

KIC 010068024

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})
010068024-01	OBS	2891.01	2.023112	132.077404	60.4	1.442	16.2	16.5	1.06	6349	0.97	1581.08
010068024-02	OBS	No	4.147078	135.520991	15.9	23.028	9.2	7.7	1.06	6349	0.43	607.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010068024-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
010068024-02	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET

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 010068024-01

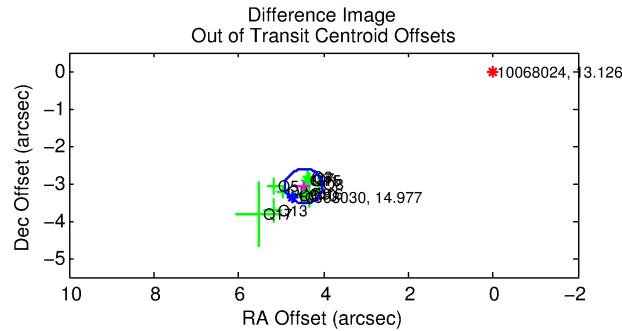
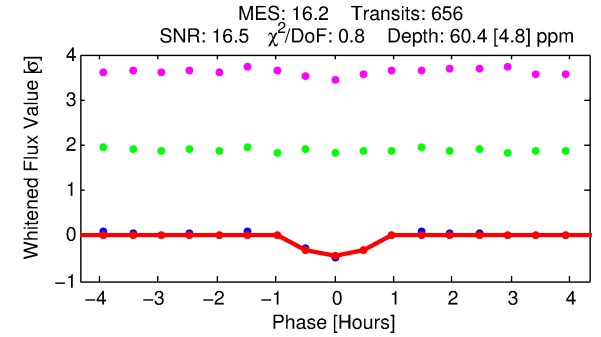
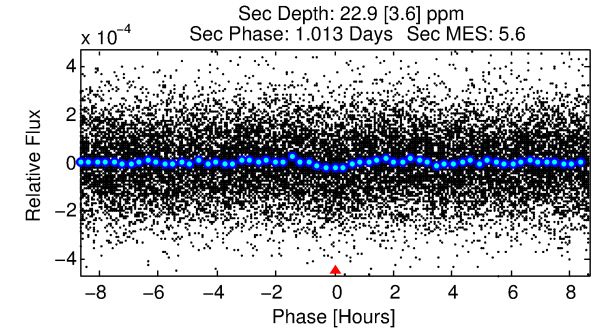
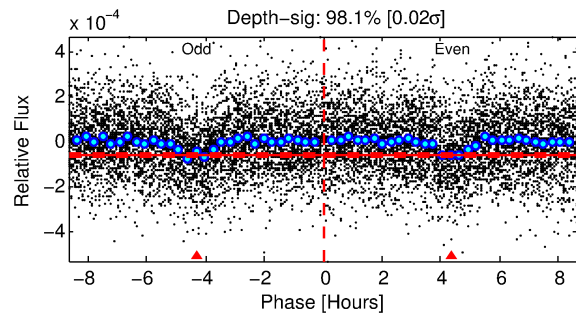
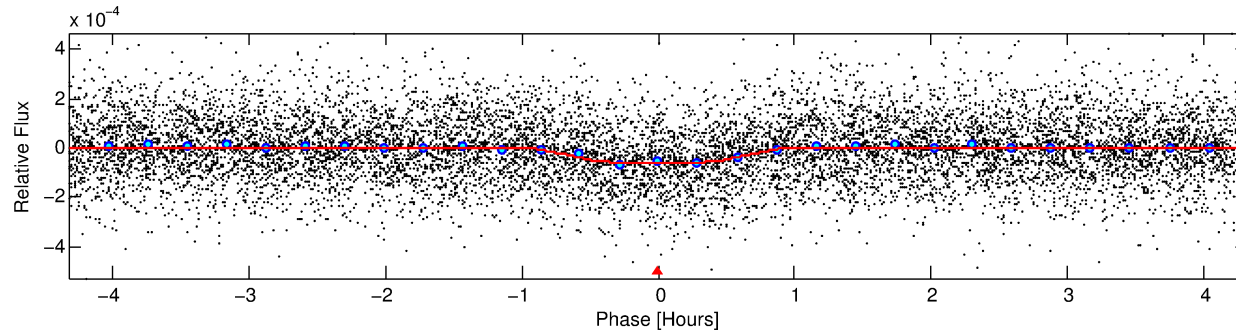
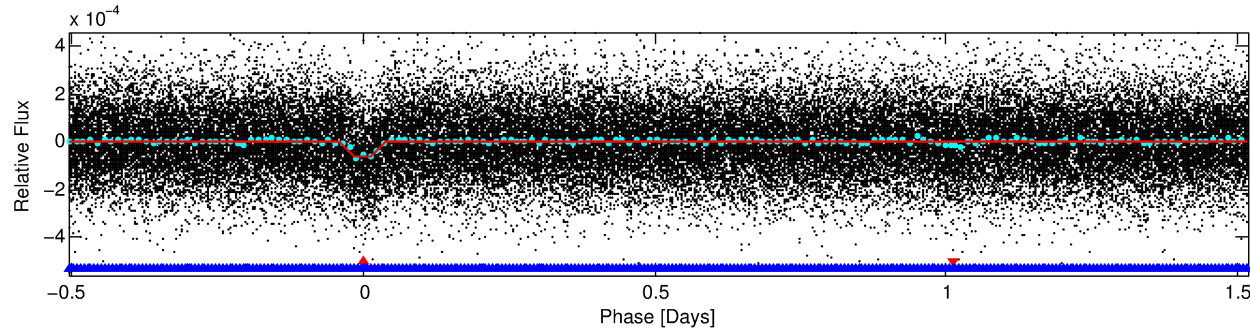
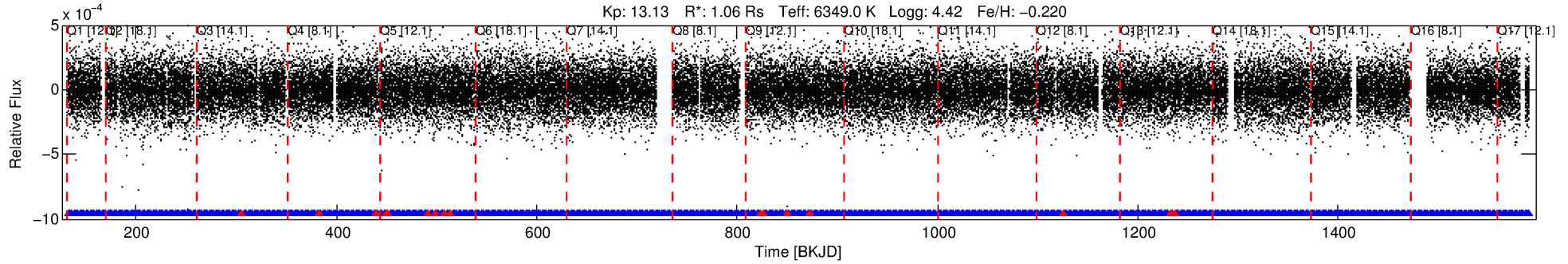
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010068024-01	10068024	529.01	10068030	1:1	5.8	2	1	14.98	13.13	22.10	Direct-PRF	0	0.42	0.20

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10068024 Candidate: 1 of 2 Period: 2.023 d
KOI: K02891.01 Corr: 0.942

Kp: 13.13 R*: 1.06 Rs Teff: 6349.0 K Logg: 4.42 Fe/H: -0.220



DV Fit Results:

Period = 2.02311 [0.00001] d
Epoch = 132.0774 [0.0014] BKJD
Rp/R* = 0.0084 [0.0027]
a/R* = 4.96 [8.50]
b = 0.90 [0.38]
Seff = 1581.08 [695.85]
Teq = 1608 [177] K
Rp = 0.97 [0.45] Re
a = 0.0321 [0.0092] AU
Ag = 13.94 [10.84] [1.19σ]
Teffp = 4804 [813] K [3.84σ]

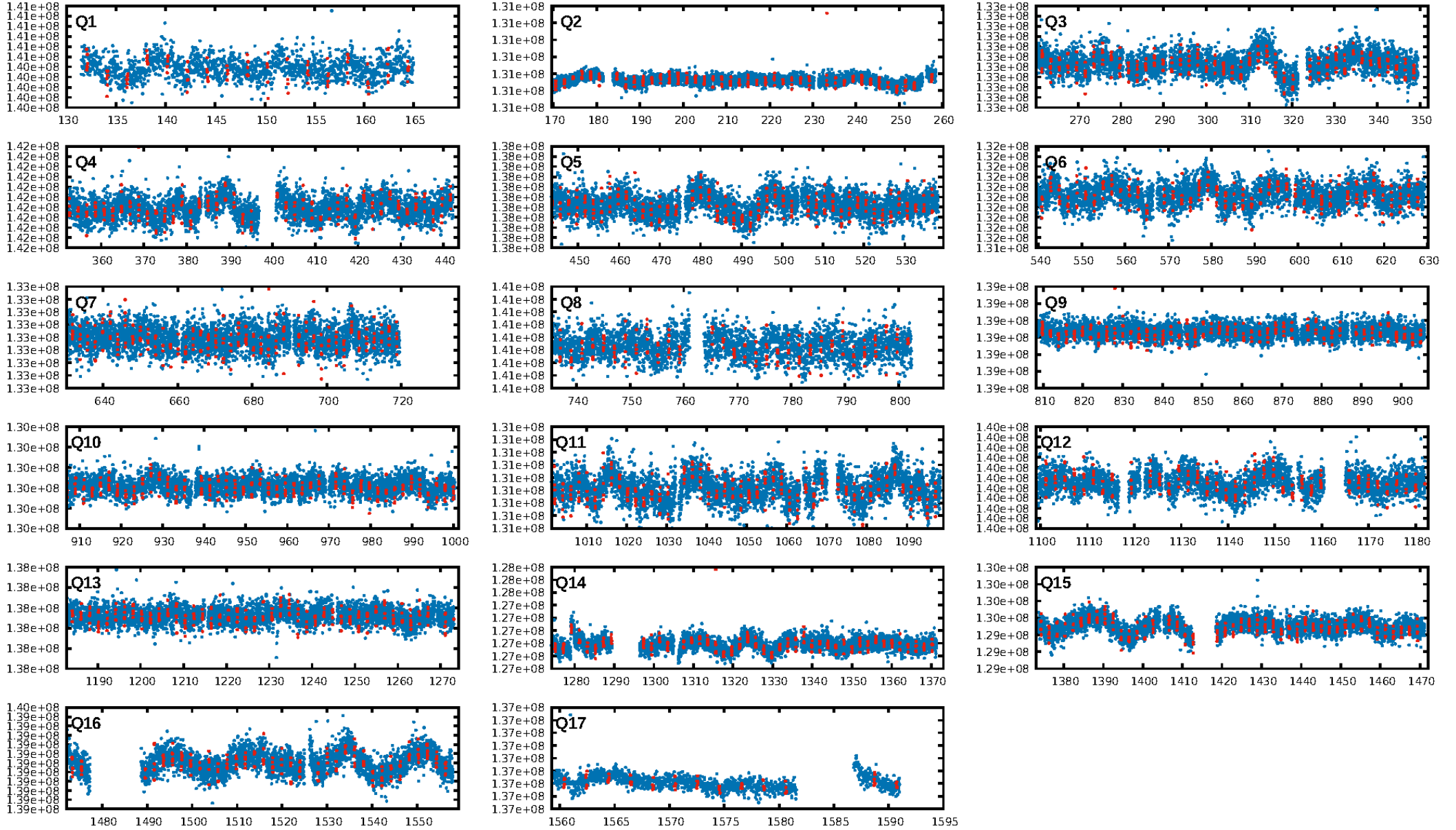
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 97.3% [2.21σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.45e-59
RollingBand-fgt: 0.97 [610/626]
GhostDiagnostic-chr: -0.03885
Centroid-sig: 0.0%
Centroid-so: 12.269 arcsec [20.88σ]
OotOffset-rm: 5.422 arcsec [35.59σ]
KicOffset-rm: 5.745 arcsec [42.04σ]
OotOffset-st: 3/4/2/4 [13]
KicOffset-st: 3/4/2/4 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [17/17]

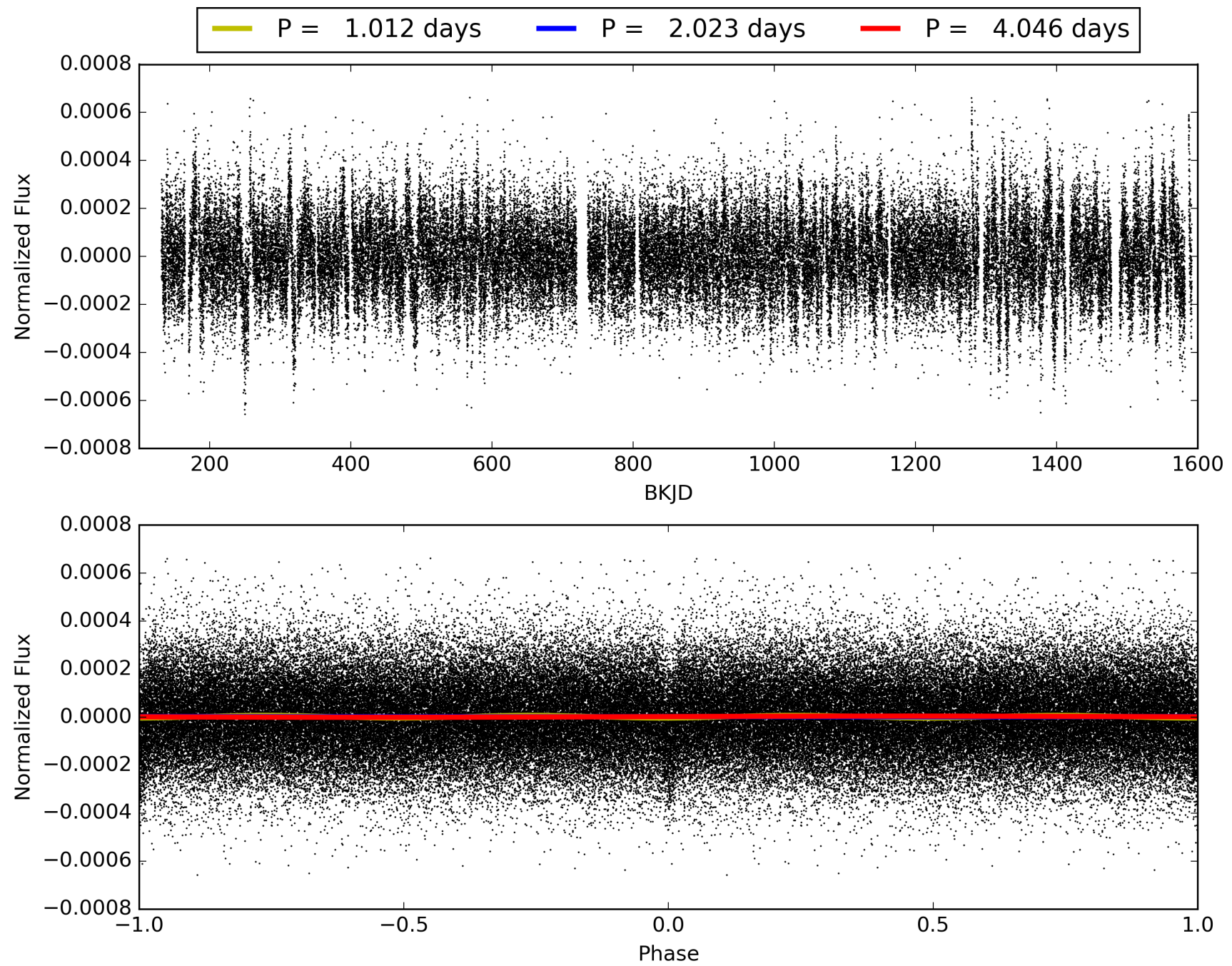
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:23:59 Z

