

KIC 005021737

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})
005021737-01	OBS	0026.01	15.039472	144.137167	5735.9	5.306	1196.2	578.7	1.44	6501	19.61	203.06
005021737-02	OBS	No	15.039478	137.206575	5505.8	5.227	1143.9	597.2	1.44	6501	19.23	203.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005021737-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
005021737-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_KIC_POS—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 005021737-01

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
005021737-01	5021737	005021732-01	5021732	1:1	4.5	0	-1	13.62	11.99	11.67	Direct-PRF	0	0.01	0.00

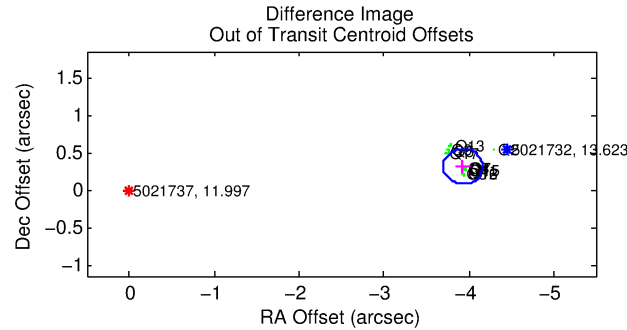
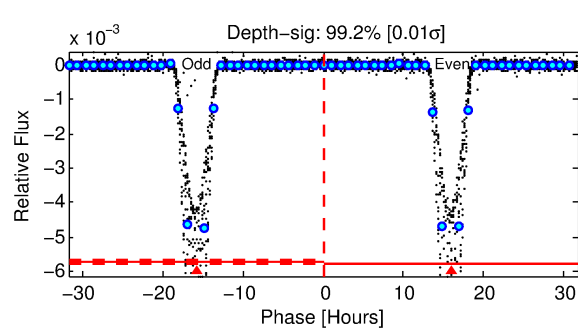
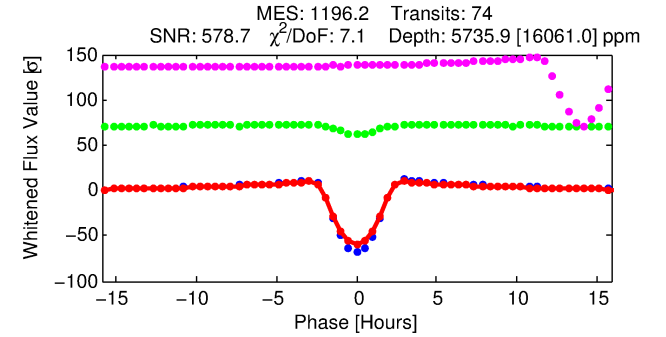
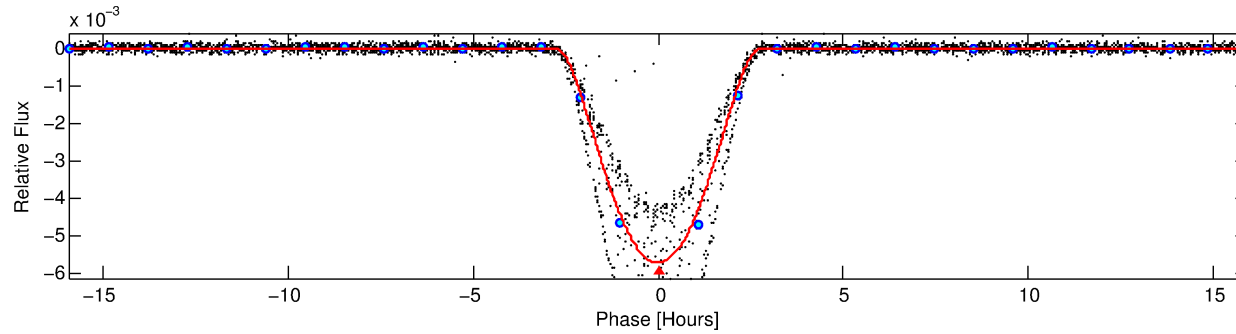
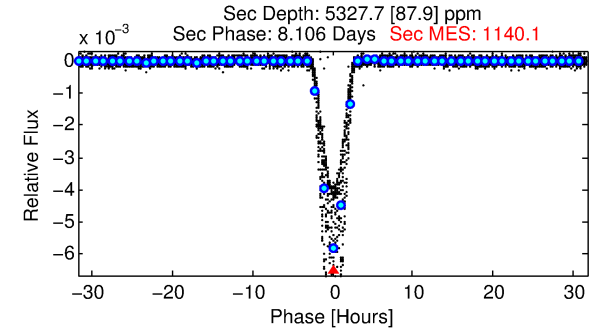
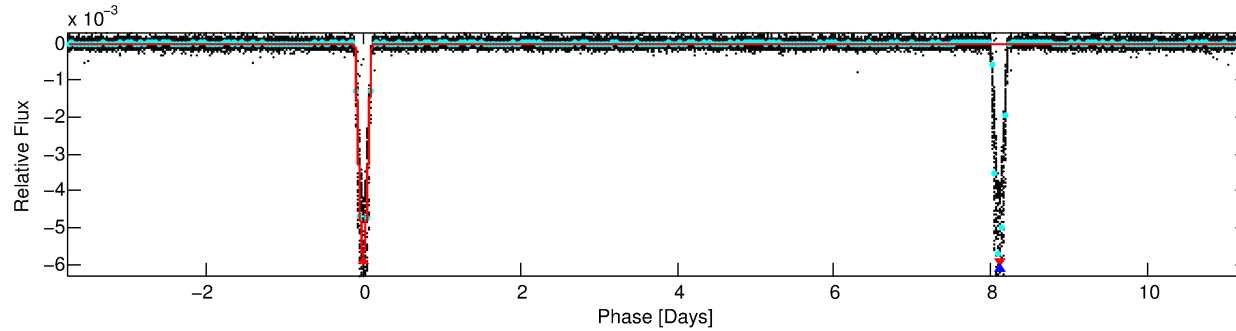
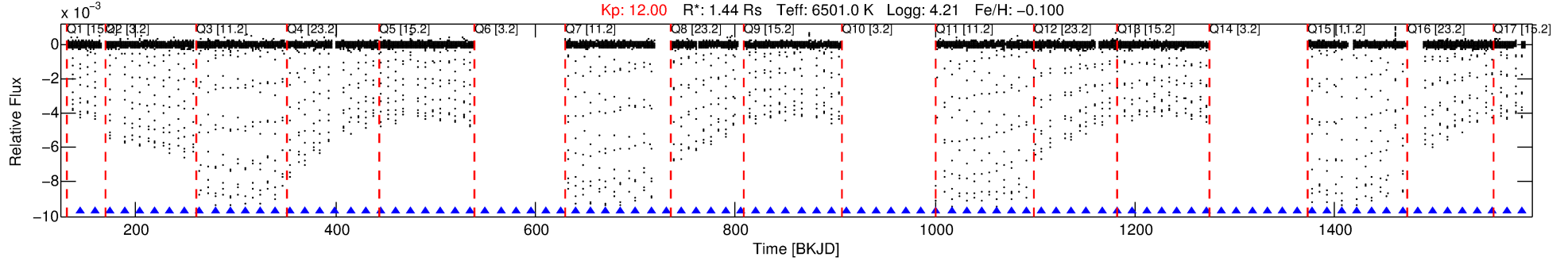
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 5021737 Candidate: 1 of 2 Period: 15.039 d

KOI: K00026.01 Corr: 0.980

Kp: 12.00 R*: 1.44 Rs Teff: 6501.0 K Logg: 4.21 Fe/H: -0.100



DV Fit Results:

Period = 15.03947 [0.00001] d
Epoch = 144.1372 [0.0003] BKJD
Rp/R* = 0.1247 [0.0144]
a/R* = 11.20 [0.23]
b = 1.00 [0.21]
Seff = 203.06 [76.55]
Teq = 963 [91] K
Rp = 19.61 [6.67] Re
a = 0.1279 [0.0329] AU
Ag = 124.73 [53.08] [2.33 sigma]
Teffp = 4973 [323] K [11.95 sigma]

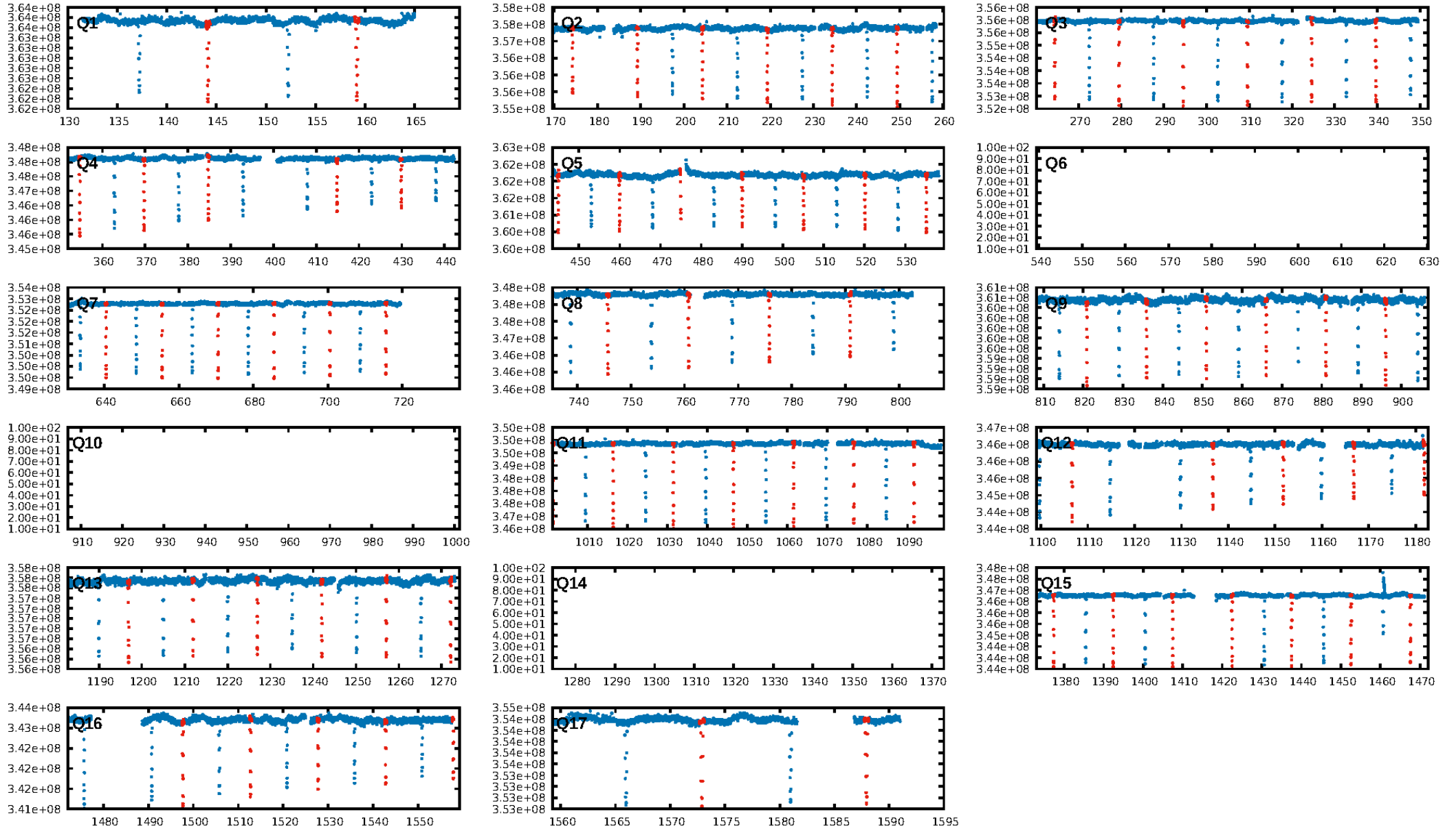
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 sigma]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [70/70]
GhostDiagnostic-chr: 0.09065
Centroid-sig: 0.0%
Centroid-so: 7.930 arcsec [796.38 sigma]
OotOffset-rm: 3.941 arcsec [50.77 sigma]
KicOffset-rm: 4.455 arcsec [66.06 sigma]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

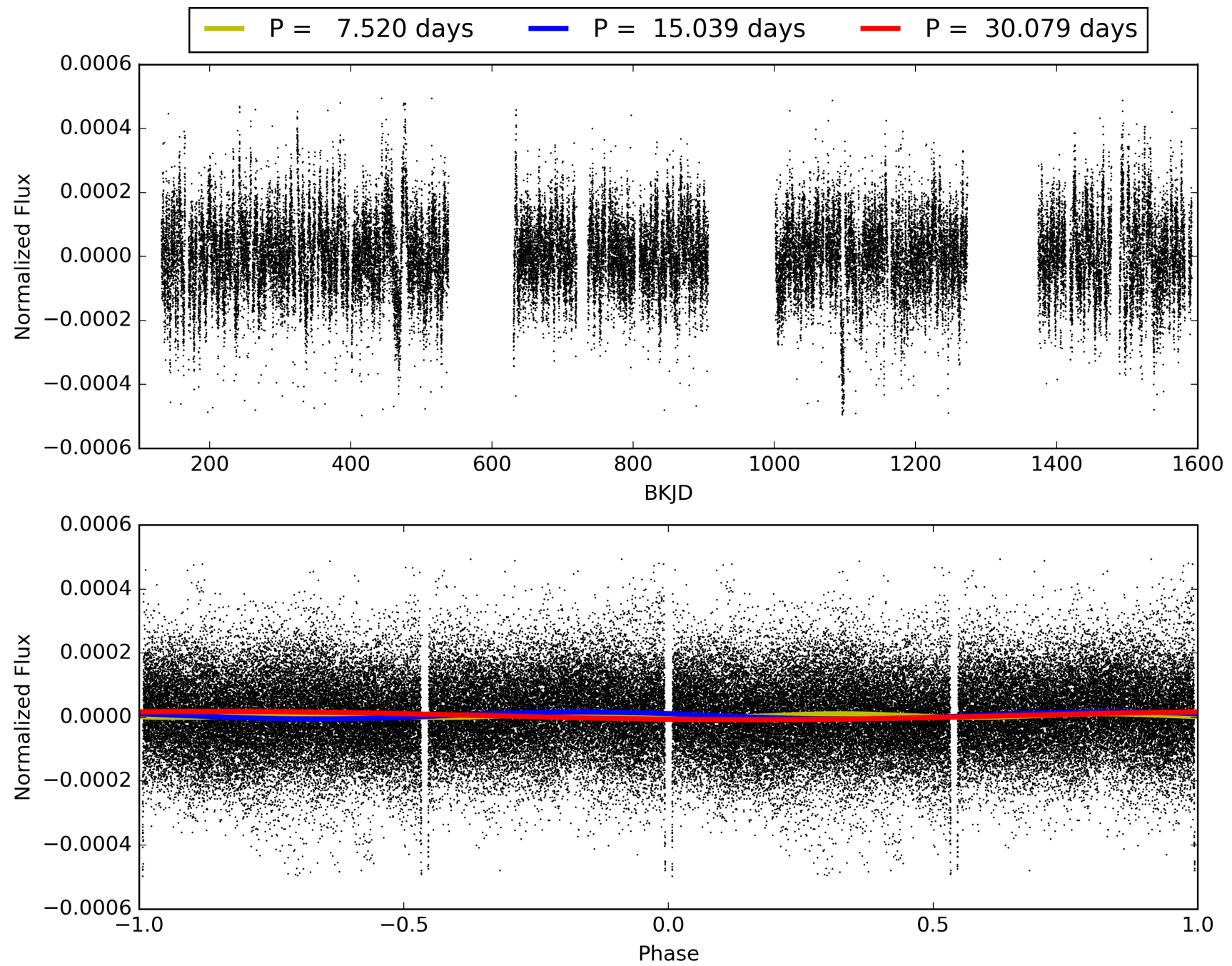
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:42:02 Z

