

KIC 002165352

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})
002165352-01	OBS	4934.01	1.581192	132.081299	125.9	1.960	10.7	16.7	0.72	4994	0.99	479.66
002165352-02	OBS	No	1.581195	132.874691	134.8	1.756	17.2	17.6	0.72	4994	1.02	479.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002165352-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
002165352-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST

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 002165352-01

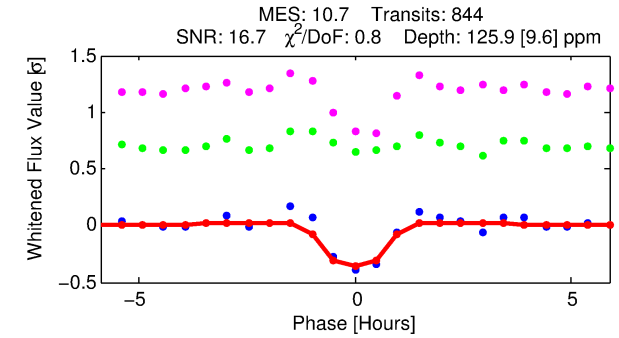
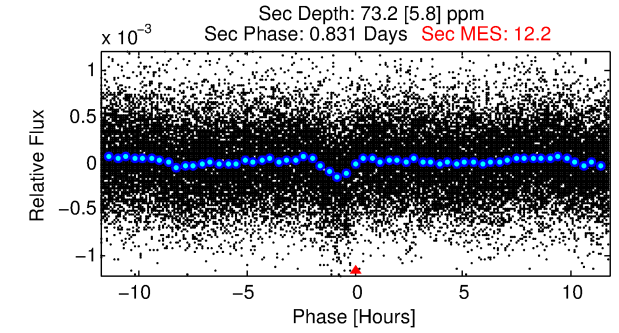
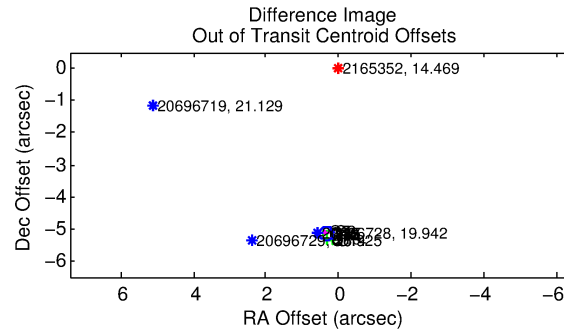
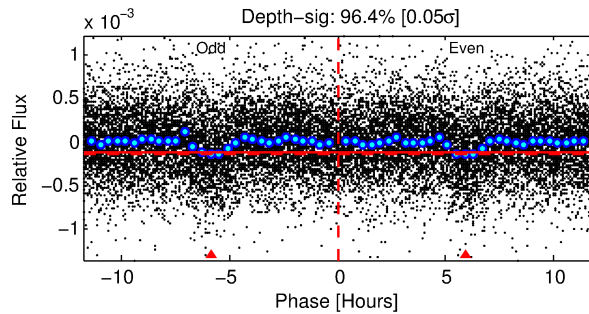
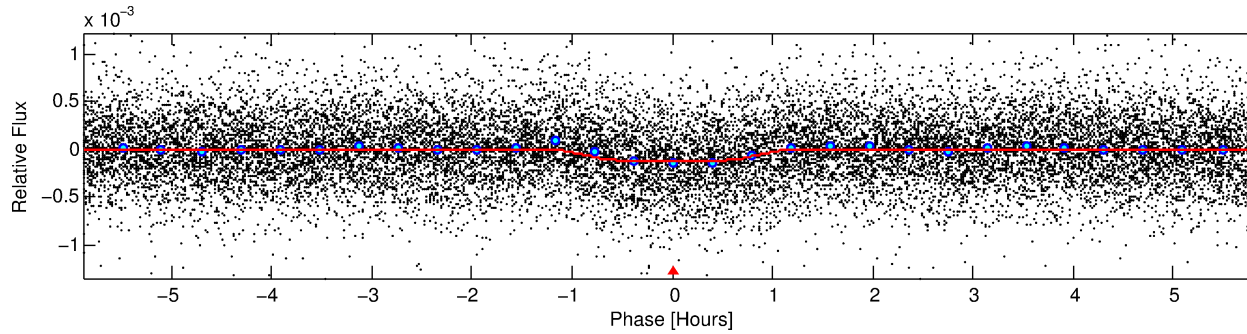
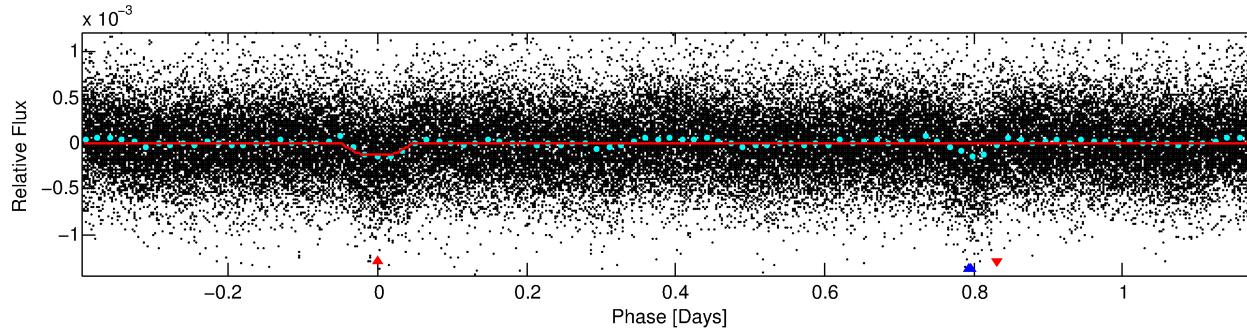
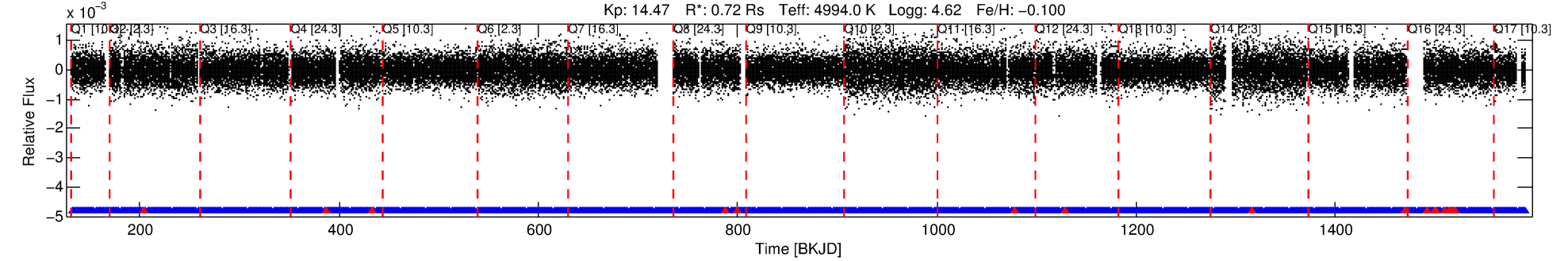
No Significant Match Found

DV One-Page Summary

KIC: 2165352 Candidate: 1 of 2 Period: 1.581 d

KOI: K04934 Corr: No Ephemeris Match

Kp: 14.47 R*: 0.72 Rs Teff: 4994.0 K Logg: 4.62 Fe/H: -0.100



DV Fit Results:

Period = 1.58119 [0.00001] d
Epoch = 132.0813 [0.0017] BKJD
Rp/R* = 0.0126 [0.0068]
a/R* = 2.99 [5.79]
b = 0.90 [0.47]
Seff = 479.66 [53.28]
Teff = 1193 [33] K
Rp = 0.99 [0.54] Re
a = 0.0245 [0.0014] AU
Ag = 24.90 [27.06] [0.88σ]
Teffp = 4121 [1118] K [2.62σ]

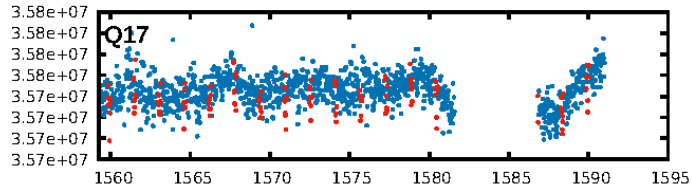
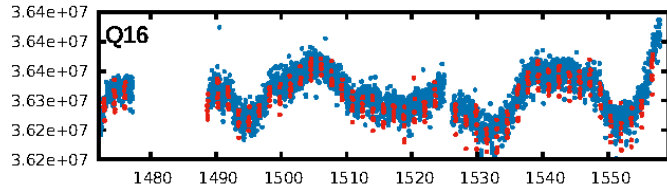
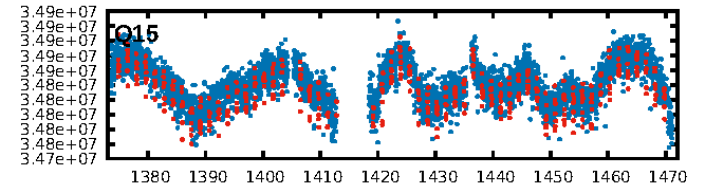
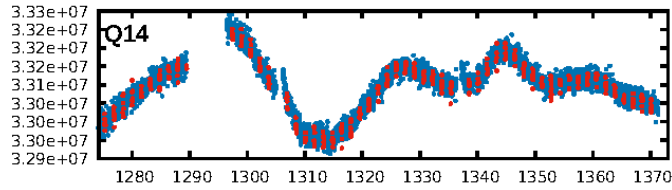
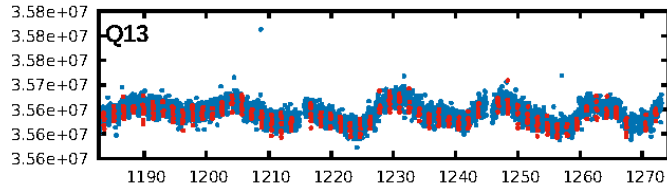
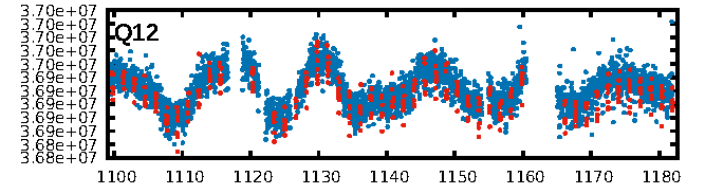
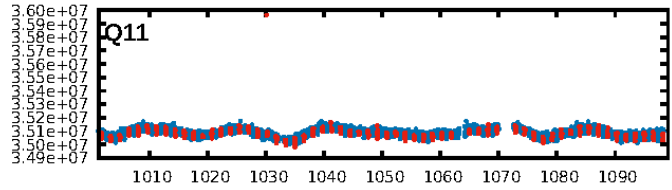
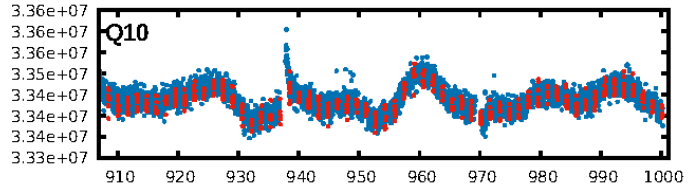
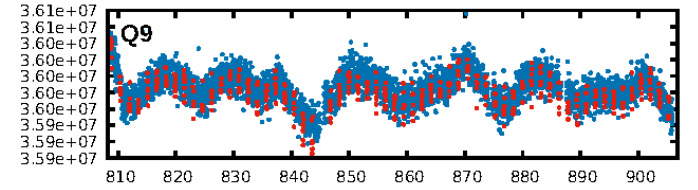
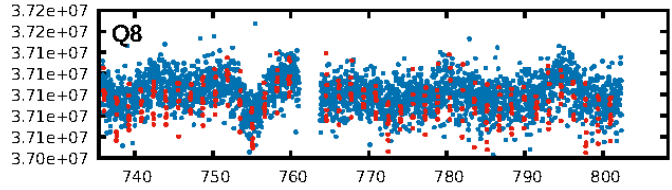
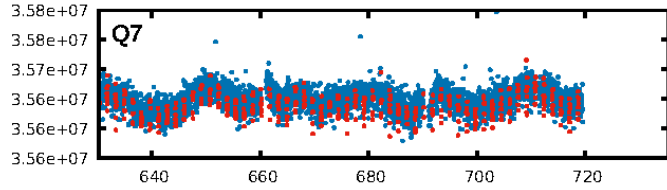
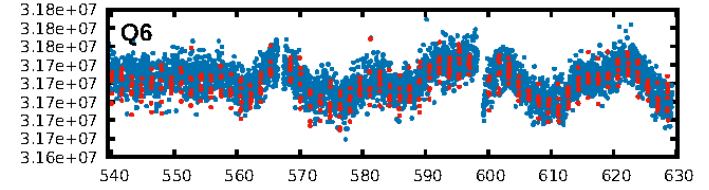
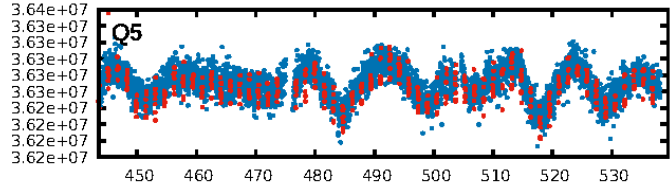
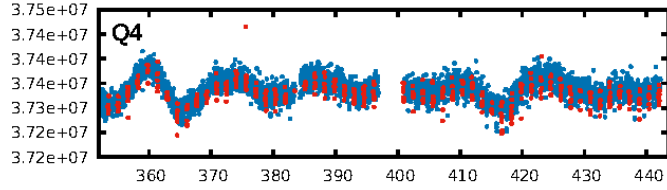
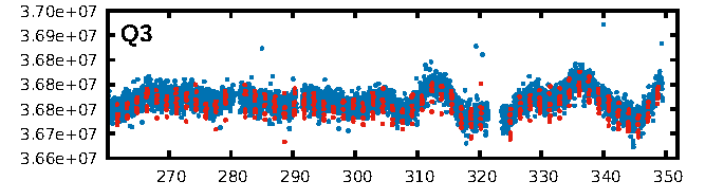
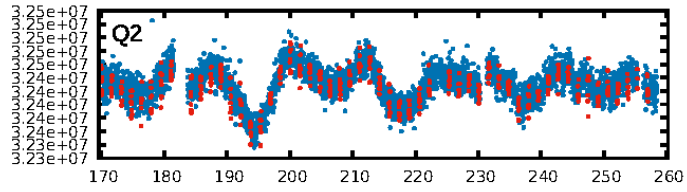
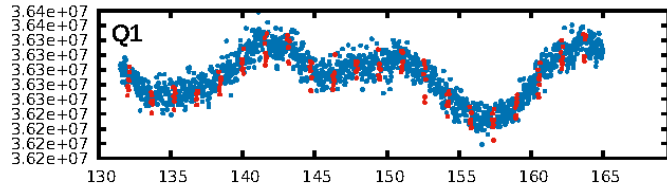
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.03e-27
RollingBand-fgt: 0.98 [791/807]
GhostDiagnostic-chr: -0.06518
Centroid-sig: 0.0%
Centroid-so: 39.496 arcsec [47.85σ]
OotOffset-rm: 5.150 arcsec [73.55σ]
KicOffset-rm: 5.281 arcsec [75.52σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

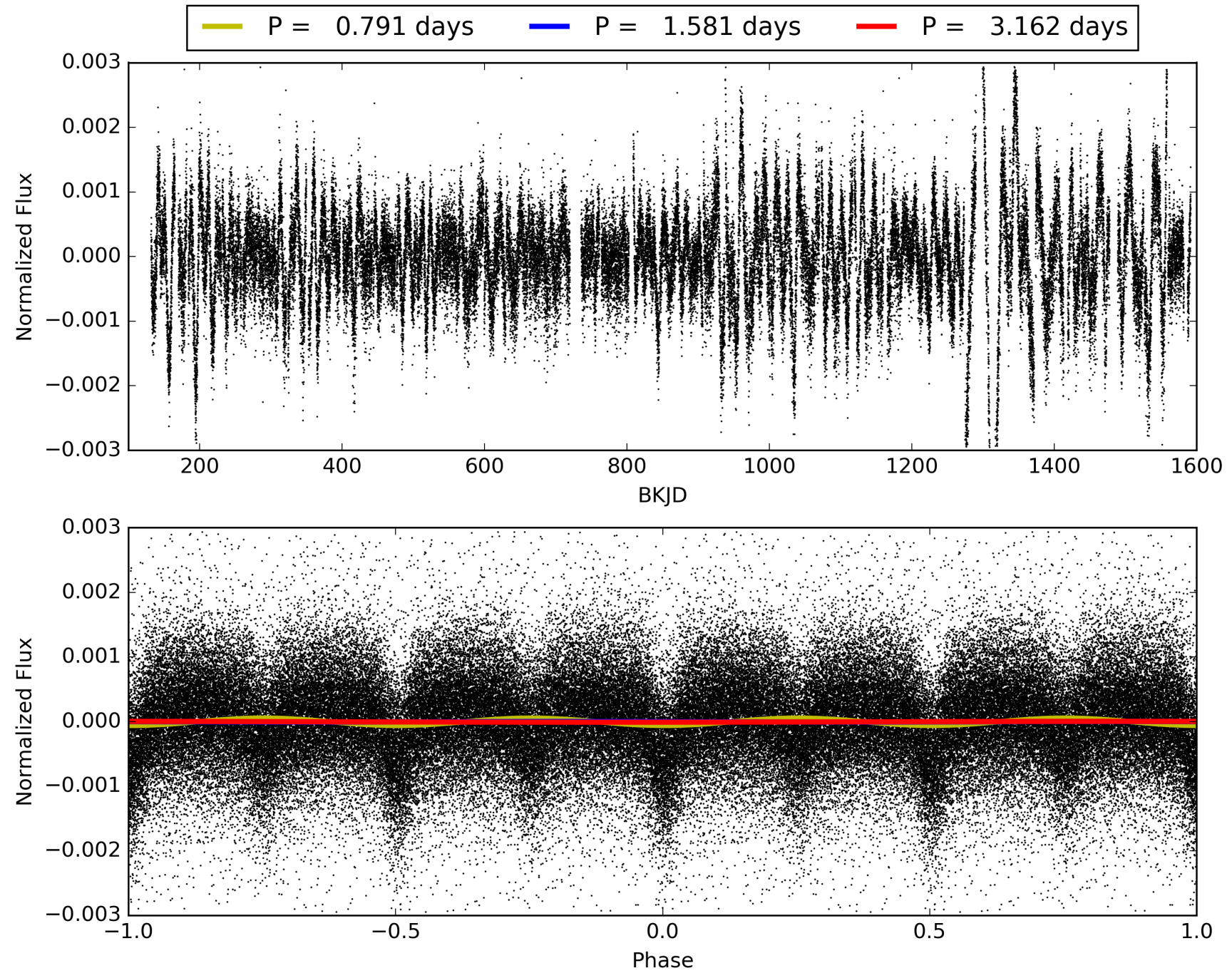
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002165352-01, PDC Light Curves

