

KIC 009650808

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})
009650808-01	OBS	1970.01	21.964004	133.035933	696.3	2.852	23.9	27.0	0.96	5774	2.83	40.50
009650808-02	OBS	1970.02	125.602928	215.430419	898.5	7.262	19.5	21.4	0.96	5774	3.12	3.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009650808-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009650808-02	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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.

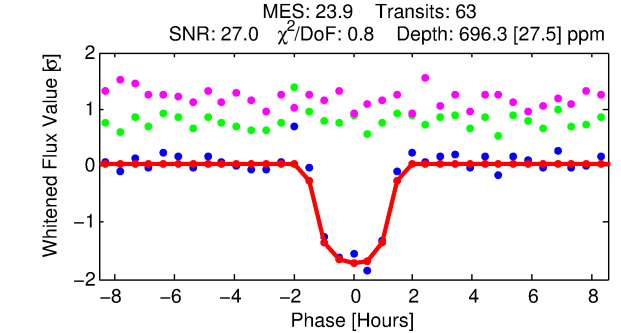
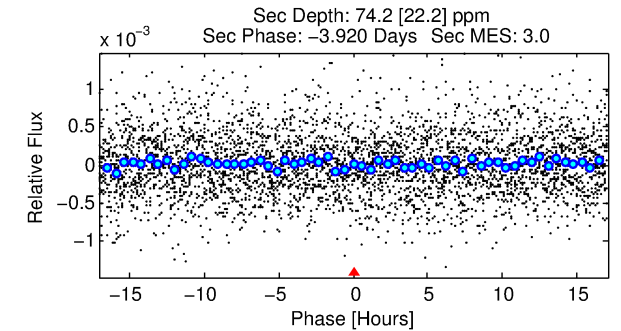
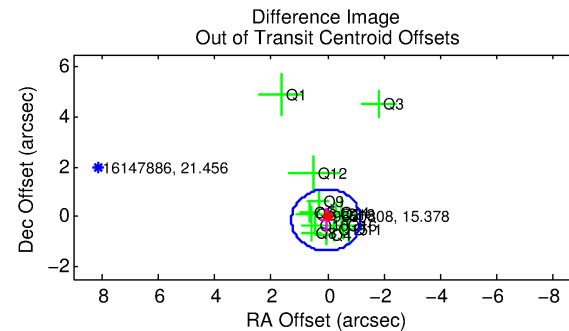
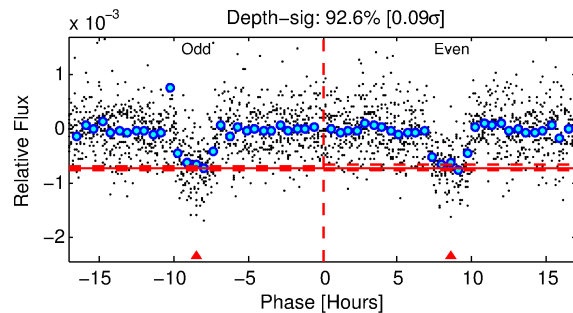
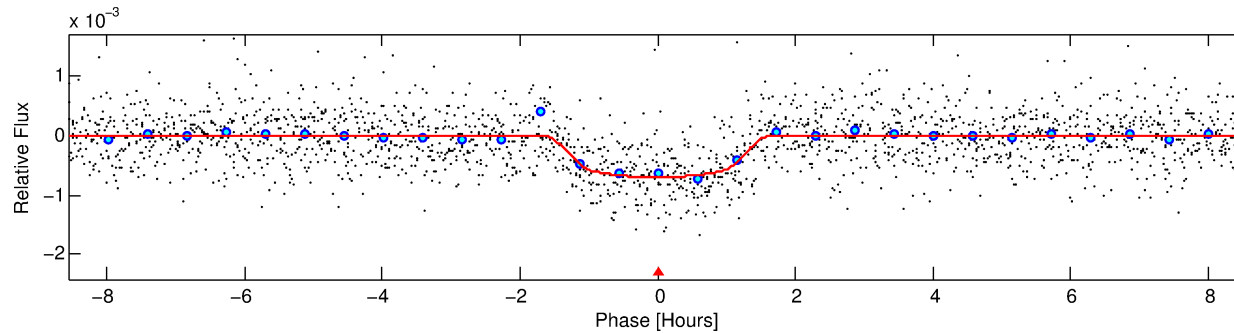
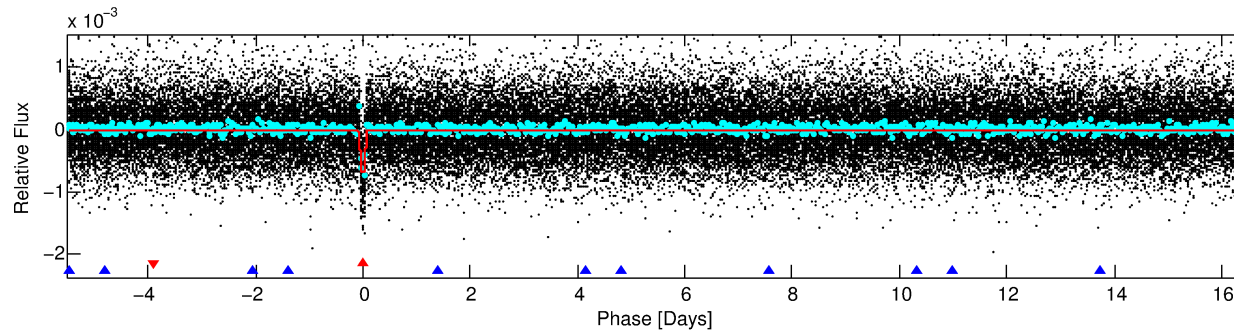
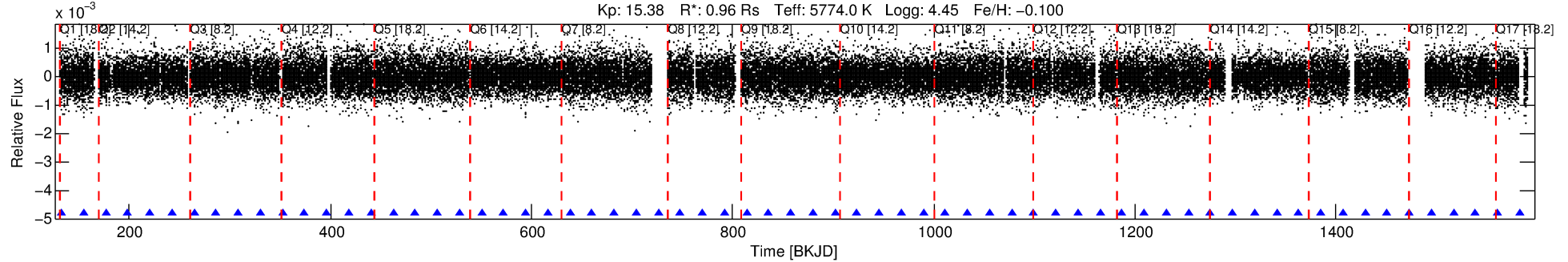
Ephemeris Match Information For 009650808-01

No Significant Match Found

DV One-Page Summary

KIC: 9650808 Candidate: 1 of 2 Period: 21.964 d
KOI: K01970.01 Name: Kepler-344b Corr: 0.976

Kp: 15.38 R*: 0.96 Rs Teff: 5774.0 K Logg: 4.45 Fe/H: -0.100



DV Fit Results:

Period = 21.96400 [0.00007] d
Epoch = 133.0359 [0.0026] BKJD
Rp/R* = 0.0271 [0.0081]
a/R* = 36.78 [49.72]
b = 0.82 [0.57]
Seff = 40.50 [14.79]
Teq = 643 [59] K
Rp = 2.83 [1.16] Re
a = 0.1502 [0.0355] AU
Ag = 115.14 [86.62] [1.32σ]
Teffp = 3258 [553] K [4.70σ]

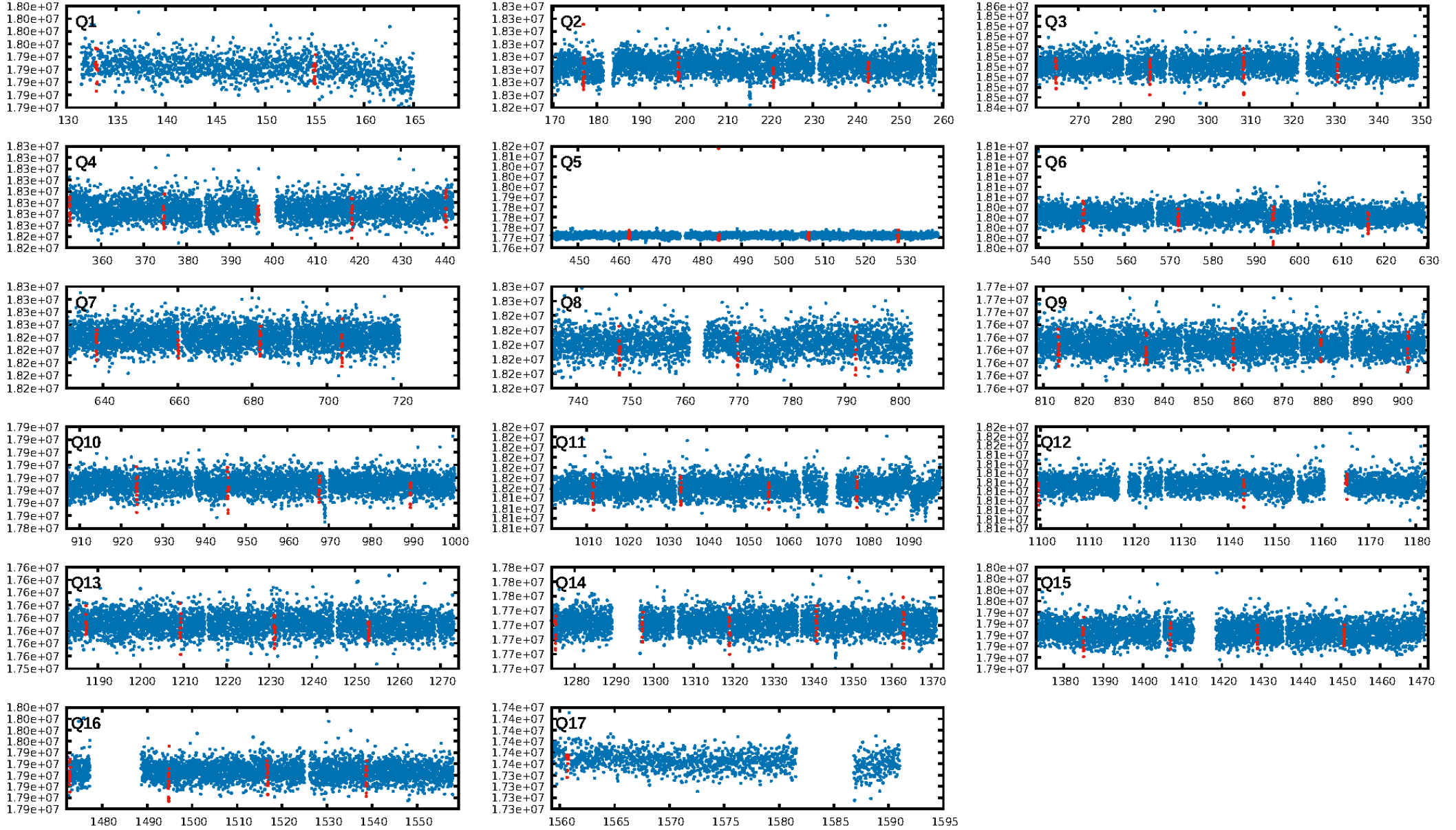
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [318.80σ]
ModelChiSquare2-sig: 74.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.30e-124
RollingBand-fgt: 1.00 [60/60]
GhostDiagnostic-chr: 9.85
Centroid-sig: 1.0%
Centroid-so: 0.880 arcsec [1.31σ]
OotOffset-rm: 0.145 arcsec [0.35σ]
KicOffset-rm: 0.308 arcsec [0.63σ]
OotOffset-st: 4/3/4/4 [15]
KicOffset-st: 4/3/4/4 [15]
DiffImageQuality-fgm: 0.80 [12/15]
DiffImageOverlap-fno: 1.00 [16/16]

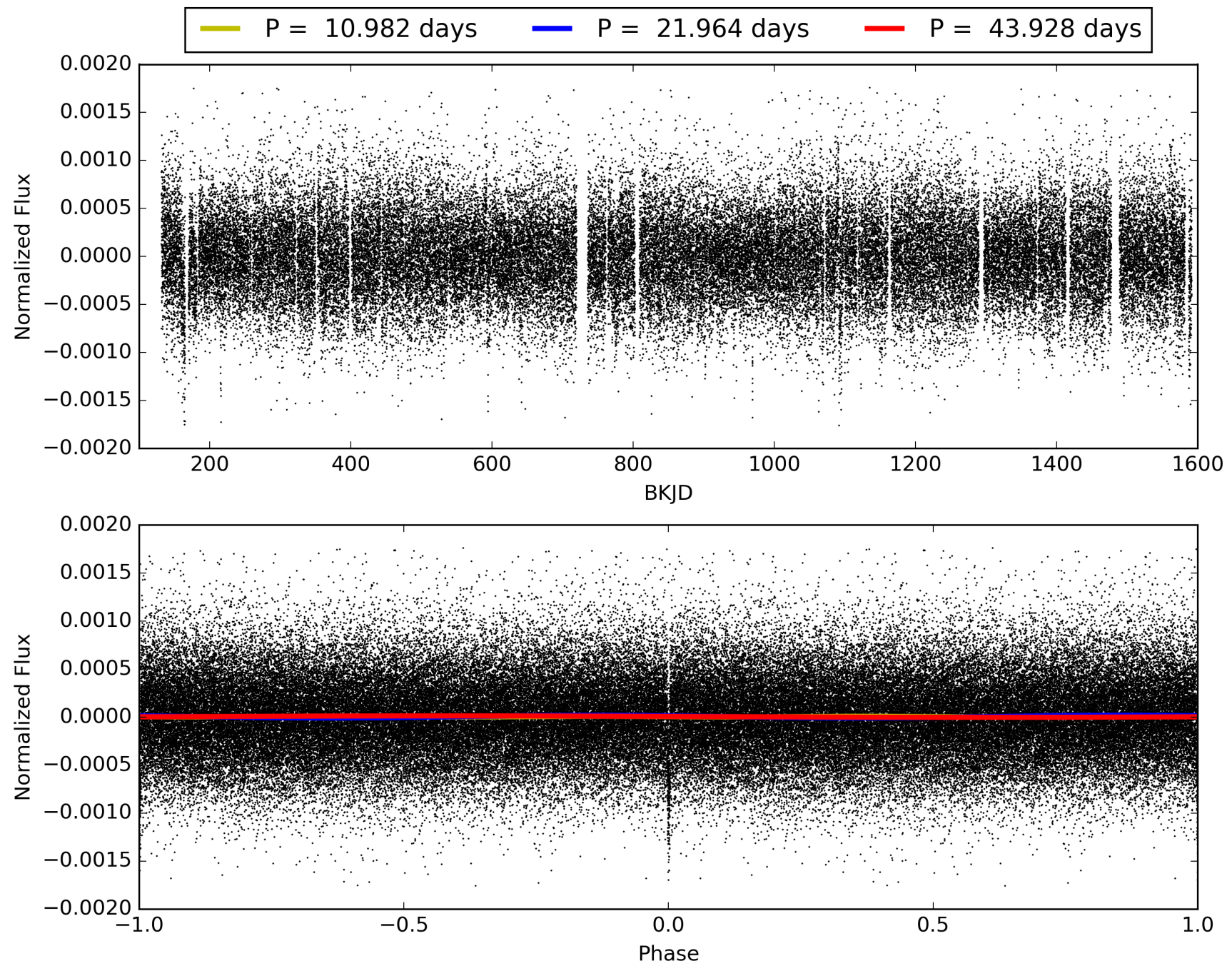
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:10:59 Z

