

KIC 010407054

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})
010407054-01	OBS	2500.01	0.933713	132.469957	42.8	4.257	21.9	19.3	1.46	6443	0.97	8883.87
010407054-02	OBS	No	302.745071	345.572312	266.6	26.308	10.1	6.8	1.46	6443	2.53	3.99

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010407054-01	OBS	FP	0.00	0	0	1	1	CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010407054-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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 010407054-01

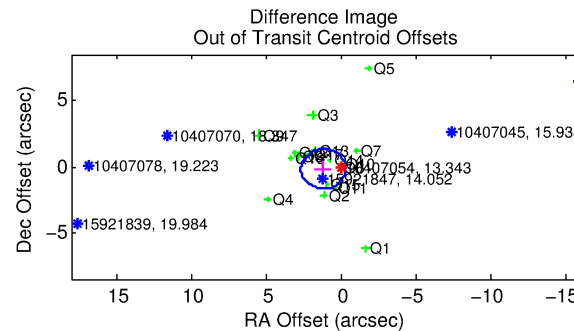
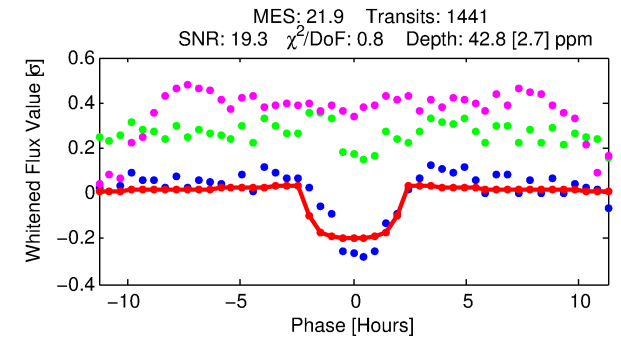
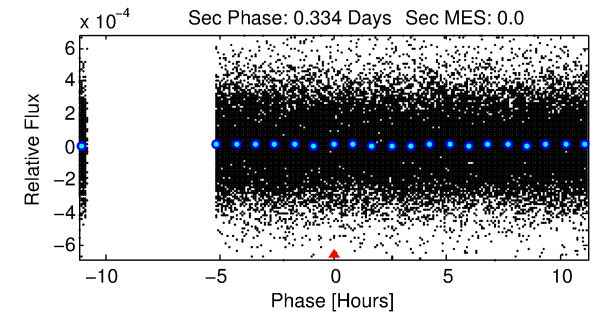
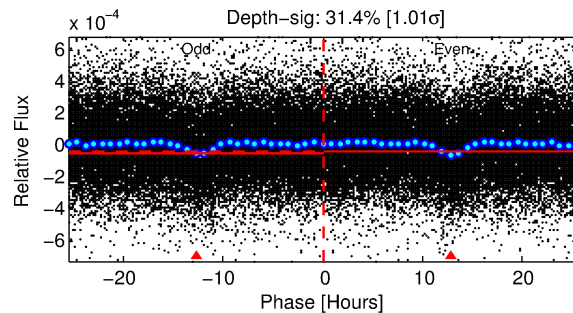
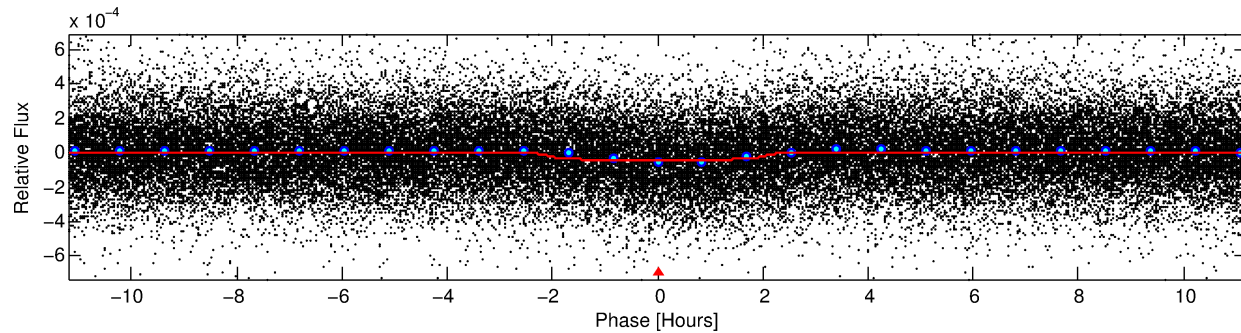
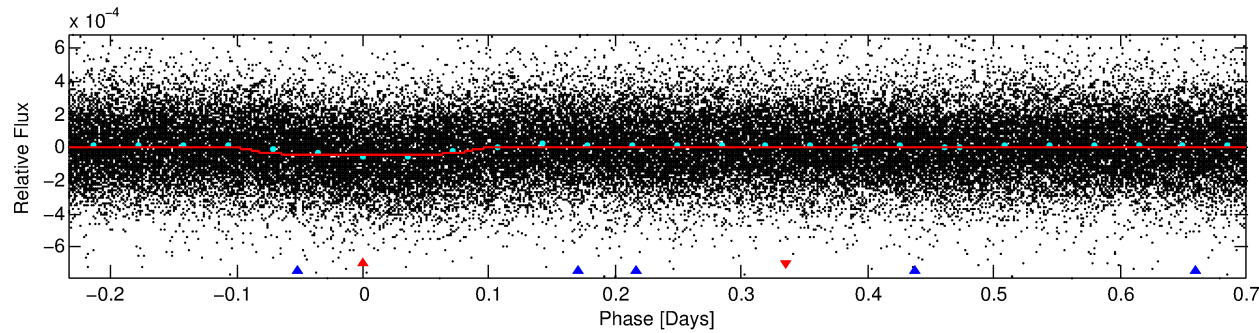
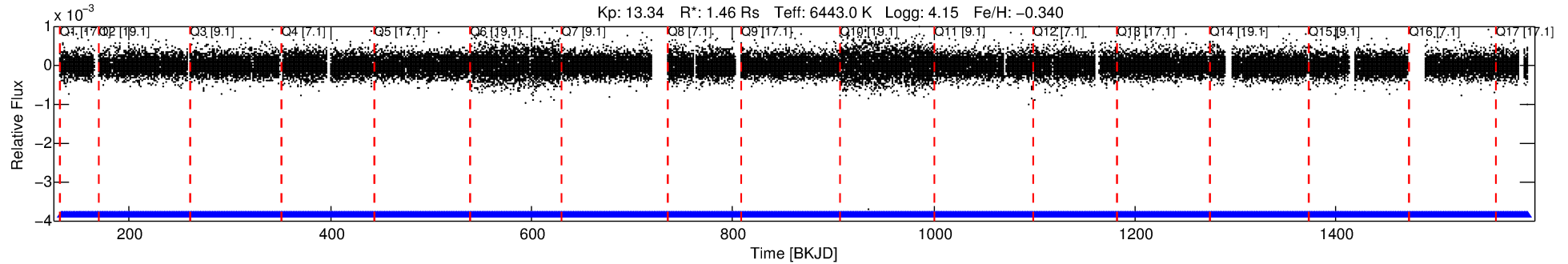
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010407054-01	10407054	1155.01	10342041	1:1	242.7	61	1	14.66	13.35	94.30	Col-Anomaly	1	3.40	1.20

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: 10407054 Candidate: 1 of 2 Period: 0.934 d
KOI: K02500.01 Corr: 0.905

Kp: 13.34 R*: 1.46 Rs Teff: 6443.0 K Logg: 4.15 Fe/H: -0.340



DV Fit Results:

Period = 0.93371 [0.00001] d
Epoch = 132.4700 [0.0023] BKJD
Rp/R* = 0.0061 [0.0023]
a/R* = 1.73 [2.28]
b = 0.32 [5.52]
Seff = 8883.87 [3978.18]
Teq = 2476 [277] K
Rp = 0.97 [0.45] Re
a = 0.0192 [0.0051] AU
Ag = N/A
Teffp = N/A

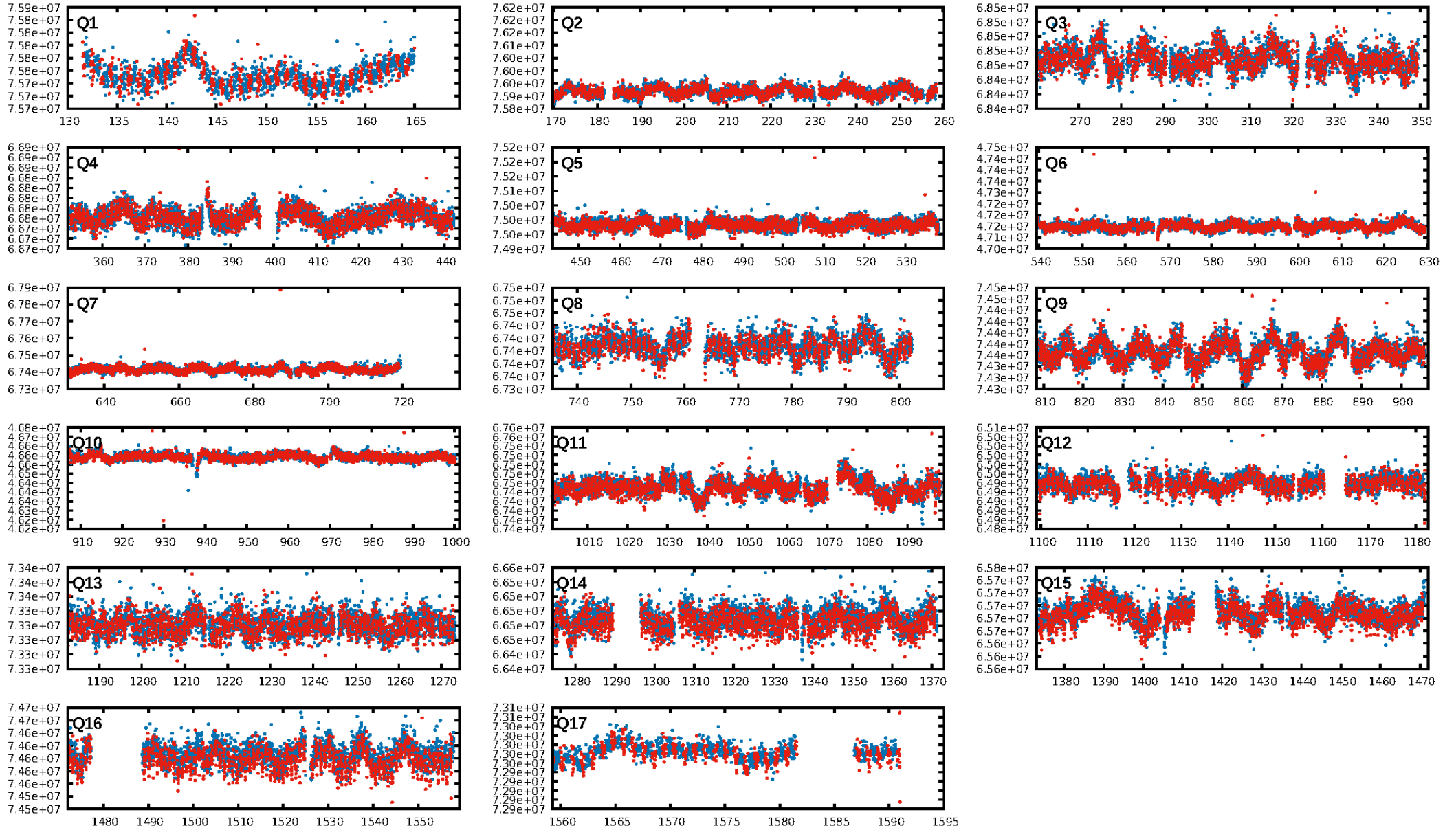
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [271.80σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.06e-81
RollingBand-fgt: 1.00 [1375/1375]
GhostDiagnostic-chr: 0.09977
Centroid-sig: 0.0%
Centroid-so: 2.143 arcsec [4.31σ]
OotOffset-rm: 1.174 arcsec [2.36σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 2.611 arcsec [5.09σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.06 [1/17]
DiffImageOverlap-fno: 1.00 [17/17]

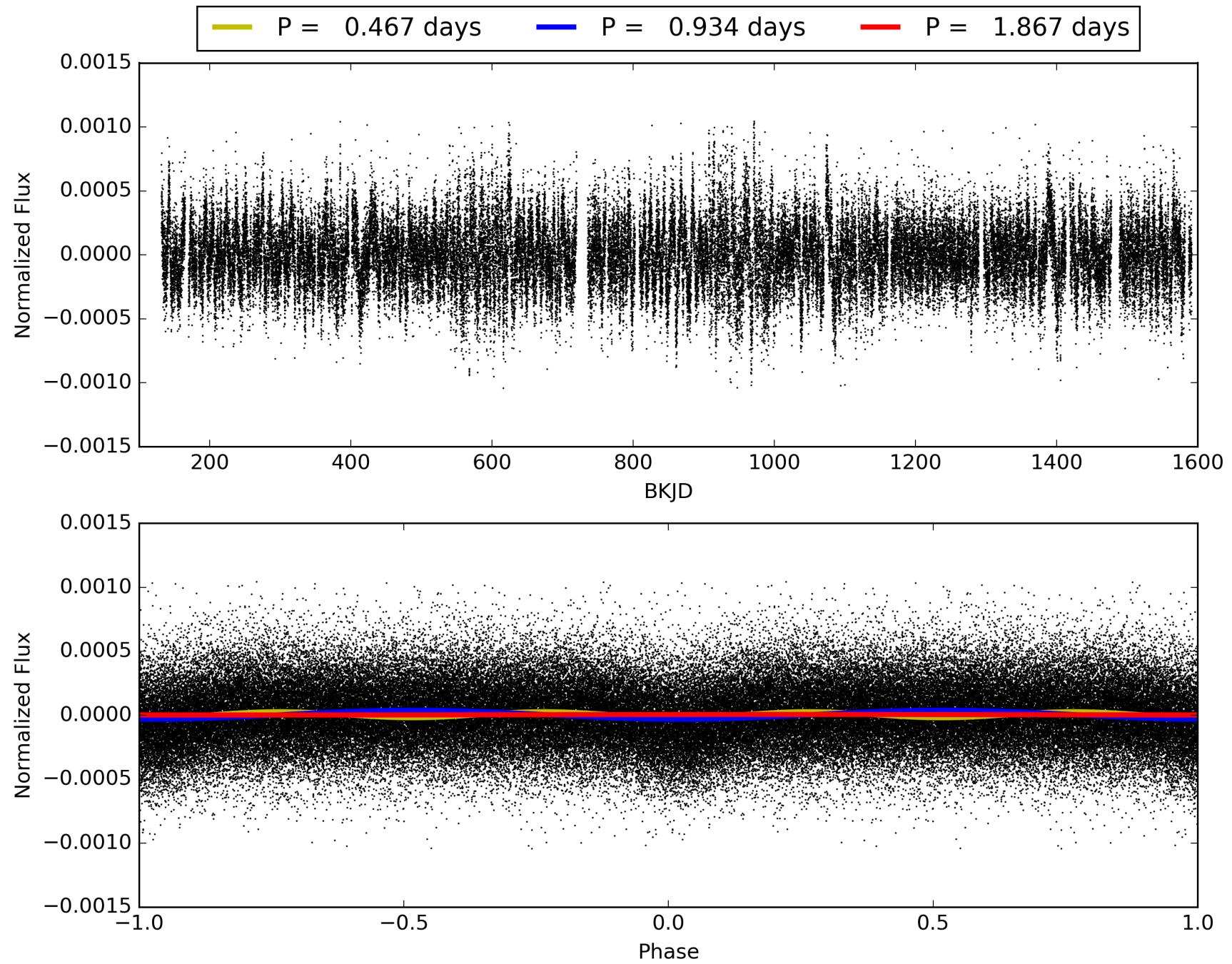
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:33:30 Z

