

KIC 008610168

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})
008610168-01	OBS	No	409.589252	357.868320	1425.6	3.807	15.4	8.1	1.85	5412	7.00	2.33
008610168-02	OBS	No	405.022761	168.377012	1518.4	5.004	17.4	8.6	1.85	5412	9.29	2.36
008610168-03	OBS	No	591.159036	332.235906	1263.9	6.057	19.7	5.5	1.85	5412	12.94	1.43
008610168-04	OBS	No	382.849991	454.276102	669.1	6.000	14.8	-1.0	1.85	5412	4.72	2.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008610168-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-02	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—CENT_FEW_DIFFS
008610168-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

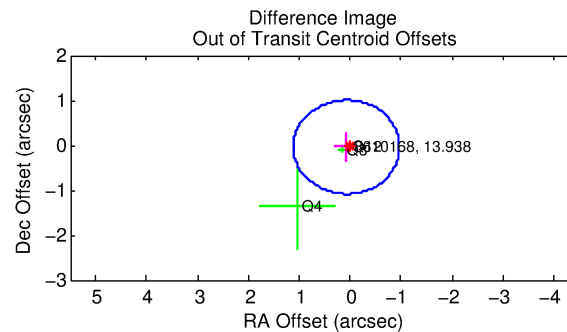
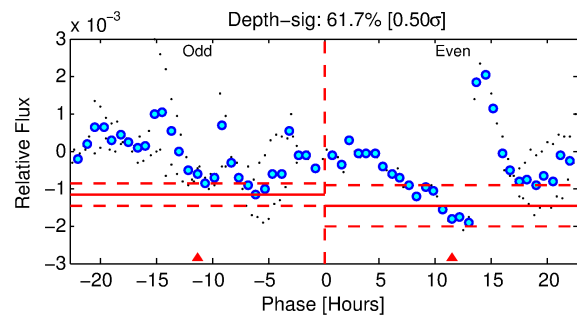
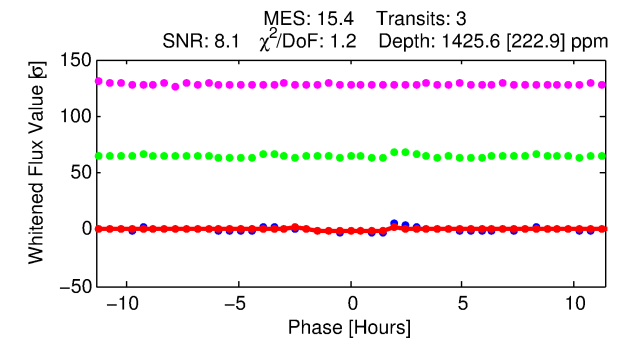
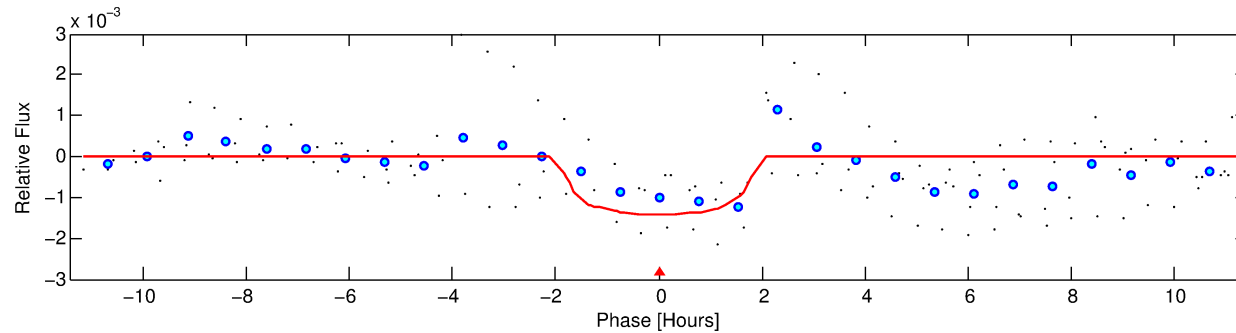
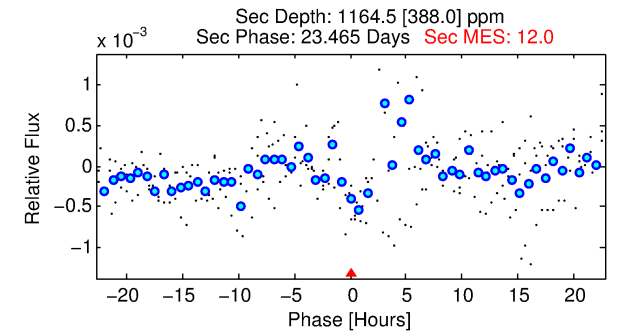
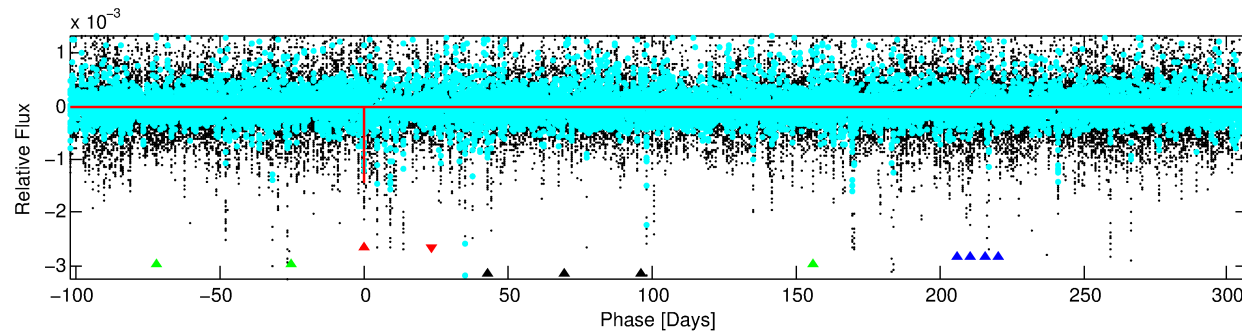
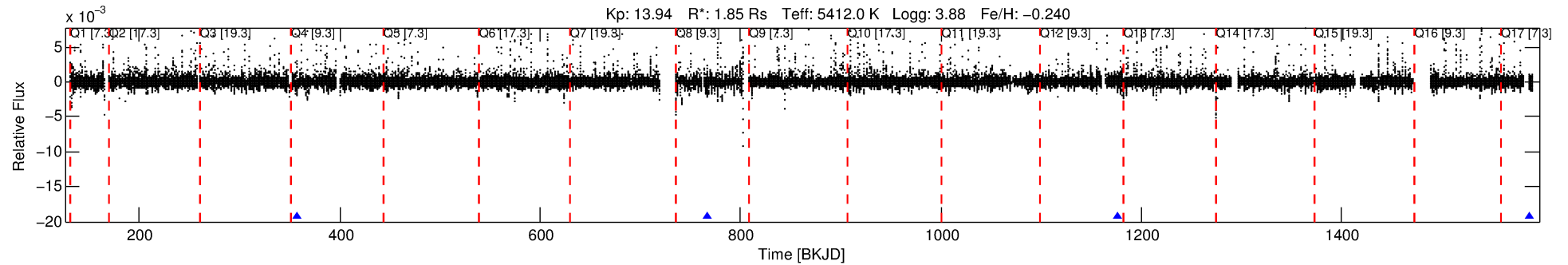
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008610168-01

No Significant Match Found

DV One-Page Summary

KIC: 8610168 Candidate: 1 of 4 Period: 409.589 d



DV Fit Results:

Period = 409.58925 [0.00380] d
Epoch = 357.8683 [0.0057] BKJD
Rp/R* = 0.0346 [0.0368]
a/R* = 799.65 [3357.82]
b = 0.35 [10.55]
Seff = 2.33 [2.55]
Teq = 315 [86] K
Rp = 7.00 [8.50] Re
a = 1.0658 [0.6831] AU
Ag = 14853.78 [35791.84] [0.41 σ]
Teffp = 5375 [2895] K [1.75 σ]

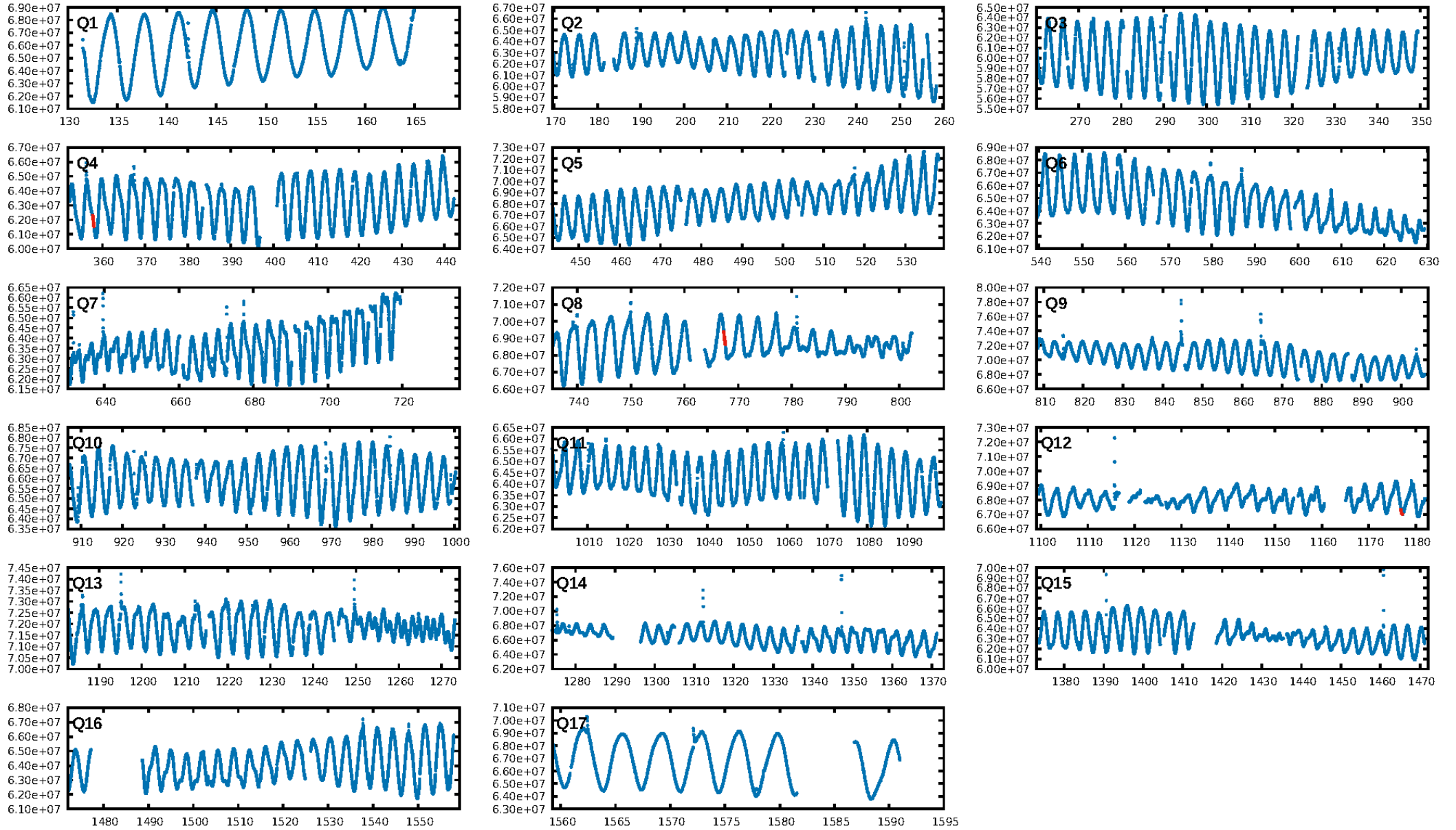
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.43 σ]
LongPeriod-sig: 100.0% [609.12 σ]
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 87.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.094
Centroid-sig: 18.3%
Centroid-so: 0.357 arcsec [0.92 σ]
OotOffset-rm: 0.085 arcsec [0.24 σ]
OotOffset-st: 0/0/3/0 [3]
KicOffset-rm: 0.089 arcsec [0.34 σ]
KicOffset-st: 0/0/3/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

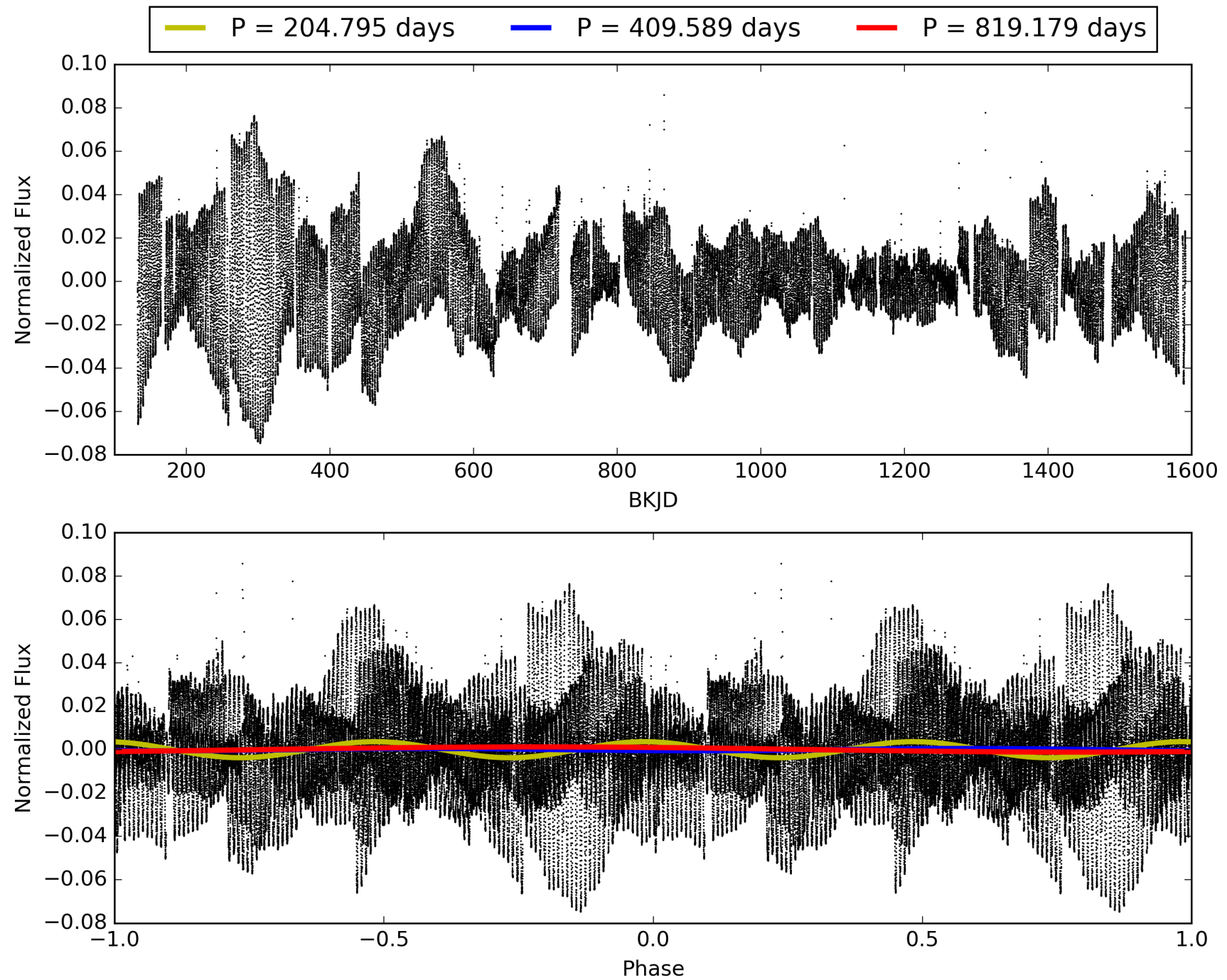
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:30:00 Z

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

TCE 008610168-01, PDC Light Curves

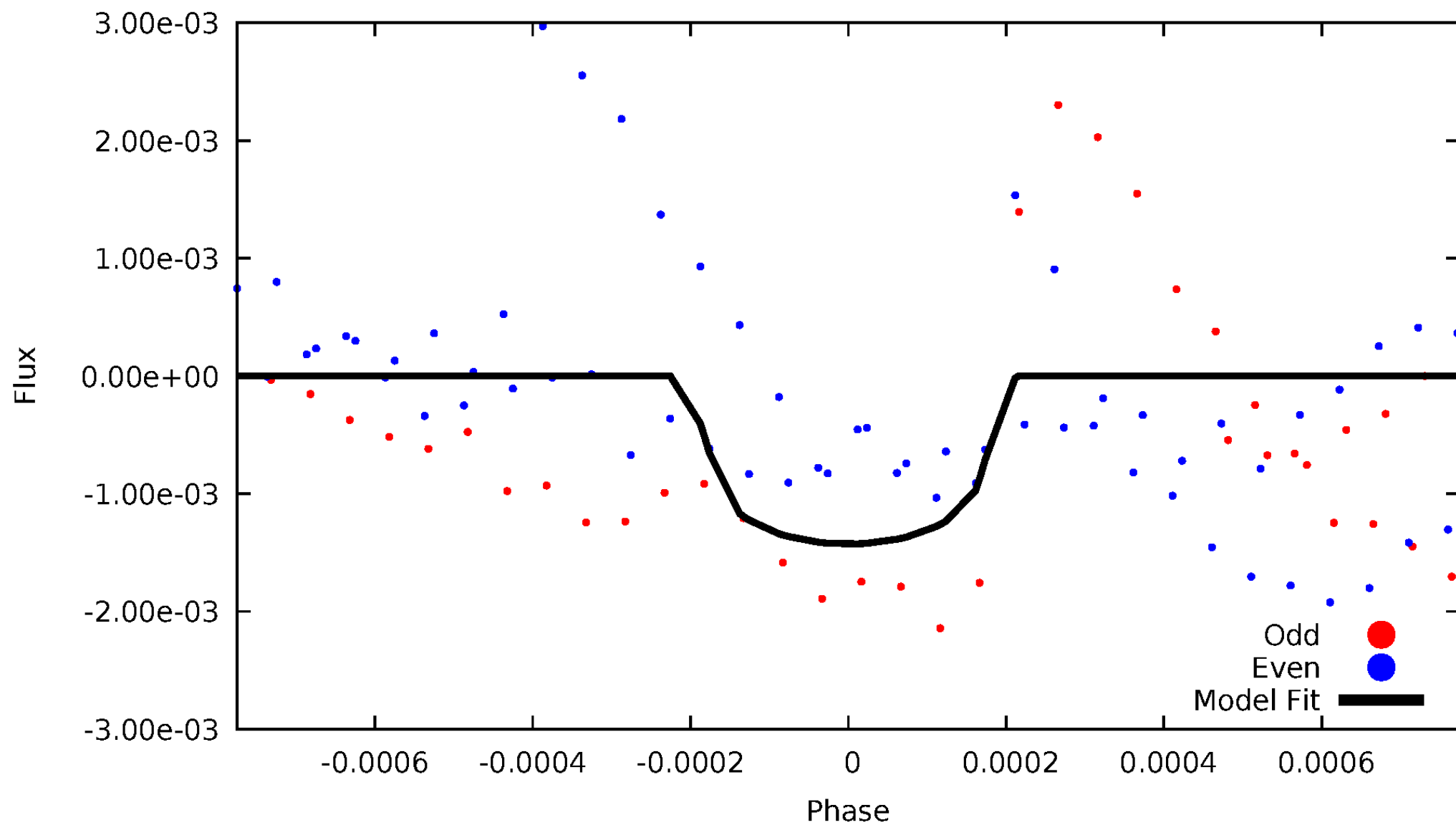


TCE 008610168-01



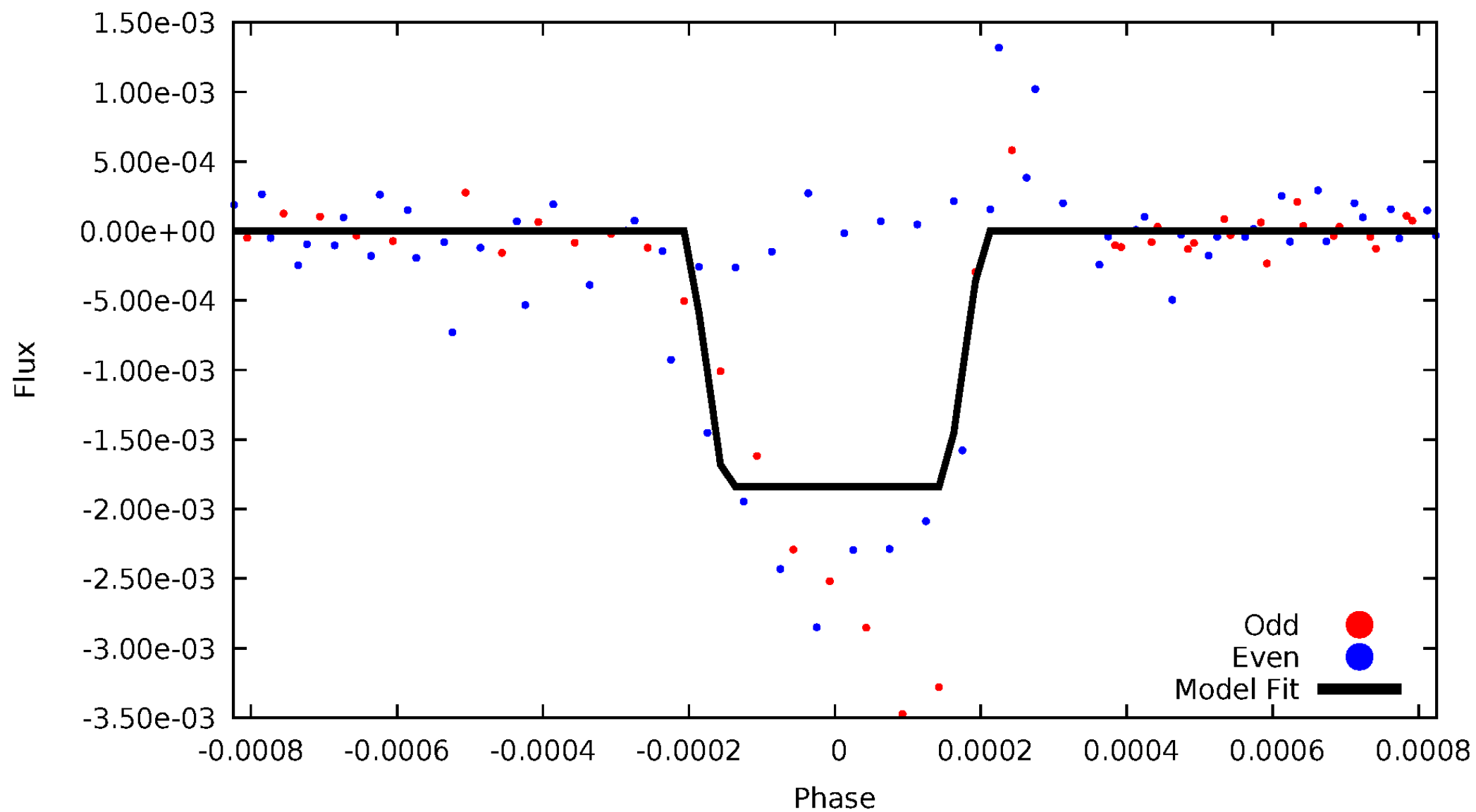
DV Odd/Even

TCE 008610168-01



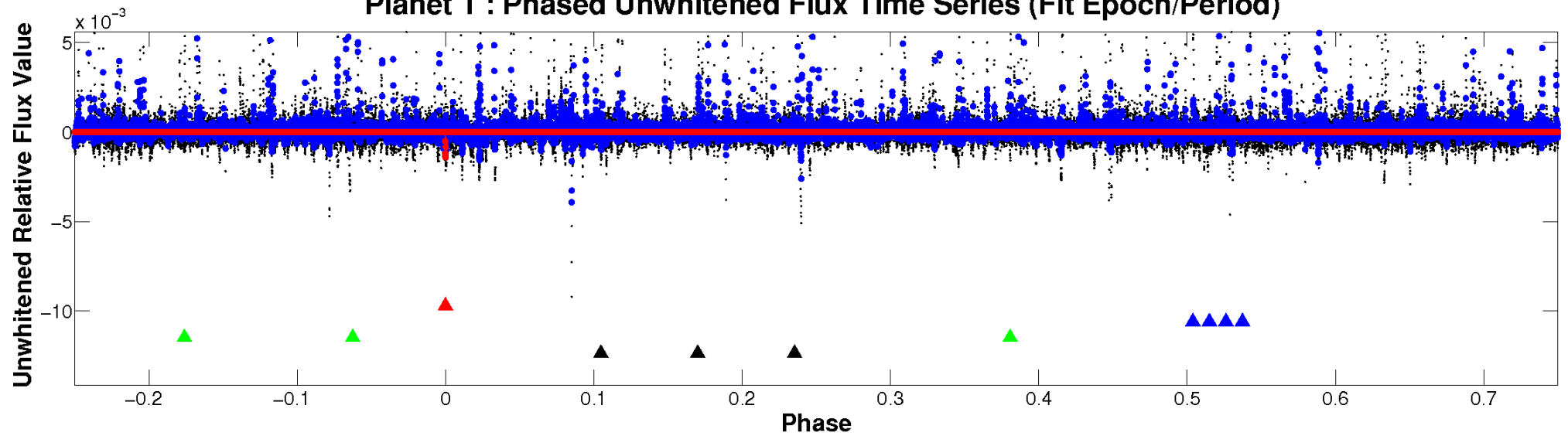
ALT Odd/Even

TCE 008610168-01

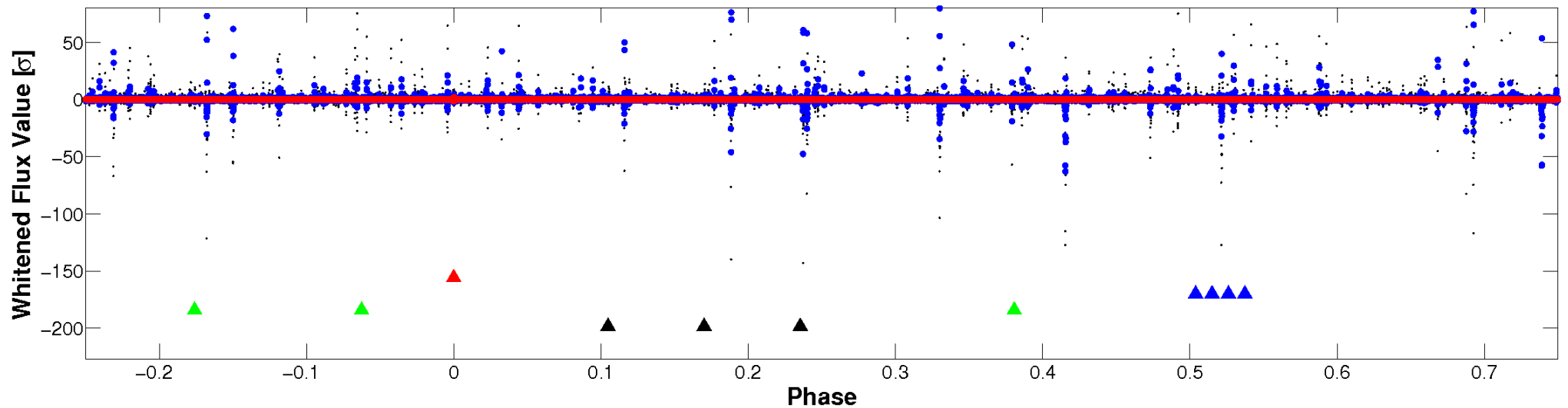


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

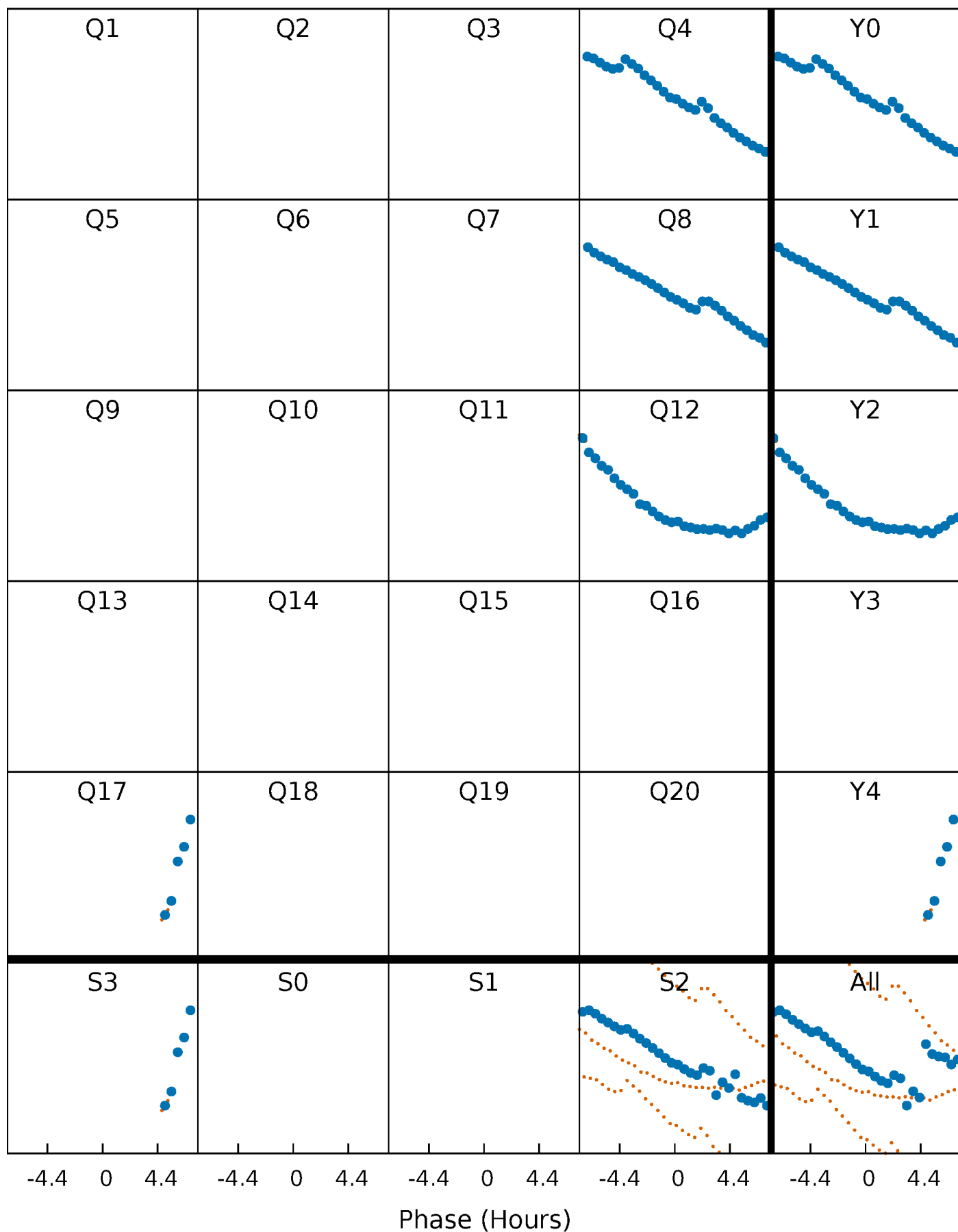


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



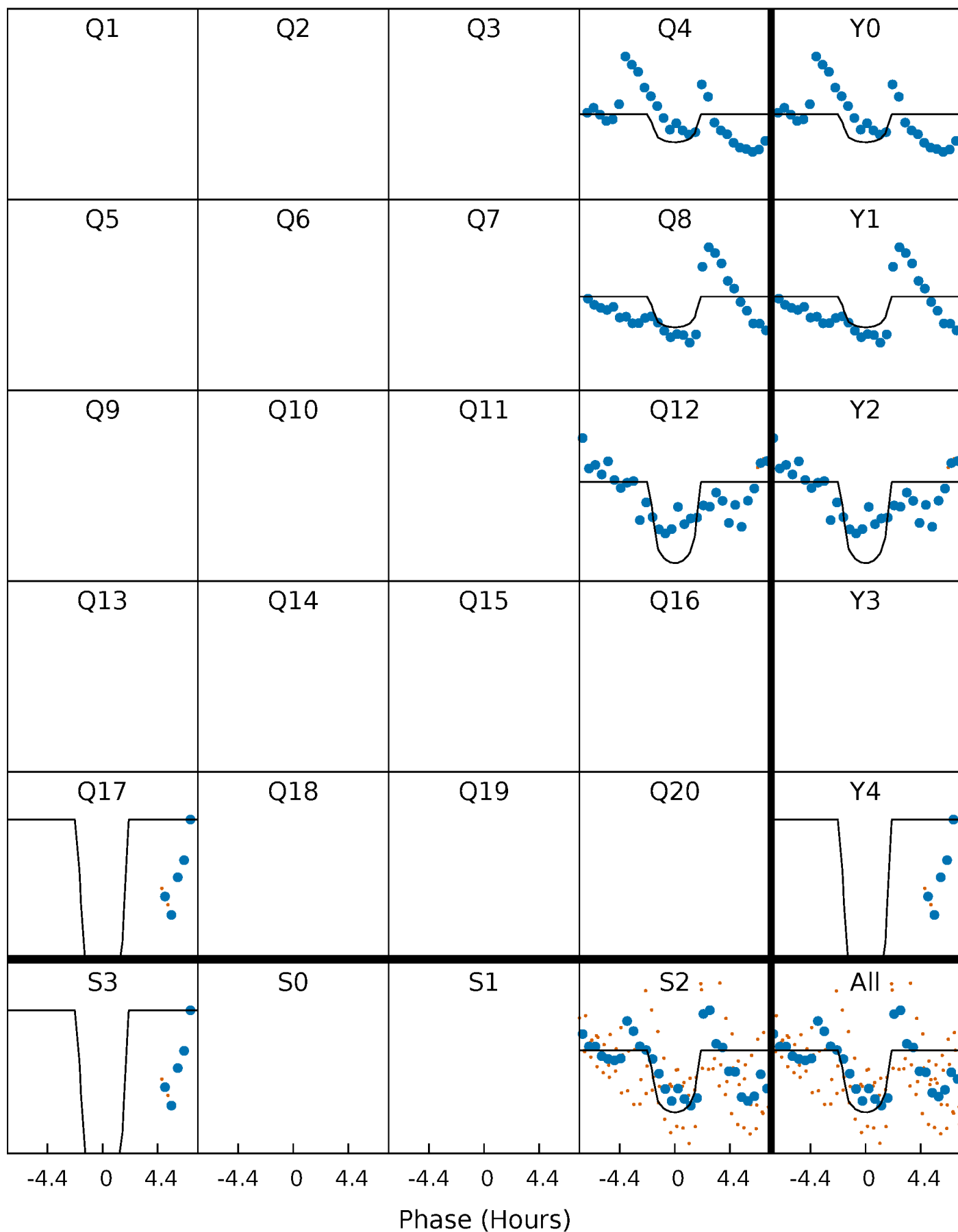
PDC Quarter-Phased Transit Curves

TCE 008610168-01 P=409.589252 Days $T_0=357.868320$ (BKJD)



