

KIC 010418224

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})
010418224-01	OBS	0428.01	6.873165	138.153165	3770.6	6.927	451.1	456.2	2.18	6490	13.70	1142.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010418224-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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.

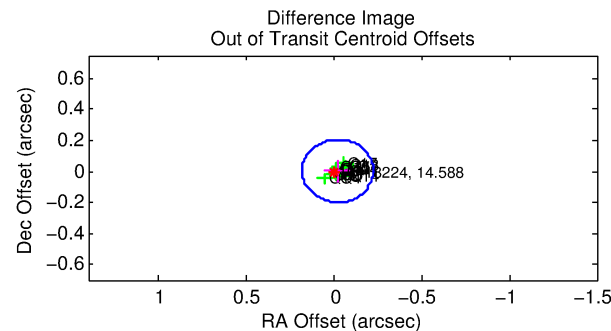
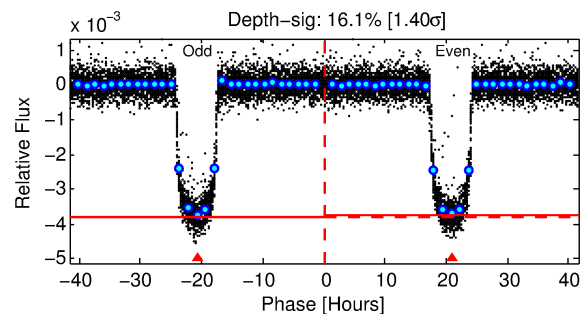
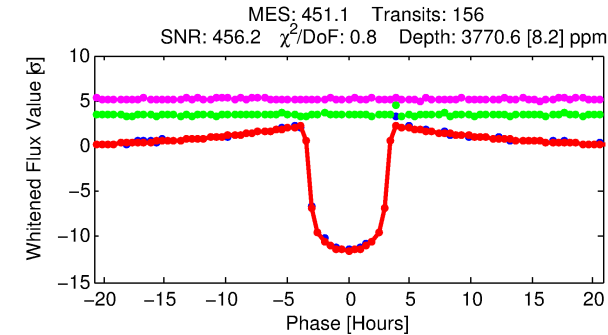
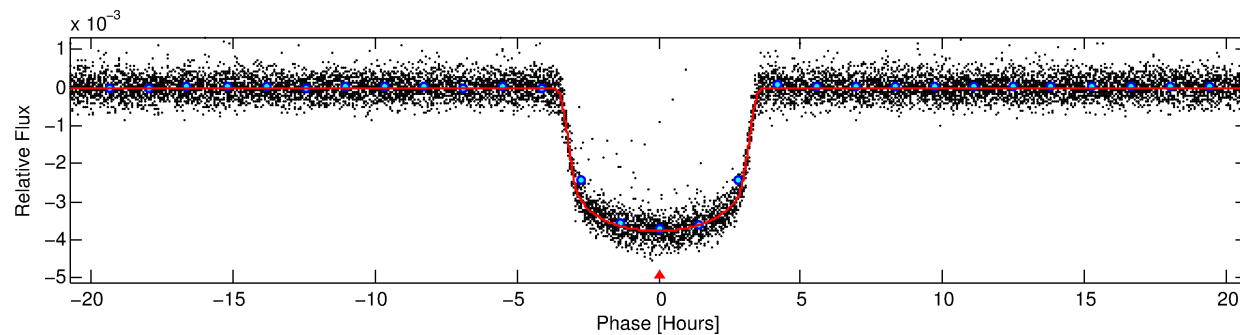
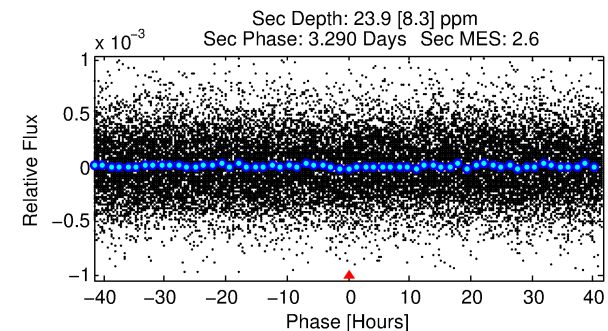
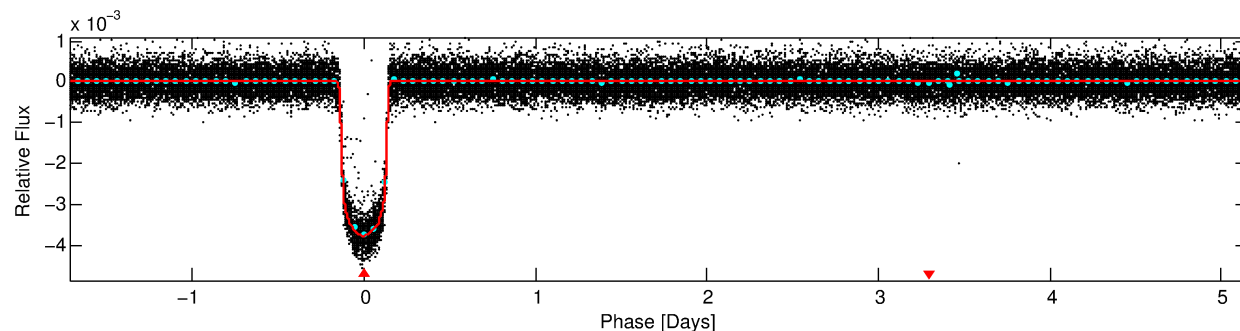
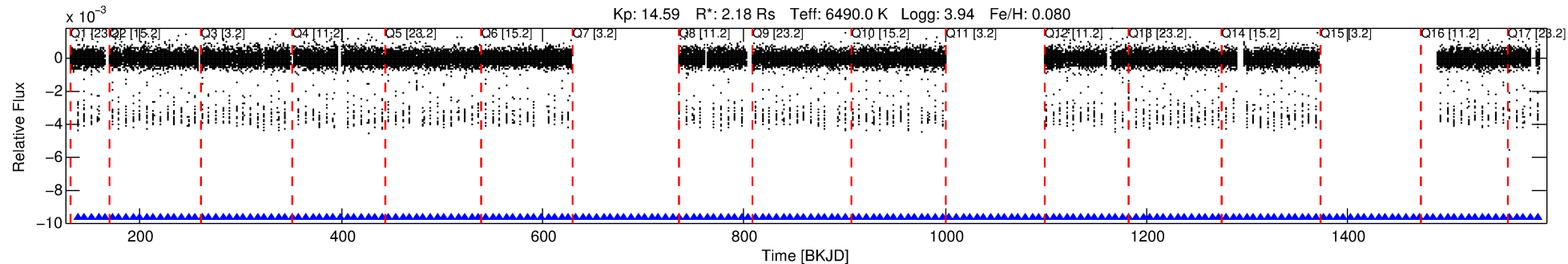
Ephemeris Match Information For 010418224-01

No Significant Match Found

DV One-Page Summary

KIC: 10418224 Candidate: 1 of 1 Period: 6.873 d
KOI: K00428.01 Name: Kepler-40b Corr: 0.995

Kp: 14.59 R*: 2.18 Rs Teff: 6490.0 K Logg: 3.94 Fe/H: 0.080



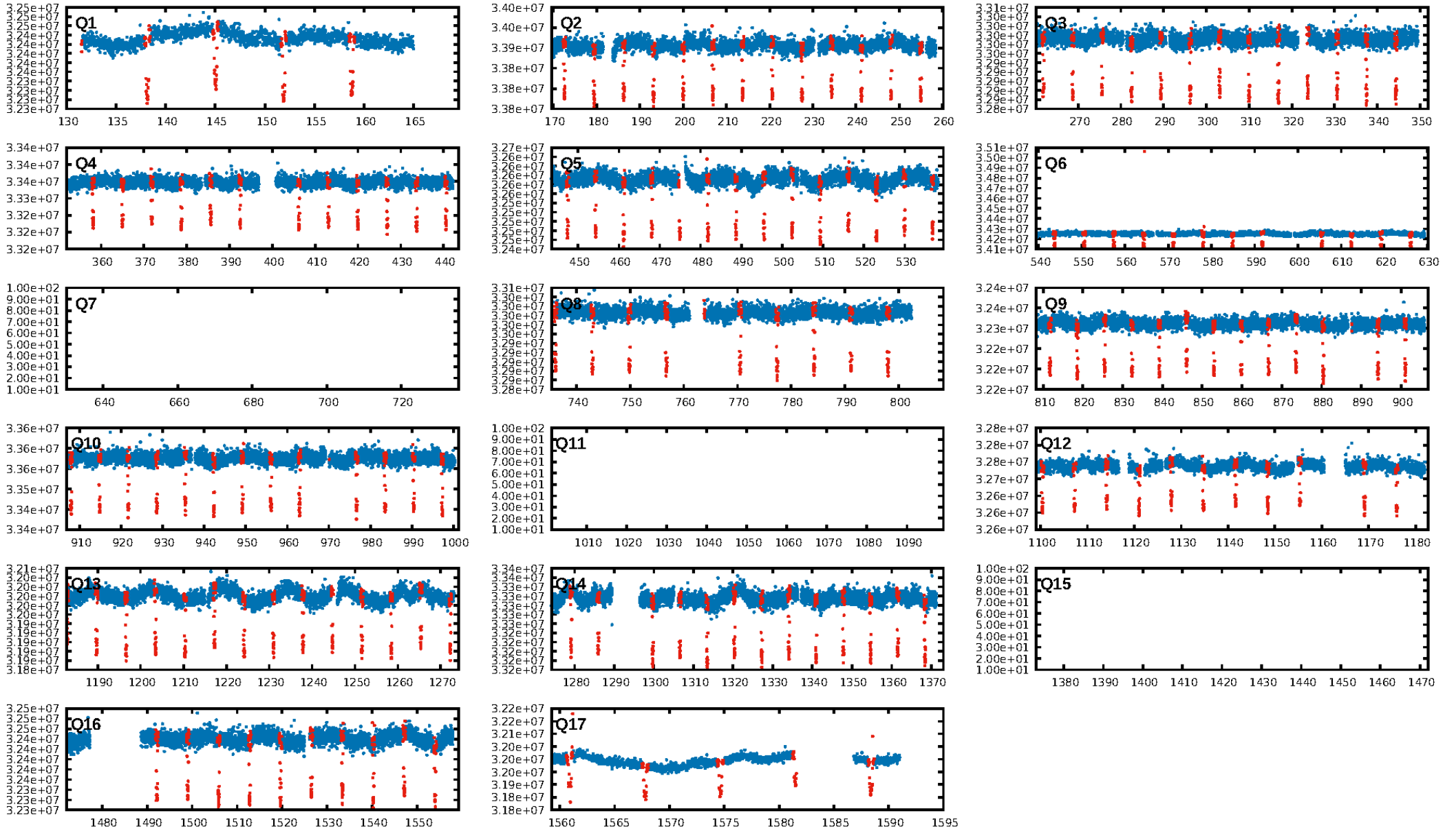
DV Fit Results:

Period = 6.87317 [0.00000] d
Epoch = 138.1532 [0.0002] BKJD
Rp/R* = 0.0576 [0.0004]
a/R* = 7.36 [0.26]
b = 0.43 [0.07]
Seff = 1142.45 [146.97]
Teq = 1482 [48] K
Rp = 13.69 [1.15] Re
a = 0.0813 [0.0057] AU
Ag = 0.46 [0.17] [-3.20σ]
Teffp = 1890 [169] K [2.32σ]

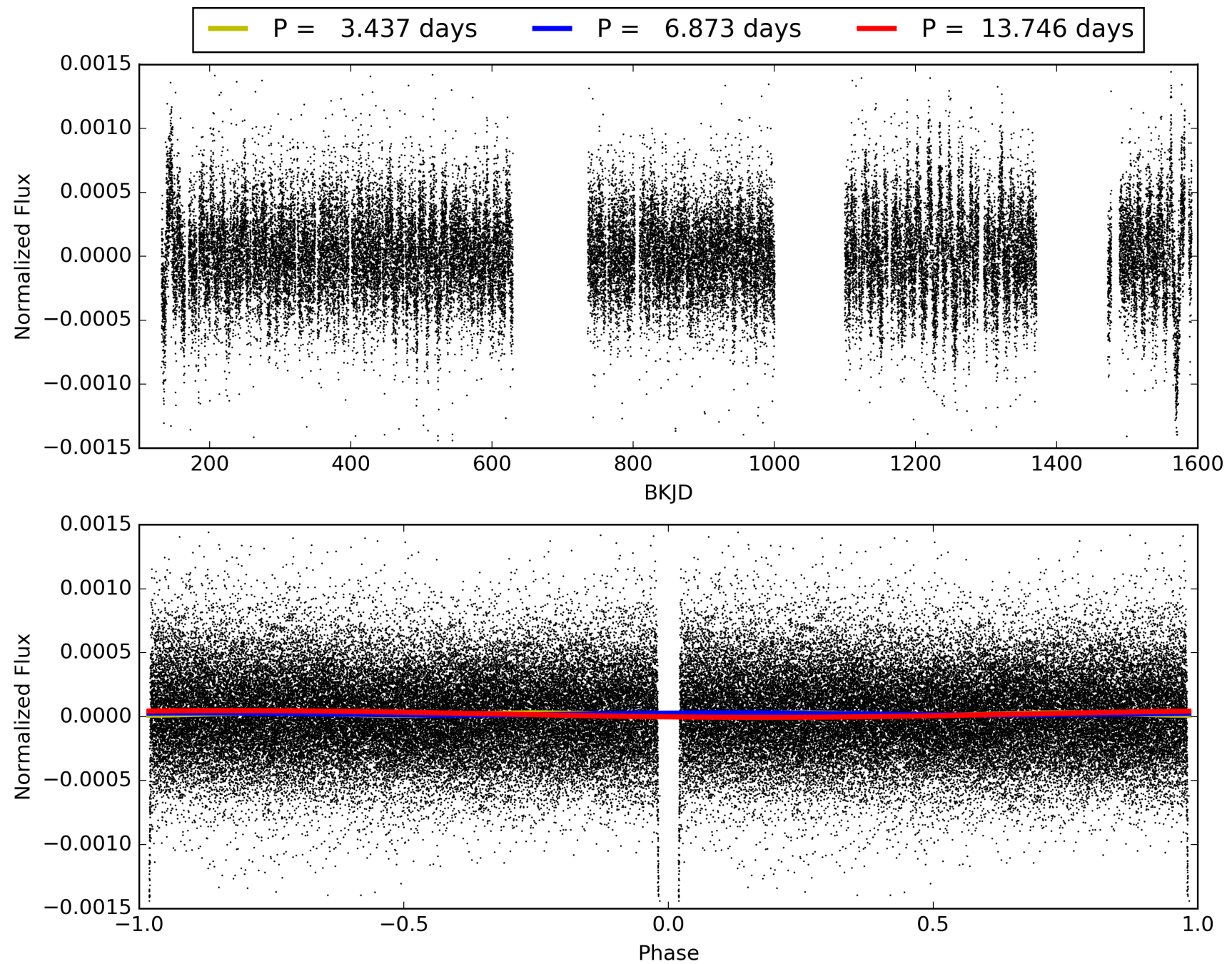
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 11.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [147/147]
GhostDiagnostic-chr: 7.709
Centroid-sig: 8.7%
Centroid-so: 0.211 arcsec [7.04σ]
OotOffset-rm: 0.021 arcsec [0.31σ]
KicOffset-rm: 0.164 arcsec [2.36σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 010418224-01, PDC Light Curves