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

TCE 005021737-01, PDC Light Curves

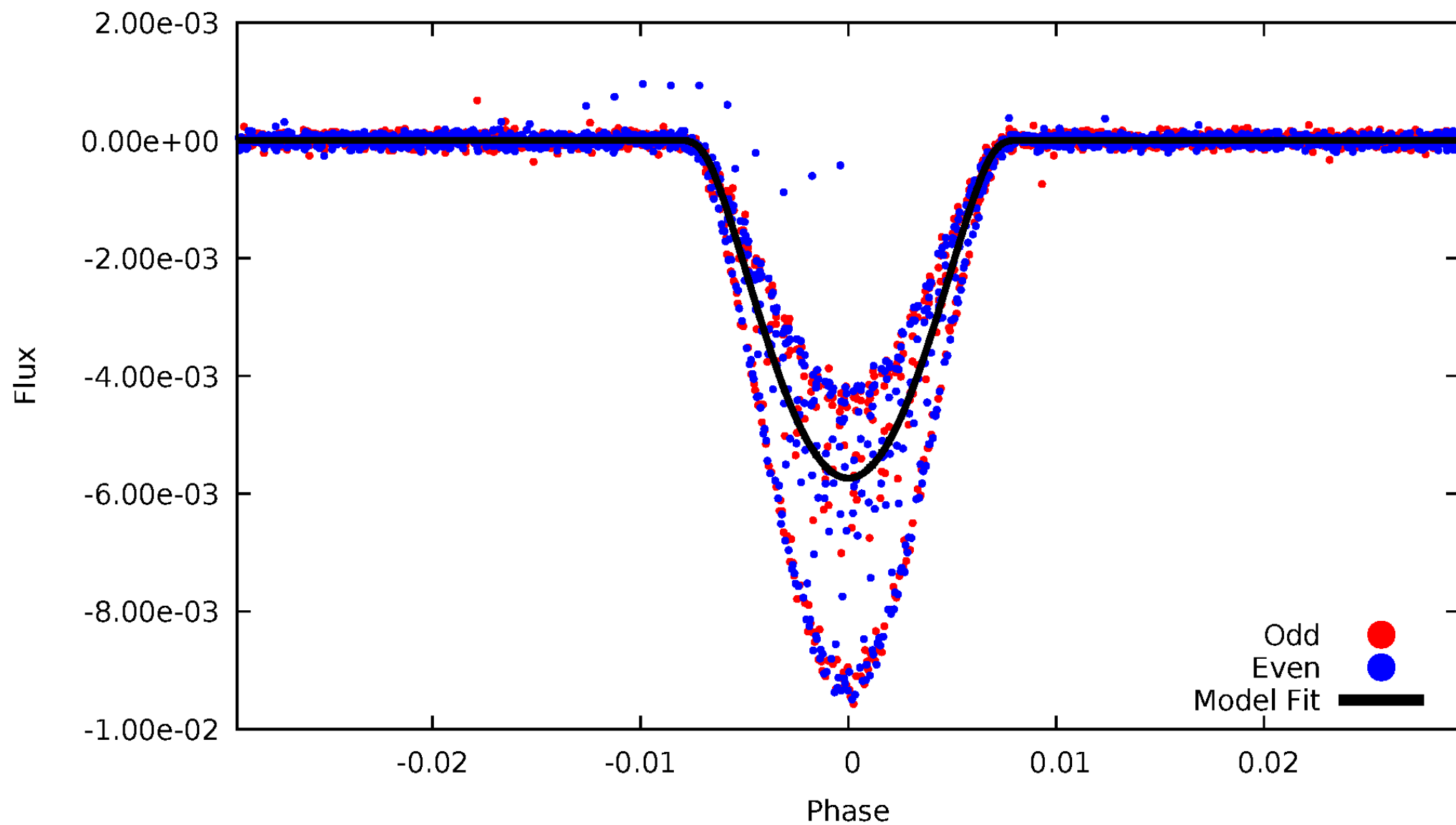


TCE 005021737-01



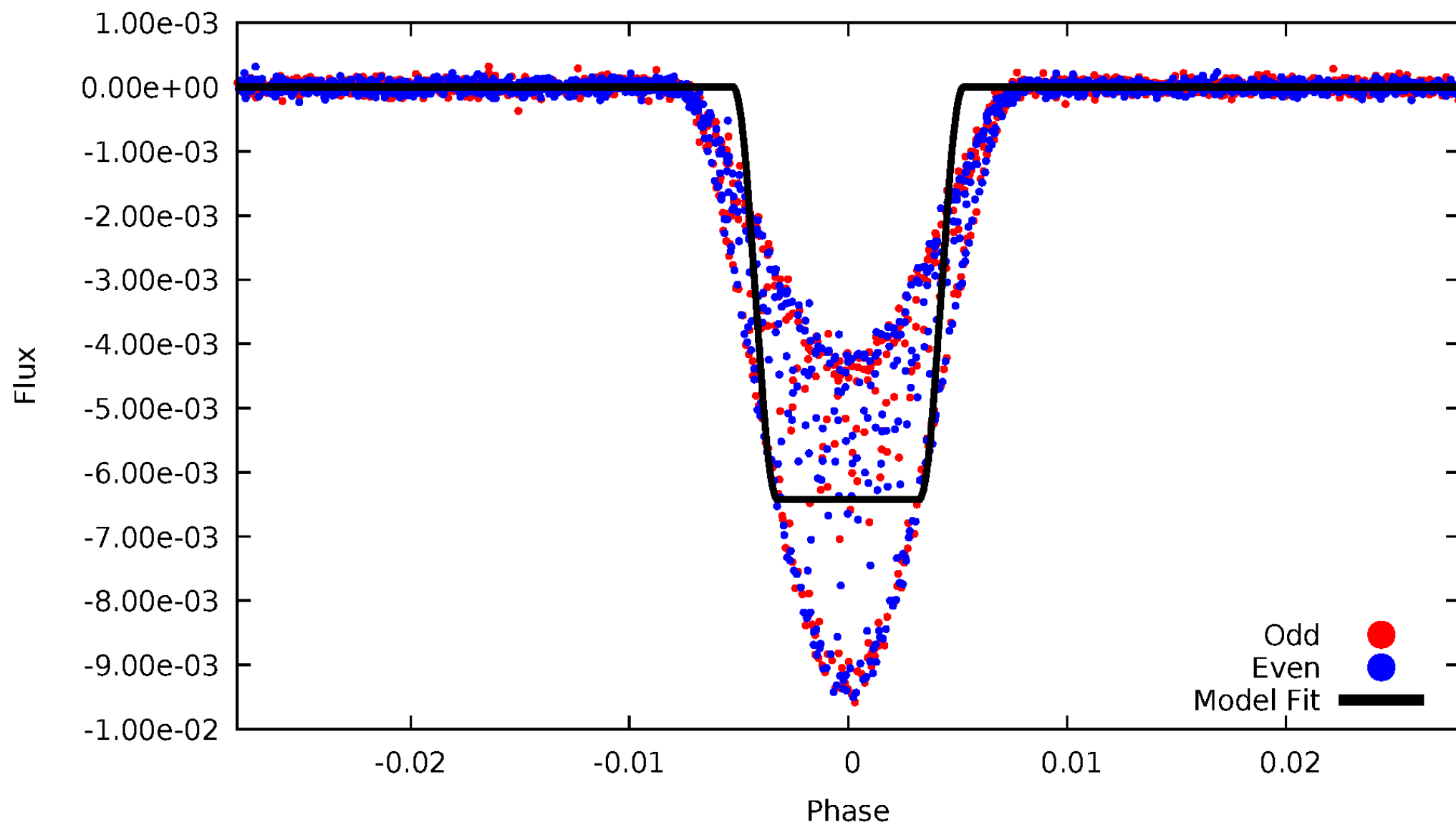
DV Odd/Even

TCE 005021737-01



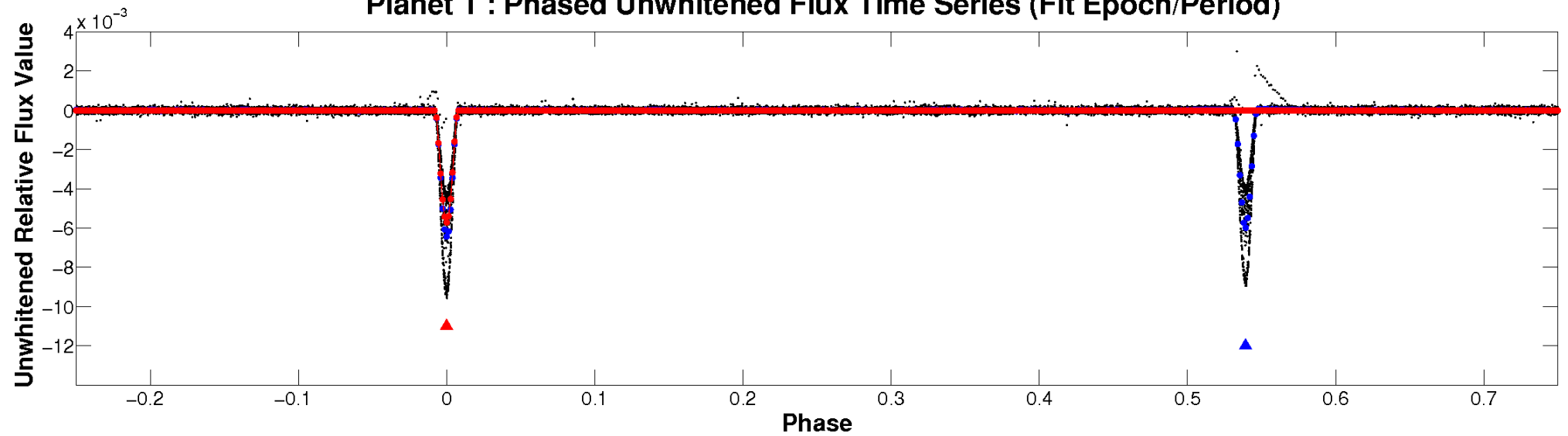
ALT Odd/Even

TCE 005021737-01

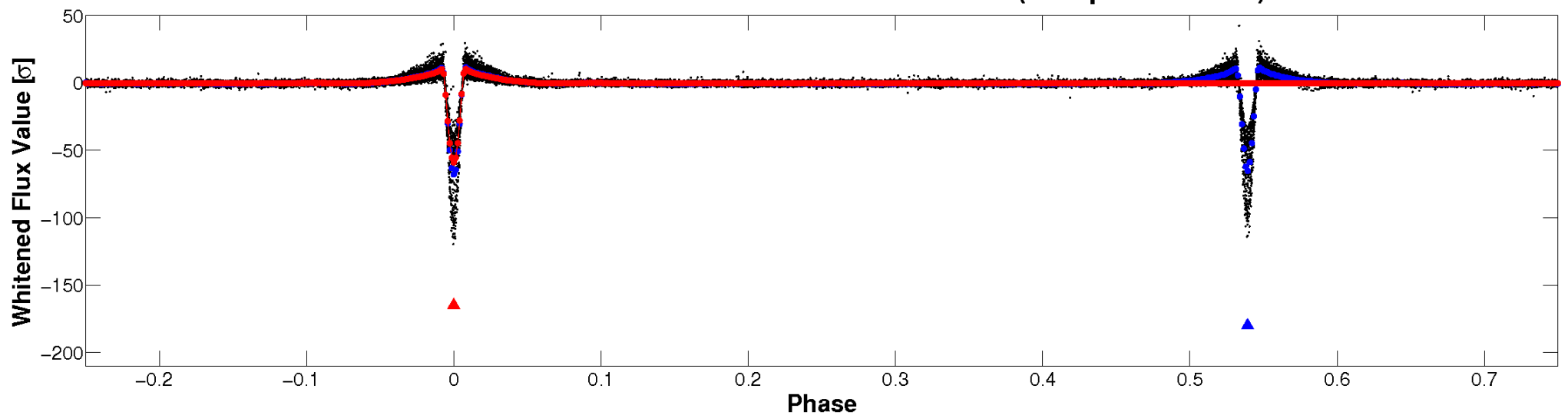


Non-Whitened Vs. Whitened Light Curve

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

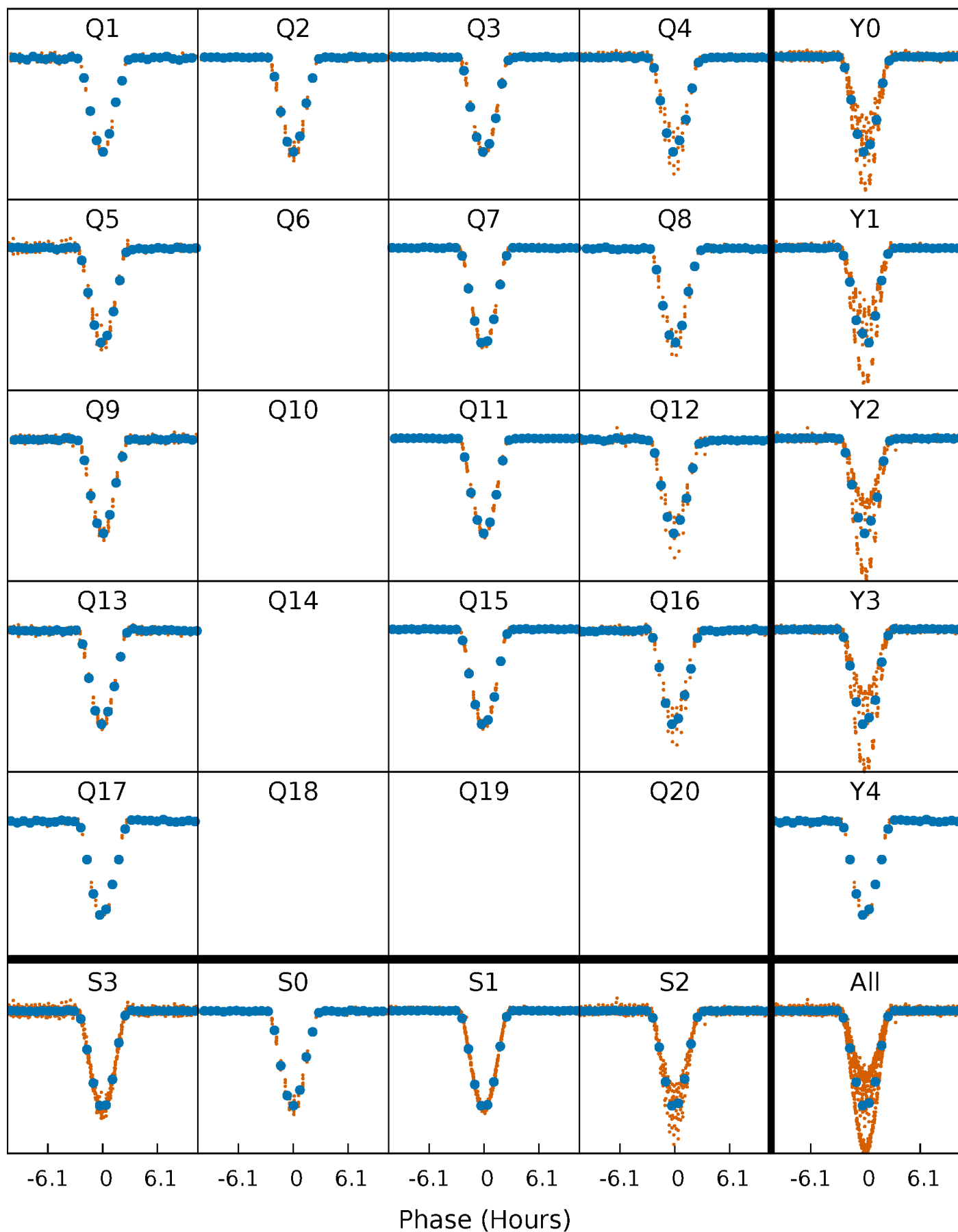


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



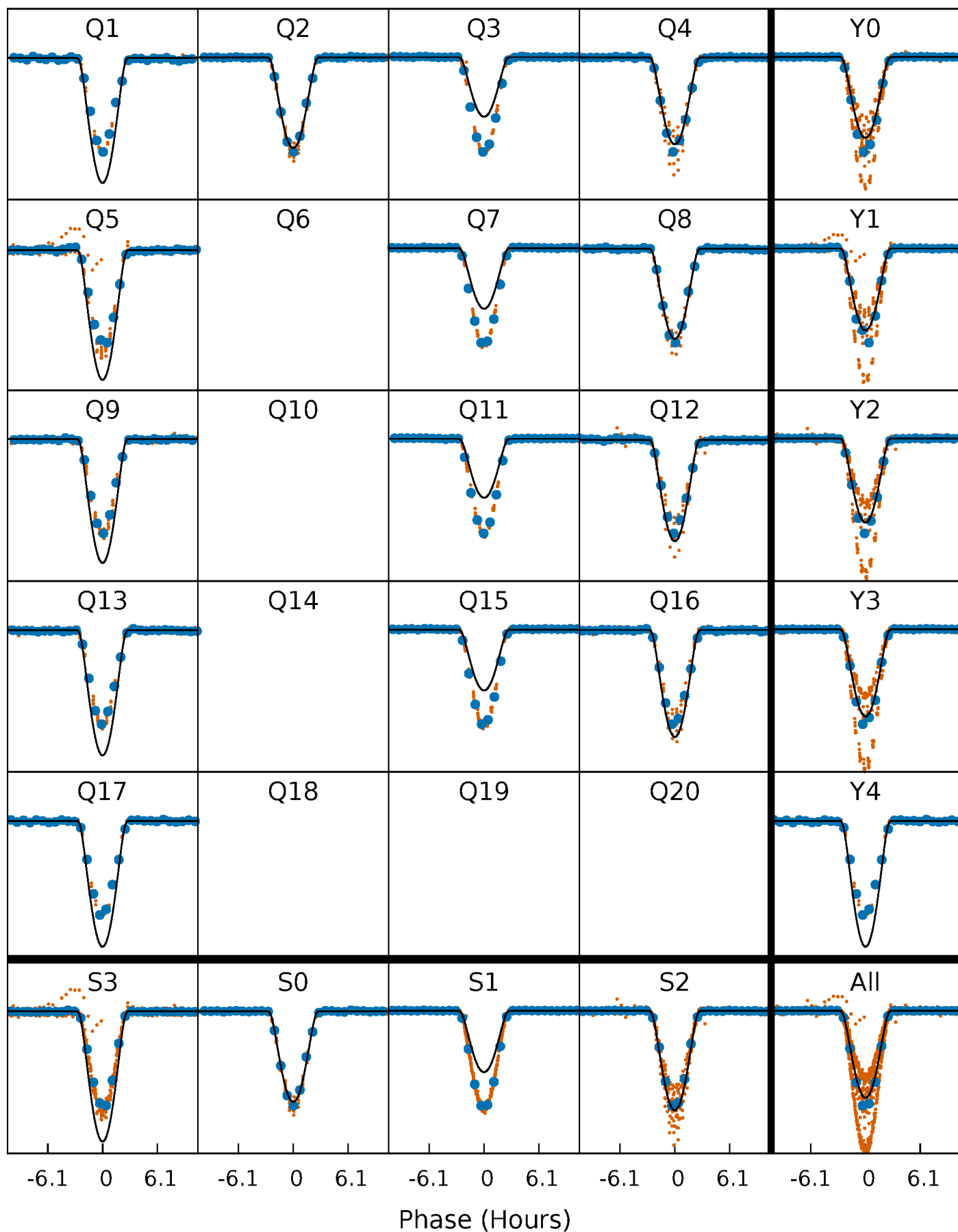
PDC Quarter-Phased Transit Curves

TCE 005021737-01 P= 15.039472 Days $T_0=144.137167$ (BKJD)



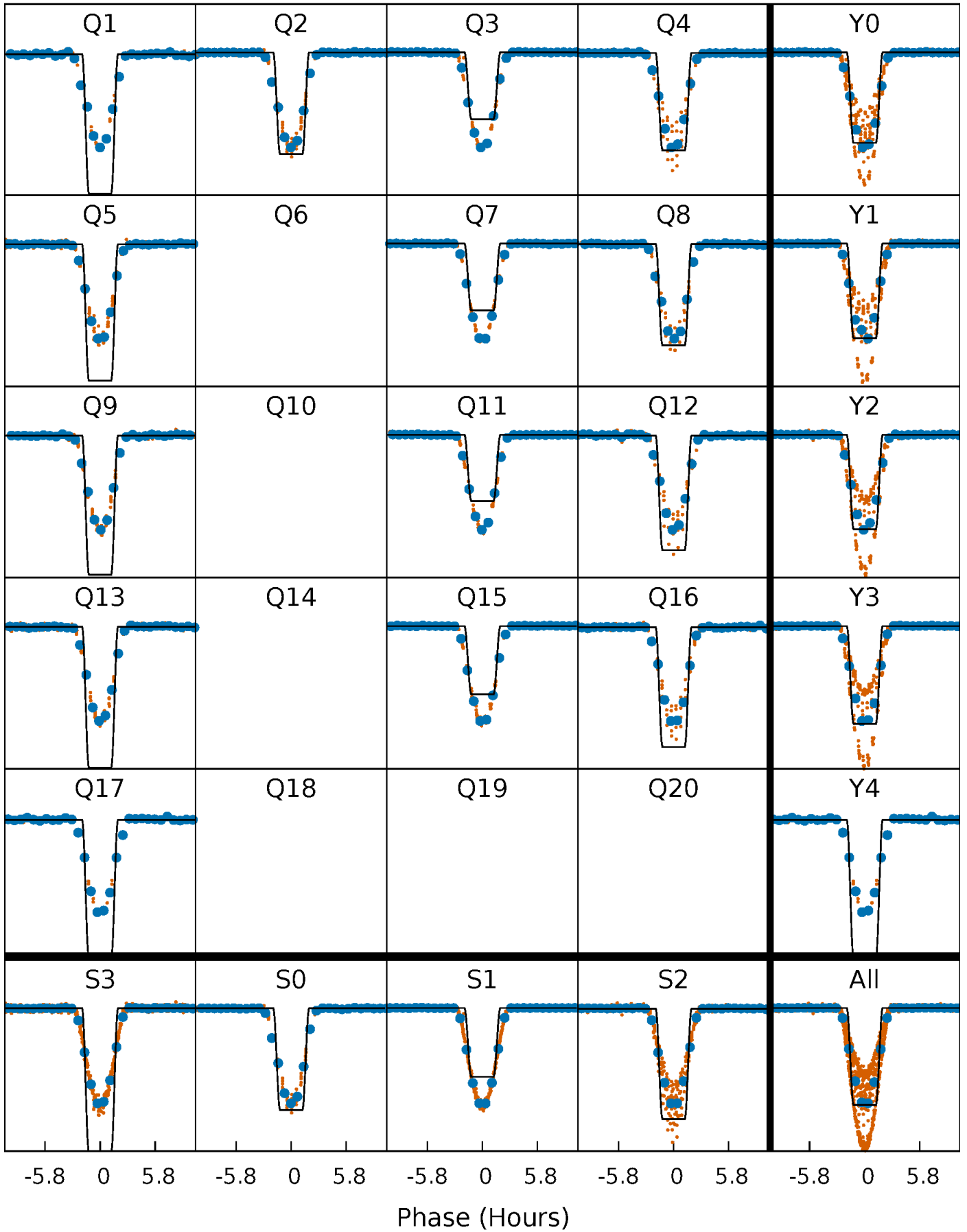
DV Quarter-Phased Transit Curves

TCE 005021737-01 P= 15.039472 Days $T_0=144.137167$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

