

KIC 010857589

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})
010857589-01	OBS	7382.01	32.532522	147.077293	83284.5	13.389	2418.0	2110.1	0.84	5845	24.29	19.43
010857589-02	OBS	No	32.532494	133.536770	61151.5	17.684	2053.9	1378.5	0.84	5845	20.66	19.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010857589-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
010857589-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

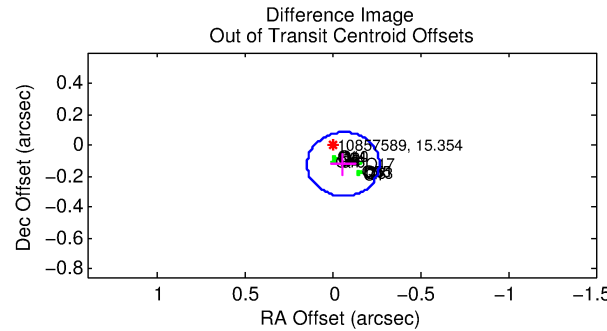
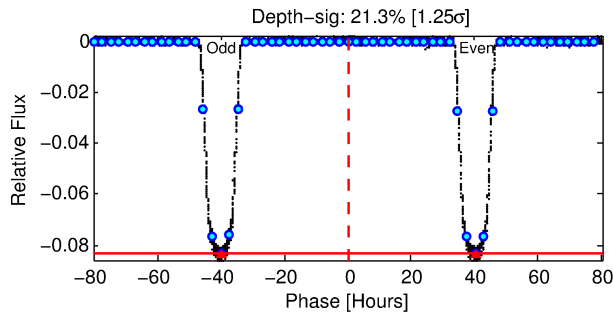
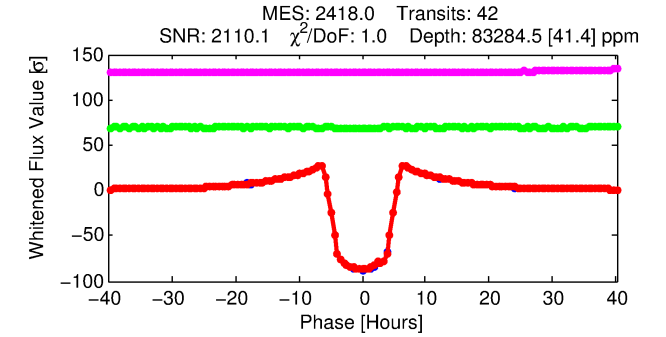
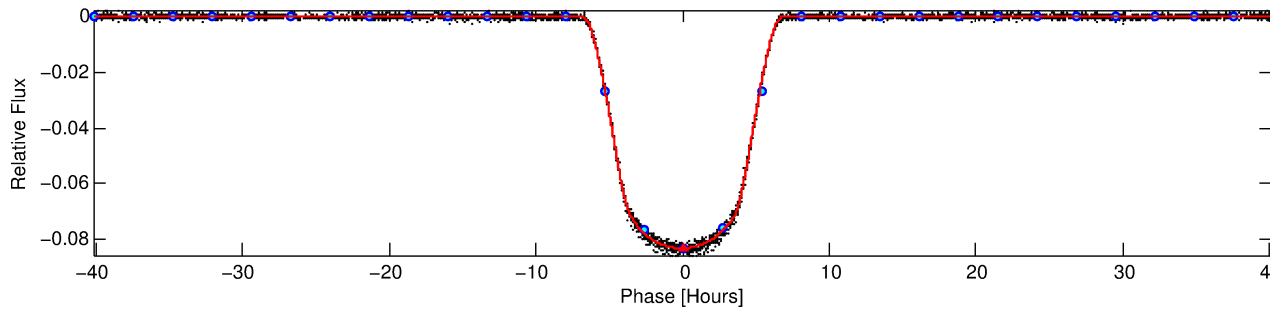
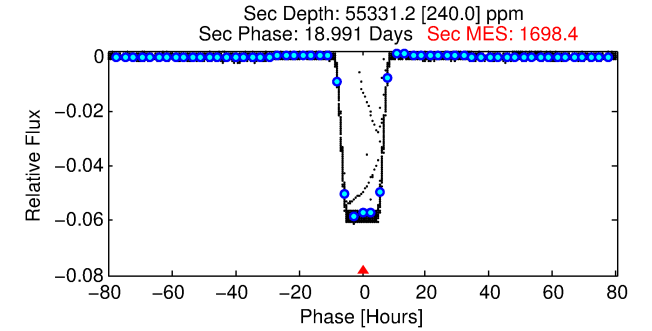
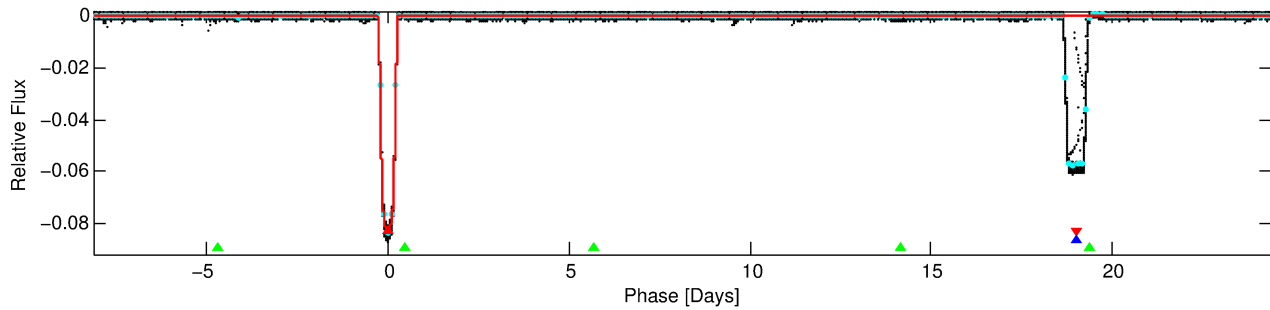
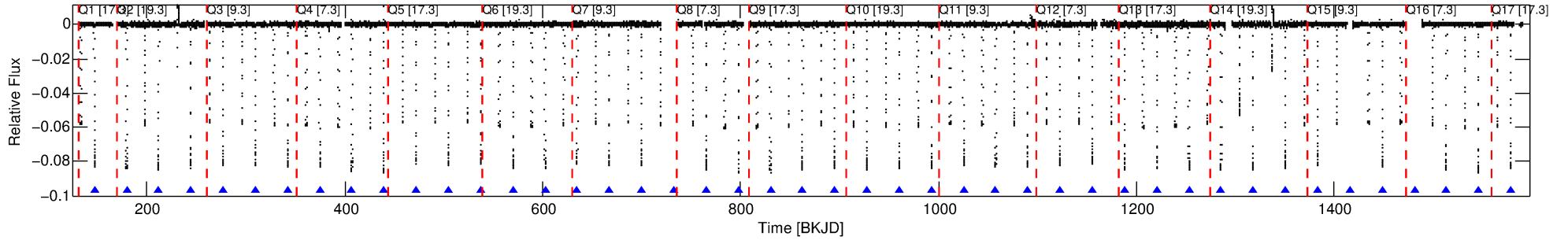
Ephemeris Match Information For 010857589-01

No Significant Match Found

DV One-Page Summary

KIC: 10857589 Candidate: 1 of 3 Period: 32.533 d
KOI: K07382.01 Corr: 0.999

Kp: 15.35 R*: 0.84 Rs Teff: 5845.0 K Logg: 4.56 Fe/H: -0.280



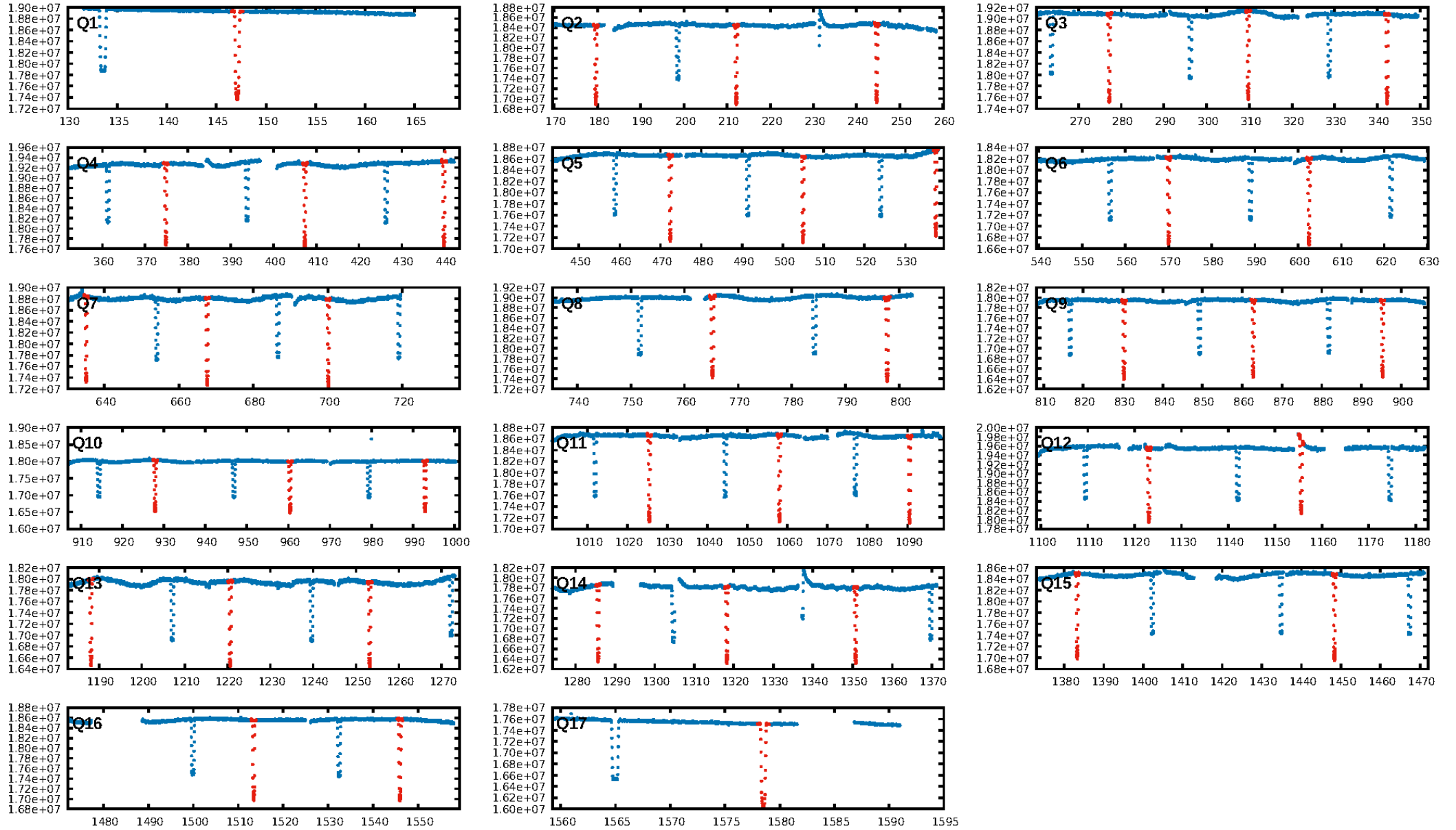
DV Fit Results:

Period = 32.53252 [0.00000] d
Epoch = 147.0773 [0.0001] BKJD
Rp/R* = 0.2656 [0.0001]
a/R* = 23.10 [0.02]
b = 0.23 [0.00]
Seff = 19.43 [6.72]
Teff = 535 [46] K
Rp = 24.29 [6.58] Re
a = 0.1944 [0.0438] AU
Ag = 1949.90 [633.71] [3.08σ]
Teffp = 5500 [164] K [29.1σ]

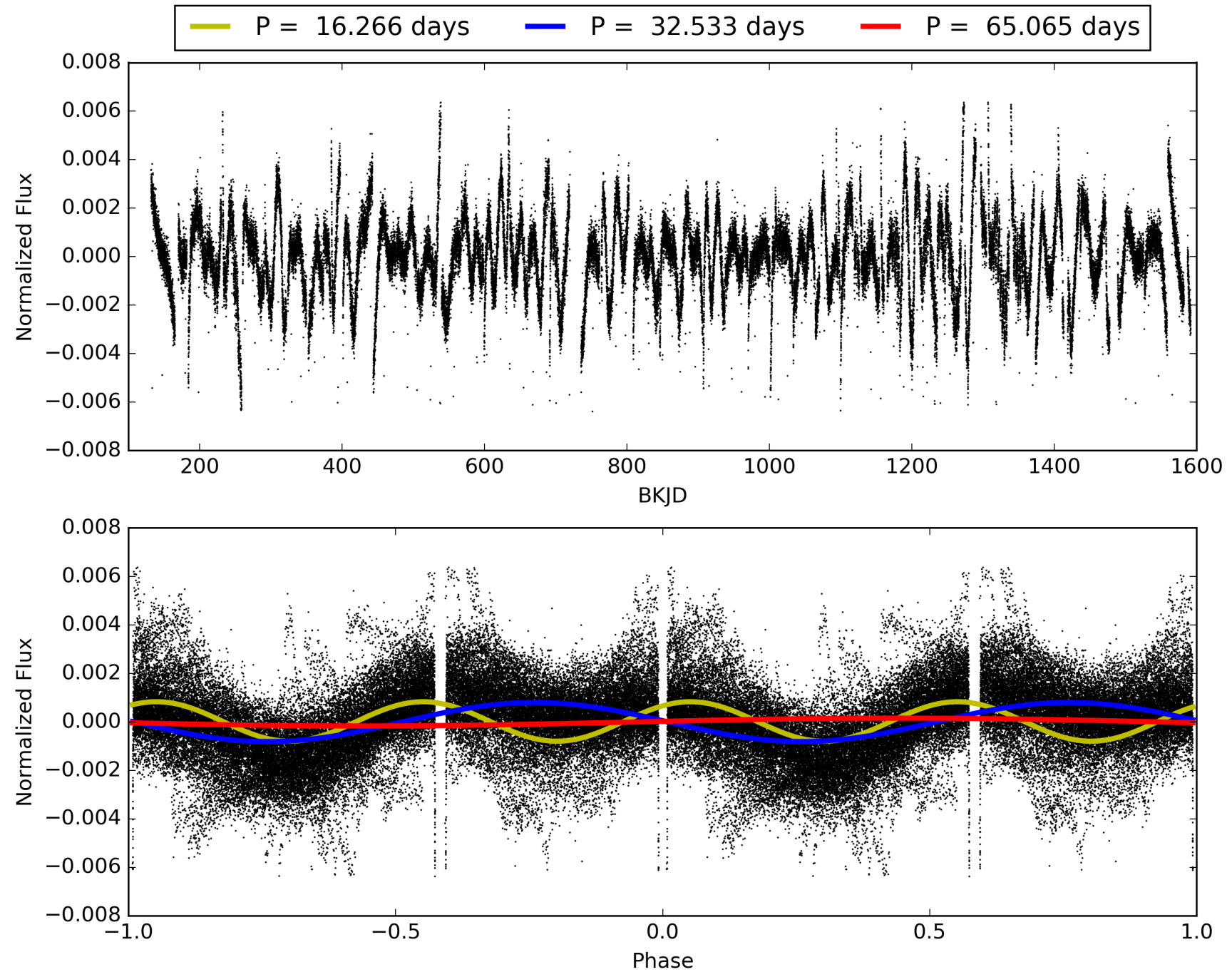
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [441.44σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 52.6%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [40/40]
GhostDiagnostic-chr: 4.594
Centroid-sig: 0.0%
Centroid-so: 0.002 arcsec [0.60σ]
OotOffset-rm: 0.136 arcsec [1.98σ]
KicOffset-rm: 0.040 arcsec [0.57σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.94 [15/16]