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

TCE 009650808-01, PDC Light Curves

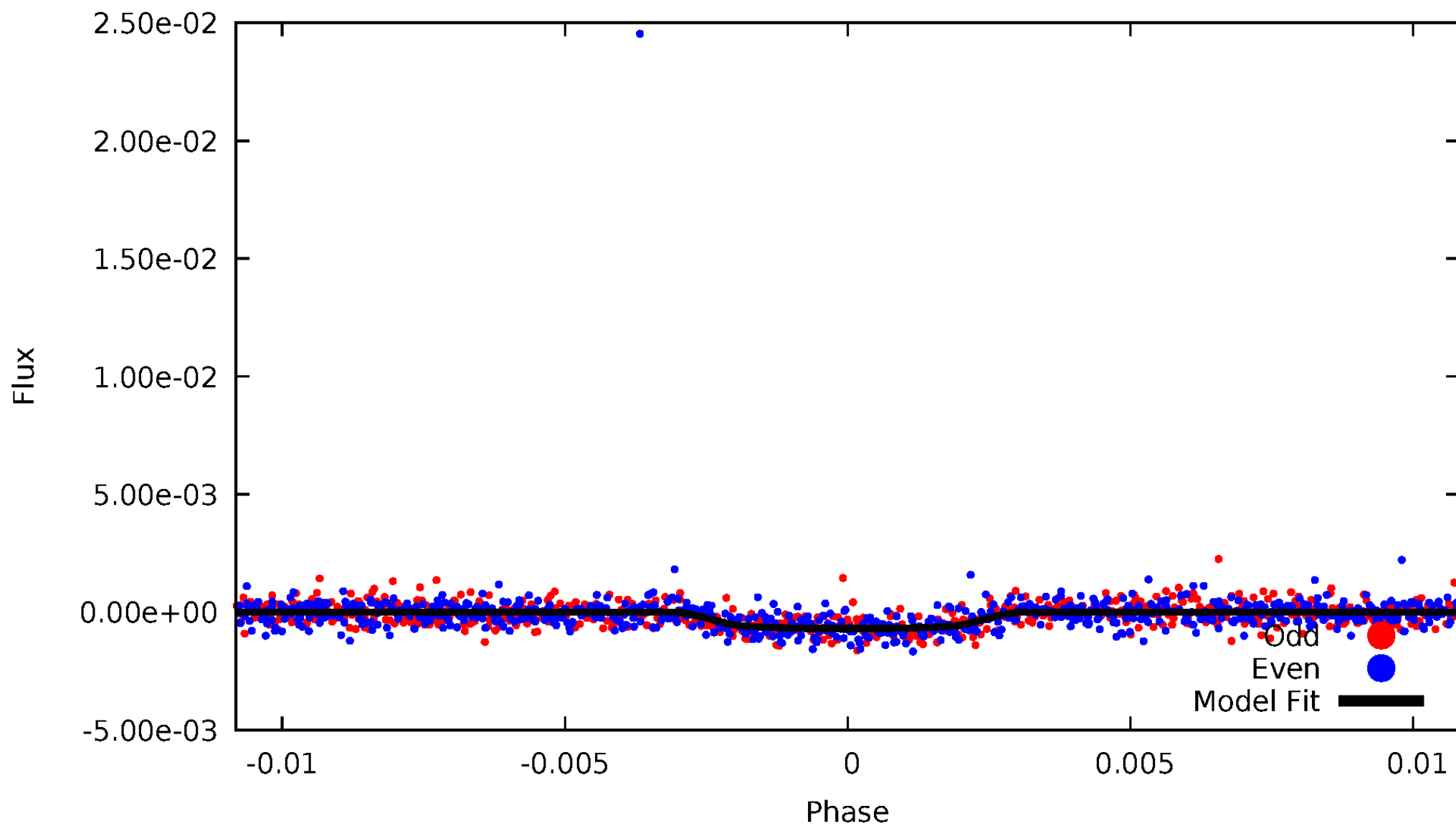


TCE 009650808-01



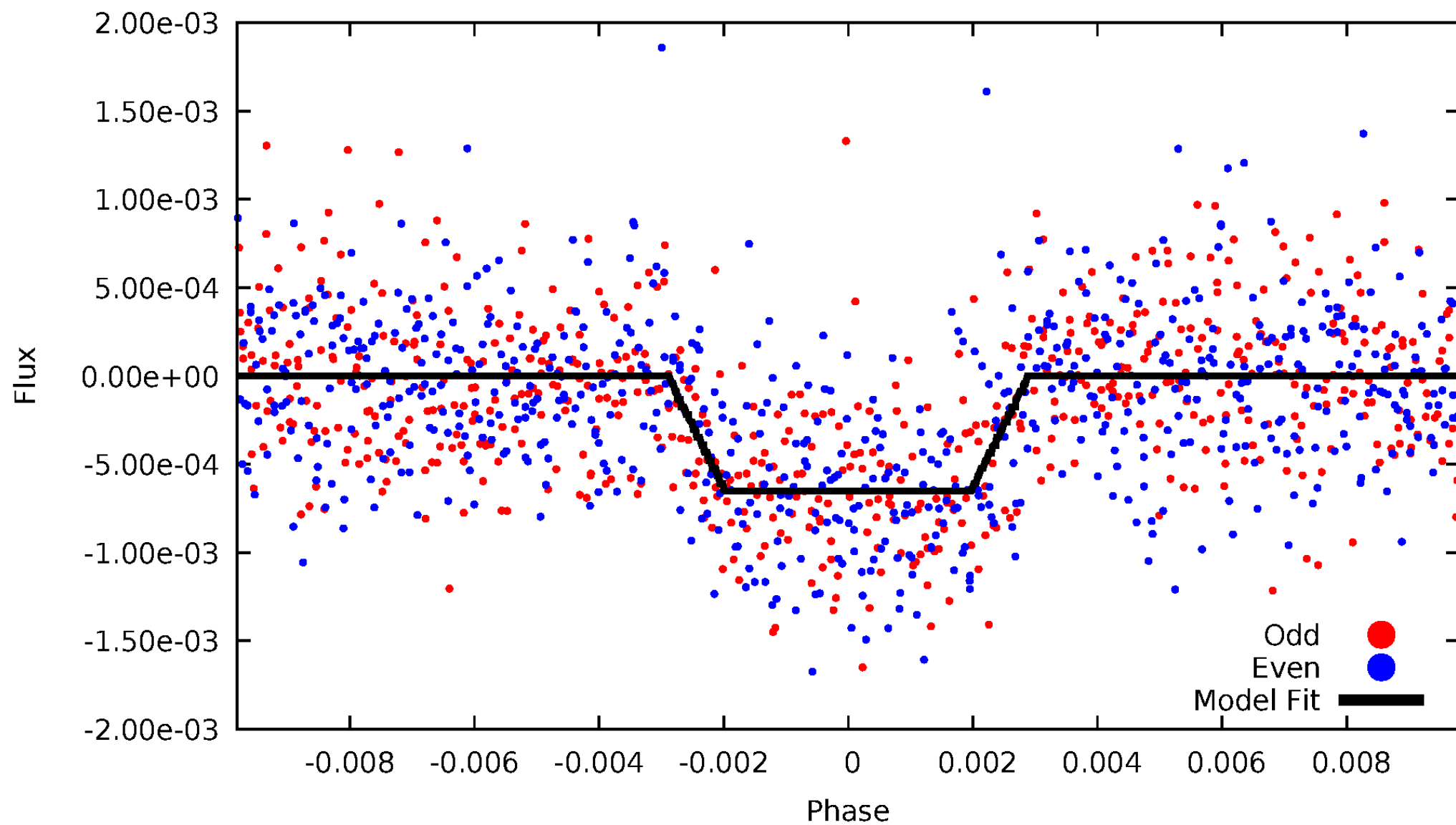
DV Odd/Even

TCE 009650808-01



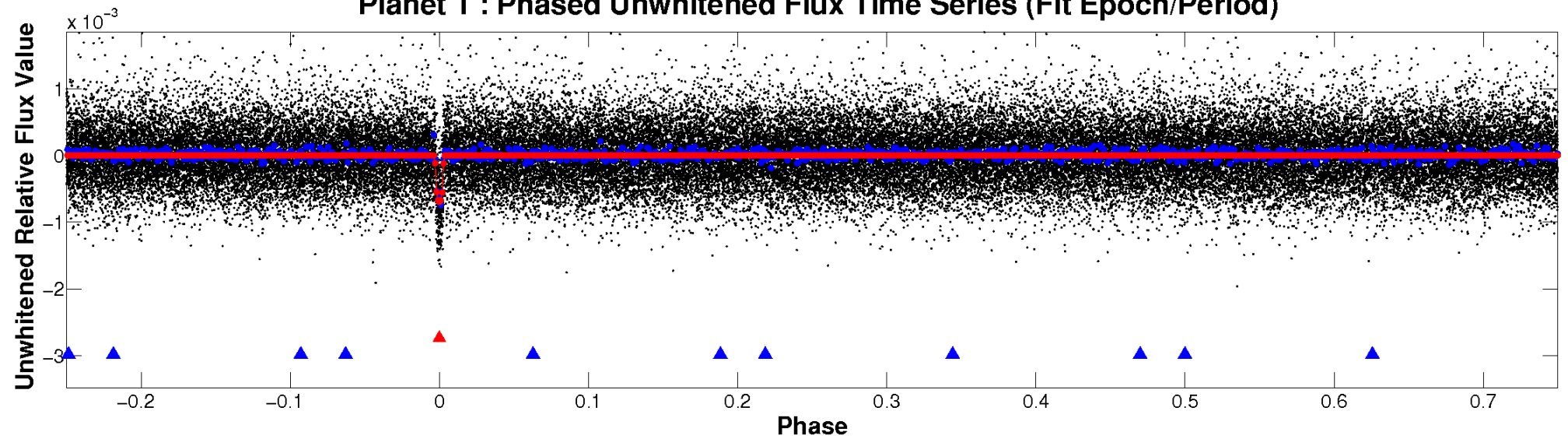
ALT Odd/Even

TCE 009650808-01

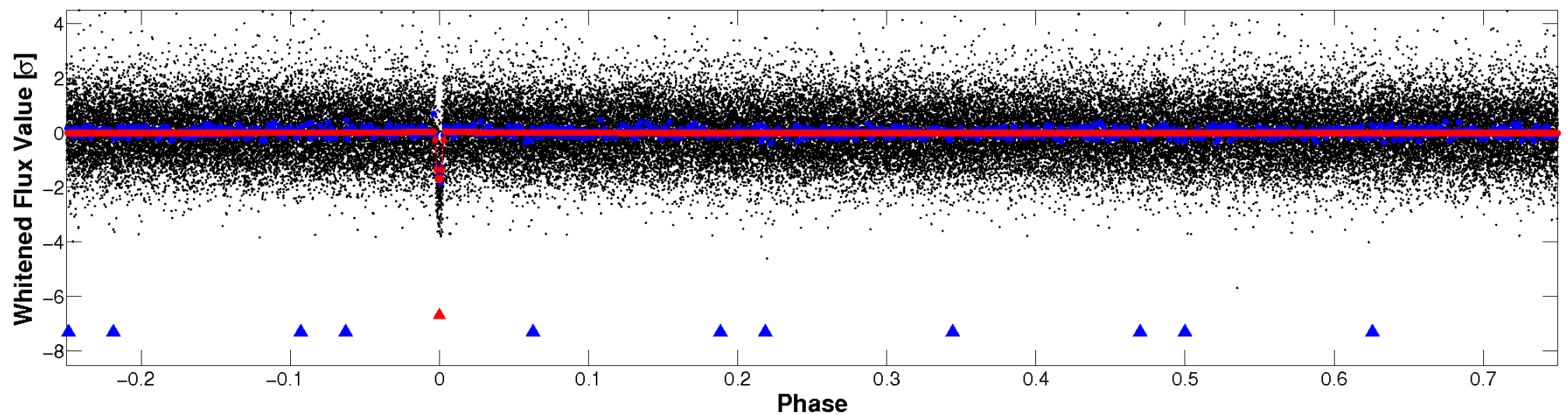


Non-Whitened Vs. Whitened Light Curve

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

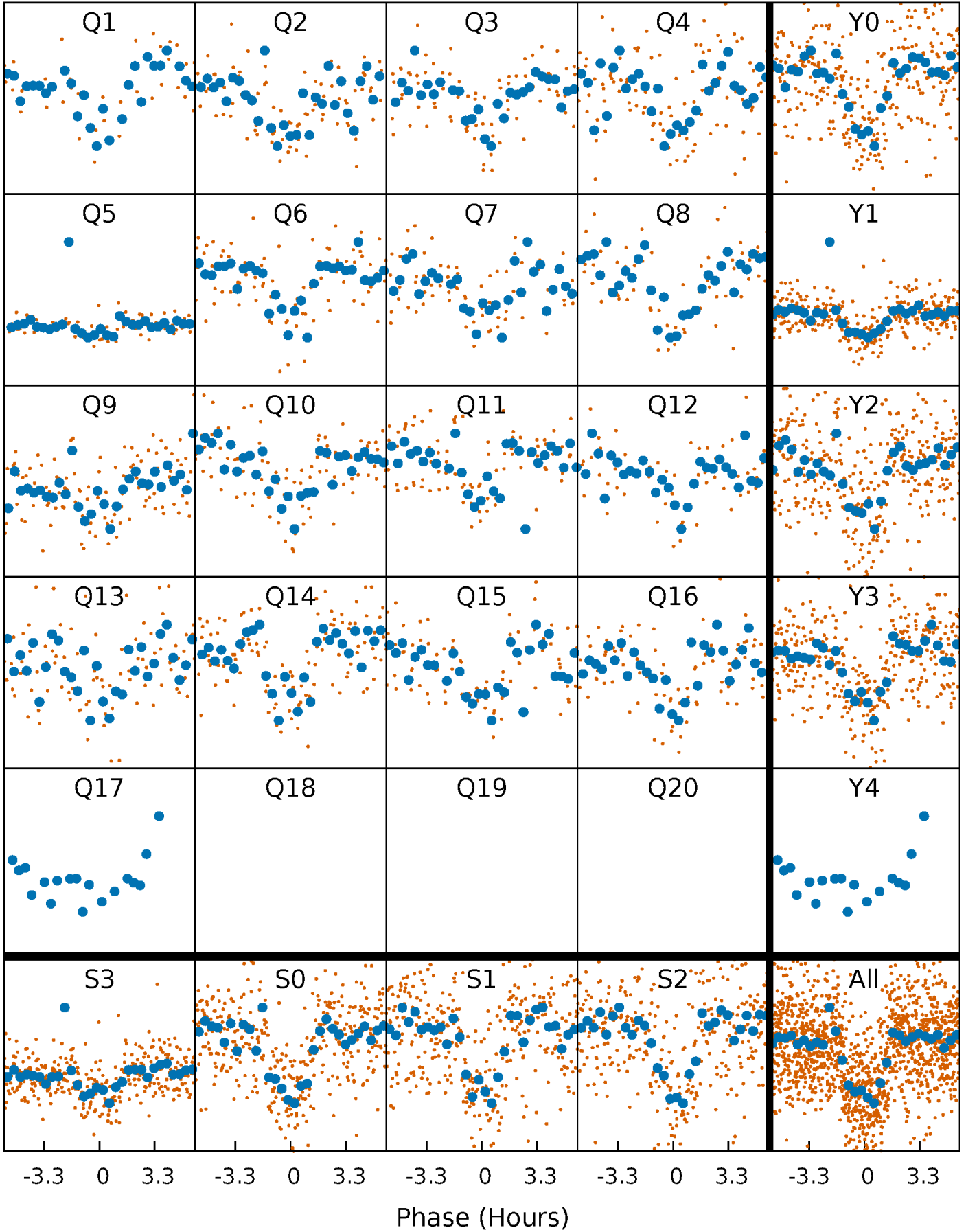


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



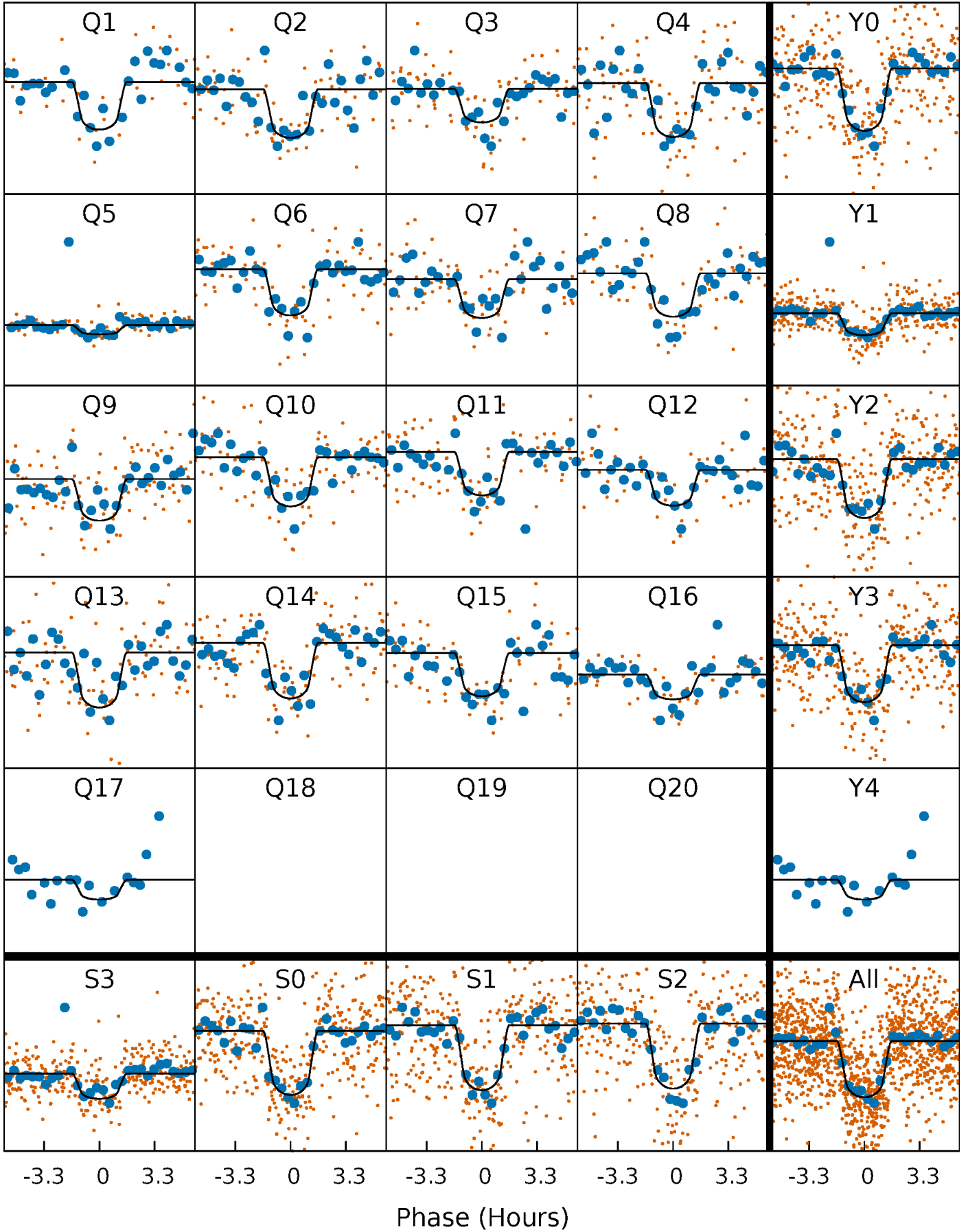
PDC Quarter-Phased Transit Curves

TCE 009650808-01 P= 21.964004 Days $T_0=133.035933$ (BKJD)



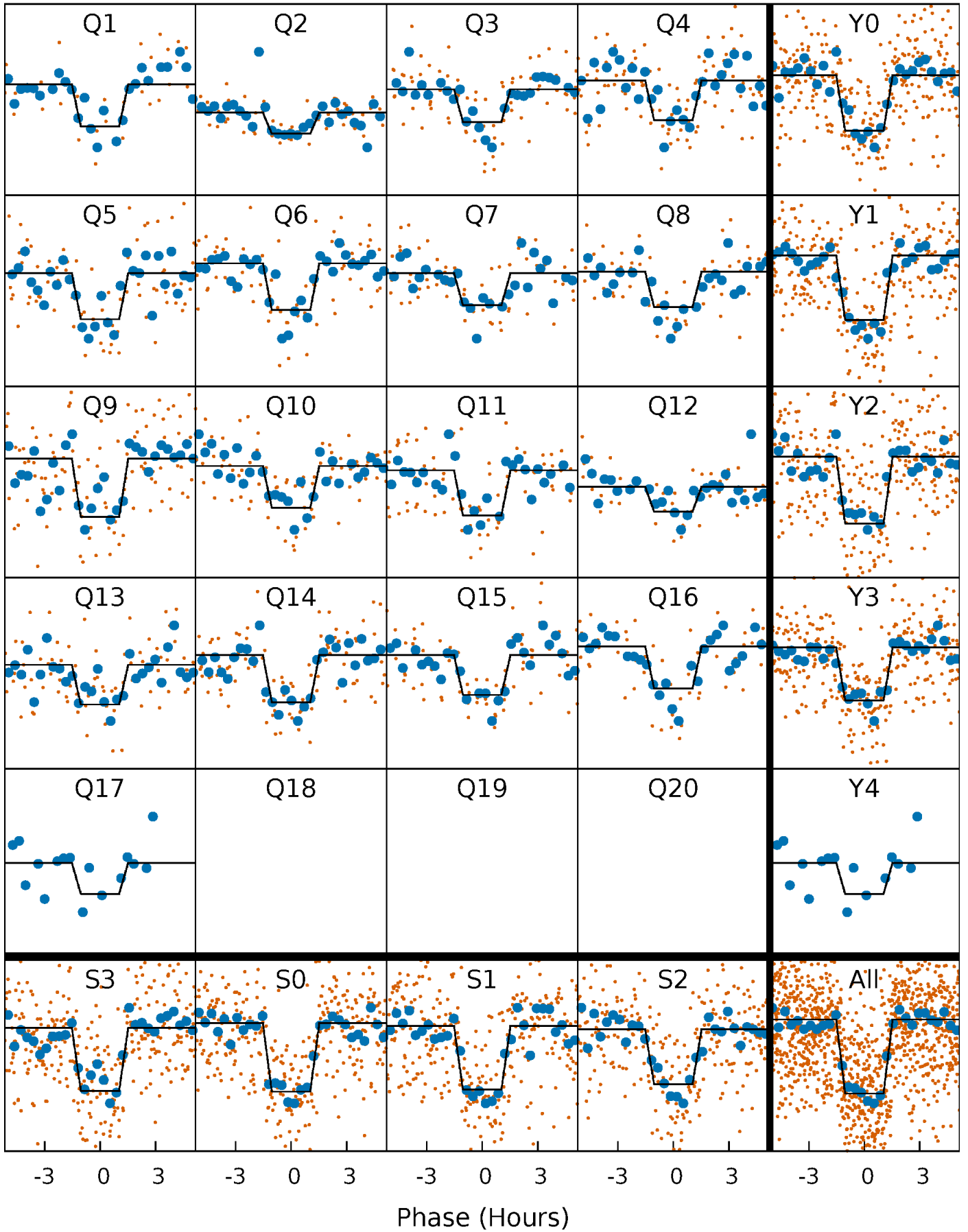
DV Quarter-Phased Transit Curves

TCE 009650808-01 P= 21.964004 Days $T_0=133.035933$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

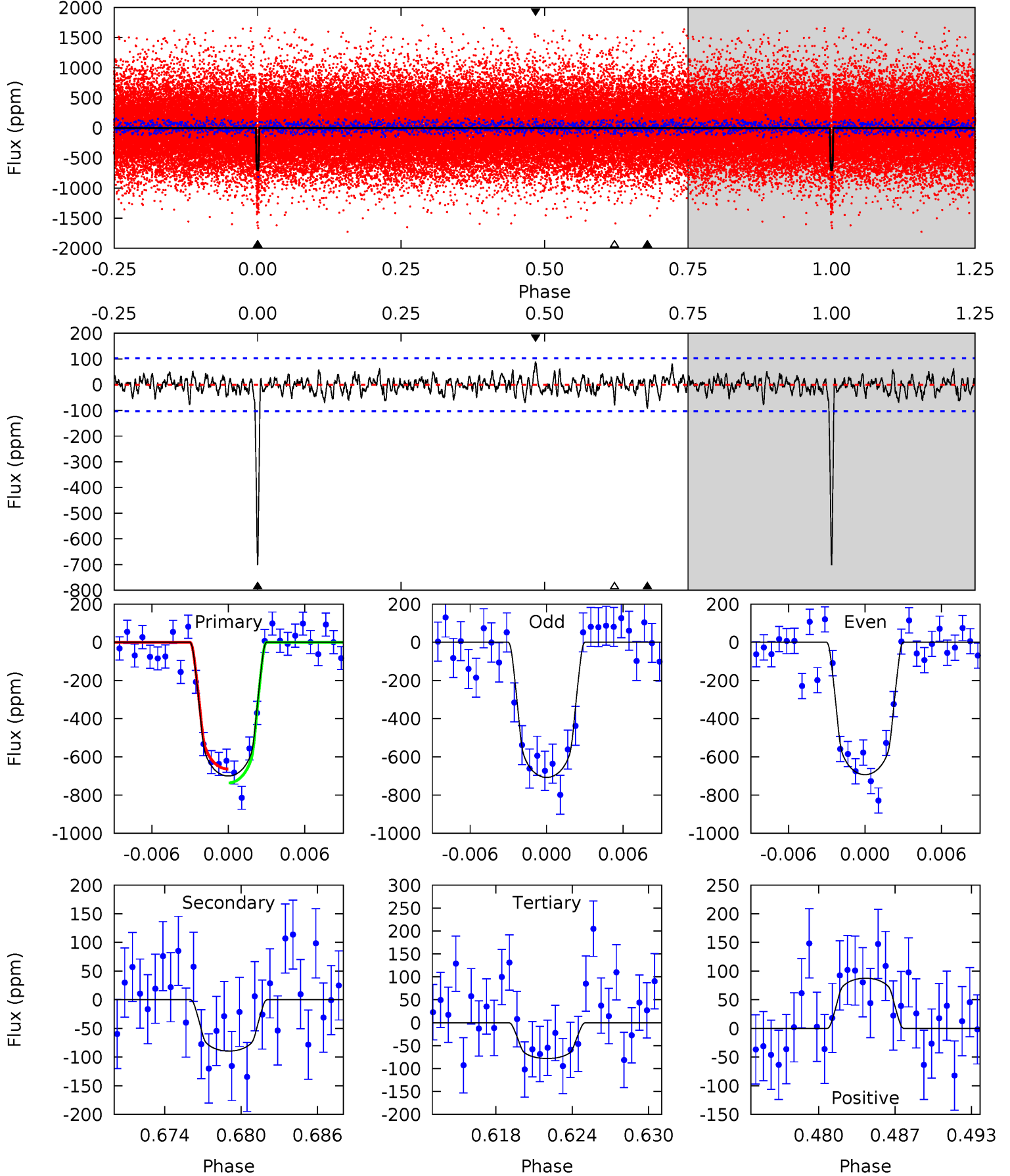
TCE 009650808-01 P= 21.964039 Days $T_0=133.034306$ (BKJD)