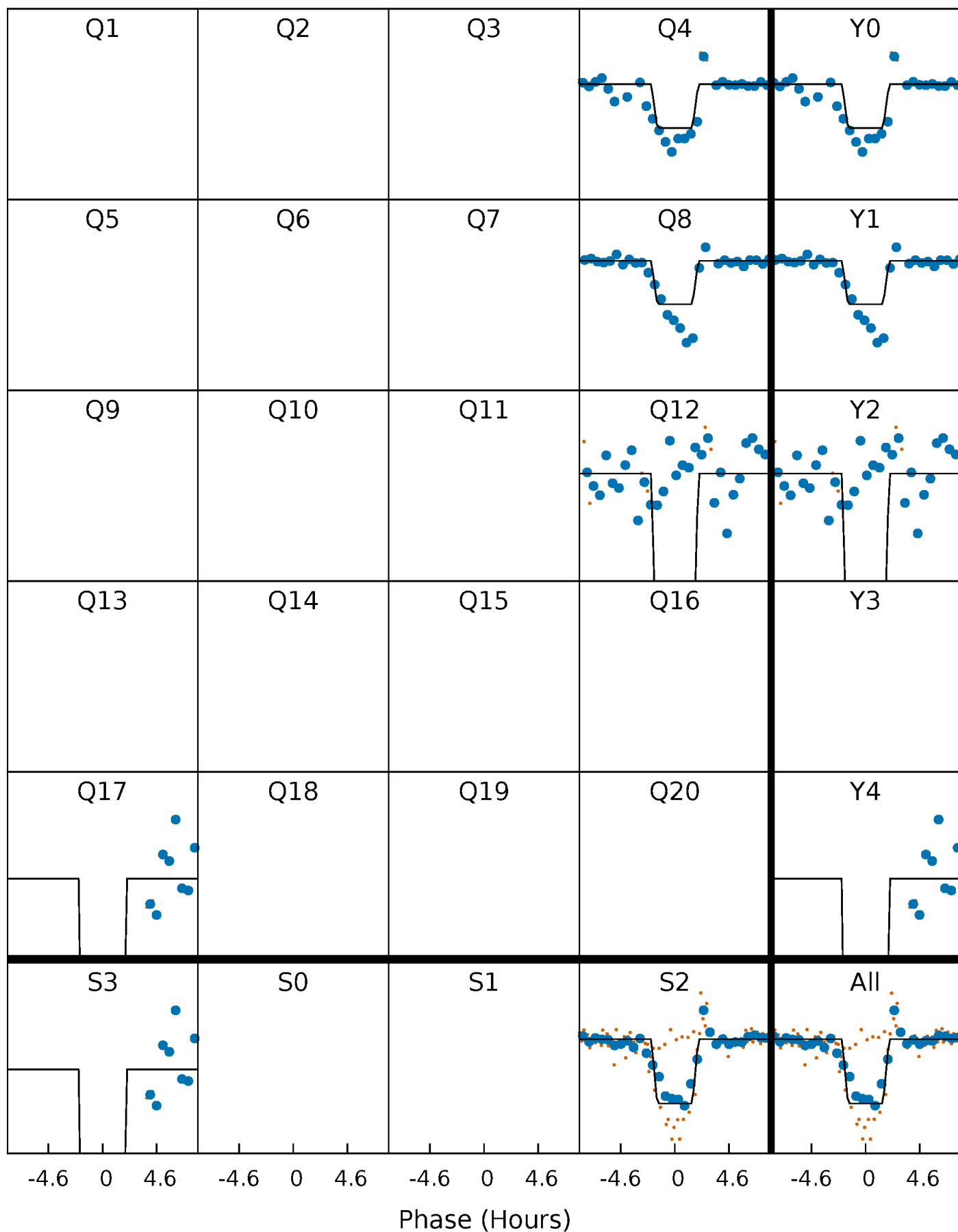
DV Quarter-Phased Transit Curves

TCE 008610168-01 P=409.589252 Days $T_0=357.868320$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

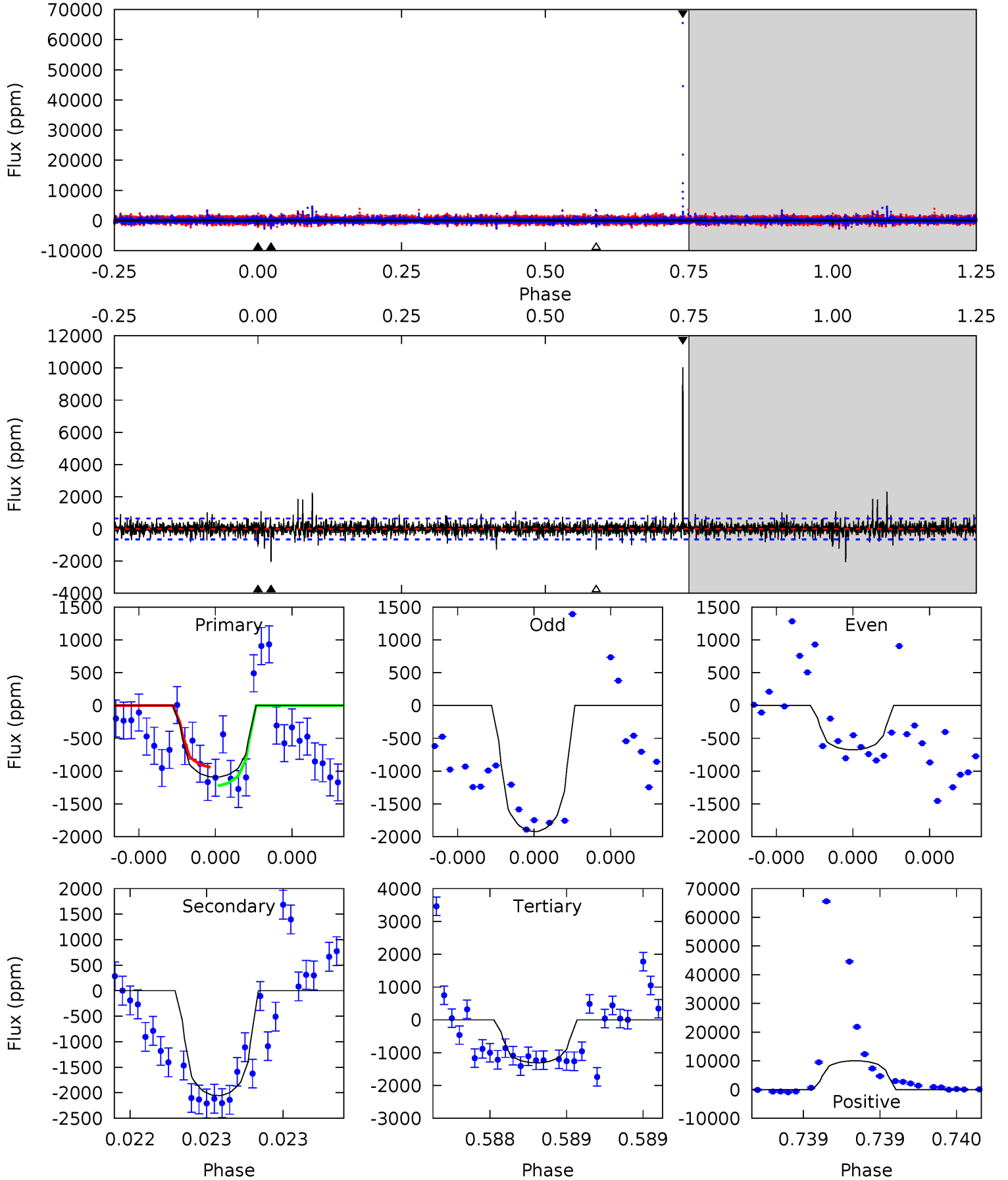
TCE 008610168-01 P=409.604333 Days $T_0=357.862943$ (BKJD)



DV Model-Shift Uniqueness Test

008610168-01, P = 409.589252 Days, E = 357.868320 Days

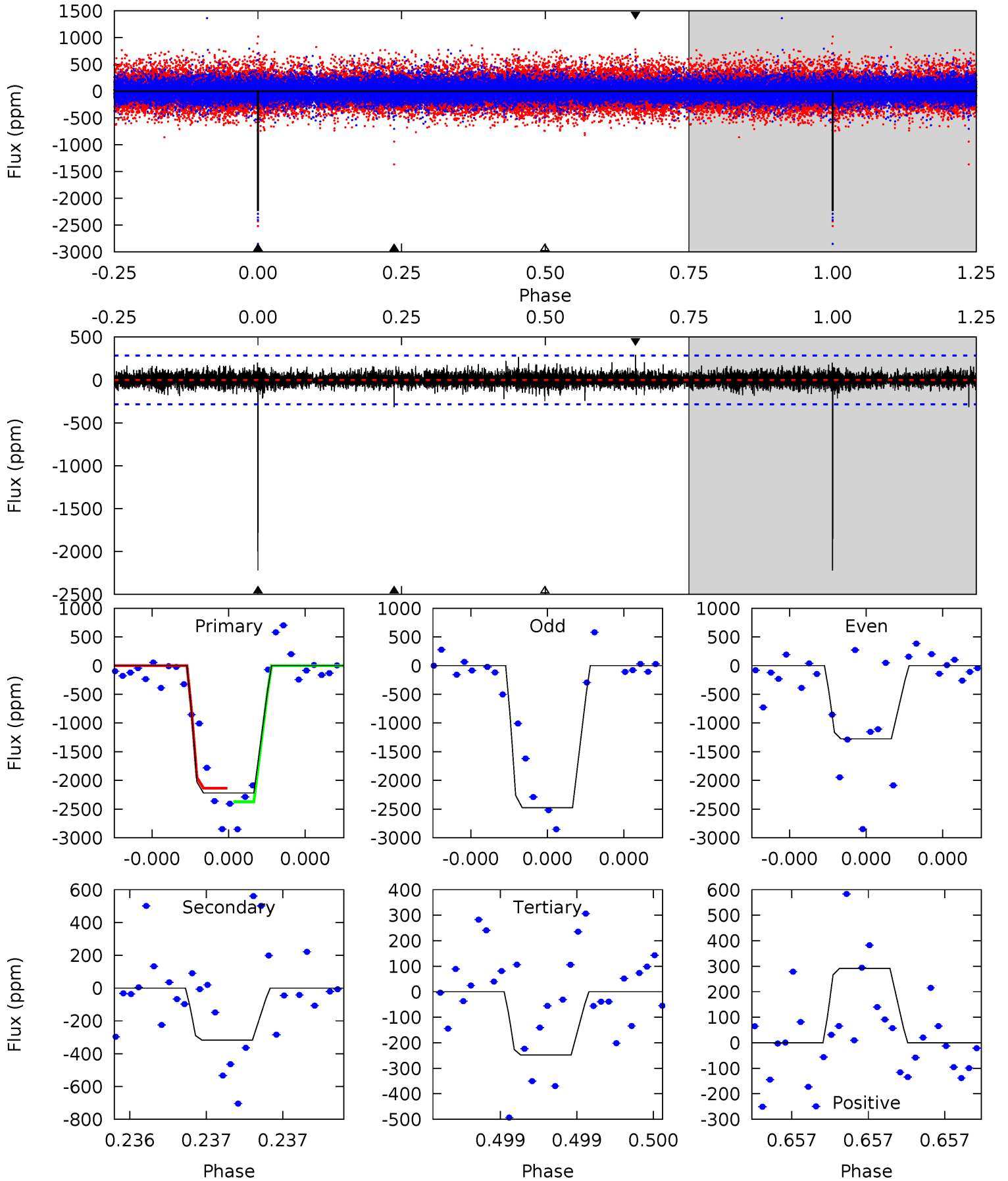
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.39	17.7	11.3	86.4	5.61	3.54	2.45	-1.87	-77.0	6.42	-68.7	2.97	1.34	0.83	1.20



Alt Model-Shift Uniqueness Test

008610168-01, P = 409.604333 Days, E = 357.862943 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.8	6.26	4.89	5.75	5.62	3.55	0.87	38.9	38.0	1.36	0.50	13.5	0.68	0.12	2.20



Stellar Parameters For KIC 008610168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5412^{+178}_{-146}	$3.885^{+0.660}_{-0.220}$	$-0.240^{+0.350}_{-0.250}$	$1.854^{+0.819}_{-1.092}$	$0.961^{+0.143}_{-0.157}$	$0.213^{+1.795}_{-0.130}$
	+3%/-3%	+17%/-6%	+146%/-104%	+44%/-59%	+15%/-16%	+844%/-61%
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 008610168-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2055 ± 116	$7.39^{+7.48}_{-4.87}$	429^{+49}_{-71}	5677^{+4608}_{-1307}	$23701^{+186557}_{-18065}$
Alt.	-317 ± 51	$8.89^{+7.99}_{-5.57}$	431^{+51}_{-61}	3715^{+1448}_{-594}	2580^{+16062}_{-1853}

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 $A_{obs} \gg 1.0$

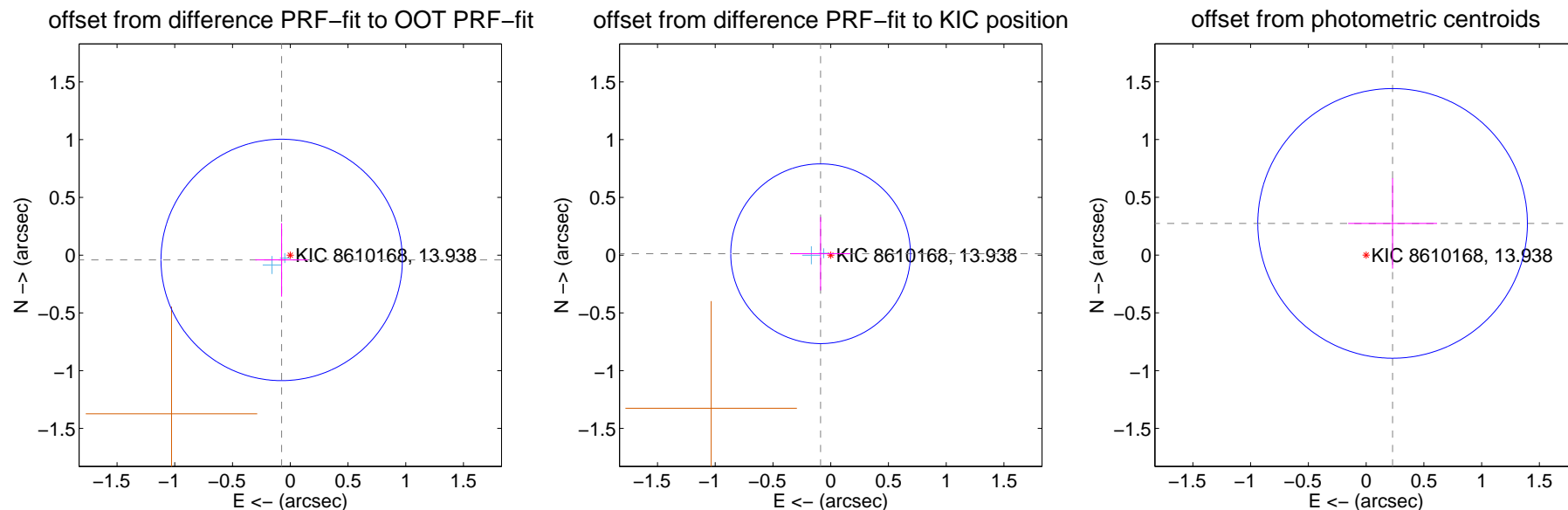
DV Centroid Data

Supplemental centroid analysis for 008610168-01. Kepler magnitude: 13.94. Transit SNR 8.08

There are 2 quarters with good PRF difference image offsets

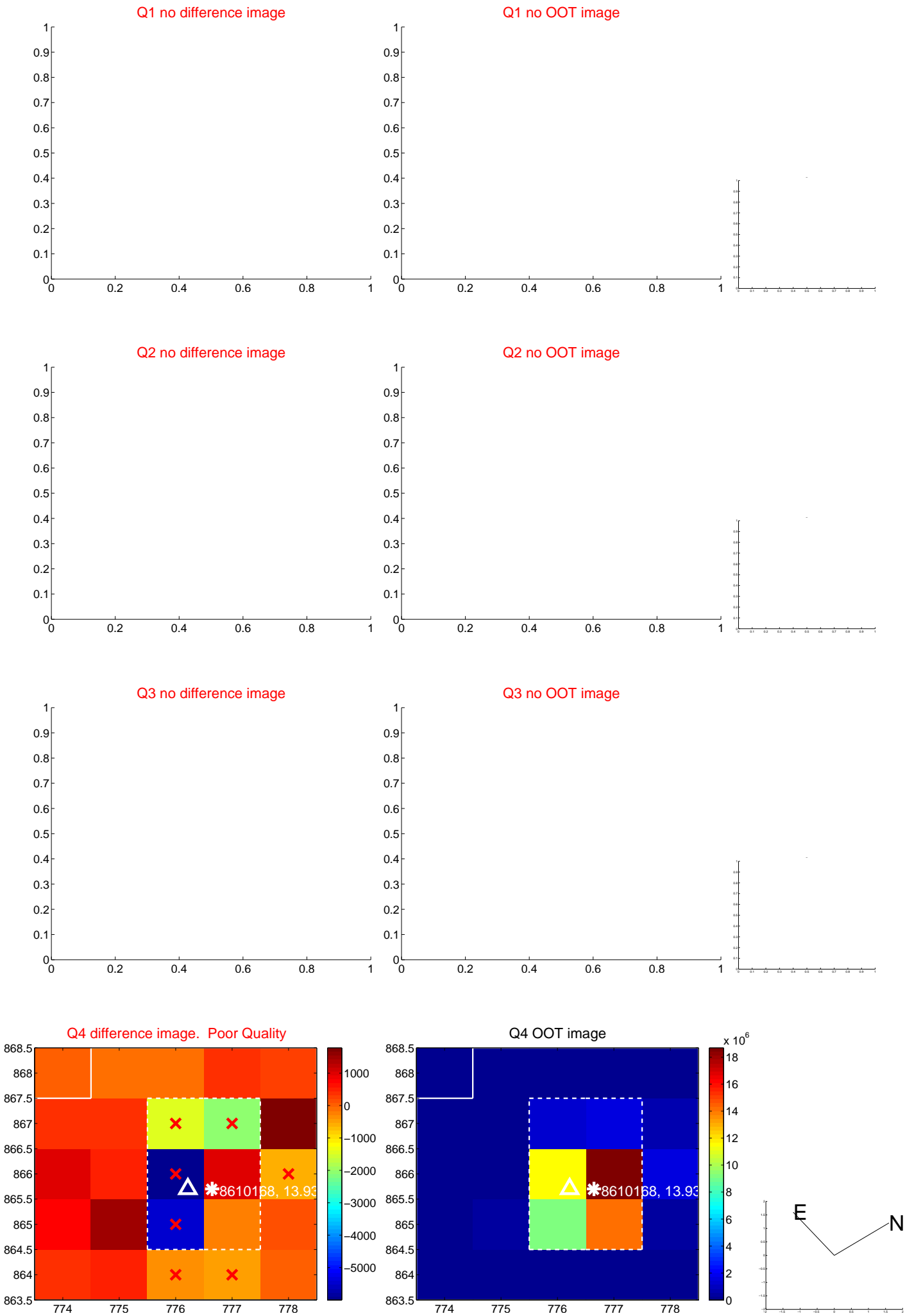
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.085 ± 0.348	0.24	0.074 ± 0.228	-0.041 ± 0.318
PRF-fit source offset from KIC position	0.089 ± 0.259	0.34	0.088 ± 0.258	0.012 ± 0.318
photometric centroid source offset	0.36 ± 0.39	0.92	-0.23 ± 0.38	0.27 ± 0.39

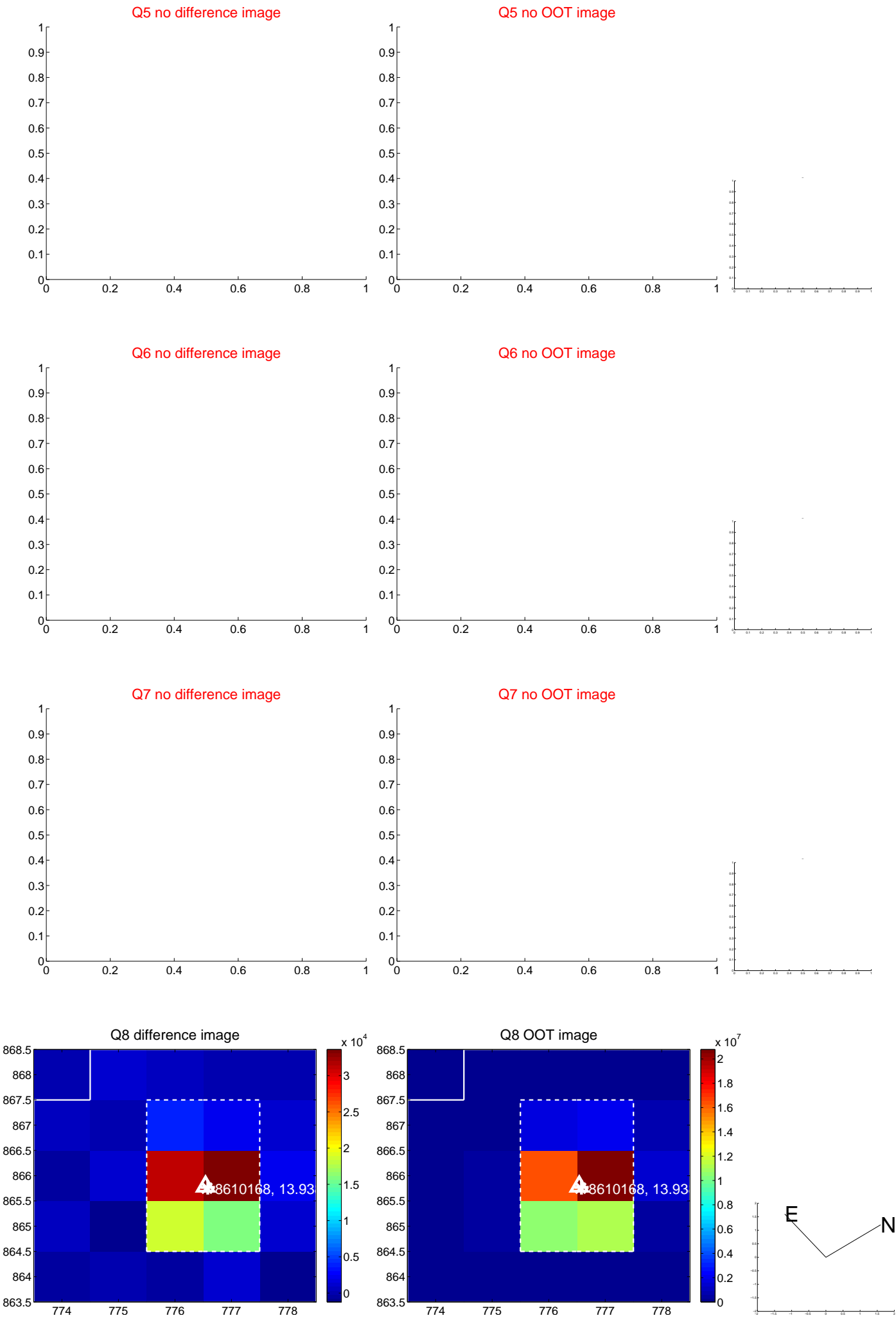


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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.

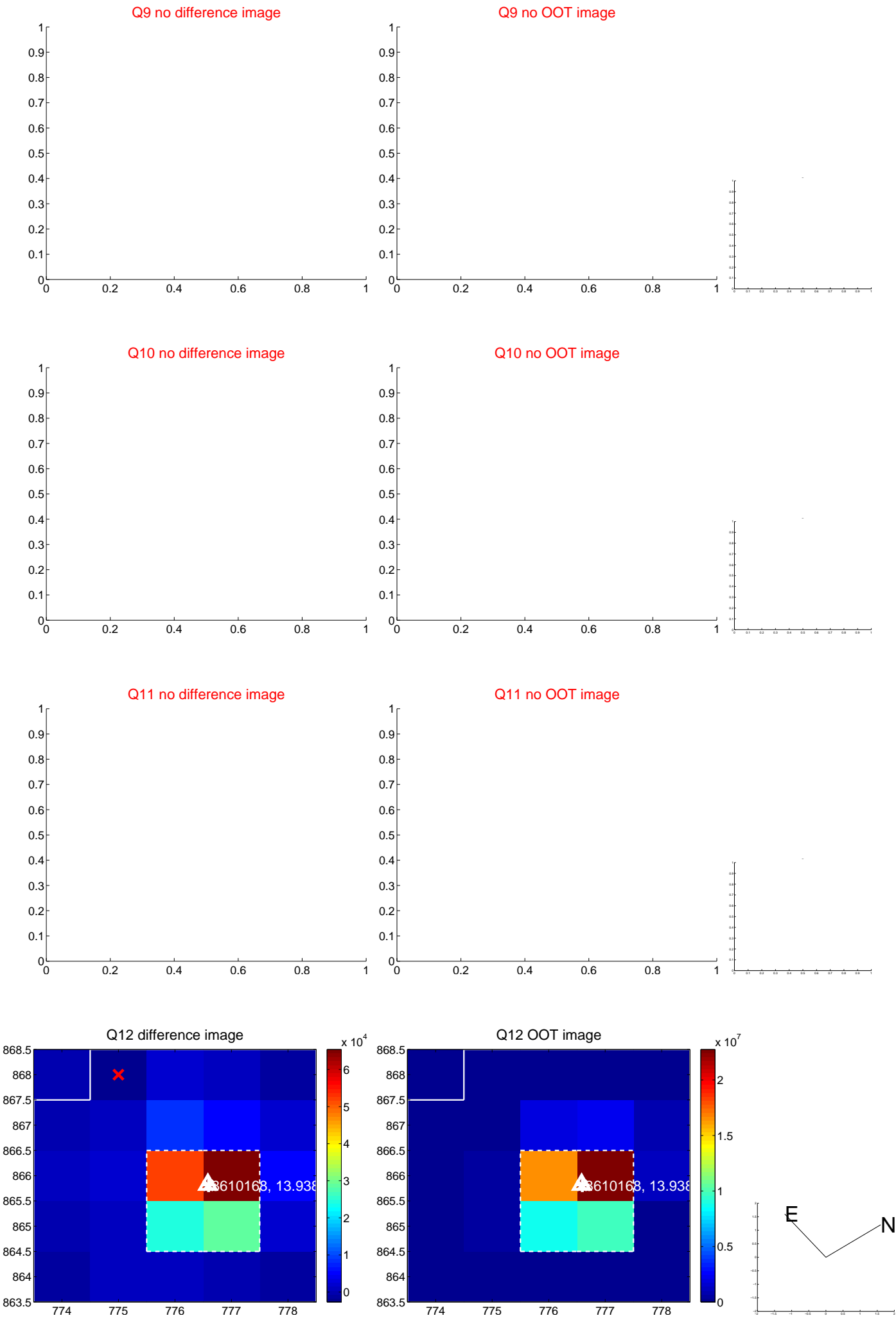
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



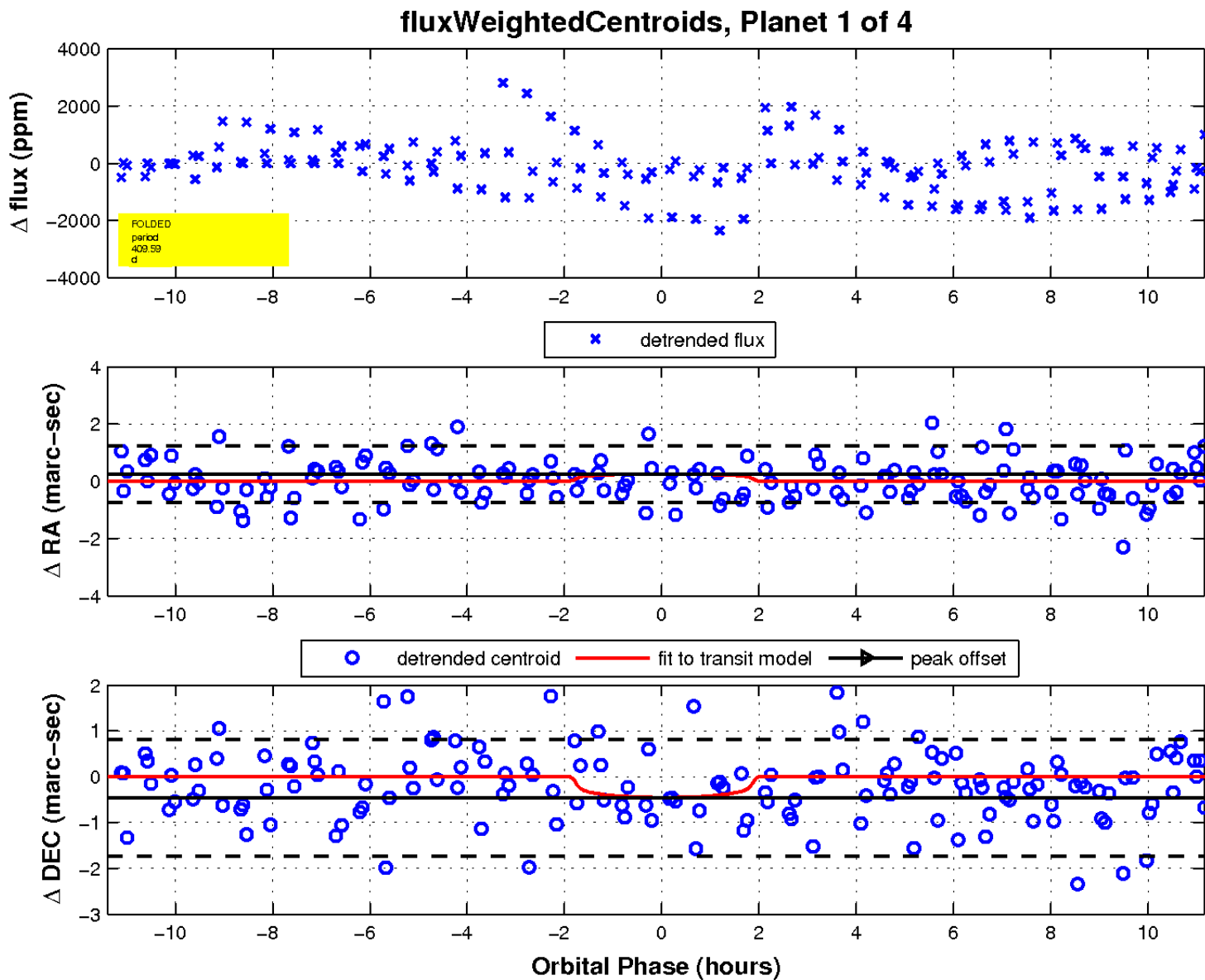
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

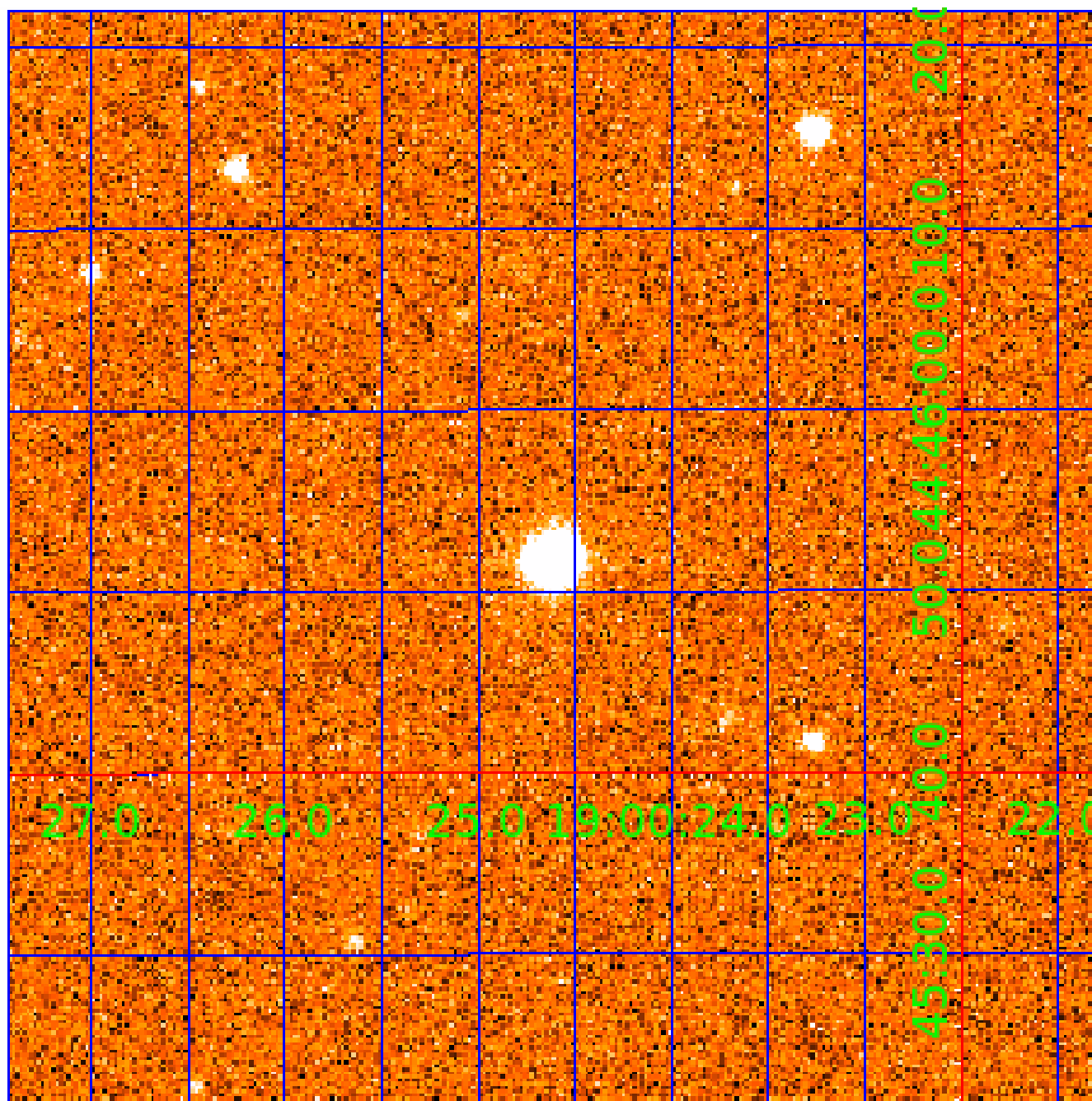


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008610168

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})
008610168-01	OBS	No	409.589252	357.868320	1425.6	3.807	15.4	8.1	1.85	5412	7.00	2.33
008610168-02	OBS	No	405.022761	168.377012	1518.4	5.004	17.4	8.6	1.85	5412	9.29	2.36
008610168-03	OBS	No	591.159036	332.235906	1263.9	6.057	19.7	5.5	1.85	5412	12.94	1.43
008610168-04	OBS	No	382.849991	454.276102	669.1	6.000	14.8	-1.0	1.85	5412	4.72	2.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008610168-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-02	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—CENT_FEW_DIFFS
008610168-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