TCE 010857589-01, PDC Light Curves

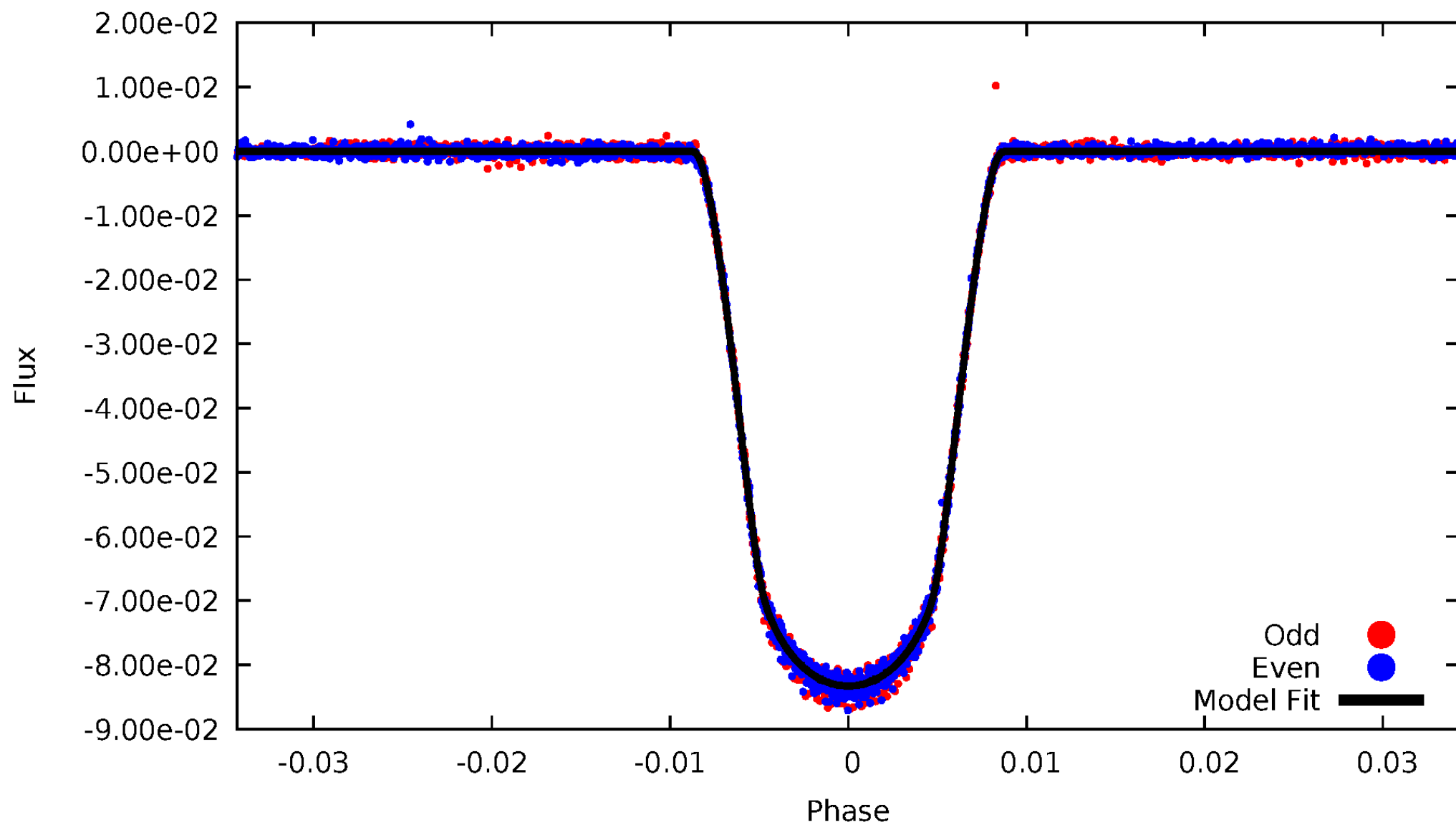


TCE 010857589-01



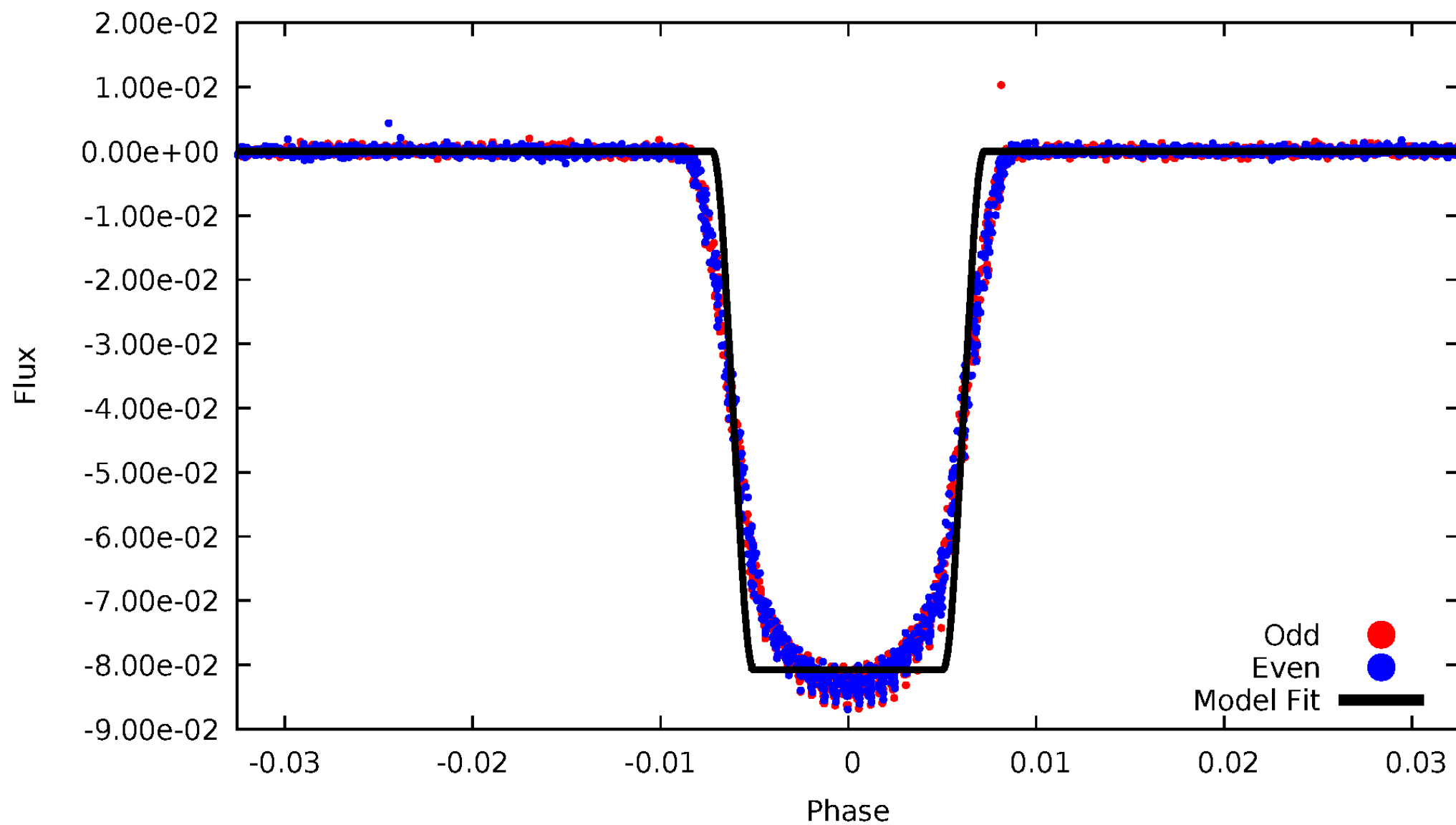
DV Odd/Even

TCE 010857589-01



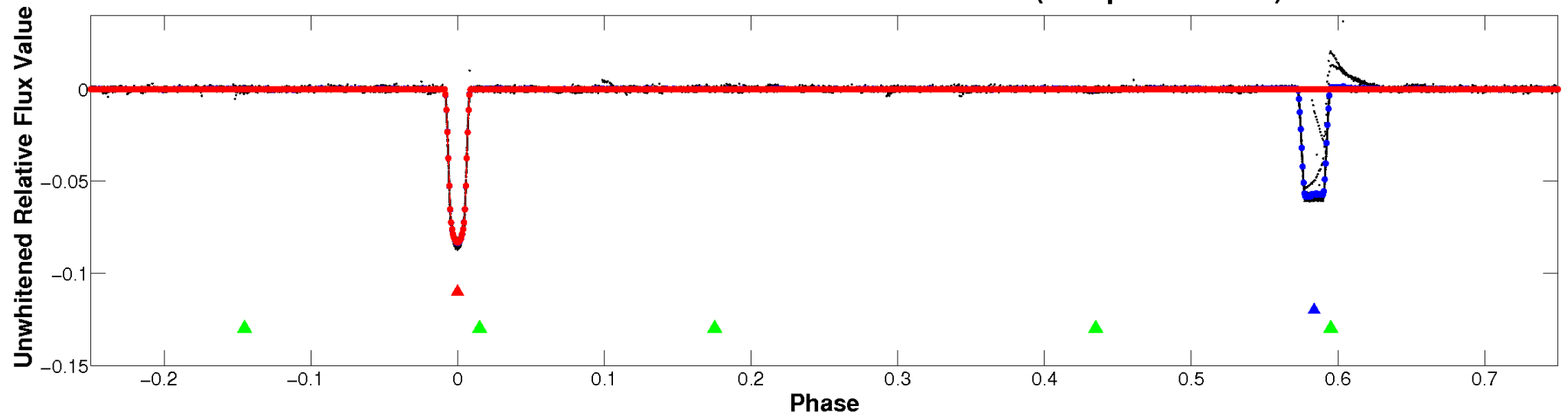
ALT Odd/Even

TCE 010857589-01

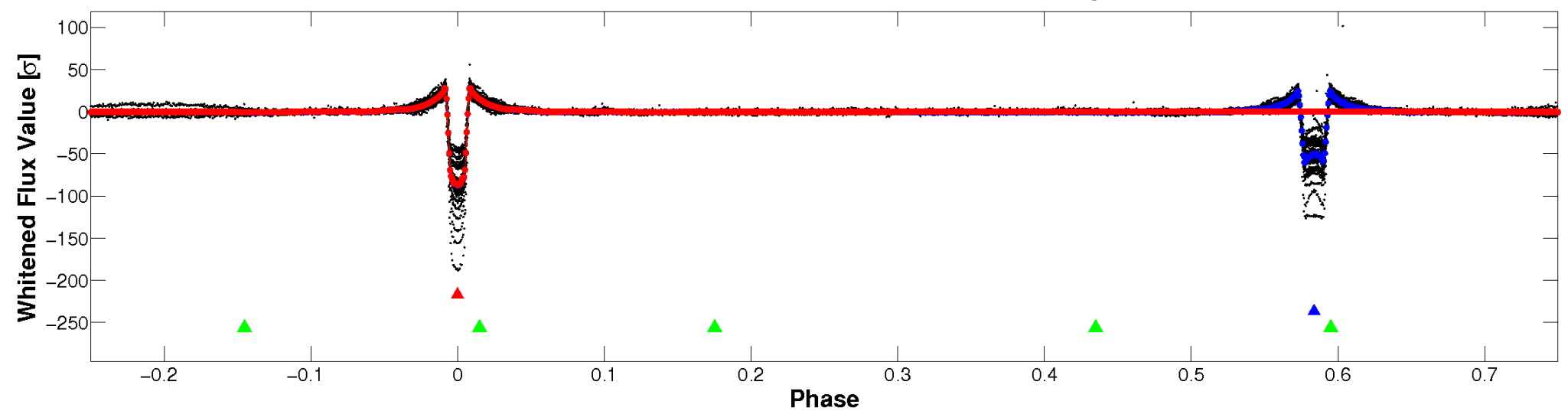


Non-Whitened Vs. Whitened Light Curve

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

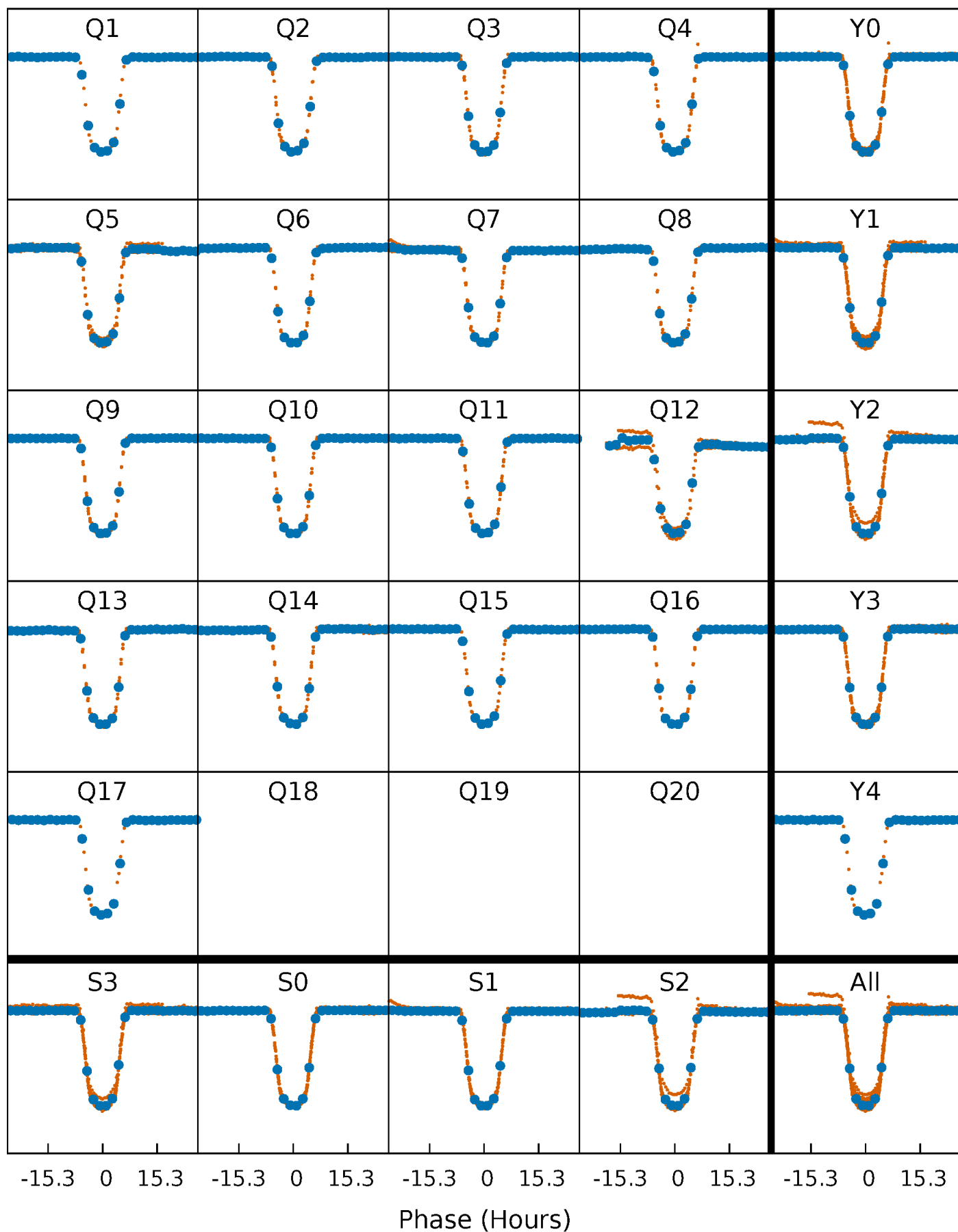


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



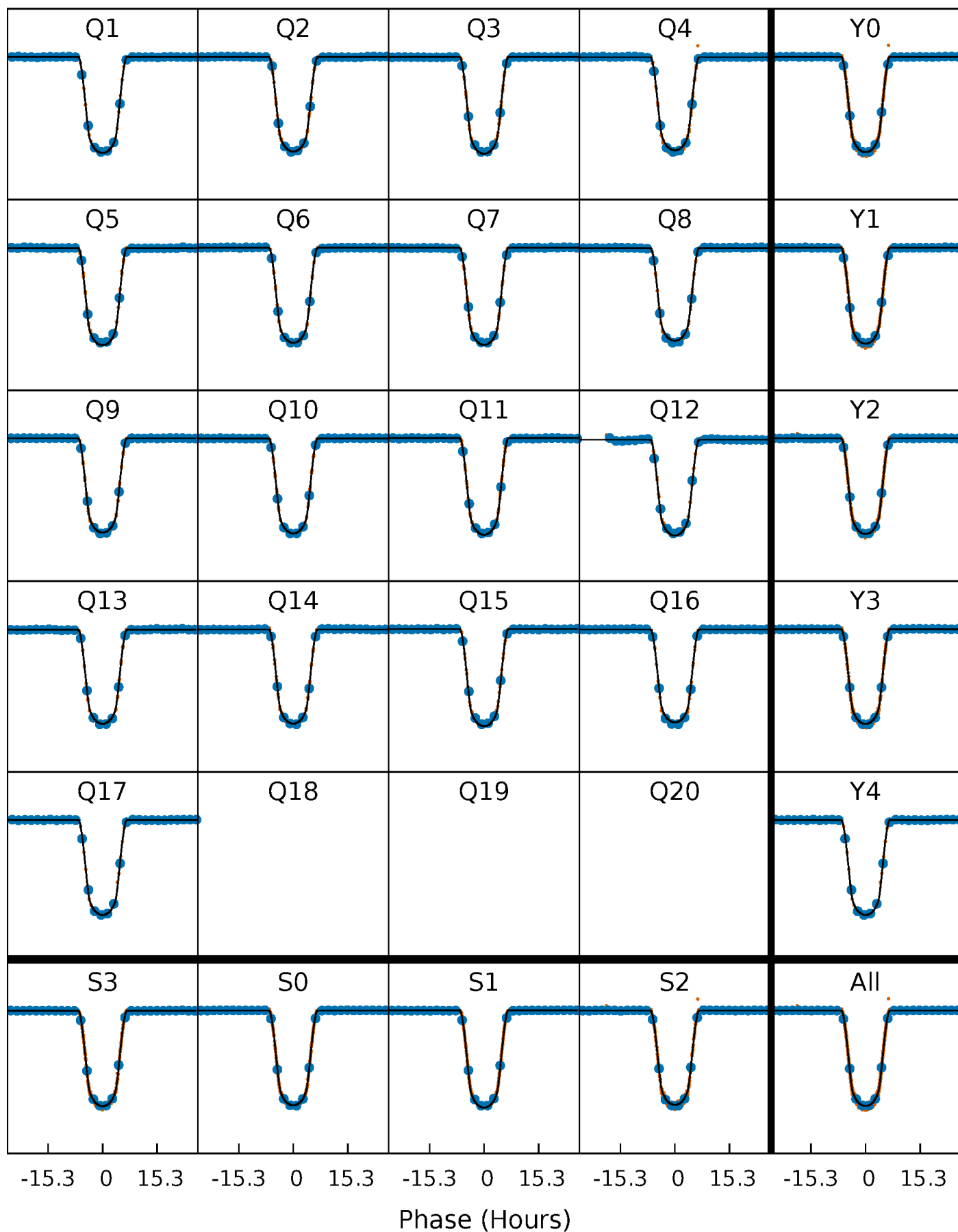
PDC Quarter-Phased Transit Curves

TCE 010857589-01 P= 32.532522 Days $T_0=147.077293$ (BKJD)



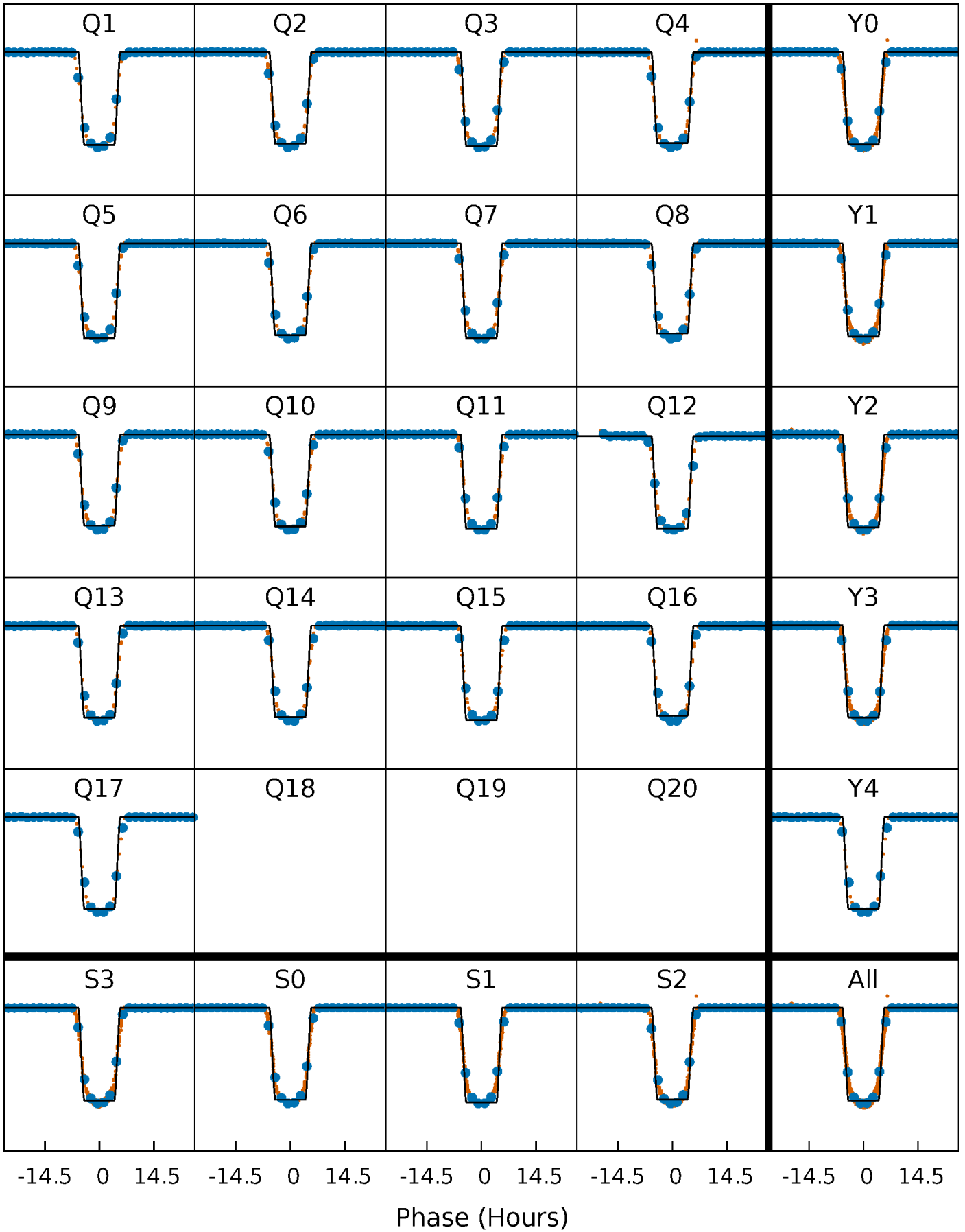
DV Quarter-Phased Transit Curves

TCE 010857589-01 P= 32.532522 Days $T_0=147.077293$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

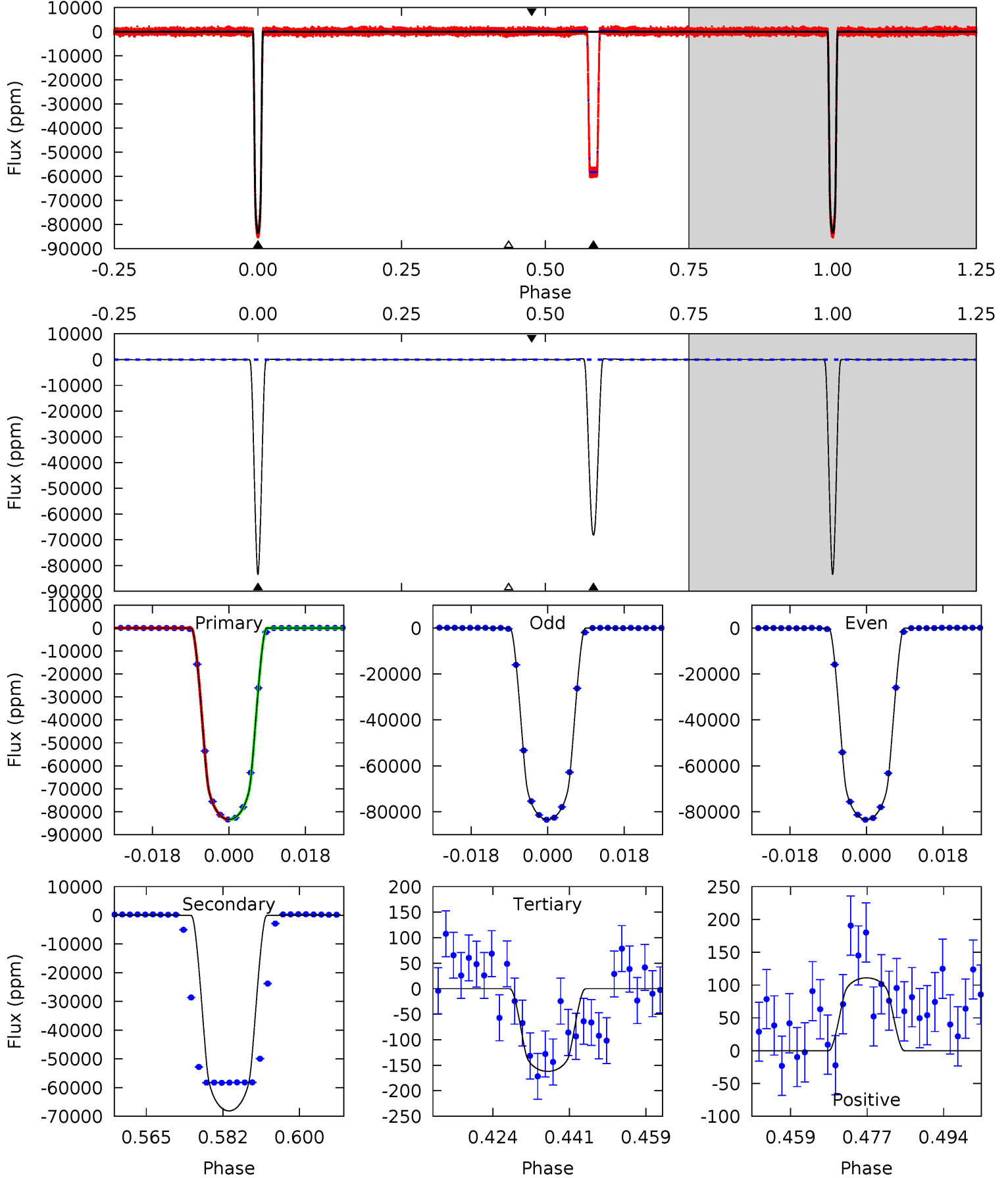
TCE 010857589-01 P= 32.532129 Days $T_0=147.085365$ (BKJD)