DV Model-Shift Uniqueness Test

009650808-01, $P = 21.964004$ Days, $E = 111.071929$ Days

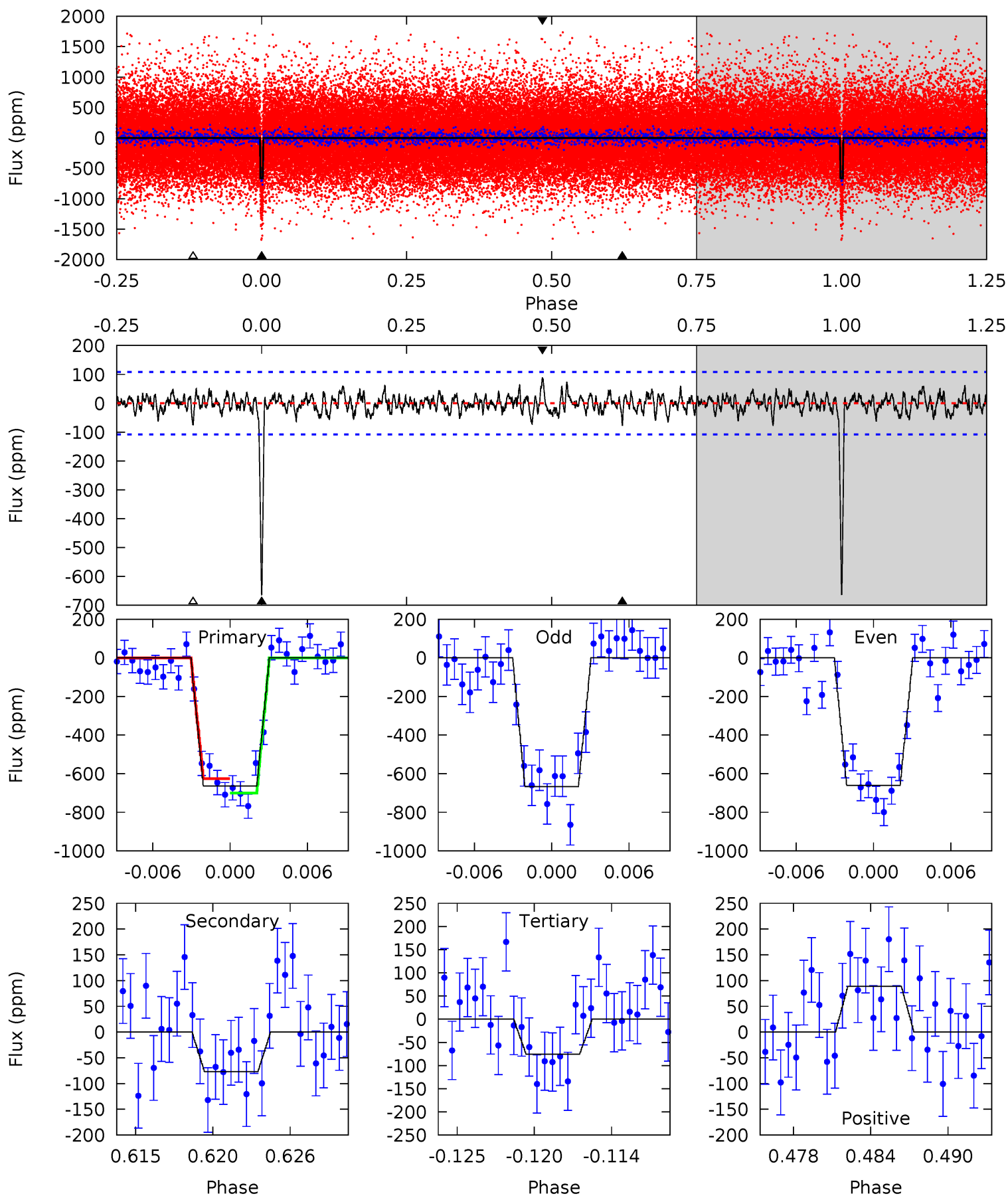
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.8	4.45	3.89	4.35	5.12	2.73	1.20	30.9	30.4	0.56	0.10	0.36	0.99	0.11	1.81



Alt Model-Shift Uniqueness Test

009650808-01, $P = 21.964039$ Days, $E = 111.070267$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.5	3.65	3.60	4.22	5.13	2.76	1.12	27.9	27.3	0.06	-0.57	0.15	0.97	0.12	1.79



Stellar Parameters For KIC 009650808

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5774^{+156}_{-173}	$4.447^{+0.081}_{-0.189}$	$-0.100^{+0.300}_{-0.300}$	$0.958^{+0.268}_{-0.115}$	$0.937^{+0.125}_{-0.102}$	$1.503^{+0.546}_{-0.781}$
	+3%/-3%	+2%/-4%	+300%/-300%	+28%/-12%	+13%/-11%	+36%/-52%
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 009650808-01 / KOI 1970.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-90 ± 20	$2.90^{+1.02}_{-0.84}$	910^{+58}_{-45}	3787^{+527}_{-341}	130^{+136}_{-61}
Alt.	-77 ± 21	$2.76^{+0.95}_{-0.84}$	910^{+61}_{-47}	3764^{+590}_{-375}	125^{+147}_{-60}

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 $A_{obs} \gg 1.0$

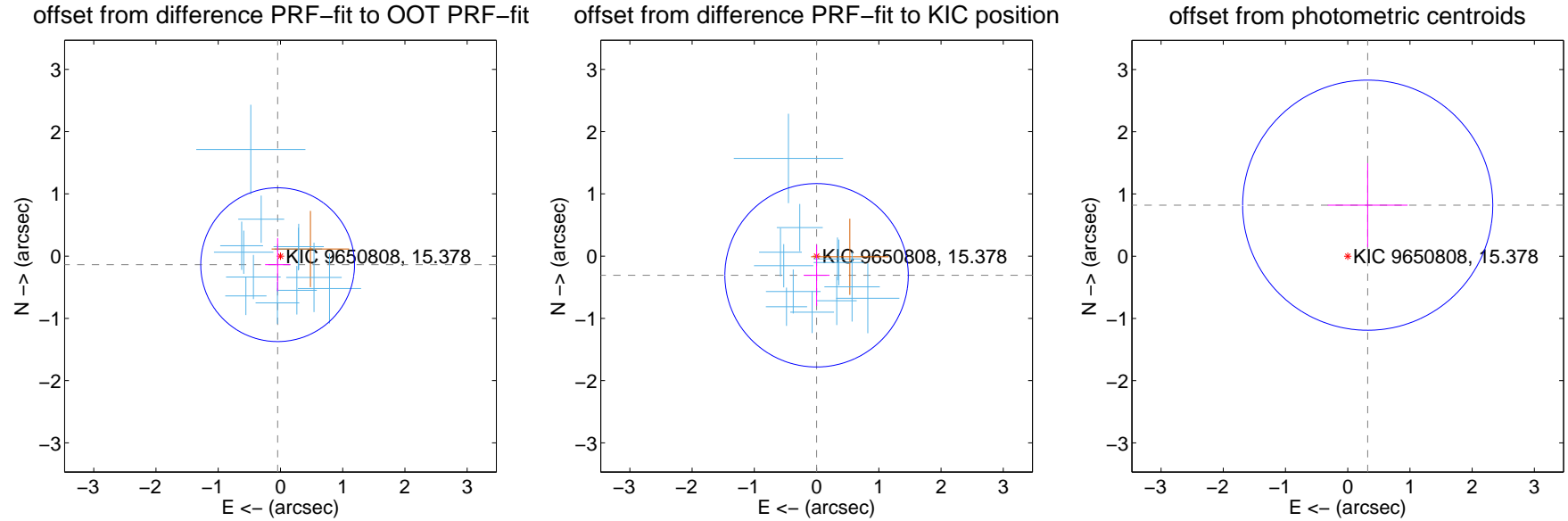
DV Centroid Data

Supplemental centroid analysis for 009650808-01. Kepler magnitude: 15.38. Transit SNR 27.04

There are 12 quarters with good PRF difference image offsets

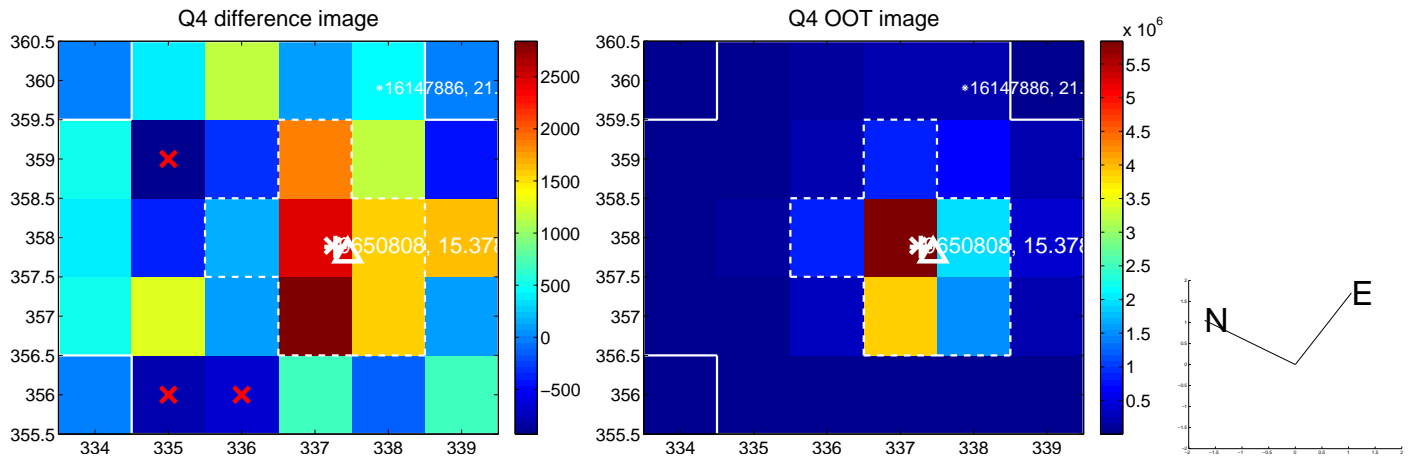
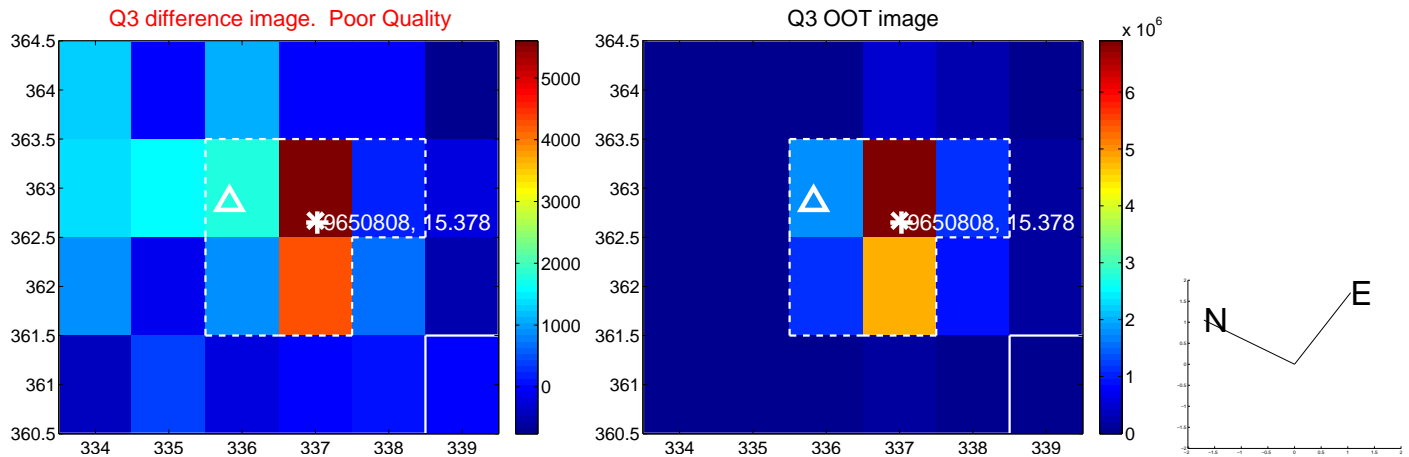
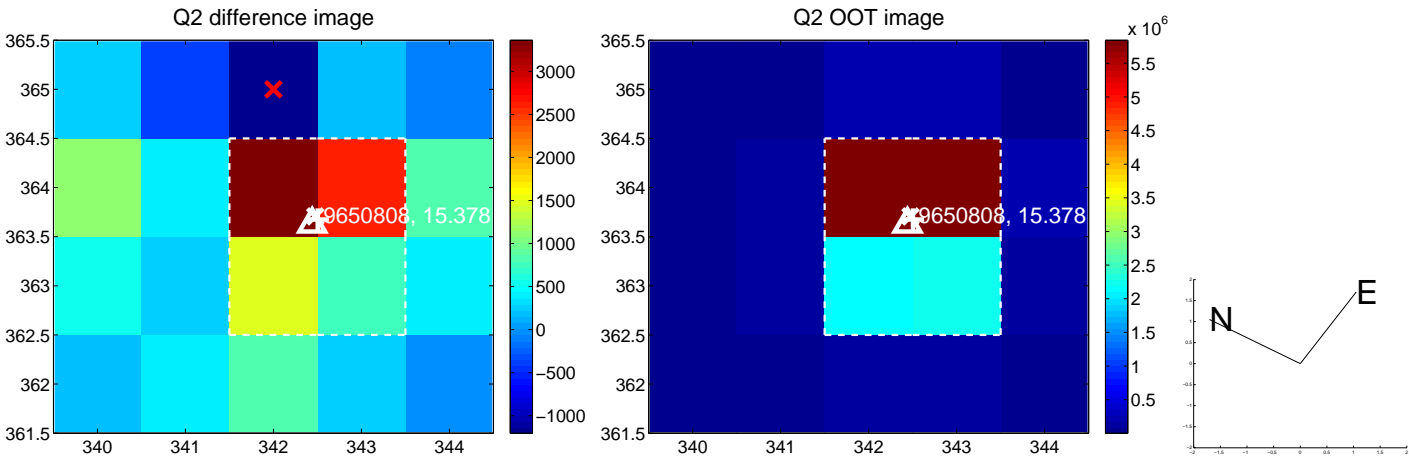
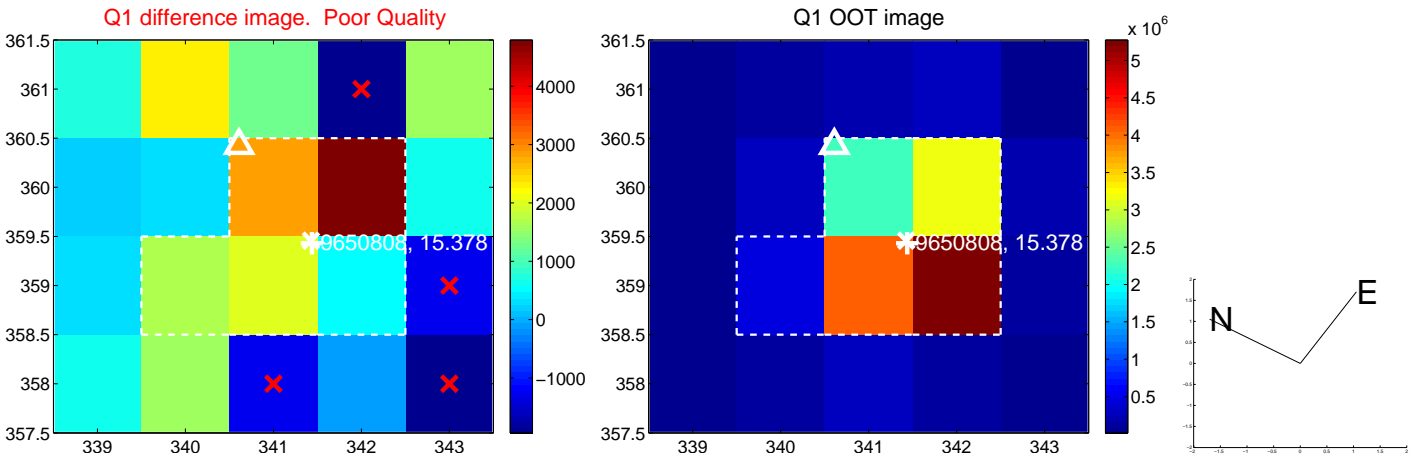
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.145 ± 0.412	0.35	0.045 ± 0.202	-0.137 ± 0.427
PRF-fit source offset from KIC position	0.308 ± 0.491	0.63	-0.000 ± 0.208	-0.308 ± 0.491
photometric centroid source offset	0.88 ± 0.67	1.31	-0.32 ± 0.64	0.82 ± 0.67

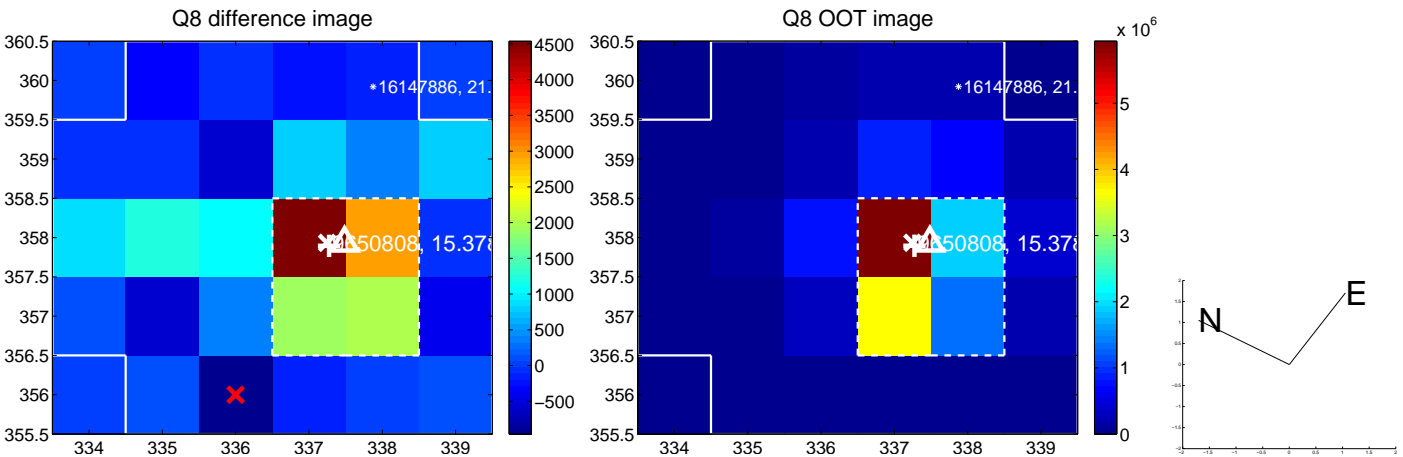
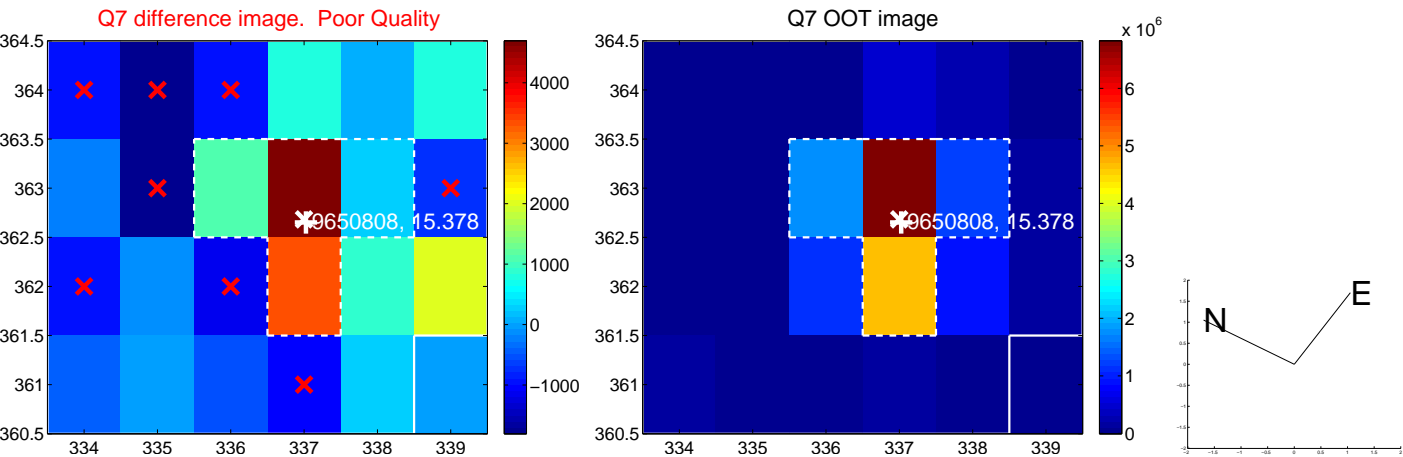
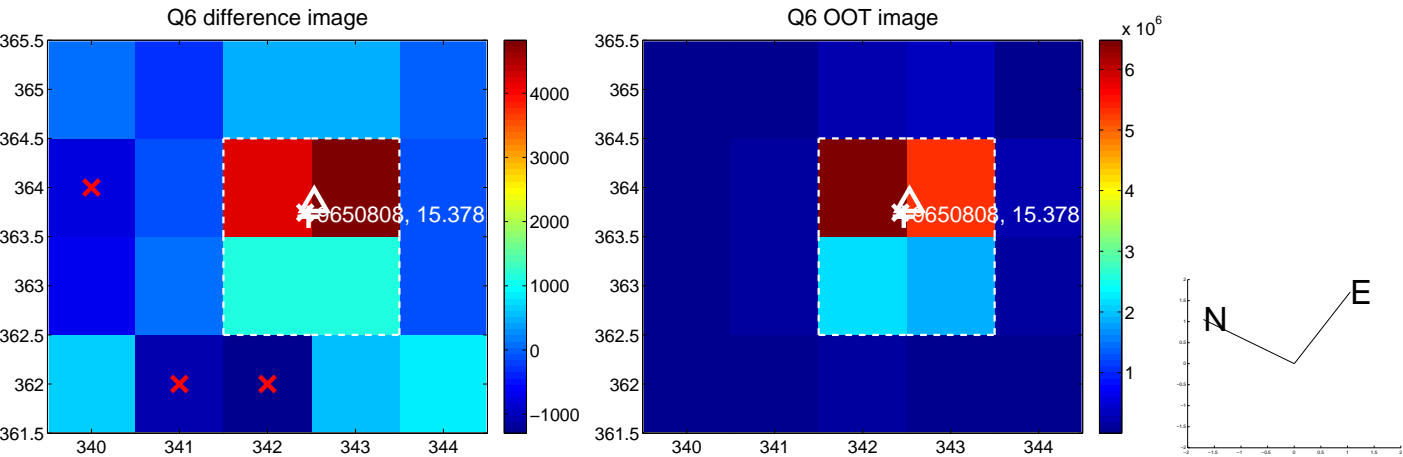
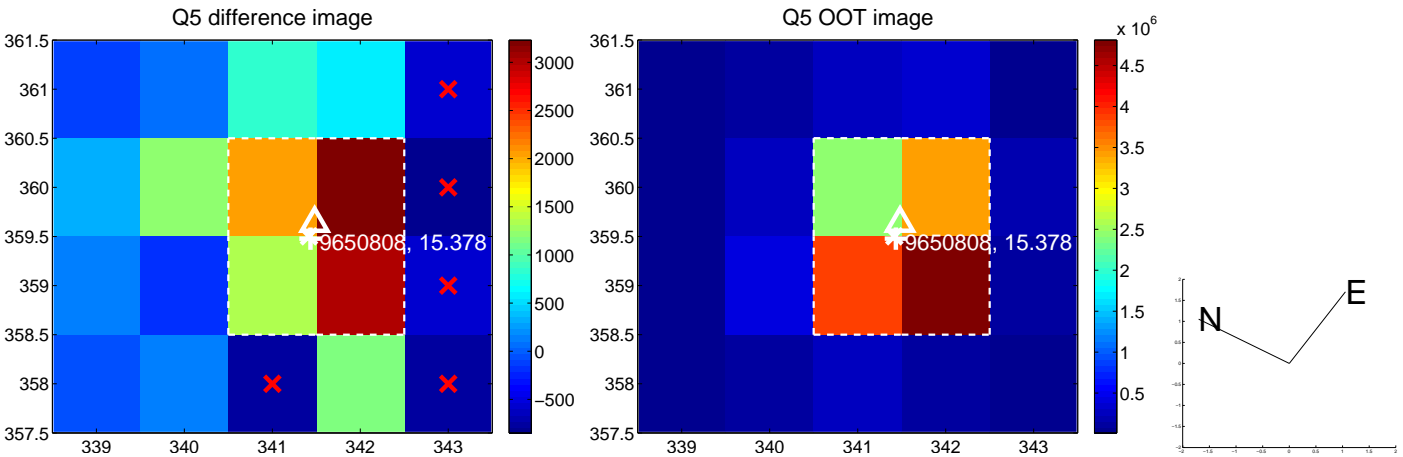