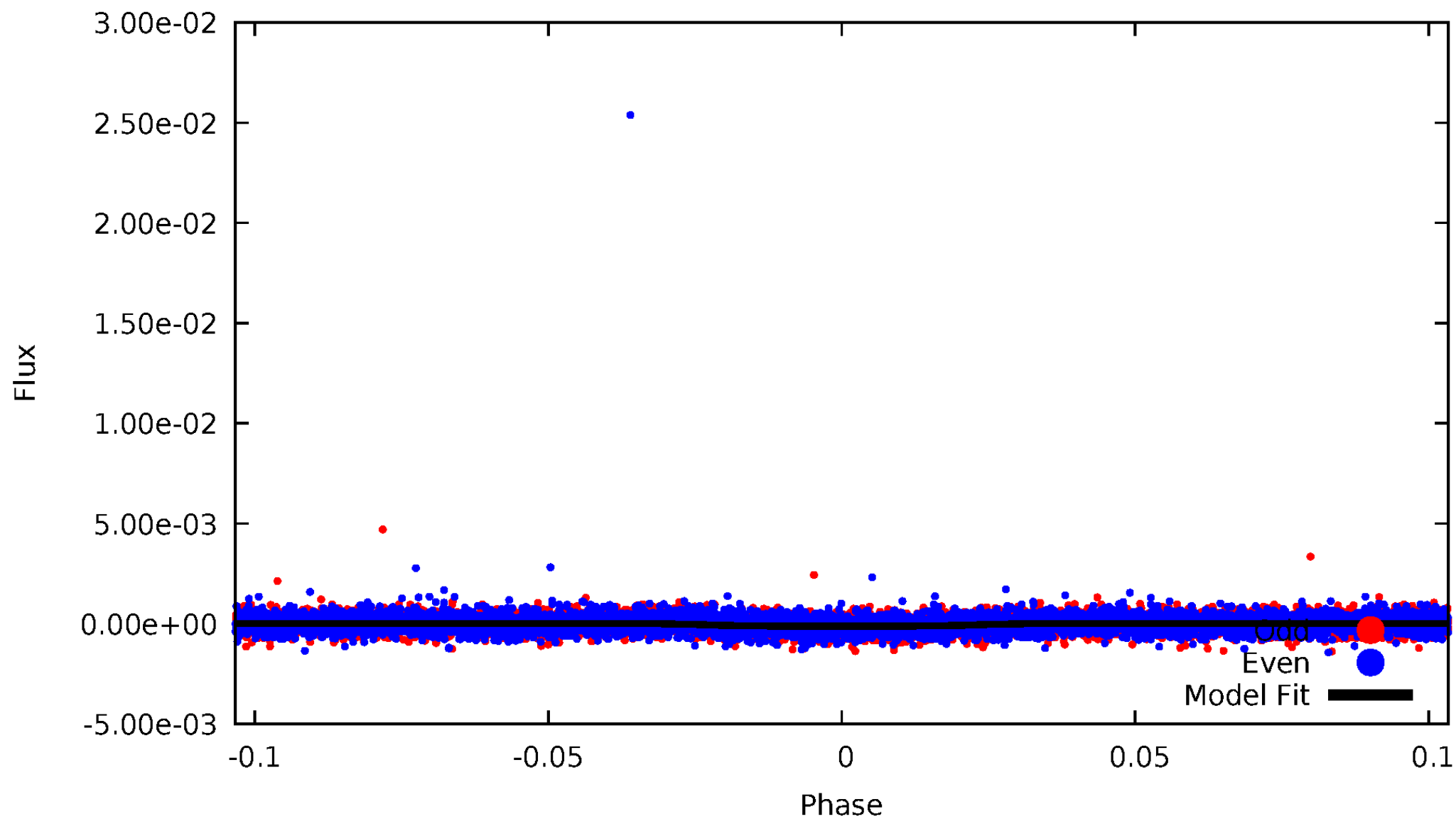


TCE 002165352-01



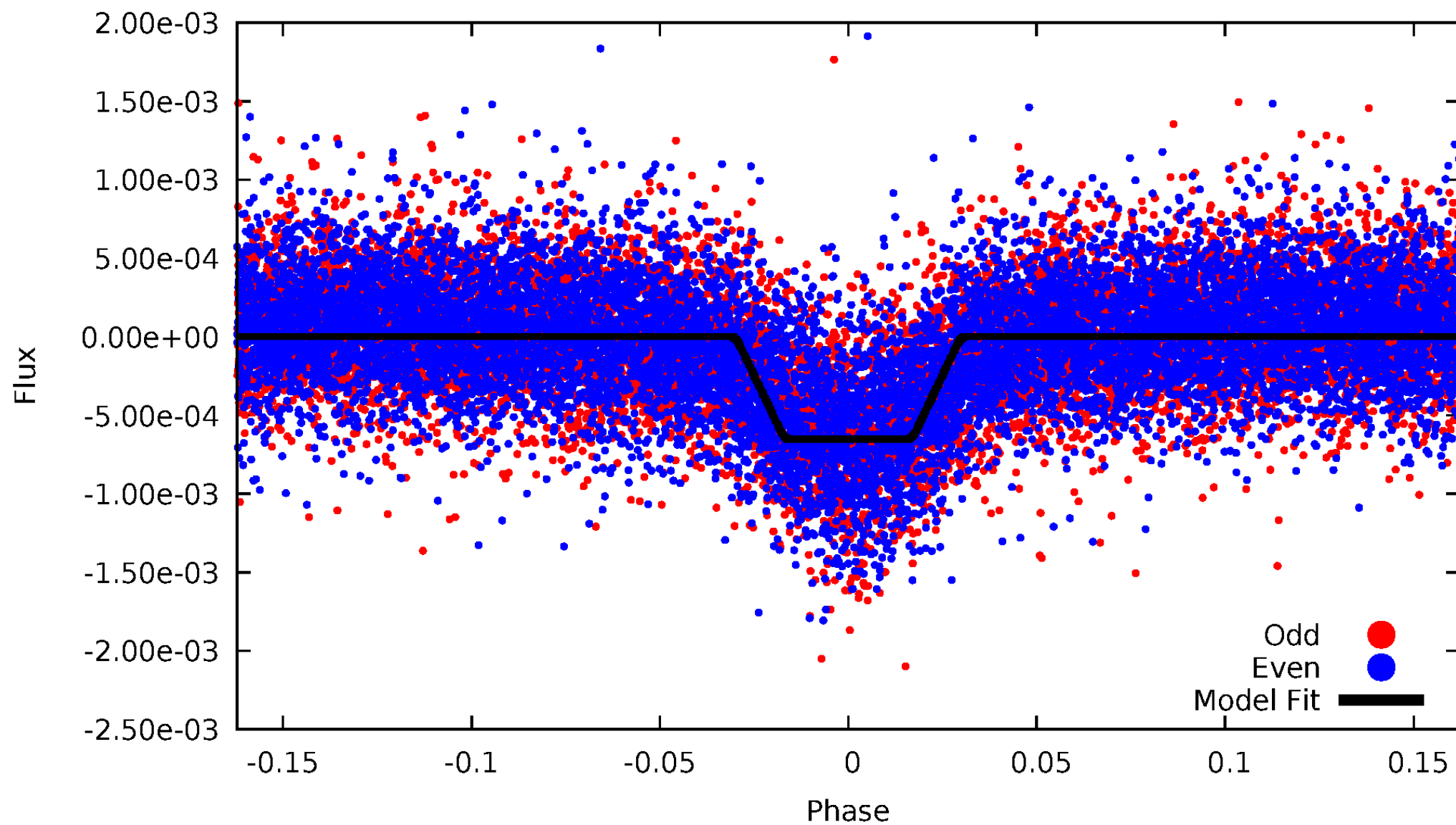
DV Odd/Even

TCE 002165352-01



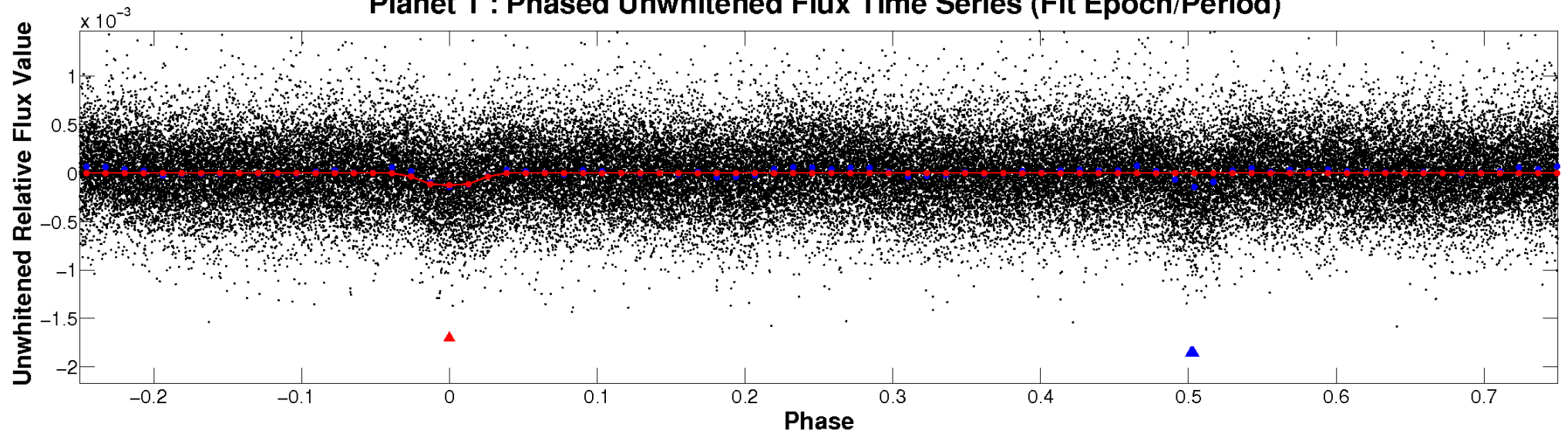
ALT Odd/Even

TCE 002165352-01

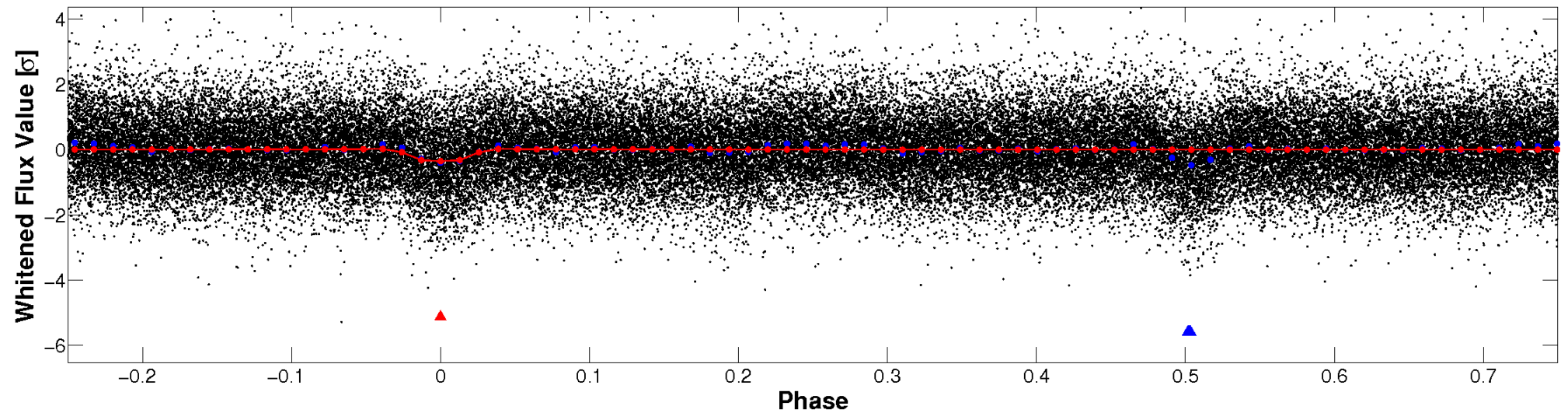


Non-Whitened Vs. Whitened Light Curve

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

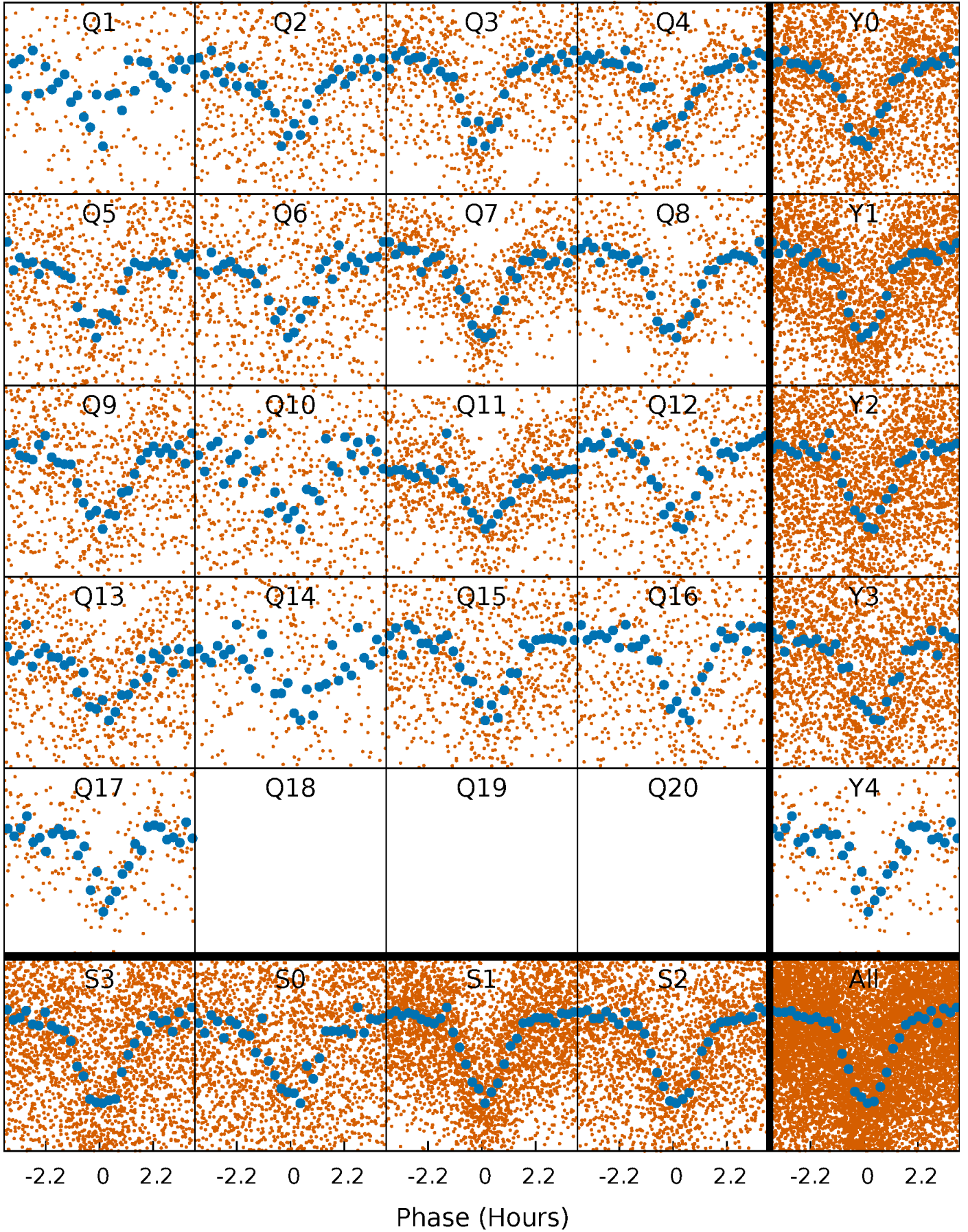


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



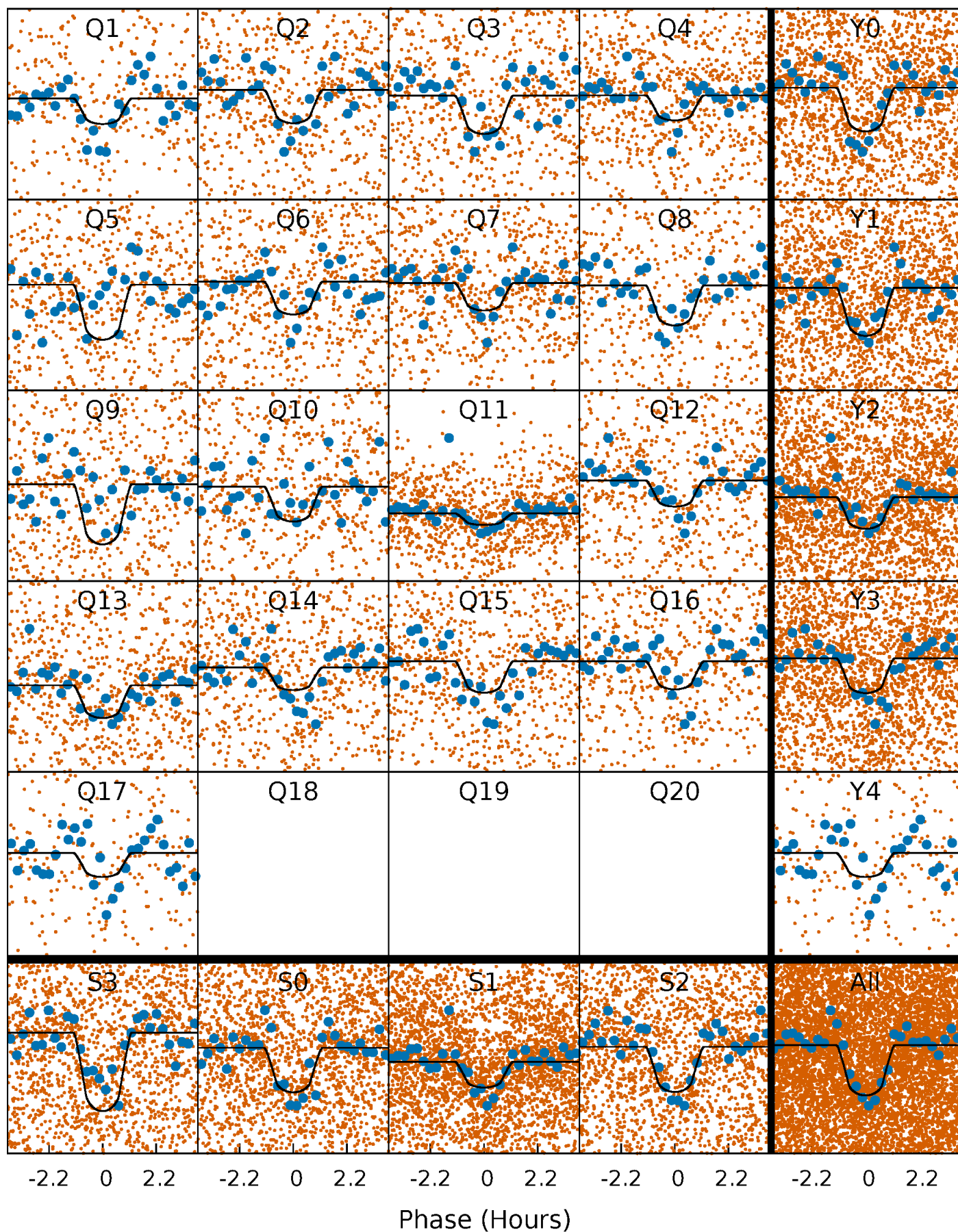
PDC Quarter-Phased Transit Curves

TCE 002165352-01 P= 1.581192 Days $T_0=132.081299$ (BKJD)



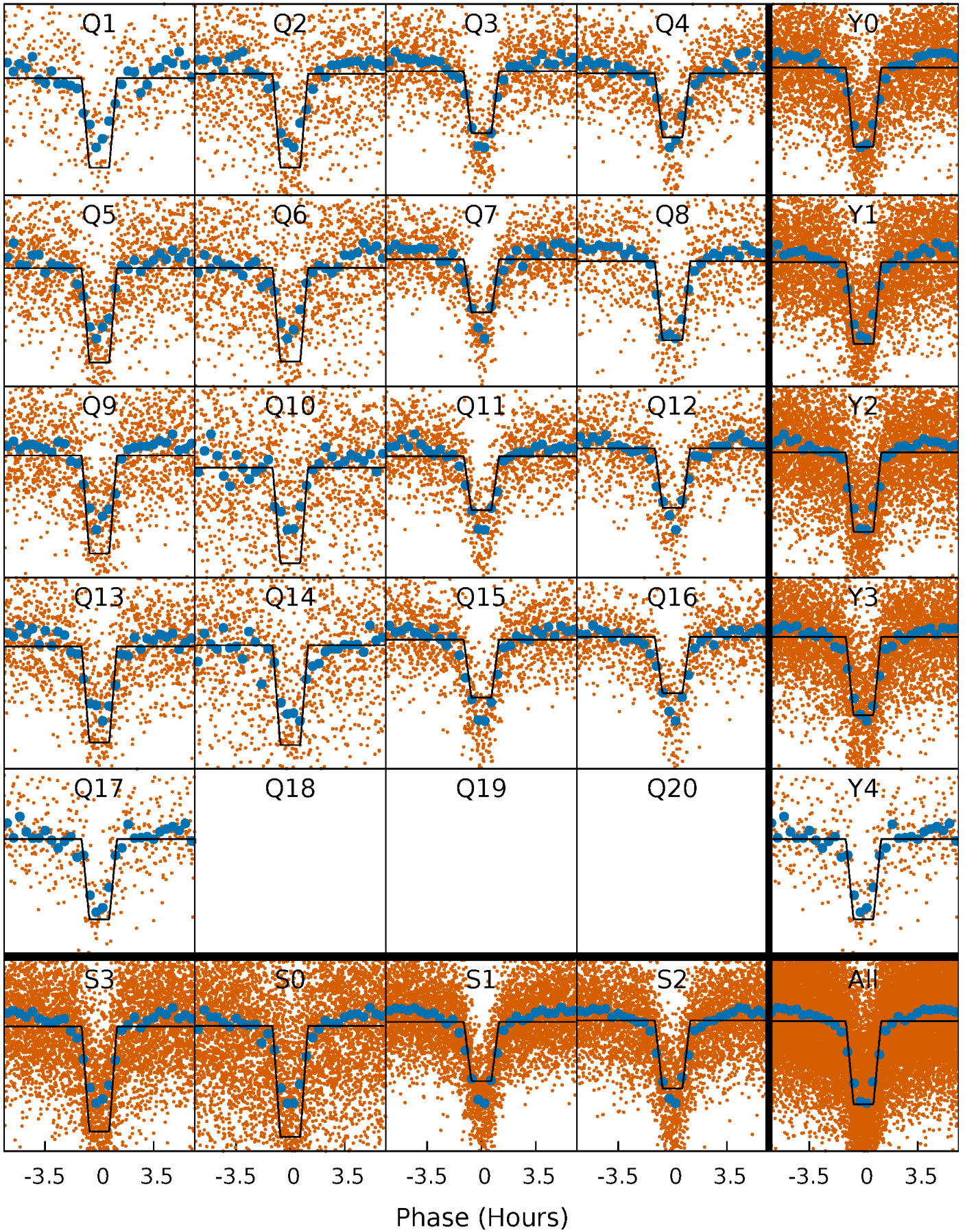
DV Quarter-Phased Transit Curves

TCE 002165352-01 P= 1.581192 Days $T_0=132.081299$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

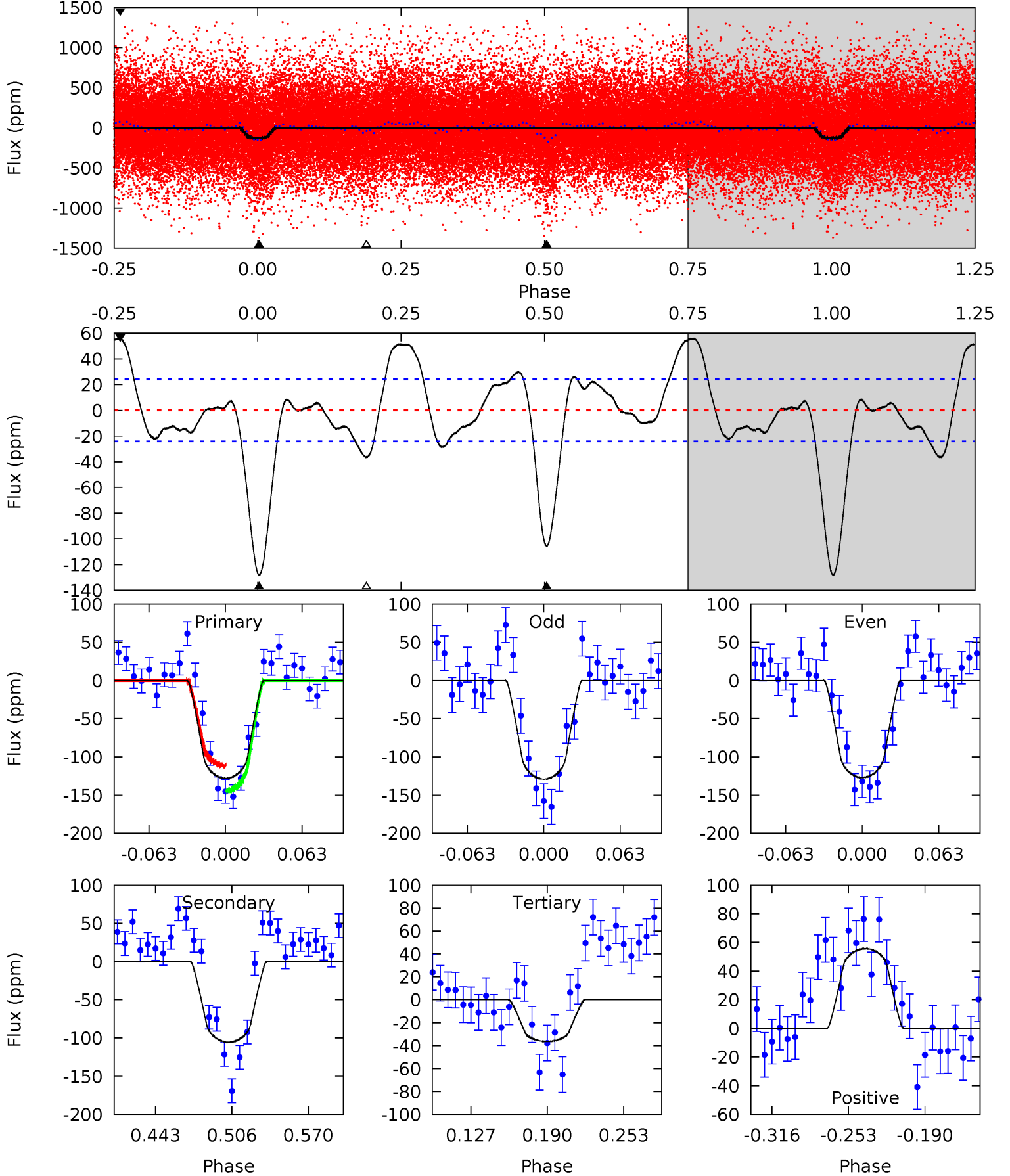
TCE 002165352-01 P= 1.581212 Days $T_0=132.077410$ (BKJD)