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

TCE 010407054-01, PDC Light Curves

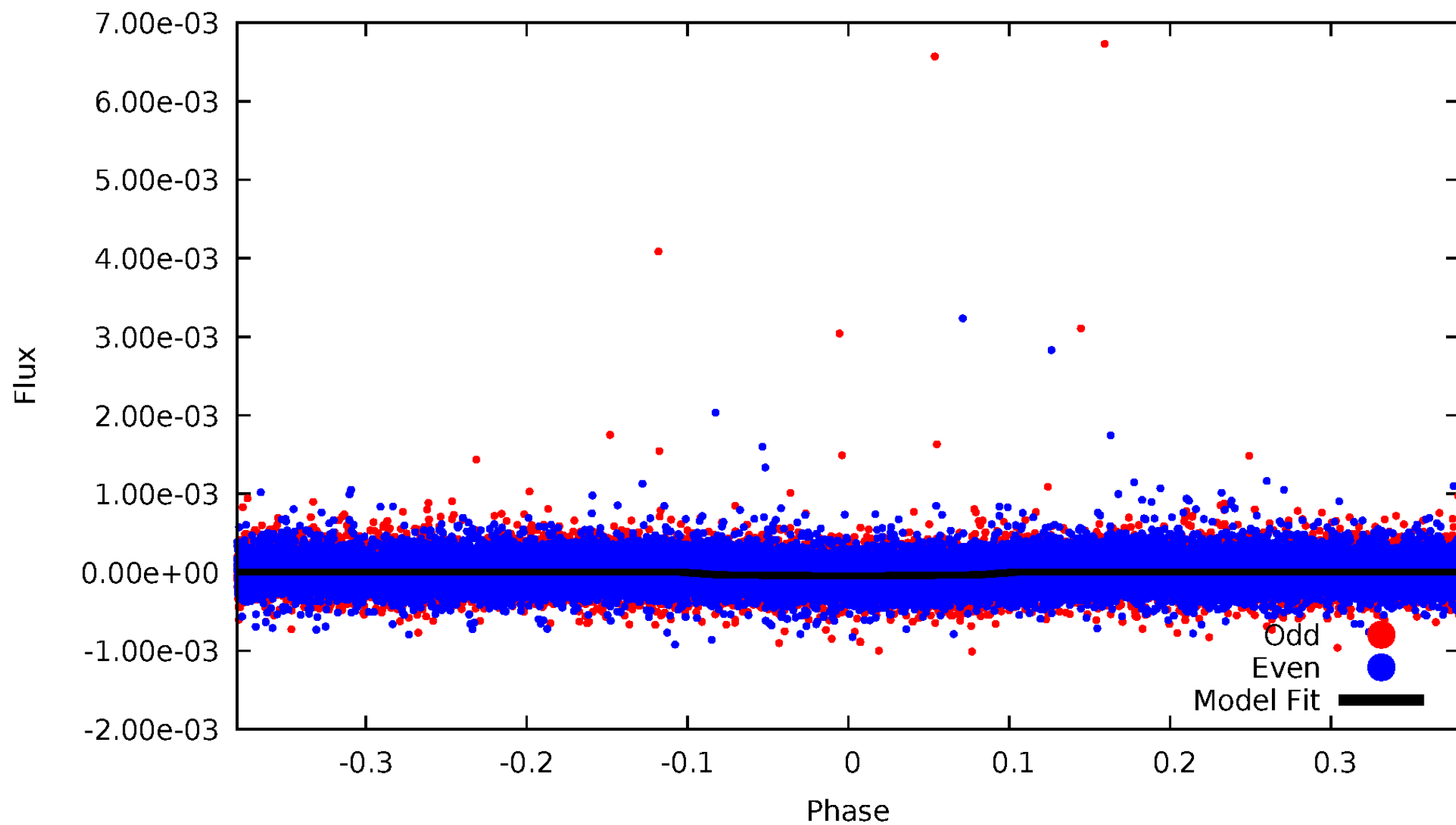


TCE 010407054-01



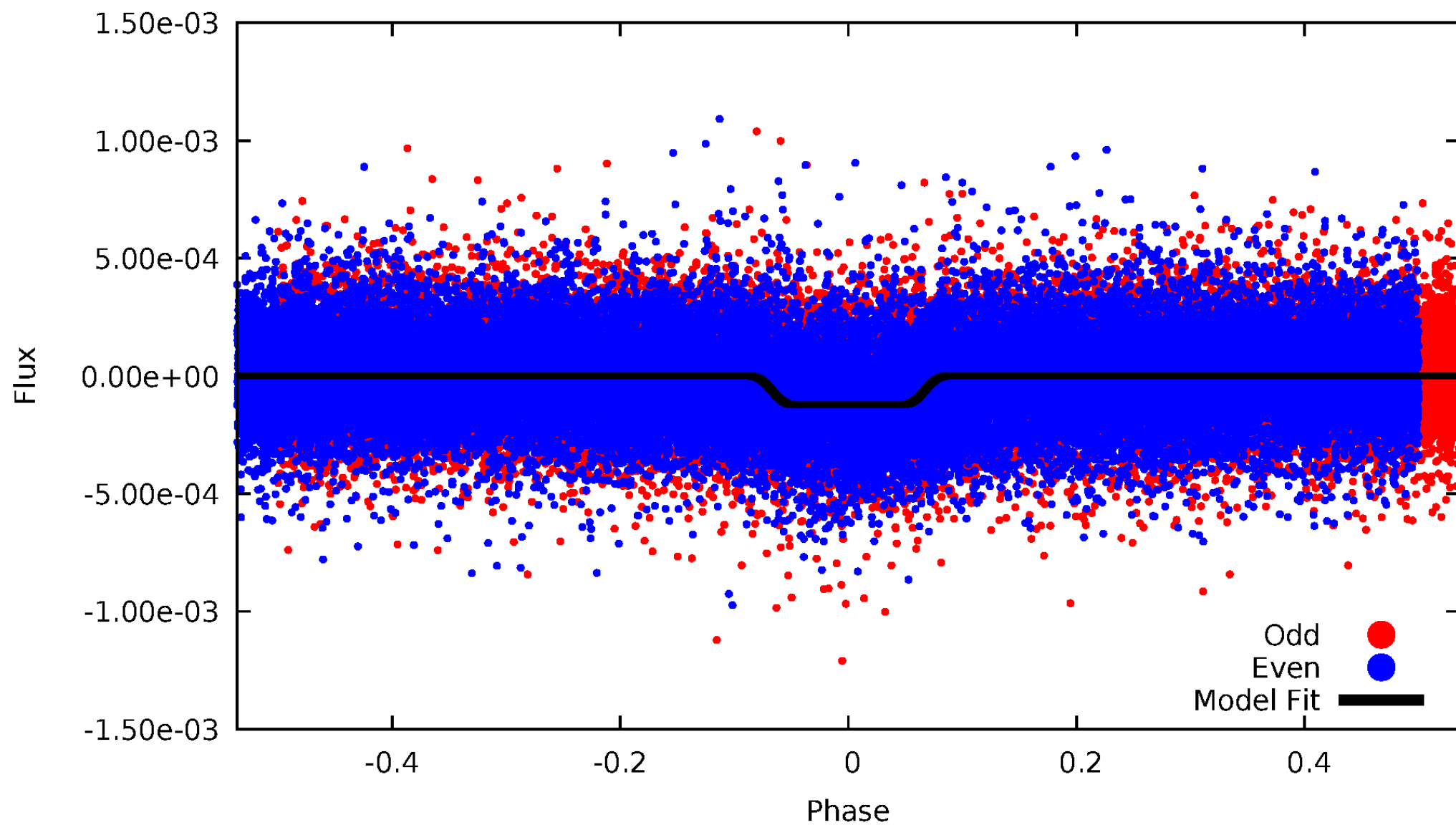
DV Odd/Even

TCE 010407054-01

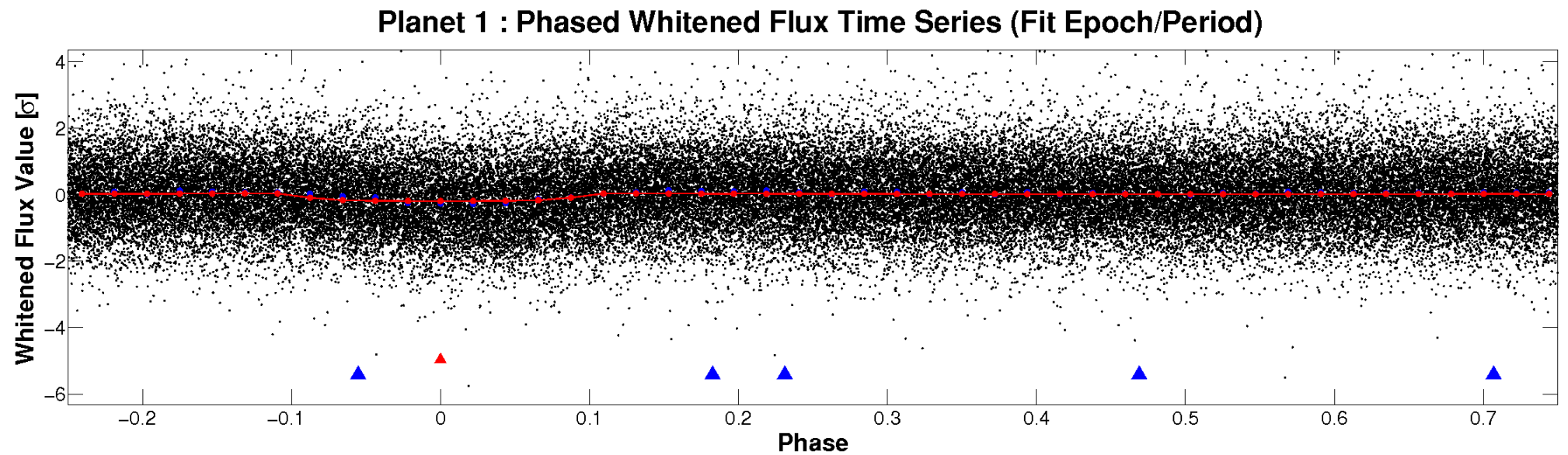
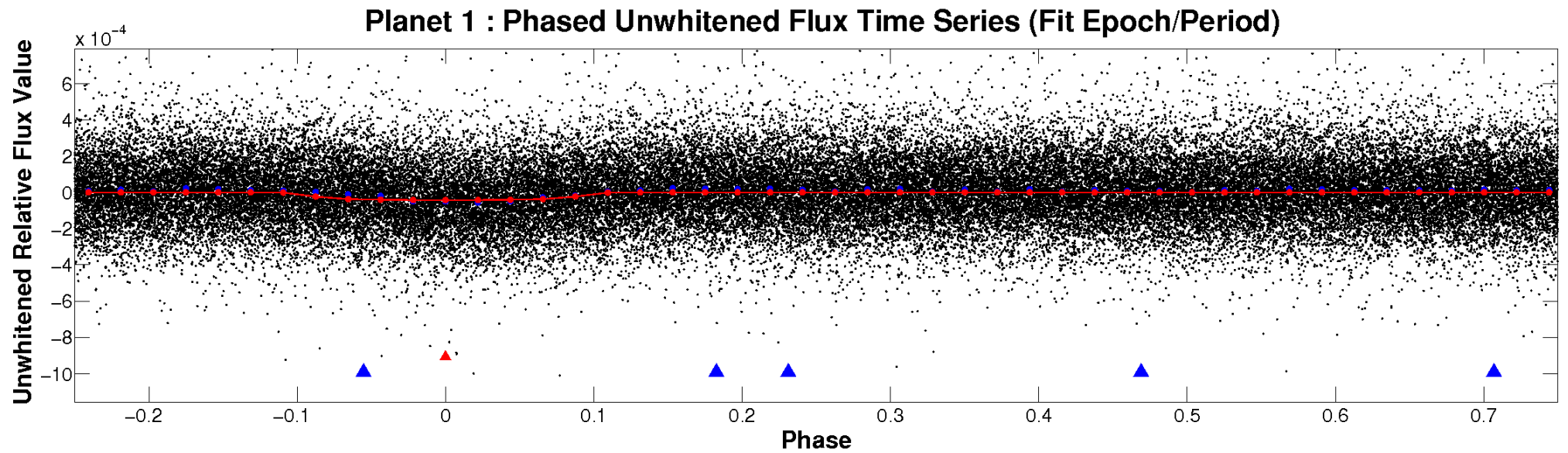


ALT Odd/Even

TCE 010407054-01

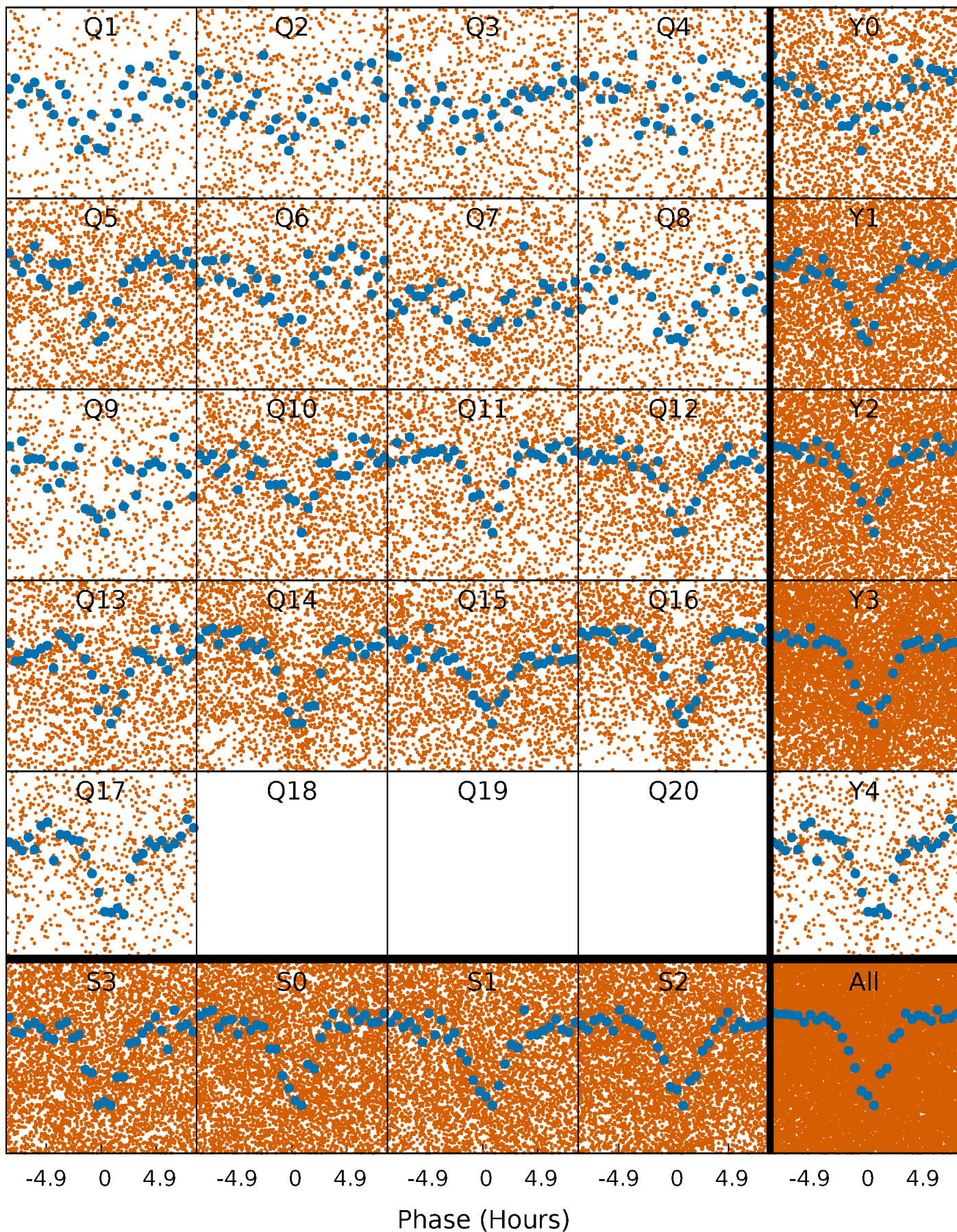


Non-Whitened Vs. Whitened Light Curve



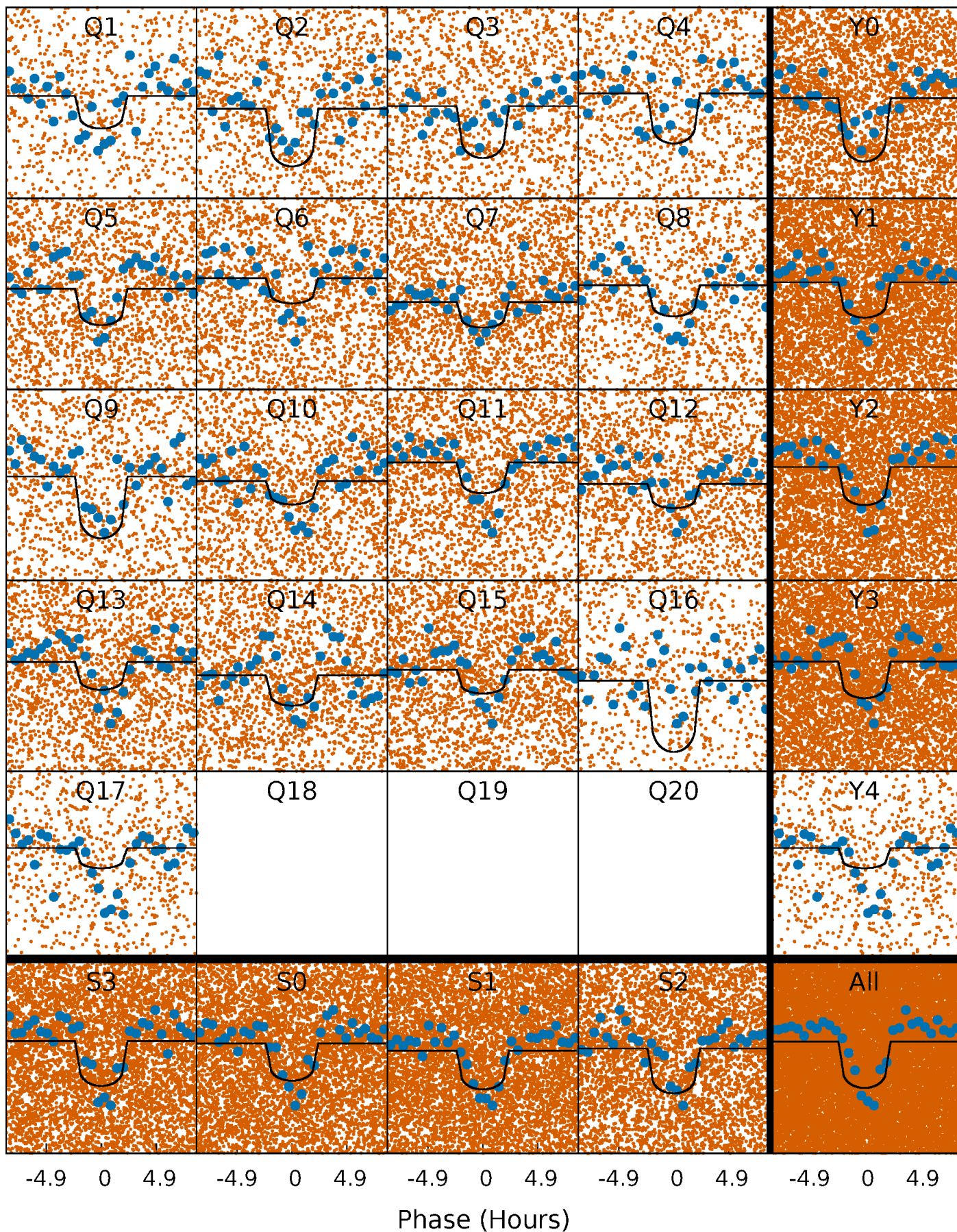
PDC Quarter-Phased Transit Curves

TCE 010407054-01 P= 0.933713 Days $T_0=132.469957$ (BKJD)



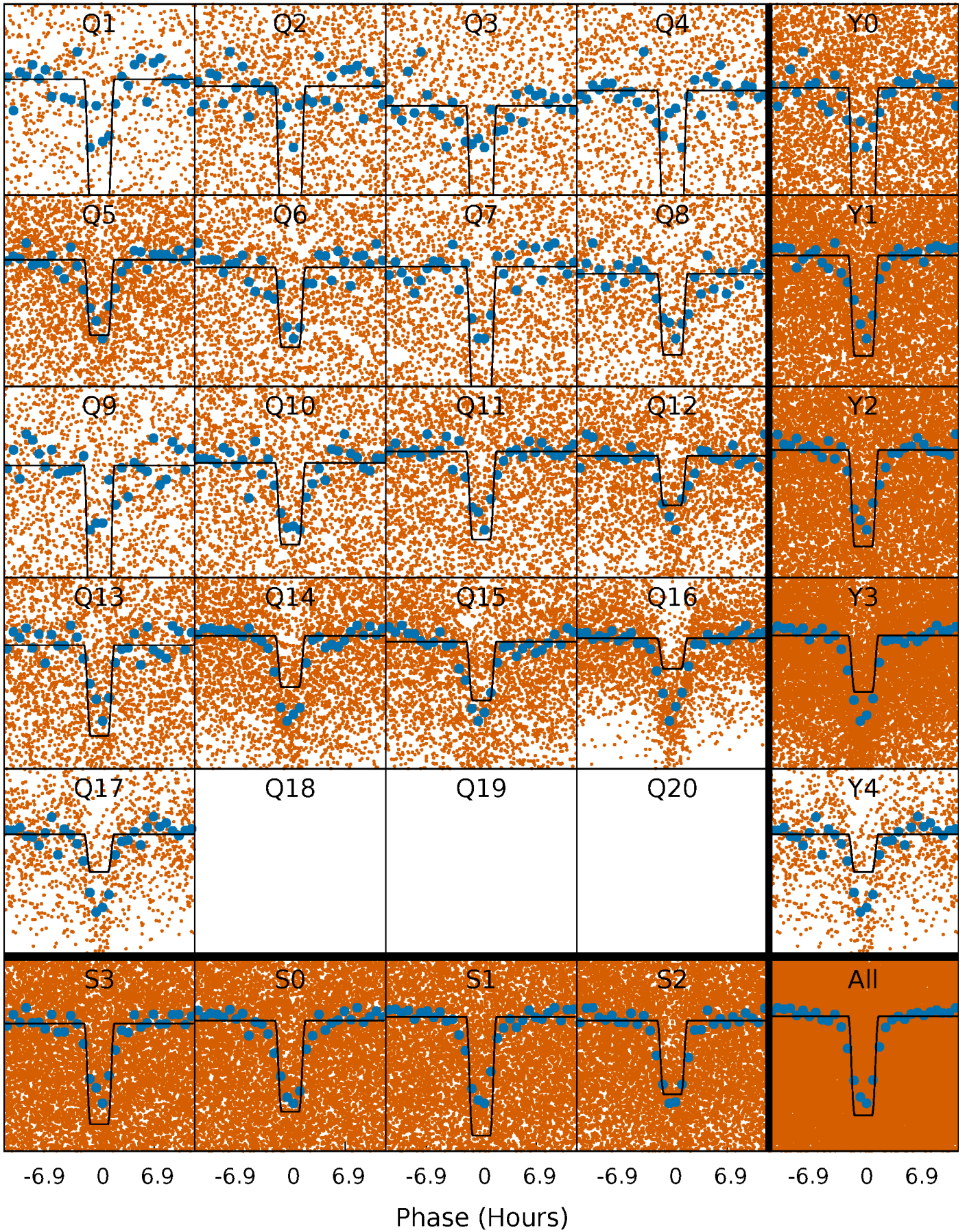
DV Quarter-Phased Transit Curves

TCE 010407054-01 P= 0.933713 Days $T_0=132.469957$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