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

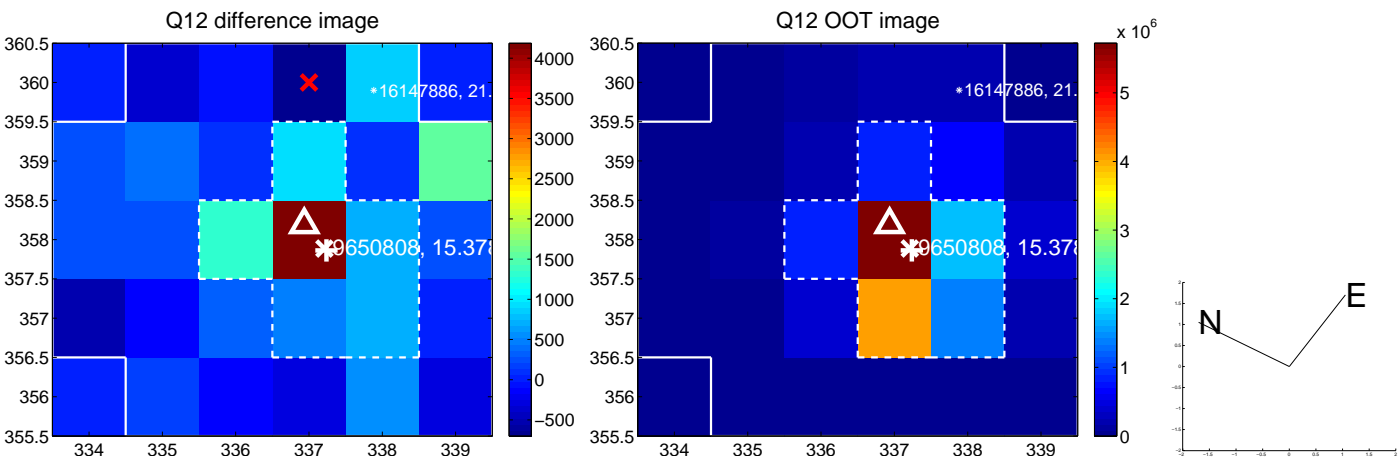
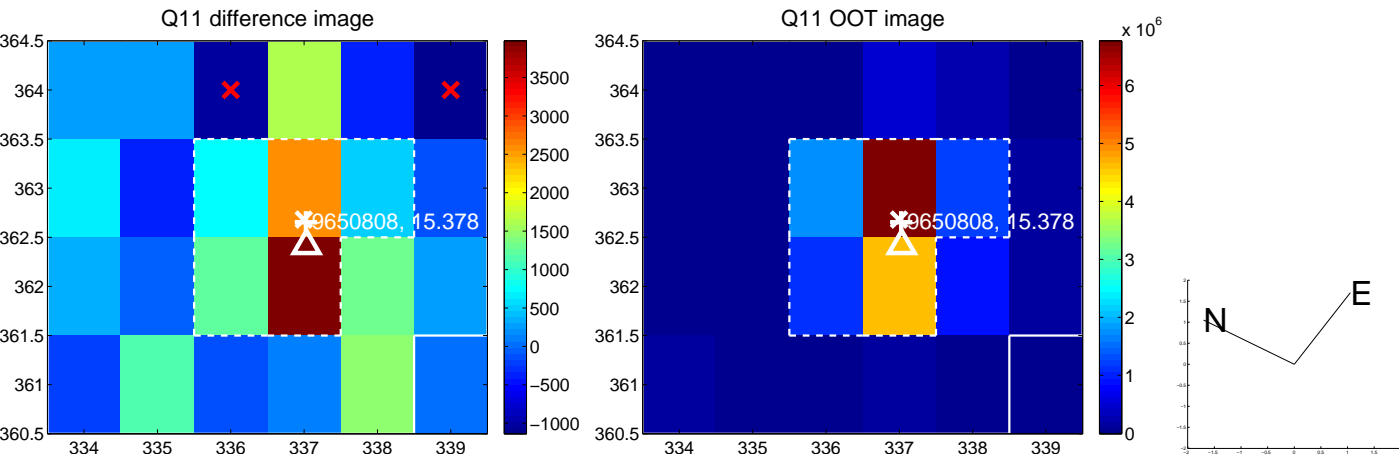
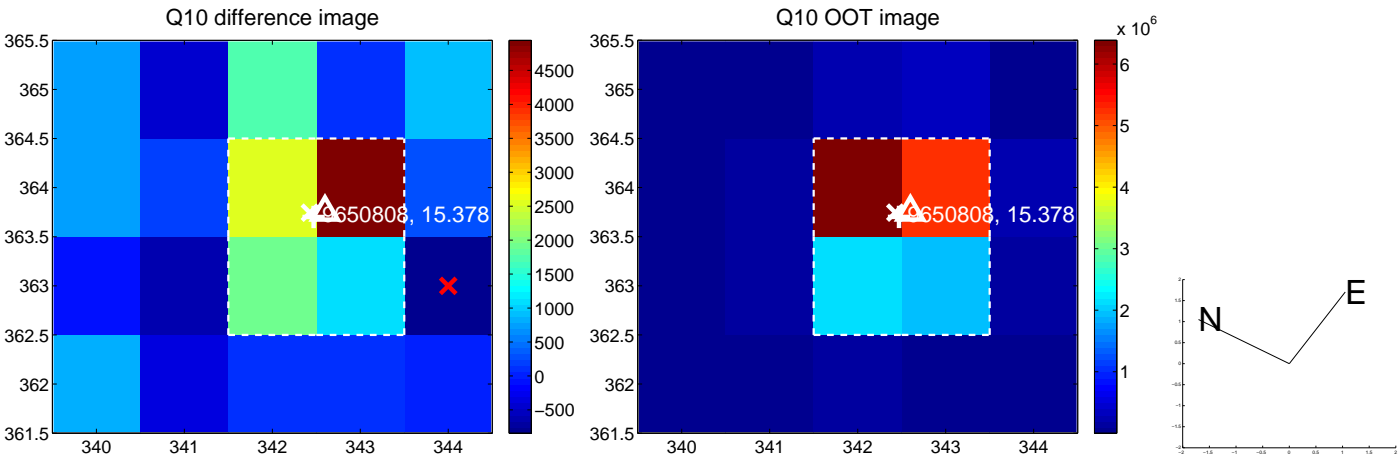
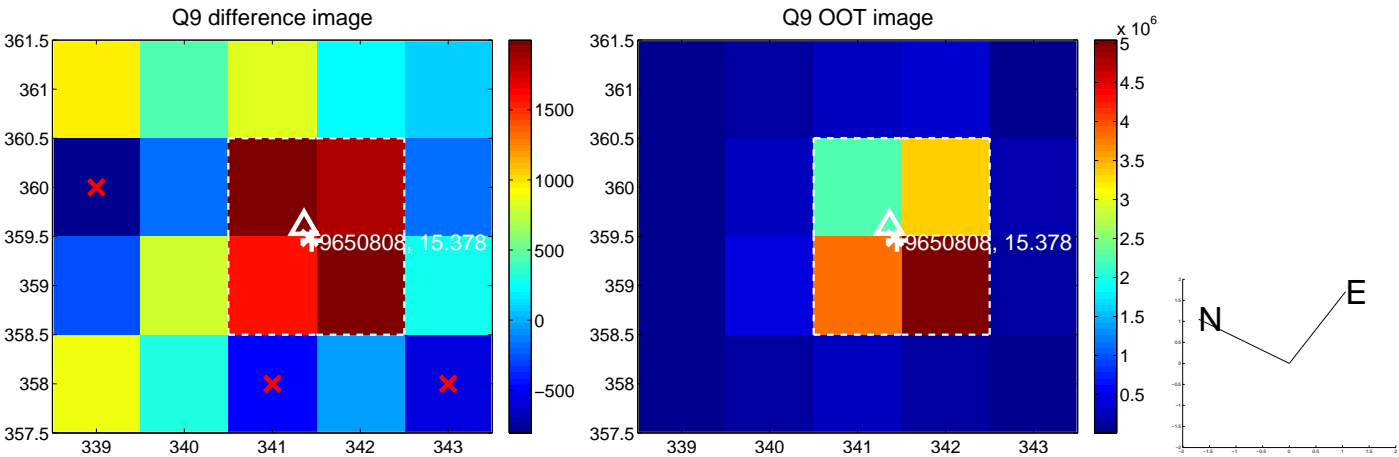
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



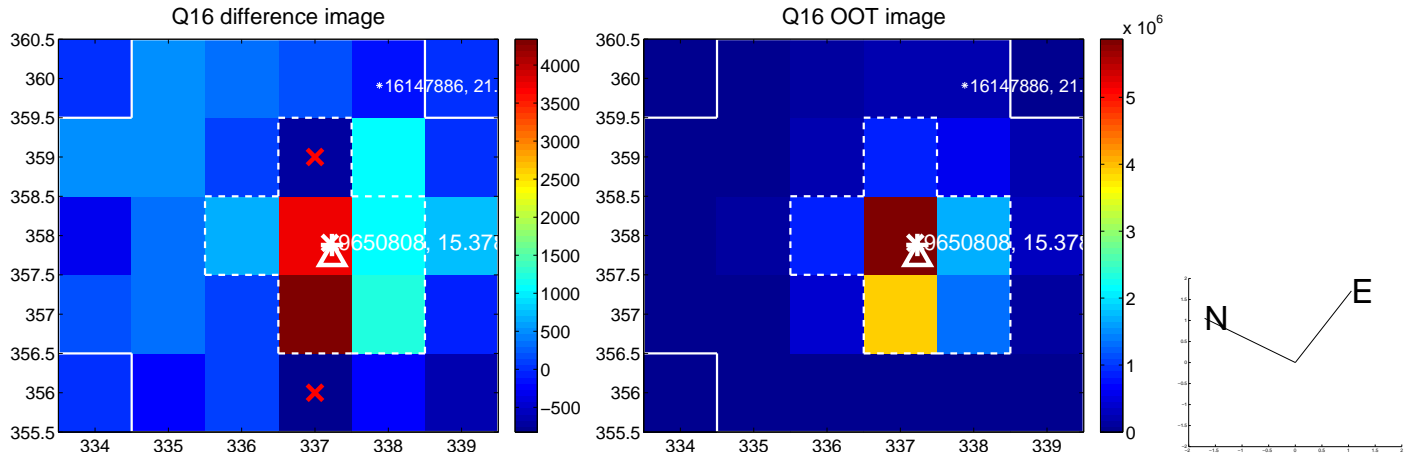
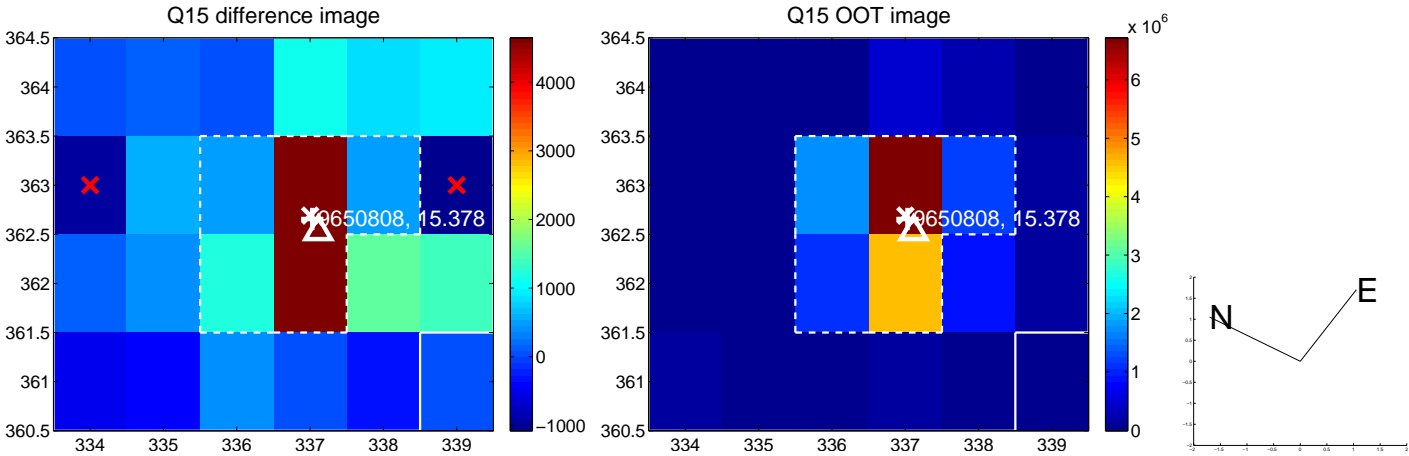
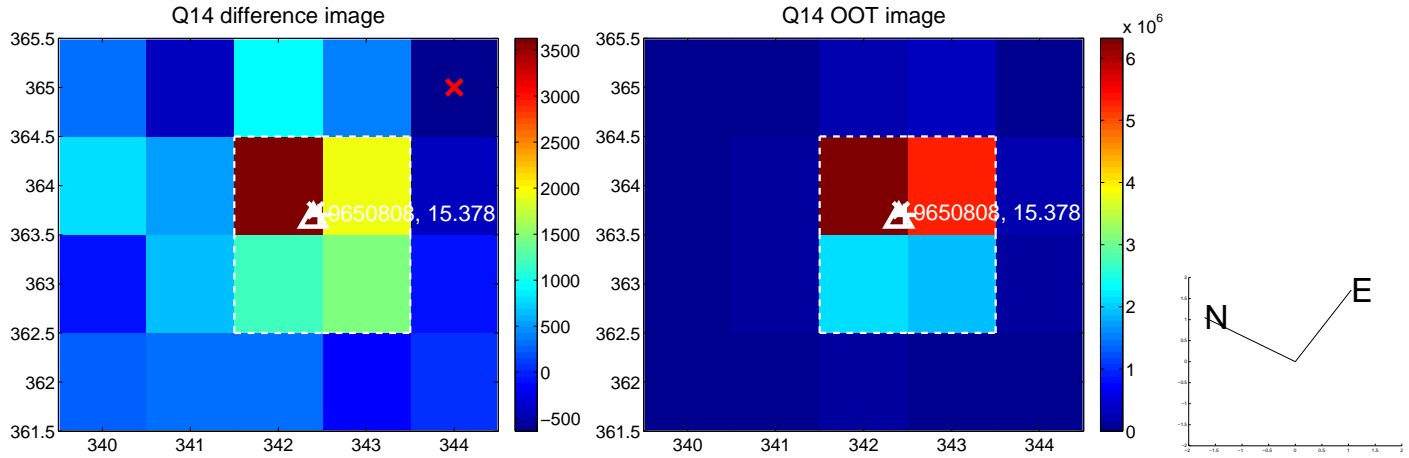
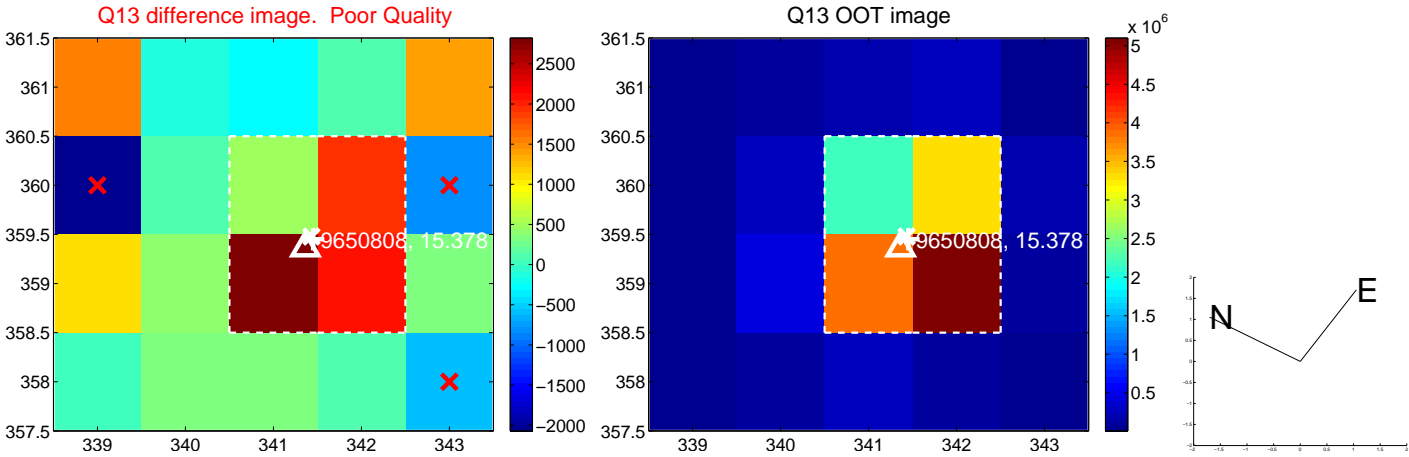
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