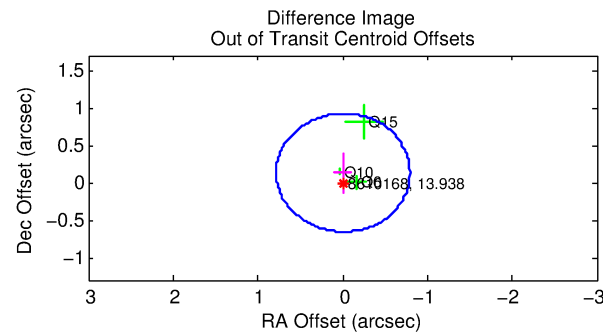
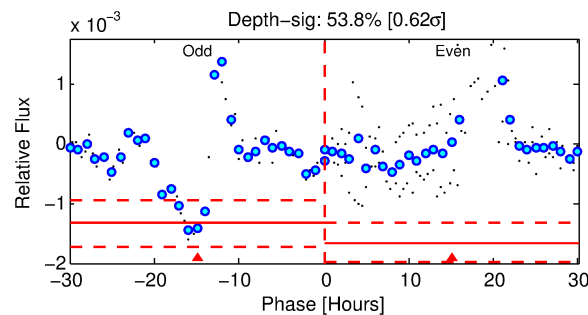
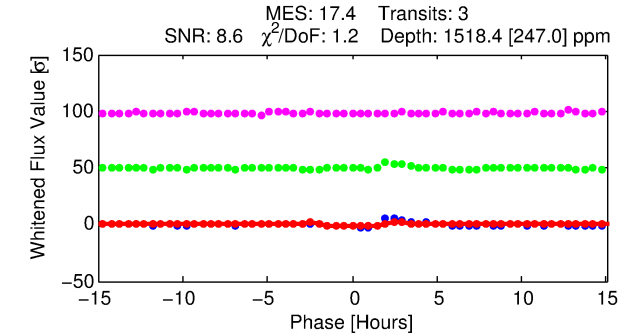
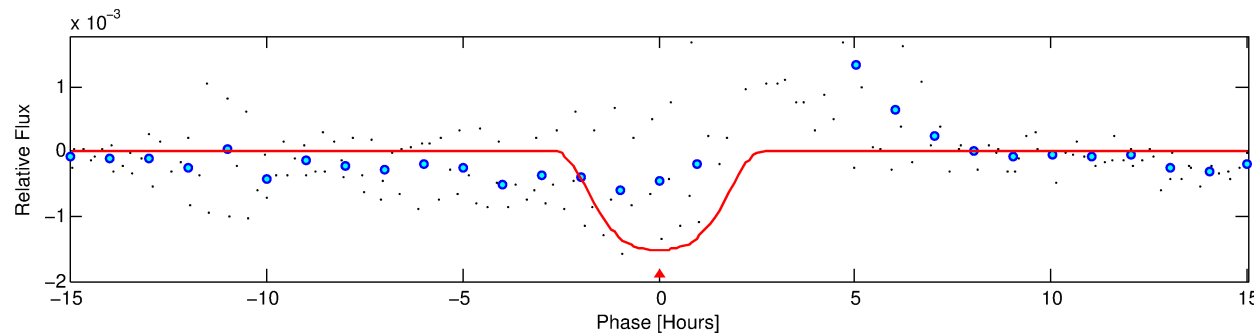
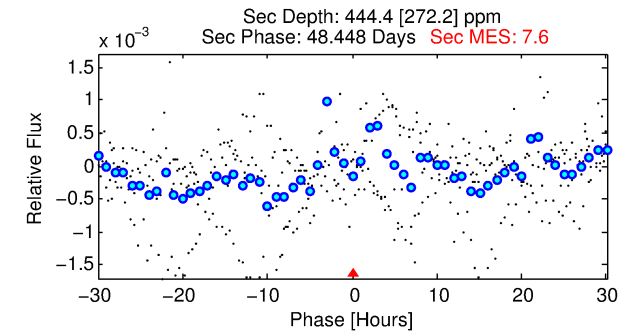
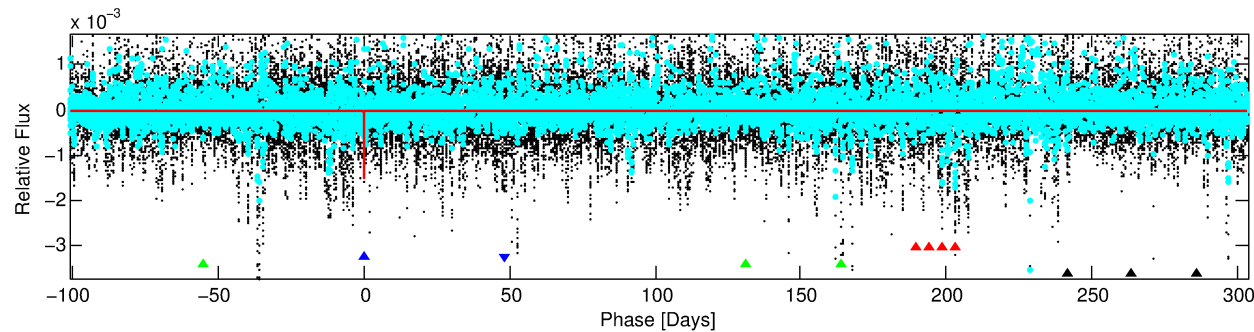
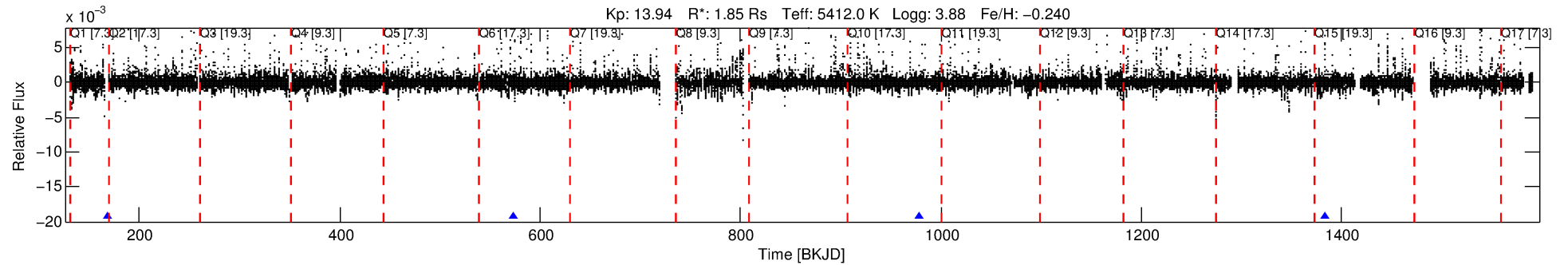
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008610168-02

No Significant Match Found

DV One-Page Summary

KIC: 8610168 Candidate: 2 of 4 Period: 405.023 d



DV Fit Results:

Period = 405.02276 [0.00645] d
Epoch = 168.3770 [0.0134] BKJD
Rp/R* = 0.0459 [0.0045]
a/R* = 274.18 [35.30]
b = 0.95 [0.02]
Seff = 2.36 [2.58]
Teq = 316 [86] K
Rp = 9.29 [5.55] Re
a = 1.0578 [0.6780] AU
Ag = 3171.54 [4004.31] [0.79 σ]
Teffp = 3667 [602] K [5.51 σ]

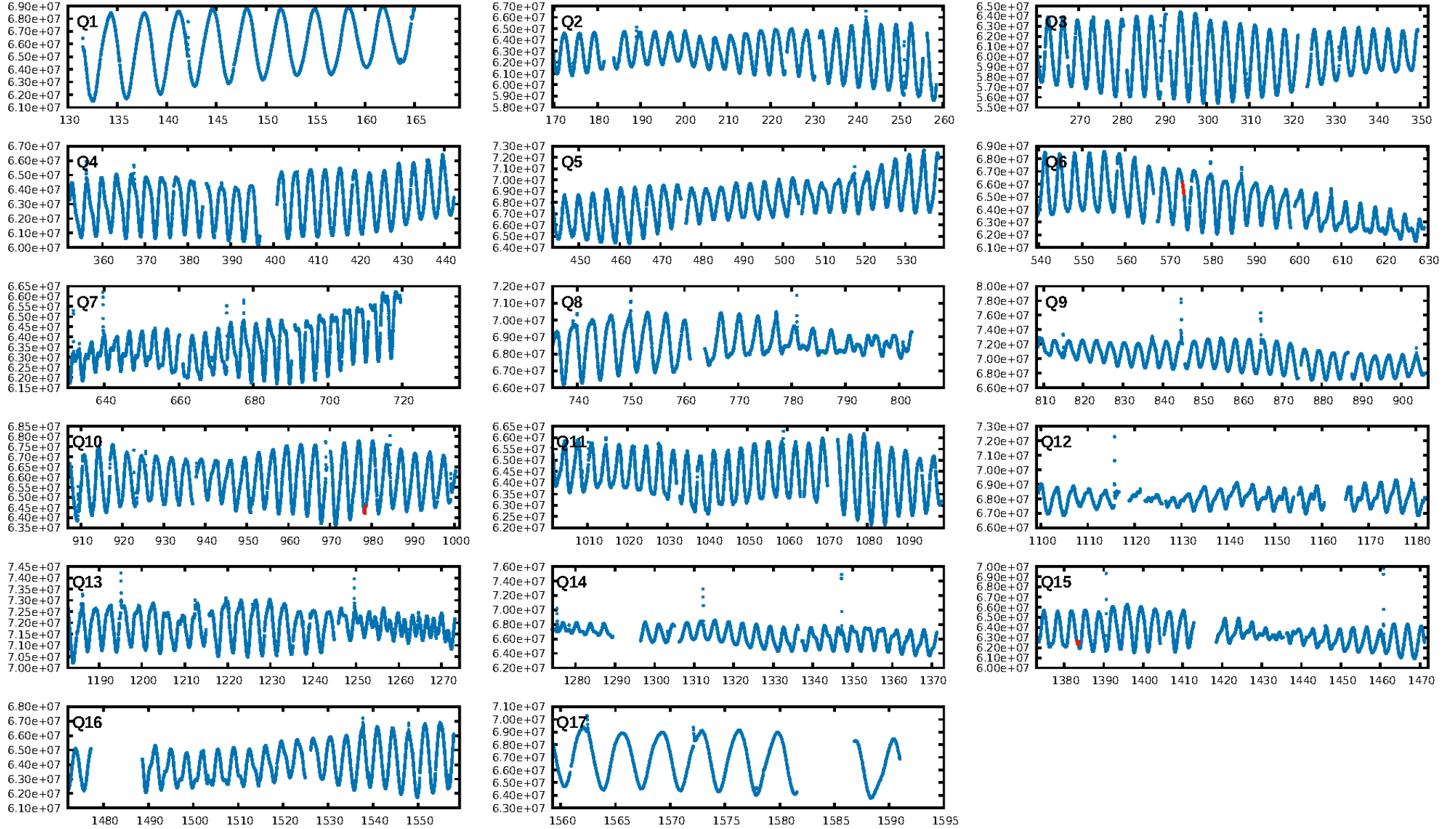
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [68.11 σ]
LongPeriod-sig: 100.0% [17.43 σ]
ModelChiSquare2-sig: 1.6%
ModelChiSquareGof-sig: 51.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.784
Centroid-sig: 97.5%
Centroid-so: 0.026 arcsec [0.07 σ]
OotOffset-rm: 0.133 arcsec [0.51 σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-rm: 0.085 arcsec [0.35 σ]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

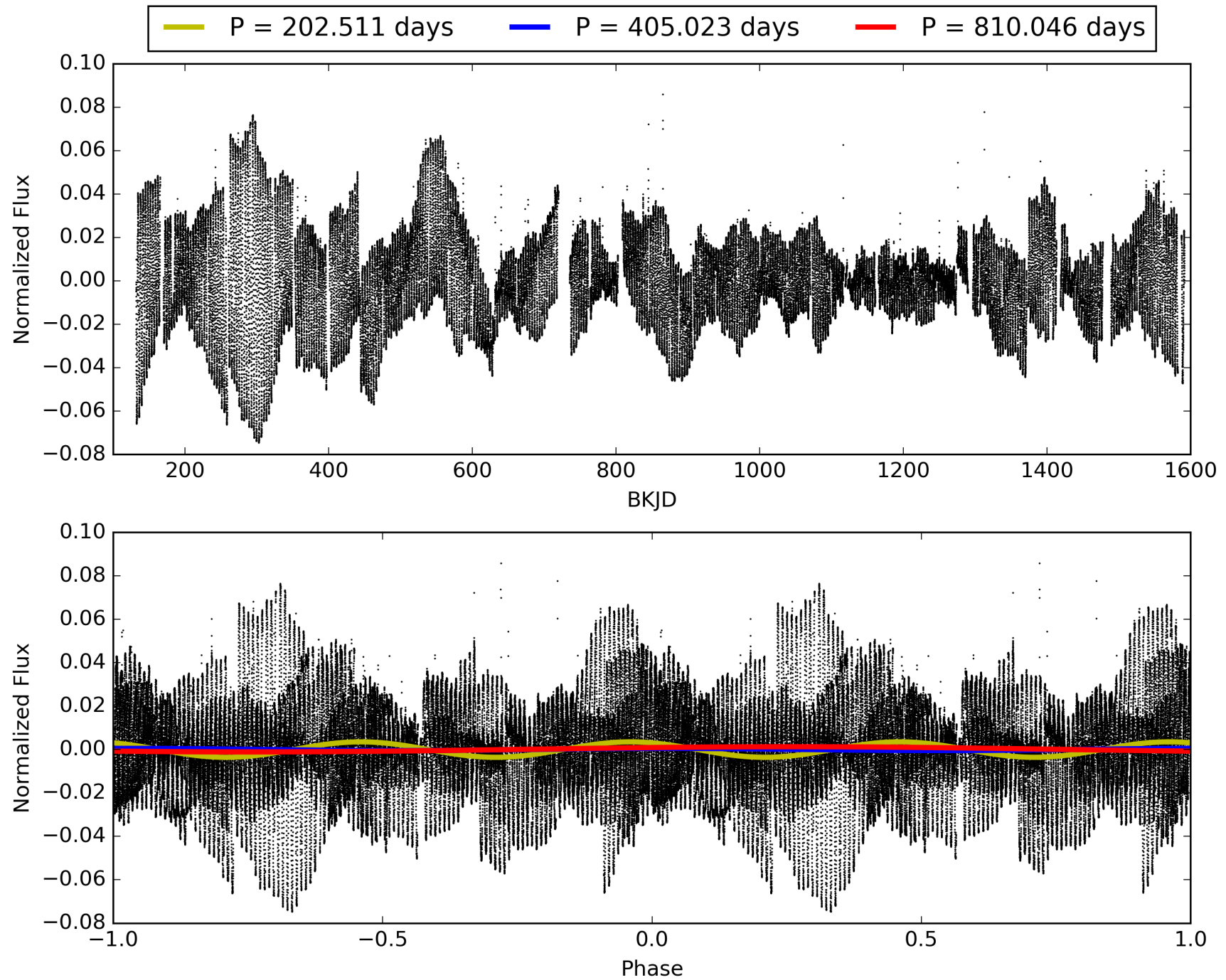
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:30:13 Z

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

TCE 008610168-02, PDC Light Curves

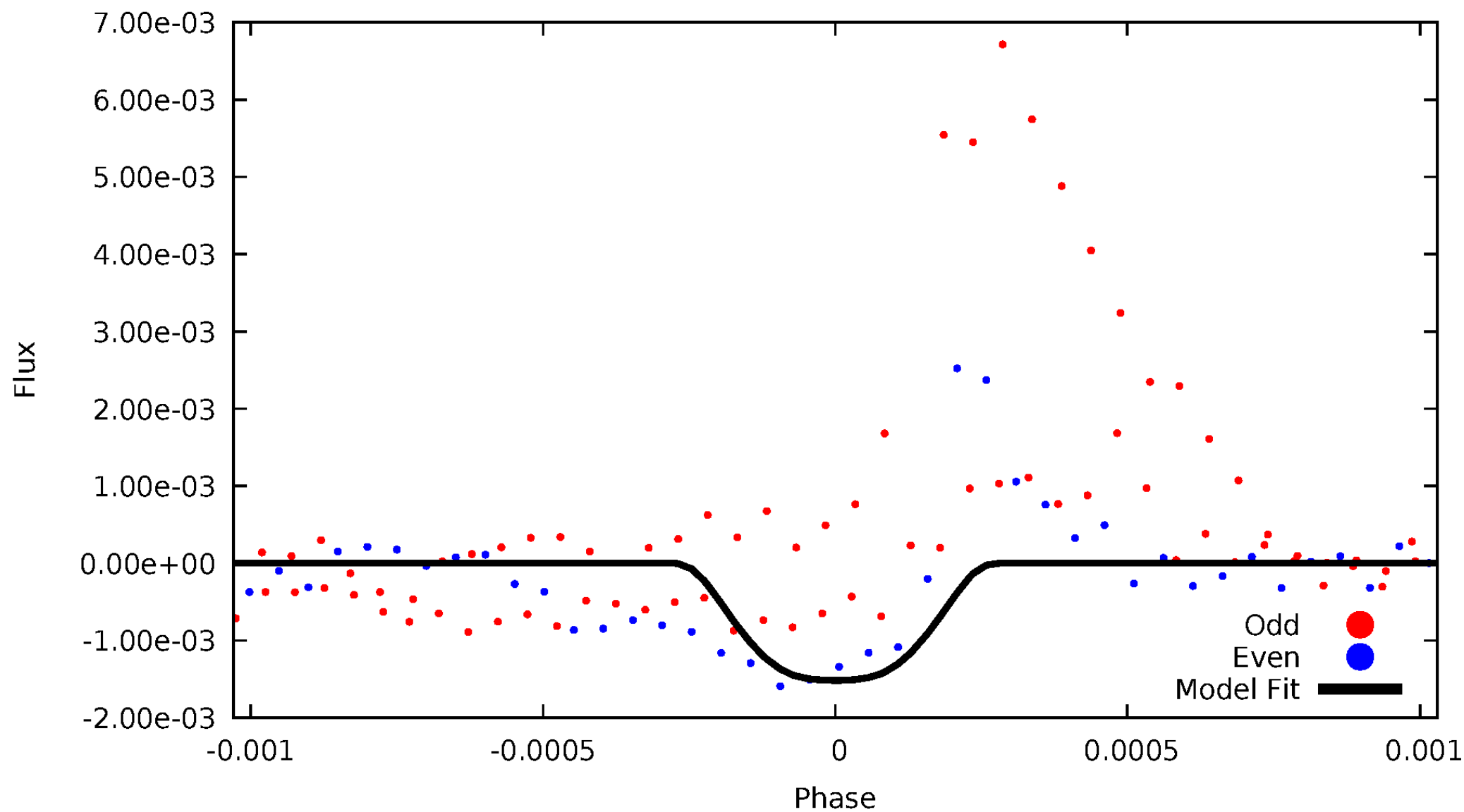


TCE 008610168-02



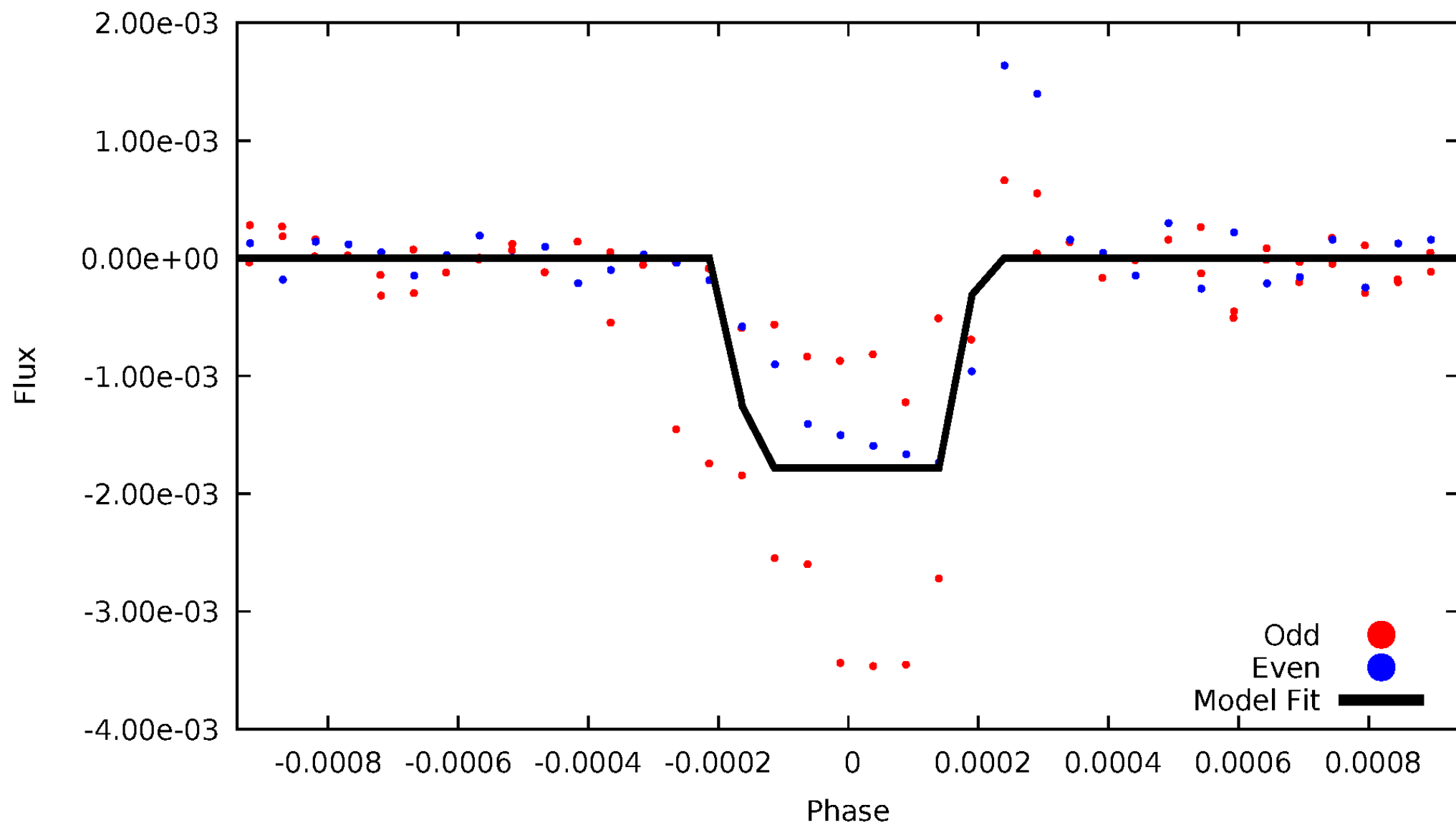
DV Odd/Even

TCE 008610168-02



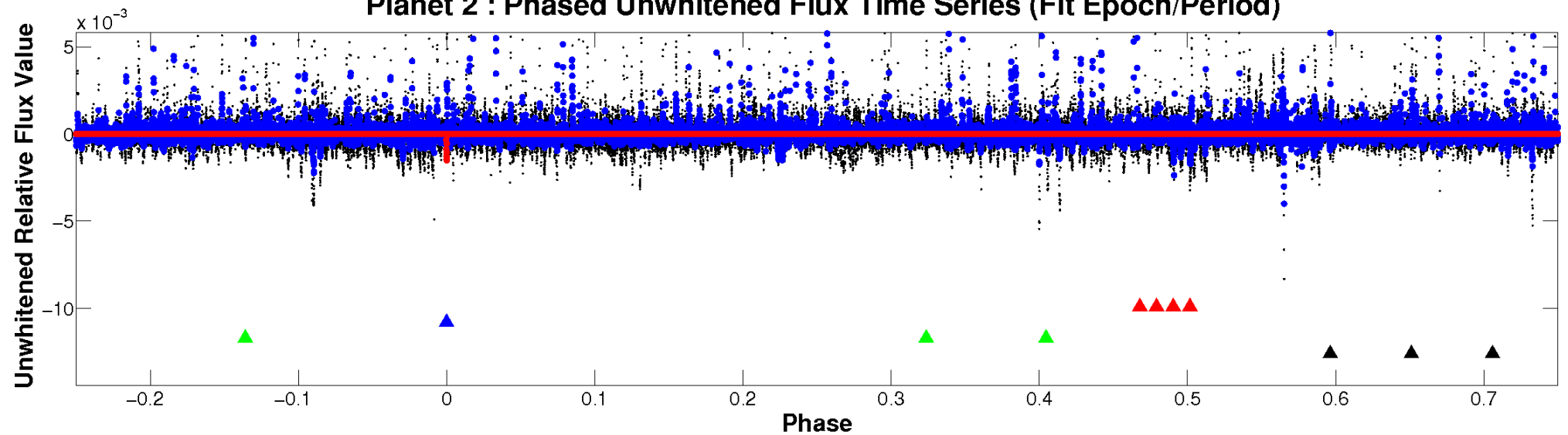
ALT Odd/Even

TCE 008610168-02

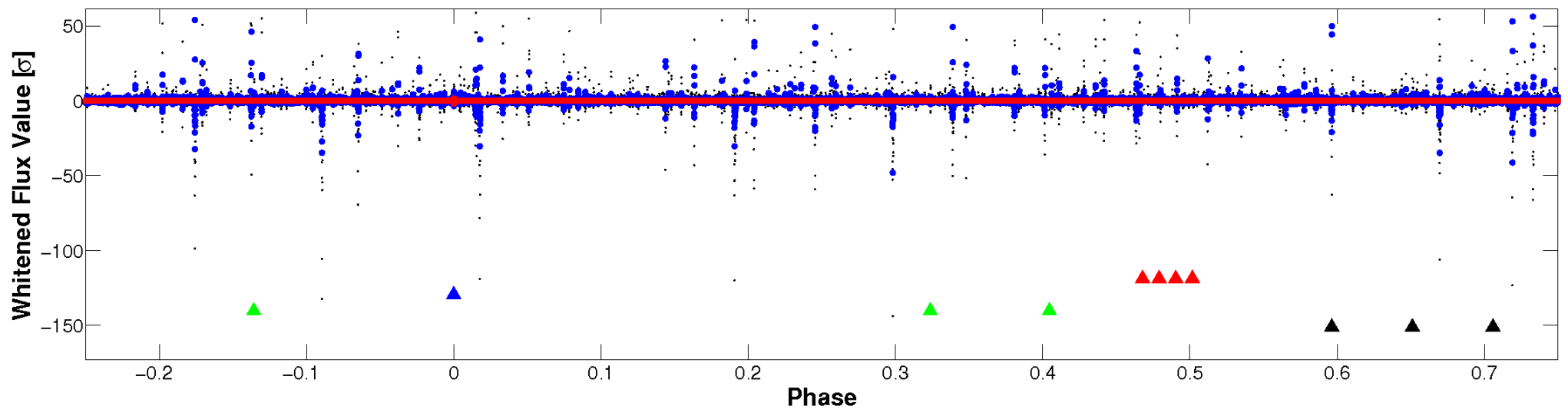


Non-Whitened Vs. Whitened Light Curve

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

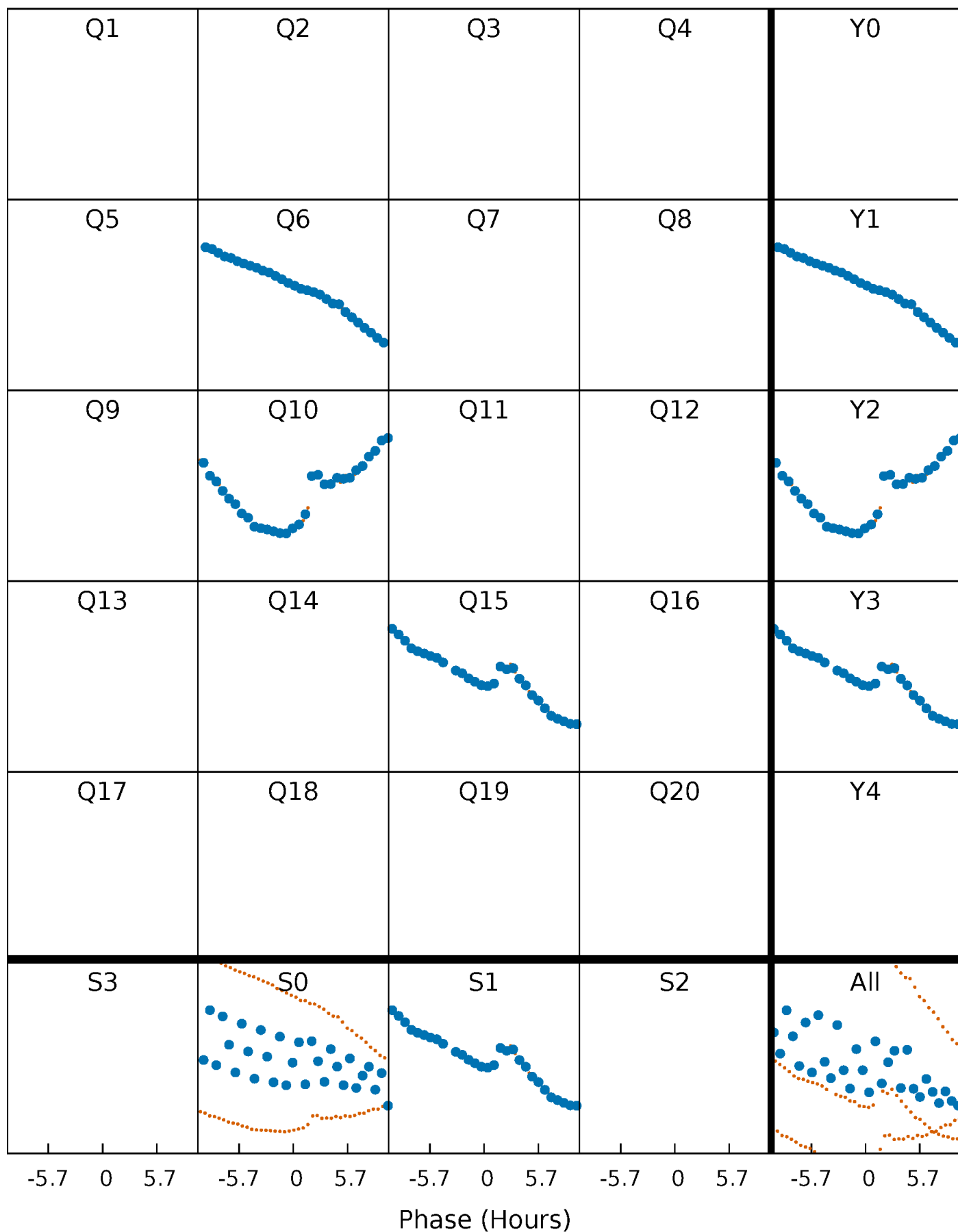


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



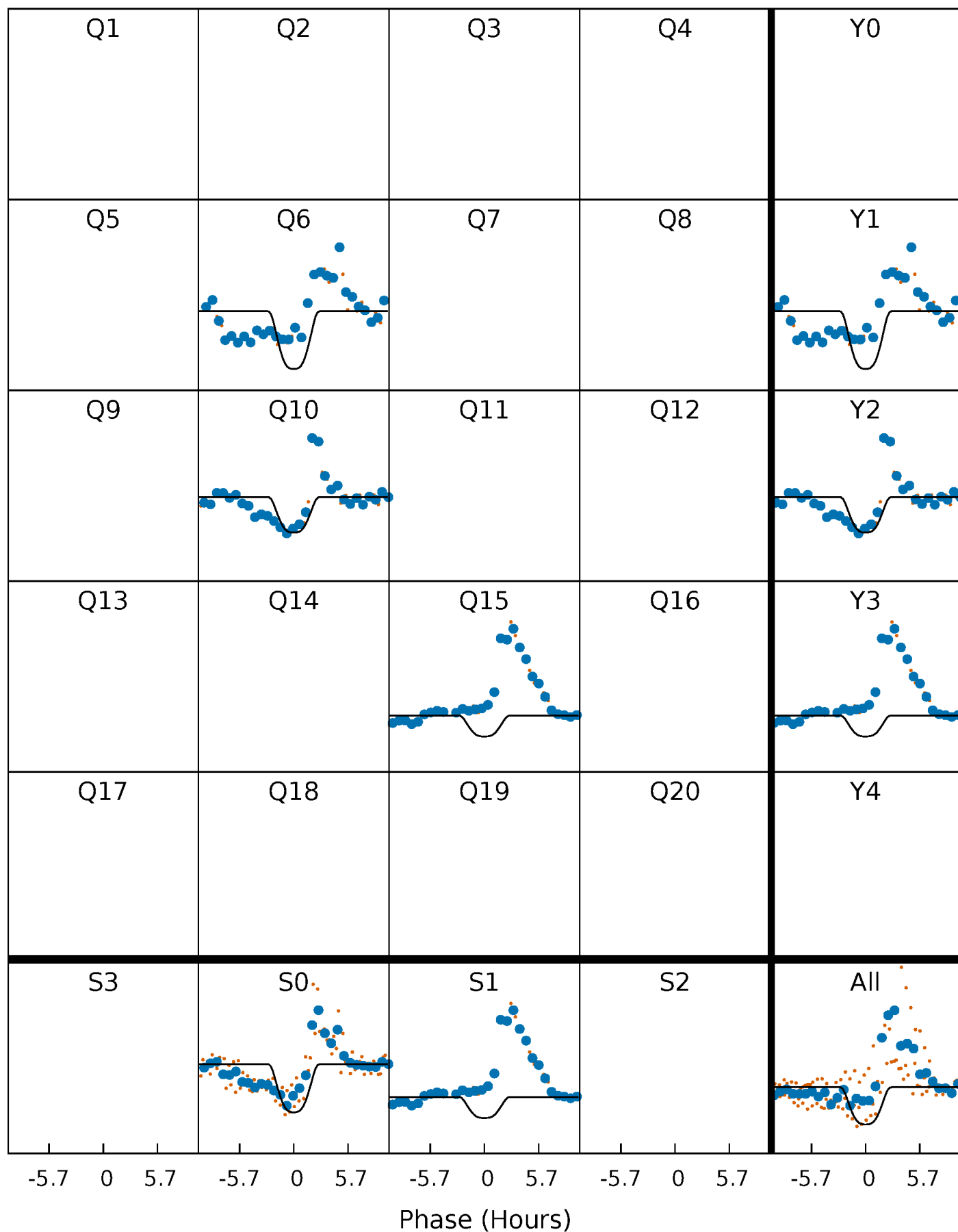
PDC Quarter-Phased Transit Curves

TCE 008610168-02 P=405.022761 Days $T_0=168.377012$ (BKJD)