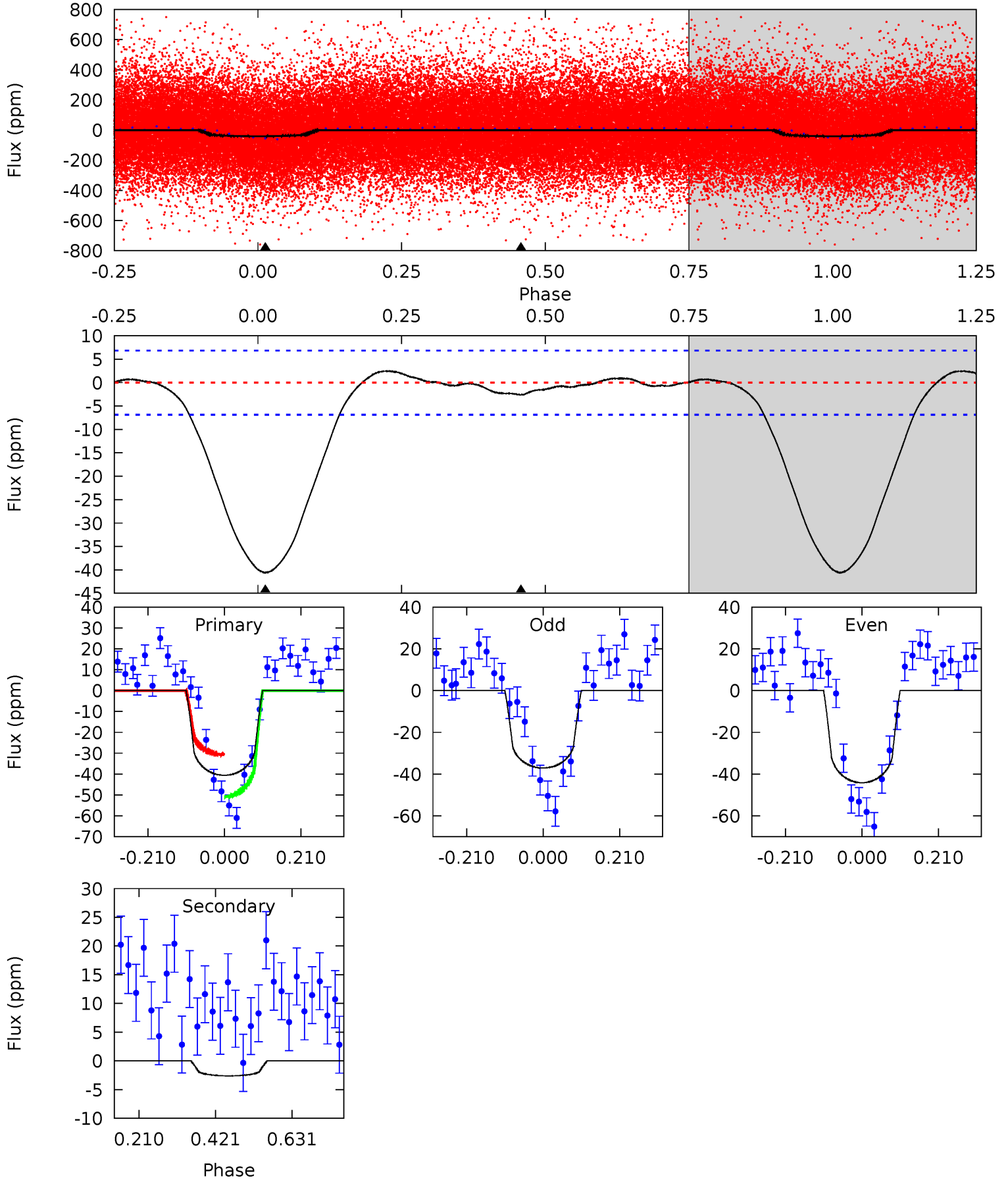
TCE 010407054-01 P= 0.933759 Days $T_0=132.440625$ (BKJD)



DV Model-Shift Uniqueness Test

010407054-01, P = 0.933713 Days, E = 130.602531 Days

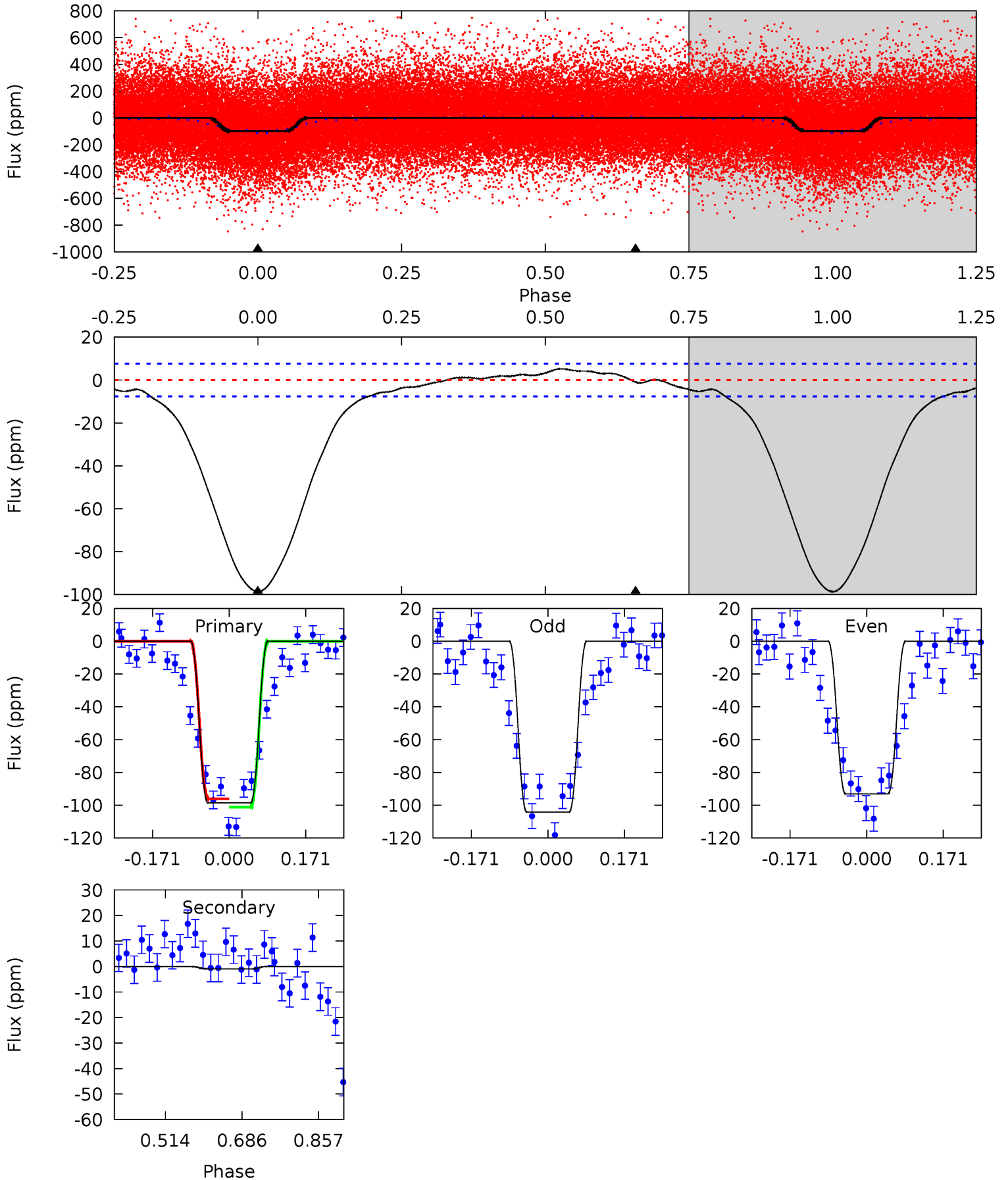
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	1.68	0	0	4.41	1.25	0.64	26.1	26.1	1.68	1.68	2.28	0.97	0.06	6.34



Alt Model-Shift Uniqueness Test

010407054-01, P = 0.933759 Days, E = 131.506866 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.5	0.56	0	0	4.45	1.37	2.02	57.5	57.5	0.56	0.56	3.23	1.09	0.05	1.46



Stellar Parameters For KIC 010407054

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6443^{+181}_{-250}	$4.146^{+0.246}_{-0.164}$	$-0.340^{+0.300}_{-0.300}$	$1.457^{+0.402}_{-0.402}$	$1.083^{+0.177}_{-0.145}$	$0.493^{+0.727}_{-0.225}$
	+3%/-4%	+6%/-4%	+88%/-88%	+28%/-28%	+16%/-13%	+147%/-46%
Source	PHO54	PHO54	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 010407054-01 / KOI 2500.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3 ± 2	$0.94^{+0.40}_{-0.38}$	3416^{+247}_{-291}	3207^{+1034}_{-6135}	$0.542^{+1.109}_{-0.354}$
Alt.	-1 ± 2	$1.70^{+0.46}_{-0.41}$	3407^{+281}_{-250}	-3225^{+497}_{-280}	$0.061^{+0.147}_{-0.126}$

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 $A_{obs} \gg 1.0$

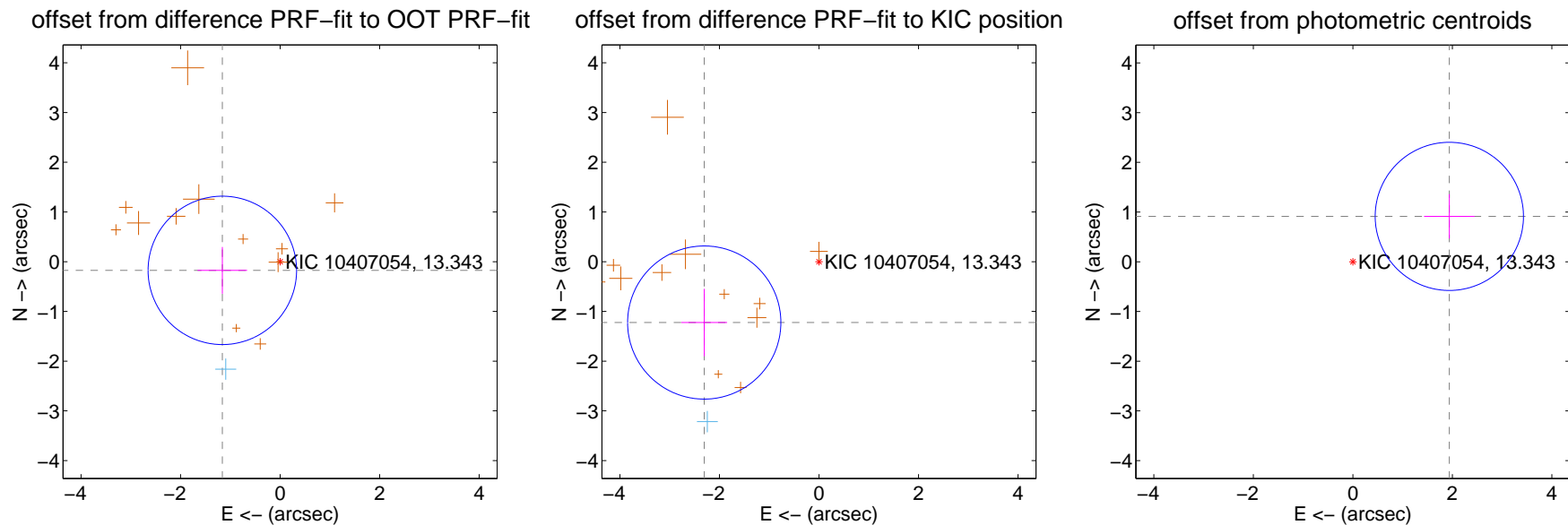
DV Centroid Data

Supplemental centroid analysis for 010407054-01. Kepler magnitude: 13.34. Transit SNR 19.26

There are 1 quarters with good PRF difference image offsets

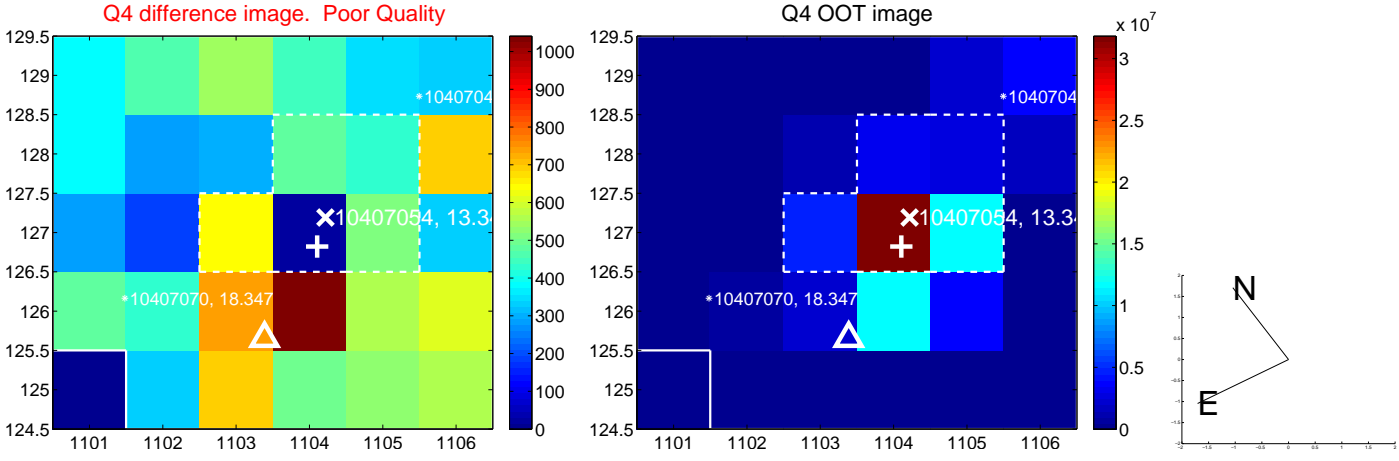
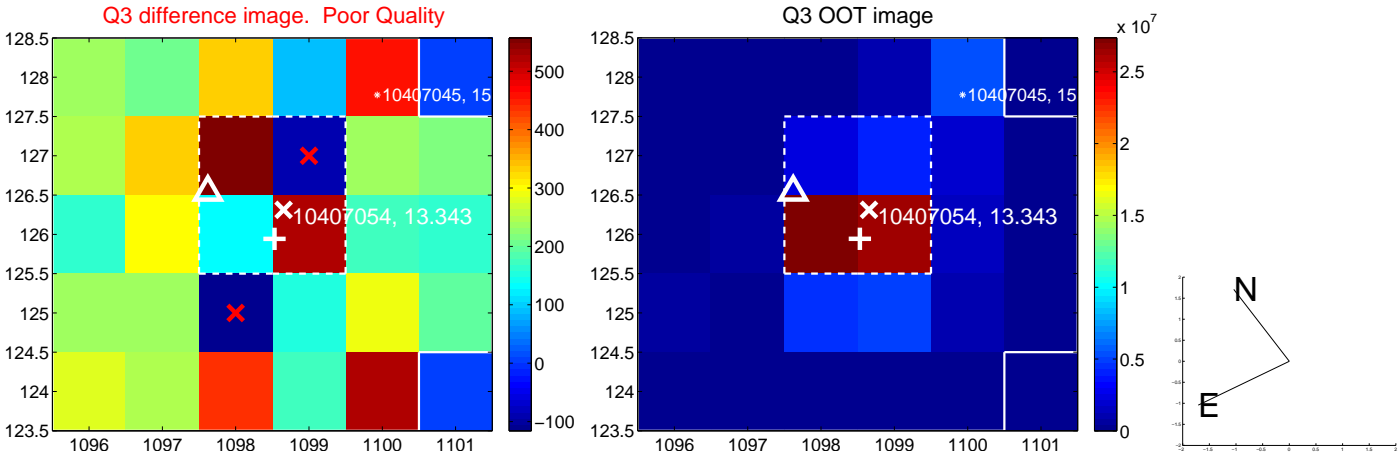
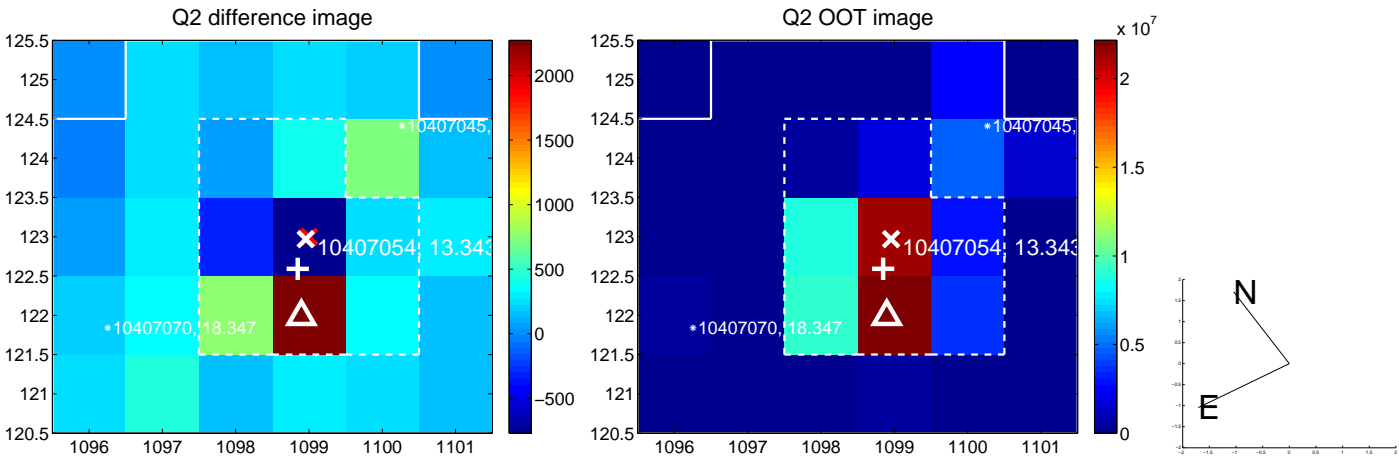
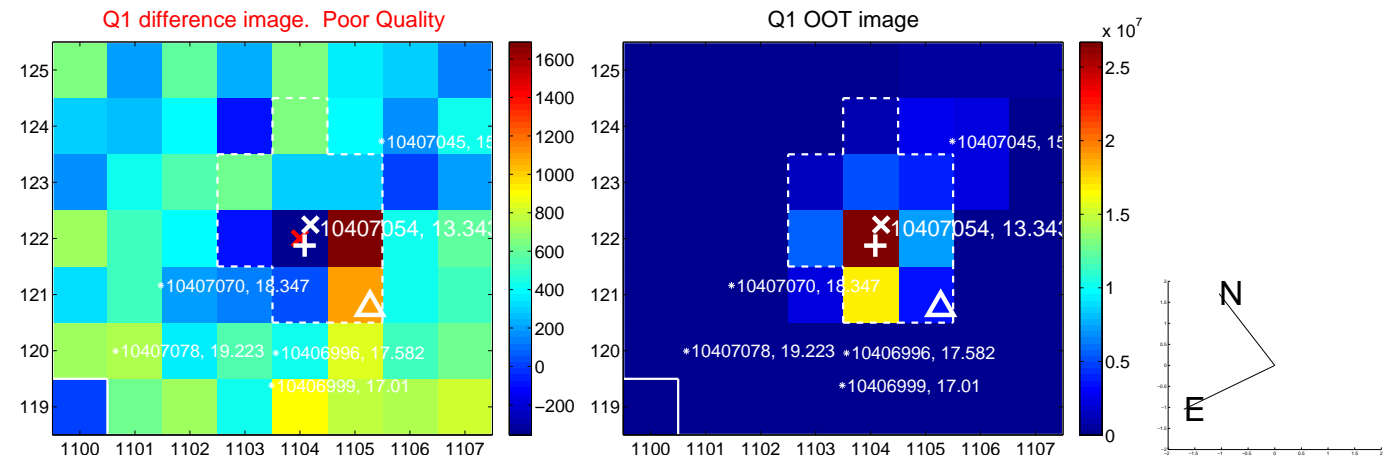
The direct PRF centroid is offset from the target star catalog position by about 1.56 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.174 ± 0.497	2.36	1.161 ± 0.498	-0.175 ± 0.470
PRF-fit source offset from KIC position	2.611 ± 0.513	5.09	2.306 ± 0.461	-1.224 ± 0.679
photometric centroid source offset	2.14 ± 0.50	4.31	-1.94 ± 0.51	0.91 ± 0.45

