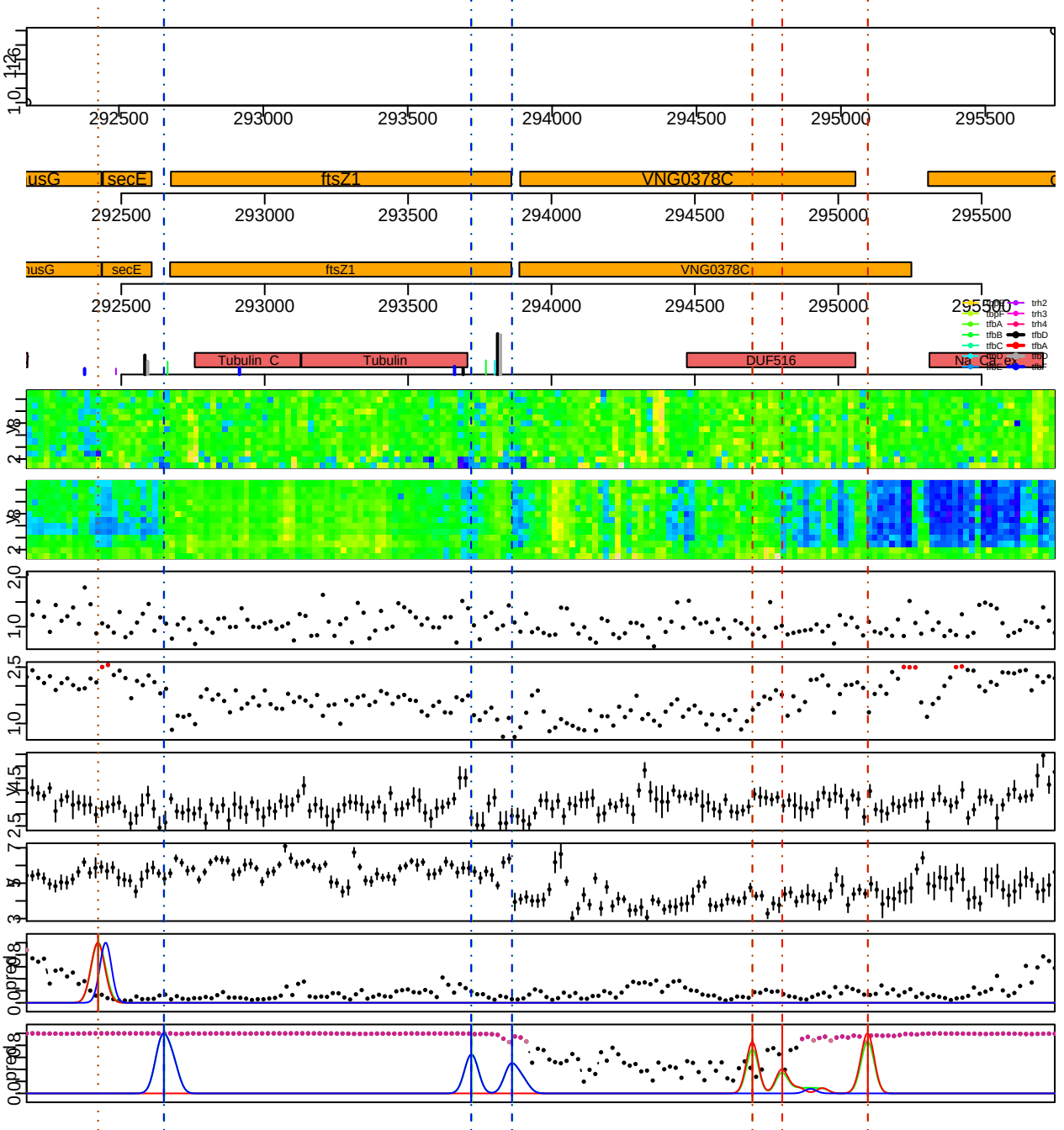
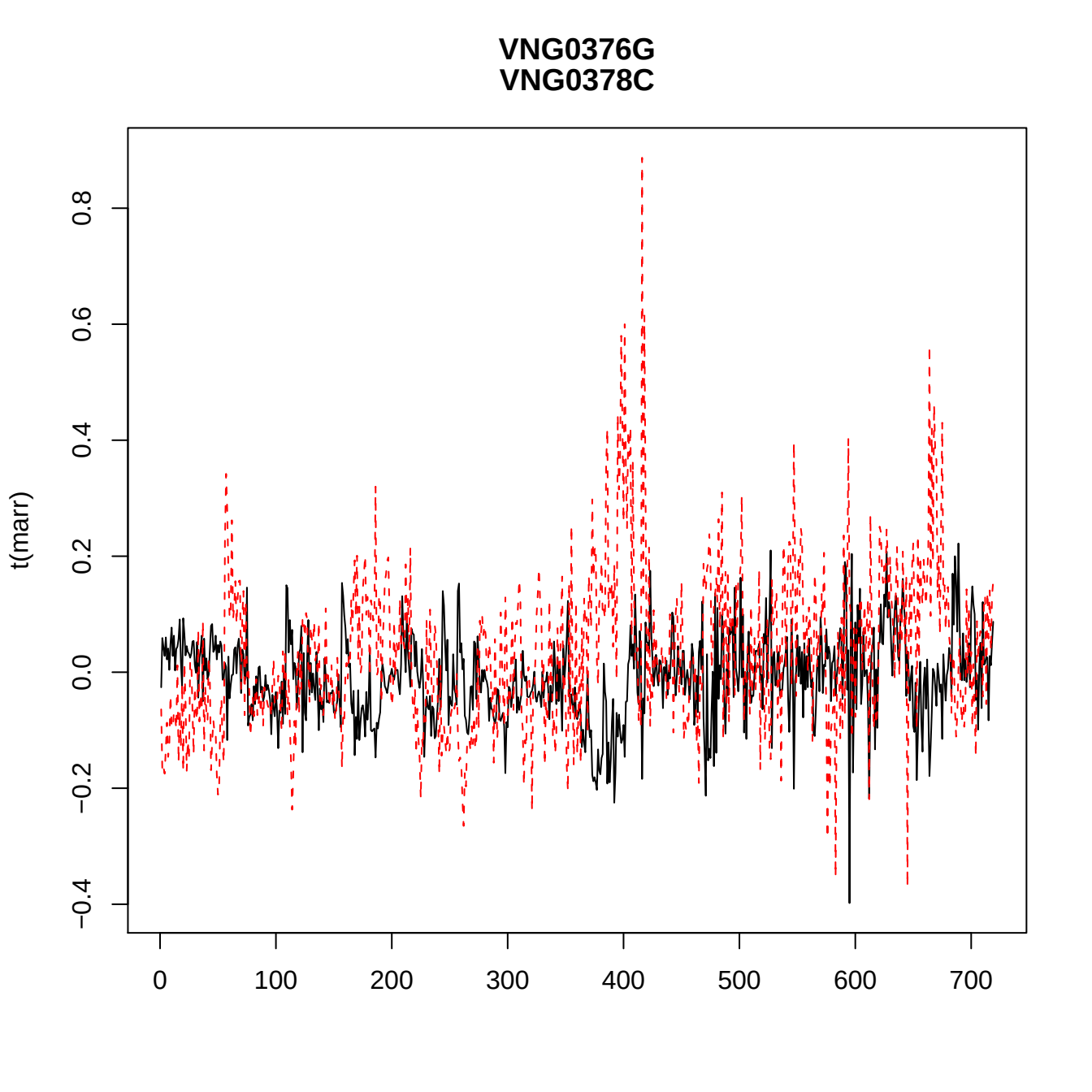
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


292500
293000
293500
294000
294500
295000
295500
secE
ftsZ1
VNG0378C
Tubulin_C
Tubulin
DUF516
Na_Ca_ex
tfbF
tfbA
tfbB
tfbC
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0376G
VNG0378C
t(marr)
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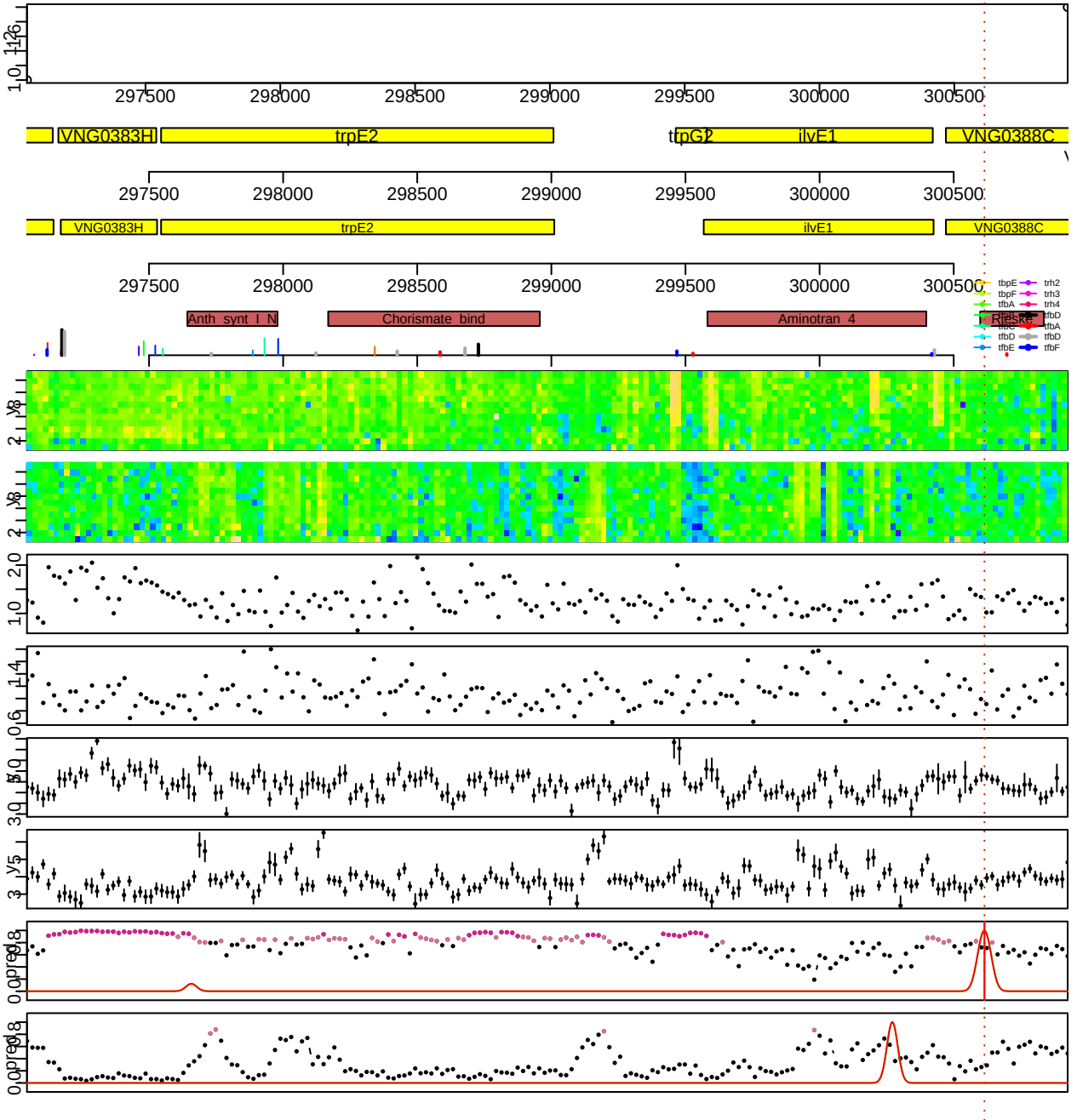
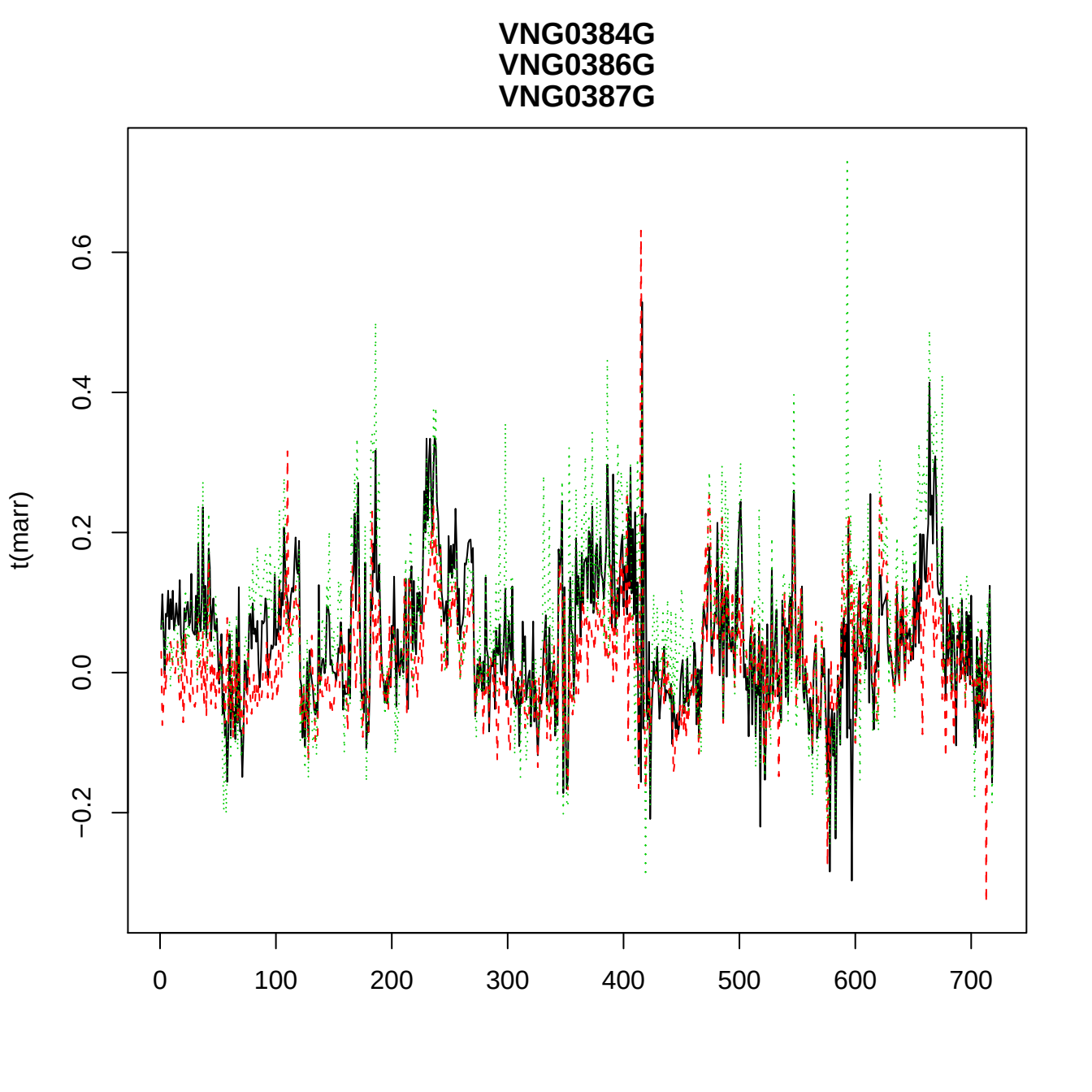
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


297500
298000
298500
299000
299500
300000
300500
VNG0383H
trpE2
trpG2
ilvE1
VNG0388C
Anth_synt_I_N
Chorismate_bind
Aminotran_4
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbA
tfbD
tfbF
pred


VNG0384G
VNG0386G
VNG0387G
t(marr)
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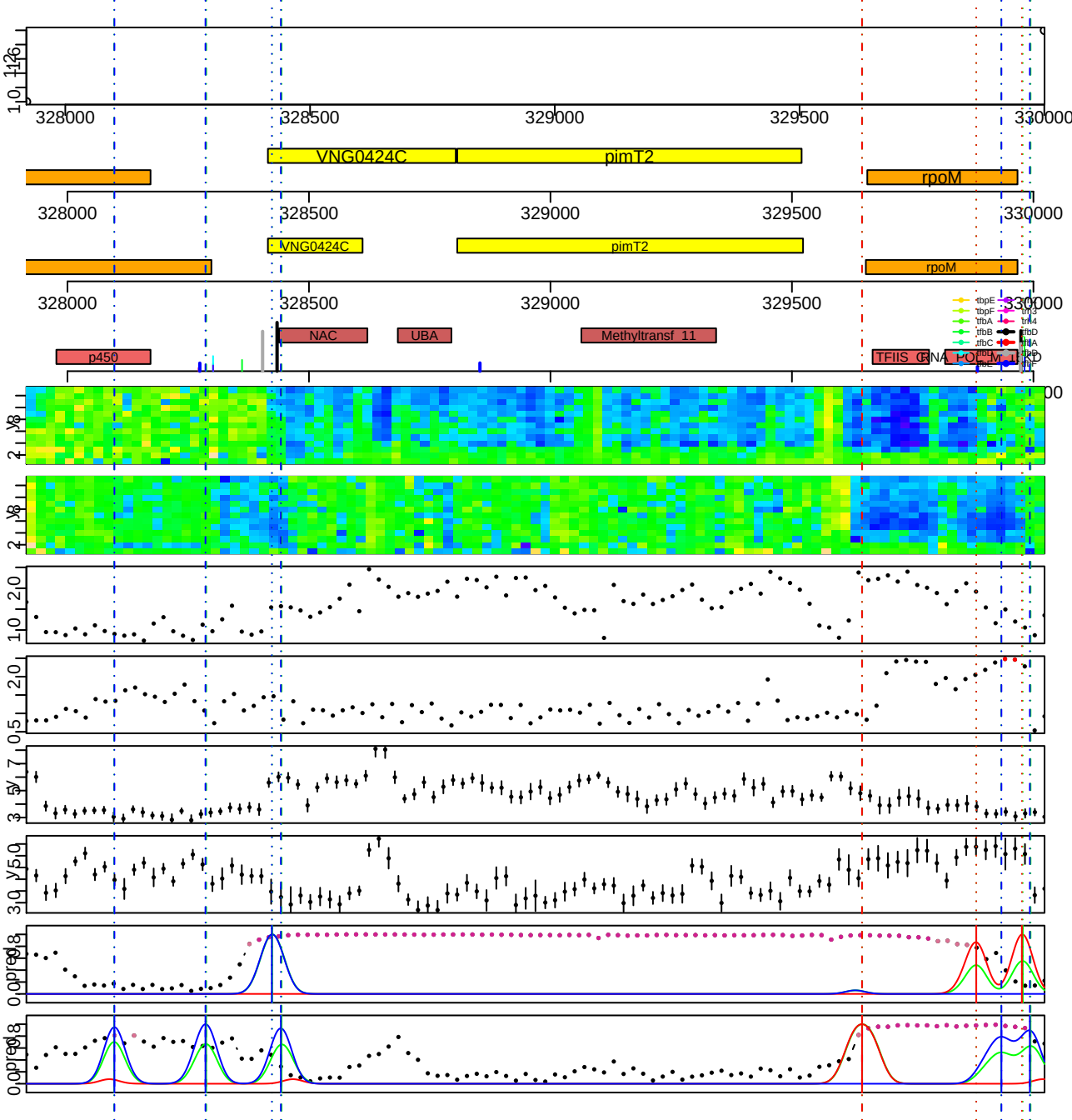
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700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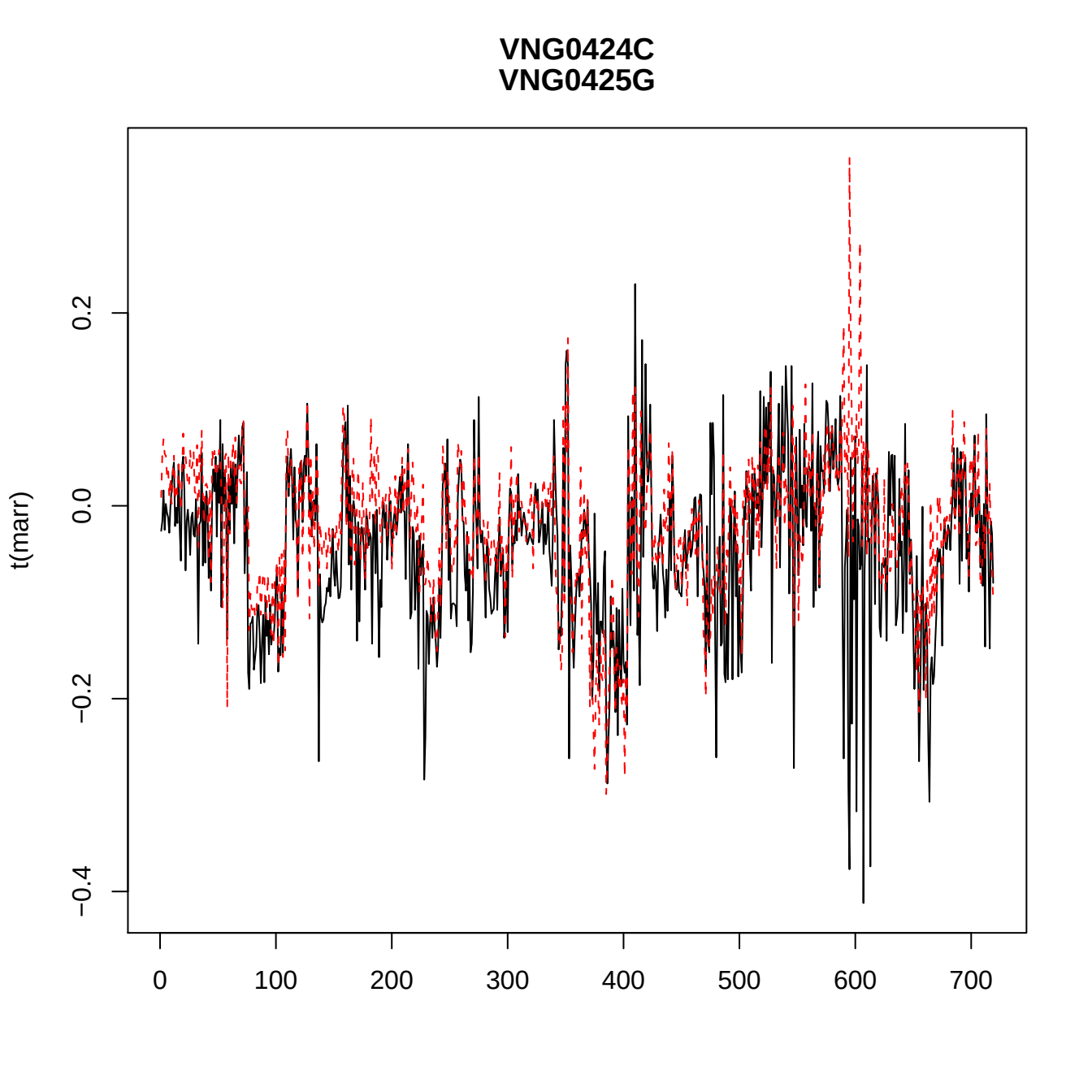
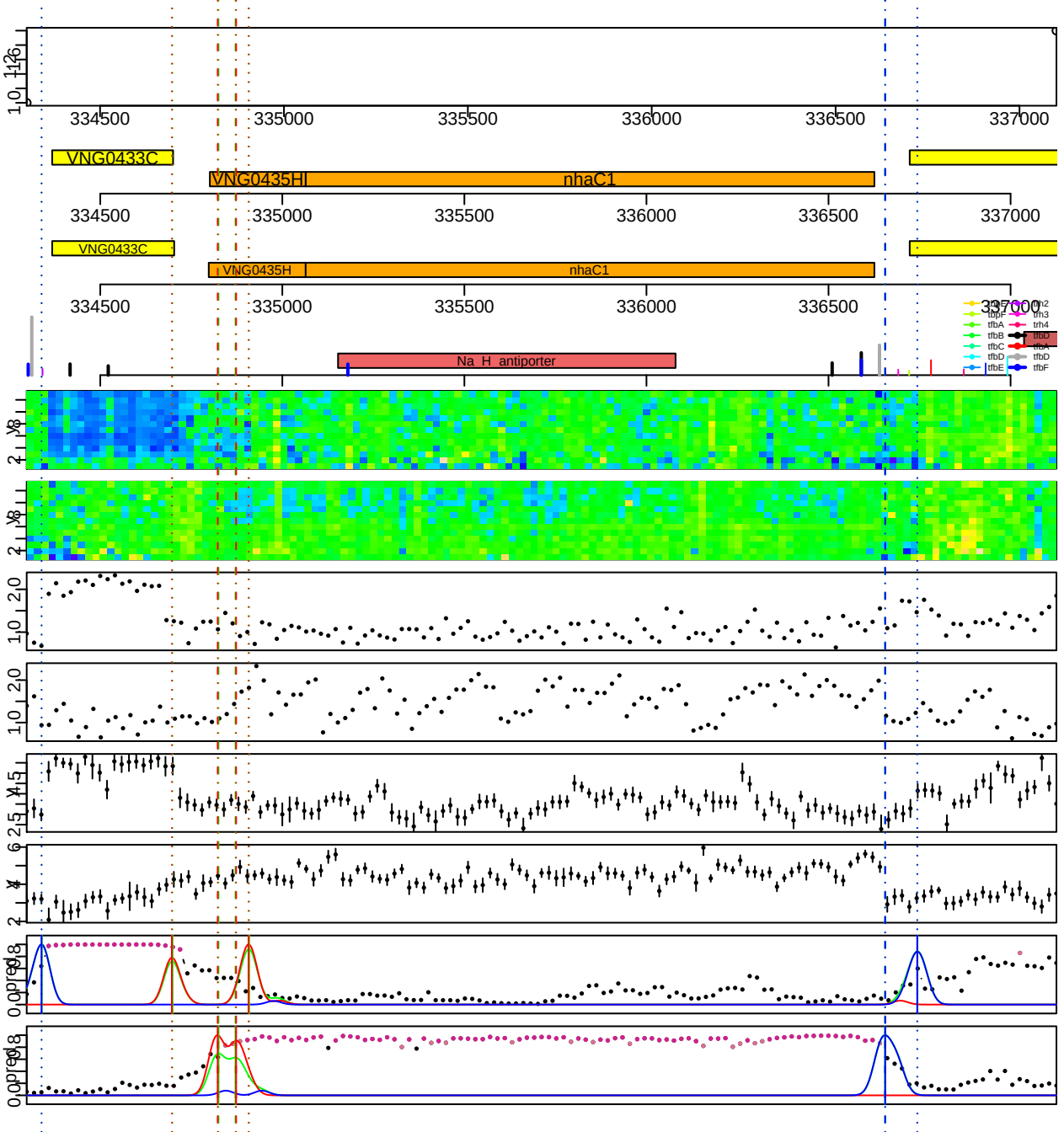
329000
329500
330000
VNG0424C
pimT2
rpoM
NAC
UBA
Methyltransf_11
p450
TFIIS_CNA
POLM_TUD
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trm3
trm4
tfbD
tfbA
tfbB
tfbC
tfbE


VNG0424C
VNG0425G
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


334500
335000
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336000
336500
337000
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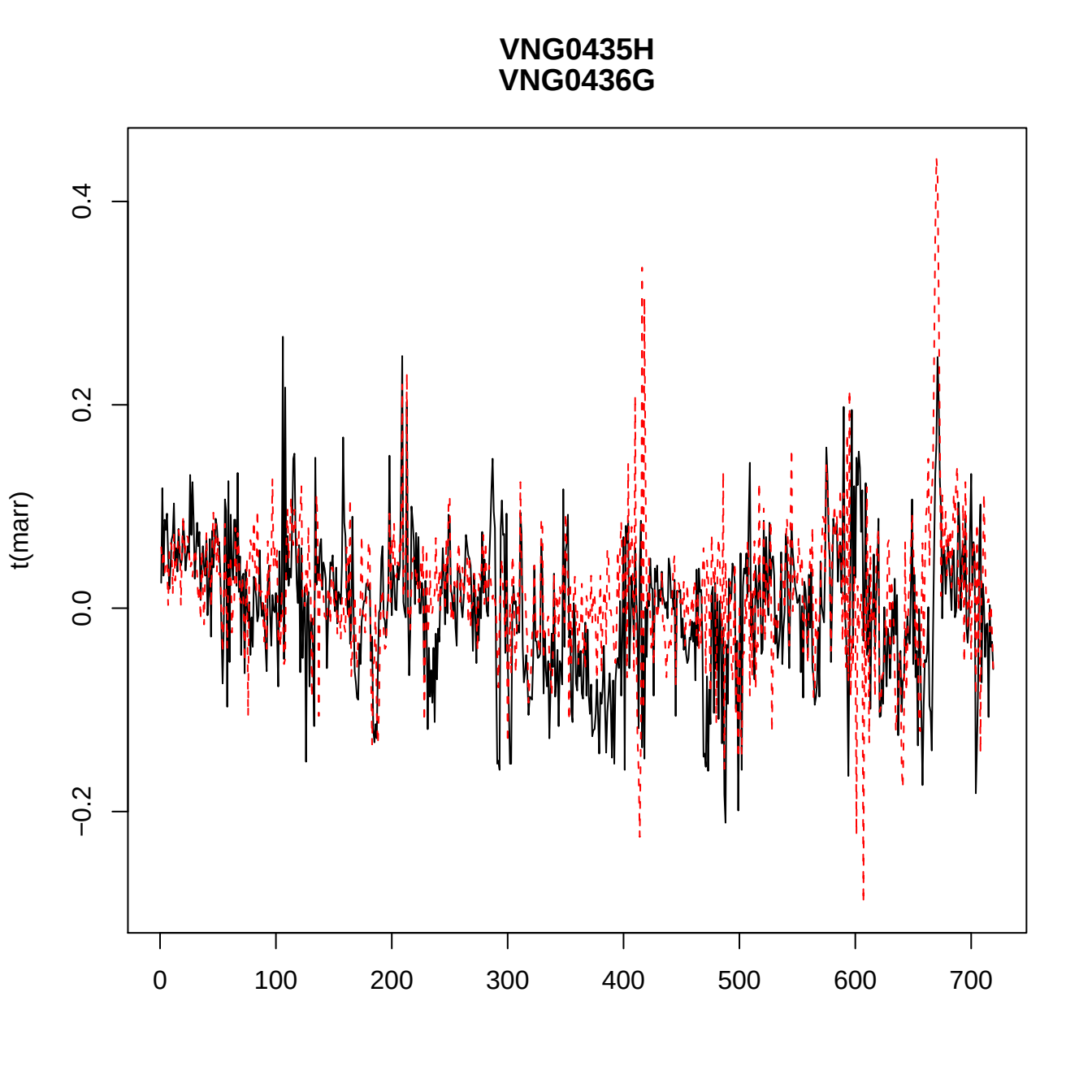
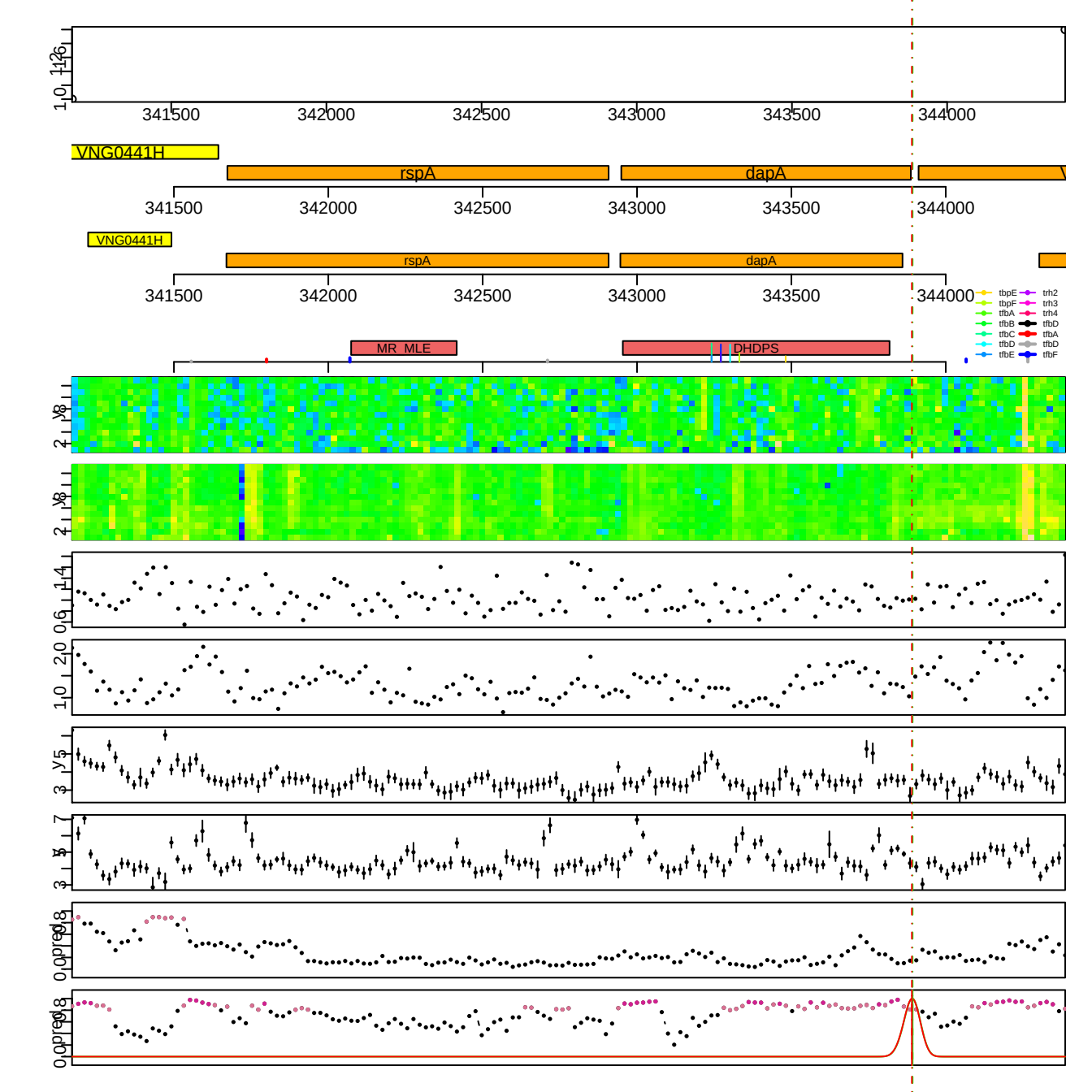
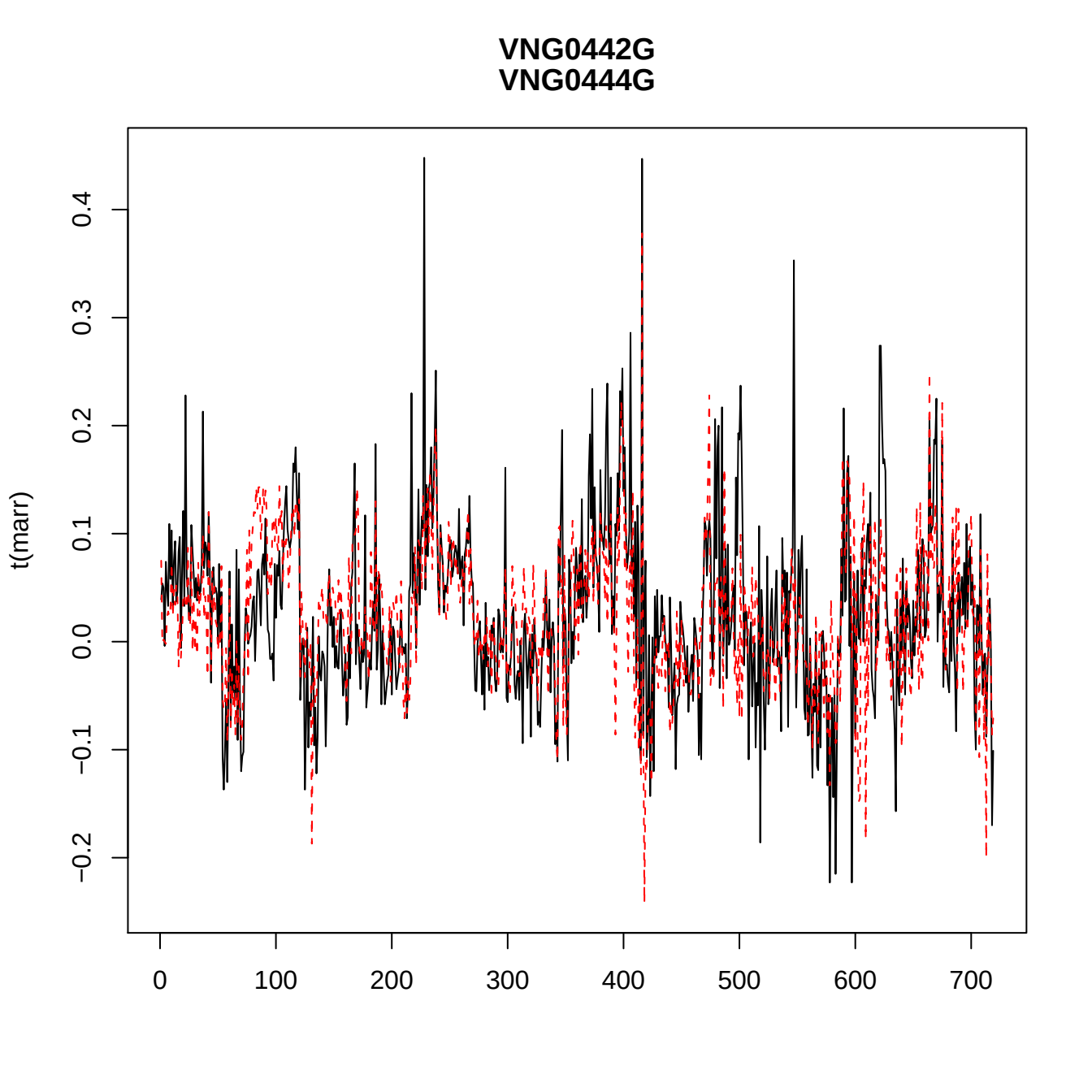
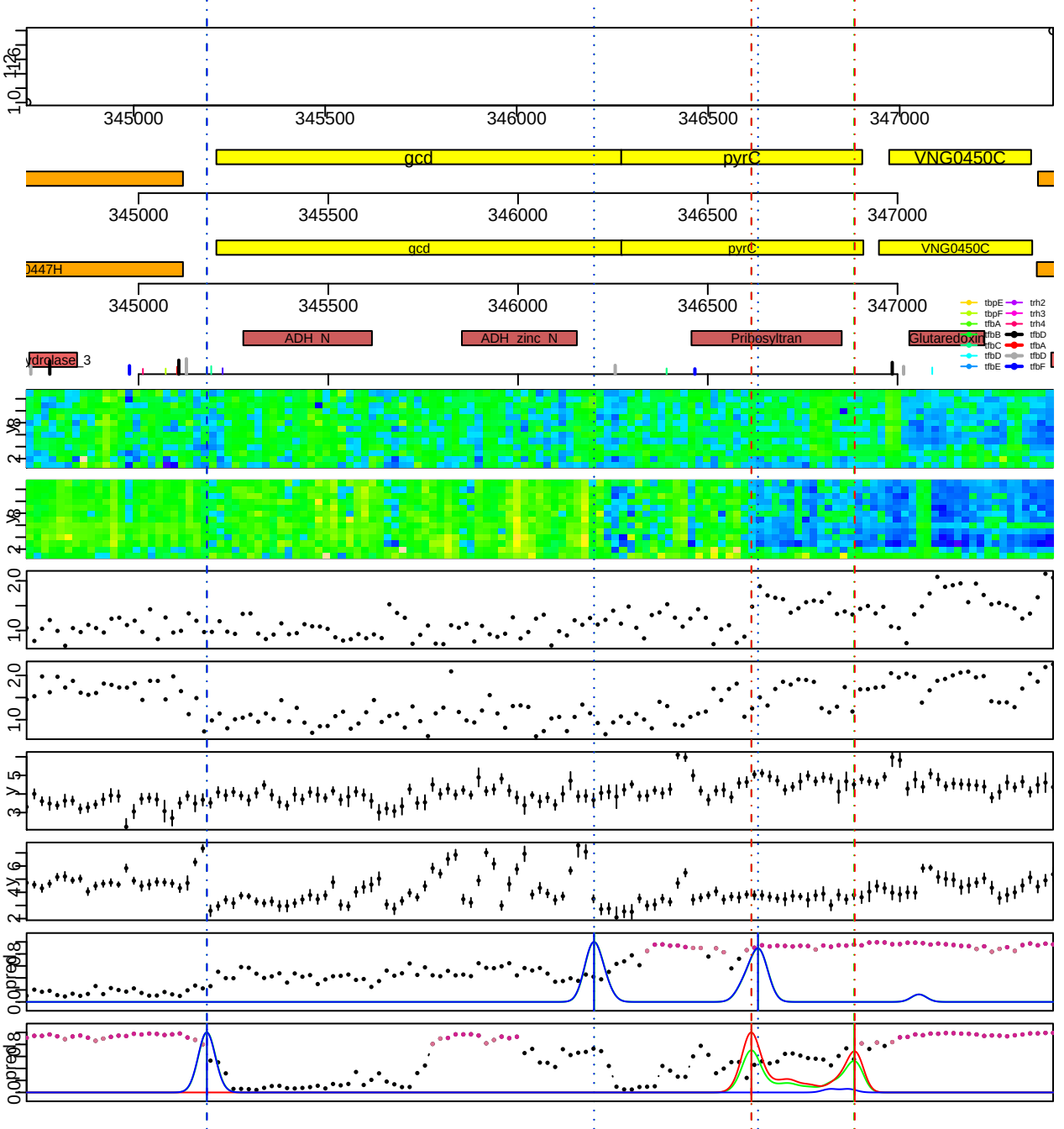
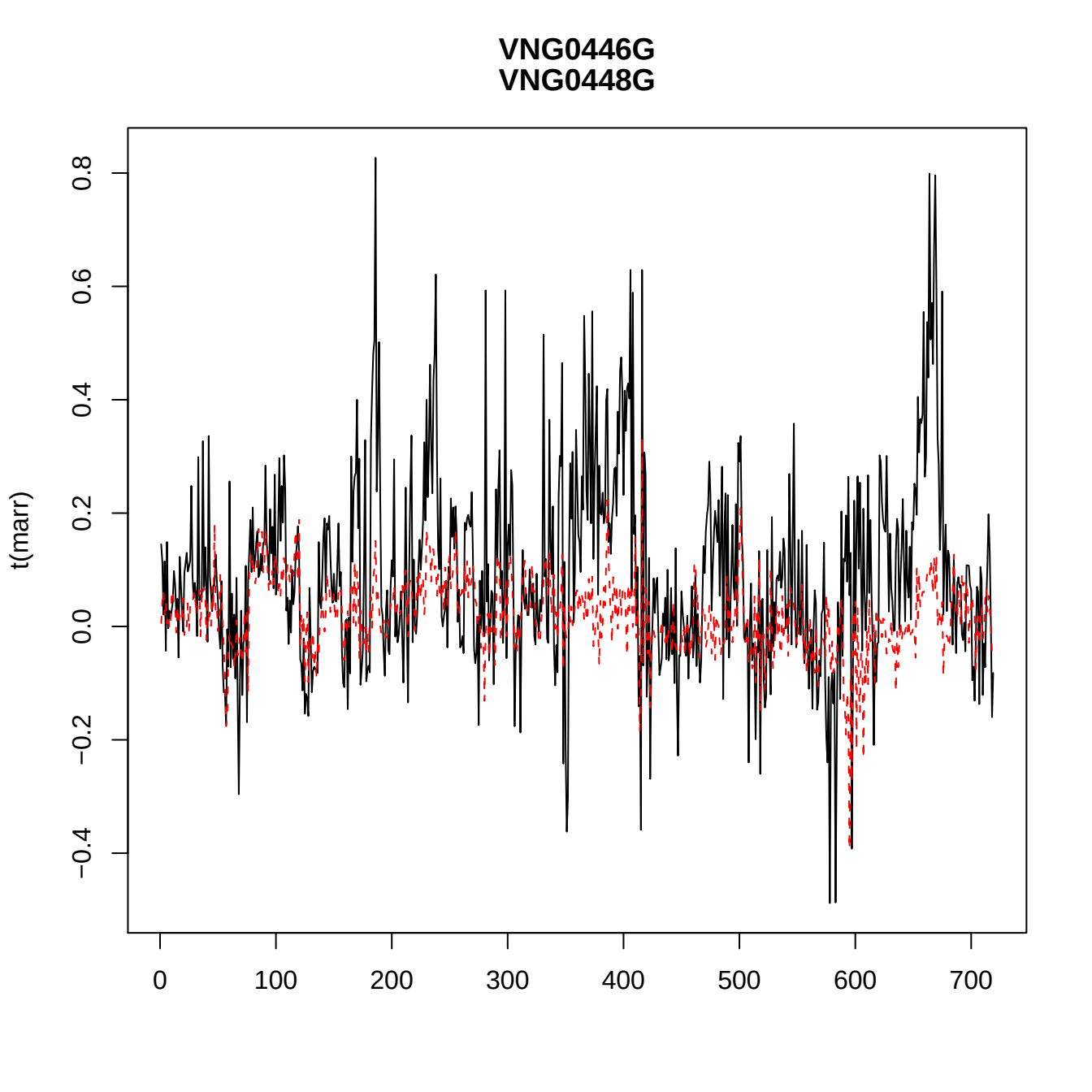
VNG0435HI
nhaC1
VNG0435H
Na_H_antiporter
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

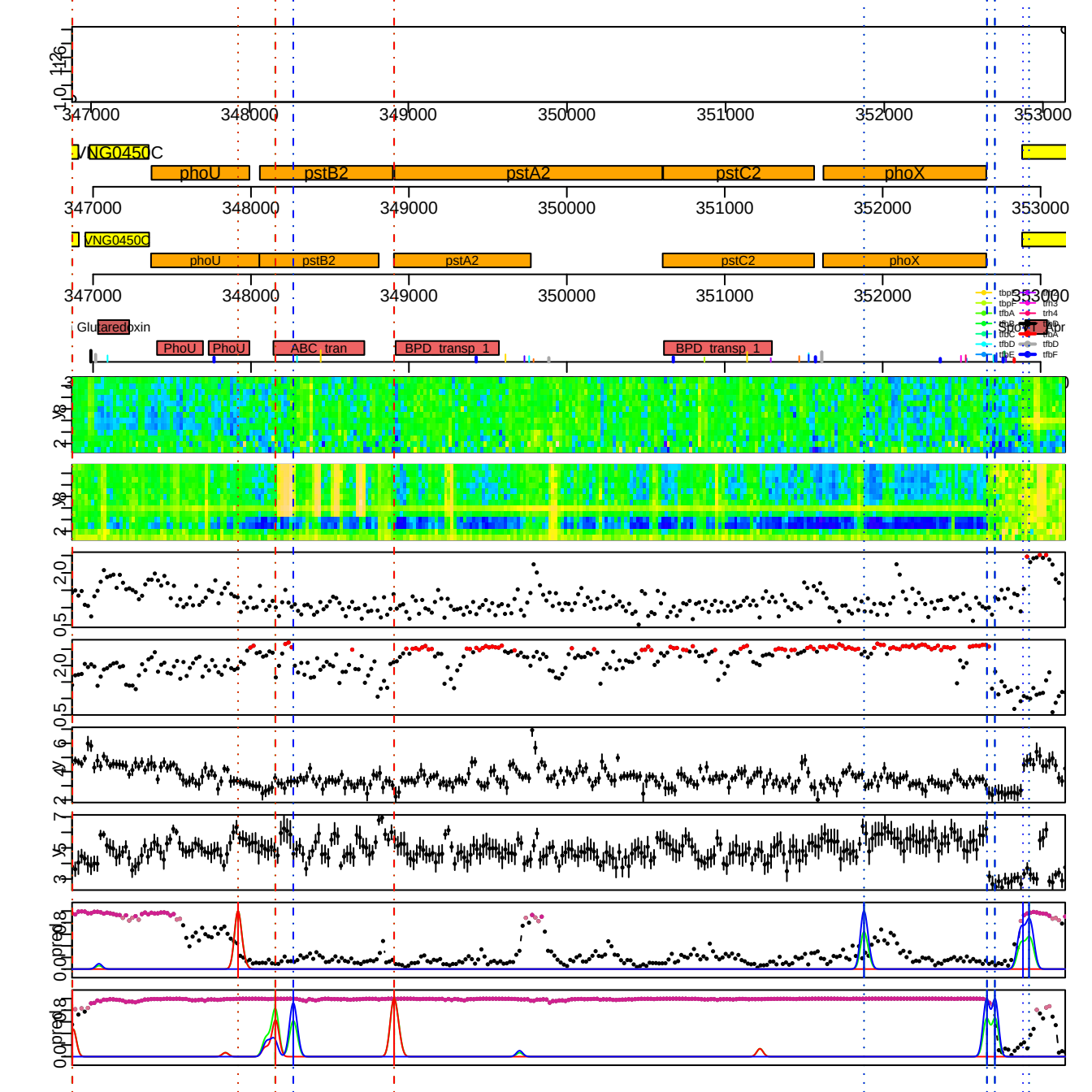

VNG0435H
VNG0436G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700


341500
342000
342500
343000
343500
344000
VNG0441H
rspA
dapA
MR_MLE
DHDPS
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0442G
VNG0444G
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700


345000
345500
346000
346500
347000
gcd
pyrC
VNG0450C
0447H
ADH_N
ADH_zinc_N
Pribosyltran
Glutaredoxin
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0446G
VNG0448G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


347000
348000
349000
350000
351000
352000
353000
VNG0450C
phoU
pstB2
pstA2
pstC2
phoX
Glutaredoxin
PhoU
PhoU
ABC_tran
BPD_transp_1
BPD_transp_1
tbpB
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
trh5
trh6
trh7
trh8
trh9
trh10
trh11
trh12
trh13
trh14
trh15
trh16
trh17
trh18
trh19
trh20
trh21
trh22
trh23
trh24
trh25
trh26
trh27
trh28
trh29
trh30
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trh38
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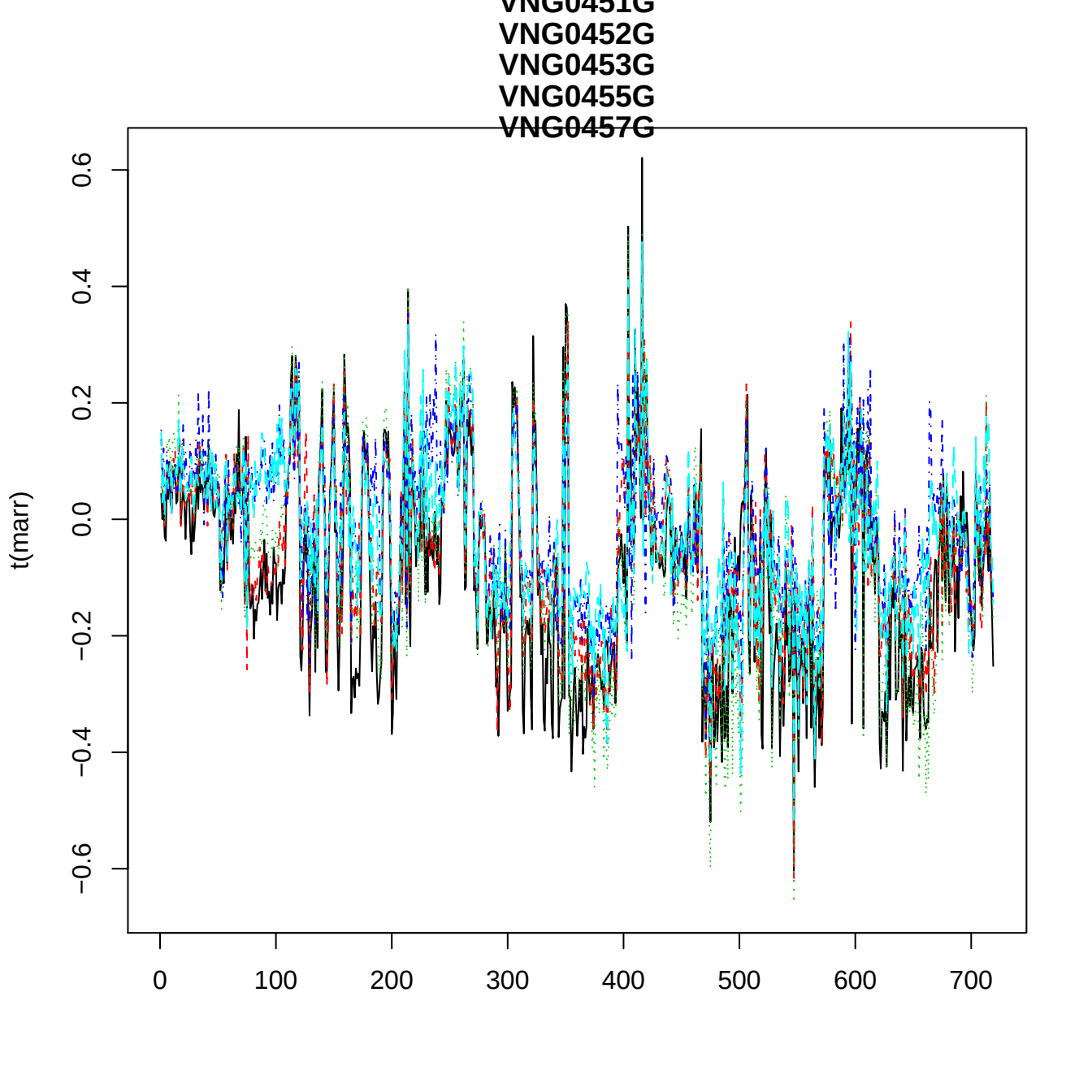
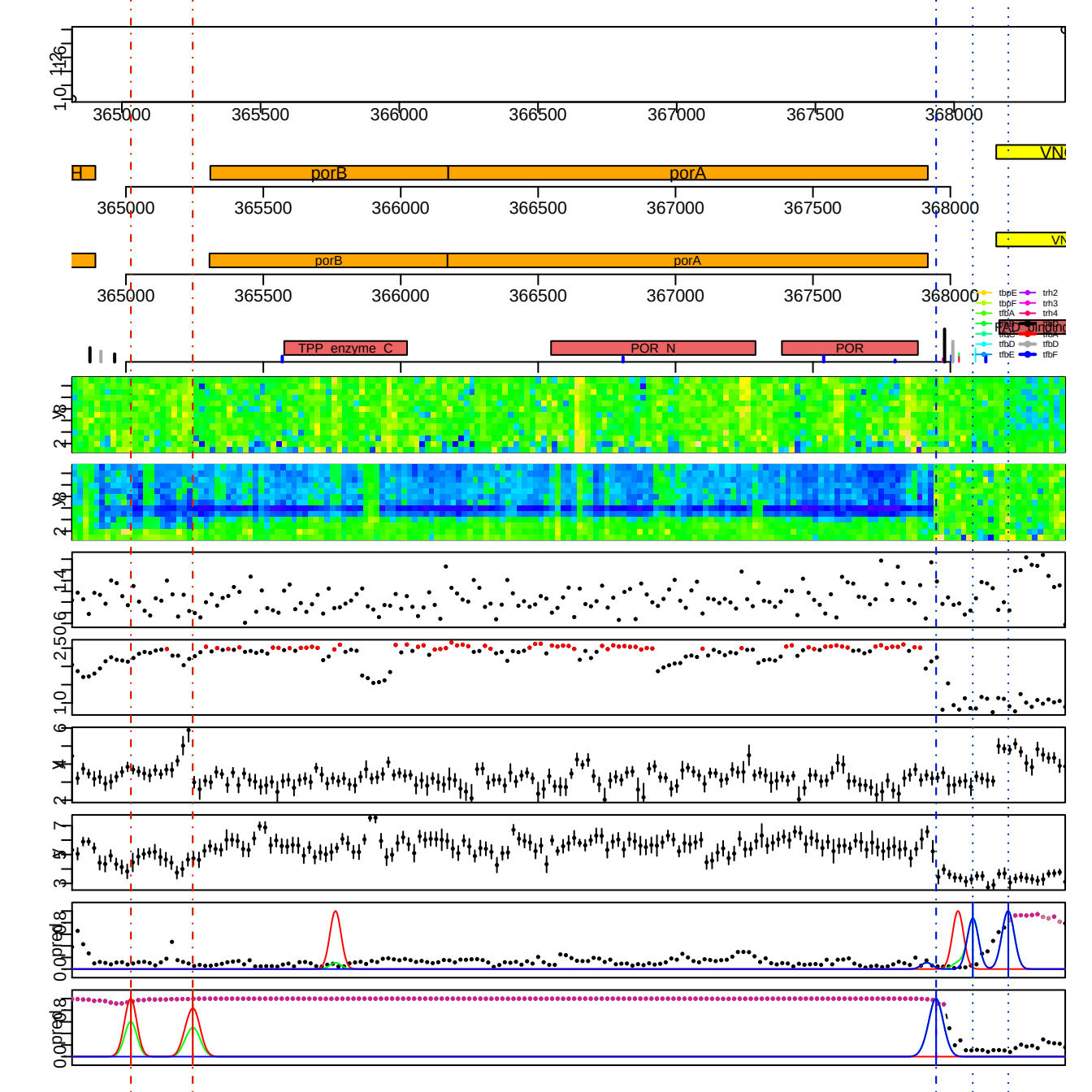
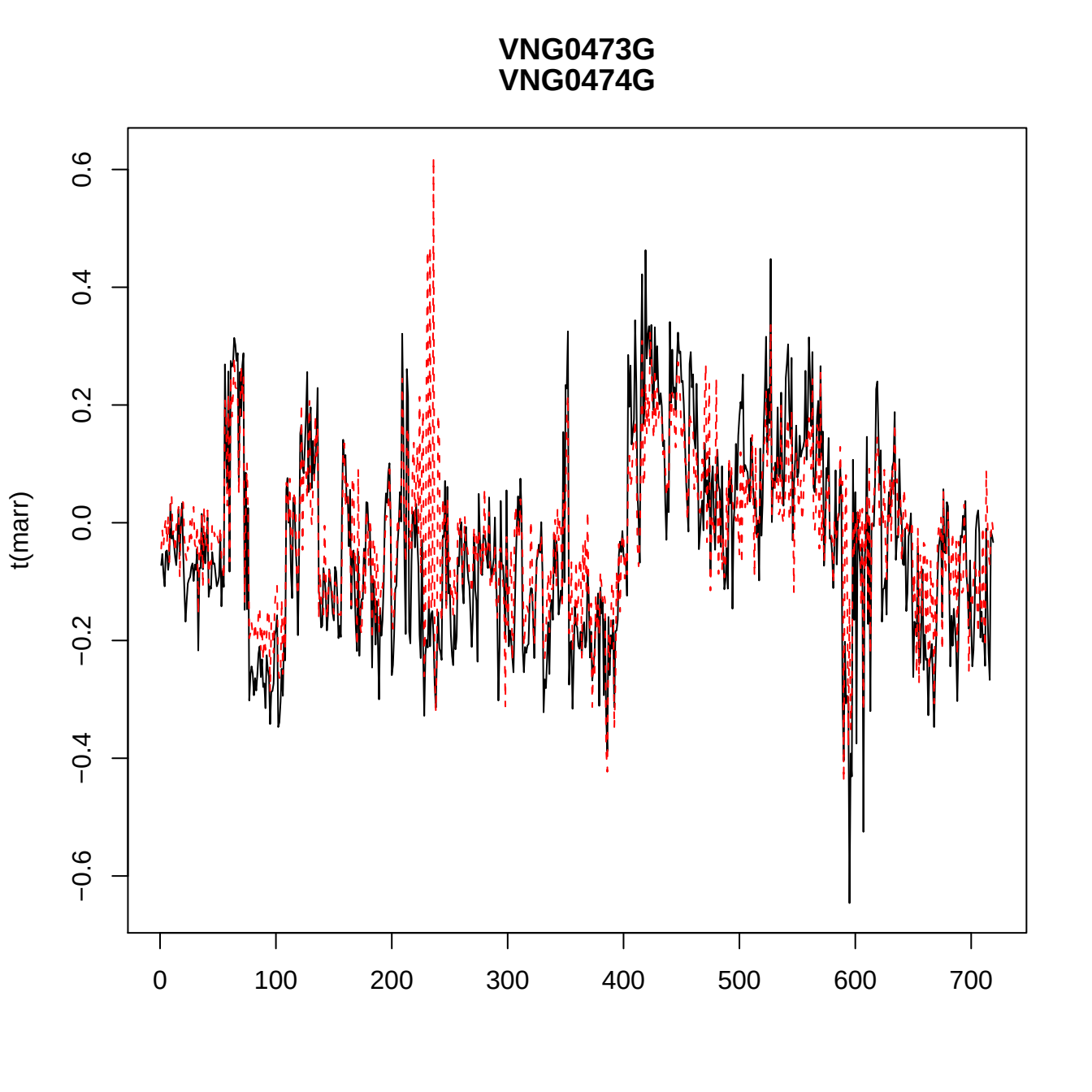
trh40
trh41
trh42


VNG0451G
VNG0452G
VNG0453G
VNG0455G
VNG0457G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


365000
365500
366000
366500
367000
367500
368000
porB
porA
TPP_enzyme_C
POR_N
POR
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF


VNG0473G
VNG0474G
t(marr)
0.6
0.4
0.2
0.0
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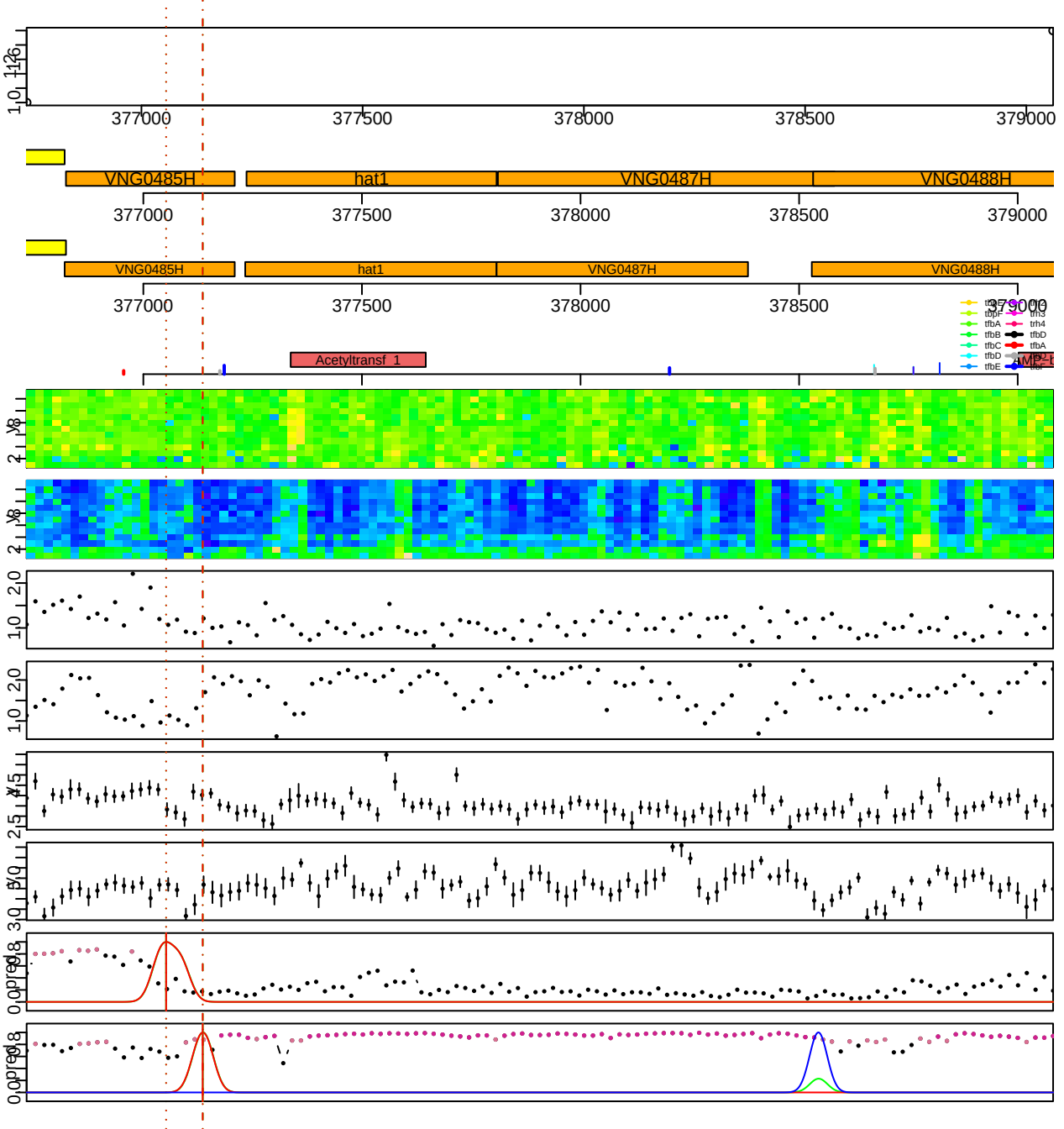
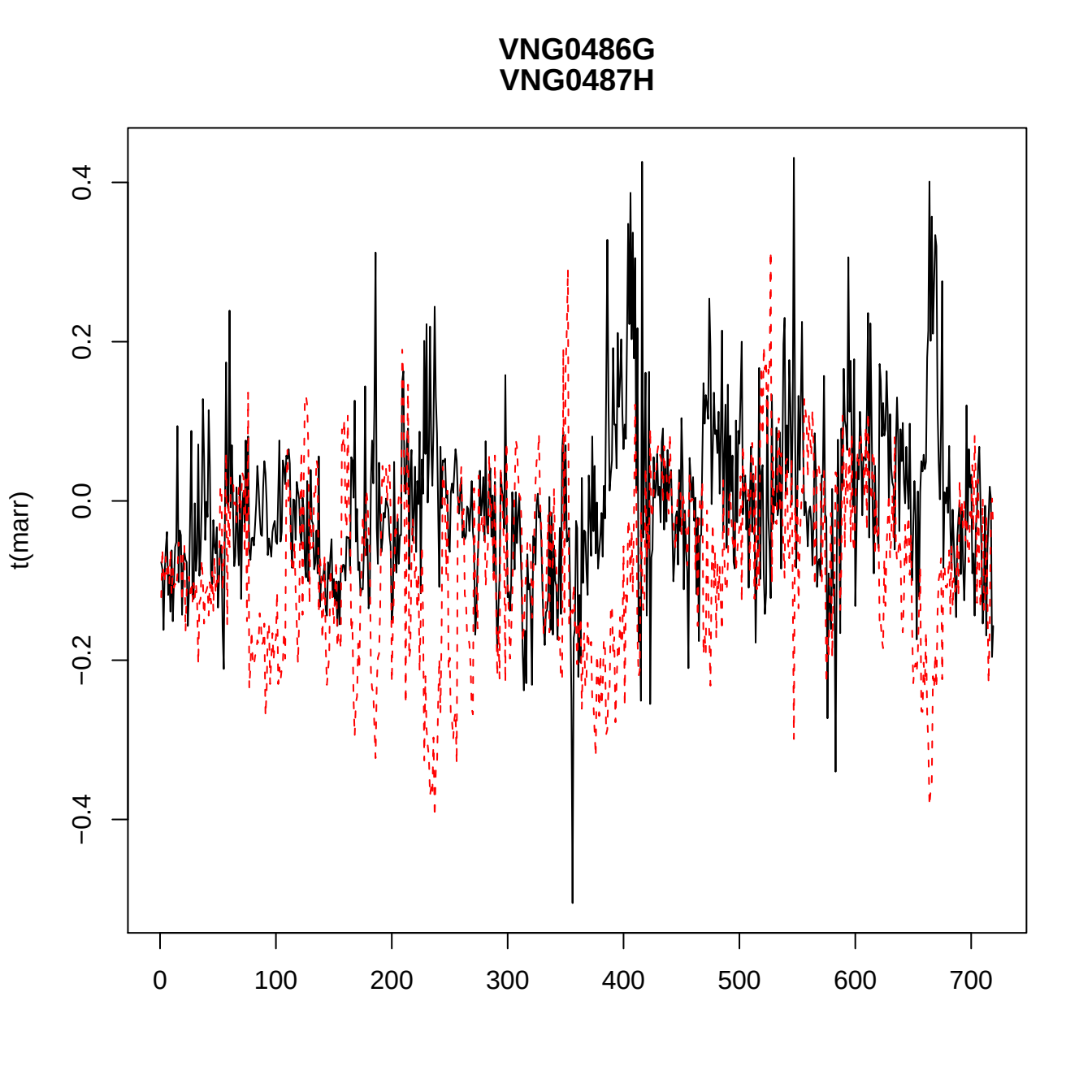
−0.4
−0.6
0
100
200
300
400
500
600
700


377000
377500
378000
378500
379000
VNG0485H
hat1
VNG0487H
VNG0488H
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
Acetyltransf_1


VNG0486G
VNG0487H
t(marr)
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0.2
0.0
−0.2
−0.4
0
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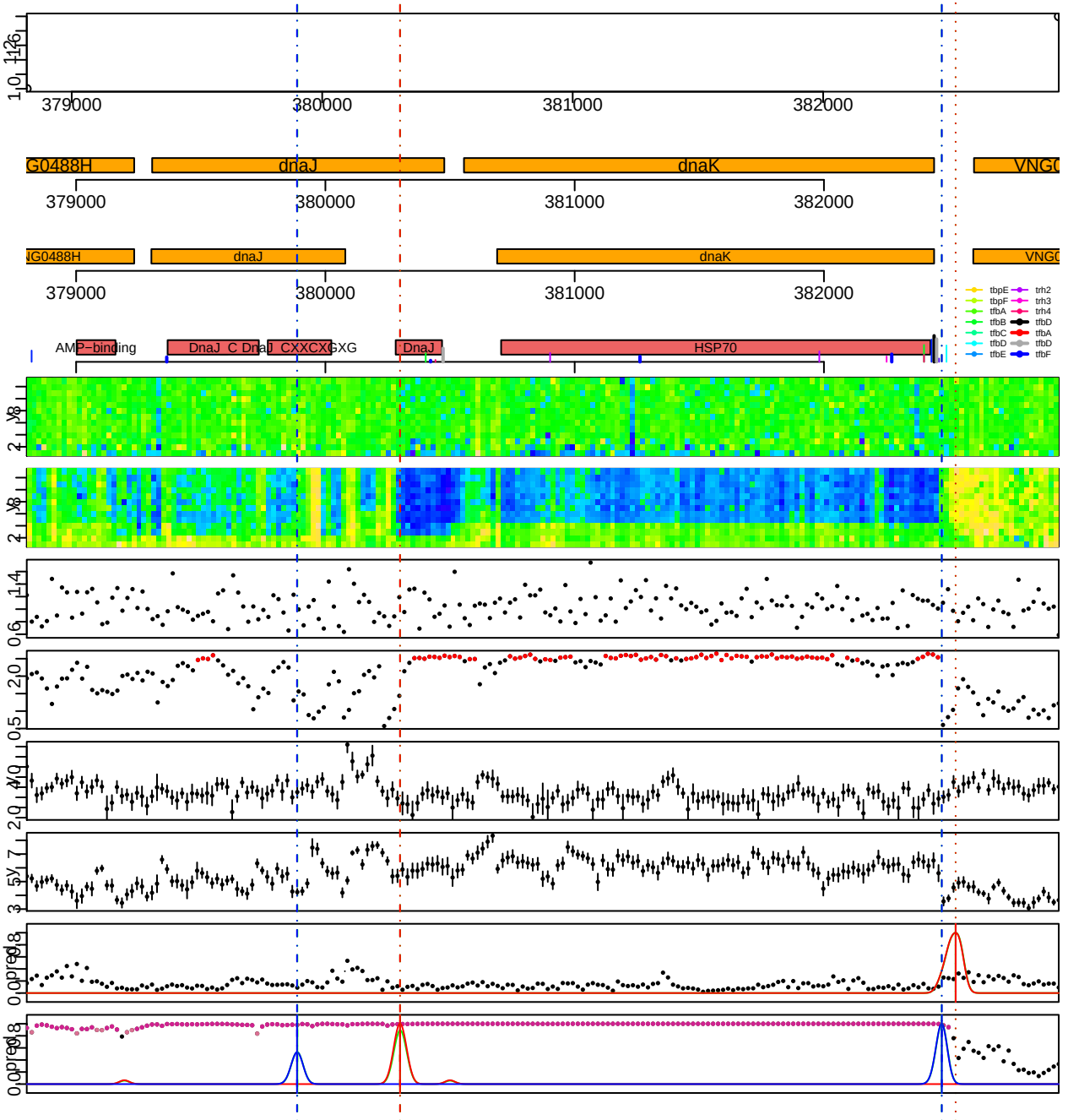
400
500
600
700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380000
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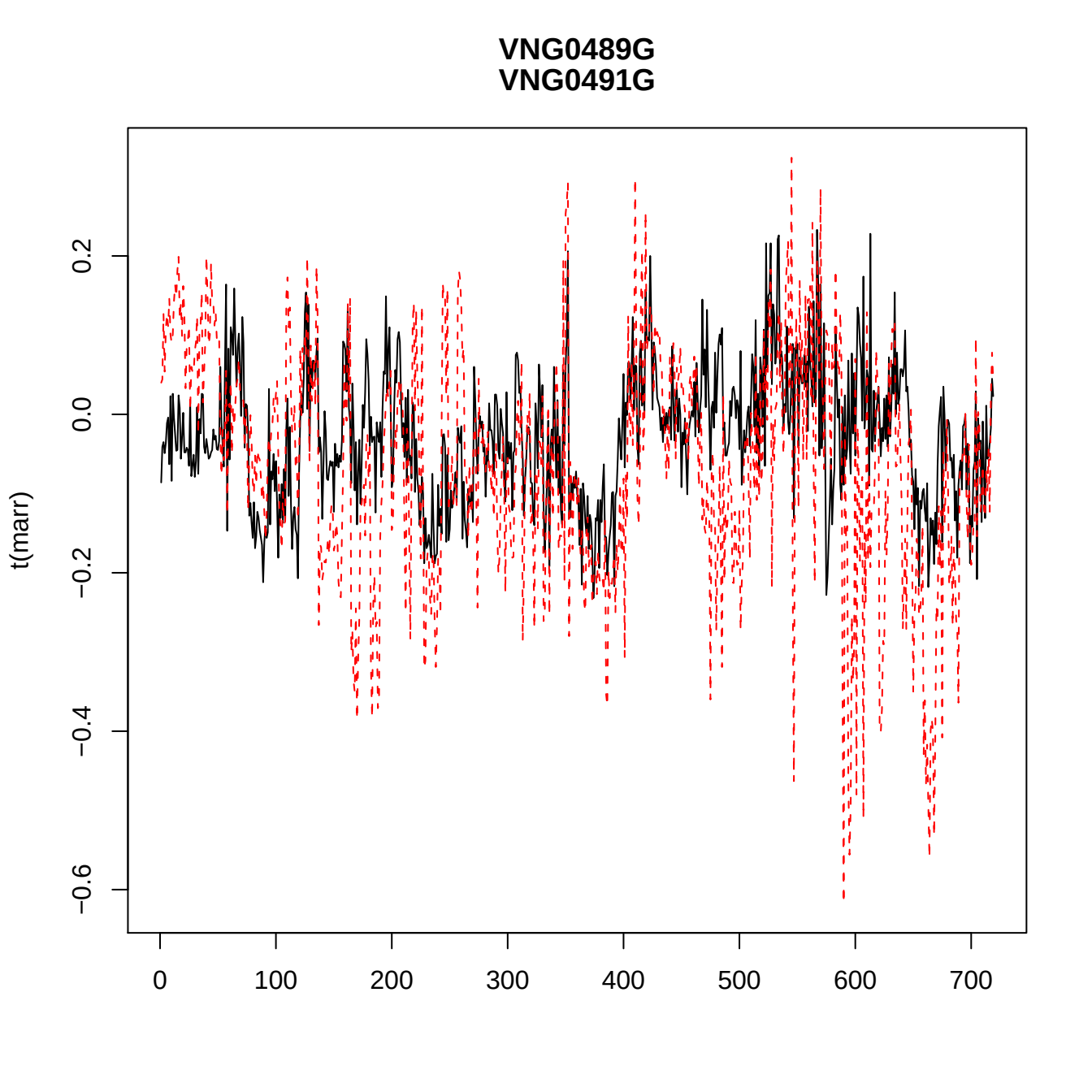
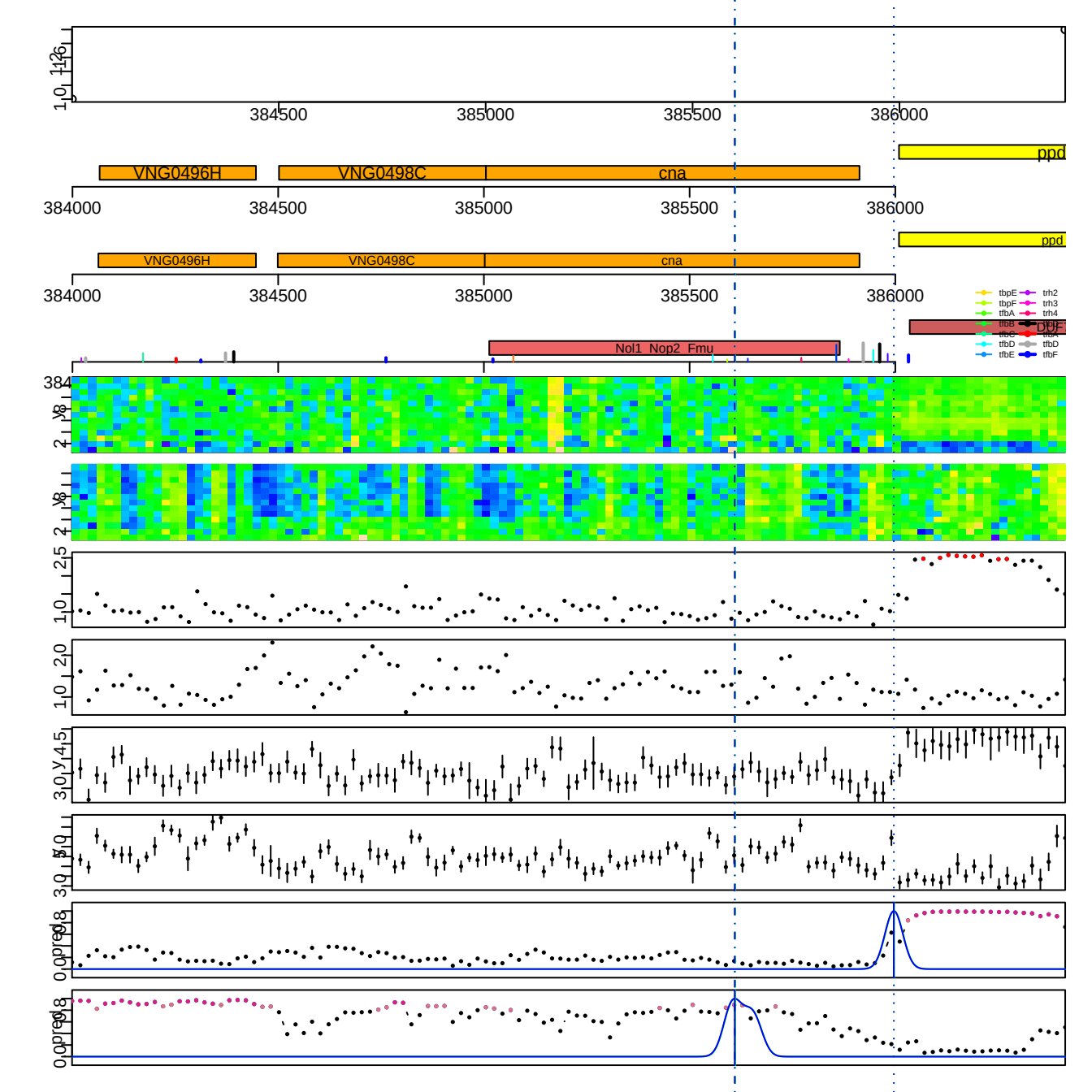
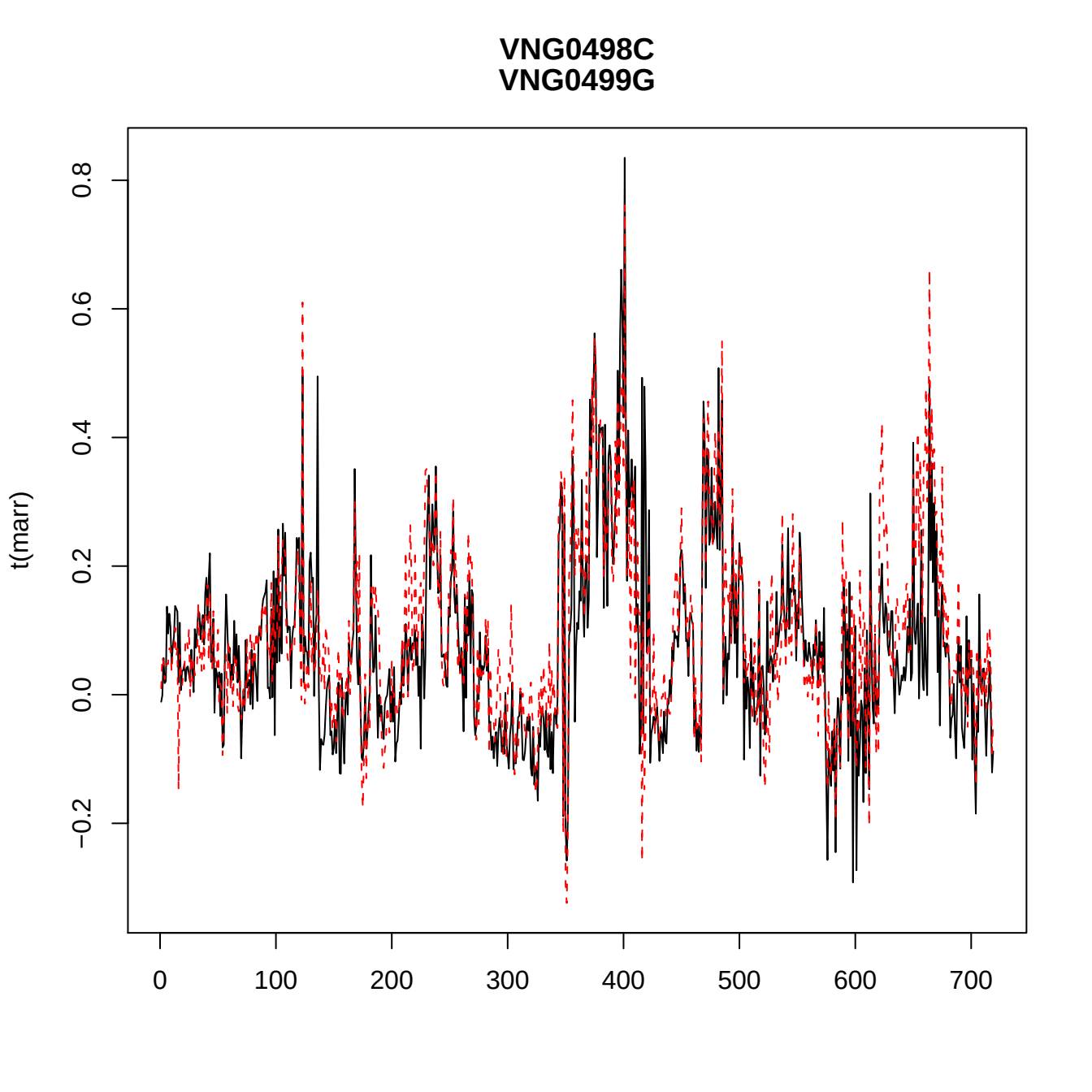
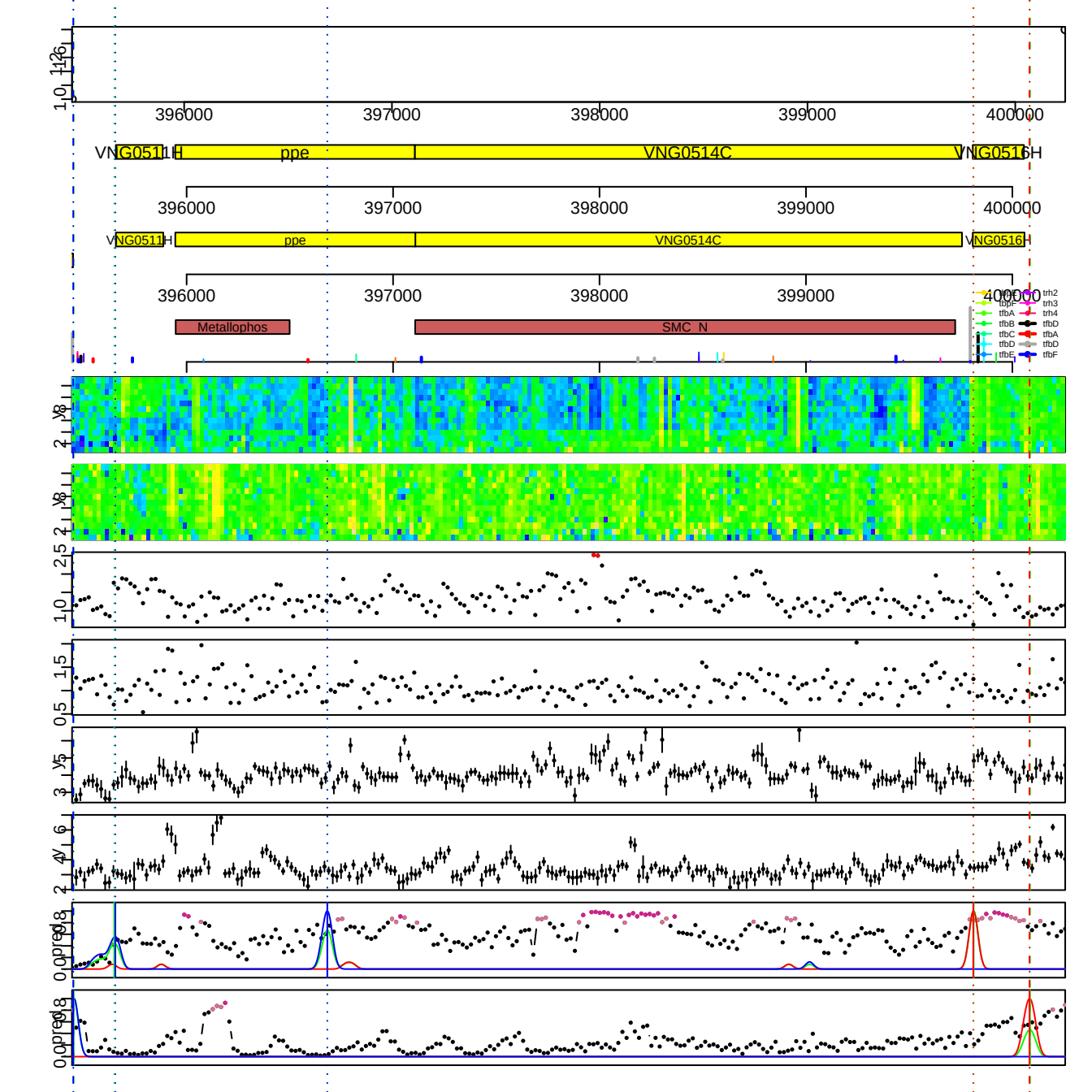
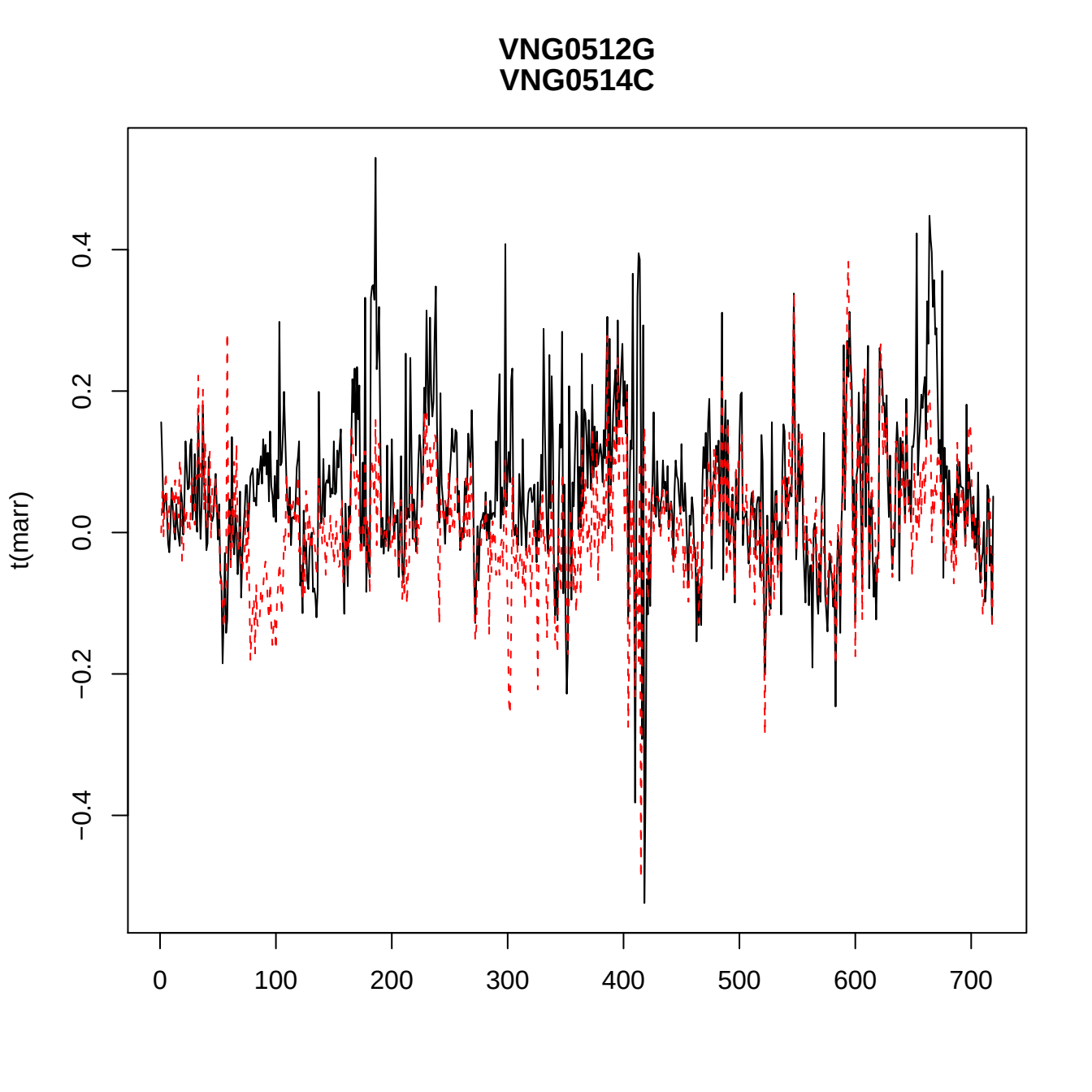
382000
G0488H
dnaJ
dnaK
VNG0
AMP−binding
DnaJ_C
DnaJ_CXXCXGXG
DnaJ
HSP70
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0489G
VNG0491G
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


384500
385000
385500
386000
ppd
VNG0496H
VNG0498C
cna
384000
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF
Nol1_Nop2_Fmu
pred


VNG0498C
VNG0499G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700


396000
397000
398000
399000
400000
VNG0511H
ppe
VNG0514C
VNG0516H
Metallophos
SMC_N
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbE
tfbC
tfbB
tfbA
tfbF


VNG0512G
VNG0514C
t(marr)
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0.2
0.0
−0.2
−0.4
0
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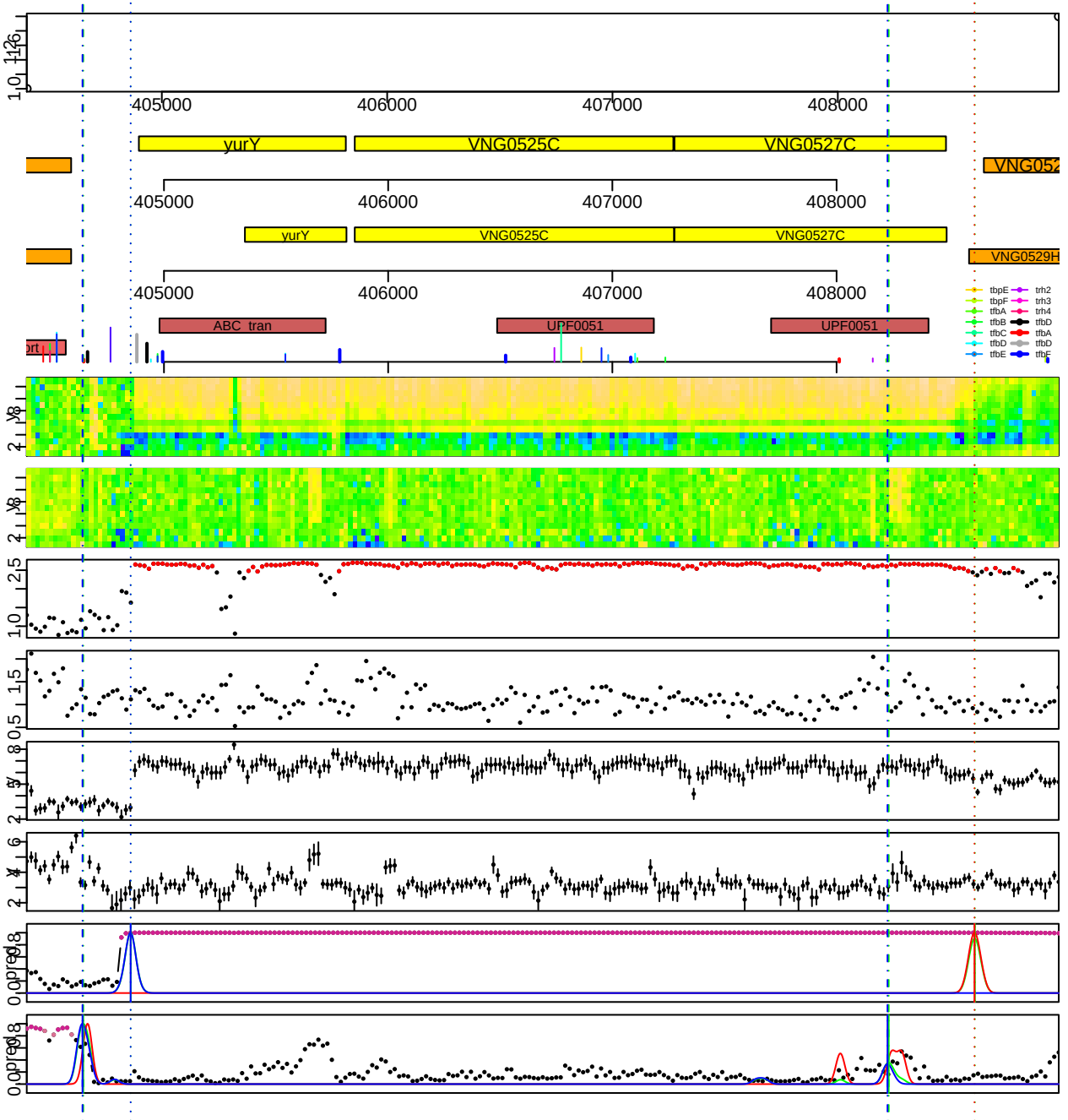
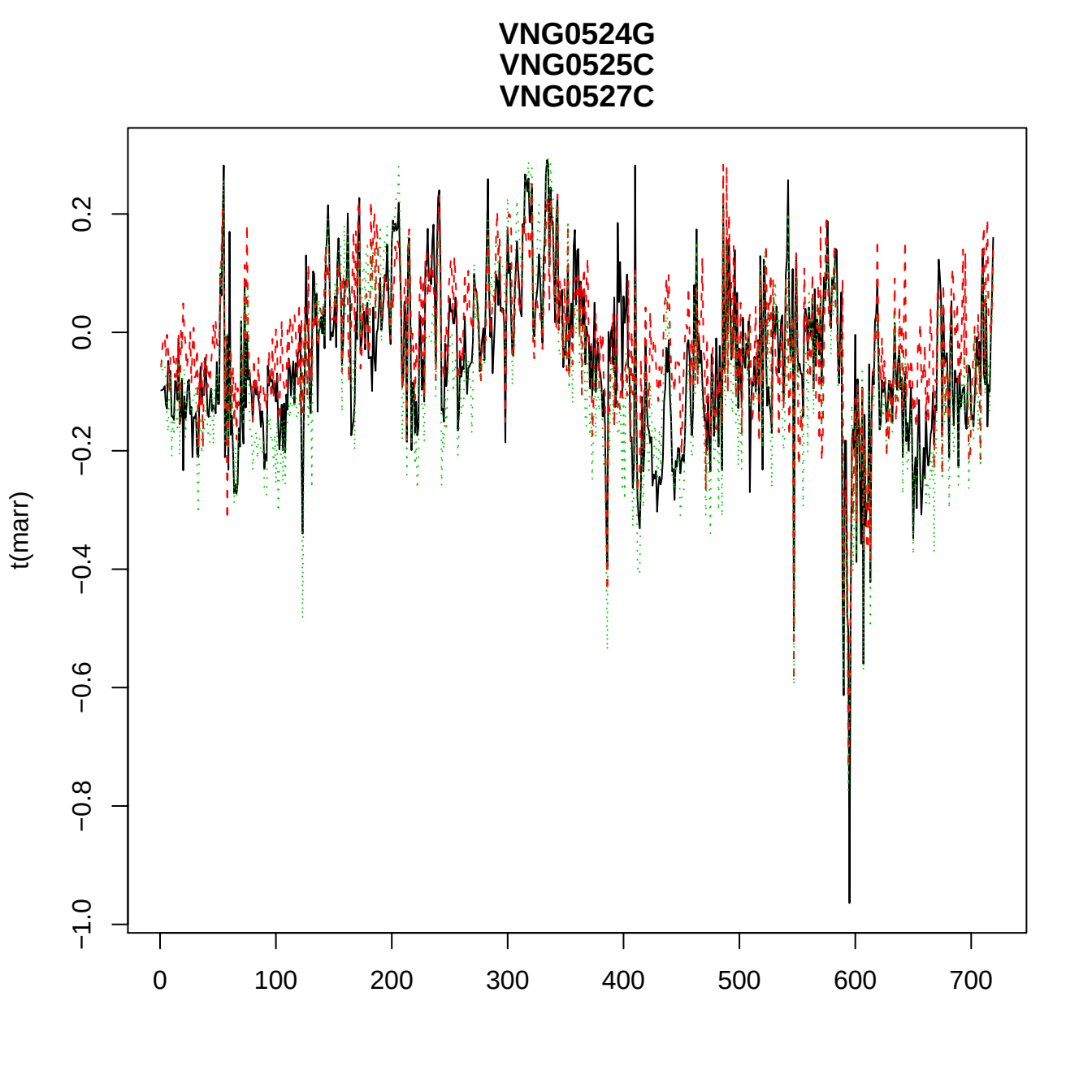
300
400
500
600
700


405000
406000
407000
408000
yurY
VNG0525C
VNG0527C
VNG0529H
ABC_tran
UPF0051
UPF0051
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbE
pred


VNG0524G
VNG0525C
VNG0527C
t(marr)
0.2
0.0
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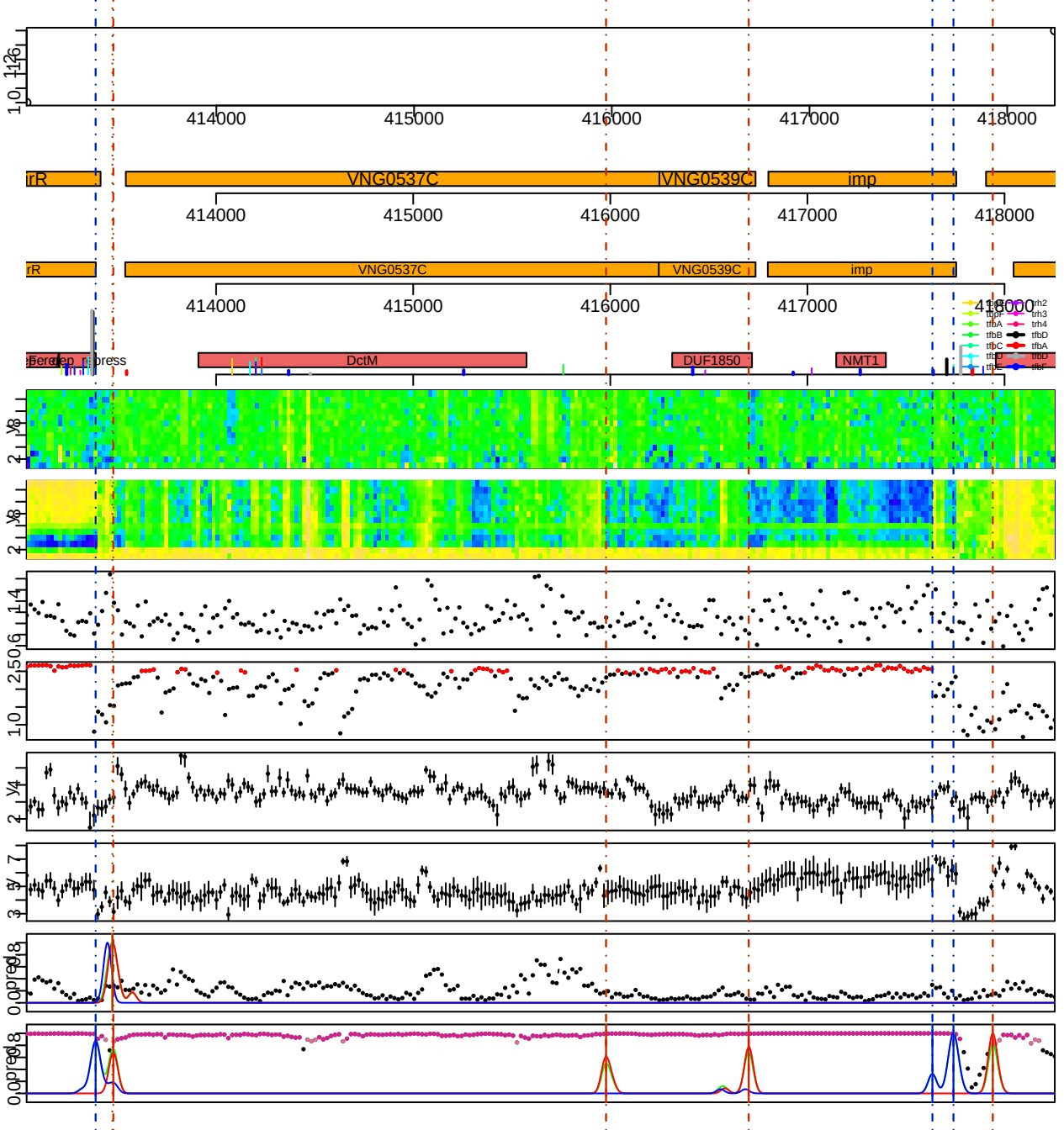
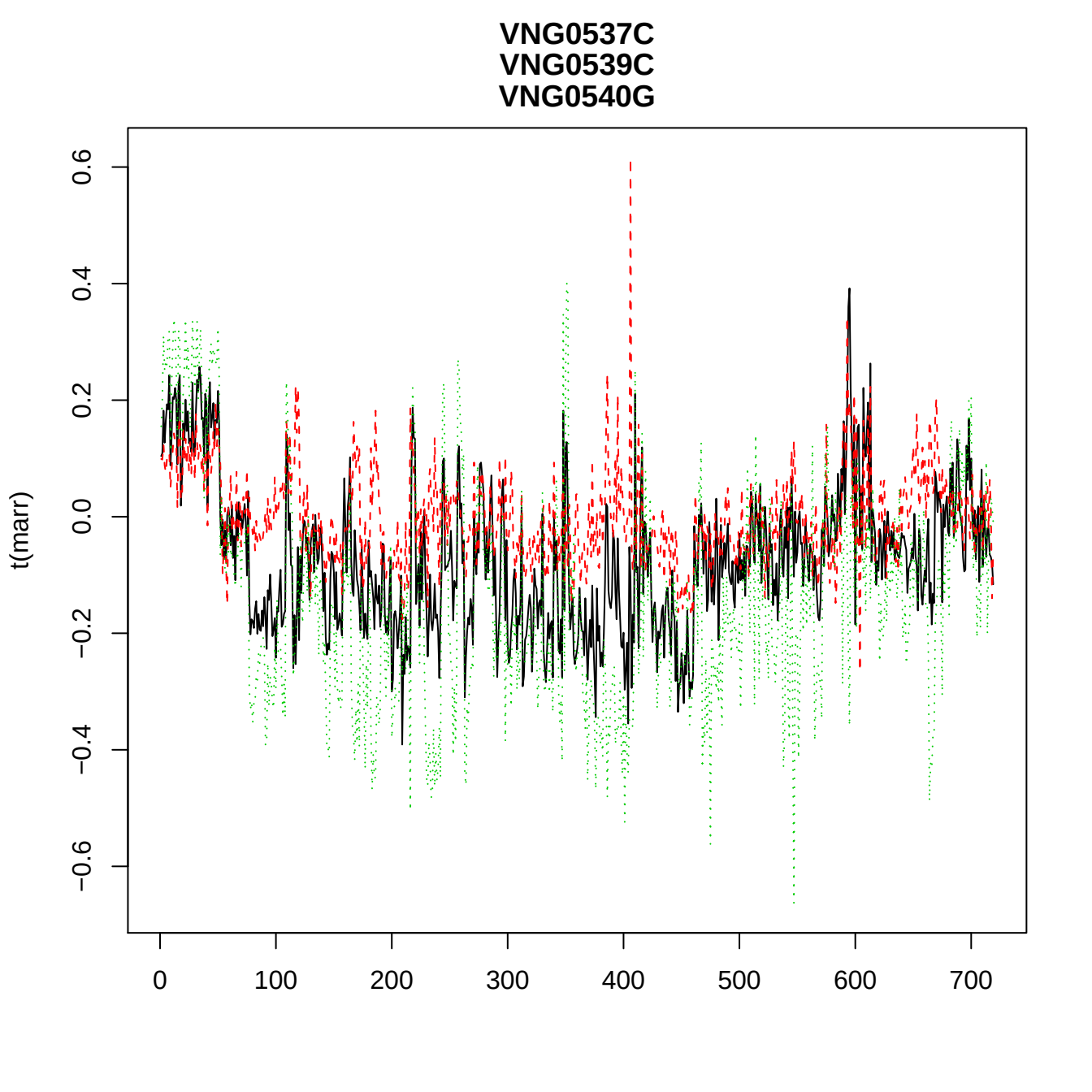
−0.4
−0.6
−0.8
−1.0
0
100
200
300
400
500
600
700


414000
415000
416000
417000
418000
VNG0537C
VNG0539C
imp
DctM
DUF1850
NMT1
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0537C
VNG0539C
VNG0540G
t(marr)
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0.4
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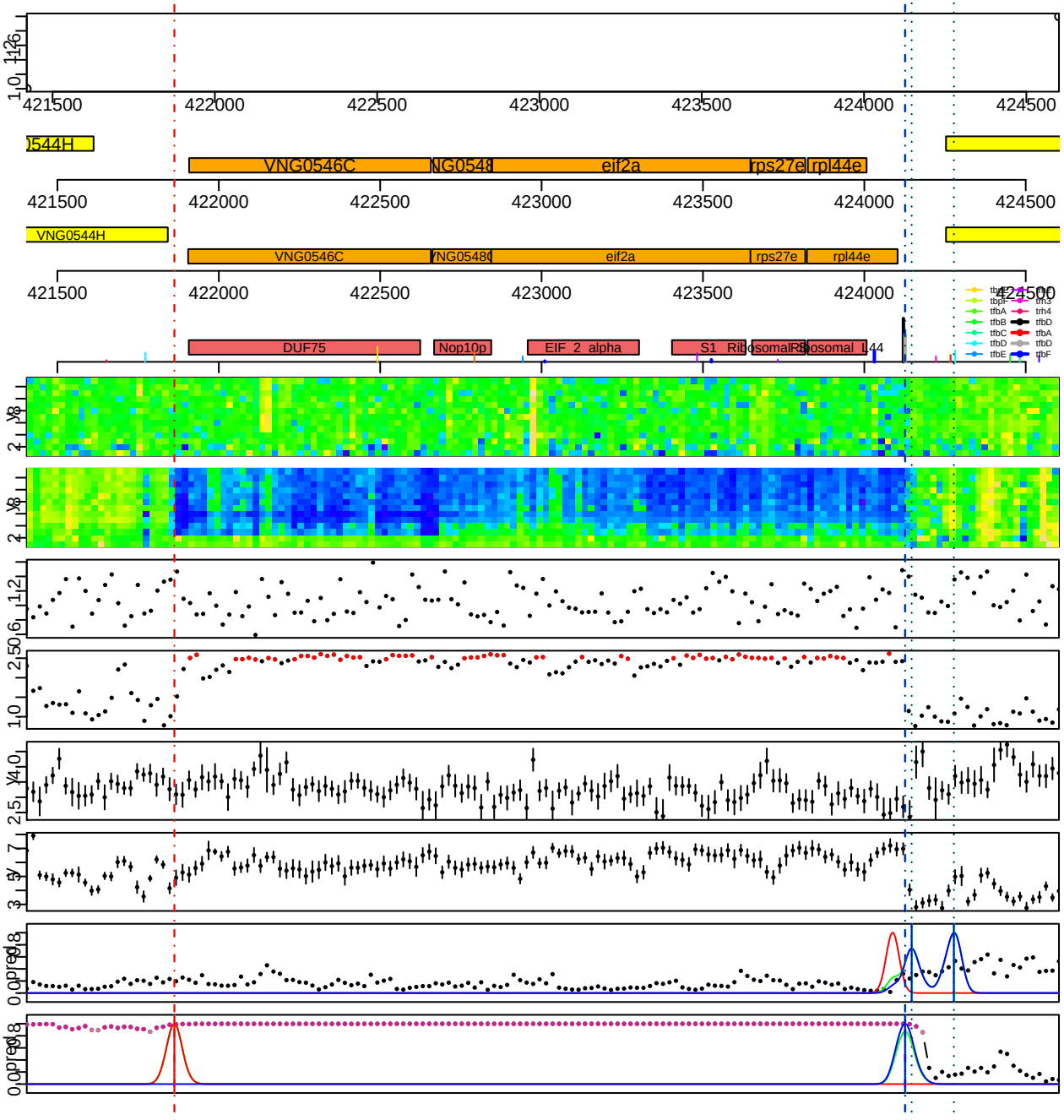
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


421500
422000
422500
423000
423500
424000
424500
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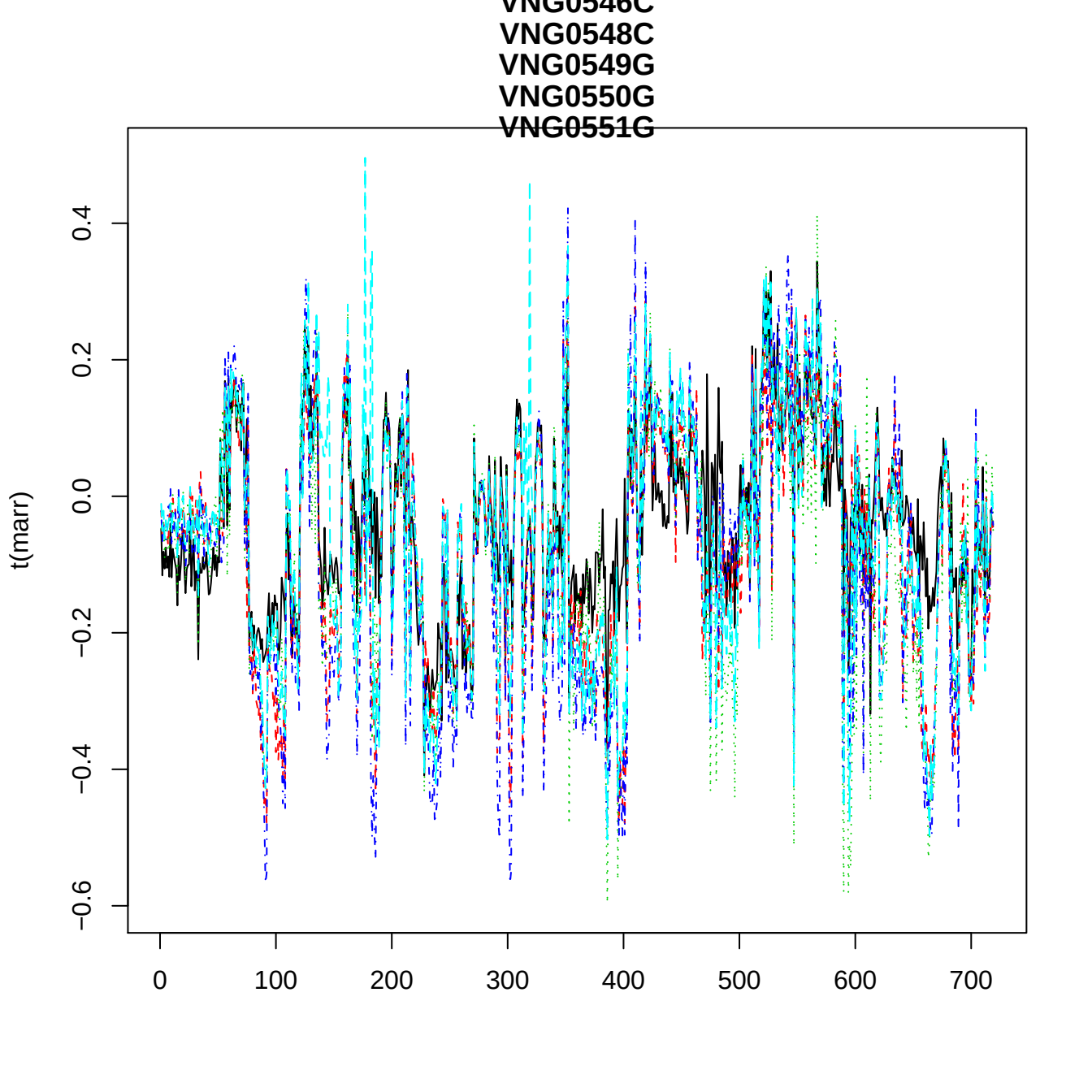
VNG0546C
eif2a
rps27e
rpl44e
DUF75
Nop10p
EIF_2_alpha
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh3
trh4


VNG0546C
VNG0548C
VNG0549G
VNG0550G
VNG0551G
t(marr)
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0.0
−0.2
−0.4
−0.6
0
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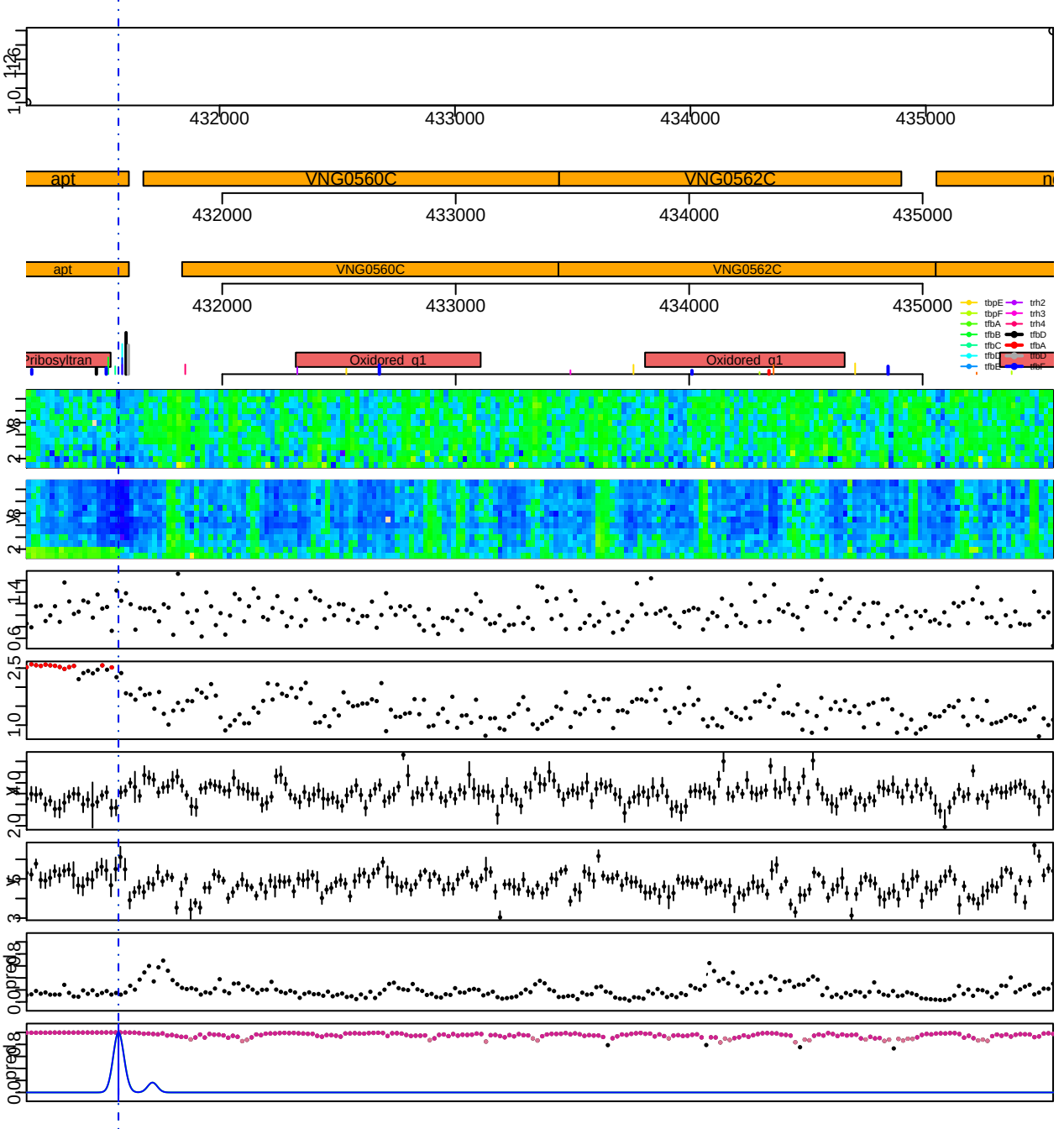
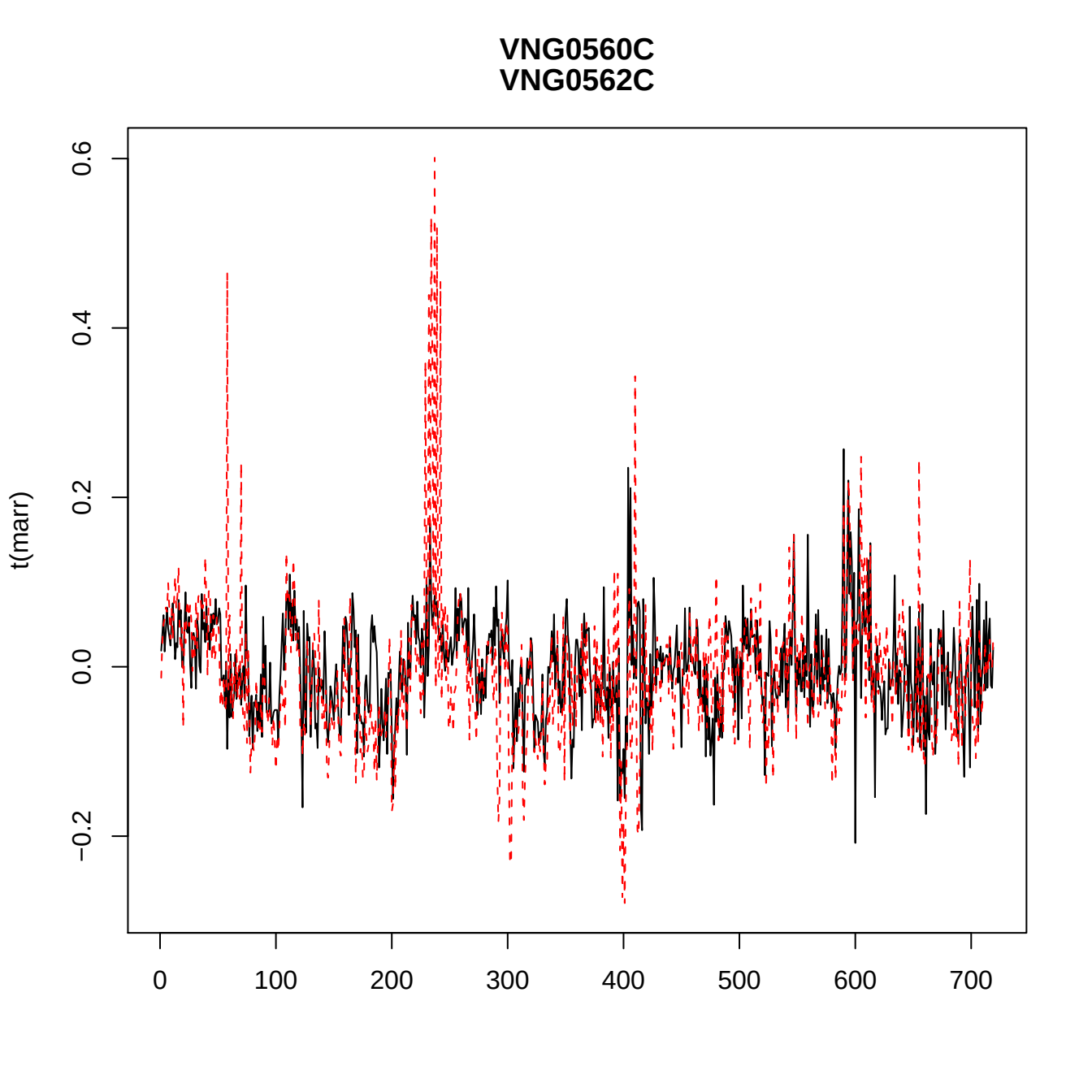
200
300
400
500
600
700



432000
433000
434000
435000
apt
VNG0560C
VNG0562C
Oxidored_q1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0560C
VNG0562C
t(marr)
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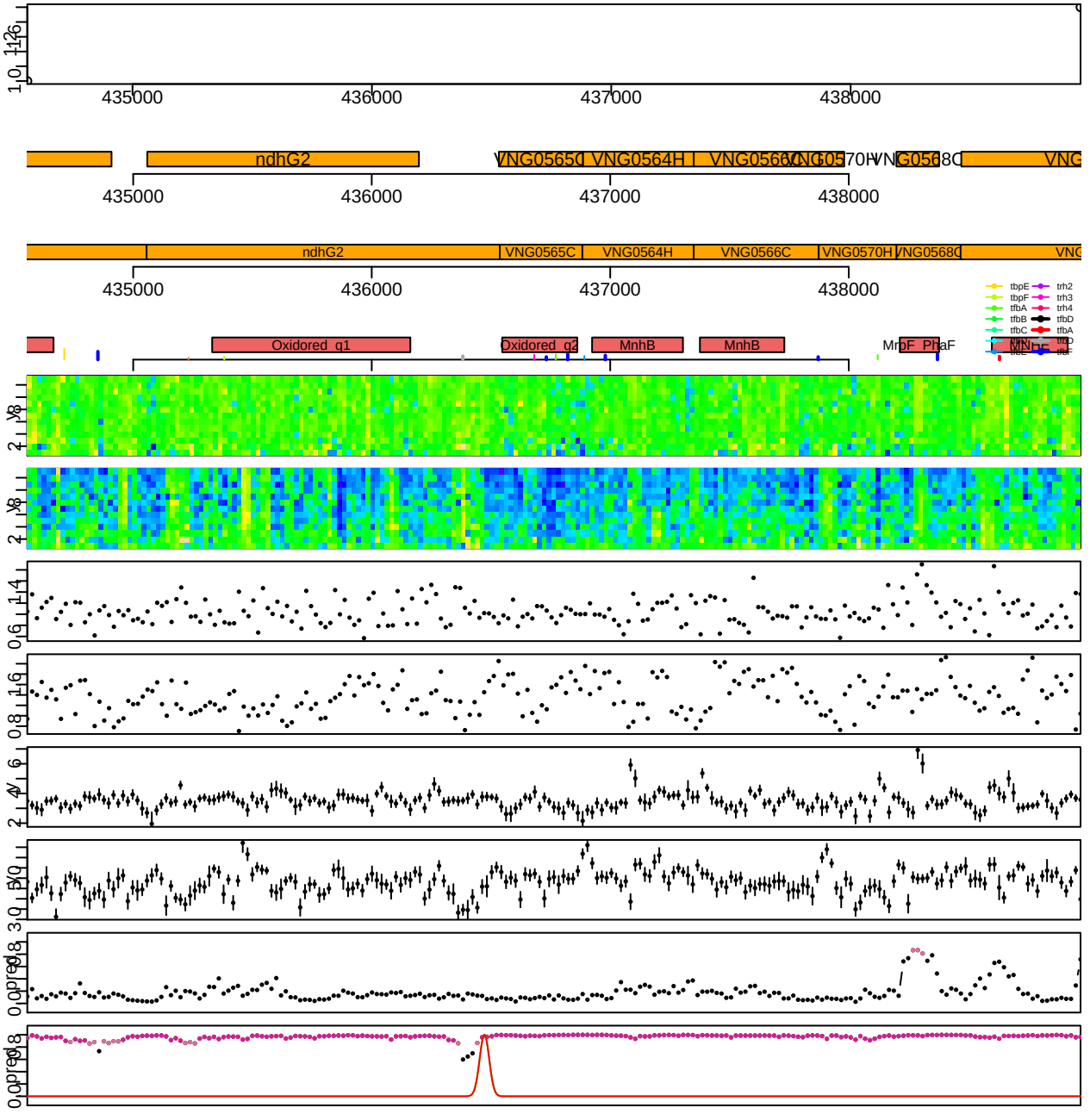
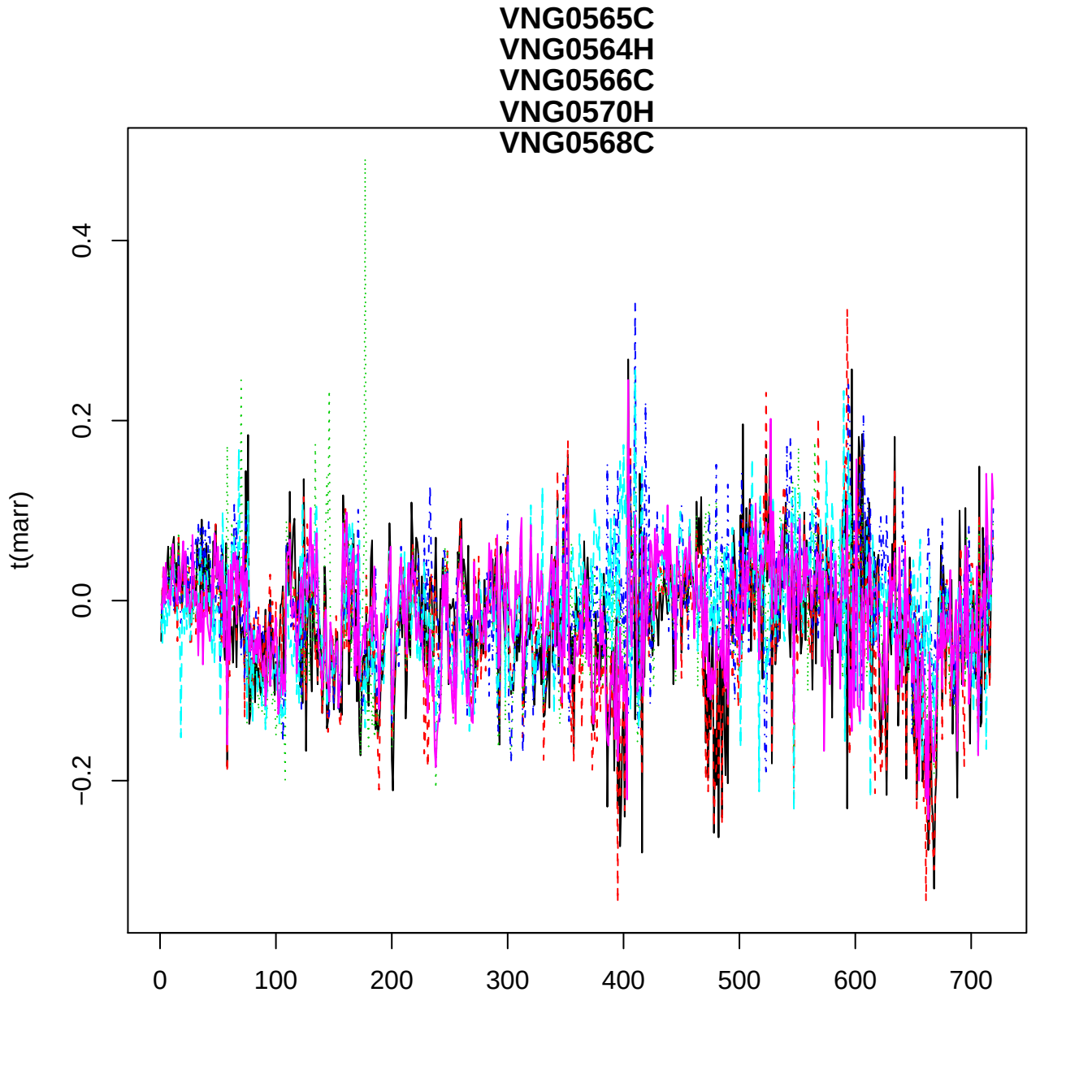
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700



435000
436000
437000
438000
ndhG2
VNG0565C
VNG0564H
VNG0566C
VNG0570H
VNG0568C
Oxidored_q1
Oxidored_q2
MnhB
MnhB
MrpF_PhaF
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA


VNG0565C
VNG0564H
VNG0566C
VNG0570H
VNG0568C
t(marr)
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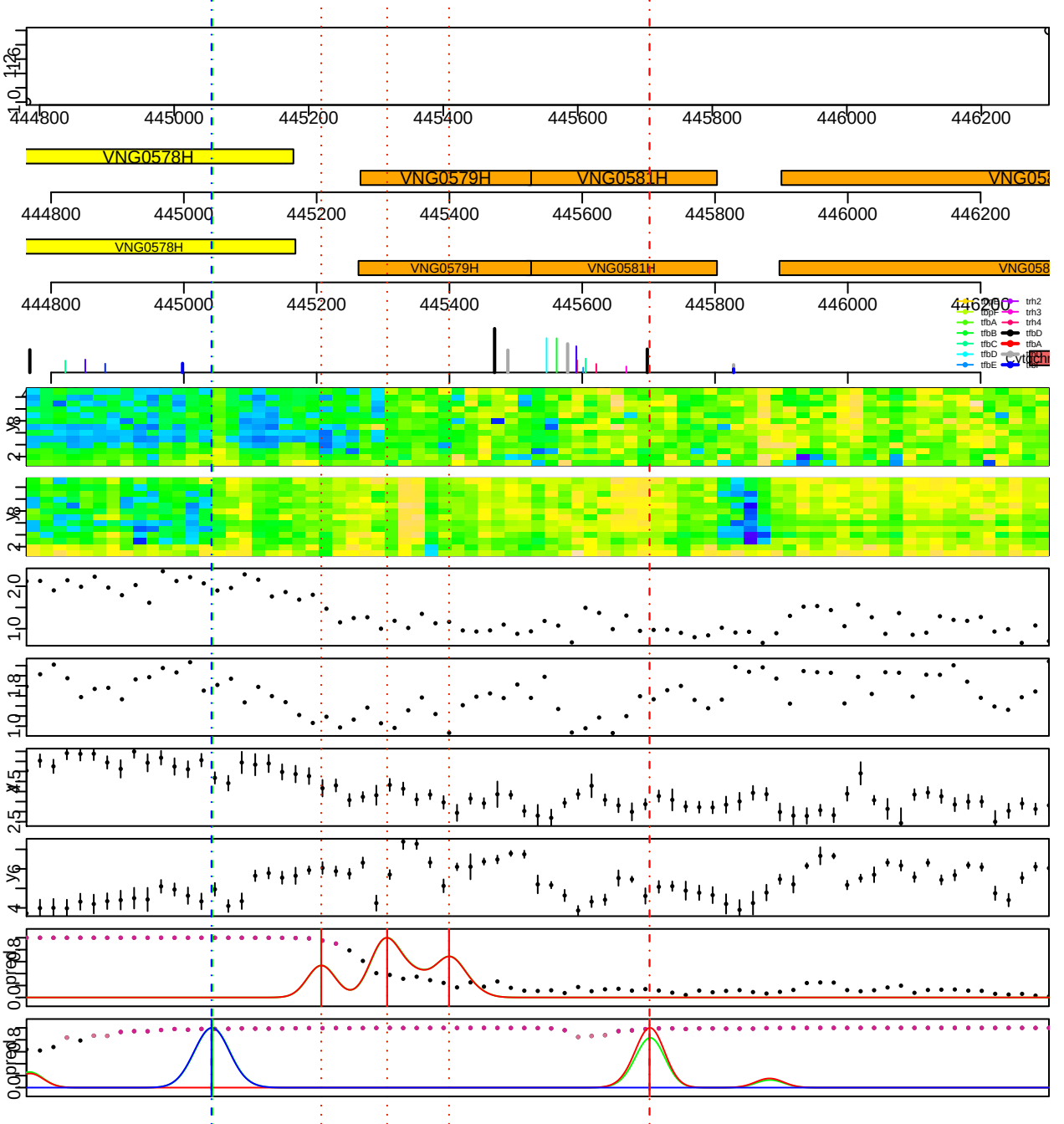
0.2
0.0
−0.2
0
100
200
300
400
500
600
700


444800
445000
445200
445400
445600
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446000
446200
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VNG0579H
VNG0581H
VNG058
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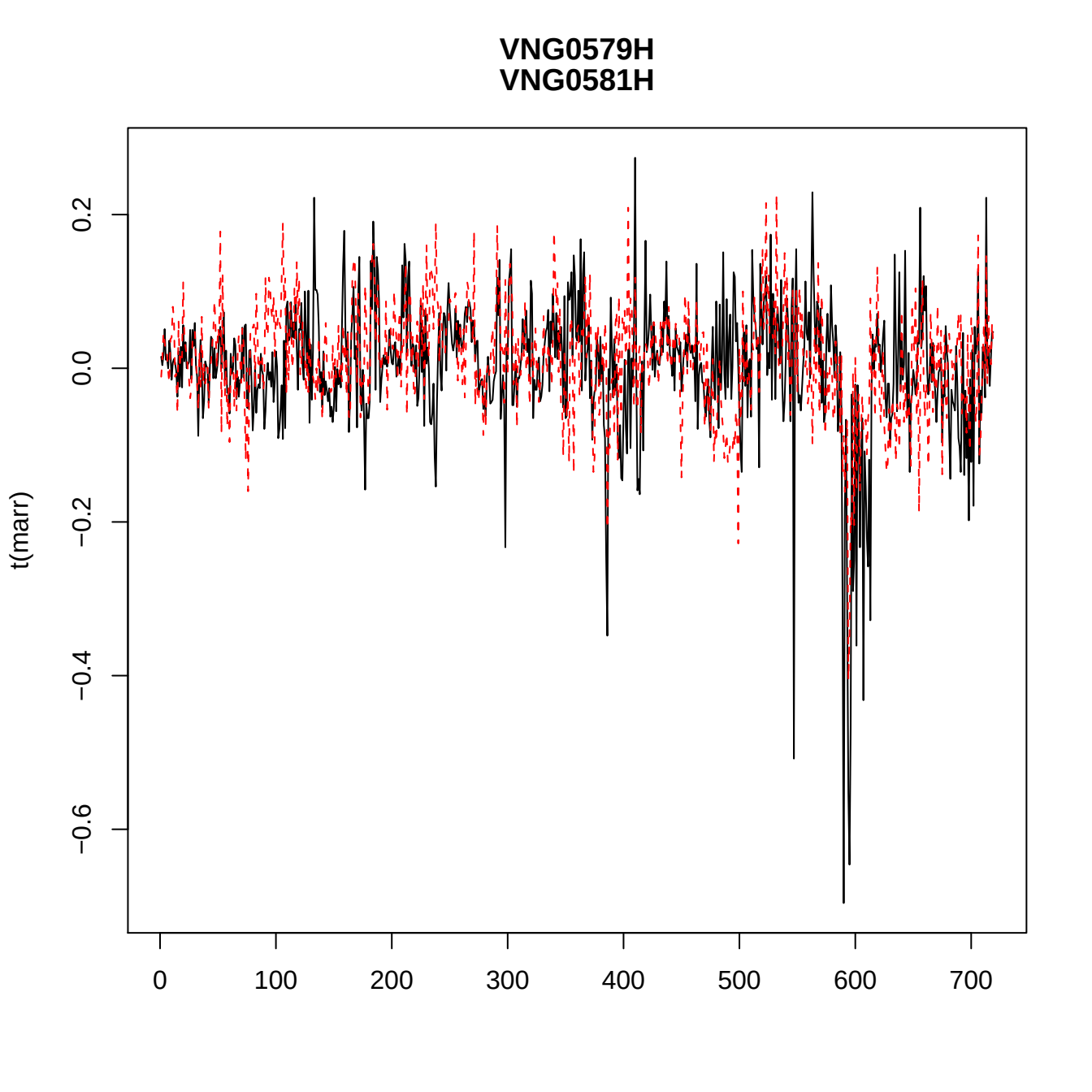
trh3
trh4
tfbD
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF


VNG0579H
VNG0581H
t(marr)
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−0.4
−0.6
0
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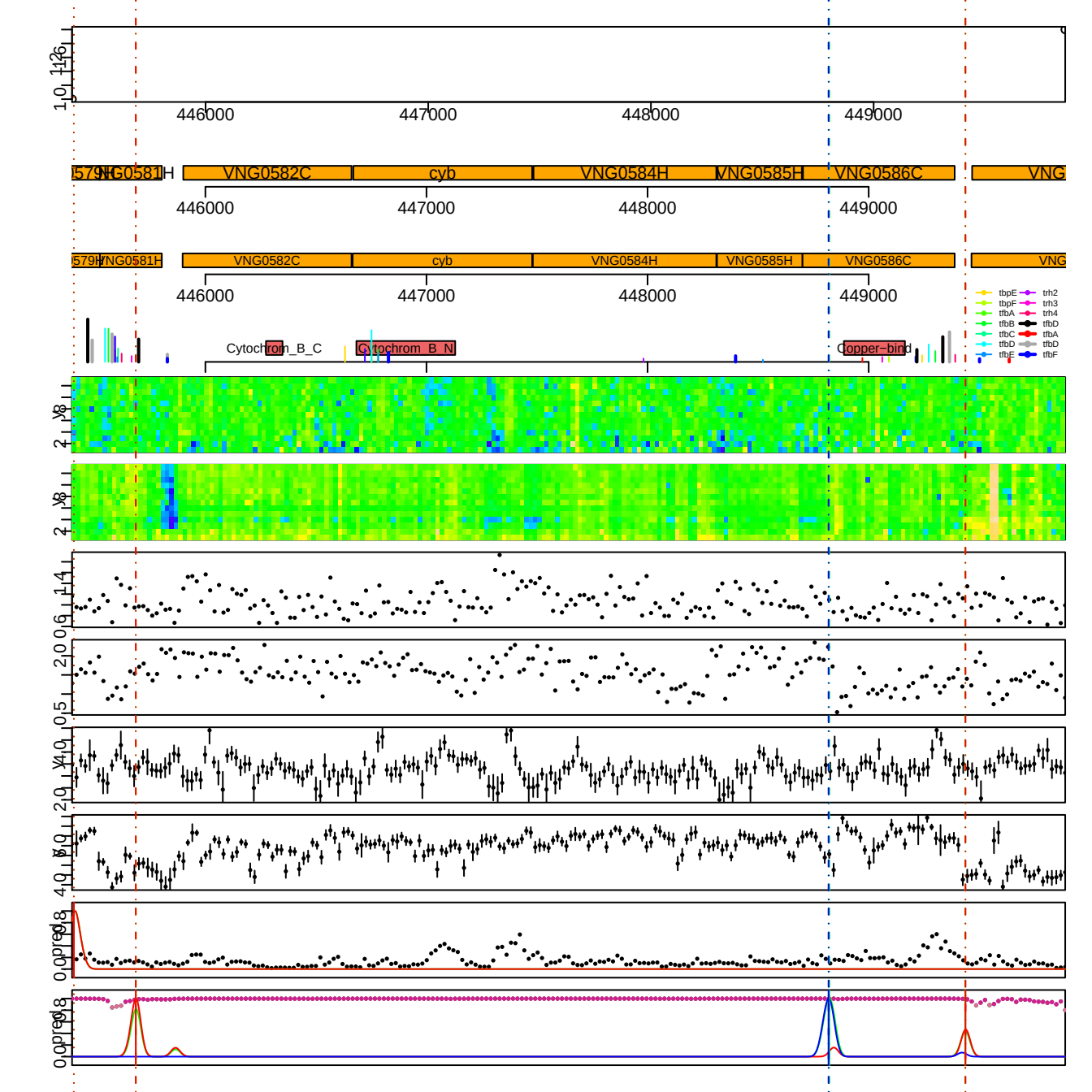
300
400
500
600
700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449000
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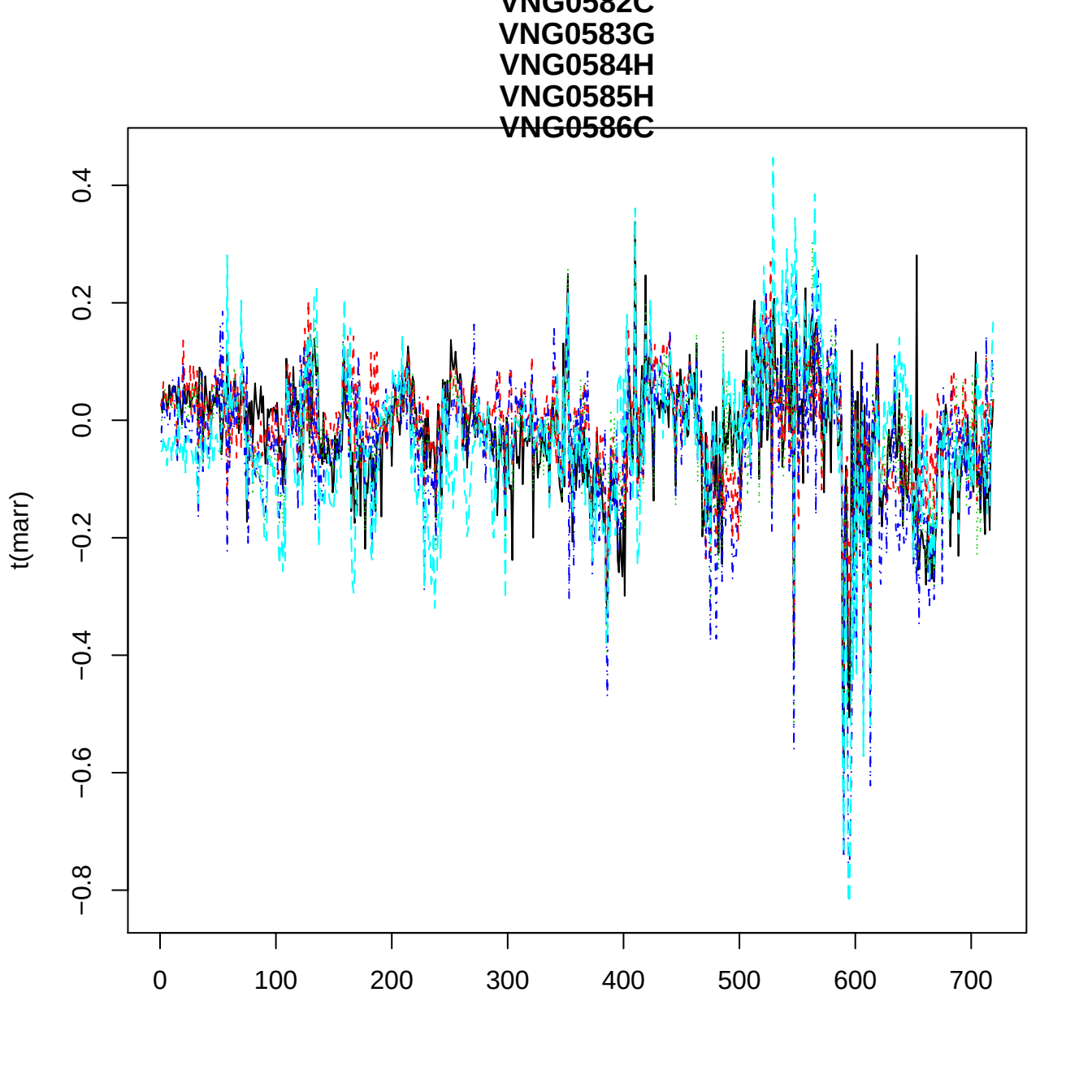
VNG0585H
VNG0586C
Cytochrom_B_C
Cytochrom_B_N
Copper-bind
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0582C
VNG0583G
VNG0584H
VNG0585H
VNG0586C
t(marr)
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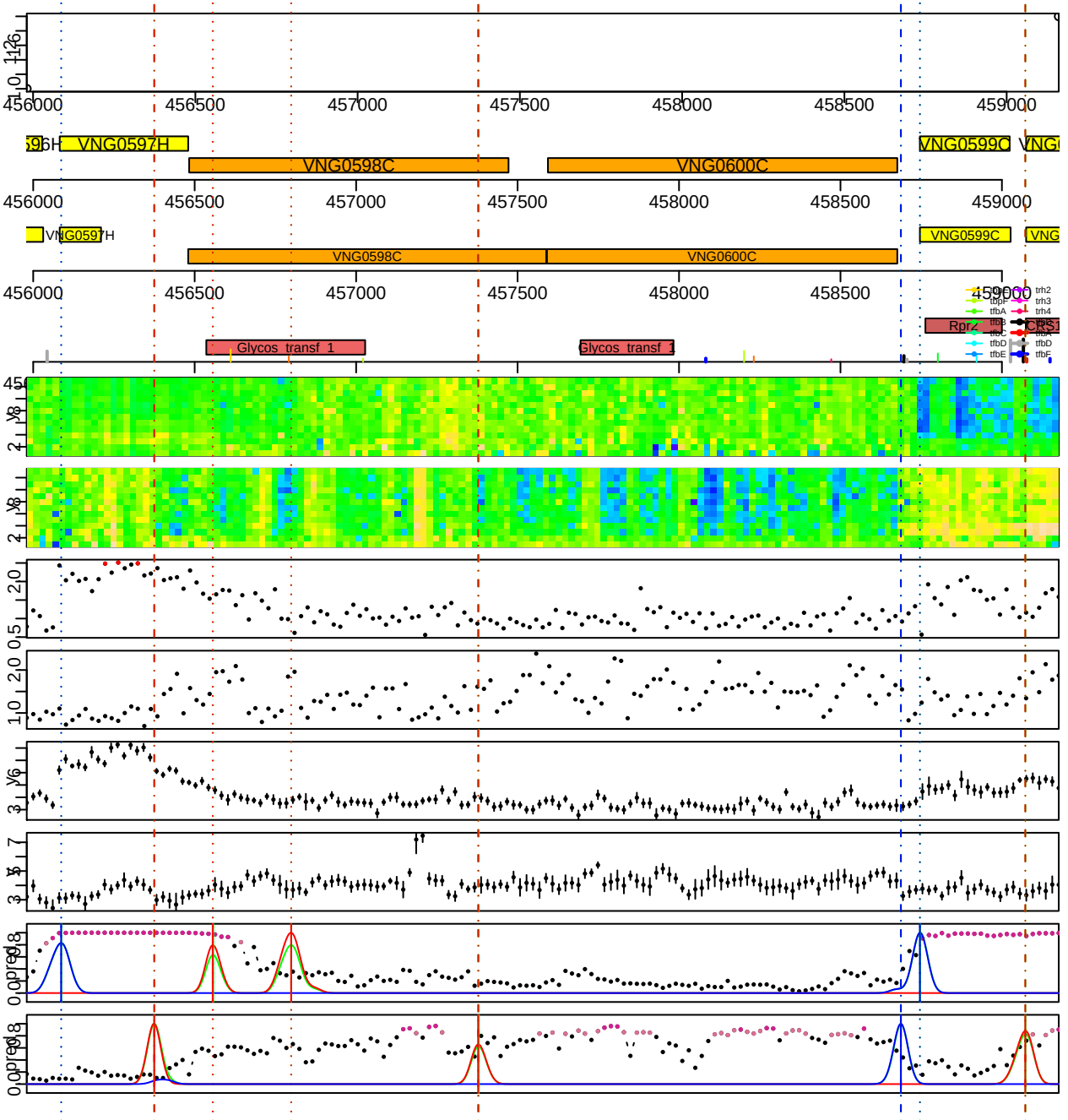
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700


456000
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457000
457500
458000
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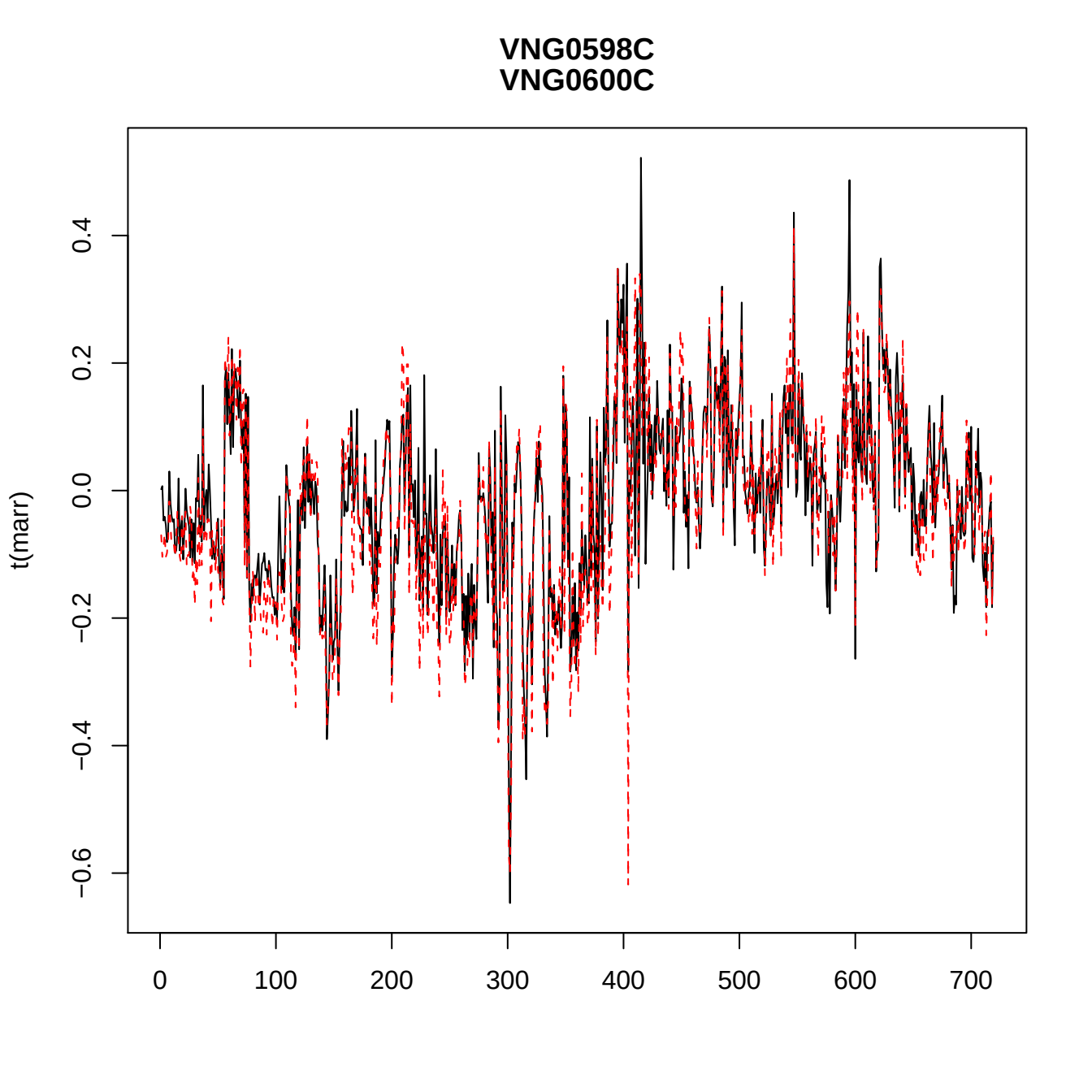
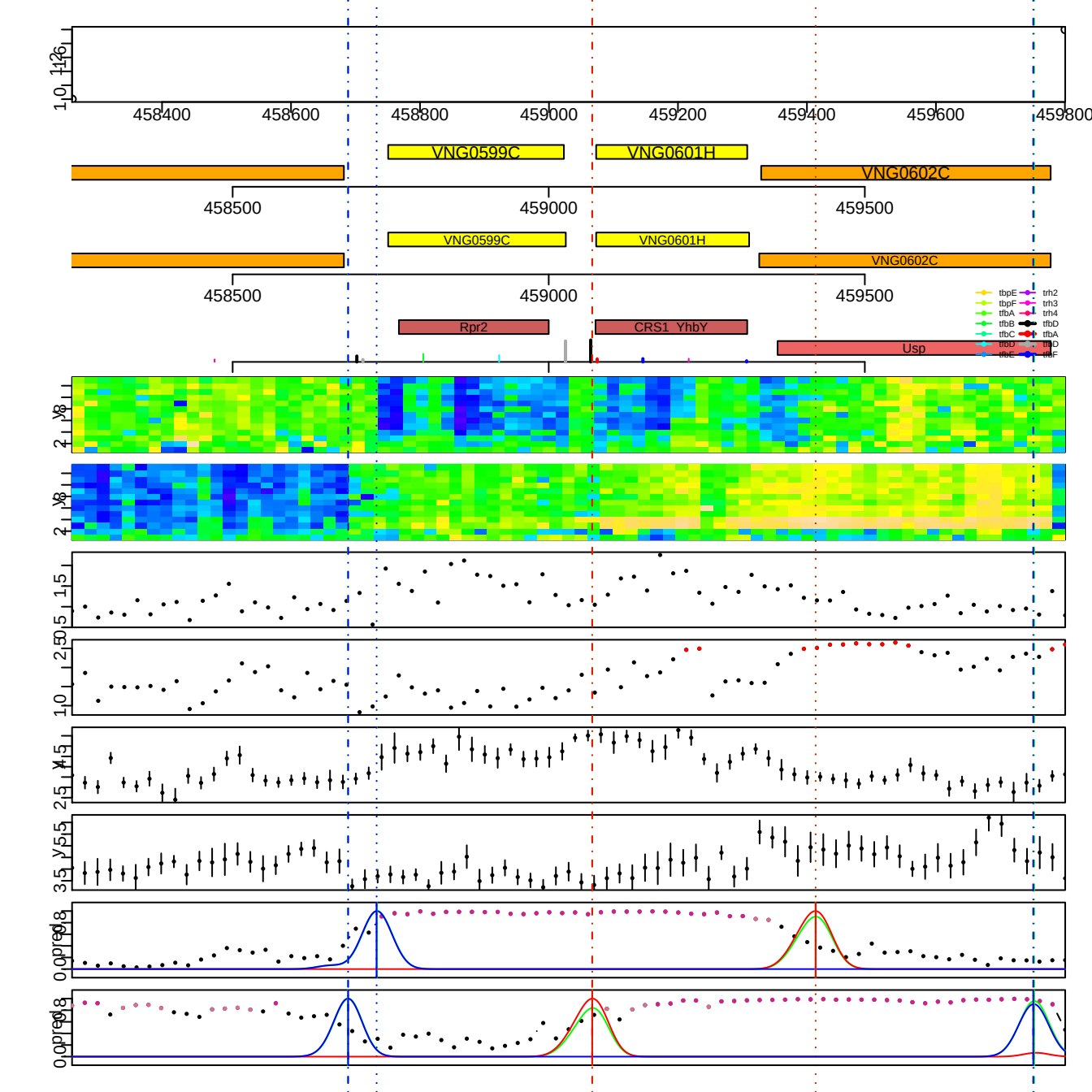
VNG0597H
VNG0598C
VNG0600C
VNG0599C
Glycos_transf_1
Glycos_transf_1
Rpr2
CRS1
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
pred


VNG0598C
VNG0600C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700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VNG0601H
VNG0602C
458500
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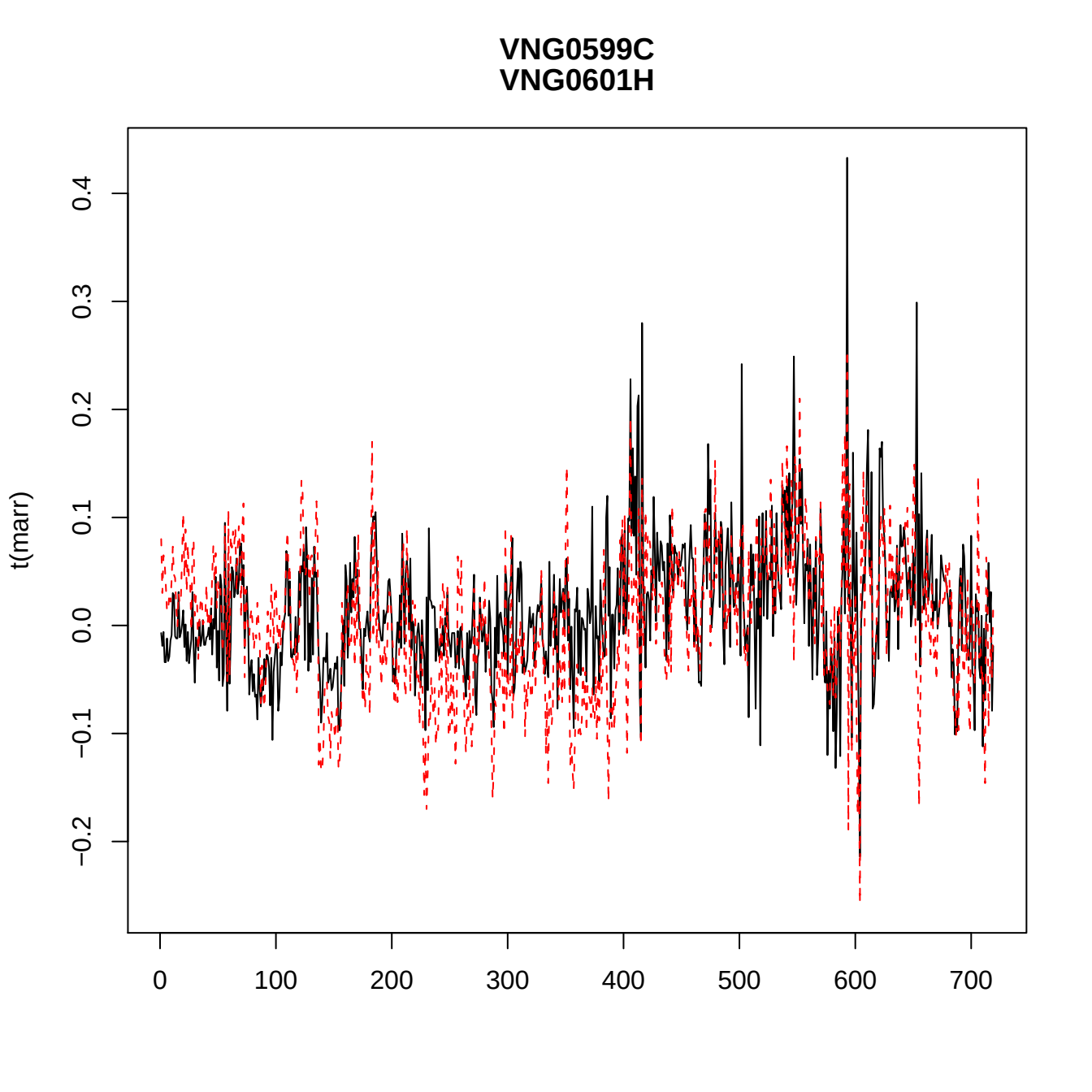
VNG0599C
VNG0601H
VNG0602C
458500
459000
459500
Rpr2
CRS1_YhbY
Usp
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0599C
VNG0601H
t(marr)
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0.1
0.0
−0.1
−0.2
0
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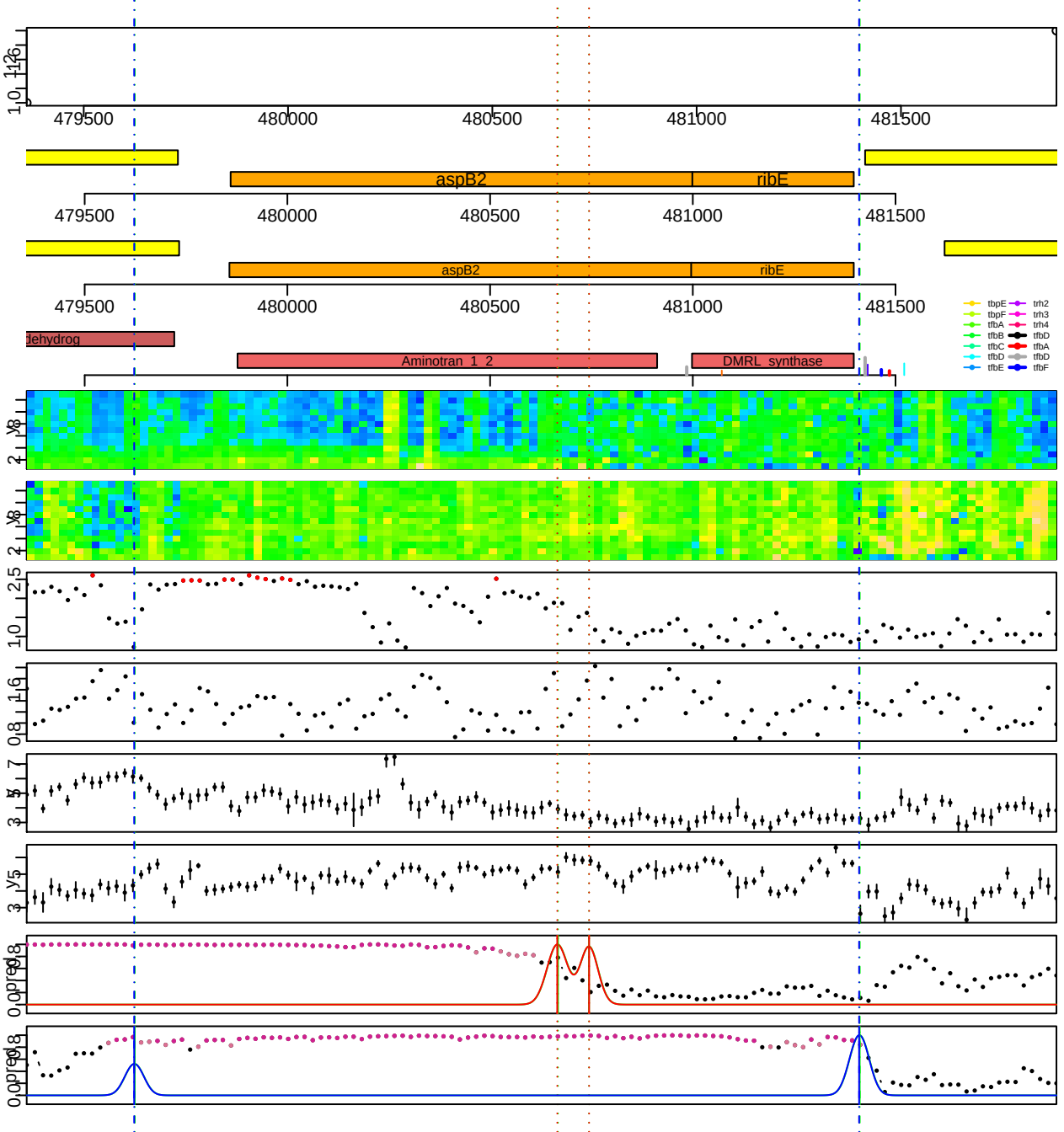
400
500
600
700


479500
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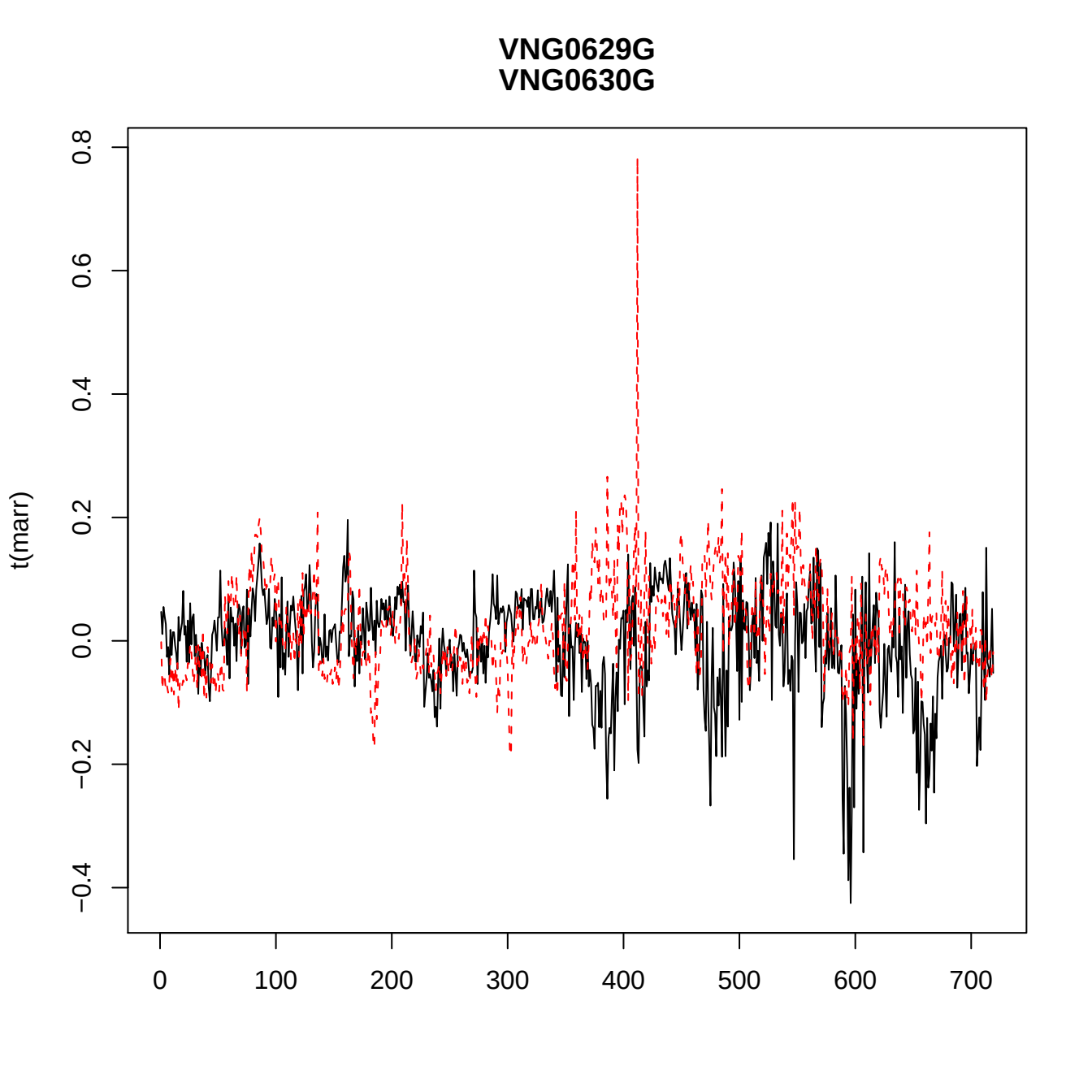
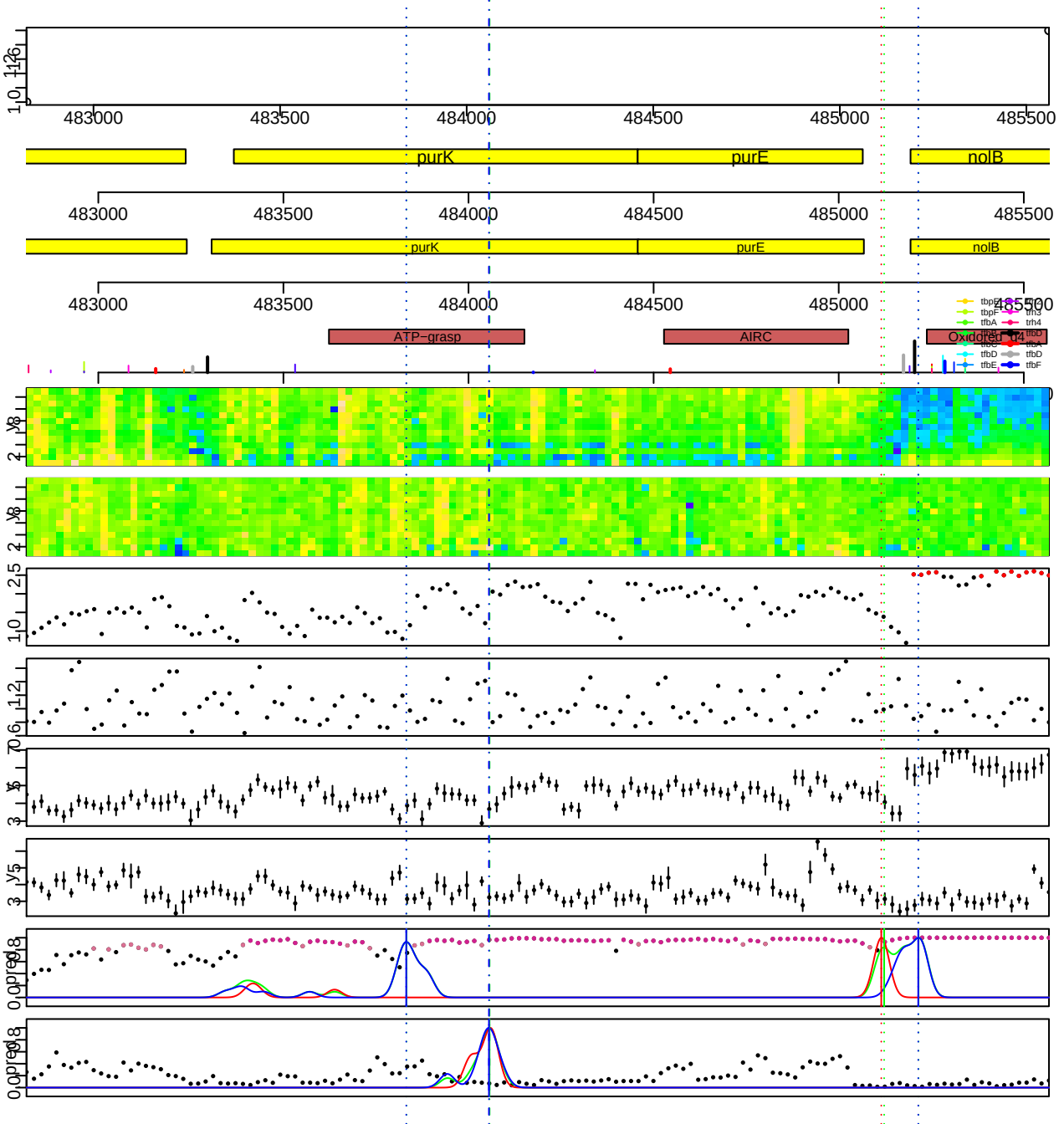
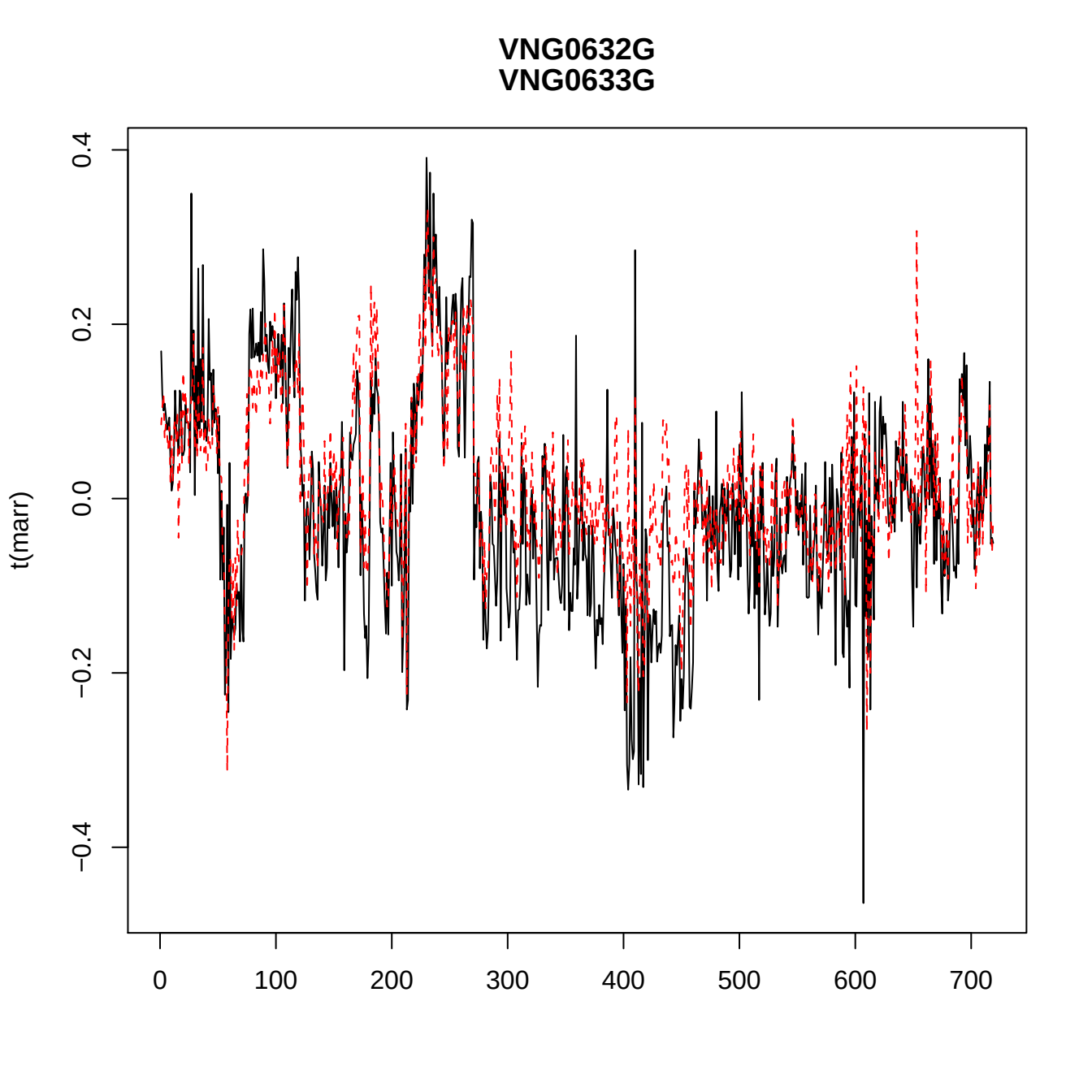
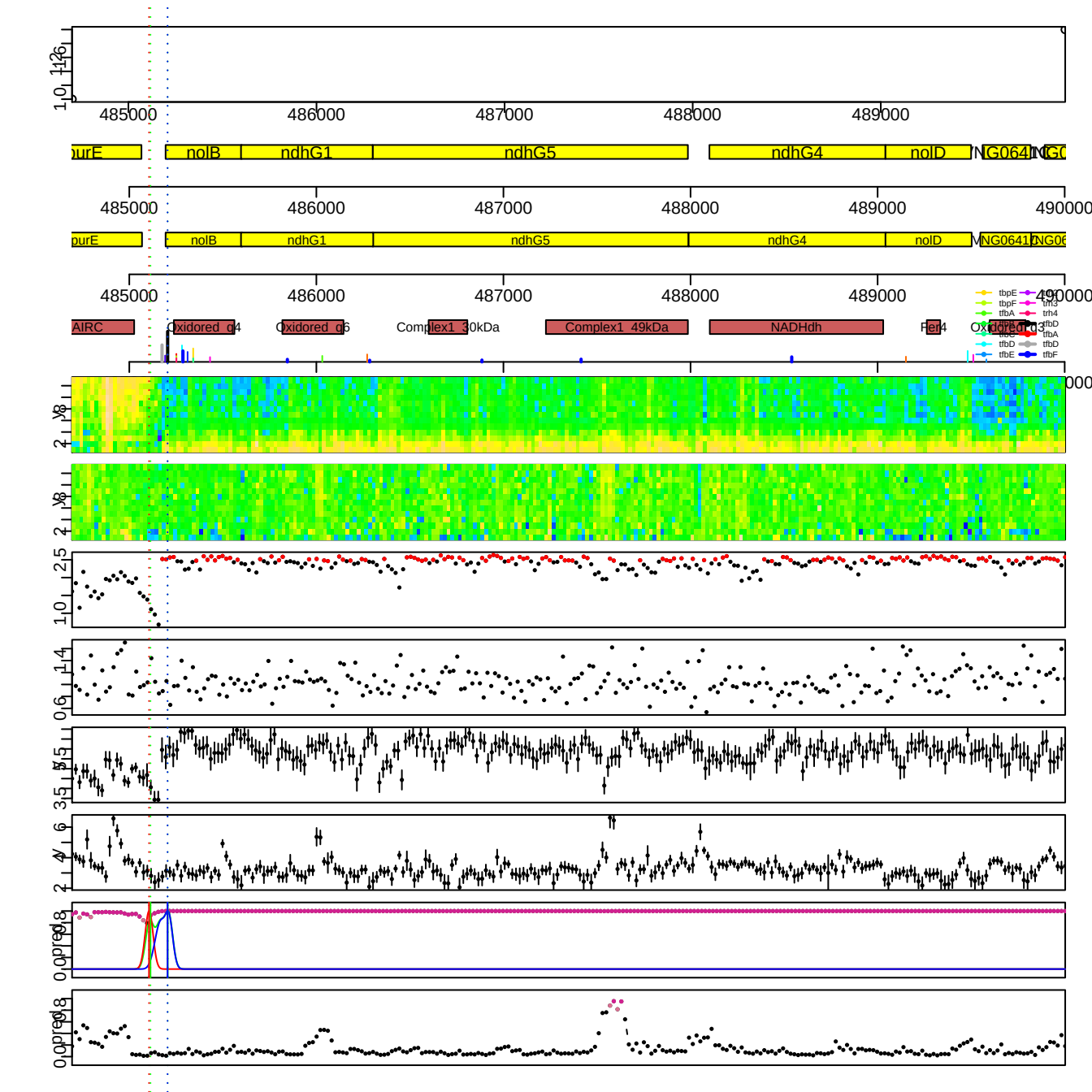
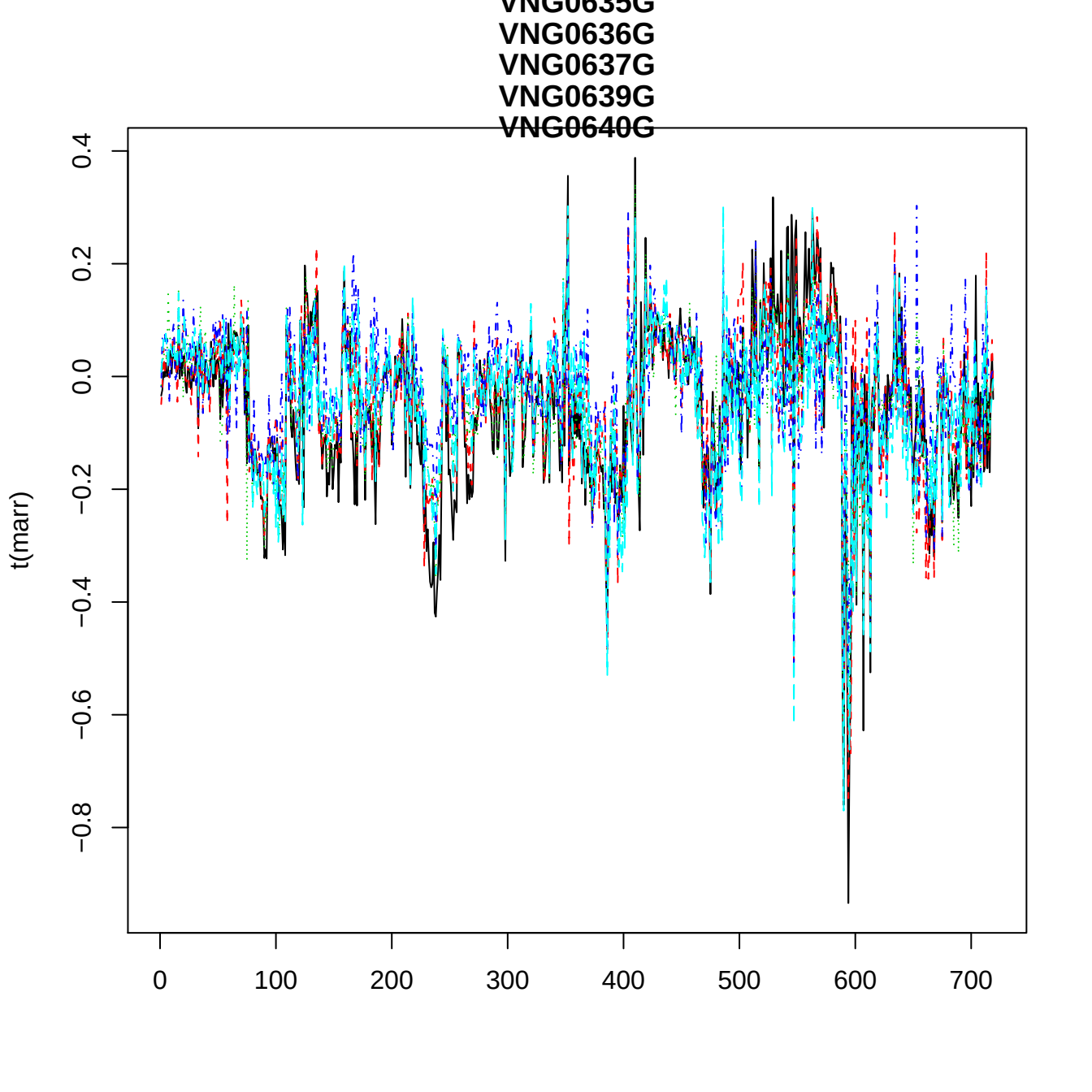
480500
481000
481500
aspB2
ribE
dehydrog
Aminotran_1_2
DMRL_synthase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

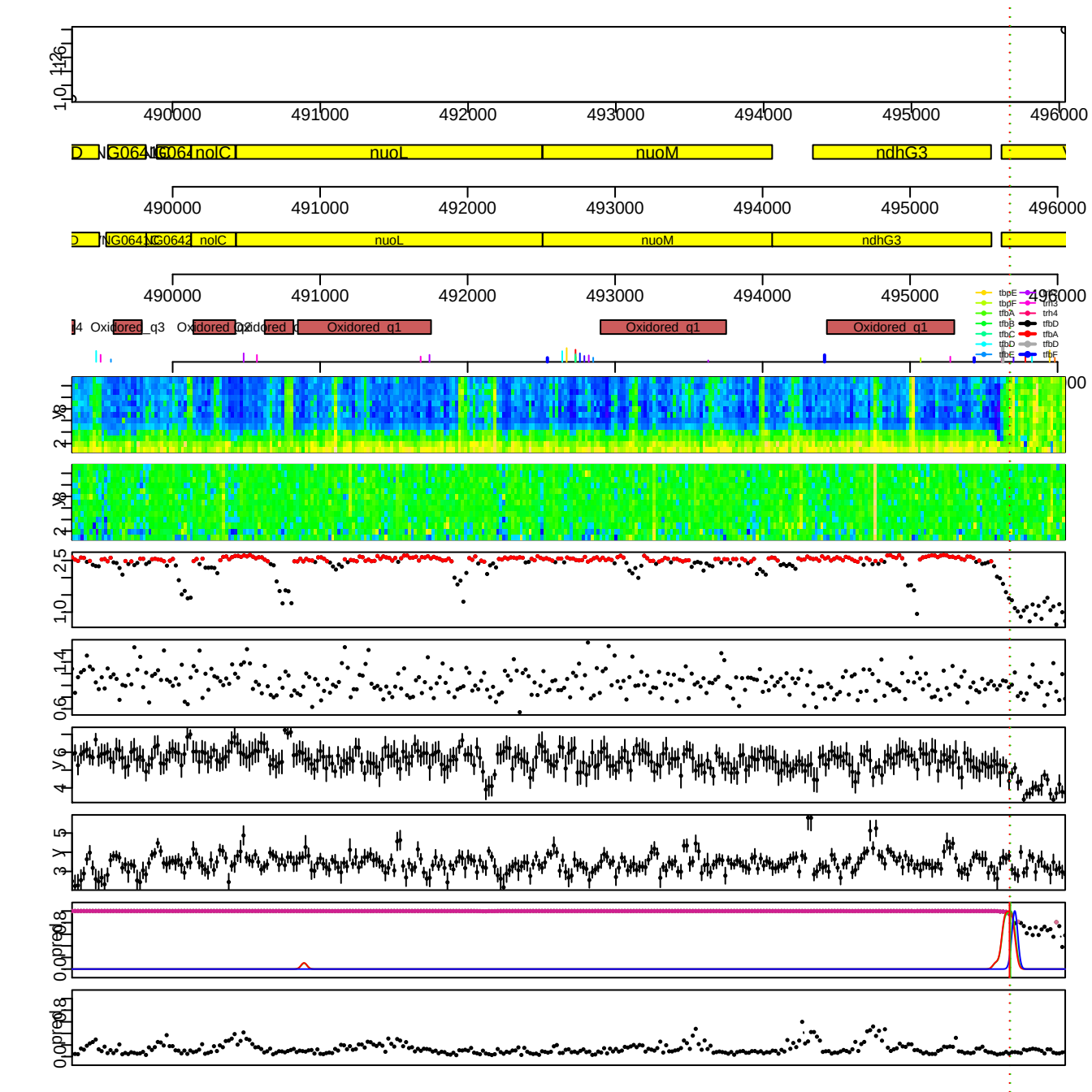

VNG0629G
VNG0630G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

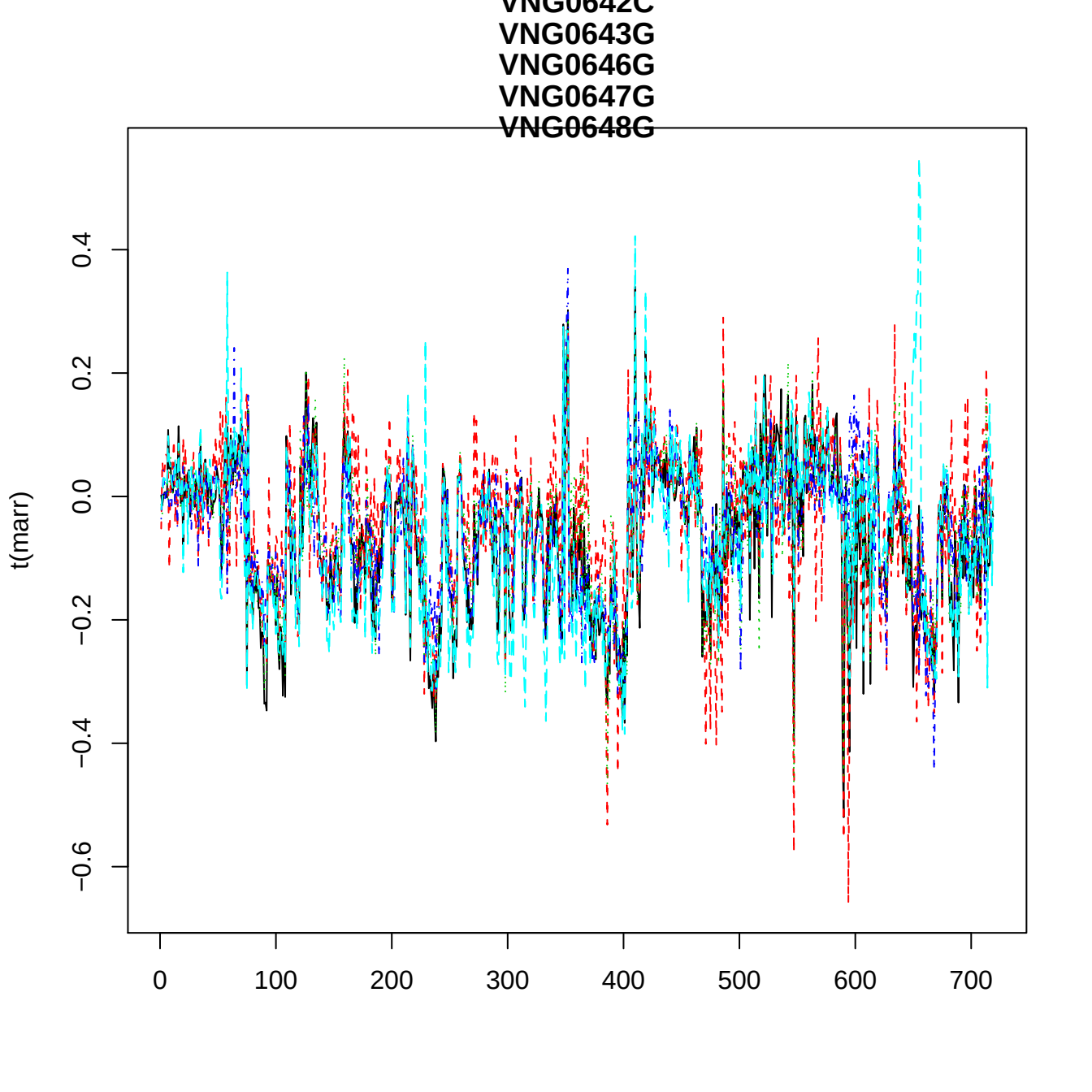

483000
483500
484000
484500
485000
485500
purK
purE
nolB
ATP-grasp
AIRC
Oxidored_q4
tbpB
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF

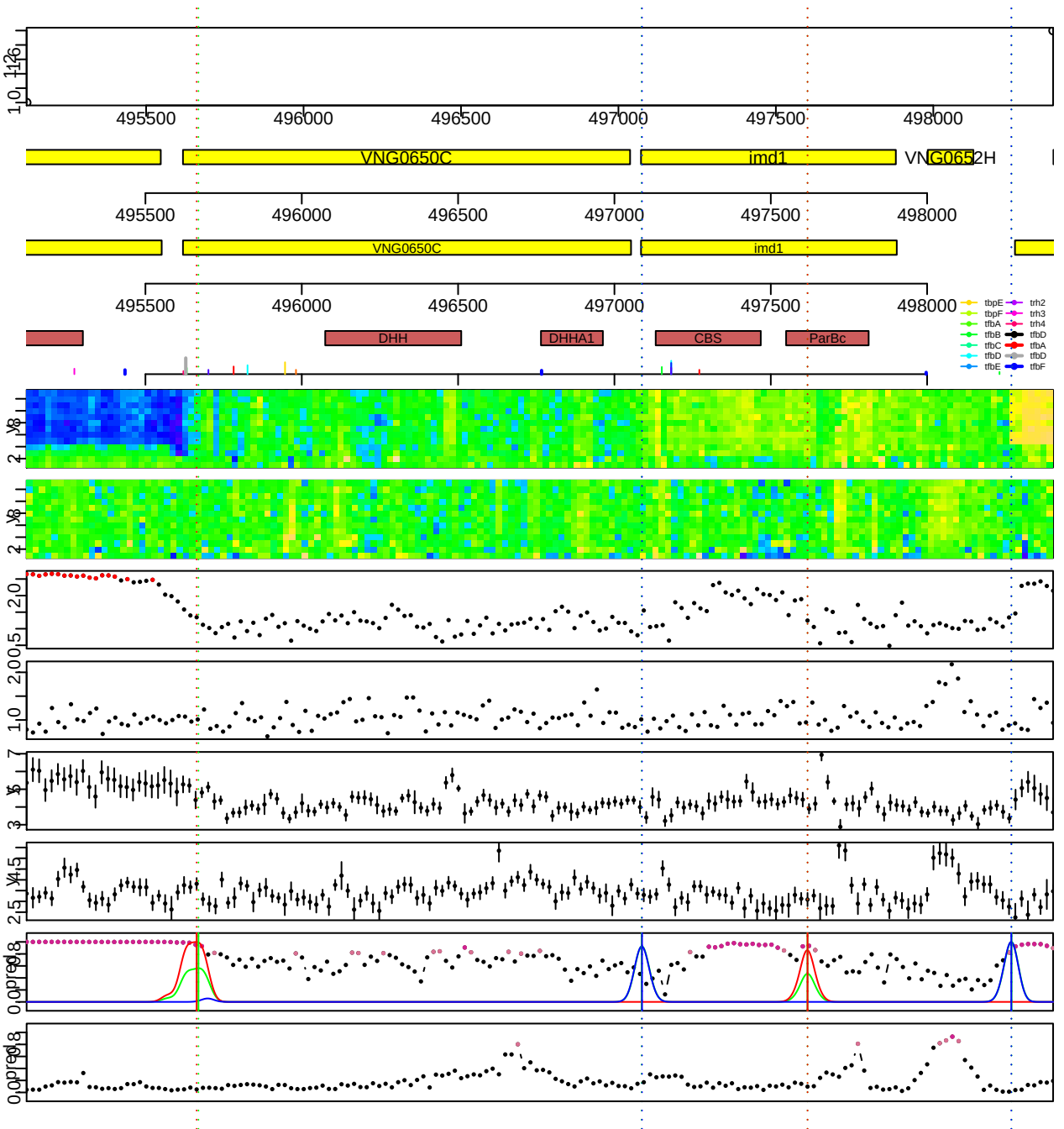

VNG0632G
VNG0633G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

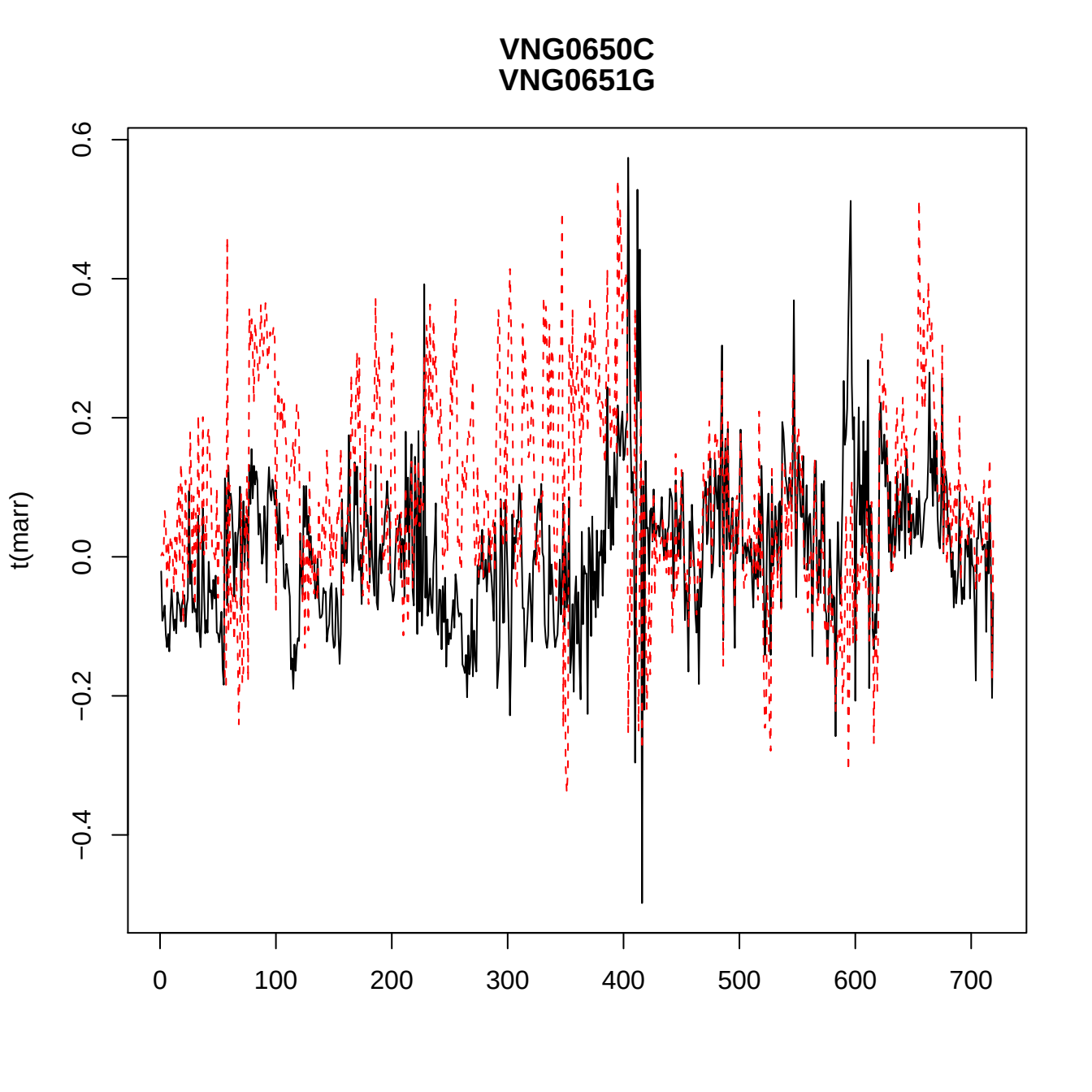

485000
486000
487000
488000
489000
490000
purE
nolB
ndhG1
ndhG5
ndhG4
nolD
NG0641
NG06
AIRC
Oxidored_q4
Oxidored_q6
Complex1_30kDa
Complex1_49kDa
NADHdh
Fer4
Oxidored_q3
tbpE
tbpF
tfbA
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF

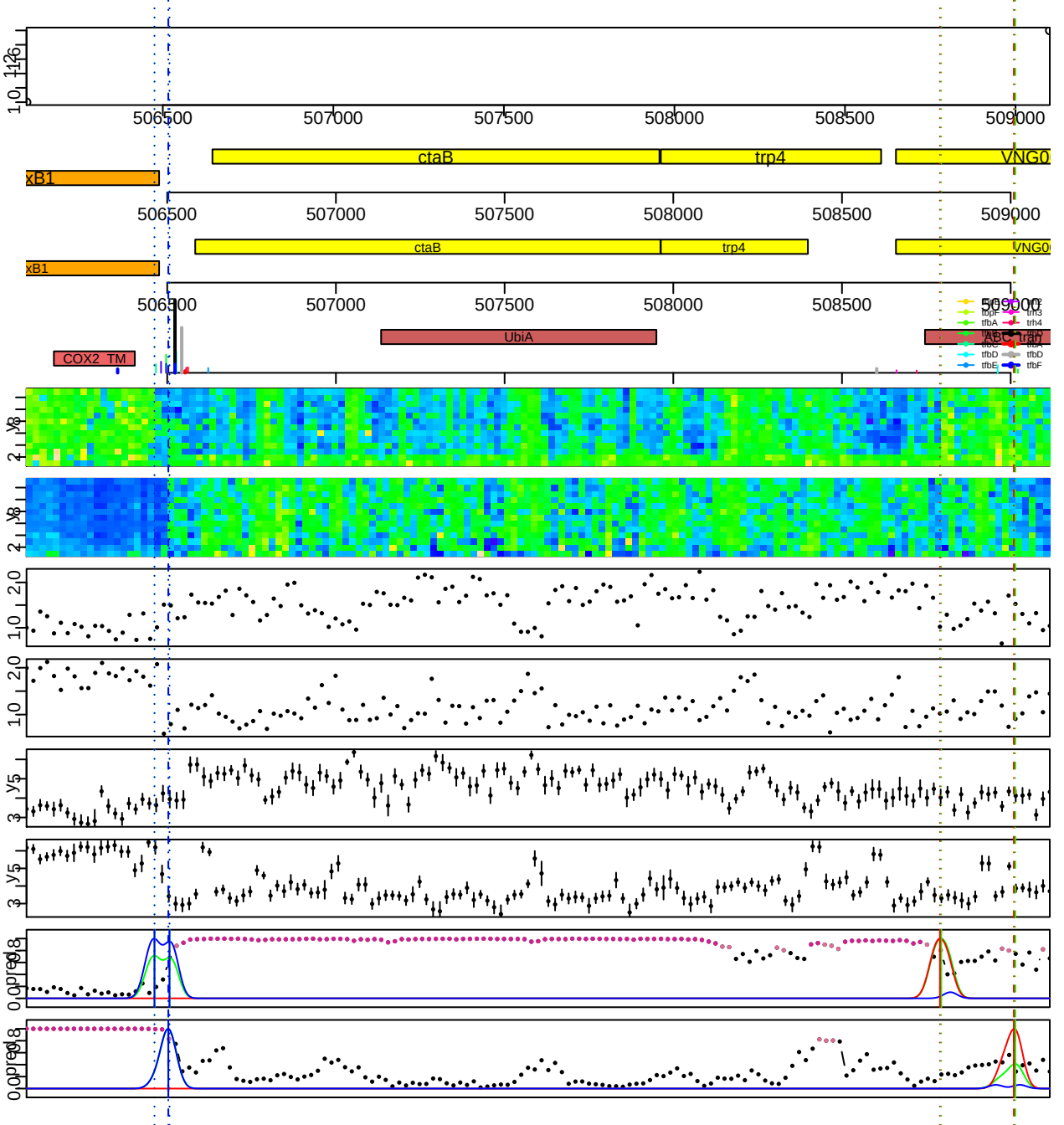

VNG0635G
VNG0636G
VNG0637G
VNG0639G
VNG0640G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

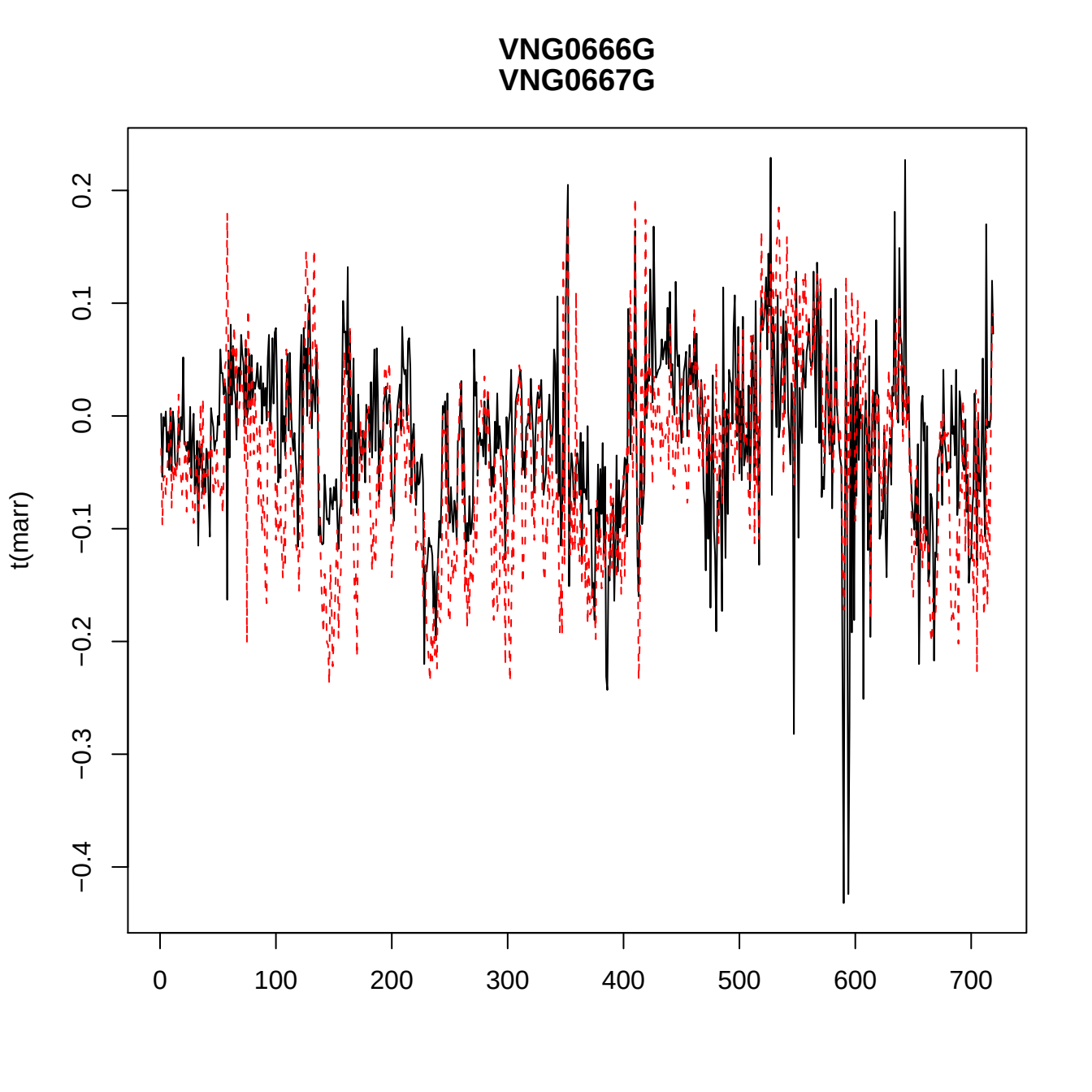

490000
491000
492000
493000
494000
495000
496000
nuoL
nuoM
ndhG3
Oxidored_q1
Oxidored_q3
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF

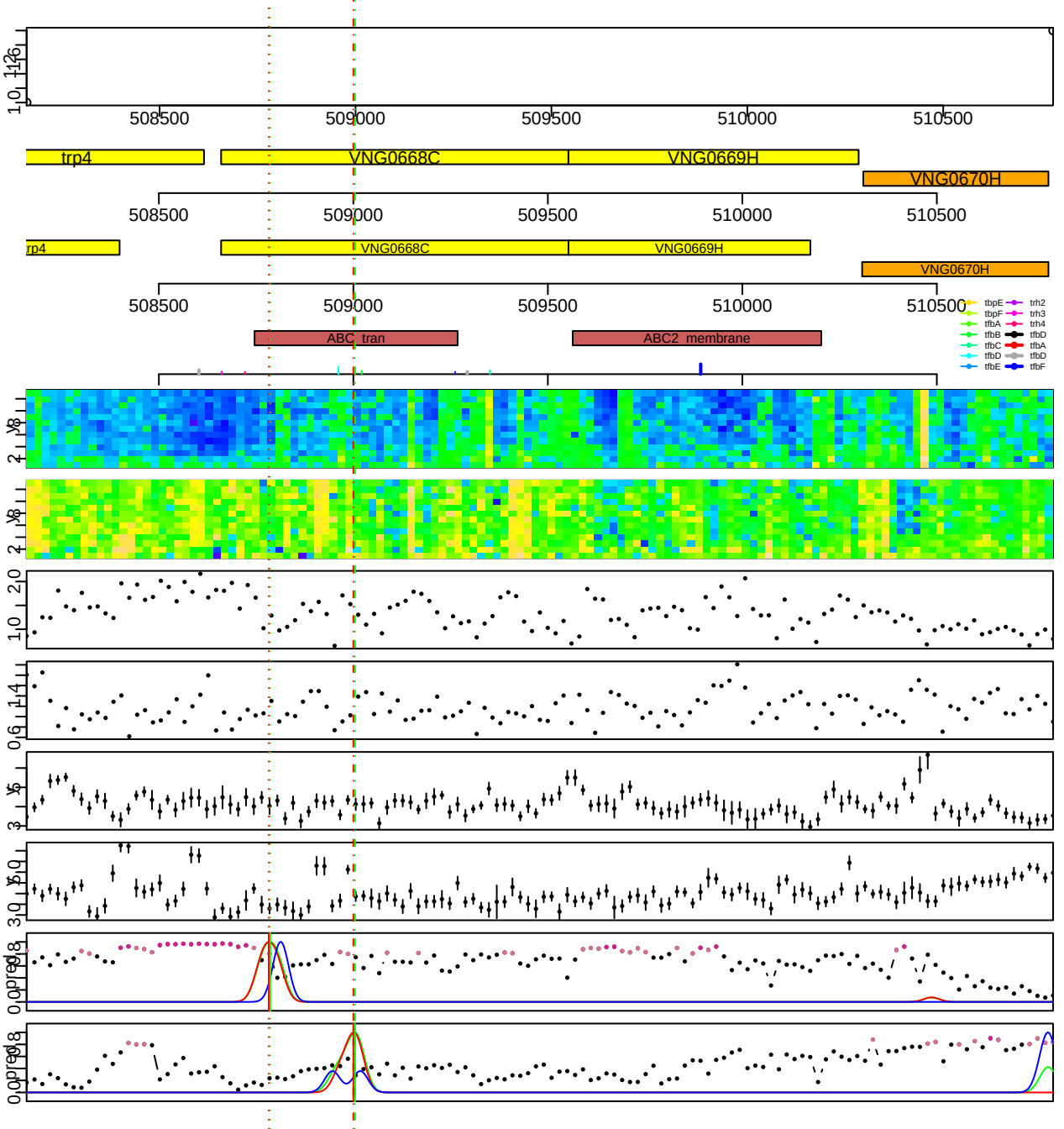

VNG0642C
VNG0643G
VNG0646G
VNG0647G
VNG0648G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

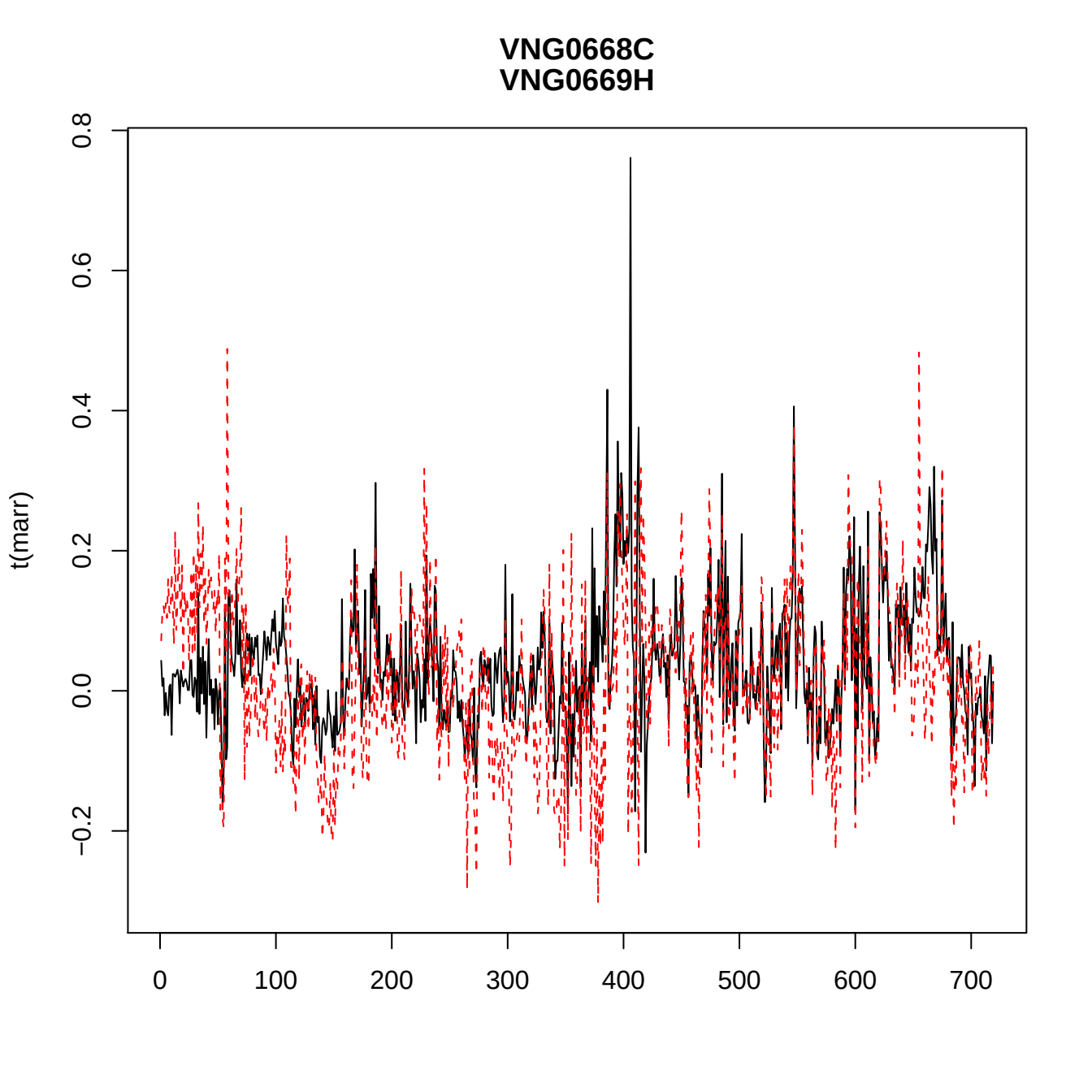

495500
496000
496500
497000
497500
498000
VNG0650C
imd1
VNG0652H
DHH
DHHA1
CBS
ParBc
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

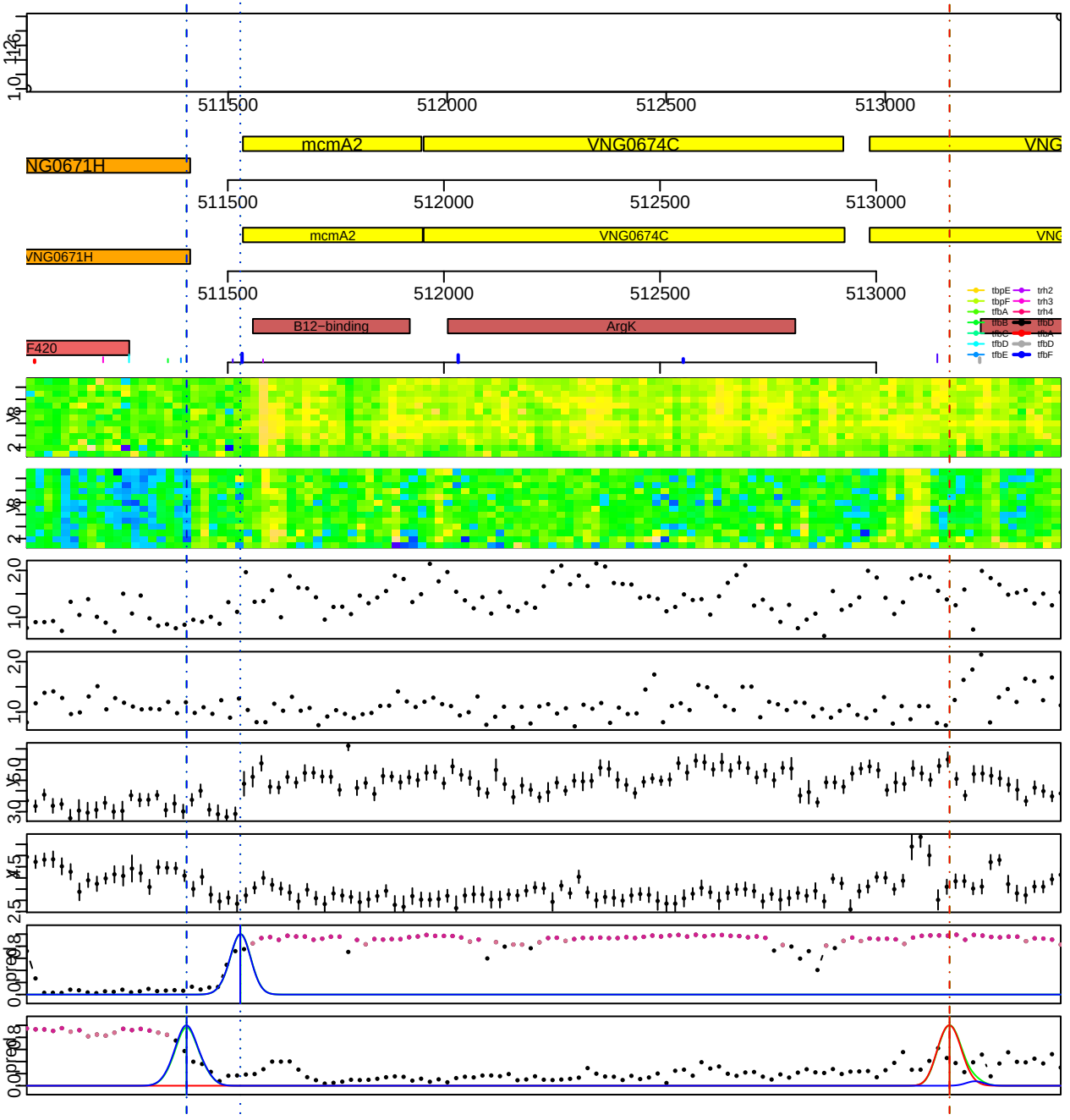

VNG0650C
VNG0651G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

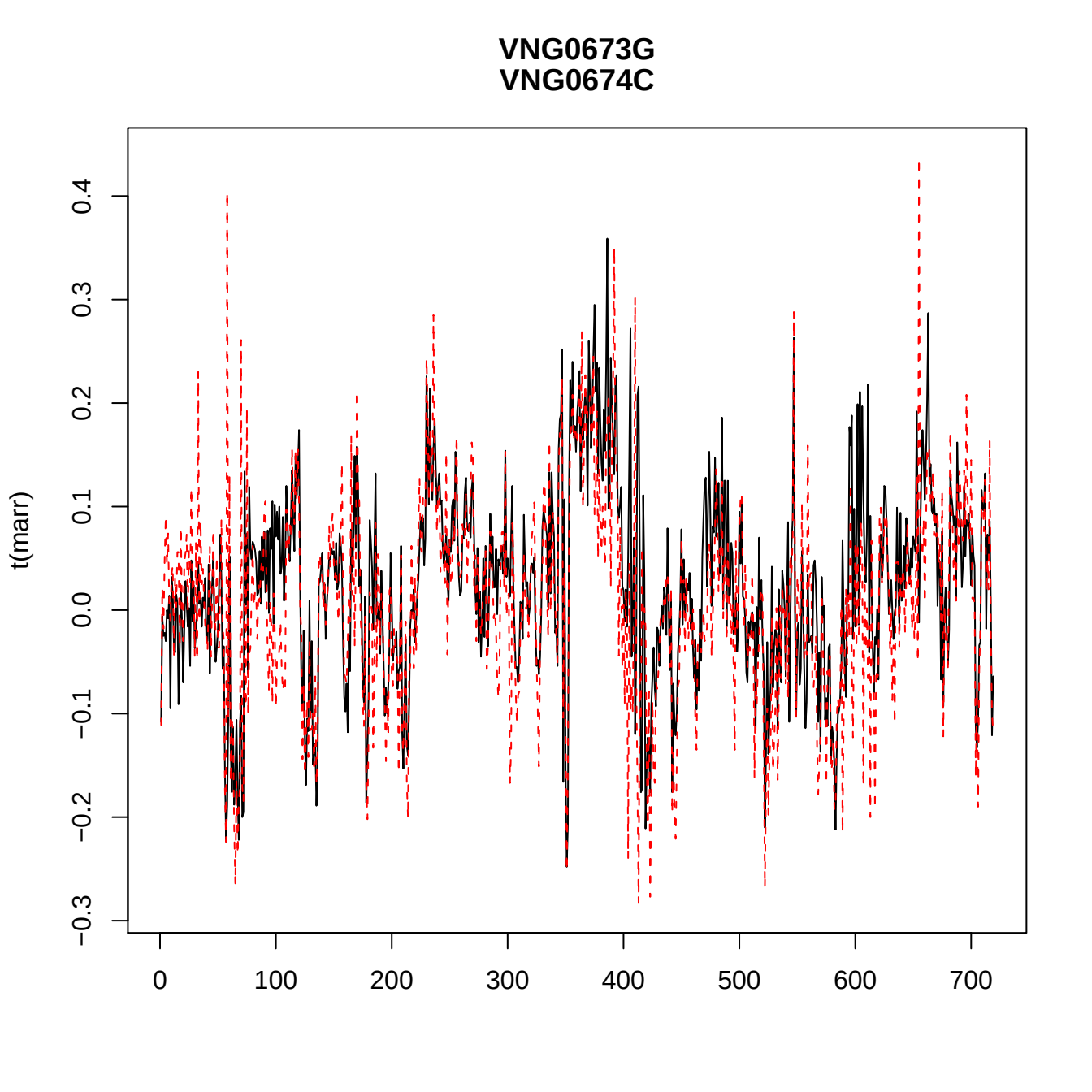

506500
507000
507500
508000
508500
509000
ctaB
trp4
VNG0
xB1
UbiA
COX2_TM
ABC_trans
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh3
trh4
pred

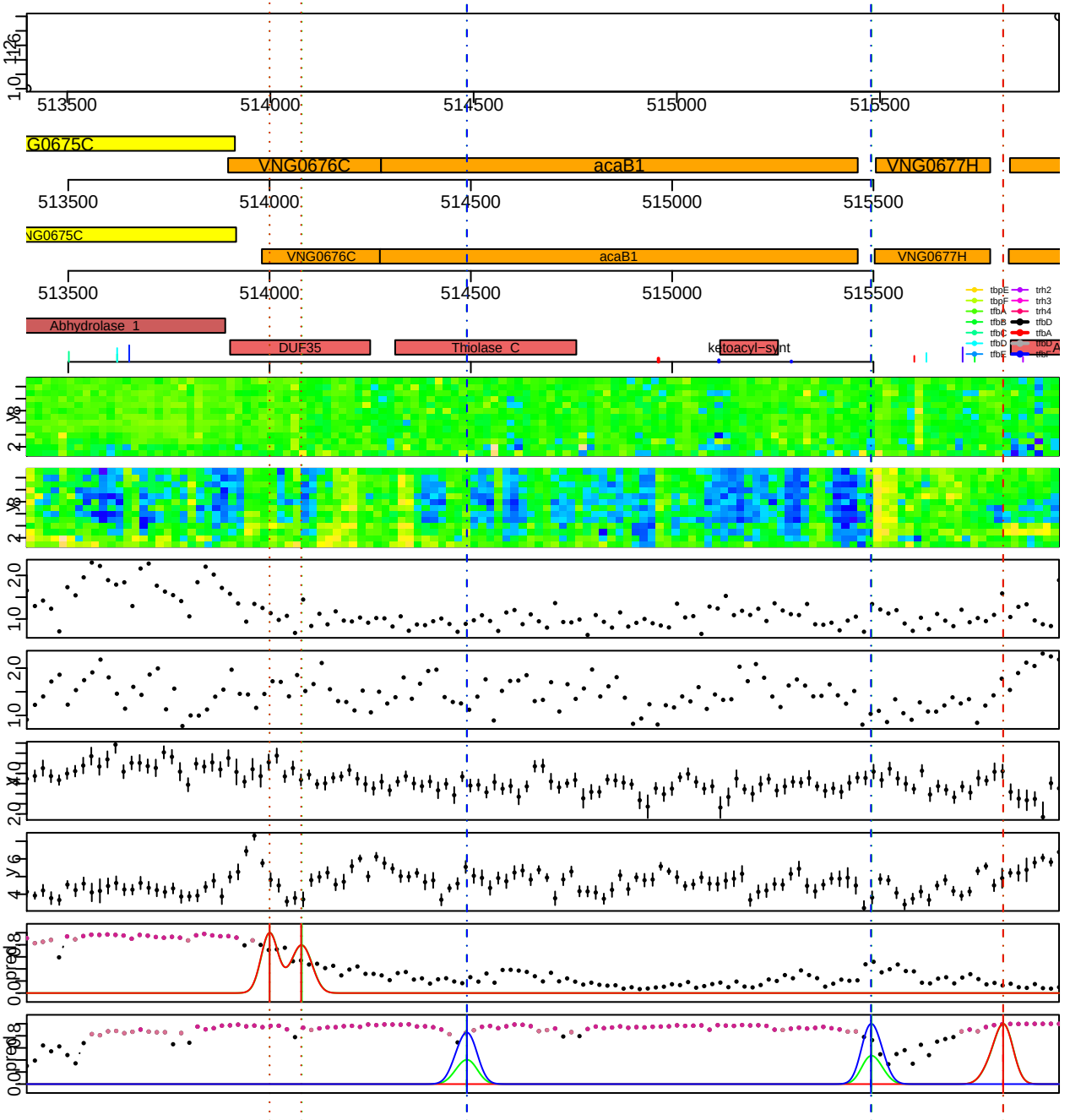

VNG0666G
VNG0667G
t(marr)
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.4
0
100
200
300
400
500
600
700

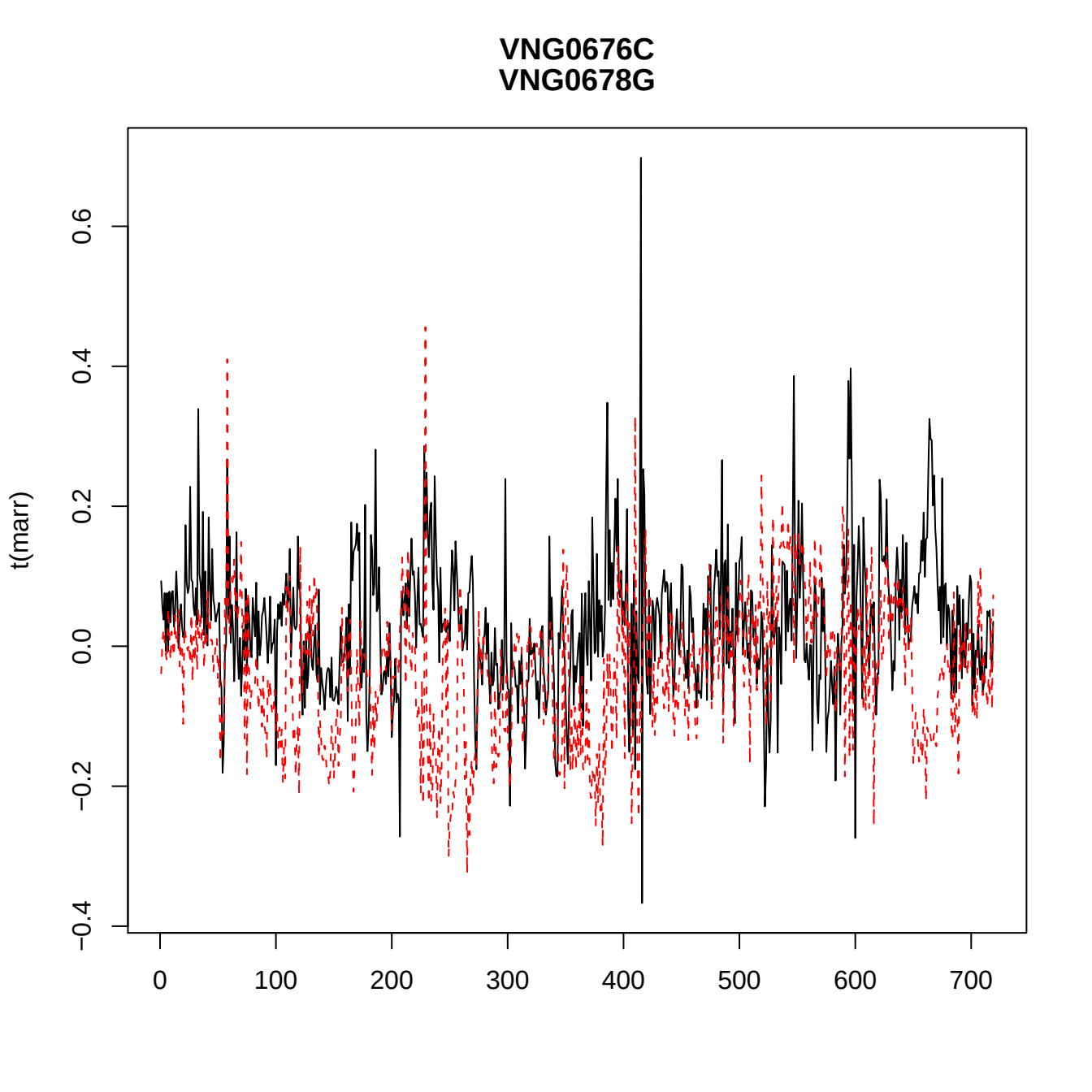

508500
509000
509500
510000
510500
trp4
VNG0668C
VNG0669H
VNG0670H
ABC_tran
ABC2_membrane
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

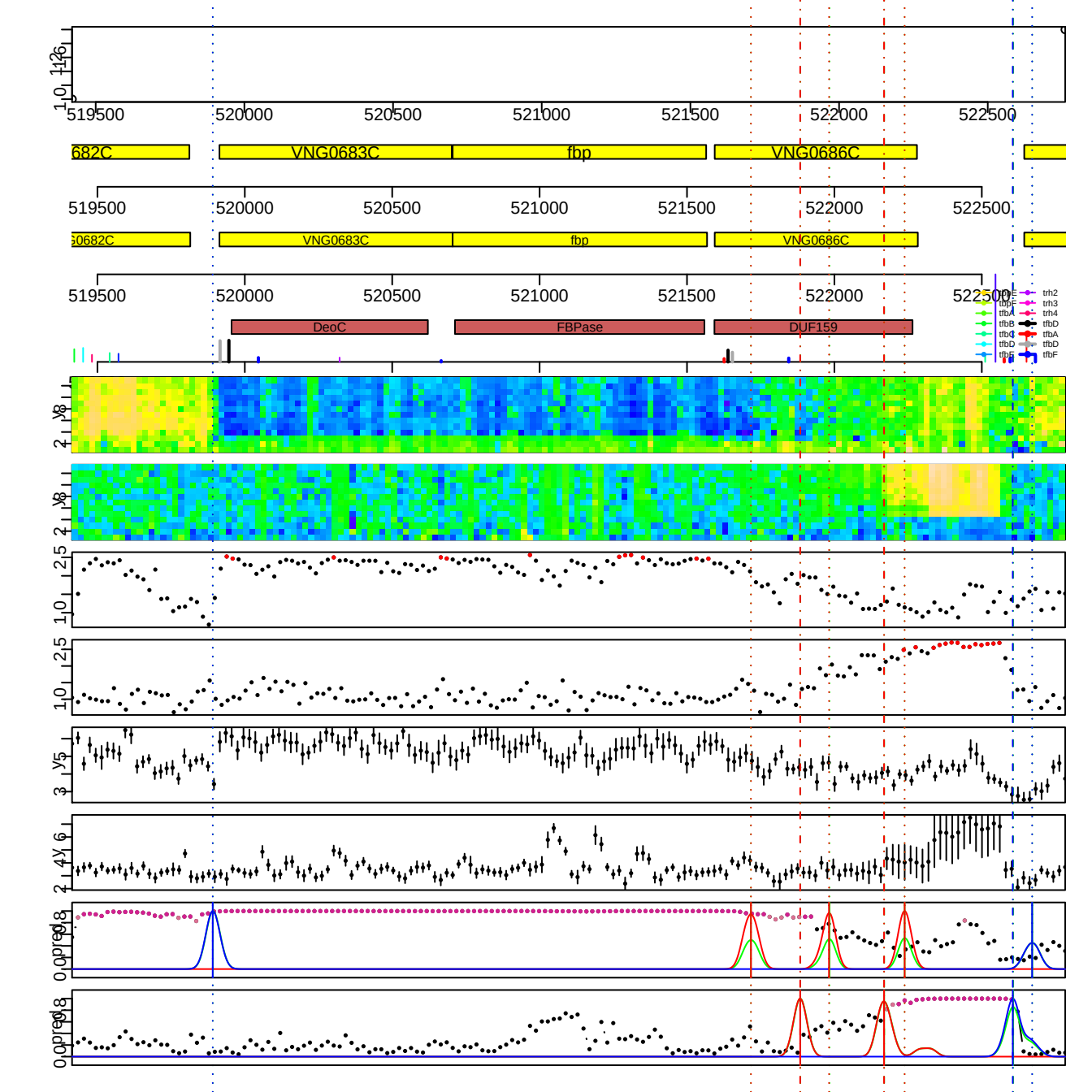

VNG0668C
VNG0669H
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700


511500
512000
512500
513000
mcmA2
VNG0674C
NG0671H
VNG0671H
B12−binding
ArgK
F420
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