DV Model-Shift Uniqueness Test

010857589-01, P = 32.532522 Days, E = 114.544771 Days

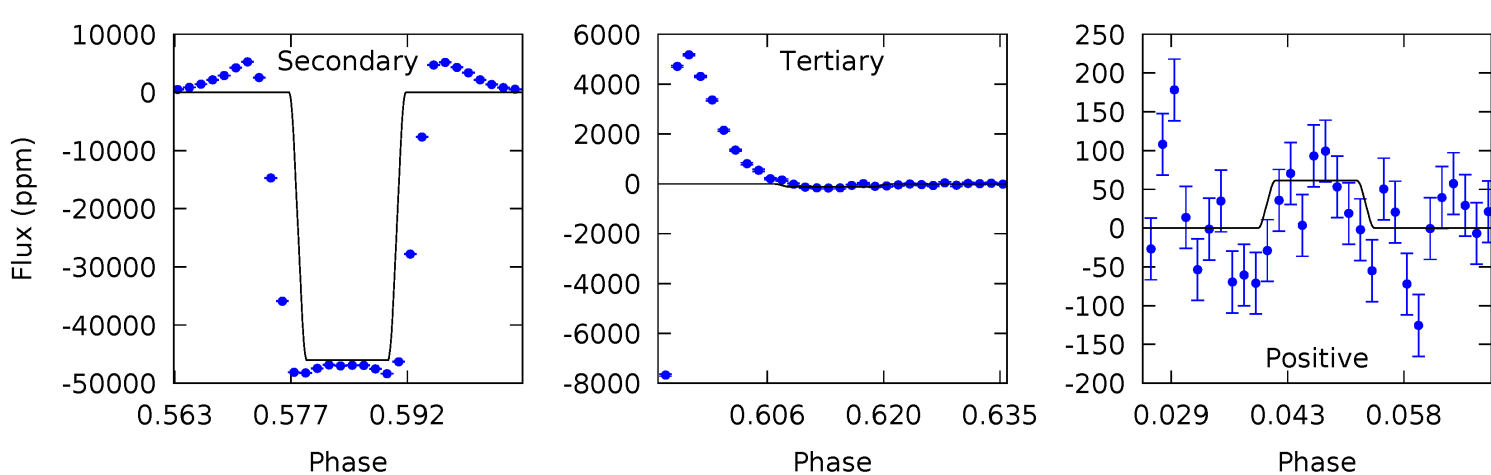
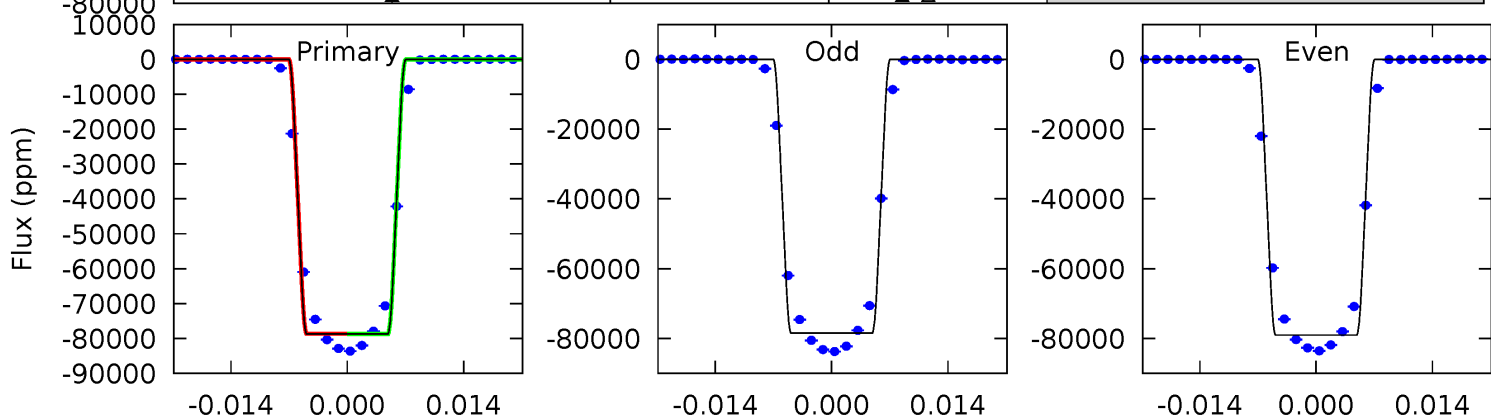
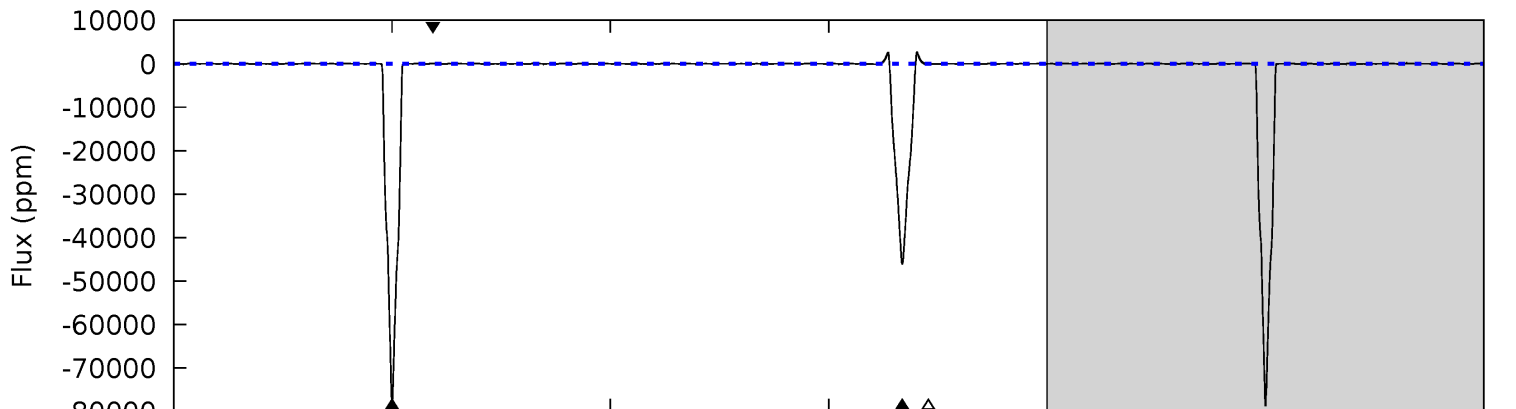
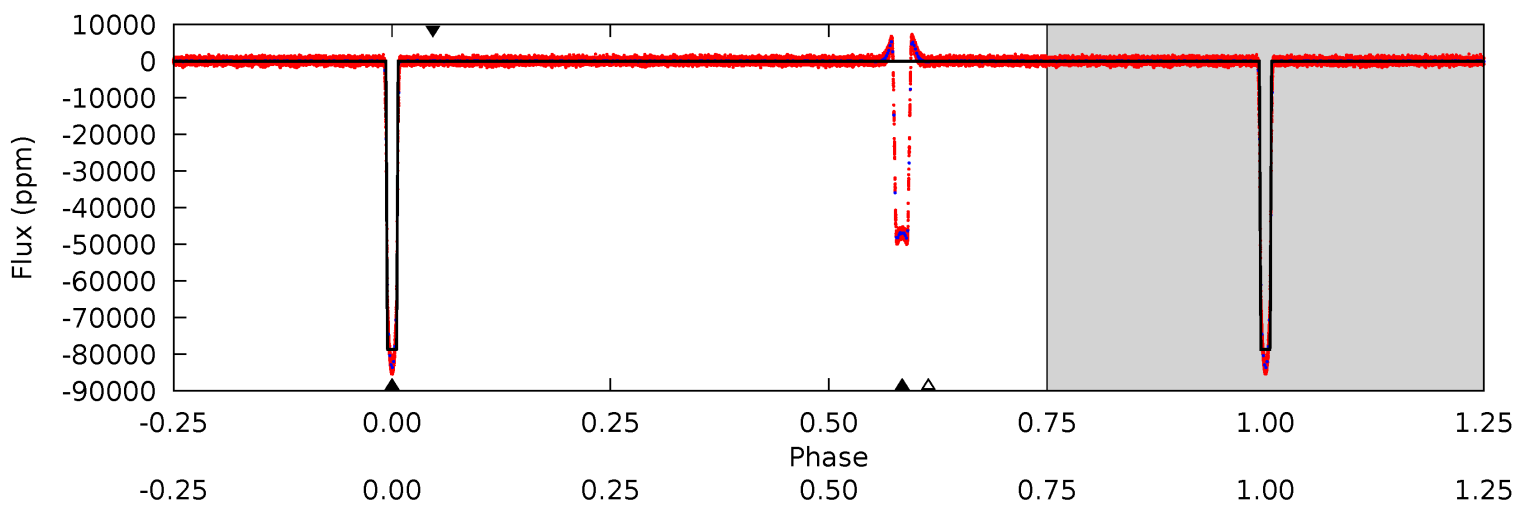
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5283	4315	10.3	7.03	4.92	2.37	4.44	5272	5276	4305	4308	0.96	1.00	0.00	0.24



Alt Model-Shift Uniqueness Test

010857589-01, P = 32.532129 Days, E = 114.553236 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3888	2274	6.44	3.03	4.96	2.45	9.44	3882	3885	2268	2271	13.1	1.00	0.03	0.22



Stellar Parameters For KIC 010857589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5845^{+145}_{-174}	$4.558^{+0.044}_{-0.176}$	$-0.280^{+0.300}_{-0.300}$	$0.838^{+0.227}_{-0.071}$	$0.926^{+0.101}_{-0.111}$	$2.214^{+0.500}_{-1.004}$
	+2%/-3%	+1%/-4%	+107%/-107%	+27%/-8%	+11%/-12%	+23%/-45%
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 010857589-01 / KOI 7382.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-68123 ± 16	$24.53^{+3.63}_{-1.38}$	759^{+44}_{-29}	5891^{+145}_{-168}	2434^{+291}_{-446}
Alt.	-46023 ± 20	$26.57^{+3.74}_{-1.76}$	761^{+49}_{-32}	5184^{+124}_{-136}	1394^{+165}_{-297}

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 $A_{obs} \gg 1.0$

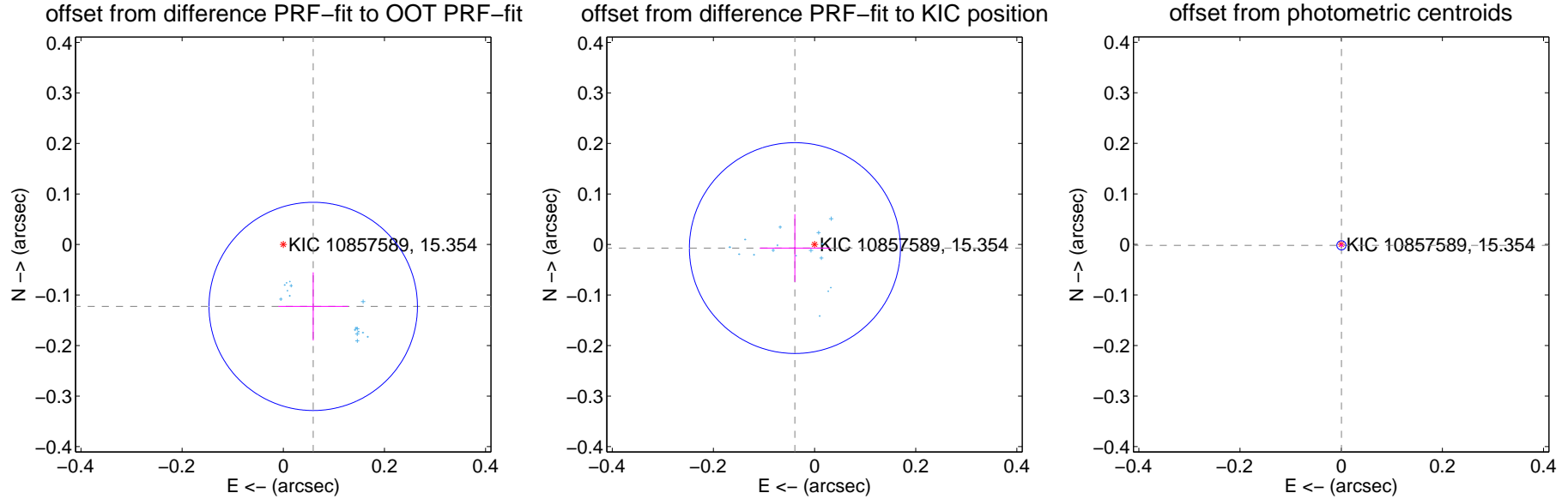
DV Centroid Data

Supplemental centroid analysis for 010857589-01. Kepler magnitude: 15.35. Transit SNR 2110.13

There are 16 quarters with good PRF difference image offsets

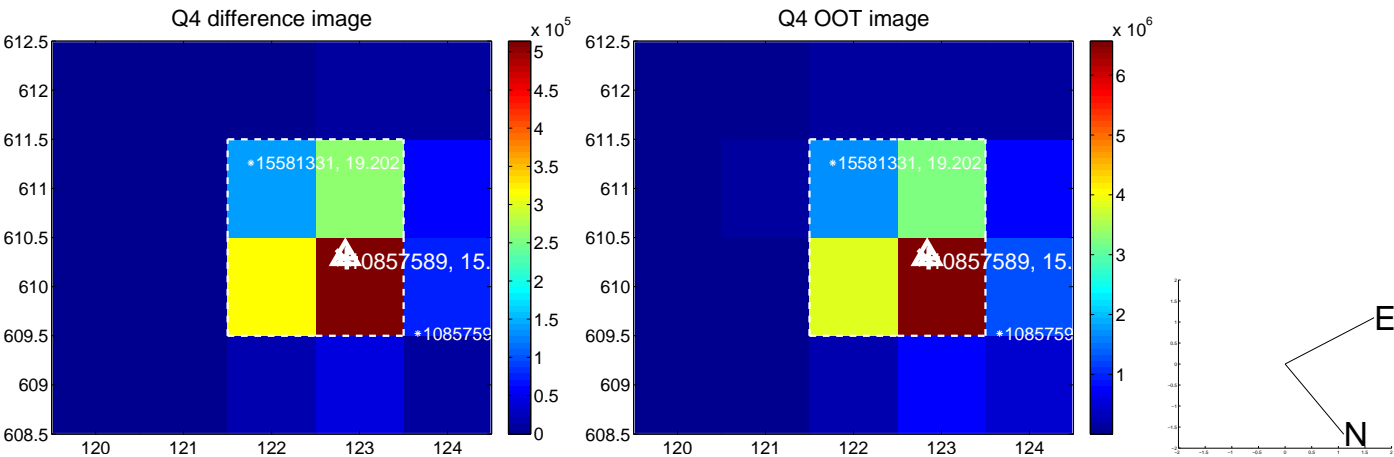
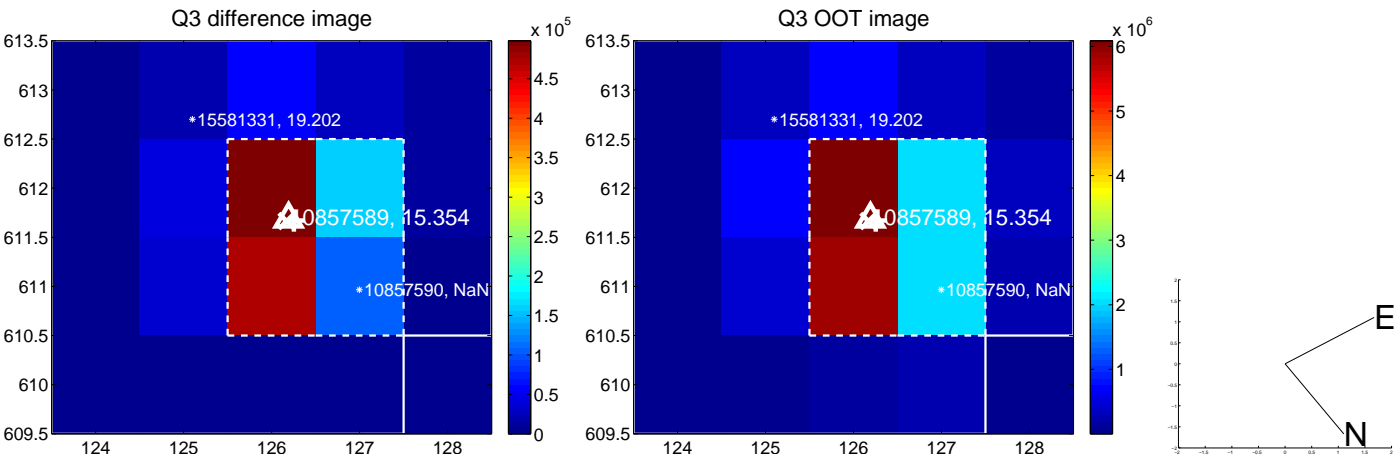
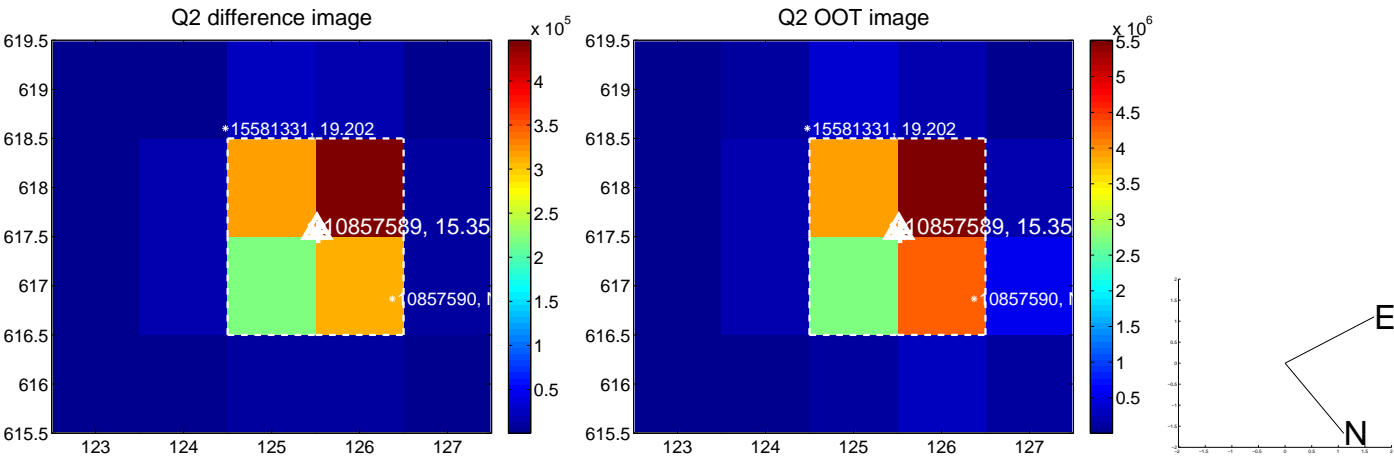
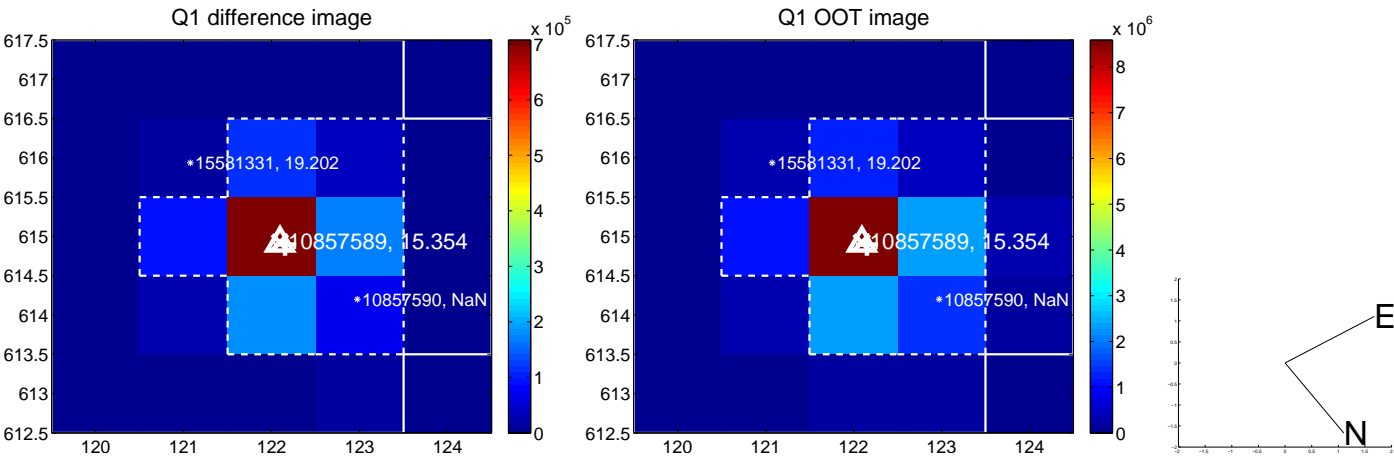
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.136 ± 0.069	1.98	-0.059 ± 0.069	-0.123 ± 0.067
PRF-fit source offset from KIC position	0.040 ± 0.070	0.57	0.039 ± 0.070	-0.007 ± 0.067
photometric centroid source offset	0.00 ± 0.00	0.60	-0.00 ± 0.00	-0.00 ± 0.00

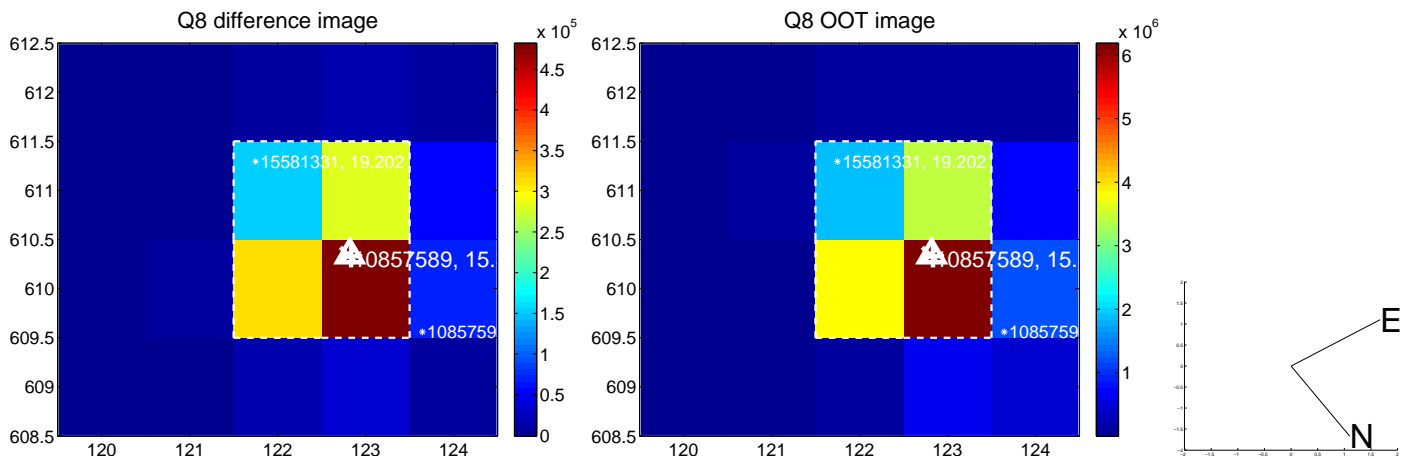
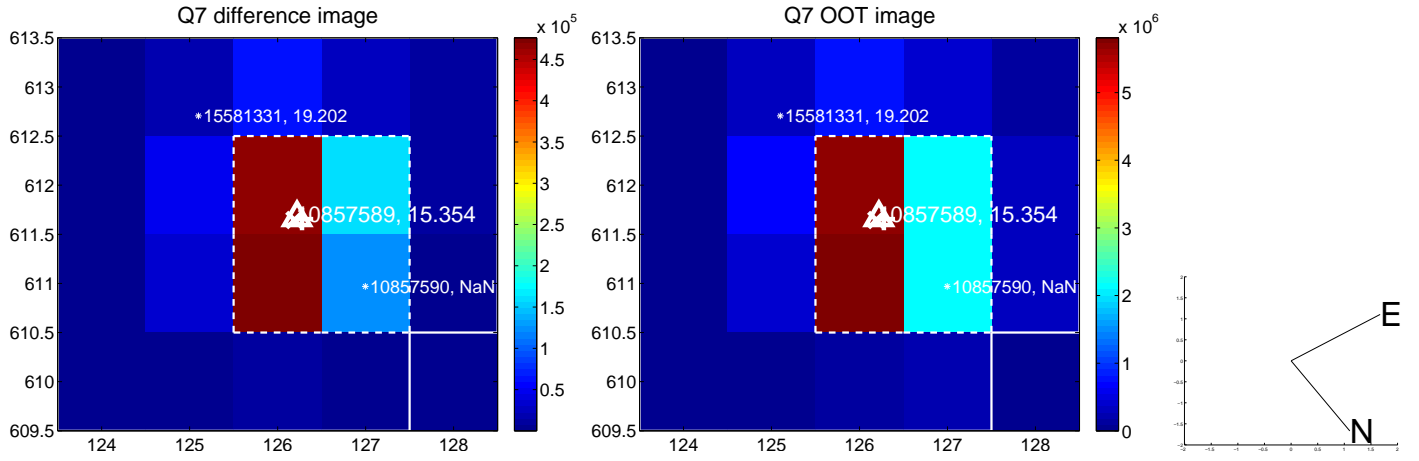
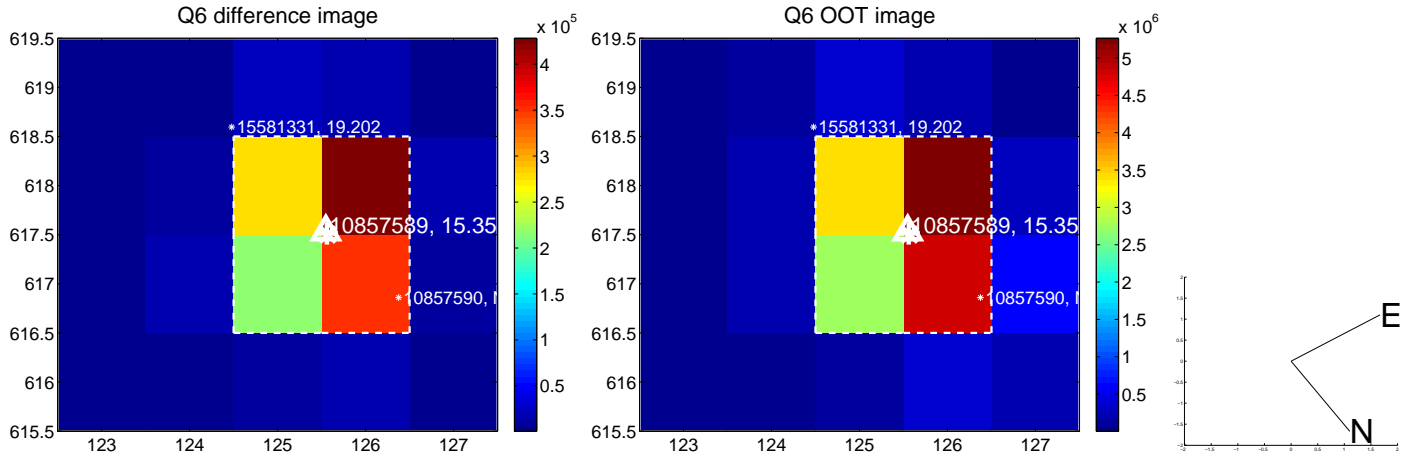
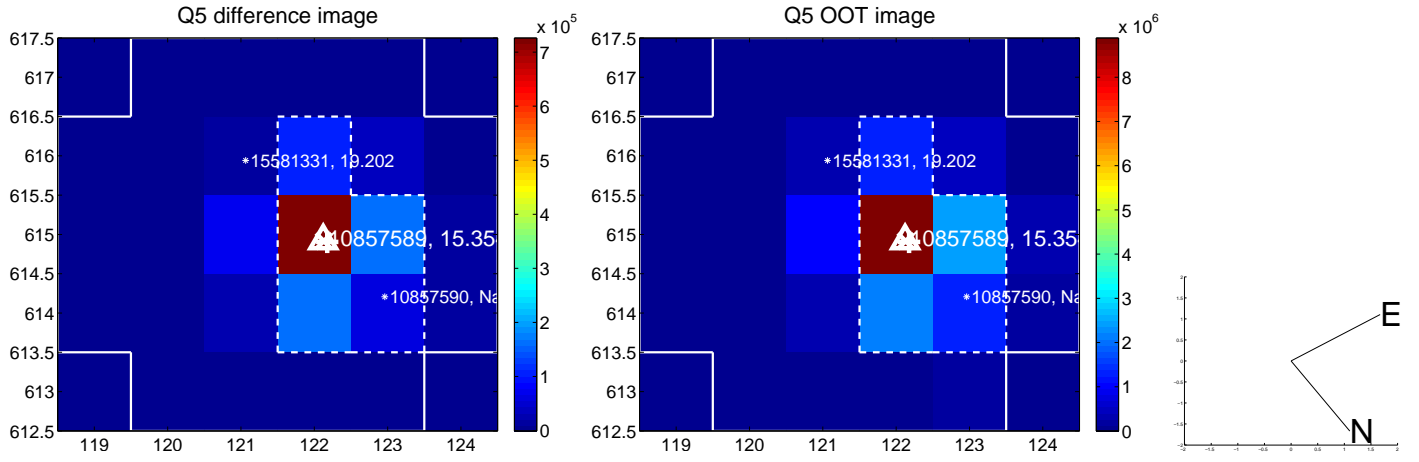


