

KIC 010031707

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})
010031707-01	OBS	1827.01	8.589635	132.020893	492.7	8.775	49.1	55.9	80.31	3837	397.43	0.00
010031707-02	OBS	No	8.589818	136.183404	125.1	8.360	15.7	16.5	80.31	3837	83.66	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010031707-01	OBS	FP	0.00	0	1	1	1	PLANET_IN_STAR—MOD_SEC_DV—DEEP_V_SHAPED—HAS_SEC_TCE—HALO_GHOST—EPHEM_MATCH
010031707-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—HALO_GHOST—EPHEM_MATCH

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 010031707-01

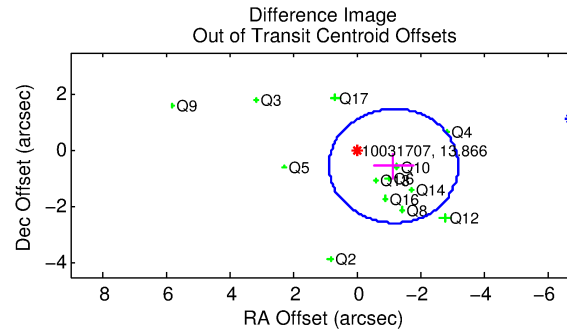
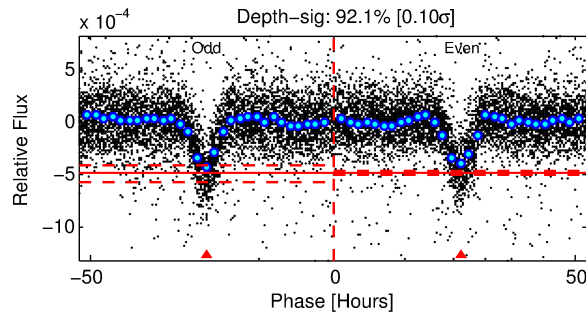
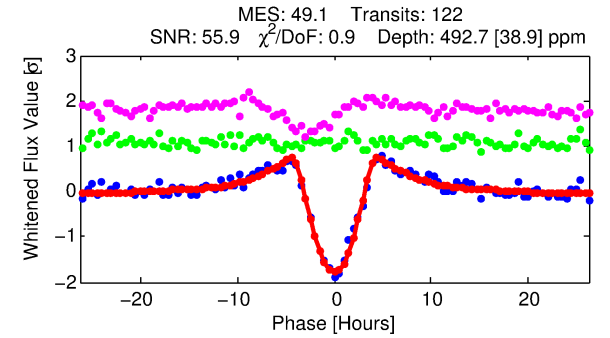
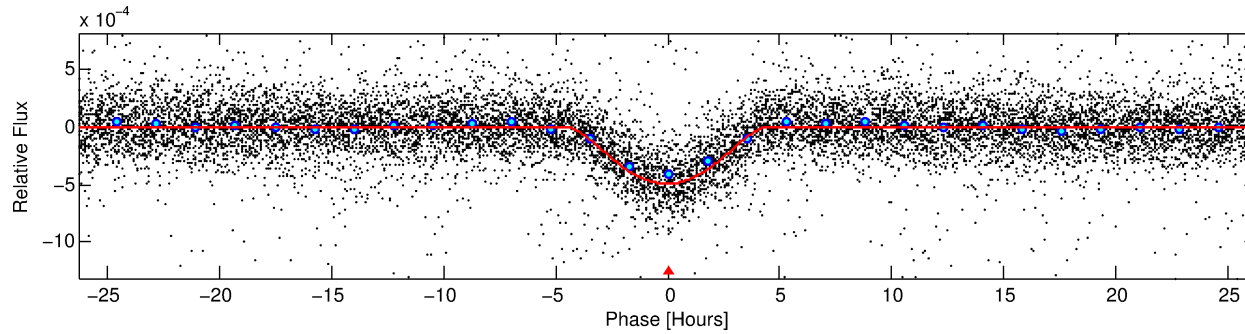
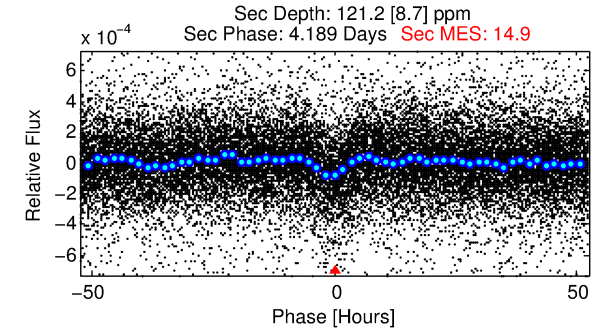
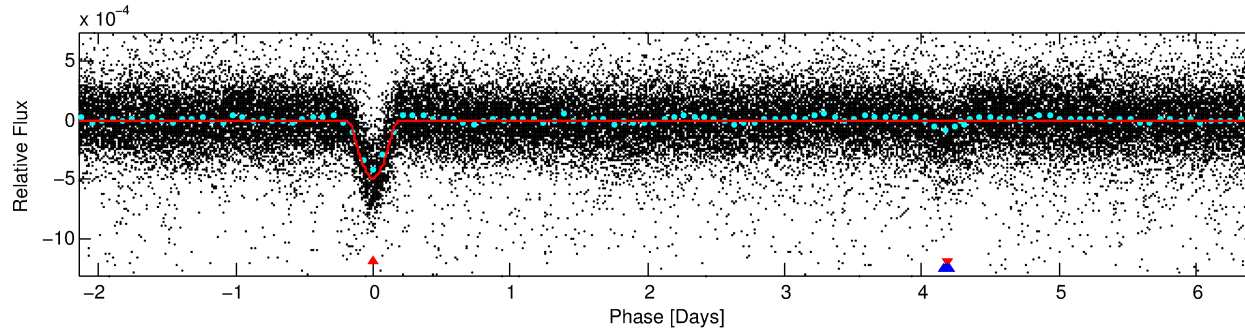
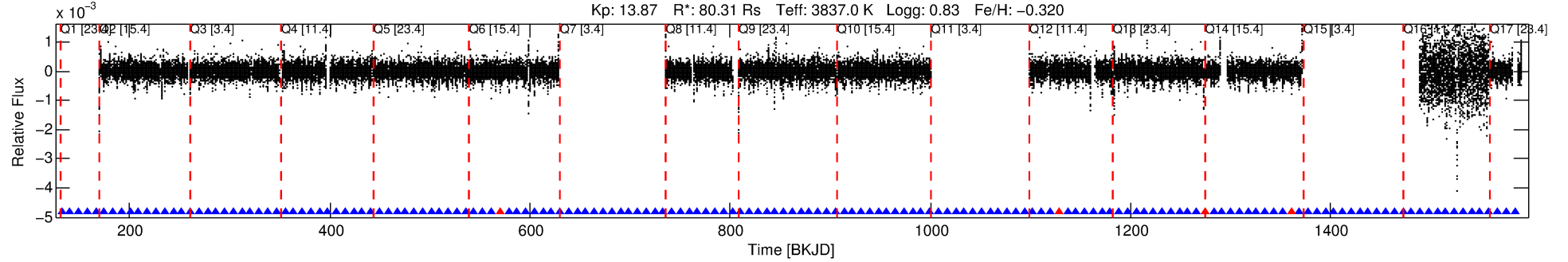
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010031707-01	10031707	010031808-01	10031808	1:1	68.7	18	0	9.56	13.87	547.95	Direct-PRF	0	0.37	0.54

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: 10031707 Candidate: 1 of 2 Period: 8.590 d
KOI: K01827.01 Corr: 0.876

Kp: 13.87 R*: 80.31 Rs Teff: 3837.0 K Logg: 0.83 Fe/H: -0.320



DV Fit Results:

Period = 8.58963 [0.00003] d
Epoch = 132.0209 [0.0027] BKJD
Rp/R* = 0.0454 [0.0235]
a/R* = 2.50 [0.24]
b = 1.00 [0.04]
Seff = N/A
Teq = N/A
Rp = 397.43 [218.05] Re
a = N/A
Ag = N/A
Teffp = N/A

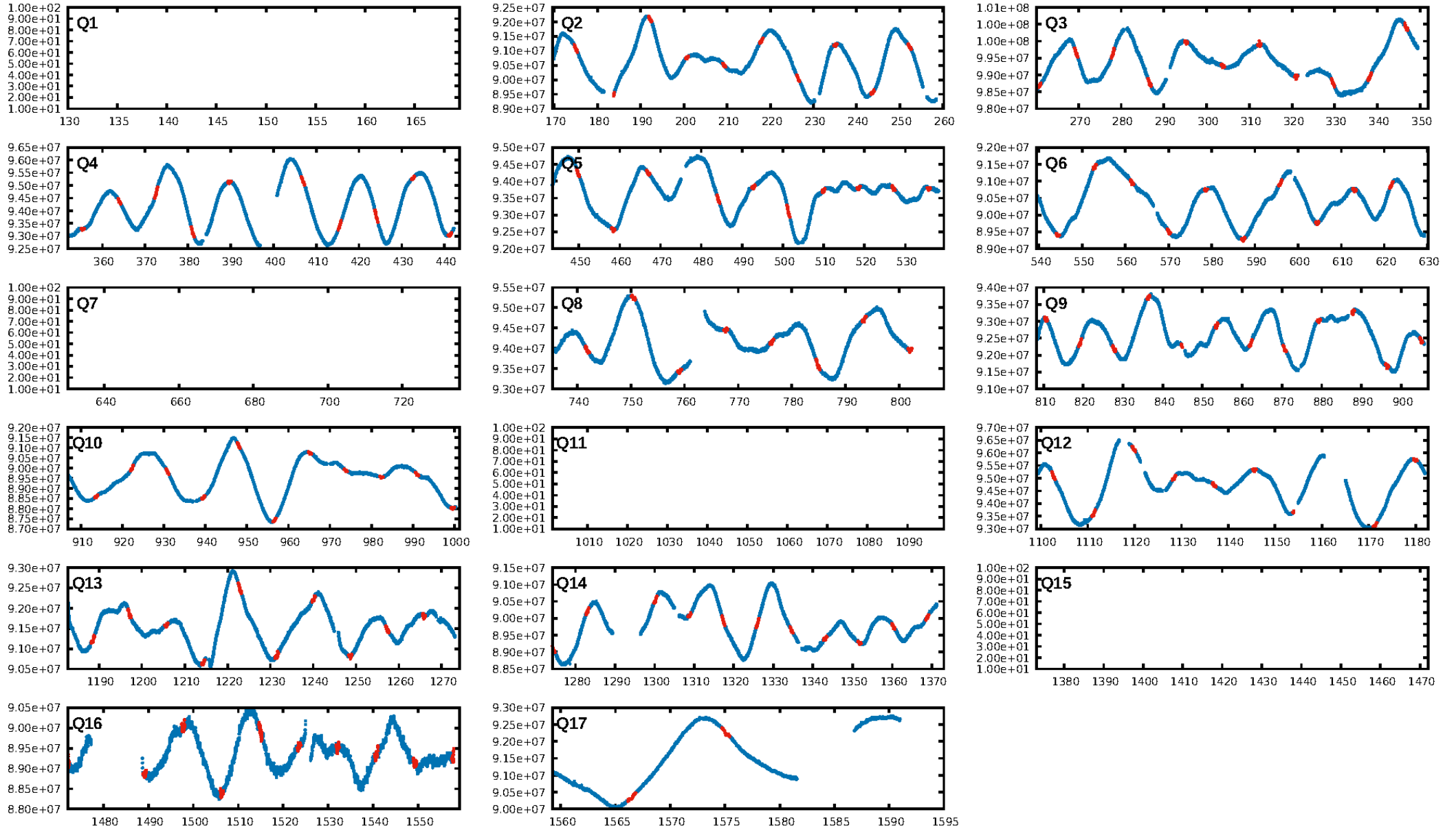
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.97 [116/120]
GhostDiagnostic-chr: -0.006981
Centroid-sig: 0.0%
Centroid-so: 2.496 arcsec [12.76σ]
OotOffset-rm: 1.290 arcsec [1.91σ]
KicOffset-rm: 0.826 arcsec [1.20σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 0.15 [2/13]
DiffImageOverlap-fno: 1.00 [13/13]

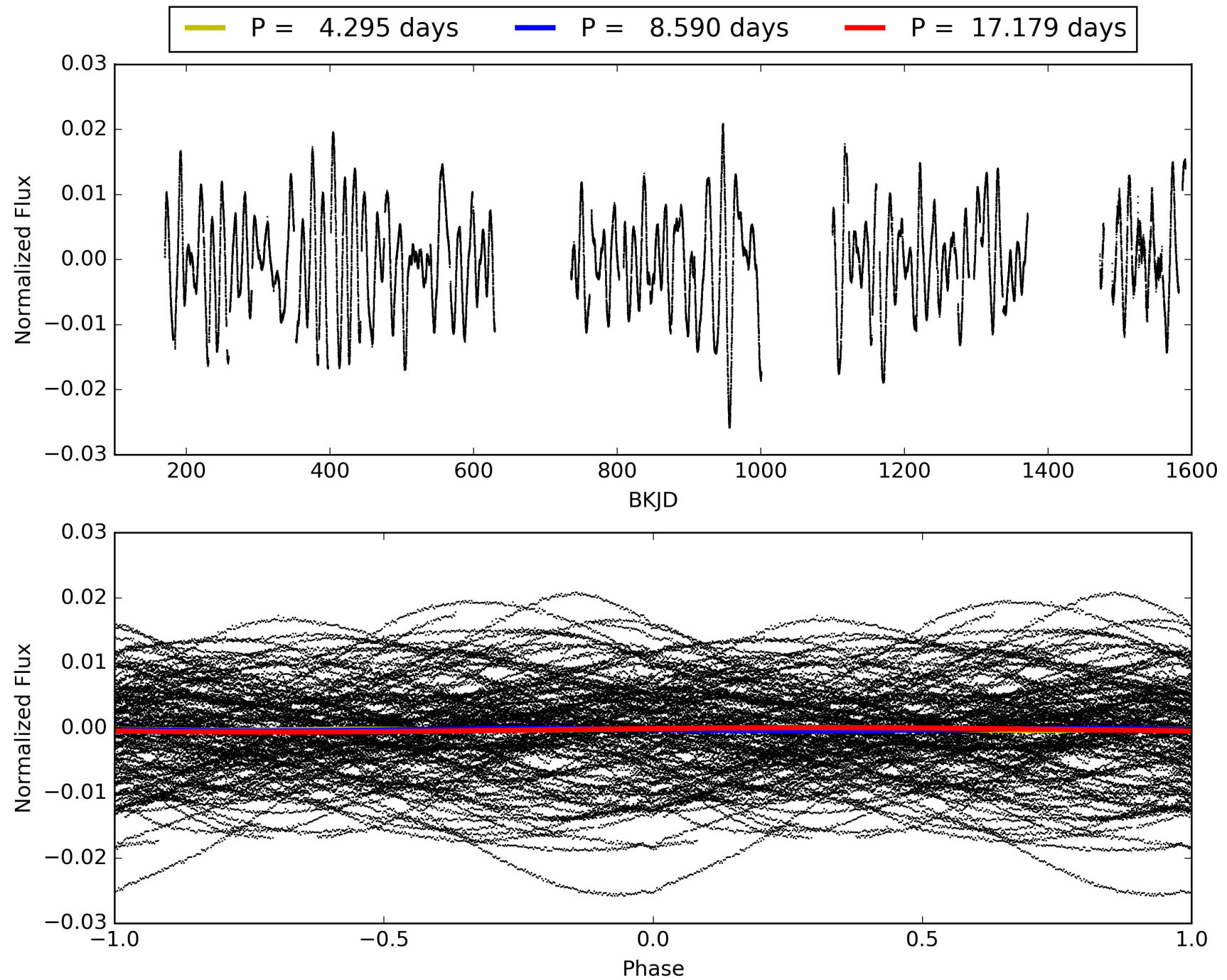
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:03:13 Z