DV Model-Shift Uniqueness Test

002165352-01, P = 1.581192 Days, E = 130.500107 Days

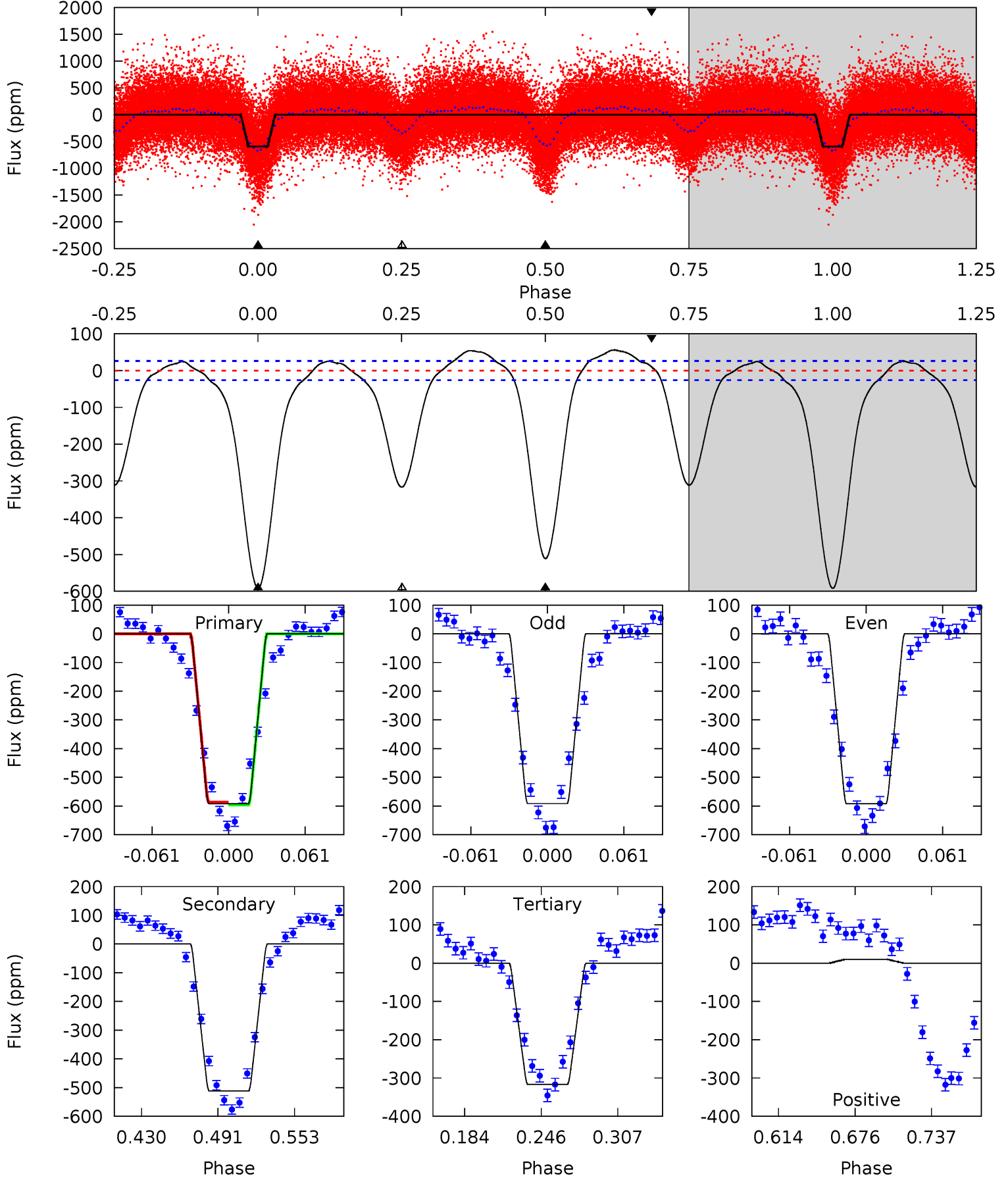
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.7	20.4	7.02	10.7	4.66	1.86	4.53	17.7	14.0	13.3	9.61	0.19	1.03	0.30	3.17



Alt Model-Shift Uniqueness Test

002165352-01, P = 1.581212 Days, E = 130.496198 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
105.9	91.5	56.7	1.80	4.67	1.87	18.4	49.2	104.1	34.8	89.7	0.09	1.00	0.09	0.85



Stellar Parameters For KIC 002165352

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4994^{+75}_{-82}	$4.620^{+0.015}_{-0.051}$	$-0.100^{+0.150}_{-0.150}$	$0.720^{+0.047}_{-0.029}$	$0.803^{+0.029}_{-0.062}$	$3.035^{+0.217}_{-0.534}$
	+2%/-2%	+0%/-1%	+150%/-150%	+7%/-4%	+4%/-8%	+7%/-18%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002165352-01 / KOI 4934.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-106 ± 5	$1.00^{+0.56}_{-0.53}$	1680^{+38}_{-33}	4593^{+1915}_{-691}	35^{+130}_{-20}
Alt.	-511 ± 6	$1.99^{+0.55}_{-0.53}$	1680^{+34}_{-37}	4785^{+703}_{-423}	43^{+36}_{-16}

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 $A_{obs} \gg 1.0$

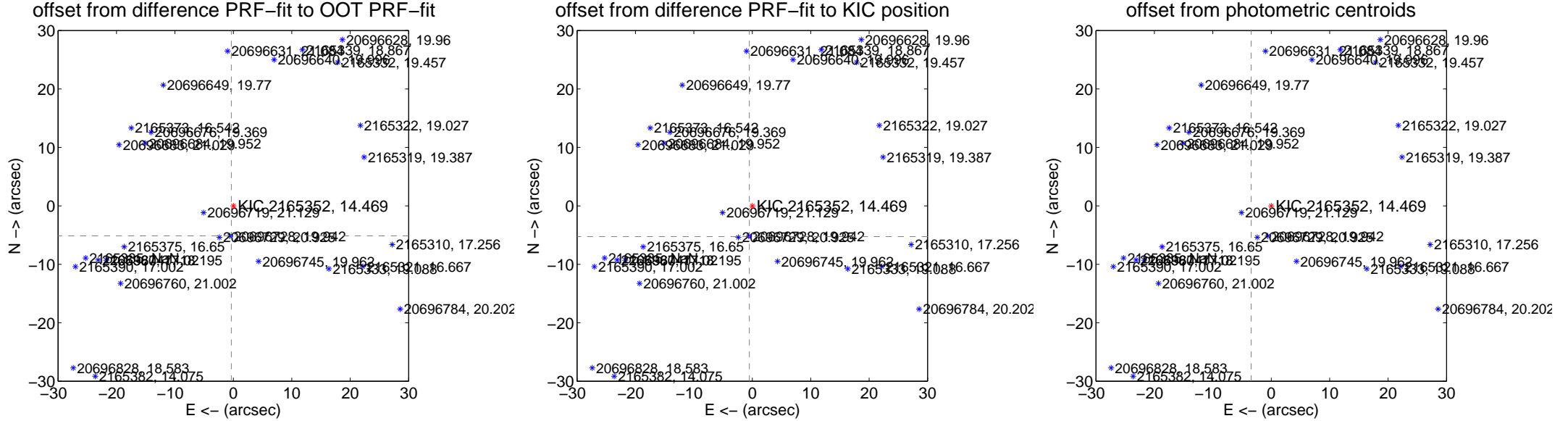
DV Centroid Data

Supplemental centroid analysis for 002165352-01. Kepler magnitude: 14.47. Transit SNR 16.67

There are 17 quarters with good PRF difference image offsets

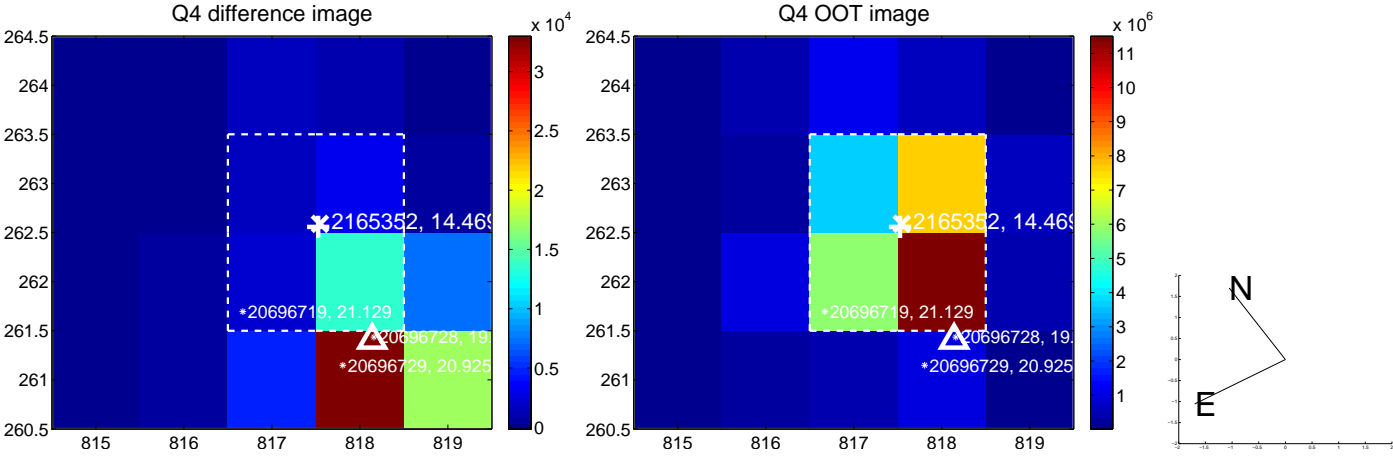
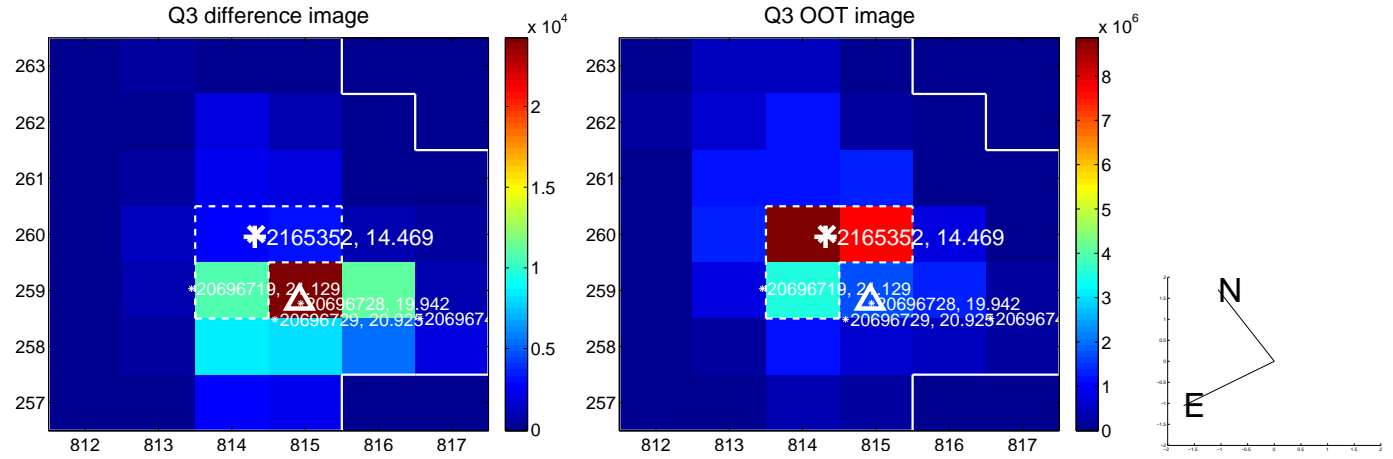
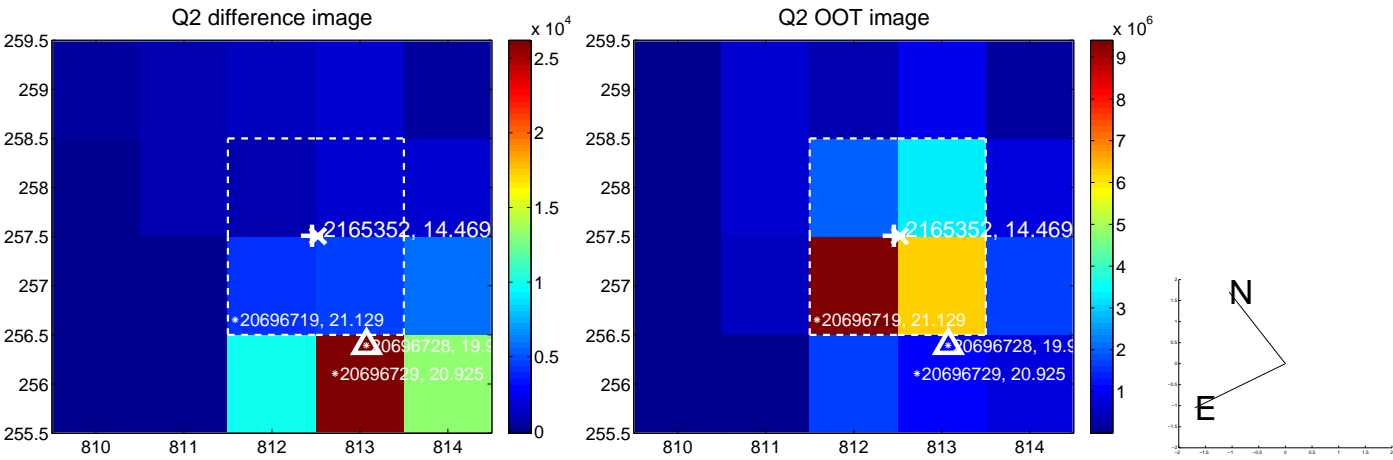
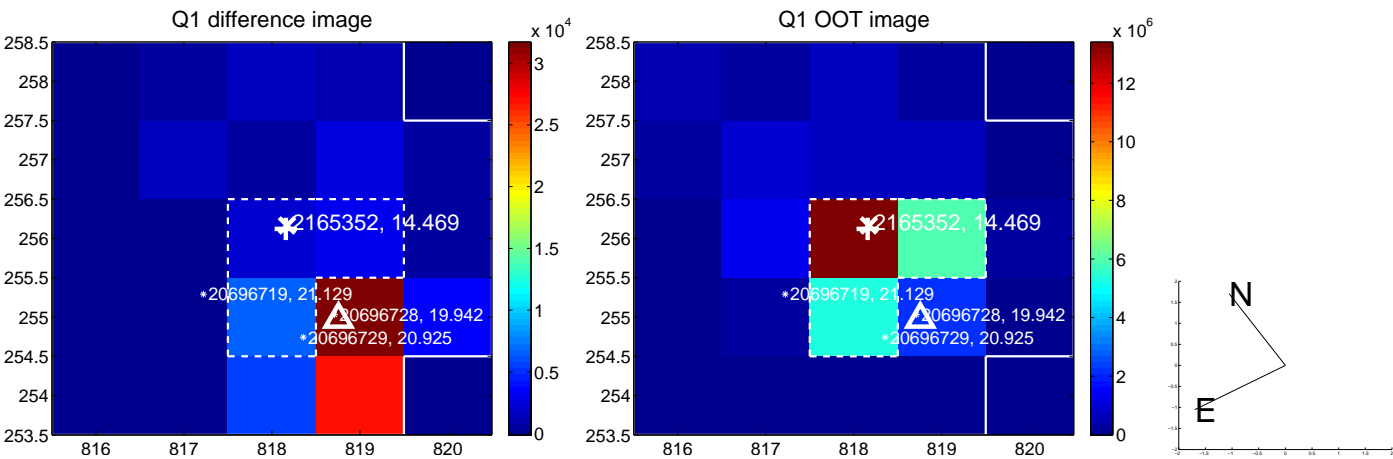
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.150 \pm 0.070	73.55	0.350 \pm 0.068	-5.138 \pm 0.070
PRF-fit source offset from KIC position	5.281 \pm 0.070	75.52	0.503 \pm 0.068	-5.257 \pm 0.070
photometric centroid source offset	39.50 \pm 0.83	47.85	3.45 \pm 0.72	-39.35 \pm 0.83

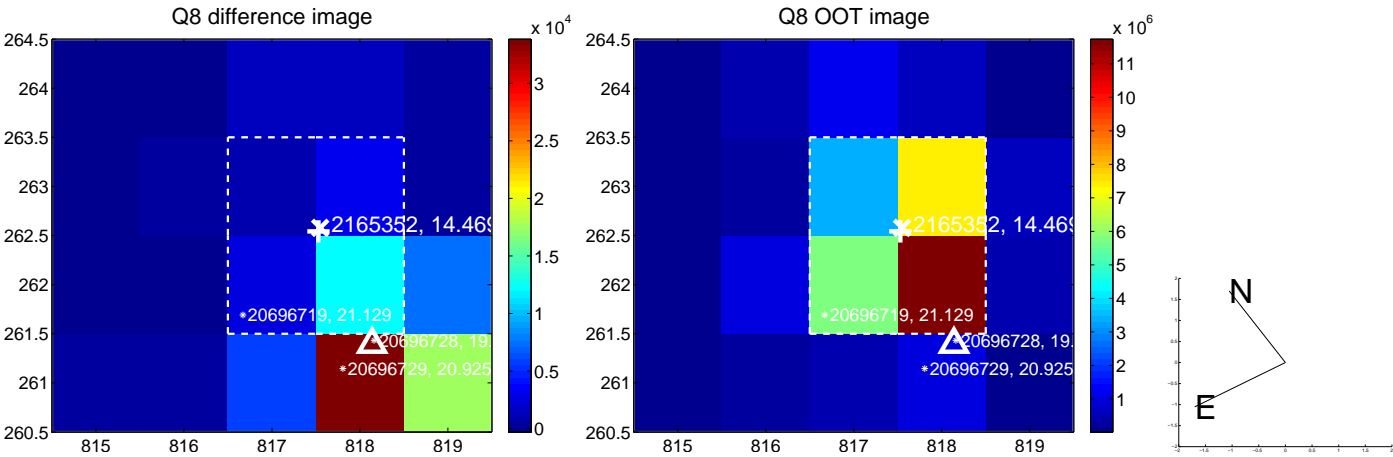
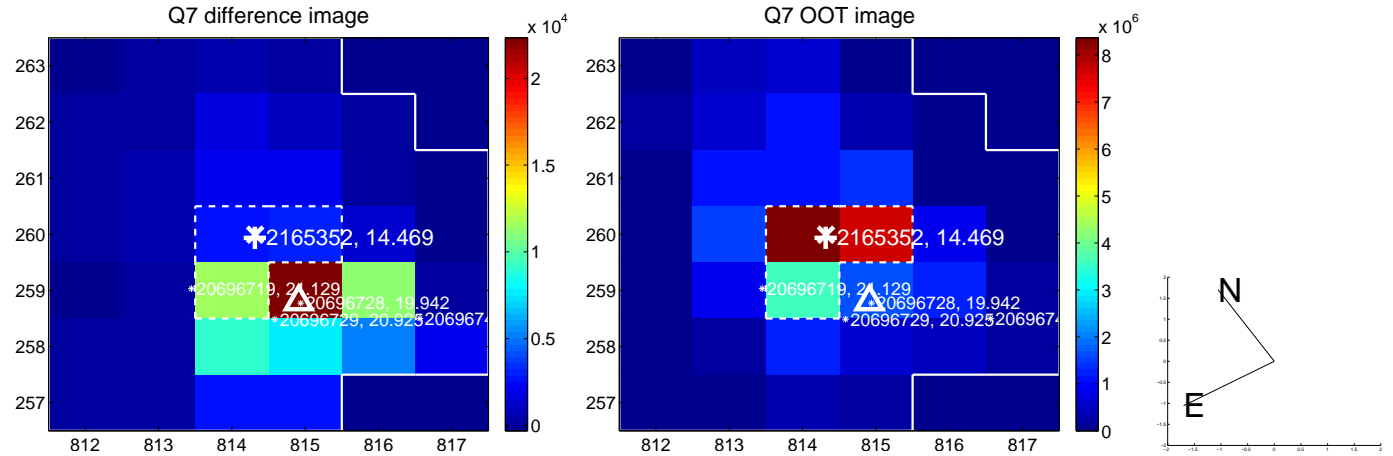
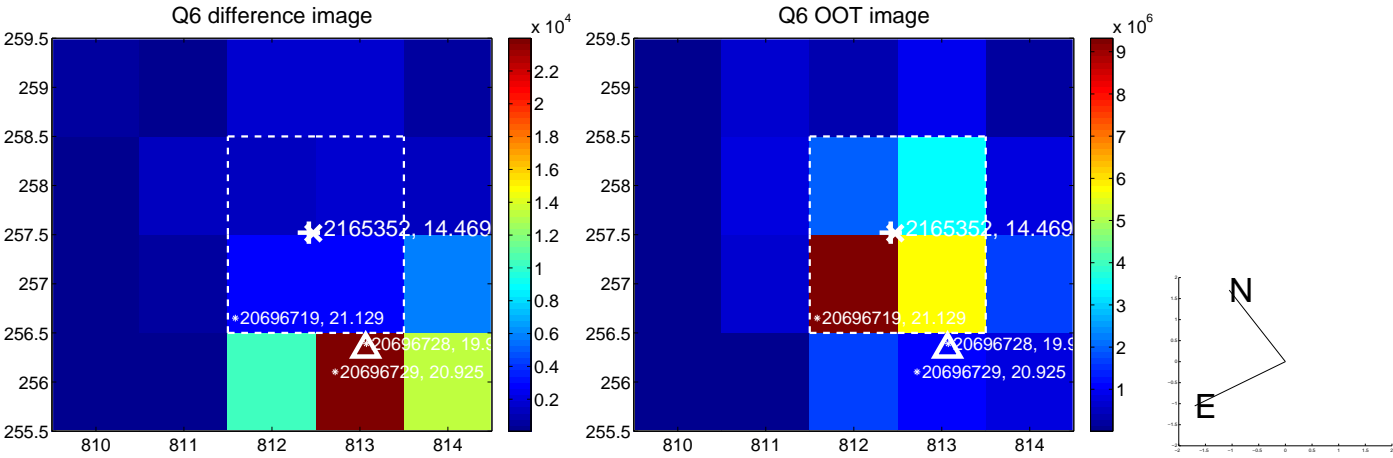
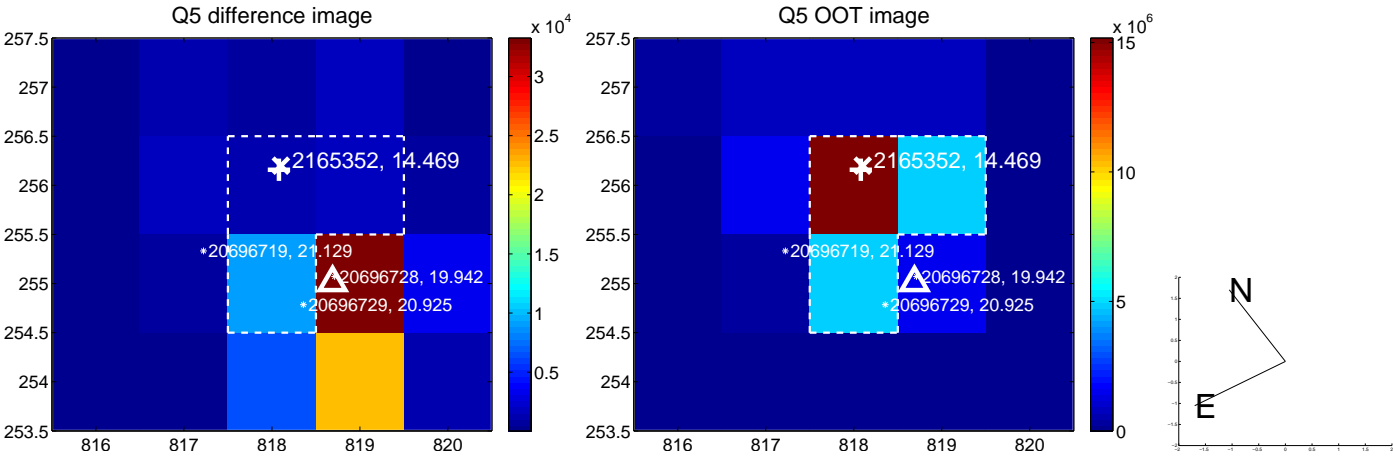