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

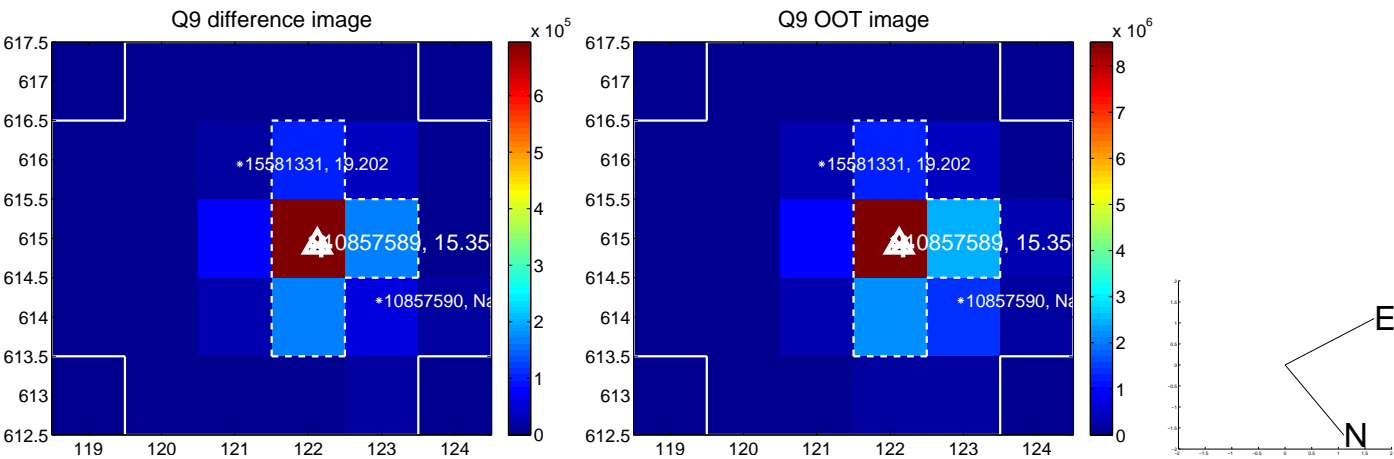
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



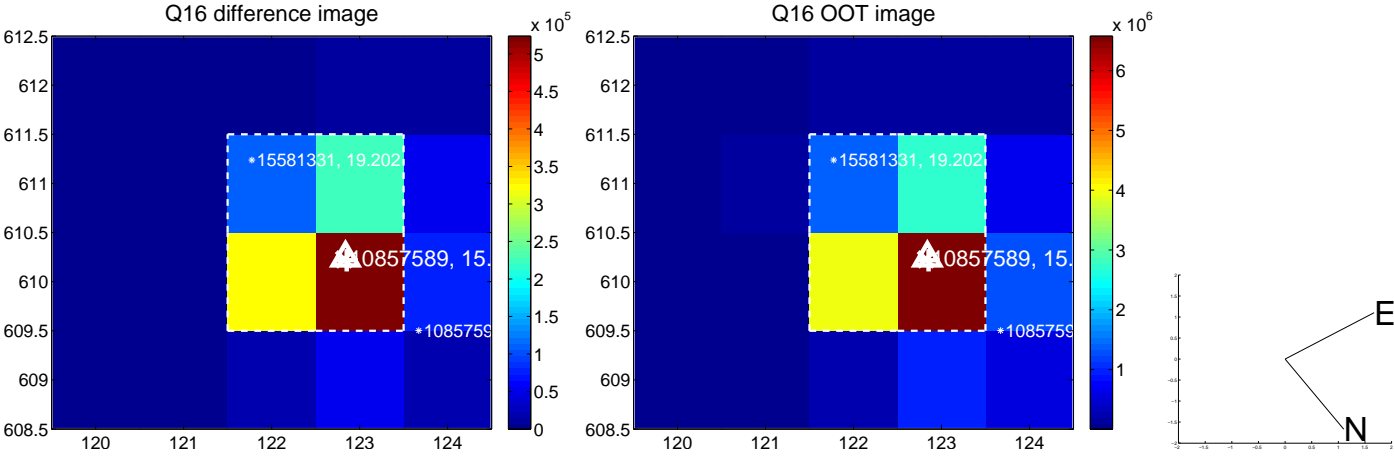
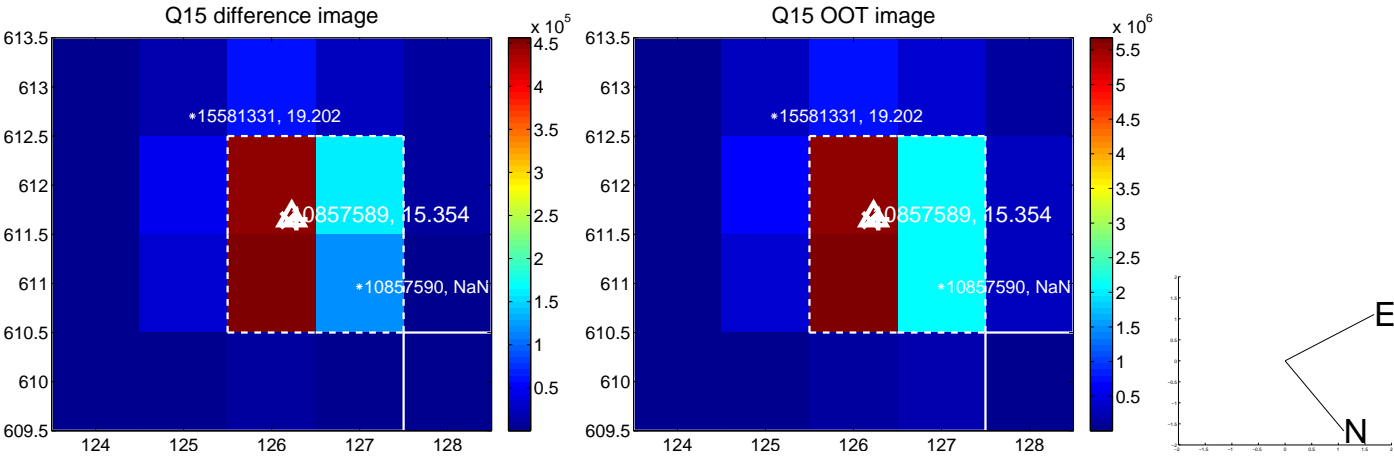
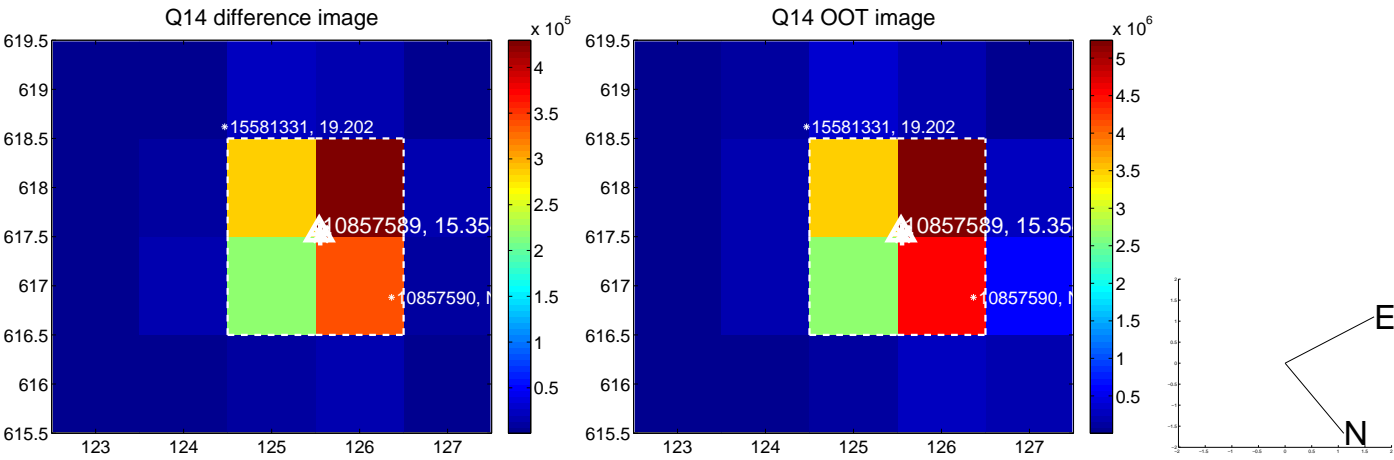
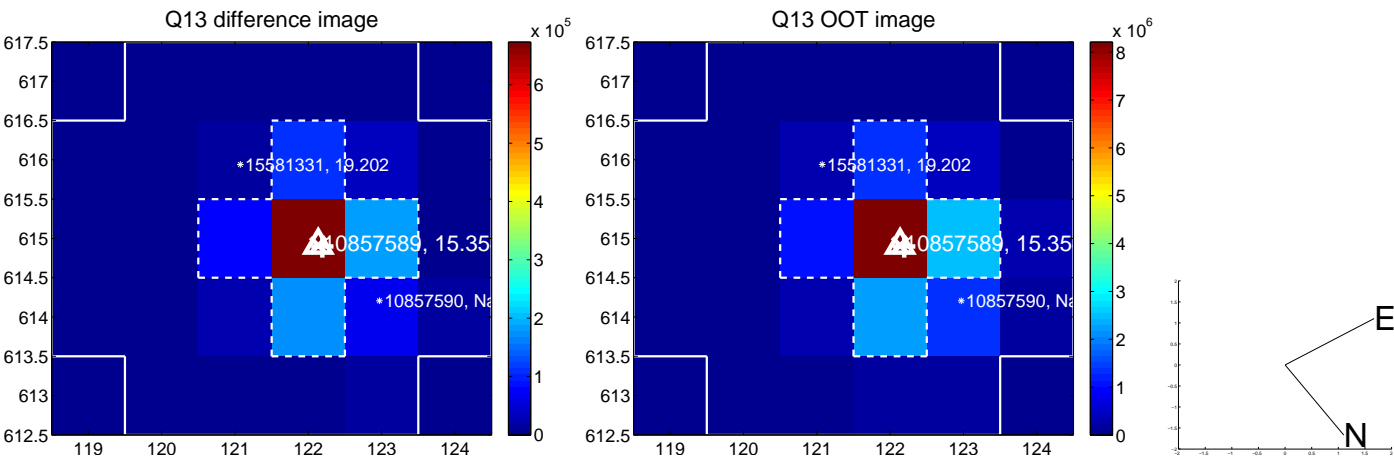
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



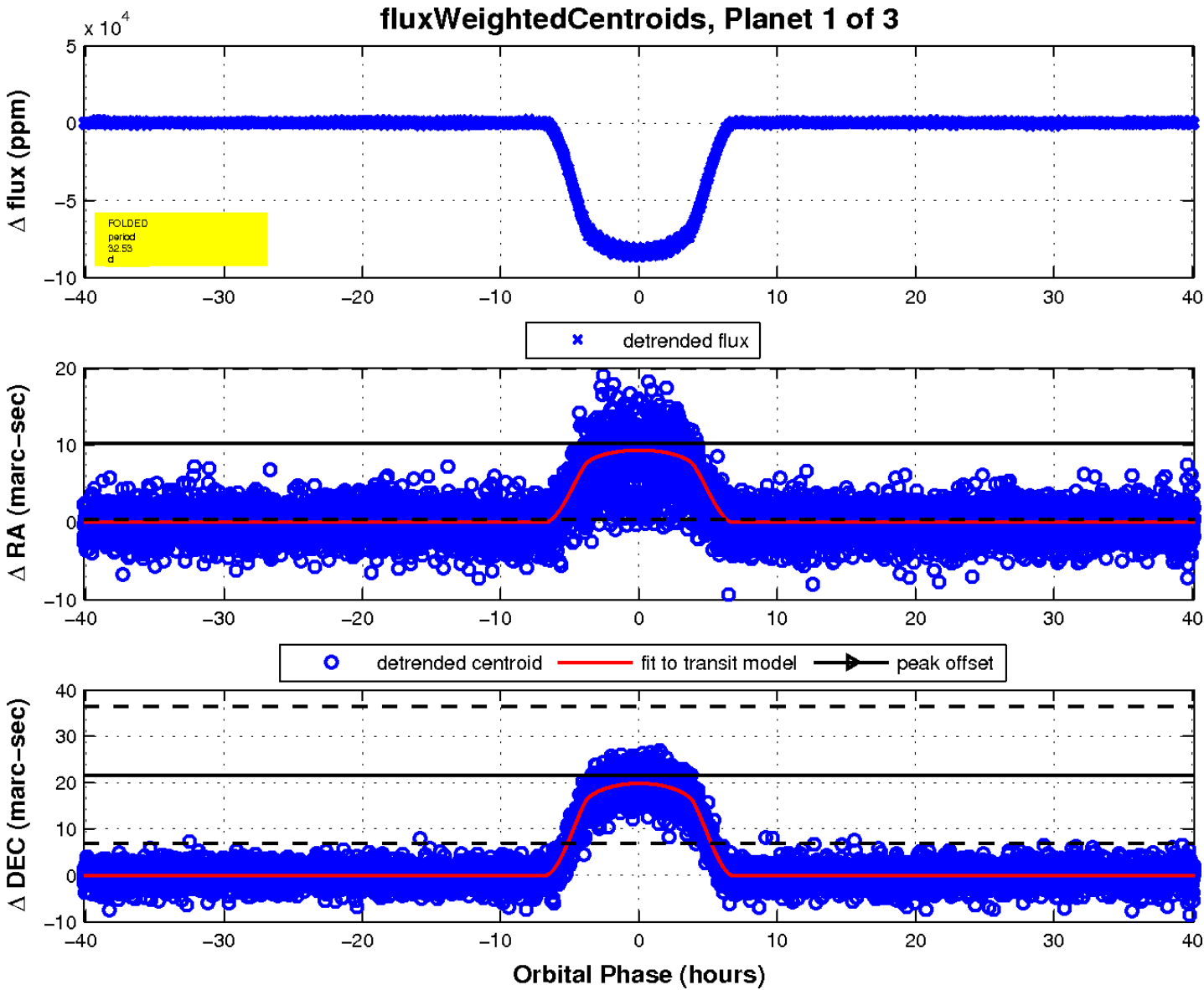
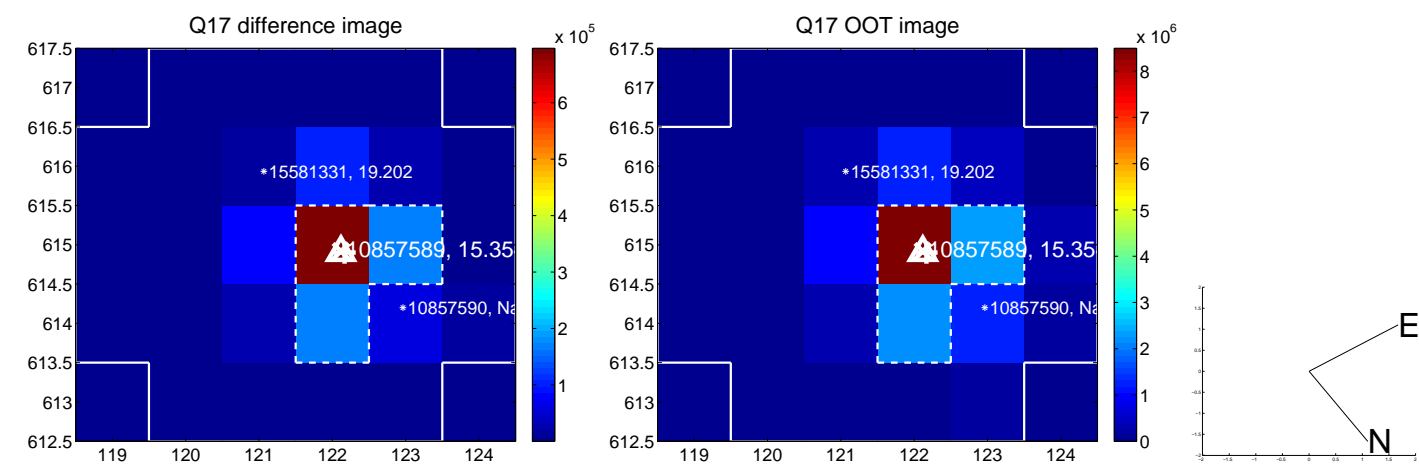
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

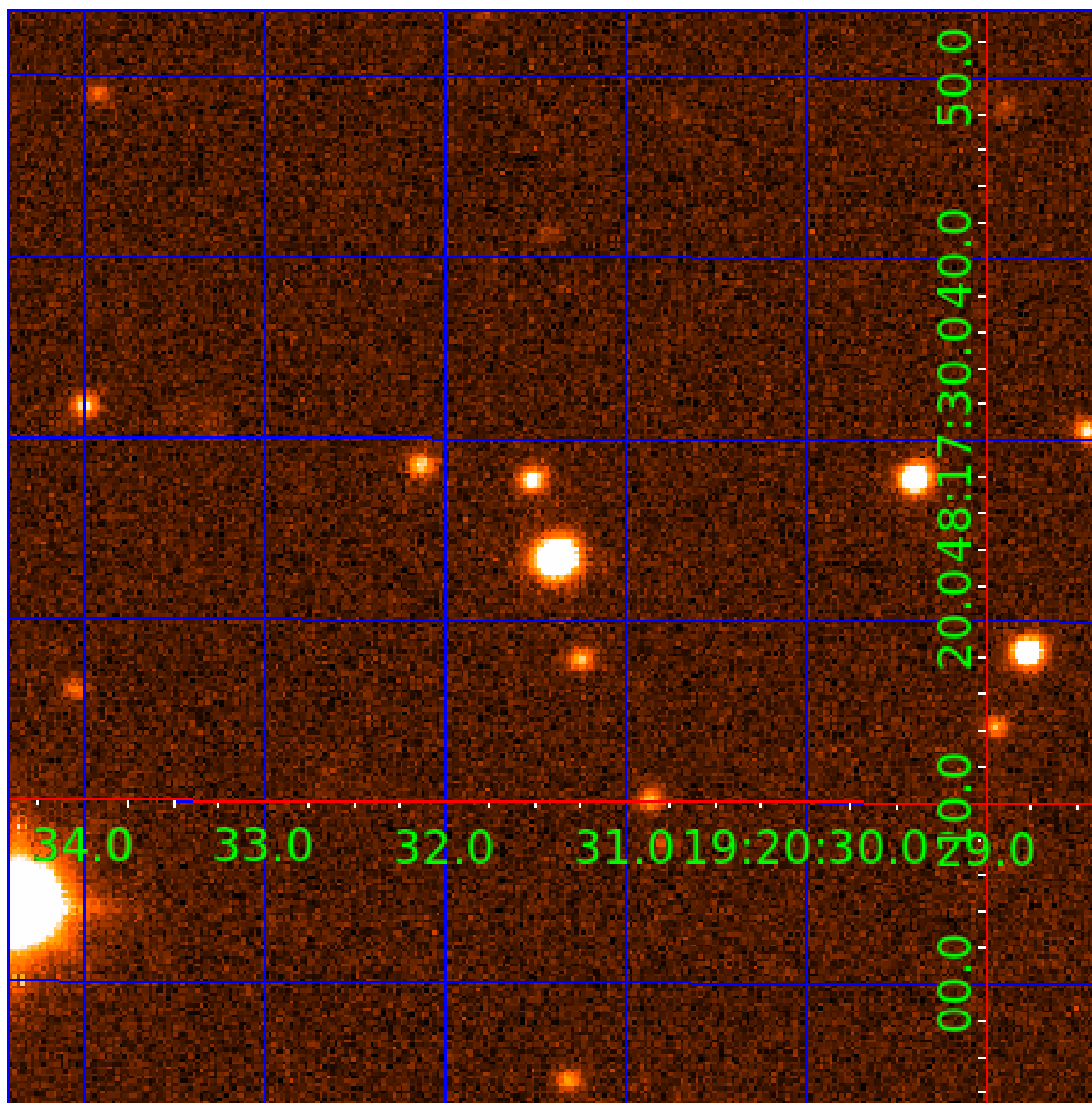


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010857589

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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010857589-02	OBS	No	32.532494	133.536770	61151.5	17.684	2053.9	1378.5	0.84	5845	20.66	19.43