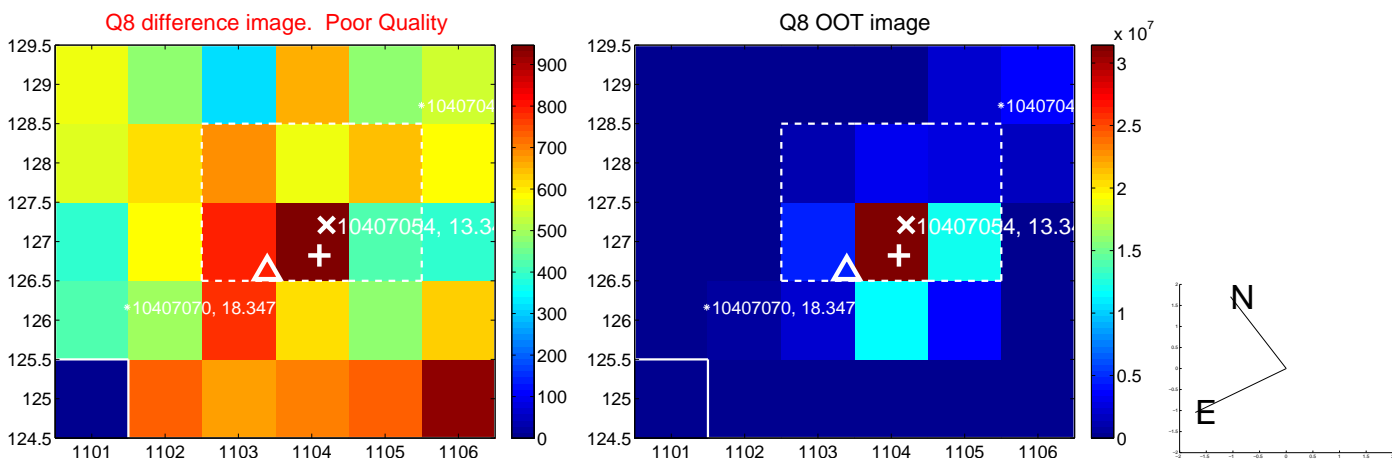
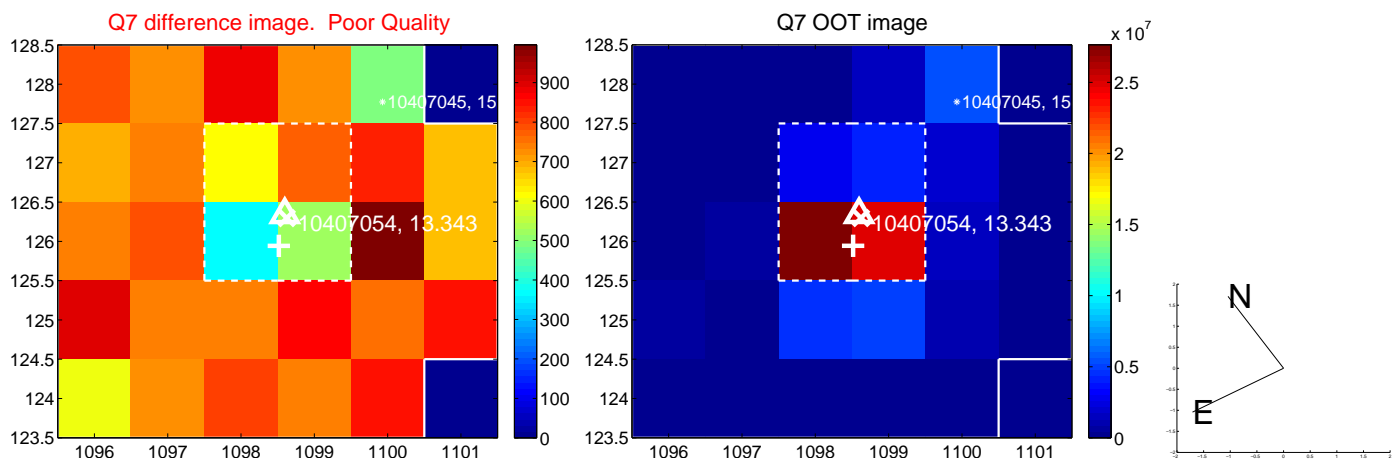
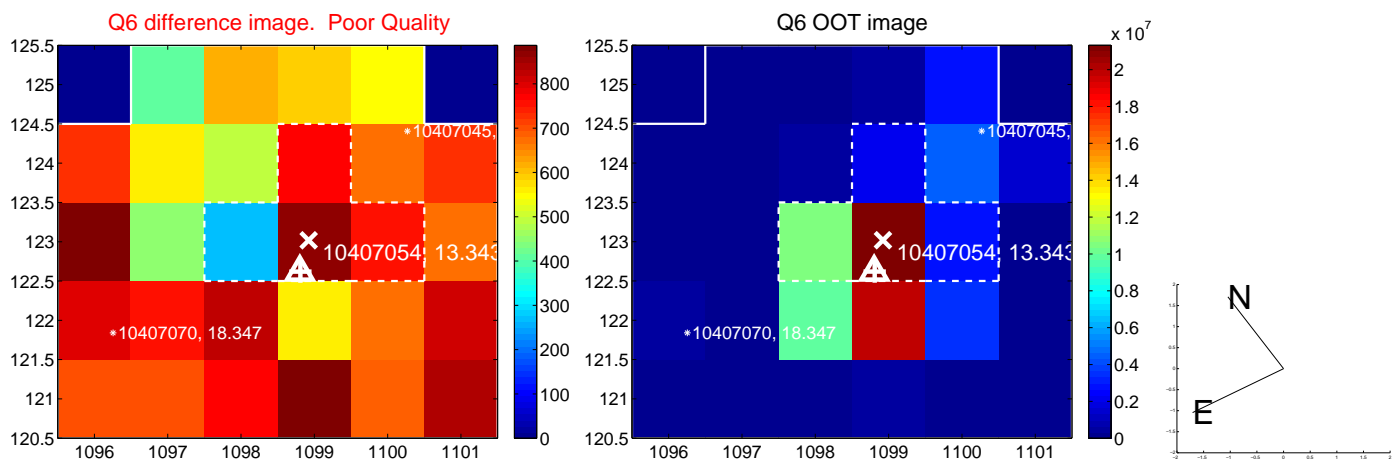
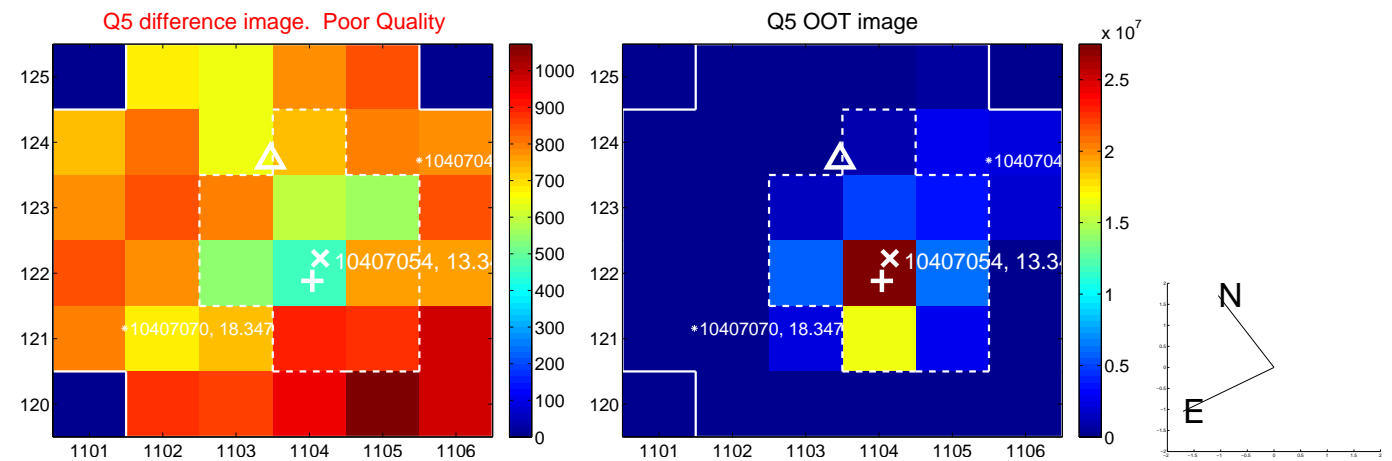


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

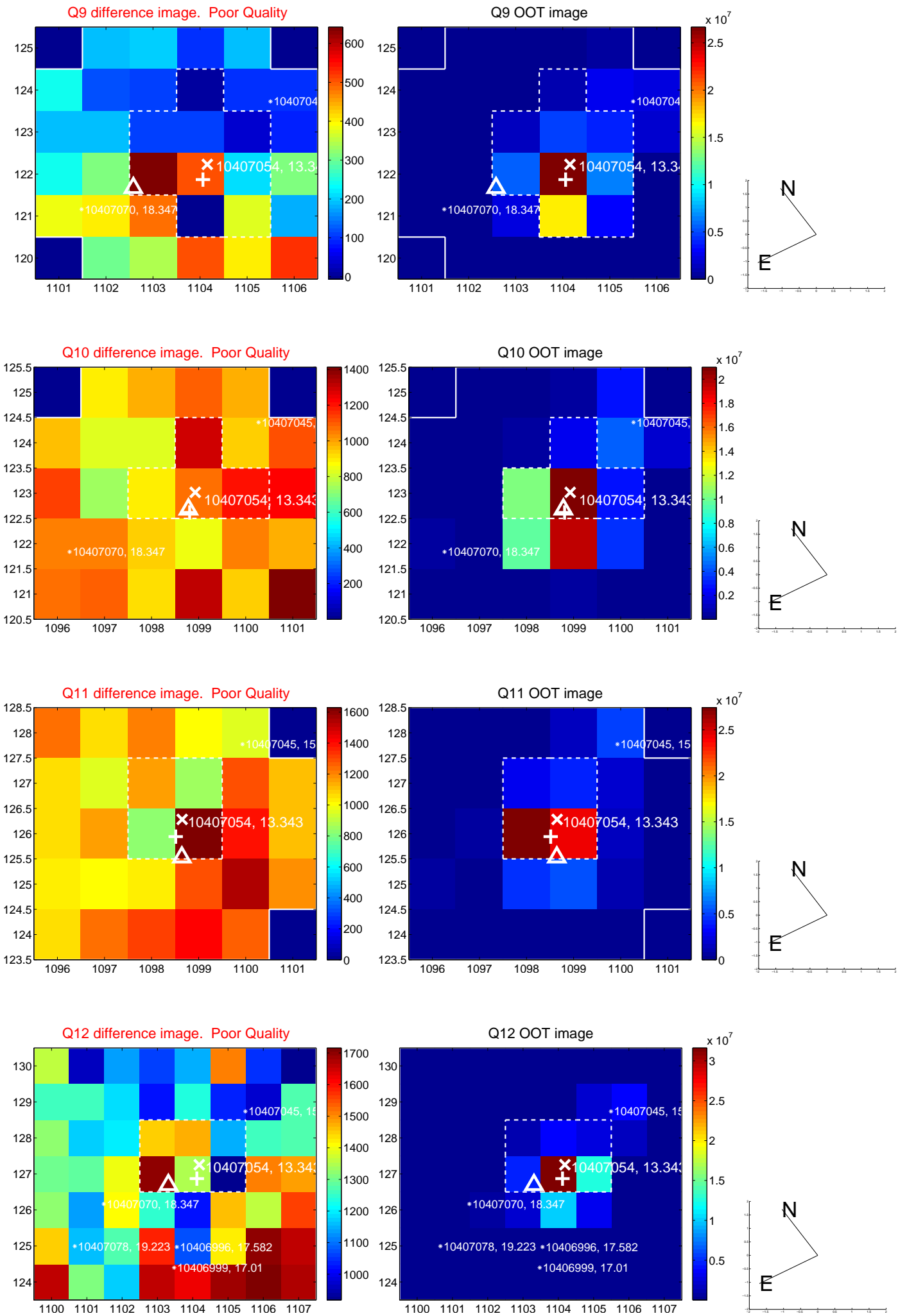
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