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

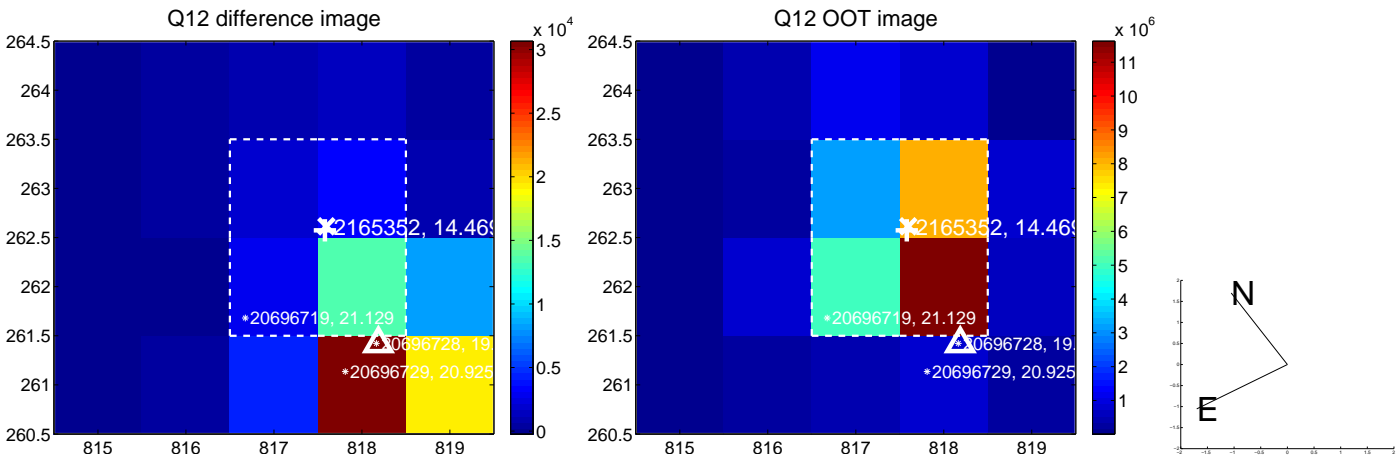
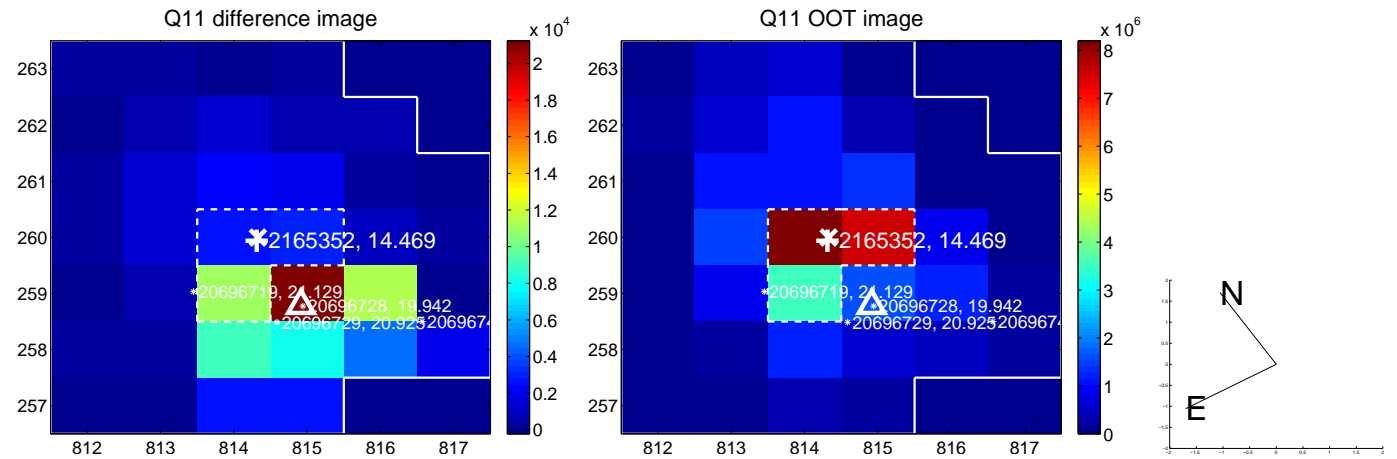
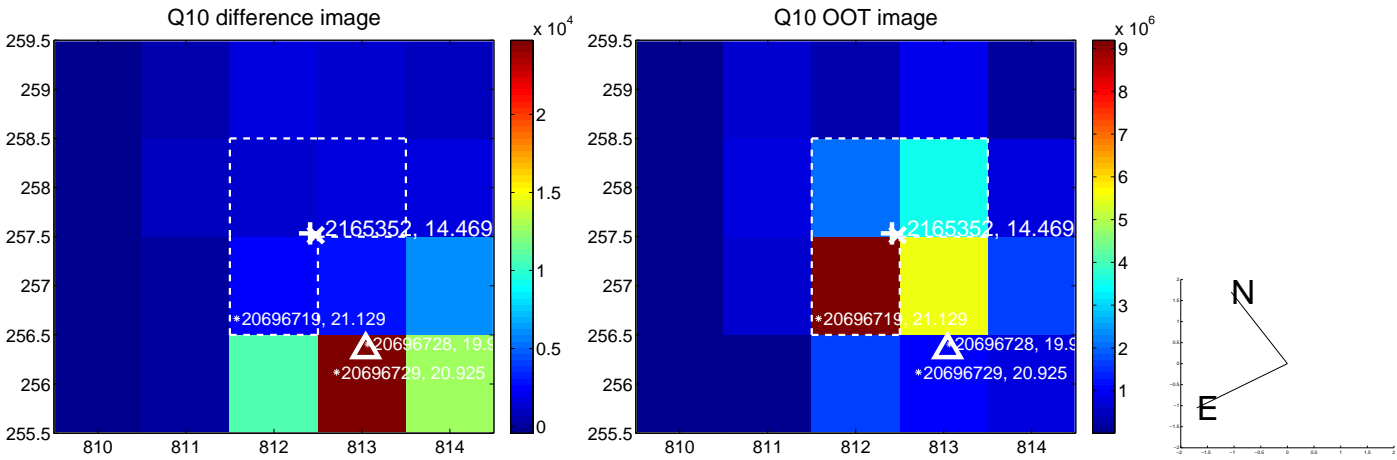
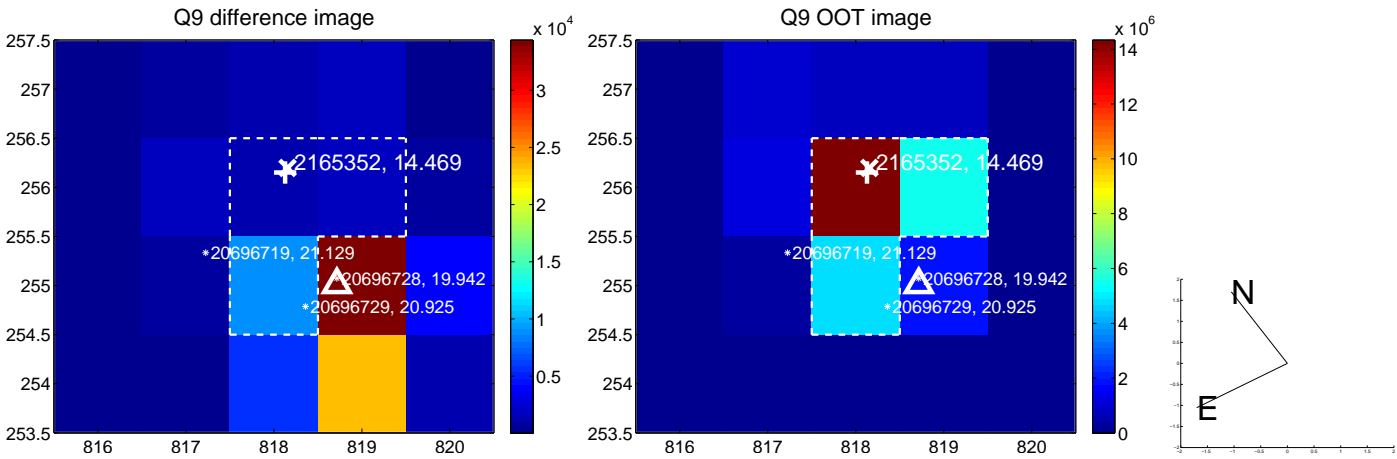
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



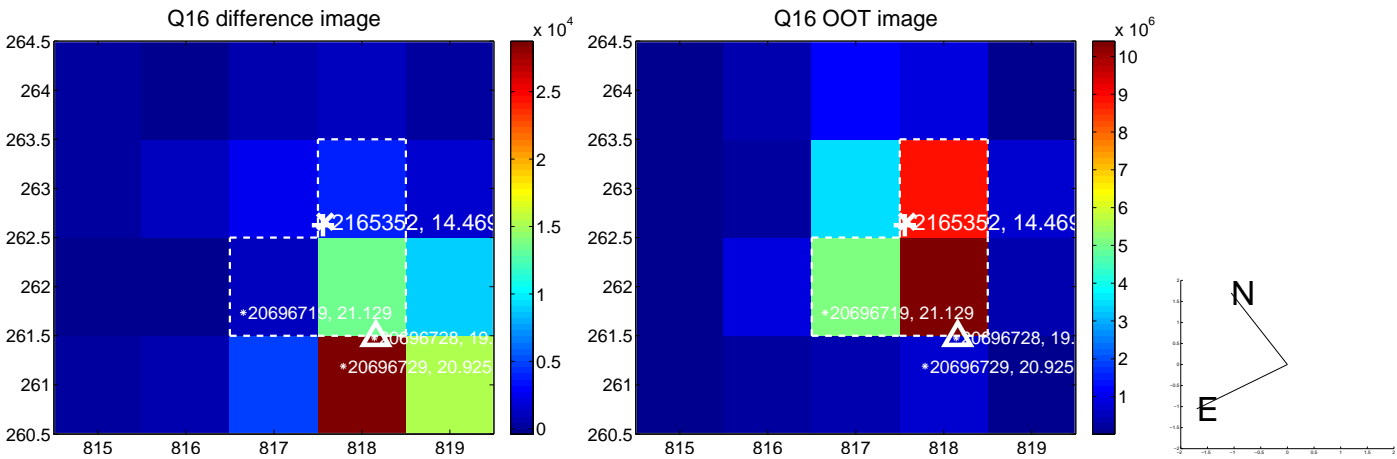
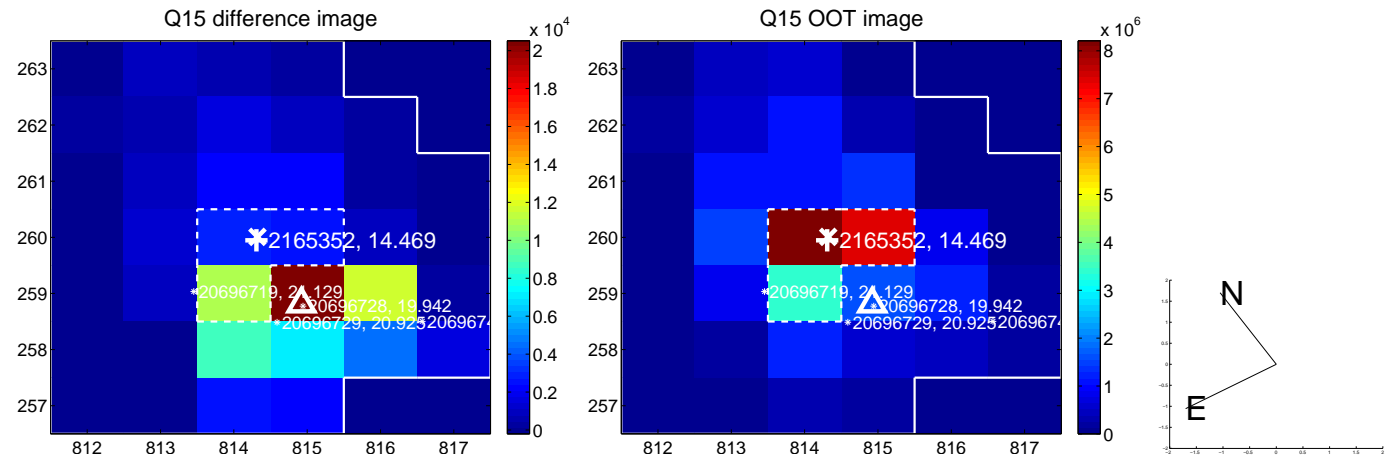
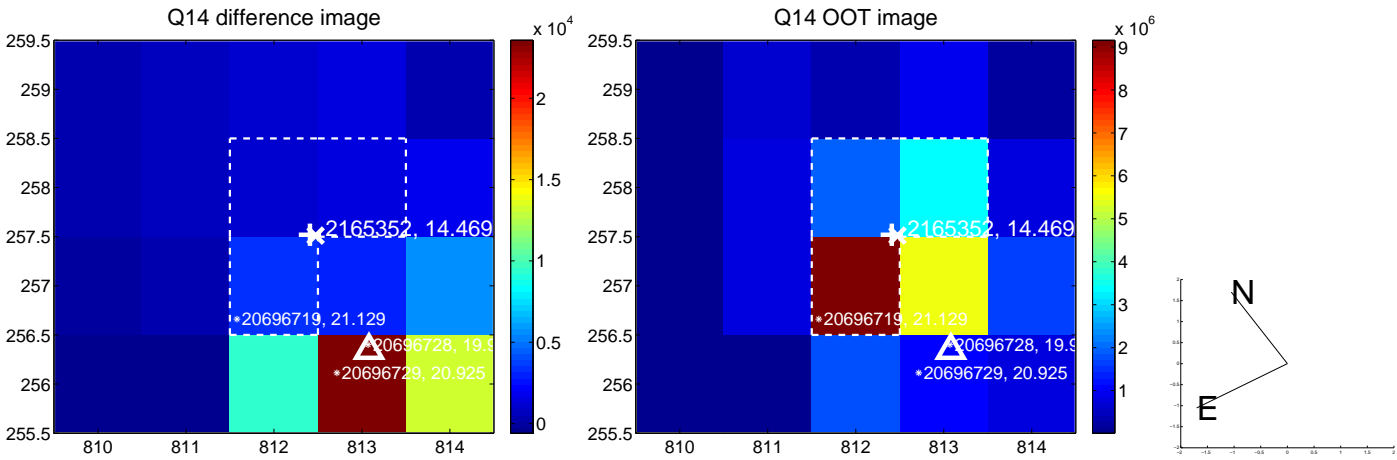
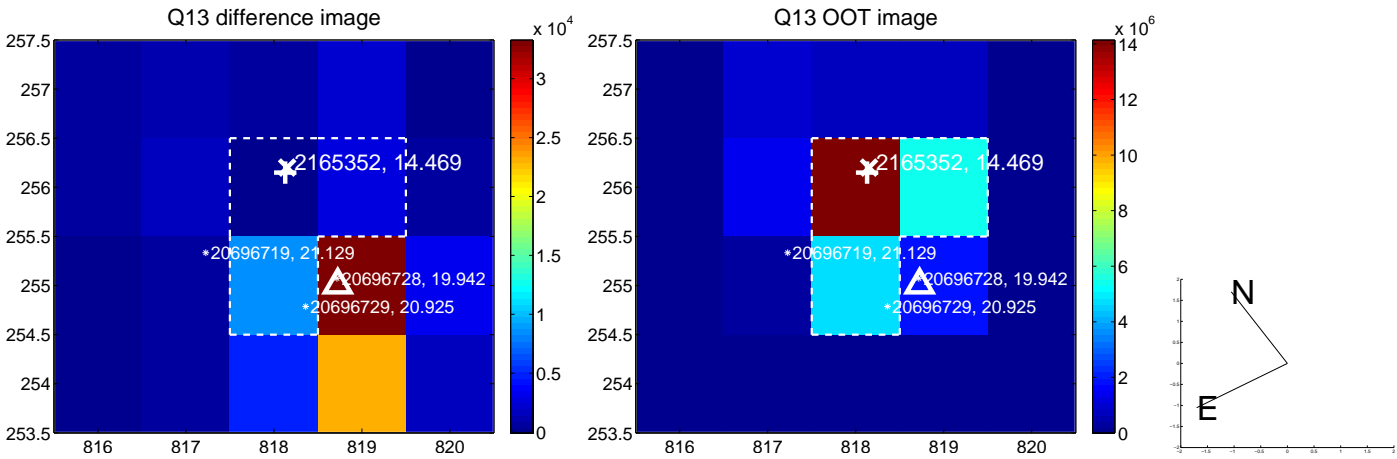
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



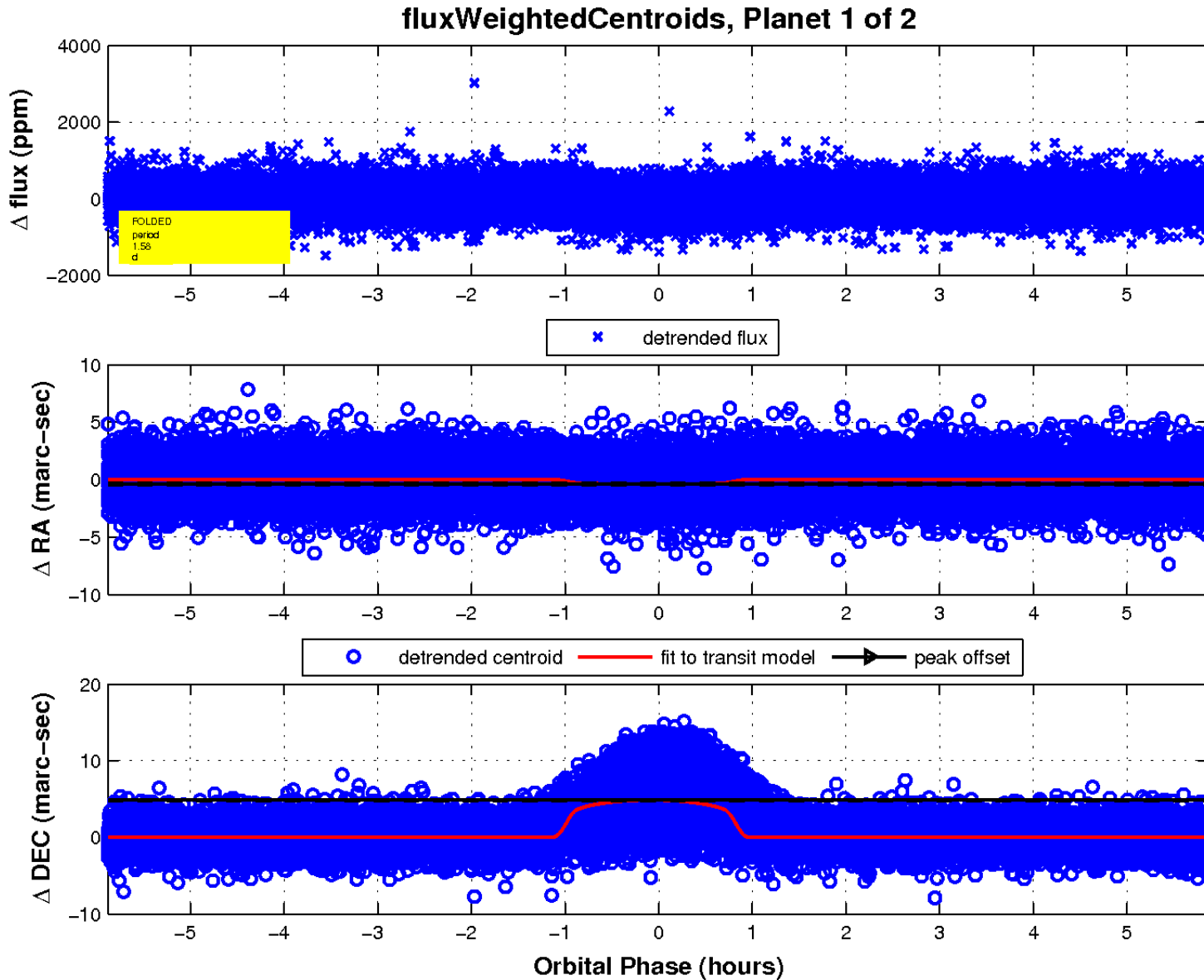
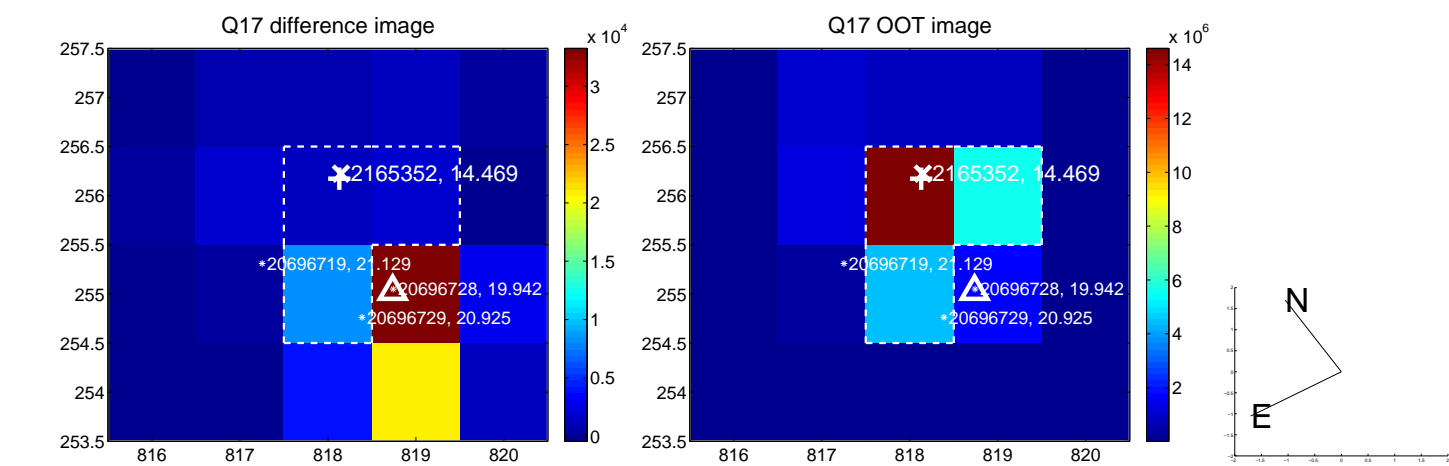
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