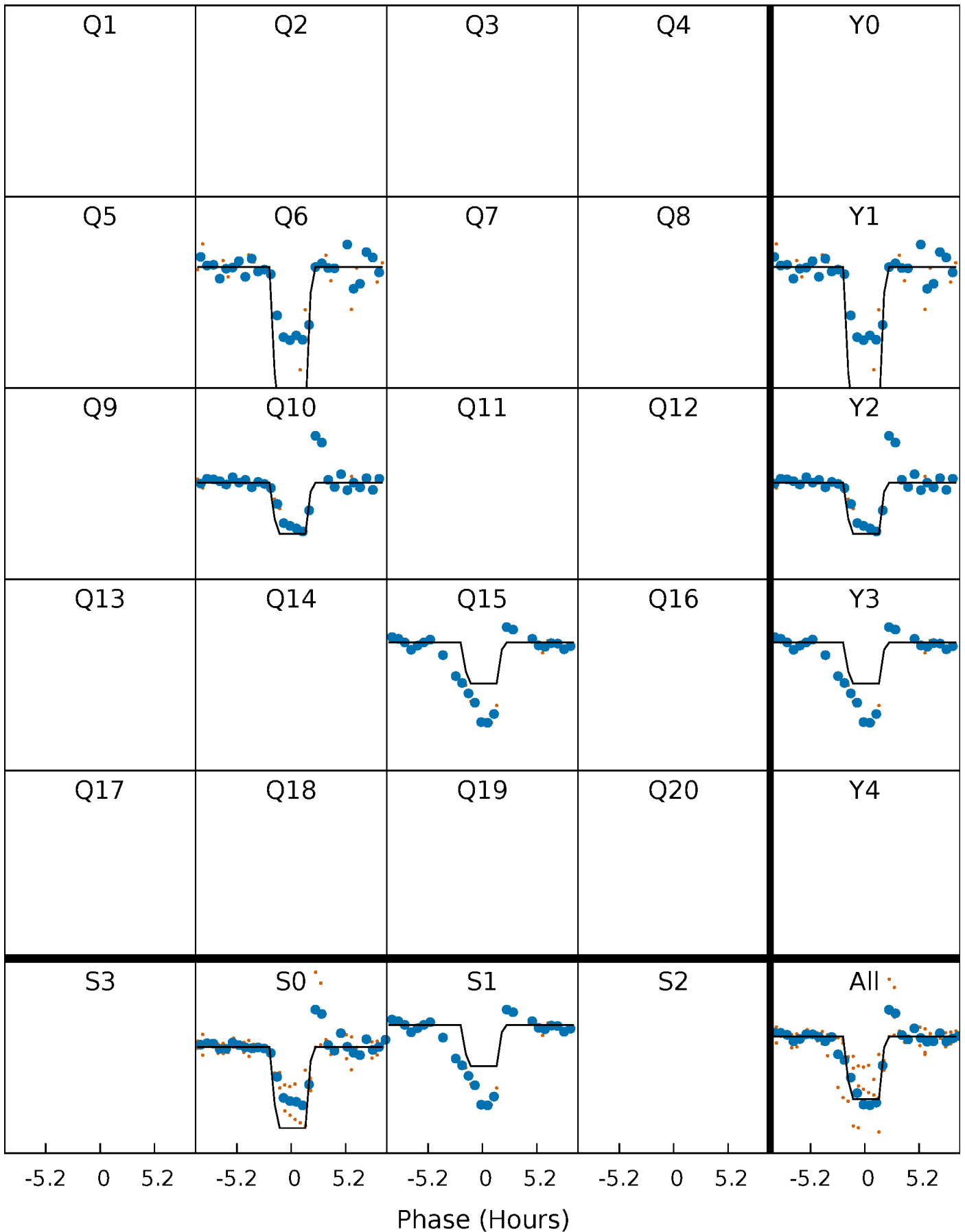
DV Quarter-Phased Transit Curves

TCE 008610168-02 P=405.022761 Days $T_0=168.377012$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

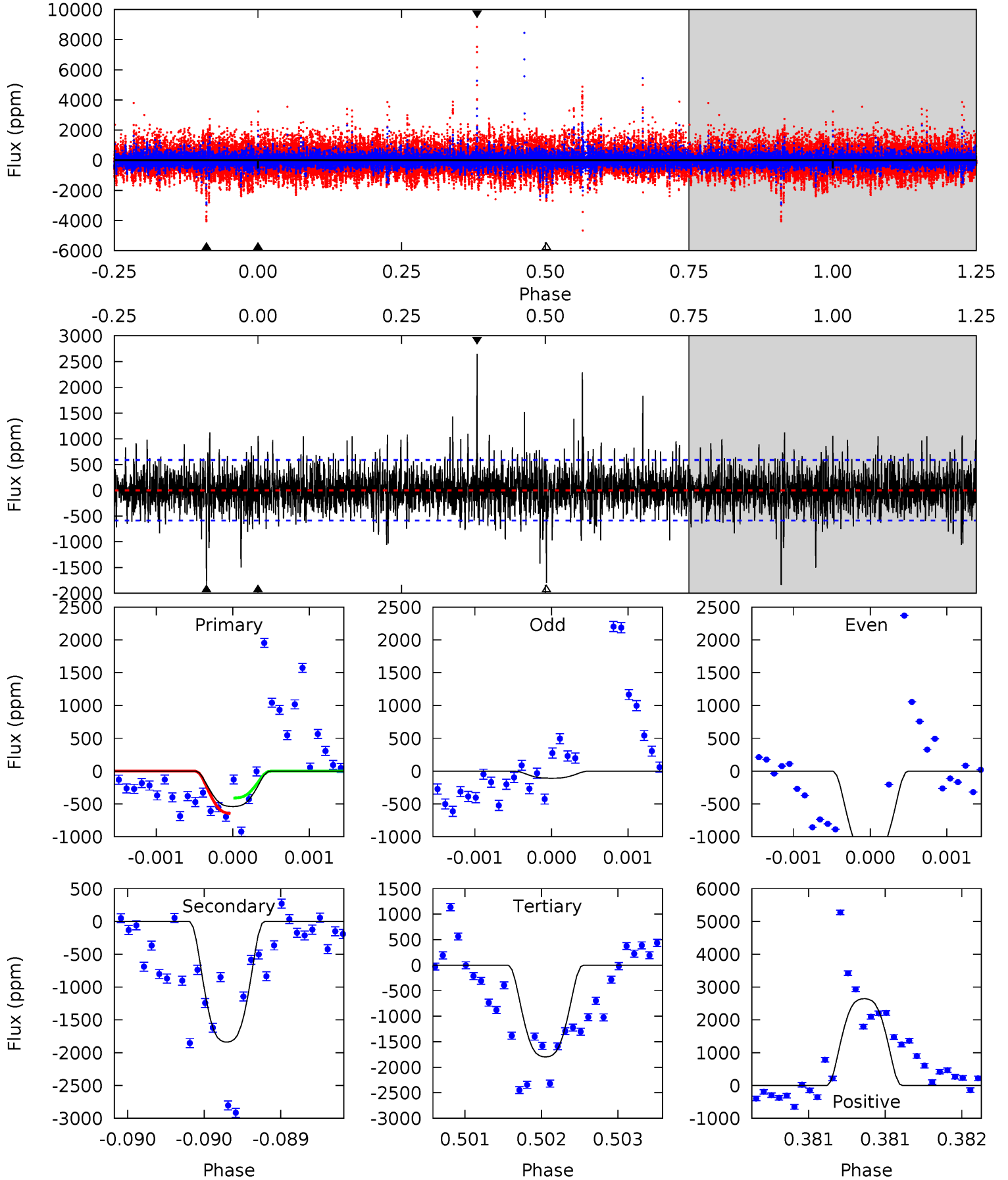
TCE 008610168-02 P=405.013593 Days $T_0=168.382375$ (BKJD)



DV Model-Shift Uniqueness Test

008610168-02, P = 405.022761 Days, E = 168.377012 Days

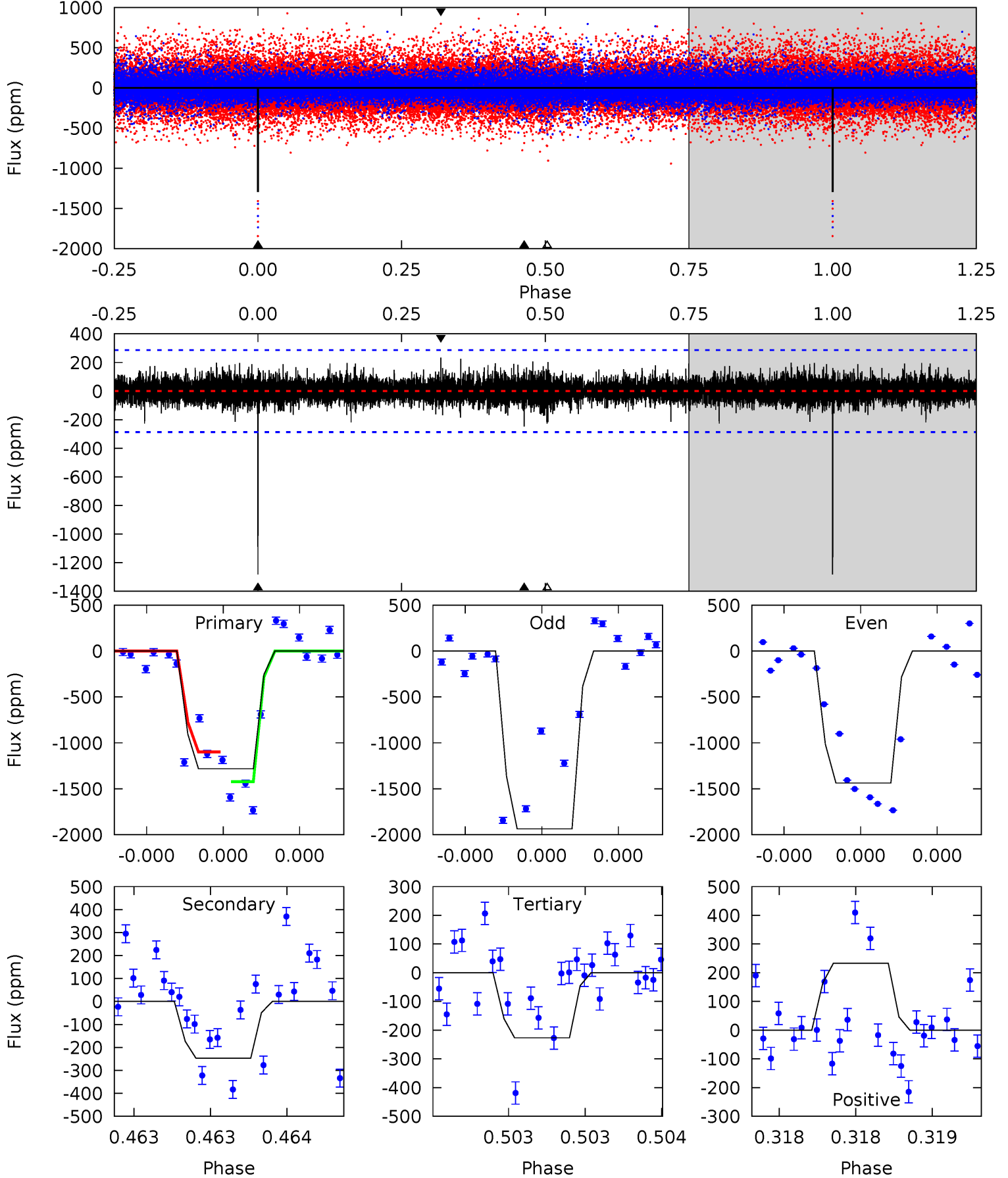
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.10	17.4	17.0	25.0	5.55	3.45	2.80	-11.9	-19.9	0.40	-7.61	2.92	0.31	0.59	1.12



Alt Model-Shift Uniqueness Test

008610168-02, P = 405.013593 Days, E = 168.382375 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	4.85	4.46	4.58	5.63	3.57	0.91	20.7	20.6	0.39	0.27	5.51	1.22	0.15	3.32



Stellar Parameters For KIC 008610168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5412^{+178}_{-146}	$3.885^{+0.660}_{-0.220}$	$-0.240^{+0.350}_{-0.250}$	$1.854^{+0.819}_{-1.092}$	$0.961^{+0.143}_{-0.157}$	$0.213^{+1.795}_{-0.130}$
	+3%/-3%	+17%/-6%	+146%/-104%	+44%/-59%	+15%/-16%	+844%/-61%
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 008610168-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1839 ± 106	$8.89^{+2.26}_{-2.61}$	435^{+53}_{-67}	5262^{+329}_{-258}	14366^{+14918}_{-5411}
Alt.	-247 ± 51	$8.02^{+2.28}_{-2.66}$	431^{+51}_{-73}	3702^{+198}_{-190}	2360^{+2648}_{-982}

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

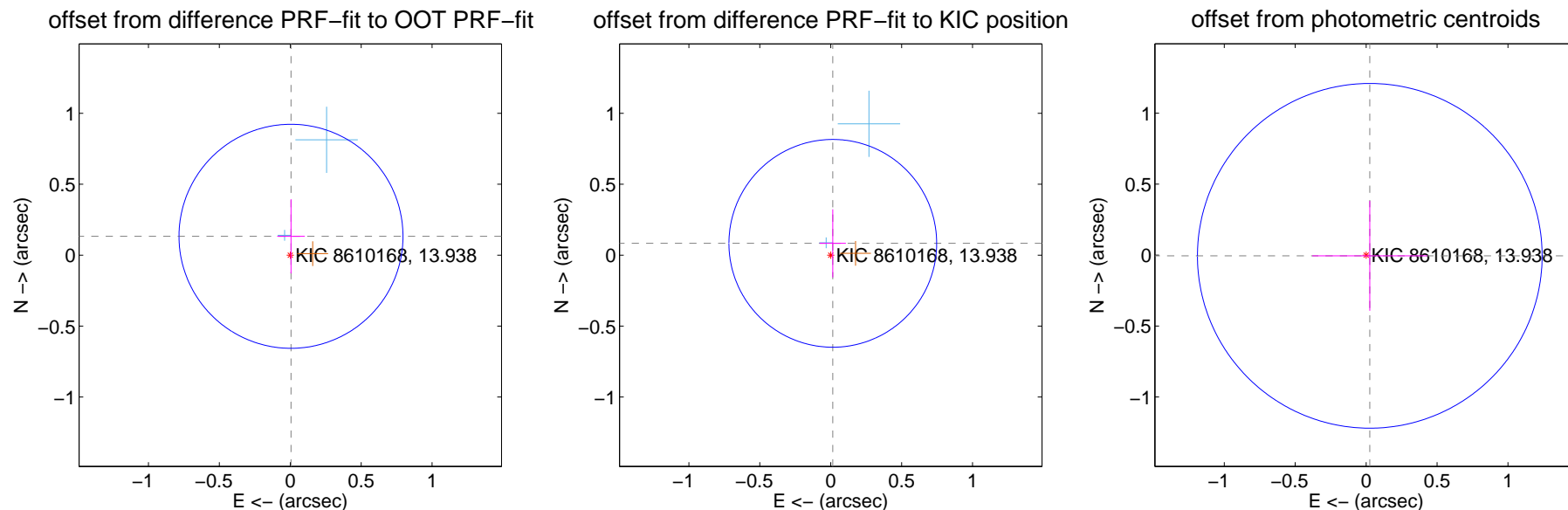
DV Centroid Data

Supplemental centroid analysis for 008610168-02. Kepler magnitude: 13.94. Transit SNR 8.63

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.133 ± 0.263	0.51	-0.005 ± 0.097	0.133 ± 0.261
PRF-fit source offset from KIC position	0.085 ± 0.244	0.35	-0.015 ± 0.092	0.083 ± 0.240
photometric centroid source offset	0.03 ± 0.40	0.07	-0.03 ± 0.41	-0.01 ± 0.39

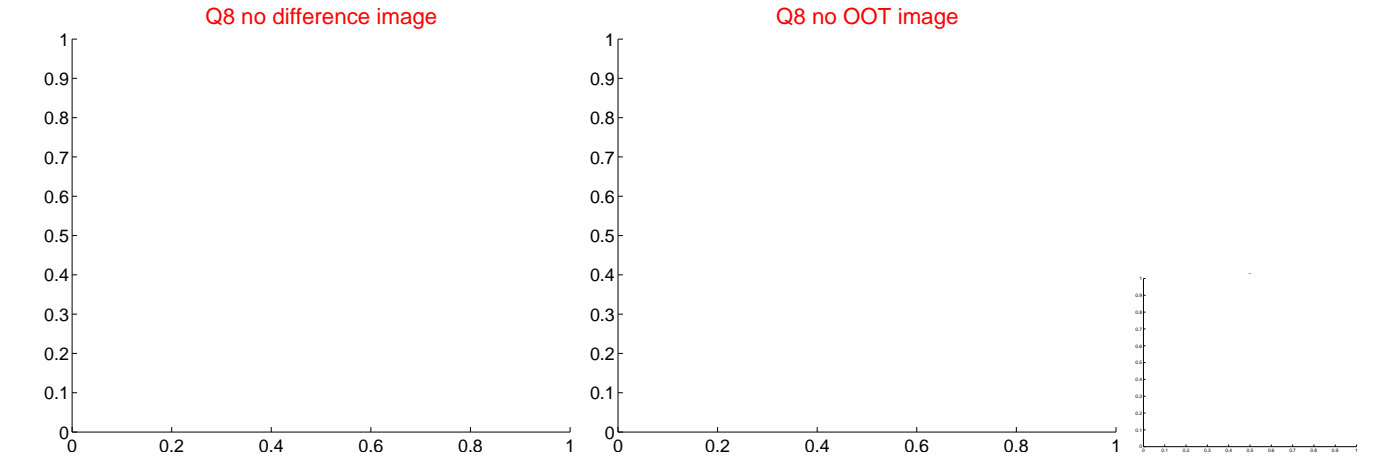
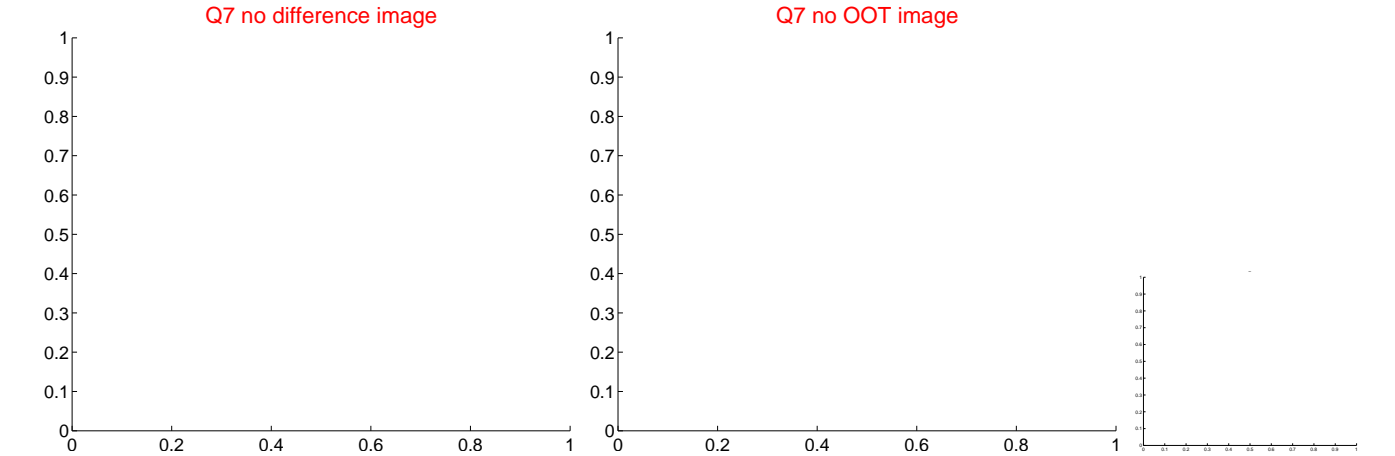
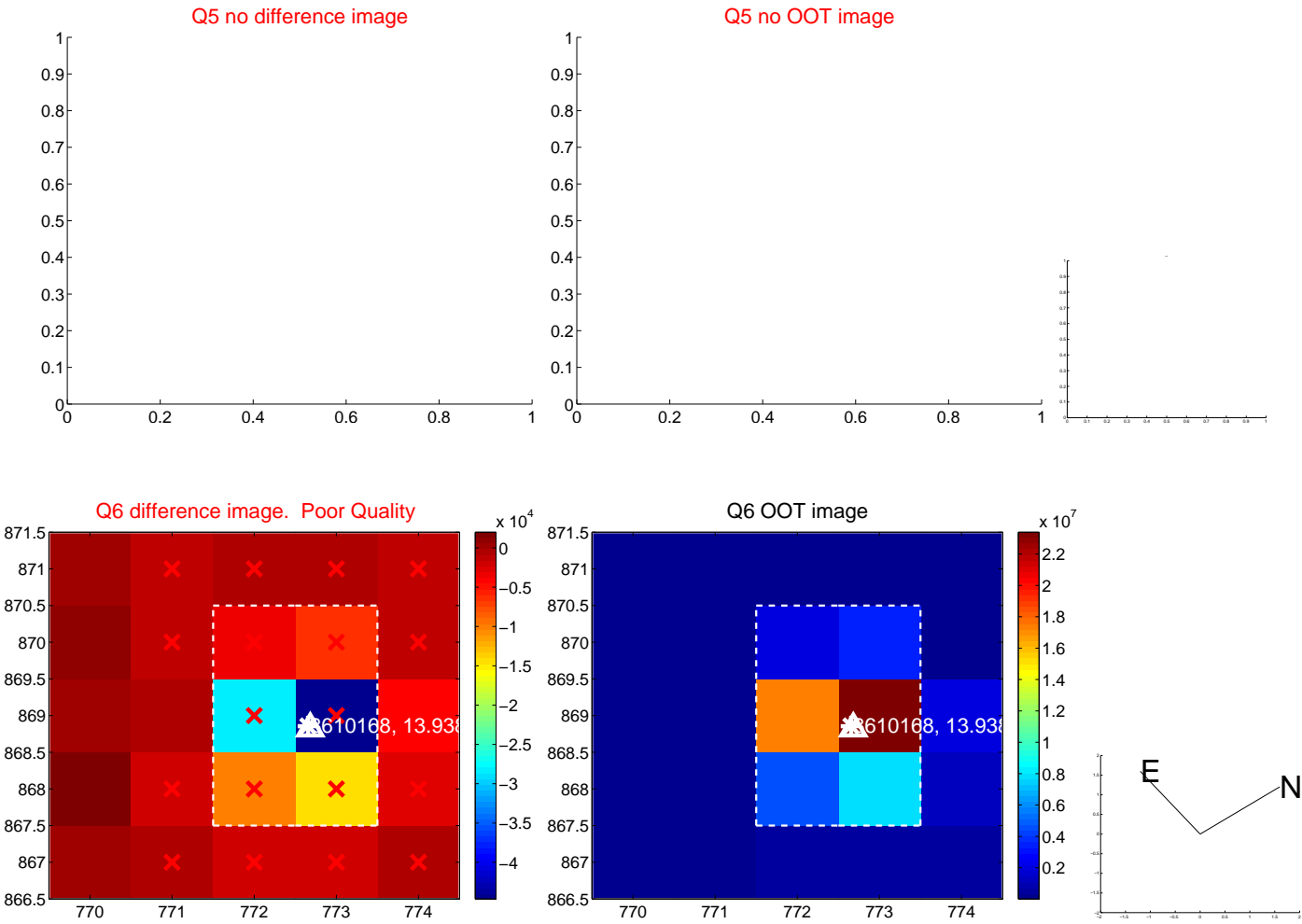


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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.

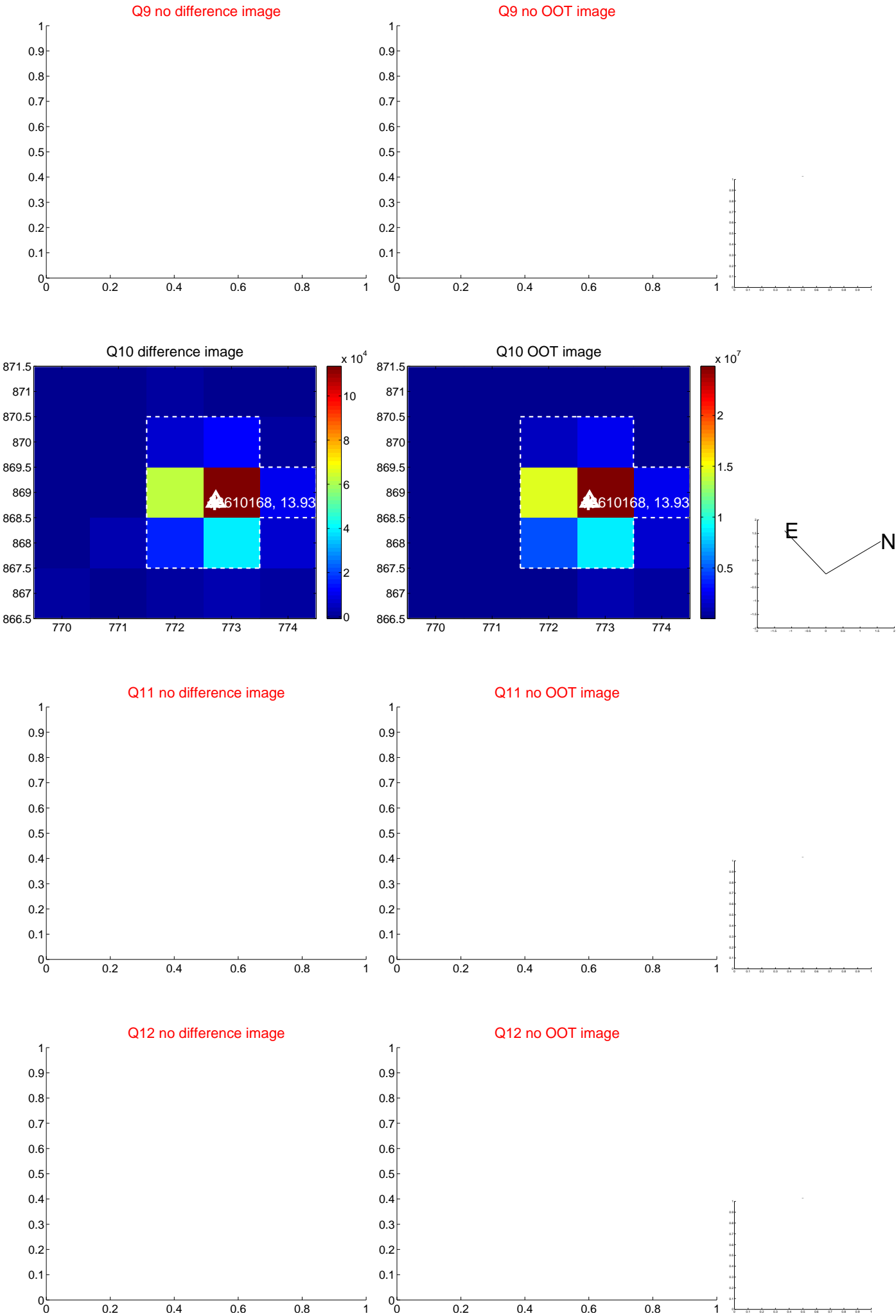
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



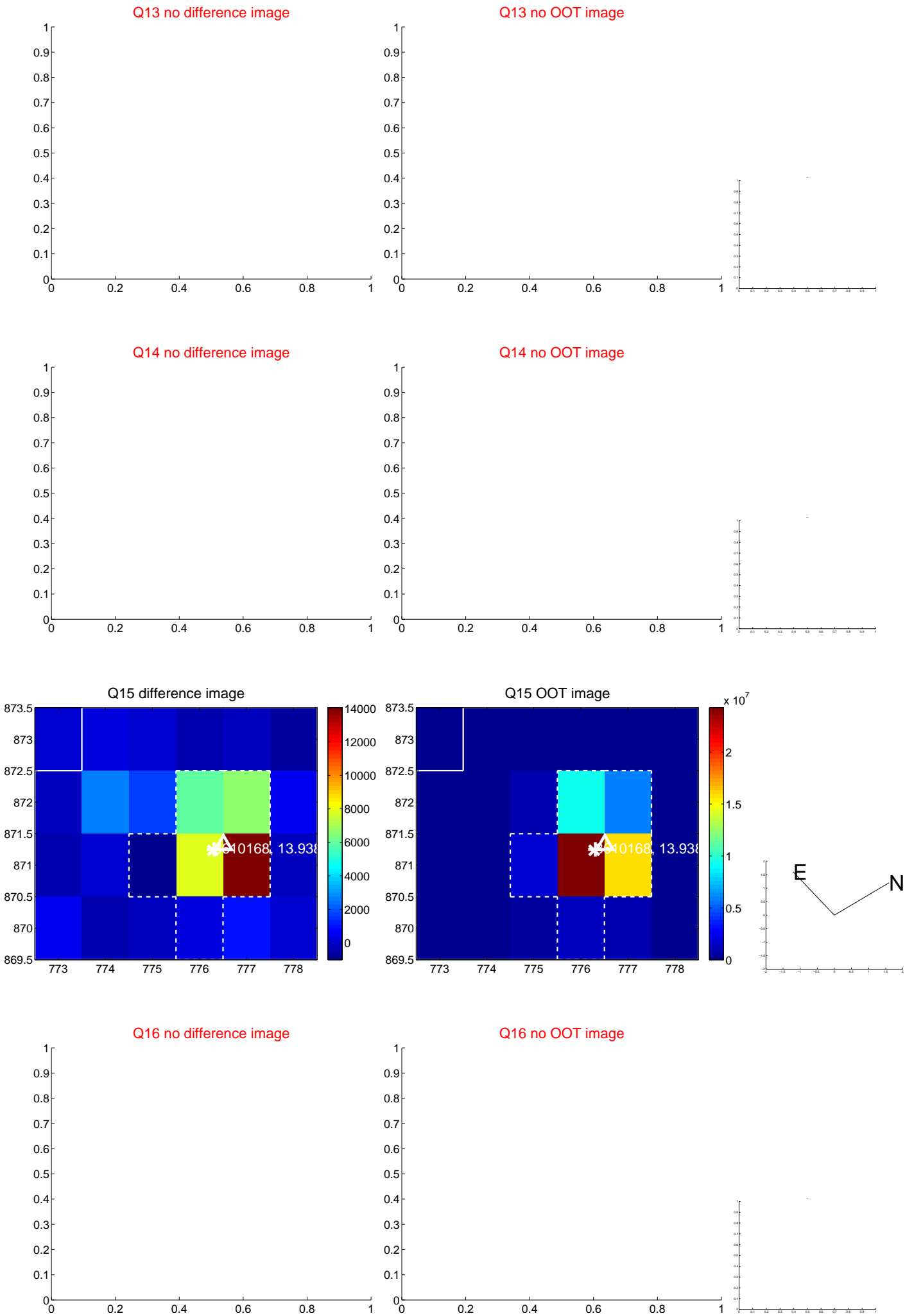
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



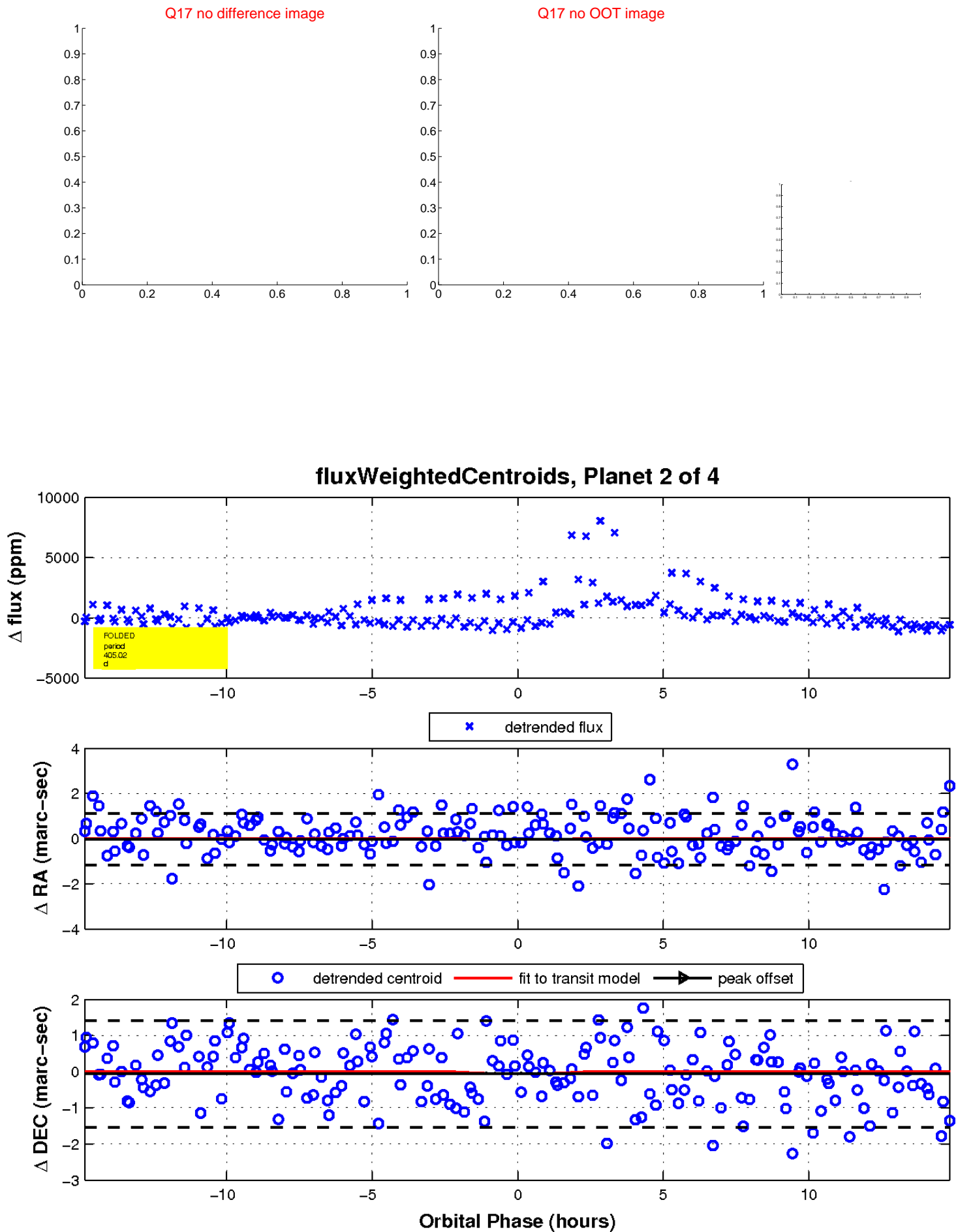
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