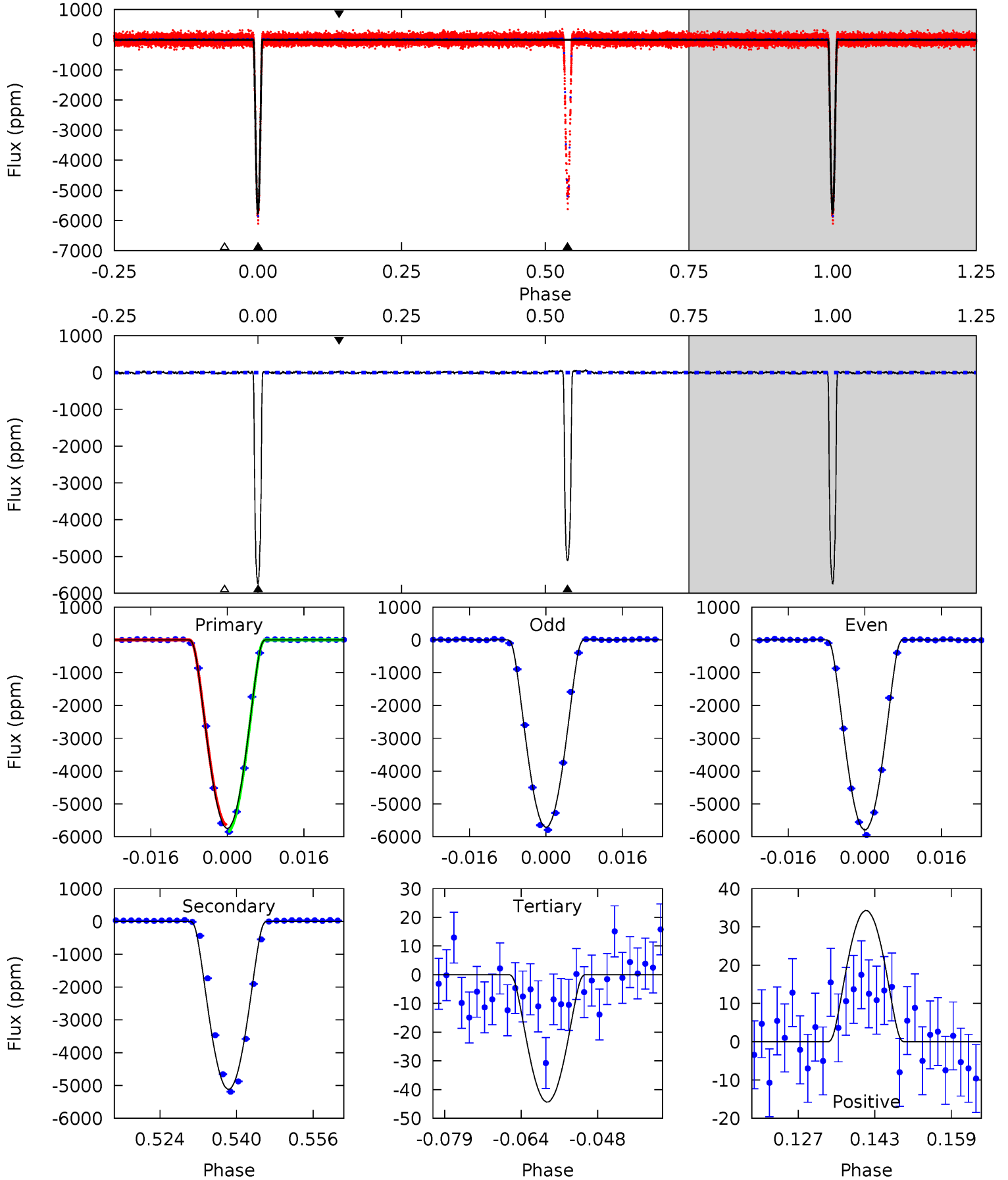
TCE 005021737-01 P= 15.039438 Days $T_0=144.138544$ (BKJD)



DV Model-Shift Uniqueness Test

005021737-01, P = 15.039472 Days, E = 129.097695 Days

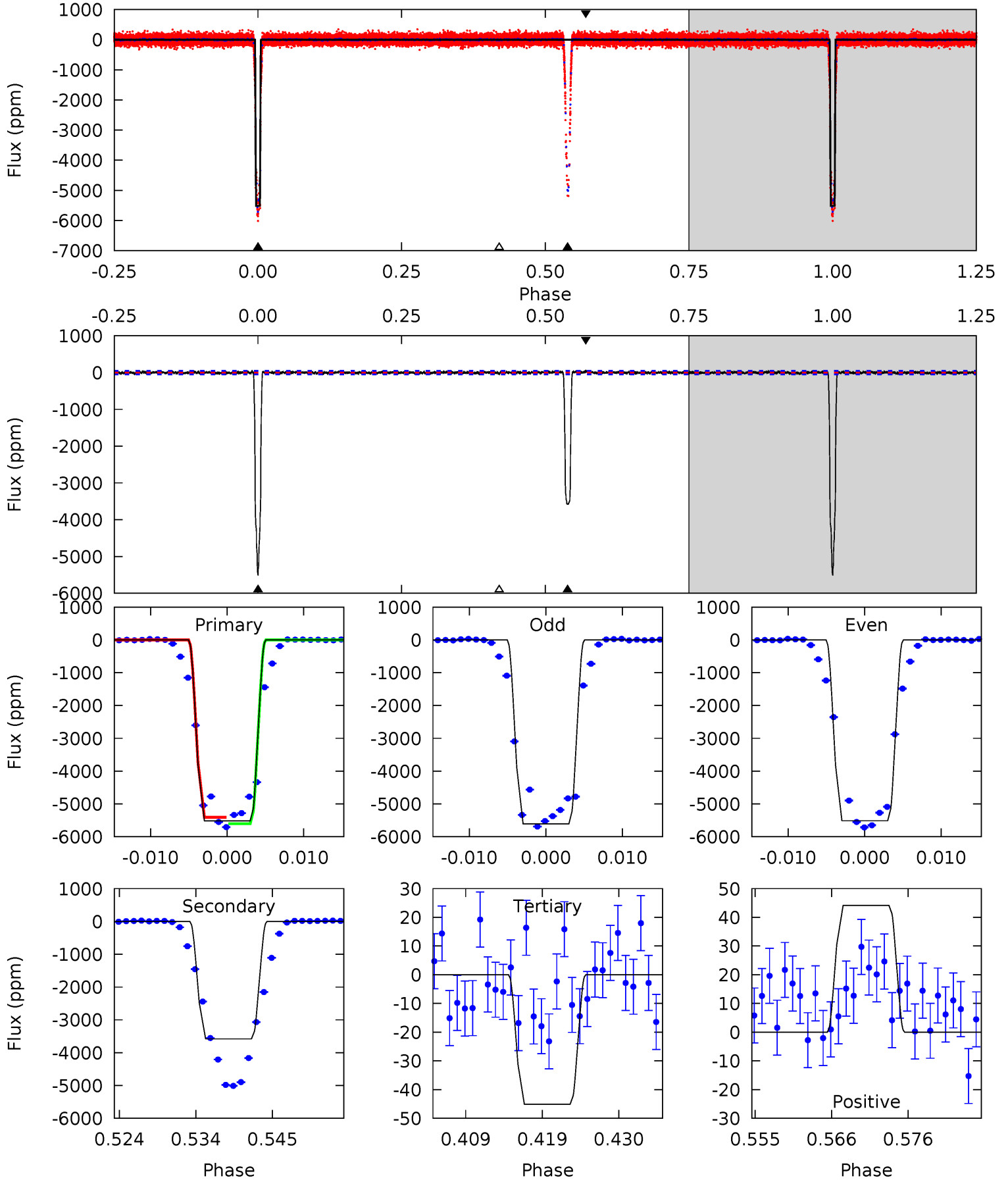
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1303	1161	10.1	7.78	4.94	2.41	3.30	1293	1296	1151	1153	9.22	1.10	0.01	0



Alt Model-Shift Uniqueness Test

005021737-01, P = 15.039438 Days, E = 129.099106 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
593.8	385.7	4.86	4.75	5.02	2.56	1.42	589.0	589.1	380.8	380.9	5.00	1.11	0.01	0



Stellar Parameters For KIC 005021737

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6501^{+146}_{-194}	$4.212^{+0.153}_{-0.187}$	$-0.100^{+0.250}_{-0.300}$	$1.441^{+0.461}_{-0.307}$	$1.236^{+0.188}_{-0.188}$	$0.582^{+0.464}_{-0.299}$
	+2%/-3%	+4%/-4%	+250%/-300%	+32%/-21%	+15%/-15%	+80%/-51%
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 005021737-01 / KOI 0026.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5111 ± 4	$19.84^{+4.10}_{-3.36}$	1351^{+104}_{-91}	4986^{+292}_{-237}	117^{+49}_{-35}
Alt.	-3582 ± 9	$12.88^{+3.30}_{-2.76}$	1350^{+107}_{-82}	5612^{+570}_{-436}	198^{+110}_{-73}

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 $A_{\text{obs}} \gg 1.0$

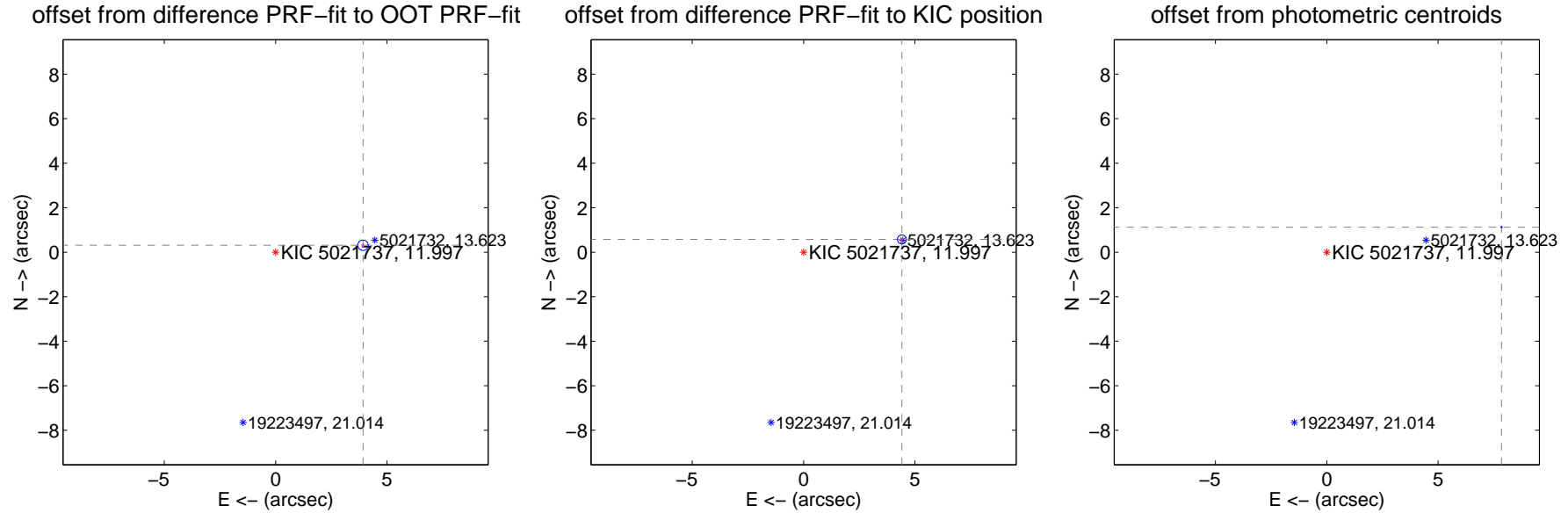
DV Centroid Data

Supplemental centroid analysis for 005021737-01. **Kepler magnitude: 12.00.** Transit SNR 578.71

There are 14 quarters with good PRF difference image offsets

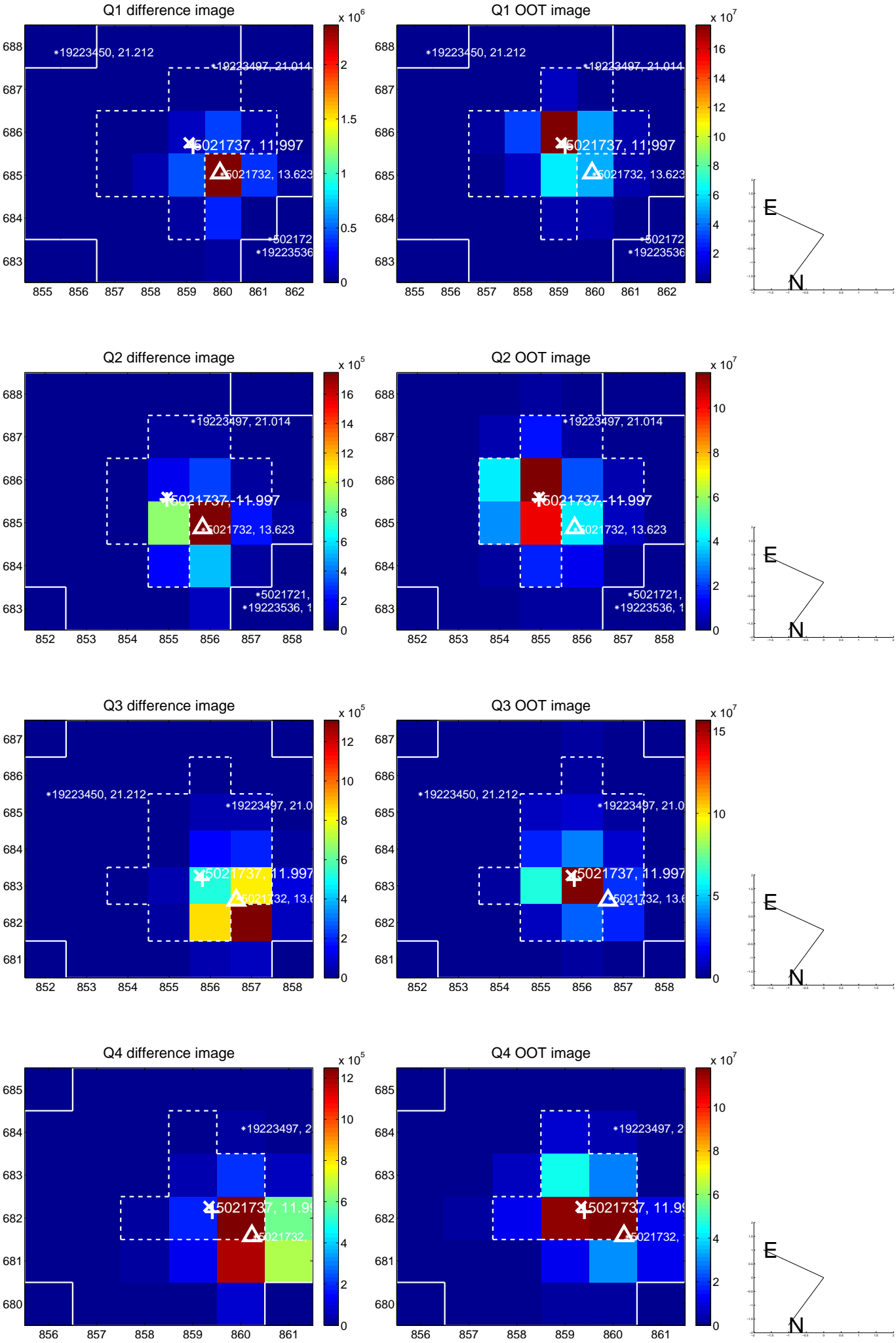
The direct PRF centroid is offset from the target star catalog position by about 0.66 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.941 \pm 0.078	50.77	-3.929 \pm 0.078	0.312 \pm 0.078
PRF-fit source offset from KIC position	4.455 \pm 0.067	66.06	-4.418 \pm 0.067	0.574 \pm 0.069
photometric centroid source offset	7.93 \pm 0.01	796.38	-7.85 \pm 0.01	1.12 \pm 0.01

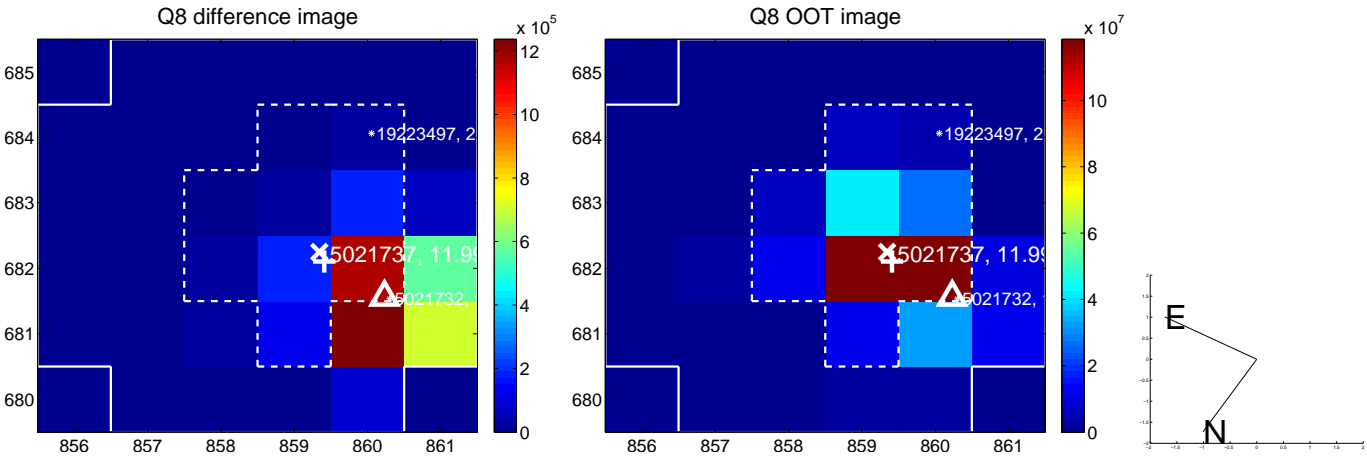
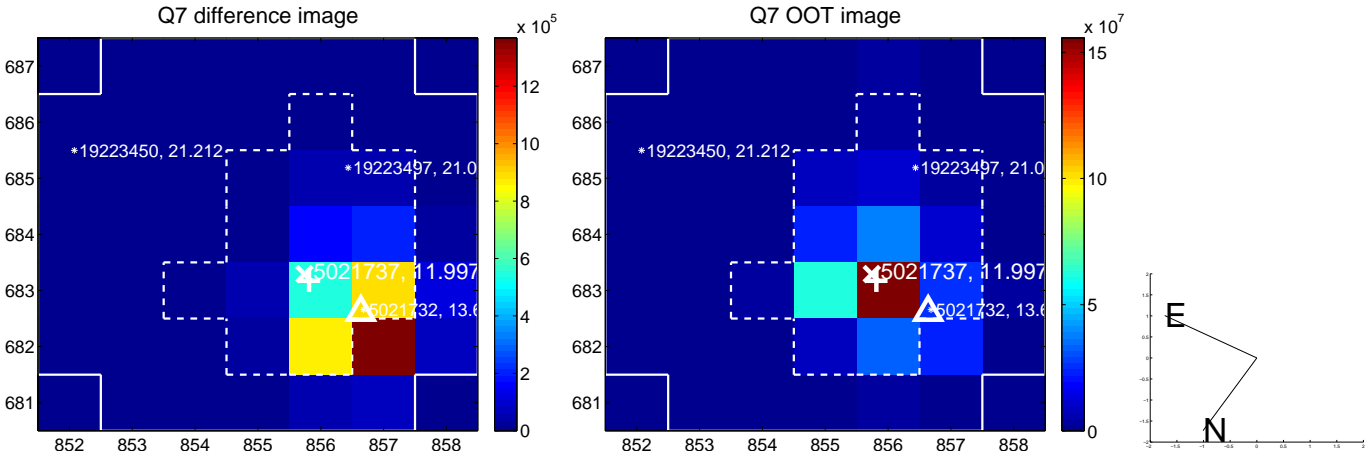
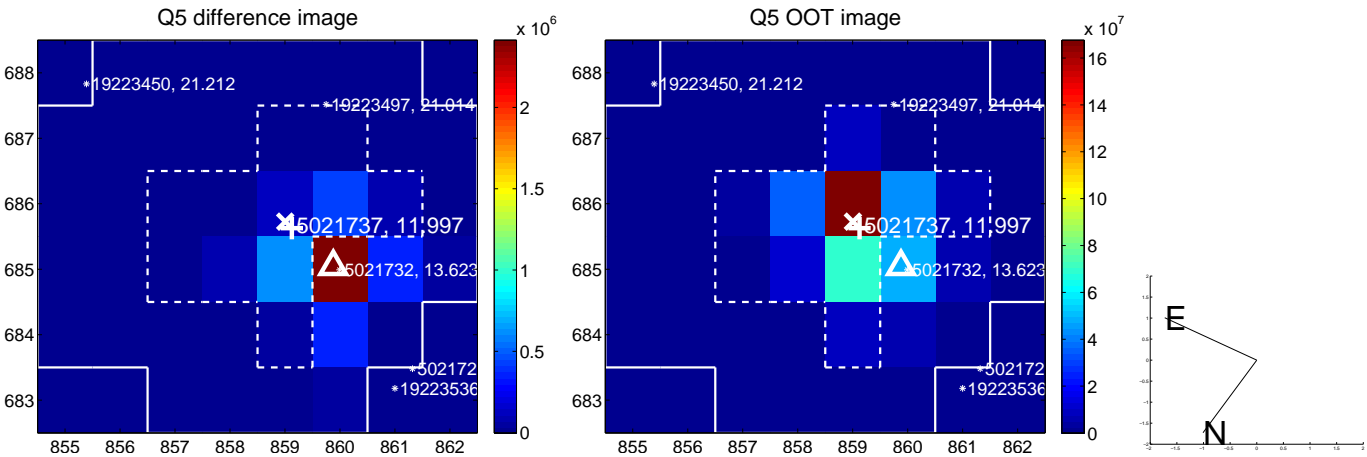