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

TCE 010068024-01, PDC Light Curves

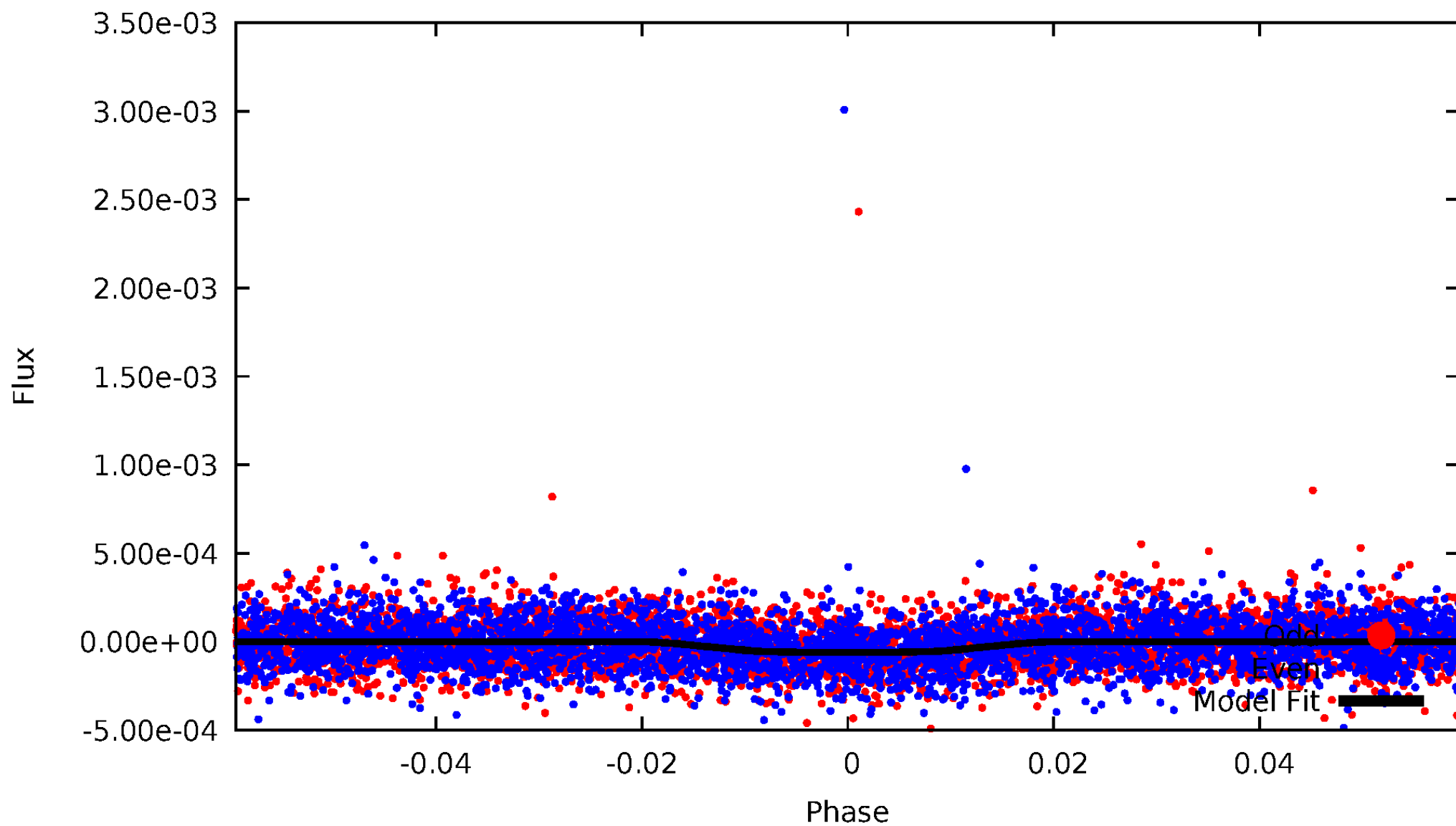


TCE 010068024-01



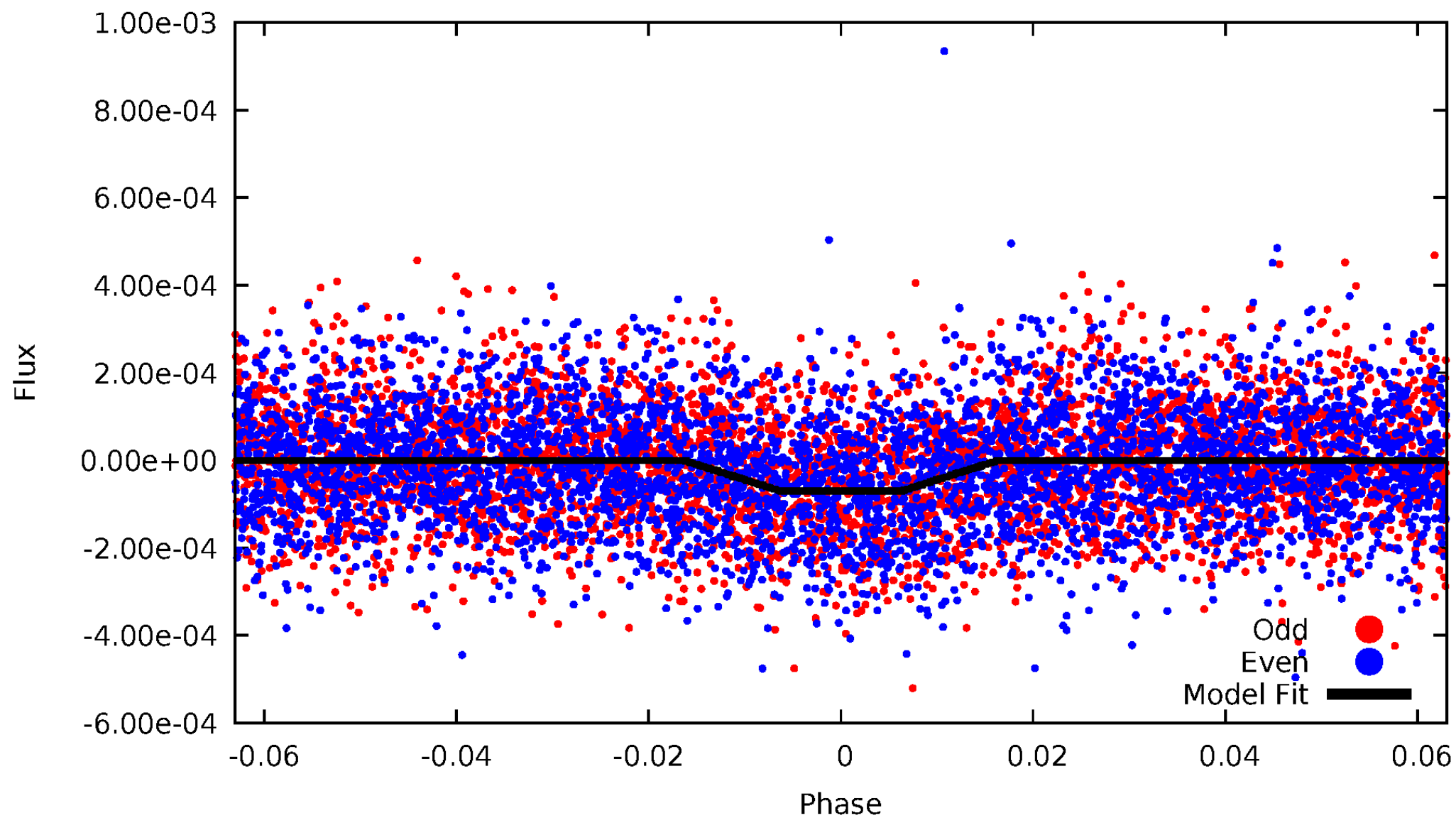
DV Odd/Even

TCE 010068024-01

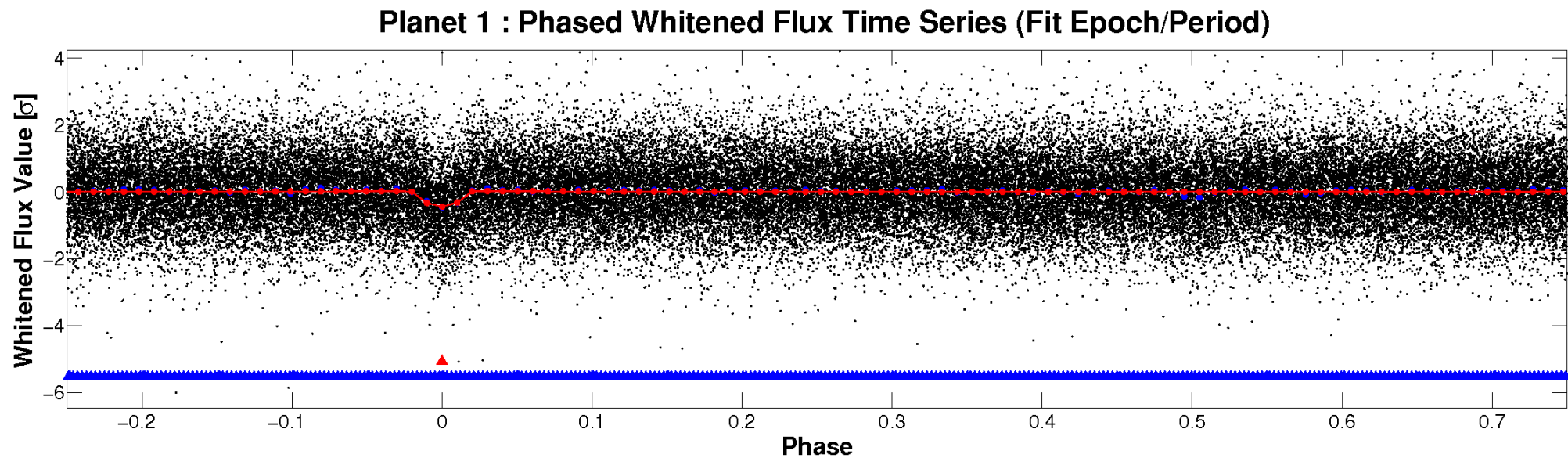
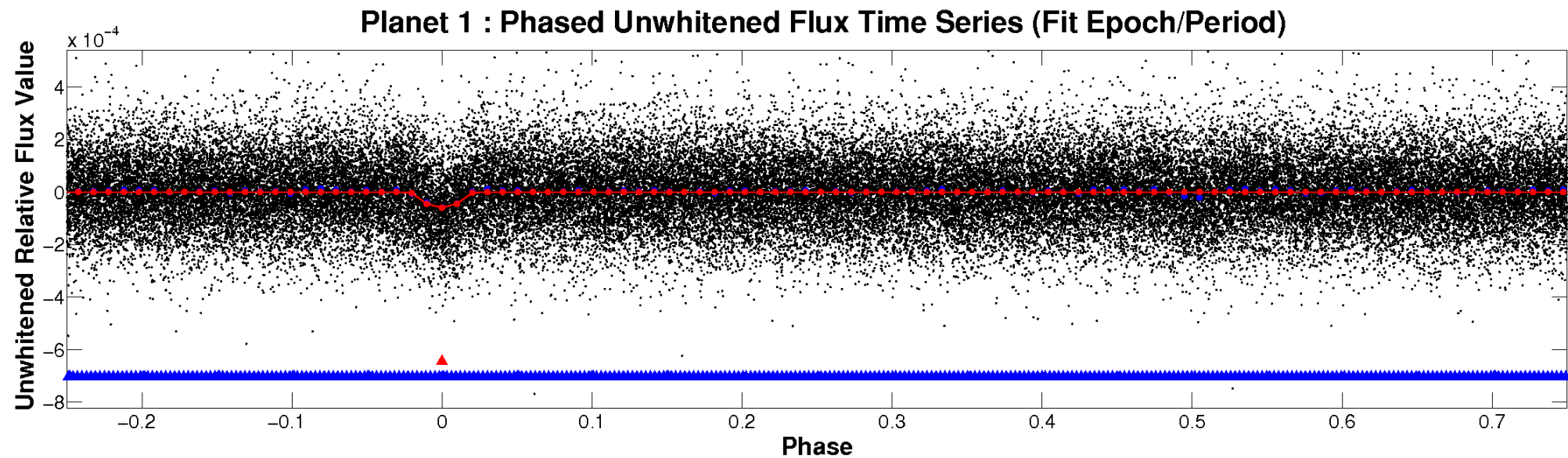


ALT Odd/Even

TCE 010068024-01

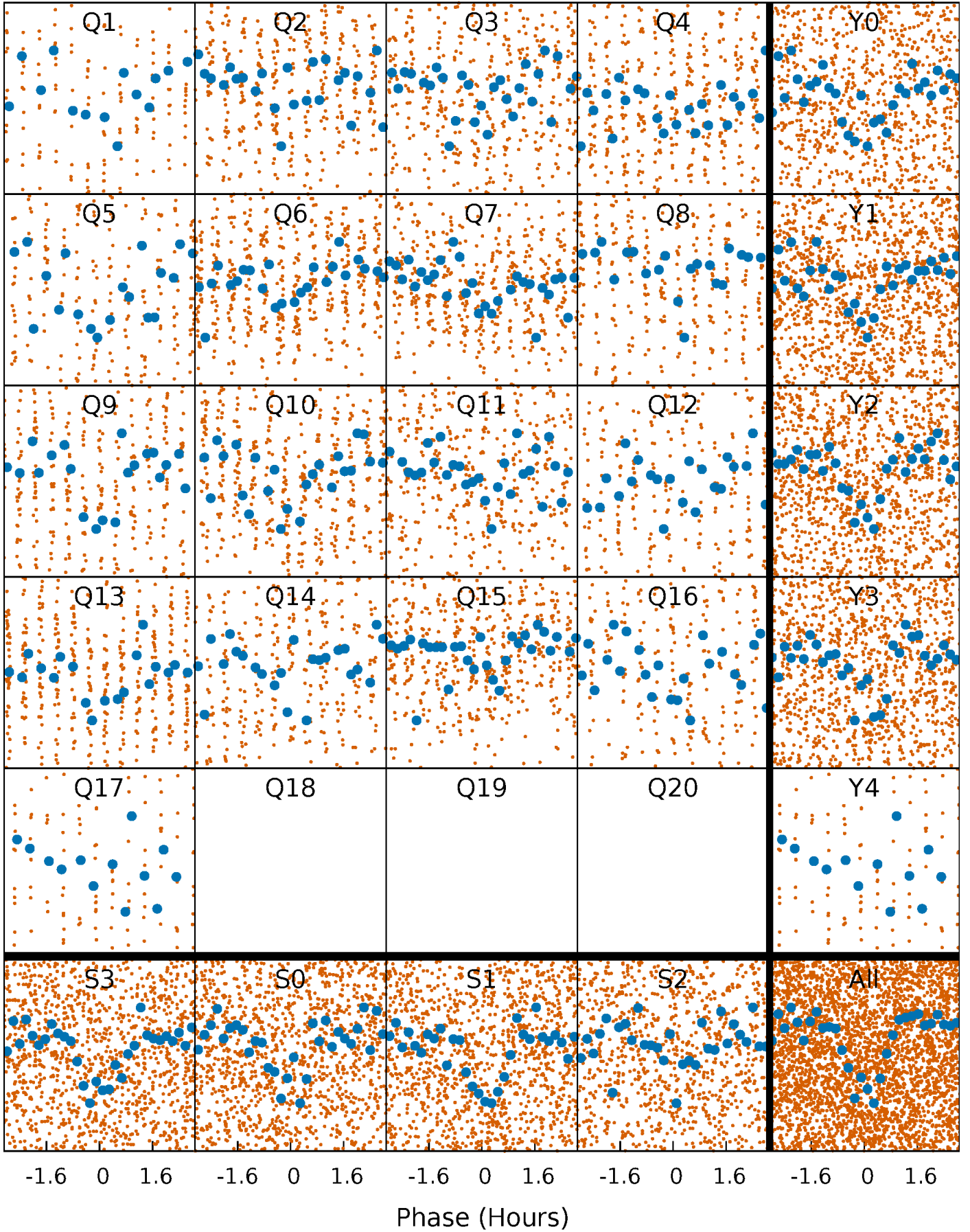


Non-Whitened Vs. Whitened Light Curve



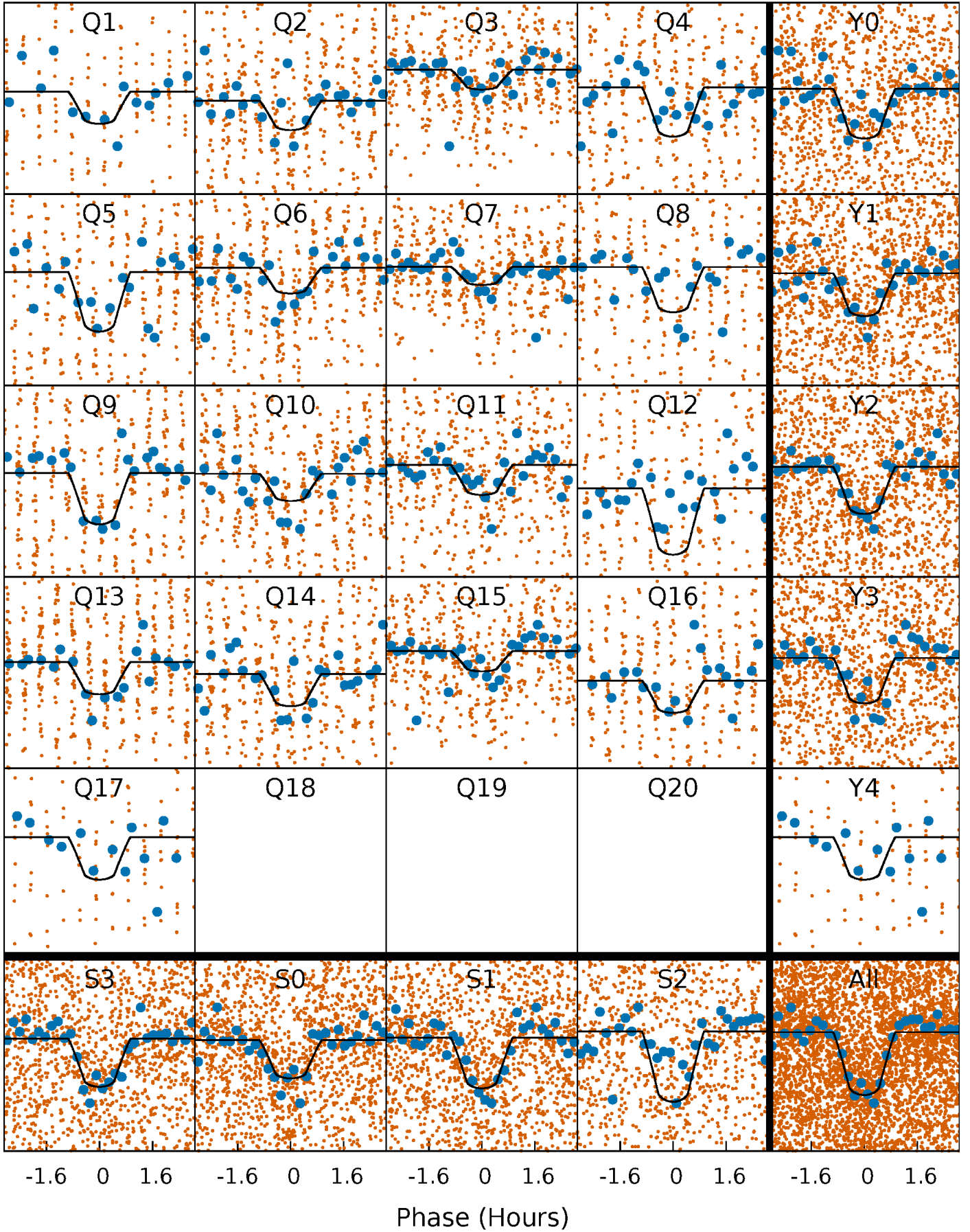
PDC Quarter-Phased Transit Curves

TCE 010068024-01 P= 2.023112 Days $T_0=132.077404$ (BKJD)



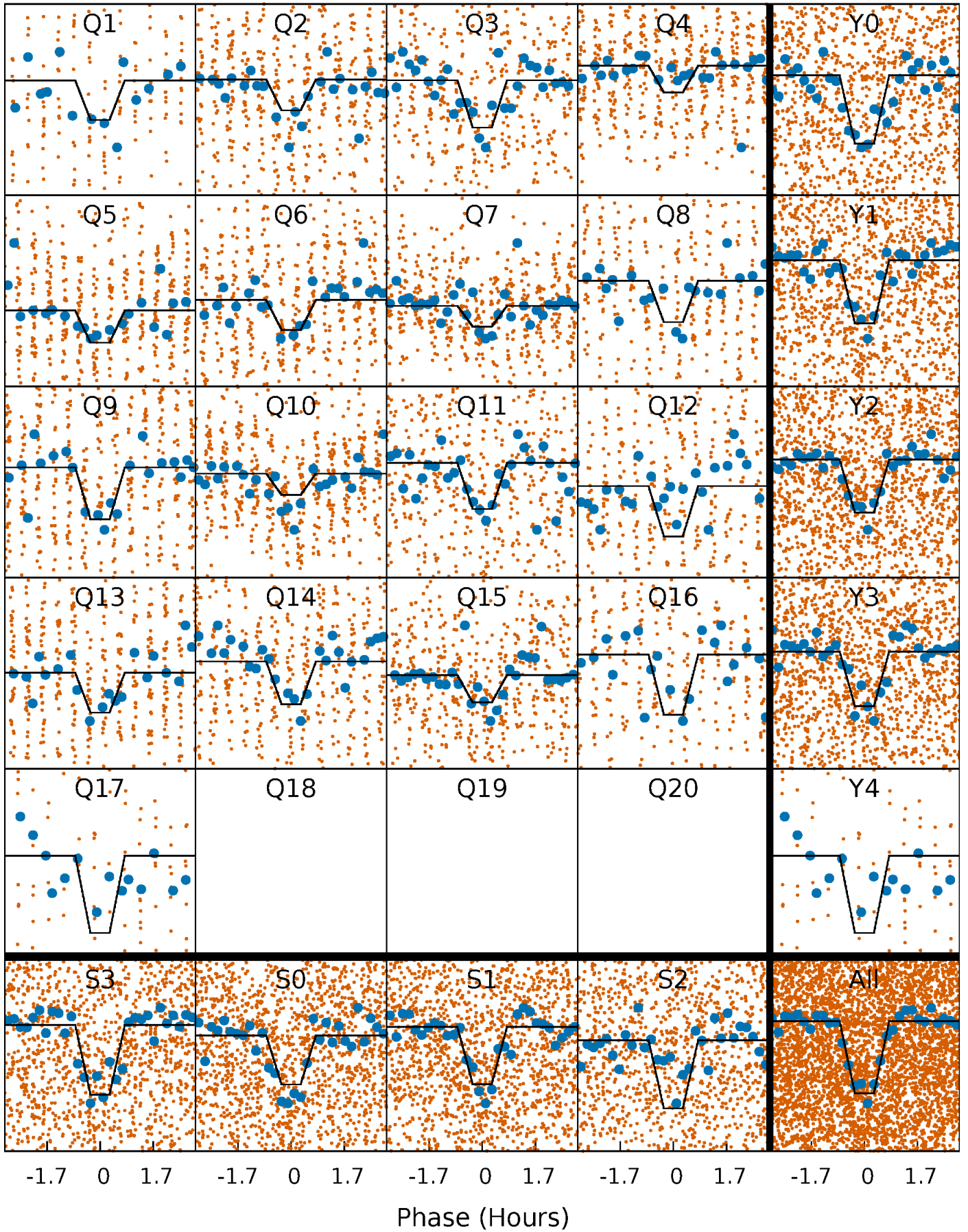
DV Quarter-Phased Transit Curves

TCE 010068024-01 P= 2.023112 Days $T_0=132.077404$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

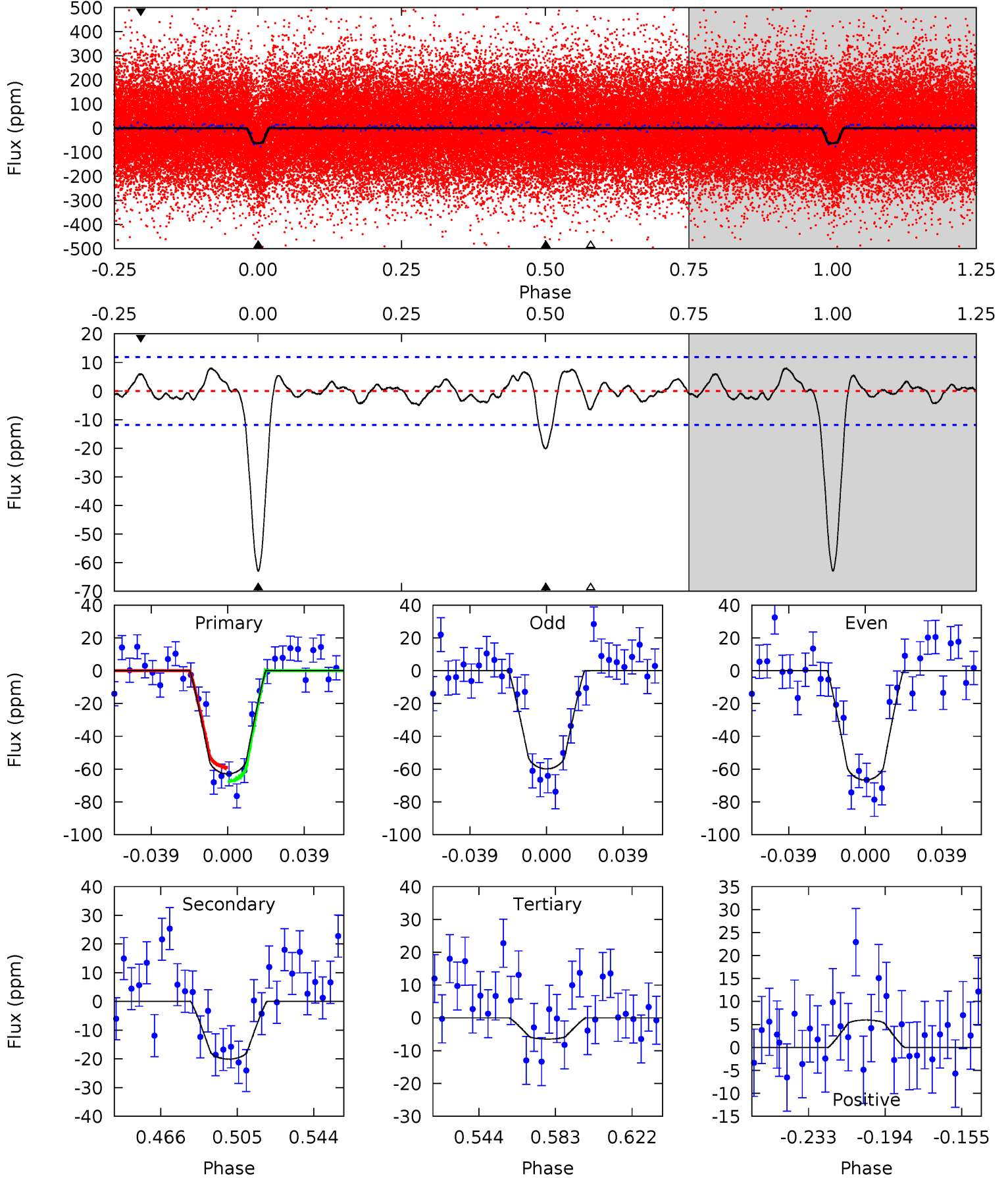
TCE 010068024-01 P= 2.023117 Days $T_0=132.077308$ (BKJD)