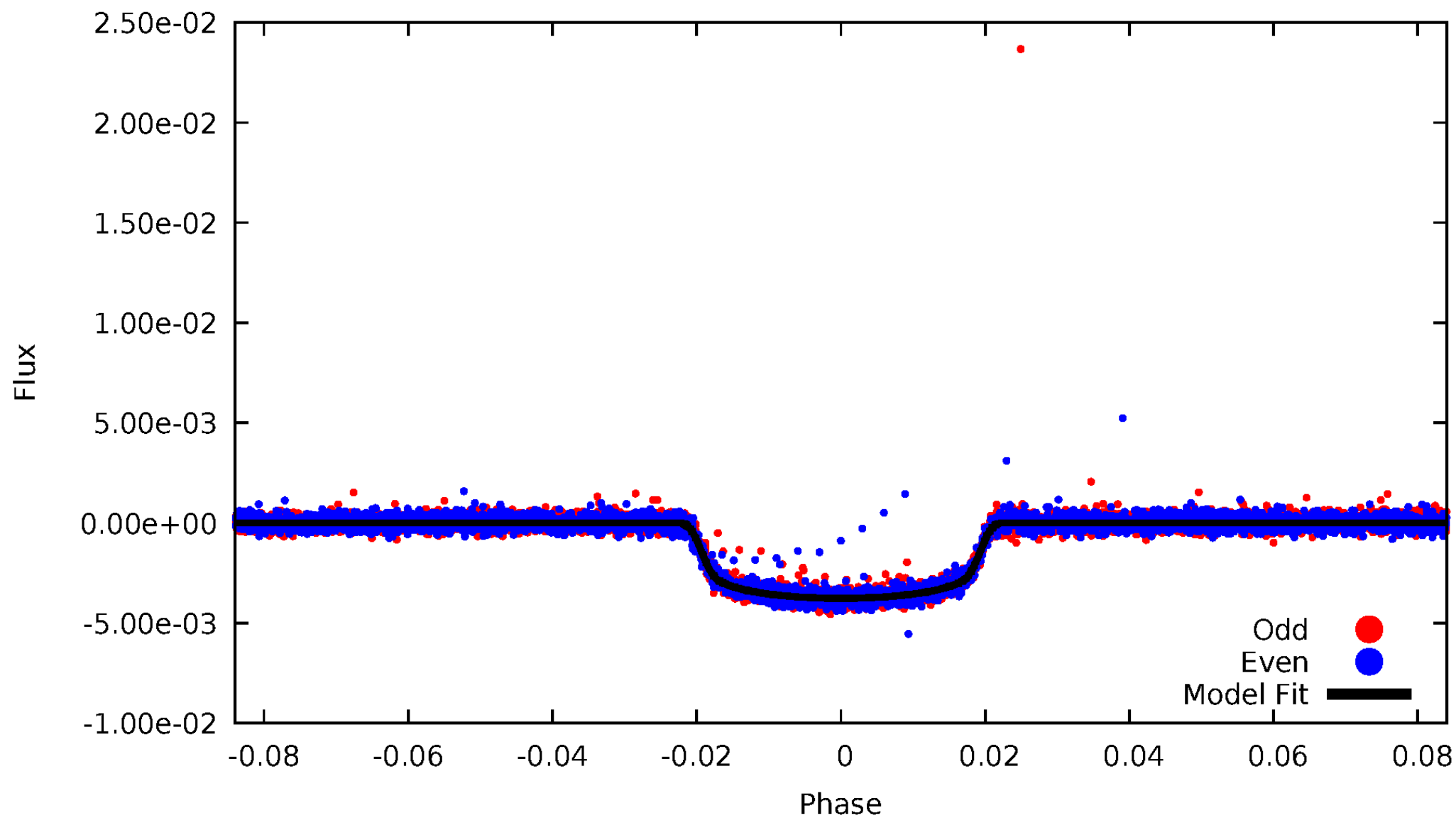


TCE 010418224-01



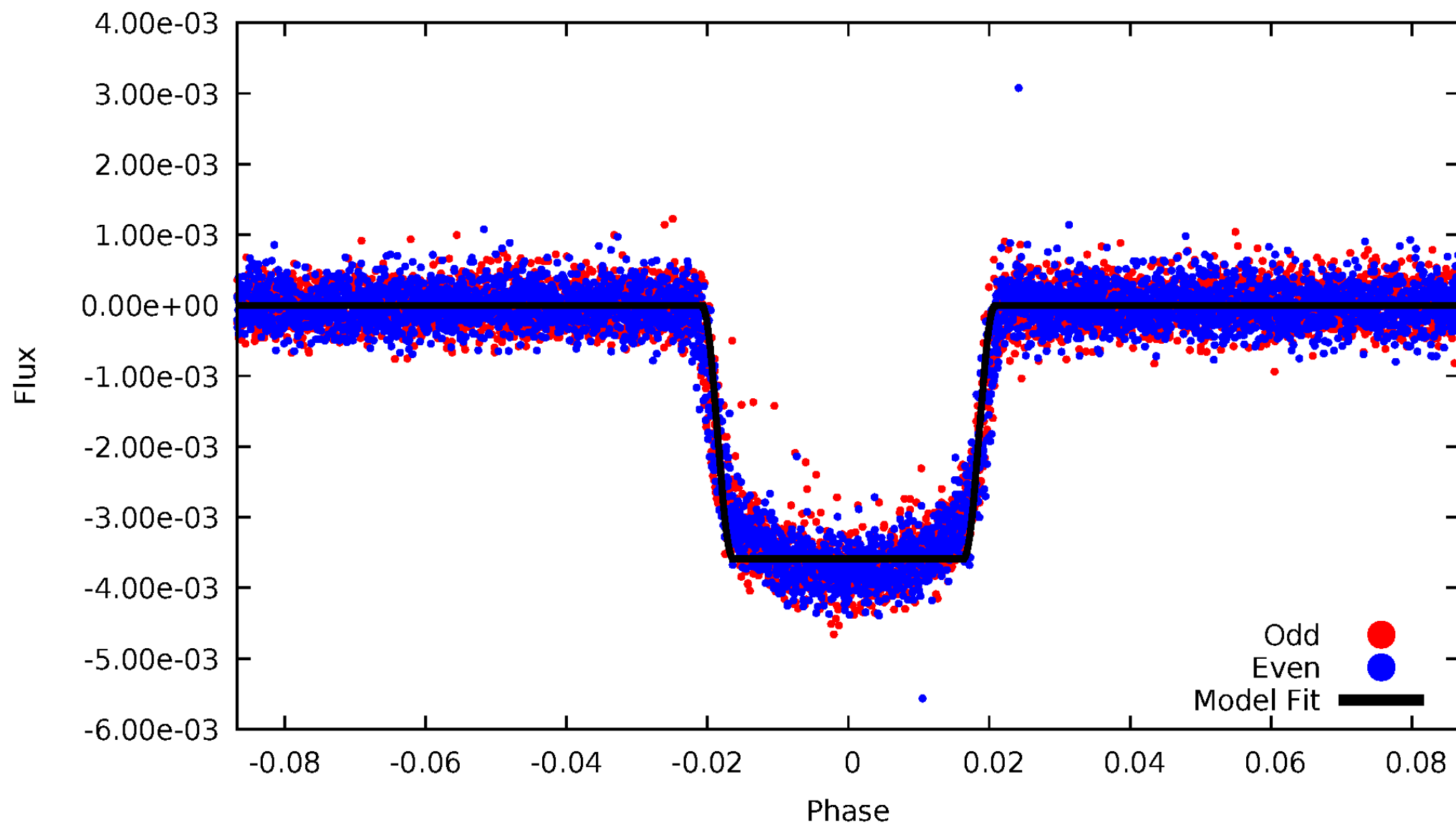
DV Odd/Even

TCE 010418224-01



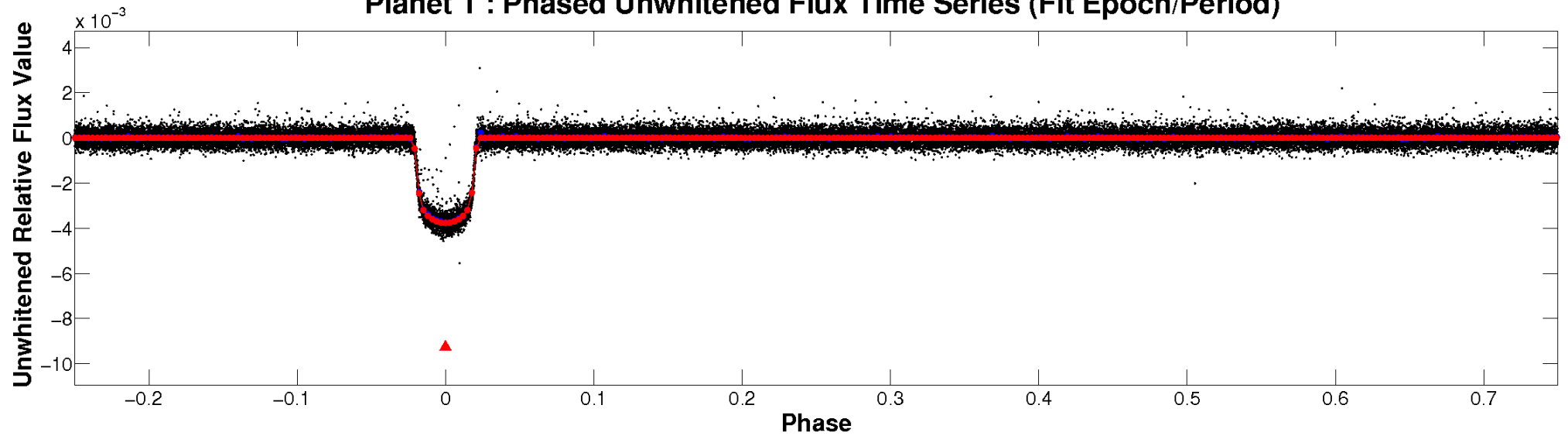
ALT Odd/Even

TCE 010418224-01

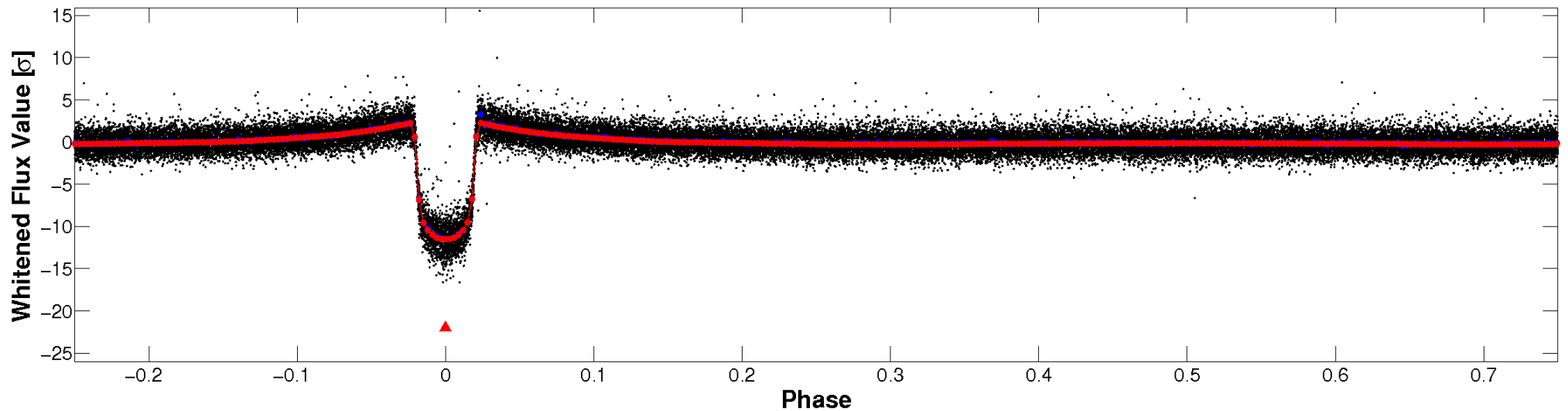


Non-Whitened Vs. Whitened Light Curve

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

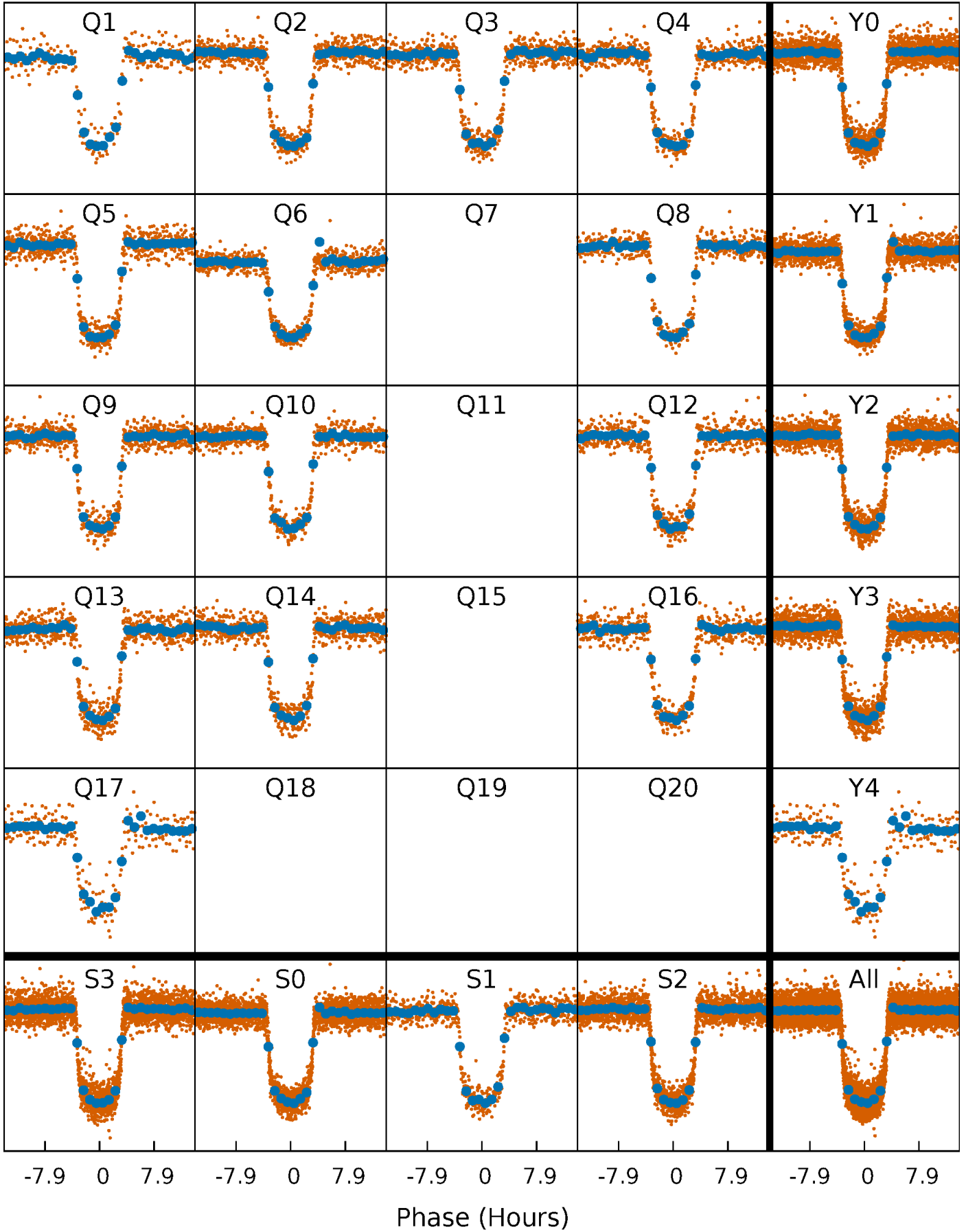


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