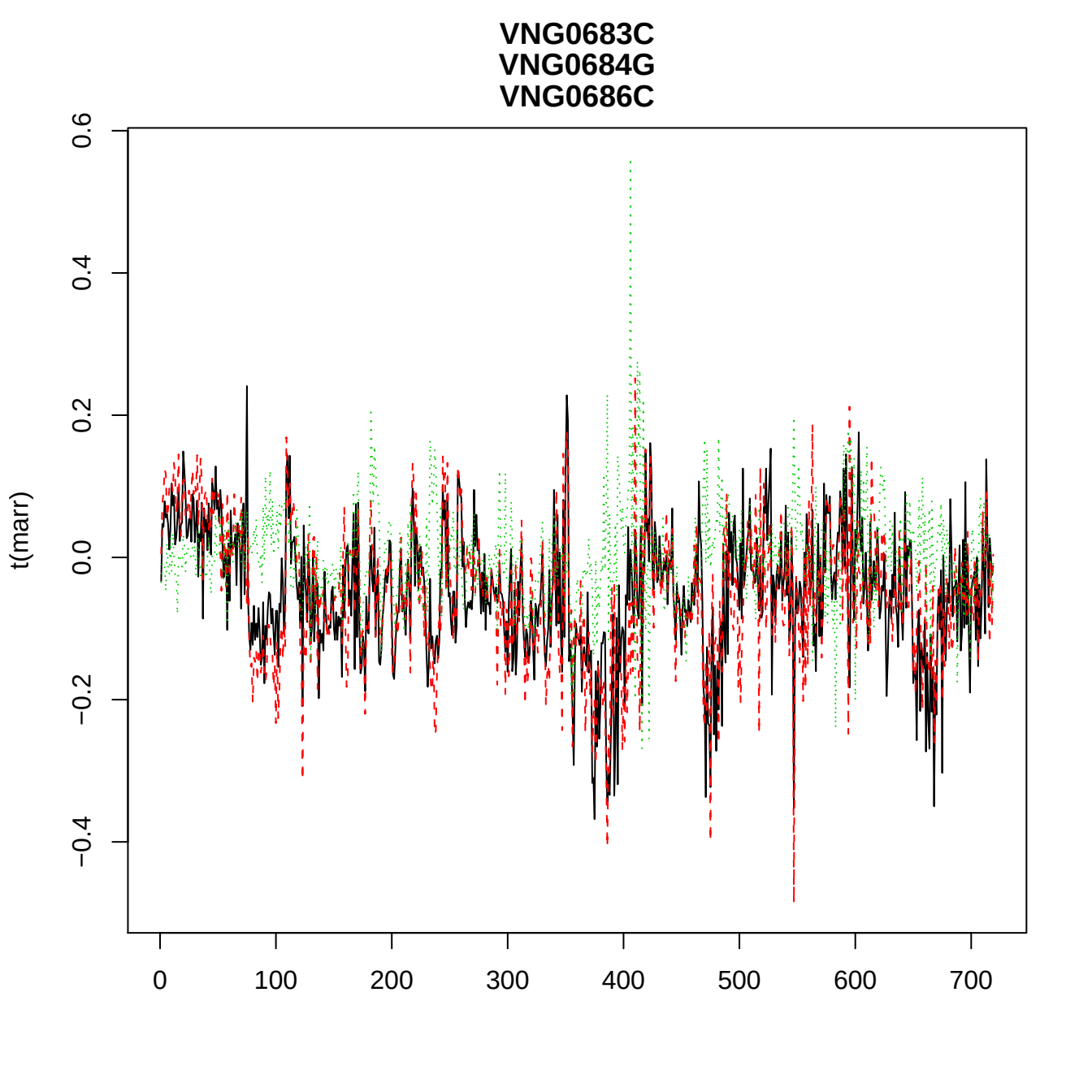

VNG0673G
VNG0674C
t(marr)
−0.3
−0.2
−0.1
0.0
0.1
0.2
0.3
0.4
0
100
200
300
400
500
600
700

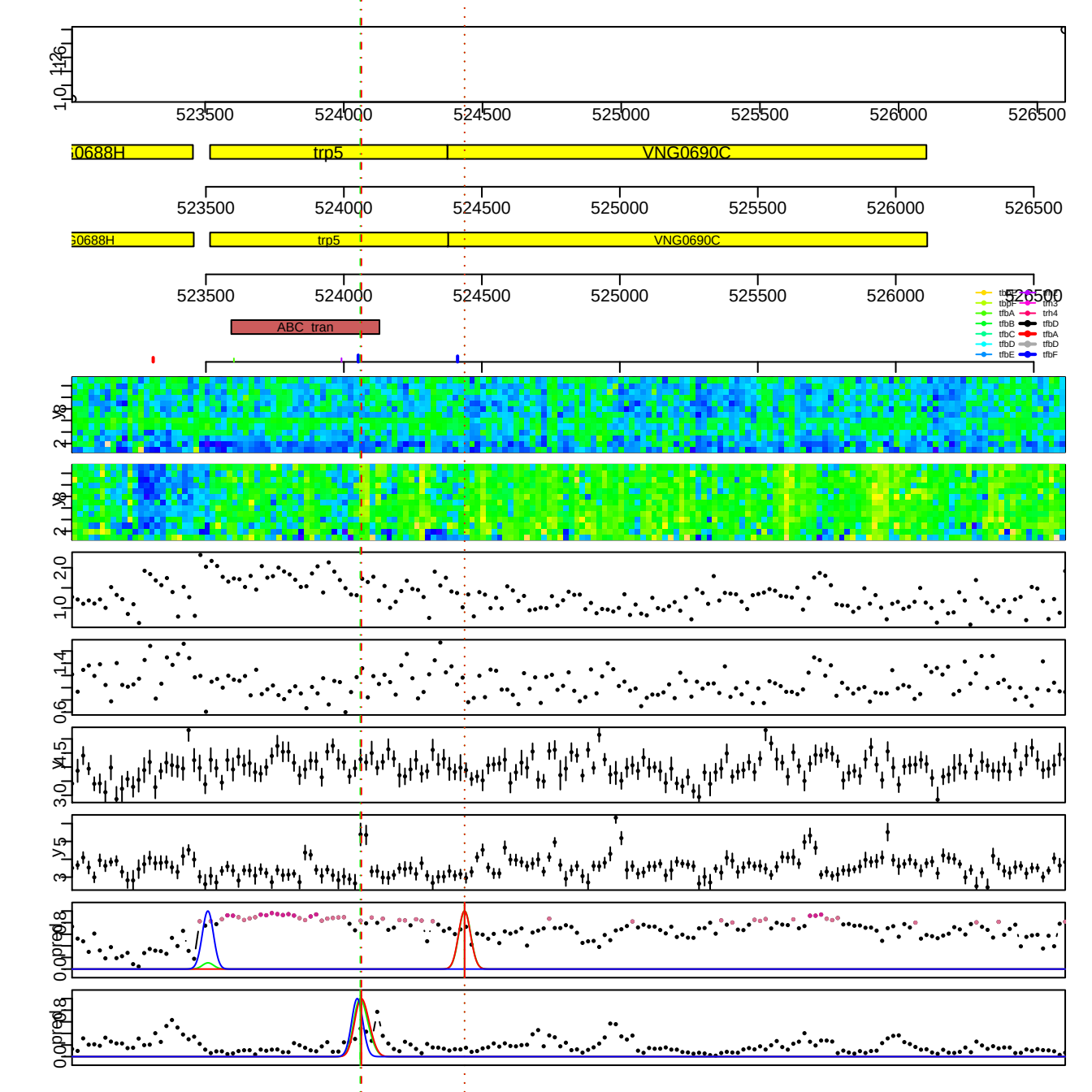

513500
514000
514500
515000
515500
G0675C
VNG0676C
acaB1
VNG0677H
Abhydrolase_1
DUF35
Thiolase_C
ketoacyl-synt
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD_A

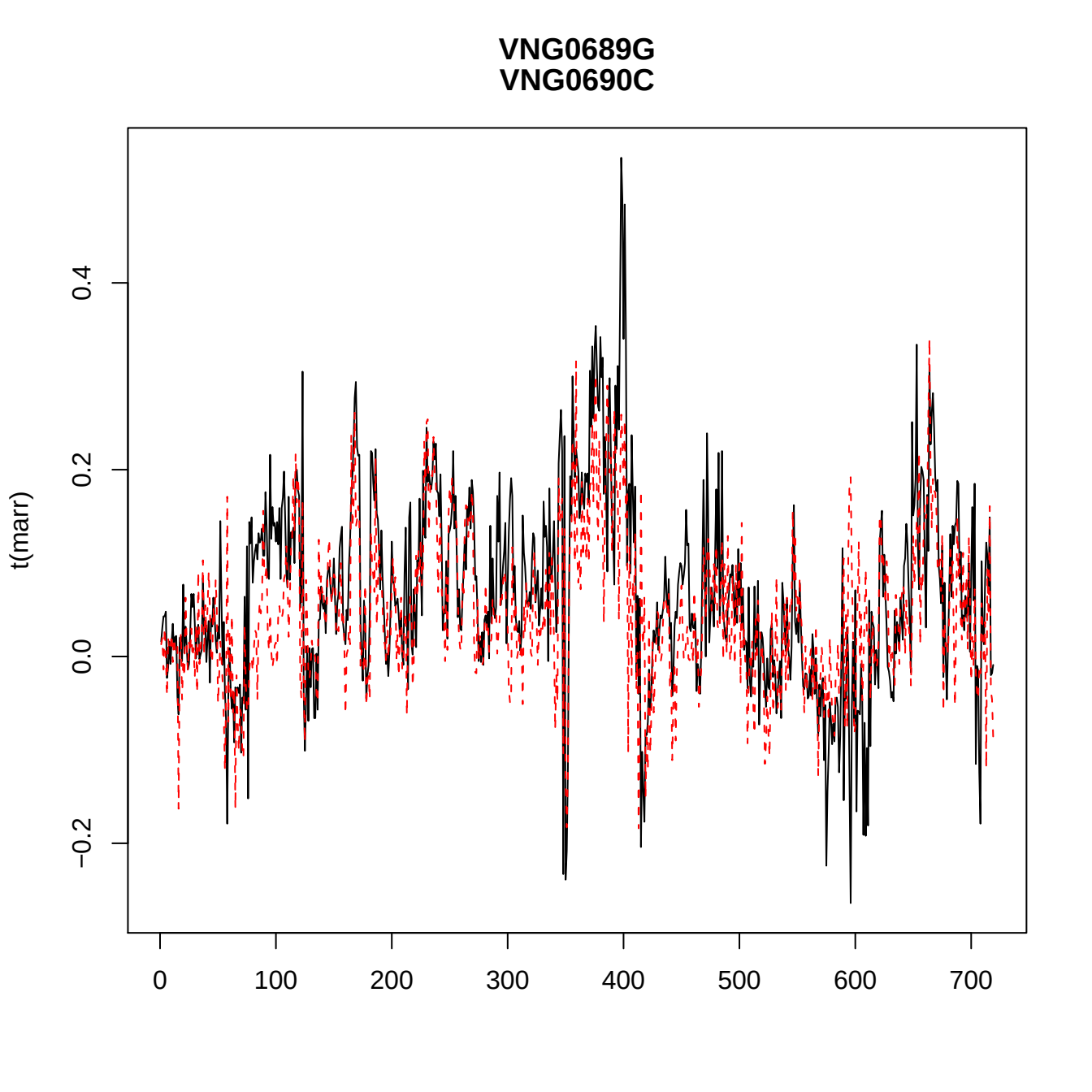

VNG0676C
VNG0678G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

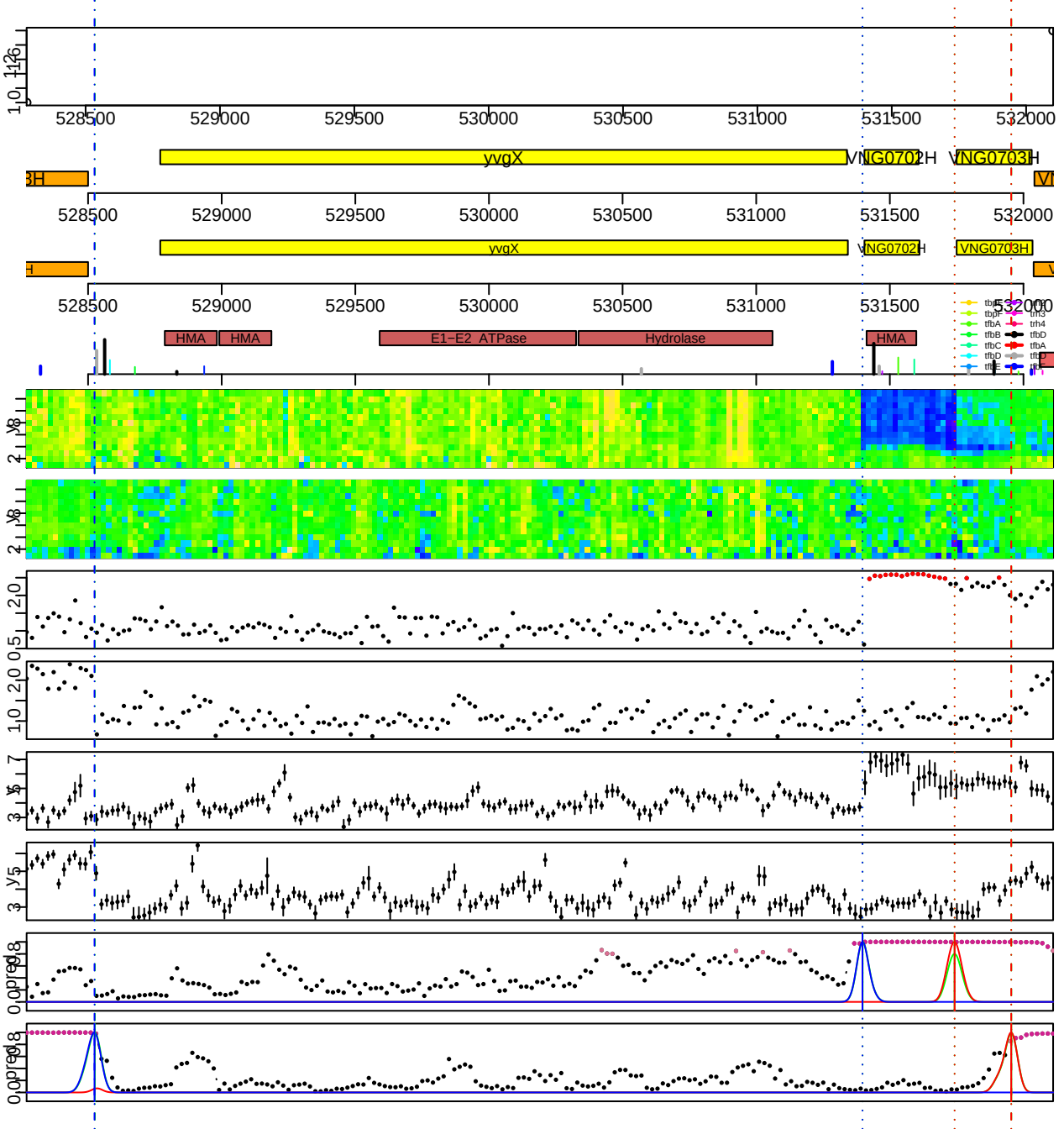


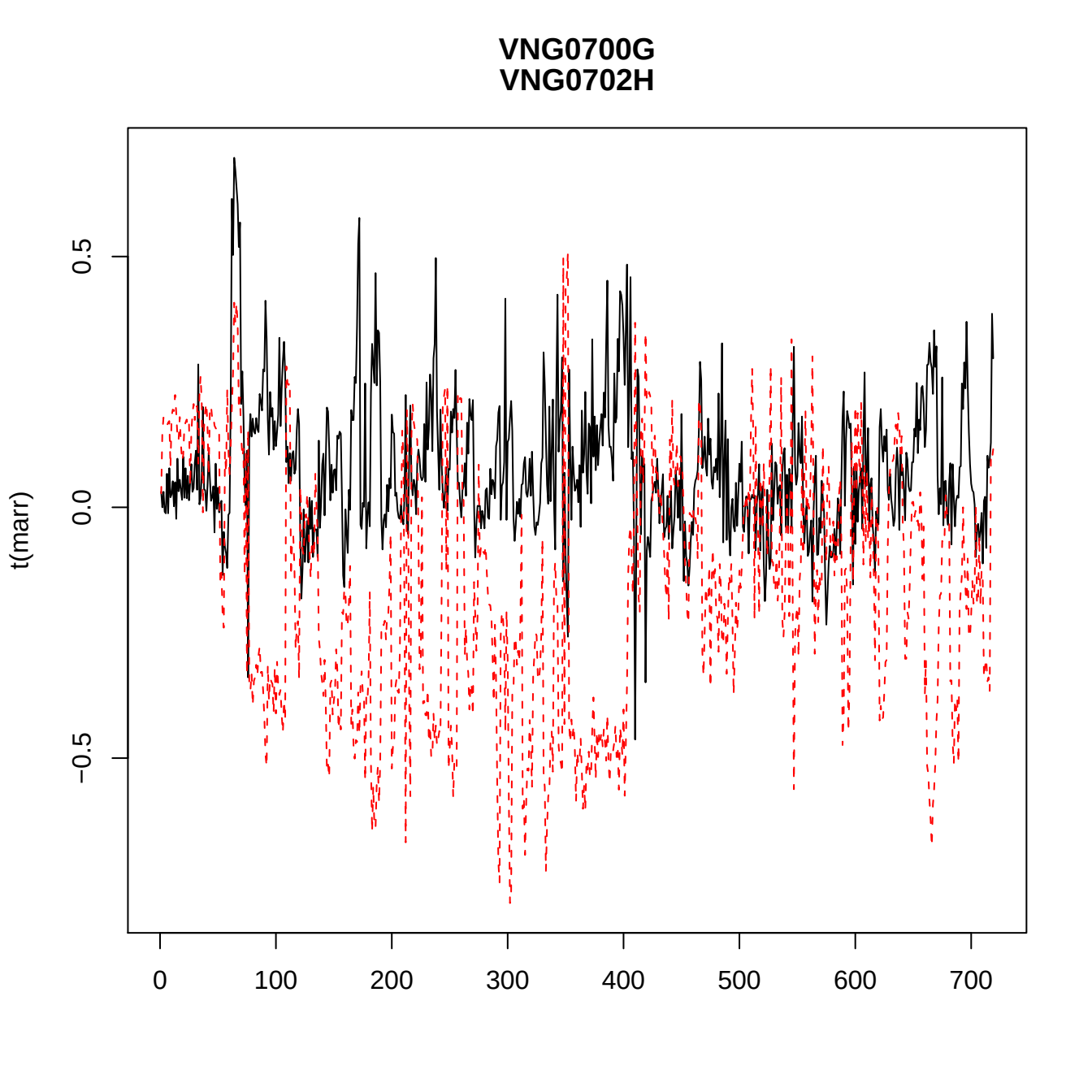
519500
520000
520500
521000
521500
522000
522500
682C
VNG0683C
fbp
VNG0686C
0682C
DeoC
FBPase
DUF159
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0683C
VNG0684G
VNG0686C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


523500
524000
524500
525000
525500
526000
526500
0688H
trp5
VNG0690C
ABC_tran
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0689G
VNG0690C
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700


528500
529000
529500
530000
530500
531000
531500
532000
yvgX
VNG0702H
VNG0703H
HMA
HMA
E1−E2_ATPase
Hydrolase
HMA
tfbA
tfbB
tfbC
tfbD
trh1
trh3
trh4
tfbA
tfbD


VNG0700G
VNG0702H
t(marr)
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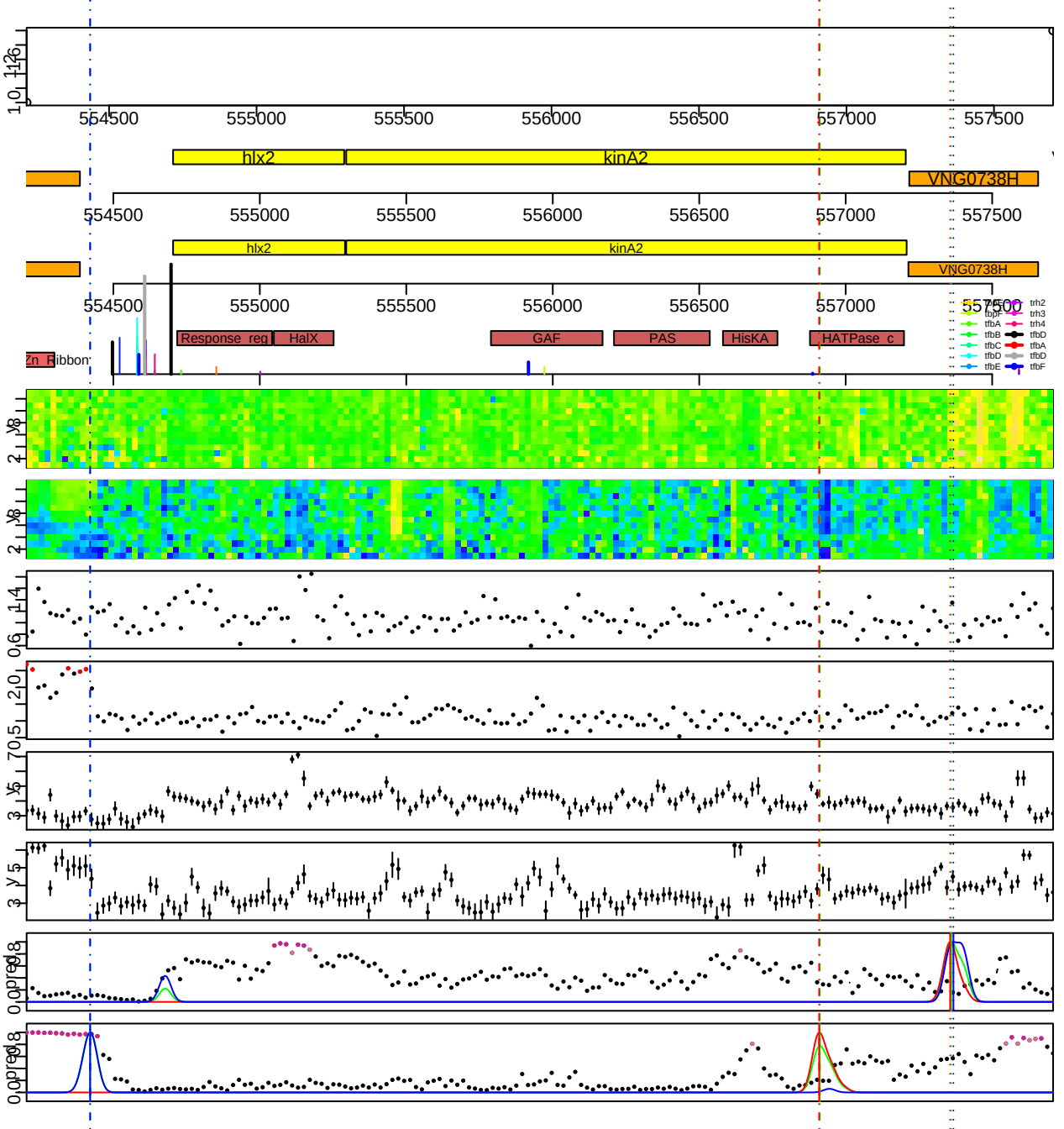
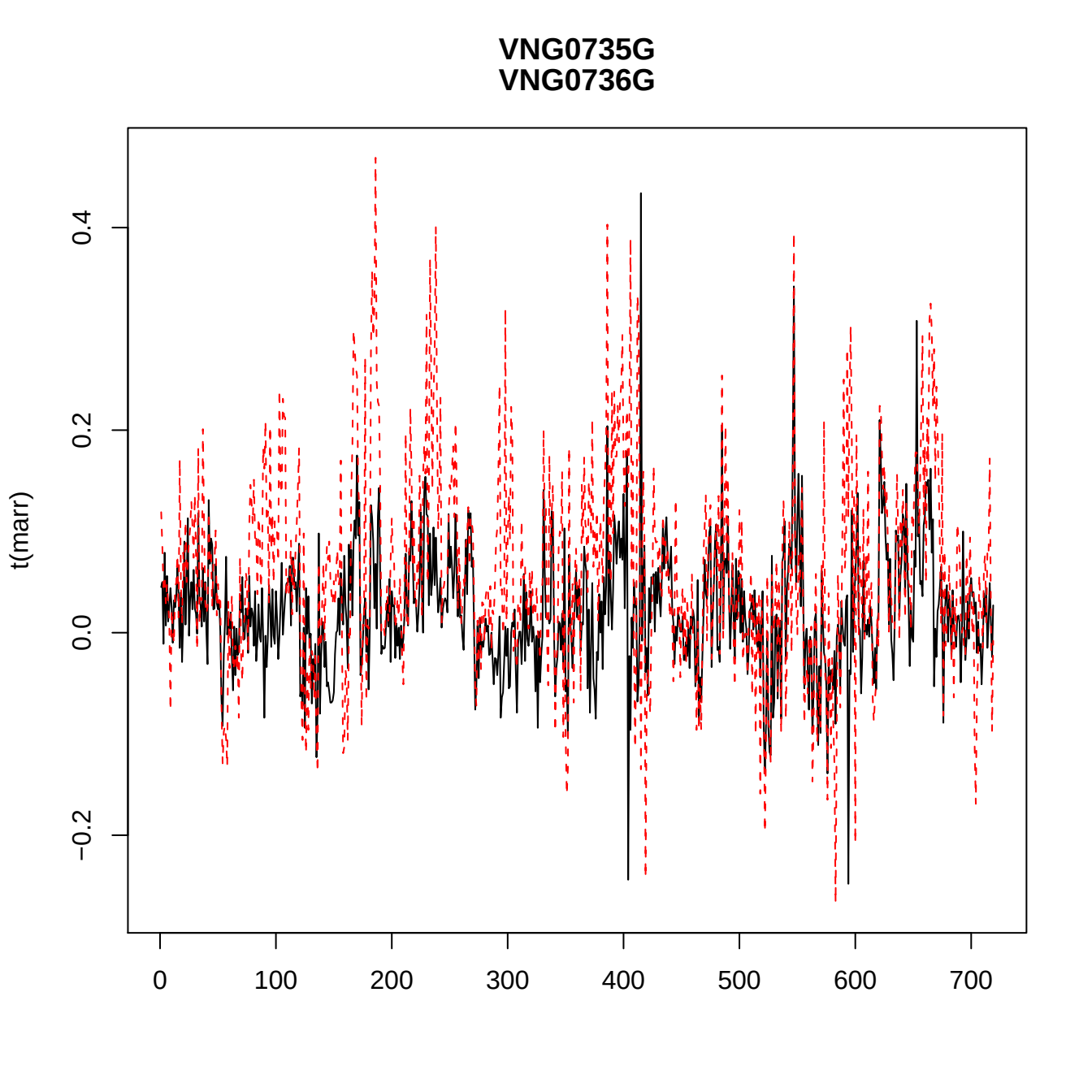
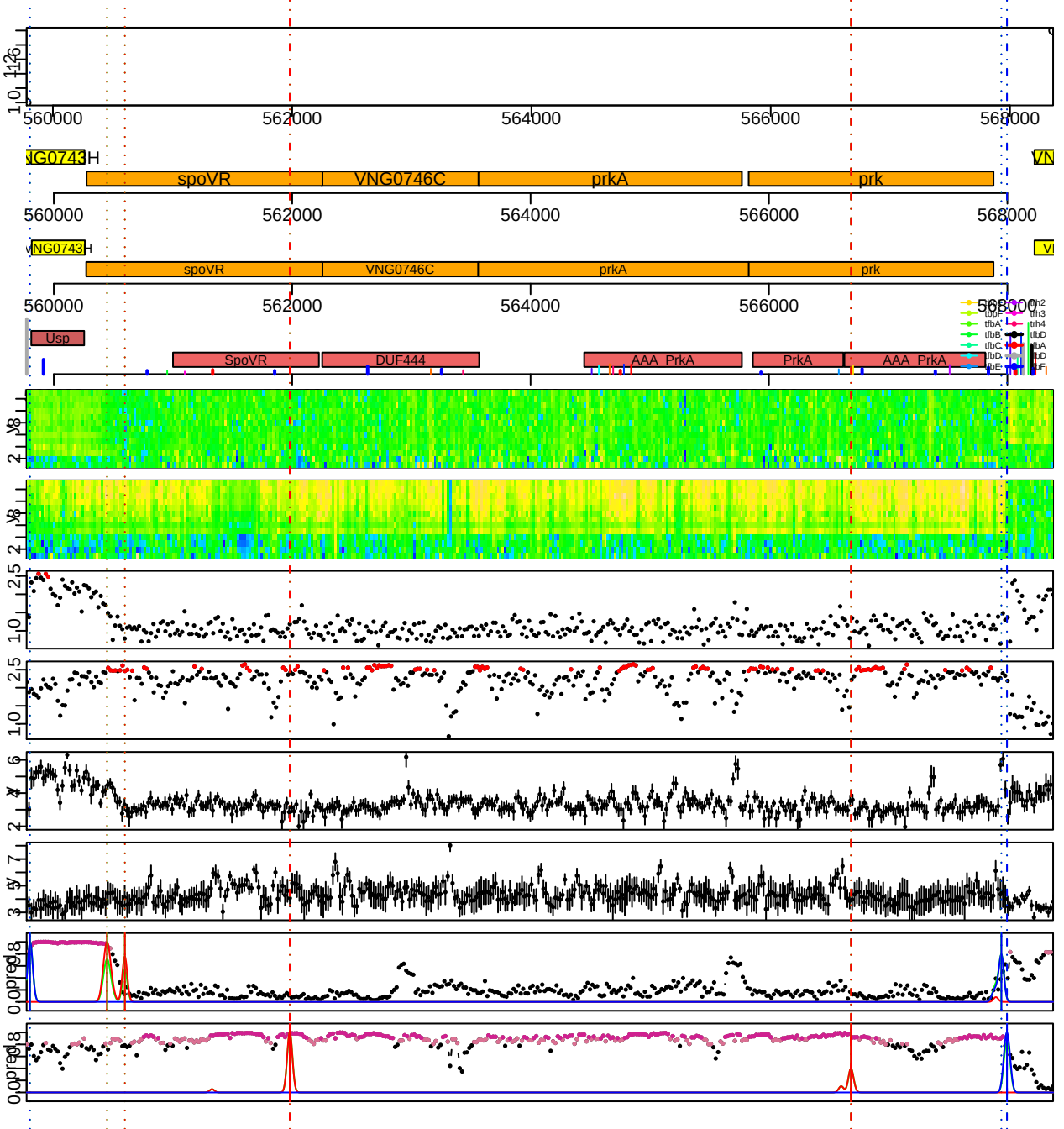
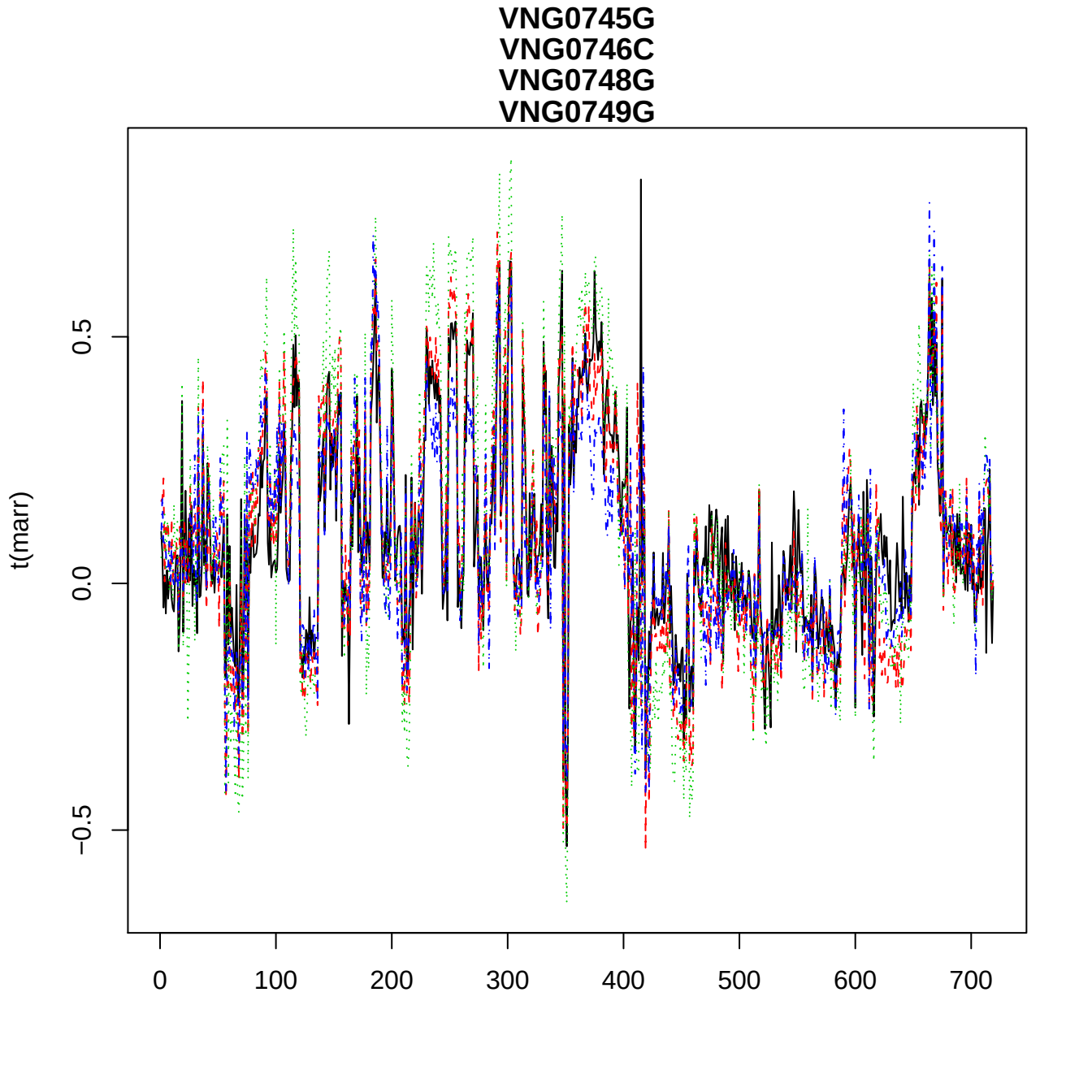
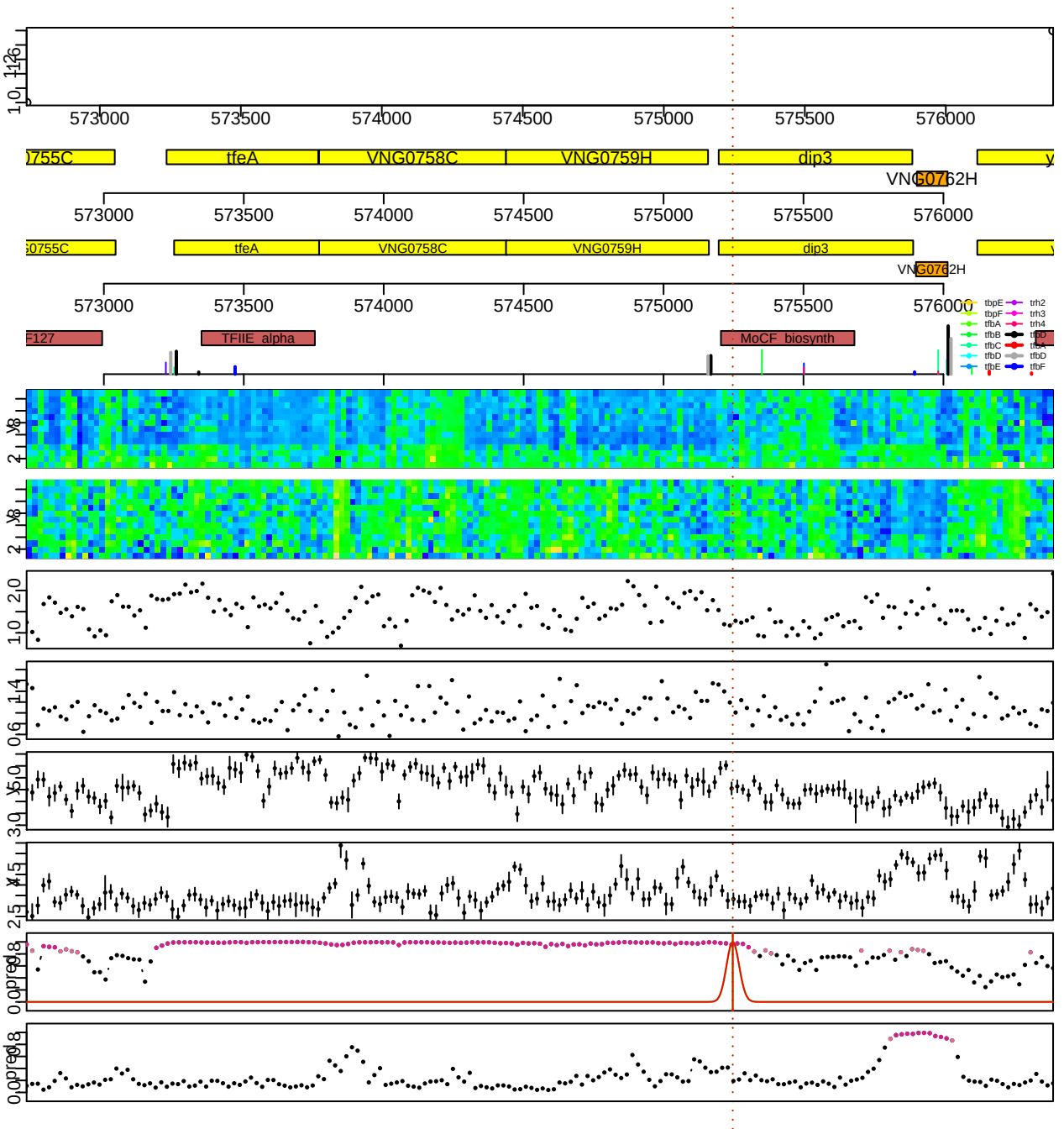
0.0
−0.5
0
100
200
300
400
500
600
700

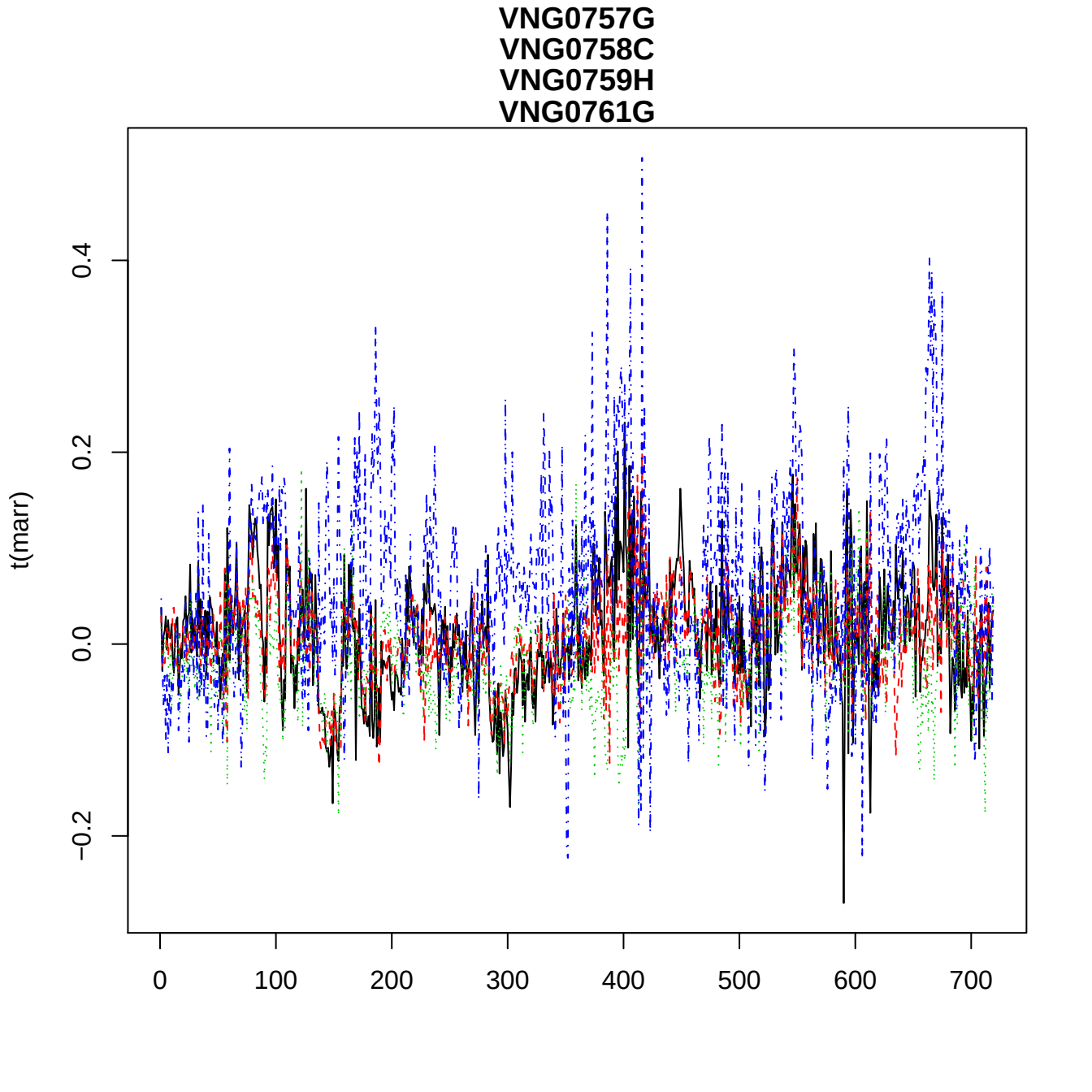

554500
555000
555500
556000
556500
557000
557500
hlx2
kinA2
VNG0738H
Response_reg
HalX
GAF
PAS
HisKA
HATPase_c
Zn_Ribbon
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE

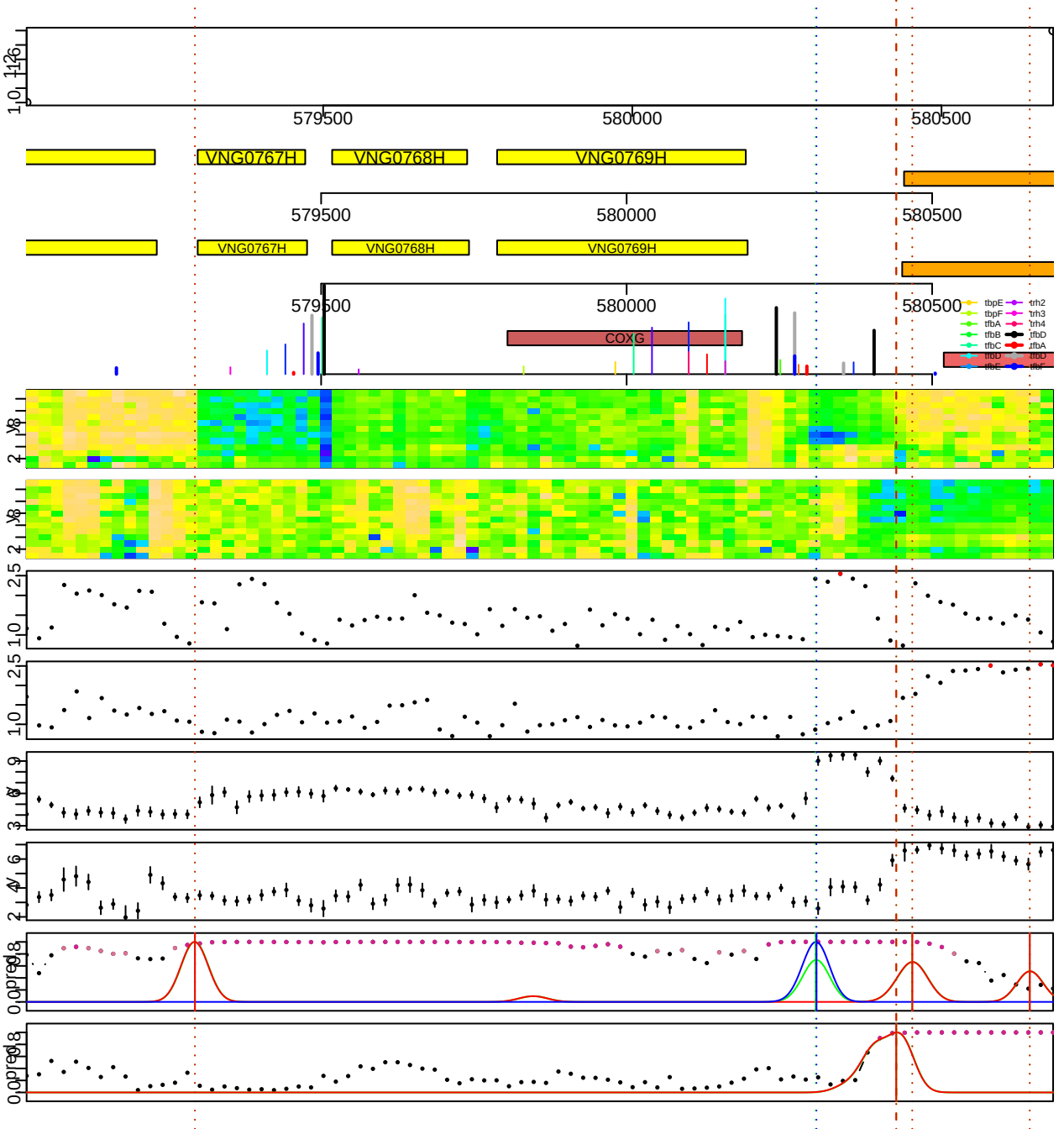

VNG0735G
VNG0736G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

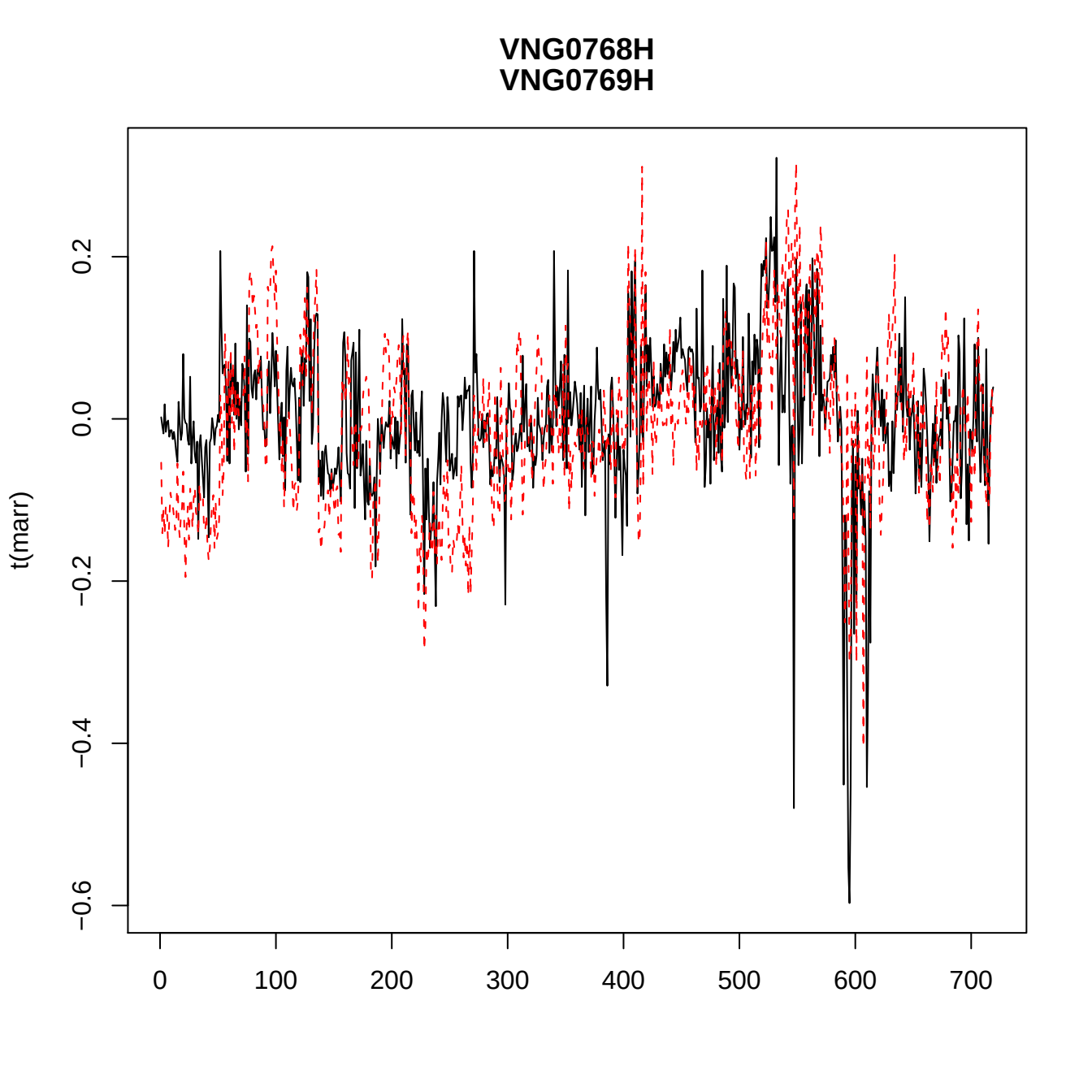

560000
562000
564000
566000
568000
VNG0743H
spoVR
VNG0746C
prkA
prk
Usp
SpoVR
DUF444
AAA_PrkA
PrkA
AAA_PrkA
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbF

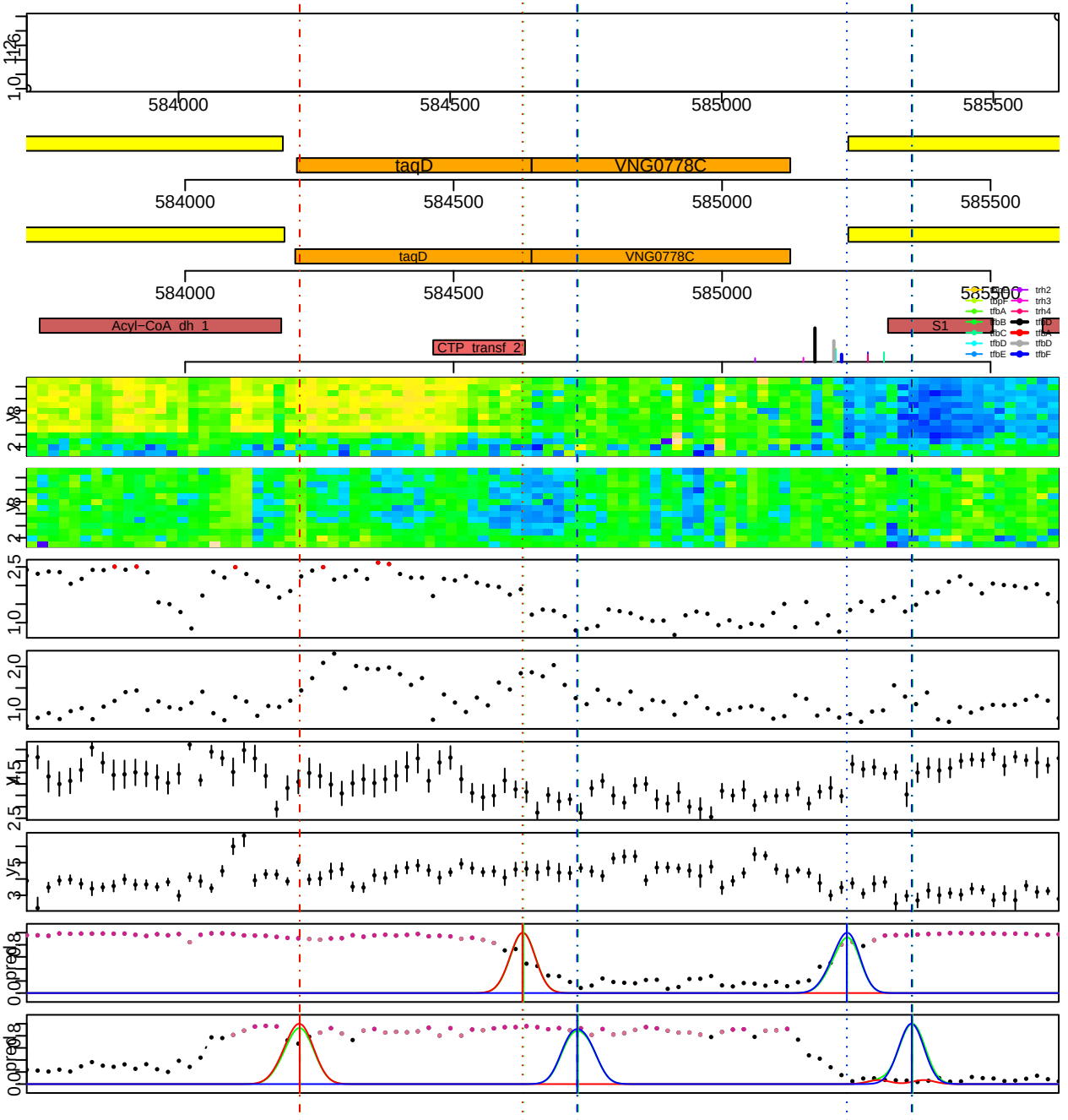

VNG0745G
VNG0746C
VNG0748G
VNG0749G
t(marr)
0.5
0.0
−0.5
0
100
200
300
400
500
600
700


573000
573500
574000
574500
575000
575500
576000
0755C
tfeA
VNG0758C
VNG0759H
dip3
VNG0762H
TFIIE_alpha
MoCF_biosynth
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

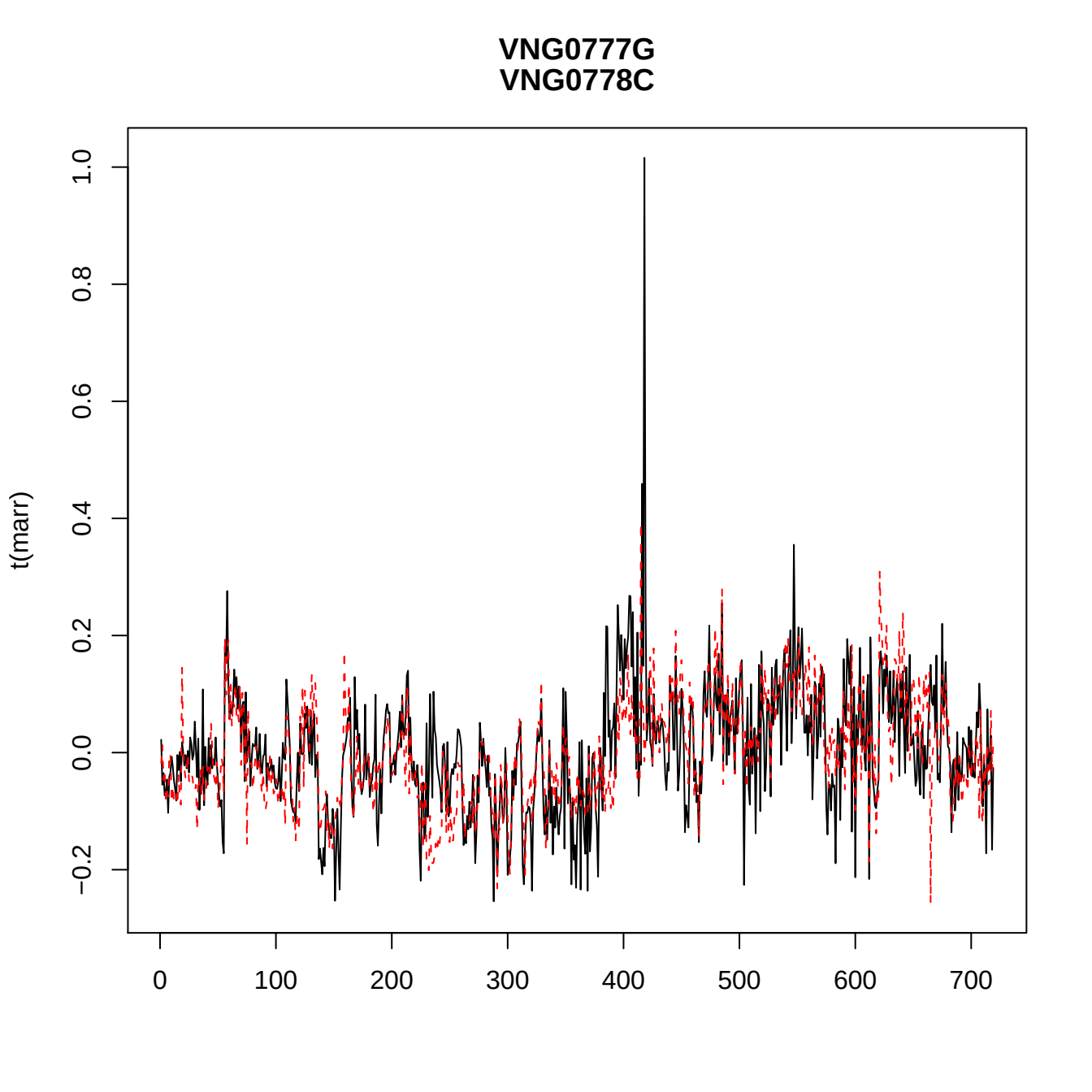

VNG0757G
VNG0758C
VNG0759H
VNG0761G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

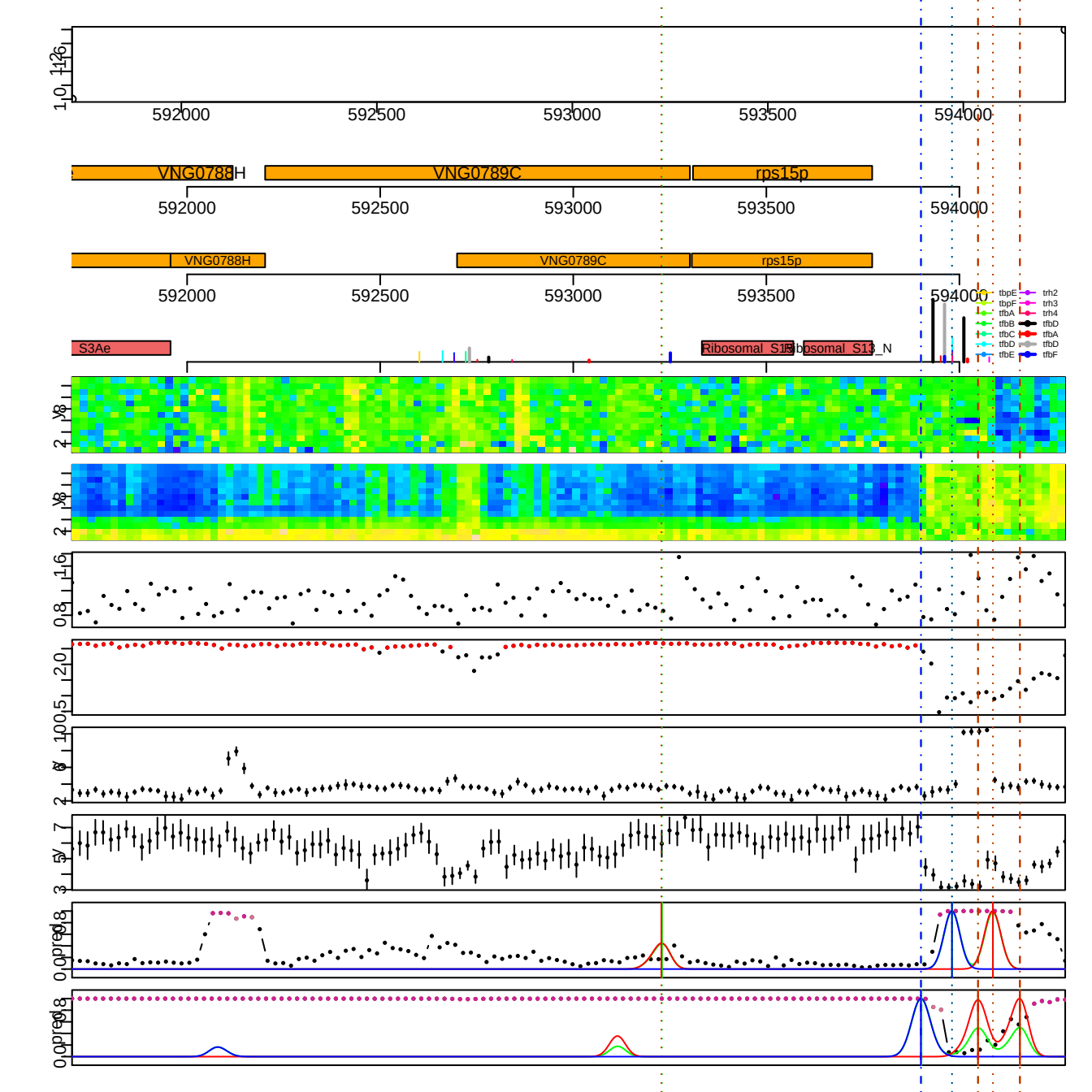

579500
580000
580500
VNG0767H
VNG0768H
VNG0769H
COXG
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0768H
VNG0769H
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700



584000
584500
585000
585500
taqD
VNG0778C
Acyl−CoA_dh_1
CTP_transf_2
S1
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF


VNG0777G
VNG0778C
t(marr)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700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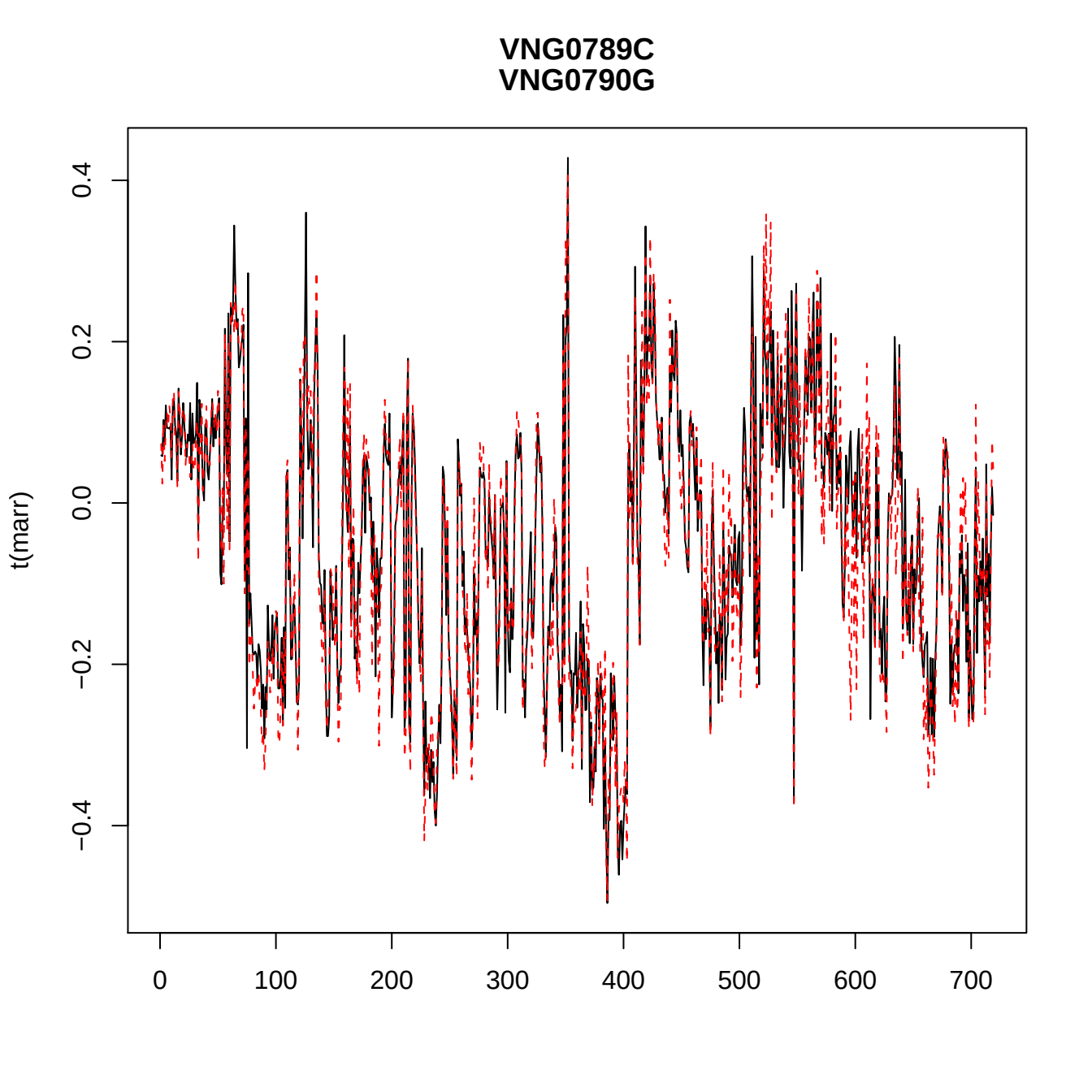
VNG0788H
VNG0789C
rps15p
S3Ae
Ribosomal_S15
Ribosomal_S13_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0789C
VNG0790G
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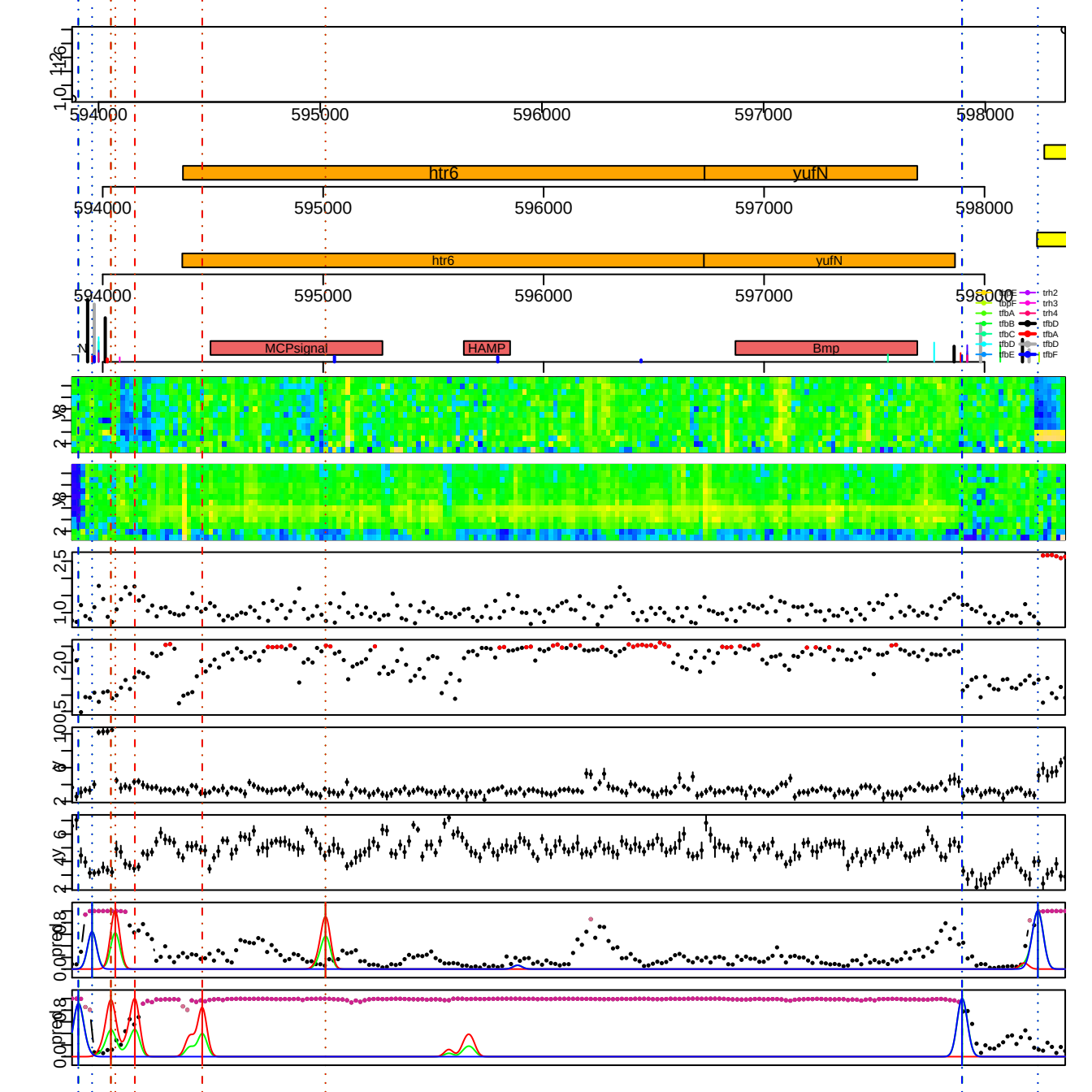

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595000
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597000
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htr6
yufN
MCPsignal
HAMP
Bmp
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
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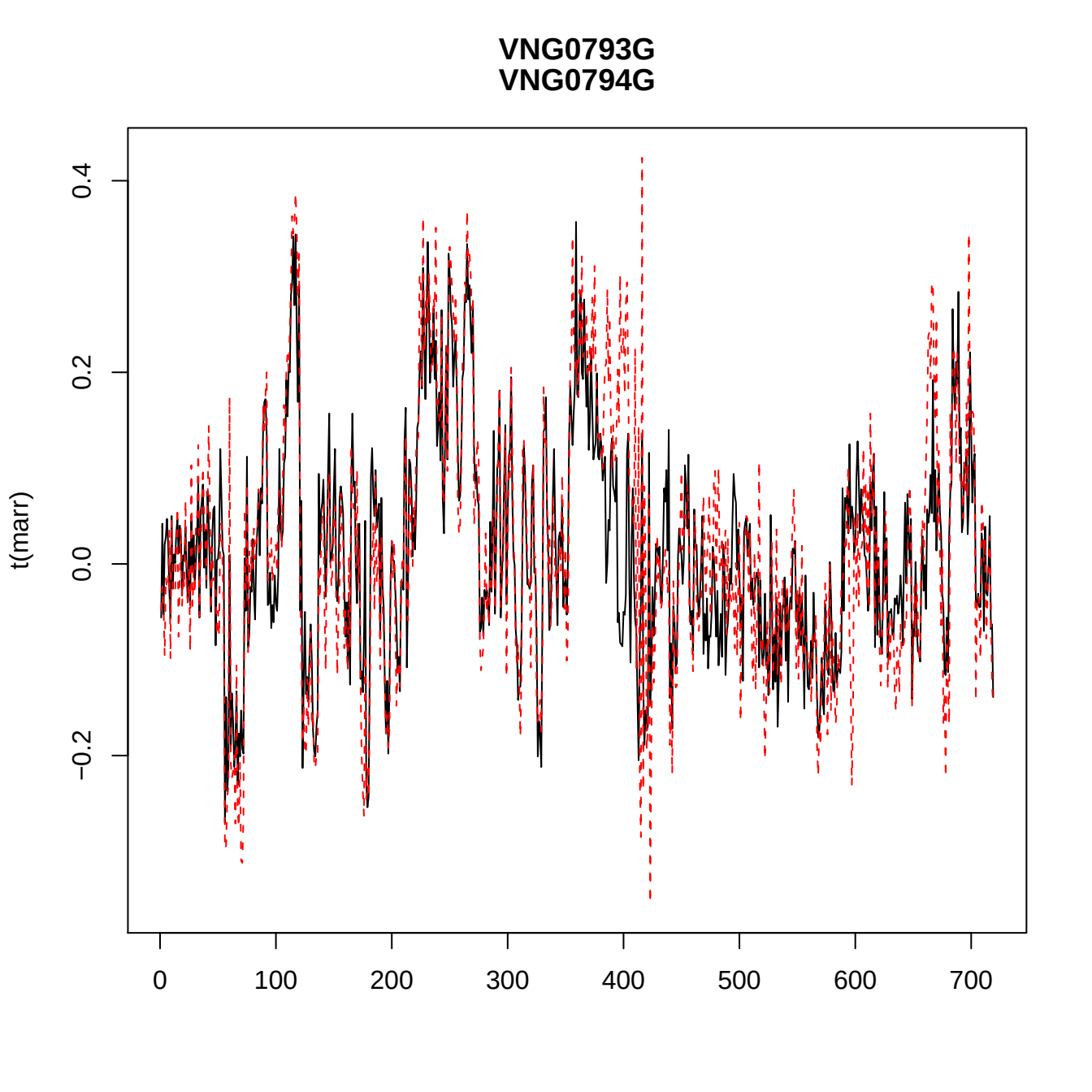
VNG0793G
VNG0794G
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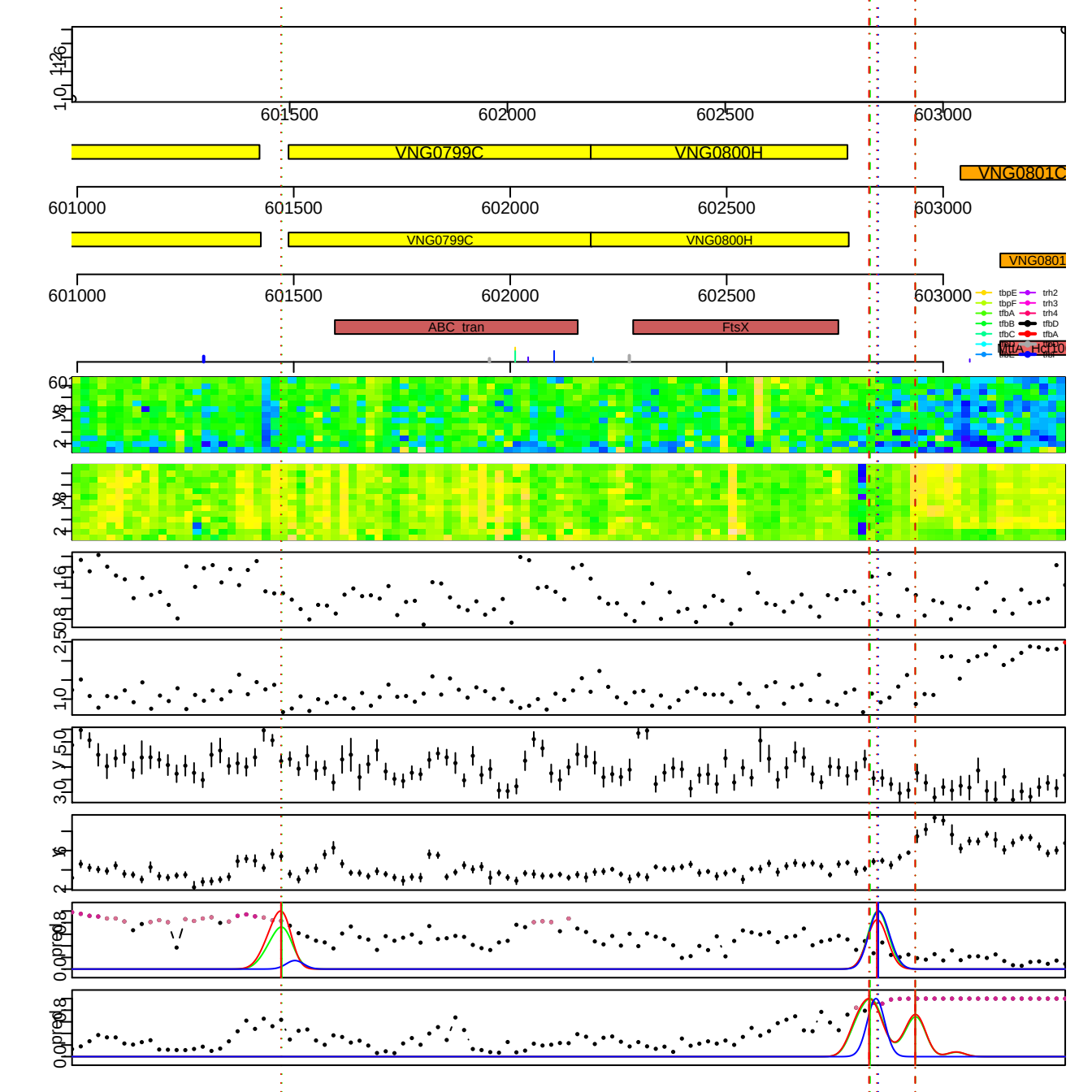
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VNG0799C
VNG0800H
VNG0801C
601000
601500
602000
602500
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VNG0799C
VNG0800H
VNG0801
601000
601500
602000
602500
603000
tbpE
tbpF
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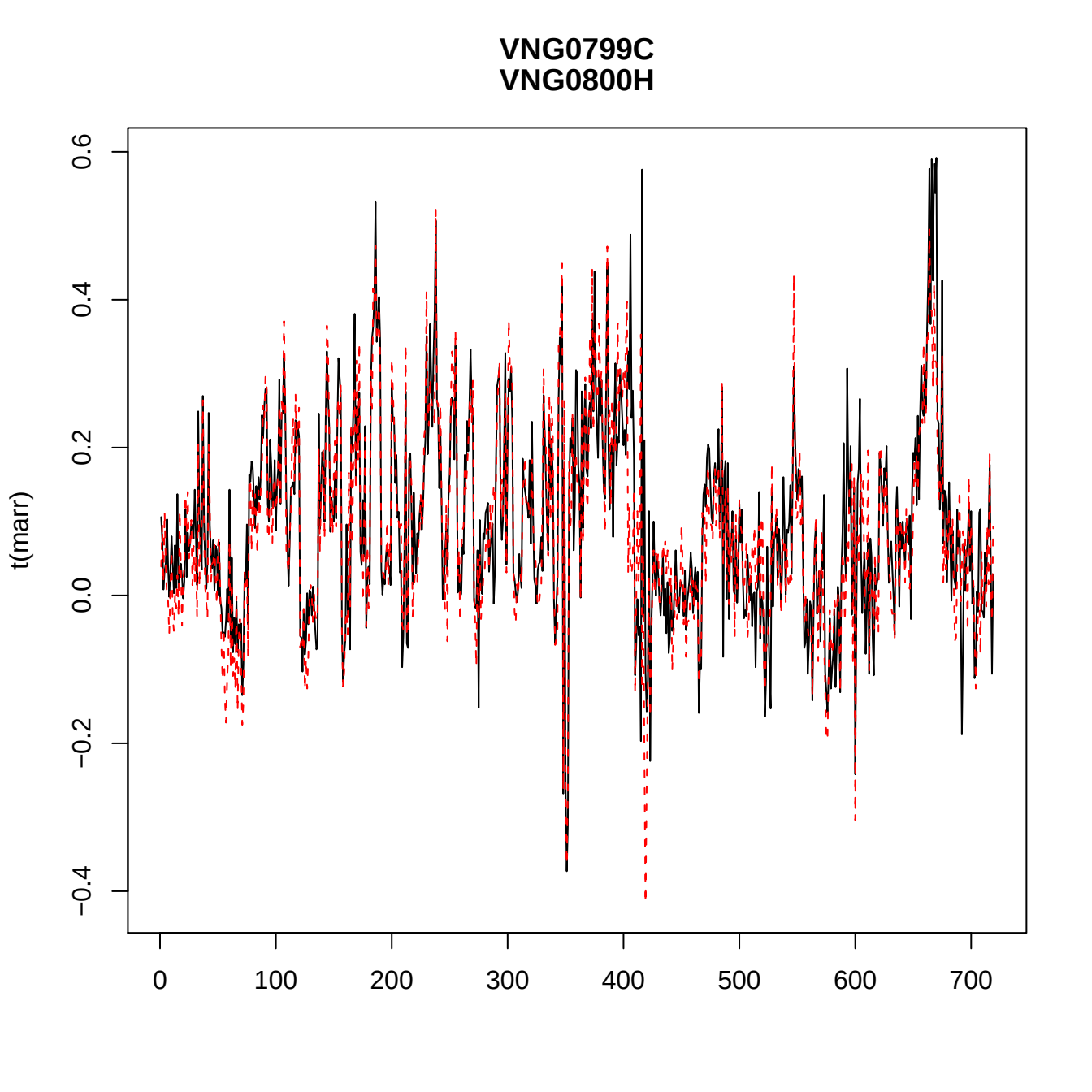
tfbC
trh2
trh3
trh4
tfbD
tfbA
ABC_tran
FtsX


VNG0799C
VNG0800H
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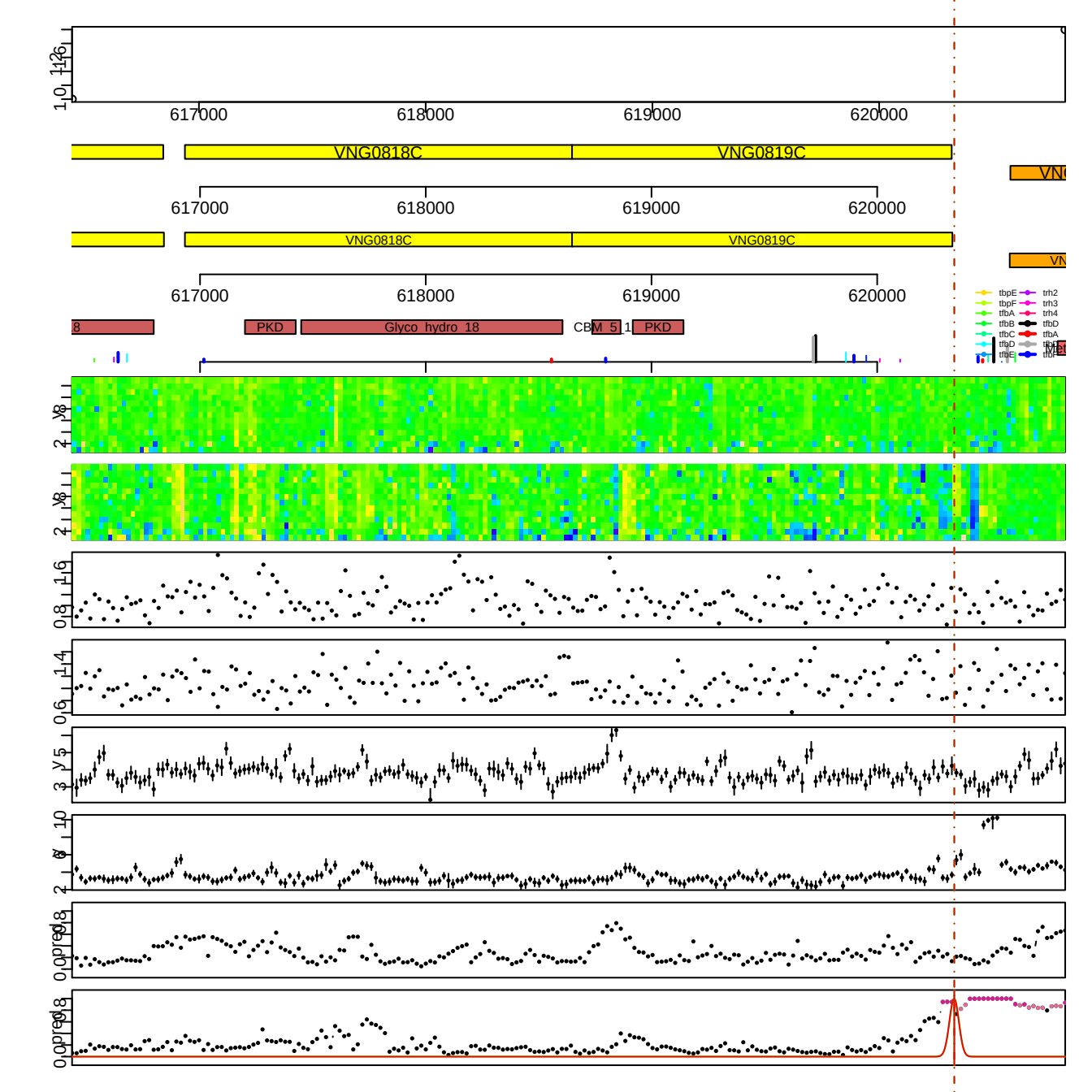
600
700


617000
618000
619000
620000
VNG0818C
VNG0819C
PKD
Glyco_hydro_18
CBM_5_1
PKD
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tbpF
tfbA
tfbB
tfbC
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trh2
trh3
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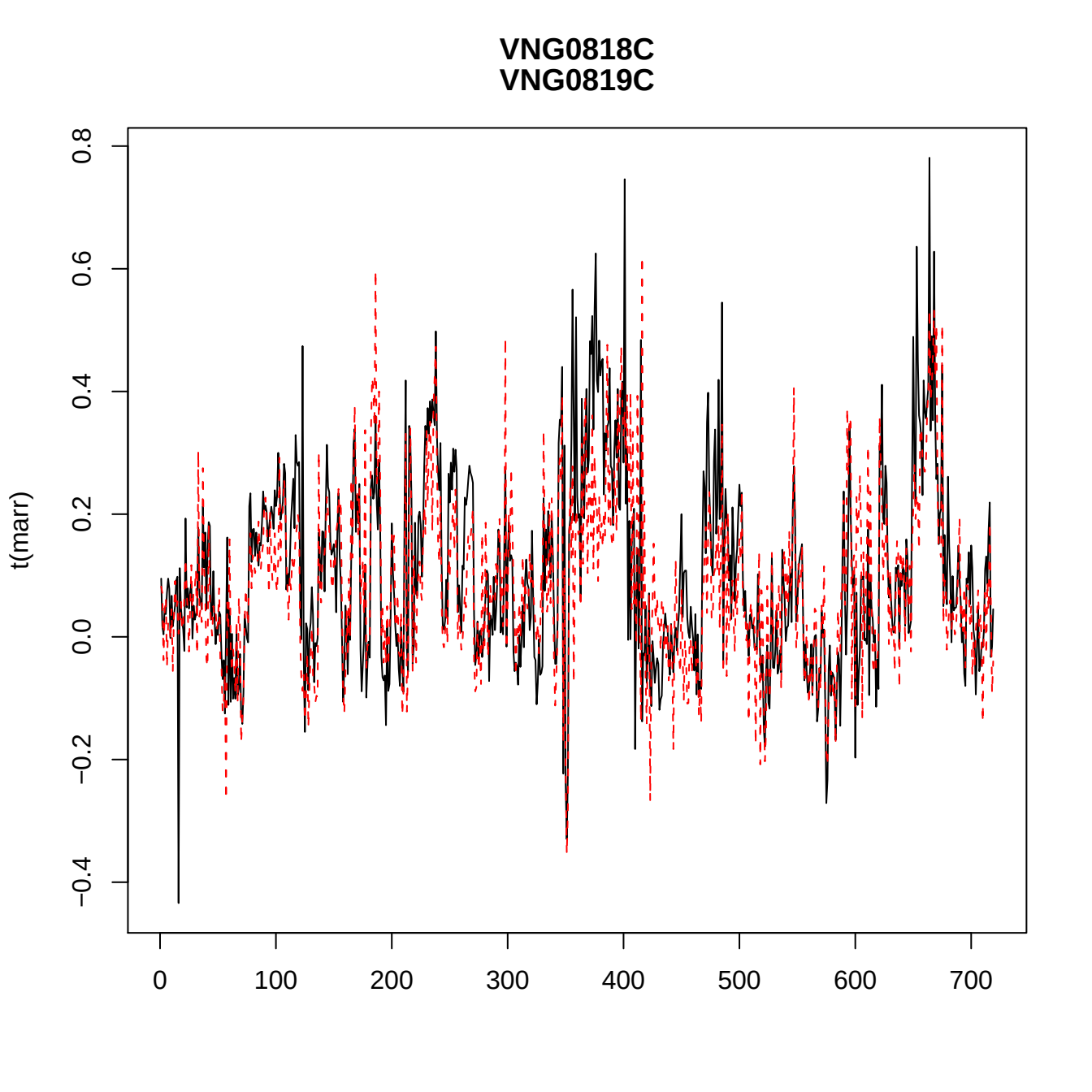
tfbA


VNG0818C
VNG0819C
t(marr)
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0.6
0.4
0.2
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−0.4
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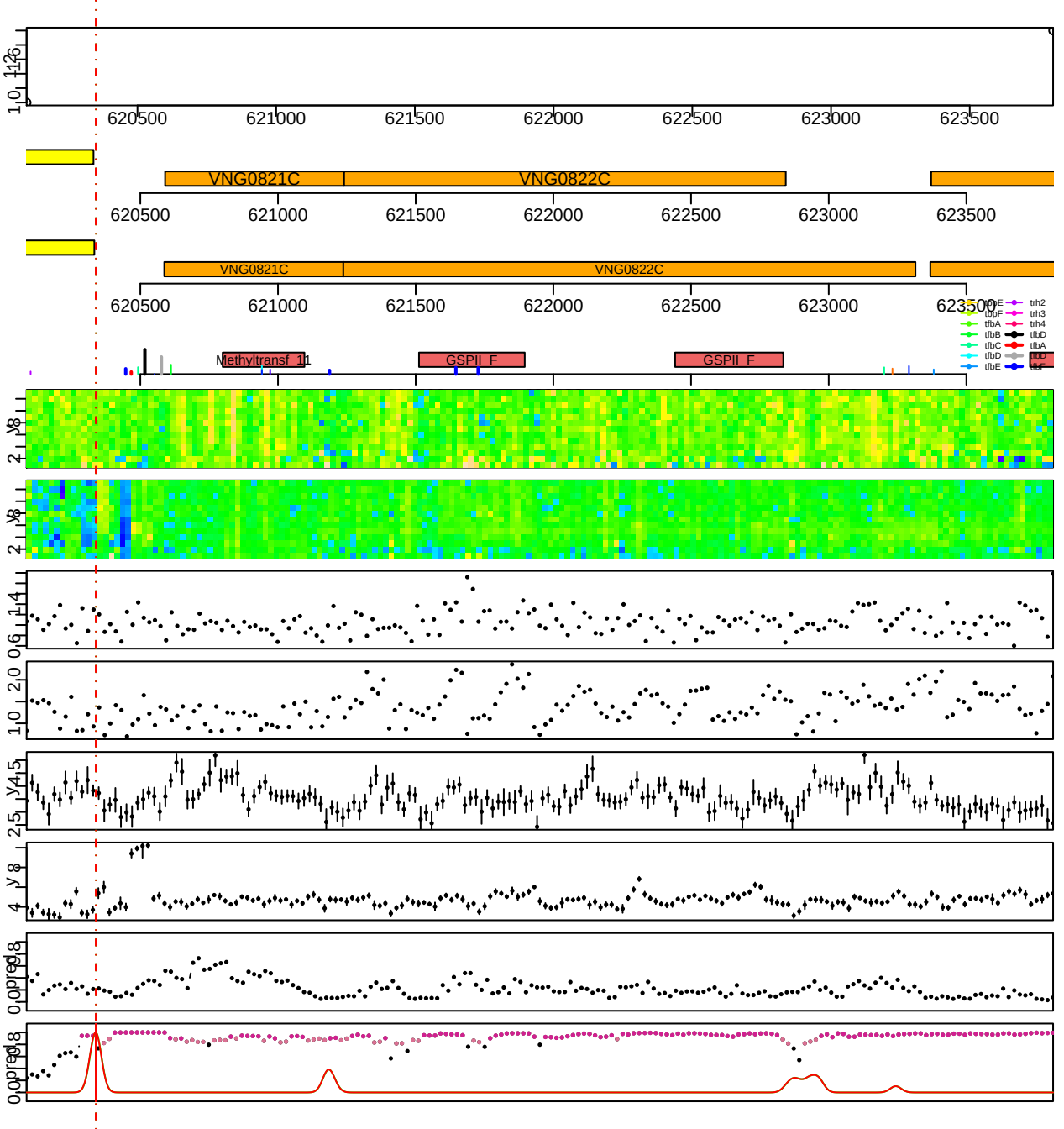
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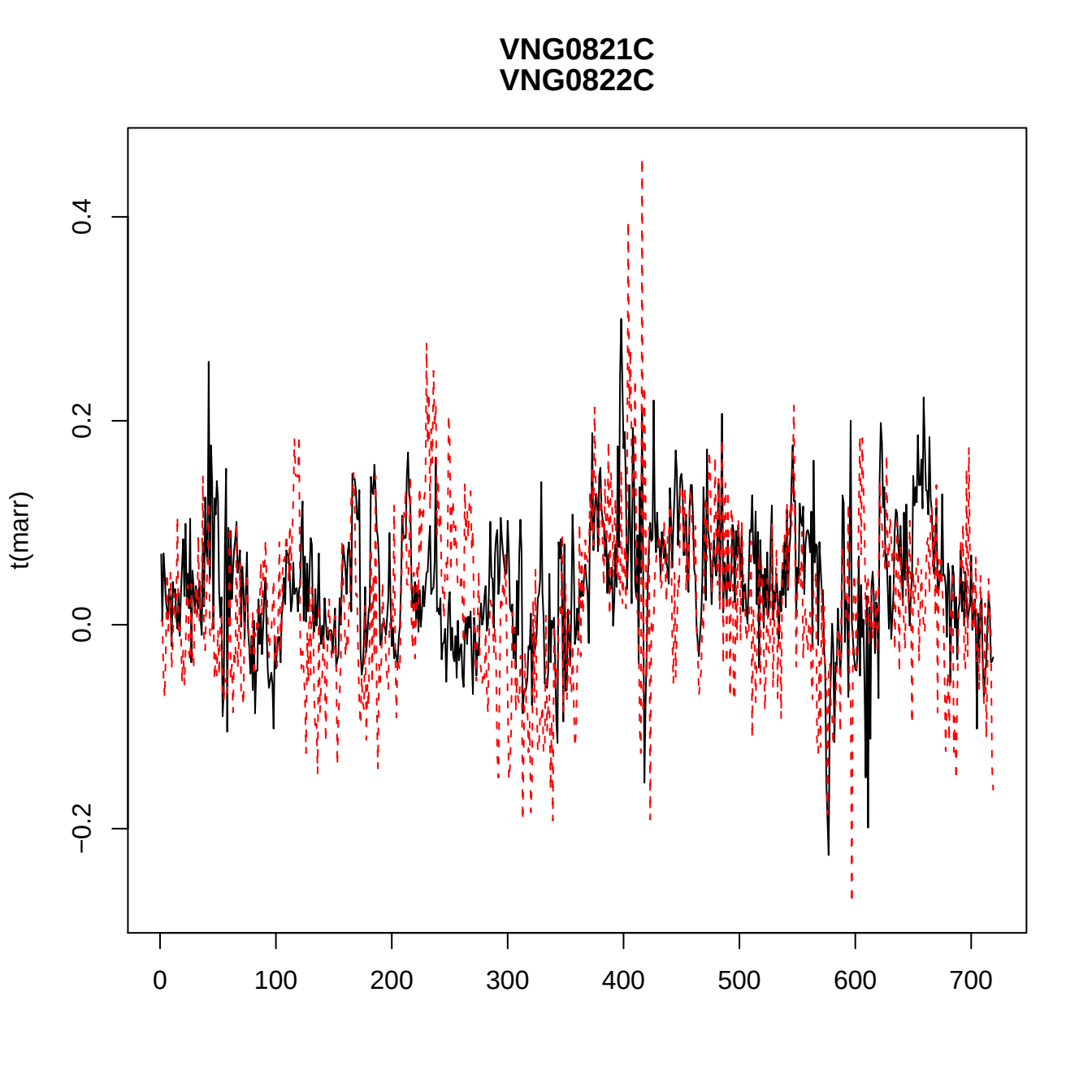
621000
621500
622000
622500
623000
623500
VNG0821C
VNG0822C
Methyltransf_11
GSPII_F
GSPII_F
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbA
tfbB
tfbC
tfbD
tfbE


VNG0821C
VNG0822C
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0
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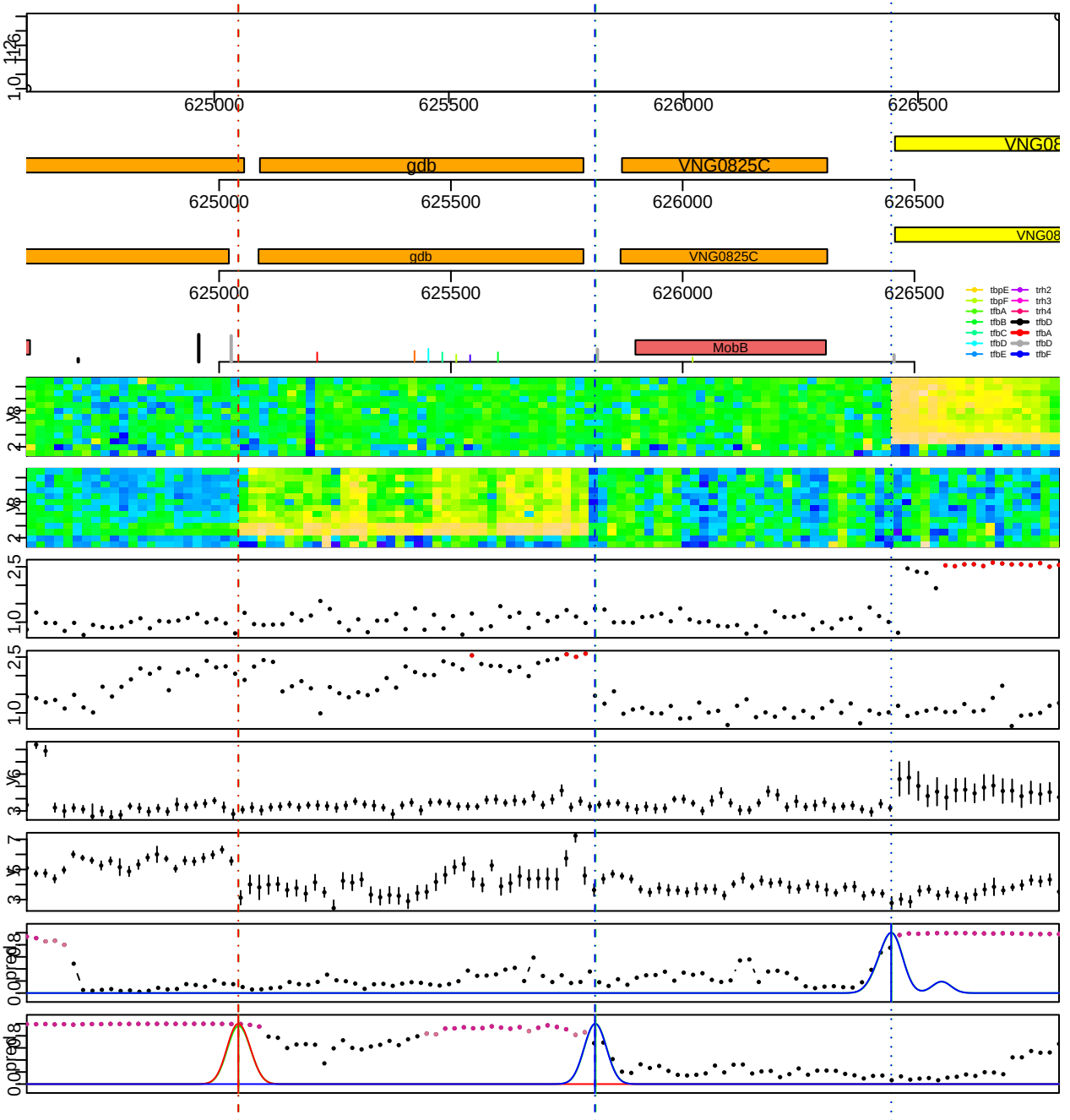
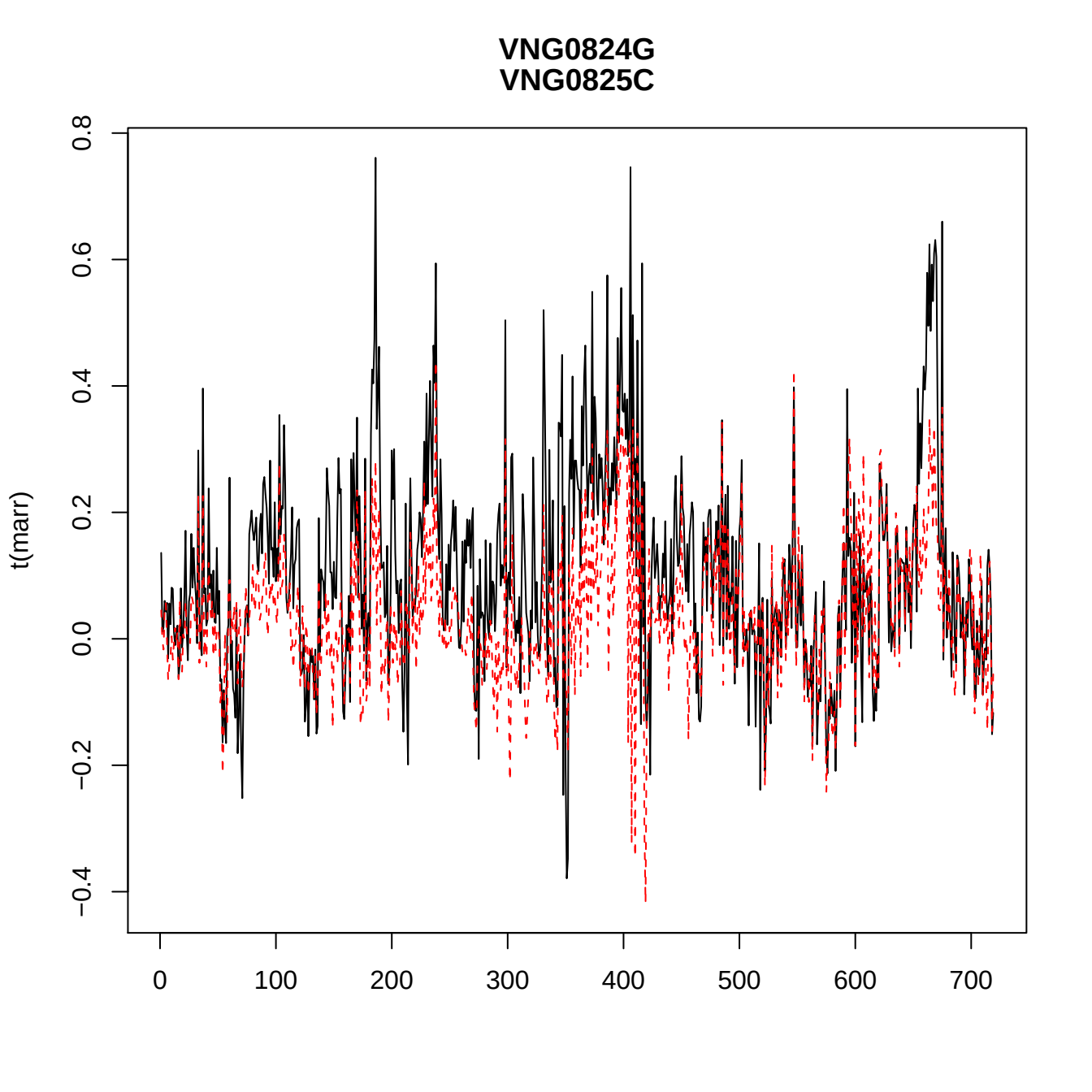

625000
625500
626000
626500
gdb
VNG0825C
VNG08
MobB
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0824G
VNG0825C
t(marr)
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0.6
0.4
0.2
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−0.2
−0.4
0
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400
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600
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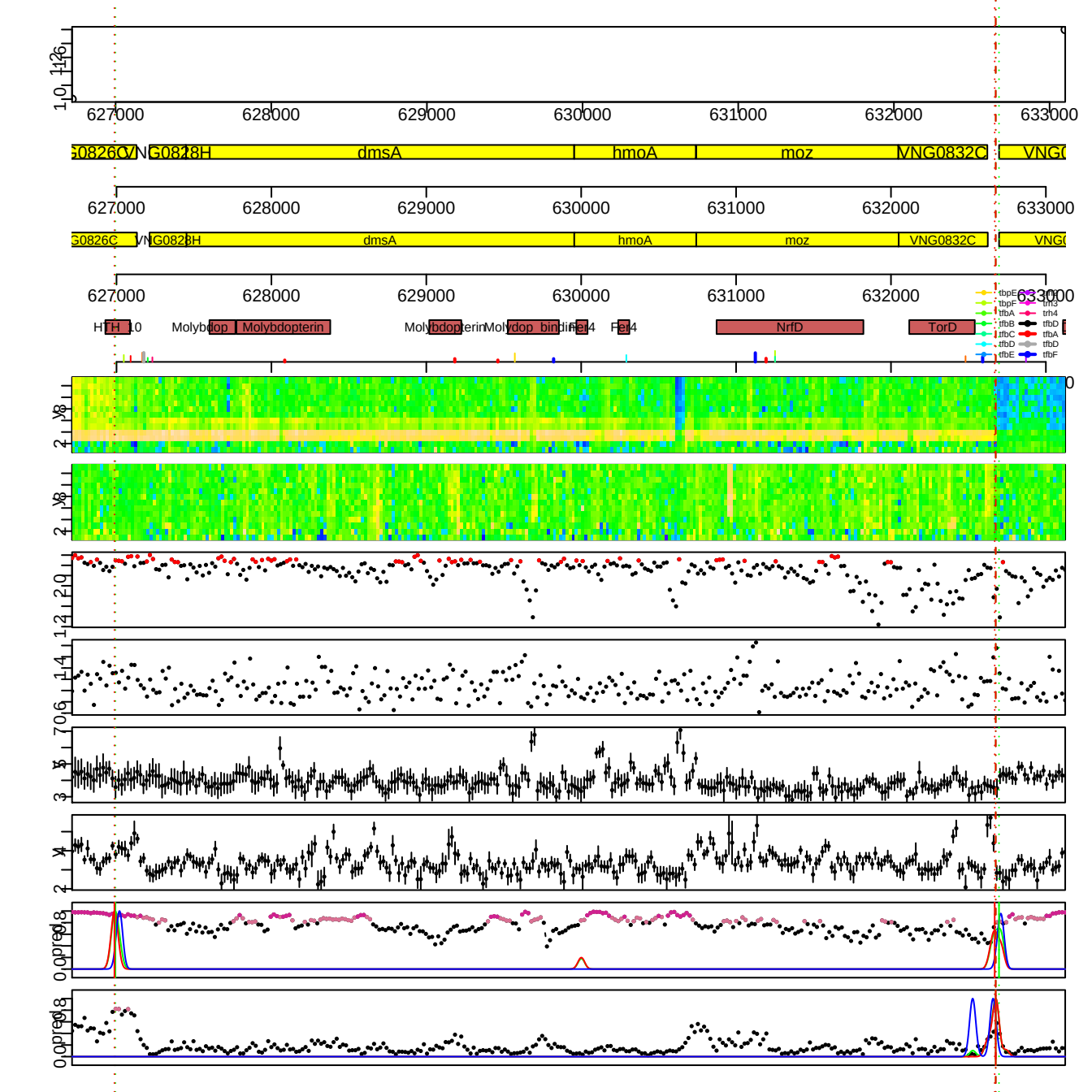
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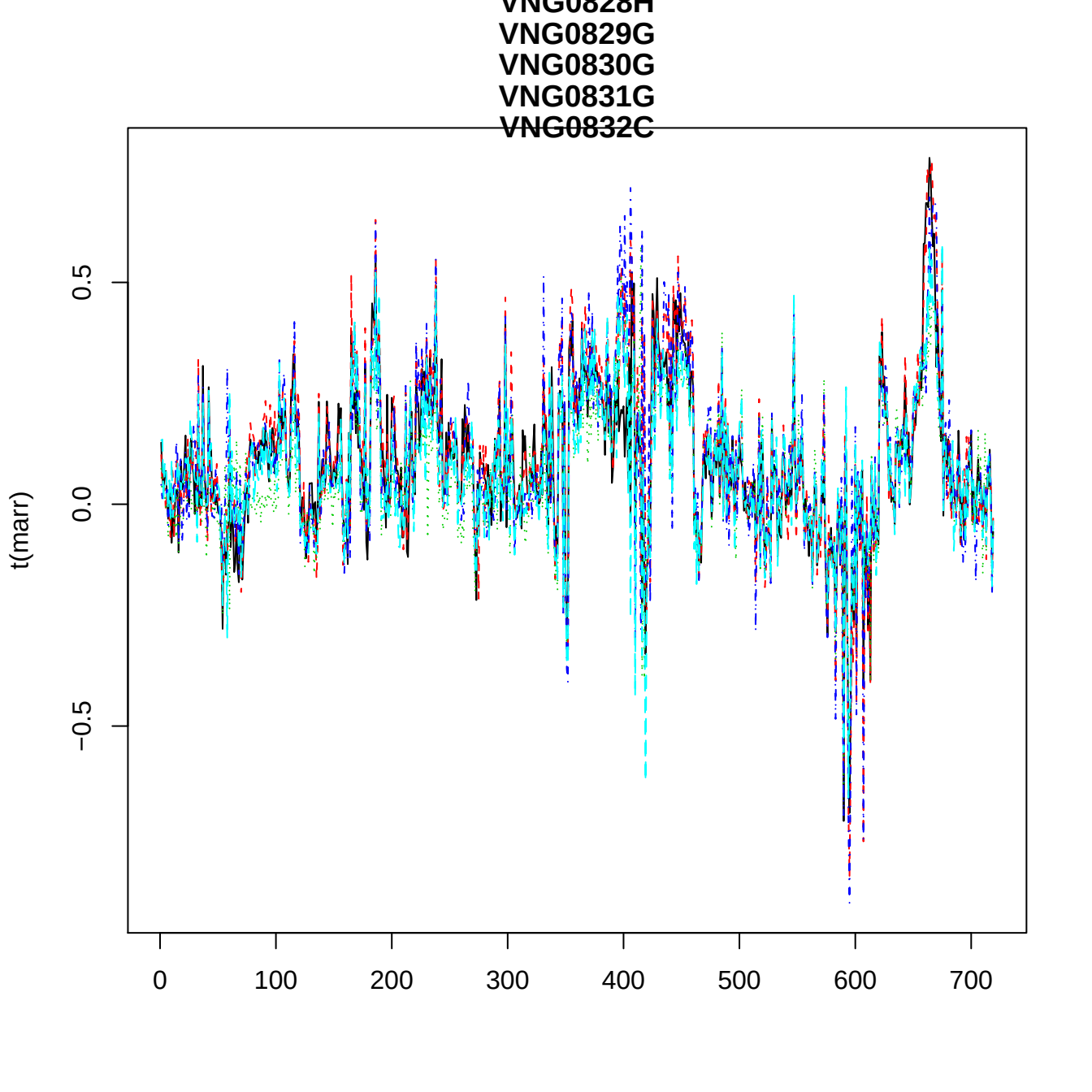
629000
630000
631000
632000
633000
dmsA
hmoA
moz
VNG0832C
HTH_10
Molybdop
Molybdopterin
NrfD
TorD
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG0828H
VNG0829G
VNG0830G
VNG0831G
VNG0832C
t(marr)
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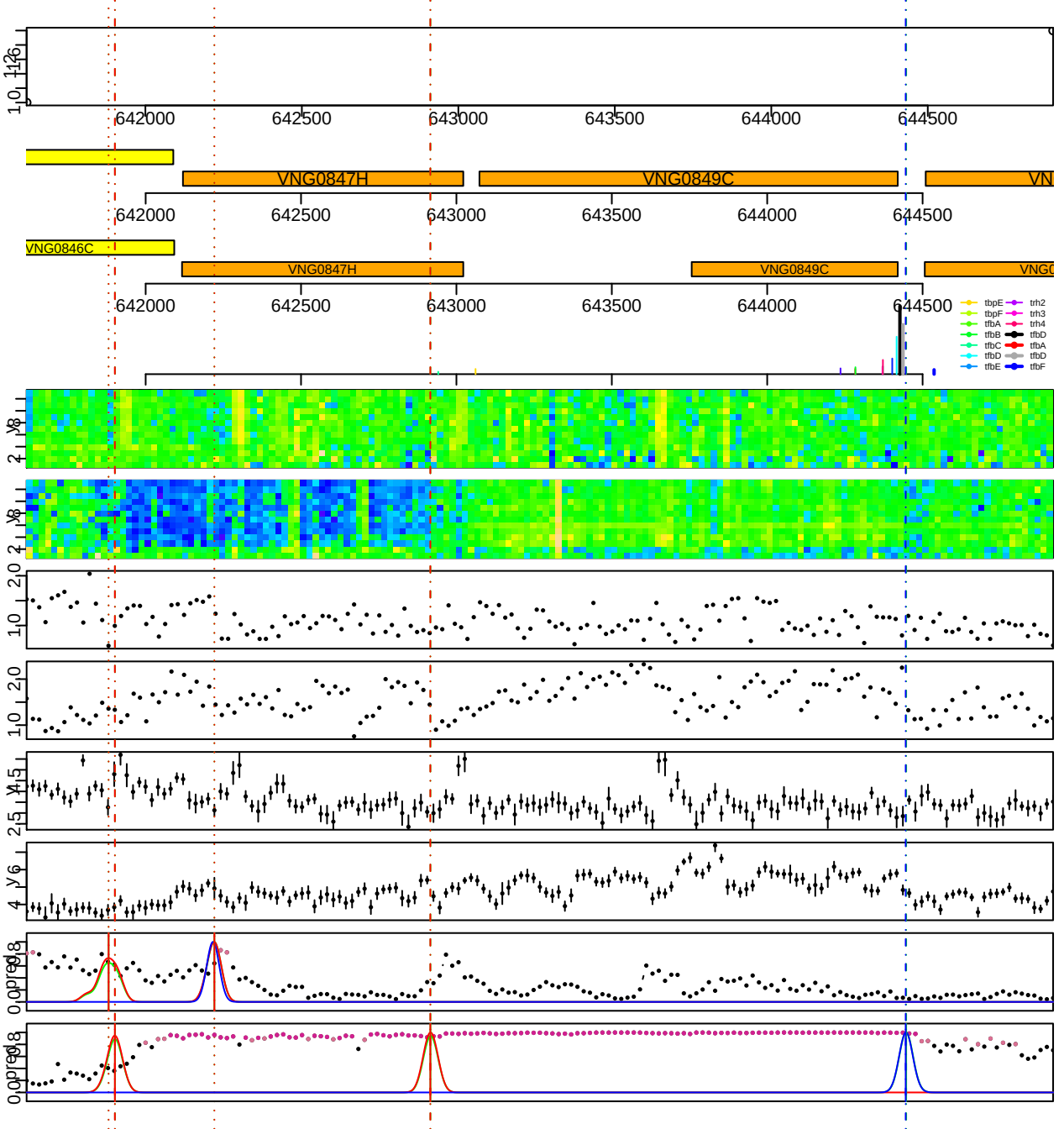
400
500
600
700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643500
644000
644500
VNG0847H
VNG0849C
VNG0846C
tbpE
tbpF
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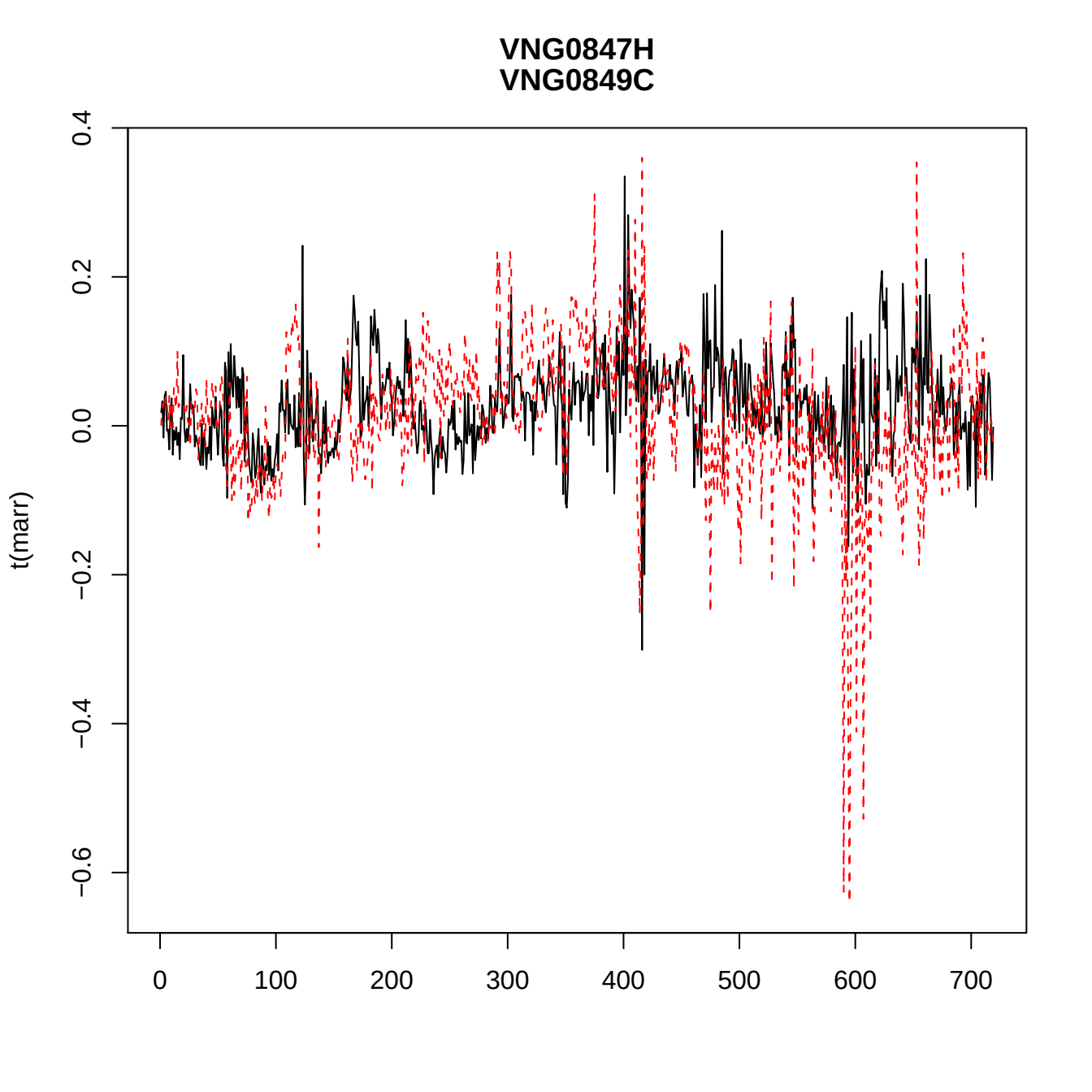
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0847H
VNG0849C
t(marr)
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−0.6
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400
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600
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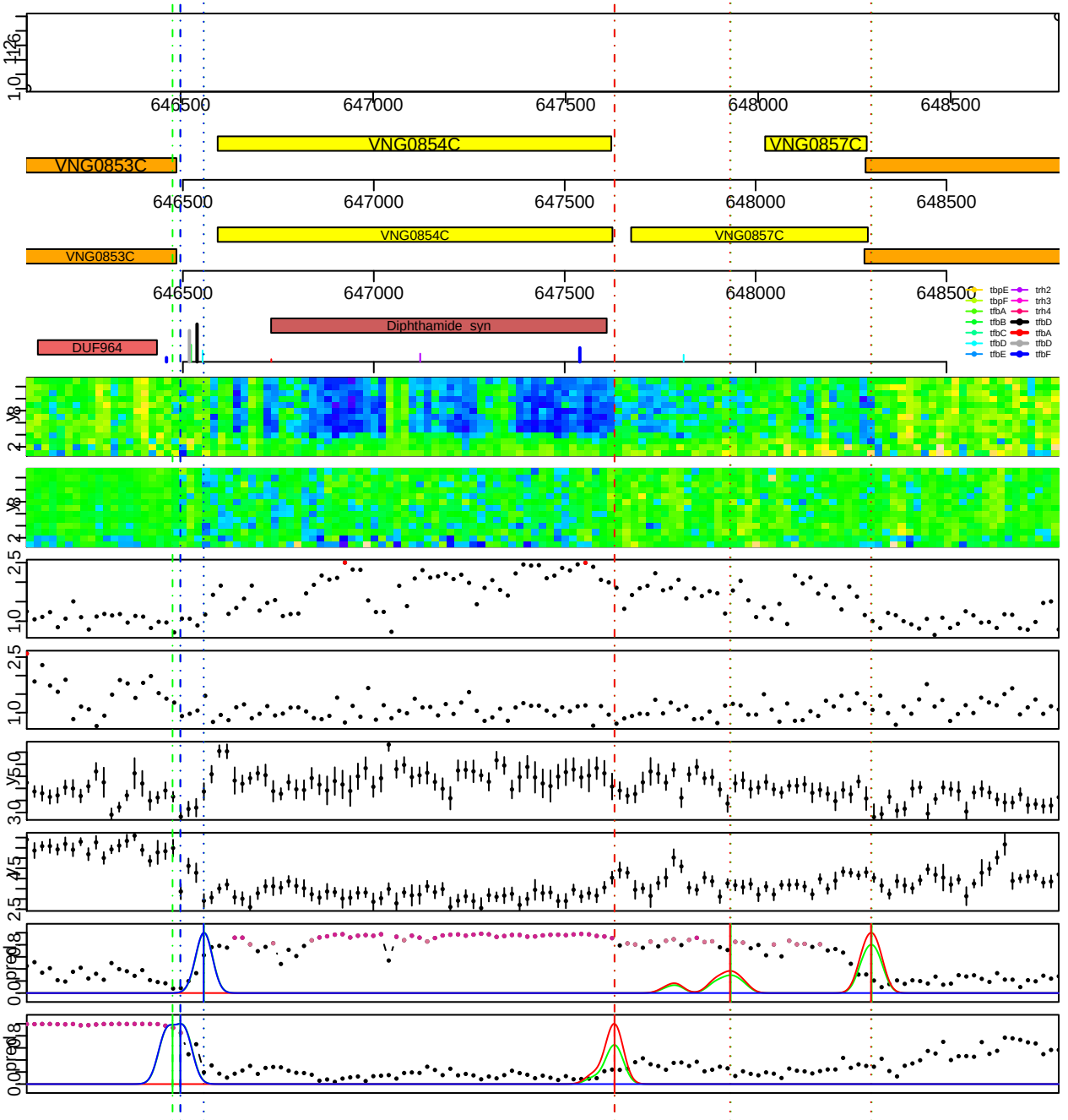
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648000
648500
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VNG0857C
VNG0853C
VNG0854C
VNG0857C
VNG0853C
Diphthamide_syn
DUF964
tbpE
tbpF
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tfbD
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trh3
trh4
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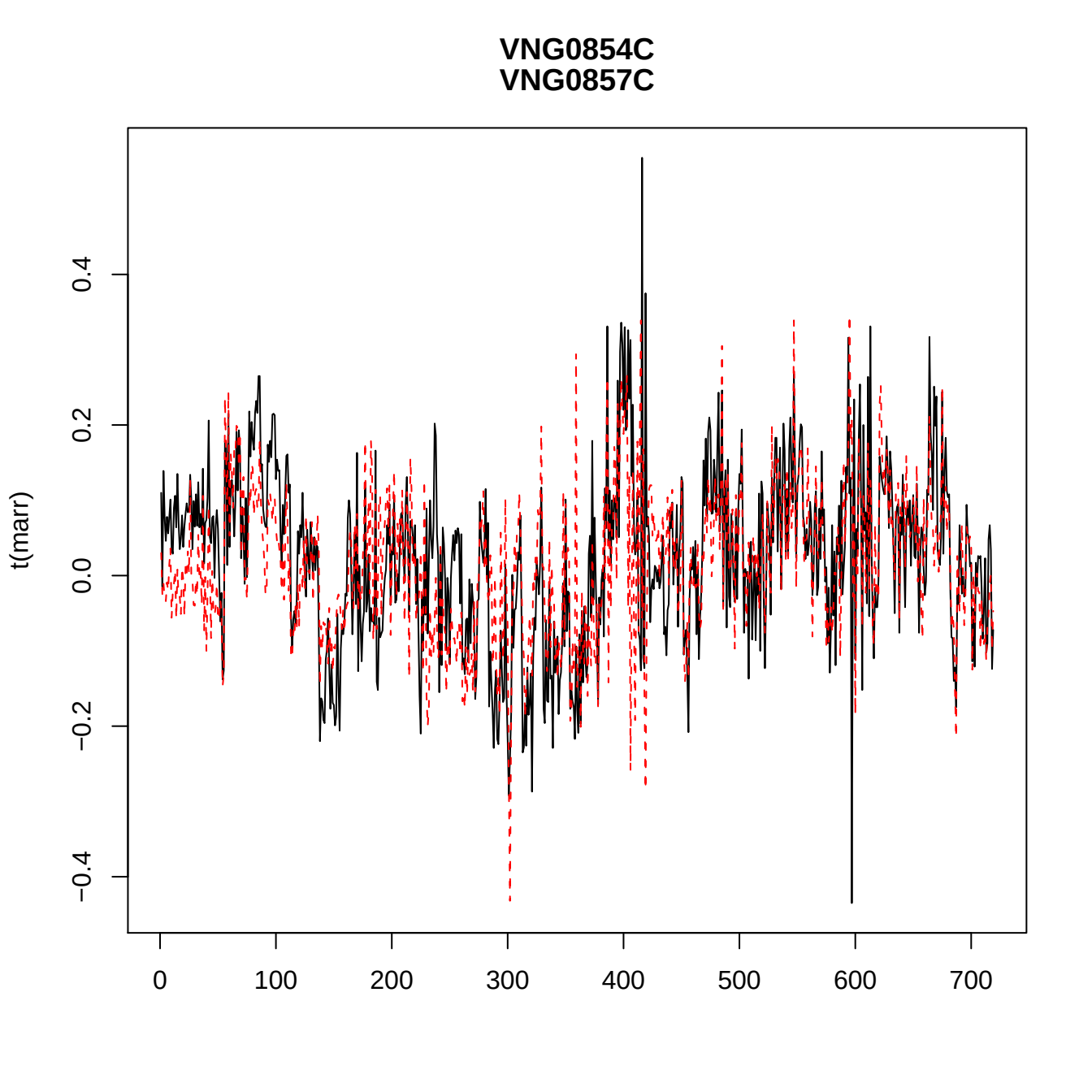
tfbD
tfbF


VNG0854C
VNG0857C
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400
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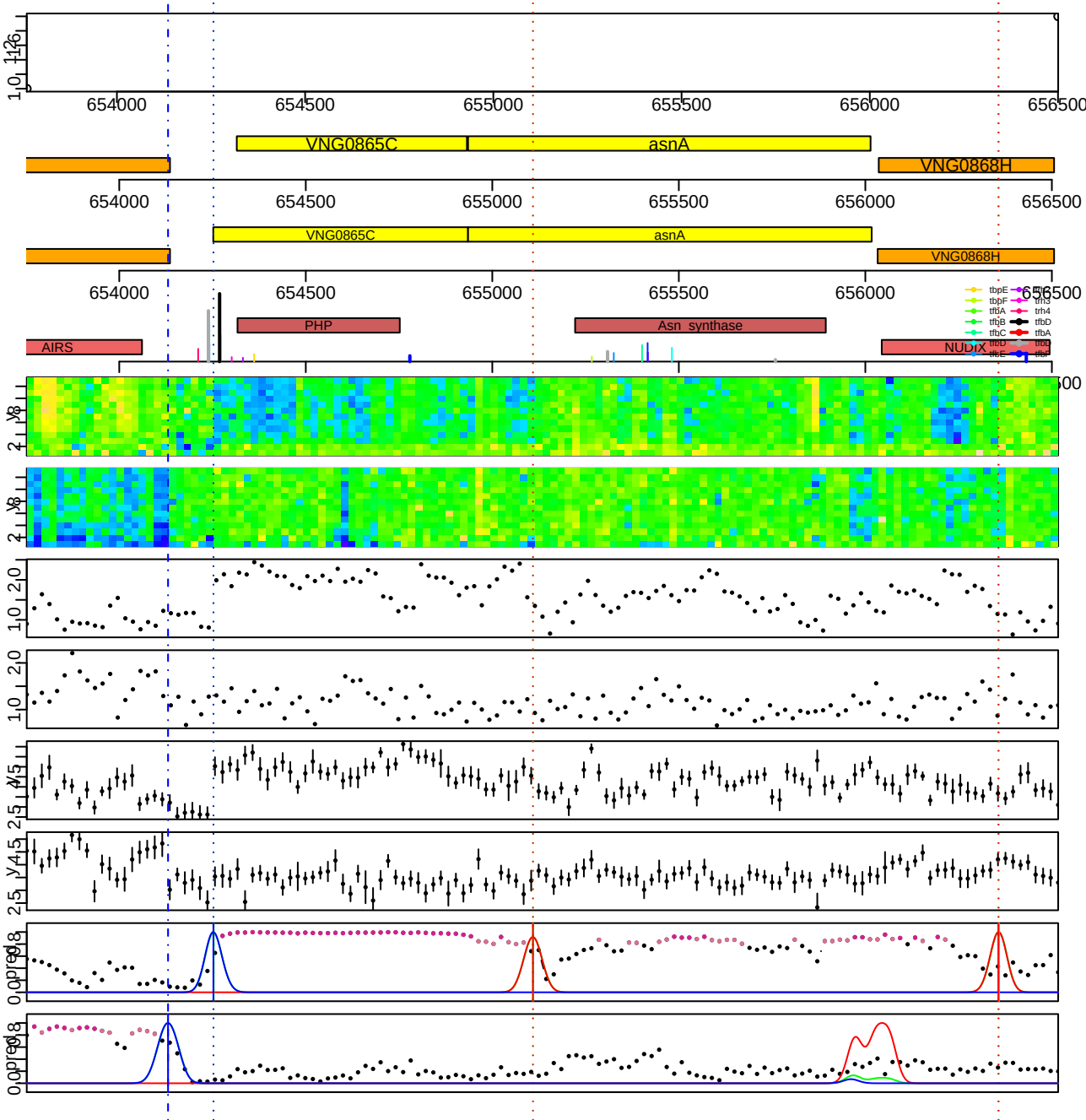
600
700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655500
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VNG0868H
PHP
Asn_synthase
AIRS
NUDIX
tbpE
tbpF
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tfbC
tfbD
tfbE
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trh4
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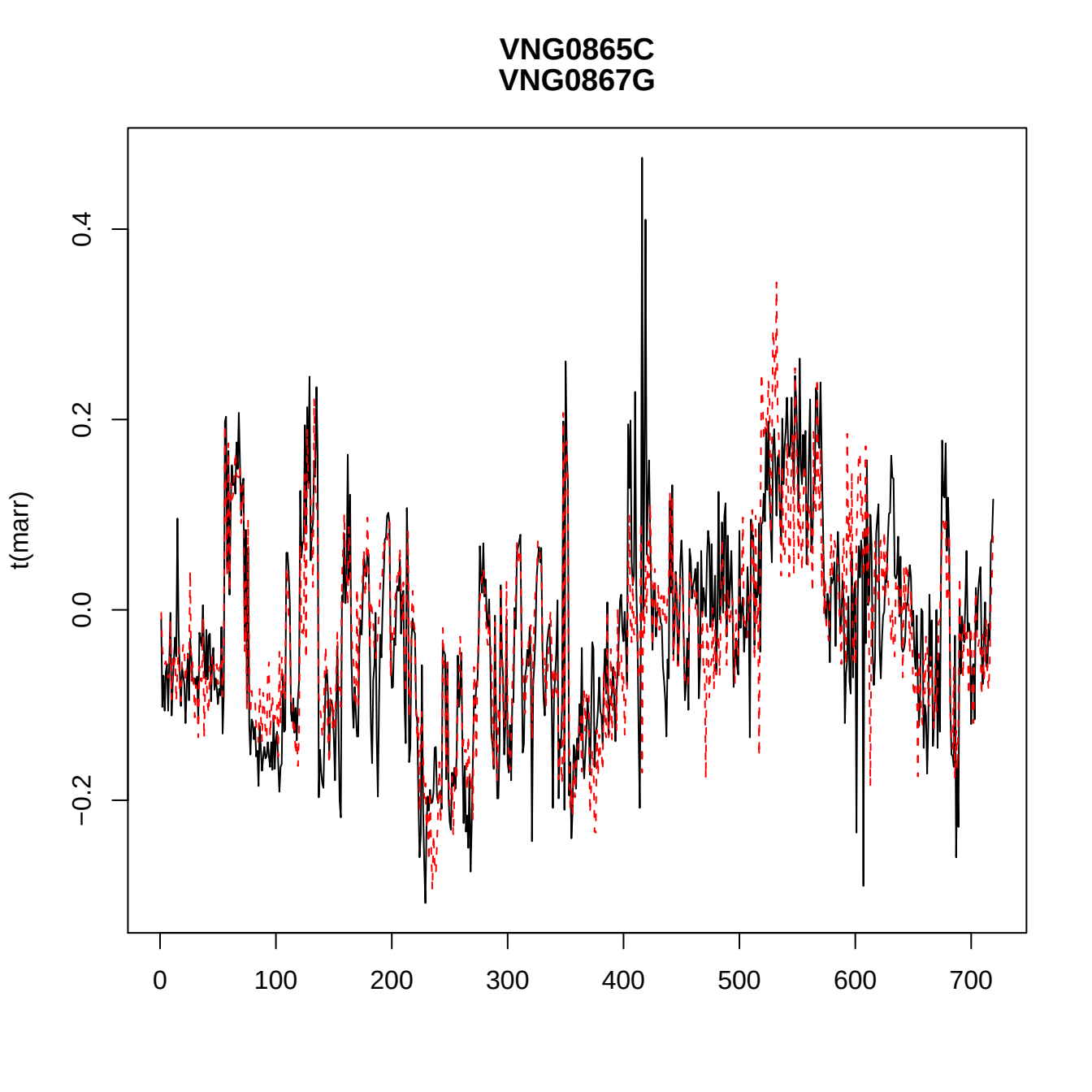
tfbA
tfbD
tfbF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VNG0867G
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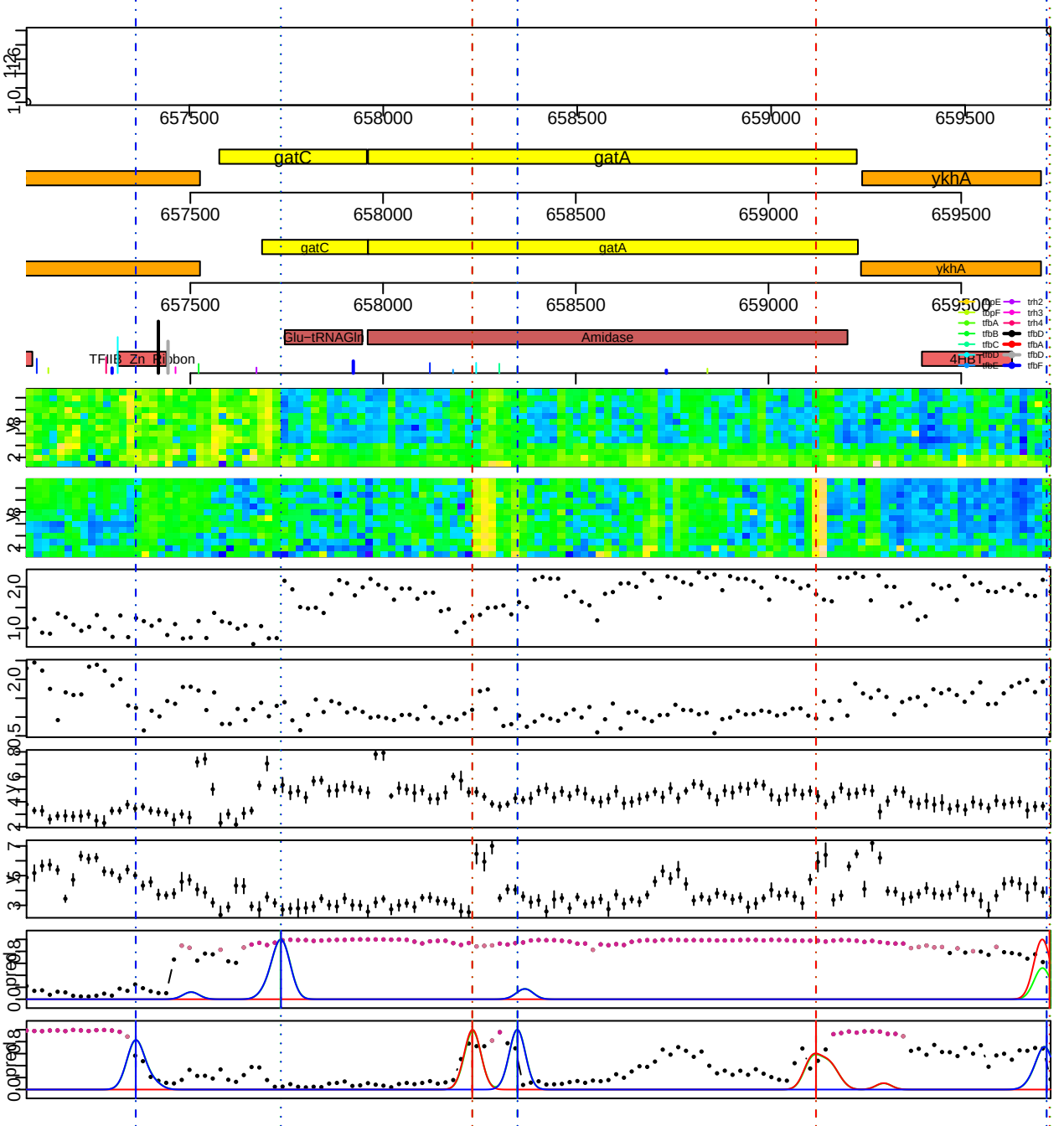
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659500
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gatA
ykhA
Glu−tRNAGln
Amidase
TFIIB_Zn_Ribbon
4HBT
tbpE
tbpF
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tfbB
tfbC
tfbD
trh2
trh3
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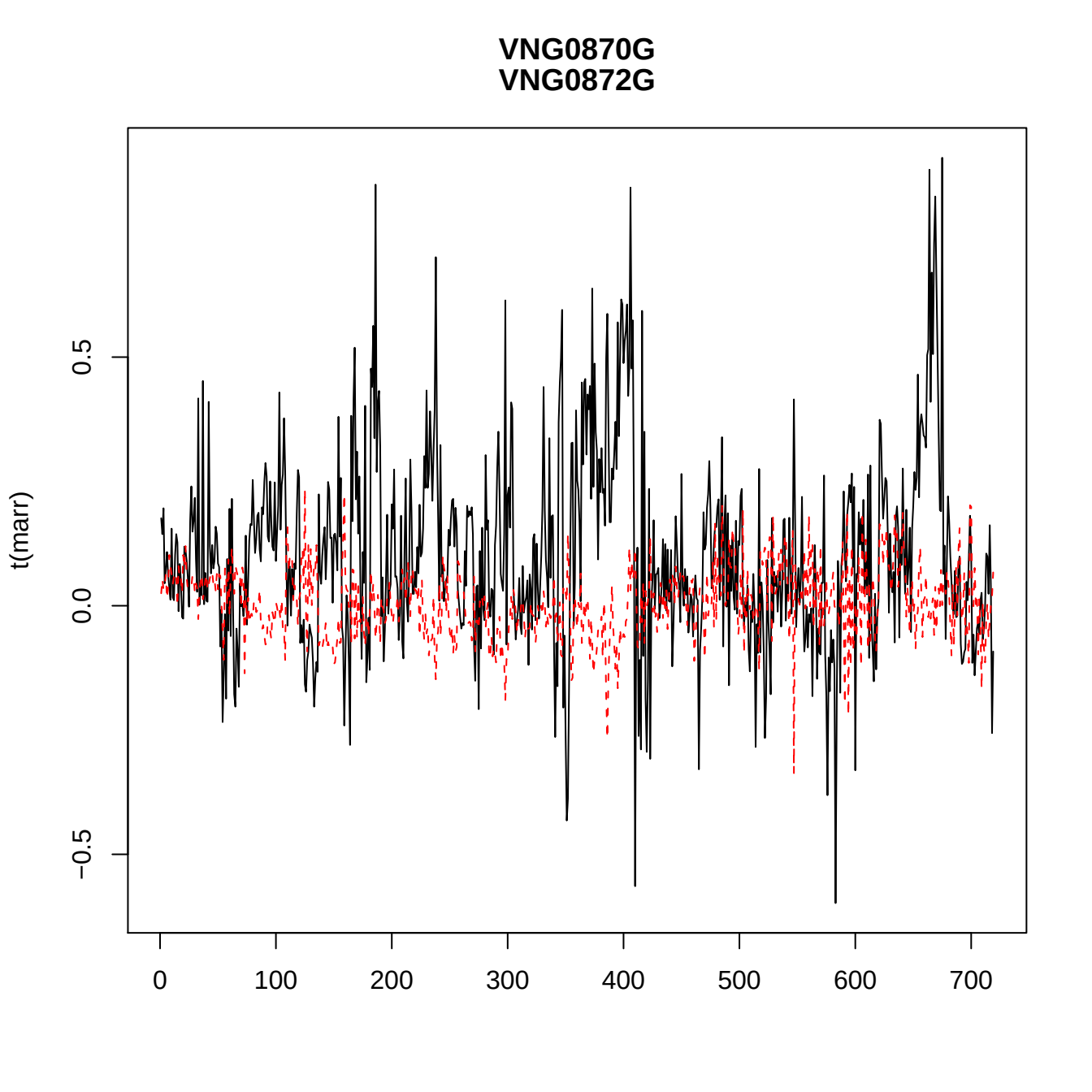
tfbD
tfbA
tfbD
tfbF
pred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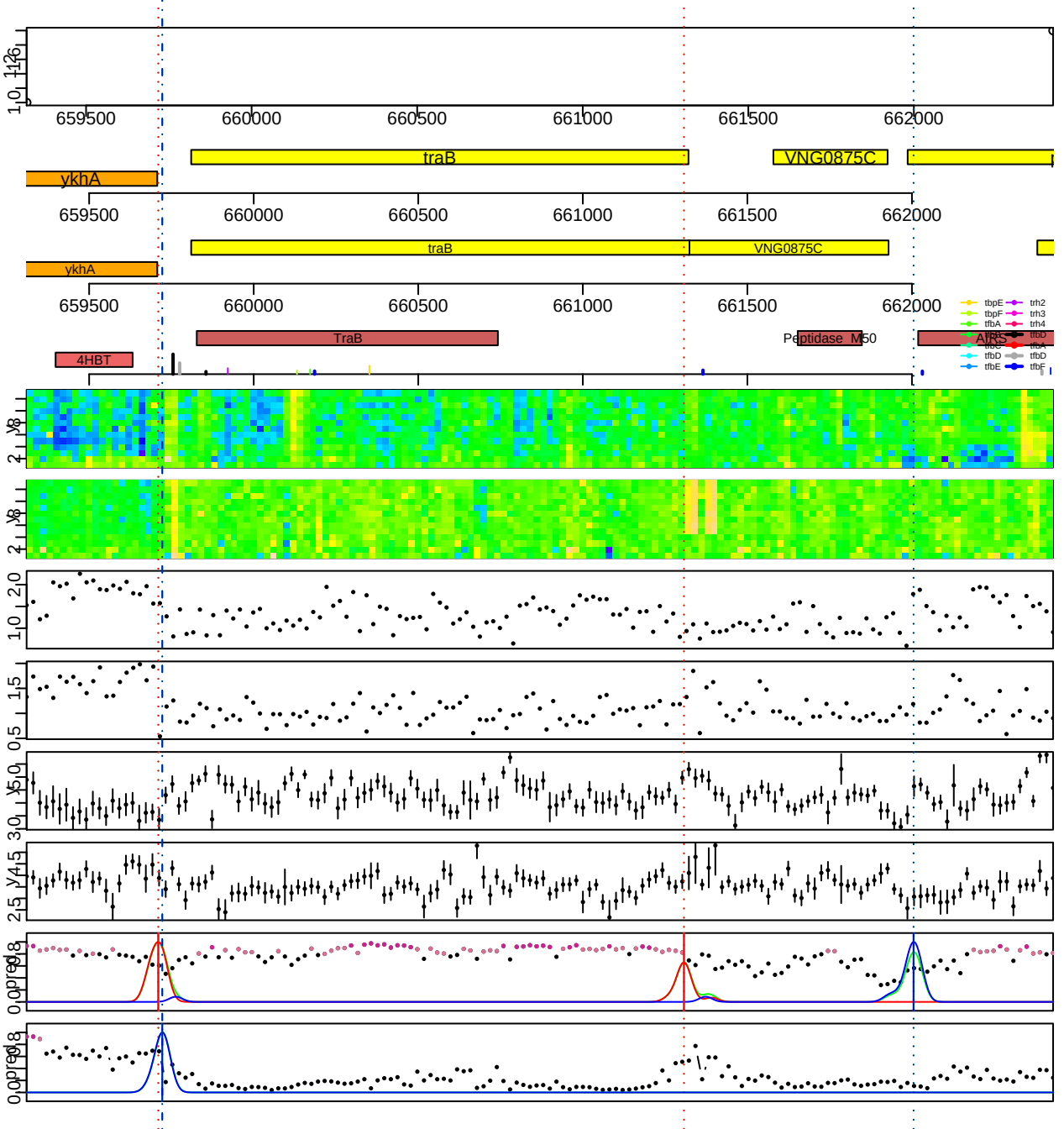
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ykhA
TraB
Peptidase_M50
ARS
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tbpE
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tfbE
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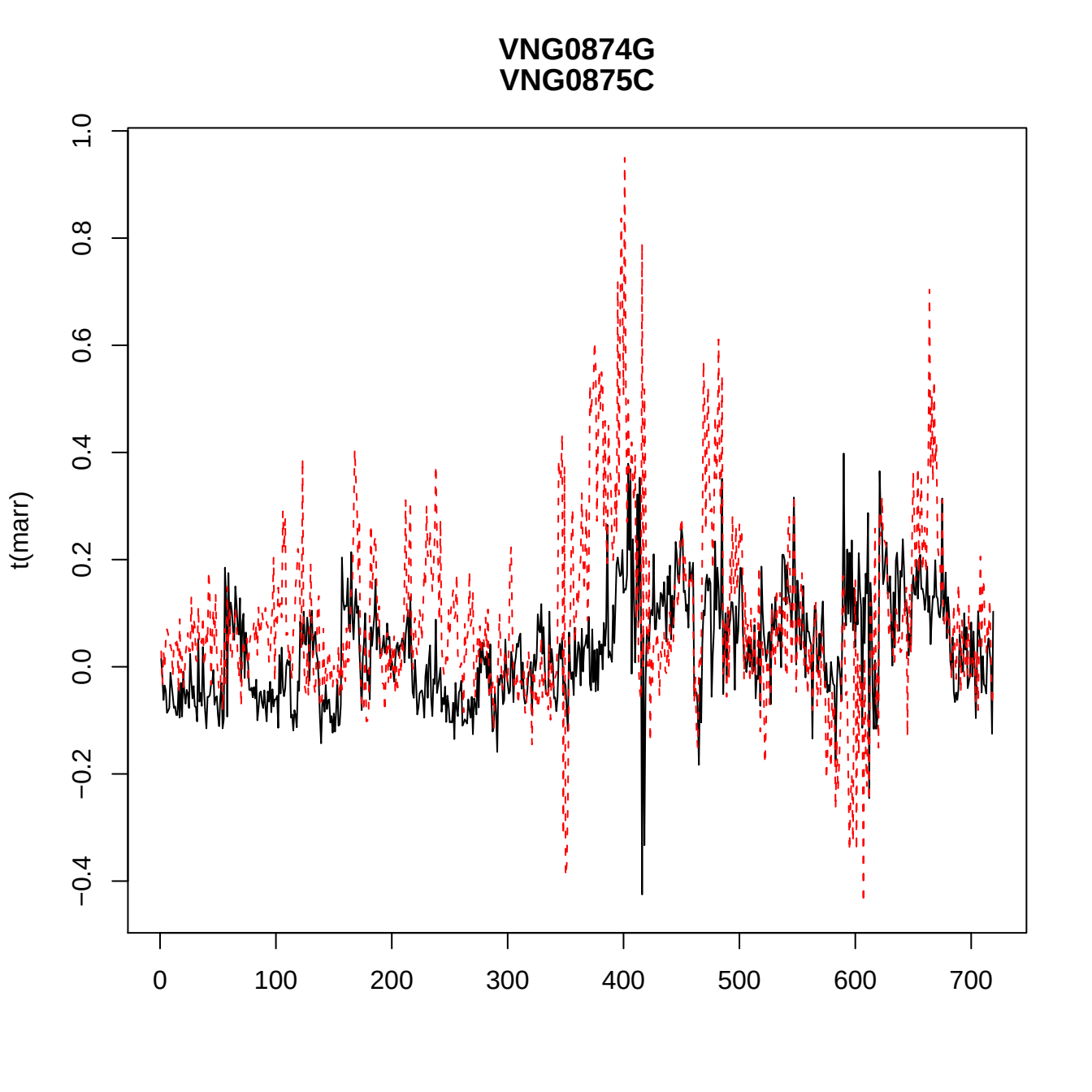
trh4
tfbD
tfbA
tfbD
tfbF
pred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VNG0875C
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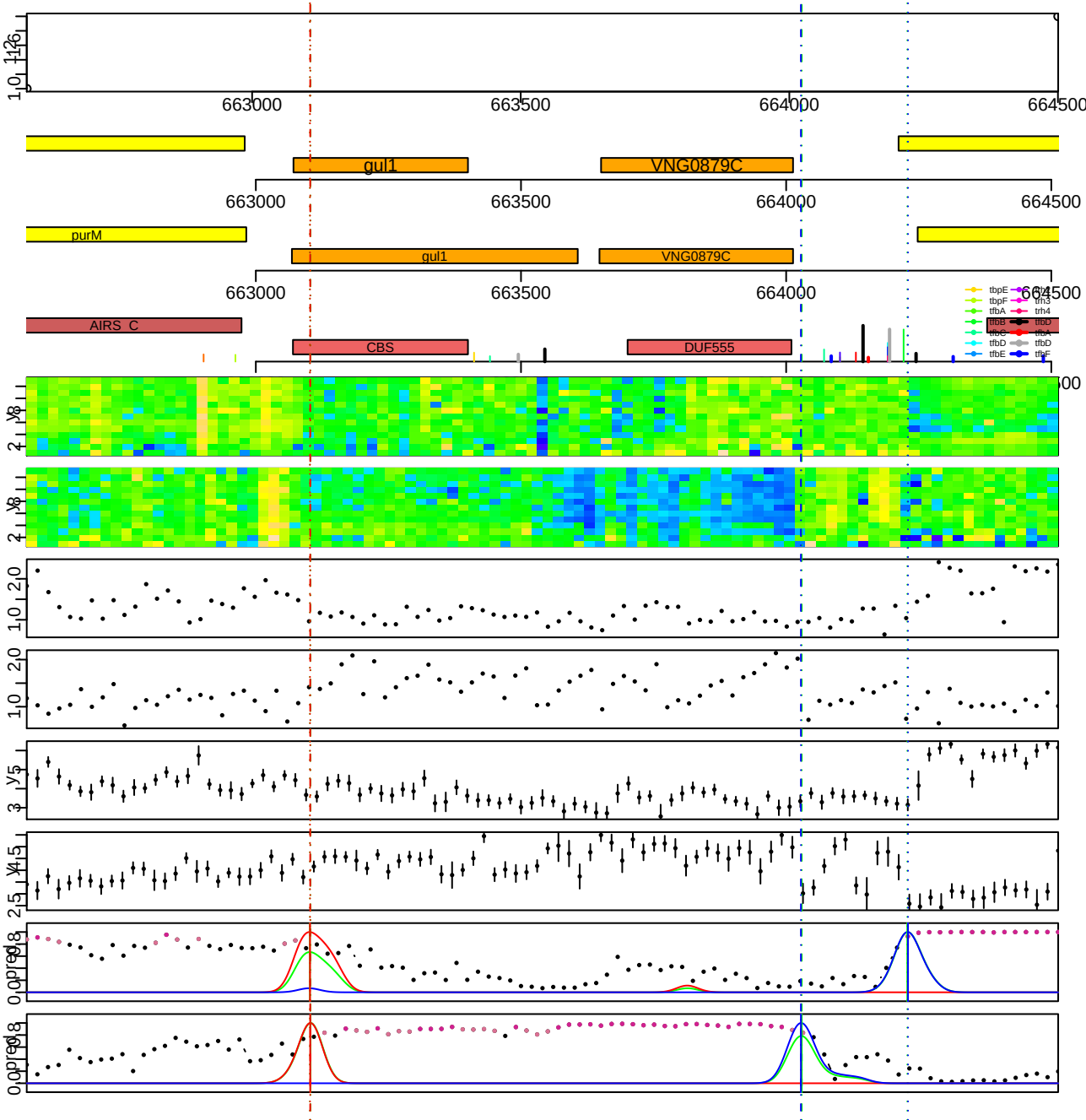
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663500
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664500
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purM
AIRS_C
CBS
DUF555
tbpE
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trh4
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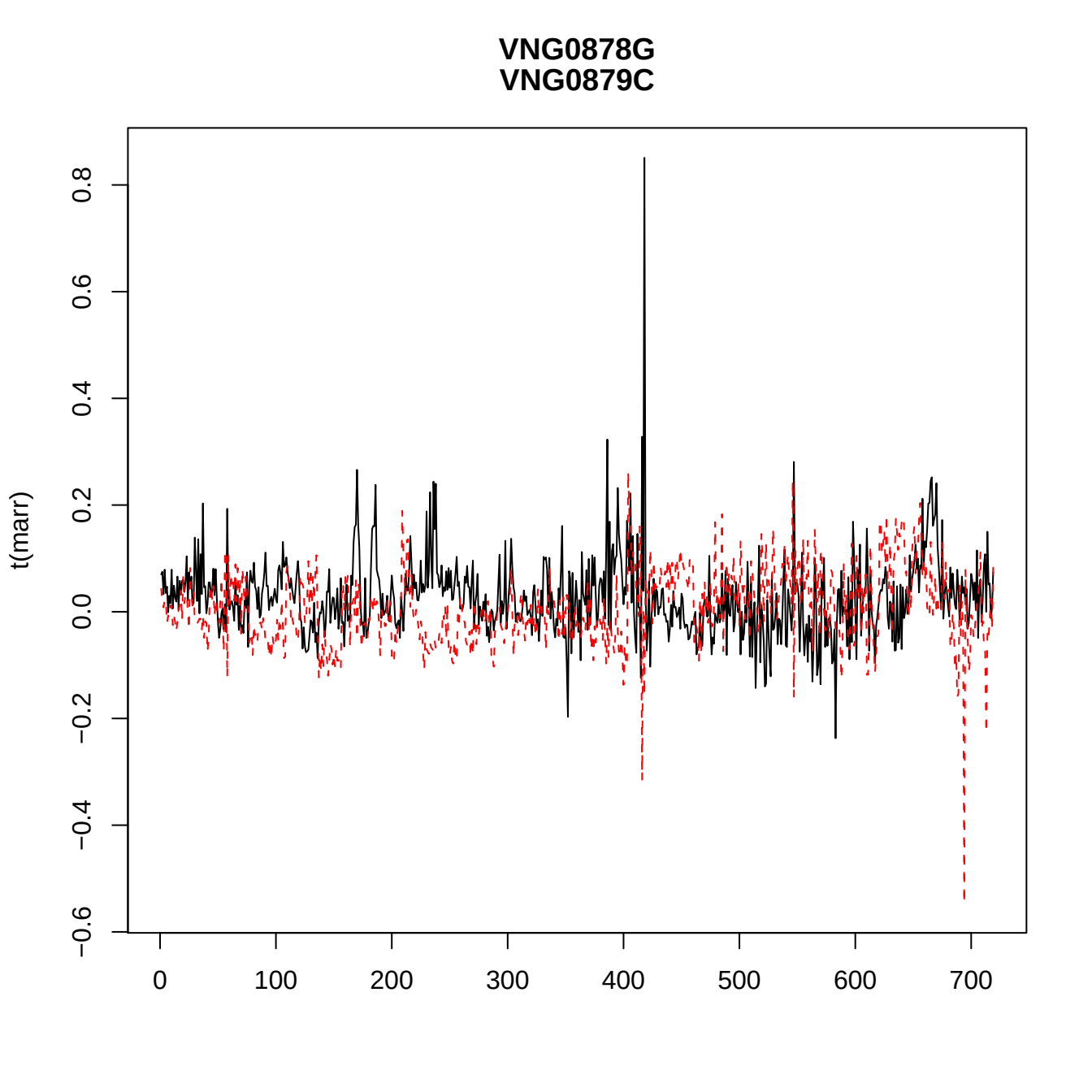
tfbD
tfbF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VNG0879C
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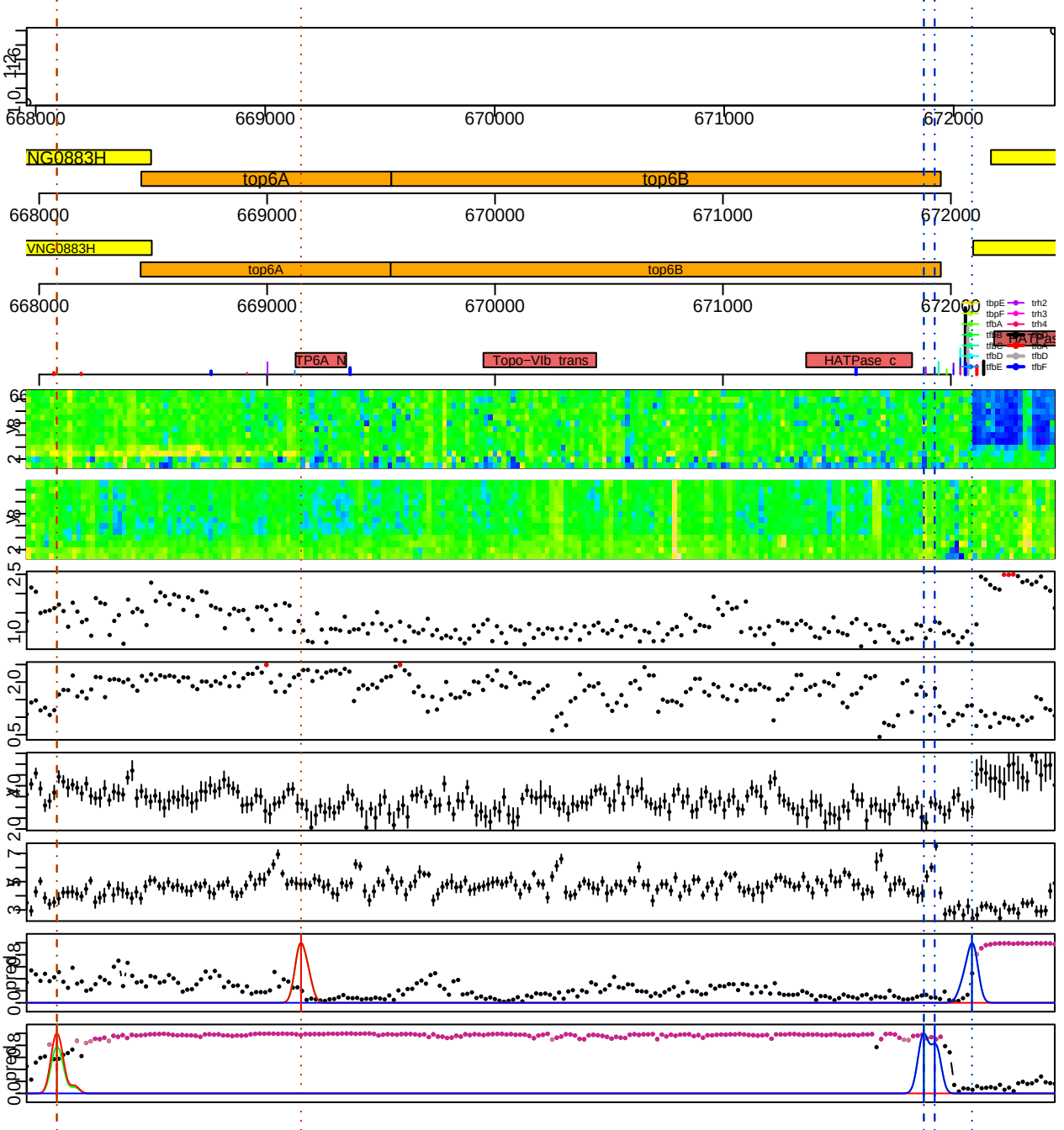
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top6B
VNG0883H
TP6A_N
Topo−VIb_trans
HATPase_c
tbpE
tbpF
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tfbB
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tfbD
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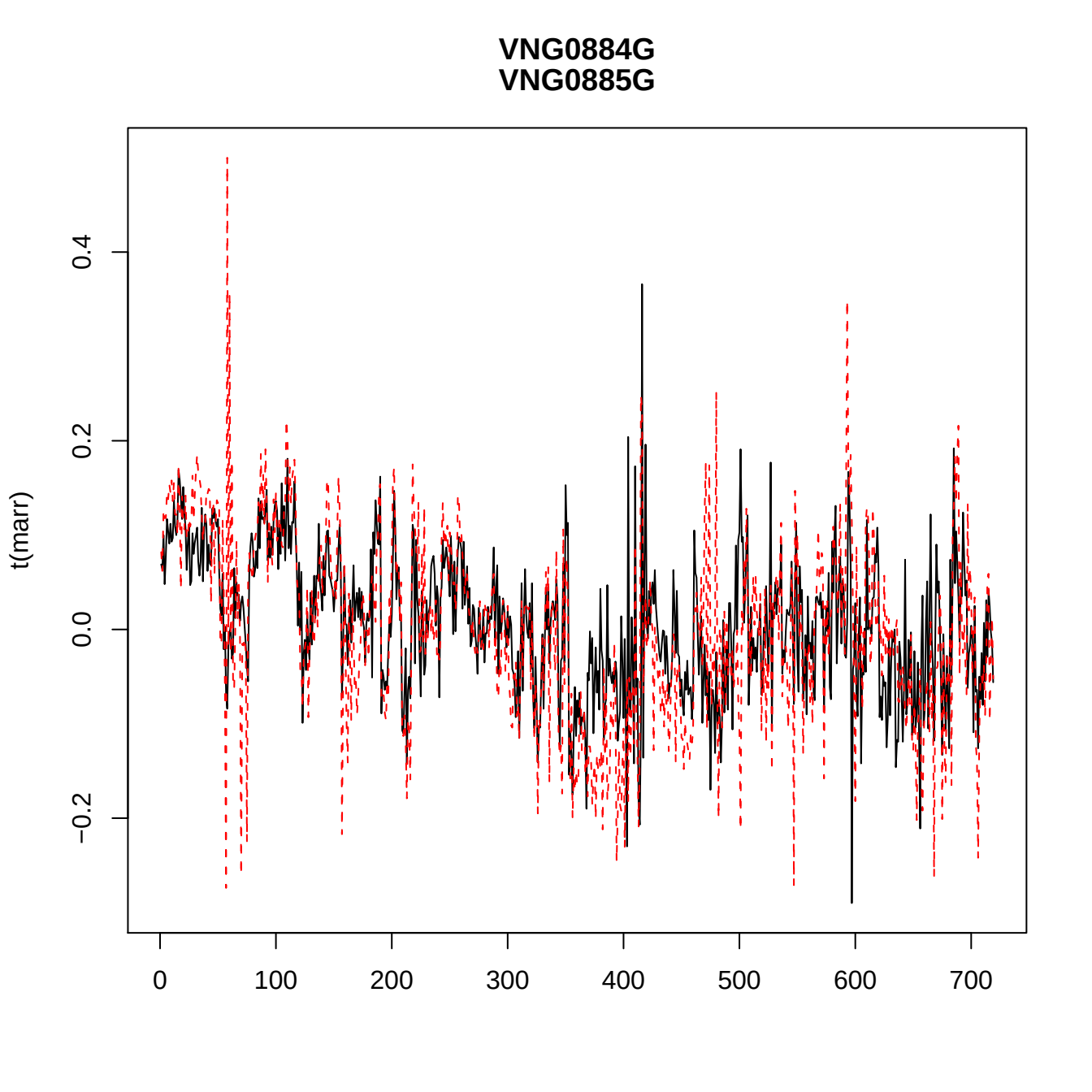
trh3
trh4
tfbA
tfbD
tfbF


VNG0884G
VNG0885G
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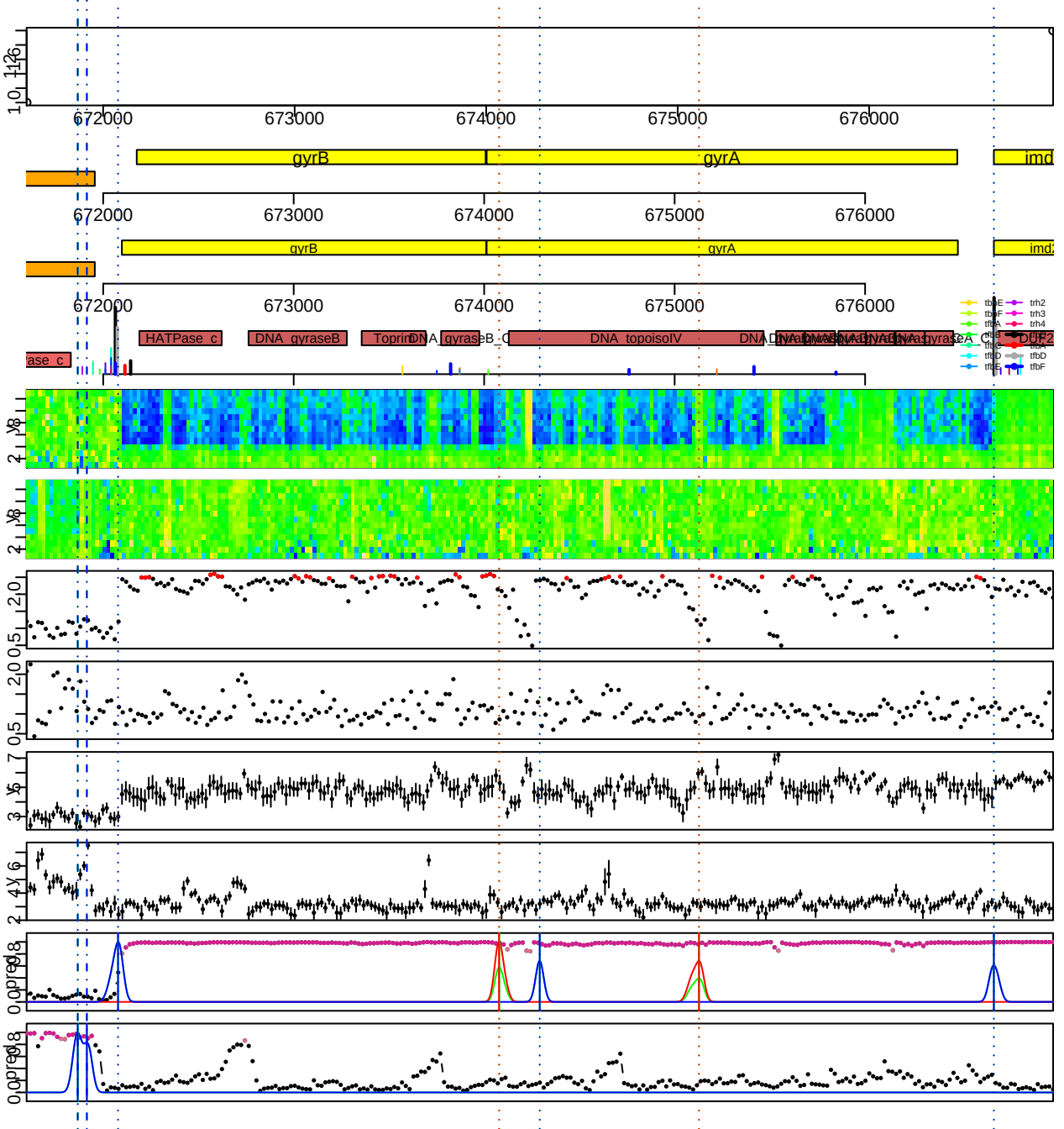
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gyrA
imd
HATPase_c
DNA_gyraseB
DNA_topoisoIV
tfbE
tfbF
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tfbC
tfbD
tfbE
trh2
trh3
trh4
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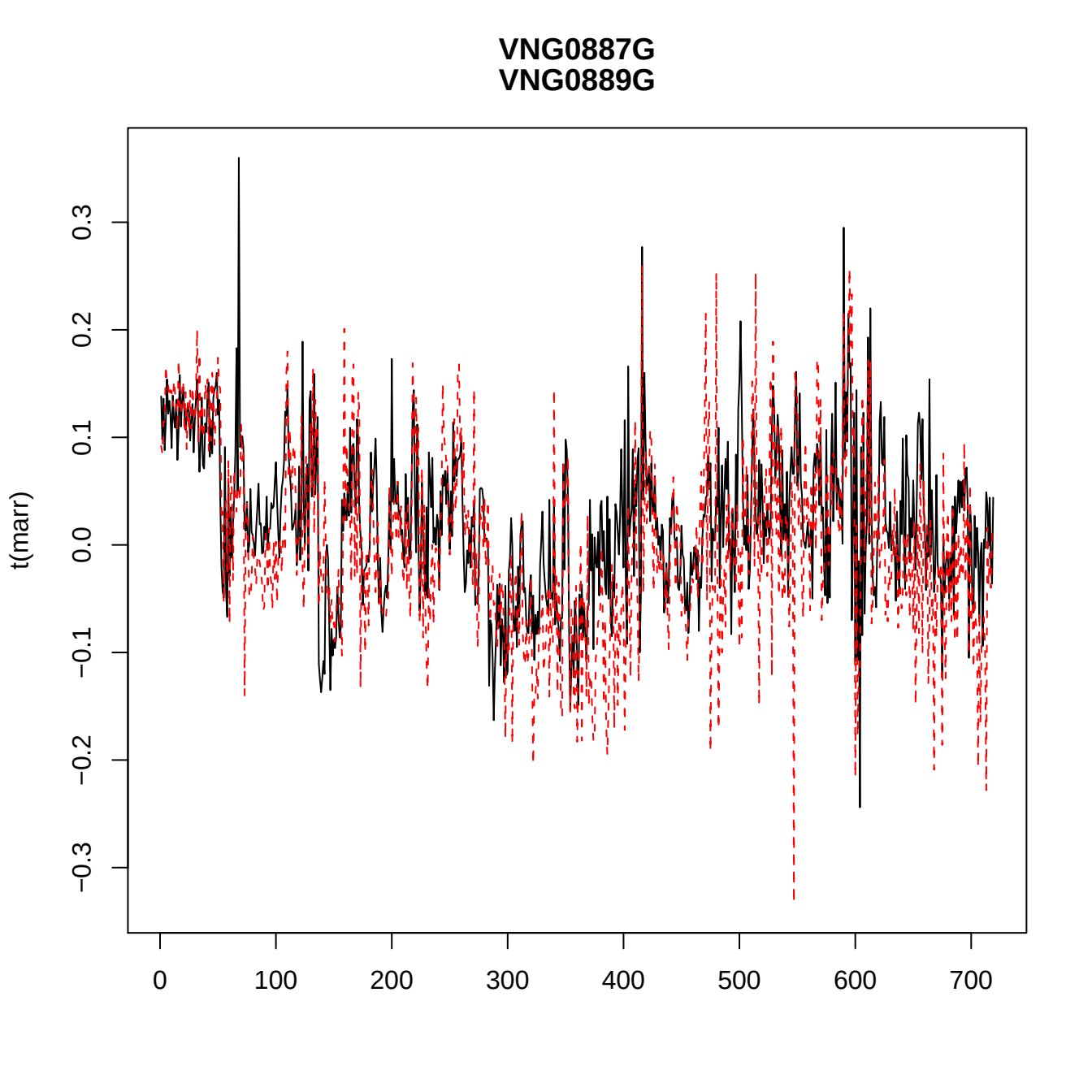
tfbF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VNG0889G
t(marr)
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−0.2
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0
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600
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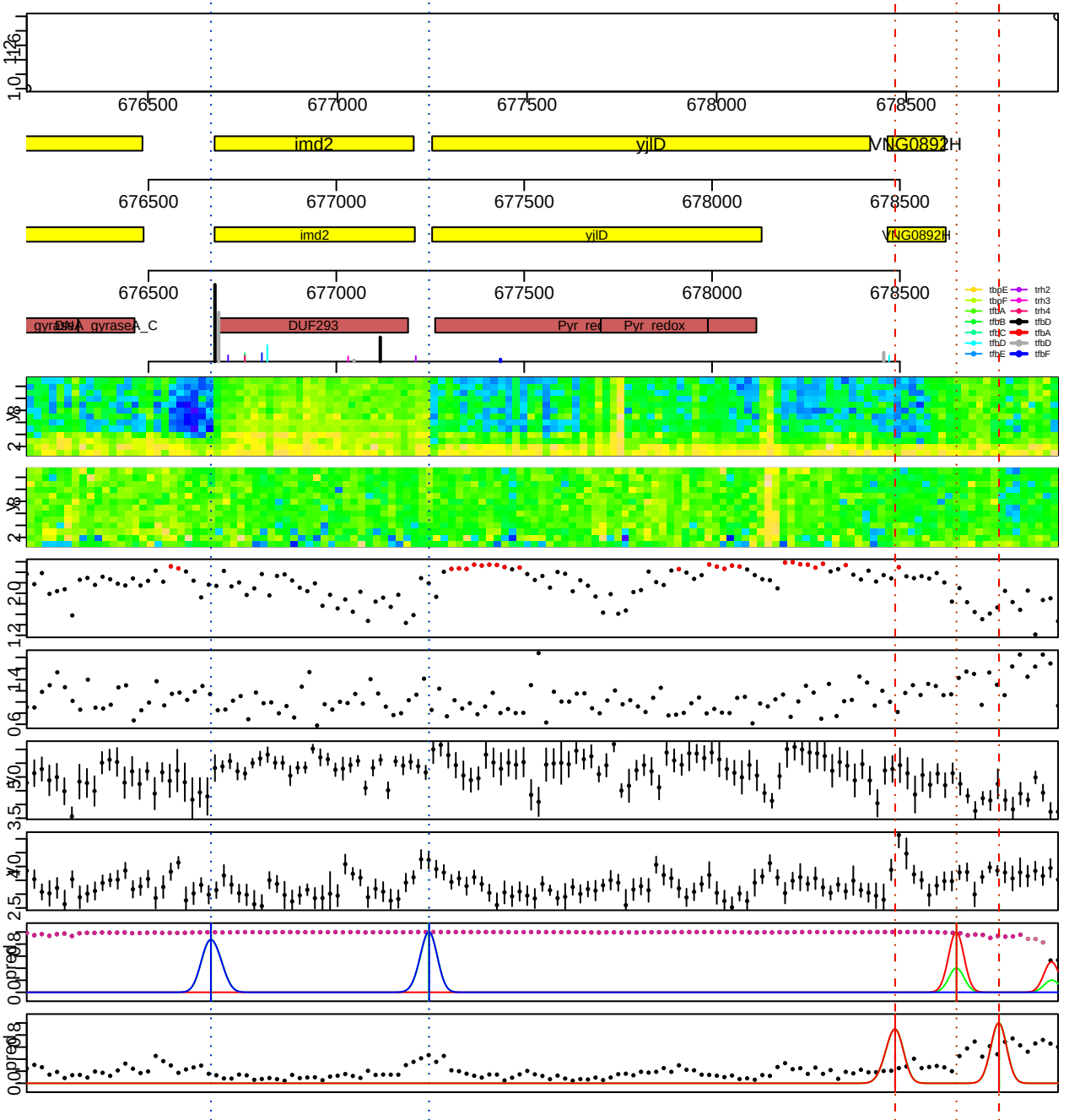
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gyrA
DUF293
Pyr_red
Pyr_redox
tbpE
tbpF
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trh4
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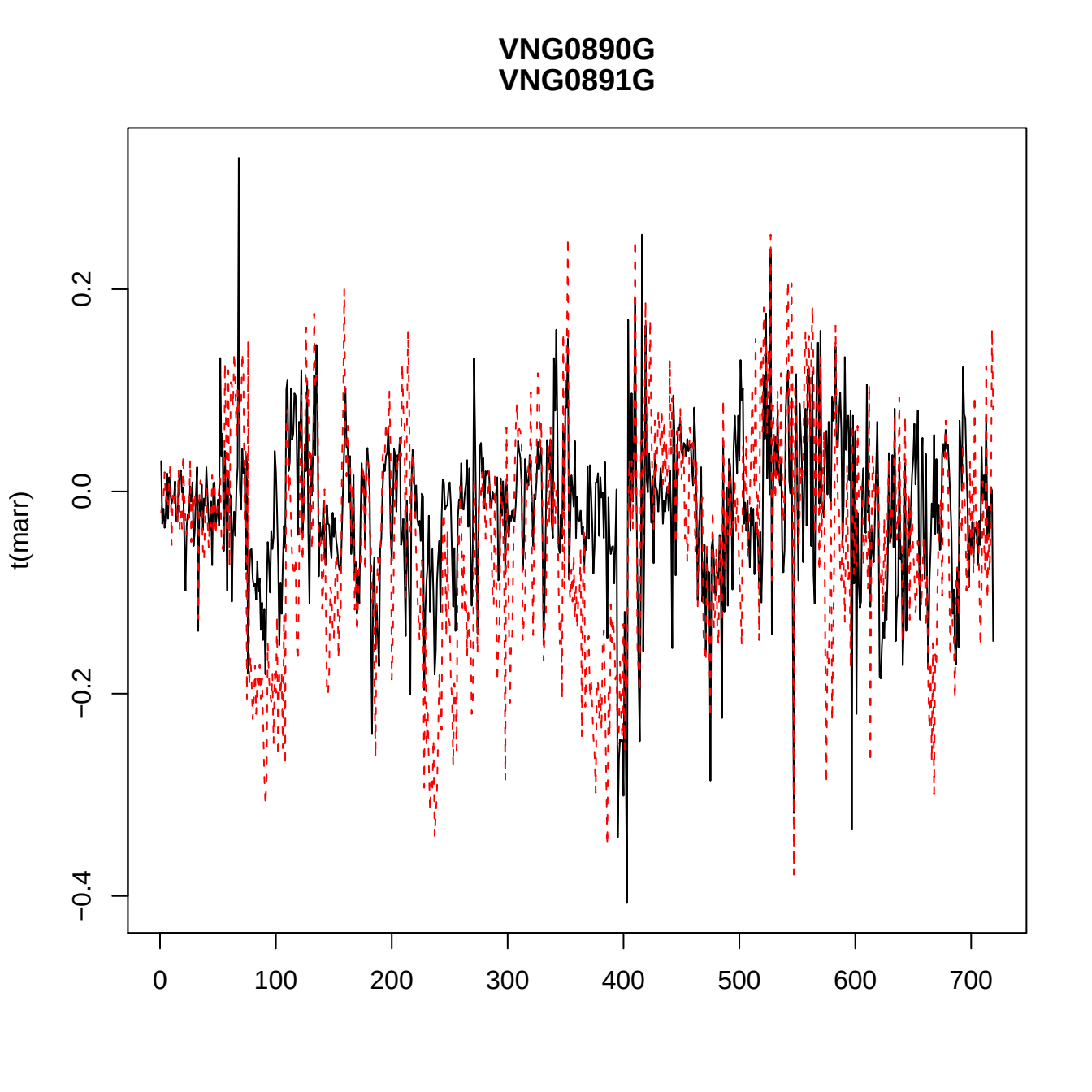
VNG0890G
VNG0891G
t(marr)
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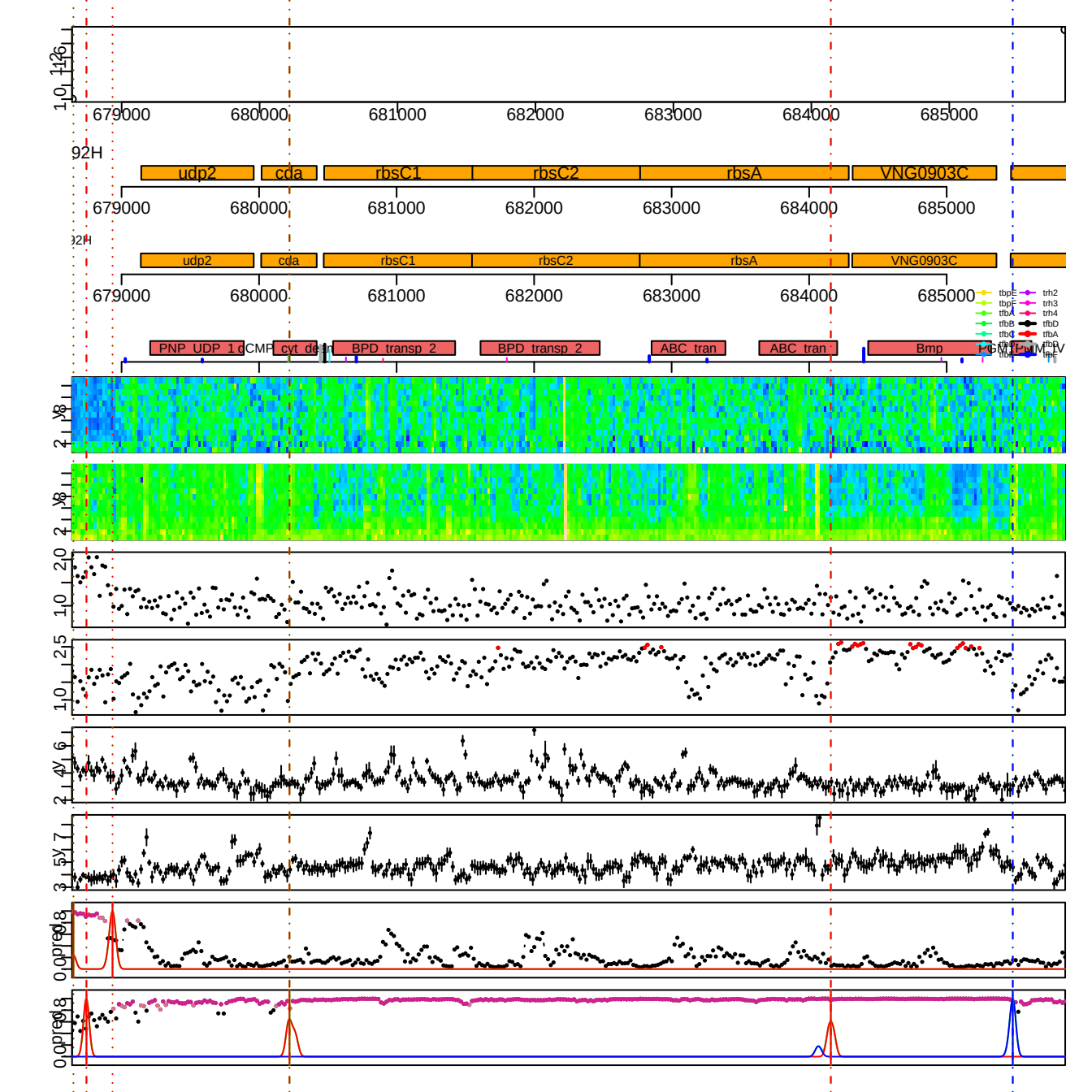

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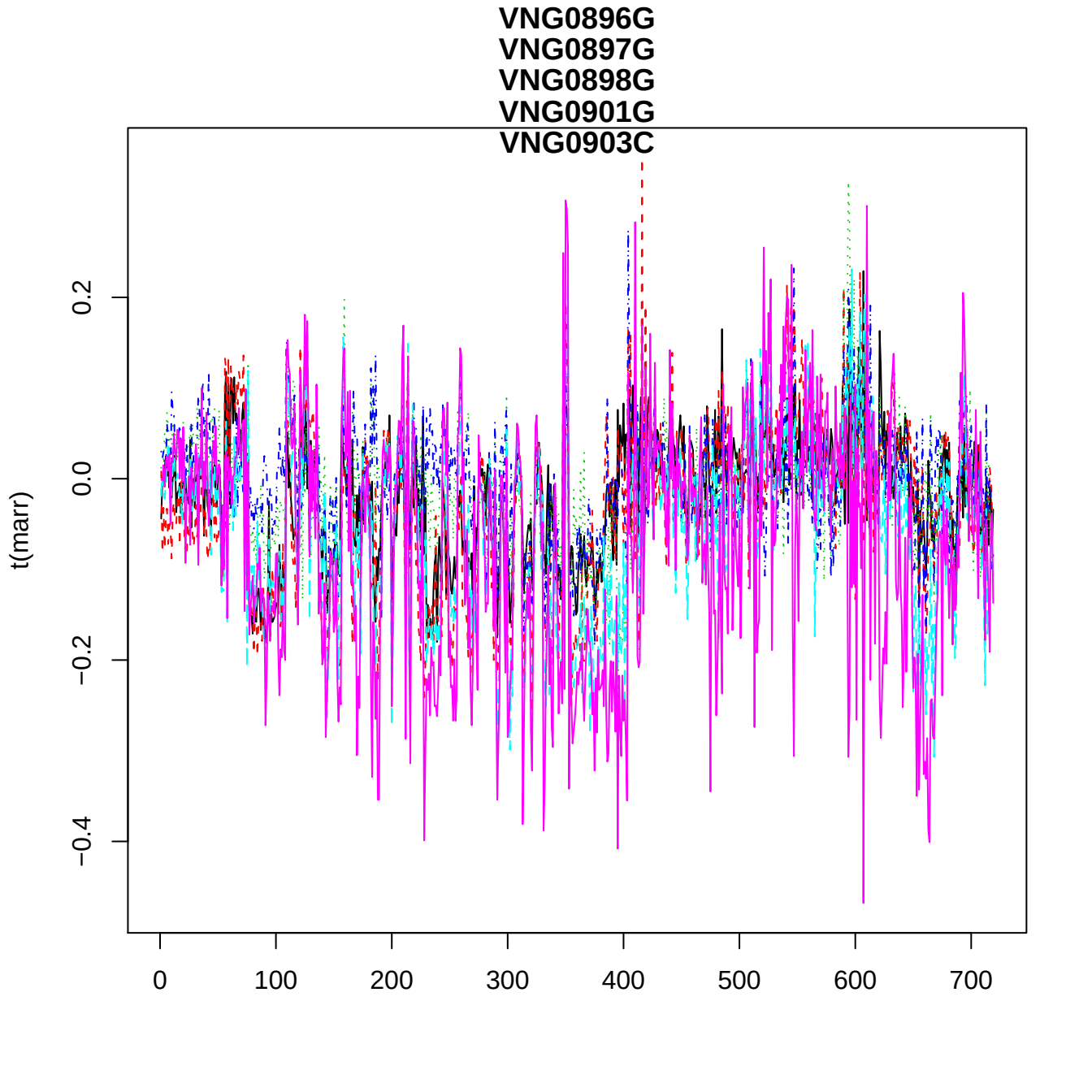
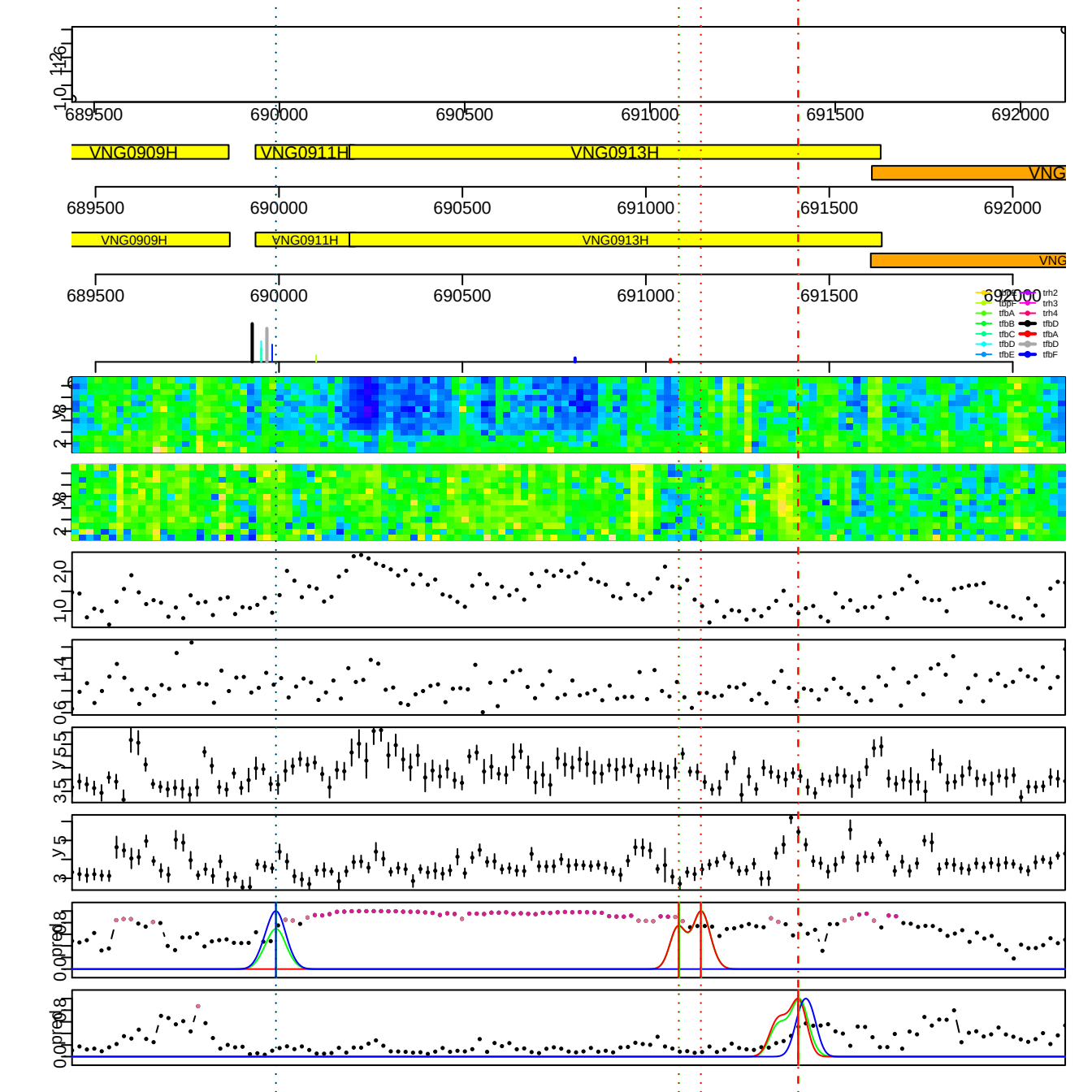
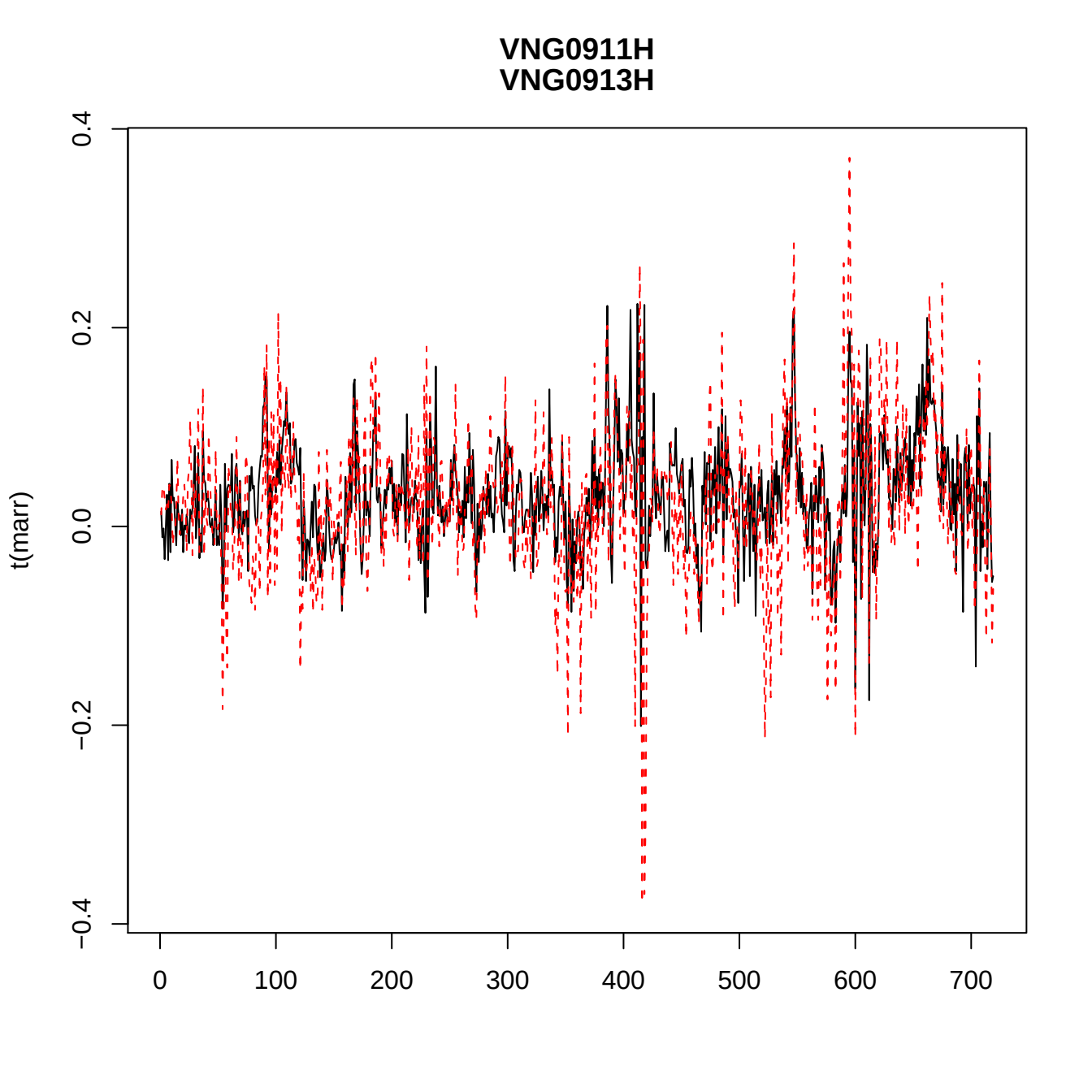
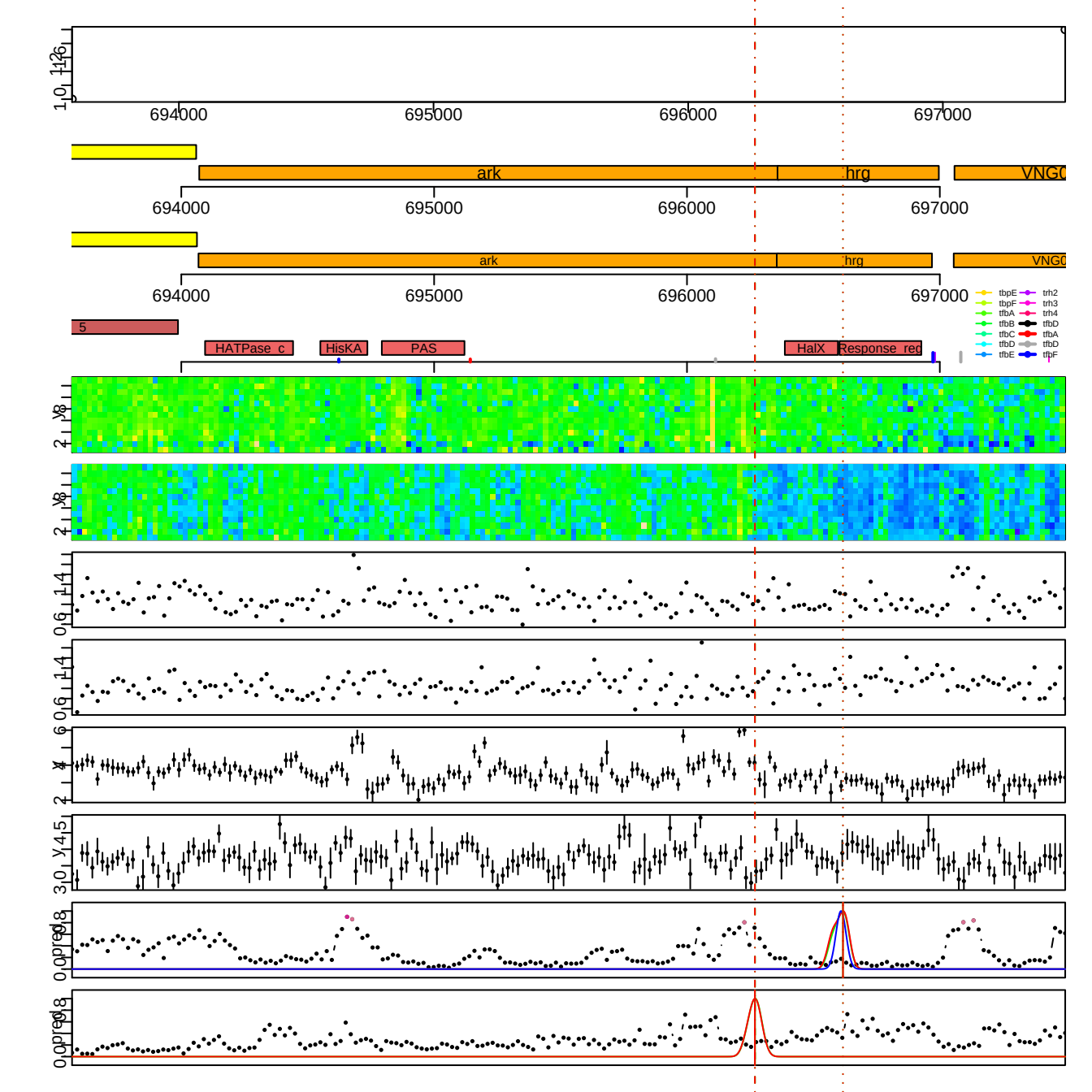
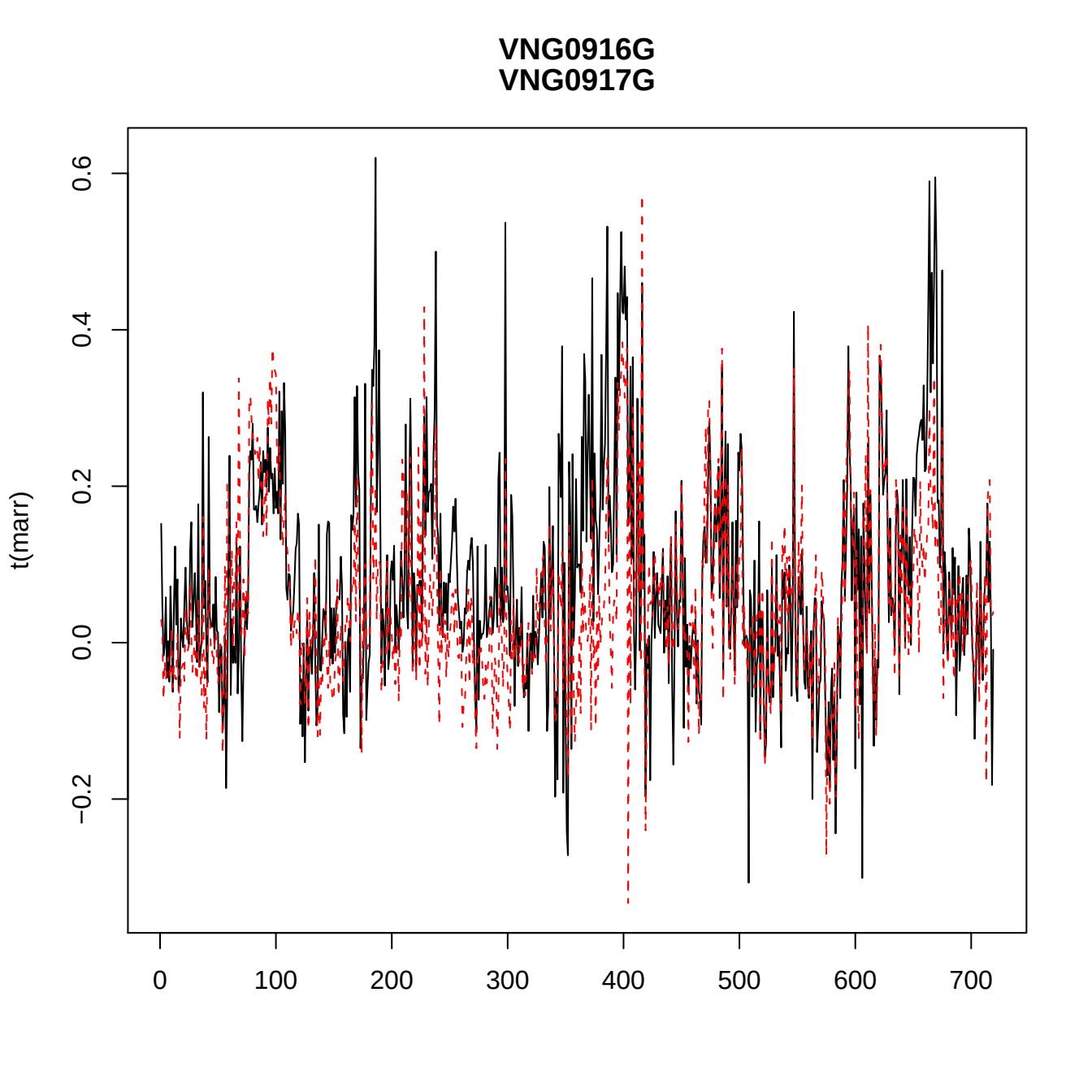
rbsC2
rbsA
VNG0903C
PNP_UDP_1
dCMP
cyt_deam
BPD_transp_2
ABC_tran
Bmp
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA


VNG0896G
VNG0897G
VNG0898G
VNG0901G
VNG0903C
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


689500
690000
690500
691000
691500
692000
VNG0909H
VNG0911H
VNG0913H
VNG
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE


VNG0911H
VNG0913H
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


694000
695000
696000
697000
ark
hrg
VNG0
5
HATPase_c
HisKA
PAS
HalX
Response_reg
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG0916G
VNG0917G
t(marr)
0.6
0.4
0.2
0.0
−0.2
0
100
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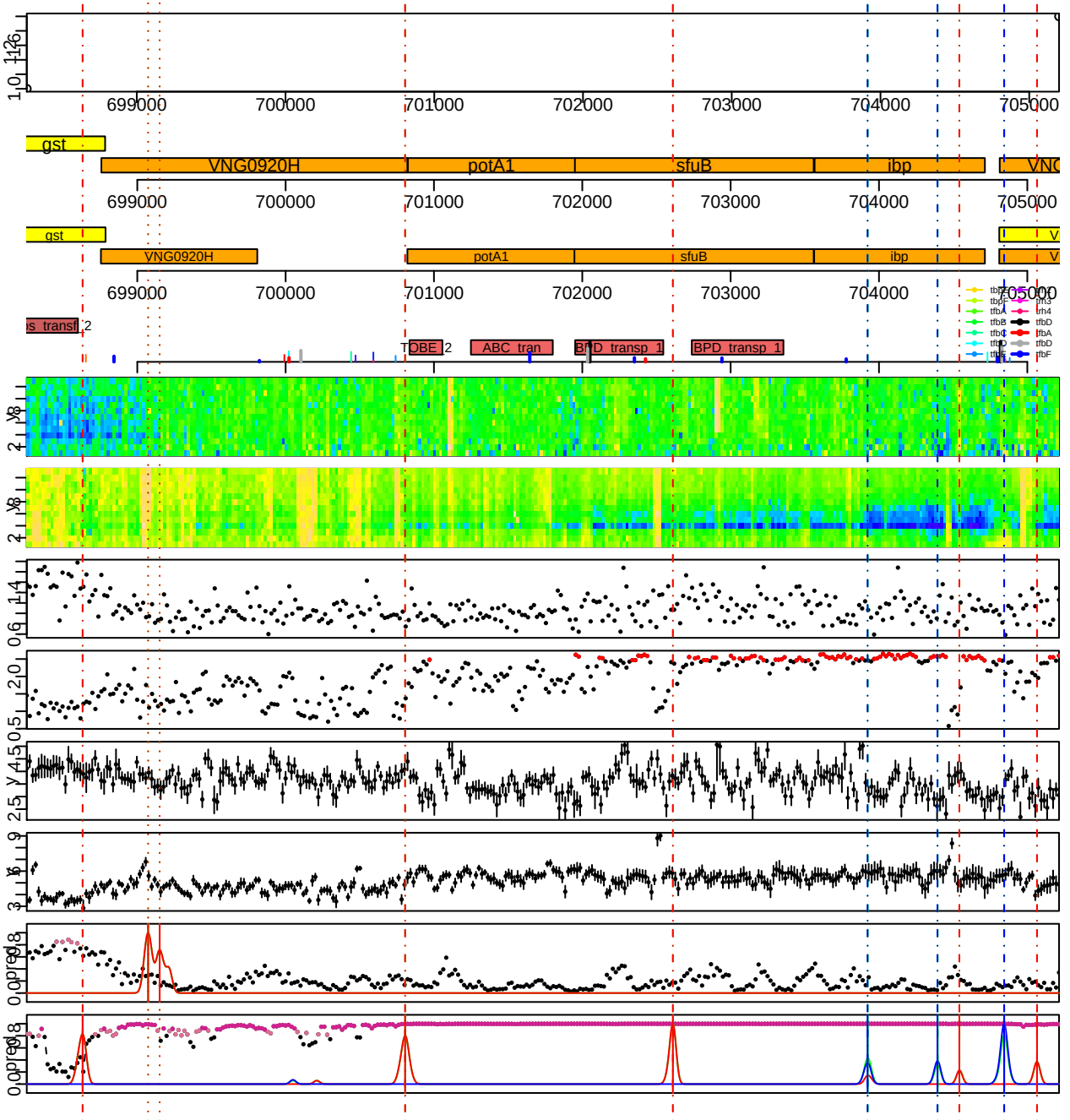
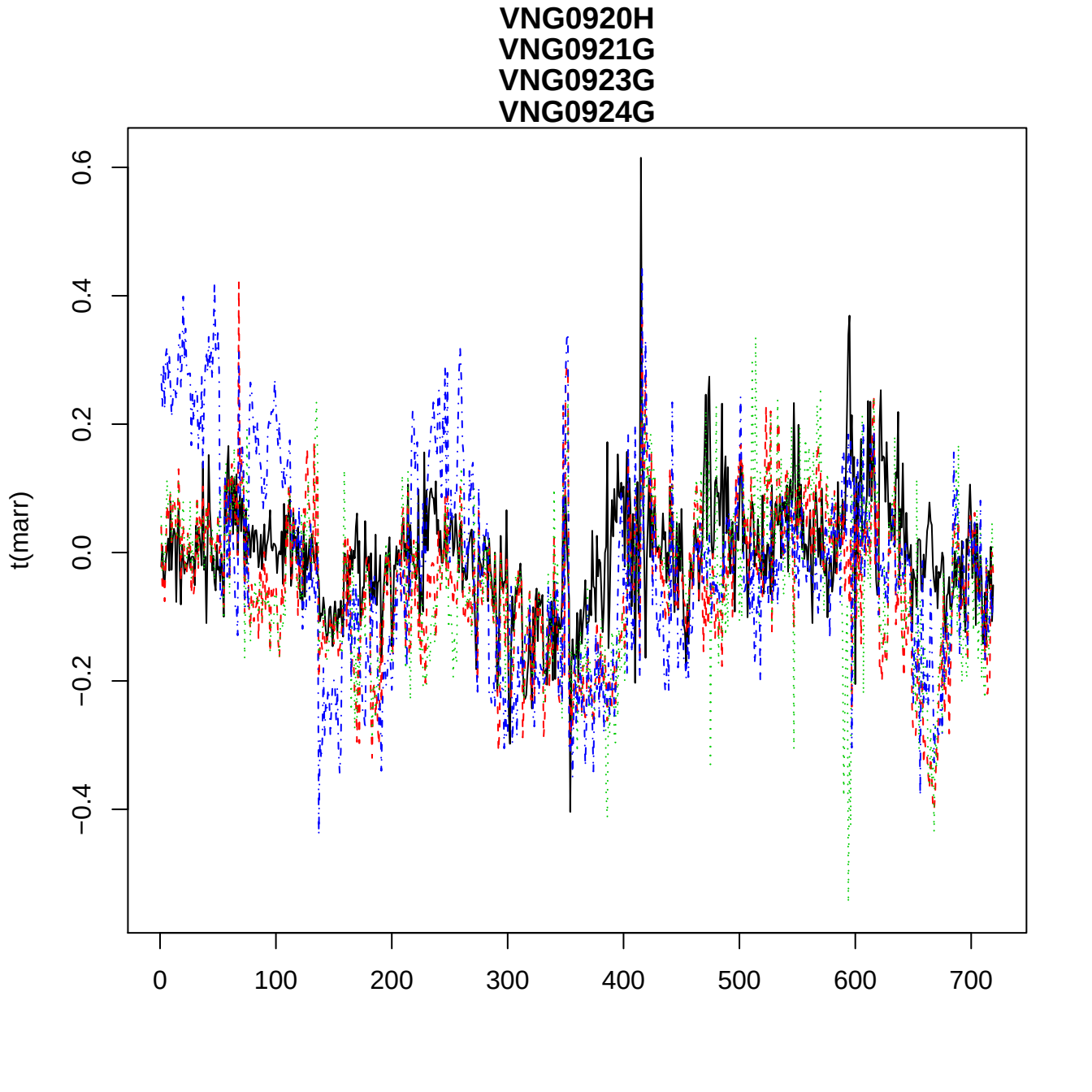
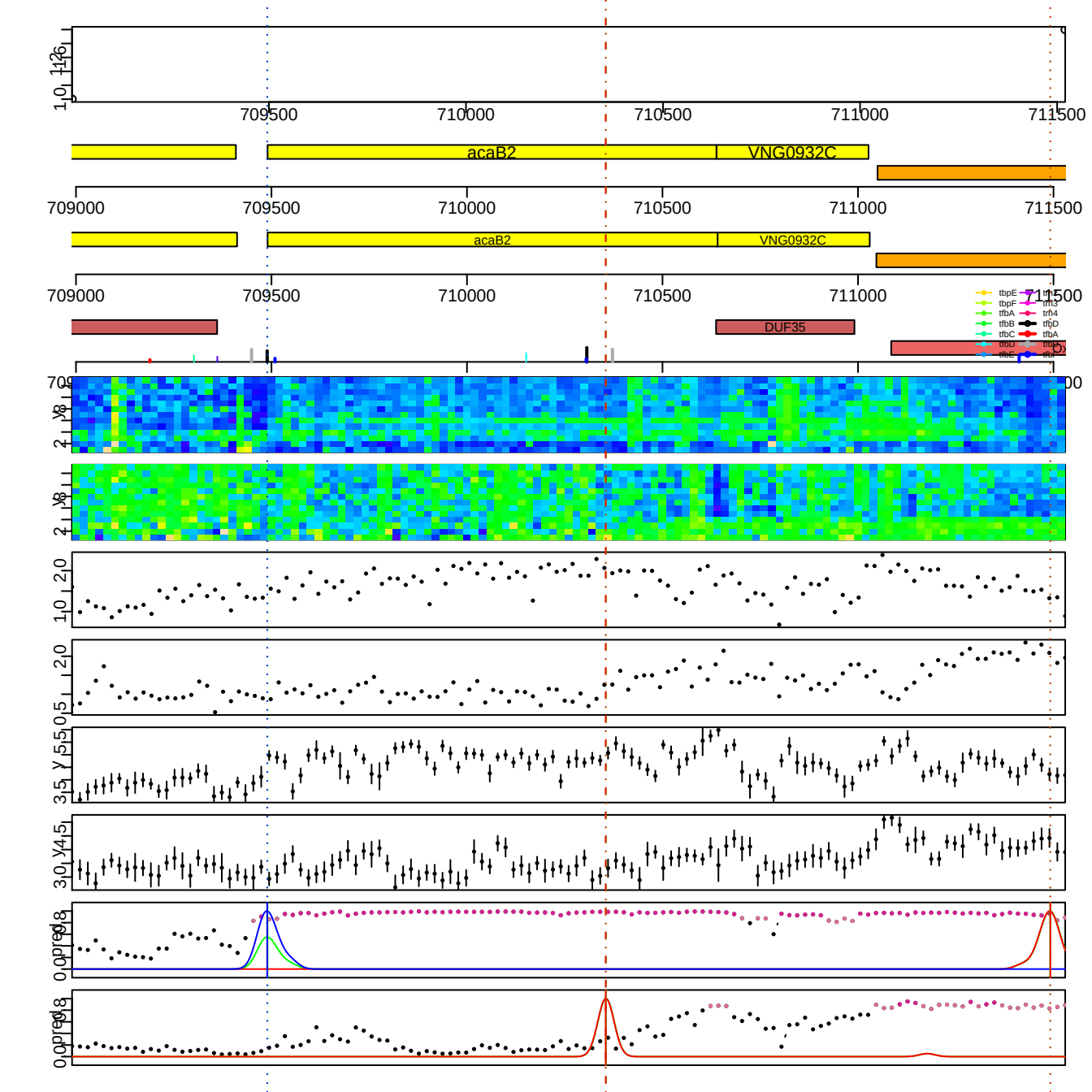
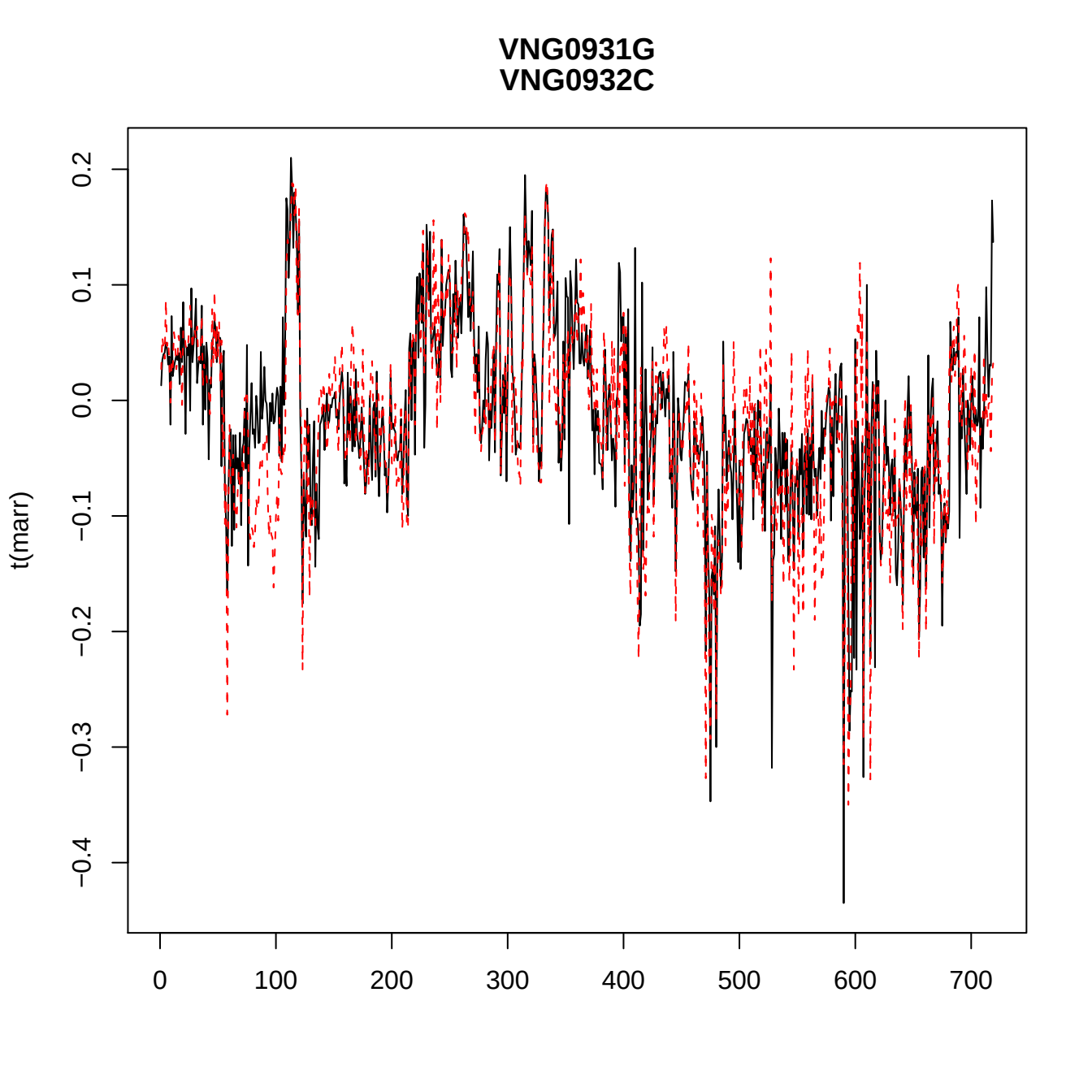
400
500
600
700

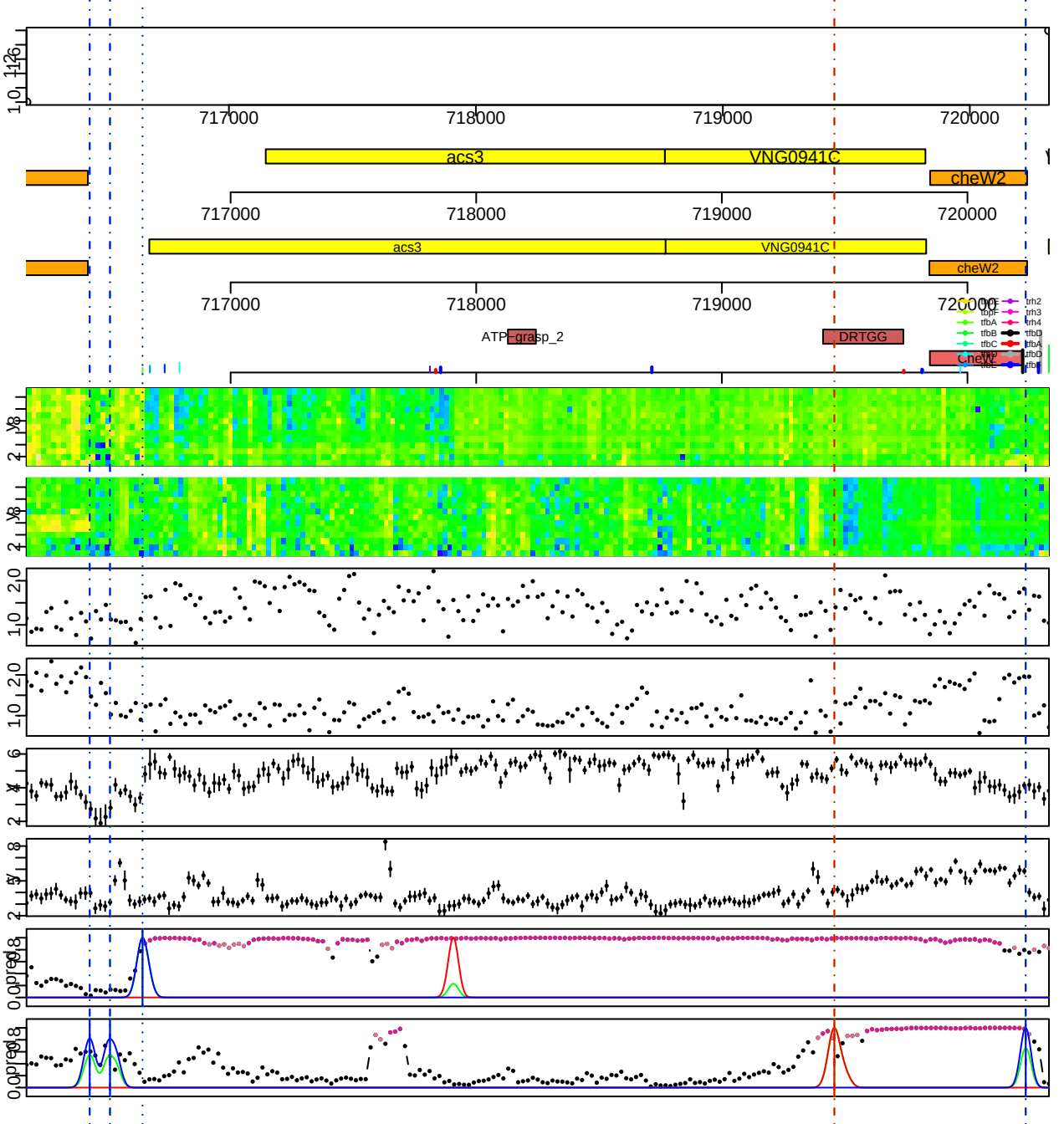

699000
700000
701000
702000
703000
704000
705000
gst
VNG0920H
potA1
sfuB
ibp
TOBE_2
ABC_tran
BPD_transp_1
BPD_transp_1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh3
trh4
tfbD
tfbA
tfbD
tfbF

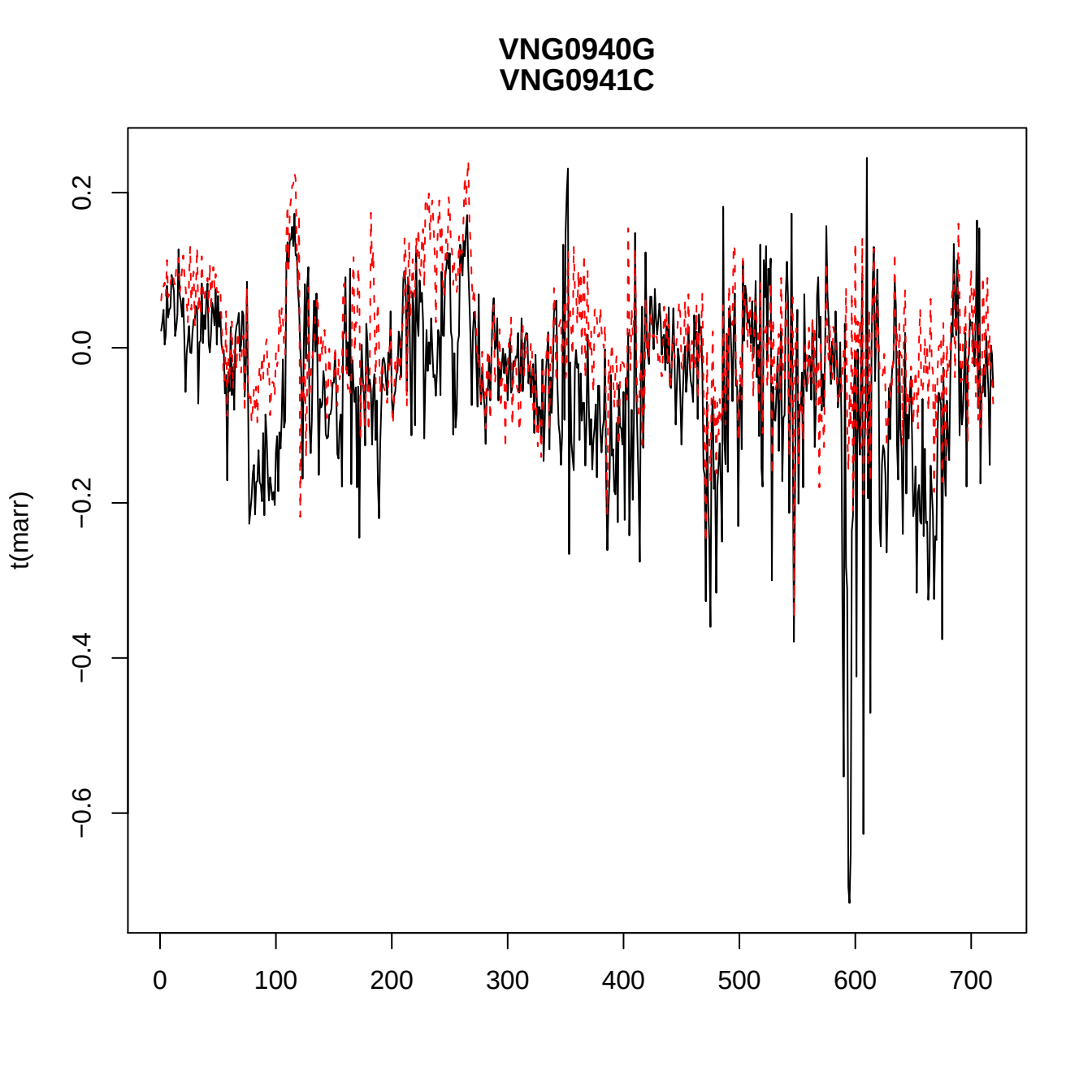

VNG0920H
VNG0921G
VNG0923G
VNG0924G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

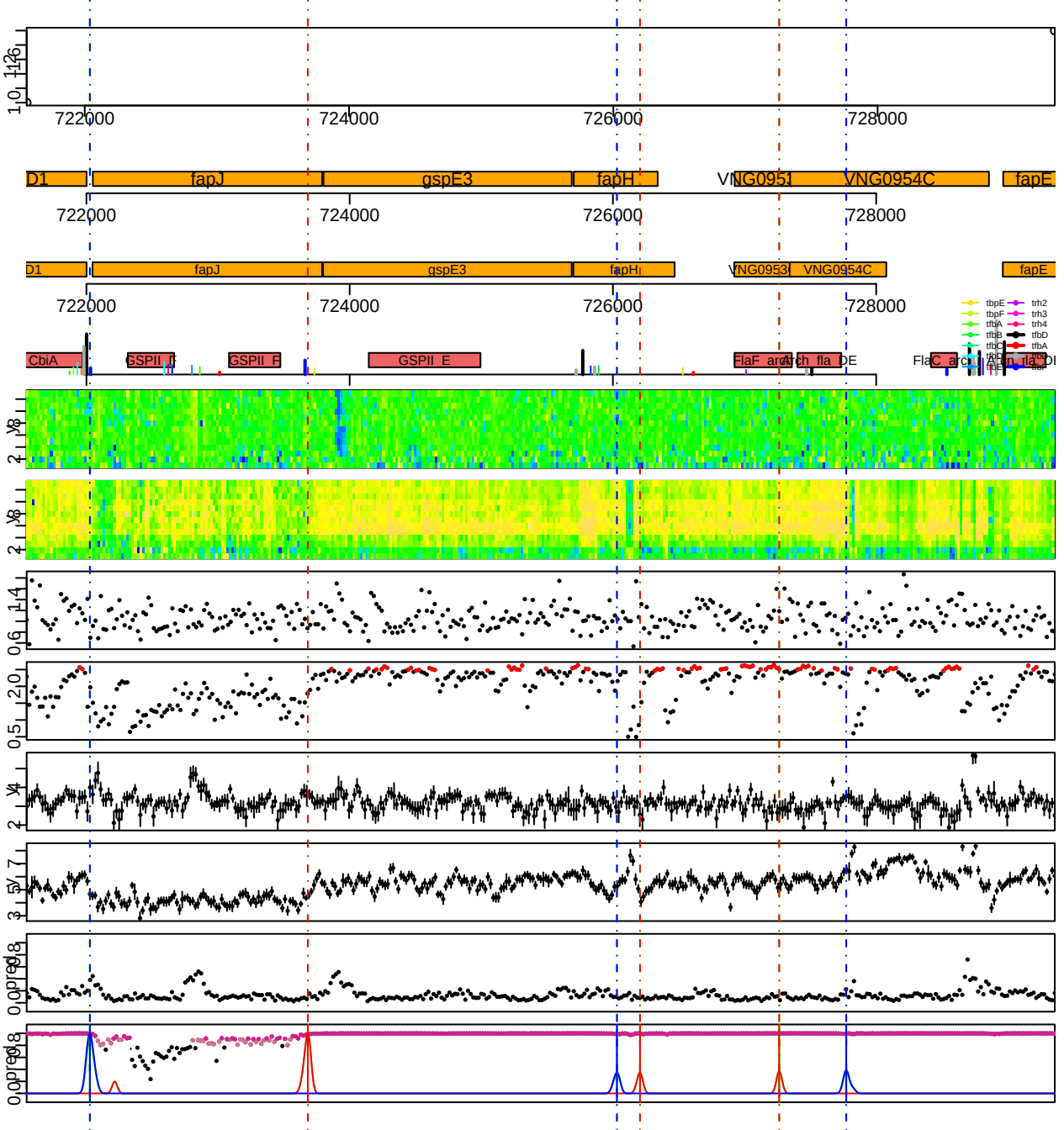


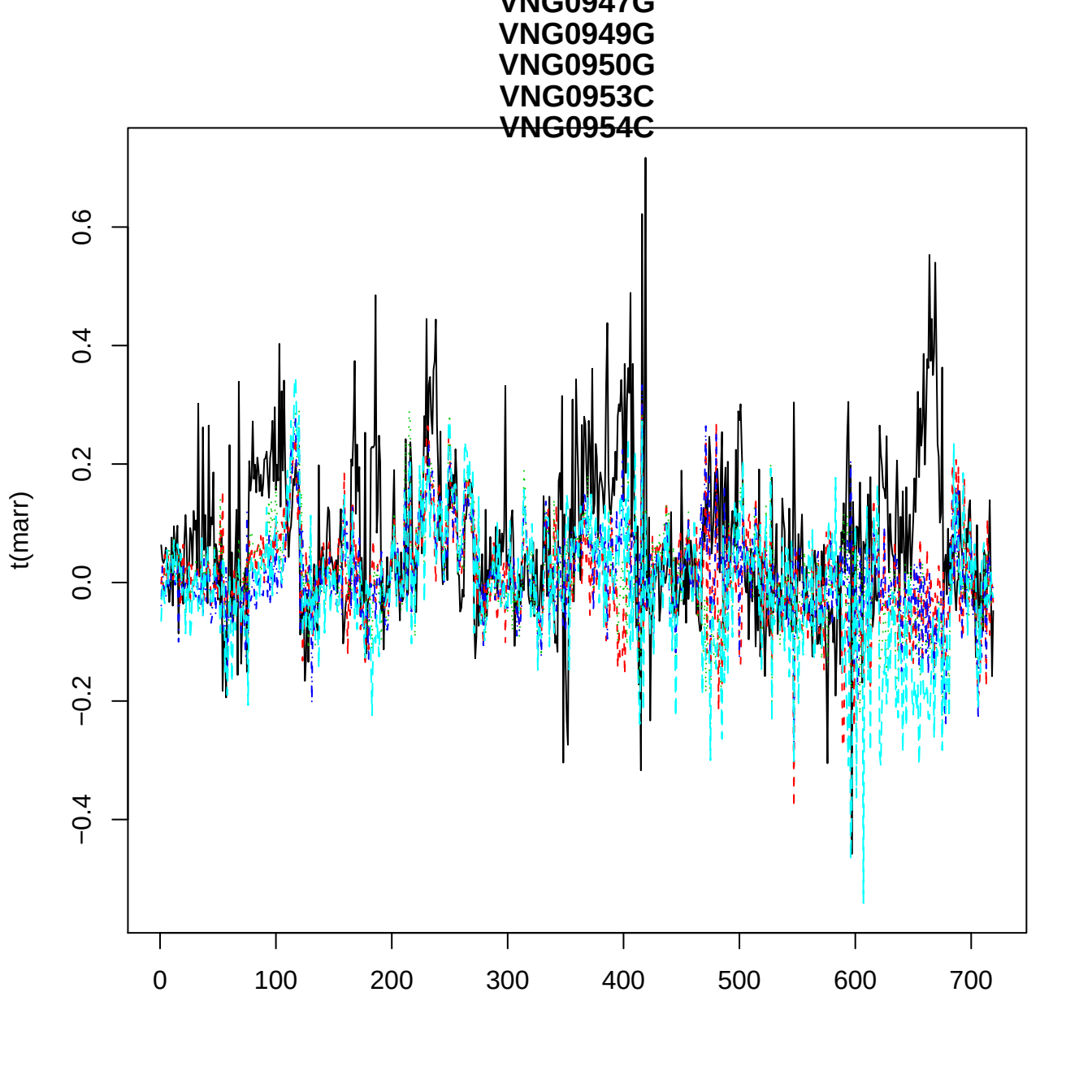
acaB2
VNG0932C
DUF35
709500
710000
710500
711000
711500
709000
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
tfh3
tfh4
tfbD
tfbA