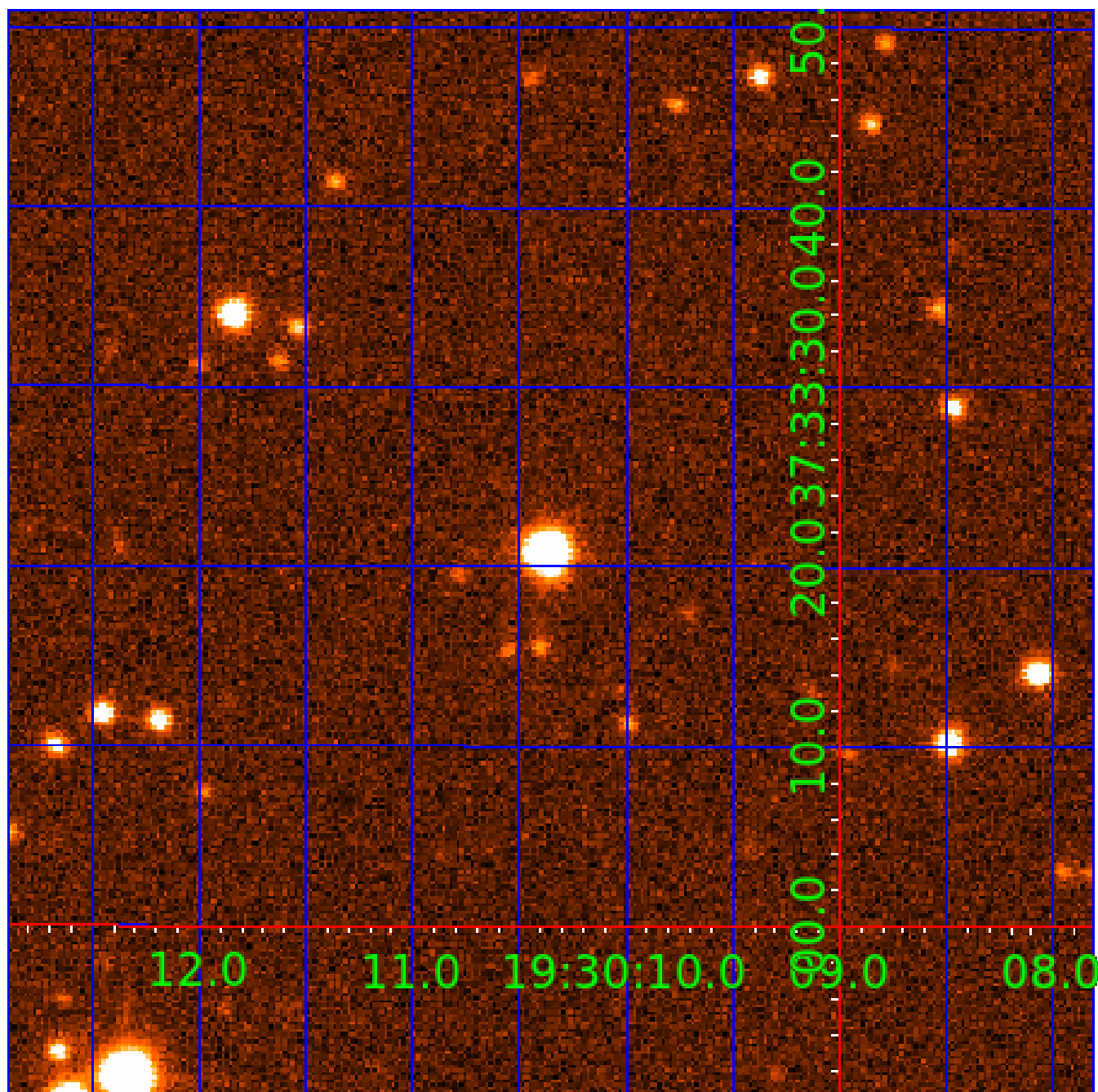


white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002165352

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})
002165352-01	OBS	4934.01	1.581192	132.081299	125.9	1.960	10.7	16.7	0.72	4994	0.99	479.66
002165352-02	OBS	No	1.581195	132.874691	134.8	1.756	17.2	17.6	0.72	4994	1.02	479.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002165352-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
002165352-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST

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.

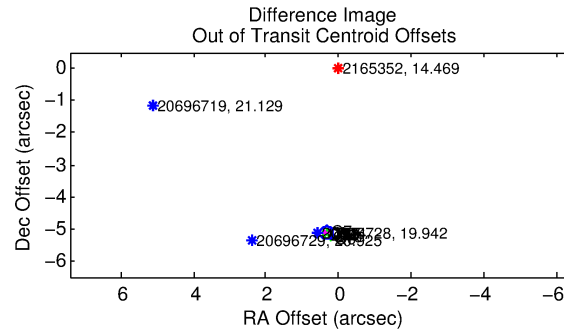
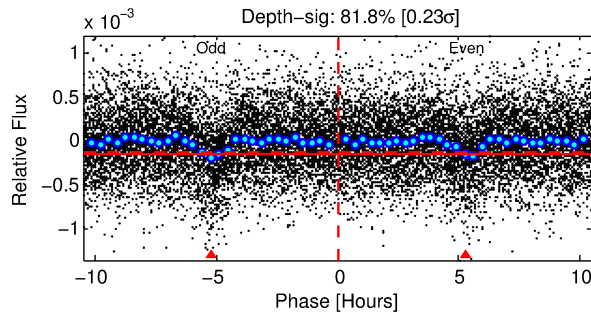
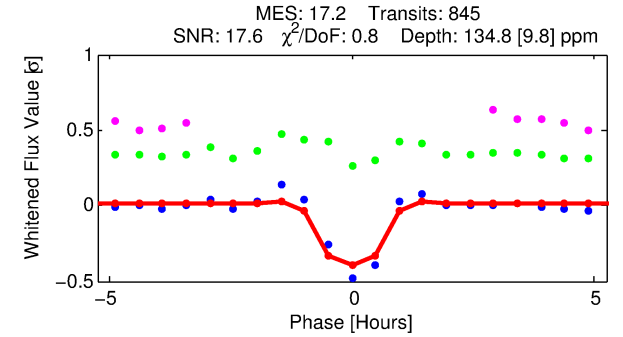
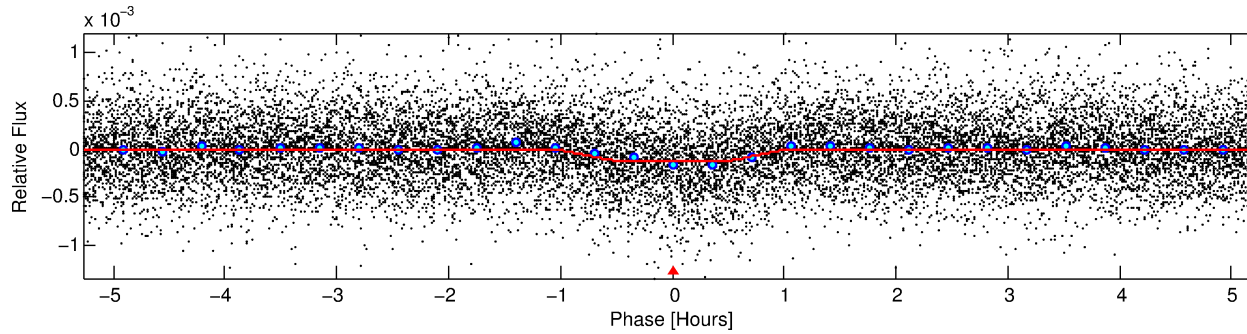
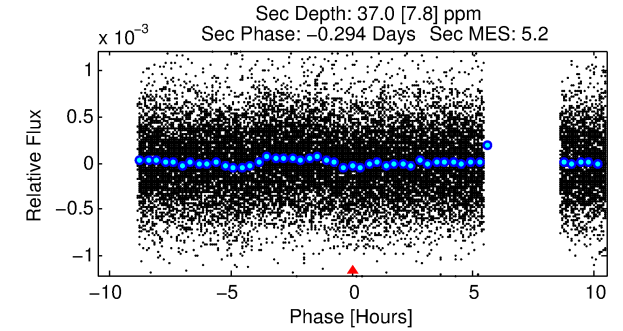
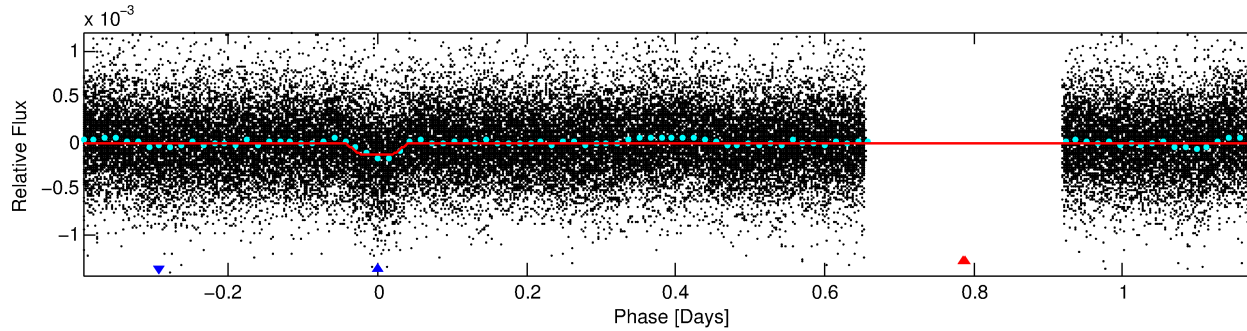
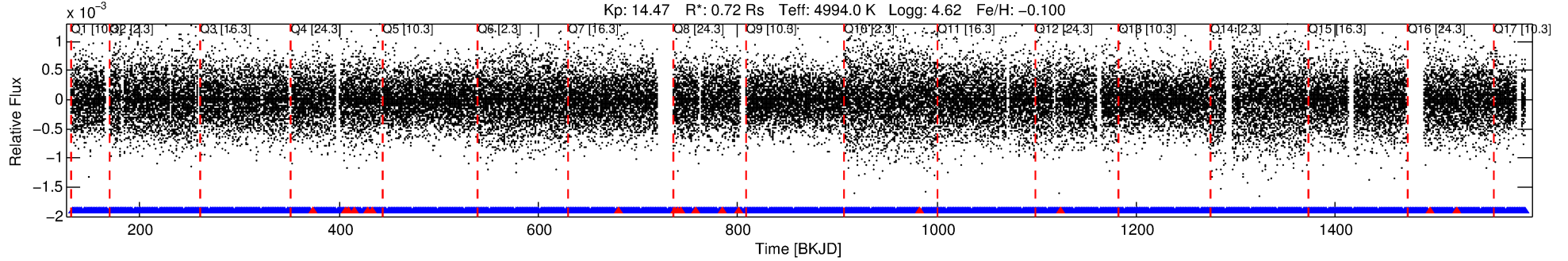
Ephemeris Match Information For 002165352-02

No Significant Match Found

DV One-Page Summary

KIC: 2165352 Candidate: 2 of 2 Period: 1.581 d
KOI: K04934 Corr: No Ephemeris Match

Kp: 14.47 R*: 0.72 Rs Teff: 4994.0 K Logg: 4.62 Fe/H: -0.100



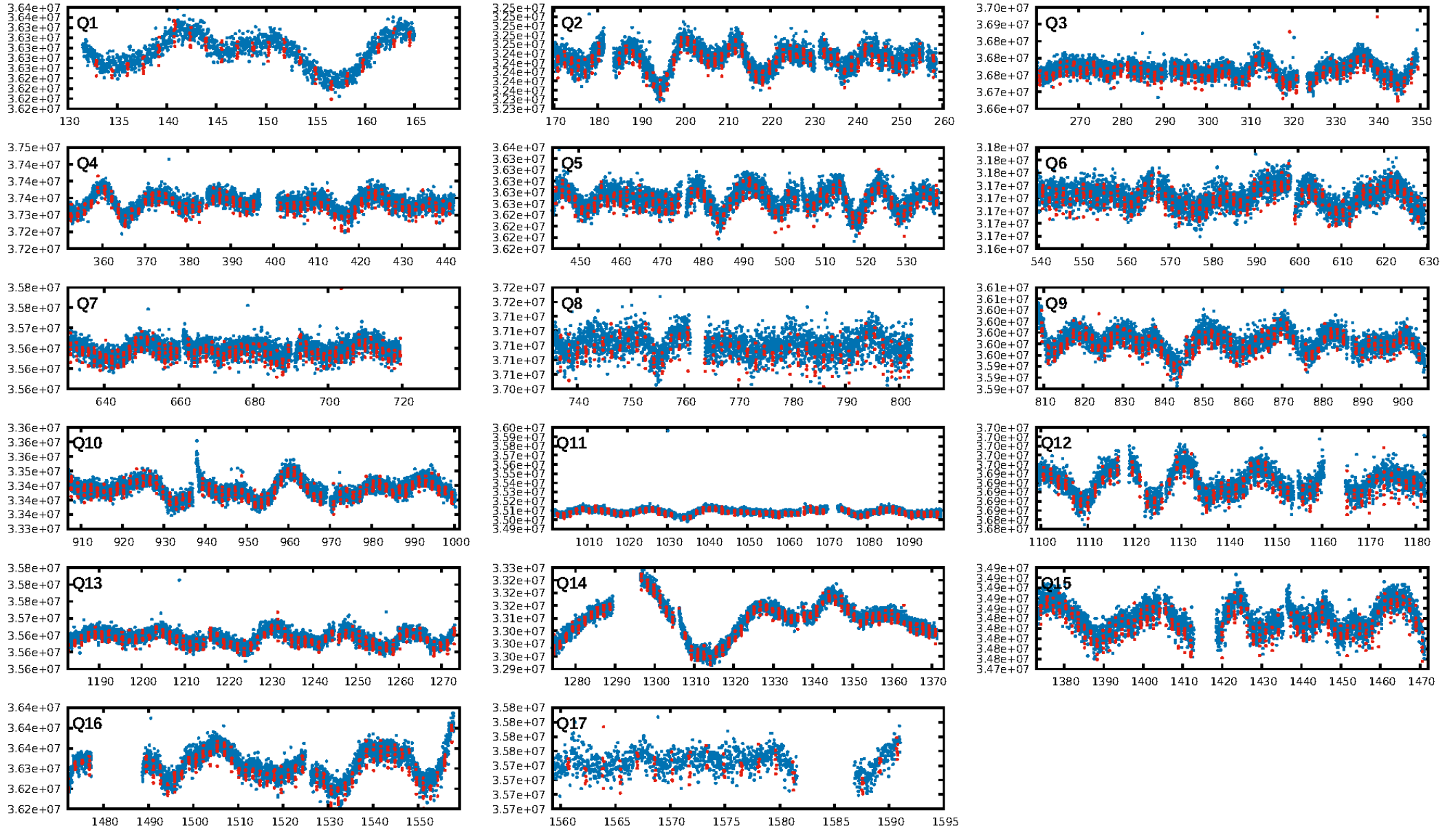
DV Fit Results:

Period = 1.58120 [0.00001] d
Epoch = 132.8747 [0.0015] BKJD
Rp/R* = 0.0130 [0.0074]
a/R* = 3.32 [6.91]
b = 0.90 [0.49]
Seff = 479.66 [53.28]
Teq = 1193 [33] K
Rp = 1.02 [0.59] Re
a = 0.0245 [0.0014] AU
Ag = 11.74 [13.64] [0.79σ]
Teffp = 3416 [990] K [2.24σ]

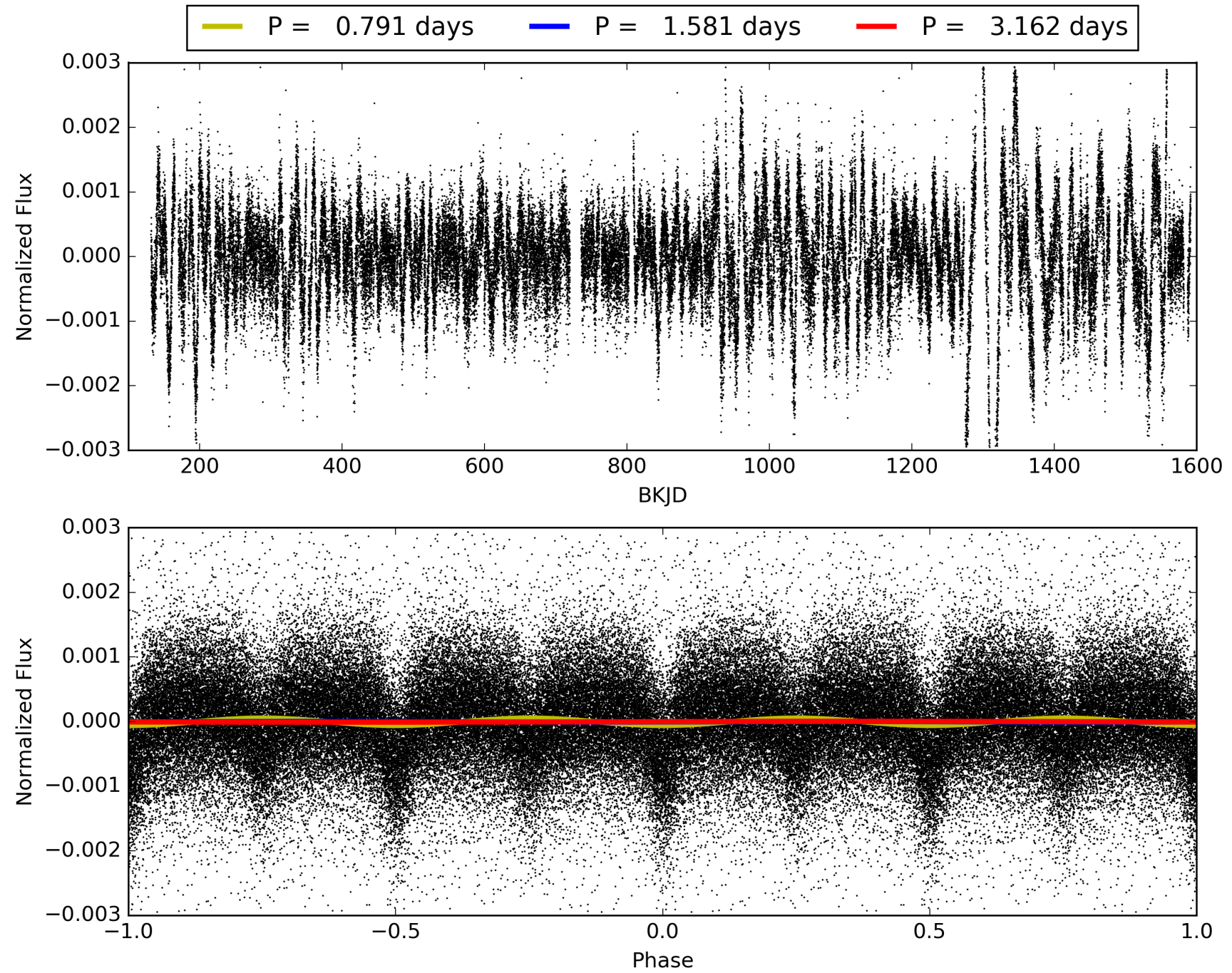
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.27e-64
RollingBand-fgt: 0.98 [790/807]
GhostDiagnostic-chr: -0.1327
Centroid-sig: 0.0%
Centroid-so: 39.972 arcsec [49.47σ]
OotOffset-rm: 5.137 arcsec [75.70σ]
KicOffset-rm: 5.250 arcsec [73.55σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 002165352-02, PDC Light Curves

