

KIC 005181824

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
005181824-02	OBS	No	458.636076	163.929038	3610.5	26.292	16.2	7.9	3.32	5011	28.57	5.16
005181824-03	OBS	No	360.779572	262.405244	807.3	3.402	21.2	4.9	3.32	5011	9.27	7.10
005181824-04	OBS	No	268.871868	250.882479	753.1	7.783	15.3	5.1	3.32	5011	8.89	10.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005181824-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

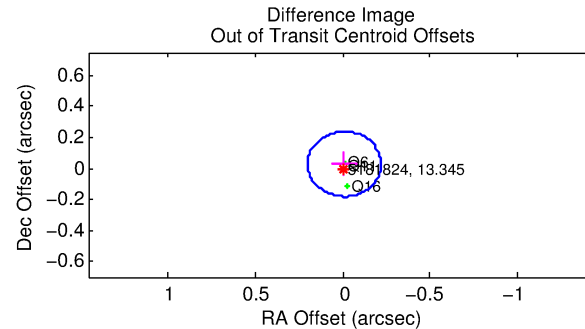
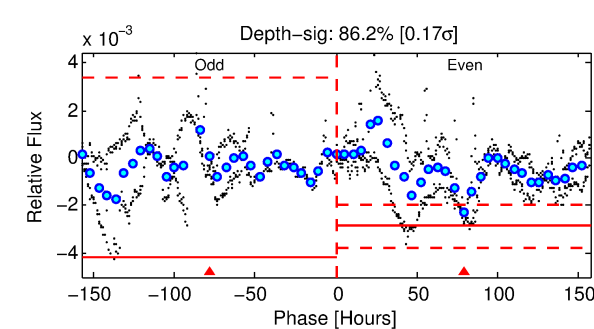
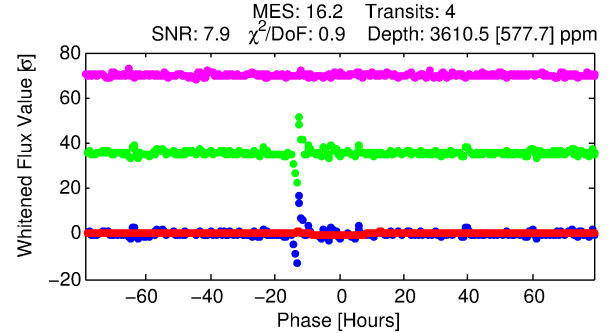
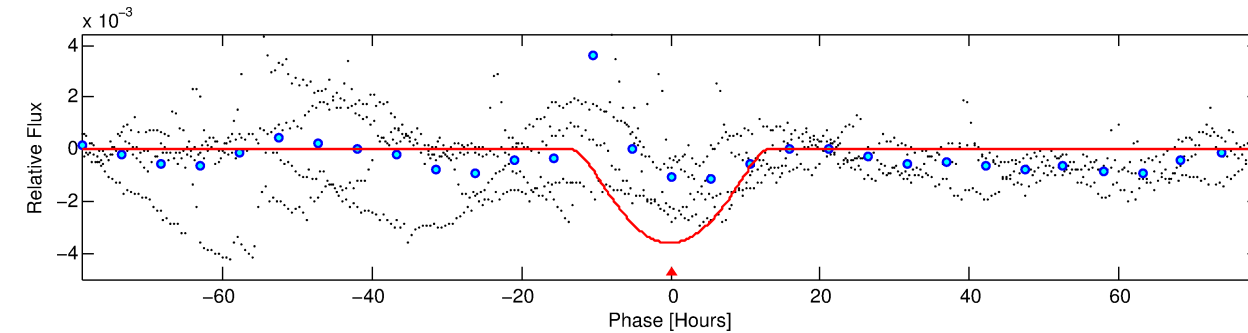
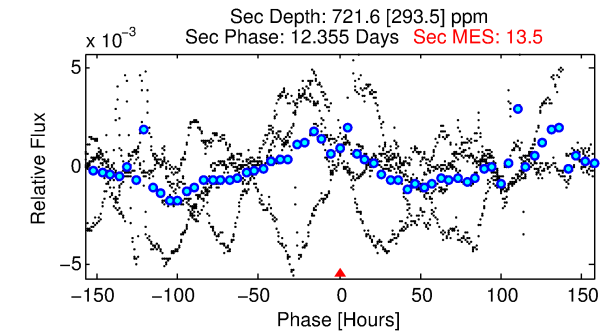
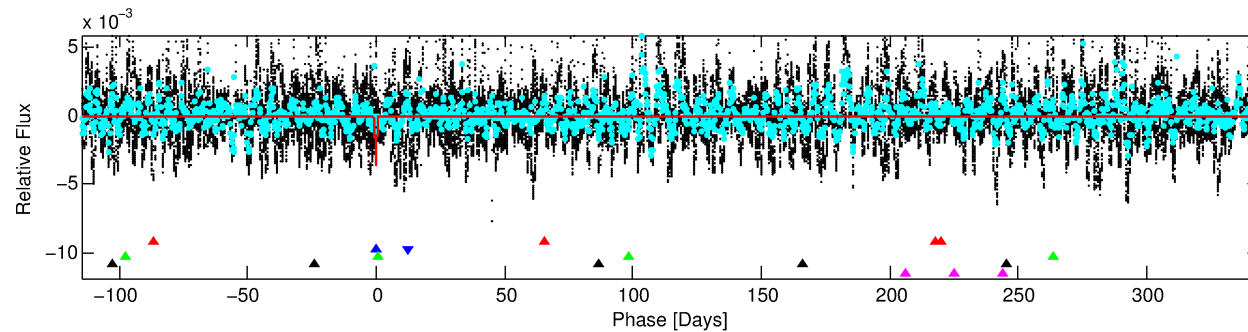
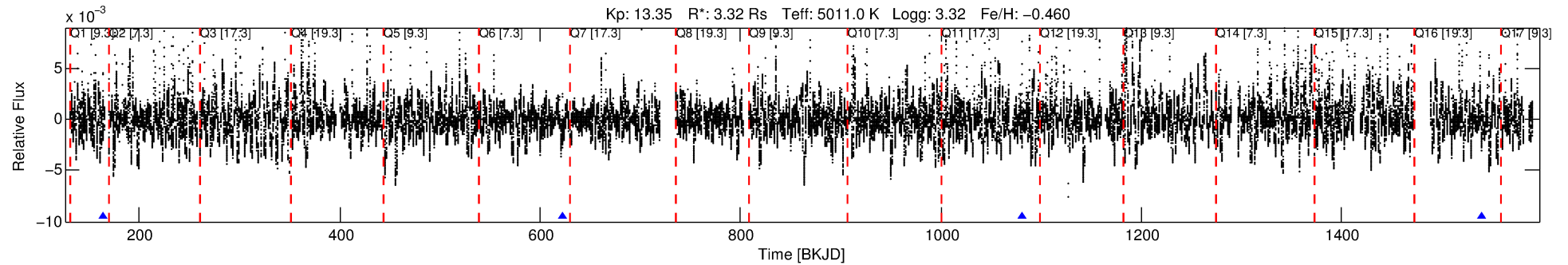
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005181824-02

No Significant Match Found

DV One-Page Summary

KIC: 5181824 Candidate: 2 of 5 Period: 458.636 d



DV Fit Results:

Period = 458.63608 [0.01755] d
Epoch = 163.9290 [0.0327] BKJD
Rp/R* = 0.0788 [0.0292]
a/R* = 66.79 [7.90]
b = 0.96 [0.06]
Seff = 5.16 [3.68]
Teq = 384 [68] K
Rp = 28.57 [19.65] Re
a = 1.1001 [0.5349] AU
Ag = 588.68 [648.51] [0.91 σ]
Teffp = 2926 [623] K [4.06 σ]

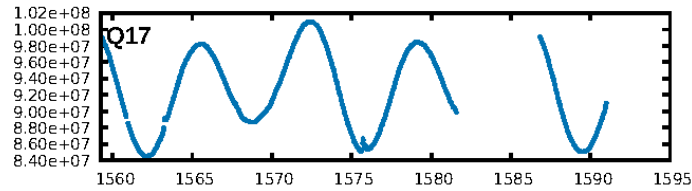
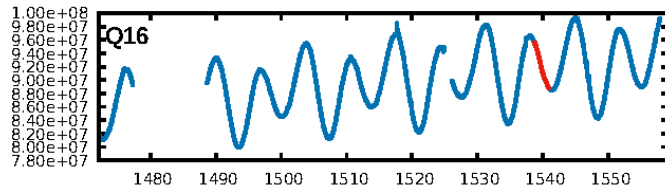
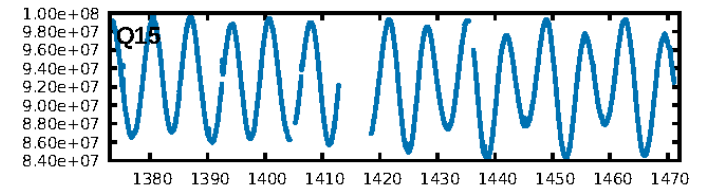
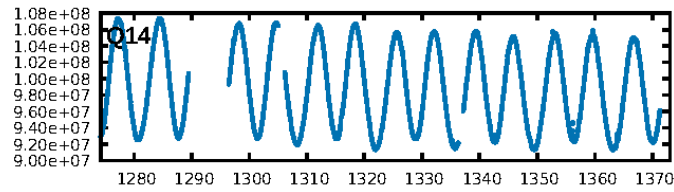
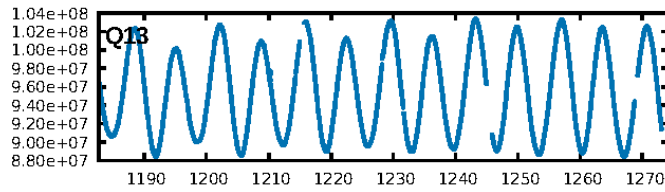
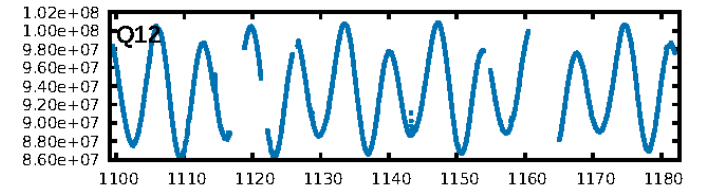
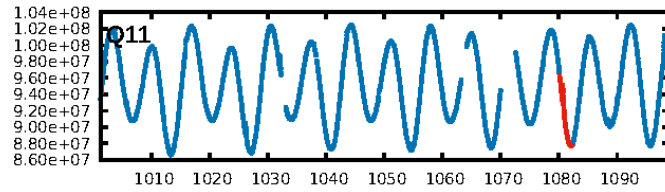
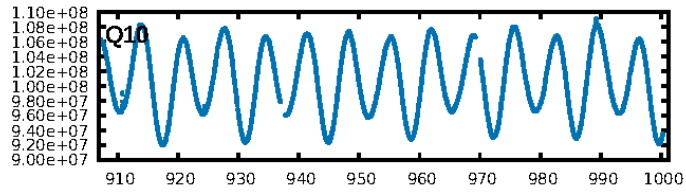
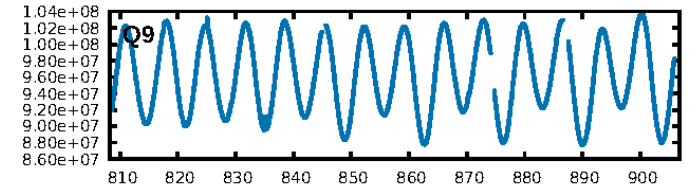
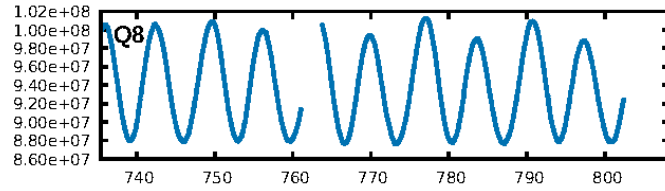
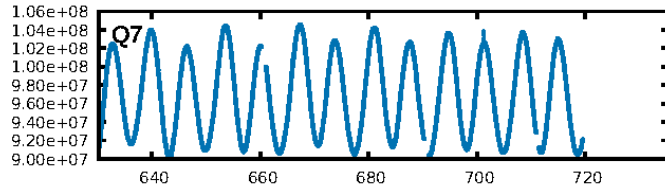
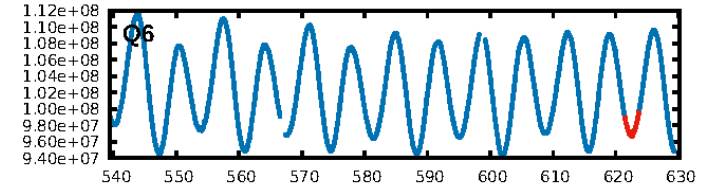
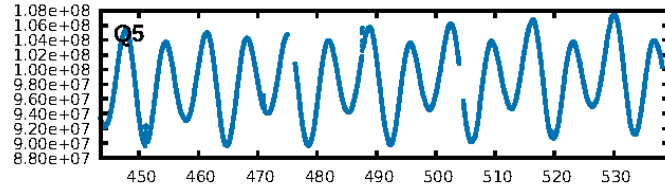
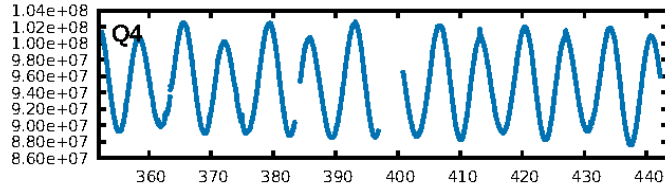
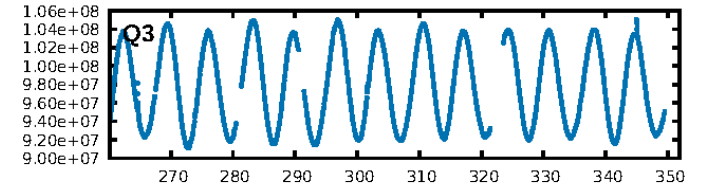
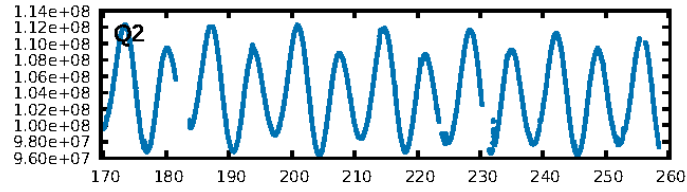
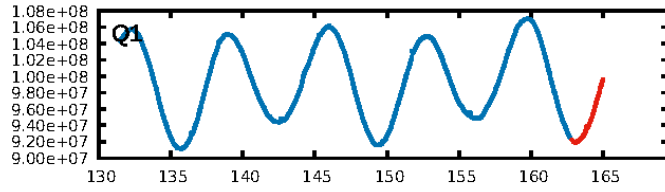
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [88.59 σ]
LongPeriod-sig: 100.0% [17.09 σ]
ModelChiSquare2-sig: 29.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 134
Centroid-sig: 84.1%
Centroid-so: 0.195 arcsec [1.58 σ]
OotOffset-rm: 0.030 arcsec [0.42 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.158 arcsec [2.21 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.67 [2/3]

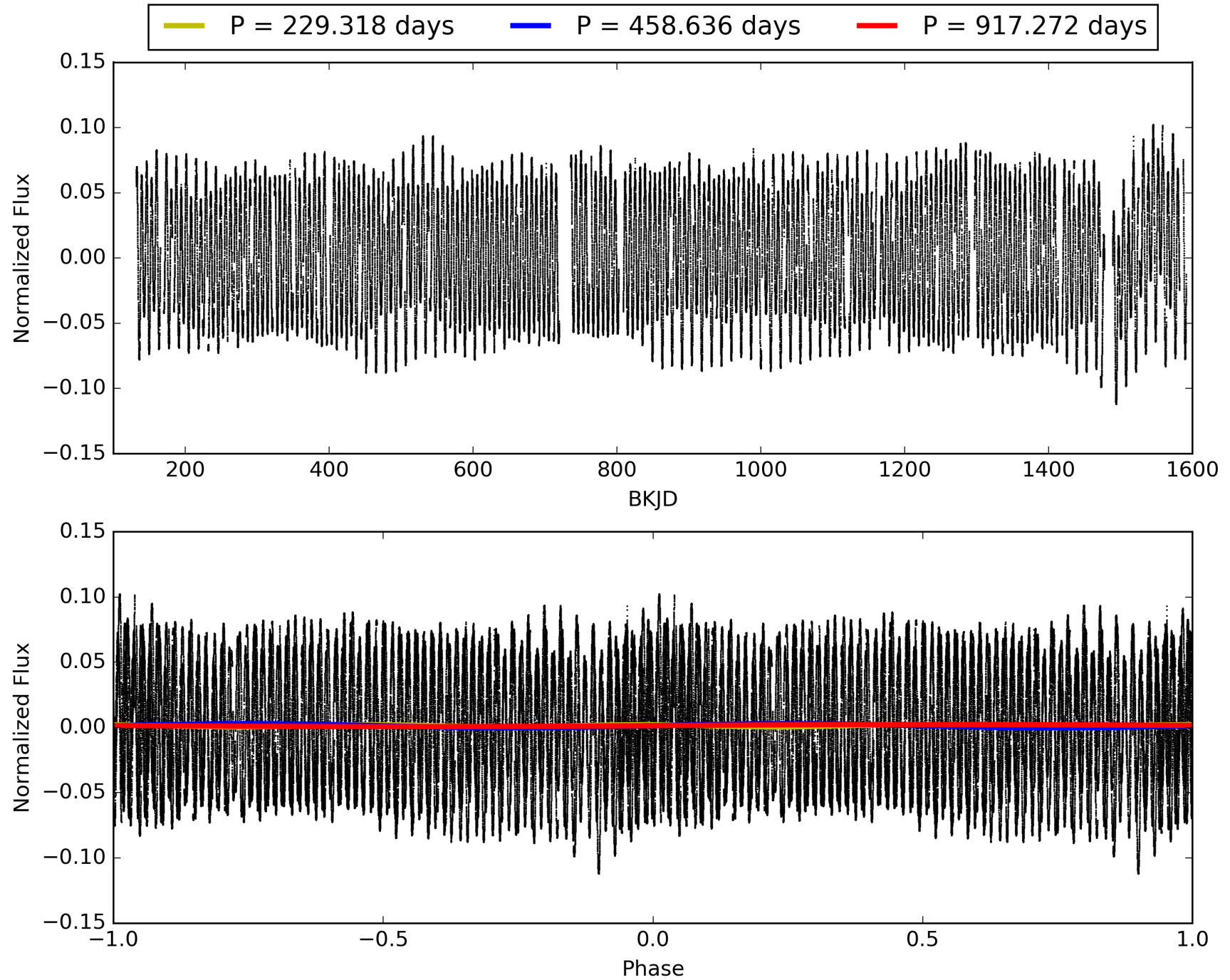
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:51:56 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005181824-02, PDC Light Curves