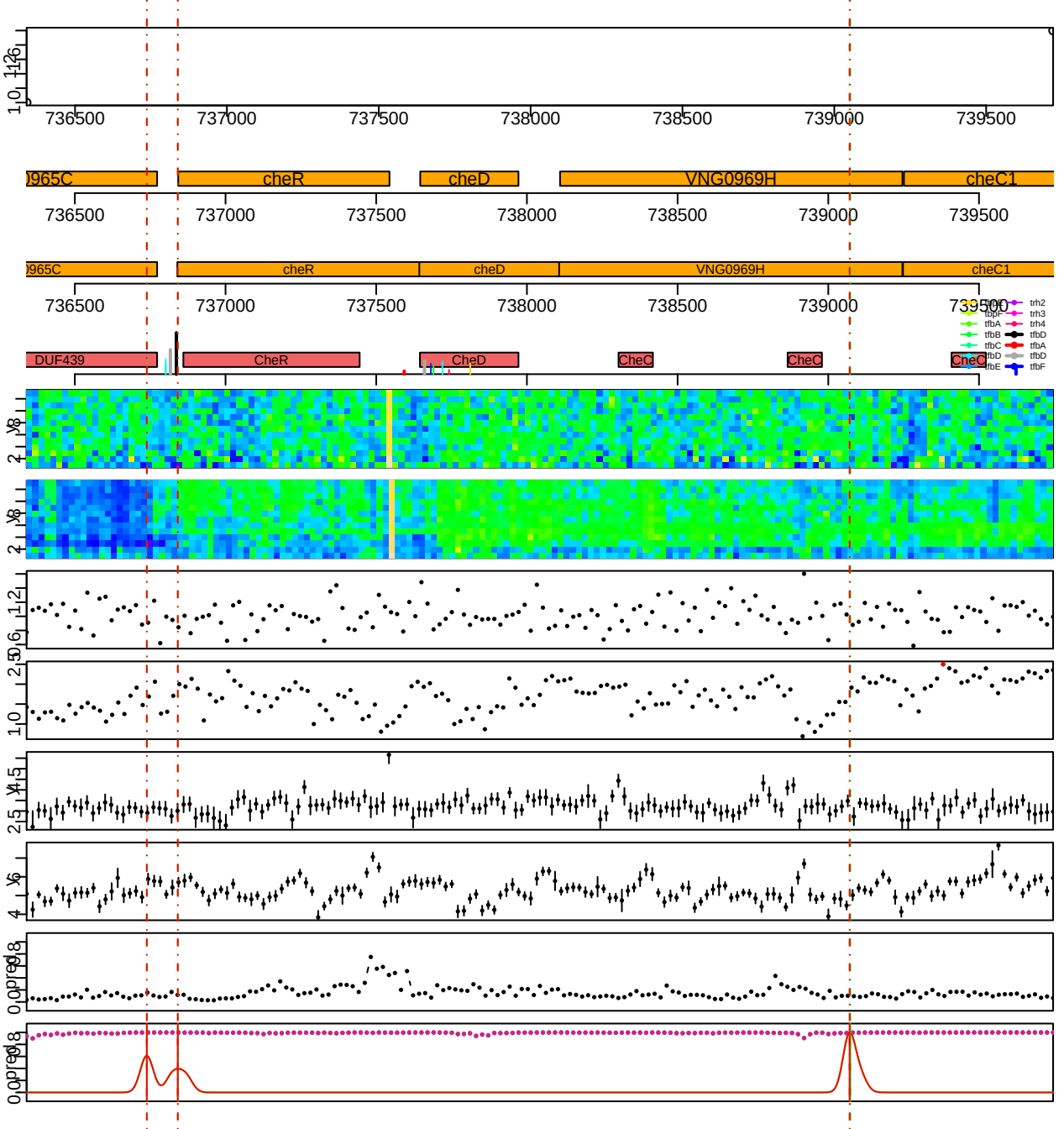

VNG0931G
VNG0932C
t(marr)
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.4
0
100
200
300
400
500
600
700

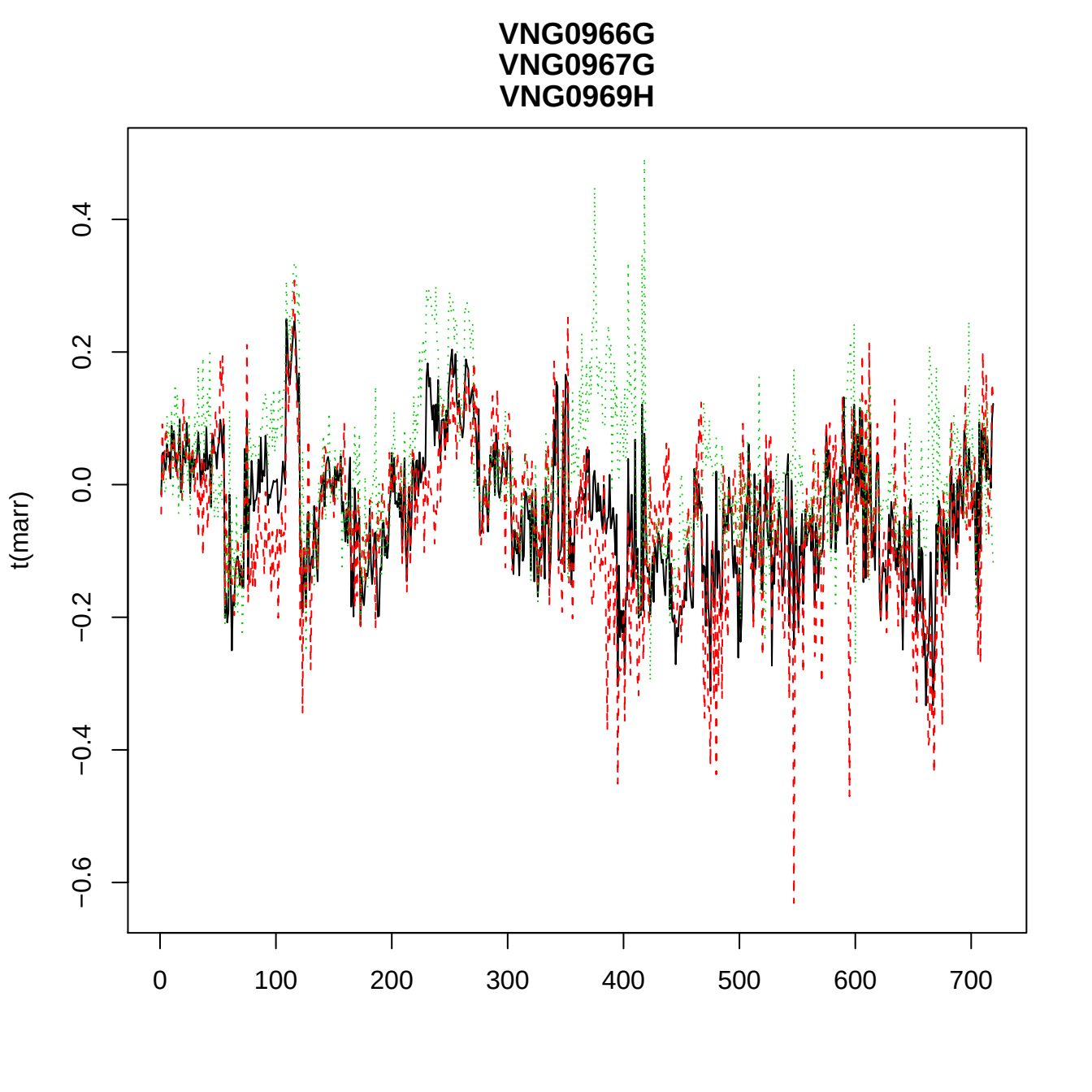

717000
718000
719000
720000
acs3
VNG0941C
cheW2
ATP-grasp_2
DRTGG
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbE

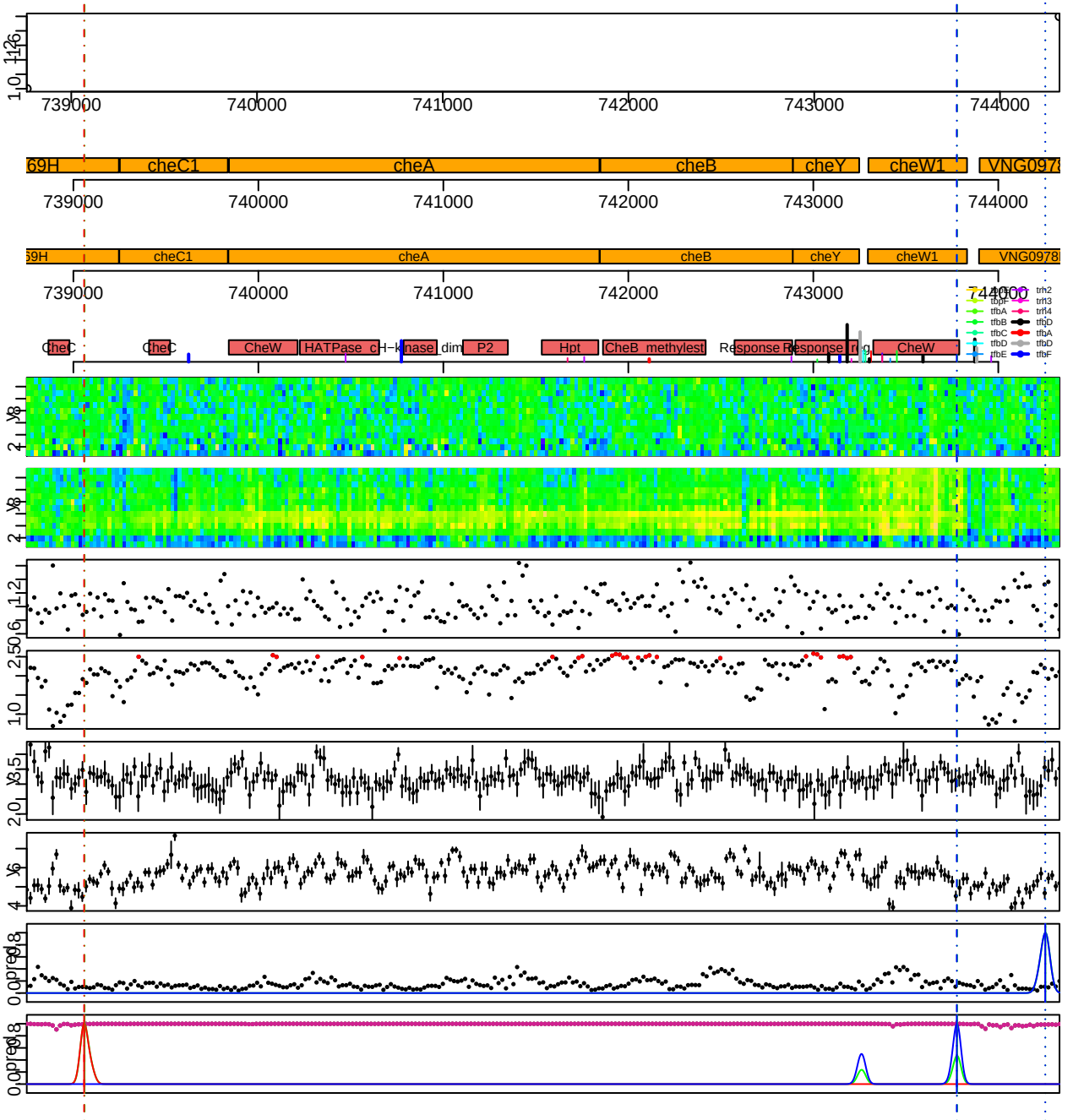

VNG0940G
VNG0941C
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

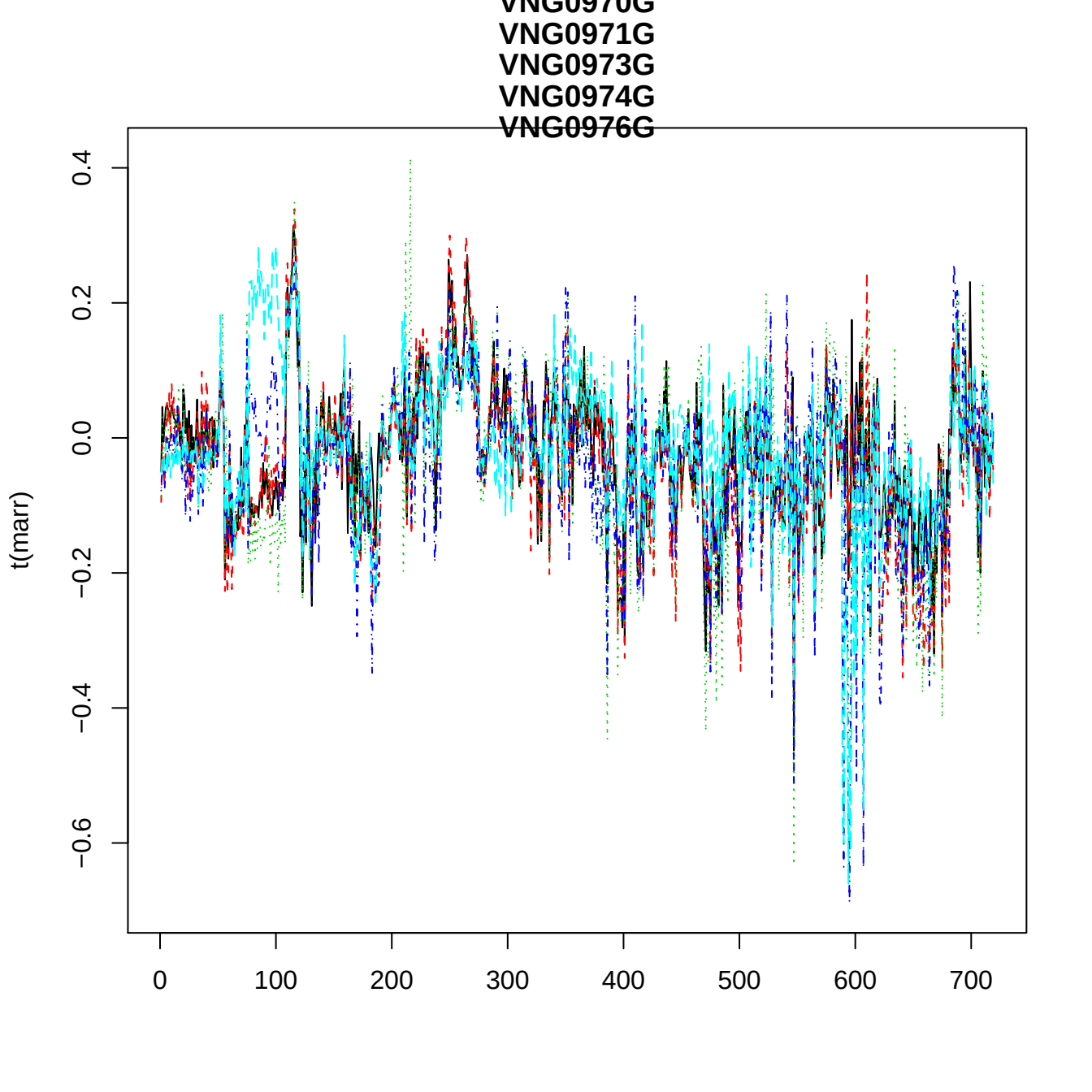

722000
724000
726000
728000
D1
fapJ
gspE3
fapH
VNG0951
VNG0954C
fapE
CbiA
GSPII_F
GSPII_E
FlaF
tbpE
tbpF
tfbA
tfbB
tfbD
trh2
trh3
trh4

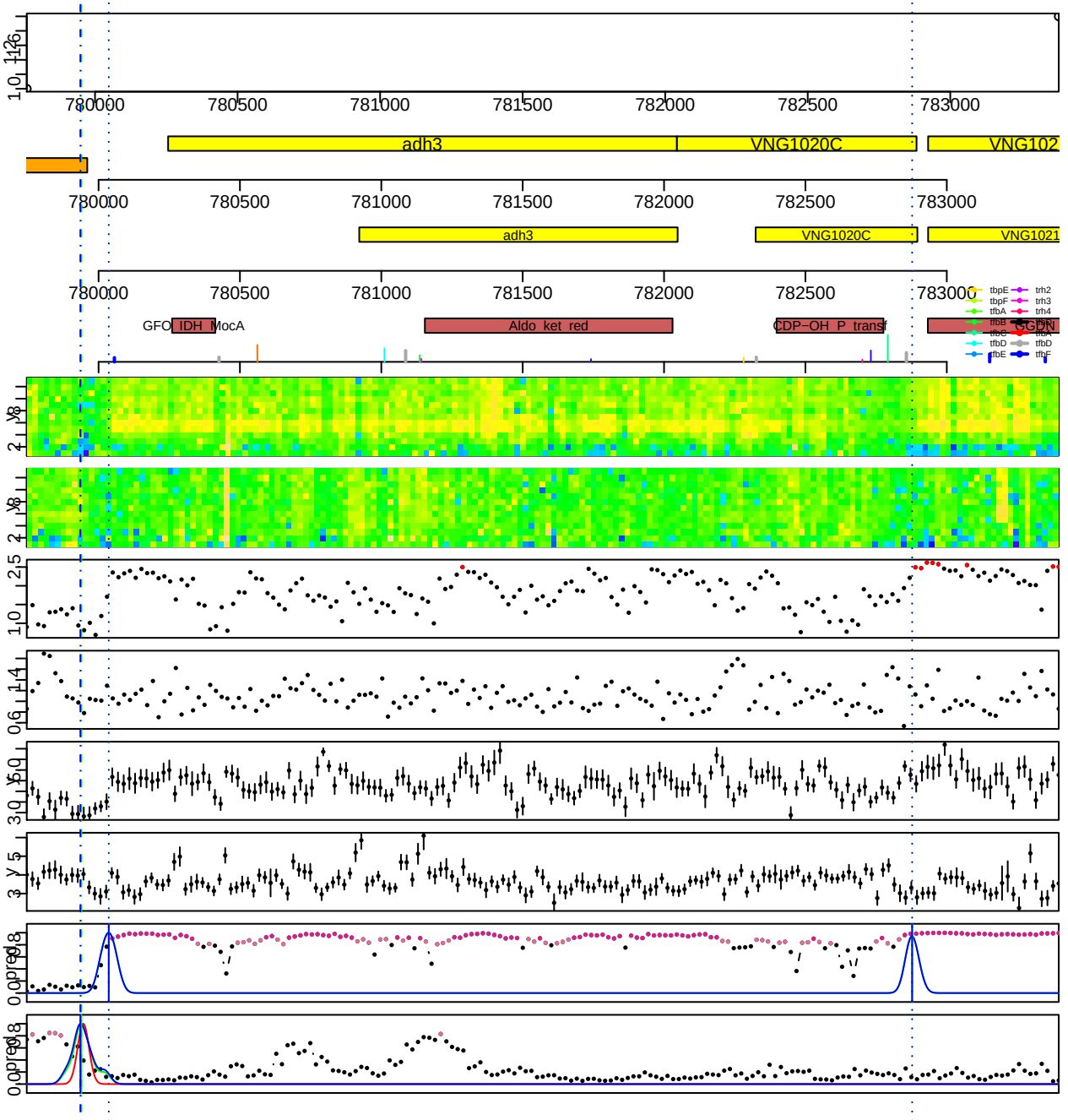

VNG0947G
VNG0949G
VNG0950G
VNG0953C
VNG0954C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

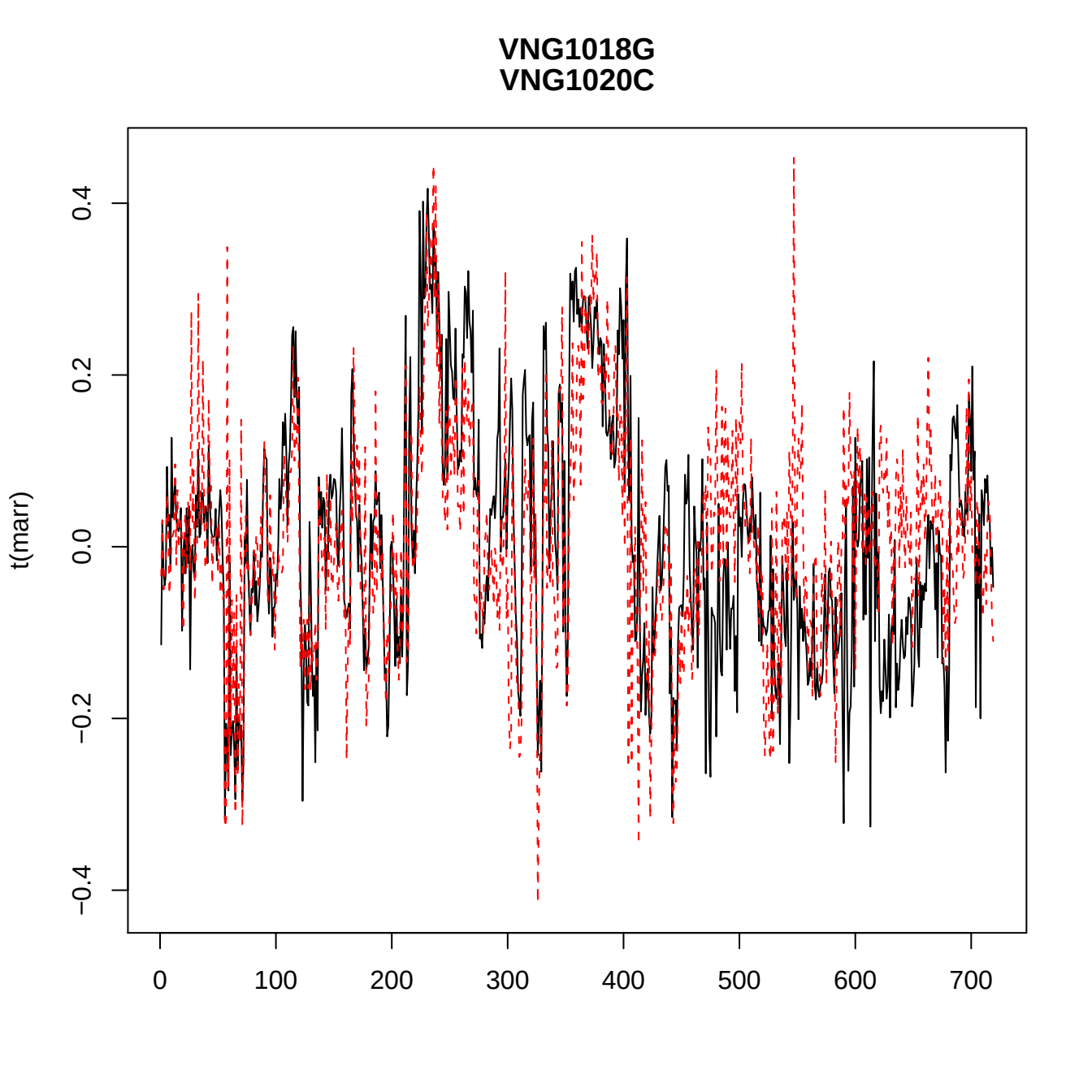

736500
737000
737500
738000
738500
739000
739500
cheR
cheD
VNG0969H
cheC1
DUF439
CheR
CheD
CheC
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE

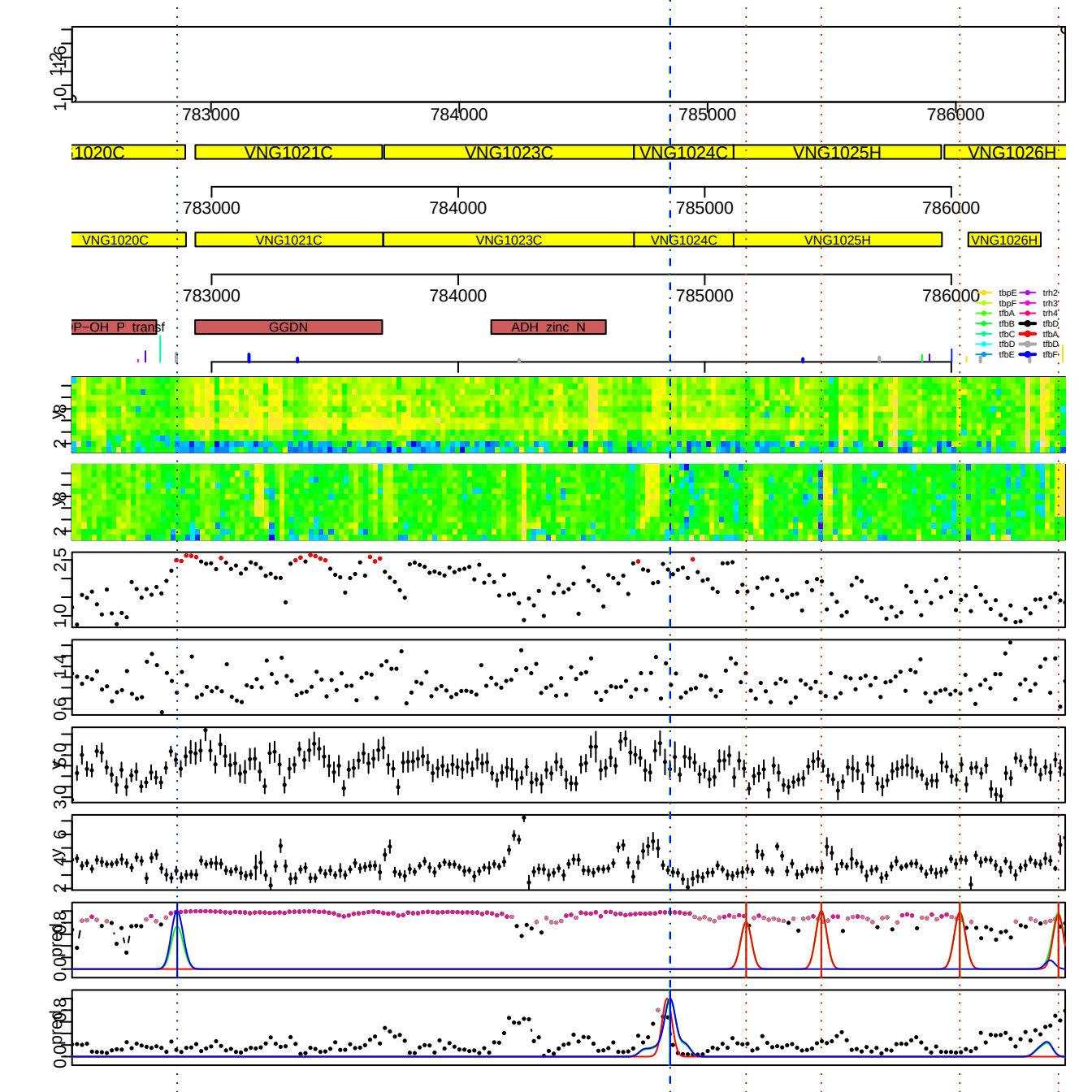

VNG0966G
VNG0967G
VNG0969H
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

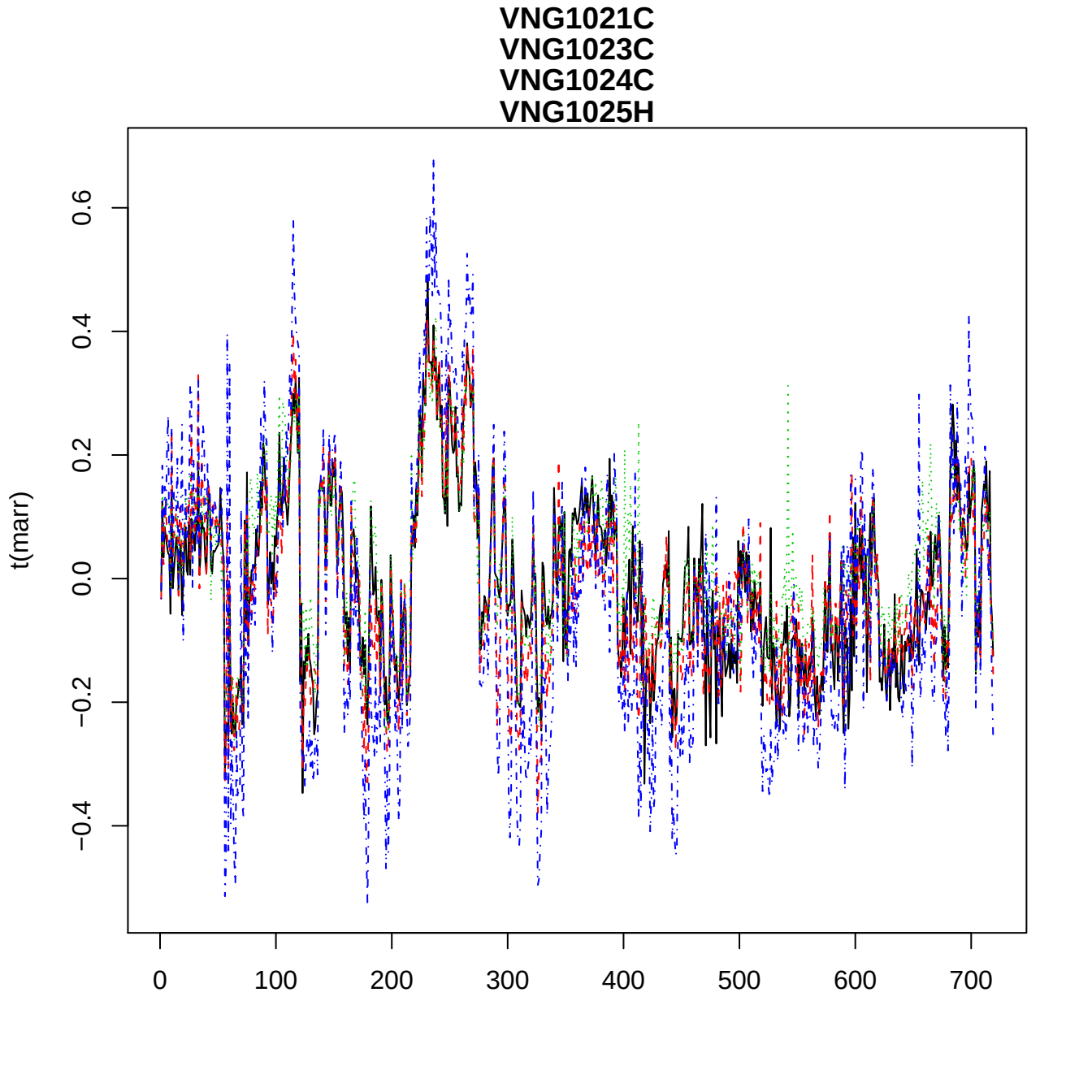

739000
740000
741000
742000
743000
744000
cheC1
cheA
cheB
cheY
cheW1
CheC
CheW
HATPase_c
H-kinase_dim
P2
Hpt
CheB_methylest
Response_reg
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbA
tfbB
tfbC
tfbE

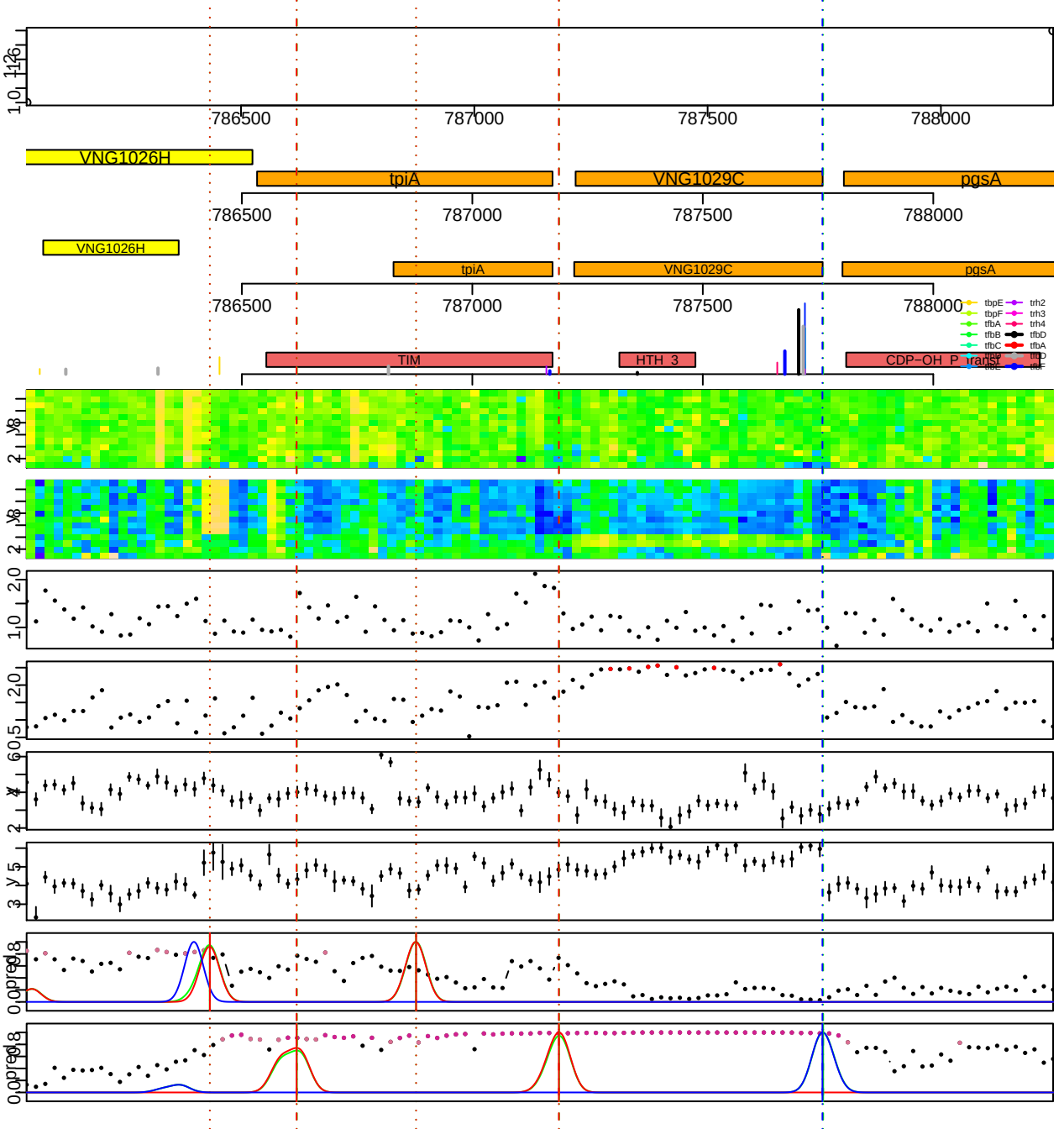

VNG0970G
VNG0971G
VNG0973G
VNG0974G
VNG0976G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


780000
780500
781000
781500
782000
782500
783000
adh3
VNG1020C
VNG102
adh3
VNG1020C
VNG1021
GFO_IDH_MocA
Aldo_ket_red
CDP-OH_P_transf
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbN
tfbA
tfbD
tfbF
pred

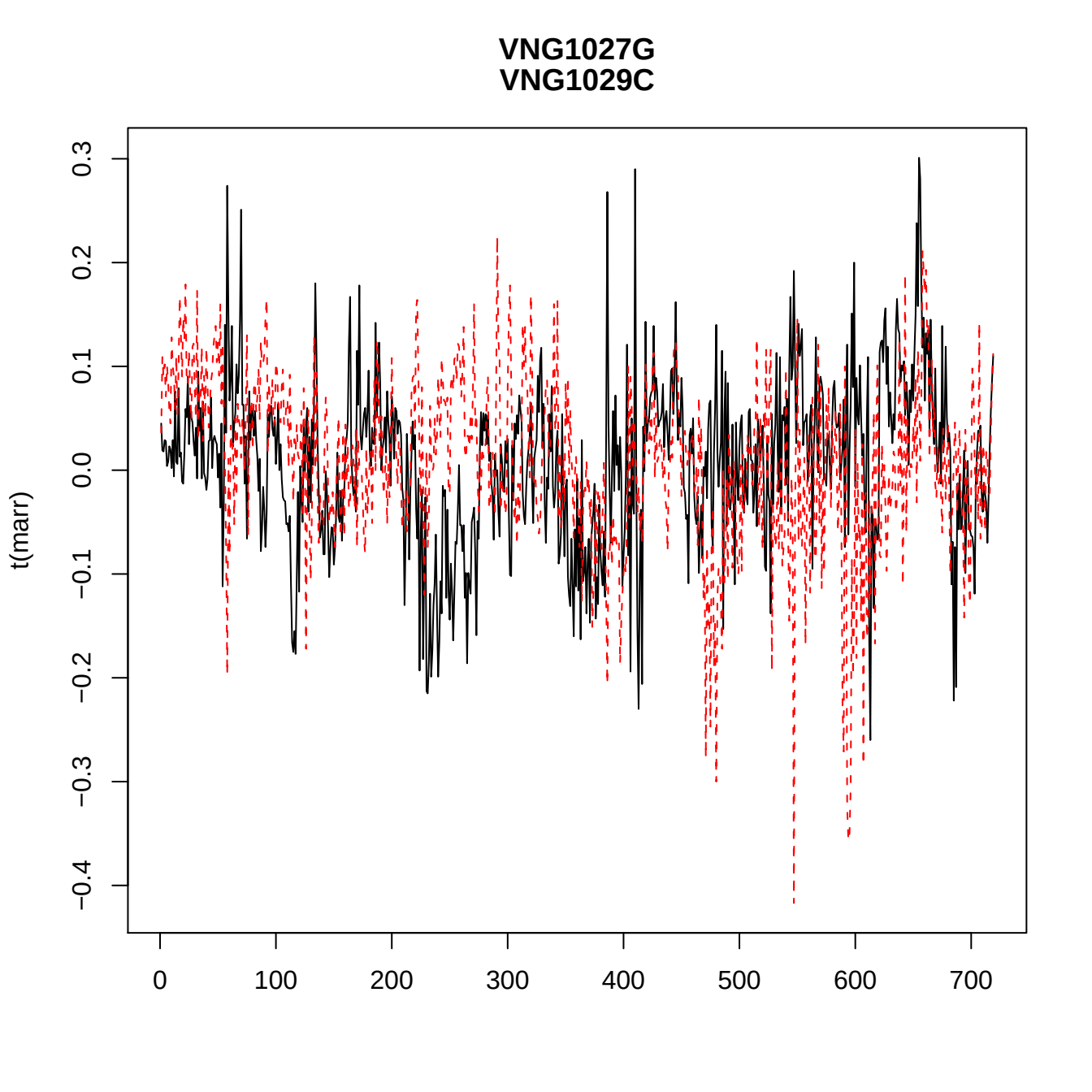

VNG1018G
VNG1020C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

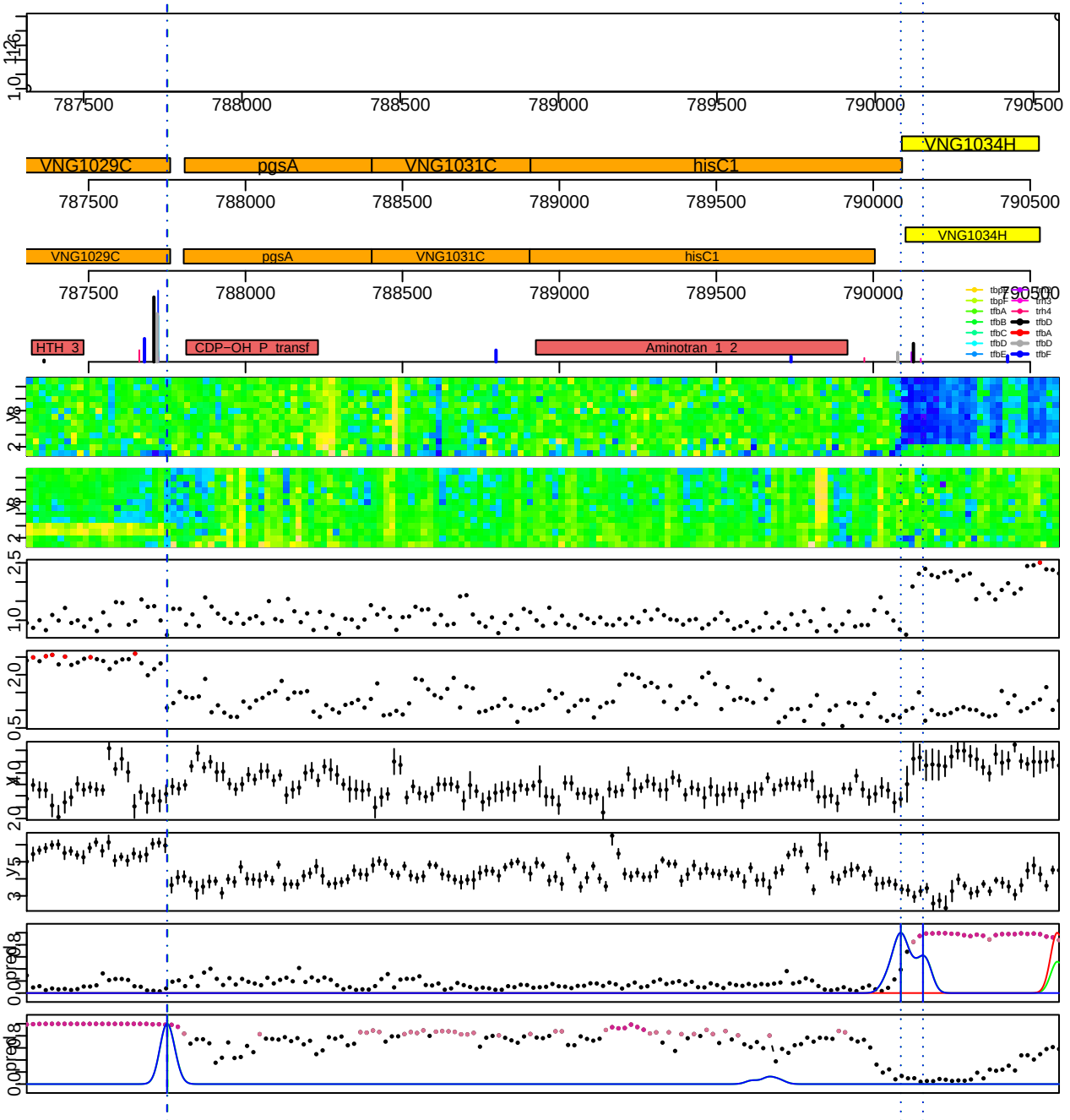

783000
784000
785000
786000
VNG1020C
VNG1021C
VNG1023C
VNG1024C
VNG1025H
VNG1026H
P−OH_P_transf
GGDN
ADH_zinc_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

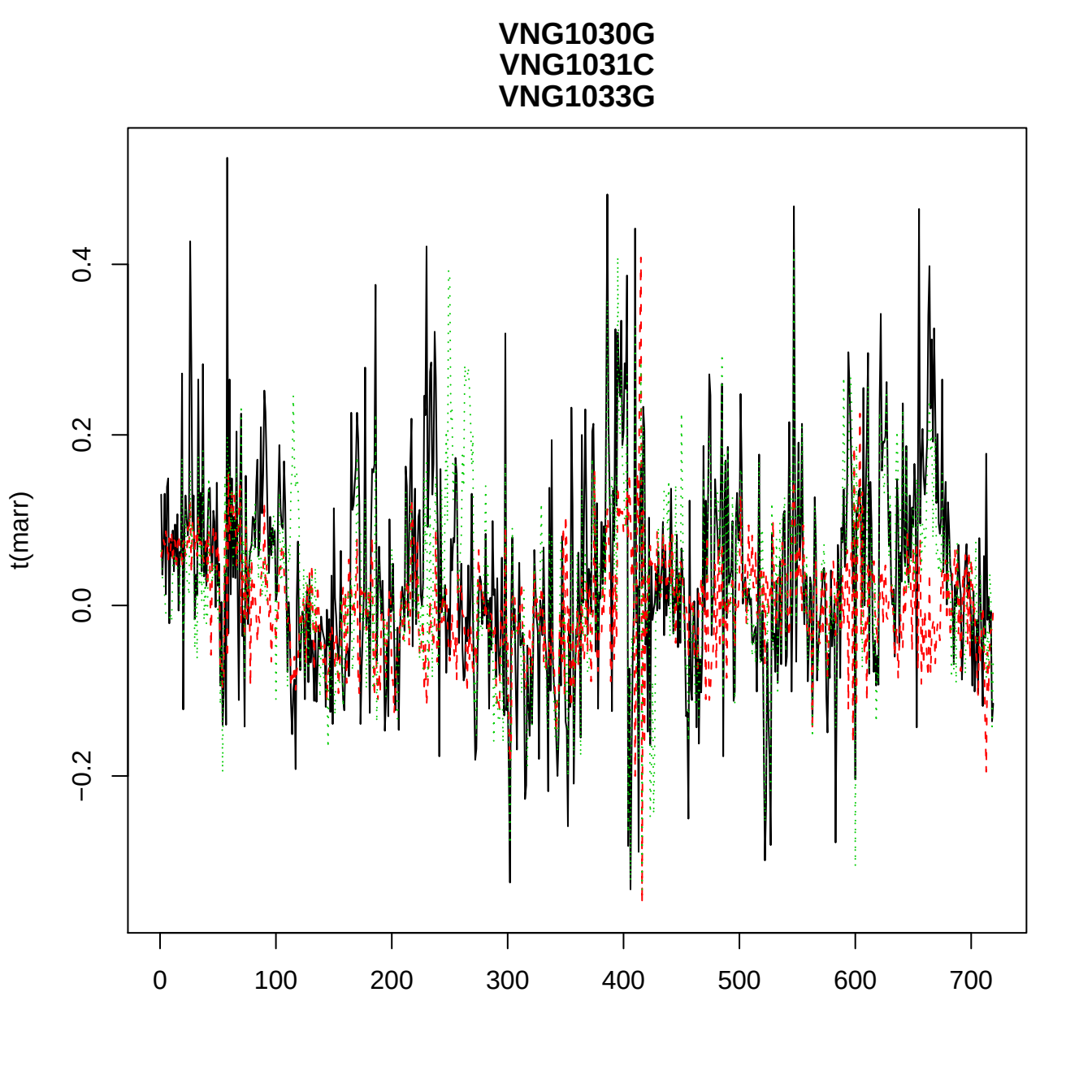

VNG1021C
VNG1023C
VNG1024C
VNG1025H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

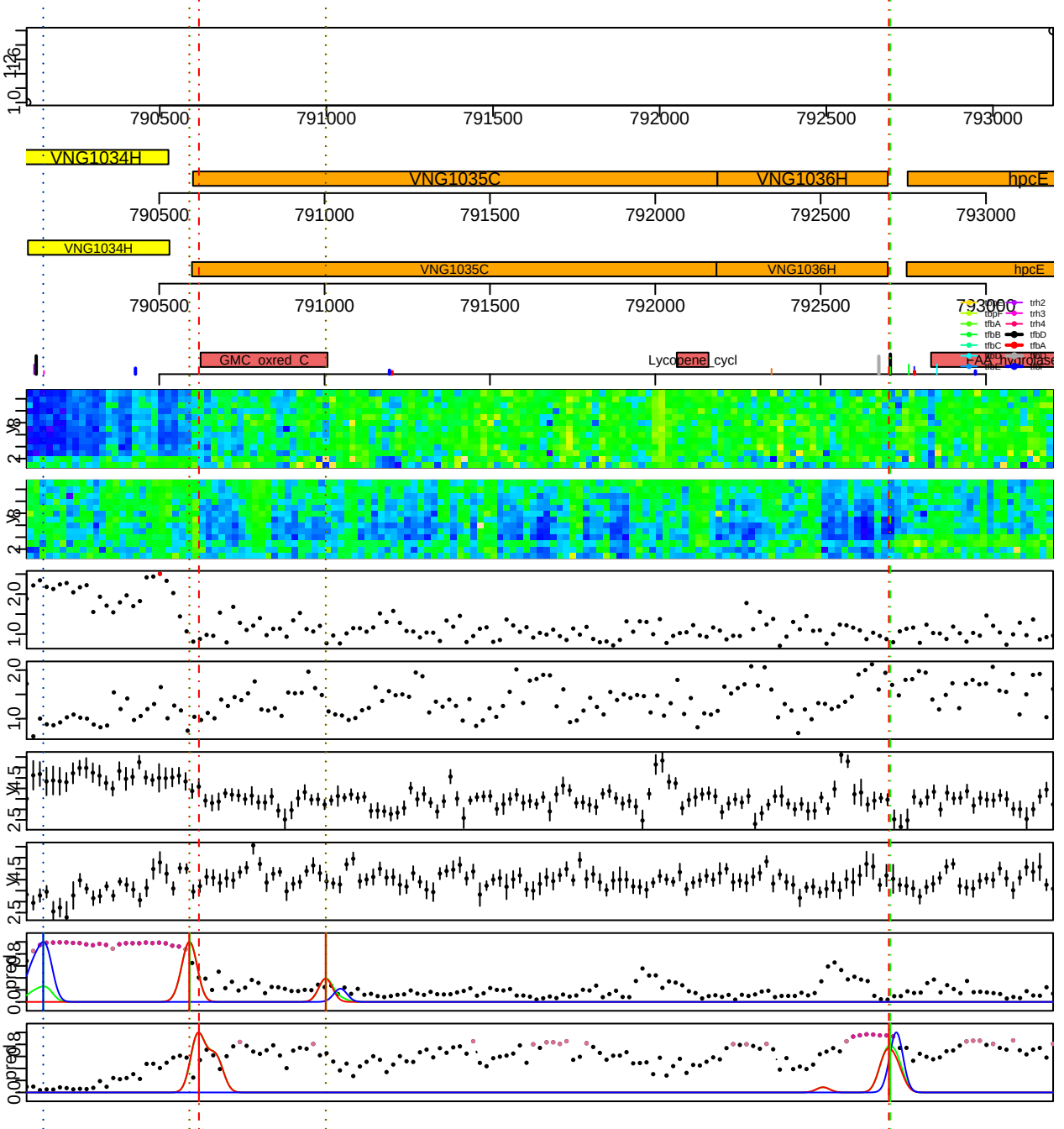


786500
787000
787500
788000
VNG1026H
tpiA
VNG1029C
pgsA
TIM
HTH_3
CDP−OH_P_transf
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA

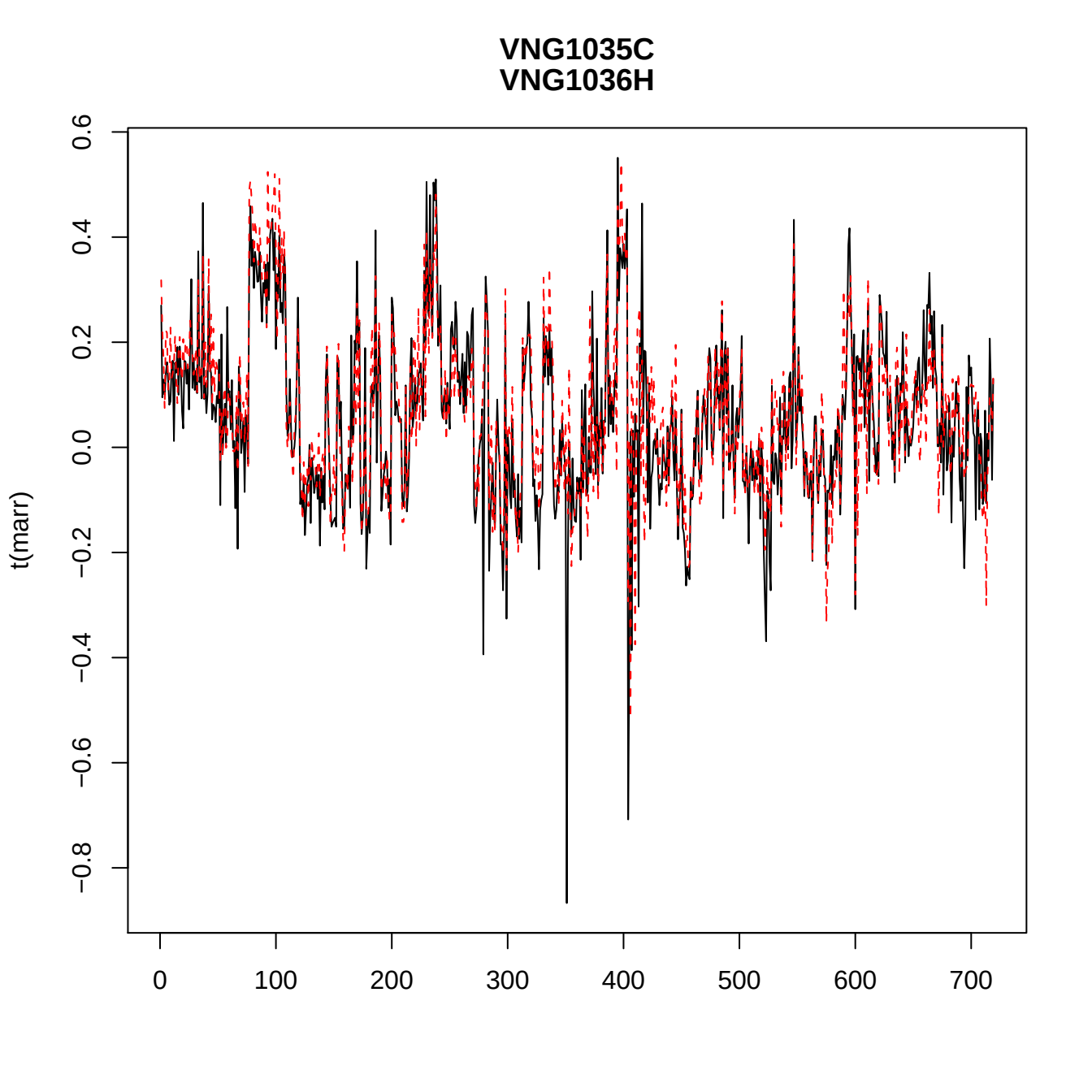

VNG1027G
VNG1029C
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.4
0
100
200
300
400
500
600
700

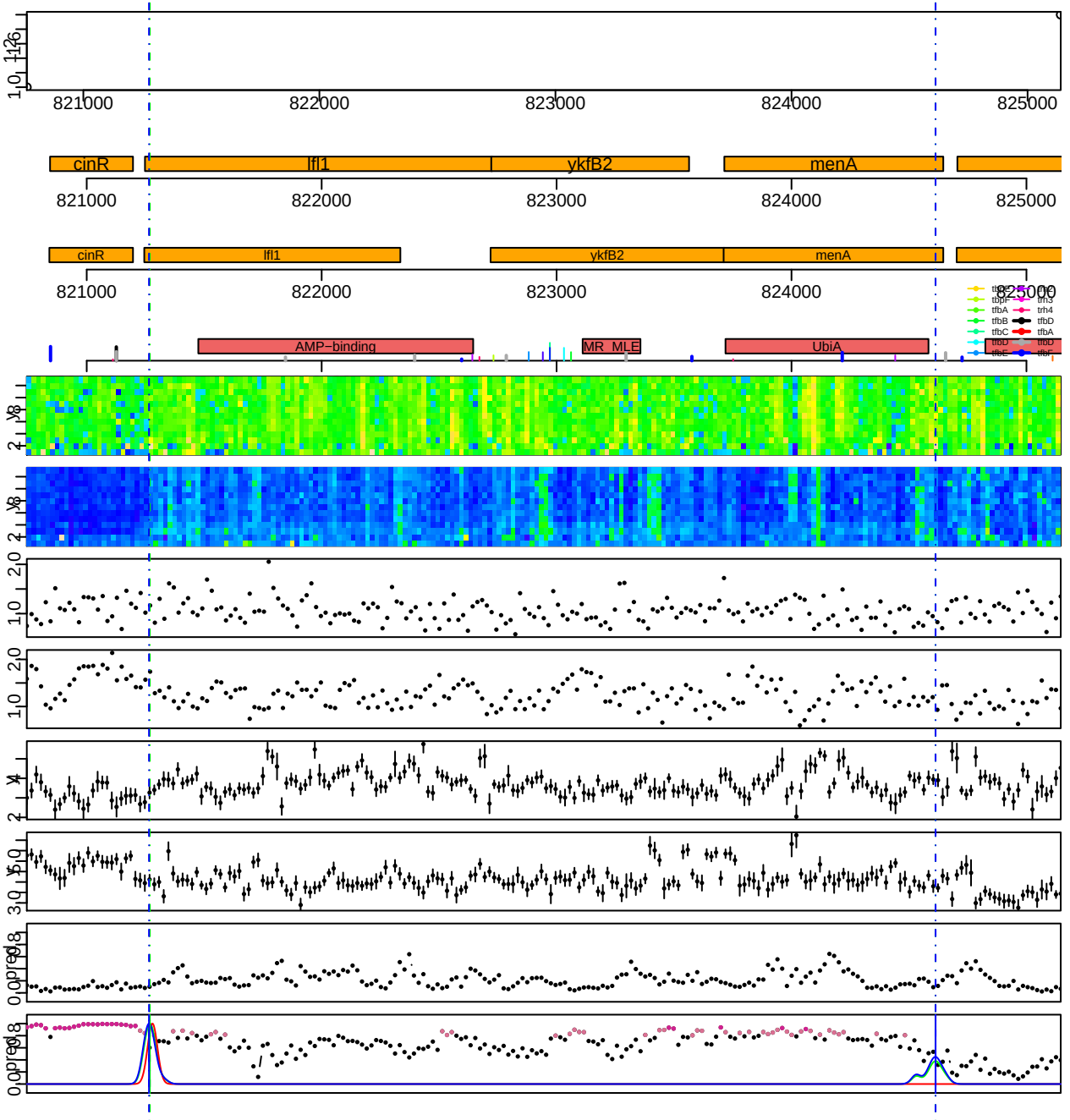

787500
788000
788500
789000
789500
790000
790500
VNG1029C
pgsA
VNG1031C
hisC1
VNG1034H
HTH_3
CDP-OH_P_transf
Aminotran_1_2
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF

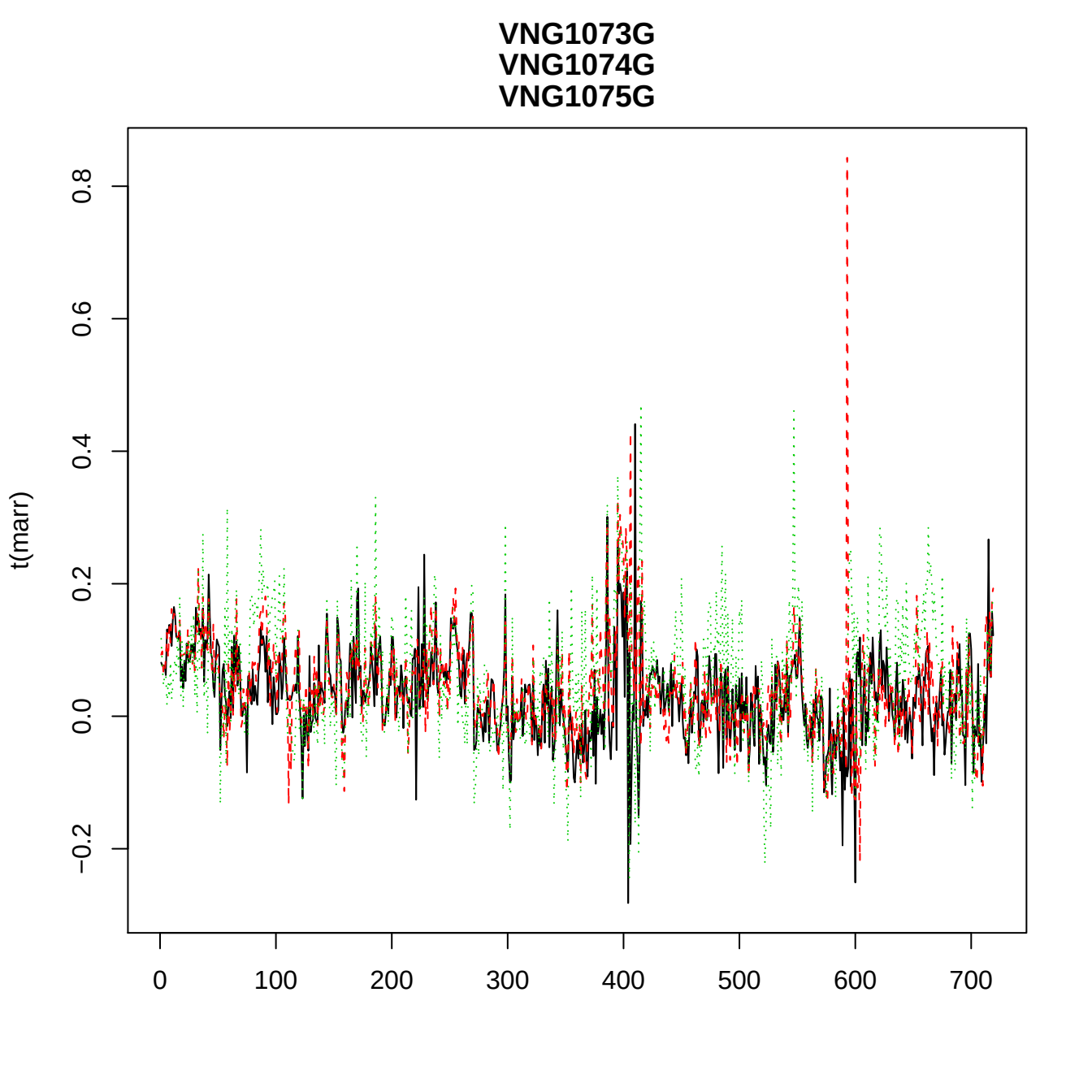

VNG1030G
VNG1031C
VNG1033G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

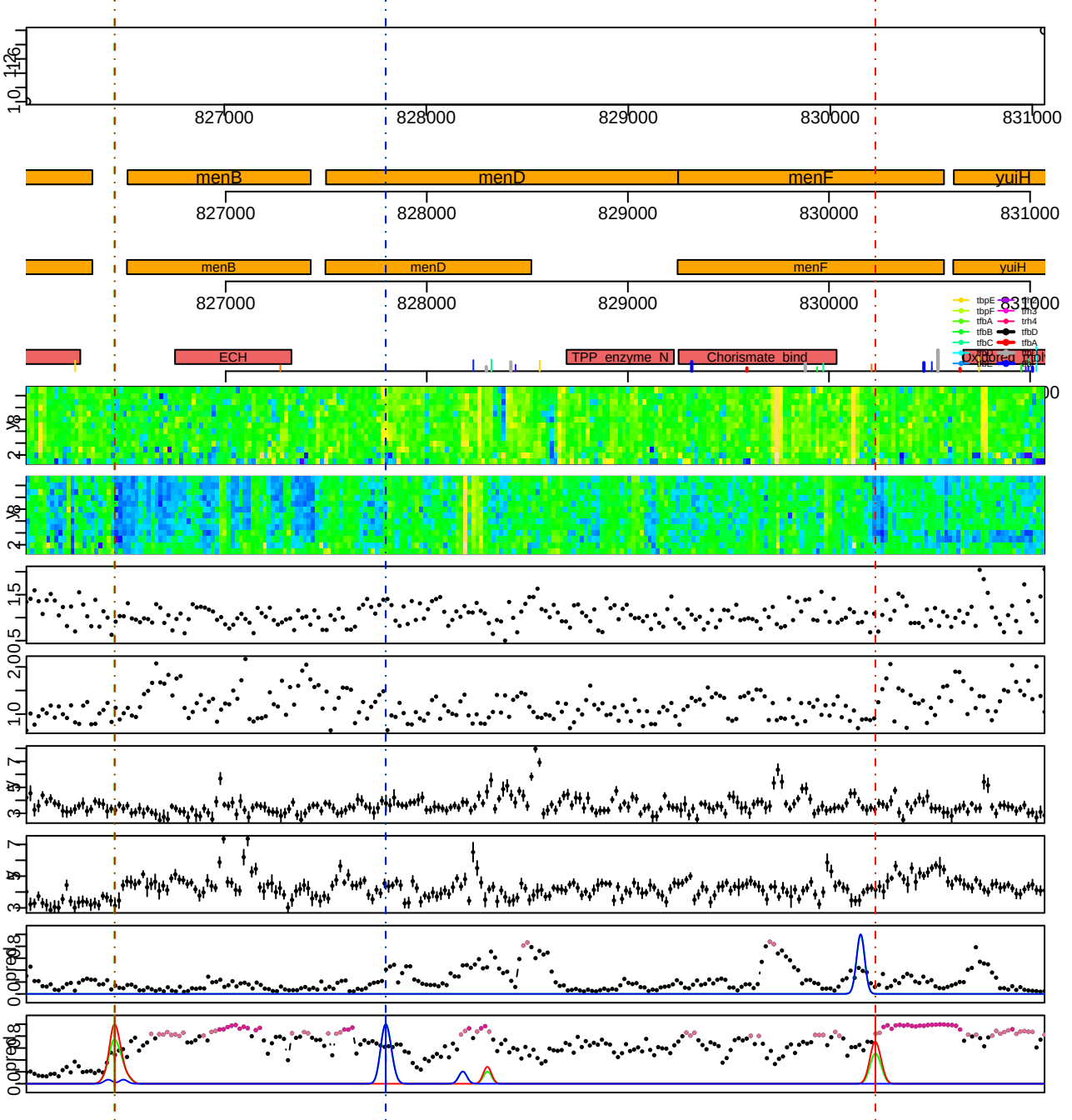


790500
791000
791500
792000
792500
793000
VNG1034H
VNG1035C
VNG1036H
hpcE
GMC_oxred_C
Lycopene_cycl
FAA_hydrolase
trh2
trh3
trh4
tfbD
tfbA
tfbB
tfbC
tbpF

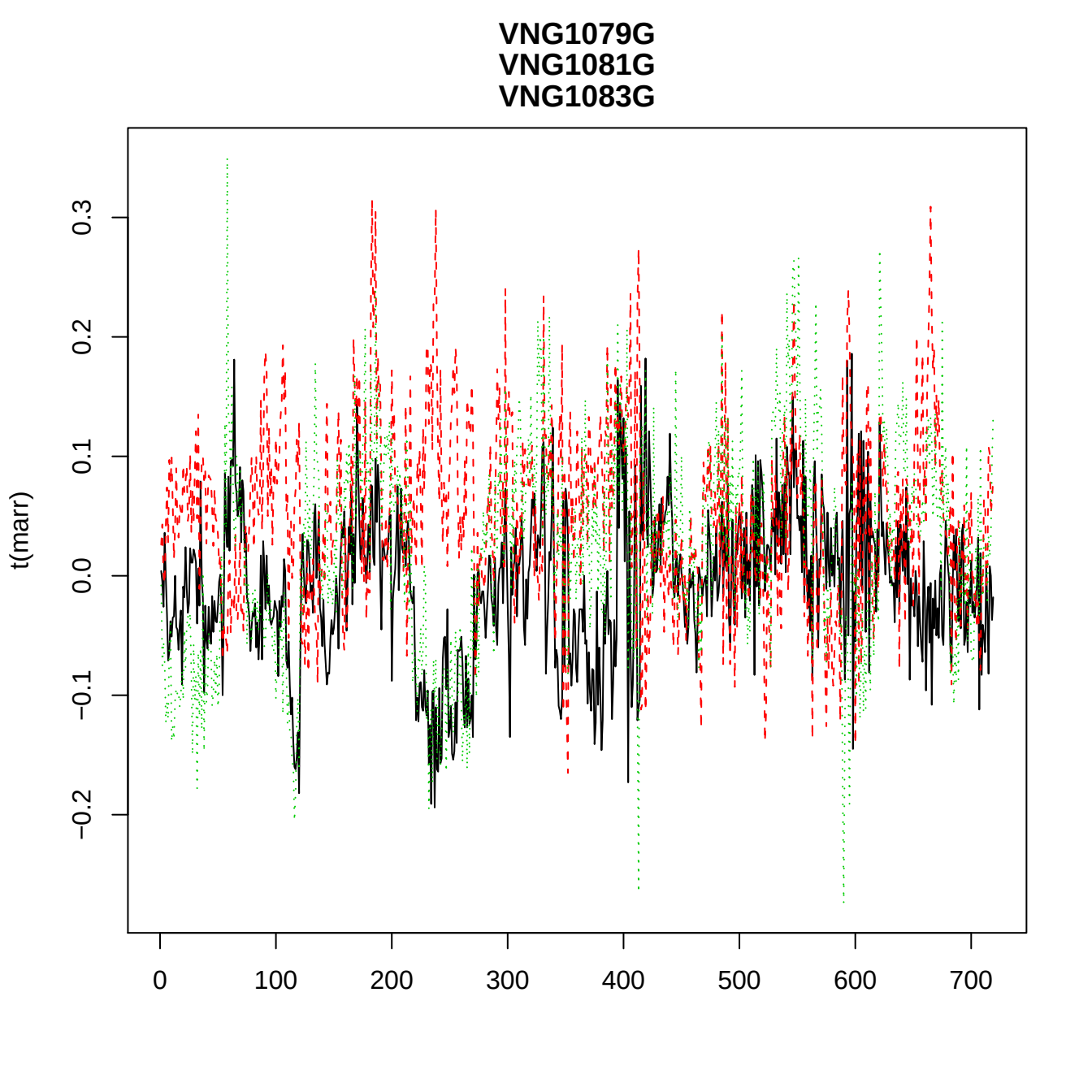

VNG1035C
VNG1036H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

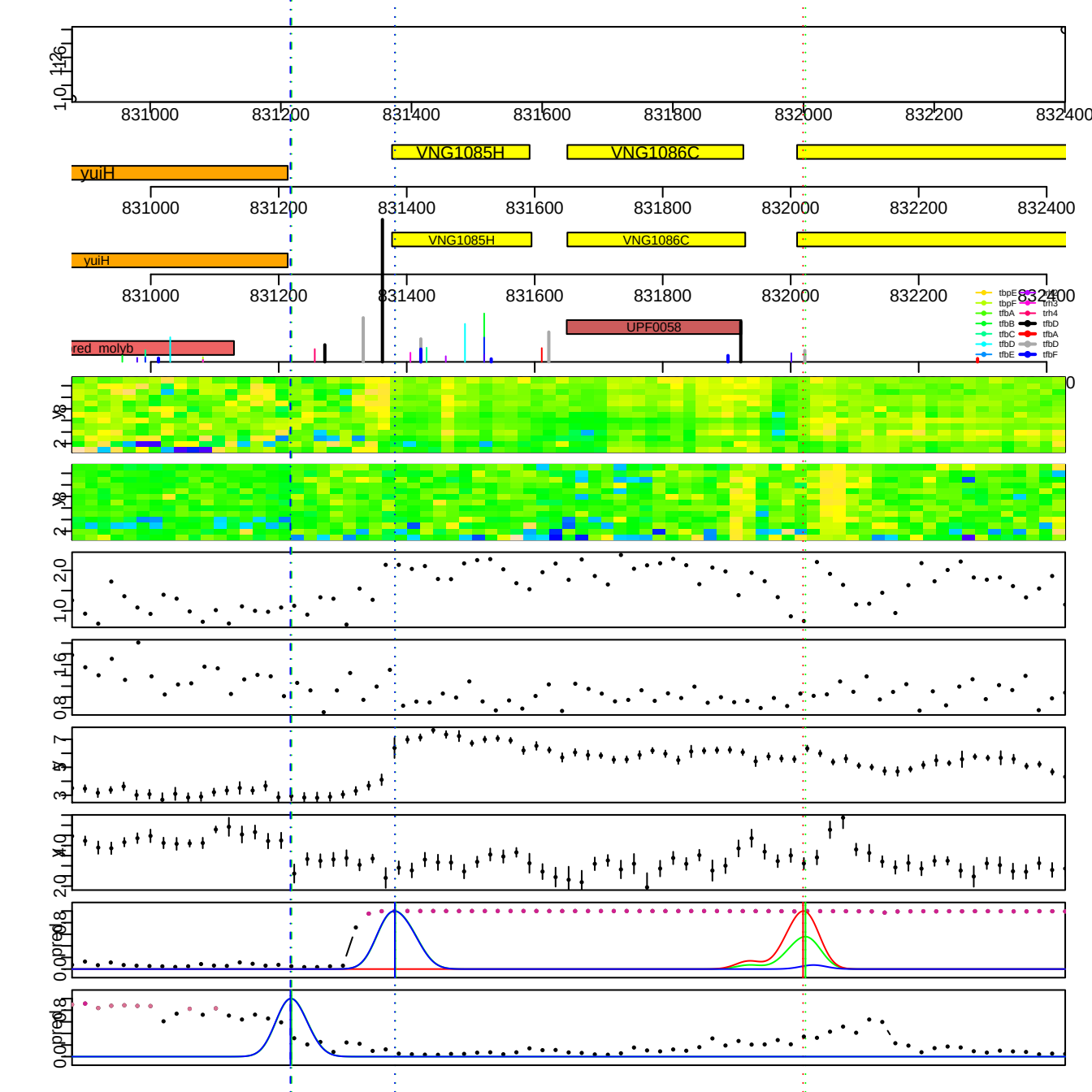

821000
822000
823000
824000
825000
cinR
lfl1
ykfB2
menA
AMP−binding
MR_MLE
UbiA
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

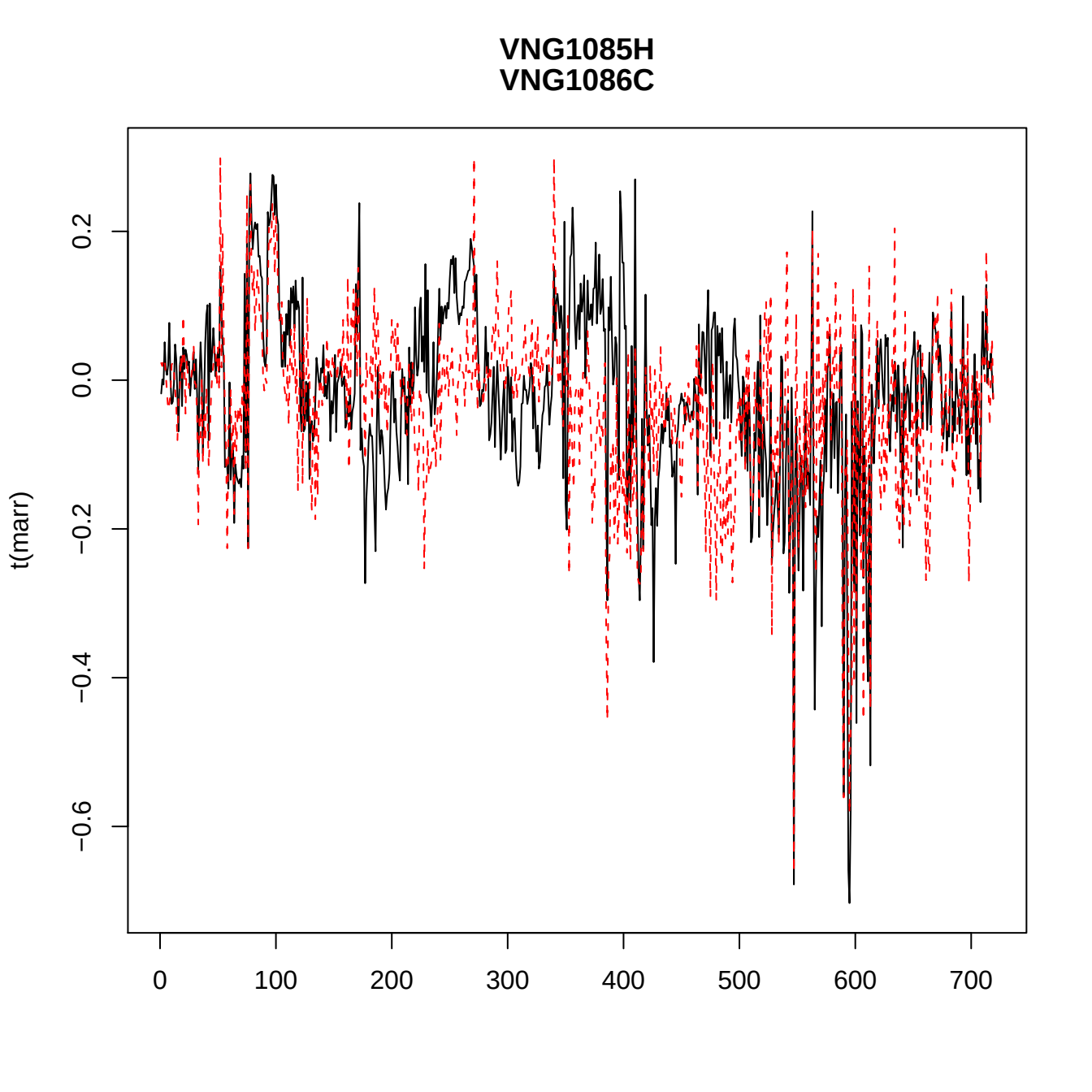

VNG1073G
VNG1074G
VNG1075G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

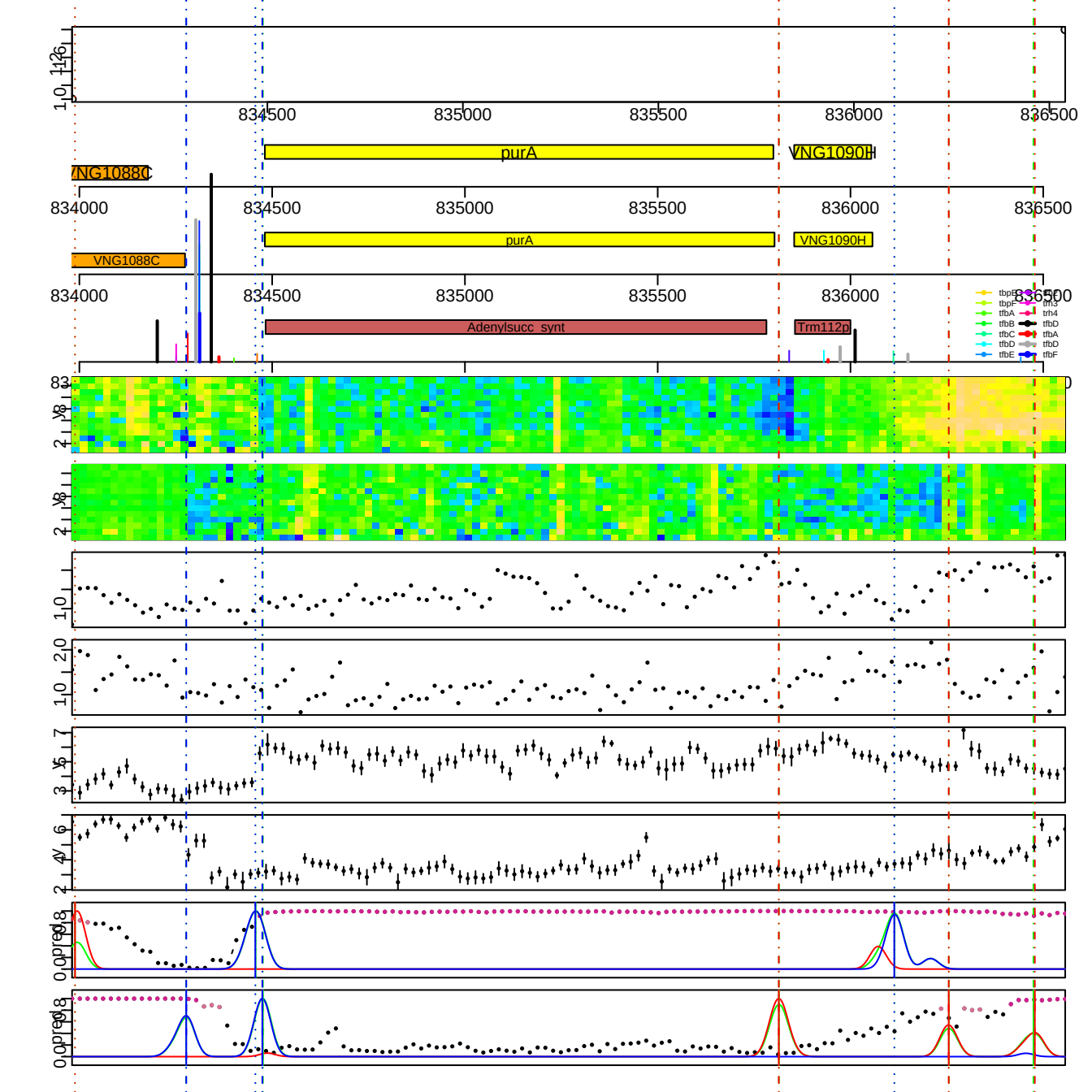


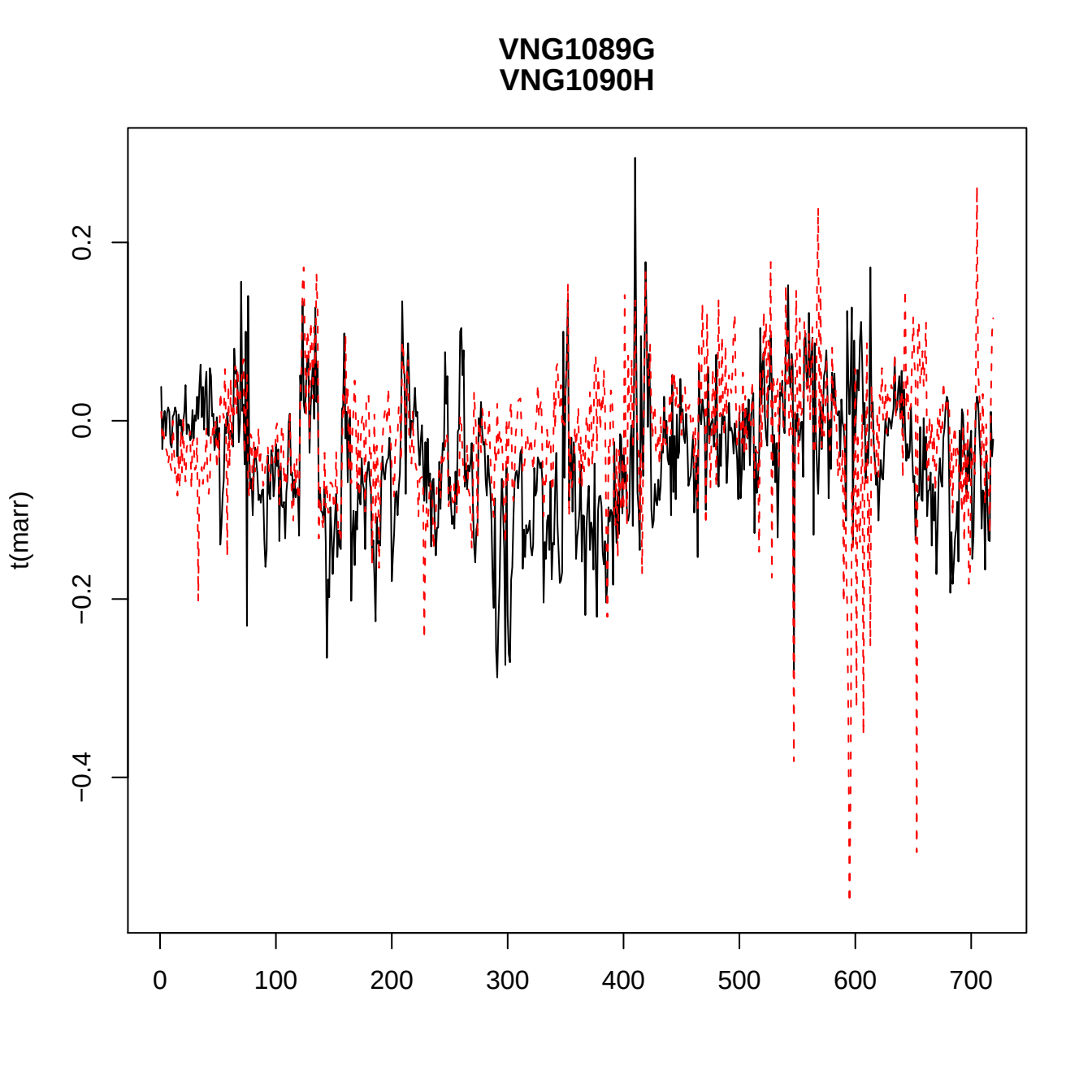
827000
828000
829000
830000
831000
menB
menD
menF
yuiH
ECH
TPP_enzyme_N
Chorismate_bind
tbpE
tbpF
tfbA
tfbB
tfbC
trh3
trh4
tfbD
tfbA

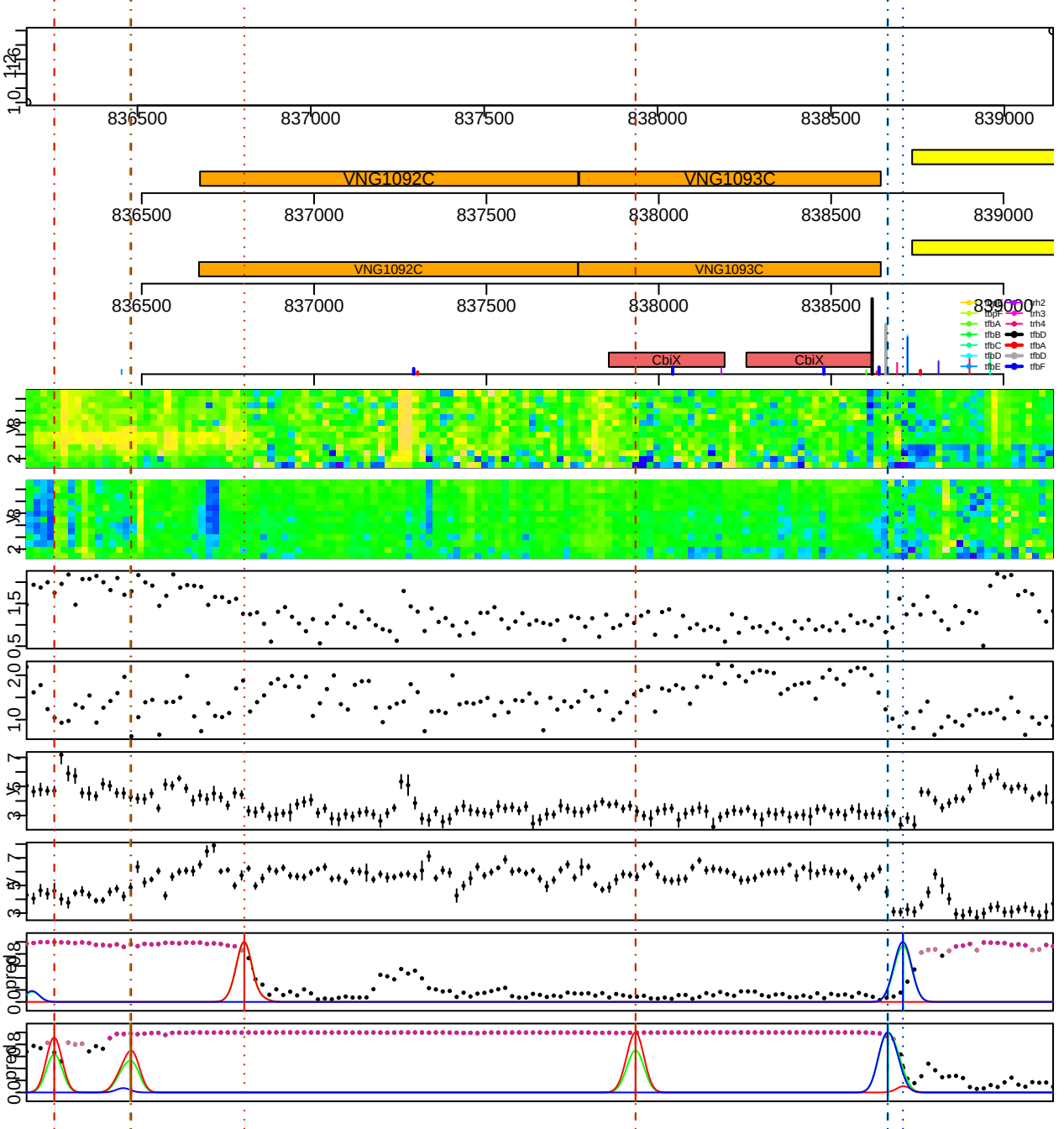

VNG1079G
VNG1081G
VNG1083G
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

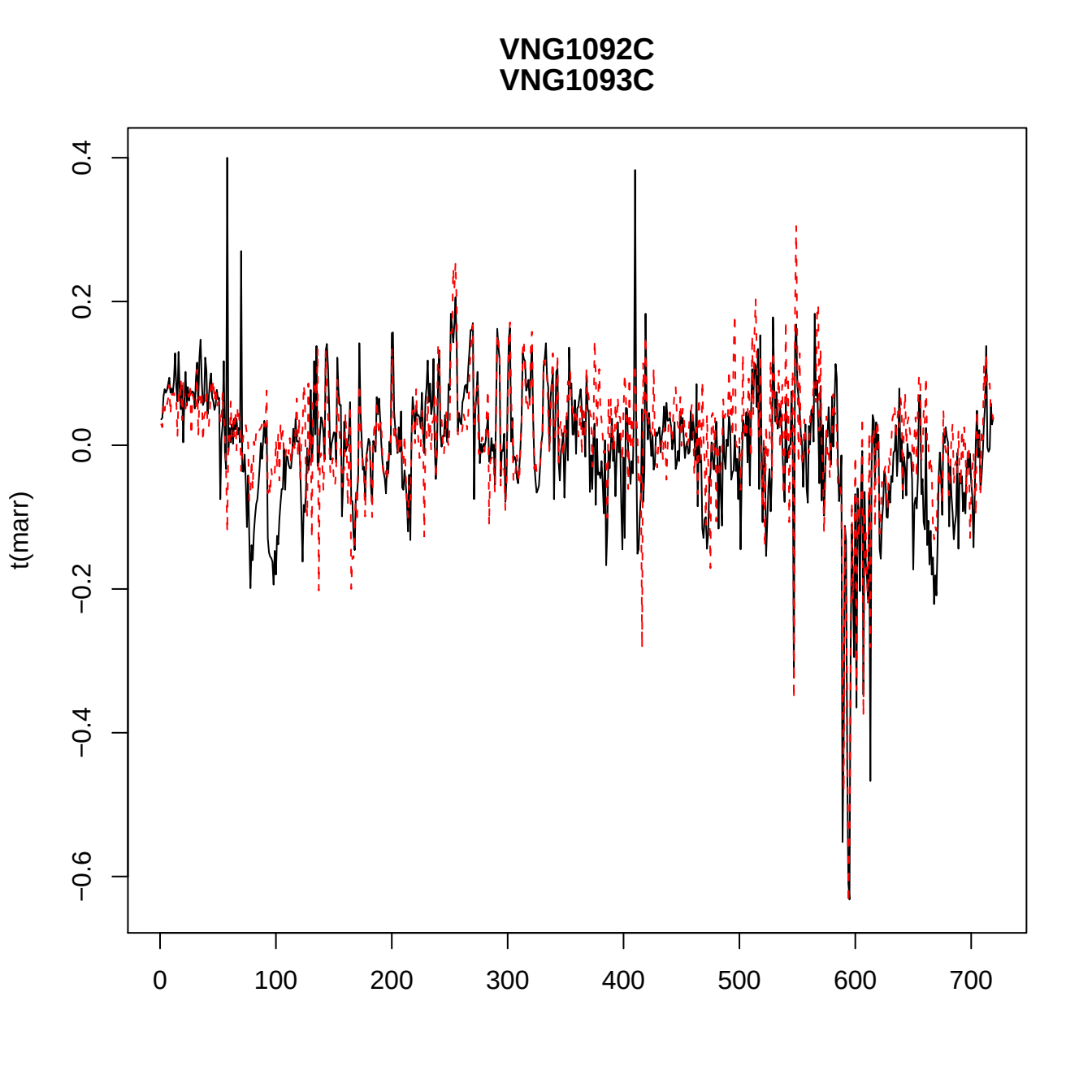

831000
831200
831400
831600
831800
832000
832200
832400
VNG1085H
VNG1086C
yuiH
UPF0058
red_molyb
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

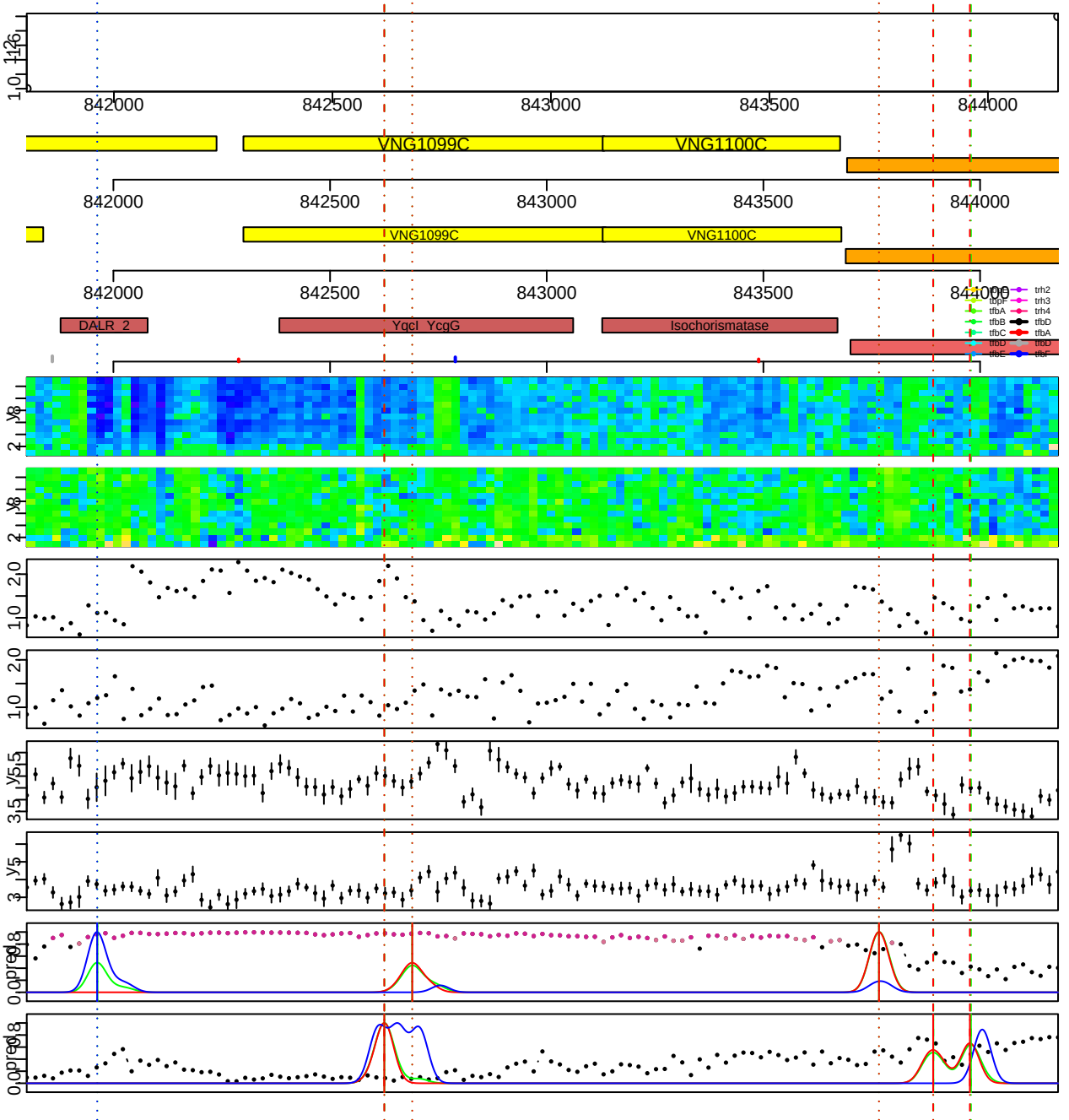

VNG1085H
VNG1086C
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

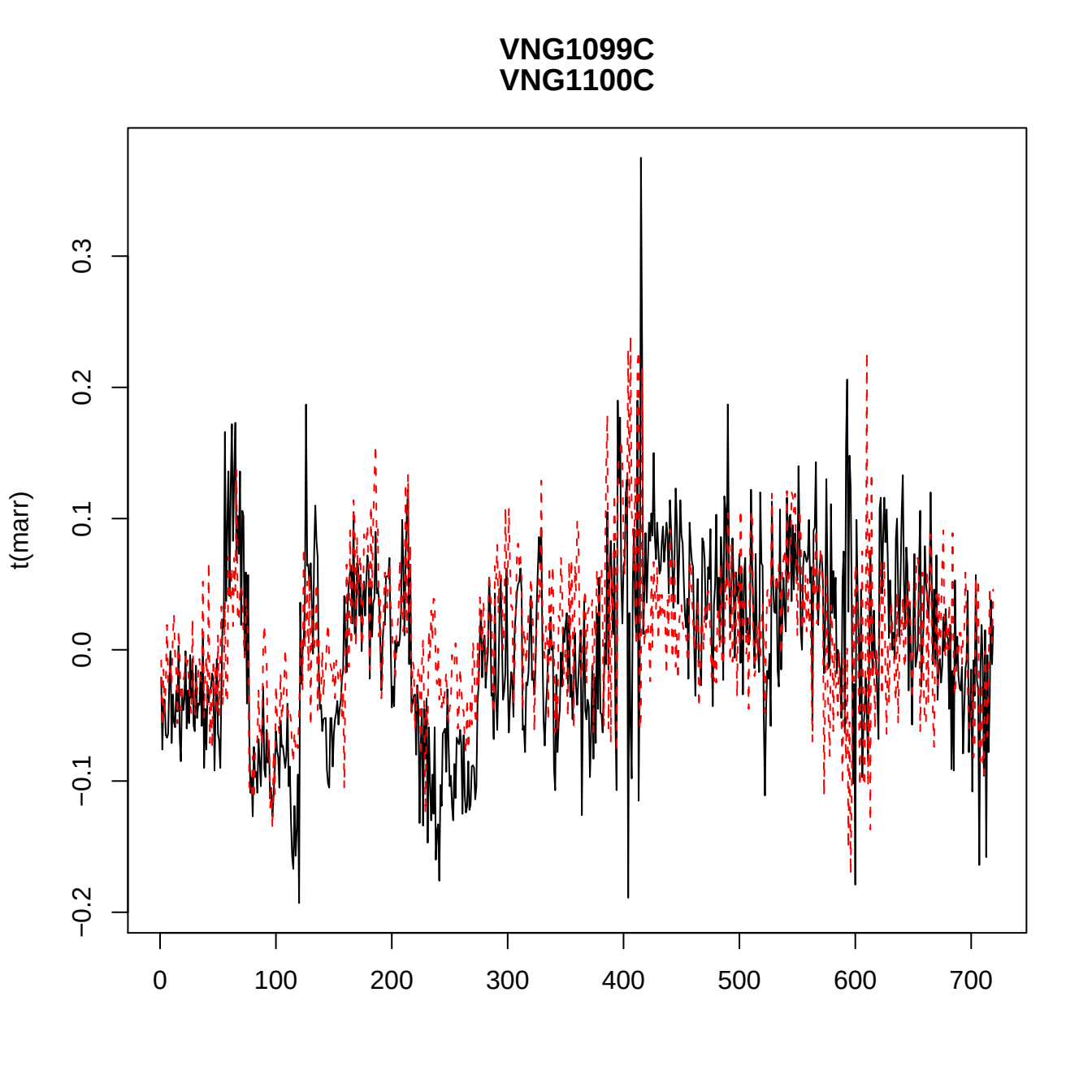

834500
835000
835500
836000
836500
purA
VNG1090H
VNG1088C
834000
VNG1088C
purA
VNG1090H
Adenylsucc_synt
Trm112p
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF

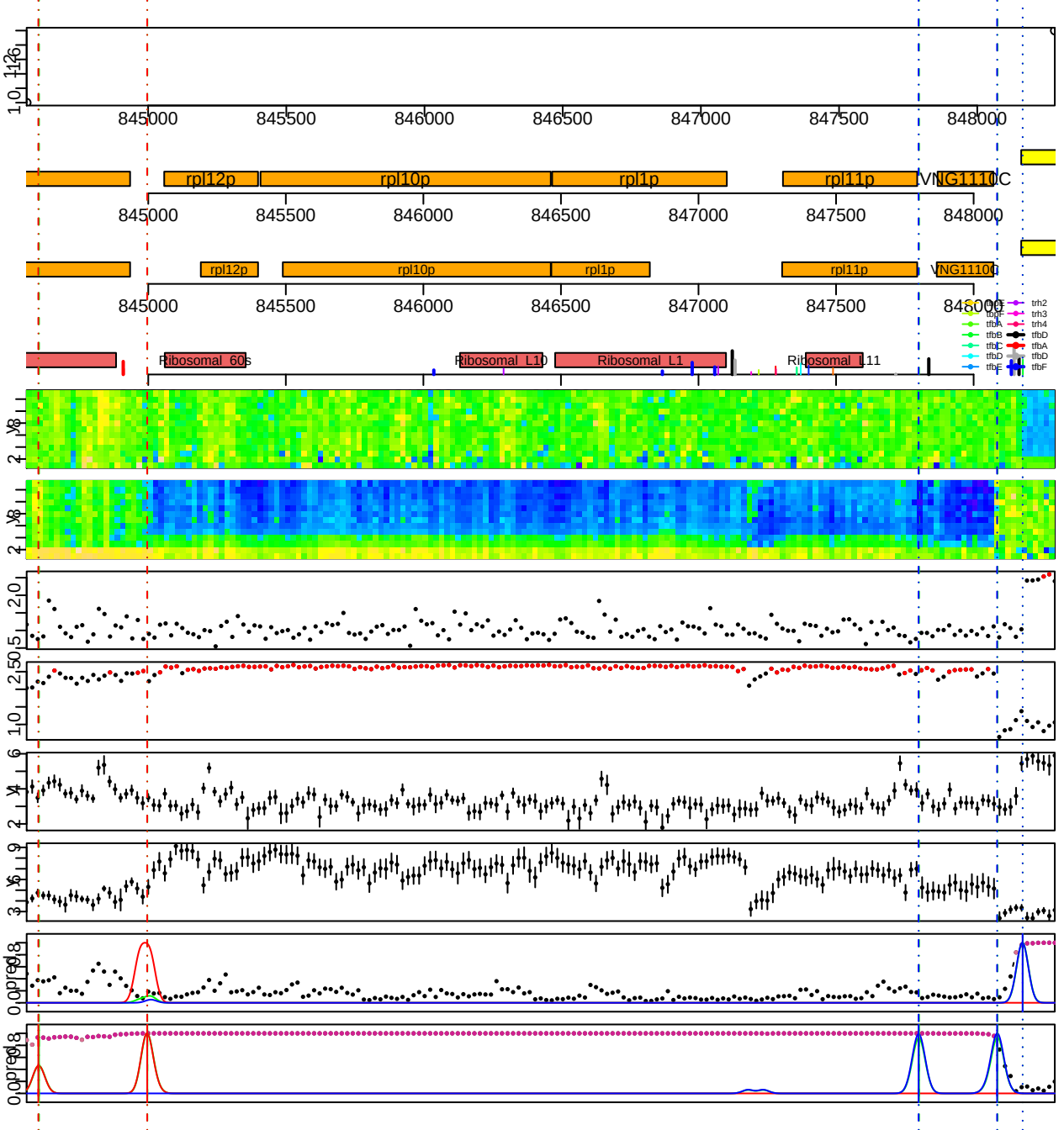

VNG1089G
VNG1090H
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

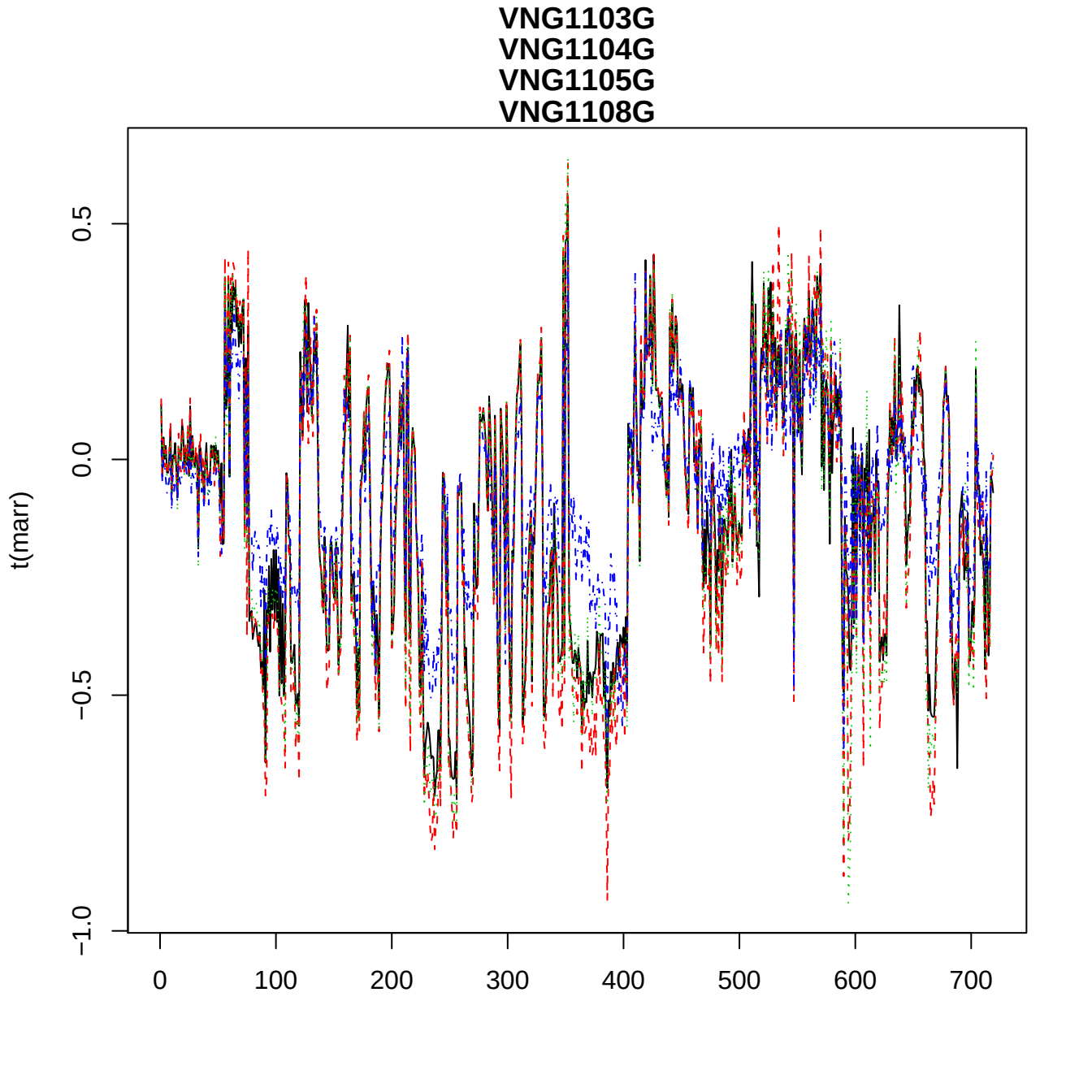

836500
837000
837500
838000
838500
839000
VNG1092C
VNG1093C
CbiX
CbiX
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE

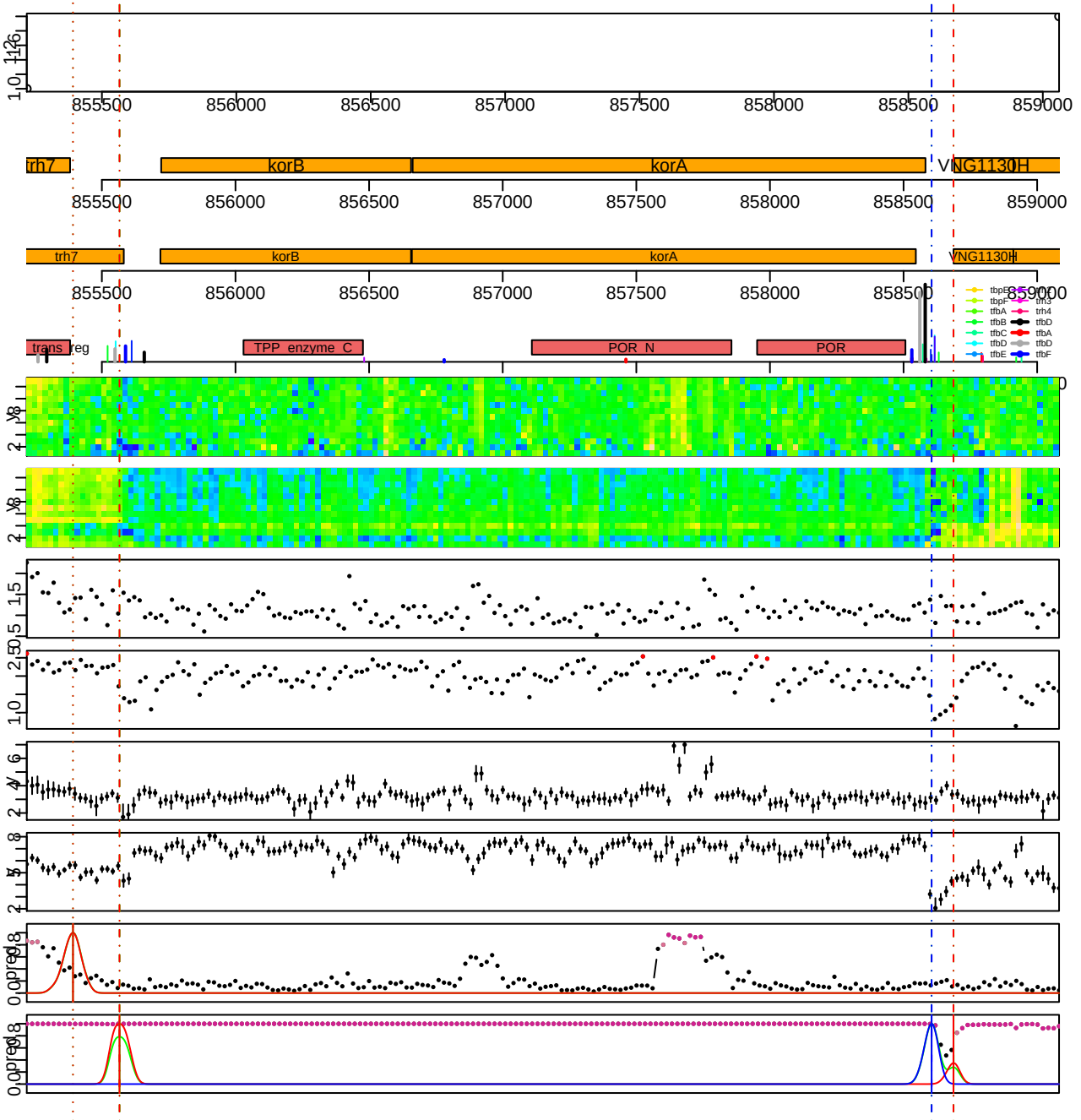

VNG1092C
VNG1093C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

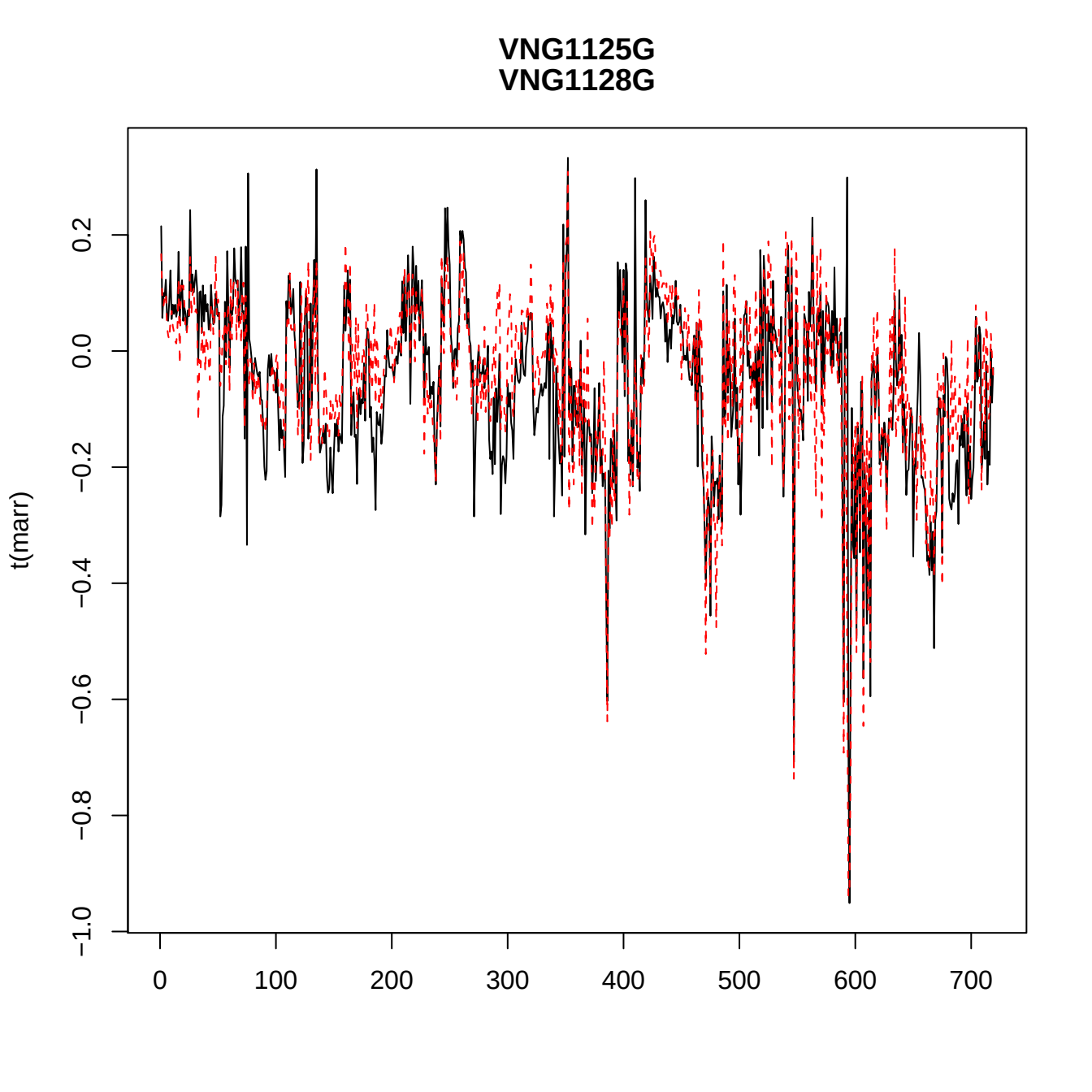

842000
842500
843000
843500
844000
VNG1099C
VNG1100C
DALR_2
YqcI_YcgG
Isochorismatase
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

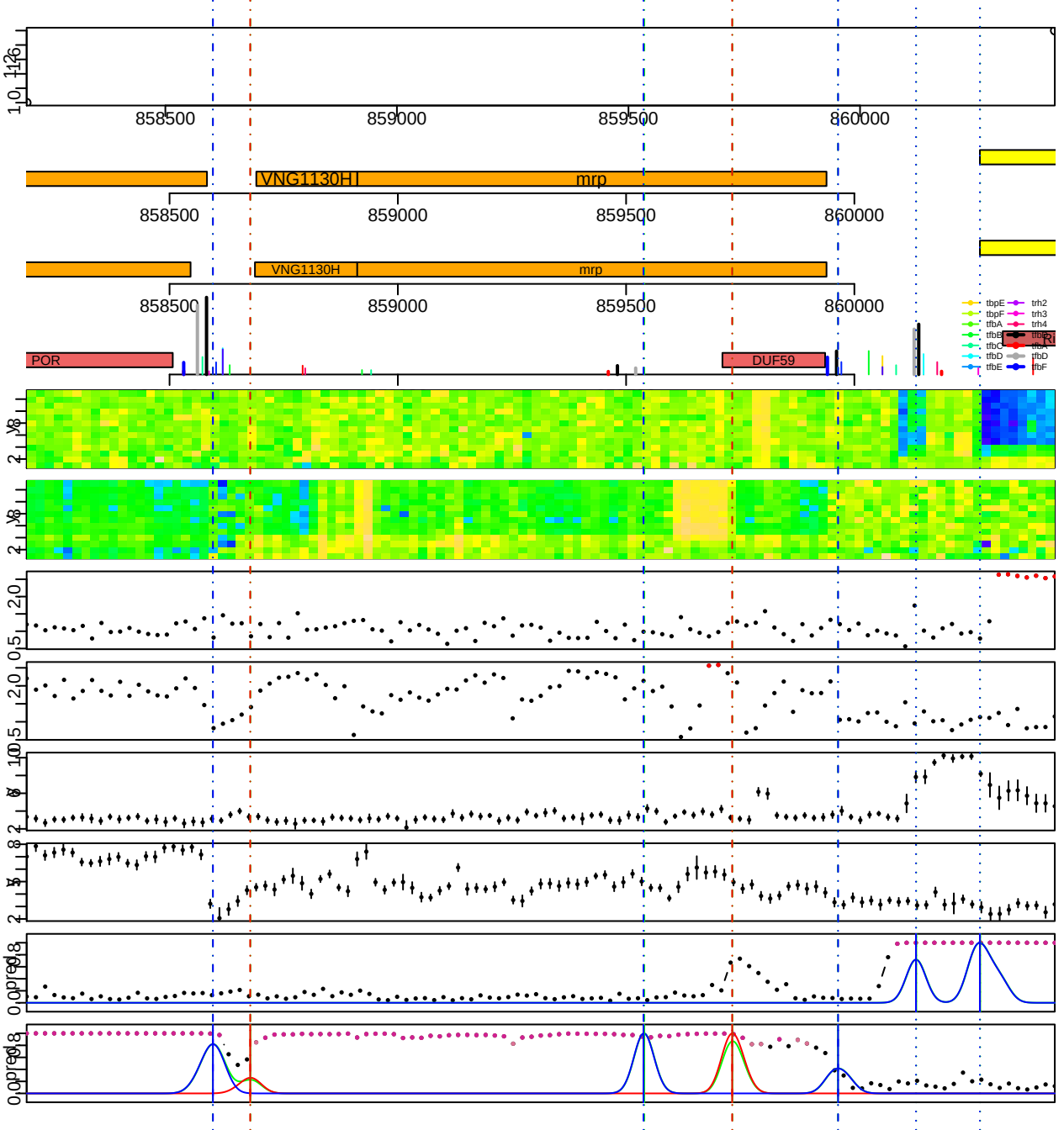

VNG1099C
VNG1100C
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

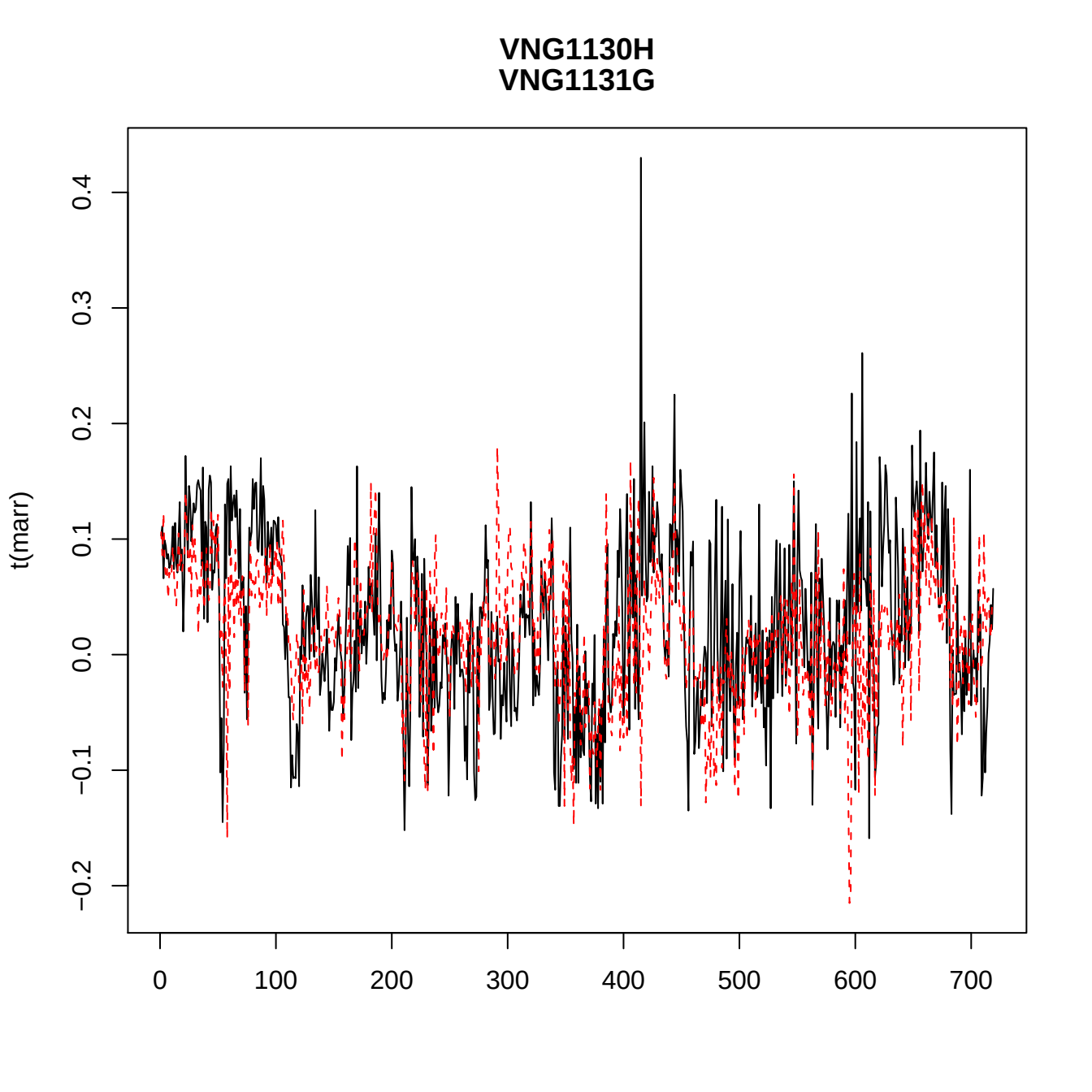

845000
845500
846000
846500
847000
847500
848000
rpl12p
rpl10p
rpl1p
rpl11p
VNG1111C
VNG1110C
Ribosomal_60s
Ribosomal_L10
Ribosomal_L1
Ribosomal_L11
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

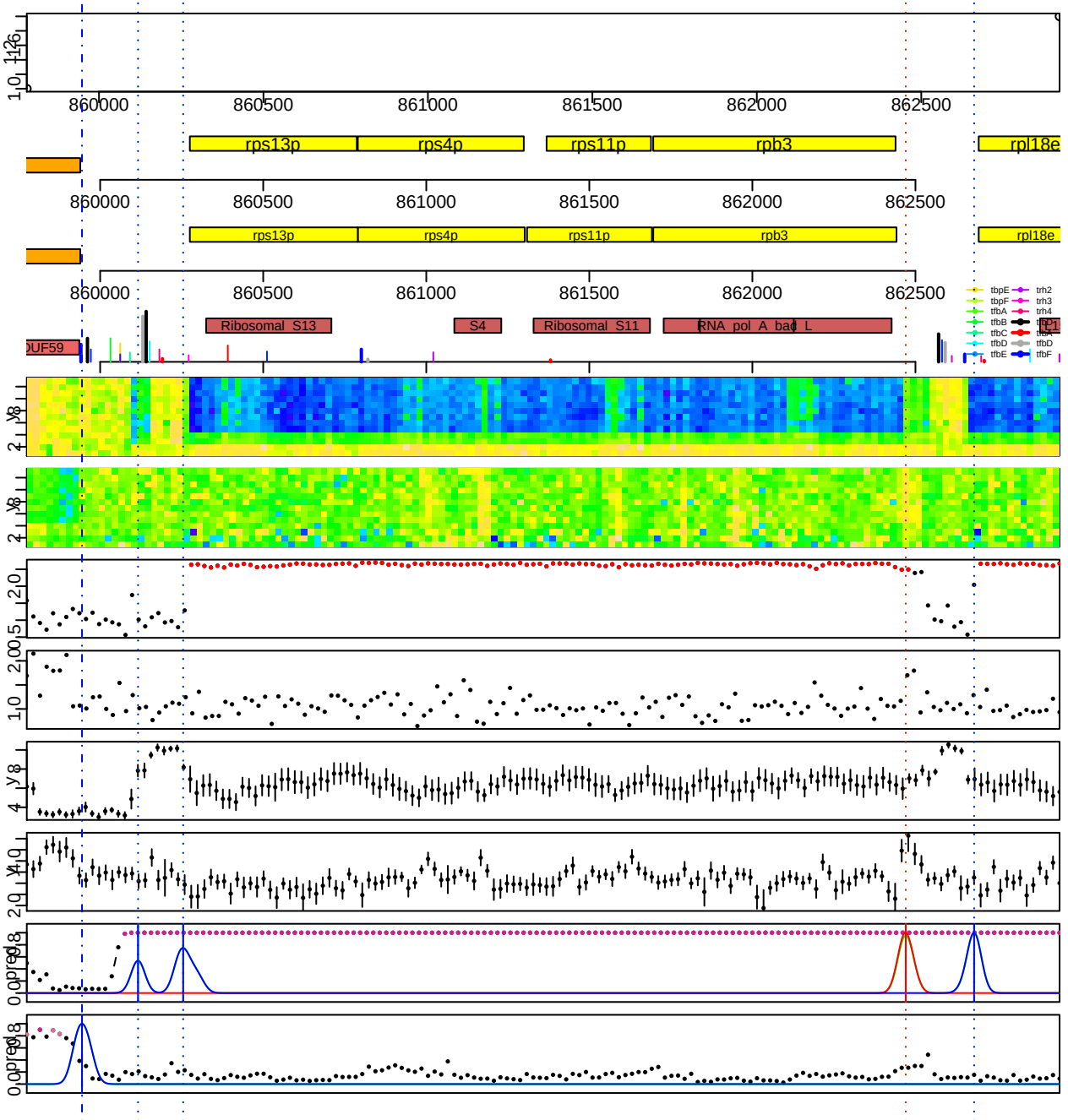

VNG1103G
VNG1104G
VNG1105G
VNG1108G
t(marr)
0.5
0.0
−0.5
−1.0
0
100
200
300
400
500
600
700

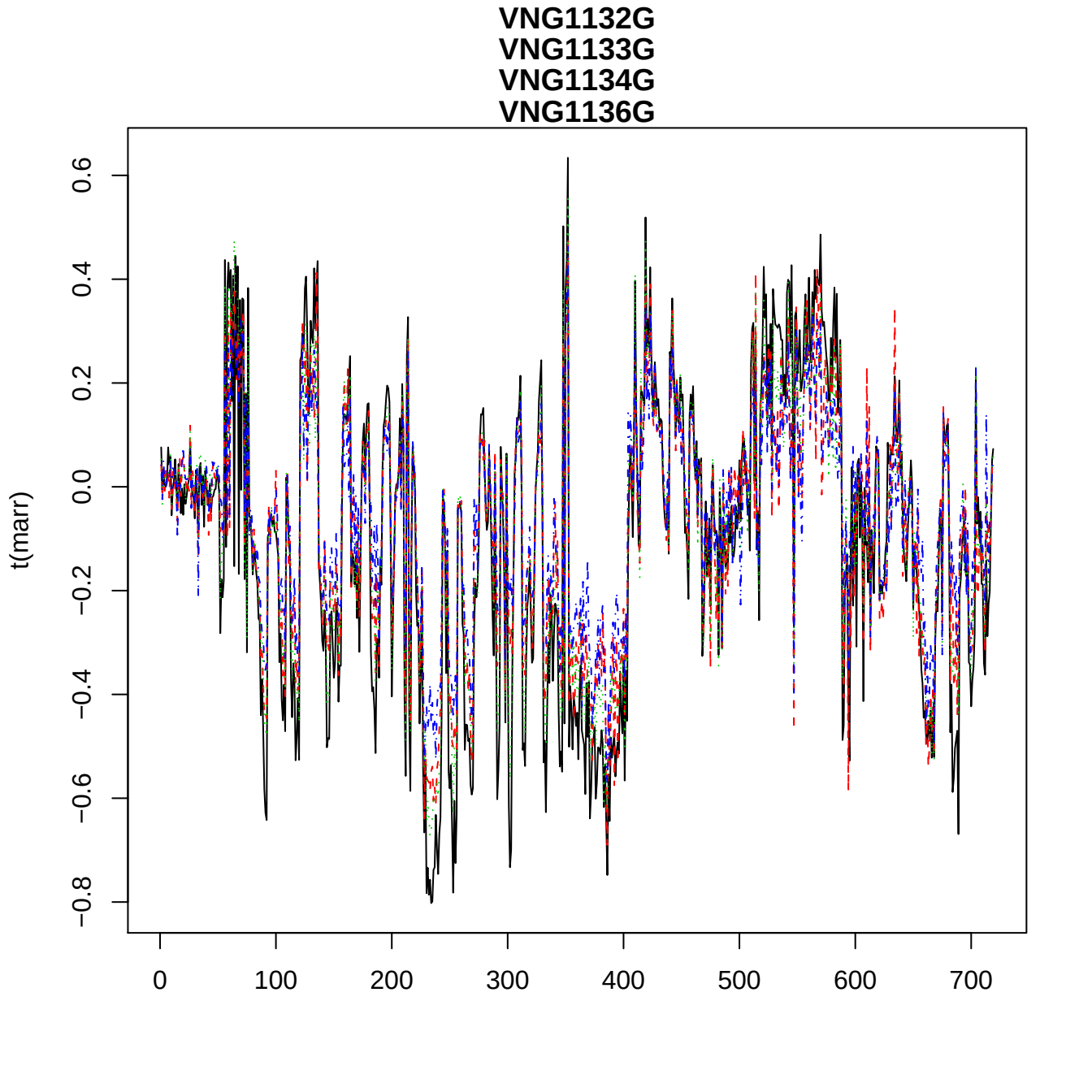

855500
856000
856500
857000
857500
858000
858500
859000
trh7
korB
korA
VNG1130H
trans_reg
TPP_enzyme_C
POR_N
POR
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

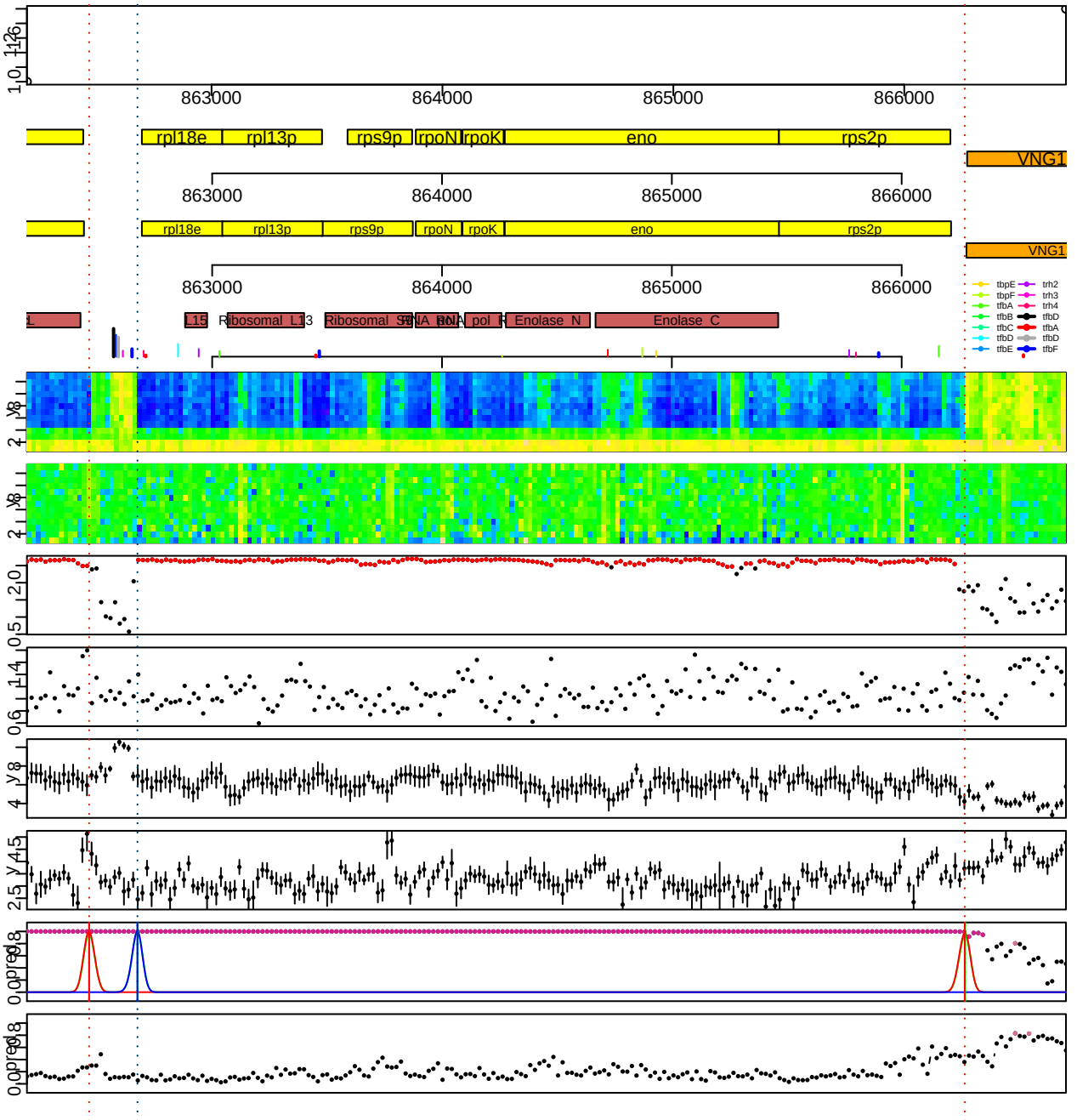

VNG1125G
VNG1128G
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
0
100
200
300
400
500
600
700

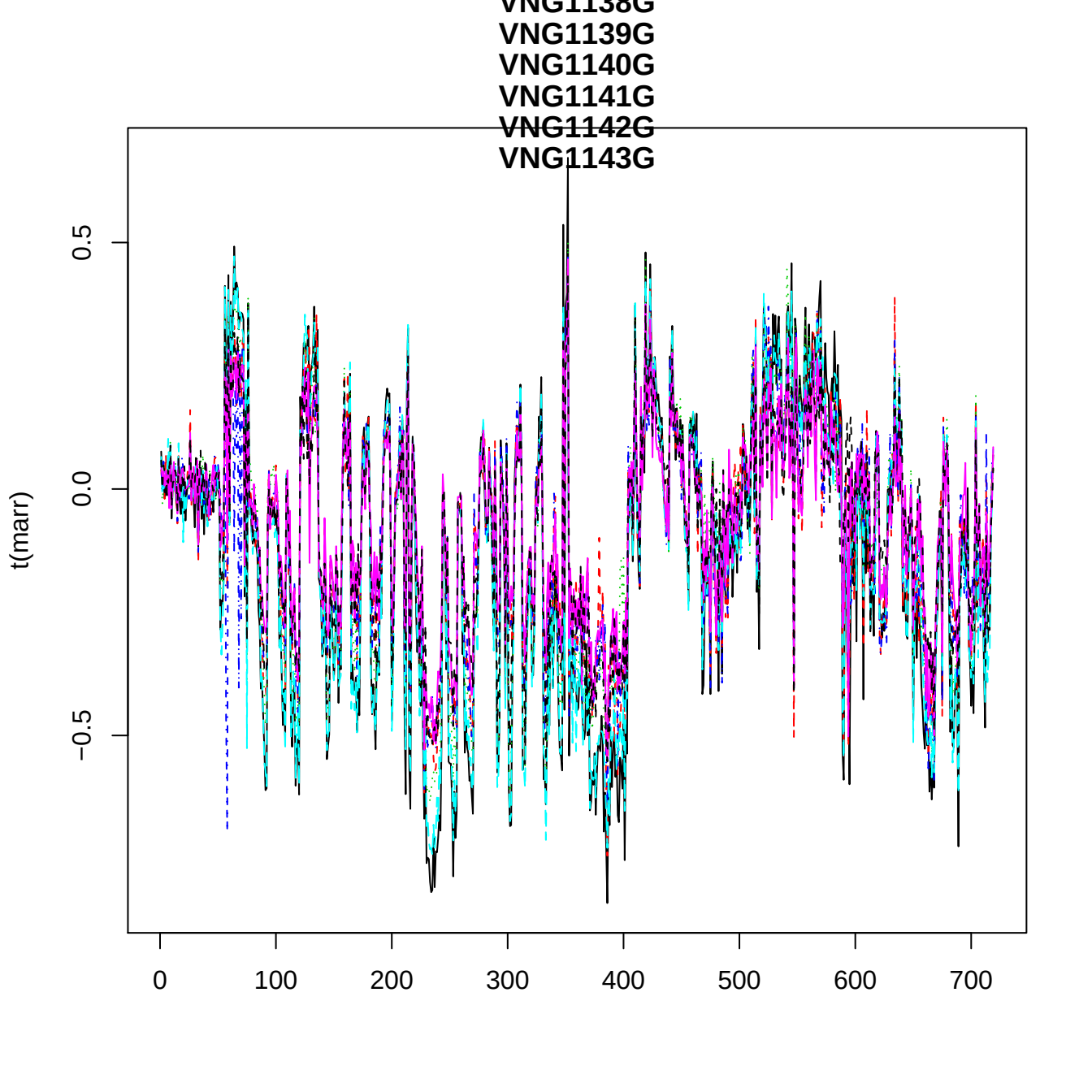

858500
859000
859500
860000
VNG1130H
mrp
POR
DUF59
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbG
tfbA
tfbD
tfbF

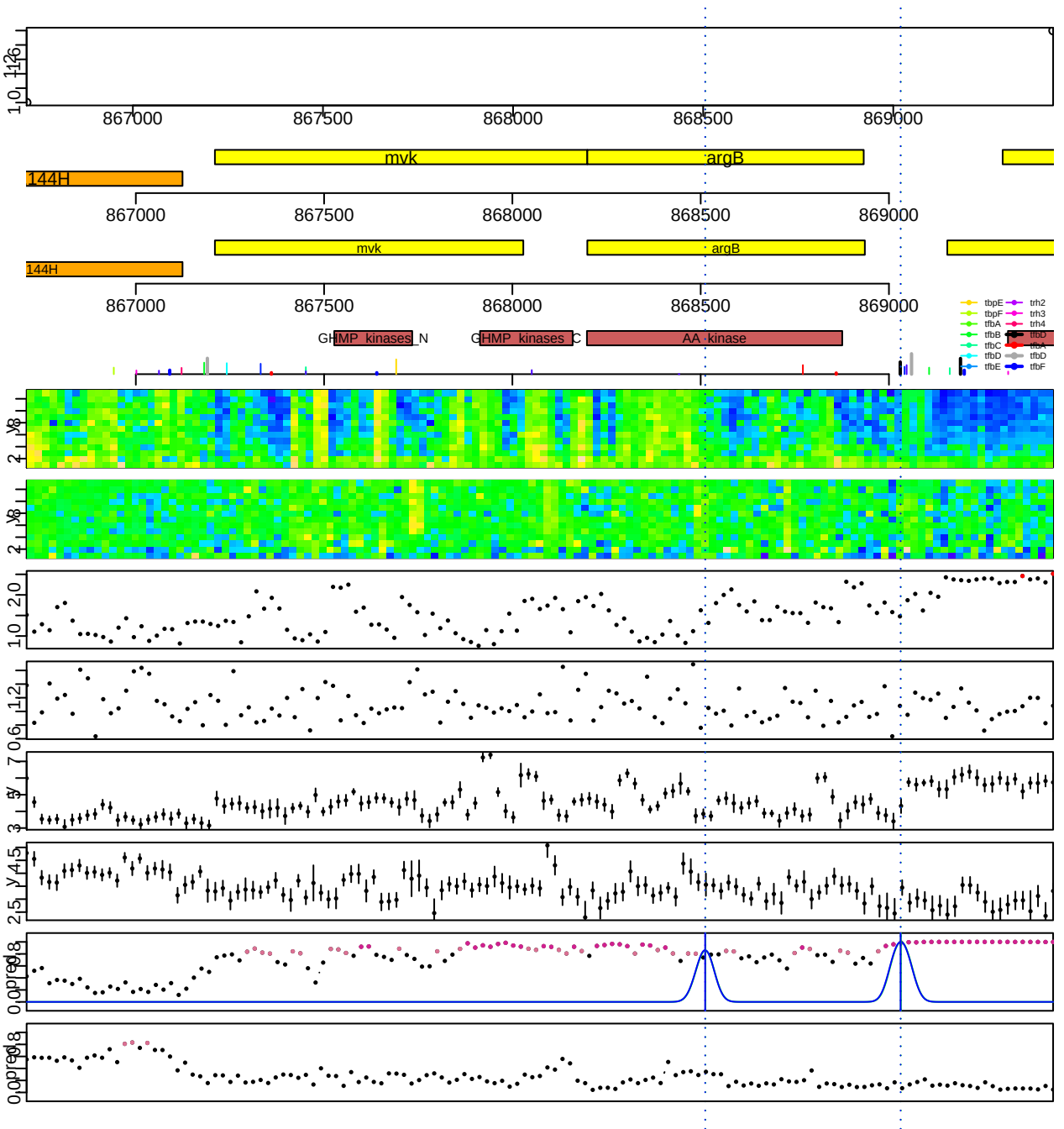

VNG1130H
VNG1131G
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

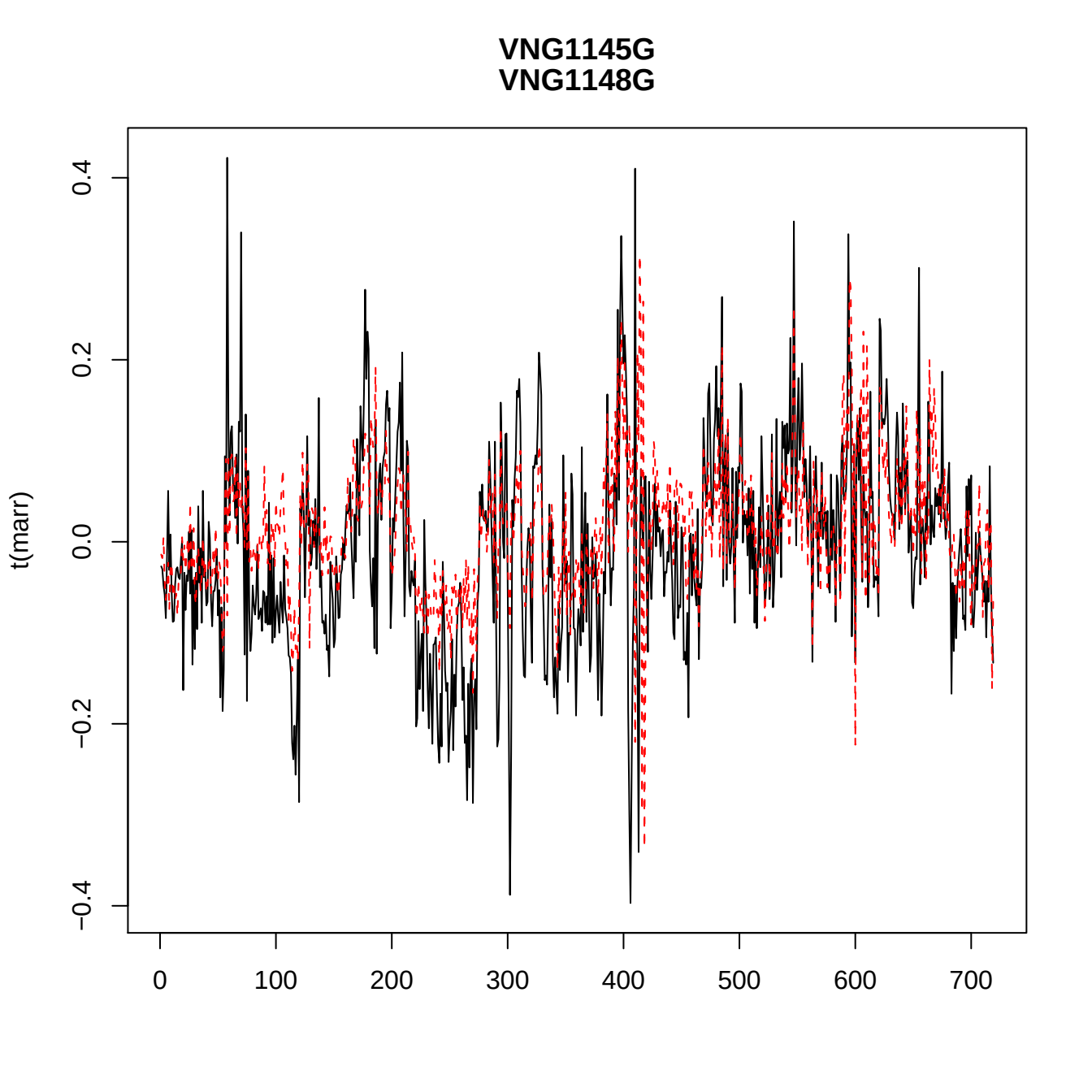

860000
860500
861000
861500
862000
862500
rps13p
rps4p
rps11p
rpb3
rpl18e
Ribosomal_S13
S4
Ribosomal_S11
RNA_pol_A_bac_L
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbG1
tfbA
tfbD
tfbF
pred

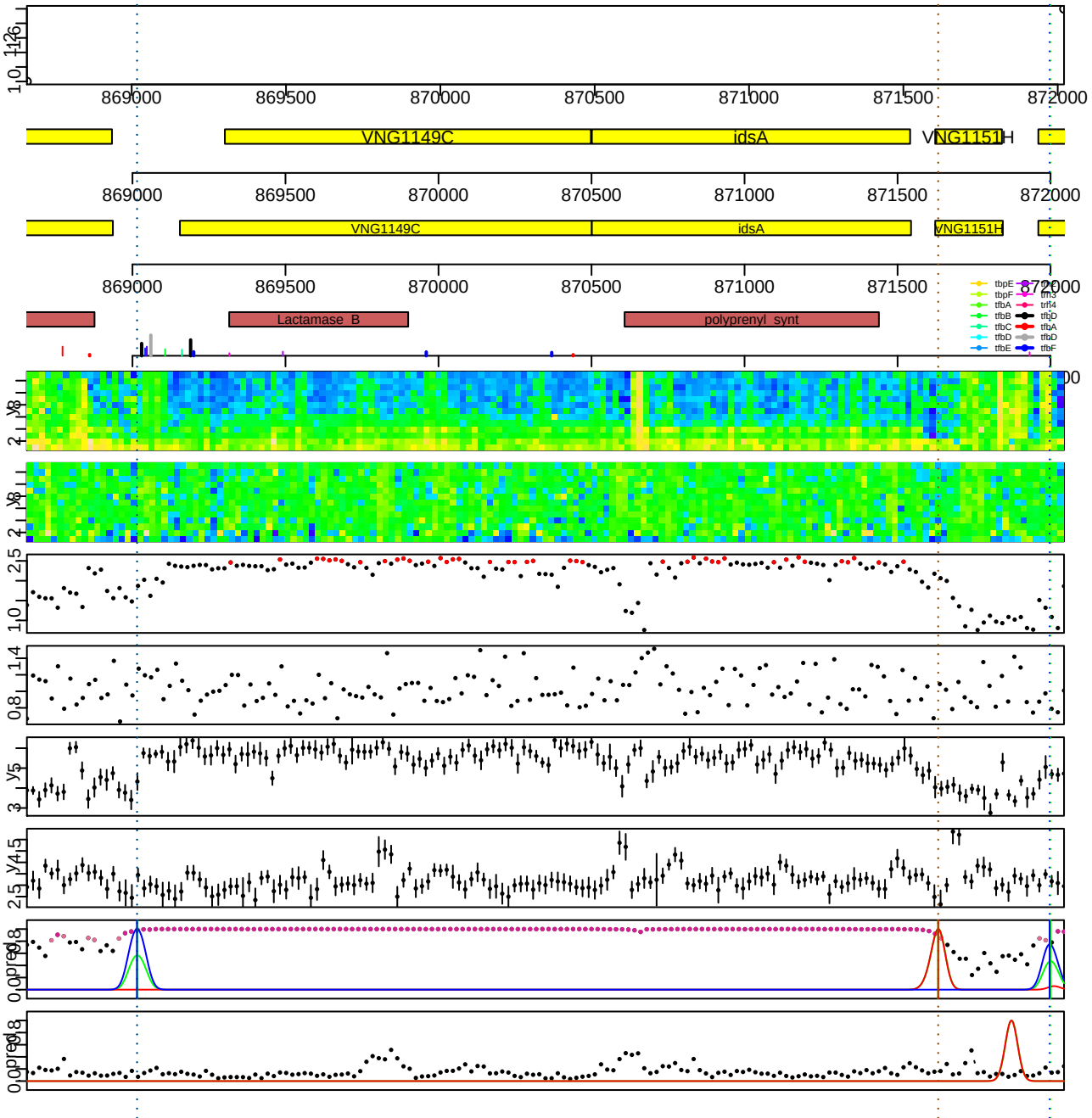

VNG1132G
VNG1133G
VNG1134G
VNG1136G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

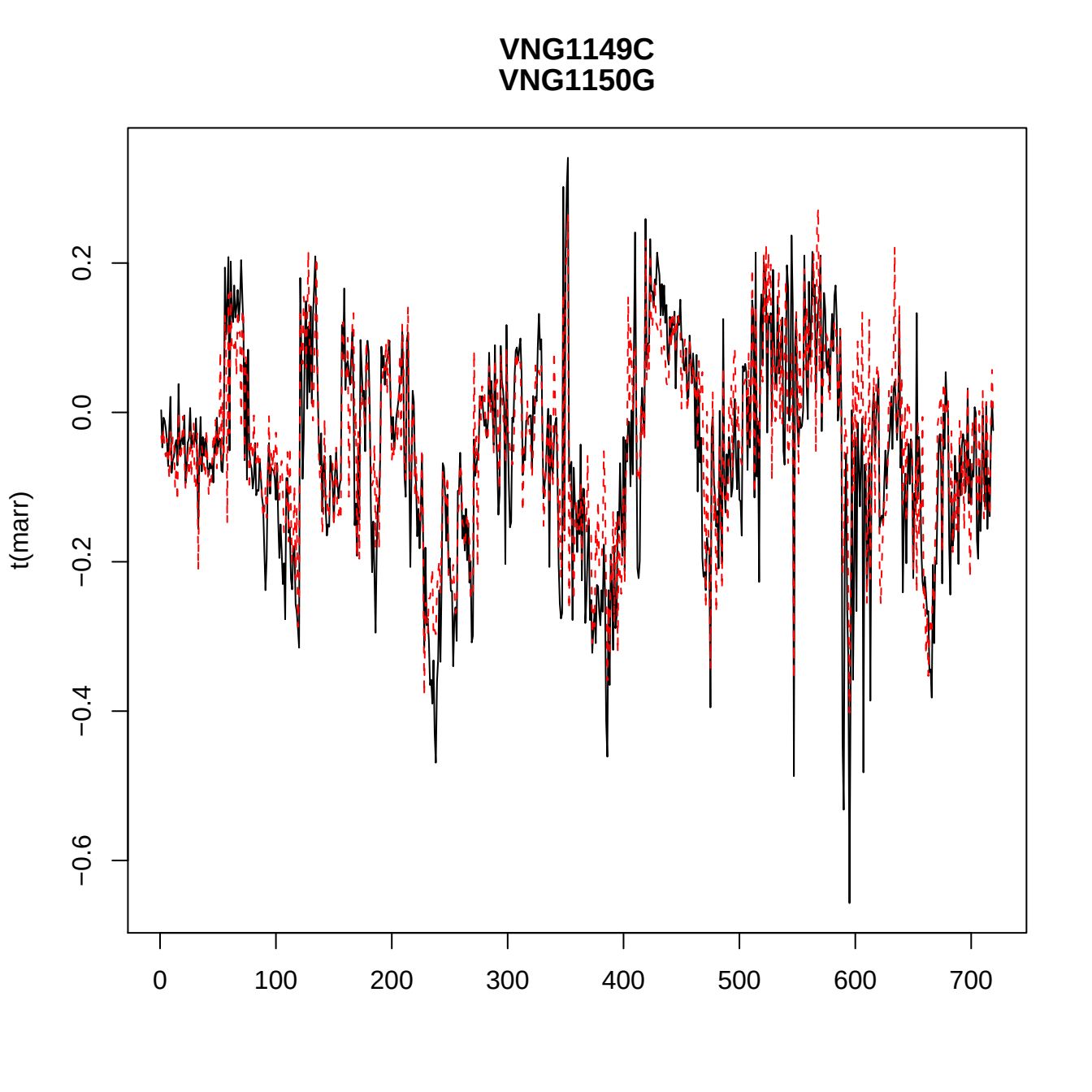

863000
864000
865000
866000
rpl18e
rpl13p
rps9p
rpoN
rpoK
eno
rps2p
VNG1
L15
Ribosomal_L13
Enolase_N
Enolase_C
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1138G
VNG1139G
VNG1140G
VNG1141G
VNG1142G
VNG1143G
t(marr)
0.5
0.0
−0.5
0
100
200
300
400
500
600
700


867000
867500
868000
868500
869000
mvk
argB
144H
GHMP_kinases_N
GHMP_kinases_C
AA_kinase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1145G
VNG1148G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


869000
869500
870000
870500
871000
871500
872000
VNG1149C
idsA
VNG1151H
Lactamase_B
polyprenyl_synt
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
tfb3
trf4
tfbD
tfbA
tfbD
tfbF
pred


VNG1149C
VNG1150G
t(marr)
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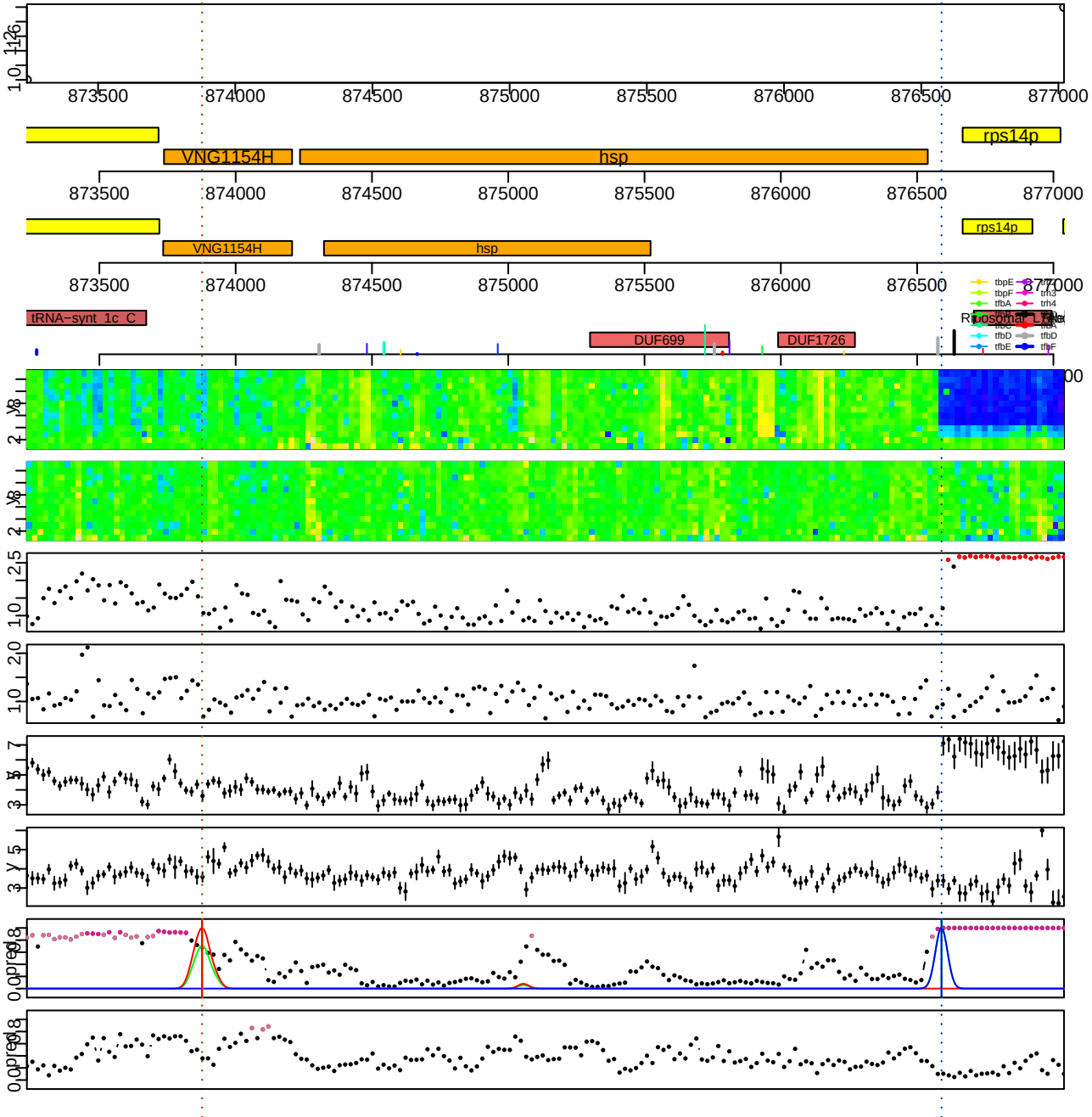
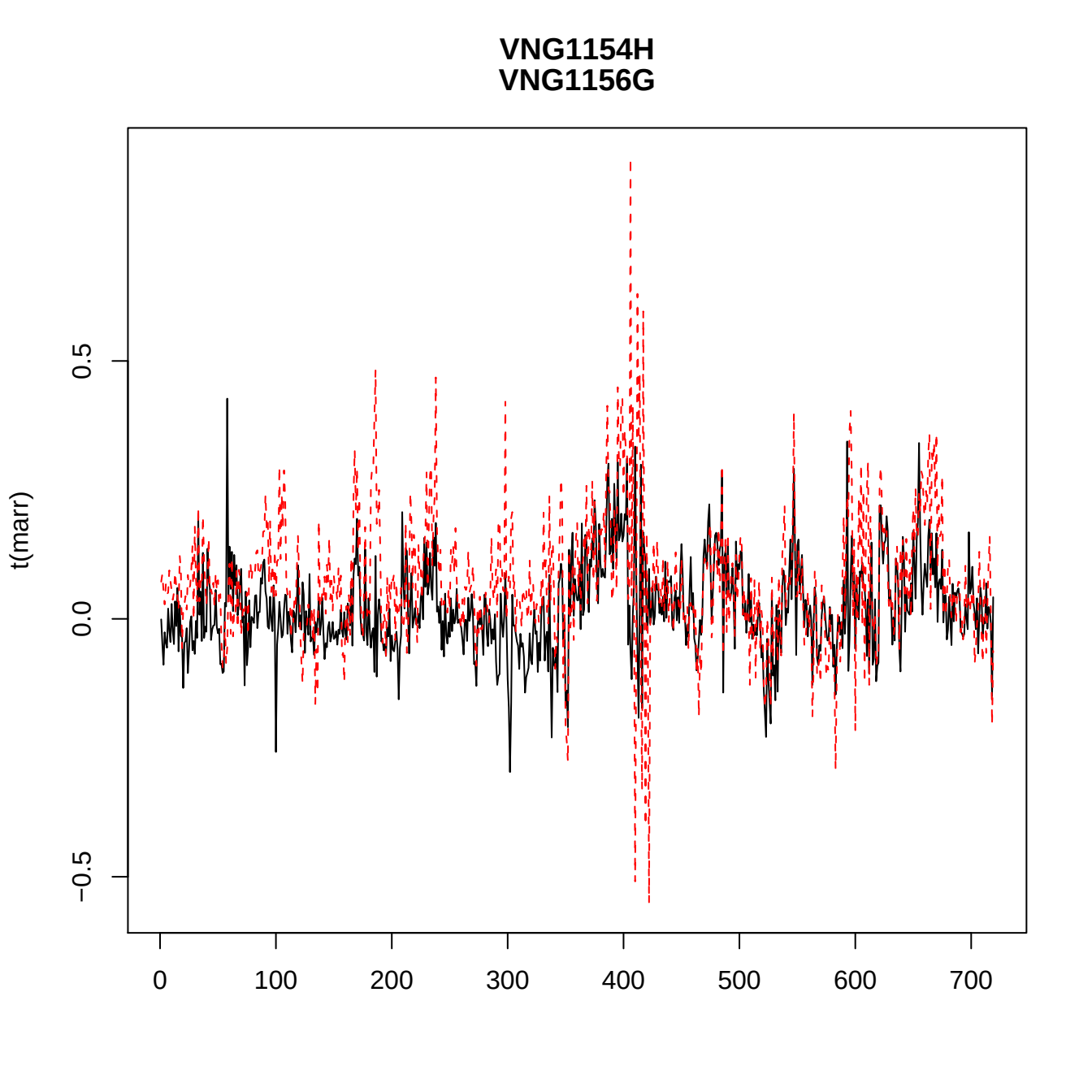
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


873500
874000
874500
875000
875500
876000
876500
877000
rps14p
VNG1154H
hsp
tRNA−synt_1c_C
DUF699
DUF1726
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbA
tfbD
tfbF


VNG1154H
VNG1156G
t(marr)
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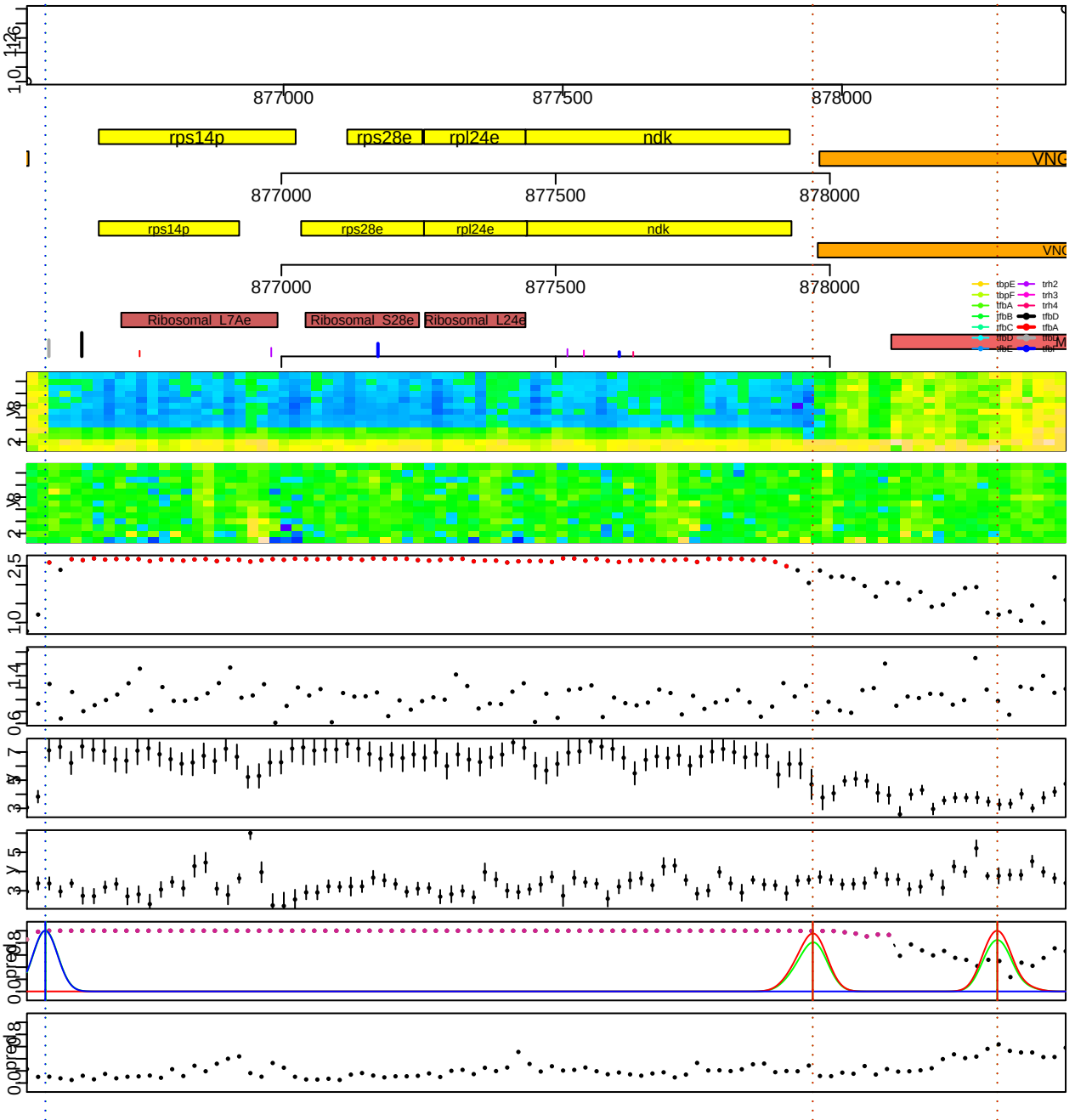
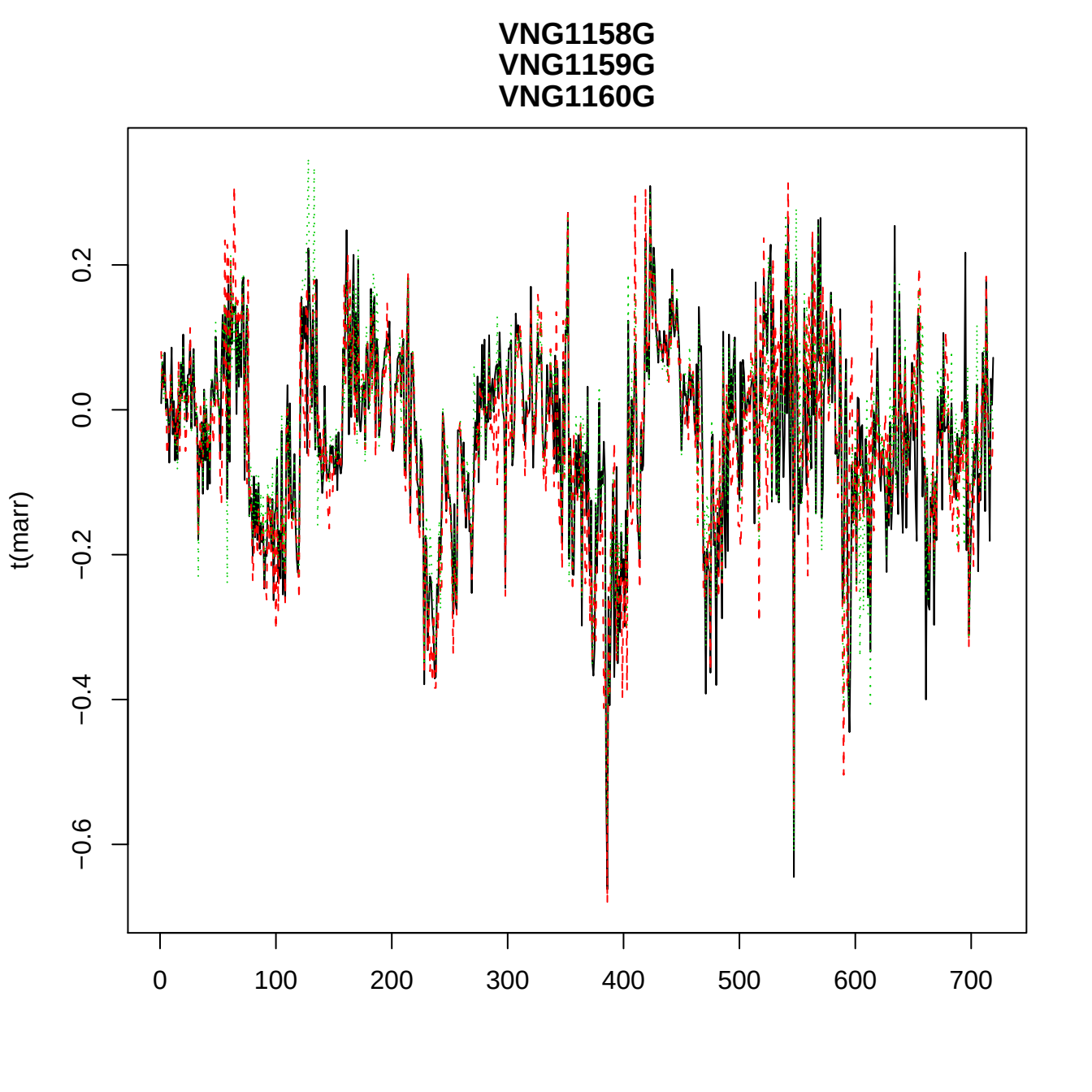
0.0
−0.5
0
100
200
300
400
500
600
700


877000
877500
878000
rps14p
rps28e
rpl24e
ndk
VNG
Ribosomal_L7Ae
Ribosomal_S28e
Ribosomal_L24e
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA


VNG1158G
VNG1159G
VNG1160G
t(marr)
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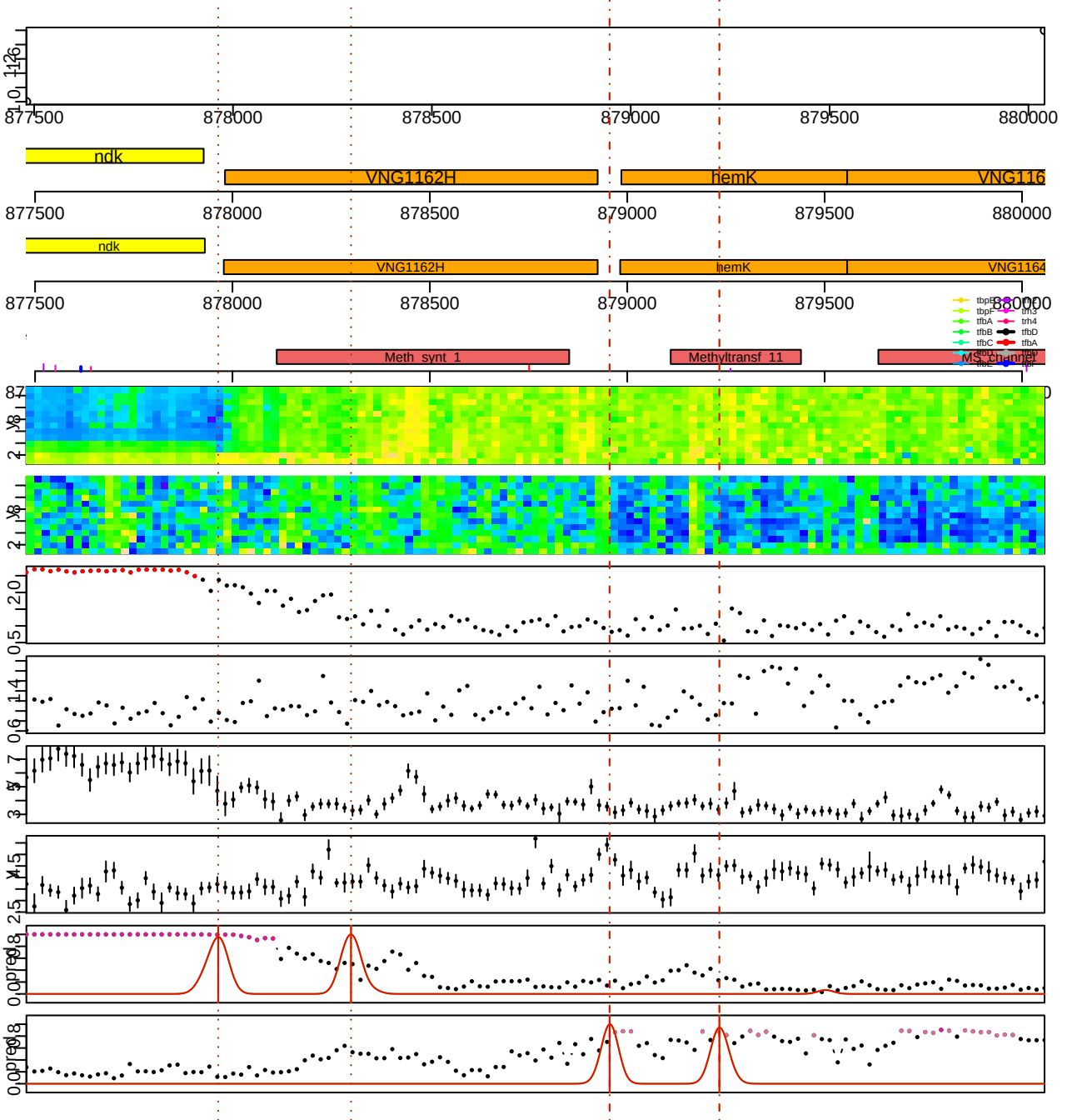
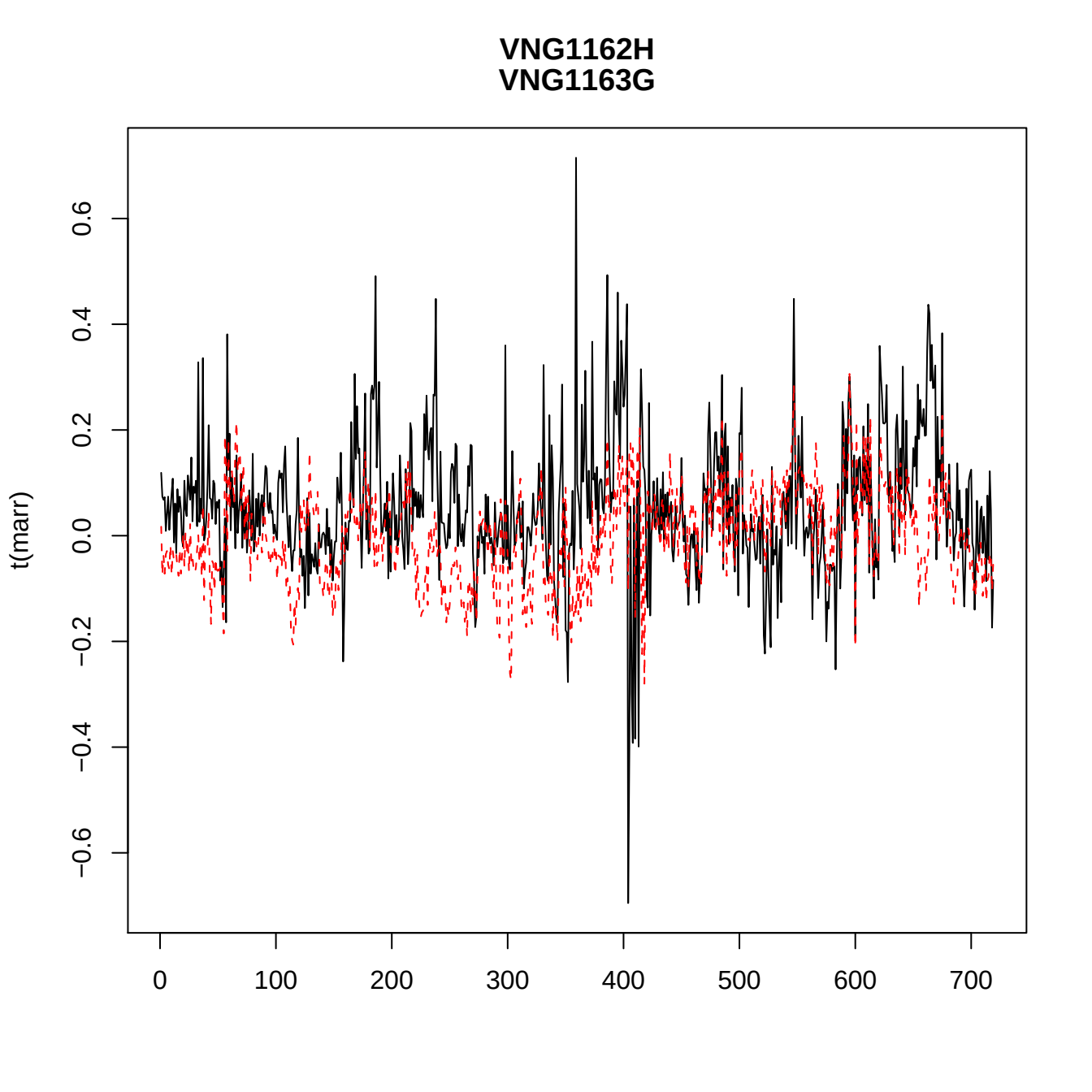
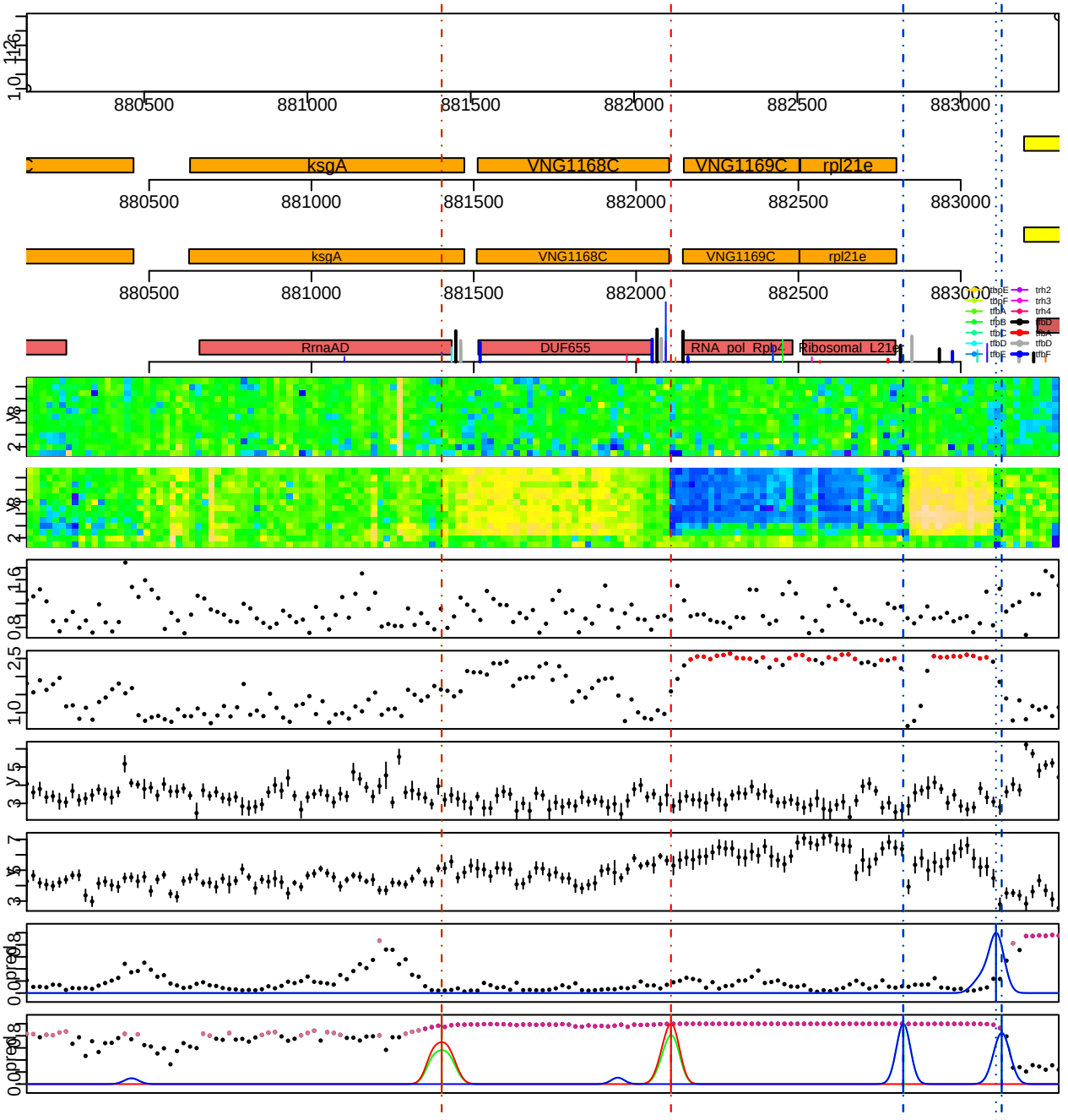
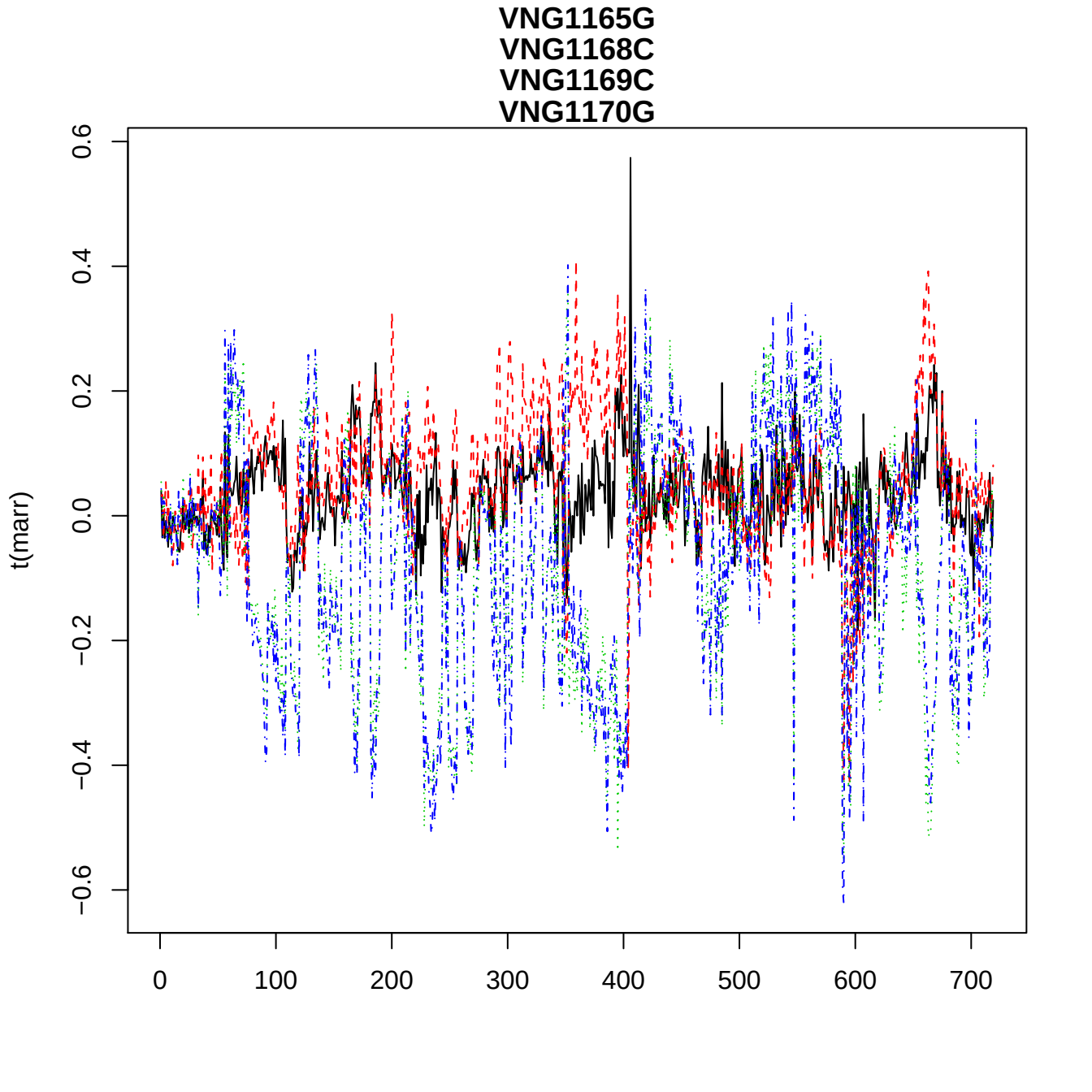
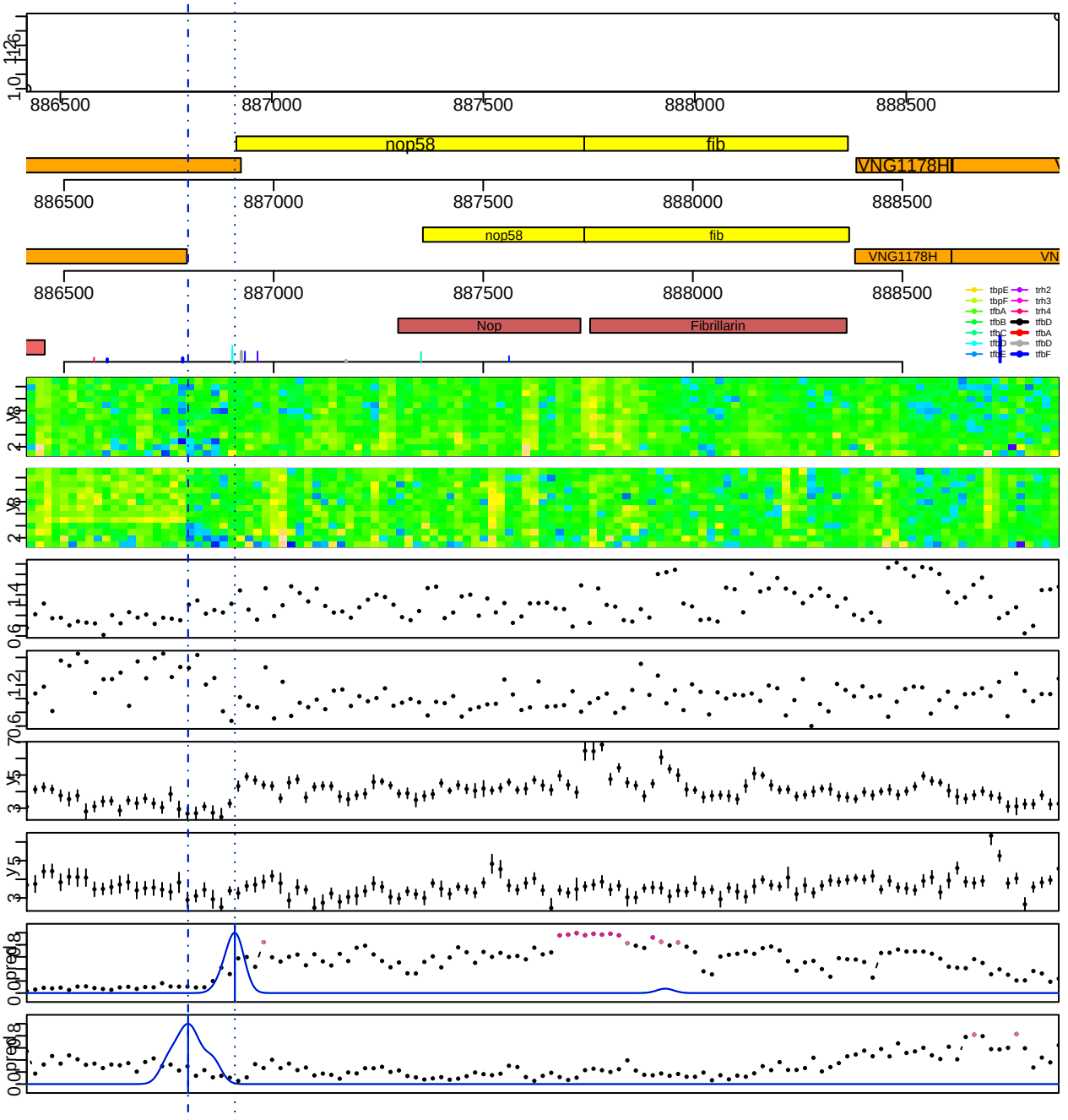
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


877500
878000
878500
879000
879500
880000
ndk
VNG1162H
hemK
VNG116
VNG1164
Meth_synt_1
Methyltransf_11
MS_channel
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tbp
tbpF


VNG1162H
VNG1163G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


880500
881000
881500
882000
882500
883000
ksgA
VNG1168C
VNG1169C
rpl21e
RrnaAD
DUF655
RNA_pol_Rpb4
Ribosomal_L21e
tbpE
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1165G
VNG1168C
VNG1169C
VNG1170G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700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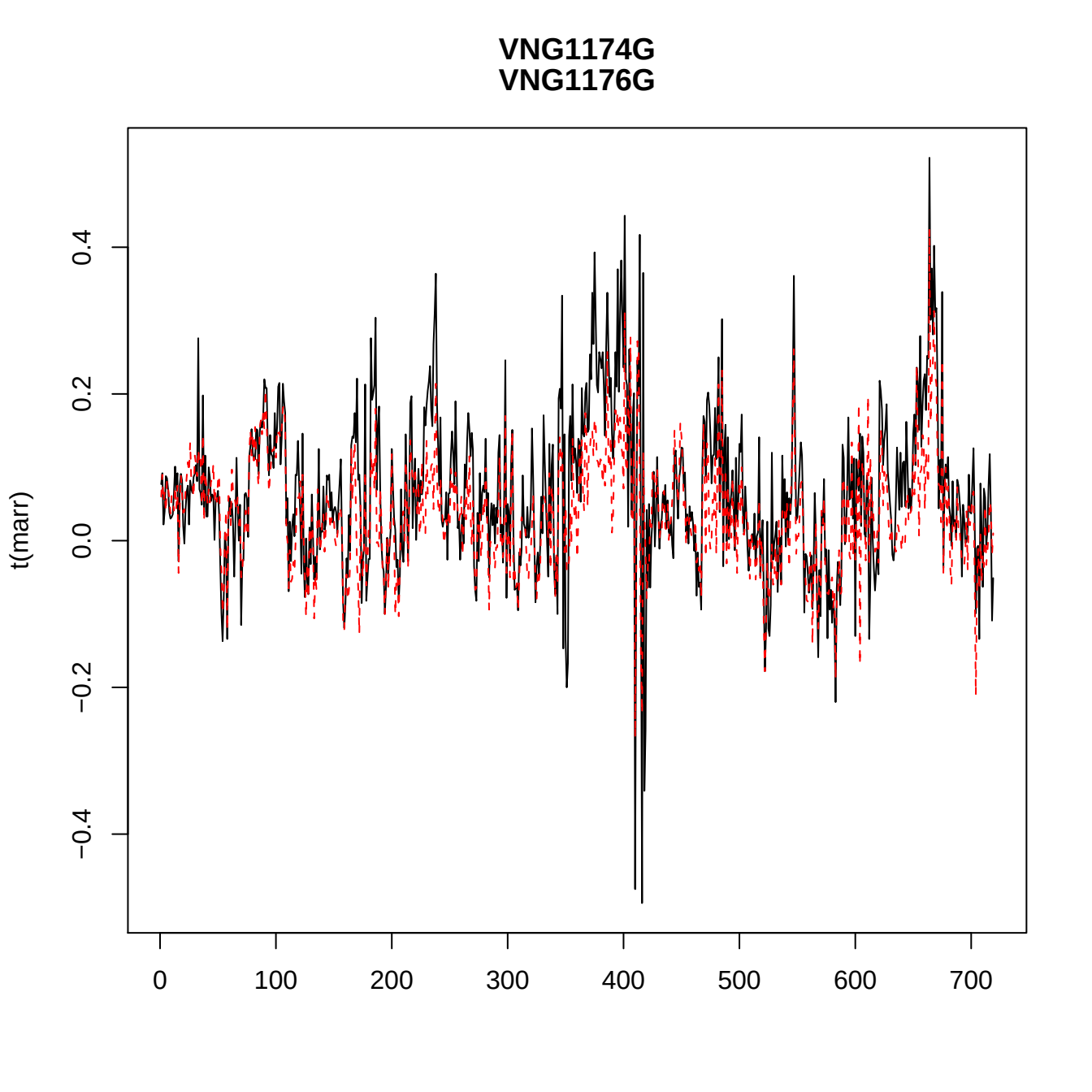
887000
887500
888000
888500
nop58
fib
VNG1178H
Nop
Fibrillarin
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1174G
VNG1176G
t(marr)
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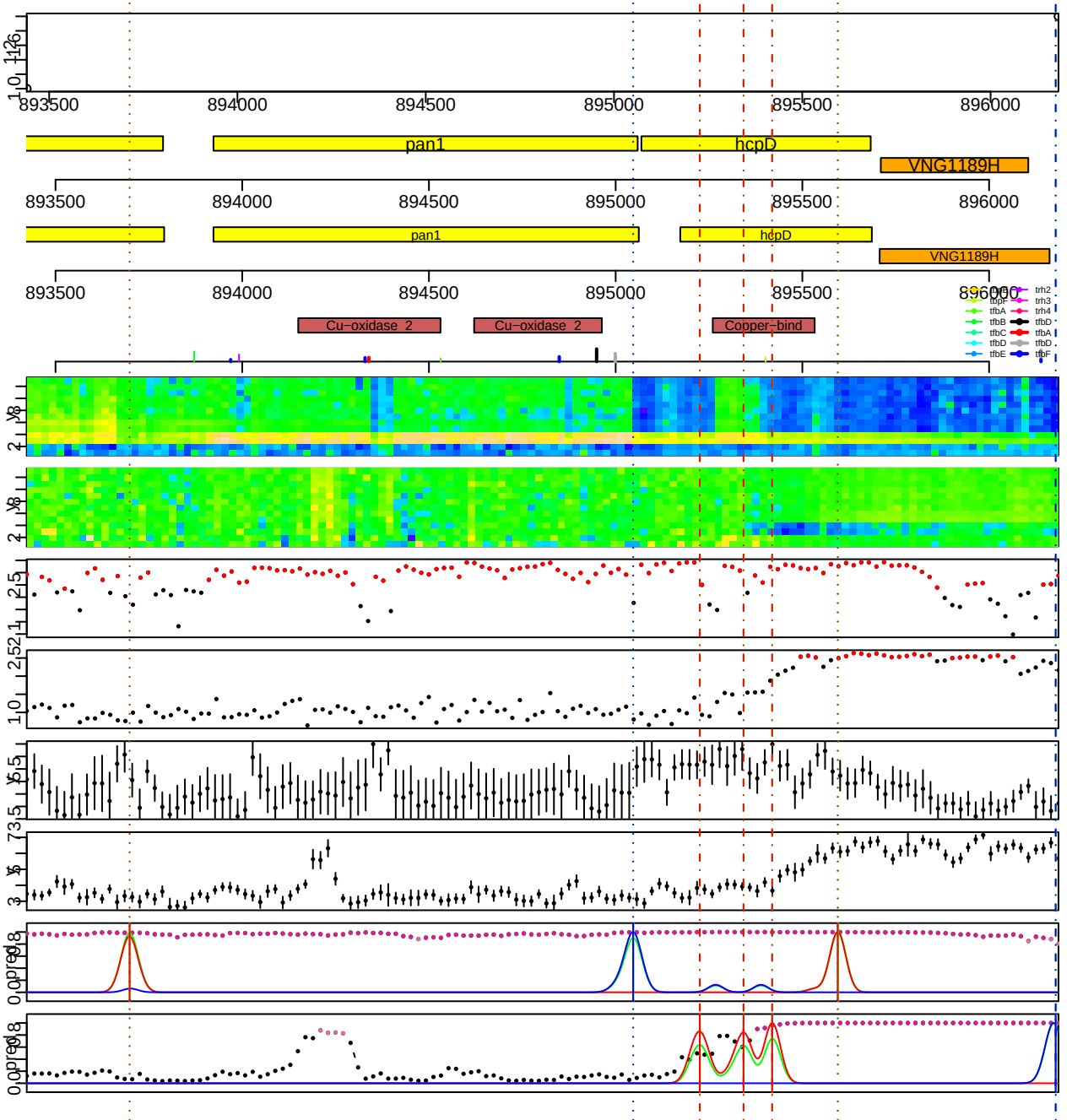
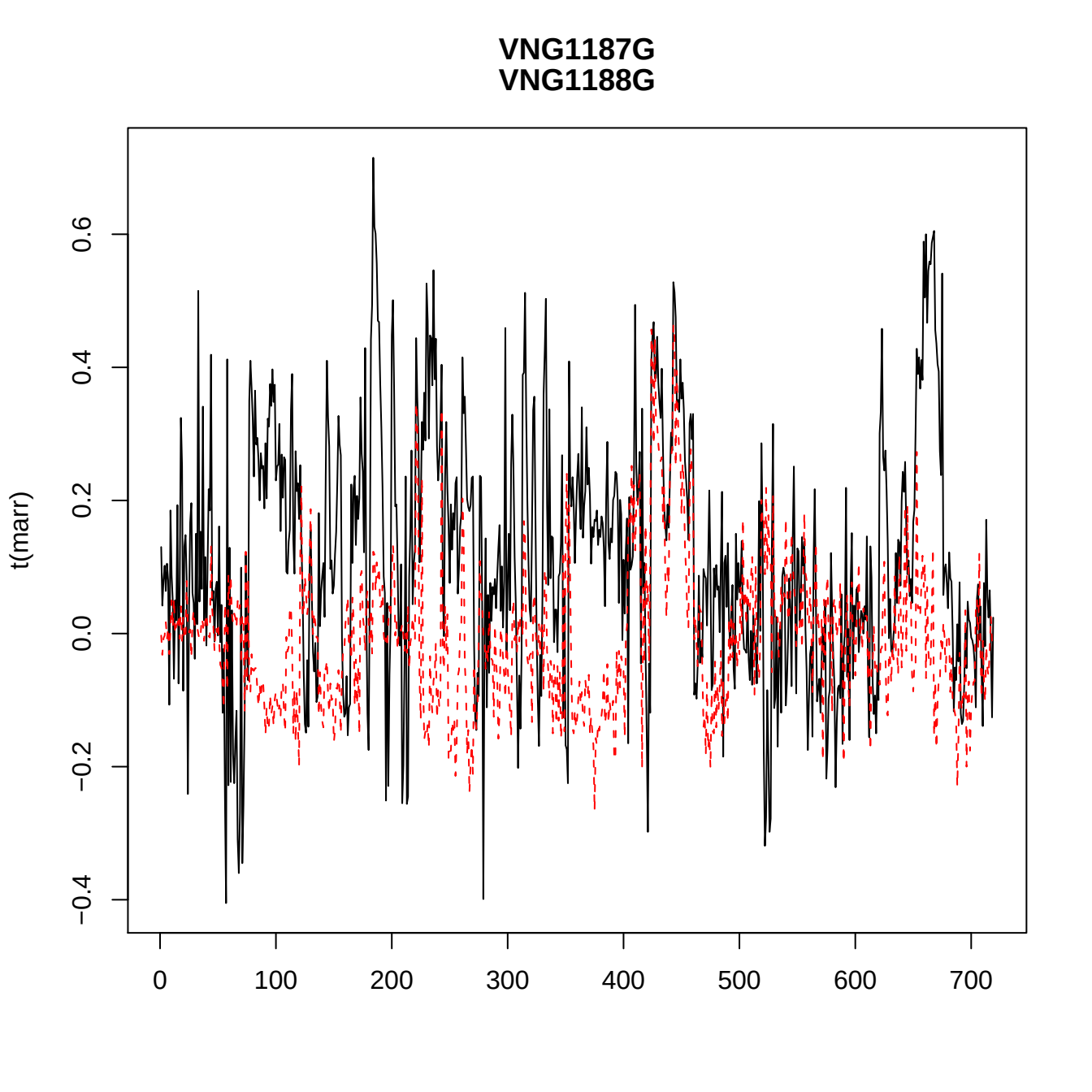
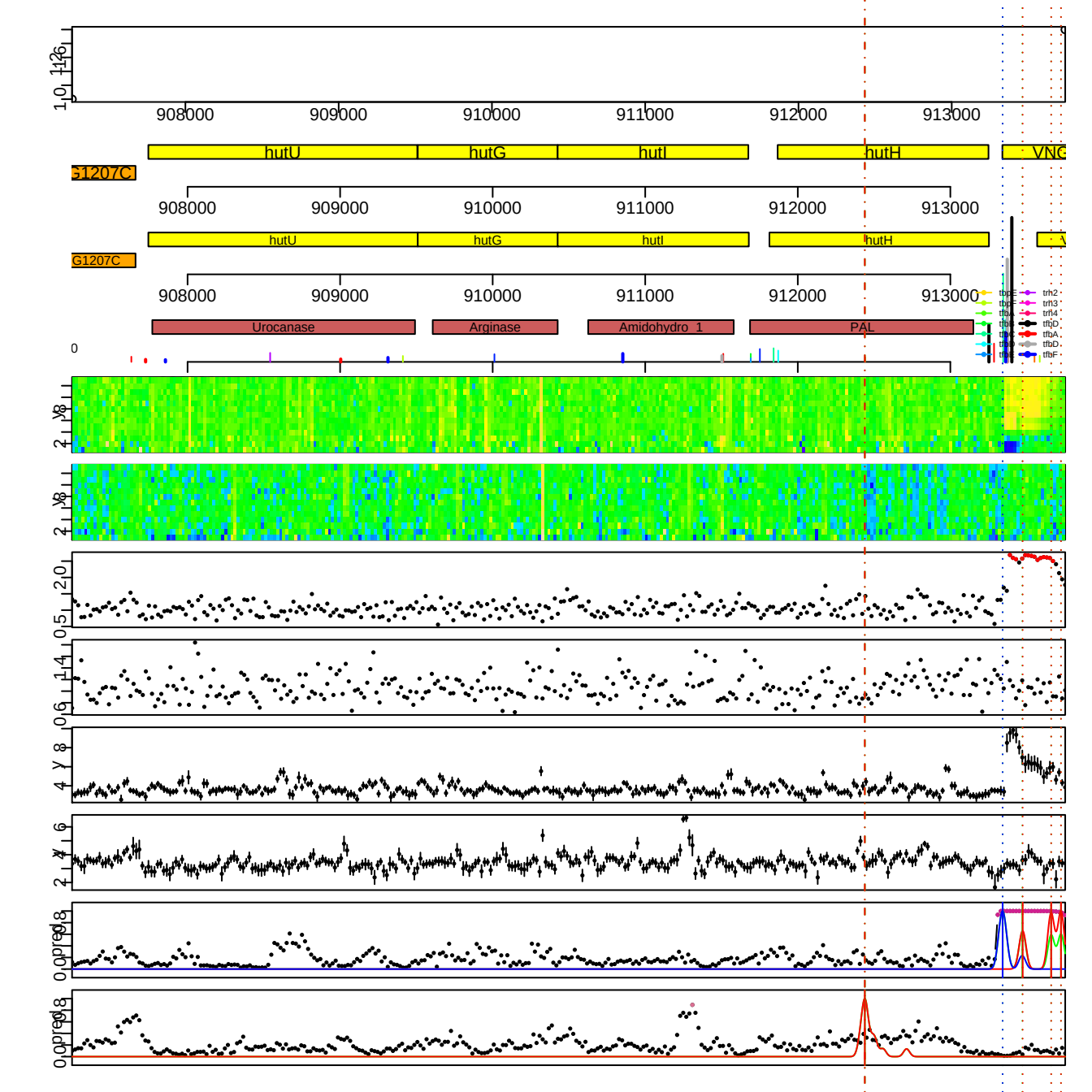
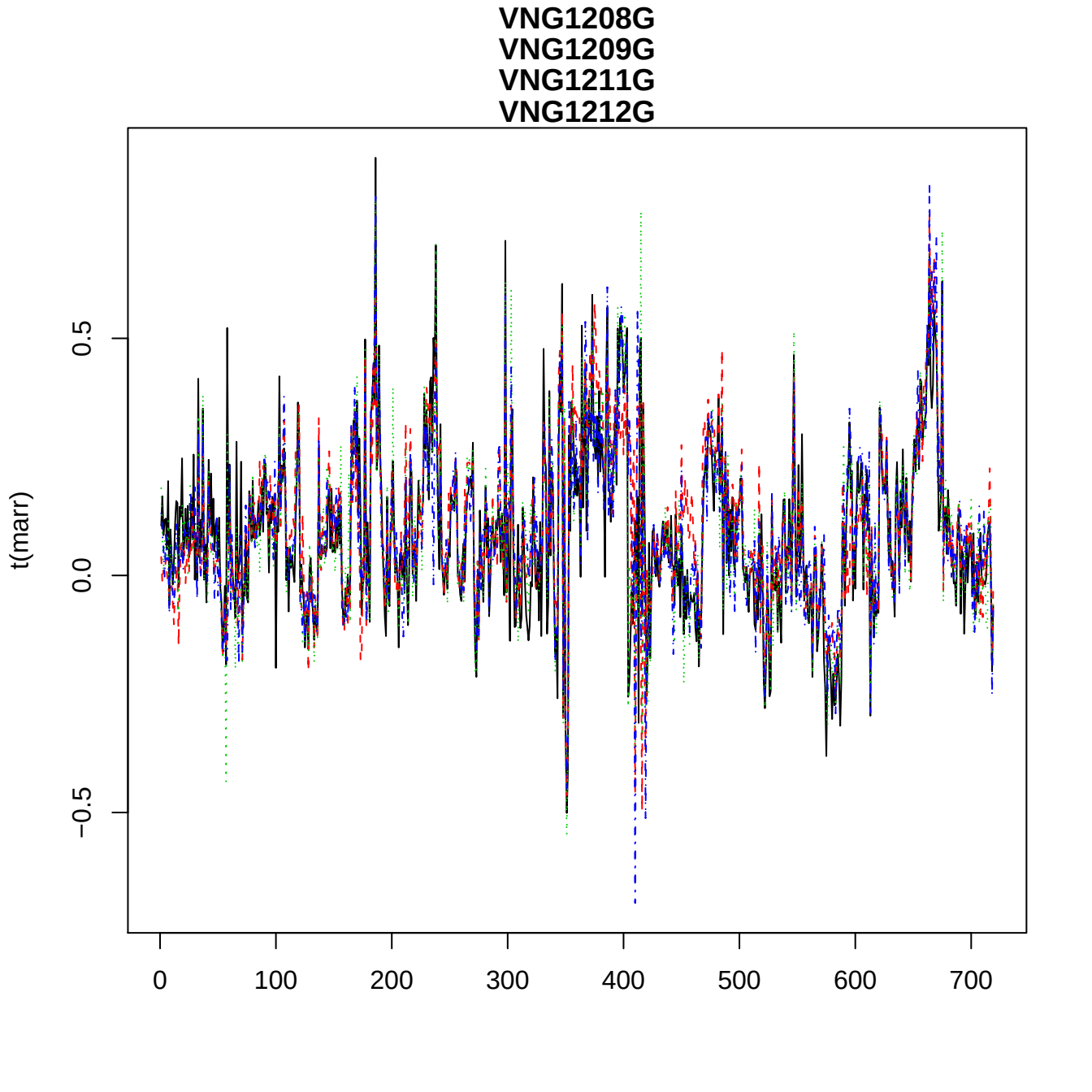
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


893500
894000
894500
895000
895500
896000
pan1
hcpD
VNG1189H
Cu−oxidase_2
Cu−oxidase_2
Copper−bind
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbE
tfbD
tfbC
tfbB
tfbA
tfbF


VNG1187G
VNG1188G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


908000
909000
910000
911000
912000
913000
hutU
hutG
hutI
hutH
VNG
G1207C
Urocanase
Arginase
Amidohydro_1
PAL
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1208G
VNG1209G
VNG1211G
VNG1212G
t(marr)
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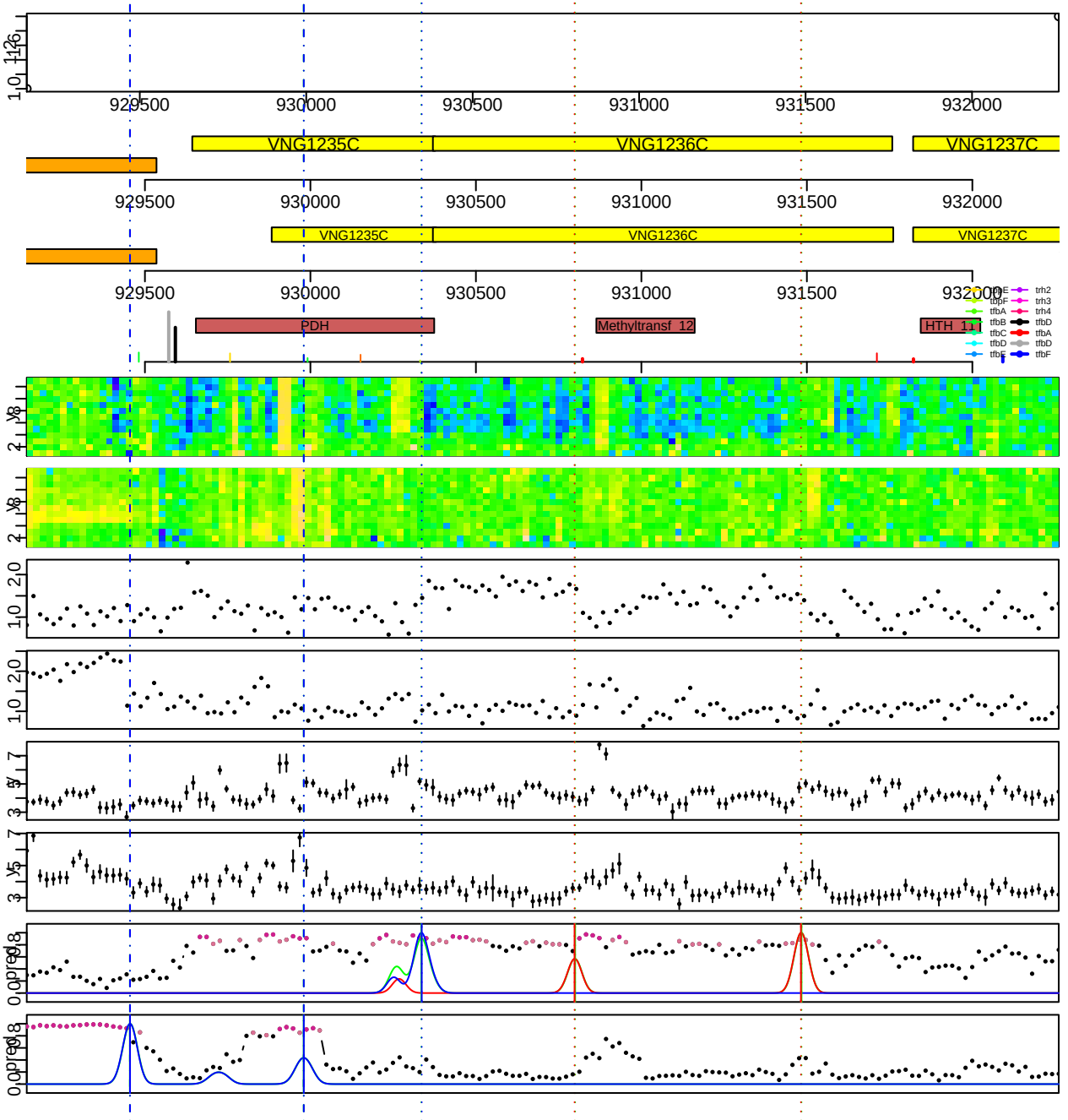
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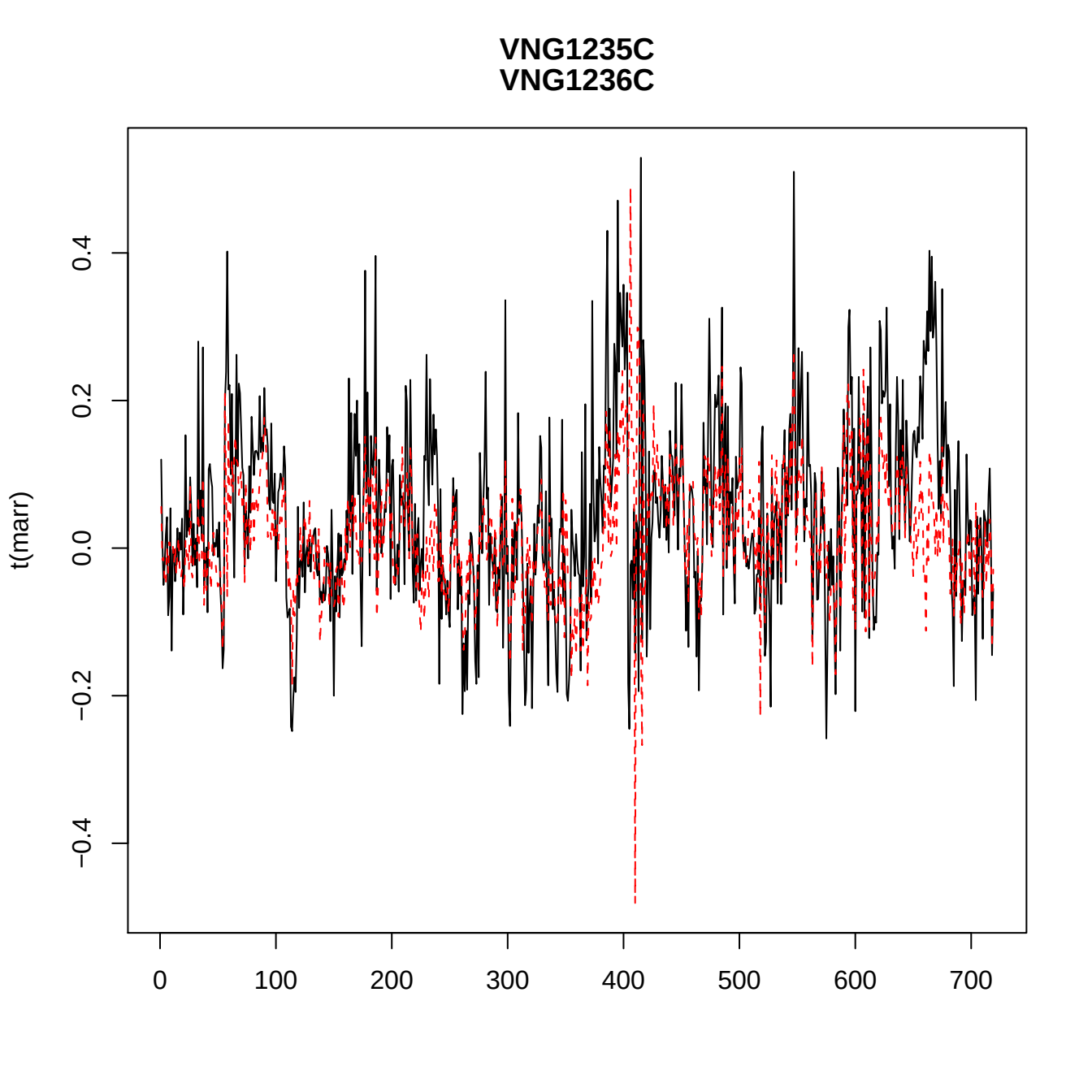
930000
930500
931000
931500
932000
VNG1235C
VNG1236C
VNG1237C
PDH
Methyltransf_12
HTH_11
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1235C
VNG1236C
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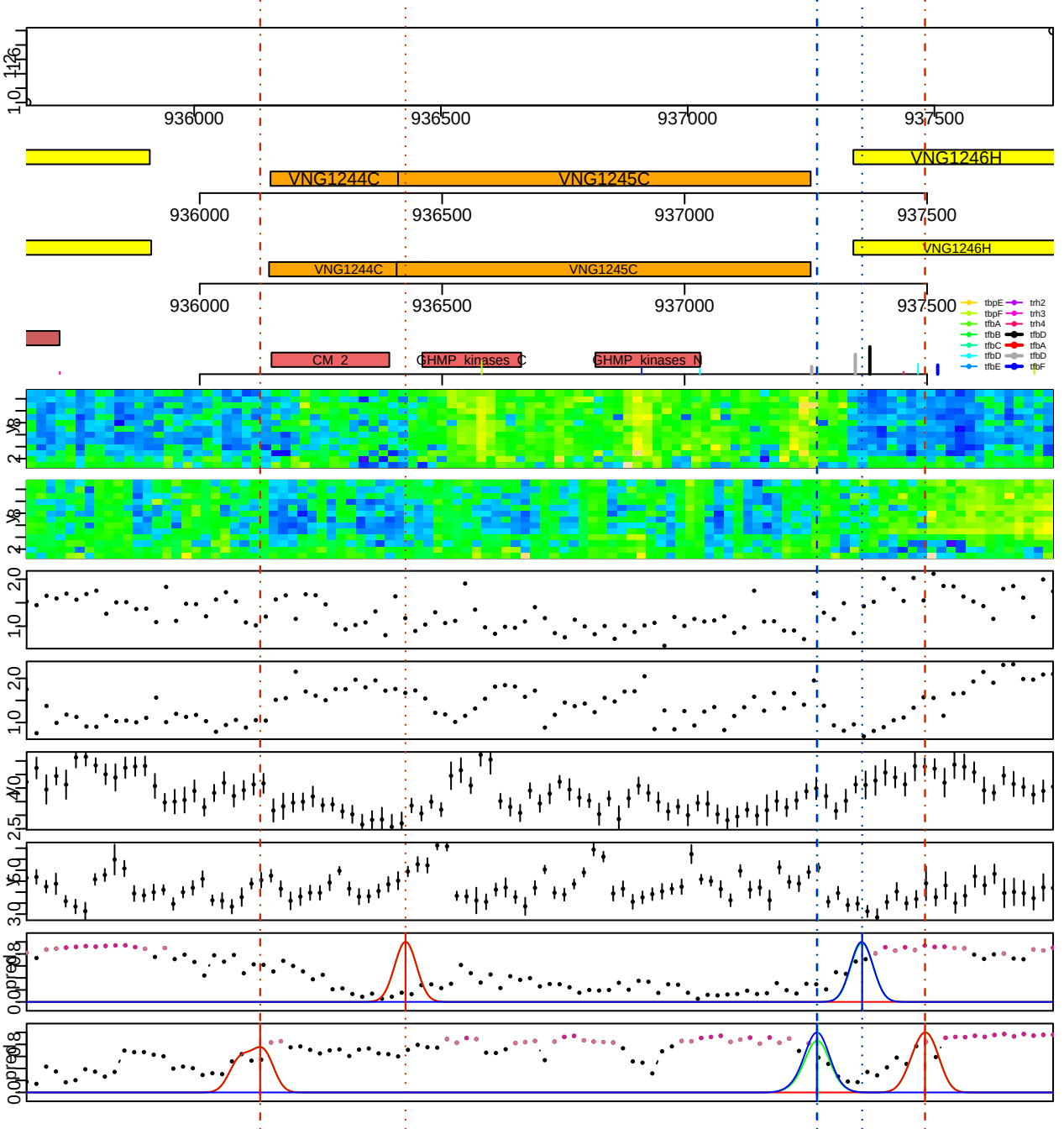
600
700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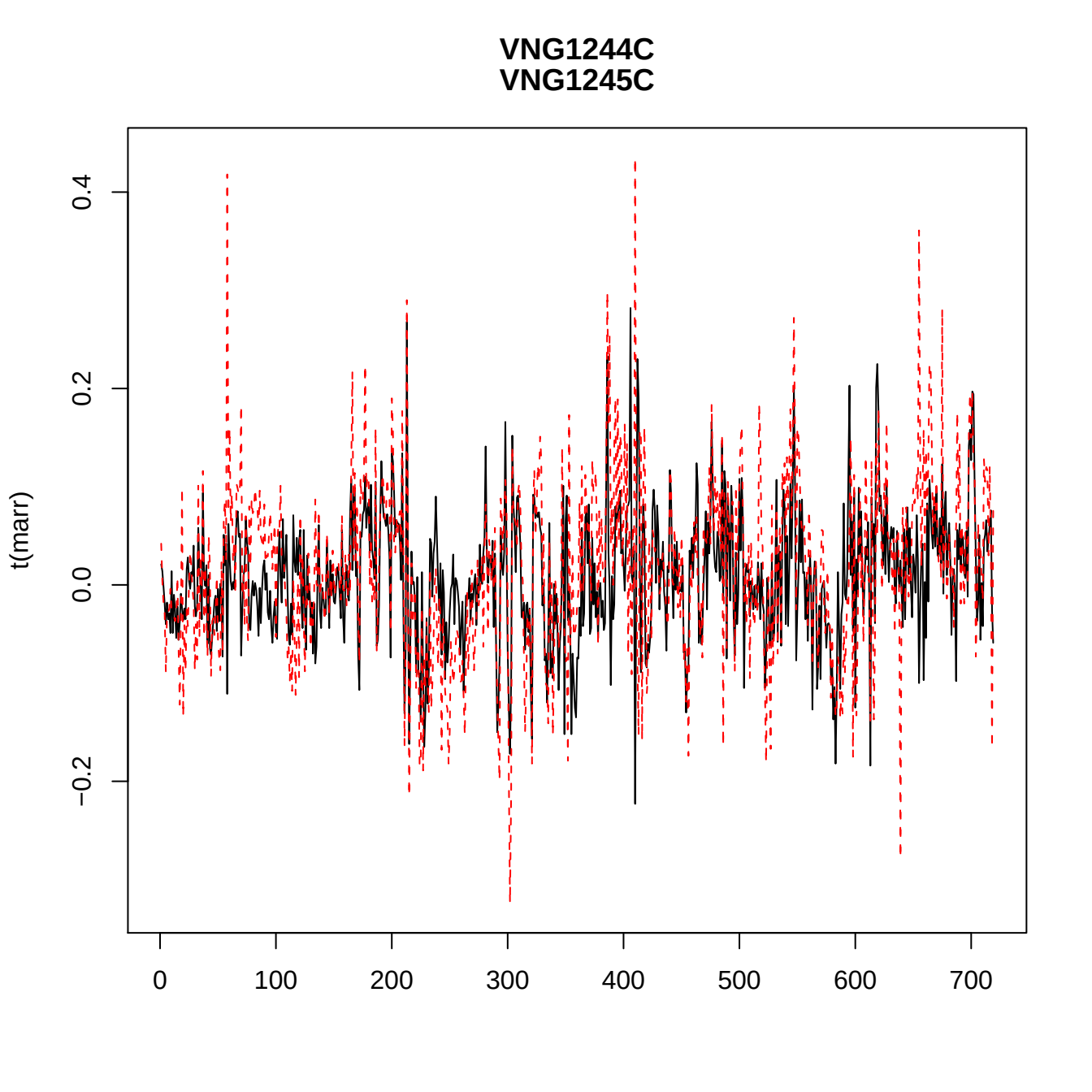
936500
937000
937500
VNG1244C
VNG1245C
VNG1246H
CM_2
GHMP_kinases_C
GHMP_kinases_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1244C
VNG1245C
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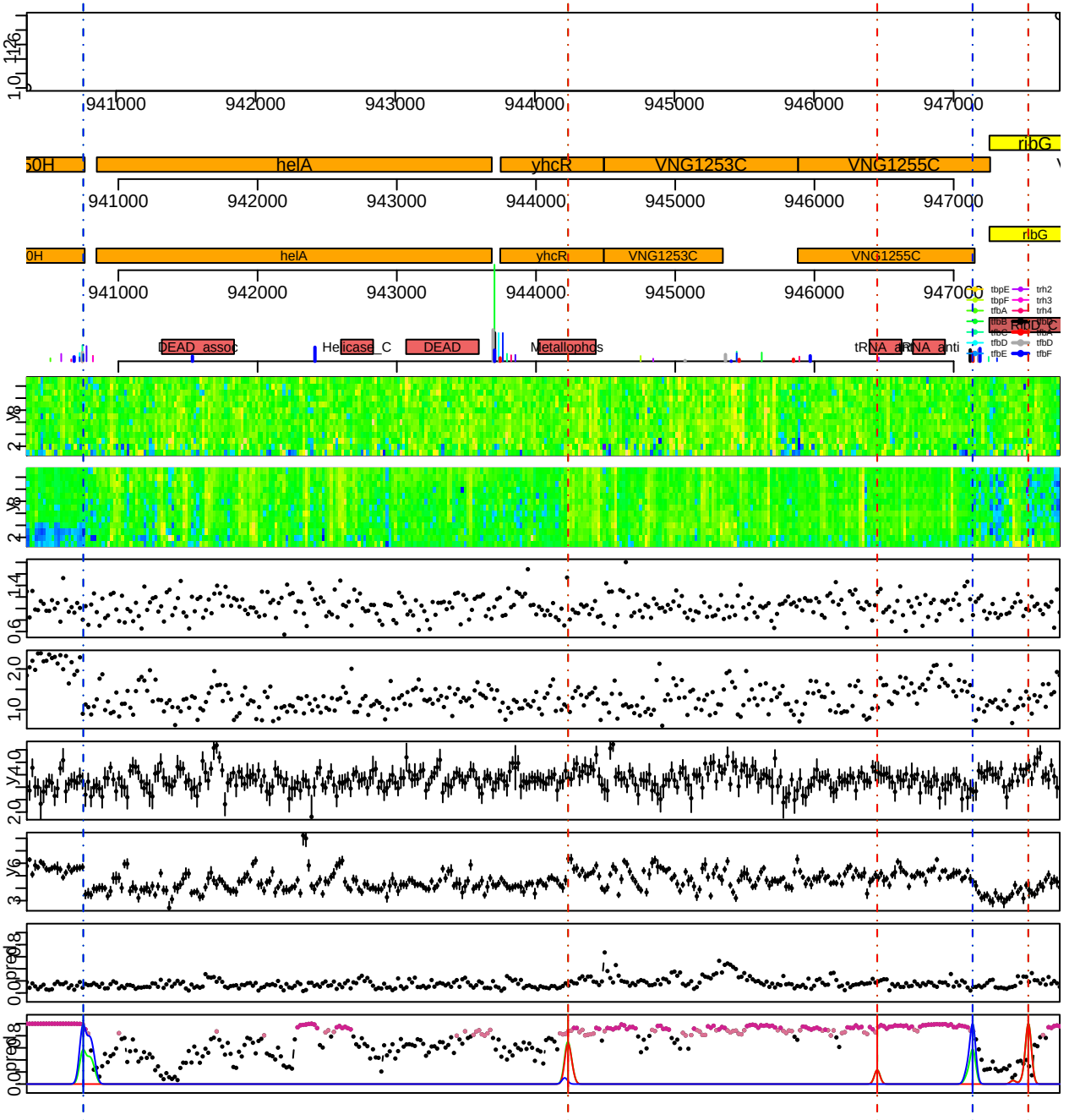
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942000
943000
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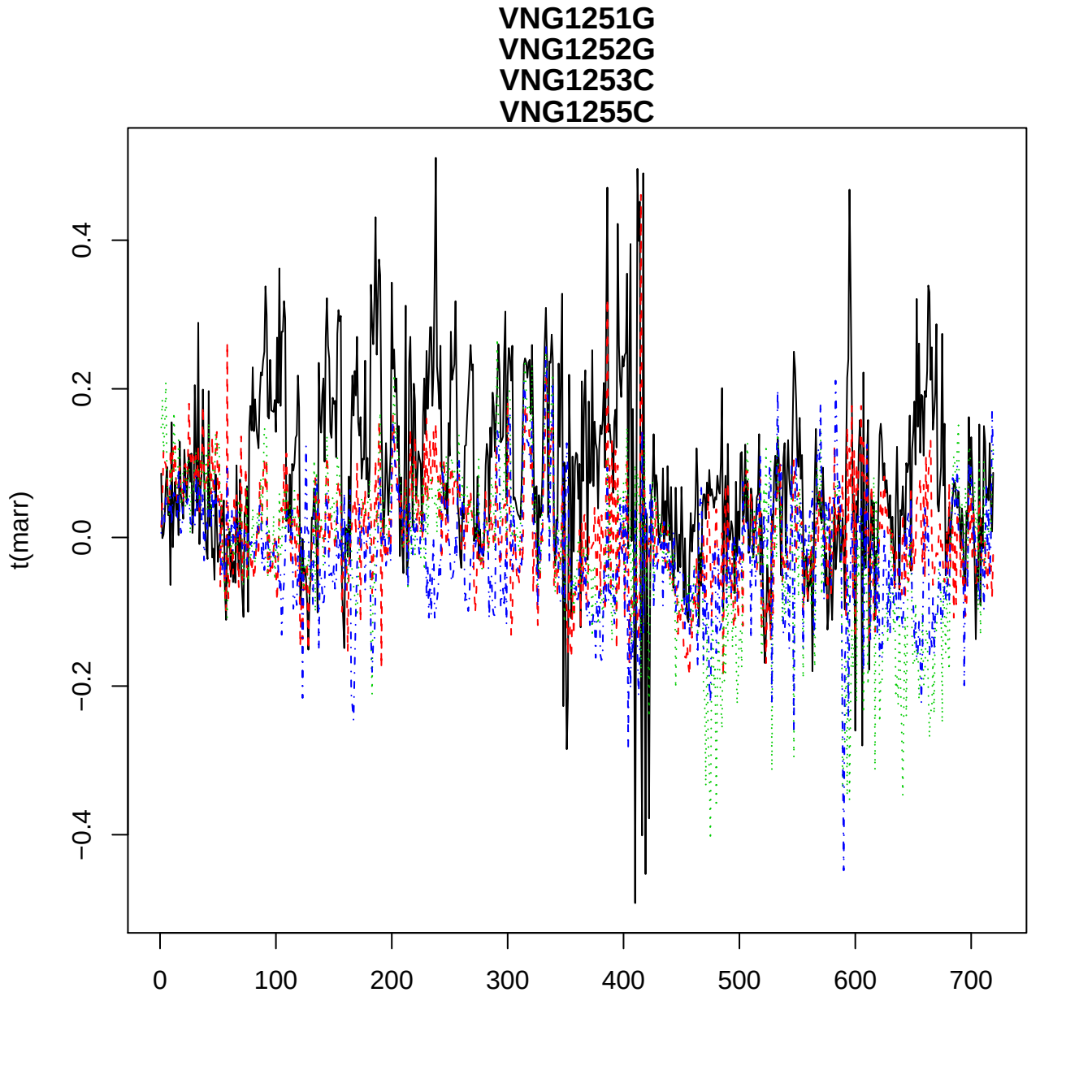
945000
946000
947000
helA
yhcR
VNG1253C
VNG1255C
rlbG
DEAD_assoc
Helicase_C
DEAD
Metallophos
tRNA_anti
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF