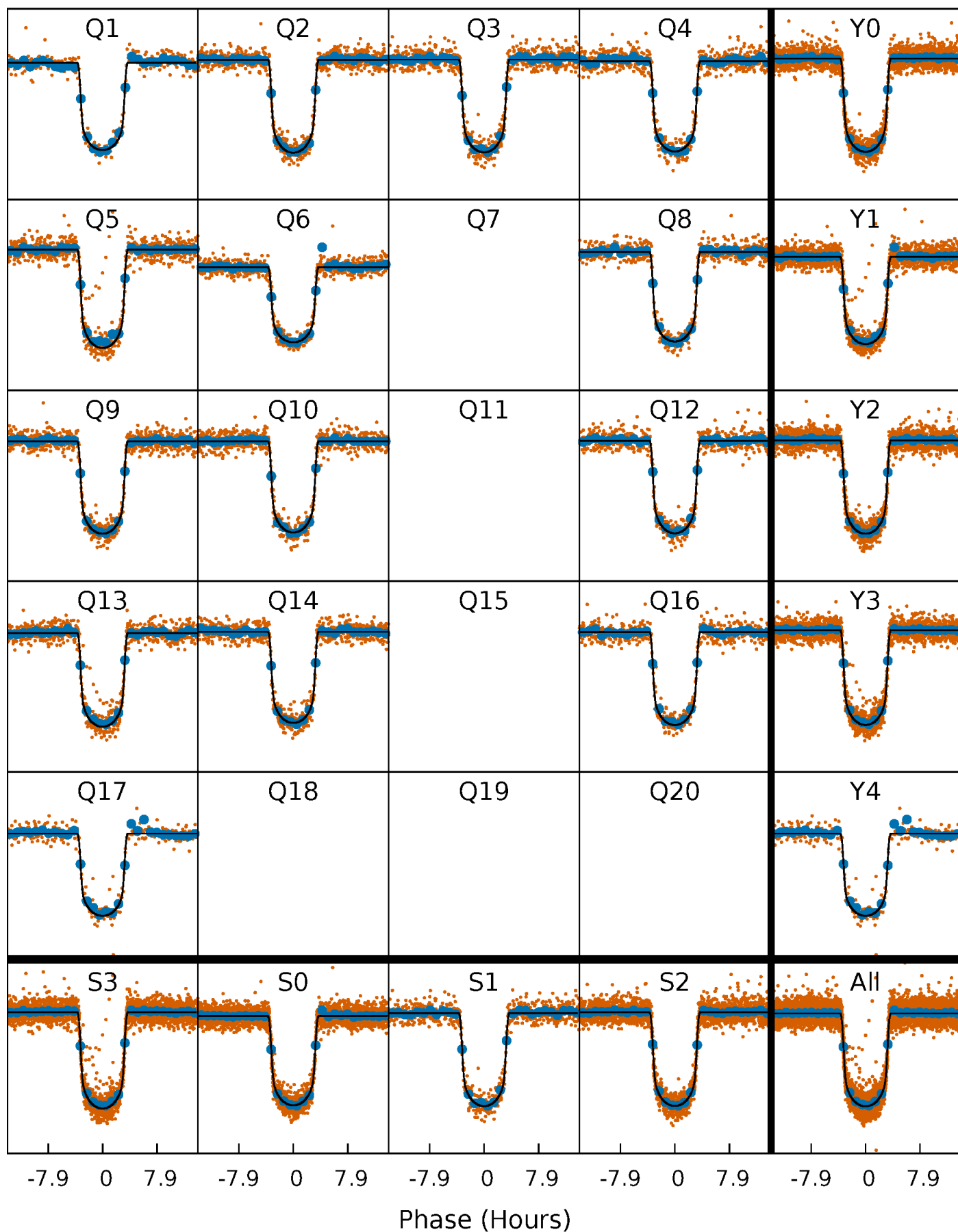
PDC Quarter-Phased Transit Curves

TCE 010418224-01 P= 6.873165 Days $T_0=138.153165$ (BKJD)



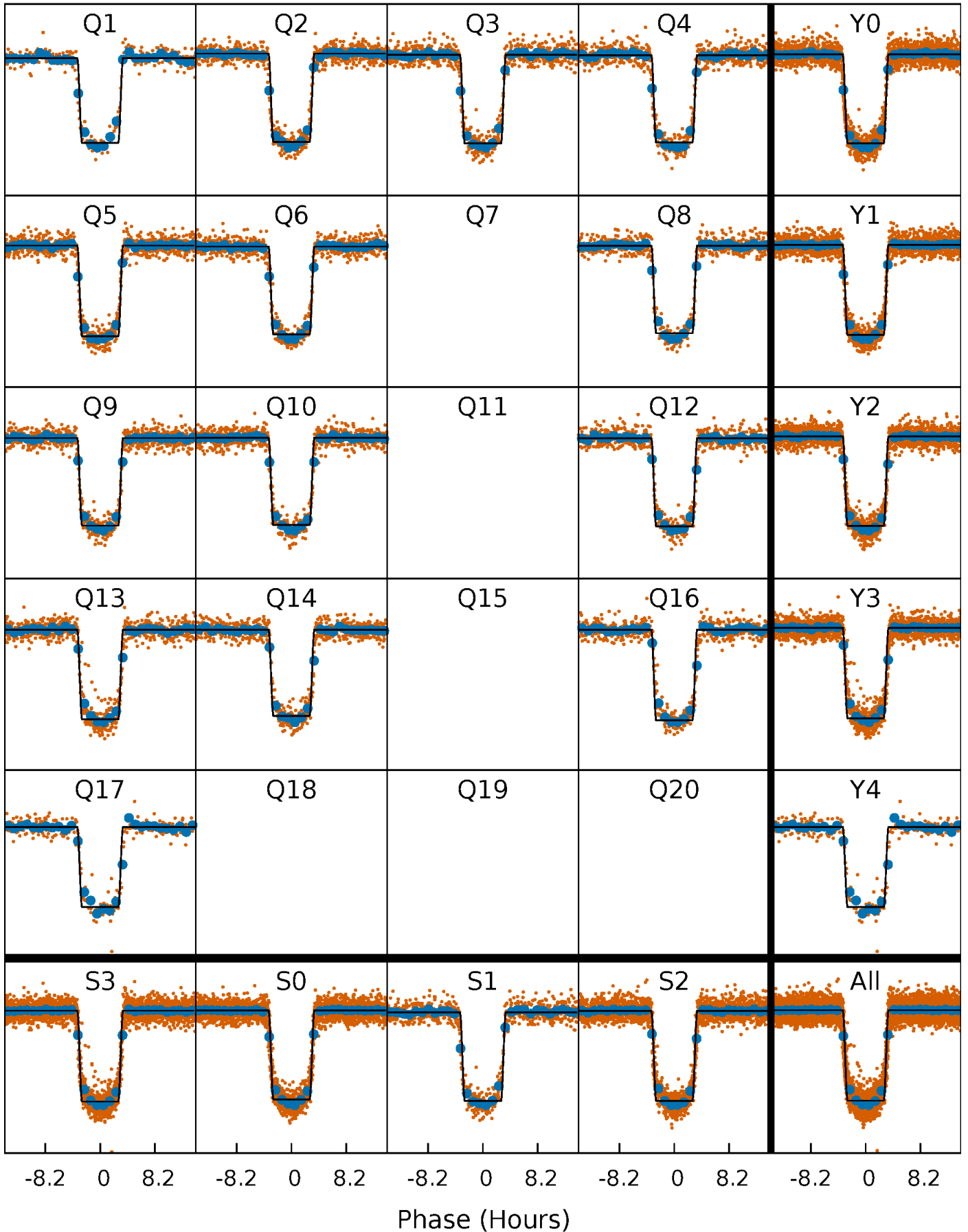
DV Quarter-Phased Transit Curves

TCE 010418224-01 P= 6.873165 Days $T_0=138.153165$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

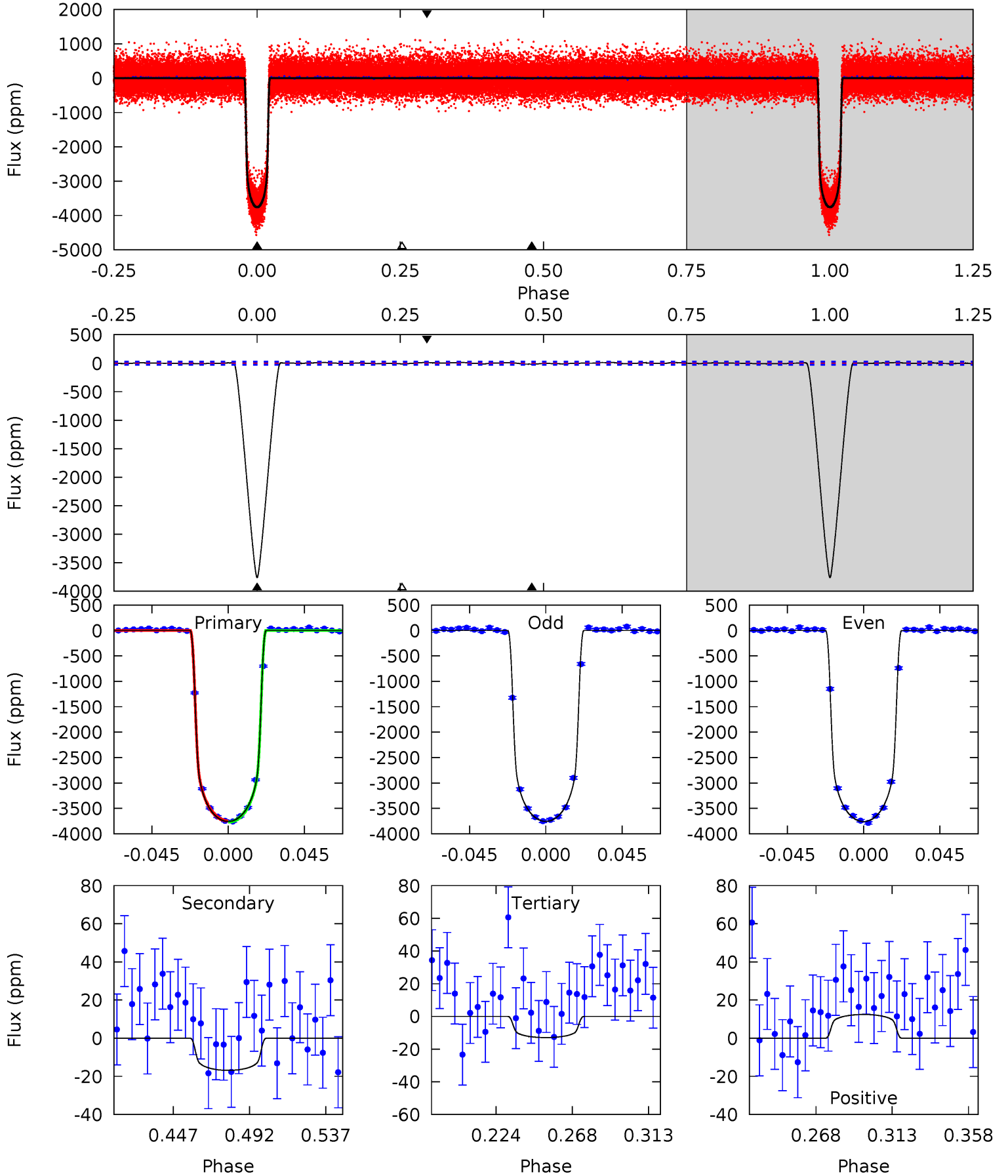
TCE 010418224-01 P= 6.873092 Days $T_0=138.160235$ (BKJD)