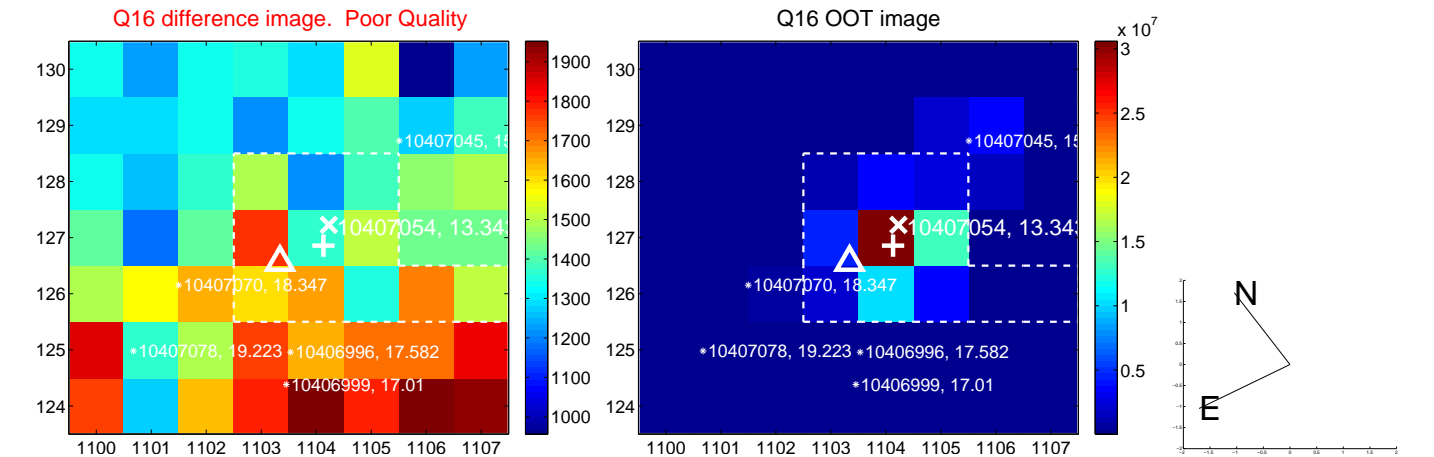
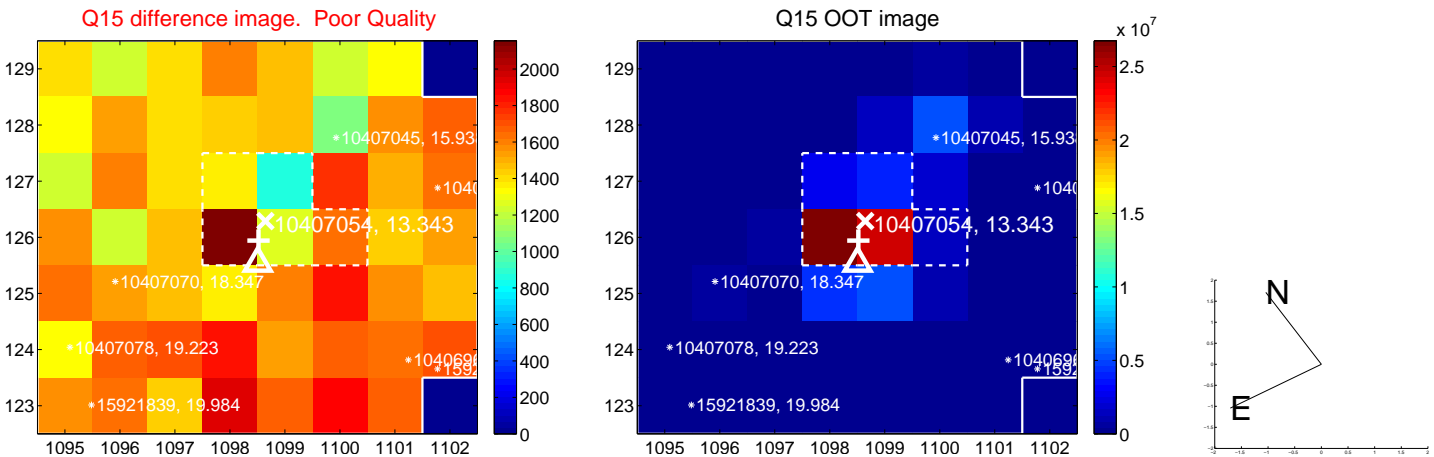
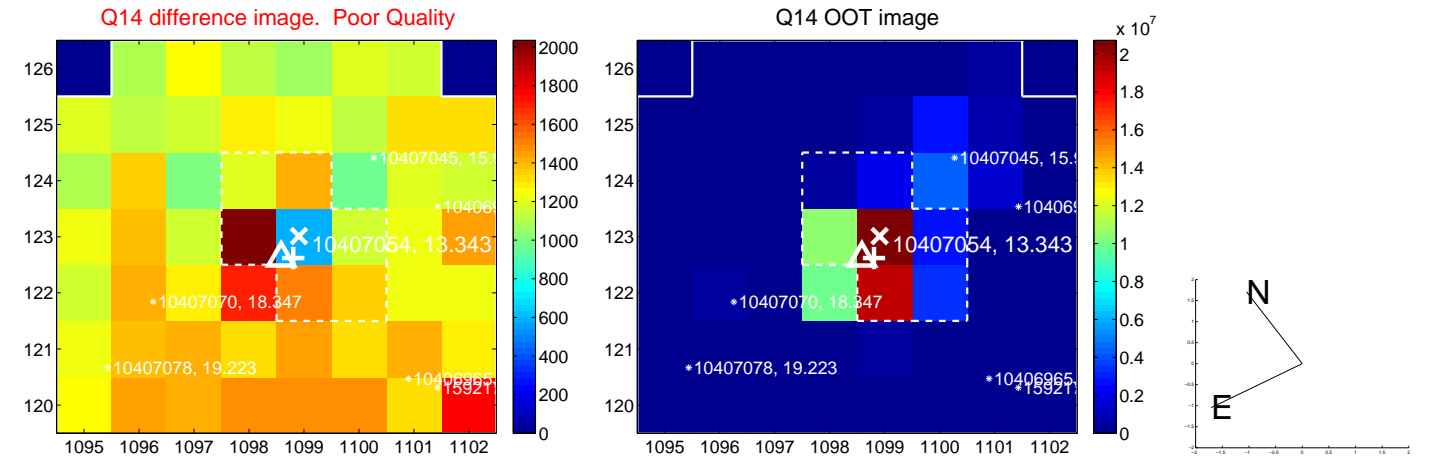
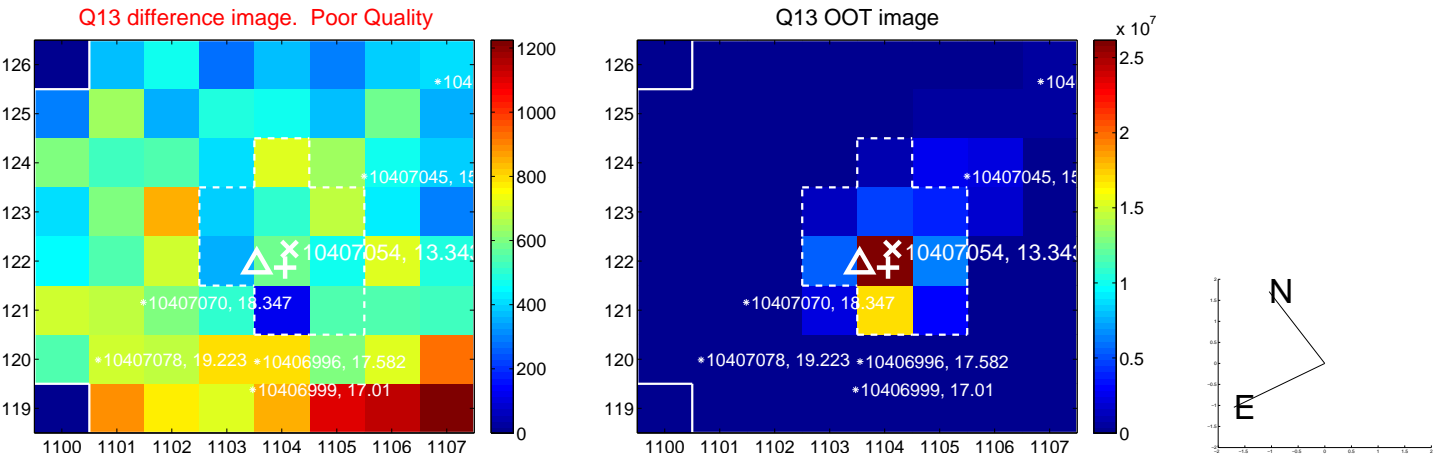
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



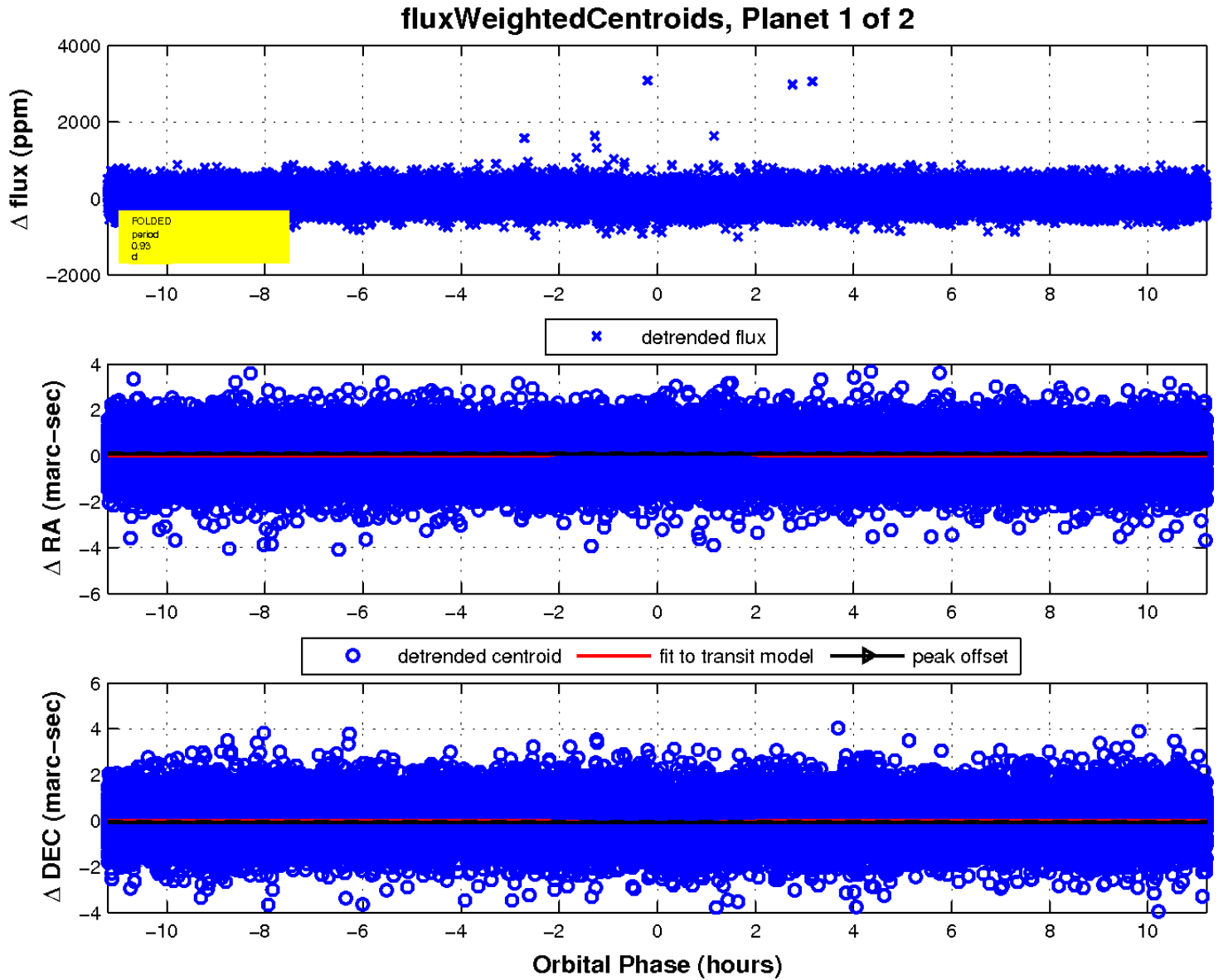
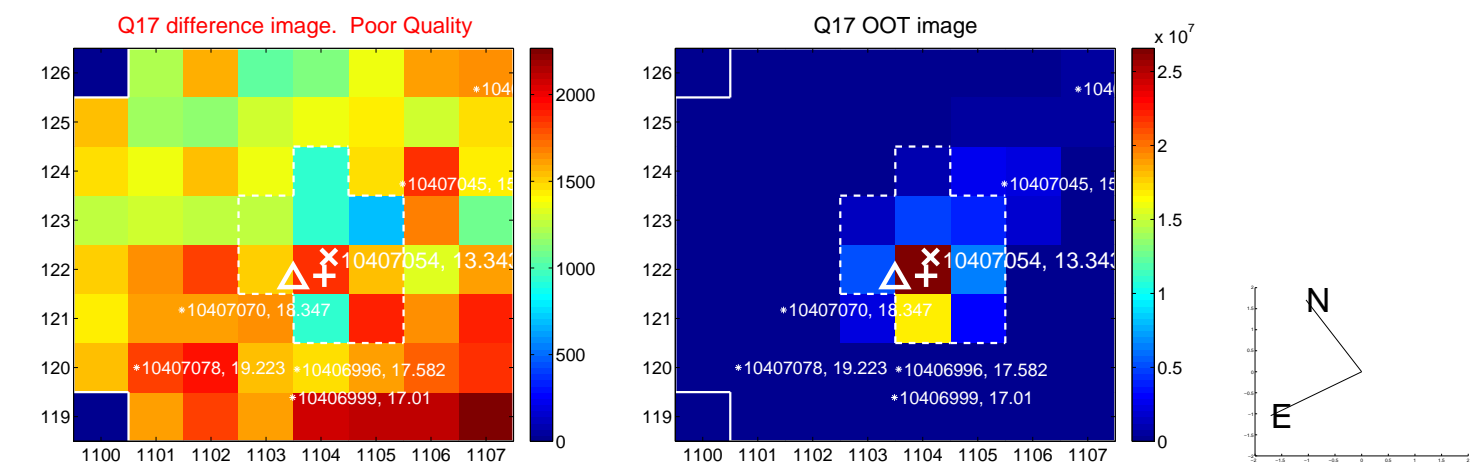
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

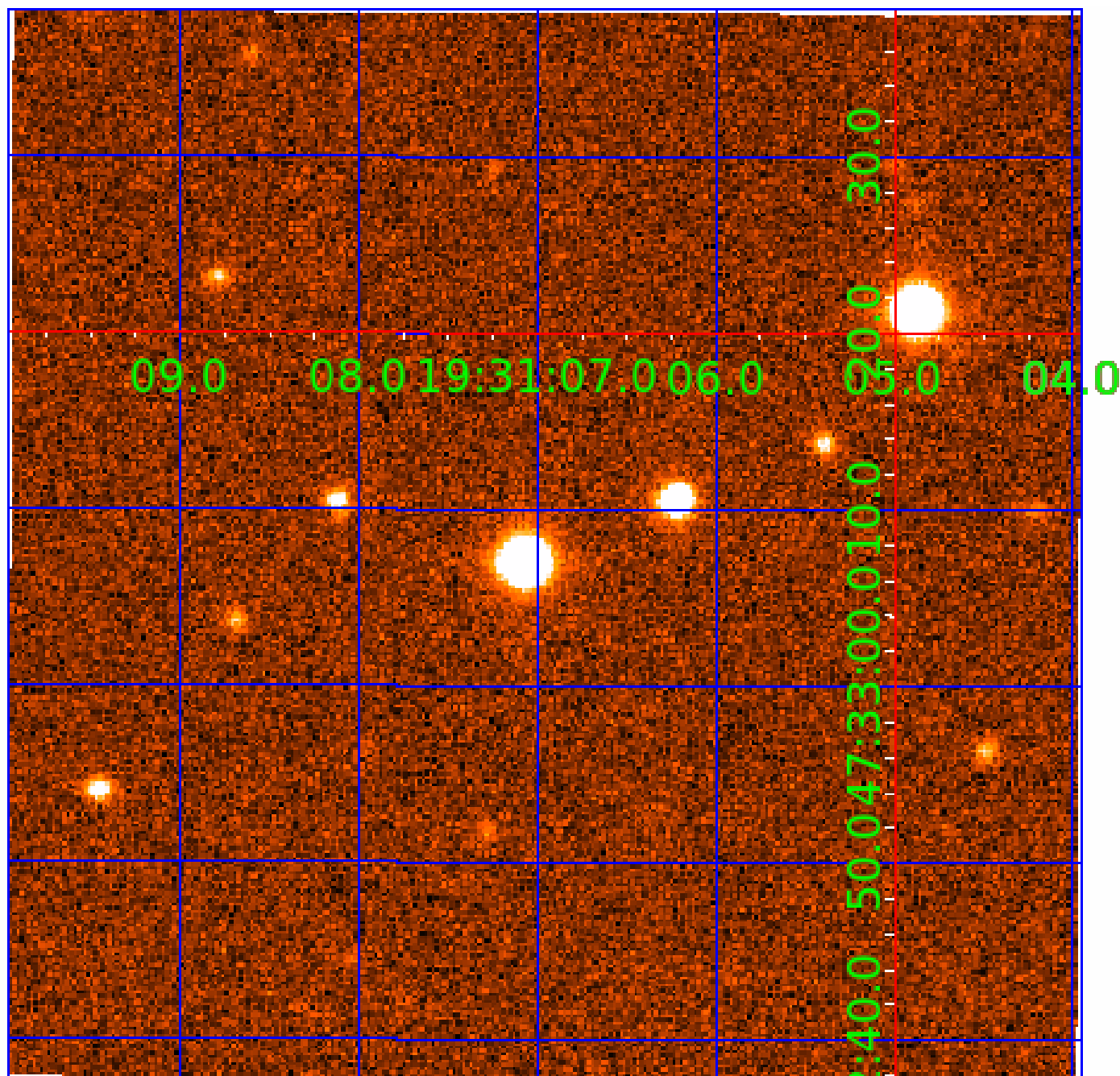


white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010407054

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})
010407054-01	OBS	2500.01	0.933713	132.469957	42.8	4.257	21.9	19.3	1.46	6443	0.97	8883.87
010407054-02	OBS	No	302.745071	345.572312	266.6	26.308	10.1	6.8	1.46	6443	2.53	3.99

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010407054-01	OBS	FP	0.00	0	0	1	1	CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010407054-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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.

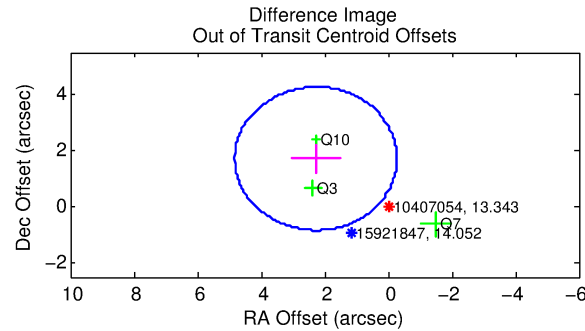
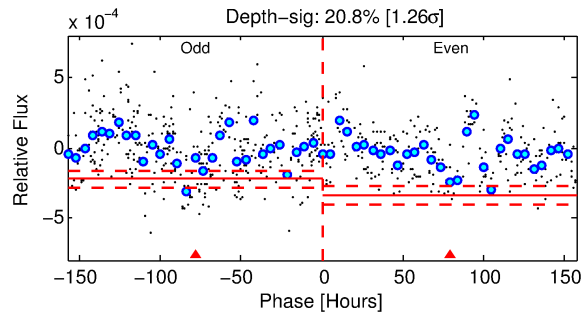
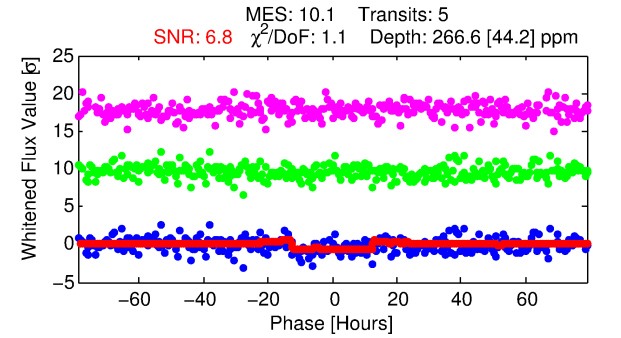
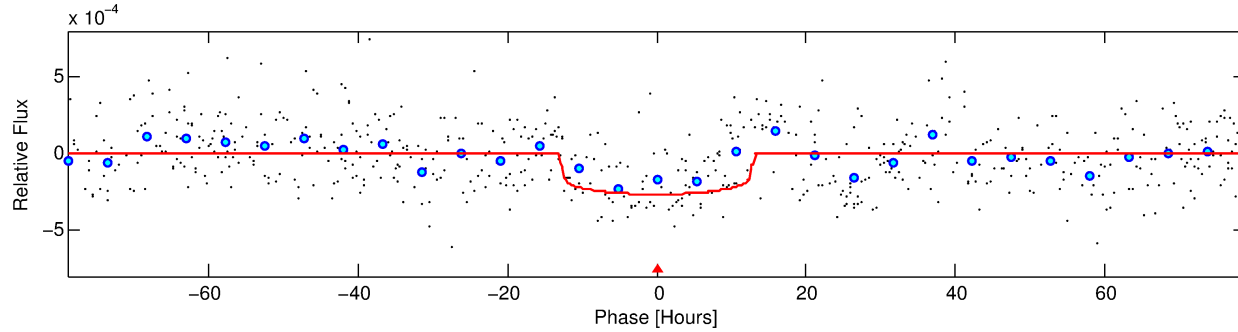
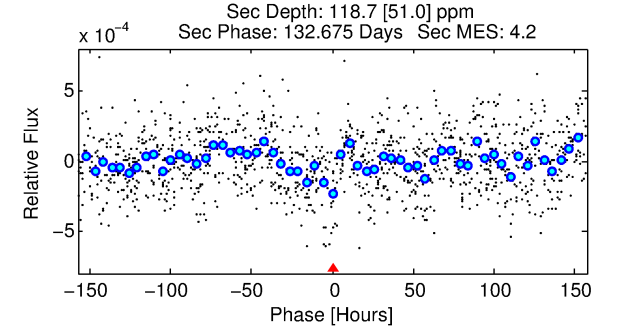
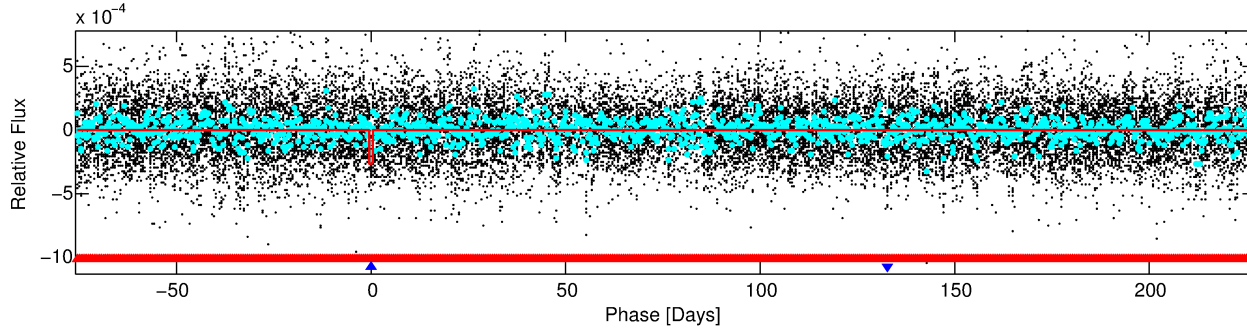
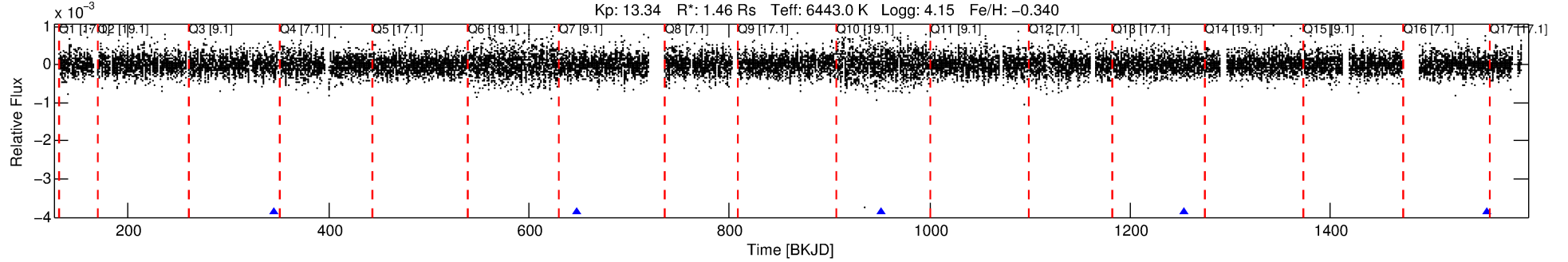
Ephemeris Match Information For 010407054-02