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

TCE 010031707-01, PDC Light Curves

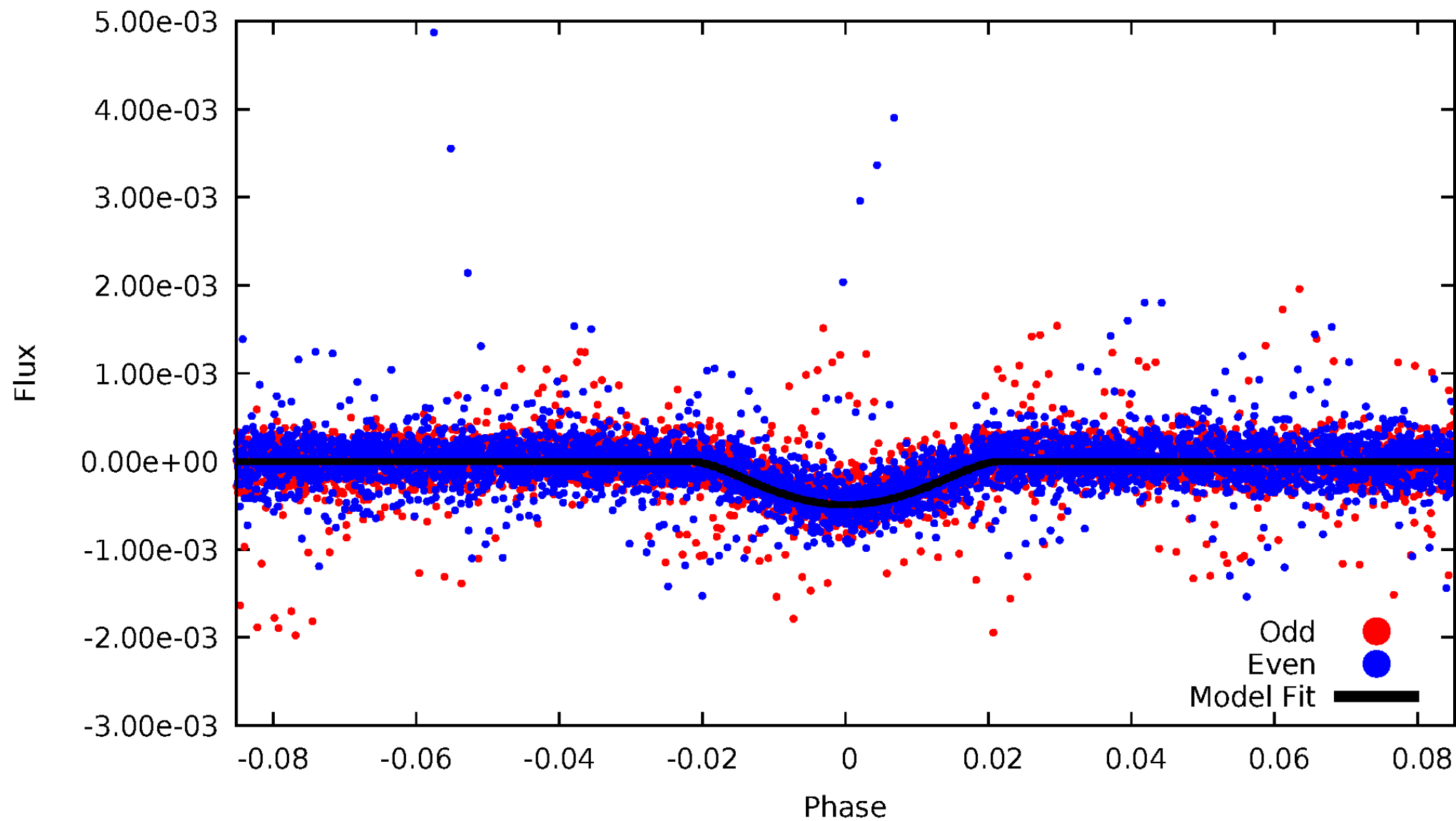


TCE 010031707-01



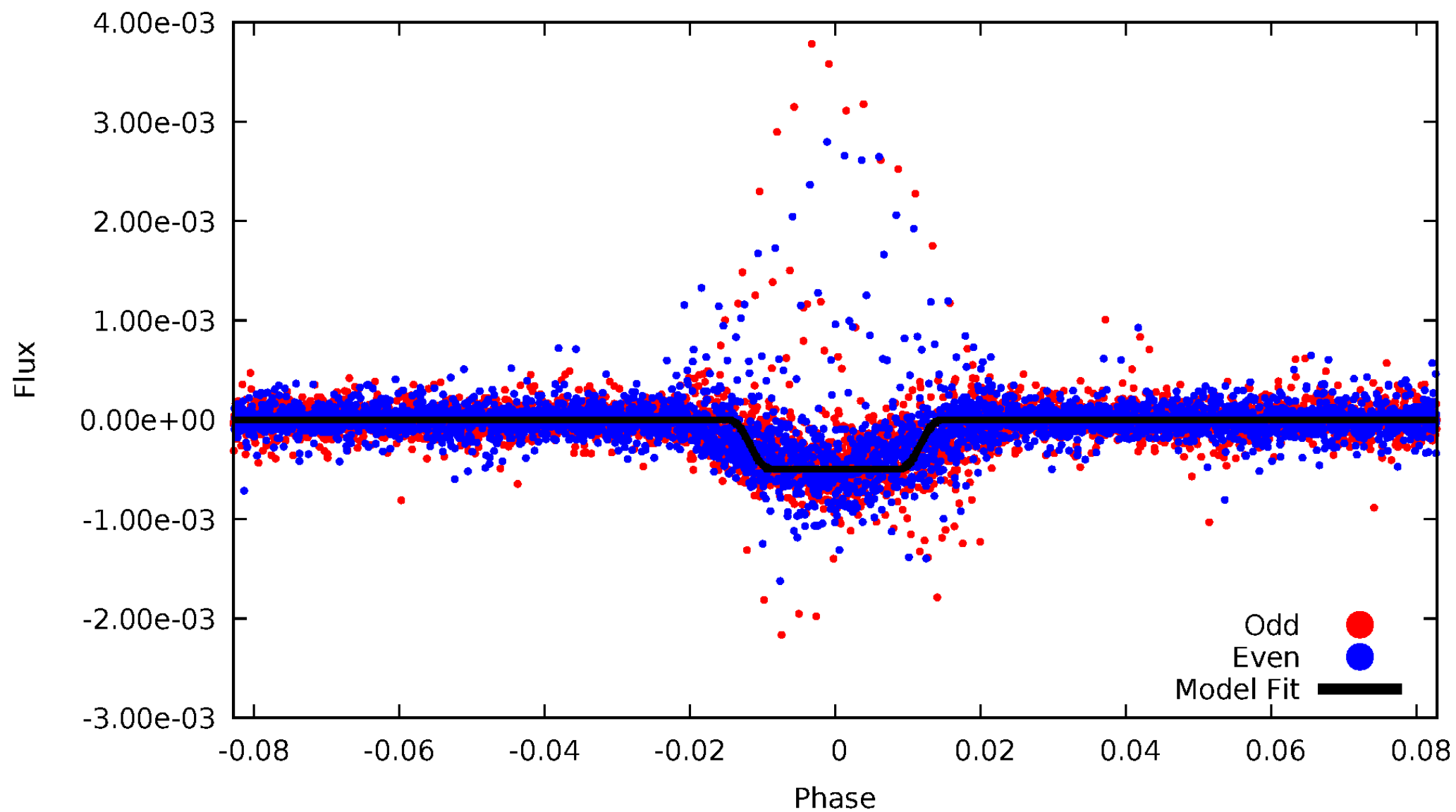
DV Odd/Even

TCE 010031707-01



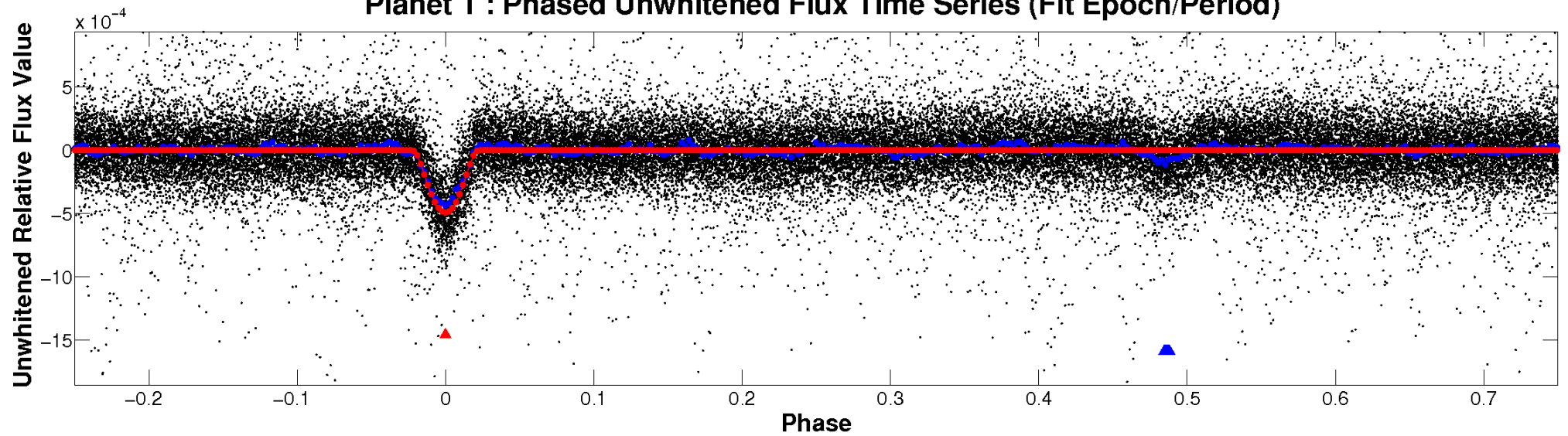
ALT Odd/Even

TCE 010031707-01

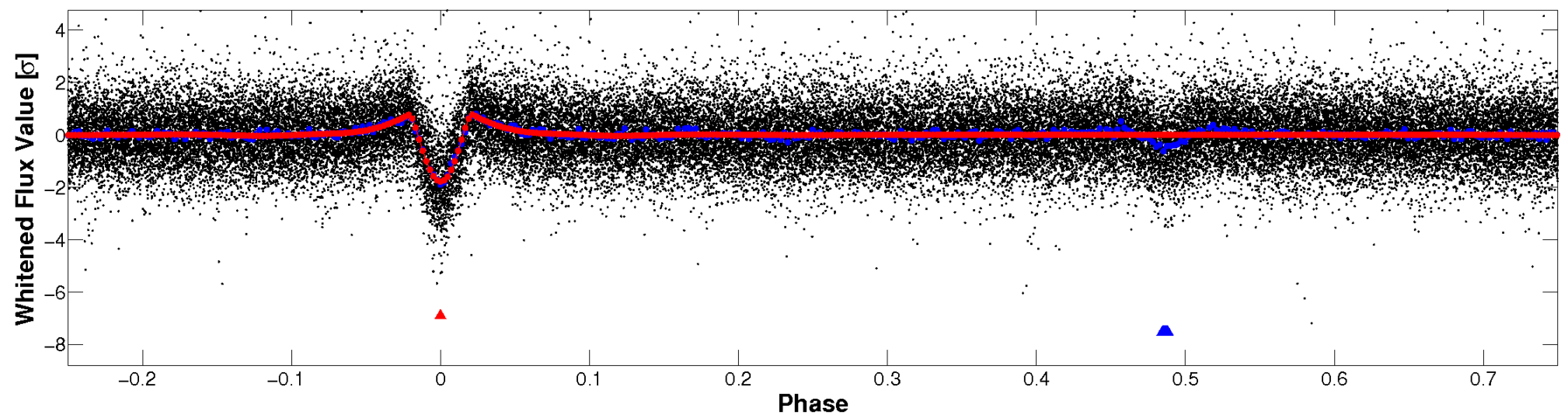


Non-Whitened Vs. Whitened Light Curve

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

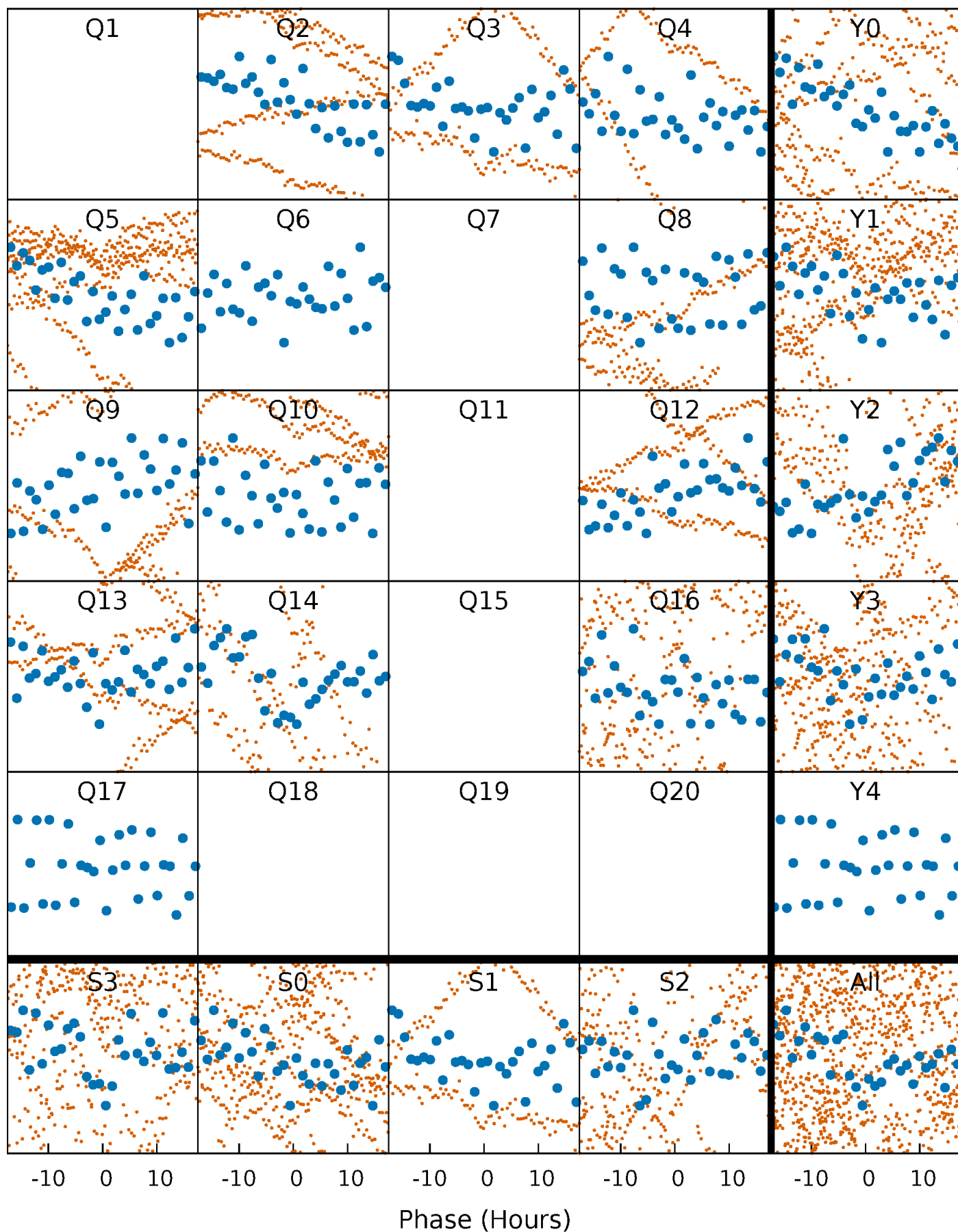


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



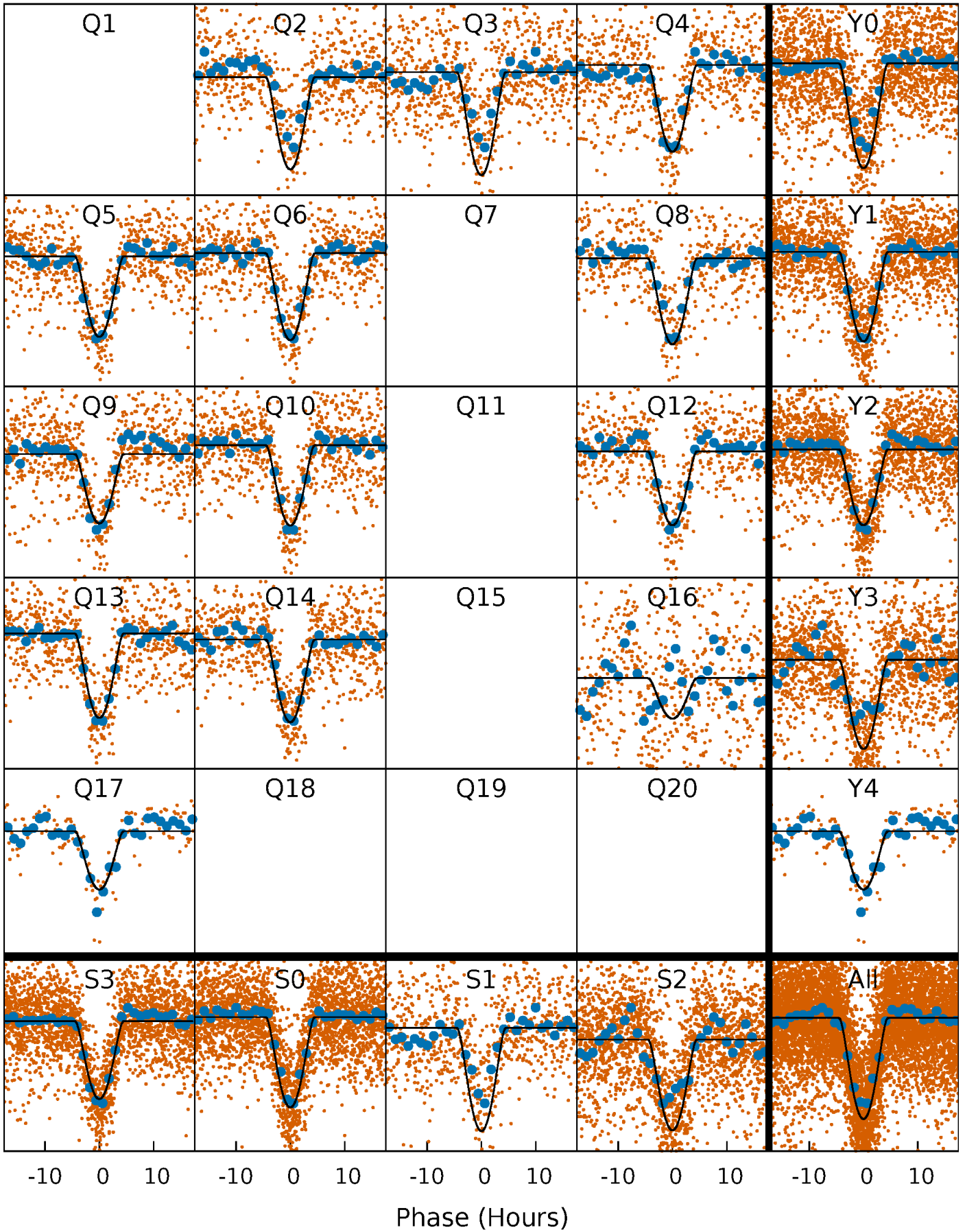
PDC Quarter-Phased Transit Curves

TCE 010031707-01 P= 8.589635 Days $T_0=132.020893$ (BKJD)



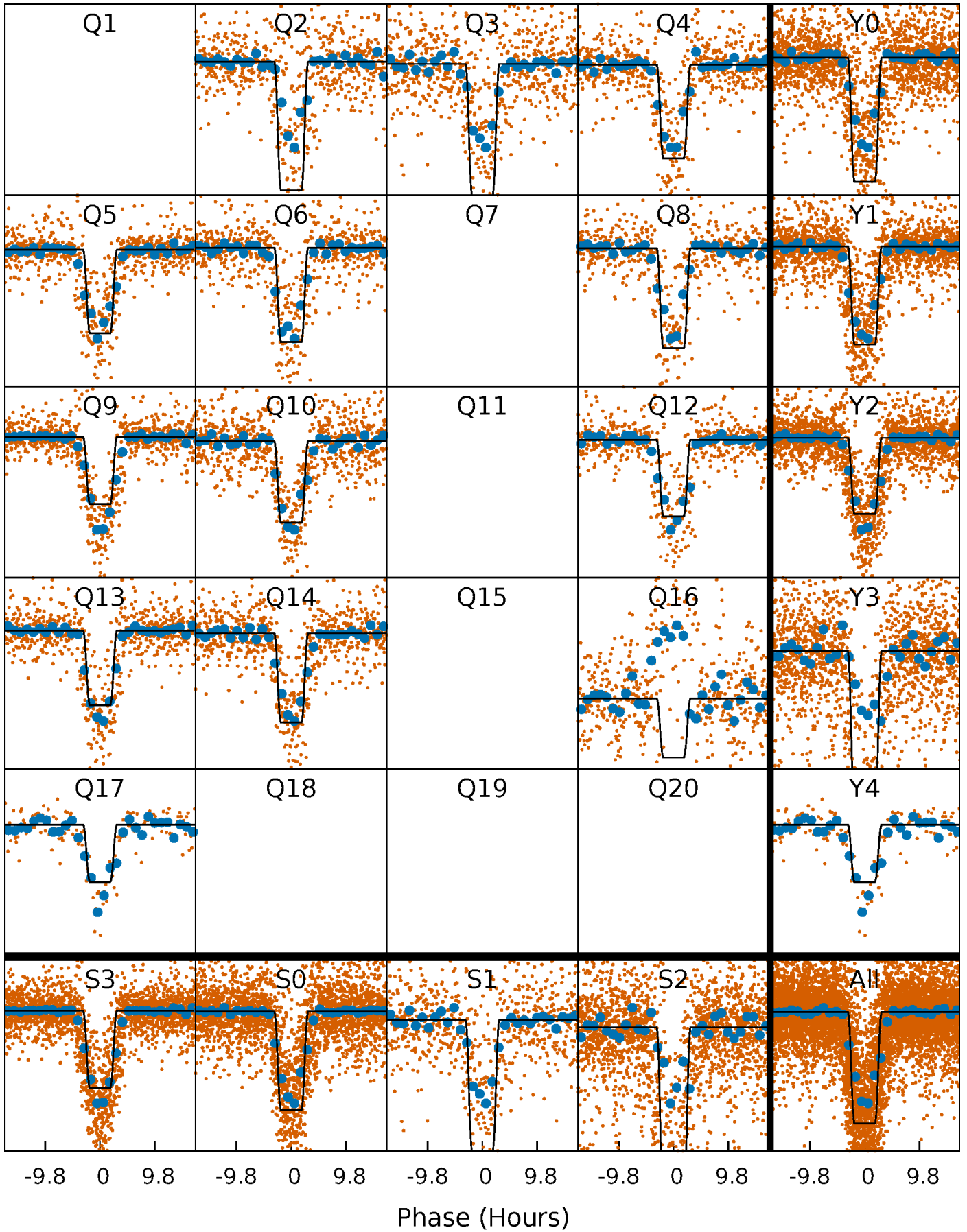
DV Quarter-Phased Transit Curves

TCE 010031707-01 P= 8.589635 Days $T_0=132.020893$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