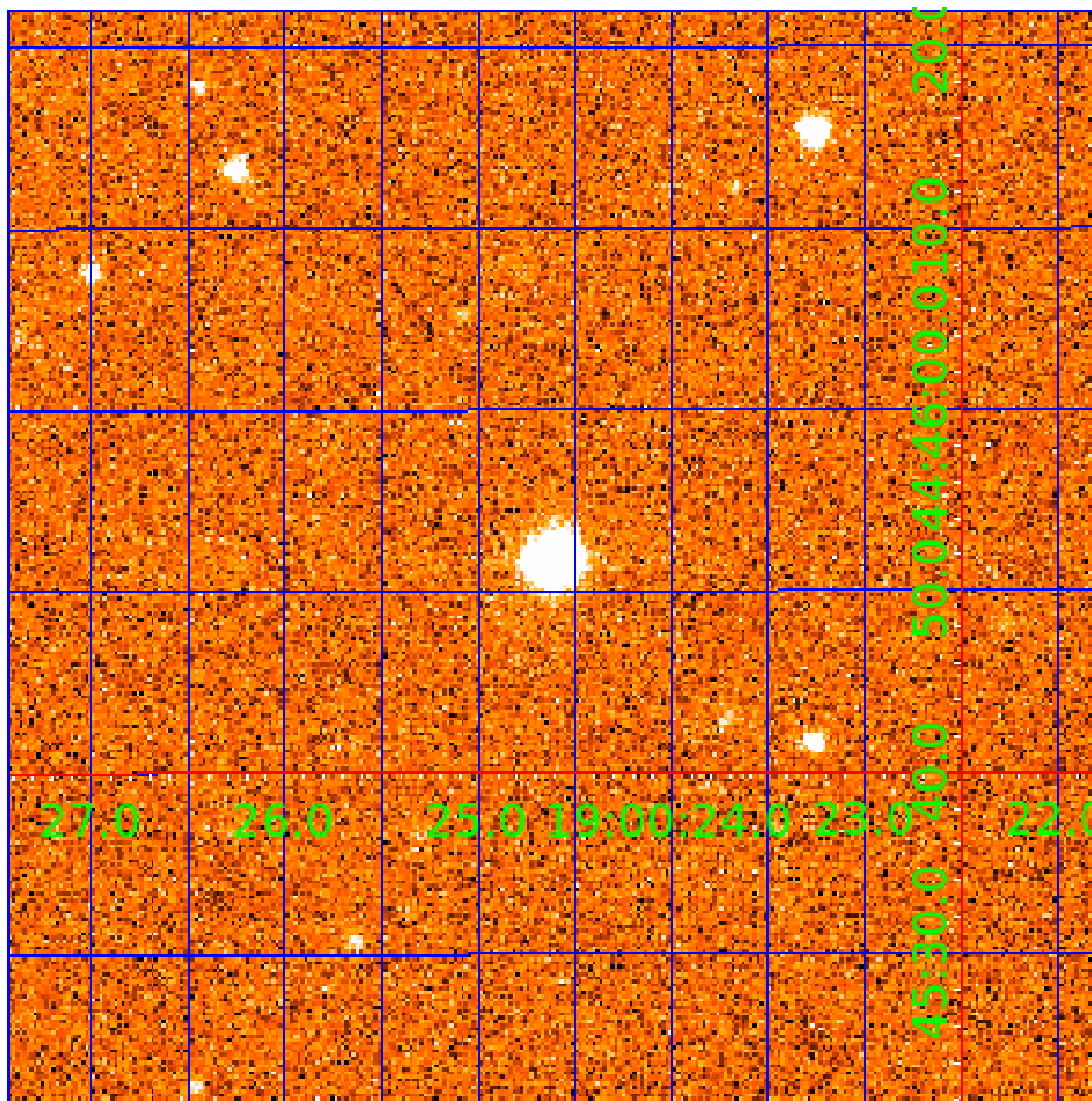


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008610168

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})
008610168-01	OBS	No	409.589252	357.868320	1425.6	3.807	15.4	8.1	1.85	5412	7.00	2.33
008610168-02	OBS	No	405.022761	168.377012	1518.4	5.004	17.4	8.6	1.85	5412	9.29	2.36
008610168-03	OBS	No	591.159036	332.235906	1263.9	6.057	19.7	5.5	1.85	5412	12.94	1.43
008610168-04	OBS	No	382.849991	454.276102	669.1	6.000	14.8	-1.0	1.85	5412	4.72	2.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008610168-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-02	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—CENT_FEW_DIFFS
008610168-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

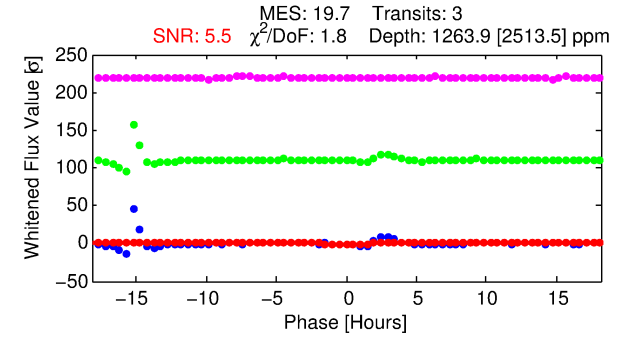
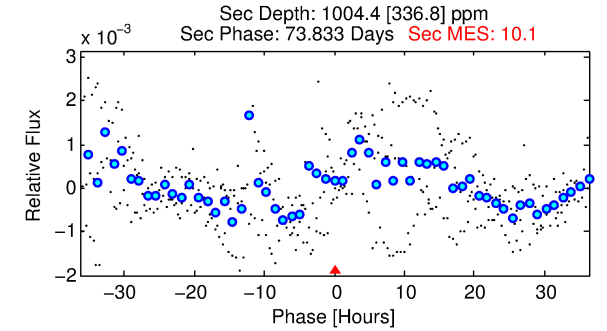
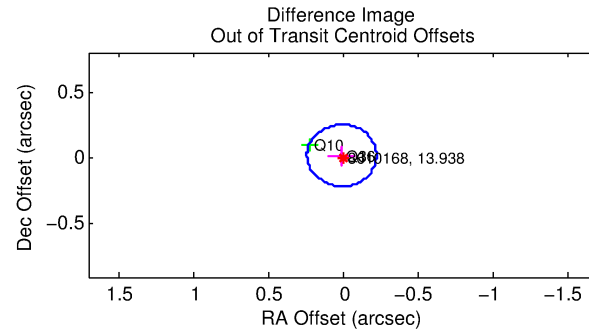
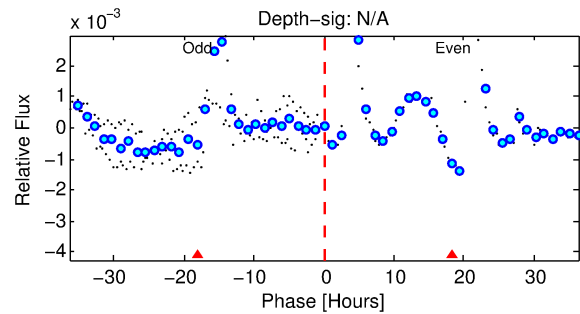
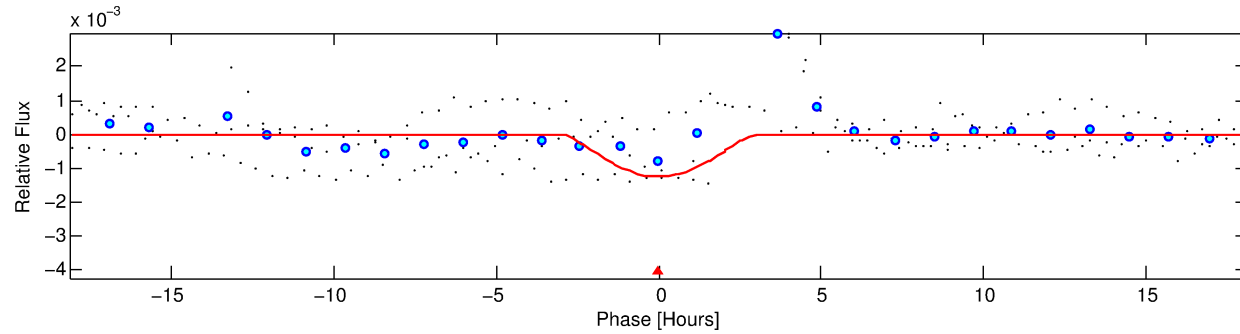
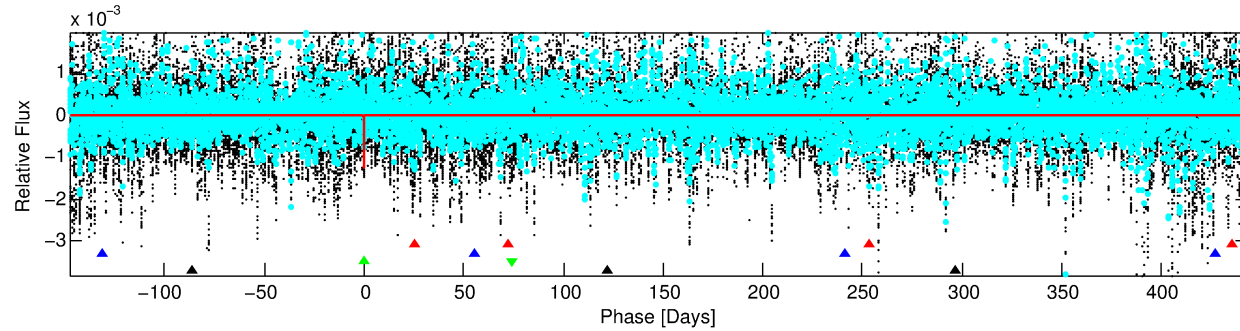
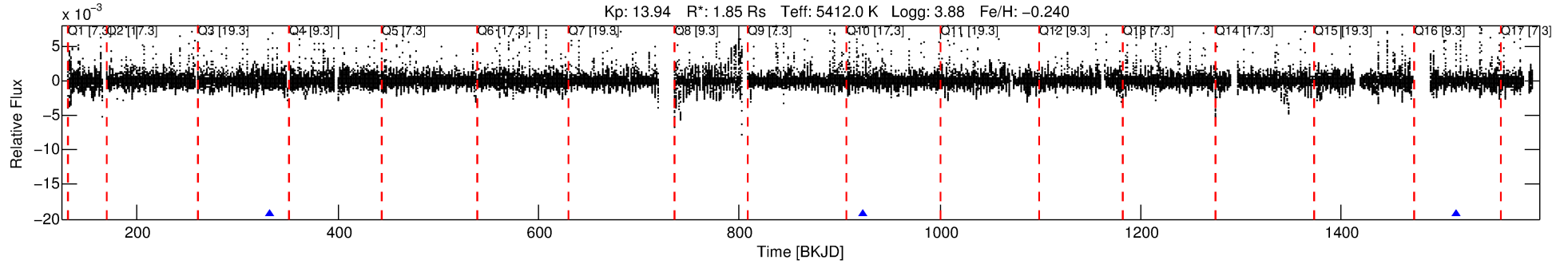
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008610168-03

No Significant Match Found

DV One-Page Summary

KIC: 8610168 Candidate: 3 of 4 Period: 591.159 d



DV Fit Results:

Period = 591.15904 [0.01583] d
Epoch = 332.2359 [0.0202] BKJD
Rp/R* = 0.0639 [0.2672]
a/R* = 270.87 [256.10]
b = 1.00 [0.30]
Seff = 1.43 [1.56]
Teq = 279 [76] K
Rp = 12.94 [54.60] Re
a = 1.3612 [0.8724] AU
Ag = 6116.43 [51594.71] [0.12] σ
Teffp = 3810 [7969] K [0.44] σ

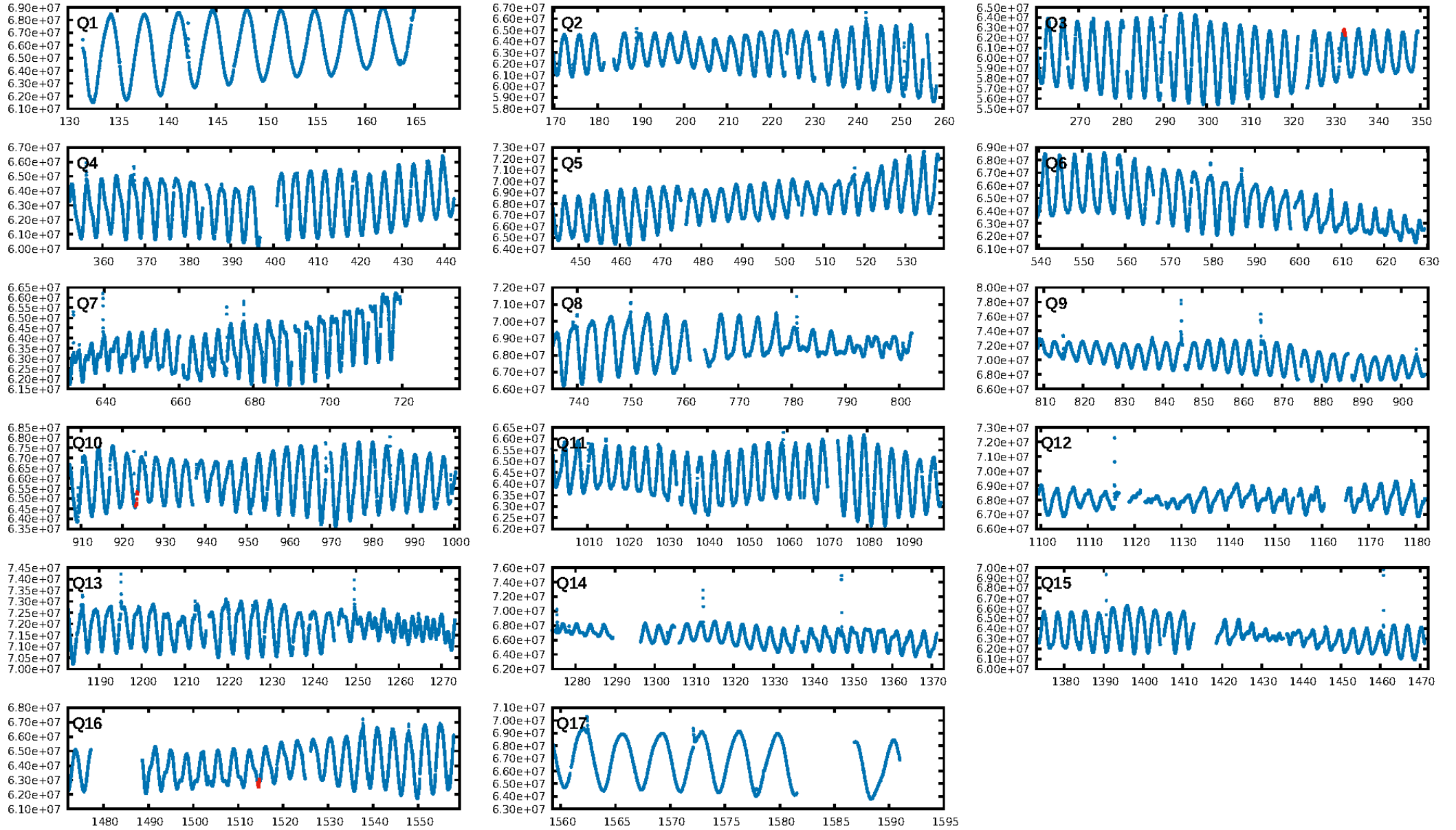
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [609.12 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 41.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.695
Centroid-sig: 33.1%
Centroid-so: 0.366 arcsec [0.74 σ]
OotOffset-rm: 0.020 arcsec [0.26 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.048 arcsec [0.70 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

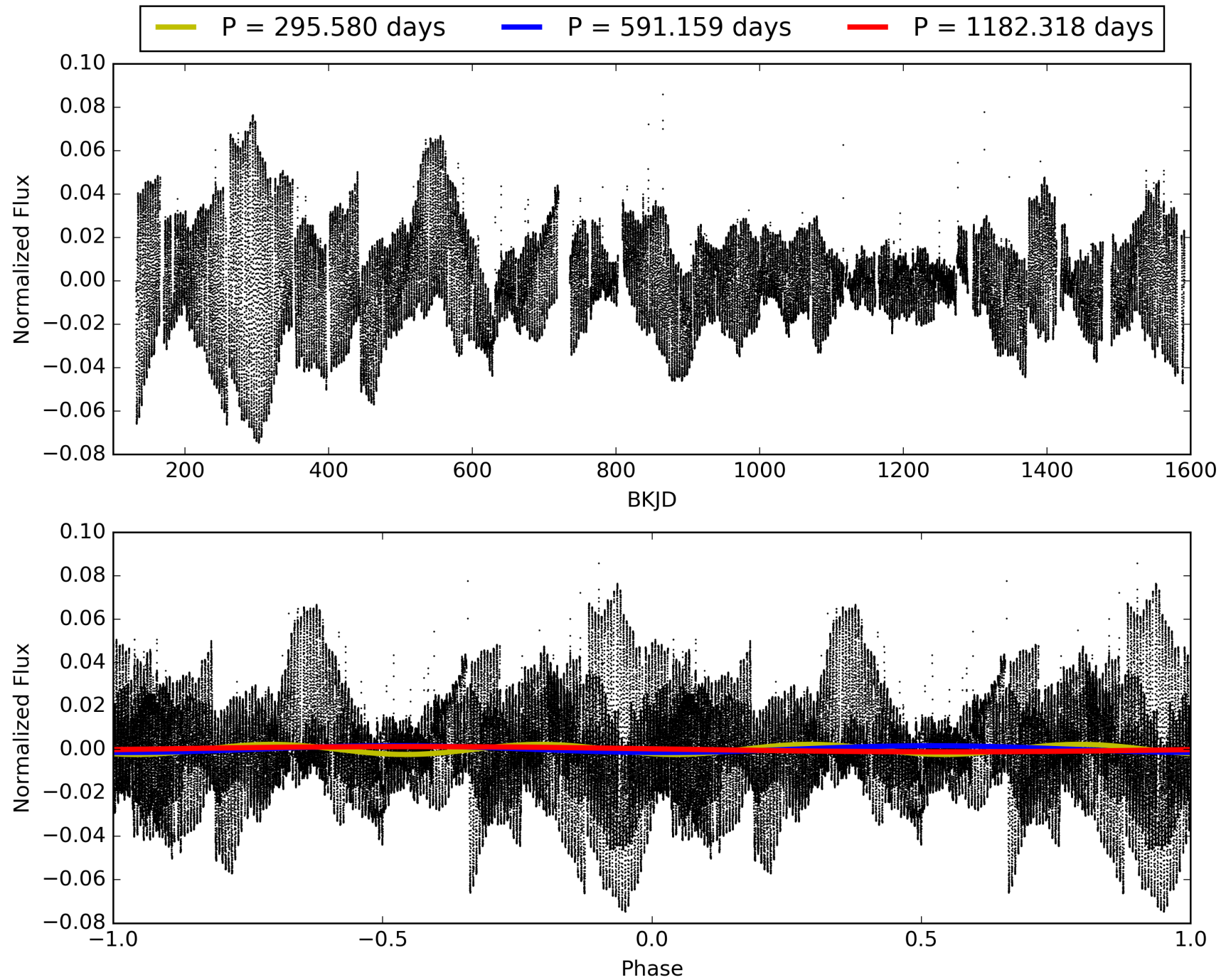
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:30:28 Z

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

TCE 008610168-03, PDC Light Curves

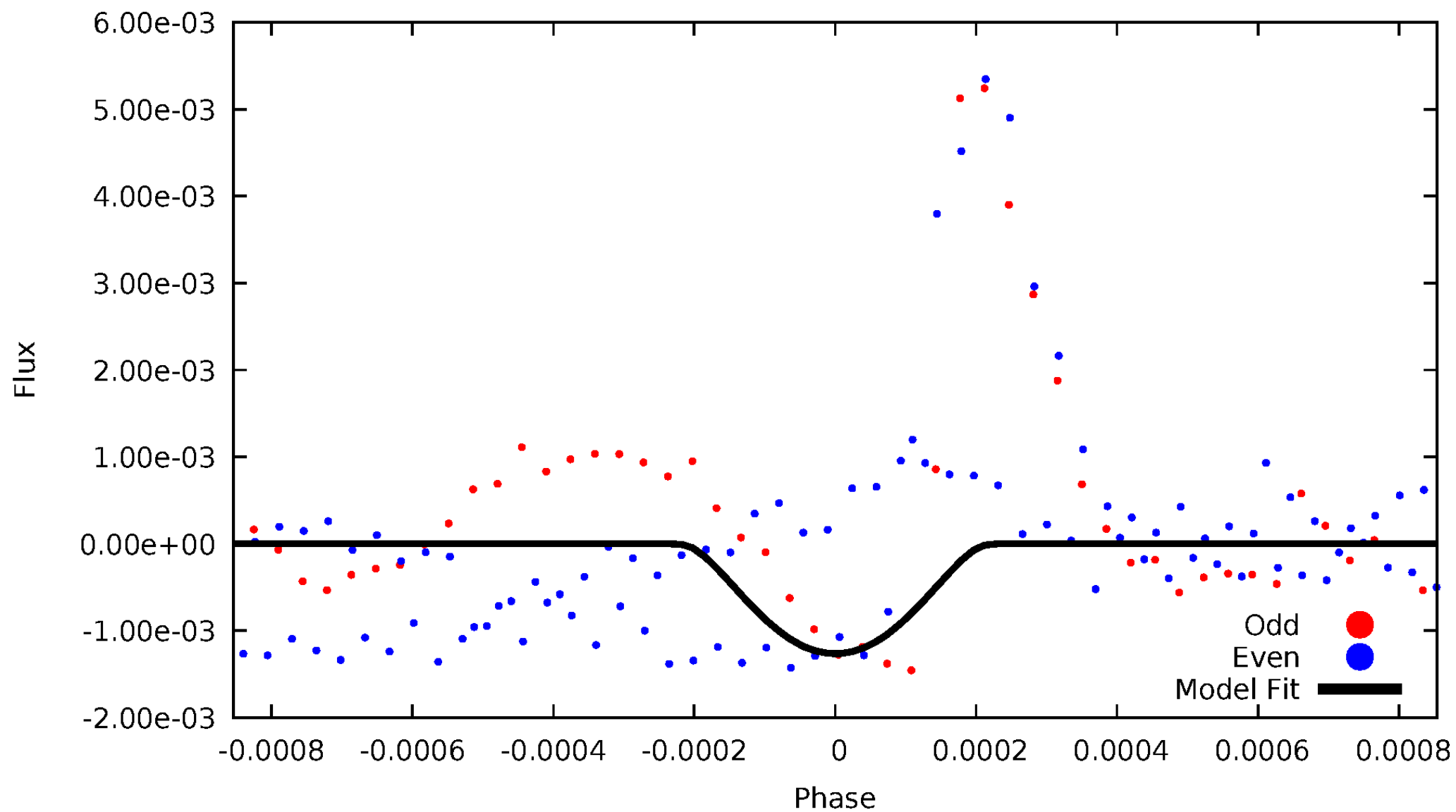


TCE 008610168-03



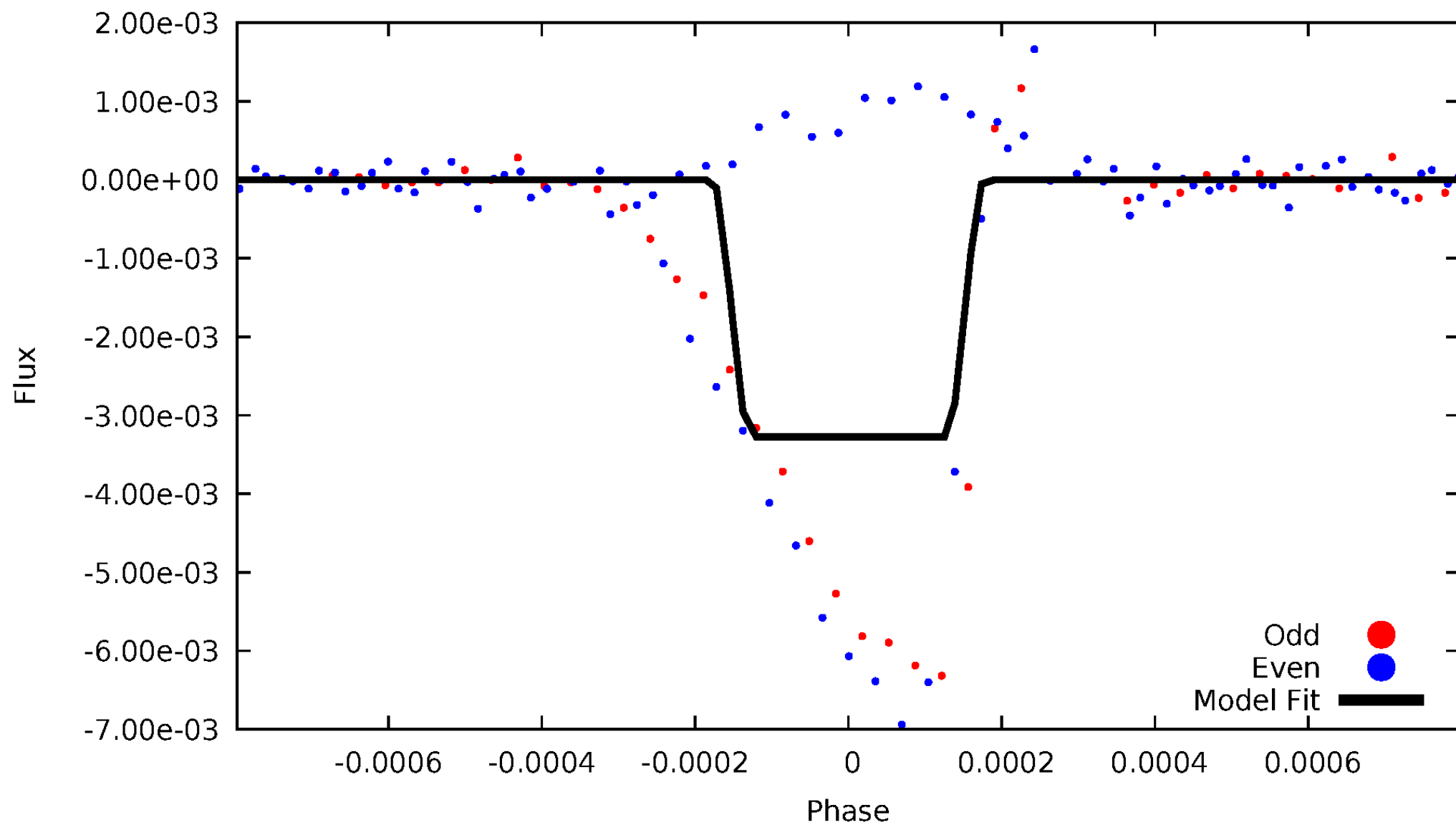
DV Odd/Even

TCE 008610168-03



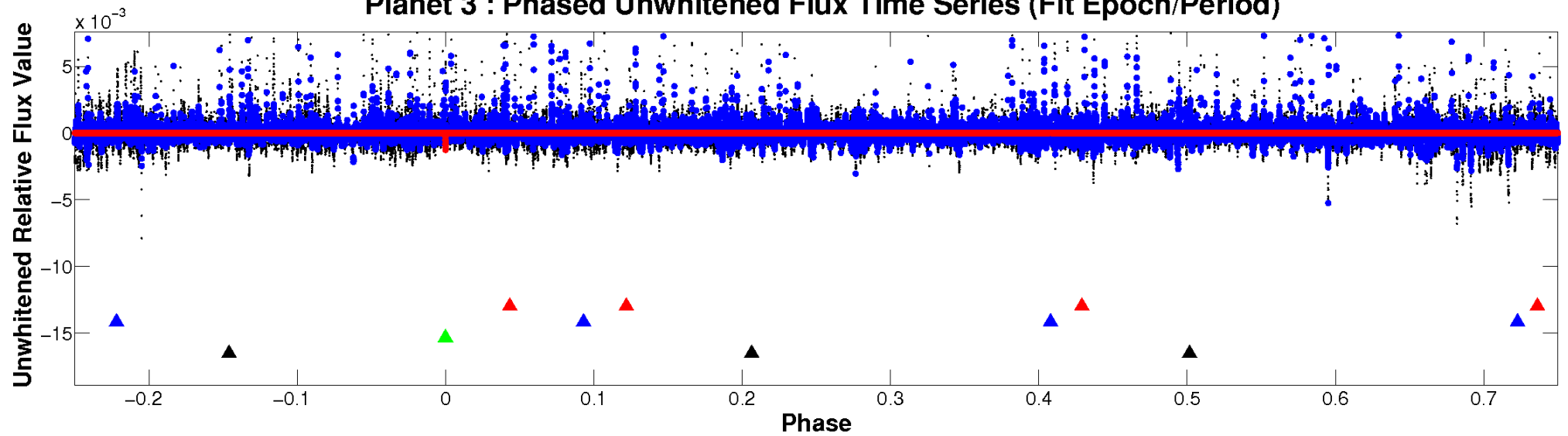
ALT Odd/Even

TCE 008610168-03

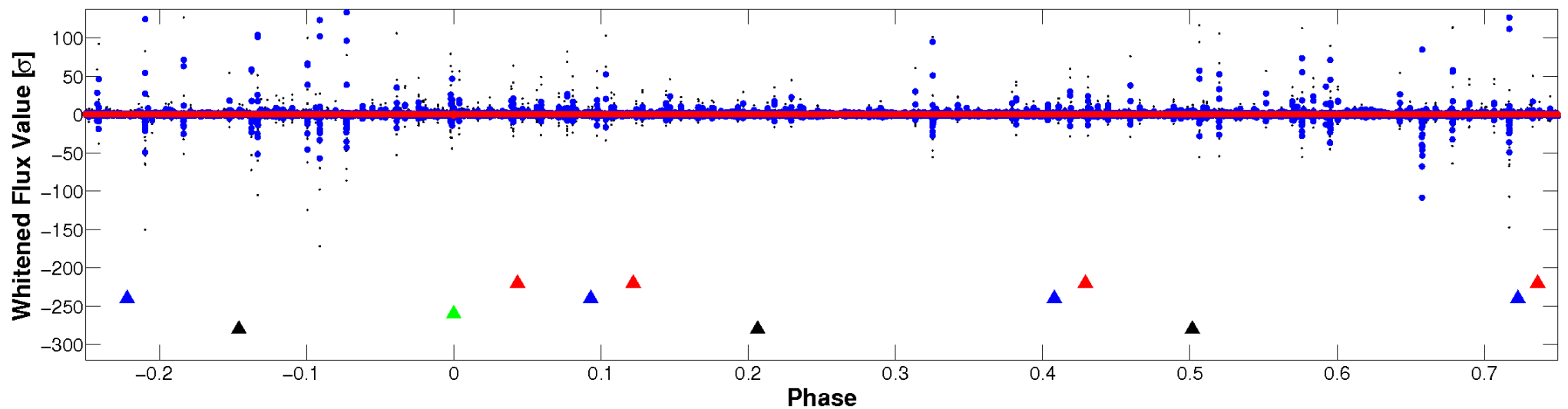


Non-Whitened Vs. Whitened Light Curve

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

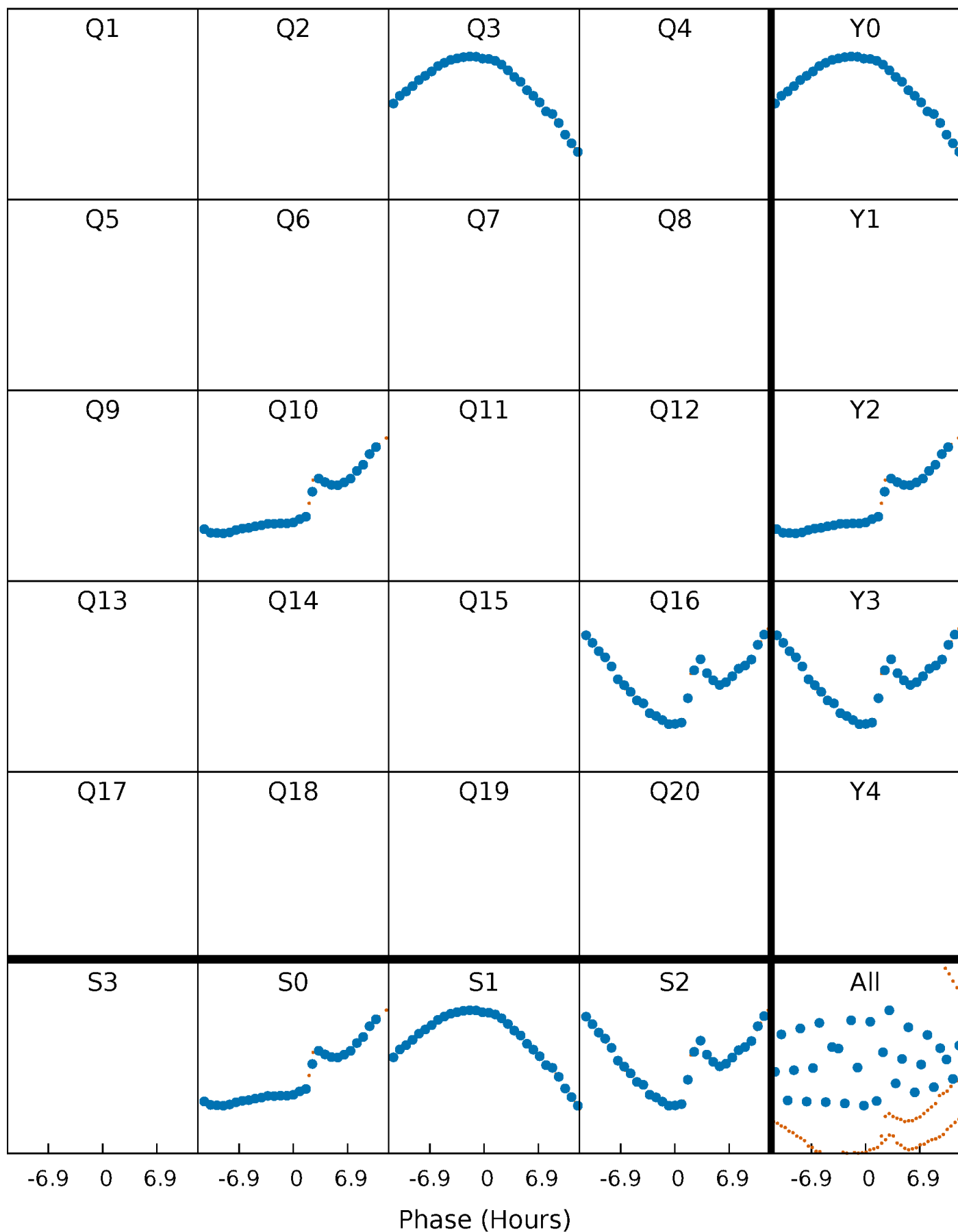


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



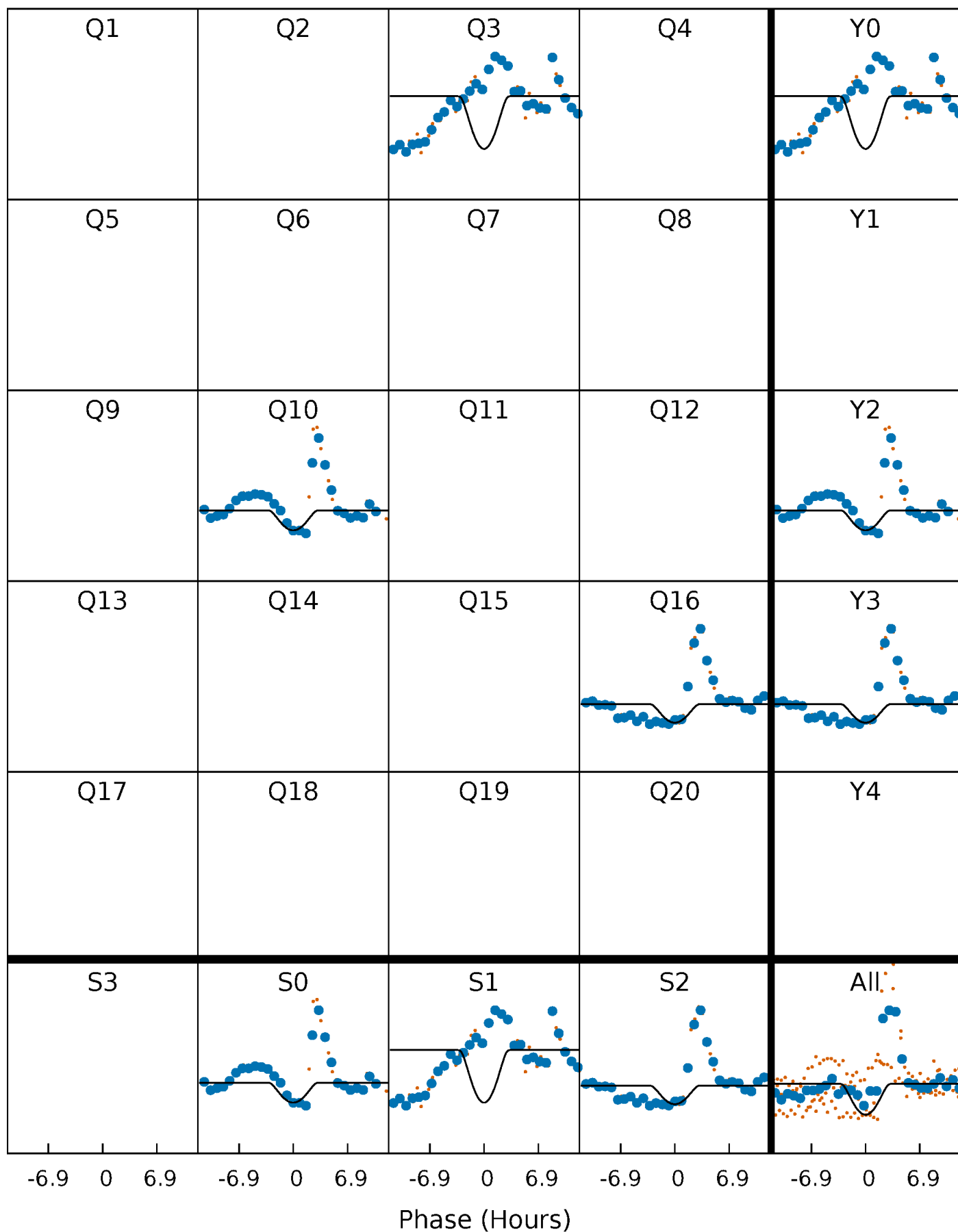
PDC Quarter-Phased Transit Curves

TCE 008610168-03 P=591.159036 Days $T_0=332.235906$ (BKJD)