VNG1251G
VNG1252G
VNG1253C
VNG1255C
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0
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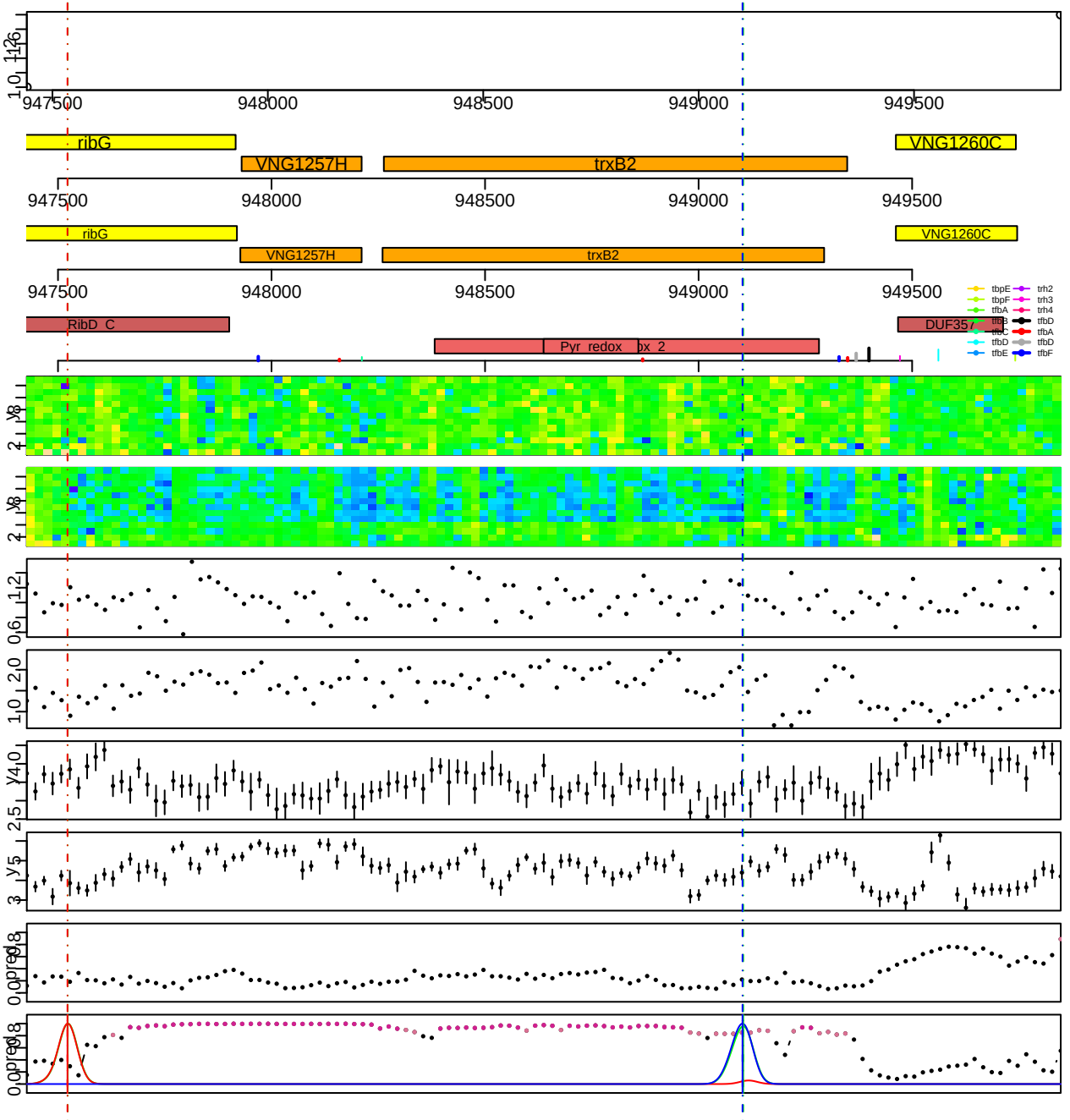
400
500
600
700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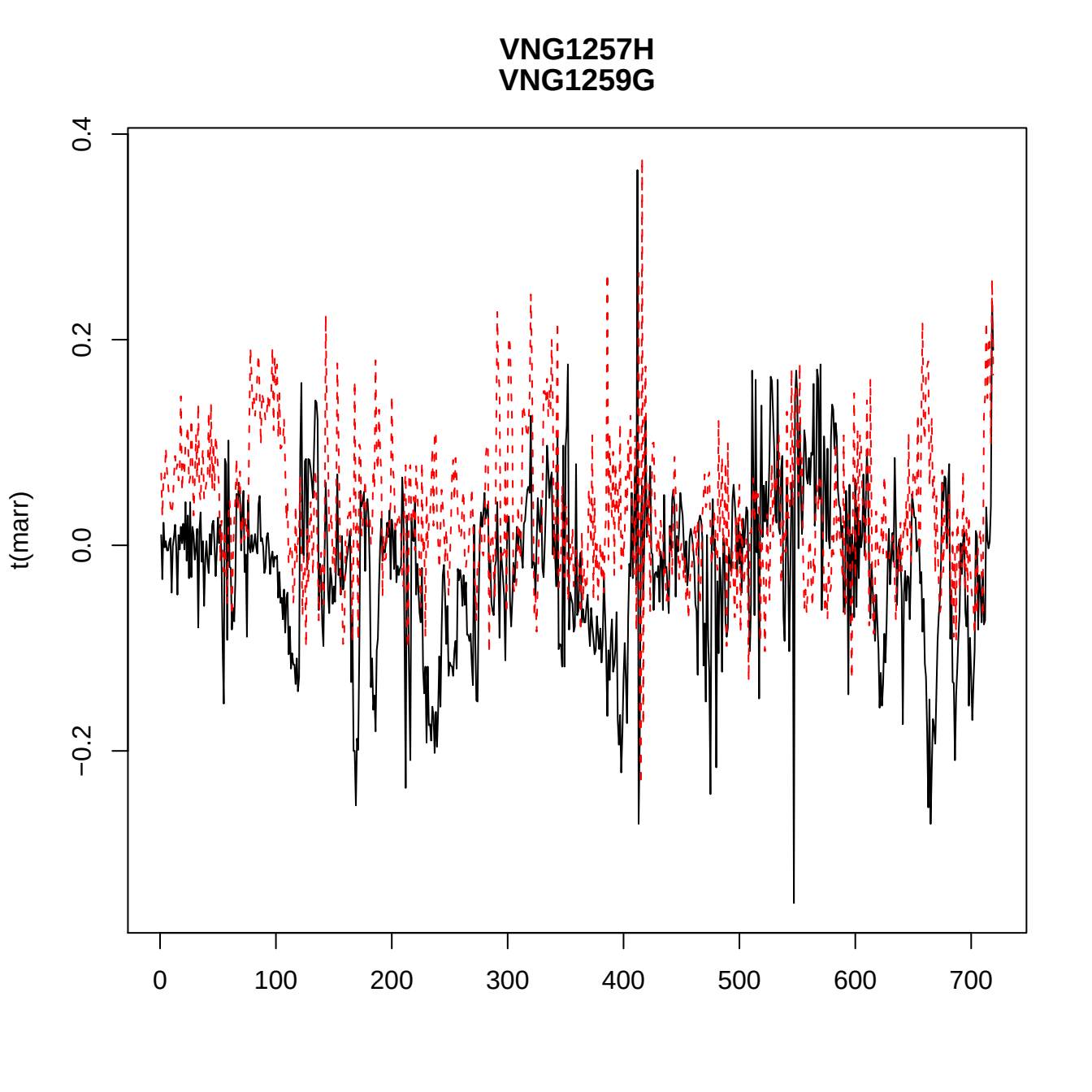
948000
948500
949000
949500
ribG
VNG1257H
trxB2
VNG1260C
RibD_C
Pyr_redox_bx_2
DUF357
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1257H
VNG1259G
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600
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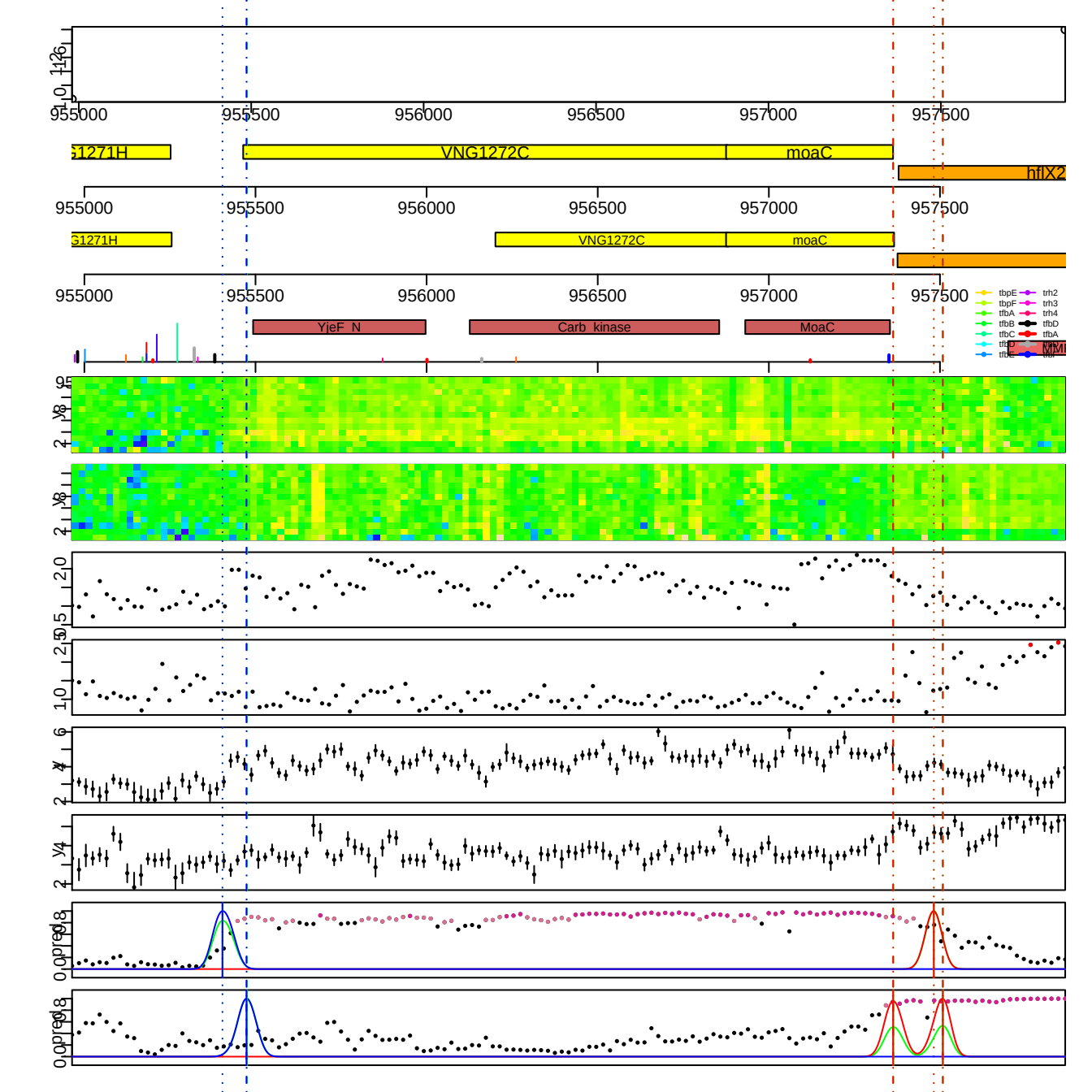
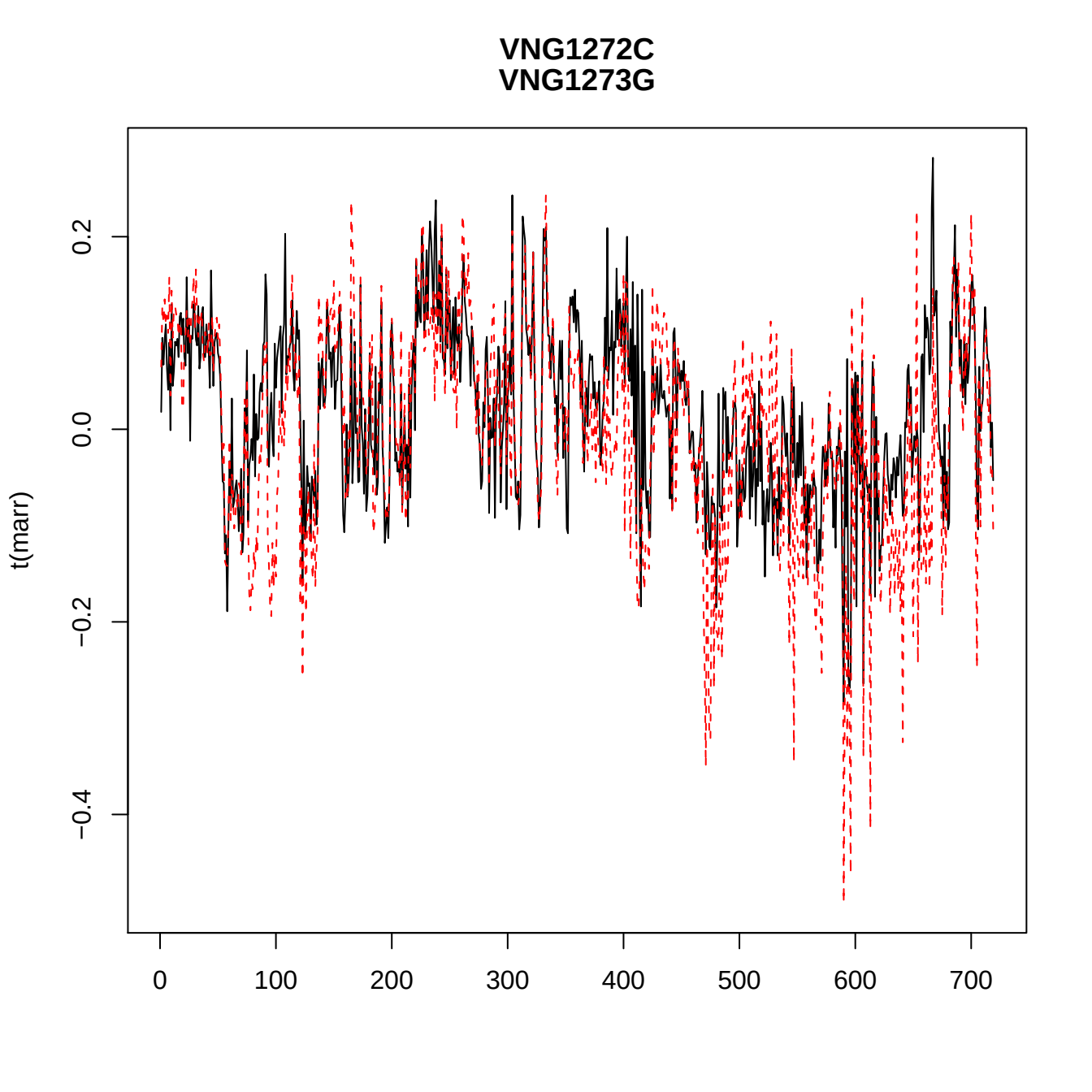


955000
955500
956000
956500
957000
957500
VNG1272C
moaC
hflX2
YjeF_N
Carb_kinase
MoaC
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA


VNG1272C
VNG1273G
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−0.4
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400
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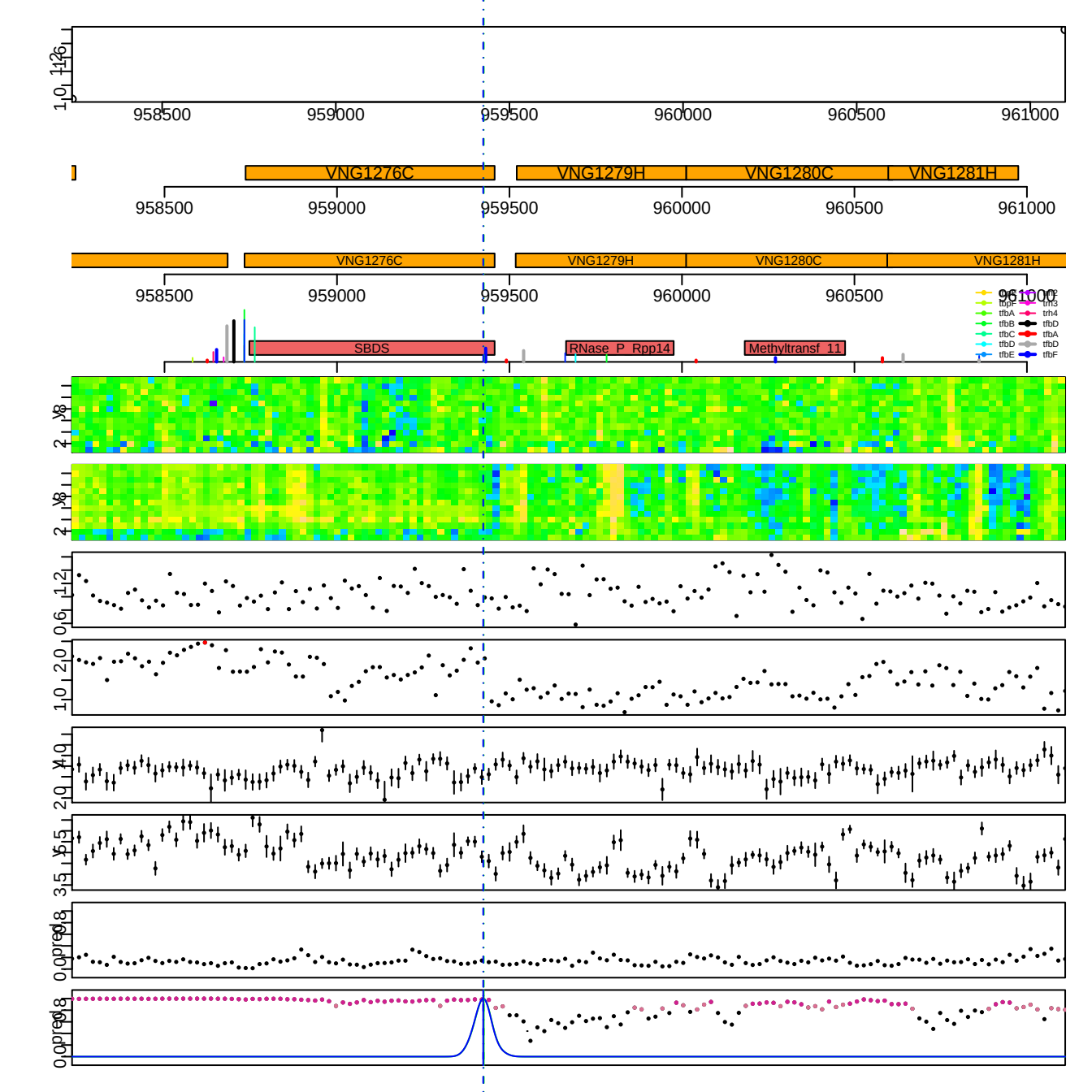
600
700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959000
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960000
960500
961000
VNG1276C
VNG1279H
VNG1280C
VNG1281H
SBDS
RNase_P_Rpp14
Methyltransf_11
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
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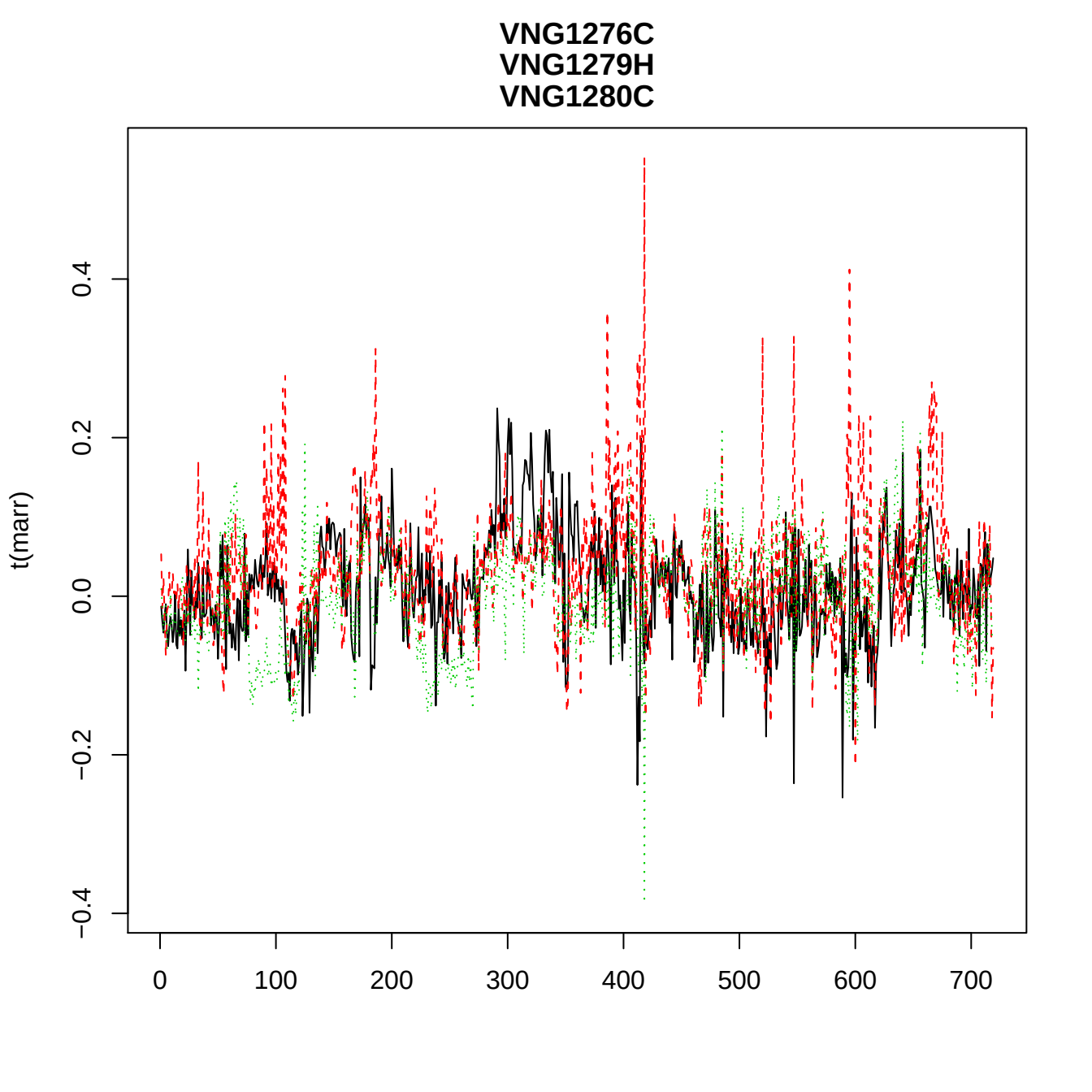
tfbA
tfbD
tfbF


VNG1276C
VNG1279H
VNG1280C
t(marr)
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−0.2
−0.4
0
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400
500
600
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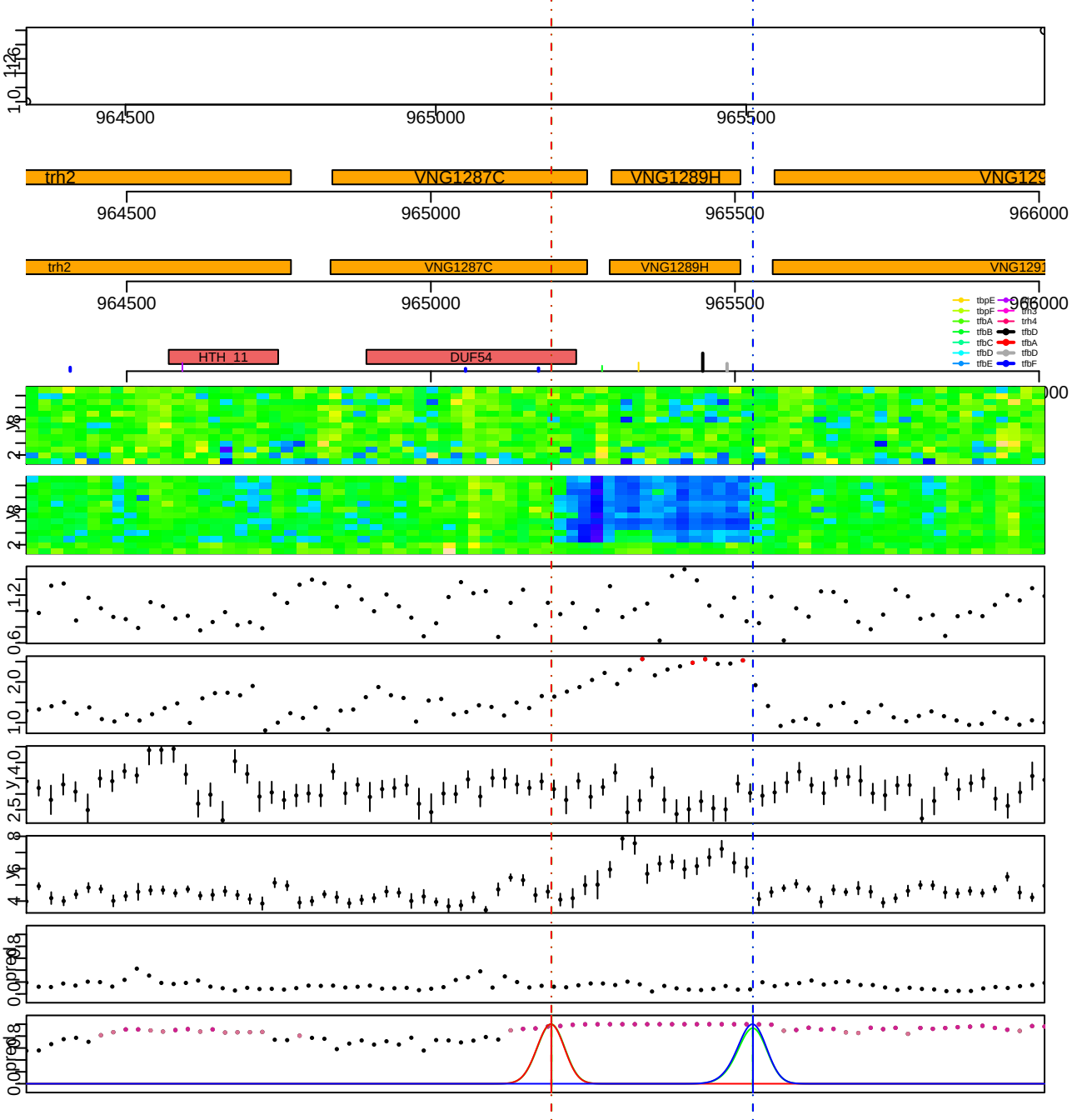
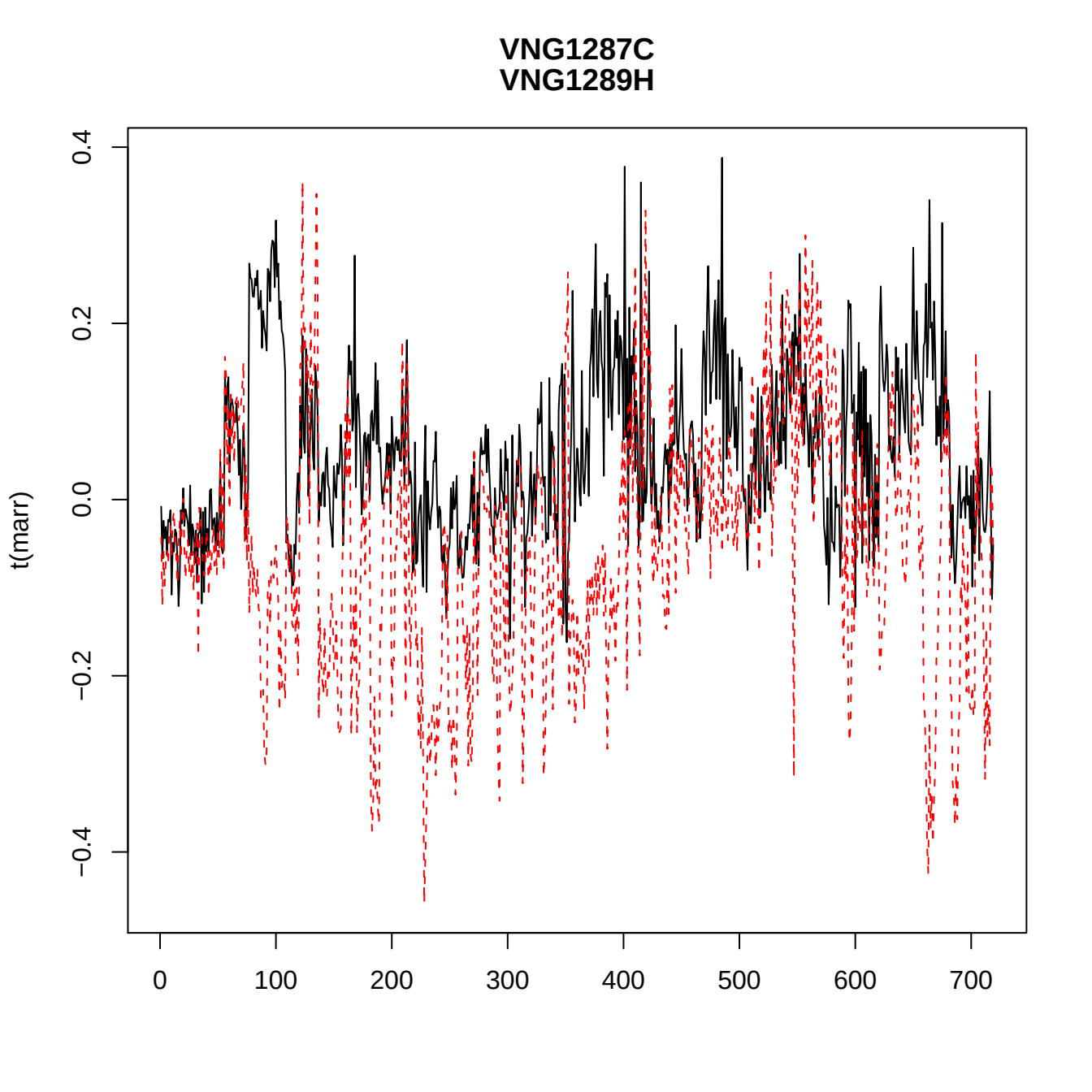

964500
965000
965500
trh2
VNG1287C
VNG1289H
966000
HTH_11
DUF54
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1287C
VNG1289H
t(marr)
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0.2
0.0
−0.2
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0
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400
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600
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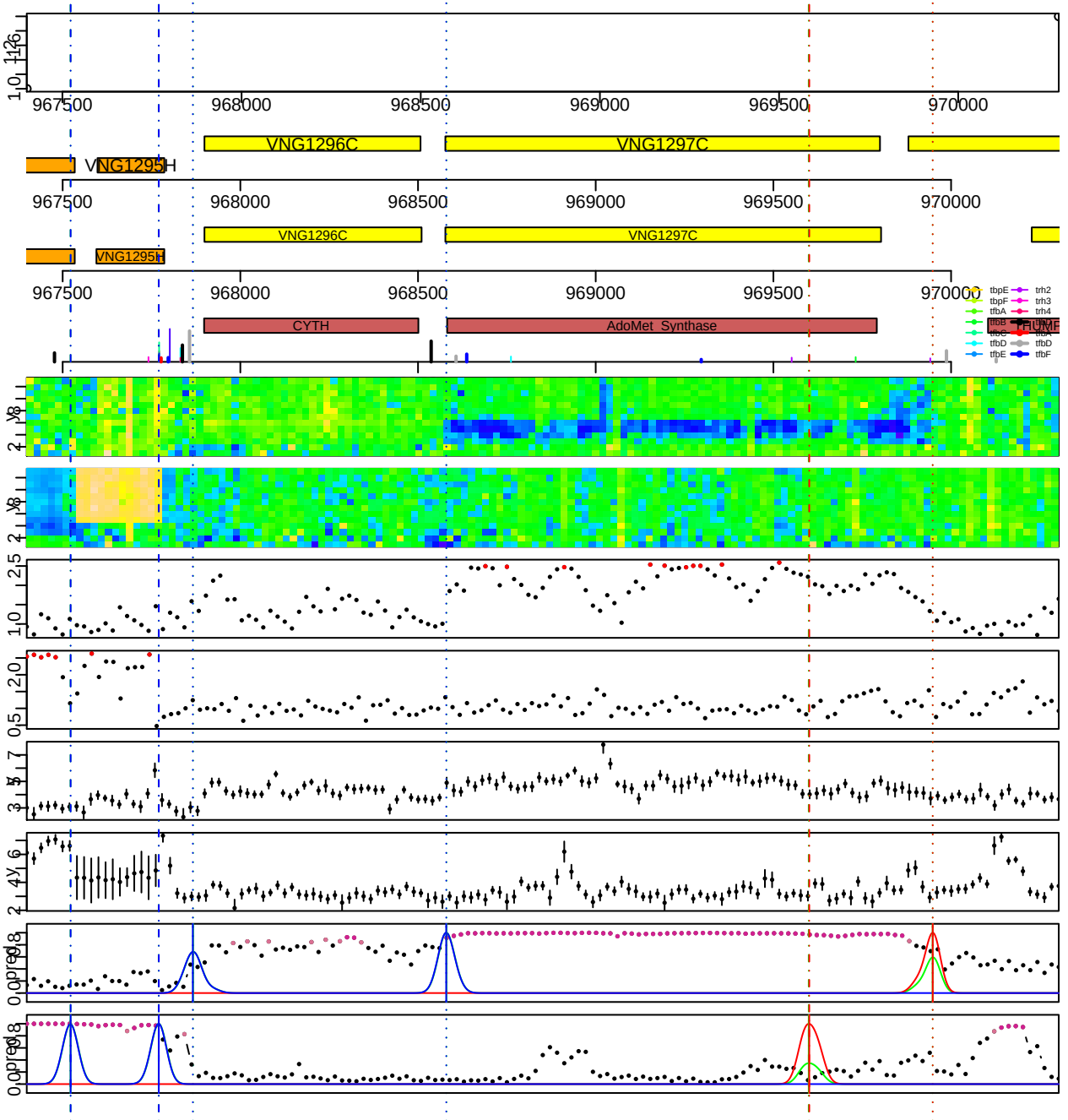
967500
968000
968500
969000
969500
970000
VNG1296C
VNG1297C
VNG1295H
CYTH
AdoMet_Synthase
tbpE
tbpF
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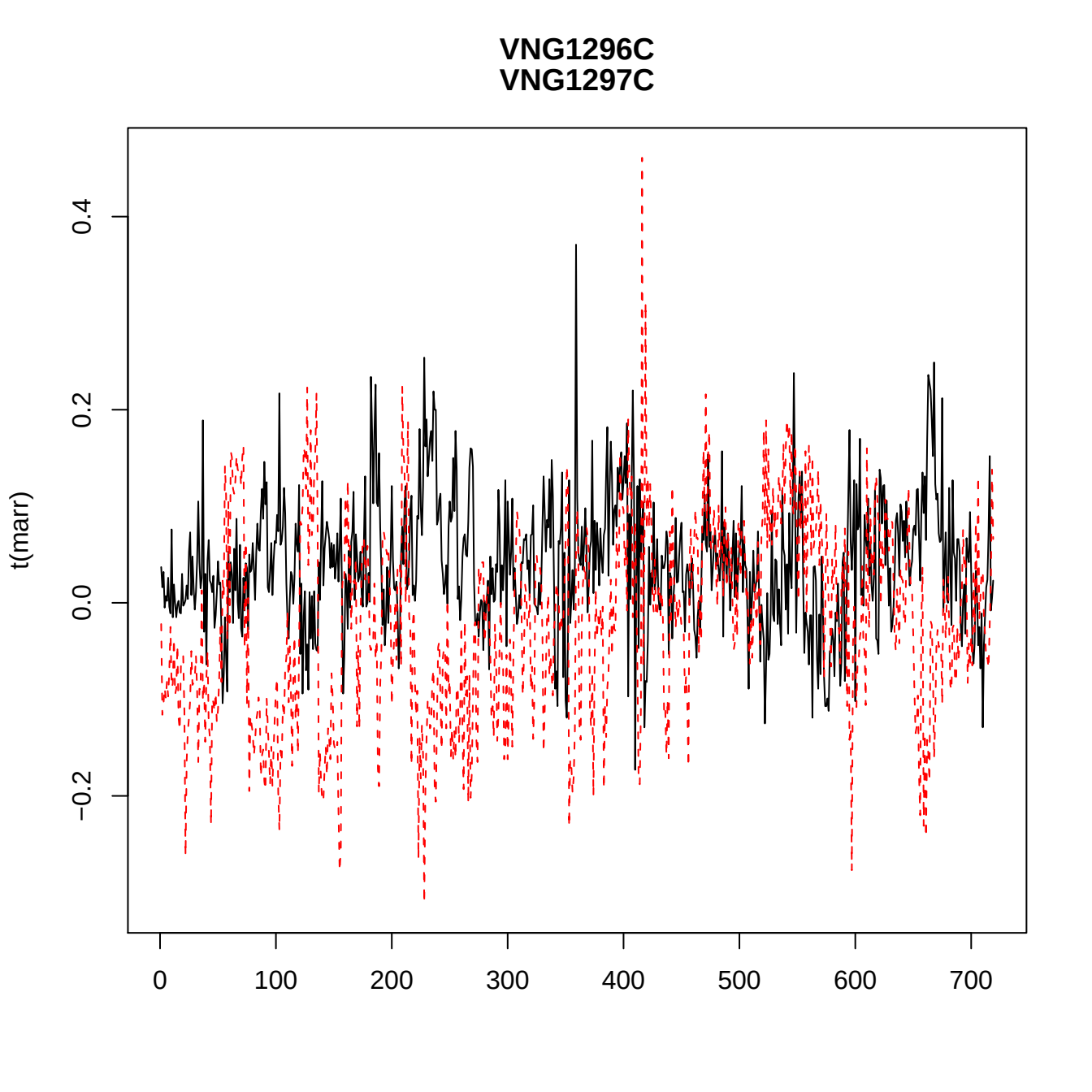
tfbB
tfbC
tfbD
tfbF
trh2
trh3
trh4
tfbA
tfbD
tfbF
pred


VNG1296C
VNG1297C
t(marr)
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0.0
−0.2
0
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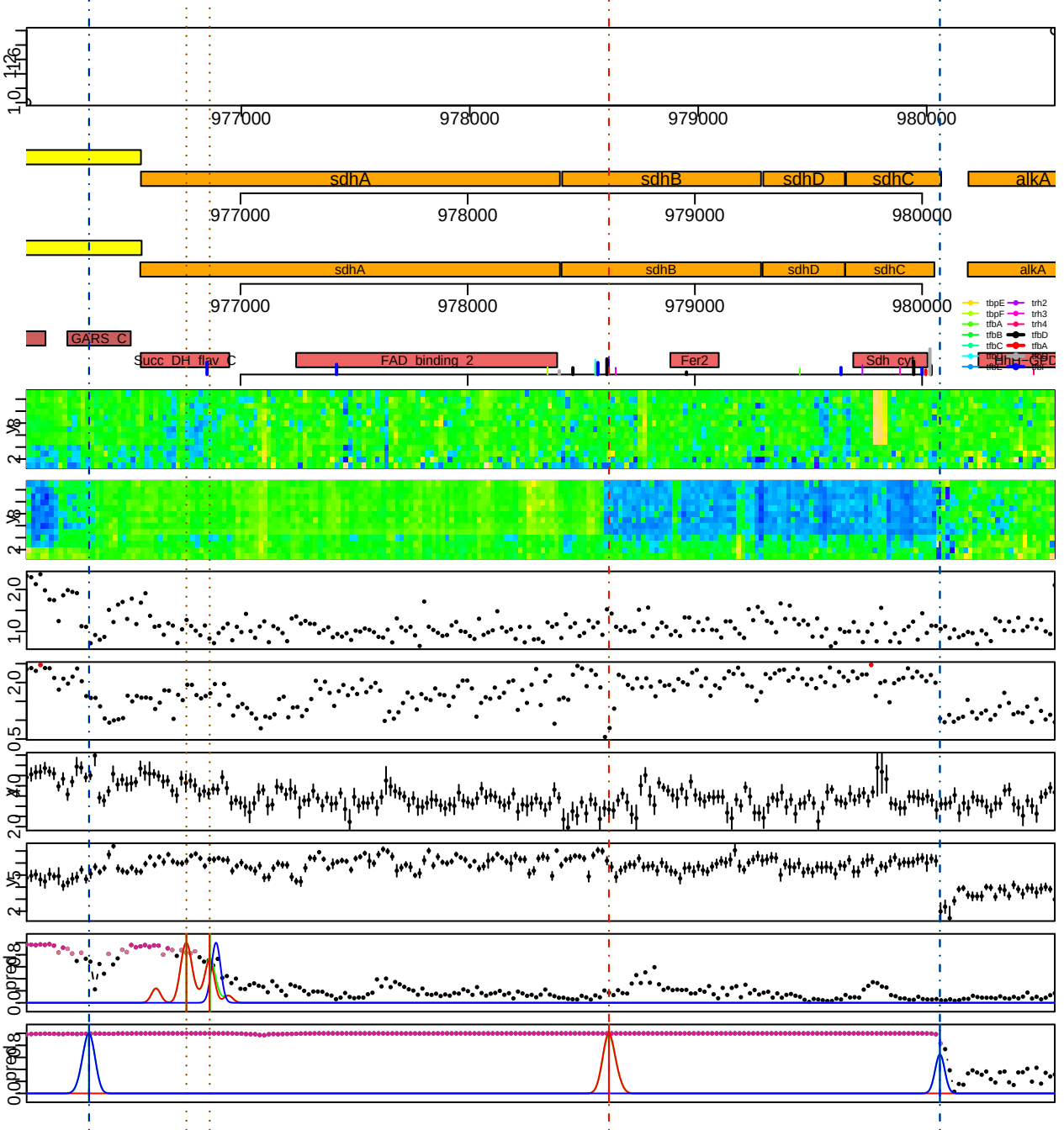
300
400
500
600
700



977000
978000
979000
980000
sdhA
sdhB
sdhD
sdhC
alkA
GARS_C
Succ_DH_flav_C
FAD_binding_2
Fer2
Sdh_cyt
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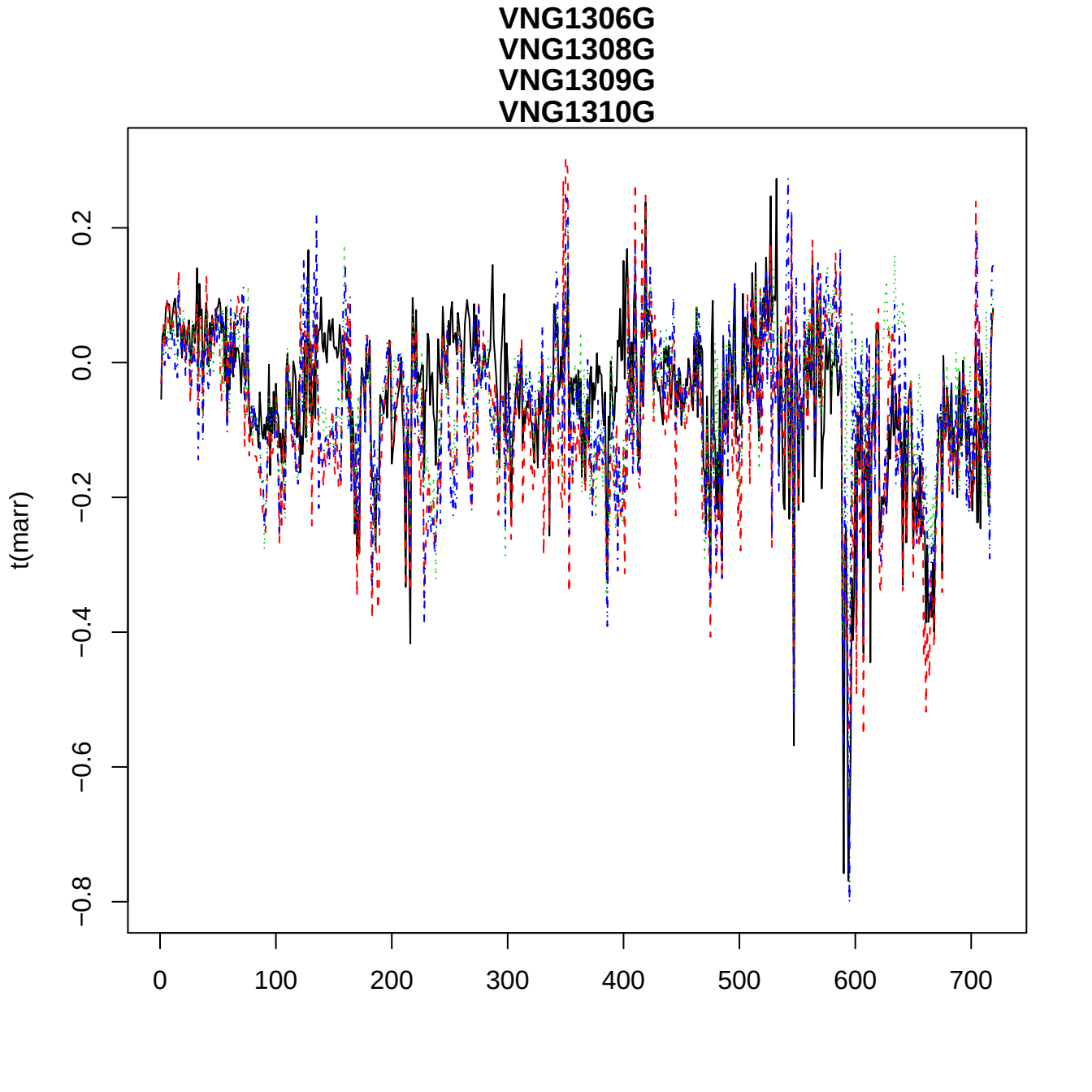
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA


VNG1306G
VNG1308G
VNG1309G
VNG1310G
t(marr)
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−0.2
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−0.6
−0.8
0
100
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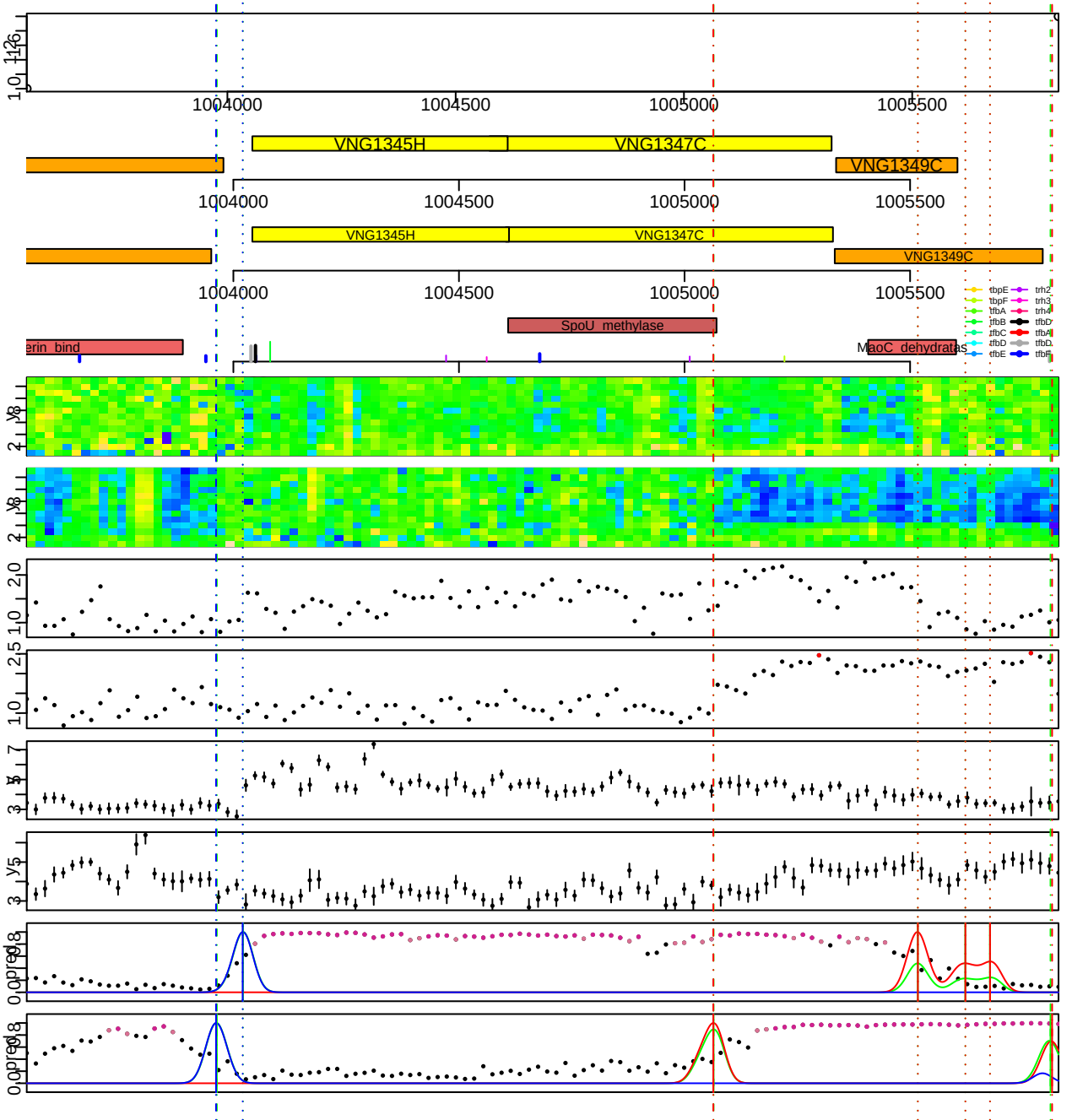
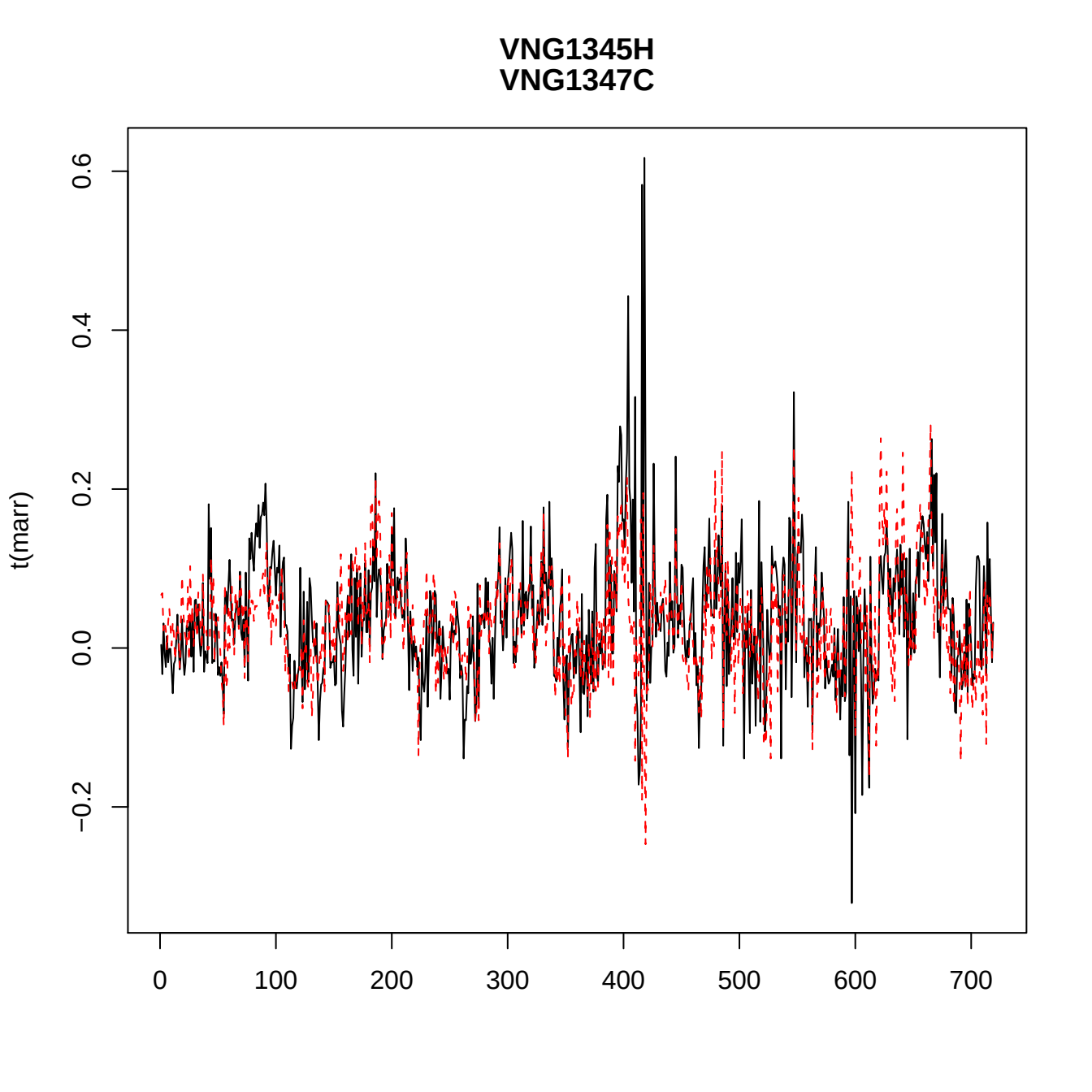
400
500
600
700


1004000
1004500
1005000
1005500
VNG1345H
VNG1347C
VNG1349C
SpoU_methylase
MaoC_dehydratas
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1345H
VNG1347C
t(marr)
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0.2
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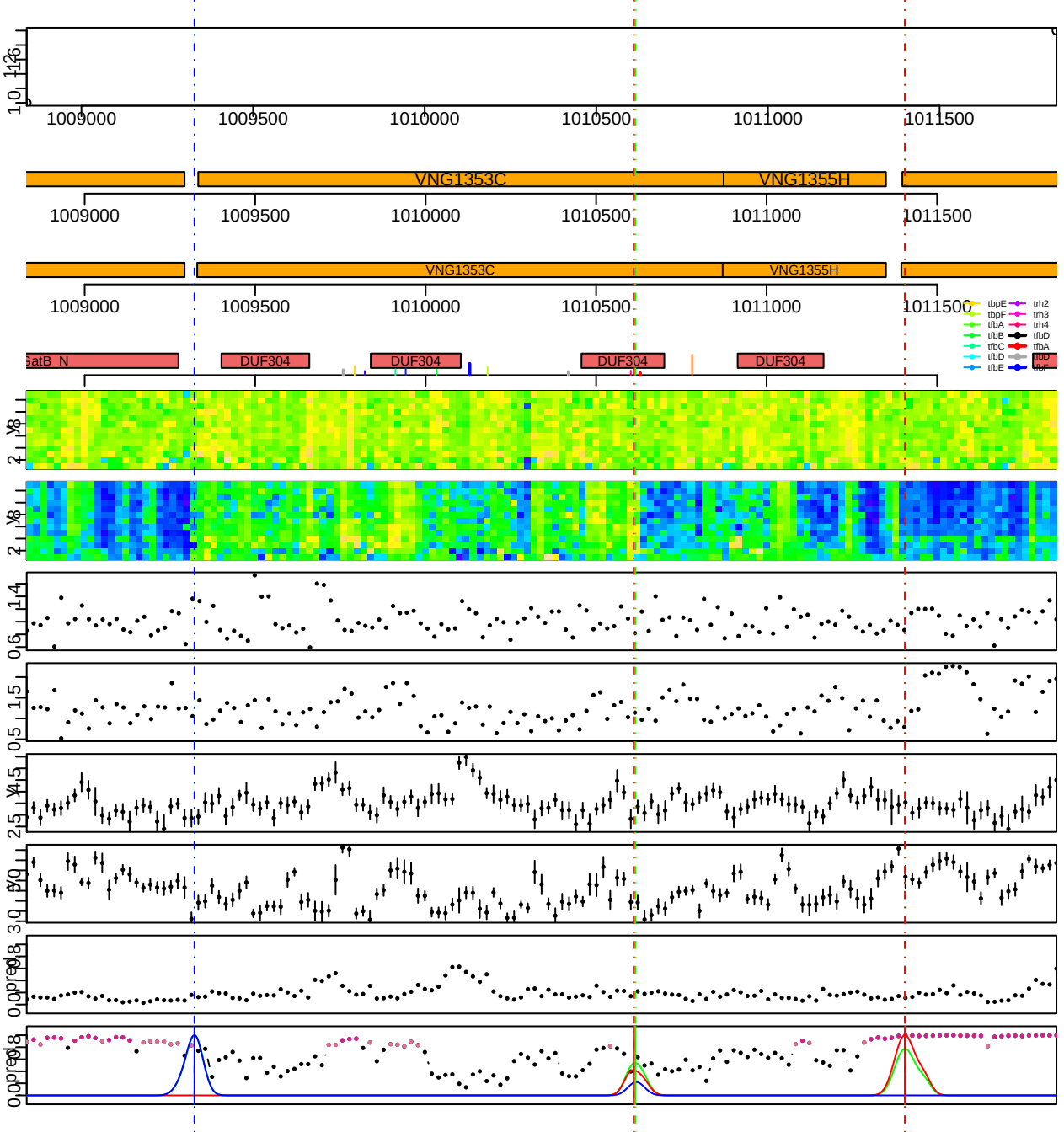
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1009500
1010000
1010500
1011000
1011500
VNG1353C
VNG1355H
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tbpF
tfbA
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tfbC
tfbD
tfbE
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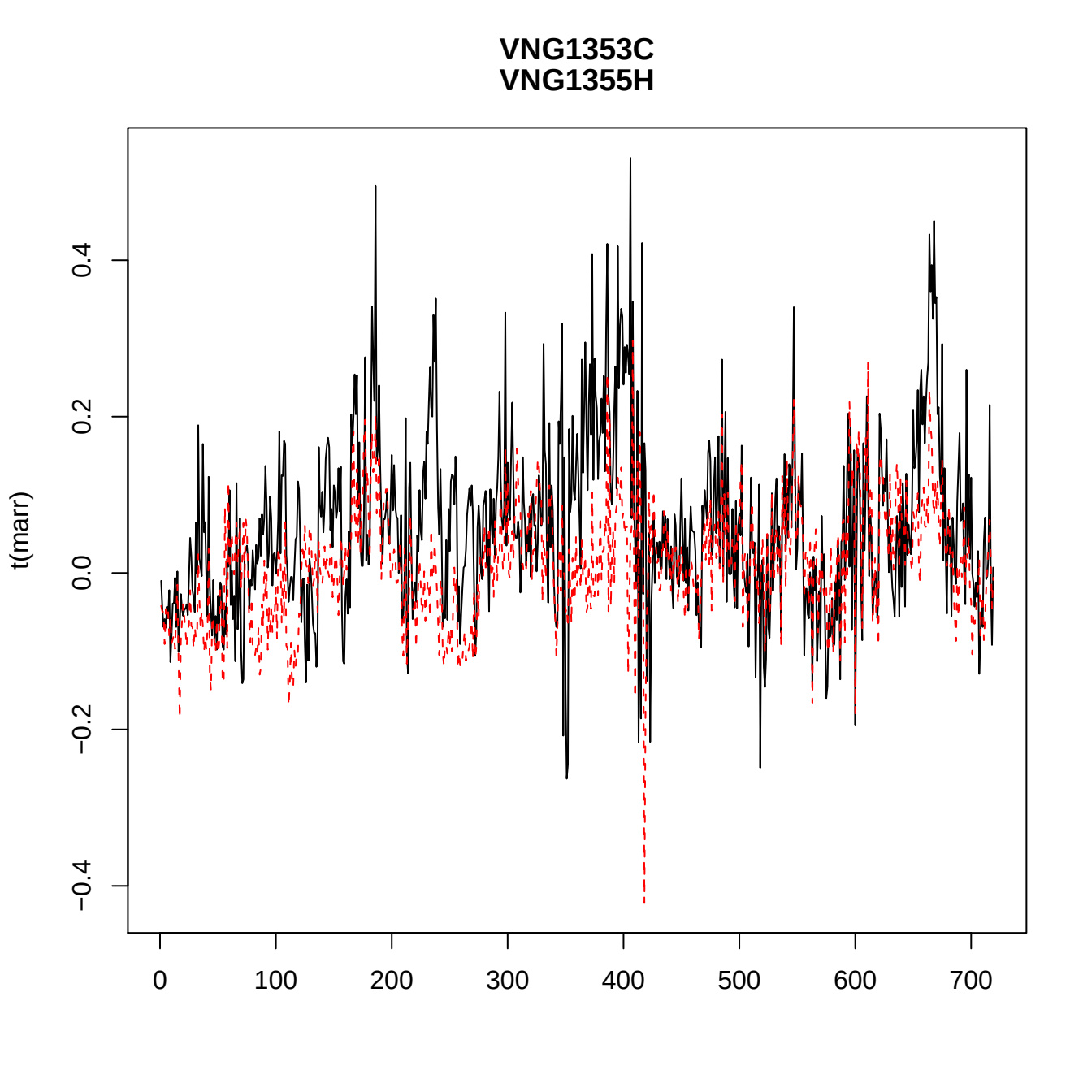
DUF304
DUF304
DUF304
DUF304


VNG1353C
VNG1355H
t(marr)
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−0.4
0
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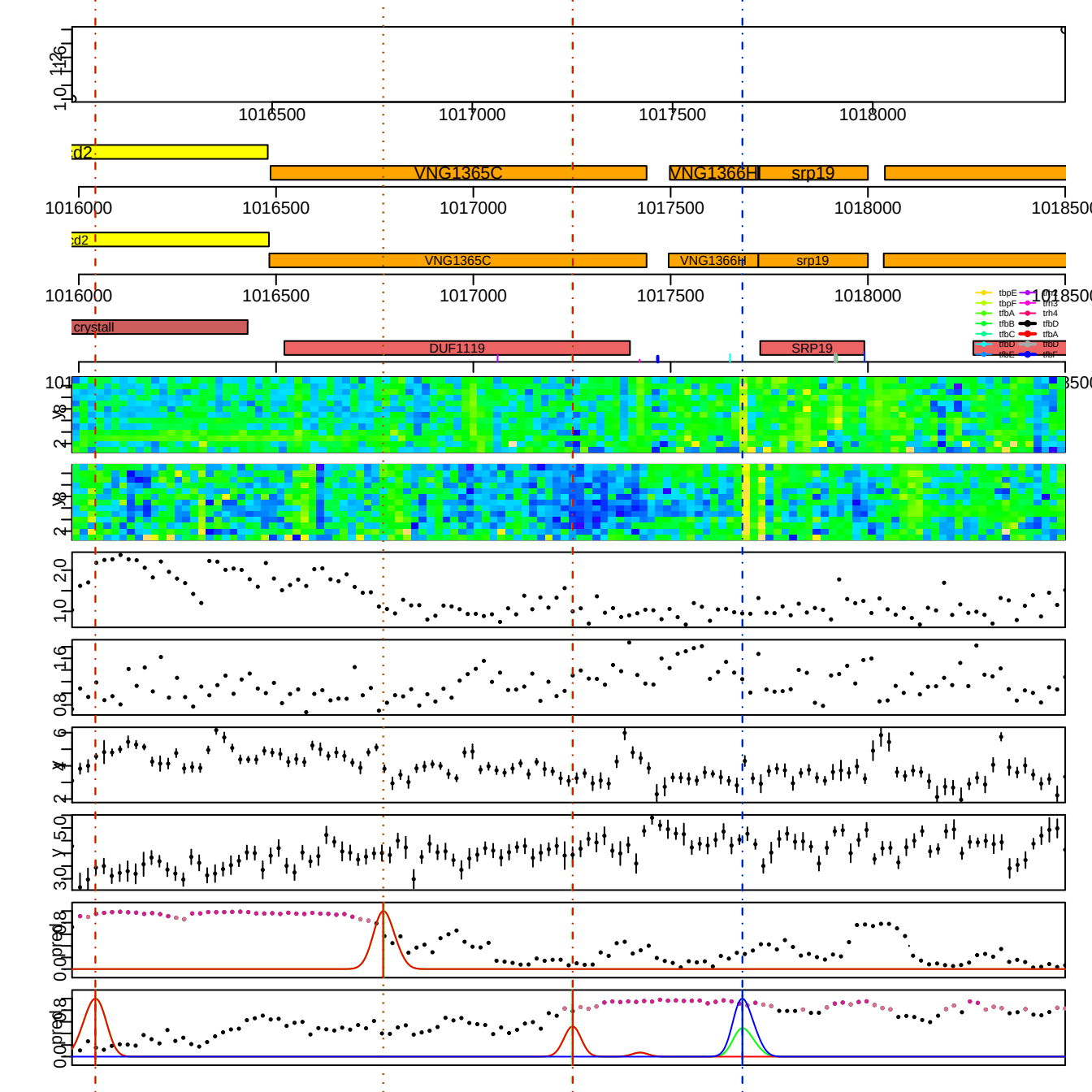
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1017000
1017500
1018000
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VNG1365C
VNG1366H
srp19
1016000
1018500
crystall
DUF1119
SRP19
tbpE
tbpF
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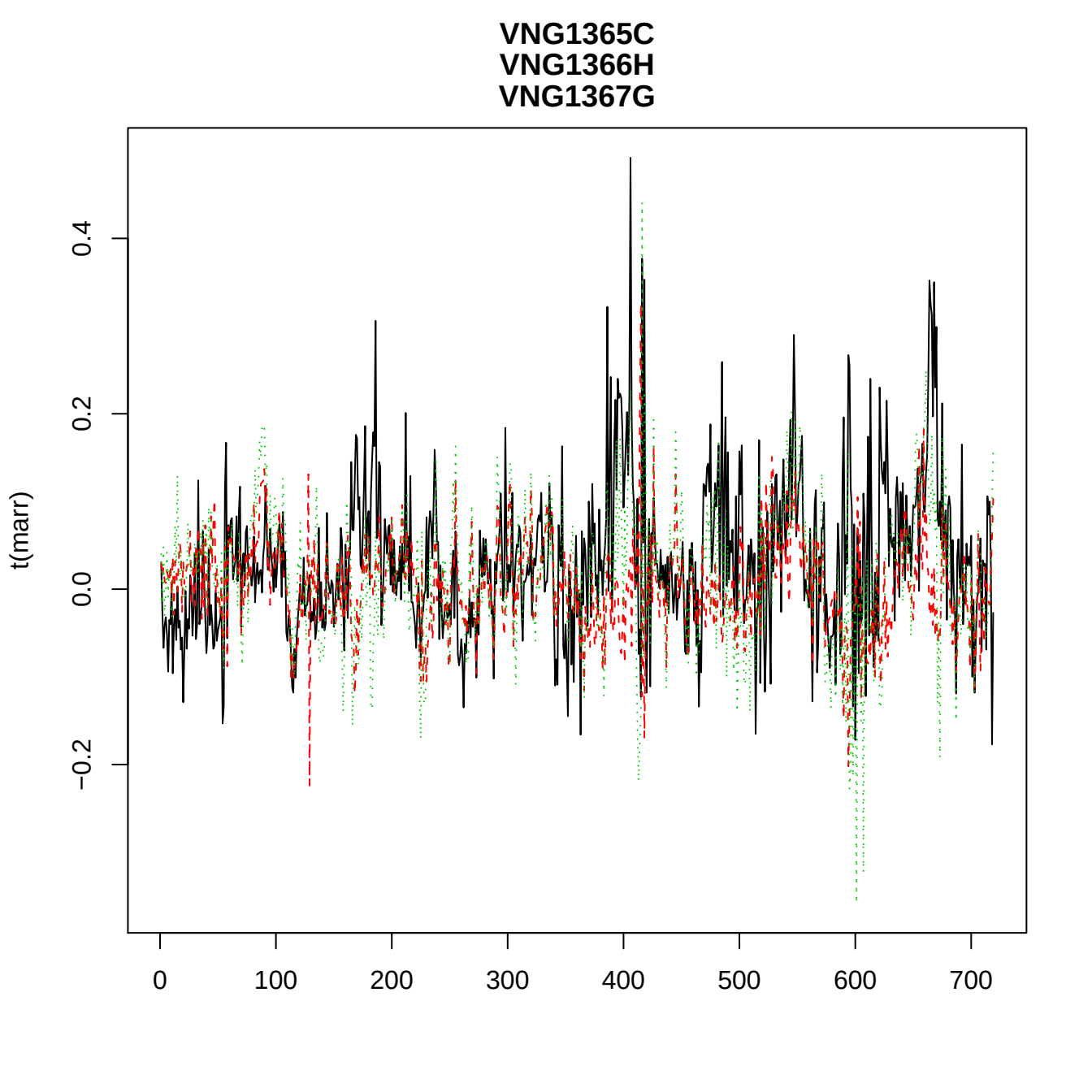
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred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VNG1366H
VNG1367G
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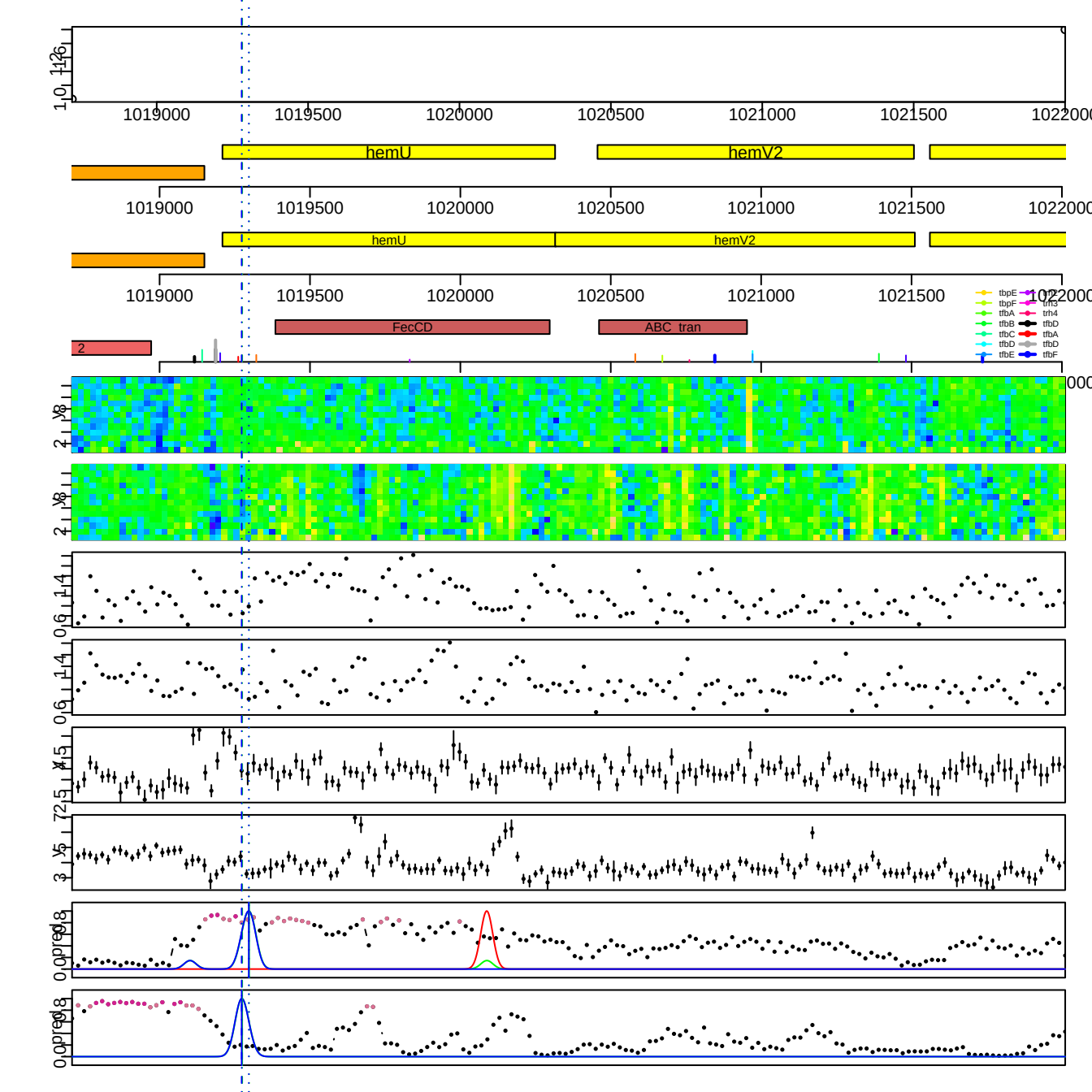
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1021000
1021500
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hemU
hemV2
FecCD
ABC_tran
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tbpF
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tfbB
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trh4
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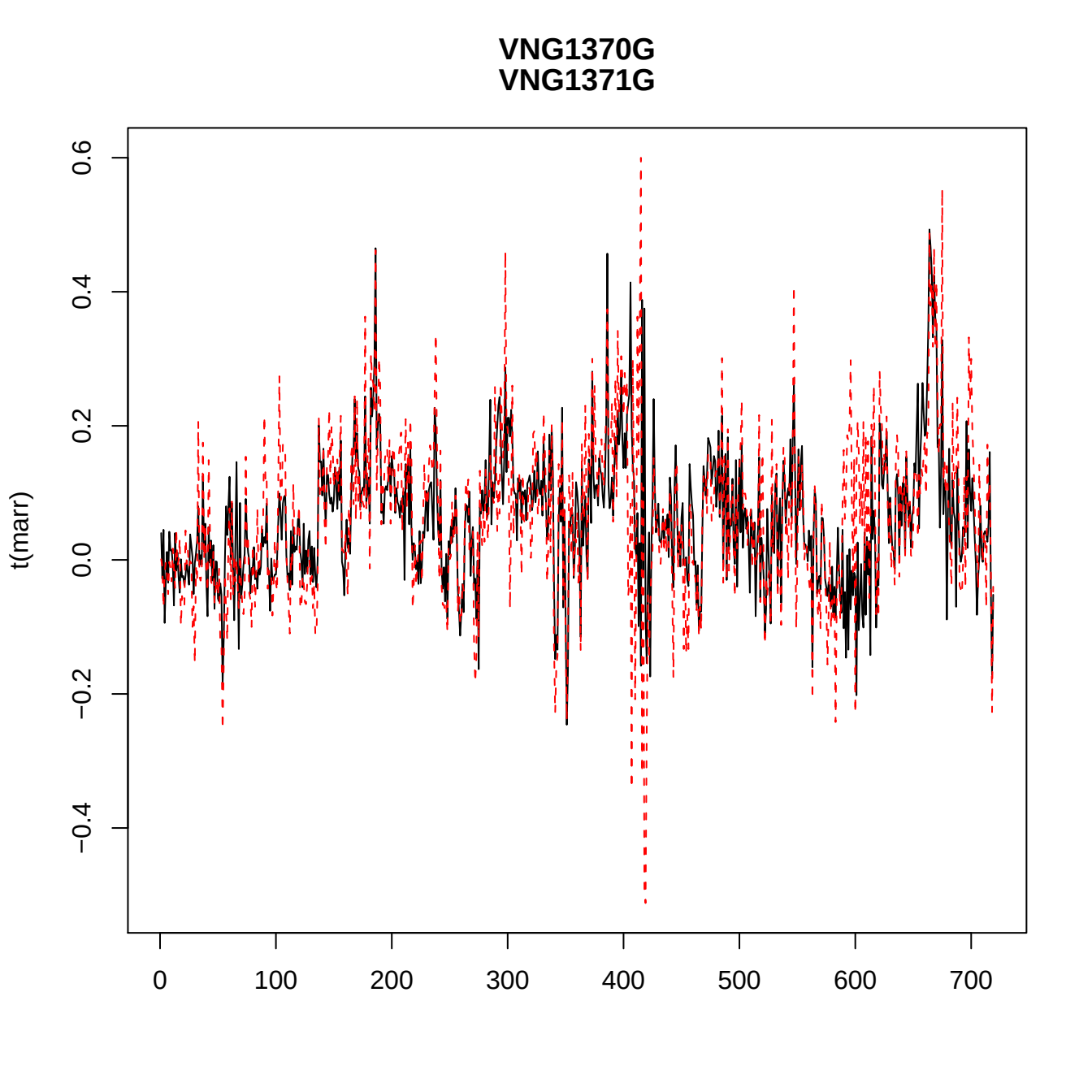
tfbF


VNG1370G
VNG1371G
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−0.4
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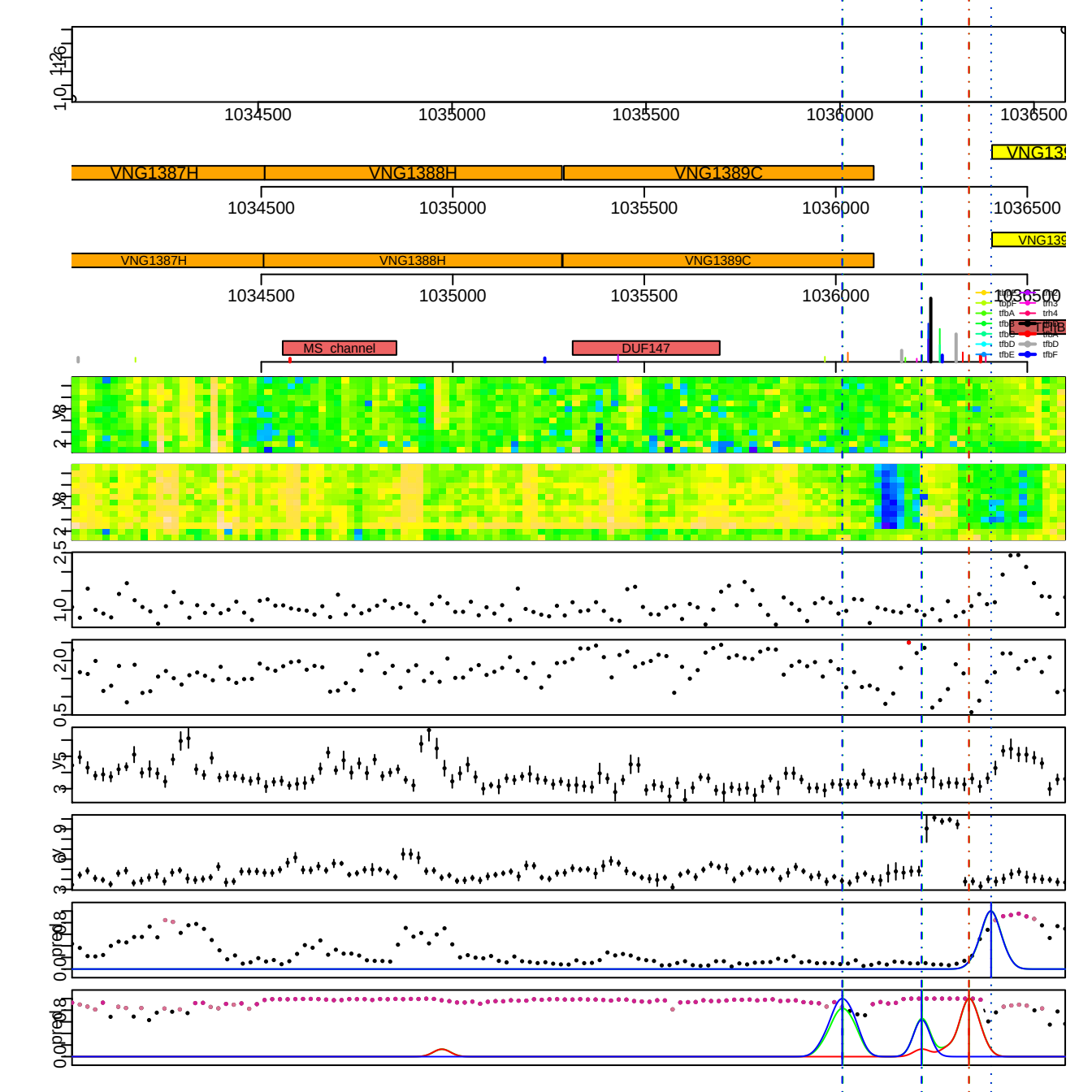

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1036500
VNG1387H
VNG1388H
VNG1389C
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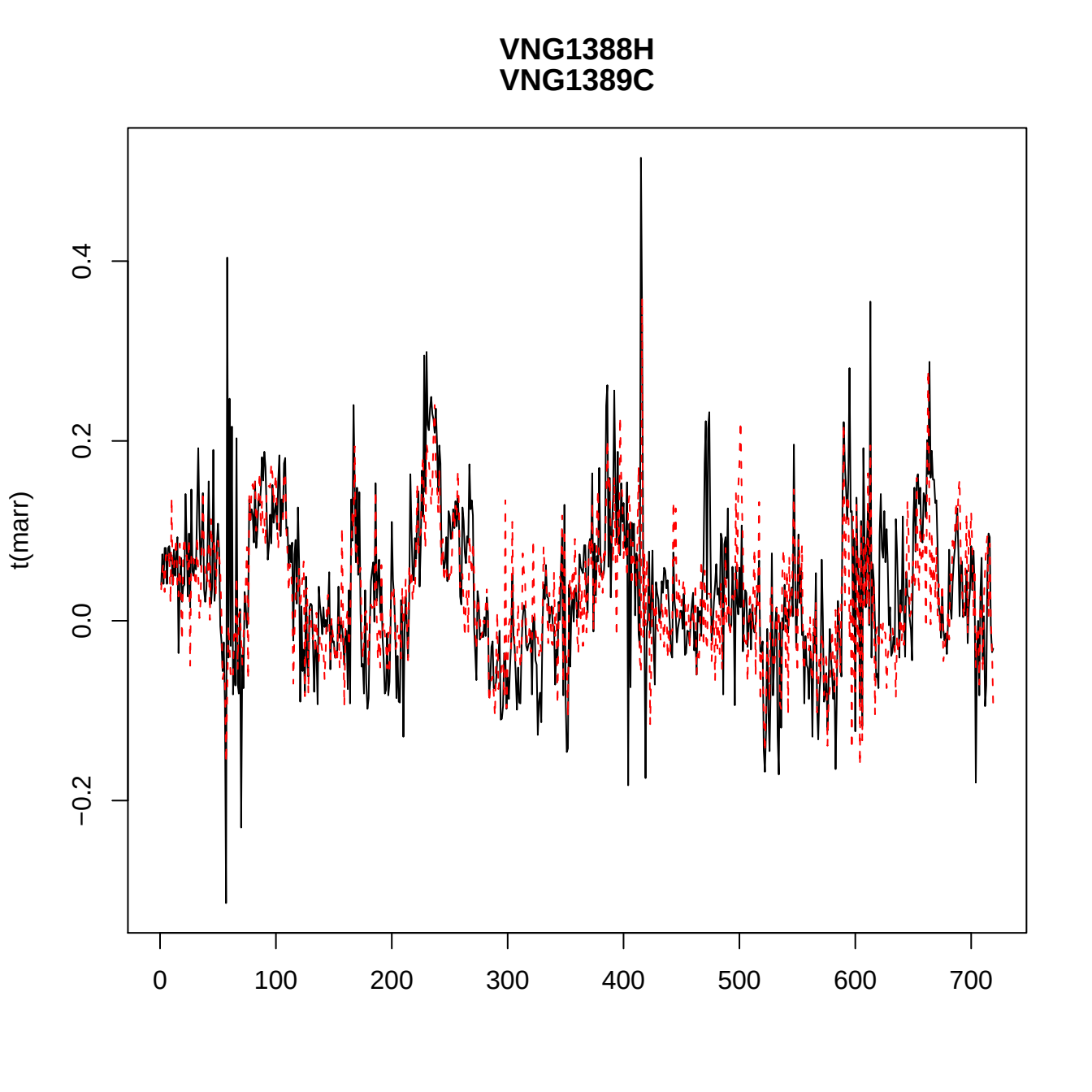
trh1
trh2


VNG1388H
VNG1389C
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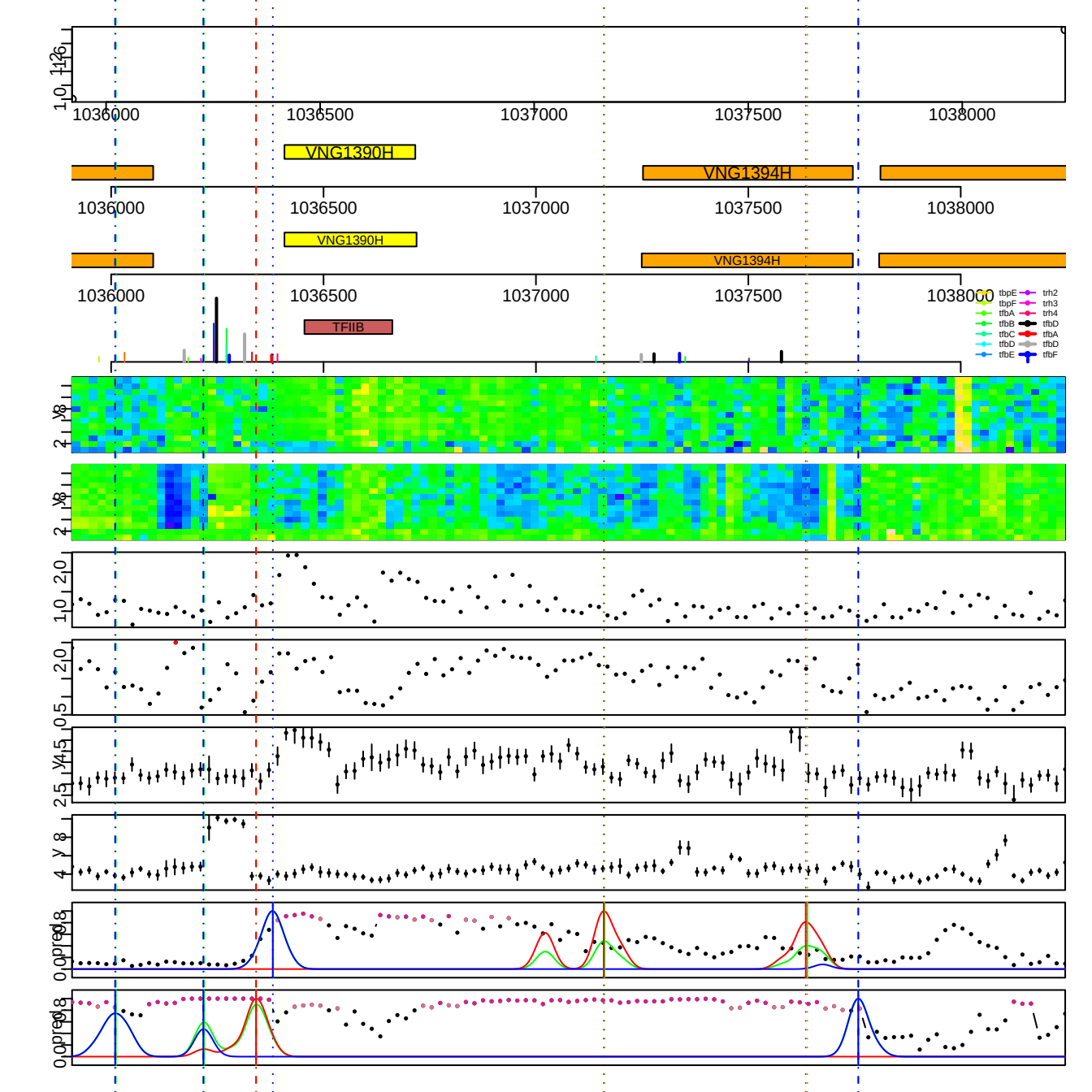
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1037000
1037500
1038000
VNG1390H
VNG1394H
TFIIB
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tbpF
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tfbC
tfbD
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trh3
trh4
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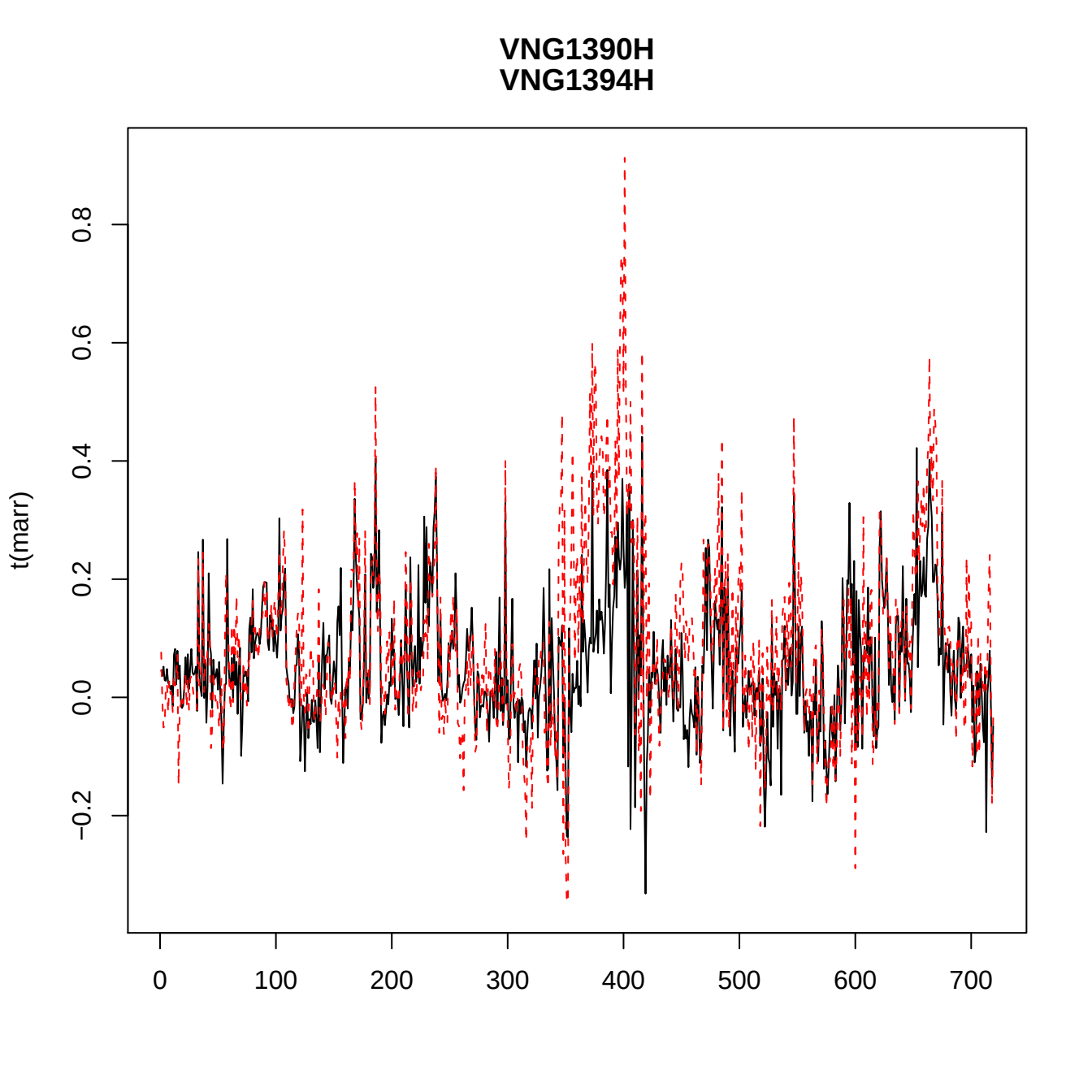
tfbA
tfbD
tfbF


VNG1390H
VNG1394H
t(marr)
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0.4
0.2
0.0
−0.2
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600
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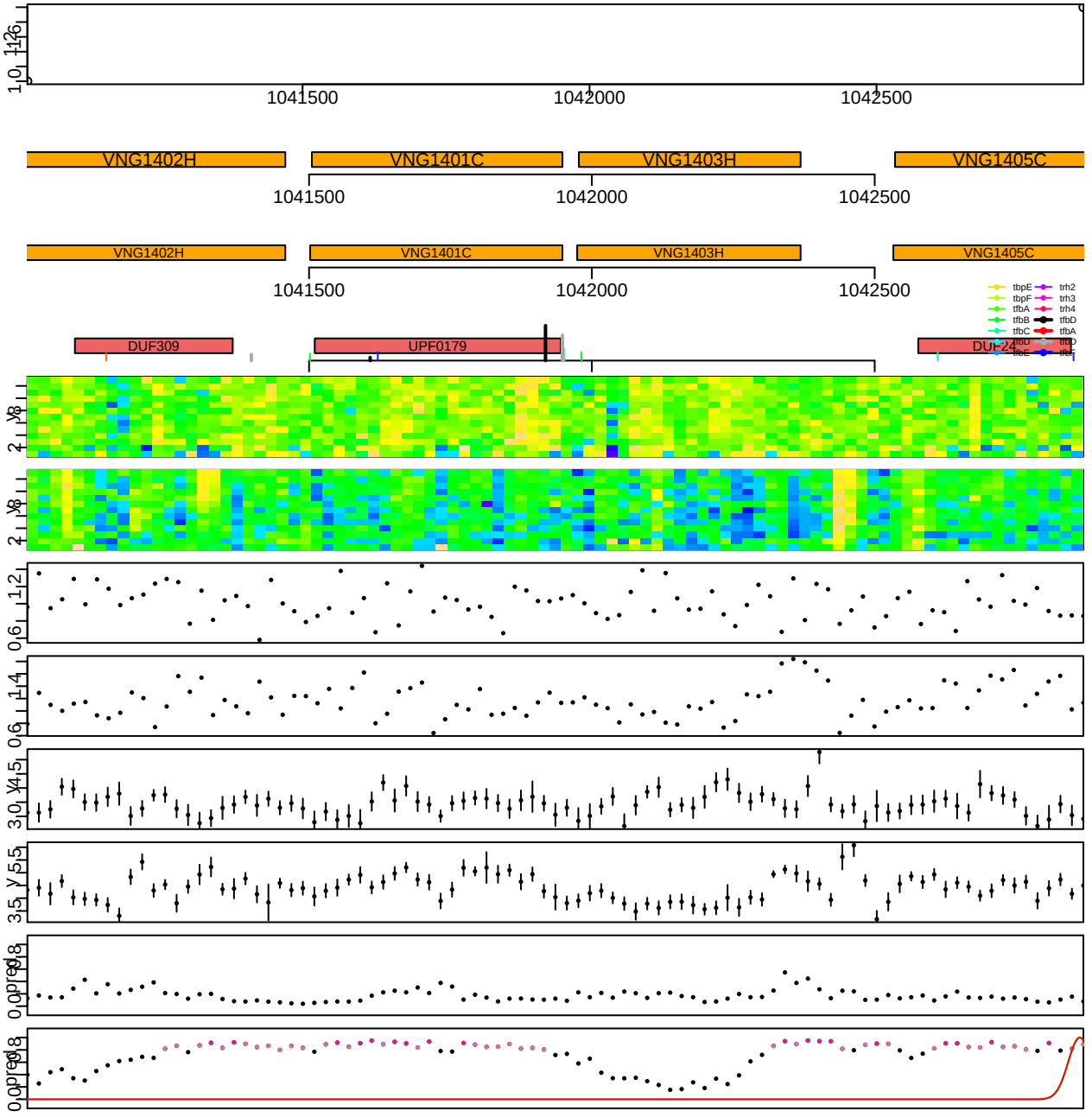
1041500
1042000
1042500
VNG1402H
VNG1401C
VNG1403H
VNG1405C
DUF309
UPF0179
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tfbB
tfbC
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trh2
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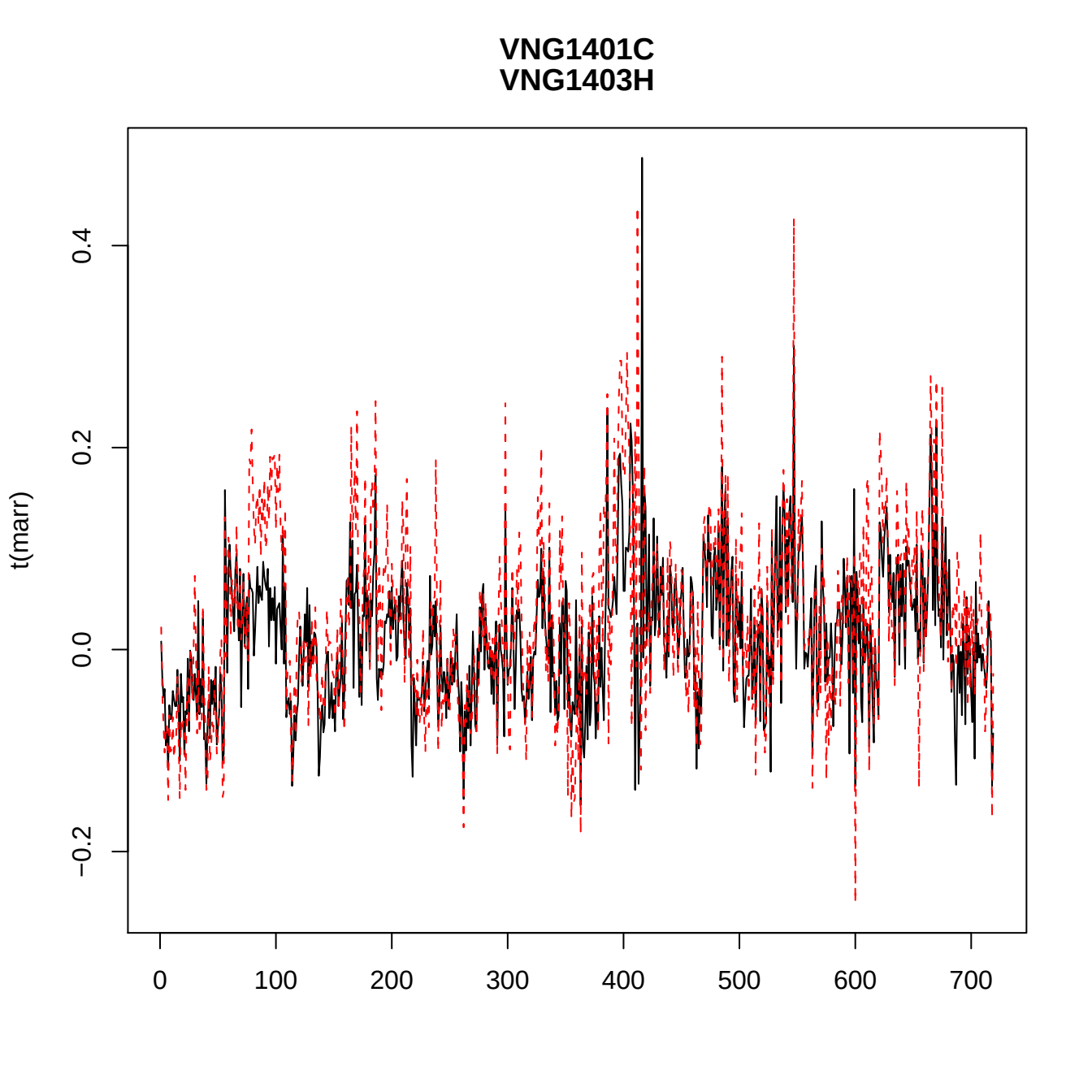
tfbA


VNG1401C
VNG1403H
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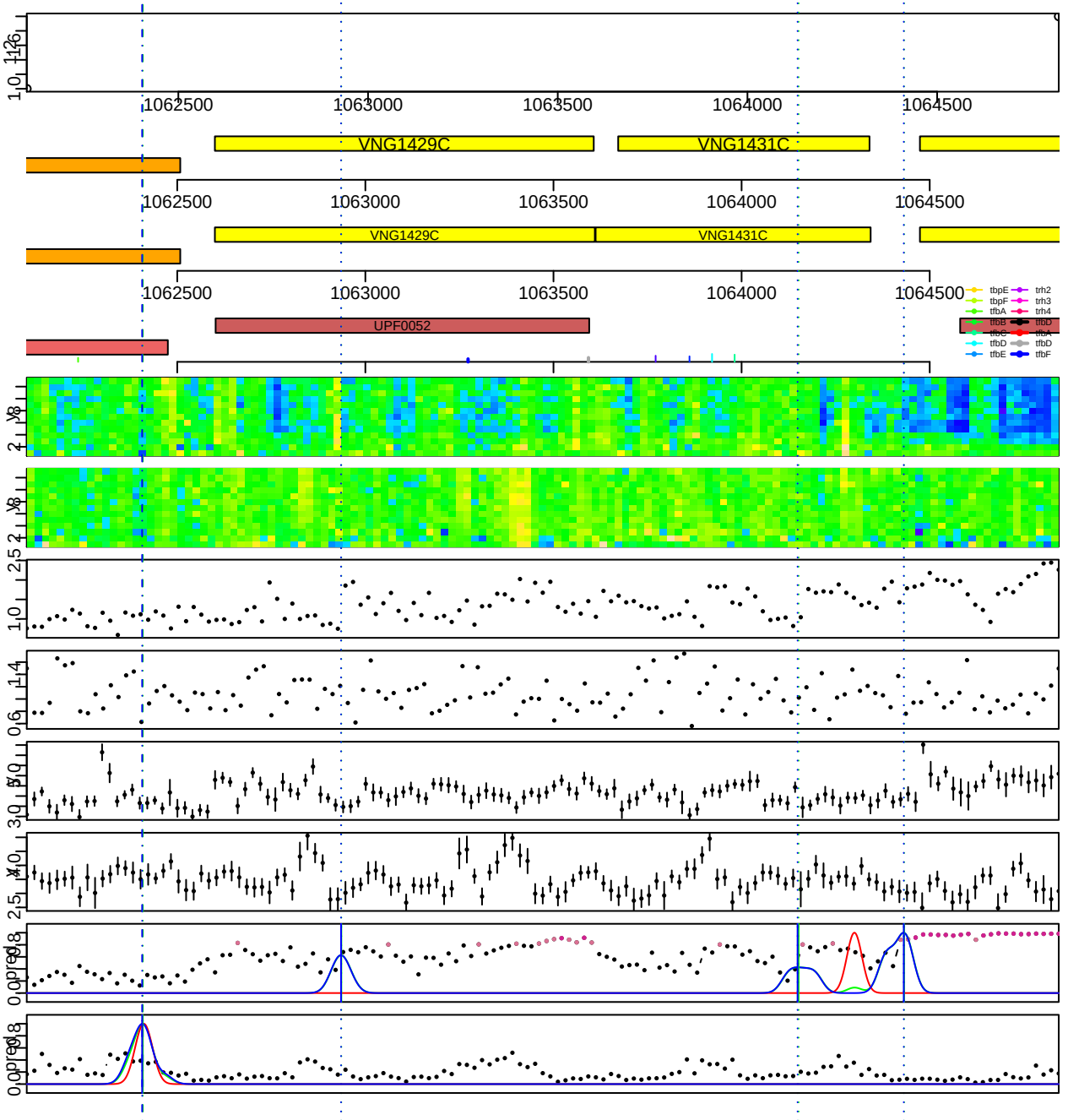
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1063500
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1064500
VNG1429C
VNG1431C
UPF0052
tbpE
tbpF
tfbA
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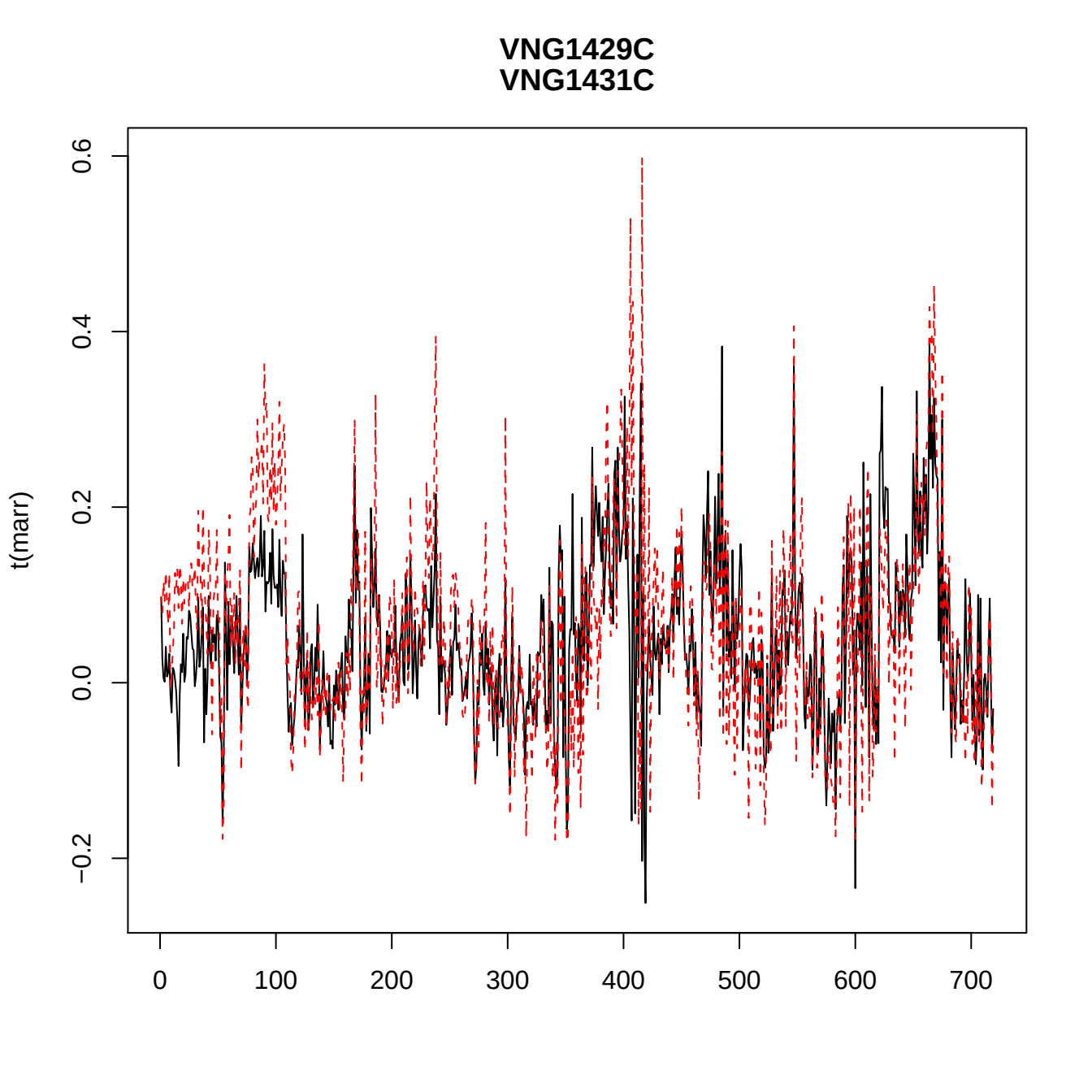
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1429C
VNG1431C
t(marr)
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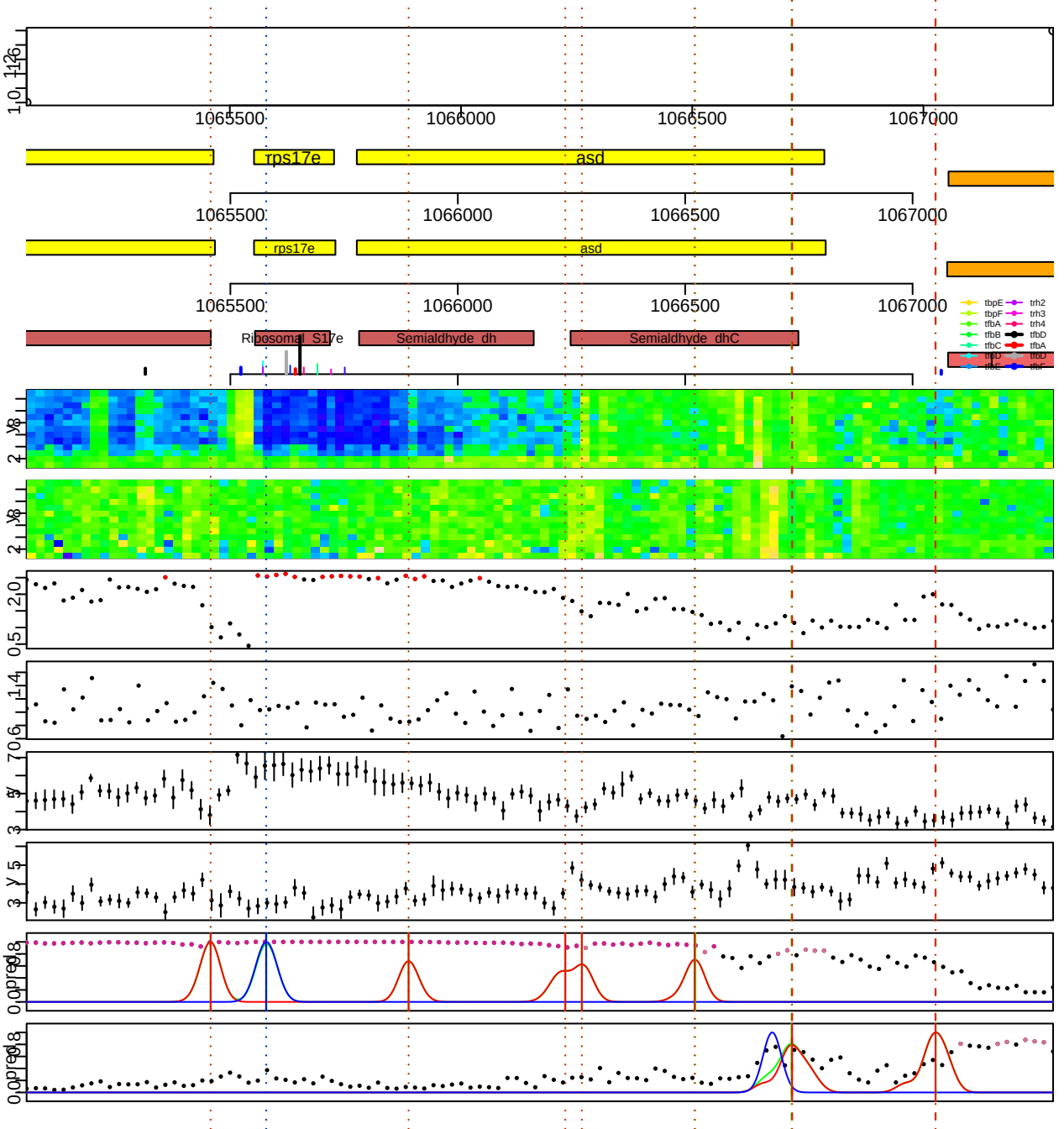
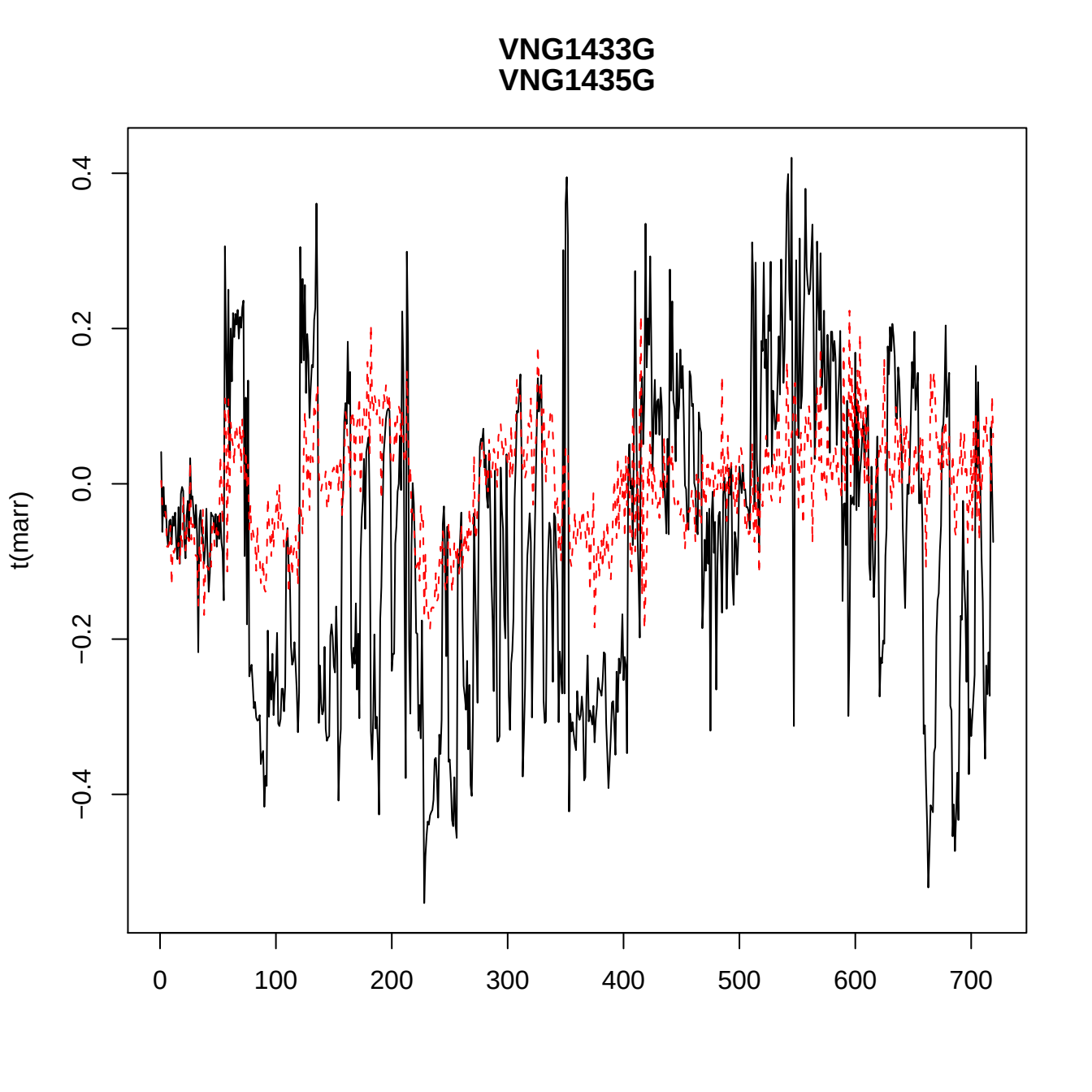
600
700


1065500
1066000
1066500
1067000
rps17e
asd
Ribosomal_S17e
Semialdhyde_dh
Semialdhyde_dhC
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbE
tfbF


VNG1433G
VNG1435G
t(marr)
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0.2
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−0.4
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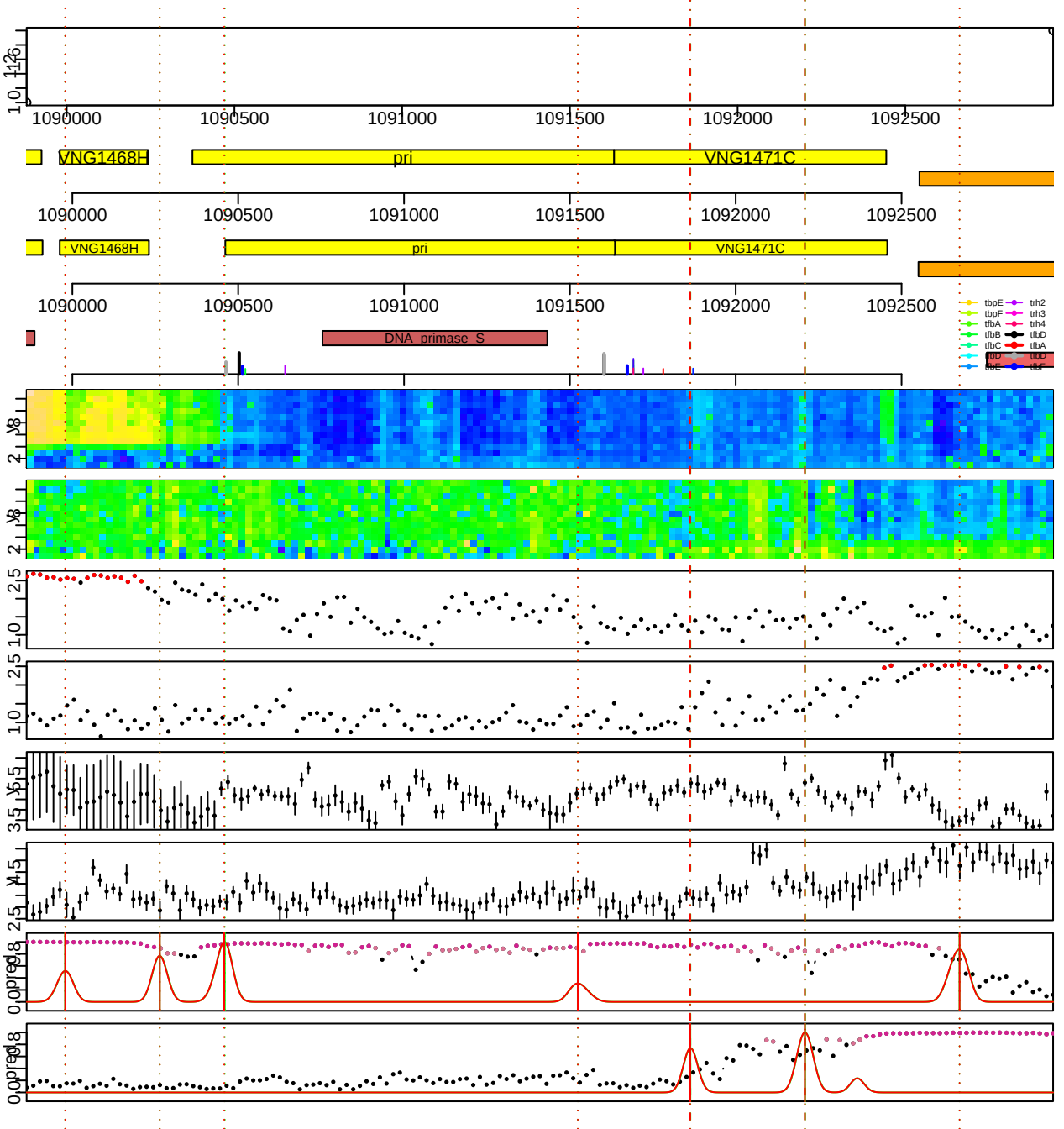
600
700



1090000
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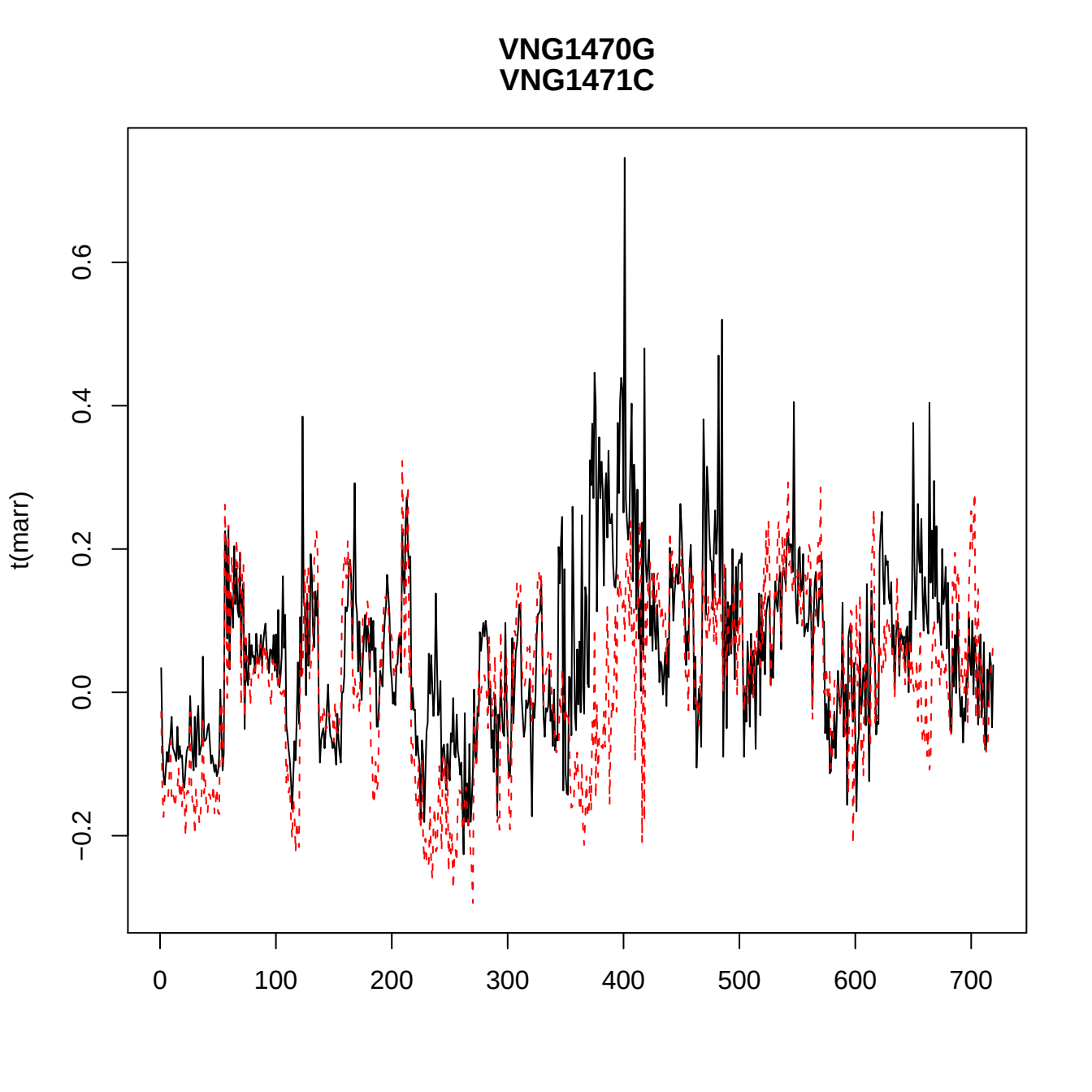
1092000
1092500
VNG1468H
pri
VNG1471C
DNA_primase_S
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1470G
VNG1471C
t(marr)
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0.4
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0.0
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600
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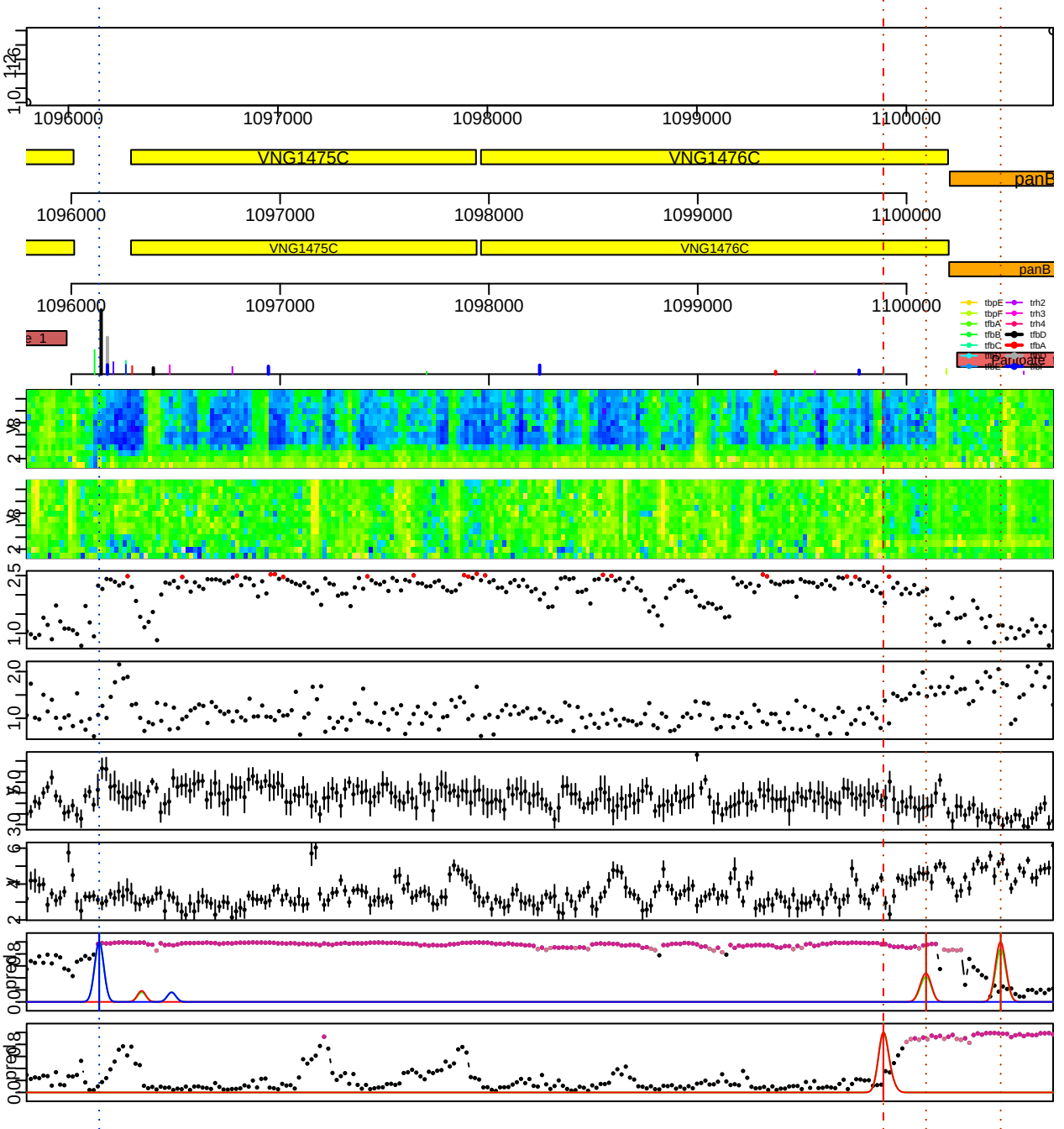
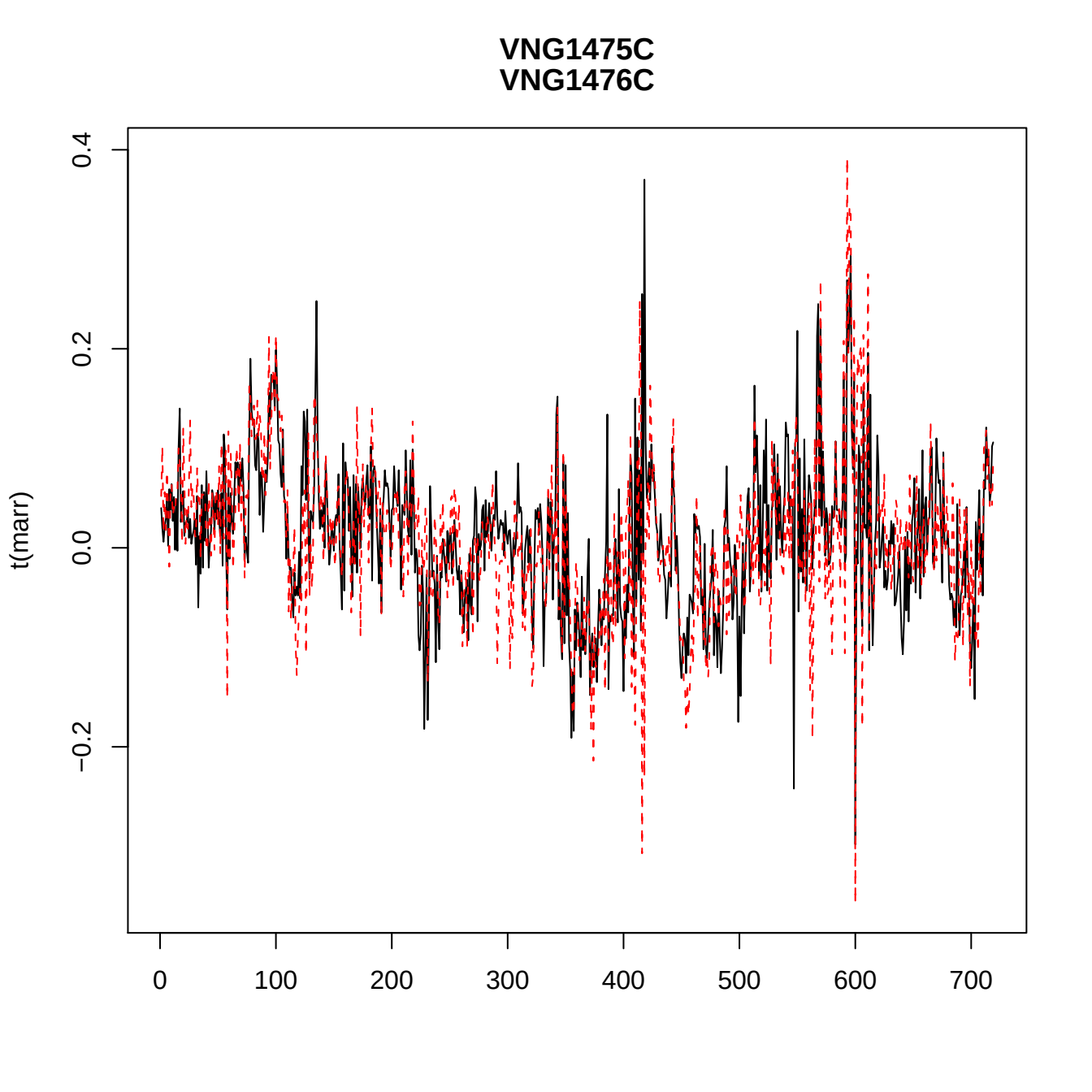

1096000
1097000
1098000
1099000
1100000
VNG1475C
VNG1476C
panB
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA
Paroate


VNG1475C
VNG1476C
t(marr)
0.4
0.2
0.0
−0.2
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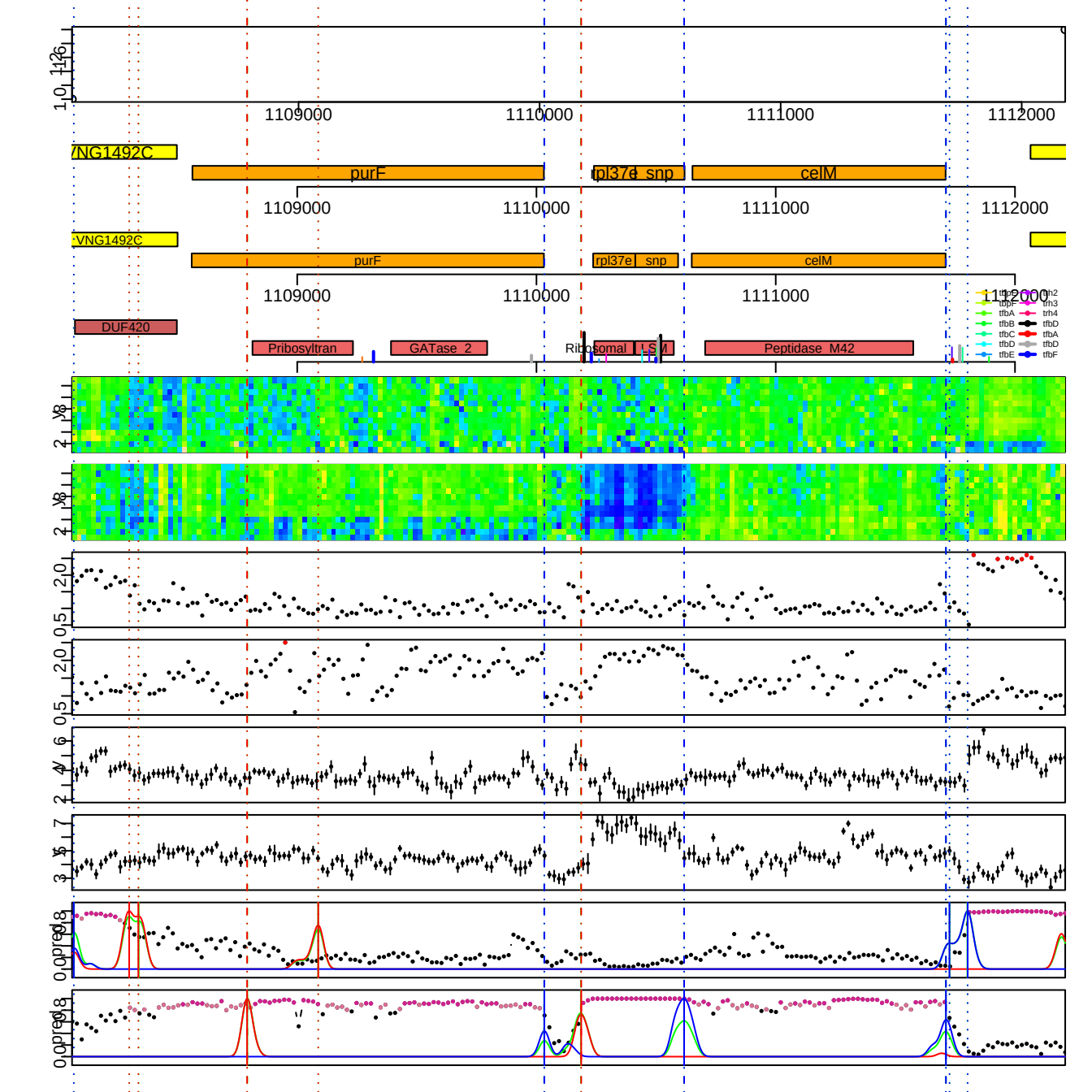
300
400
500
600
700



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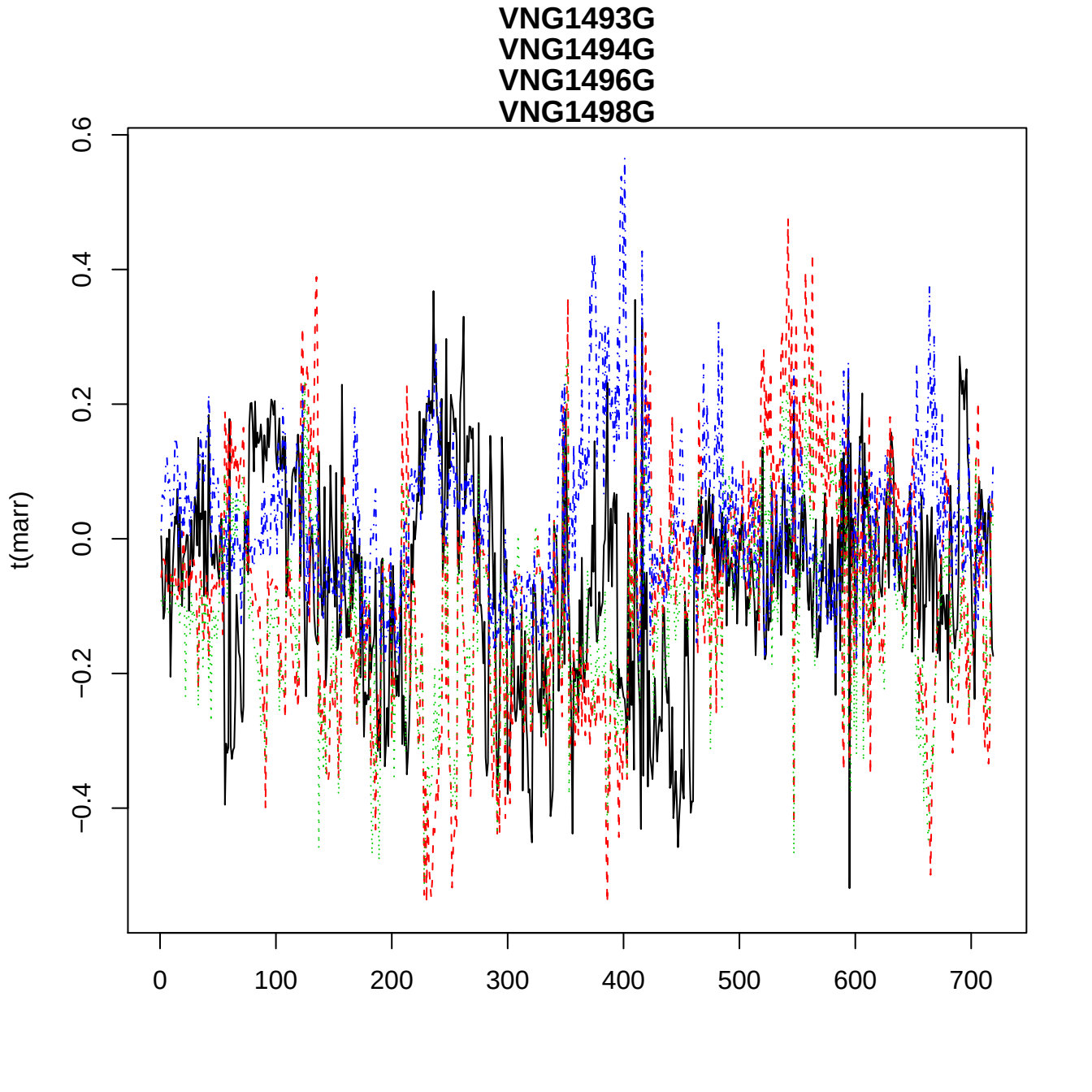
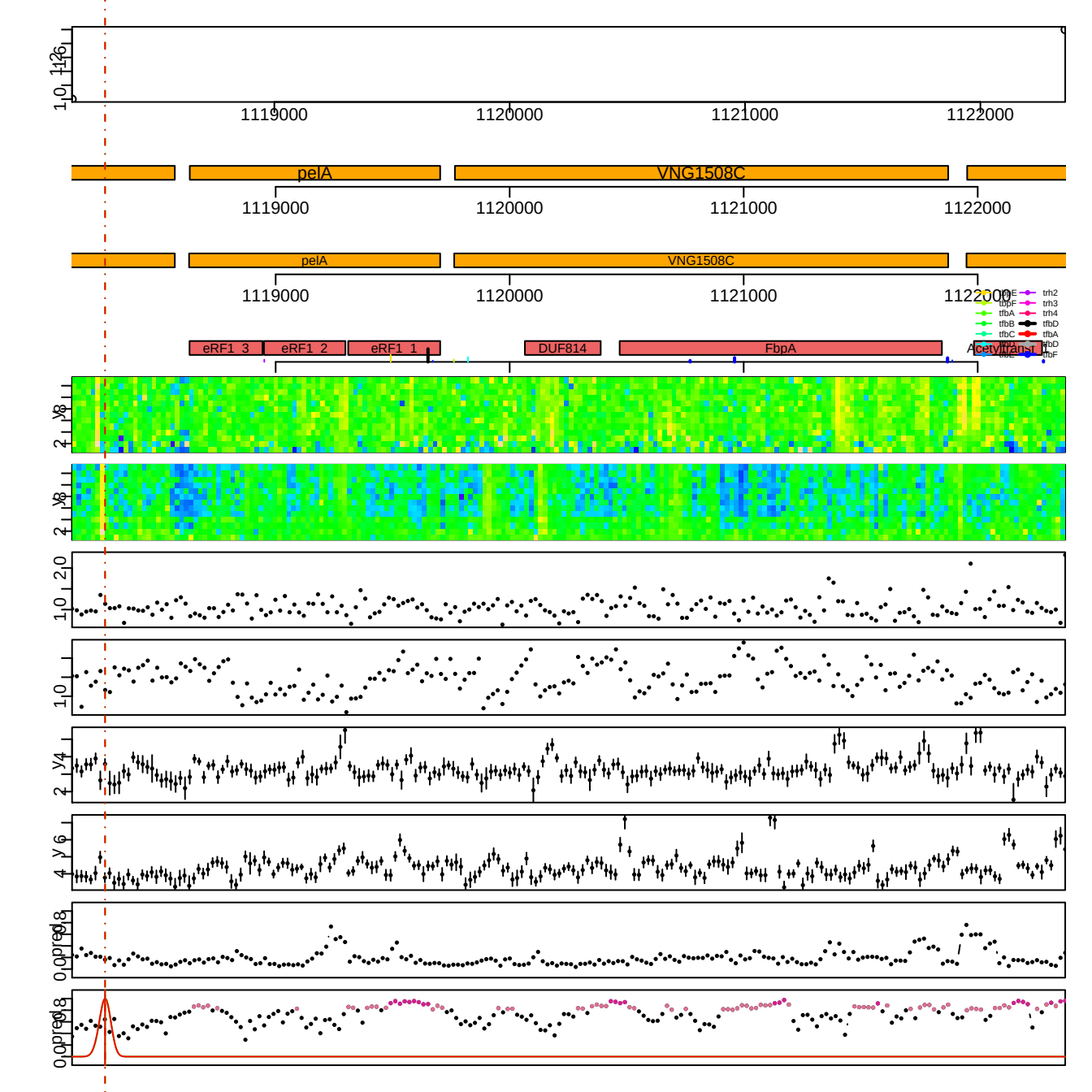
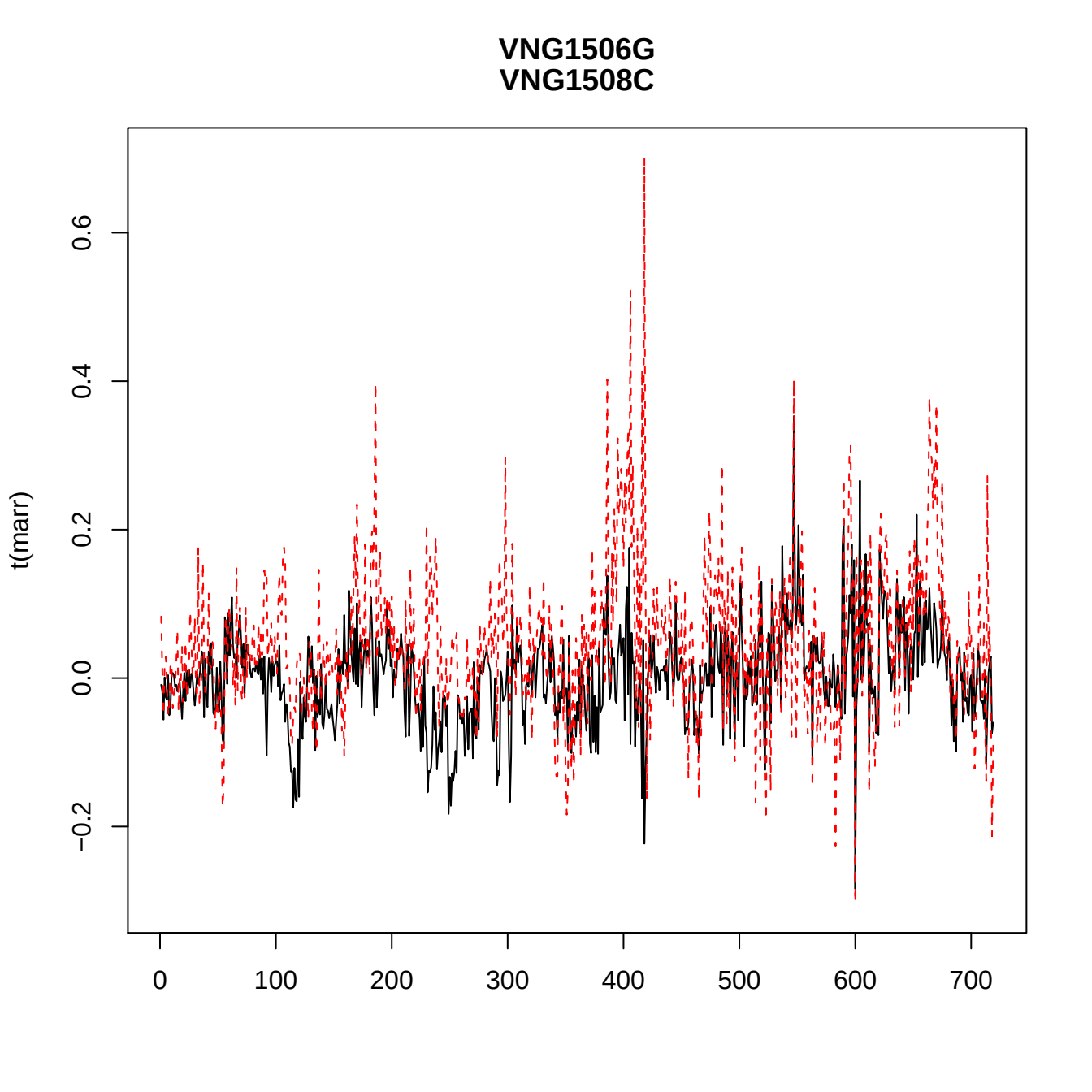
1111000
1112000
VNG1492C
purF
rpl37e snp
celM
DUF420
Pribosyltran
GATase_2
Ribosomal
LSM
Peptidase_M42
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
tfh2
tfh3
tfh4
tfbD
tfbA
tfbD
tfbF


VNG1493G
VNG1494G
VNG1496G
VNG1498G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1119000
1120000
1121000
1122000
pelA
VNG1508C
eRF1_3
eRF1_2
eRF1_1
DUF814
FbpA
AcetyltransT
tfbE
tfbF
tfbA
tfbB
tfbC
tfbG
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1506G
VNG1508C
t(marr)
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0.4
0.2
0.0
−0.2
0
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200
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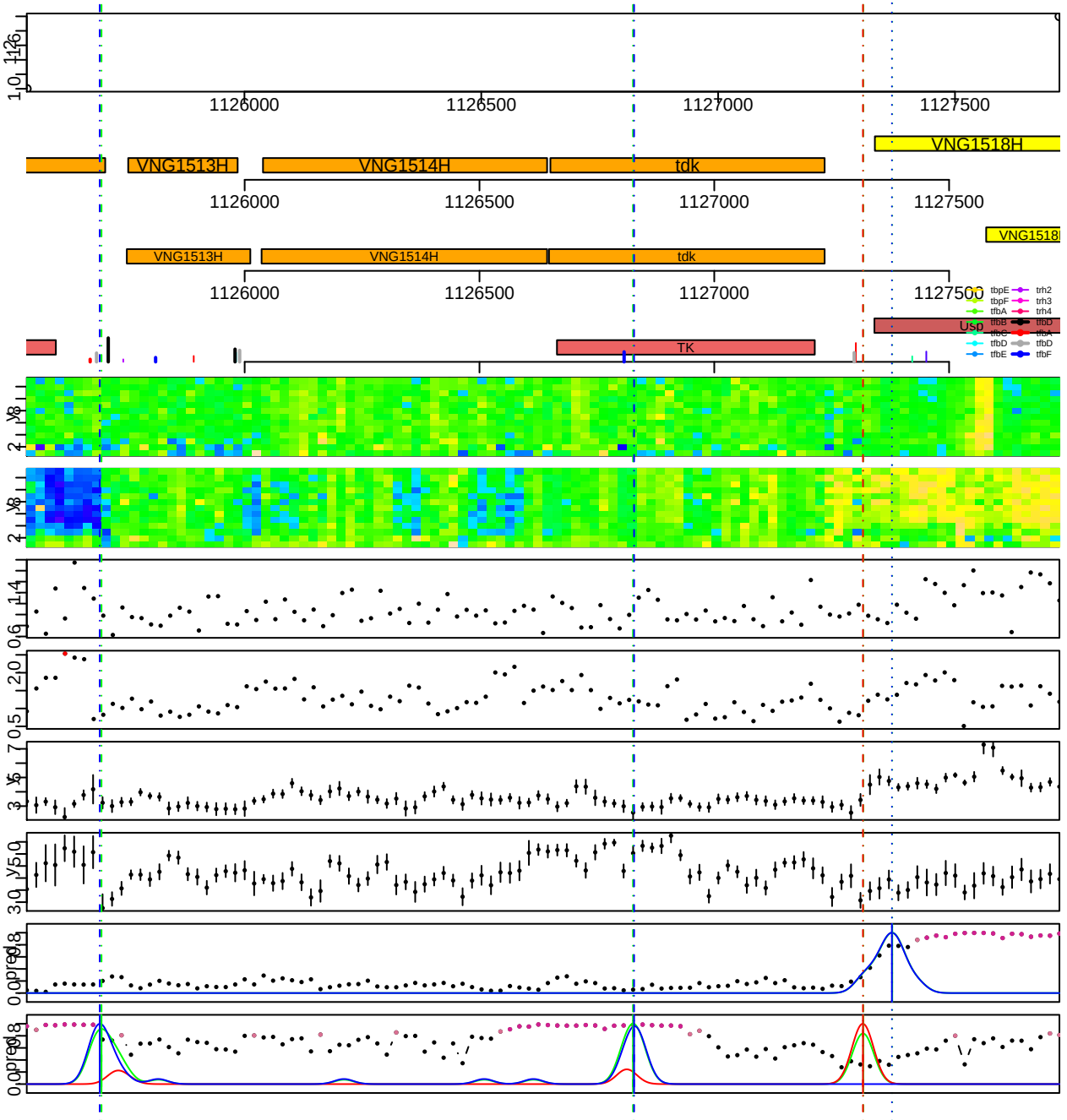
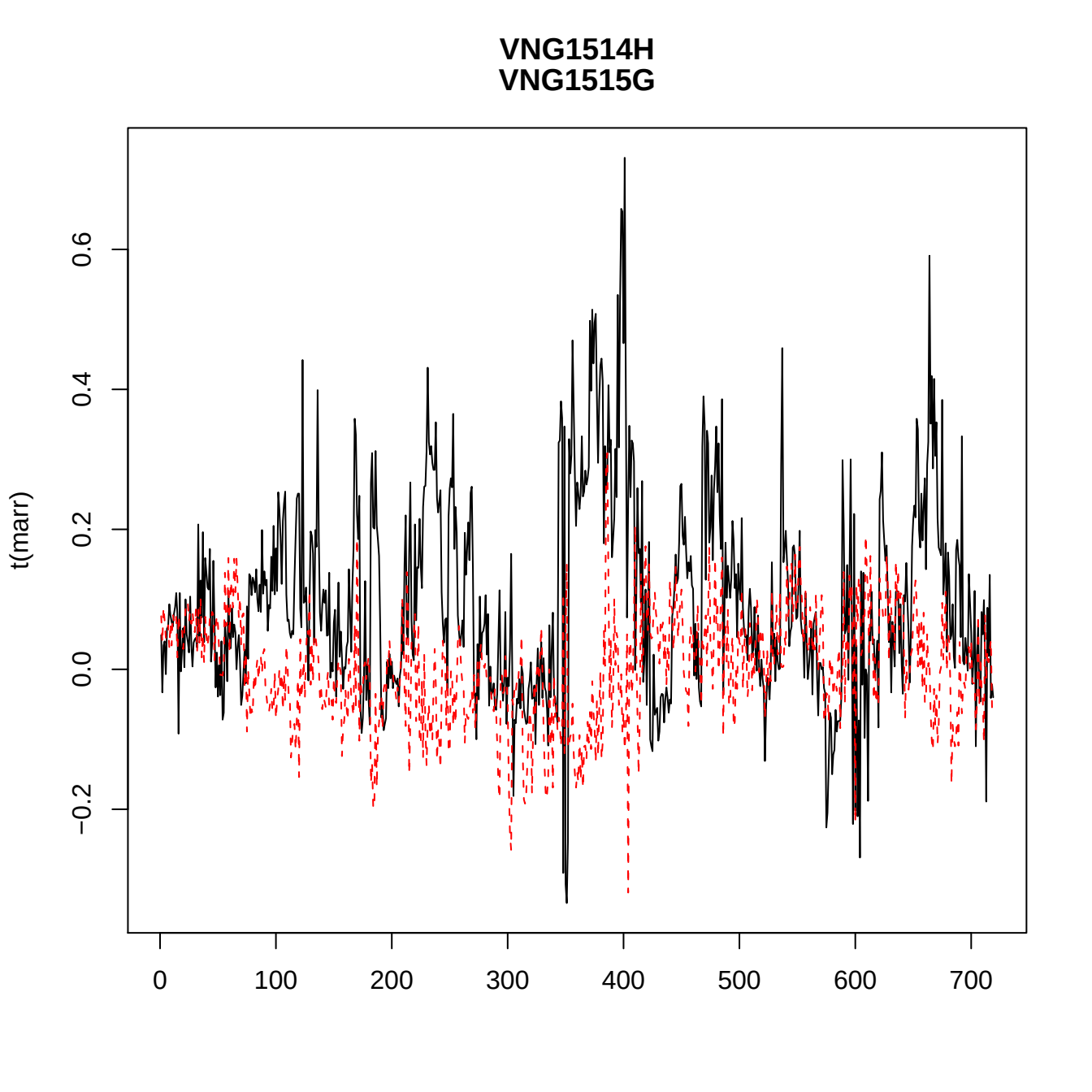
400
500
600
700


1126000
1126500
1127000
1127500
VNG1518H
VNG1513H
VNG1514H
tdk
VNG1518
Usp
TK
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1514H
VNG1515G
t(marr)
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0.4
0.2
0.0
−0.2
0
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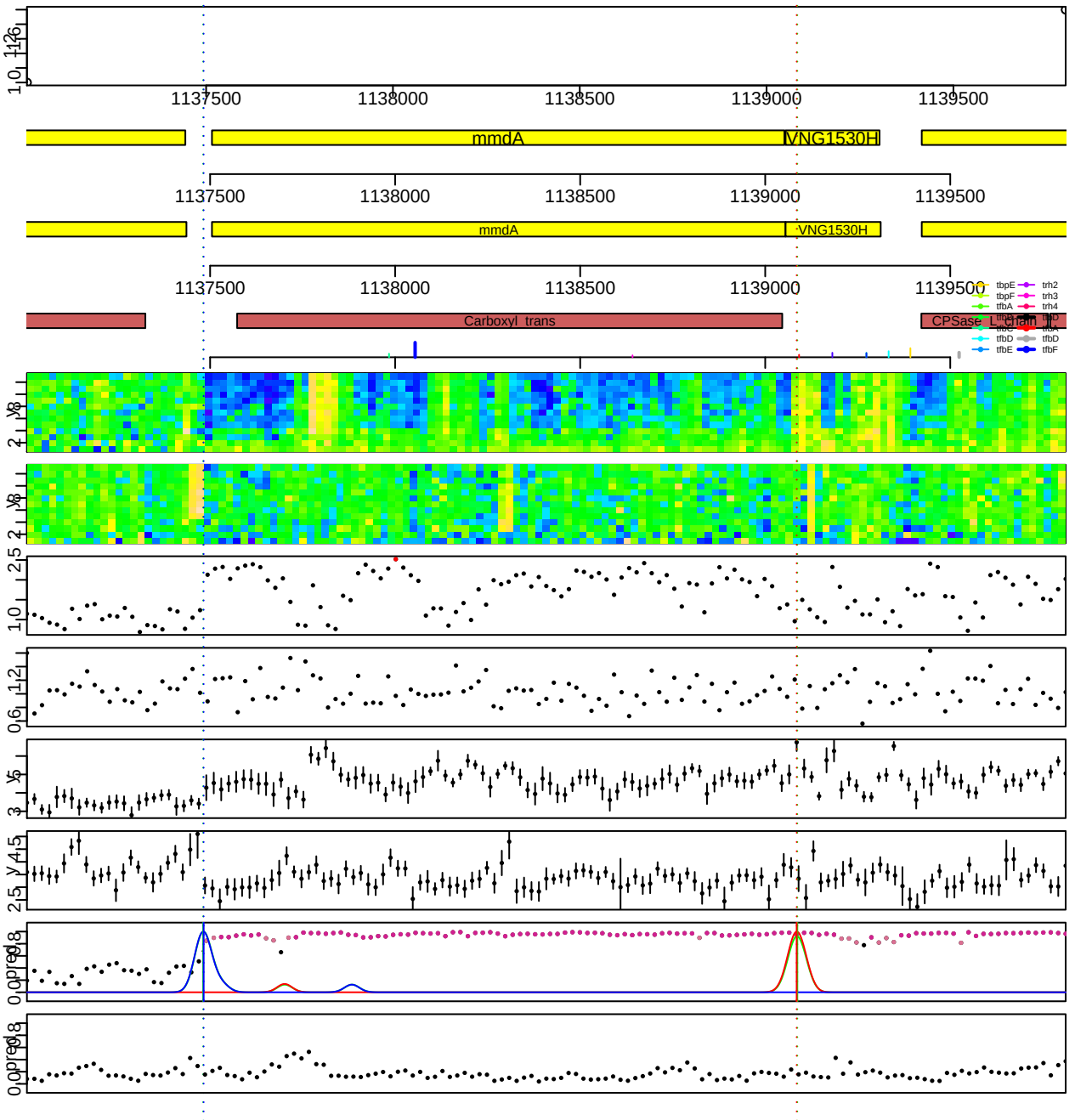
200
300
400
500
600
700


1137500
1138000
1138500
1139000
1139500
mmdA
VNG1530H
Carboxyl_trans
CPSase_L_chain
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh2
trh3
trh4
trh5
trh6
trh7
trh8
trh9
trh10
trh11
trh12
trh13
trh14
trh15
trh16
trh17
trh18
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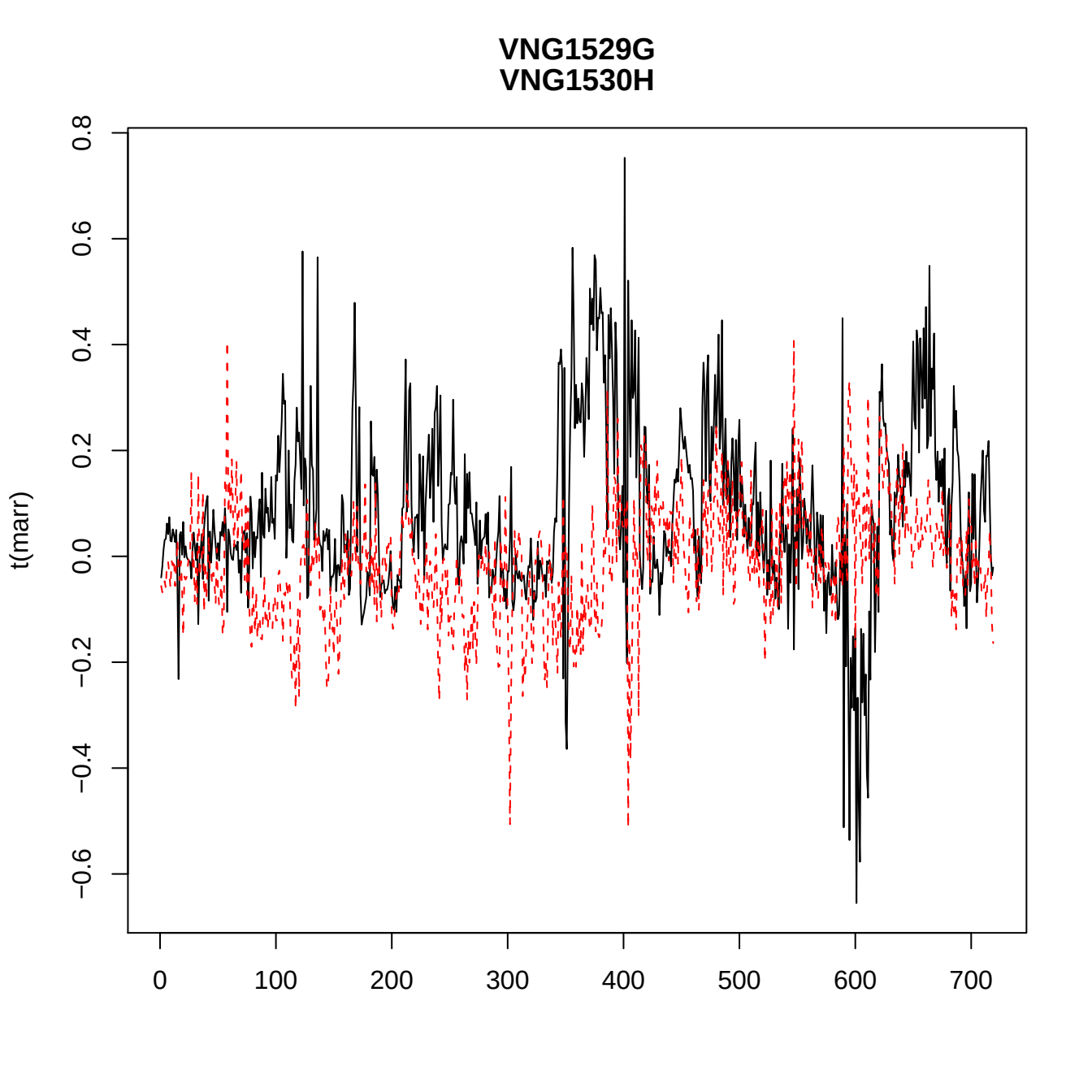
trh41


VNG1529G
VNG1530H
t(marr)
0.8
0.6
0.4
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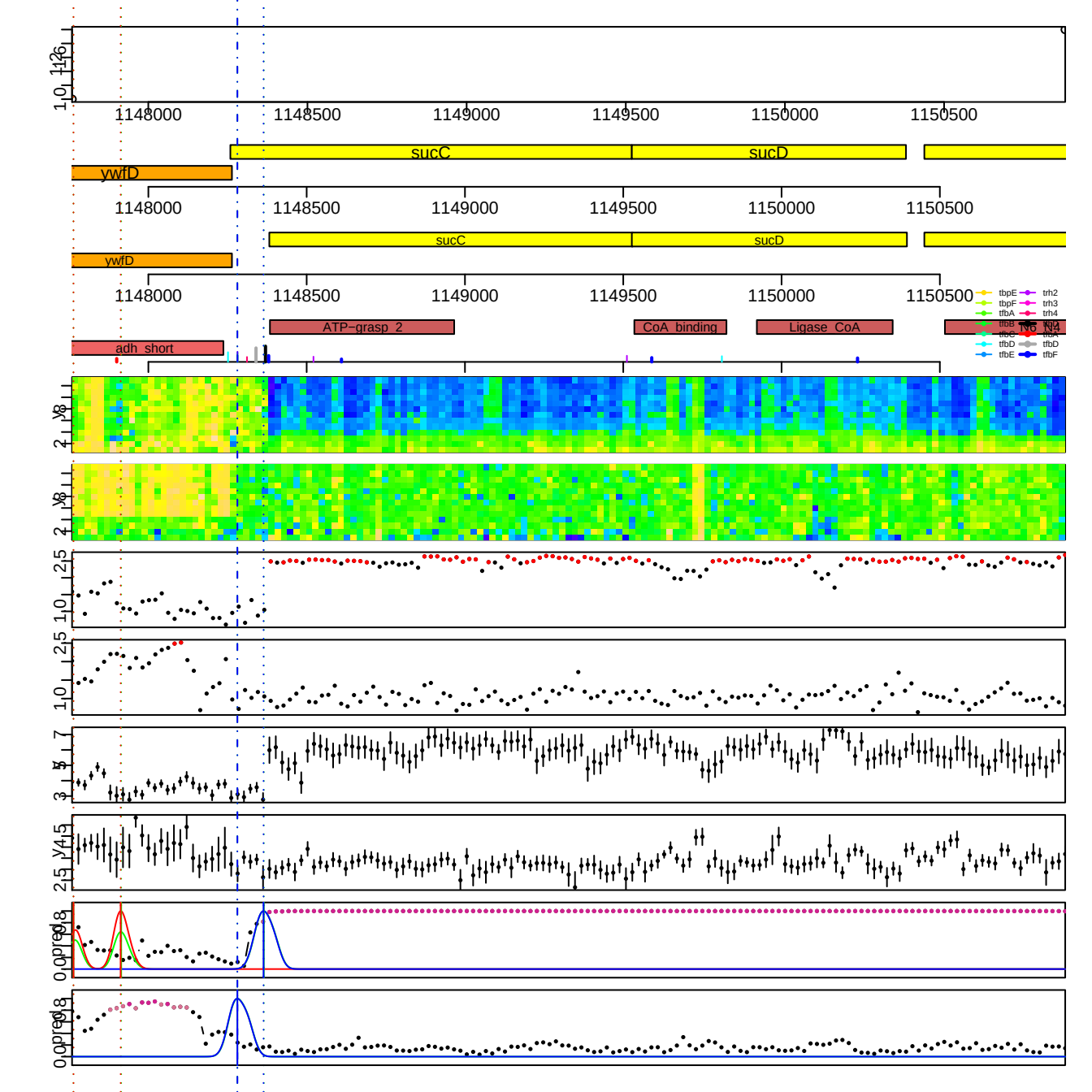
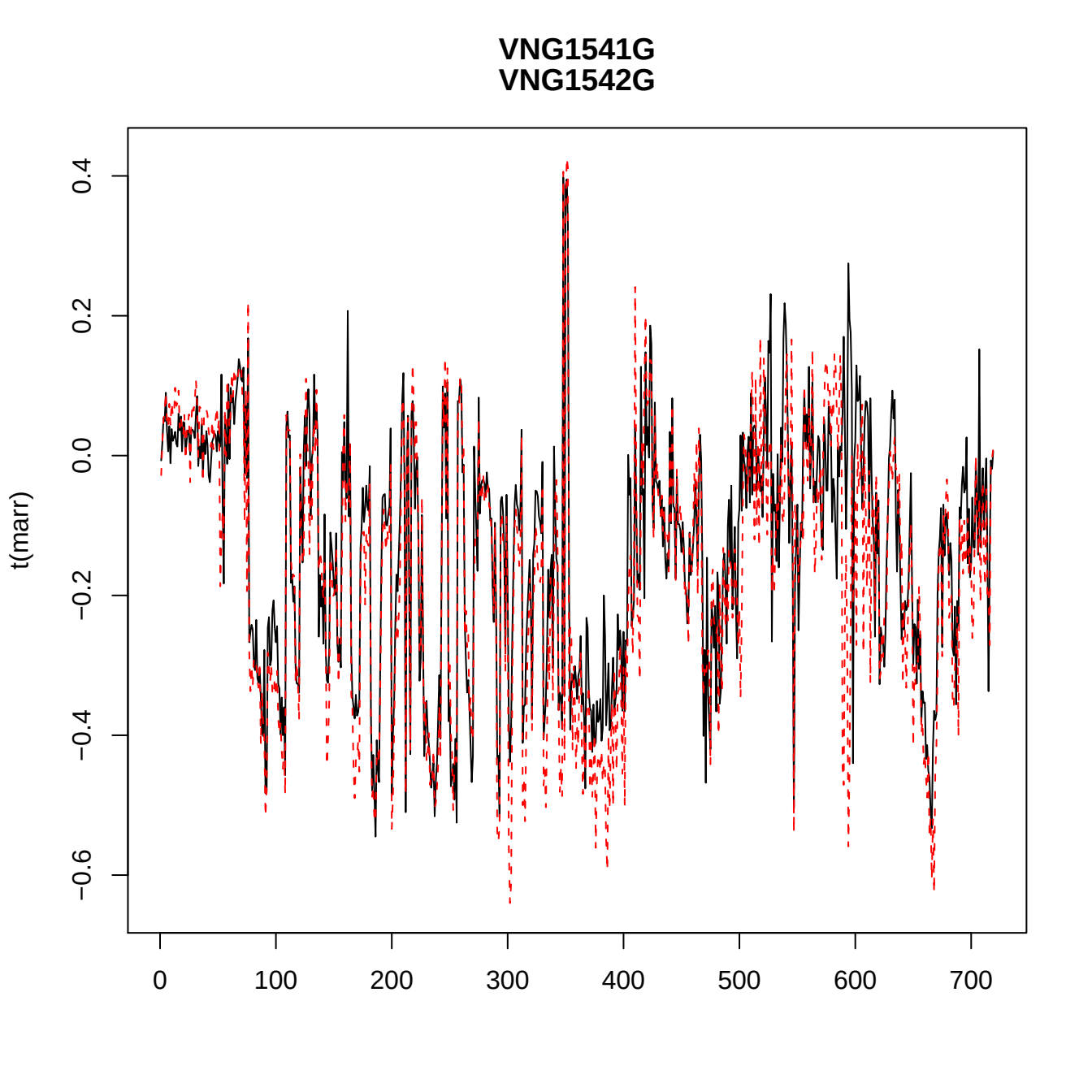
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


1148000
1148500
1149000
1149500
1150000
1150500
sucC
sucD
ywfD
ATP−grasp_2
CoA_binding
Ligase_CoA
adh_short
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
trh5
tfbA
tfbD
tfbF
pred


VNG1541G
VNG1542G
t(marr)
0.4
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0.0
−0.2
−0.4
−0.6
0
100
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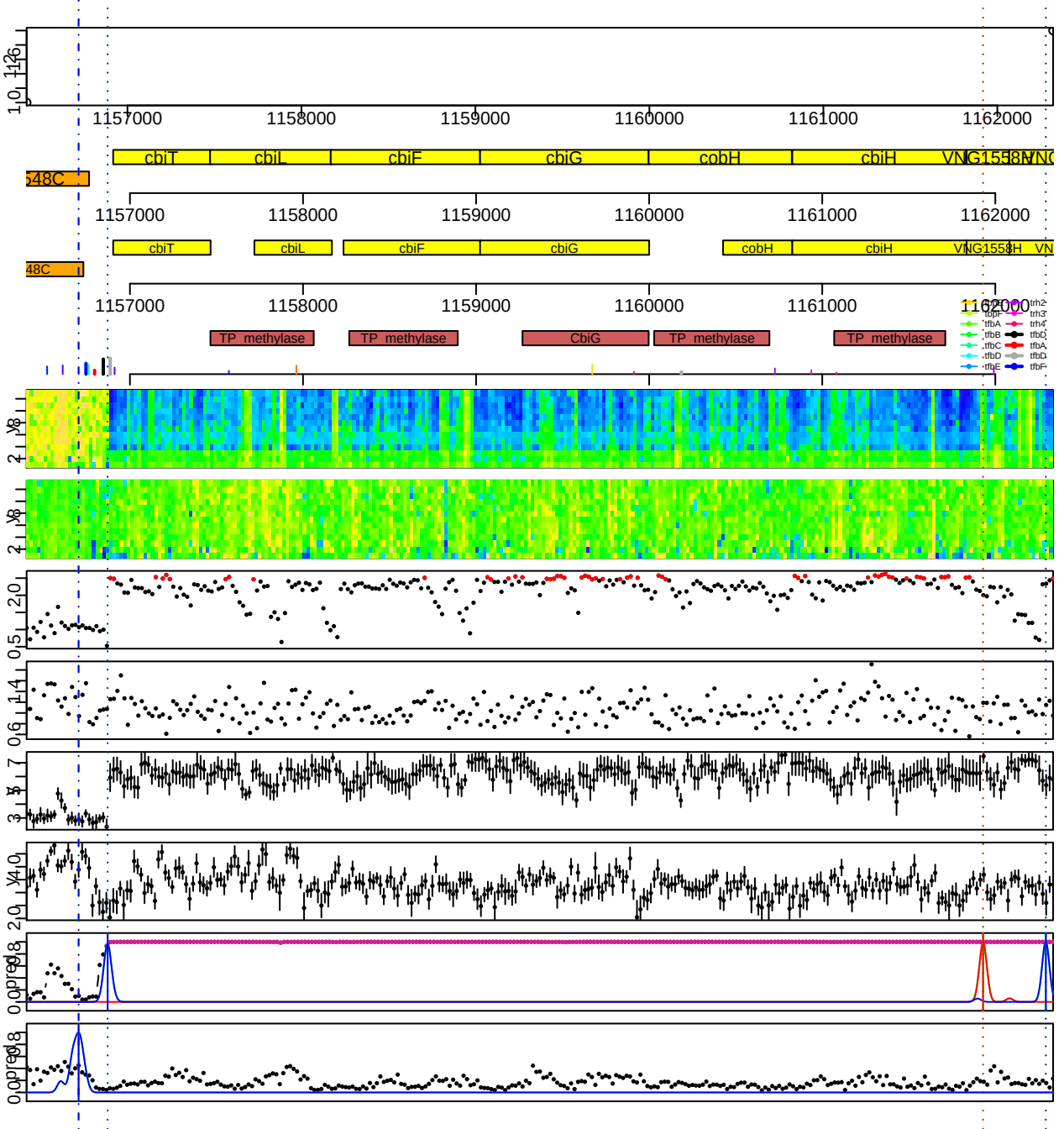
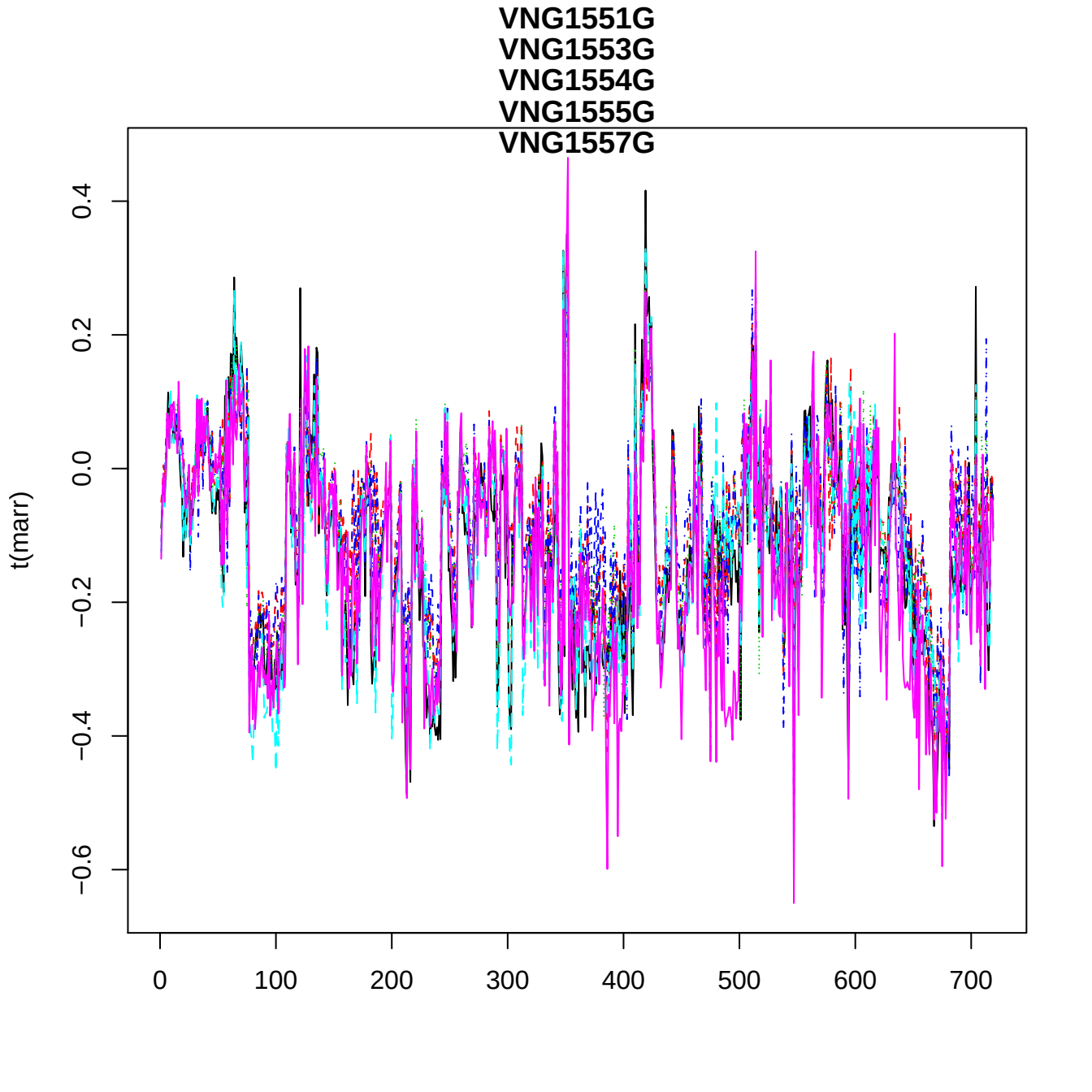
300
400
500
600
700


1157000
1158000
1159000
1160000
1161000
1162000
cbiT
cbiL
cbiF
cbiG
cobH
cbiH
TP_methylase
TP_methylase
CbiG
TP_methylase
TP_methylase
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1551G
VNG1553G
VNG1554G
VNG1555G
VNG1557G
t(marr)
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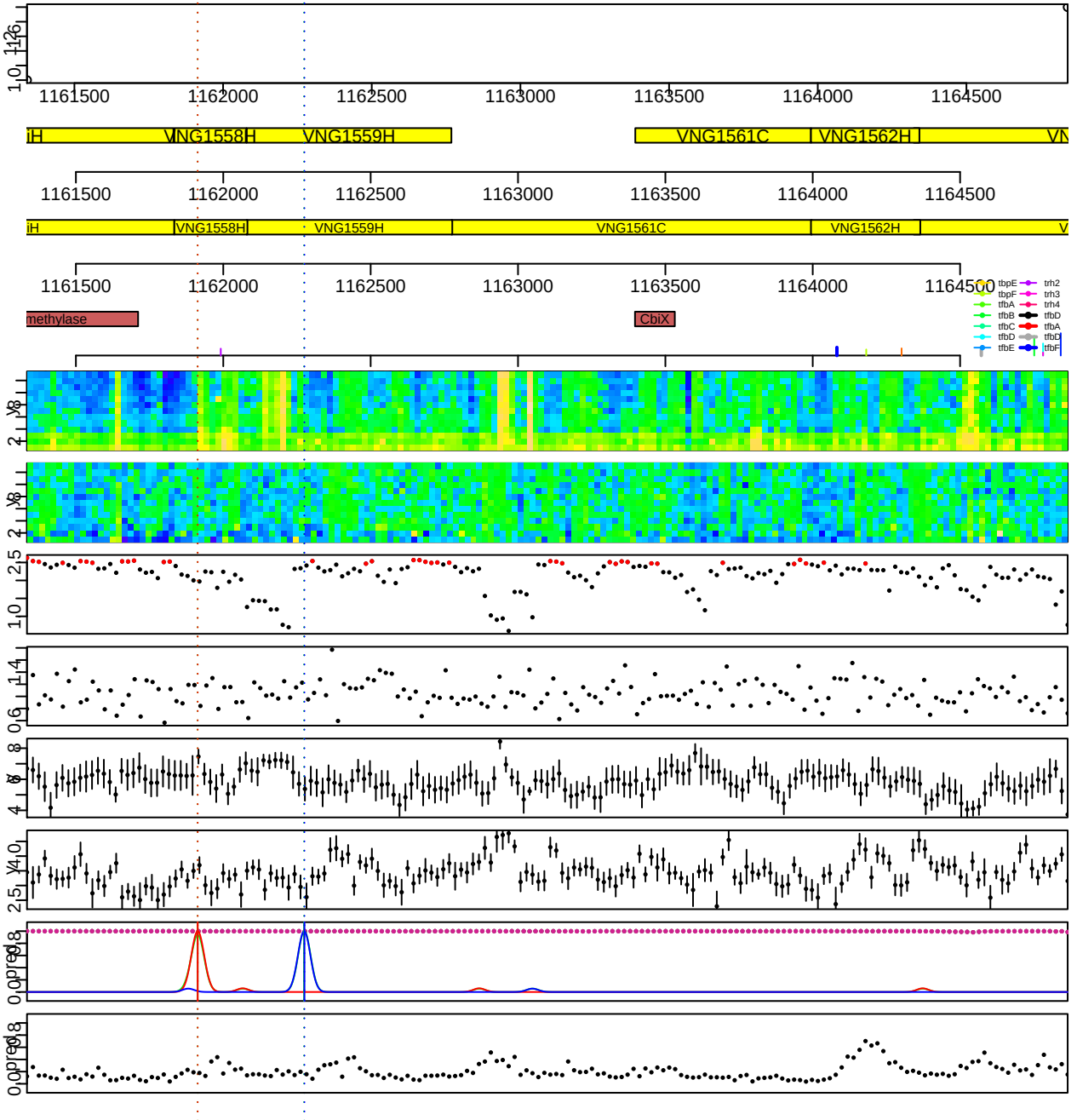
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700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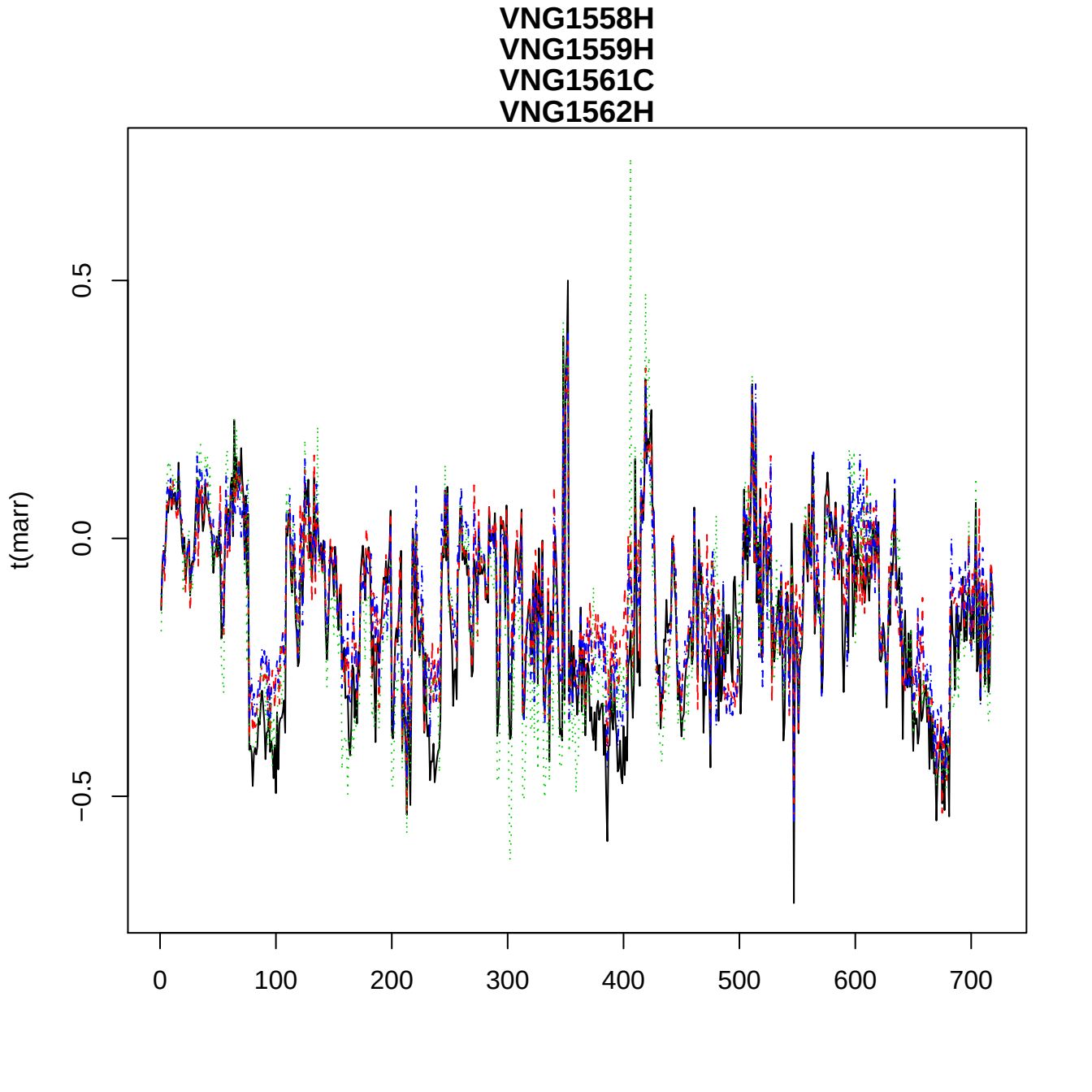
1162000
1162500
1163000
1163500
1164000
1164500
VNG1558H
VNG1559H
VNG1561C
VNG1562H
methylase
CbiX
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1558H
VNG1559H
VNG1561C
VNG1562H
t(marr)
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0.0
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0
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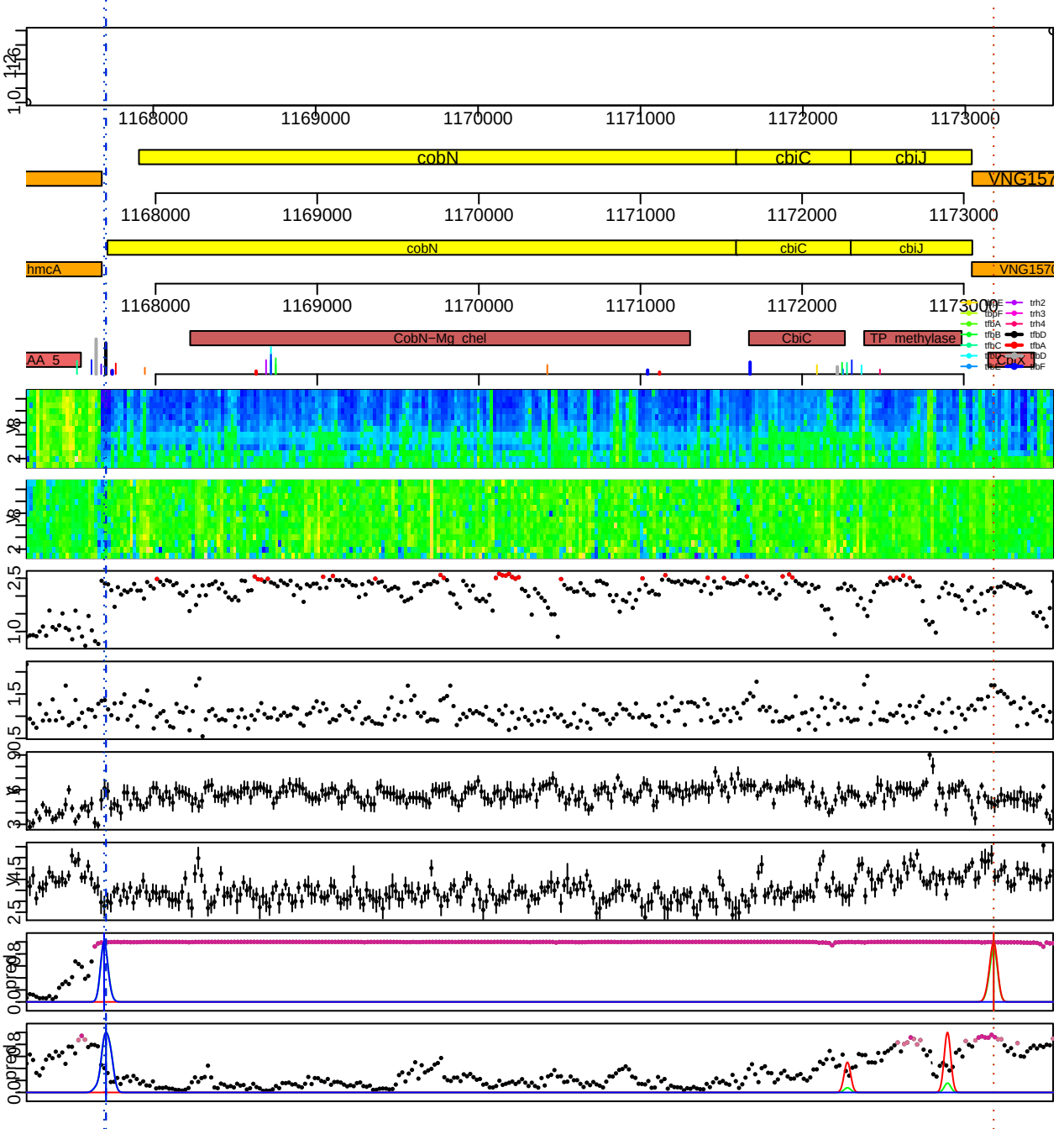
400
500
600
700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1169000
1170000
1171000
1172000
1173000
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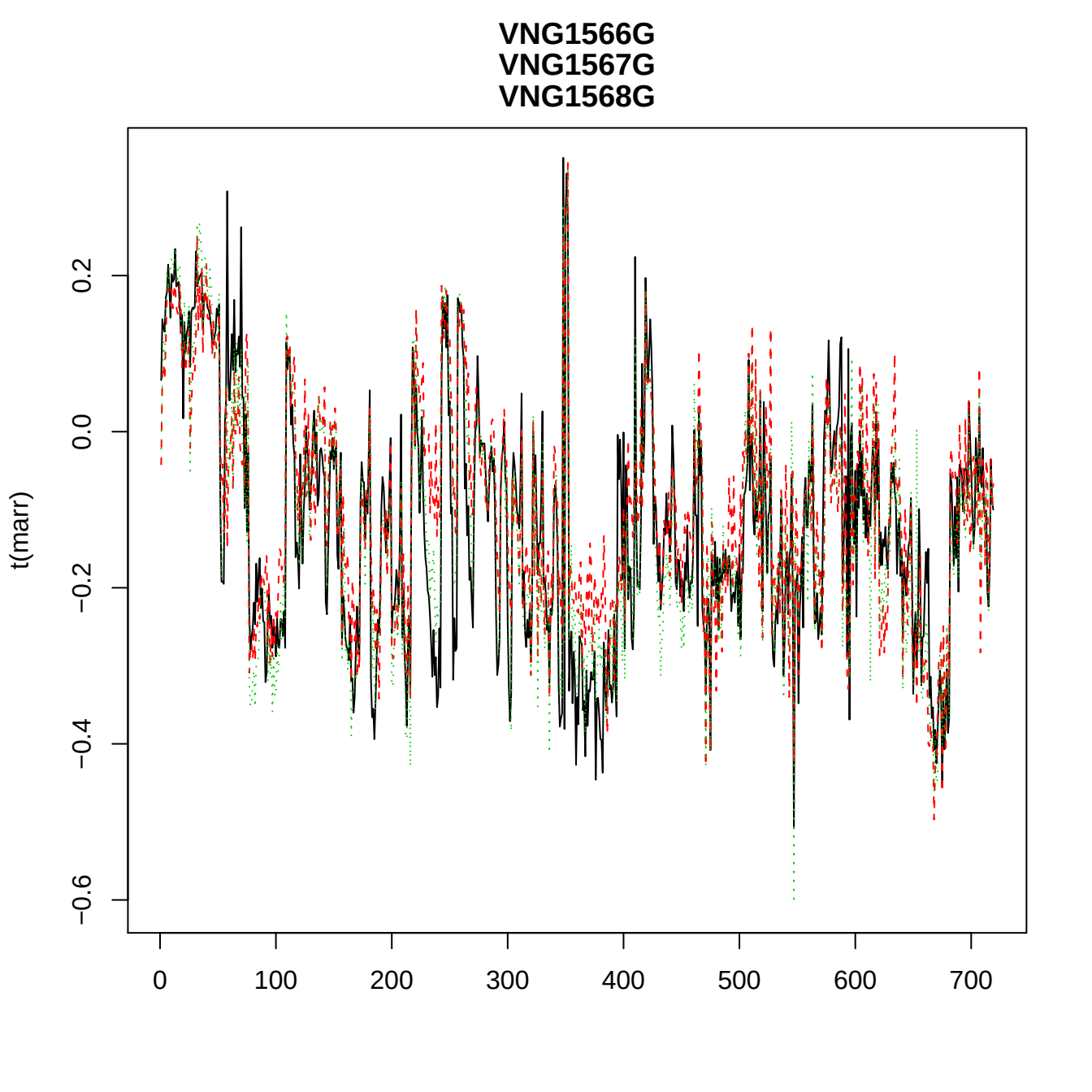
cbiC
cbiJ
VNG157
hmcA
CobN-Mg_chel
CbiC
TP_methylase
AA_5
CbiX
trh2
trh3
trh4
tfbD
tfbA
tfbF


VNG1566G
VNG1567G
VNG1568G
t(marr)
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−0.6
0
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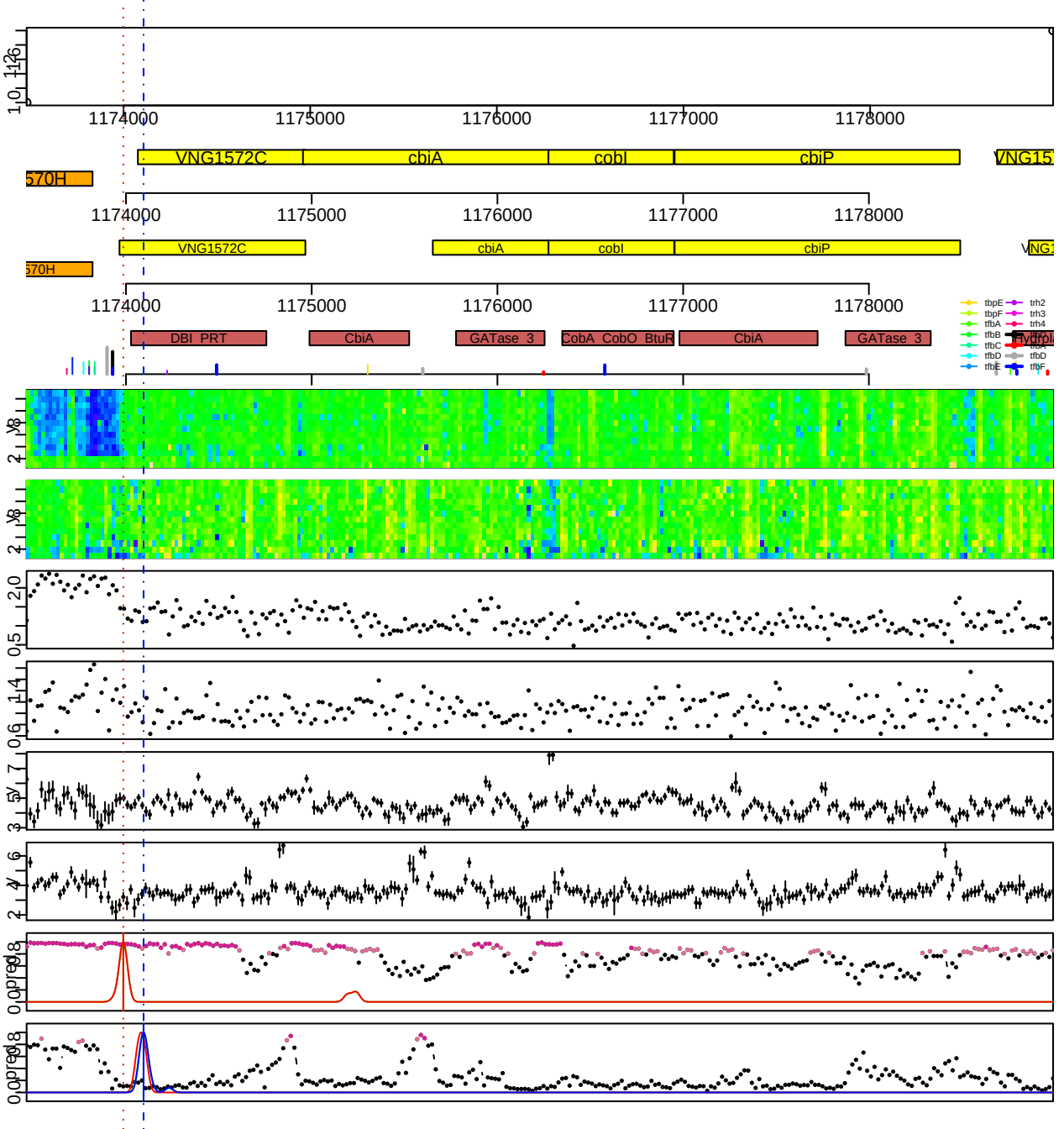
400
500
600
700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1175000
1176000
1177000
1178000
VNG1572C
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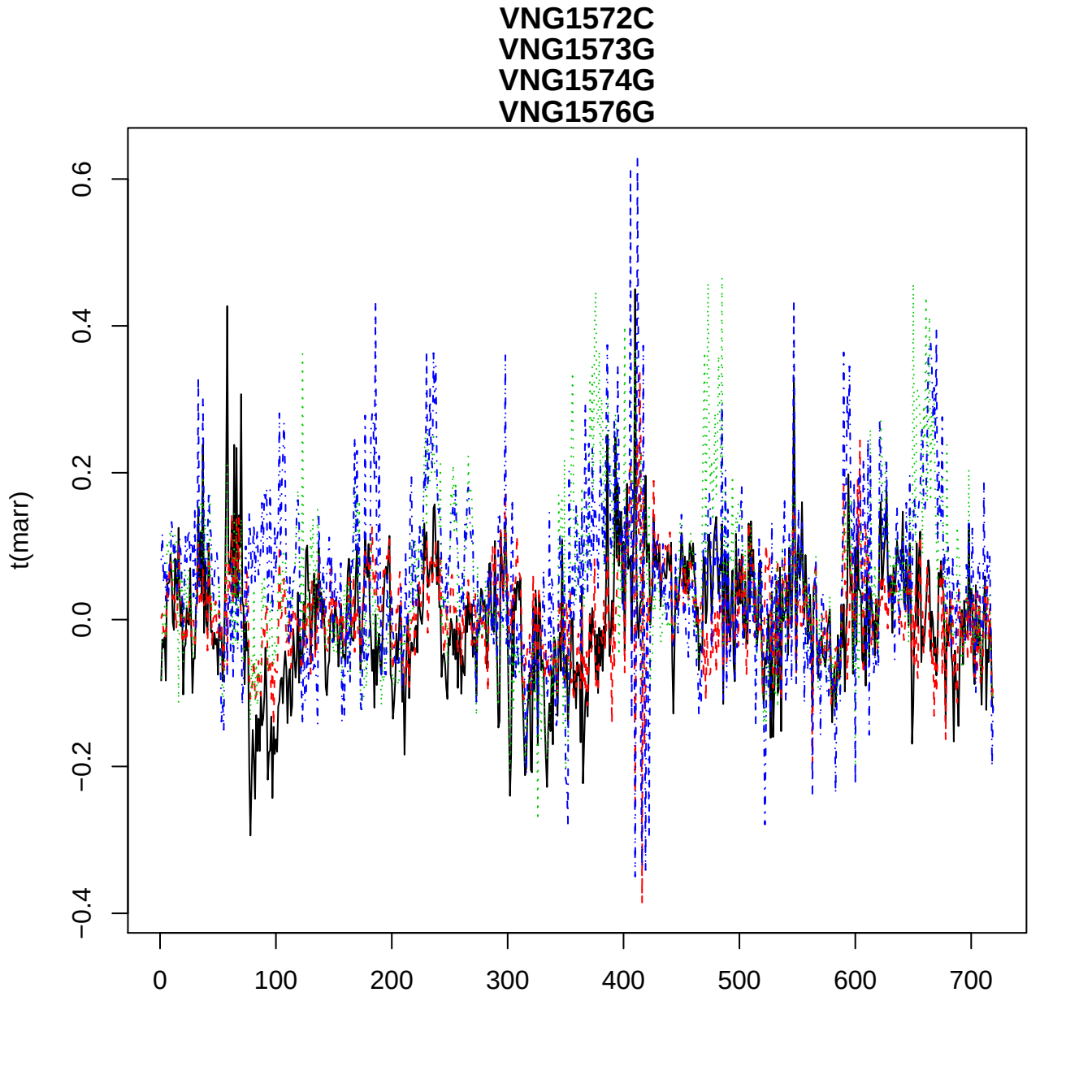
cobI
cbiP
570H
DBI_PRT
CbiA
GATase_3
CobA_CobO_BtuR
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbF


VNG1572C
VNG1573G
VNG1574G
VNG1576G
t(marr)
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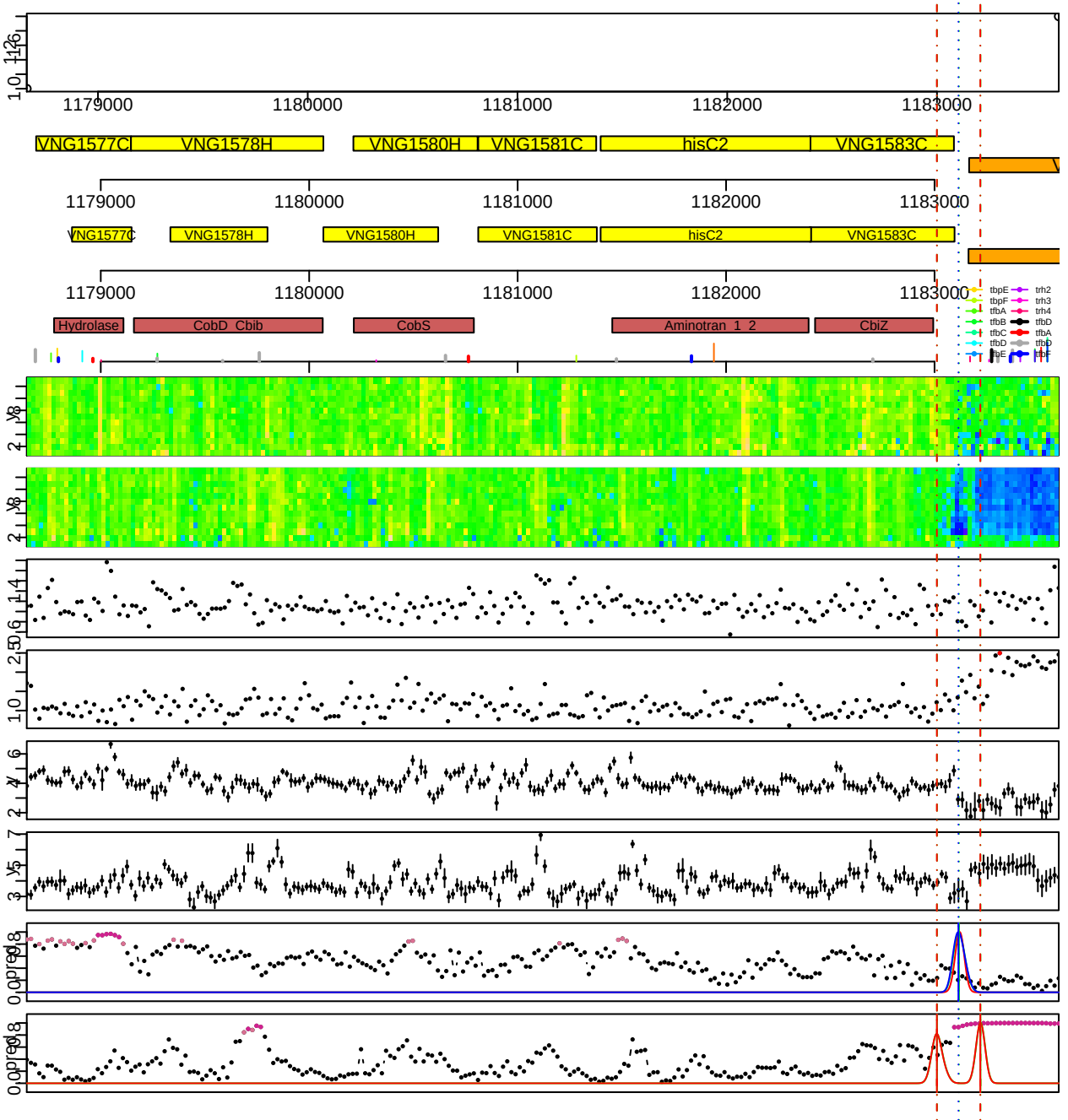
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700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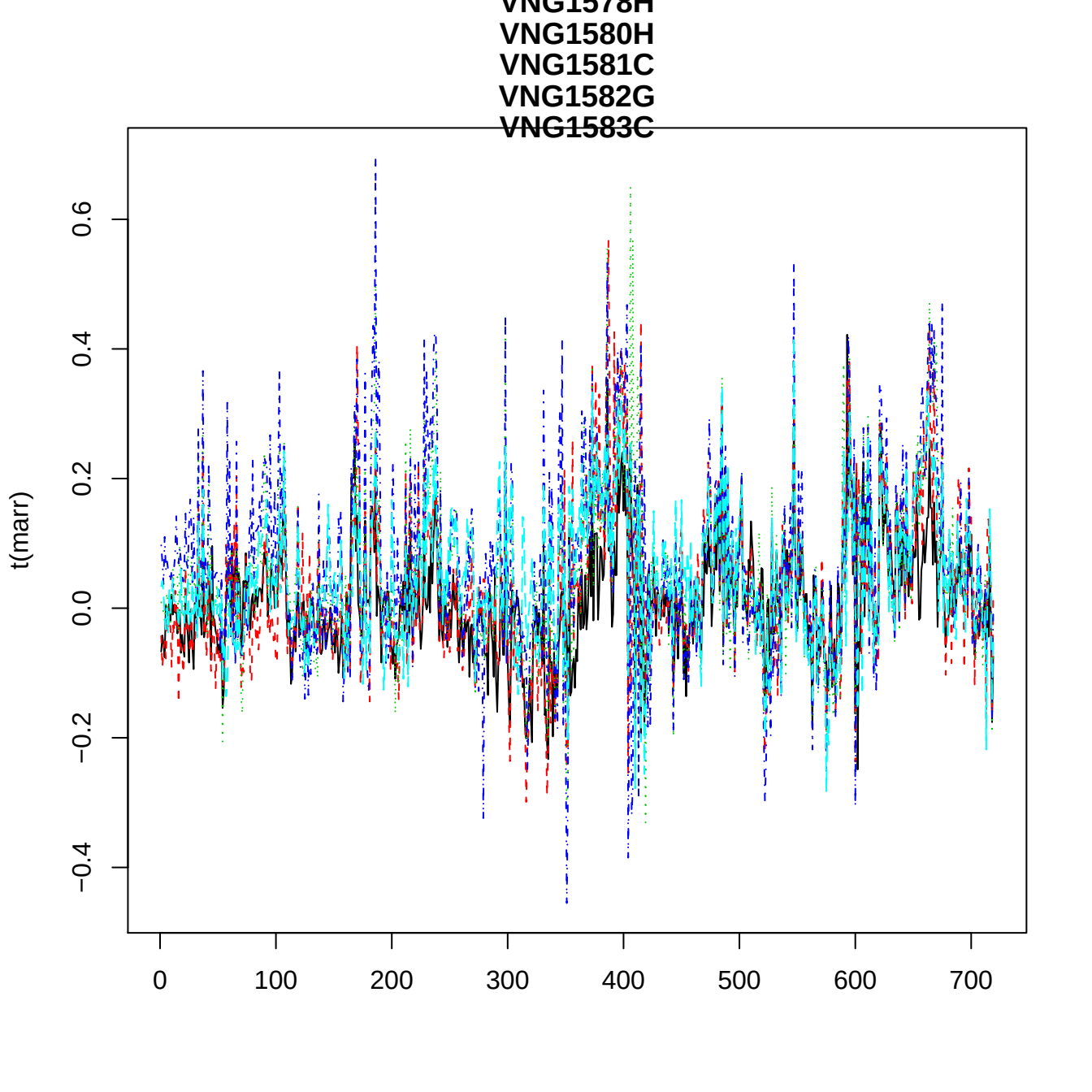
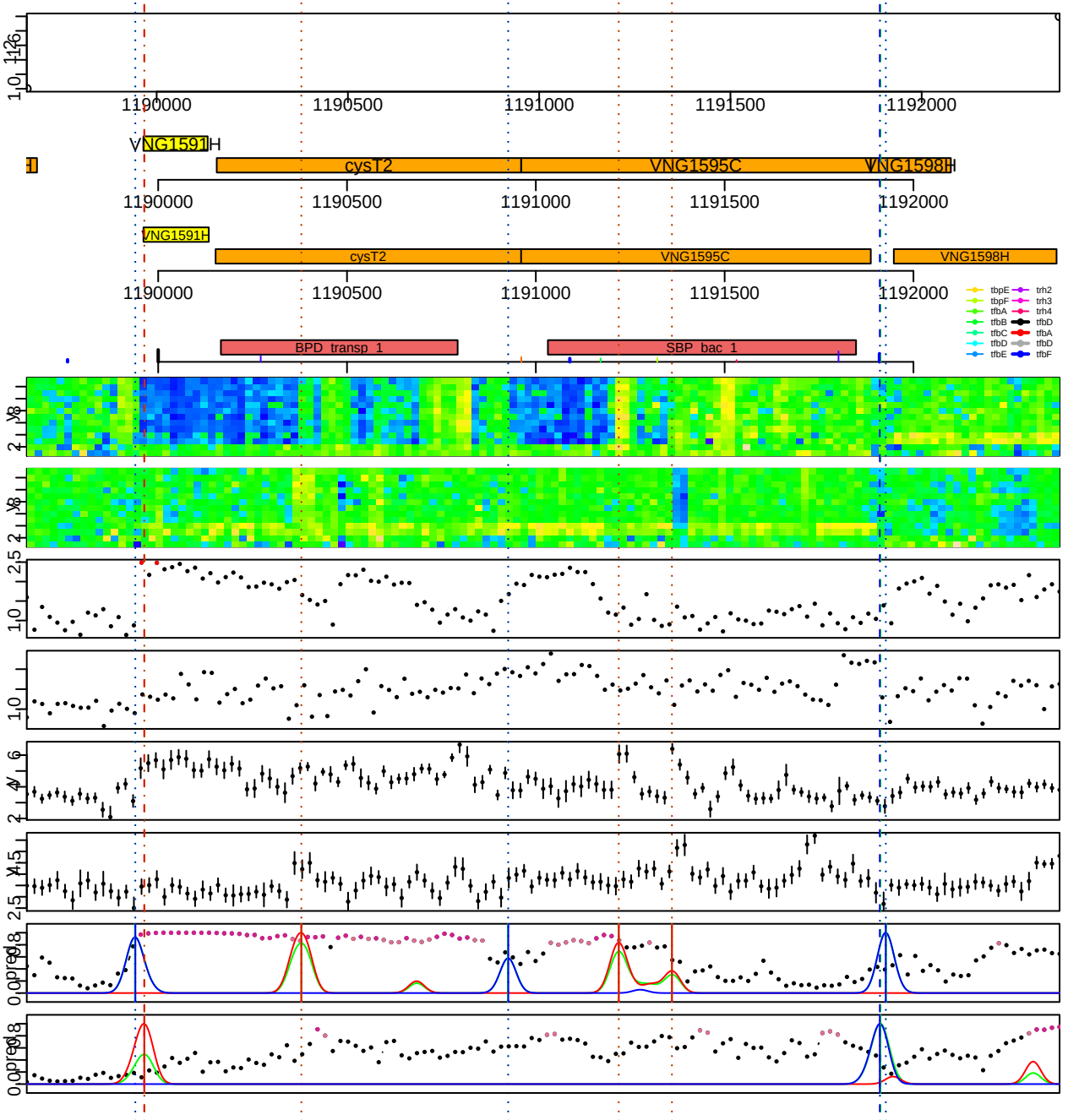
1180000
1181000
1182000
1183000
VNG1577C
VNG1578H
VNG1580H
VNG1581C
hisC2
VNG1583C
Hydrolase
CobD_Cbib
CobS
Aminotran_1_2
CbiZ
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1578H
VNG1580H
VNG1581C
VNG1582G
VNG1583C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700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1190500
1191000
1191500
1192000
VNG1591H
cysT2
VNG1595C
VNG1598H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
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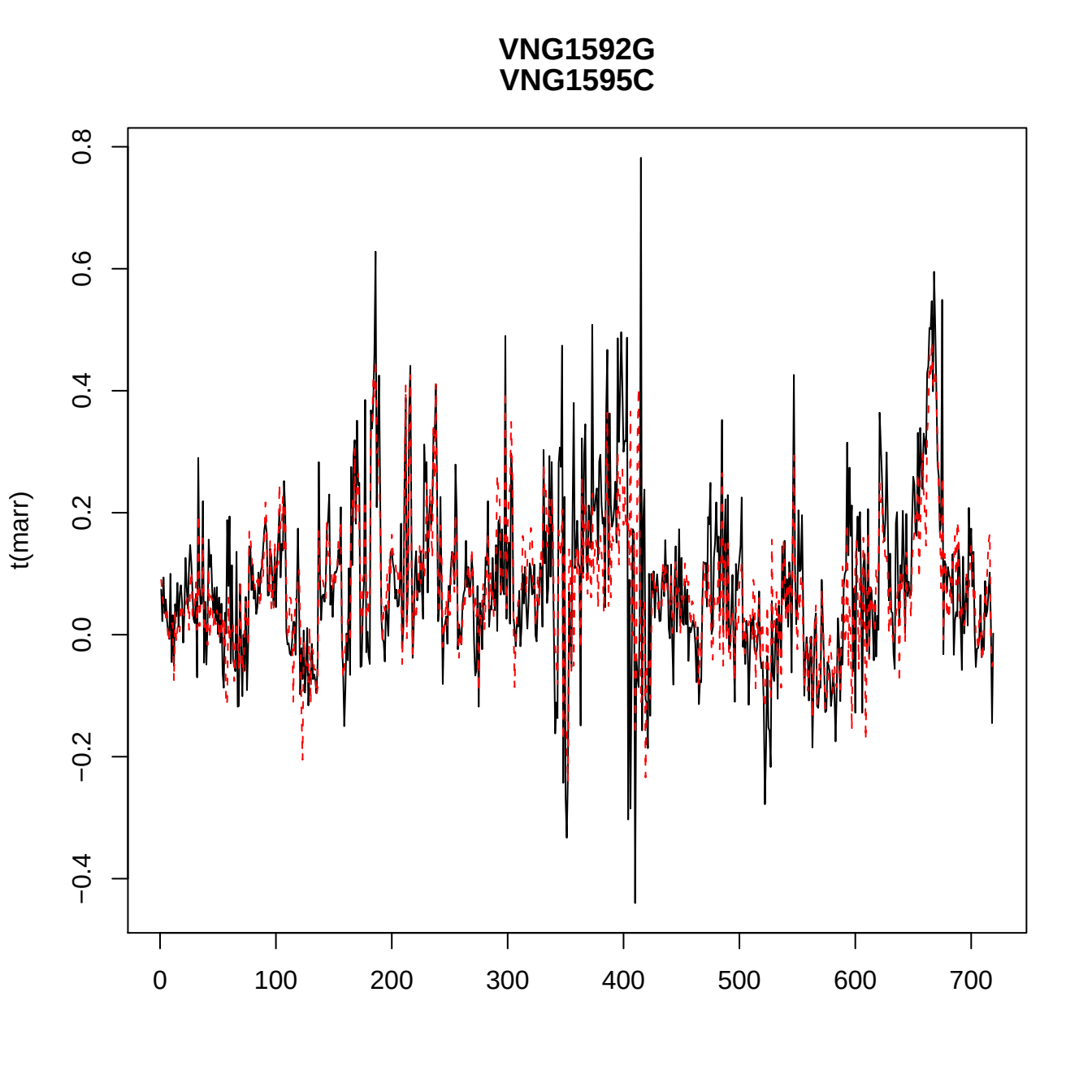
trh3
trh4
tfbD
tfbA
tfbD
tfbF
BPD_transp_1
SBP_bac_1
pred


VNG1592G
VNG1595C
t(marr)
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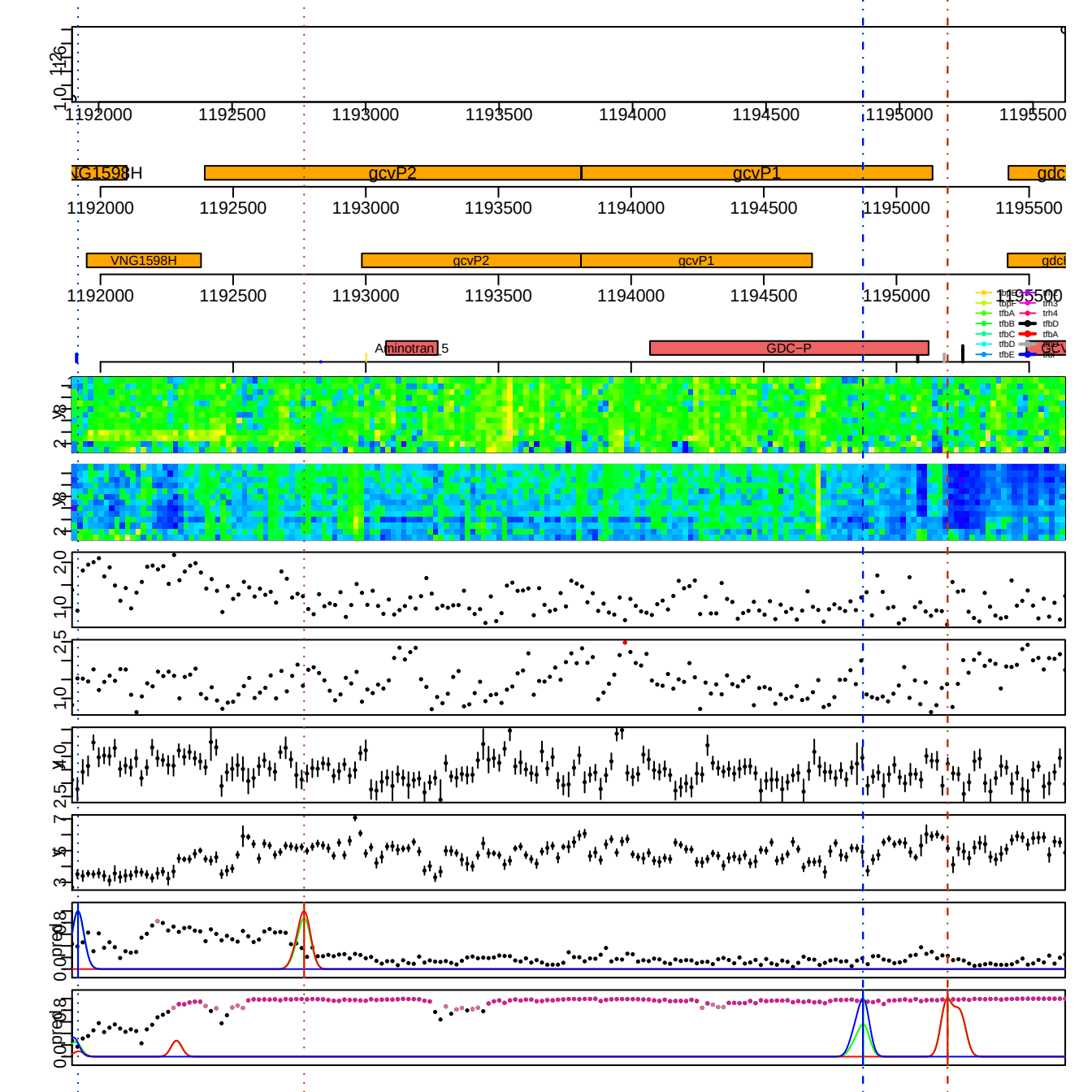
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700



1192000
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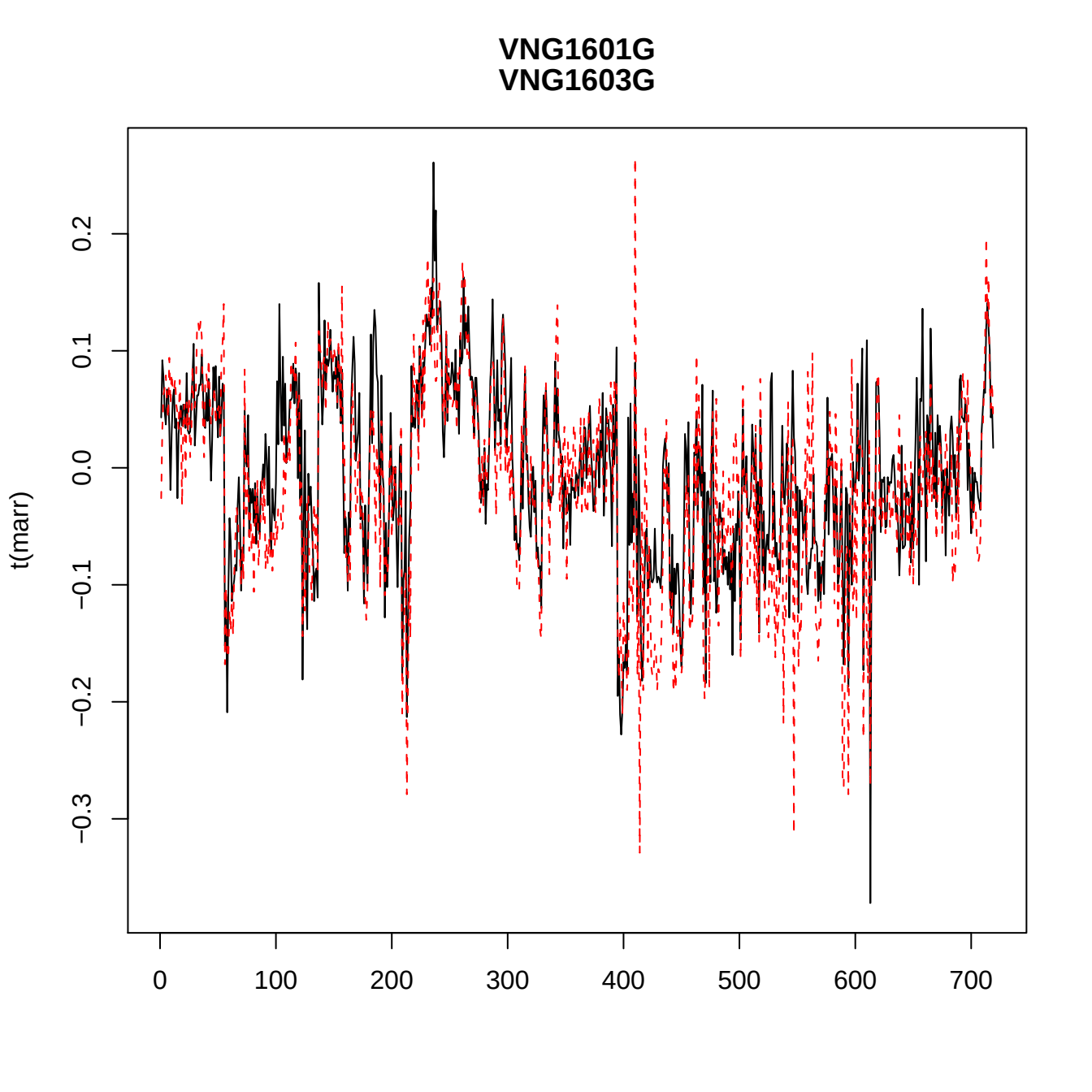
1193000
1193500
1194000
1194500
1195000
1195500
VNG1598H
gcvP2
gcvP1
gdc
Aminotran_5
GDC−P
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA


VNG1601G
VNG1603G
t(marr)
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0.0
−0.1
−0.2
−0.3
0
100
200
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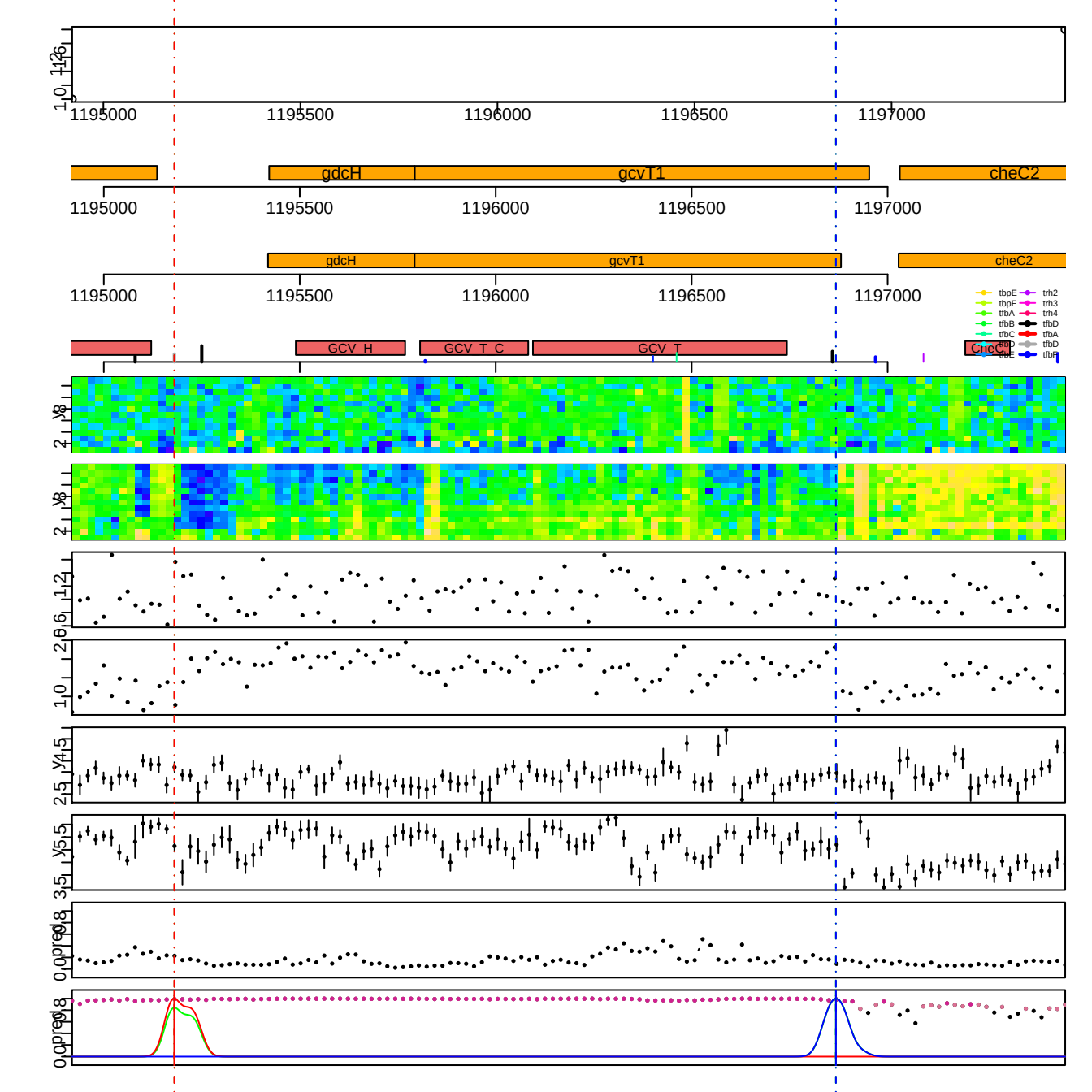
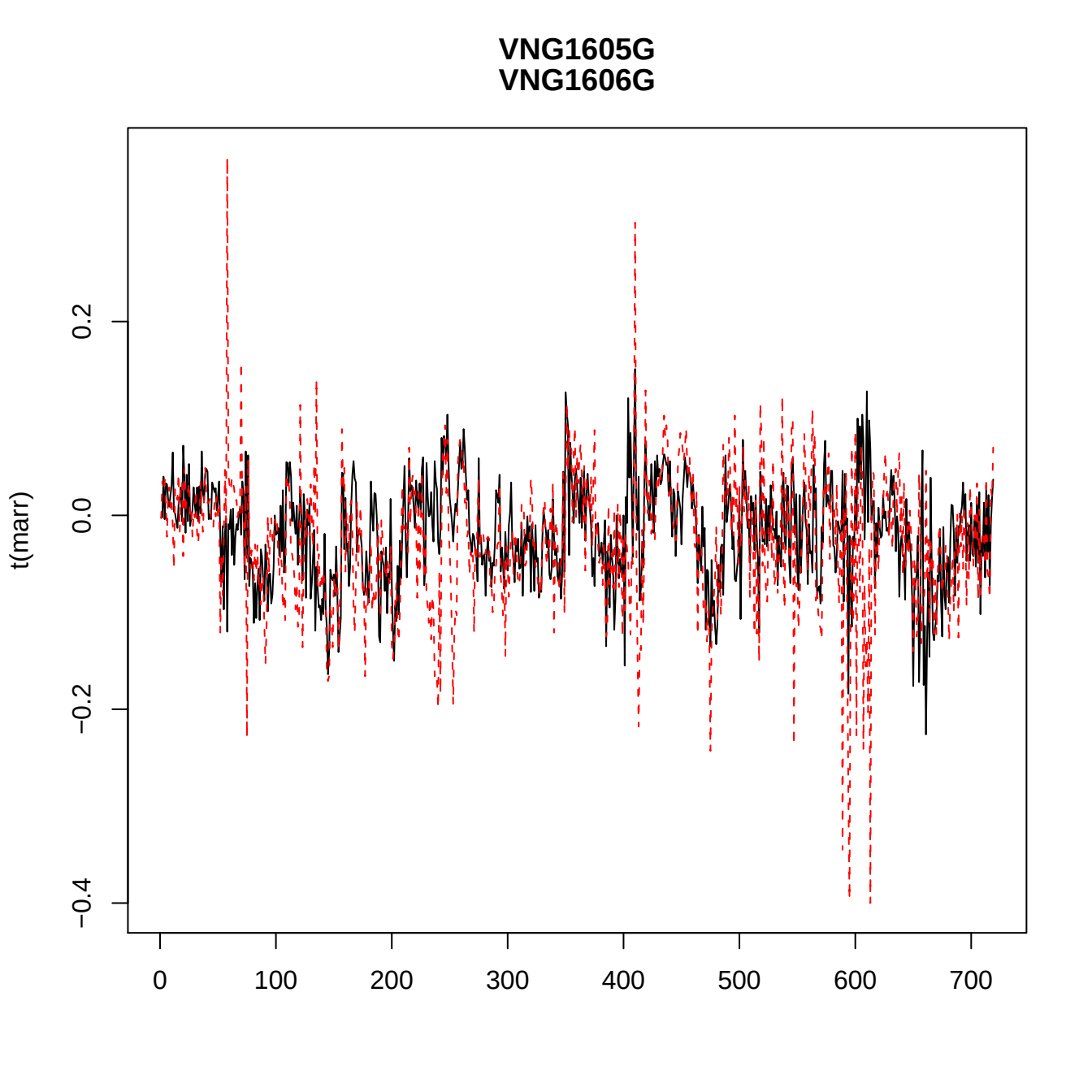
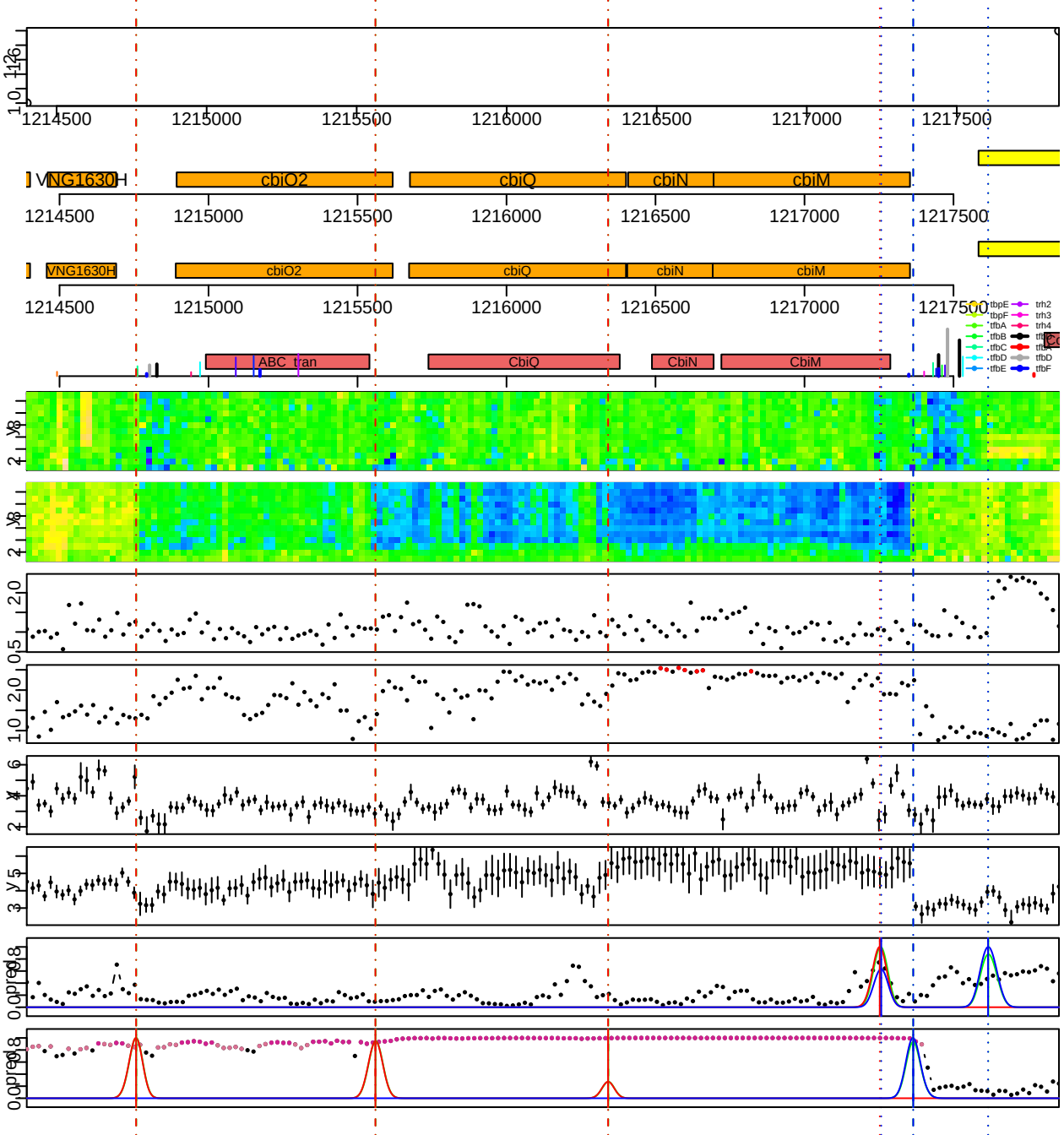
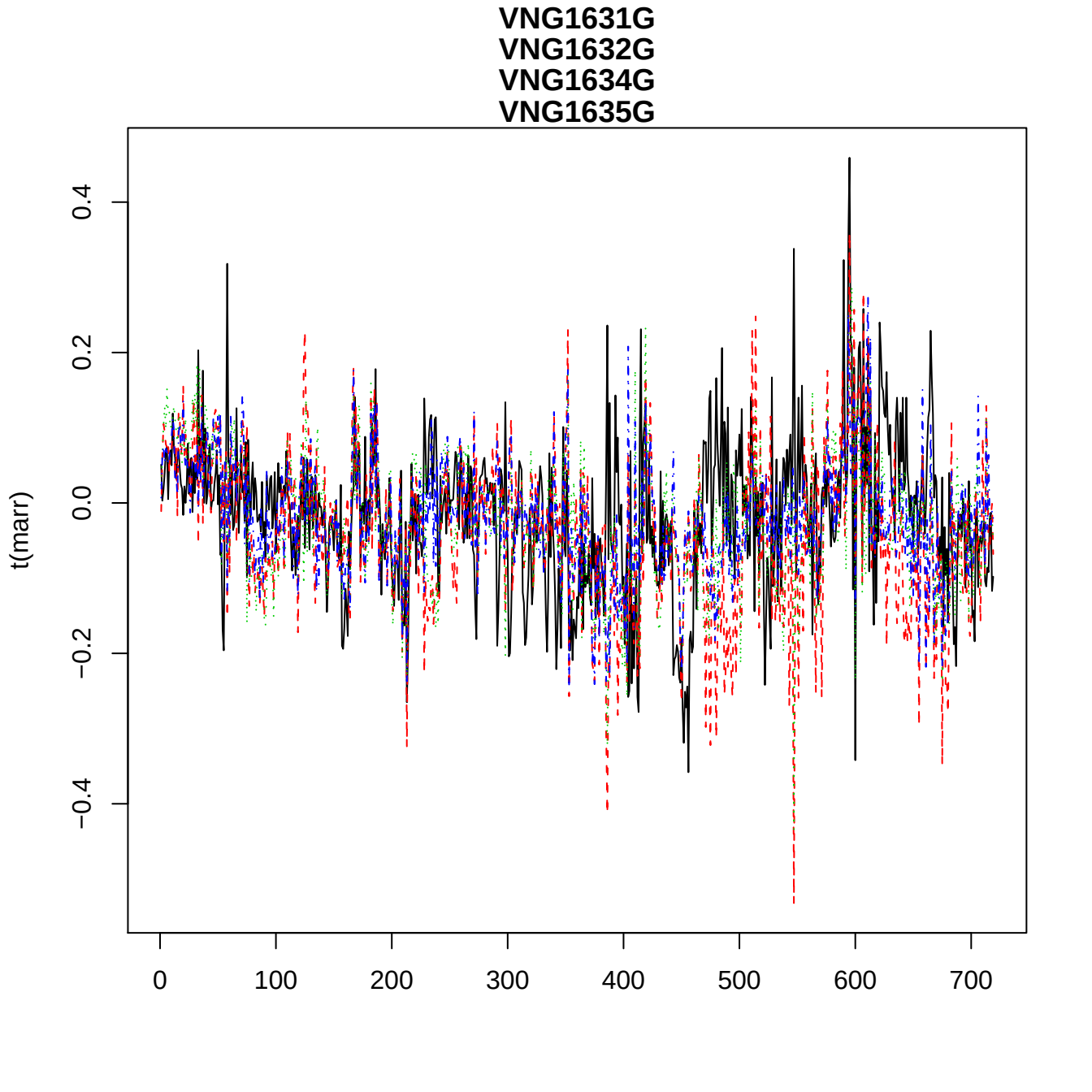
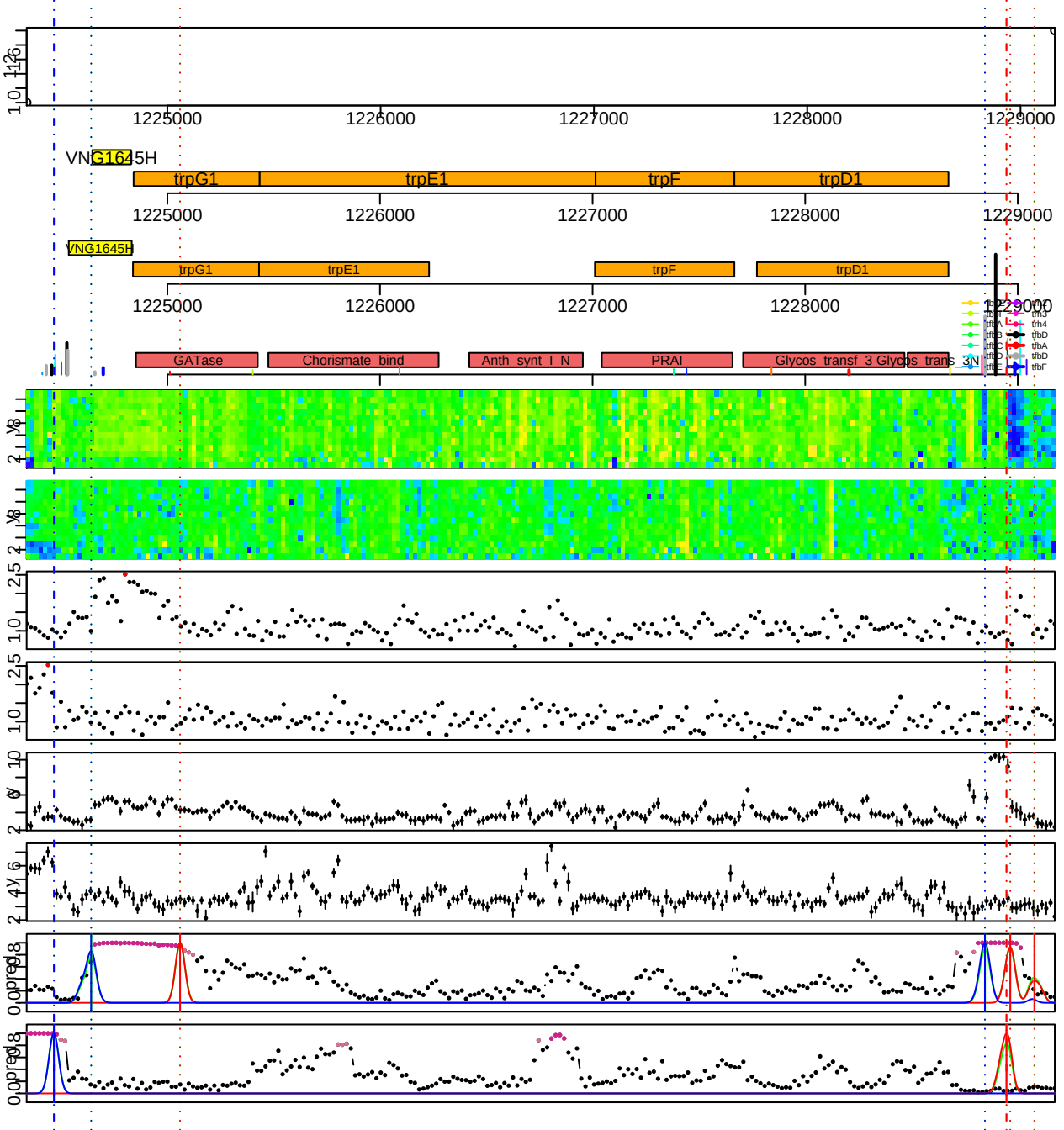
400
500
600
700


1195000
1195500
1196000
1196500
1197000
gdcH
gcvT1
cheC2
GCV_H
GCV_T_C
GCV_T
tbpE
tbpF
tfbA
tfbB
tfbC
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

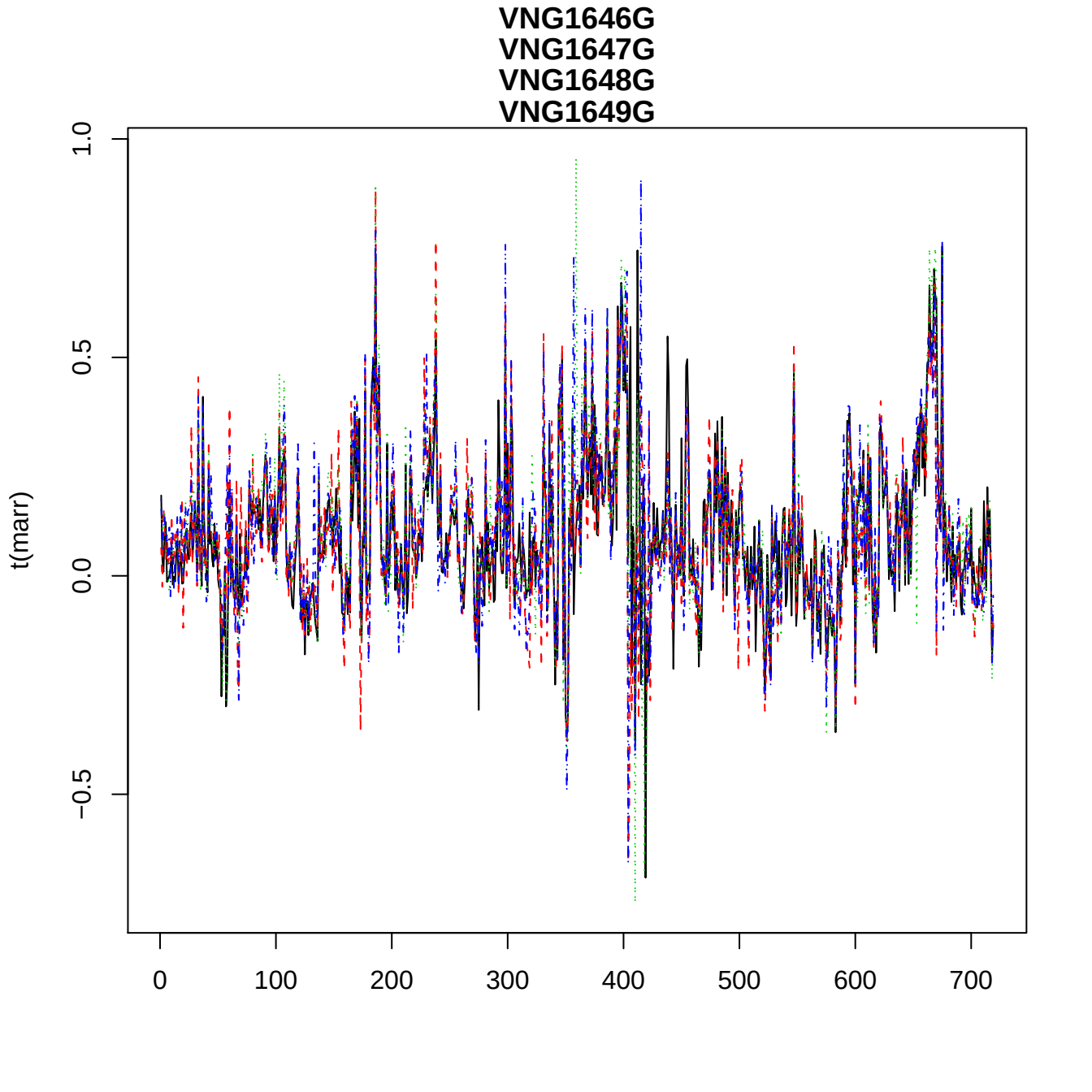

VNG1605G
VNG1606G
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

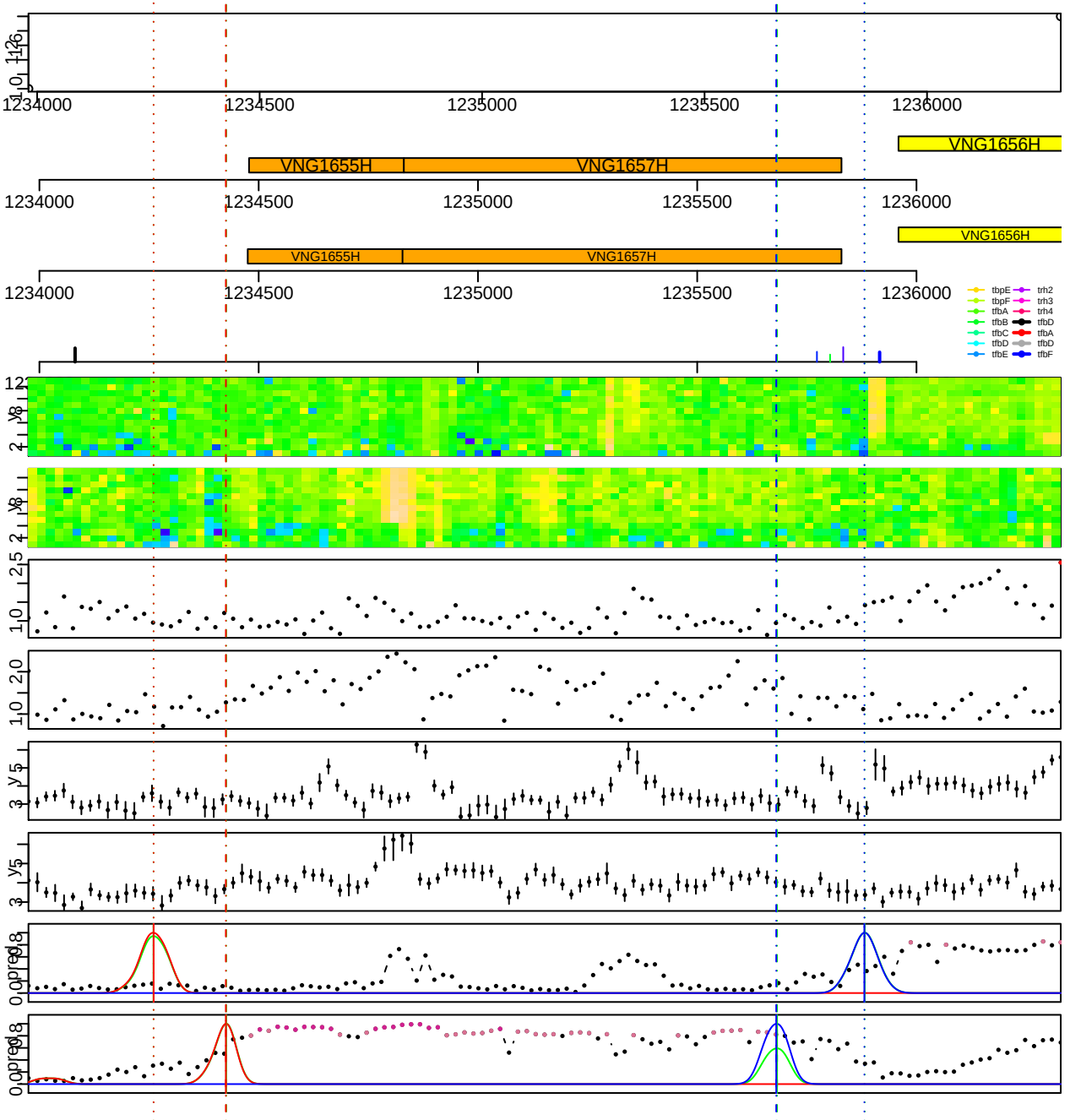

1214500
1215000
1215500
1216000
1216500
1217000
1217500
VNG1630H
cbiO2
cbiQ
cbiN
cbiM
ABC_tran
CbiQ
CbiN
CbiM
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbF
pred

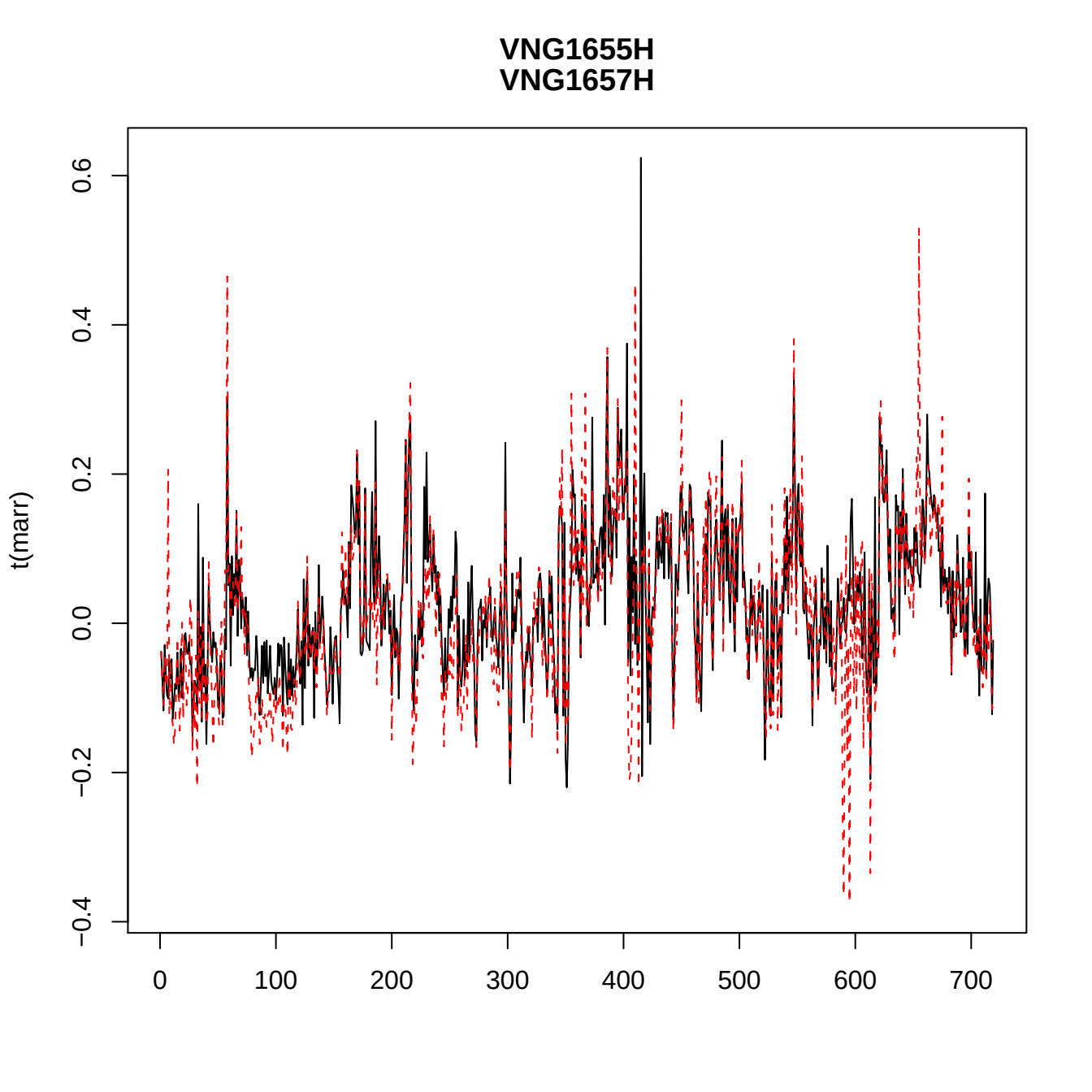

VNG1631G
VNG1632G
VNG1634G
VNG1635G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

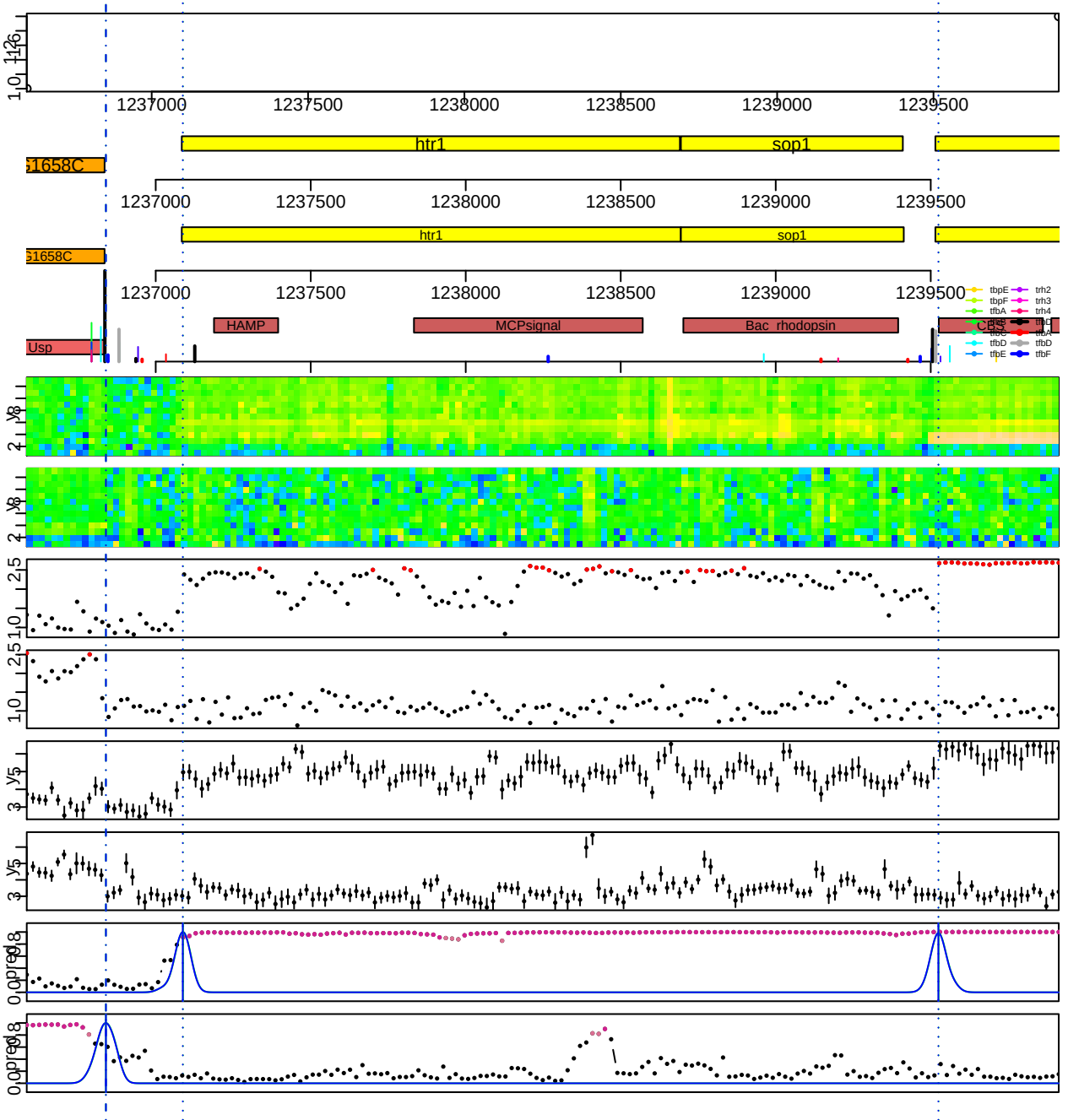


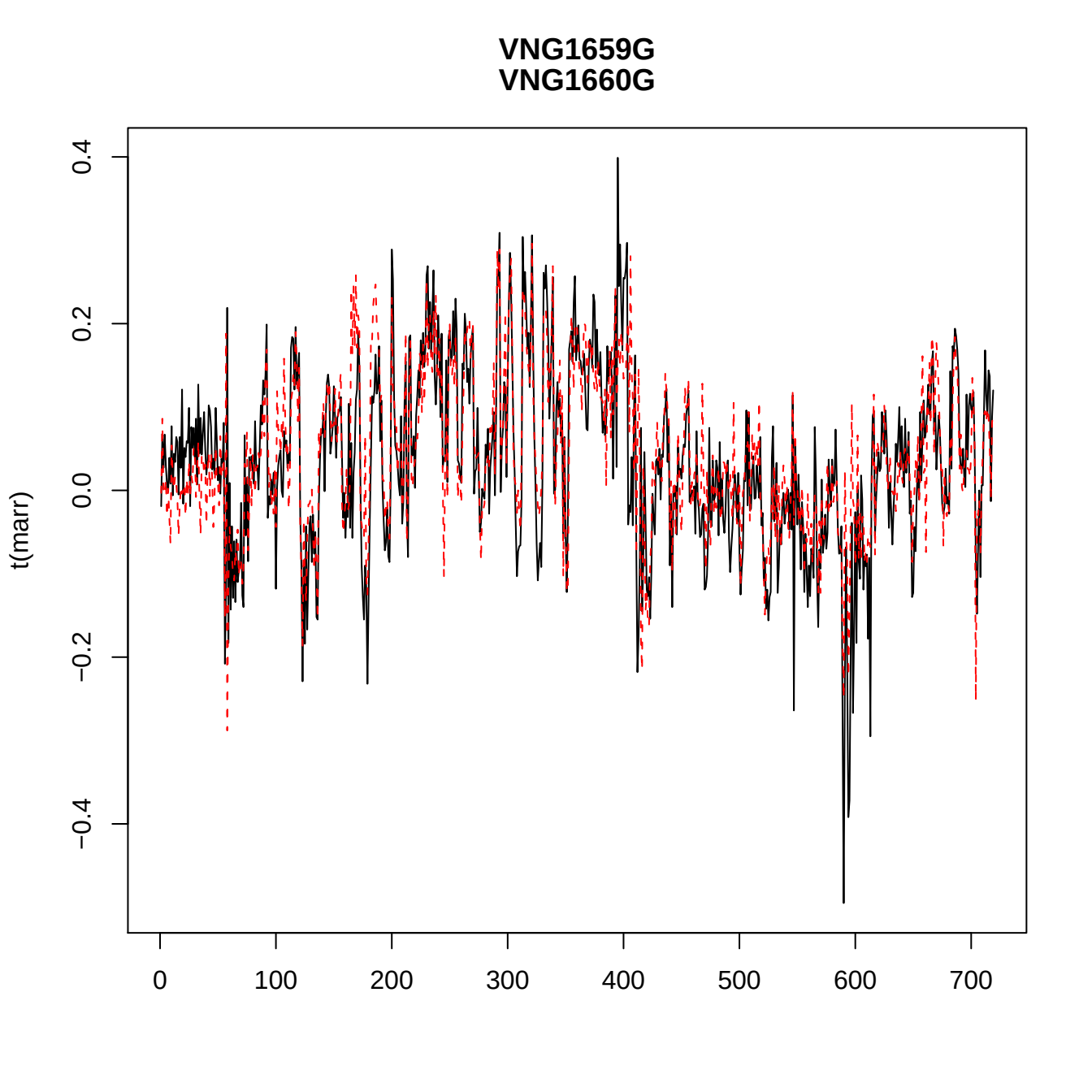
1225000
1226000
1227000
1228000
1229000
VNG1645H
trpG1
trpE1
trpF
trpD1
GATase
Chorismate_bind
Anth_synt_I_N
PRAI
Glycos_transf_3
Glycos_trans_3N
trh3
trh4
tfbA
tfbD
tfbF

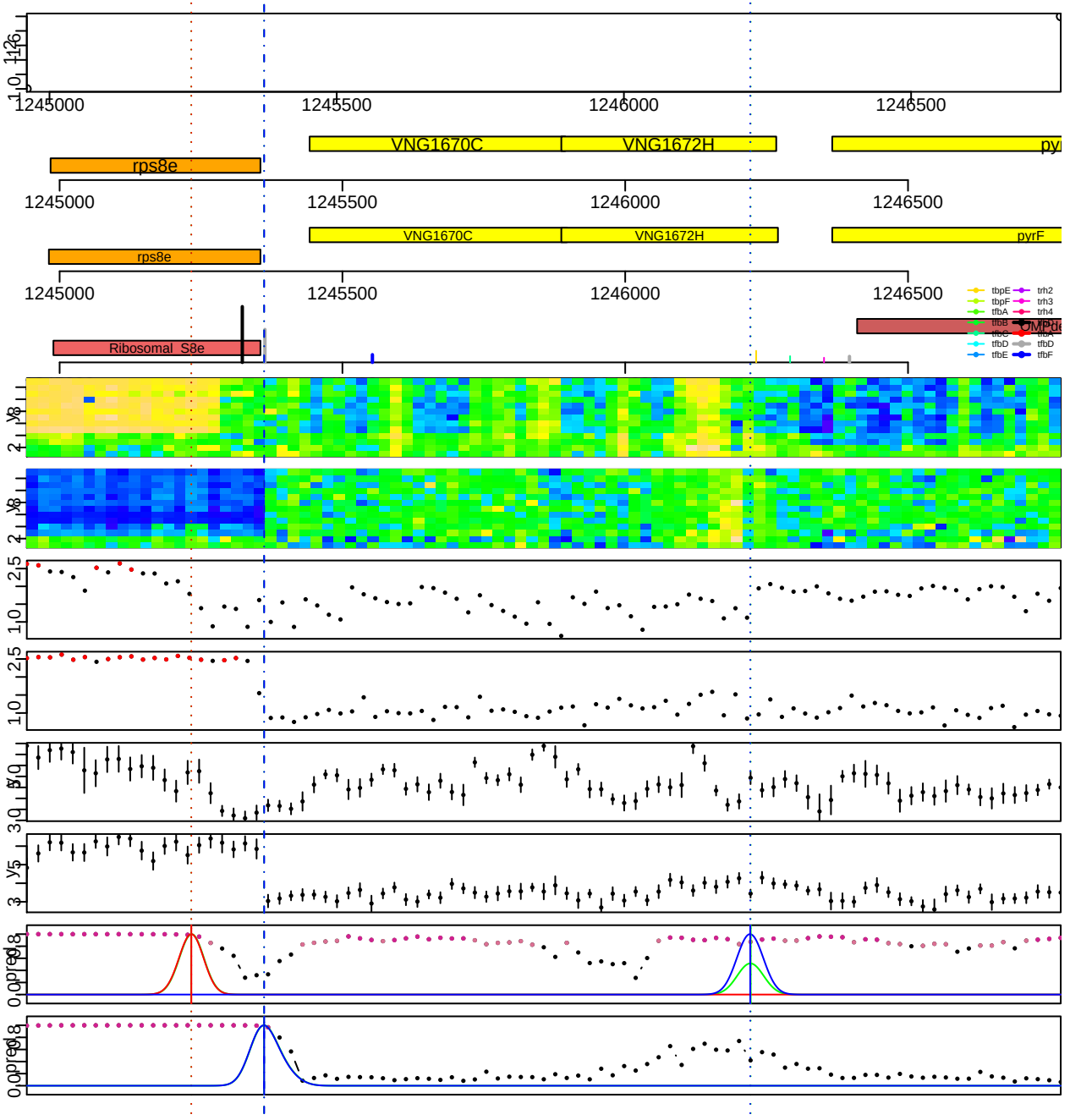

VNG1646G
VNG1647G
VNG1648G
VNG1649G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

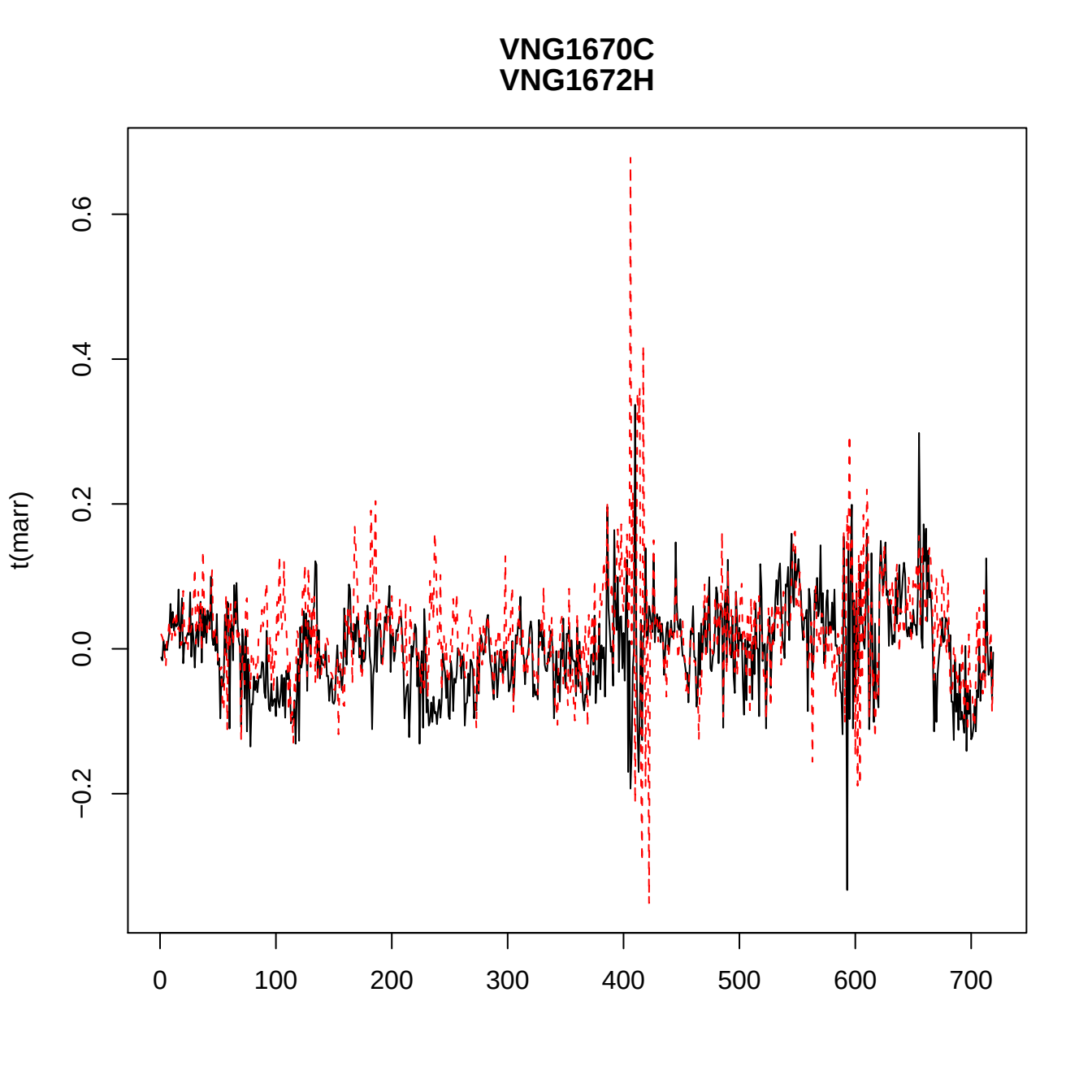

1234000
1234500
1235000
1235500
1236000
VNG1656H
VNG1655H
VNG1657H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

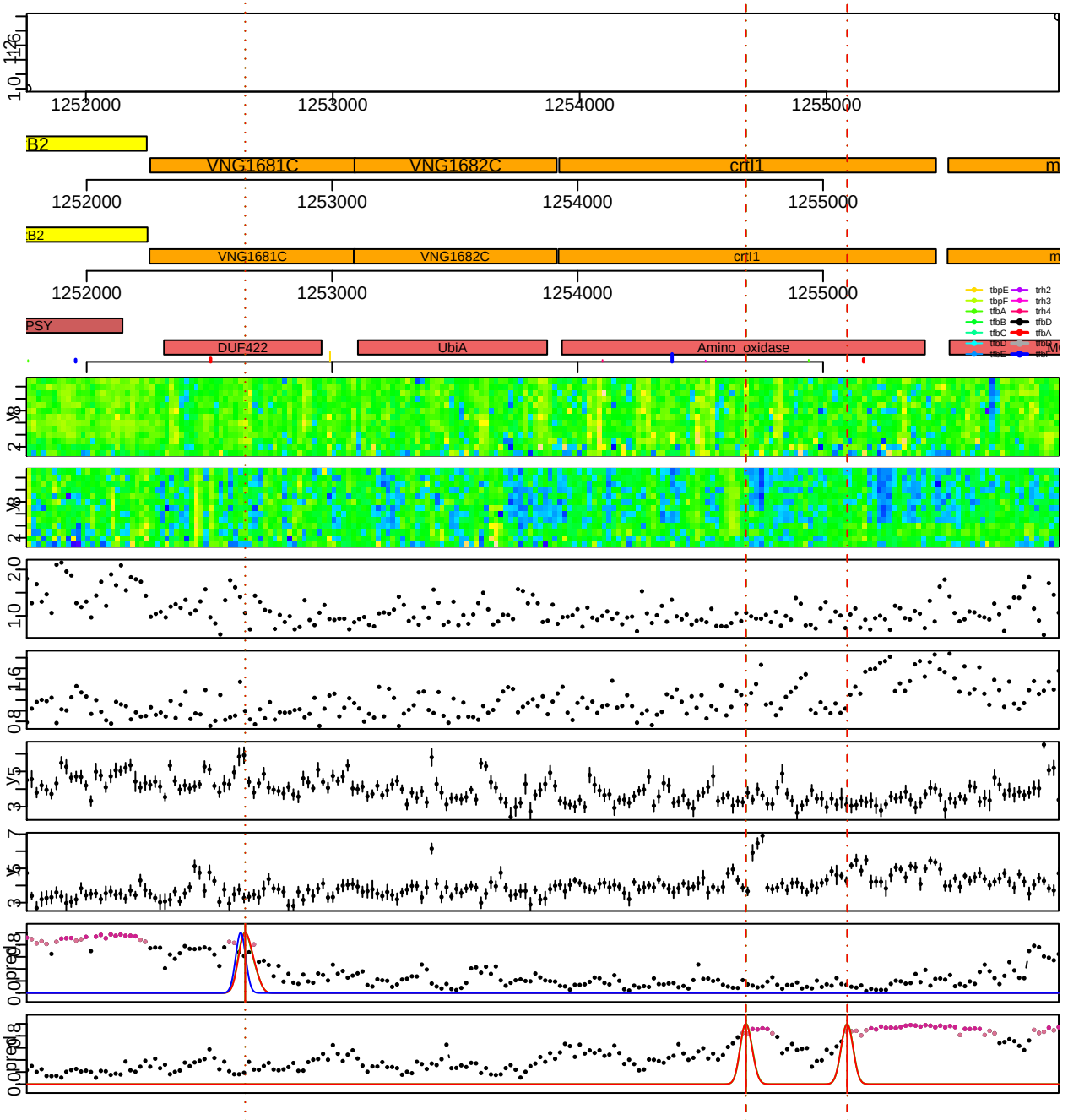

VNG1655H
VNG1657H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

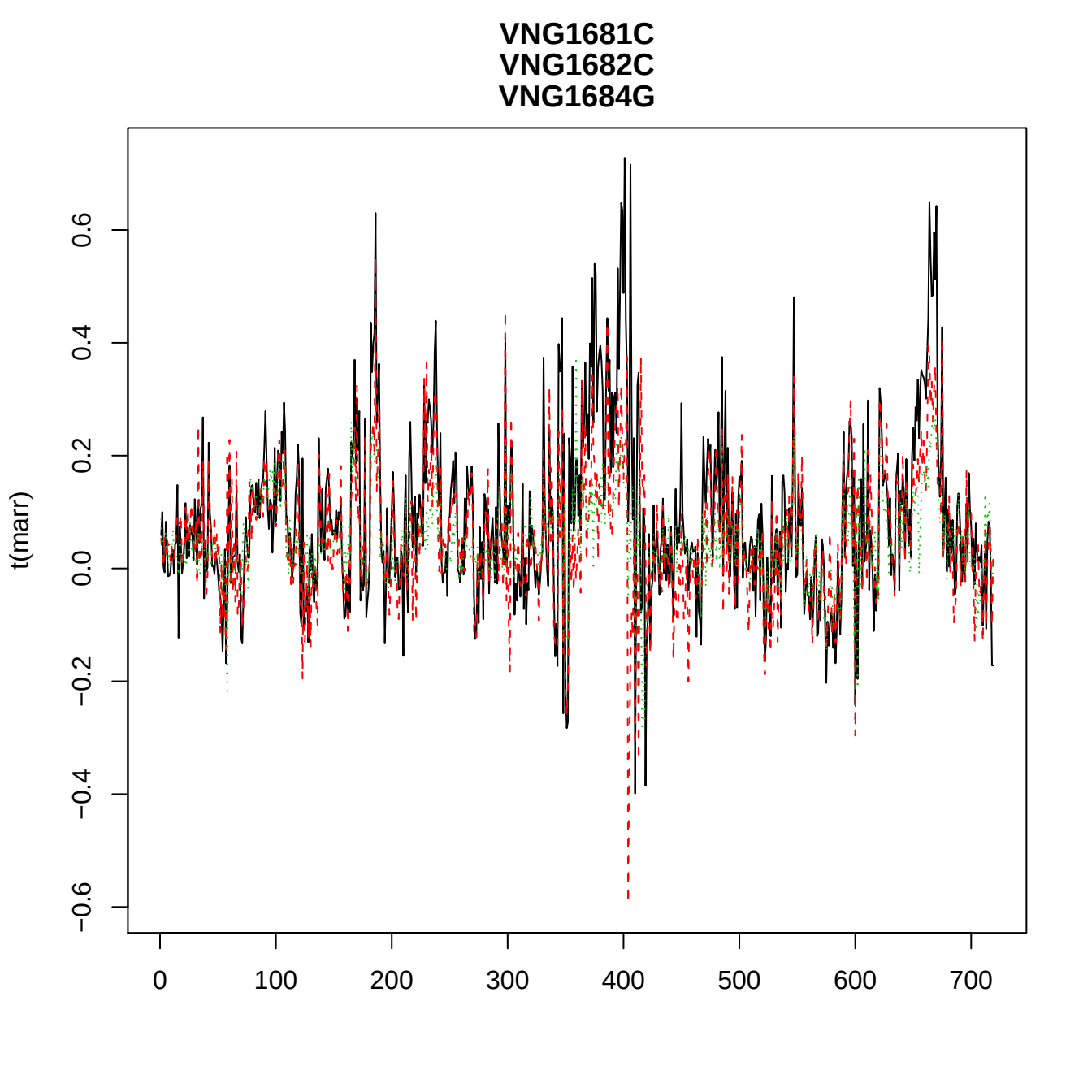

1237000
1237500
1238000
1238500
1239000
1239500
htr1
sop1
HAMP
MCPsignal
Bac_rhodopsin
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbG
tfbA
tfbD
tfbF

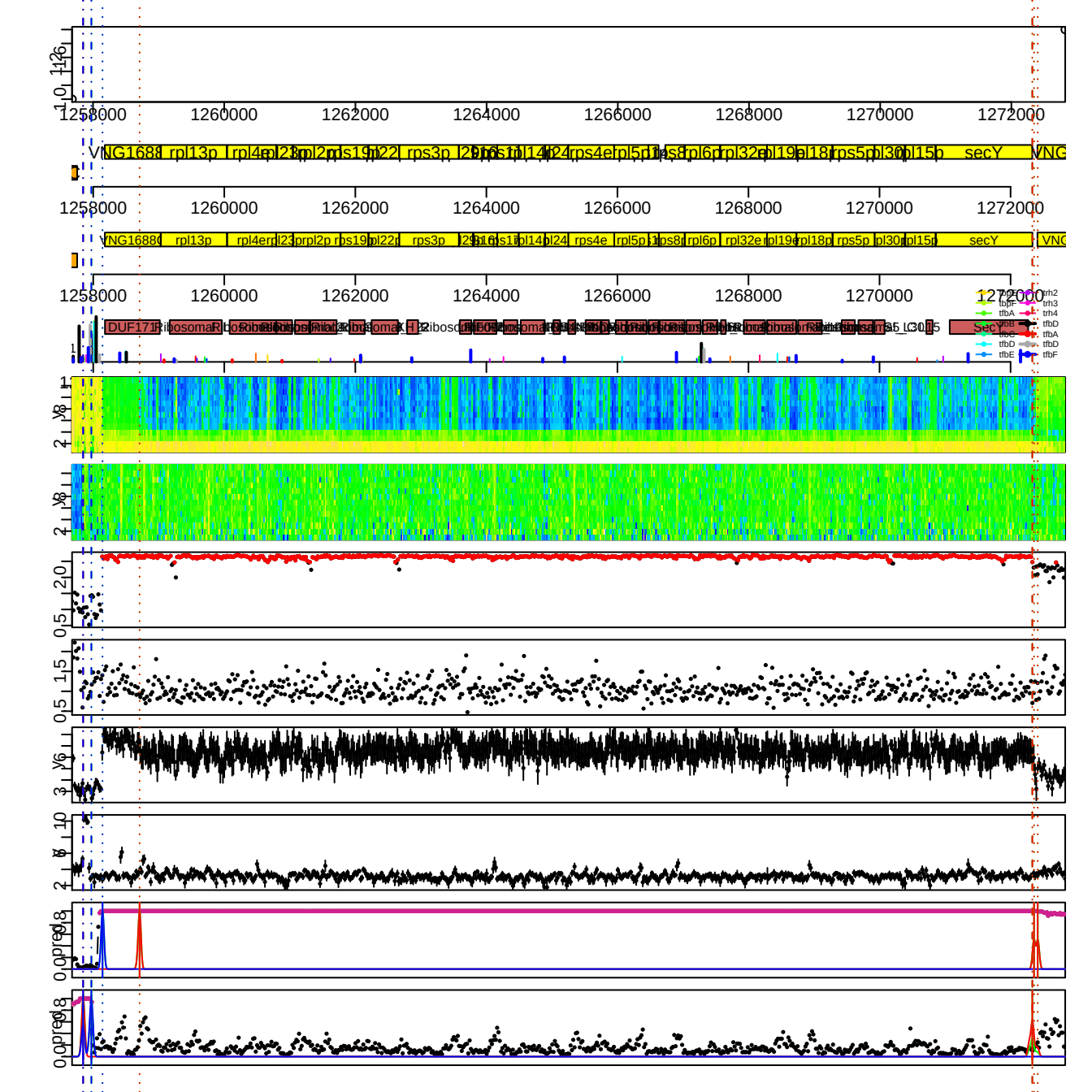

VNG1659G
VNG1660G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1245000
1245500
1246000
1246500
VNG1670C
VNG1672H
rps8e
pyrF
Ribosomal_S8e
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF

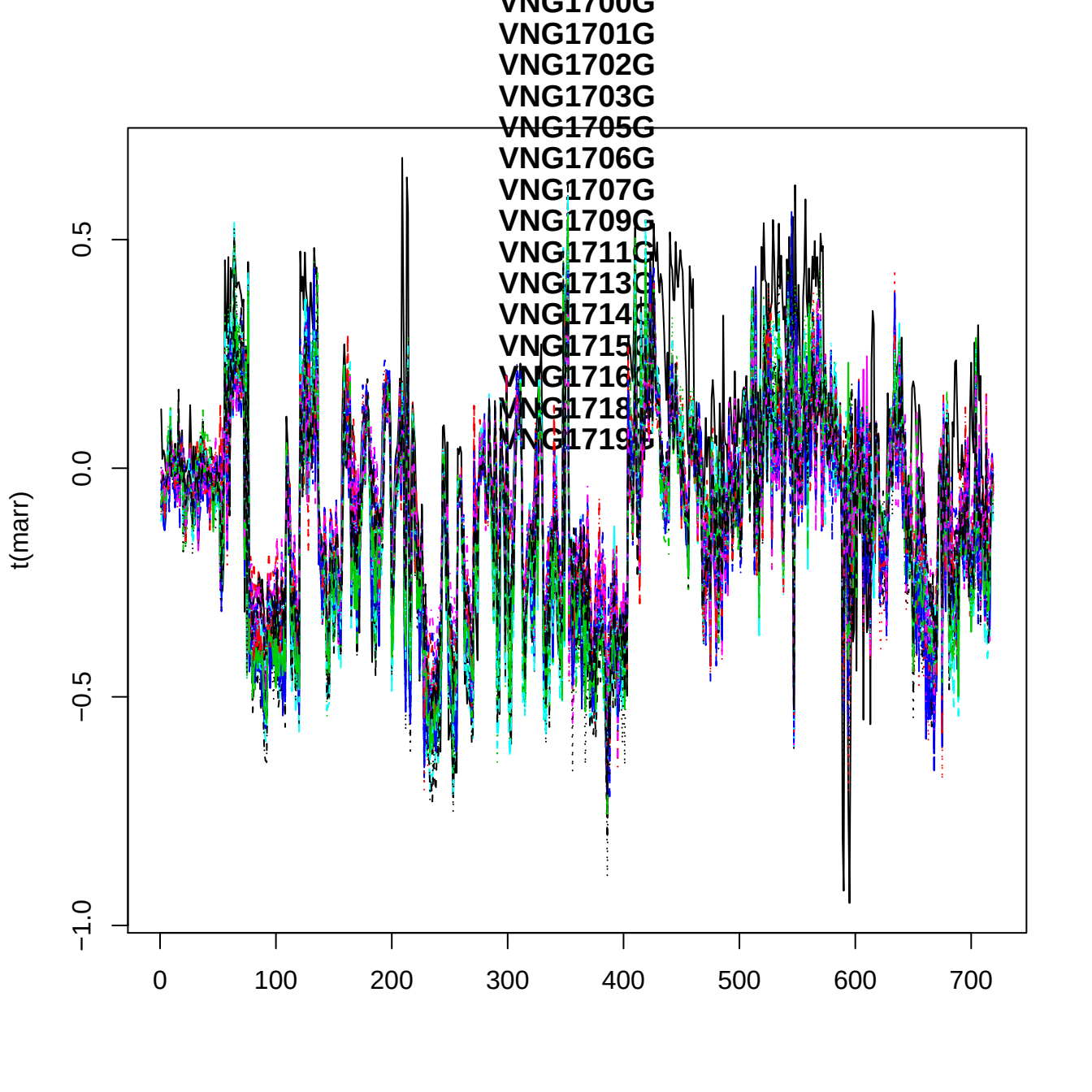

VNG1670C
VNG1672H
t(marr)
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

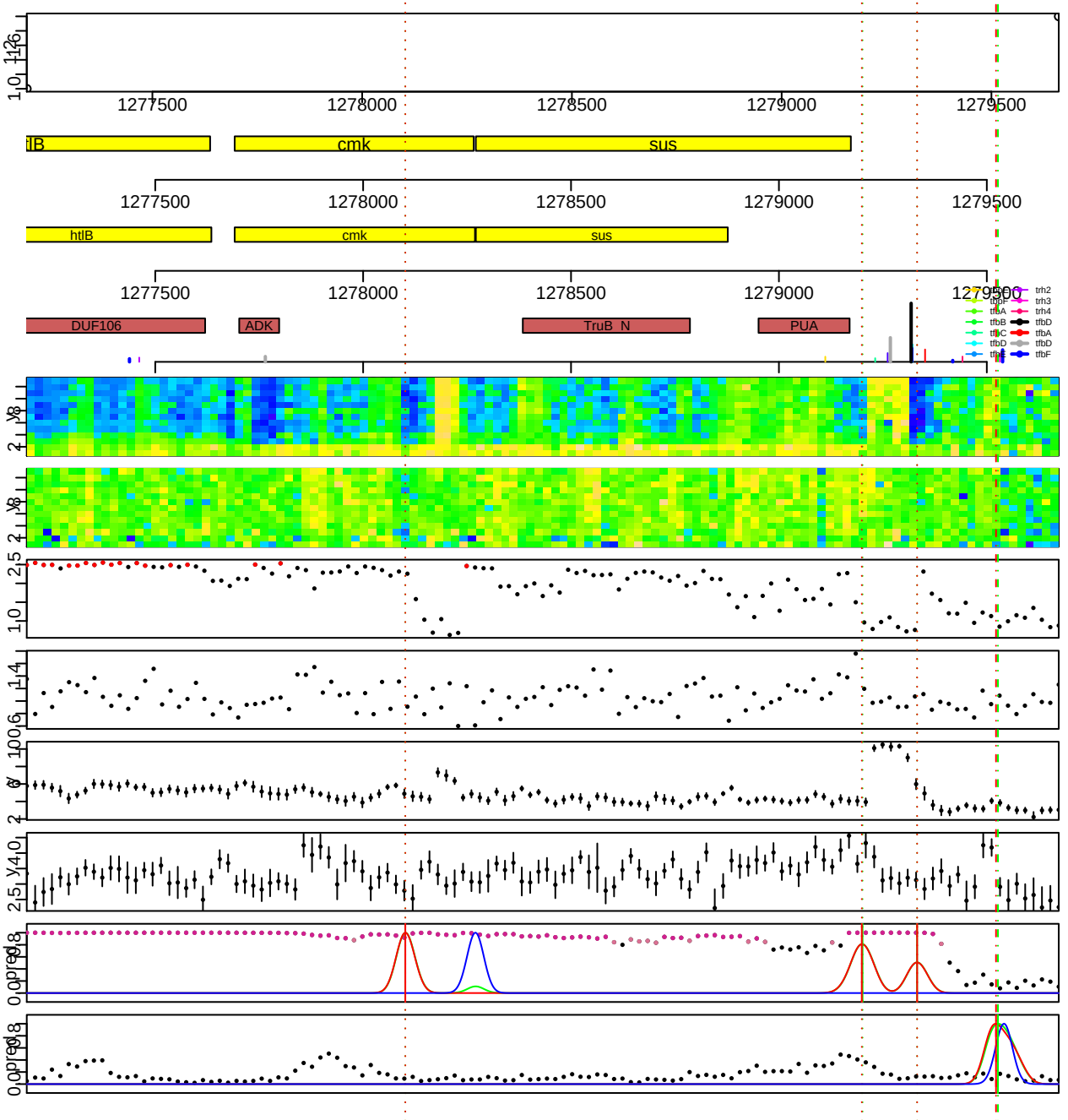

1252000
1253000
1254000
1255000
B2
VNG1681C
VNG1682C
crtI1
PSY
DUF422
UbiA
Amino_oxidase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA

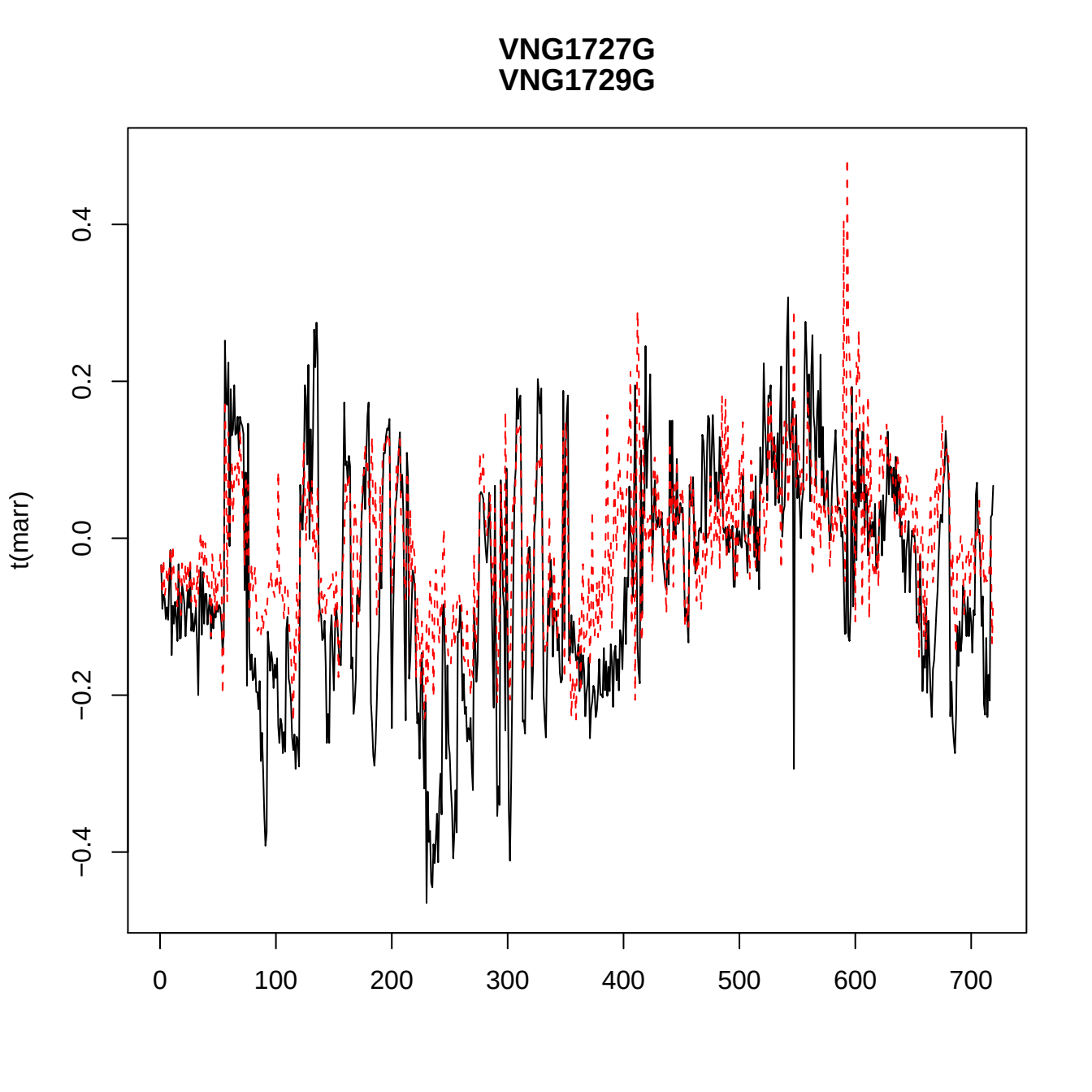

VNG1681C
VNG1682C
VNG1684G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

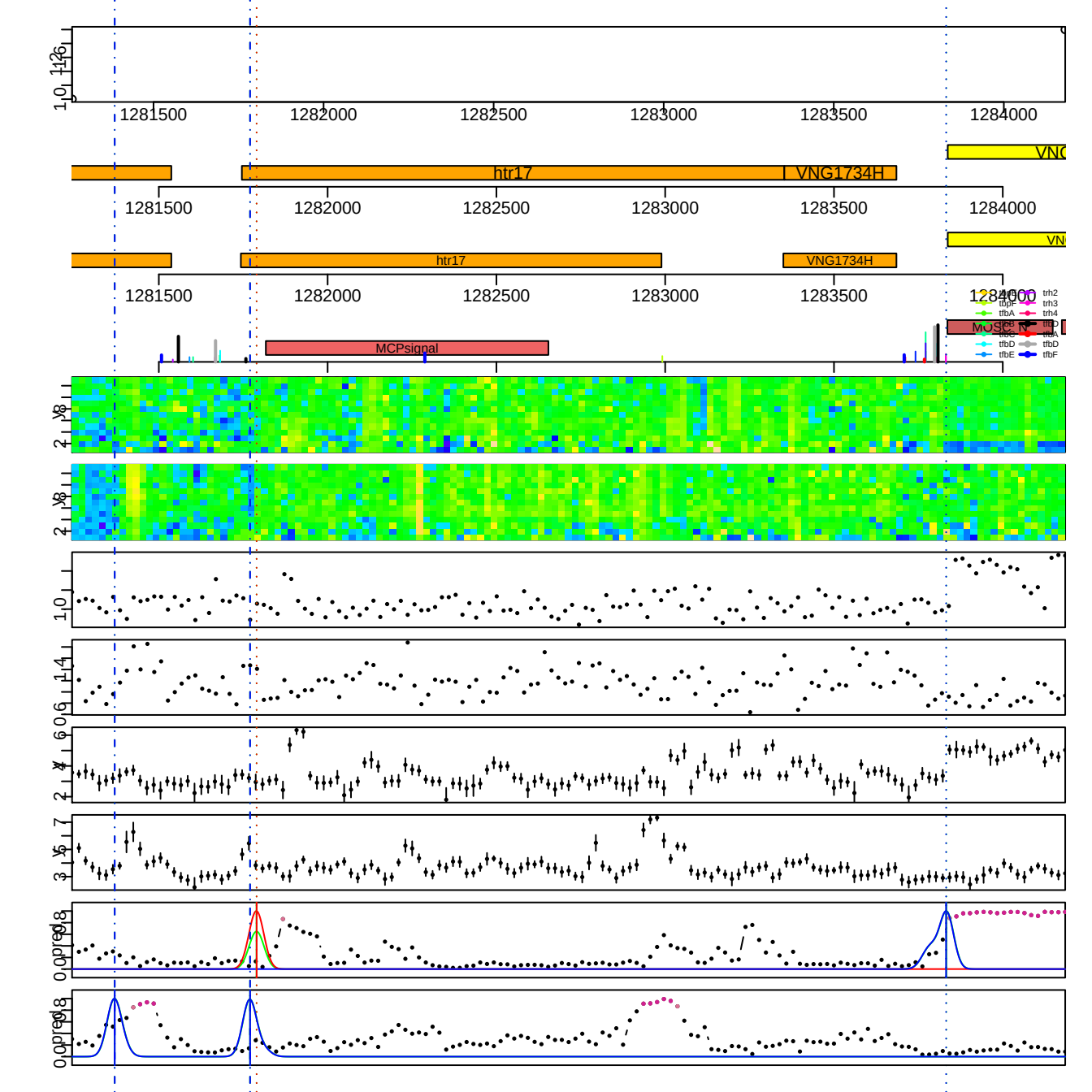


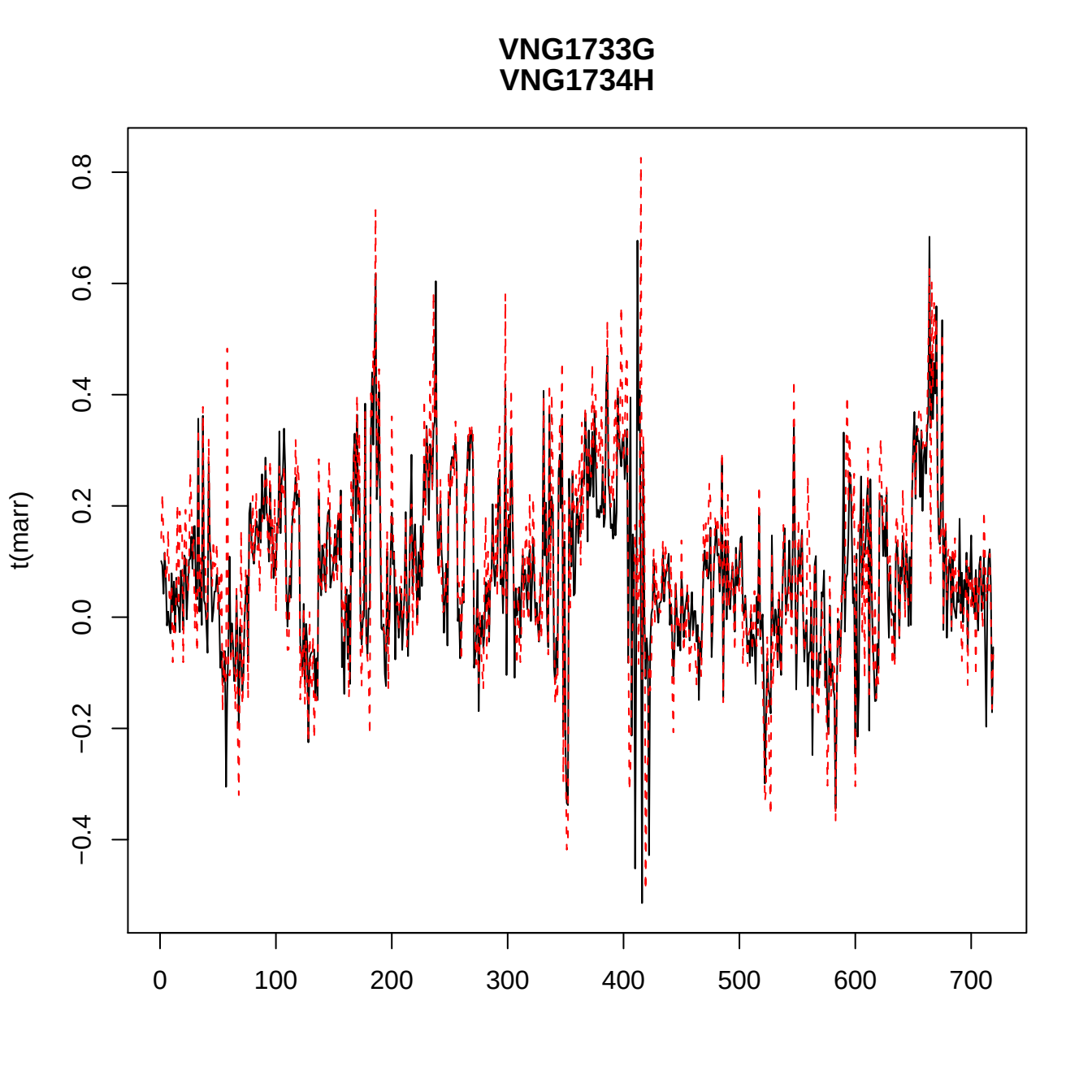
1258000
1260000
1262000
1264000
1266000
1268000
1270000
1272000
secY
rpl13p
rps4e
rpl6p
rpl32e
rps5p
rpl15p
DUF171
Ribosoma
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh2
trh3
trh4

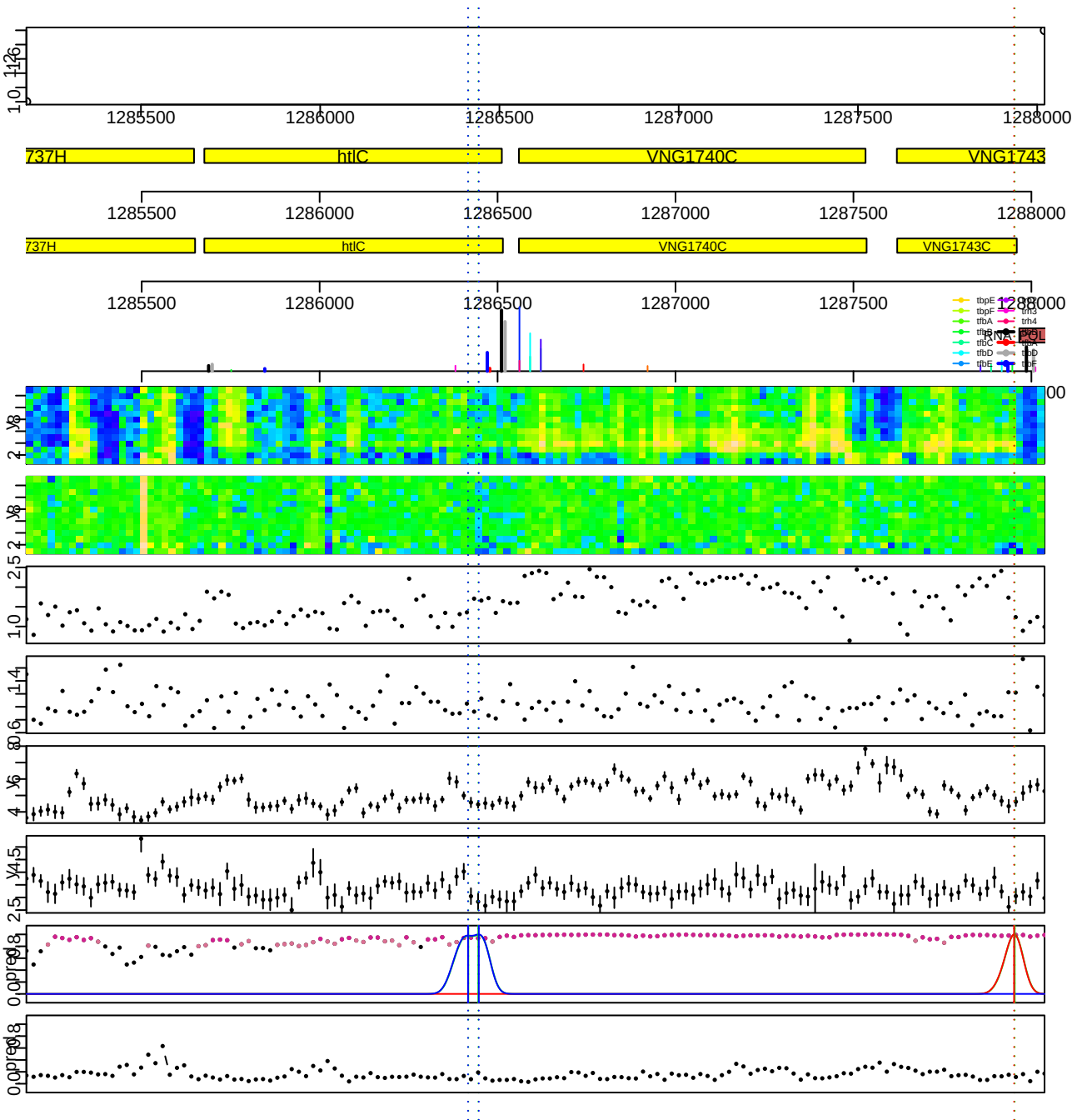

VNG1700G
VNG1701G
VNG1702G
VNG1703G
VNG1705G
VNG1706G
VNG1707G
VNG1709G
VNG1711G
VNG1713G
VNG1714G
VNG1715G
VNG1716G
VNG1718G
VNG1719G
t(marr)
−1.0
−0.5
0.0
0.5
0
100
200
300
400
500
600
700

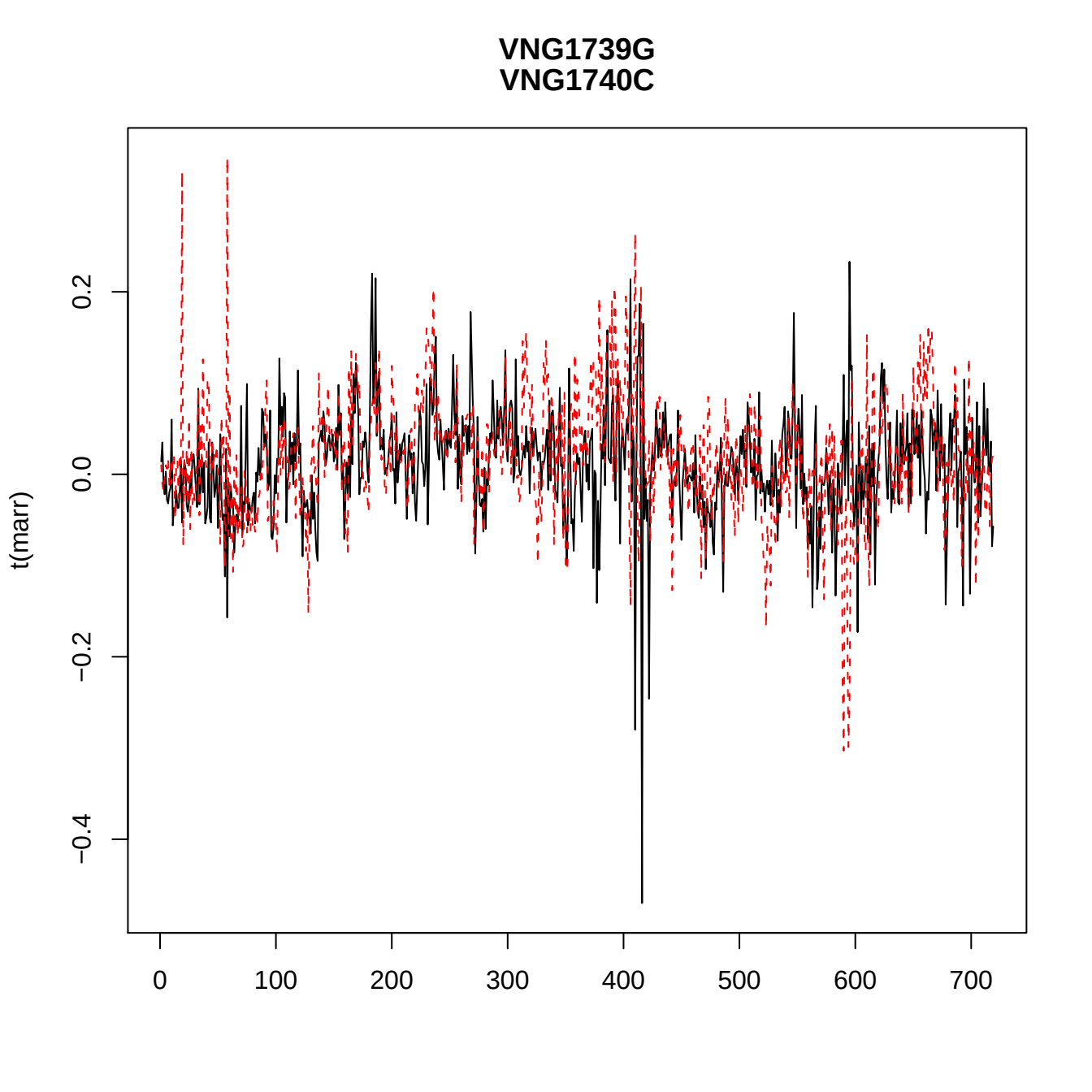

1277500
1278000
1278500
1279000
1279500
tlB
cmk
sus
htlB
DUF106
ADK
TruB_N
PUA
trh2
trh3
trh4
tfbB
tfbD
tfbA
tfbD
tfbF
pred

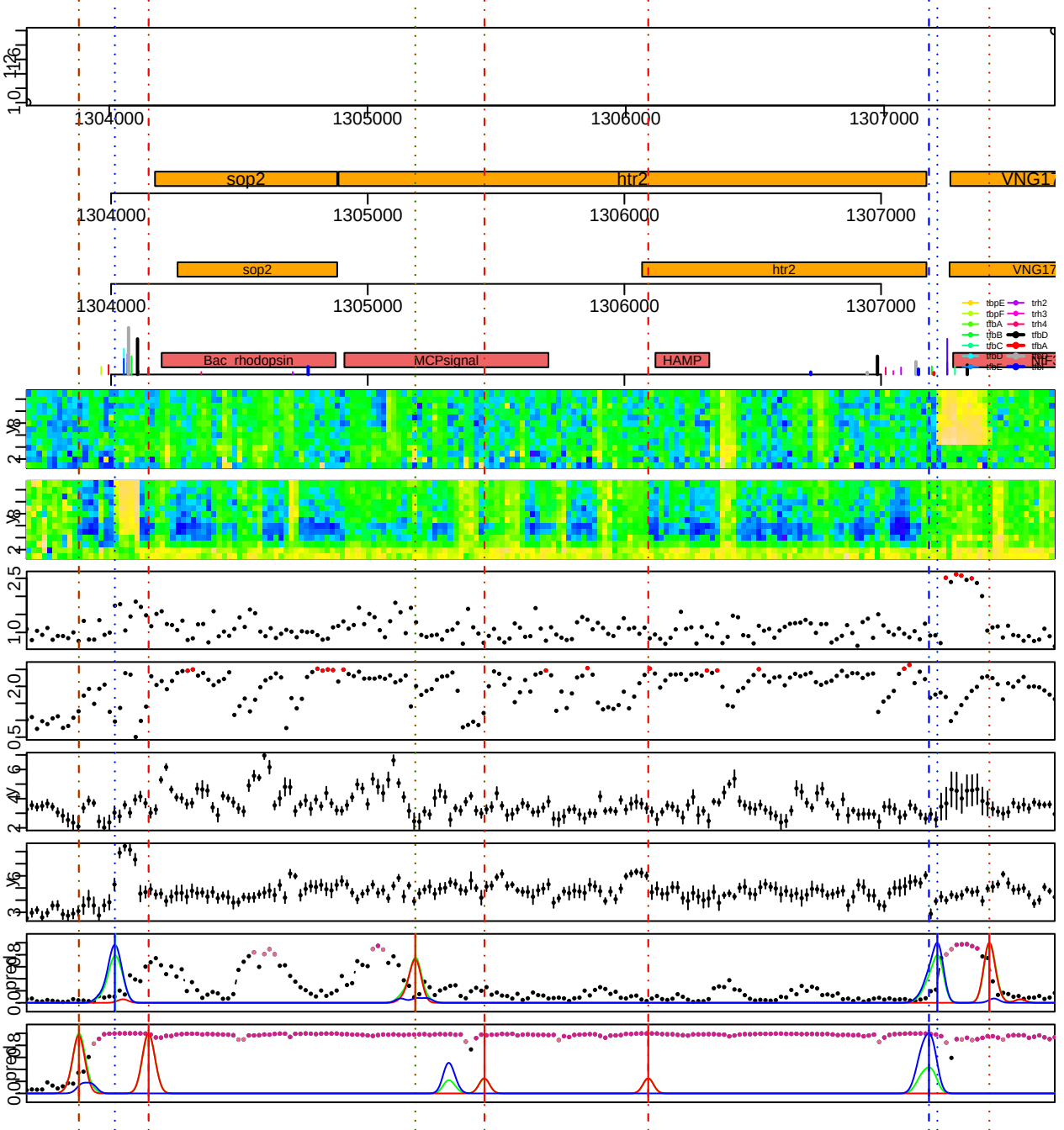

VNG1727G
VNG1729G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1281500
1282000
1282500
1283000
1283500
1284000
htr17
VNG1734H
MCPsignal
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF

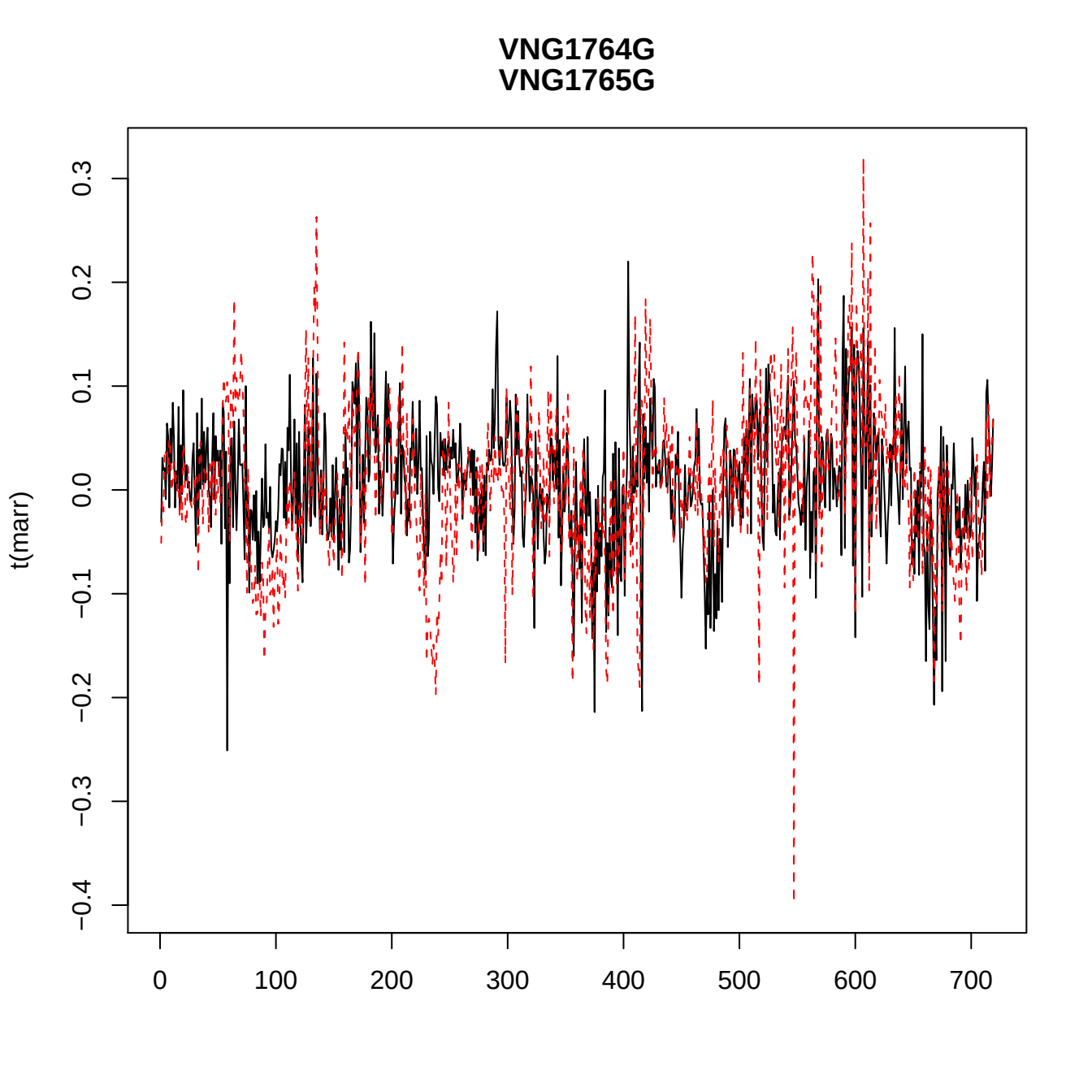

VNG1733G
VNG1734H
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

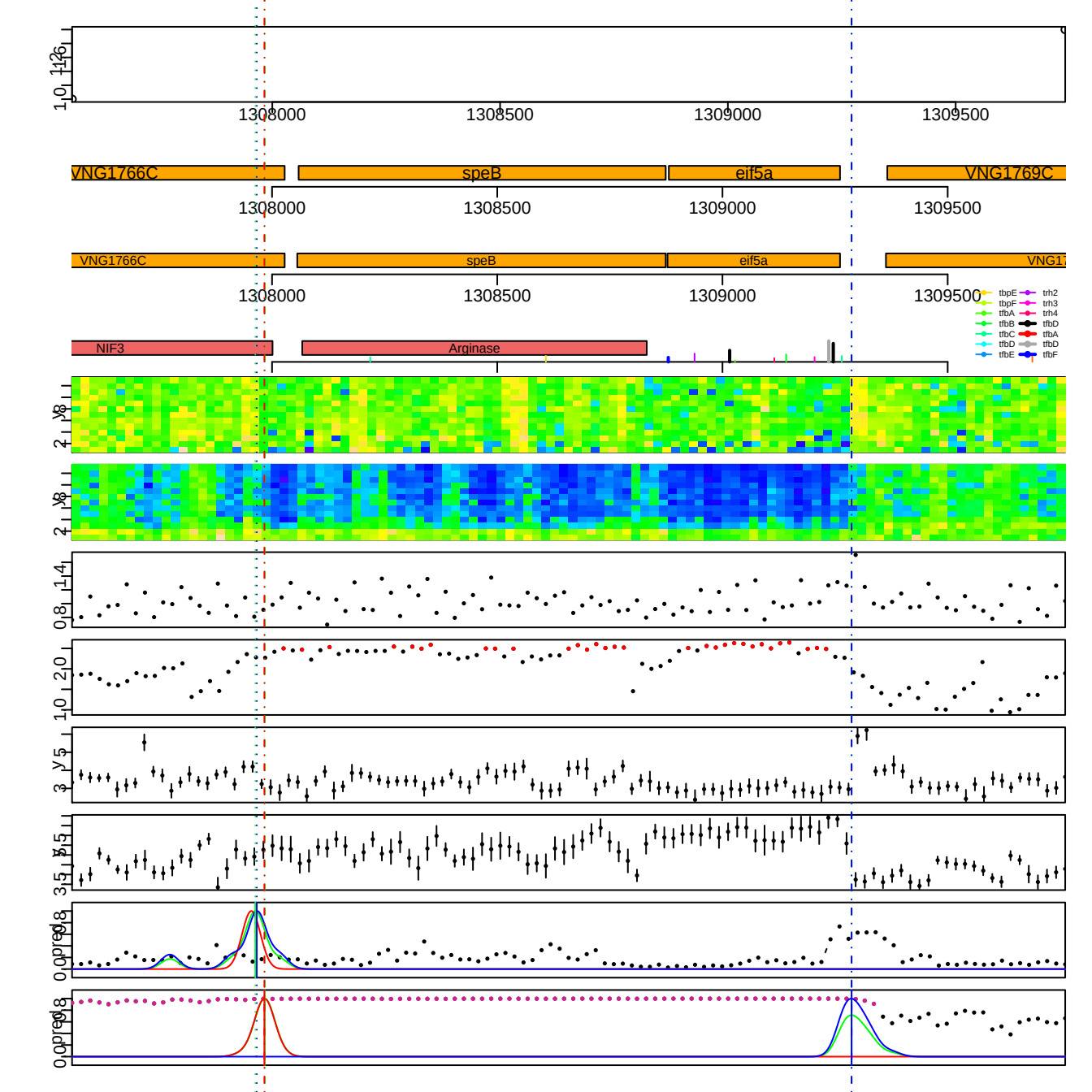

1285500
1286000
1286500
1287000
1287500
1288000
737H
htlC
VNG1740C
VNG1743
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
RNA_POL


VNG1739G
VNG1740C
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700



1304000
1305000
1306000
1307000
sop2
htr2
VNG17
Bac_rhodopsin
MCPsignal
HAMP
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA


VNG1764G
VNG1765G
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.4
0
100
200
300
400
500
600
700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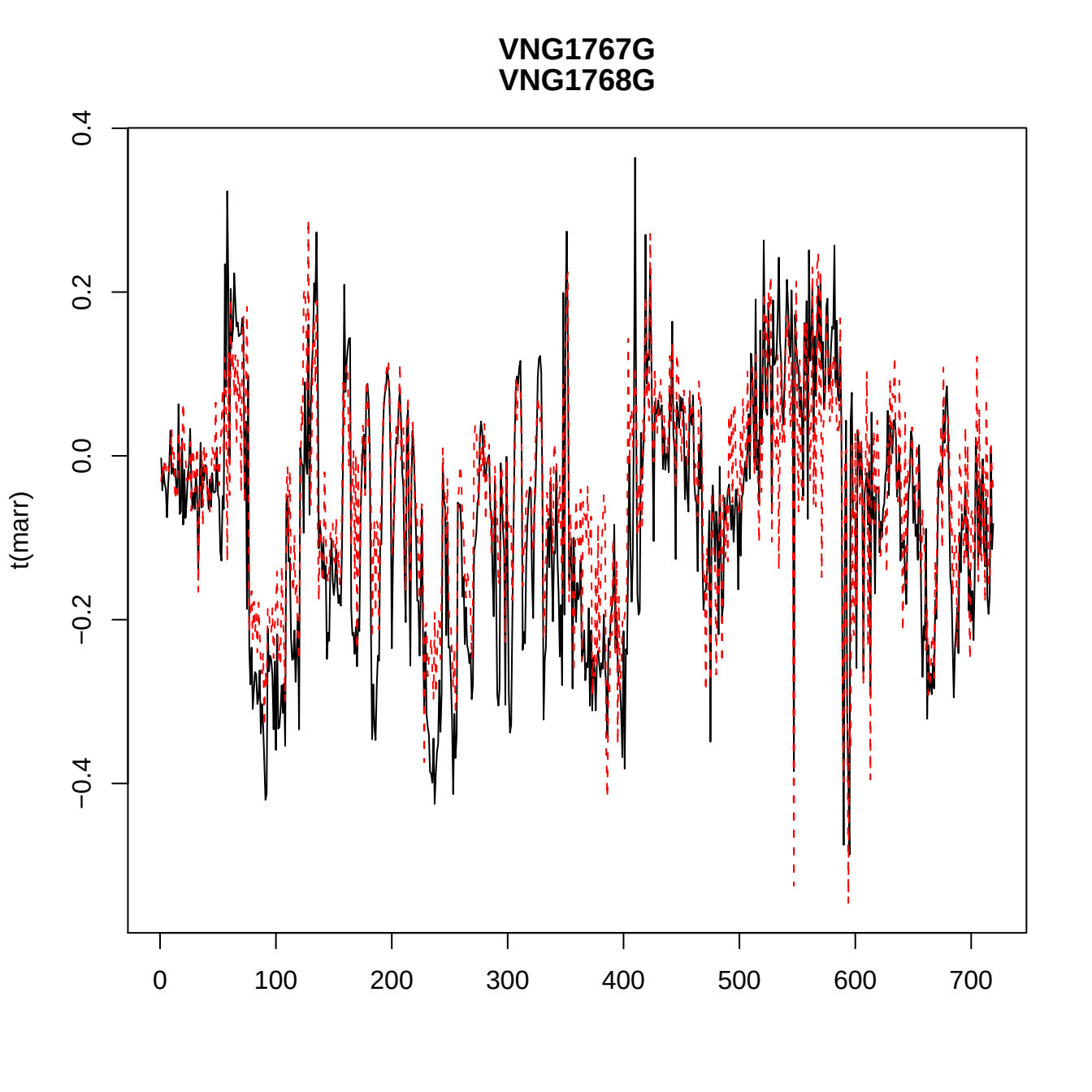
1308500
1309000
1309500
VNG1766C
speB
eif5a
VNG1769C
NIF3
Arginase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1767G
VNG1768G
t(marr)
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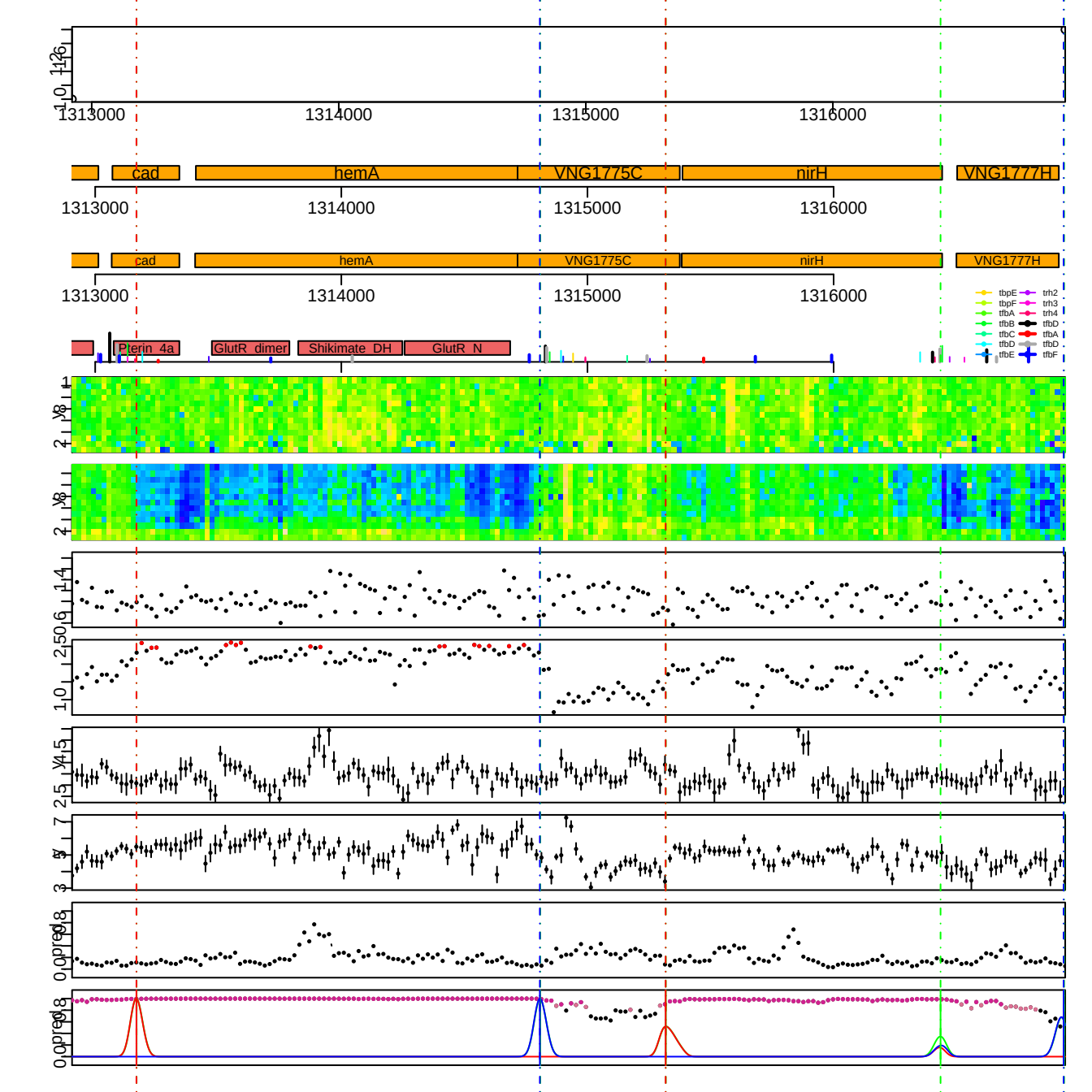
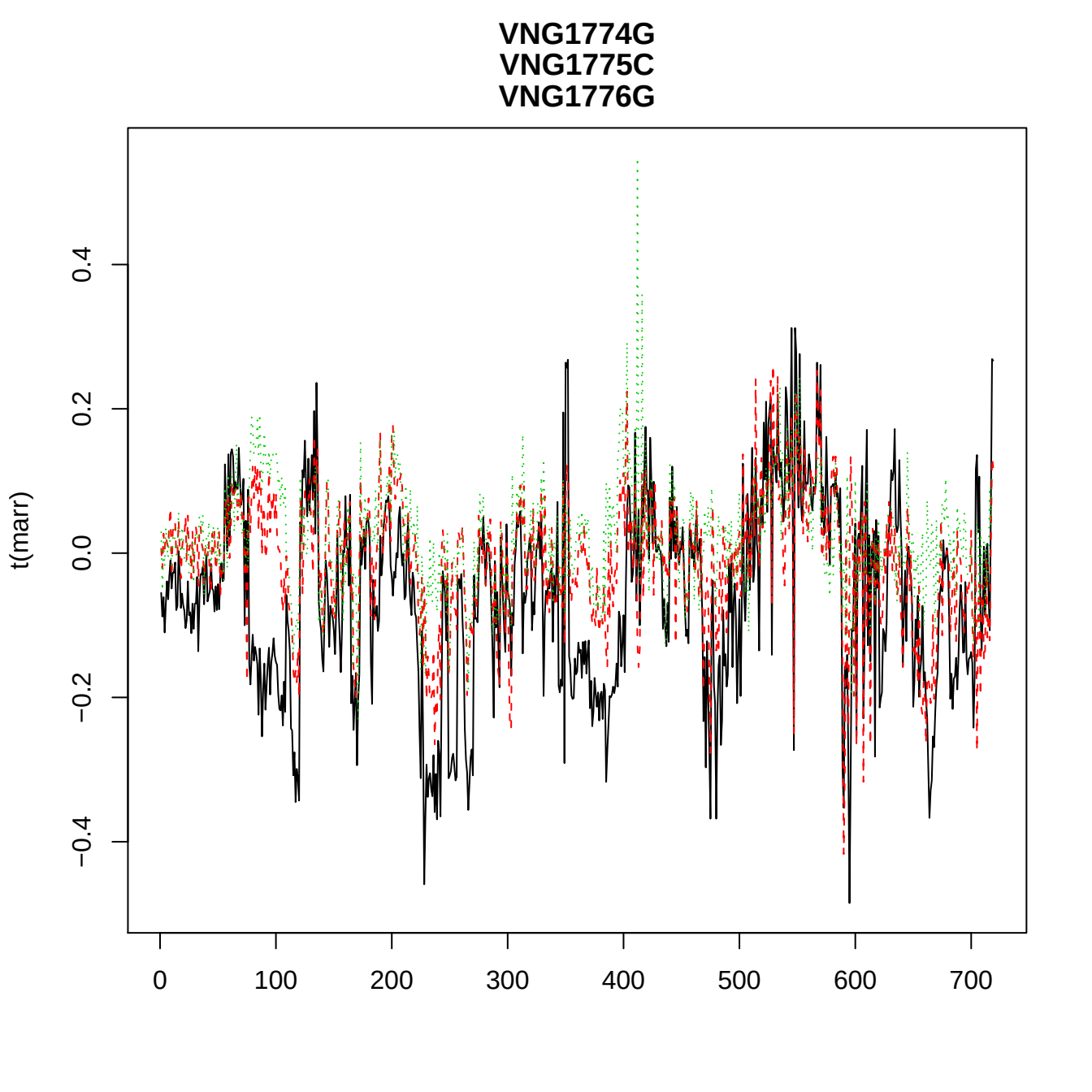
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1313000
1314000
1315000
1316000
cad
hemA
VNG1775C
nirH
VNG1777H
Pterin_4a
GlutR_dimer
Shikimate_DH
GlutR_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1774G
VNG1775C
VNG1776G
t(marr)
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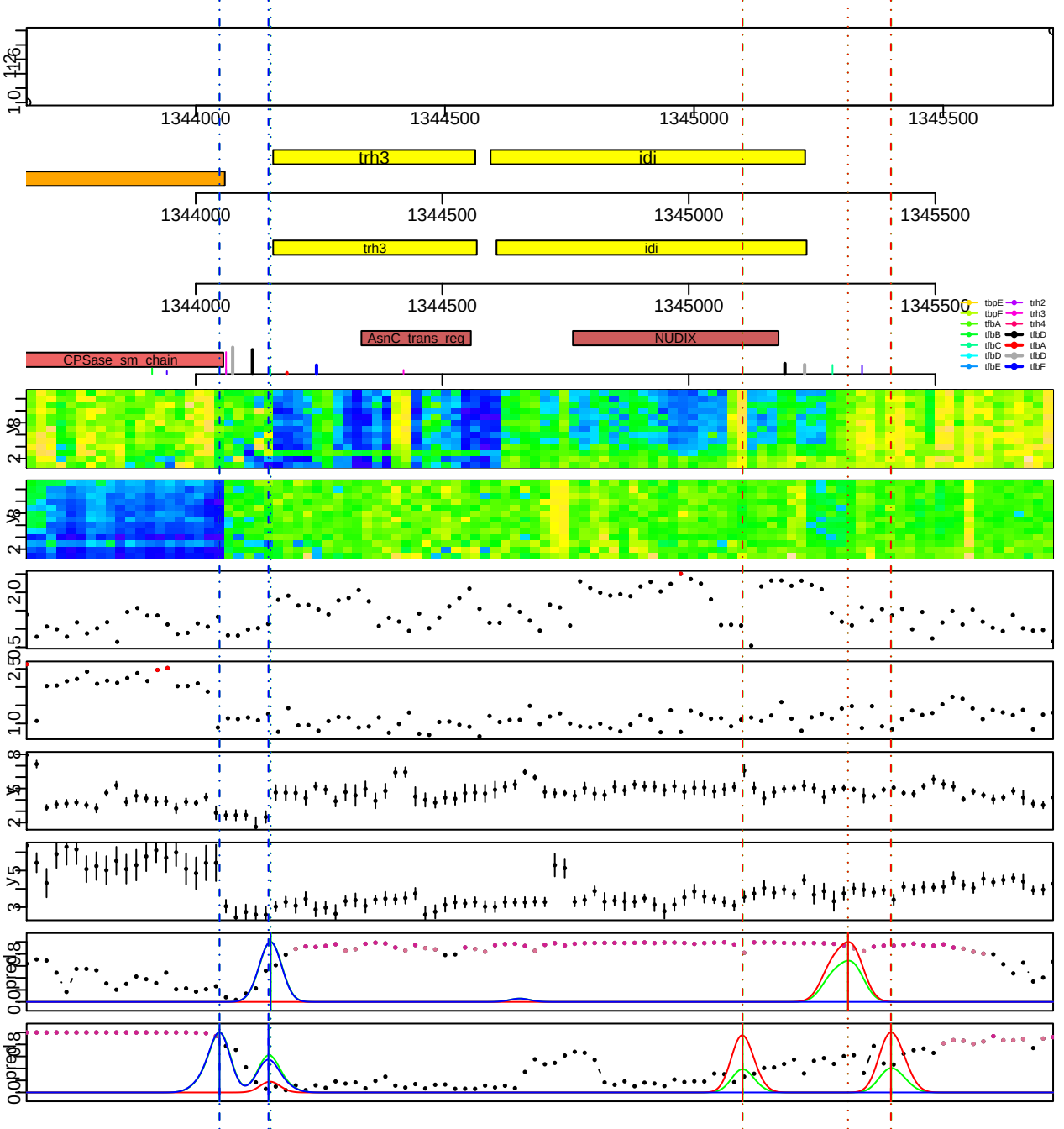
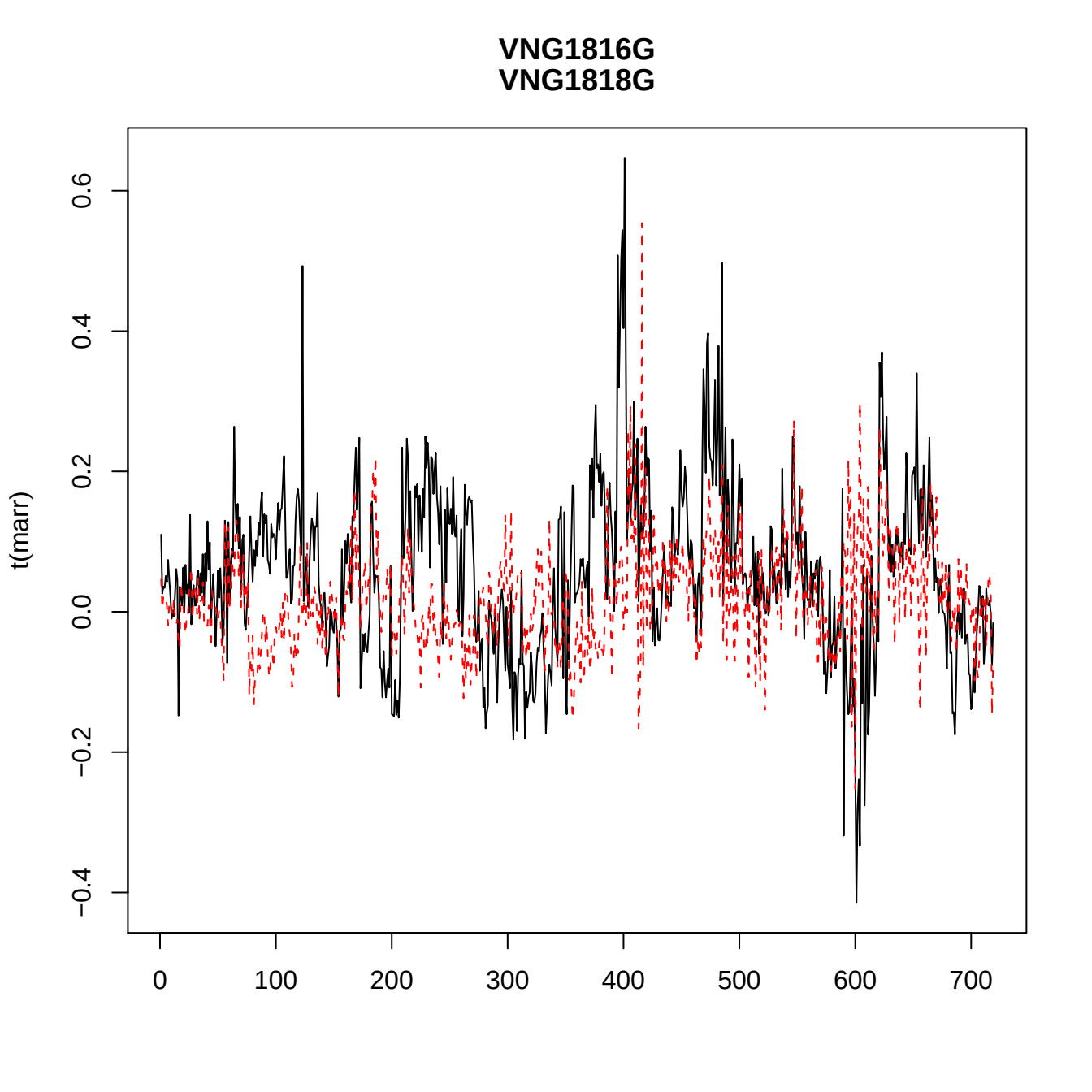
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1344000
1344500
1345000
1345500
trh3
idi
AsnC_trans_reg
NUDIX
CPSase_sm_chain
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG1816G
VNG1818G
t(marr)
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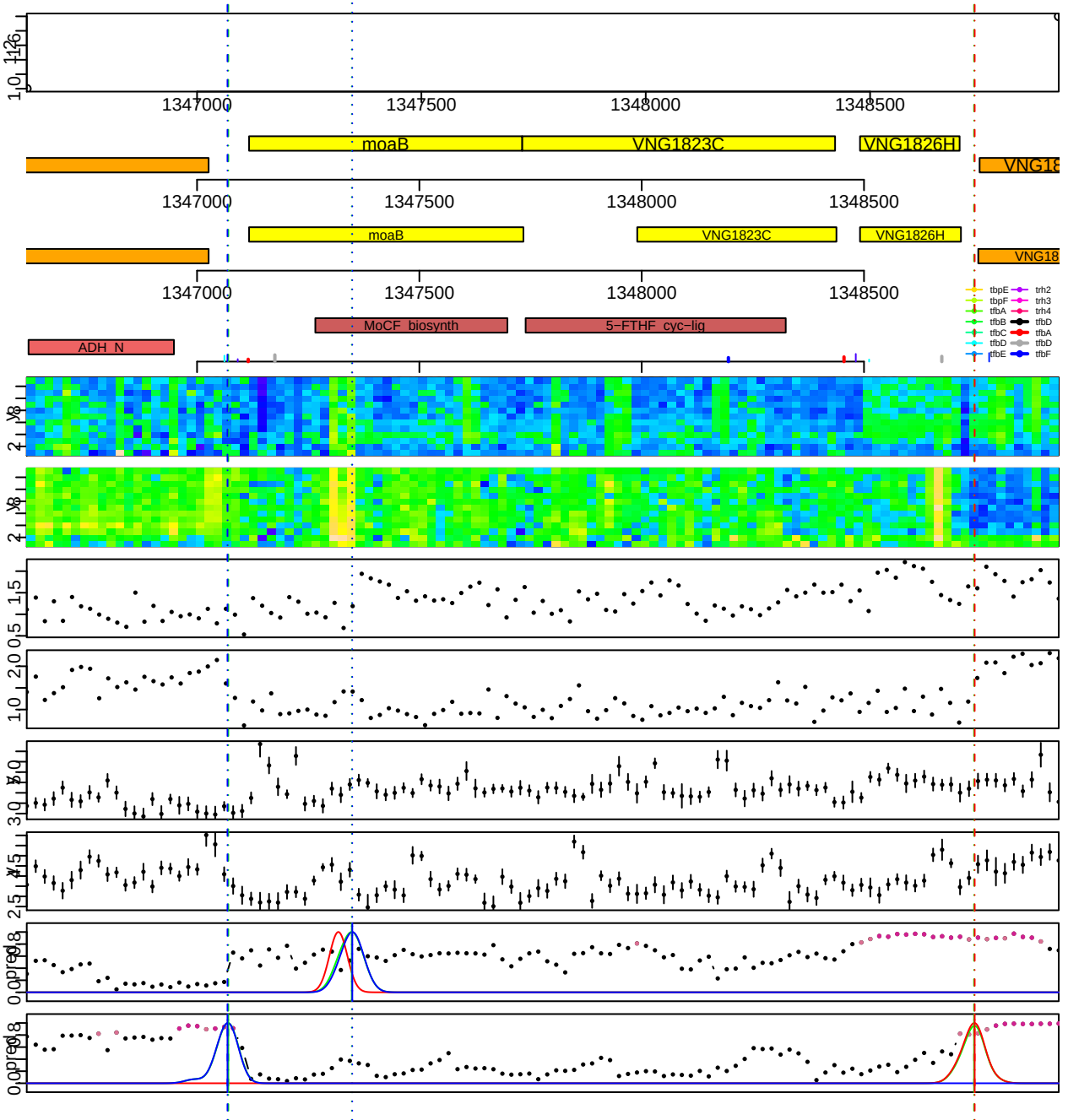
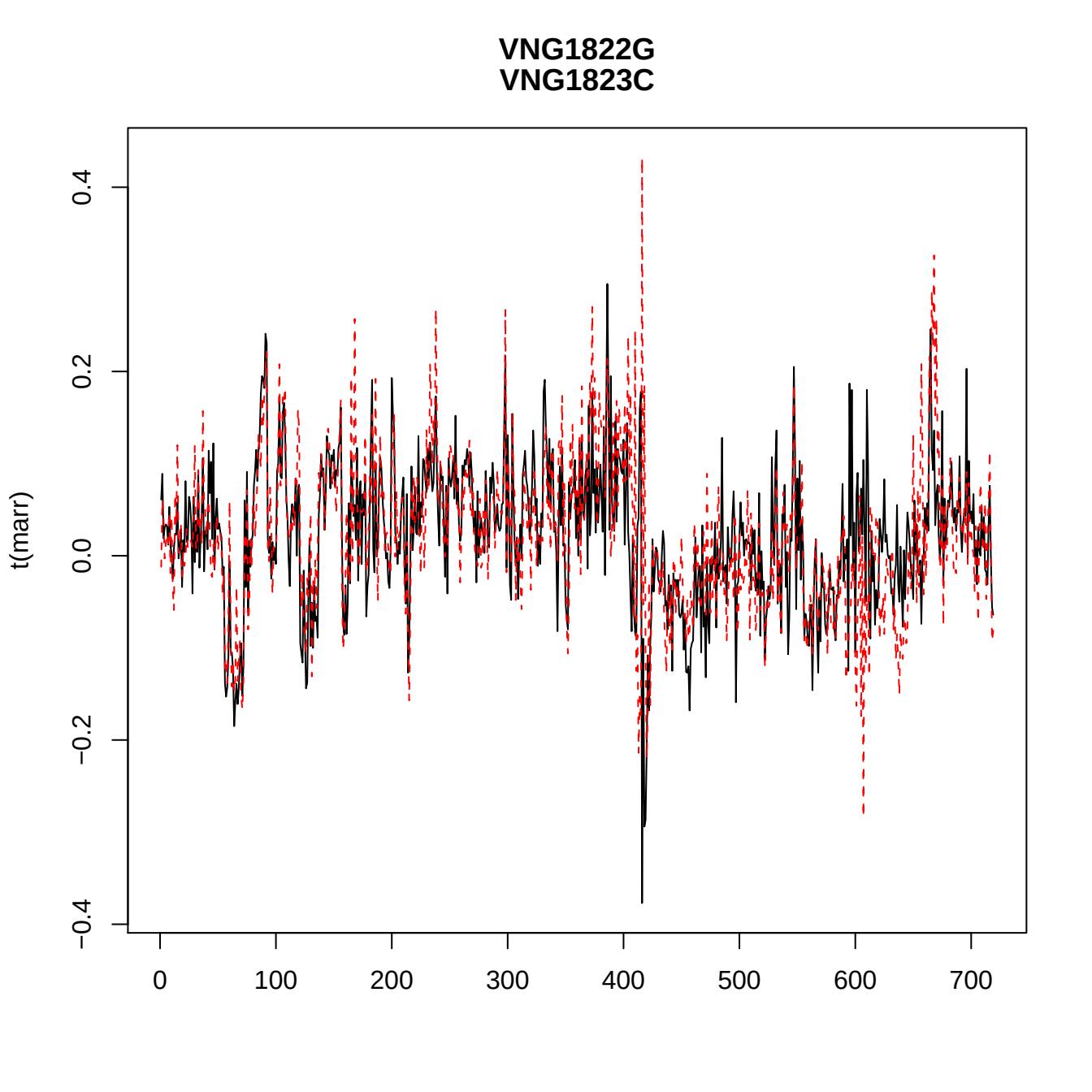
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1347000
1347500
1348000
1348500
moaB
VNG1823C
VNG1826H
VNG18
MoCF_biosynth
5-FTHF_cyc-lig
ADH_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG1822G
VNG1823C
t(marr)
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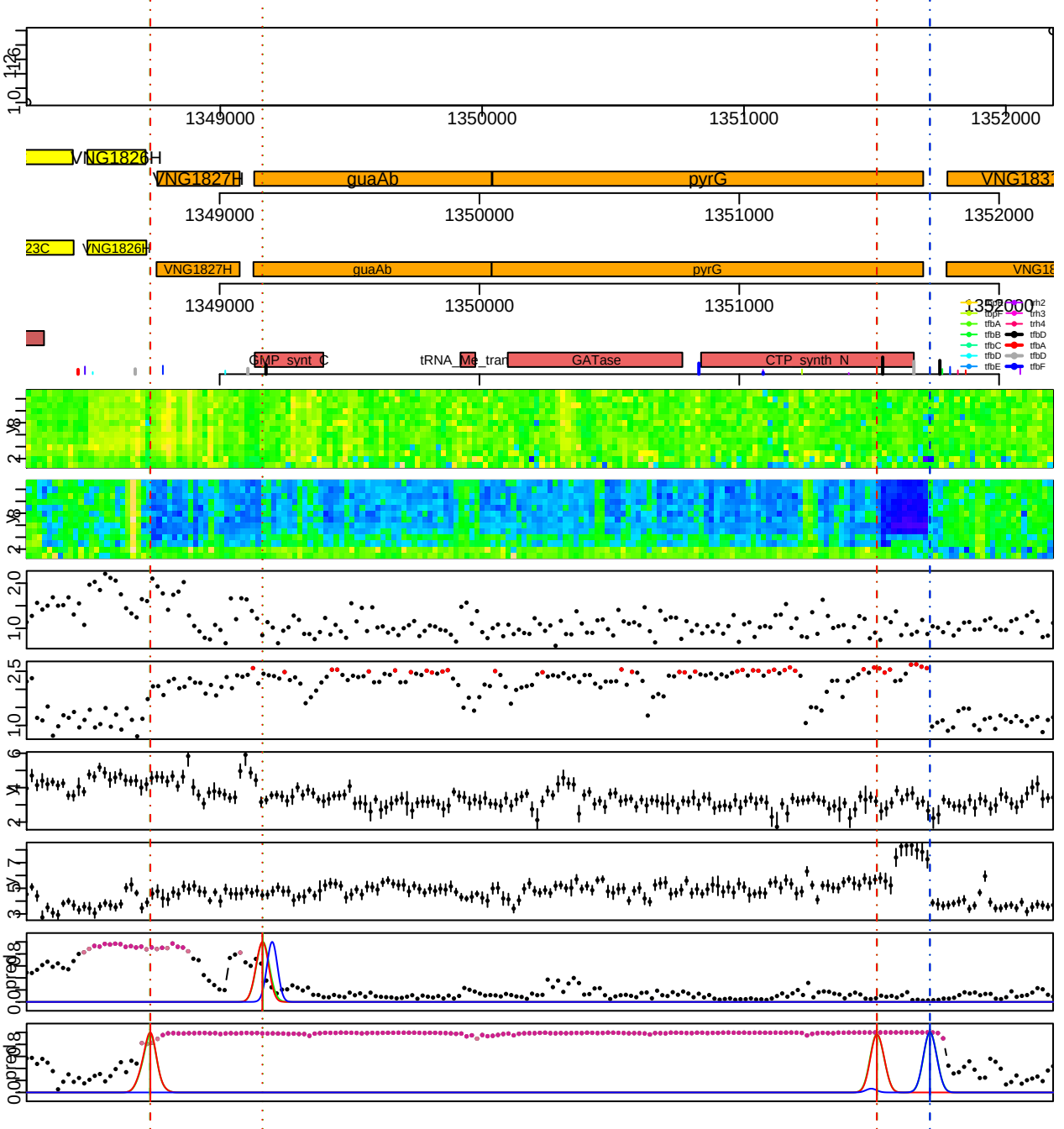
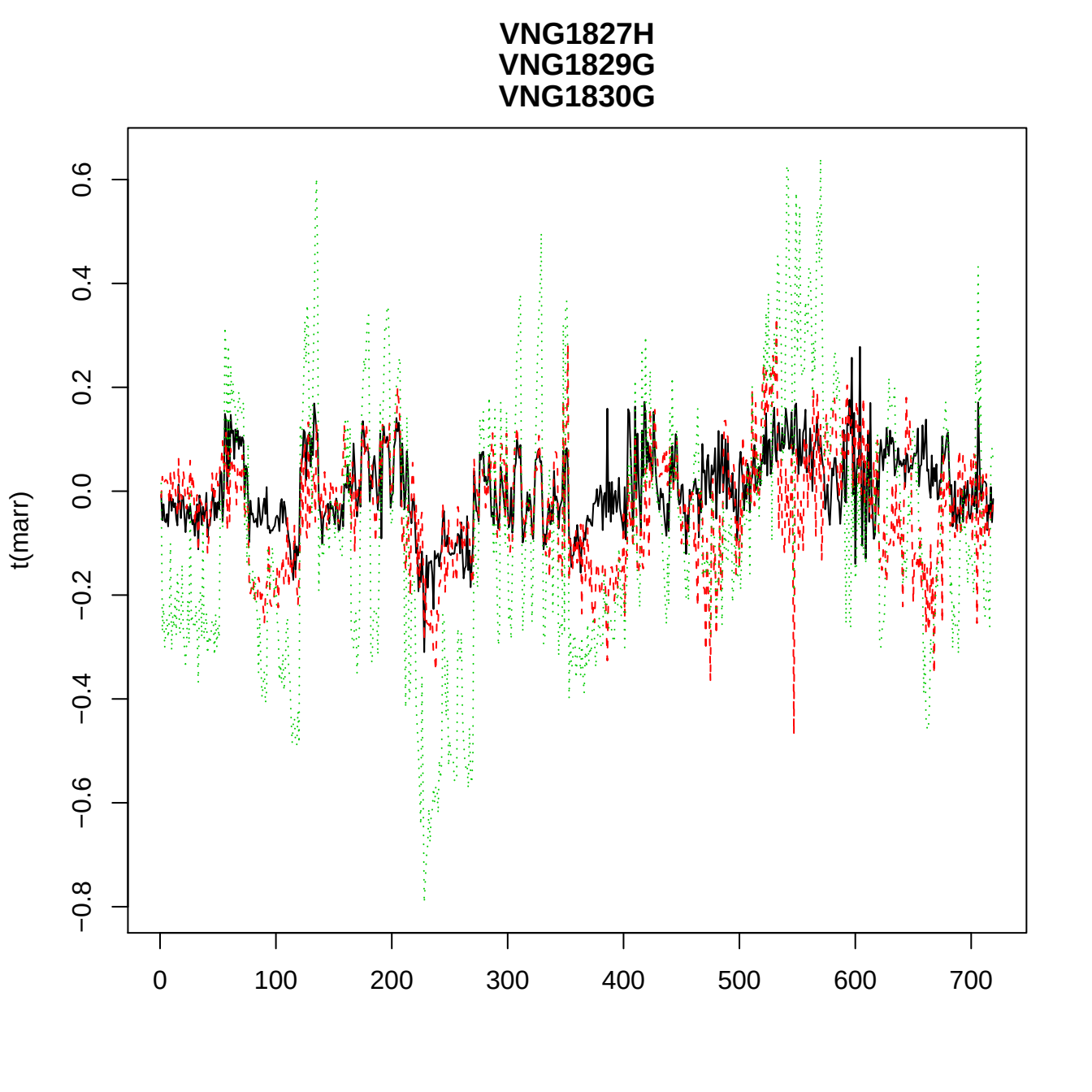
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1349000
1350000
1351000
1352000
VNG1826H
VNG1827H
guaAb
pyrG
VNG1831
23C
GMP_synt_C
tRNA_Me_tran
GATase
CTP_synth_N
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
trh1
trh2
trh3
trh4
tfbA
tfbD
tfbD
tfbF


VNG1827H
VNG1829G
VNG1830G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
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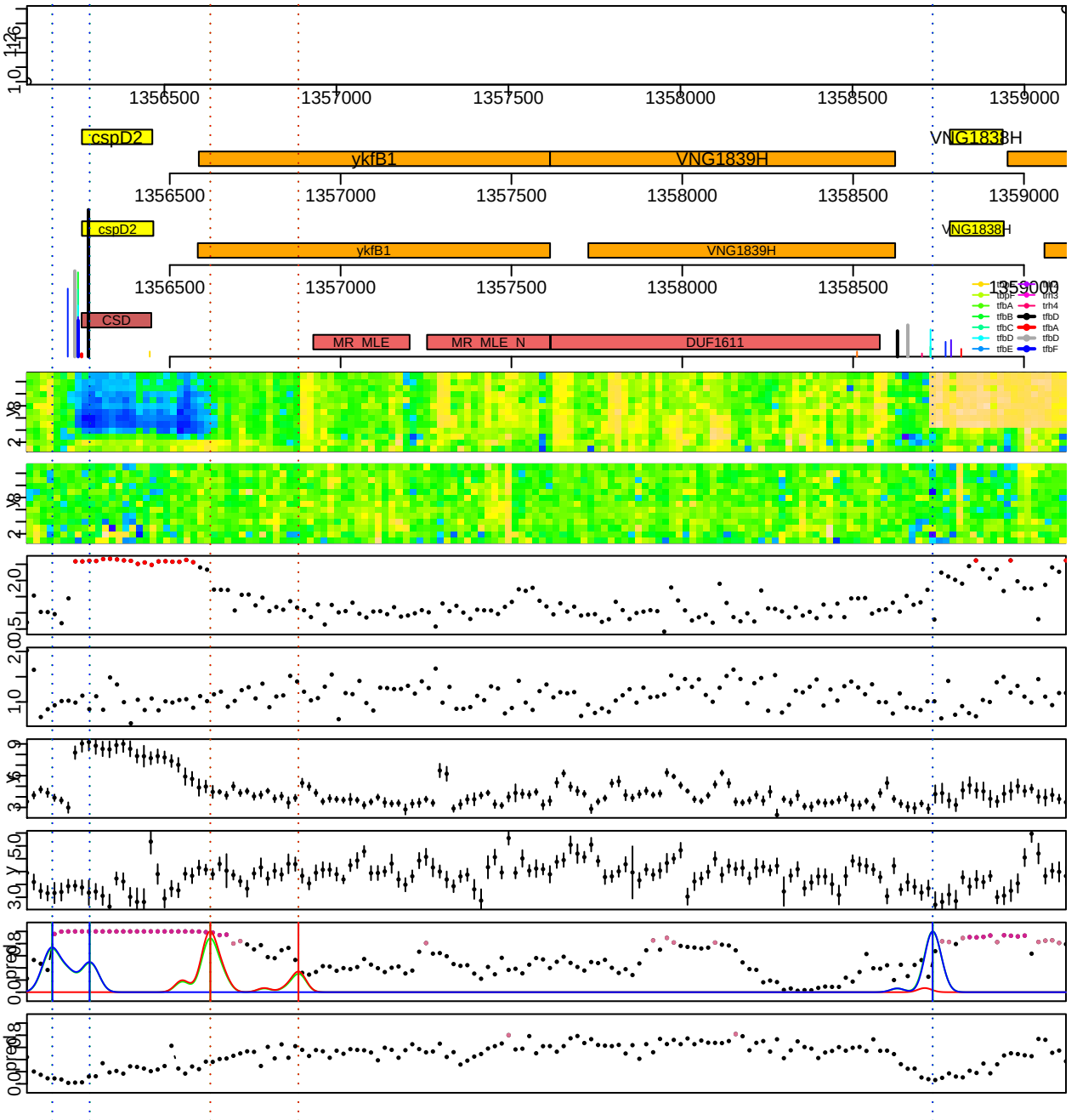
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ykfB1
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VNG1838H
CSD
MR_MLE
MR_MLE_N
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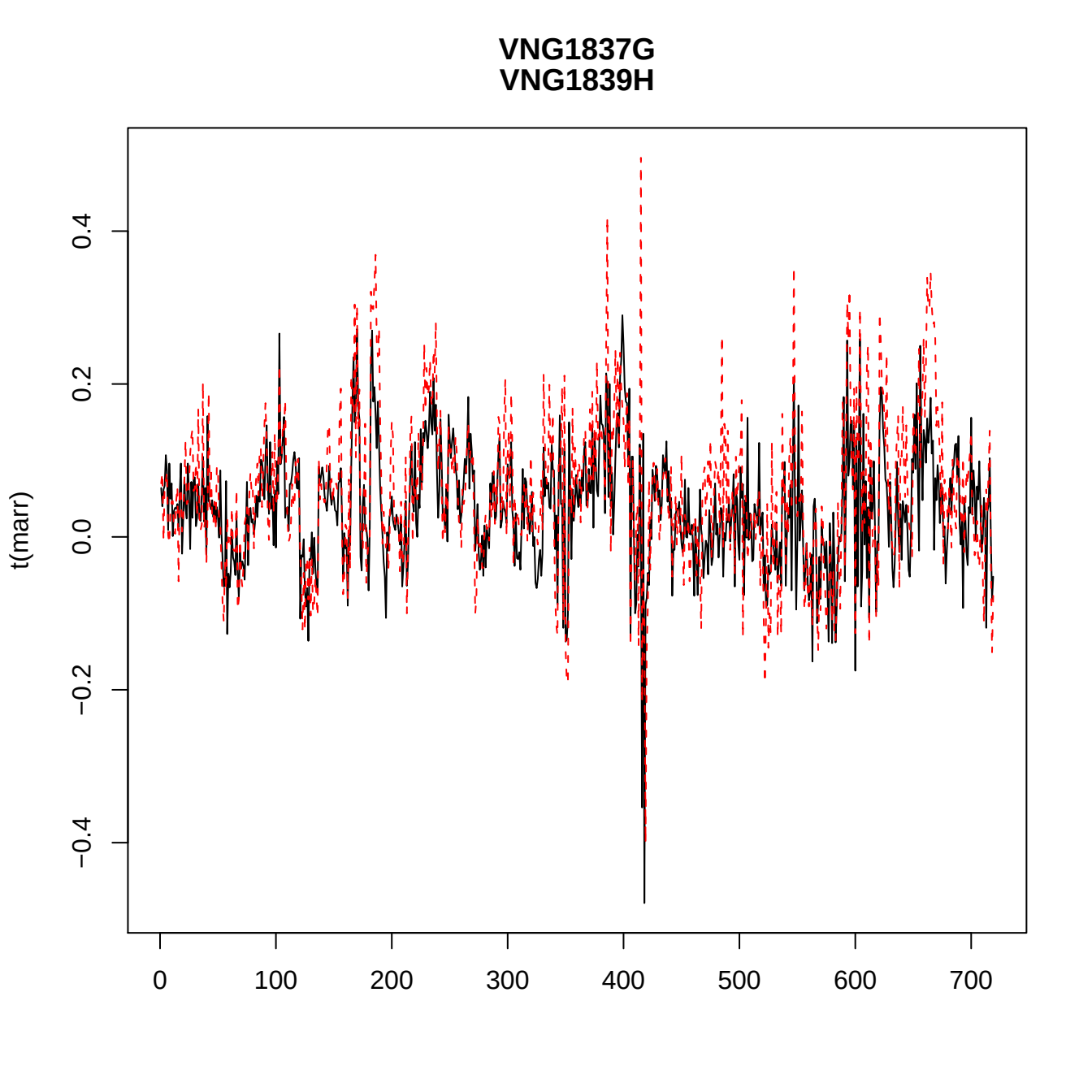
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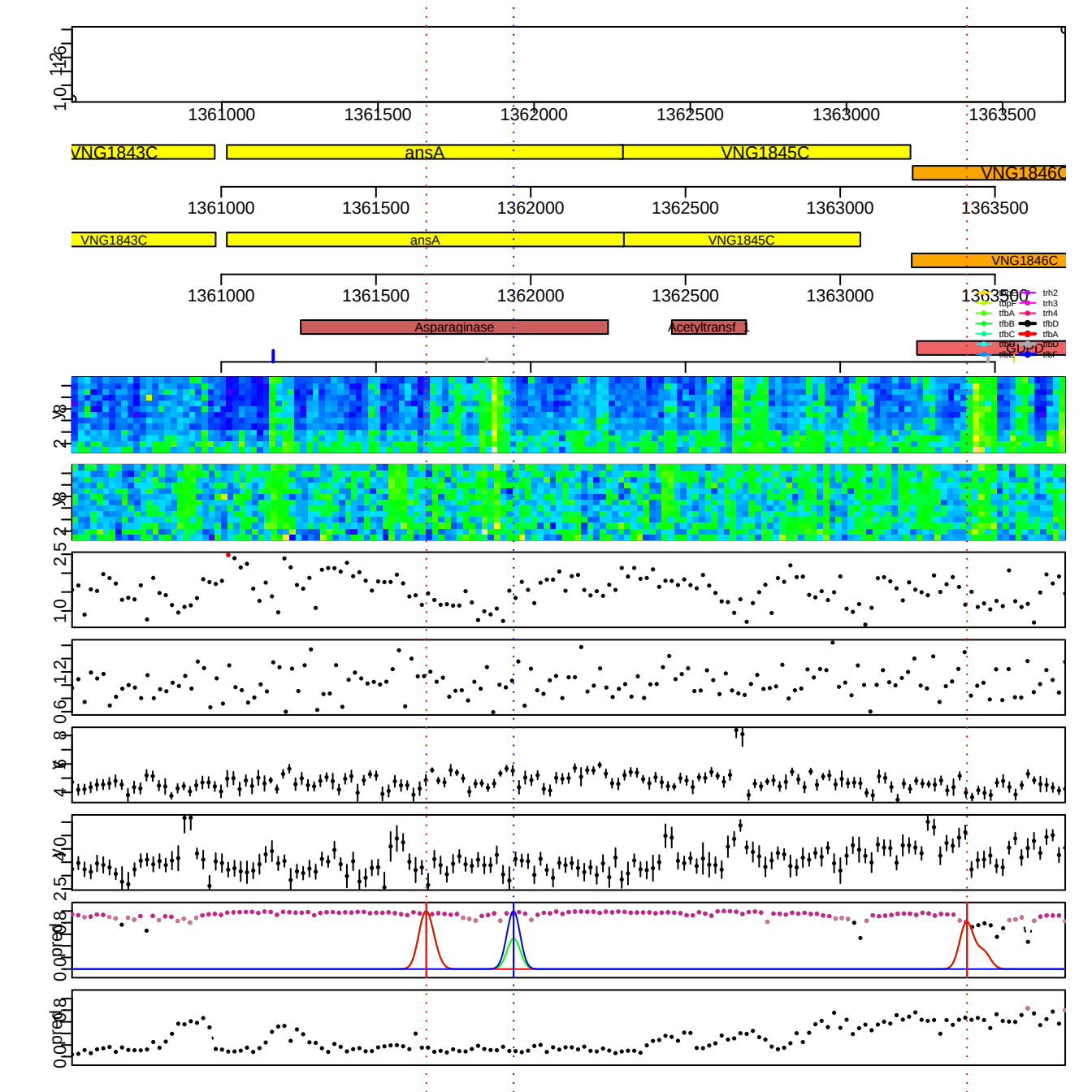
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GUPD
trh2
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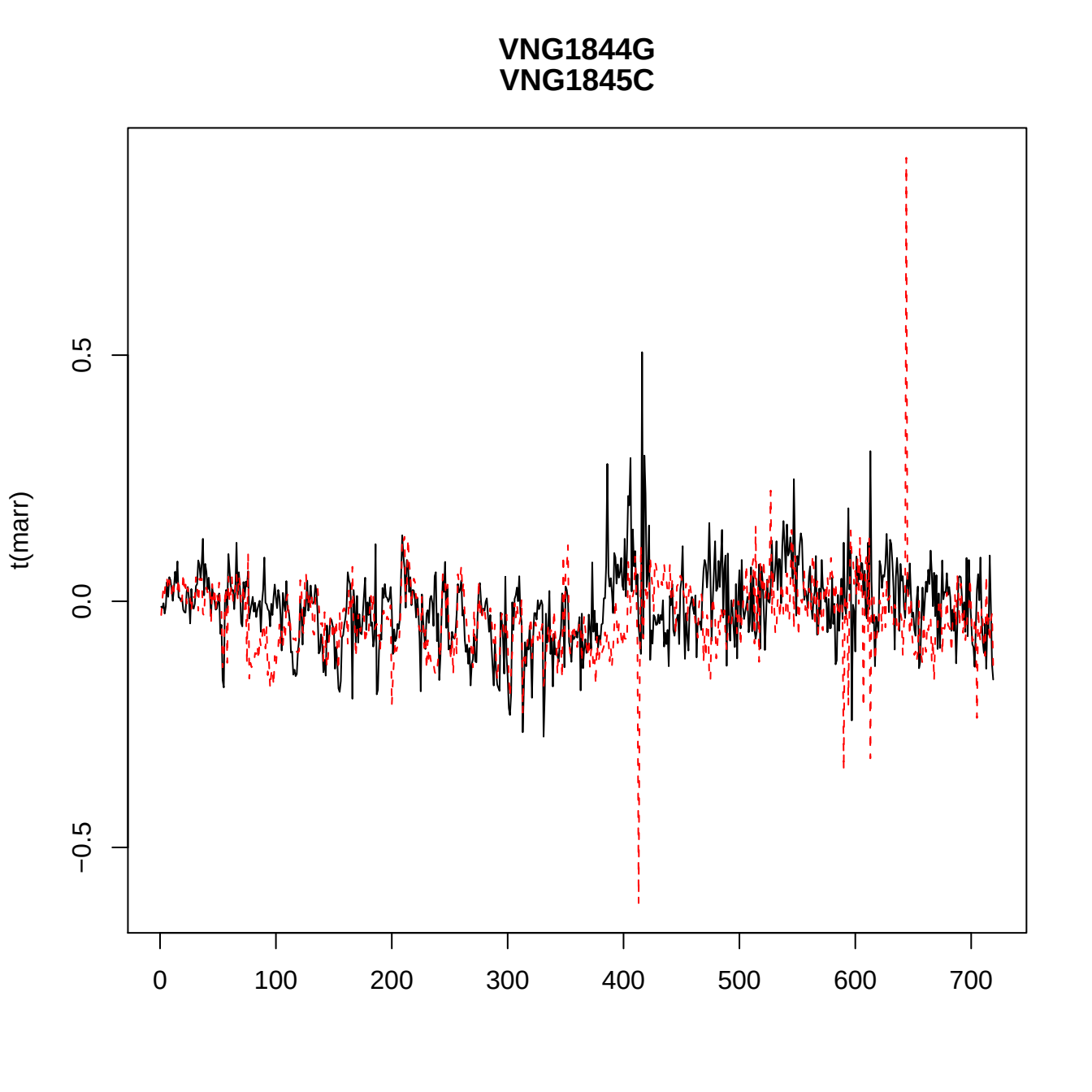
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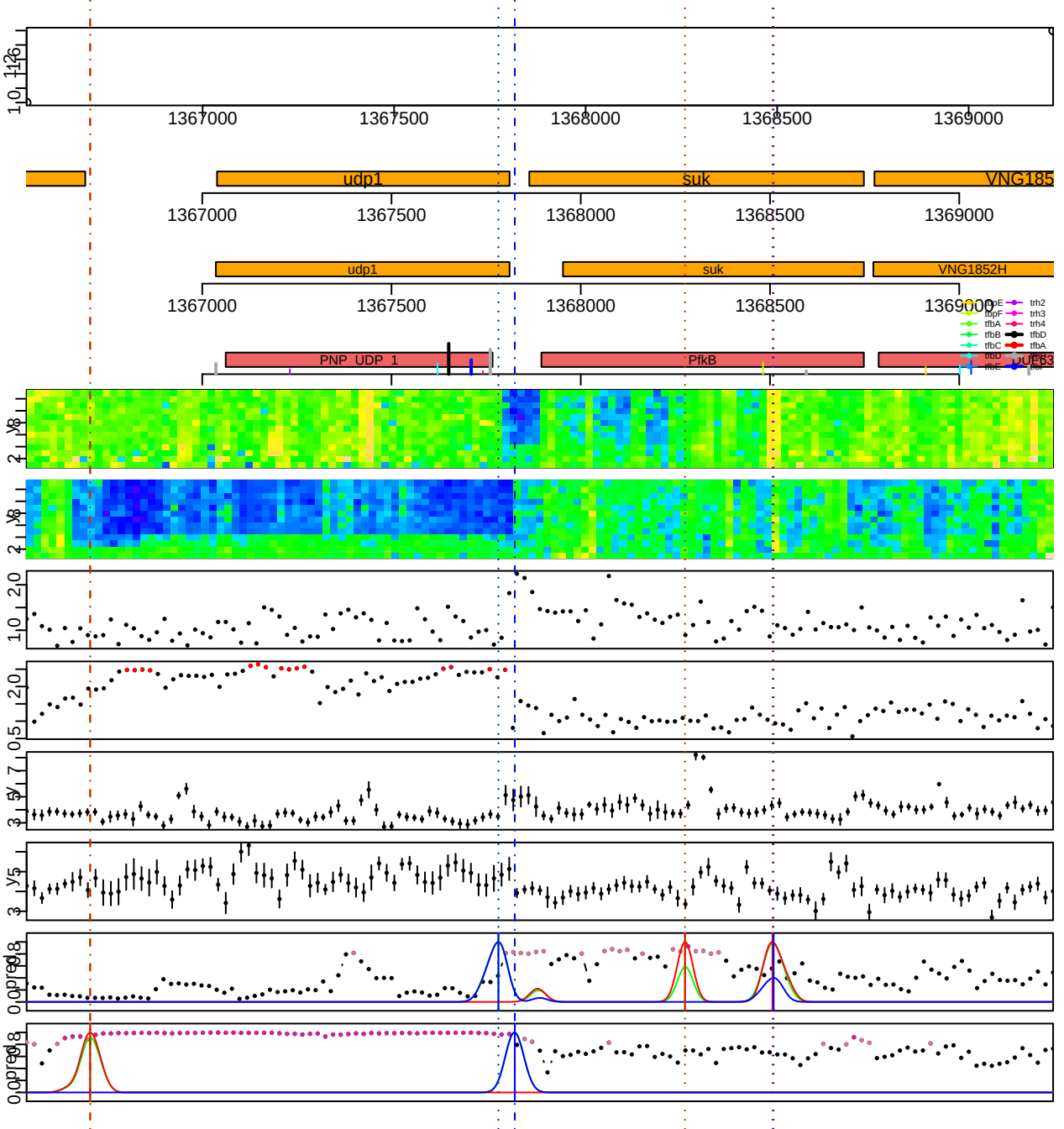
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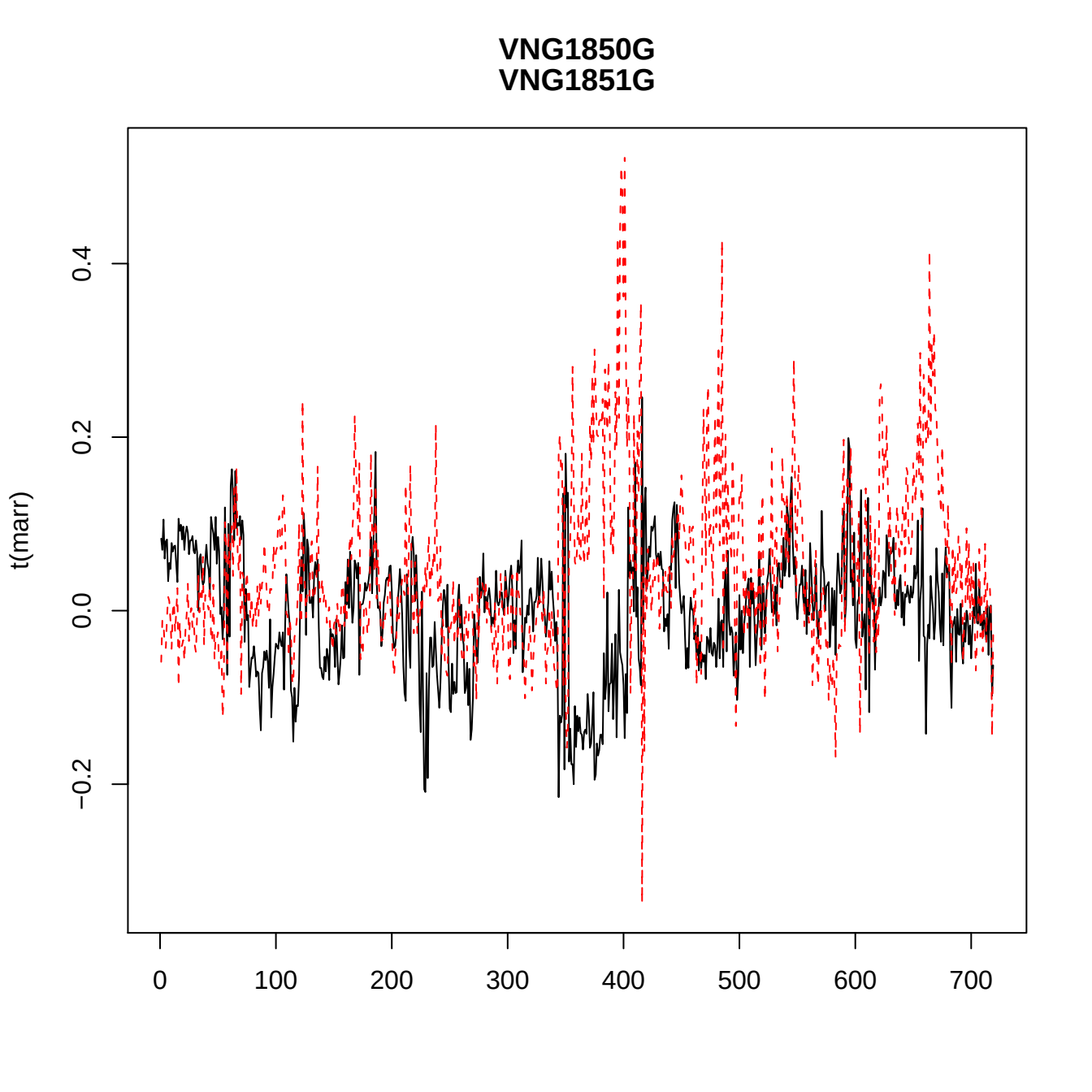
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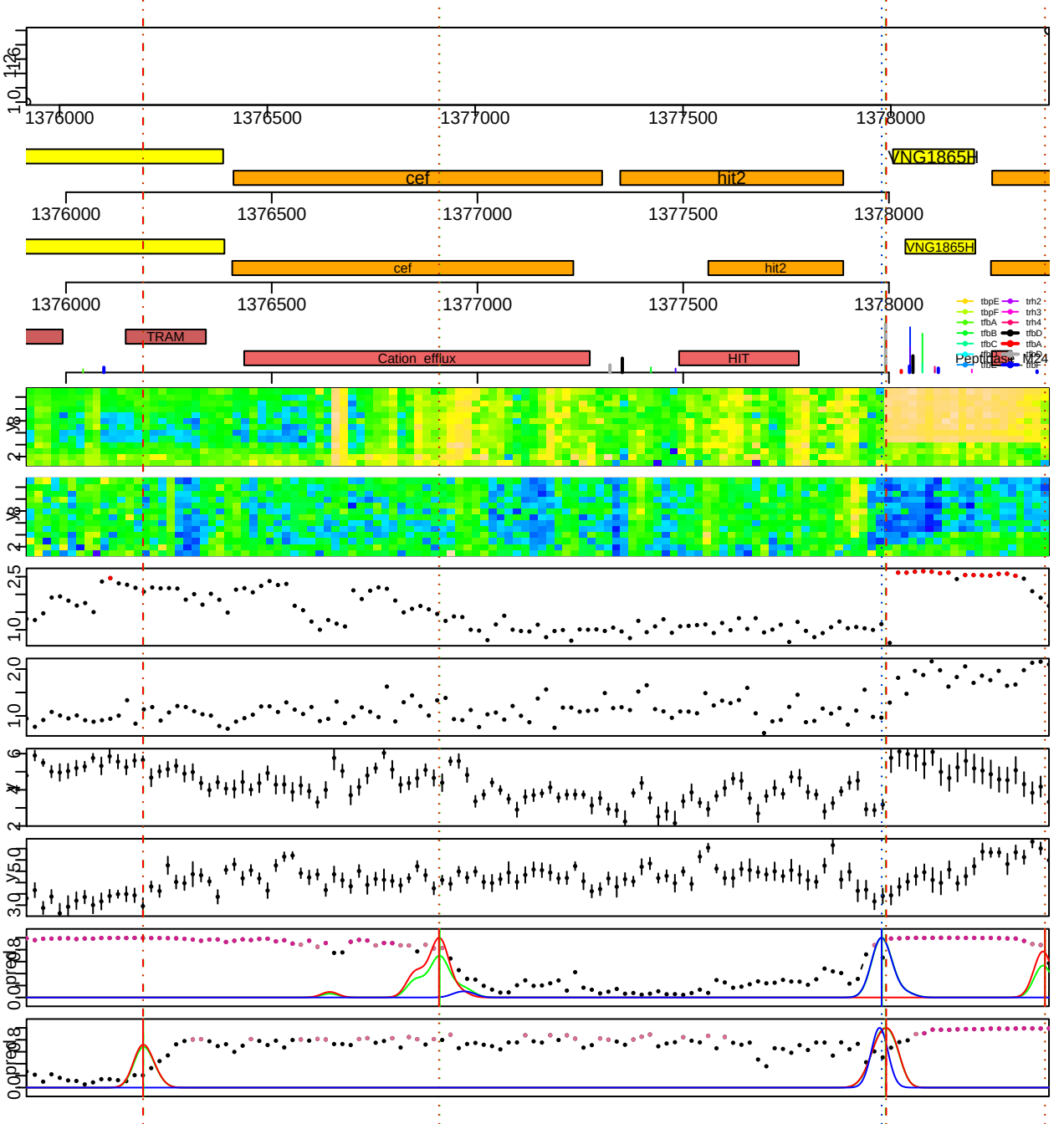
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Cation_efflux
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tfbB
tfbC
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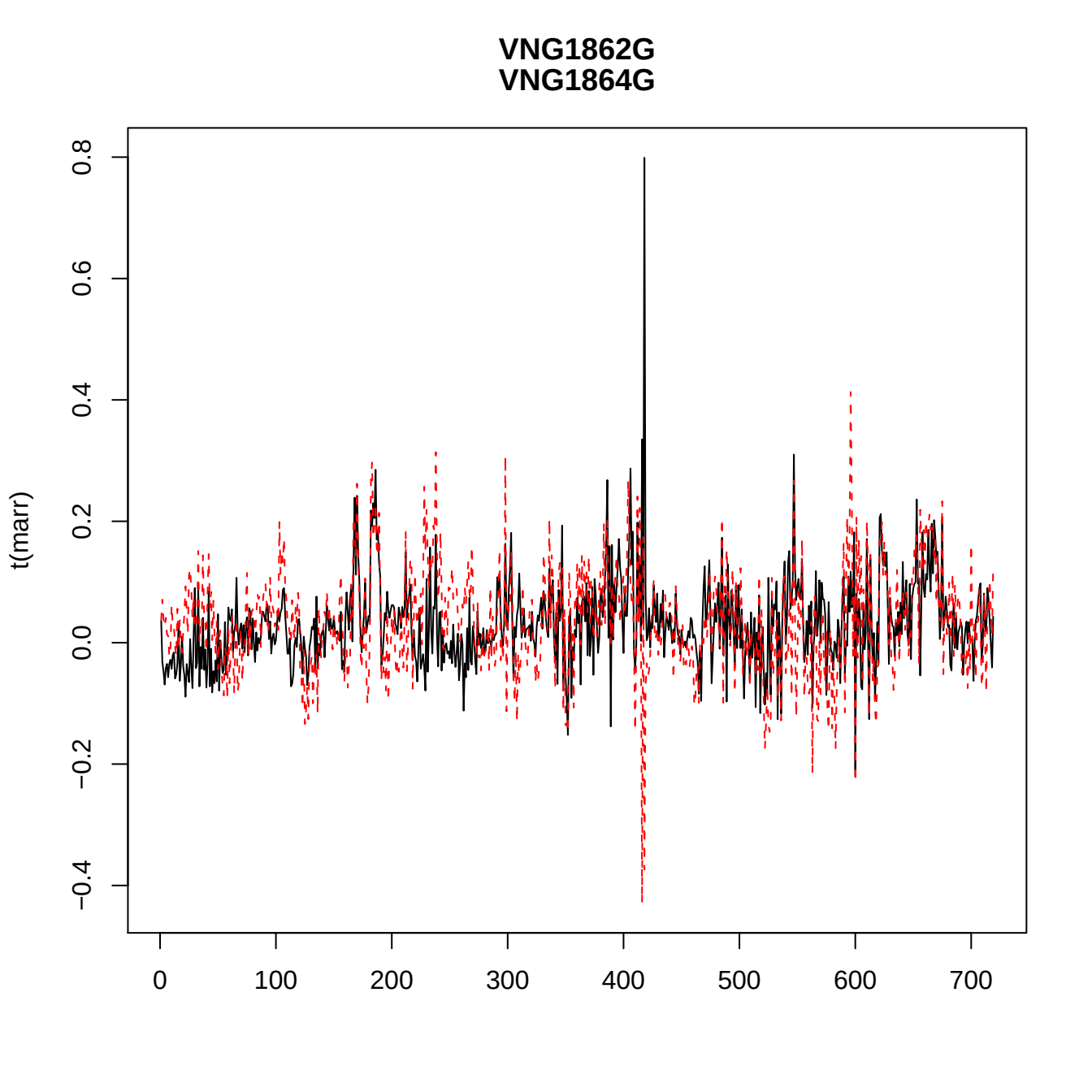
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VNG1864G
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−0.4
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600
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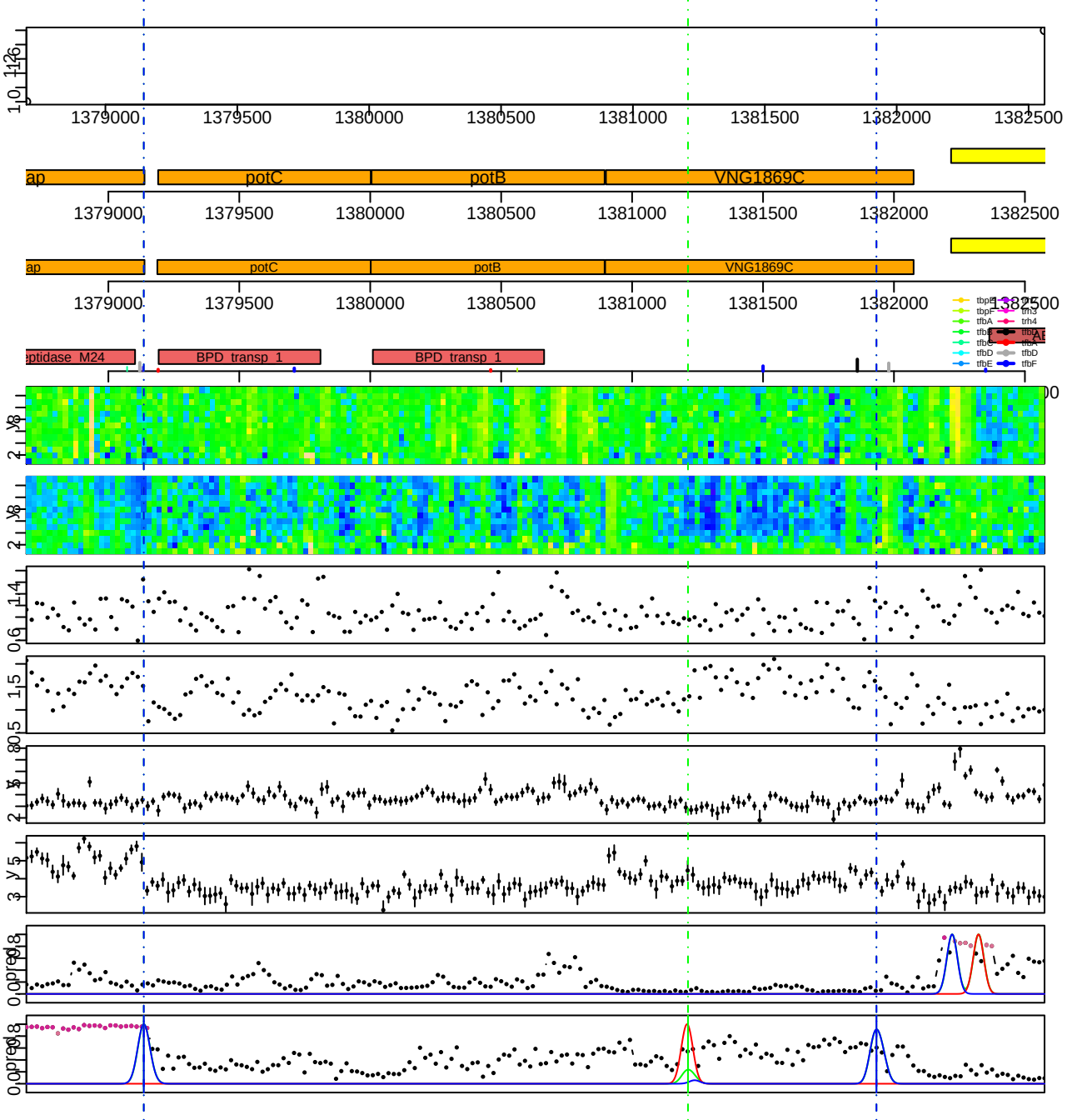
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potB
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BPD_transp_1
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trh4
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tfbF
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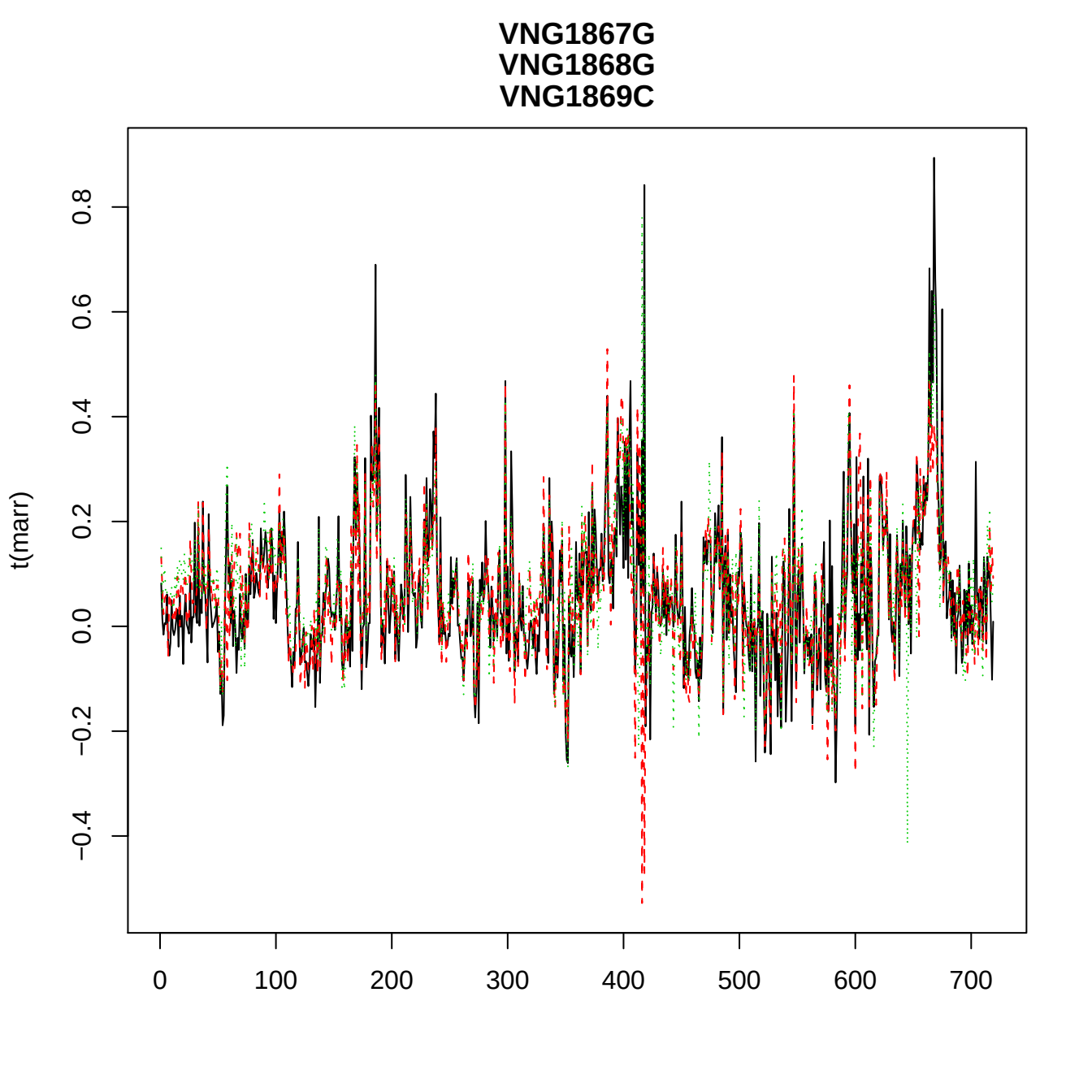
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VNG1869C
t(marr)
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−0.4
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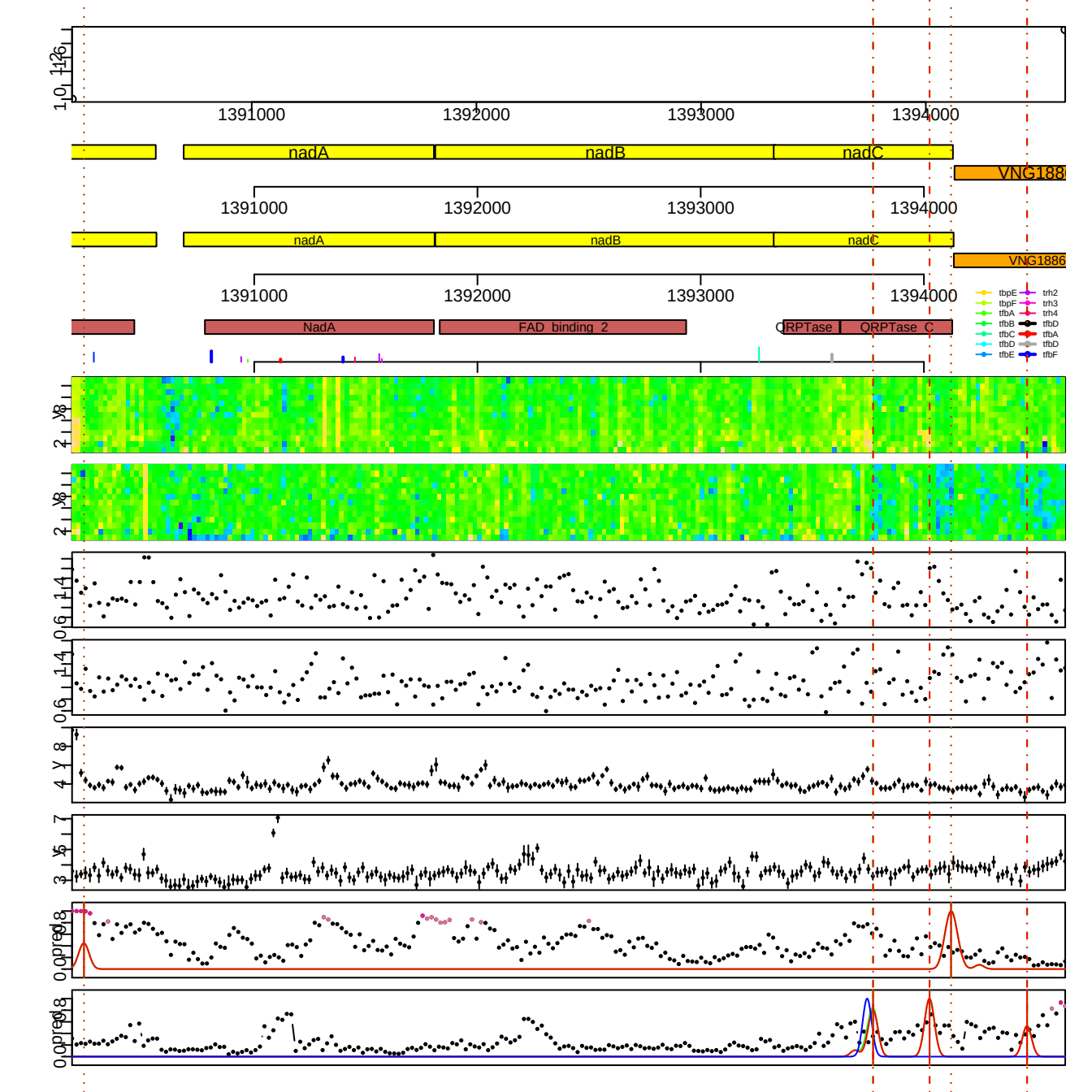
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VNG1886
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ORPTase_C
tbpE
tbpF
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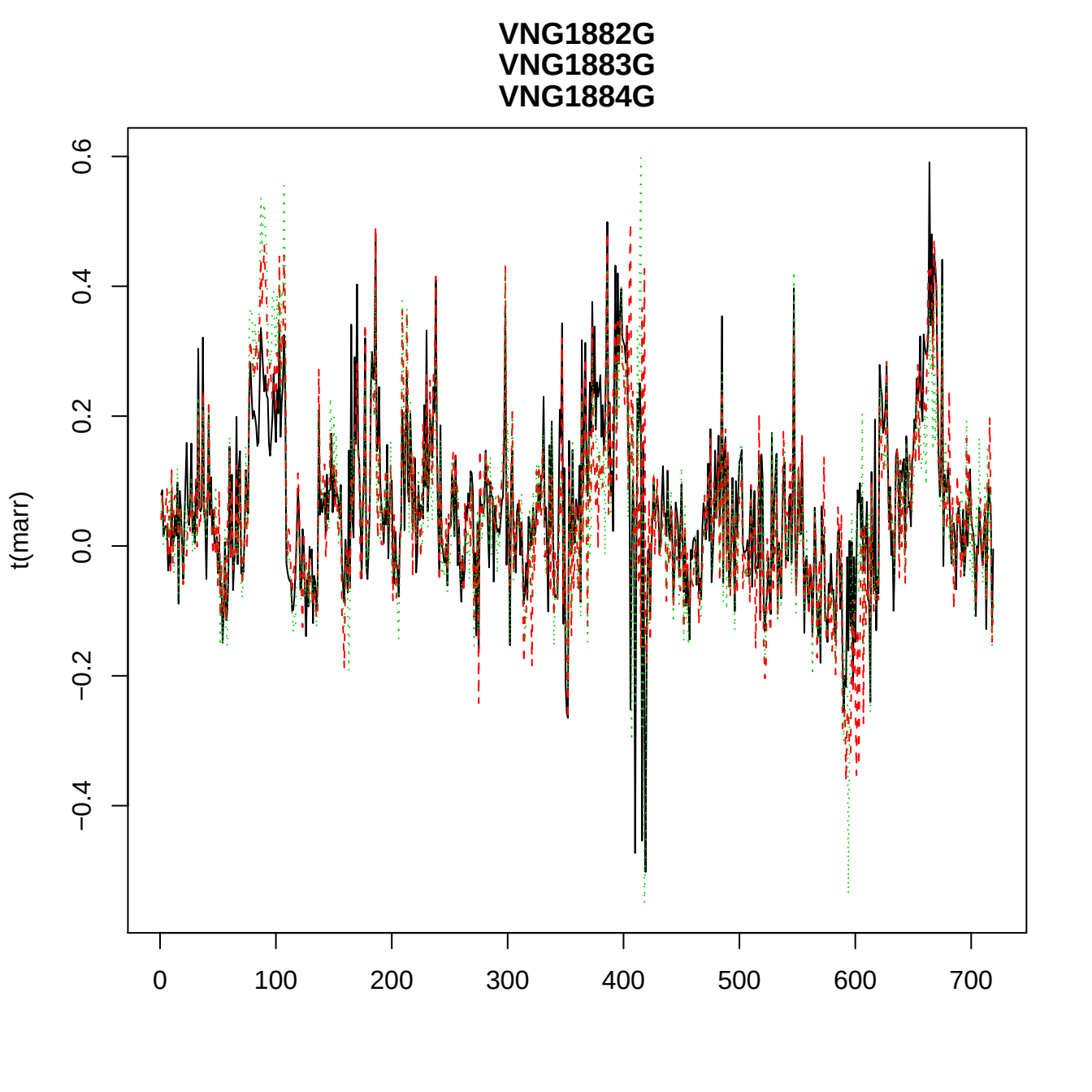
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VNG1883G
VNG1884G
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−0.4
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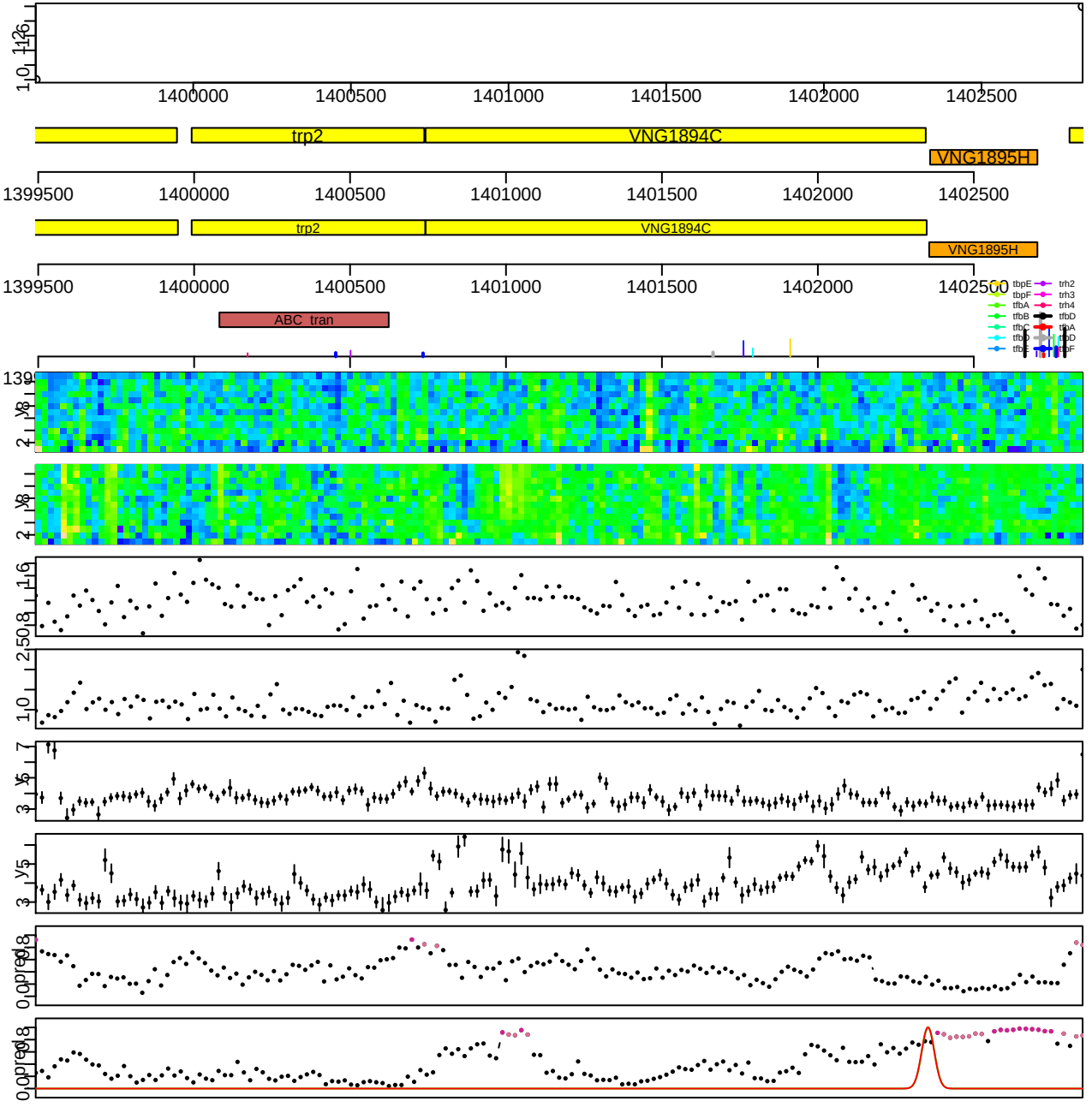
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1399500
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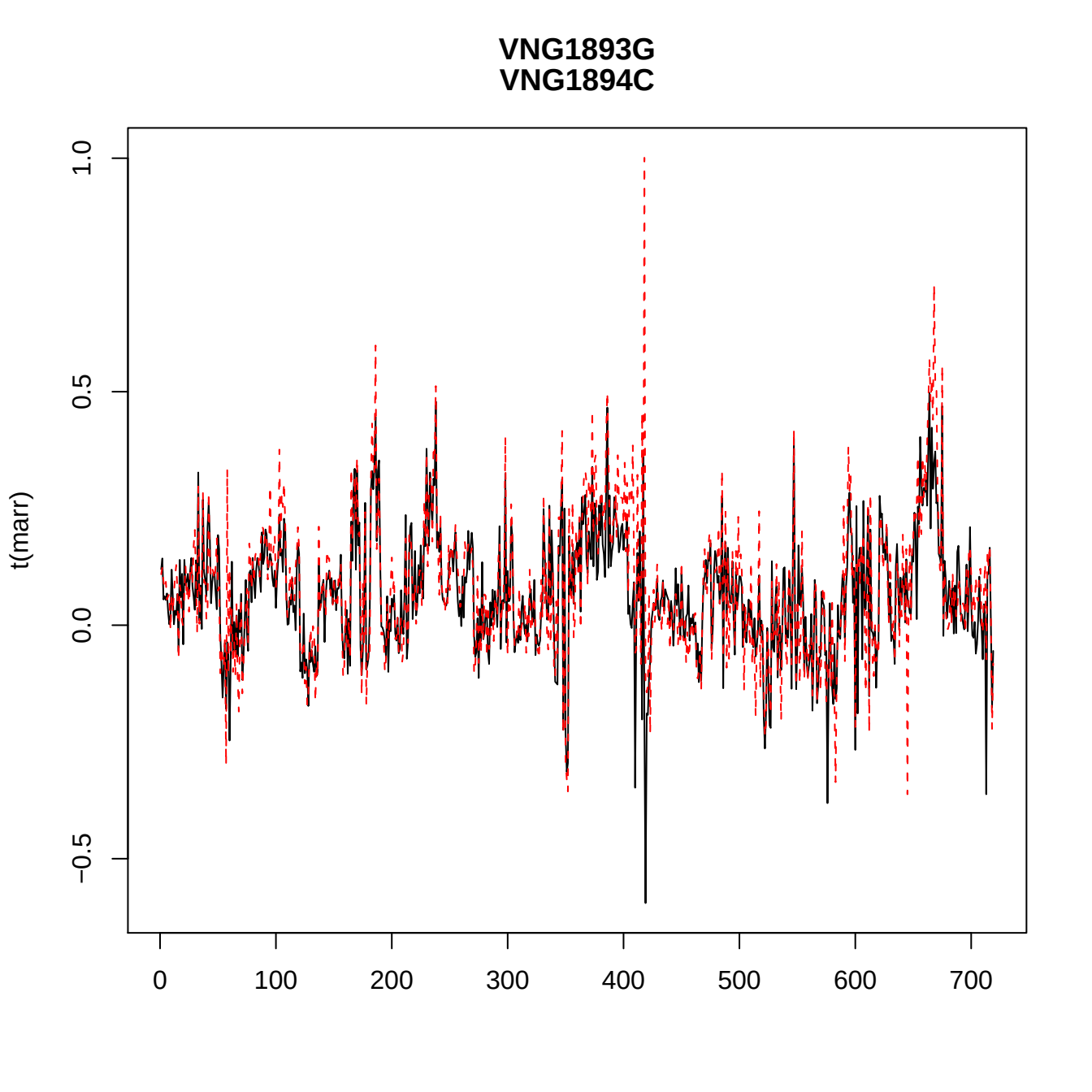
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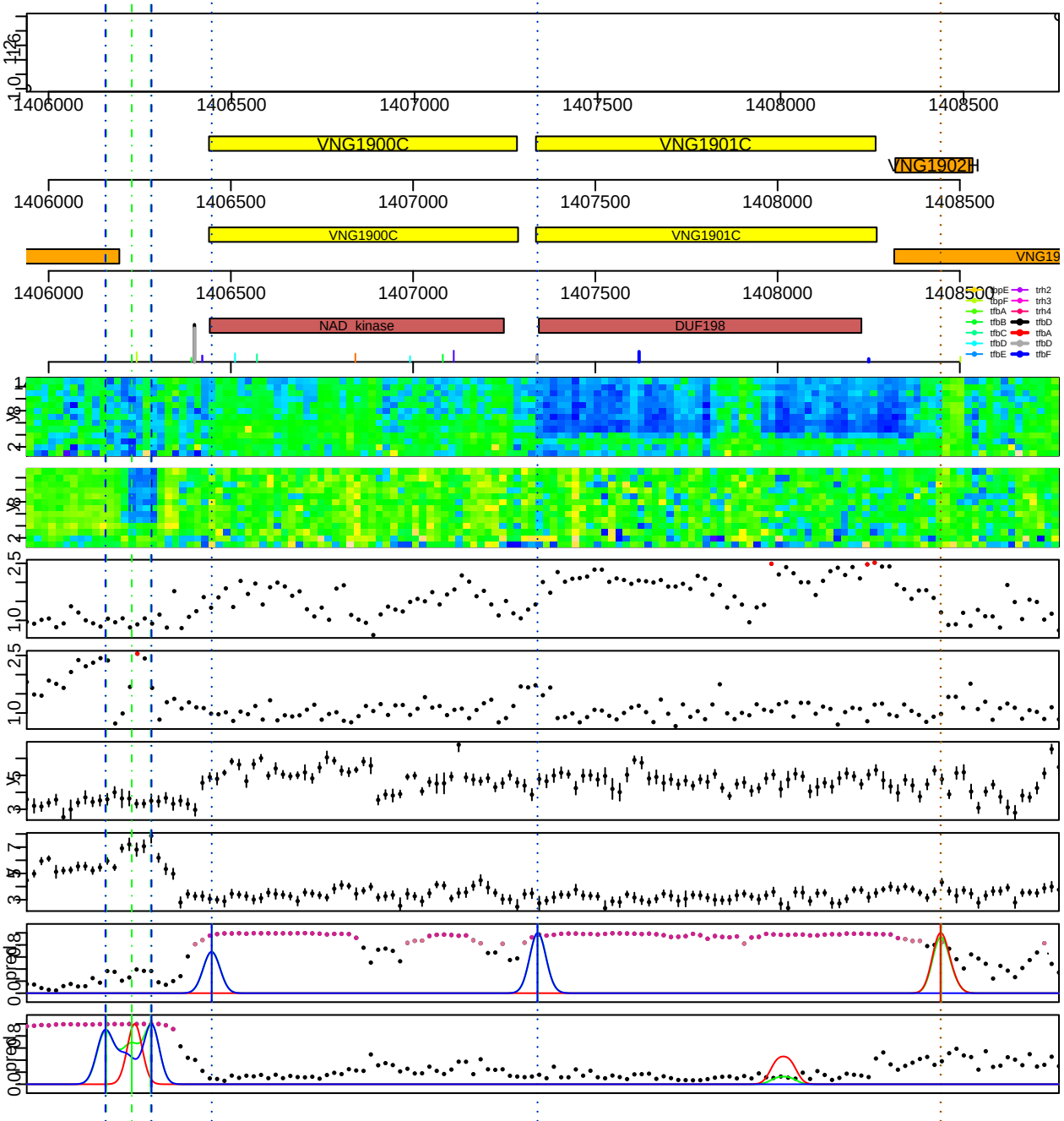
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1407000
1407500
1408000
1408500
VNG1900C
VNG1901C
VNG1902H
VNG19
NAD_kinase
DUF198
tbpE
tbpF
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tfbF
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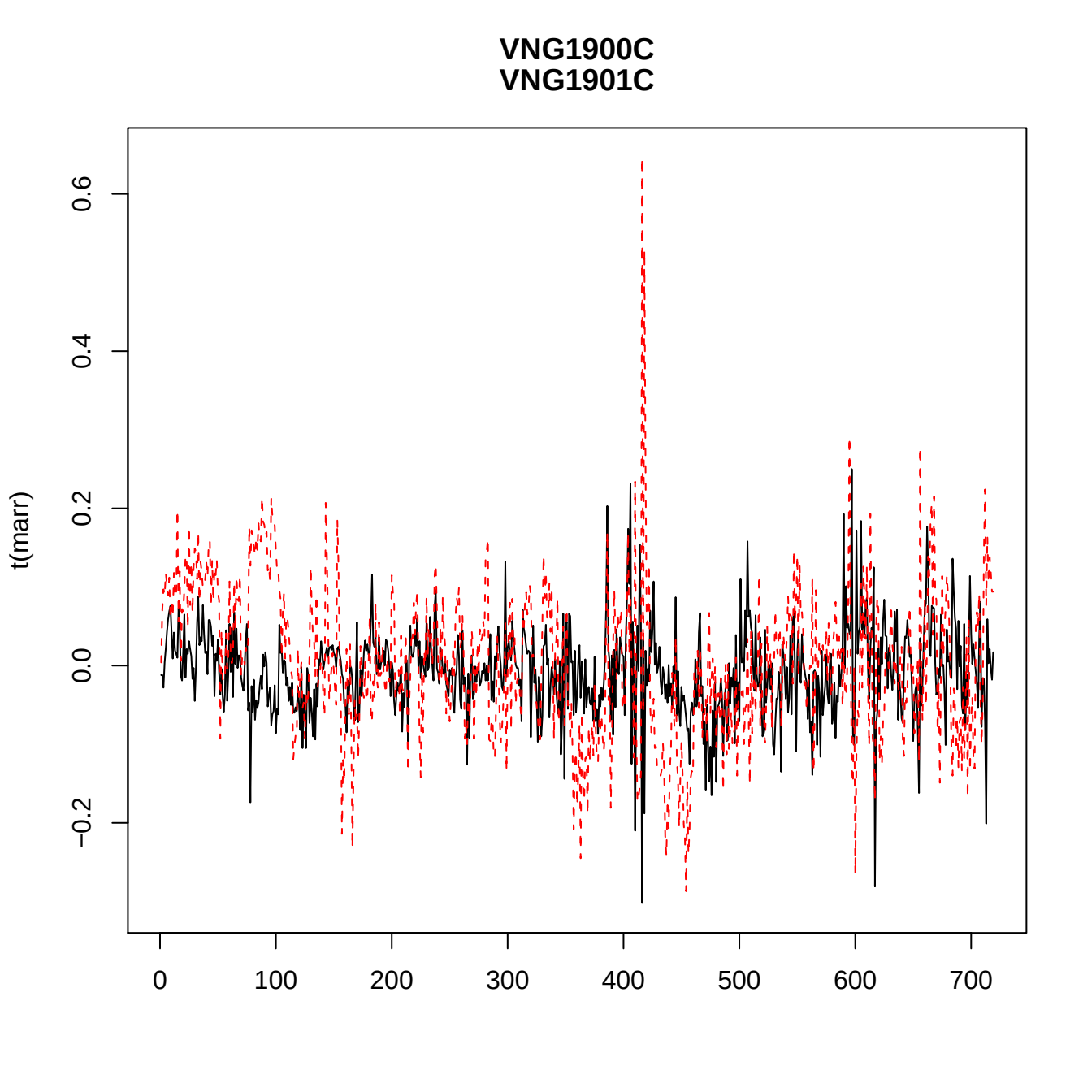
VNG1900C
VNG1901C
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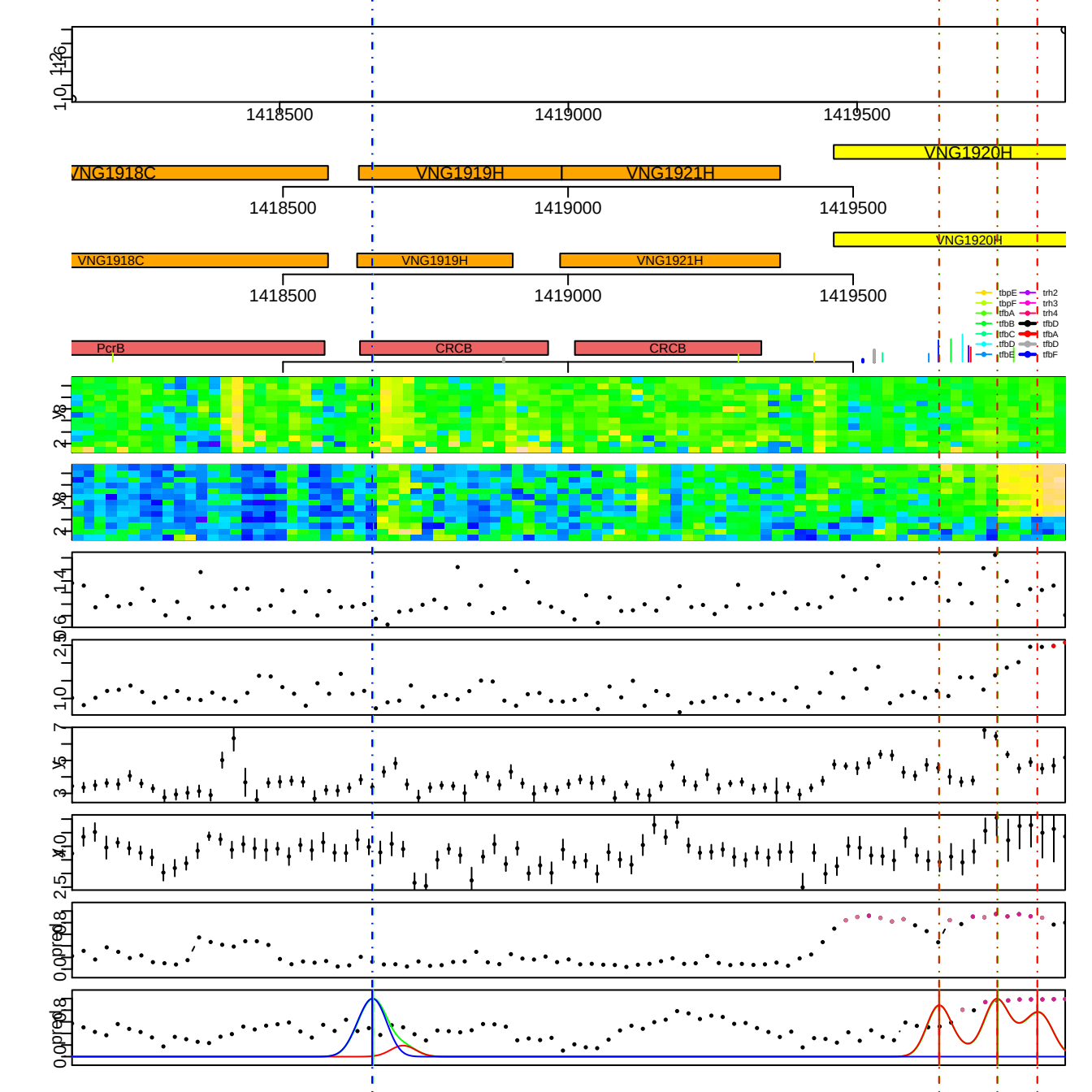
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1419500
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VNG1919H
VNG1921H
VNG1920H
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CRCB
CRCB
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tbpF
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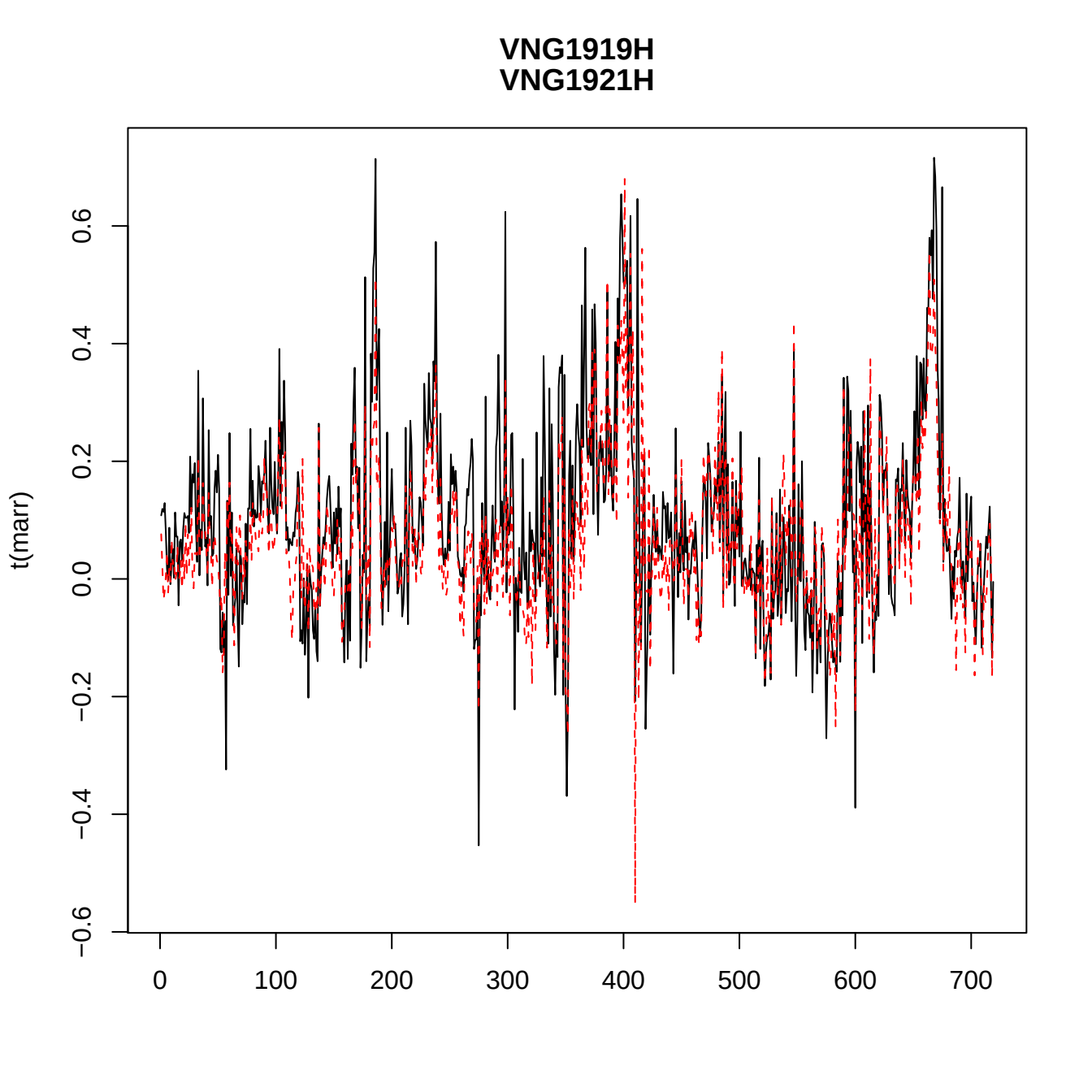
VNG1919H
VNG1921H
t(marr)
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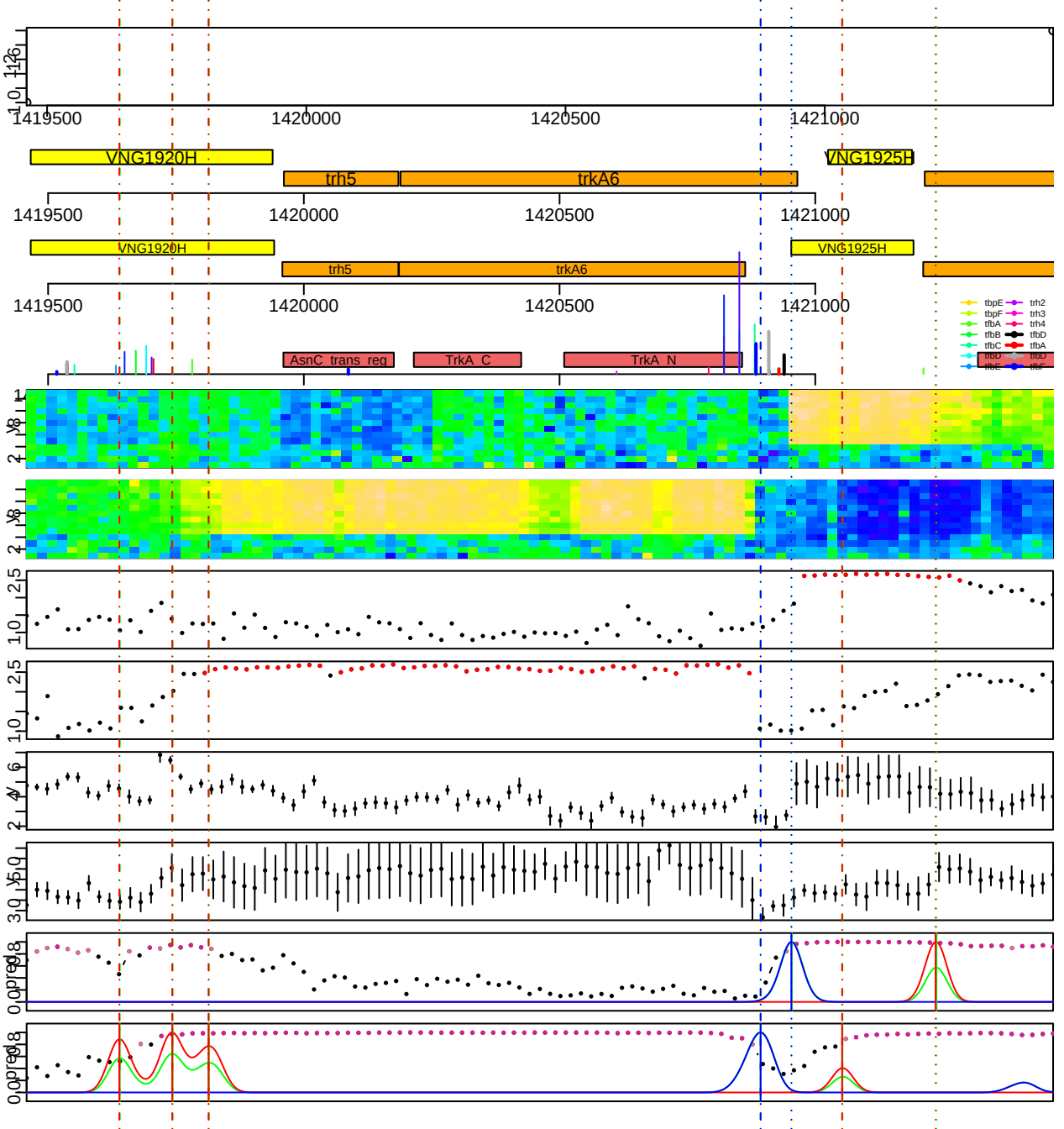
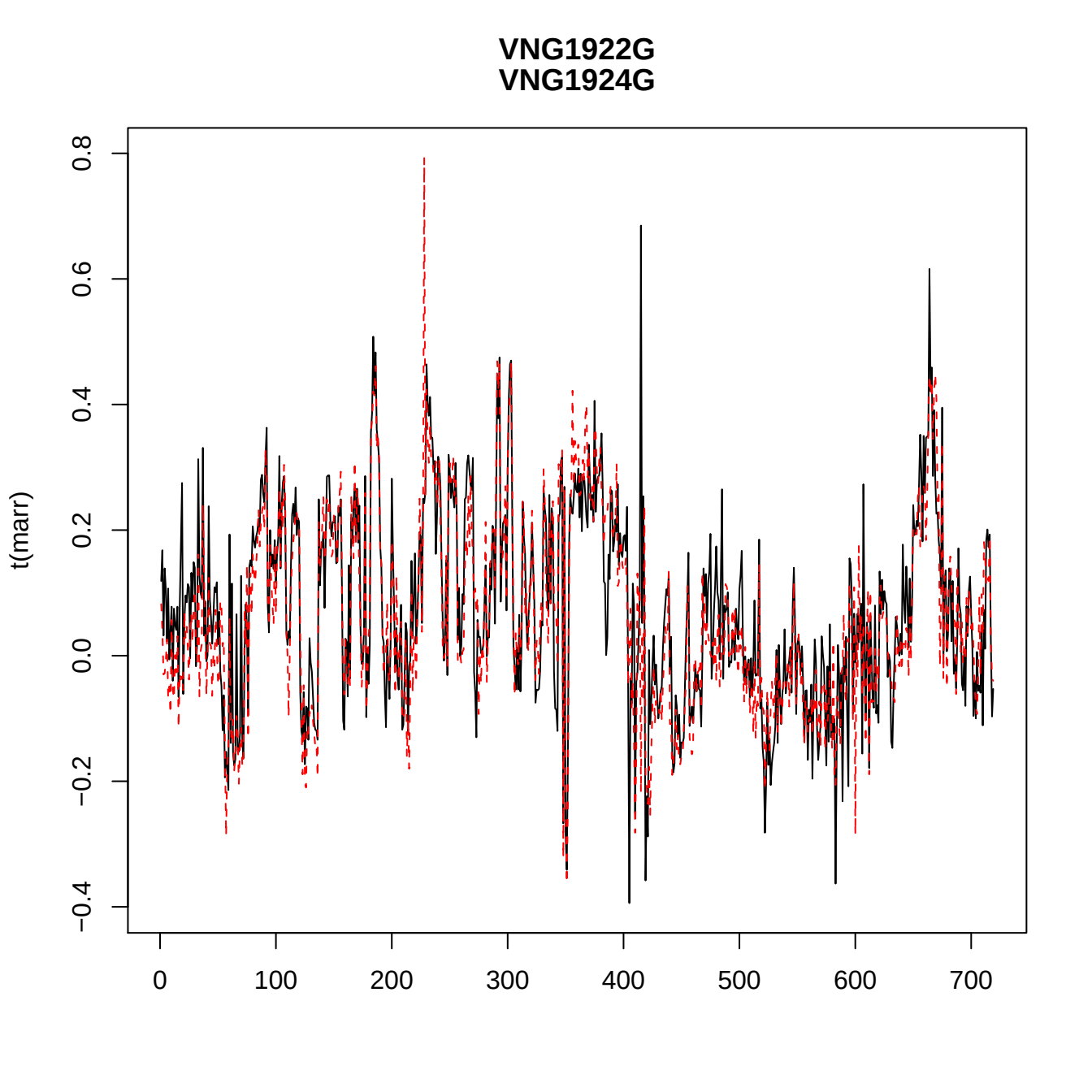
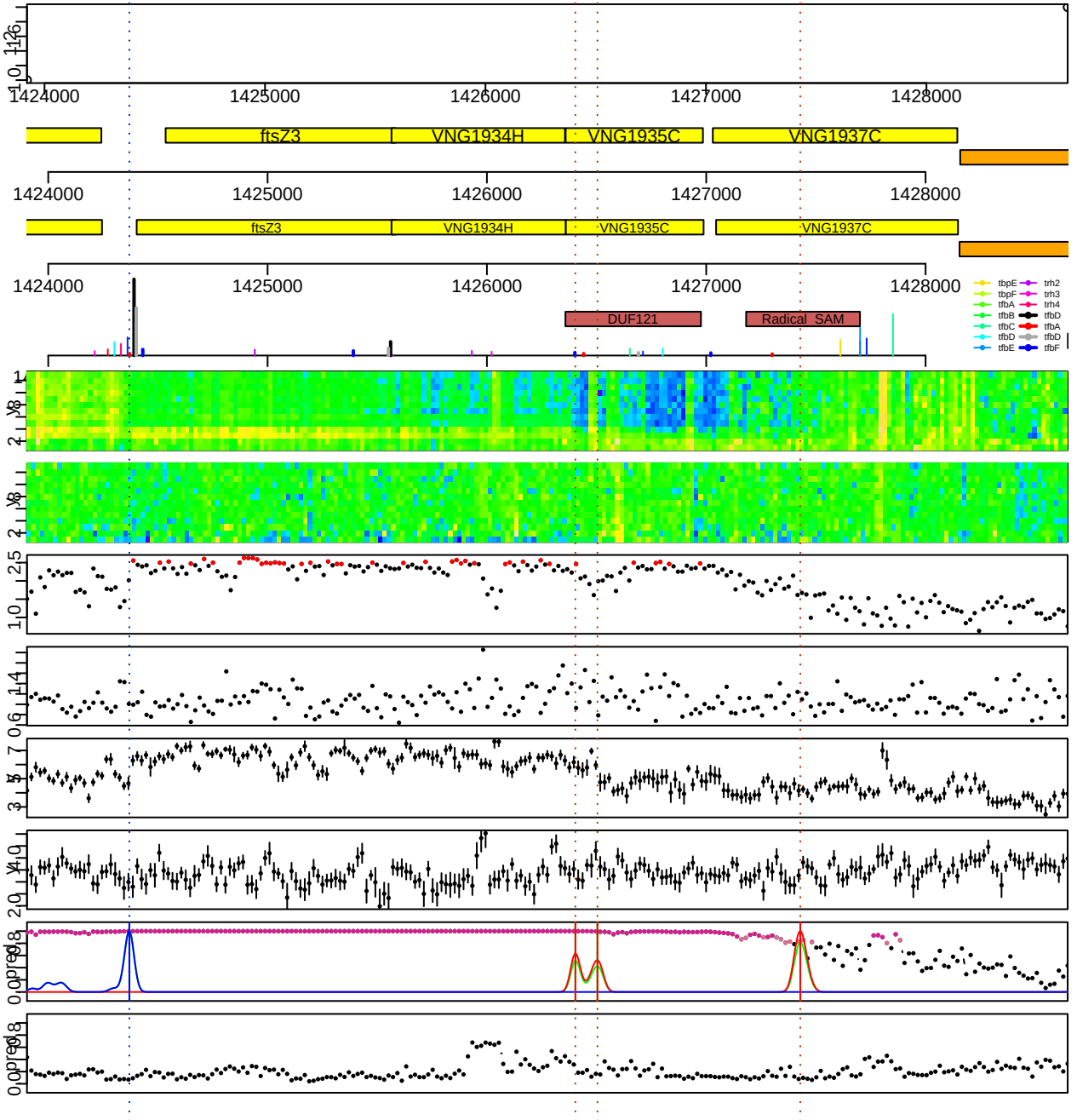
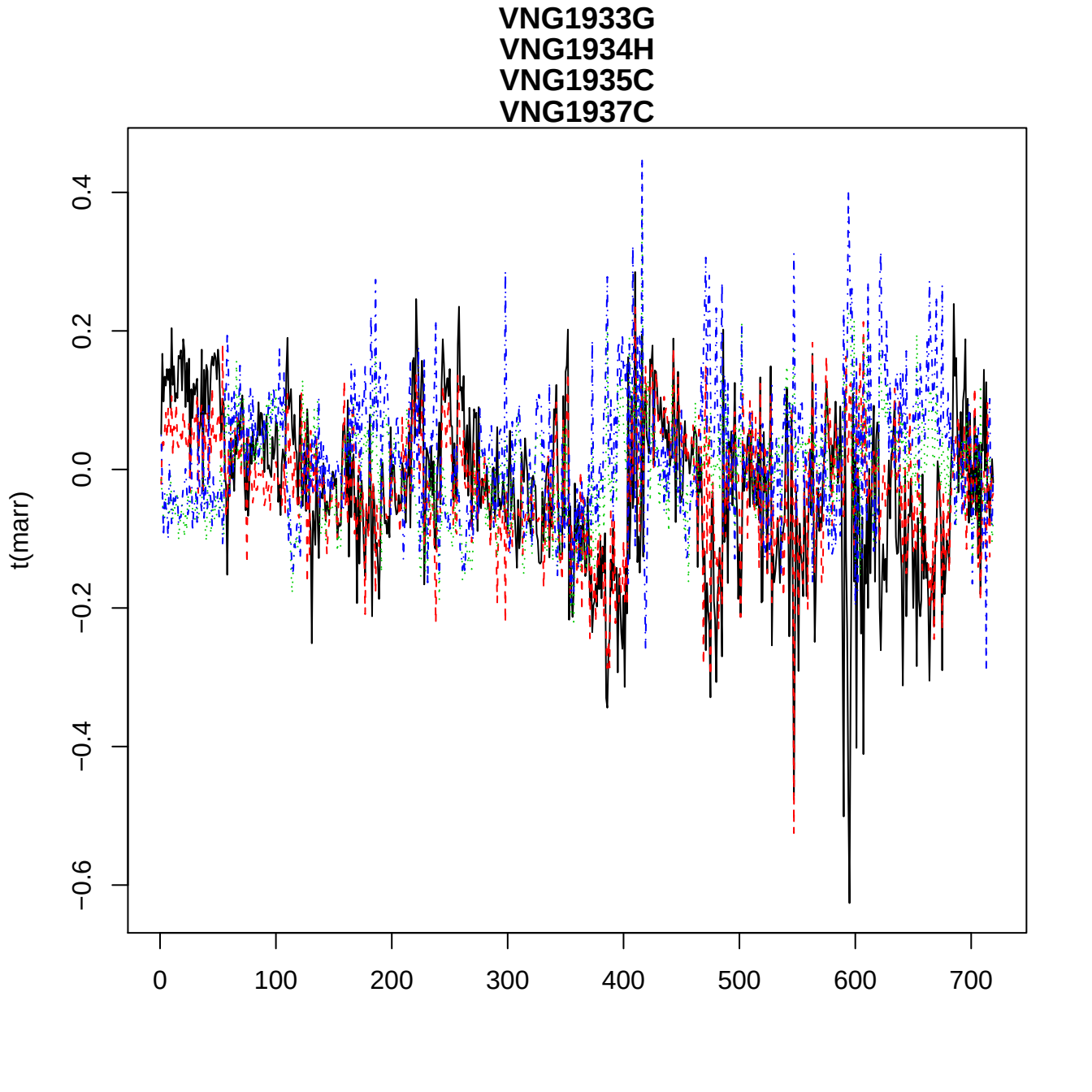
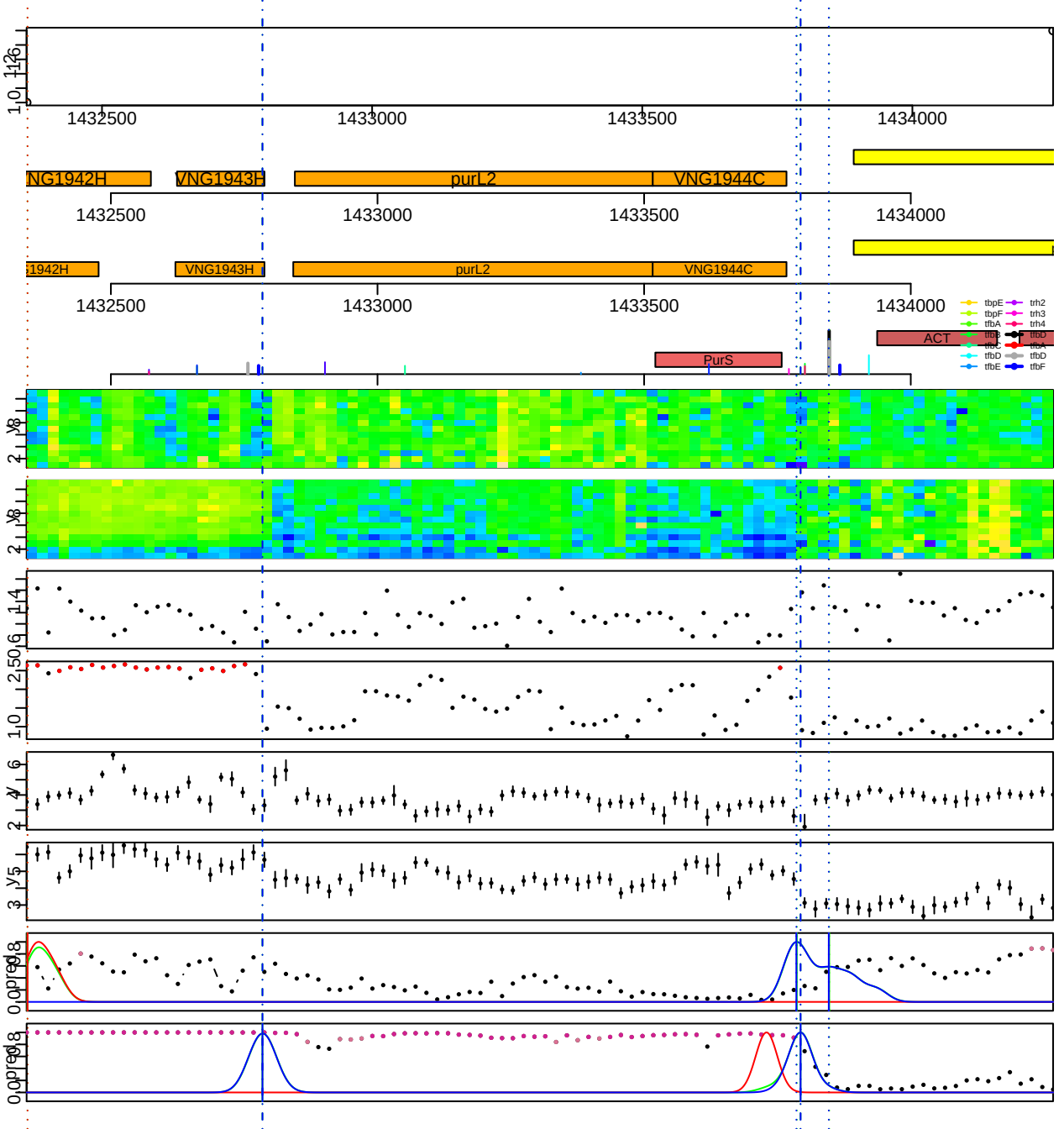
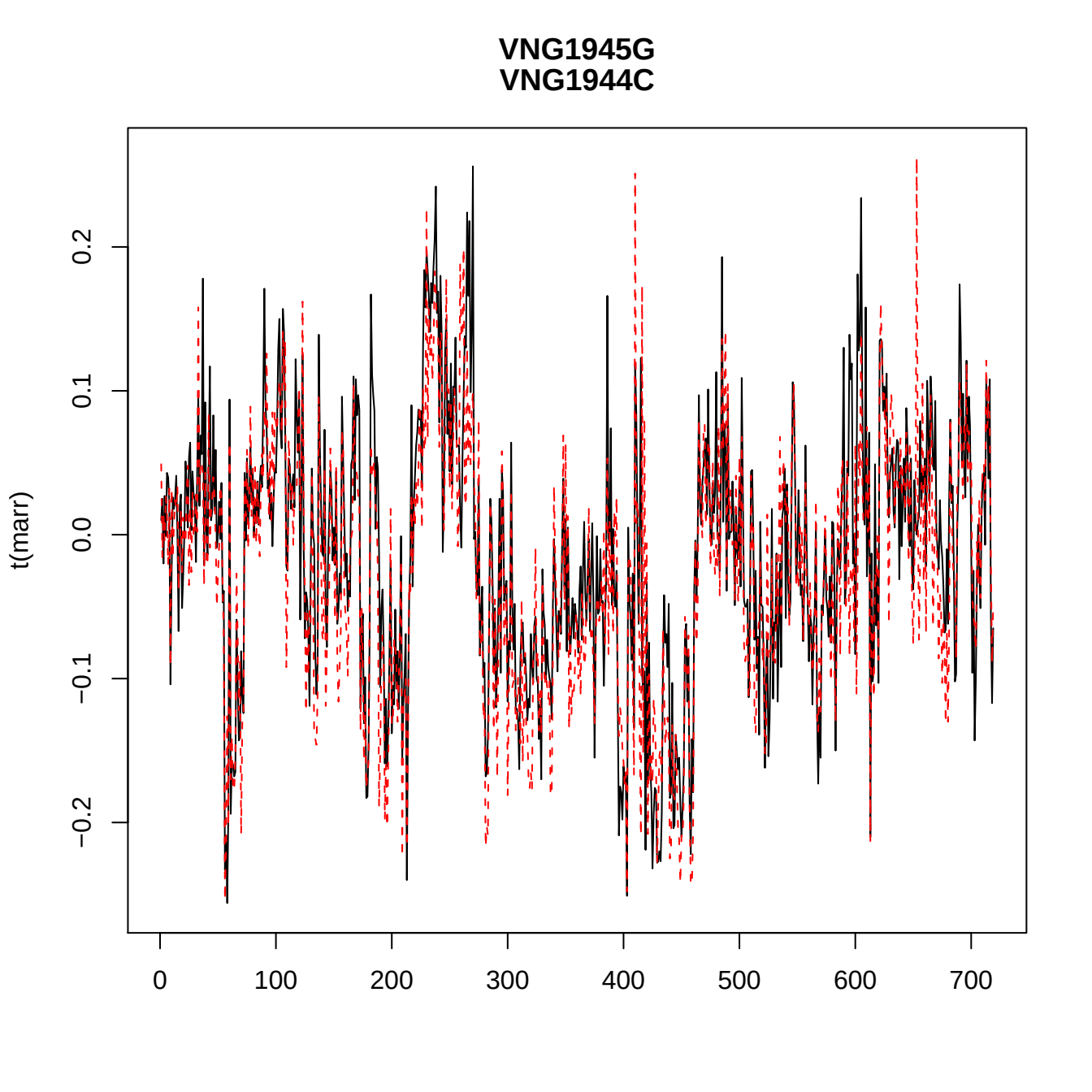

1419500
1420000
1420500
1421000
VNG1920H
trh5
trkA6
VNG1925H
AsnC_trans_reg
TrkA_C
TrkA_N
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

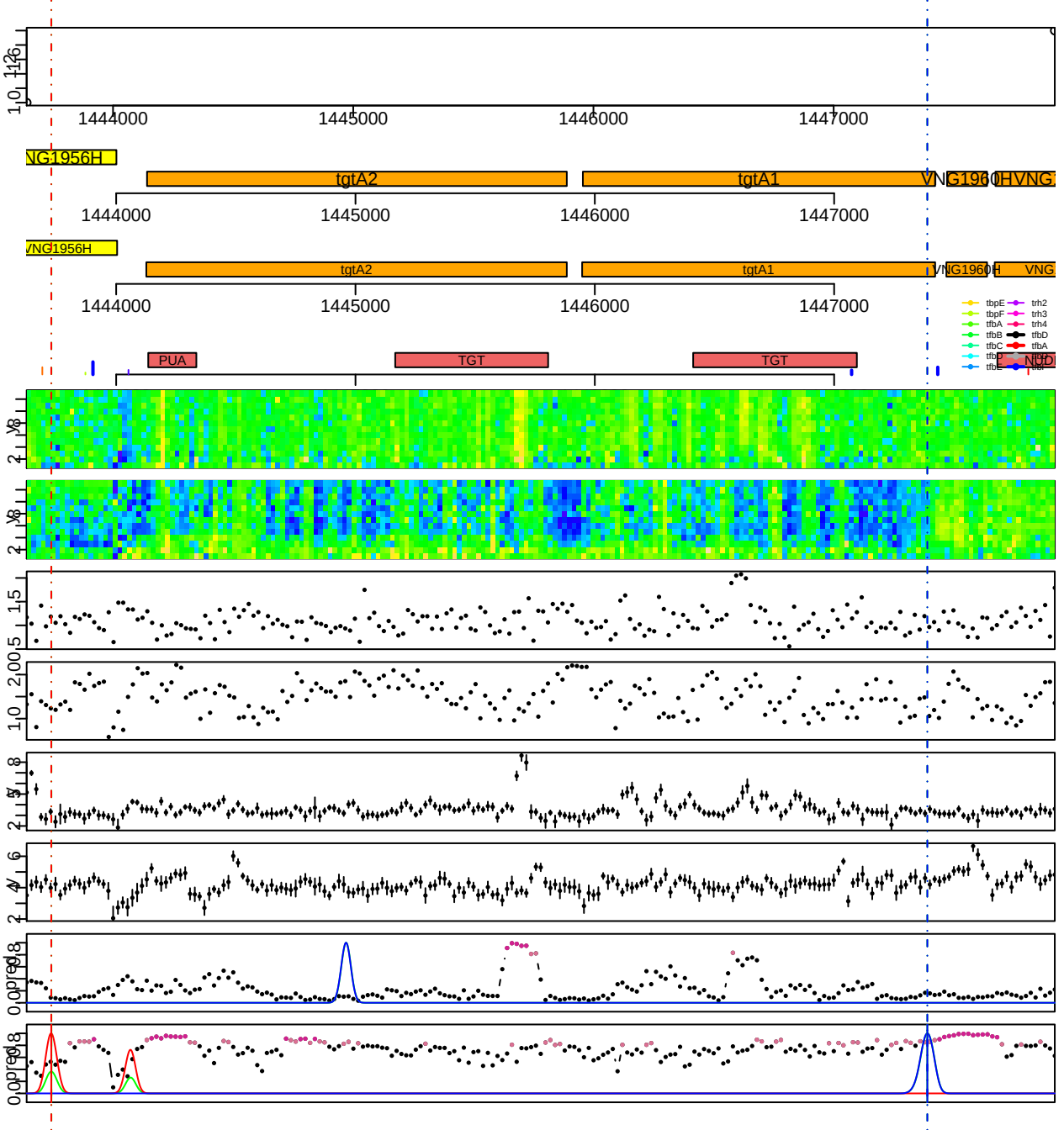

VNG1922G
VNG1924G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

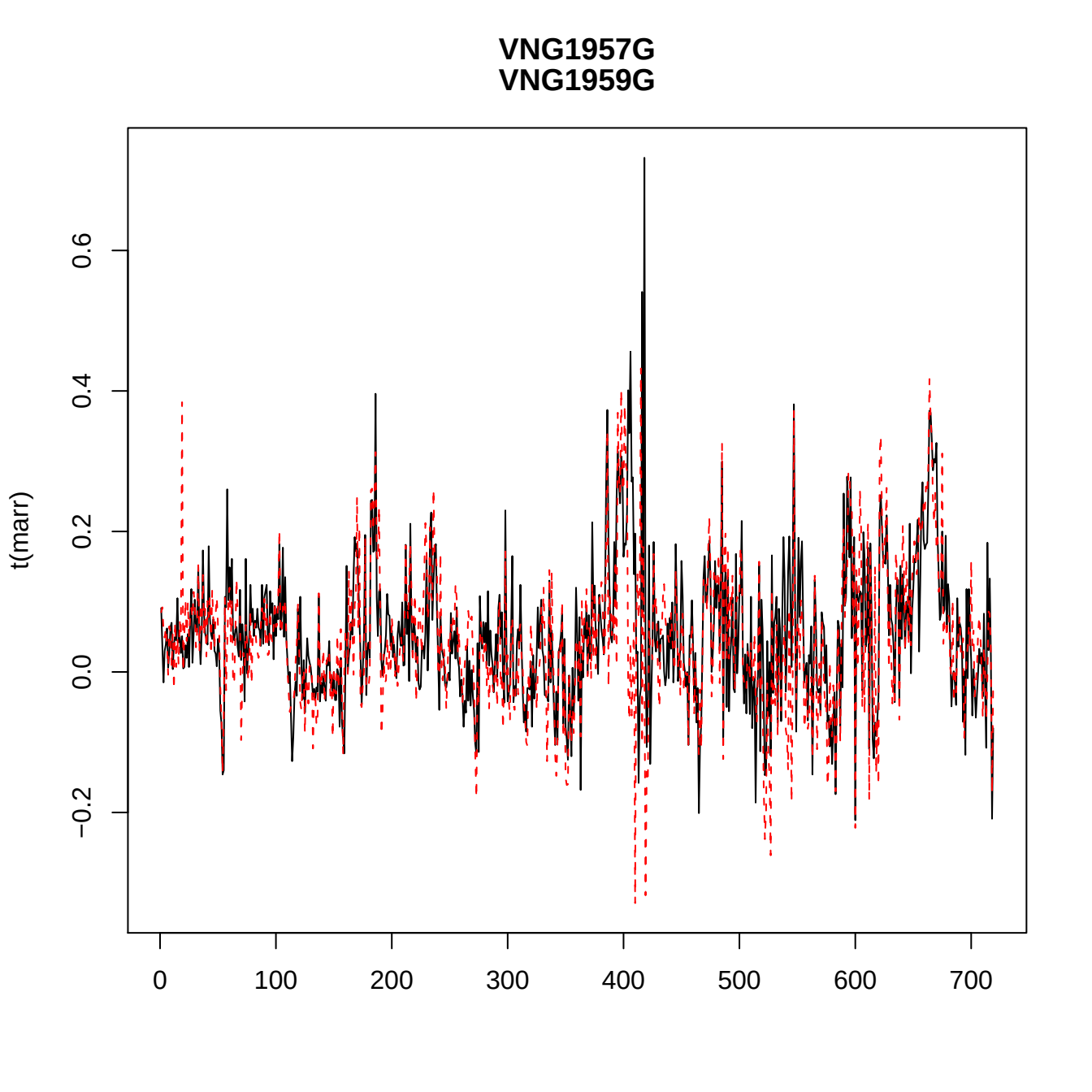

1424000
1425000
1426000
1427000
1428000
ftsZ3
VNG1934H
VNG1935C
VNG1937C
DUF121
Radical_SAM
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

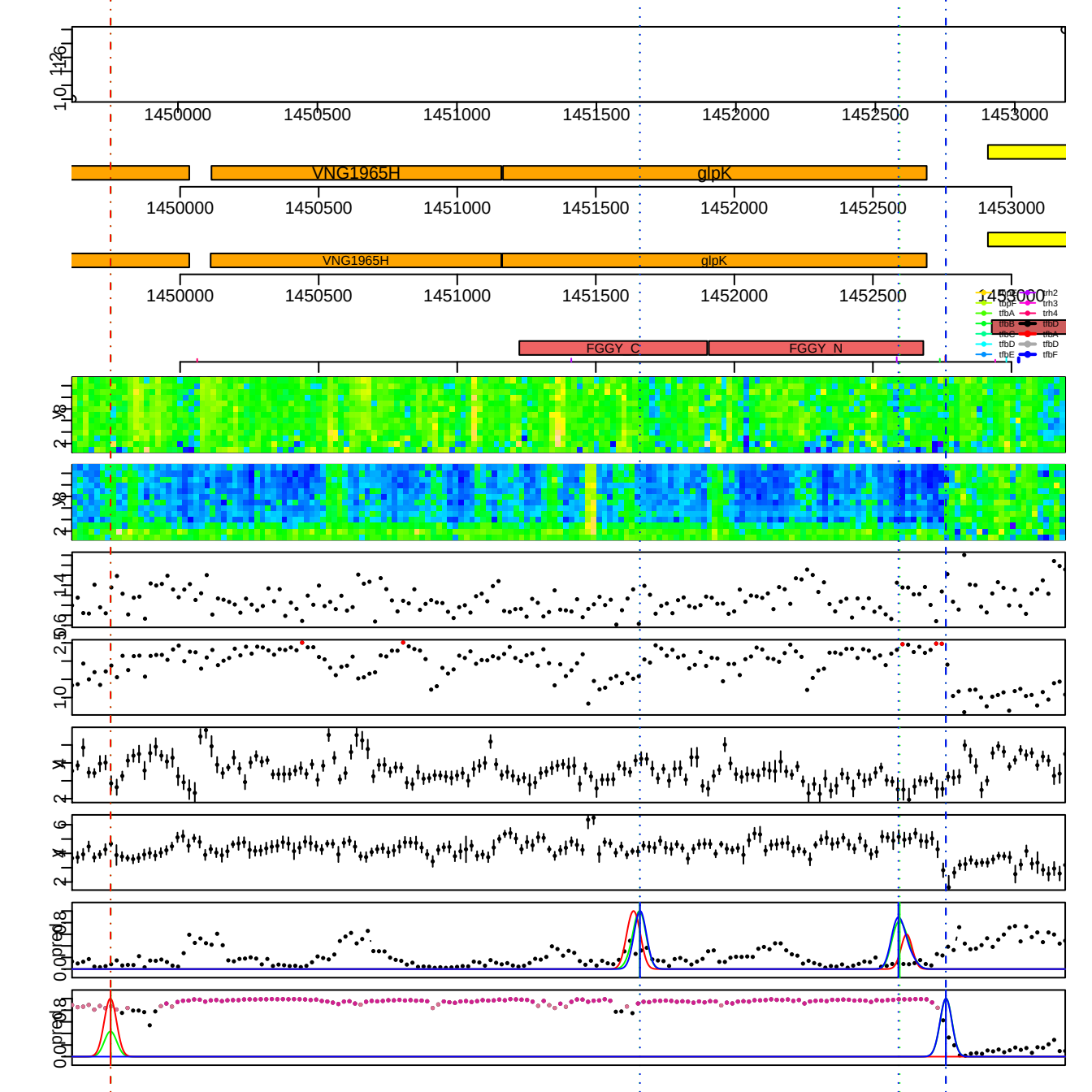

VNG1933G
VNG1934H
VNG1935C
VNG1937C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

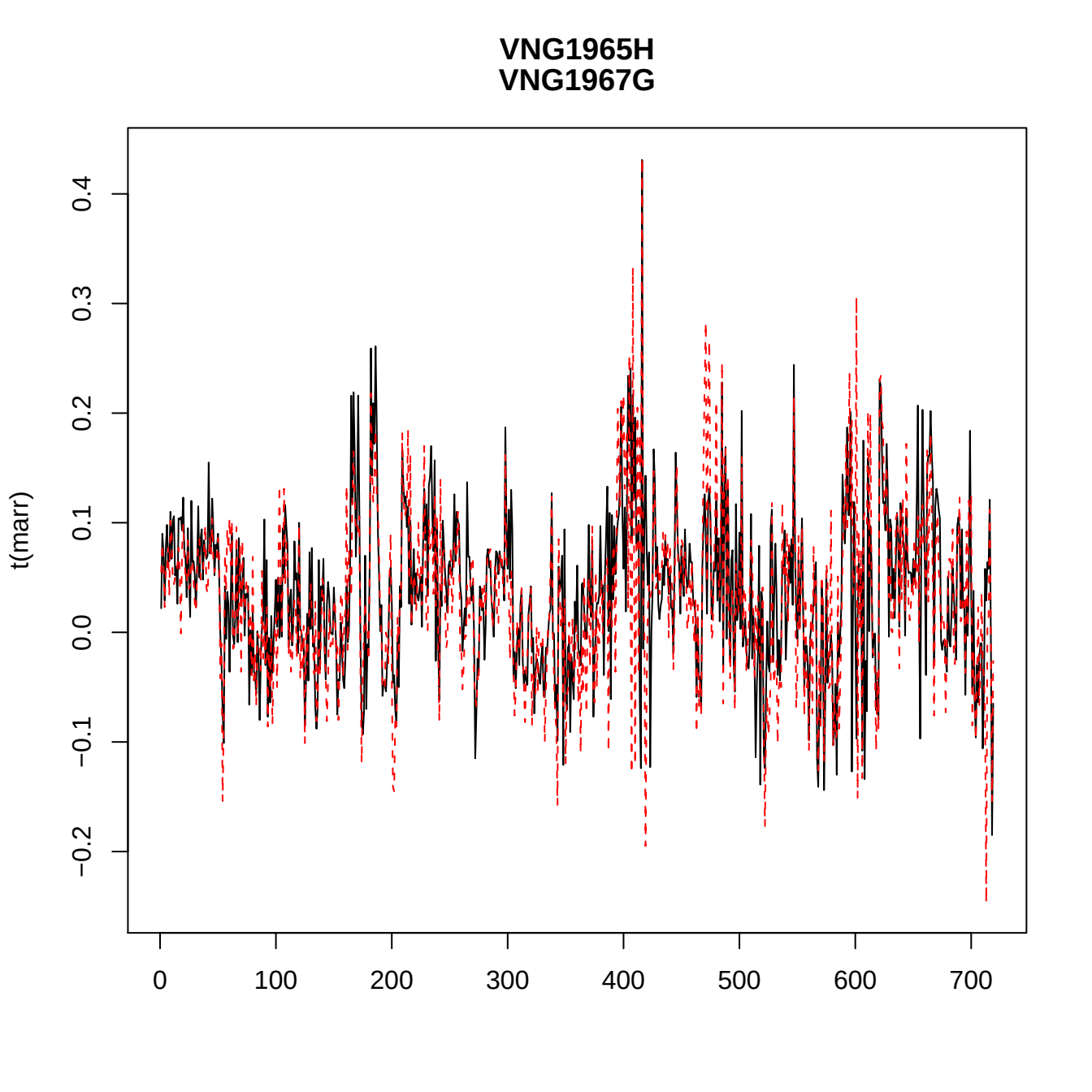

1432500
1433000
1433500
1434000
NG1942H
VNG1943H
purL2
VNG1944C
PurS
ACT
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