DV Model-Shift Uniqueness Test

010068024-01, P = 2.023112 Days, E = 130.054292 Days

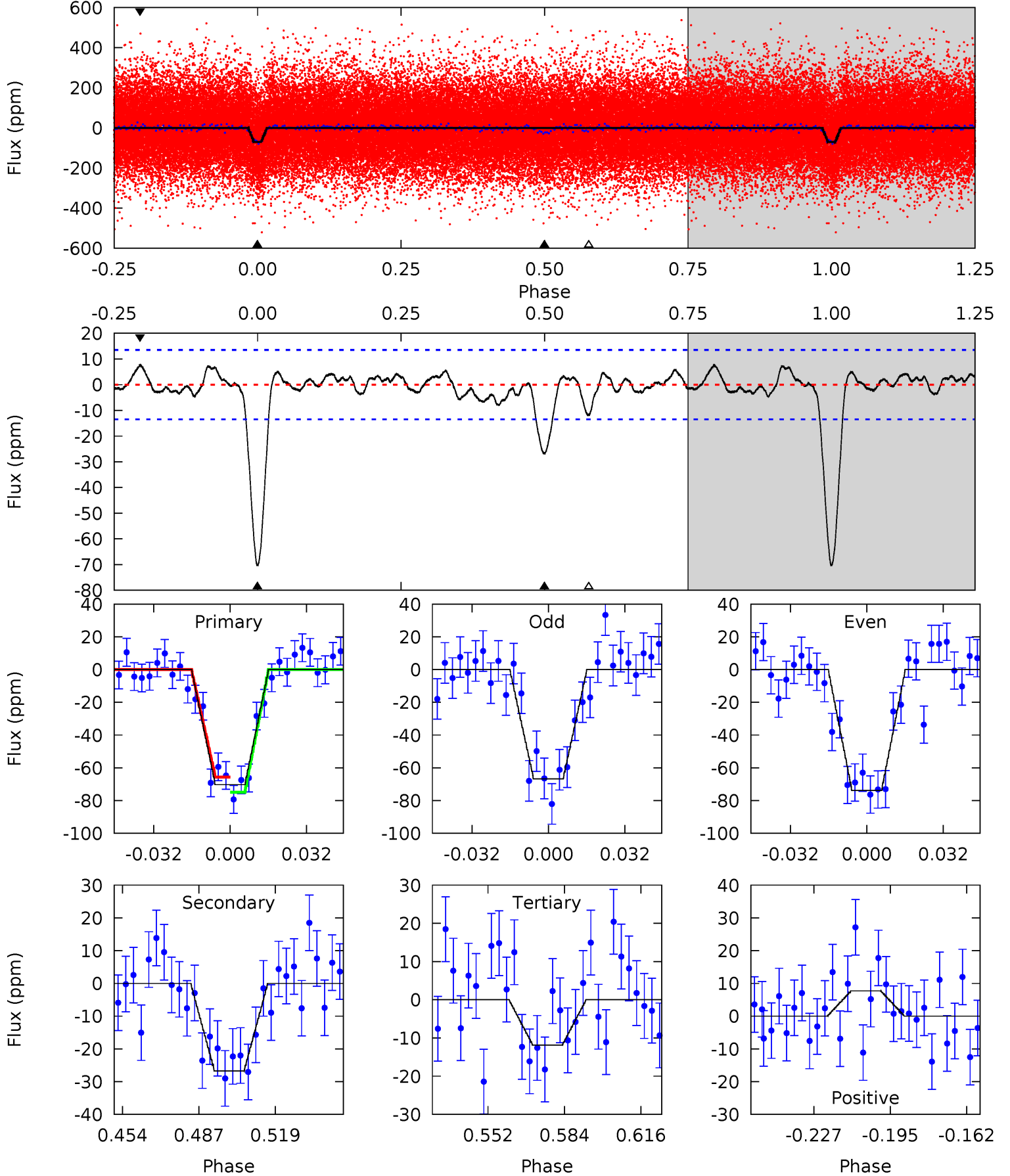
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	8.05	2.60	2.39	4.76	2.07	1.15	22.6	22.8	5.46	5.66	1.37	0.96	0.11	1.73



Alt Model-Shift Uniqueness Test

010068024-01, P = 2.023117 Days, E = 130.054191 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.0	9.51	4.21	2.74	4.80	2.14	1.22	20.8	22.3	5.30	6.77	1.28	1.03	0.10	1.64



Stellar Parameters For KIC 010068024

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6349^{+176}_{-242}	$4.422^{+0.070}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.059^{+0.363}_{-0.121}$	$1.077^{+0.169}_{-0.138}$	$1.278^{+0.379}_{-0.686}$
	+3%/-4%	+2%/-5%	+114%/-136%	+34%/-11%	+16%/-13%	+30%/-54%
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 010068024-01 / KOI 2891.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-20 ± 2	$1.02^{+0.38}_{-0.34}$	2298^{+178}_{-126}	4750^{+860}_{-549}	11^{+14}_{-5}
Alt.	-27 ± 3	$1.01^{+0.37}_{-0.34}$	2282^{+197}_{-124}	5045^{+997}_{-585}	15^{+18}_{-7}

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

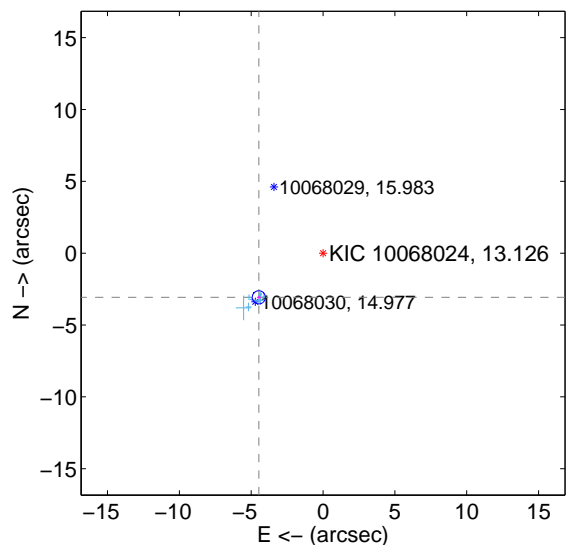
Supplemental centroid analysis for 010068024-01. Kepler magnitude: 13.13. Transit SNR 16.50

There are 13 quarters with good PRF difference image offsets

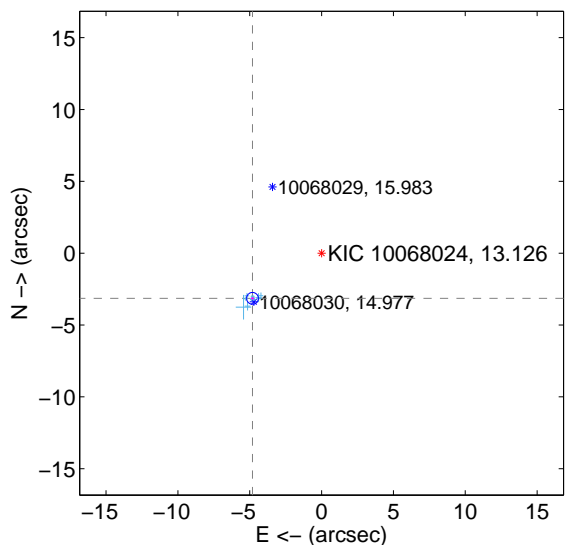
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.422 ± 0.152	35.59	4.468 ± 0.135	-3.073 ± 0.108
PRF-fit source offset from KIC position	5.745 ± 0.137	42.04	4.809 ± 0.127	-3.144 ± 0.097
photometric centroid source offset	12.27 ± 0.59	20.88	9.93 ± 0.60	-7.21 ± 0.57

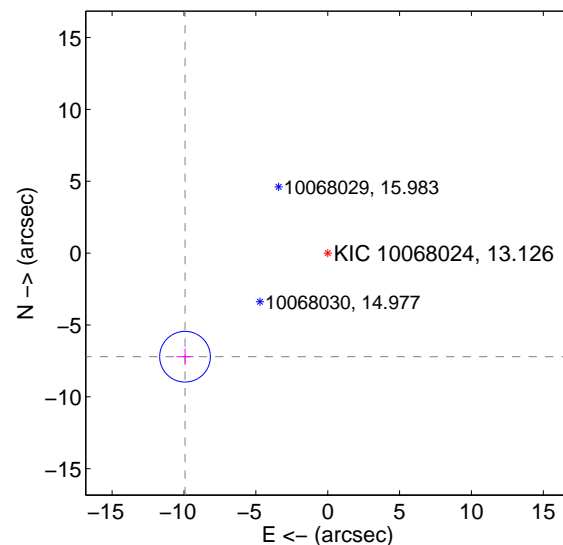
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

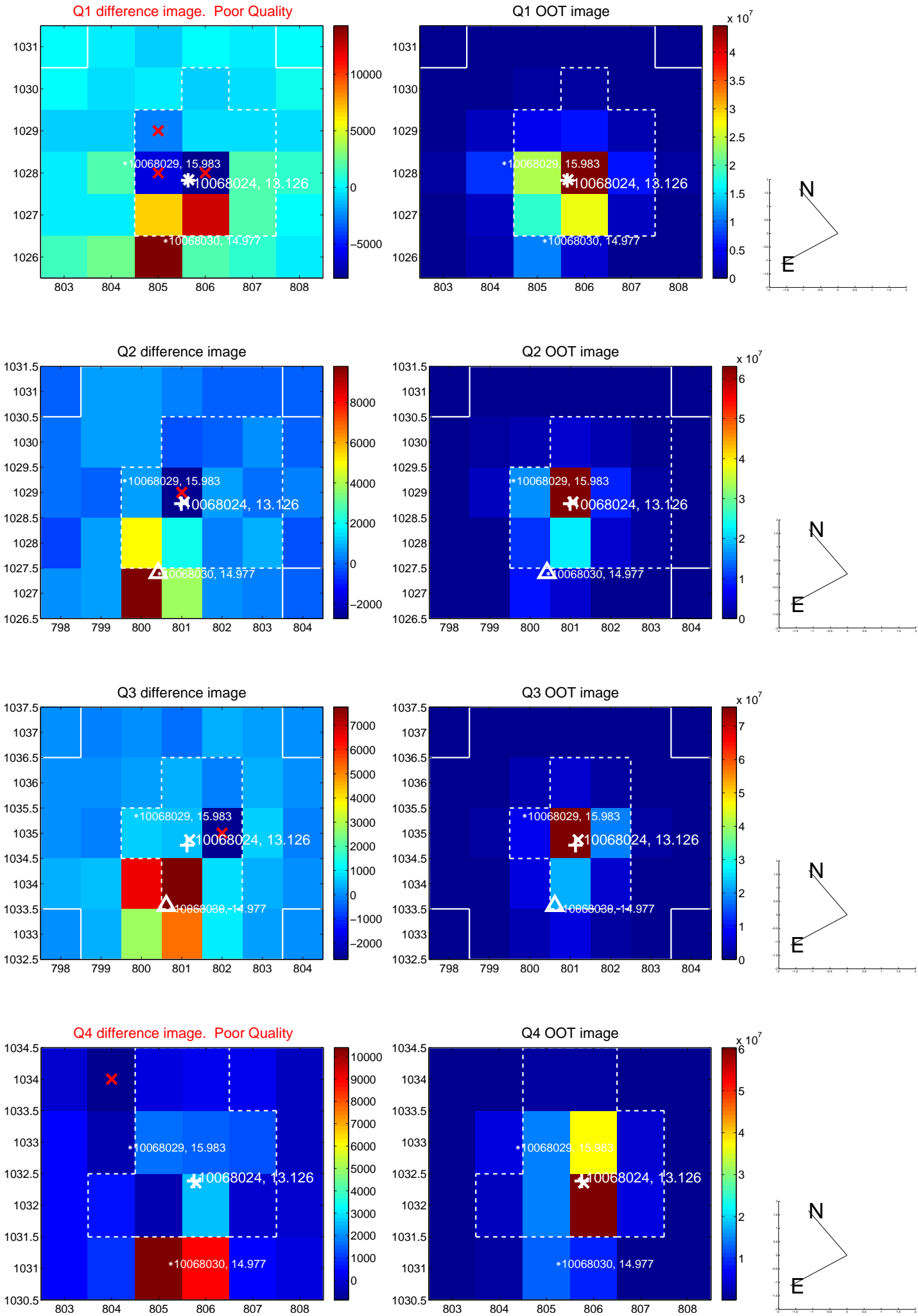


offset from photometric centroids

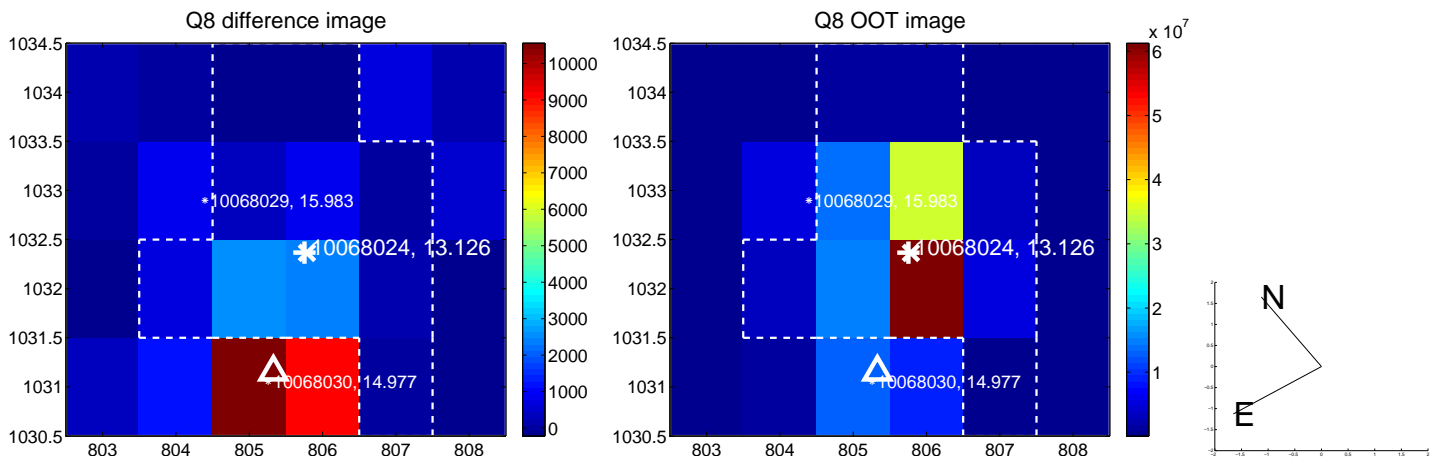
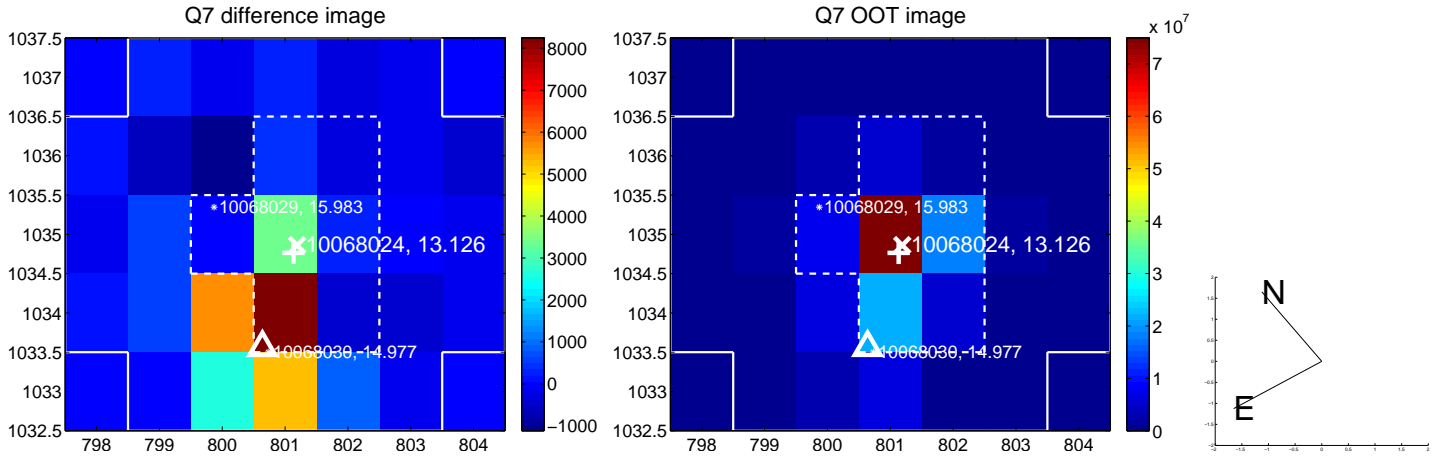
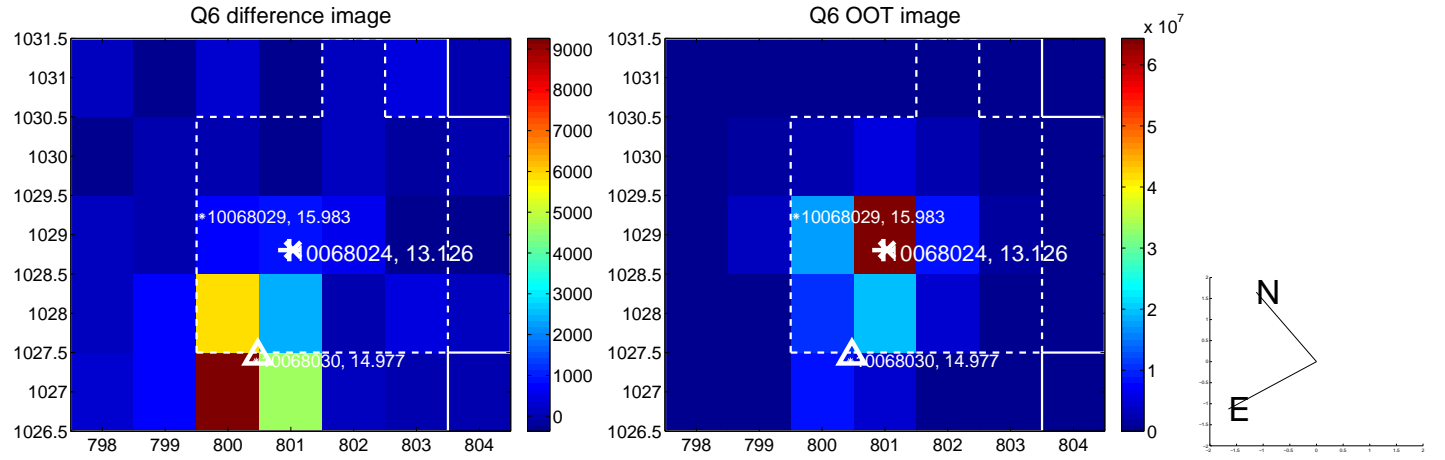
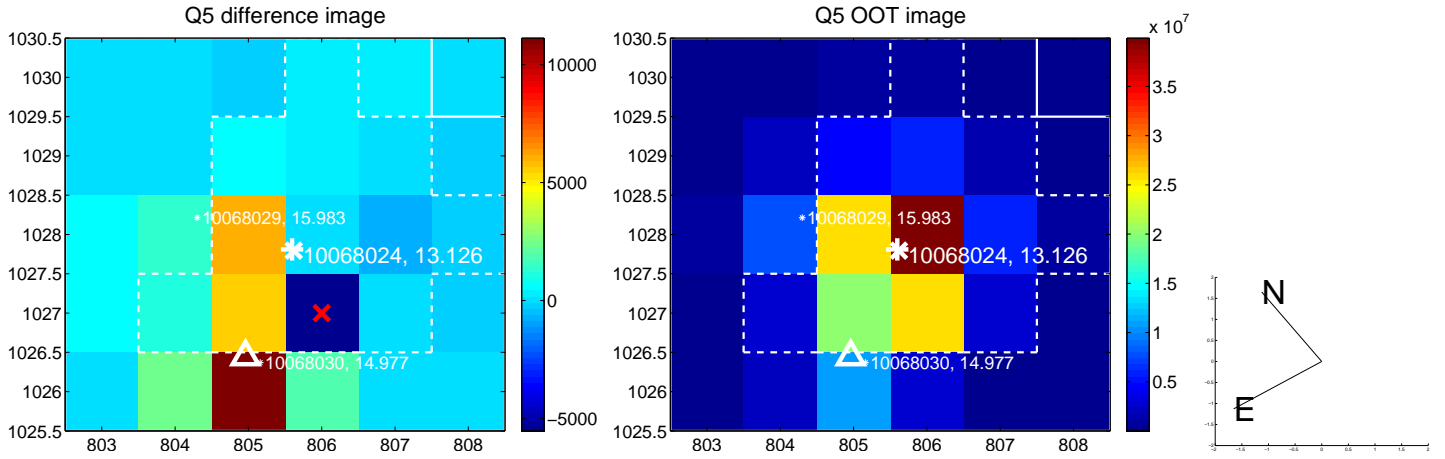