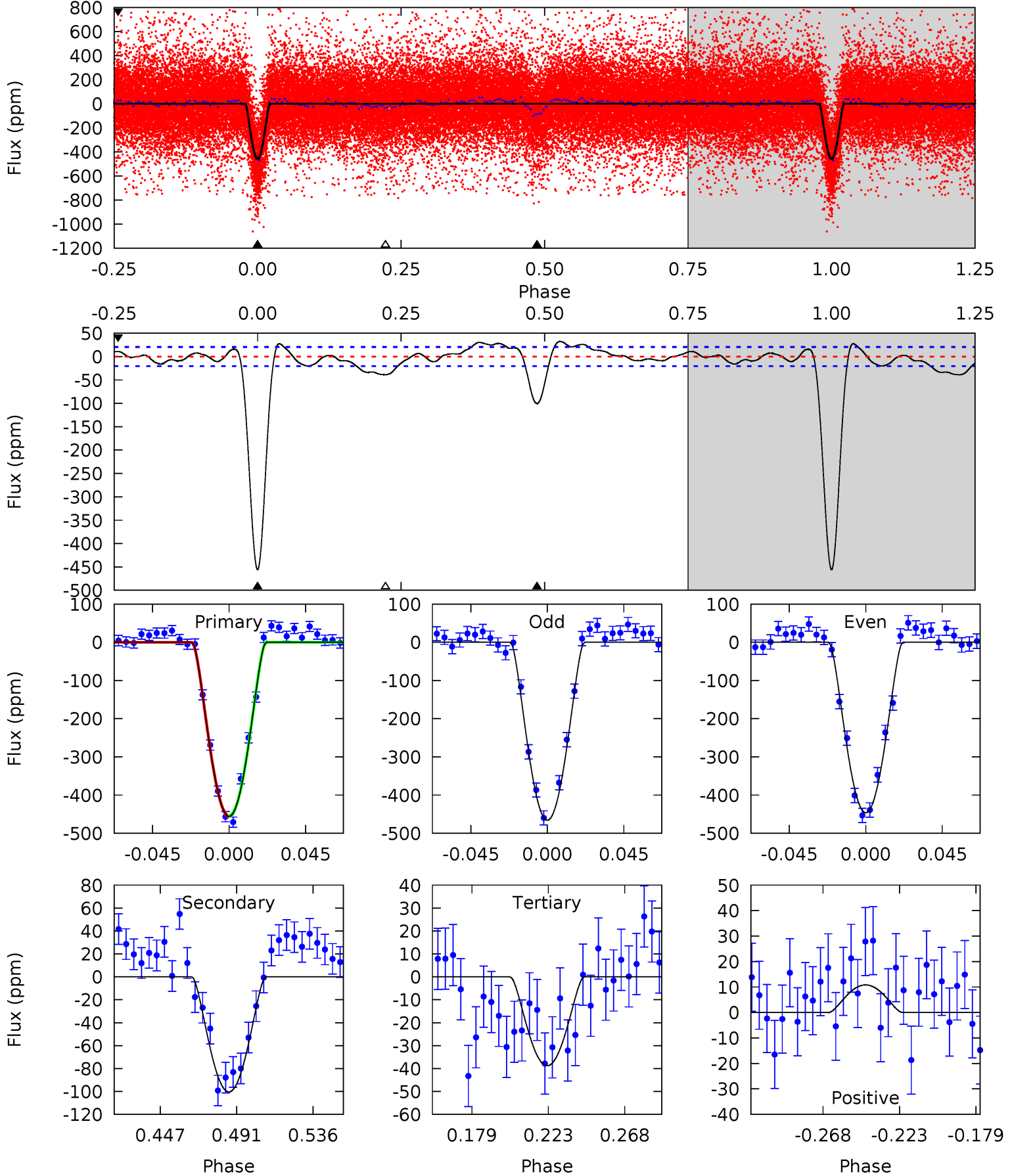
TCE 010031707-01 P= 8.589616 Days $T_0=132.025088$ (BKJD)



DV Model-Shift Uniqueness Test

010031707-01, P = 8.589635 Days, E = 132.020893 Days

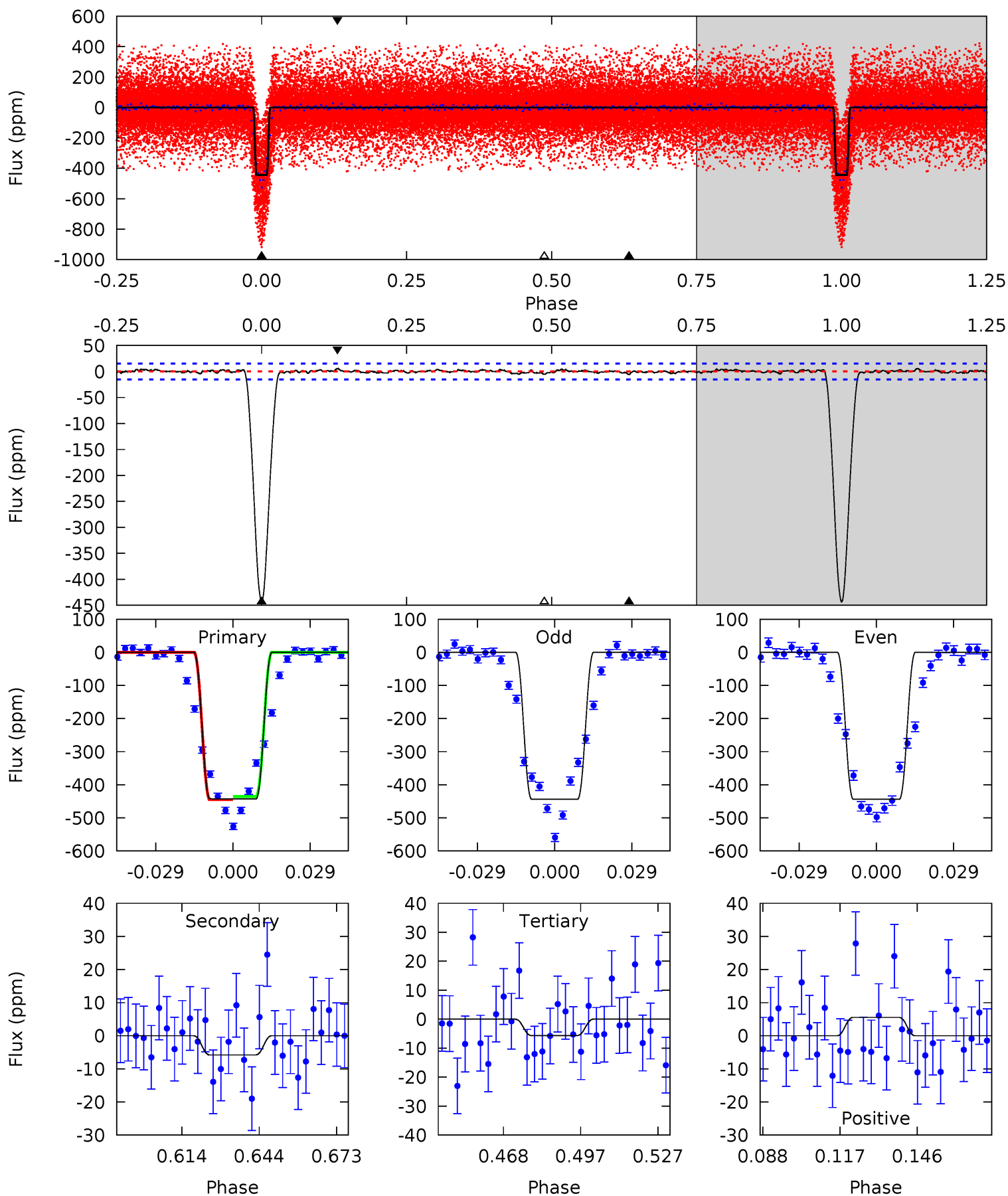
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
105.1	23.1	8.94	2.50	4.73	2.01	3.63	96.2	102.6	14.2	20.7	2.27	0.92	0.07	0.09



Alt Model-Shift Uniqueness Test

010031707-01, P = 8.589616 Days, E = 132.025088 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
138.8	1.82	1.76	1.74	4.82	2.18	0.60	137.0	137.1	0.05	0.08	0.01	0.84	0.01	0



Stellar Parameters For KIC 010031707

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3837^{+90}_{-102}	$0.829^{+0.030}_{-0.030}$	$-0.320^{+0.200}_{-0.250}$	$80.307^{+2.693}_{-14.364}$	$1.585^{+0.092}_{-0.521}$	$0.000^{+0.000}_{-0.000}$
	+2%/-3%	+4%/-4%	+62%/-78%	+3%/-18%	+6%/-33%	+25%/-8%
Source	PHO54	AST54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 010031707-01 / KOI 1827.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-100 ± 4	$409.01^{+202.62}_{-203.99}$	6841^{+183}_{-193}	-5095^{+204}_{-167}	$0.003^{+0.009}_{-0.002}$
Alt.	-6 ± 3	$238.87^{+181.35}_{-152.64}$	6860^{+177}_{-208}	-5126^{+202}_{-173}	$0.000^{+0.003}_{-0.000}$

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

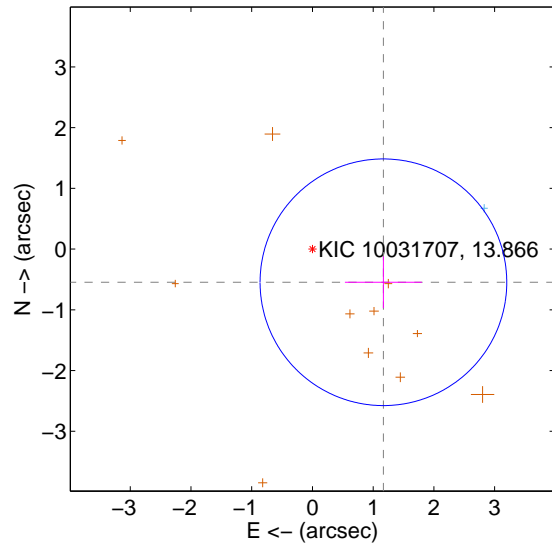
Supplemental centroid analysis for 010031707-01. Kepler magnitude: 13.87. Transit SNR 55.90

There are 2 quarters with good PRF difference image offsets

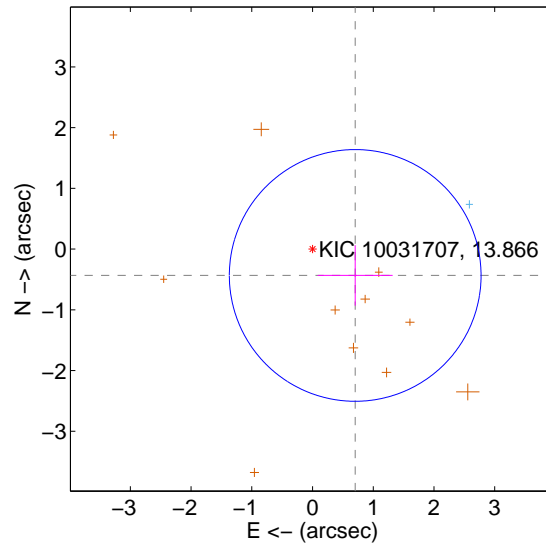
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.290 ± 0.677	1.91	-1.169 ± 0.634	-0.546 ± 0.426
PRF-fit source offset from KIC position	0.826 ± 0.691	1.20	-0.703 ± 0.617	-0.434 ± 0.497
photometric centroid source offset	2.50 ± 0.20	12.76	-2.49 ± 0.20	0.22 ± 0.18

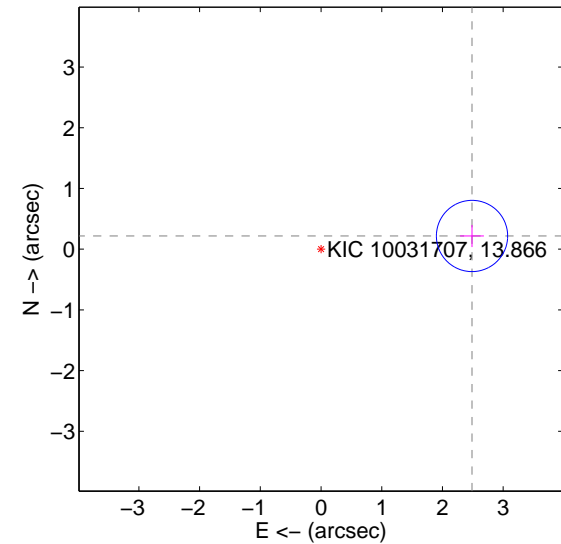
offset from difference PRF-fit to OOT PRF-fit



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.

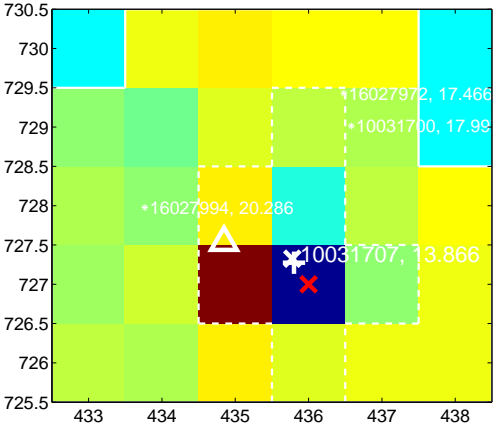
Q1 no difference image



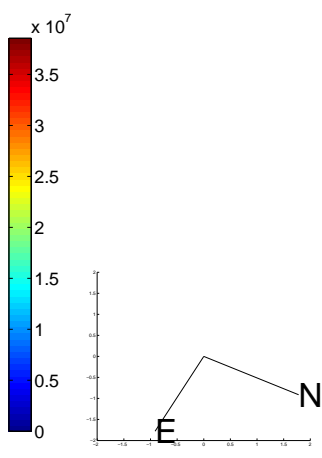
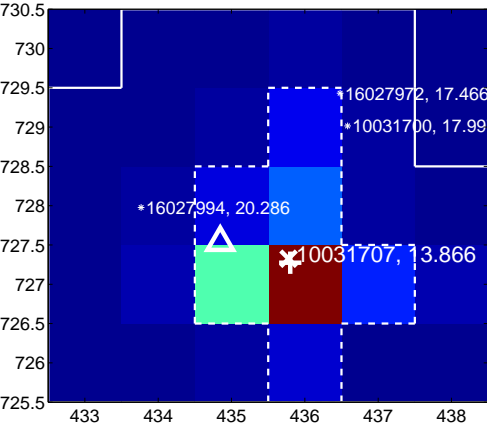
Q1 no OOT image



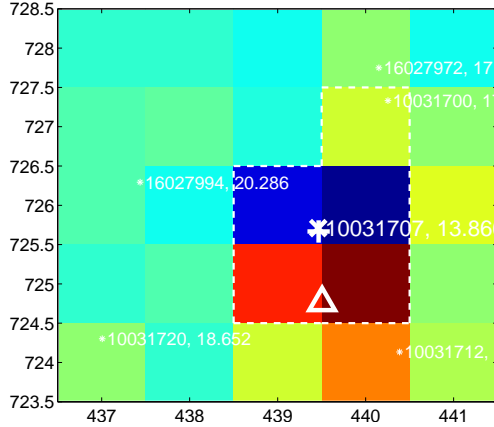
Q2 difference image. Poor Quality



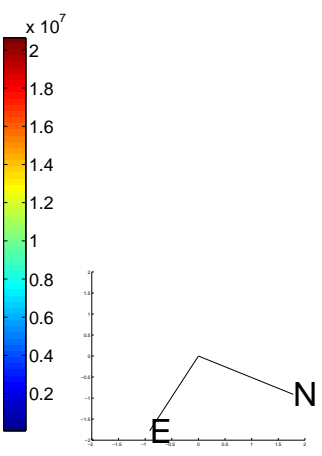
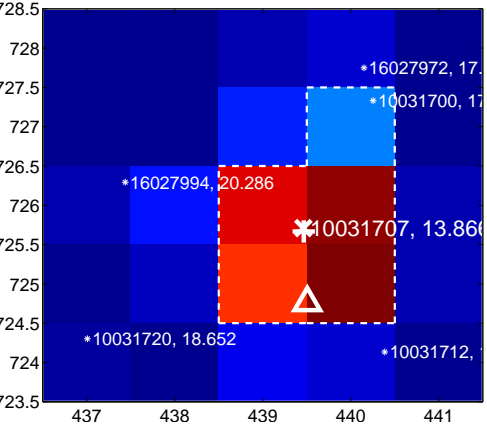
Q2 OOT image



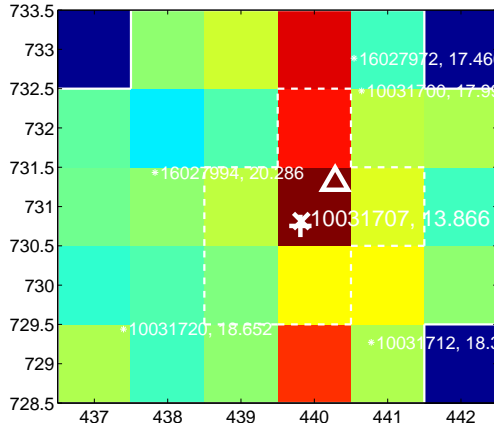
Q3 difference image. Poor Quality



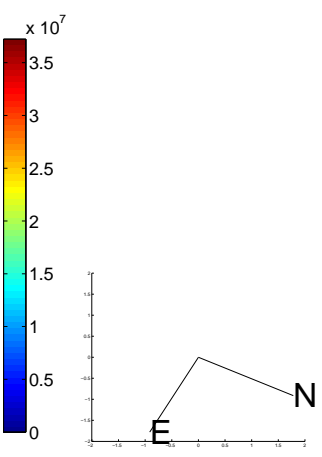
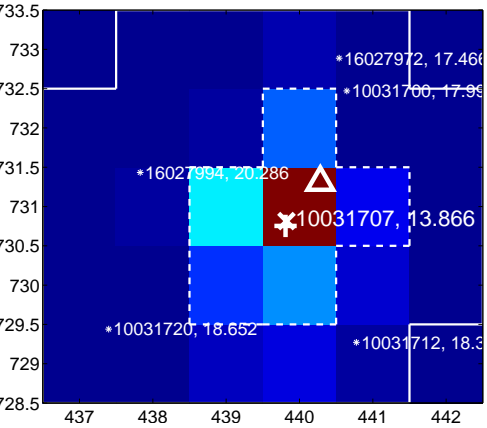
Q3 OOT image