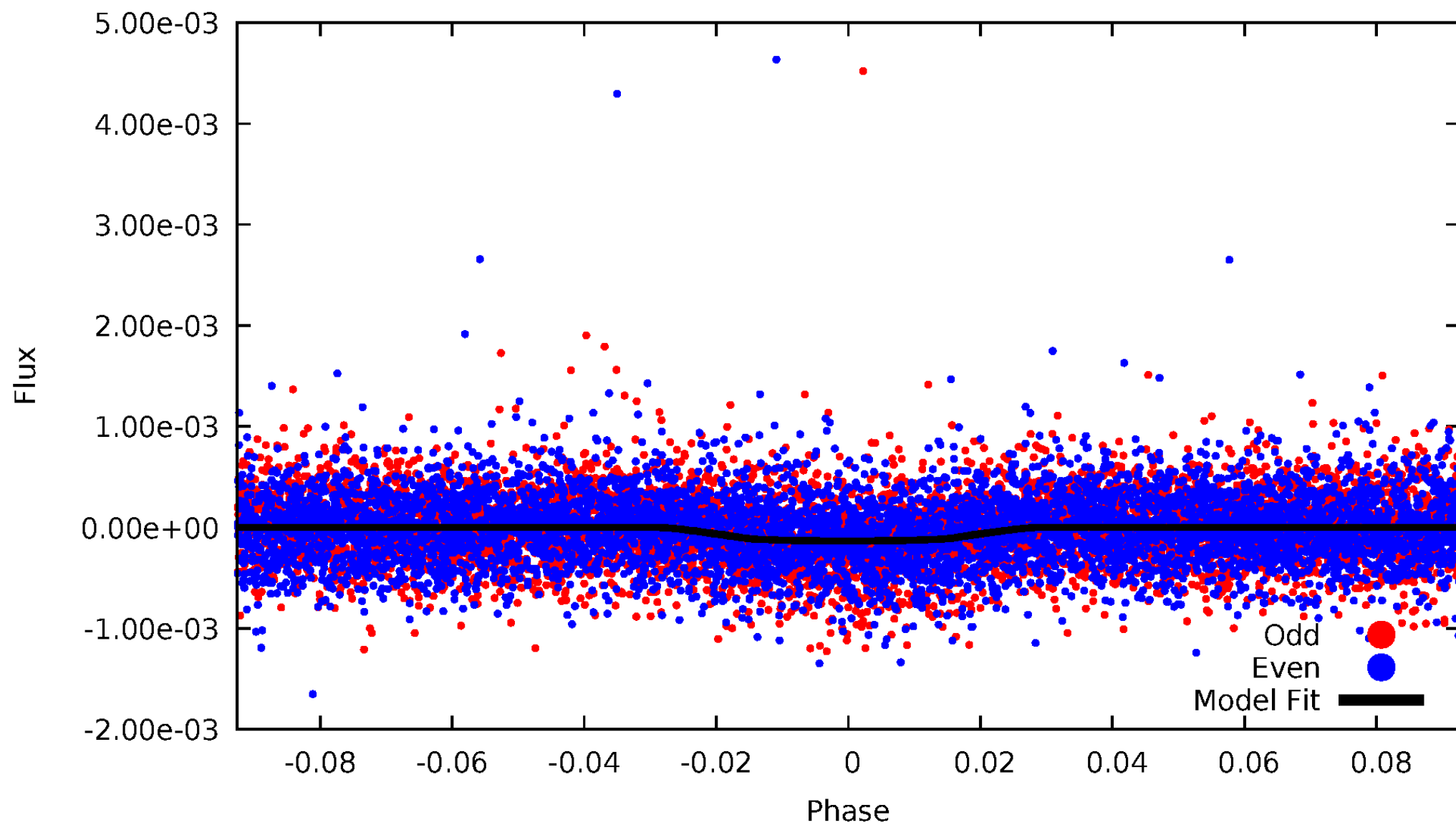


TCE 002165352-02



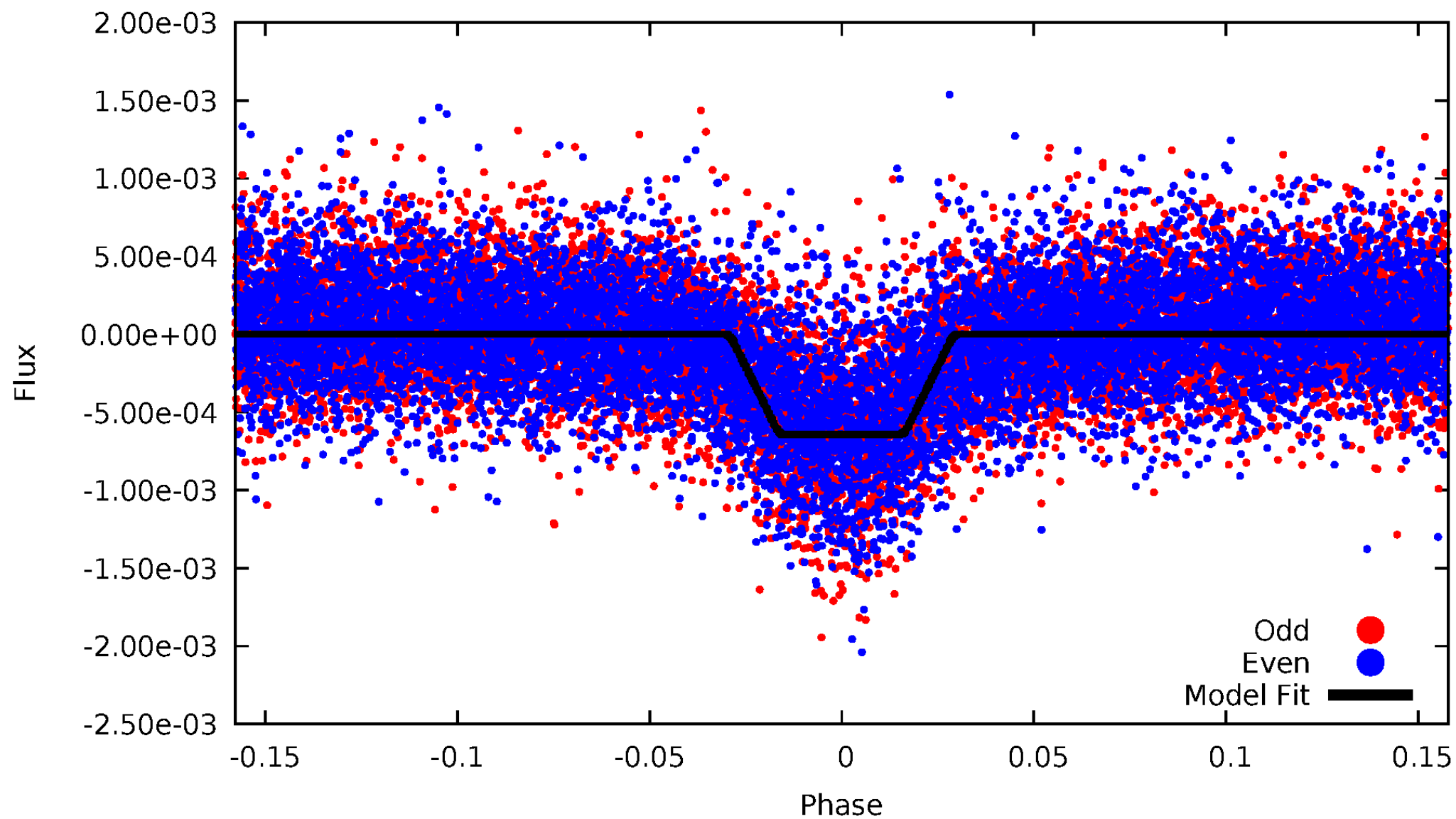
DV Odd/Even

TCE 002165352-02



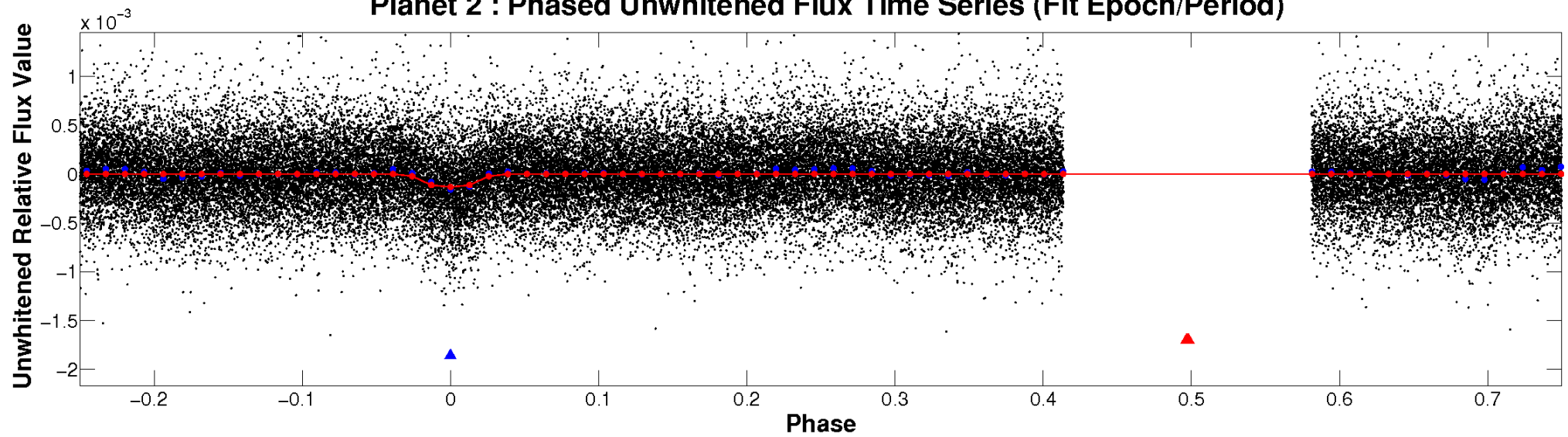
ALT Odd/Even

TCE 002165352-02

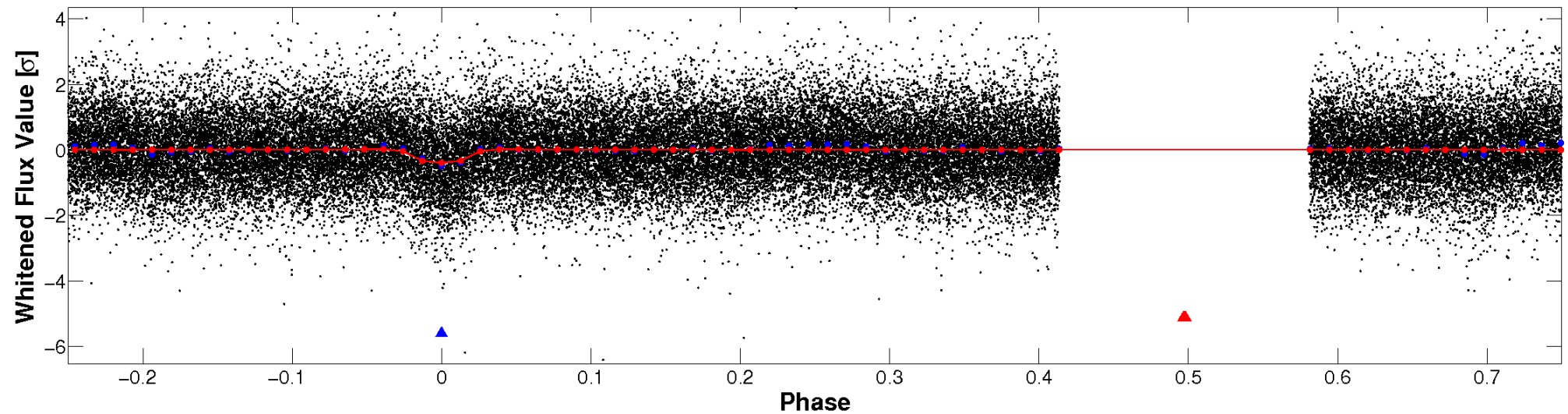


Non-Whitened Vs. Whitened Light Curve

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

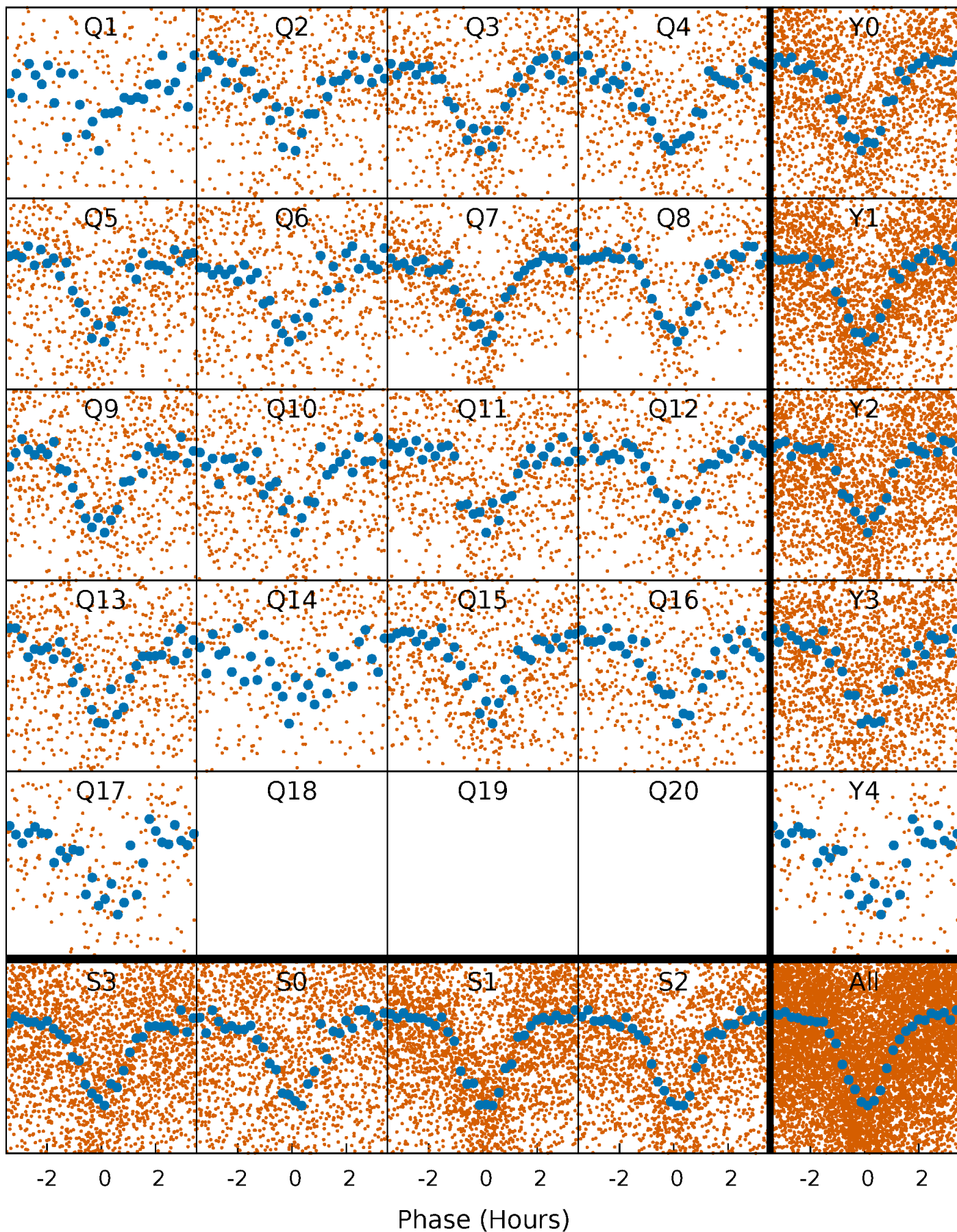


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



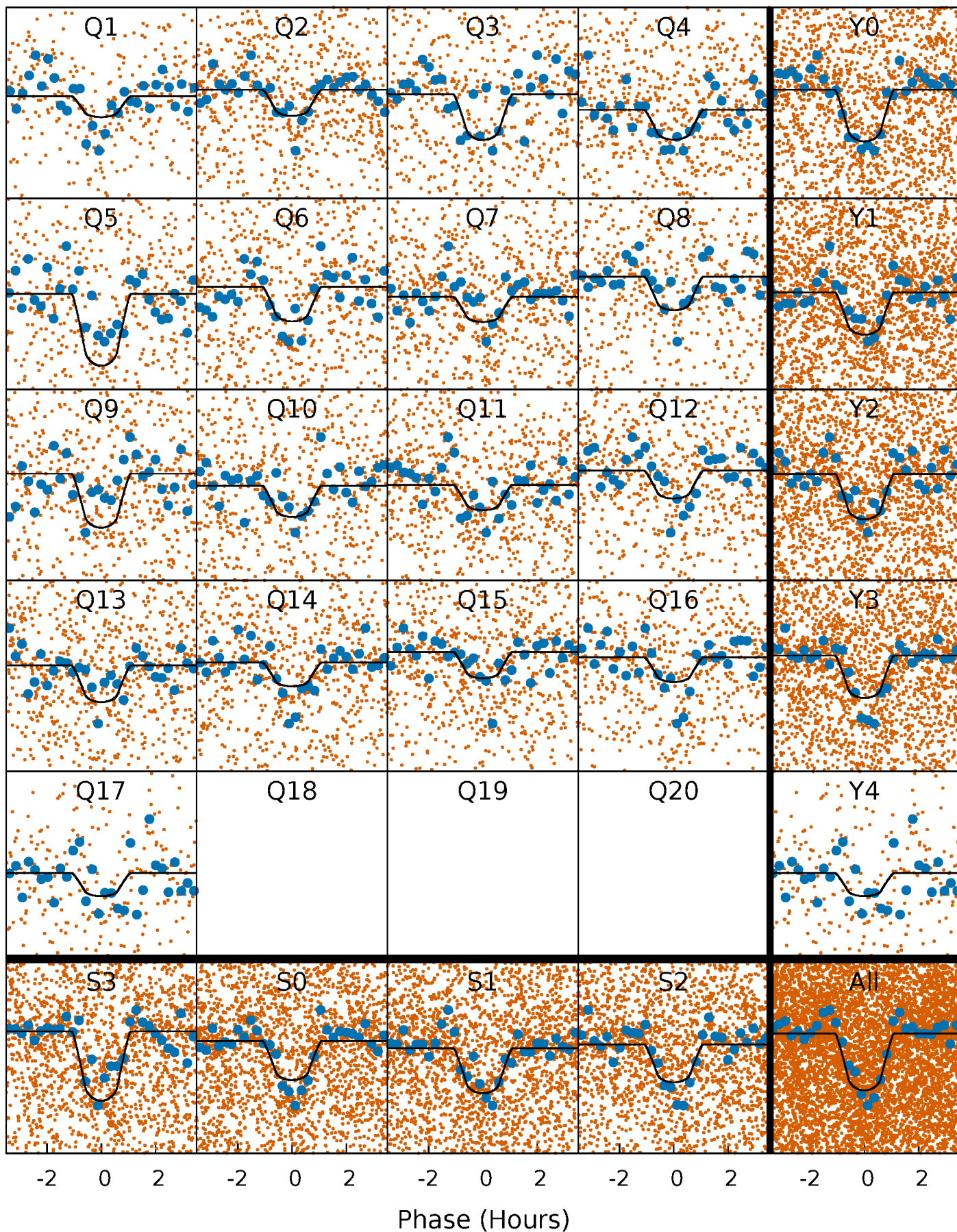
PDC Quarter-Phased Transit Curves

TCE 002165352-02 P= 1.581195 Days $T_0=132.874691$ (BKJD)



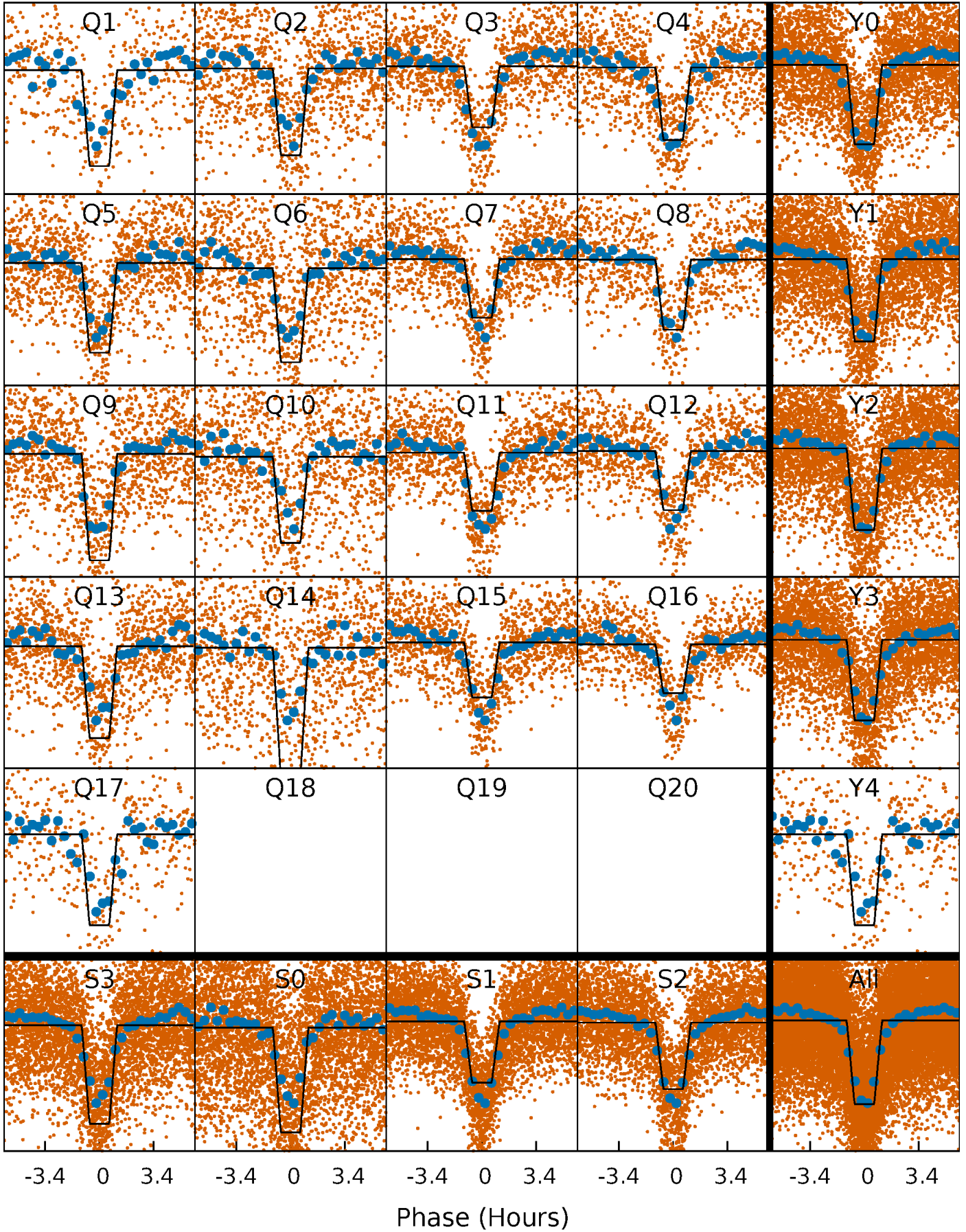
DV Quarter-Phased Transit Curves

TCE 002165352-02 P= 1.581195 Days $T_0=132.874691$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

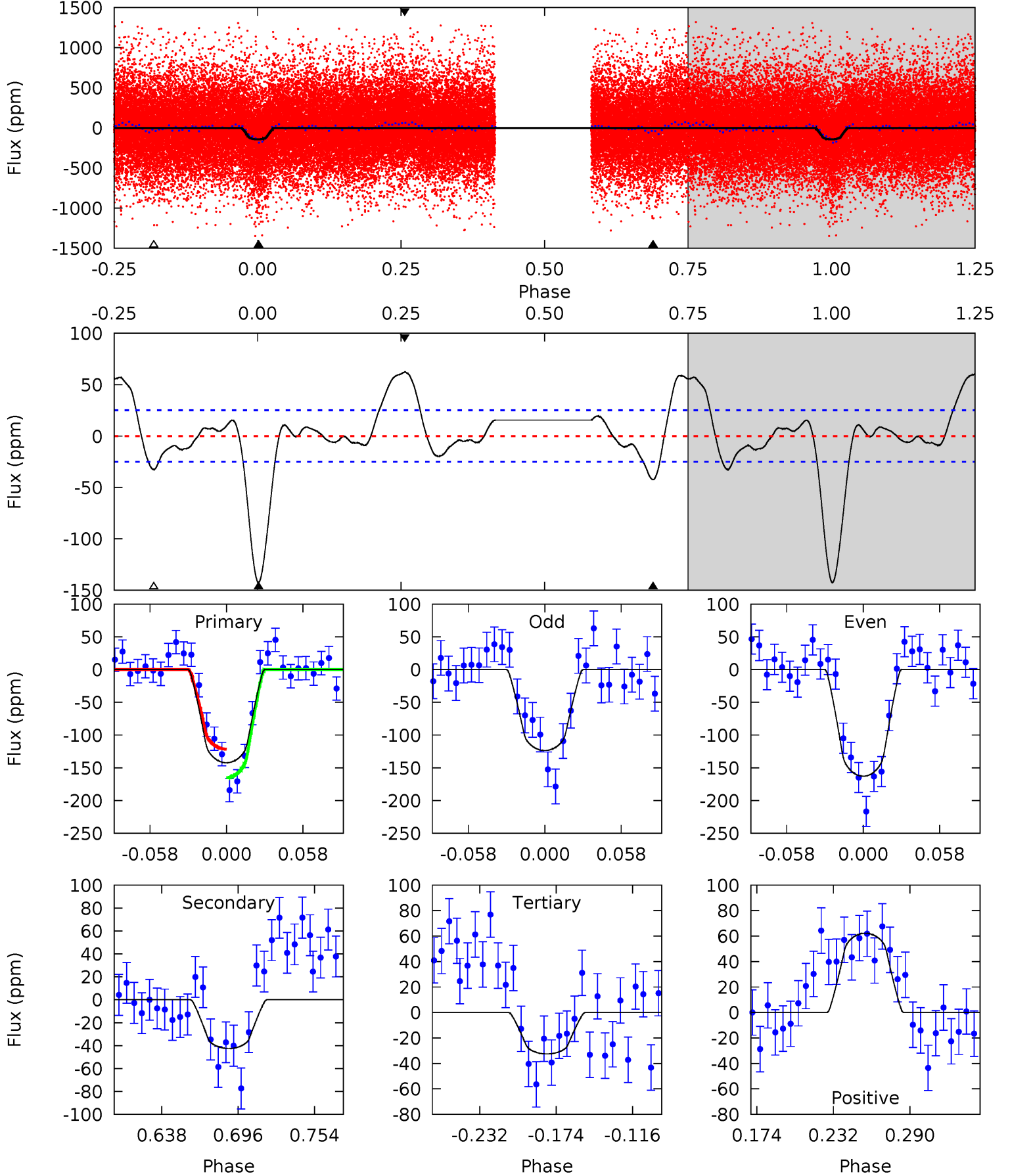
TCE 002165352-02 P= 1.581201 Days $T_0=132.874283$ (BKJD)