DV Model-Shift Uniqueness Test

010418224-01, P = 6.873165 Days, E = 131.280000 Days

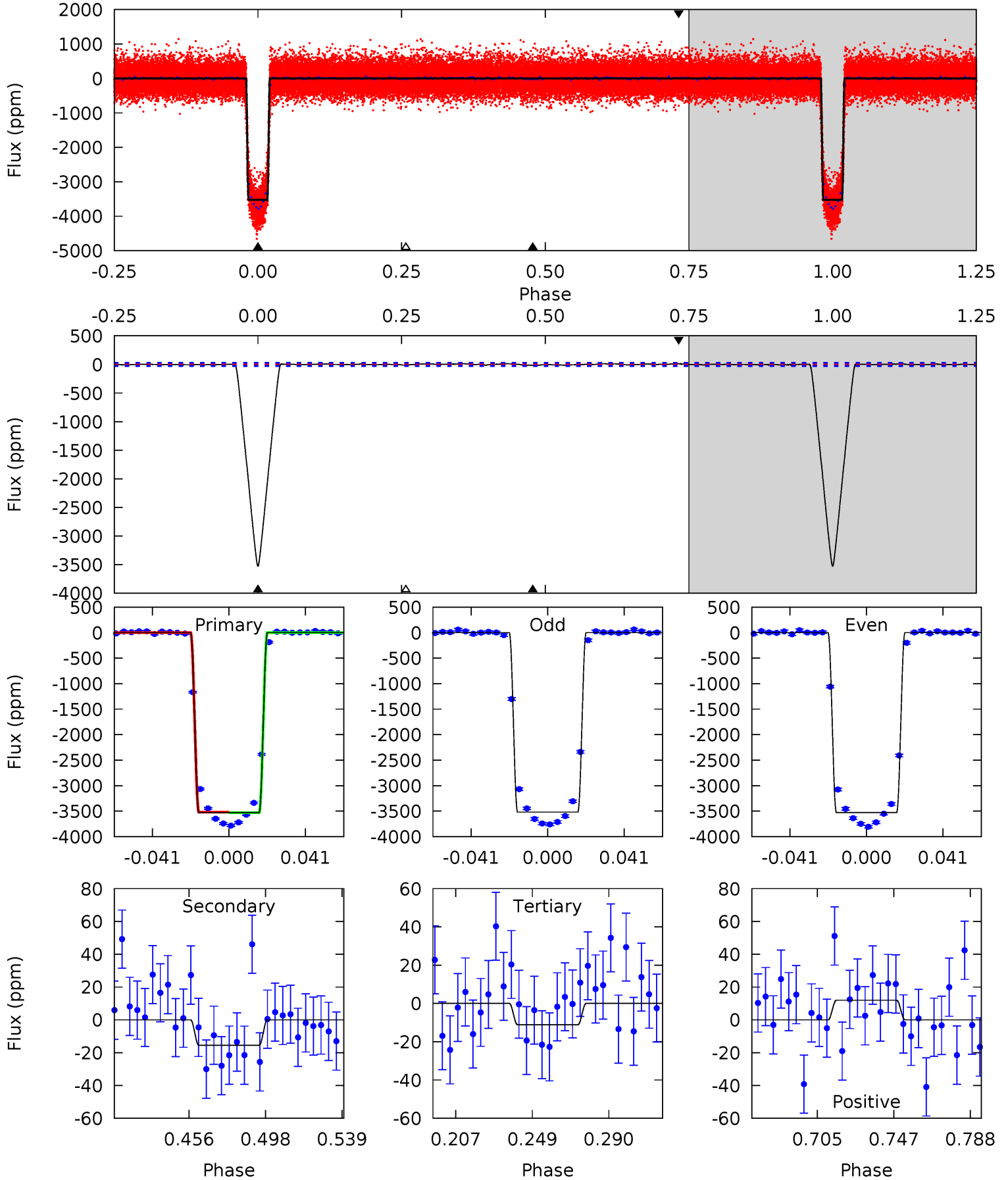
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
668.1	3.00	2.30	2.21	4.73	2.01	1.08	665.8	665.9	0.69	0.79	0.31	0.99	0.00	2.06



Alt Model-Shift Uniqueness Test

010418224-01, P = 6.873092 Days, E = 131.287143 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
608.1	2.68	1.92	2.06	4.75	2.04	0.90	606.2	606.1	0.76	0.61	0.74	1.00	0.00	1.25



Stellar Parameters For KIC 010418224

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6490^{+129}_{-129}	$3.942^{+0.055}_{-0.049}$	$0.080^{+0.150}_{-0.150}$	$2.179^{+0.166}_{-0.182}$	$1.516^{+0.093}_{-0.105}$	$0.206^{+0.049}_{-0.033}$
	+2%/-2%	+1%/-1%	+188%/-188%	+8%/-8%	+6%/-7%	+24%/-16%
Source	SPE39	TRA39	SPE39	DSEP		

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

Secondary Eclipse Parameters for KIC 010418224-01 / KOI 0428.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-17 ± 6	$13.71^{+0.63}_{-0.68}$	2071^{+59}_{-59}	1966^{+346}_{-4159}	$0.331^{+0.112}_{-0.114}$
Alt.	-16 ± 6	$14.26^{+0.62}_{-0.71}$	2069^{+59}_{-61}	-1933^{+4139}_{-373}	$0.276^{+0.117}_{-0.106}$

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 $A_{obs} \gg 1.0$

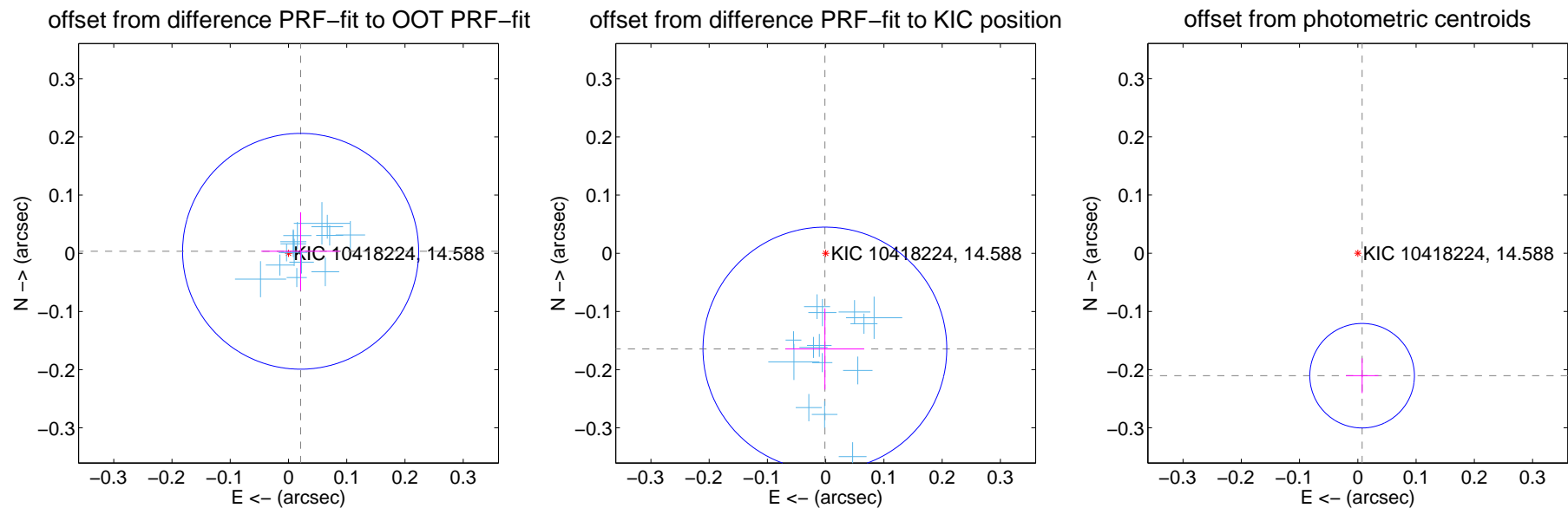
DV Centroid Data

Supplemental centroid analysis for 010418224-01. Kepler magnitude: 14.59. Transit SNR 456.18

There are 14 quarters with good PRF difference image offsets

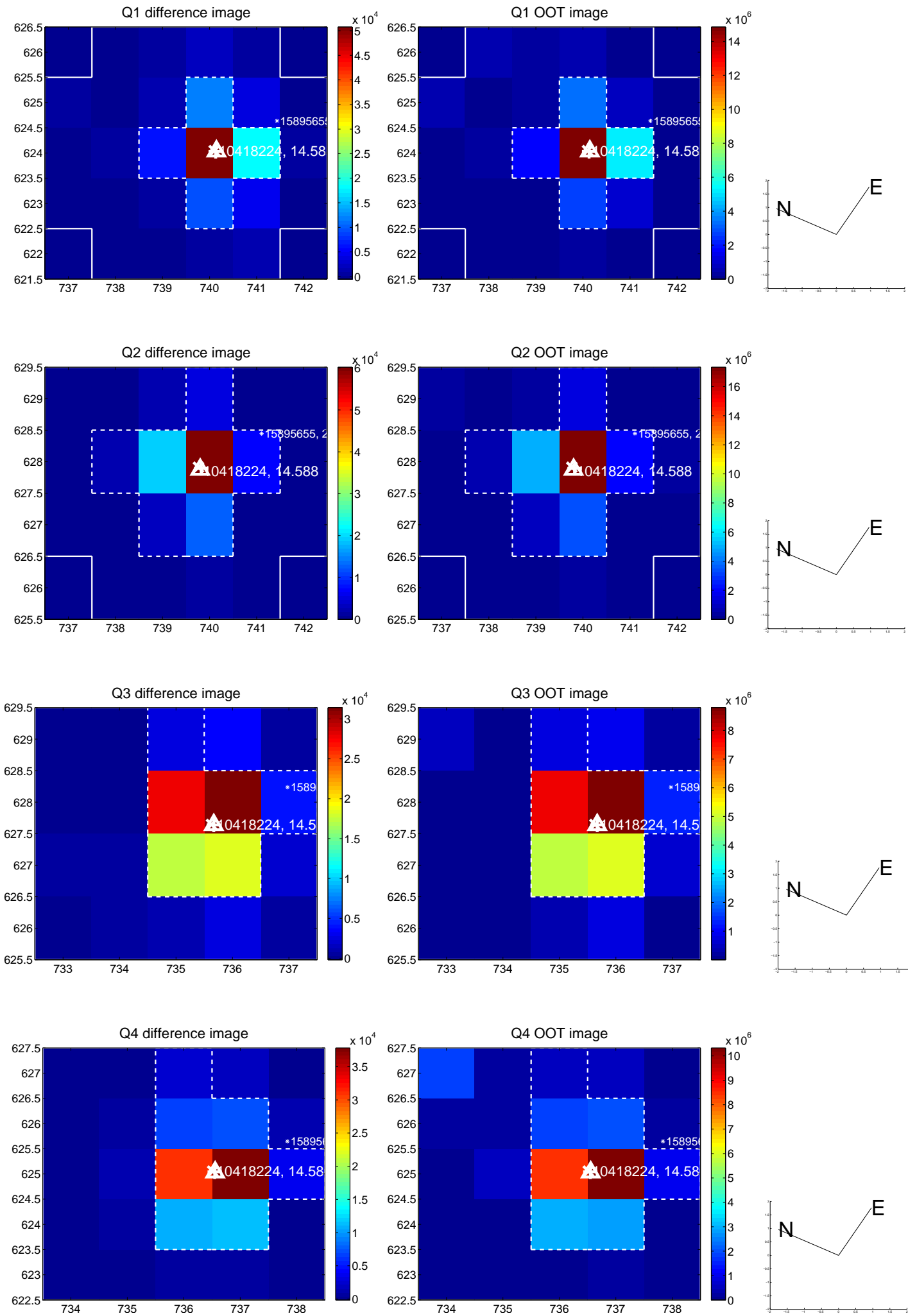
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.021 ± 0.068	0.31	-0.021 ± 0.067	0.003 ± 0.067
PRF-fit source offset from KIC position	0.164 ± 0.070	2.36	0.001 ± 0.068	-0.164 ± 0.070
photometric centroid source offset	0.21 ± 0.03	7.04	-0.01 ± 0.03	-0.21 ± 0.03