No Significant Match Found

DV One-Page Summary

KIC: 10407054 Candidate: 2 of 2 Period: 302.745 d
KOI: K02500 Corr: No Ephemeris Match

Kp: 13.34 R*: 1.46 Rs Teff: 6443.0 K Logg: 4.15 Fe/H: -0.340



DV Fit Results:

Period = 302.74507 [0.00991] d
Epoch = 345.5723 [0.0316] BKJD
Rp/R* = 0.0159 [0.0042]
a/R* = 66.48 [87.41]
b = 0.68 [1.05]
Seff = 3.99 [1.79]
Teq = 360 [40] K
Rp = 2.53 [0.97] Re
a = 0.9065 [0.2390] AU
Ag = 8369.50 [6689.60] [1.25σ]
Teffp = 5329 [929] K [5.34σ]

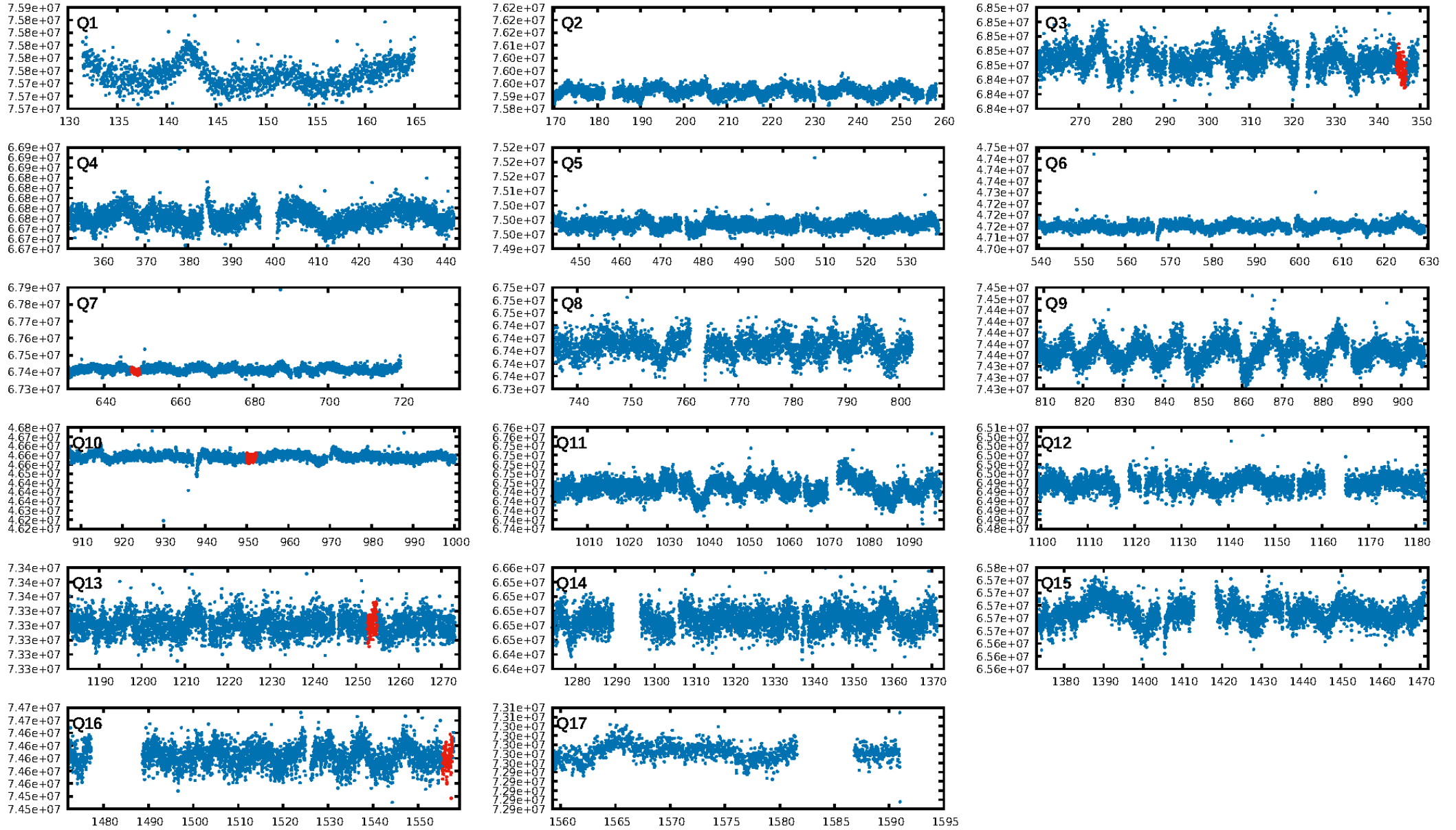
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [271.80σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 26.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.75e-12
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.541
Centroid-sig: 0.1%
Centroid-so: 1.186 arcsec [1.97σ]
OotOffset-rm: 2.850 arcsec [3.35σ]
KicOffset-rm: 3.550 arcsec [3.25σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/4]

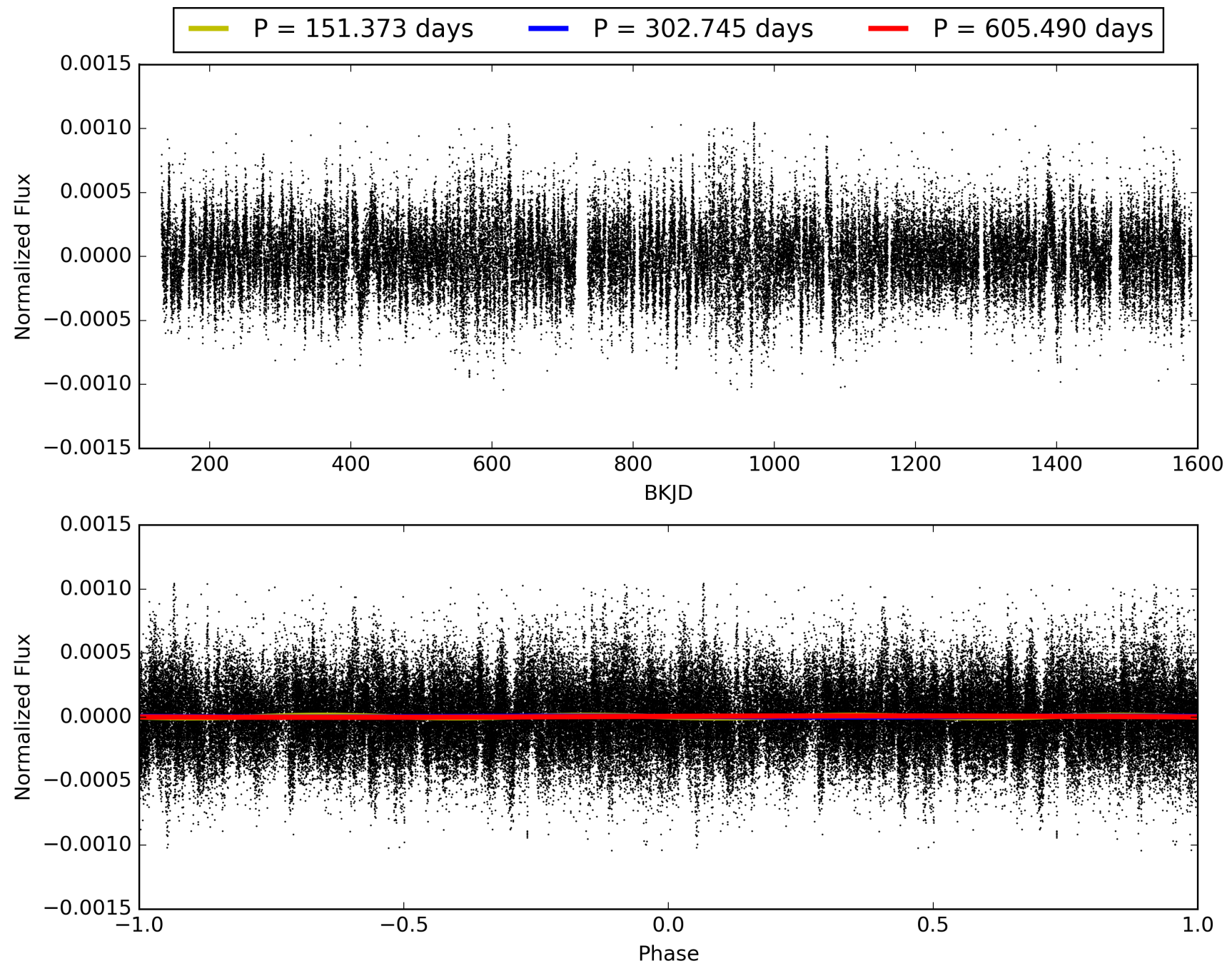
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:33:41 Z