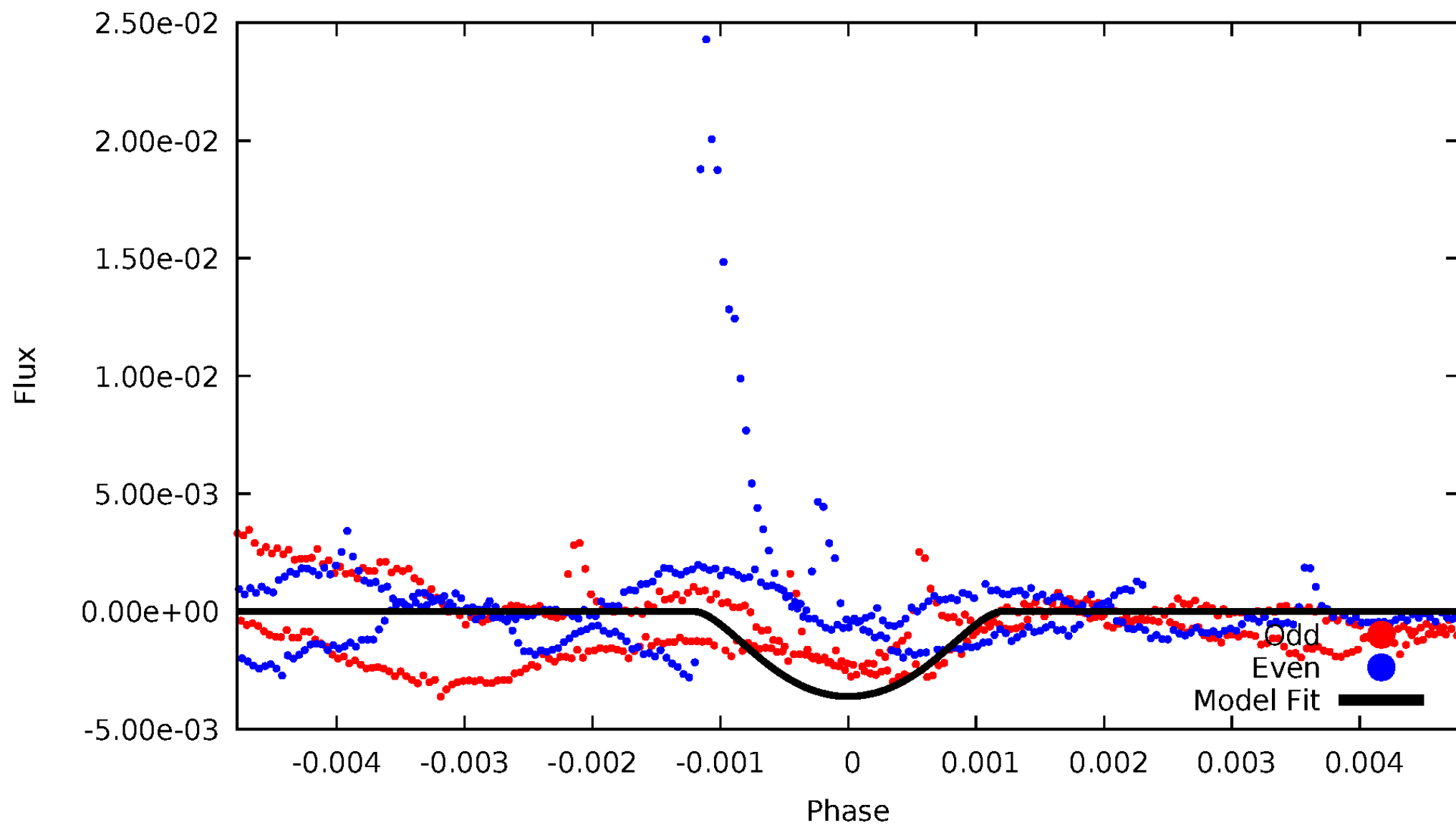


TCE 005181824-02



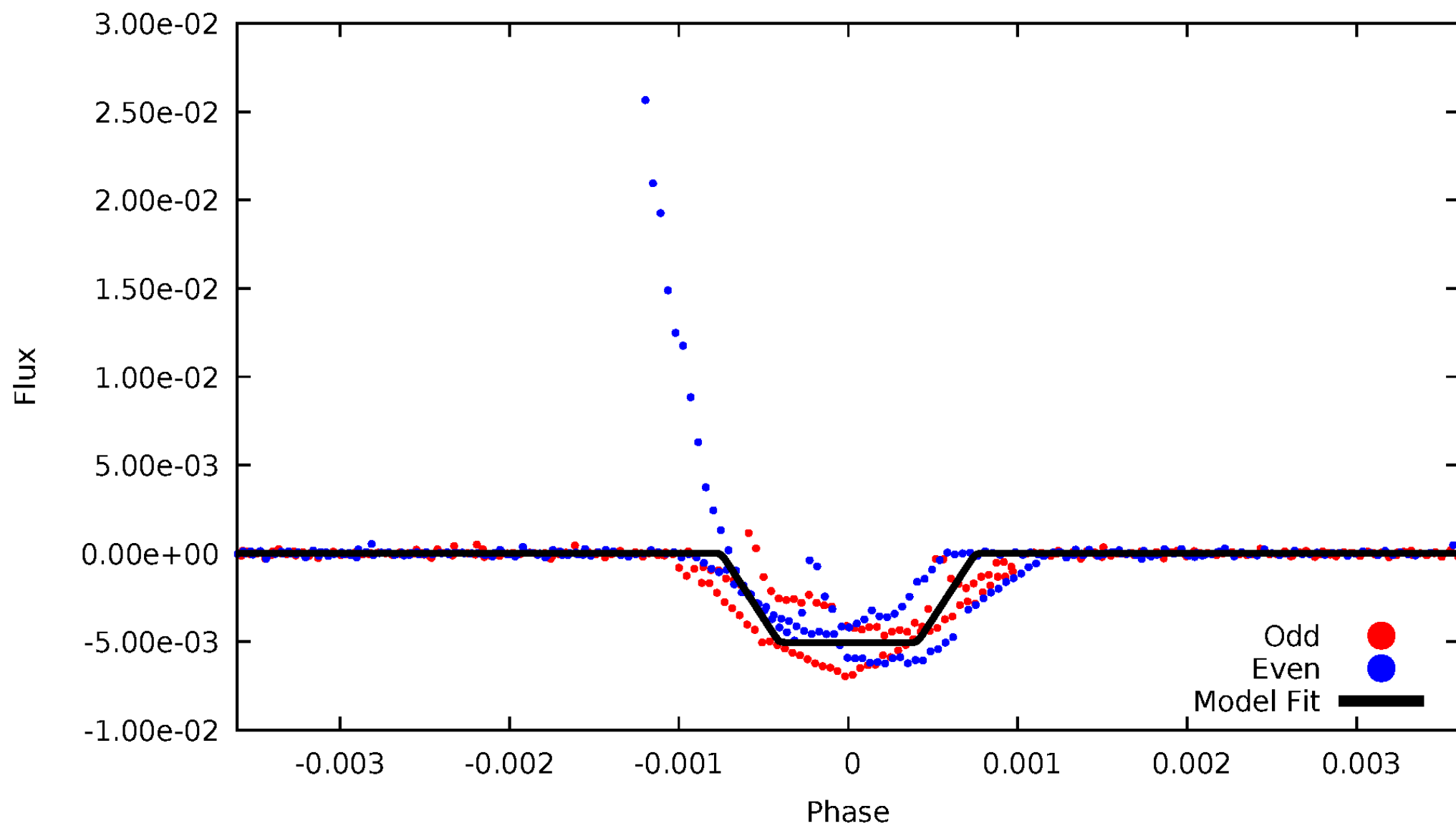
DV Odd/Even

TCE 005181824-02



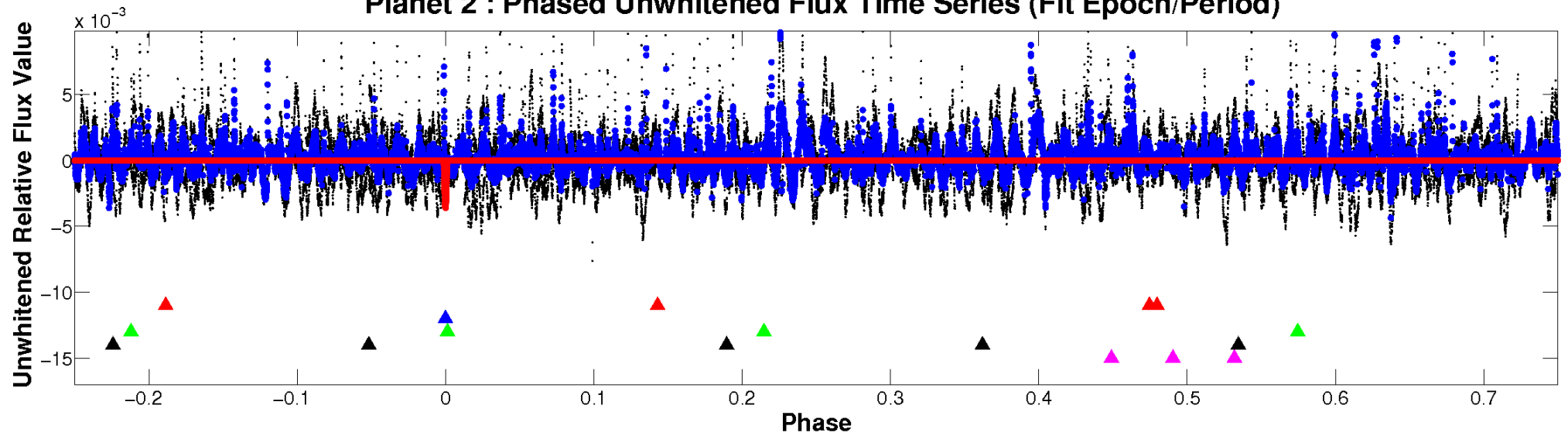
ALT Odd/Even

TCE 005181824-02

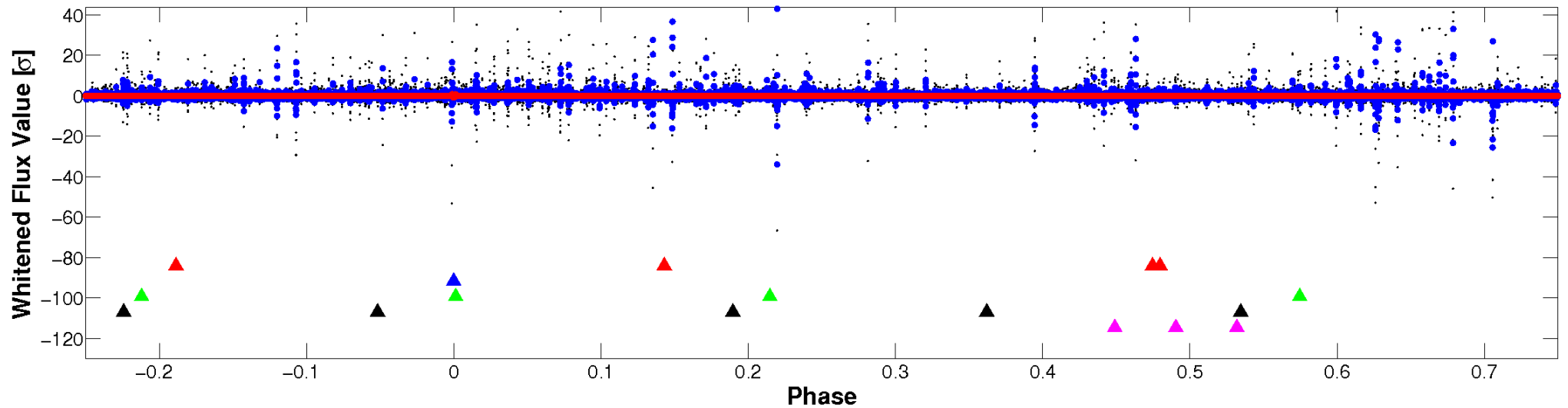


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

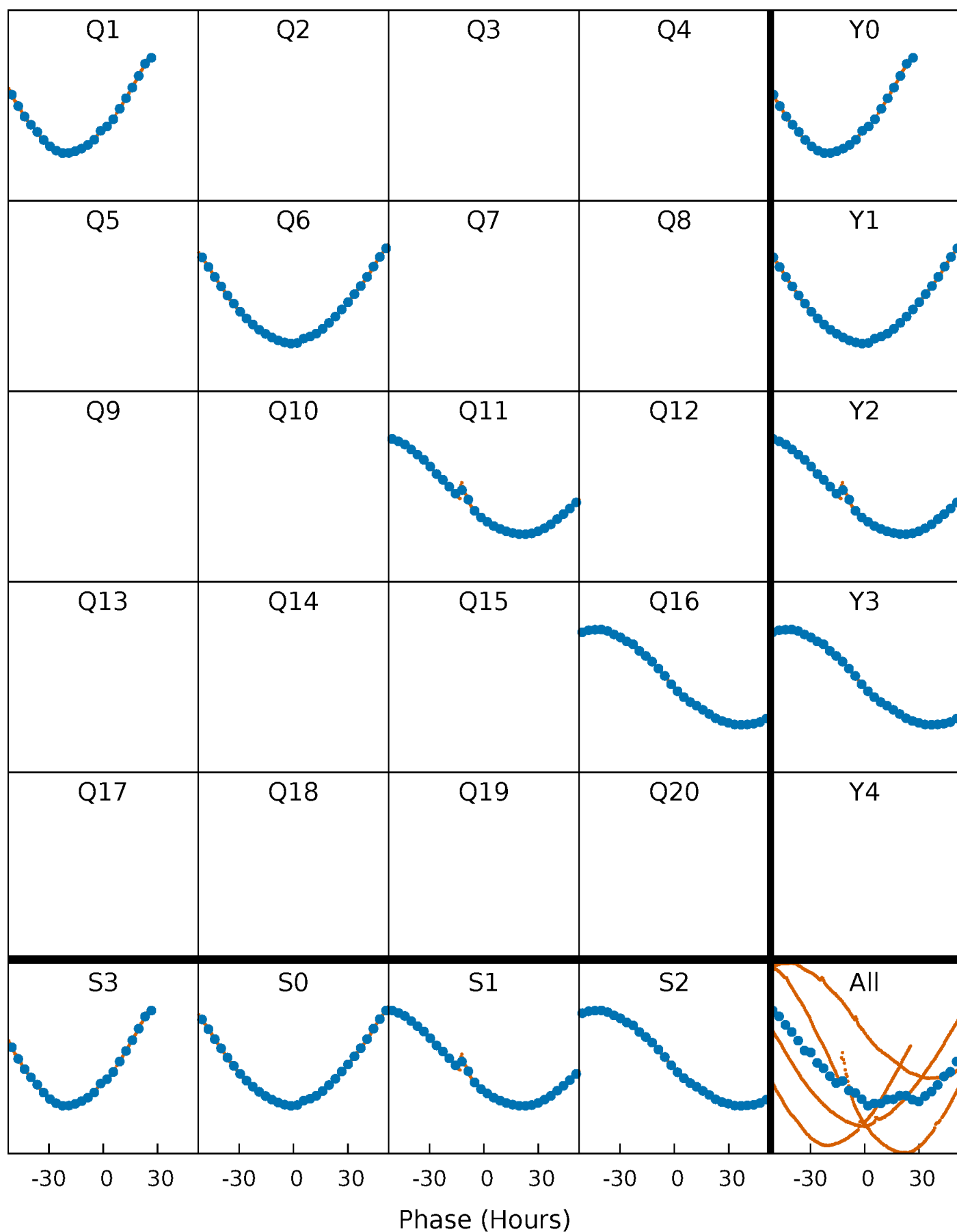


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



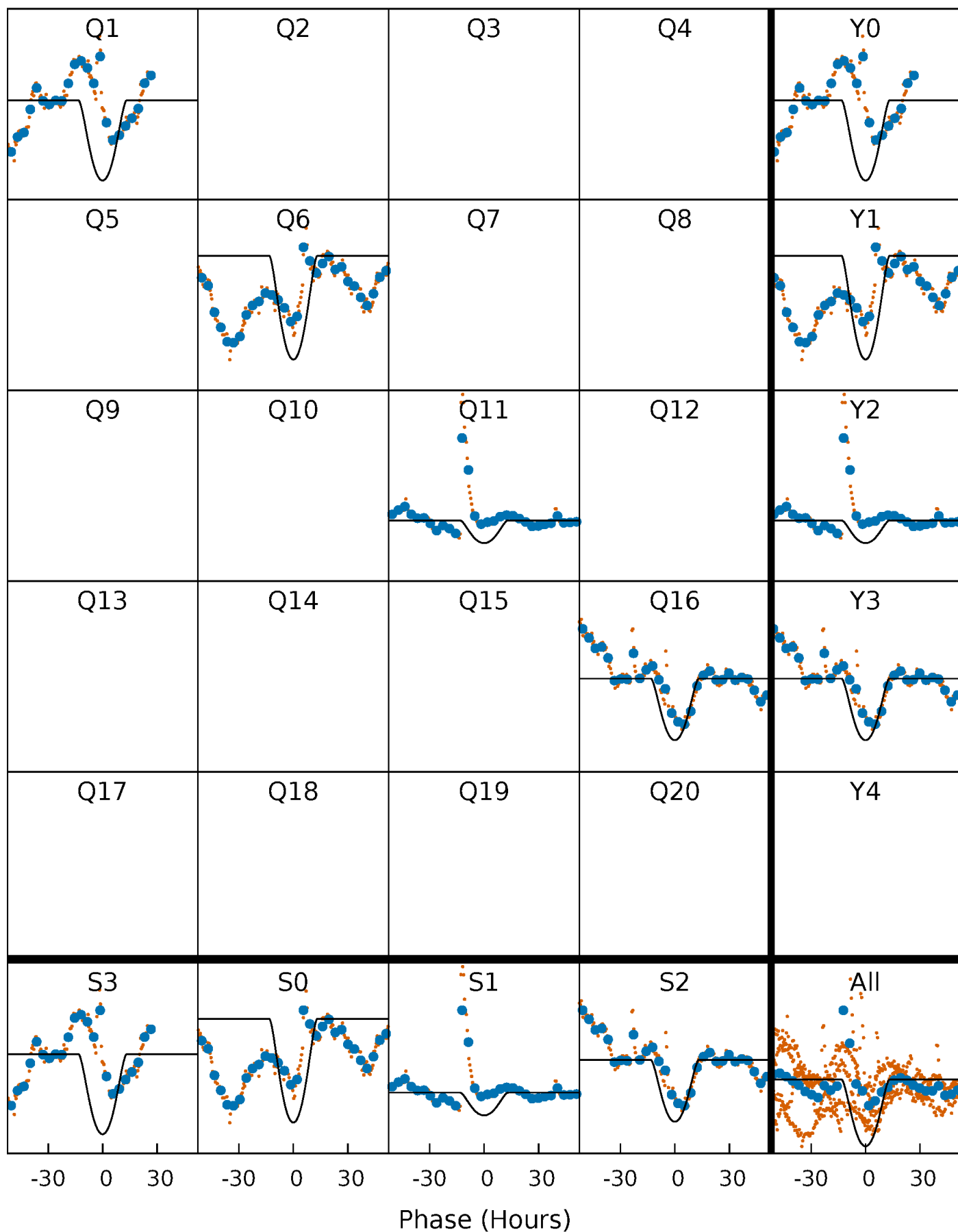
PDC Quarter-Phased Transit Curves

TCE 005181824-02 P=458.636076 Days $T_0=163.929038$ (BKJD)



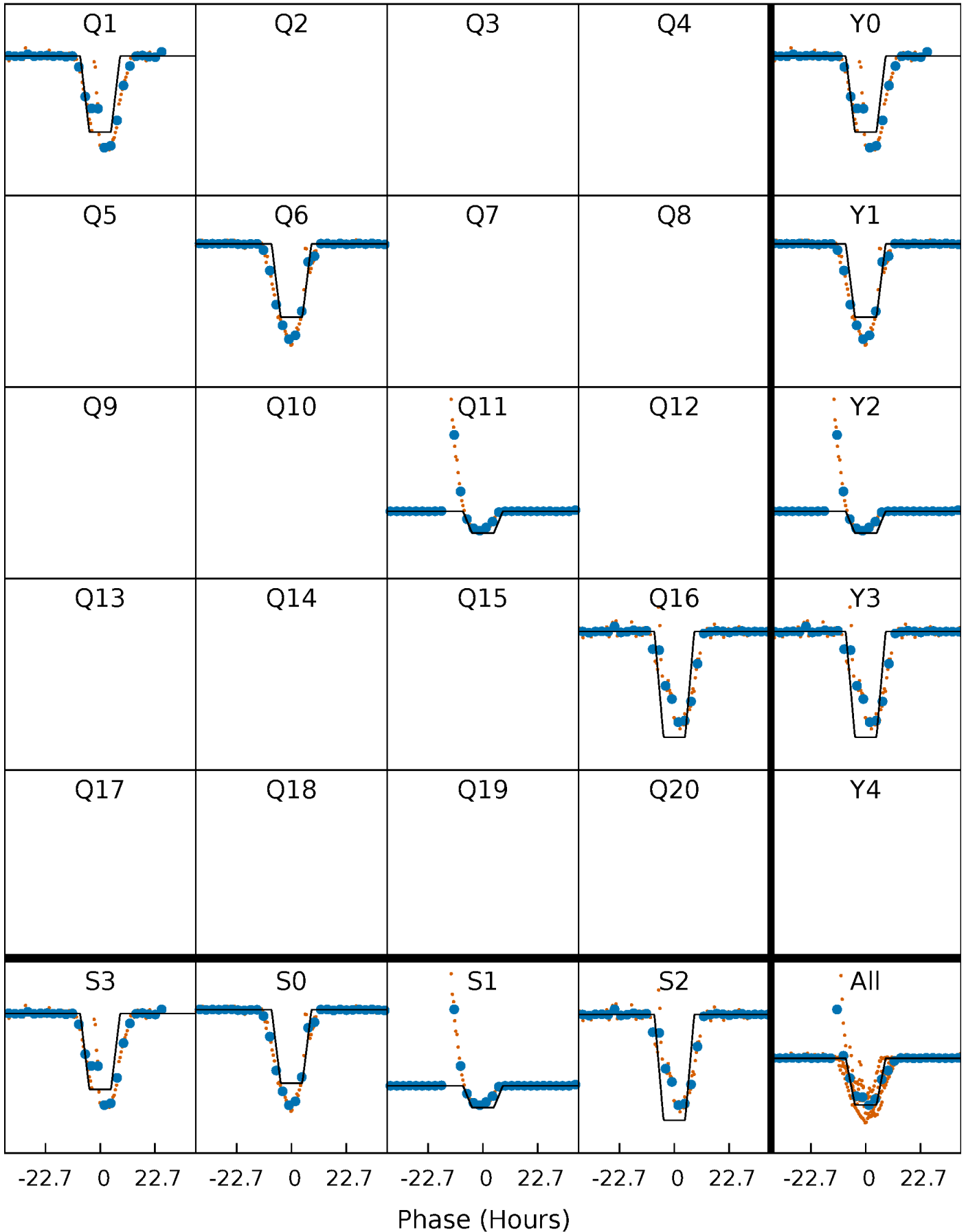
DV Quarter-Phased Transit Curves

TCE 005181824-02 P=458.636076 Days $T_0=163.929038$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

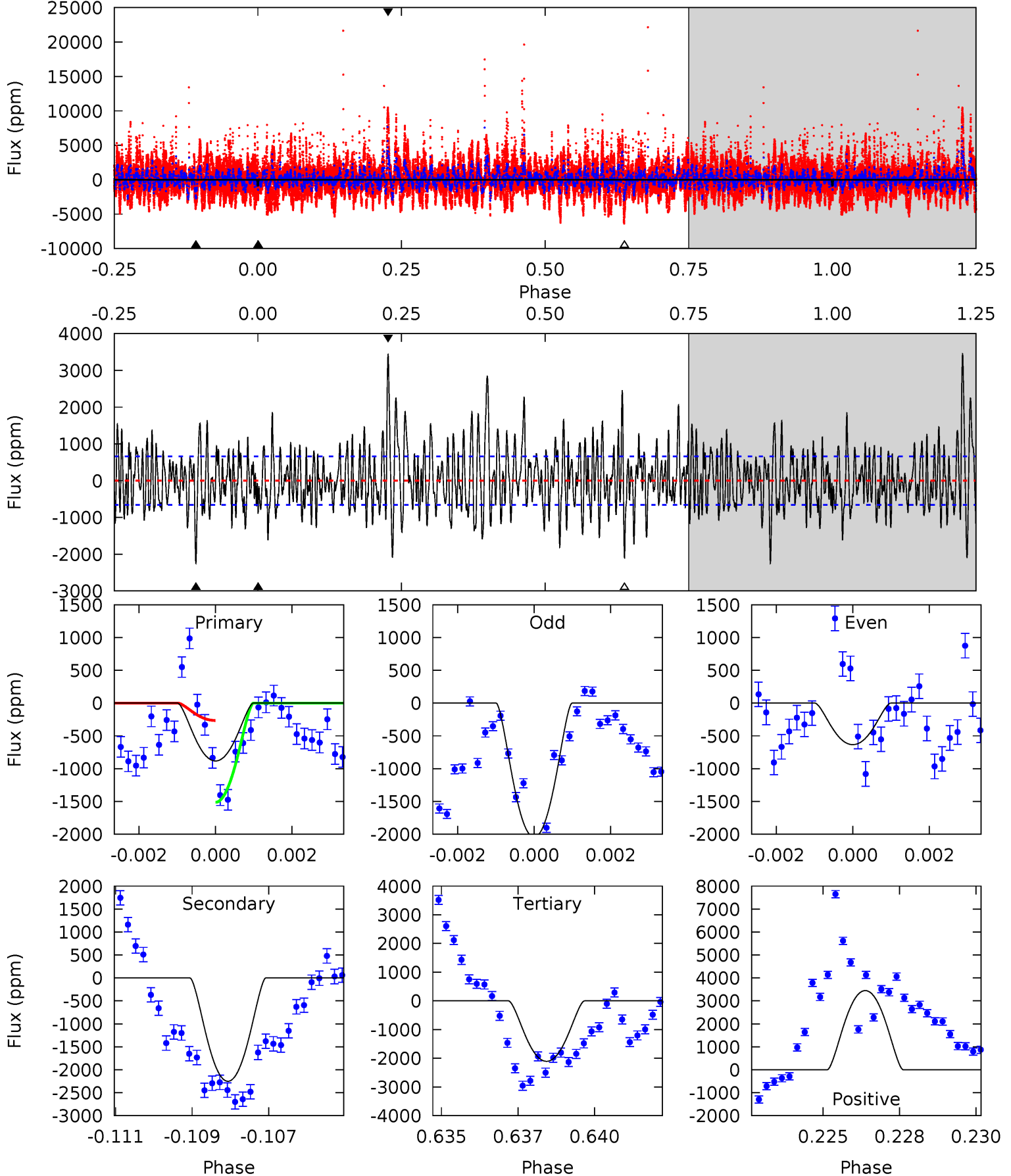
TCE 005181824-02 P=458.658499 Days $T_0=163.924010$ (BKJD)



DV Model-Shift Uniqueness Test

005181824-02, P = 458.636076 Days, E = 163.929038 Days

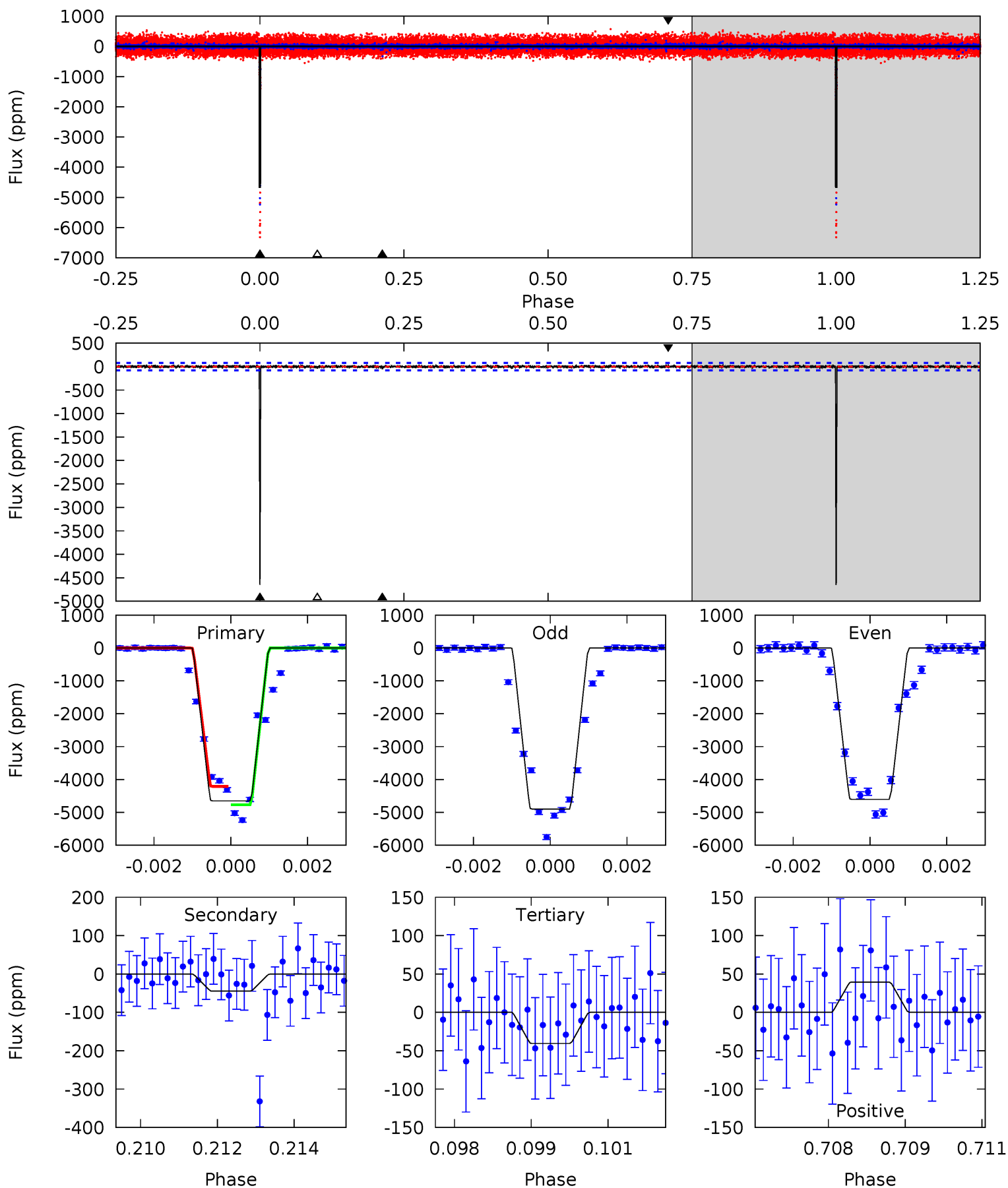
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.09	18.1	16.9	27.7	5.29	3.03	5.88	-9.83	-20.6	1.16	-9.61	5.43	0.83	0.61	5.04



Alt Model-Shift Uniqueness Test

005181824-02, P = 458.658499 Days, E = 163.924010 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
311.8	2.99	2.72	2.64	5.38	3.17	0.57	309.1	309.2	0.27	0.35	12.1	1.04	0.01	0



Stellar Parameters For KIC 005181824

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5011^{+125}_{-112}	$3.321^{+0.385}_{-0.315}$	$-0.460^{+0.300}_{-0.250}$	$3.324^{+1.925}_{-1.444}$	$0.843^{+0.280}_{-0.186}$	$0.032^{+0.102}_{-0.023}$
	+2%/-2%	+12%/-9%	+65%/-54%	+58%/-43%	+33%/-22%	+314%/-71%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 005181824-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2252 ± 125	$28.74^{+14.95}_{-12.06}$	537^{+72}_{-66}	4105^{+822}_{-447}	1807^{+3733}_{-970}
Alt.	-45 ± 15	$25.68^{+13.69}_{-11.26}$	535^{+72}_{-64}	2388^{+315}_{-208}	44^{+98}_{-27}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

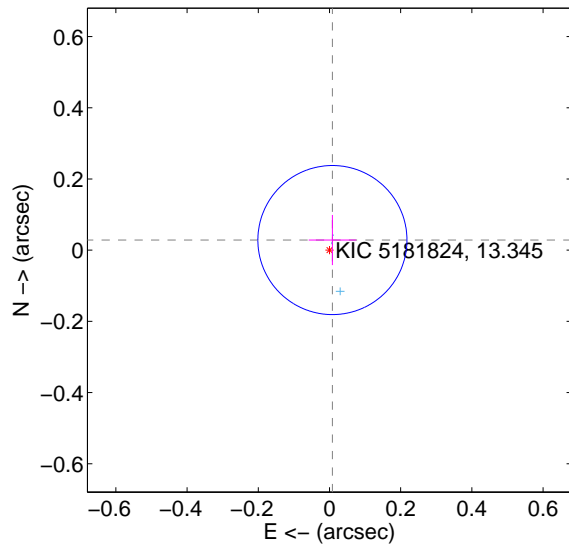
Supplemental centroid analysis for 005181824-02. Kepler magnitude: 13.35. Transit SNR 7.95

There are 3 quarters with good PRF difference image offsets

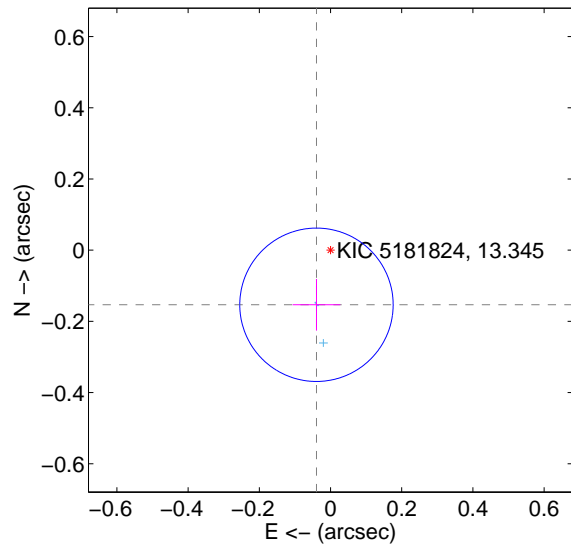
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.030 ± 0.070	0.42	-0.008 ± 0.067	0.028 ± 0.070
PRF-fit source offset from KIC position	0.158 ± 0.072	2.21	0.039 ± 0.067	-0.153 ± 0.073
photometric centroid source offset	0.20 ± 0.12	1.58	0.15 ± 0.15	-0.13 ± 0.08

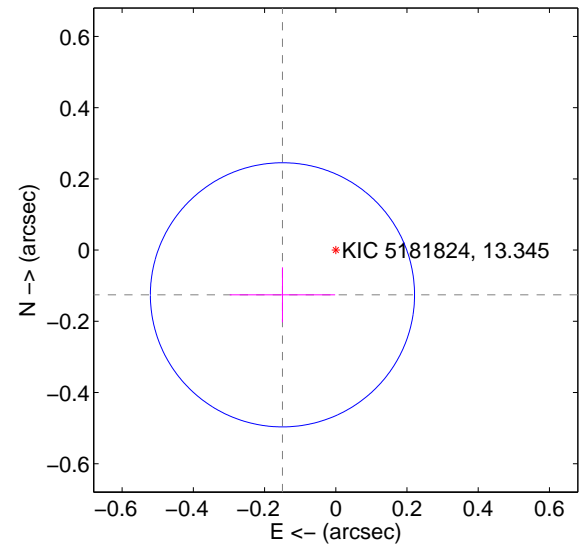
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs $> 15,000,000$ are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