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010857589-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
010857589-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

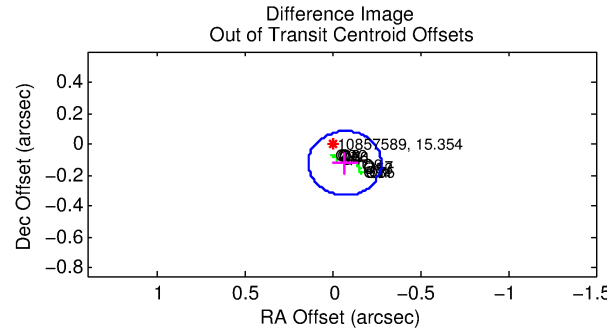
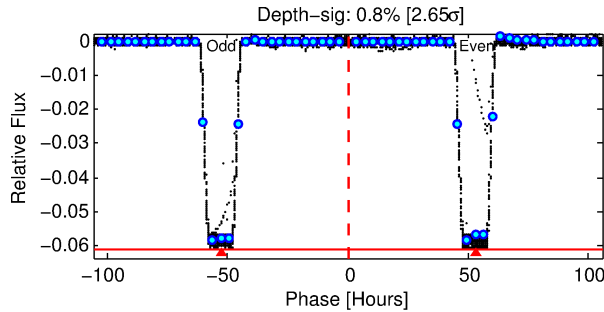
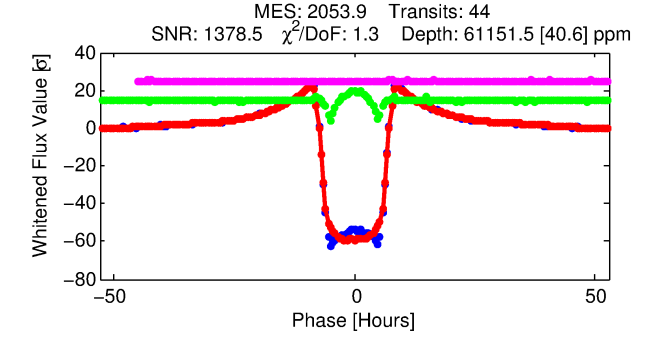
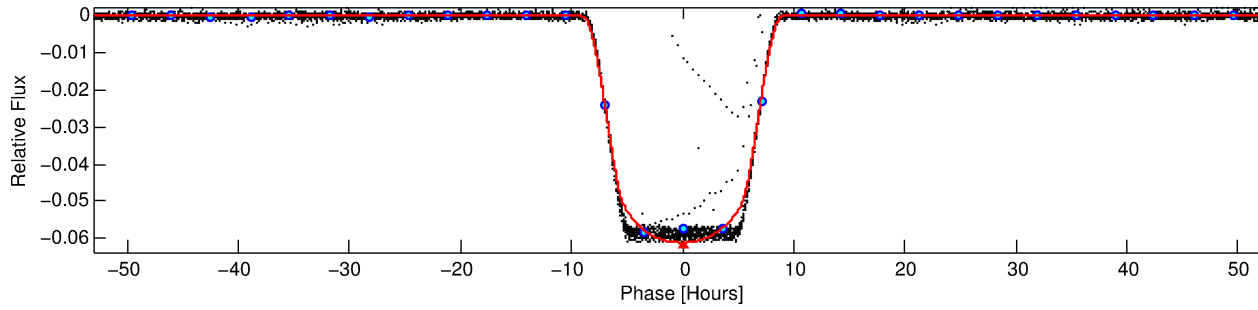
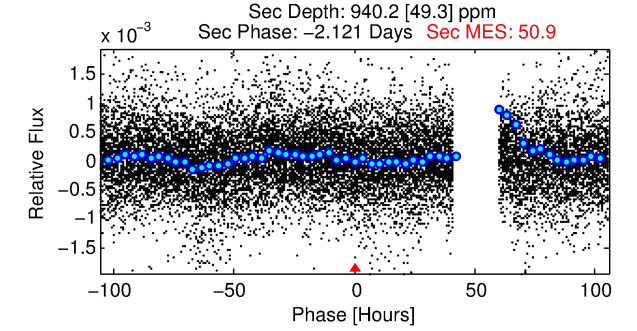
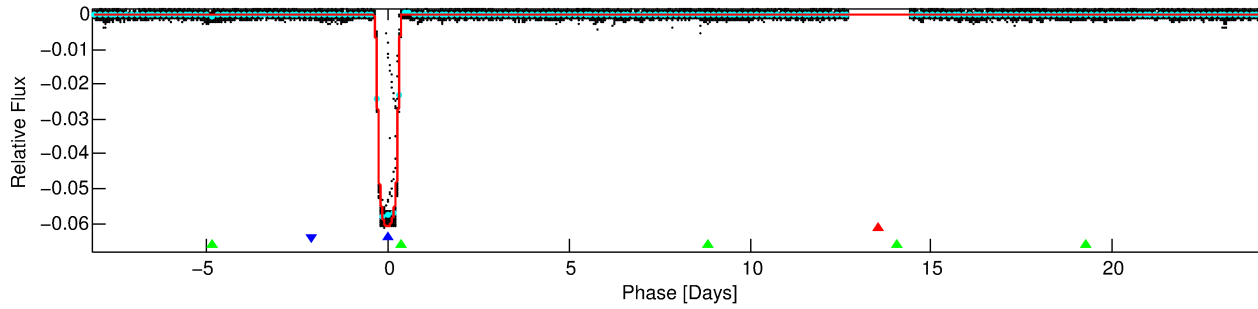
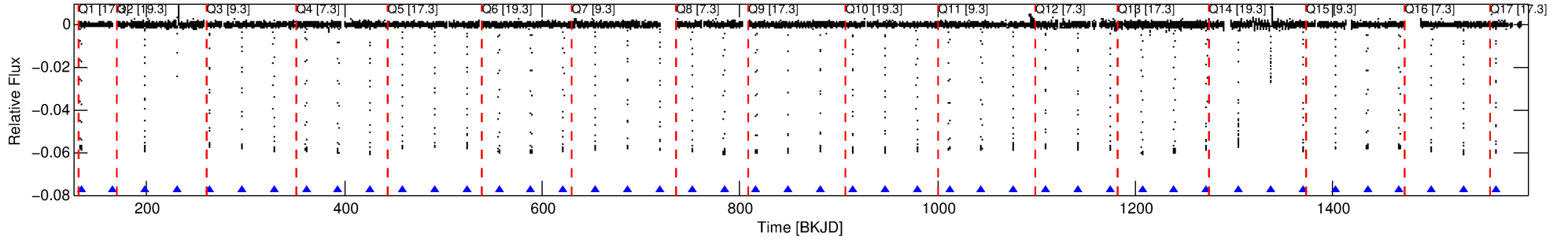
Ephemeris Match Information For 010857589-02

No Significant Match Found

DV One-Page Summary

KIC: 10857589 Candidate: 2 of 3 Period: 32.532 d
KOI: K07382 Corr: No Ephemeris Match

Kp: 15.35 R*: 0.84 Rs Teff: 5845.0 K Logg: 4.56 Fe/H: -0.280



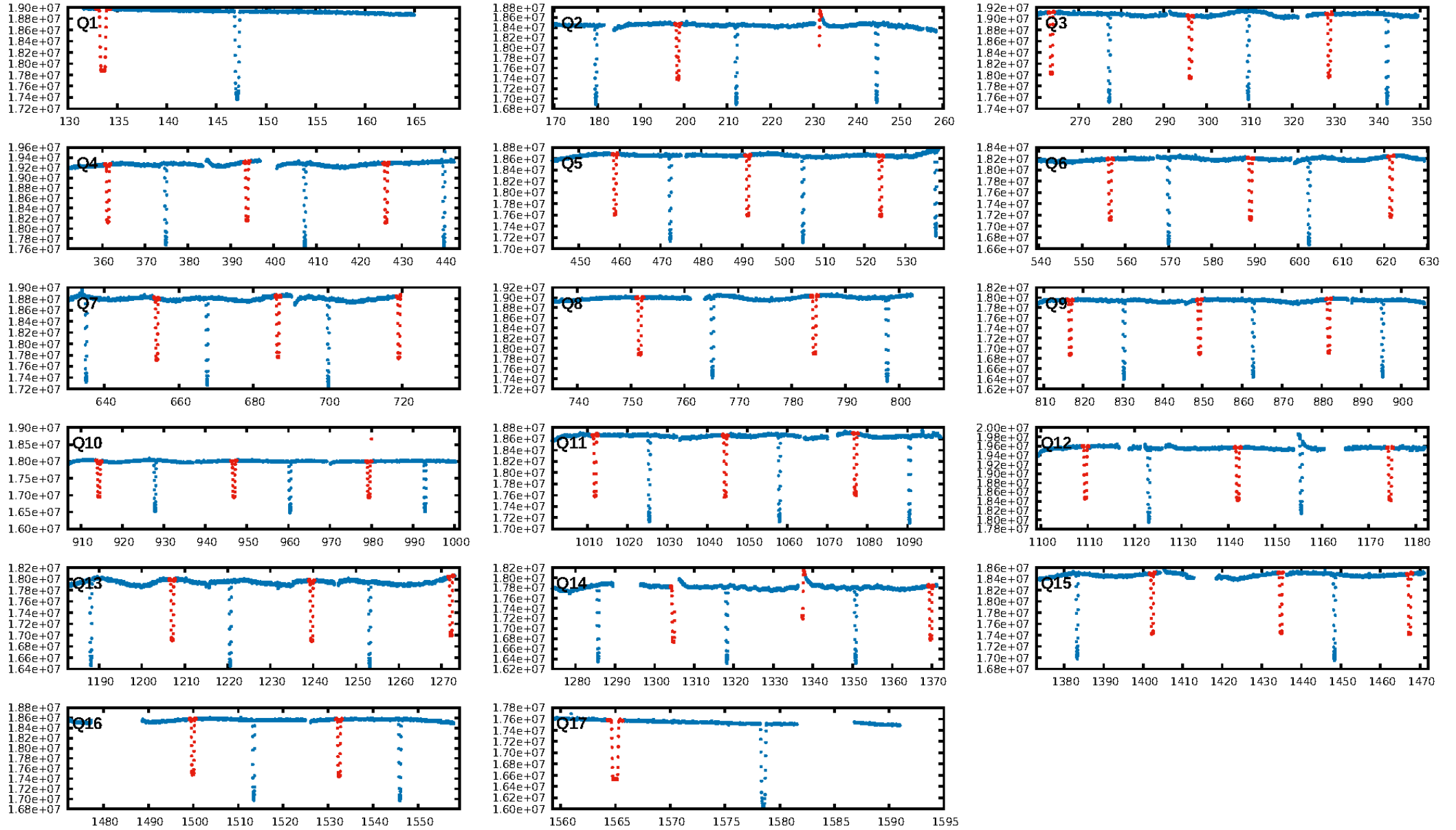
DV Fit Results:

Period = 32.53249 [0.00001] d
Epoch = 133.5368 [0.0002] BKJD
Rp/R* = 0.2259 [0.0001]
a/R* = 17.24 [0.02]
b = 0.00 [5.26]
Seff = 19.43 [6.72]
Teq = 535 [46] K
Rp = 20.66 [5.60] Re
a = 0.1944 [0.0438] AU
Ag = 45.81 [15.08] [2.97σ]
Teffp = 2153 [70] K [19.27σ]

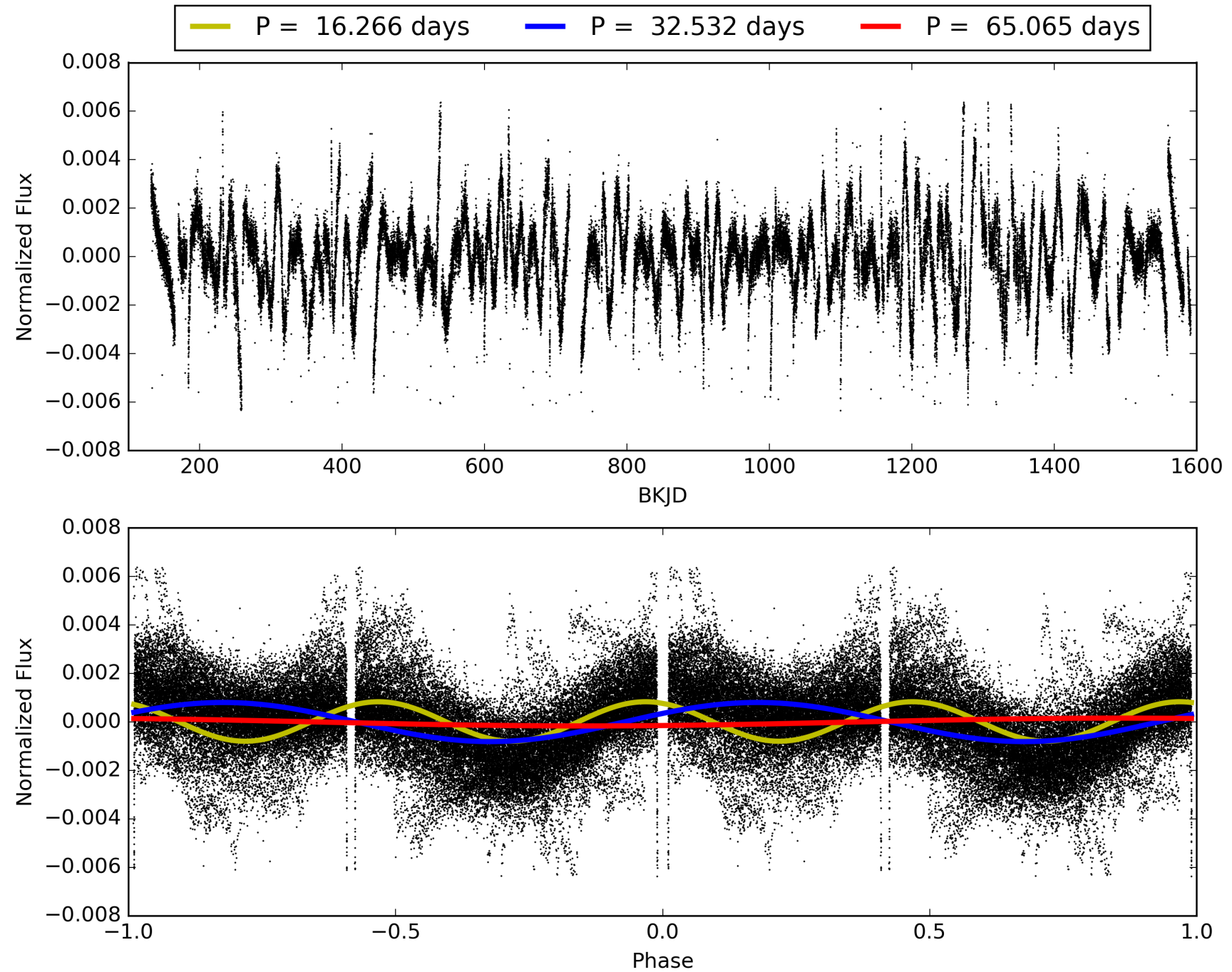
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [42/42]
GhostDiagnostic-chr: 3.052
Centroid-sig: 0.0%
Centroid-so: 0.006 arcsec [1.47σ]
OotOffset-rm: 0.140 arcsec [2.03σ]
KicOffset-rm: 0.045 arcsec [0.64σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 010857589-02, PDC Light Curves