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

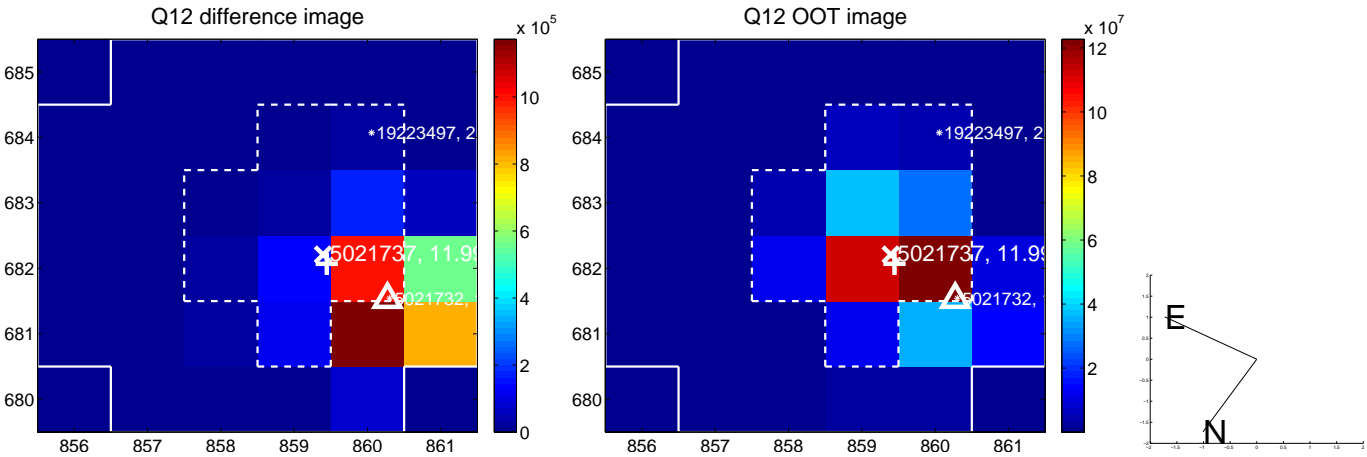
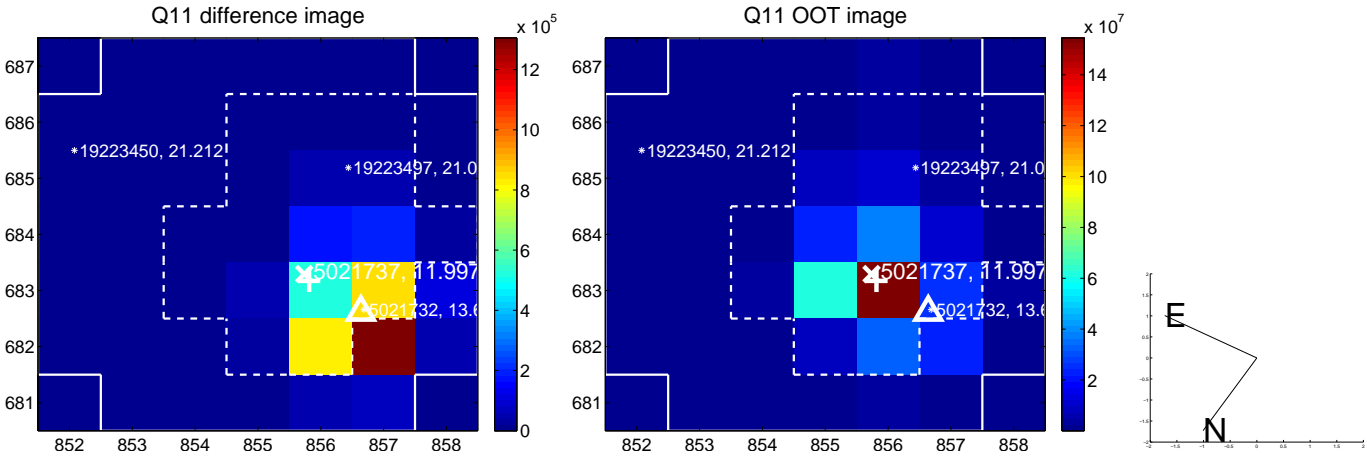
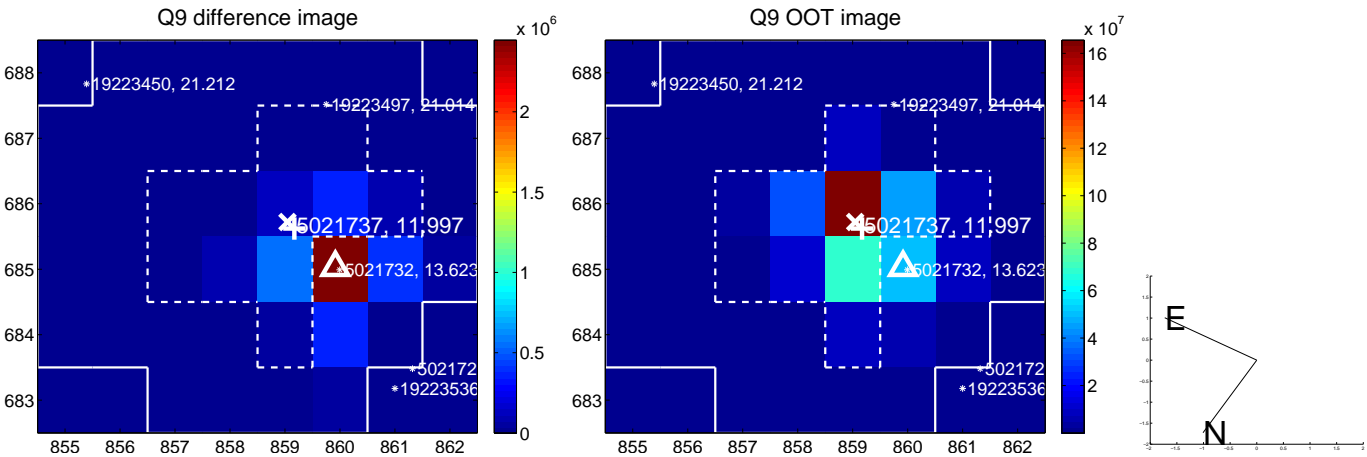
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



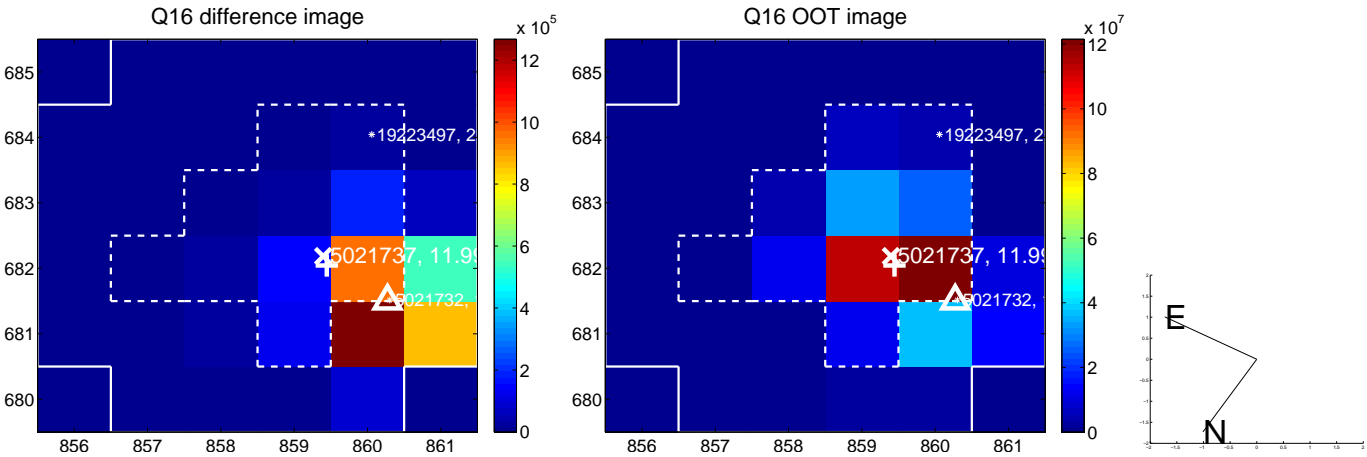
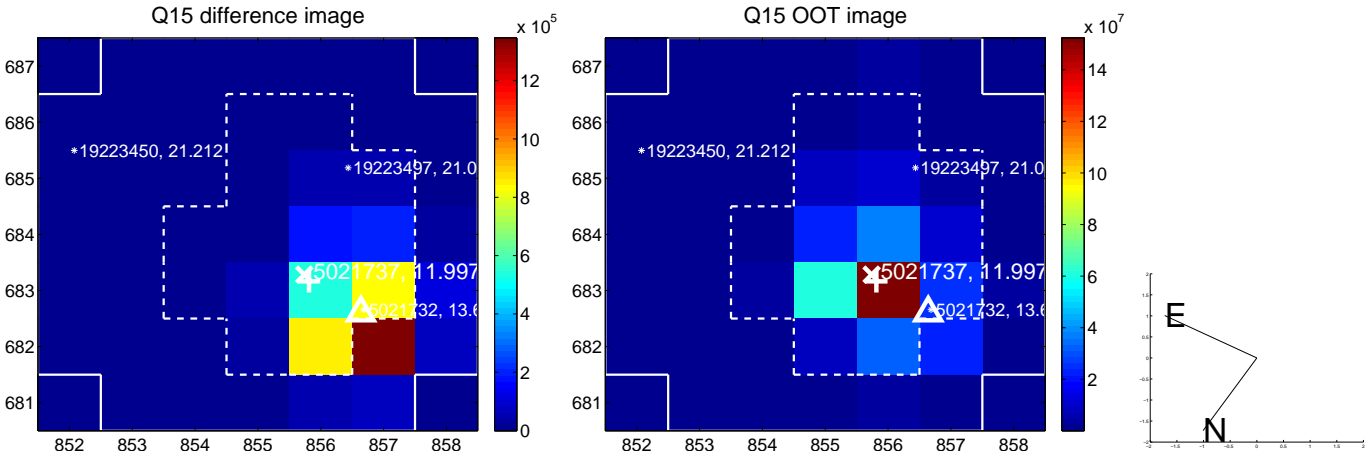
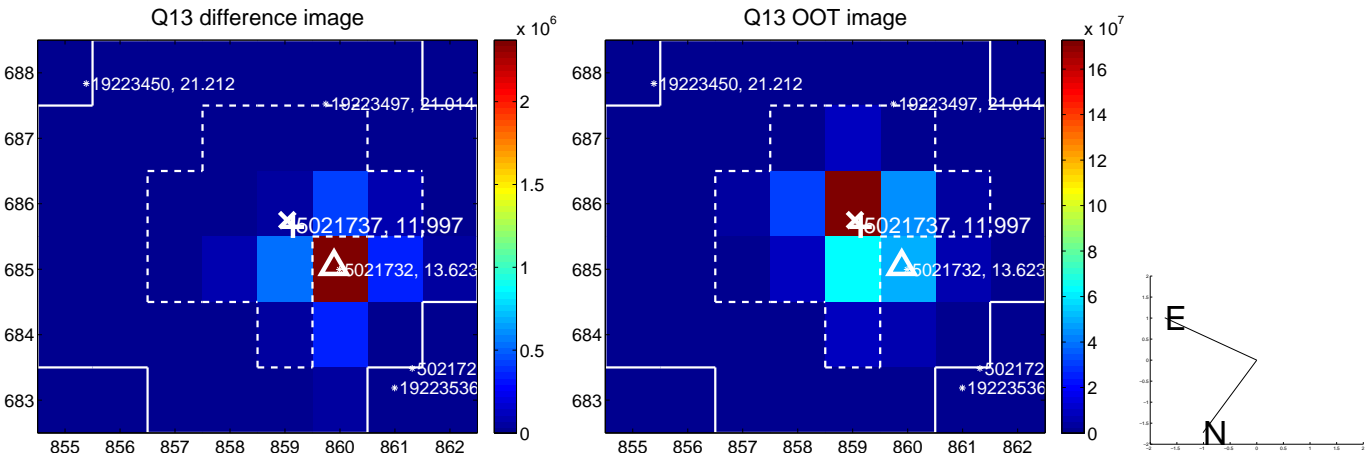
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



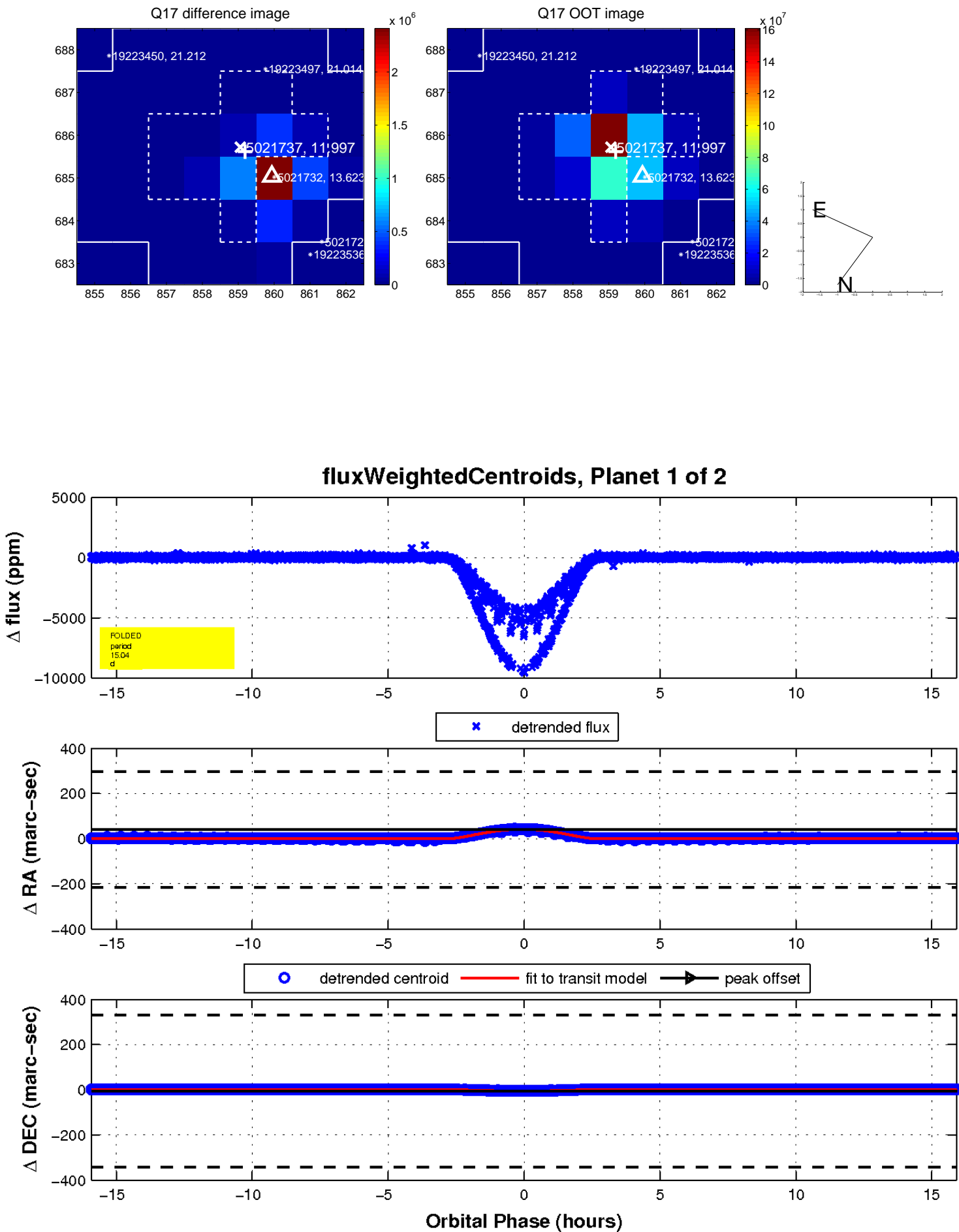
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

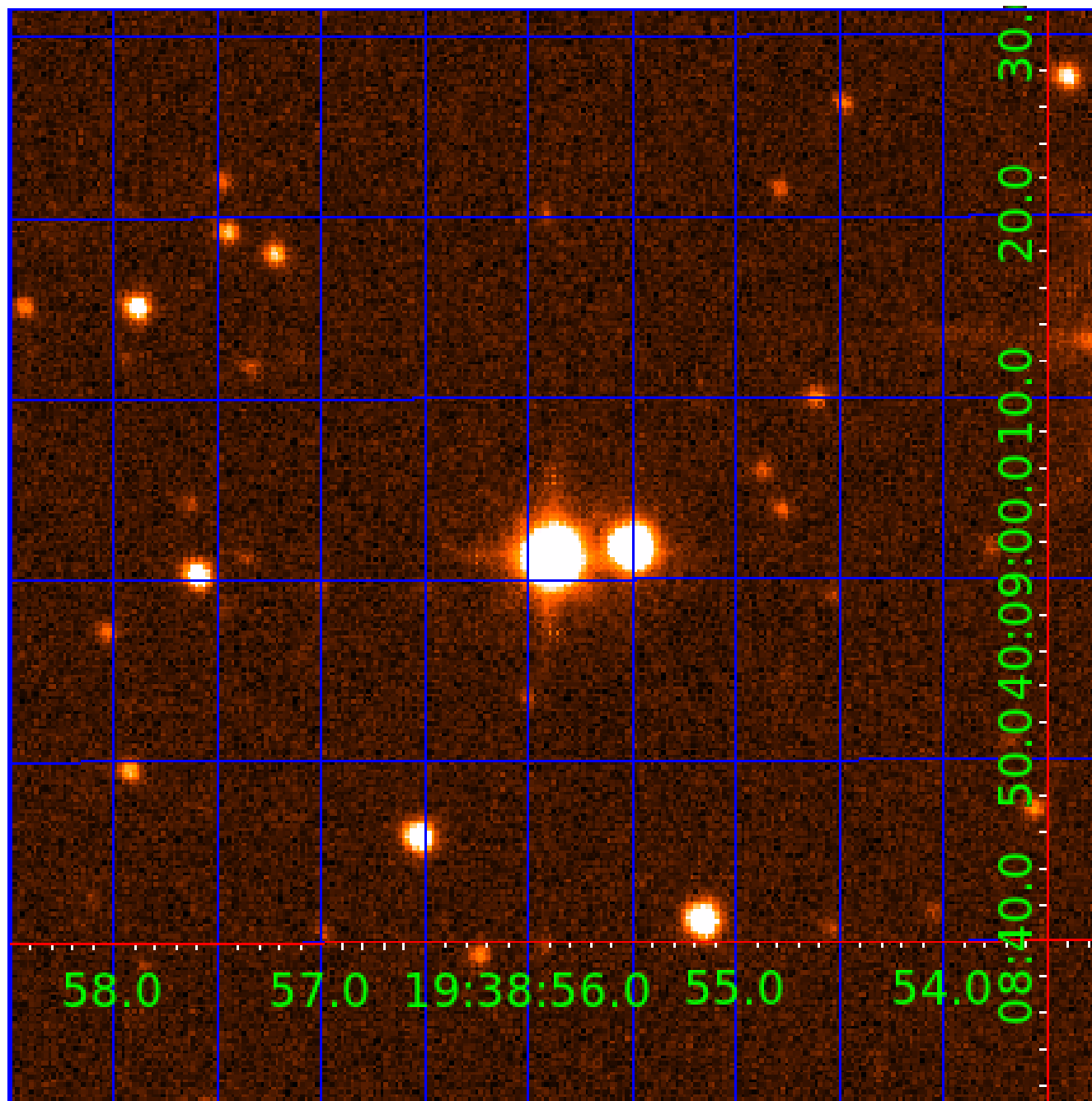


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



UKIRT Image

Declination



KIC 005021737

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})
005021737-01	OBS	0026.01	15.039472	144.137167	5735.9	5.306	1196.2	578.7	1.44	6501	19.61	203.06
005021737-02	OBS	No	15.039478	137.206575	5505.8	5.227	1143.9	597.2	1.44	6501	19.23	203.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005021737-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
005021737-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_KIC_POS—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 005021737-02