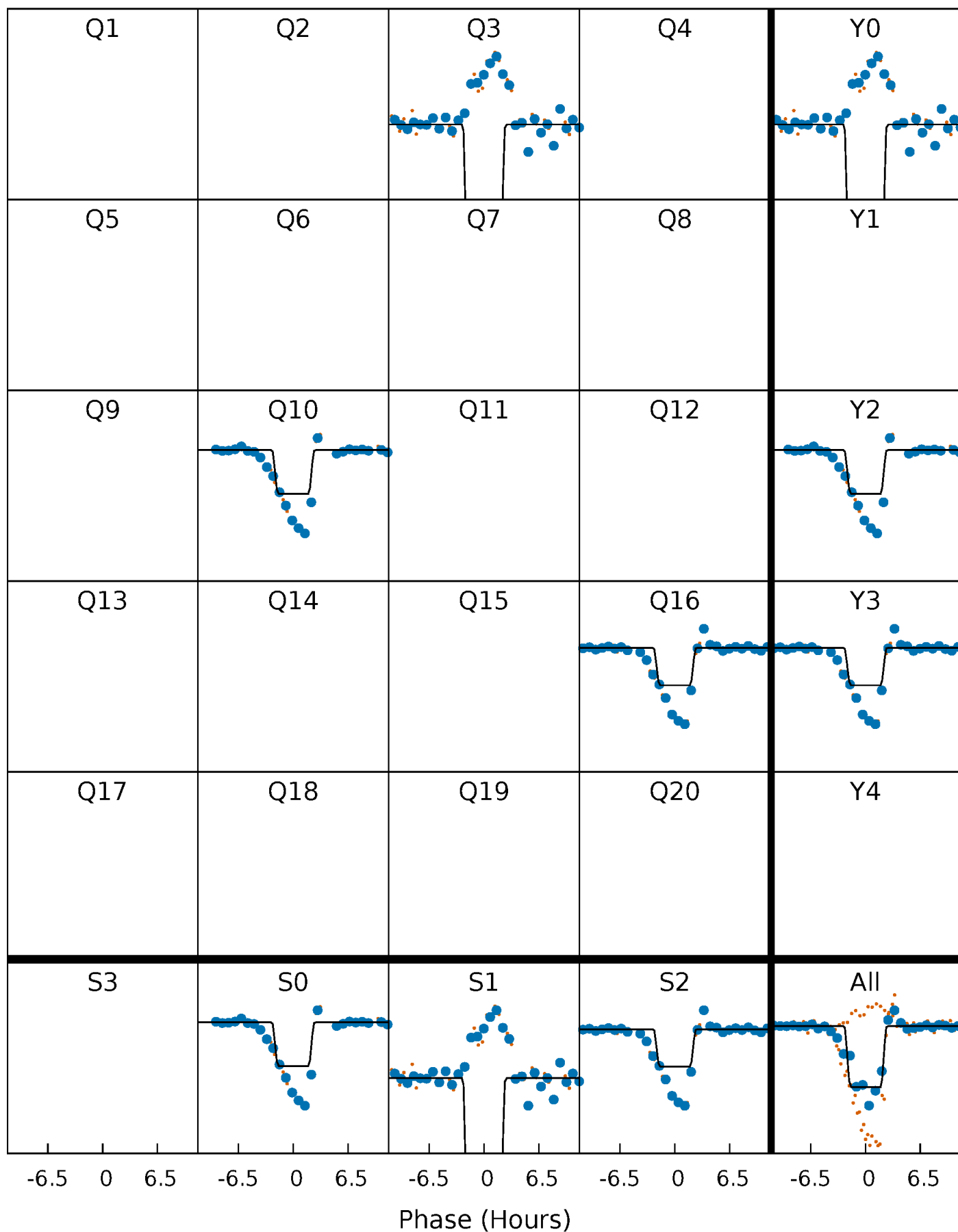
DV Quarter-Phased Transit Curves

TCE 008610168-03 P=591.159036 Days $T_0=332.235906$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

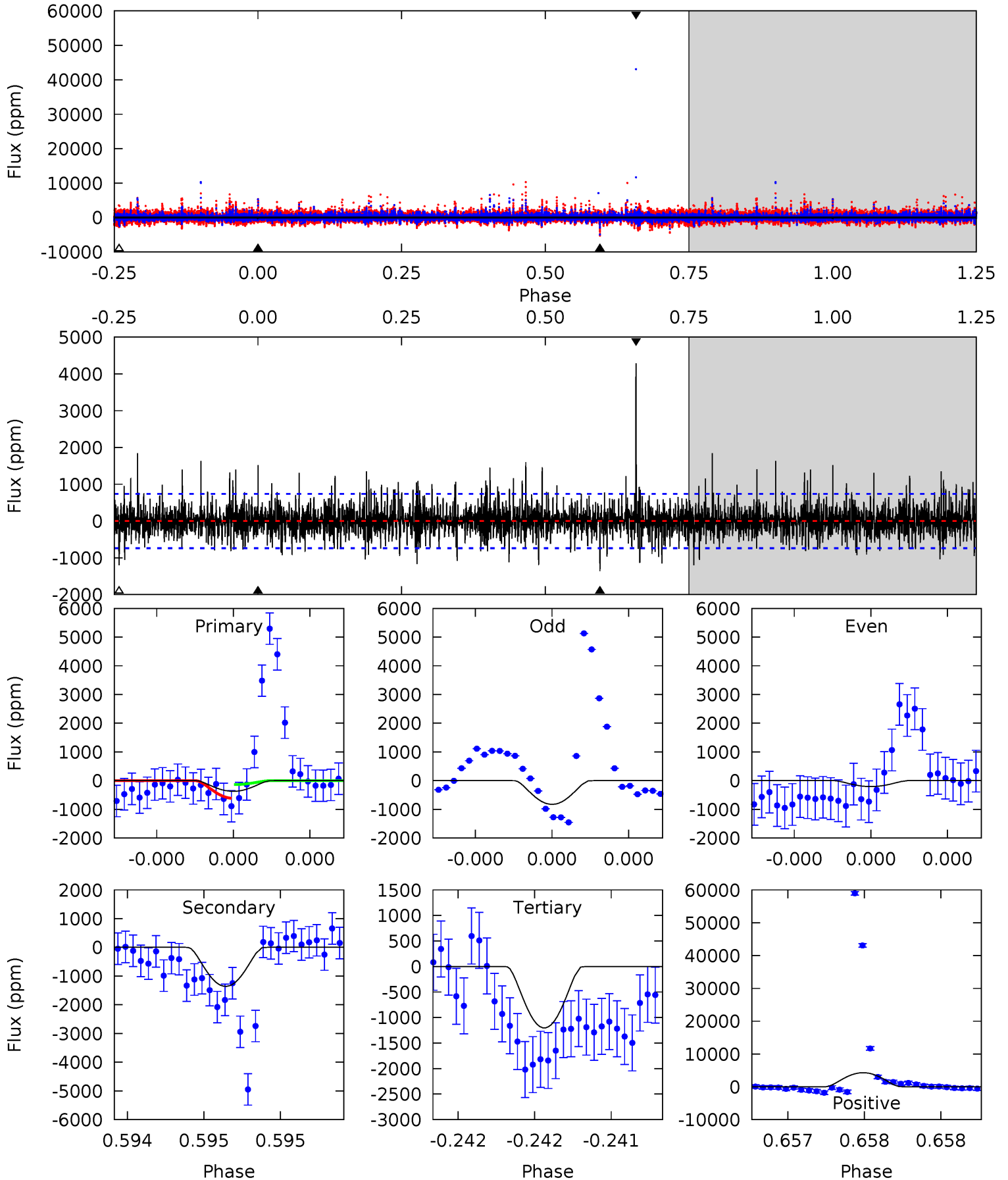
TCE 008610168-03 P=591.149702 Days $T_0=332.237265$ (BKJD)



DV Model-Shift Uniqueness Test

008610168-03, P = 591.159036 Days, E = 332.235906 Days

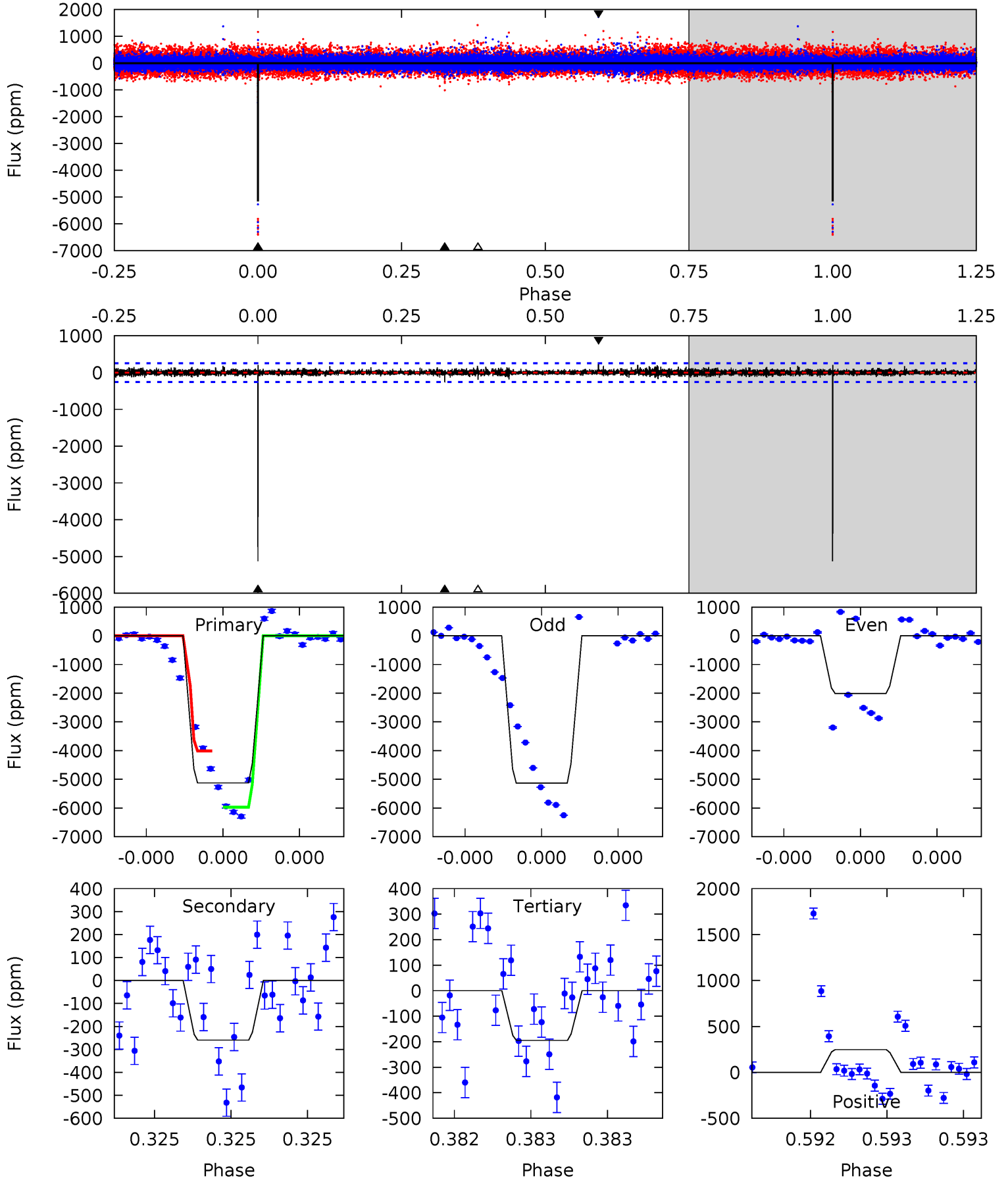
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.82	10.3	9.11	32.5	5.59	3.51	2.36	-6.29	-29.6	1.18	-22.2	1.35	0.43	0.76	1.82



Alt Model-Shift Uniqueness Test

008610168-03, P = 591.149702 Days, E = 332.237265 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
112.3	5.68	4.26	5.42	5.63	3.57	0.72	108.1	106.9	1.42	0.27	35.9	0.62	0.05	0



Stellar Parameters For KIC 008610168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5412^{+178}_{-146}	$3.885^{+0.660}_{-0.220}$	$-0.240^{+0.350}_{-0.250}$	$1.854^{+0.819}_{-1.092}$	$0.961^{+0.143}_{-0.157}$	$0.213^{+1.795}_{-0.130}$
	+3%/-3%	+17%/-6%	+146%/-104%	+44%/-59%	+15%/-16%	+844%/-61%
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 008610168-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1360 ± 132	$36.01^{+42.07}_{-24.68}$	378^{+49}_{-60}	2980^{+1275}_{-522}	1036^{+9041}_{-815}
Alt.	-260 ± 46	$37.26^{+41.82}_{-27.16}$	383^{+45}_{-64}	2384^{+998}_{-336}	196^{+2438}_{-154}

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

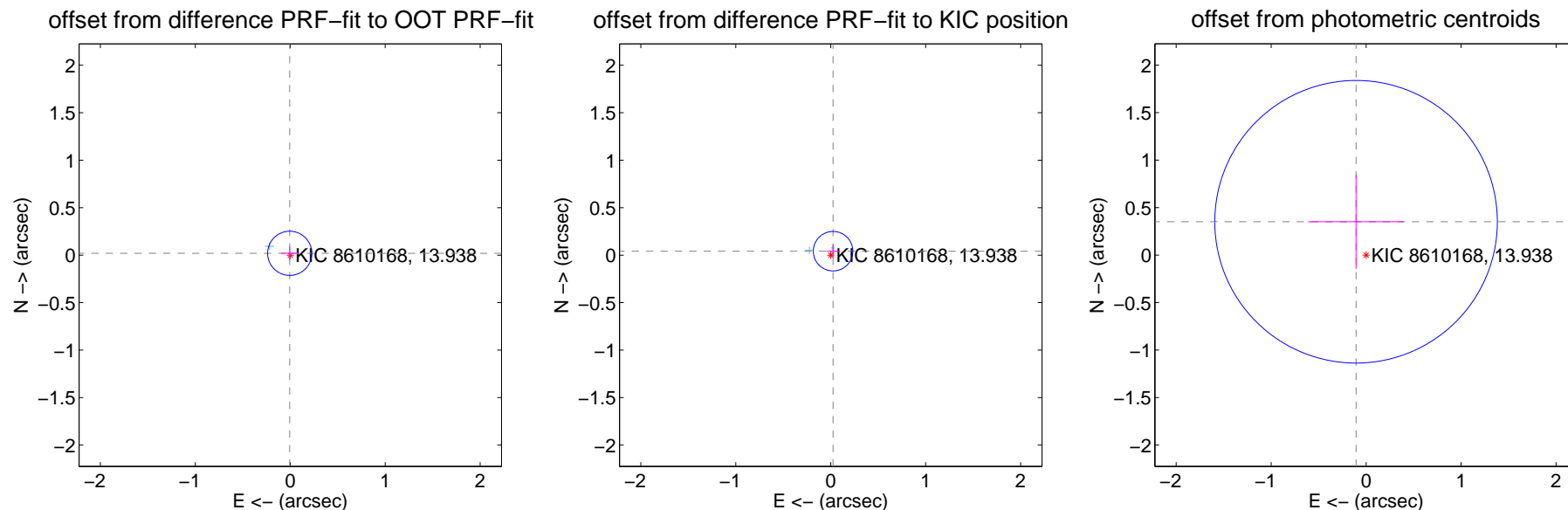
DV Centroid Data

Supplemental centroid analysis for 008610168-03. Kepler magnitude: 13.94. Transit SNR 5.50

There are 2 quarters with good PRF difference image offsets

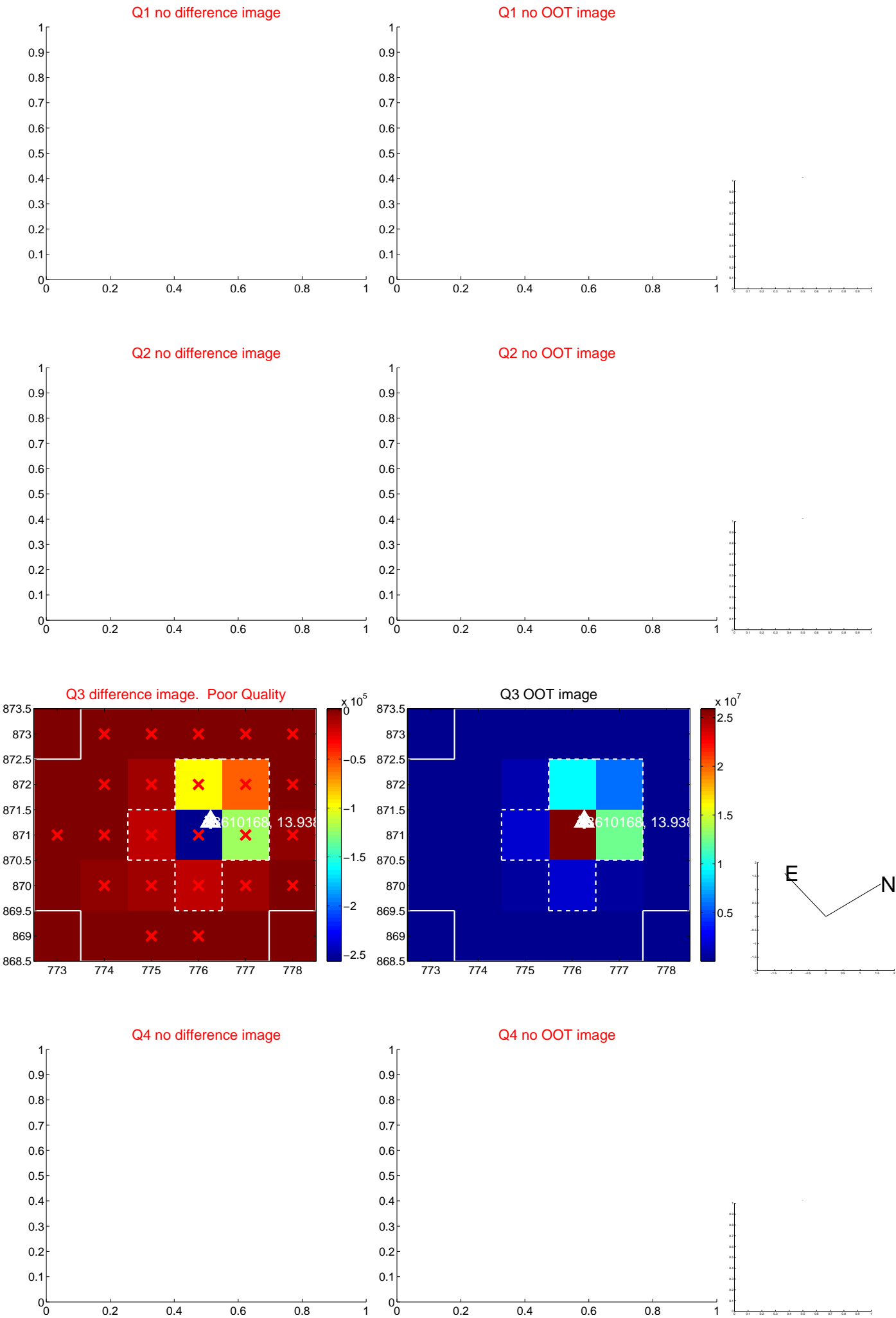
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.020 ± 0.078	0.26	0.006 ± 0.091	0.019 ± 0.070
PRF-fit source offset from KIC position	0.048 ± 0.069	0.70	-0.025 ± 0.070	0.042 ± 0.069
photometric centroid source offset	0.37 ± 0.50	0.74	0.11 ± 0.51	0.35 ± 0.49



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.

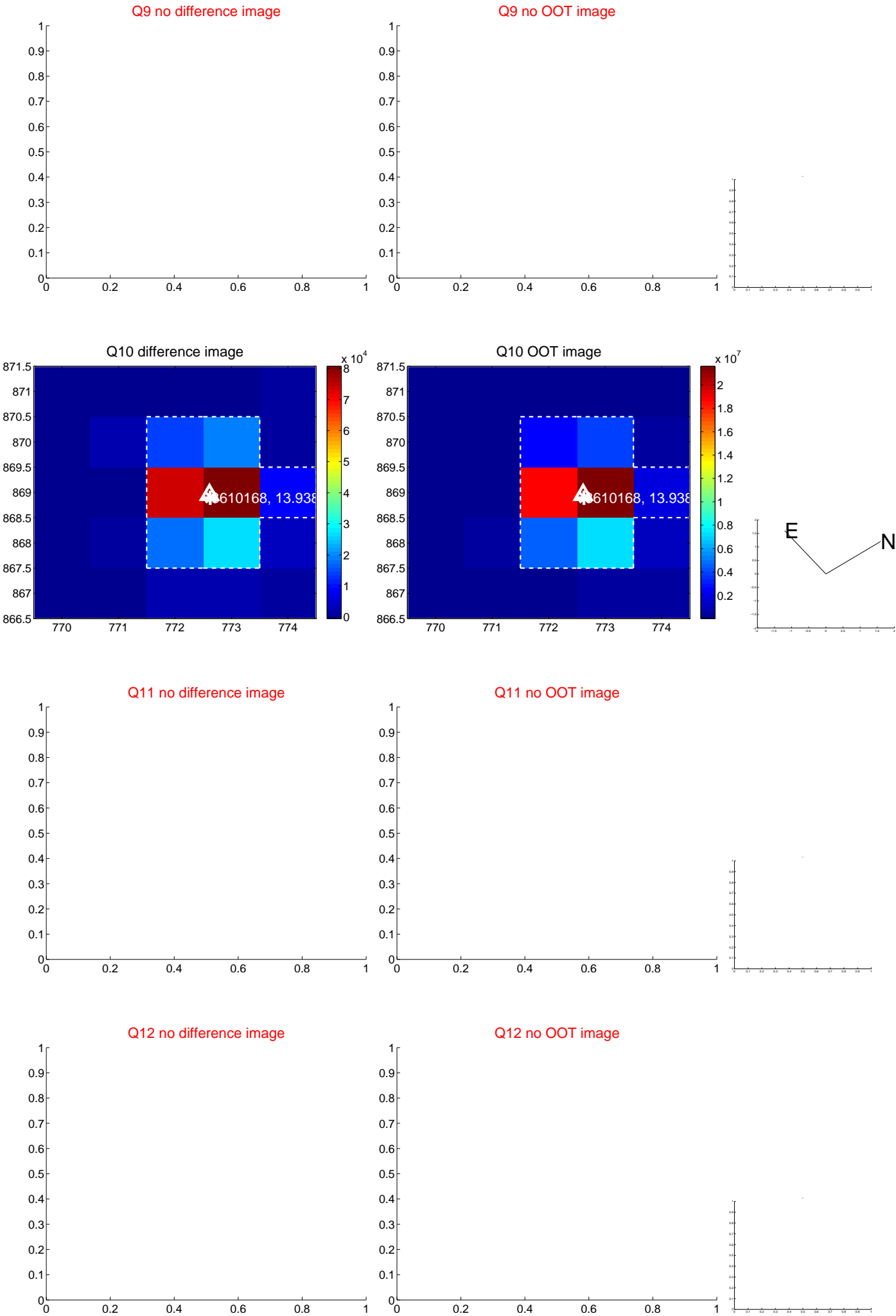
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



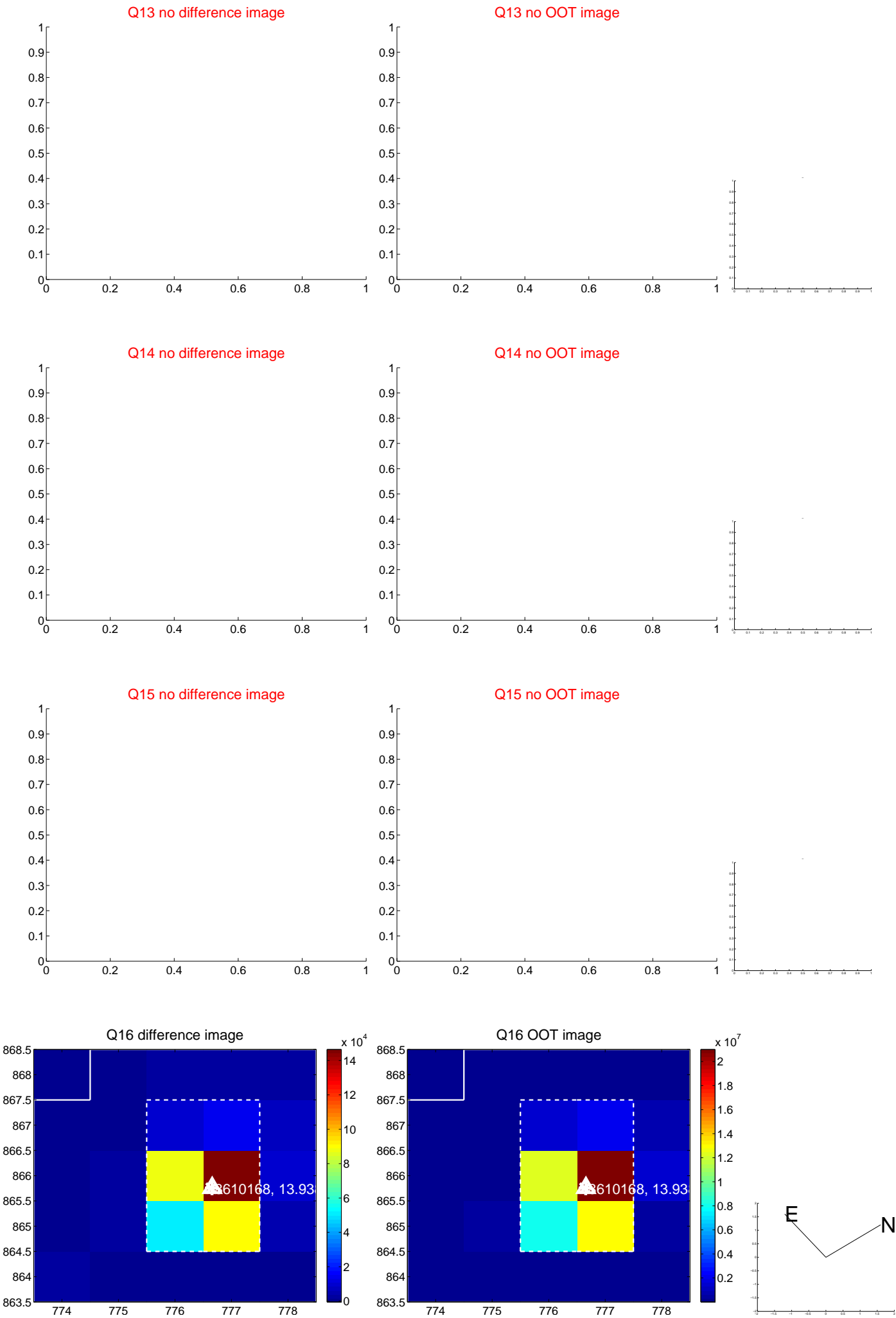
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



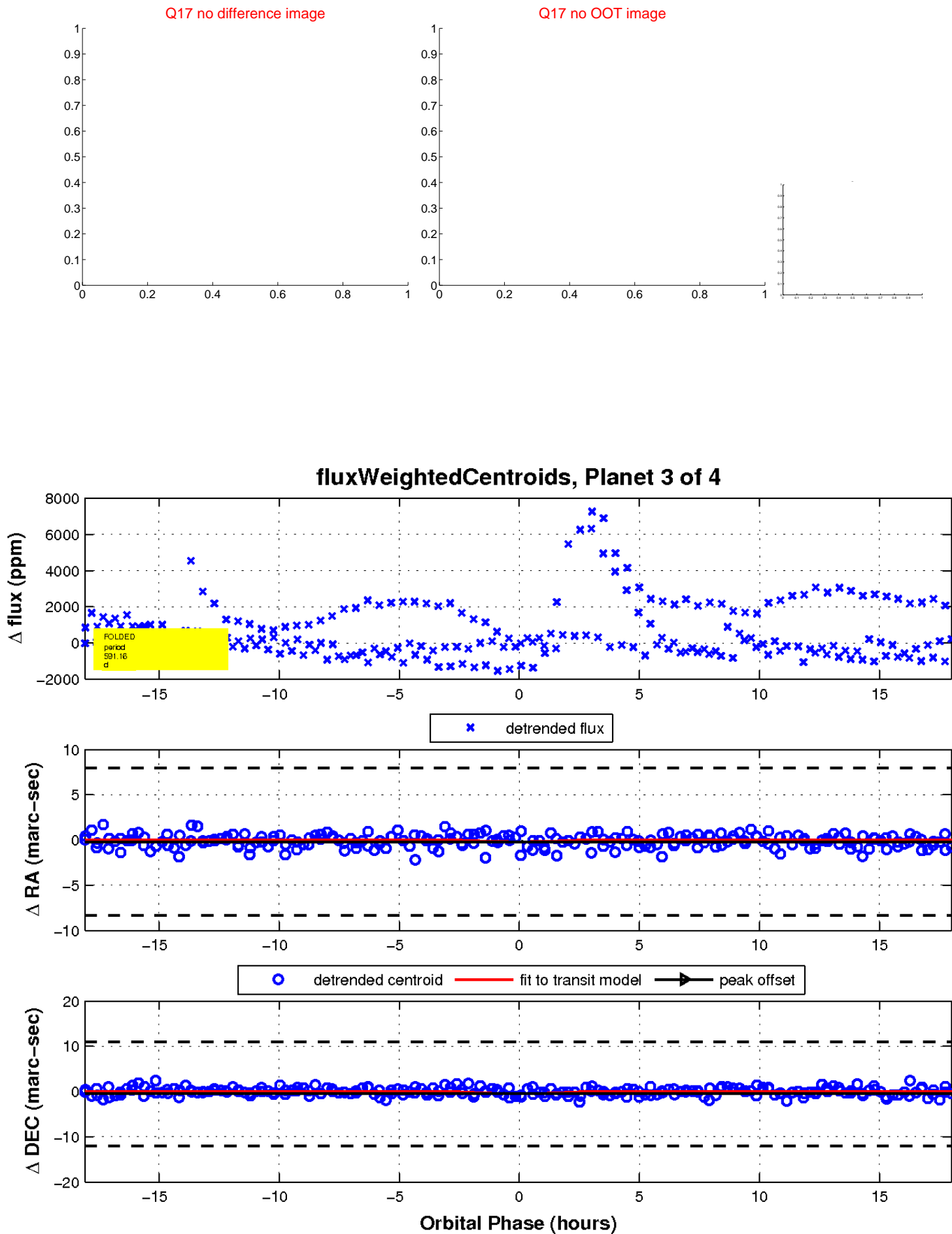
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