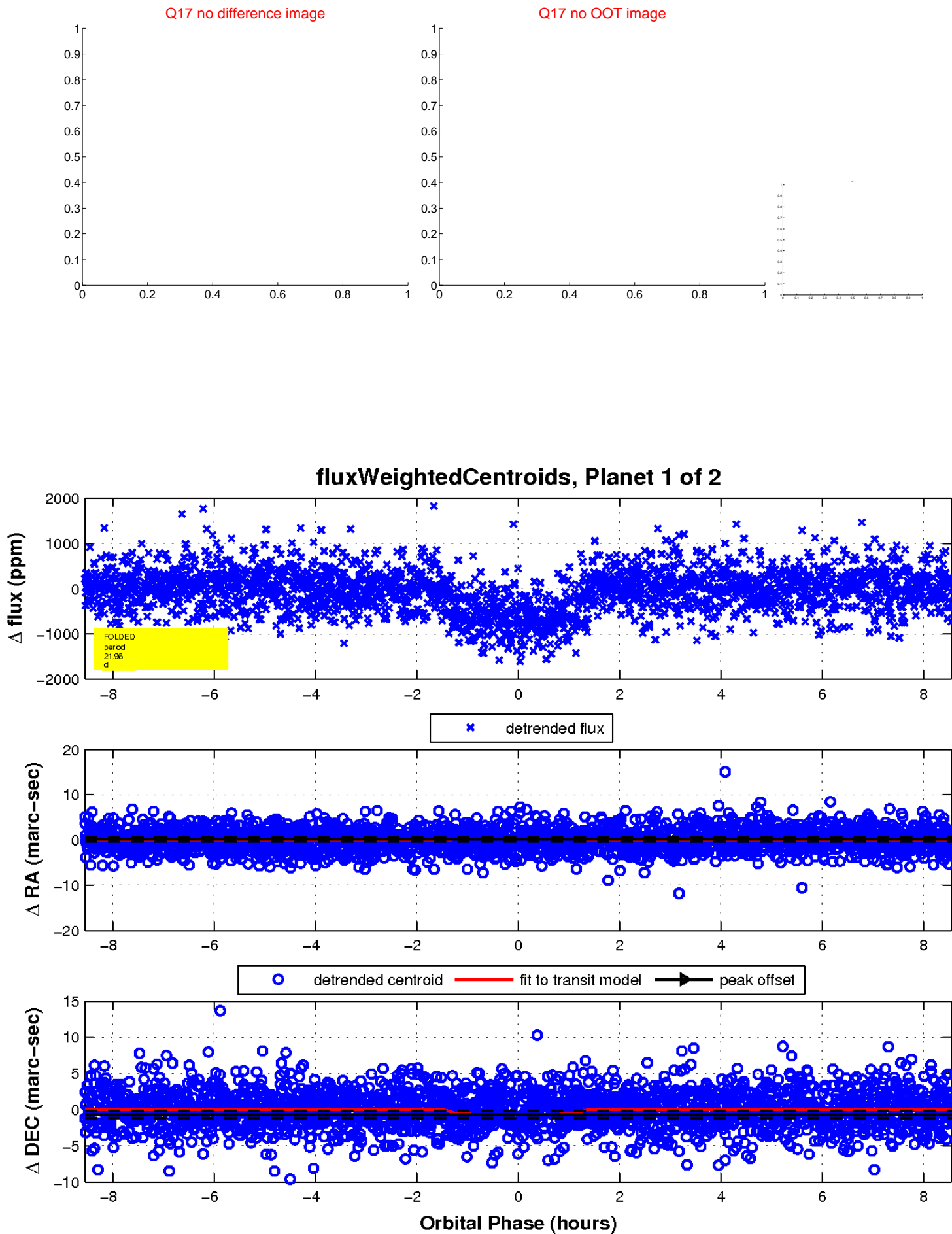
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

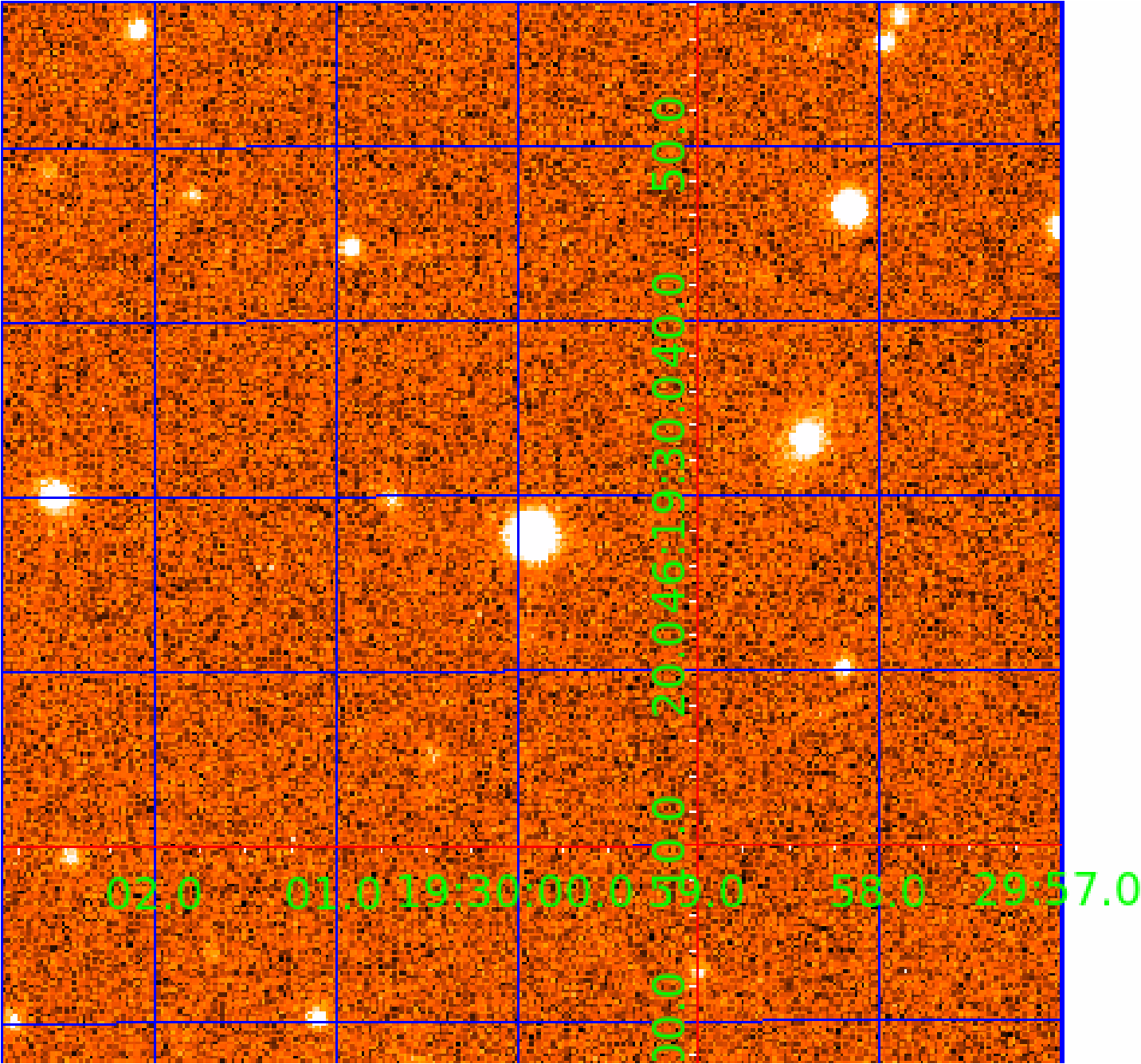


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009650808

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})
009650808-01	OBS	1970.01	21.964004	133.035933	696.3	2.852	23.9	27.0	0.96	5774	2.83	40.50
009650808-02	OBS	1970.02	125.602928	215.430419	898.5	7.262	19.5	21.4	0.96	5774	3.12	3.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009650808-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009650808-02	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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.

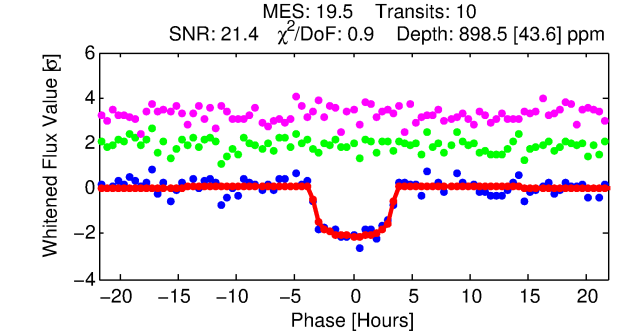
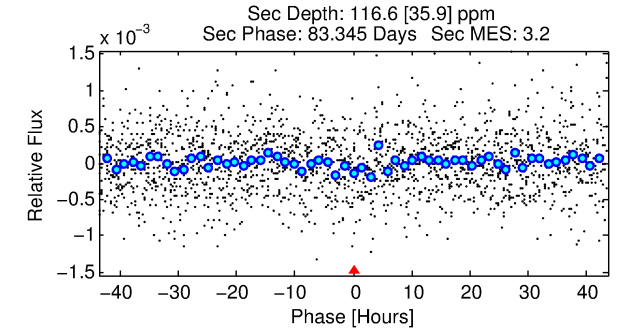
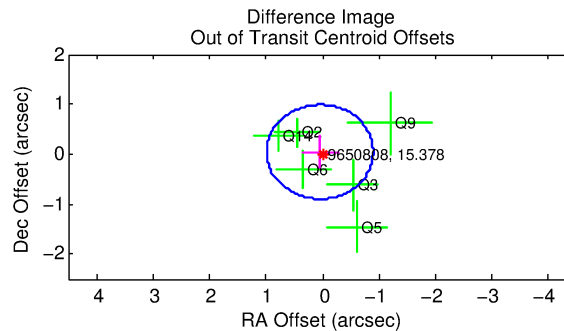
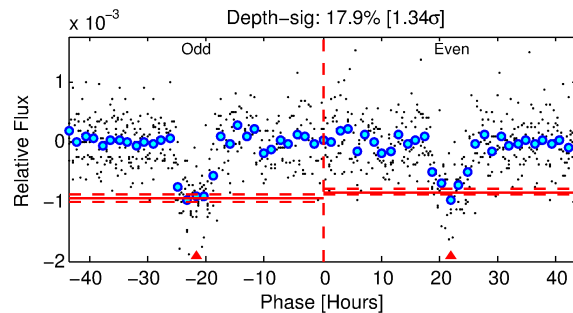
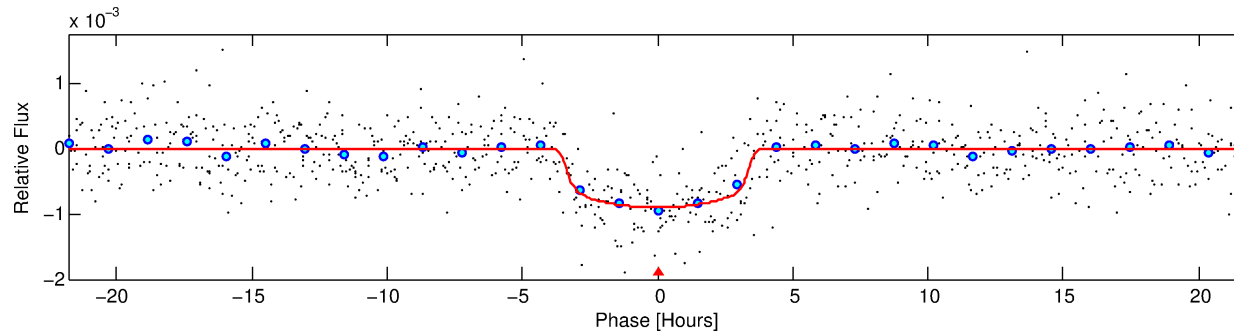
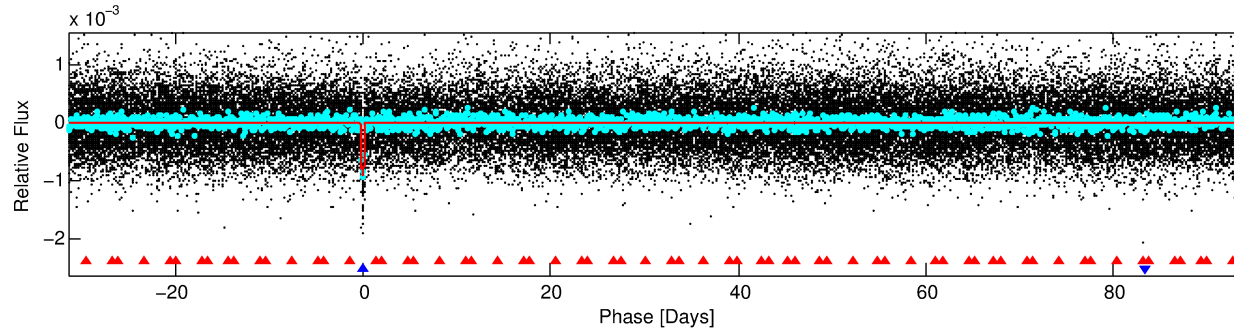
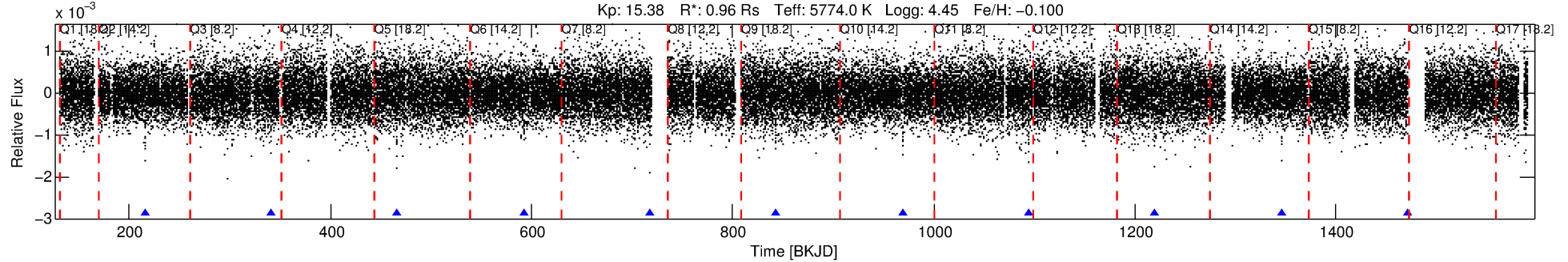
Ephemeris Match Information For 009650808-02

No Significant Match Found

DV One-Page Summary

KIC: 9650808 Candidate: 2 of 2 Period: 125.603 d
KOI: K01970.02 Name: Kepler-344c Corr: 0.988

Kp: 15.38 R*: 0.96 Rs Teff: 5774.0 K Logg: 4.45 Fe/H: -0.100



DV Fit Results:

Period = 125.60293 [0.00106] d
Epoch = 215.4304 [0.0061] BKJD
Rp/R* = 0.0299 [0.0055]
a/R* = 92.62 [75.31]
b = 0.75 [0.47]
Seff = 3.96 [1.45]
Teq = 360 [33] K
Rp = 3.12 [1.05] Re
a = 0.4804 [0.1135] AU
Ag = 1516.76 [895.88] [1.69σ]
Teffp = 3471 [429] K [7.23σ]

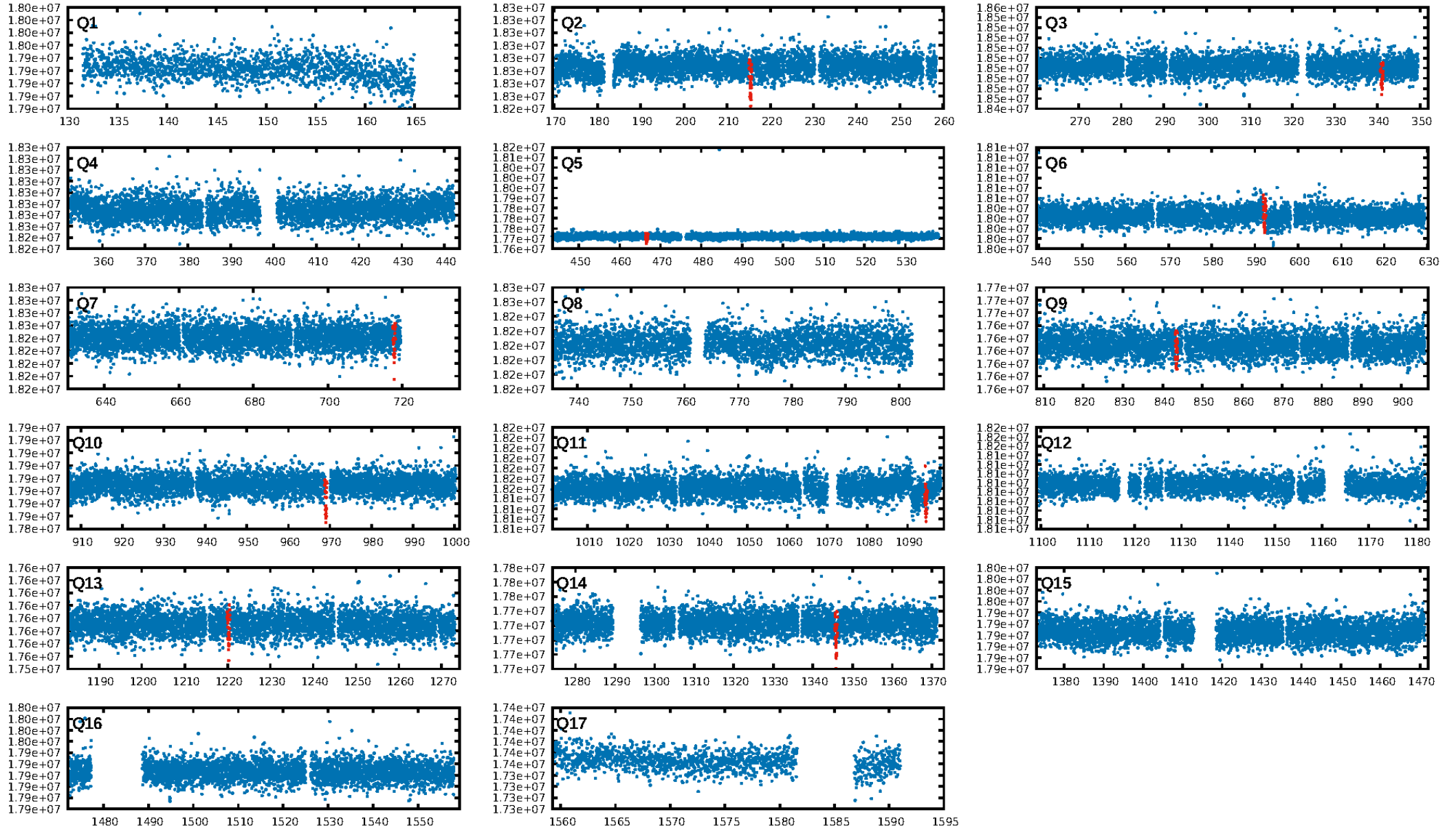
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [318.80σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.51e-83
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: 7.416
Centroid-sig: 47.2%
Centroid-so: 0.612 arcsec [0.80σ]
OotOffset-rm: 0.066 arcsec [0.21σ]
OotOffset-st: 3/1/0/2 [6]
KicOffset-rm: 0.150 arcsec [0.45σ]
KicOffset-st: 3/1/0/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [8/8]

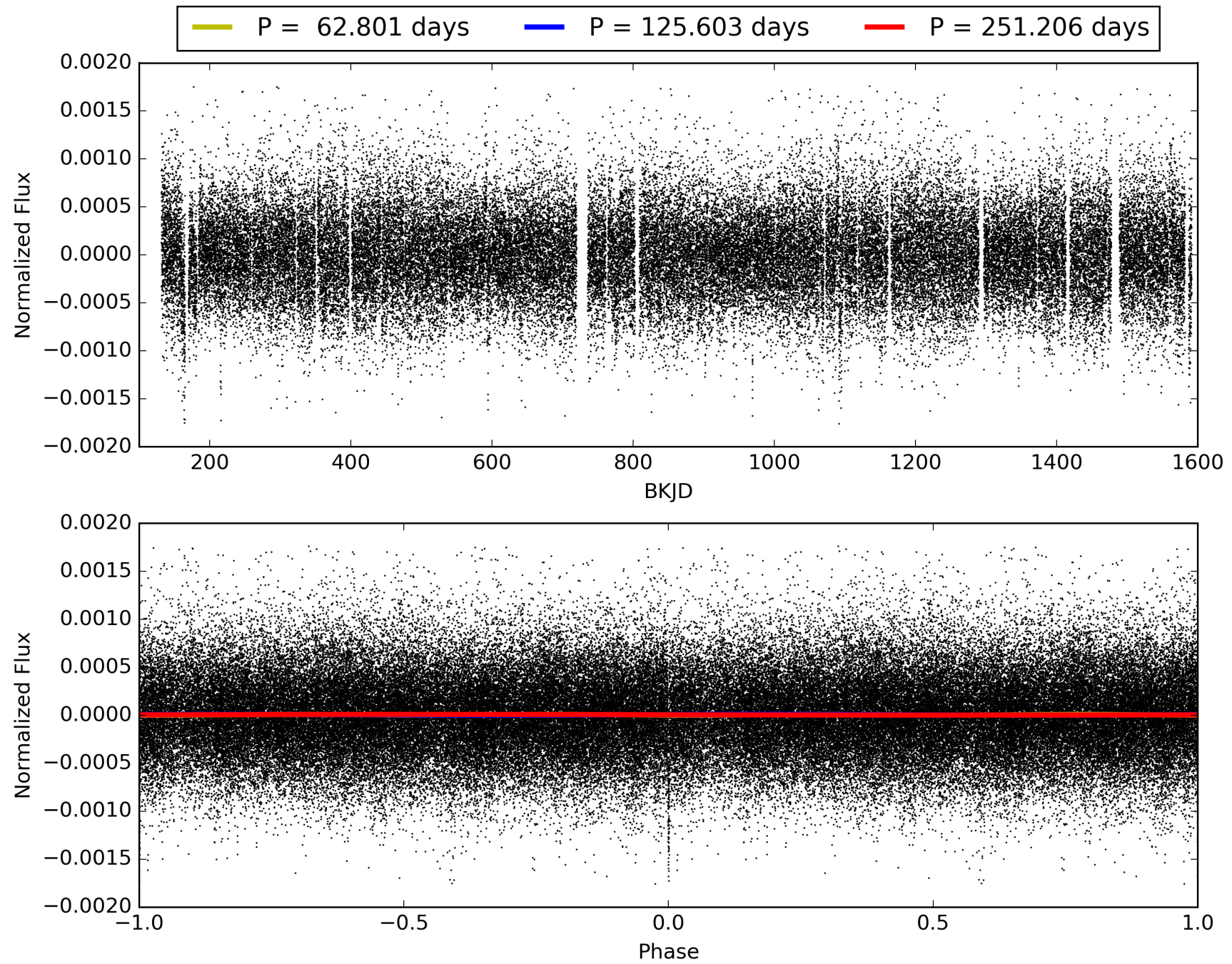
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:11:12 Z