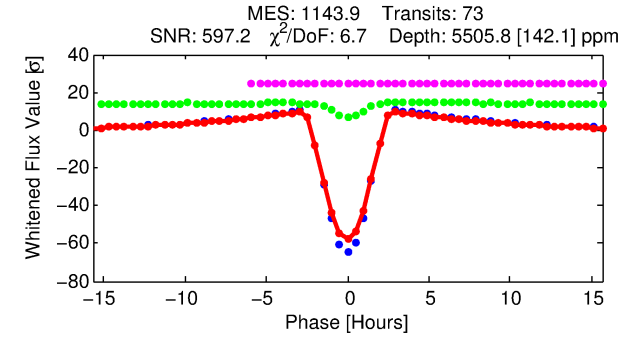
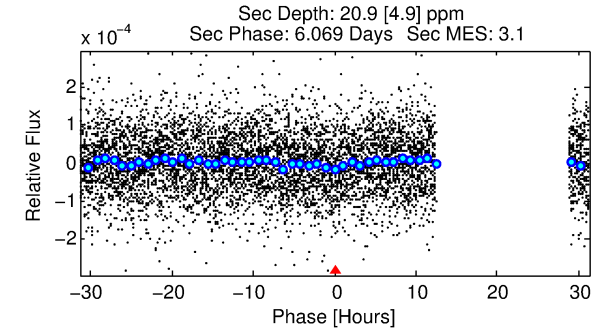
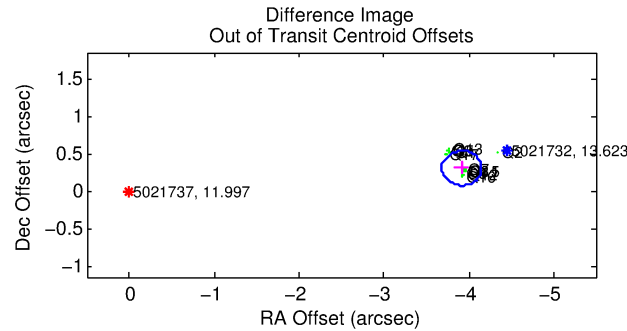
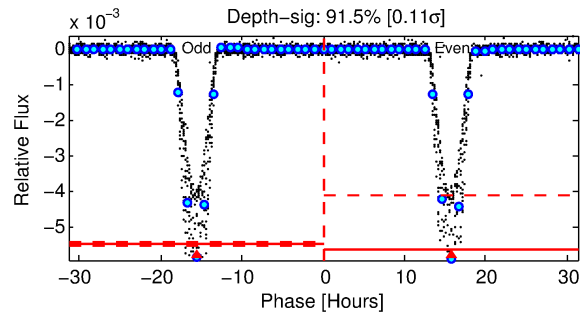
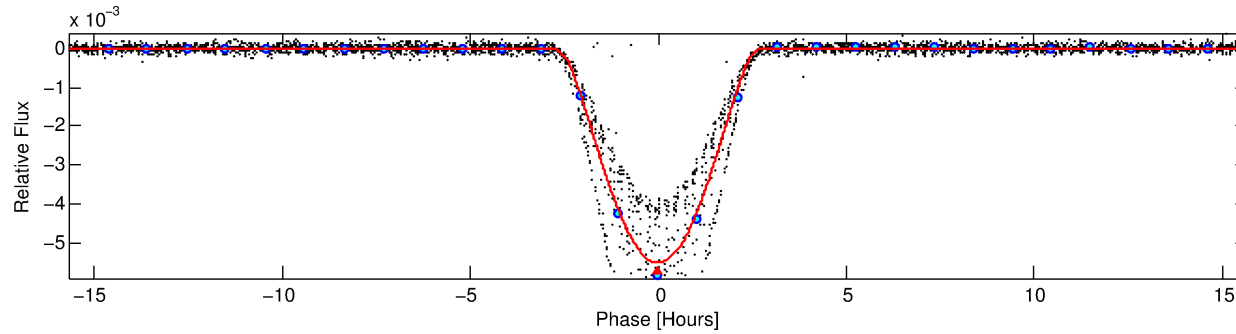
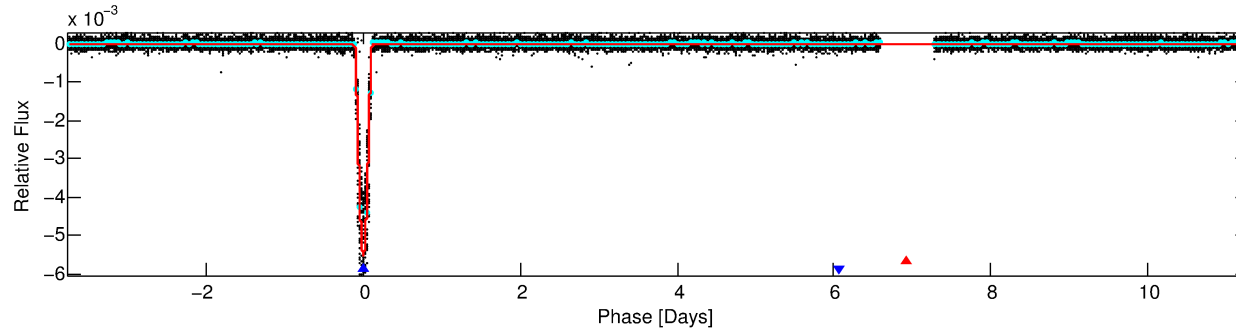
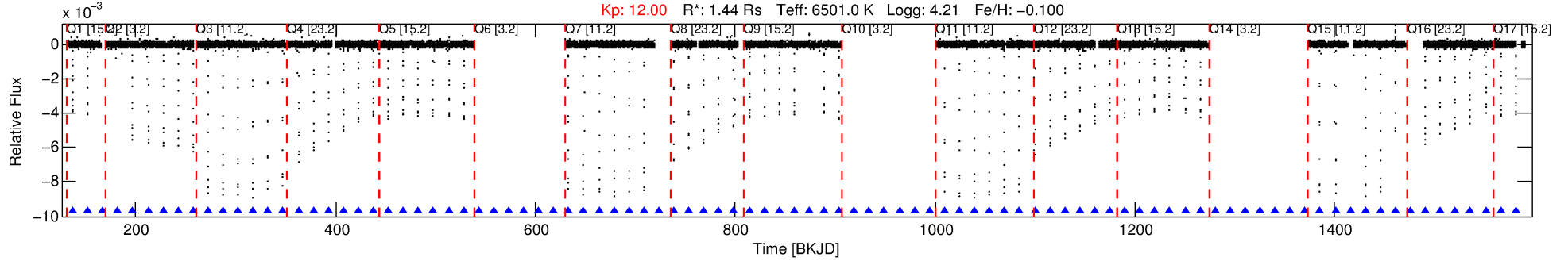
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
005021737-02	5021737	005021732-sec	5021732	1:1	4.5	0	-1	13.62	11.99	8.61	Direct-PRF	0	0.06	0.05

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: 5021737 Candidate: 2 of 2 Period: 15.039 d
KOI: K00026 Corr: No Ephemeris Match

Kp: 12.00 R*: 1.44 Rs Teff: 6501.0 K Logg: 4.21 Fe/H: -0.100



DV Fit Results:

Period = 15.03948 [0.00001] d
Epoch = 137.2066 [0.0003] BKJD
Rp/R* = 0.1223 [0.0146]
a/R* = 11.25 [0.24]
b = 1.00 [0.02]
Seff = 203.06 [76.55]
Teq = 963 [91] K
Rp = 19.23 [6.57] Re
a = 0.1279 [0.0329] AU
Ag = 0.51 [0.25] [-1.97σ]
Teffp = 1257 [111] K [2.05σ]

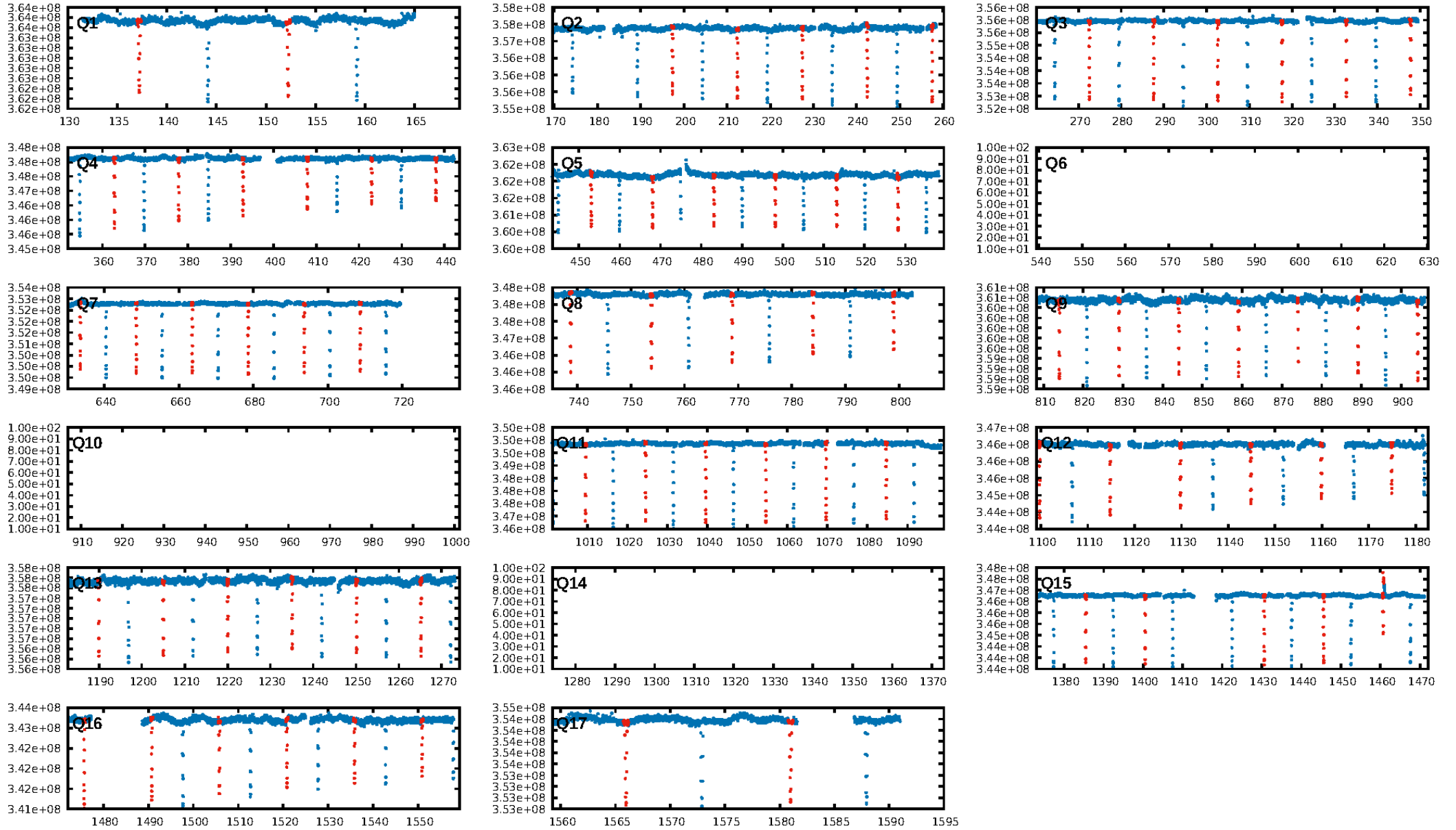
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [69/69]
GhostDiagnostic-chr: 0.1051
Centroid-sig: 0.0%
Centroid-so: 7.838 arcsec [750.45σ]
OotOffset-rm: 3.928 arcsec [50.81σ]
KicOffset-rm: 4.461 arcsec [66.37σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

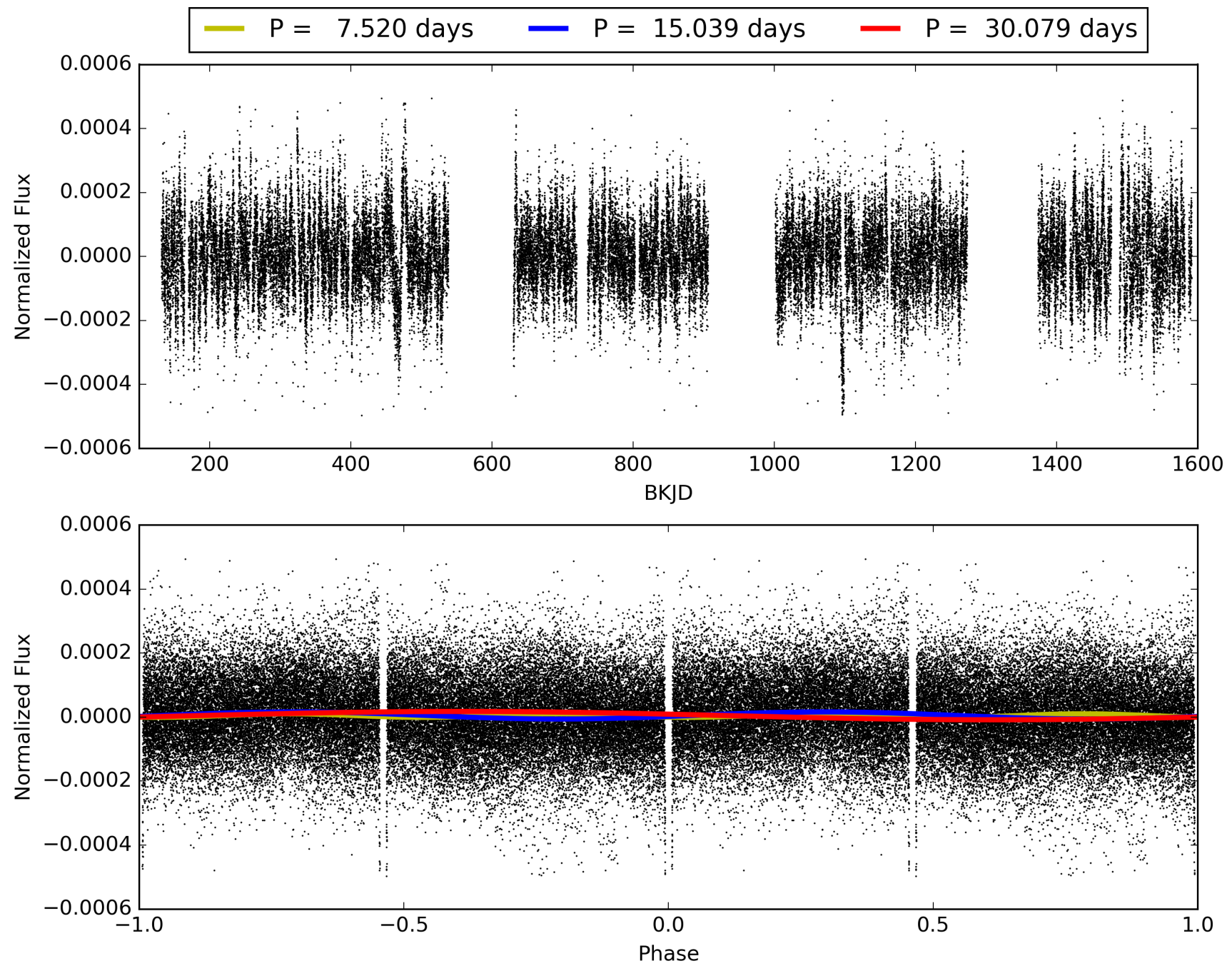
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:42:07 Z