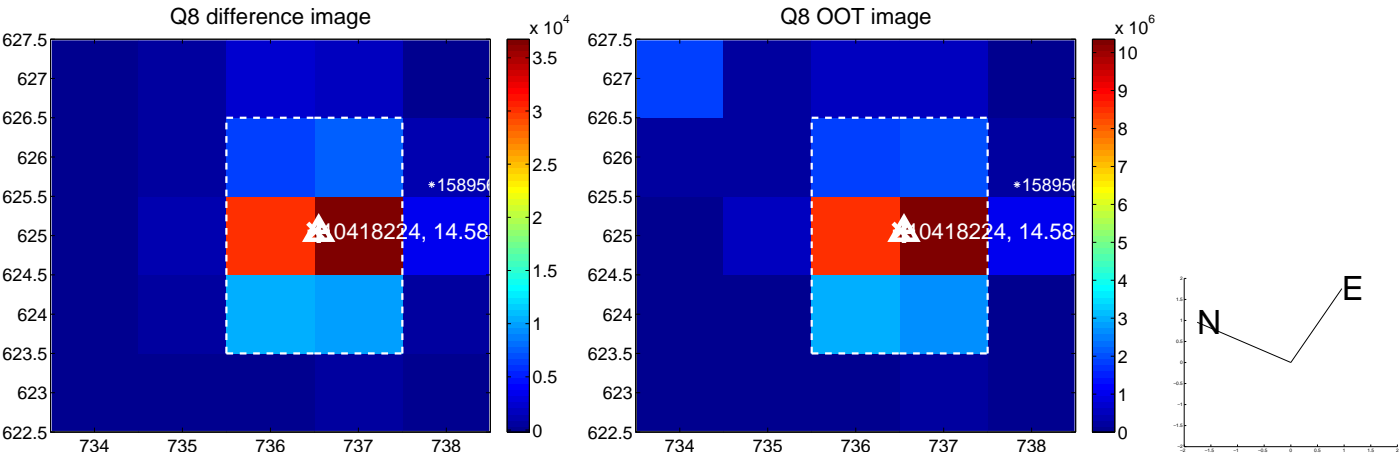
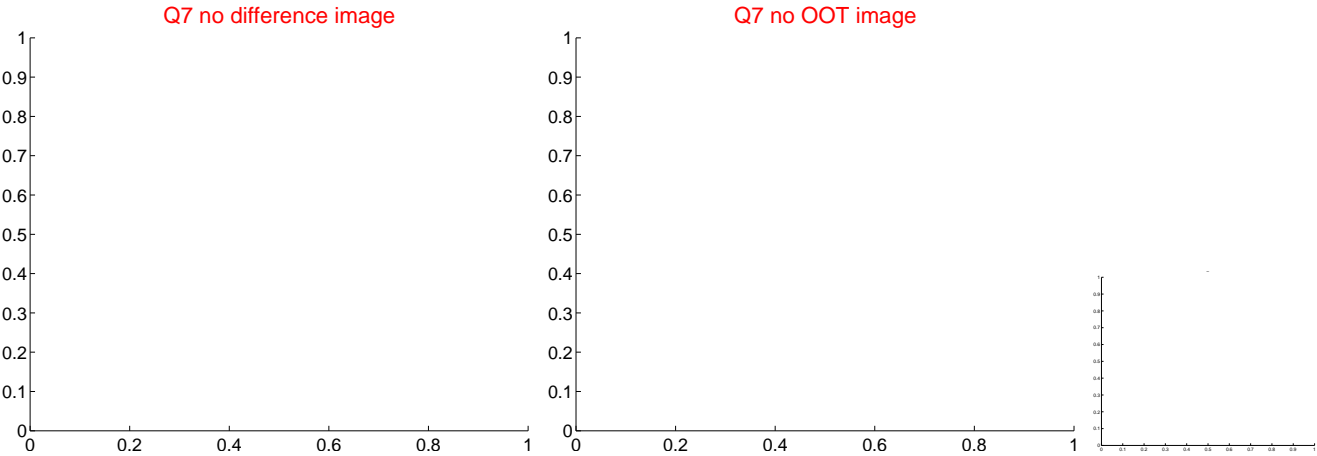
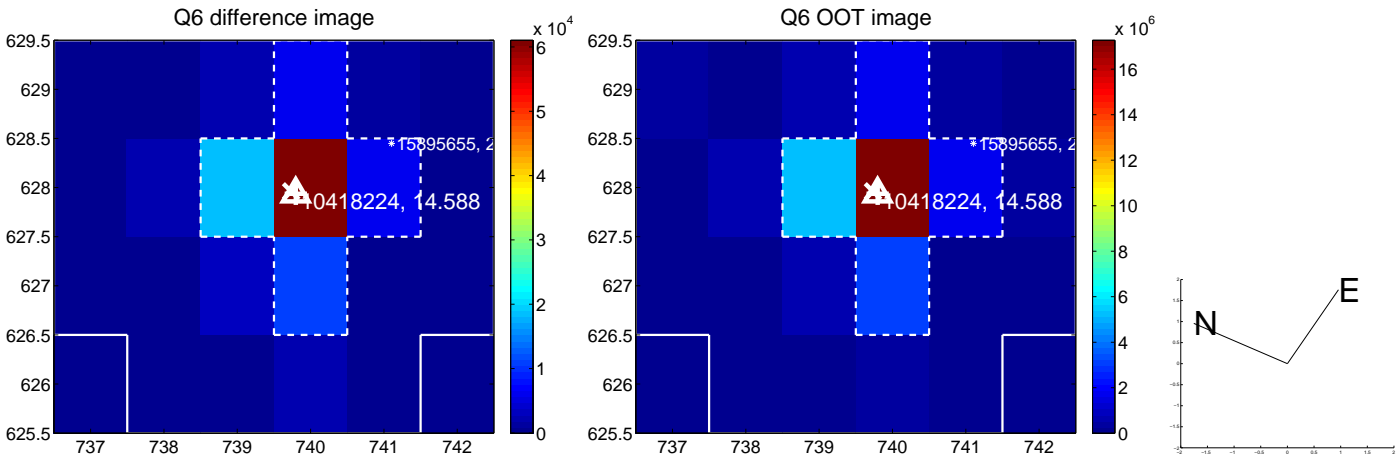
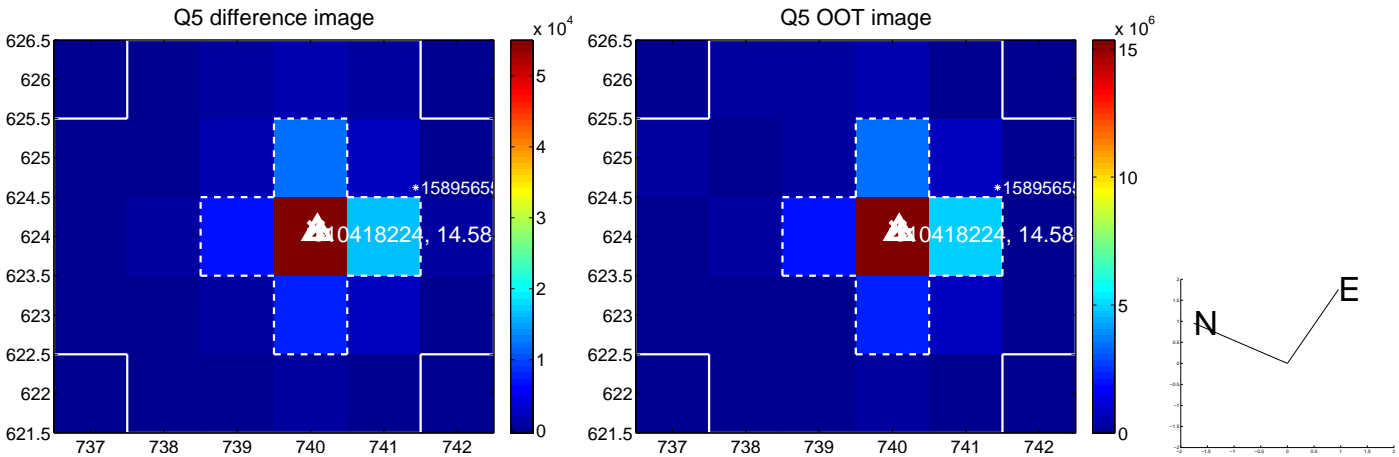