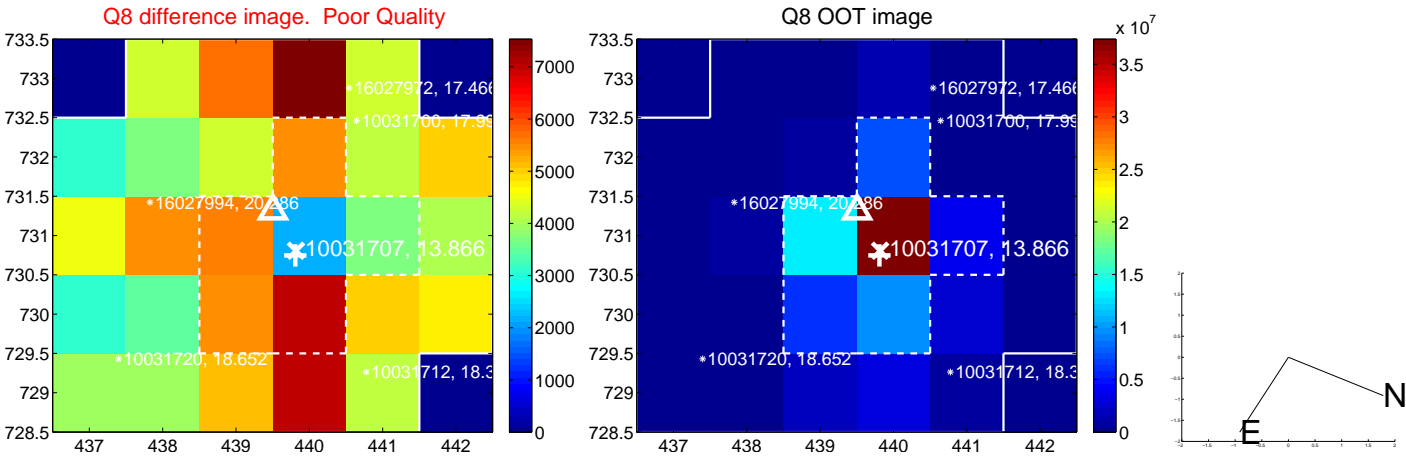
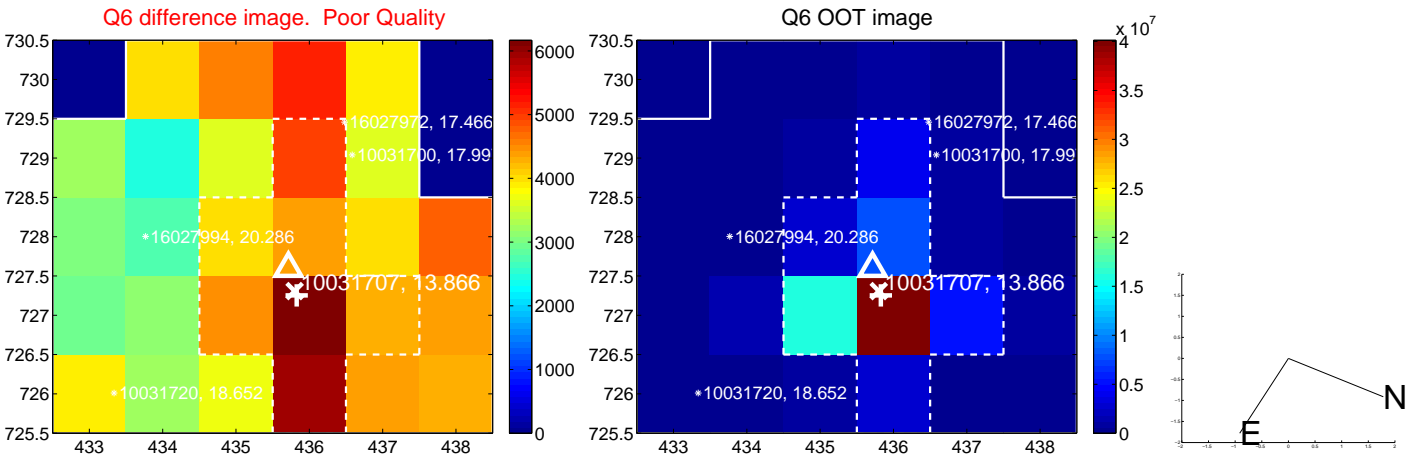
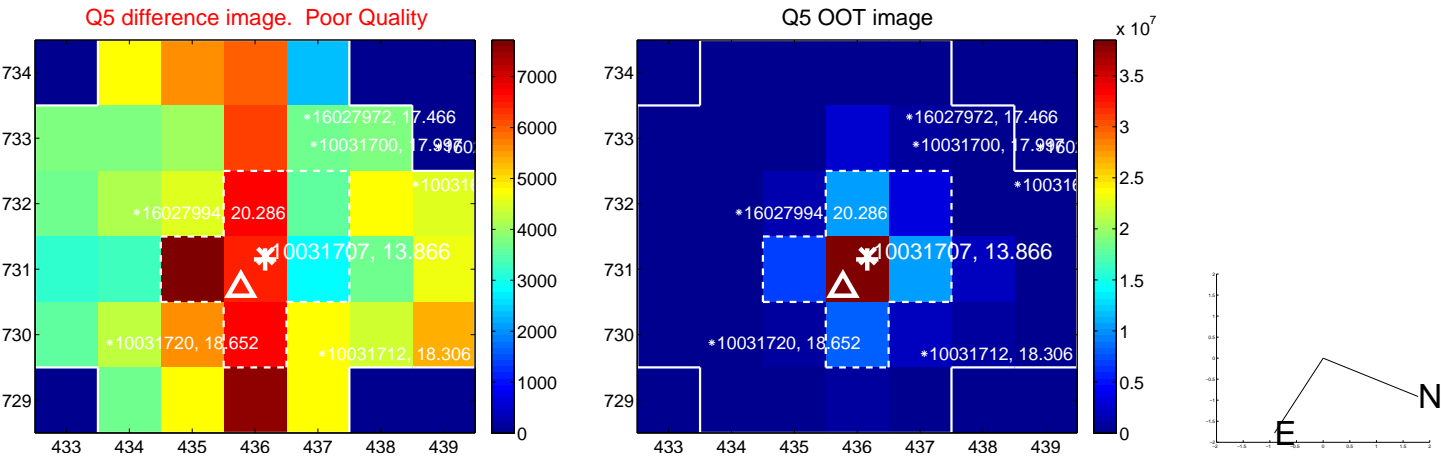
Q4 difference image



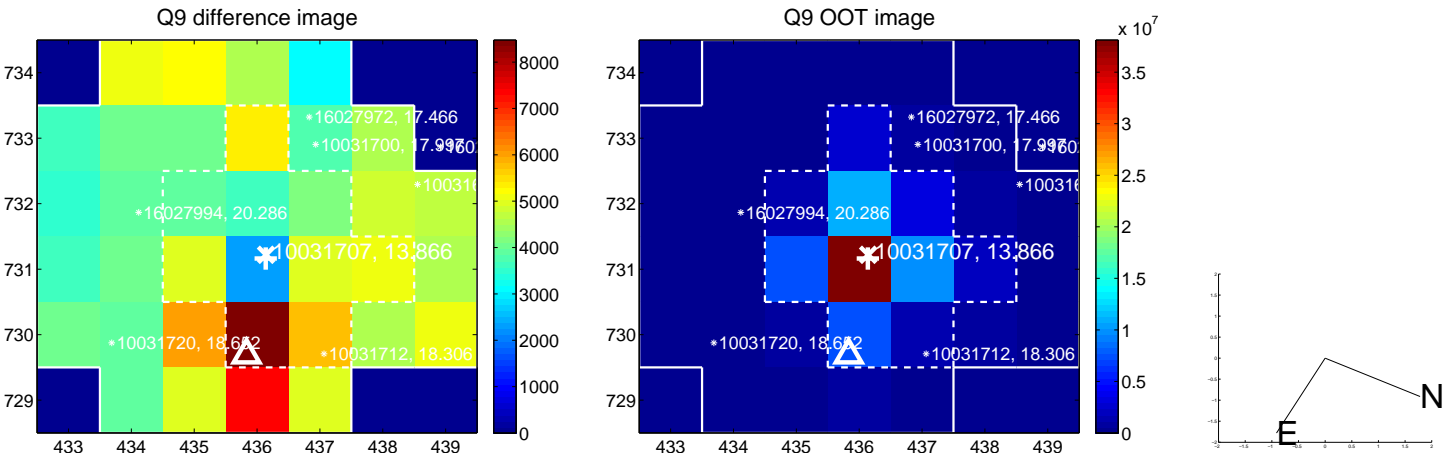
Q4 OOT image



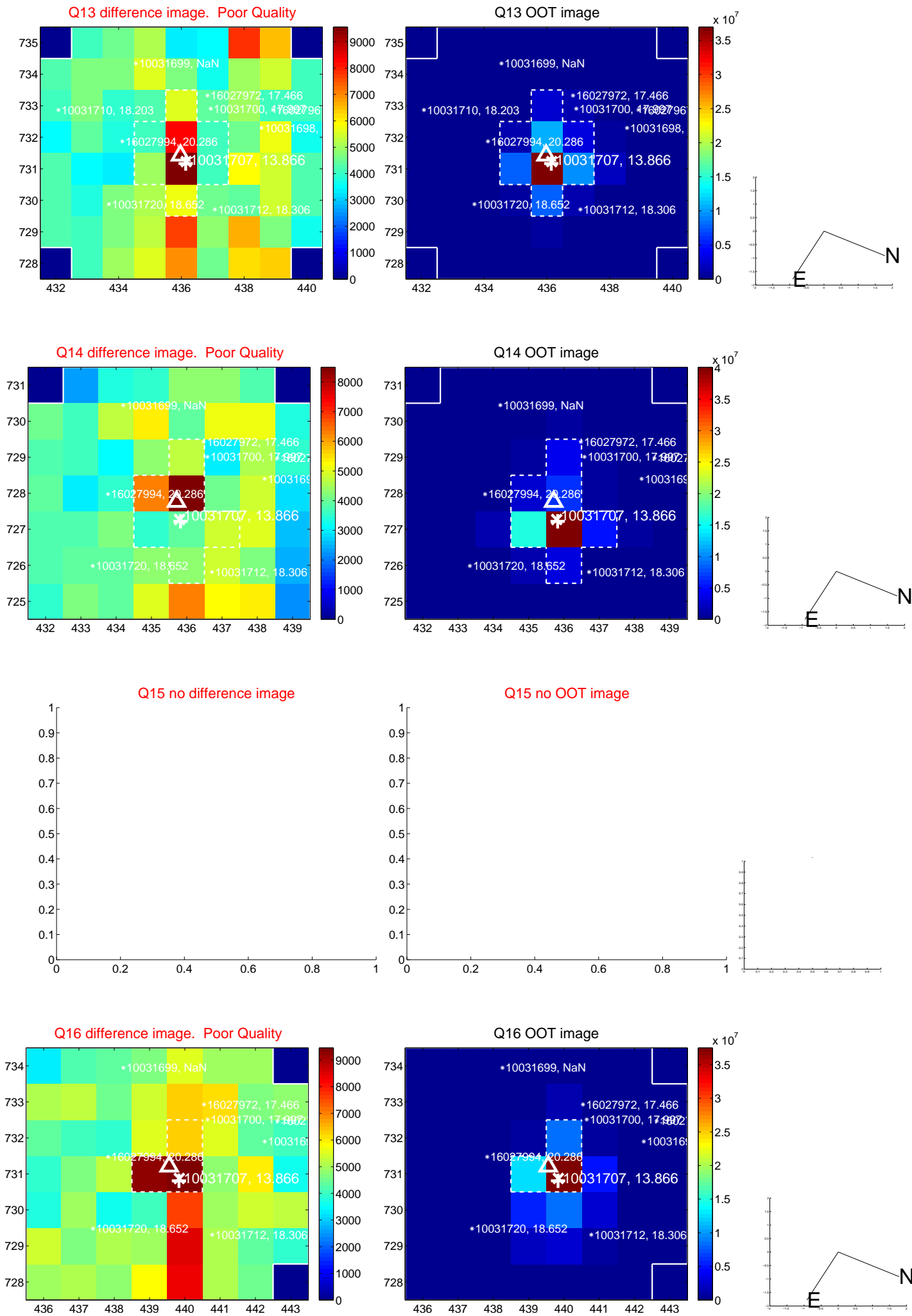
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



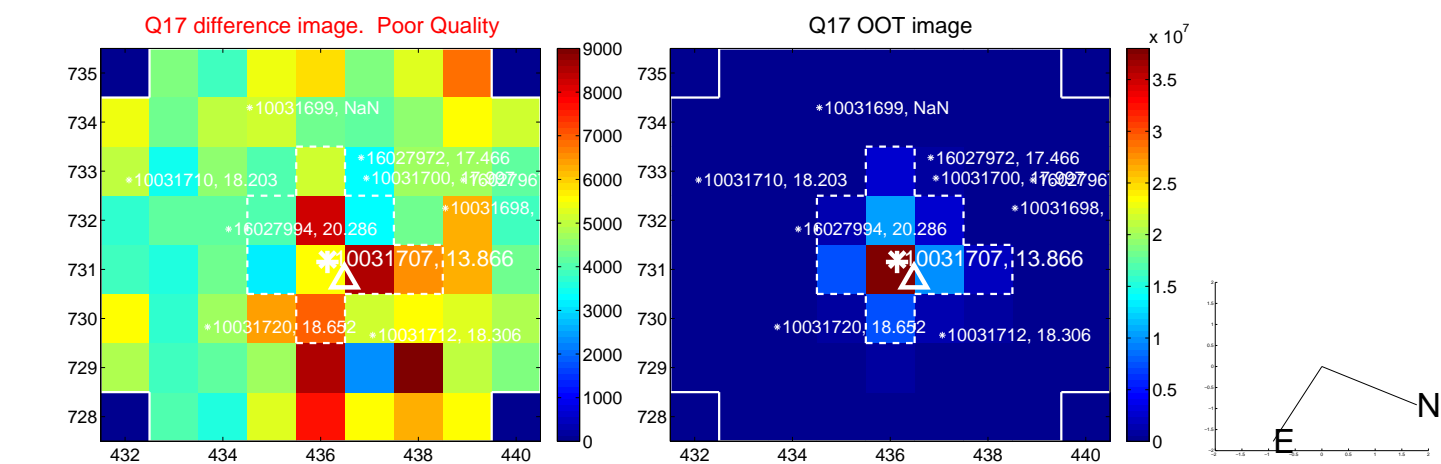
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



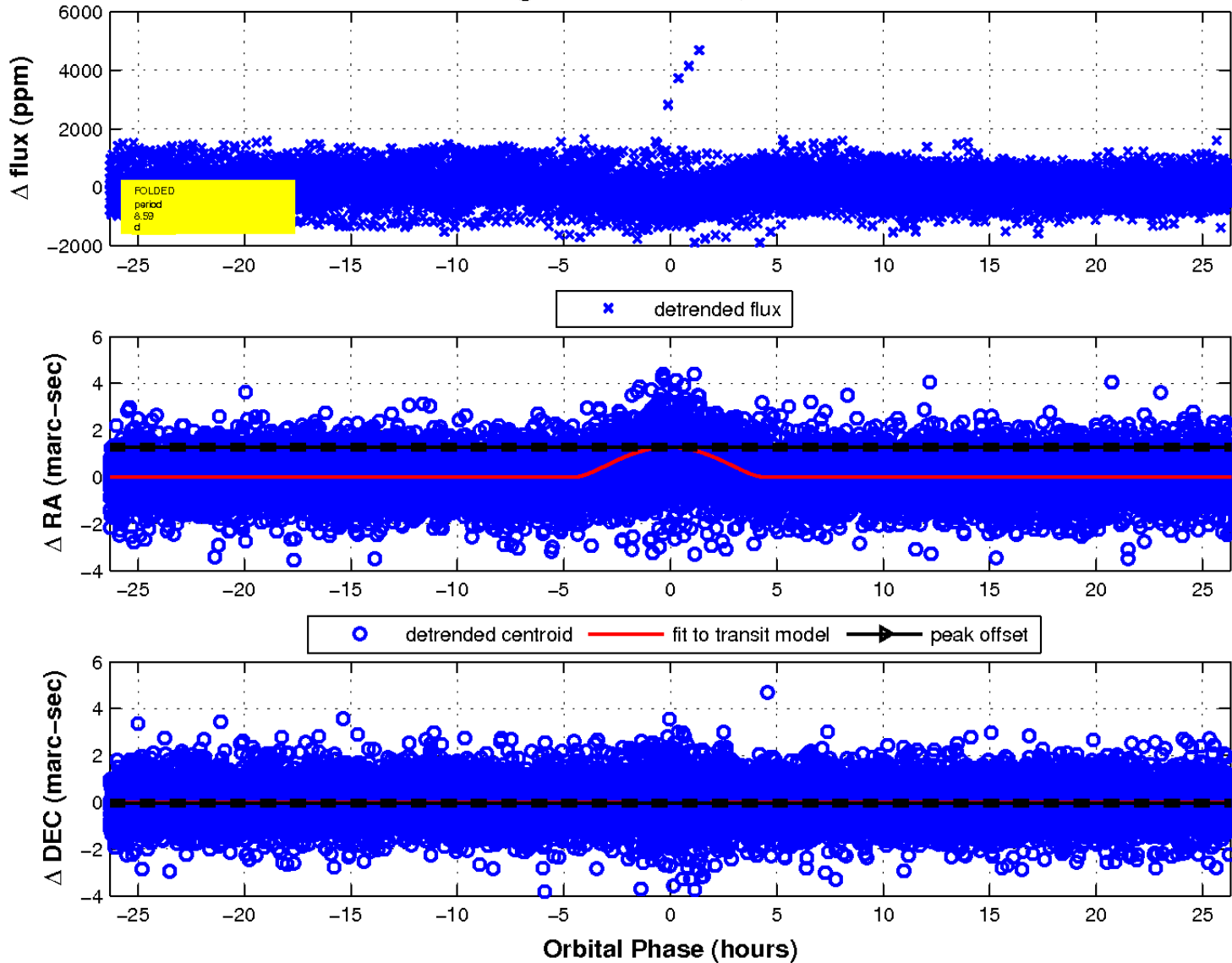
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

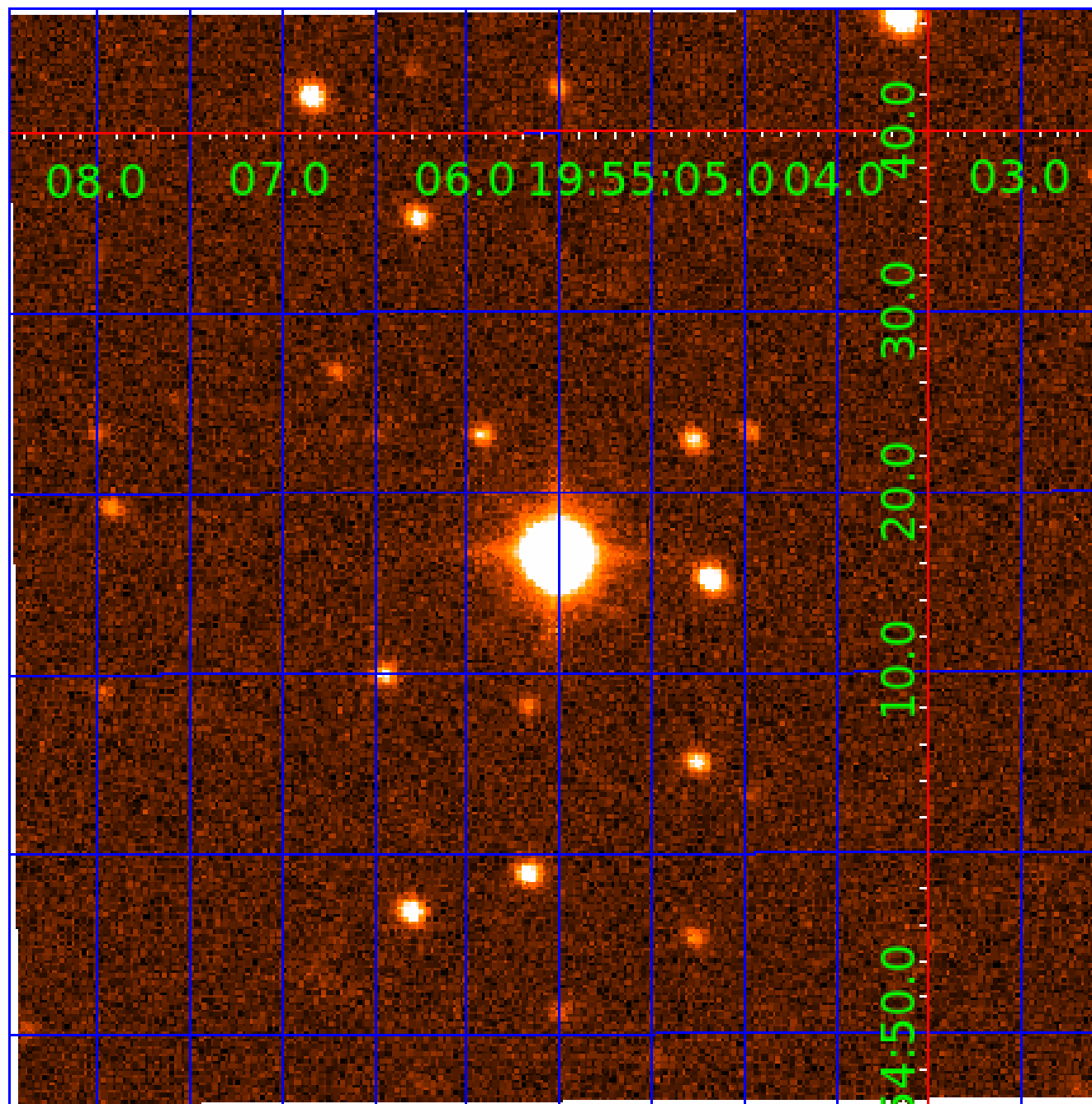


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010031707

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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010031707-02	OBS	No	8.589818	136.183404	125.1	8.360	15.7	16.5	80.31	3837	83.66	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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010031707-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—HALO_GHOST—EPHEM_MATCH

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.