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

TCE 009650808-02, PDC Light Curves

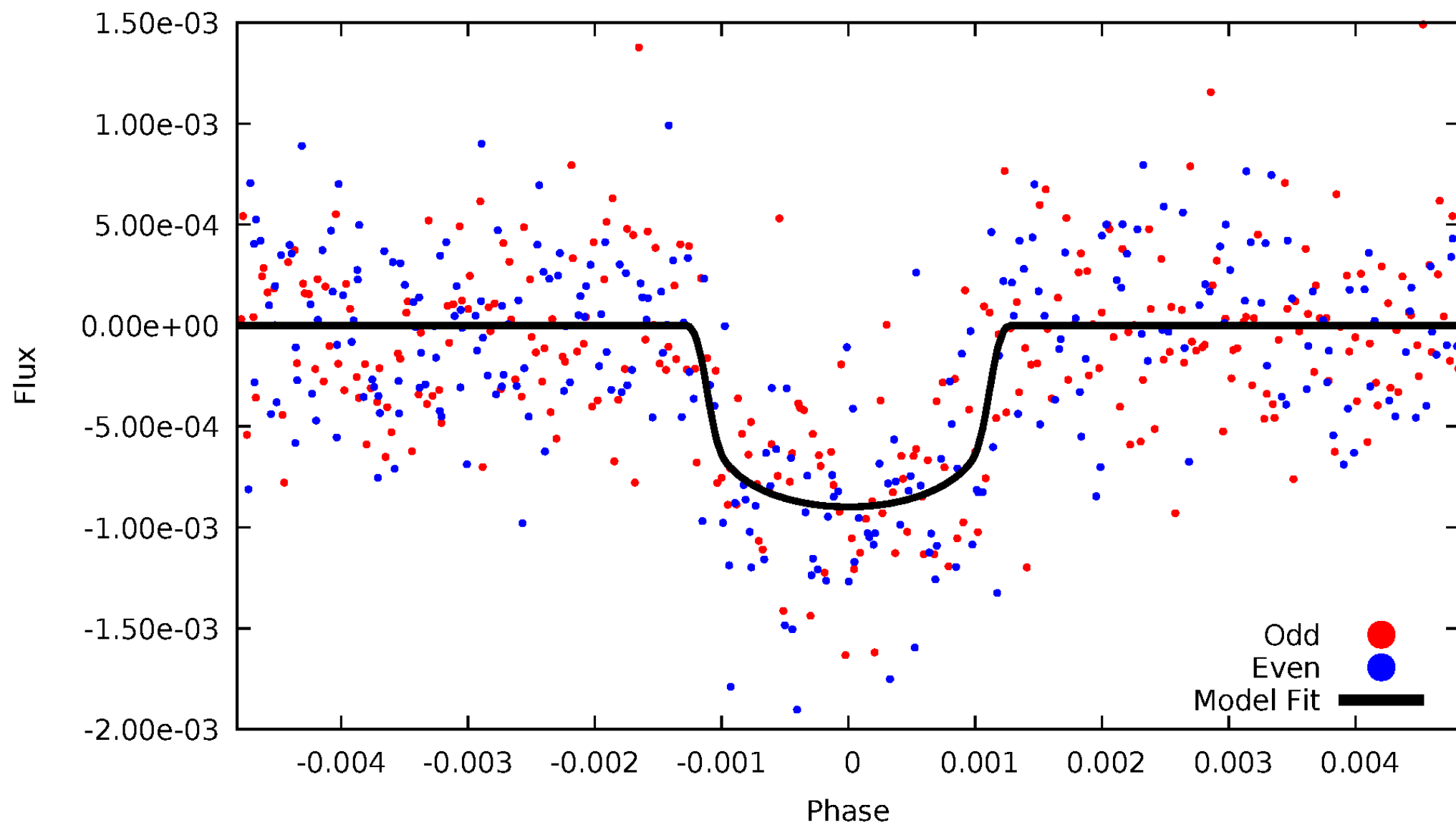


TCE 009650808-02



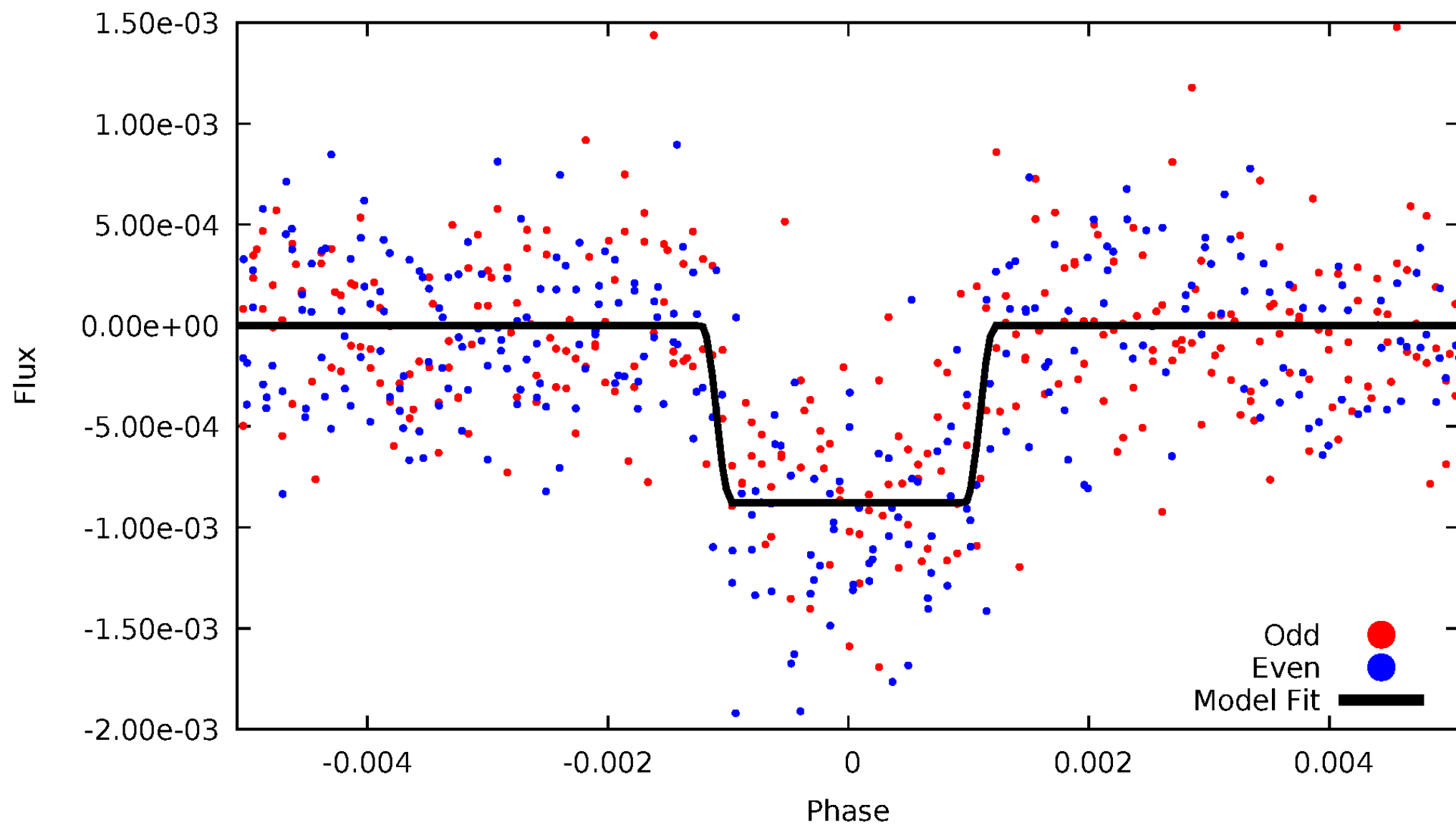
DV Odd/Even

TCE 009650808-02



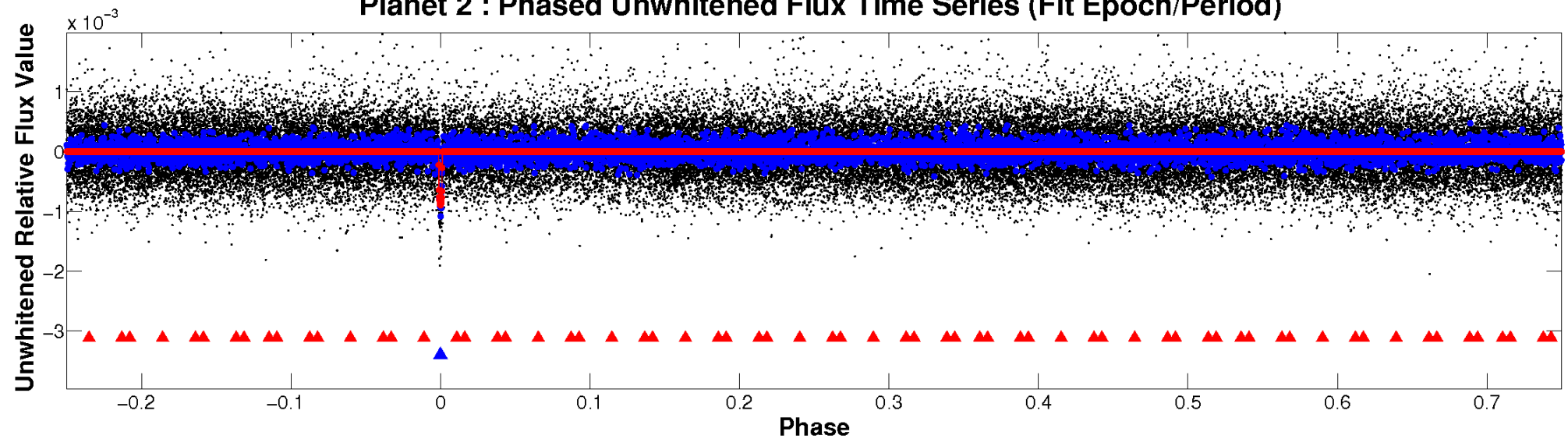
ALT Odd/Even

TCE 009650808-02

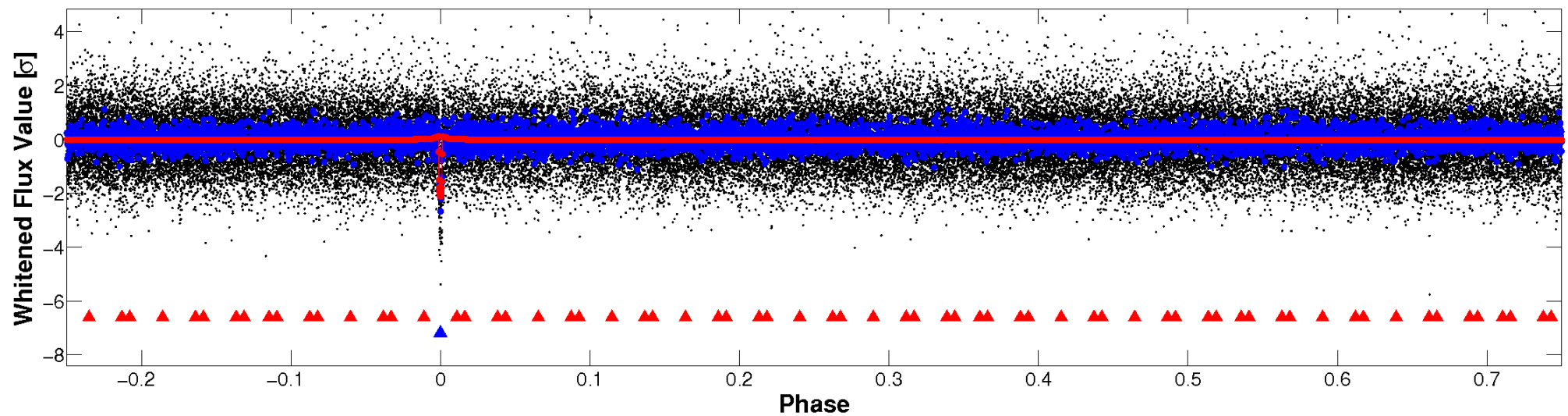


Non-Whitened Vs. Whitened Light Curve

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

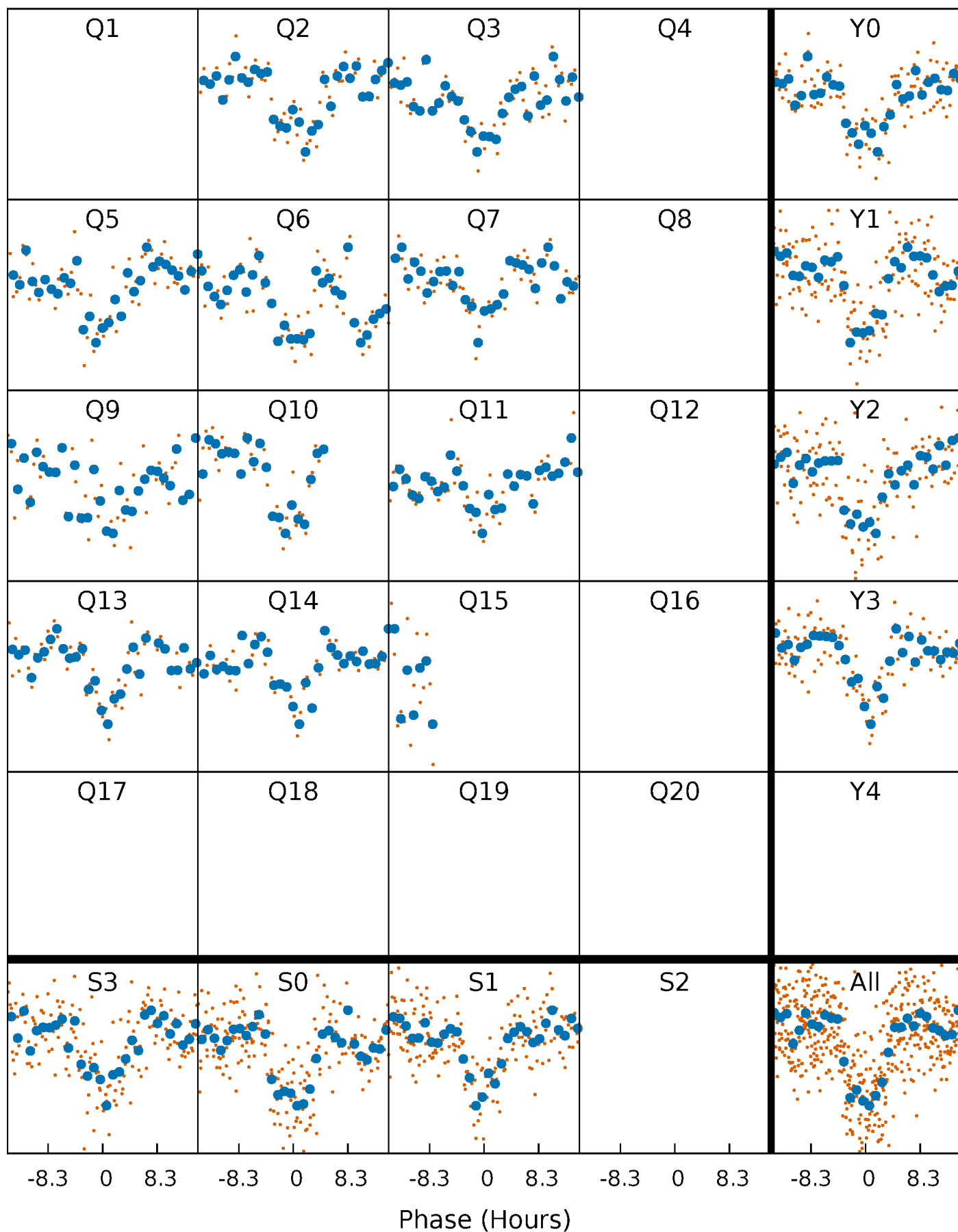


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



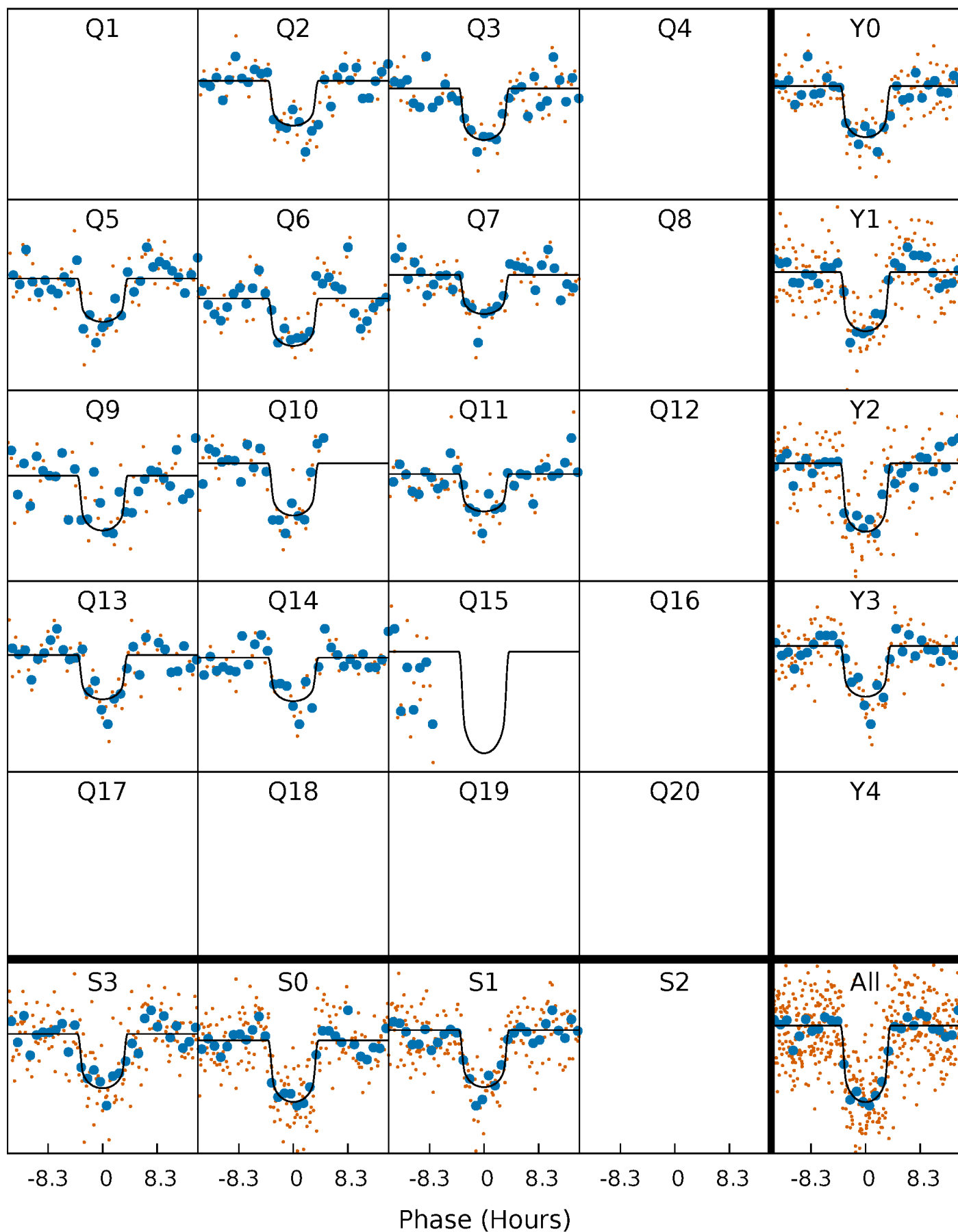
PDC Quarter-Phased Transit Curves

TCE 009650808-02 $P=125.602928$ Days $T_0=215.430419$ (BKJD)