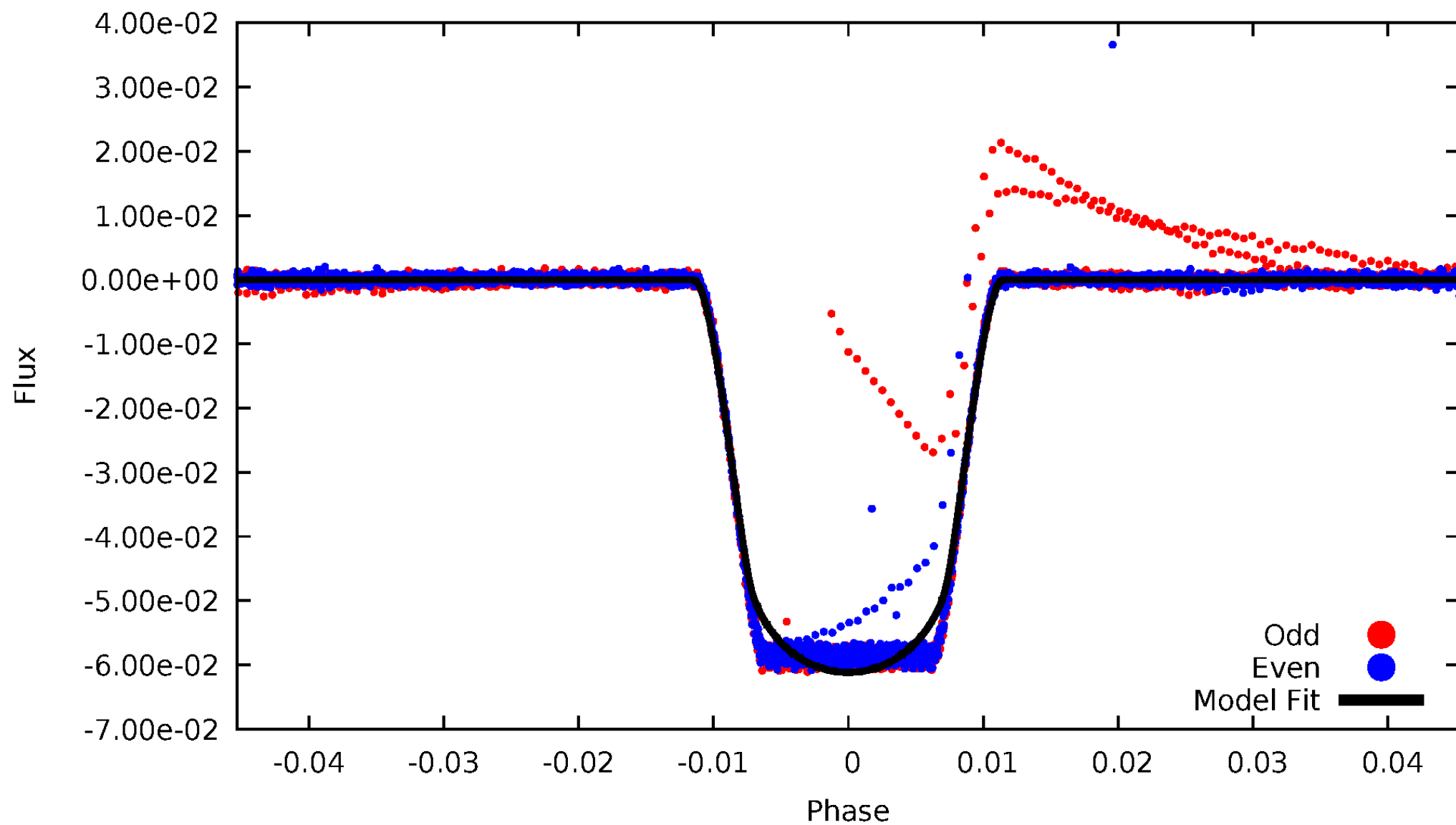


TCE 010857589-02



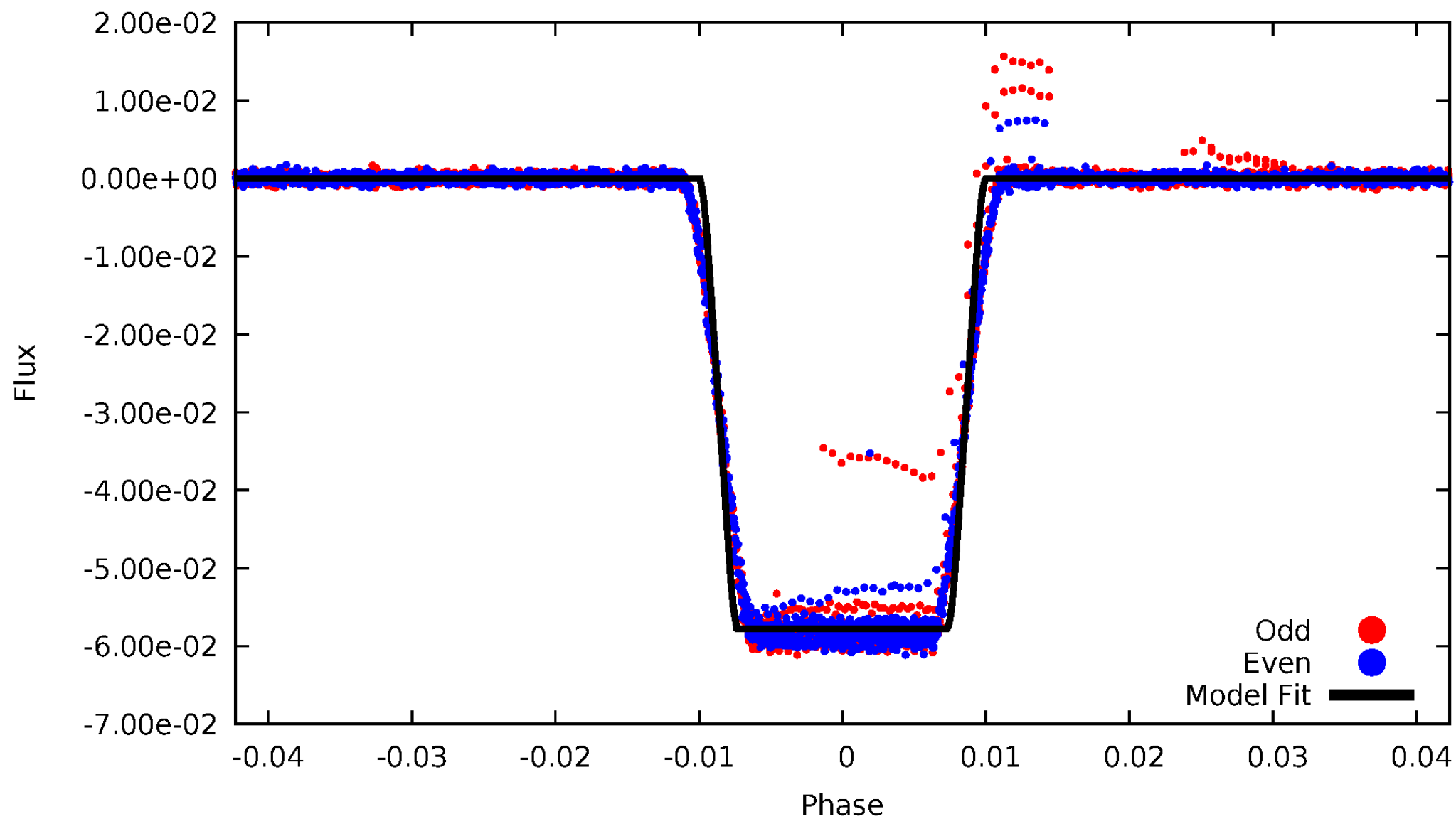
DV Odd/Even

TCE 010857589-02



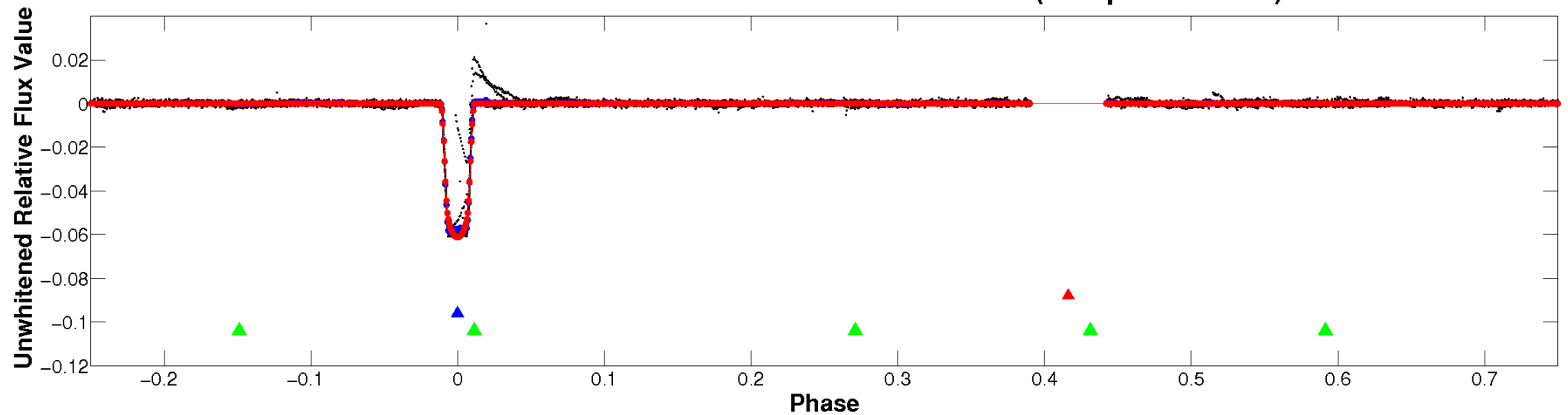
ALT Odd/Even

TCE 010857589-02

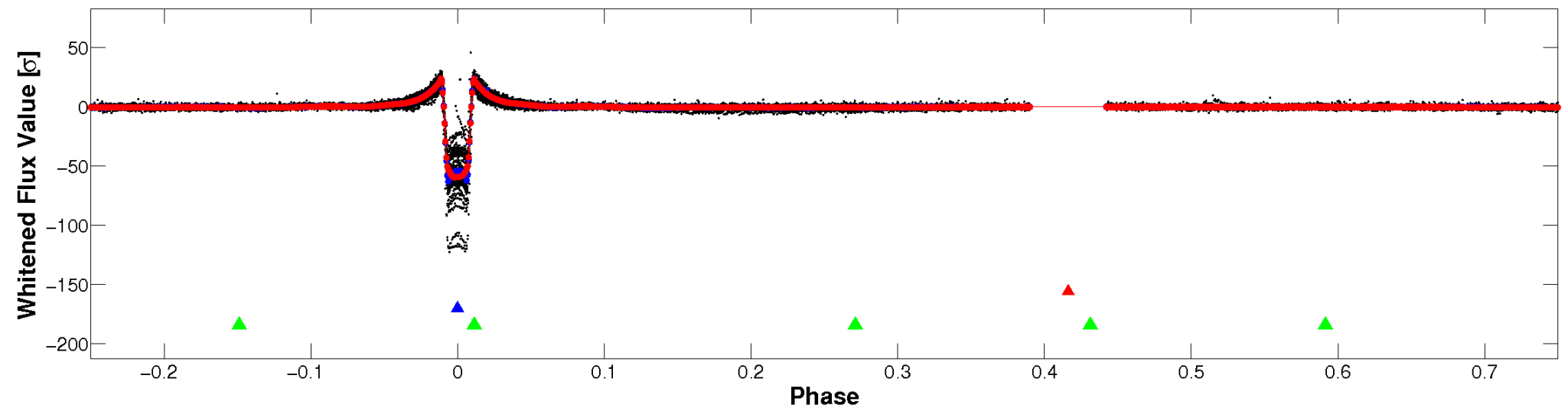


Non-Whitened Vs. Whitened Light Curve

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

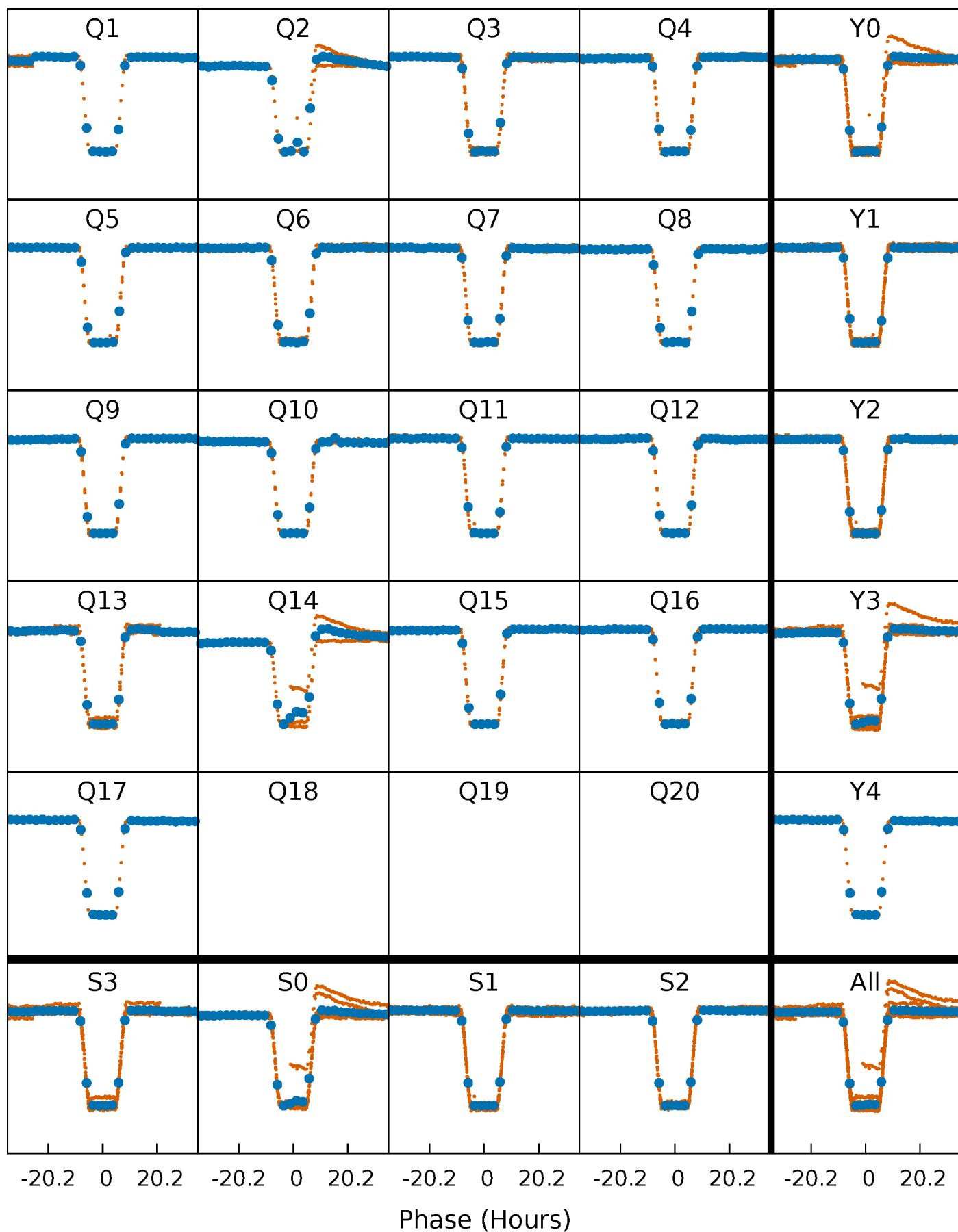


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



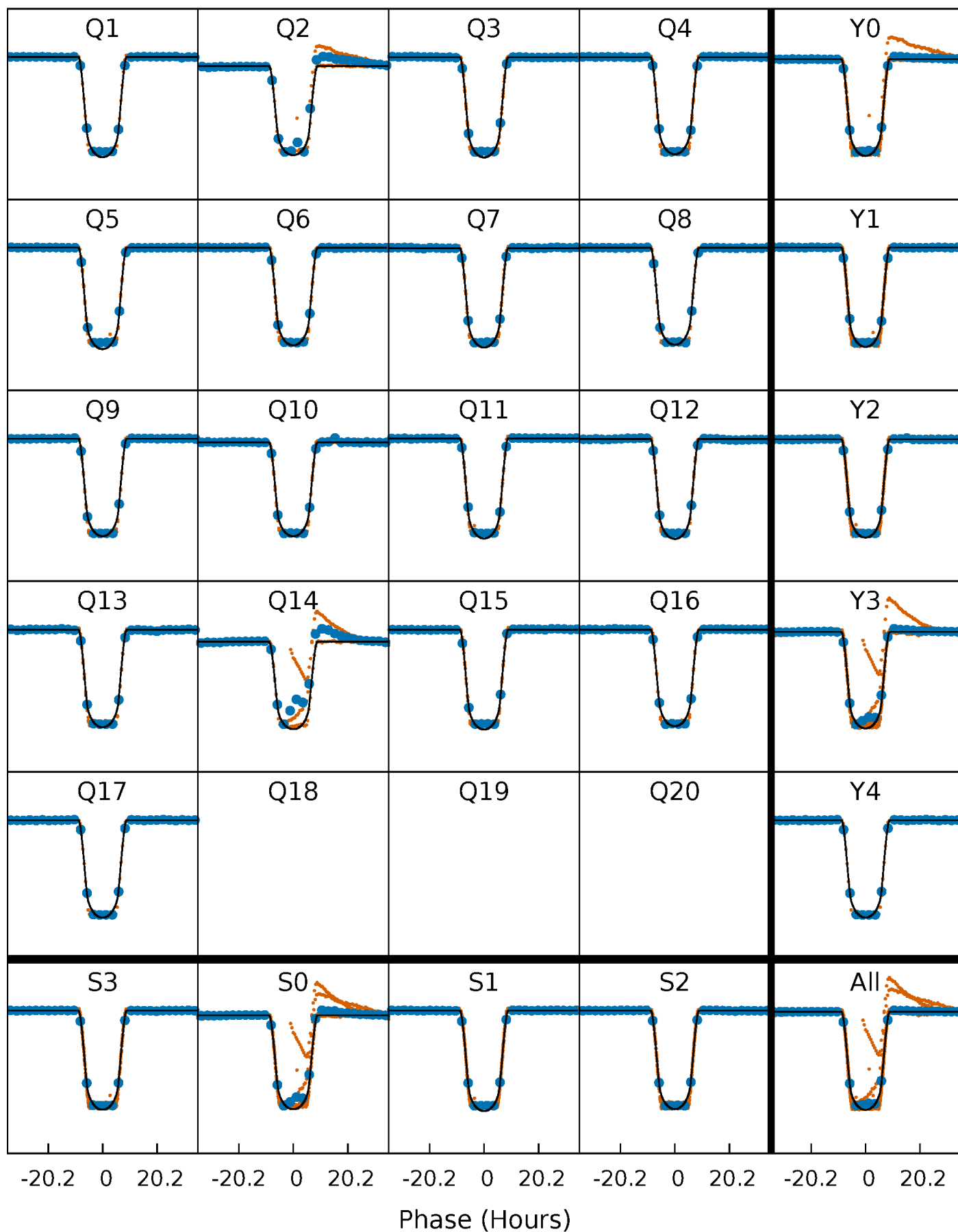
PDC Quarter-Phased Transit Curves

TCE 010857589-02 P= 32.532494 Days $T_0=133.536770$ (BKJD)



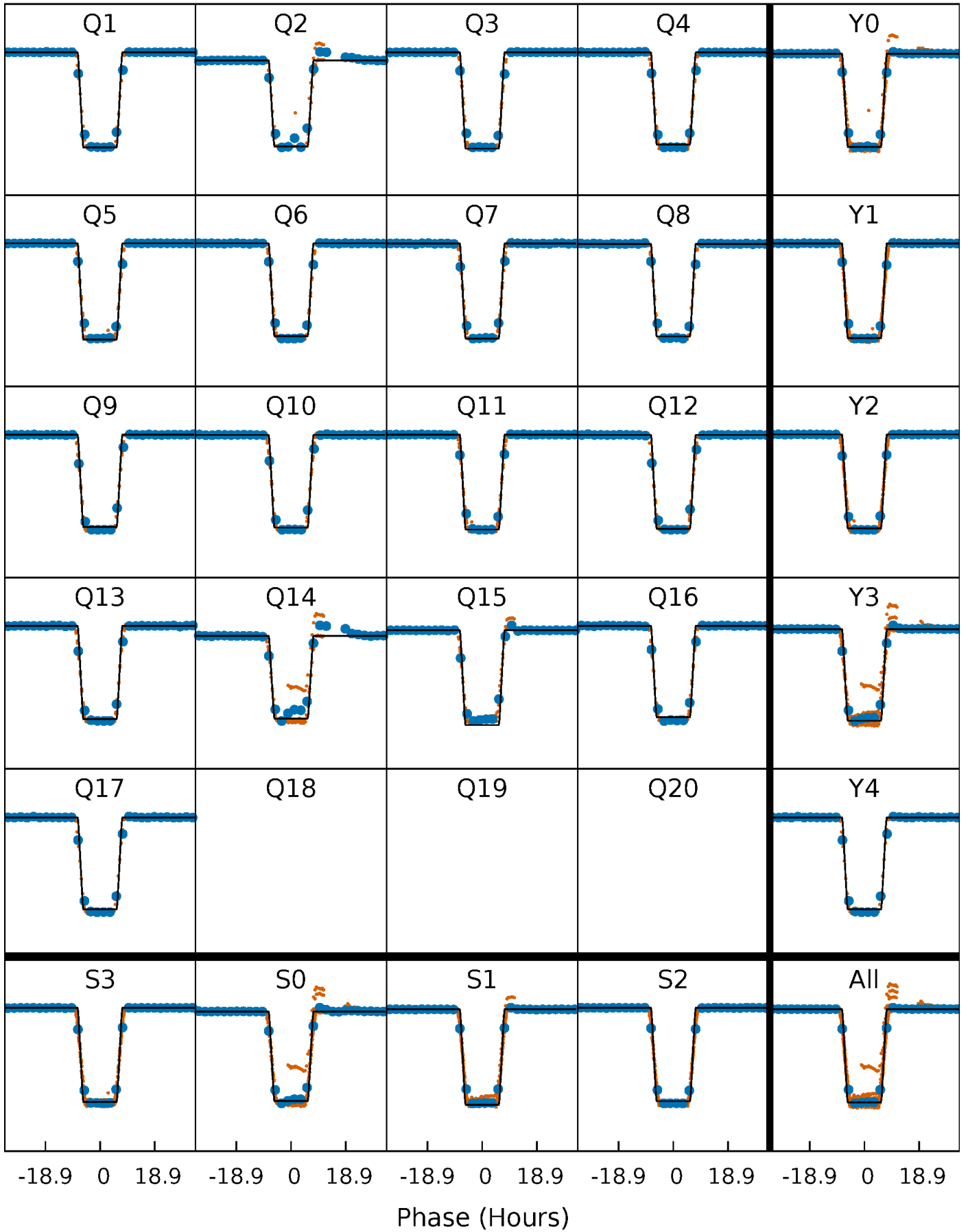
DV Quarter-Phased Transit Curves

TCE 010857589-02 P= 32.532494 Days $T_0=133.536770$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

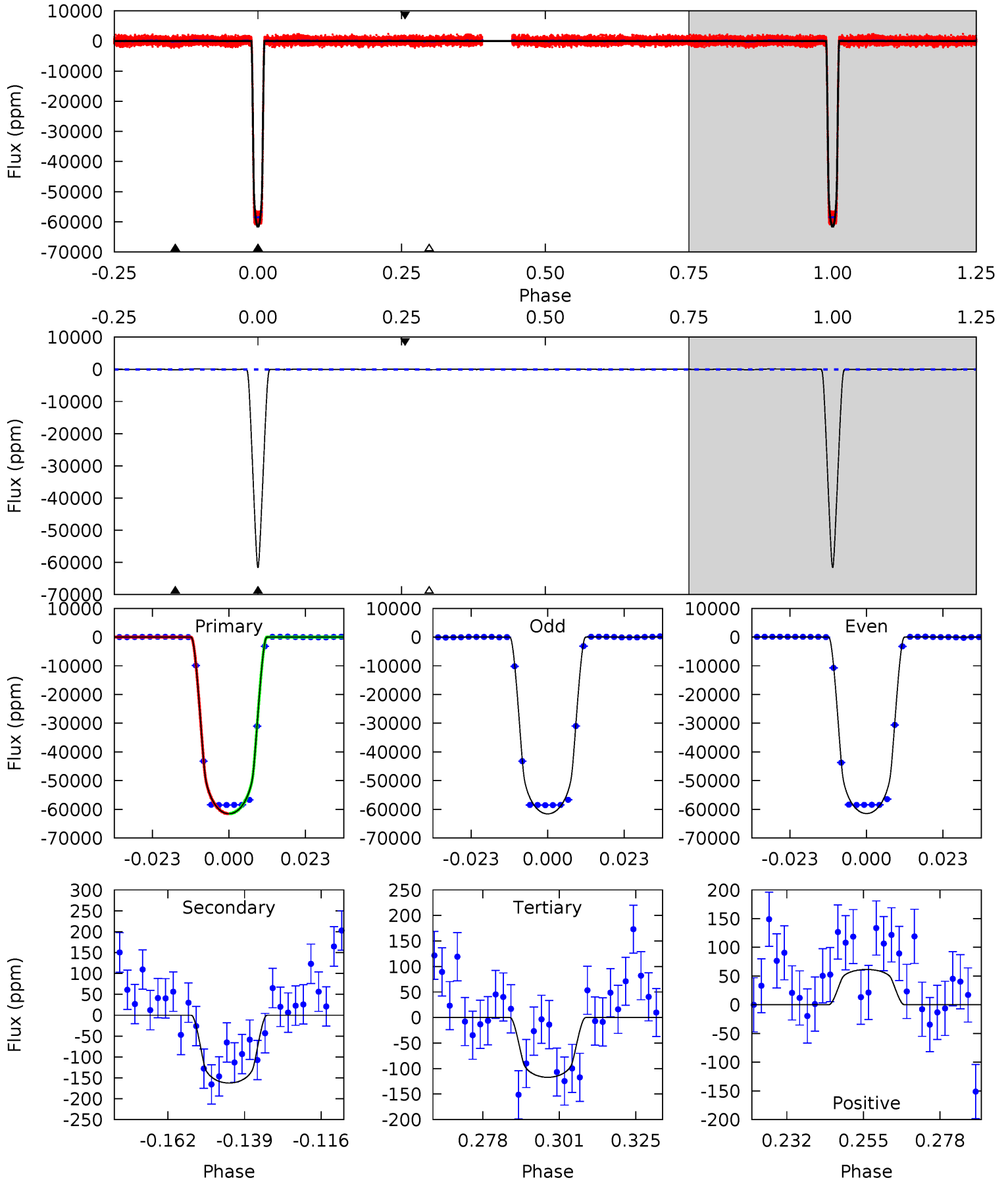
TCE 010857589-02 P= 32.532704 Days $T_0=133.531349$ (BKJD)