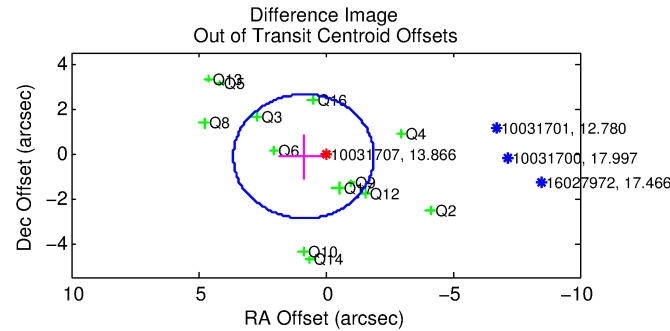
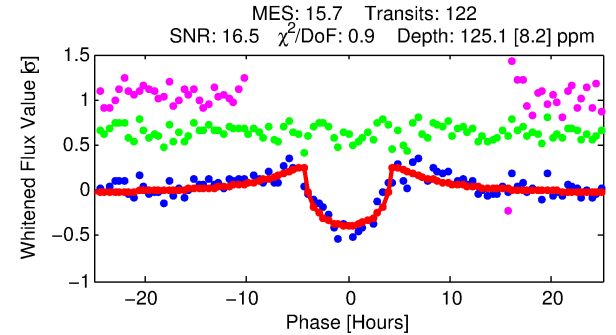
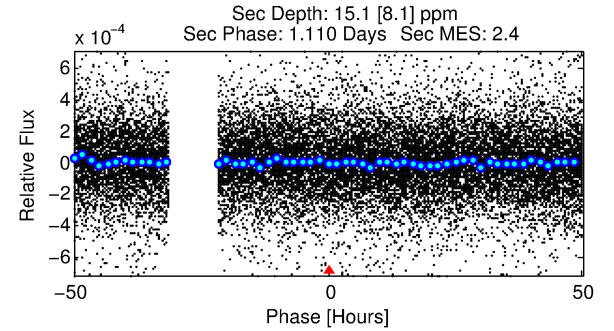
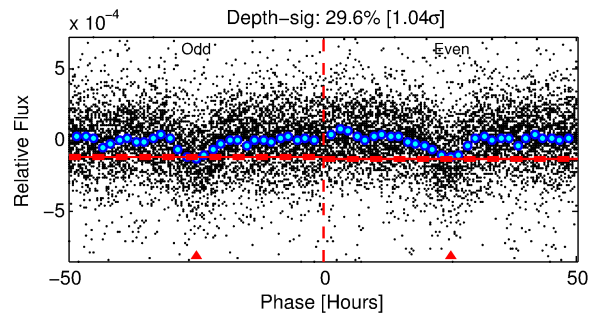
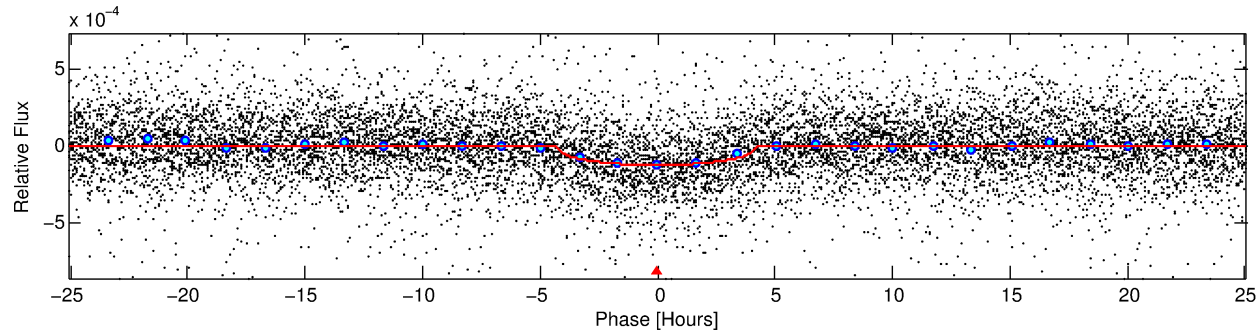
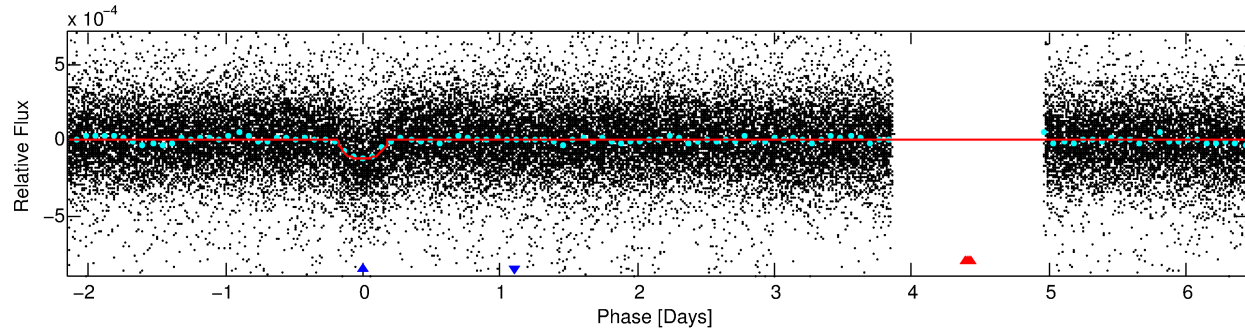
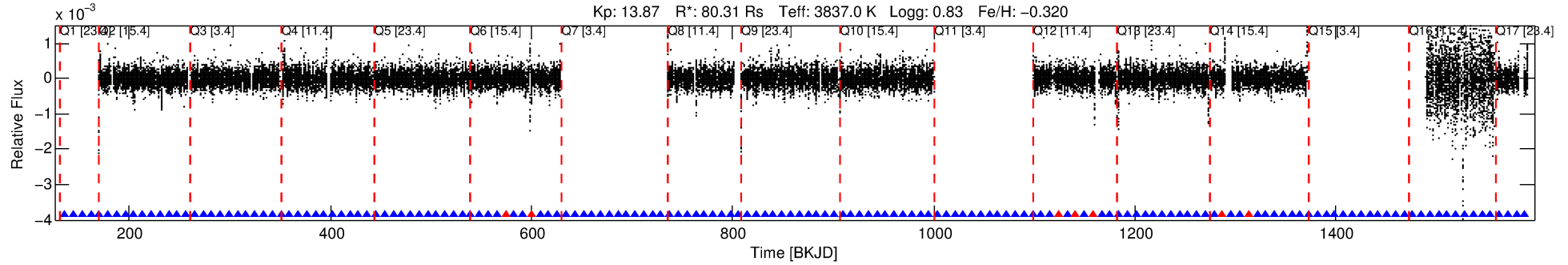
Ephemeris Match Information For 010031707-02

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
010031707-02	10031707	010031808-02	10031808	1:1	68.7	18	0	9.56	13.87	645.58	Direct-PRF	0	0.95	0.79

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: 10031707 Candidate: 2 of 2 Period: 8.590 d
KOI: K01827 Corr: No Ephemeris Match



DV Fit Results:

Period = 8.58982 [0.00007] d
Epoch = 136.1834 [0.0062] BKJD
Rp/R* = 0.0095 [0.0032]
a/R* = 7.92 [6.18]
b = 0.08 [10.57]
Seff = N/A
Teq = N/A
Rp = 83.66 [32.09] Re
a = N/A
Ag = N/A
Teffp = N/A

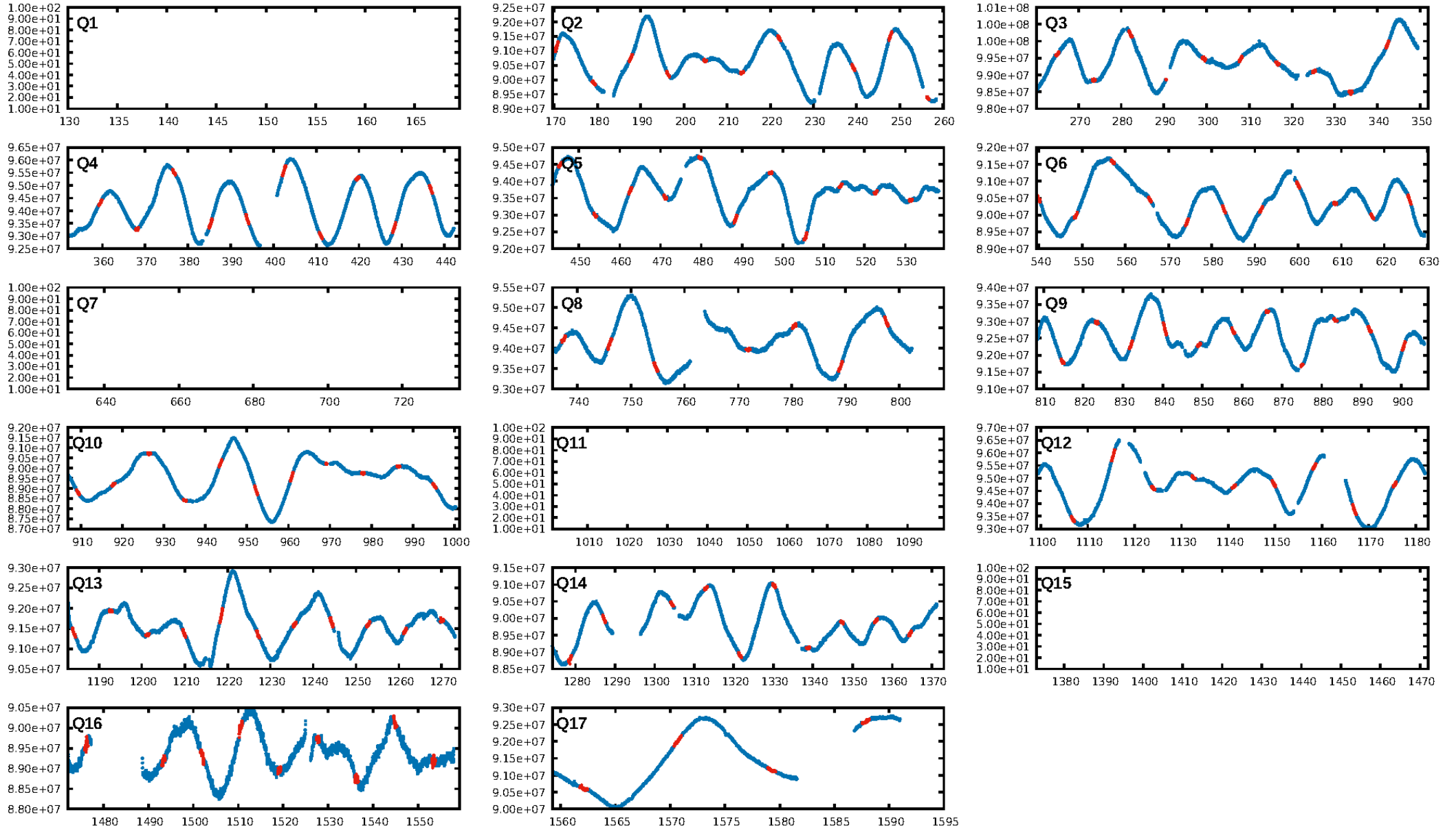
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.51e-46
RollingBand-fgt: 0.94 [111/118]
GhostDiagnostic-chr: -0.1109
Centroid-sig: 0.0%
Centroid-so: 2.773 arcsec [4.30 σ]
OotOffset-rm: 0.871 arcsec [0.95 σ]
KicOffset-rm: 1.060 arcsec [1.15 σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 0.31 [4/13]
DiffImageOverlap-fno: 1.00 [13/13]

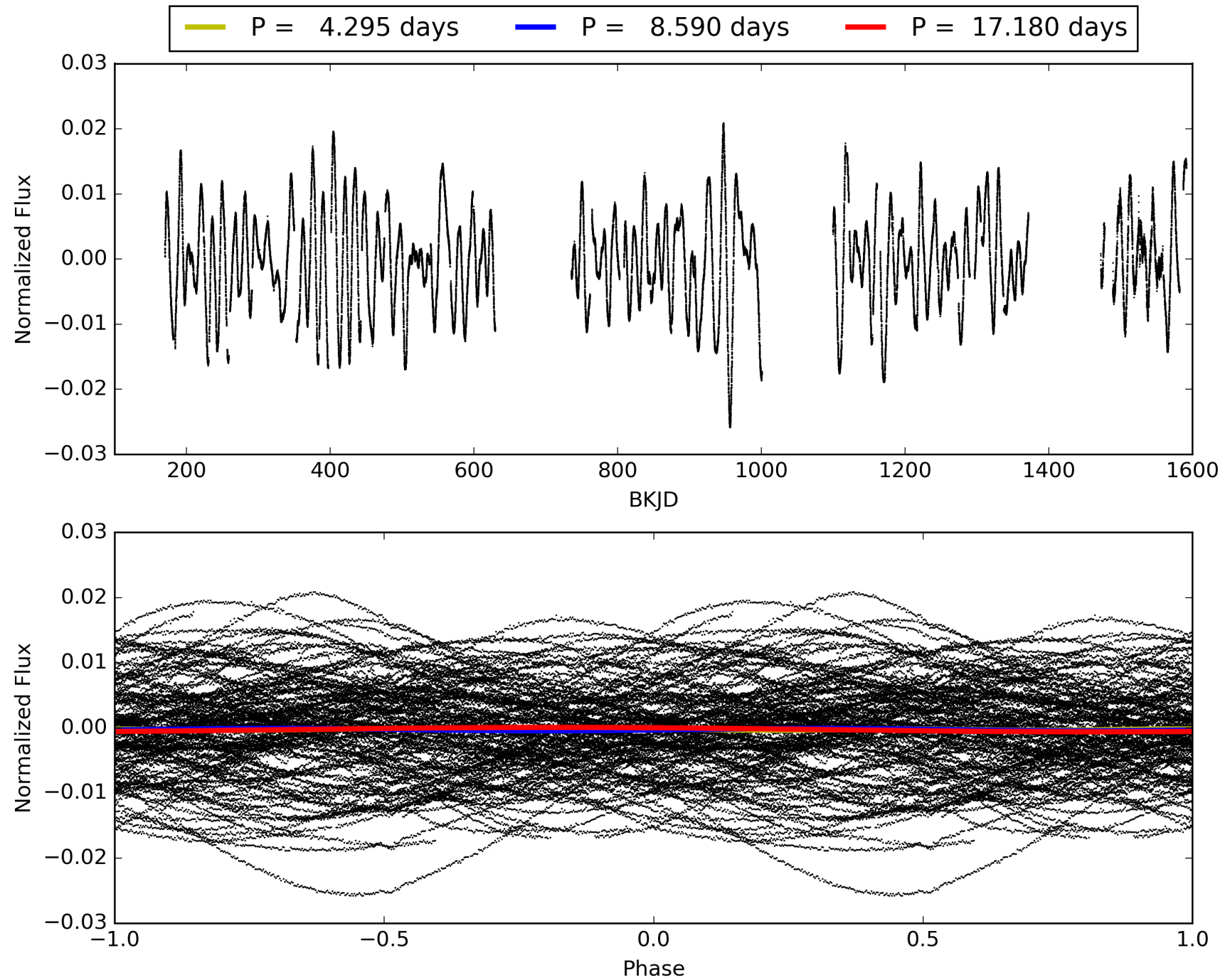
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:03:20 Z