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

TCE 005021737-02, PDC Light Curves

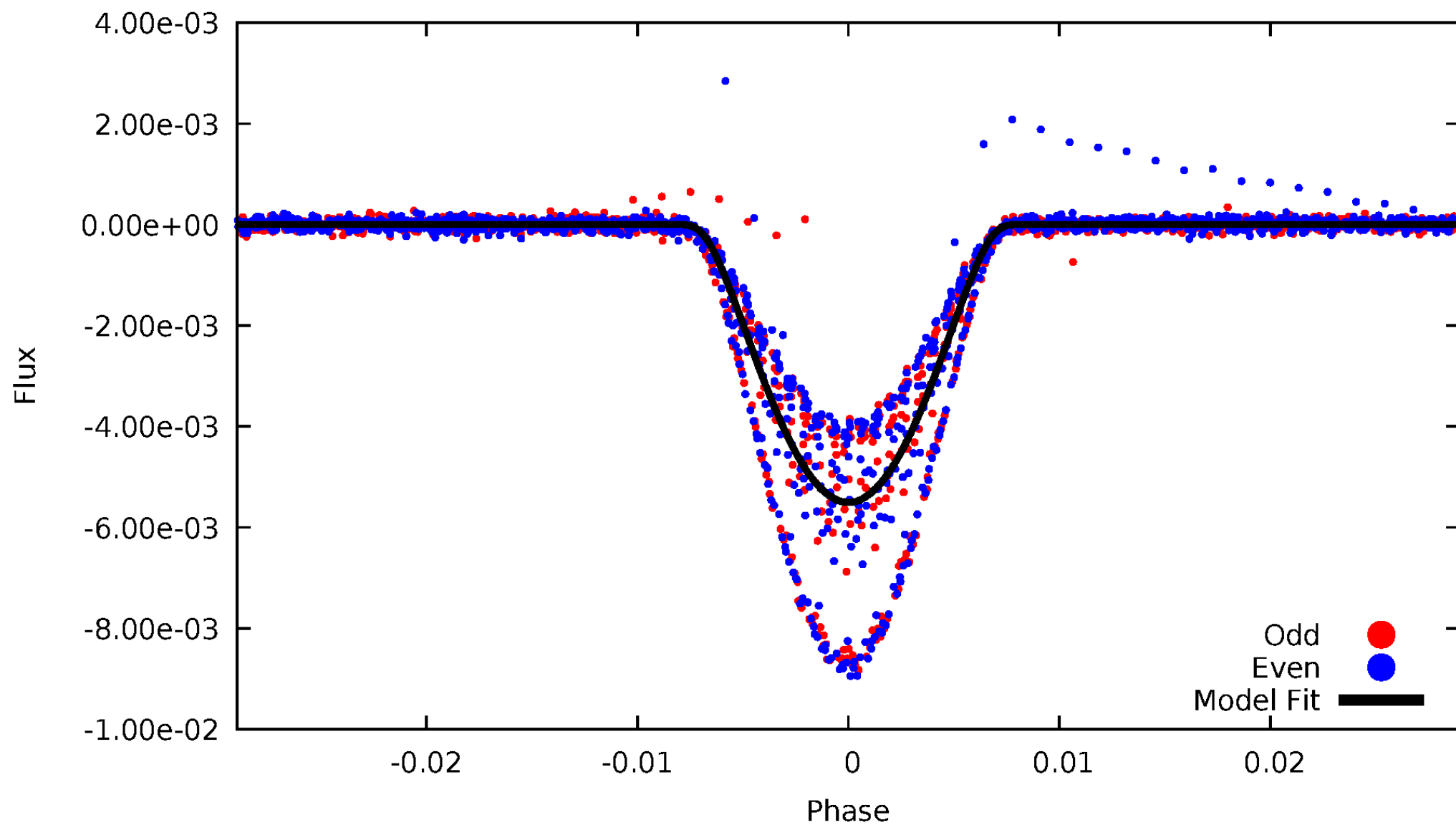


TCE 005021737-02



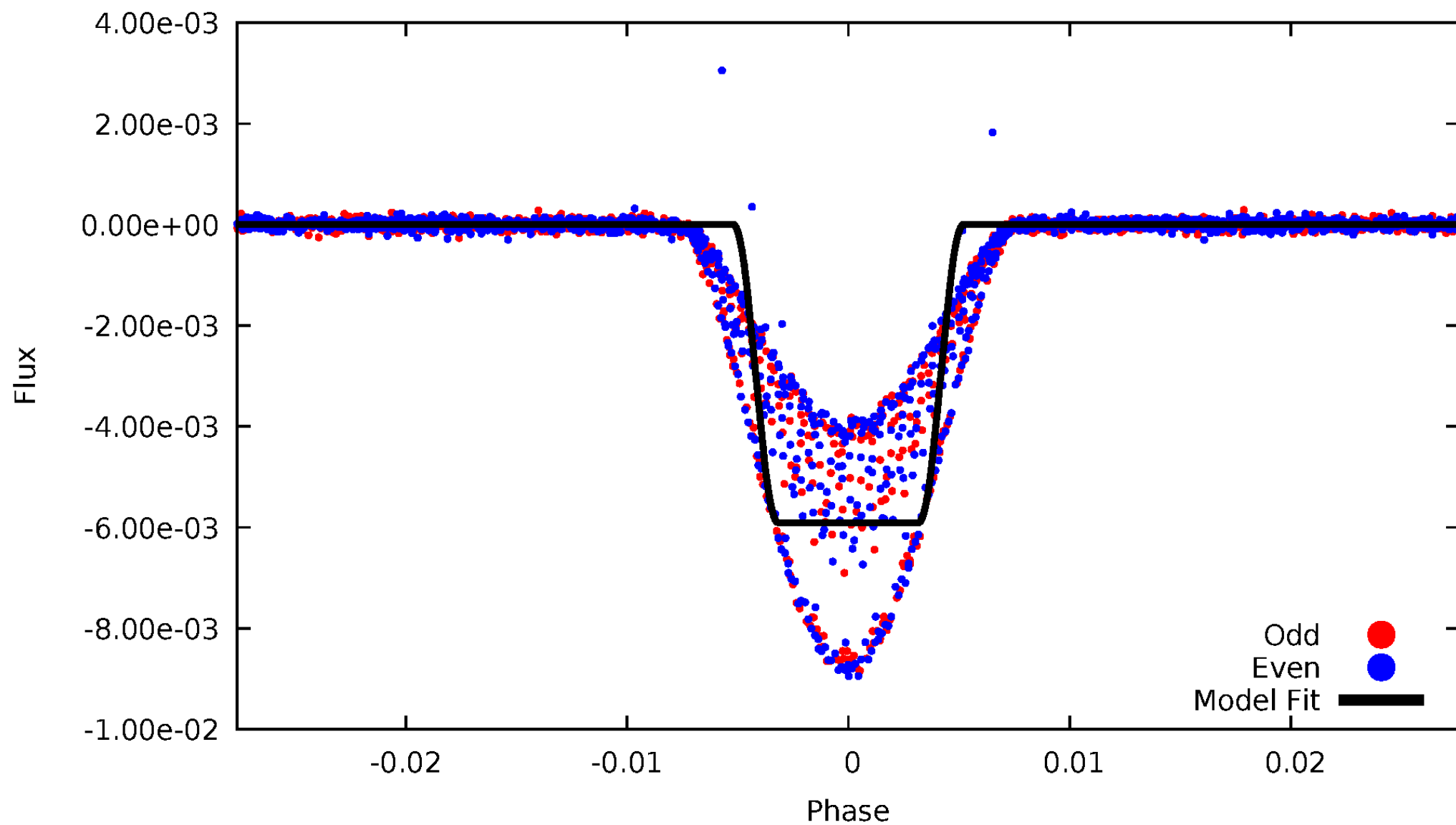
DV Odd/Even

TCE 005021737-02



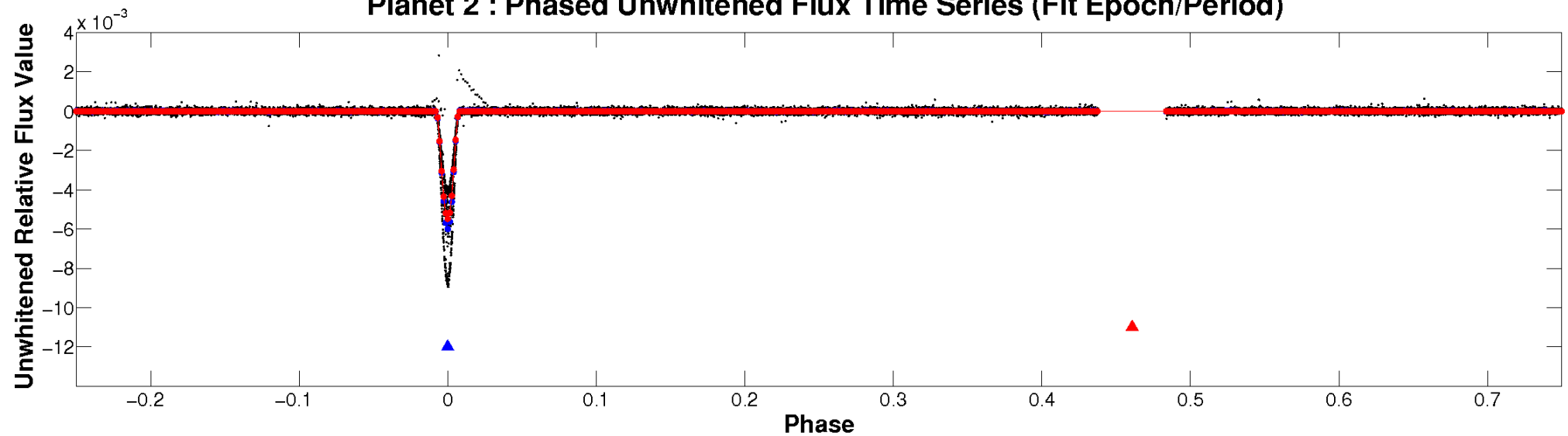
ALT Odd/Even

TCE 005021737-02

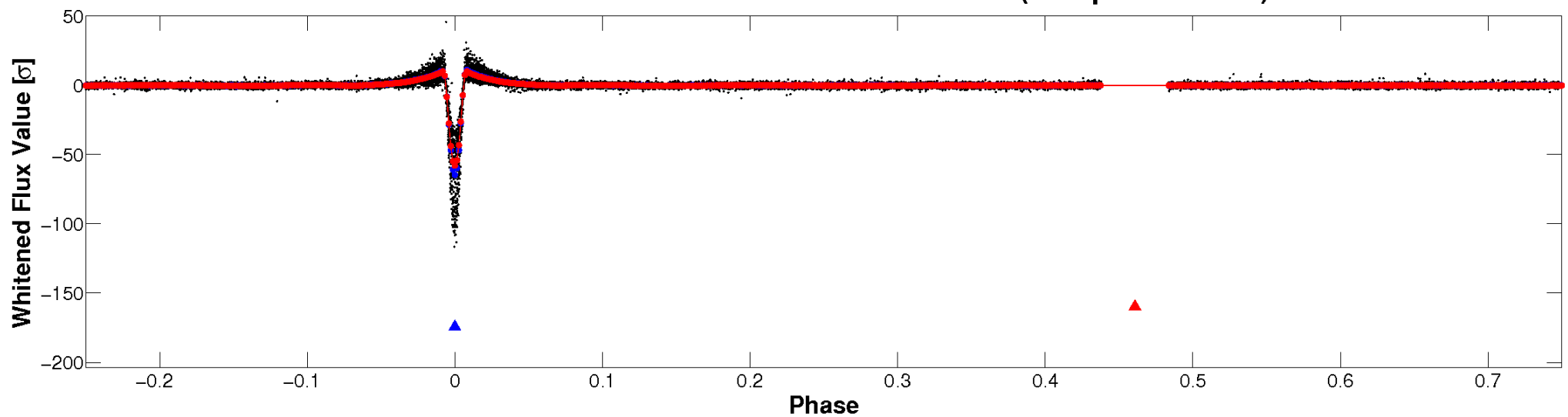


Non-Whitened Vs. Whitened Light Curve

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

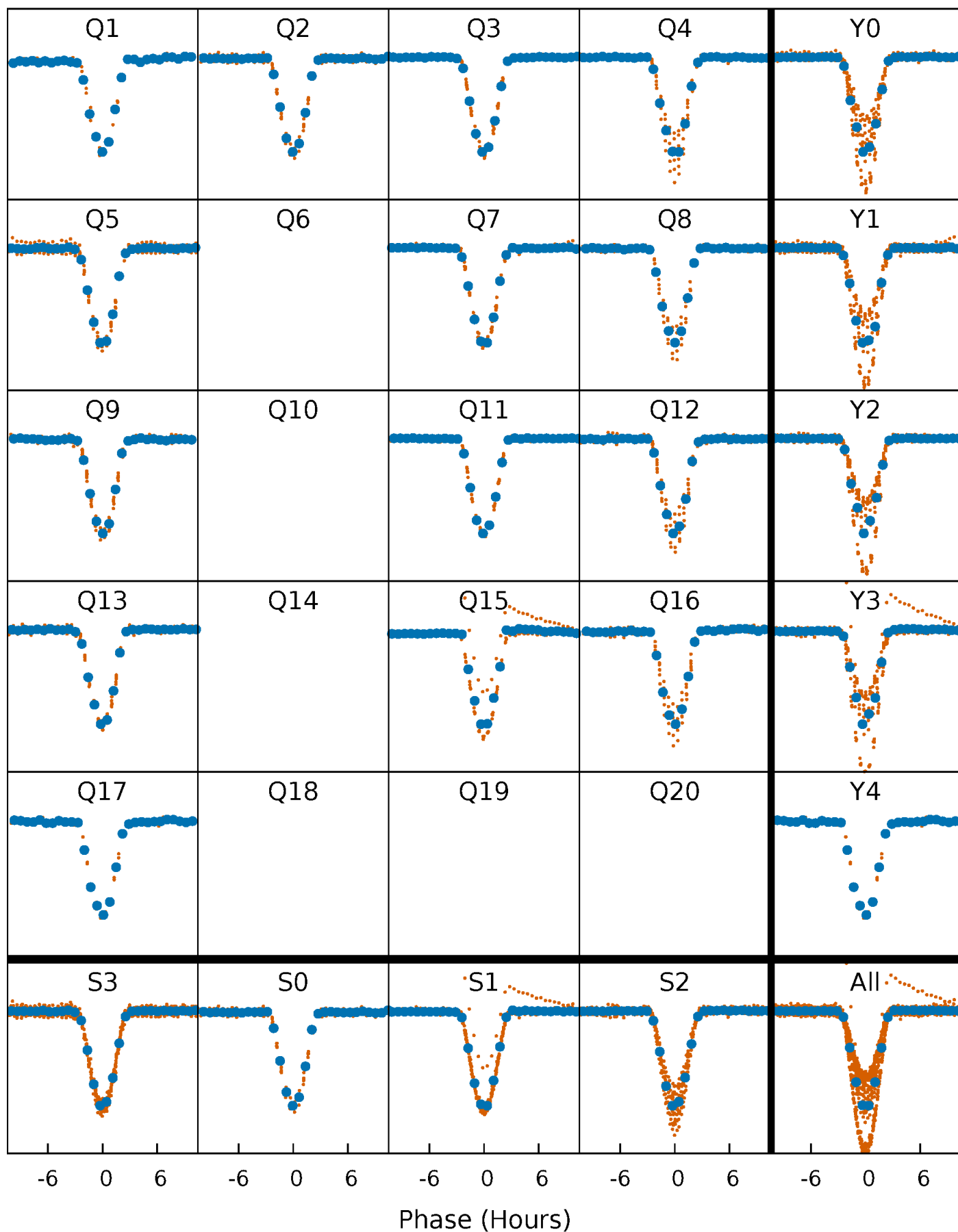


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



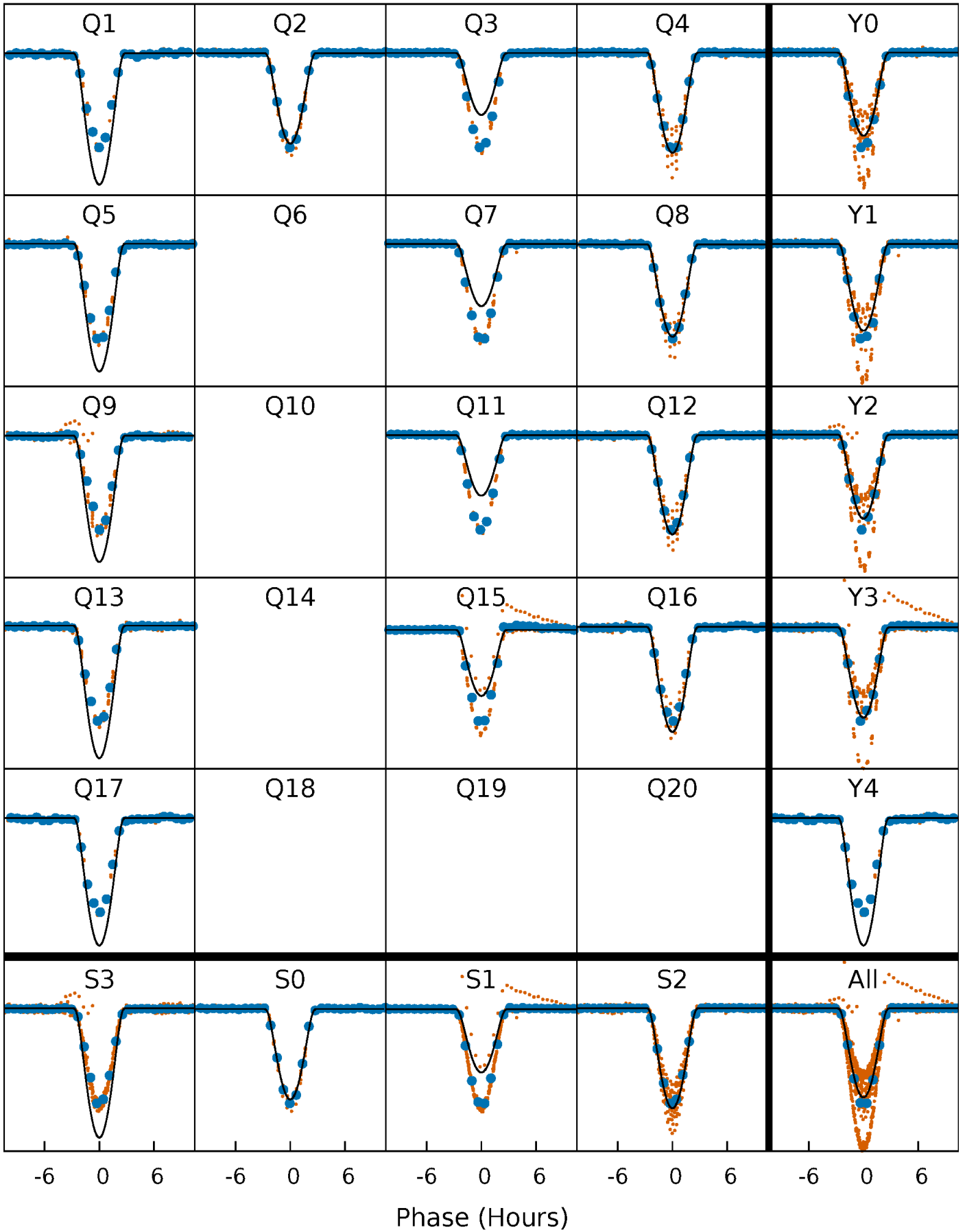
PDC Quarter-Phased Transit Curves

TCE 005021737-02 $P = 15.039478$ Days $T_0 = 137.206575$ (BKJD)



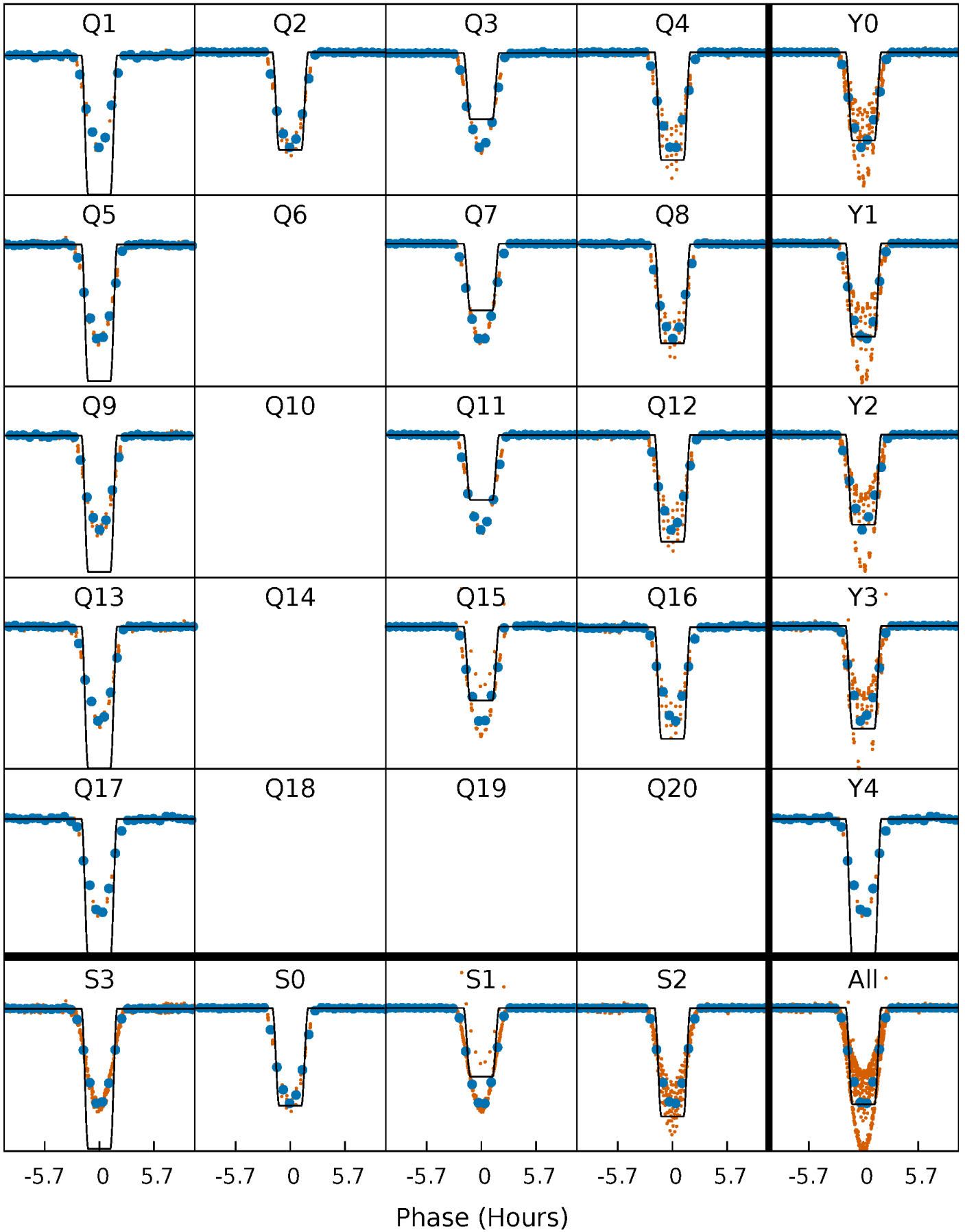
DV Quarter-Phased Transit Curves

TCE 005021737-02 P= 15.039478 Days $T_0=137.206575$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