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

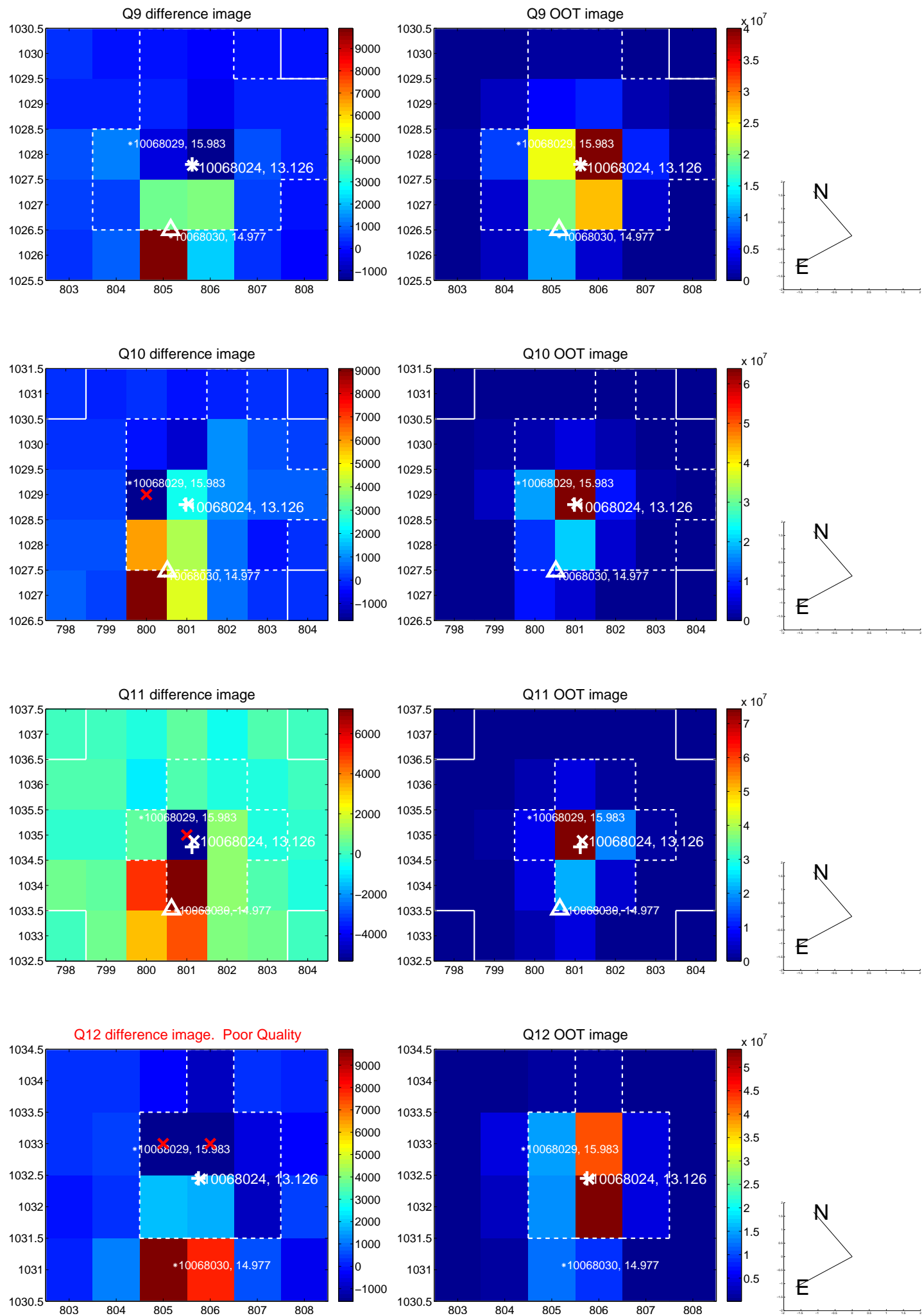
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



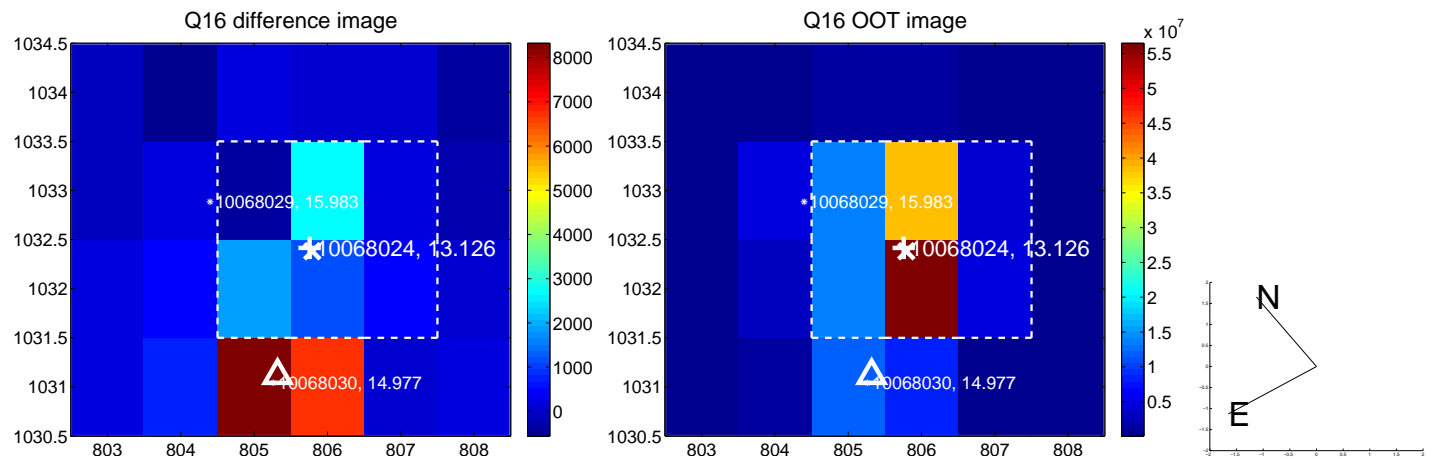
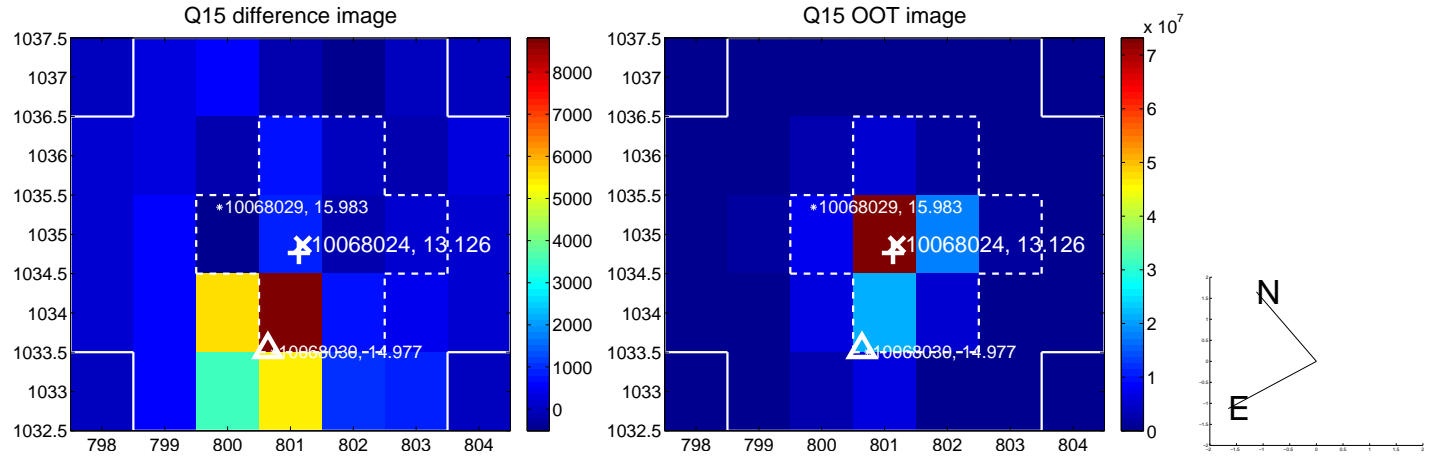
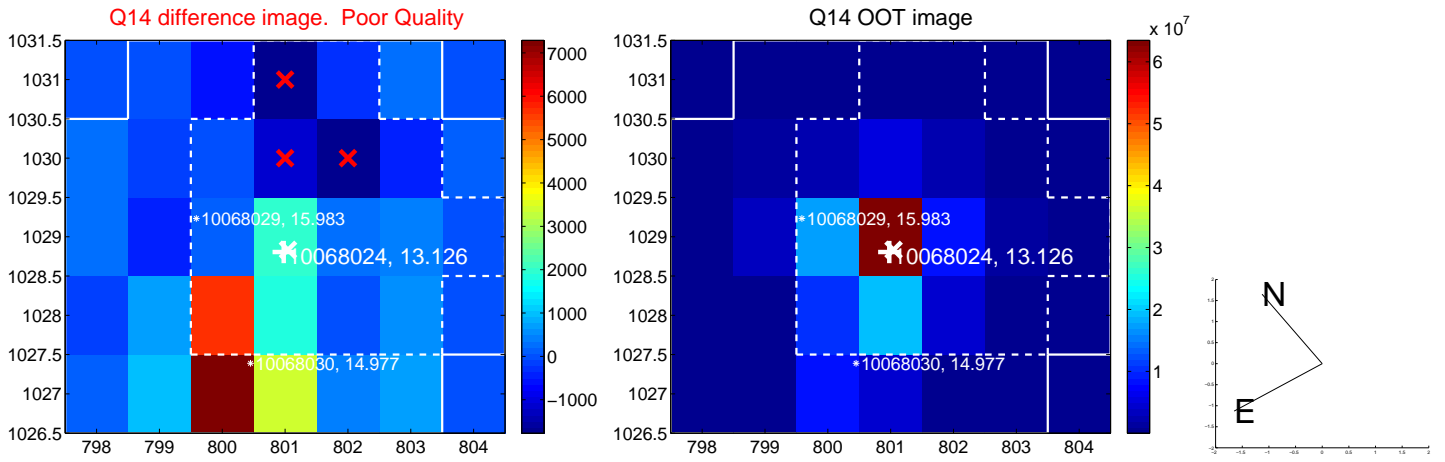
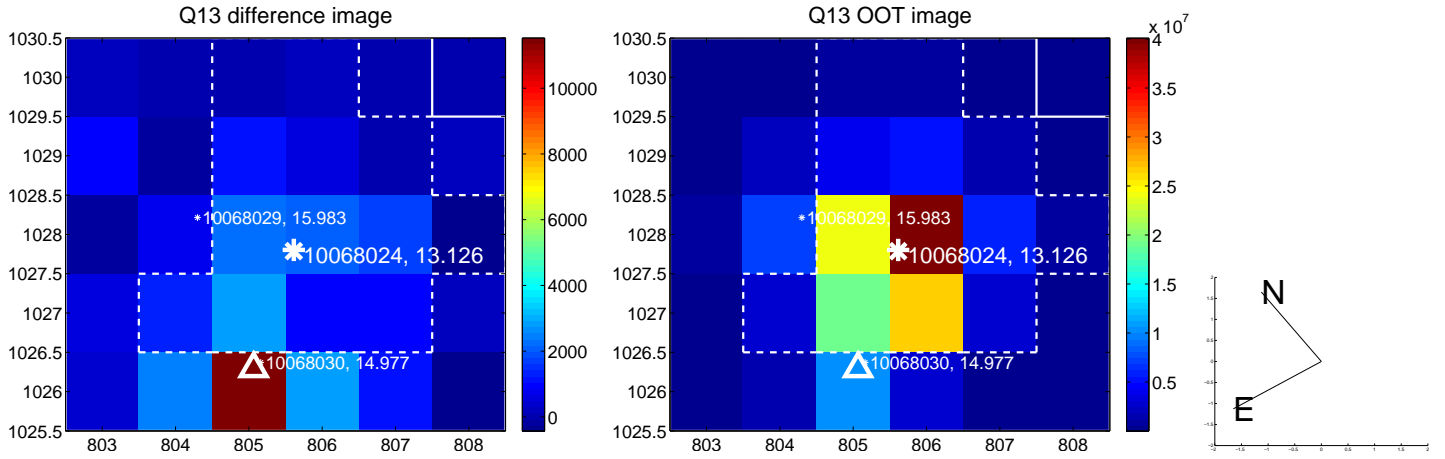
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



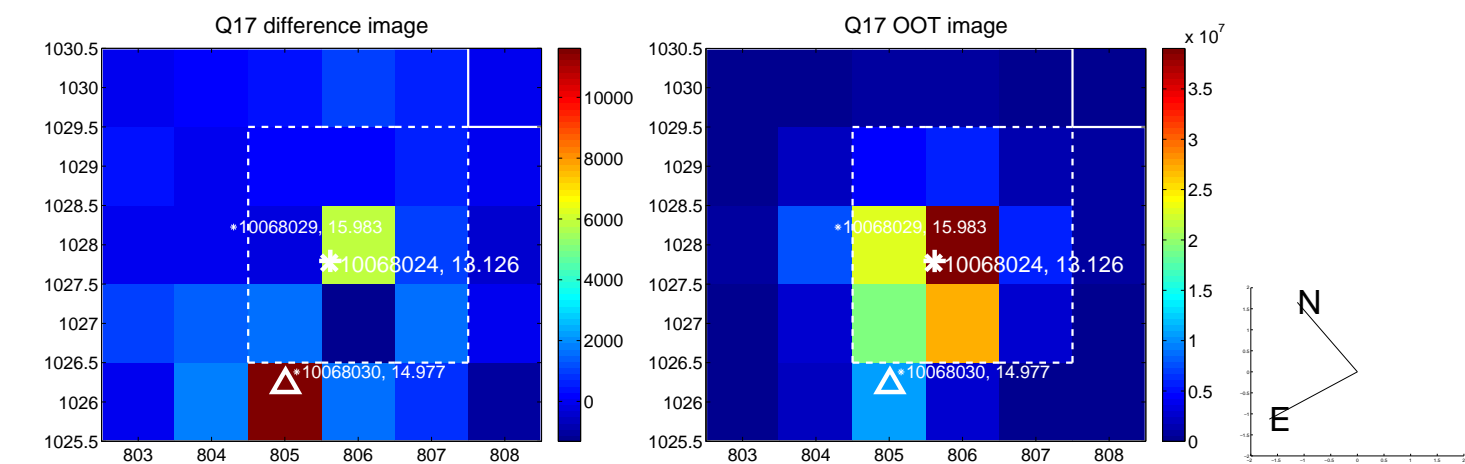
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



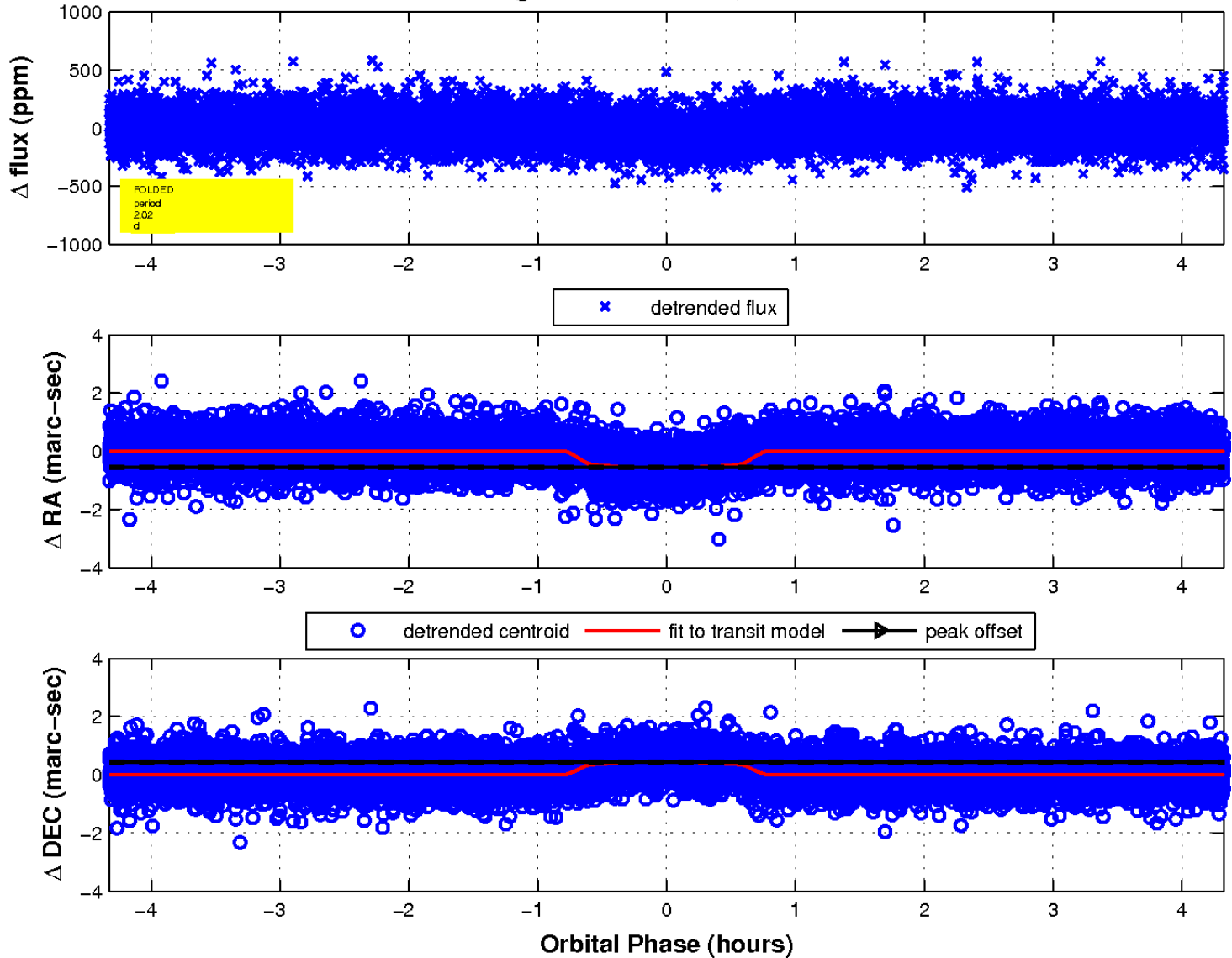
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



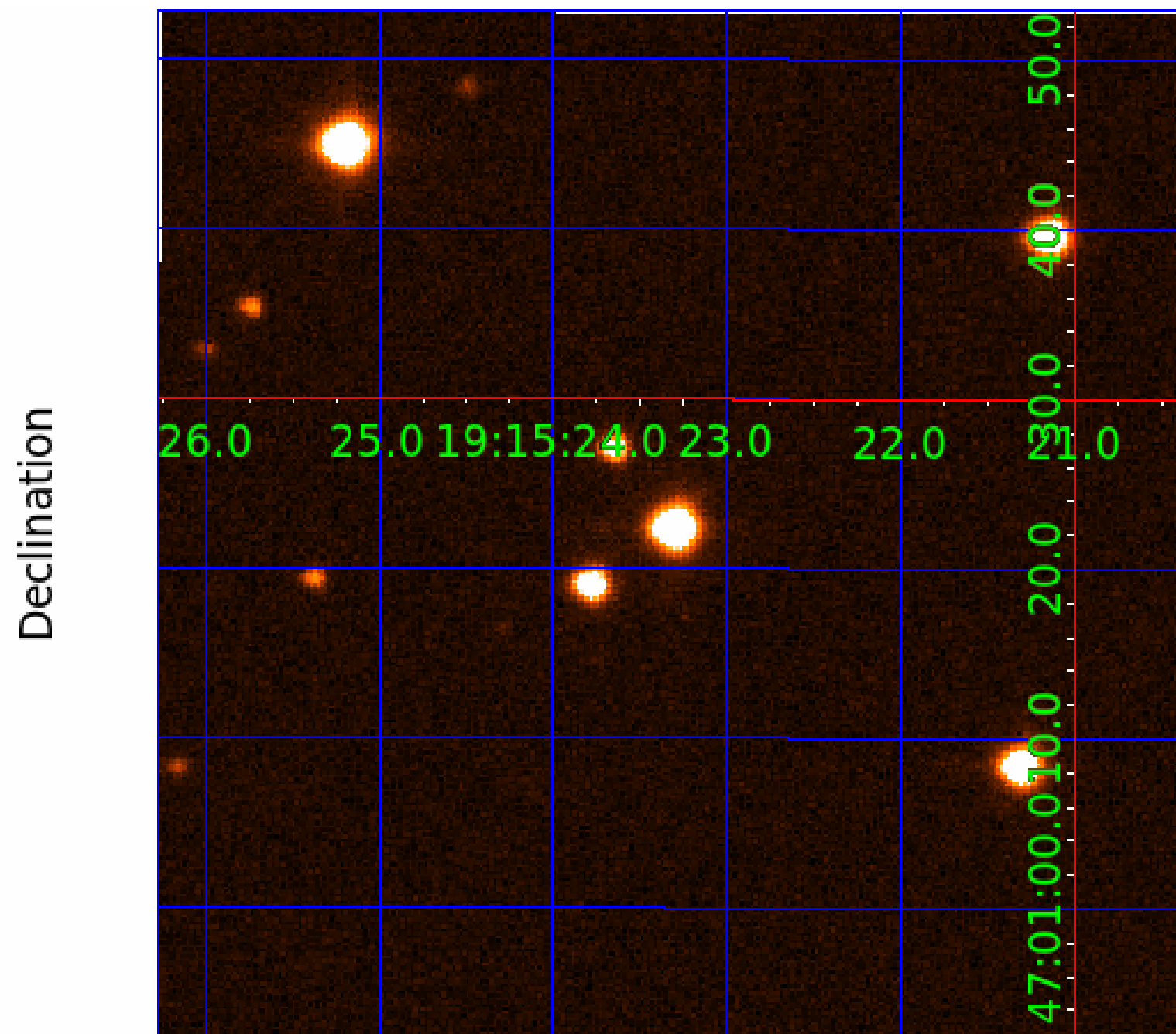
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 010068024

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})
010068024-01	OBS	2891.01	2.023112	132.077404	60.4	1.442	16.2	16.5	1.06	6349	0.97	1581.08
010068024-02	OBS	No	4.147078	135.520991	15.9	23.028	9.2	7.7	1.06	6349	0.43	607.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010068024-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
010068024-02	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET

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 010068024-02

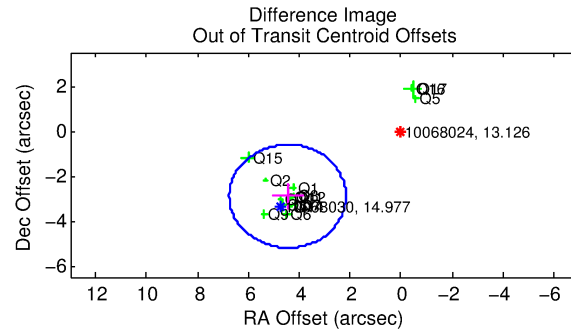
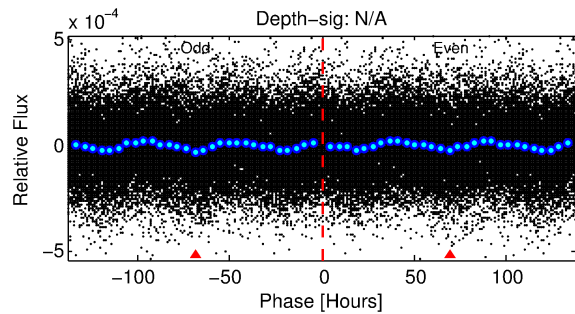
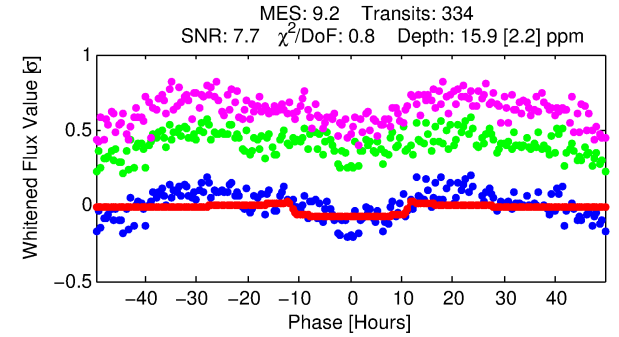
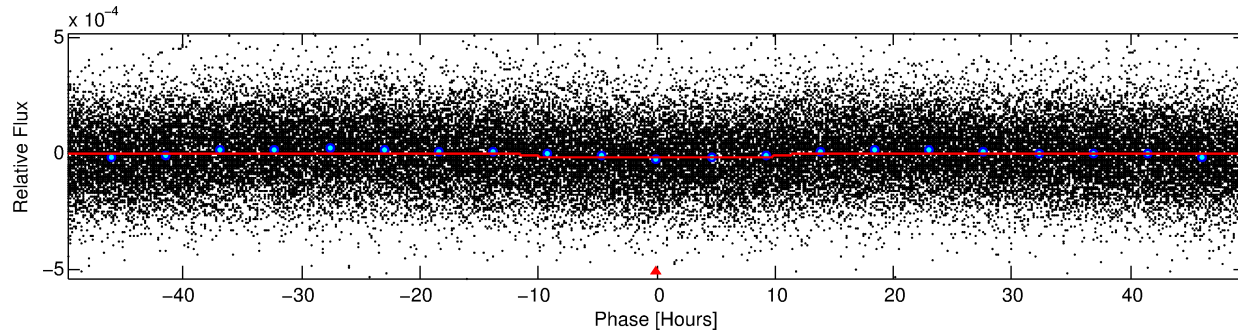
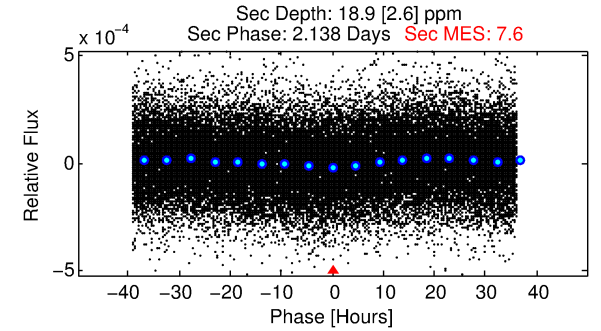
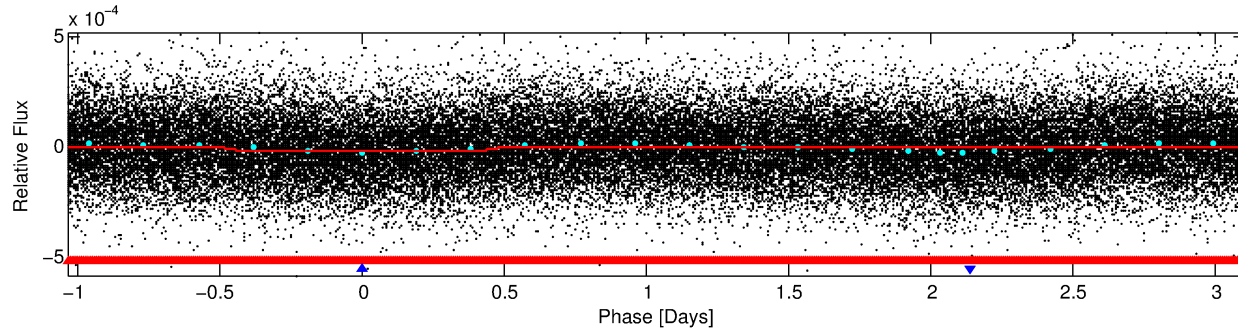
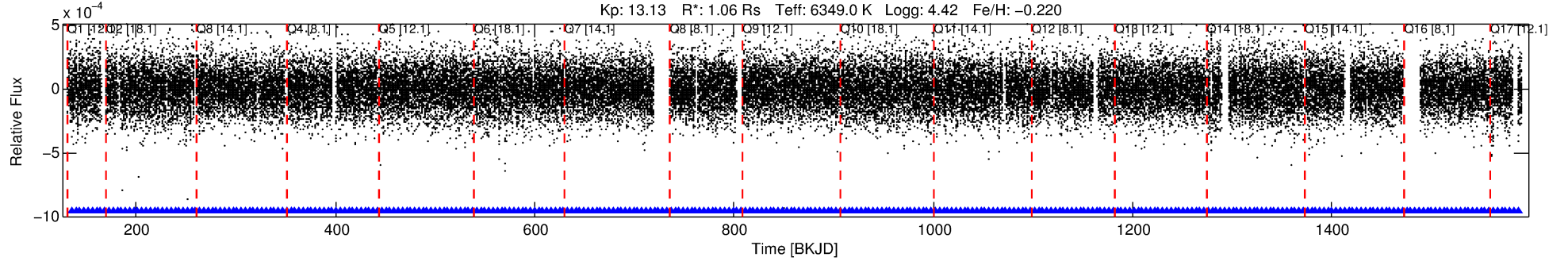
No Significant Match Found

DV One-Page Summary

KIC: 10068024 Candidate: 2 of 2 Period: 4.147 d

KOI: K02891 Corr: No Ephemeris Match

Kp: 13.13 R*: 1.06 Rs Teff: 6349.0 K Logg: 4.42 Fe/H: -0.220



DV Fit Results:

Period = 4.14708 [0.00011] d
Epoch = 135.5210 [0.0178] BKJD
Rp/R* = 0.0037 [0.0037]
a/R* = 1.48 [4.27]
b = 0.27 [18.01]
Seff = 607.19 [267.23]
Teq = 1266 [139] K
Rp = 0.43 [0.46] Re
a = 0.0519 [0.0148] AU
Ag = 153.42 [318.20] [0.48σ]
Teffp = 6888 [3510] K [1.60σ]

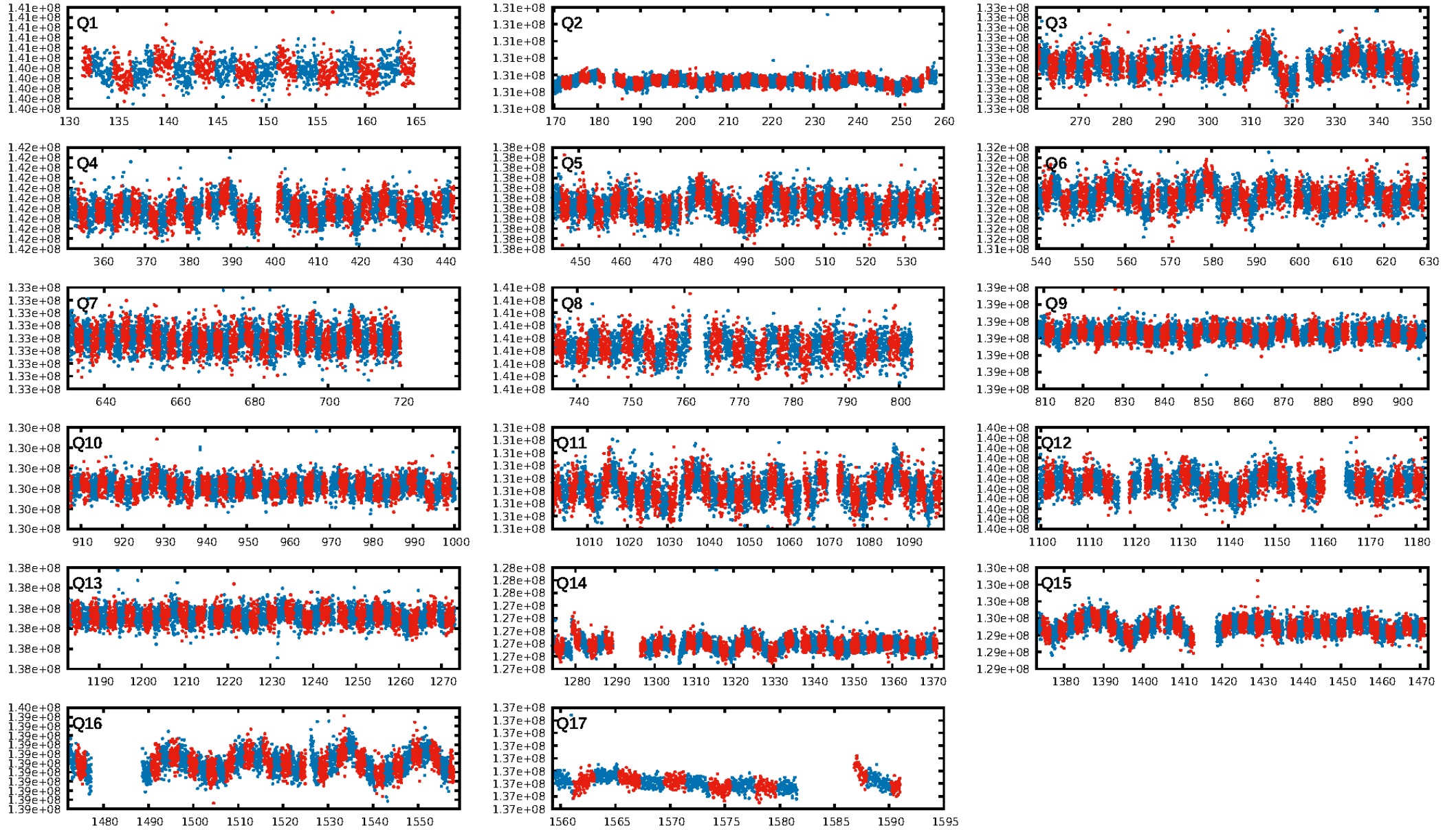
DV Diagnostic Results:

ShortPeriod-sig: 97.3% [2.21σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.06e-22
RollingBand-fgt: 1.00 [318/318]
GhostDiagnostic-chr: -1.606
Centroid-sig: 0.0%
Centroid-so: 5.374 arcsec [4.84σ]
OotOffset-rm: 5.320 arcsec [6.95σ]
KicOffset-rm: 5.673 arcsec [7.78σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.73 [11/15]
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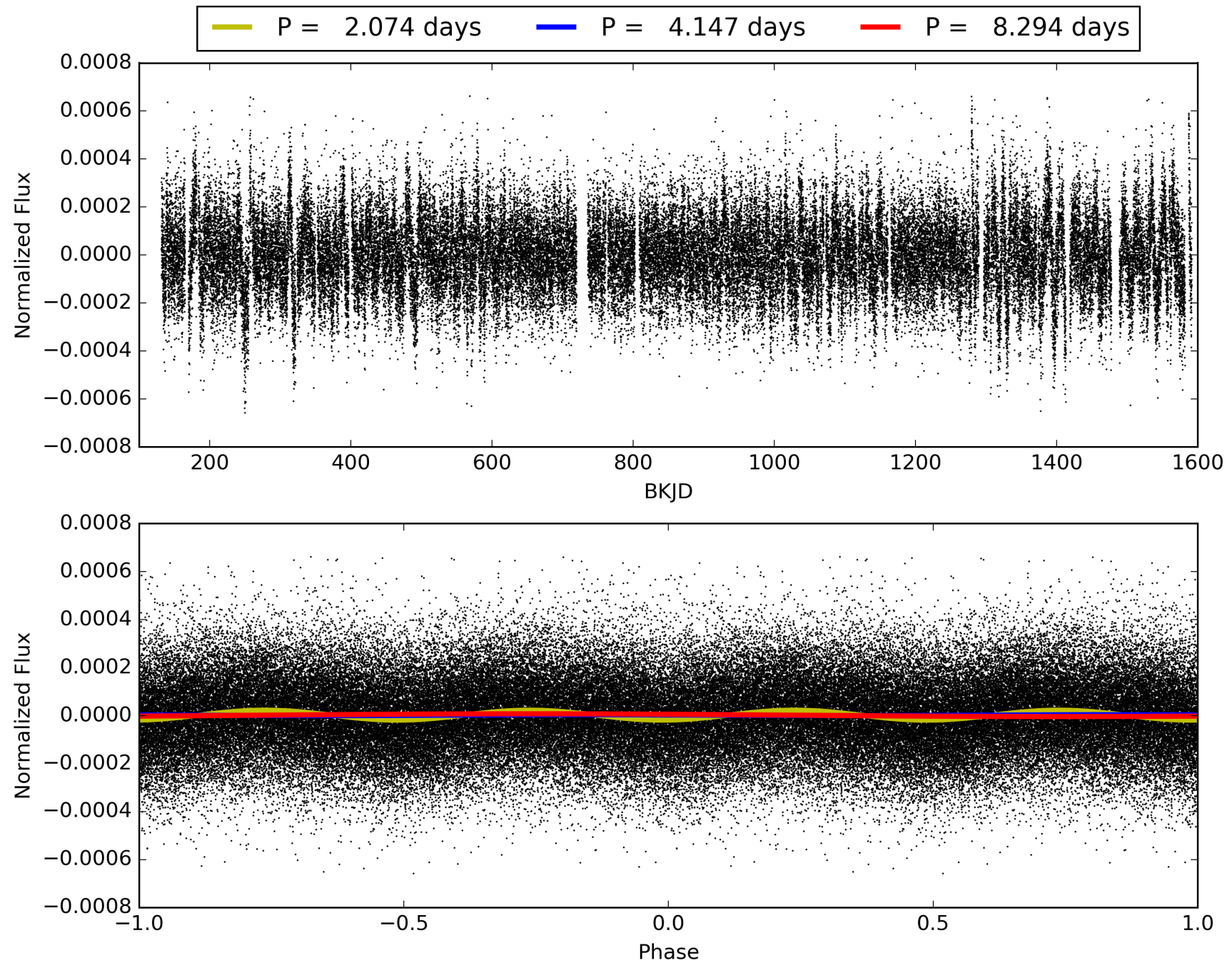
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:24:09 Z