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

TCE 010031707-02, PDC Light Curves

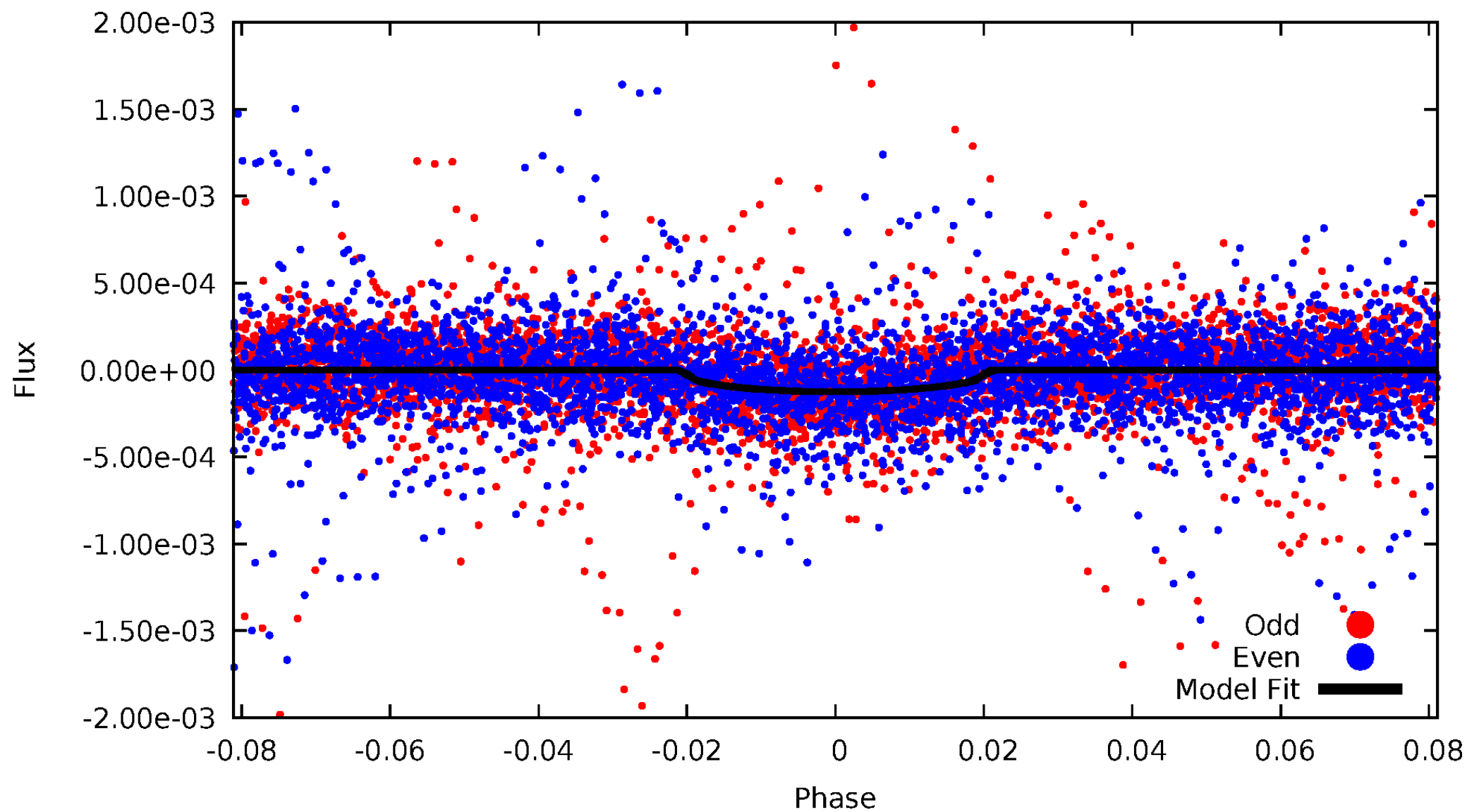


TCE 010031707-02



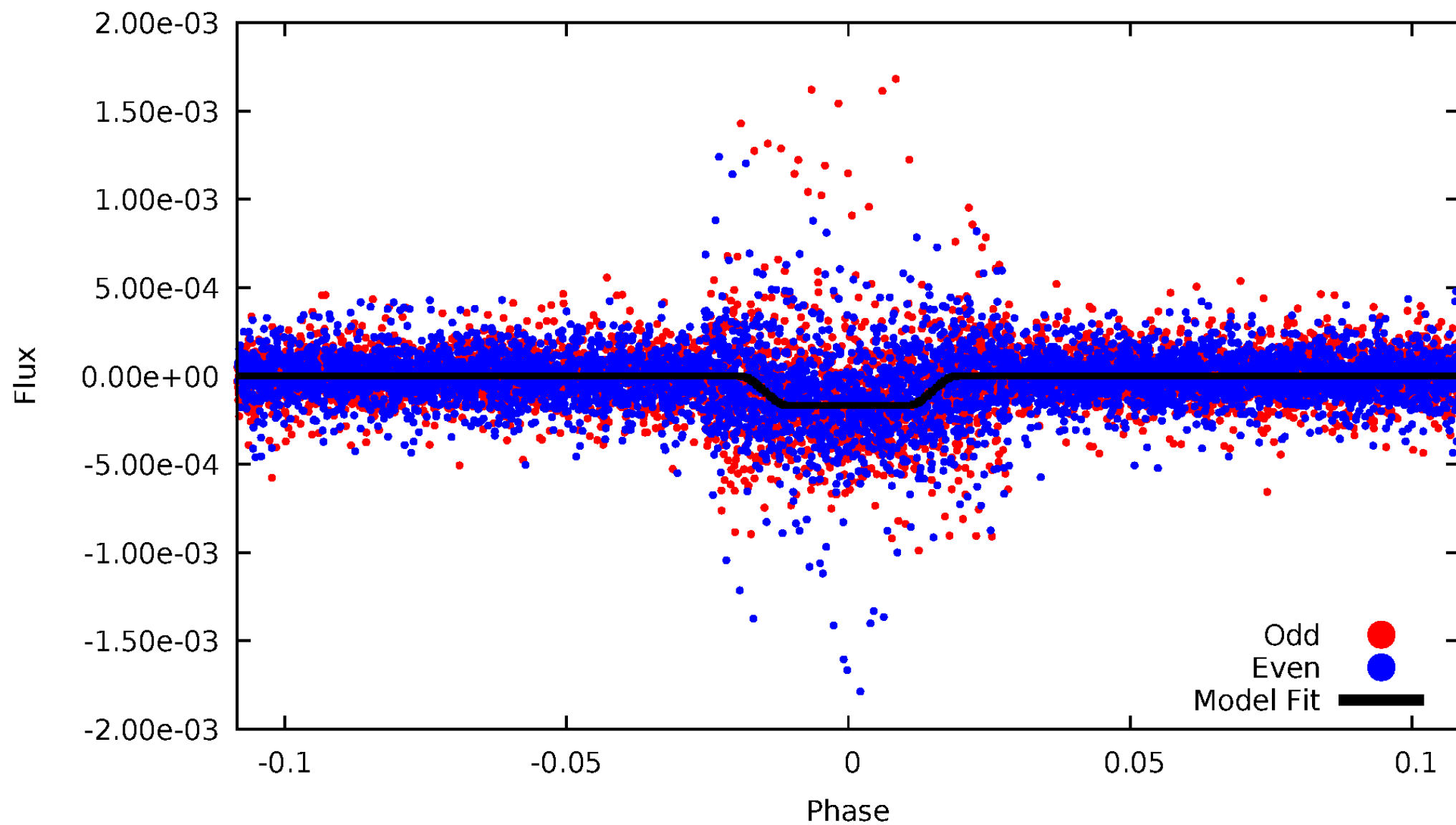
DV Odd/Even

TCE 010031707-02



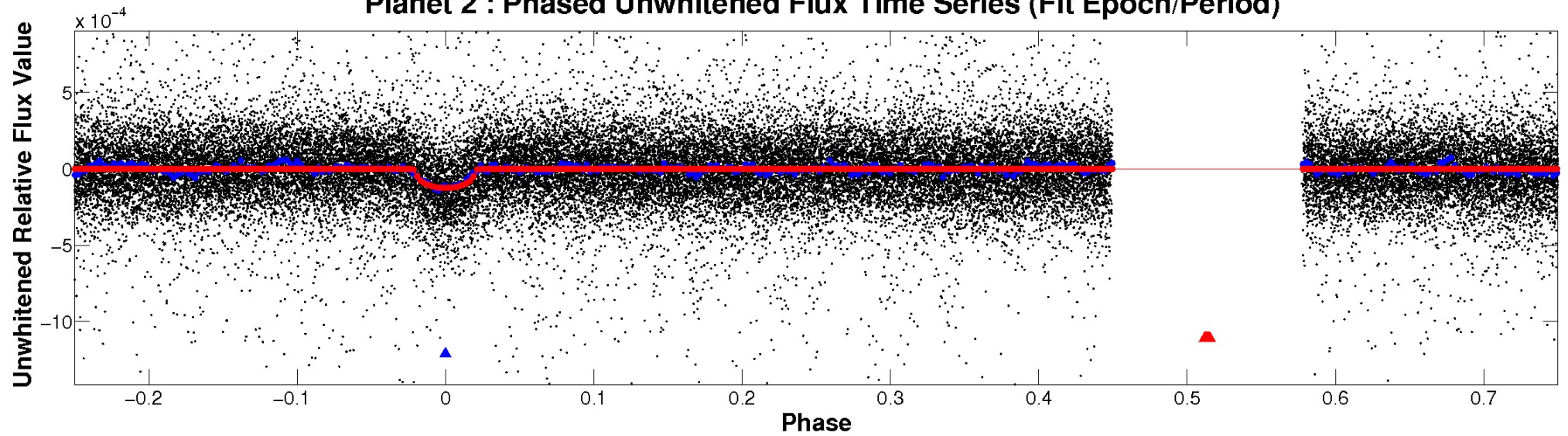
ALT Odd/Even

TCE 010031707-02

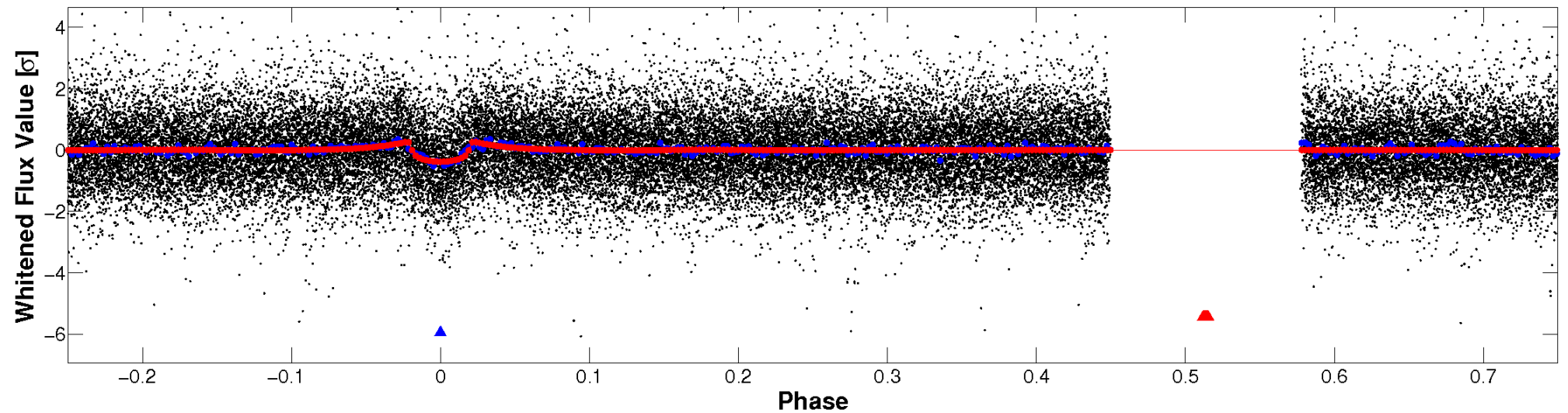


Non-Whitened Vs. Whitened Light Curve

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

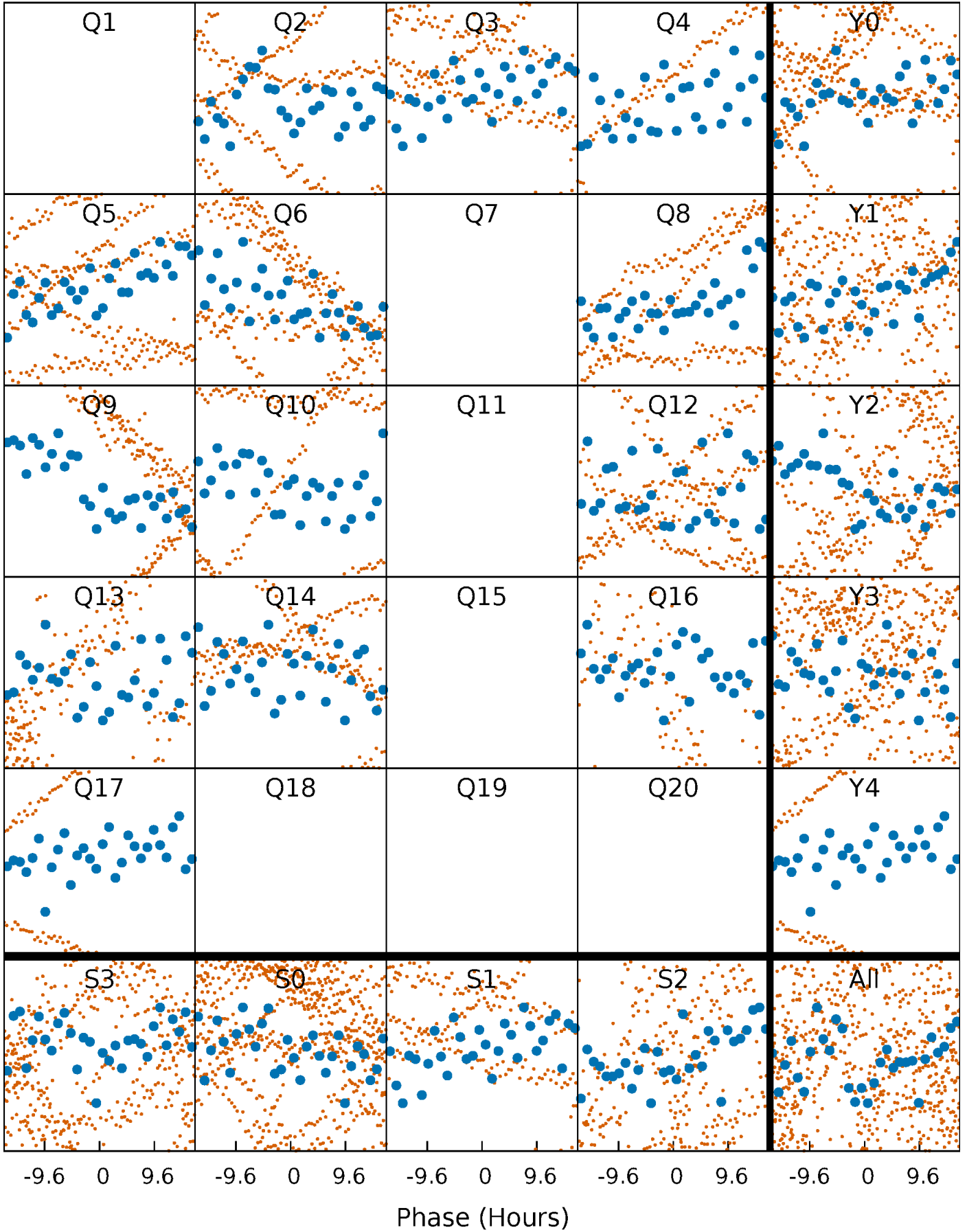


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



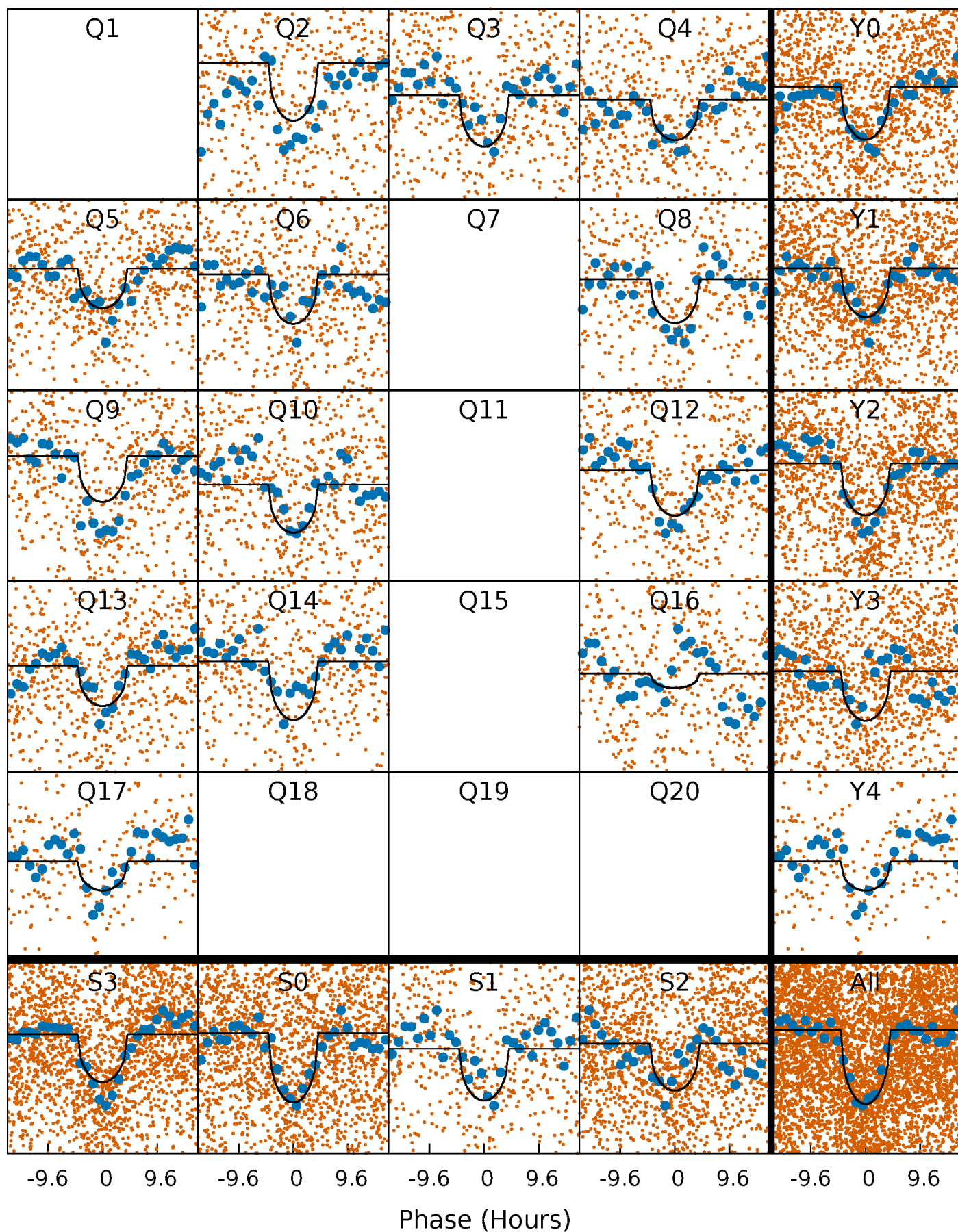
PDC Quarter-Phased Transit Curves

TCE 010031707-02 P= 8.589818 Days $T_0=136.183404$ (BKJD)



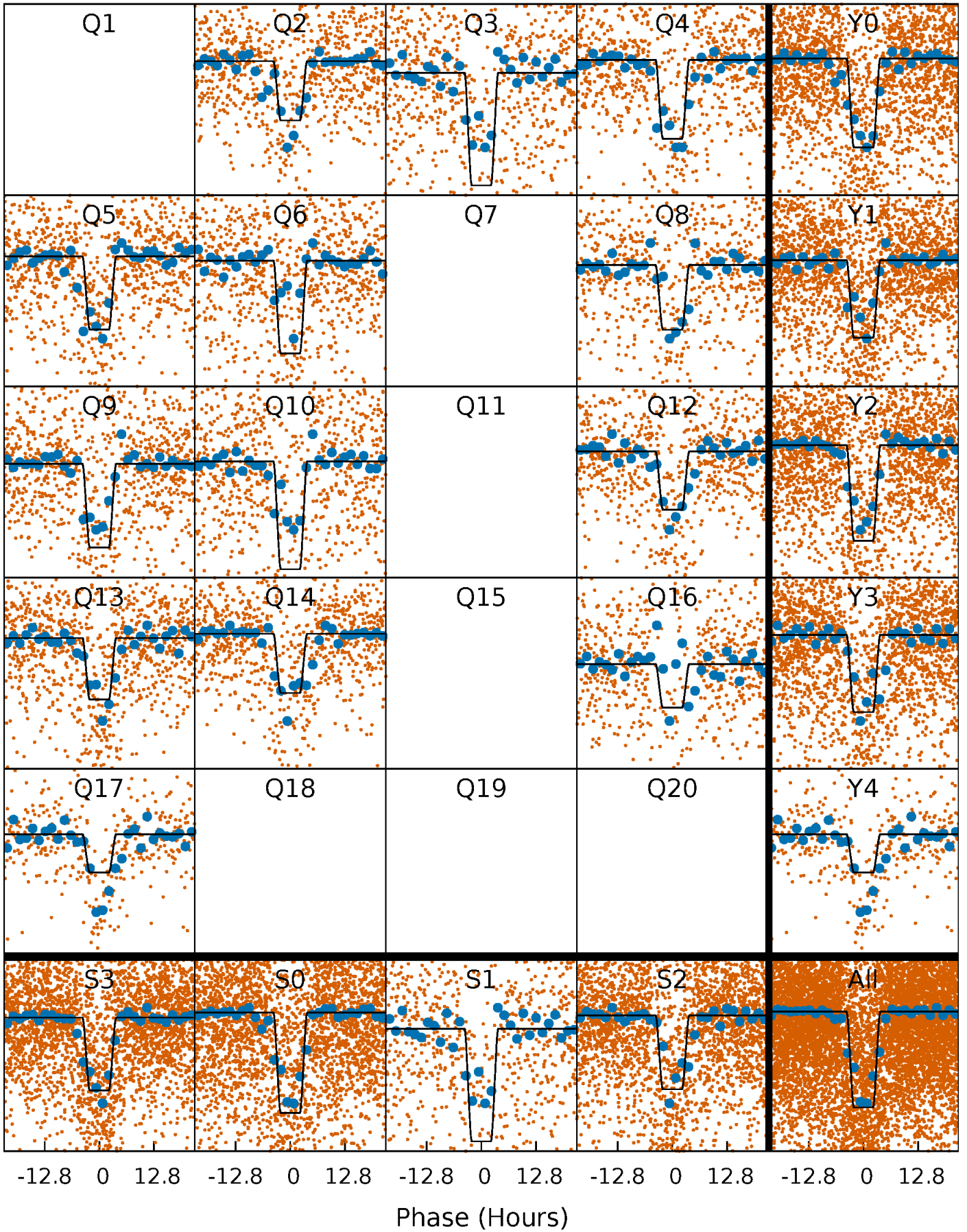
DV Quarter-Phased Transit Curves

TCE 010031707-02 P= 8.589818 Days $T_0=136.183404$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