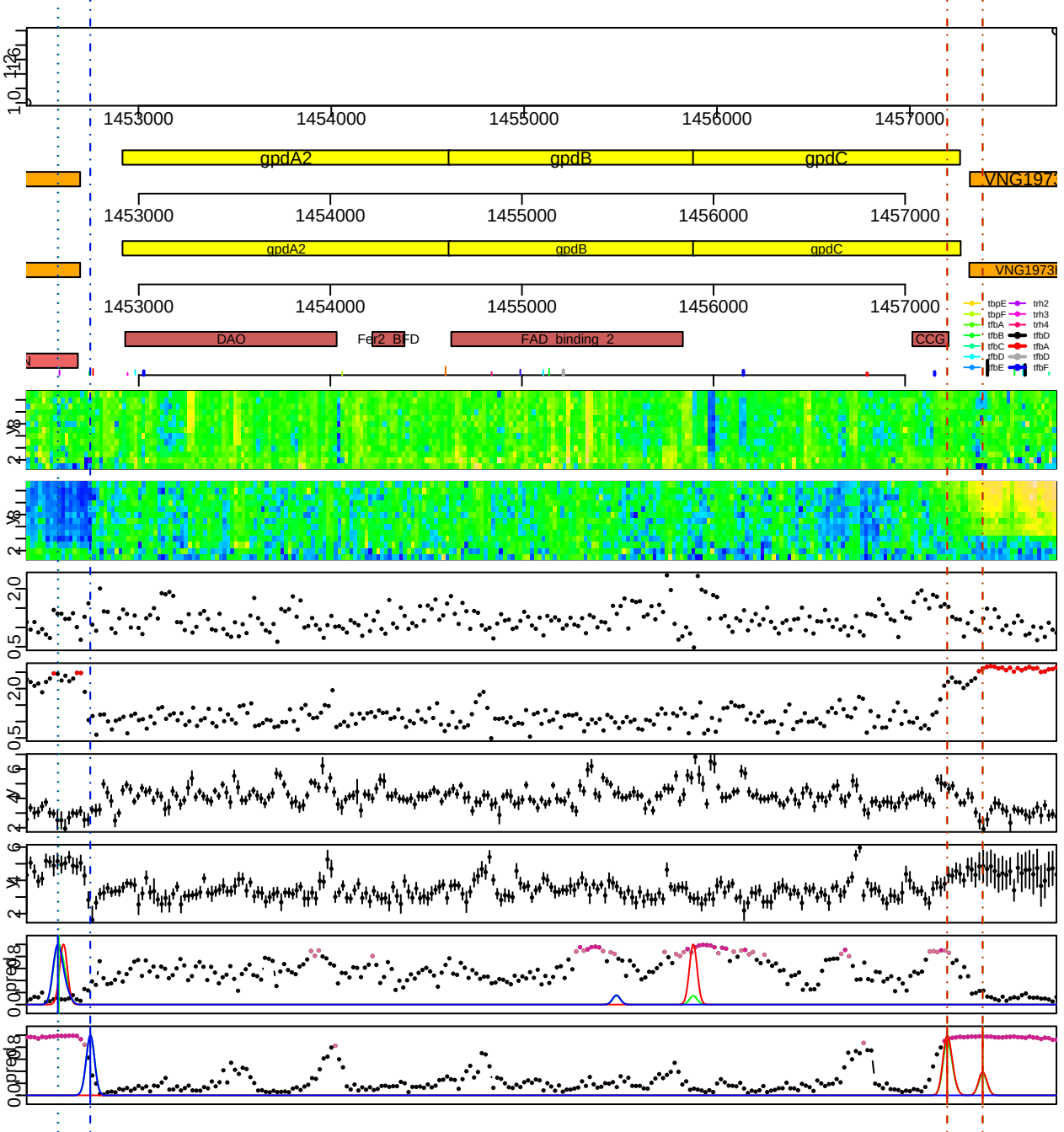

VNG1945G
VNG1944C
t(marr)
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

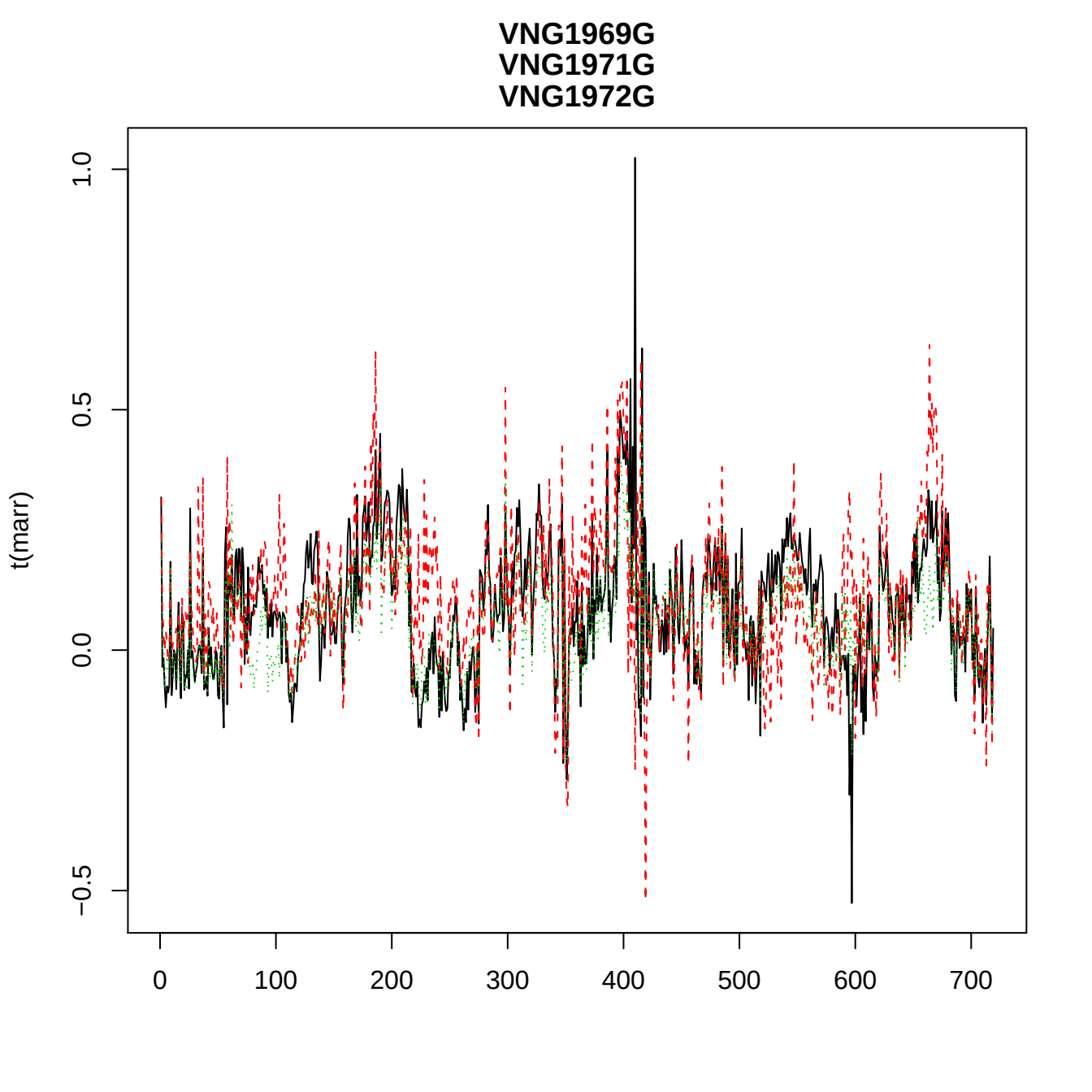

1444000
1445000
1446000
1447000
tgtA2
tgtA1
PUA
TGT
TGT
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA

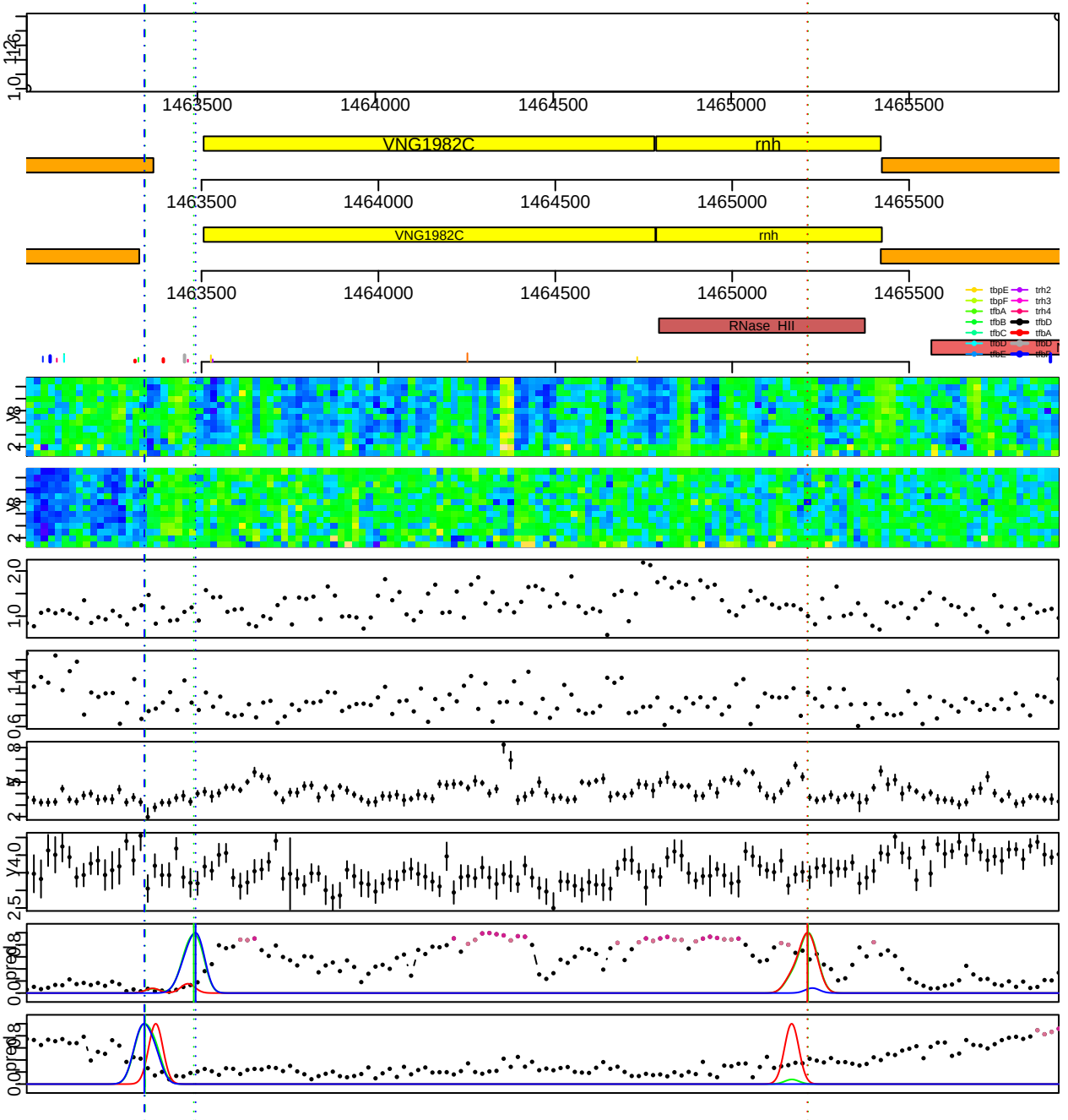

VNG1957G
VNG1959G
t(marr)
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

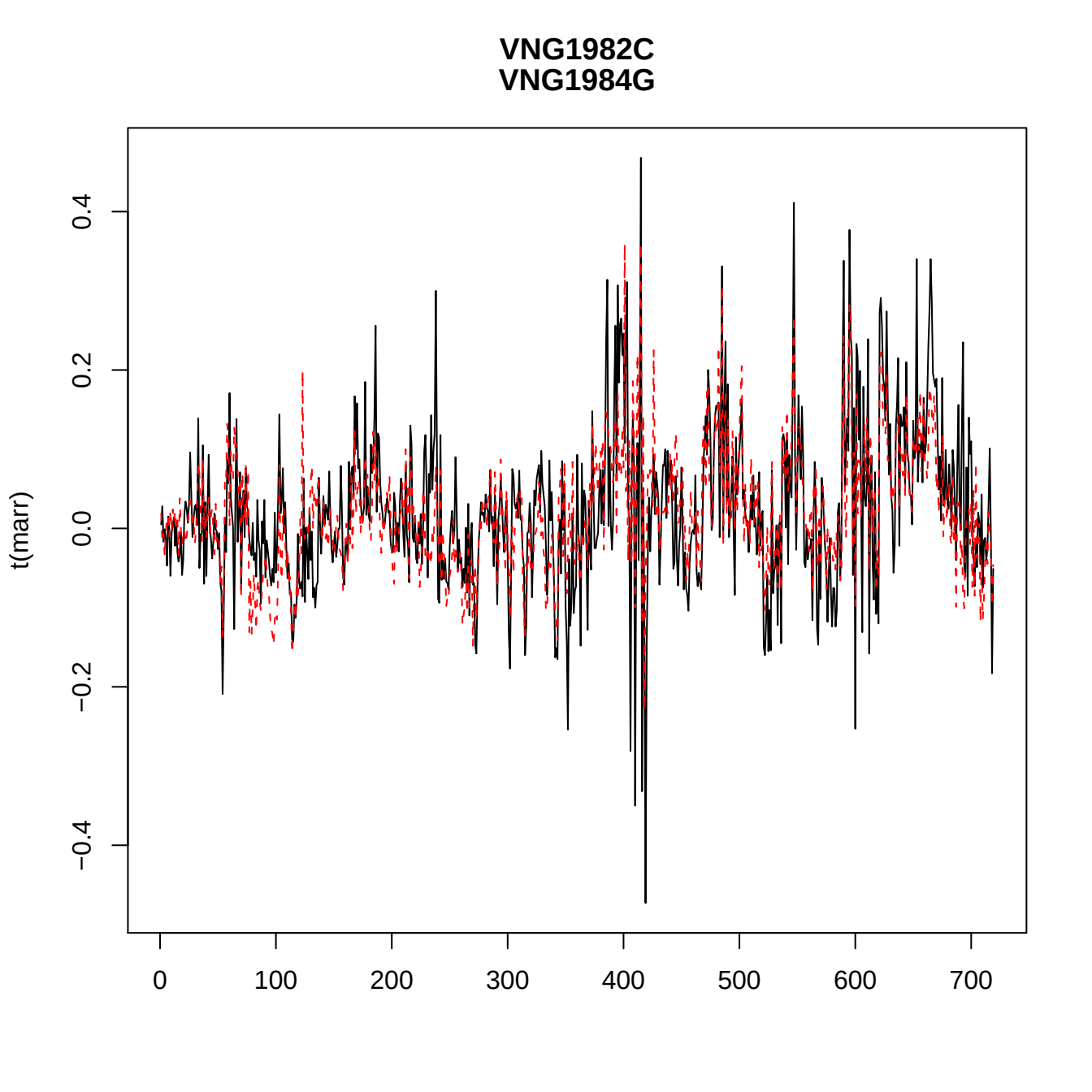

1450000
1450500
1451000
1451500
1452000
1452500
1453000
VNG1965H
glpK
FGGY_C
FGGY_N
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

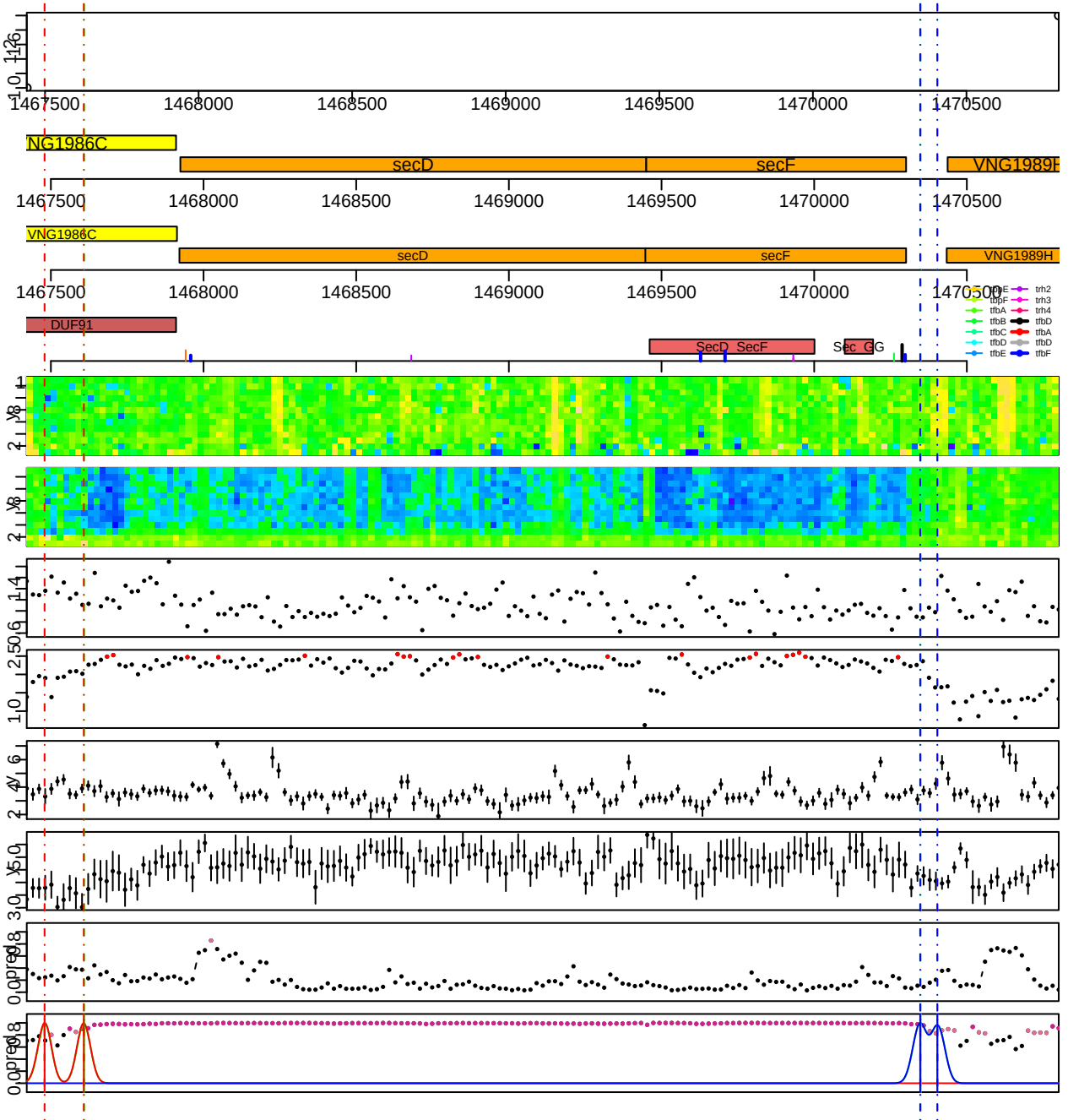

VNG1965H
VNG1967G
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

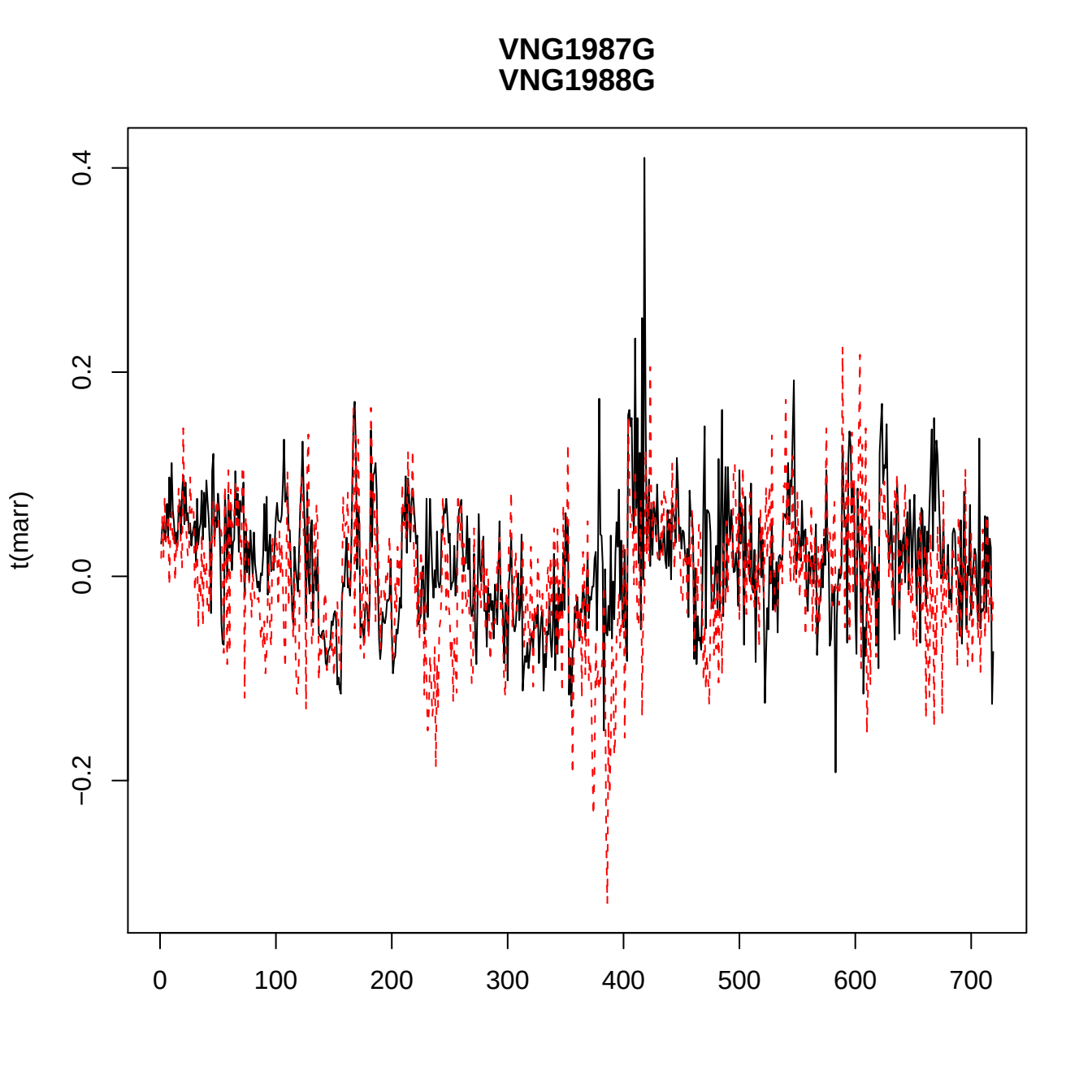

1453000
1454000
1455000
1456000
1457000
gpdA2
gpdB
gpdC
VNG1973
DAO
Fer2_BFD
FAD_binding_2
CCG
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

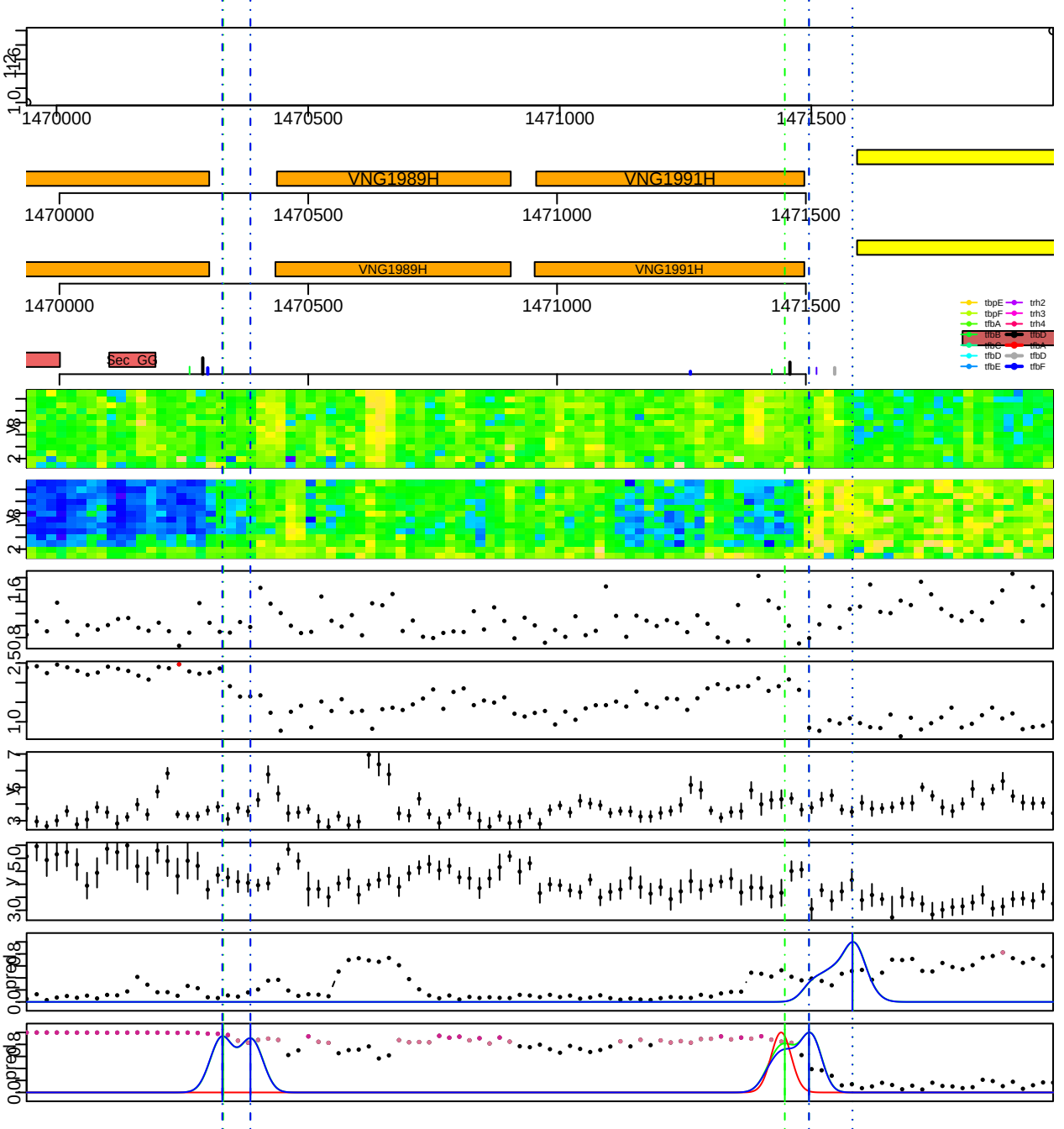

VNG1969G
VNG1971G
VNG1972G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

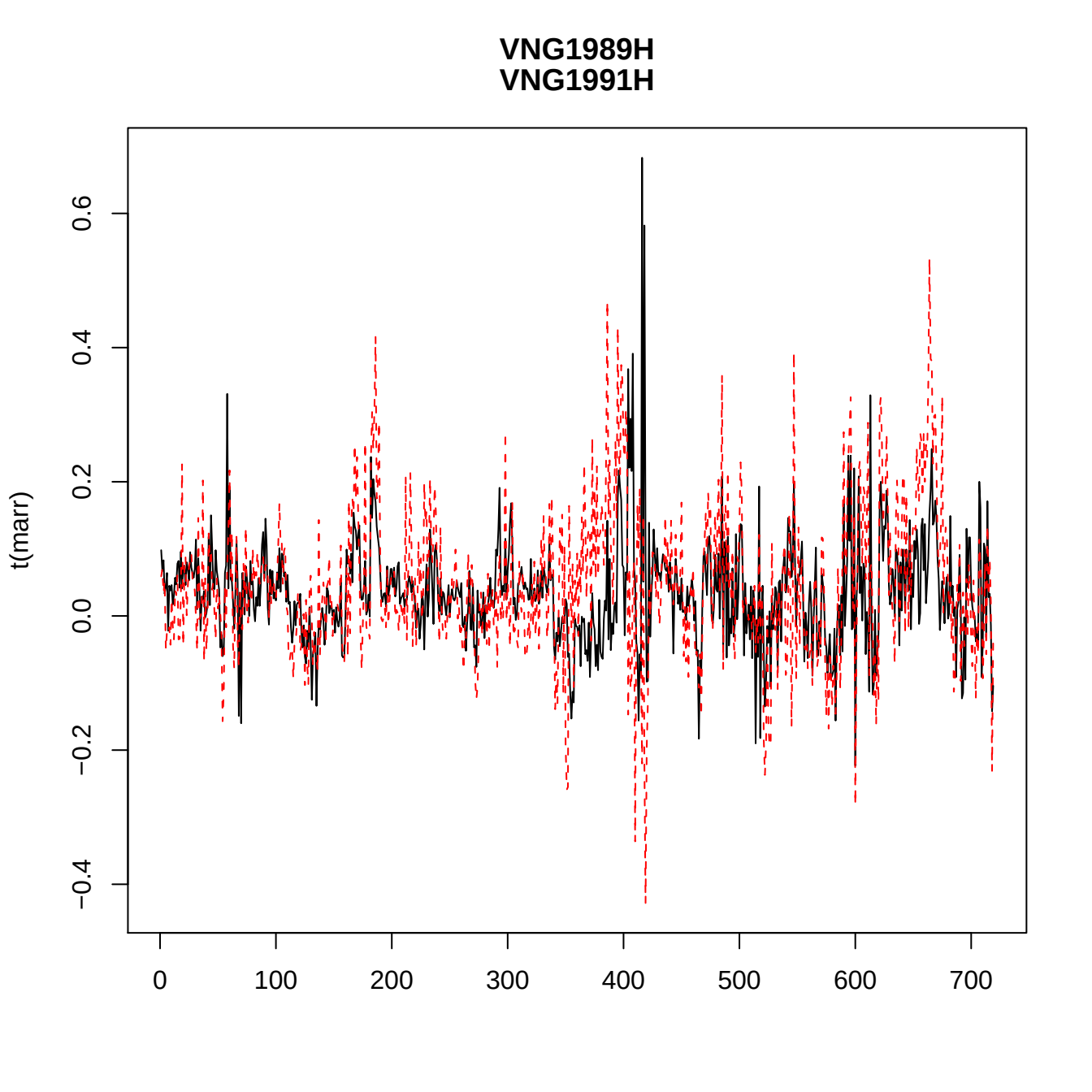

1463500
1464000
1464500
1465000
1465500
VNG1982C
rnh
RNase_HII
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD

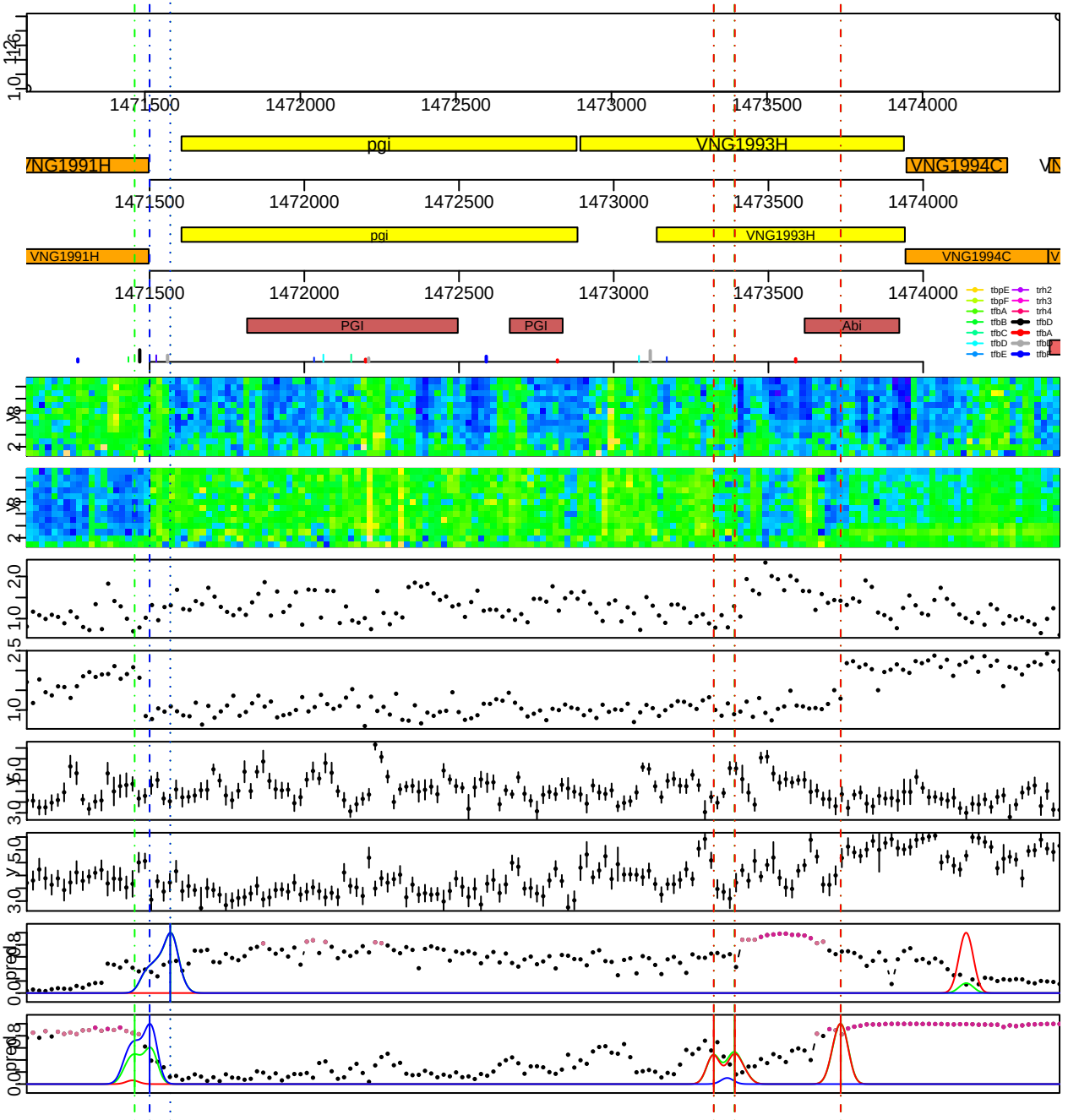

VNG1982C
VNG1984G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

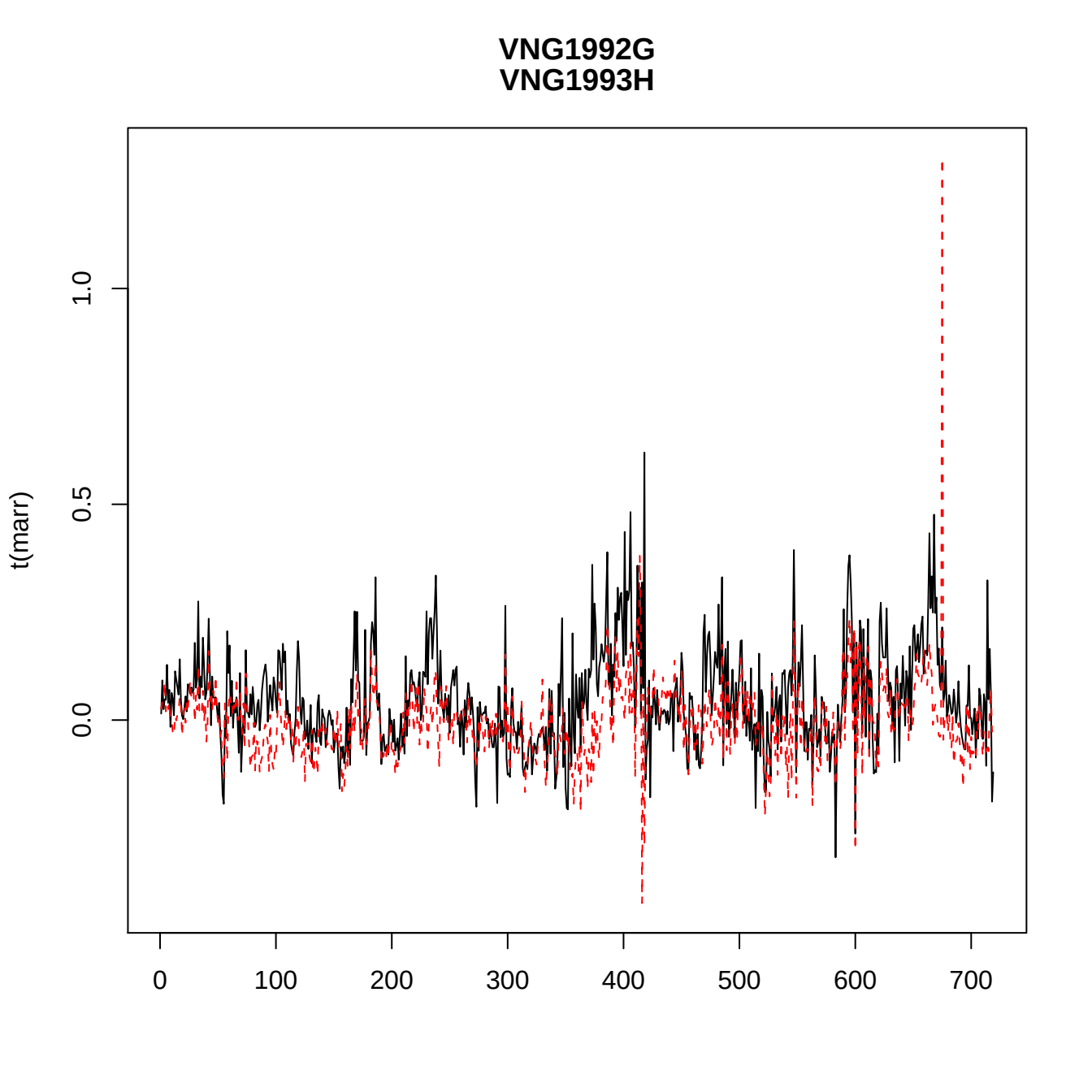

1467500
1468000
1468500
1469000
1469500
1470000
1470500
NG1986C
secD
secF
VNG1989H
VNG1986C
DUF91
SecD SecF
Sec GG
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

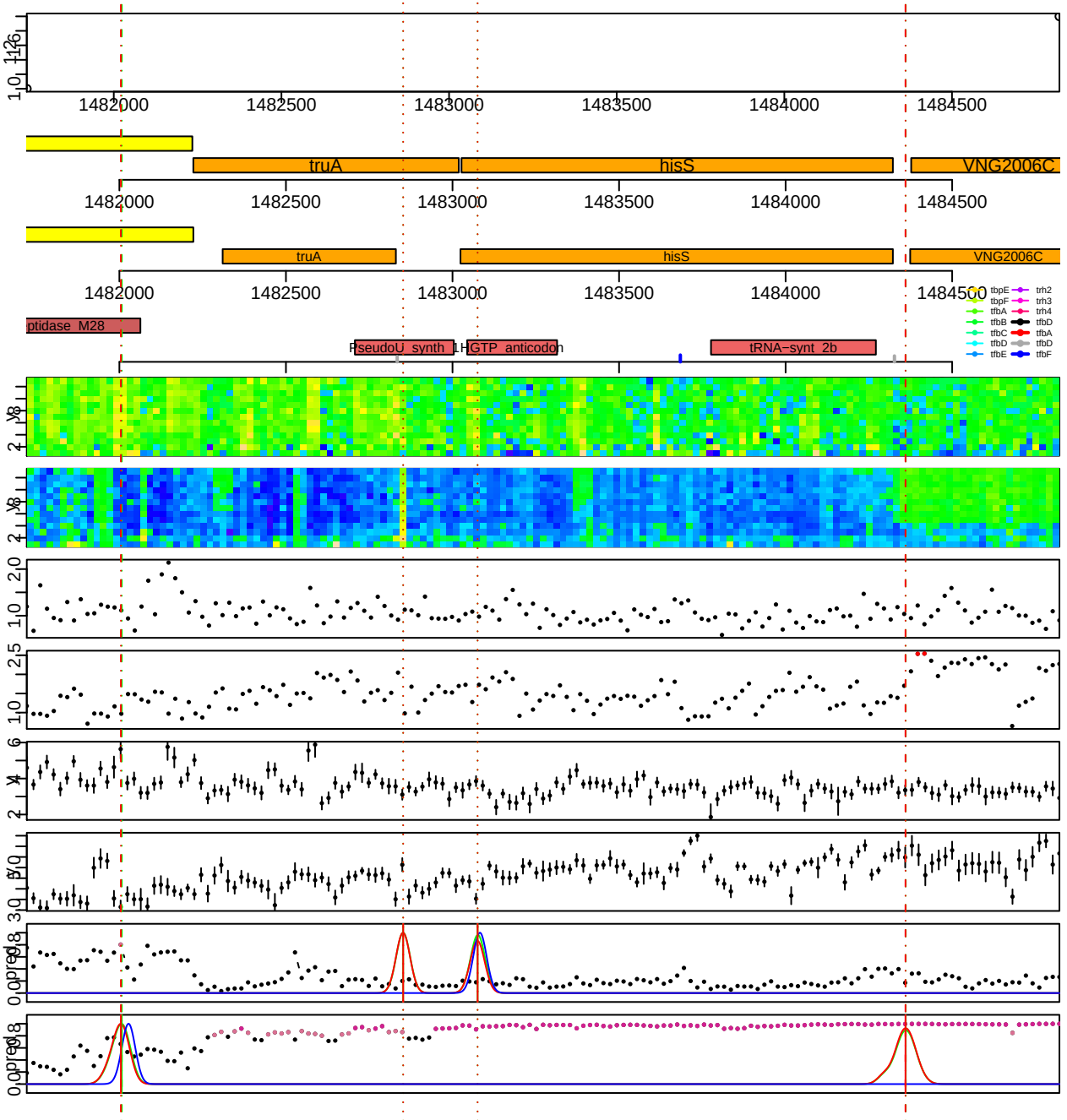

VNG1987G
VNG1988G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

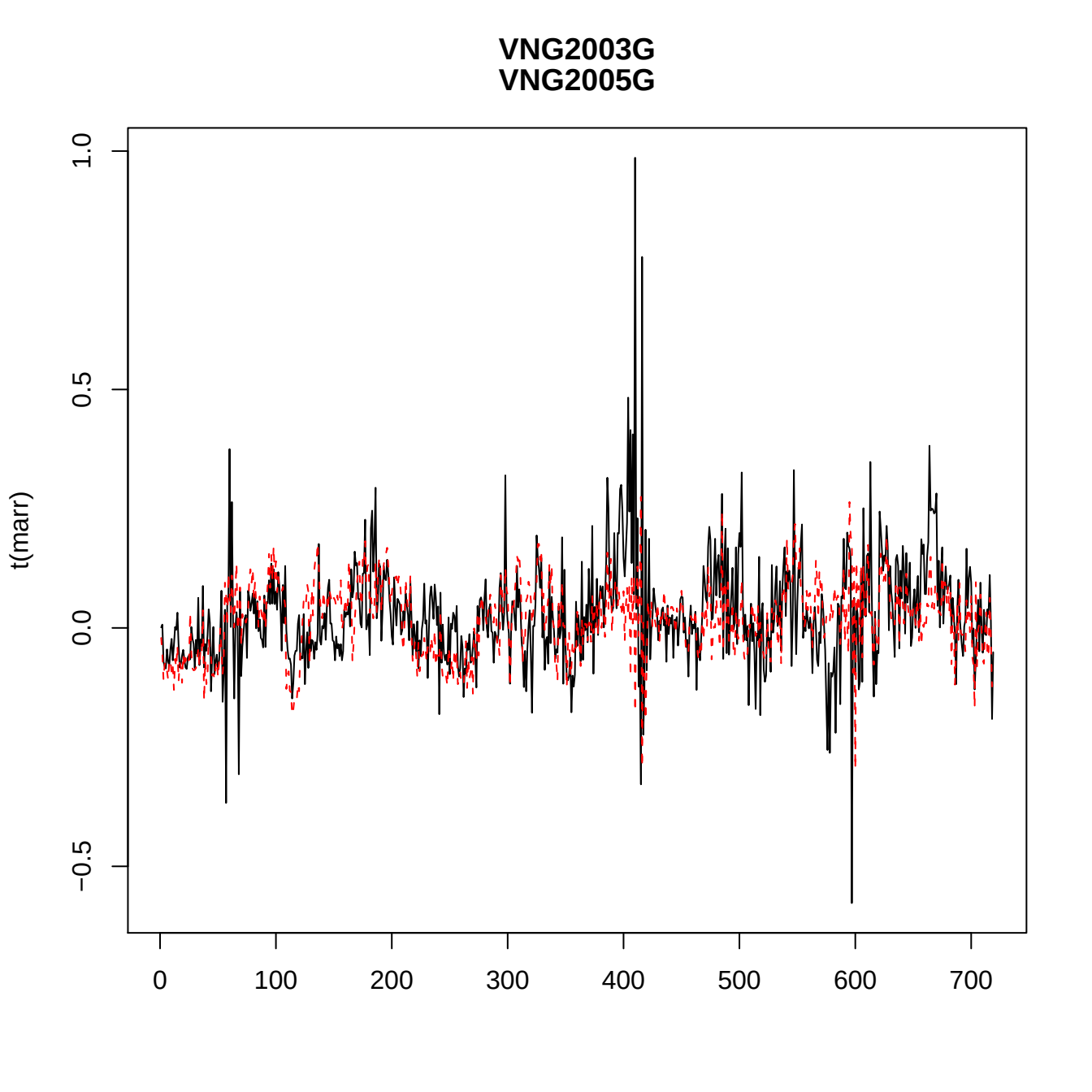

1470000
1470500
1471000
1471500
VNG1989H
VNG1991H
Sec
GG
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

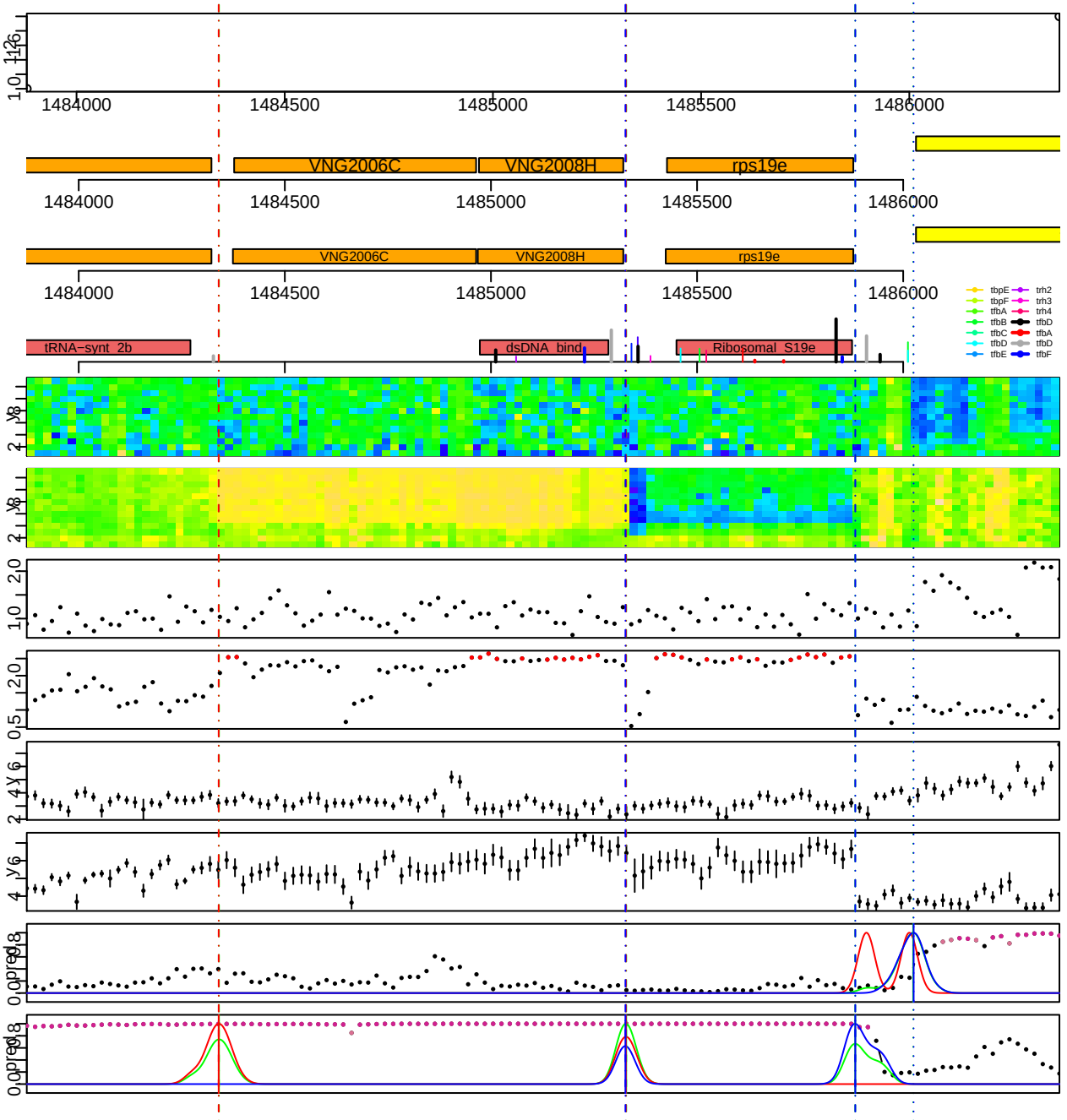

VNG1989H
VNG1991H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

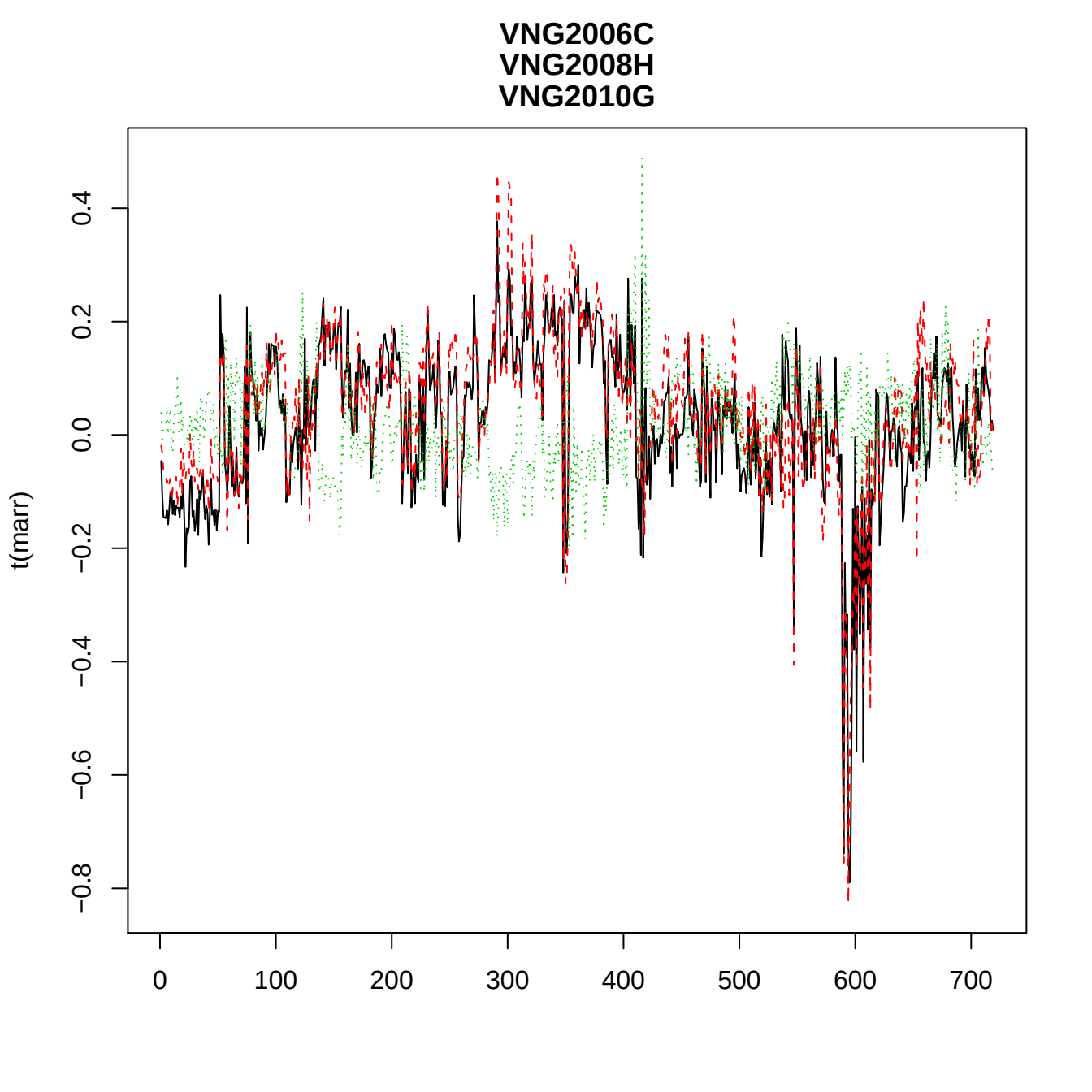

1471500
1472000
1472500
1473000
1473500
1474000
pgi
VNG1993H
VNG1991H
VNG1994C
PGI
Abi
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA

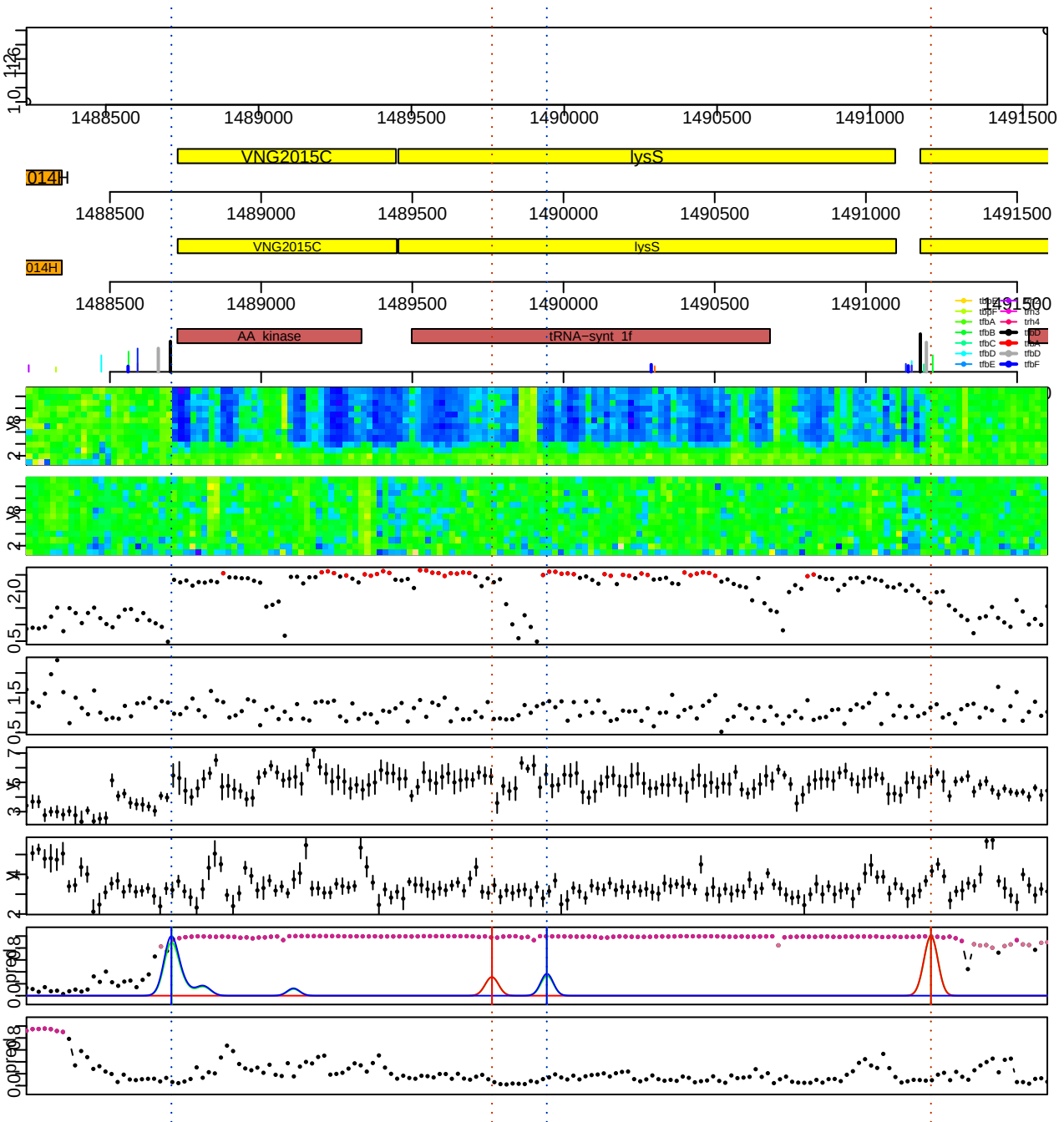

VNG1992G
VNG1993H
t(marr)
0.0
0.5
1.0
0
100
200
300
400
500
600
700

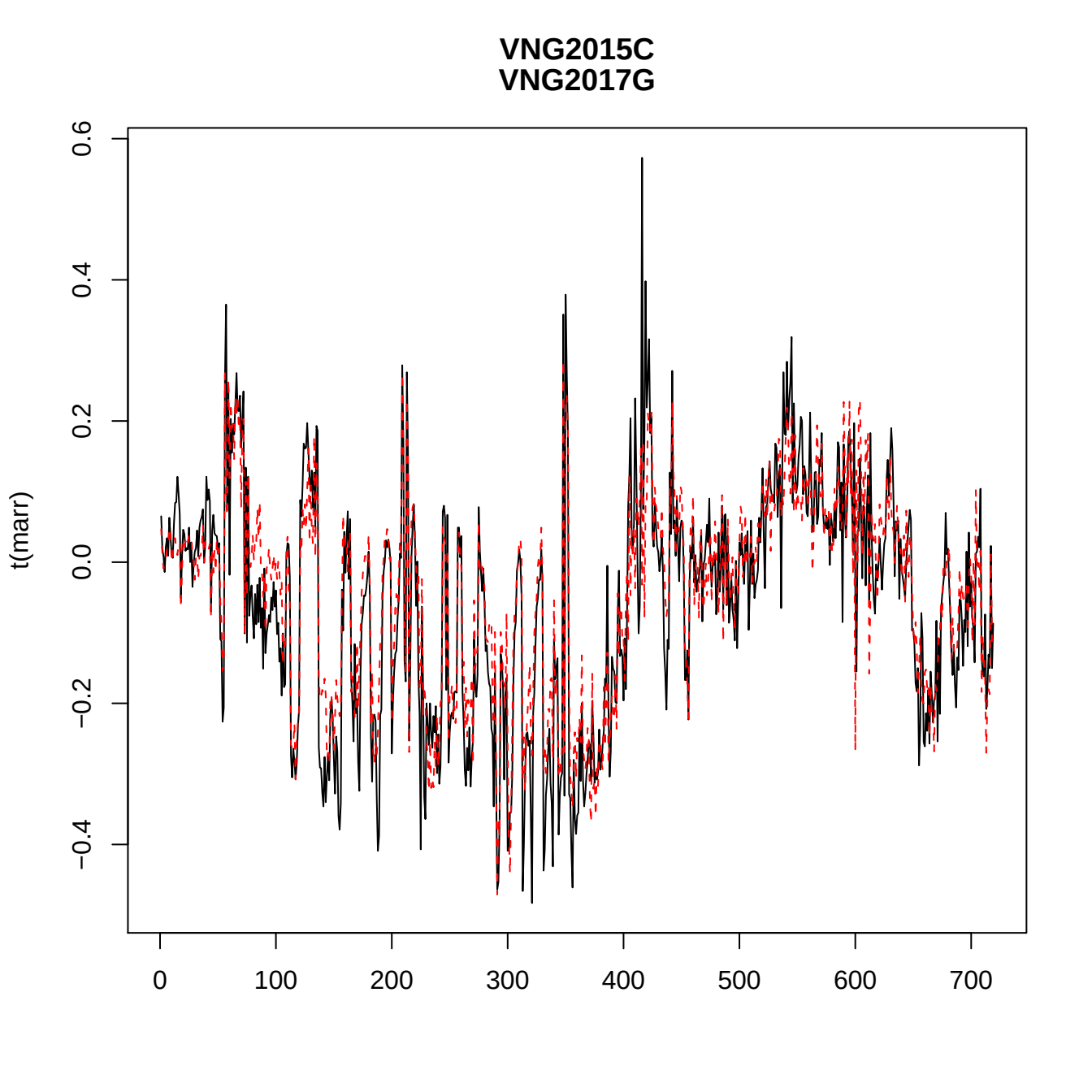

1482000
1482500
1483000
1483500
1484000
1484500
truA
hisS
VNG2006C
ptidase_M28
PseudoU_synth_1
HGTP_anticodon
tRNA-synt_2b
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

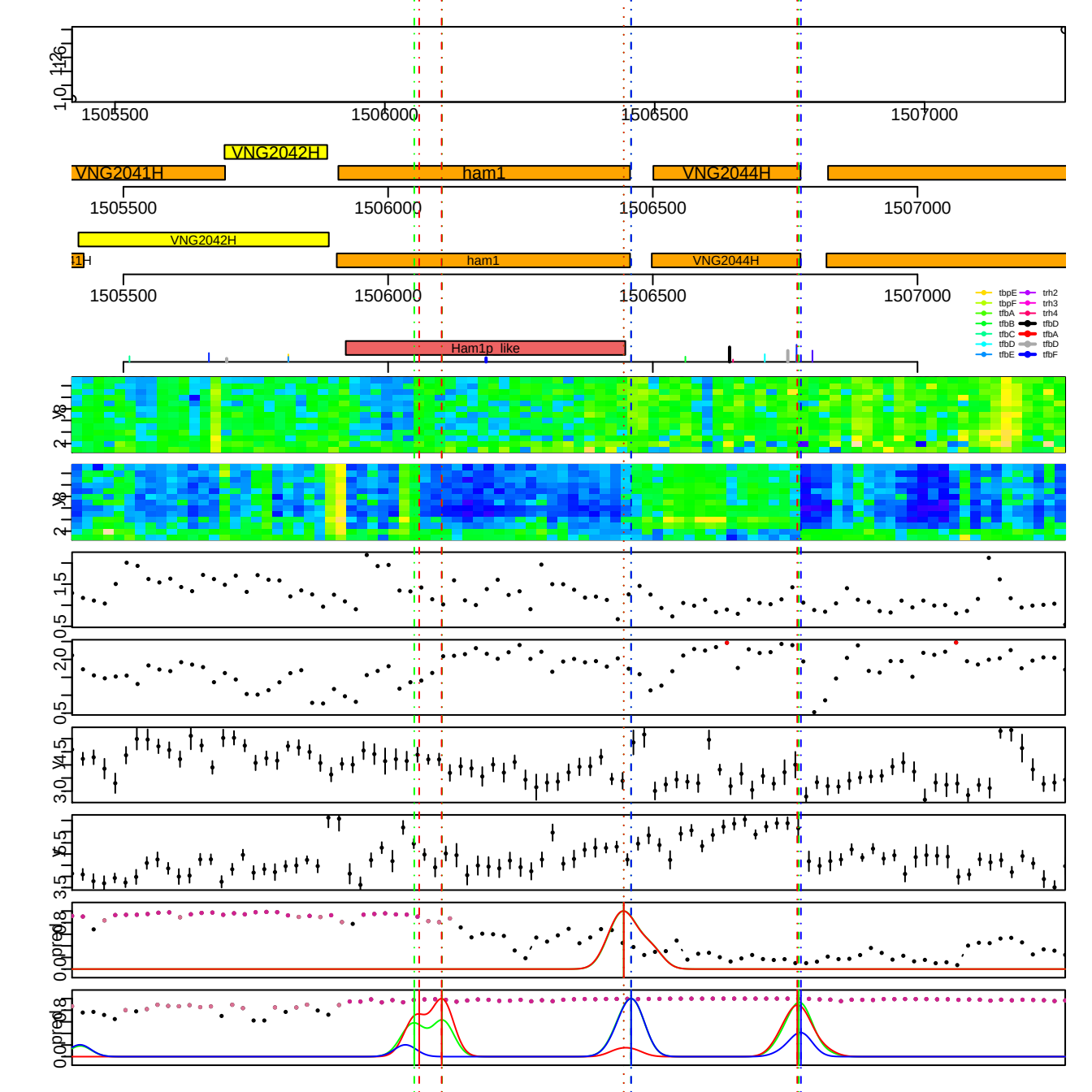

VNG2003G
VNG2005G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

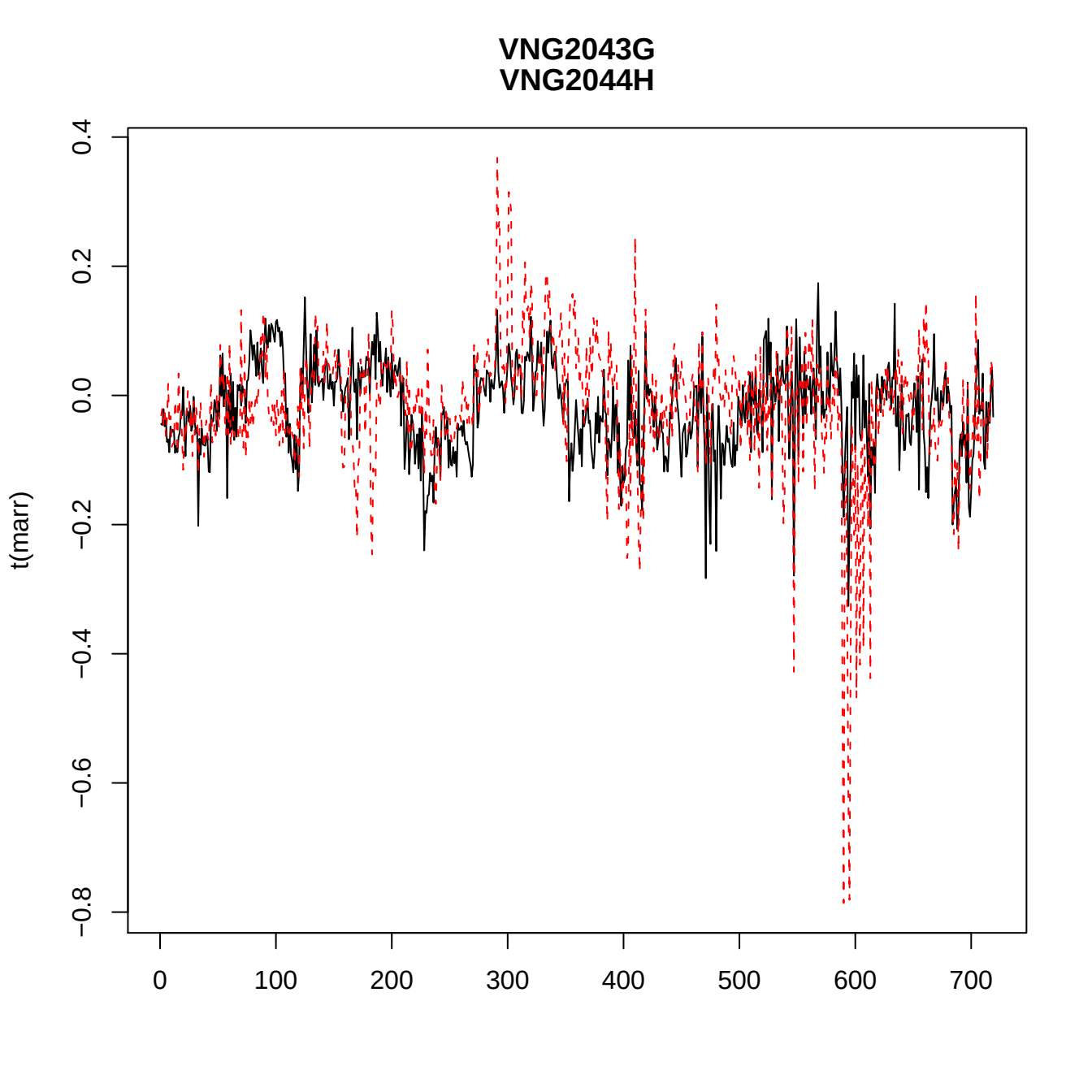

1484000
1484500
1485000
1485500
1486000
VNG2006C
VNG2008H
rps19e
tRNA−synt_2b
dsDNA_bind
Ribosomal_S19e
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

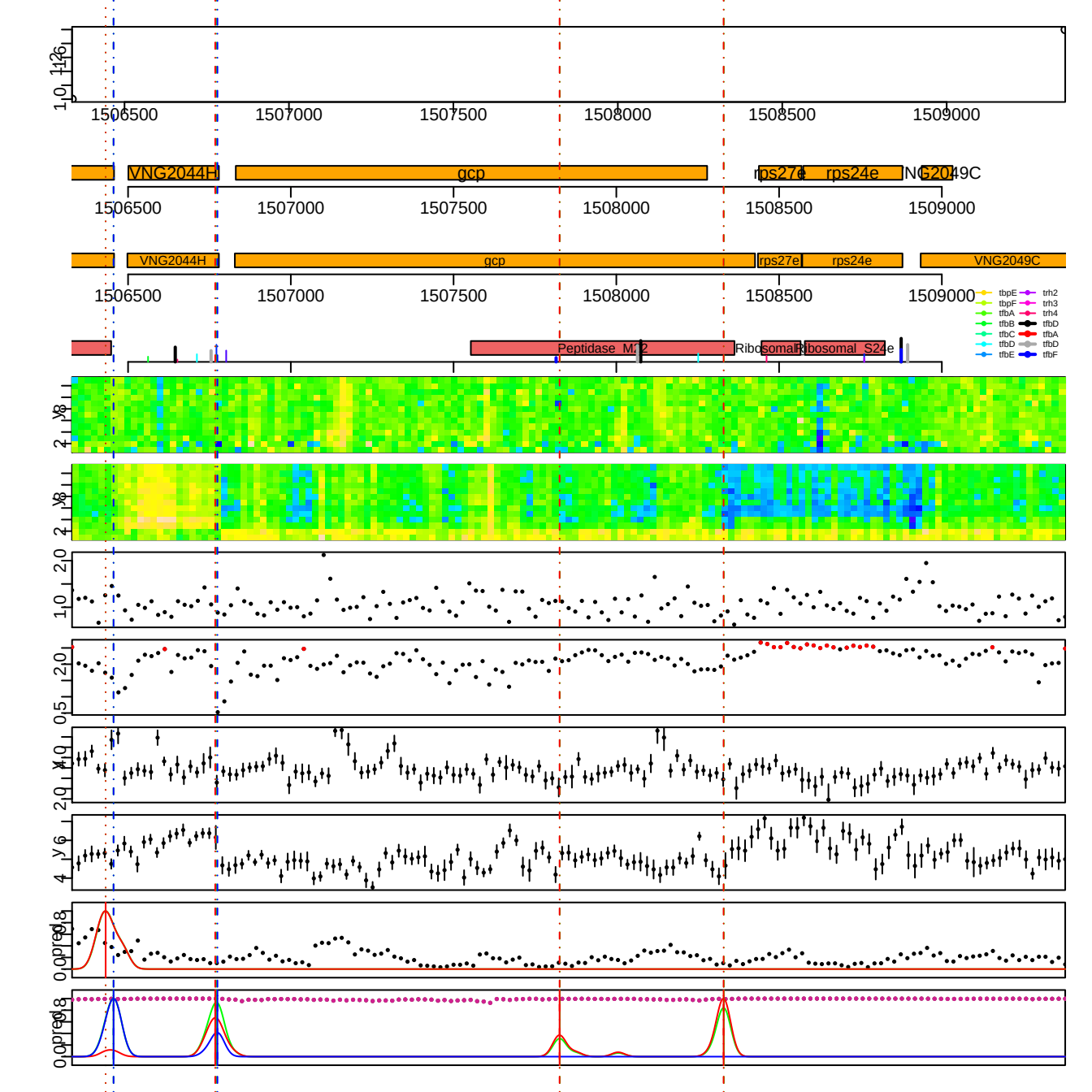

VNG2006C
VNG2008H
VNG2010G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

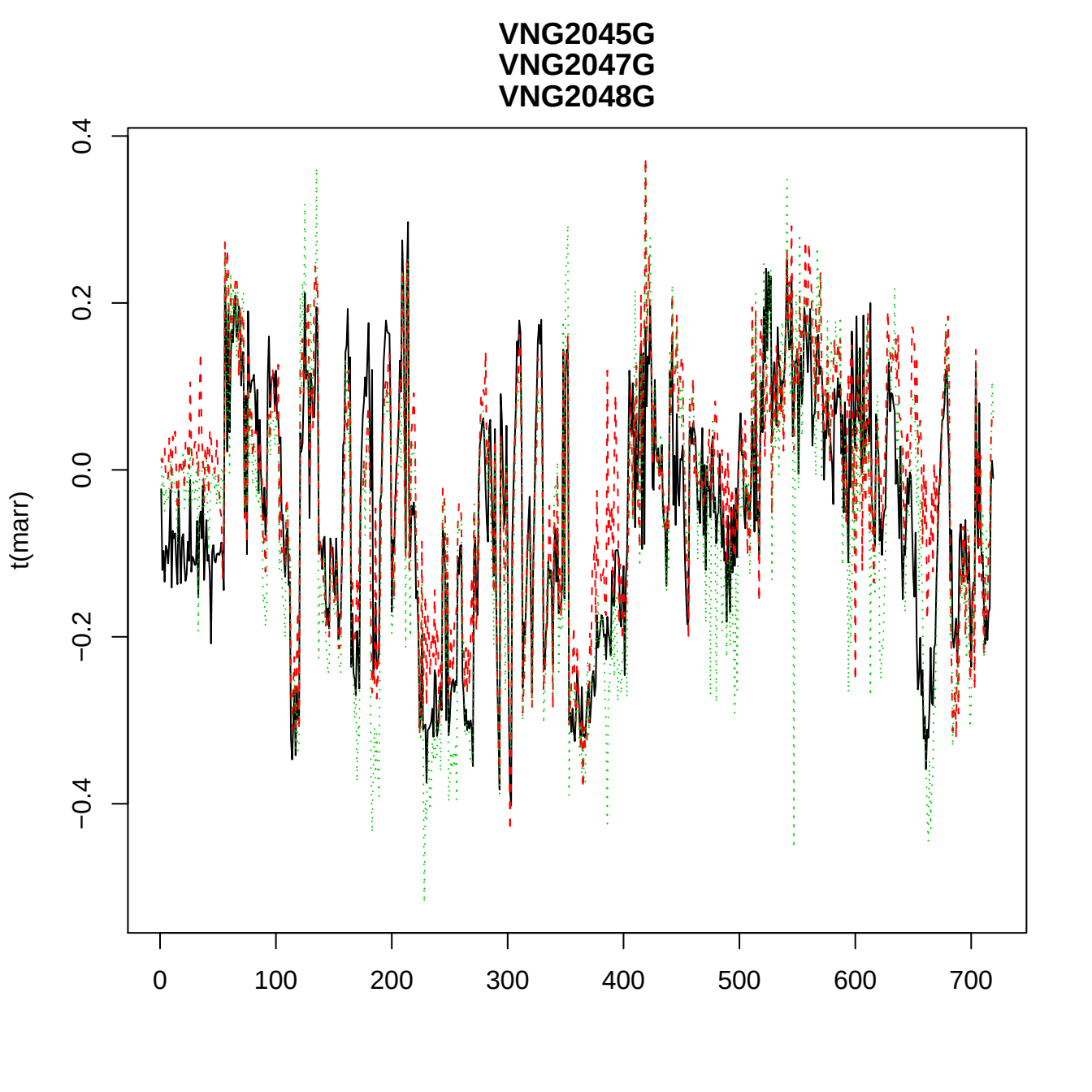

1488500
1489000
1489500
1490000
1490500
1491000
1491500
VNG2015C
lysS
014H
AA_kinase
tRNA−synt_1f
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh3
trh4
tfbD
tfbA
tfbD
tfbF

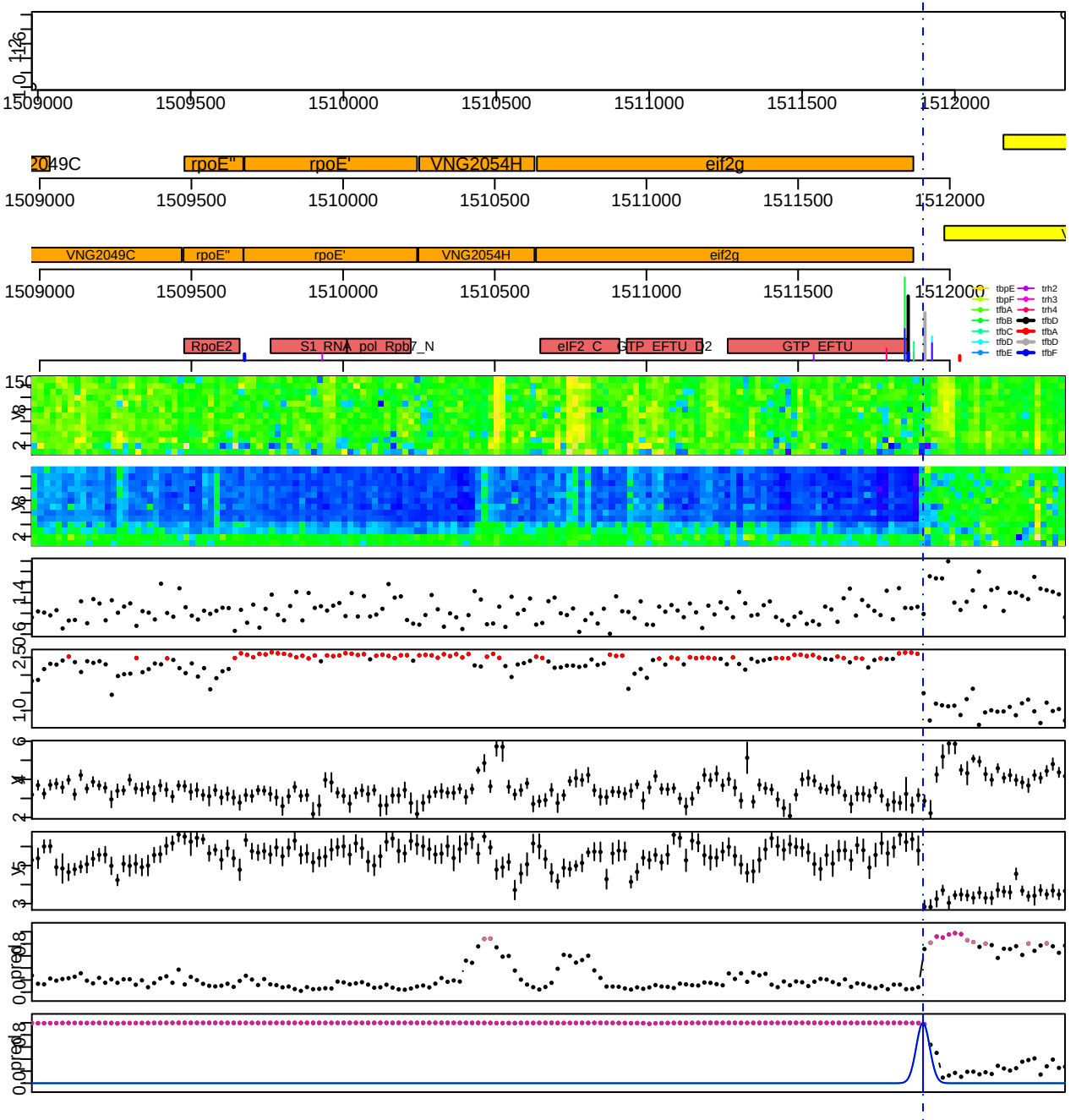

VNG2015C
VNG2017G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

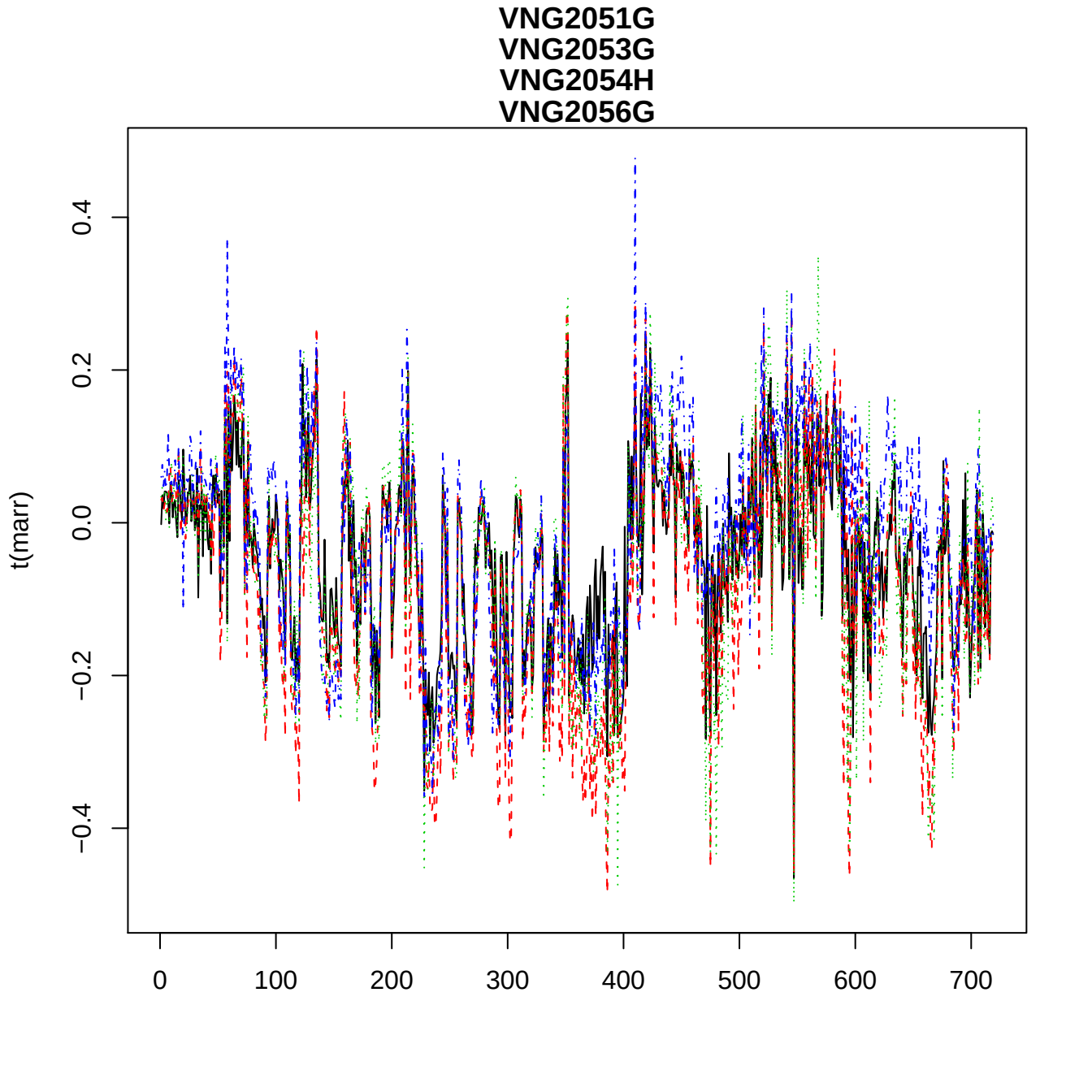

1505500
1506000
1506500
1507000
VNG2042H
VNG2041H
ham1
VNG2044H
Ham1p_like
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

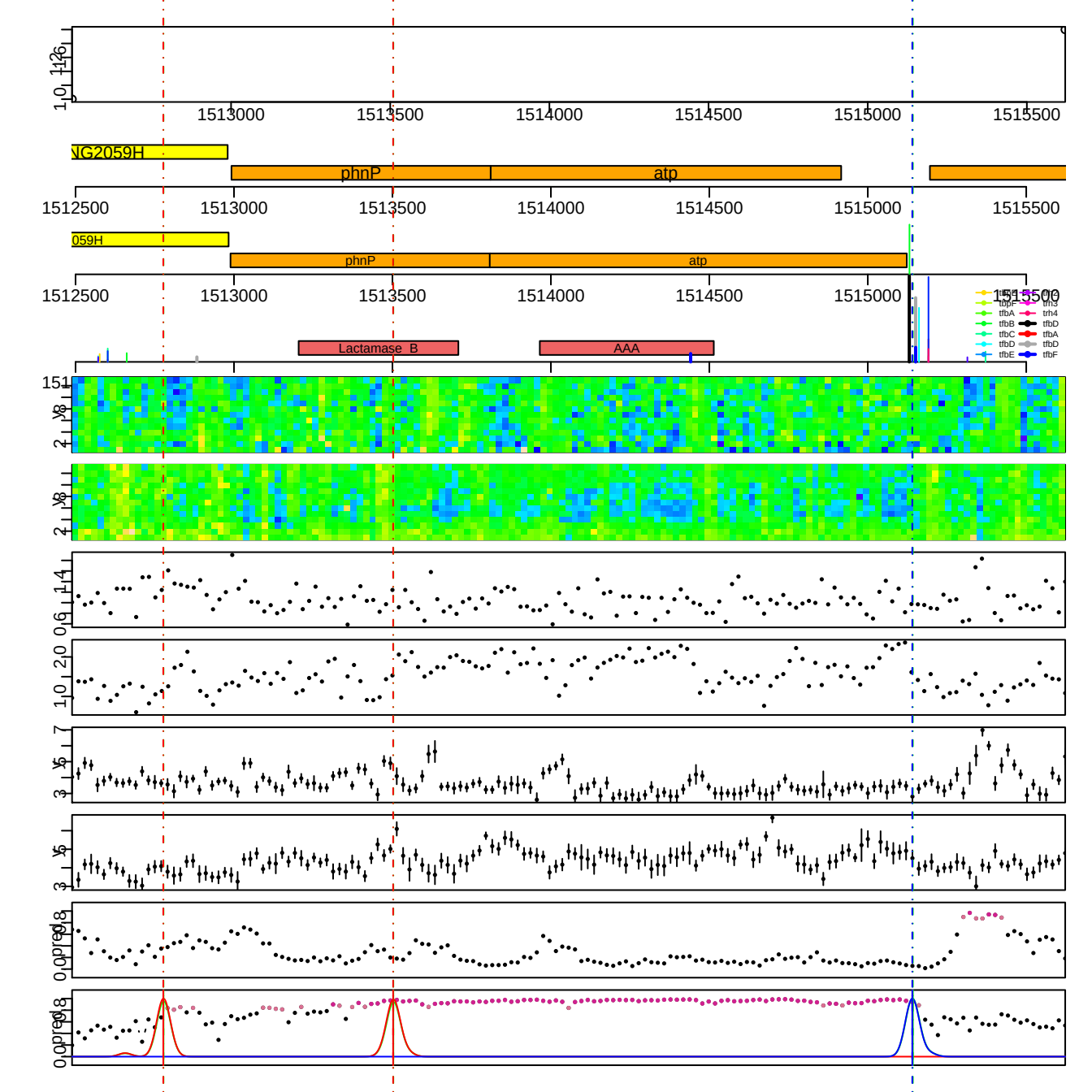

VNG2043G
VNG2044H
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

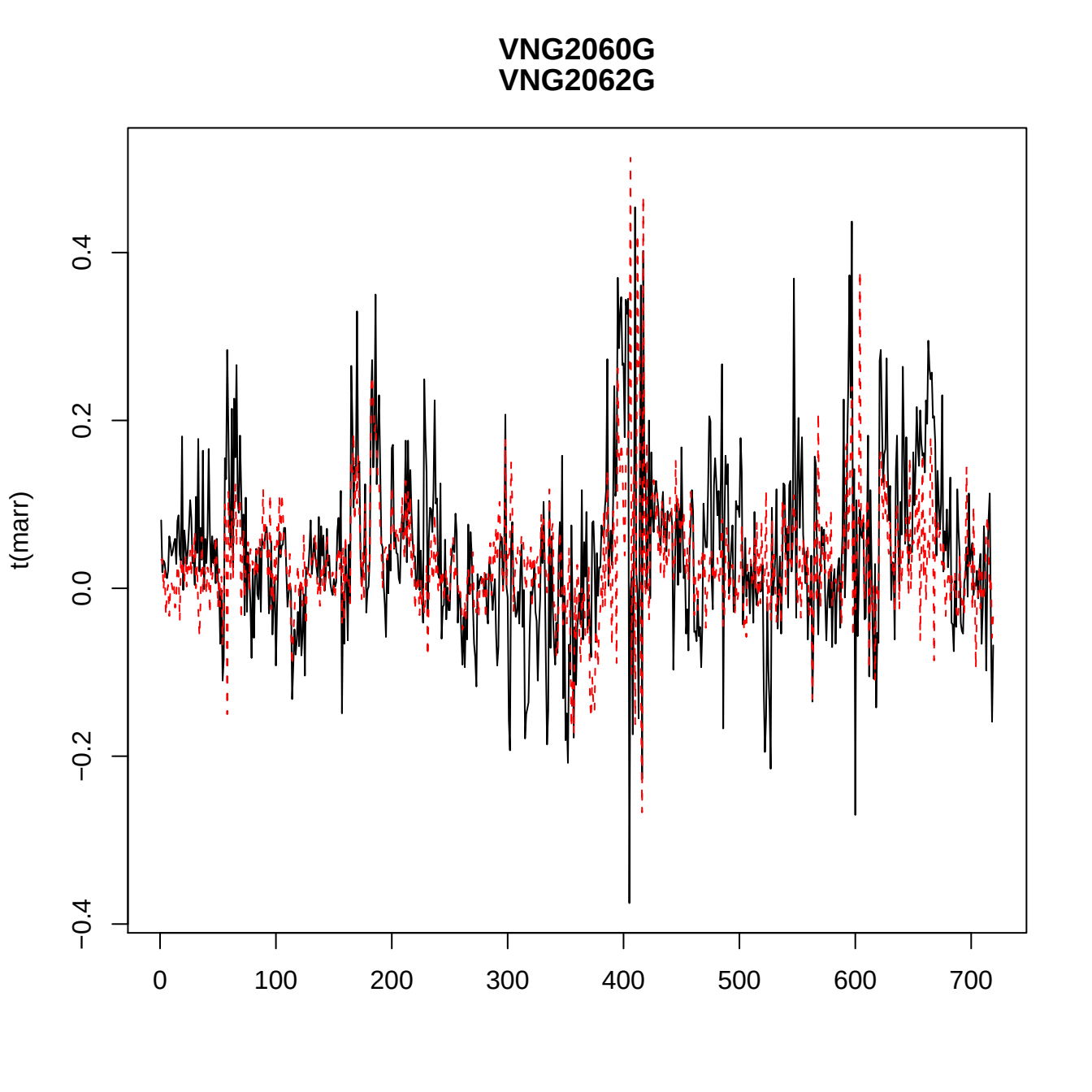

1506500
1507000
1507500
1508000
1508500
1509000
VNG2044H
gcp
rps27e
rps24e
VNG2049C
Peptidase_M22
Ribosomal_S24e
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

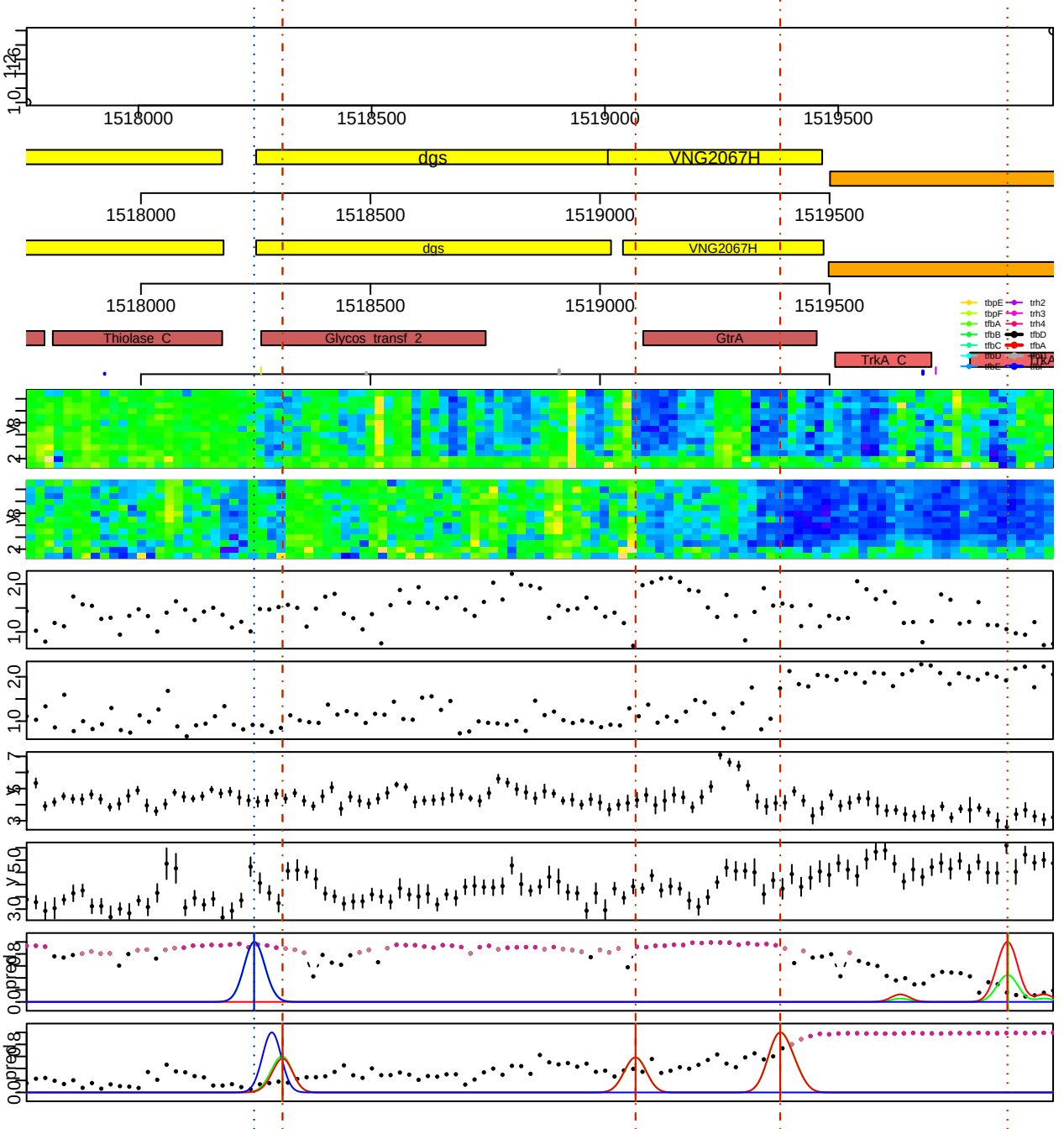

VNG2045G
VNG2047G
VNG2048G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1509000
1509500
1510000
1510500
1511000
1511500
1512000
VNG2049C
rpoE''
rpoE'
VNG2054H
eif2g
RpoE2
S1_RNA_pol_Rpb7_N
eIF2_C
GTP_EFTU_D2
GTP_EFTU
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

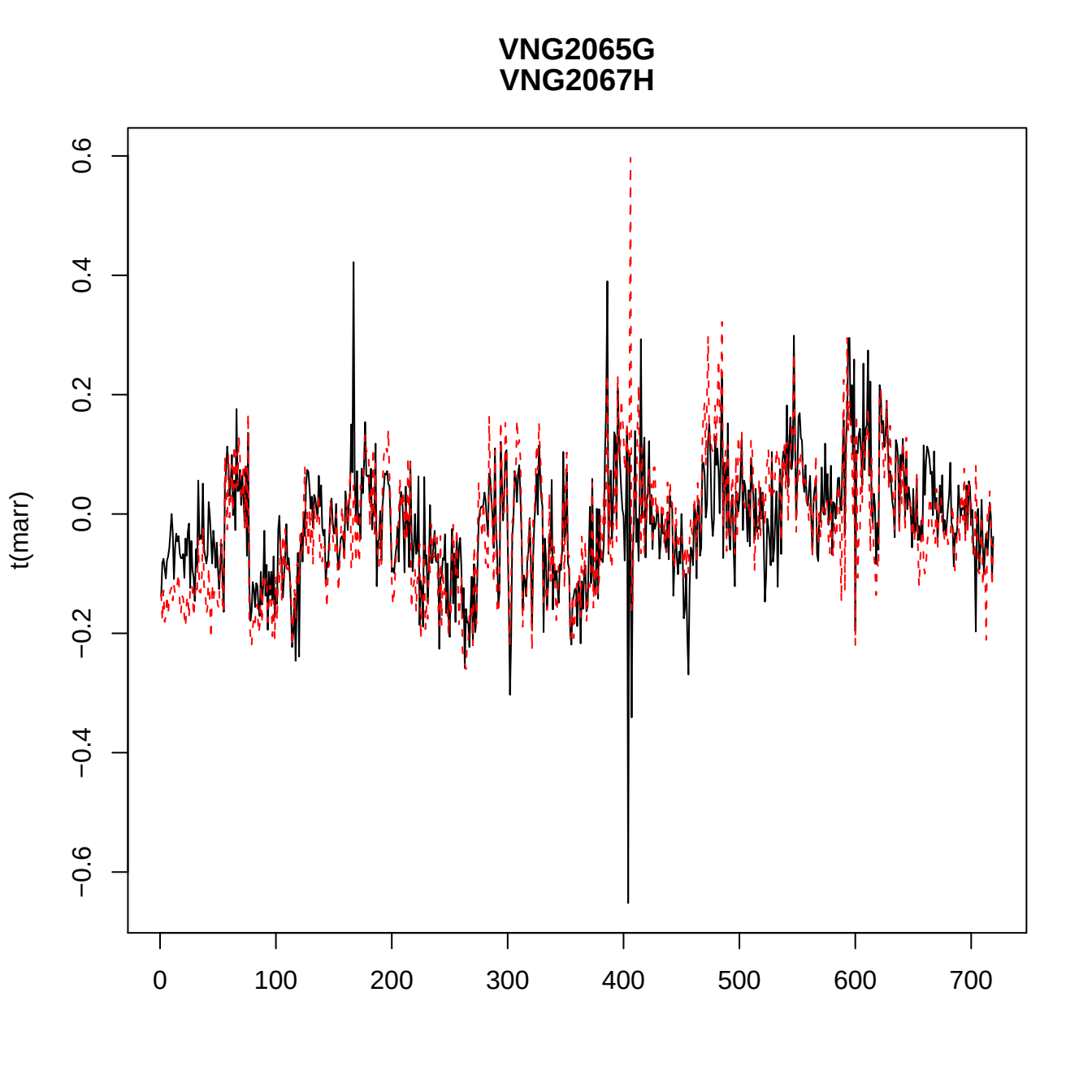

VNG2051G
VNG2053G
VNG2054H
VNG2056G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

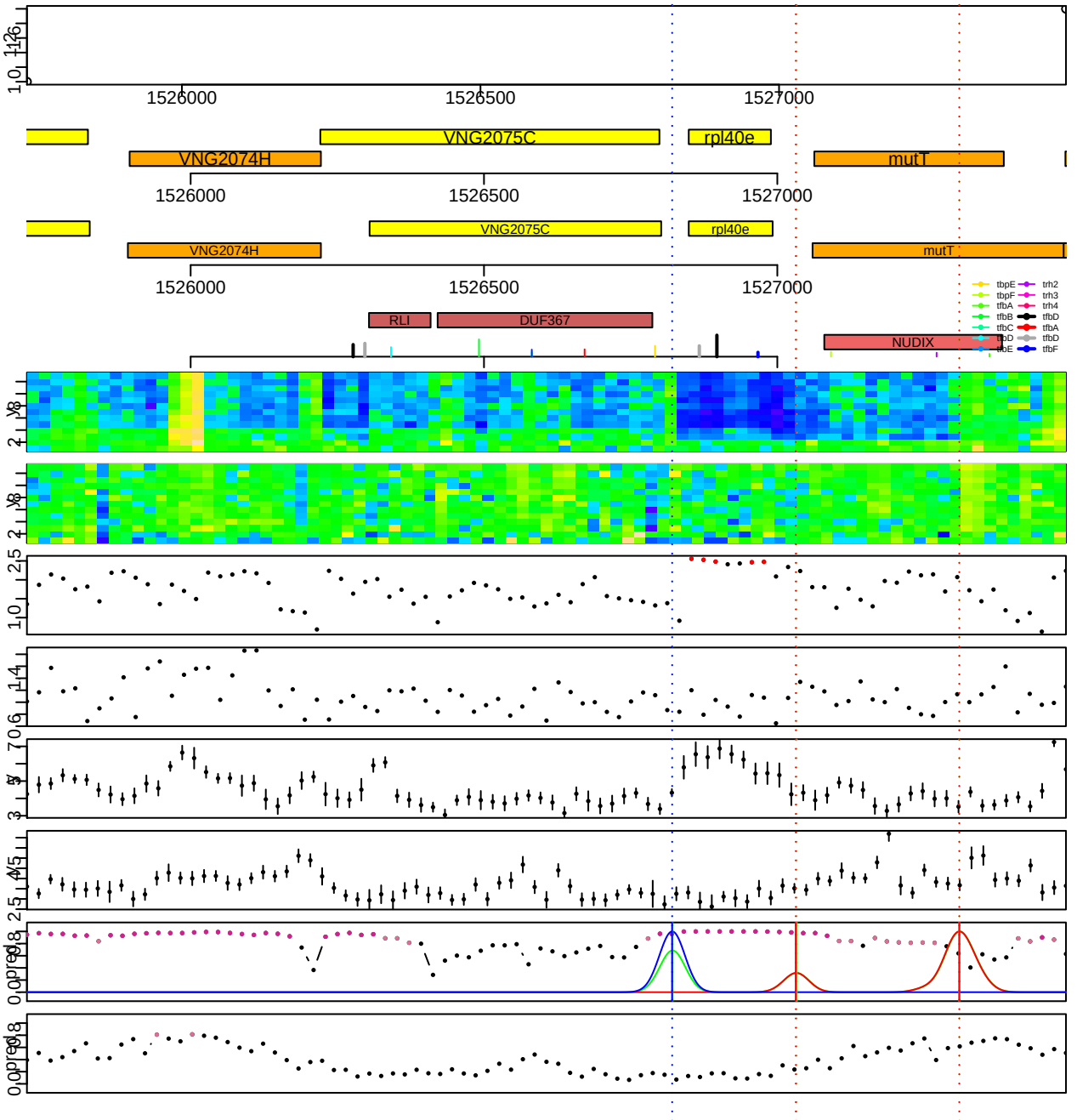

1513000
1513500
1514000
1514500
1515000
1515500
phnP
atp
1512500
059H
Lactamase_B
AAA
tfbF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF

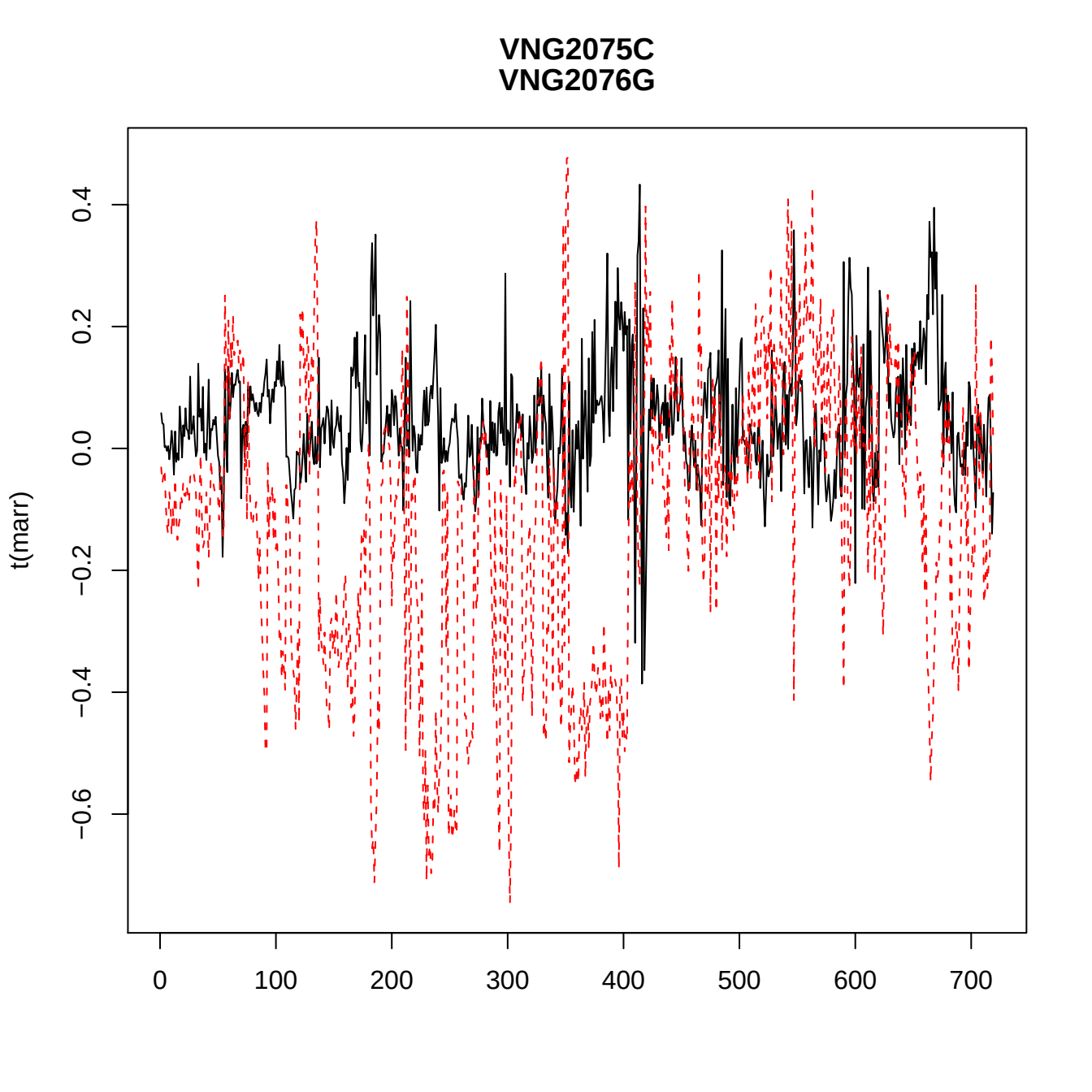

VNG2060G
VNG2062G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

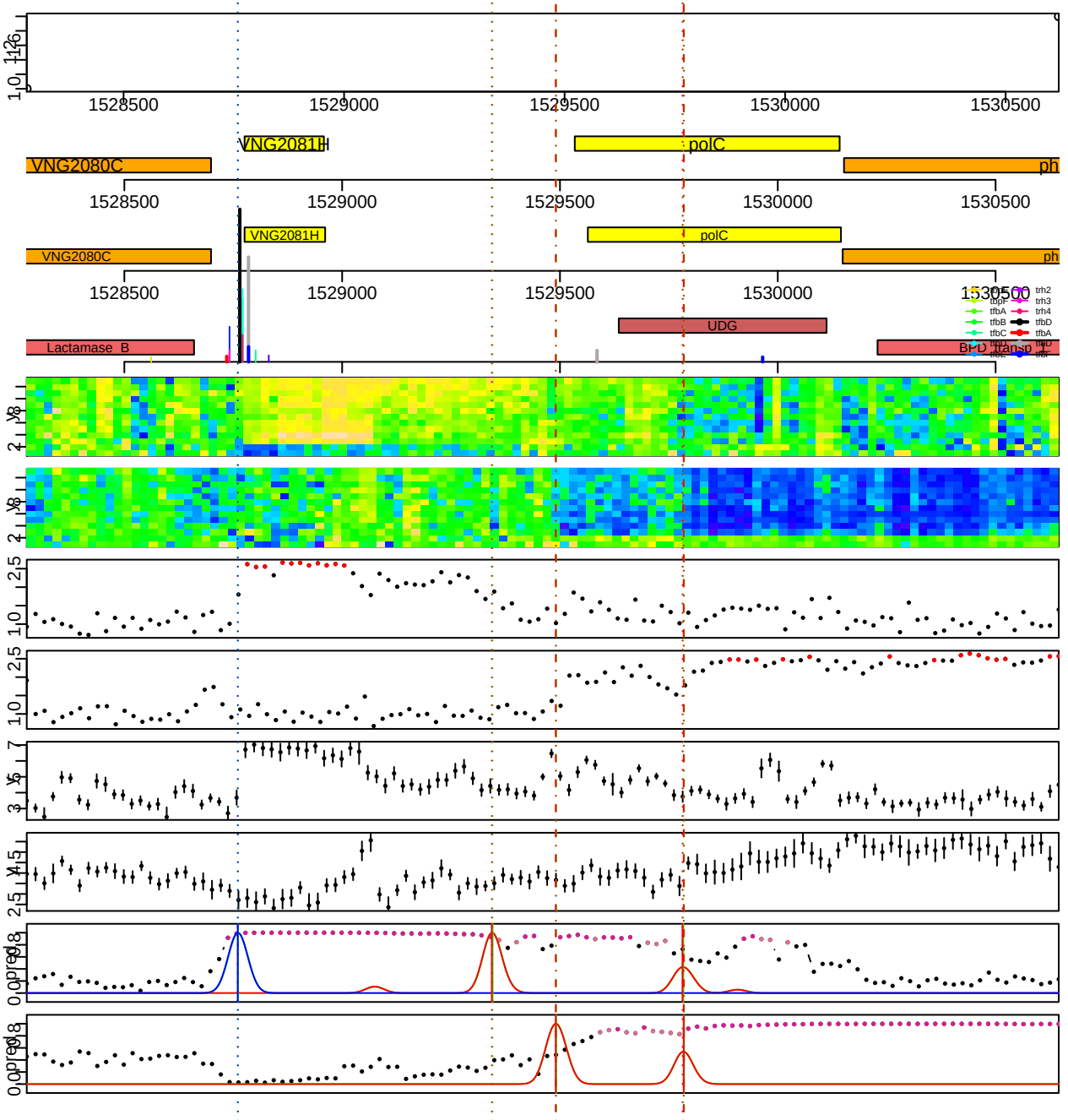


1518000
1518500
1519000
1519500
dgs
VNG2067H
Thiolase_C
Glycos_transf_2
GtrA
TrkA_C
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA

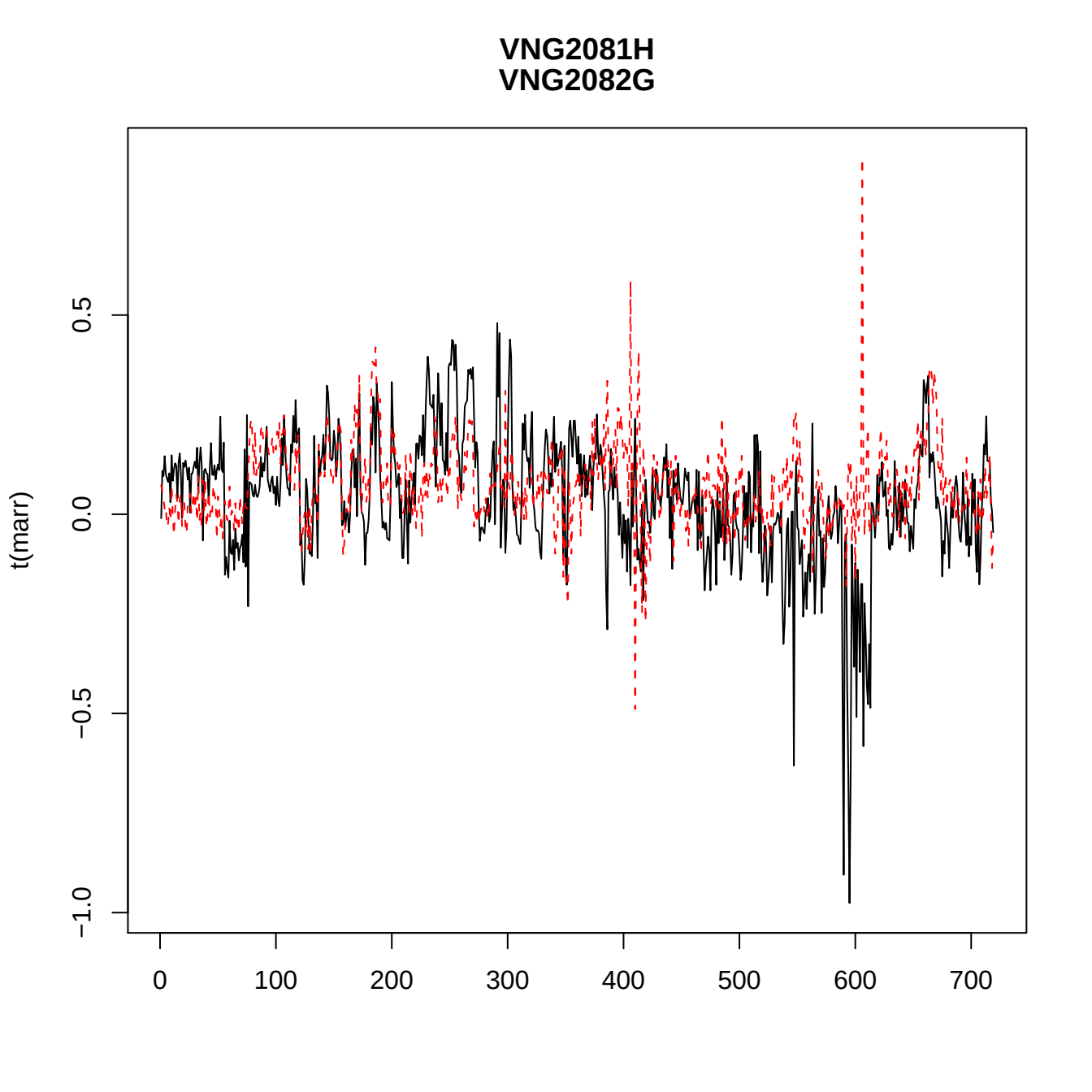

VNG2065G
VNG2067H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

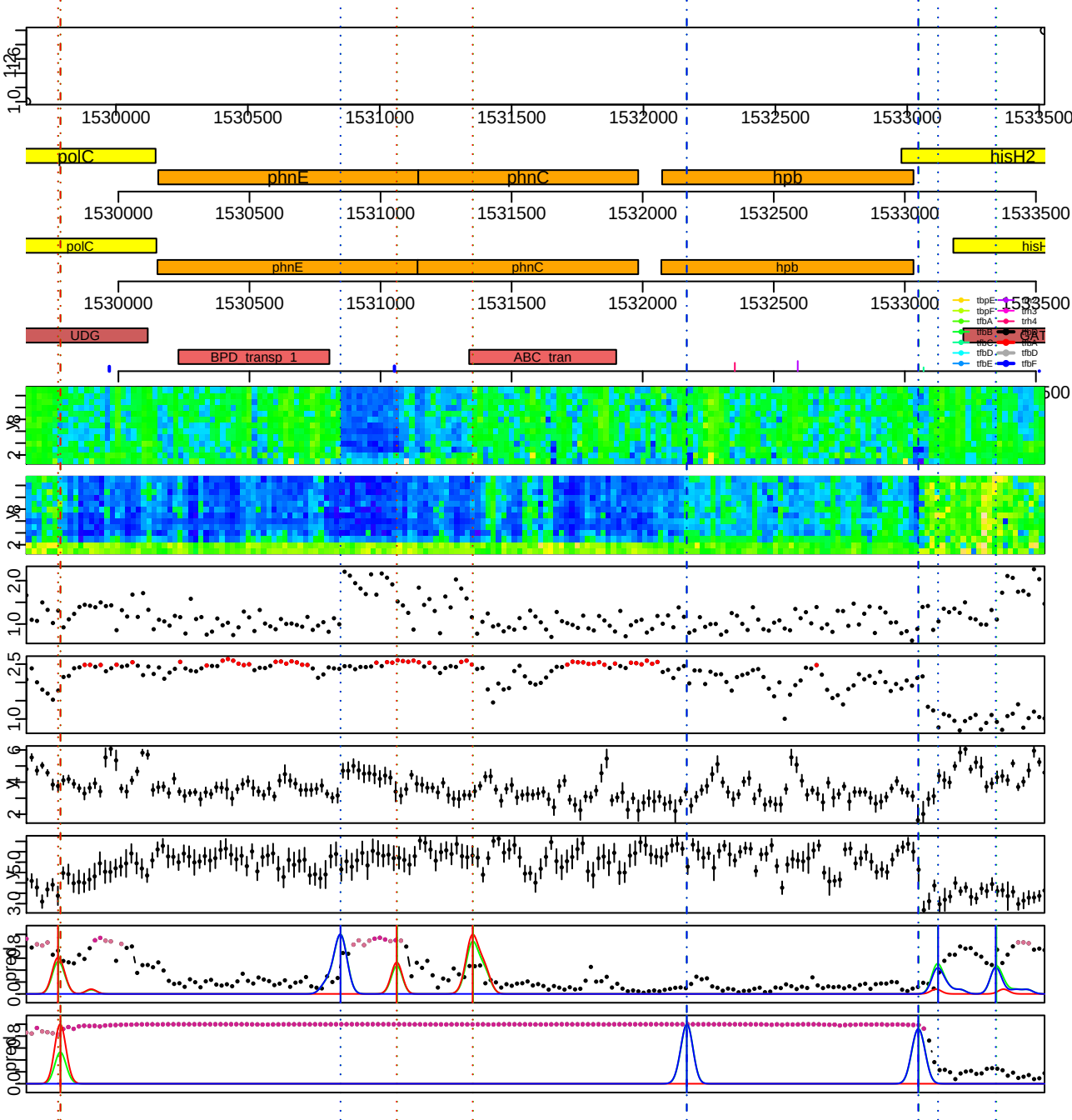

1526000
1526500
1527000
VNG2075C
rpl40e
VNG2074H
mutT
RLI
DUF367
NUDIX
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

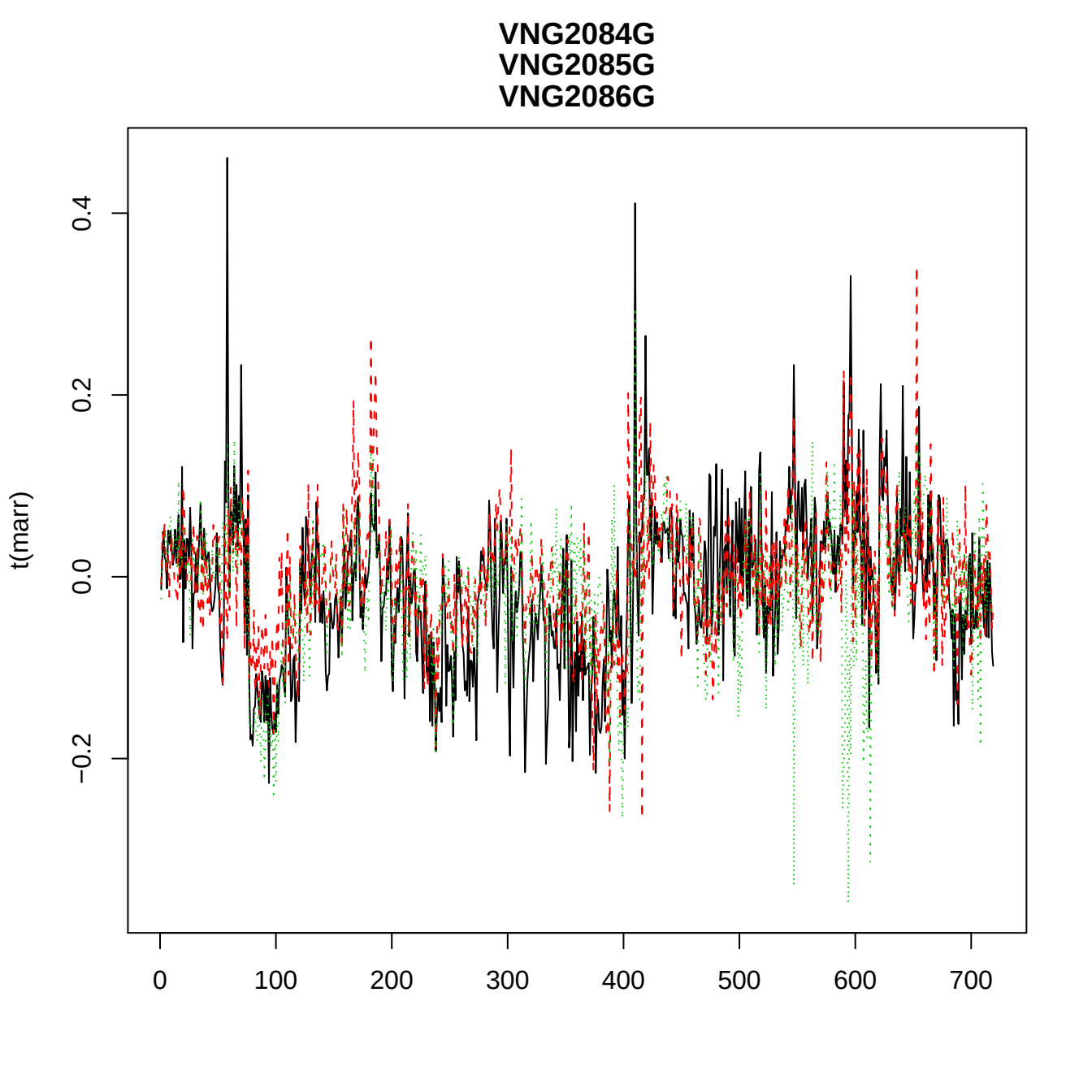

VNG2075C
VNG2076G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

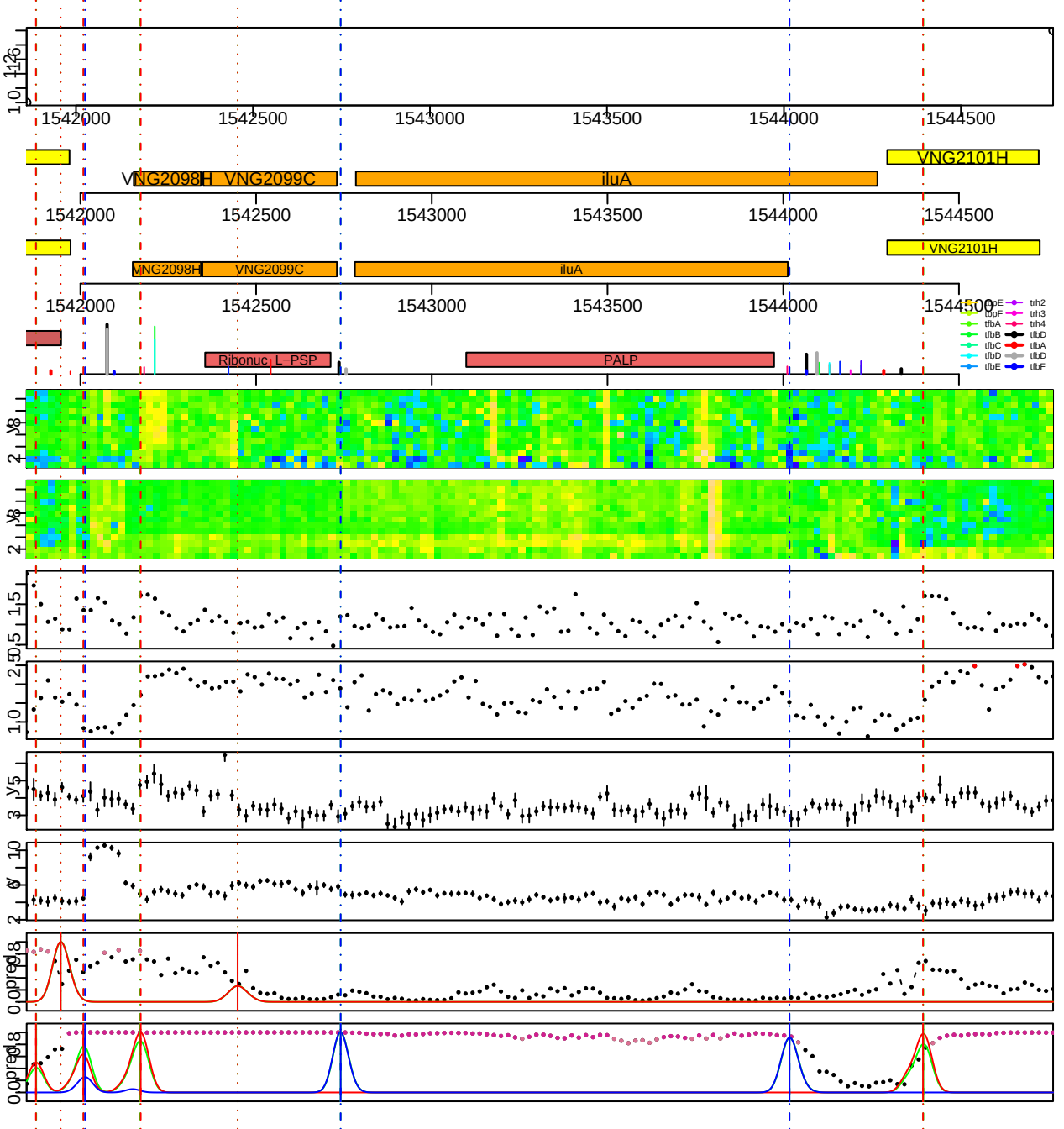


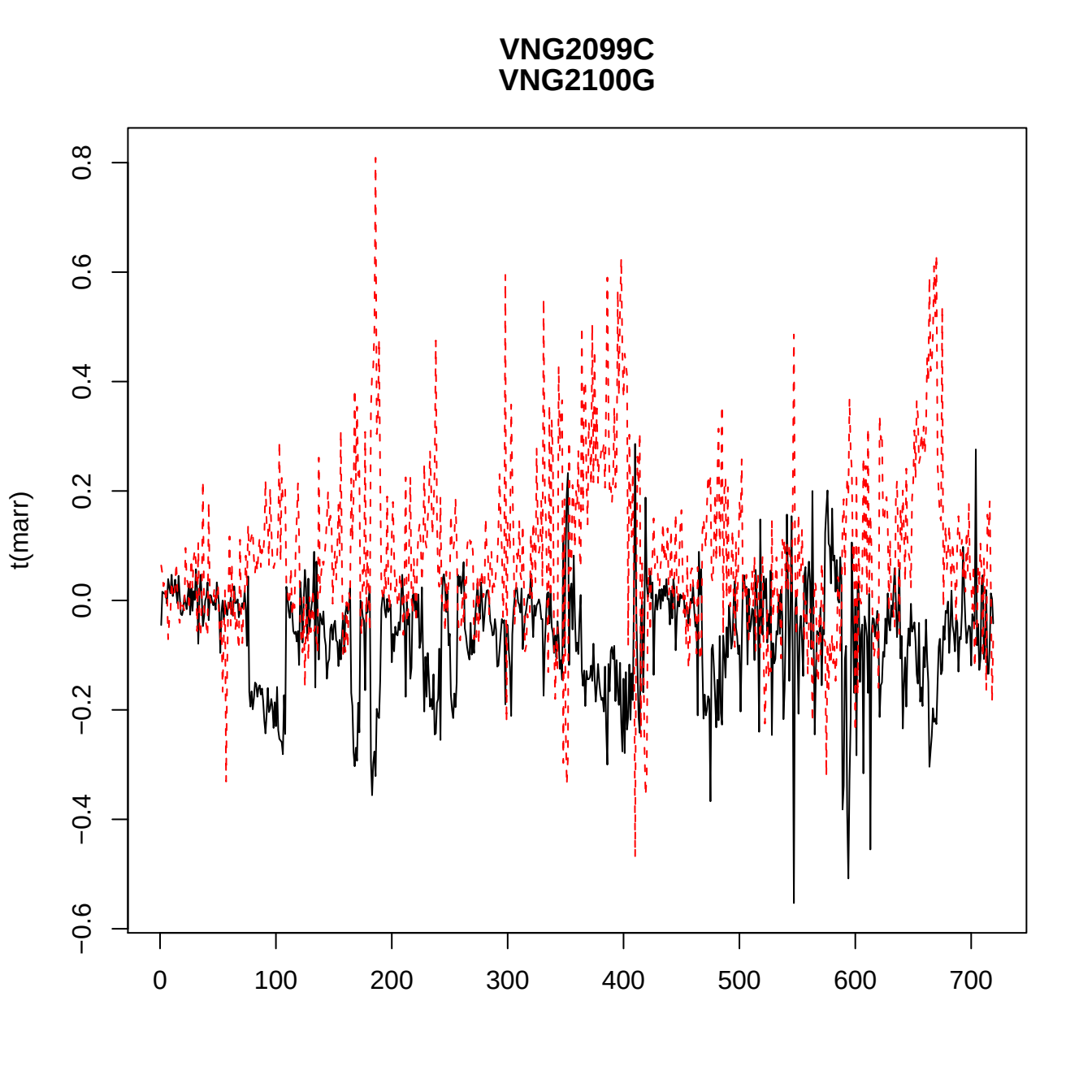
1528500
1529000
1529500
1530000
1530500
VNG2081H
polC
VNG2080C
ph
UDG
Lactamase_B
BPD_transp_1
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
tbpF

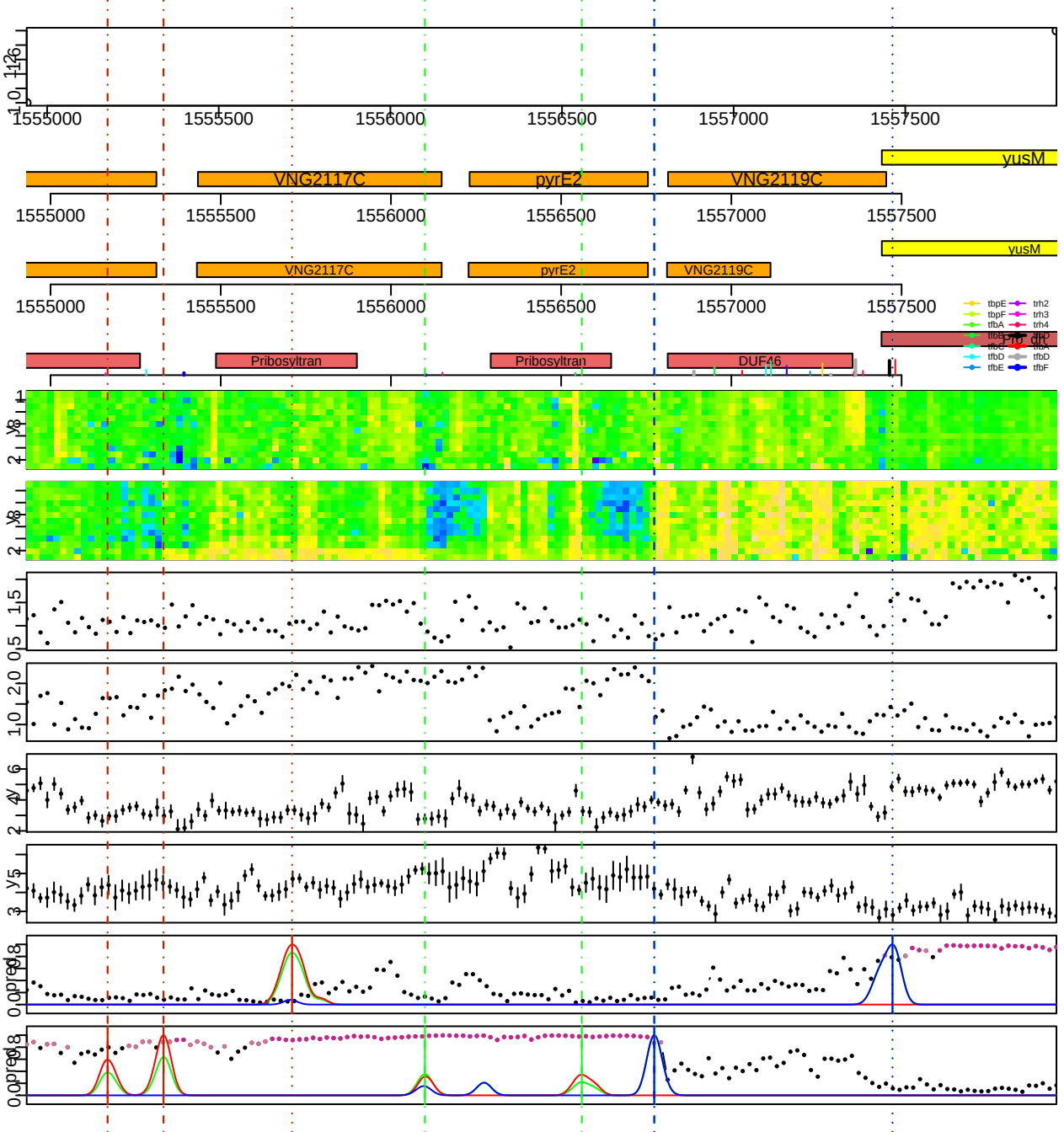

VNG2081H
VNG2082G
t(marr)
0.5
0.0
−0.5
−1.0
0
100
200
300
400
500
600
700

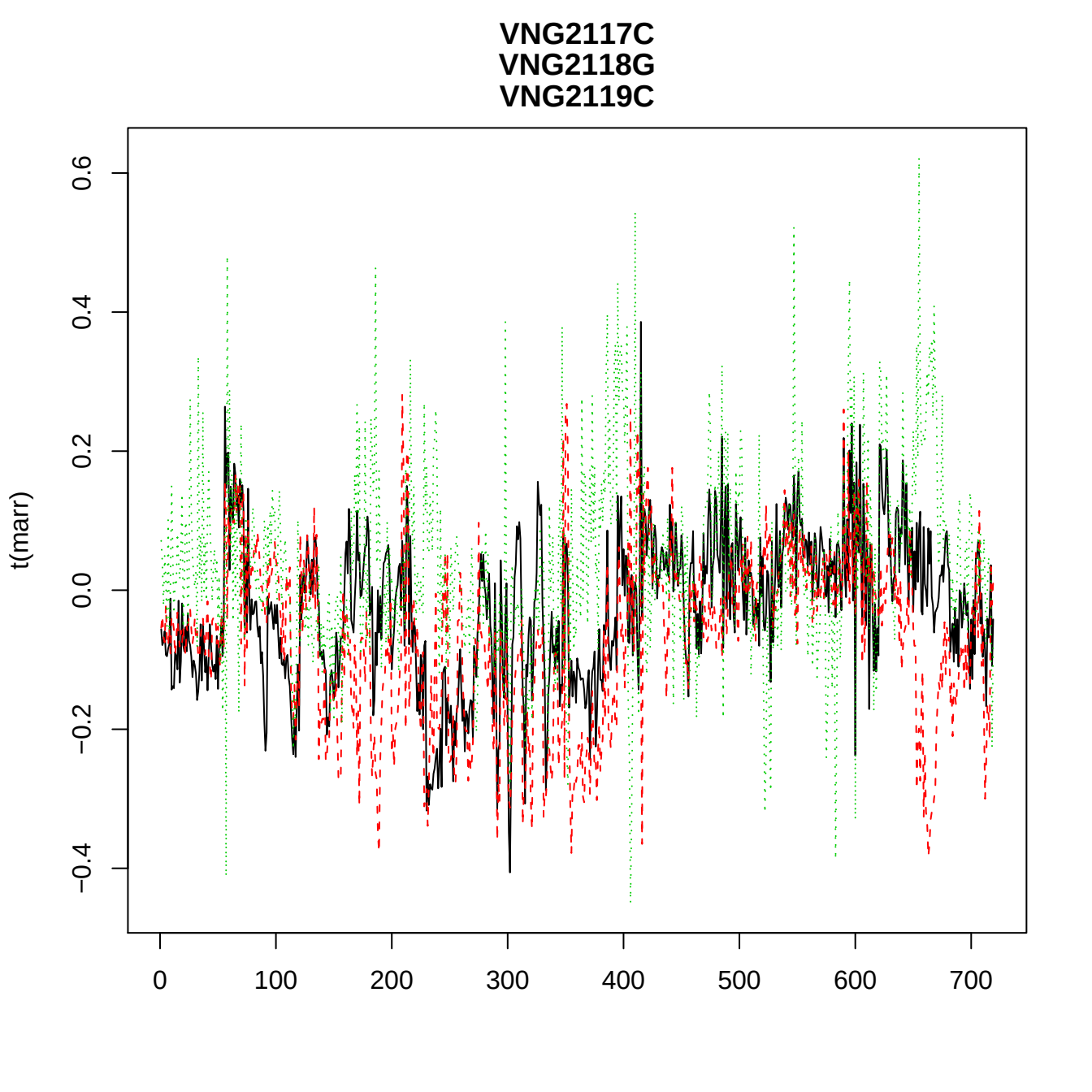

1530000
1530500
1531000
1531500
1532000
1532500
1533000
1533500
polC
phnE
phnC
hpb
hisH2
UDG
BPD_transp_1
ABC_tran
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbA
tfbD
tfbF
pred

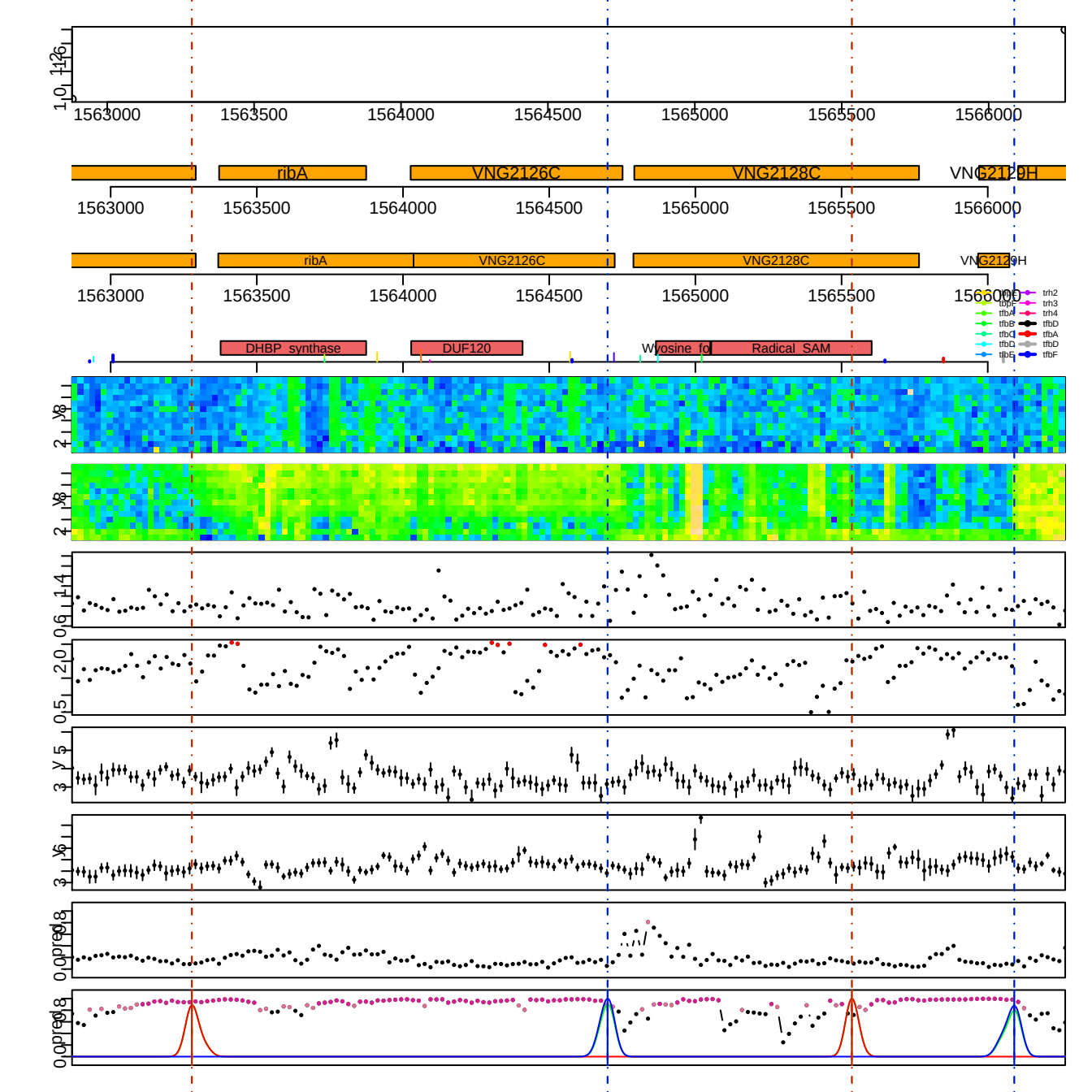

VNG2084G
VNG2085G
VNG2086G
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

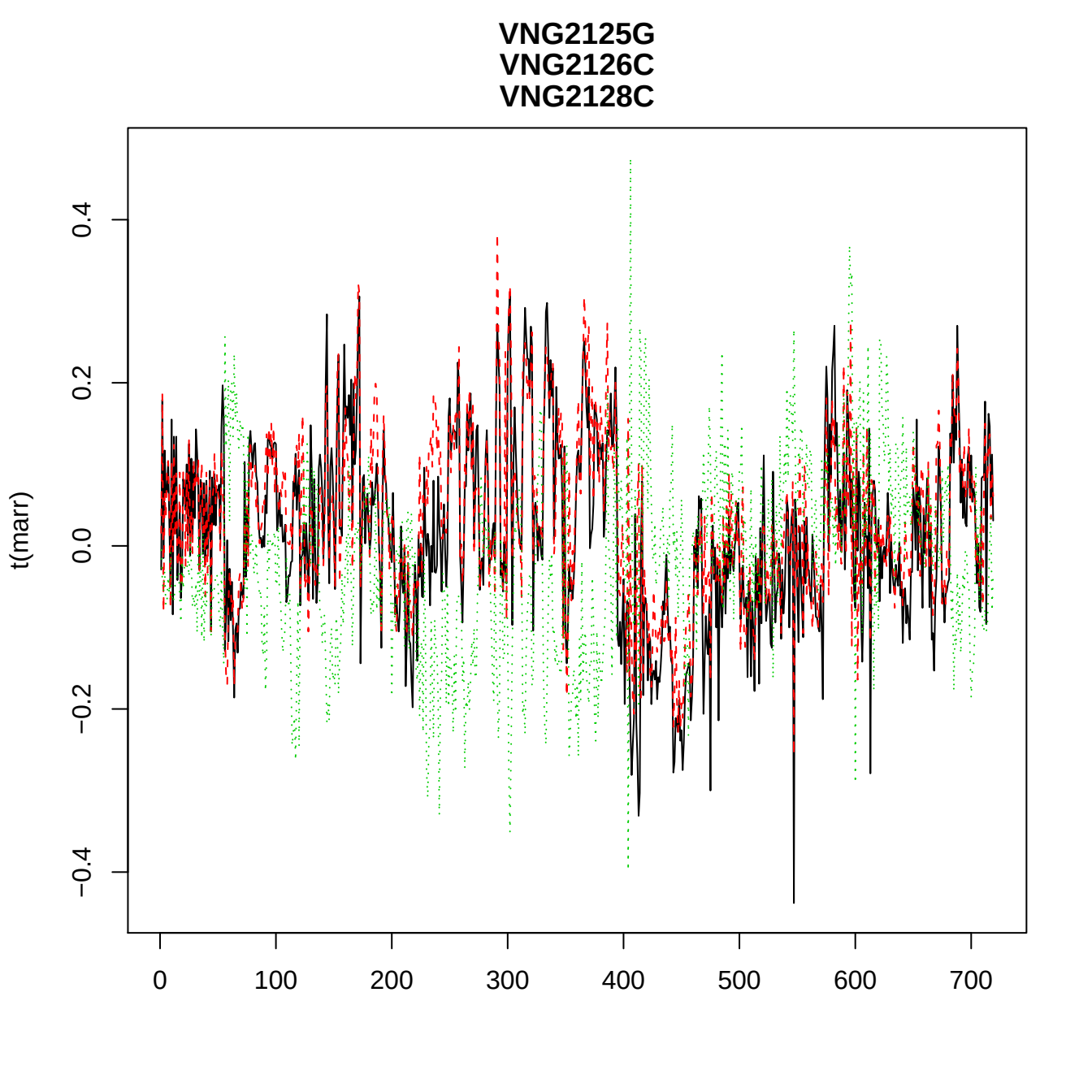

1542000
1542500
1543000
1543500
1544000
1544500
VNG2098H
VNG2099C
iluA
VNG2101H
Ribonuc_L−PSP
PALP
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

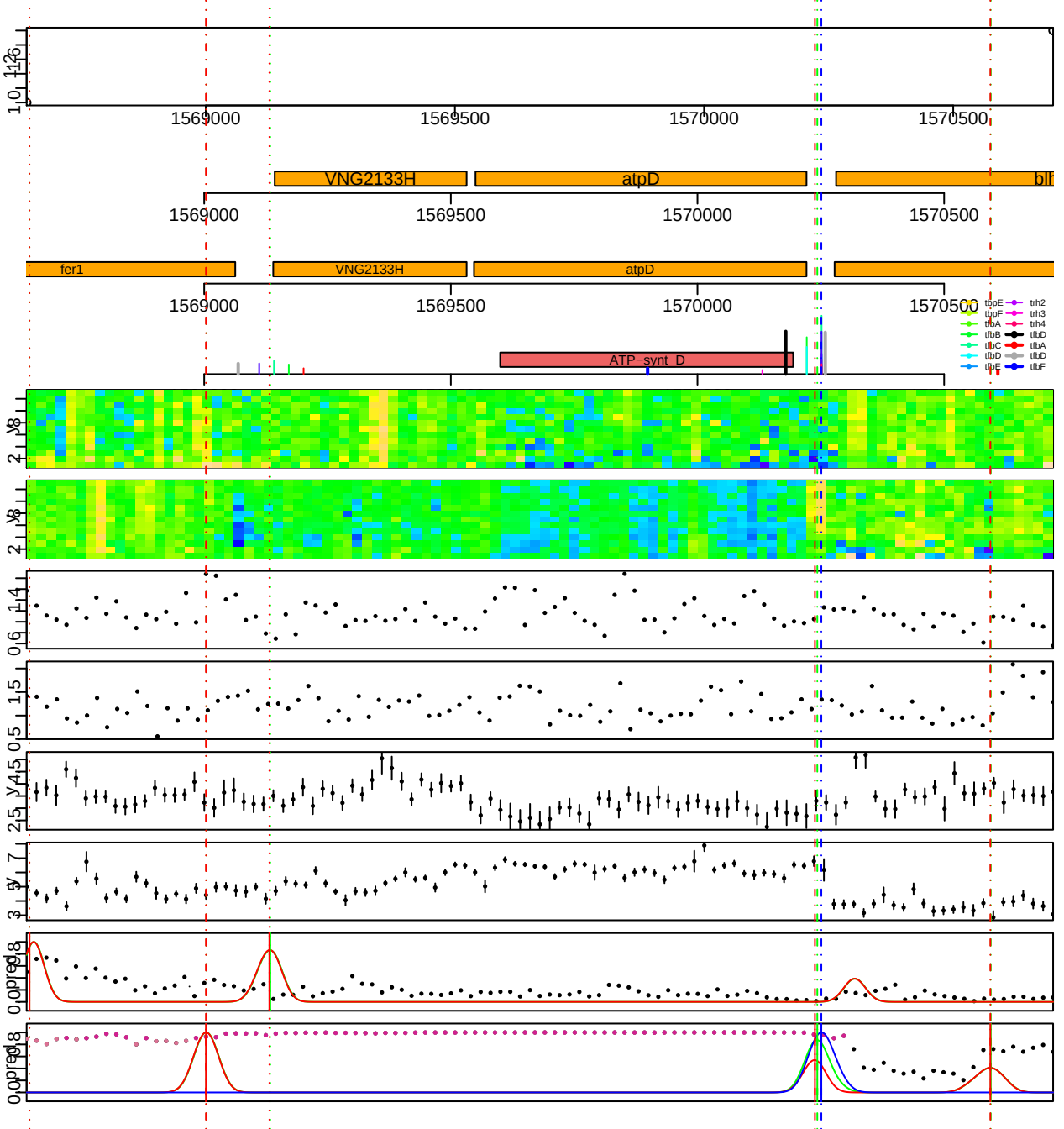

VNG2099C
VNG2100G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

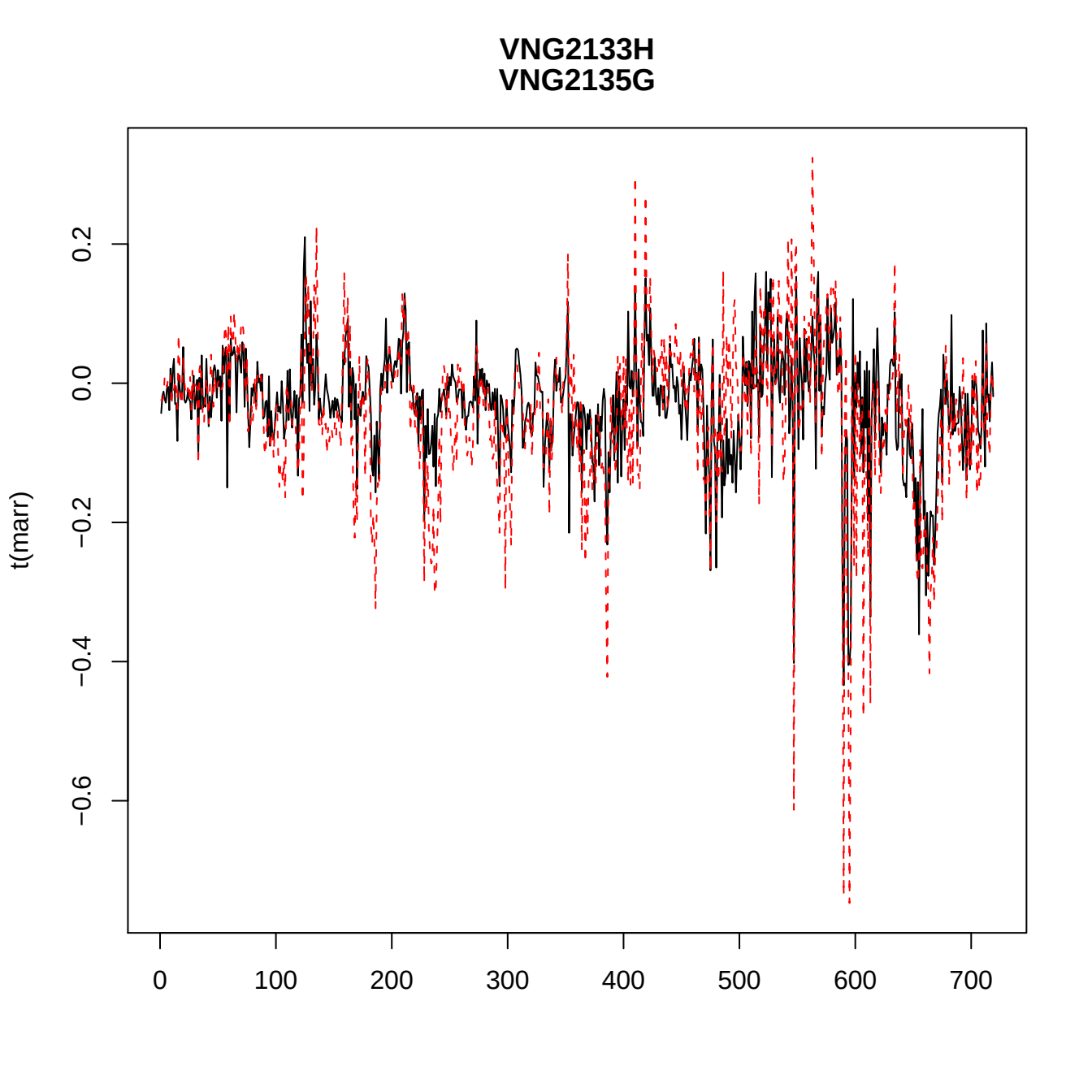

1555000
1555500
1556000
1556500
1557000
1557500
yusM
VNG2117C
pyrE2
VNG2119C
Pribosyltran
Pribosyltran
DUF46
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbG
tfbA
tfbD
tfbF
pred

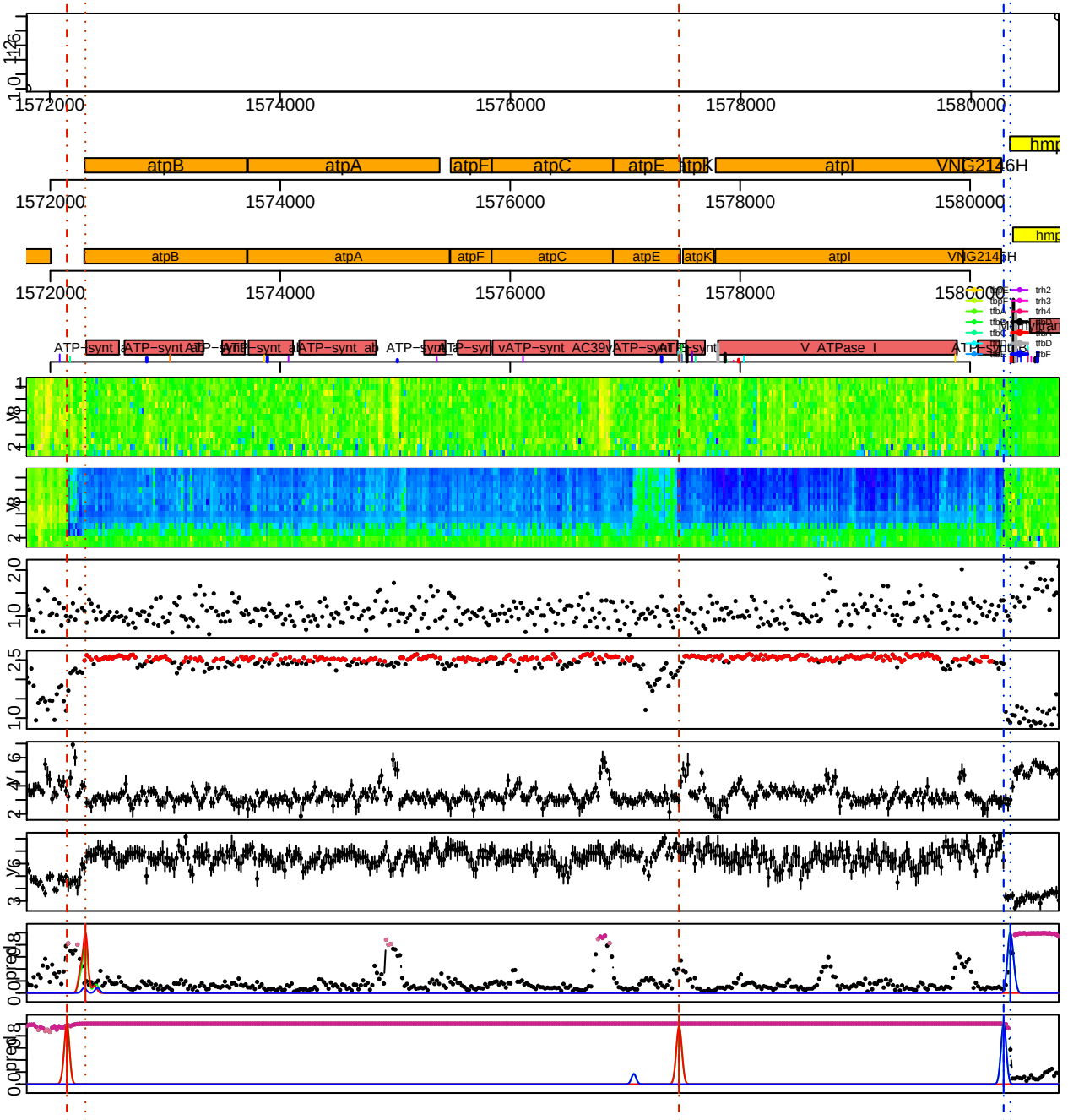

VNG2117C
VNG2118G
VNG2119C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

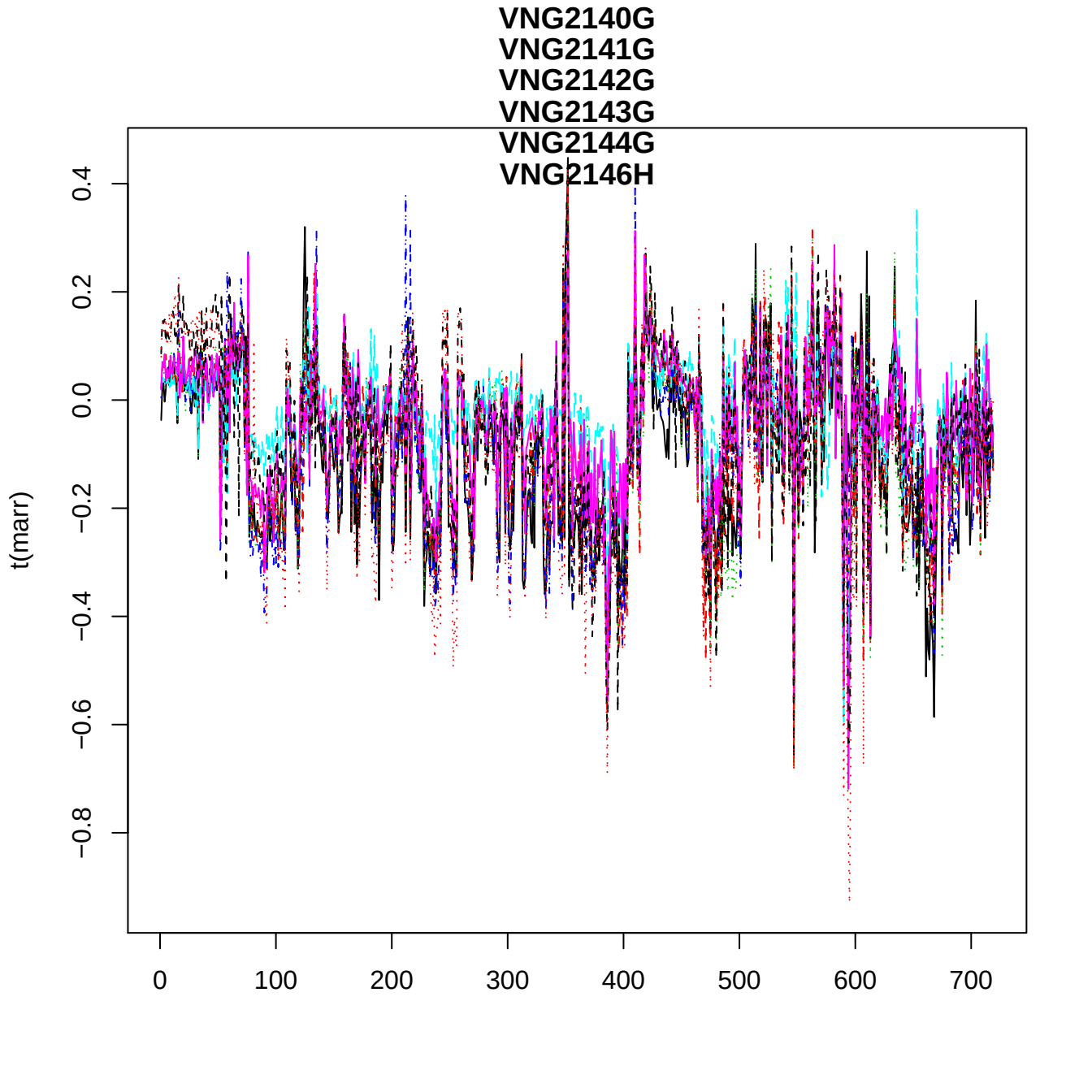

1563000
1563500
1564000
1564500
1565000
1565500
1566000
ribA
VNG2126C
VNG2128C
VNG2129H
DHBP_synthase
DUF120
Wyosine_fo
Radical_SAM
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbA
tfbD
tfbF

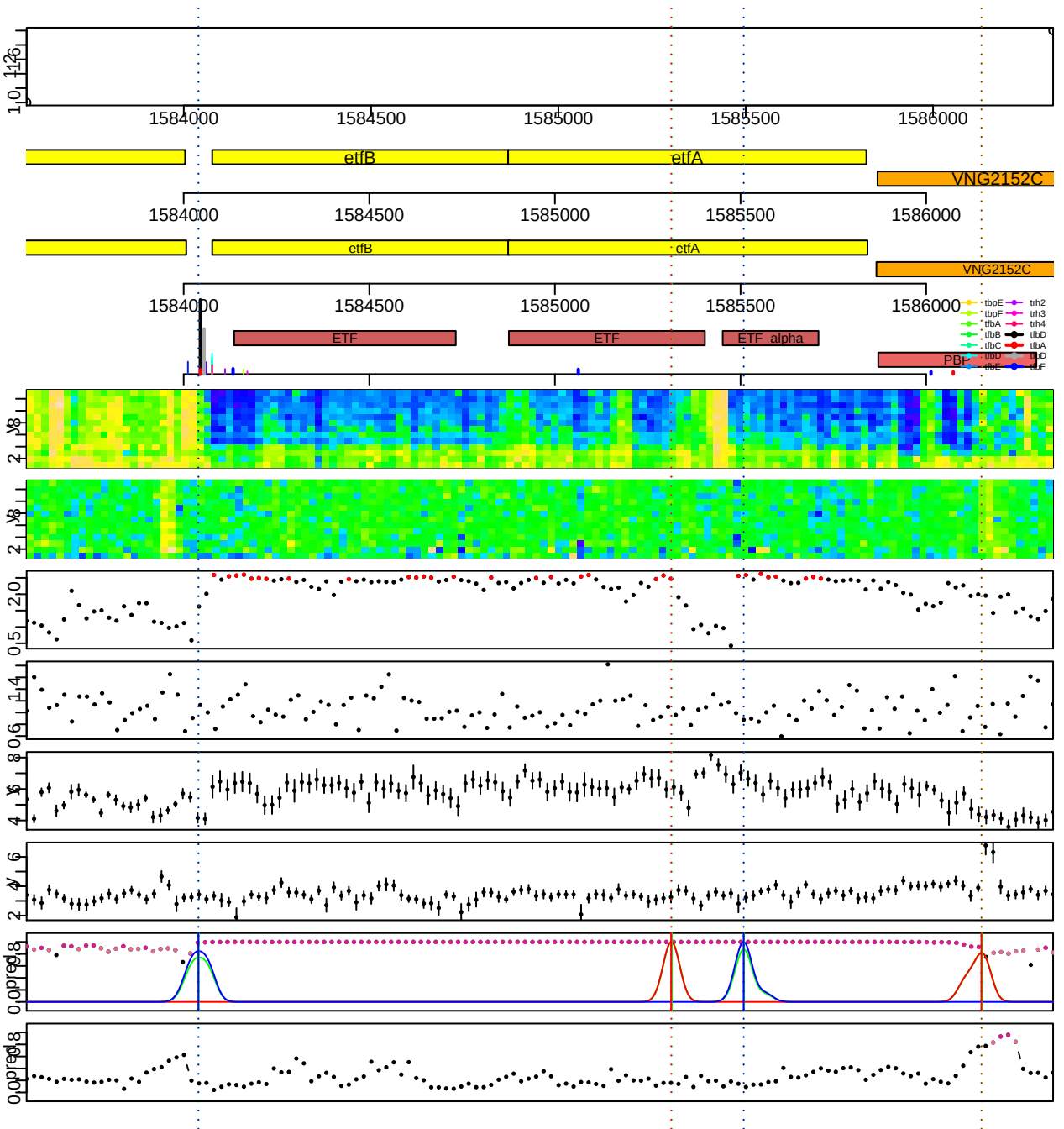

VNG2125G
VNG2126C
VNG2128C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

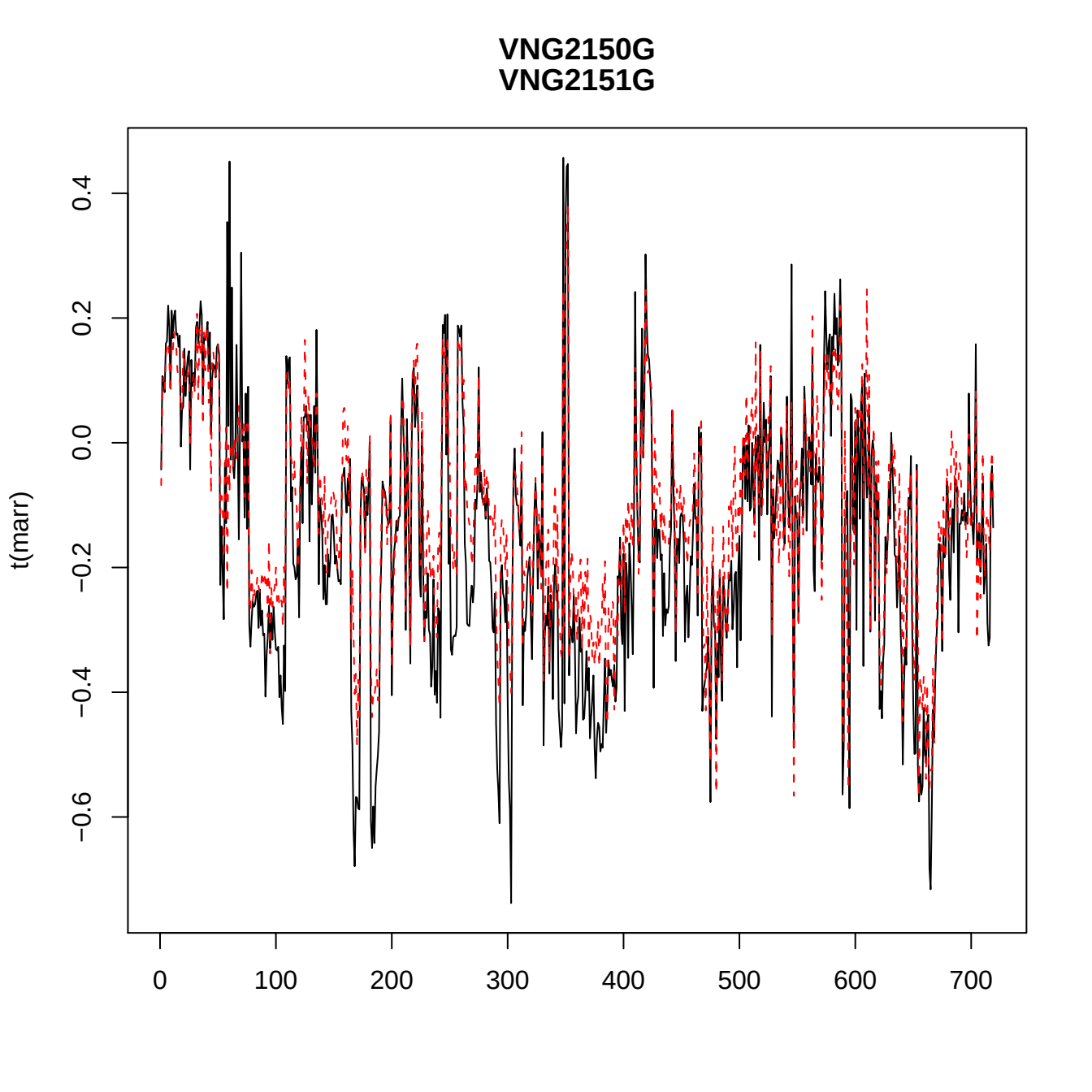

1569000
1569500
1570000
1570500
VNG2133H
atpD
fer1
ATP−synt_D
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

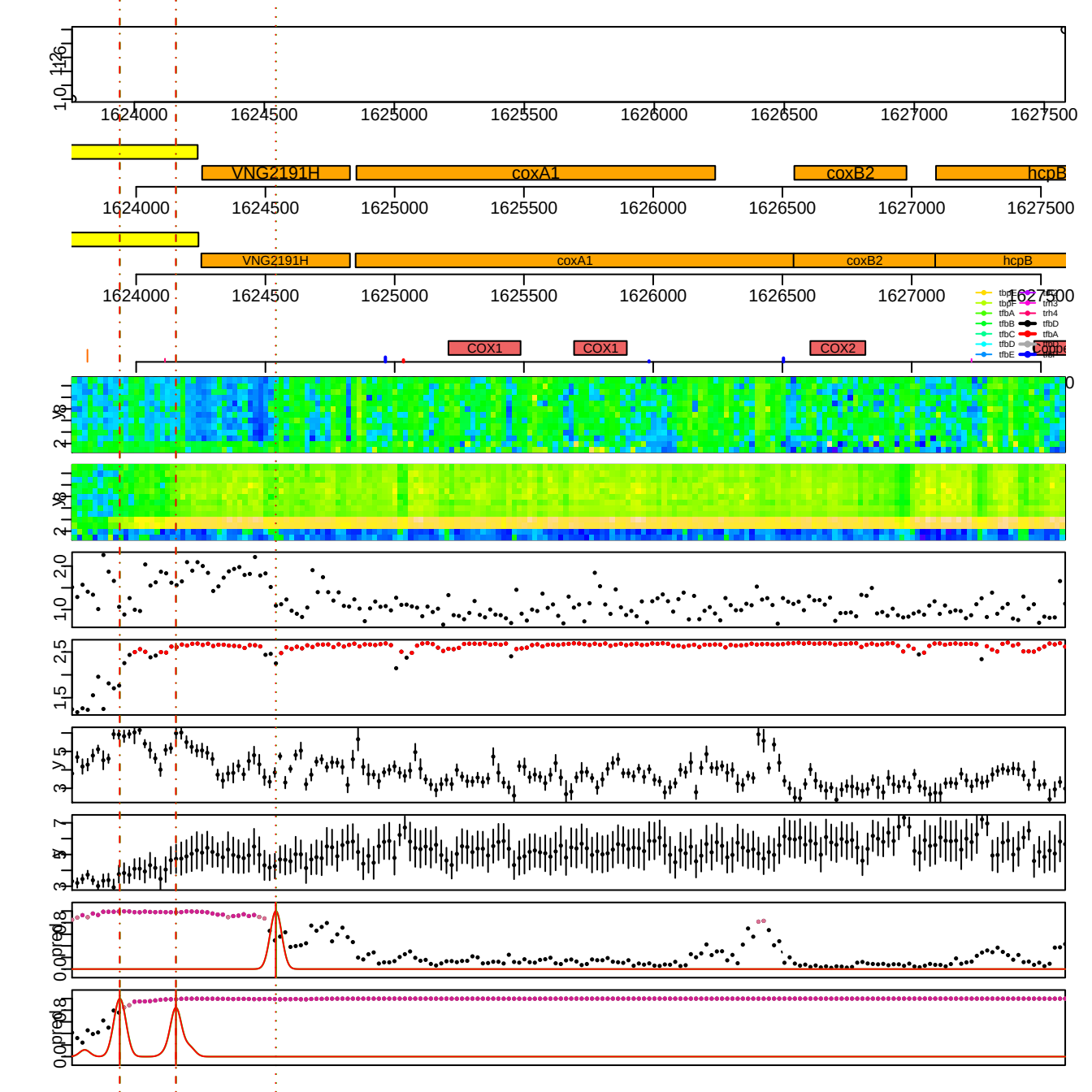

VNG2133H
VNG2135G
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

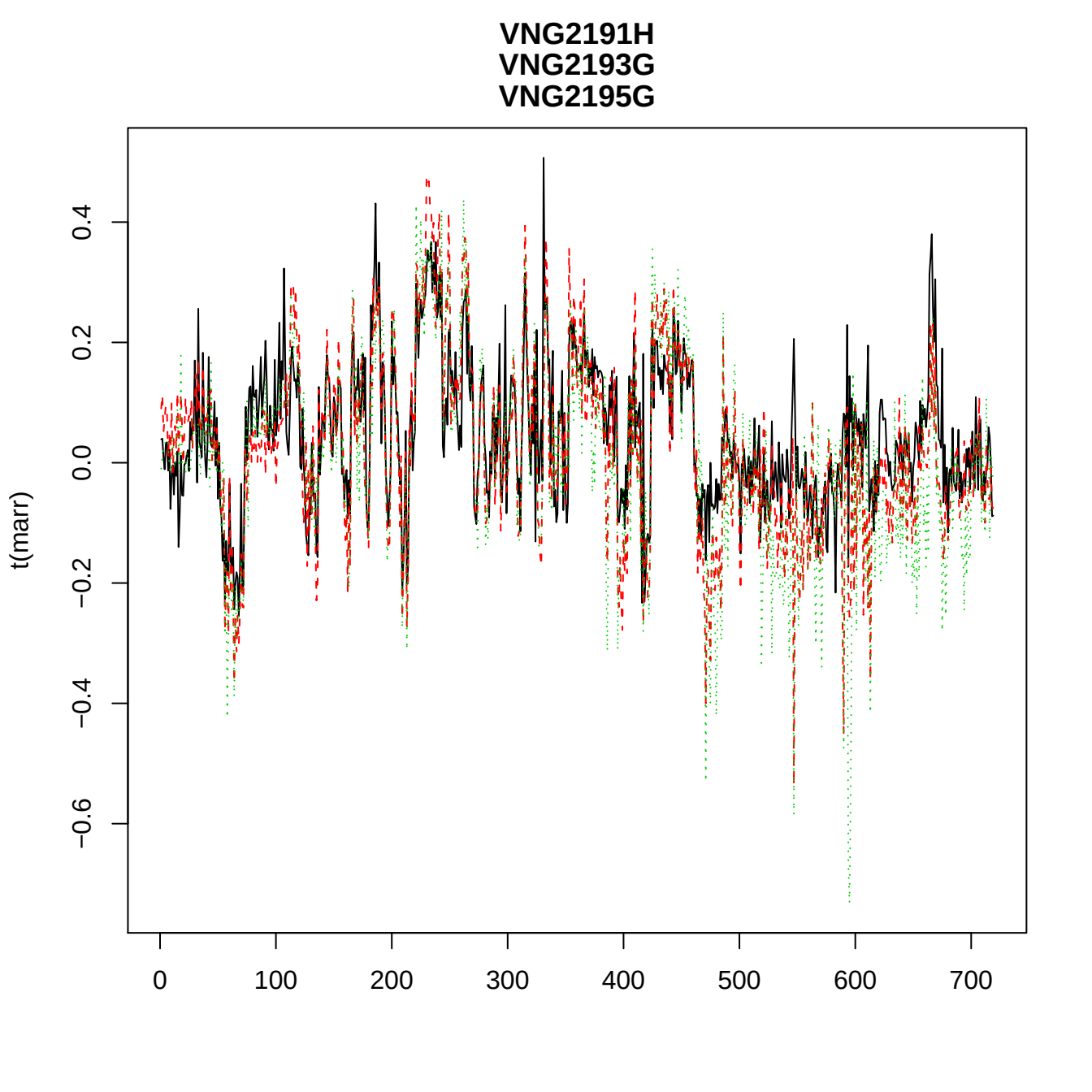

1572000
1574000
1576000
1578000
1580000
atpB
atpA
atpF
atpC
atpE
atpK
atpI
VNG2146H
hmp
ATP-synt
ATP-synt_A
ATP-synt_AB
ATP-synt_ab
vATP-synt_AC39
V_ATPase_I
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbF
pred

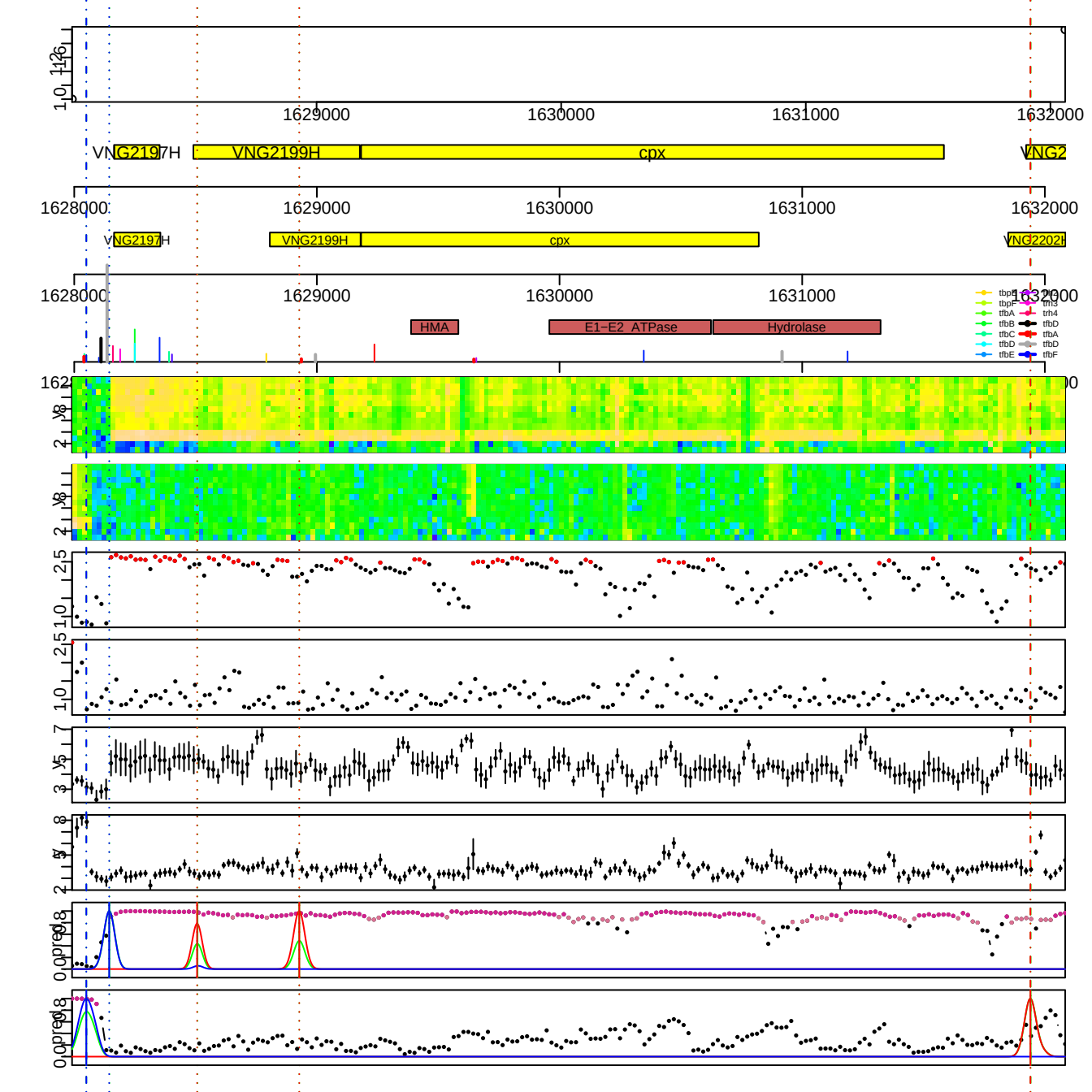

VNG2140G
VNG2141G
VNG2142G
VNG2143G
VNG2144G
VNG2146H
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

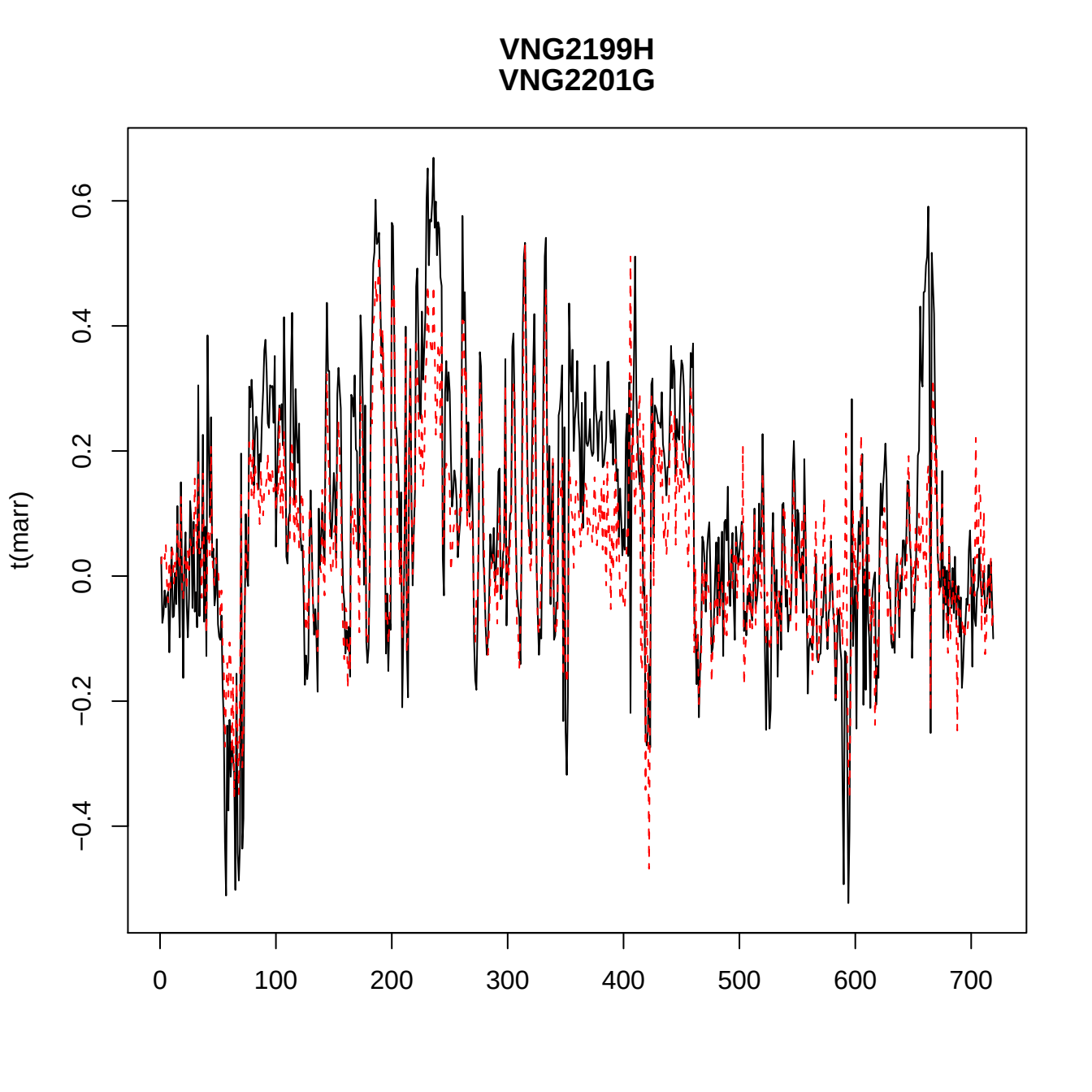

1584000
1584500
1585000
1585500
1586000
etfB
etfA
VNG2152C
ETF
ETF
ETF alpha
PBP
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG2150G
VNG2151G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


1624000
1624500
1625000
1625500
1626000
1626500
1627000
1627500
VNG2191H
coxA1
coxB2
hcpB
COX1
COX1
COX2
COXB
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
coxB
tbpE


VNG2191H
VNG2193G
VNG2195G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


1629000
1630000
1631000
1632000
VNG2197H
VNG2199H
cpx
VNG2202H
1628000
HMA
E1−E2_ATPase
Hydrolase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2199H
VNG2201G
t(marr)
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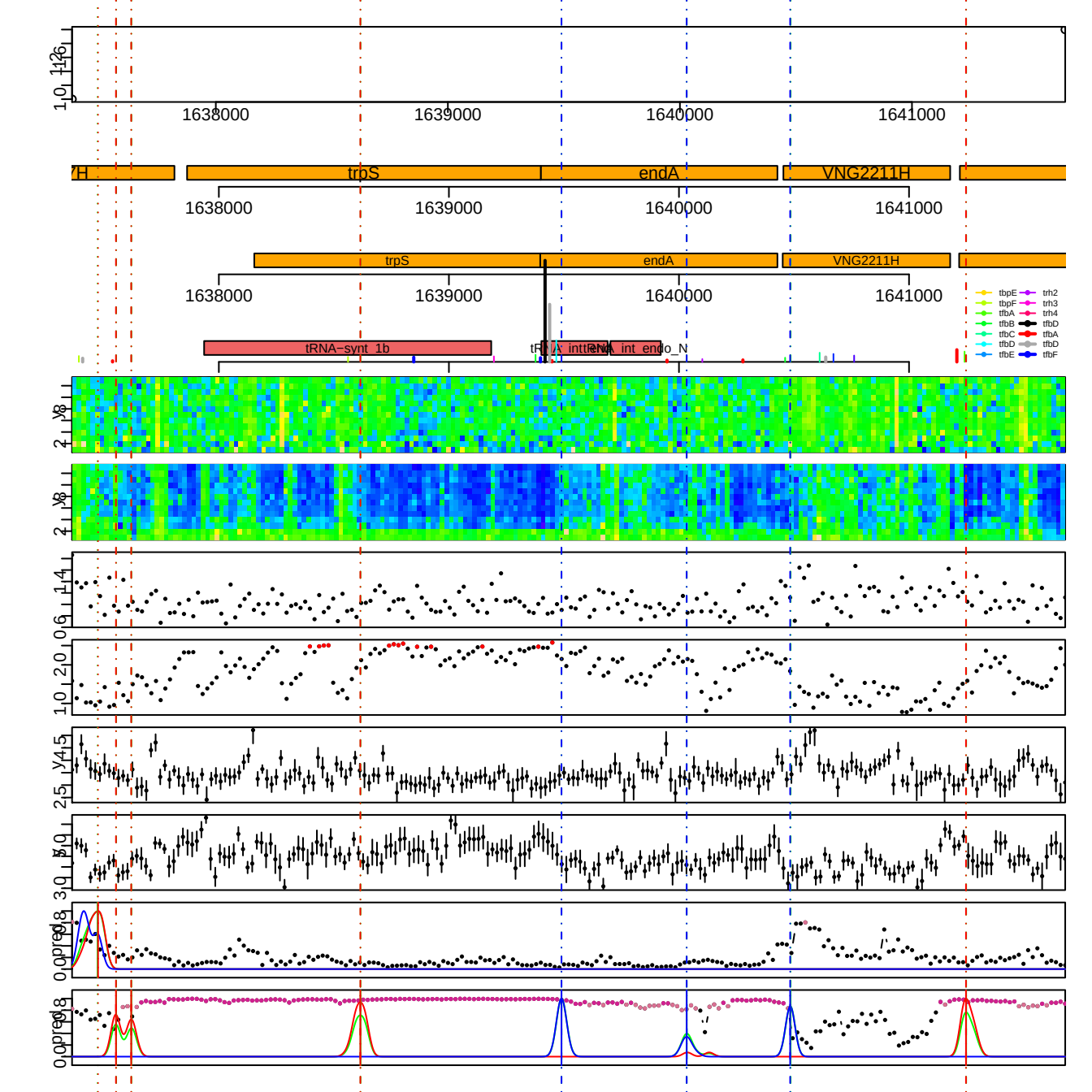
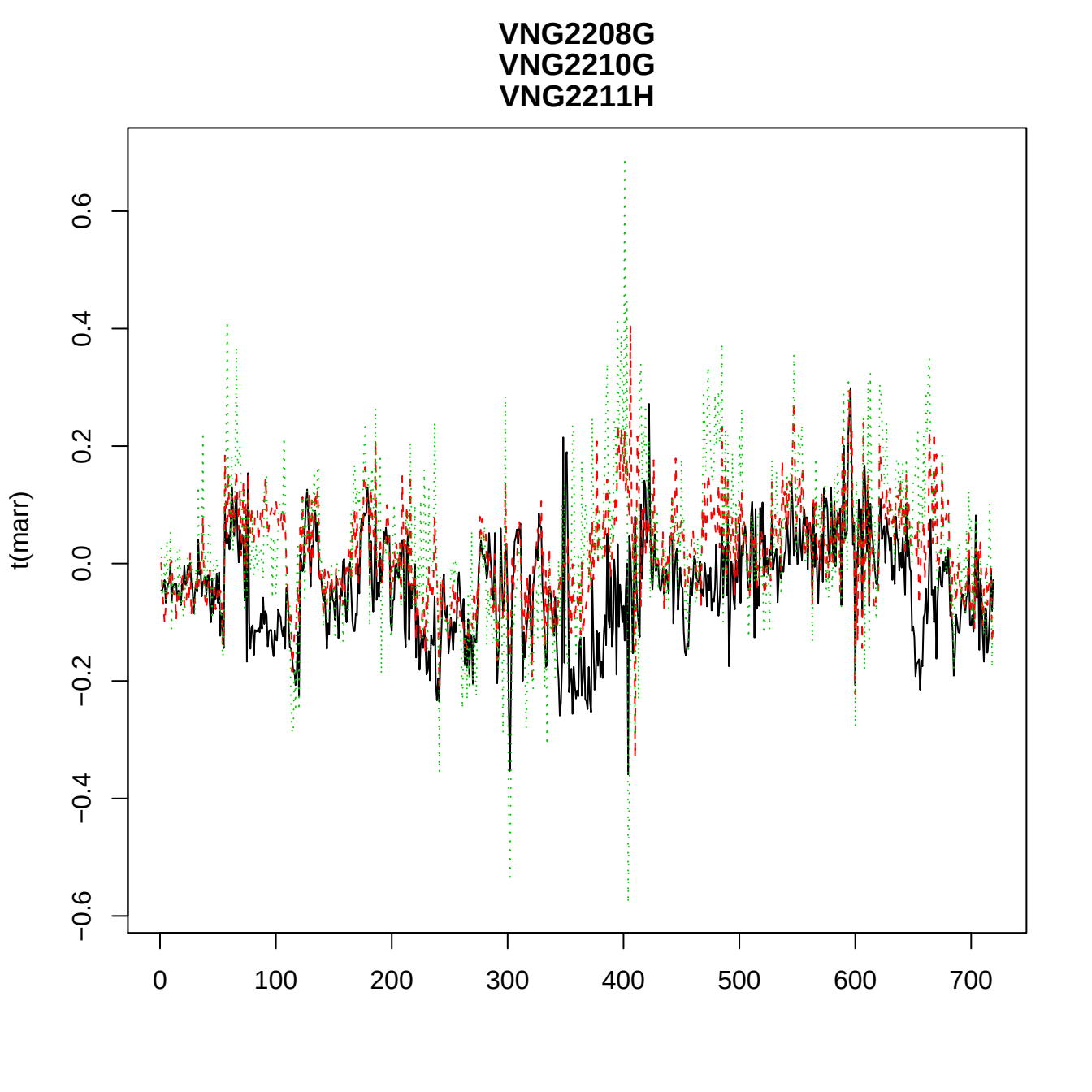
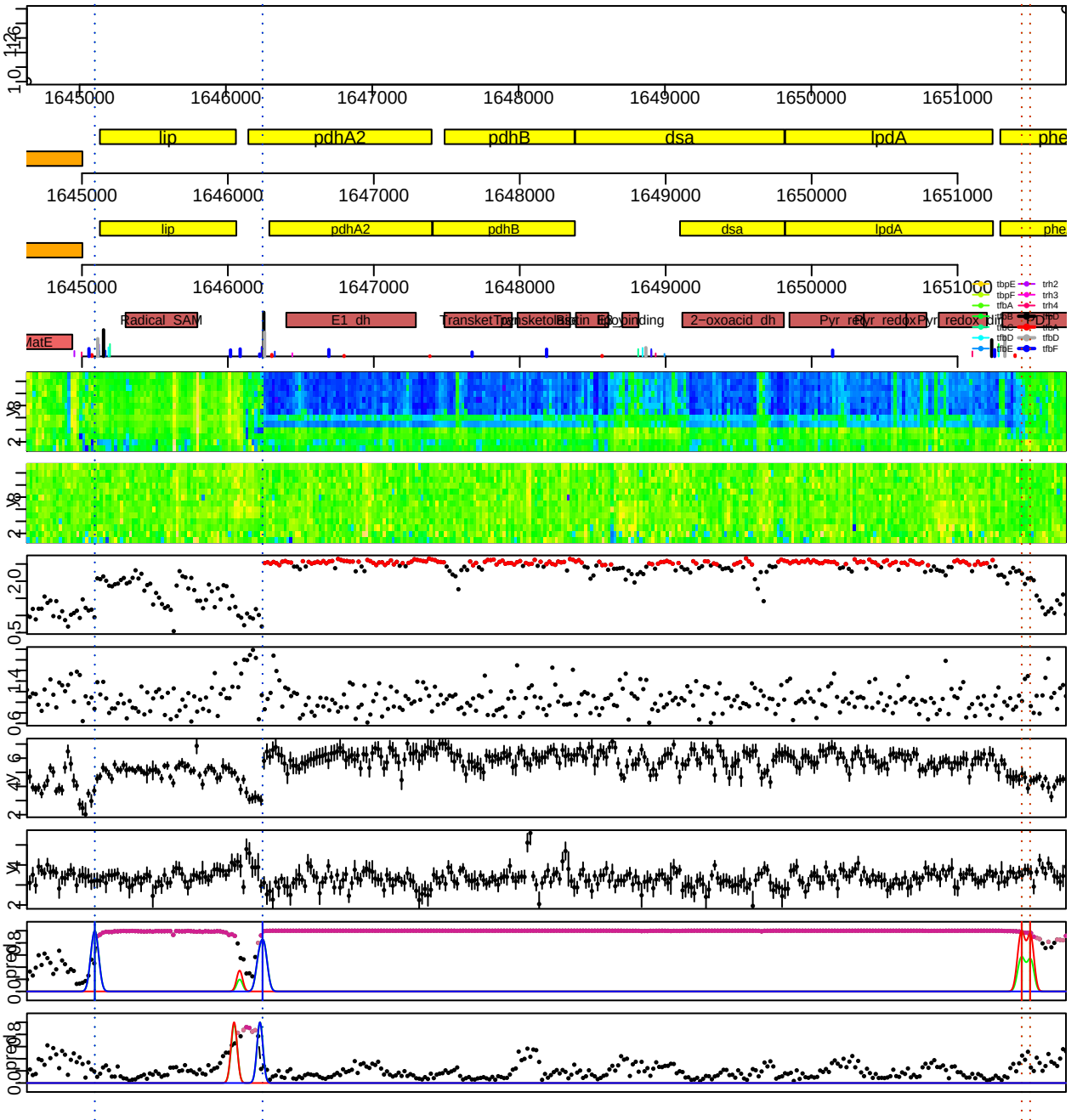
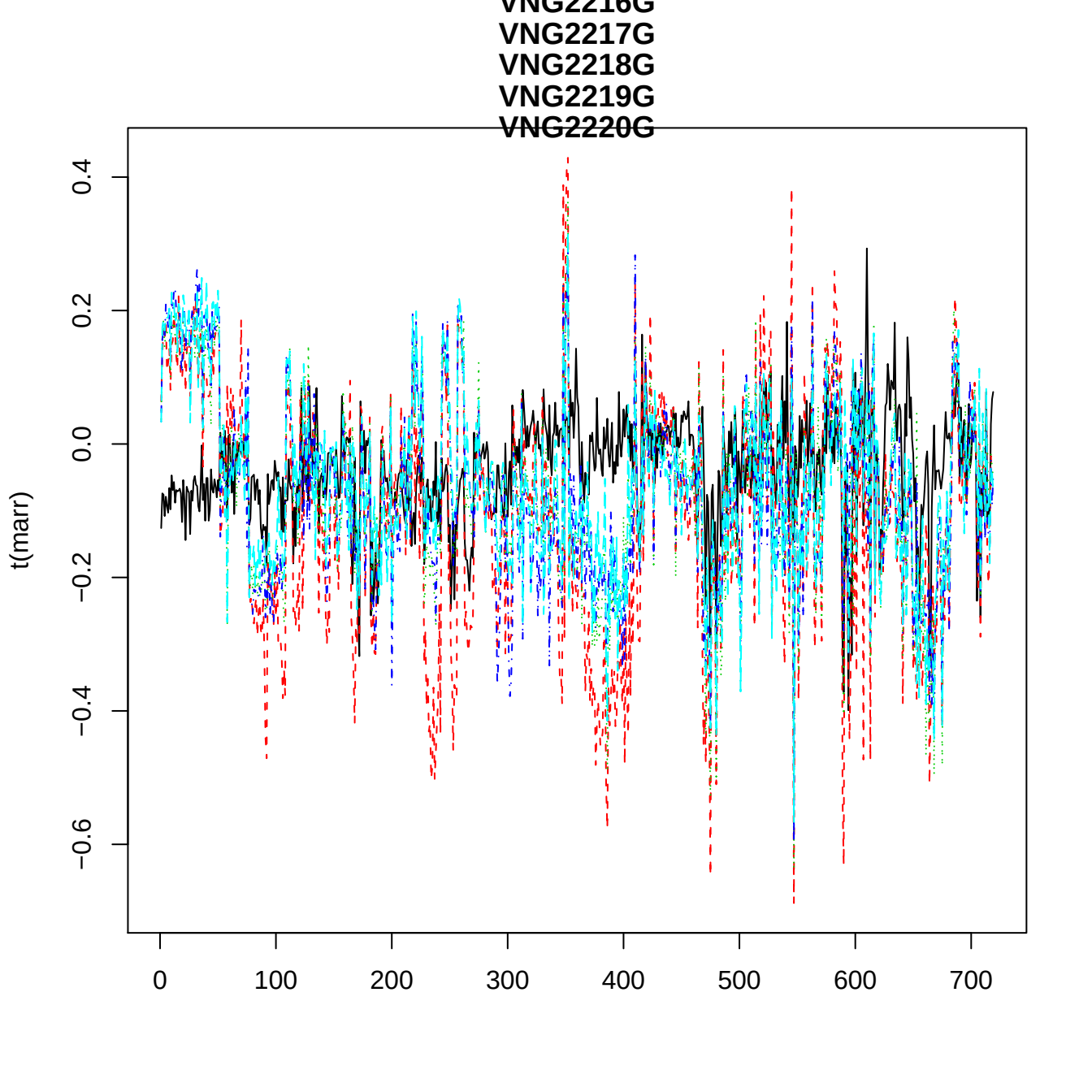
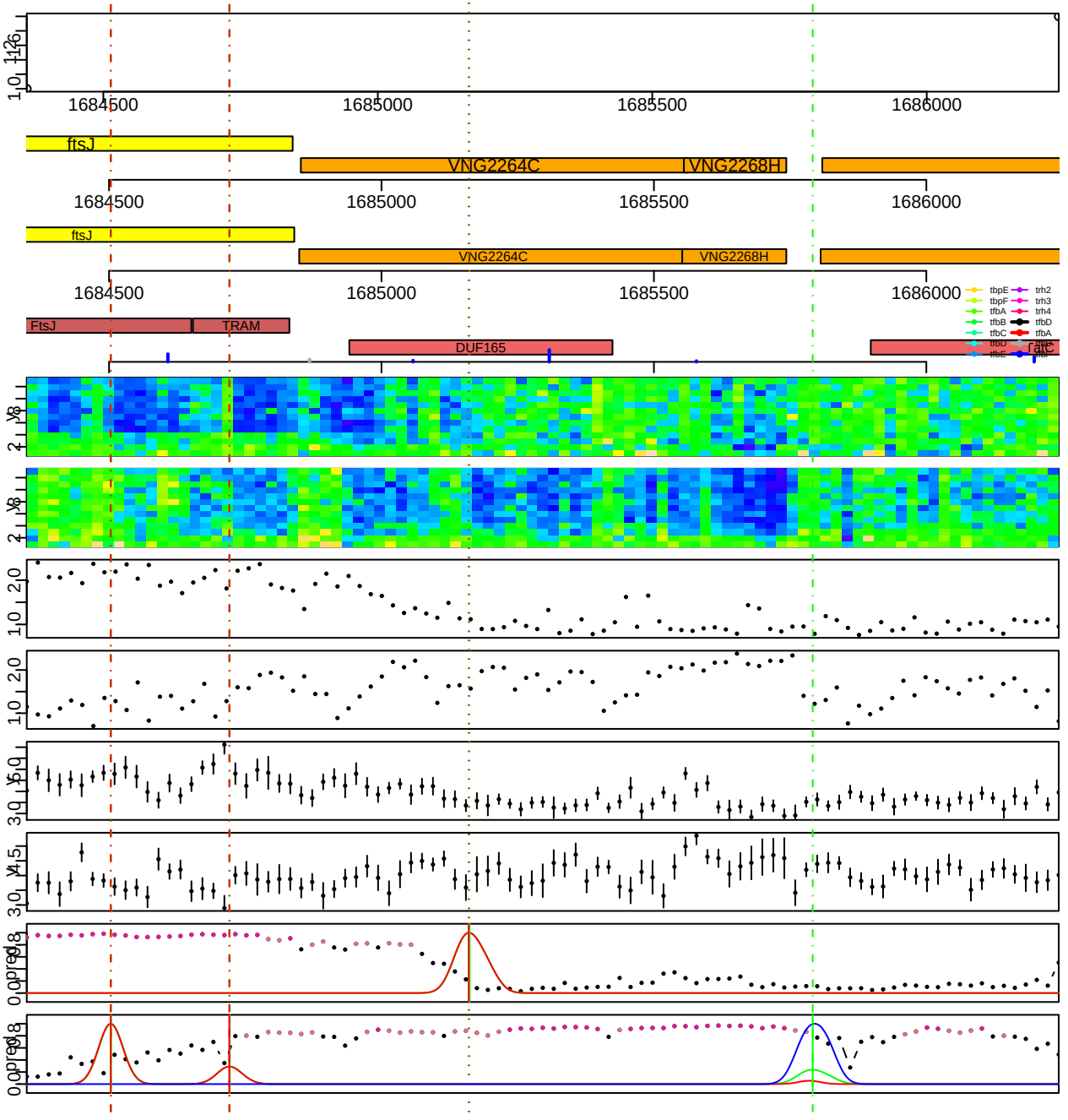
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1638000
1639000
1640000
1641000
trpS
endA
VNG2211H
tRNA−synt_1b
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

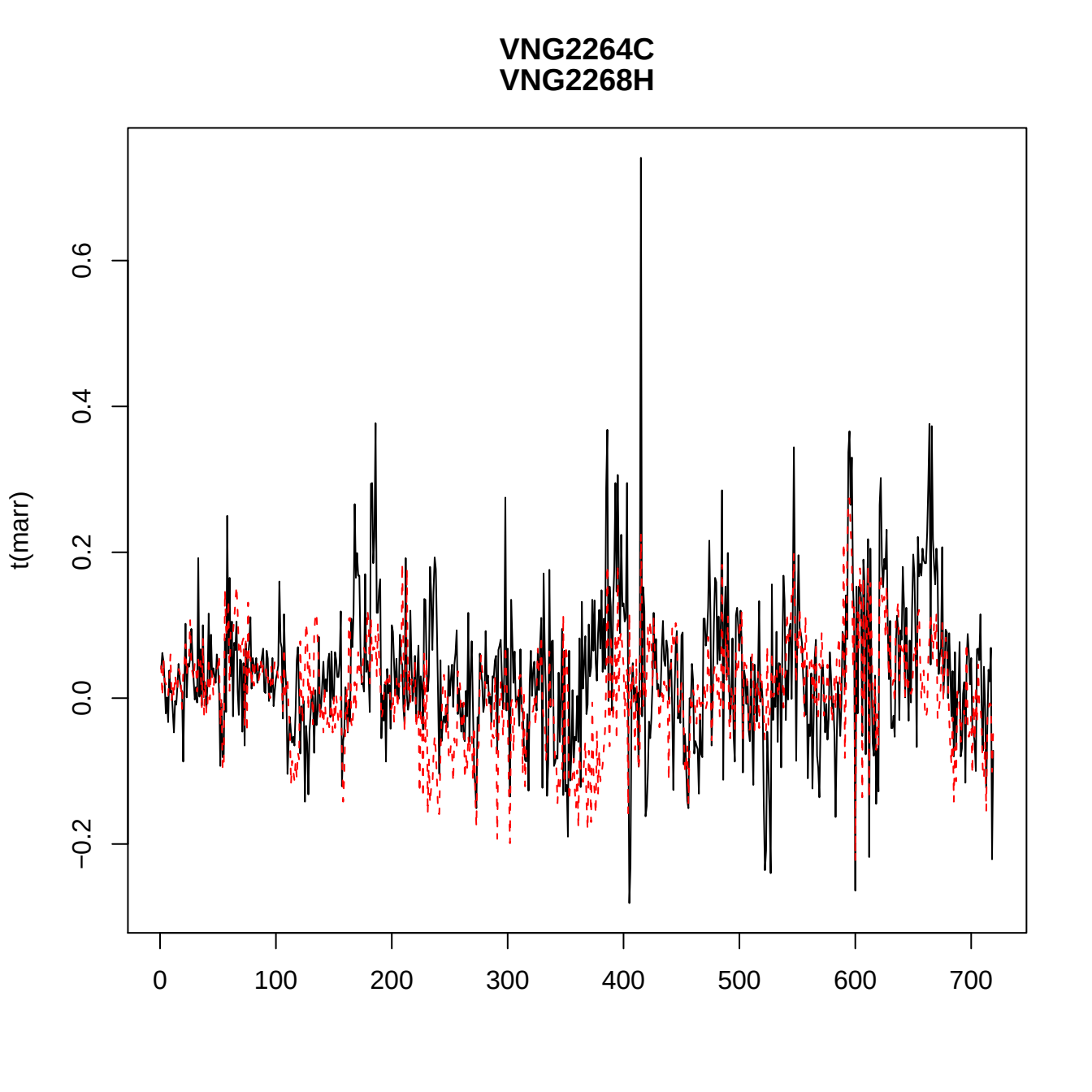

VNG2208G
VNG2210G
VNG2211H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

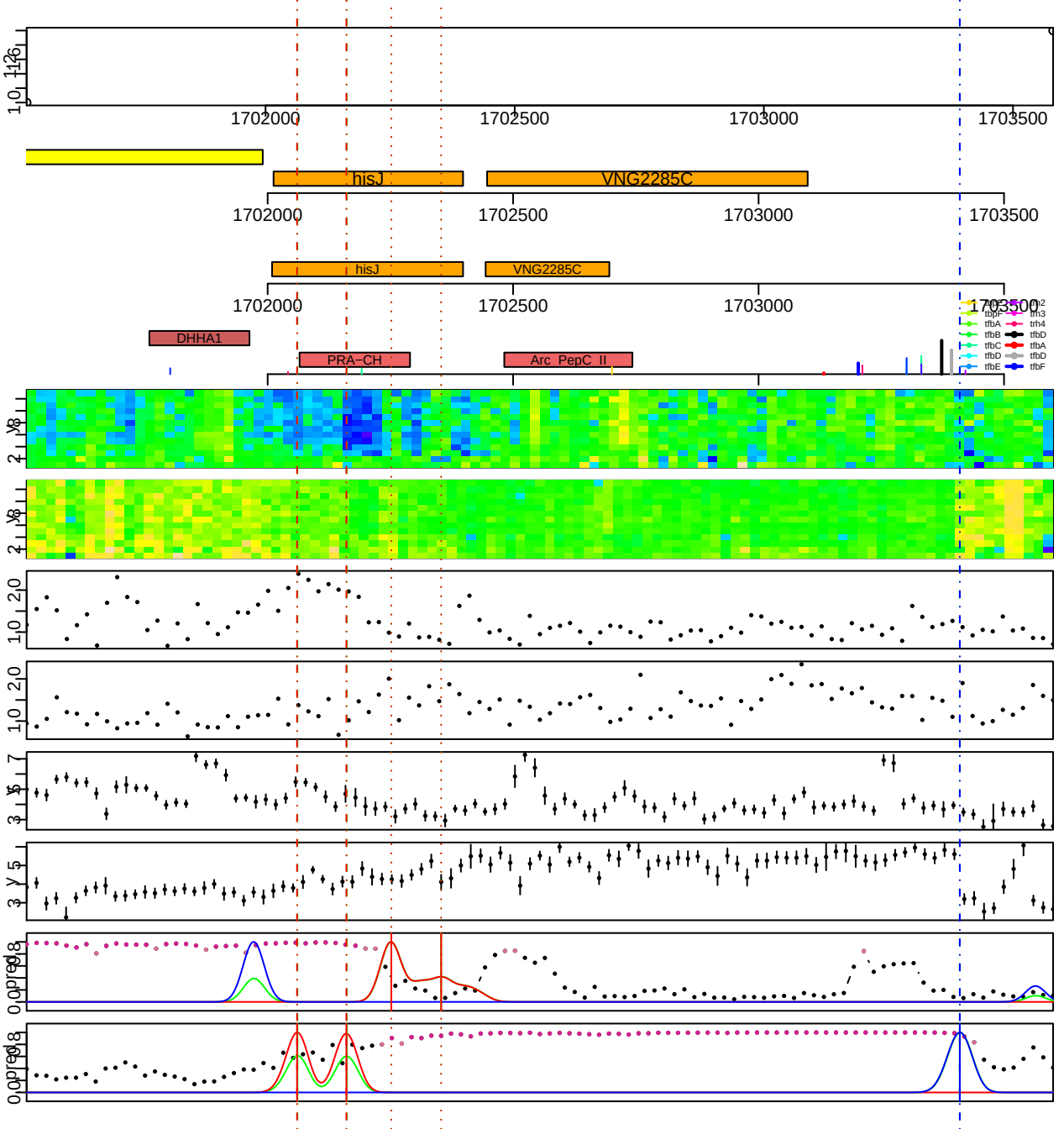

1645000
1646000
1647000
1648000
1649000
1650000
1651000
lip
pdhA2
pdhB
dsa
lpdA
phe
Radical_SAM
E1_dh
2−oxoacid_dh
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

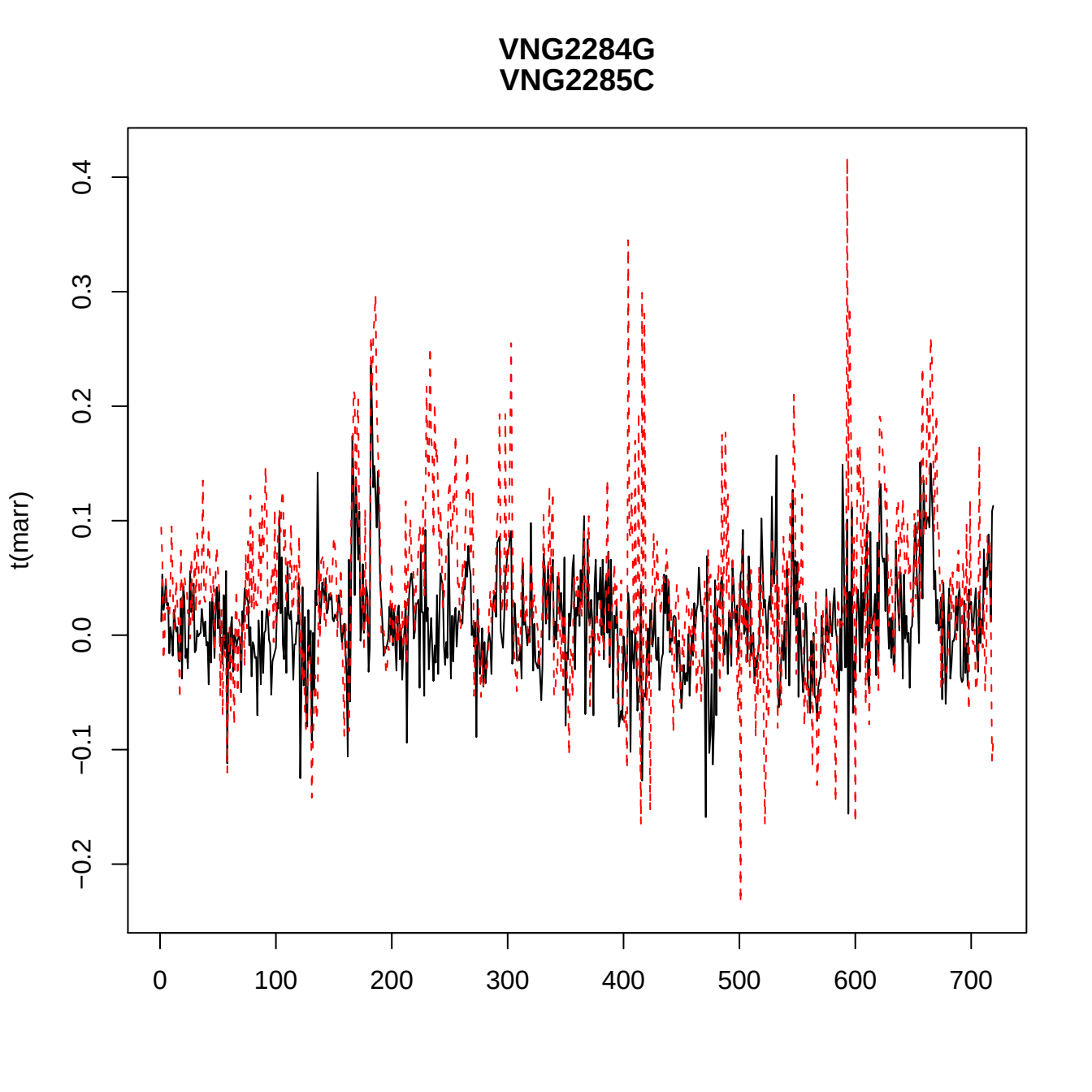

VNG2216G
VNG2217G
VNG2218G
VNG2219G
VNG2220G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

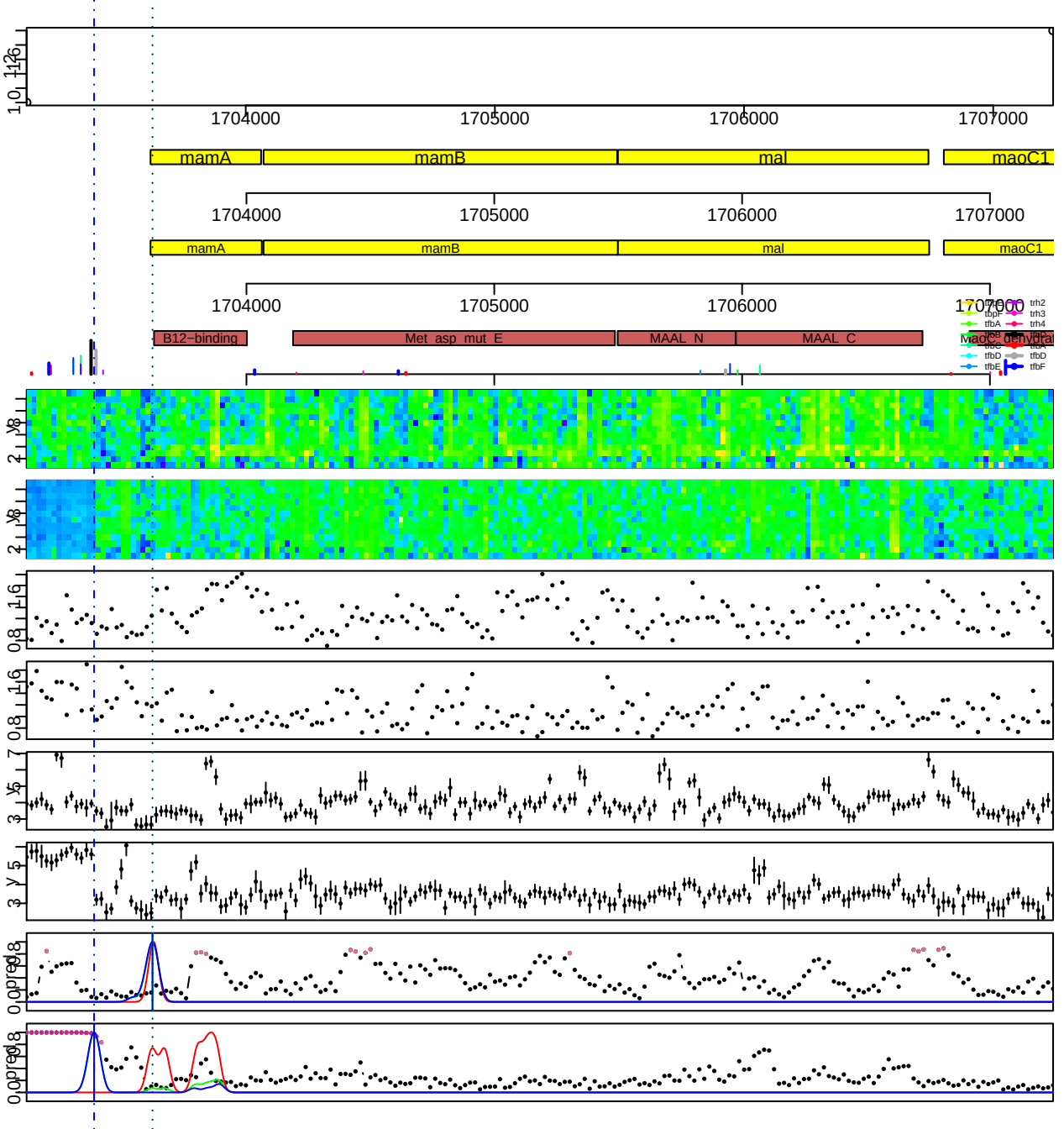


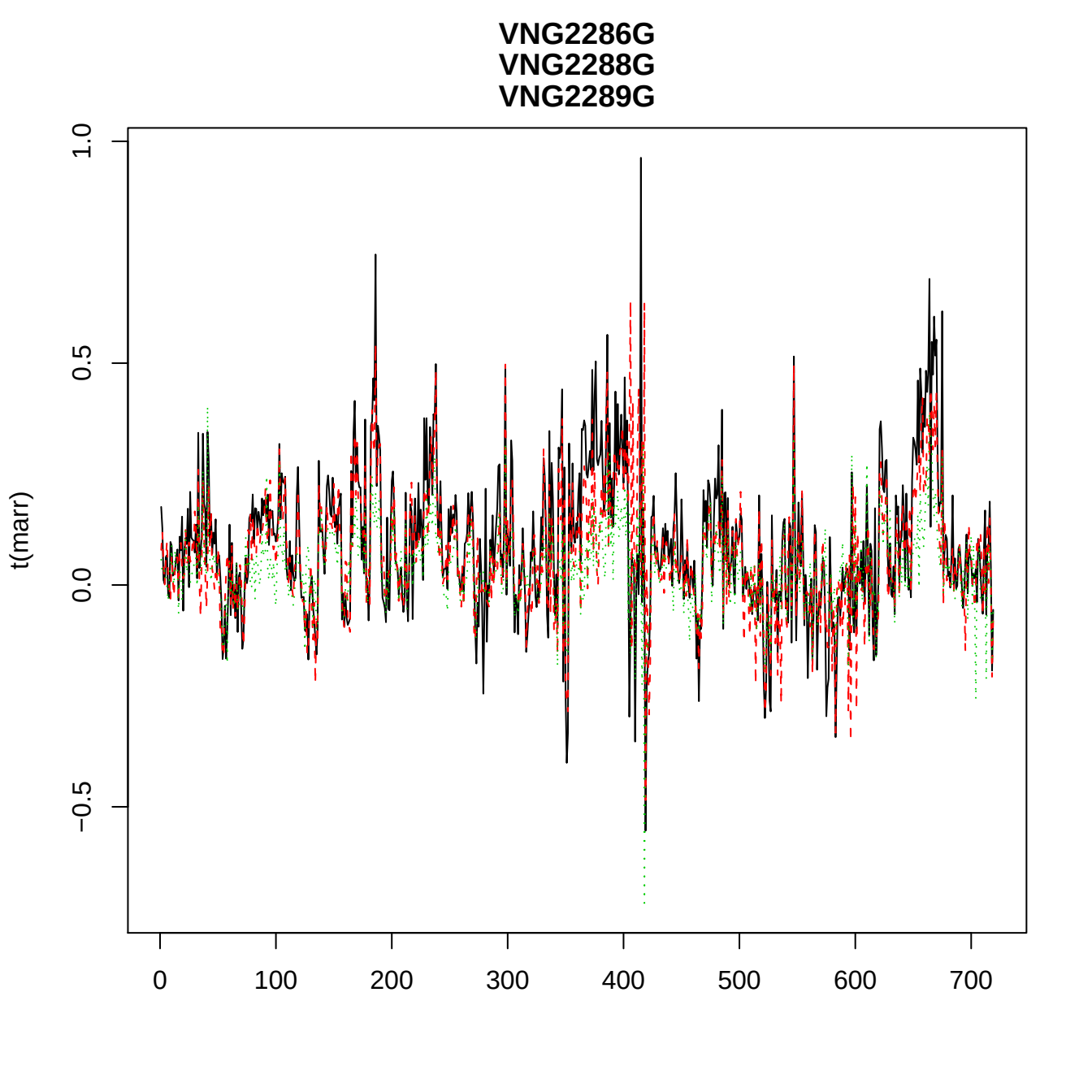
1684500
1685000
1685500
1686000
ftsJ
VNG2264C
VNG2268H
FtsJ
TRAM
DUF165
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA

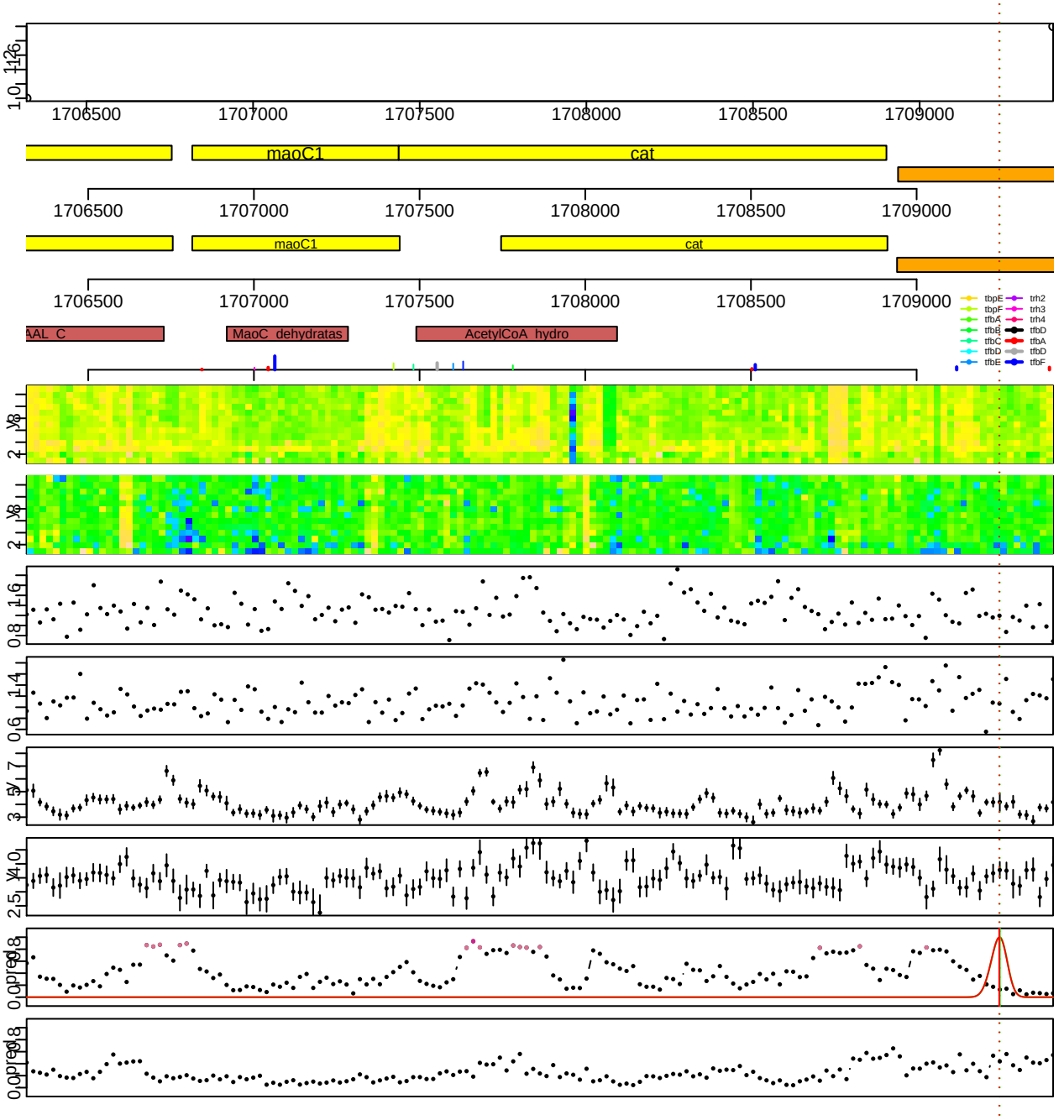

VNG2264C
VNG2268H
t(marr)
0.6
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

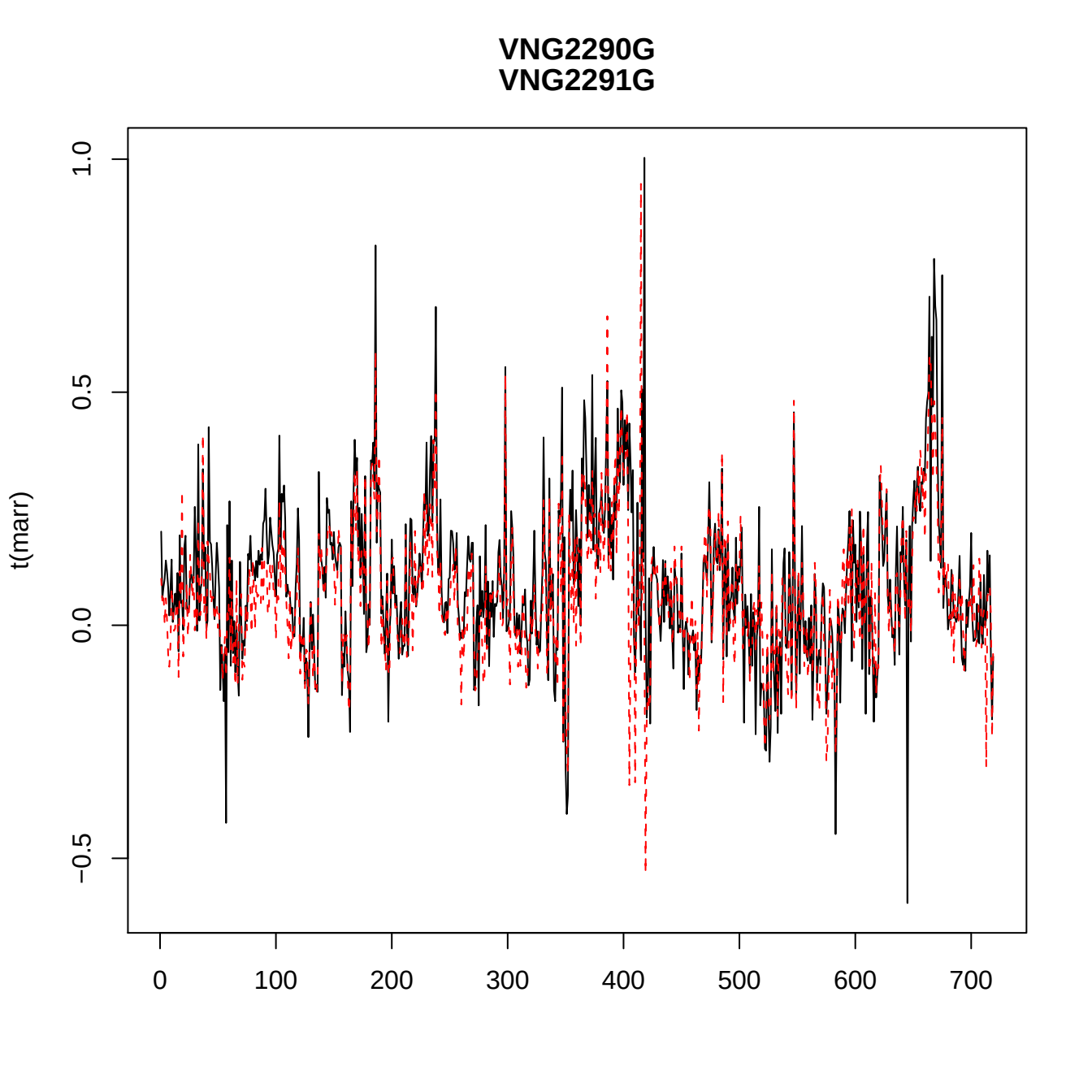

1702000
1702500
1703000
1703500
hisJ
VNG2285C
DHHA1
PRA−CH
Arc_PepC_II
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

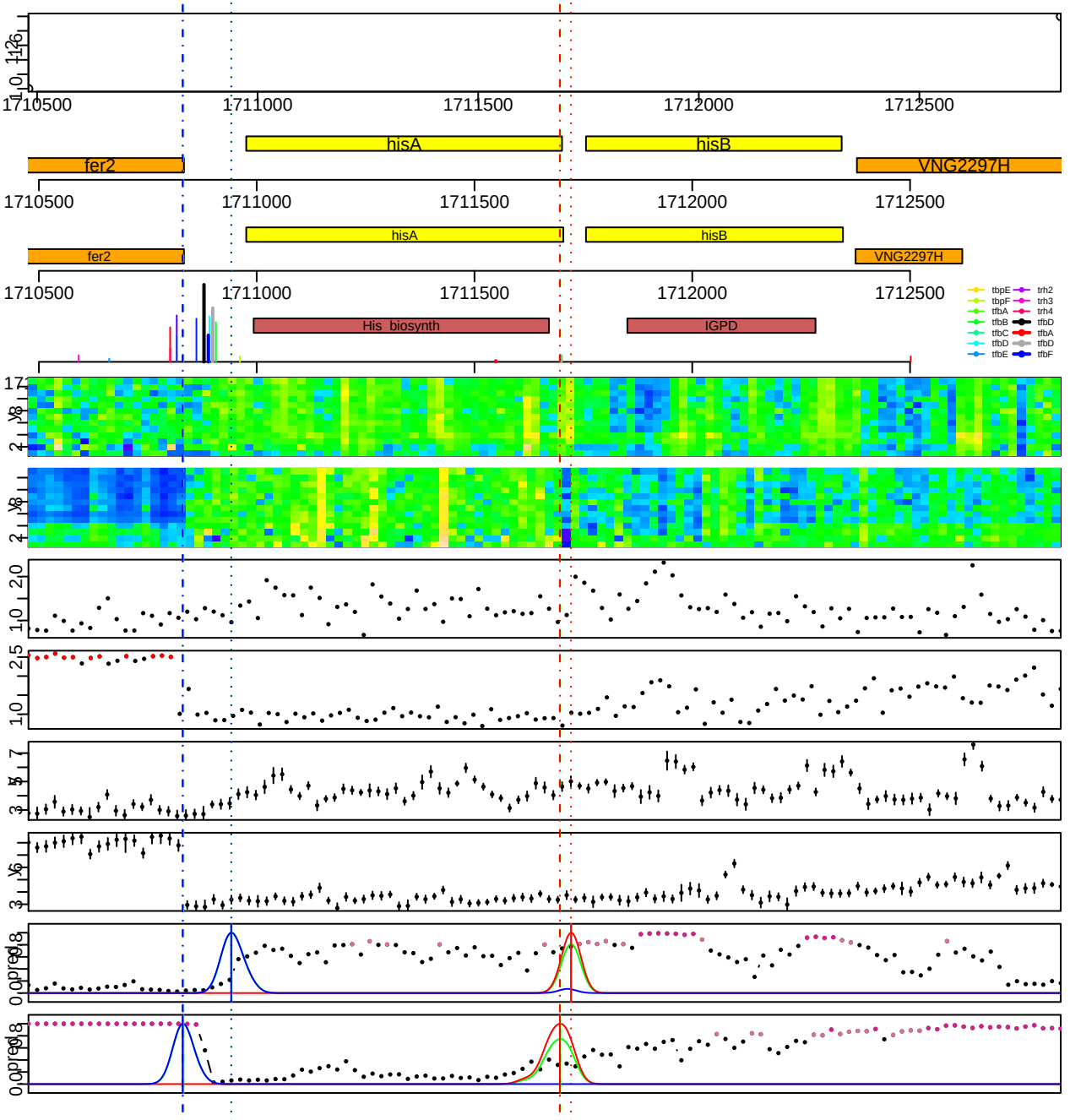

VNG2284G
VNG2285C
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

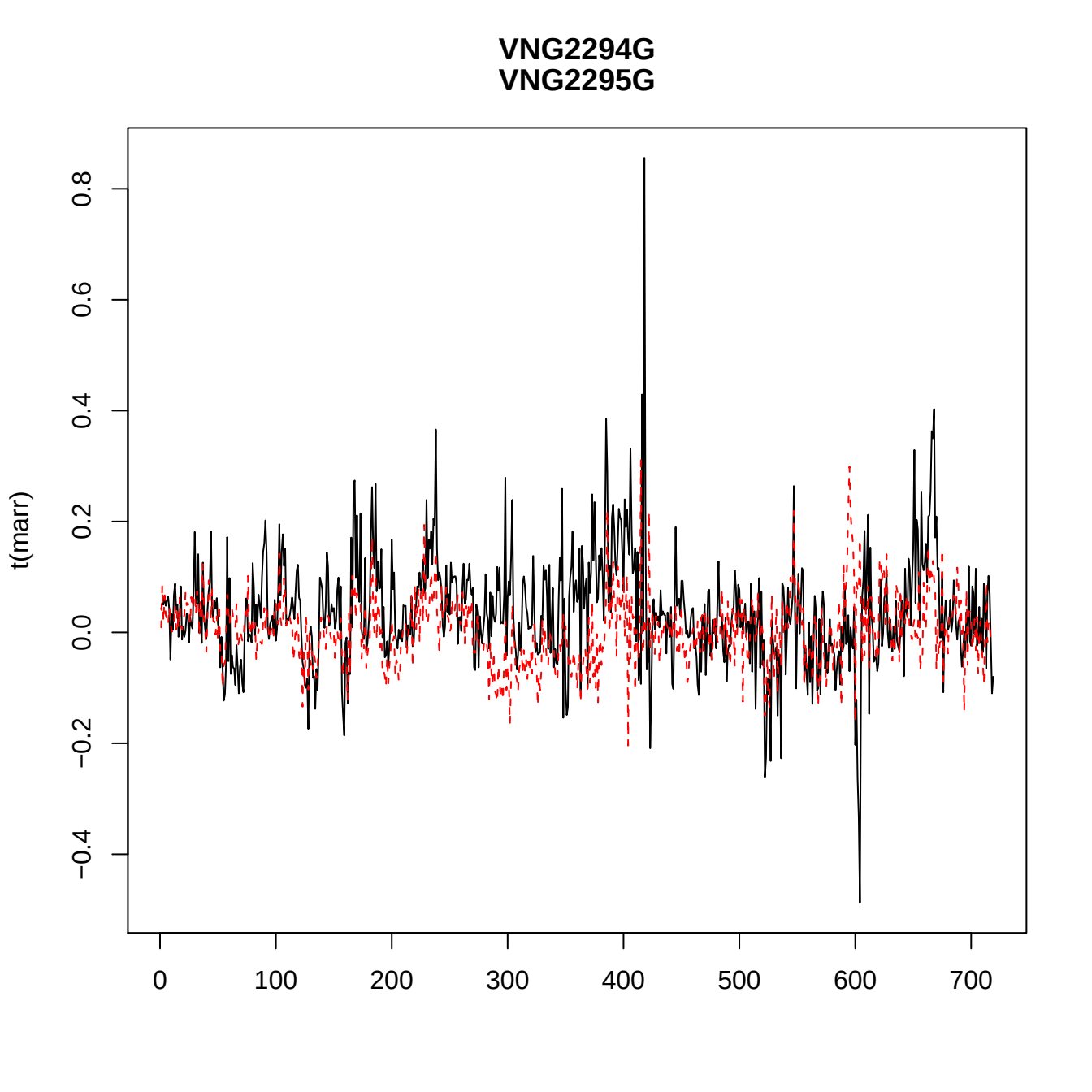

1704000
1705000
1706000
1707000
mamA
mamB
mal
maoC1
B12−binding
Met_asp_mut_E
MAAL_N
MAAL_C
maoC_dehydrat
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF