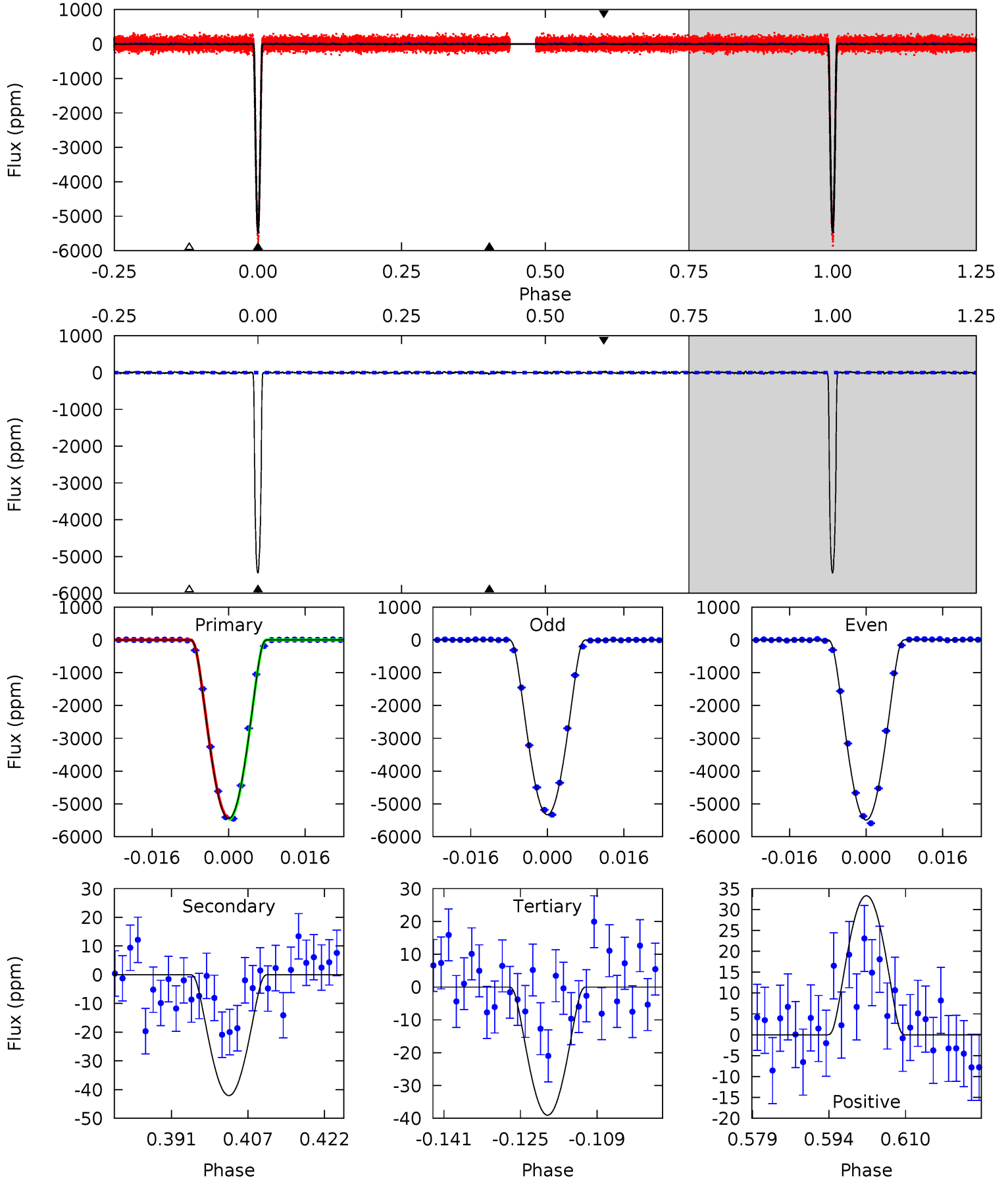
TCE 005021737-02 P= 15.039438 Days $T_0=137.208486$ (BKJD)



DV Model-Shift Uniqueness Test

005021737-02, P = 15.039478 Days, E = 122.167097 Days

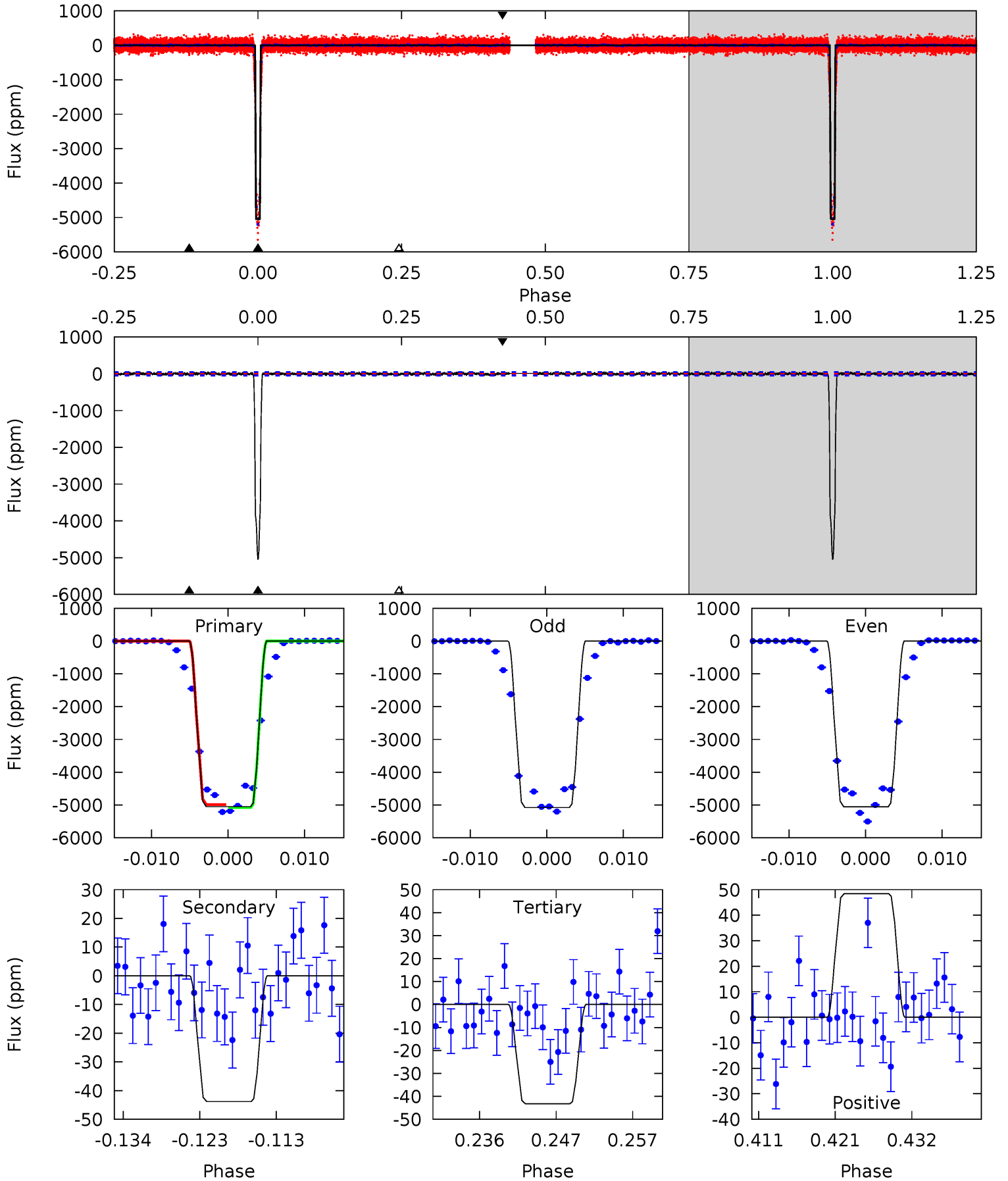
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1232	9.52	8.84	7.54	4.94	2.42	2.56	1224	1225	0.68	1.99	18.3	1.07	0.01	0



Alt Model-Shift Uniqueness Test

005021737-02, P = 15.039438 Days, E = 122.169048 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
546.4	4.74	4.68	5.25	5.02	2.57	1.40	541.7	541.1	0.06	-0.50	1.32	1.09	0.01	0



Stellar Parameters For KIC 005021737

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6501^{+146}_{-194}	$4.212^{+0.153}_{-0.187}$	$-0.100^{+0.250}_{-0.300}$	$1.441^{+0.461}_{-0.307}$	$1.236^{+0.188}_{-0.188}$	$0.582^{+0.464}_{-0.299}$
	+2%/-3%	+4%/-4%	+250%/-300%	+32%/-21%	+15%/-15%	+80%/-51%
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 005021737-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-42 ± 4	$19.37^{+3.88}_{-3.35}$	1358^{+105}_{-90}	2288^{+115}_{-111}	$0.990^{+0.467}_{-0.310}$
Alt.	-44 ± 9	$12.11^{+3.42}_{-2.85}$	1349^{+110}_{-82}	2644^{+207}_{-177}	$2.545^{+1.982}_{-1.009}$

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 $A_{\text{obs}} \gg 1.0$

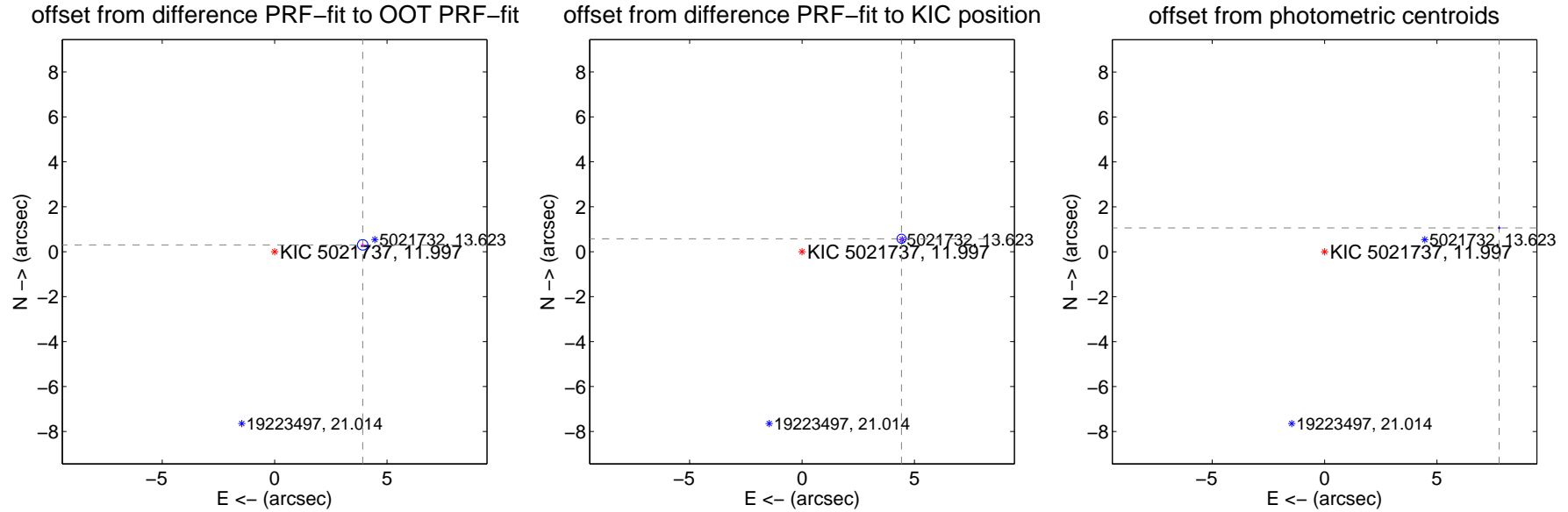
DV Centroid Data

Supplemental centroid analysis for 005021737-02. **Kepler magnitude: 12.00.** Transit SNR 597.23

There are 14 quarters with good PRF difference image offsets

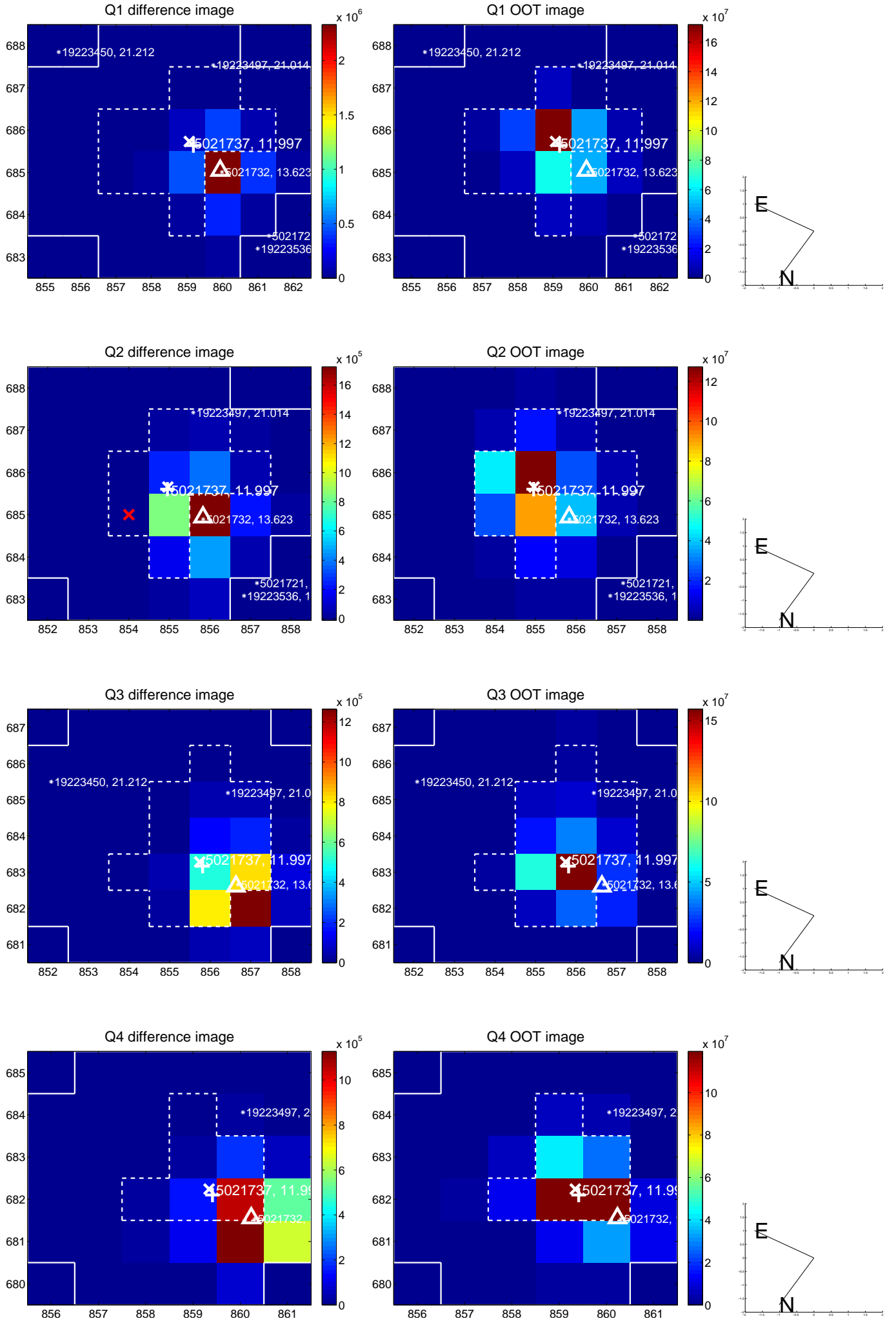
The direct PRF centroid is offset from the target star catalog position by about 0.66 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.928 ± 0.077	50.81	-3.917 ± 0.078	0.304 ± 0.076
PRF-fit source offset from KIC position	4.461 ± 0.067	66.37	-4.424 ± 0.067	0.576 ± 0.069
photometric centroid source offset	7.84 ± 0.01	750.45	-7.77 ± 0.01	1.06 ± 0.01

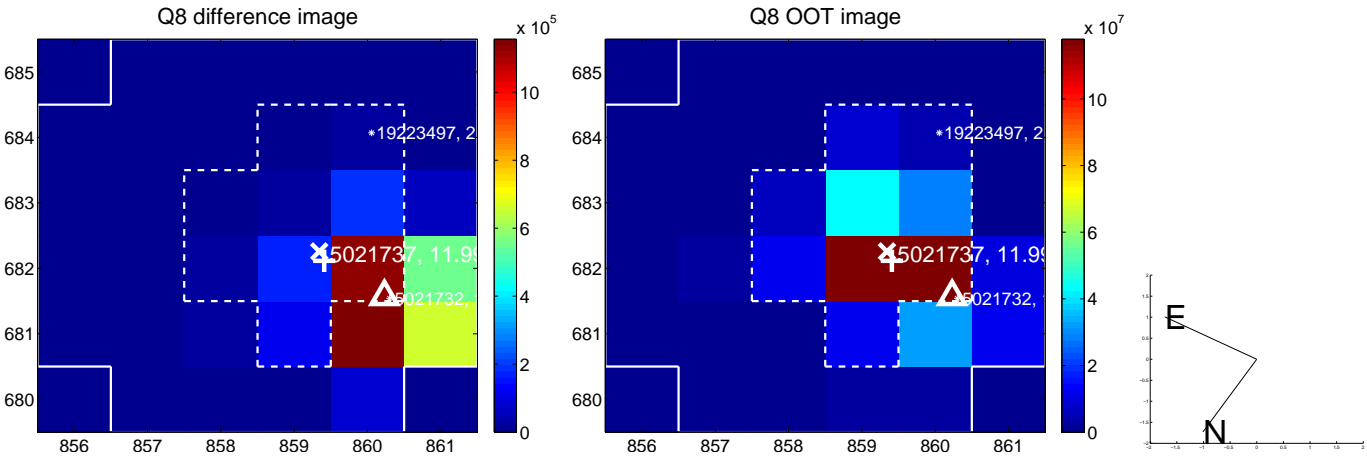
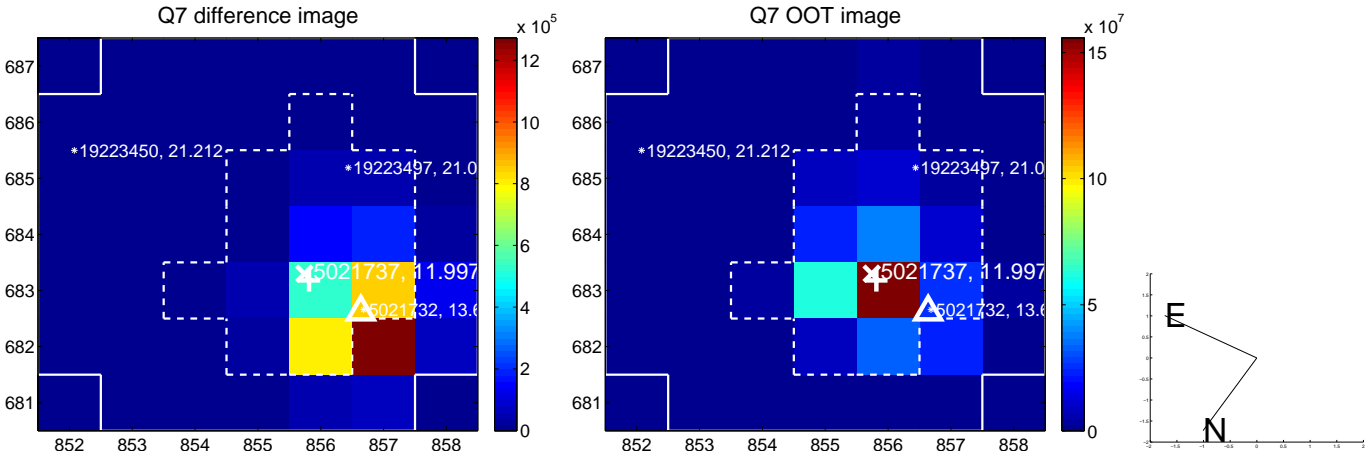
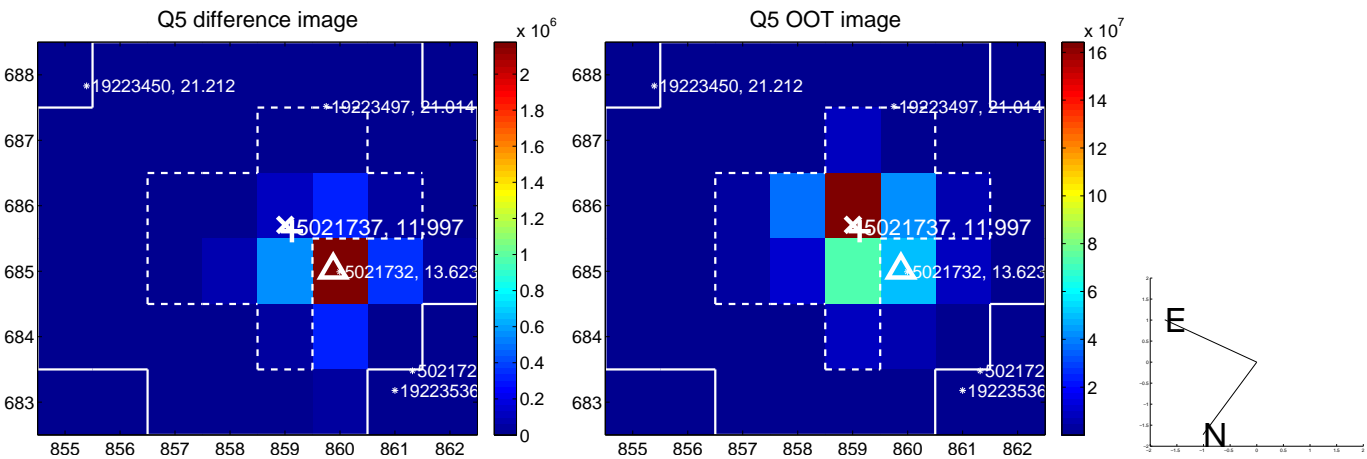