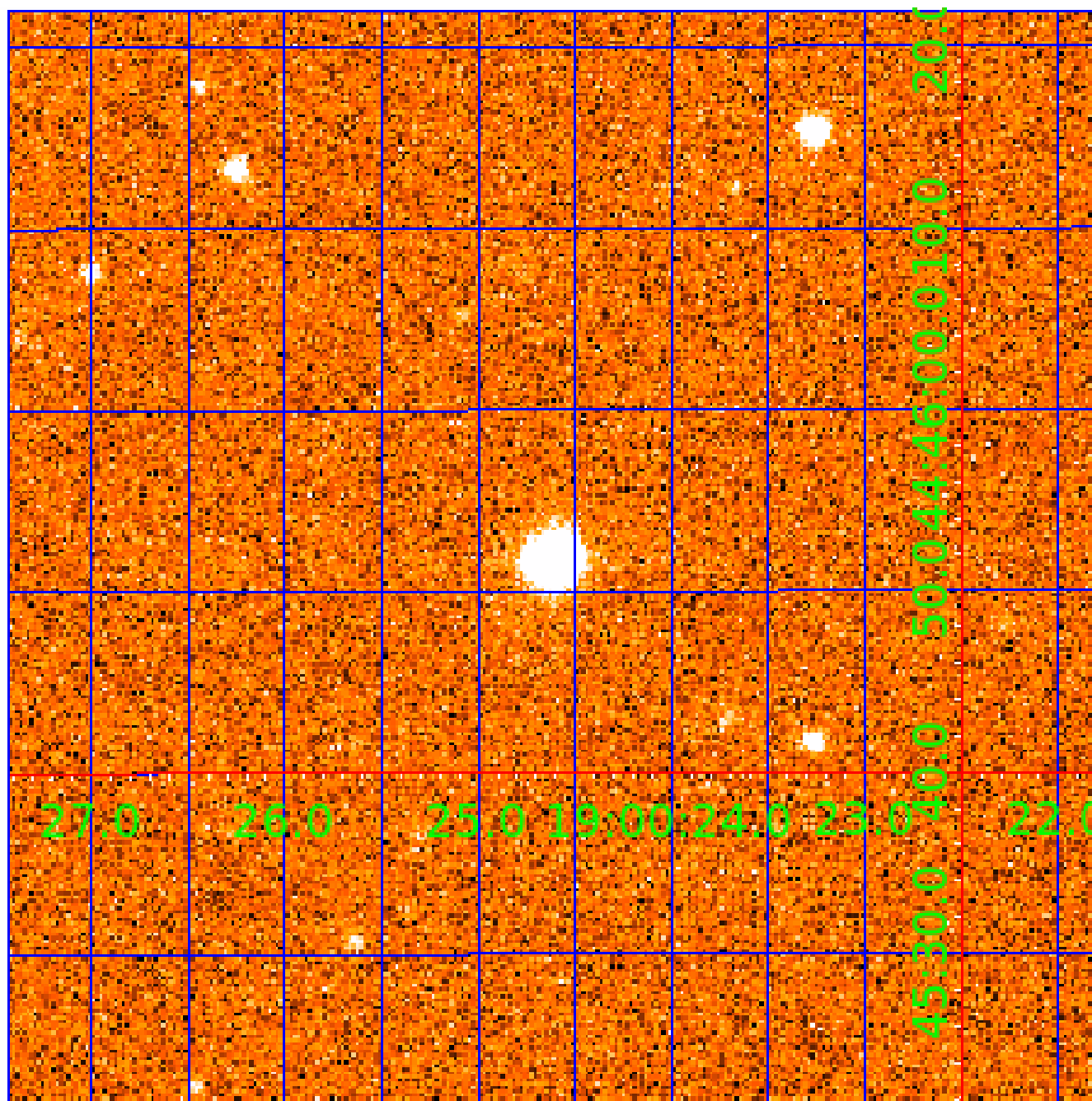


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008610168

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})
008610168-01	OBS	No	409.589252	357.868320	1425.6	3.807	15.4	8.1	1.85	5412	7.00	2.33
008610168-02	OBS	No	405.022761	168.377012	1518.4	5.004	17.4	8.6	1.85	5412	9.29	2.36
008610168-03	OBS	No	591.159036	332.235906	1263.9	6.057	19.7	5.5	1.85	5412	12.94	1.43
008610168-04	OBS	No	382.849991	454.276102	669.1	6.000	14.8	-1.0	1.85	5412	4.72	2.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008610168-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-02	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—CENT_FEW_DIFFS
008610168-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008610168-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

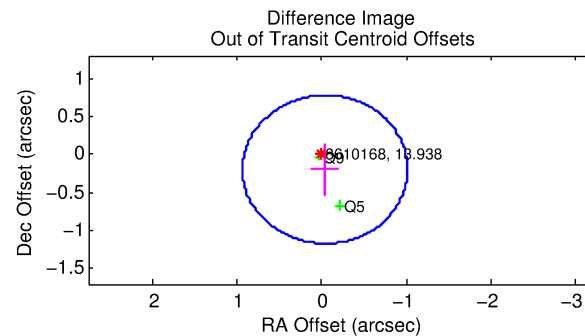
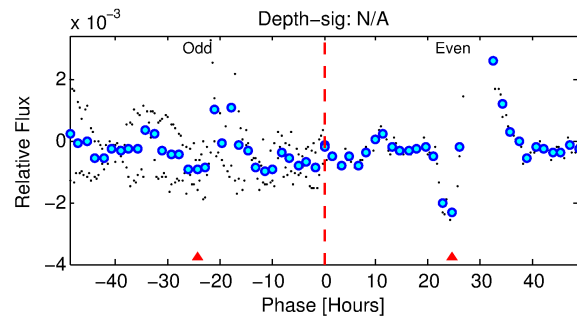
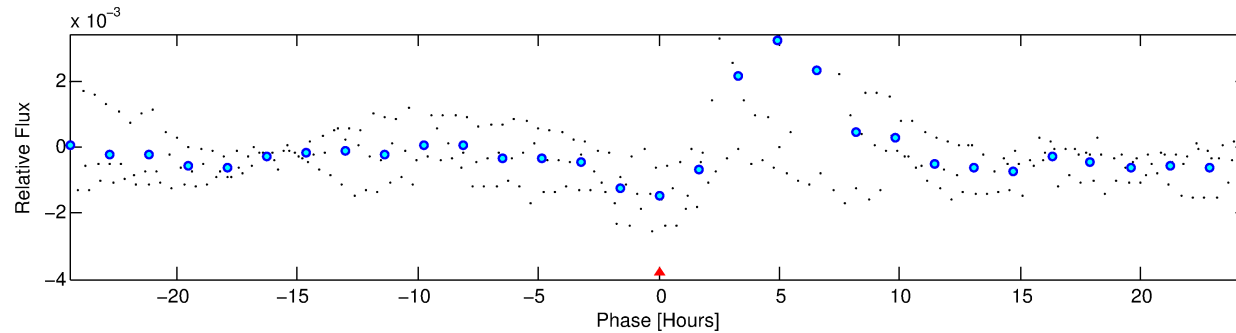
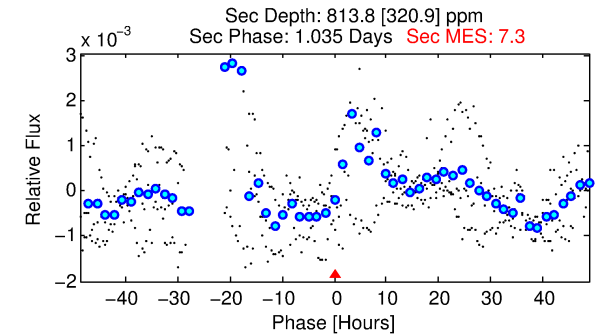
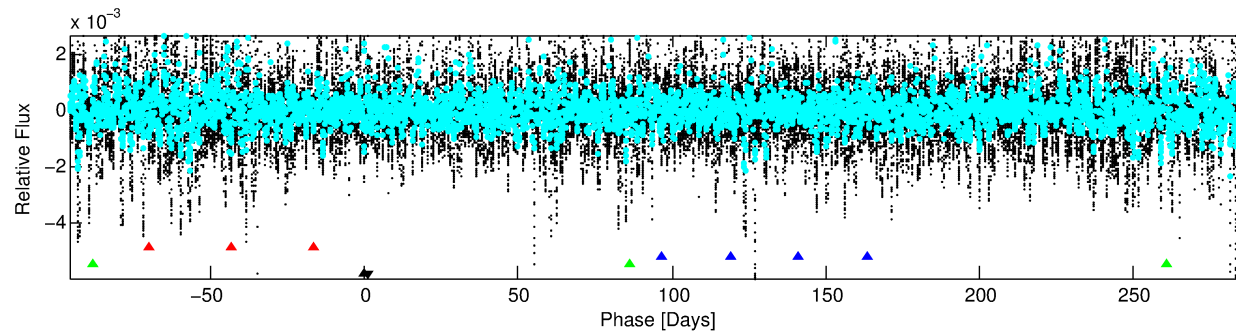
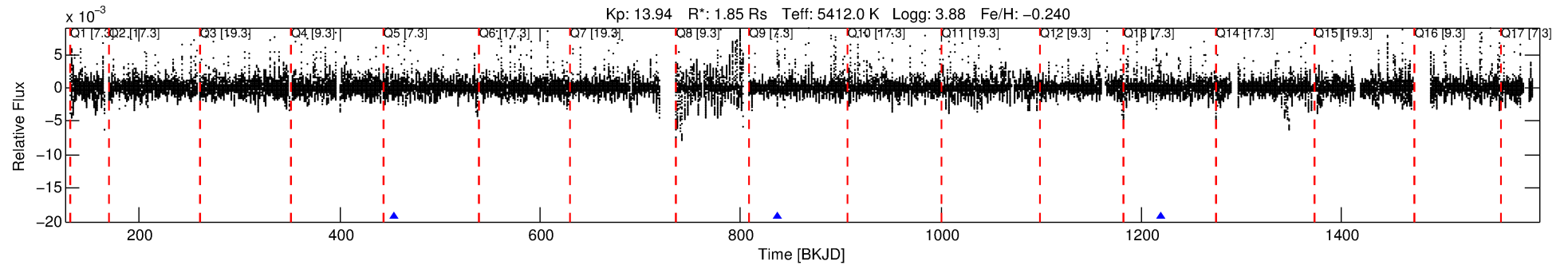
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008610168-04

No Significant Match Found

DV One-Page Summary

KIC: 8610168 Candidate: 4 of 4 Period: 382.850 d



TPS TCE Results:

Period = 382.84999 d
Epoch = 454.2761 BKJD

DV fit results are unavailable

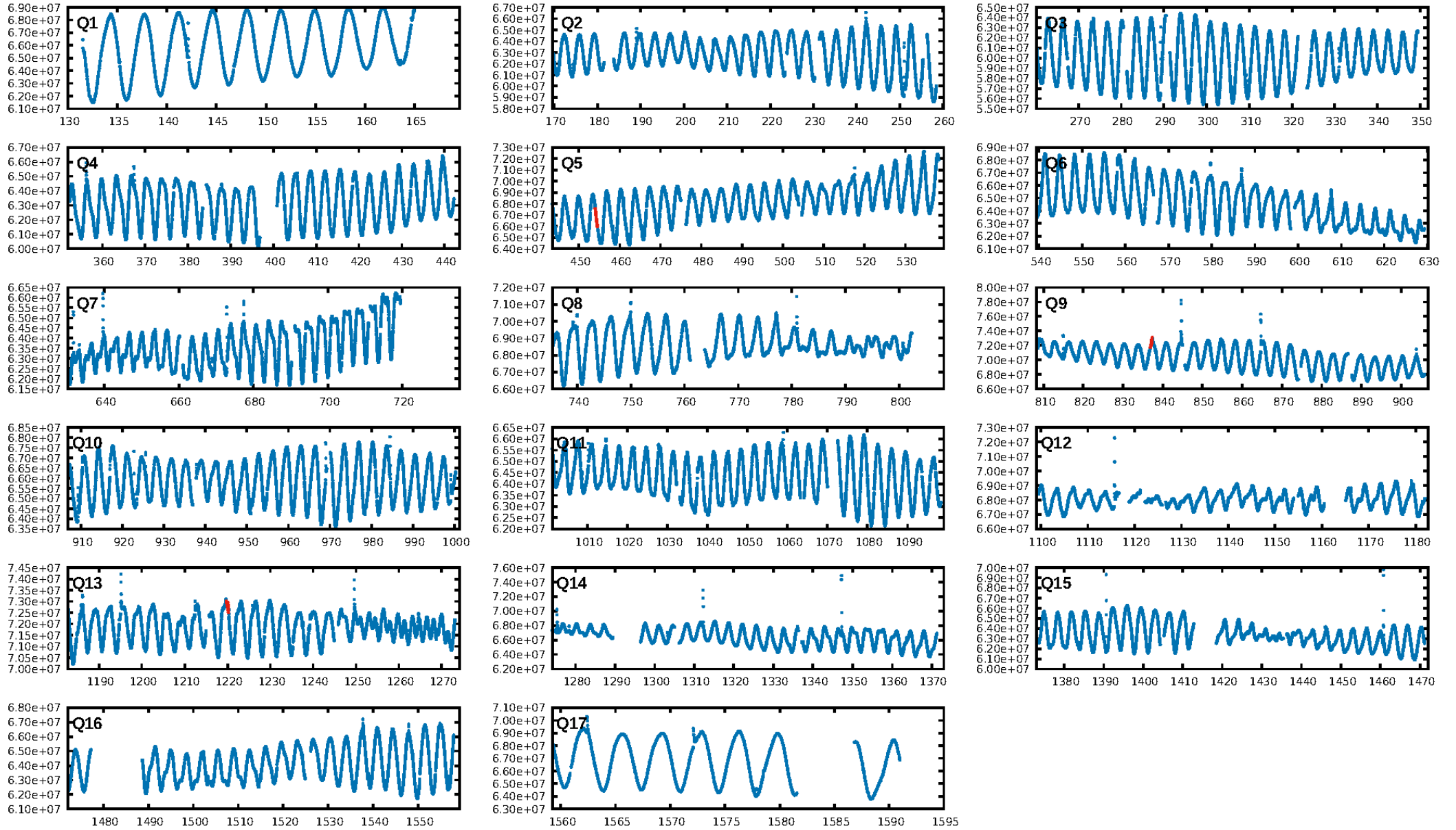
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [68.11 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 5.371
Centroid-sig: 9.1%
Centroid-so: 0.298 arcsec [1.55 σ]
OotOffset-rm: 0.199 arcsec [0.61 σ]
KicOffset-rm: 0.191 arcsec [0.56 σ]
OotOffset-st: 0/0/2 [2]
KicOffset-st: 0/0/2 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

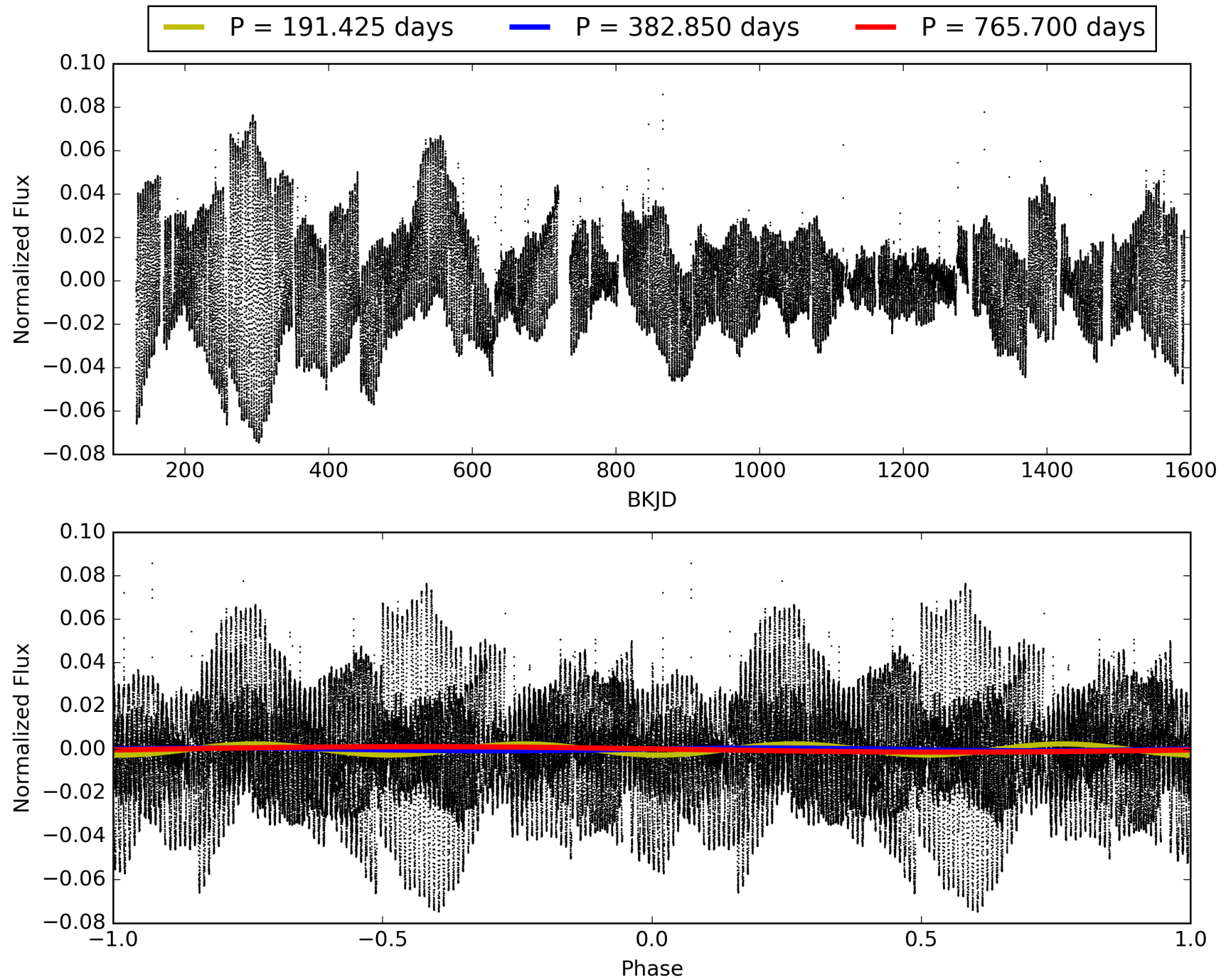
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 07:30:39 Z

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

TCE 008610168-04, PDC Light Curves

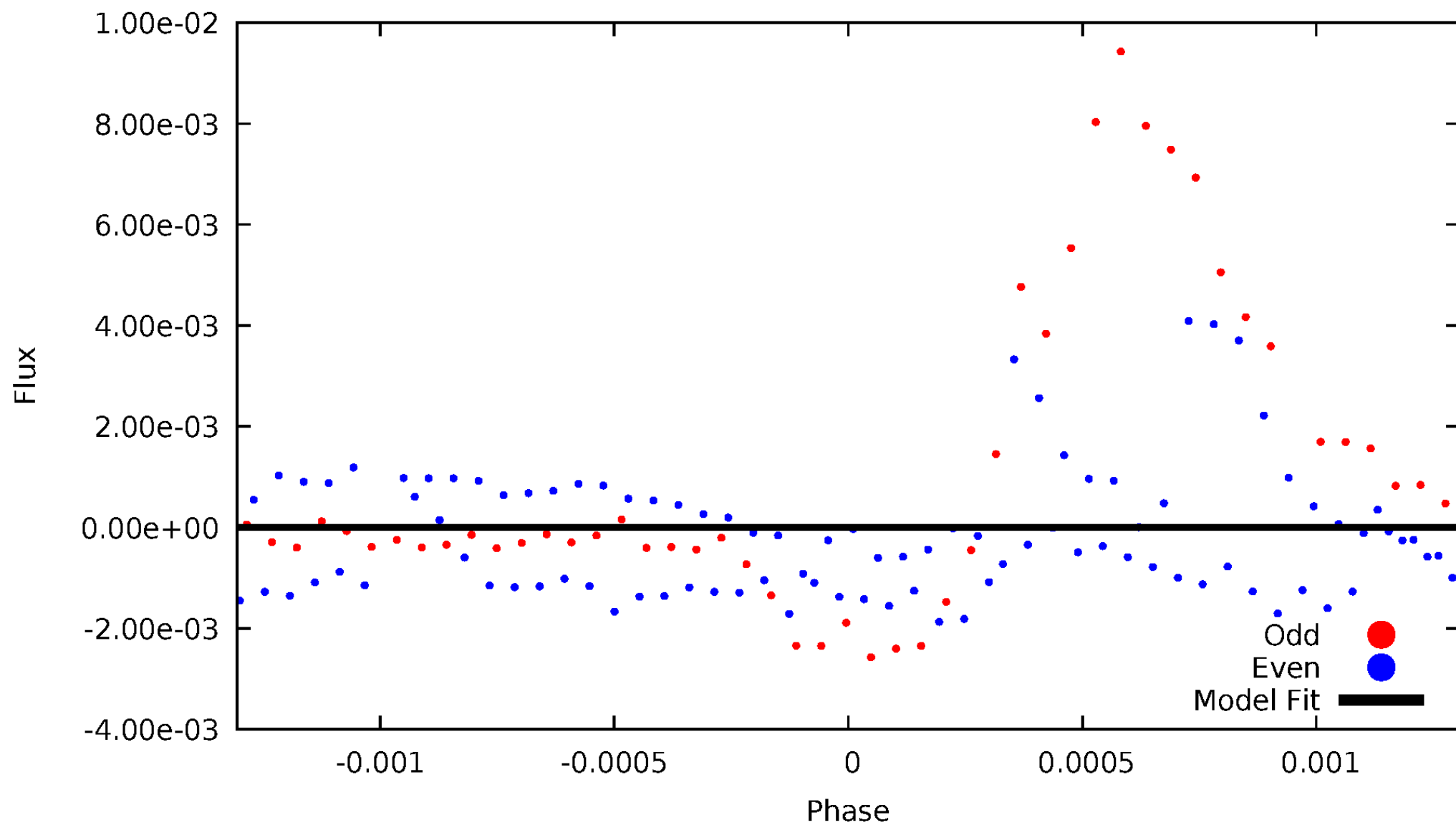


TCE 008610168-04



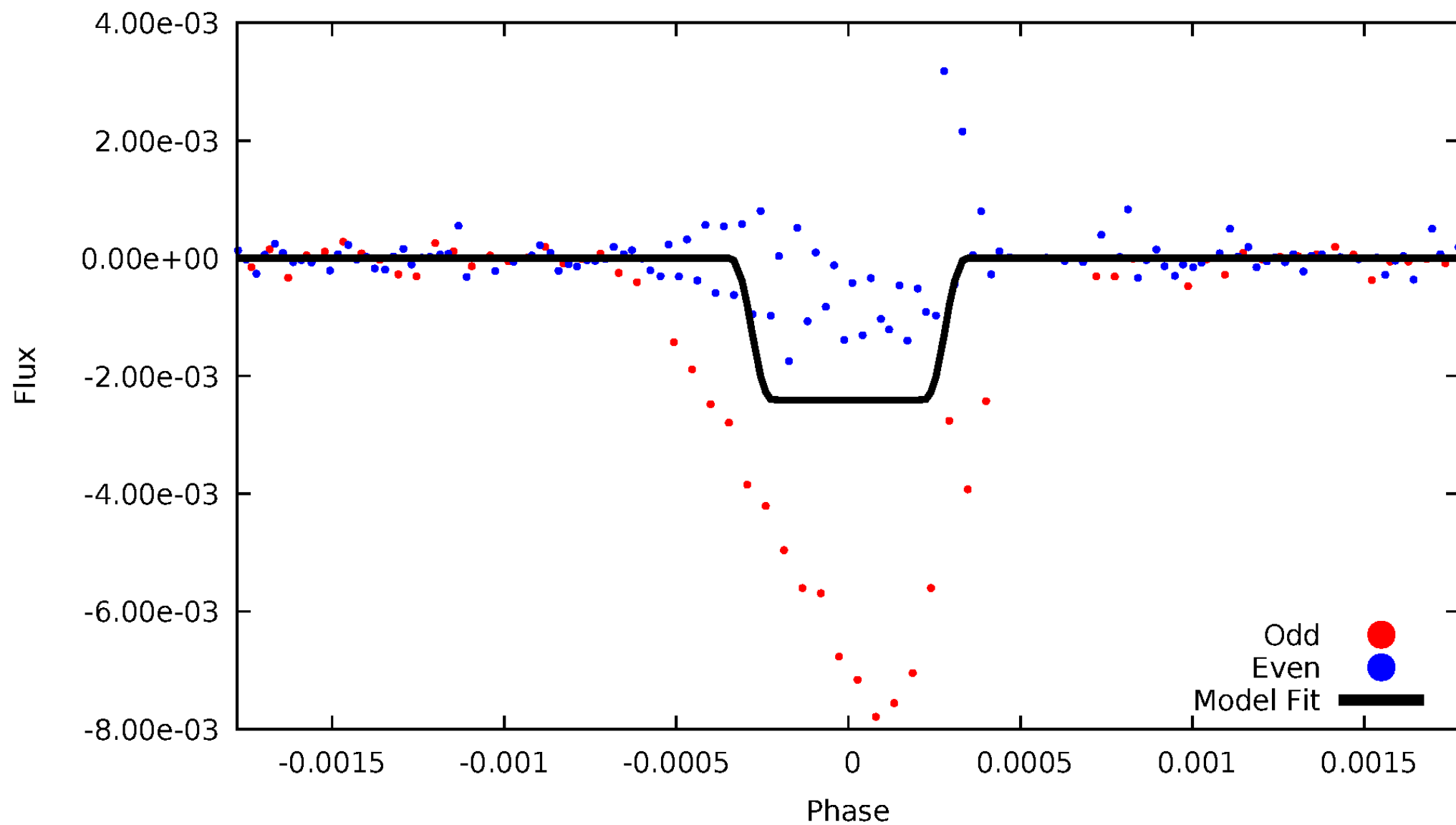
DV Odd/Even

TCE 008610168-04



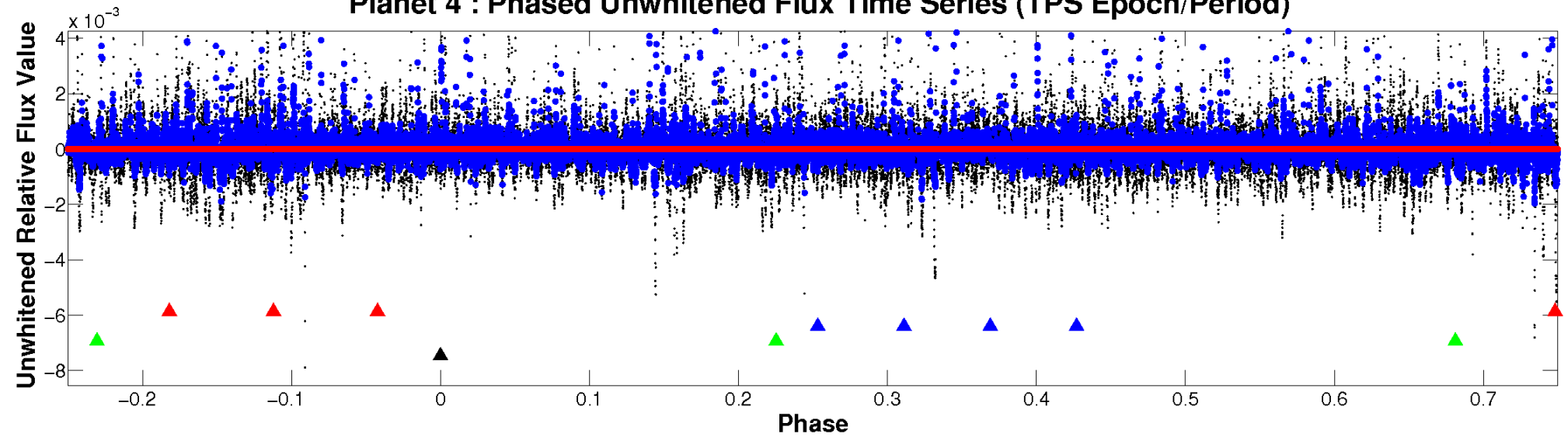
ALT Odd/Even

TCE 008610168-04

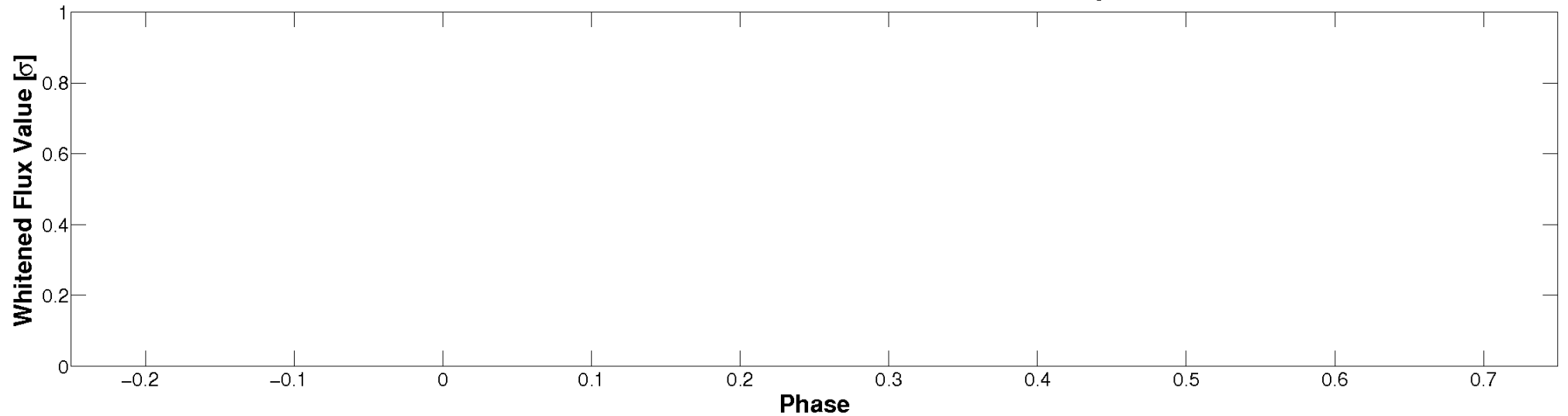


Non-Whitened Vs. Whitened Light Curve

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

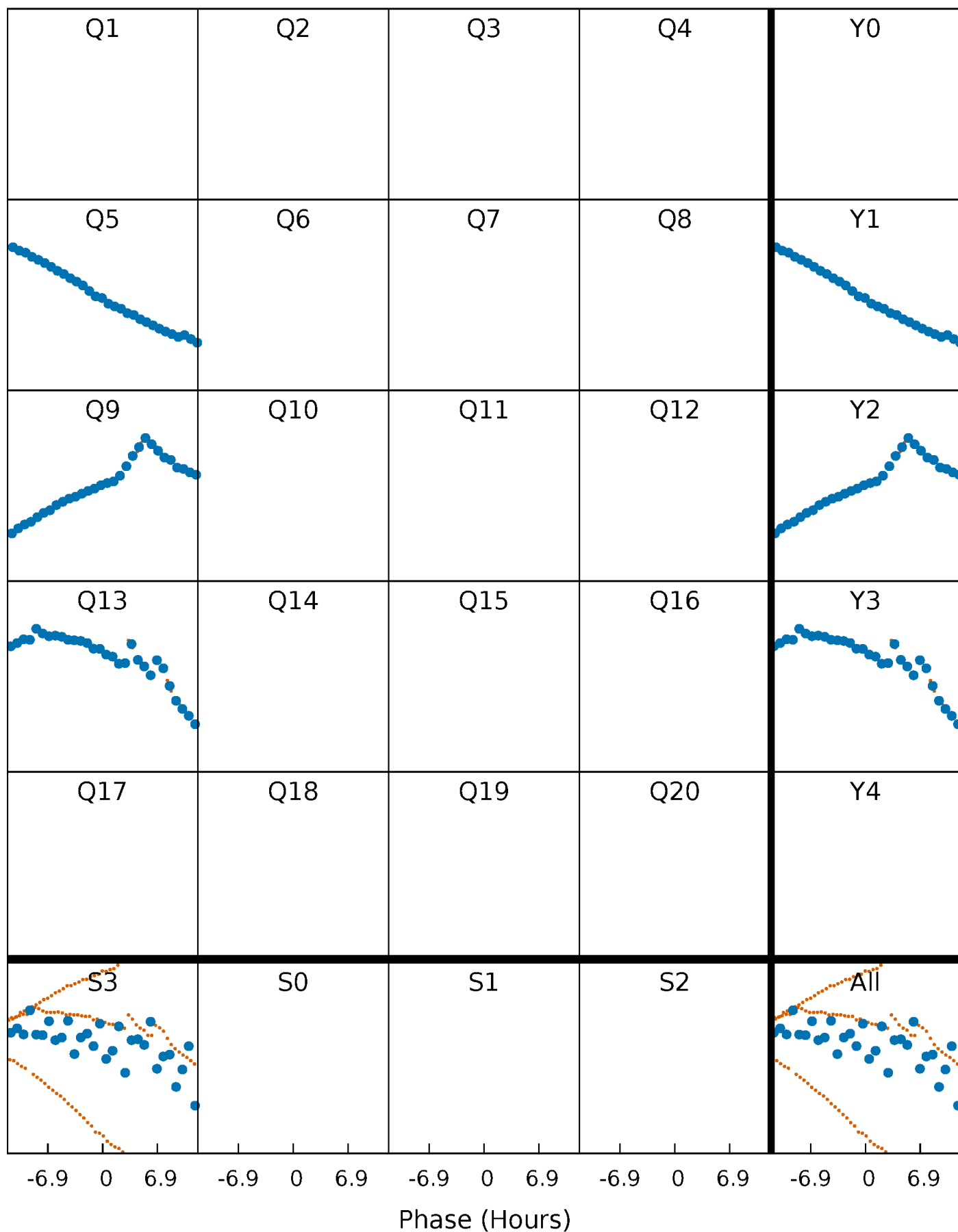


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



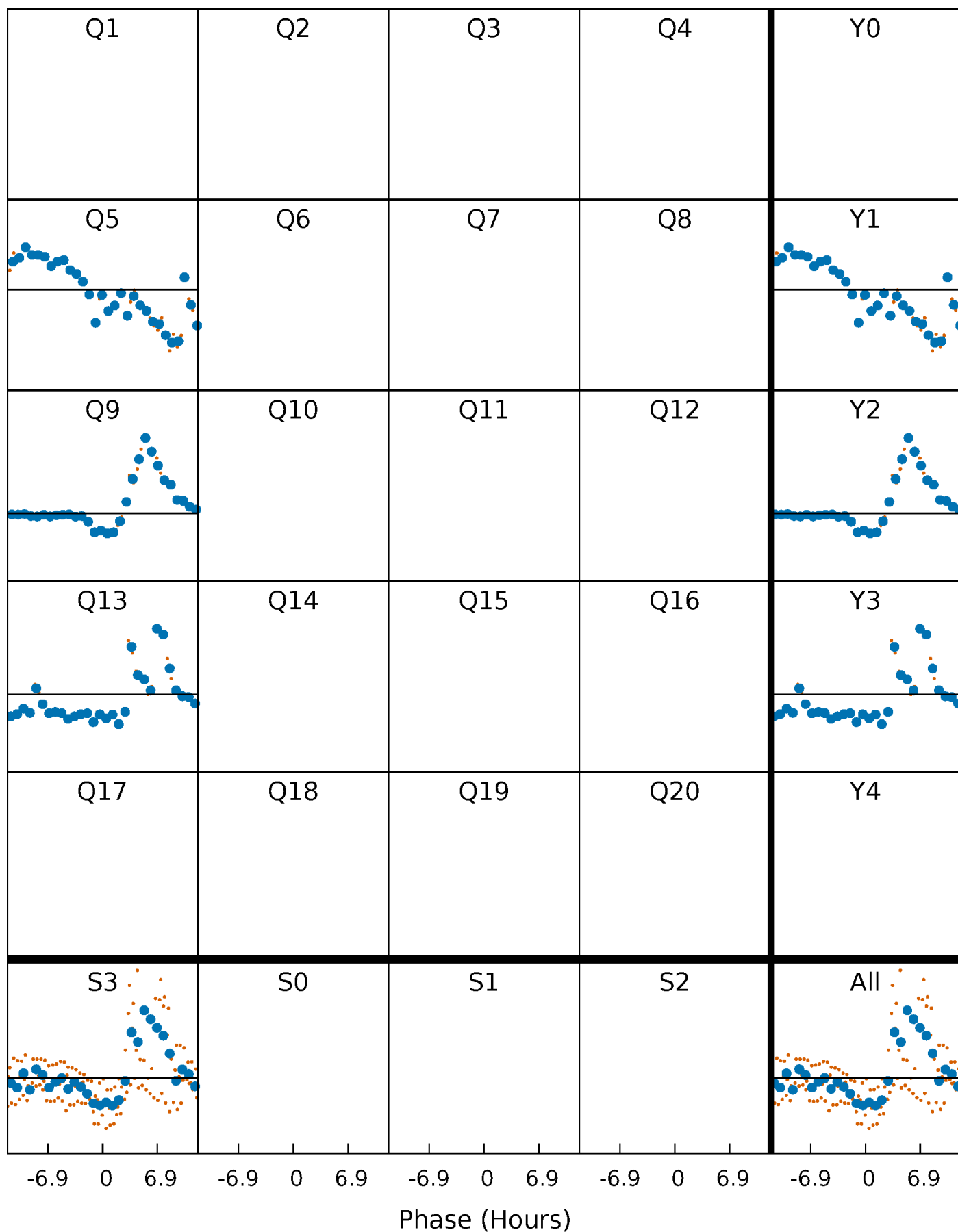
PDC Quarter-Phased Transit Curves

TCE 008610168-04 $P=382.849991$ Days $T_0=454.276102$ (BKJD)