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

TCE 010068024-02, PDC Light Curves

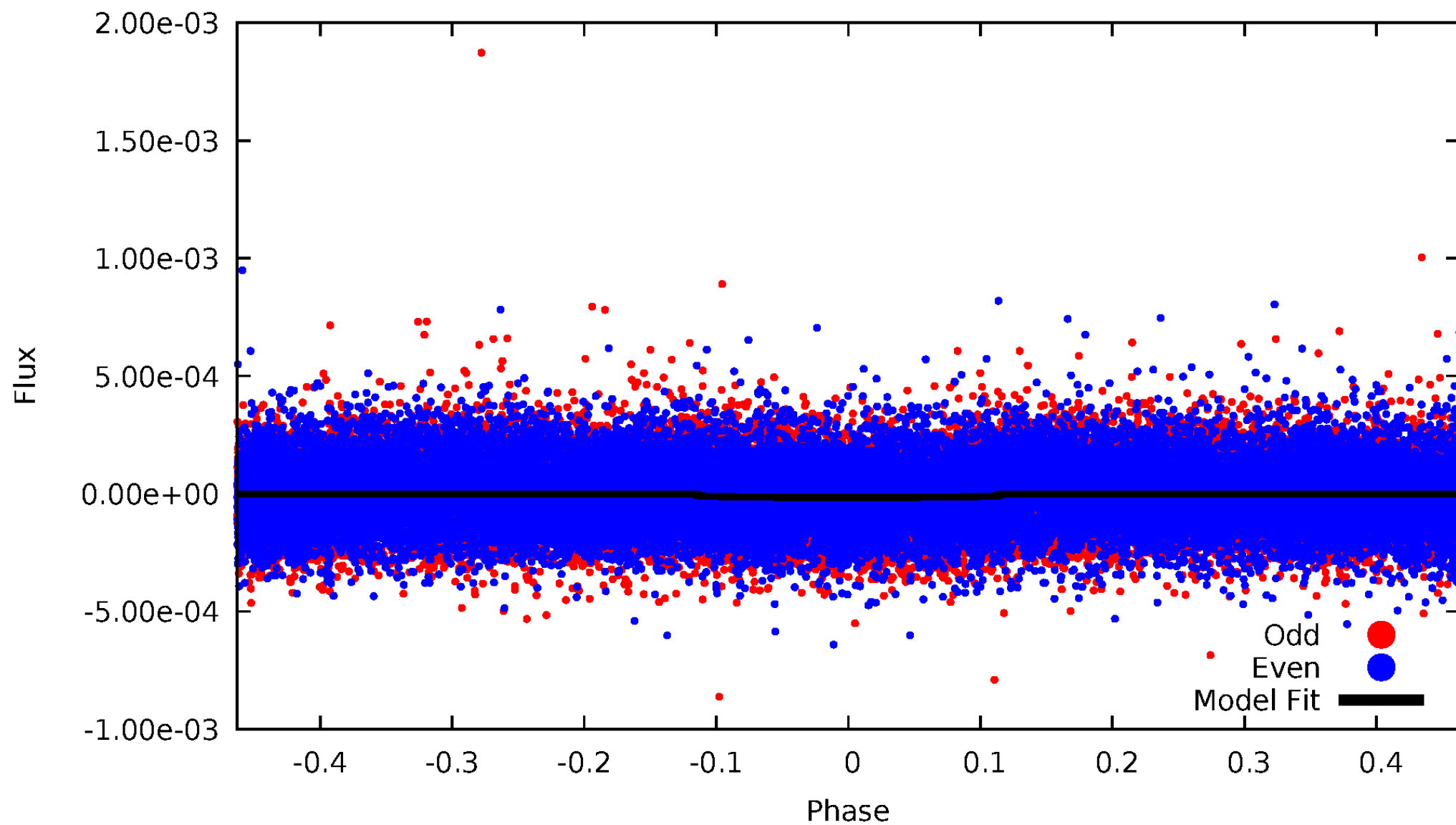


TCE 010068024-02



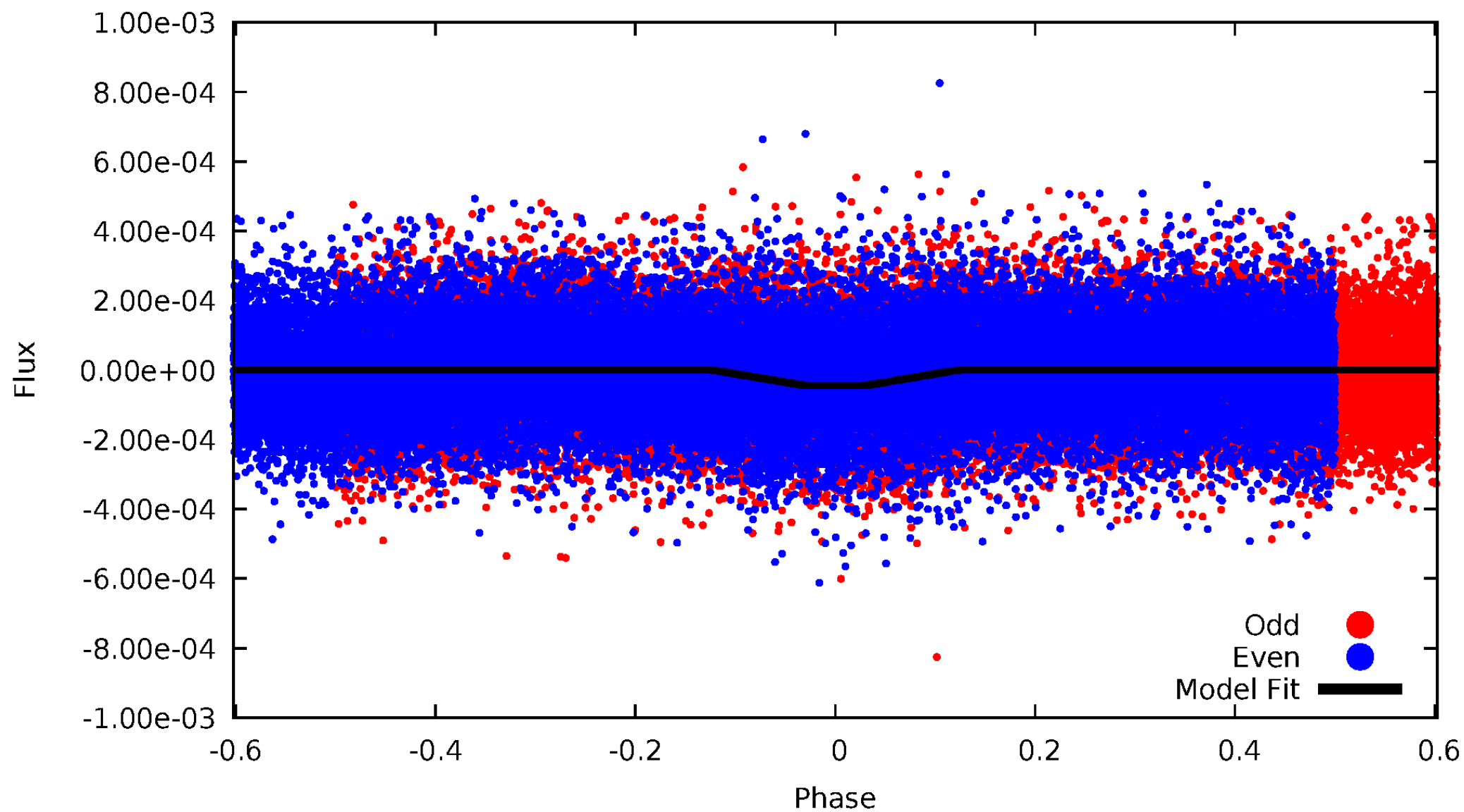
DV Odd/Even

TCE 010068024-02



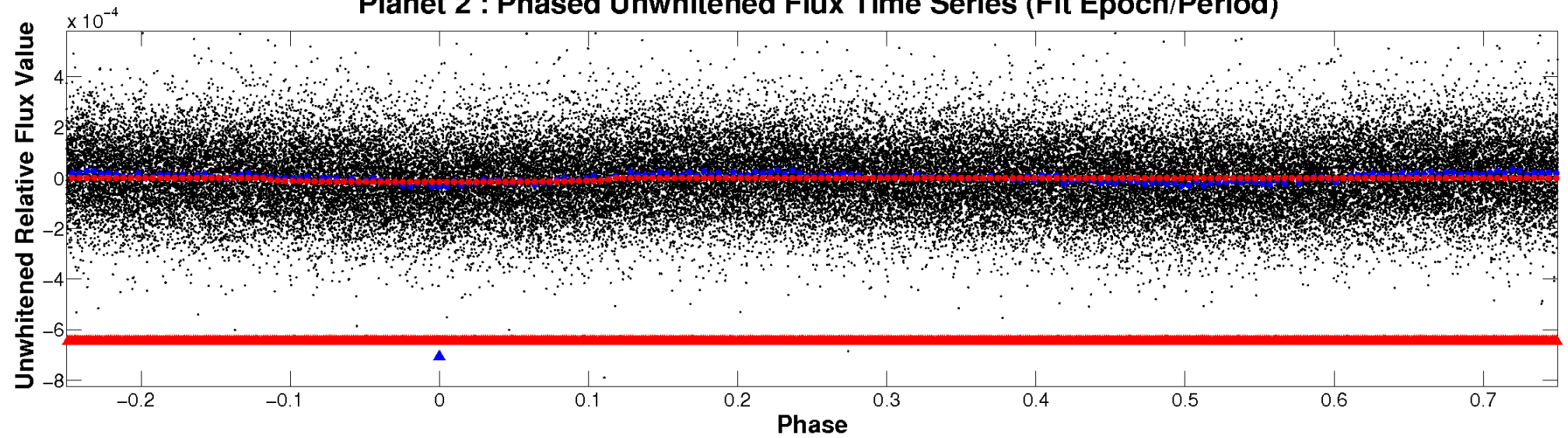
ALT Odd/Even

TCE 010068024-02

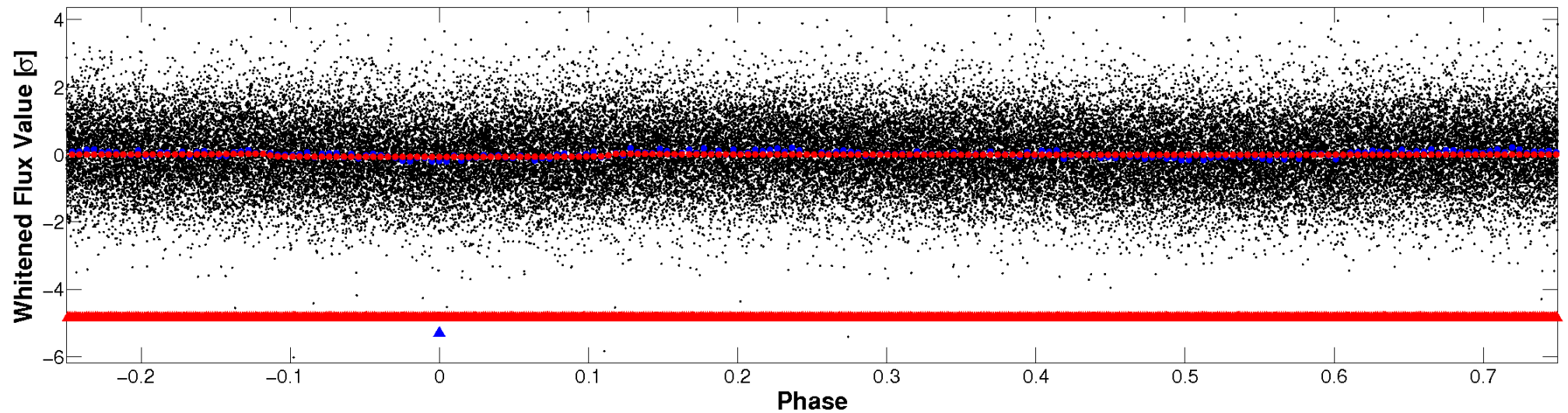


Non-Whitened Vs. Whitened Light Curve

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

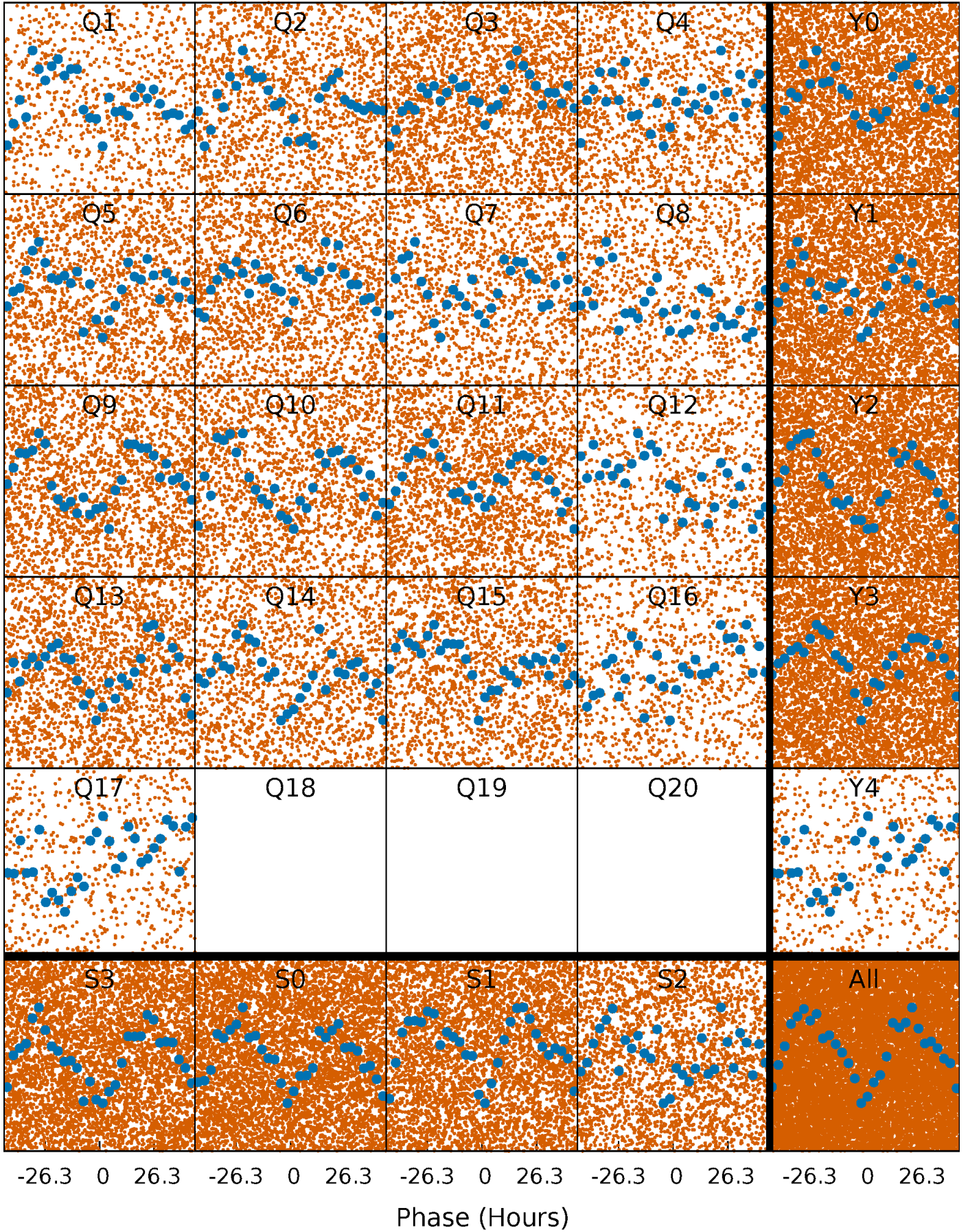


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



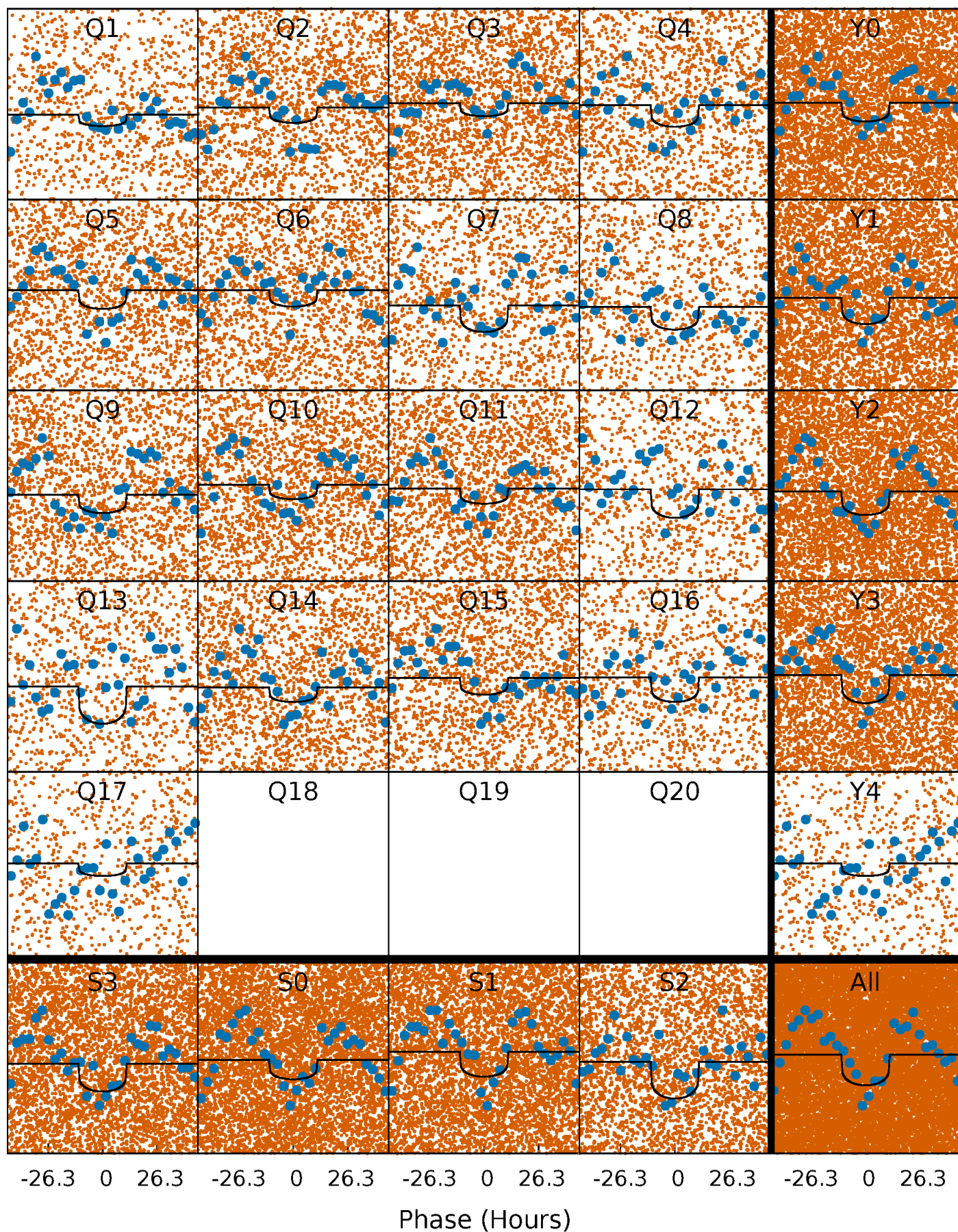
PDC Quarter-Phased Transit Curves

TCE 010068024-02 P= 4.147078 Days $T_0=135.520991$ (BKJD)



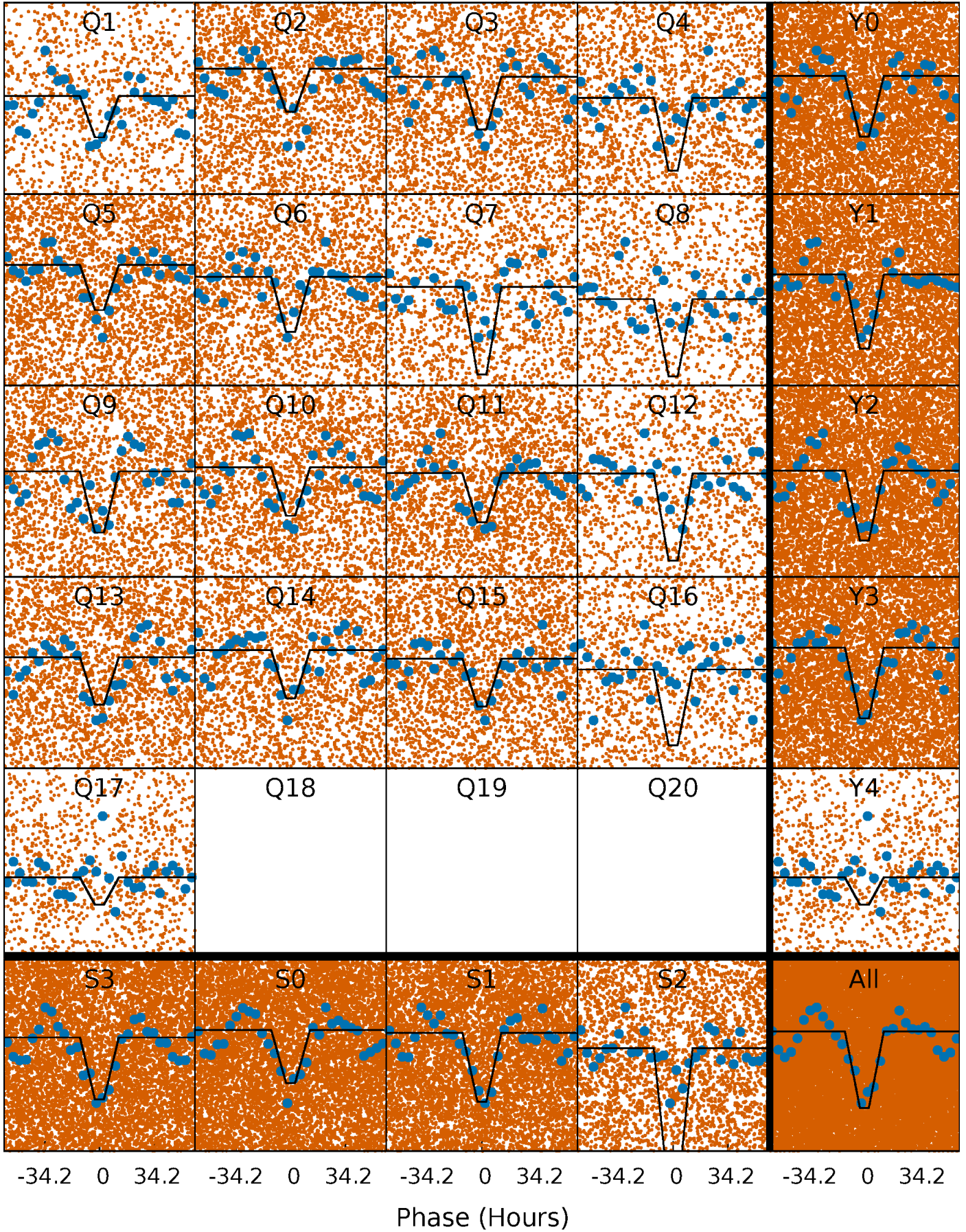
DV Quarter-Phased Transit Curves

TCE 010068024-02 P= 4.147078 Days $T_0=135.520991$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

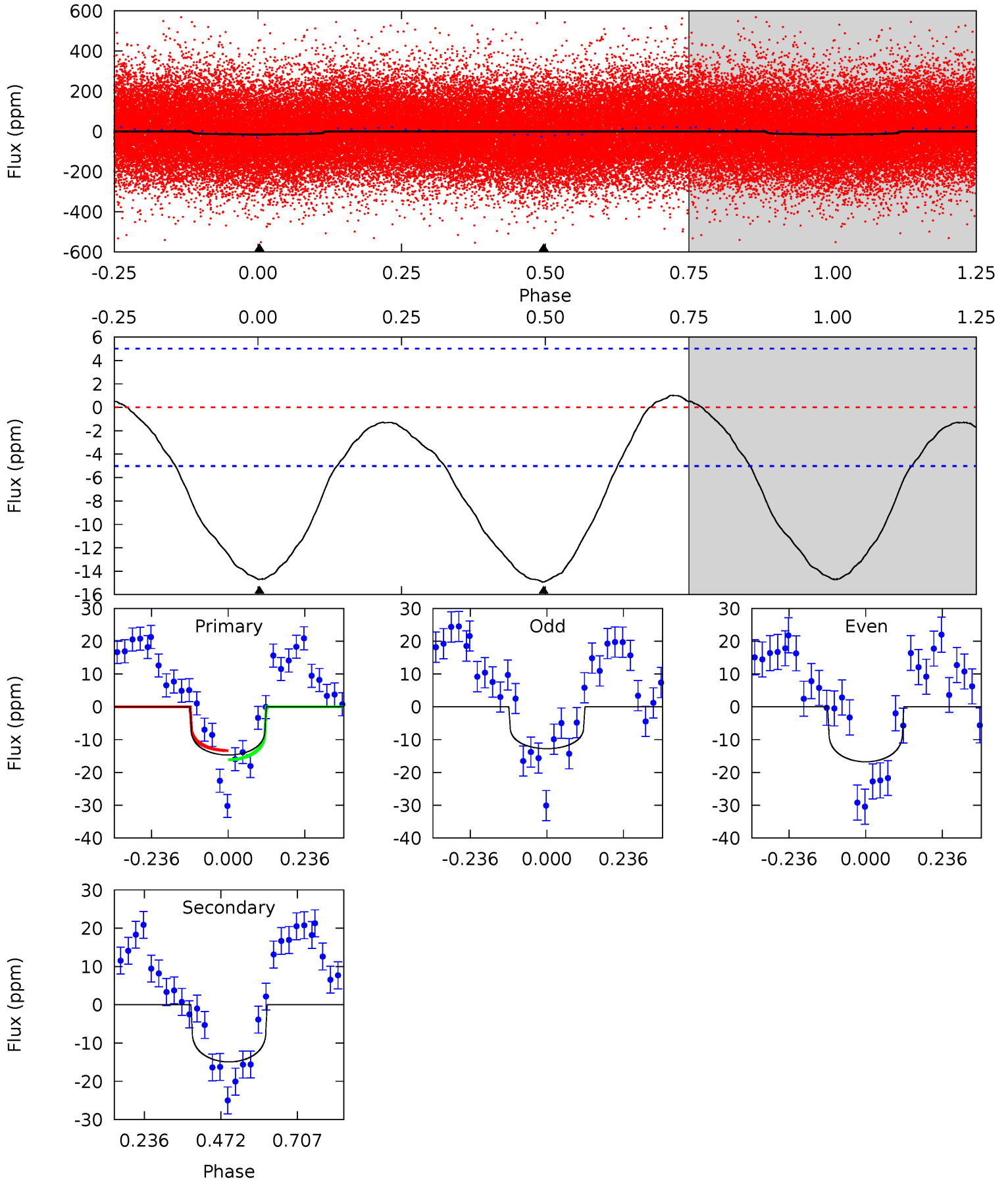
TCE 010068024-02 P= 4.146888 Days $T_0=135.560673$ (BKJD)