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

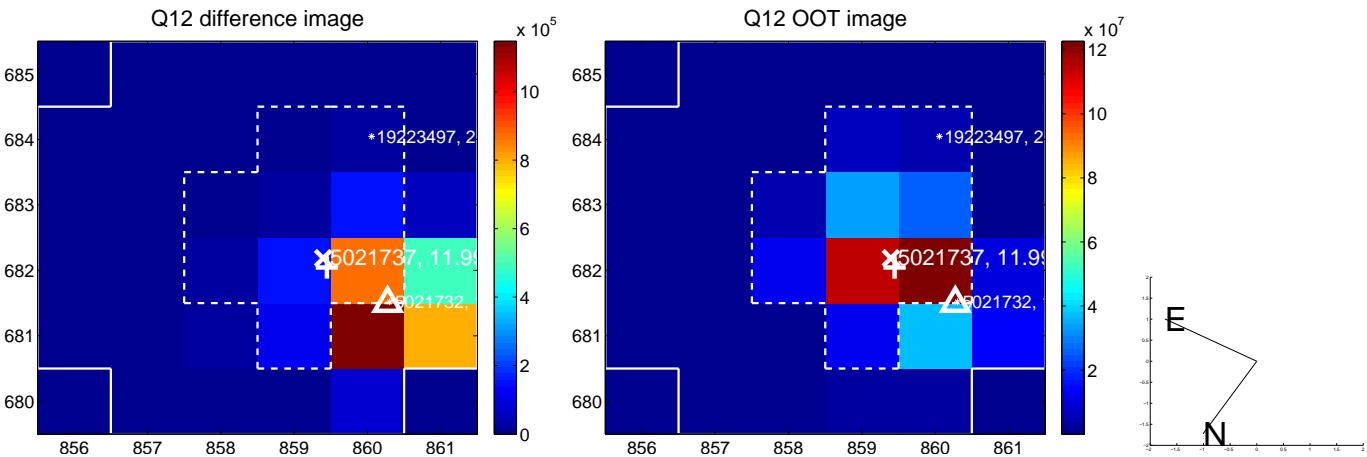
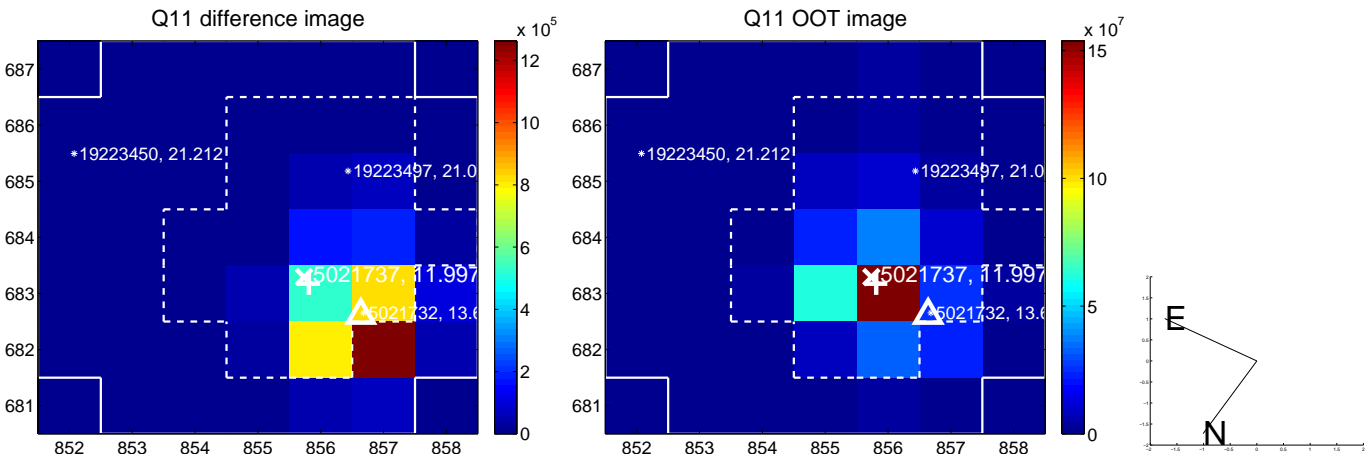
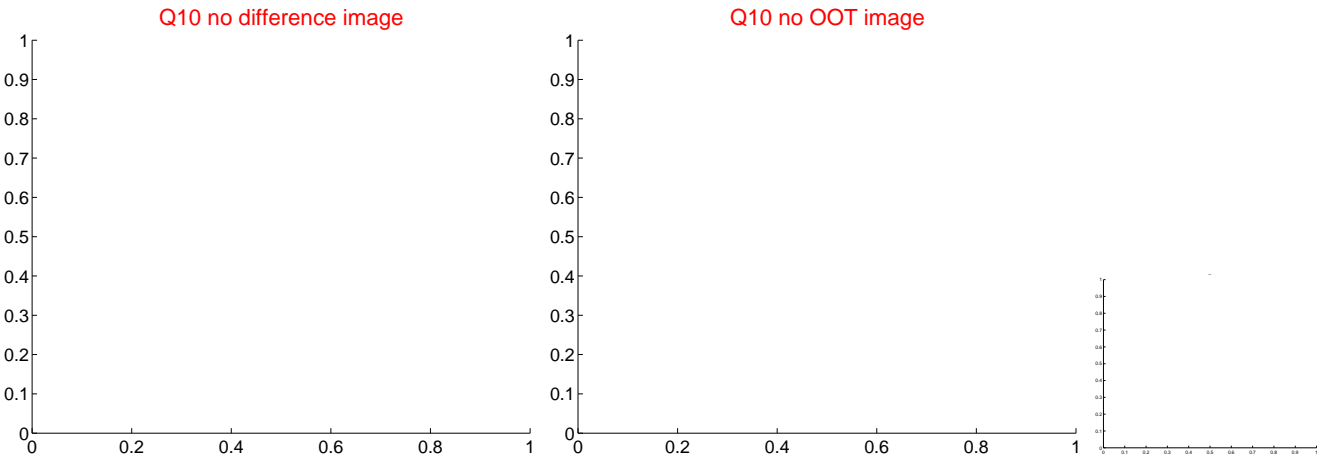
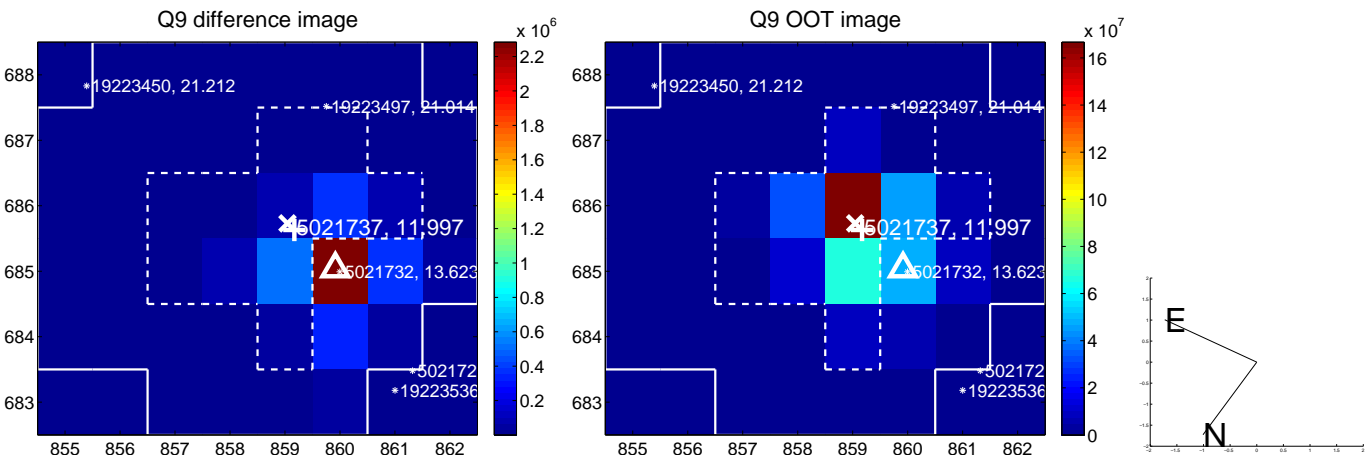
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



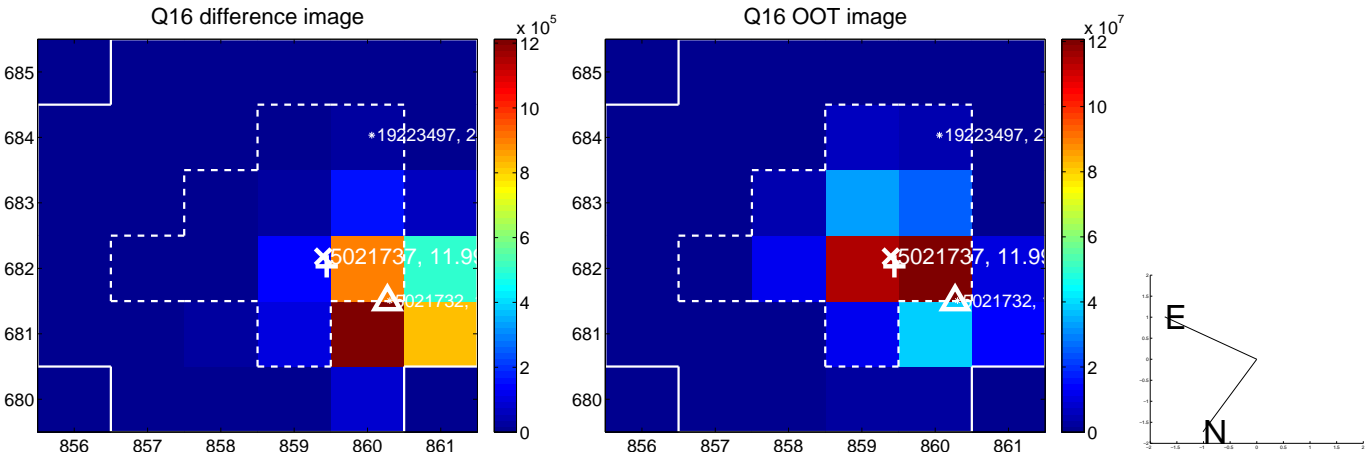
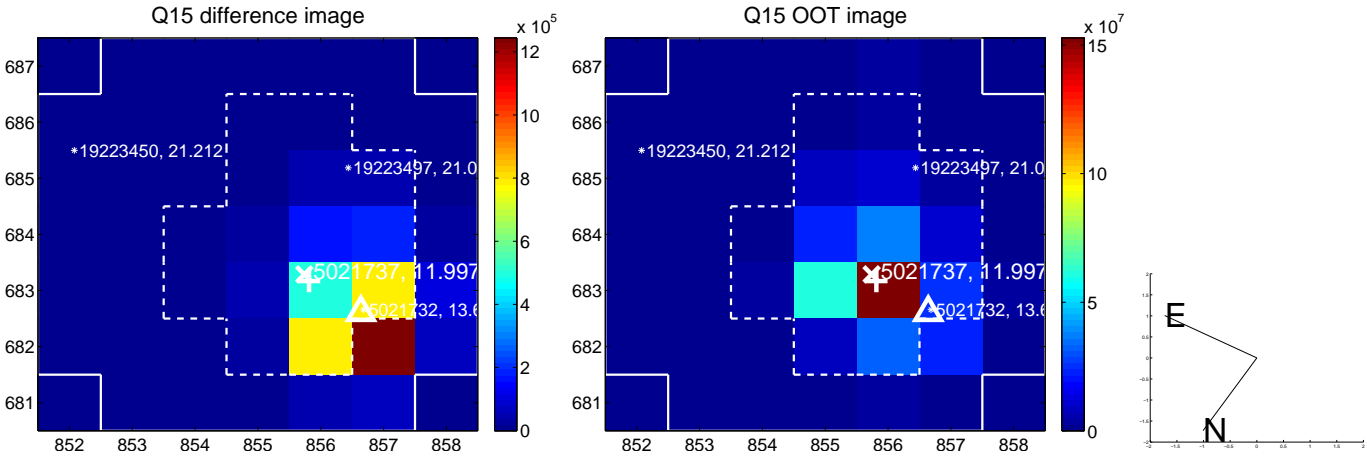
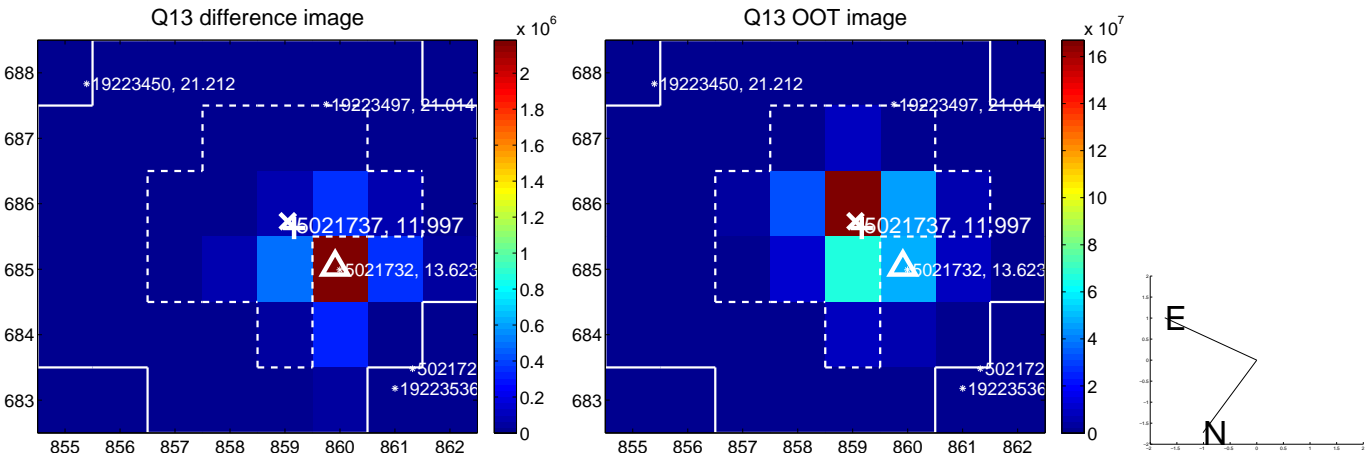
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



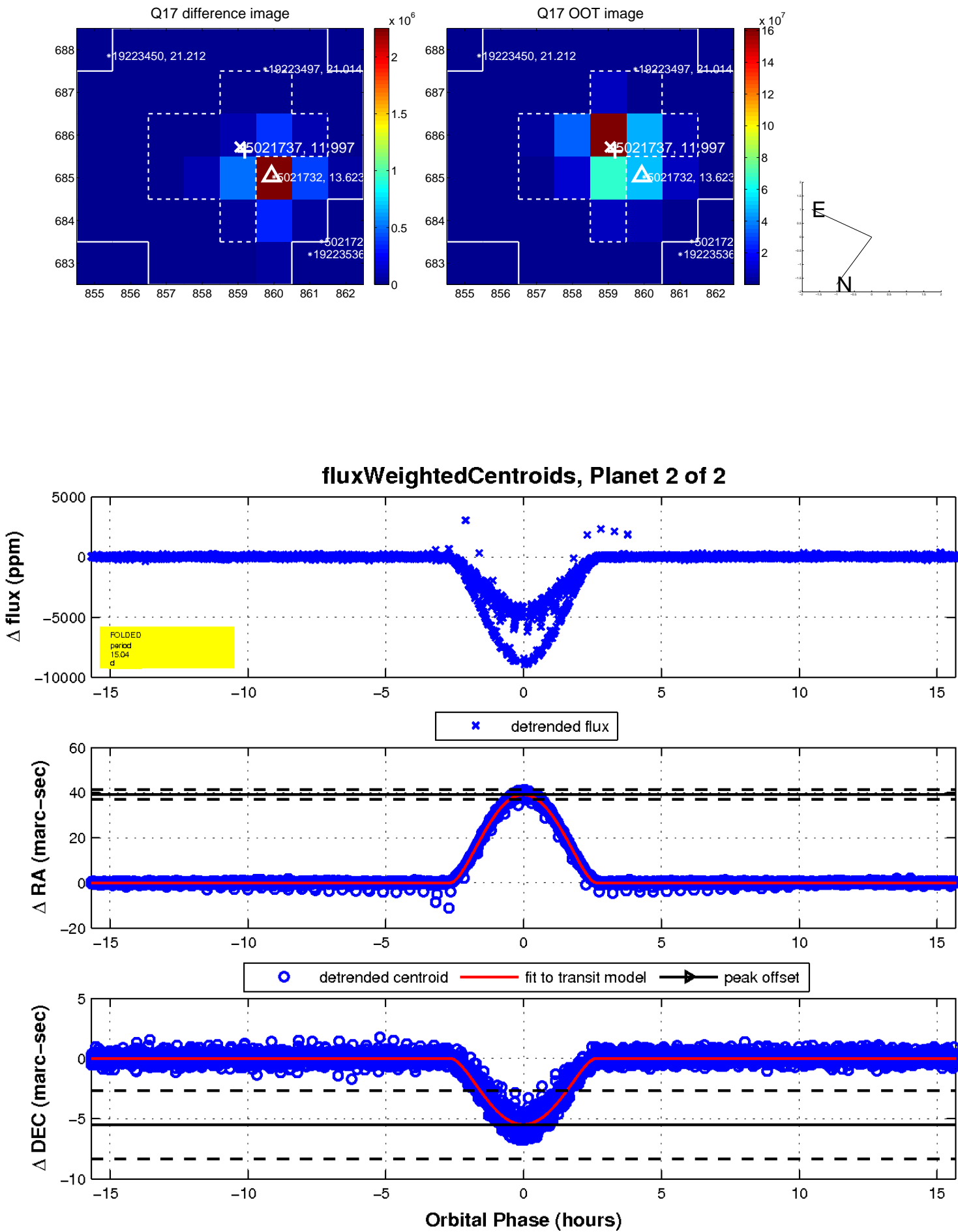
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