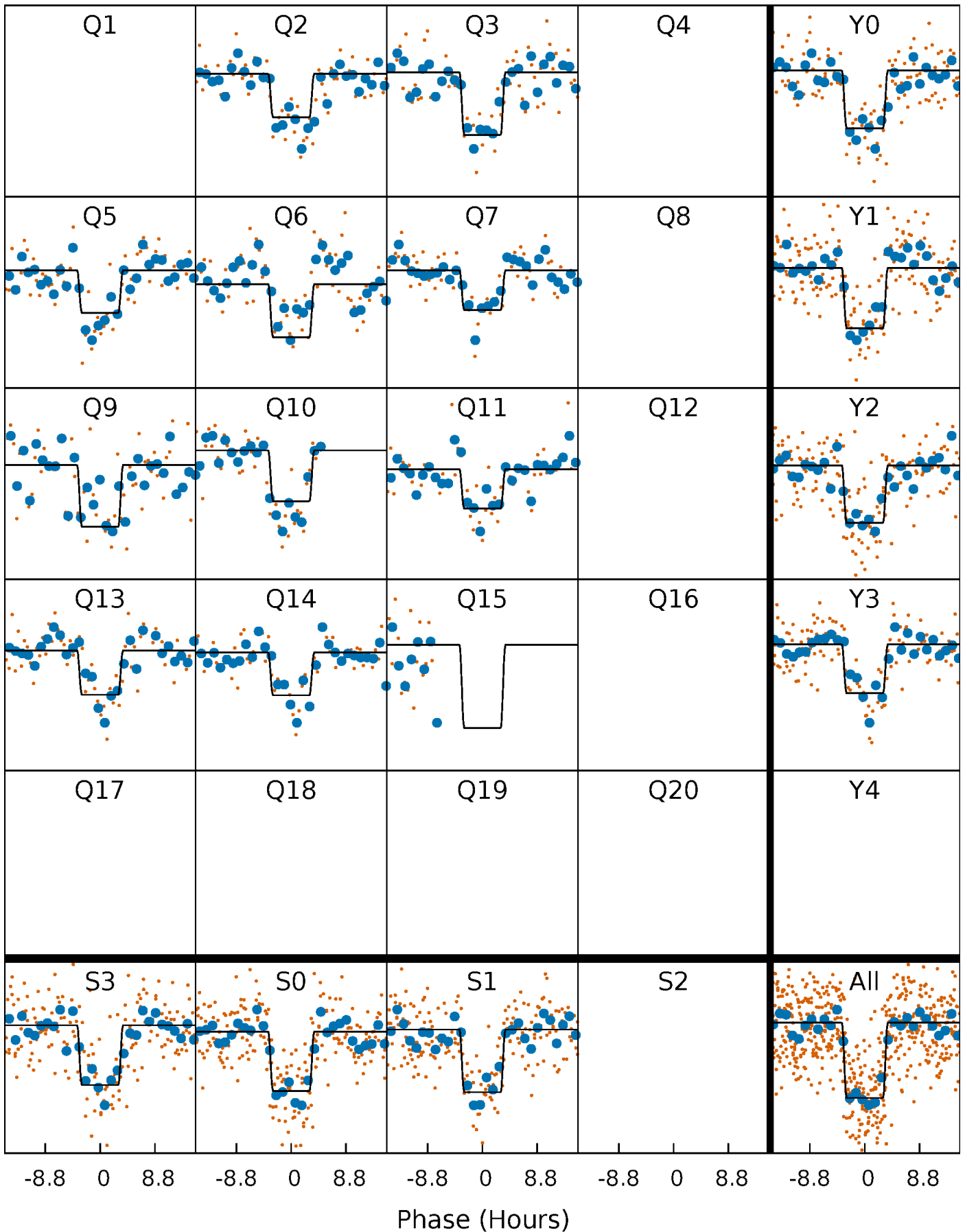
DV Quarter-Phased Transit Curves

TCE 009650808-02 P=125.602928 Days $T_0=215.430419$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

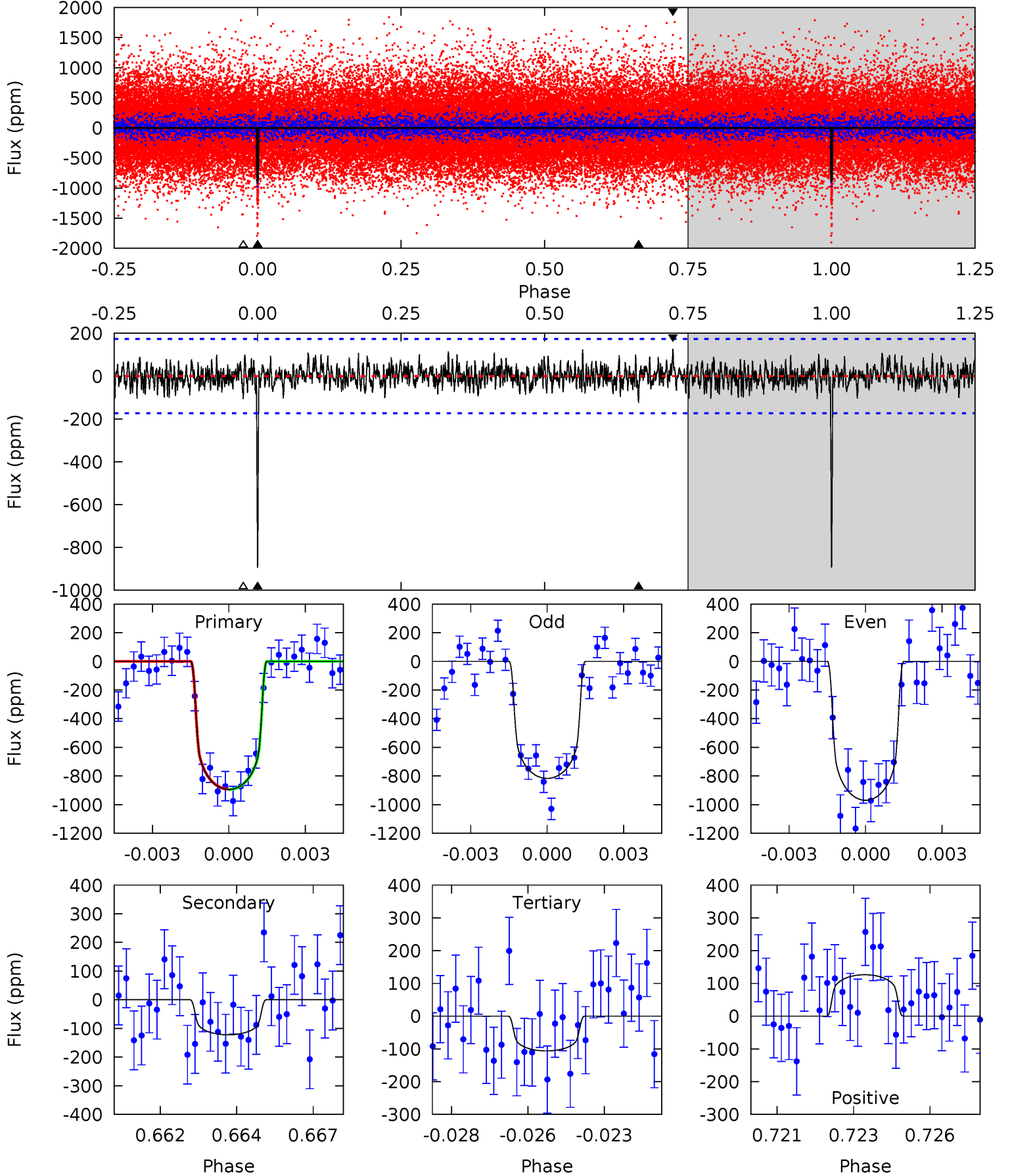
TCE 009650808-02 P=125.601896 Days $T_0=215.433652$ (BKJD)



DV Model-Shift Uniqueness Test

009650808-02, P = 125.602928 Days, E = 89.827491 Days

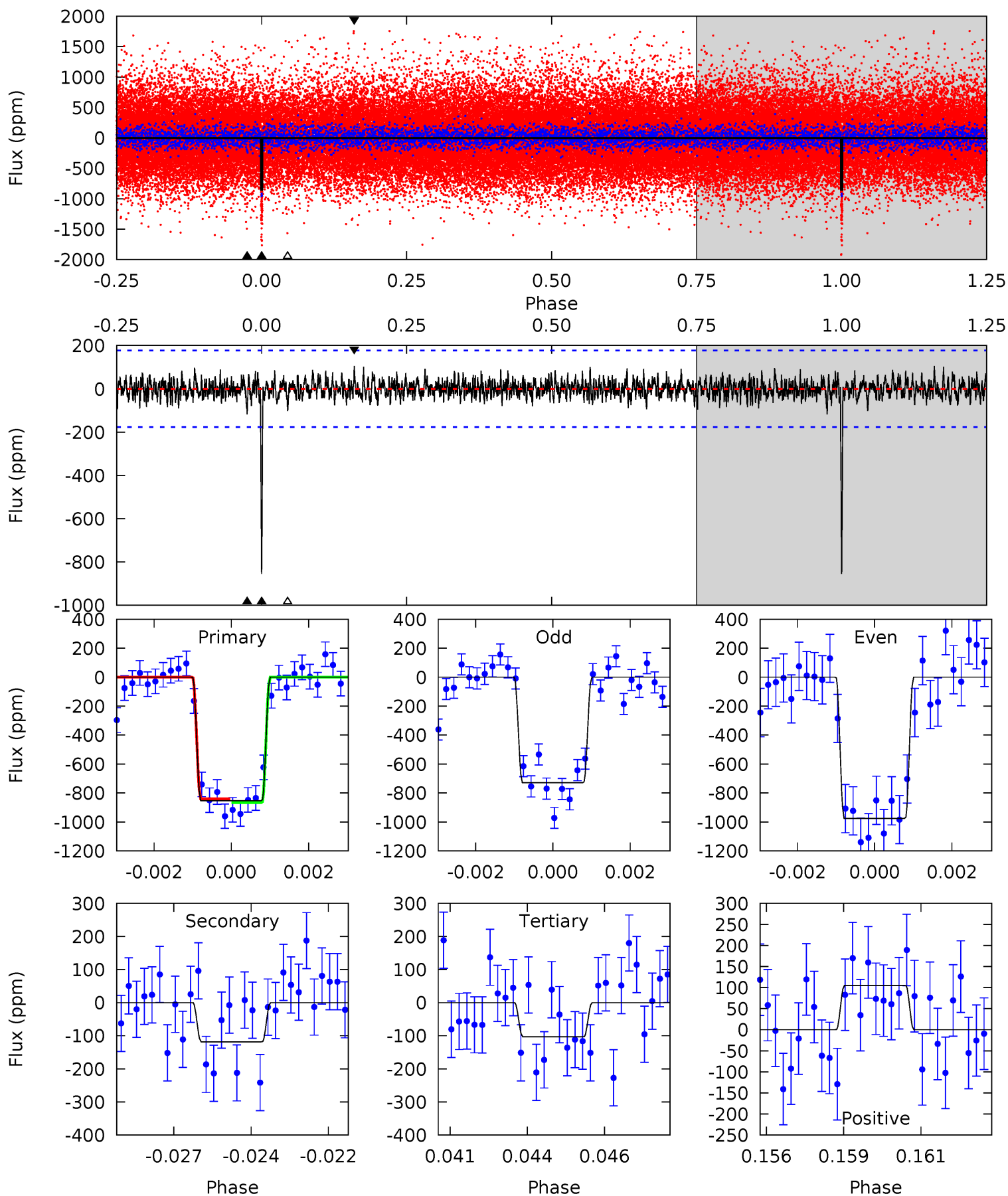
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.2	3.73	3.24	3.85	5.28	3.02	1.12	24.0	23.4	0.49	-0.13	2.33	0.97	0.12	0.04



Alt Model-Shift Uniqueness Test

009650808-02, $P = 125.601896$ Days, $E = 89.831756$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.5	3.53	3.08	3.14	5.29	3.03	0.94	22.4	22.4	0.46	0.39	3.72	1.02	0.11	0.41



Stellar Parameters For KIC 009650808

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5774^{+156}_{-173}	$4.447^{+0.081}_{-0.189}$	$-0.100^{+0.300}_{-0.300}$	$0.958^{+0.268}_{-0.115}$	$0.937^{+0.125}_{-0.102}$	$1.503^{+0.546}_{-0.781}$
	+3%/-3%	+2%/-4%	+300%/-300%	+28%/-12%	+13%/-11%	+36%/-52%
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 009650808-02 / KOI 1970.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-122 ± 33	$3.22^{+0.79}_{-0.61}$	509^{+34}_{-25}	3839^{+368}_{-302}	1435^{+1003}_{-601}
Alt.	-118 ± 33	$3.19^{+0.78}_{-0.67}$	510^{+36}_{-27}	3843^{+338}_{-267}	1420^{+996}_{-566}

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

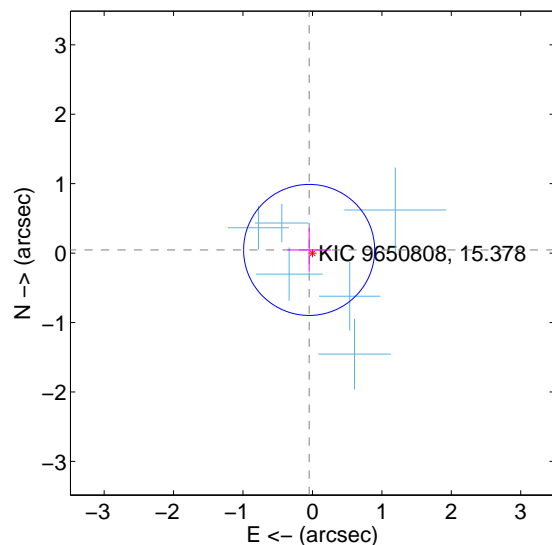
Supplemental centroid analysis for 009650808-02. Kepler magnitude: 15.38. Transit SNR 21.39

There are 6 quarters with good PRF difference image offsets

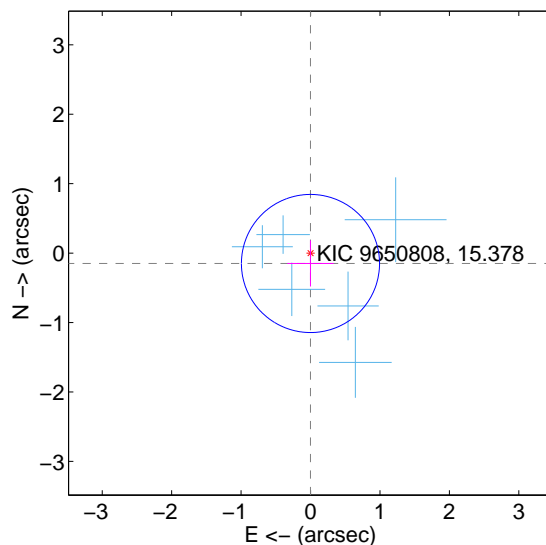
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.066 ± 0.315	0.21	0.048 ± 0.315	0.046 ± 0.314
PRF-fit source offset from KIC position	0.150 ± 0.332	0.45	0.001 ± 0.333	-0.150 ± 0.332
photometric centroid source offset	0.61 ± 0.76	0.80	0.39 ± 0.74	-0.47 ± 0.78

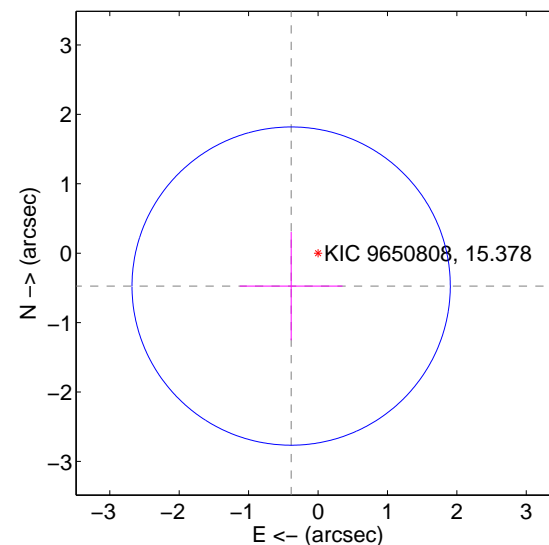
offset from difference PRF-fit to OOT PRF-fit



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.