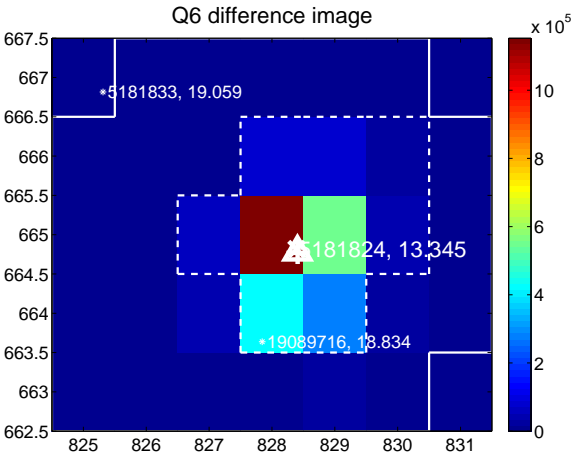
Q5 no difference image



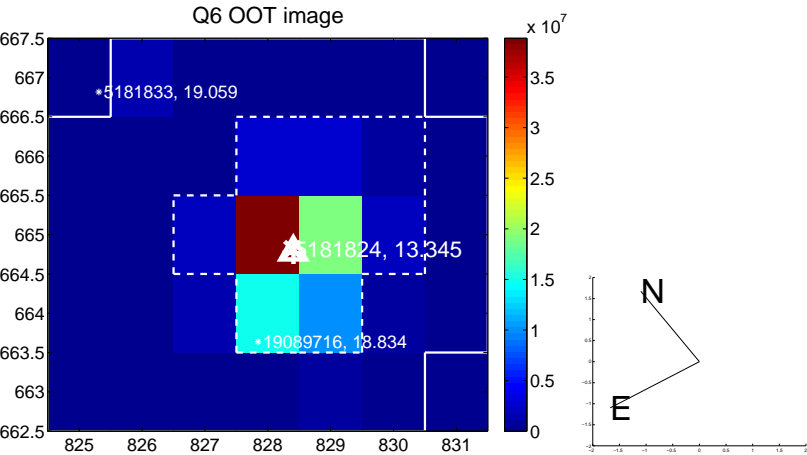
Q5 no OOT image



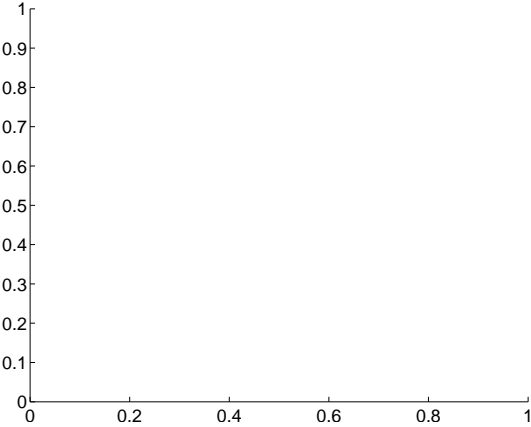
Q6 difference image



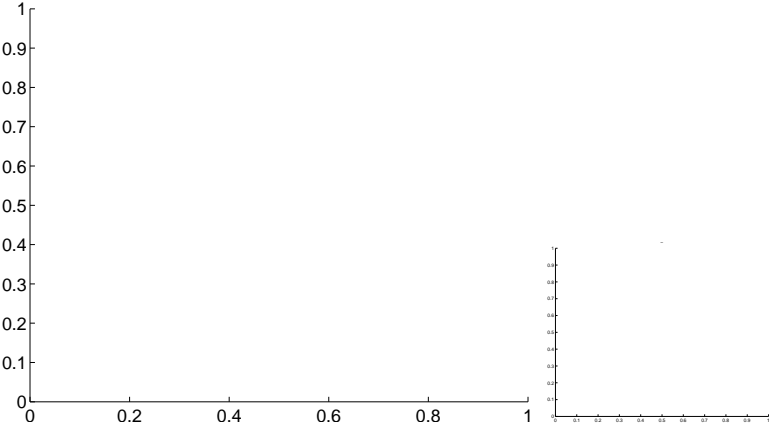
Q6 OOT image



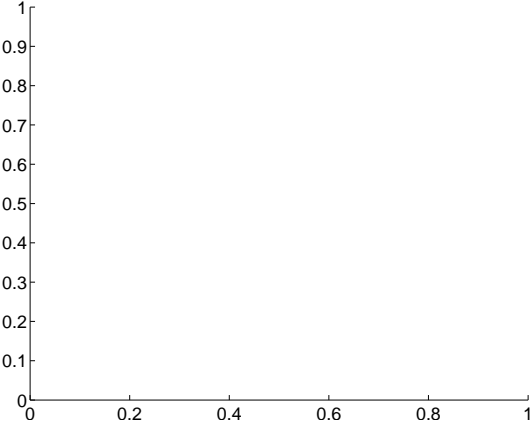
Q7 no difference image



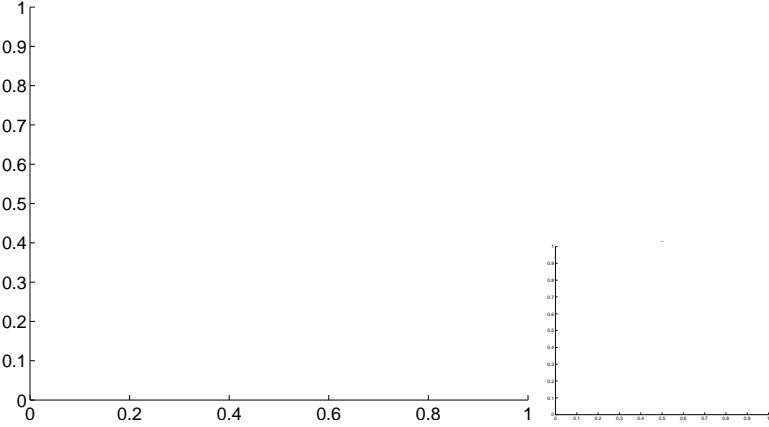
Q7 no OOT image



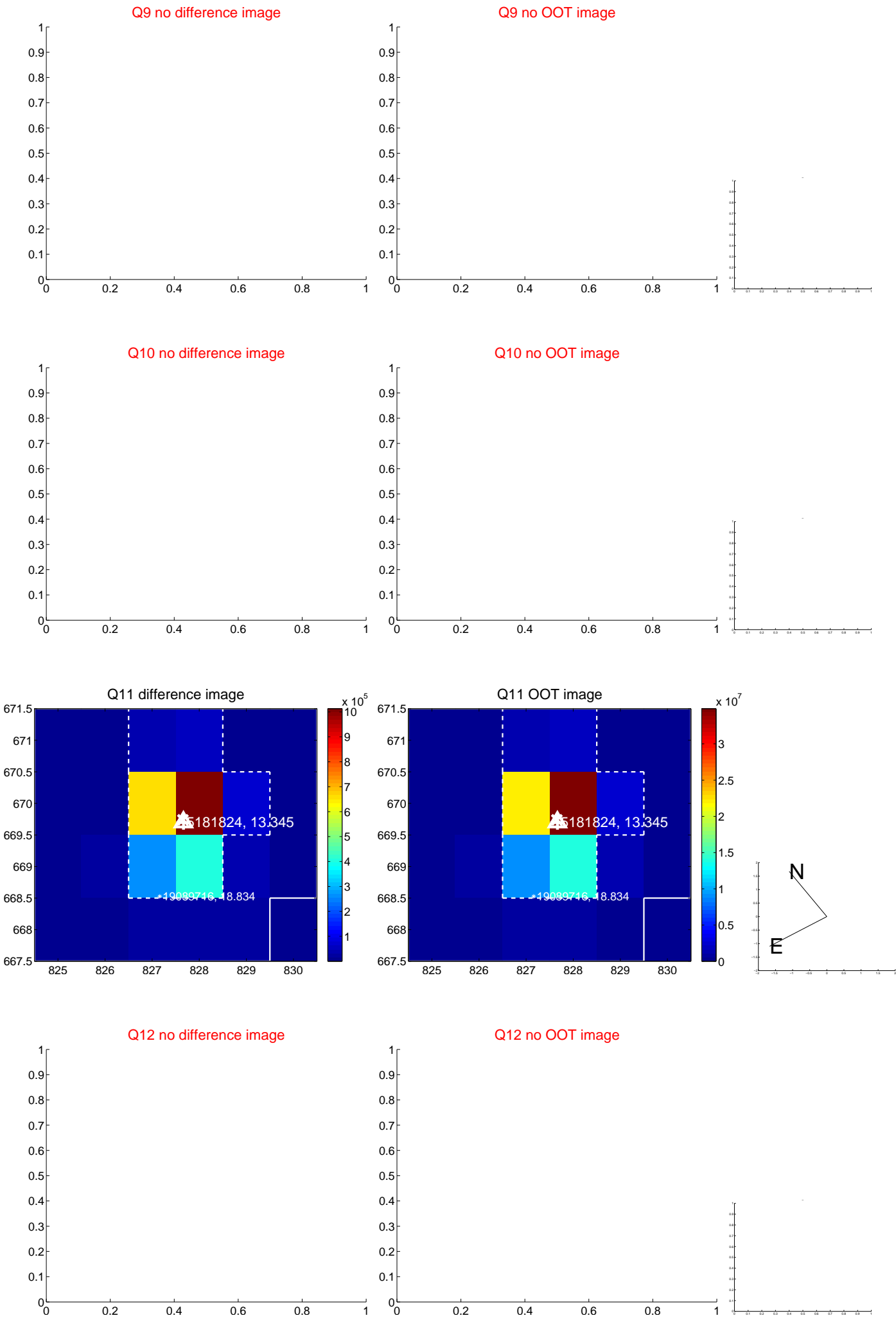
Q8 no difference image



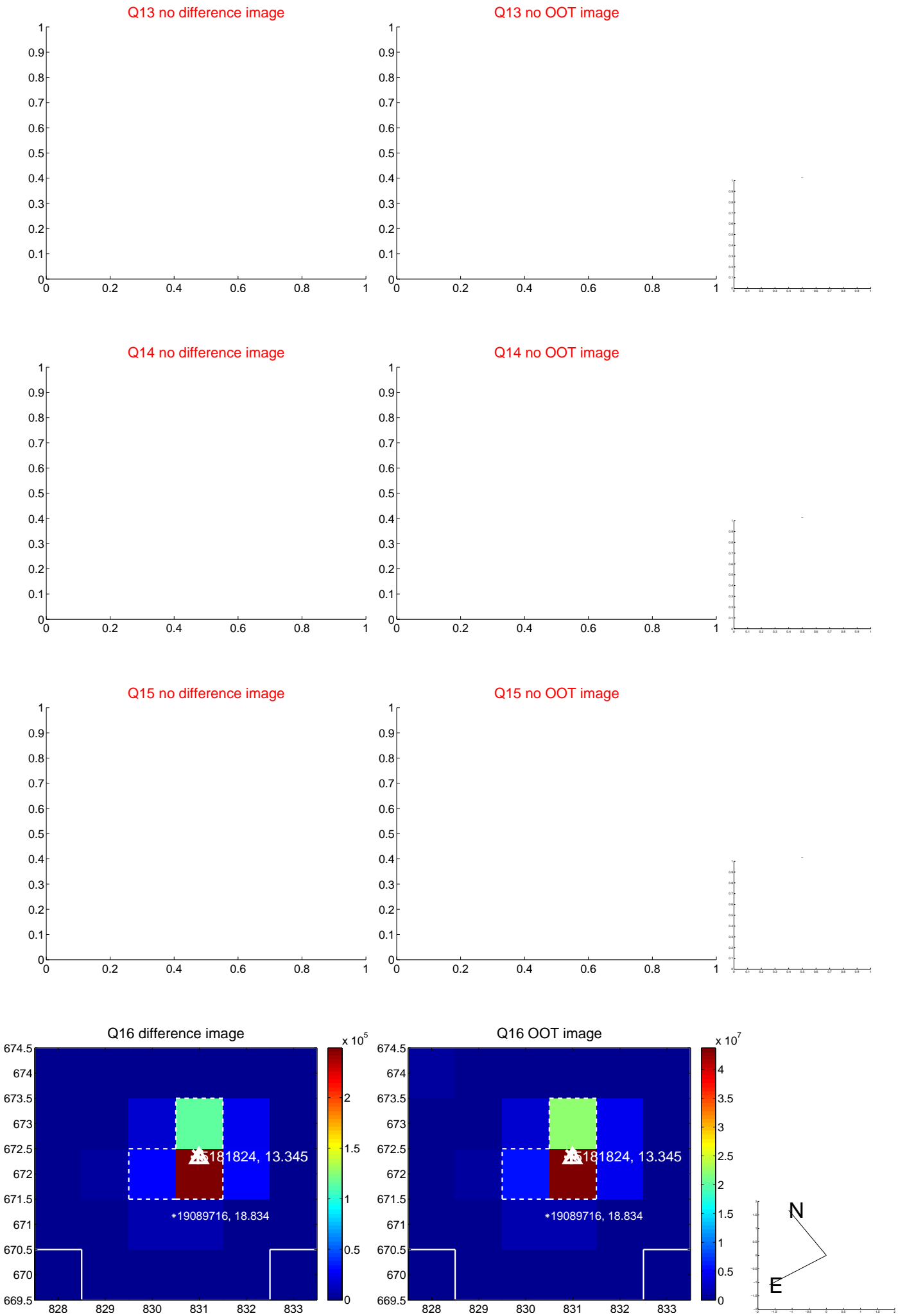
Q8 no OOT image



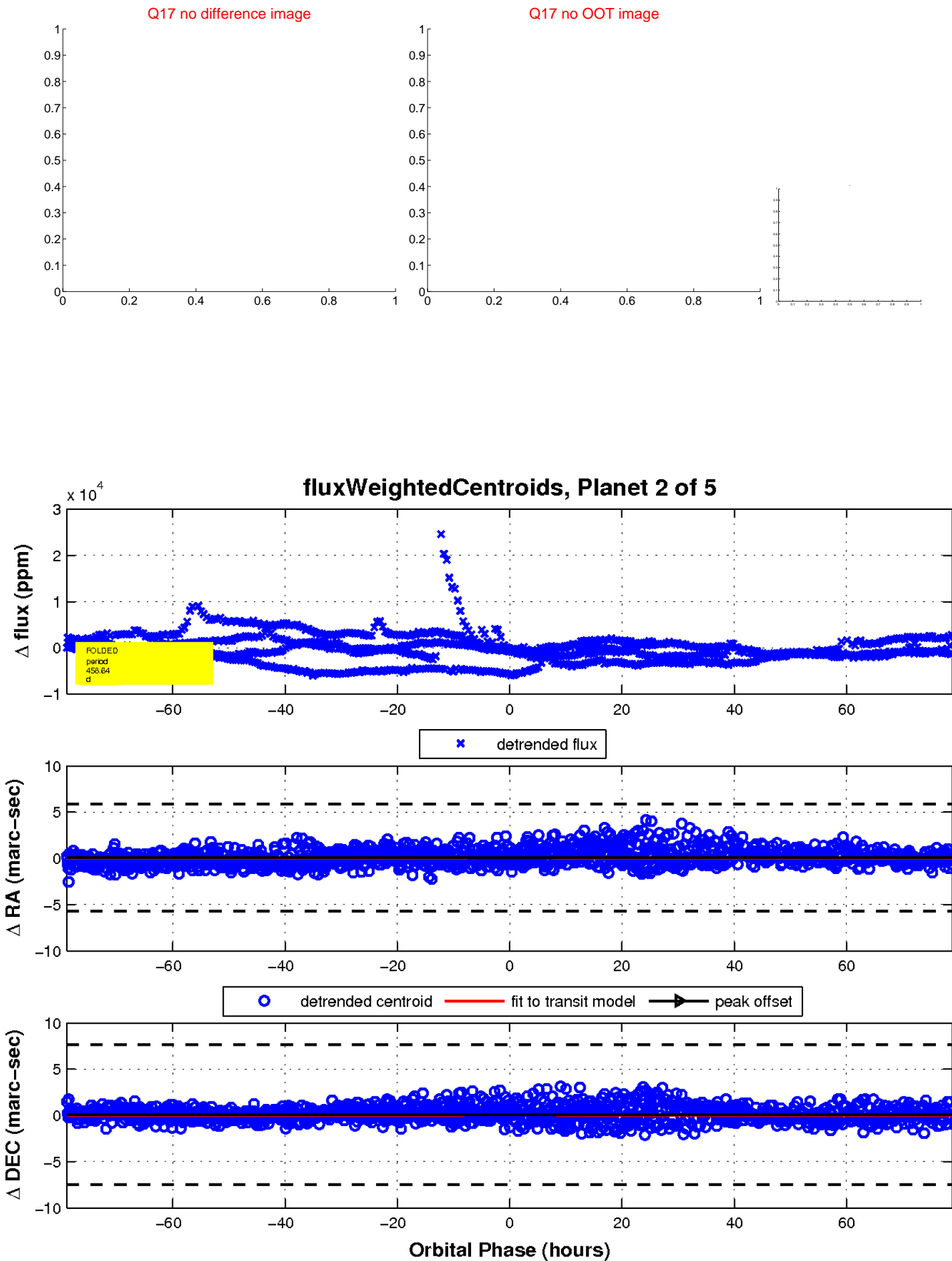
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

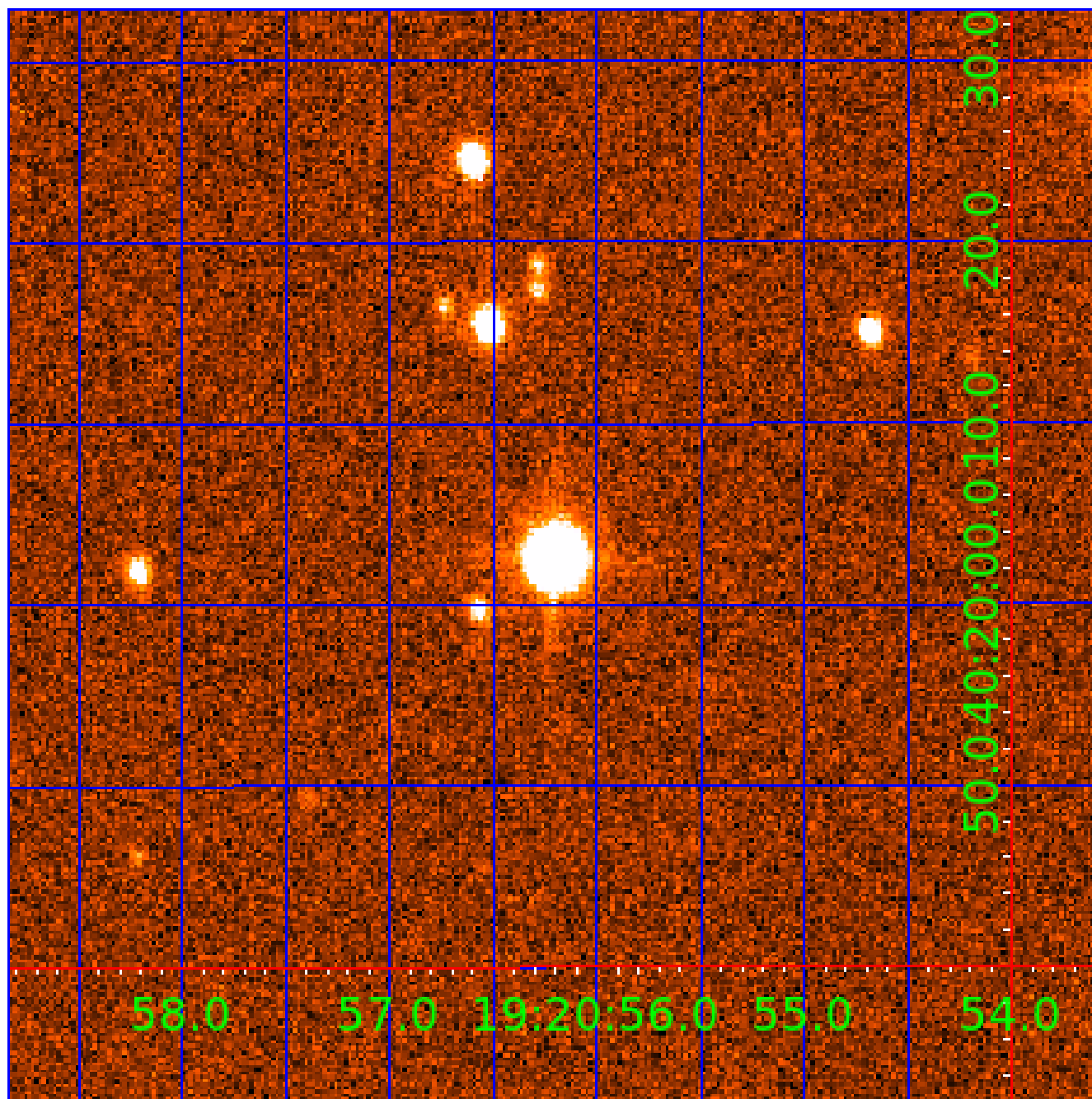


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005181824

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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005181824-03	OBS	No	360.779572	262.405244	807.3	3.402	21.2	4.9	3.32	5011	9.27	7.10
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005181824-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

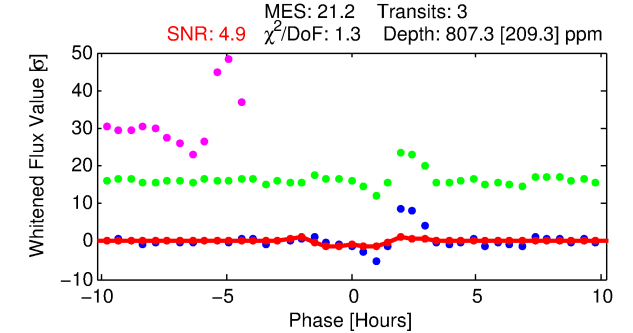
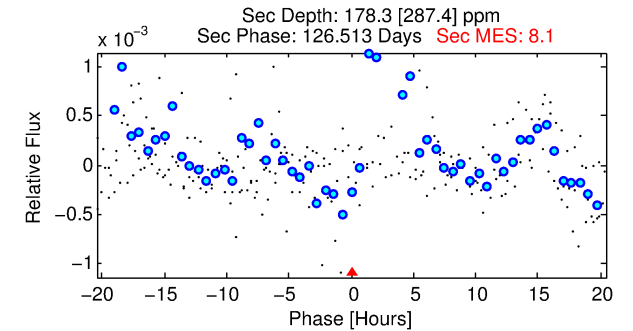
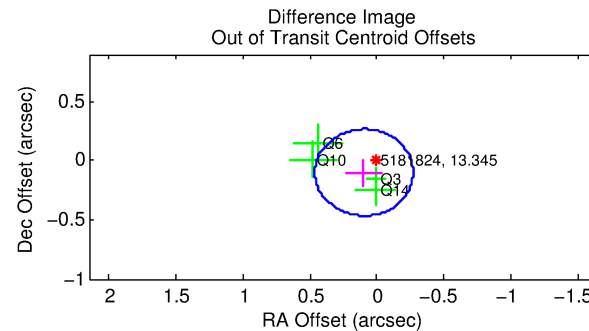
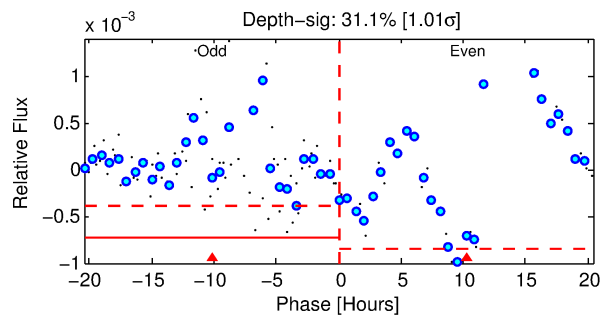
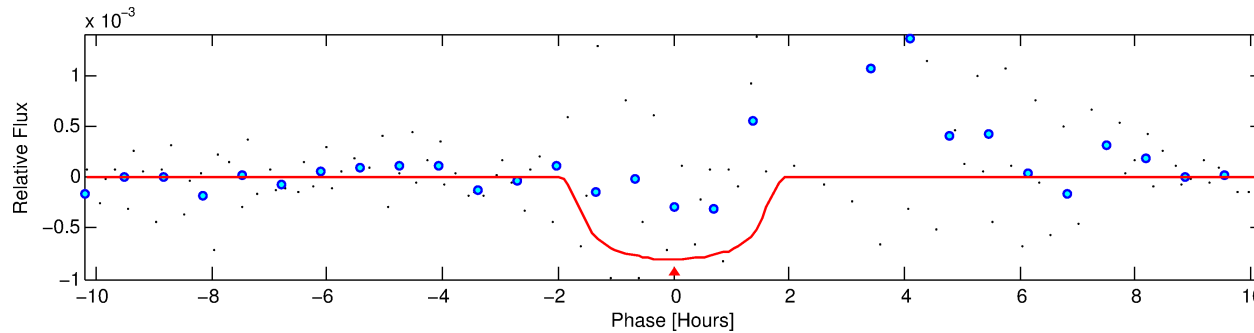
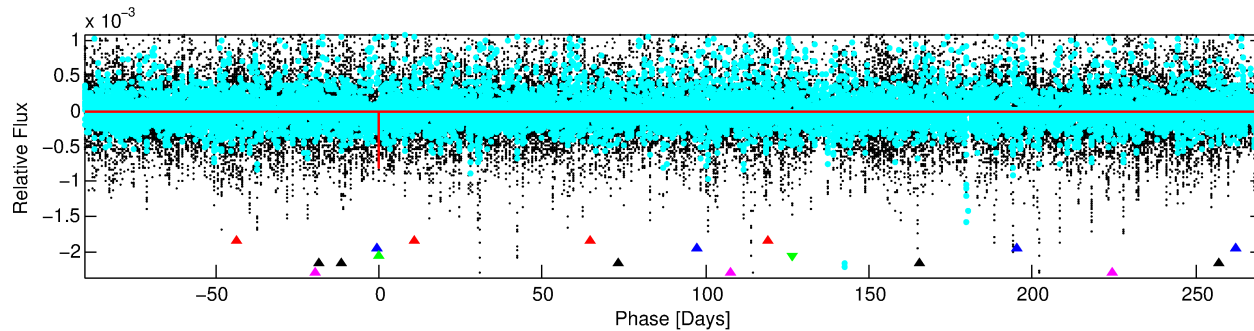
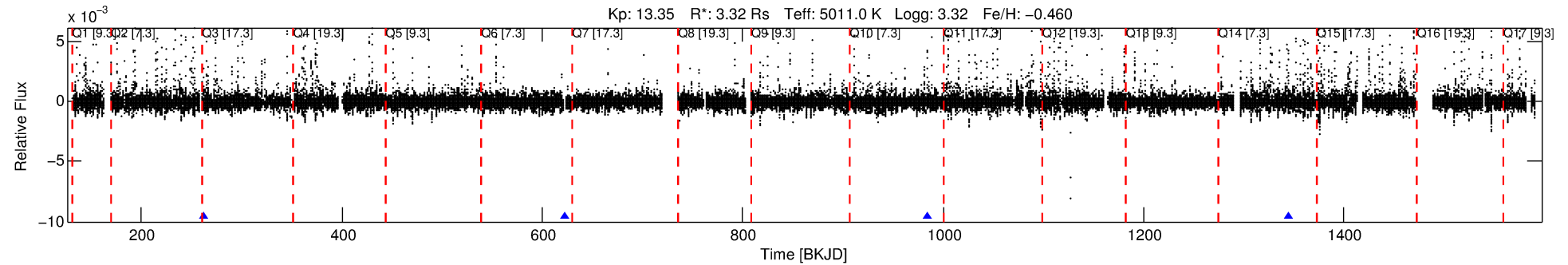
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005181824-03

No Significant Match Found

DV One-Page Summary

KIC: 5181824 Candidate: 3 of 5 Period: 360.780 d



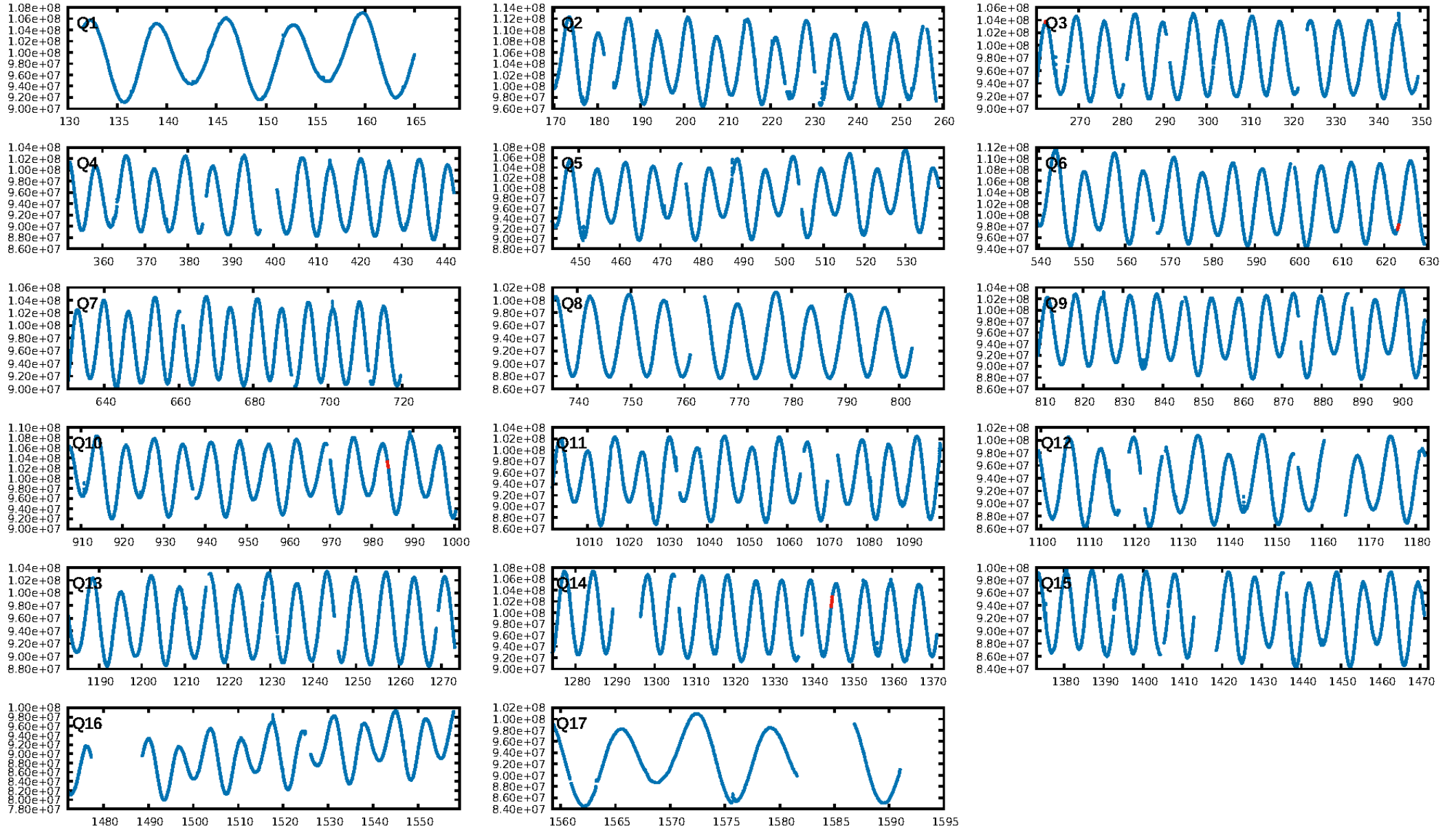
DV Fit Results:

Period = 360.77957 [0.00391] d
Epoch = 262.4052 [0.0102] BKJD
Rp/R* = 0.0256 [0.1066]
a/R* = 811.23 [12528.52]
b = 0.22 [66.94]
Seff = 7.10 [5.06]
Teq = 416 [74] K
Rp = 9.27 [39.03] Re
a = 0.9375 [0.4558] AU
Ag = 1003.82 [8557.88] [0.12σ]
Teffp = 3623 [7695] K [0.42σ]

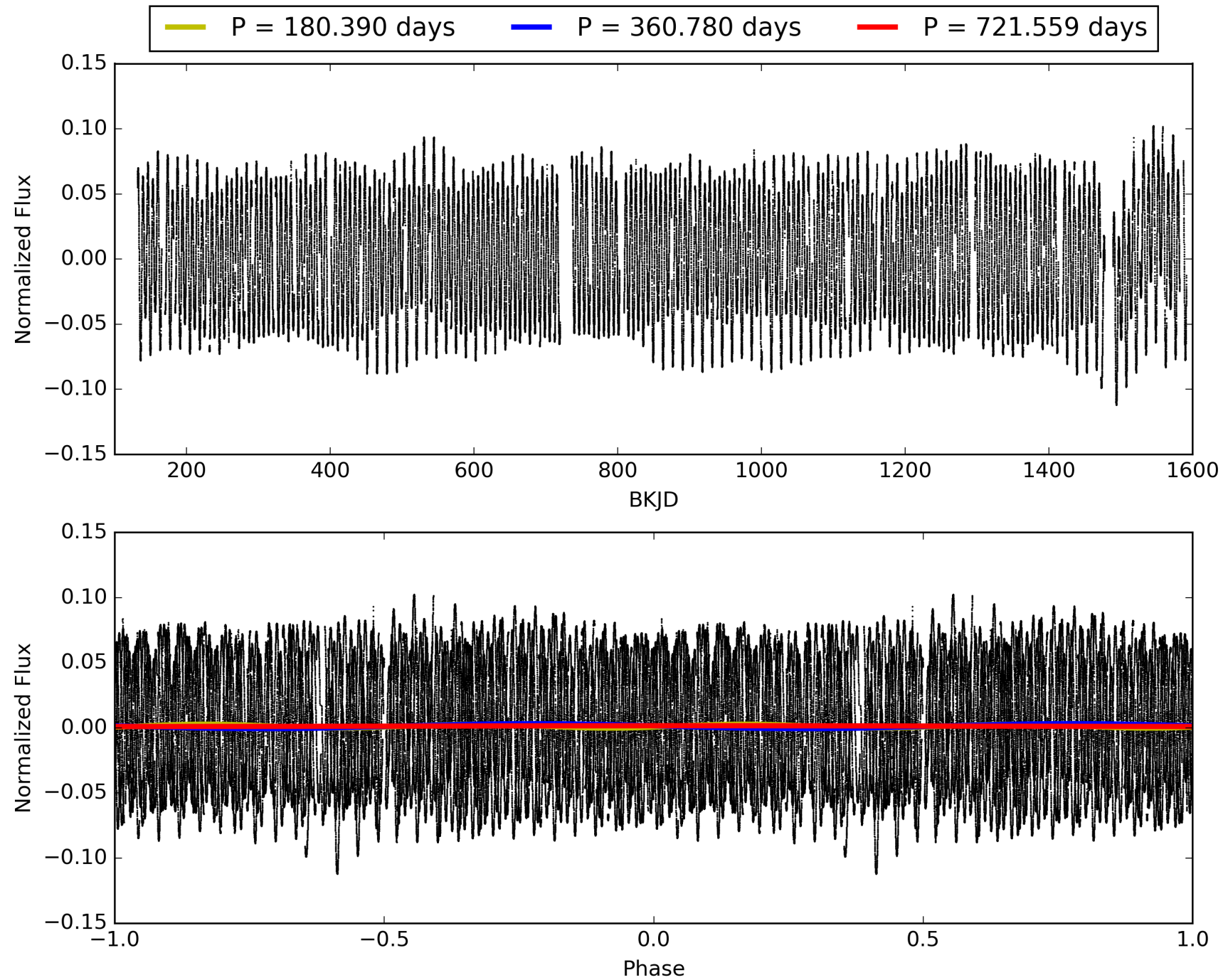
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [293.46σ]
LongPeriod-sig: 100.0% [88.59σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 62.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.7412
Centroid-sig: 11.9%
Centroid-so: 0.700 arcsec [1.19σ]
OotOffset-rm: 0.138 arcsec [1.13σ]
OotOffset-st: 3/1/0/0 [4]
KicOffset-rm: 0.337 arcsec [2.97σ]
KicOffset-st: 3/1/0/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 0.75 [3/4]

TCE 005181824-03, PDC Light Curves

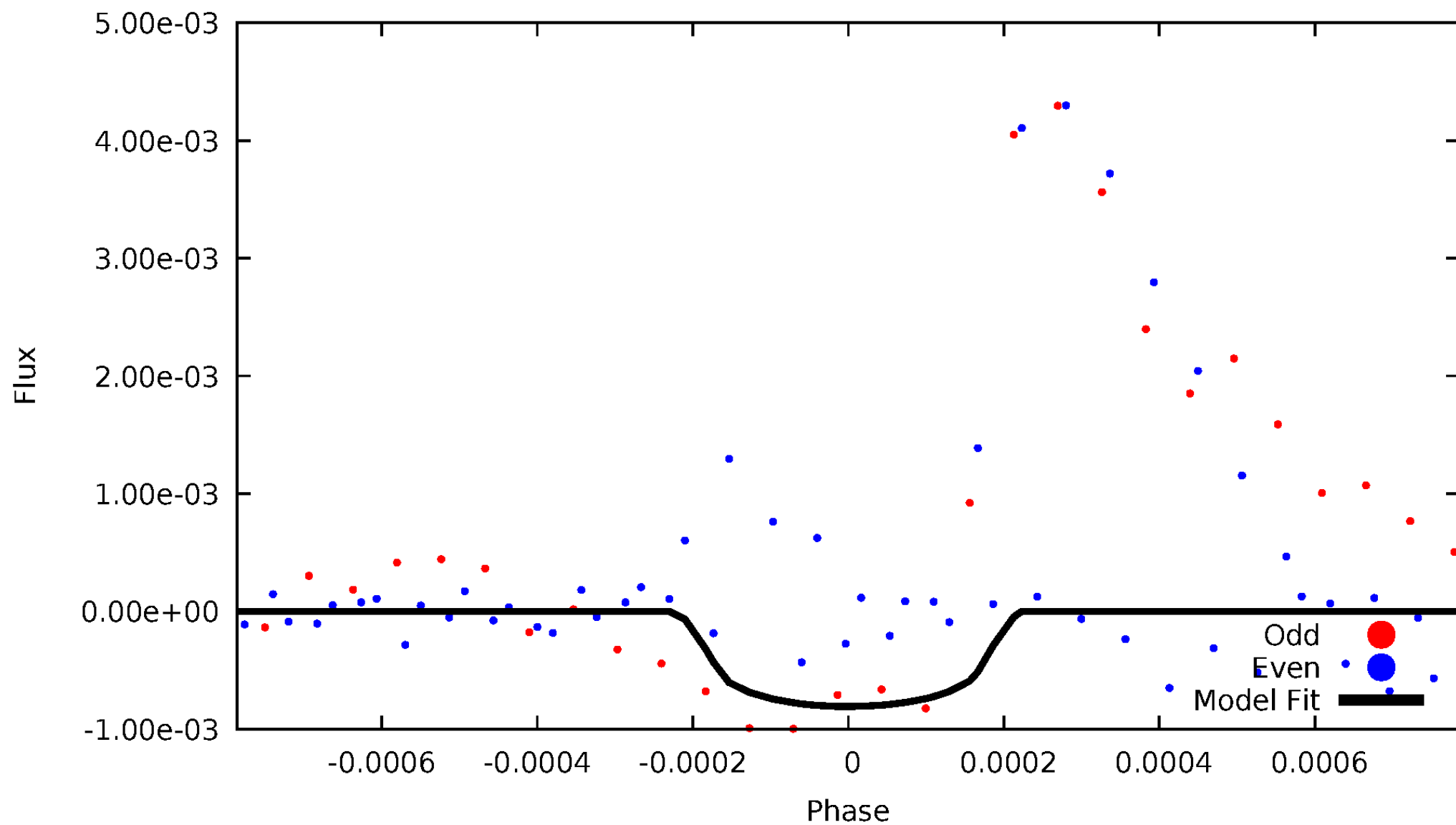


TCE 005181824-03



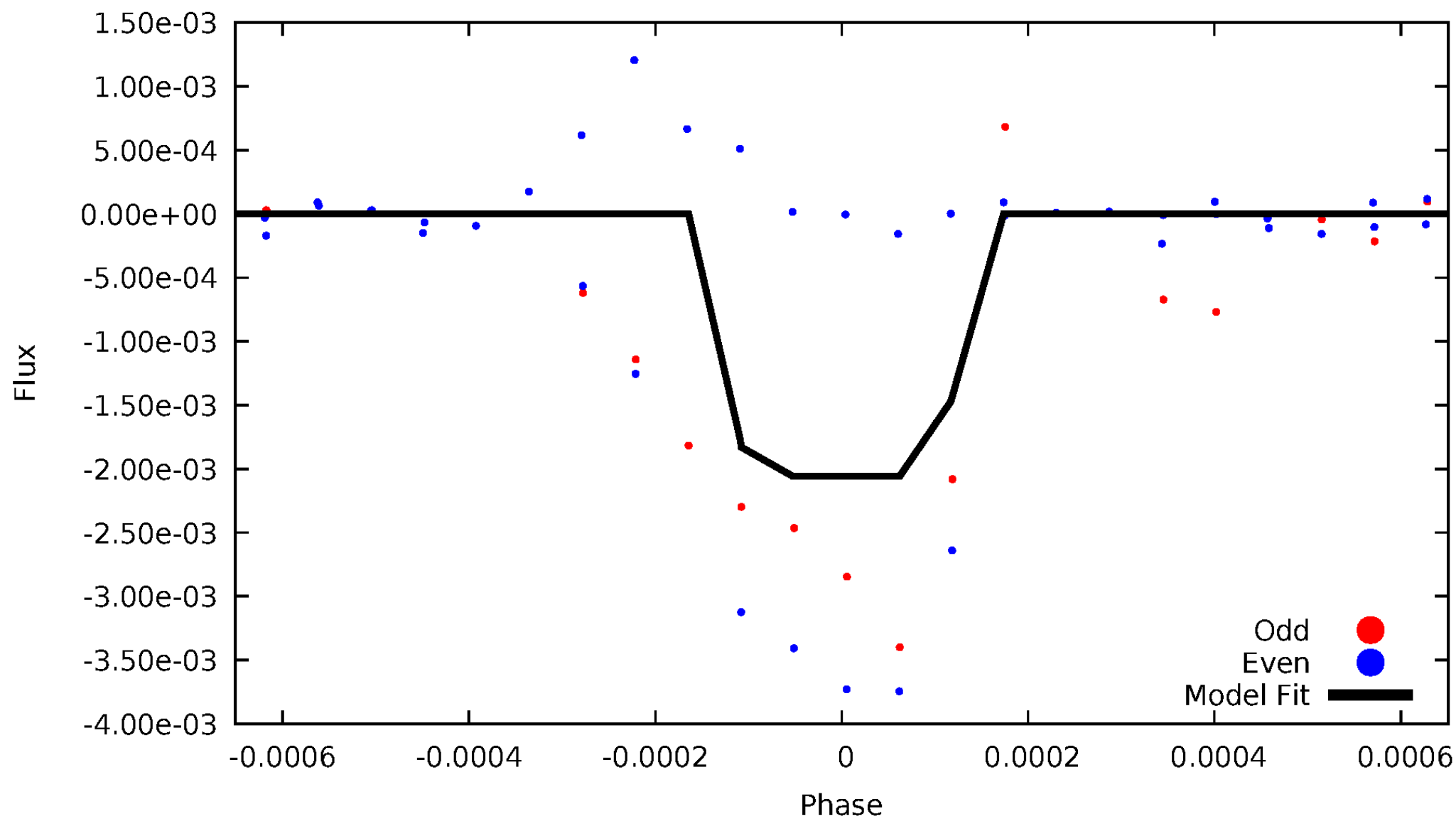
DV Odd/Even

TCE 005181824-03



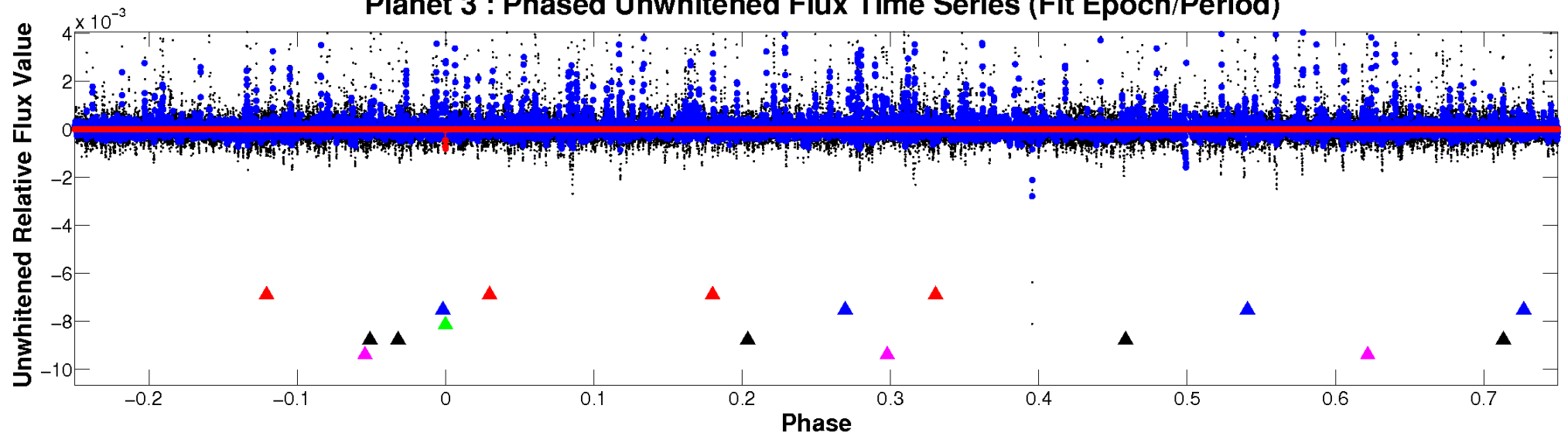
ALT Odd/Even

TCE 005181824-03

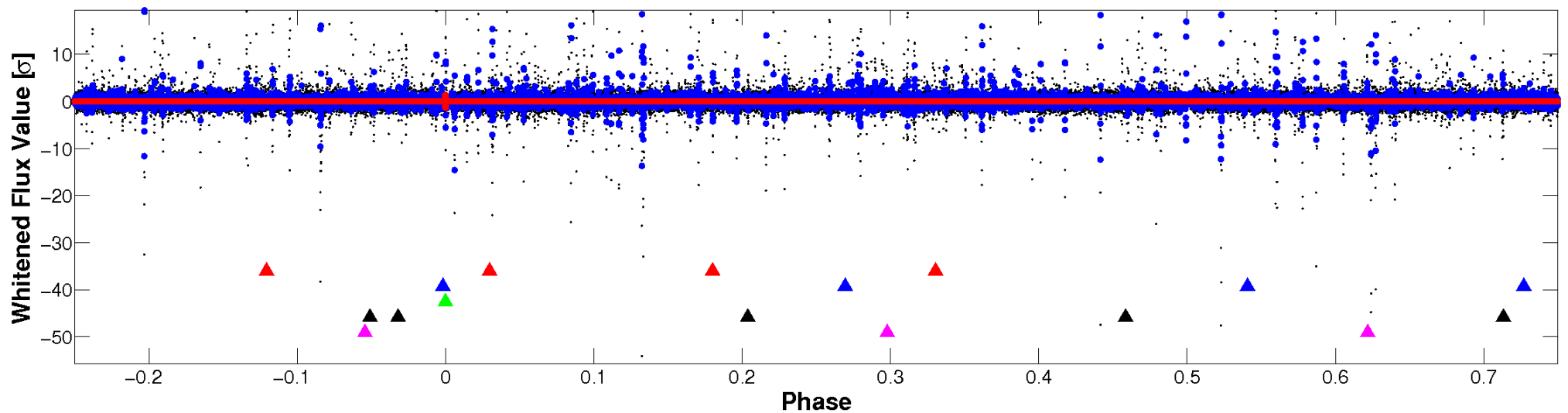


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

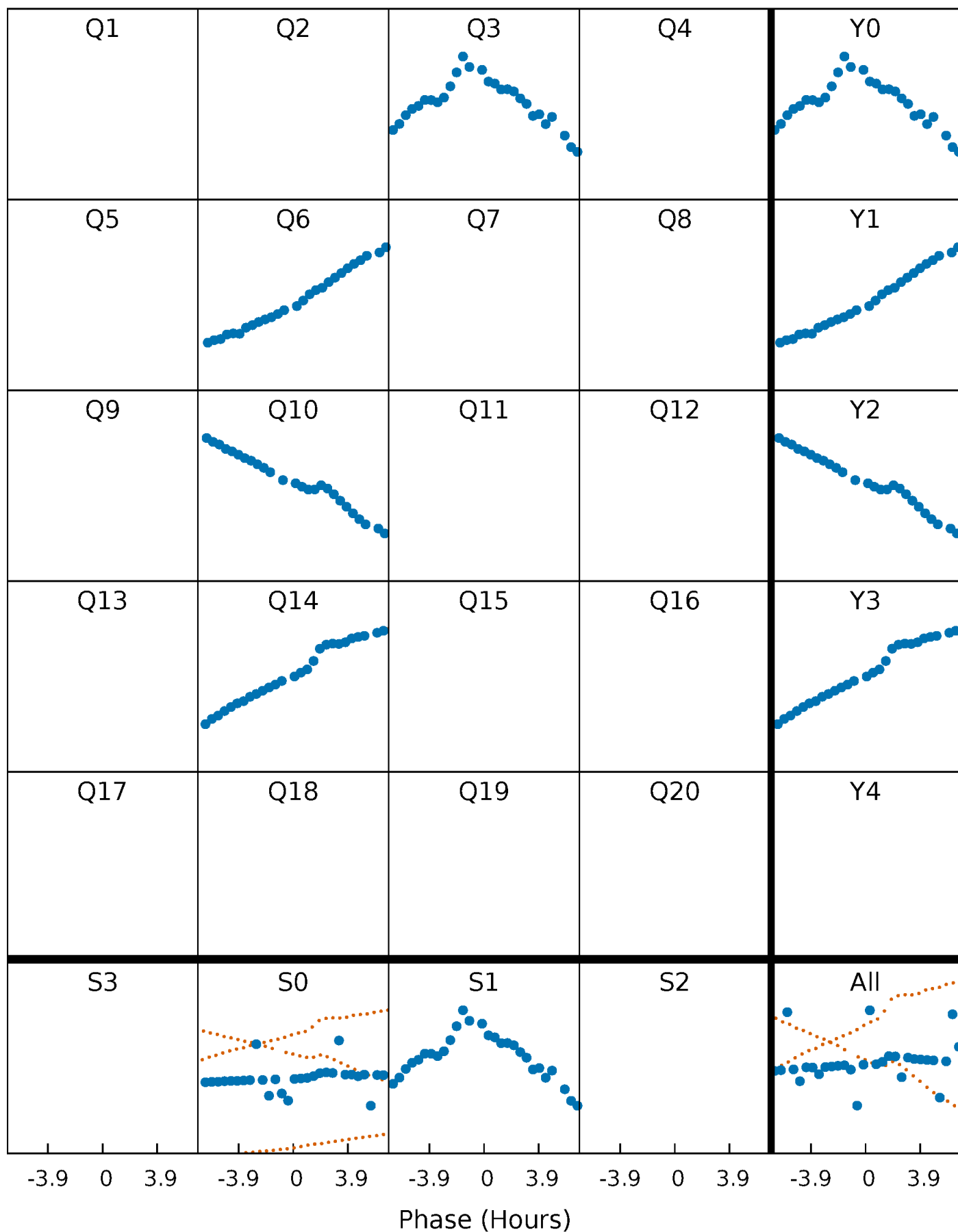


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



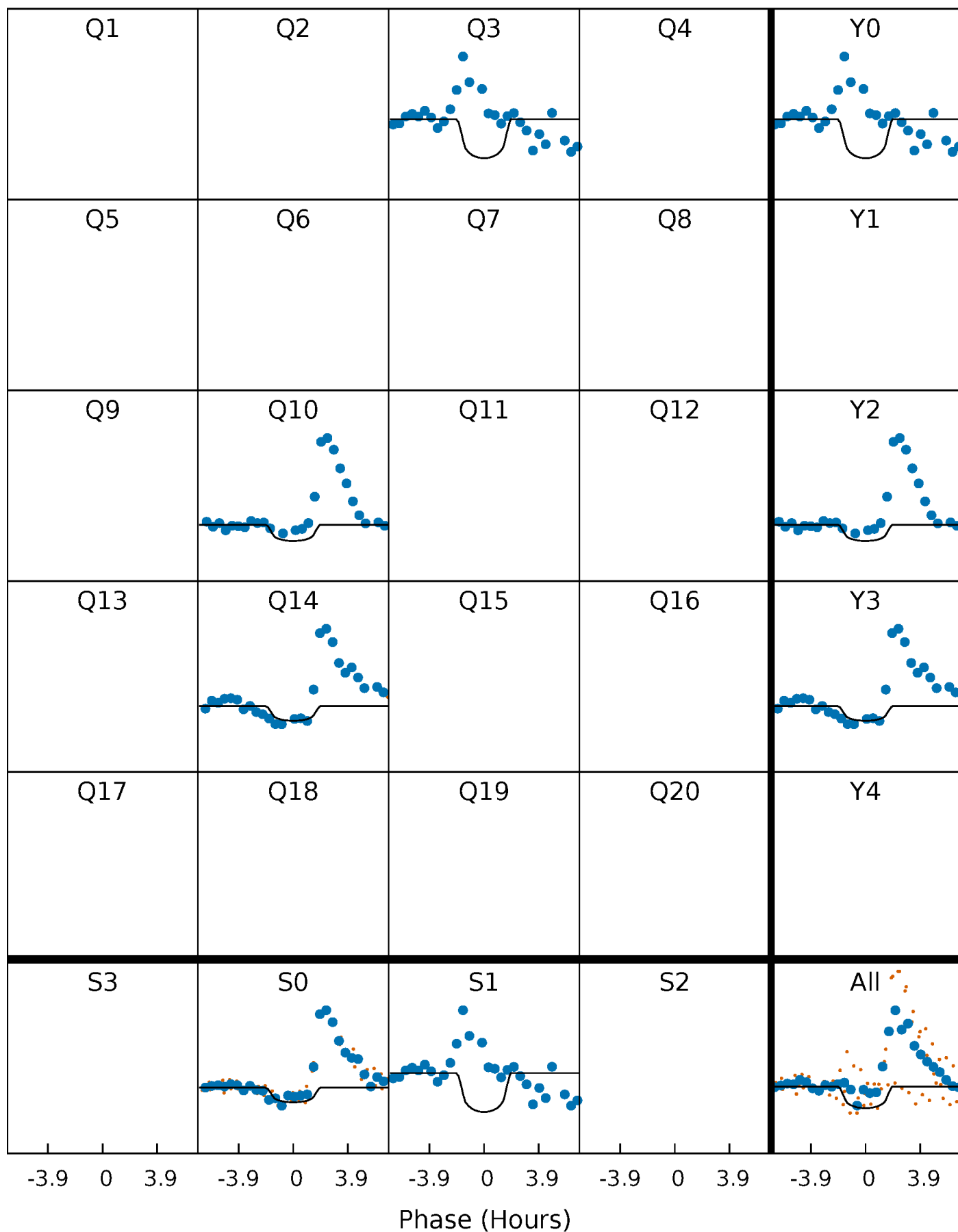
PDC Quarter-Phased Transit Curves

TCE 005181824-03 P=360.779571 Days $T_0=262.405244$ (BKJD)



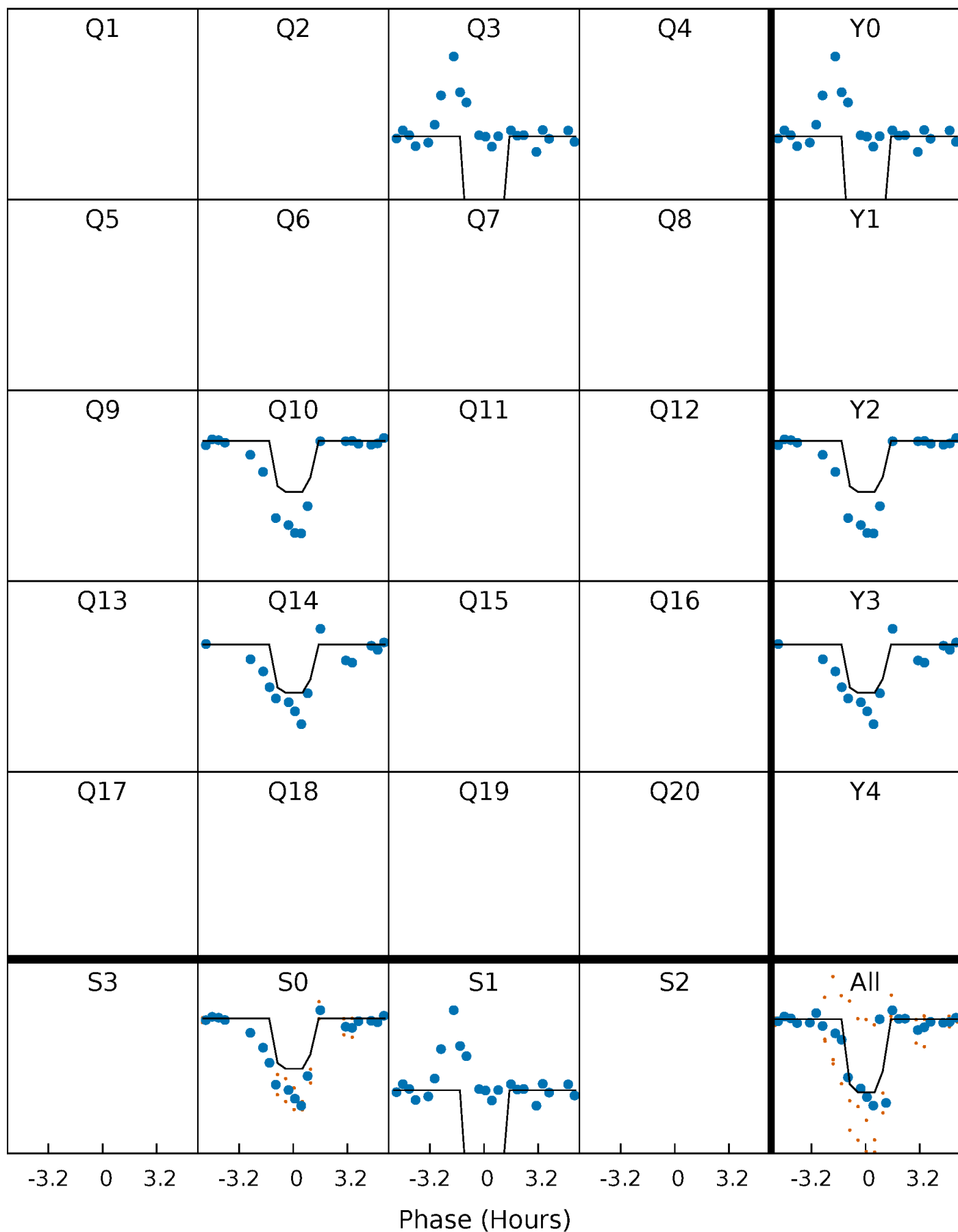
DV Quarter-Phased Transit Curves

TCE 005181824-03 P=360.779571 Days $T_0=262.405244$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