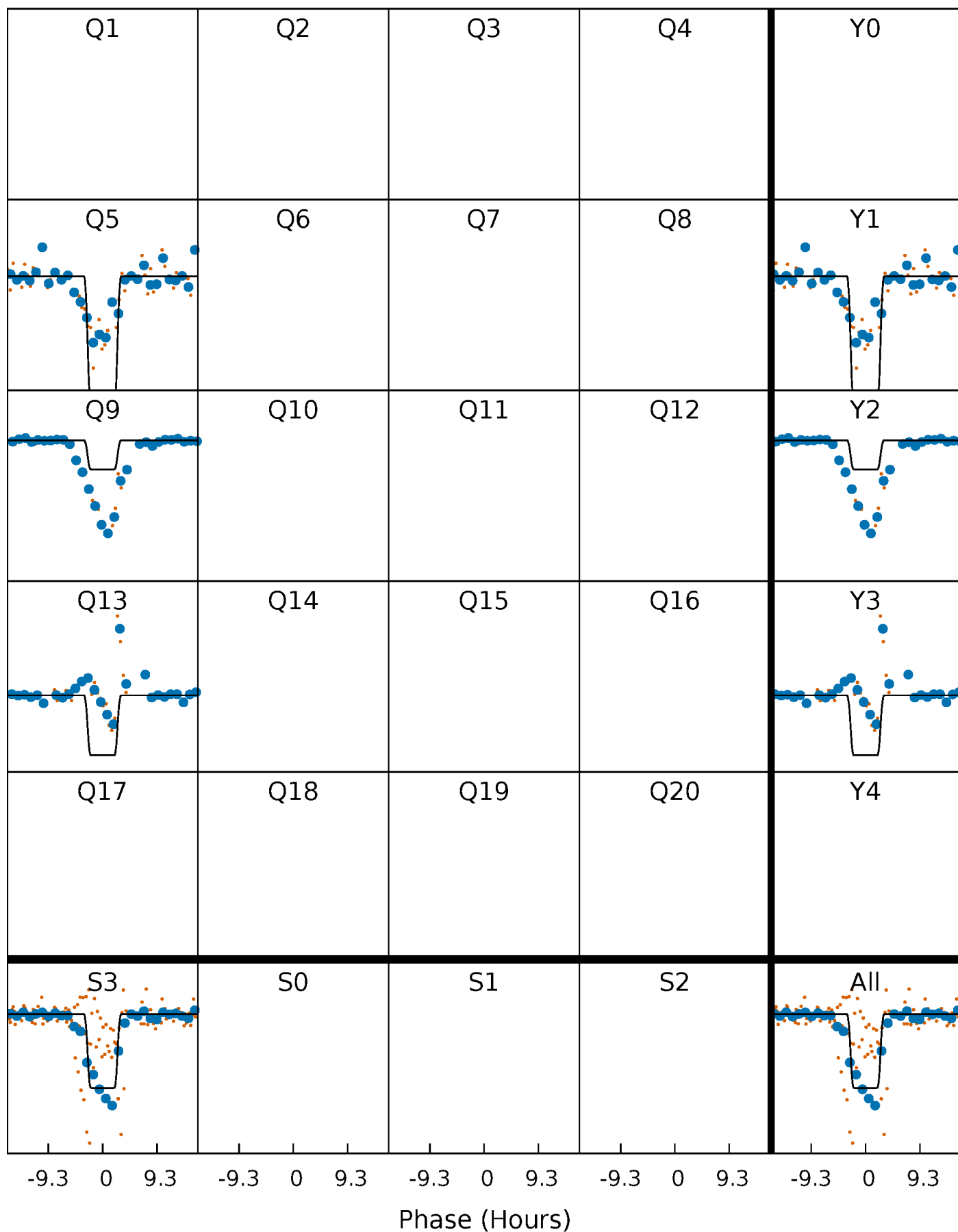
DV Quarter-Phased Transit Curves

TCE 008610168-04 $P=382.849991$ Days $T_0=454.276102$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

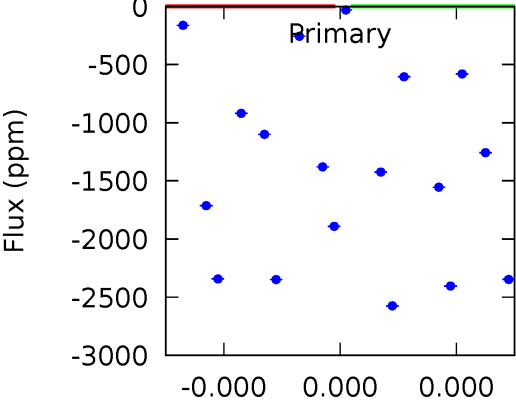
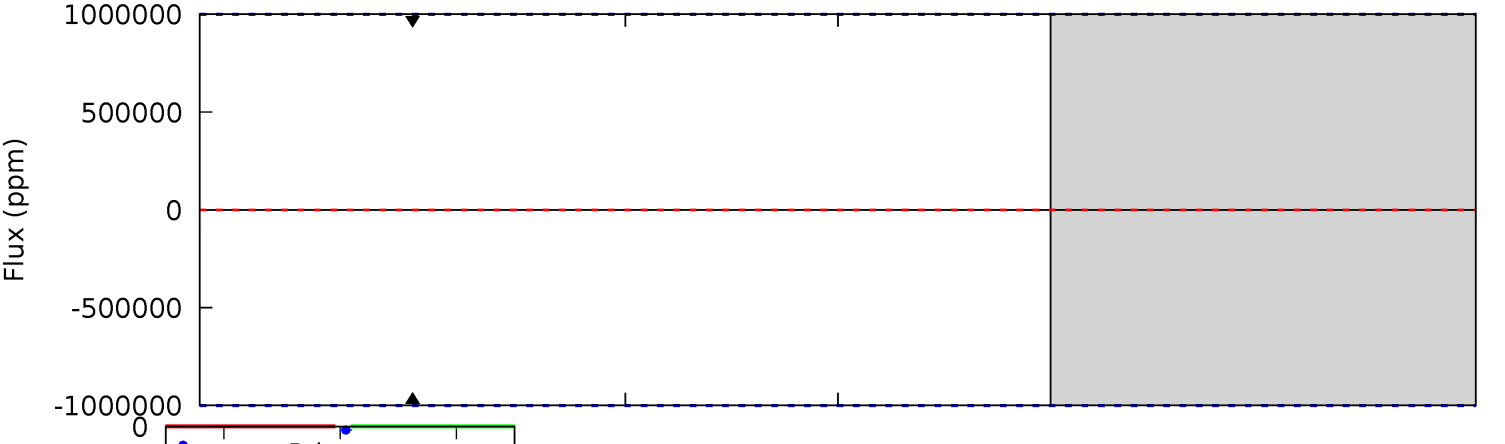
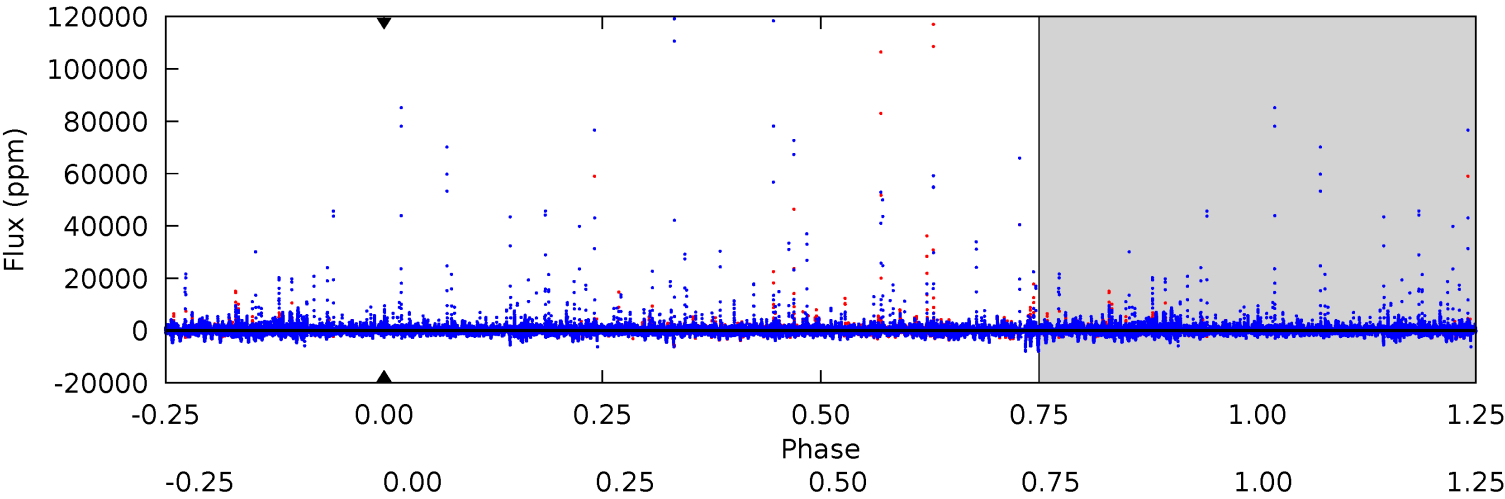
TCE 008610168-04 $P=382.849991$ Days $T_0=454.305003$ (BKJD)



DV Model-Shift Uniqueness Test

008610168-04, P = 382.849991 Days, E = 71.426111 Days

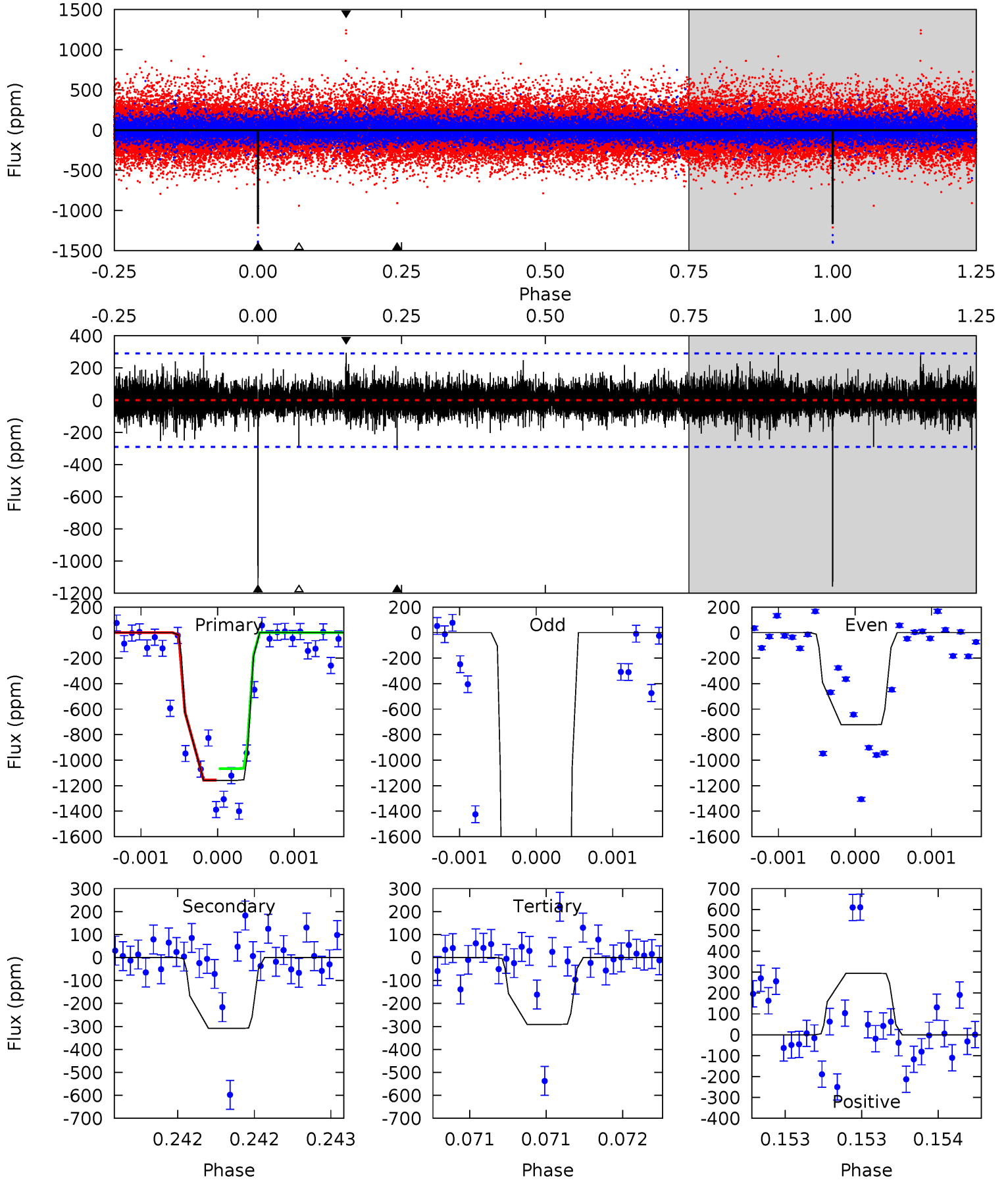
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008610168-04, P = 382.849991 Days, E = 71.455012 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.0	5.87	5.54	5.60	5.53	3.41	0.98	16.5	16.4	0.33	0.27	85.0	2.36	0.20	0.84



Stellar Parameters For KIC 008610168

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5412^{+178}_{-146}	$3.885^{+0.660}_{-0.220}$	$-0.240^{+0.350}_{-0.250}$	$1.854^{+0.819}_{-1.092}$	$0.961^{+0.143}_{-0.157}$	$0.213^{+1.795}_{-0.130}$
	+3%/-3%	+17%/-6%	+146%/-104%	+44%/-59%	+15%/-16%	+844%/-61%
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 008610168-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$13.80^{+17.58}_{-9.94}$	443^{+48}_{-73}	4393^{+15244}_{-19829}	$4888^{+622333}_{-463840}$
Alt.	-308 ± 53	$15.66^{+17.50}_{-11.12}$	440^{+50}_{-79}	3052^{+1352}_{-502}	682^{+7170}_{-516}

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 $A_{obs} \gg 1.0$

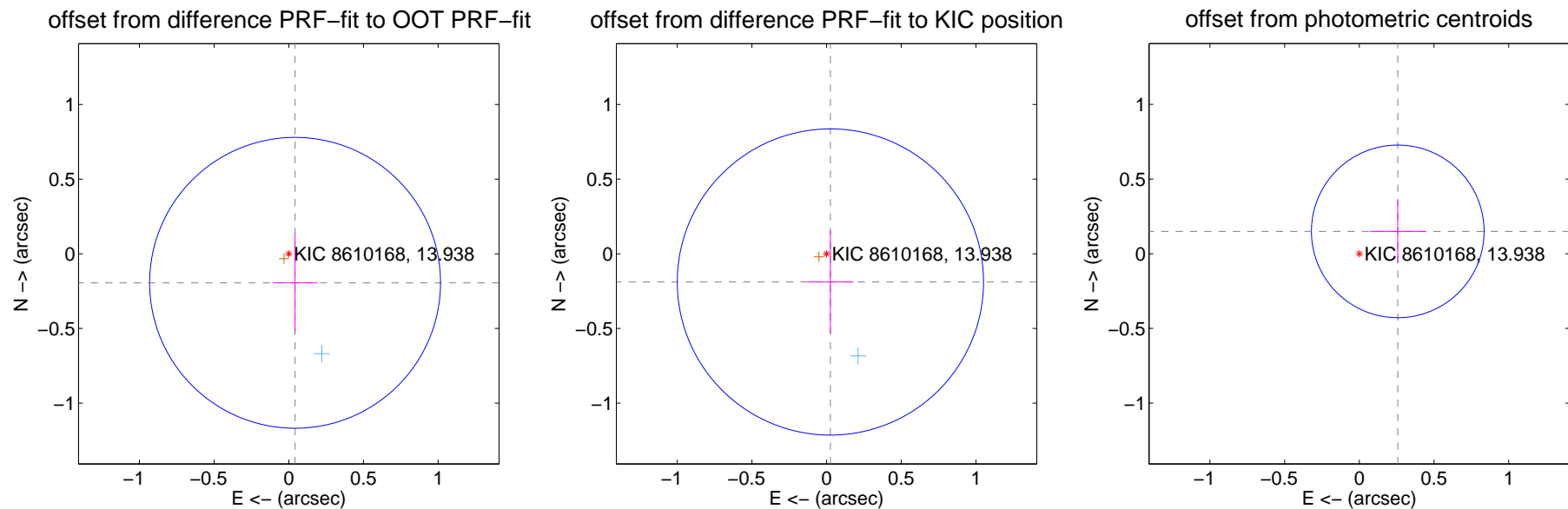
DV Centroid Data

Supplemental centroid analysis for 008610168-04. Kepler magnitude: 13.94. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.199 ± 0.325	0.61	-0.042 ± 0.150	-0.195 ± 0.331
PRF-fit source offset from KIC position	0.191 ± 0.342	0.56	-0.026 ± 0.155	-0.189 ± 0.344
photometric centroid source offset	0.30 ± 0.19	1.55	-0.26 ± 0.19	0.15 ± 0.21

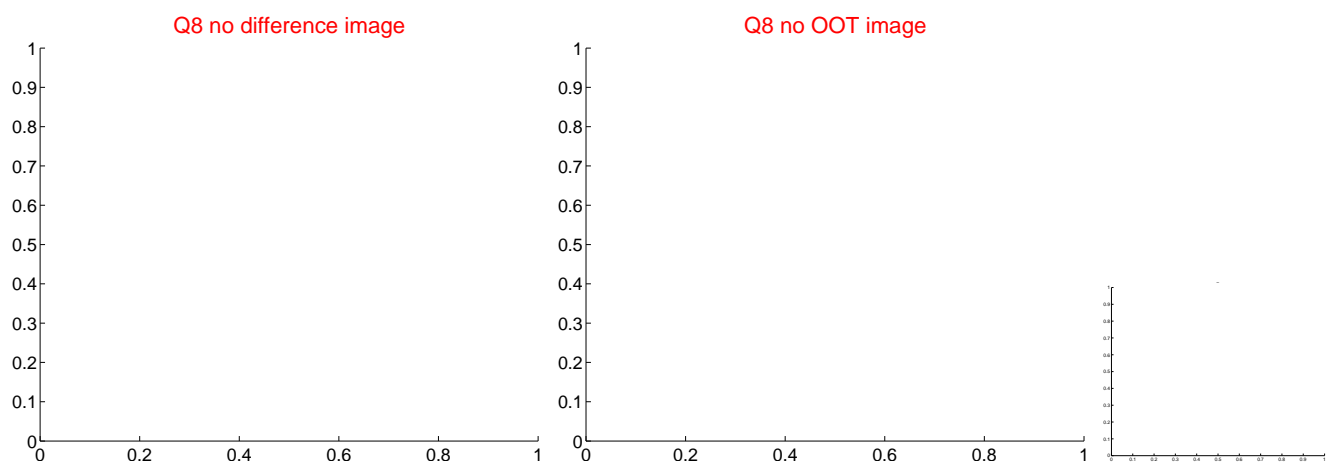
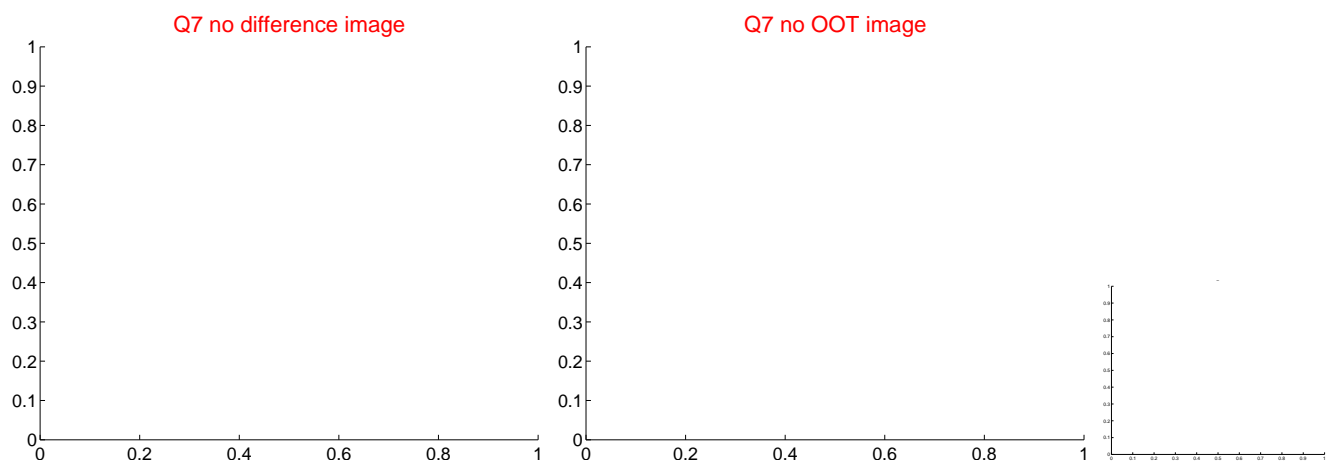
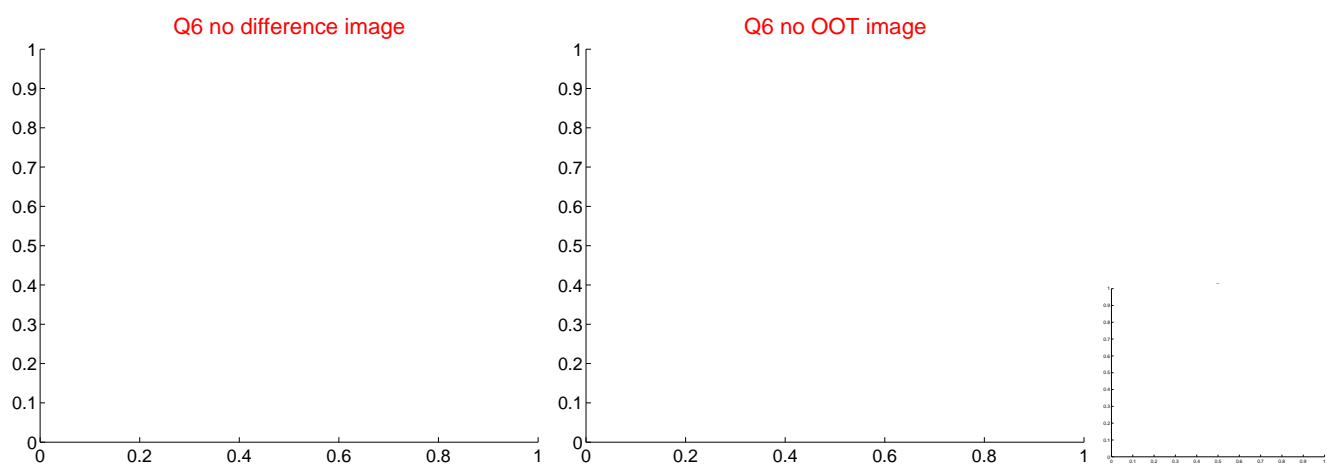
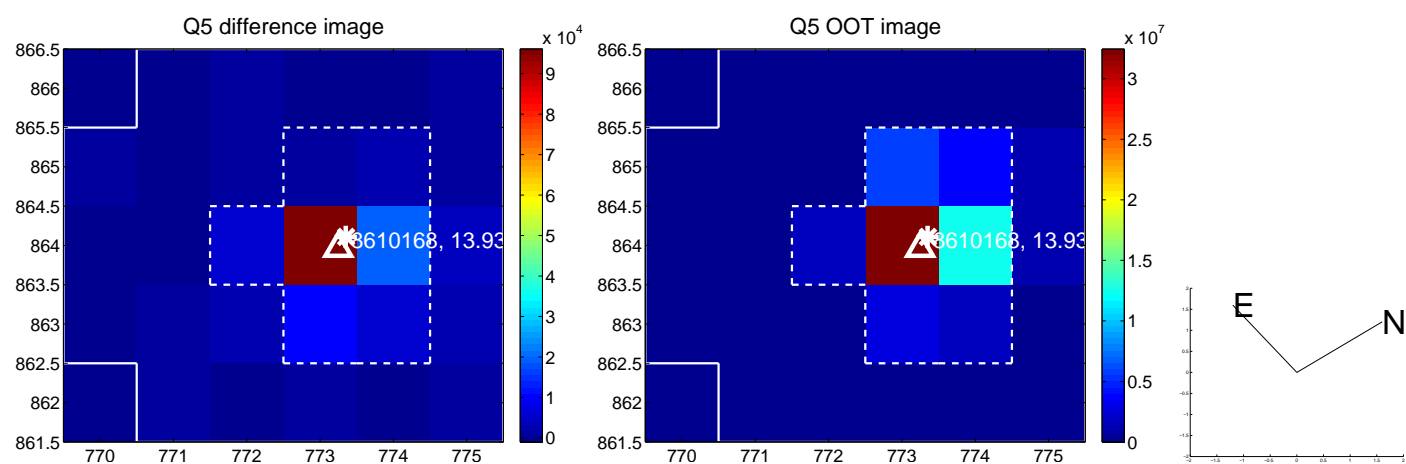


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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.

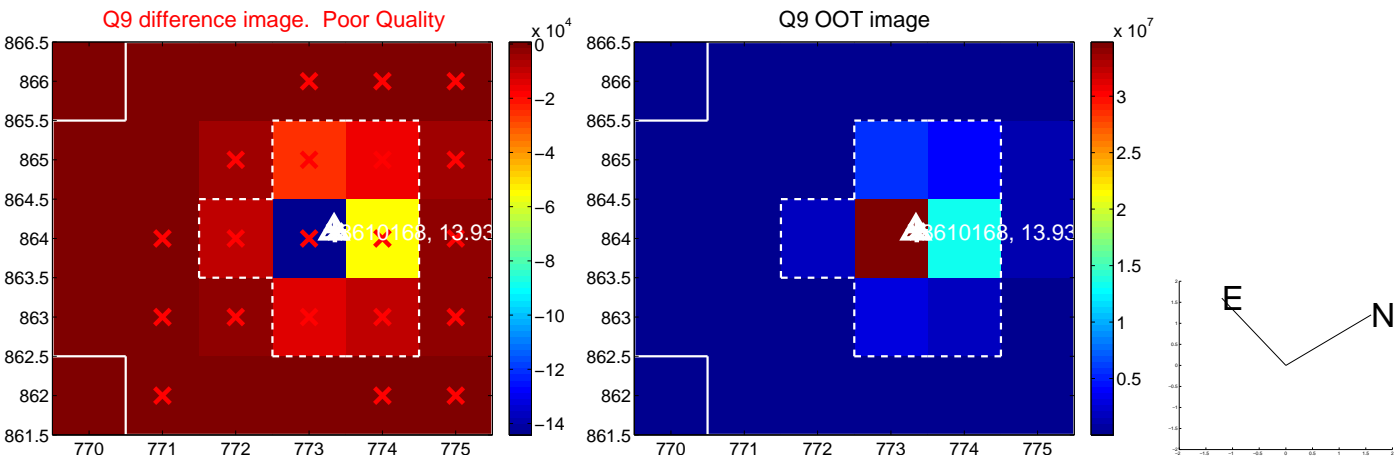
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



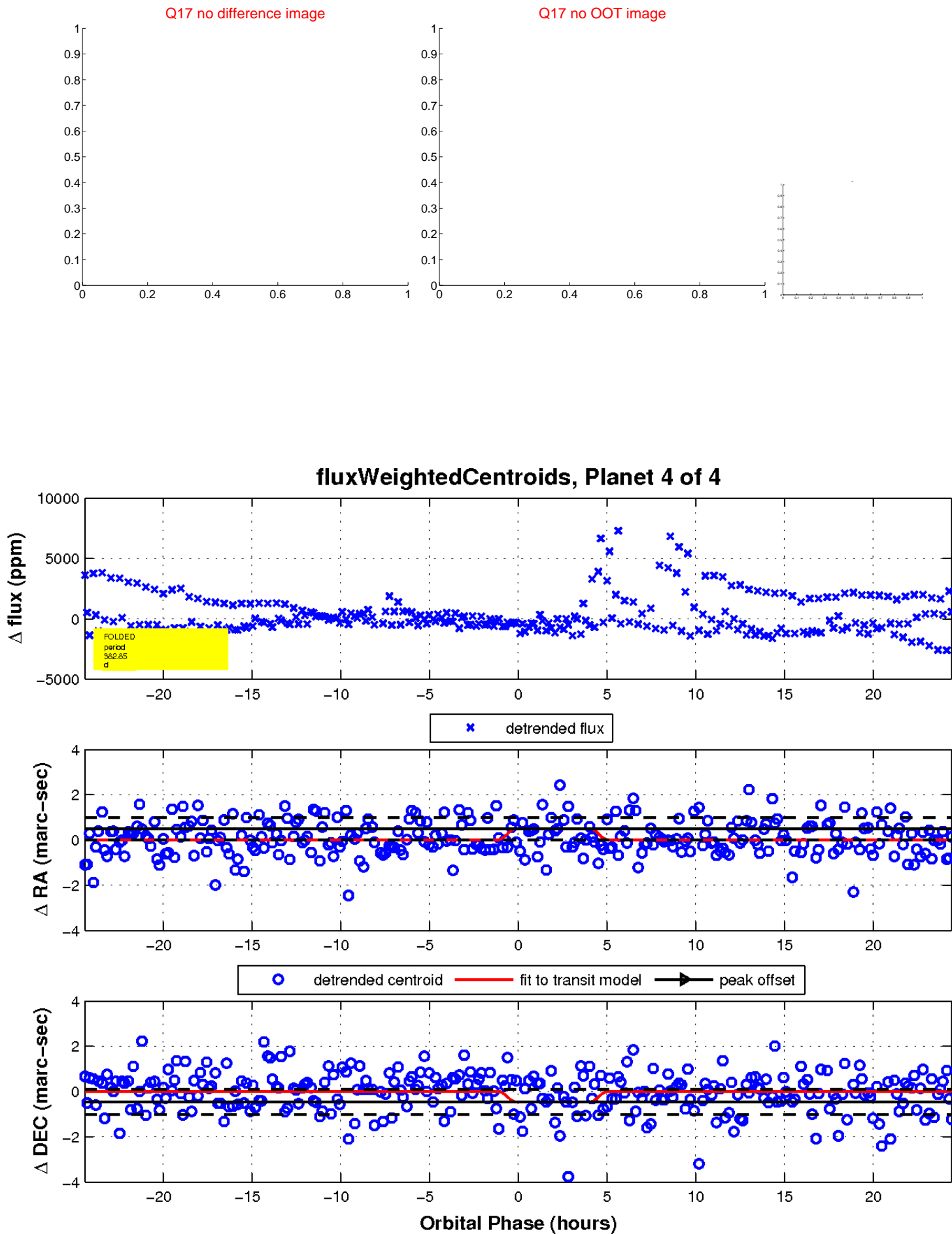
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