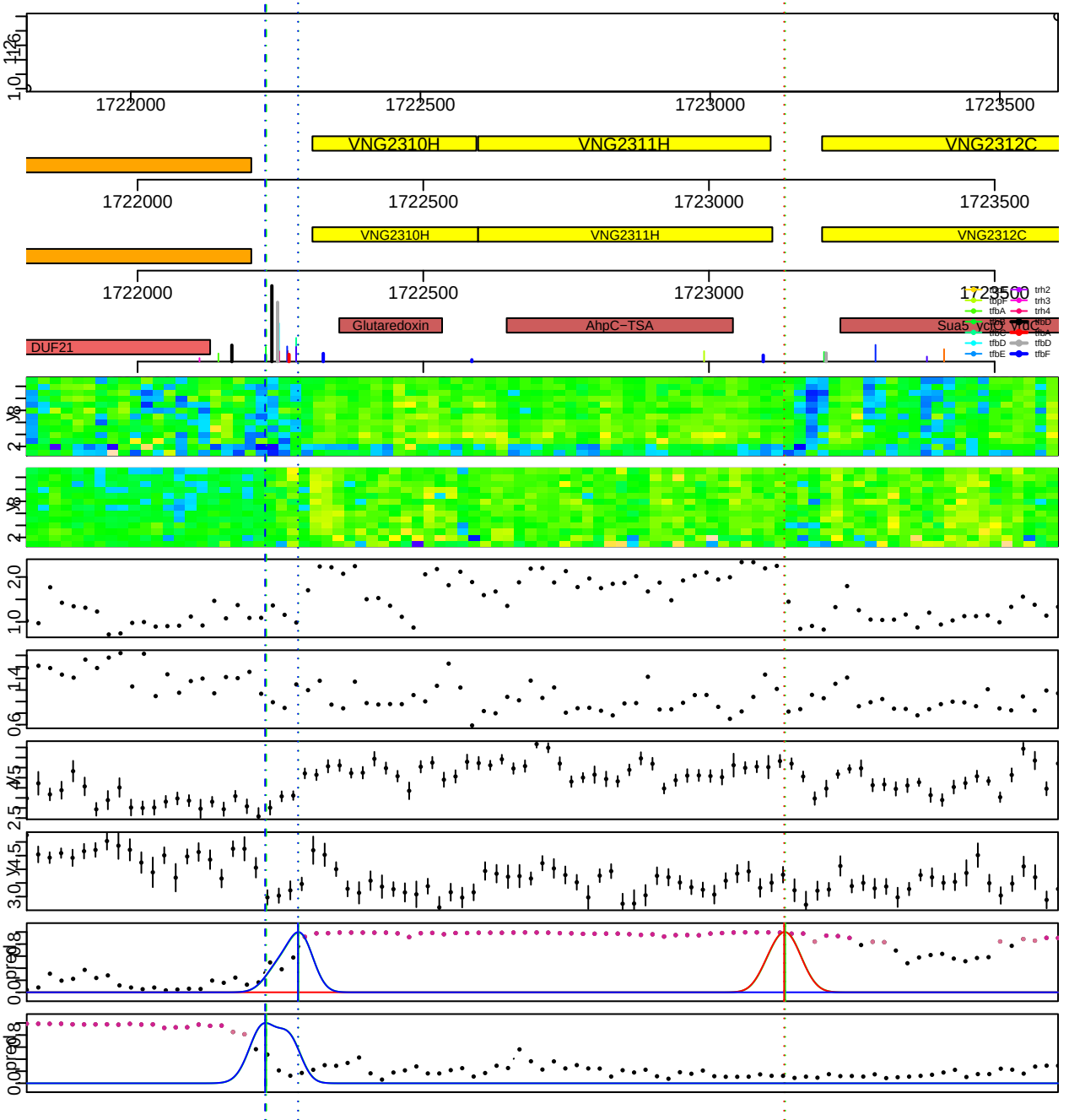

VNG2286G
VNG2288G
VNG2289G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

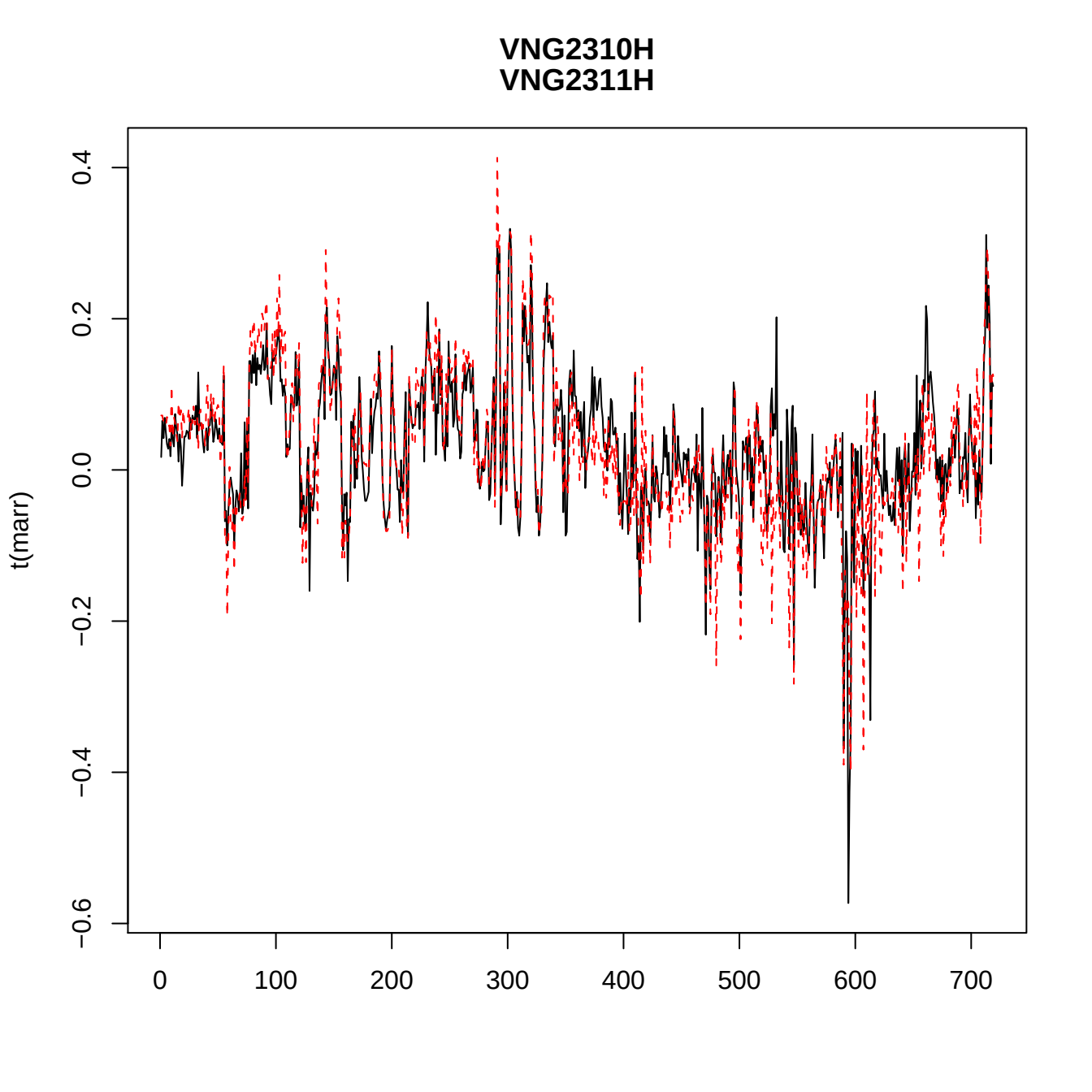

1706500
1707000
1707500
1708000
1708500
1709000
maoC1
cat
maoC1
cat
AAL_C
MaoC_dehydratas
AcetylCoA_hydro
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

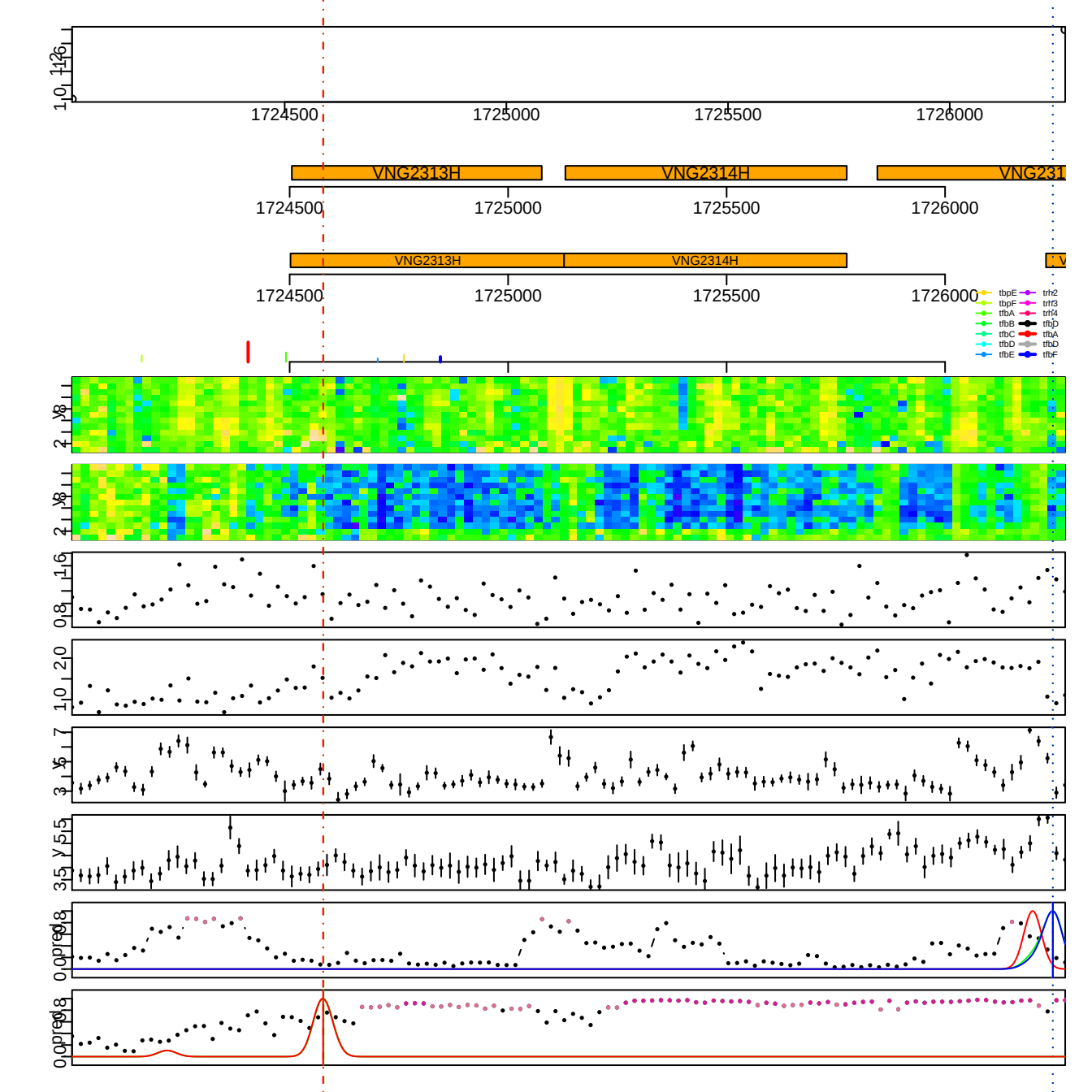

VNG2290G
VNG2291G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

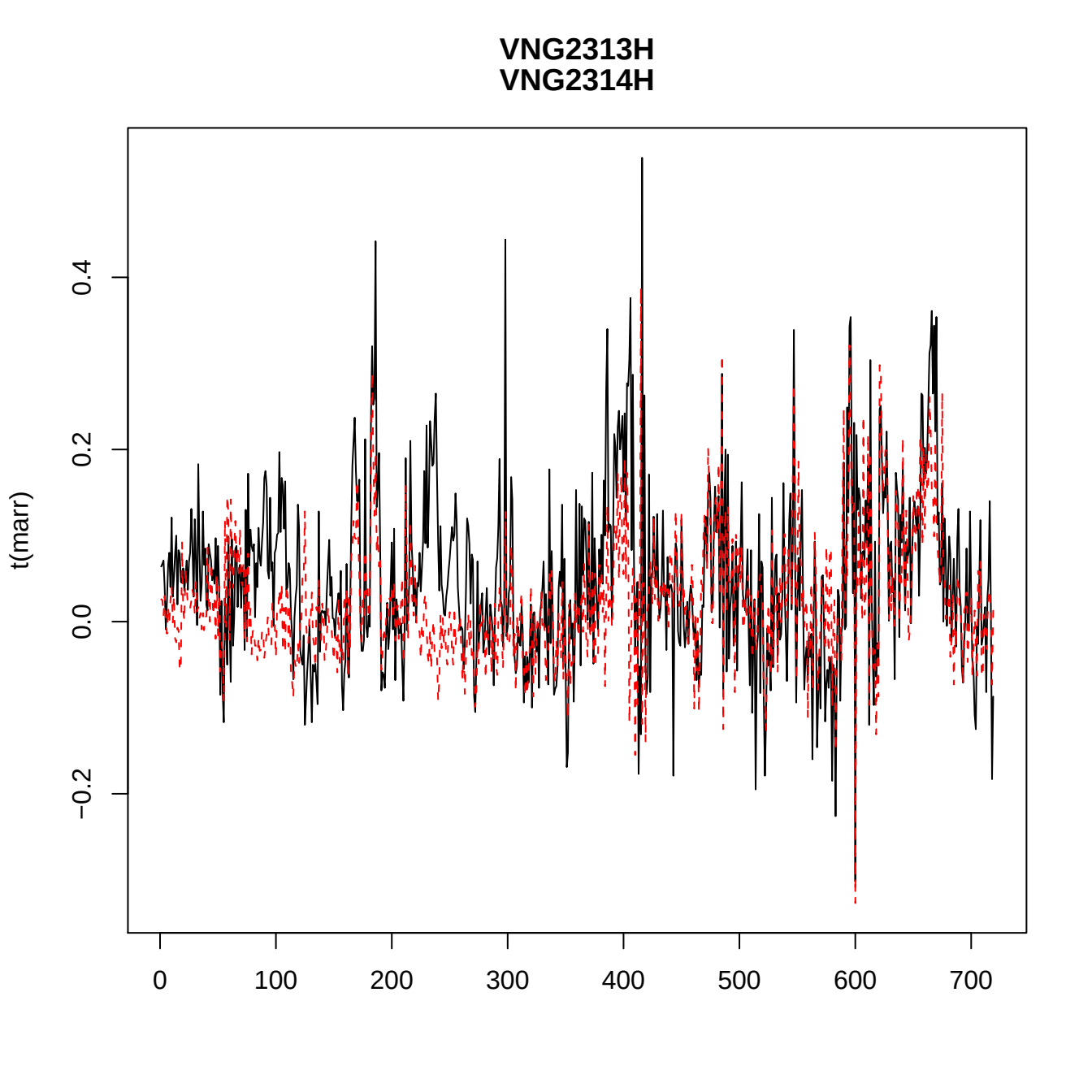

1710500
1711000
1711500
1712000
1712500
hisA
hisB
fer2
VNG2297H
His_biosynth
IGPD
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

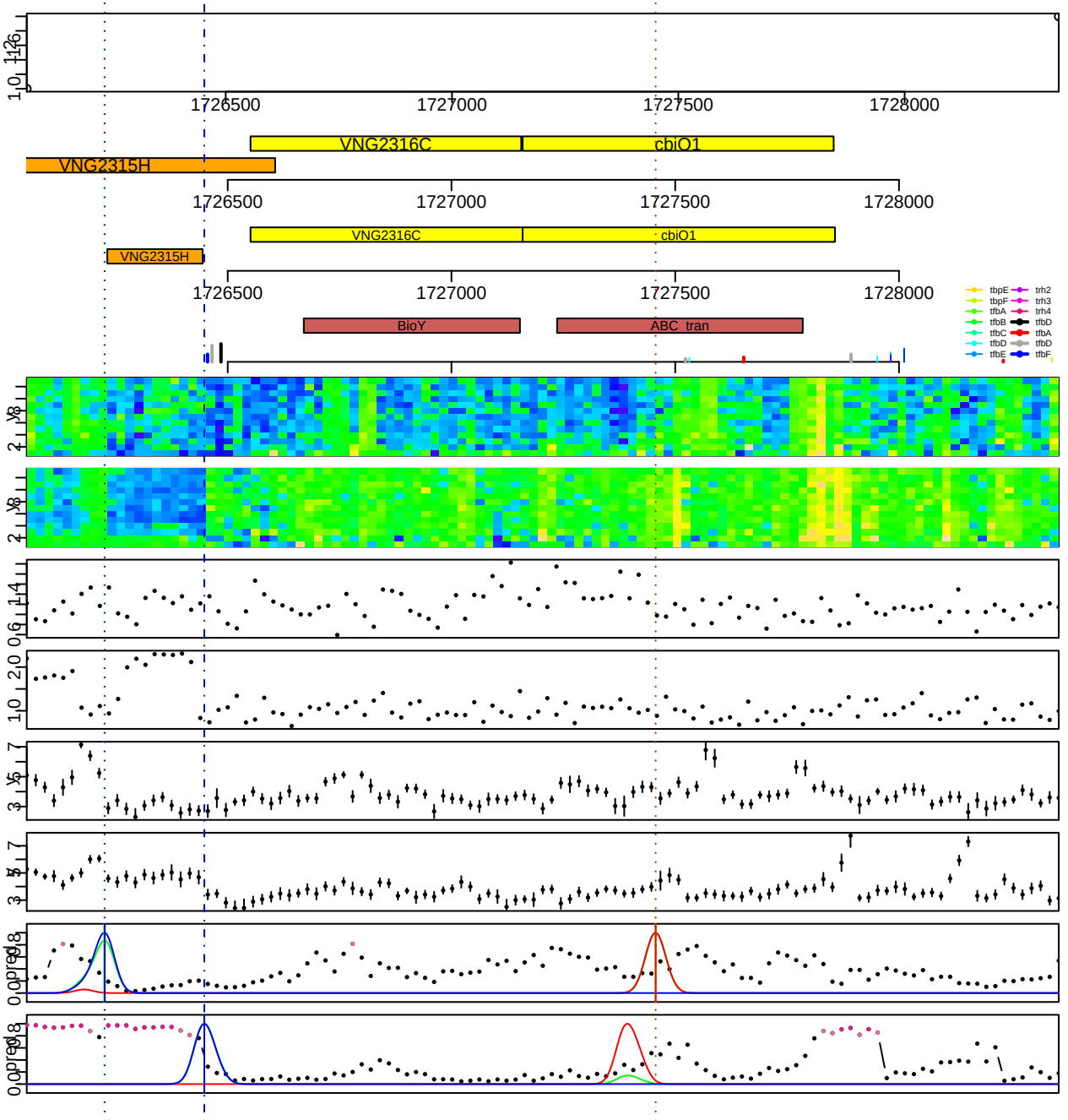

VNG2294G
VNG2295G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

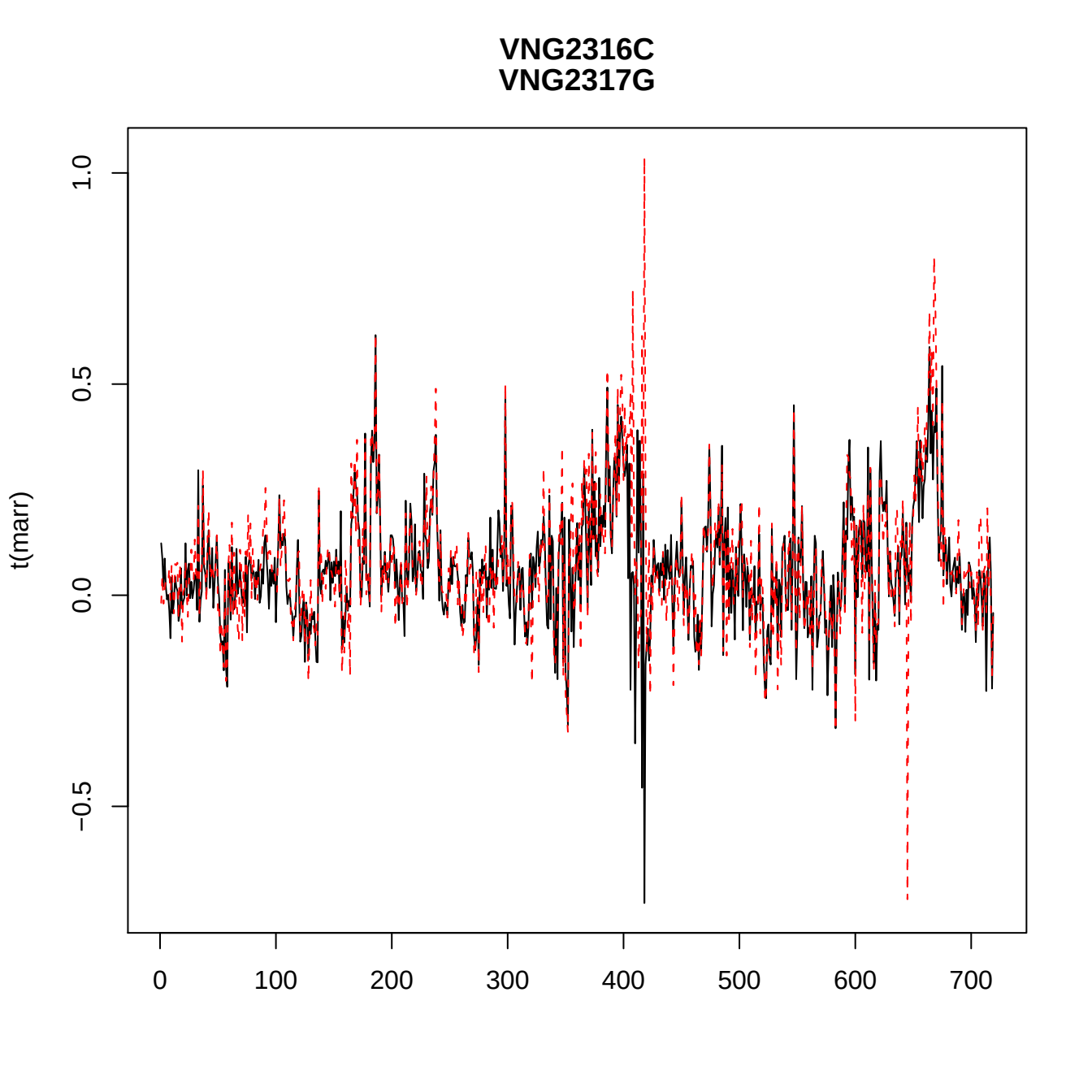

1722000
1722500
1723000
1723500
VNG2310H
VNG2311H
VNG2312C
Glutaredoxin
AhpC−TSA
Sua5_yciO_yrdC
DUF21
trh2
trh3
trh4
tfbA
tfbD
tfbE
tfbF

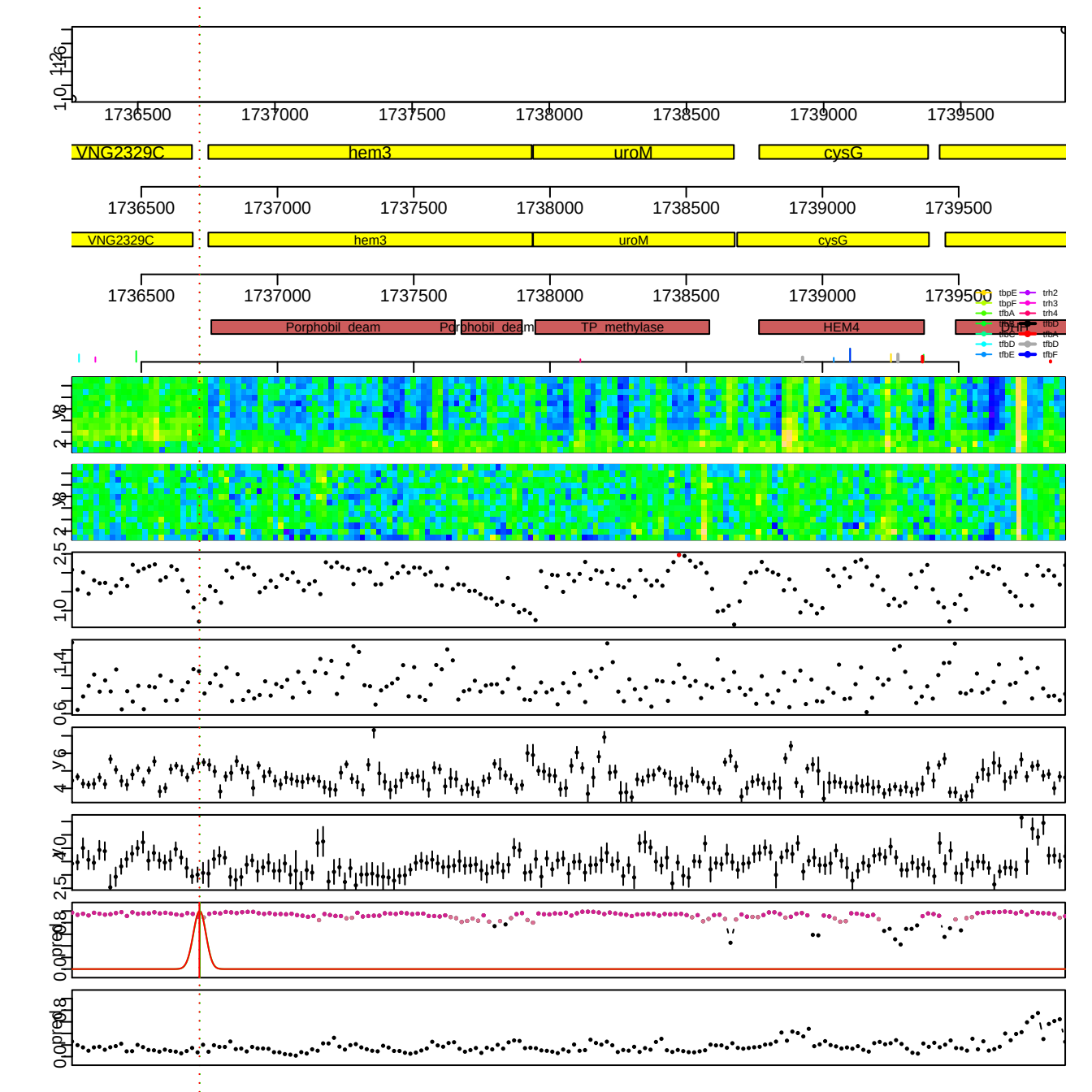

VNG2310H
VNG2311H
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

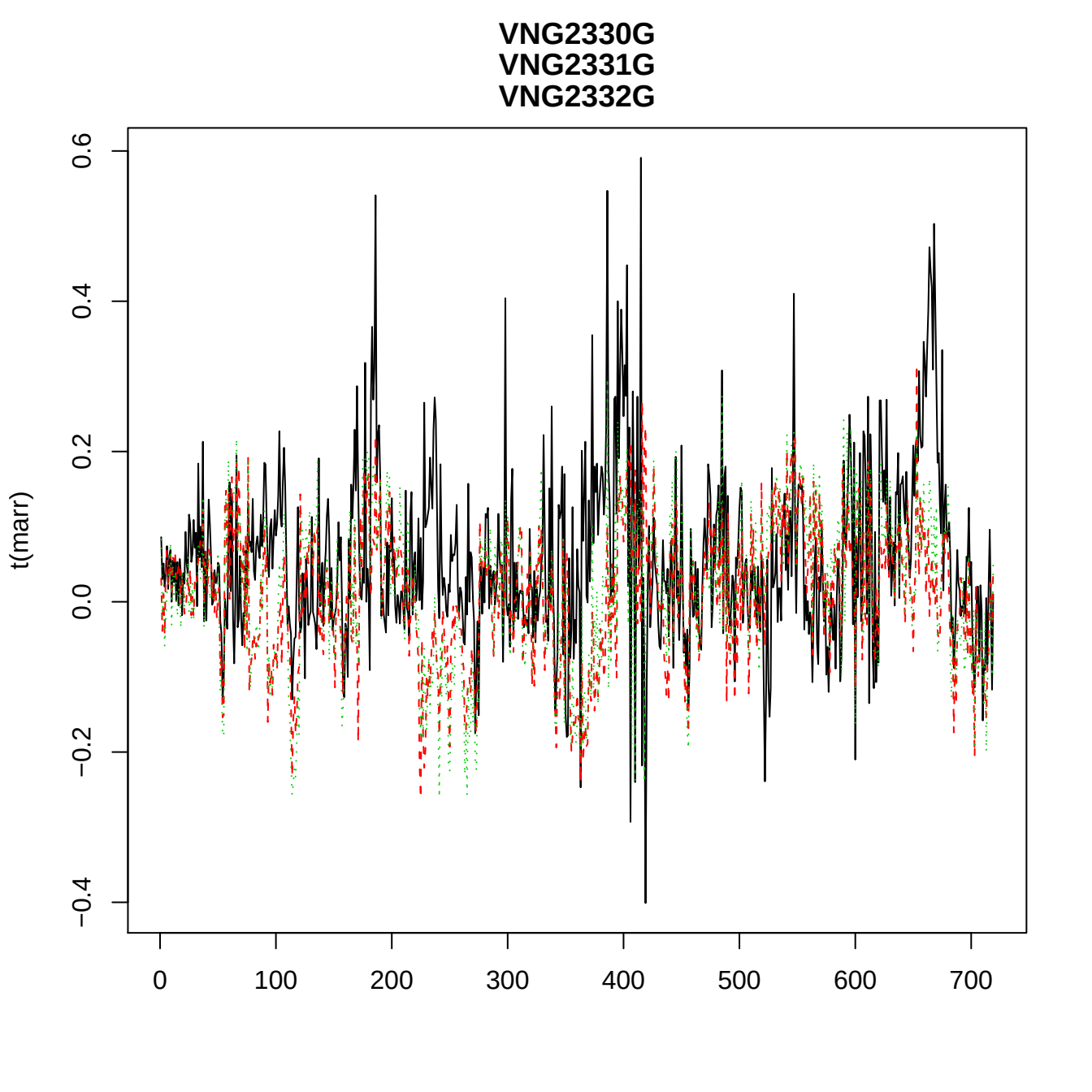

1724500
1725000
1725500
1726000
VNG2313H
VNG2314H
VNG231
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

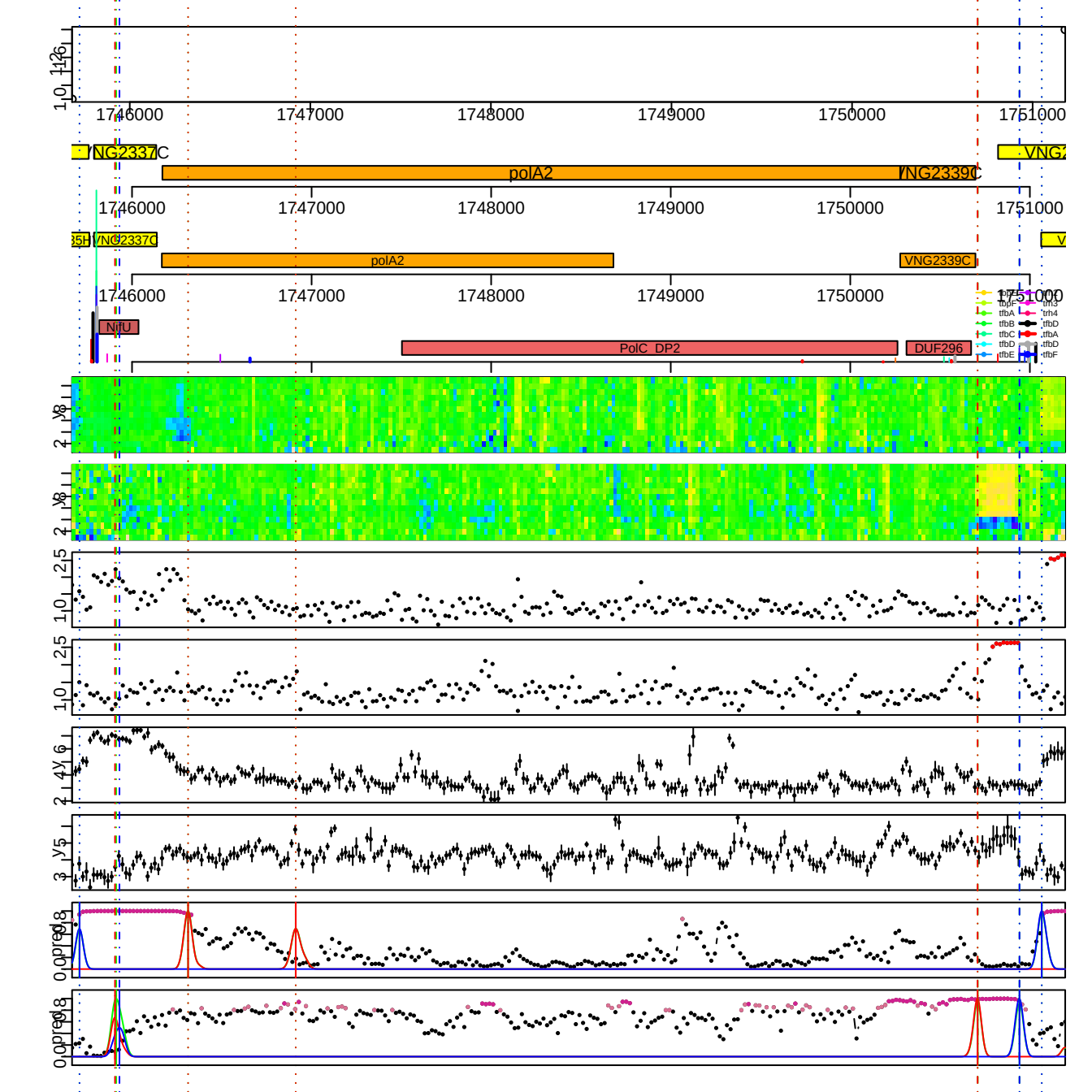

VNG2313H
VNG2314H
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

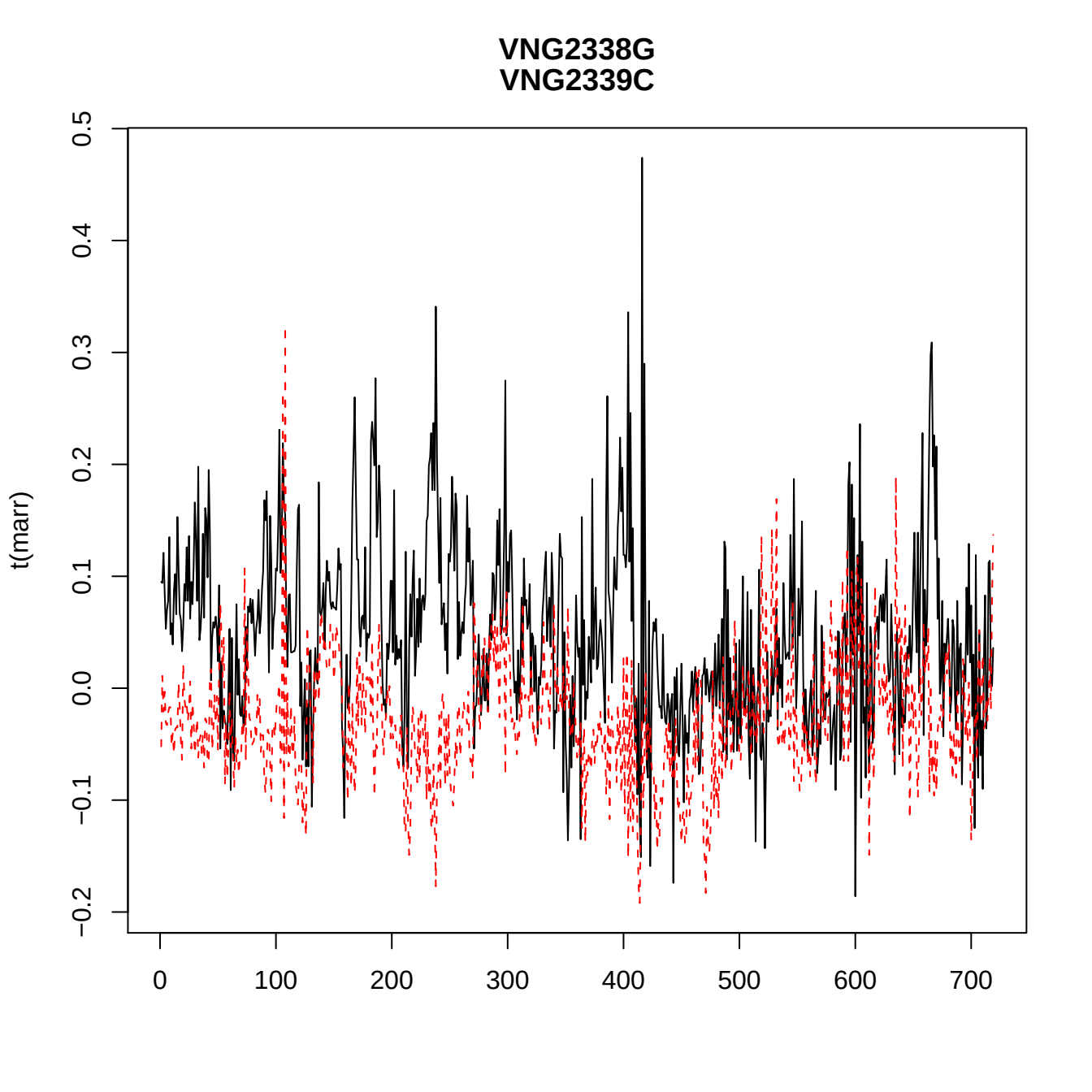

1726500
1727000
1727500
1728000
VNG2316C
cbiO1
VNG2315H
BioY
ABC_tran
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

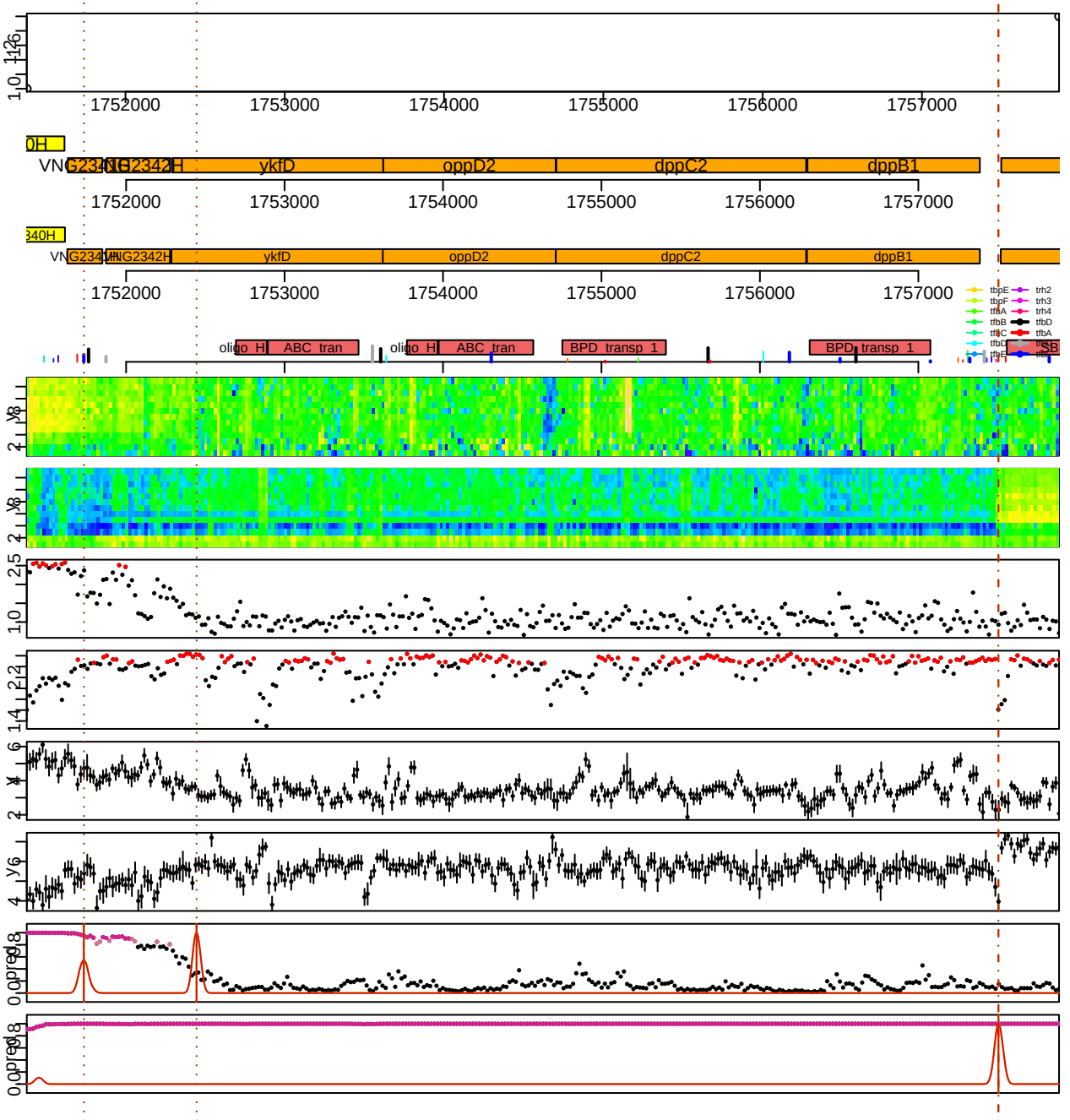

VNG2316C
VNG2317G
t(marr)
1.0
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

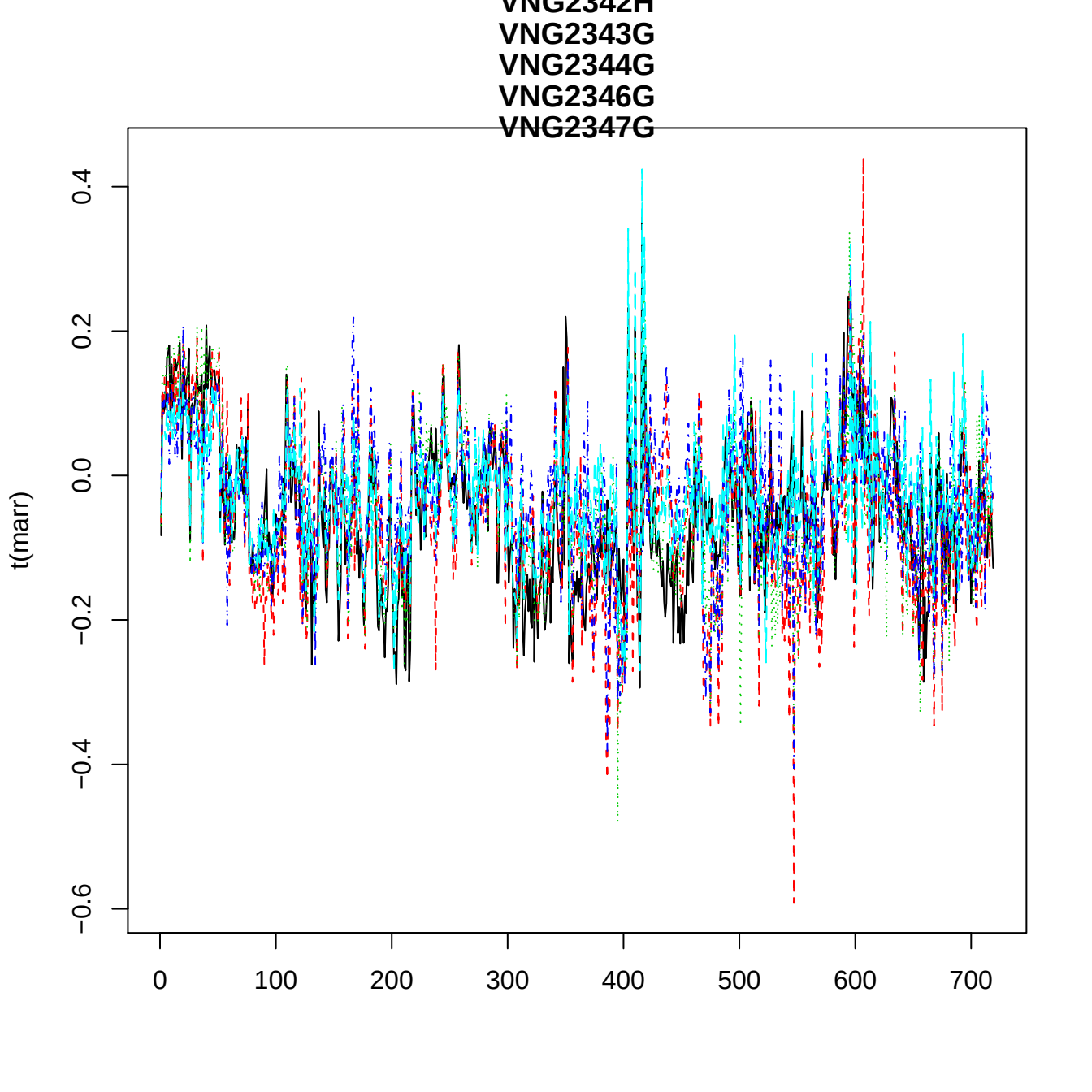

1736500
1737000
1737500
1738000
1738500
1739000
1739500
VNG2329C
hem3
uroM
cysG
Porphobil_deam
Porphobil_deam
TP_methylase
HEM4
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

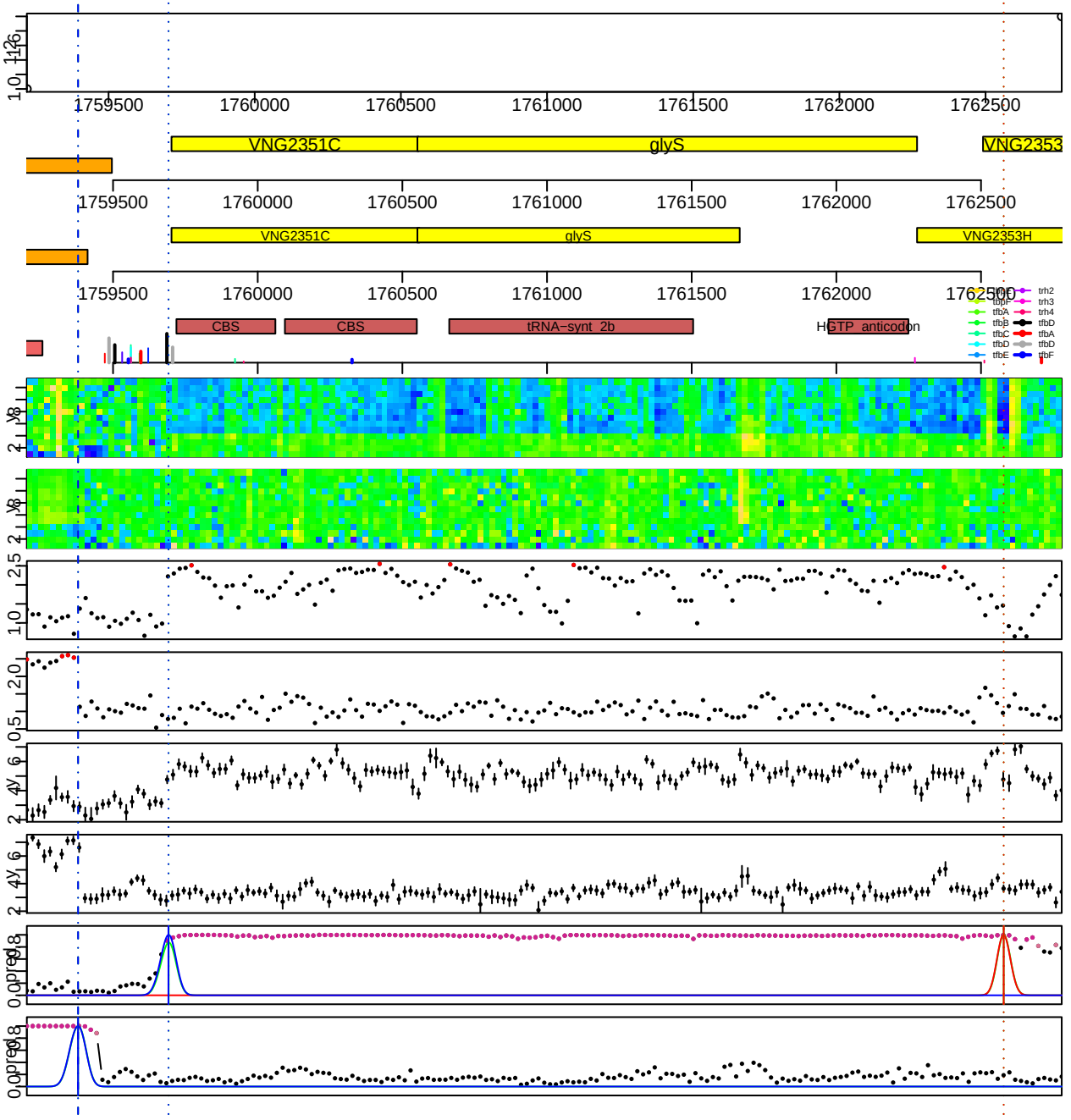

VNG2330G
VNG2331G
VNG2332G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

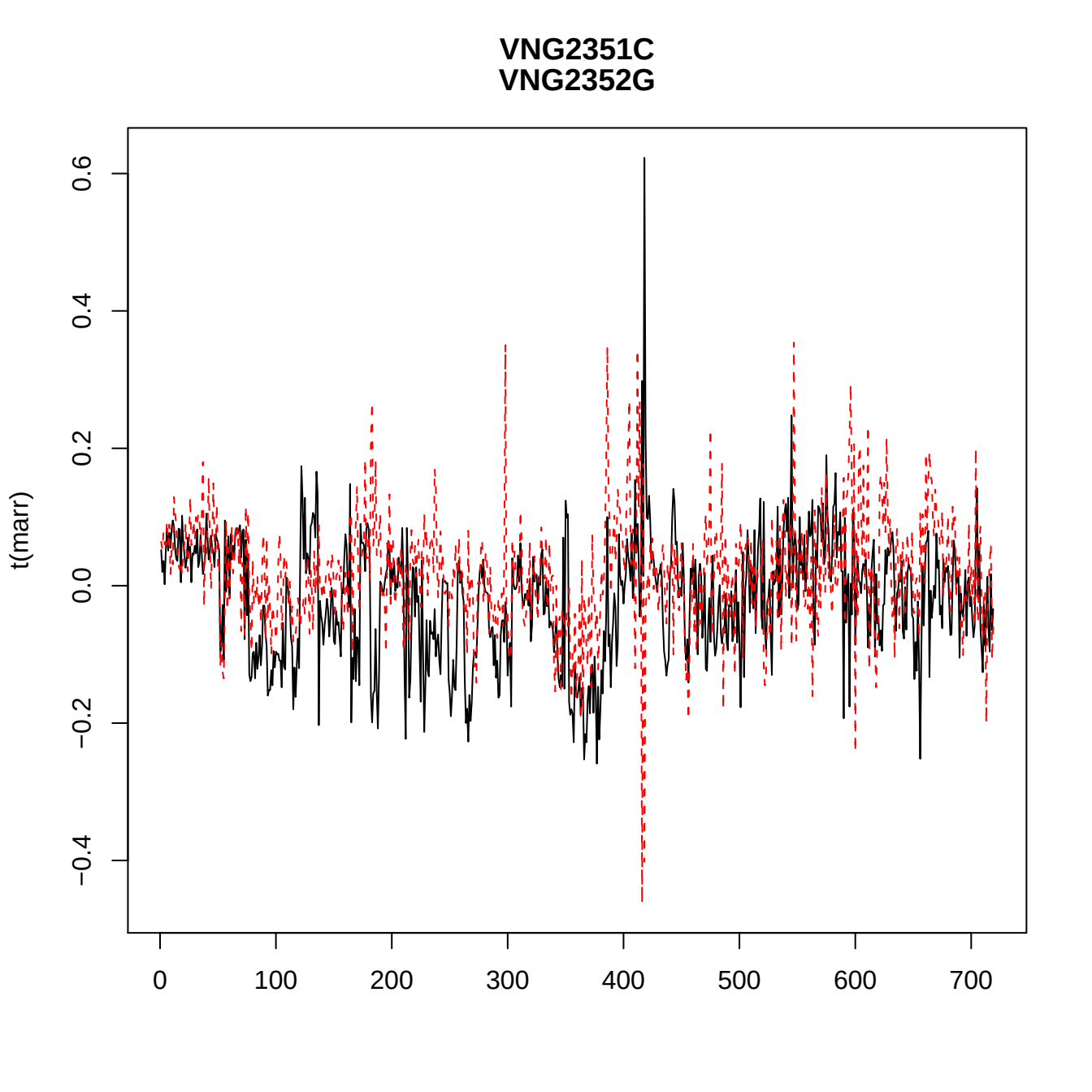

1746000
1747000
1748000
1749000
1750000
1751000
VNG2337C
polA2
VNG2339C
NifU
PolC_DP2
DUF296
tfbF
trh3
tfbA
trh4
tfbB
tfbD
tfbC
tfbA
tfbD
tfbD
tfbE
tfbF

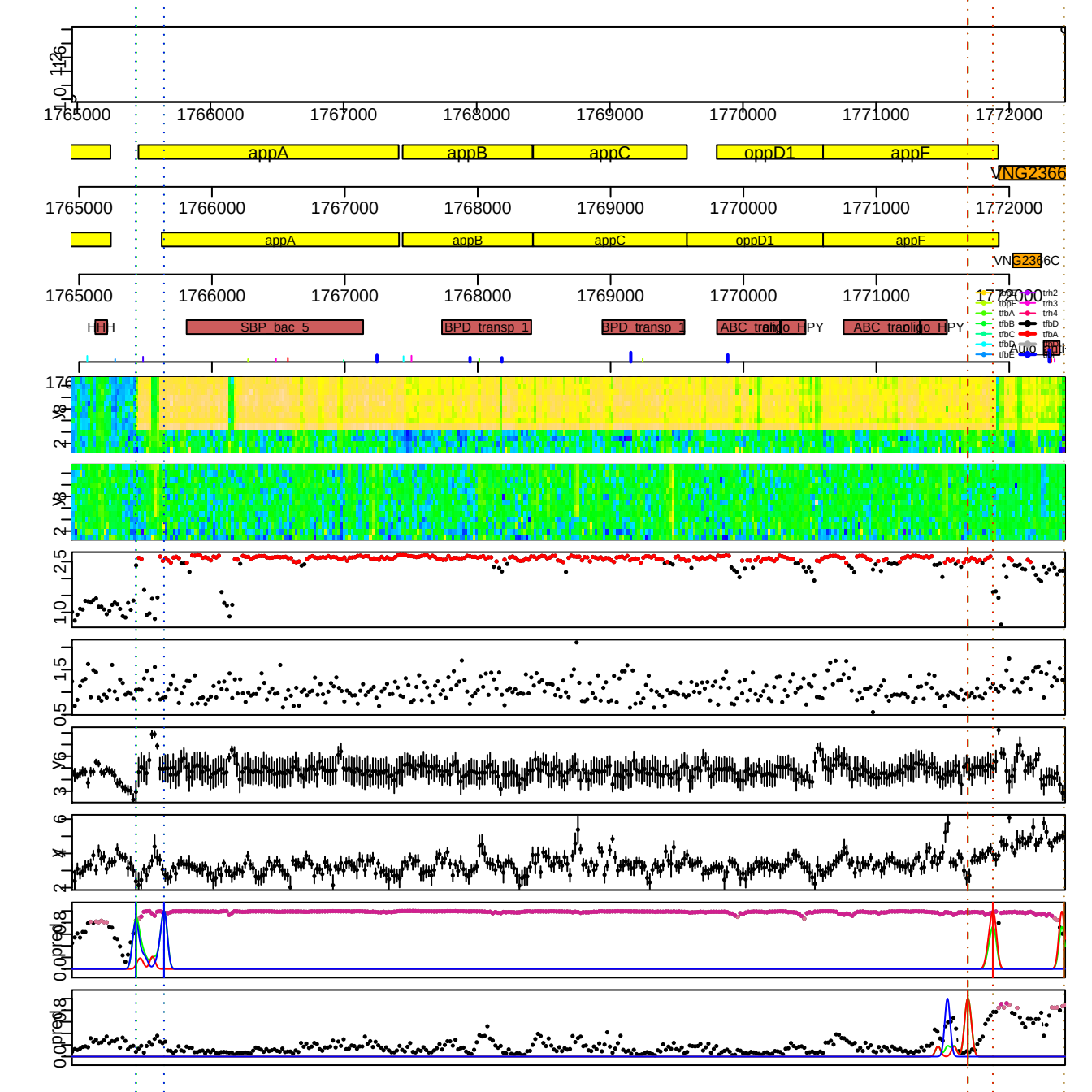

VNG2338G
VNG2339C
t(marr)
0.5
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

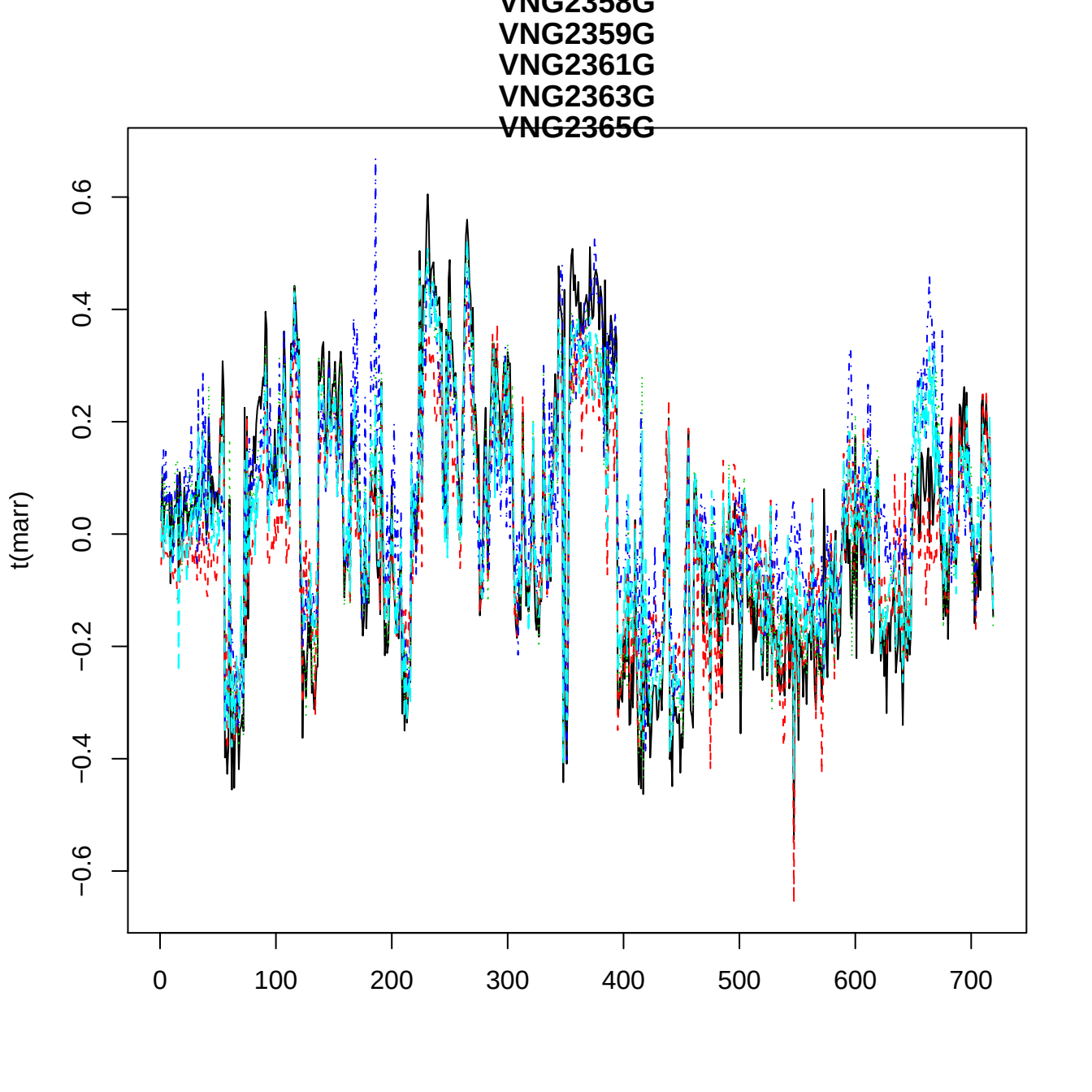

1752000
1753000
1754000
1755000
1756000
1757000
ykfD
oppD2
dppC2
dppB1
oligo_H
ABC_tran
BPD_transp_1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
SB

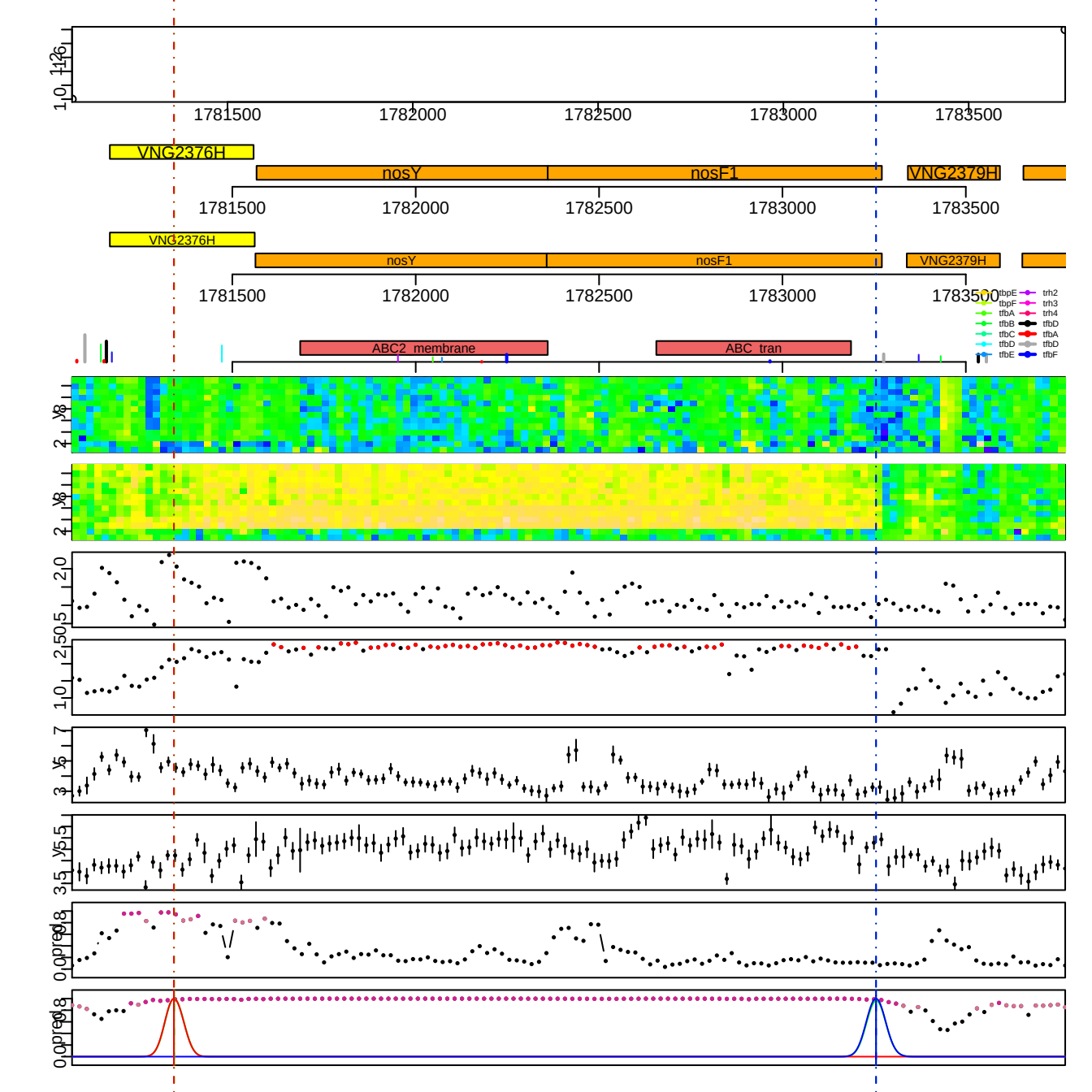

VNG2342H
VNG2343G
VNG2344G
VNG2346G
VNG2347G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

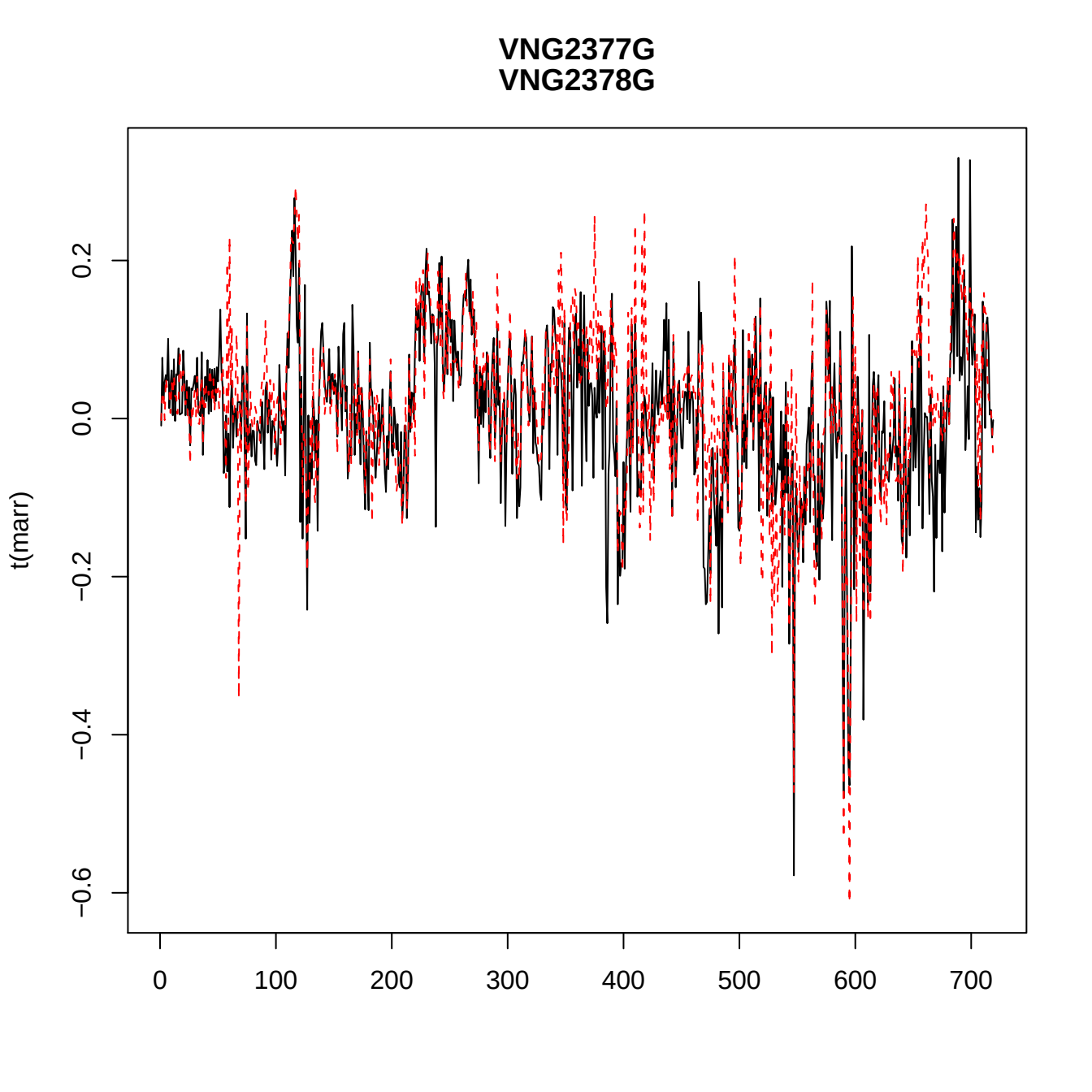

1759500
1760000
1760500
1761000
1761500
1762000
1762500
VNG2351C
glyS
VNG2353
VNG2353H
CBS
CBS
tRNA−synt_2b
HGTP_anticodon
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
pred

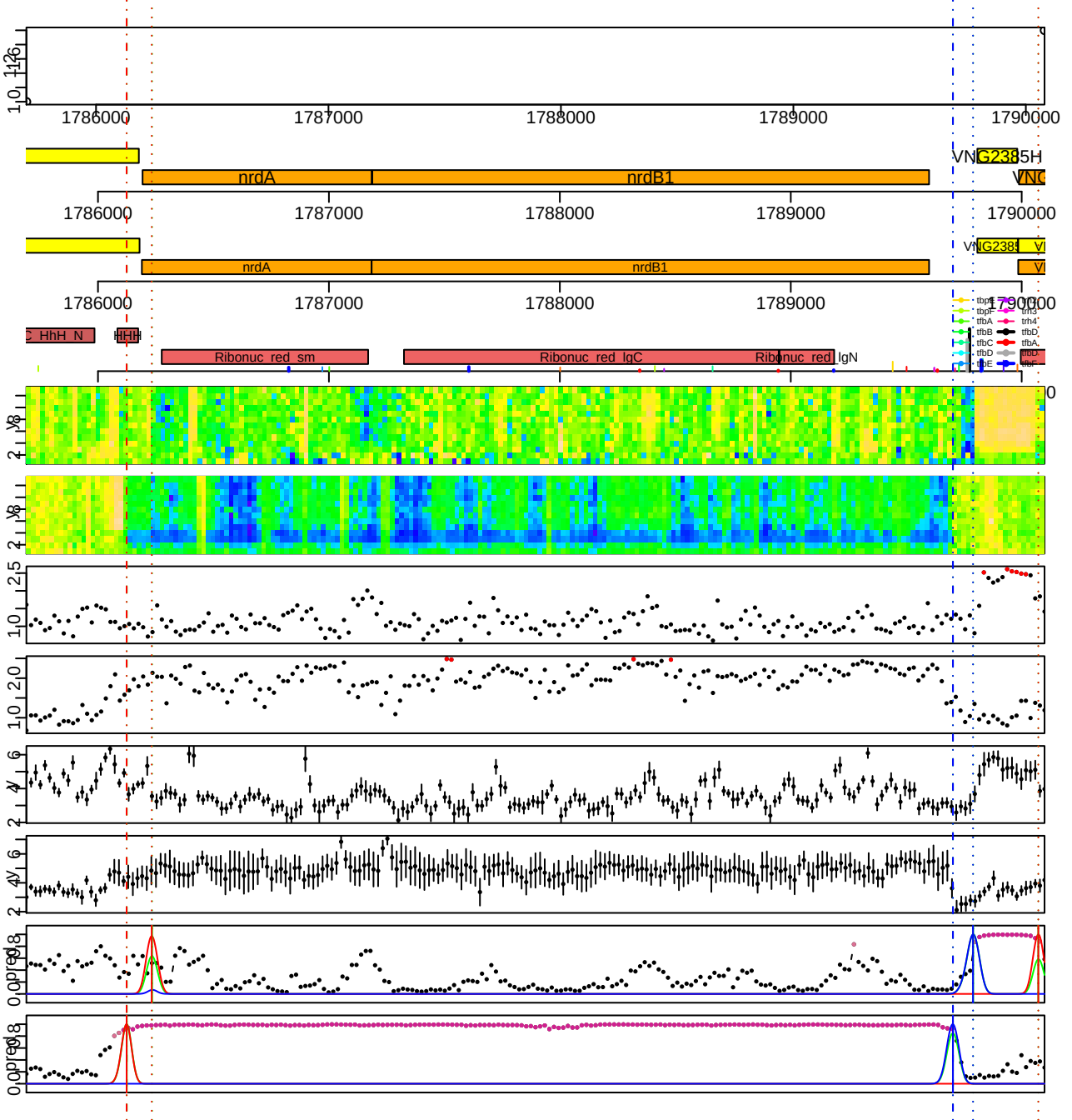

VNG2351C
VNG2352G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1765000
1766000
1767000
1768000
1769000
1770000
1771000
1772000
appA
appB
appC
oppD1
appF
VNG2366
VNG2366C
HHH
SBP_bac_5
BPD_transp_1
BPD_transp_1
ABC_tran
ABC_tran
HPY
HPY
tbpA
tbpB
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbB
tfbE
pred

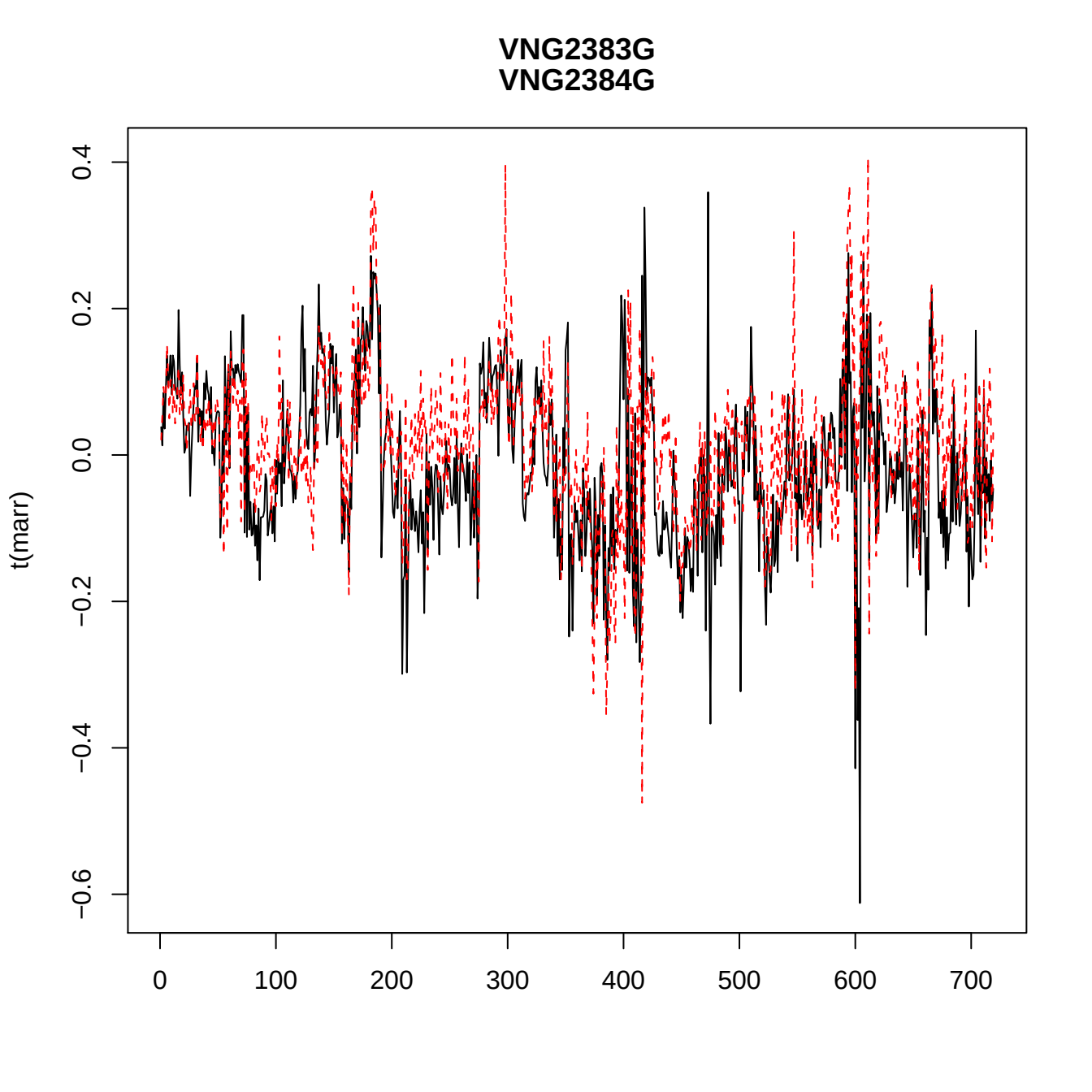

VNG2358G
VNG2359G
VNG2361G
VNG2363G
VNG2365G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

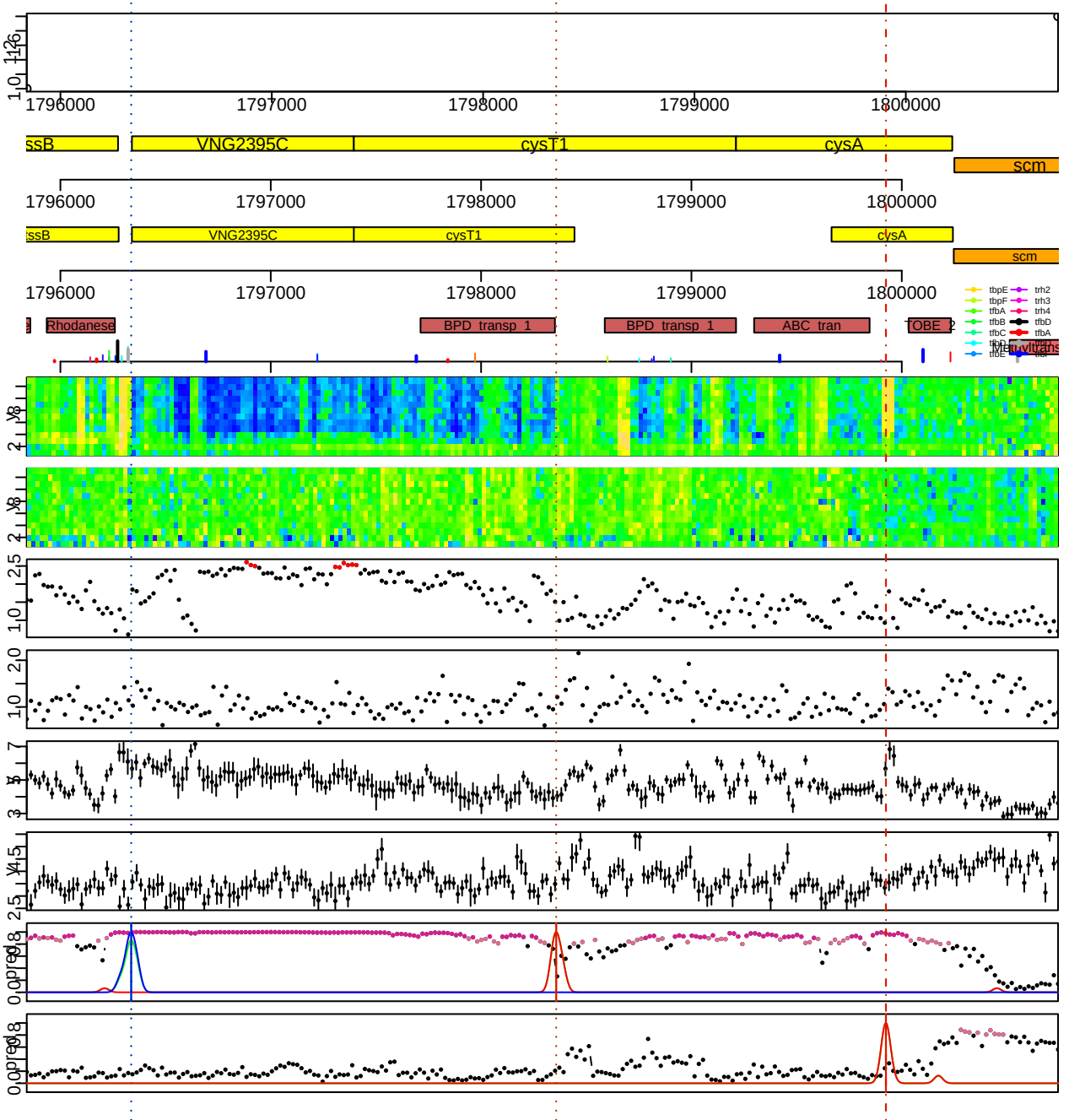

1781500
1782000
1782500
1783000
1783500
VNG2376H
nosY
nosF1
VNG2379H
ABC2_membrane
ABC_tran
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2377G
VNG2378G
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

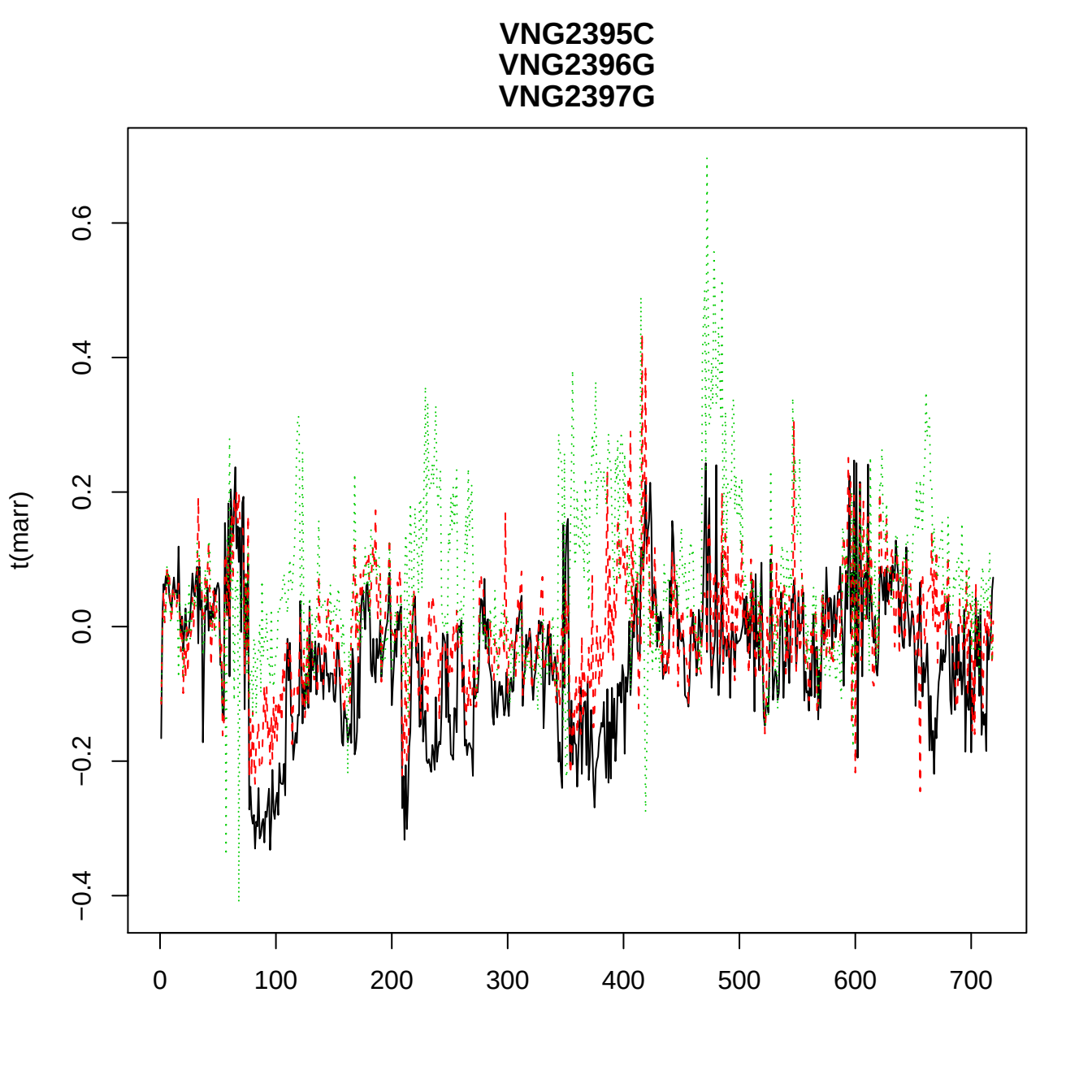


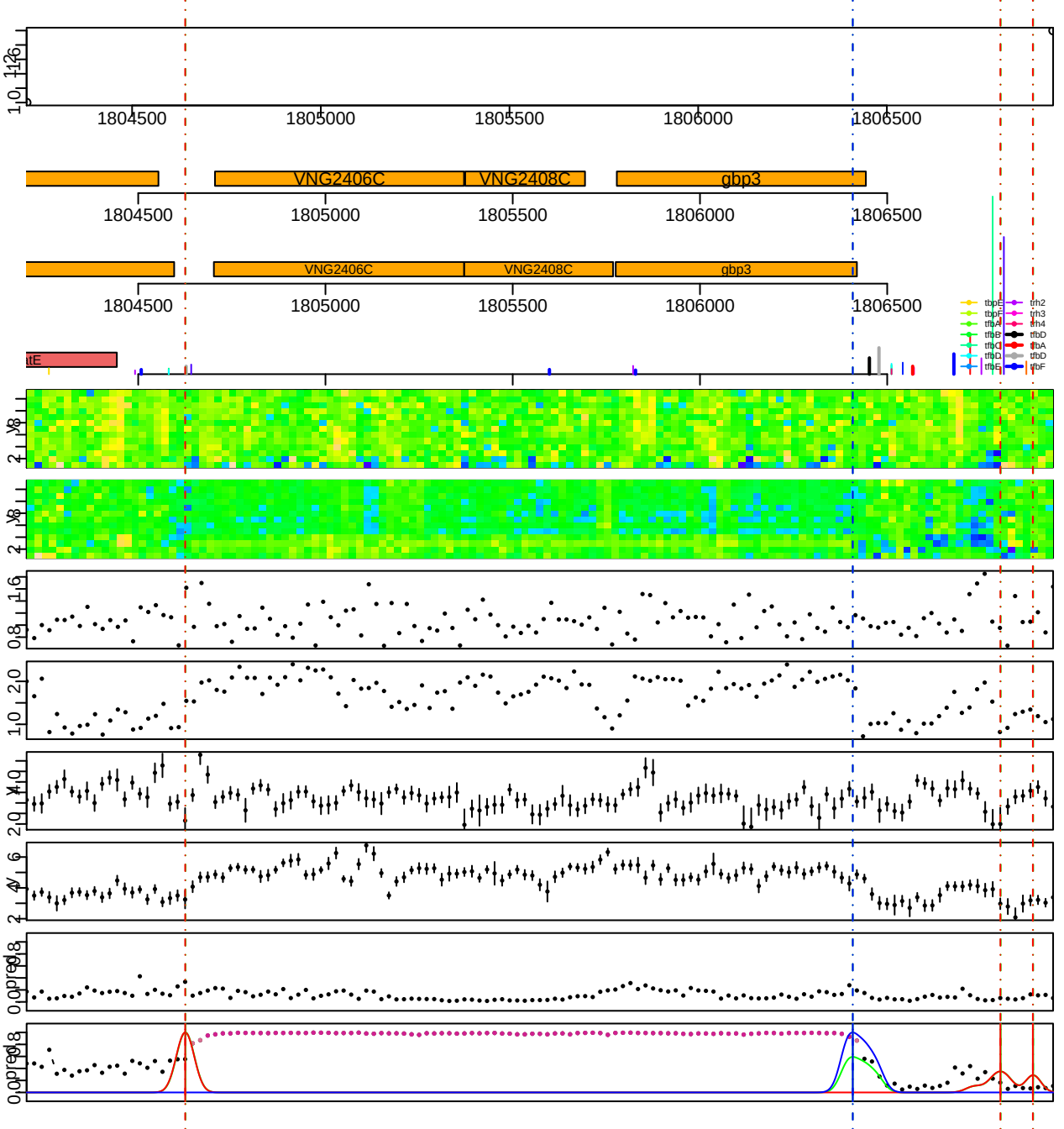
1786000
1787000
1788000
1789000
1790000
VNG2385H
nrdA
nrdB1
HhH_N
HHH
Ribonuc_red_sm
Ribonuc_red_lgC
Ribonuc_red_lgN
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2383G
VNG2384G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

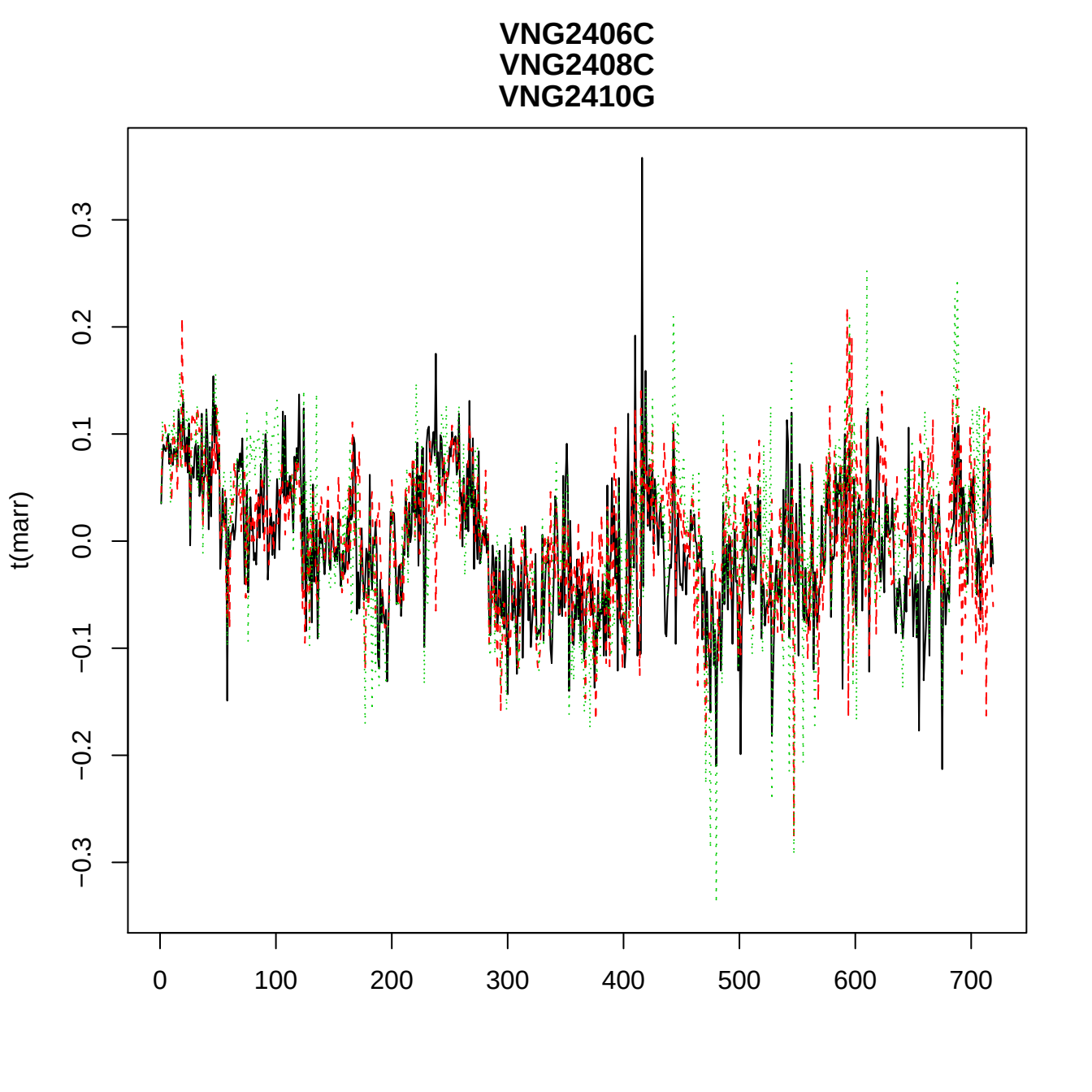


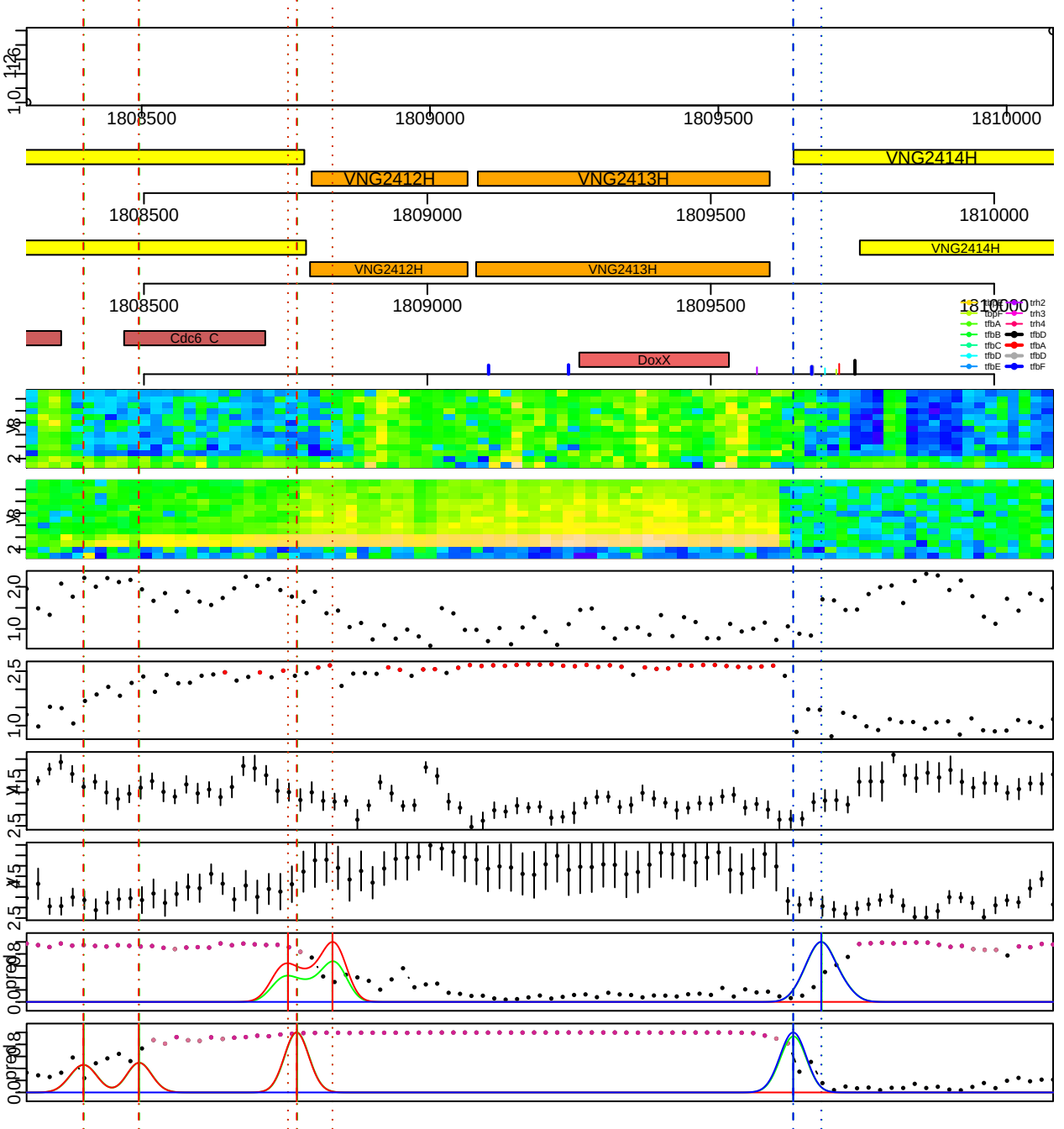
1796000
1797000
1798000
1799000
1800000
ssB
VNG2395C
cysT1
cysA
scm
Rhodanese
BPD_transp_1
ABC_tran
TOBE_2
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA

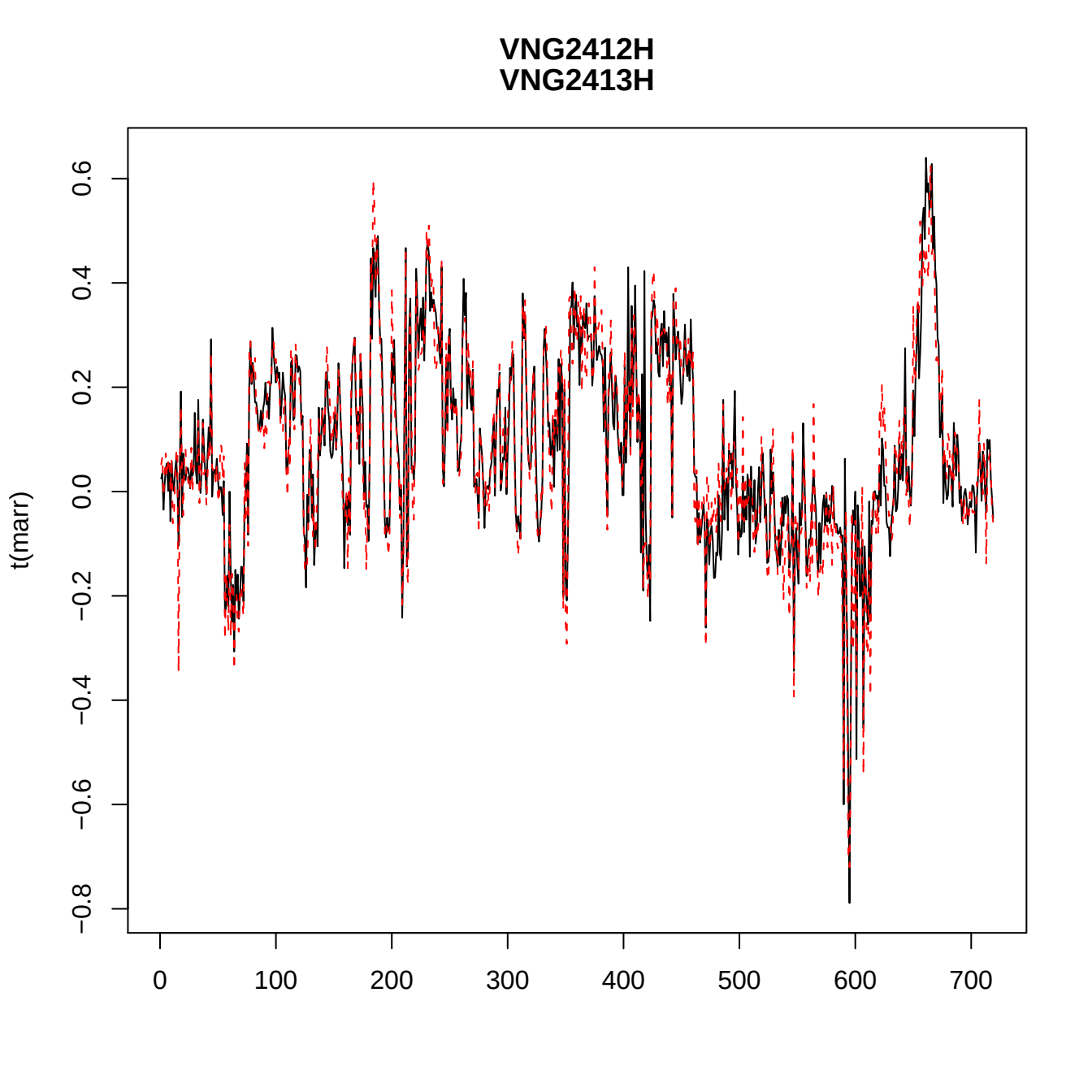

VNG2395C
VNG2396G
VNG2397G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

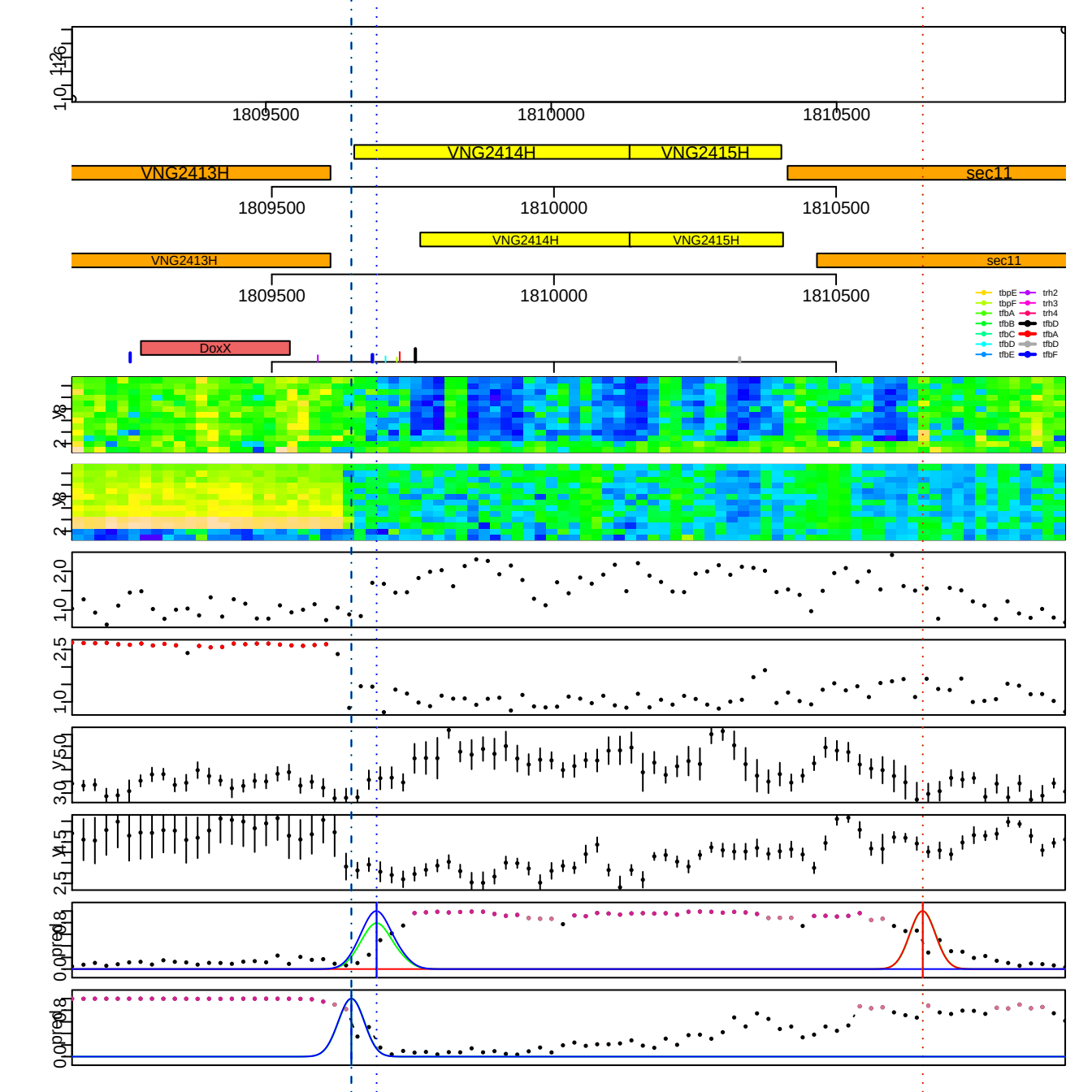


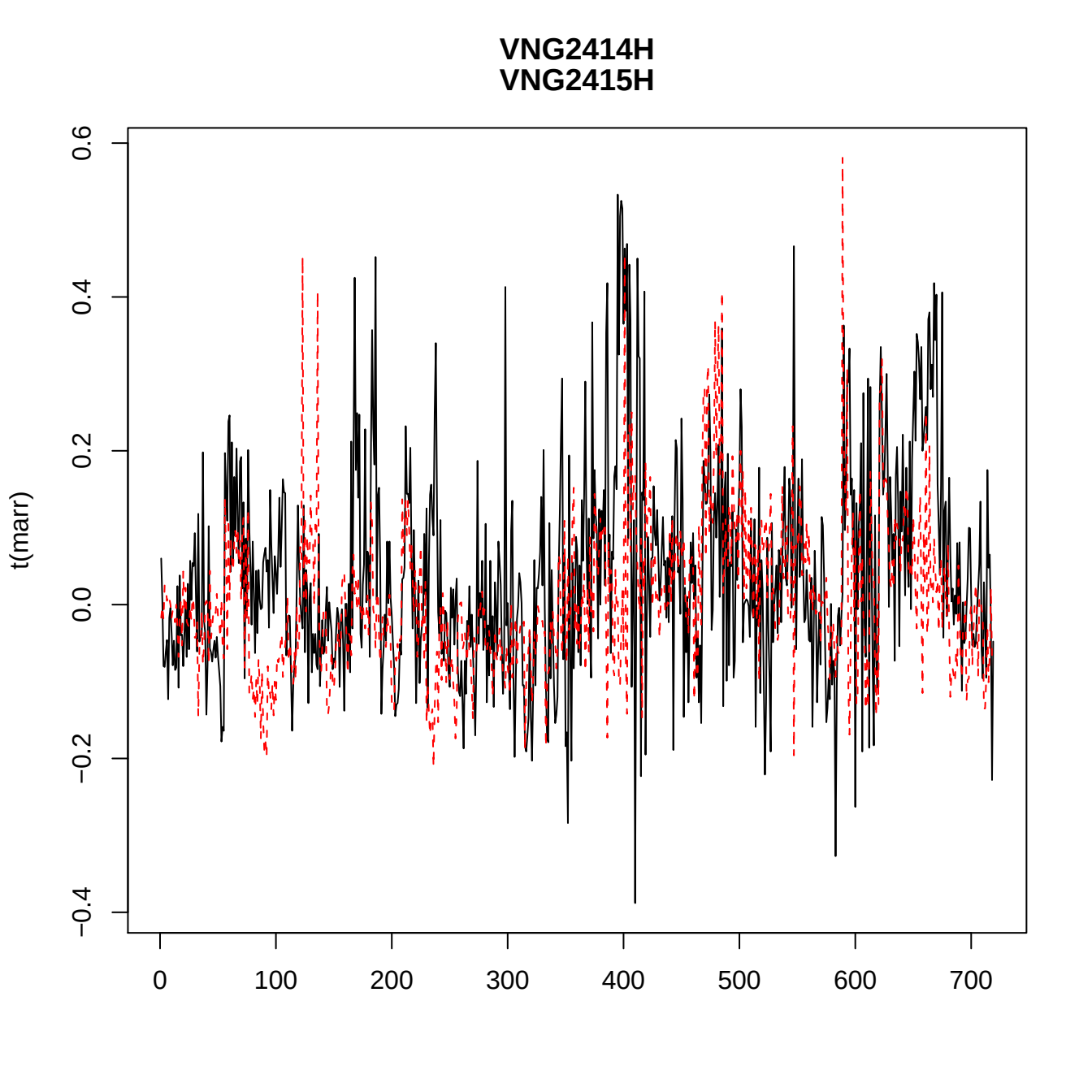
1804500
1805000
1805500
1806000
1806500
VNG2406C
VNG2408C
gbp3
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2406C
VNG2408C
VNG2410G
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
0
100
200
300
400
500
600
700


1808500
1809000
1809500
1810000
VNG2414H
VNG2412H
VNG2413H
Cdc6_C
DoxX
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE


VNG2412H
VNG2413H
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700


1809500
1810000
1810500
VNG2414H
VNG2415H
VNG2413H
sec11
DoxX
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG2414H
VNG2415H
t(marr)
0.6
0.4
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−0.4
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600
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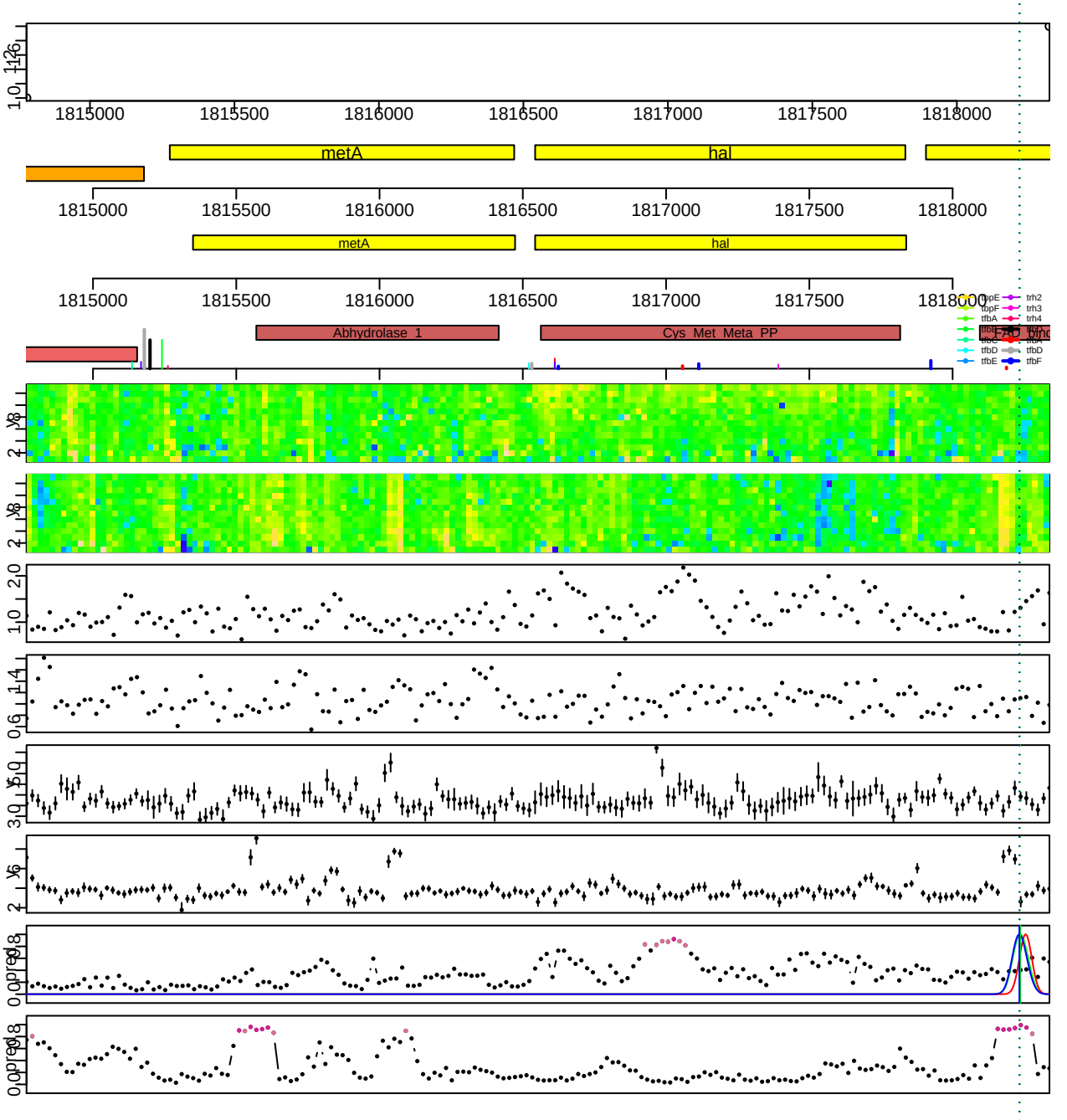
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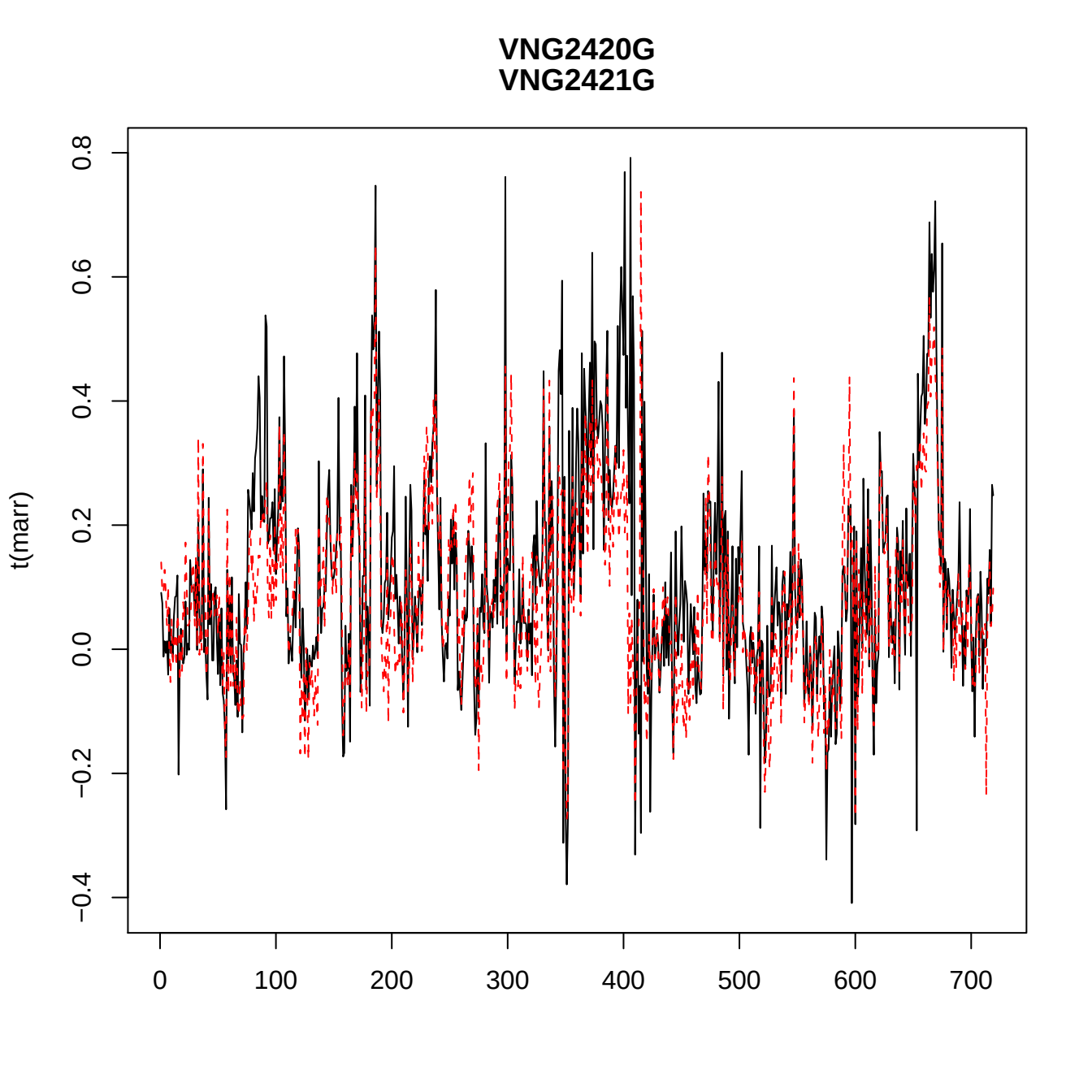
1815500
1816000
1816500
1817000
1817500
1818000
metA
hal
Abhydrolase_1
Cys_Met_Meta_PP
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF


VNG2420G
VNG2421G
t(marr)
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0.2
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−0.4
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500
600
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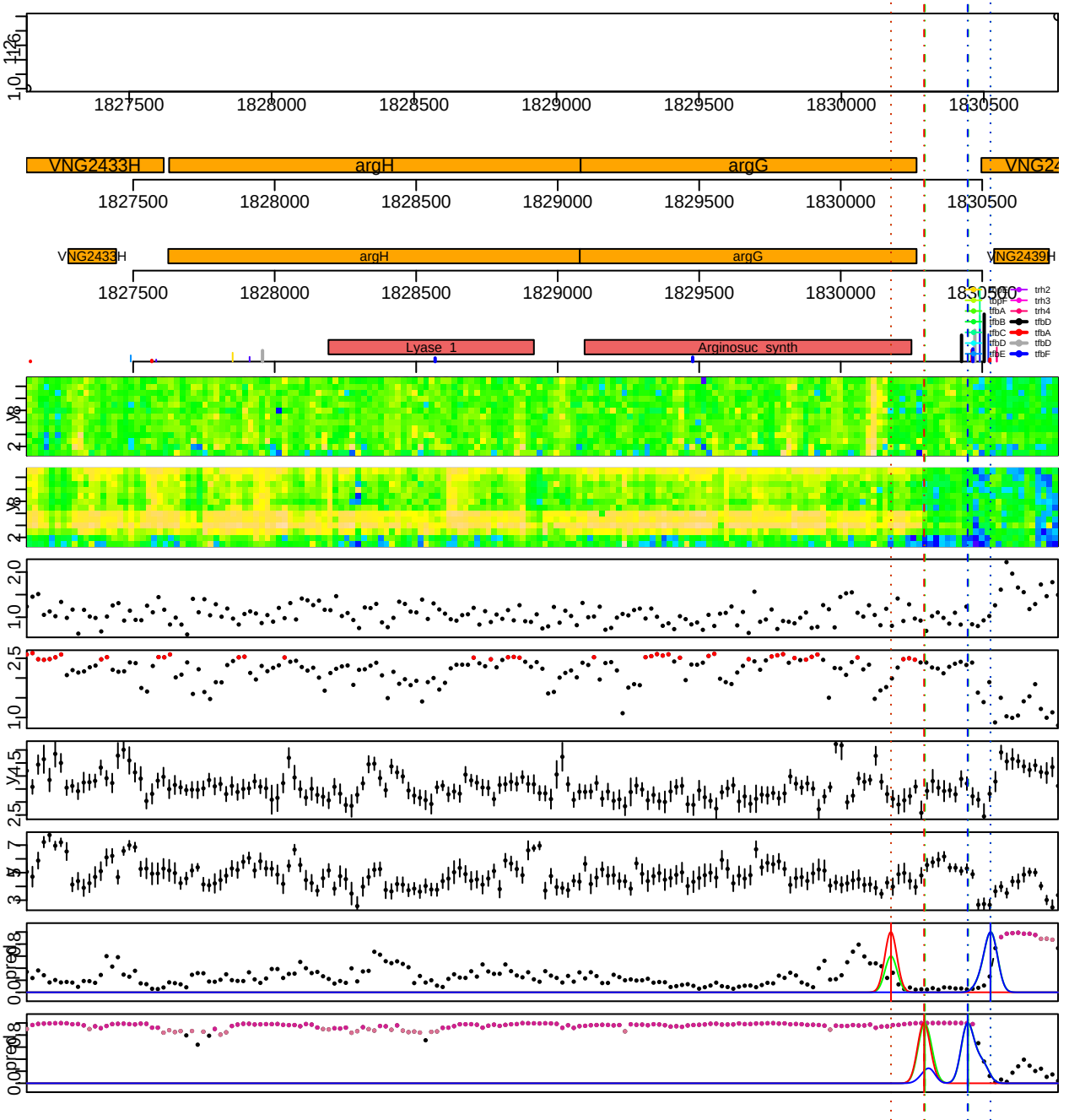
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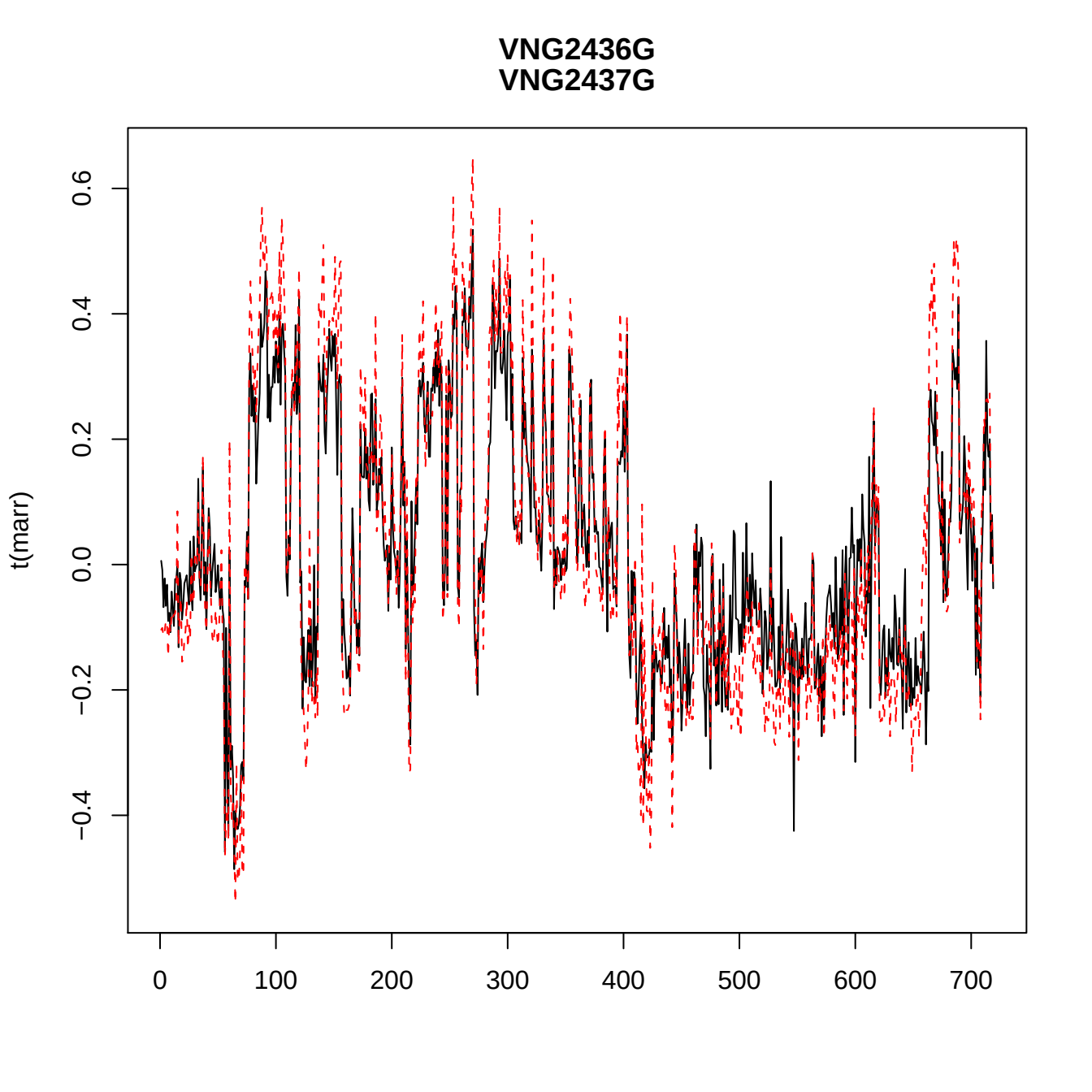
1828000
1828500
1829000
1829500
1830000
1830500
VNG2433H
argH
argG
VNG2439H
Lyase_1
Arginosuc_synth
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
pred


VNG2436G
VNG2437G
t(marr)
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0.4
0.2
0.0
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−0.4
0
100
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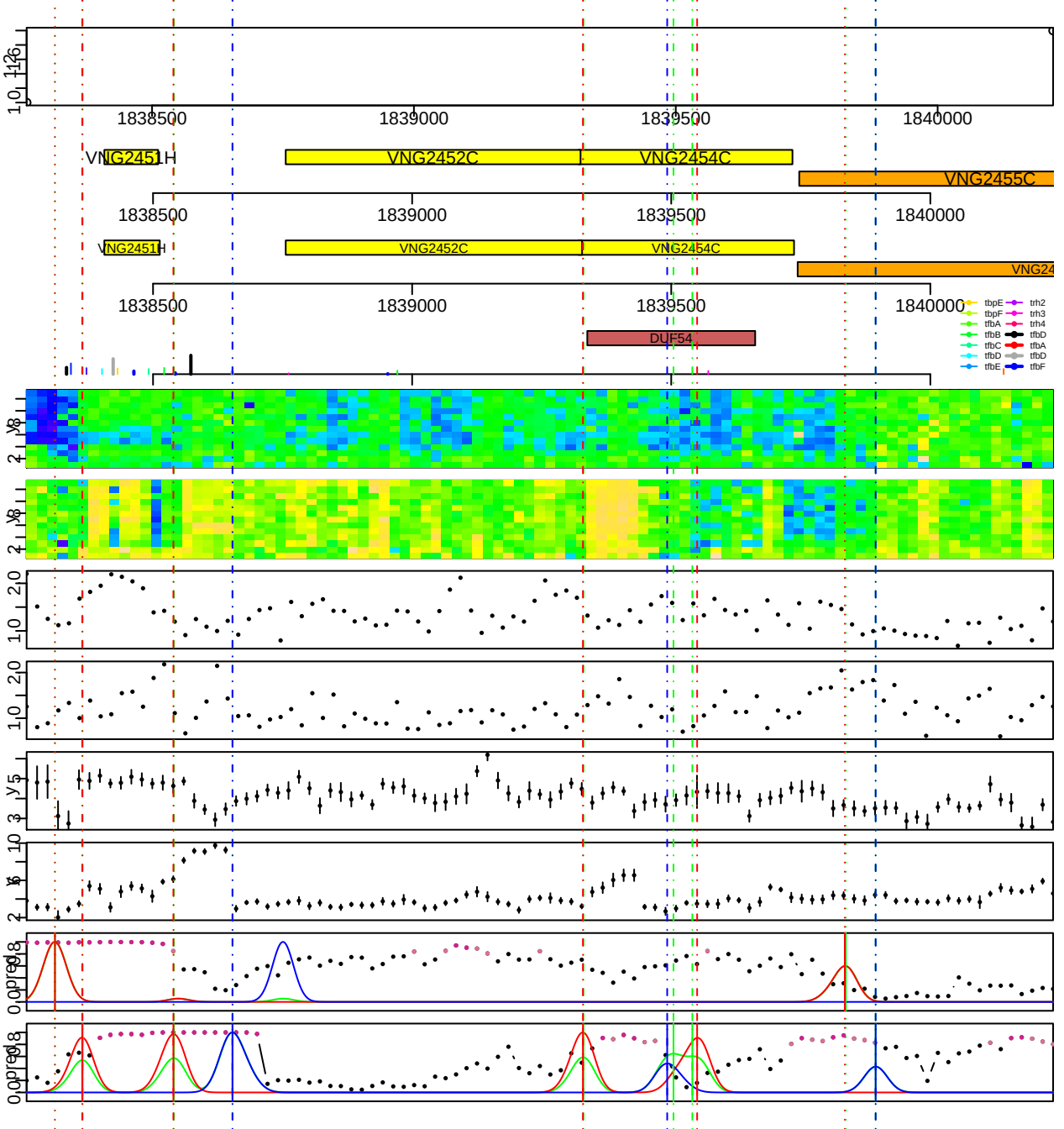
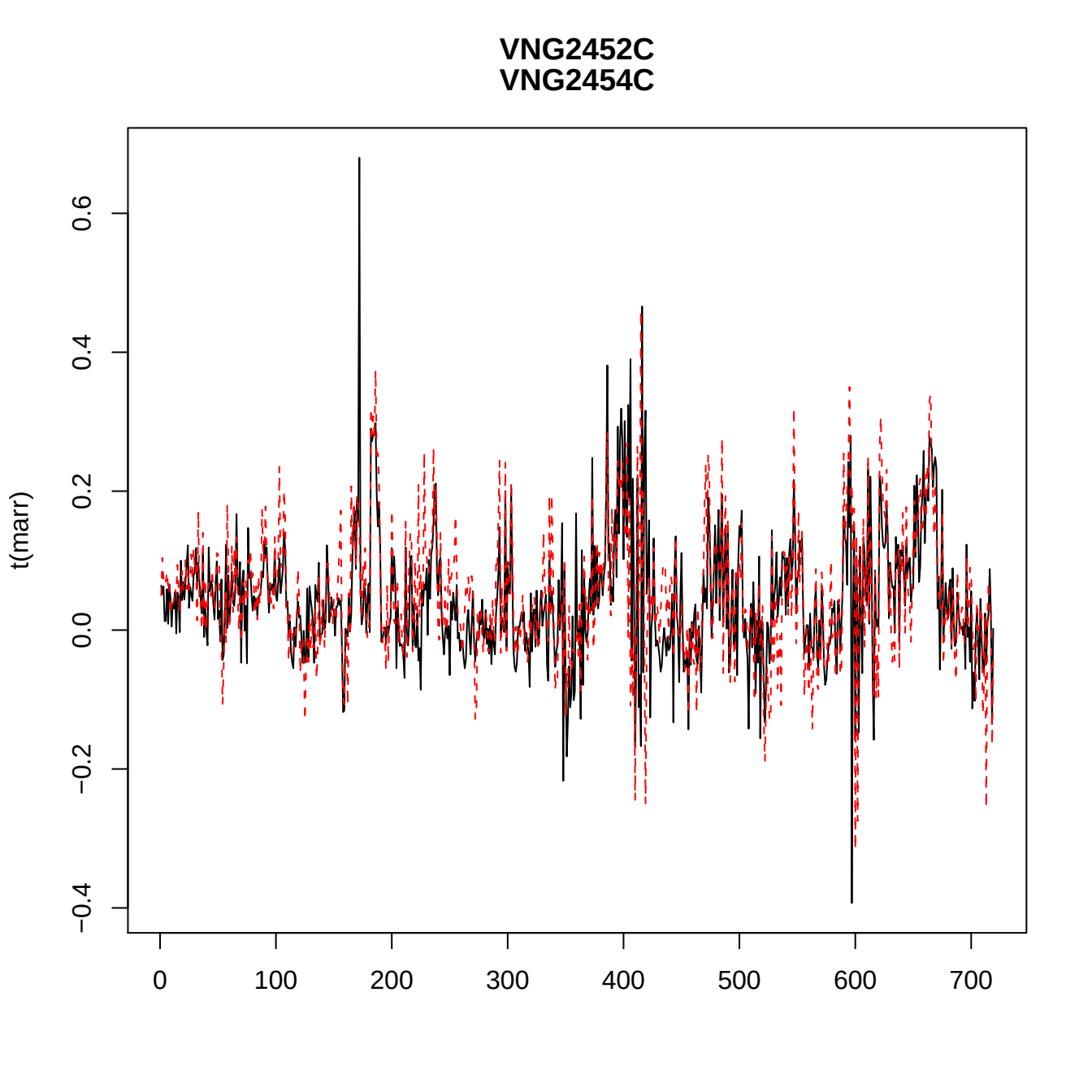
400
500
600
700


1838500
1839000
1839500
1840000
VNG2451H
VNG2452C
VNG2454C
VNG2455C
VNG24
DUF54
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2452C
VNG2454C
t(marr)
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0.2
0.0
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−0.4
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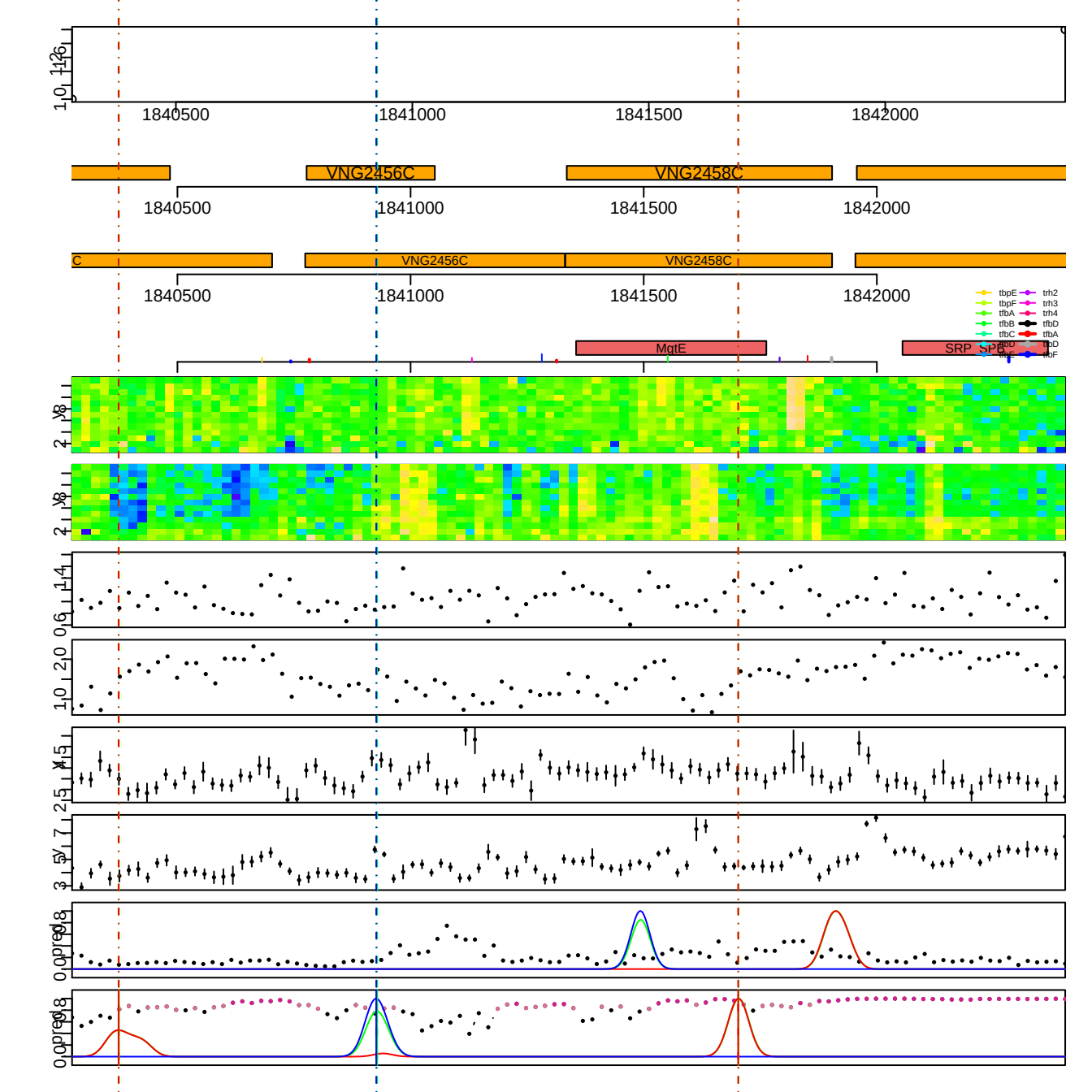
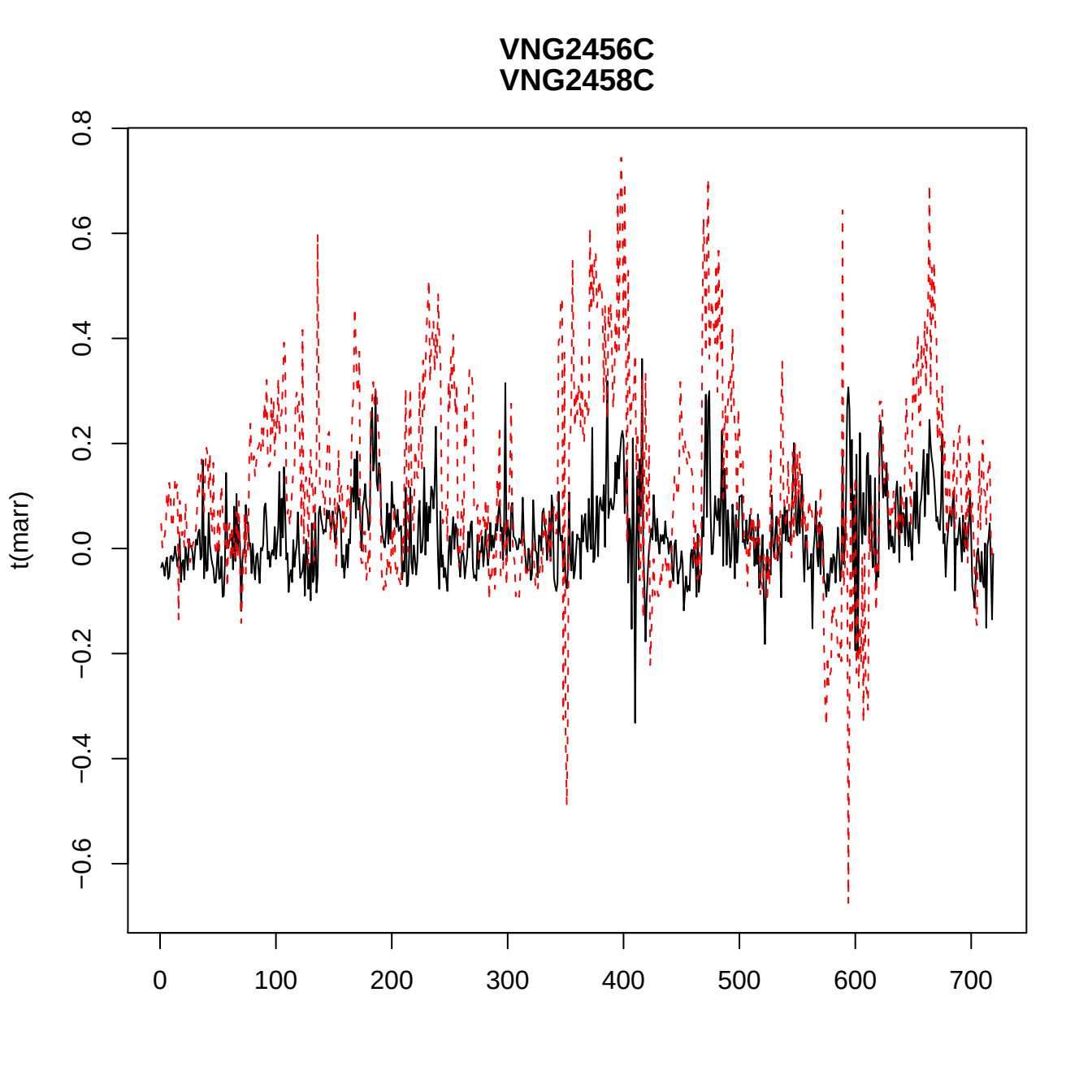
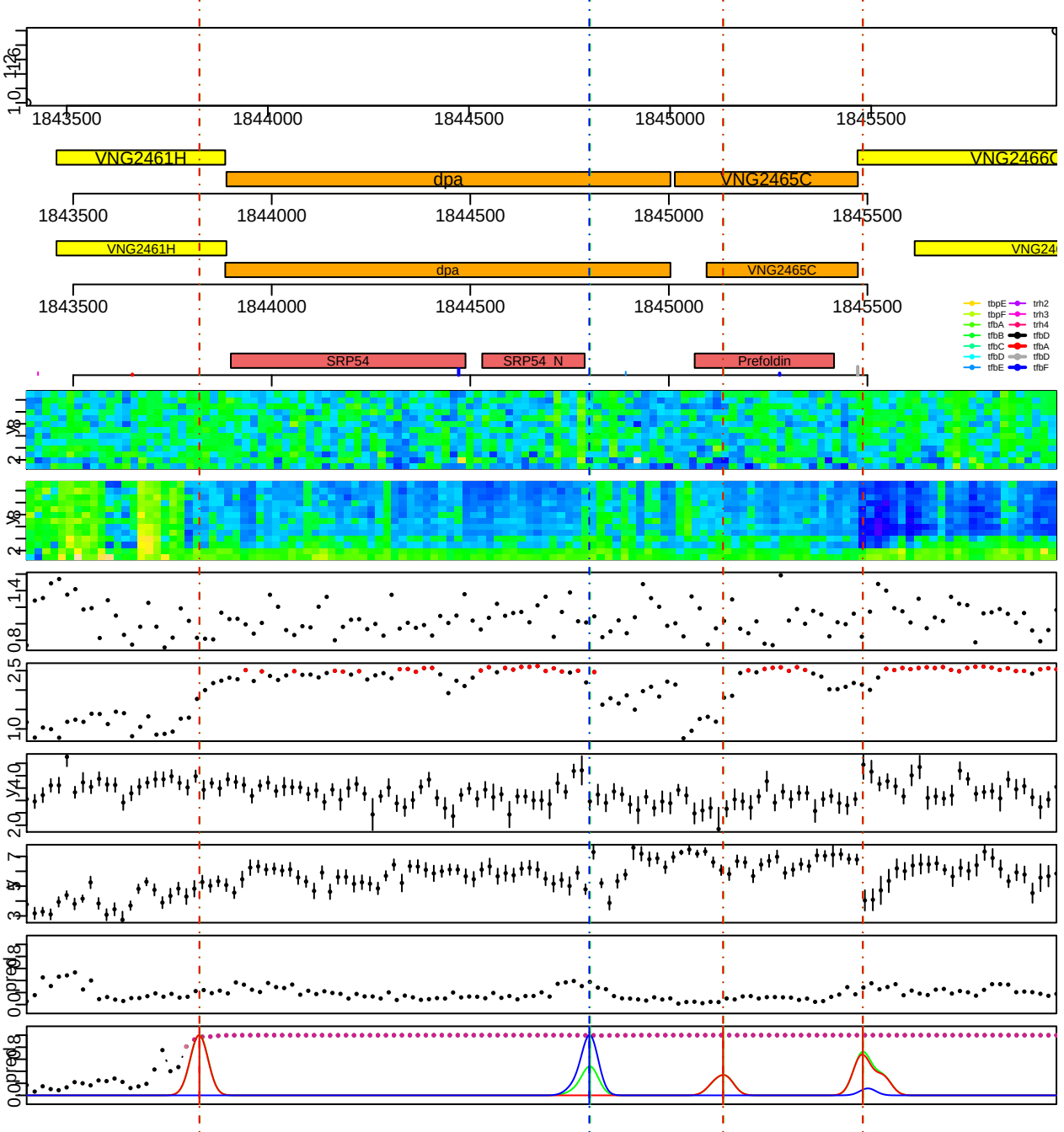
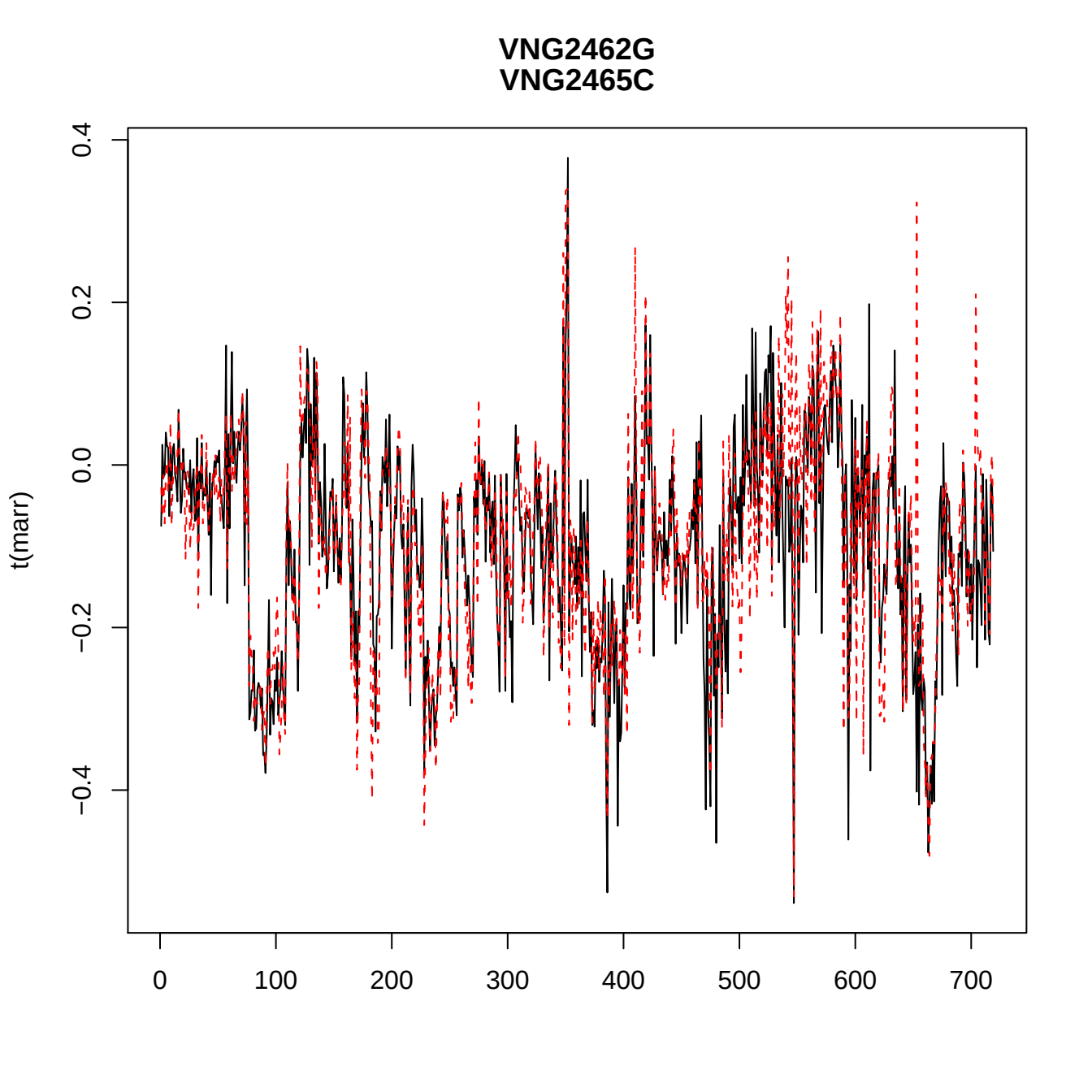
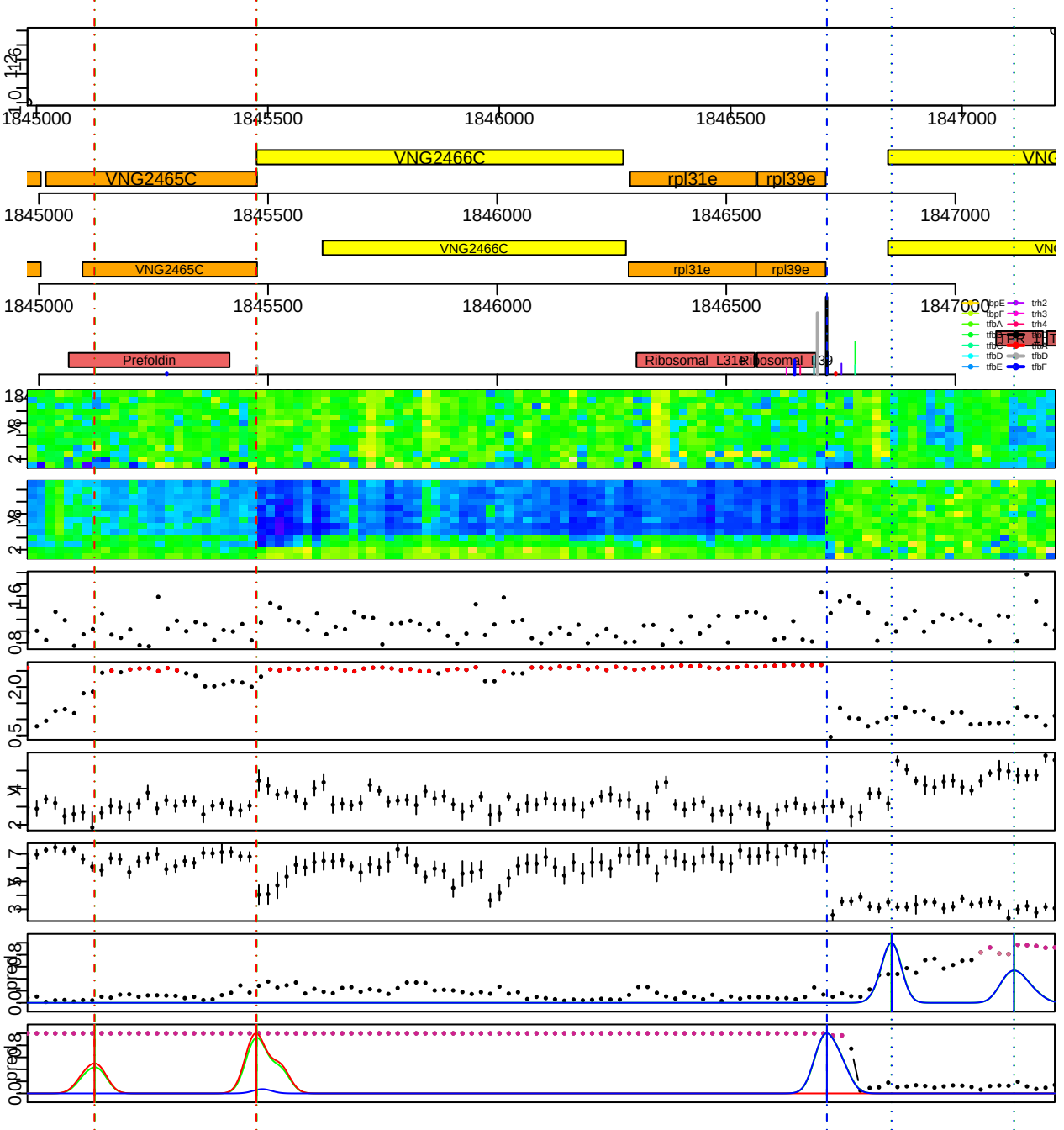
600
700

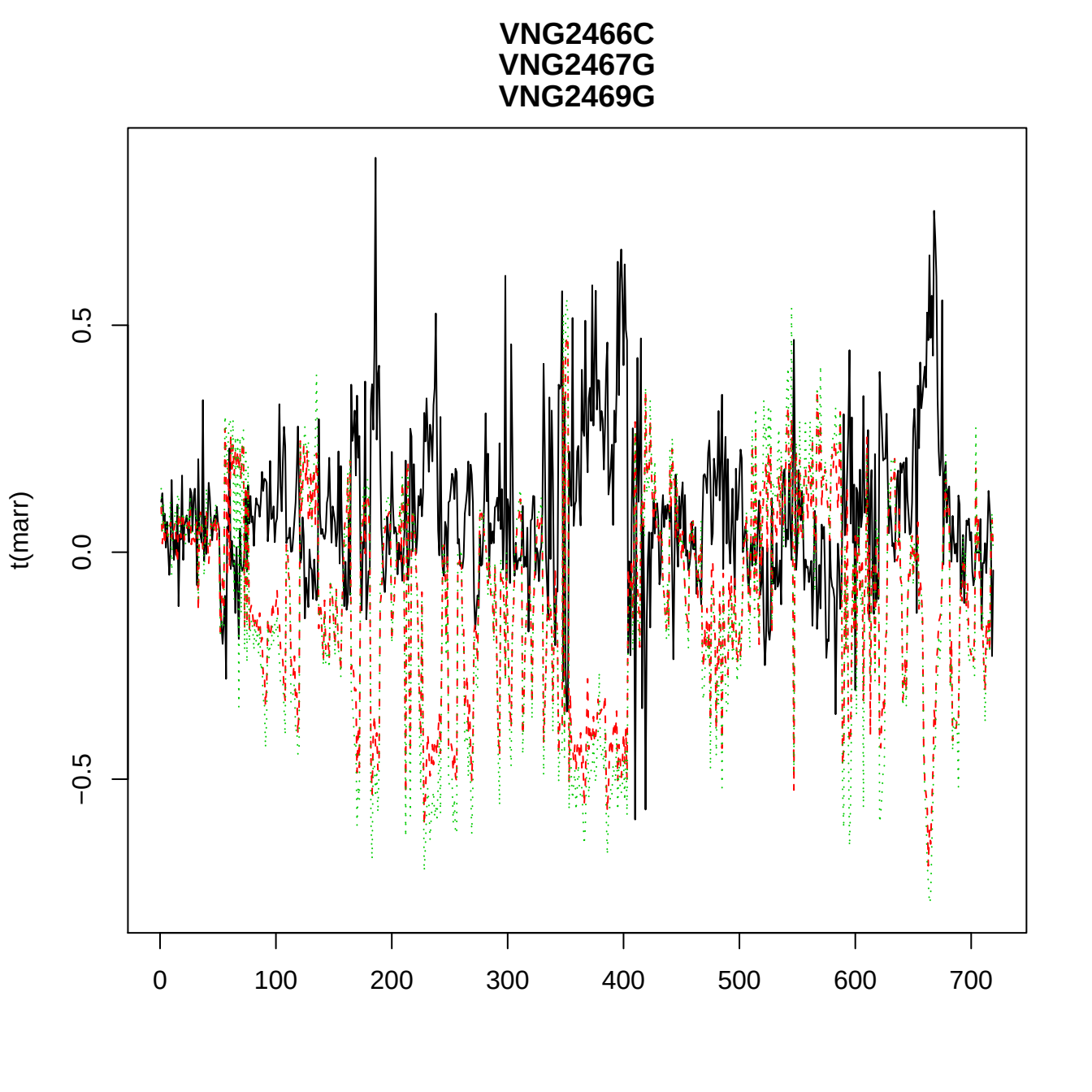

1840500
1841000
1841500
1842000
VNG2456C
VNG2458C
MqtE
SRP_SPB
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbF

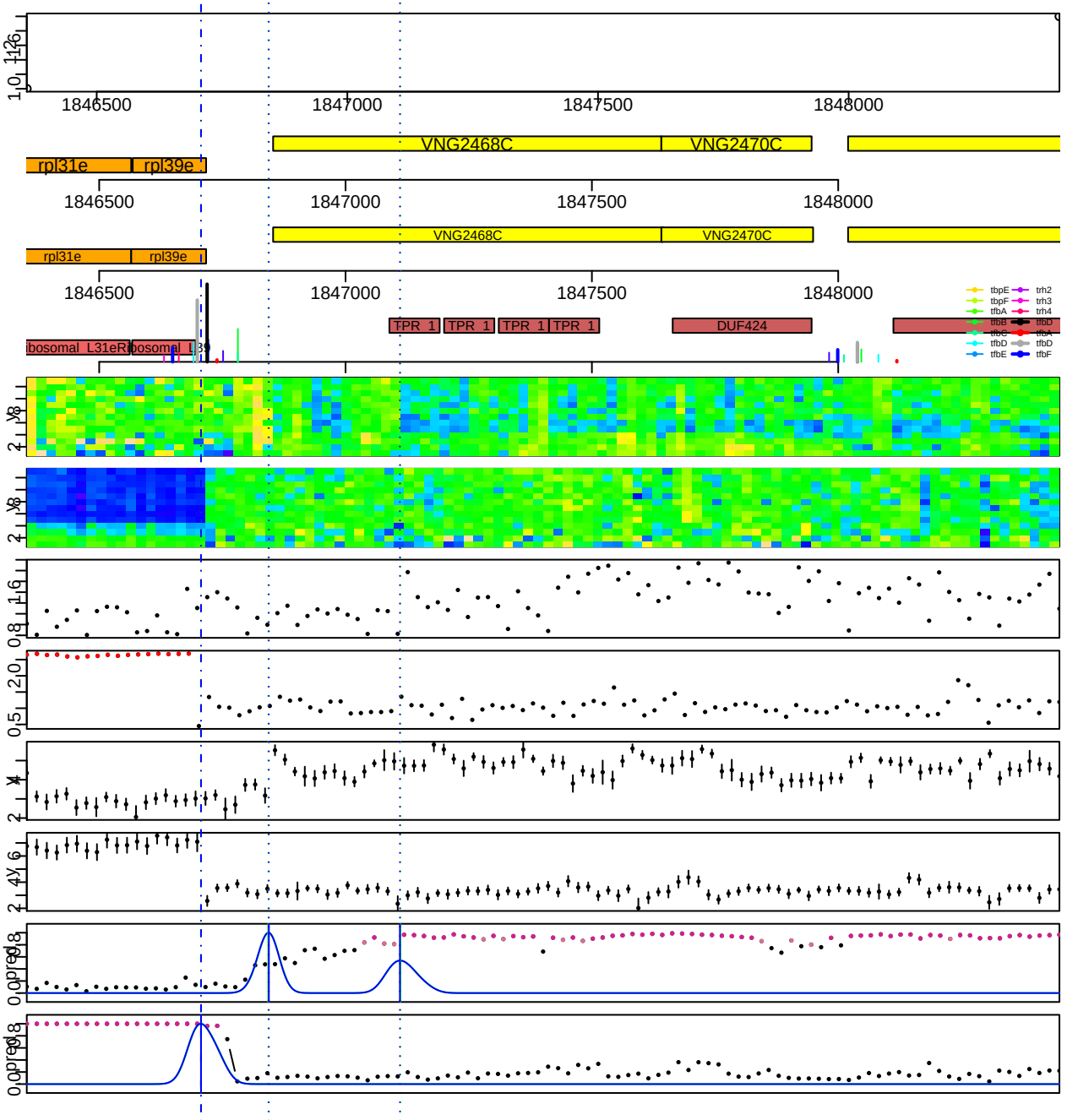

VNG2456C
VNG2458C
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700

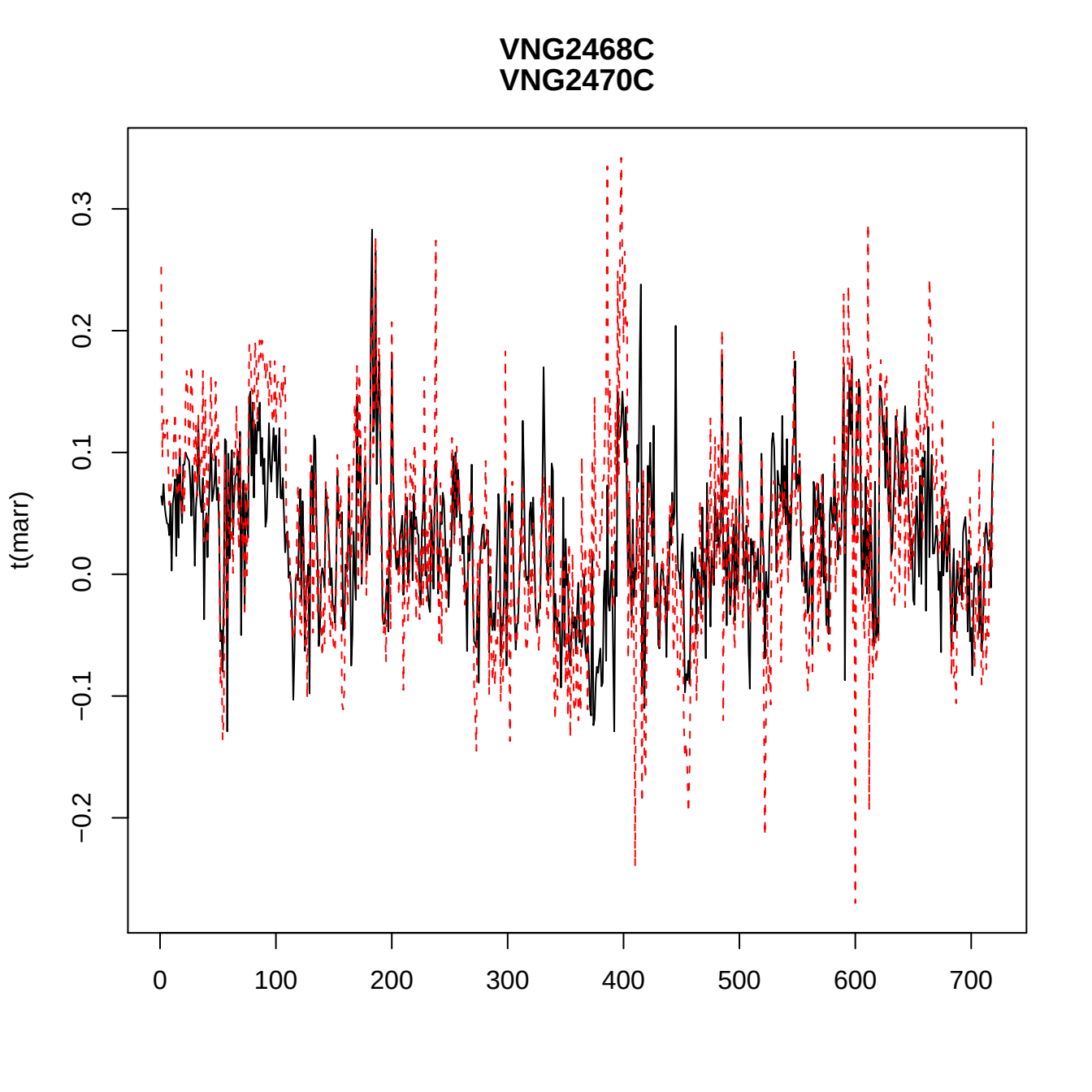

1843500
1844000
1844500
1845000
1845500
VNG2461H
dpa
VNG2465C
VNG2466C
SRP54
SRP54_N
Prefoldin
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

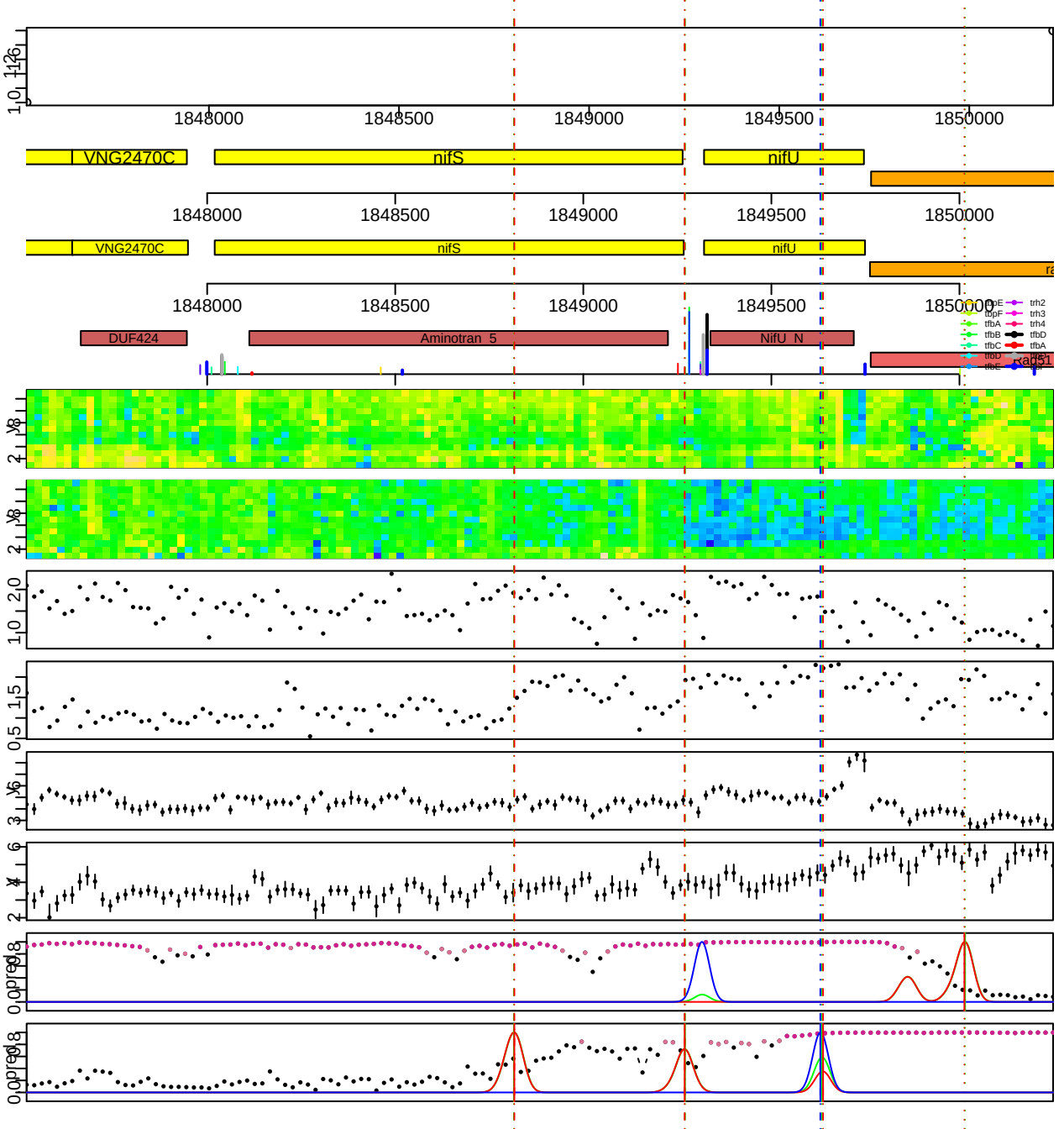

VNG2462G
VNG2465C
t(marr)
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

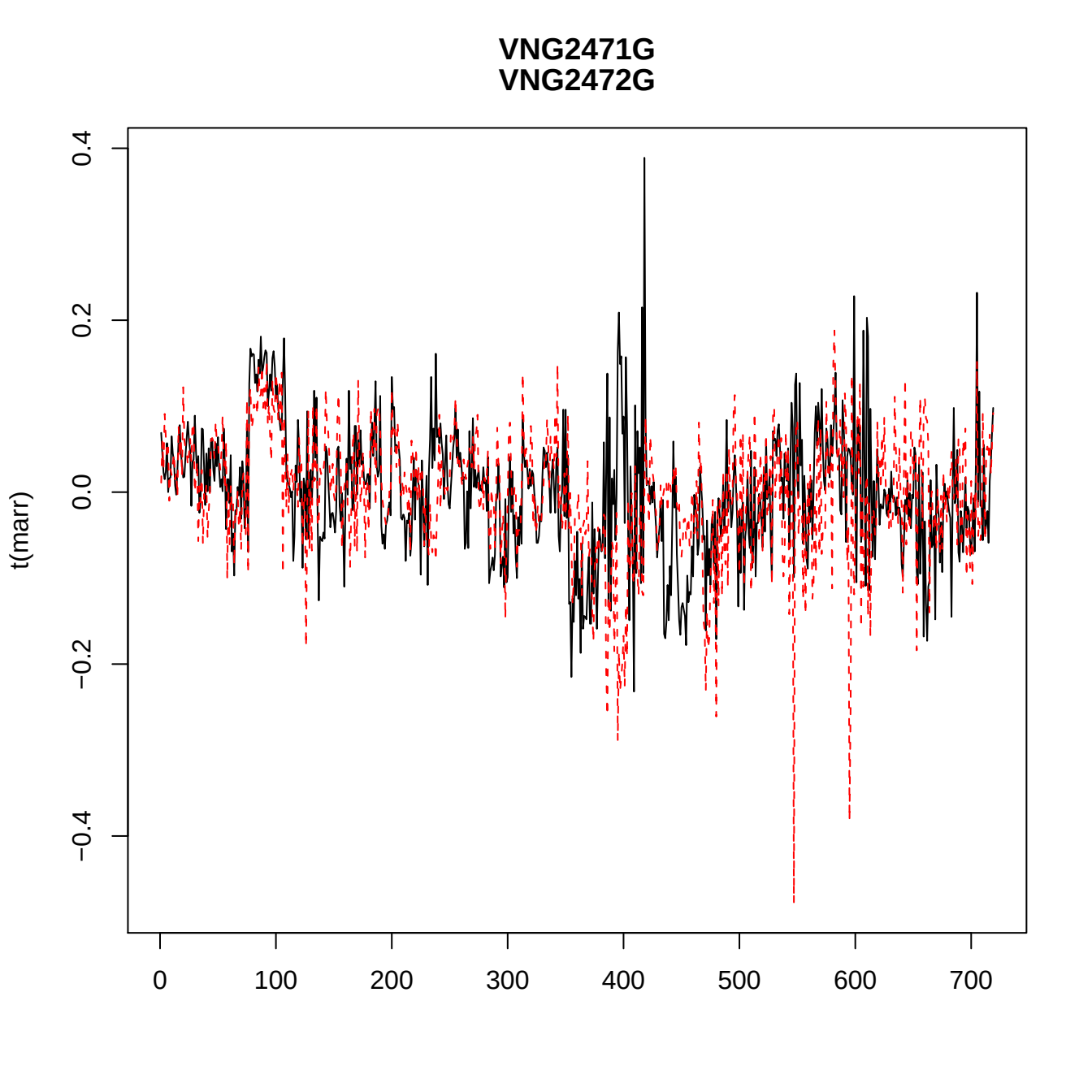

1845000
1845500
1846000
1846500
1847000
VNG2466C
VNG2465C
rpl31e
rpl39e
Prefoldin
Ribosomal_L31e
Ribosomal_L39
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbF
pred


VNG2466C
VNG2467G
VNG2469G
t(marr)
0.5
0.0
−0.5
0
100
200
300
400
500
600
700


1846500
1847000
1847500
1848000
VNG2468C
VNG2470C
rpl31e
rpl39e
TPR_1
DUF424
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2468C
VNG2470C
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700


1848000
1848500
1849000
1849500
1850000
VNG2470C
nifS
nifU
DUF424
Aminotran_5
NifU_N
tfbE
tfbF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
Rad51


VNG2471G
VNG2472G
t(marr)
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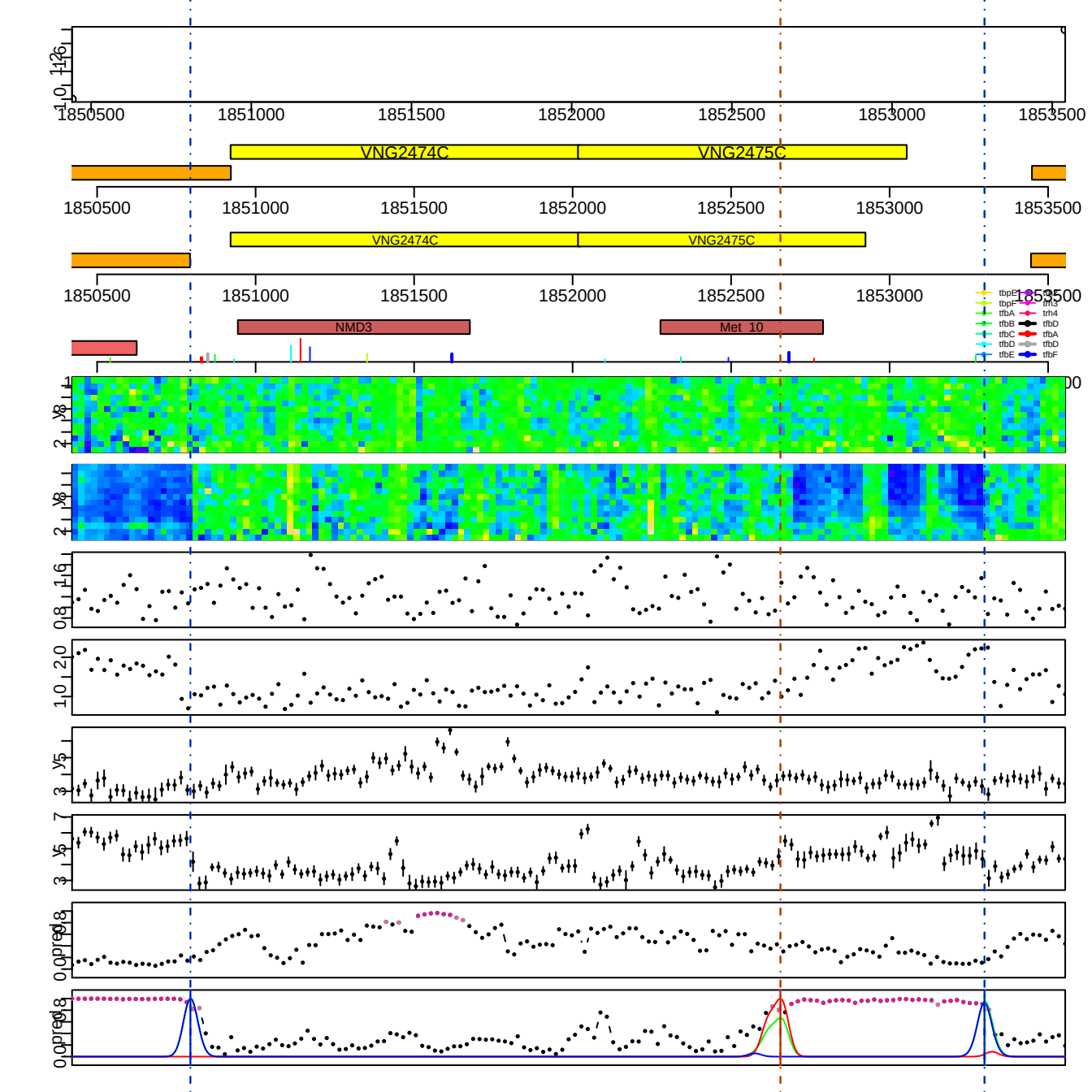
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700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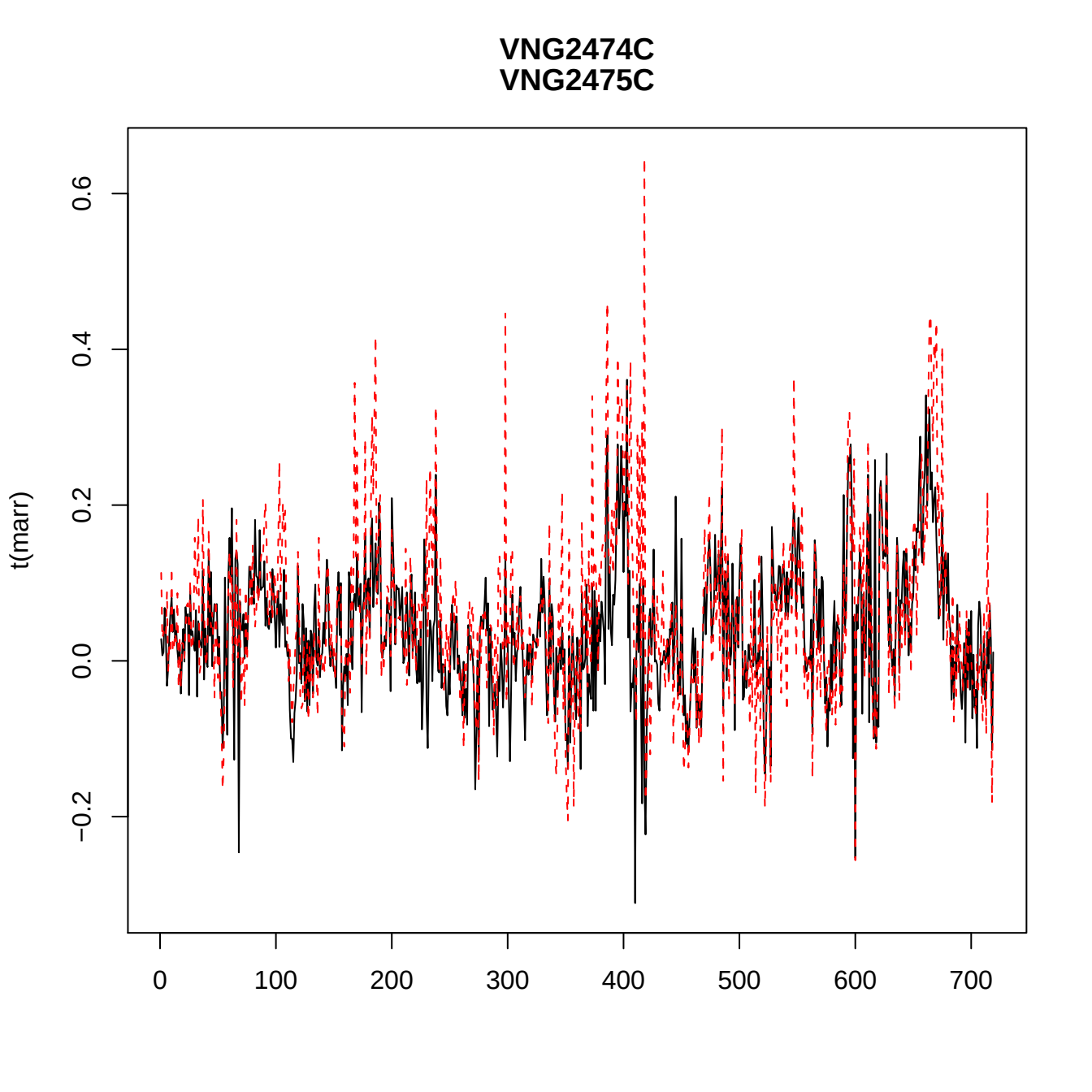
1851000
1851500
1852000
1852500
1853000
1853500
VNG2474C
VNG2475C
NMD3
Met_10
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2474C
VNG2475C
t(marr)
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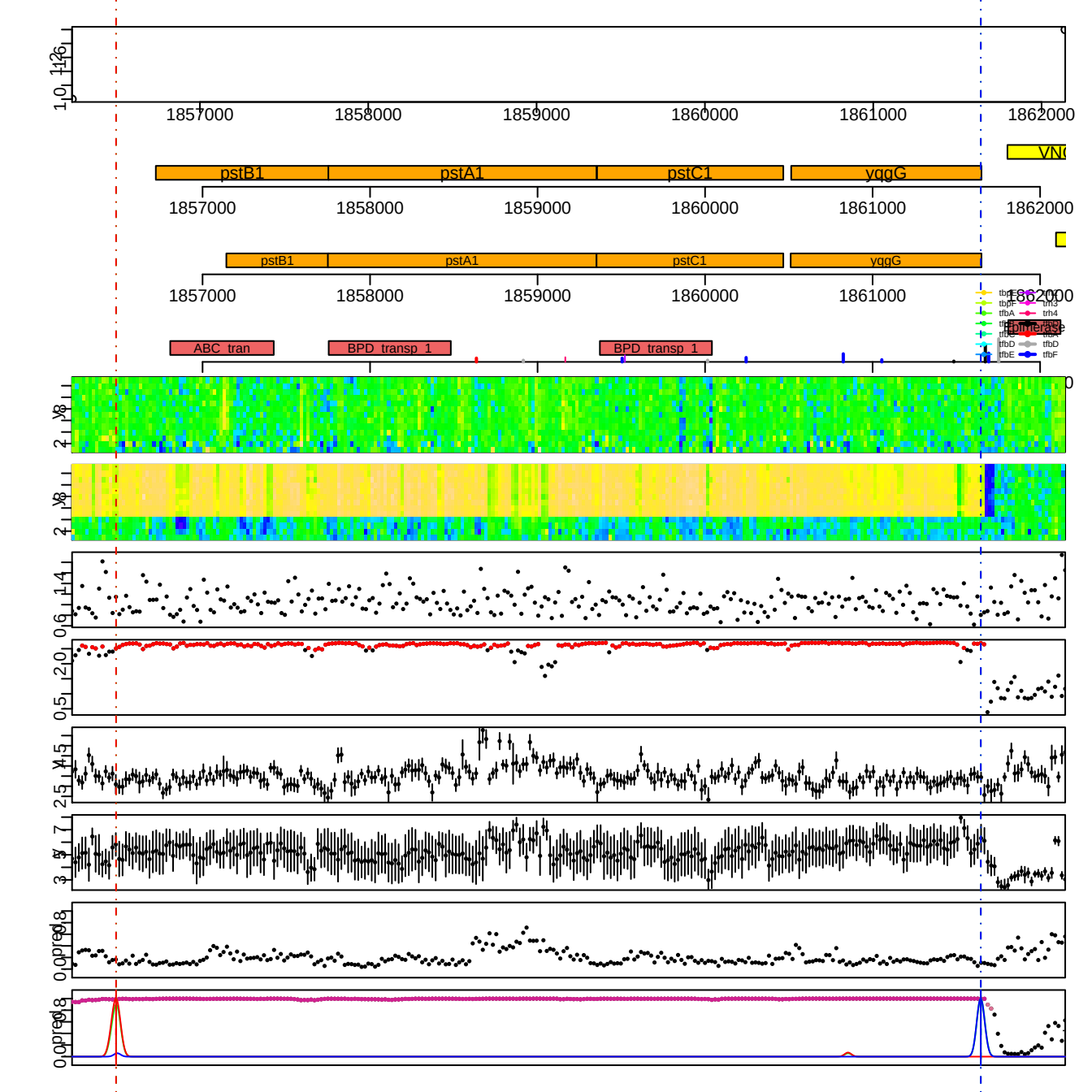
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700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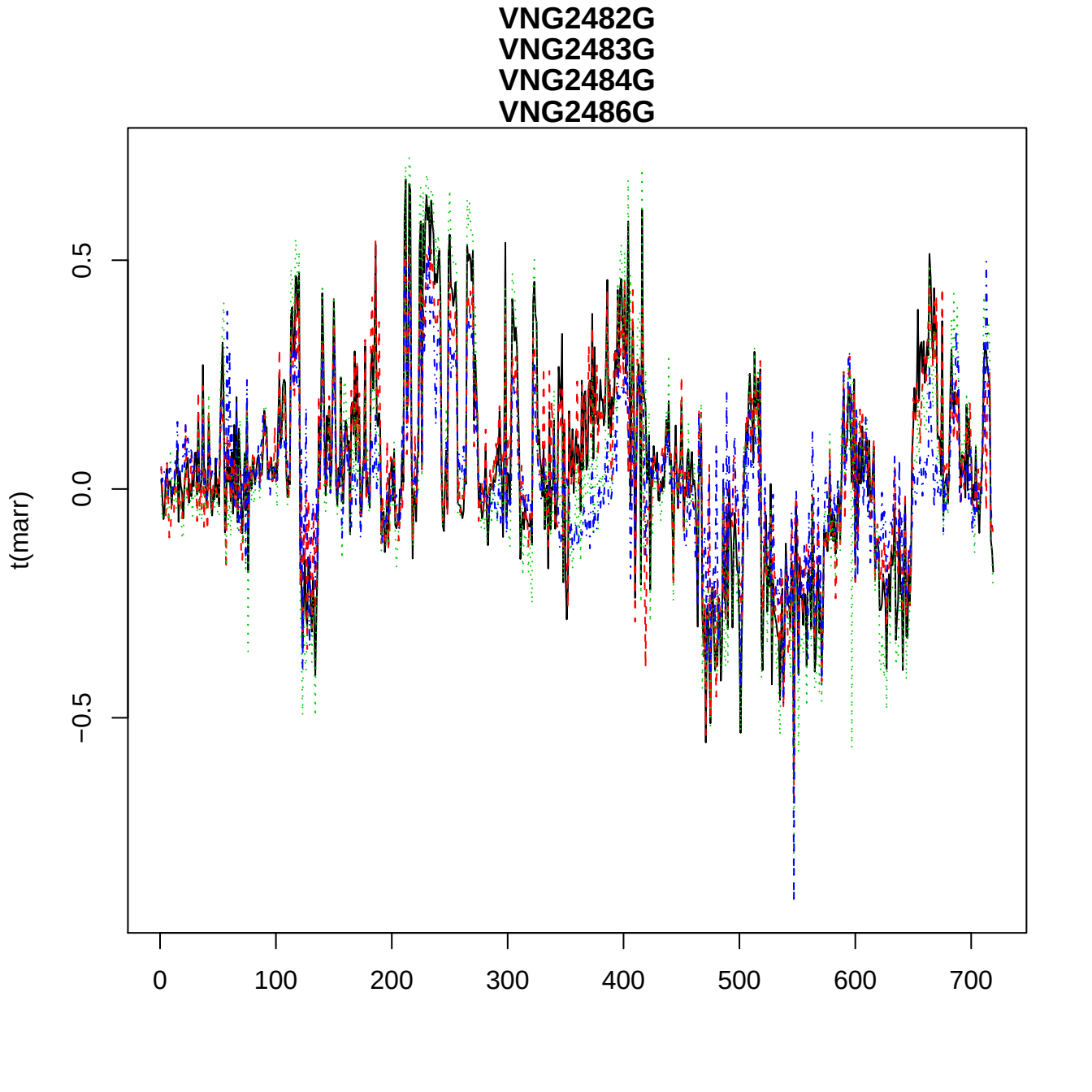
1858000
1859000
1860000
1861000
1862000
pstB1
pstA1
pstC1
yqgG
ABC_tran
BPD_transp_1
BPD_transp_1
tbfC
tbfF
tbfA
tbfB
tbfE
tbfD
tbfE
trh3
trh4
tbfA
tbfB
tbfD
tbfF


VNG2482G
VNG2483G
VNG2484G
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t(marr)
0.5
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0
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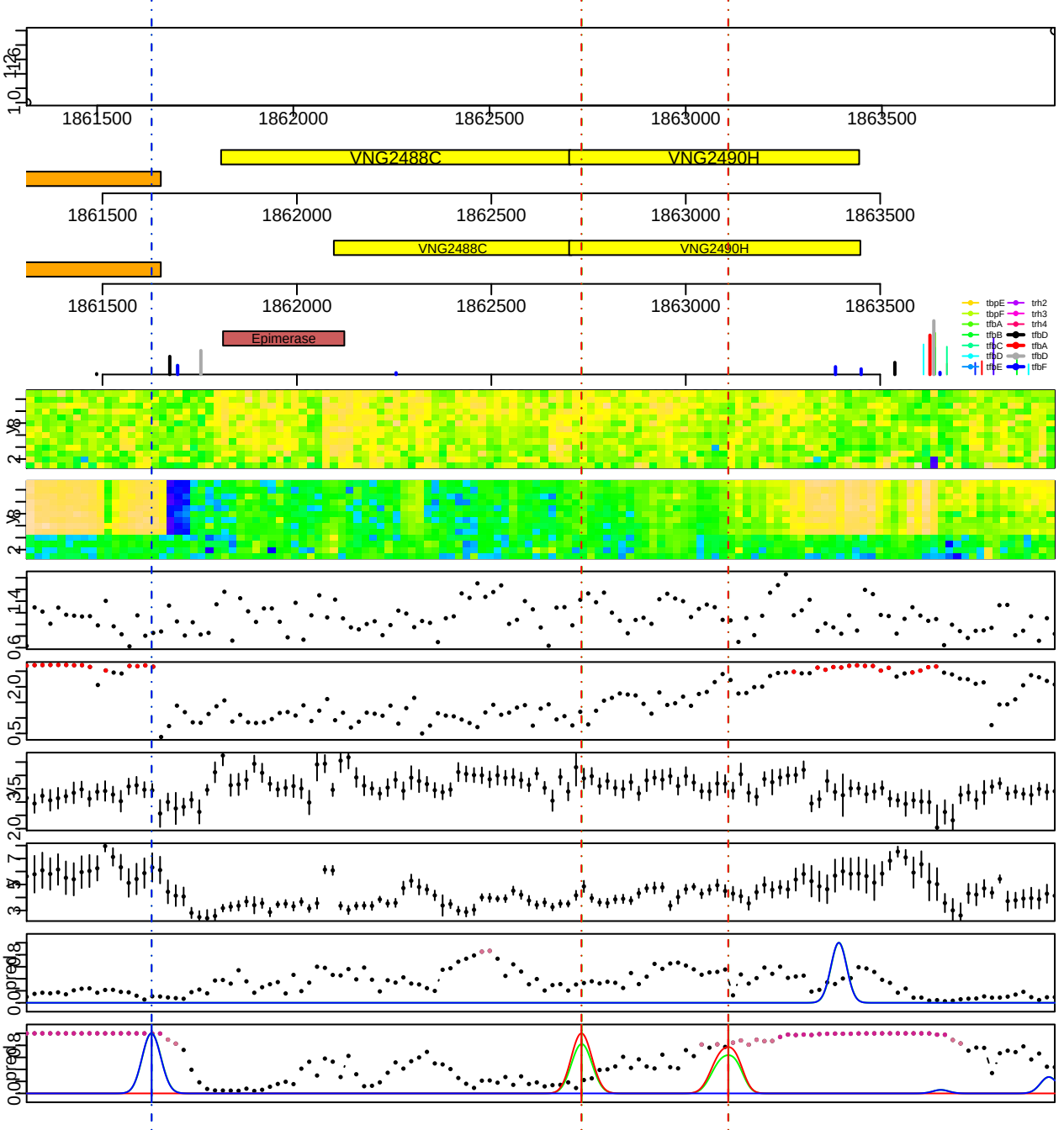
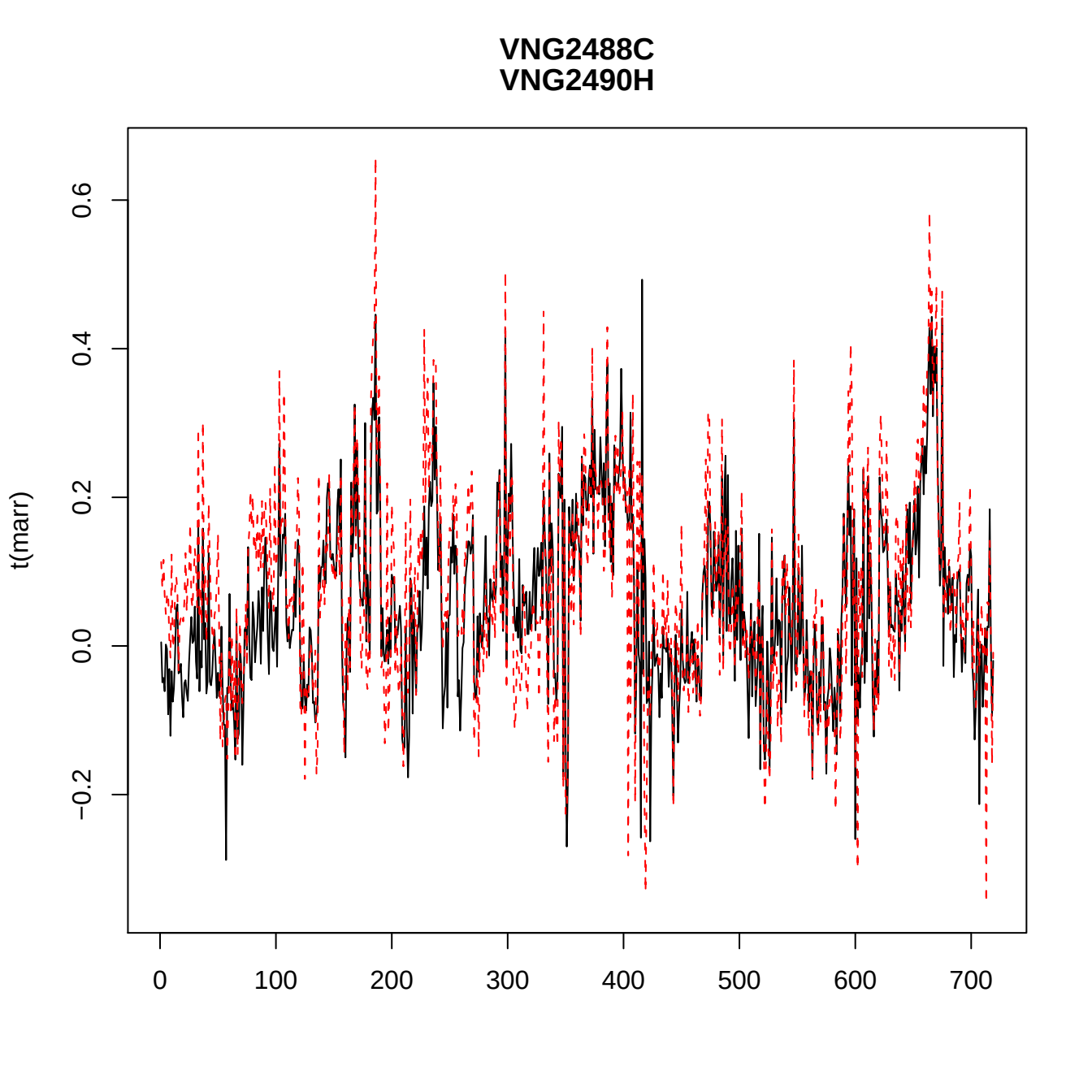
400
500
600
700


1861500
1862000
1862500
1863000
1863500
VNG2488C
VNG2490H
Epimerase
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG2488C
VNG2490H
t(marr)
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0
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400
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600
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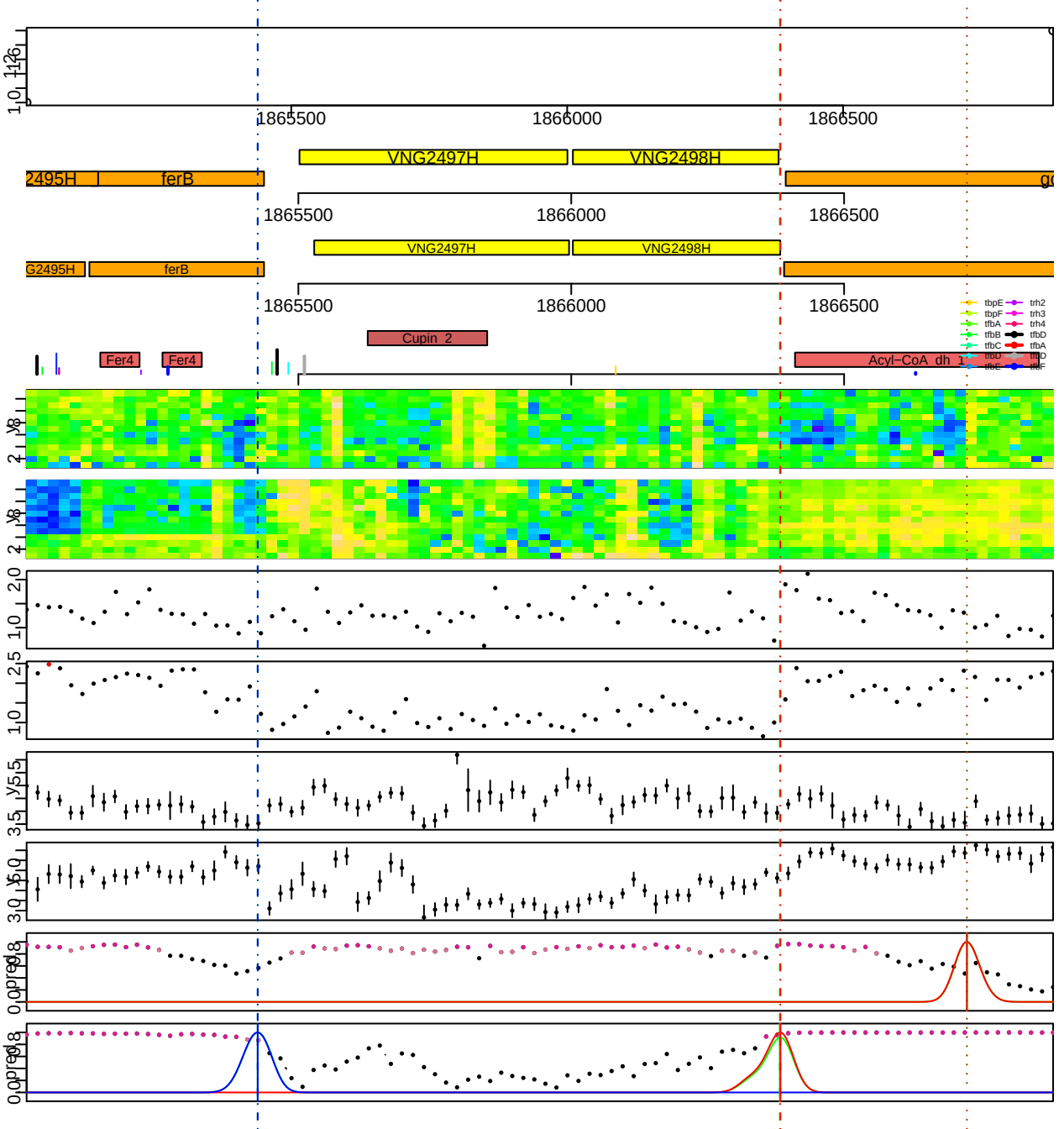
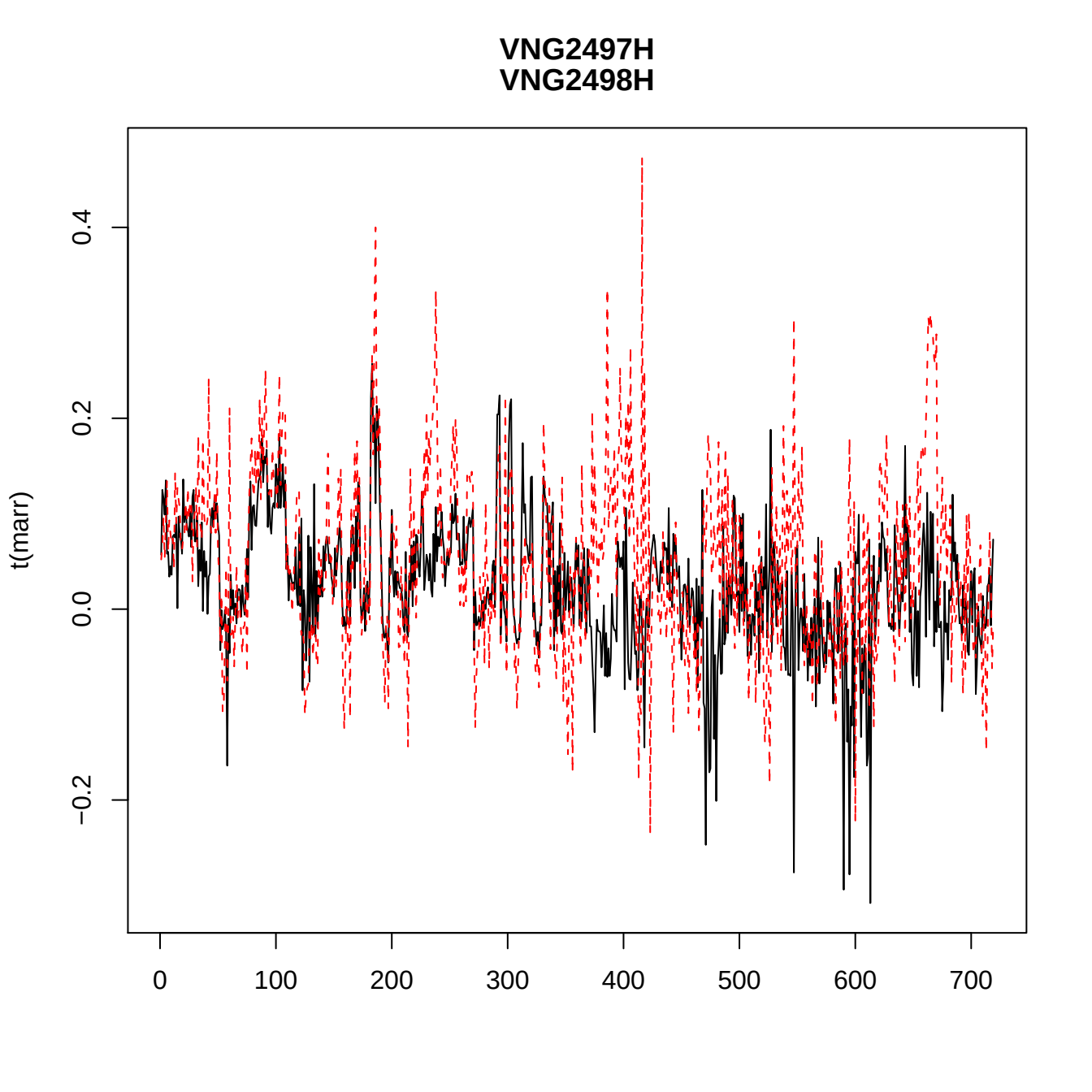

1865500
1866000
1866500
VNG2497H
VNG2498H
ferB
Cupin_2
Fer4
Fer4
Acyl-CoA_dh_1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2497H
VNG2498H
t(marr)
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0.0
−0.2
0
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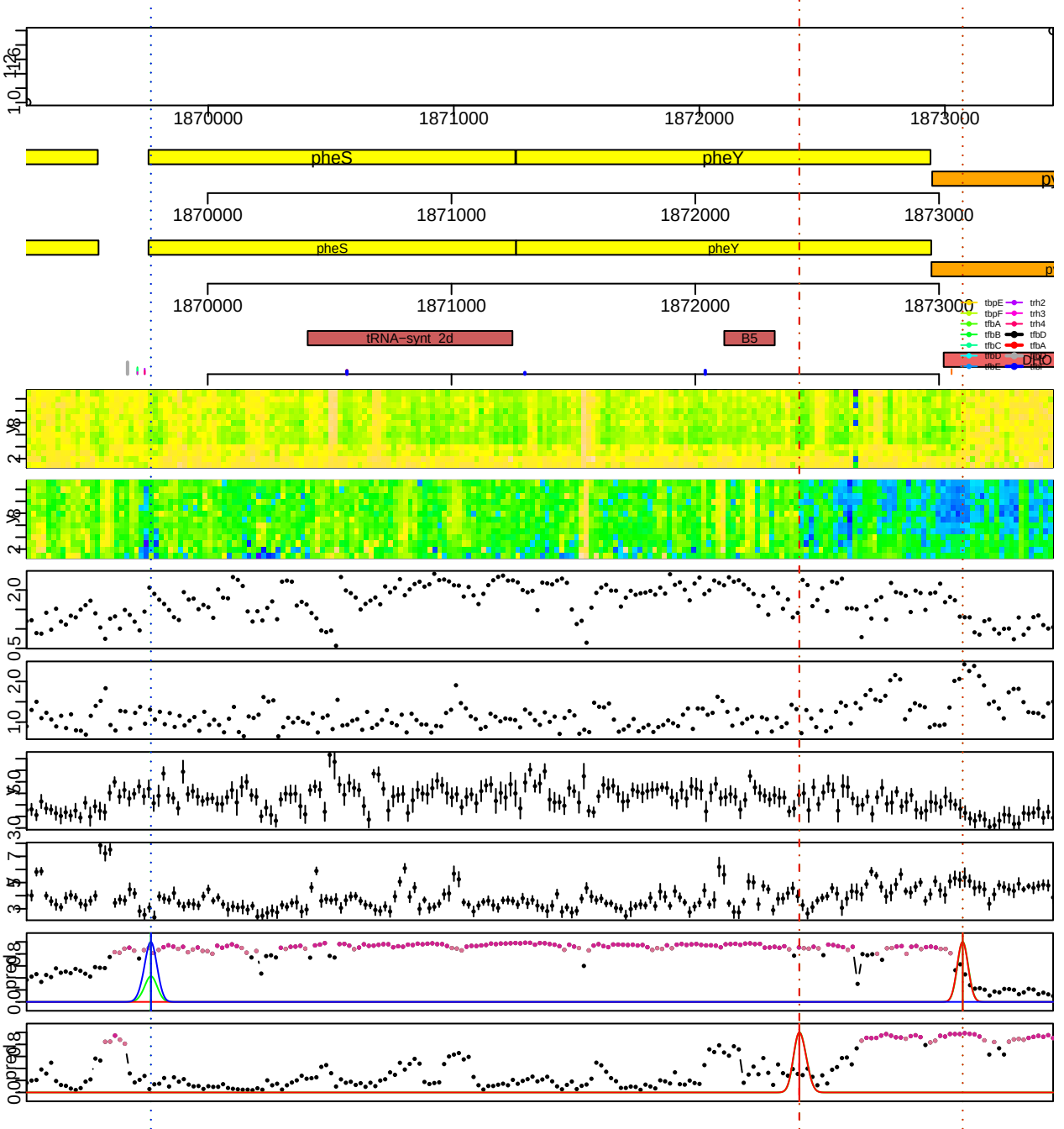
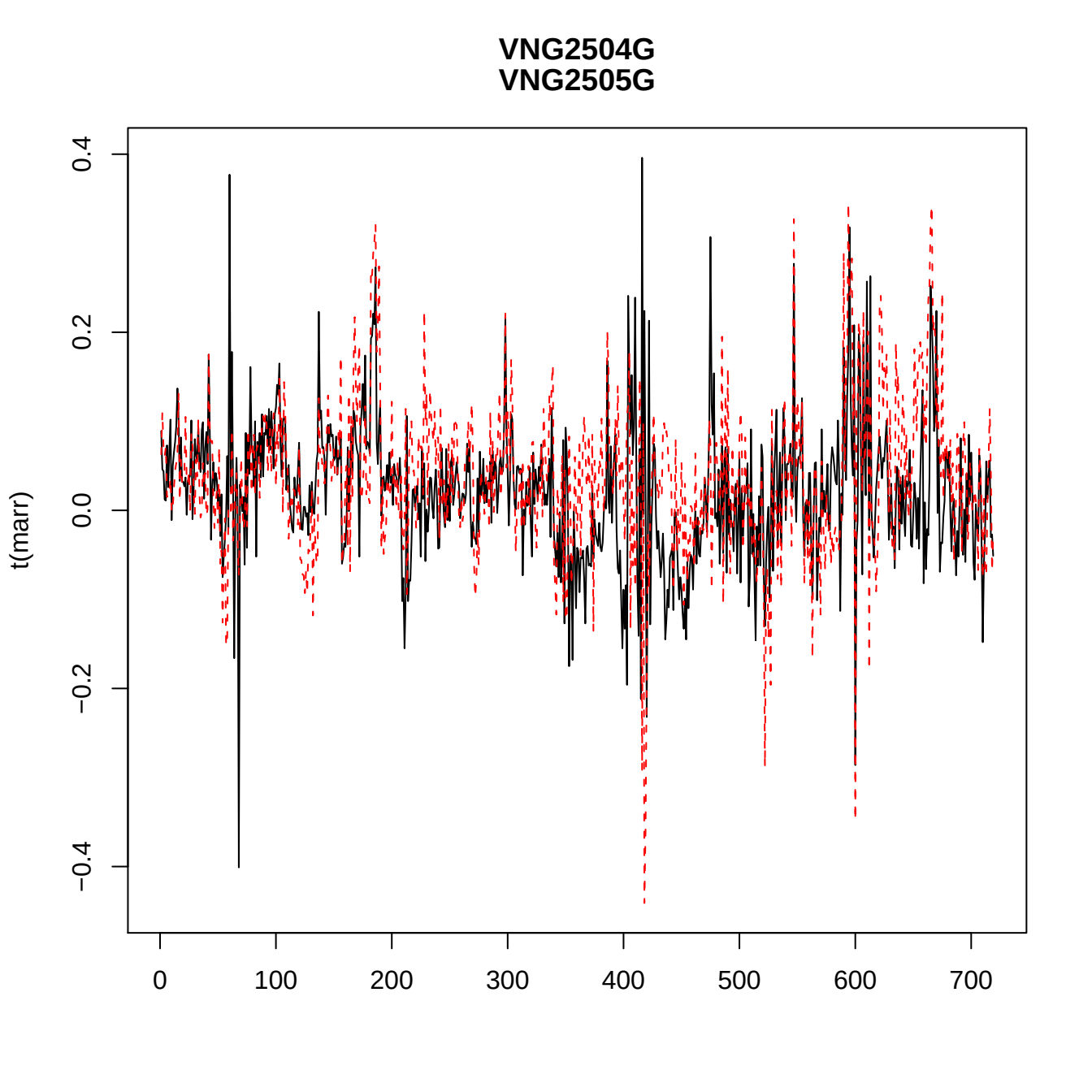
200
300
400
500
600
700


1870000
1871000
1872000
1873000
pheS
pheY
tRNA−synt_2d
B5
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
DHO
pred


VNG2504G
VNG2505G
t(marr)
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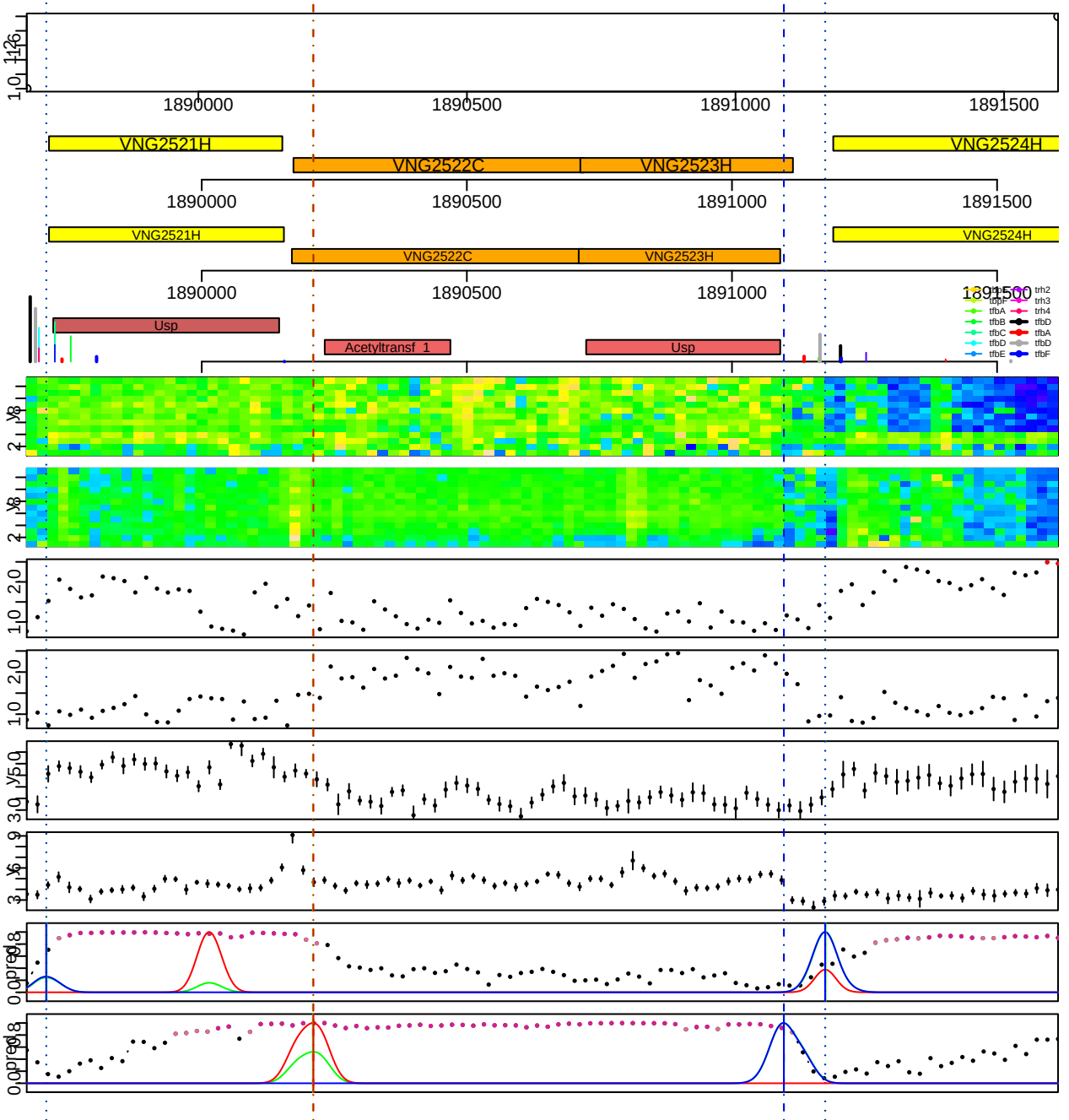
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1890000
1890500
1891000
1891500
VNG2521H
VNG2522C
VNG2523H
VNG2524H
Usp
Acetyltransf_1
Usp
trh2
trh3
trh4
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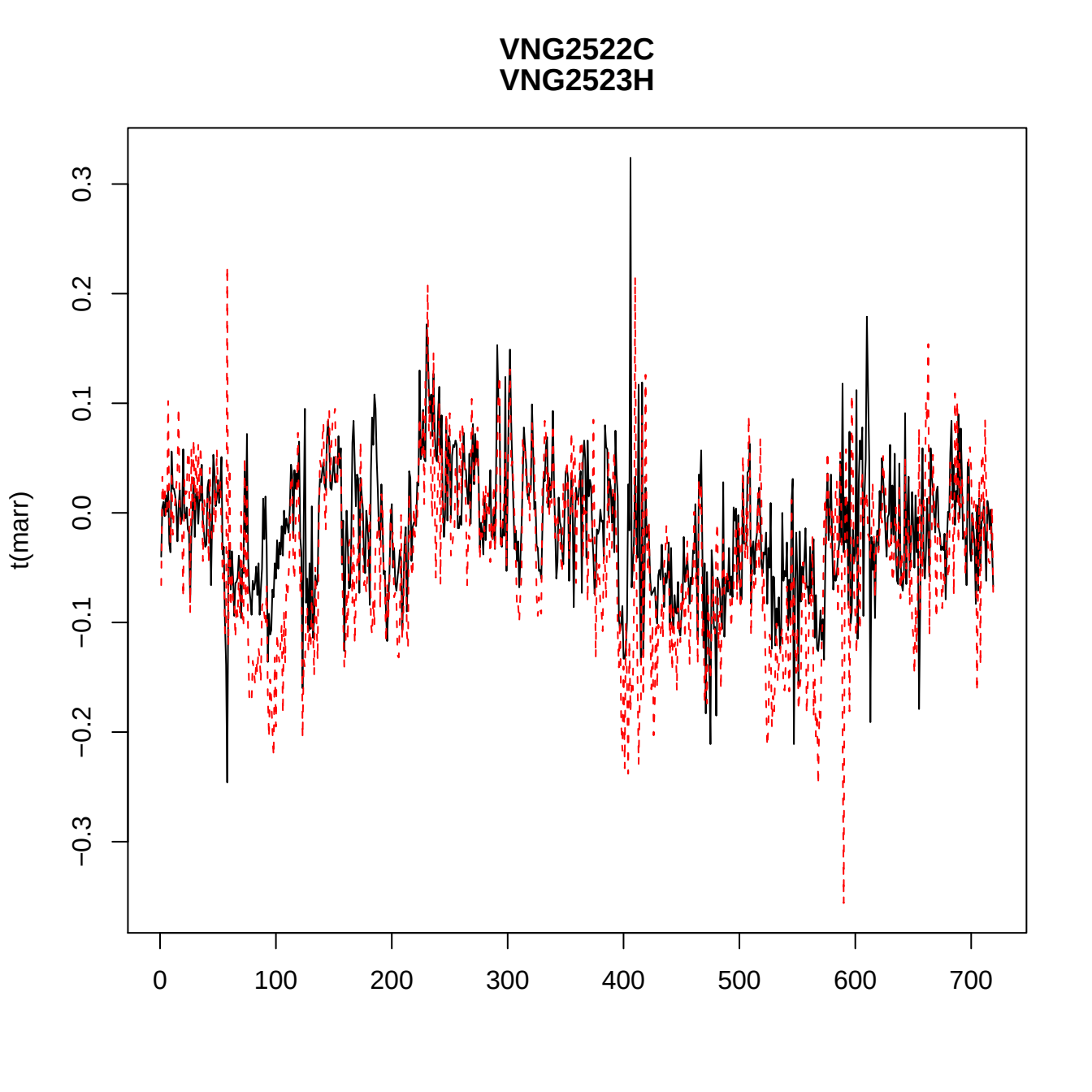
tfbA
tfbD
tfbF
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE


VNG2522C
VNG2523H
t(marr)
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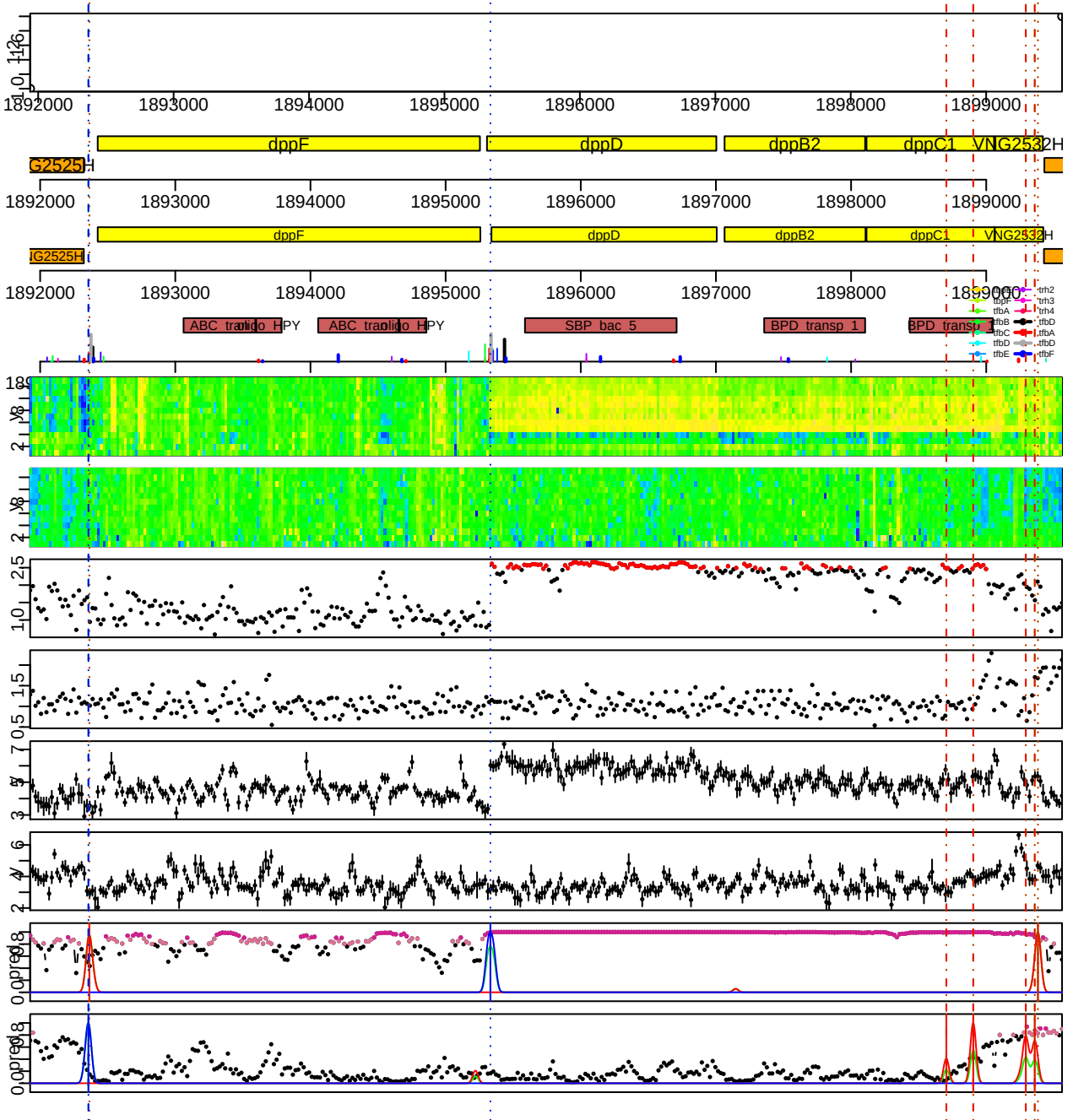
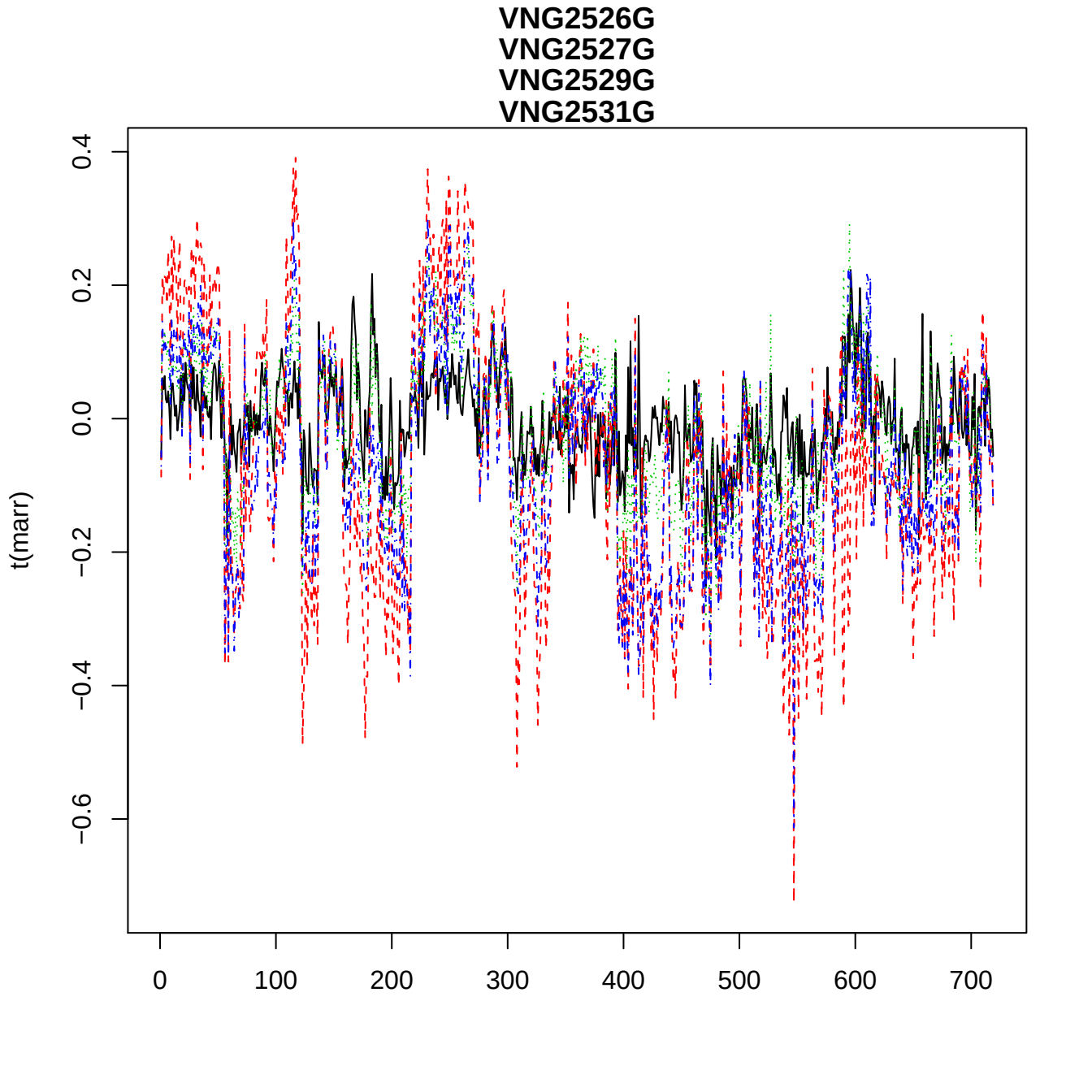
0.0
−0.1
−0.2
−0.3
0
100
200
300
400
500
600
700


1892000
1893000
1894000
1895000
1896000
1897000
1898000
1899000
dppF
dppD
dppB2
dppC1
VNG2532H
VNG2525H
ABC_tranlido_HPY
SBP_bac_5
BPD_transp_1
trh2
trh3
trh4
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
pred


VNG2526G
VNG2527G
VNG2529G
VNG2531G
t(marr)
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0.0
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−0.4
−0.6
0
100
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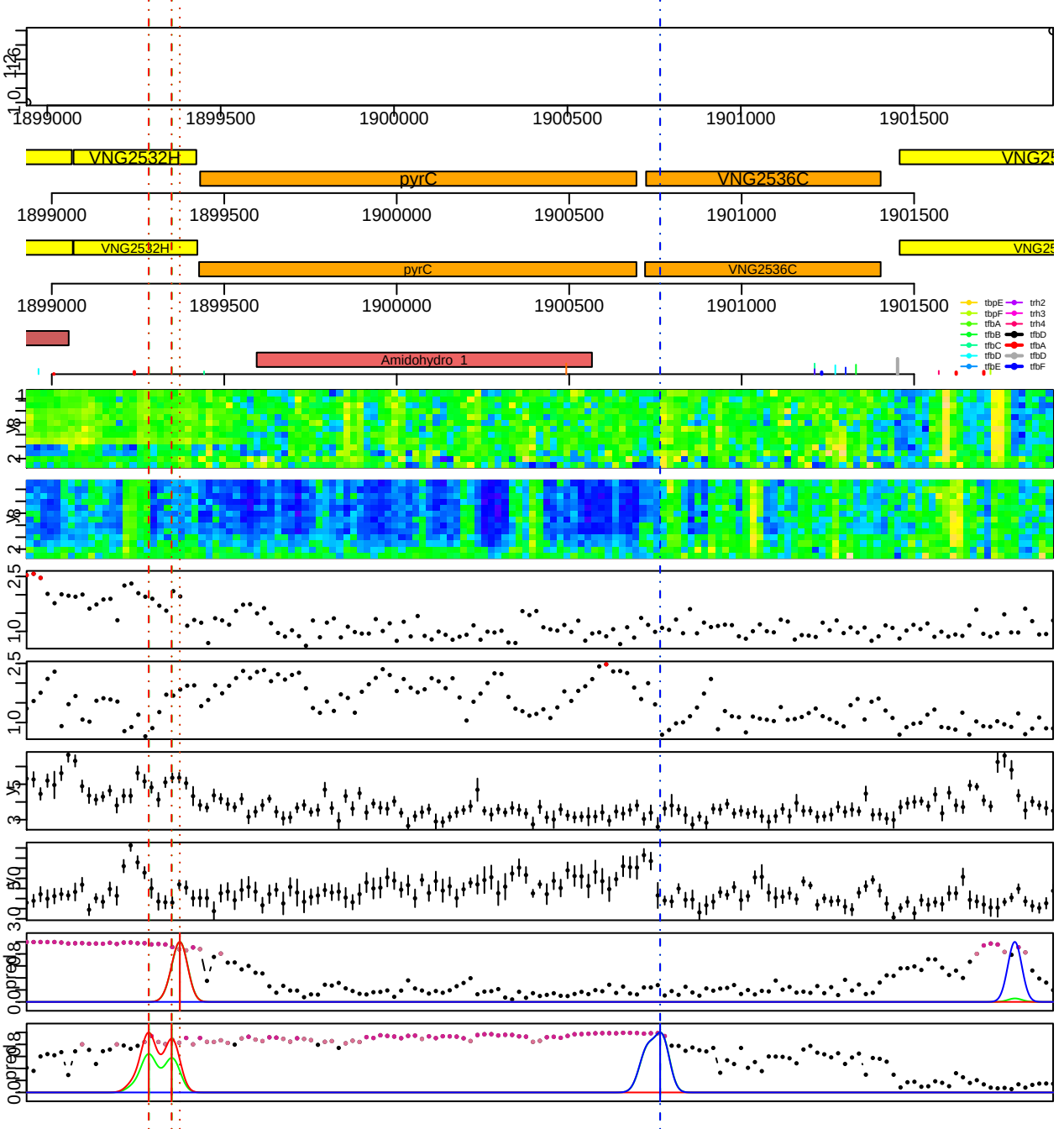
300
400
500
600
700