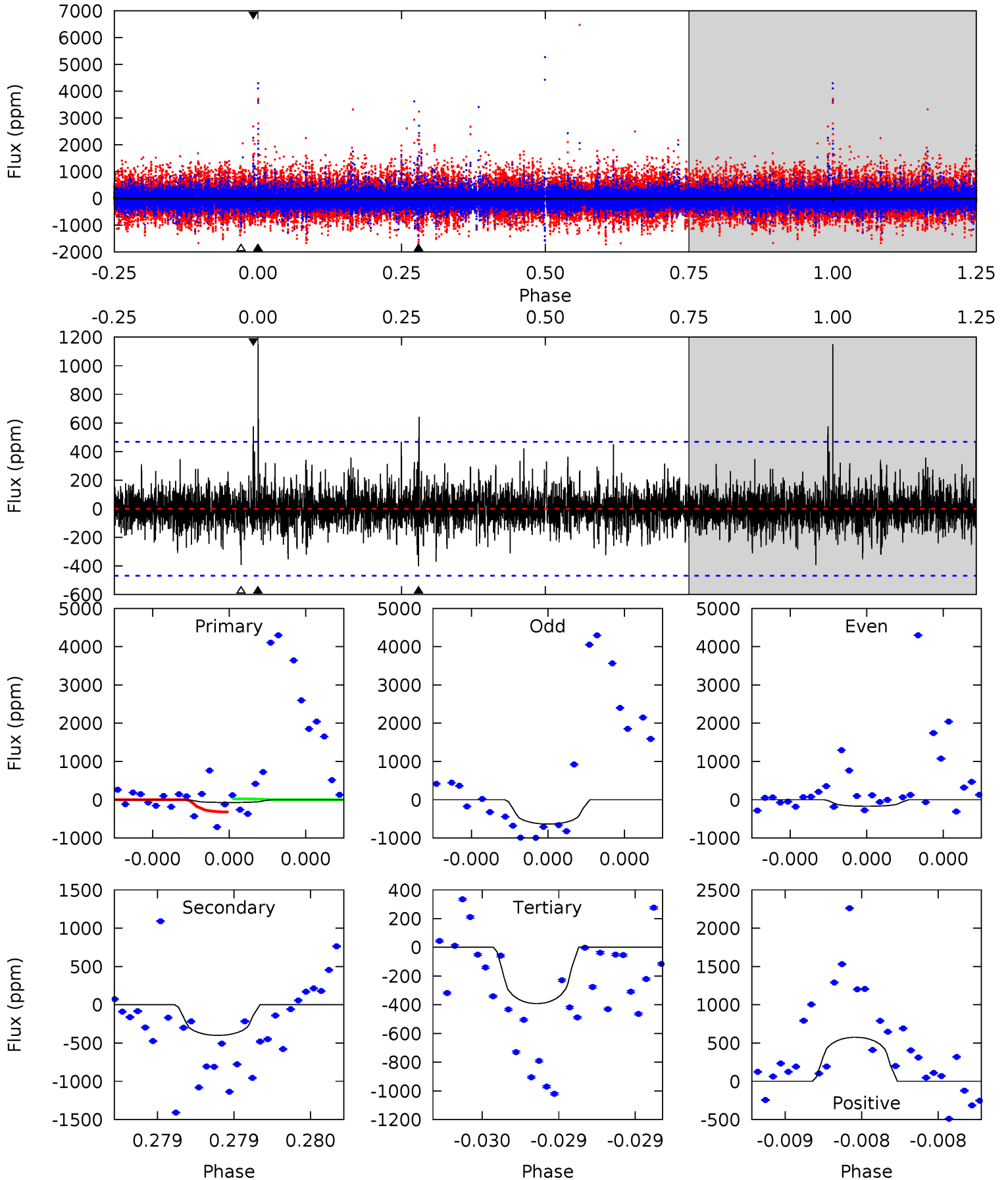
TCE 005181824-03 P=360.775730 Days $T_0=262.430216$ (BKJD)



DV Model-Shift Uniqueness Test

005181824-03, P = 360.779571 Days, E = 262.405244 Days

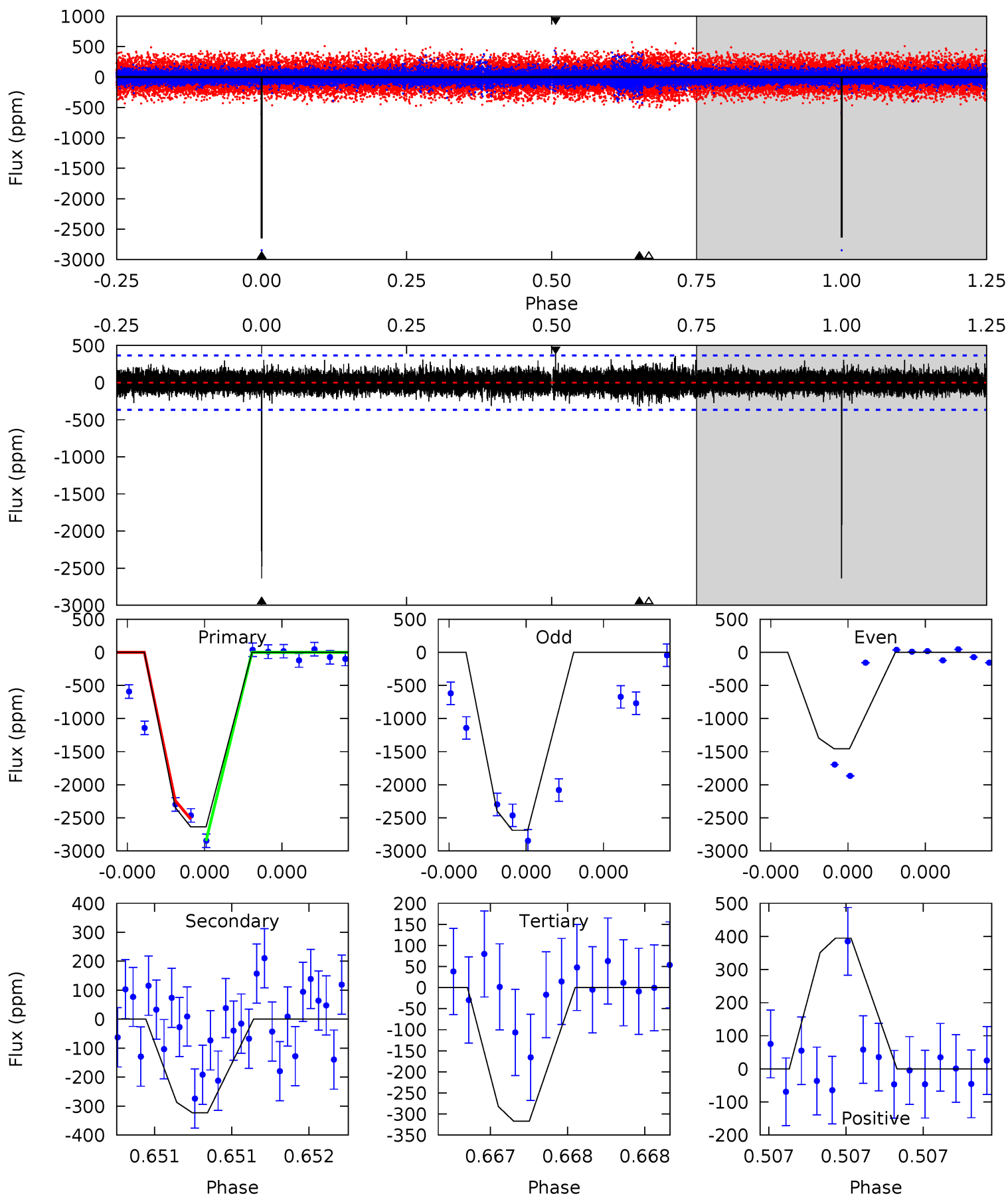
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.87	4.79	4.70	6.90	5.61	3.54	1.09	-3.83	-6.03	0.09	-2.11	2.04	5.74	0.74	1.75



Alt Model-Shift Uniqueness Test

005181824-03, P = 360.775730 Days, E = 262.430216 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.8	5.00	4.91	6.11	5.67	3.63	1.04	35.9	34.7	0.09	-1.12	15.8	0.75	0.13	2.46



Stellar Parameters For KIC 005181824

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5011^{+125}_{-112}	$3.321^{+0.385}_{-0.315}$	$-0.460^{+0.300}_{-0.250}$	$3.324^{+1.925}_{-1.444}$	$0.843^{+0.280}_{-0.186}$	$0.032^{+0.102}_{-0.023}$
	+2%/-2%	+12%/-9%	+65%/-54%	+58%/-43%	+33%/-22%	+314%/-71%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 005181824-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-400 ± 83	$30.11^{+31.95}_{-22.15}$	582^{+81}_{-62}	3065^{+1478}_{-514}	219^{+2602}_{-167}
Alt.	-323 ± 65	$29.86^{+37.04}_{-19.49}$	578^{+83}_{-63}	2951^{+1220}_{-507}	169^{+1353}_{-132}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

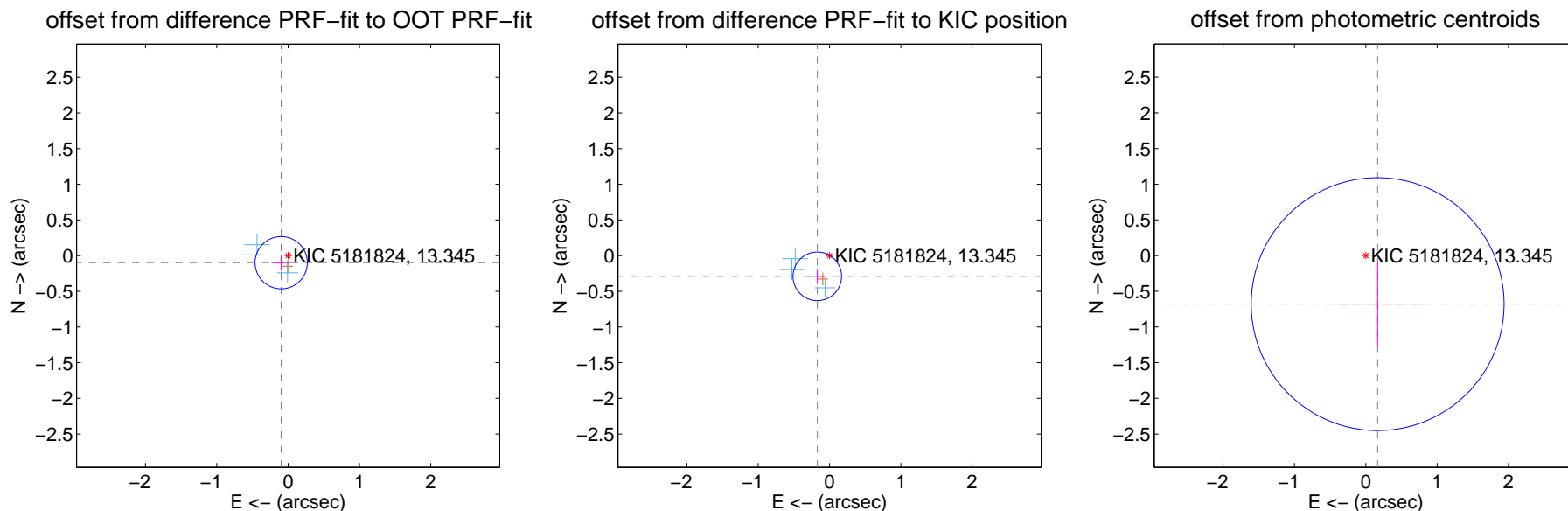
DV Centroid Data

Supplemental centroid analysis for 005181824-03. Kepler magnitude: 13.35. Transit SNR 4.85

There are 3 quarters with good PRF difference image offsets

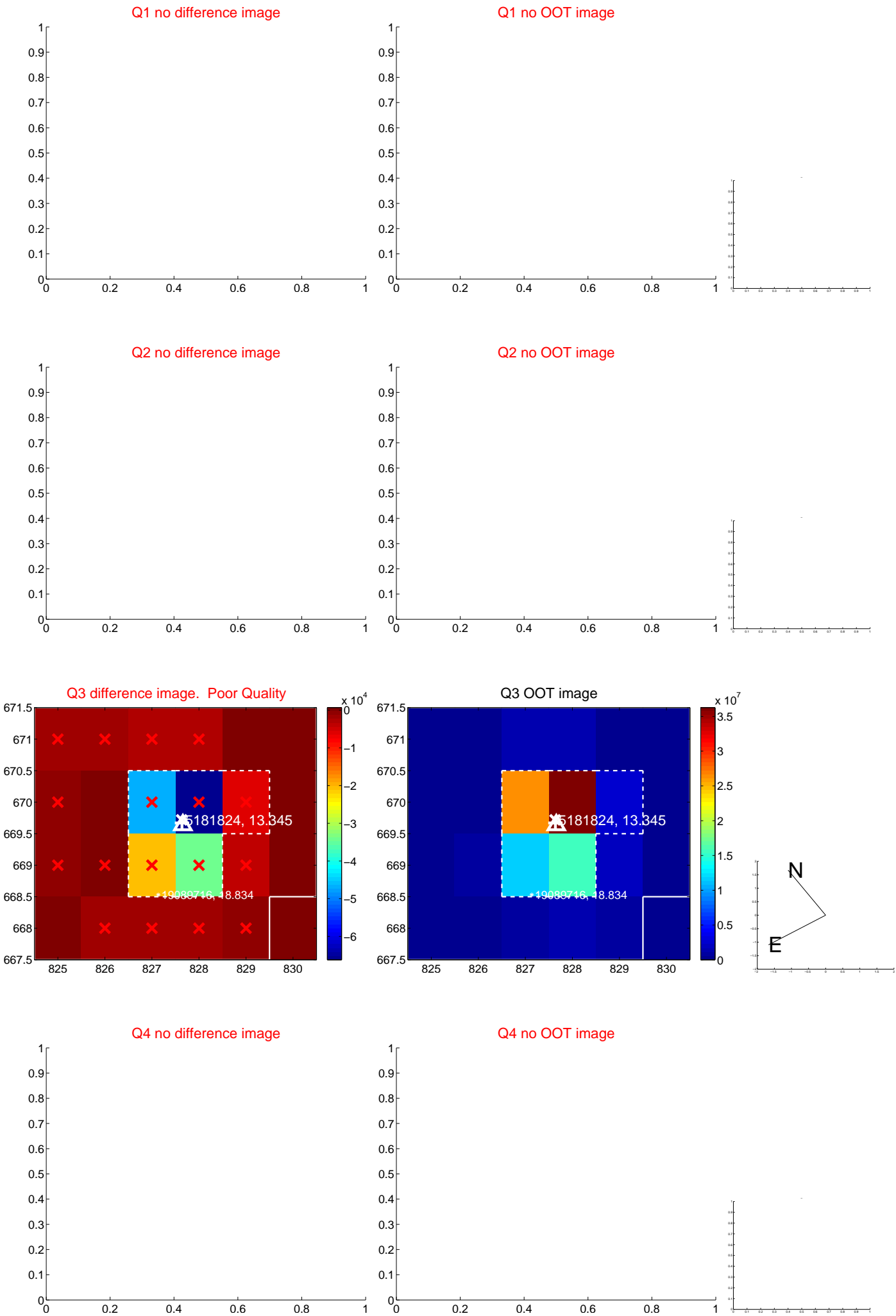
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.138 ± 0.122	1.13	0.097 ± 0.133	-0.099 ± 0.110
PRF-fit source offset from KIC position	0.337 ± 0.113	2.97	0.171 ± 0.127	-0.290 ± 0.108
photometric centroid source offset	0.70 ± 0.59	1.19	-0.17 ± 0.64	-0.68 ± 0.59

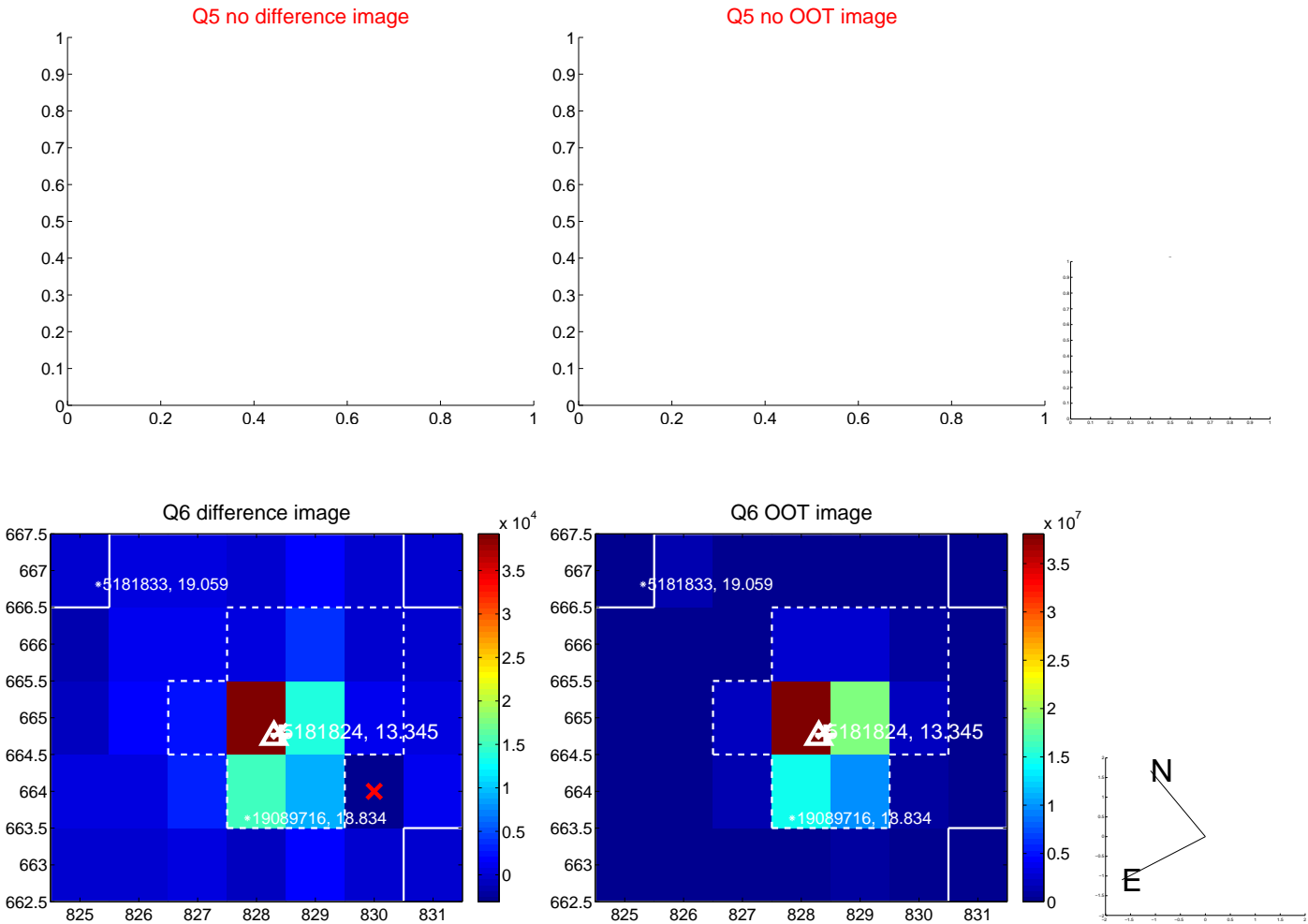


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

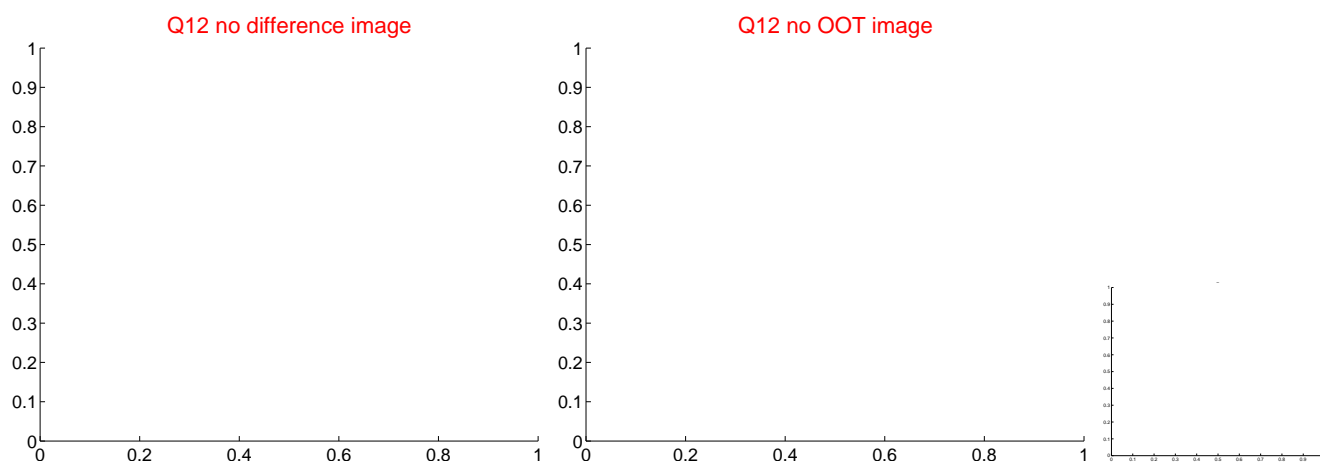
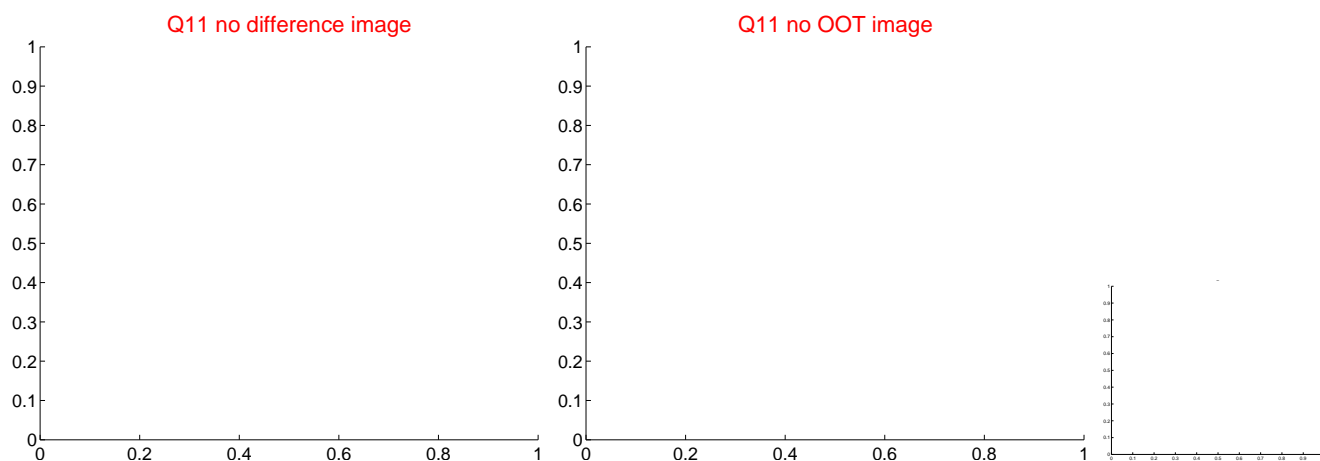
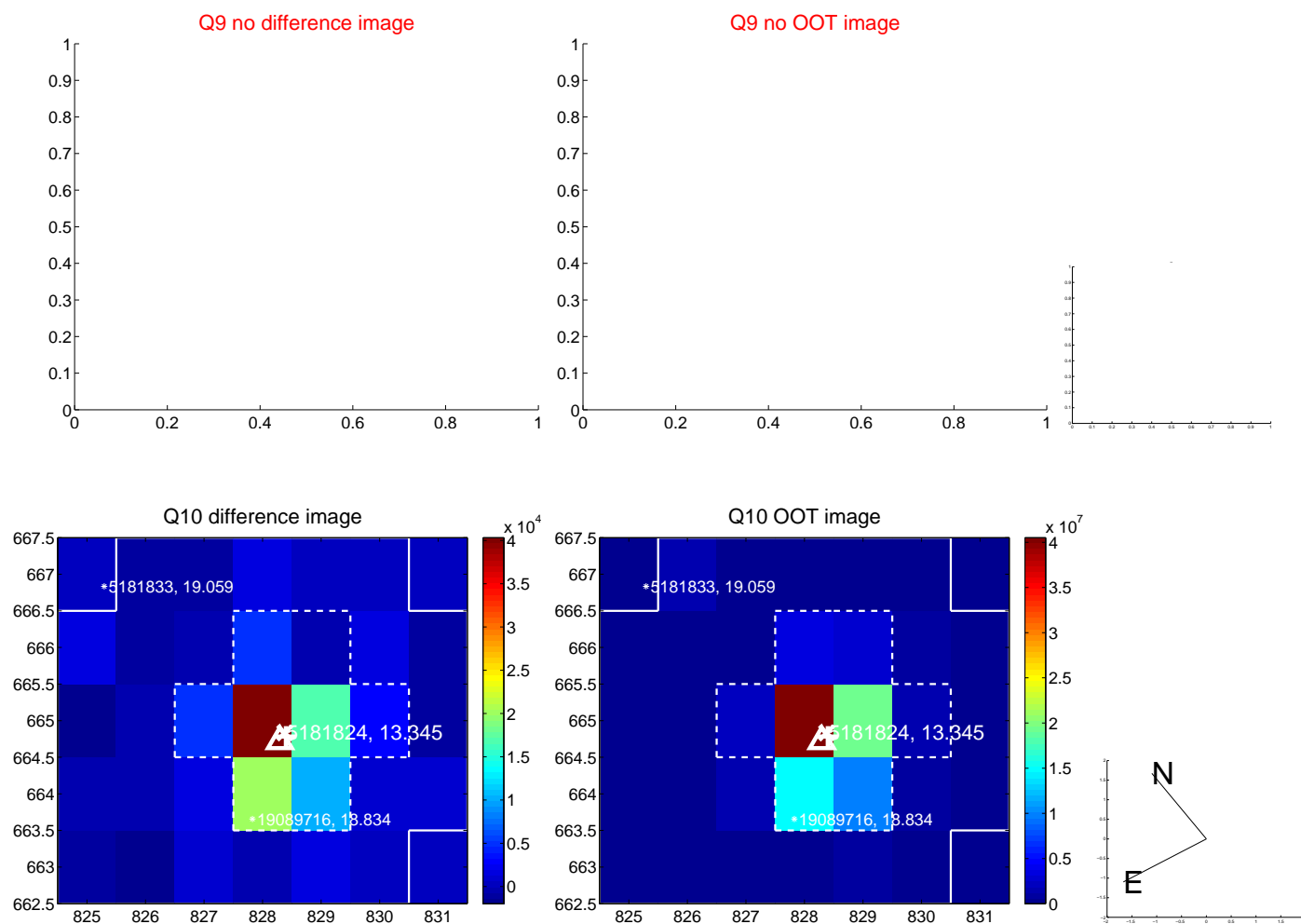
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