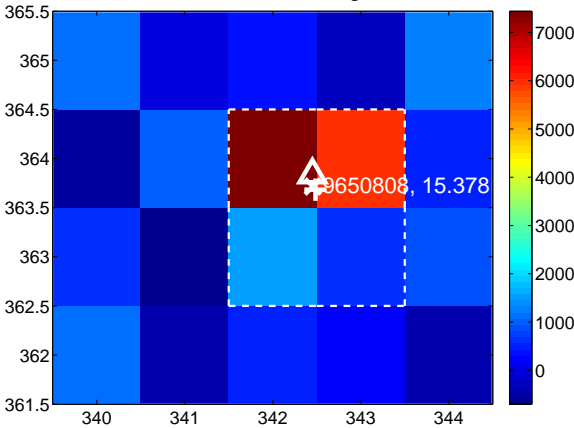
Q1 no difference image



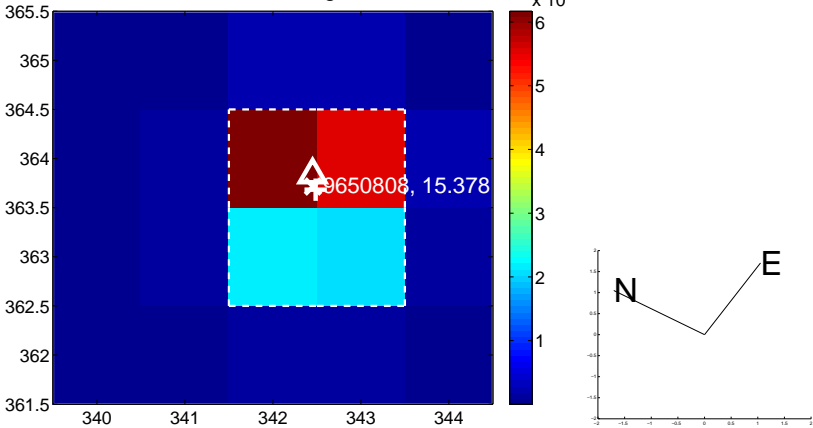
Q1 no OOT image



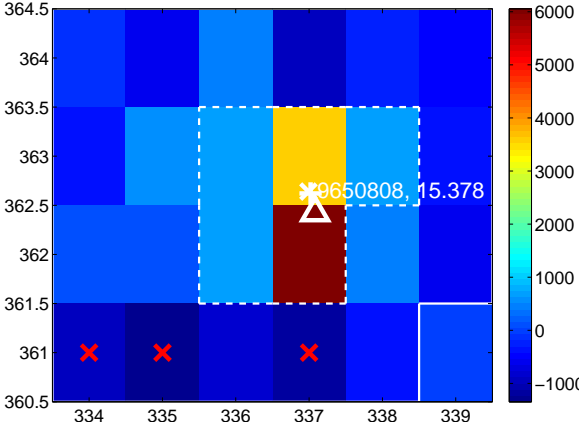
Q2 difference image



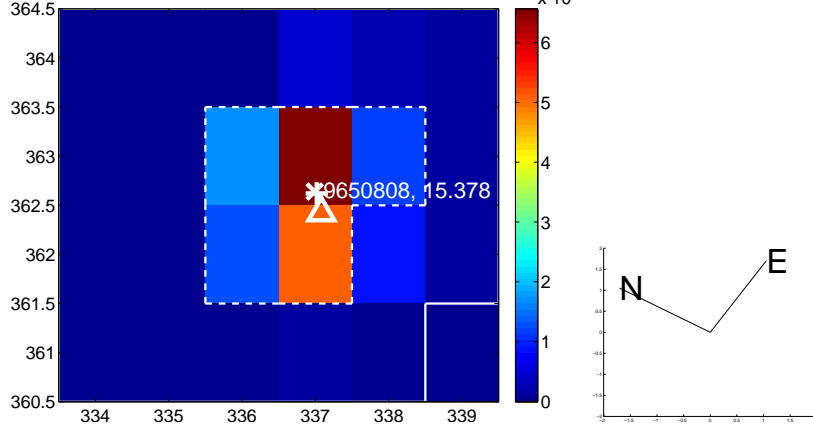
Q2 OOT image



Q3 difference image



Q3 OOT image



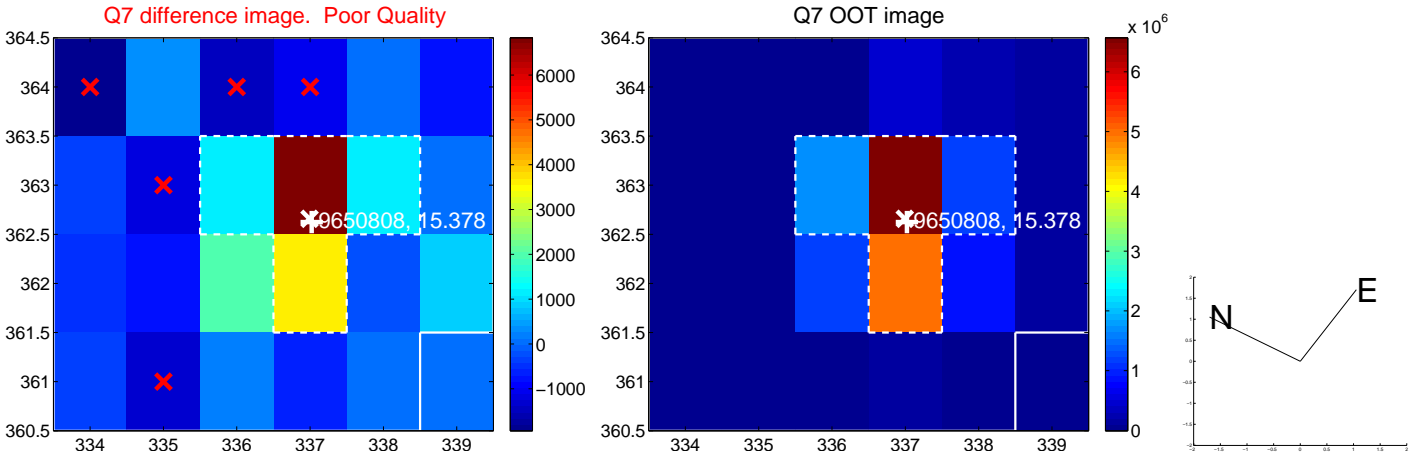
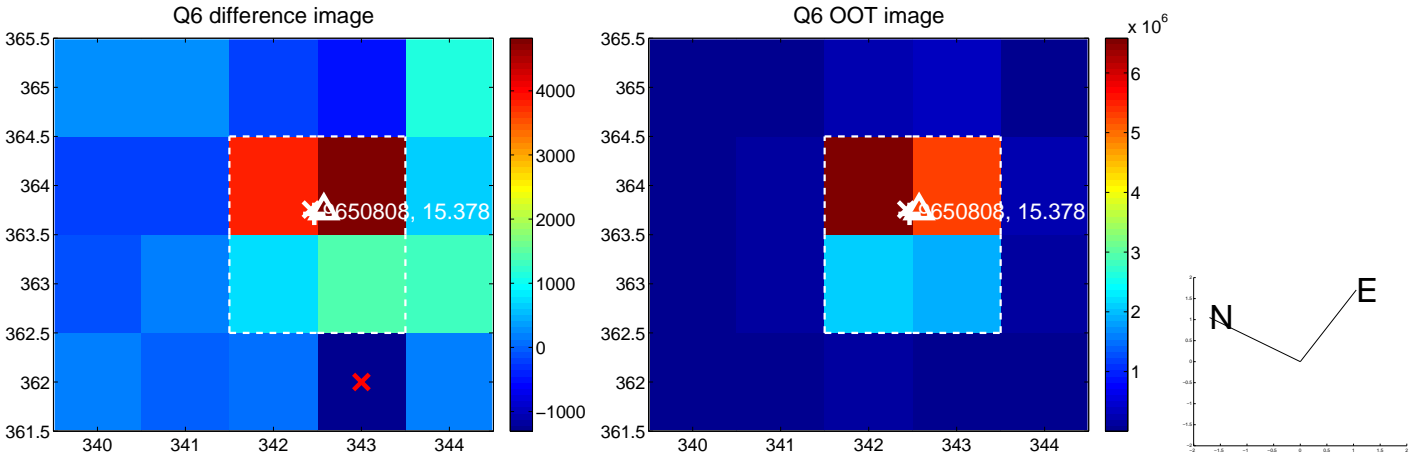
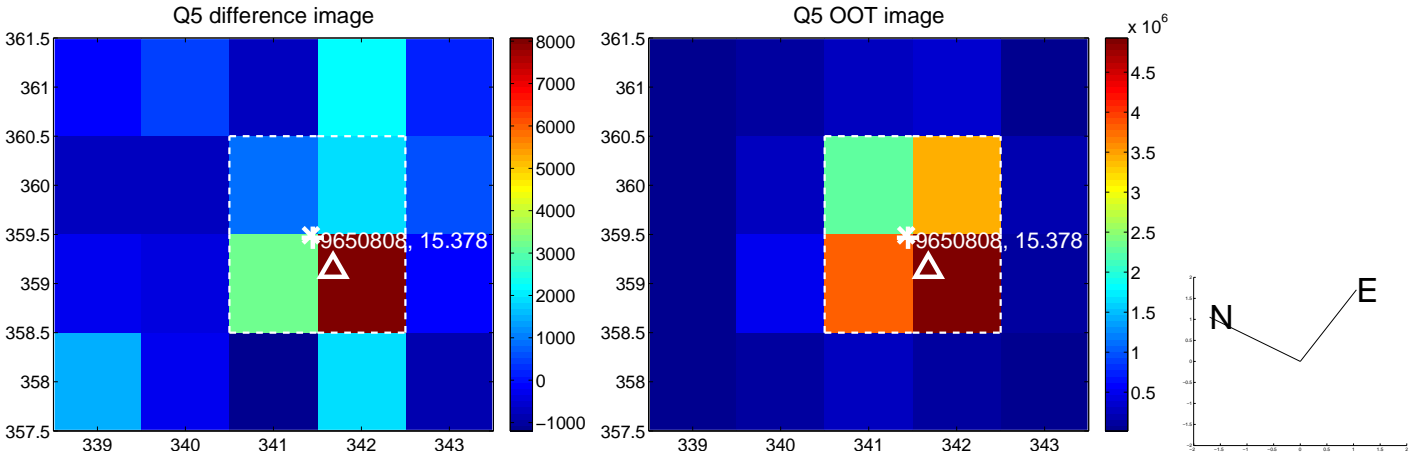
Q4 no difference image



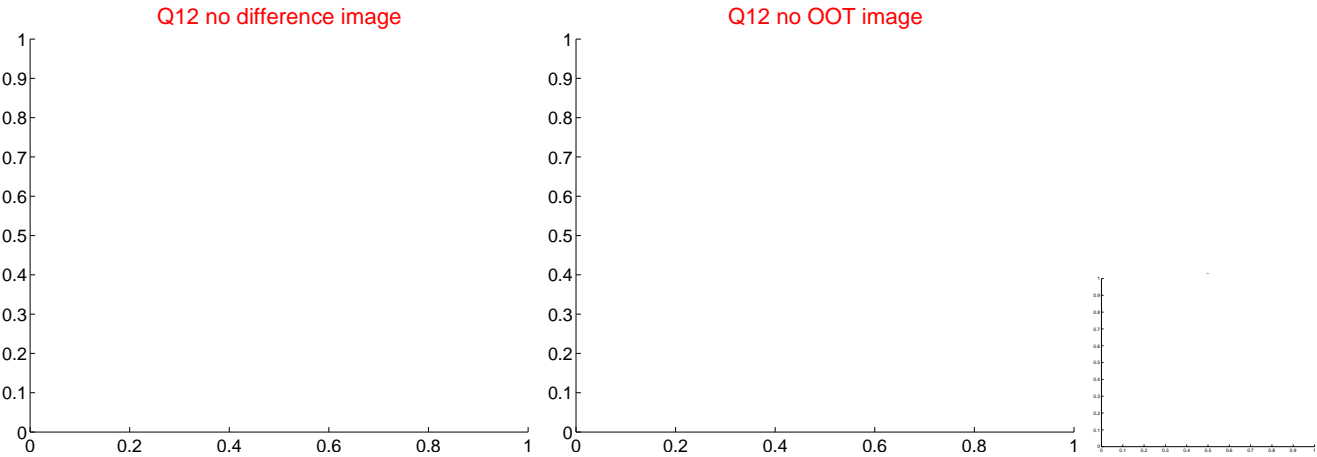
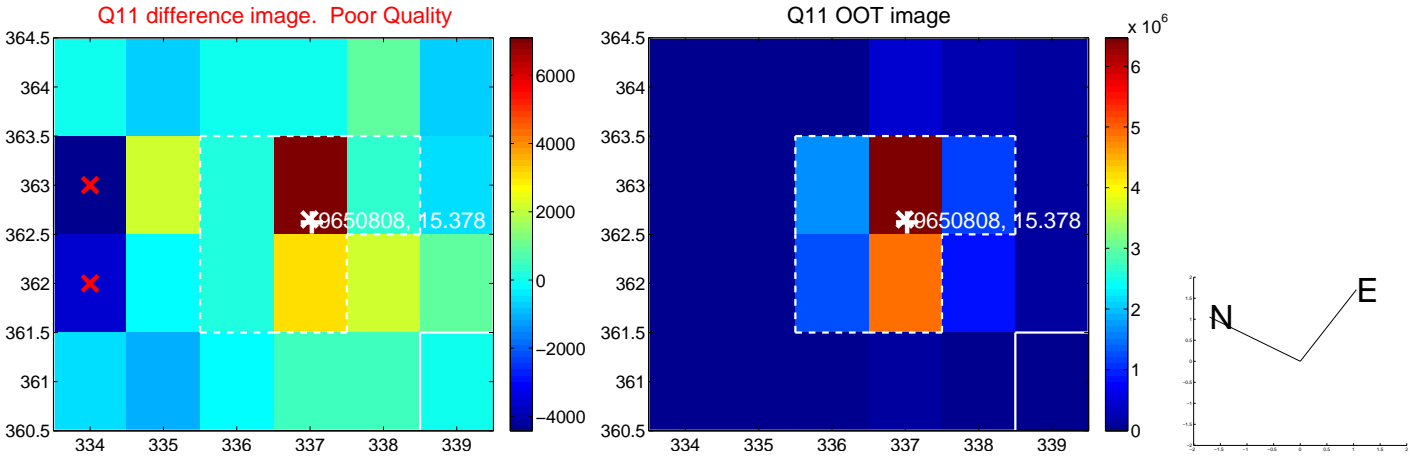
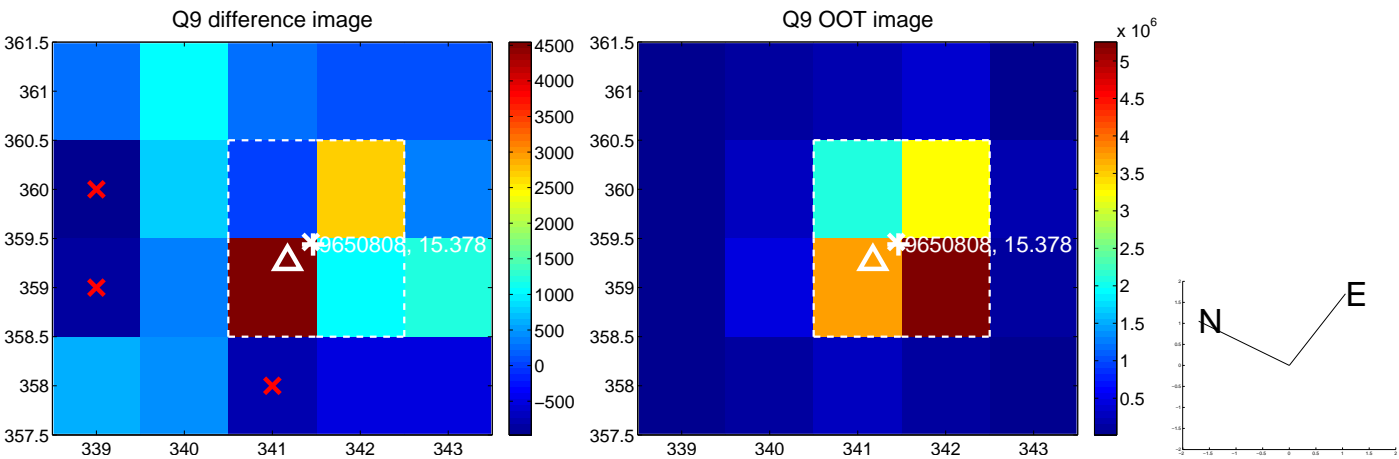
Q4 no OOT image



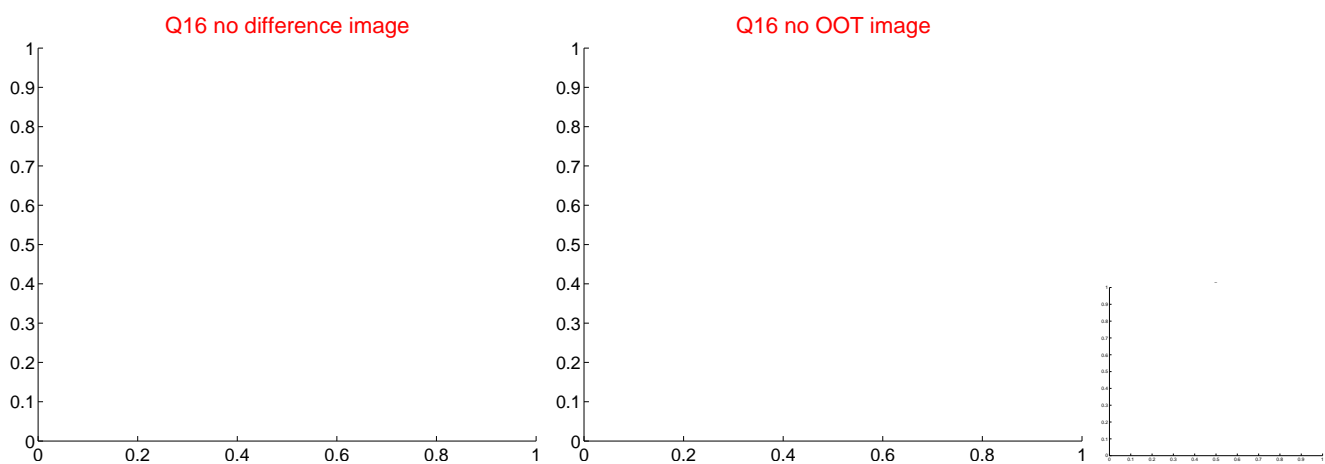
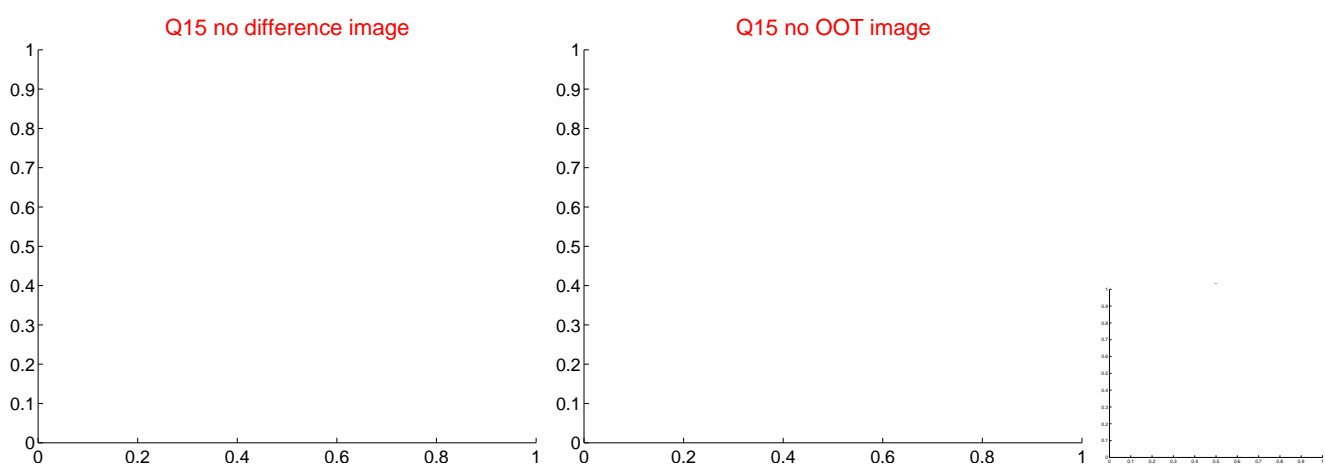
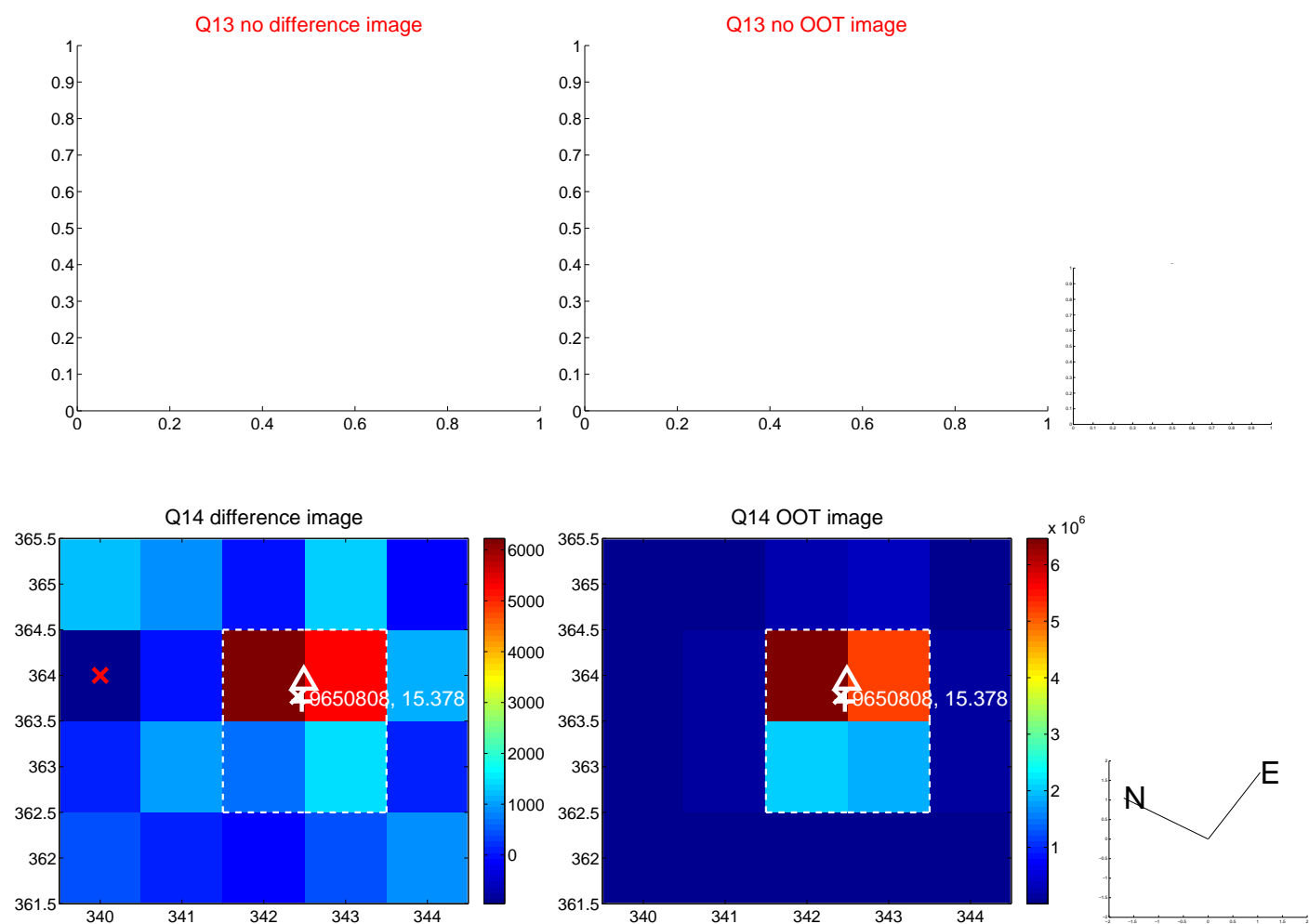
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



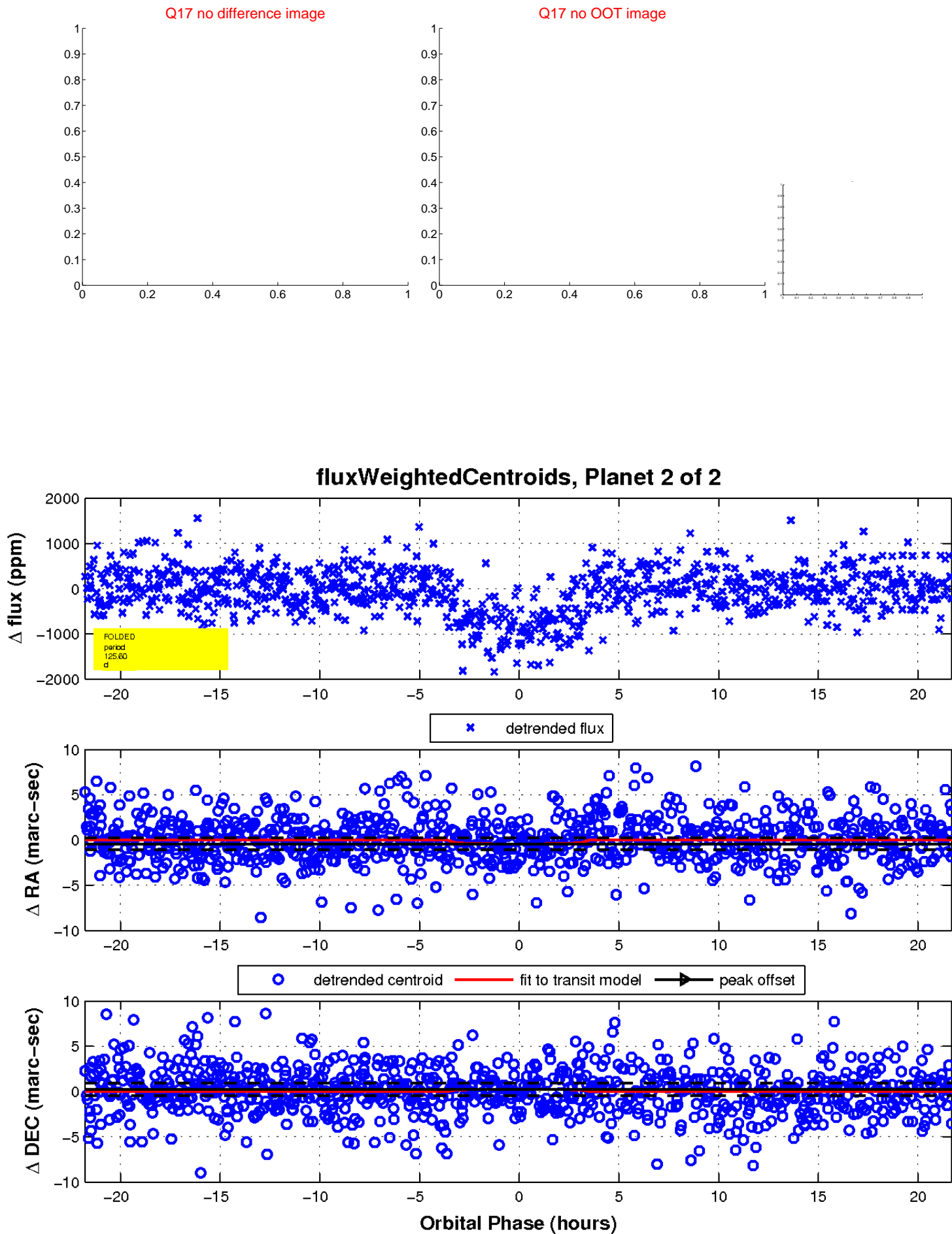
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