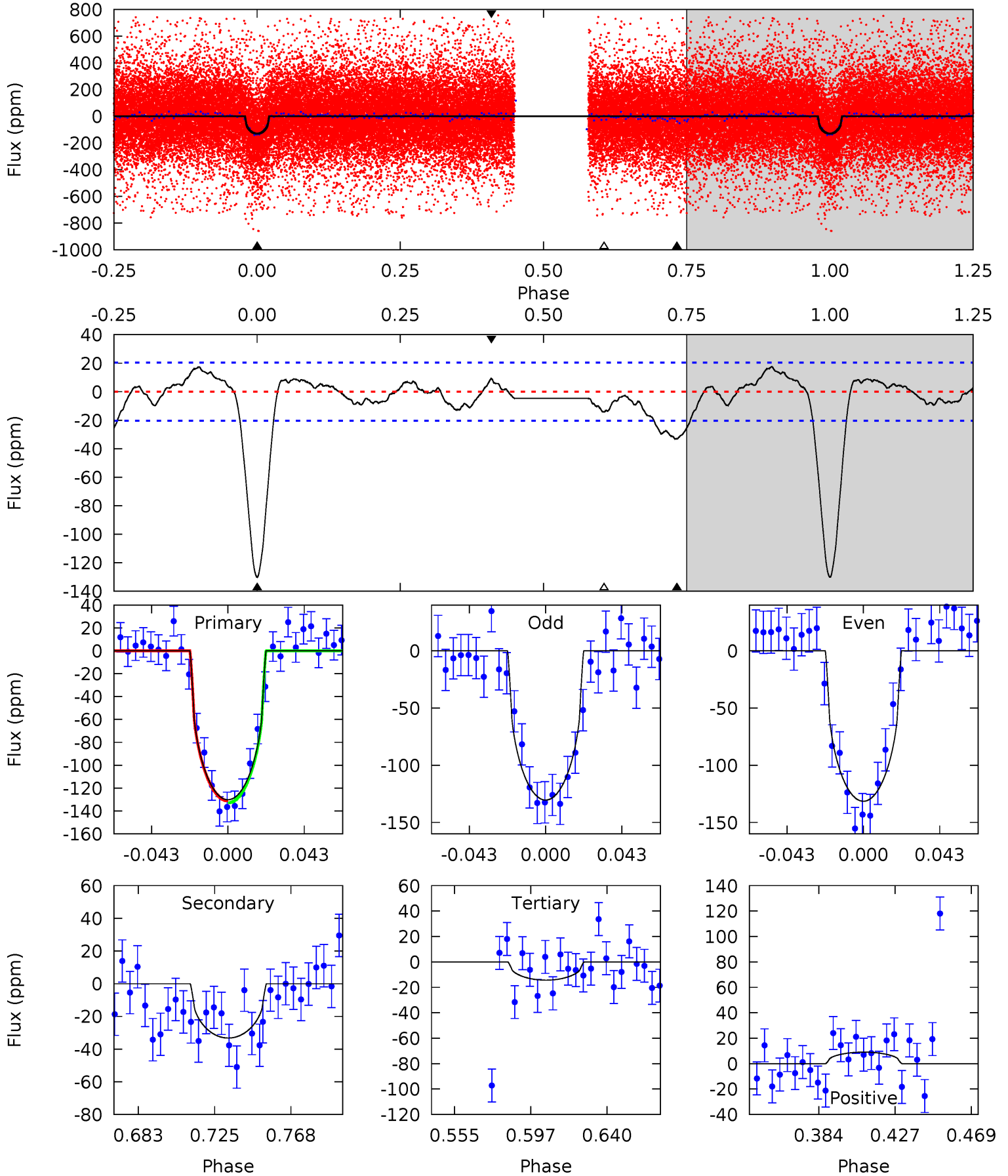
TCE 010031707-02 P= 8.589540 Days $T_0=136.178060$ (BKJD)



DV Model-Shift Uniqueness Test

010031707-02, P = 8.589818 Days, E = 136.183404 Days

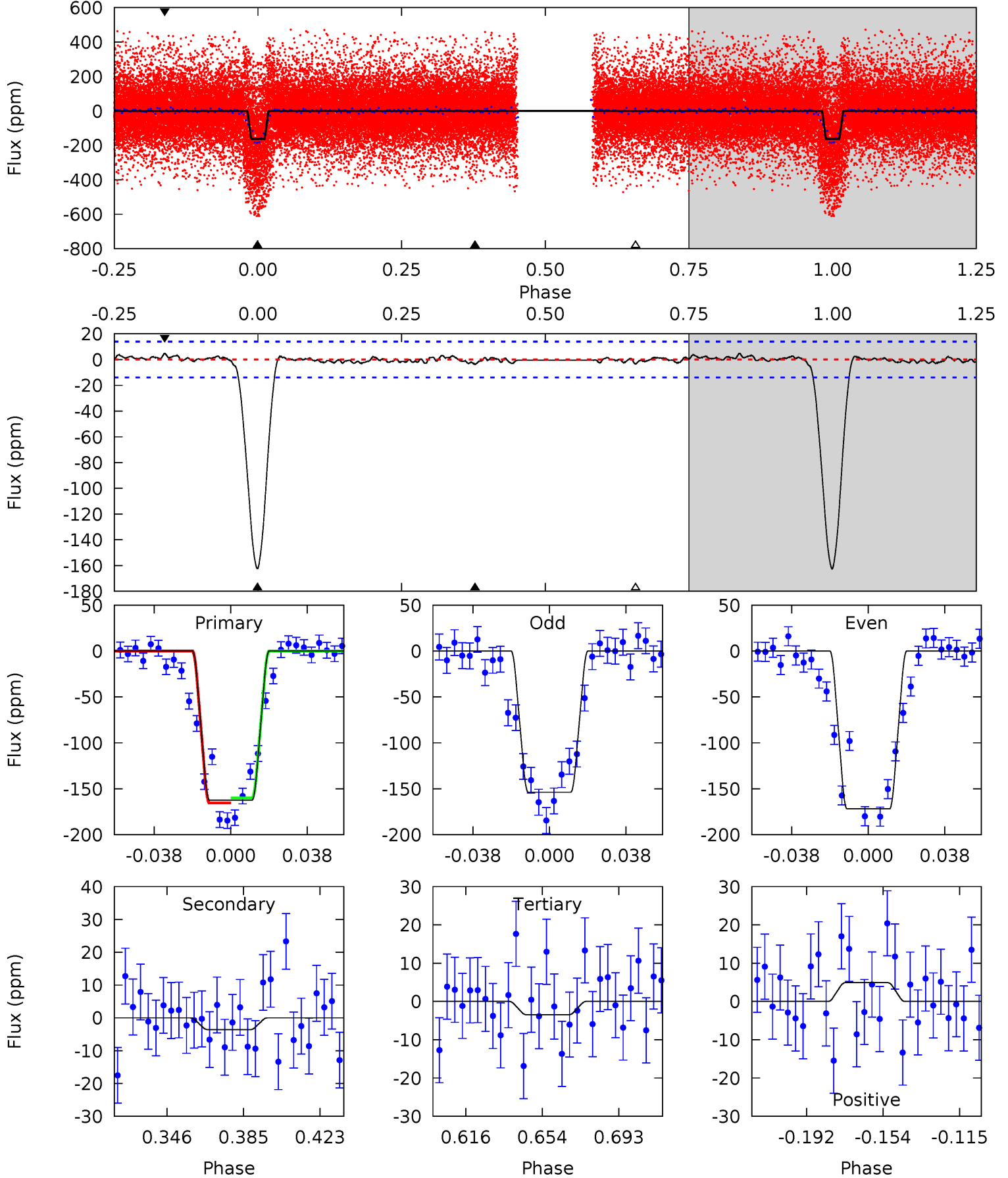
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.3	7.72	3.34	2.11	4.74	2.03	1.76	26.9	28.2	4.39	5.62	0.12	0.98	0.12	0.22



Alt Model-Shift Uniqueness Test

010031707-02, P = 8.589540 Days, E = 136.178060 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.5	1.23	1.18	1.67	4.76	2.07	0.54	54.3	53.8	0.04	-0.45	3.08	1.00	0.03	0.96



Stellar Parameters For KIC 010031707

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3837^{+90}_{-102}	$0.829^{+0.030}_{-0.030}$	$-0.320^{+0.200}_{-0.250}$	$80.307^{+2.693}_{-14.364}$	$1.585^{+0.092}_{-0.521}$	$0.000^{+0.000}_{-0.000}$
	+2%/-3%	+4%/-4%	+62%/-78%	+3%/-18%	+6%/-33%	+25%/-8%
Source	PHO54	AST54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 010031707-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-33 ± 4	$84.56^{+27.72}_{-27.35}$	6845^{+183}_{-211}	-5001^{+219}_{-197}	$0.023^{+0.029}_{-0.010}$
Alt.	-4 ± 3	$112.80^{+29.19}_{-27.41}$	6856^{+182}_{-214}	-5130^{+192}_{-163}	$0.001^{+0.002}_{-0.001}$

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 $A_{obs} \gg 1.0$

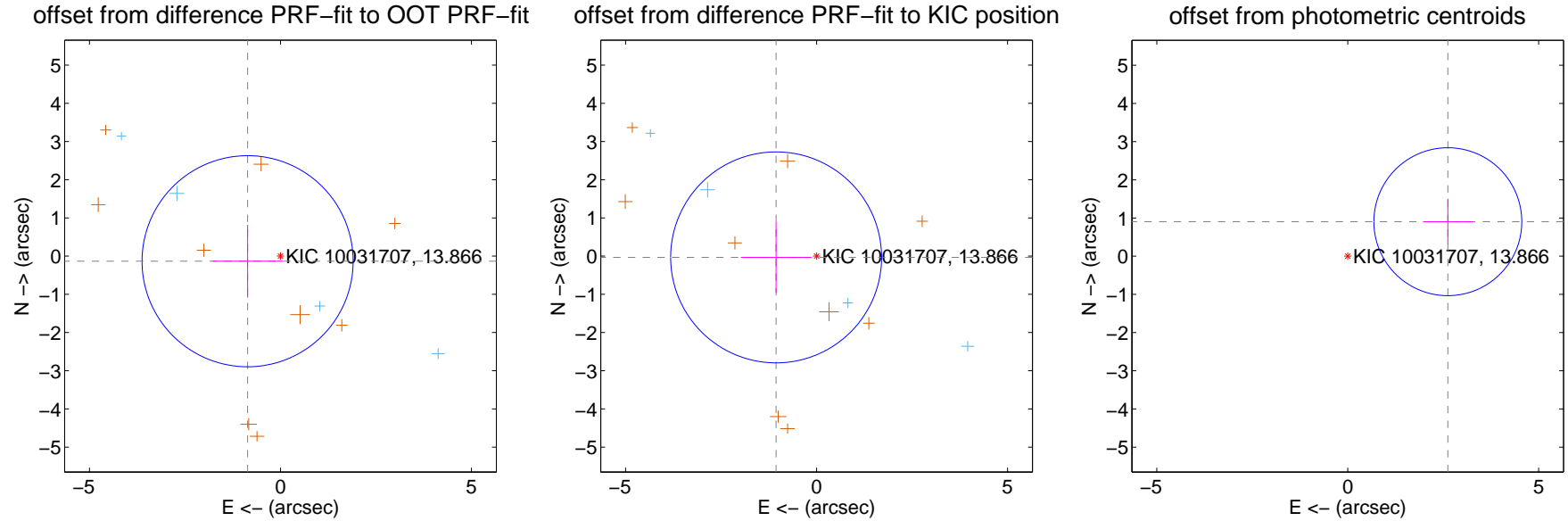
DV Centroid Data

Supplemental centroid analysis for 010031707-02. Kepler magnitude: 13.87. Transit SNR 16.45

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.871 ± 0.921	0.95	0.861 ± 0.920	-0.133 ± 0.953
PRF-fit source offset from KIC position	1.060 ± 0.920	1.15	1.059 ± 0.920	-0.033 ± 0.926
photometric centroid source offset	2.77 ± 0.65	4.30	-2.62 ± 0.65	0.90 ± 0.60



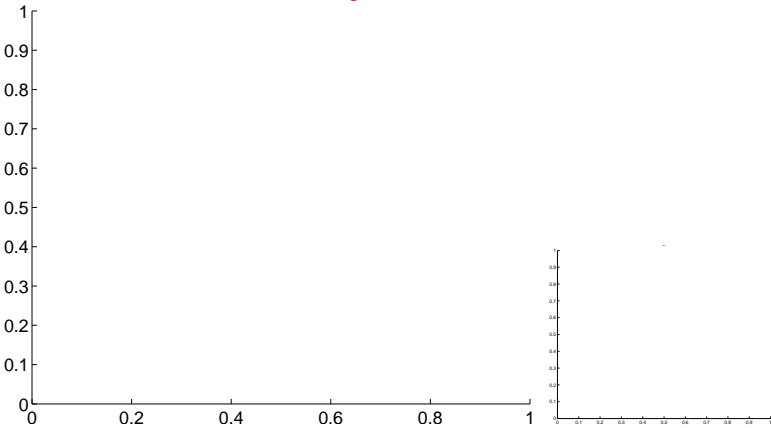
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