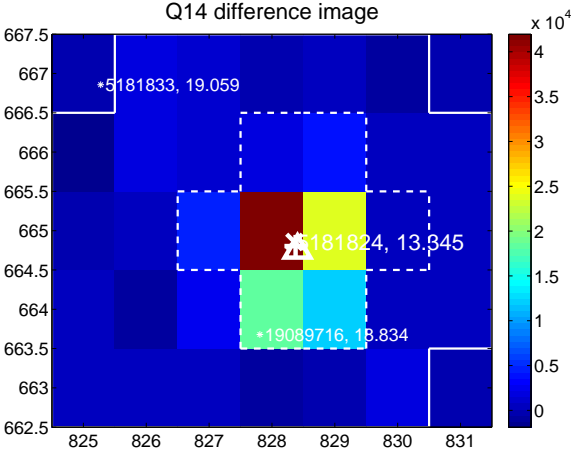
Q13 no difference image



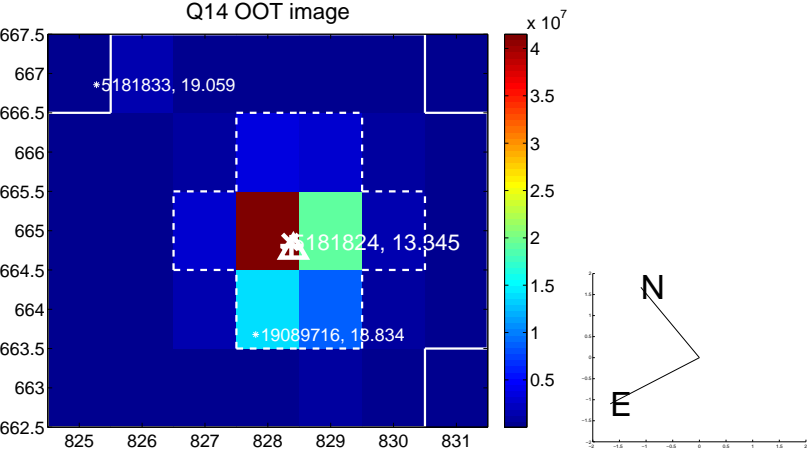
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



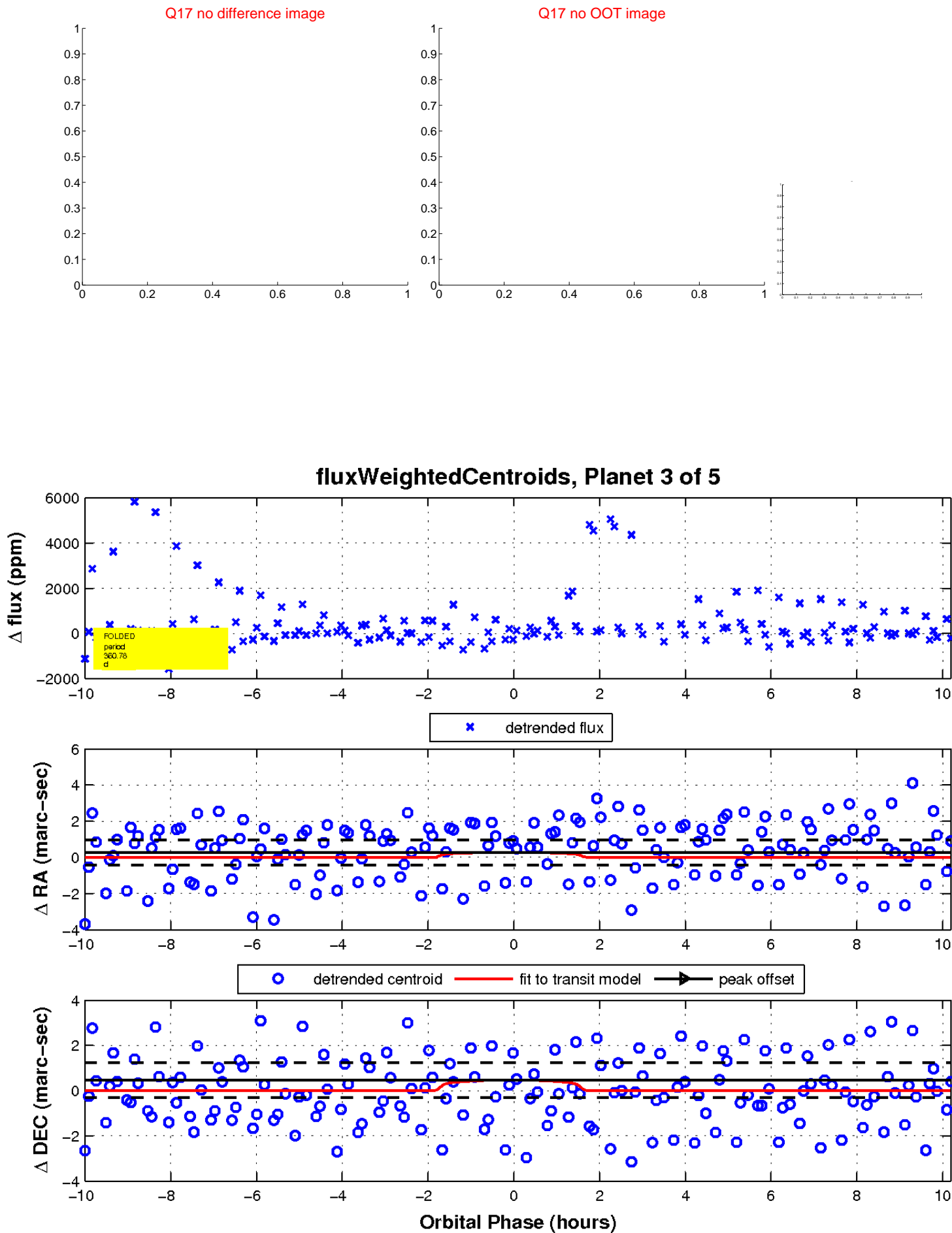
Q16 no difference image



Q16 no OOT image

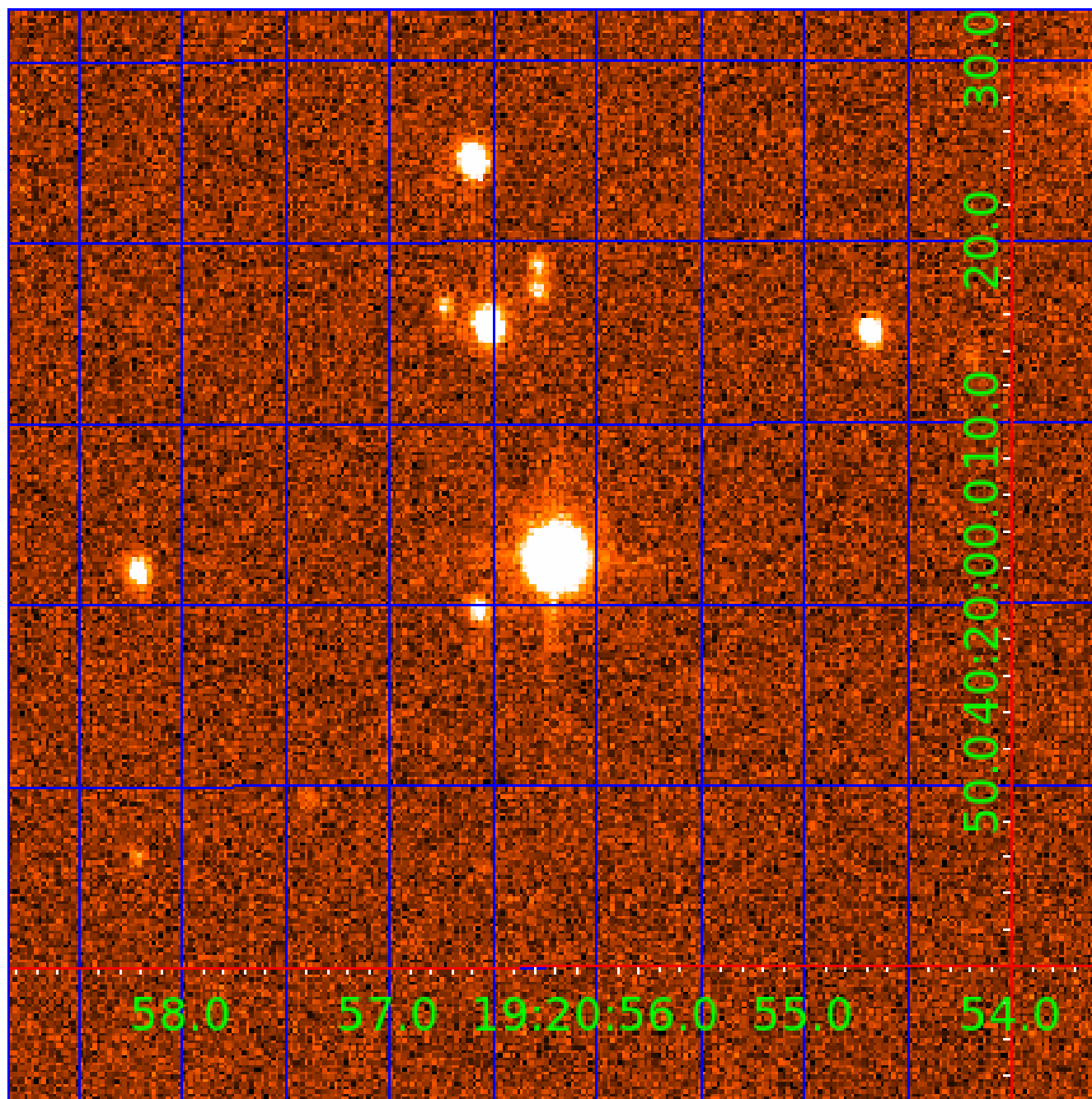


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005181824

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
005181824-02	OBS	No	458.636076	163.929038	3610.5	26.292	16.2	7.9	3.32	5011	28.57	5.16
005181824-03	OBS	No	360.779572	262.405244	807.3	3.402	21.2	4.9	3.32	5011	9.27	7.10
005181824-04	OBS	No	268.871868	250.882479	753.1	7.783	15.3	5.1	3.32	5011	8.89	10.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005181824-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
005181824-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

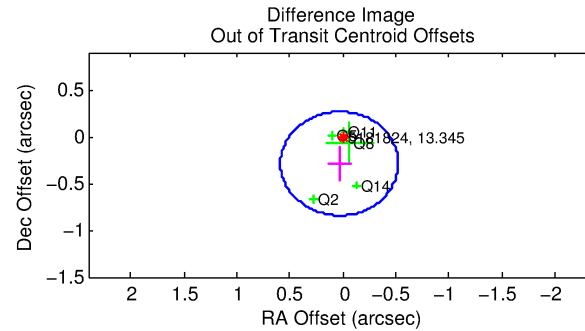
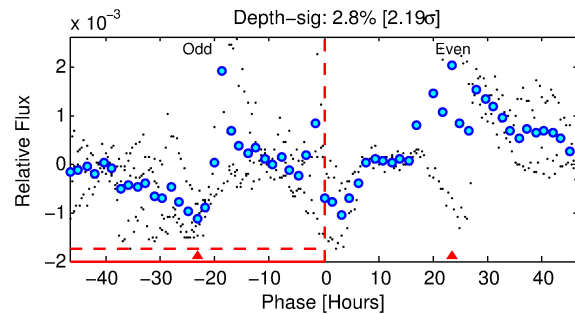
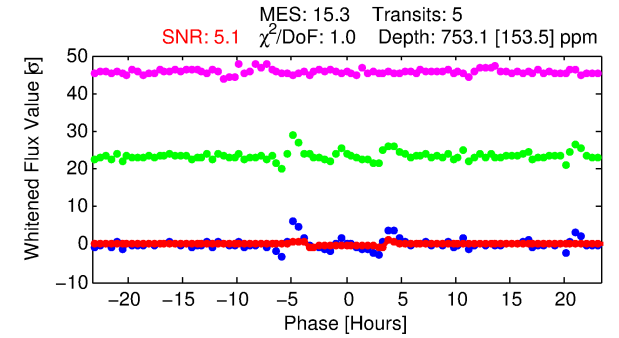
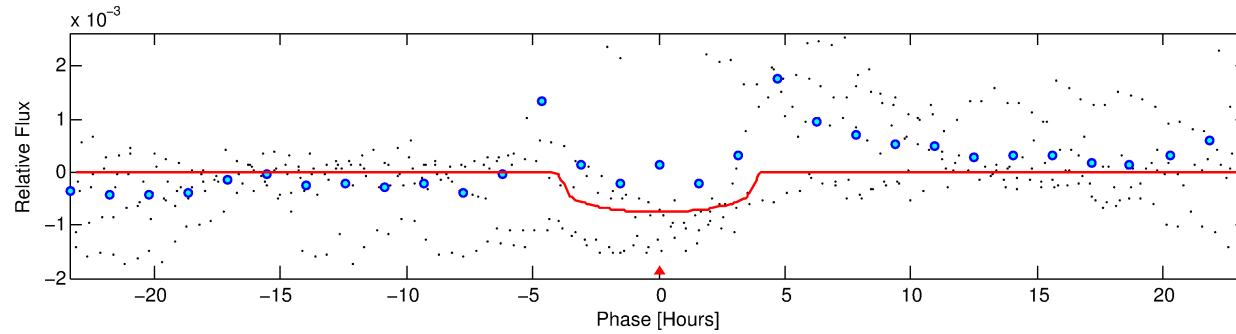
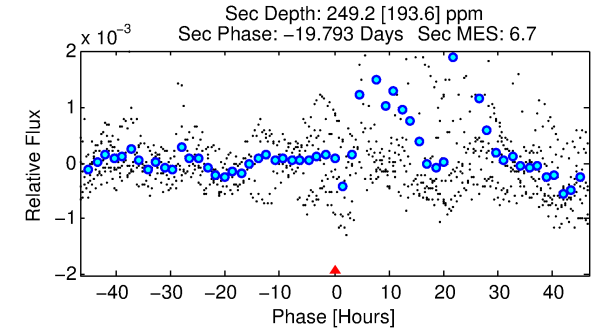
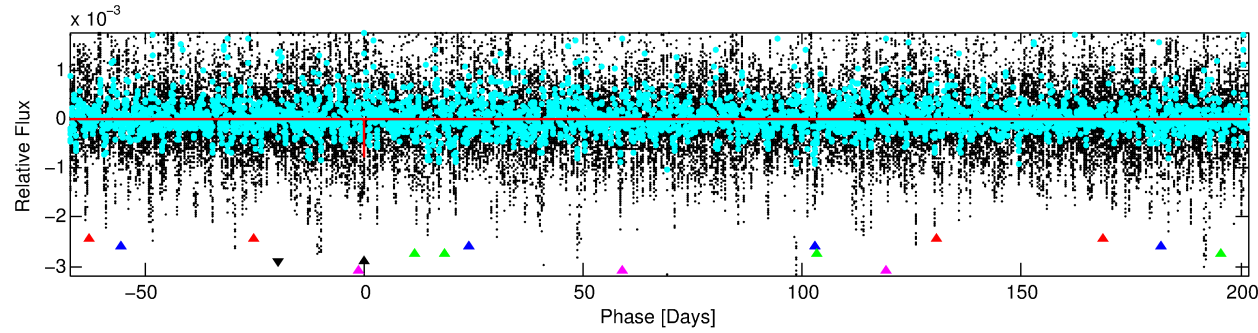
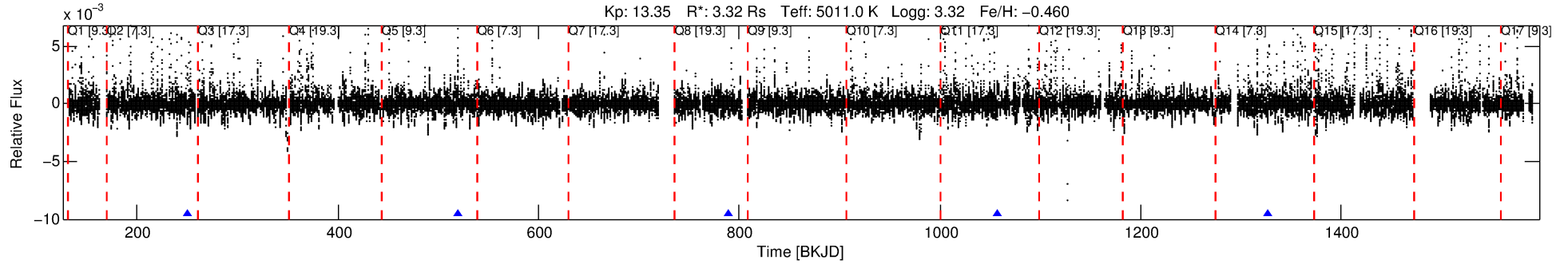
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005181824-04

No Significant Match Found

DV One-Page Summary

KIC: 5181824 Candidate: 4 of 5 Period: 268.872 d



DV Fit Results:

Period = 268.87187 [0.00287] d
Epoch = 250.8825 [0.0071] BKJD
Rp/R* = 0.0245 [0.0247]
a/R* = 269.70 [1012.51]
b = 0.07 [52.40]
Seff = 10.51 [7.49]
Teq = 459 [82] K
Rp = 8.89 [10.33] Re
a = 0.7706 [0.3747] AU
Ag = 1029.86 [2339.45] [0.44] σ
Teffp = 4021 [2173] K [1.64] σ

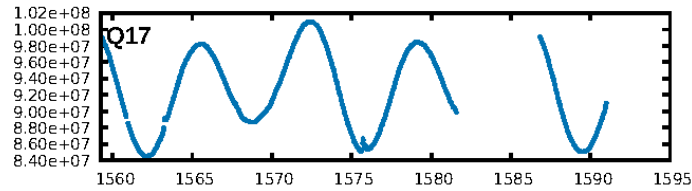
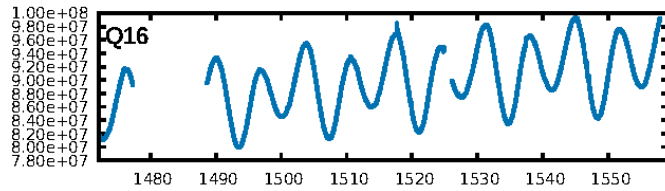
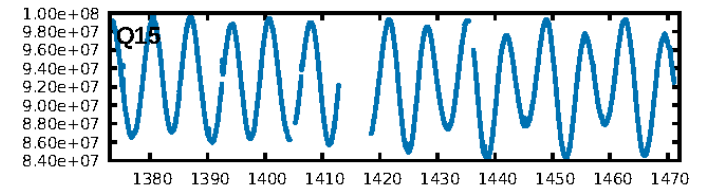
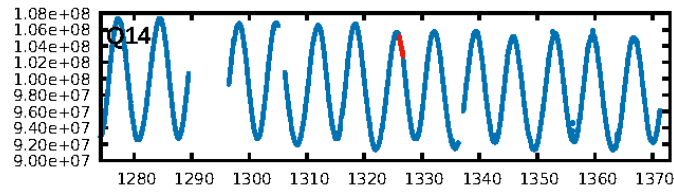
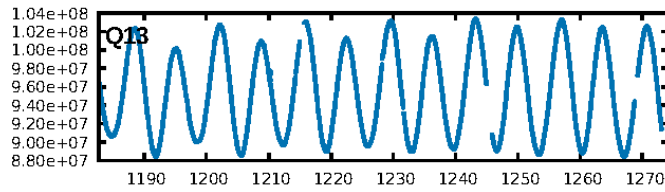
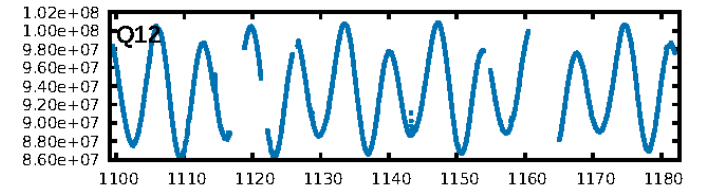
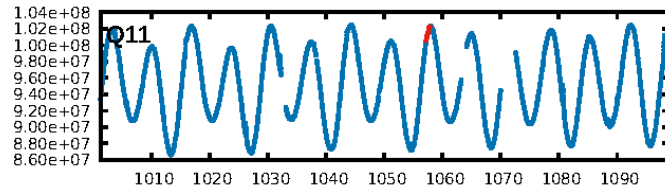
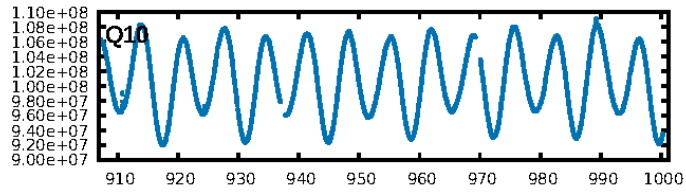
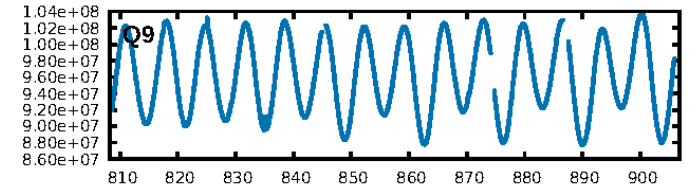
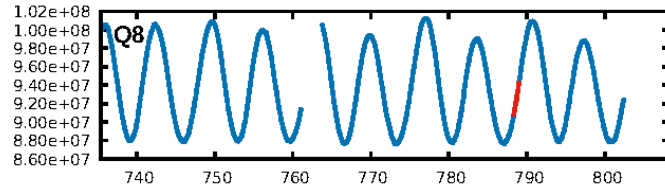
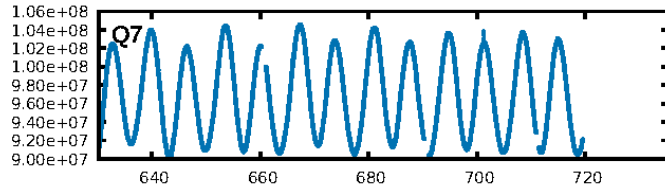
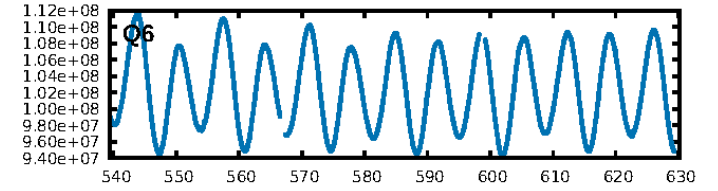
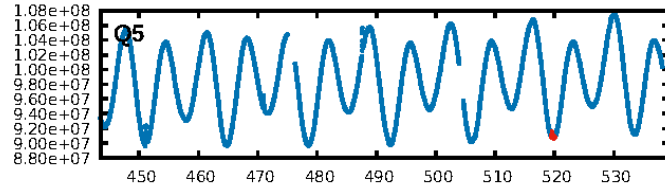
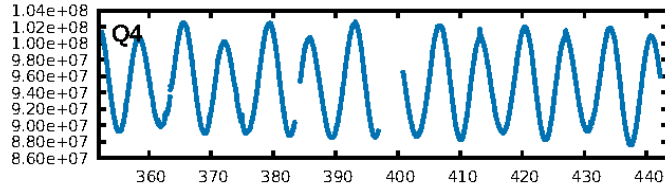
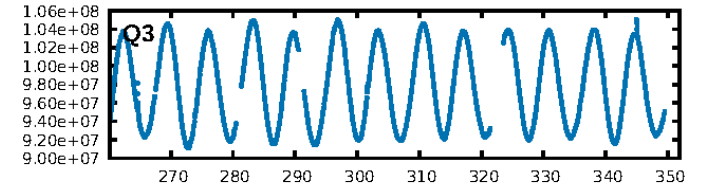
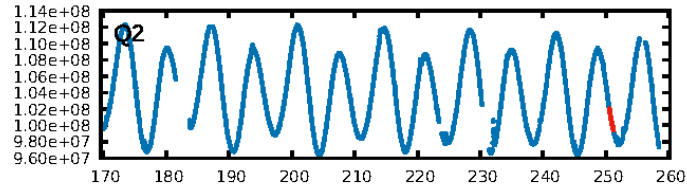
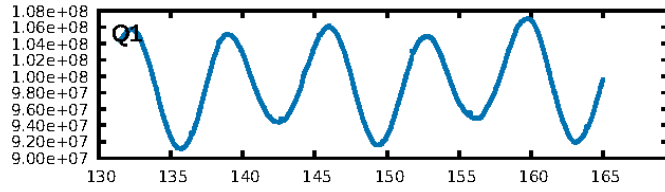
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [109.07] σ
ModelChiSquare2-sig: 22.9%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -6.249
Centroid-sig: 68.4%
Centroid-so: 0.175 arcsec [0.31] σ
OotOffset-rm: 0.290 arcsec [1.57] σ
KicOffset-rm: 0.454 arcsec [2.25] σ
OotOffset-st: 2/1/1/1 [5]
KicOffset-st: 2/1/1/1 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 1.00 [5/5]

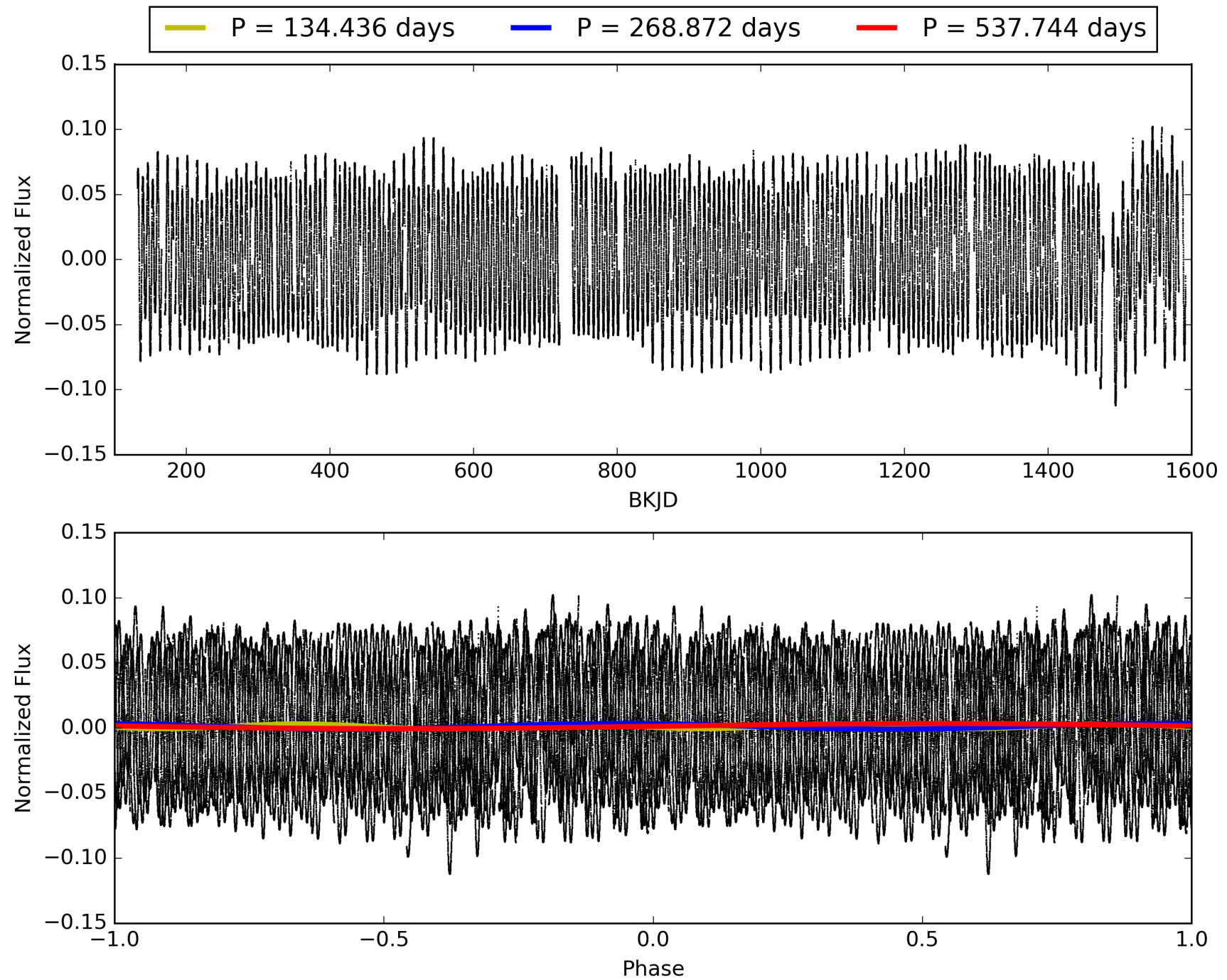
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:52:20 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005181824-04, PDC Light Curves