DV Model-Shift Uniqueness Test

010857589-02, P = 32.532494 Days, E = 101.004276 Days

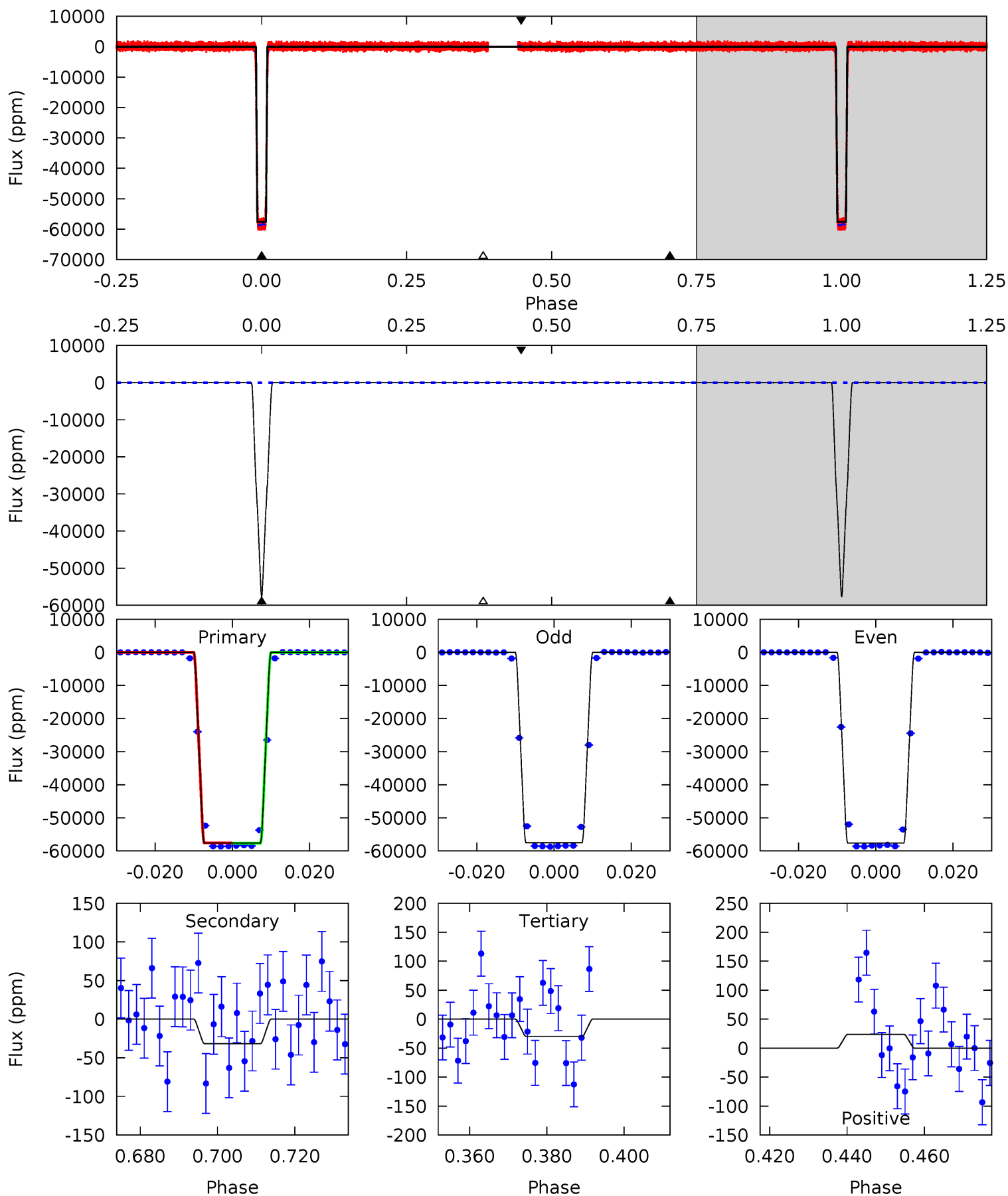
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4460	11.8	8.49	4.45	4.86	2.27	3.24	4452	4456	3.29	7.32	4.06	0.98	0.00	1.15



Alt Model-Shift Uniqueness Test

010857589-02, P = 32.532704 Days, E = 100.998645 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4328	2.38	2.23	1.80	4.89	2.33	0.71	4326	4326	0.15	0.57	4.36	0.98	0.00	0



Stellar Parameters For KIC 010857589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5845^{+145}_{-174}	$4.558^{+0.044}_{-0.176}$	$-0.280^{+0.300}_{-0.300}$	$0.838^{+0.227}_{-0.071}$	$0.926^{+0.101}_{-0.111}$	$2.214^{+0.500}_{-1.004}$
	+2%/-3%	+1%/-4%	+107%/-107%	+27%/-8%	+11%/-12%	+23%/-45%
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 010857589-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-162 ± 14	$21.15^{+3.05}_{-1.44}$	761^{+47}_{-33}	2293^{+37}_{-39}	$7.373^{+1.250}_{-1.636}$
Alt.	-32 ± 13	$22.52^{+2.98}_{-1.57}$	762^{+45}_{-31}	1857^{+89}_{-137}	$1.206^{+0.576}_{-0.530}$

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

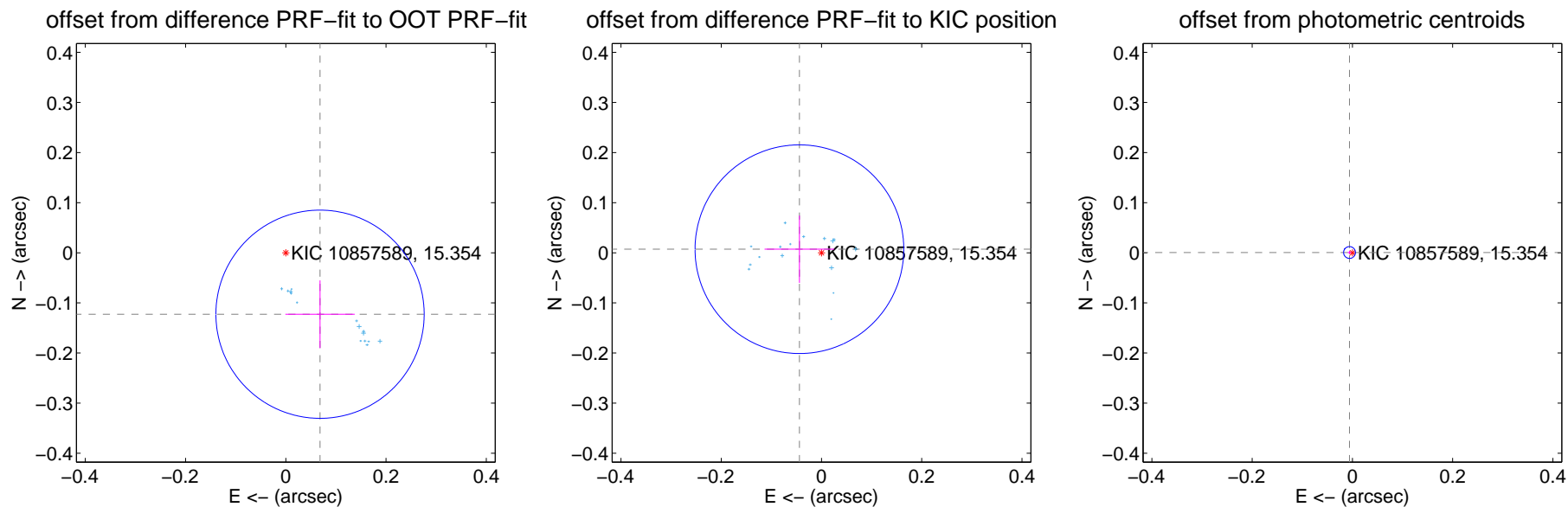
DV Centroid Data

Supplemental centroid analysis for 010857589-02. Kepler magnitude: 15.35. Transit SNR 1378.45

There are 16 quarters with good PRF difference image offsets

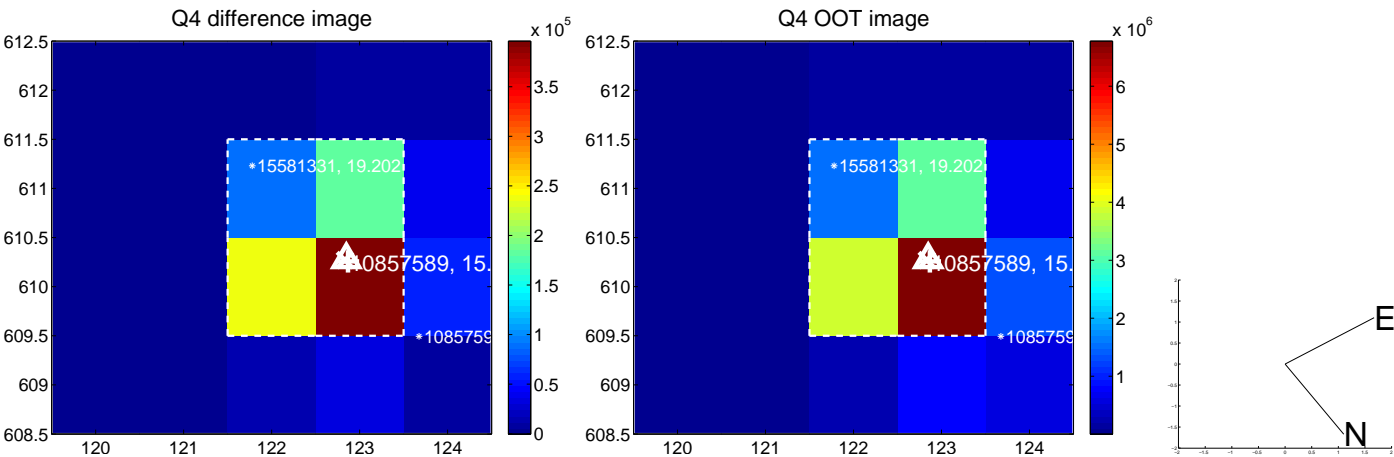
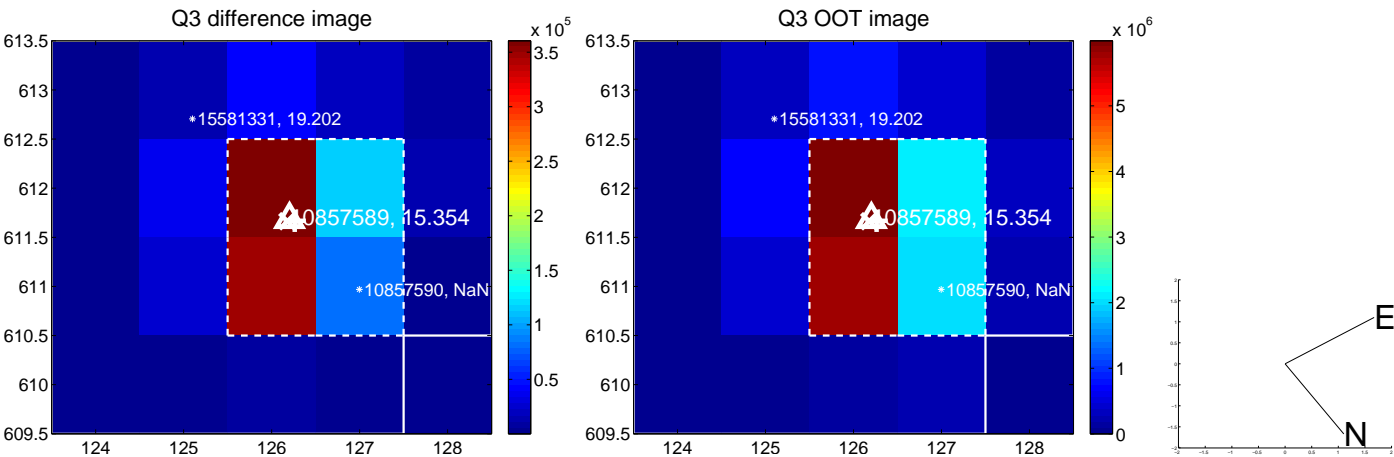
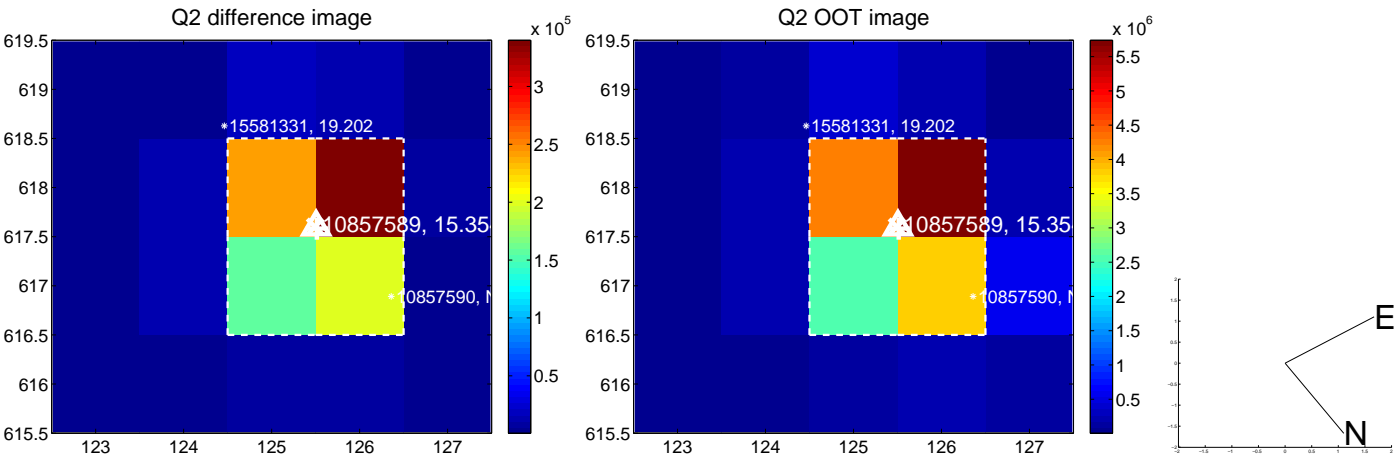
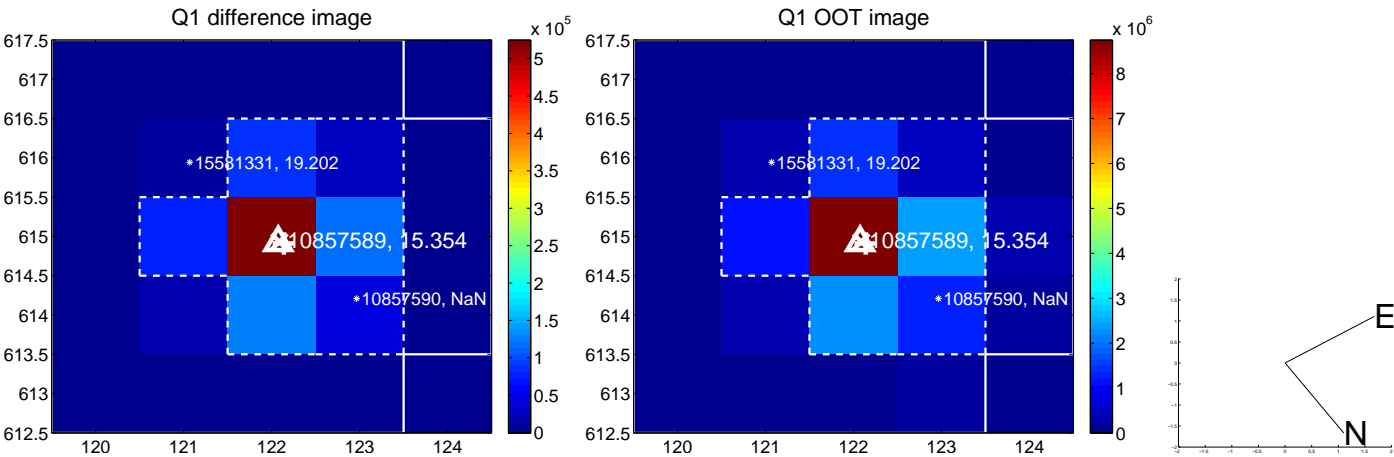
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.140 ± 0.069	2.03	-0.068 ± 0.069	-0.123 ± 0.068
PRF-fit source offset from KIC position	0.045 ± 0.069	0.64	0.044 ± 0.069	0.007 ± 0.067
photometric centroid source offset	0.01 ± 0.00	1.47	0.01 ± 0.00	0.00 ± 0.00

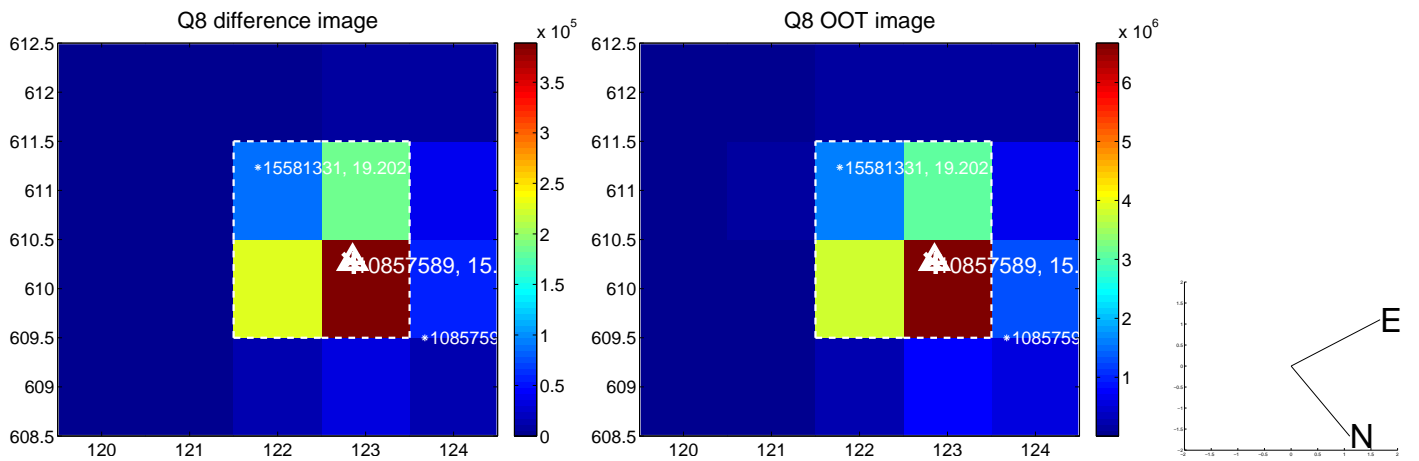
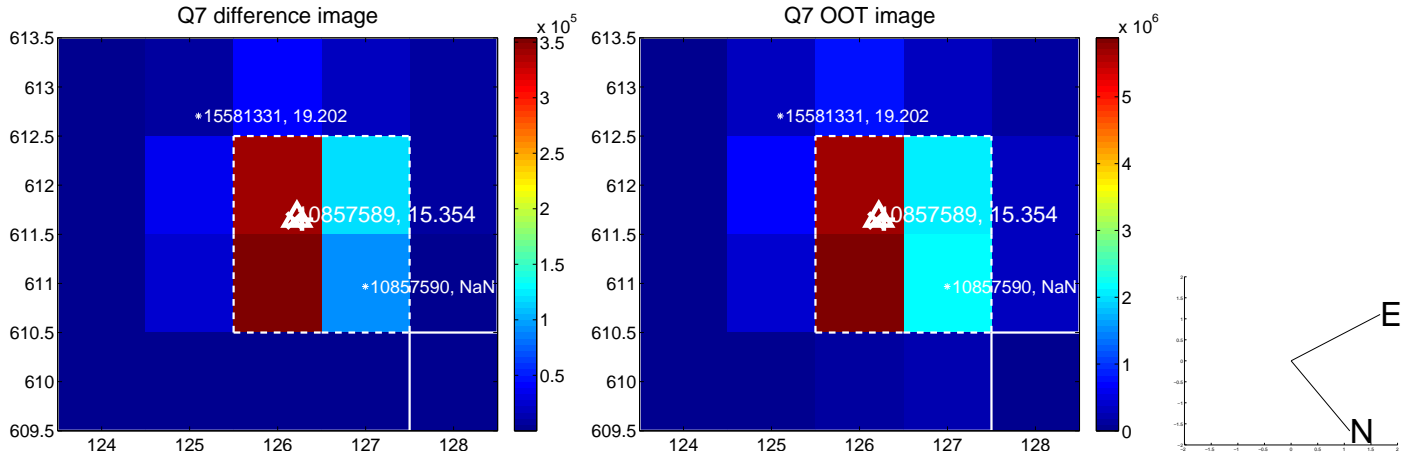
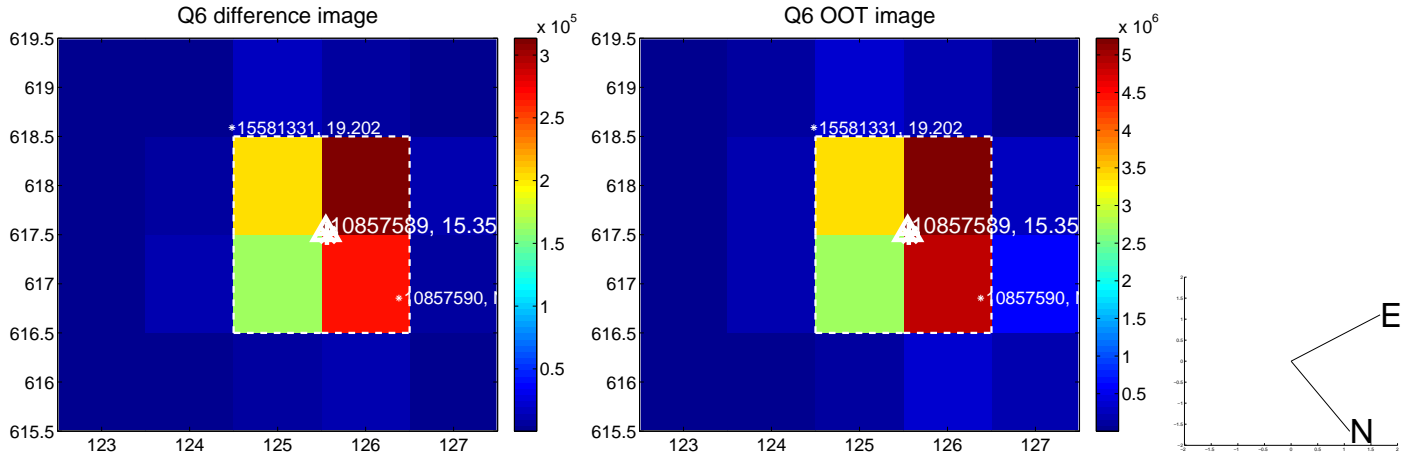
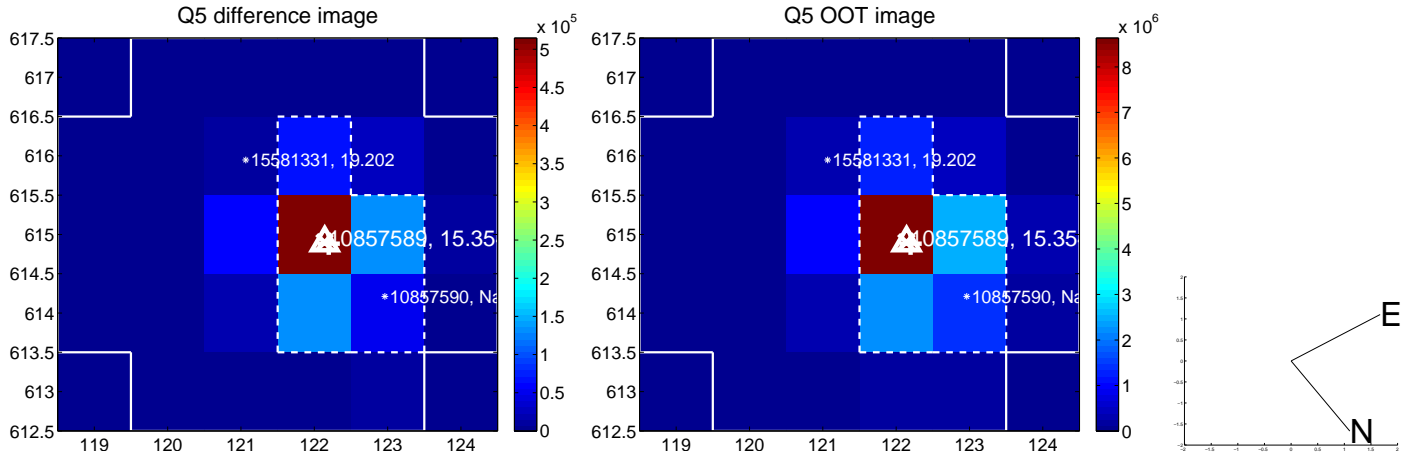