1899000
1899500
1900000
1900500
1901000
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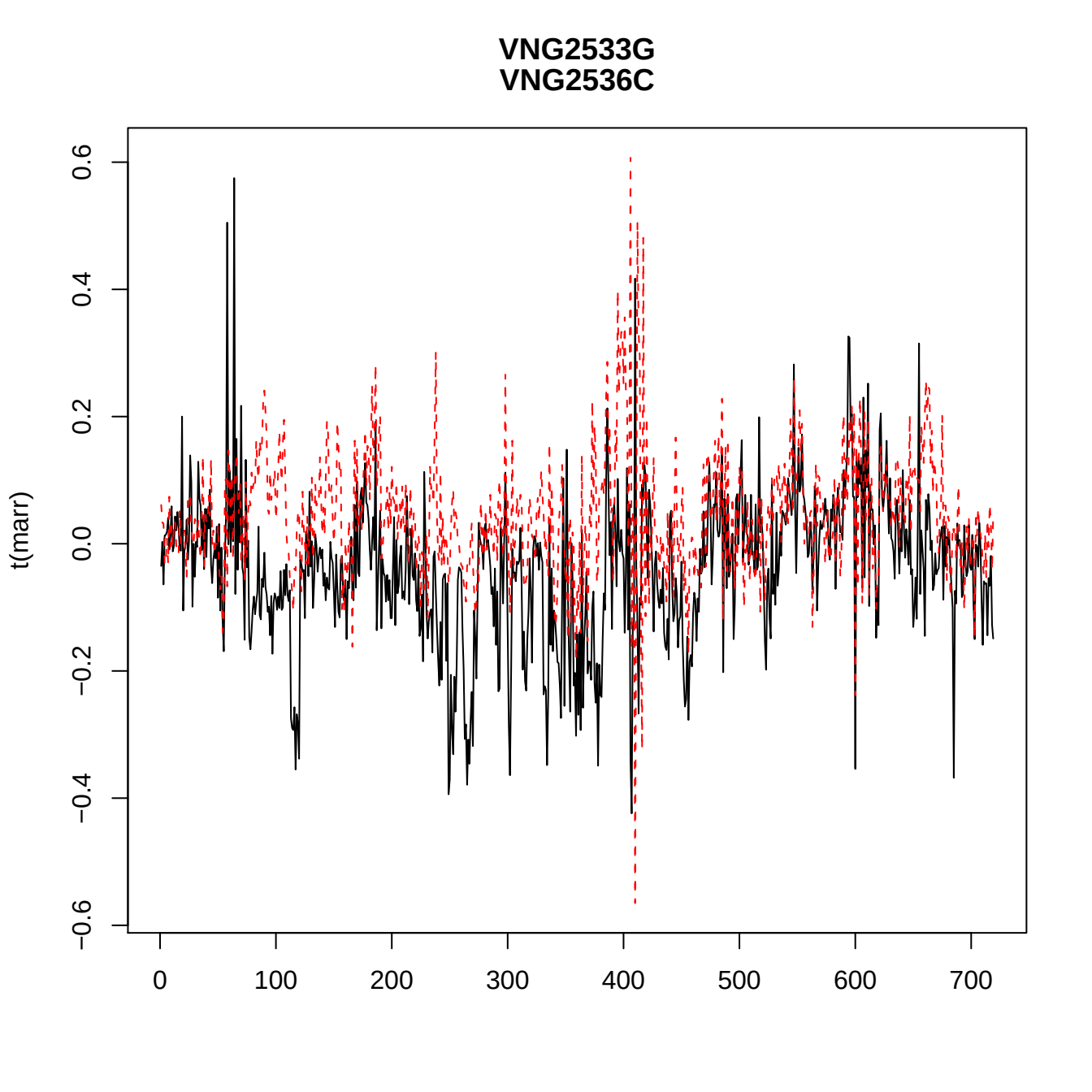
VNG2532H
pyrC
VNG2536C
Amidohydro_1
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2533G
VNG2536C
t(marr)
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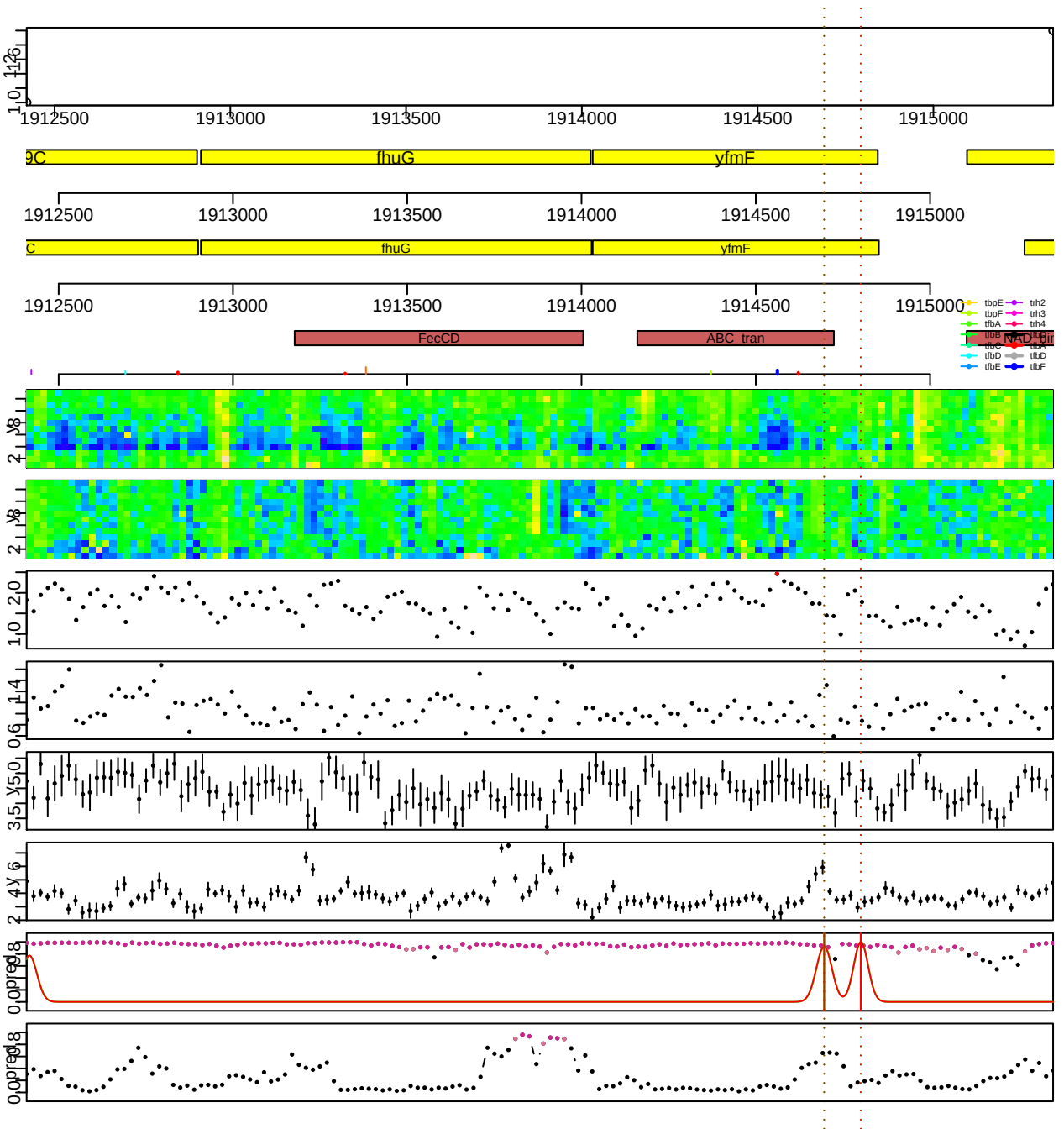
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


1912500
1913000
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1914000
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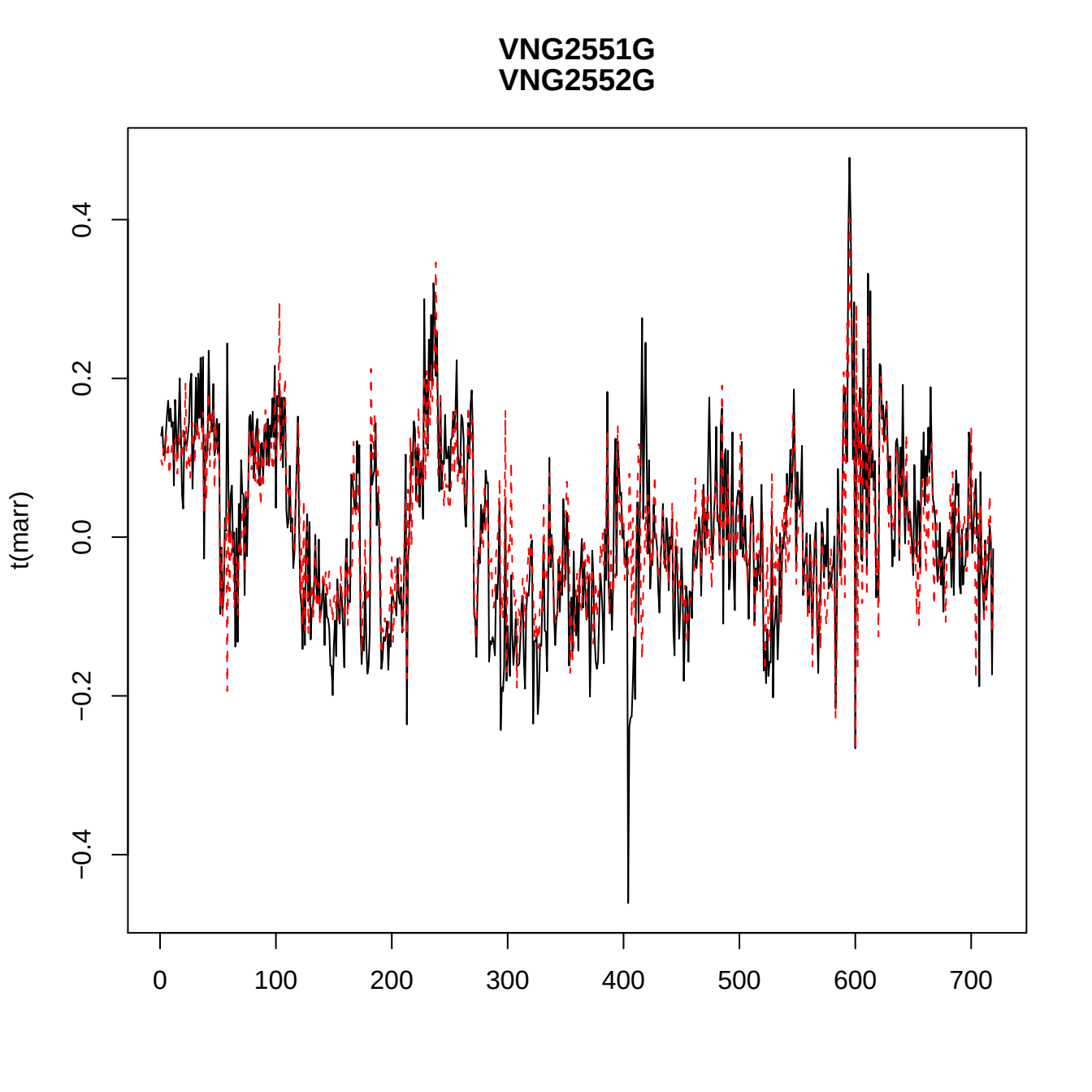
fhuG
yfmF
FecCD
ABC_tran
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF


VNG2551G
VNG2552G
t(marr)
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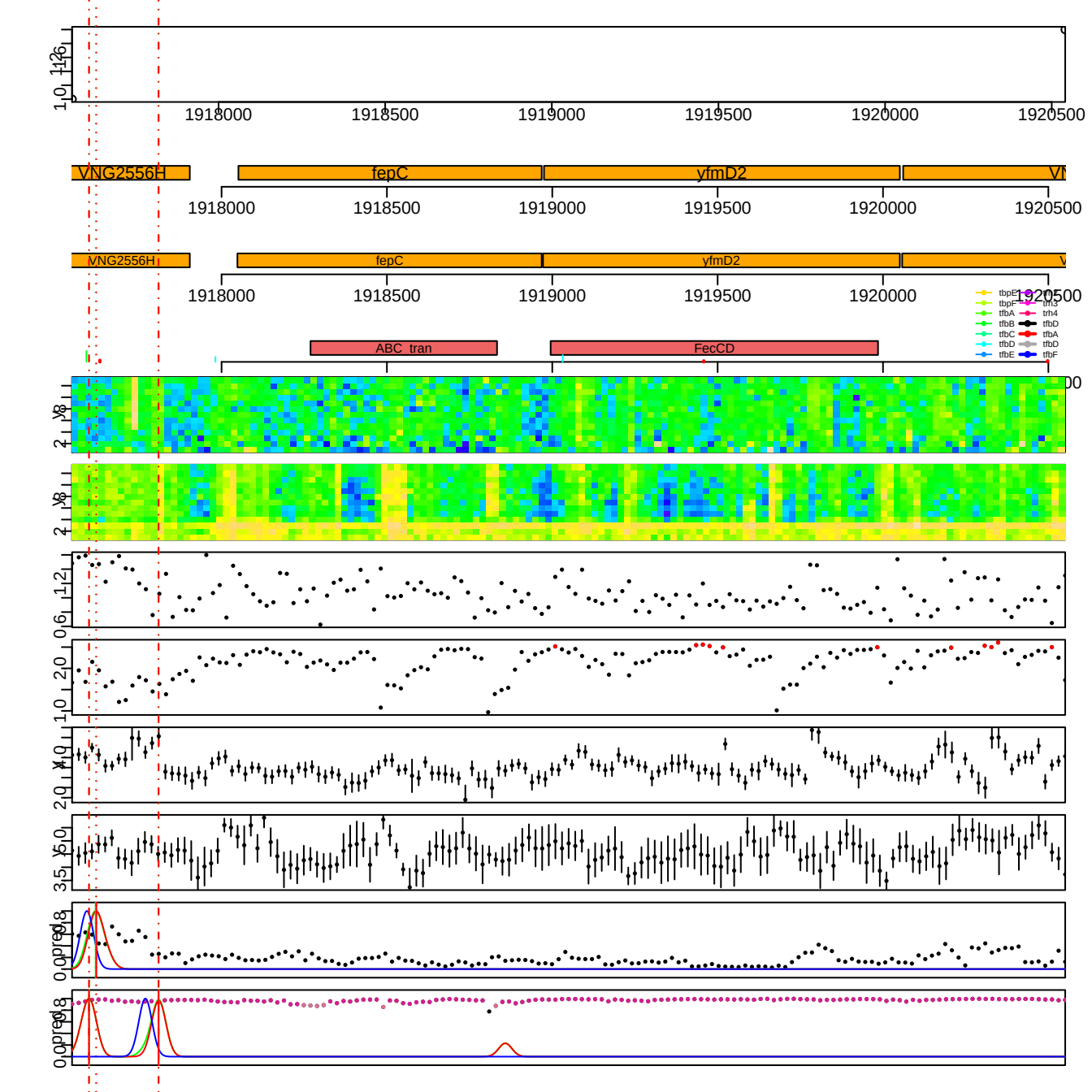
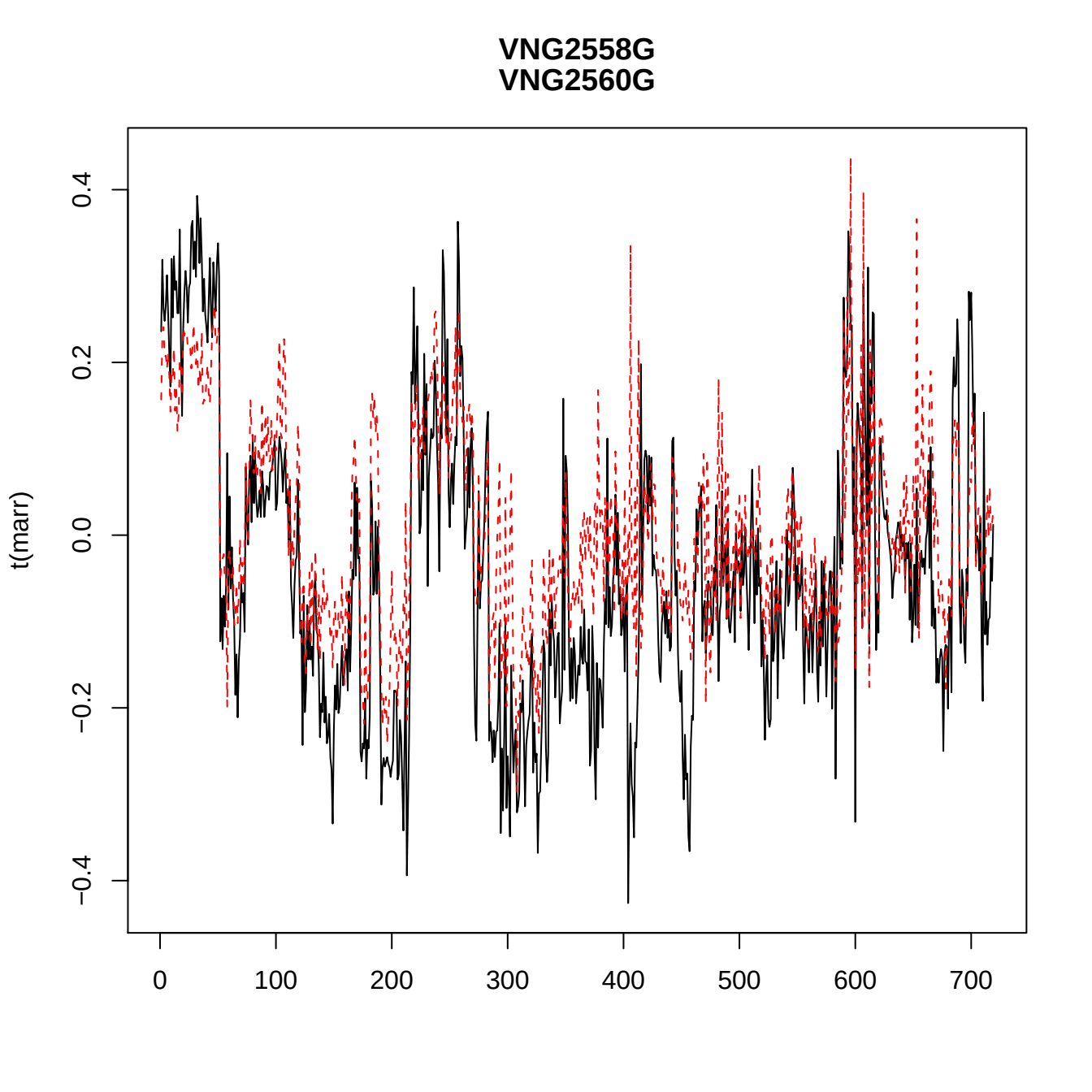
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1918000
1918500
1919000
1919500
1920000
1920500
VNG2556H
fepC
yfmD2
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
ABC_tran
FecCD


VNG2558G
VNG2560G
t(marr)
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0.2
0.0
−0.2
−0.4
0
100
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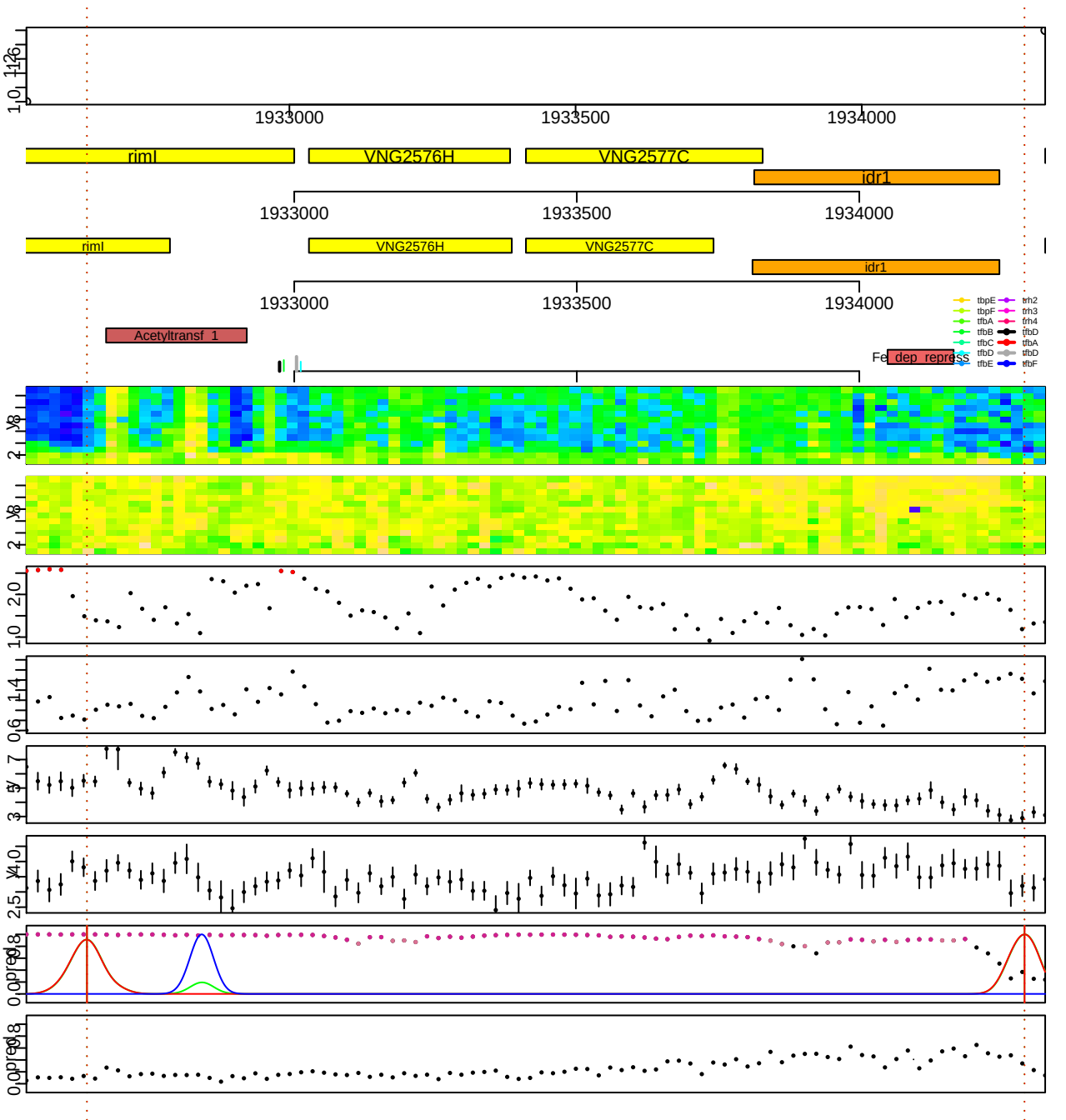
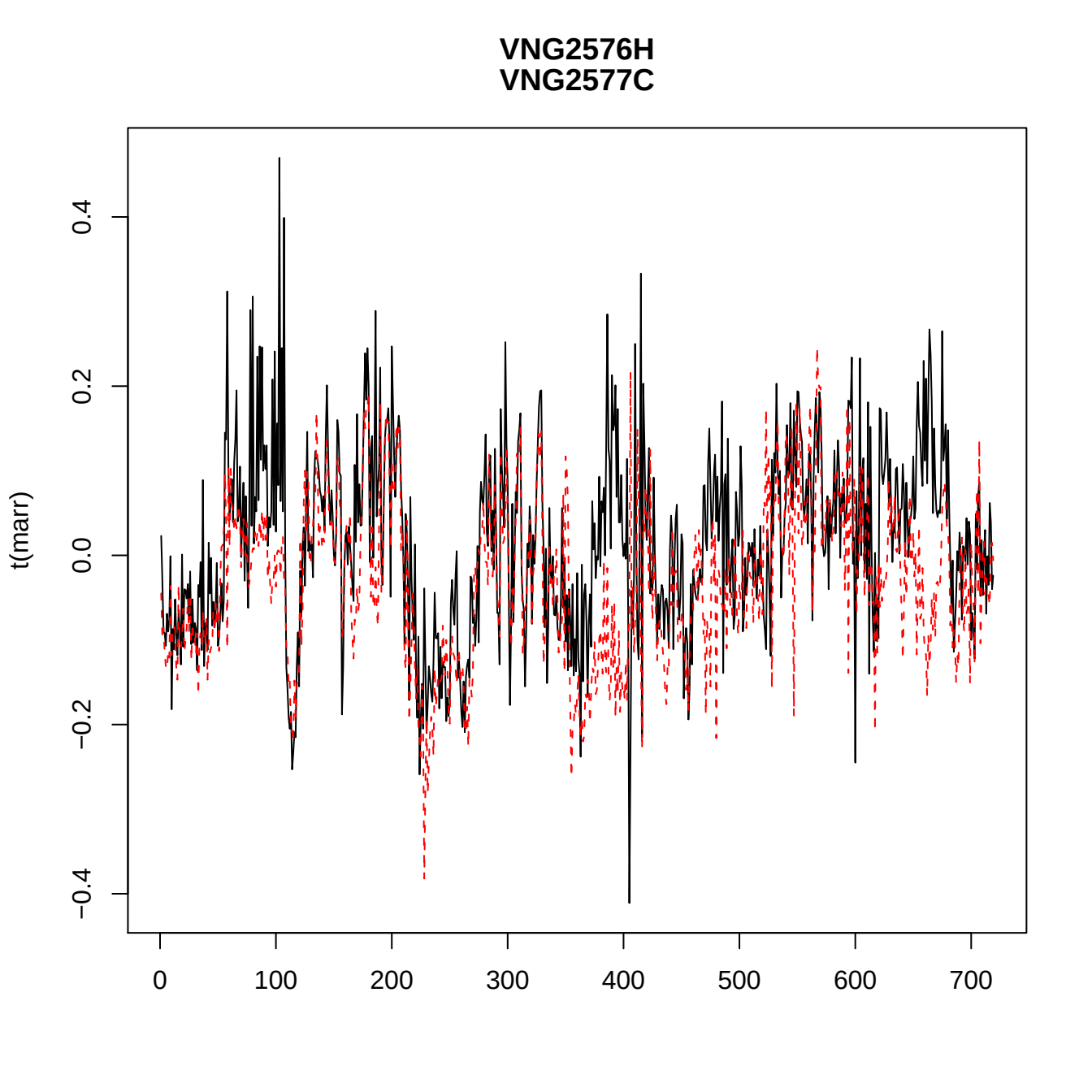
400
500
600
700


1933000
1933500
1934000
rimI
VNG2576H
VNG2577C
idr1
Acetyltransf_1
Fe_dep_repress
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2576H
VNG2577C
t(marr)
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0.2
0.0
−0.2
−0.4
0
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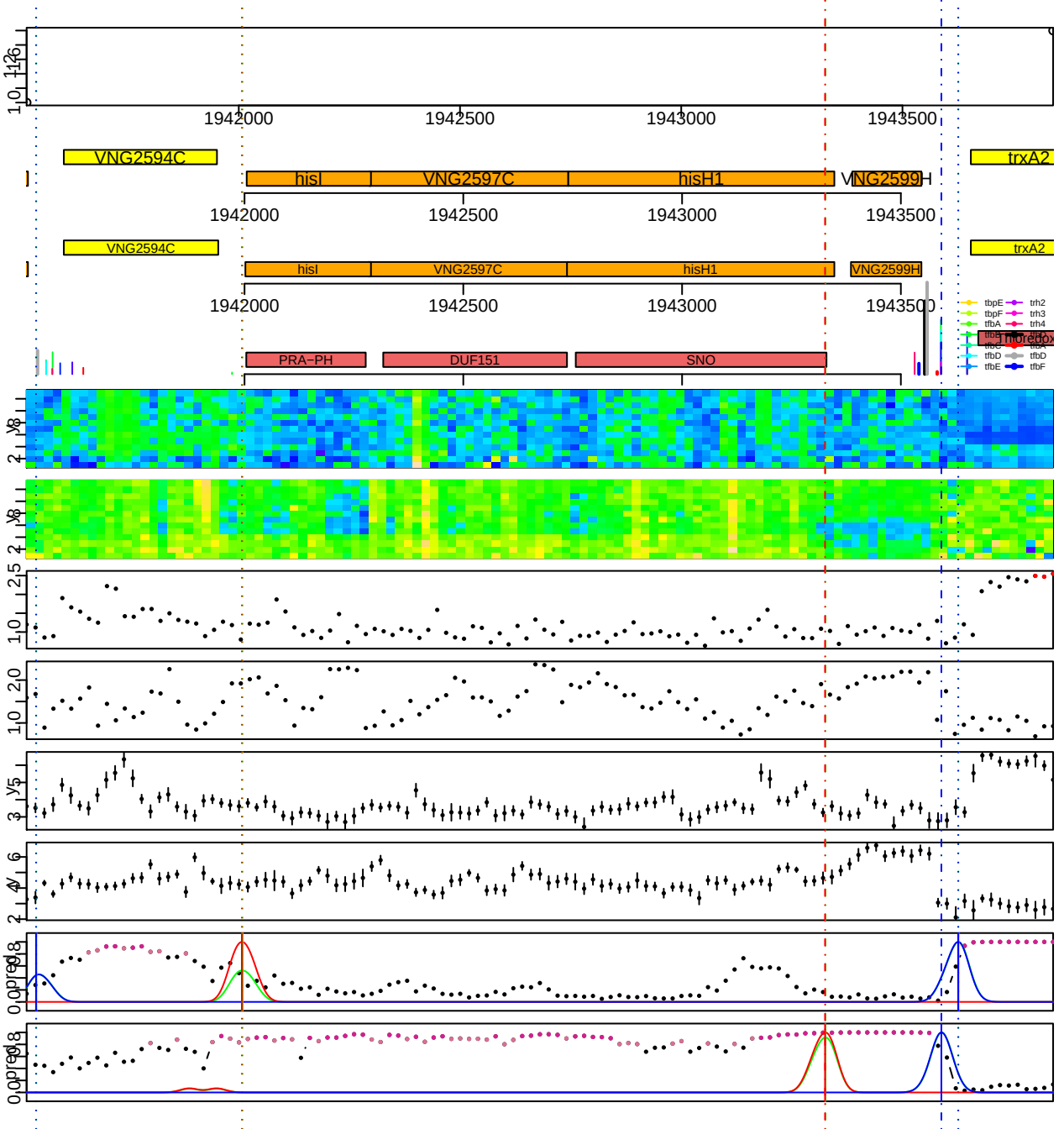
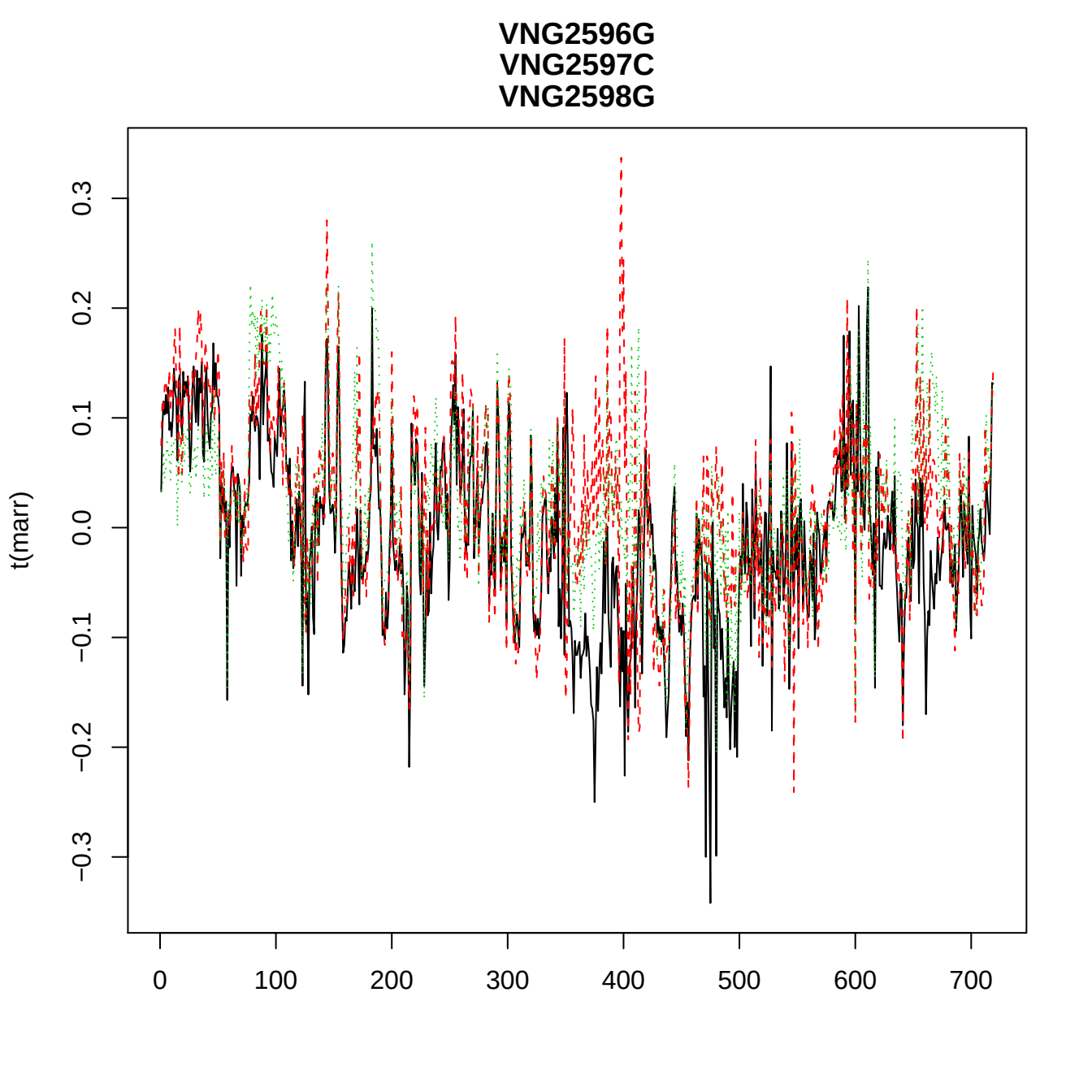
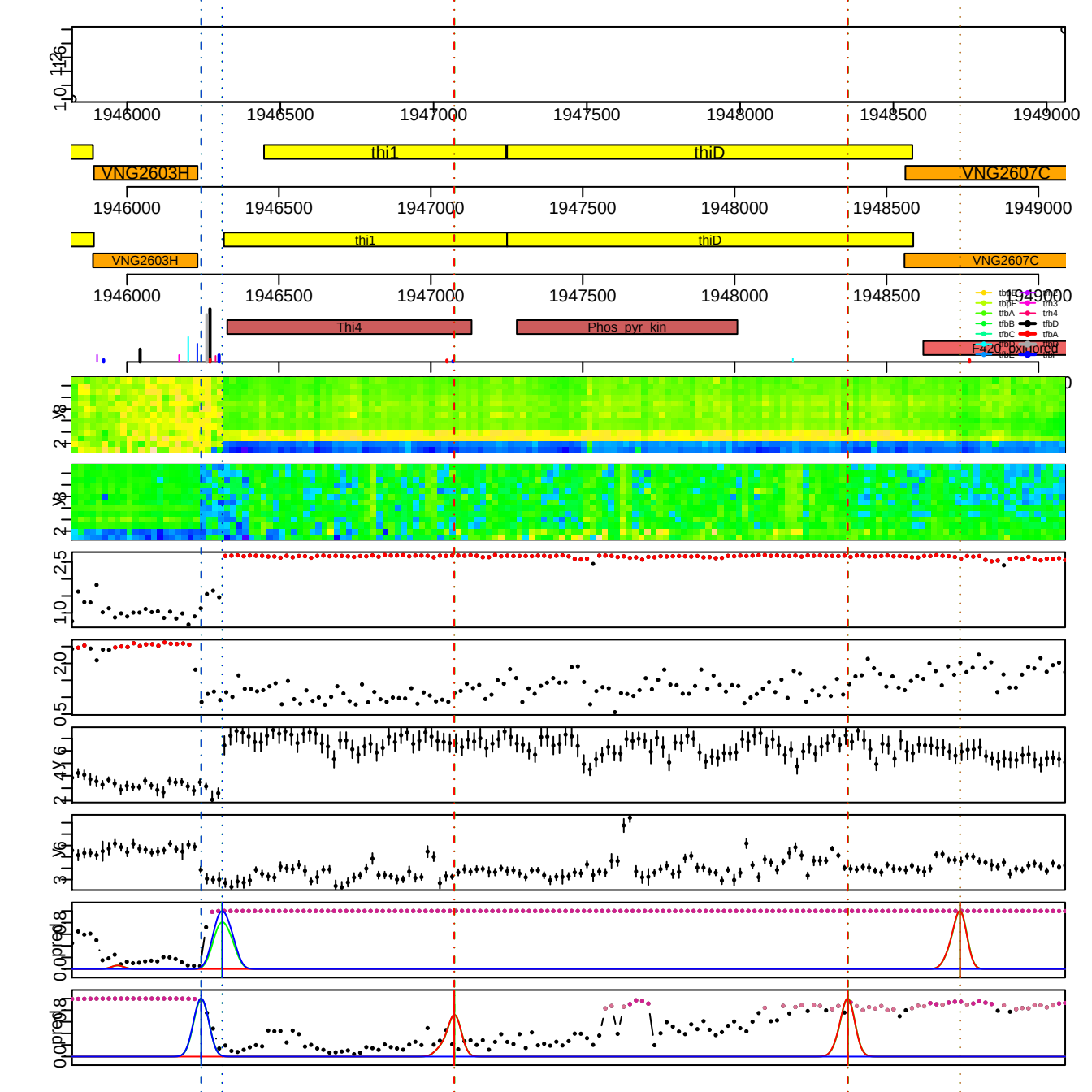
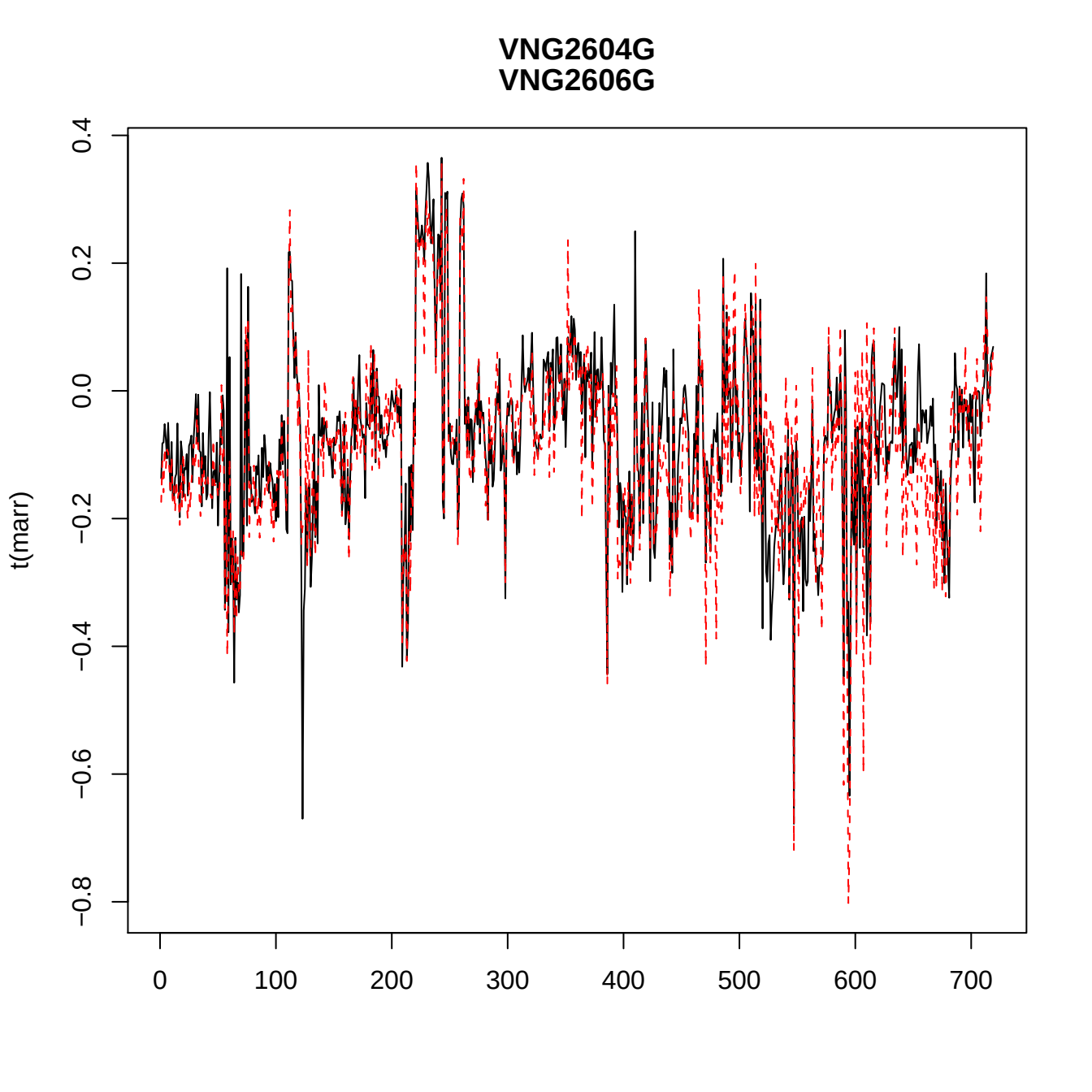
400
500
600
700

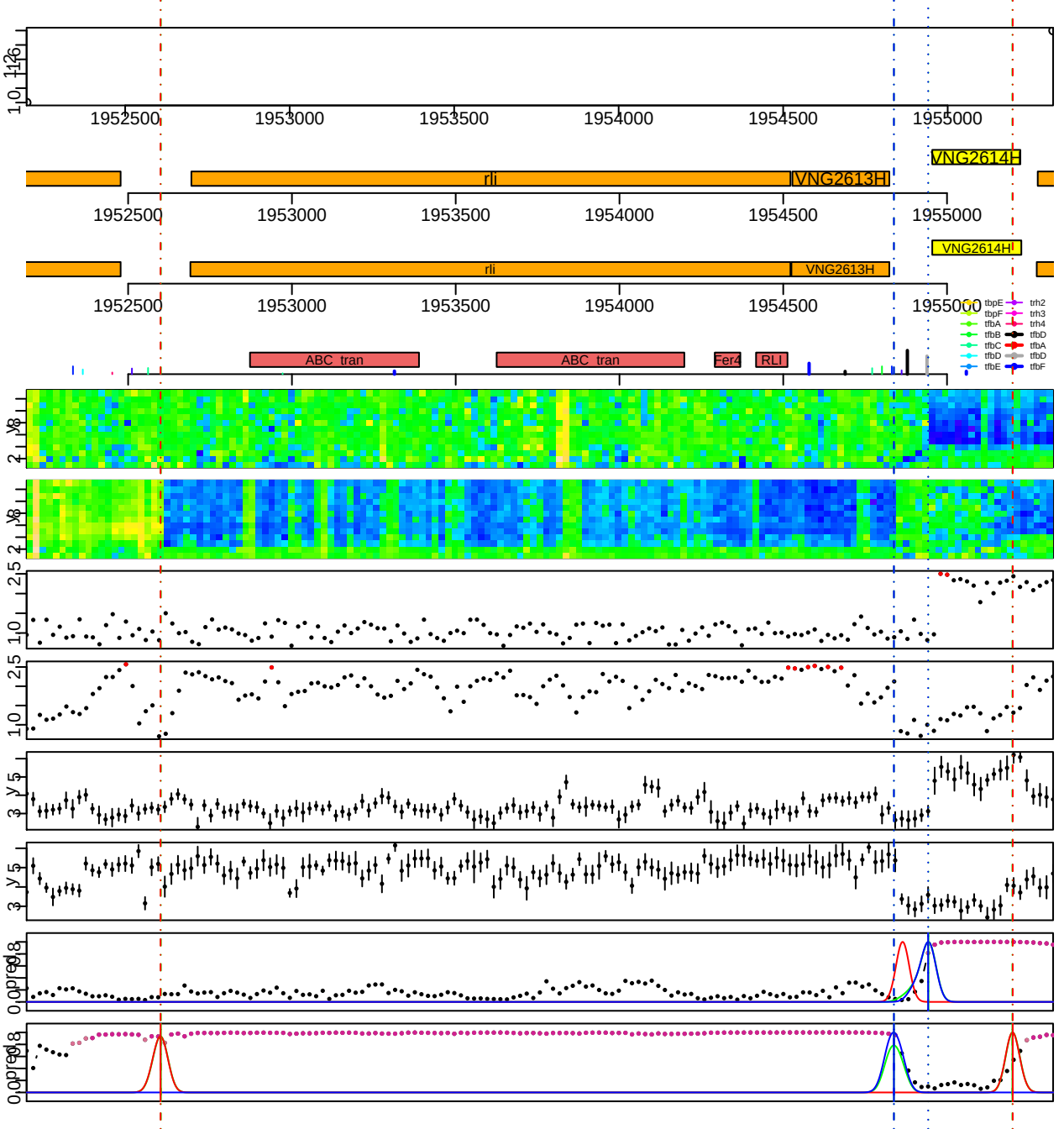

1942000
1942500
1943000
1943500
VNG2594C
hisI
VNG2597C
hisH1
VNG2599H
trxA2
PRA−PH
DUF151
SNO
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbA
tfbD
tfbF

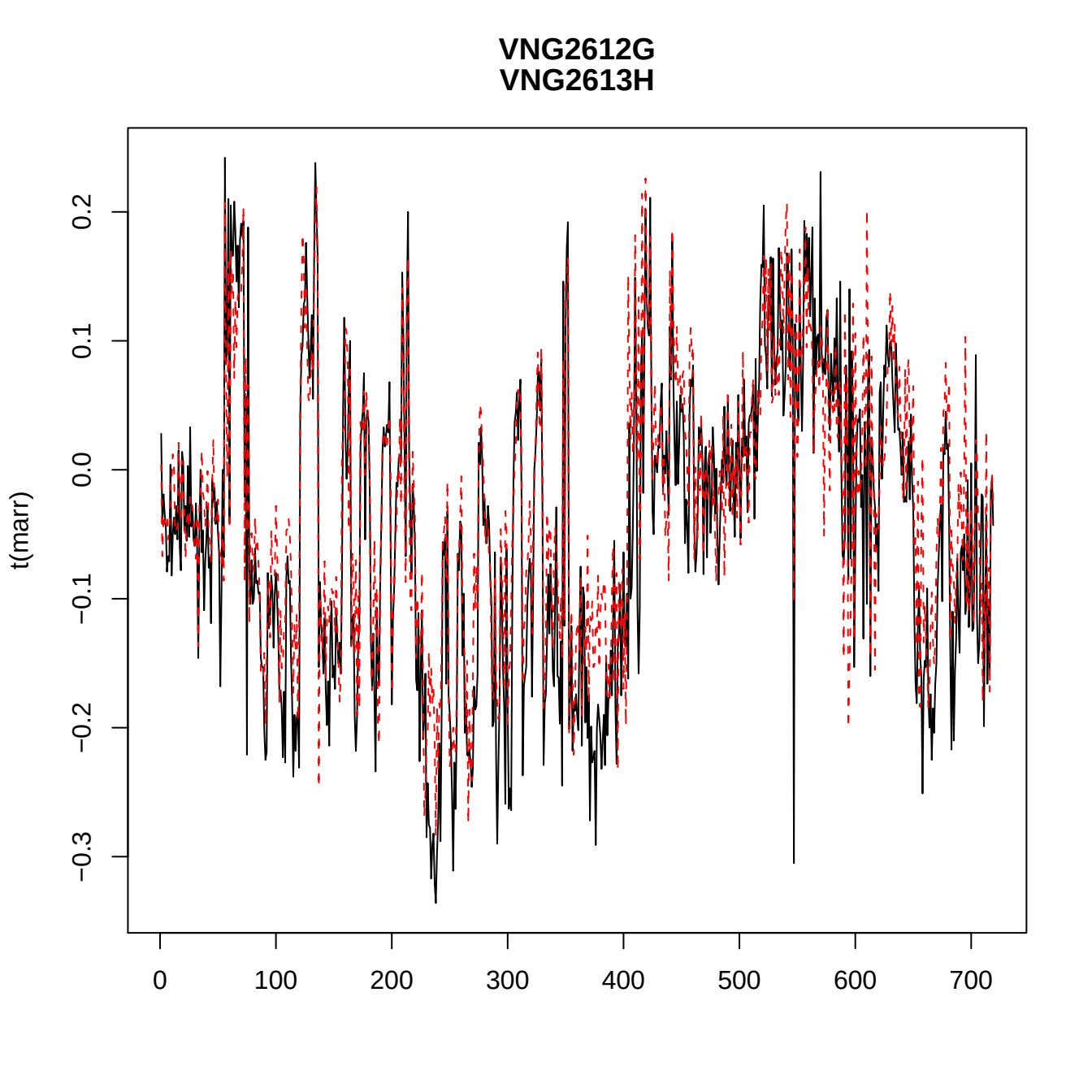

VNG2596G
VNG2597C
VNG2598G
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
0
100
200
300
400
500
600
700



1946000
1946500
1947000
1947500
1948000
1948500
1949000
thi1
thiD
VNG2603H
VNG2607C
Thi4
Phos_pyr_kin
F420_oxidored
tbpF
tfbA
tfbB
tfbC
trh3
trh4
tfbD
tfbA


VNG2604G
VNG2606G
t(marr)
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700


1952500
1953000
1953500
1954000
1954500
1955000
VNG2614H
rli
VNG2613H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
ABC_tran
ABC_tran
Fer4
RLI
pred


VNG2612G
VNG2613H
t(marr)
0.2
0.1
0.0
−0.1
−0.2
−0.3
0
100
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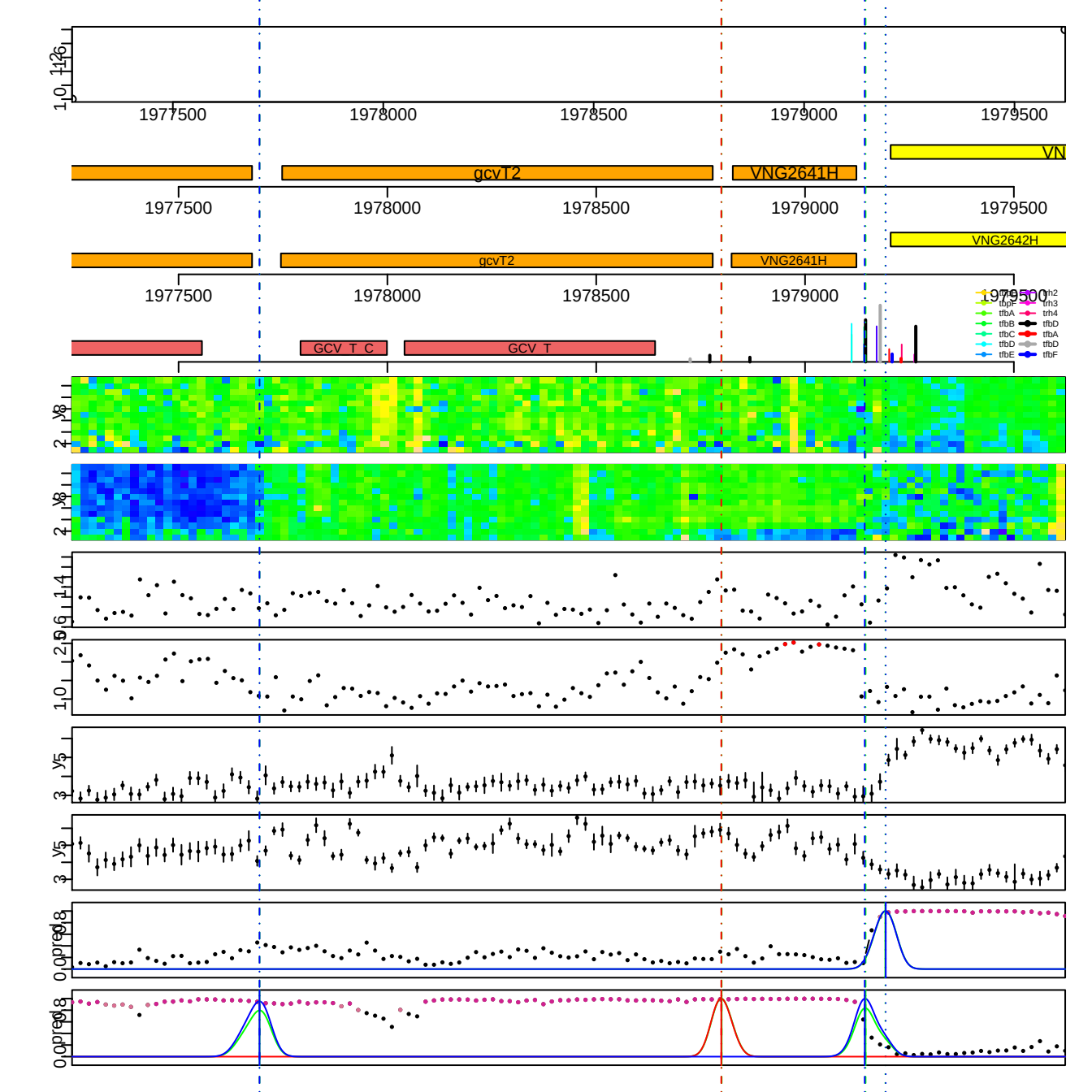
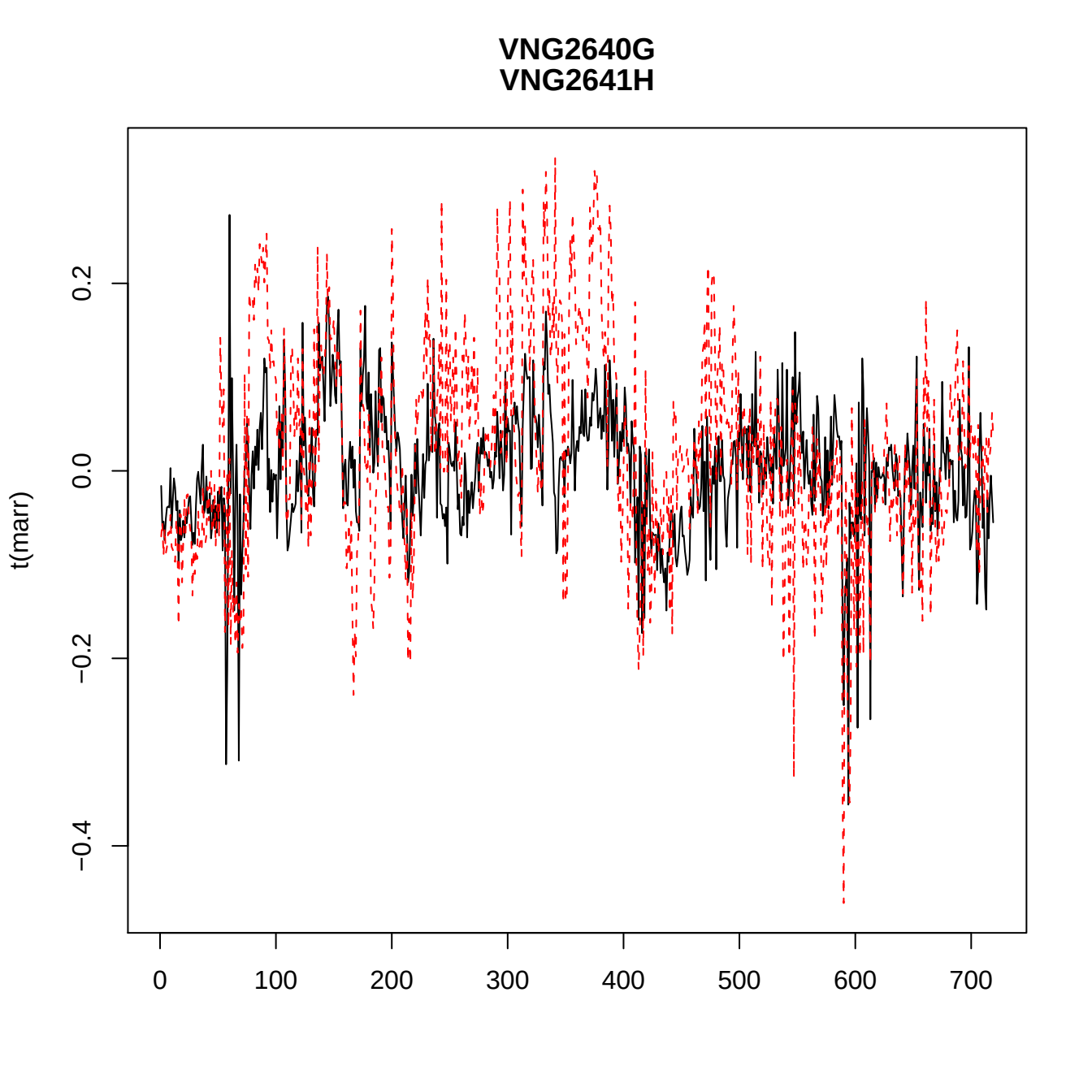
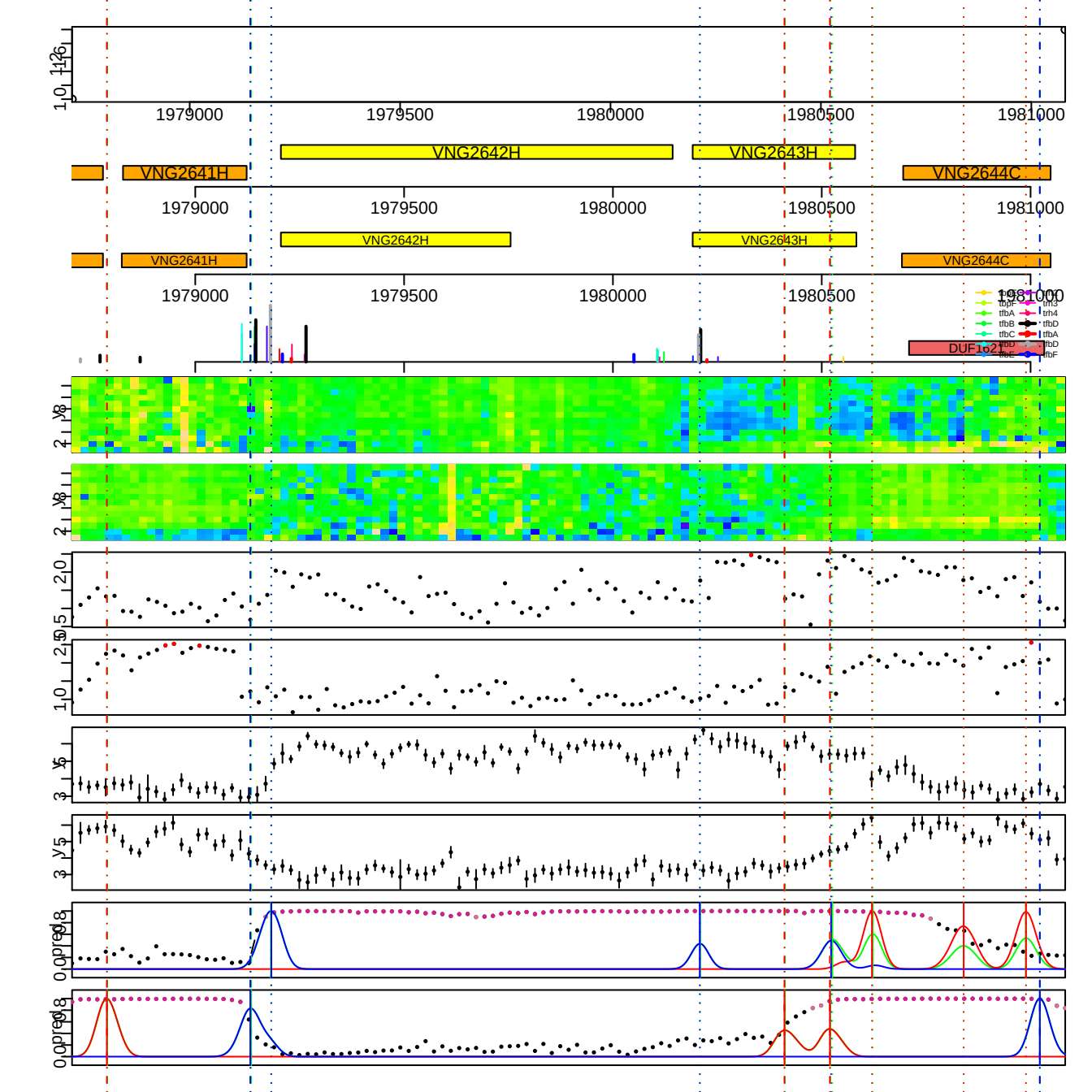
300
400
500
600
700


1977500
1978000
1978500
1979000
1979500
gcvT2
VNG2641H
VNG2642H
GCV T C
GCV T
tfbF
tfbB
tfbA
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2640G
VNG2641H
t(marr)
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


1979000
1979500
1980000
1980500
1981000
VNG2641H
VNG2642H
VNG2643H
VNG2644C
DUF1621
tfbF
tfbE
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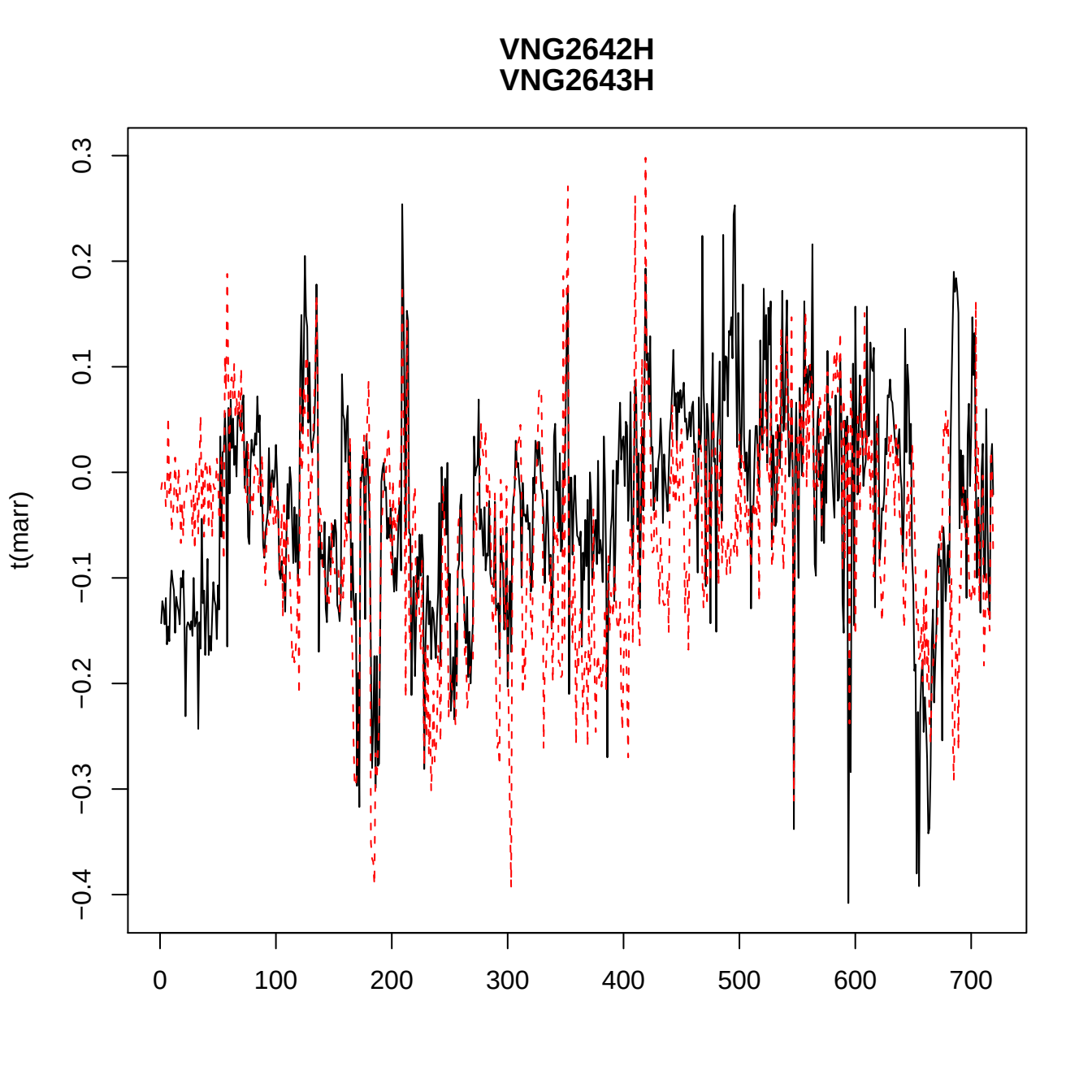
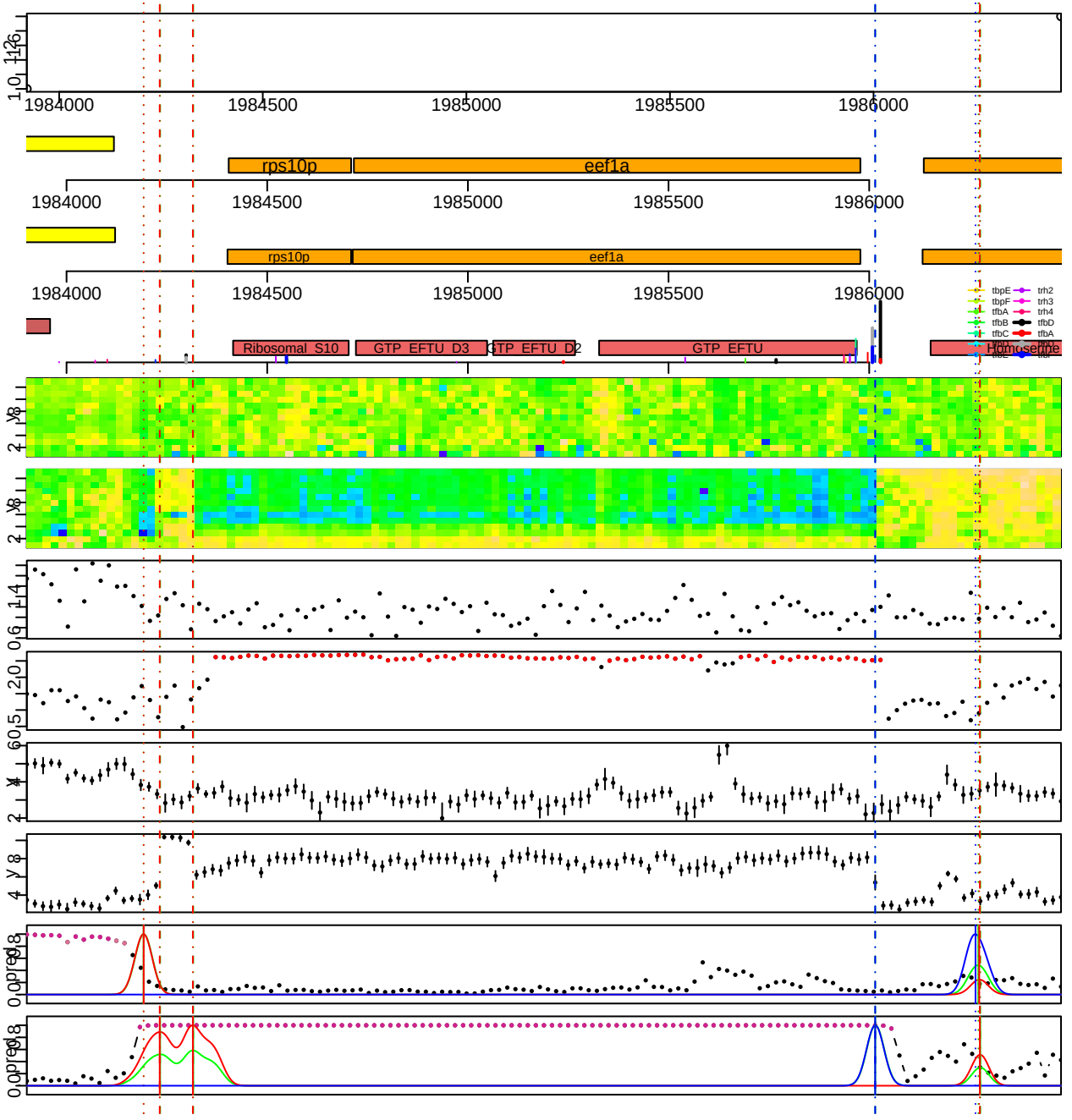
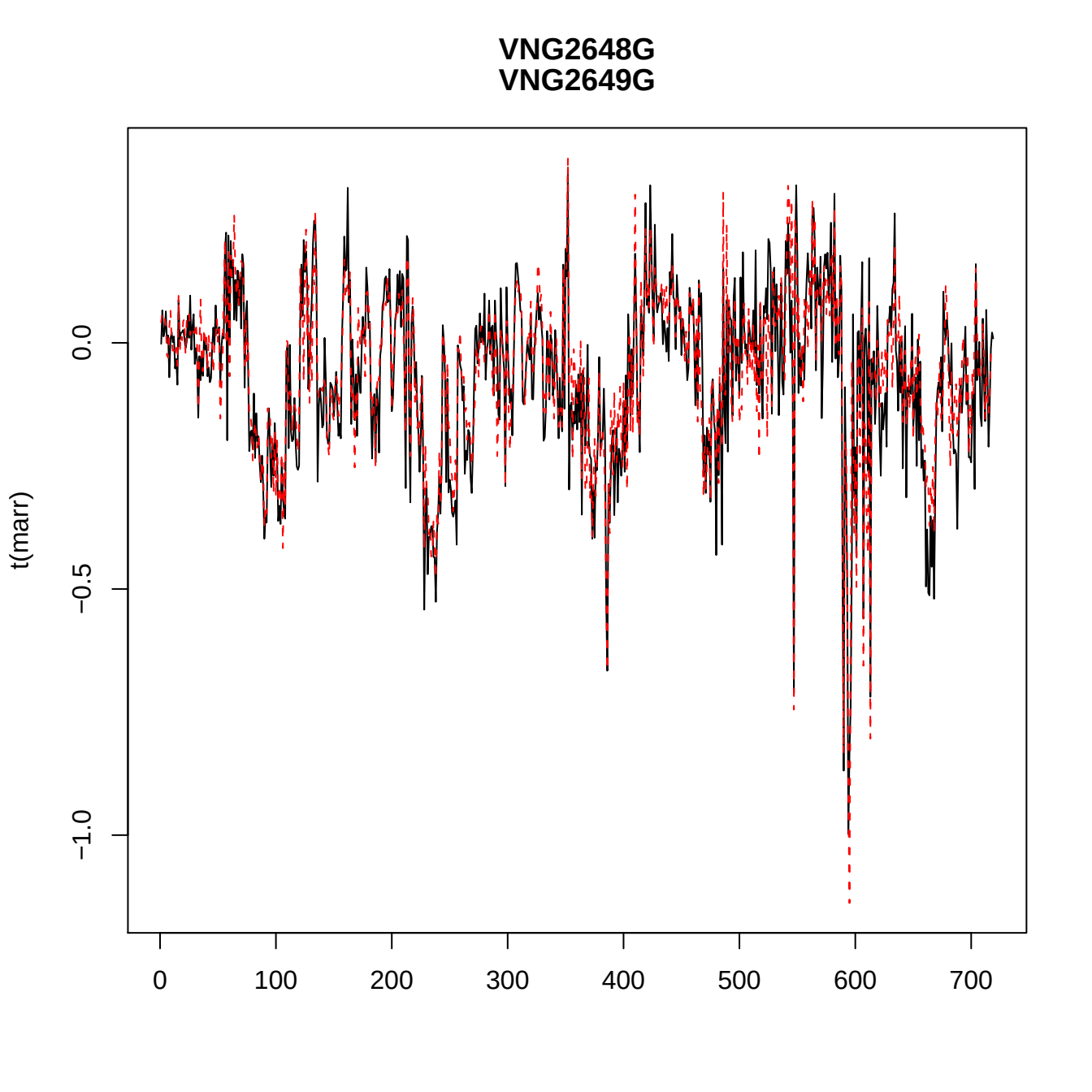
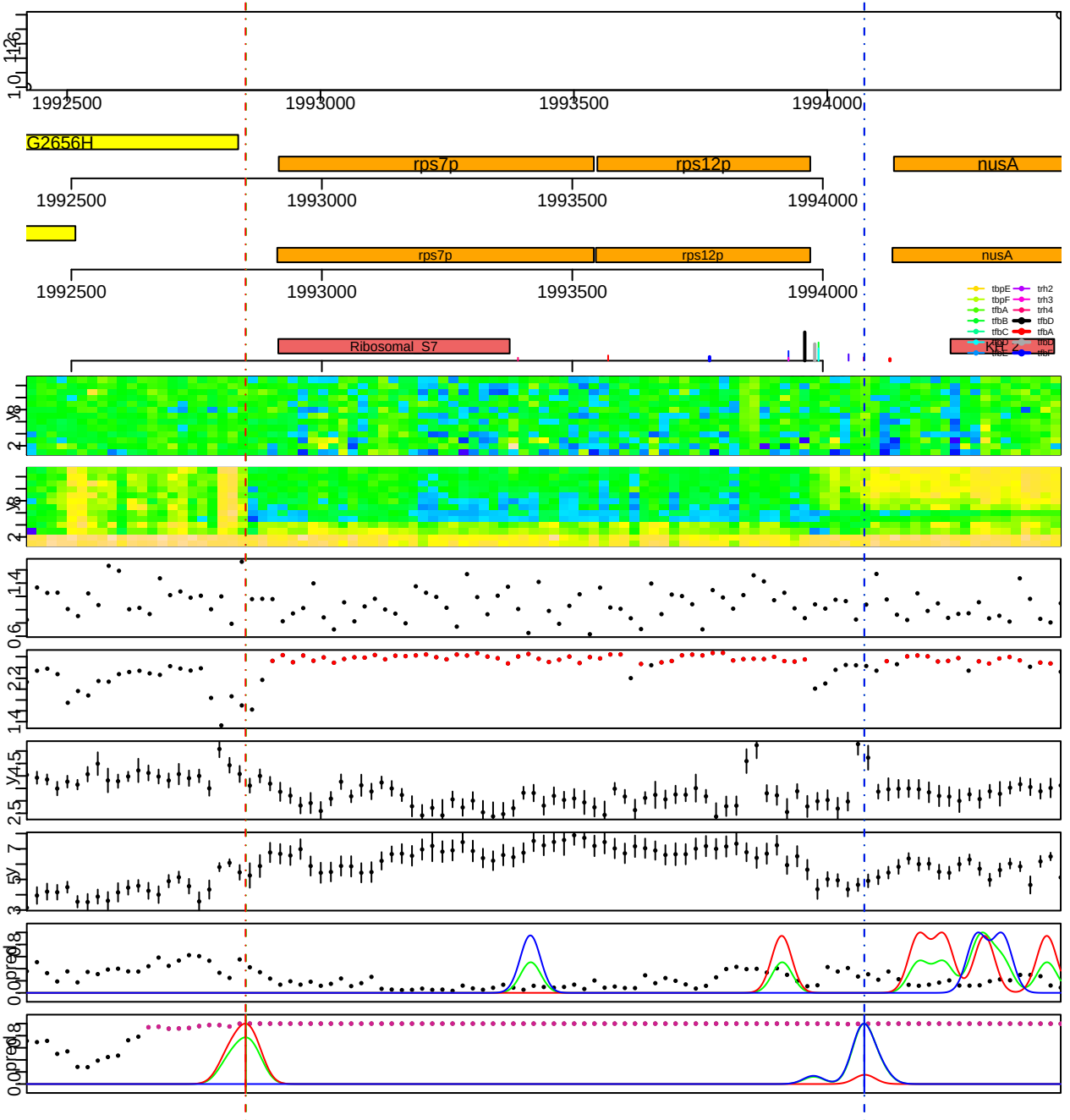
trh3
trh2
trh1

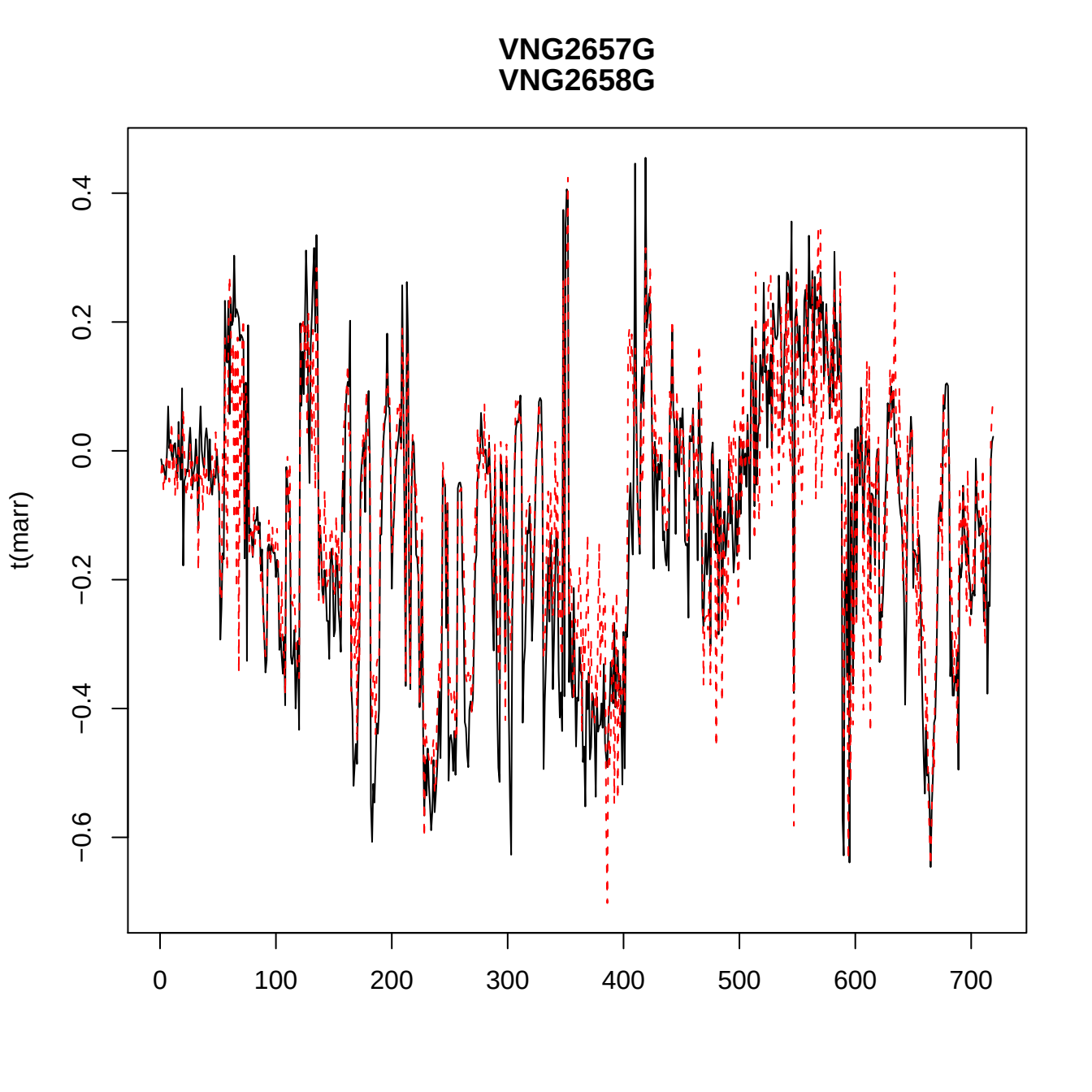

VNG2642H
VNG2643H
t(marr)
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.4
0
100
200
300
400
500
600
700


1984000
1984500
1985000
1985500
1986000
rps10p
eef1a
Ribosomal_S10
GTP_EFTU_D3
GTP_EFTU_D2
GTP_EFTU
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA
Homoserine


VNG2648G
VNG2649G
t(marr)
0.0
−0.5
−1.0
0
100
200
300
400
500
600
700



1992500
1993000
1993500
1994000
G2656H
rps7p
rps12p
nusA
Ribosomal_S7
KH_2
tbpE
tbpF
tfbA
tfbB
tfbC
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG2657G
VNG2658G
t(marr)
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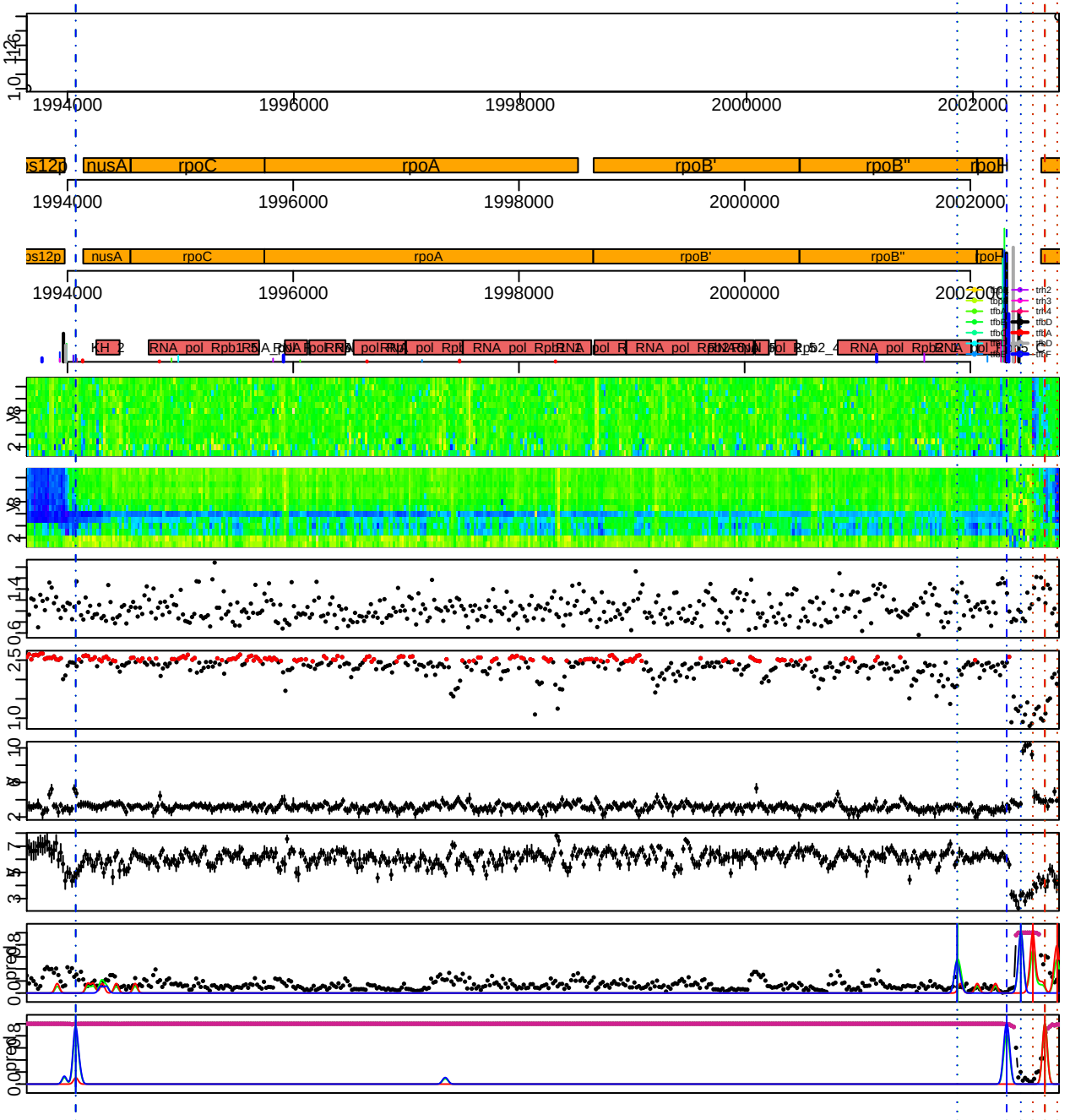
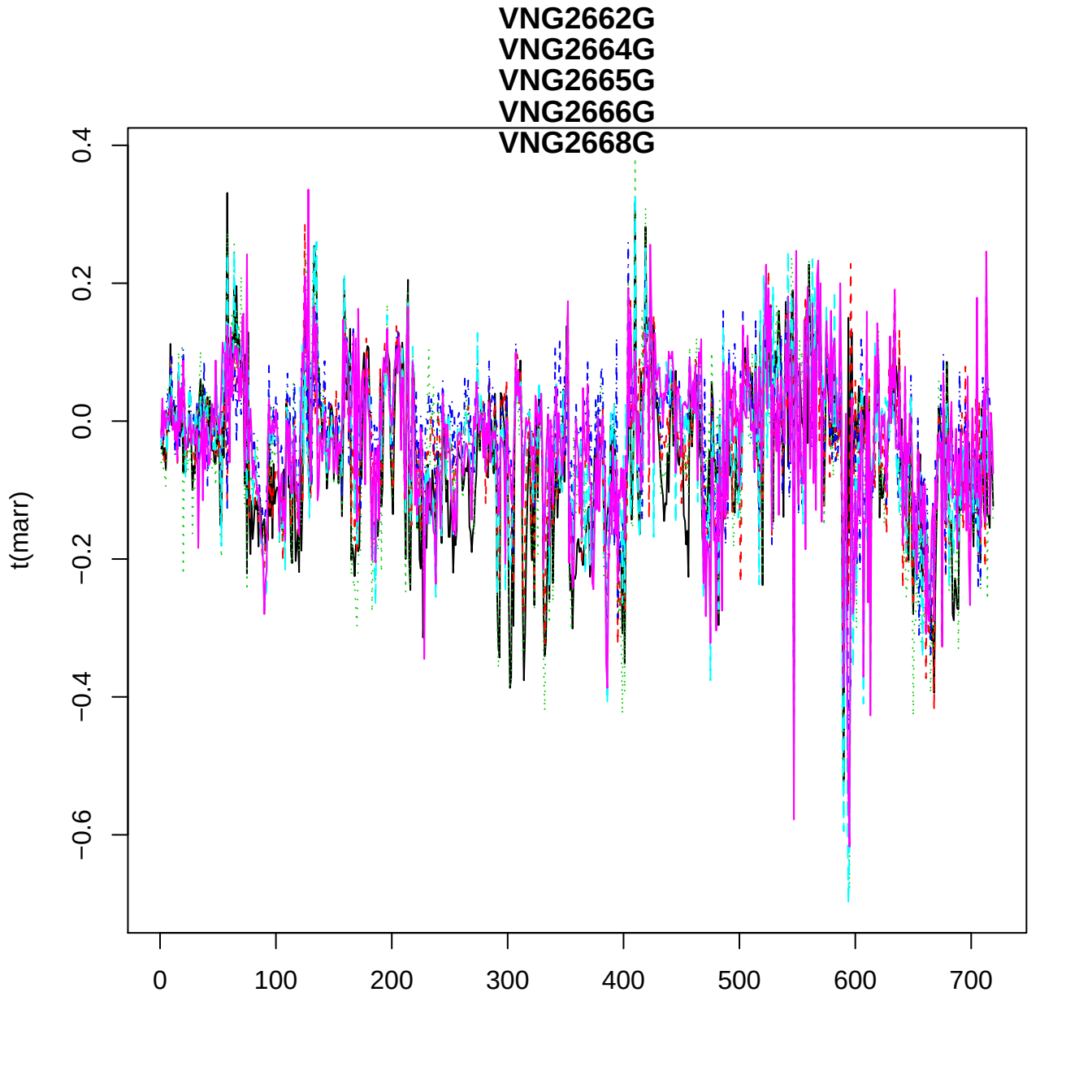
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


1994000
1996000
1998000
2000000
2002000
nusA
rpoC
rpoA
rpoB'
rpoB"
rpoH
trn2
trn3
trn4
tfbA
tfbB
tfbC
tfbD
tfbA
tfbD
tfbF


VNG2662G
VNG2664G
VNG2665G
VNG2666G
VNG2668G
t(marr)
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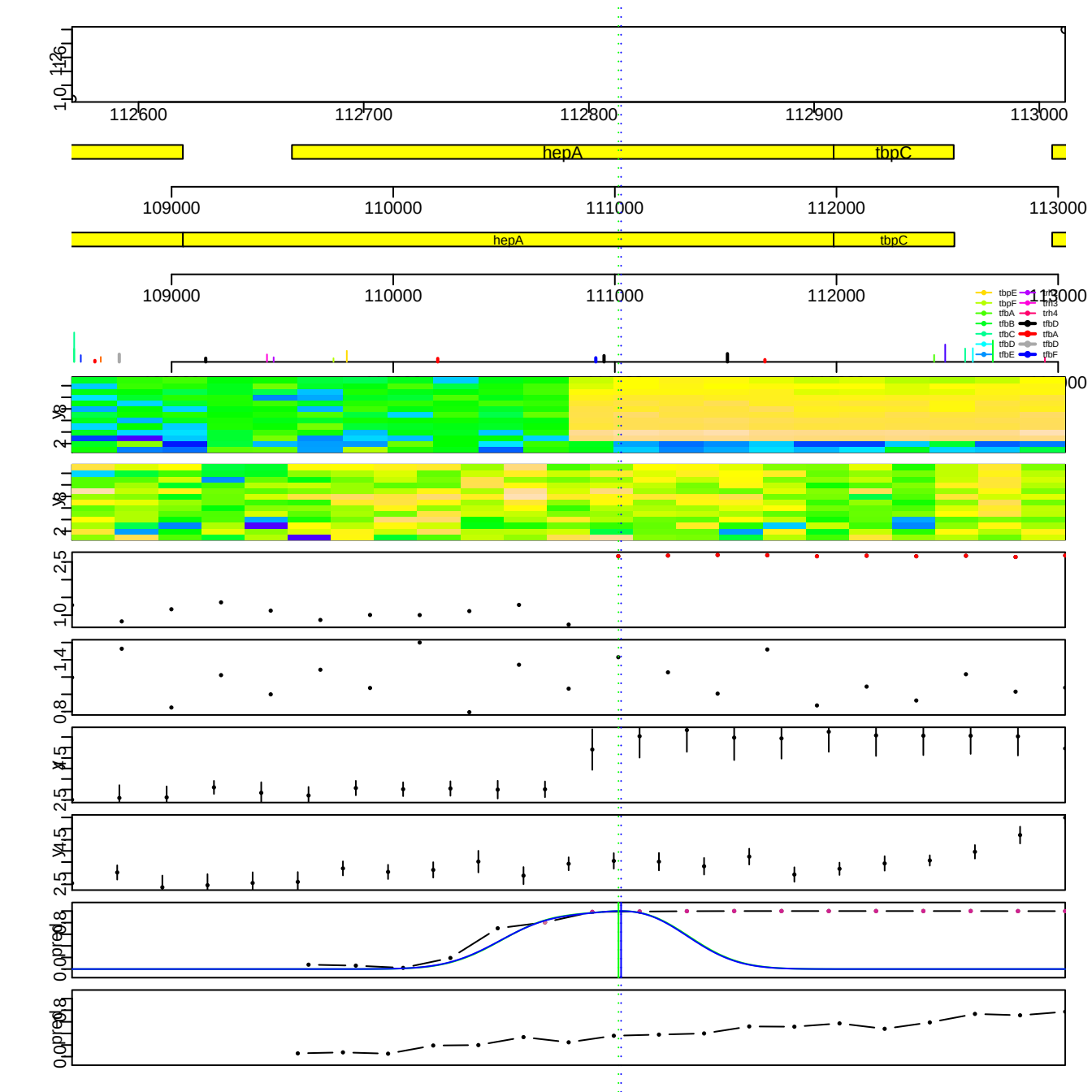
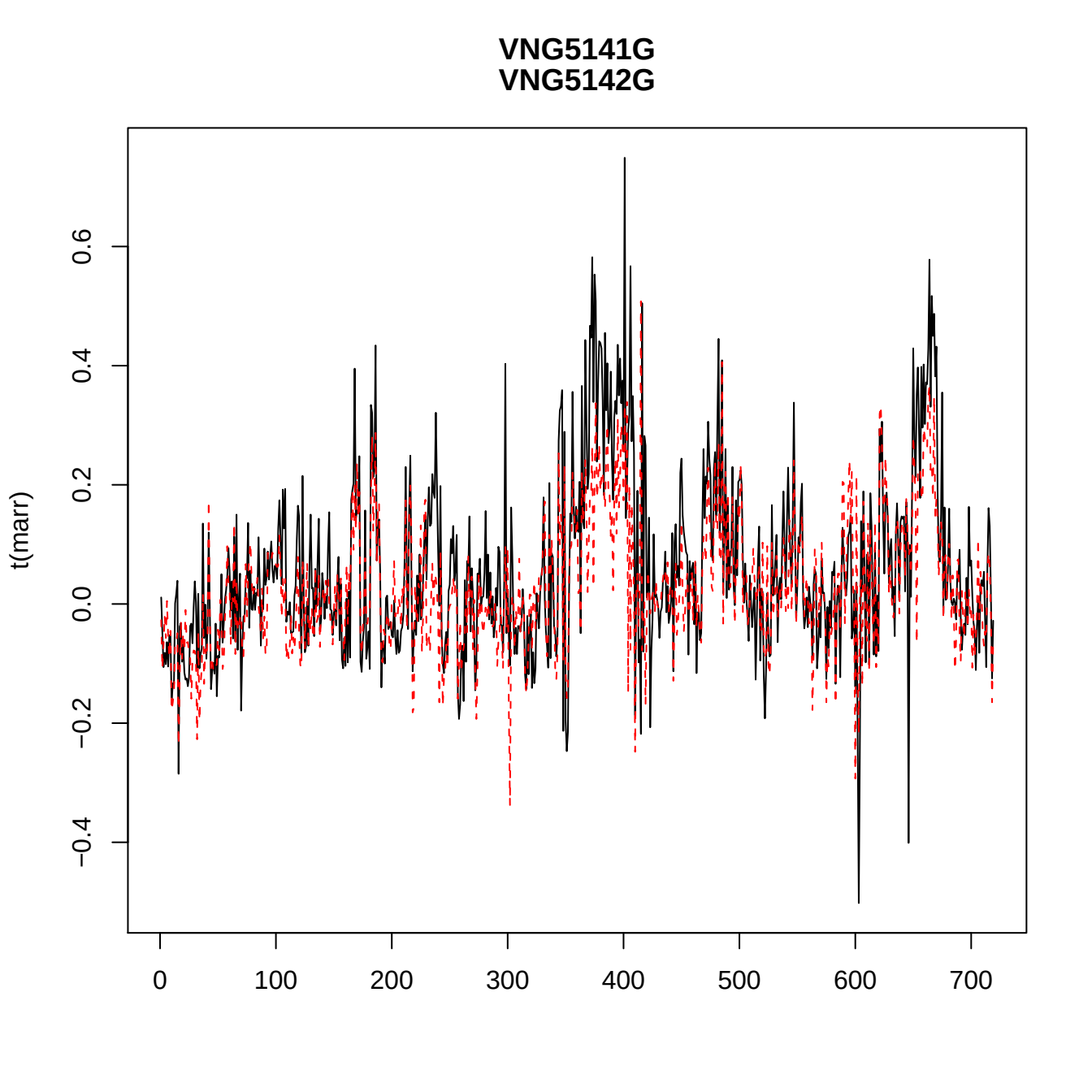
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


112600
112700
112800
112900
113000
hepA
tbpC
109000
110000
111000
112000
113000
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG5141G
VNG5142G
t(marr)
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0.2
0.0
−0.2
−0.4
0
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400
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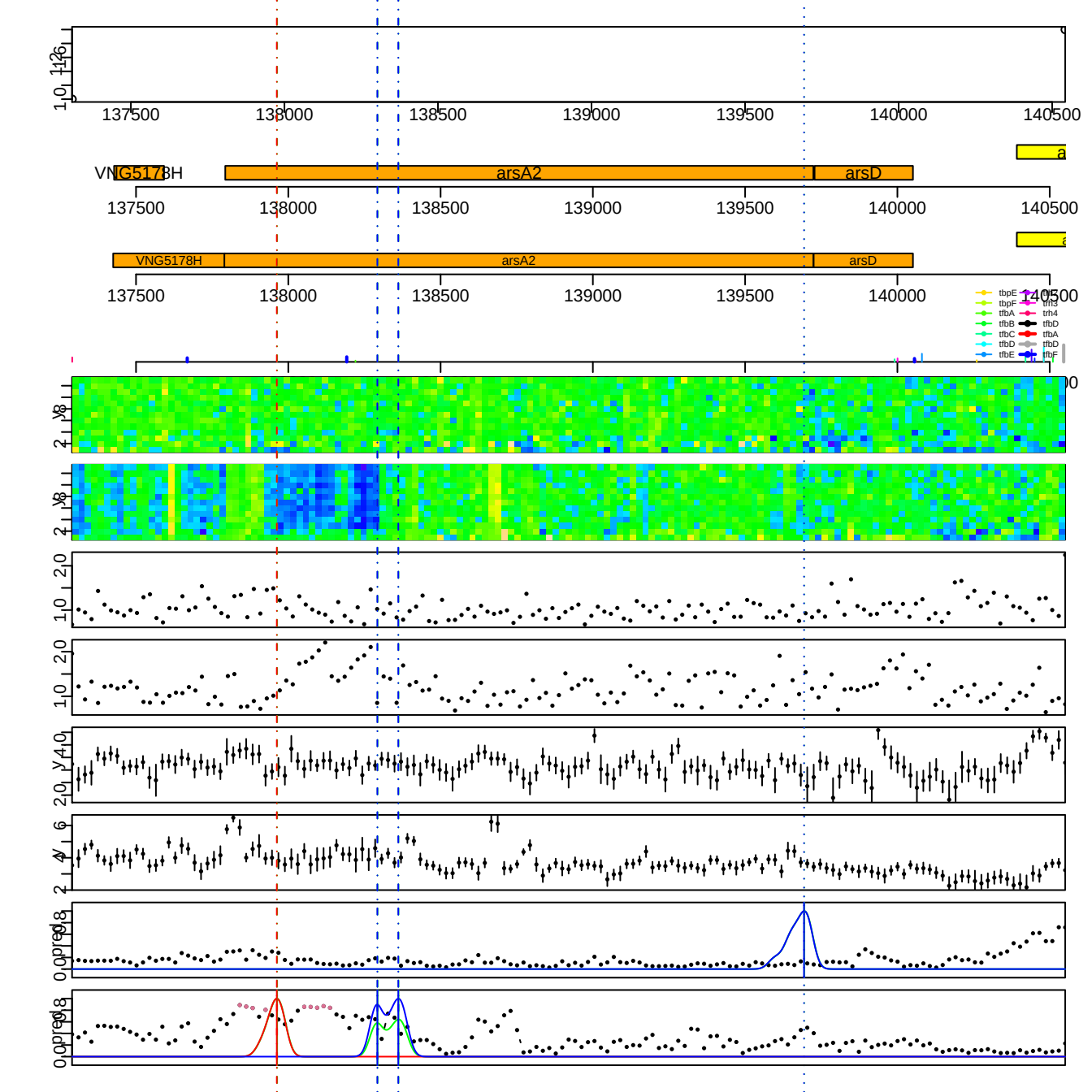
600
700


137500
138000
138500
139000
139500
140000
140500
VNG5178H
arsA2
arsD
tbpE
tbpF
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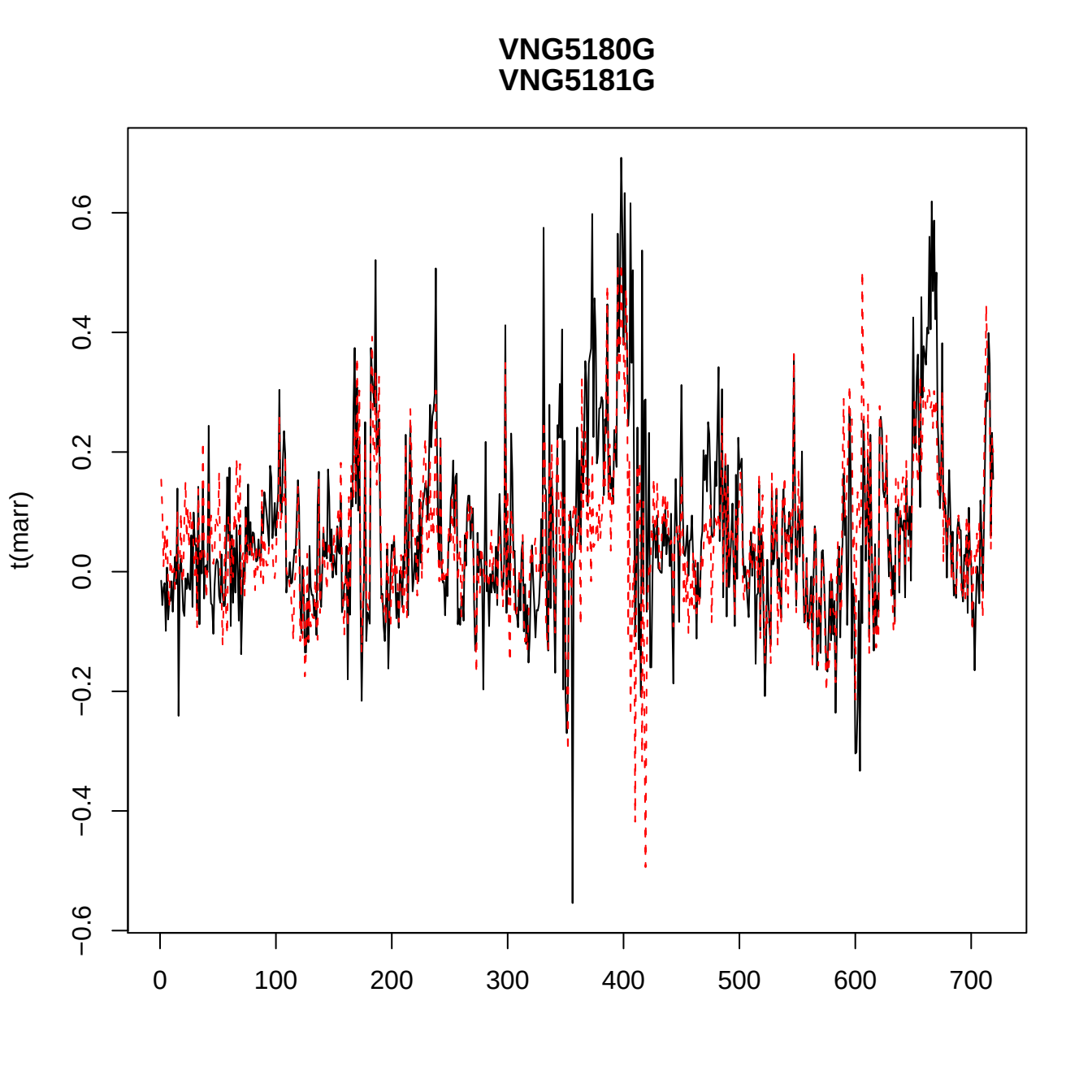
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG5180G
VNG5181G
t(marr)
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−0.4
−0.6
0
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400
500
600
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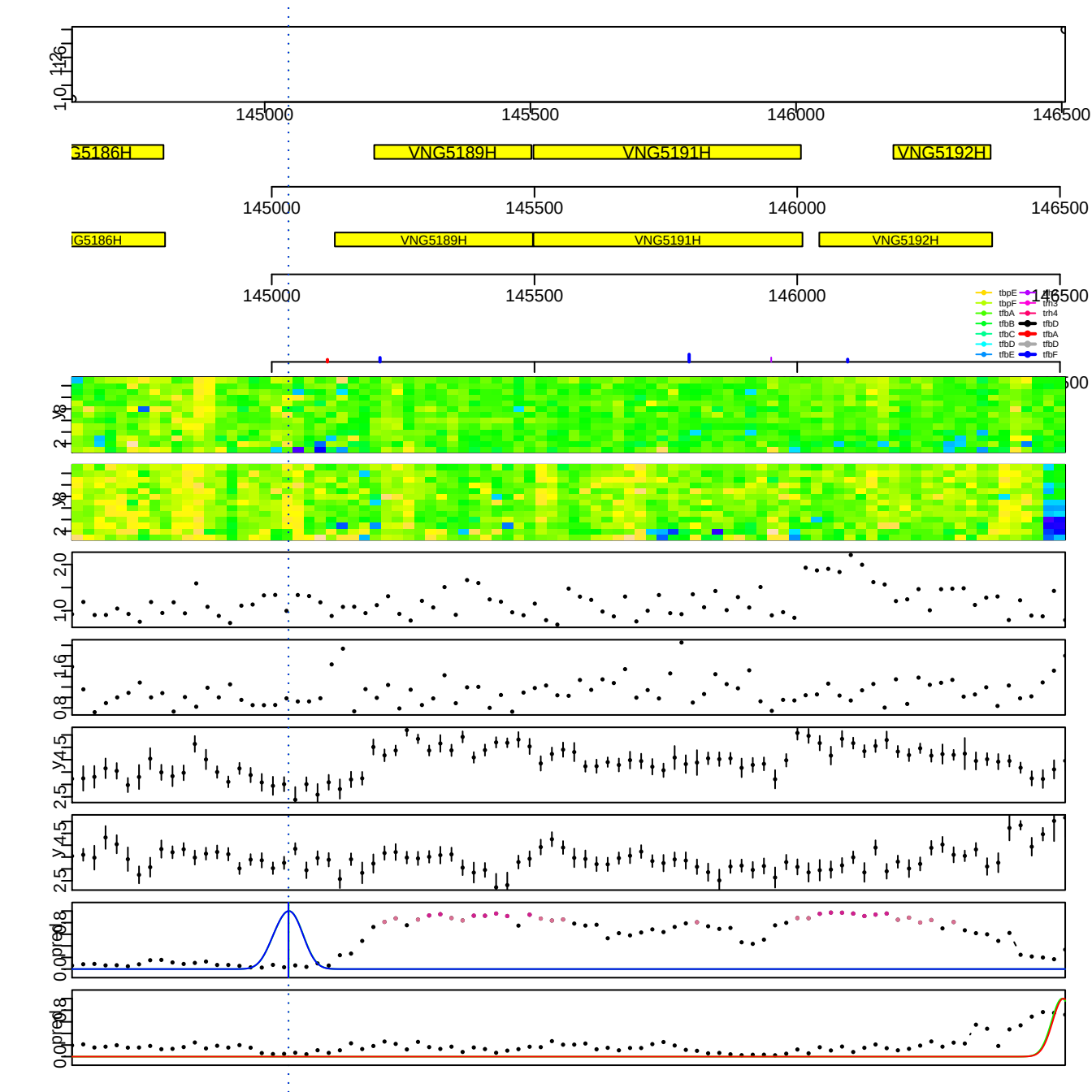
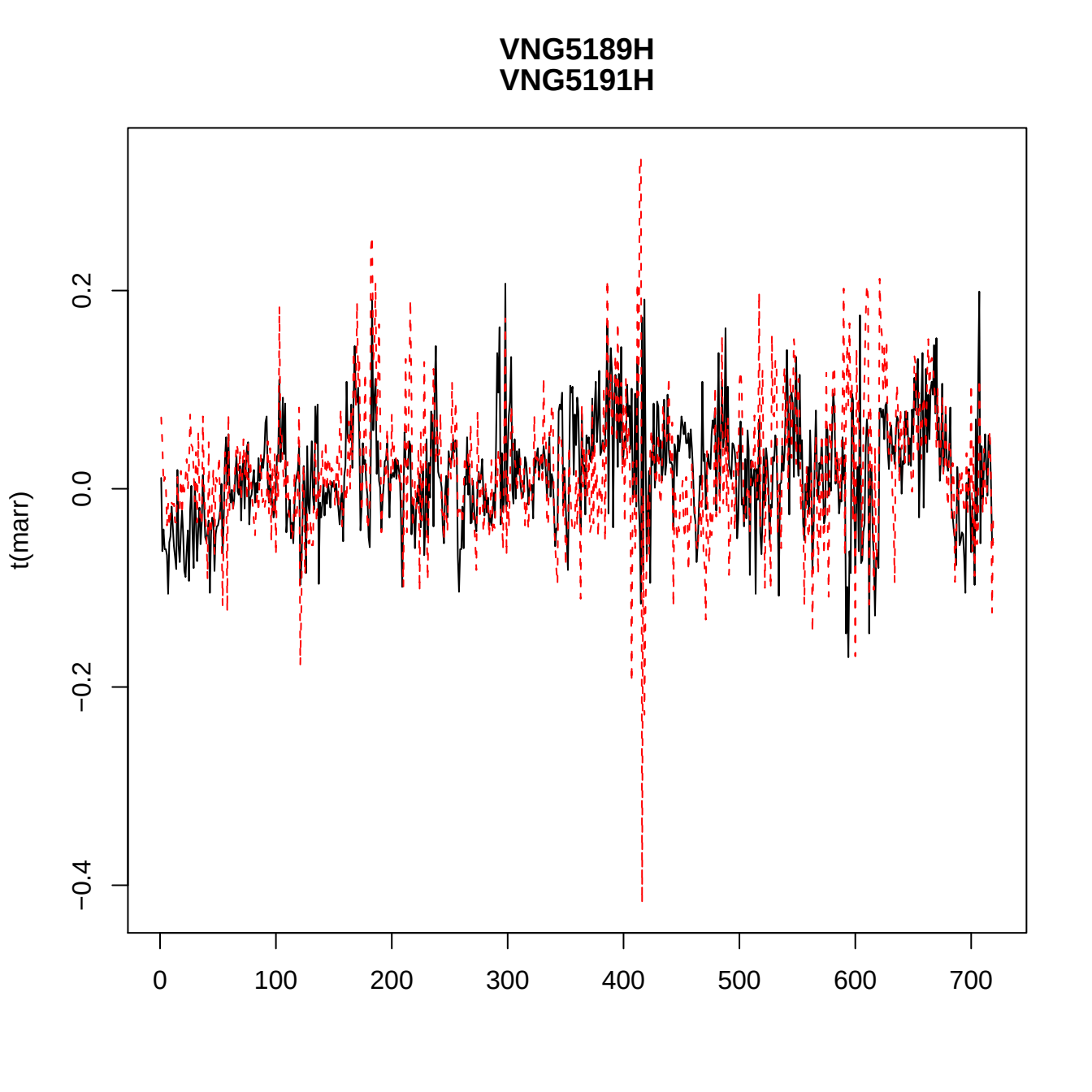

145000
145500
146000
146500
G5186H
VNG5189H
VNG5191H
VNG5192H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh4
tfbD
tfbA
tfbD
tfbF


VNG5189H
VNG5191H
t(marr)
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−0.2
−0.4
0
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400
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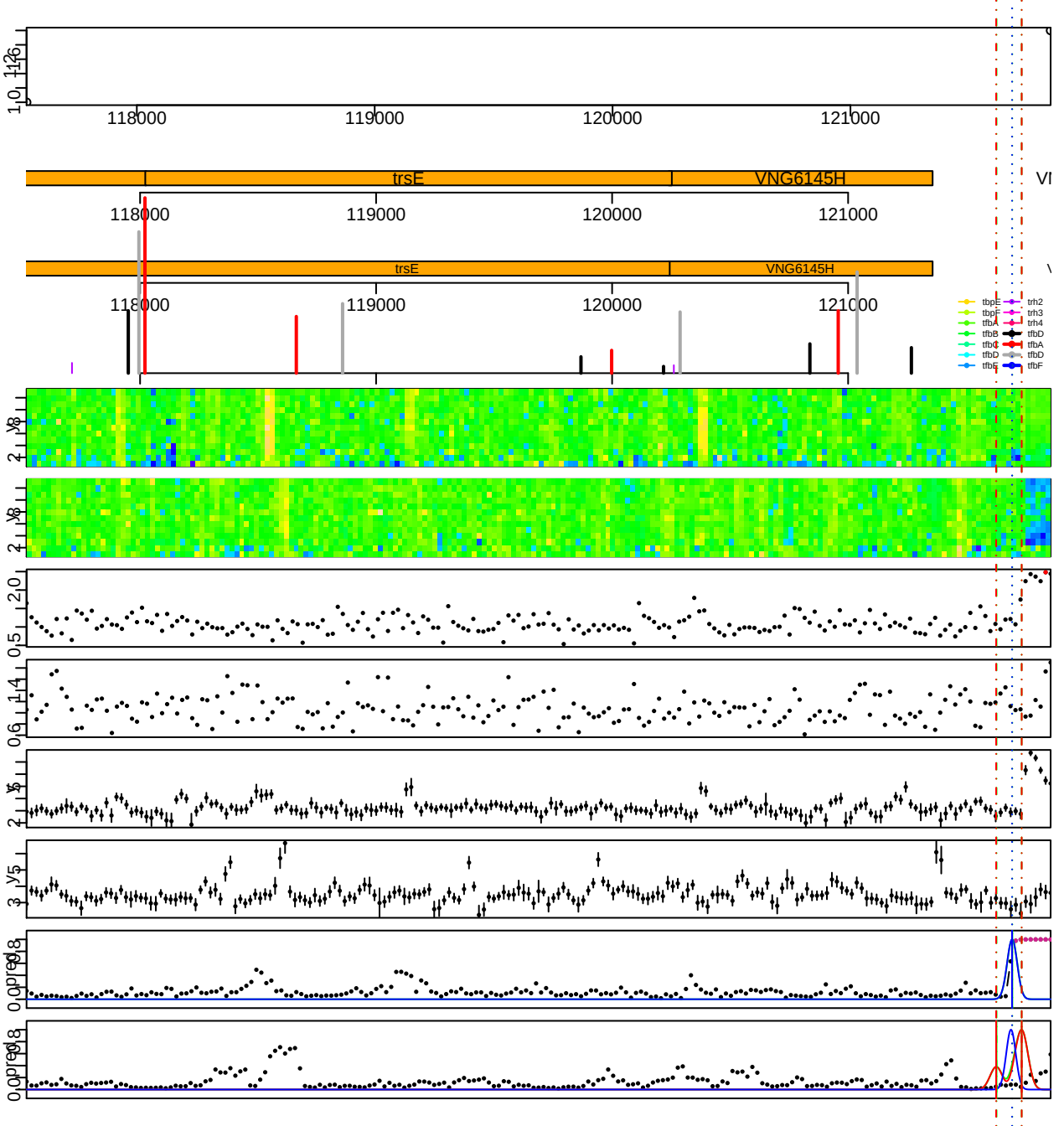
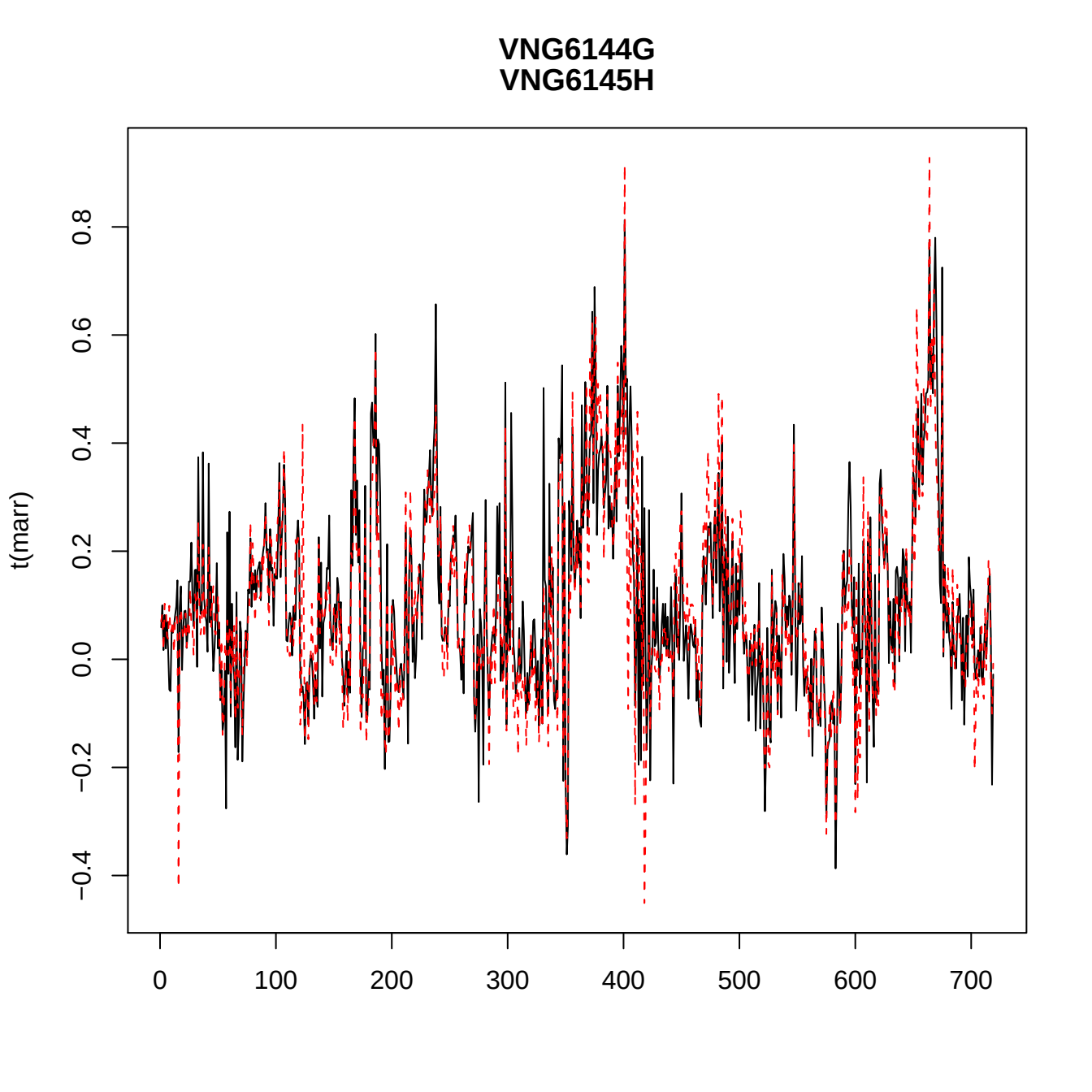
600
700


118000
119000
120000
121000
trsE
VNG6145H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG6144G
VNG6145H
t(marr)
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0.6
0.4
0.2
0.0
−0.2
−0.4
0
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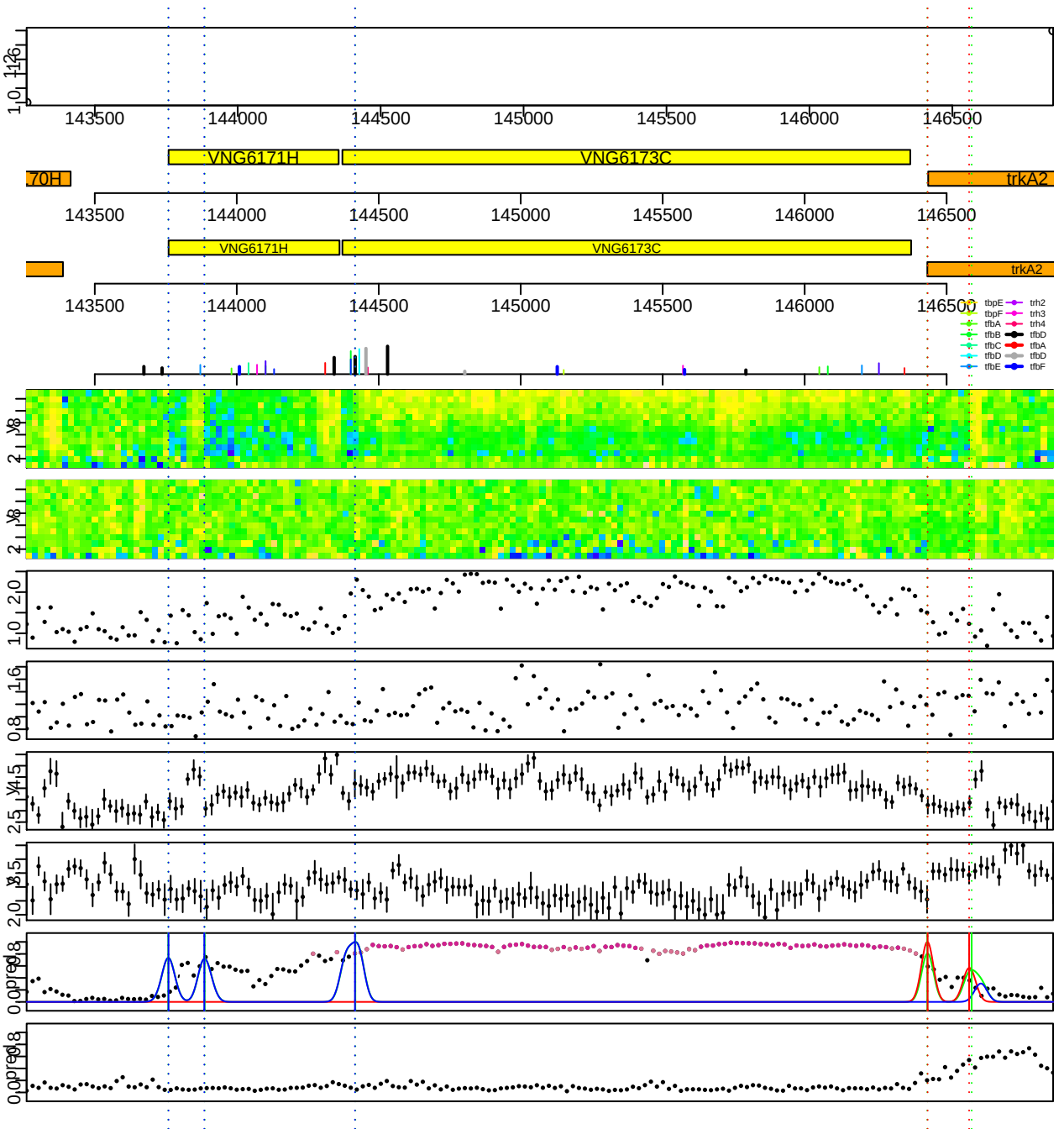
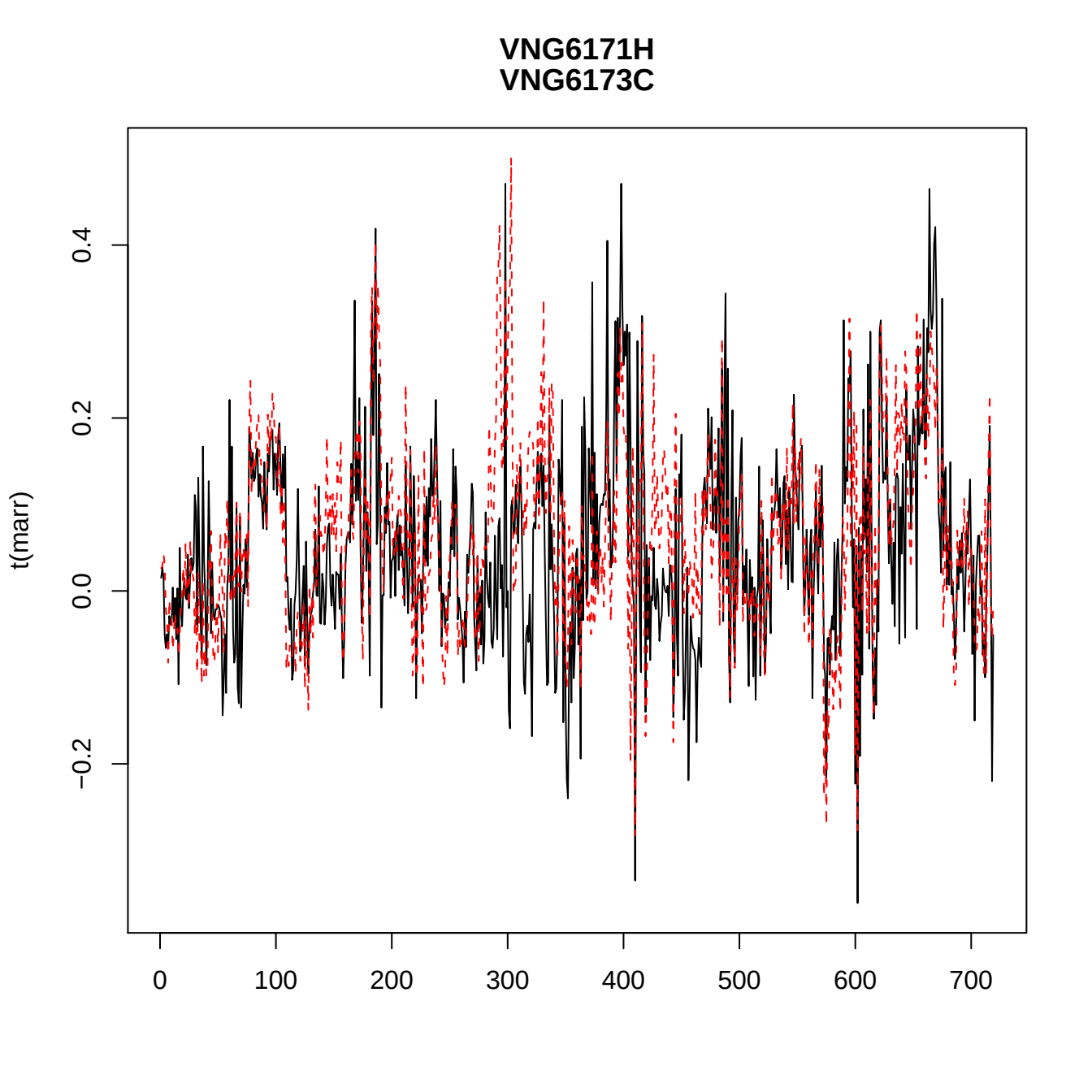
300
400
500
600
700


143500
144000
144500
145000
145500
146000
146500
VNG6171H
VNG6173C
70H
trkA2
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG6171H
VNG6173C
t(marr)
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0.2
0.0
−0.2
0
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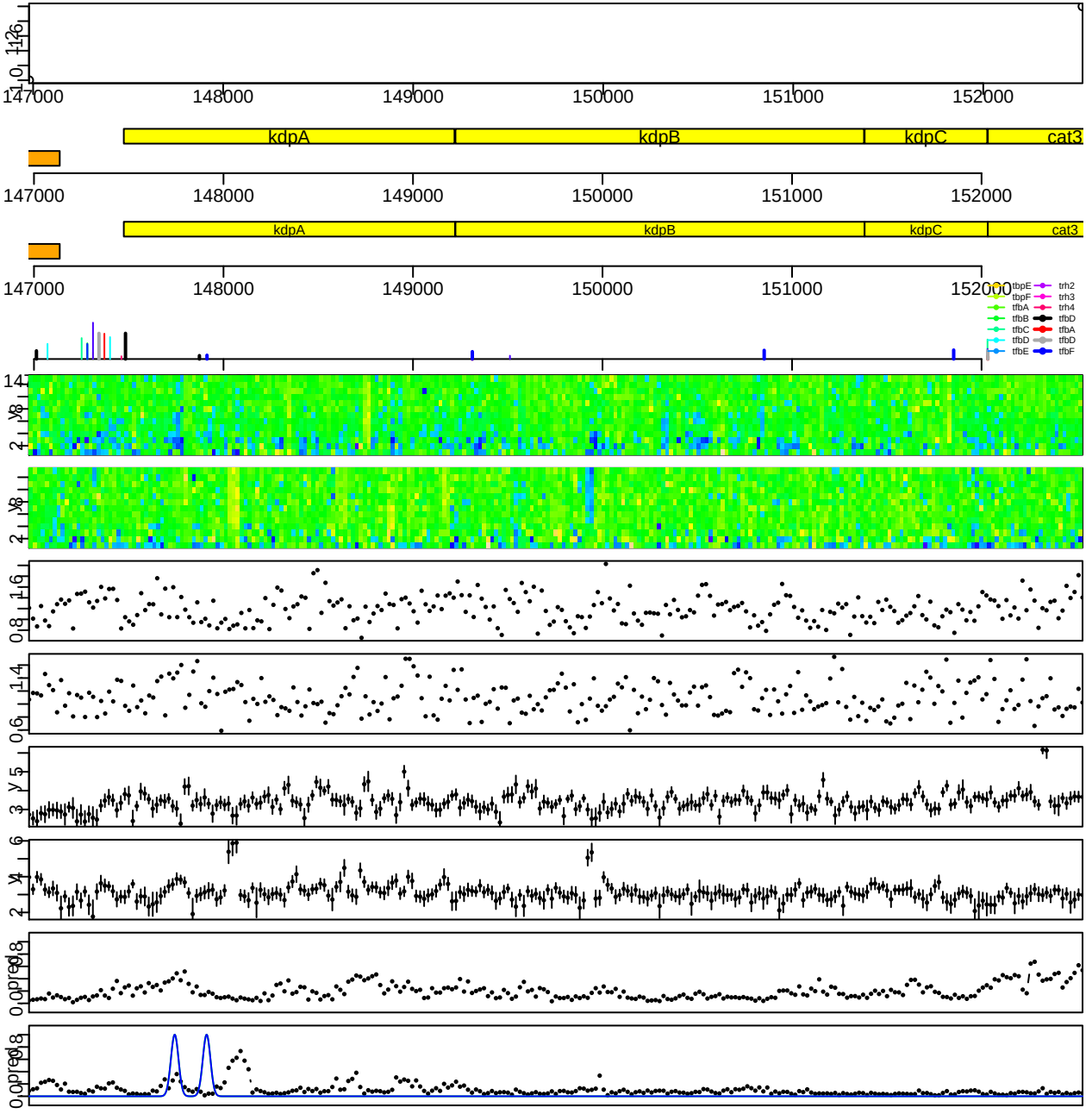
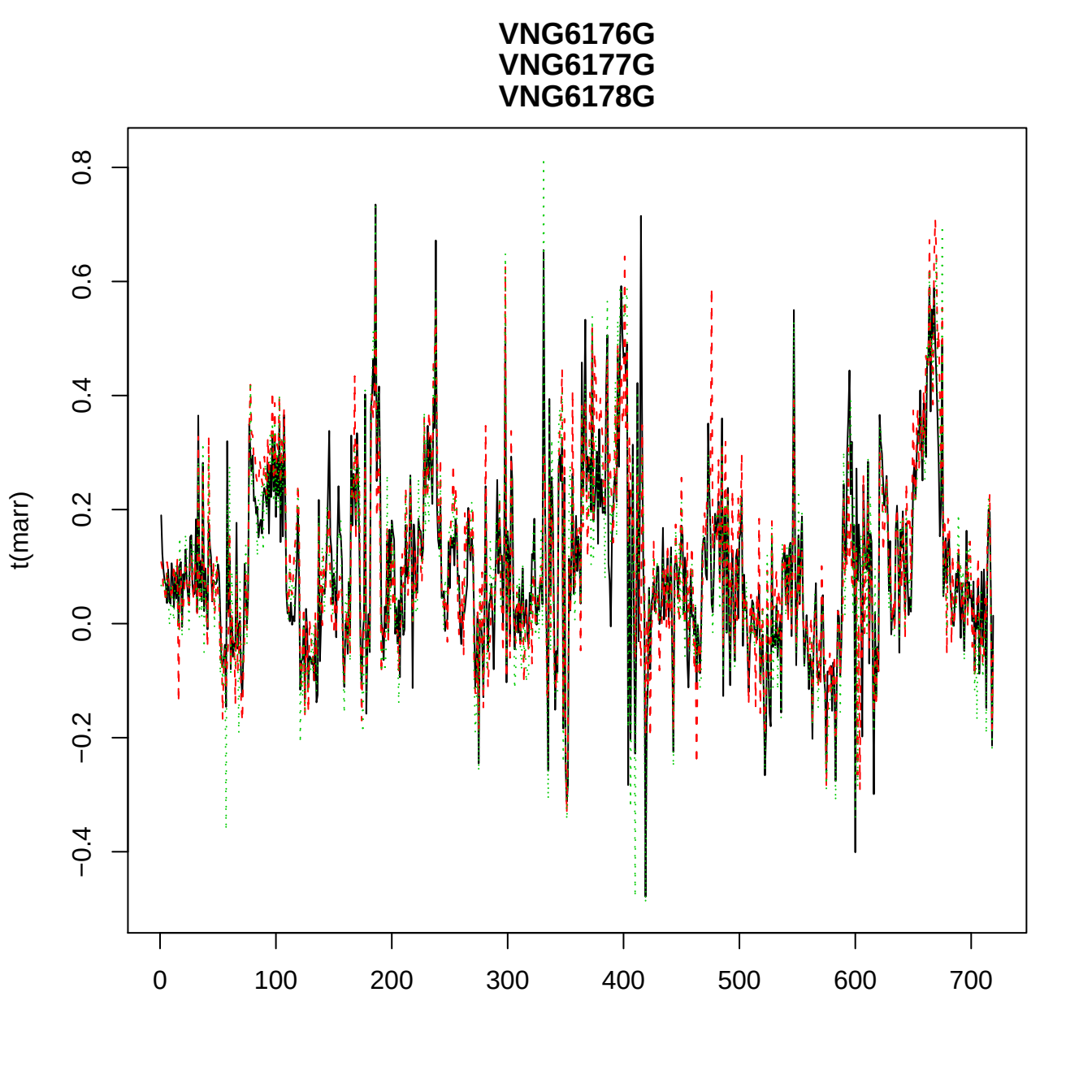
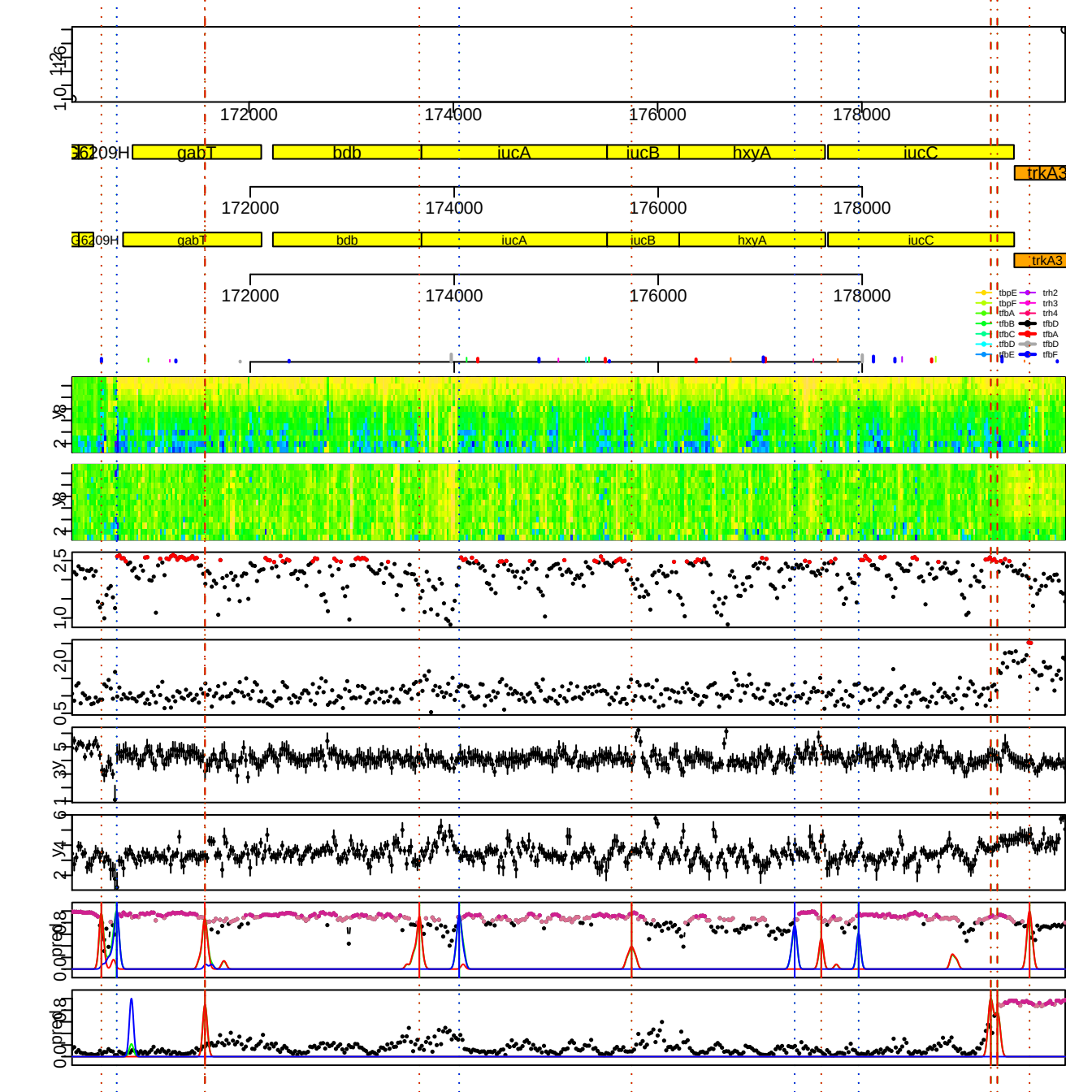
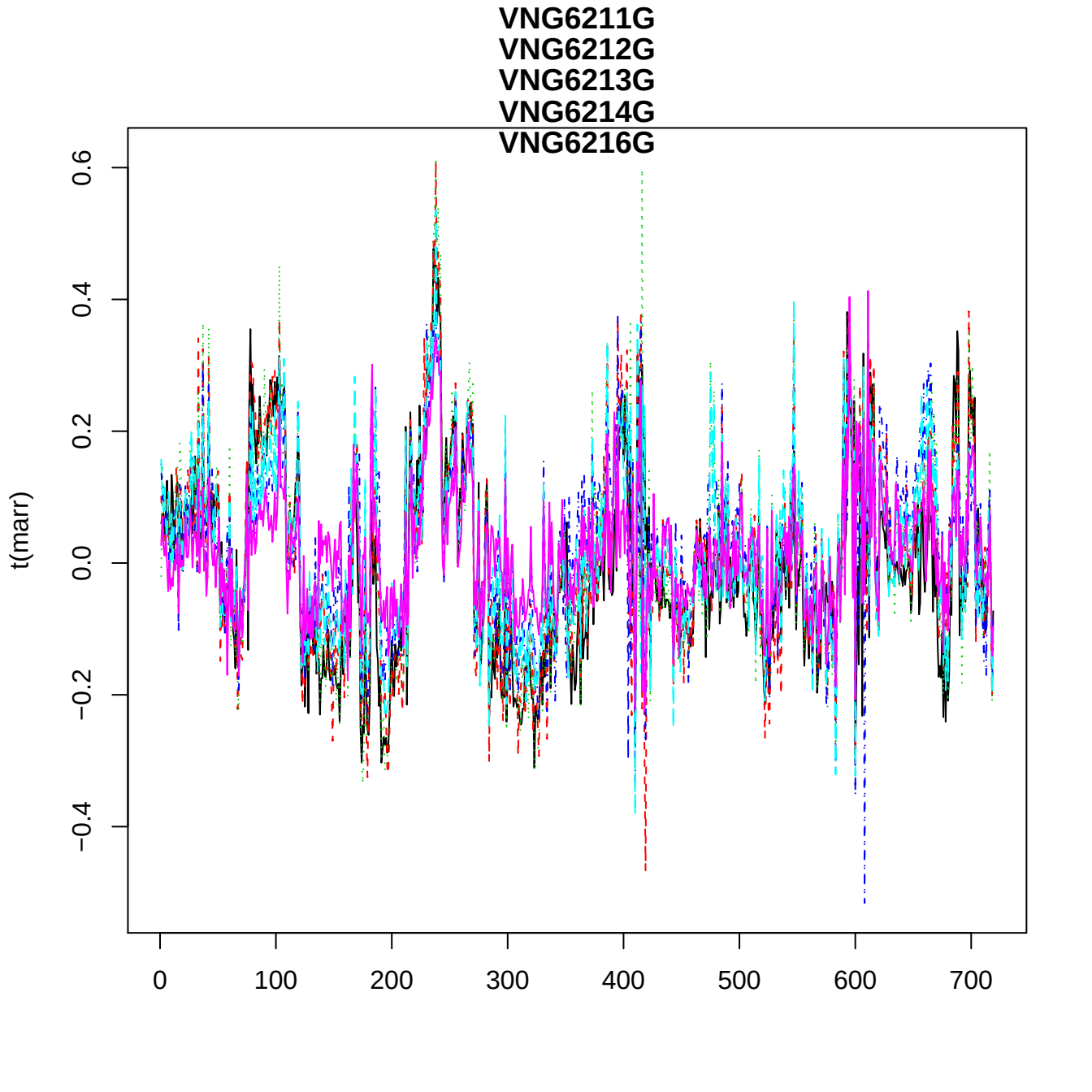
200
300
400
500
600
700


147000
148000
149000
150000
151000
152000
kdpA
kdpB
kdpC
cat3
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred


VNG6176G
VNG6177G
VNG6178G
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700


172000
174000
176000
178000
gabT
bdb
iucA
iucB
hxyA
iucC
trkA3
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG6211G
VNG6212G
VNG6213G
VNG6214G
VNG6216G
t(marr)
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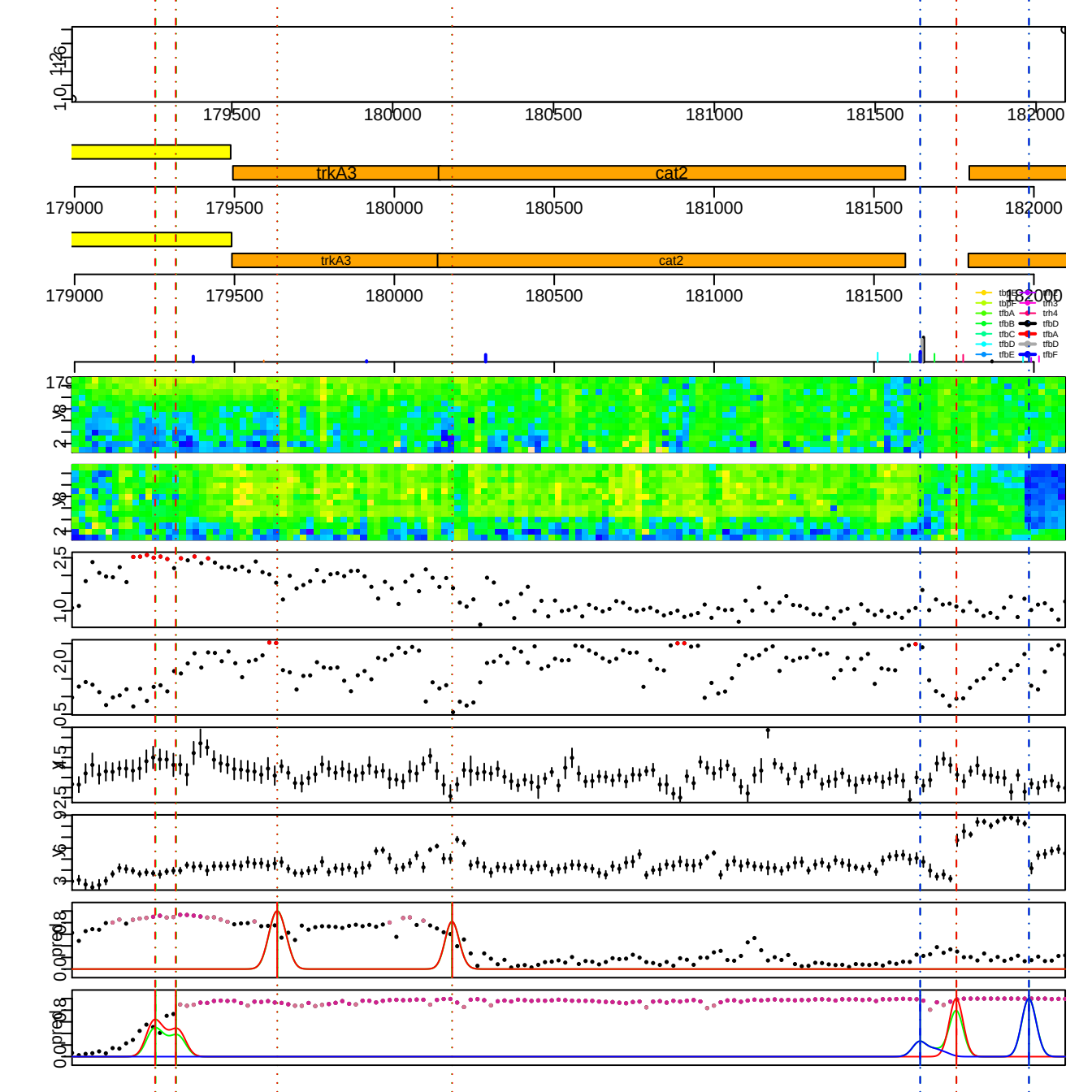
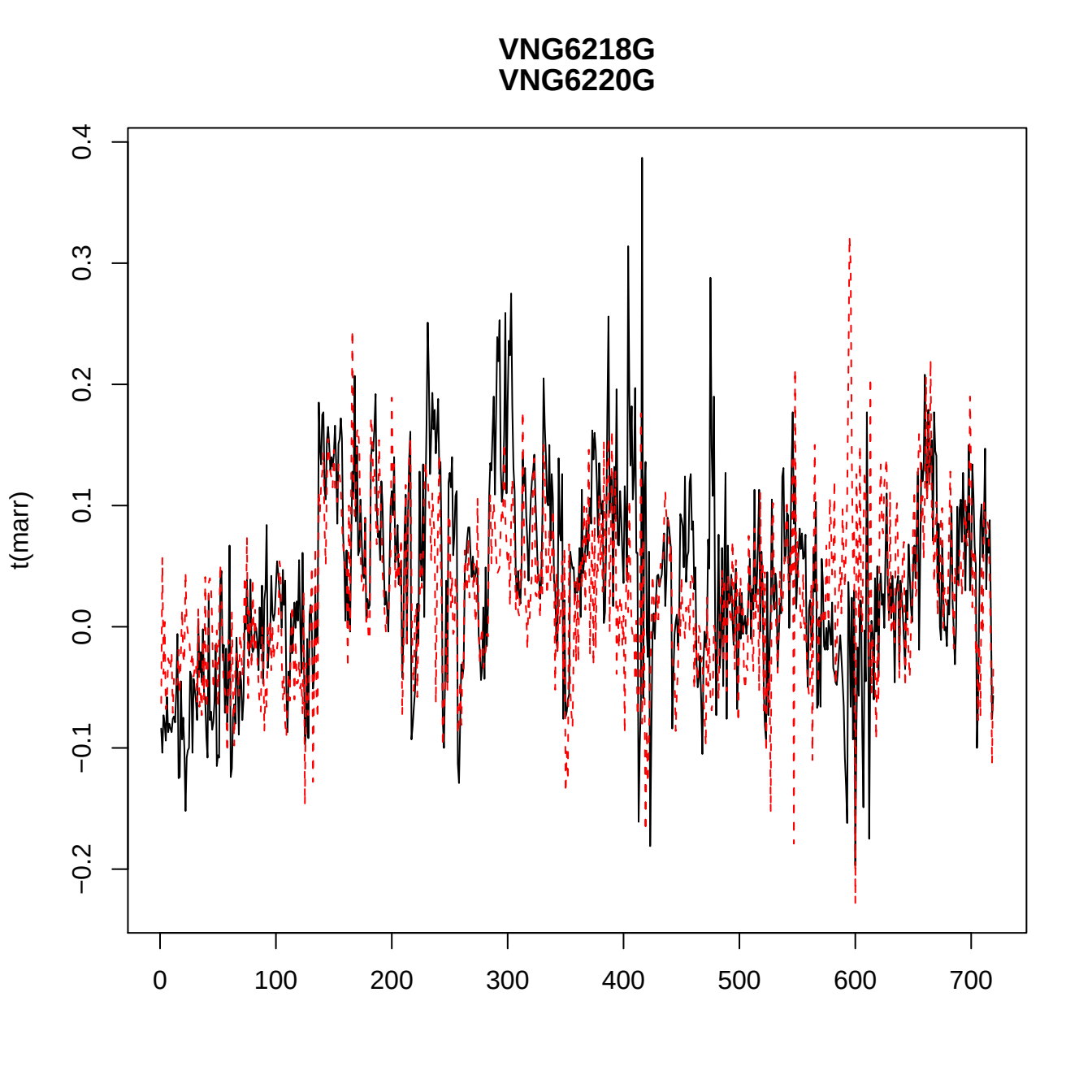
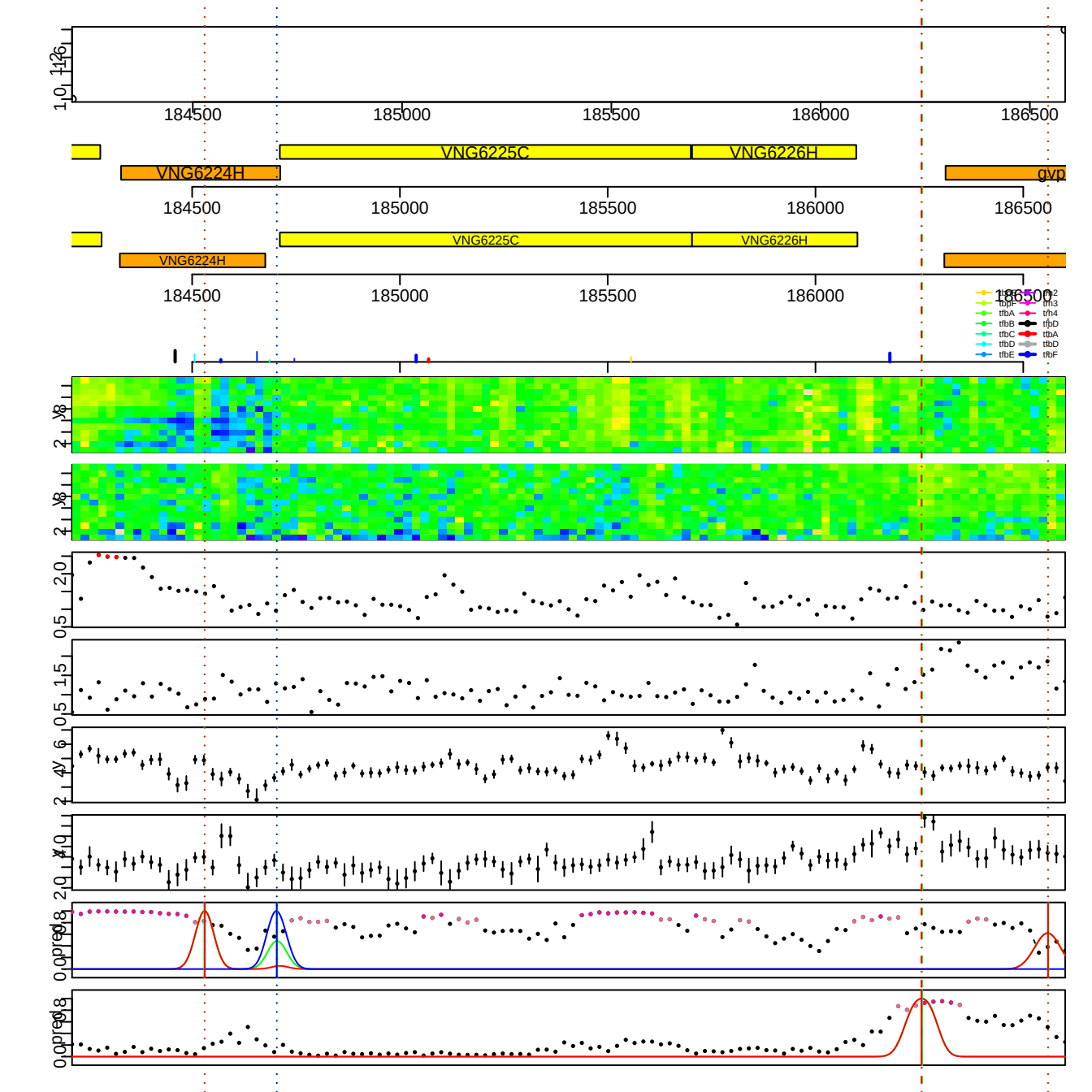
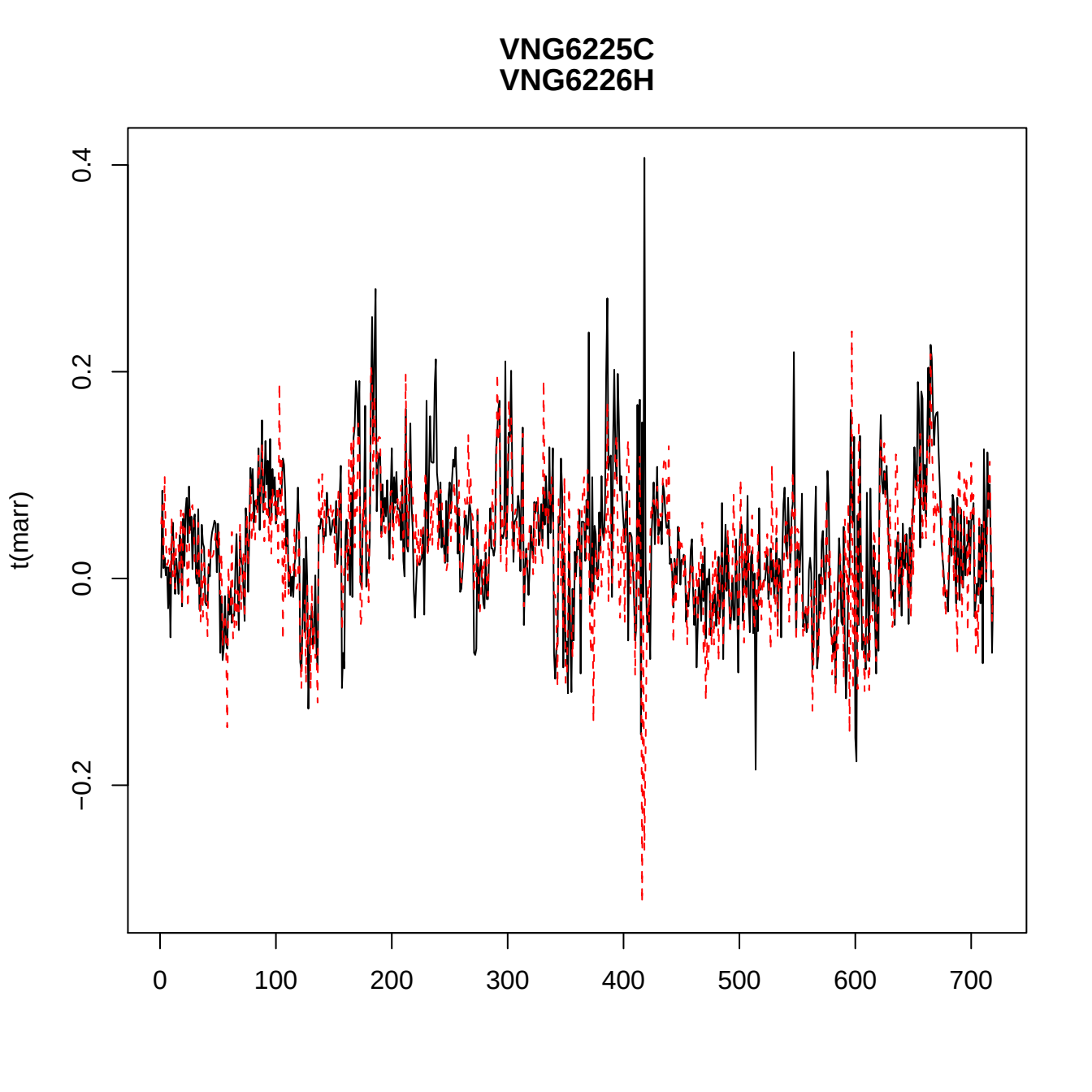
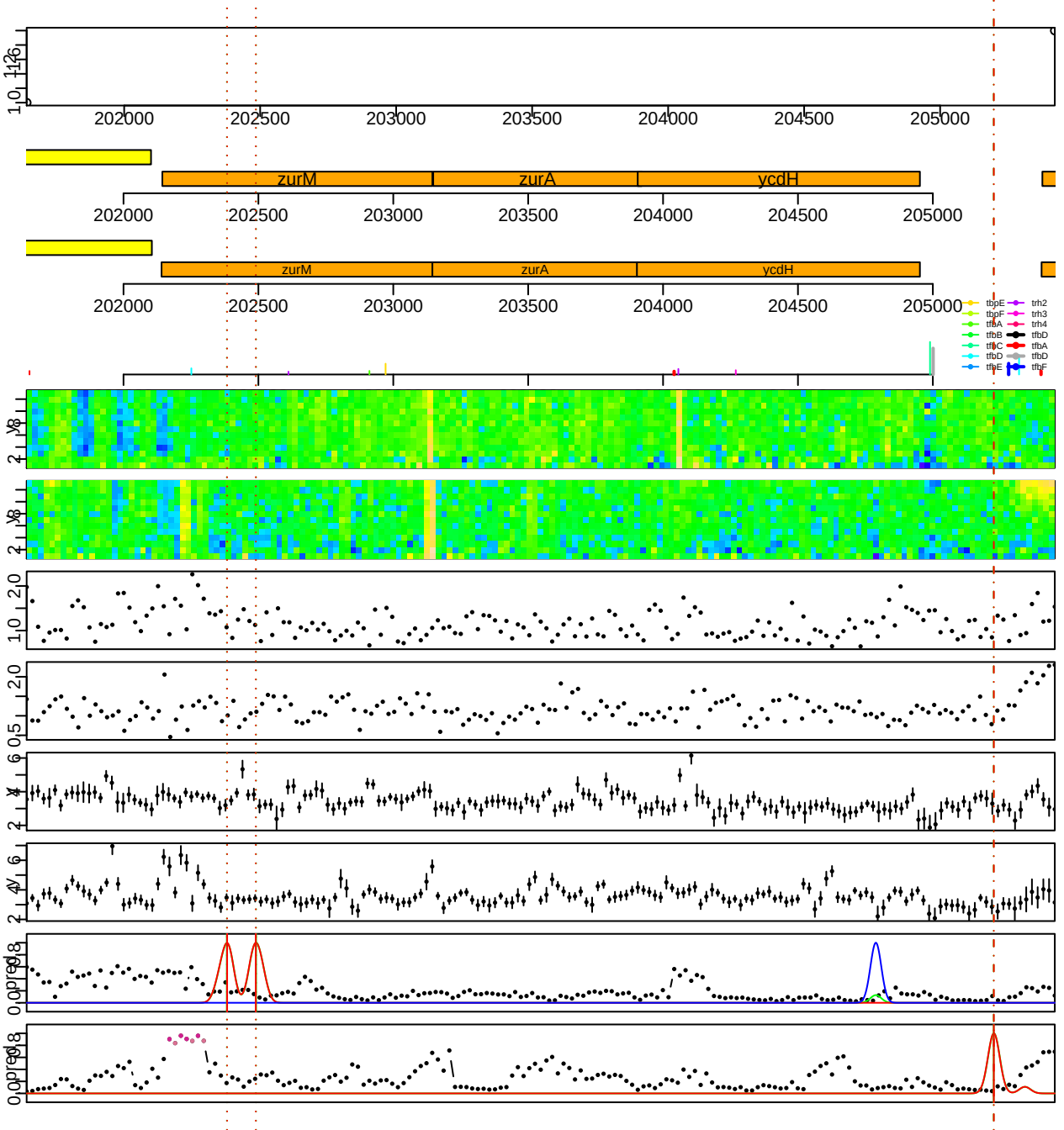
0.4
0.2
0.0
−0.2
−0.4
0
100
200
300
400
500
600
700

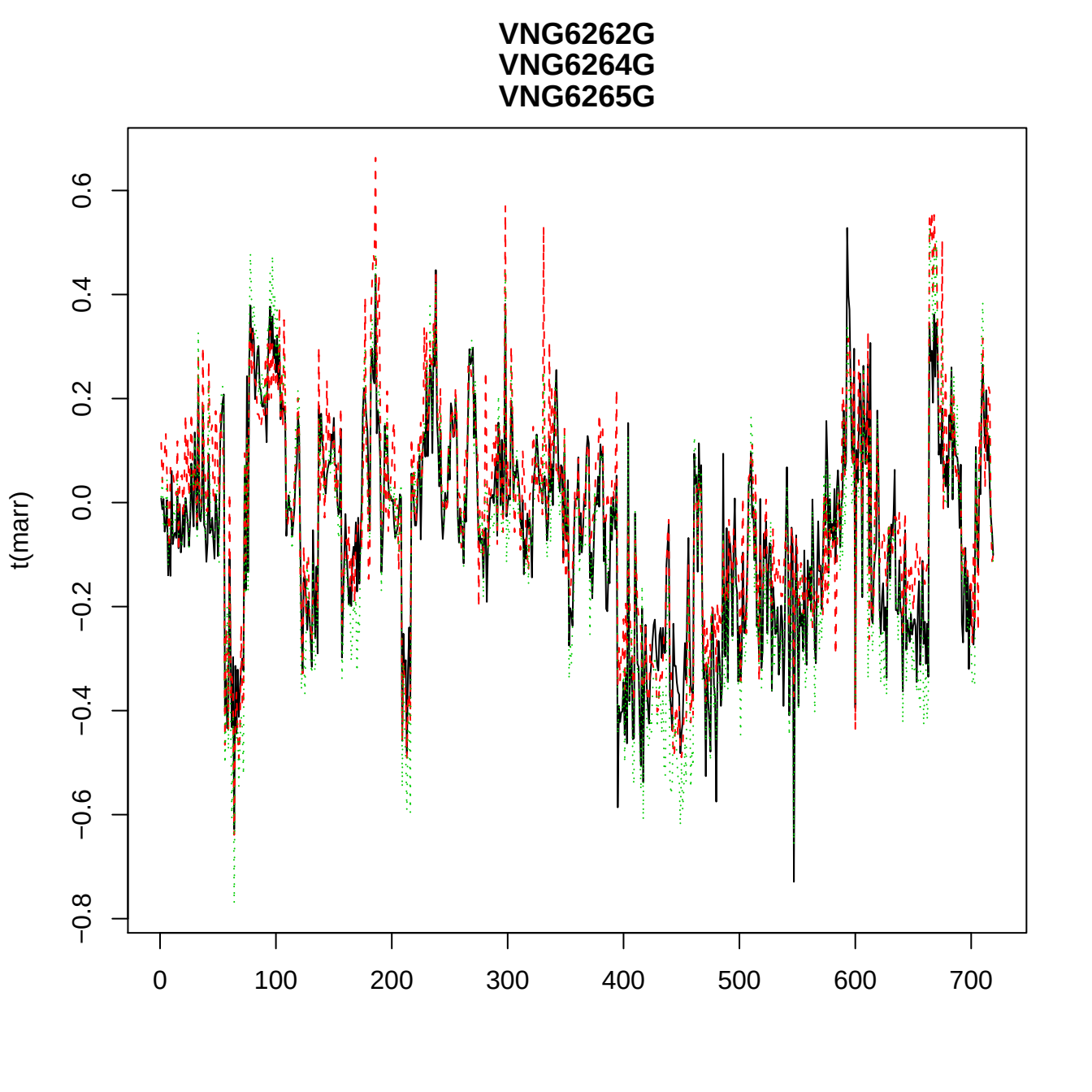

179500
180000
180500
181000
181500
182000
trkA3
cat2
179000
tfbE
tfbF

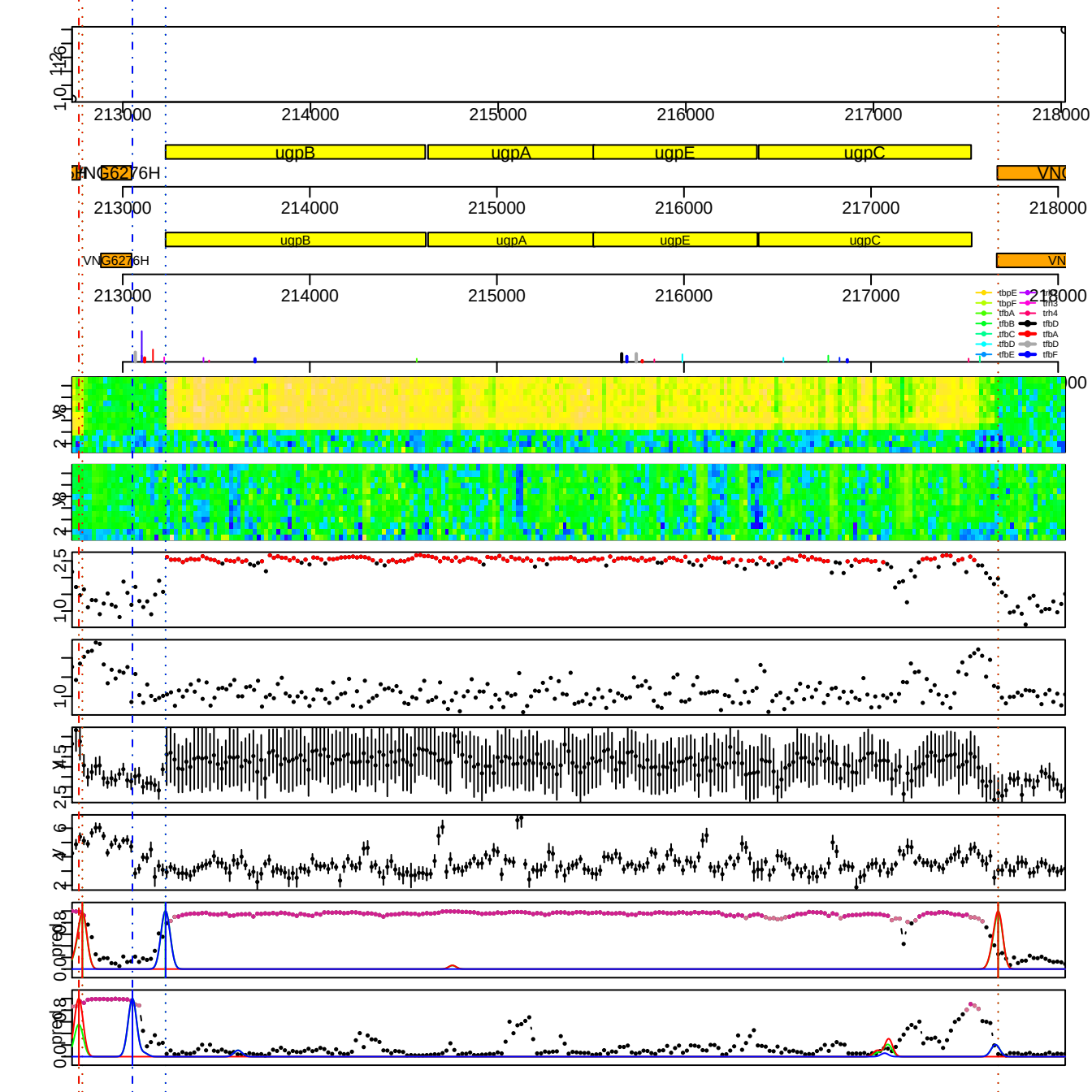

VNG6218G
VNG6220G
t(marr)
0.4
0.3
0.2
0.1
0.0
−0.1
−0.2
0
100
200
300
400
500
600
700

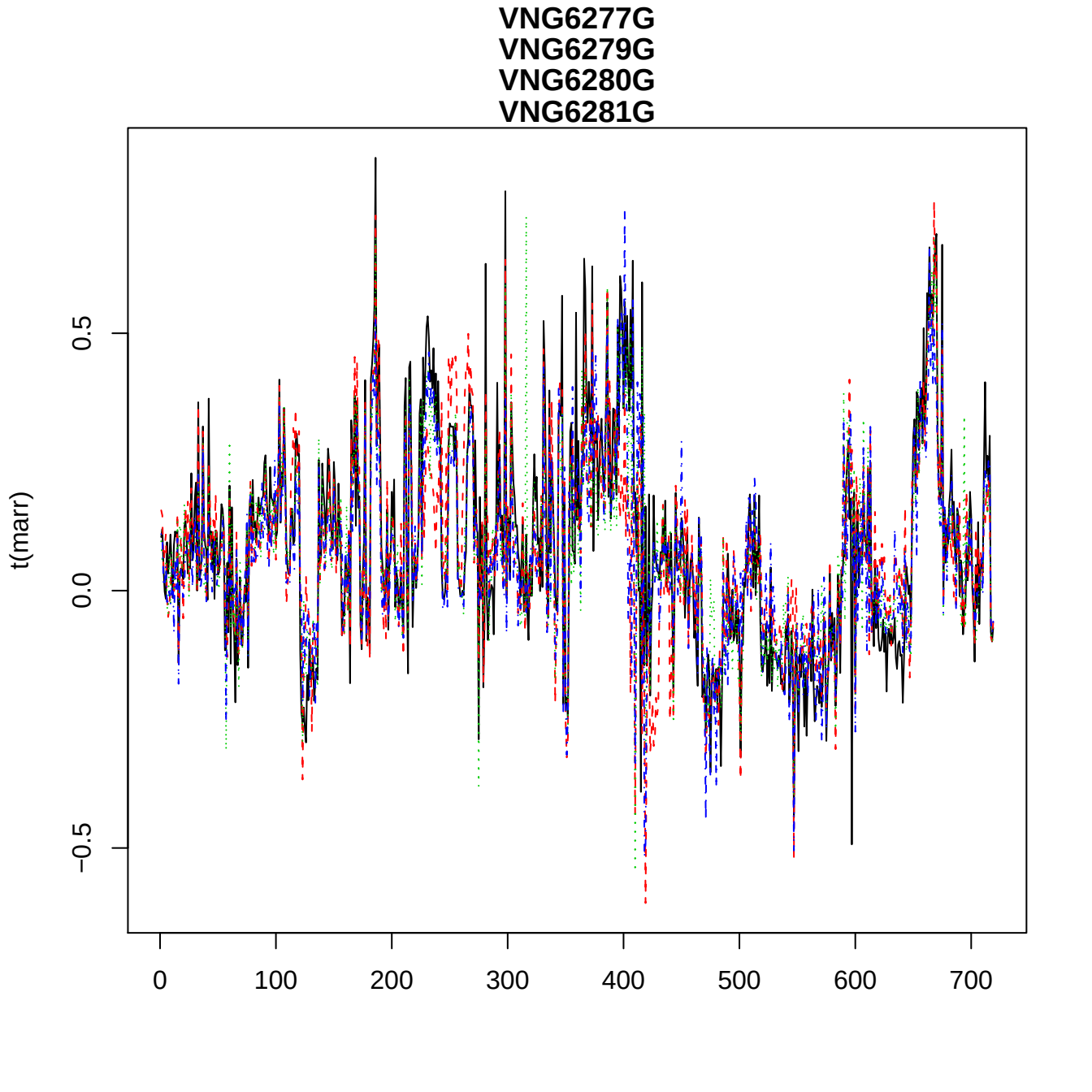

184500
185000
185500
186000
186500
VNG6225C
VNG6226H
VNG6224H
gvp
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
tfh2
tfh3
tfh4
tfbD
tfbA
tfbD
tfbF
pred

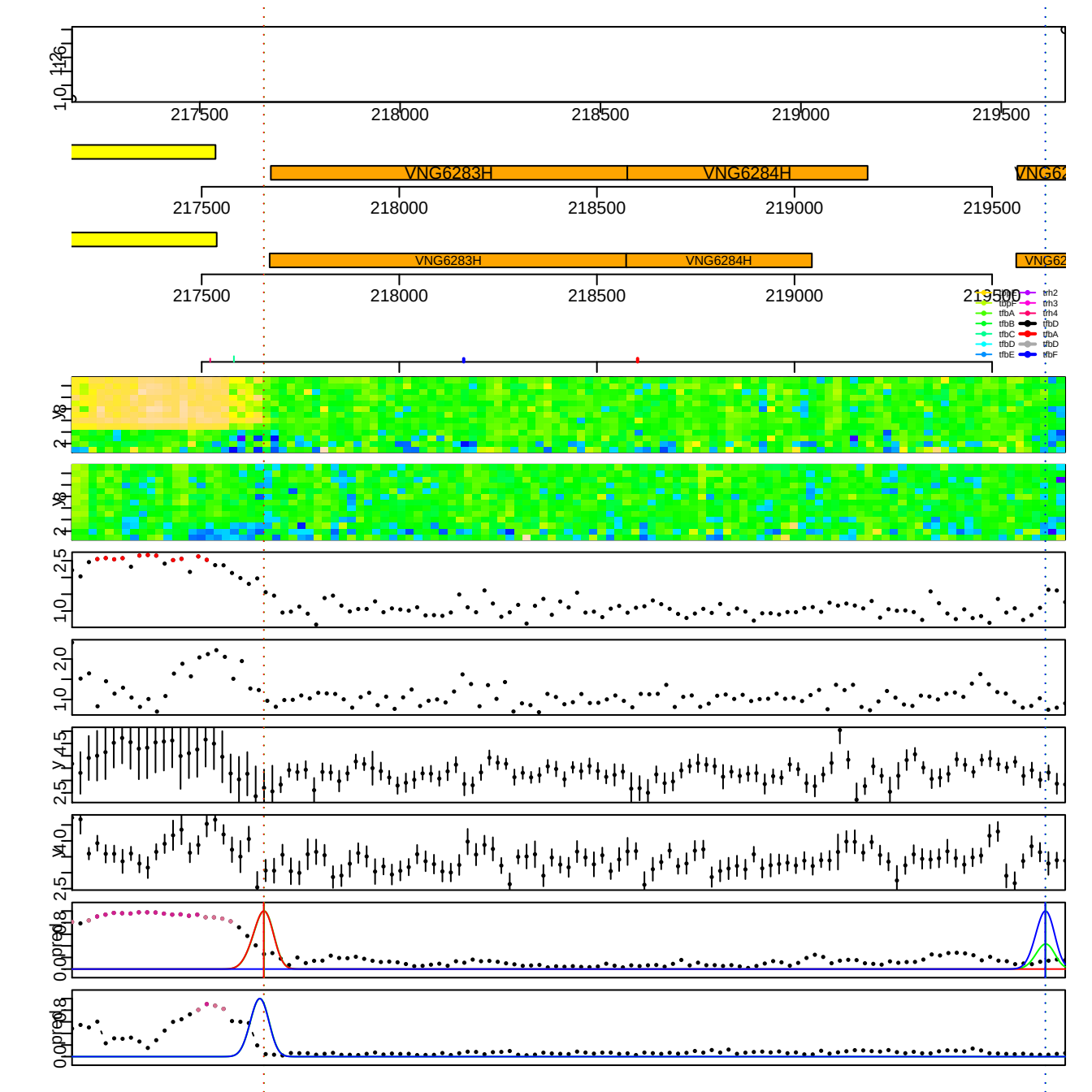

VNG6225C
VNG6226H
t(marr)
0.4
0.2
0.0
−0.2
0
100
200
300
400
500
600
700

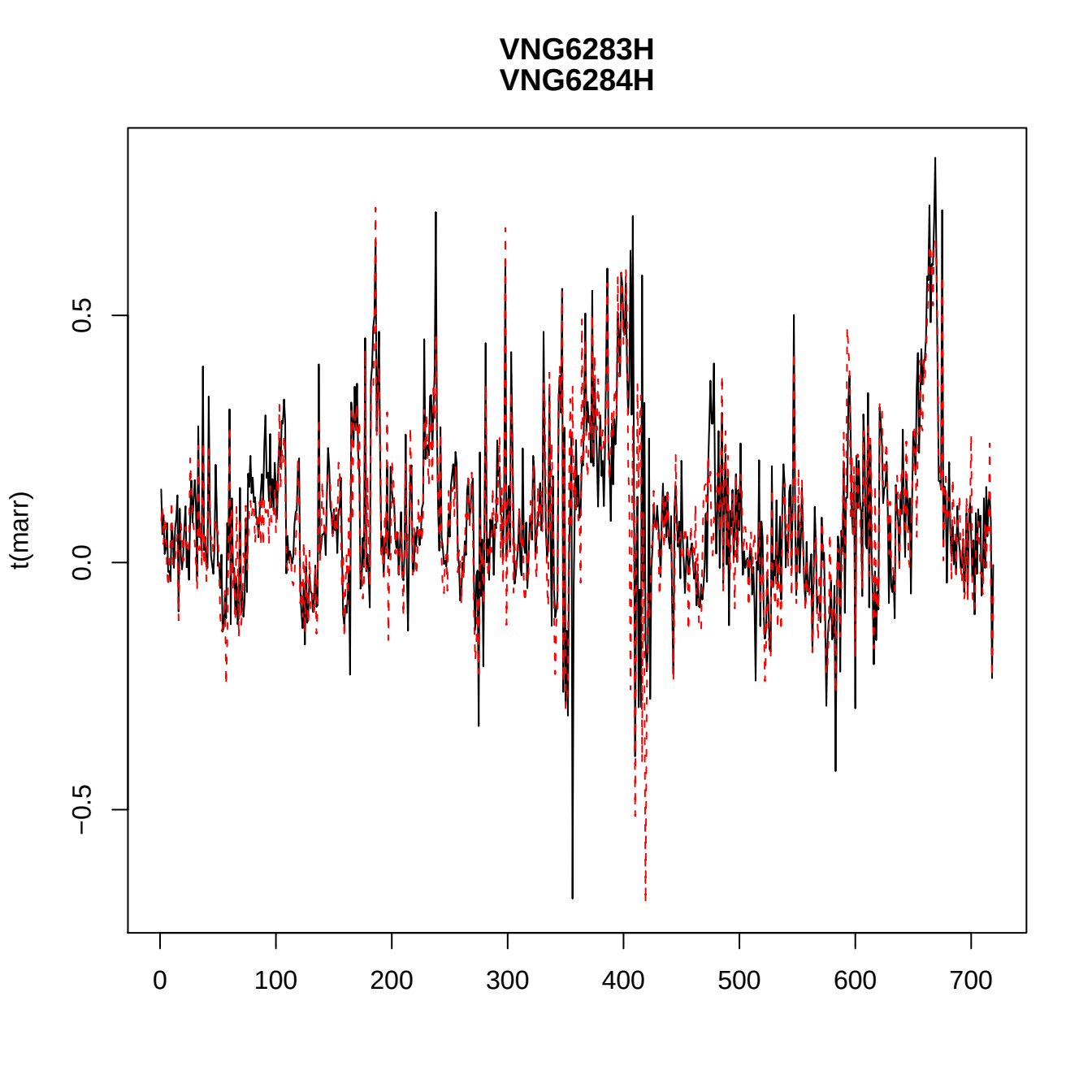

202000
202500
203000
203500
204000
204500
205000
zurM
zurA
ycdH
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

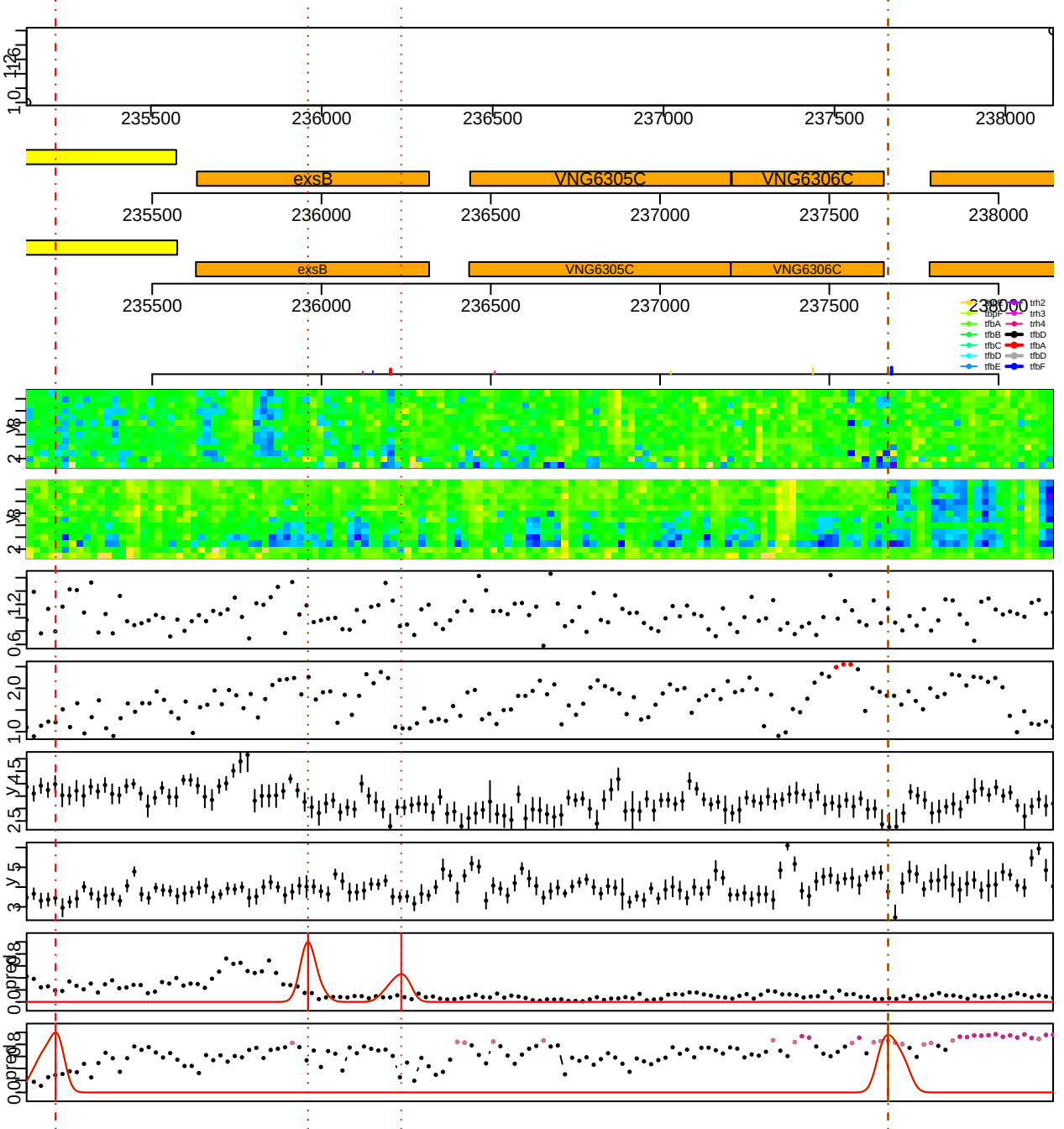

VNG6262G
VNG6264G
VNG6265G
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
−0.8
0
100
200
300
400
500
600
700

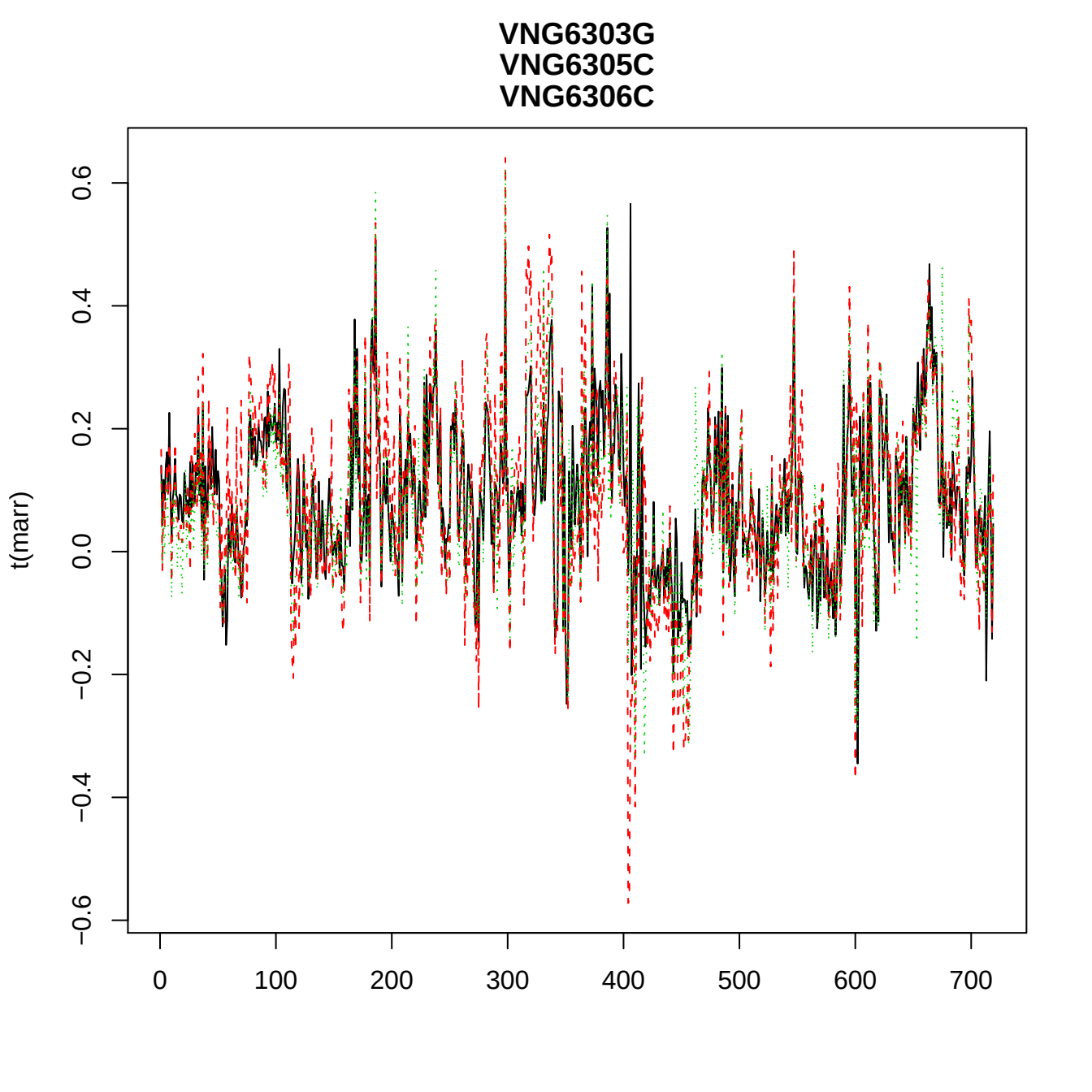

213000
214000
215000
216000
217000
218000
ugpB
ugpA
ugpE
ugpC
VNG6276H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh3
trh4
tfbD
tfbA
tfbD
tfbF
pred

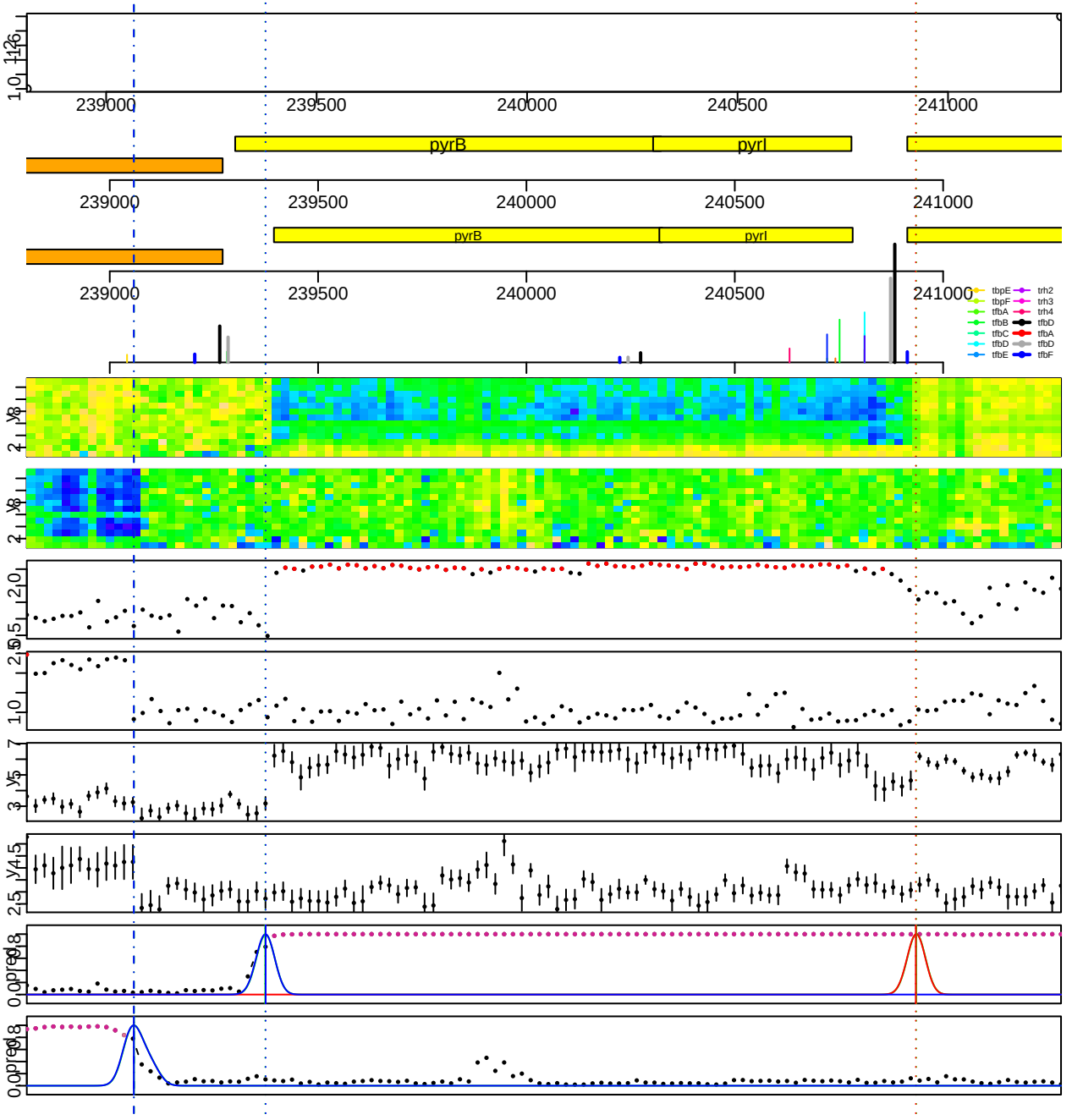

VNG6277G
VNG6279G
VNG6280G
VNG6281G
t(marr)
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

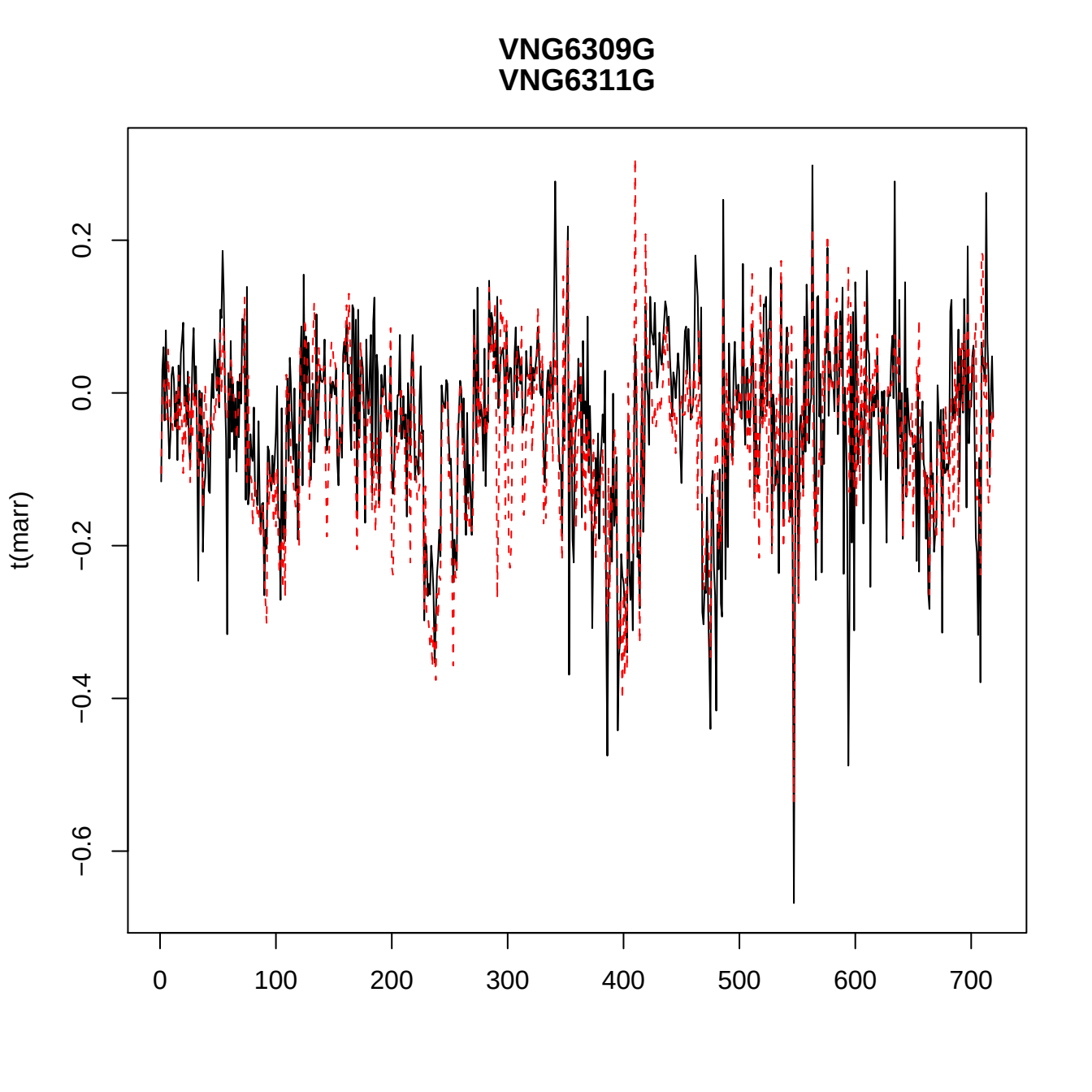

217500
218000
218500
219000
219500
VNG6283H
VNG6284H
VNG62
tfbA
tfbB
tfbC
tfbD
tfbE
tfbF
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF

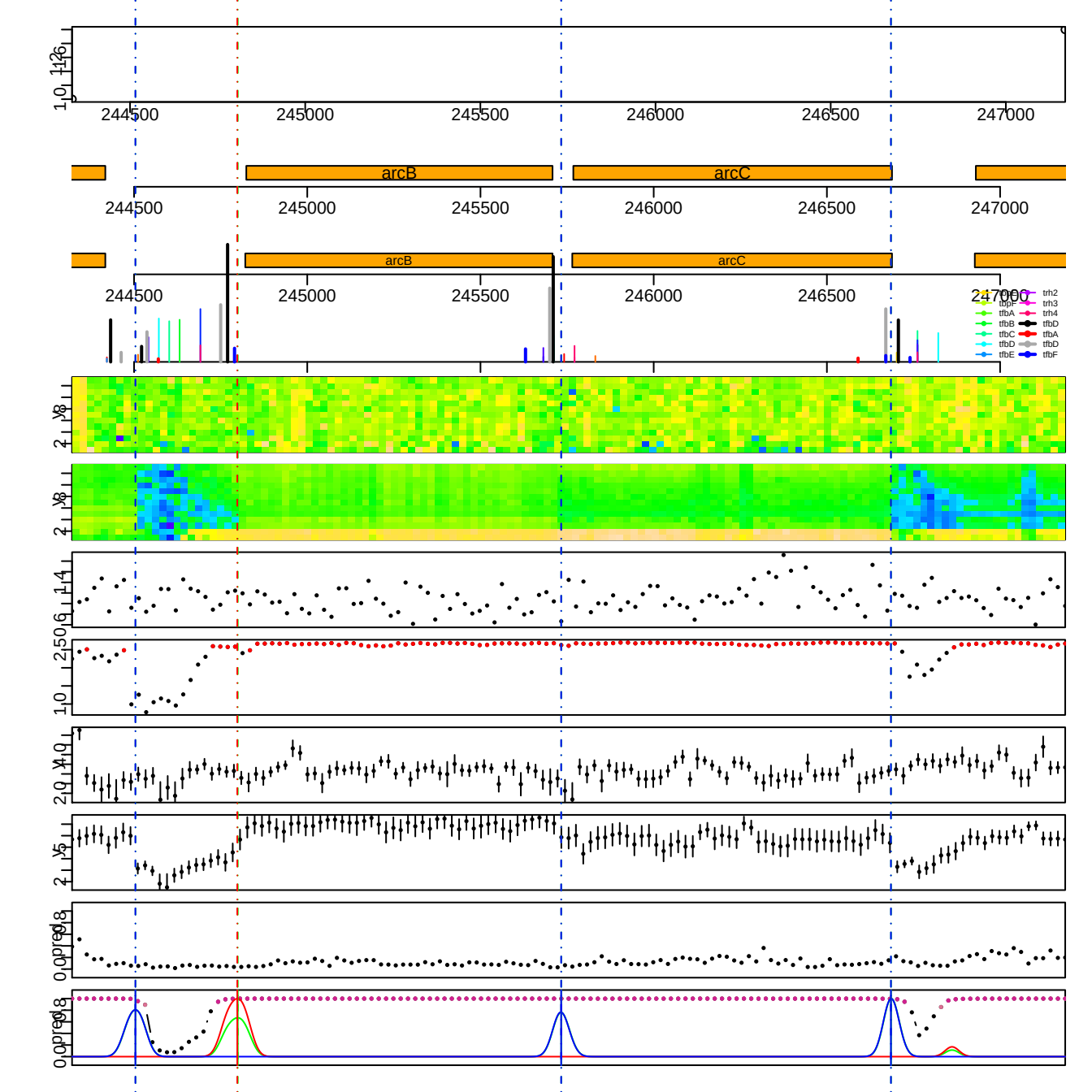

VNG6283H
VNG6284H
t(marr)
0.5
0.0
−0.5
0
100
200
300
400
500
600
700

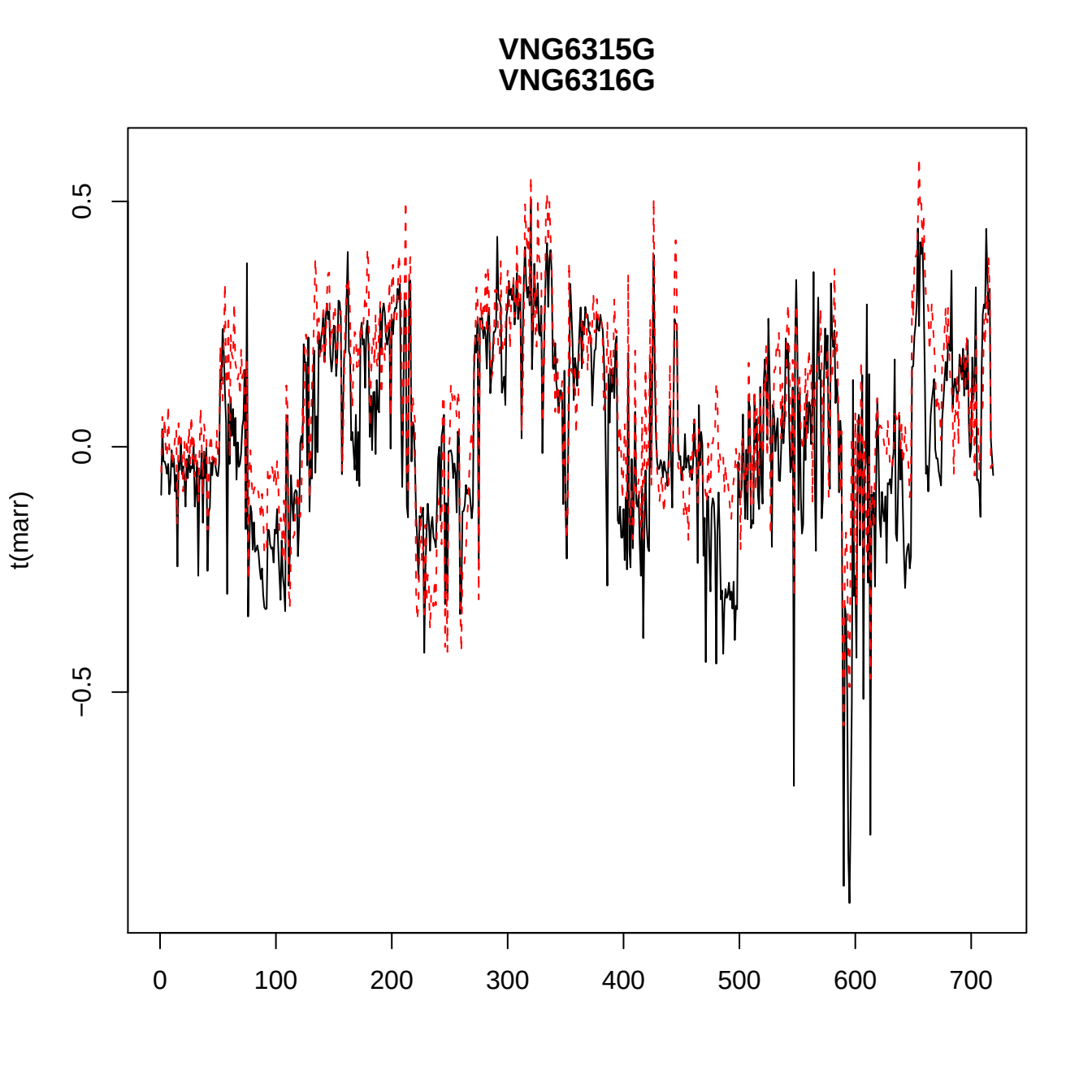

235500
236000
236500
237000
237500
238000
exsB
VNG6305C
VNG6306C
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE


VNG6303G
VNG6305C
VNG6306C
t(marr)
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


239000
239500
240000
240500
241000
pyrB
pyrI
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG6309G
VNG6311G
t(marr)
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


244500
245000
245500
246000
246500
247000
arcB
arcC
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG6315G
VNG6316G
t(marr)
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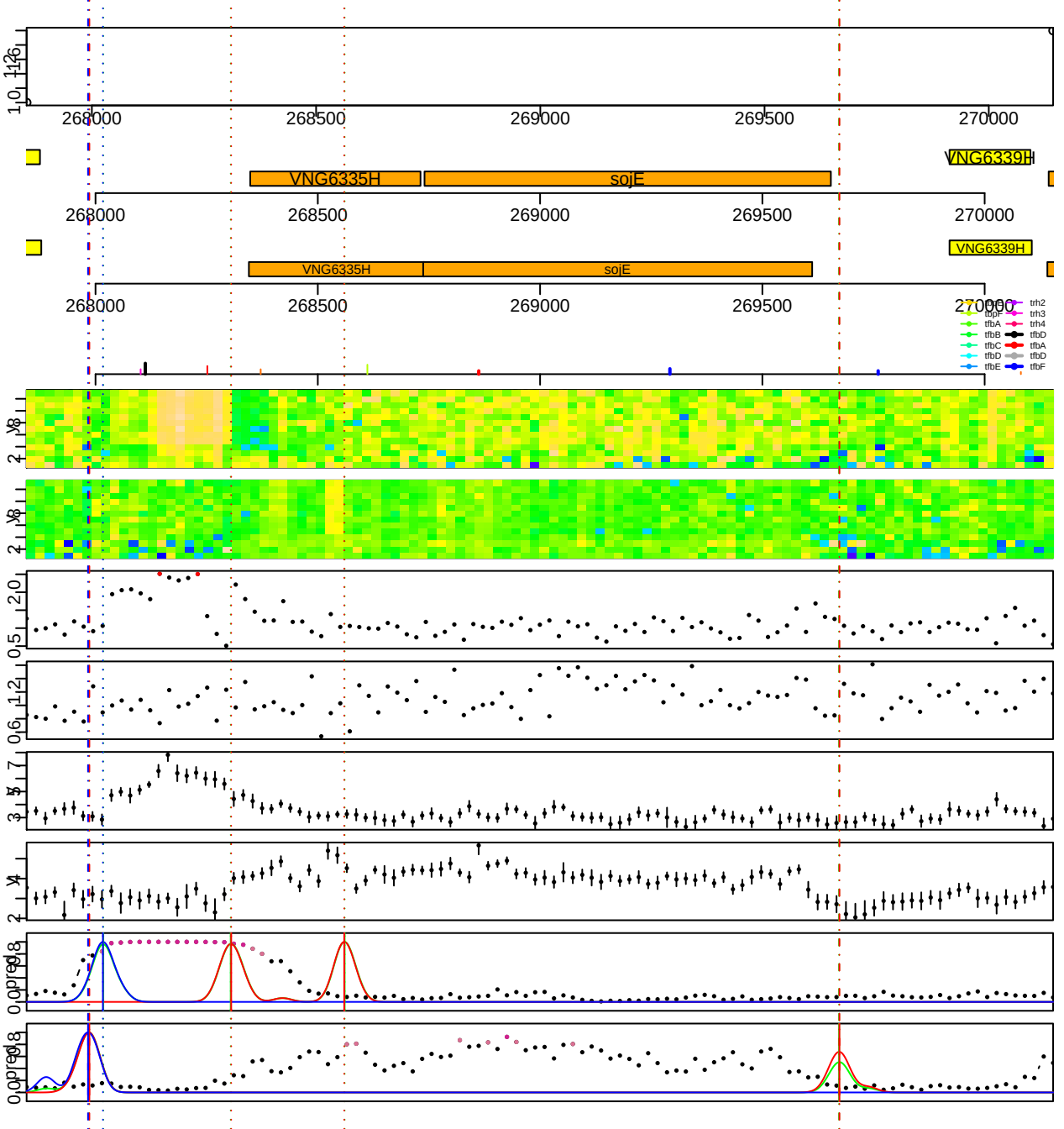
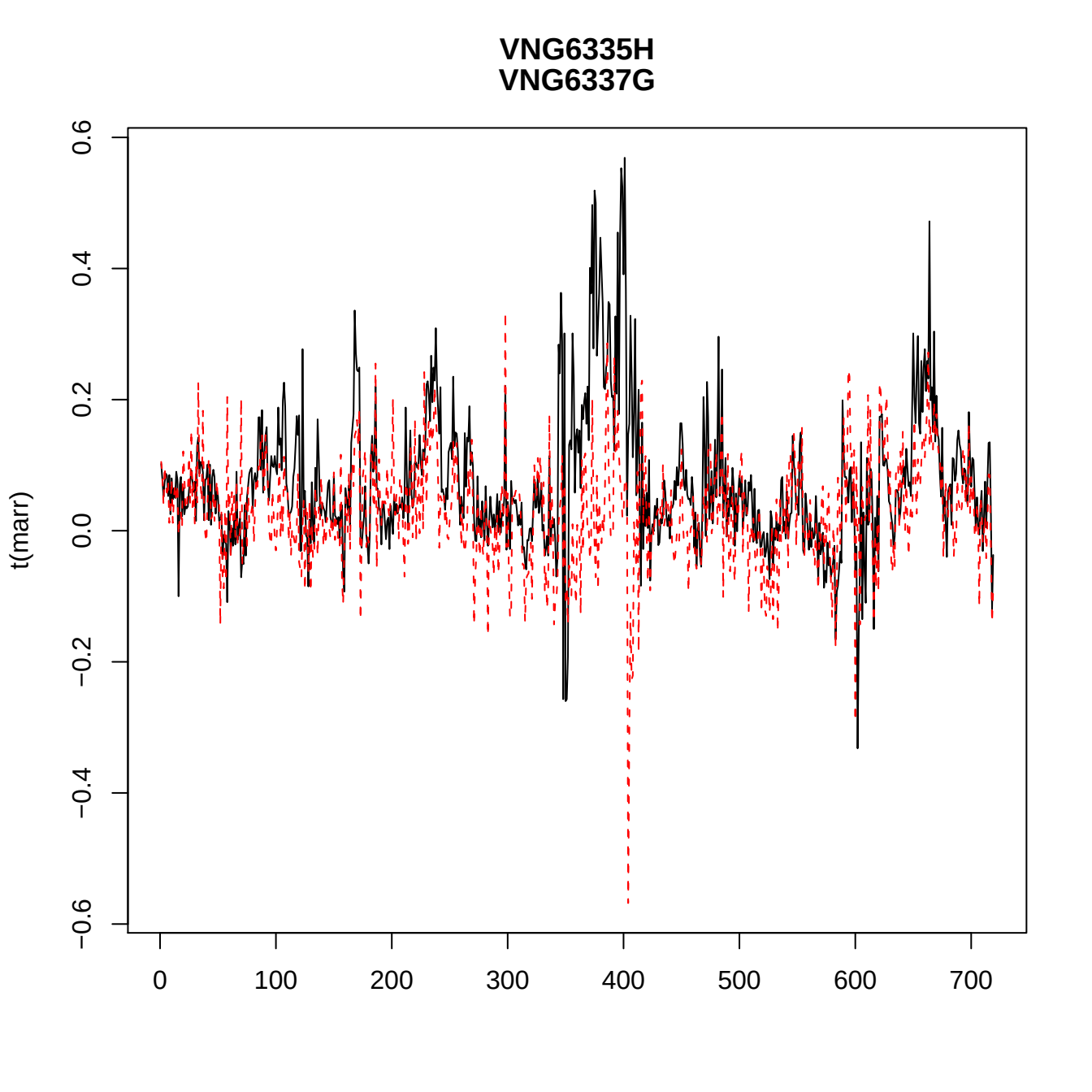
0.0
−0.5
0
100
200
300
400
500
600
700


268000
268500
269000
269500
270000
VNG6335H
sojE
VNG6339H
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbE
tfbD
tfbC
tfbB
tfbA
tfbF
pred


VNG6335H
VNG6337G
t(marr)
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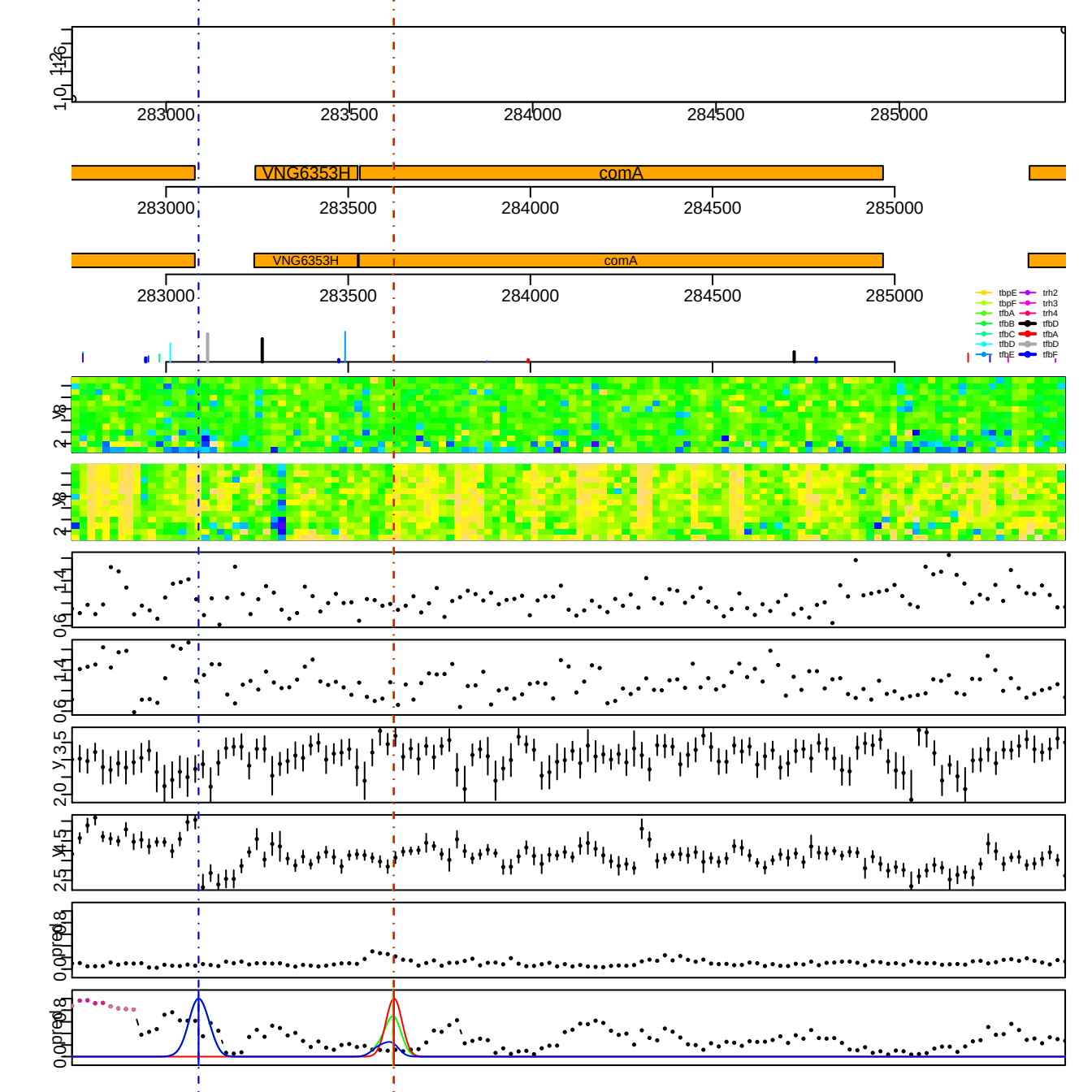
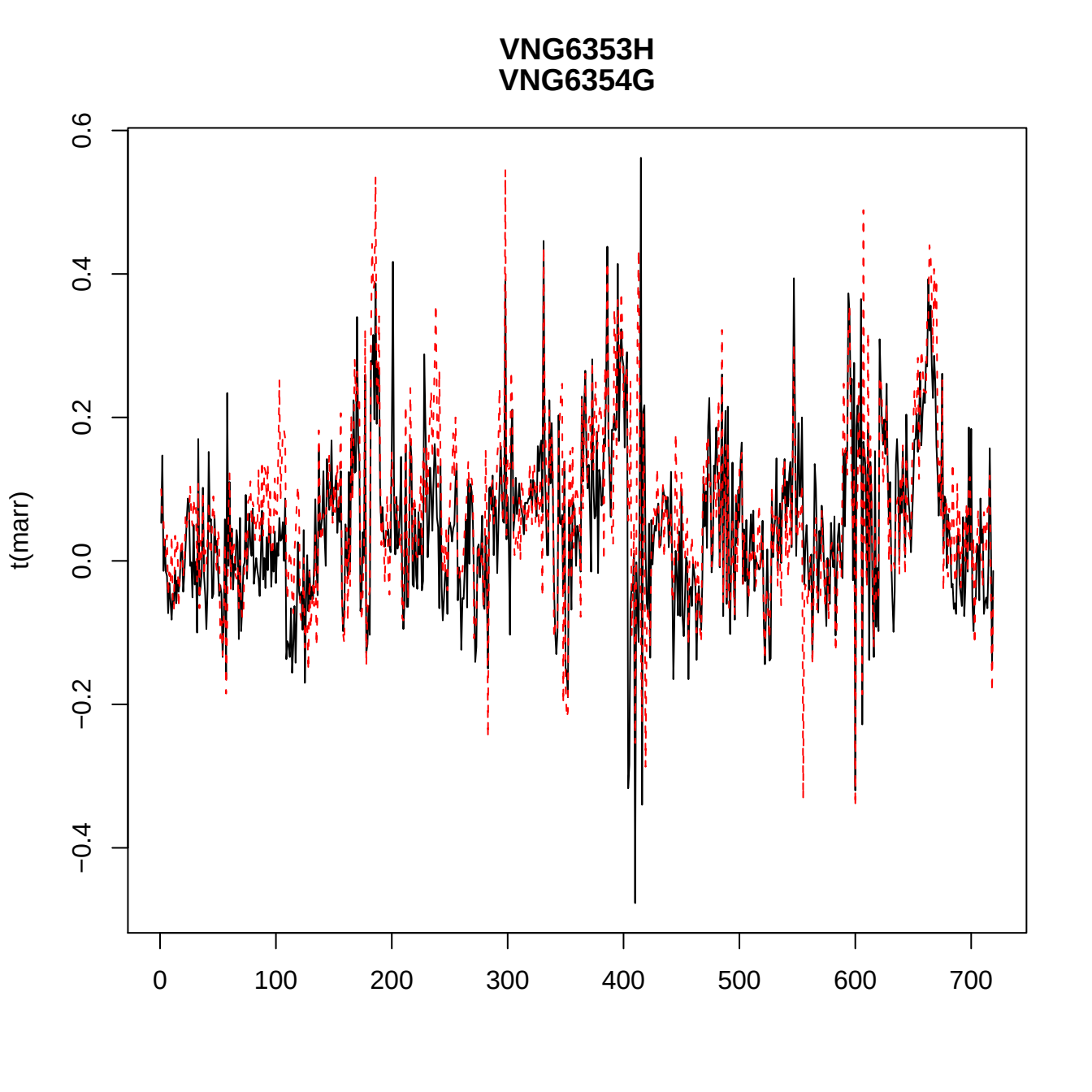
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700


283000
283500
284000
284500
285000
VNG6353H
comA
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF


VNG6353H
VNG6354G
t(marr)
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0.2
0.0
−0.2
−0.4
0
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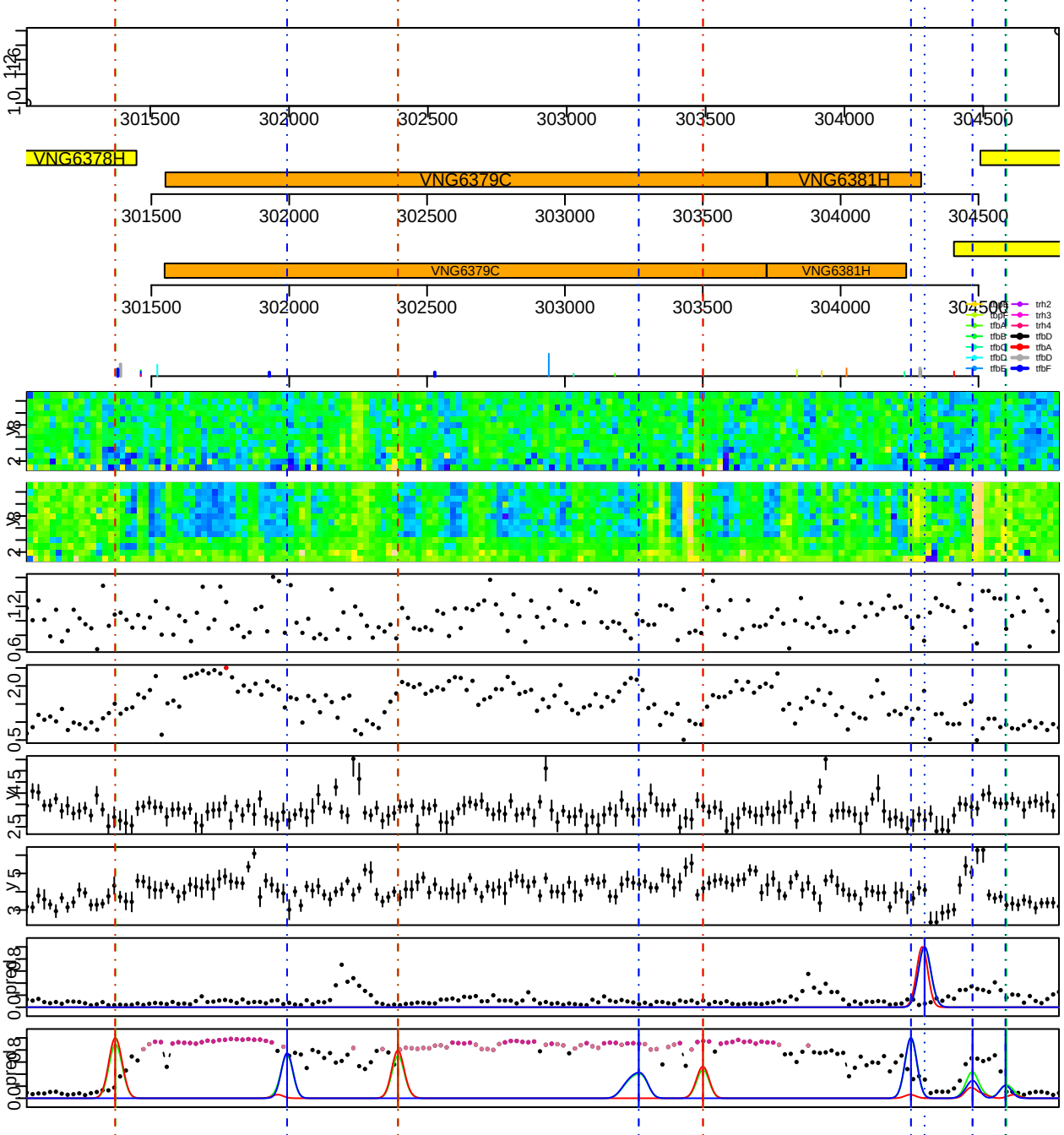
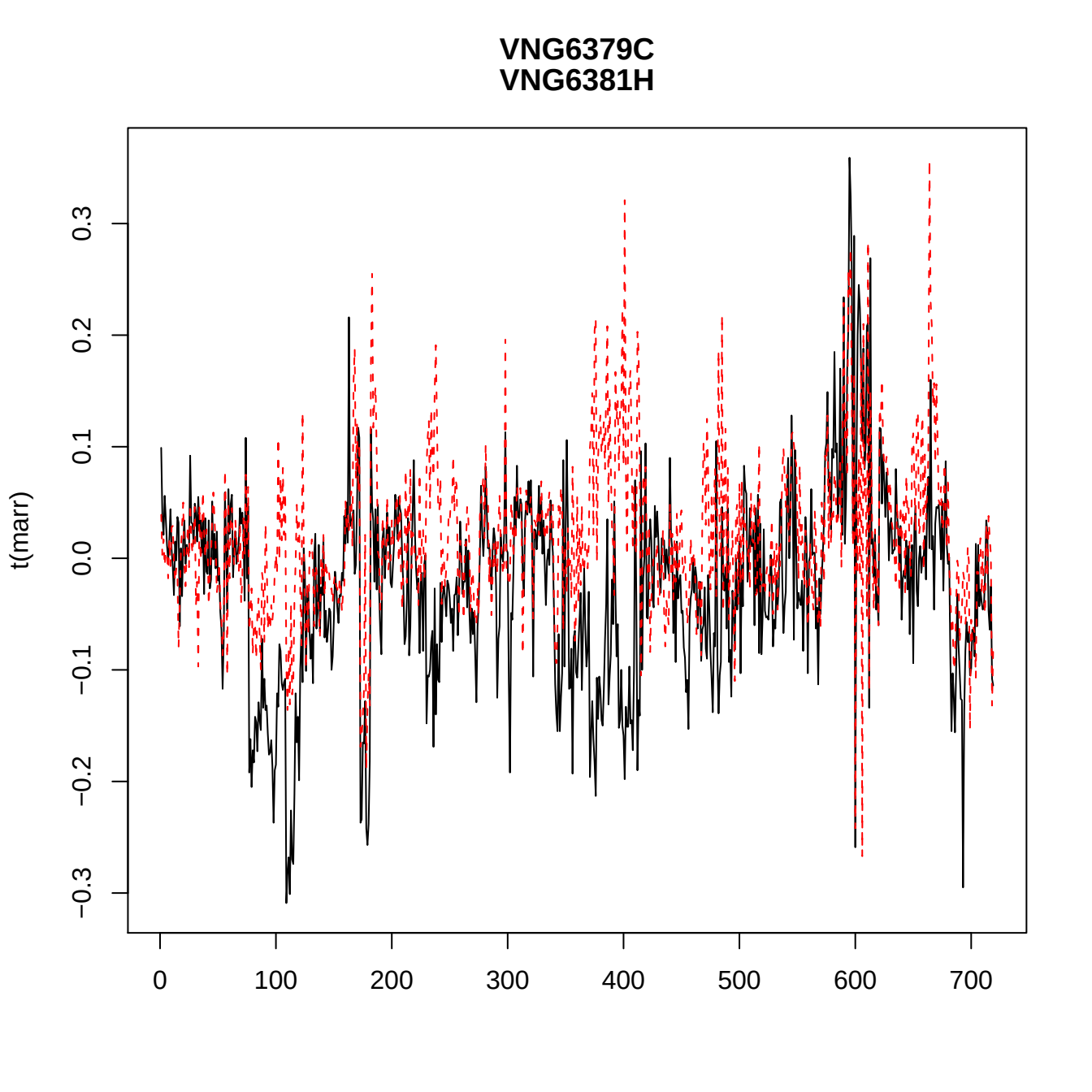
300
400
500
600
700


301500
302000
302500
303000
303500
304000
304500
VNG6378H
VNG6379C
VNG6381H
VNG6379C
VNG6381H
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbF
tfbF
tfbA
tfbB
tfbC
tfbD
tfbE


VNG6379C
VNG6381H
t(marr)
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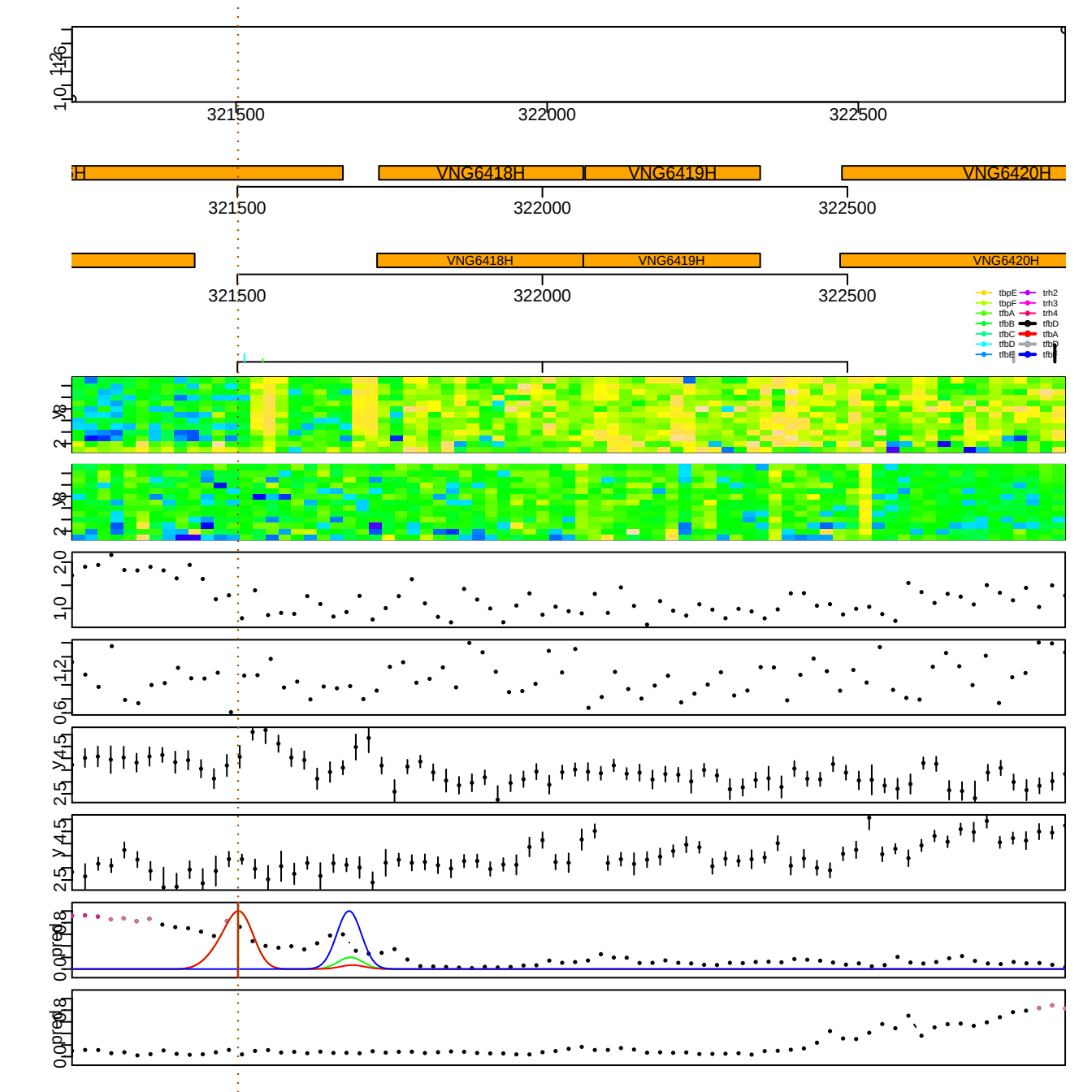
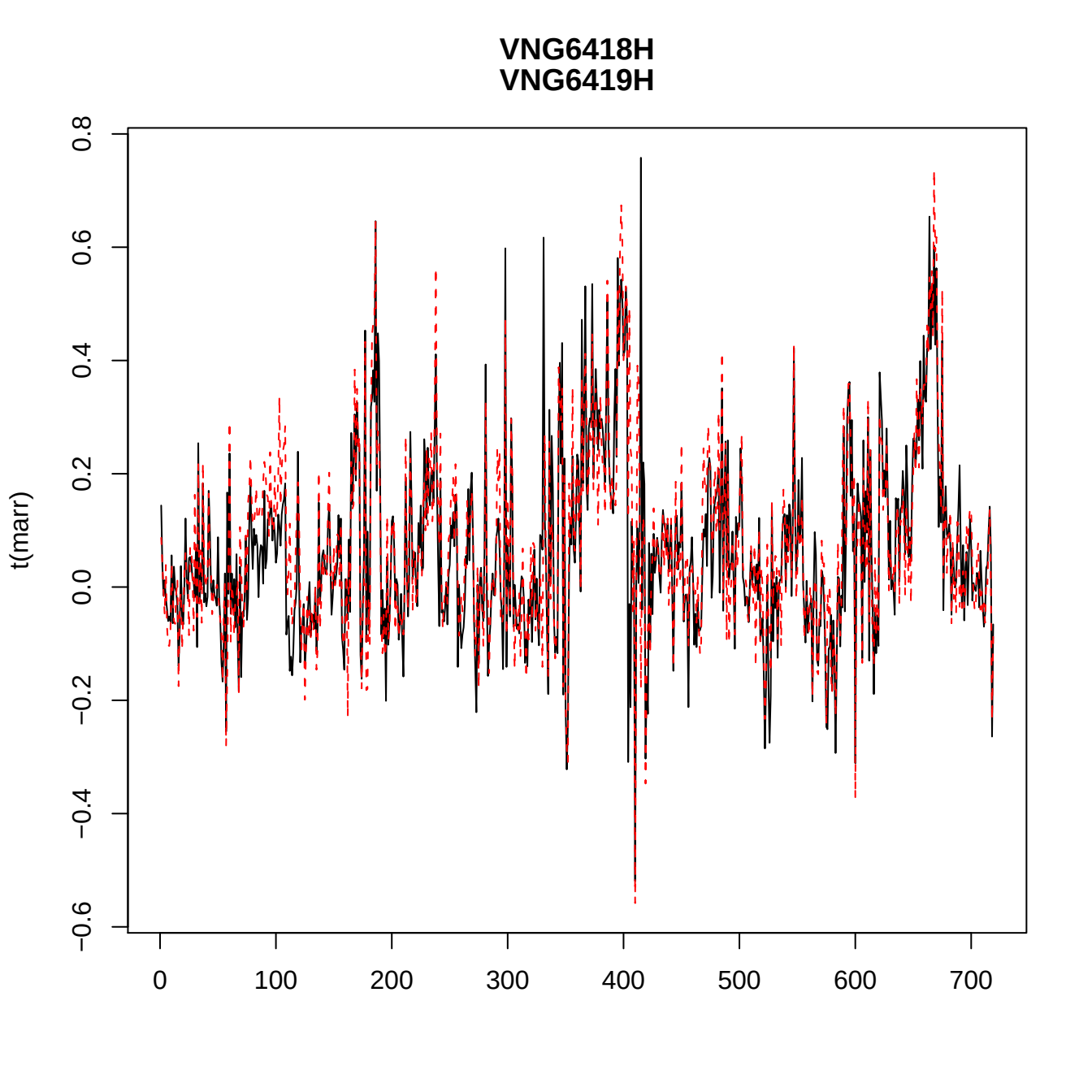
0.1
0.0
−0.1
−0.2
−0.3
0
100
200
300
400
500
600
700


321500
322000
322500
VNG6418H
VNG6419H
VNG6420H
tbpE
tbpF
tfbA
tfbB
tfbC
tfbD
tfbE
trh2
trh3
trh4
tfbD
tfbA
tfbD
tfbB


VNG6418H
VNG6419H
t(marr)
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
0
100
200
300
400
500
600
700