DV Model-Shift Uniqueness Test

002165352-02, P = 1.581195 Days, E = 131.293496 Days

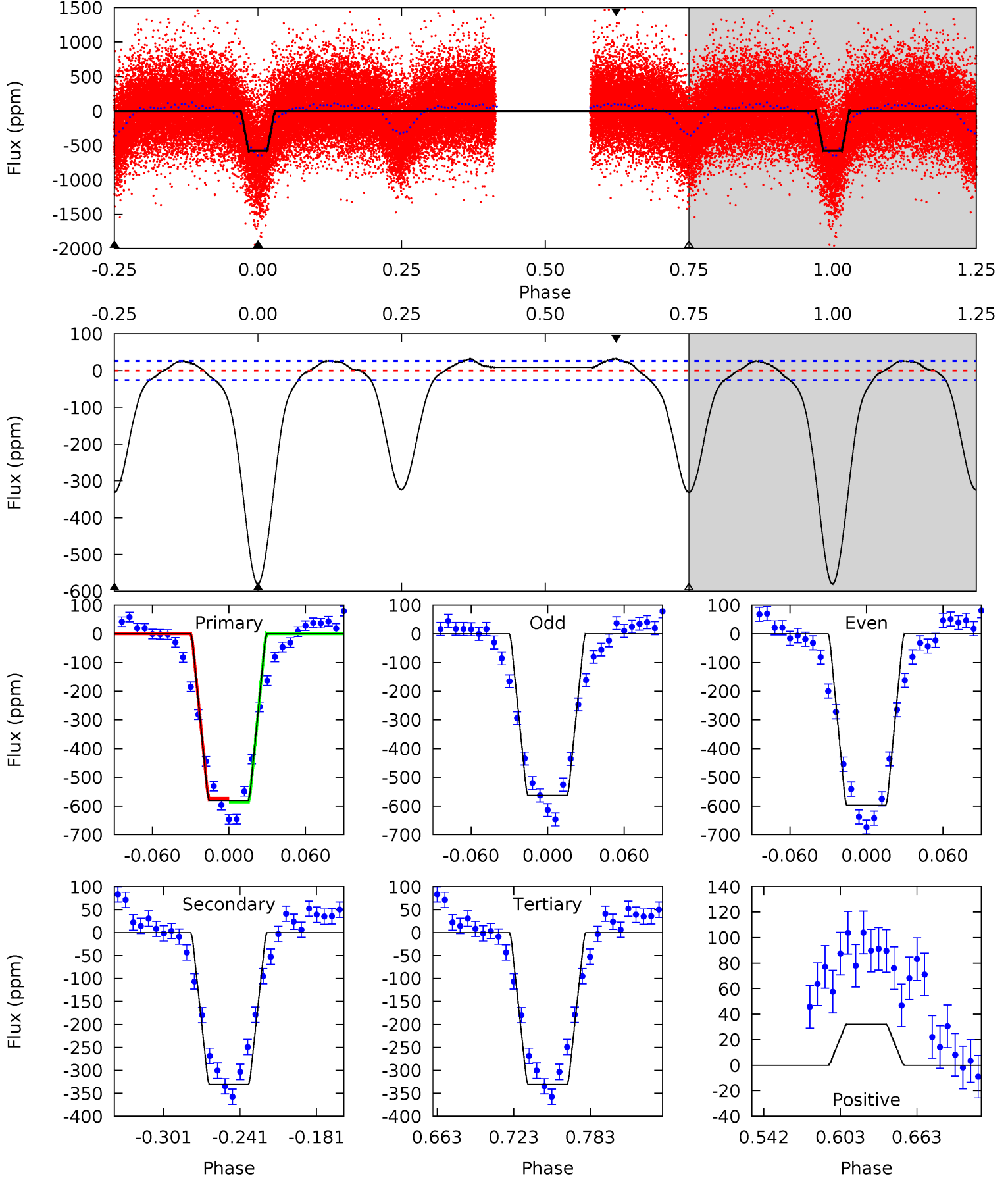
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.5	7.93	6.07	11.6	4.68	1.90	4.34	20.5	14.9	1.87	-3.67	3.67	0.99	0.30	4.06



Alt Model-Shift Uniqueness Test

002165352-02, P = 1.581201 Days, E = 131.293082 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
104.3	59.4	59.4	5.76	4.67	1.88	17.5	44.9	98.5	0.01	53.7	3.07	1.02	0.05	1.15



Stellar Parameters For KIC 002165352

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4994^{+75}_{-82}	$4.620^{+0.015}_{-0.051}$	$-0.100^{+0.150}_{-0.150}$	$0.720^{+0.047}_{-0.029}$	$0.803^{+0.029}_{-0.062}$	$3.035^{+0.217}_{-0.534}$
	+2%/-2%	+0%/-1%	+150%/-150%	+7%/-4%	+4%/-8%	+7%/-18%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002165352-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-43 ± 5	$1.05^{+0.59}_{-0.55}$	1678^{+37}_{-31}	3818^{+1237}_{-540}	13^{+42}_{-8}
Alt.	-331 ± 6	$2.01^{+0.63}_{-0.57}$	1678^{+36}_{-31}	4369^{+625}_{-410}	27^{+26}_{-11}

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 $A_{obs} \gg 1.0$

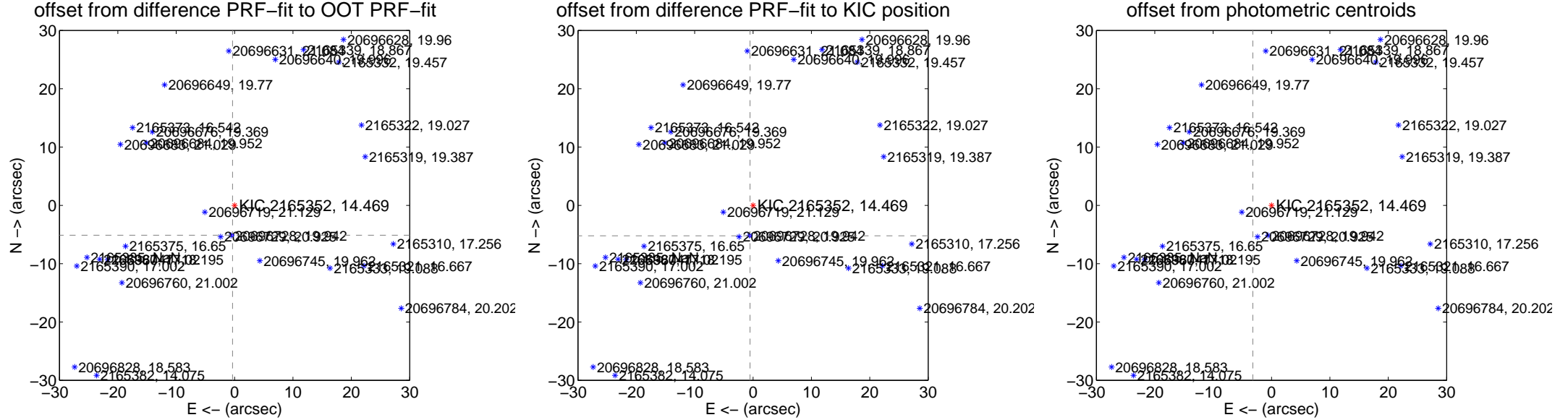
DV Centroid Data

Supplemental centroid analysis for 002165352-02. Kepler magnitude: 14.47. Transit SNR 17.65

There are 17 quarters with good PRF difference image offsets

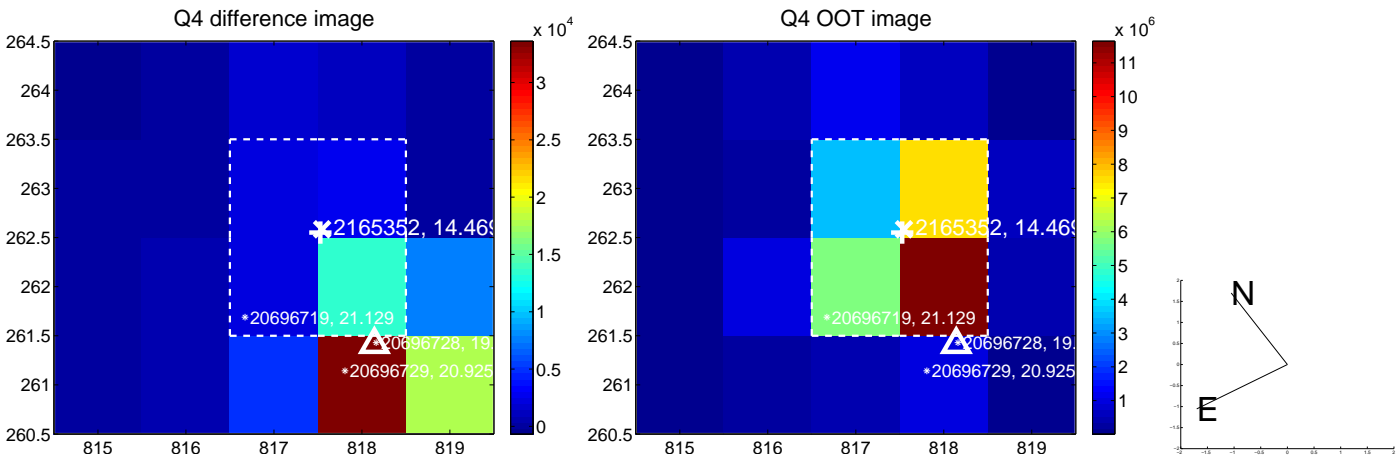
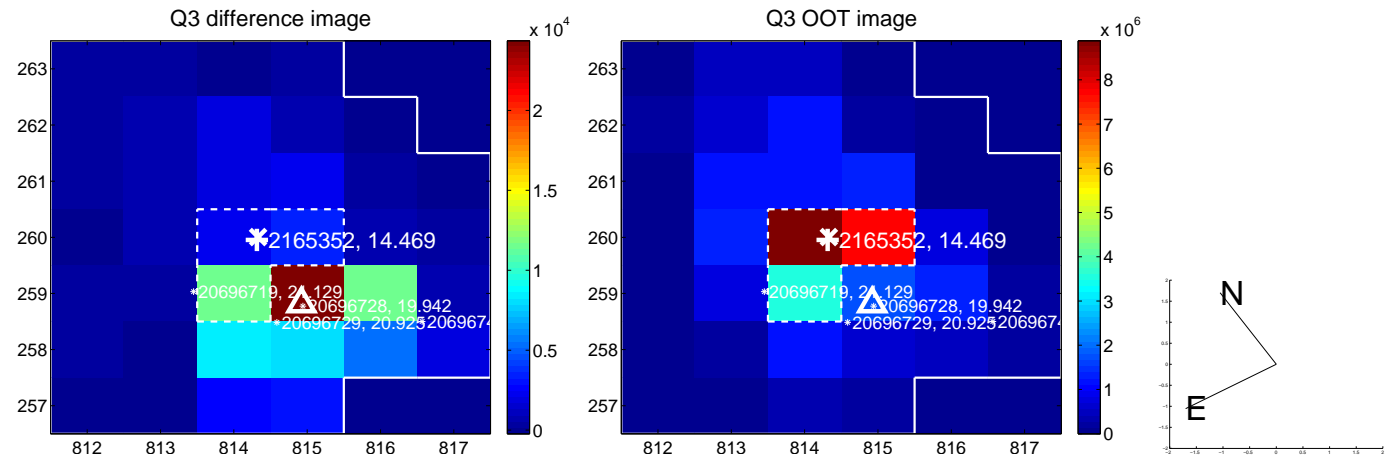
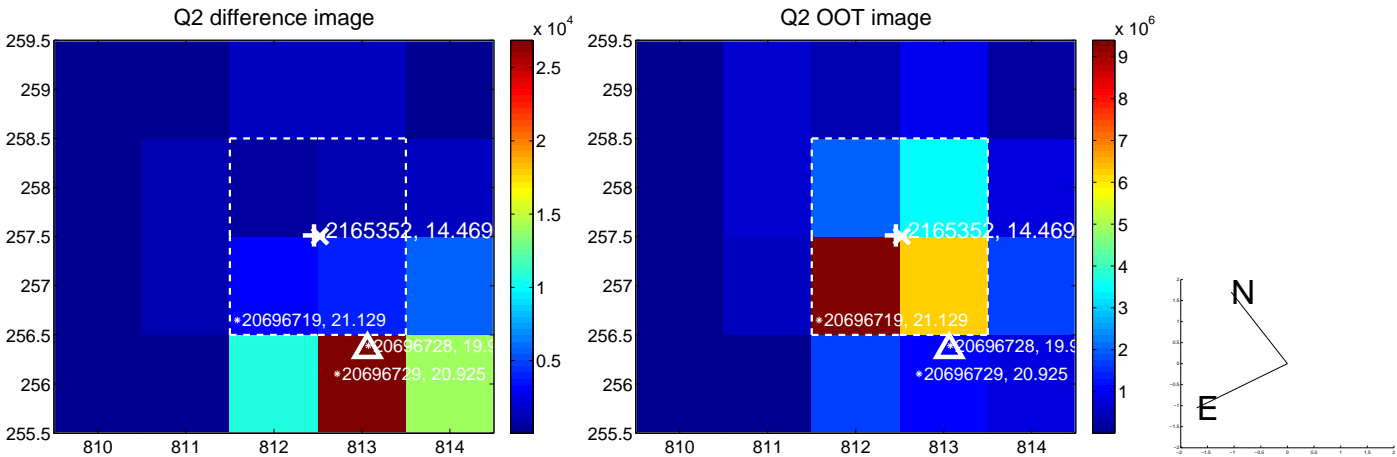
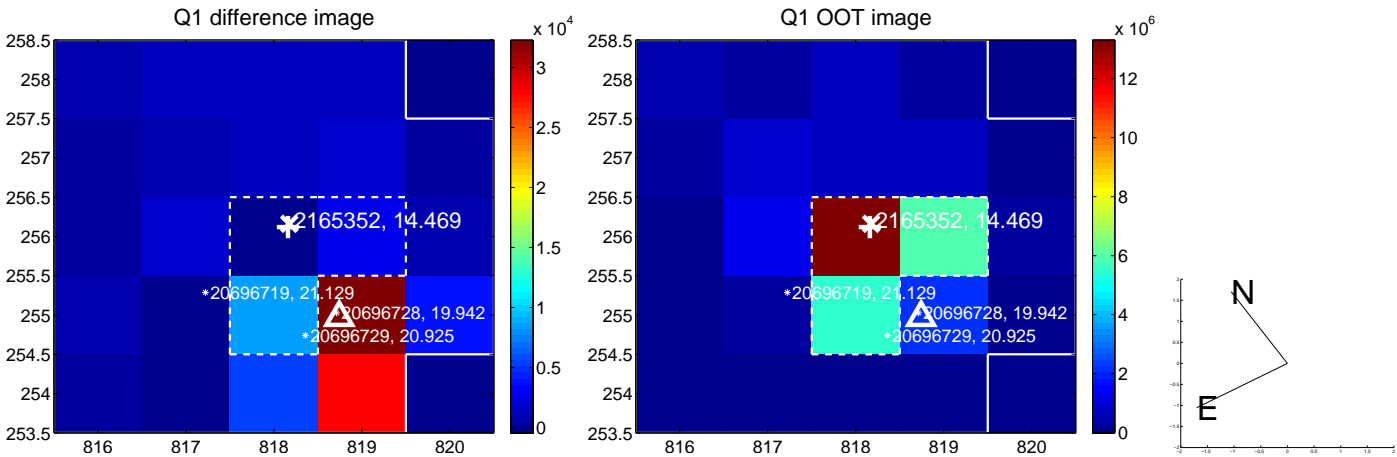
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.137 \pm 0.068	75.70	0.355 \pm 0.068	-5.124 \pm 0.068
PRF-fit source offset from KIC position	5.250 \pm 0.071	73.55	0.517 \pm 0.068	-5.224 \pm 0.071
photometric centroid source offset	39.97 \pm 0.81	49.47	3.21 \pm 0.71	-39.84 \pm 0.81

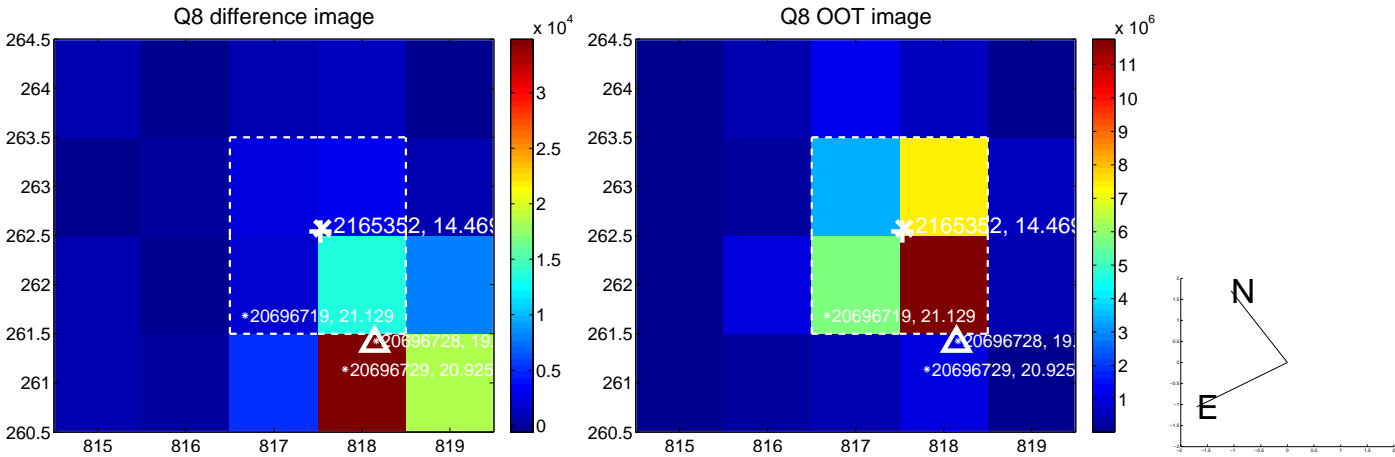
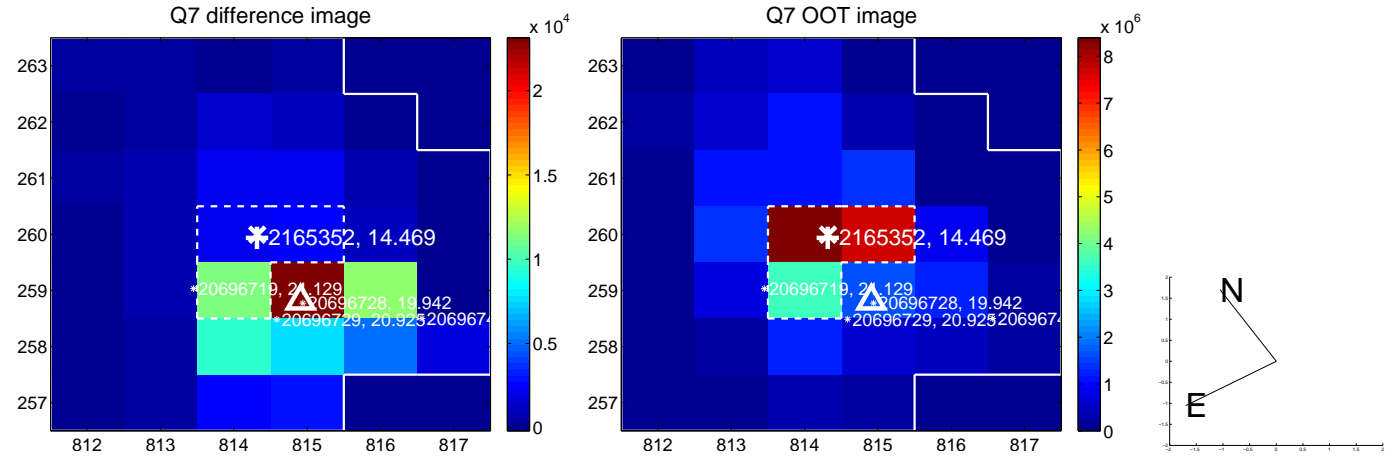
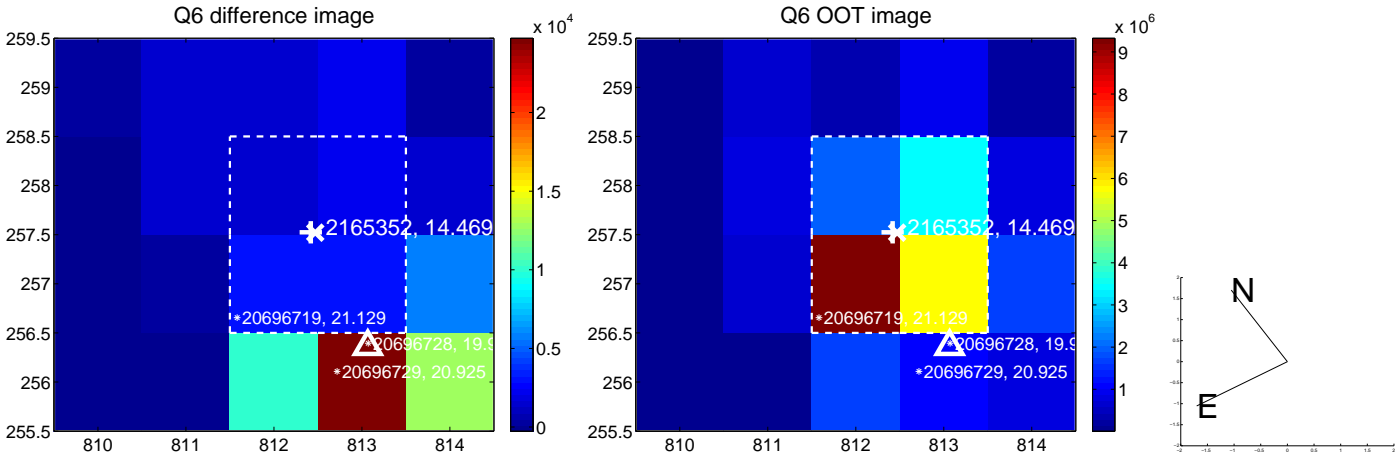
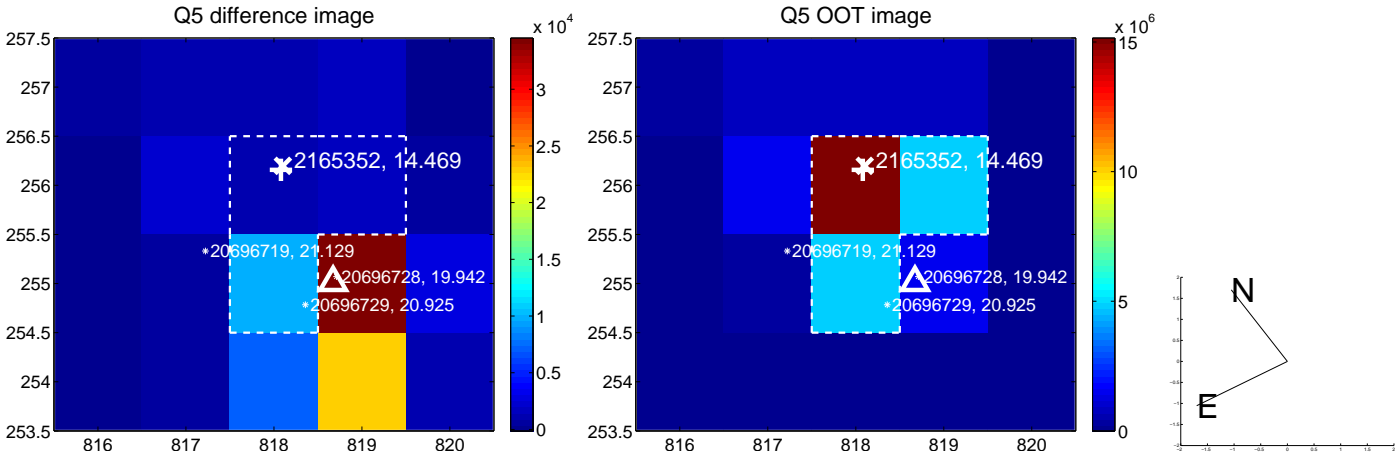