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

TCE 010407054-02, PDC Light Curves

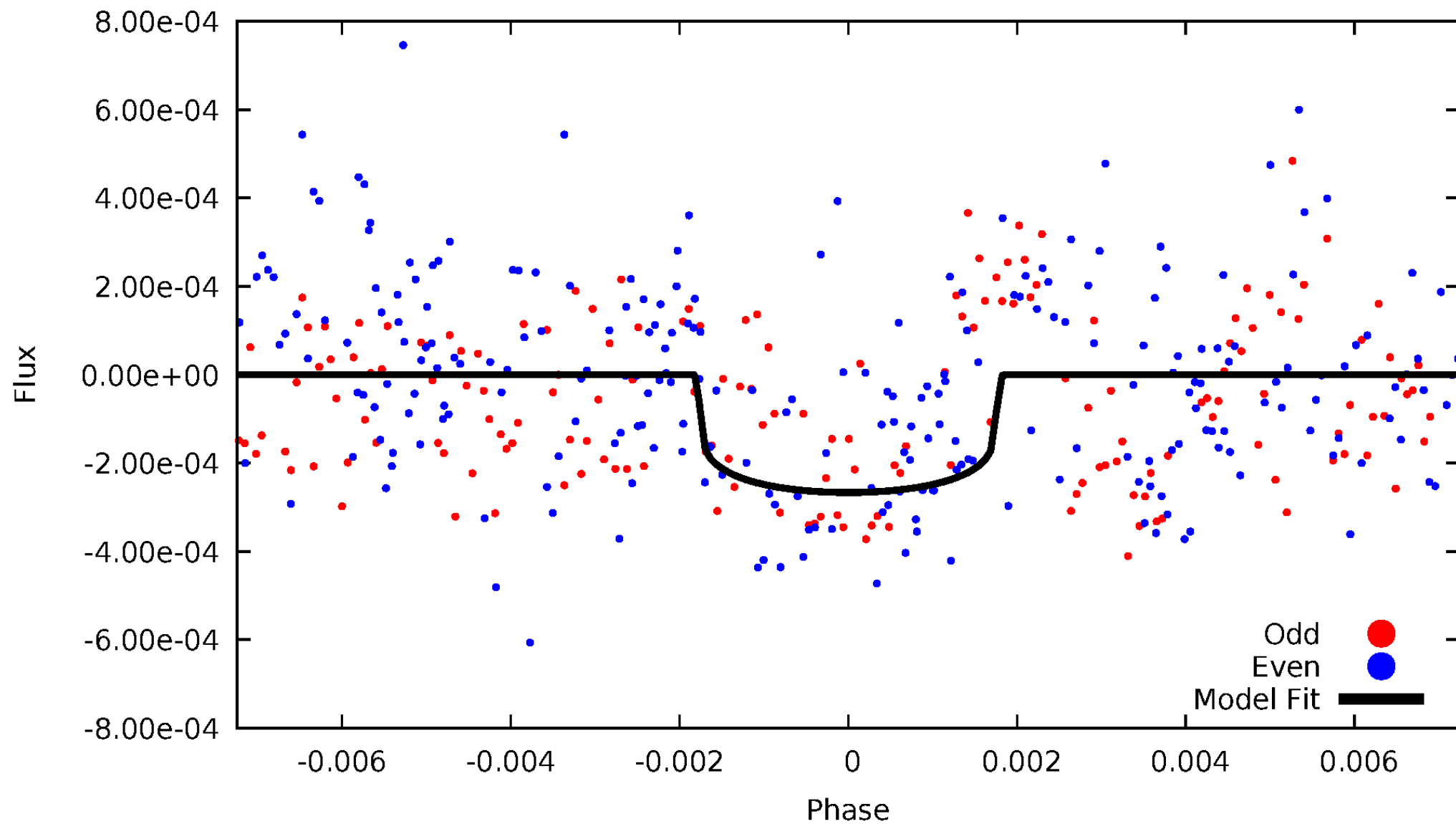


TCE 010407054-02



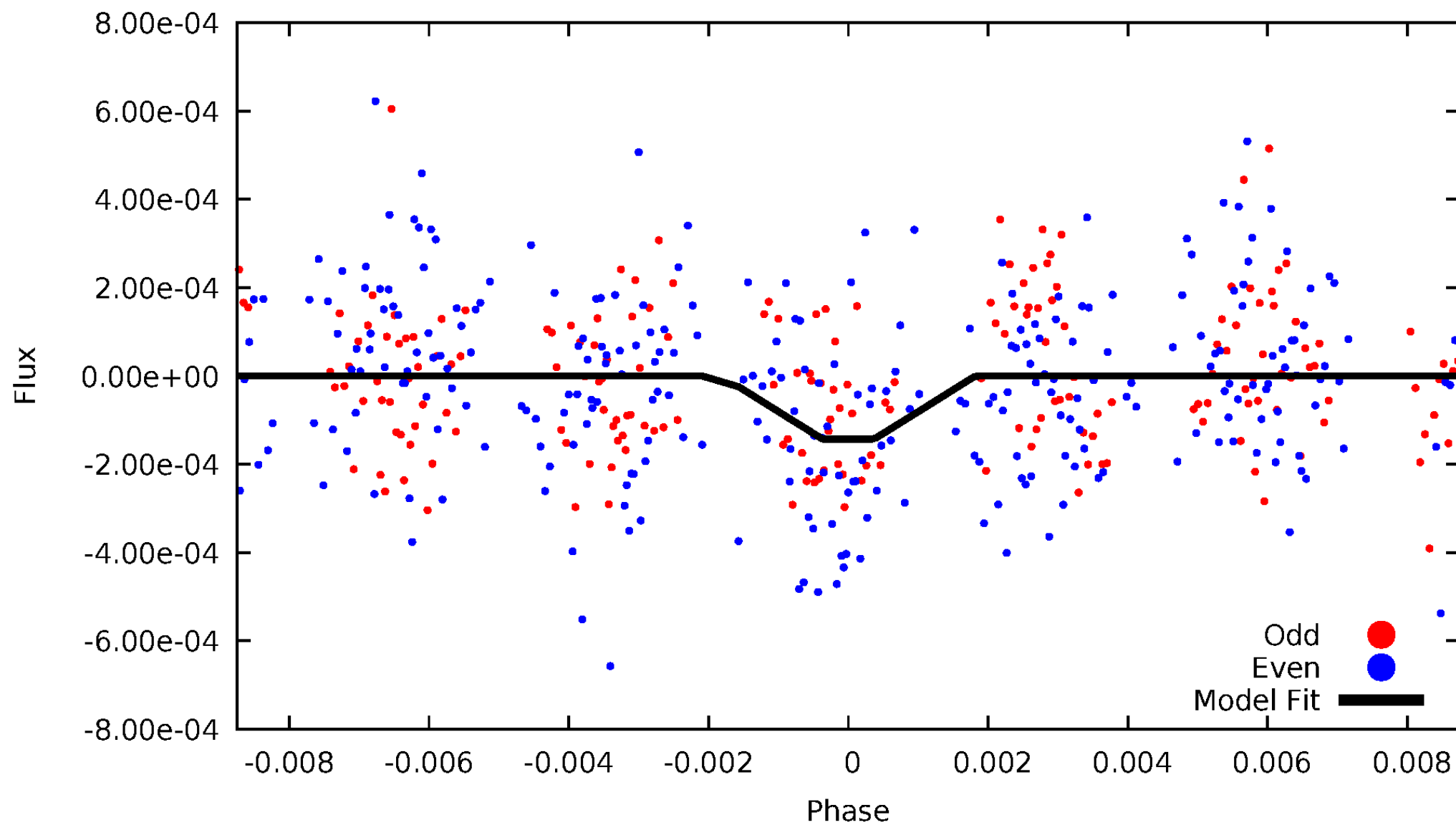
DV Odd/Even

TCE 010407054-02



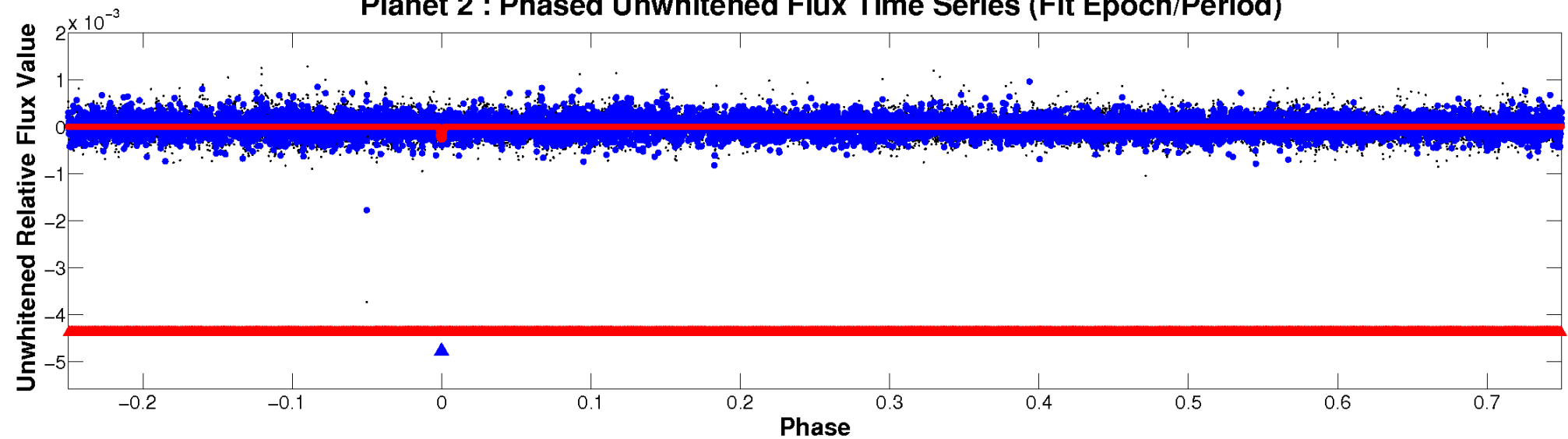
ALT Odd/Even

TCE 010407054-02

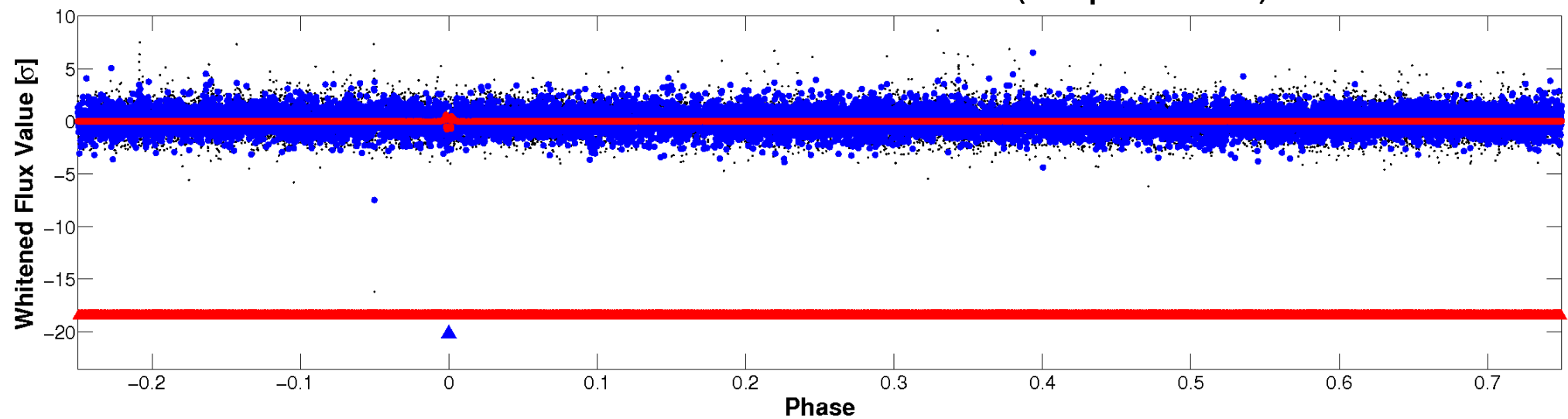


Non-Whitened Vs. Whitened Light Curve

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



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



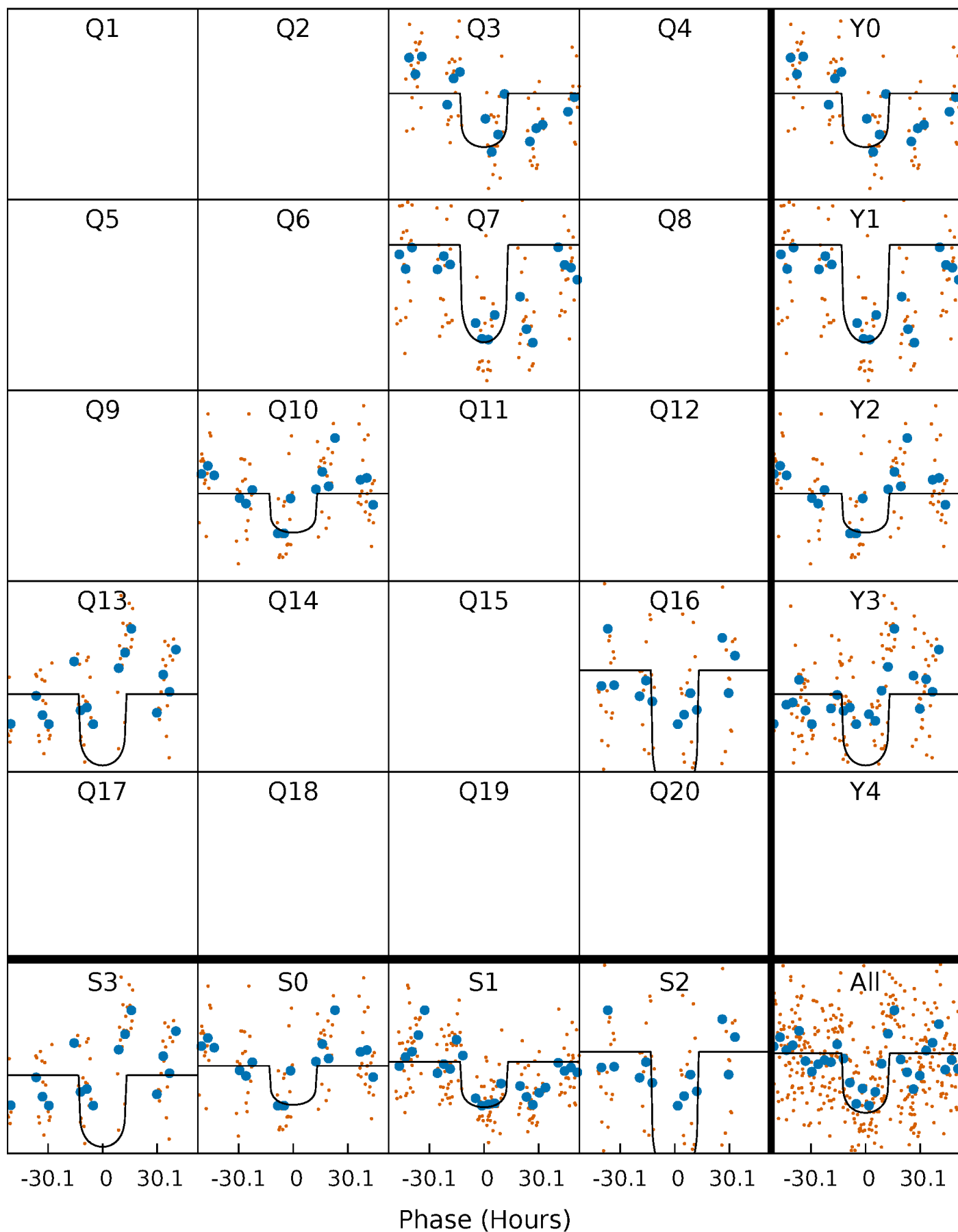
PDC Quarter-Phased Transit Curves

TCE 010407054-02 P=302.745071 Days $T_0=345.572312$ (BKJD)



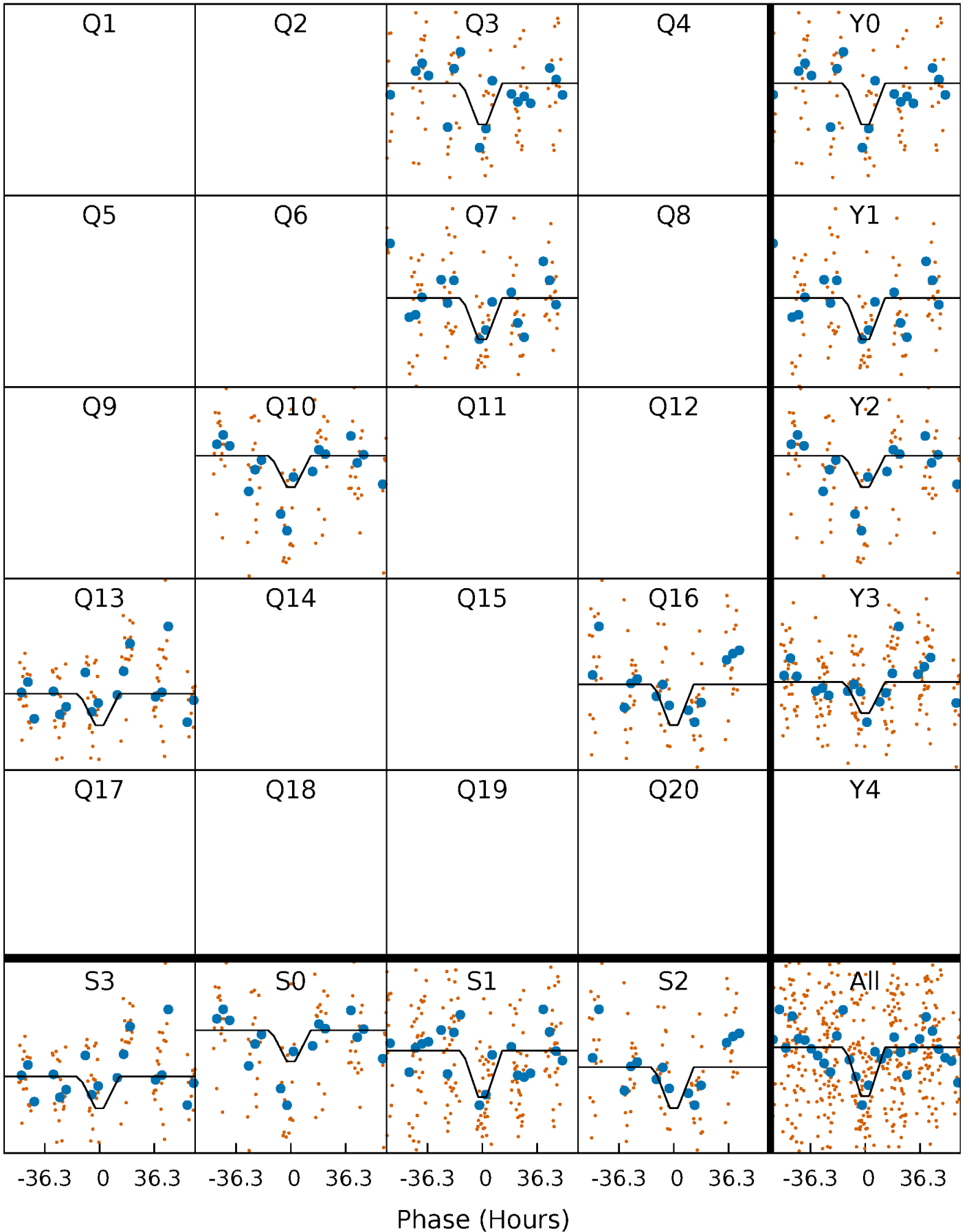
DV Quarter-Phased Transit Curves

TCE 010407054-02 $P=302.745071$ Days $T_0=345.572312$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

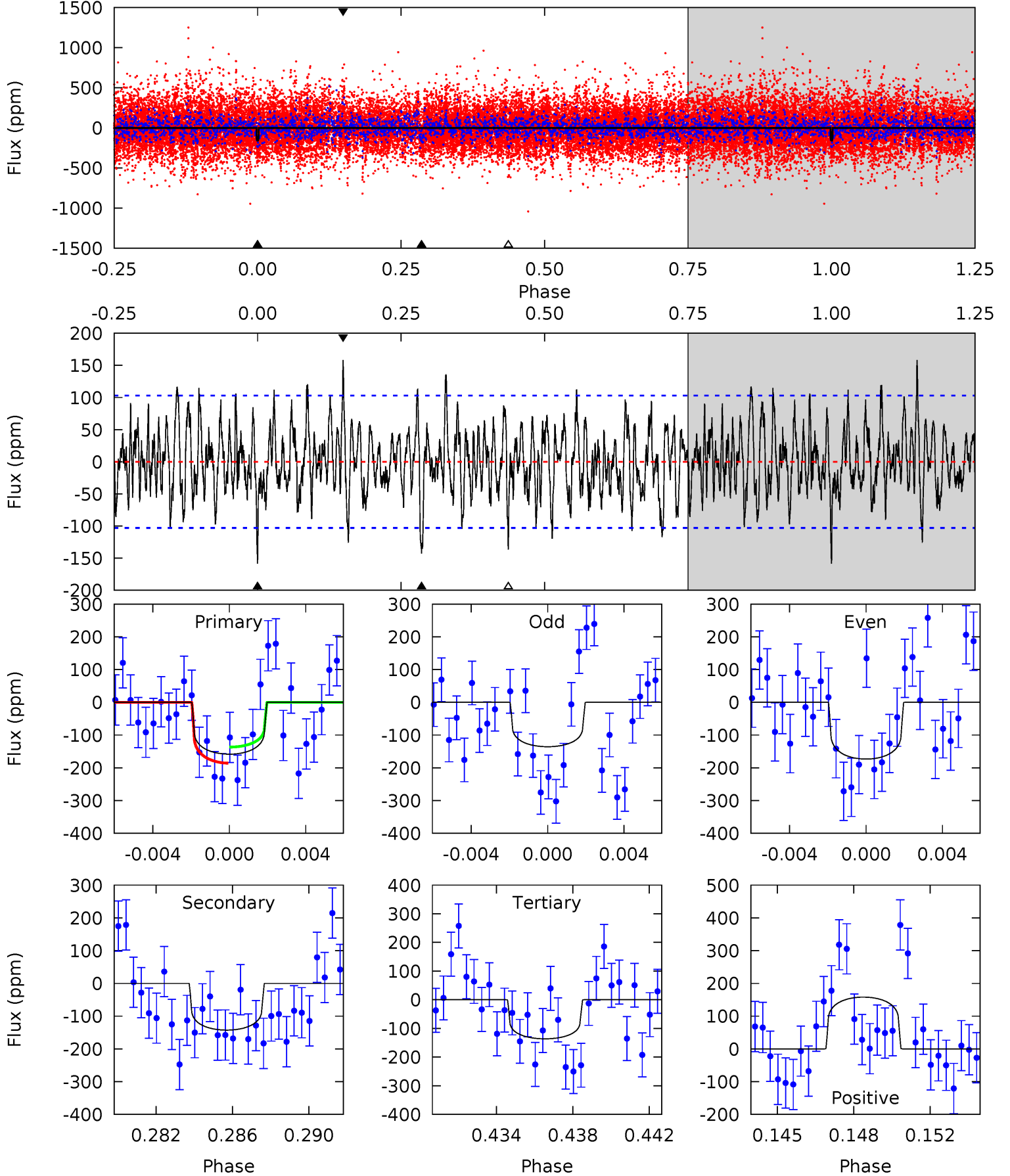
TCE 010407054-02 P=302.627835 Days $T_0=345.695412$ (BKJD)



DV Model-Shift Uniqueness Test

010407054-02, P = 302.745071 Days, E = 42.827241 Days

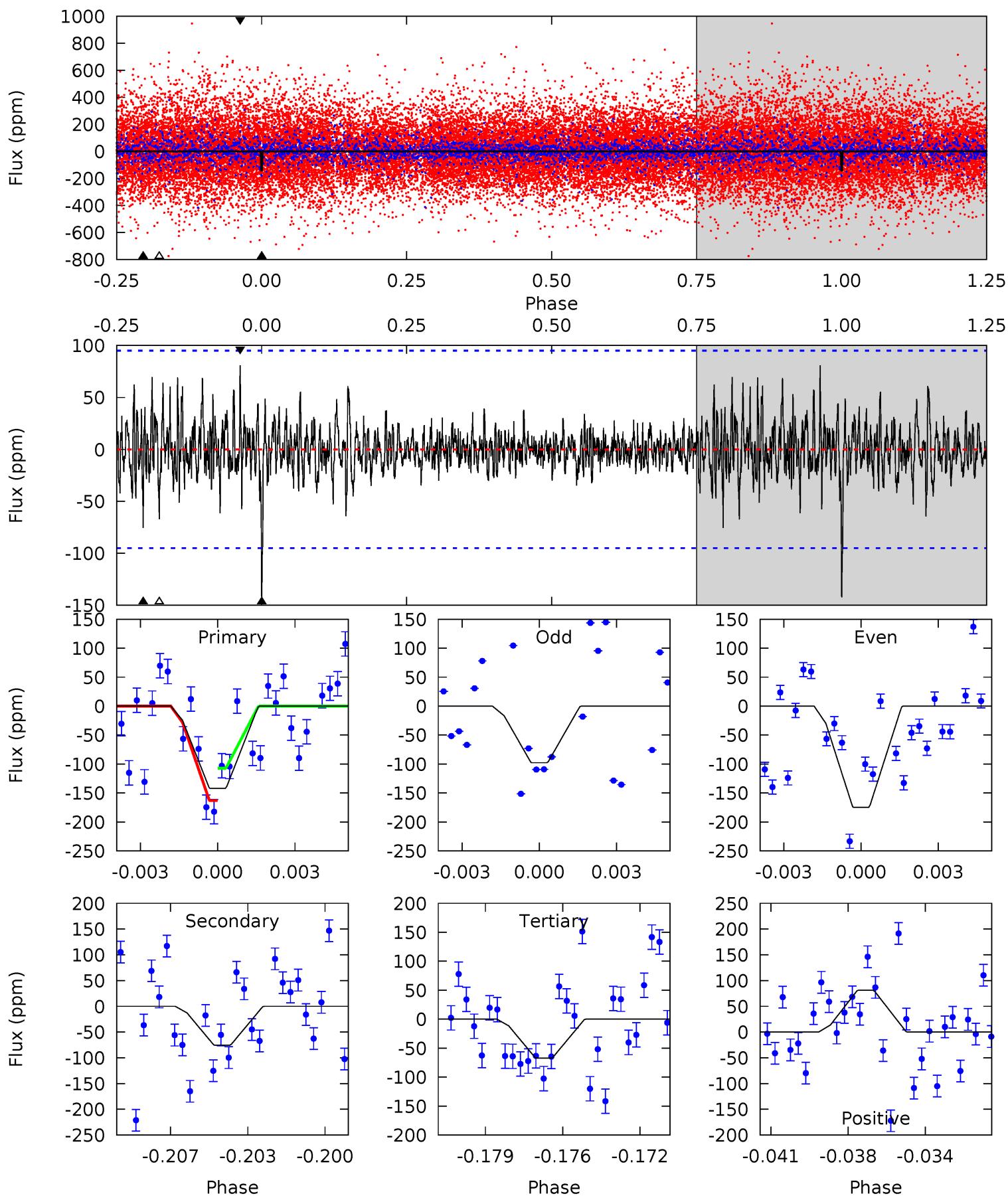
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.02	7.22	6.90	8.00	5.21	2.90	2.26	1.12	0.01	0.32	-0.78	0.93	0.80	0.50	1.24