DV Model-Shift Uniqueness Test

010068024-02, P = 4.147078 Days, E = 131.373913 Days

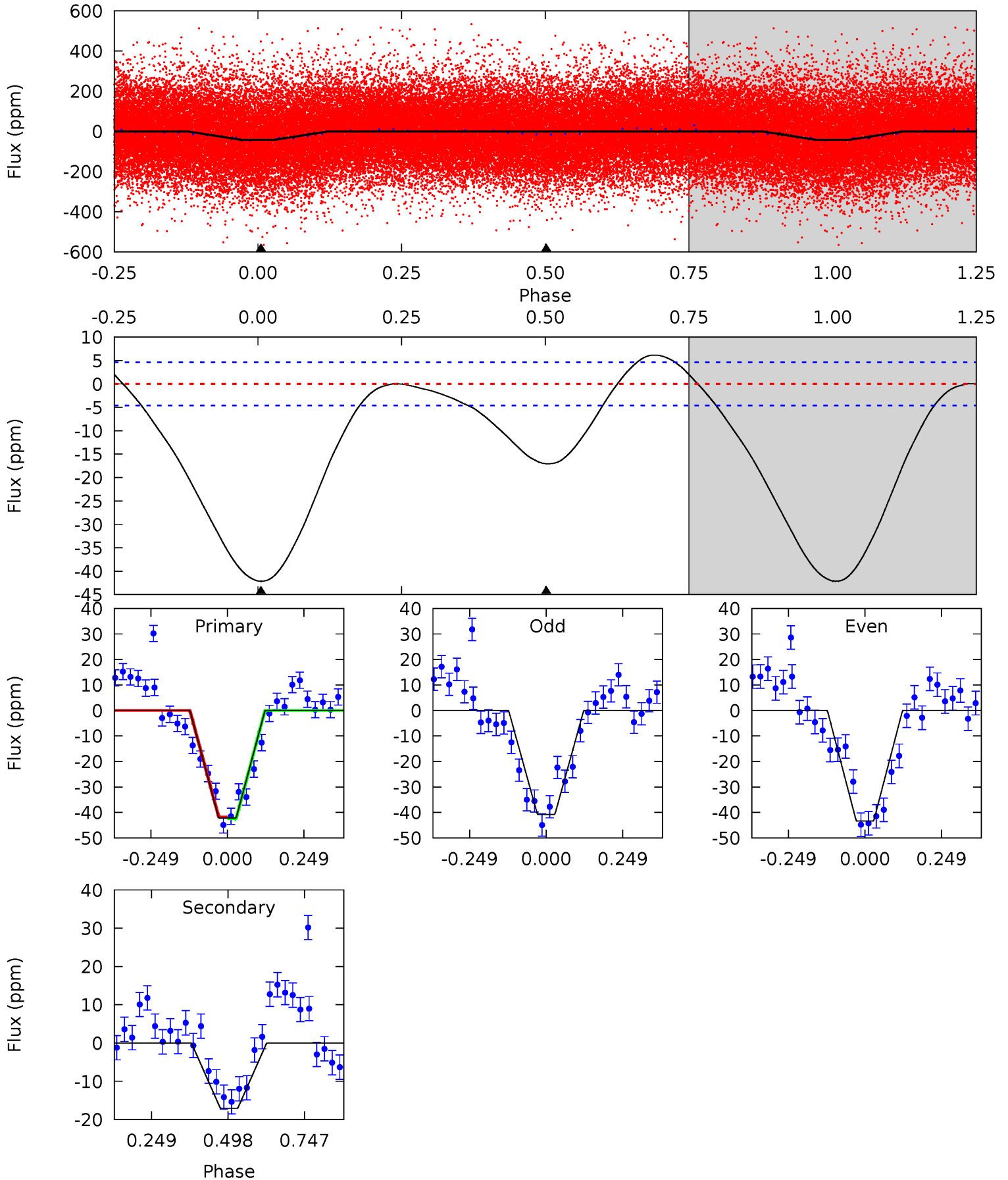
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	13.0	0	0	4.38	1.19	1.06	12.8	12.8	13.0	13.0	1.73	1.01	0.06	1.21



Alt Model-Shift Uniqueness Test

010068024-02, P = 4.146888 Days, E = 131.413785 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.9	16.2	0	0	4.37	1.15	1.60	39.9	39.9	16.2	16.2	1.23	1.04	0.13	0.29



Stellar Parameters For KIC 010068024

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6349^{+176}_{-242}	$4.422^{+0.070}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.059^{+0.363}_{-0.121}$	$1.077^{+0.169}_{-0.138}$	$1.278^{+0.379}_{-0.686}$
	+3%/-4%	+2%/-5%	+114%/-136%	+34%/-11%	+16%/-13%	+30%/-54%
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 010068024-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-15 ± 1	$0.54^{+0.44}_{-0.33}$	1798^{+127}_{-96}	5885^{+4117}_{-1300}	75^{+407}_{-52}
Alt.	-17 ± 1	$0.83^{+0.45}_{-0.42}$	1797^{+144}_{-99}	4994^{+2101}_{-787}	37^{+110}_{-21}

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

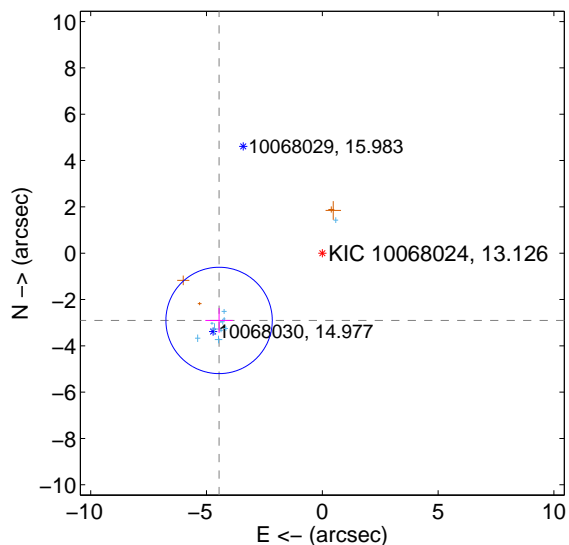
Supplemental centroid analysis for 010068024-02. Kepler magnitude: 13.13. Transit SNR 7.67

There are 11 quarters with good PRF difference image offsets

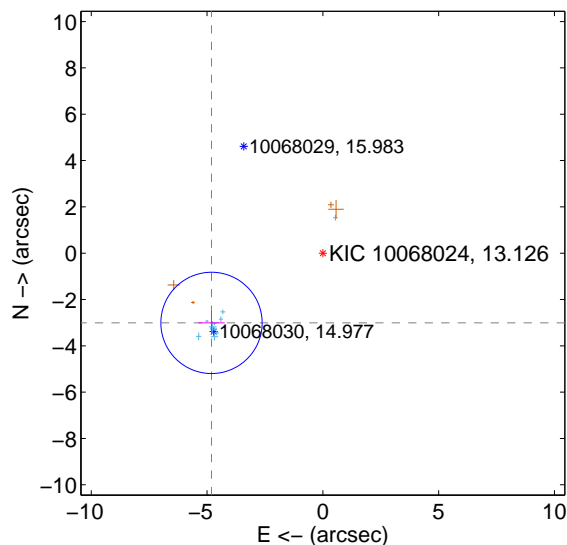
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.320 ± 0.766	6.95	4.457 ± 0.595	-2.905 ± 0.532
PRF-fit source offset from KIC position	5.673 ± 0.729	7.78	4.808 ± 0.569	-3.010 ± 0.506
photometric centroid source offset	5.37 ± 1.11	4.84	5.04 ± 1.13	-1.86 ± 0.97

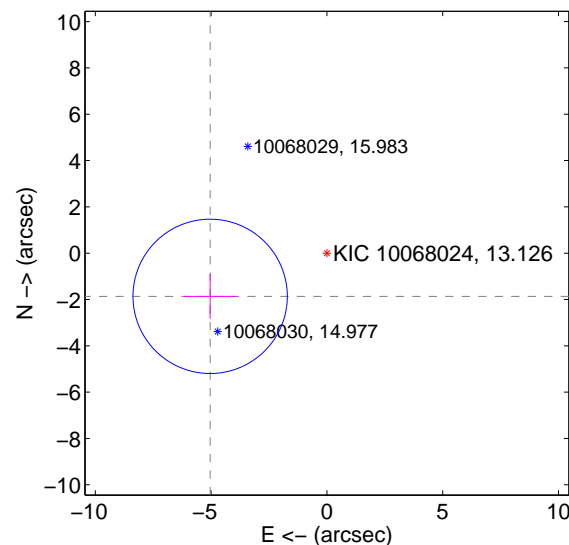
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

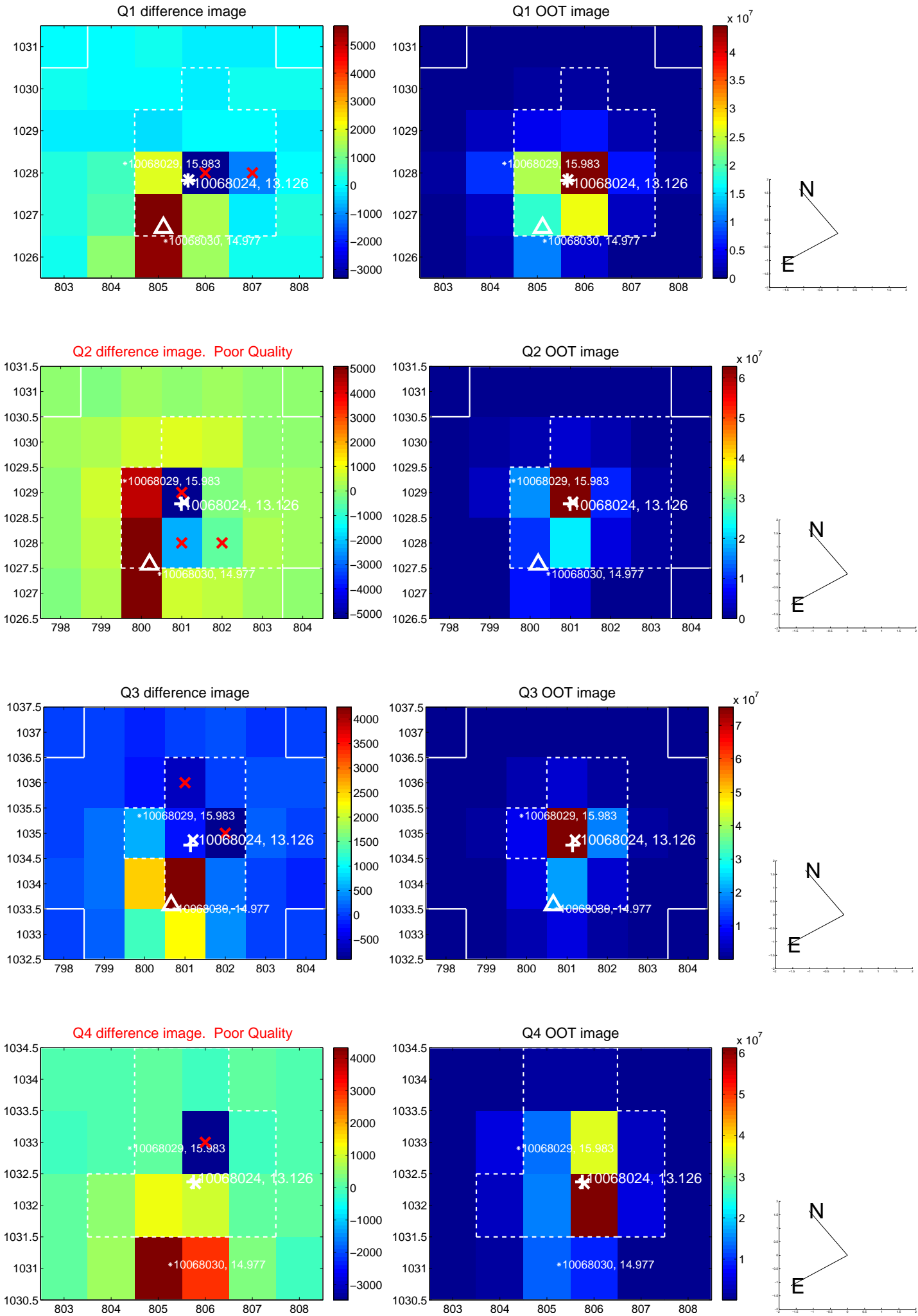


offset from photometric centroids

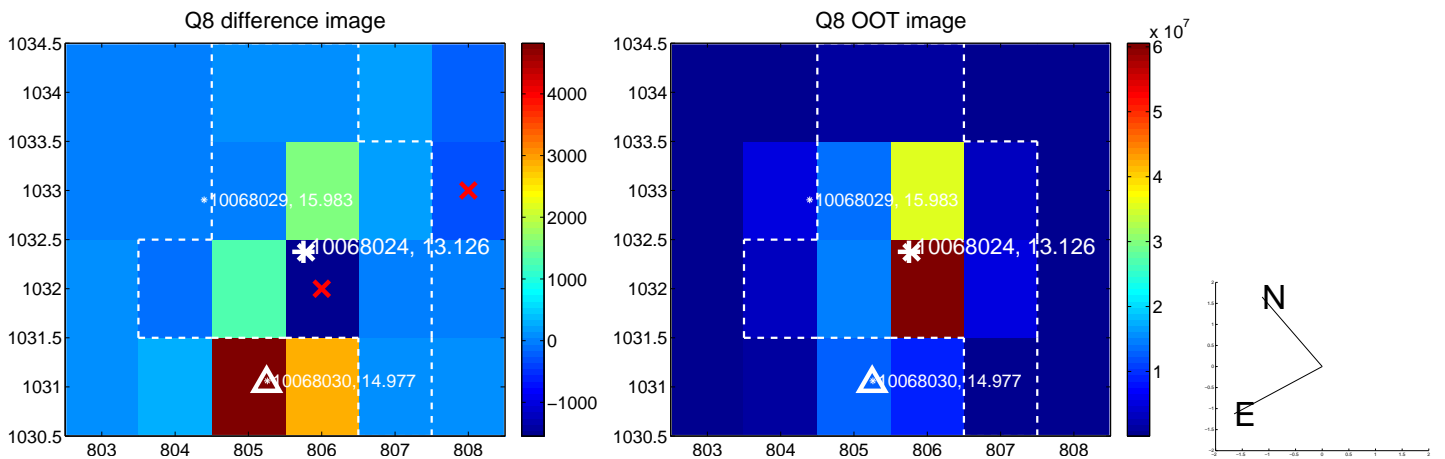
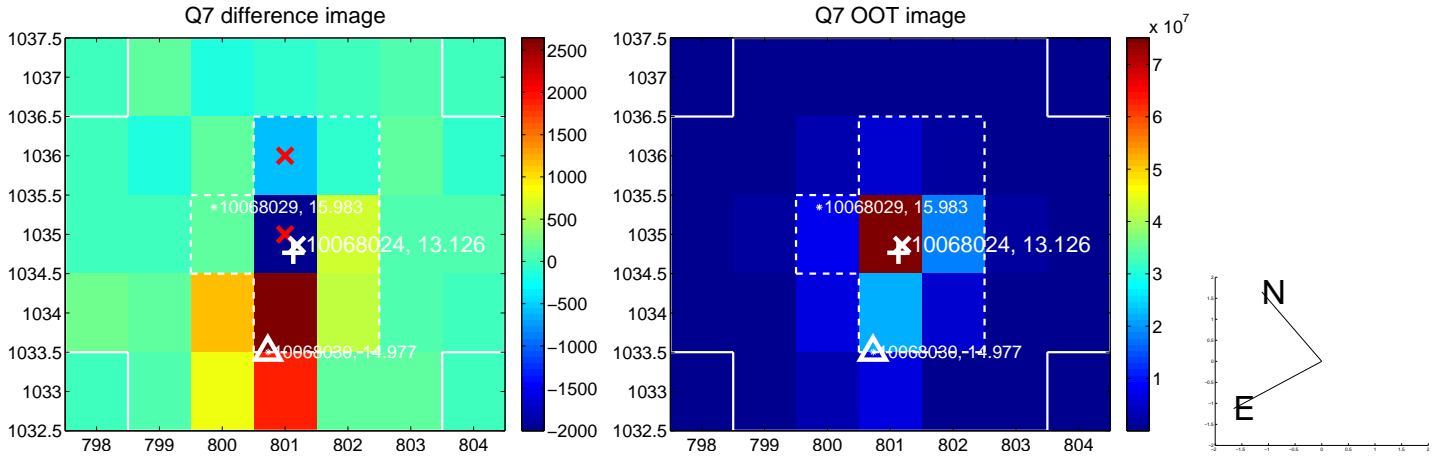
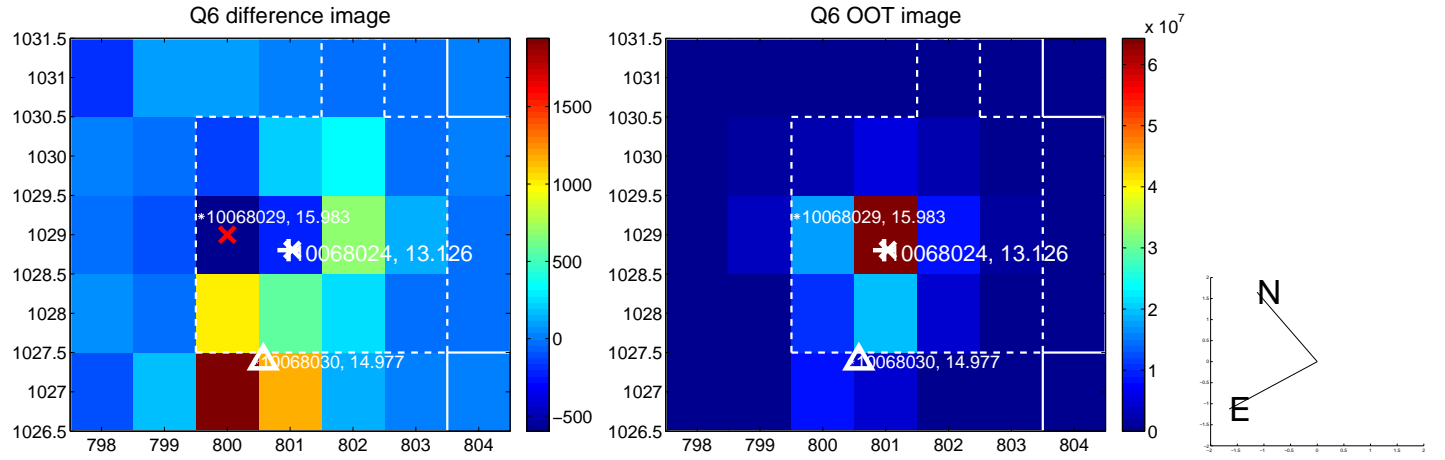
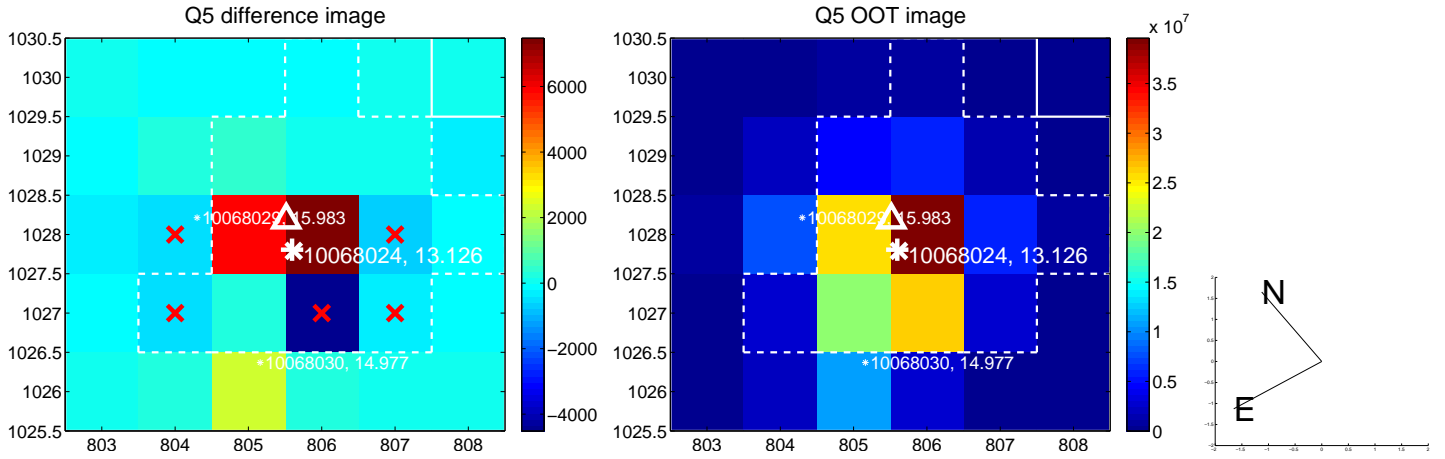