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

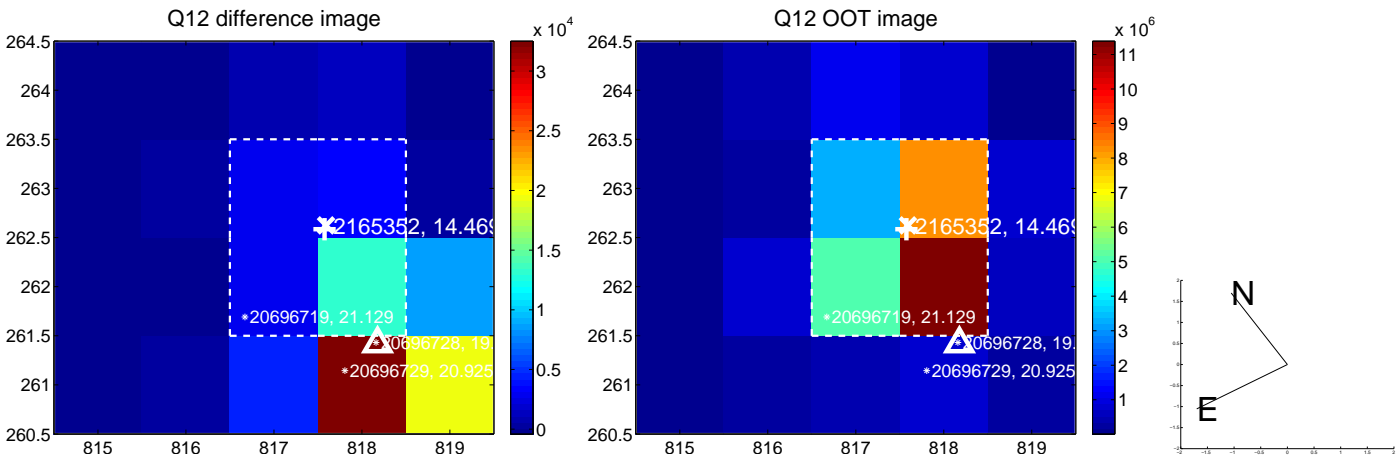
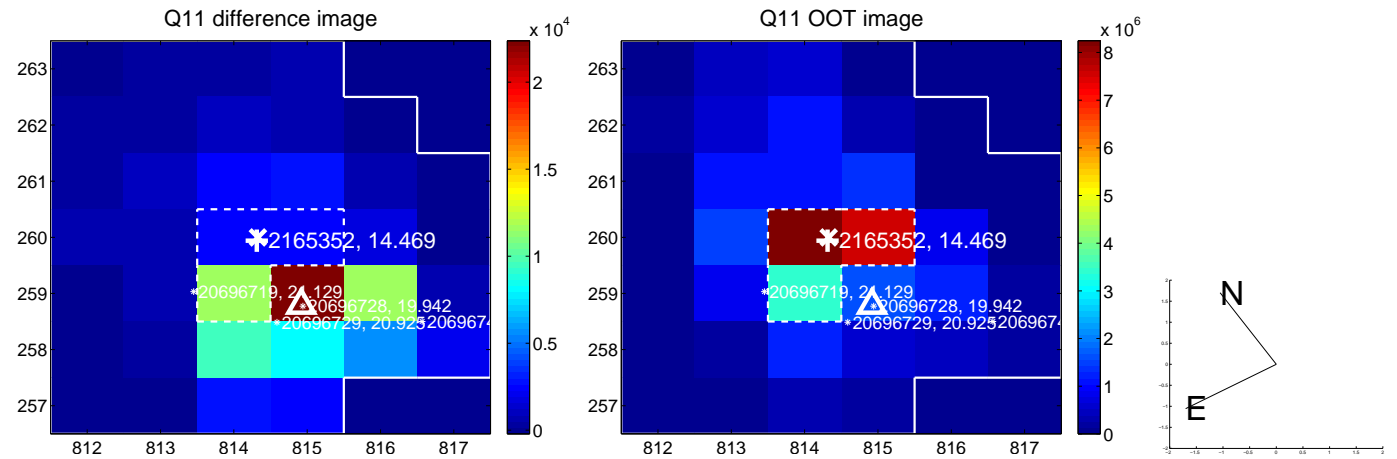
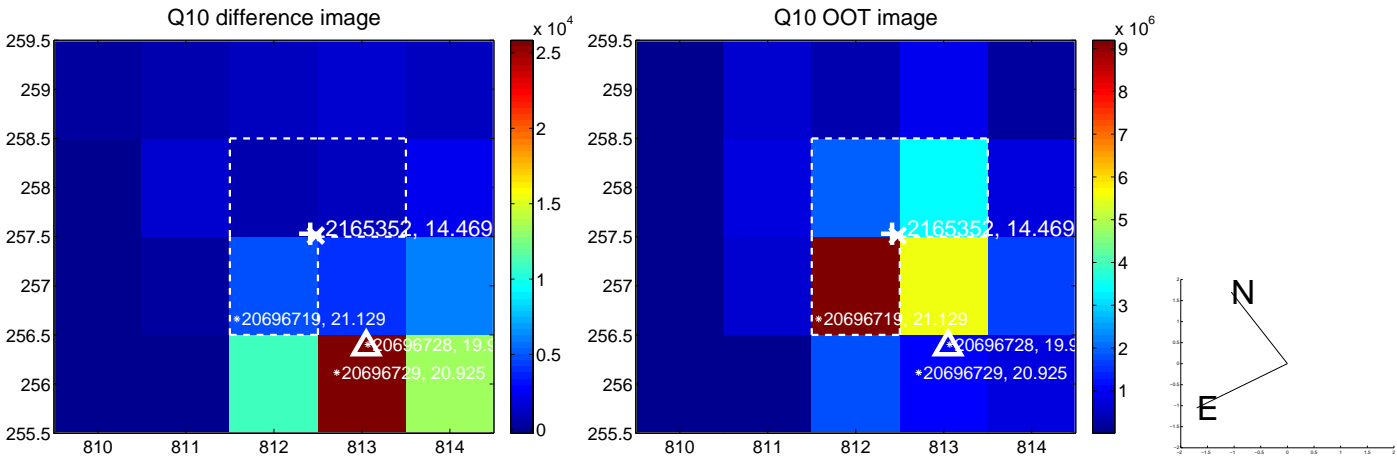
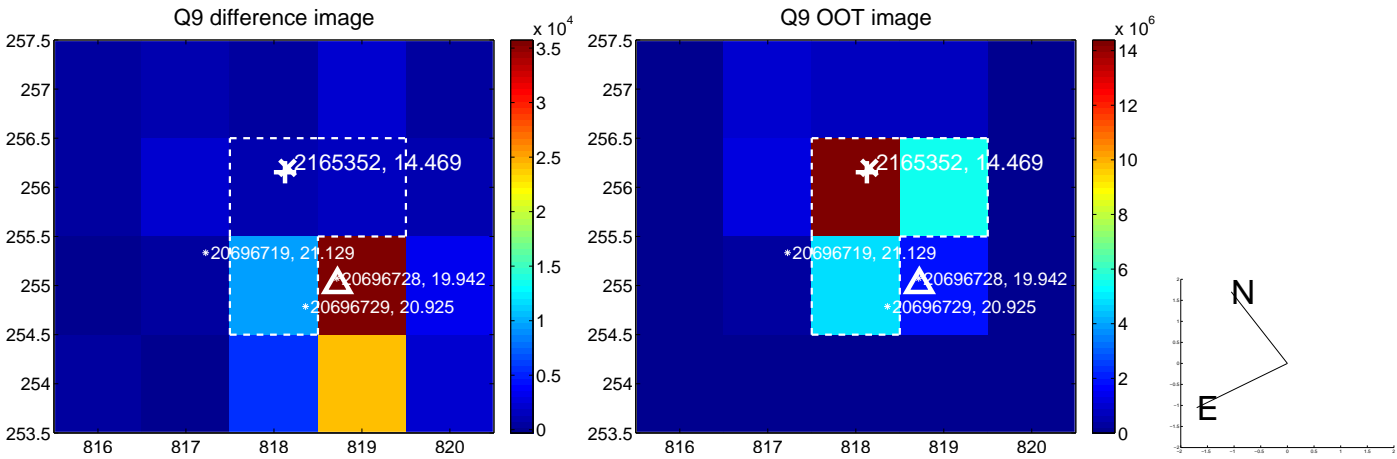
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



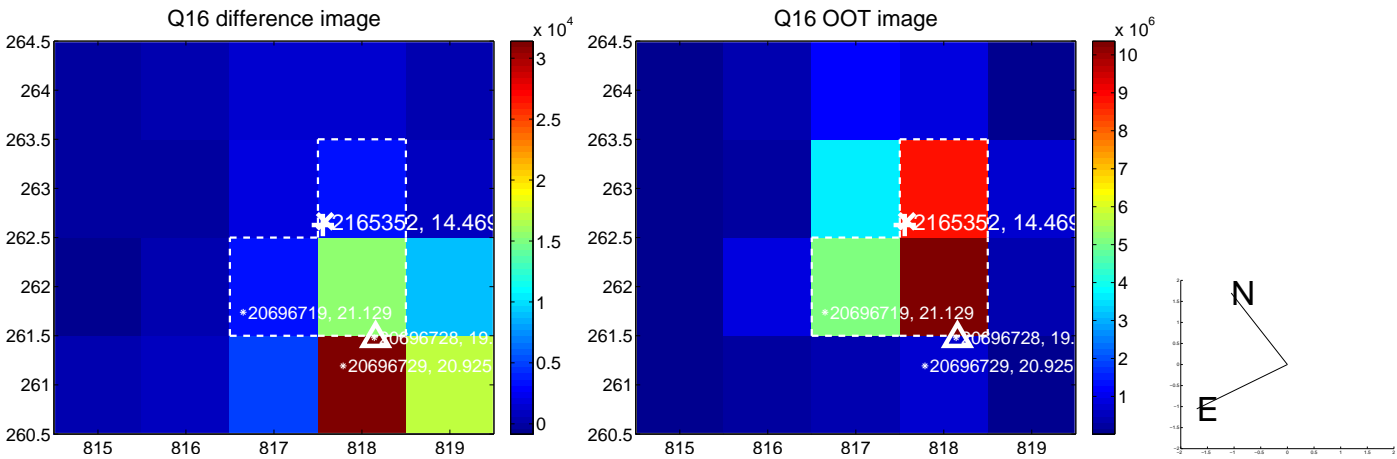
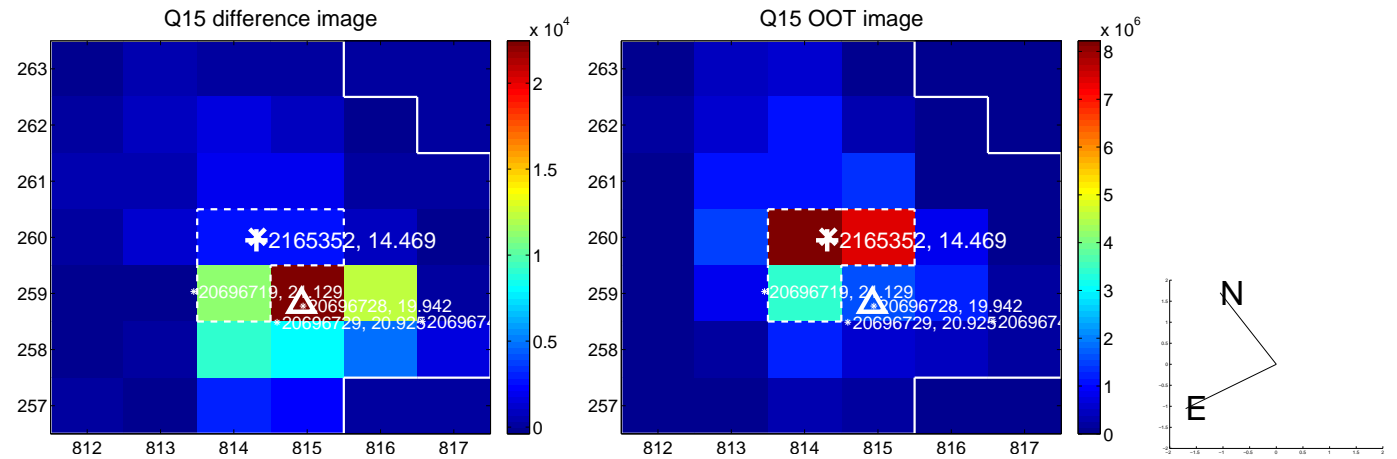
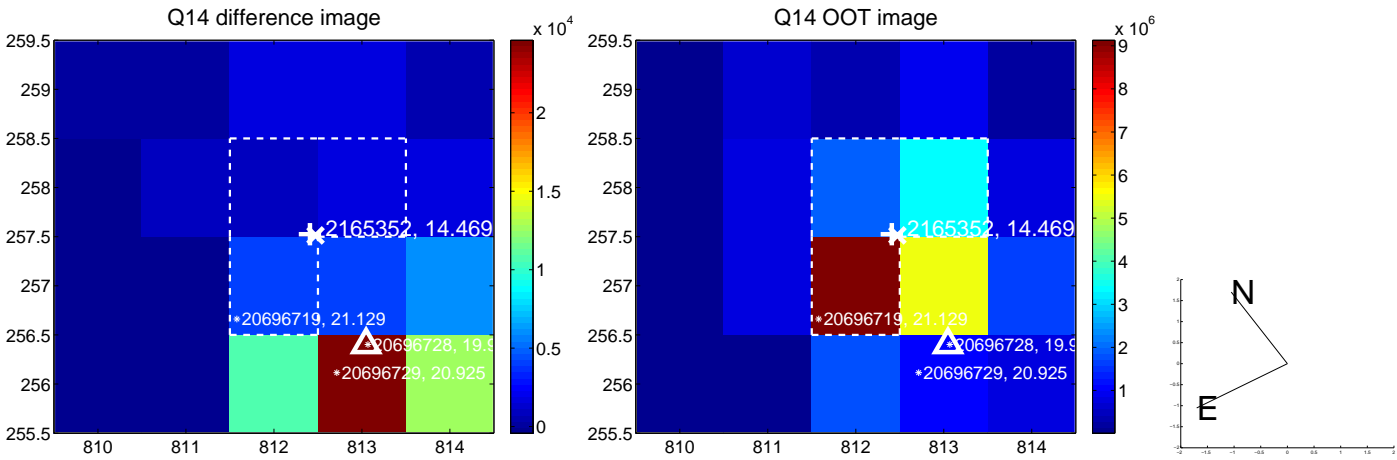
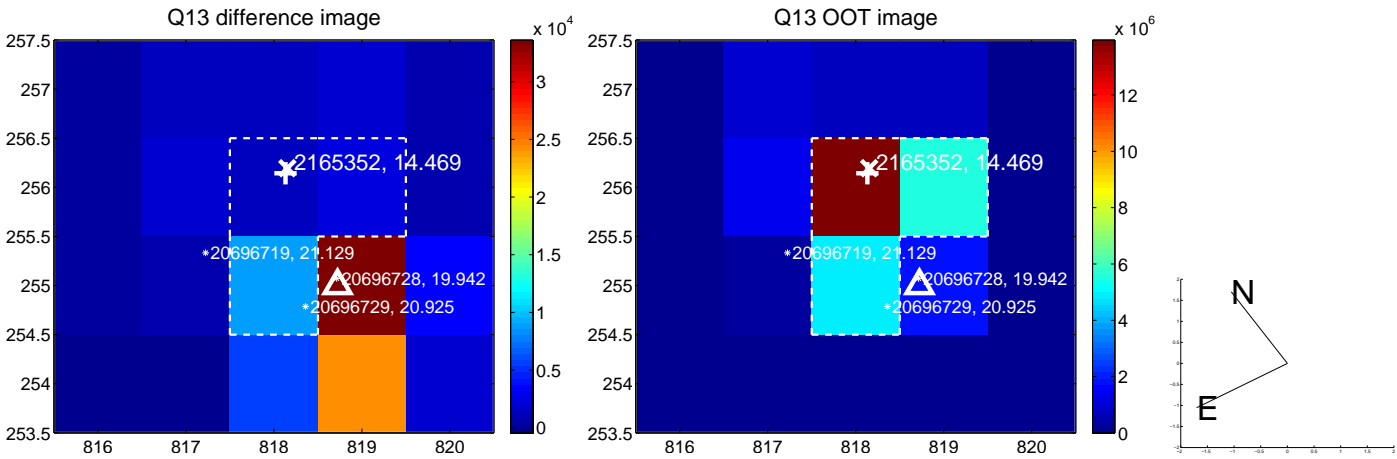
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



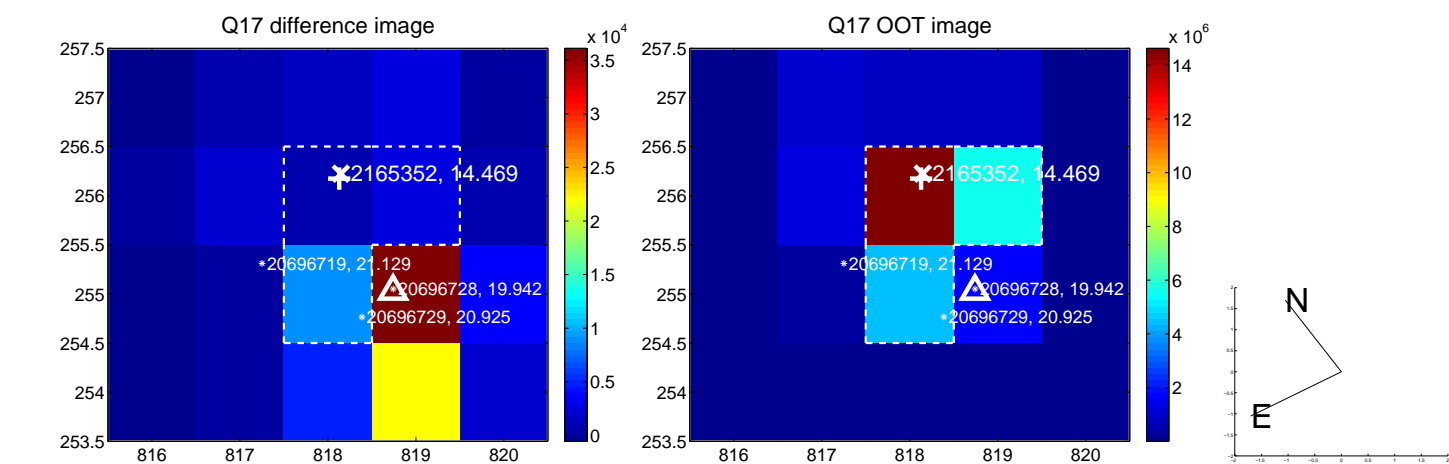
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



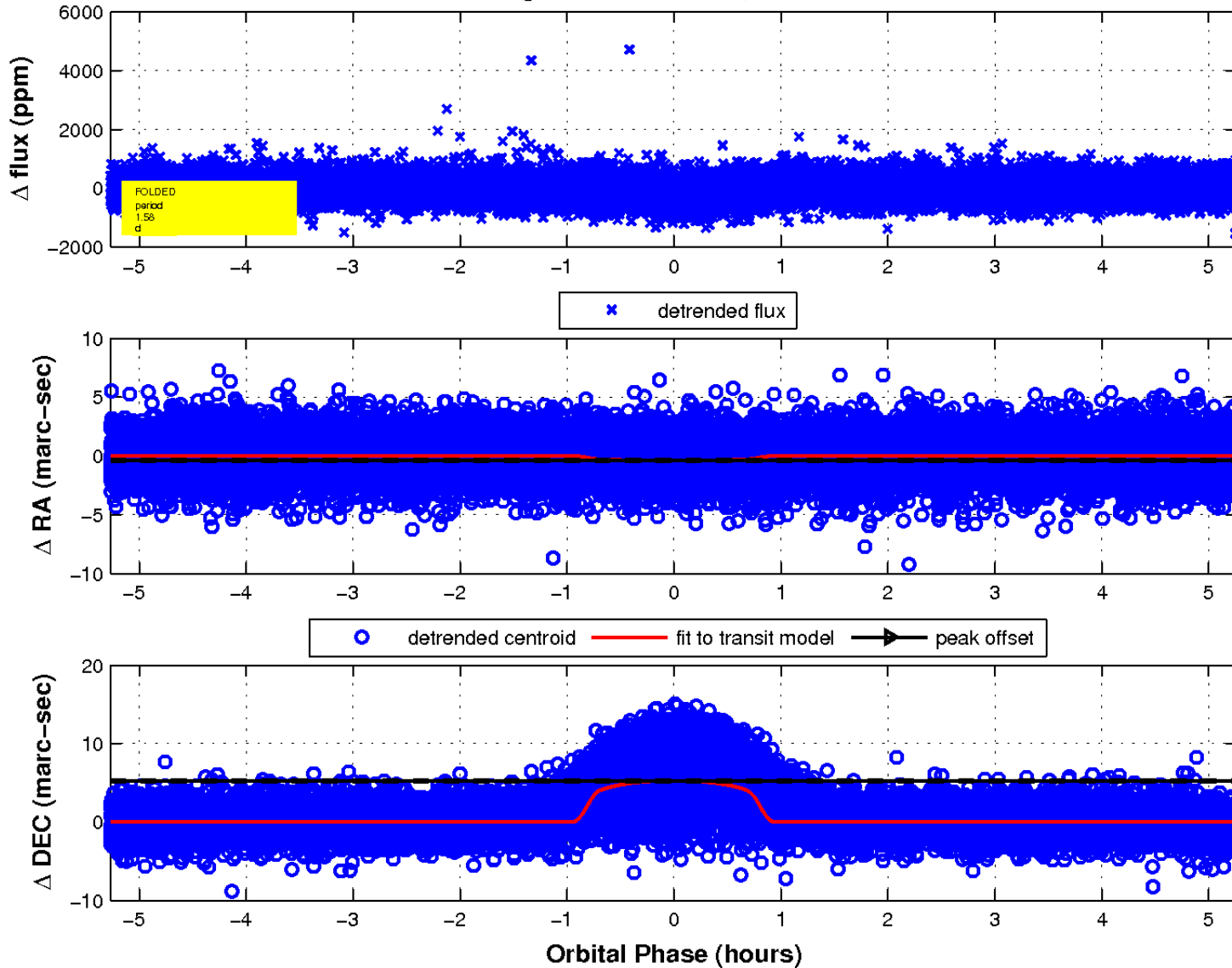
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