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

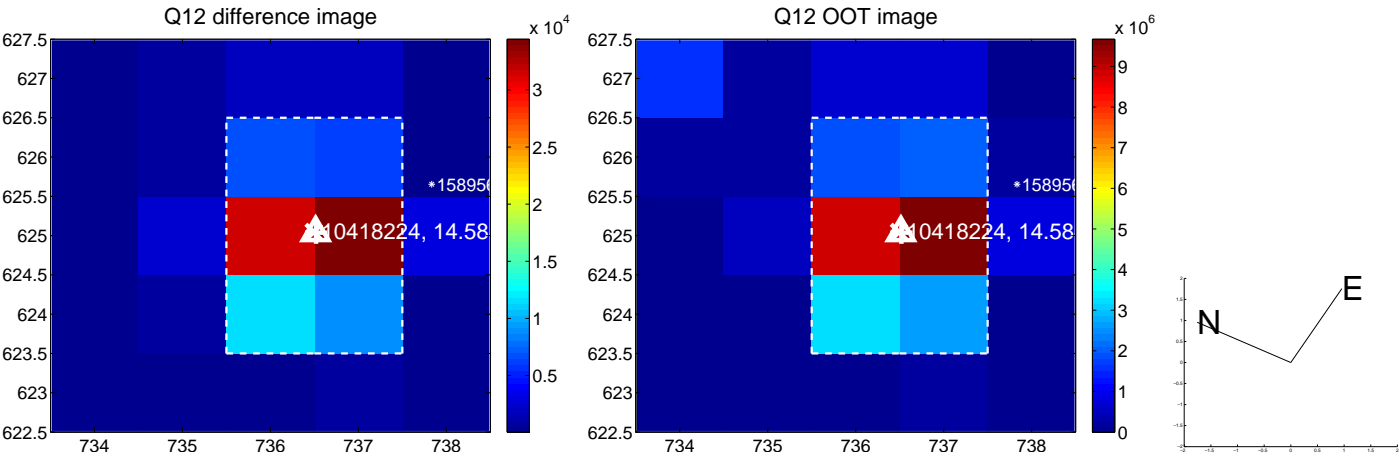
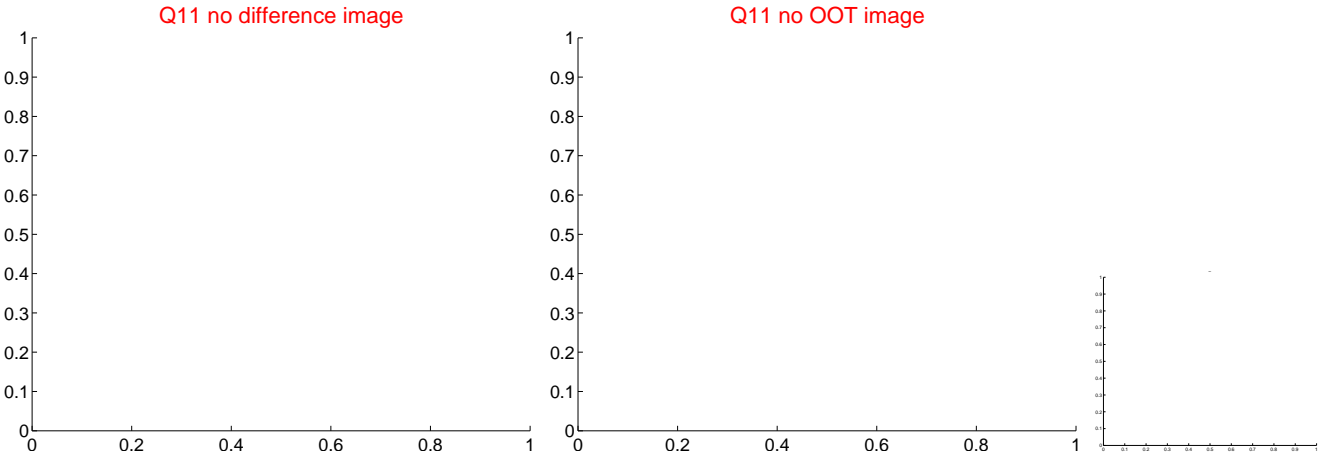
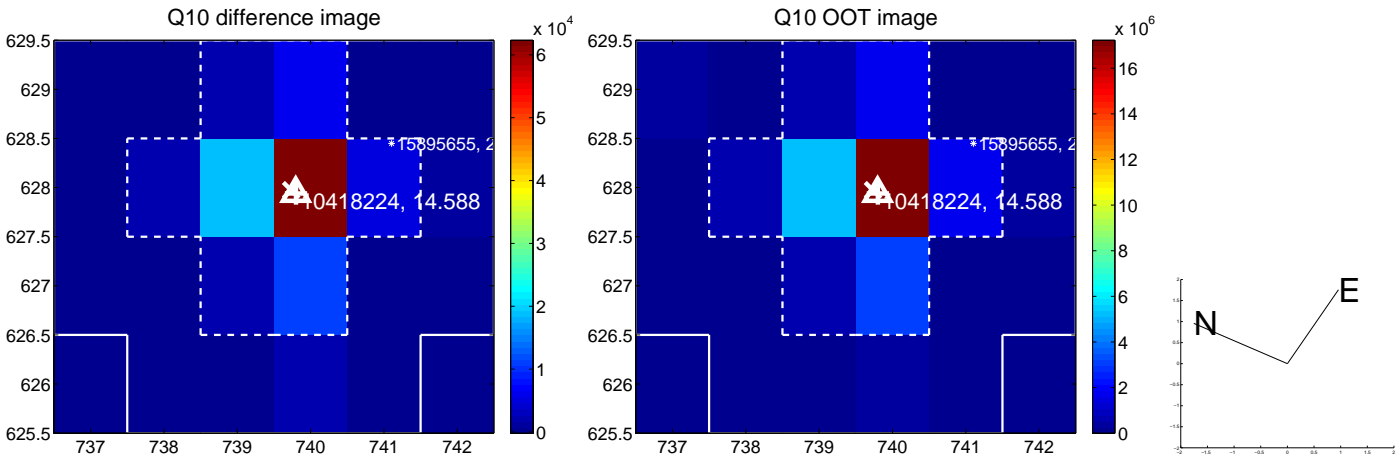
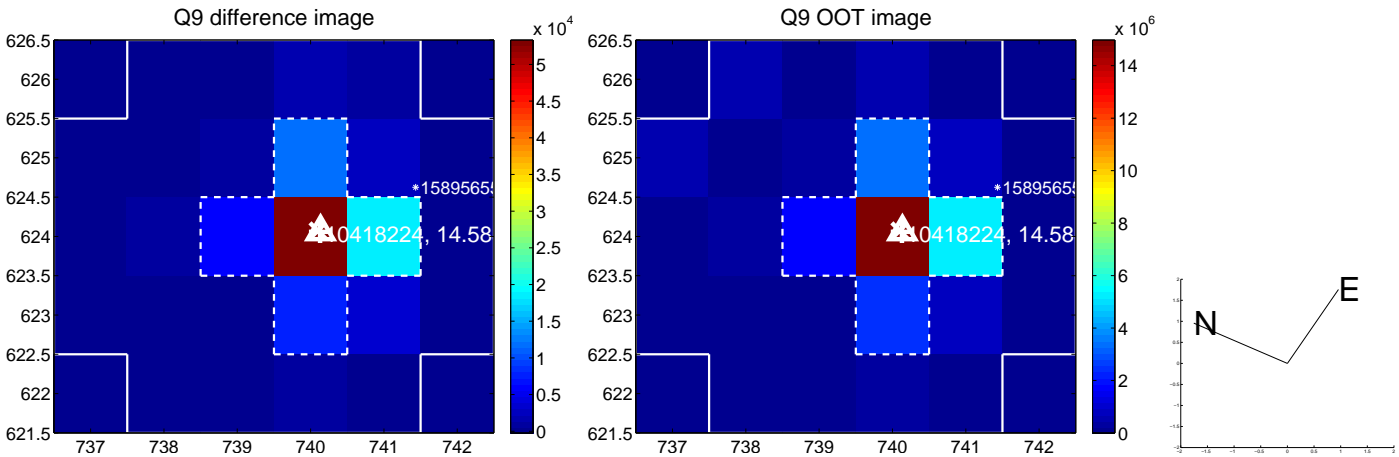
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