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

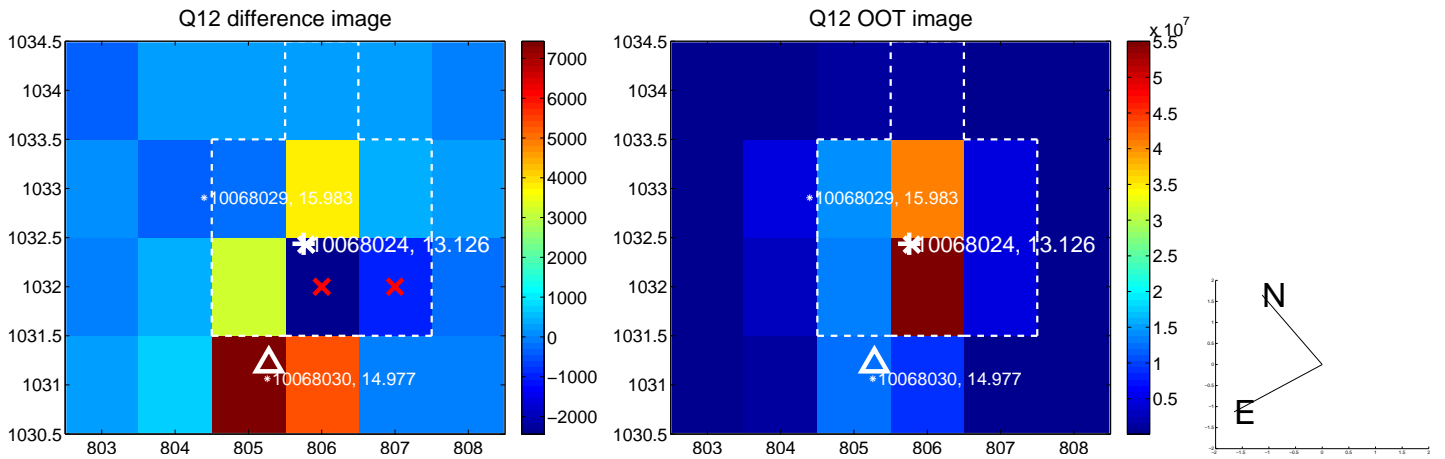
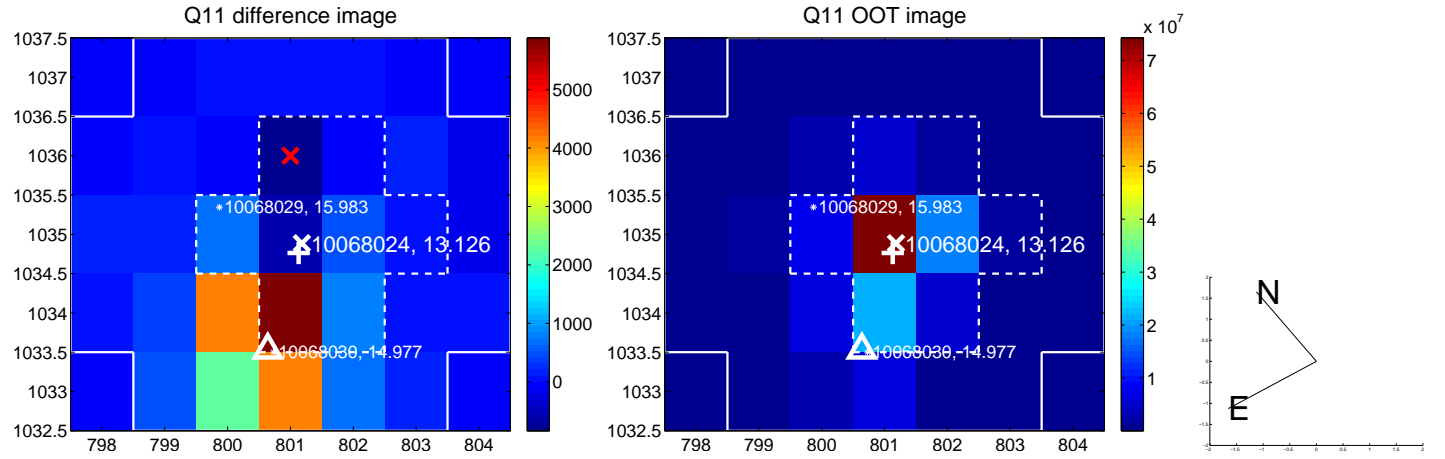
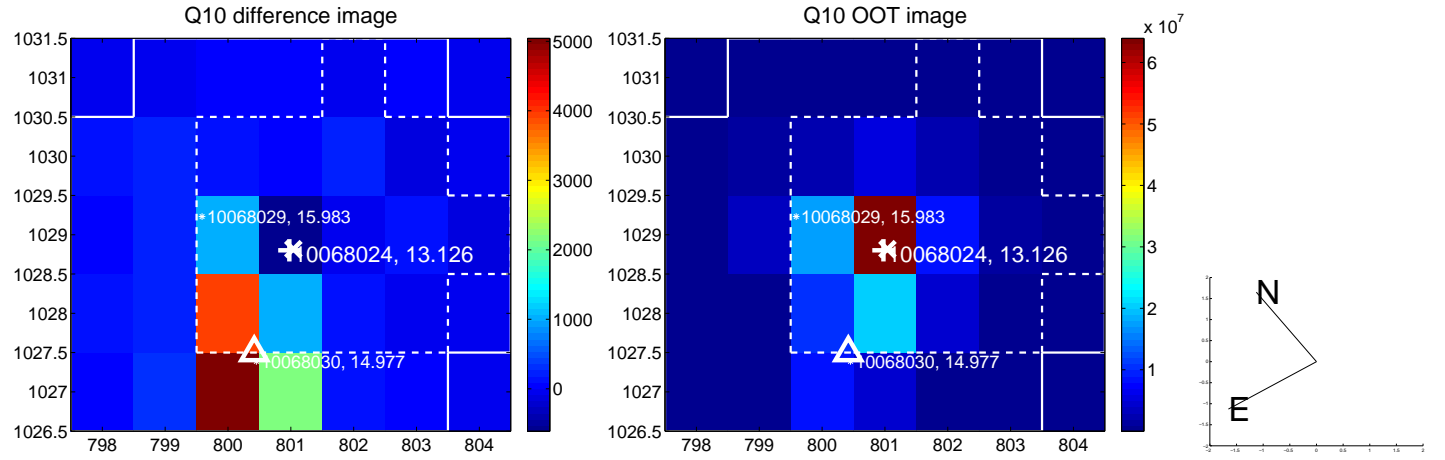
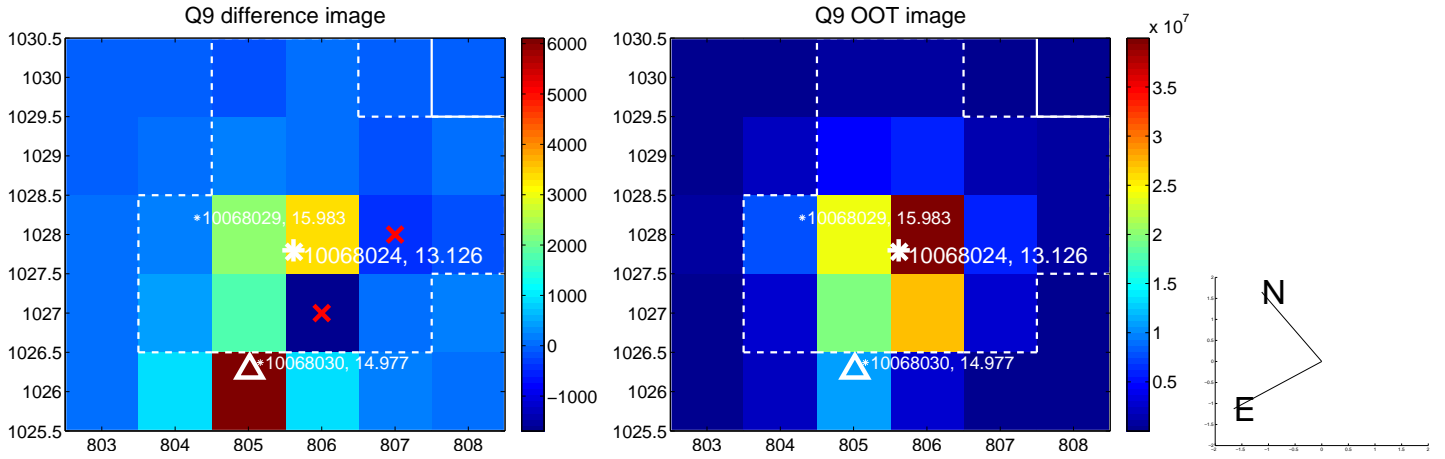
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



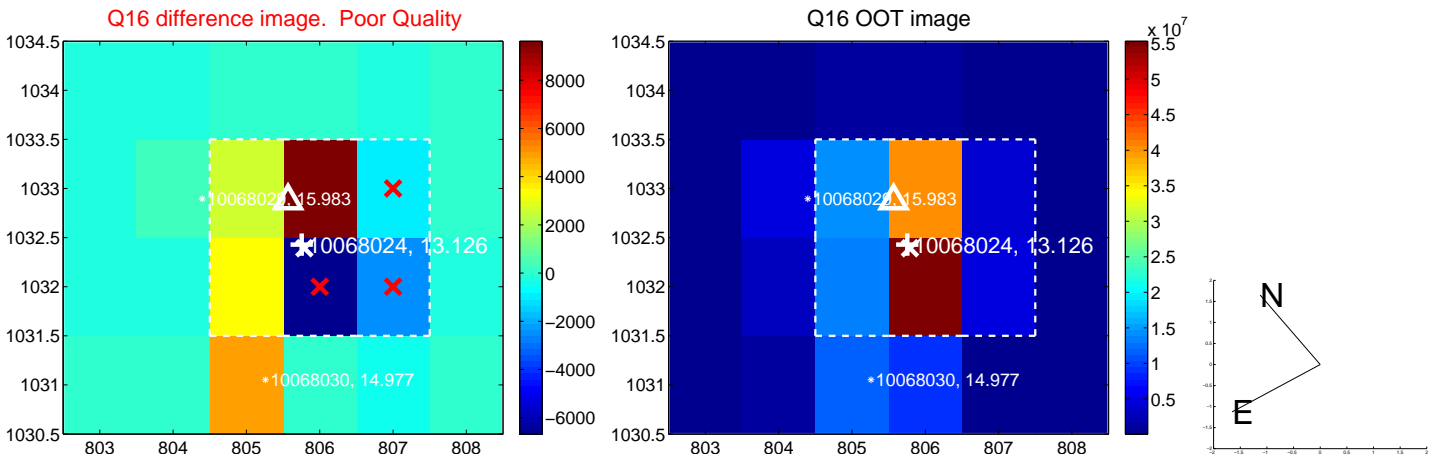
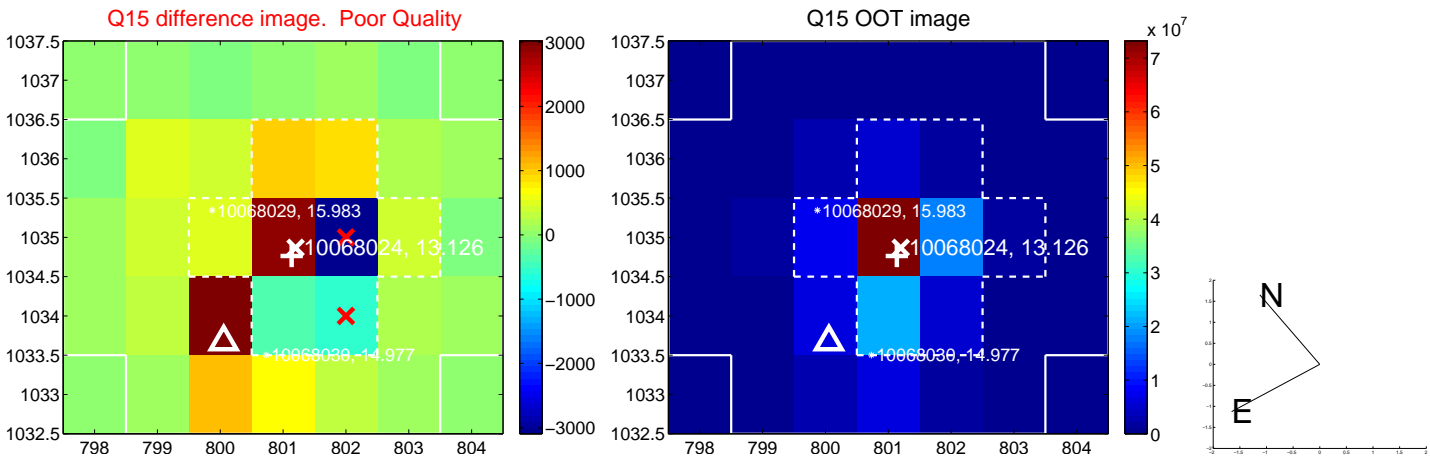
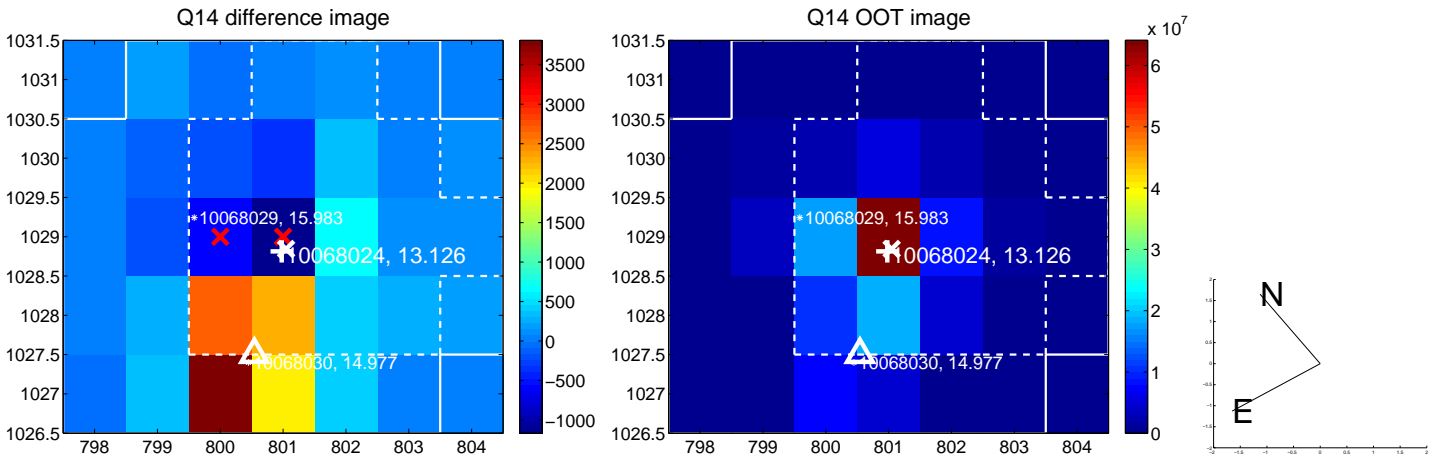
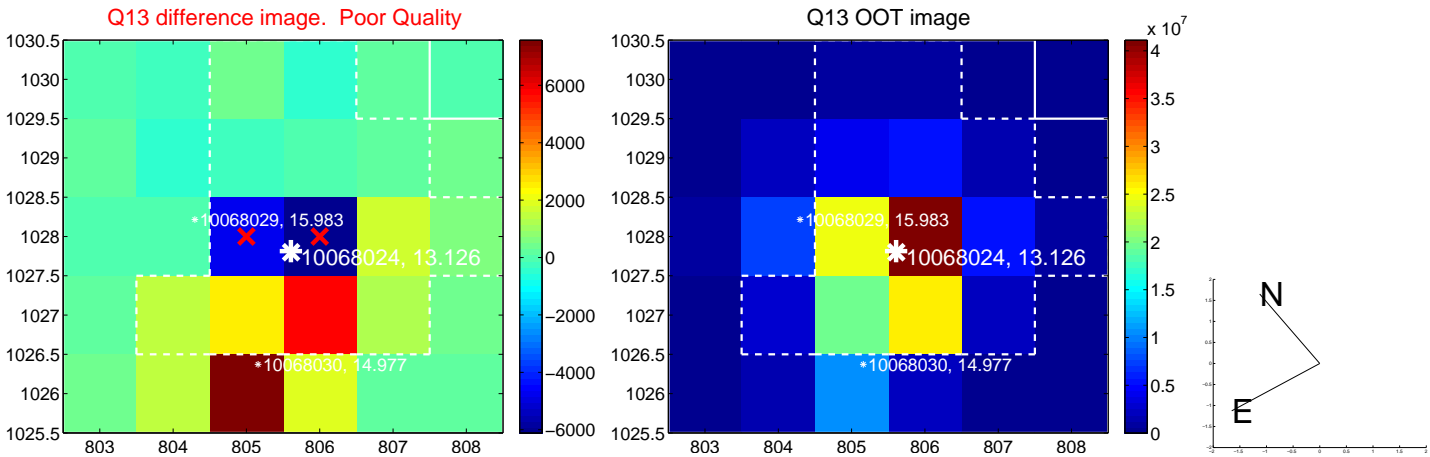
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



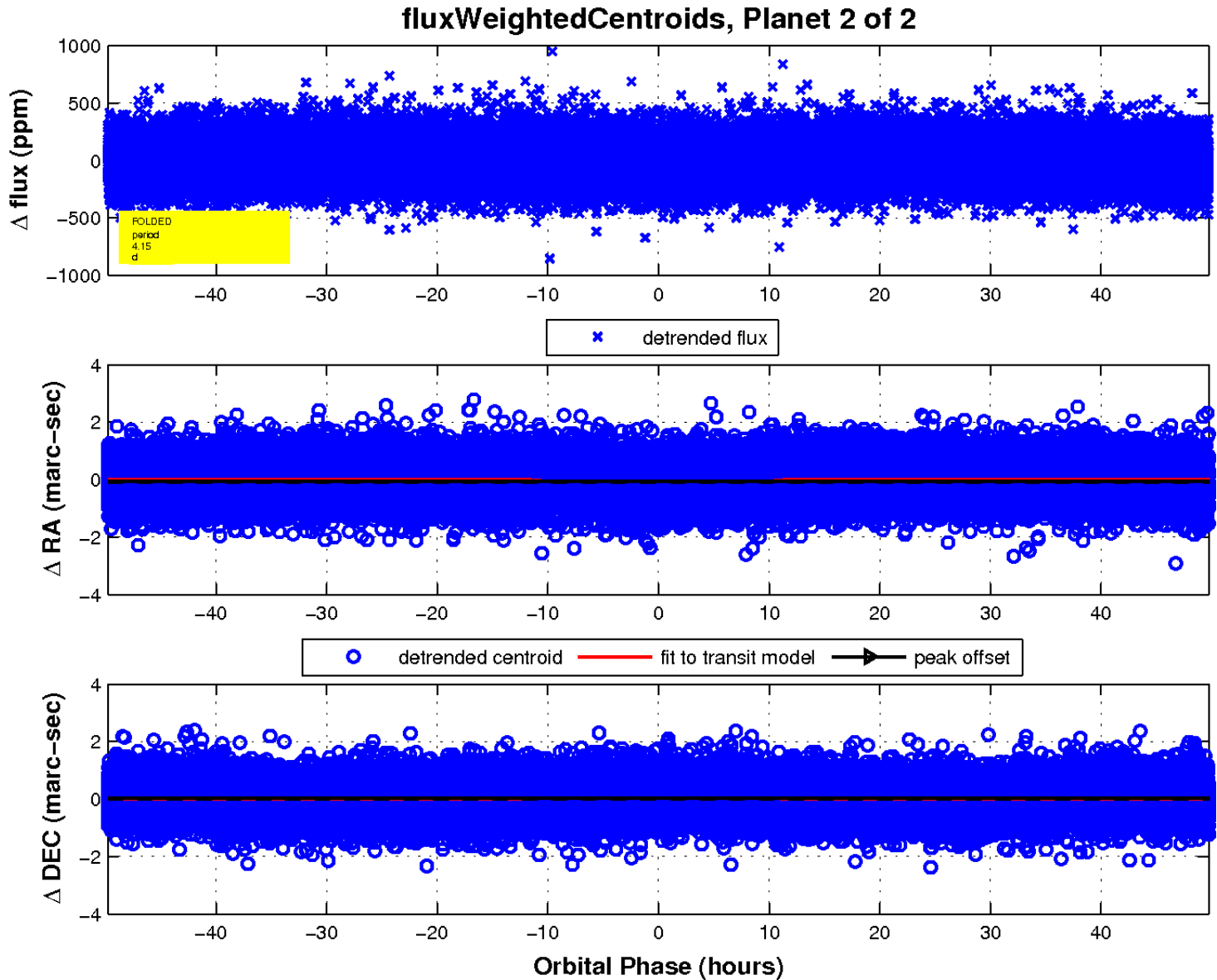
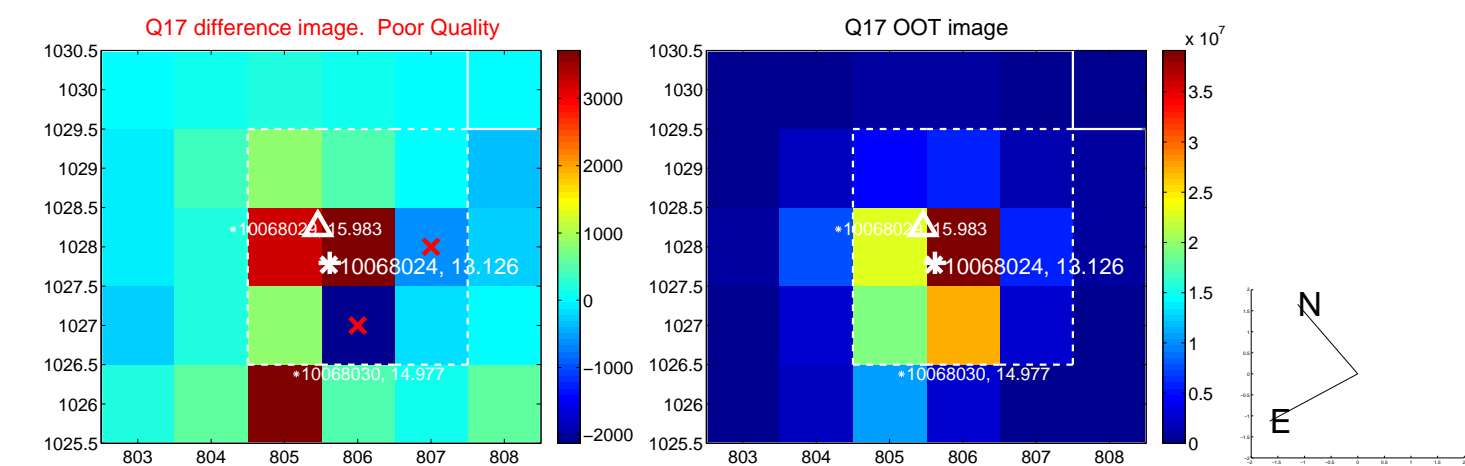
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image