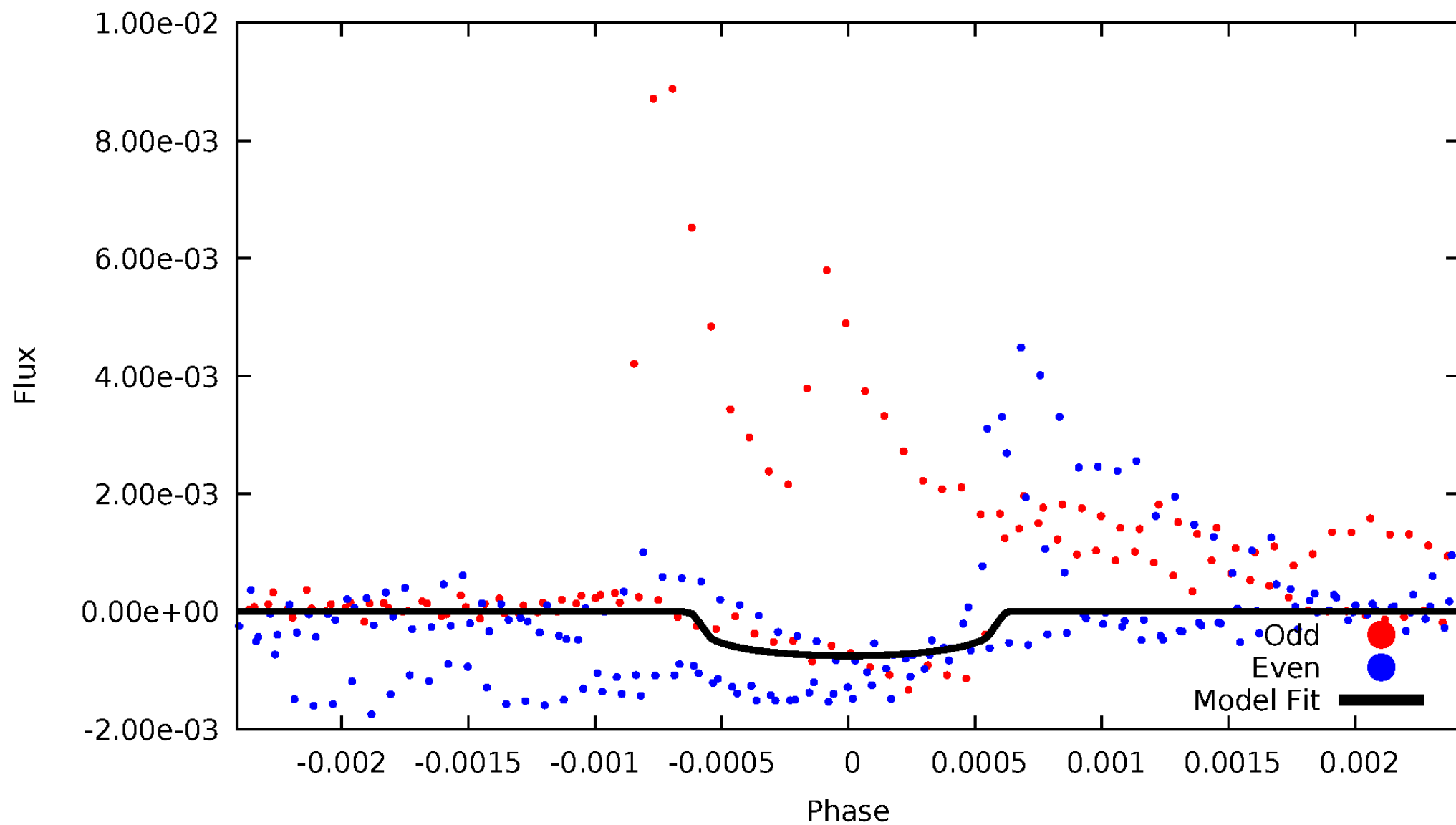


TCE 005181824-04



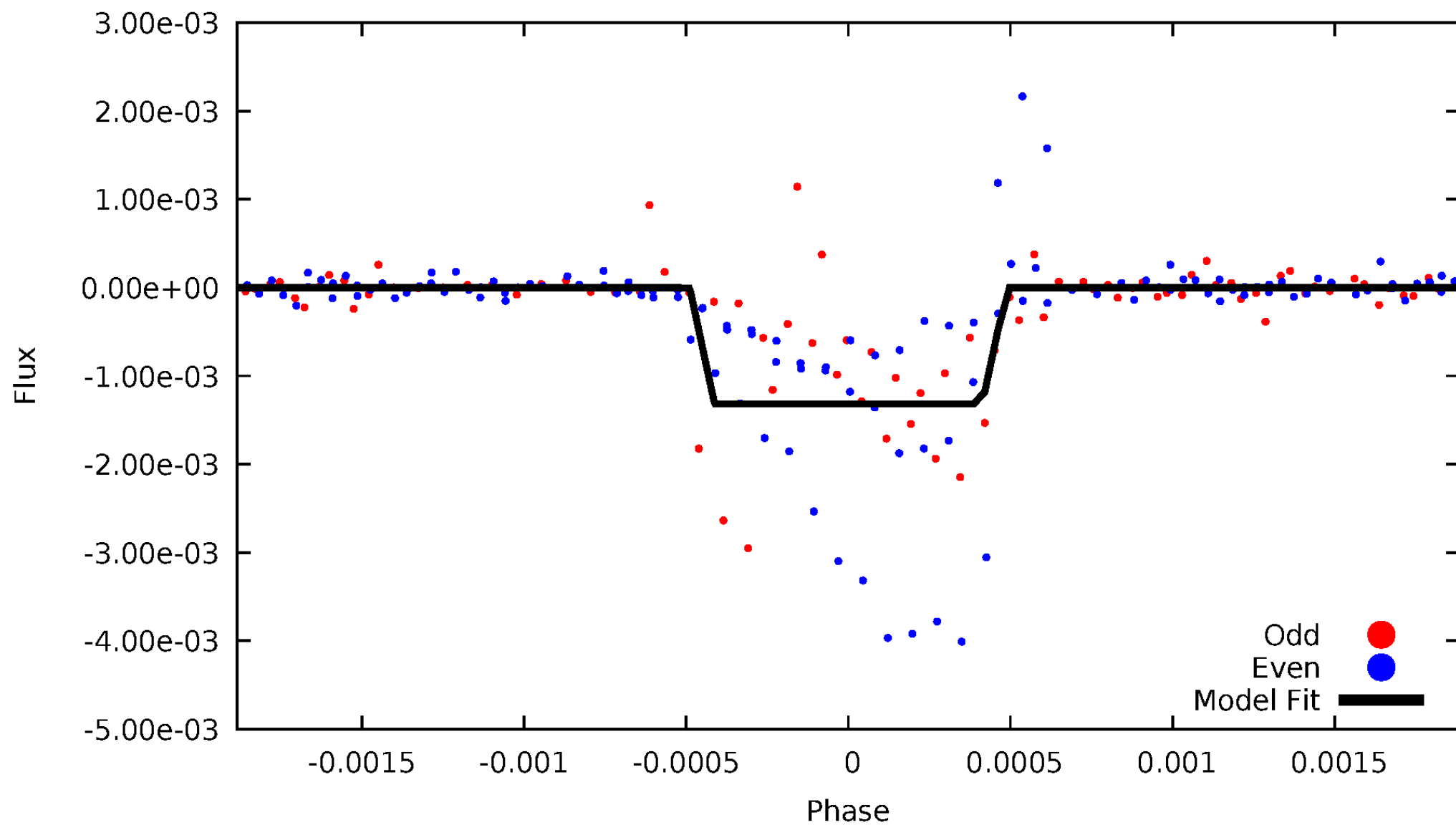
DV Odd/Even

TCE 005181824-04



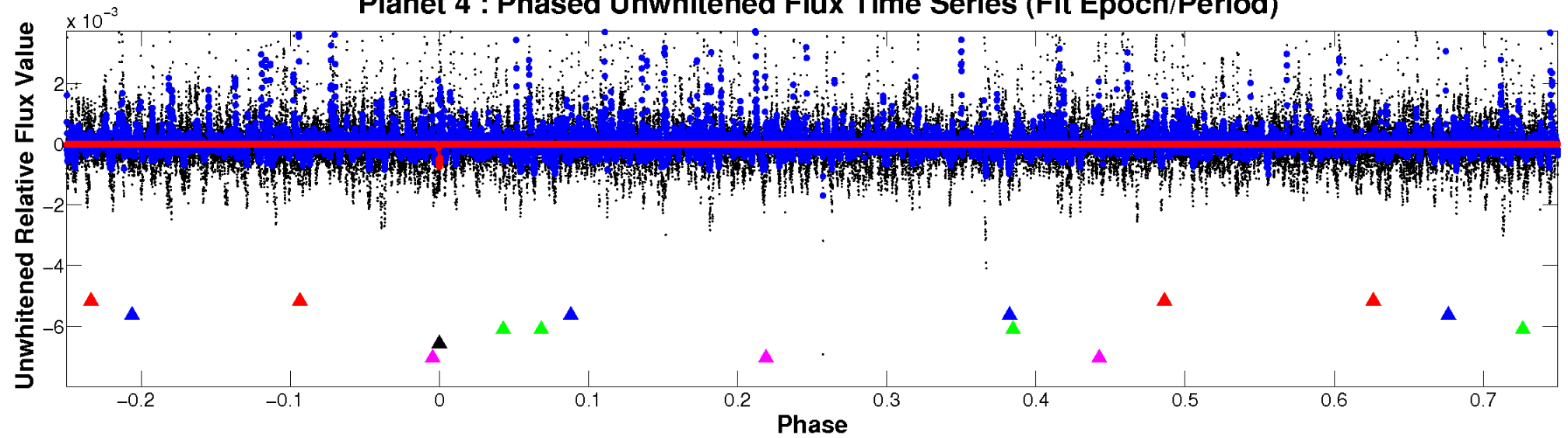
ALT Odd/Even

TCE 005181824-04

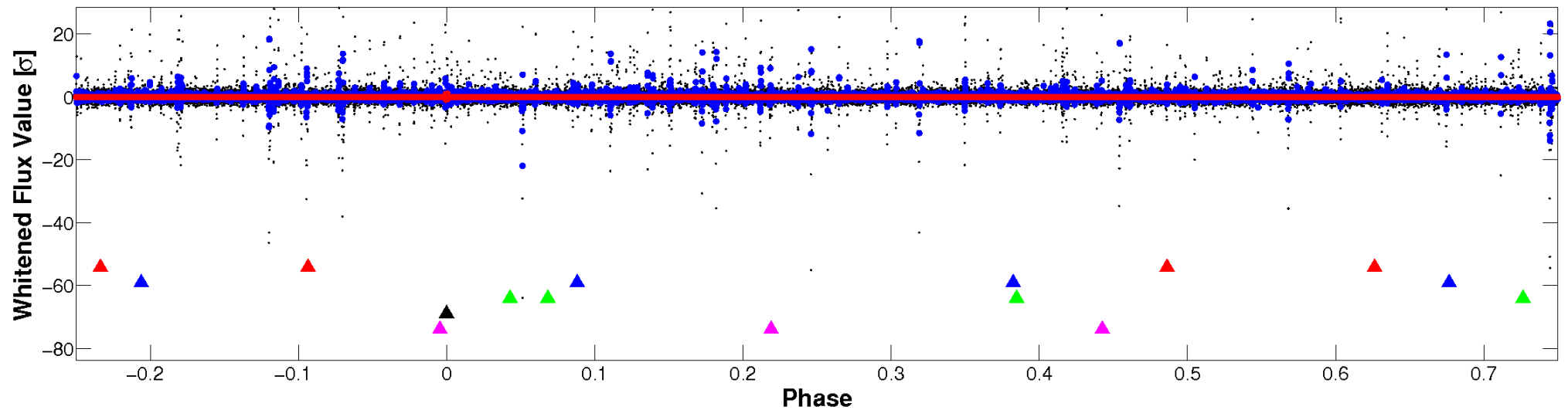


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

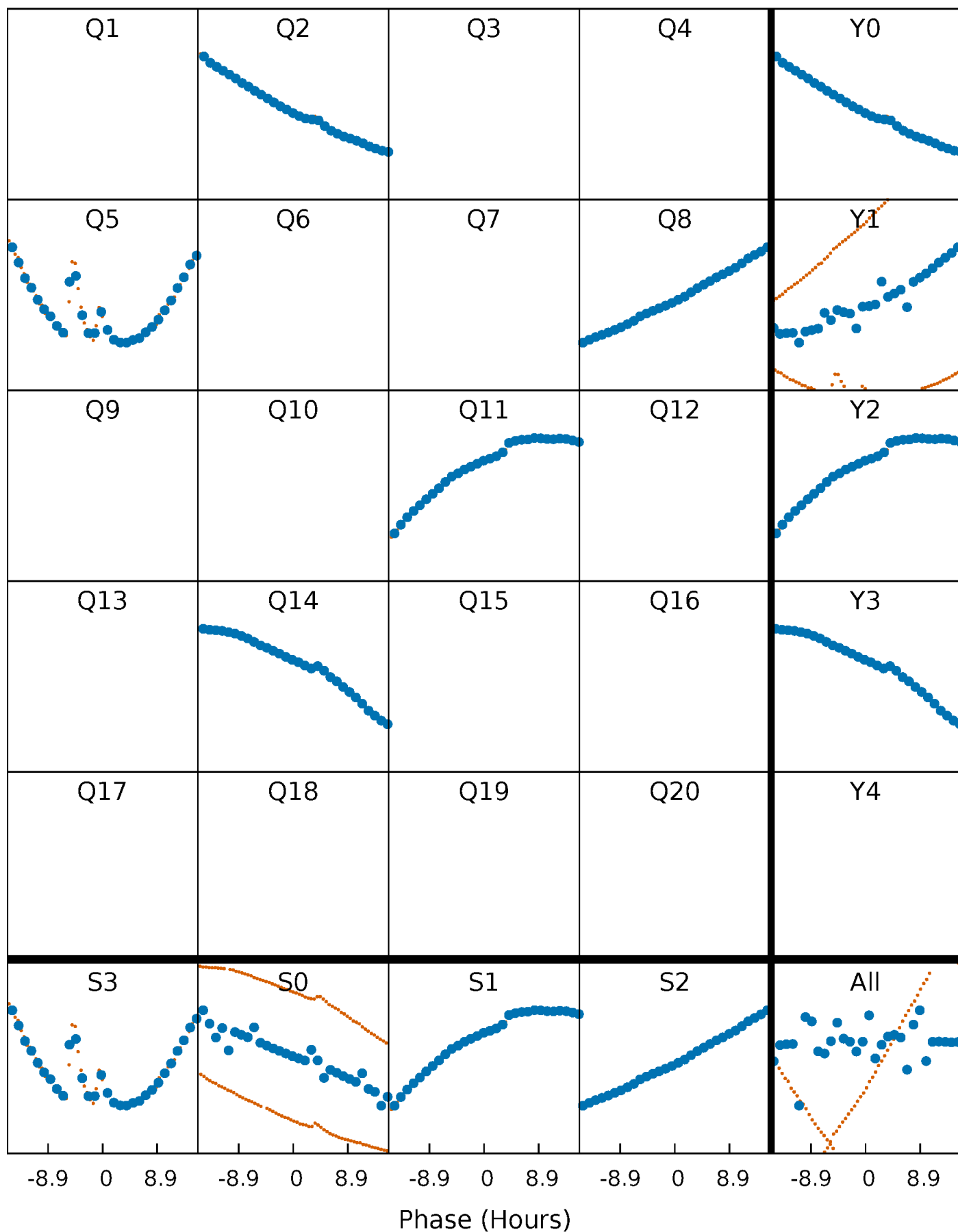


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



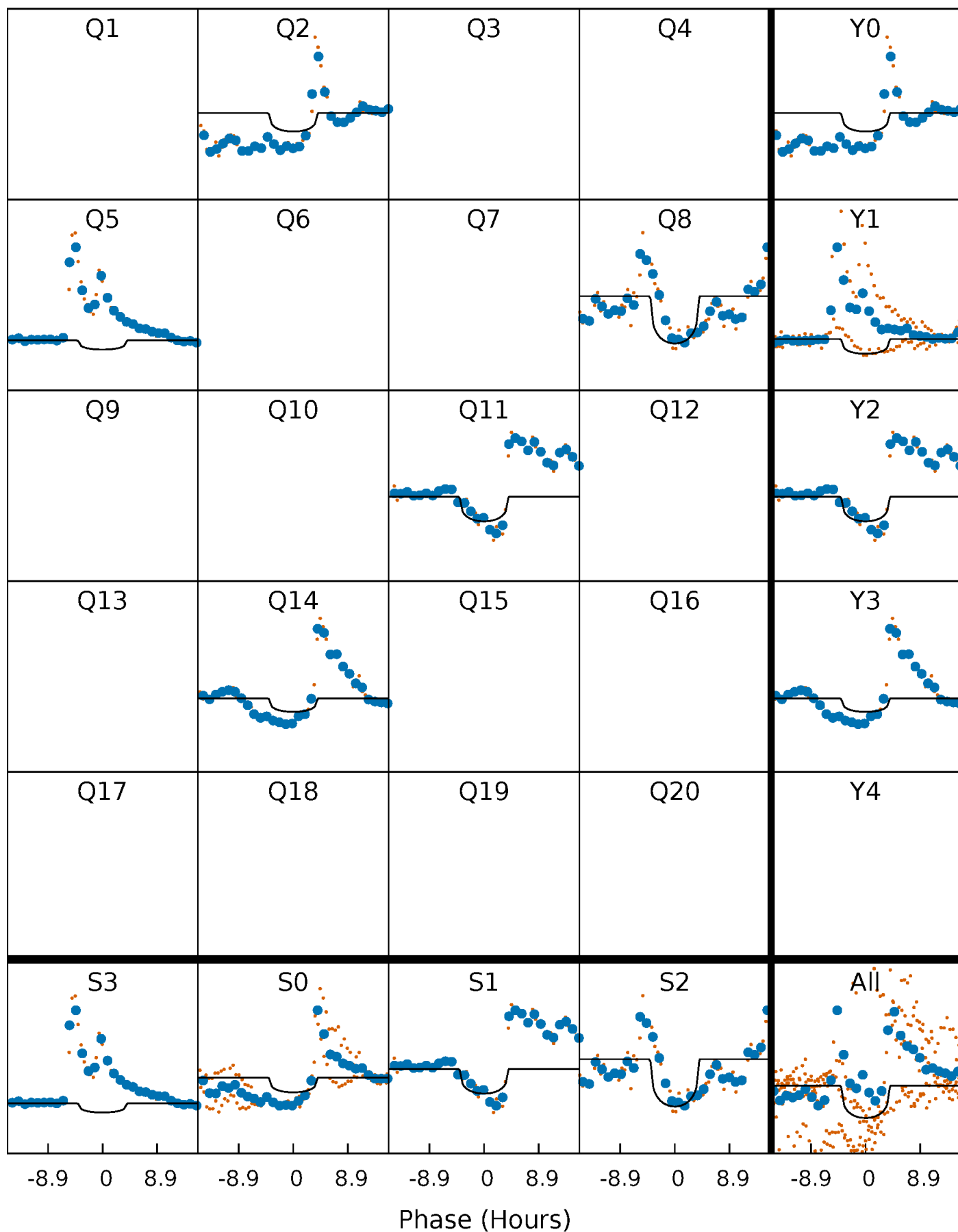
PDC Quarter-Phased Transit Curves

TCE 005181824-04 P=268.871868 Days $T_0=250.882479$ (BKJD)



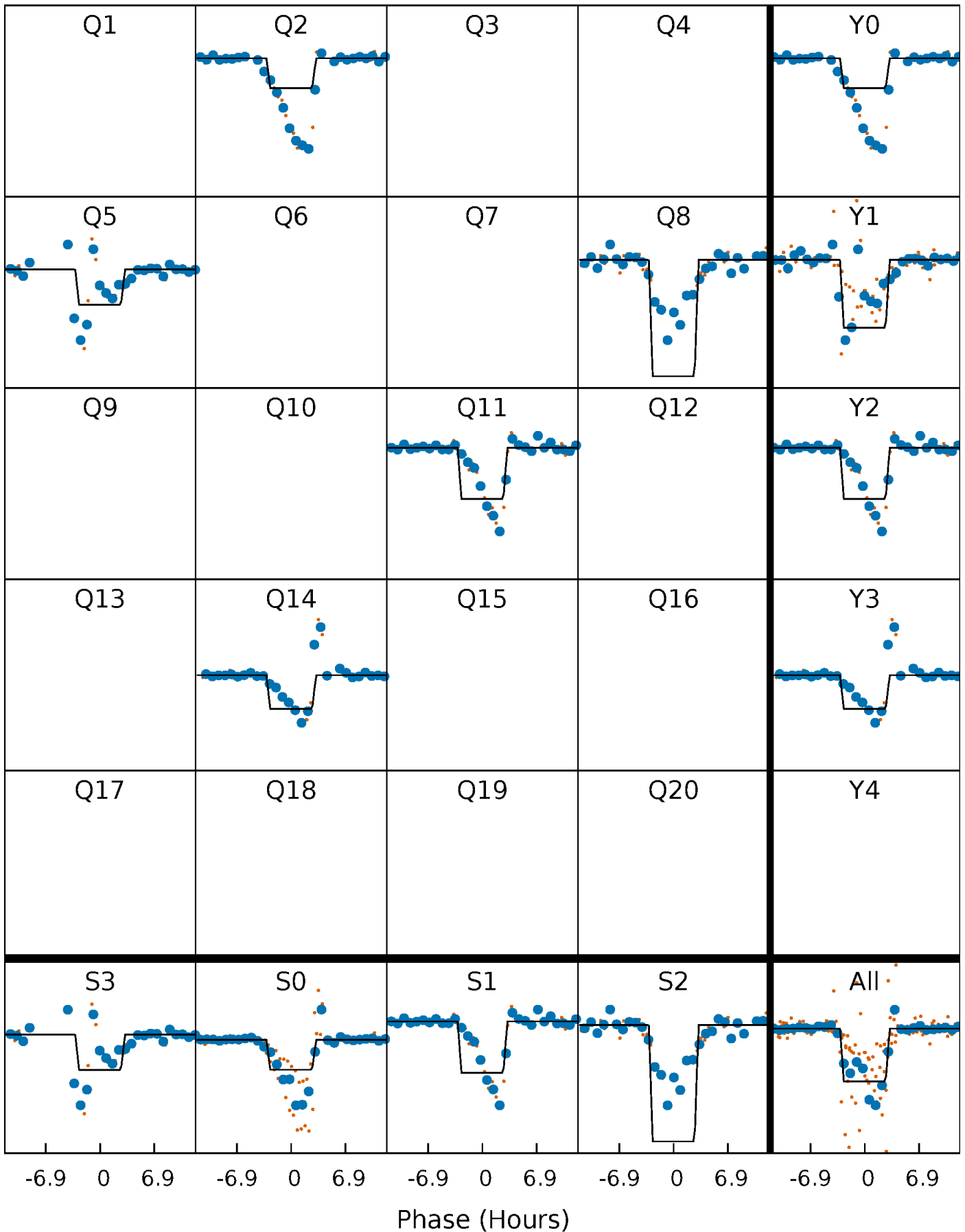
DV Quarter-Phased Transit Curves

TCE 005181824-04 P=268.871868 Days $T_0=250.882479$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

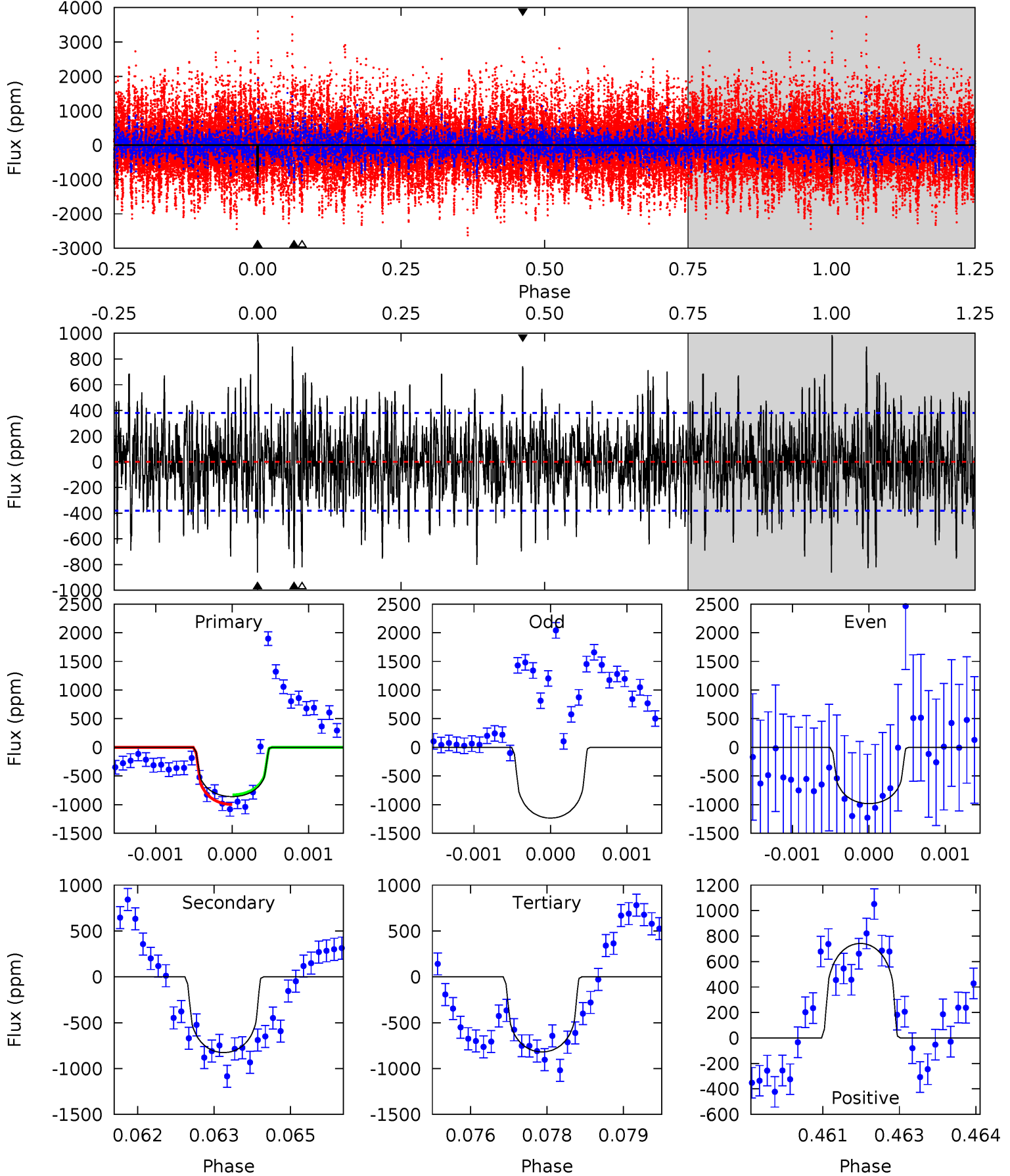
TCE 005181824-04 $P=268.878405$ Days $T_0=250.895200$ (BKJD)