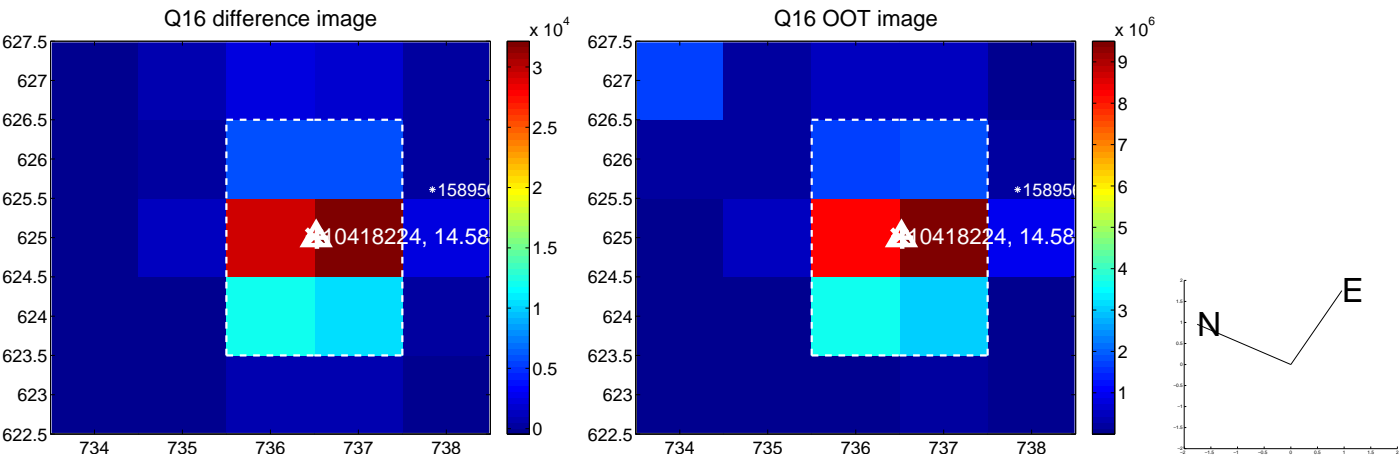
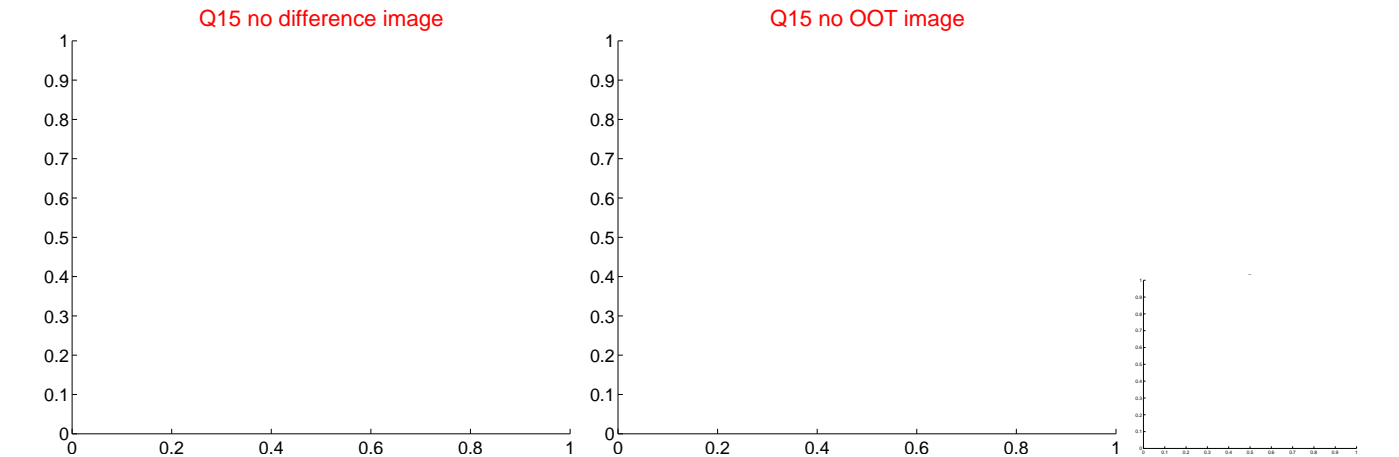
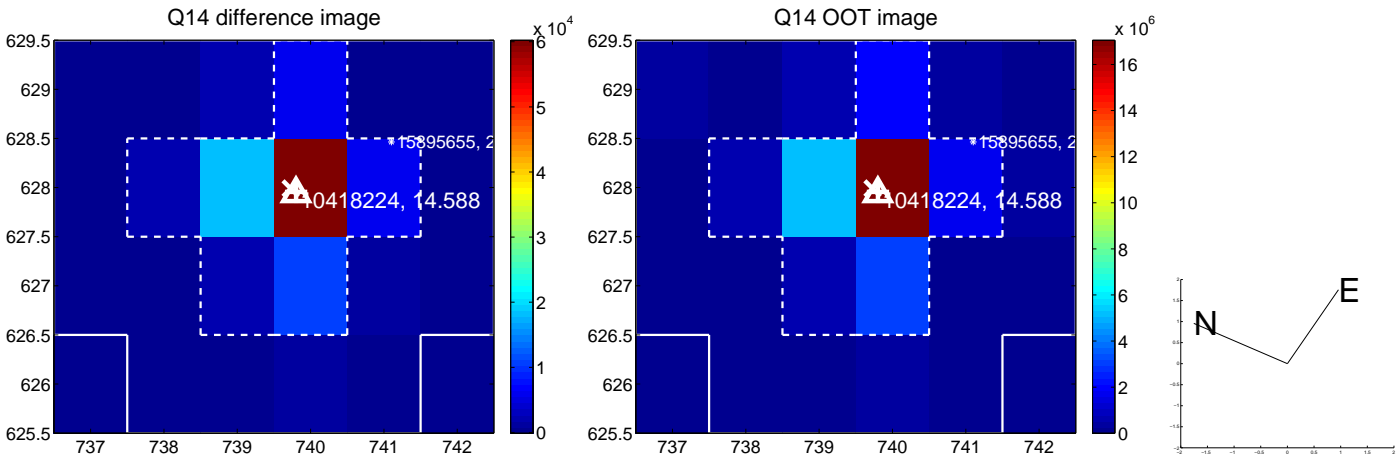
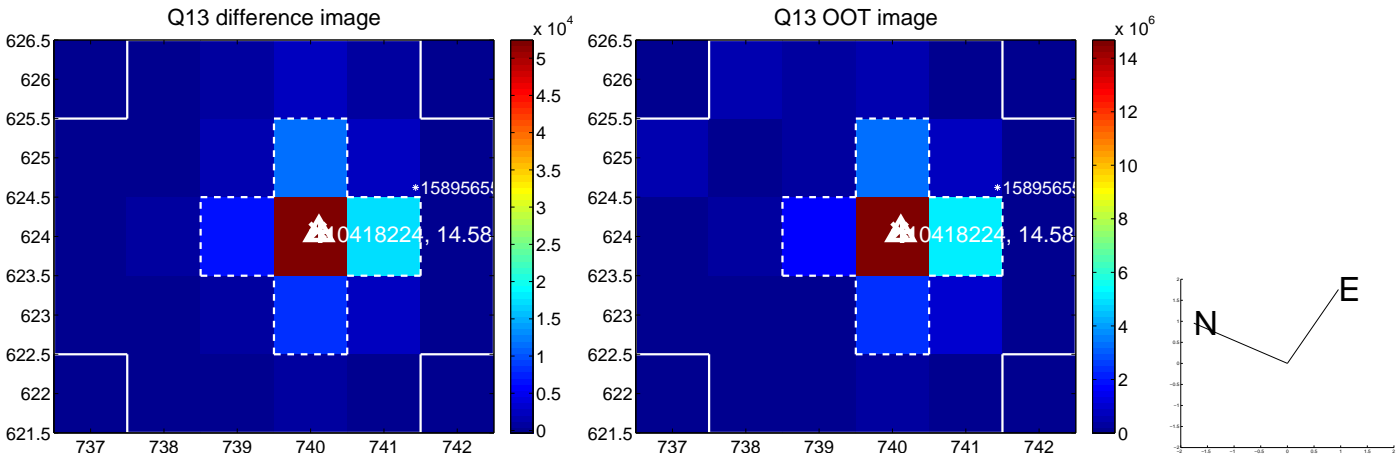
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



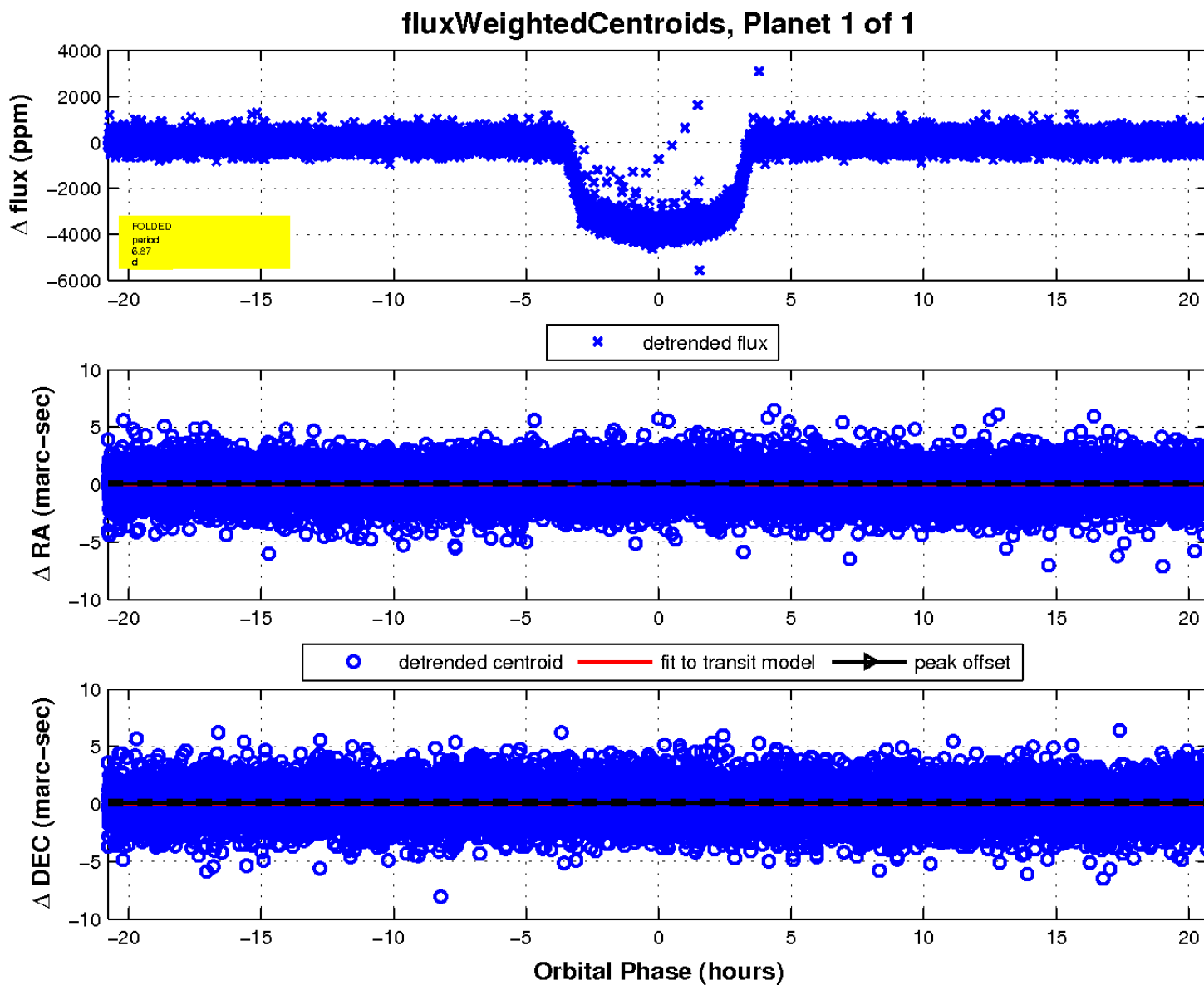
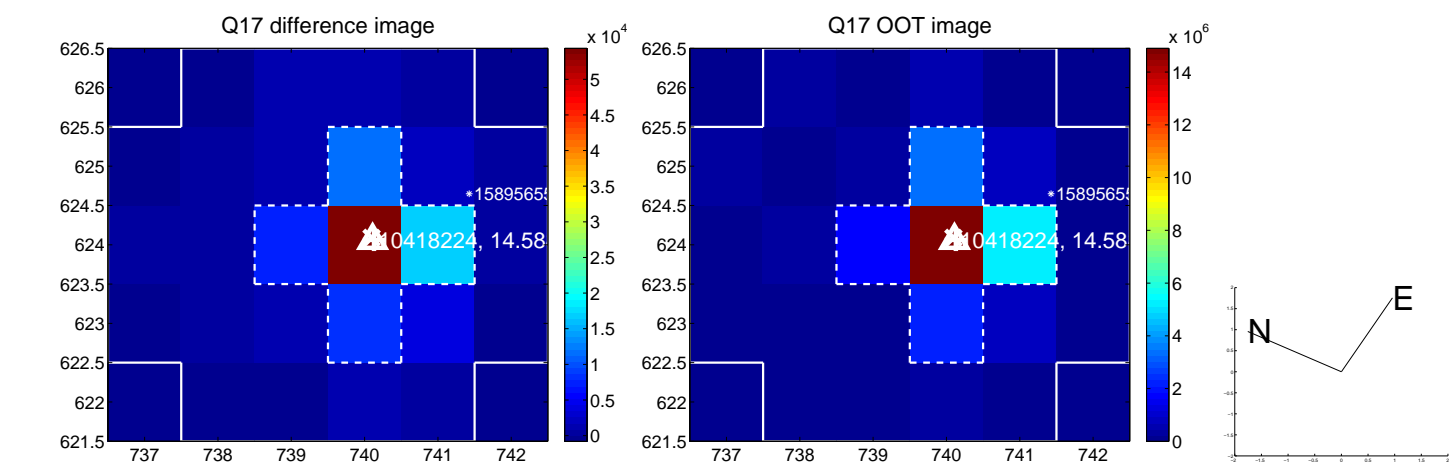
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image

Declination