Alt Model-Shift Uniqueness Test

010407054-02, $P = 302.627835$ Days, $E = 43.067577$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.82	4.16	3.70	4.45	5.23	2.93	0.96	4.12	3.37	0.46	-0.30	2.04	1.01	0.36	1.50



Stellar Parameters For KIC 010407054

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	6443^{+181}_{-250}	$4.146^{+0.246}_{-0.164}$	$-0.340^{+0.300}_{-0.300}$	$1.457^{+0.402}_{-0.402}$	$1.083^{+0.177}_{-0.145}$	$0.493^{+0.727}_{-0.225}$
	+3%/-4%	+6%/-4%	+88%/-88%	+28%/-28%	+16%/-13%	+147%/-46%
Source	PHO54	PHO54	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 010407054-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-143 ± 20	$2.43^{+0.83}_{-0.70}$	497^{+43}_{-41}	5598^{+971}_{-631}	10951^{+11692}_{-4867}
Alt.	-76 ± 18	$1.84^{+0.79}_{-0.69}$	498^{+38}_{-41}	5544^{+1291}_{-796}	10029^{+15596}_{-5286}

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

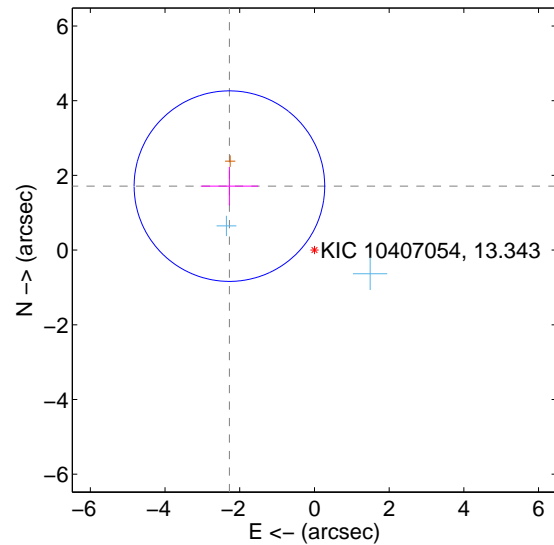
Supplemental centroid analysis for 010407054-02. Kepler magnitude: 13.34. Transit SNR 6.84

There are 2 quarters with good PRF difference image offsets

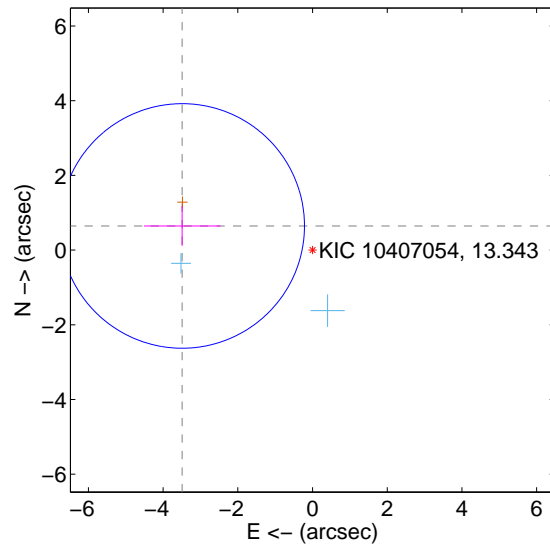
The direct PRF centroid is offset from the target star catalog position by about 1.65 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.850 ± 0.850	3.35	2.277 ± 0.768	1.713 ± 0.517
PRF-fit source offset from KIC position	3.550 ± 1.092	3.25	3.491 ± 1.022	0.647 ± 0.533
photometric centroid source offset	1.19 ± 0.60	1.97	1.16 ± 0.60	0.27 ± 0.53

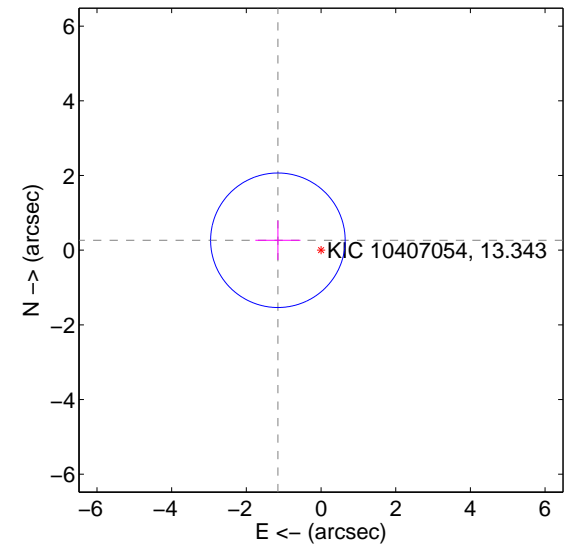
offset from difference PRF-fit to OOT PRF-fit



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



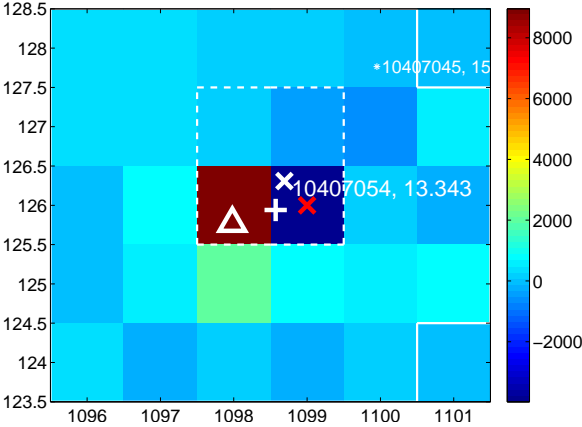
Q2 no difference image



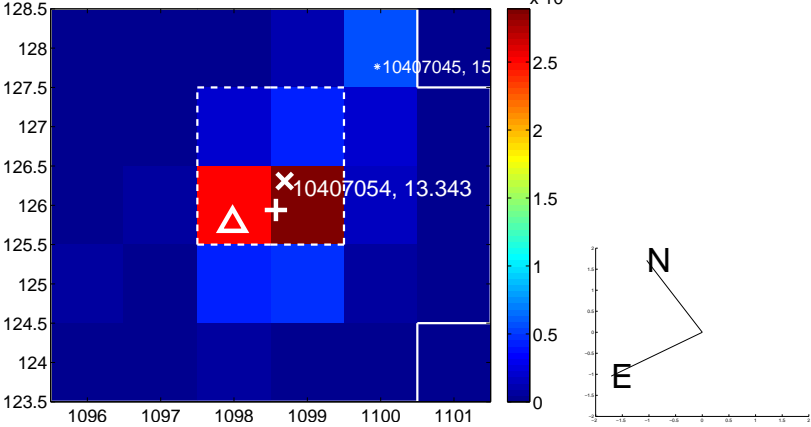
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



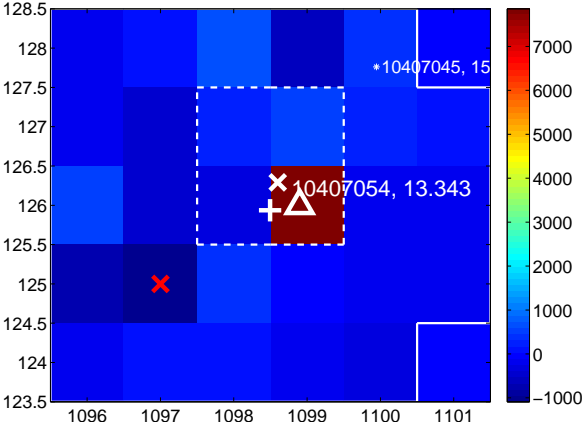
Q6 no difference image



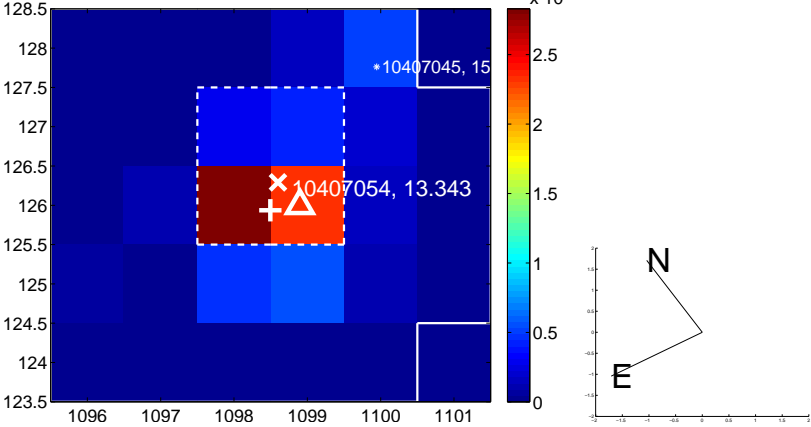
Q6 no OOT image



Q7 difference image



Q7 OOT image



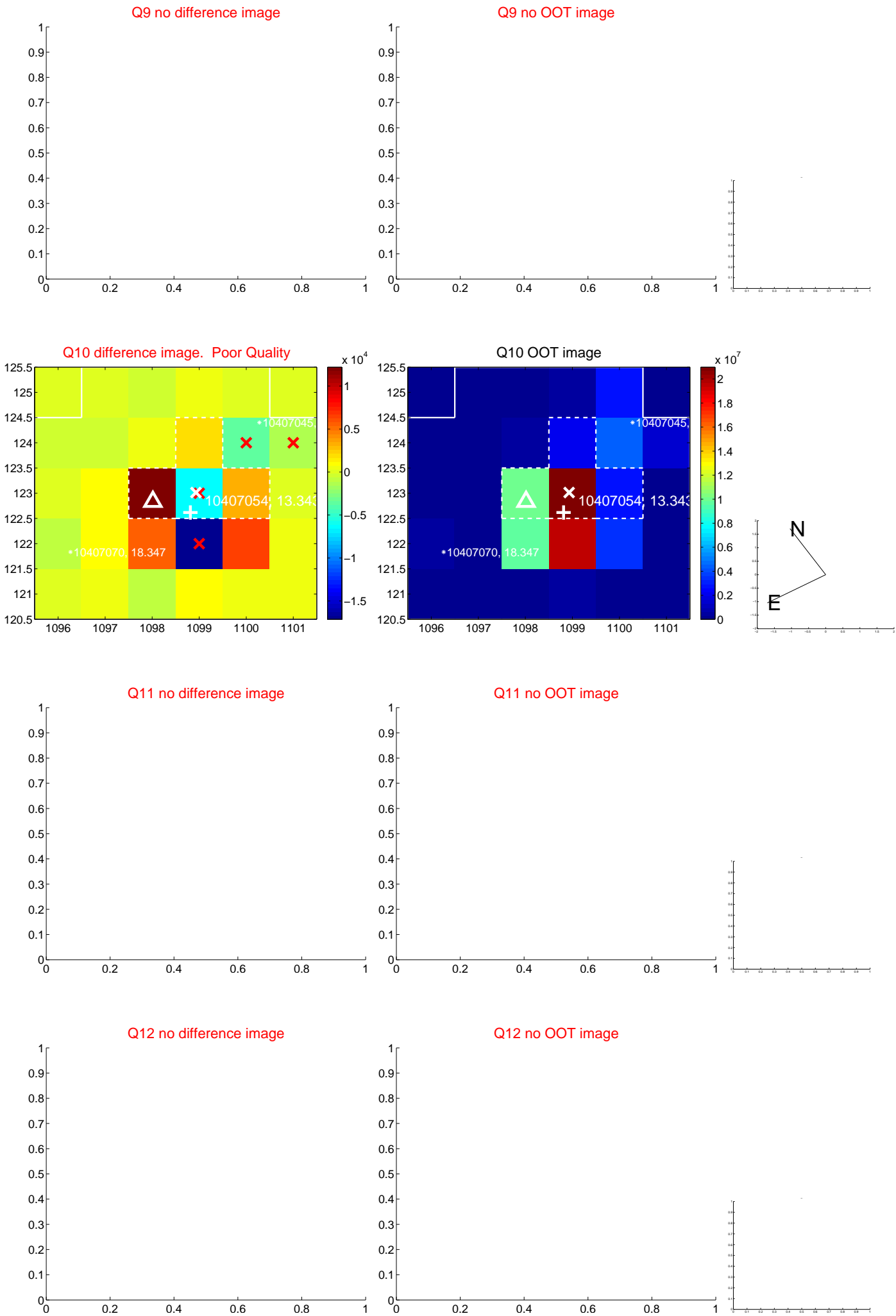
Q8 no difference image



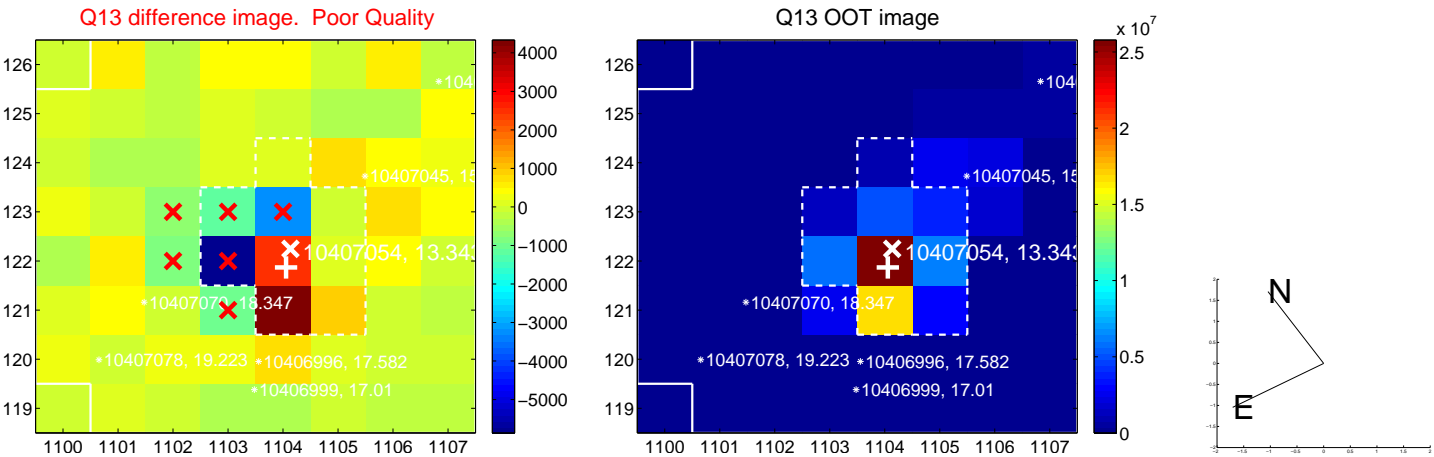
Q8 no OOT image



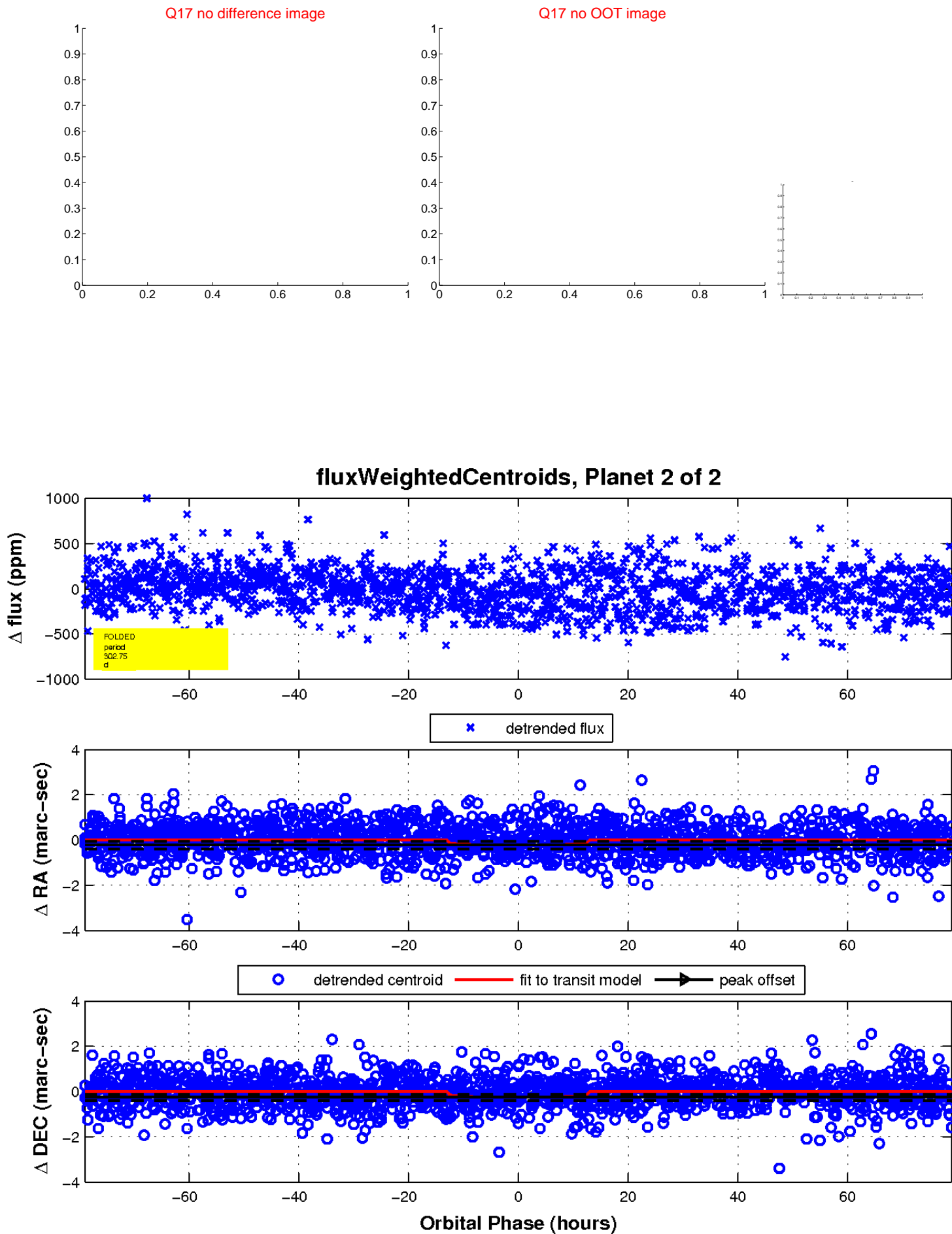
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