DV Model-Shift Uniqueness Test

005181824-04, P = 268.871868 Days, E = 250.882479 Days

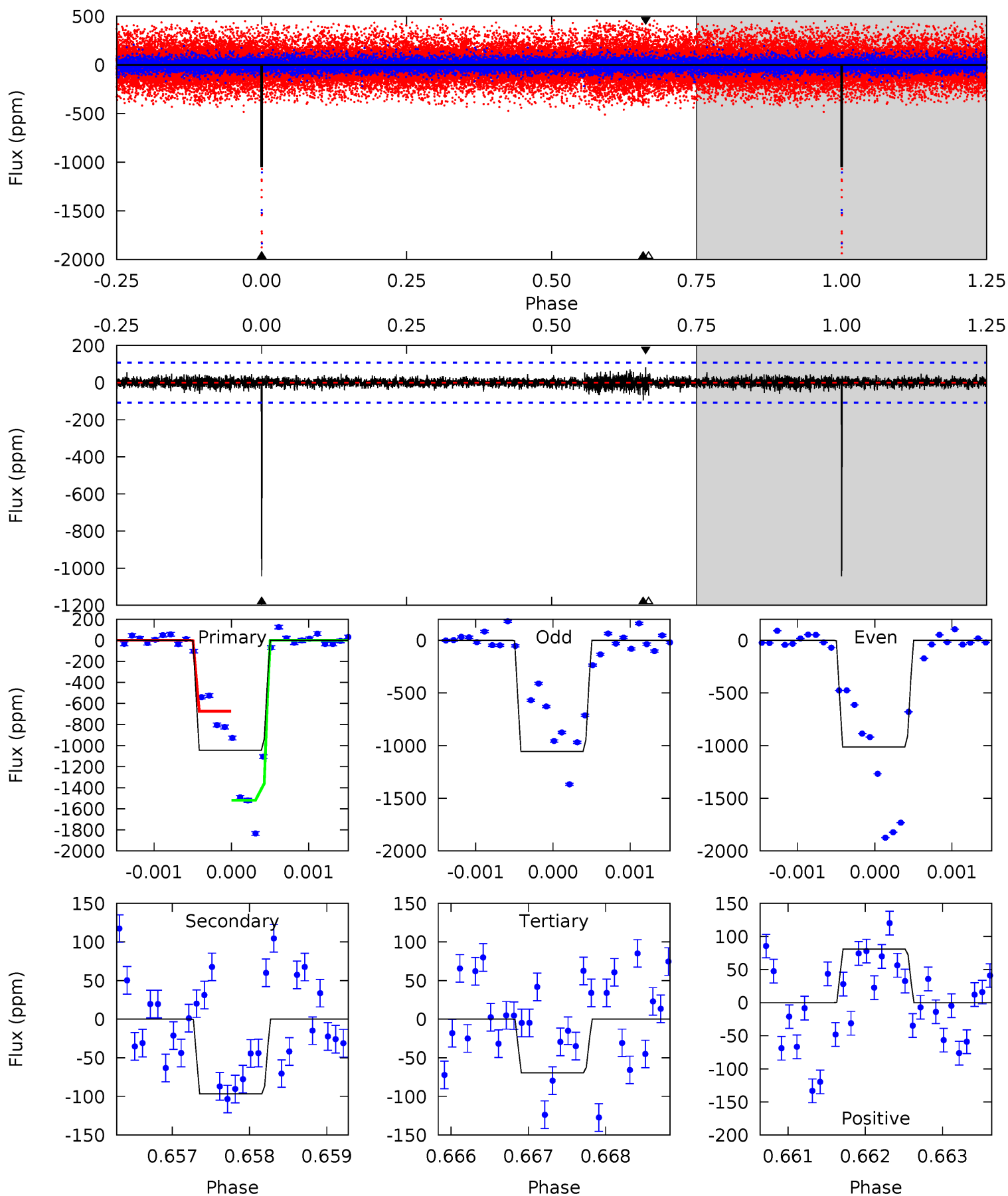
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	11.7	11.6	10.6	5.41	3.22	3.27	0.59	1.68	0.11	1.19	1.70	-0.01	0.53	1.18



Alt Model-Shift Uniqueness Test

005181824-04, P = 268.878405 Days, E = 250.895200 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.9	4.90	3.52	4.09	5.45	3.29	0.71	49.4	48.8	1.38	0.81	1.02	1.23	0.07	21.6



Stellar Parameters For KIC 005181824

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5011^{+125}_{-112}	$3.321^{+0.385}_{-0.315}$	$-0.460^{+0.300}_{-0.250}$	$3.324^{+1.925}_{-1.444}$	$0.843^{+0.280}_{-0.186}$	$0.032^{+0.102}_{-0.023}$
	+2%/-2%	+12%/-9%	+65%/-54%	+58%/-43%	+33%/-22%	+314%/-71%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 005181824-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-826 ± 70	$10.55^{+9.77}_{-6.64}$	642^{+96}_{-81}	4981^{+2891}_{-1009}	2501^{+14331}_{-1829}
Alt.	-97 ± 20	$13.74^{+10.37}_{-7.95}$	643^{+88}_{-75}	3112^{+1014}_{-387}	169^{+797}_{-115}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

DV Centroid Data

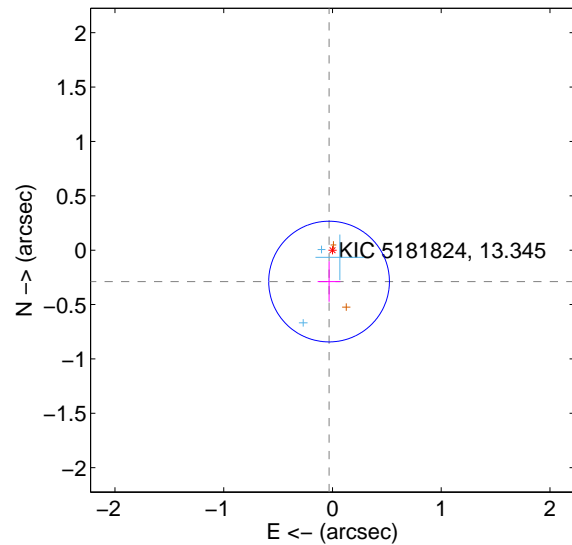
Supplemental centroid analysis for 005181824-04. Kepler magnitude: 13.35. Transit SNR 5.08

There are 3 quarters with good PRF difference image offsets

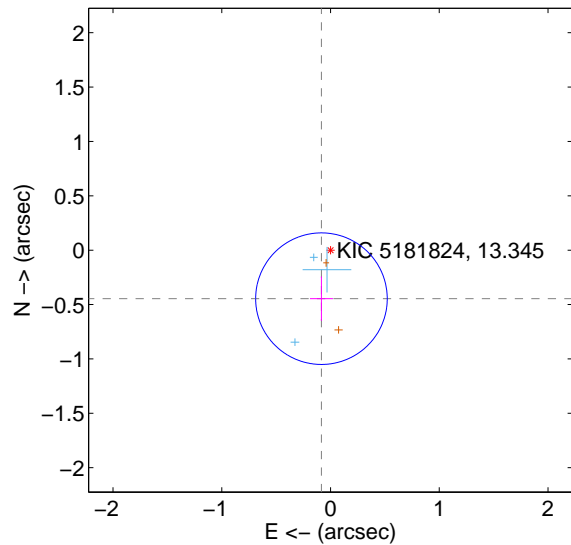
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.290 ± 0.185	1.57	0.031 ± 0.105	-0.289 ± 0.186
PRF-fit source offset from KIC position	0.454 ± 0.202	2.25	0.083 ± 0.105	-0.446 ± 0.204
photometric centroid source offset	0.17 ± 0.56	0.31	-0.17 ± 0.57	-0.05 ± 0.46

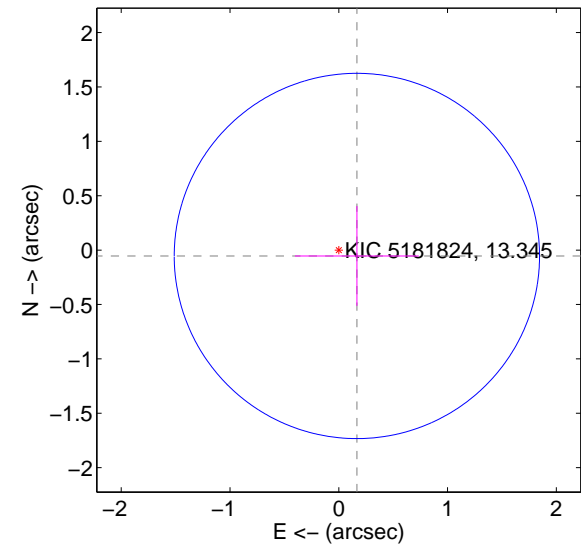
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

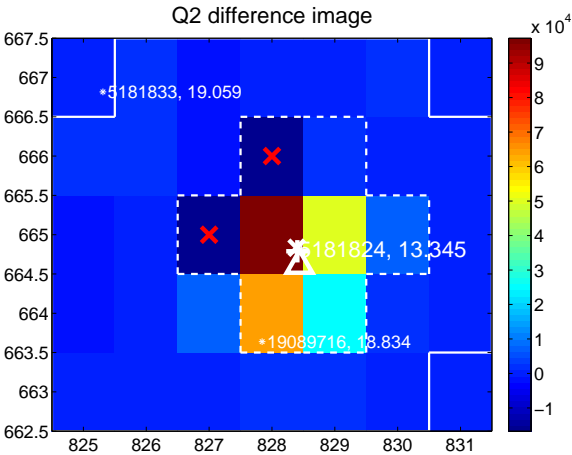
Q1 no difference image



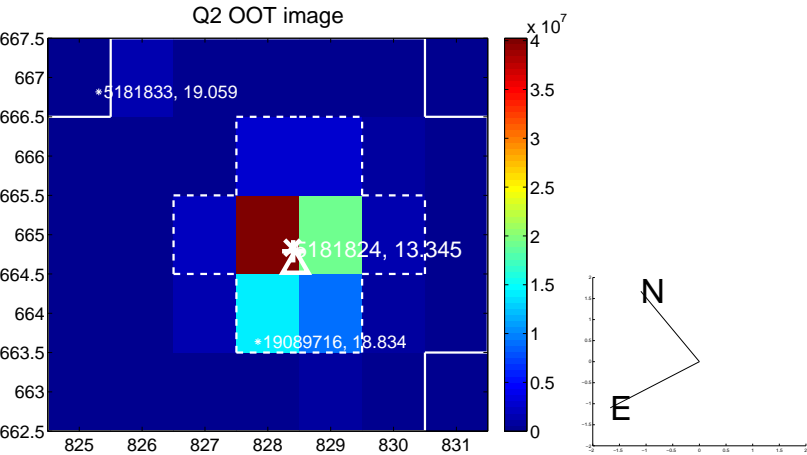
Q1 no OOT image



Q2 difference image



Q2 OOT image



Q3 no difference image



Q3 no OOT image



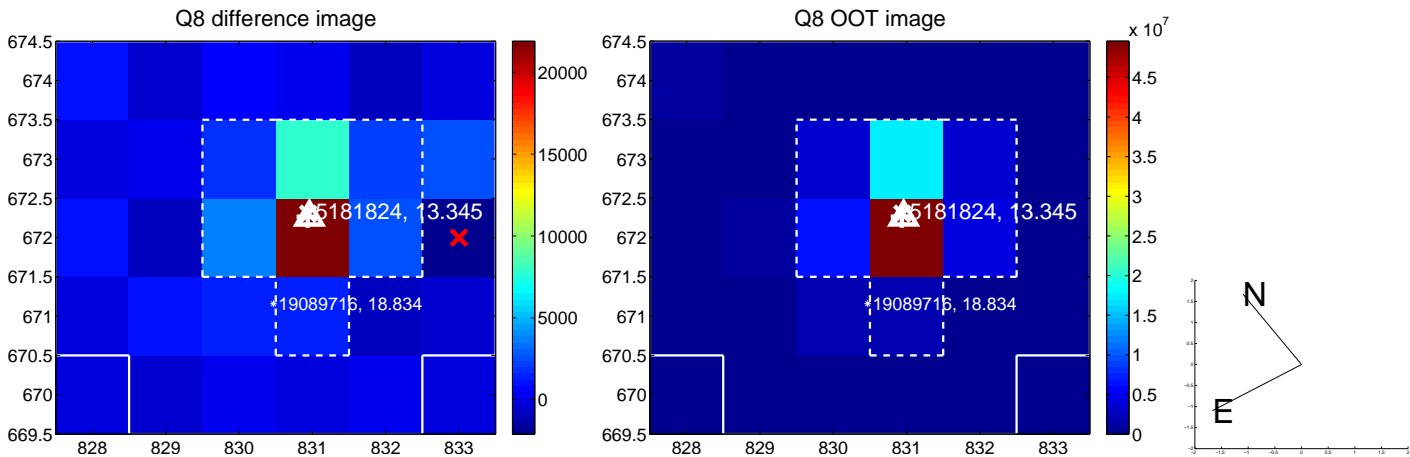
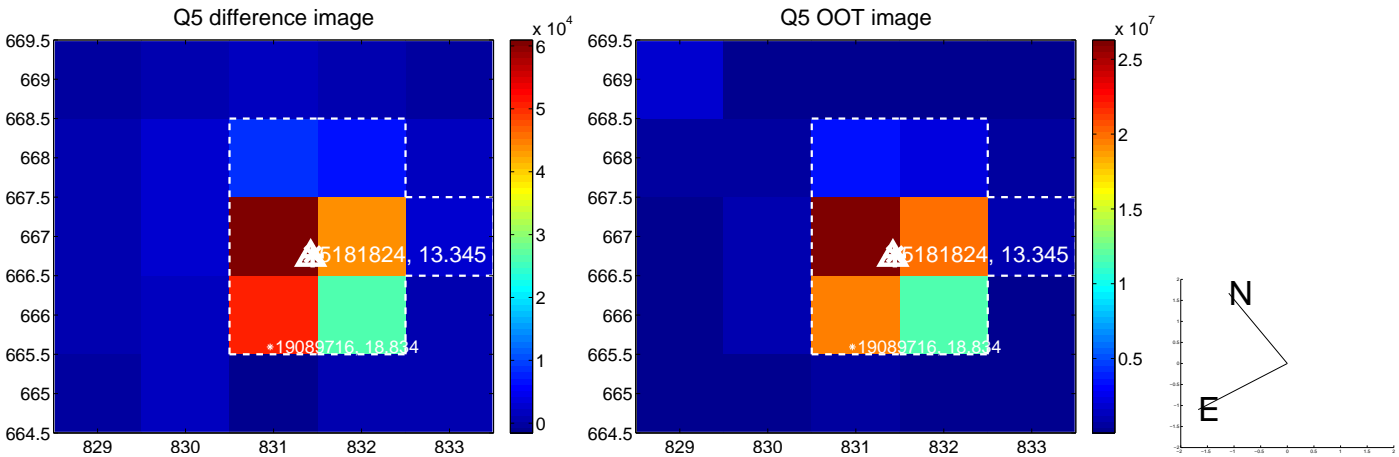
Q4 no difference image



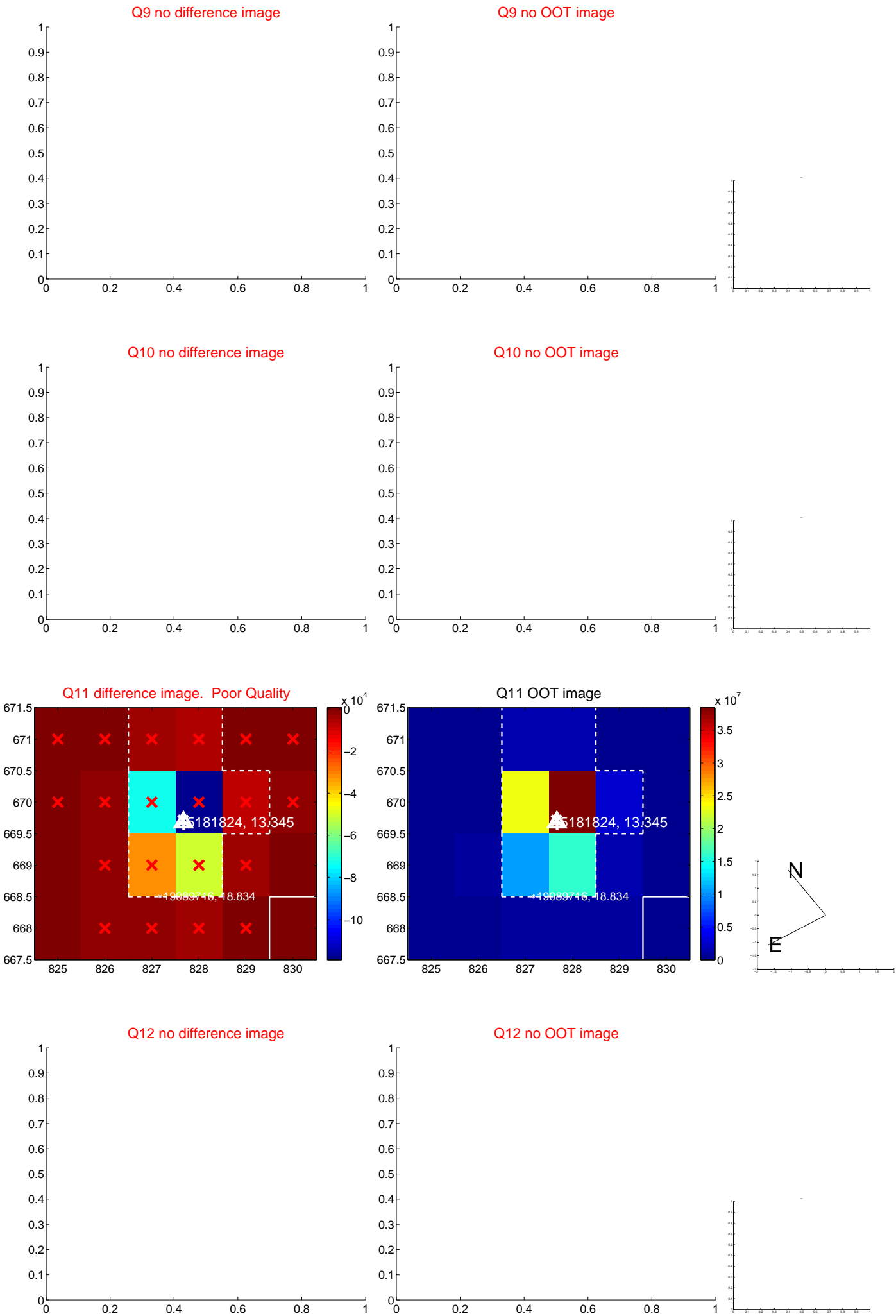
Q4 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

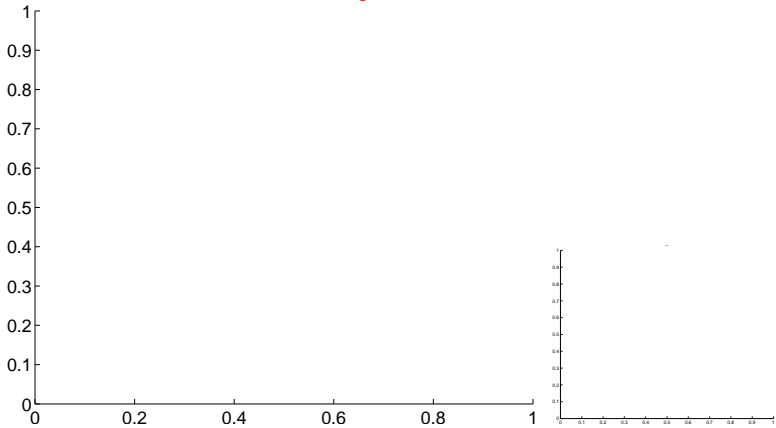


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

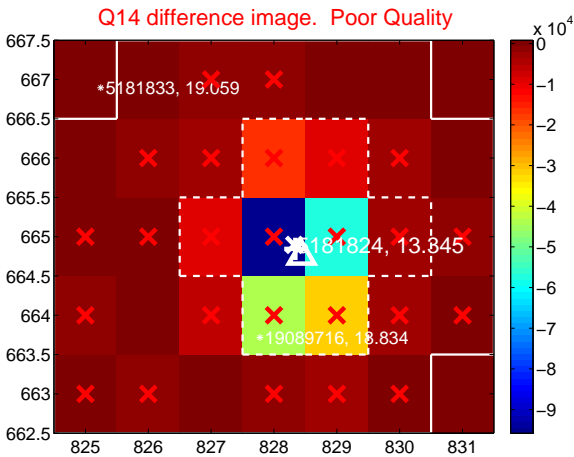
Q13 no difference image



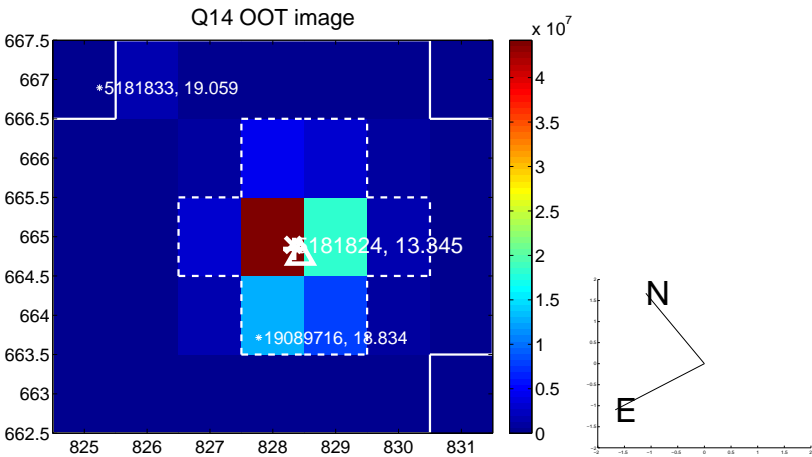
Q13 no OOT image



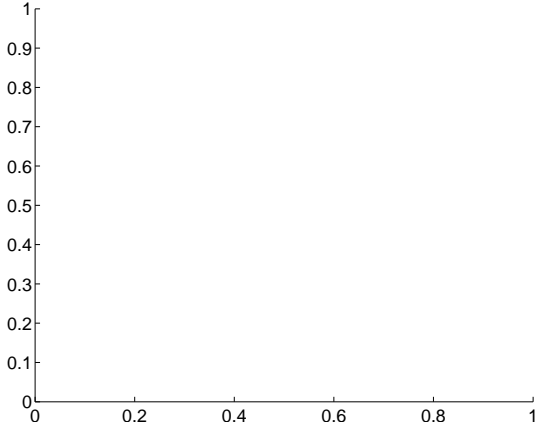
Q14 difference image. Poor Quality



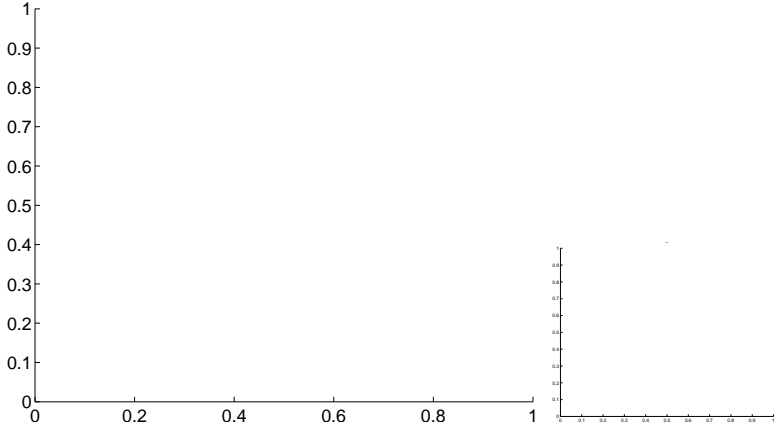
Q14 OOT image



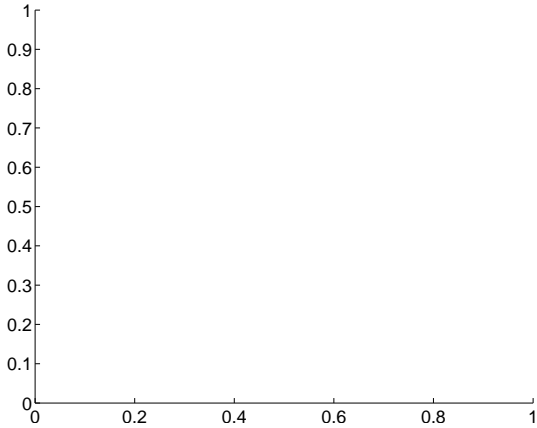
Q15 no difference image



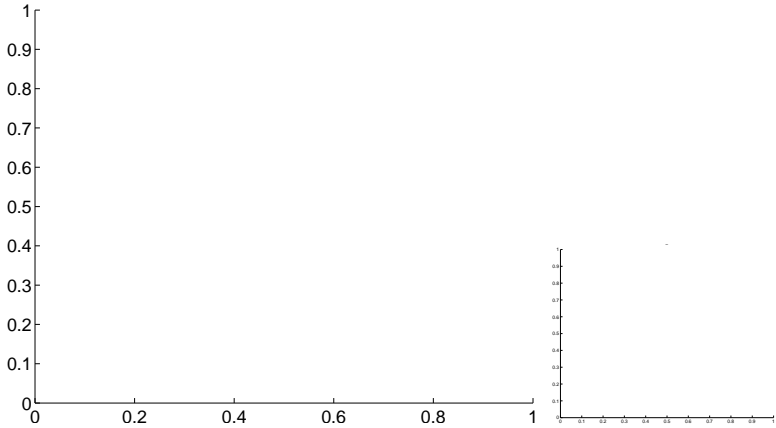
Q15 no OOT image



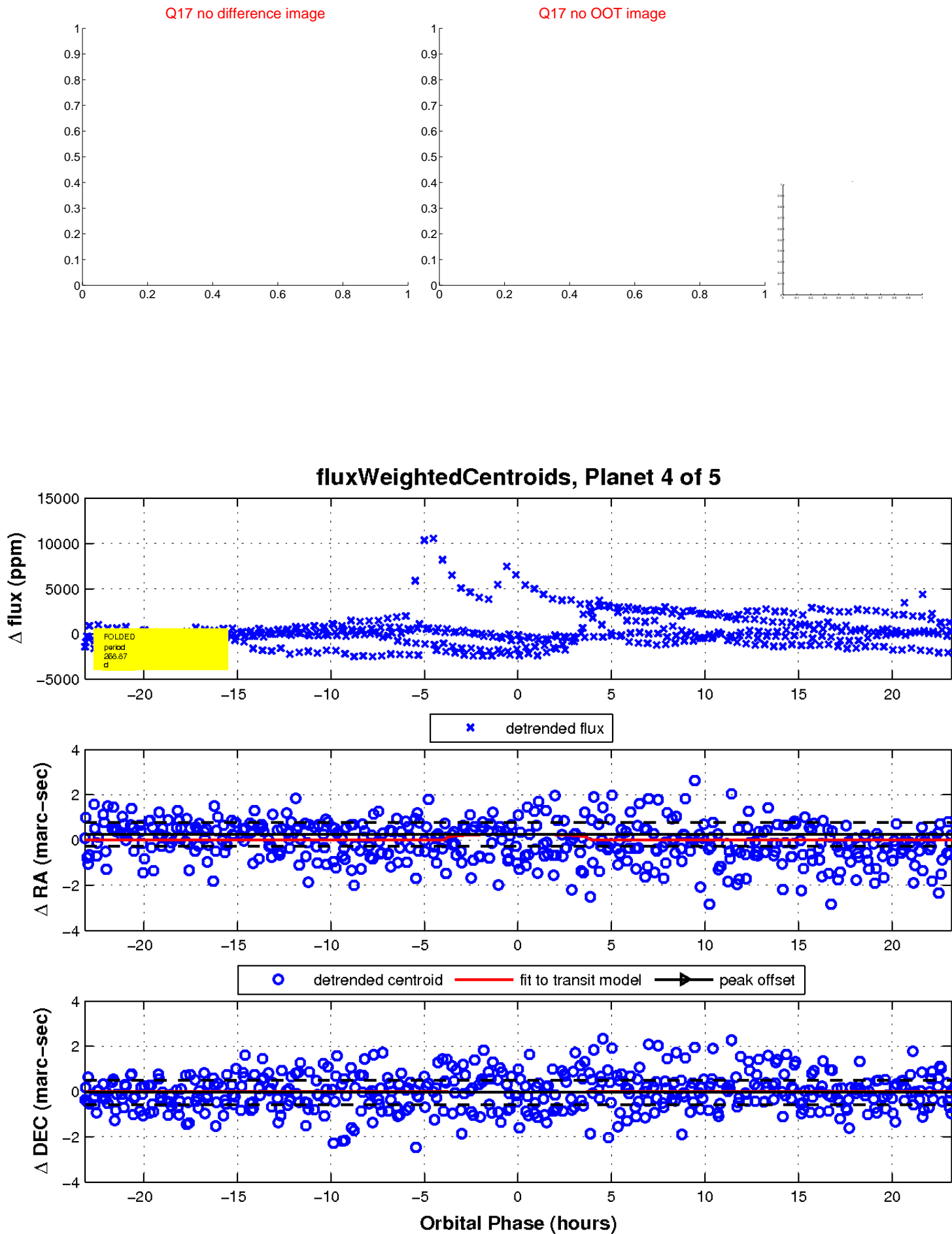
Q16 no difference image



Q16 no OOT image



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