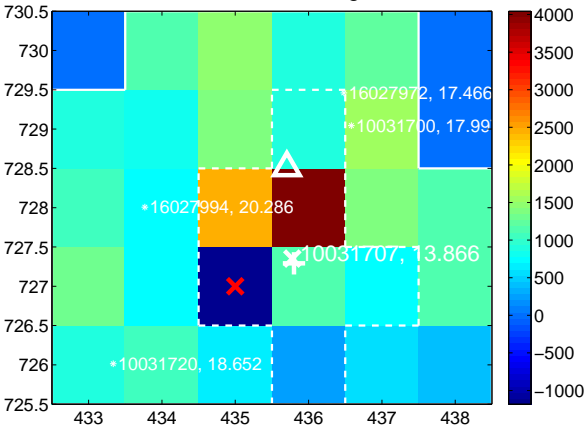
Q1 no difference image



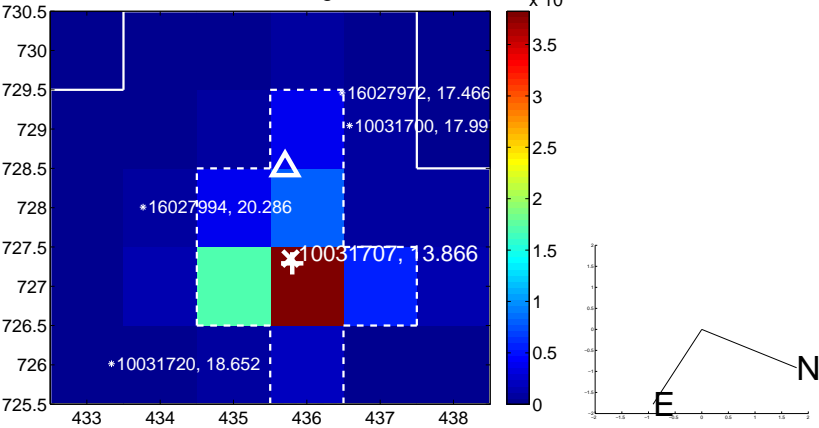
Q1 no OOT image



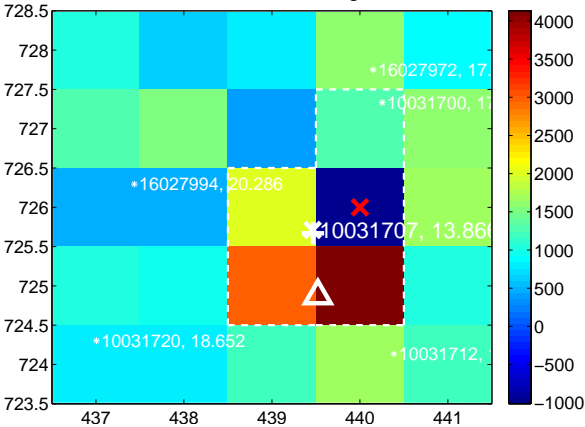
Q2 difference image



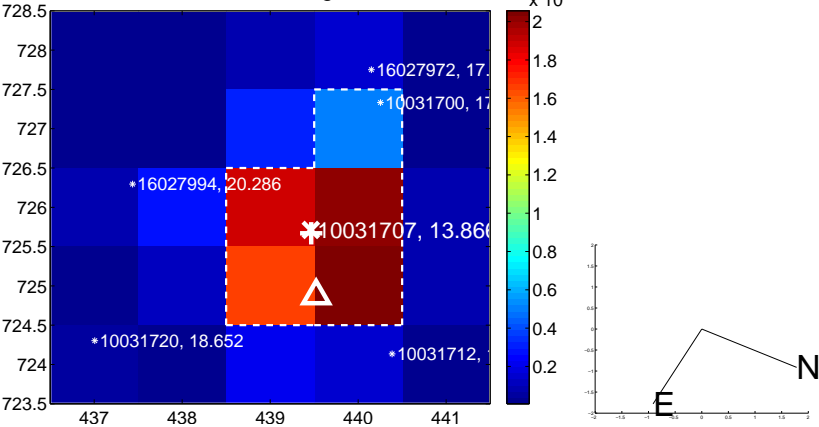
Q2 OOT image



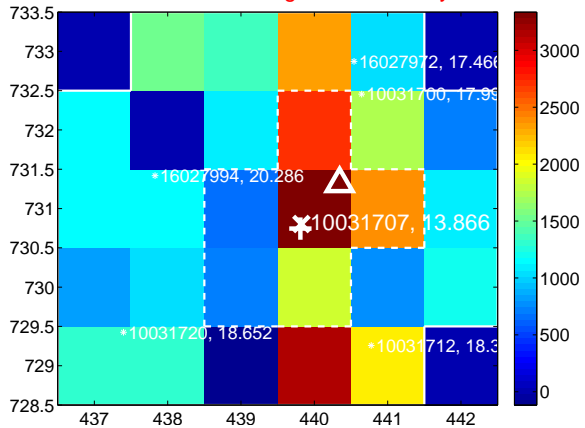
Q3 difference image



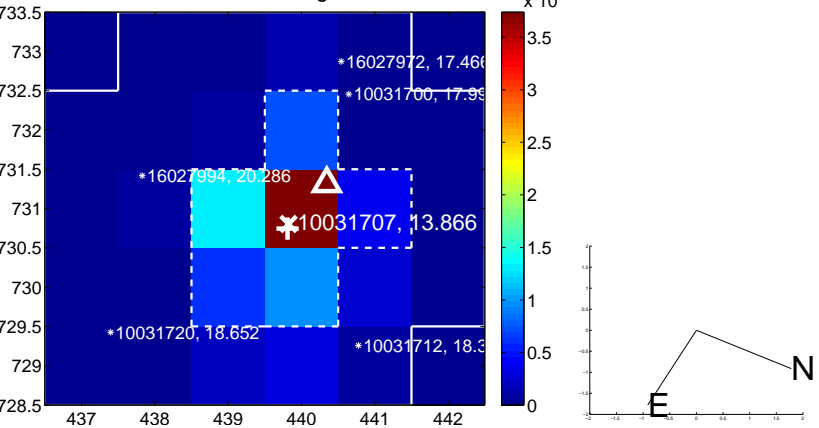
Q3 OOT image



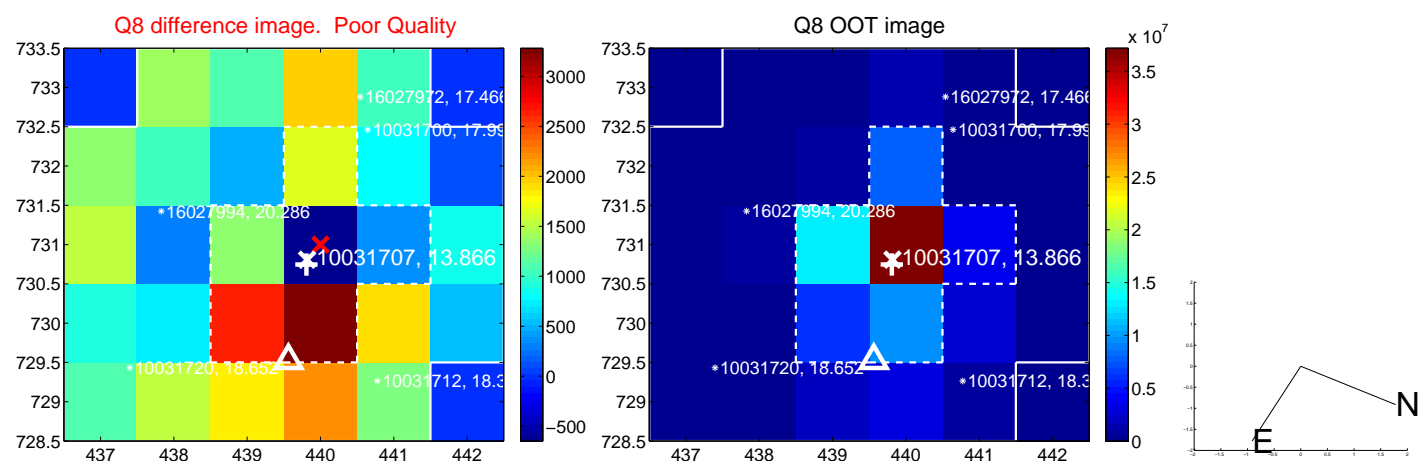
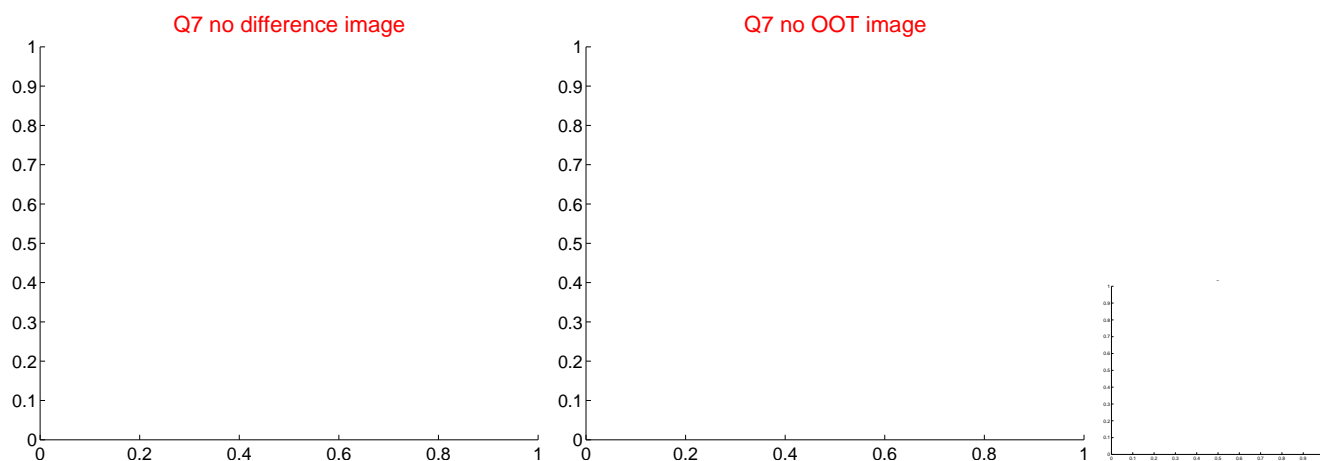
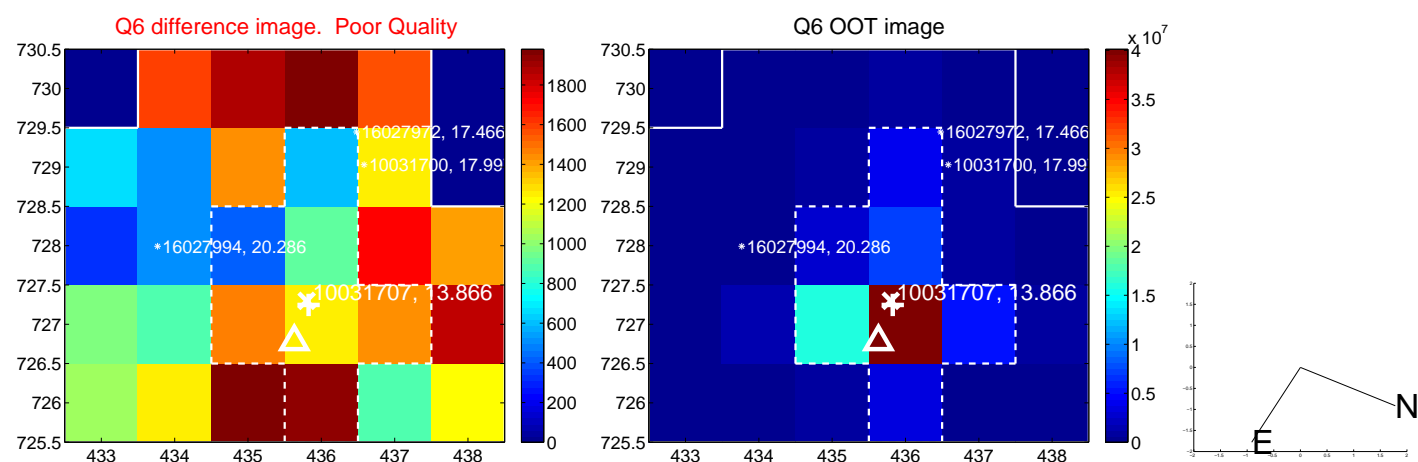
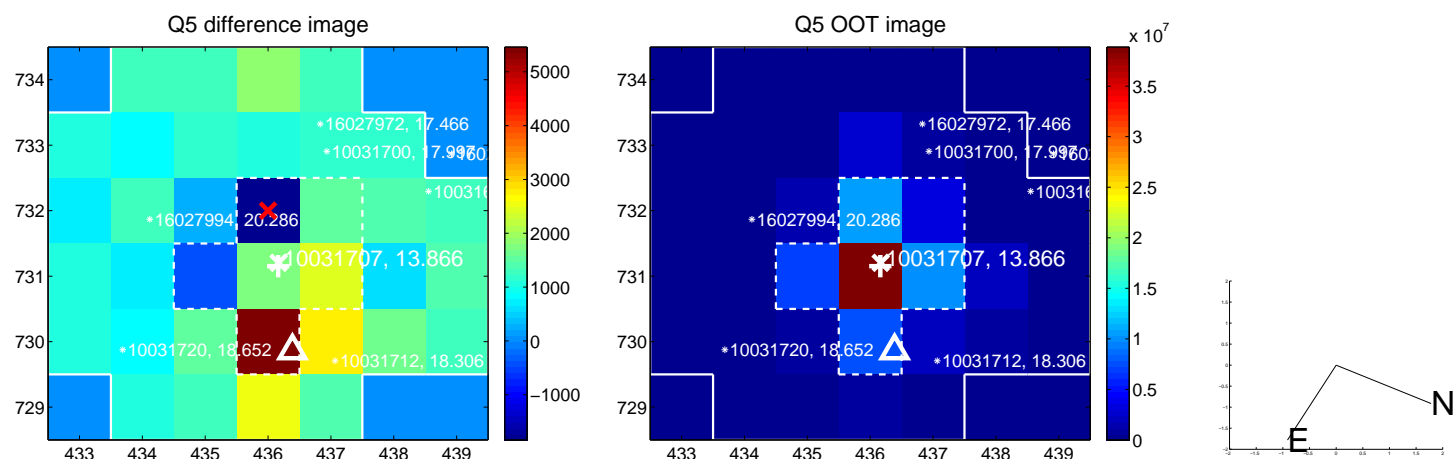
Q4 difference image. Poor Quality



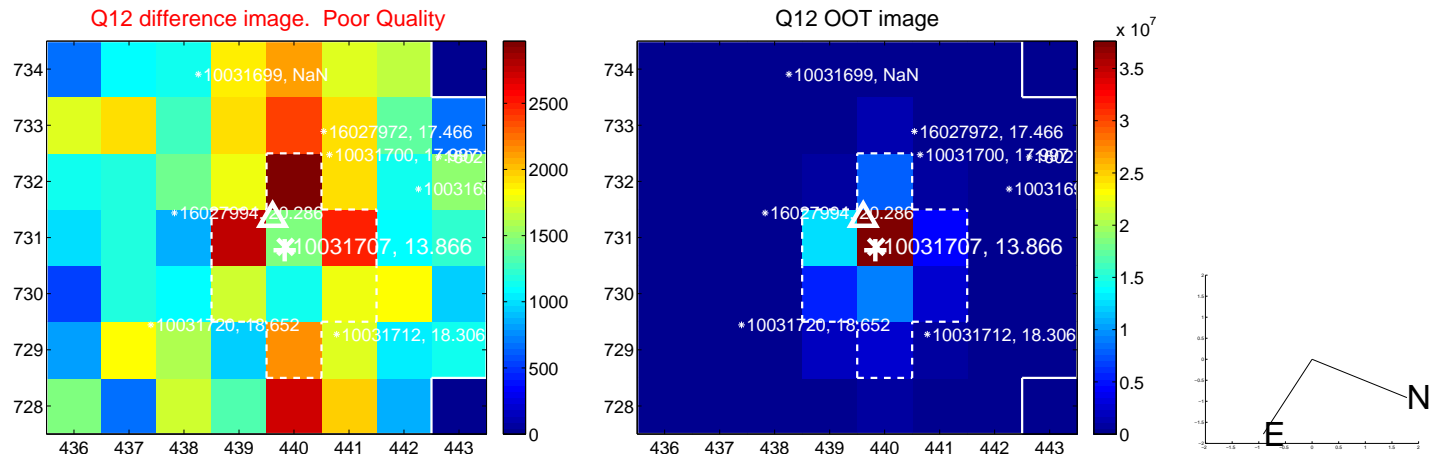
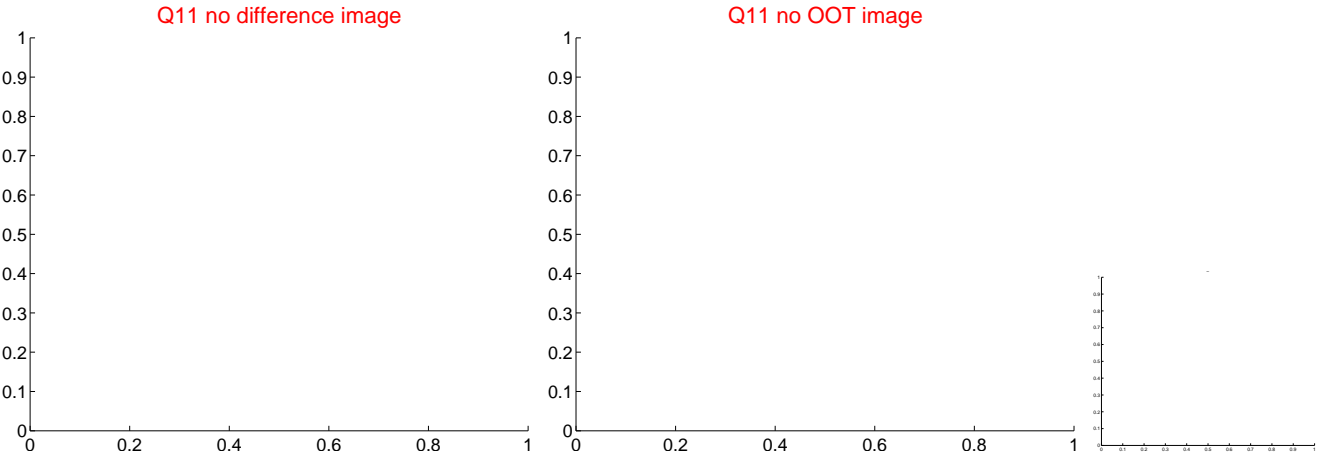
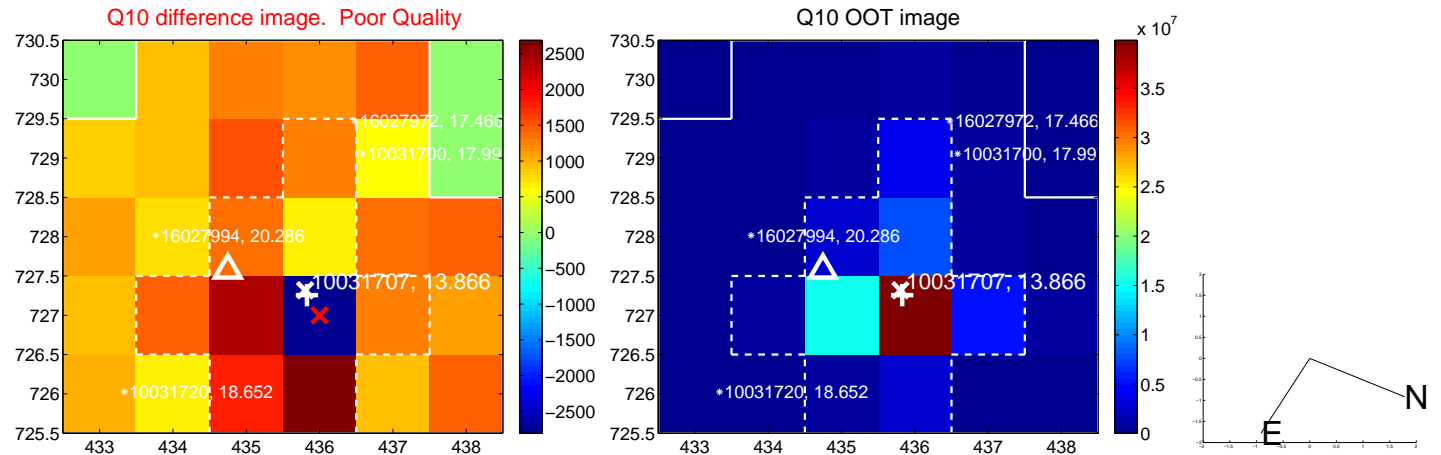
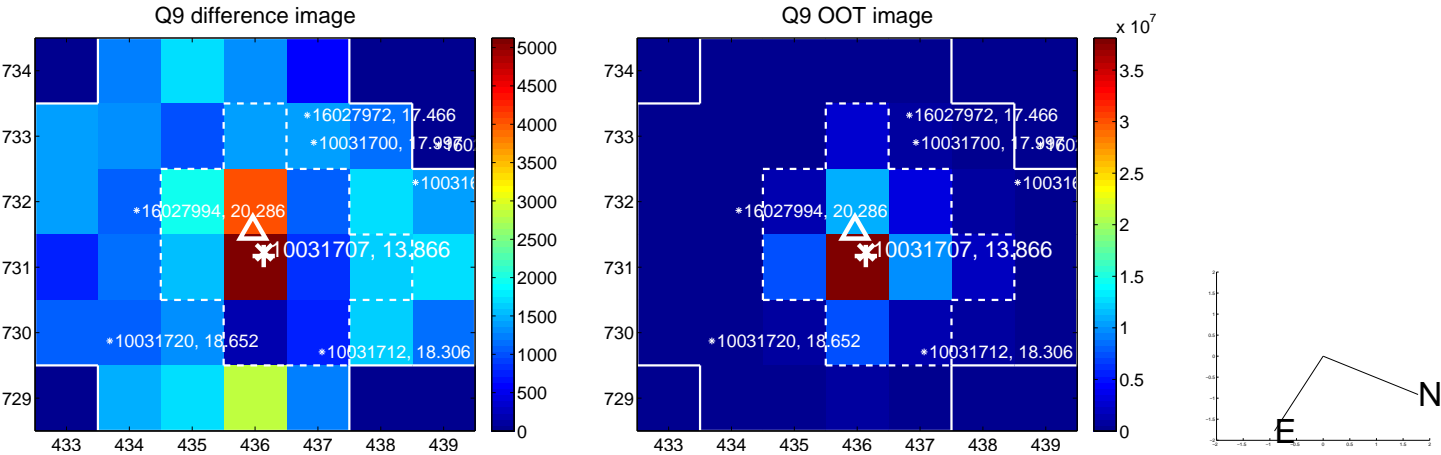
Q4 OOT image



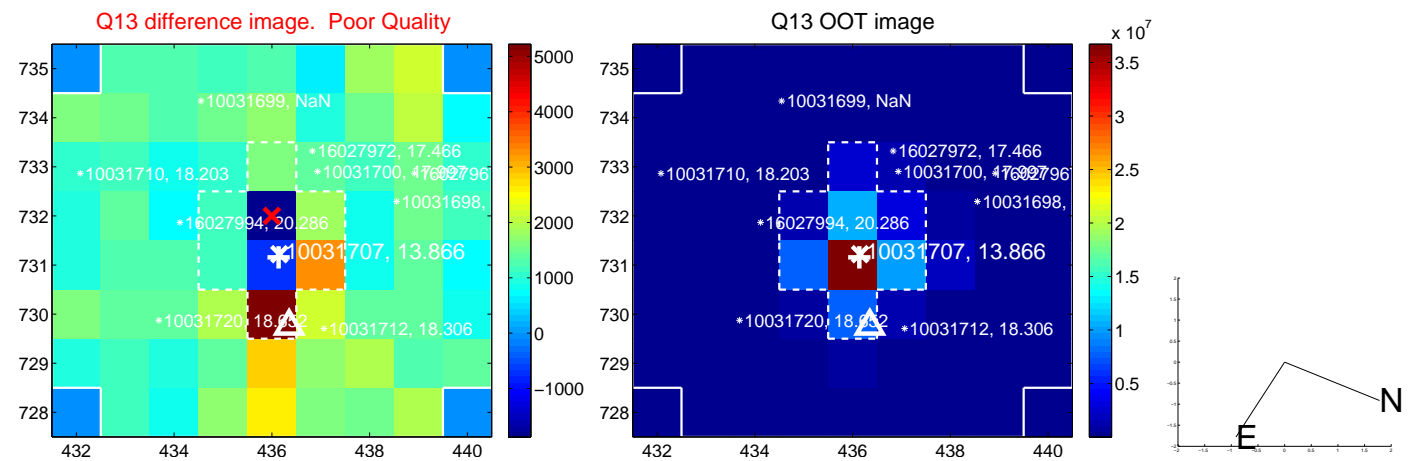
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



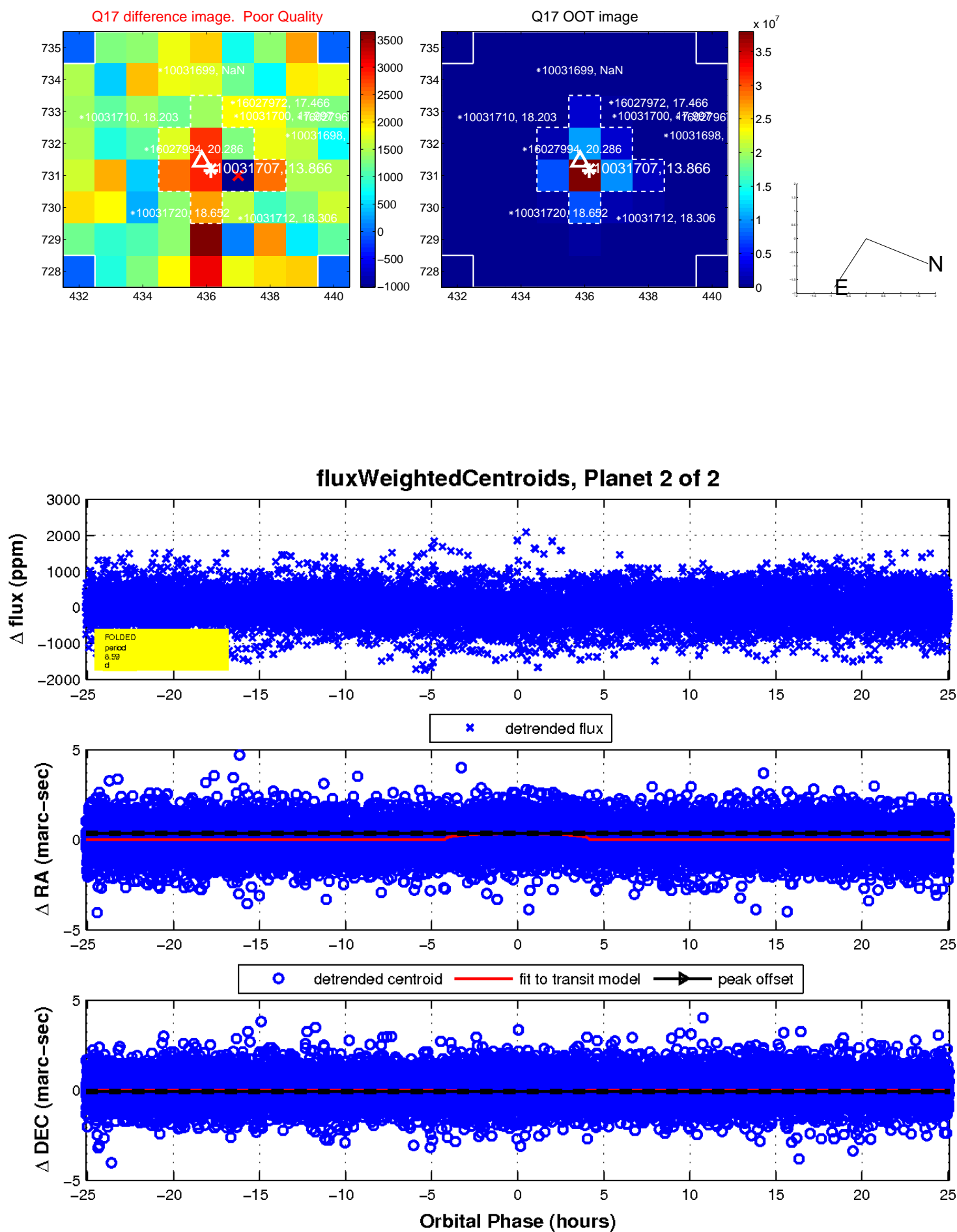
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