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

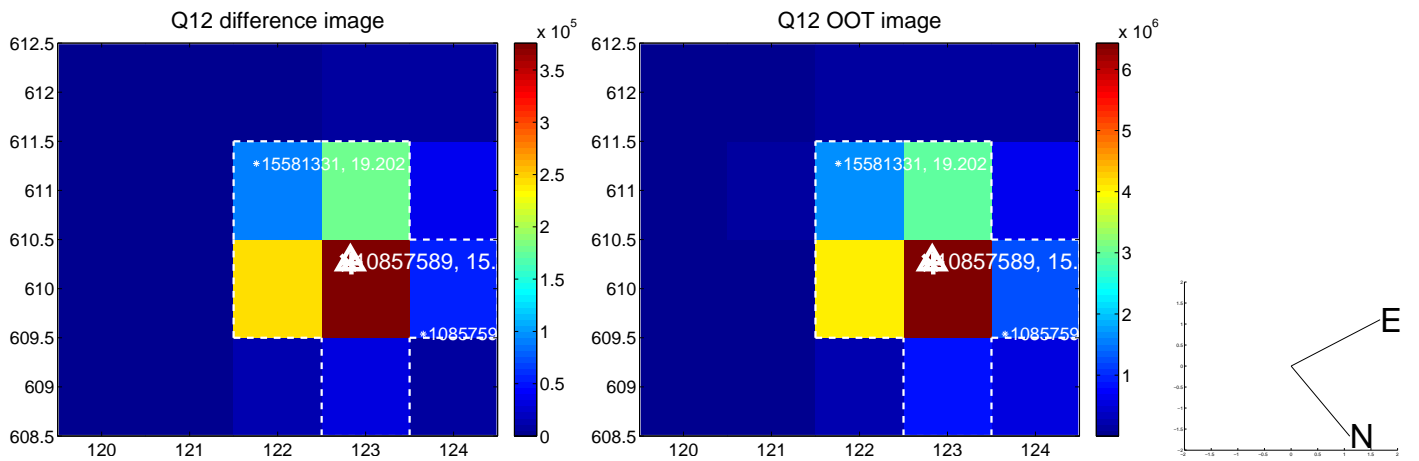
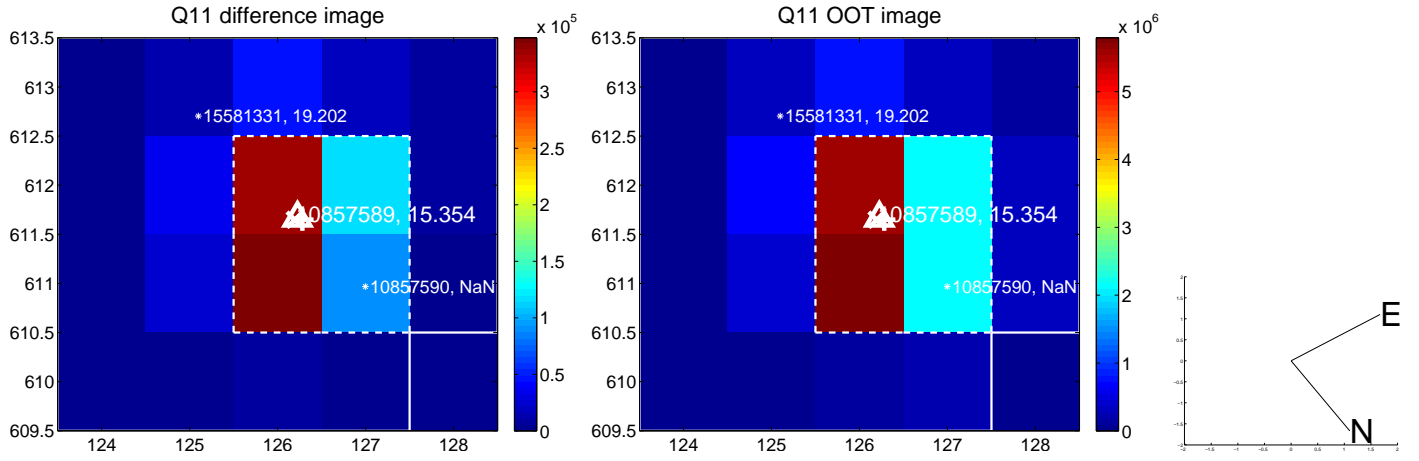
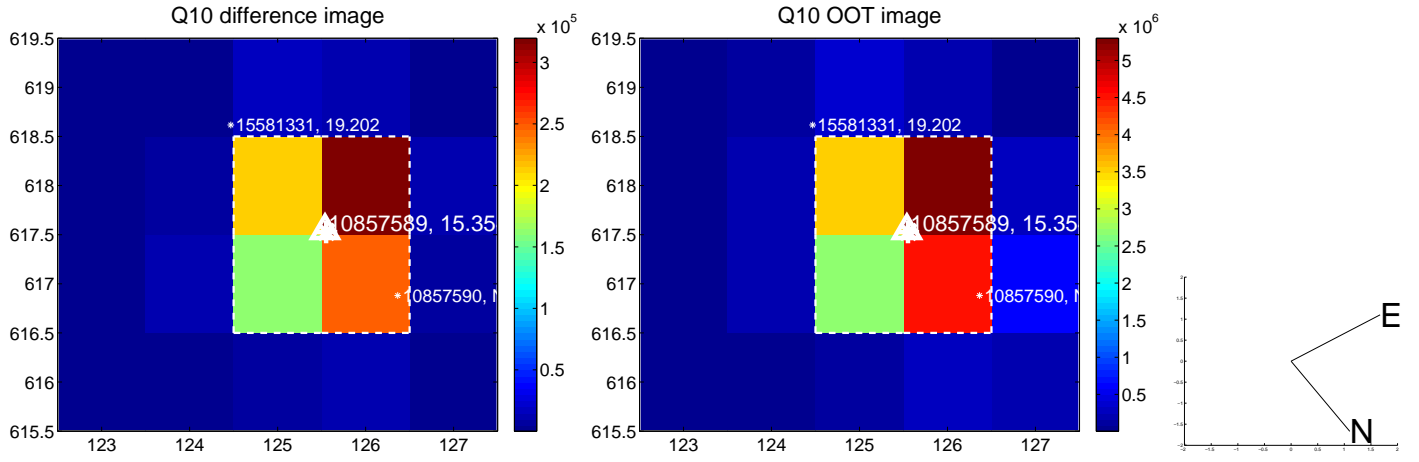
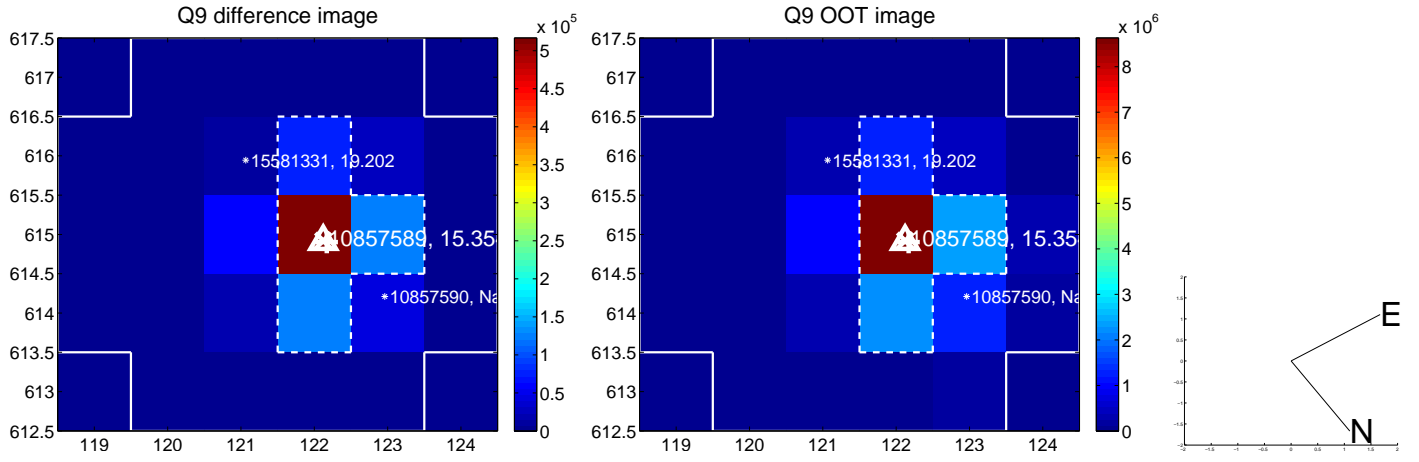
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



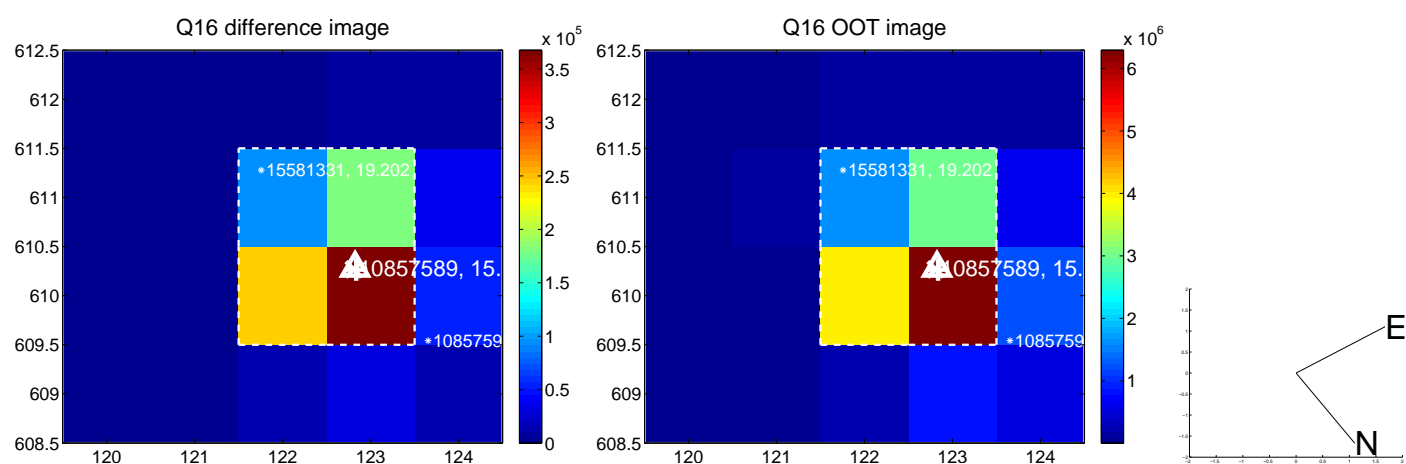
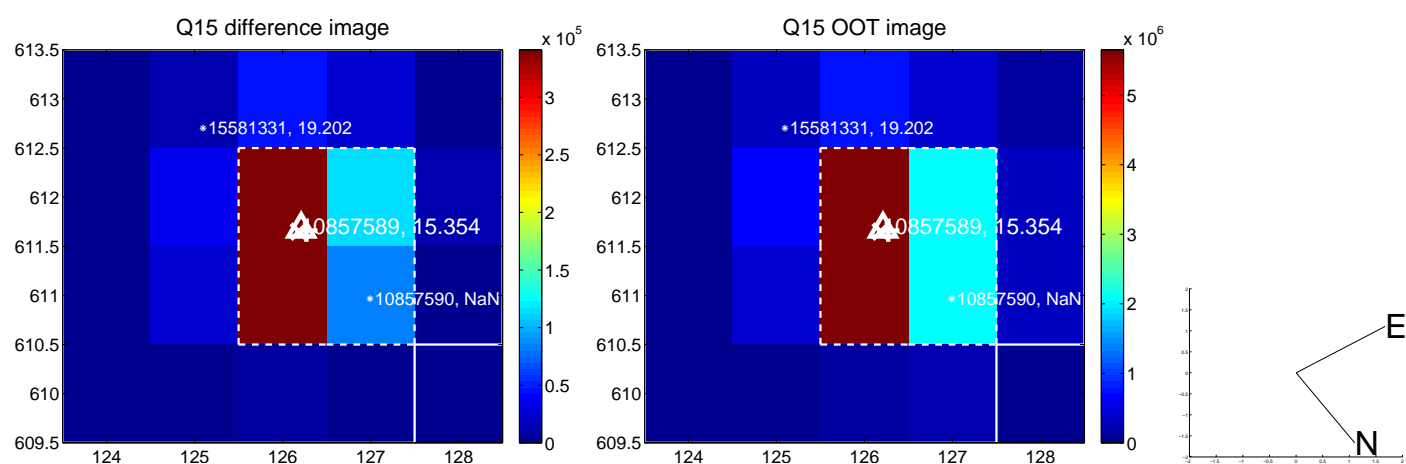
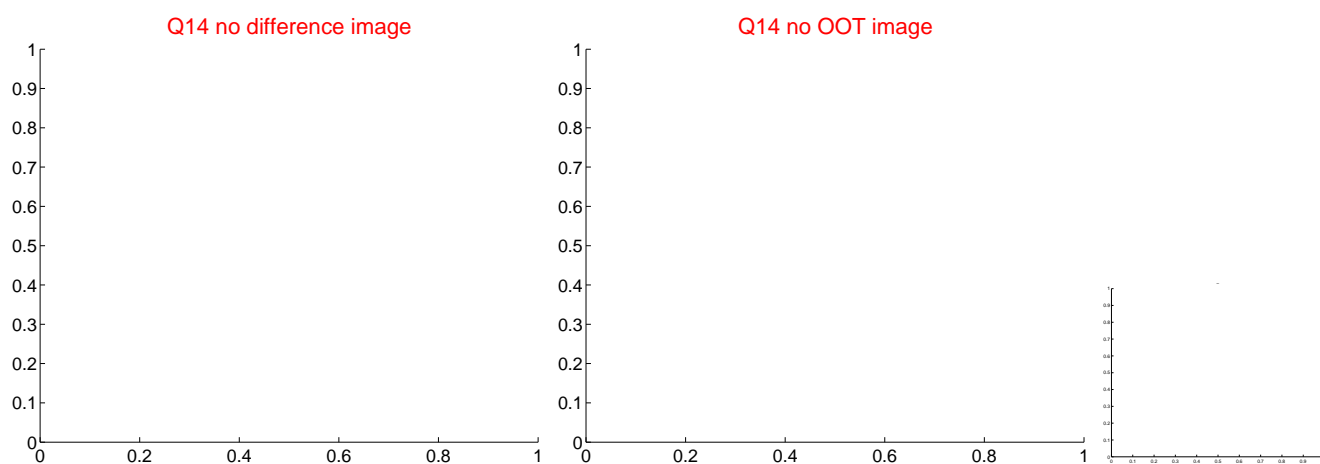
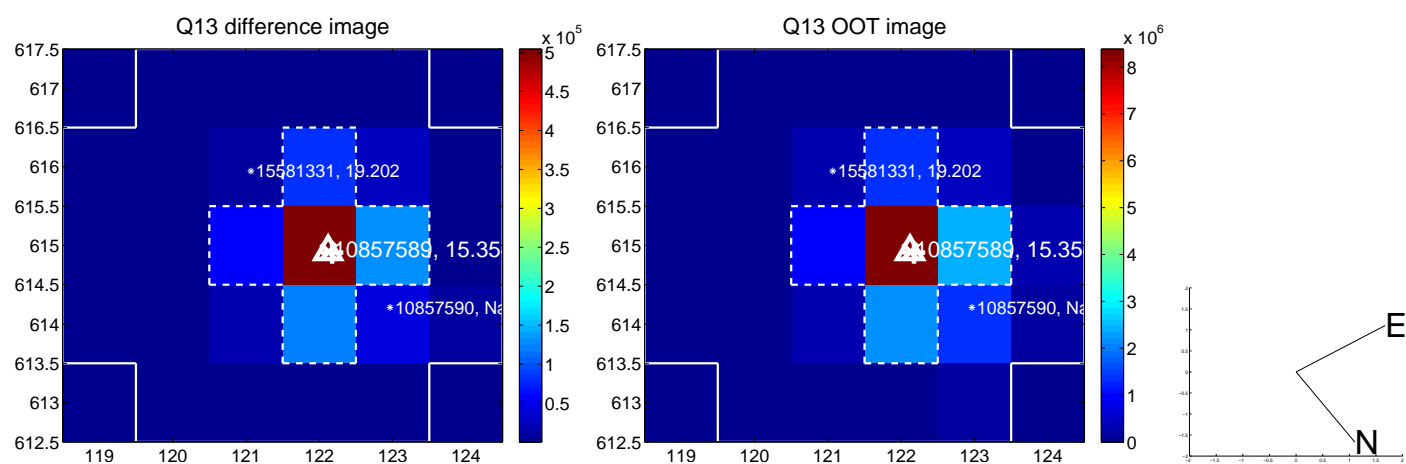
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



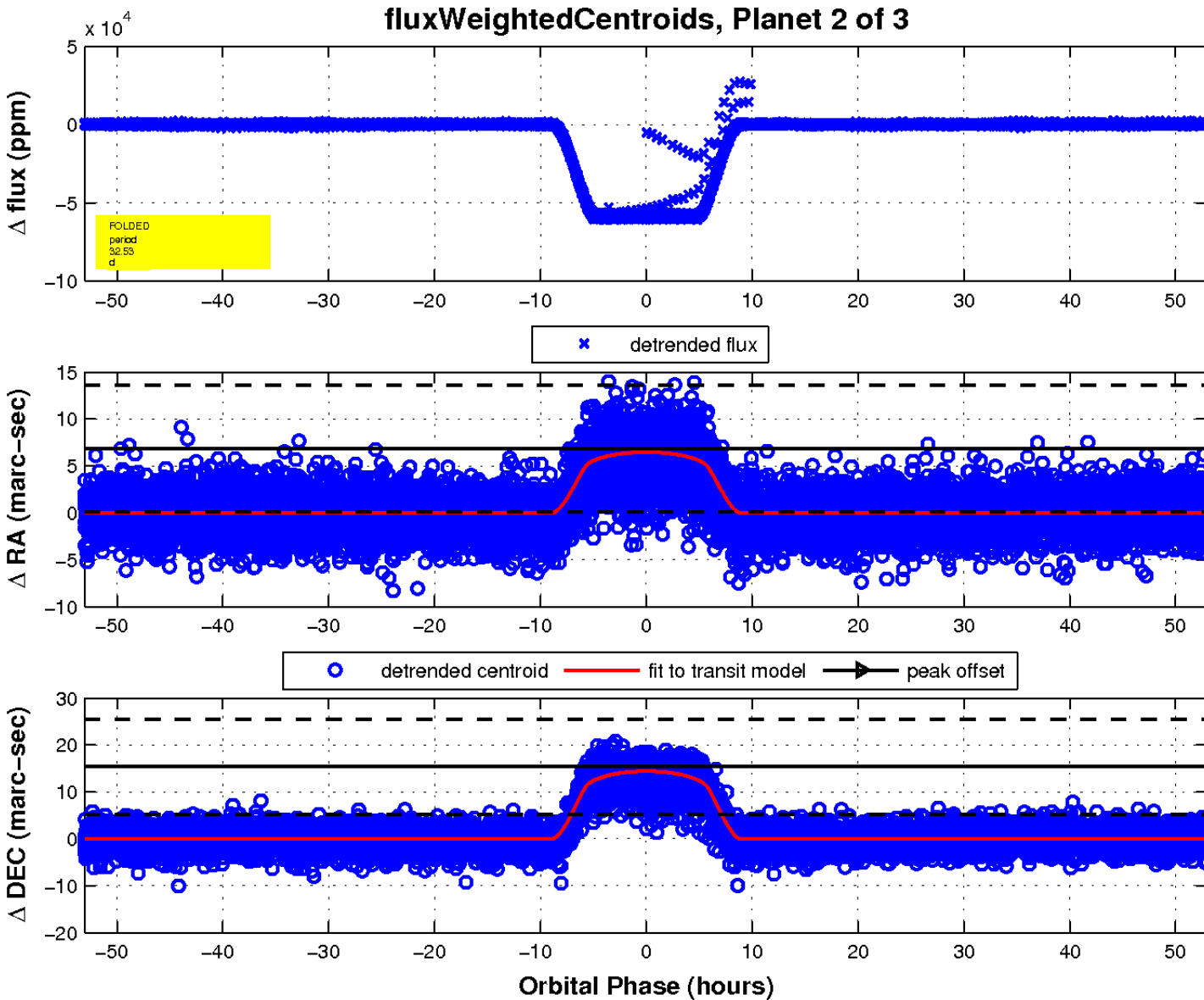
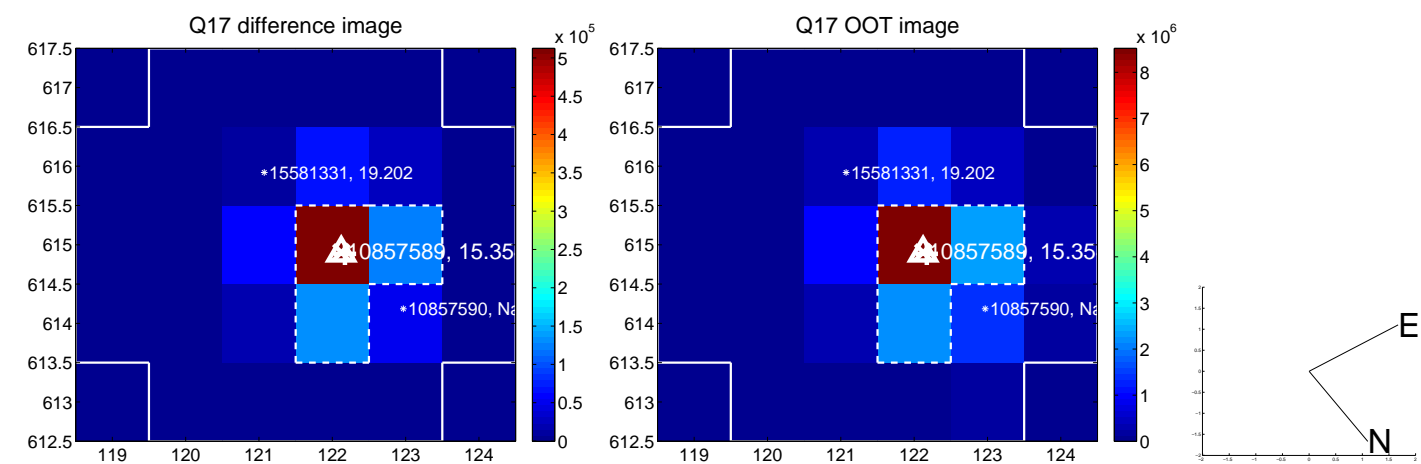
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

