

# KIC 008164012

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008164012-01	OBS	2116.01	1.252744	131.919190	169.9	2.281	25.0	33.8	1.71	5907	2.64	5533.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008164012-01	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.

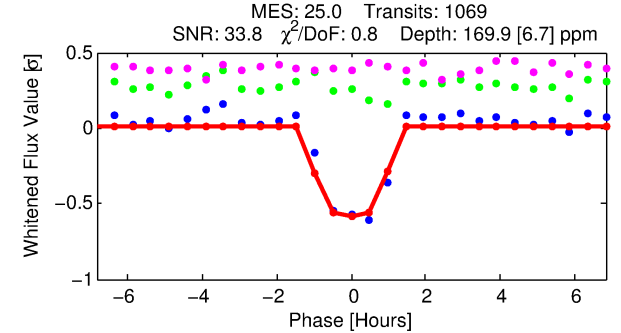
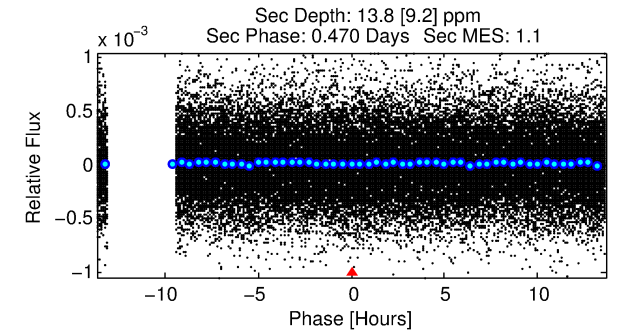
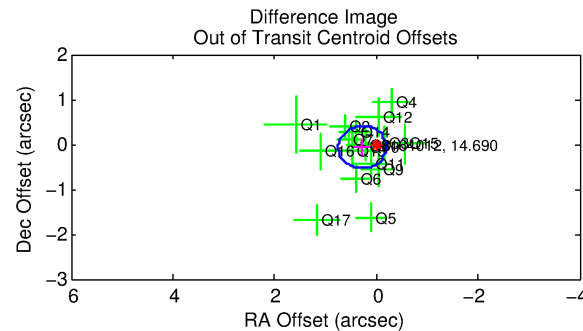
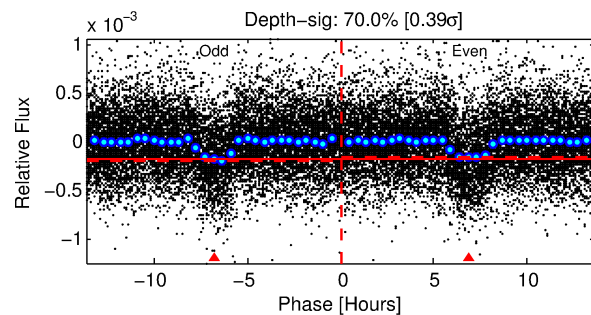
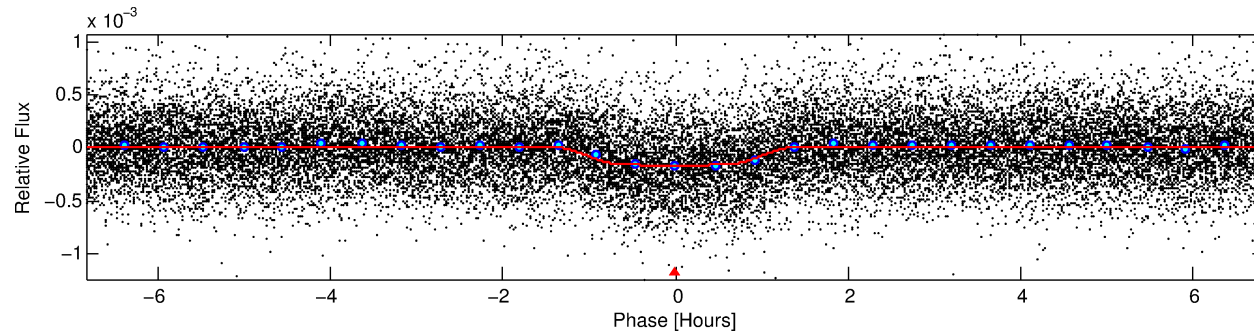
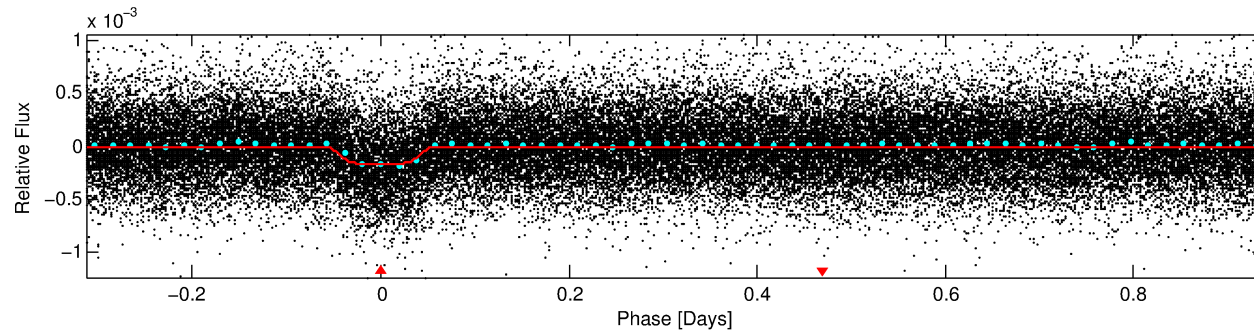
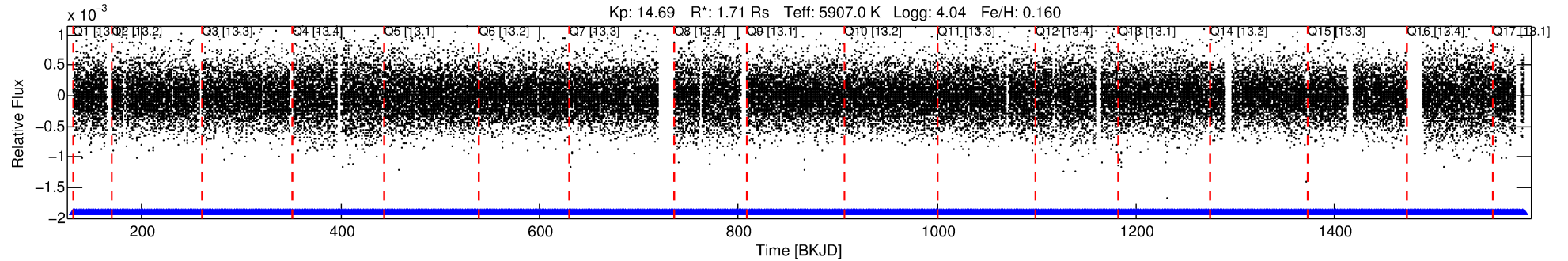
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008164012-01

No Significant Match Found

# DV One-Page Summary

KIC: 8164012 Candidate: 1 of 1 Period: 1.253 d  
KOI: K02116.01 Corr: 0.945



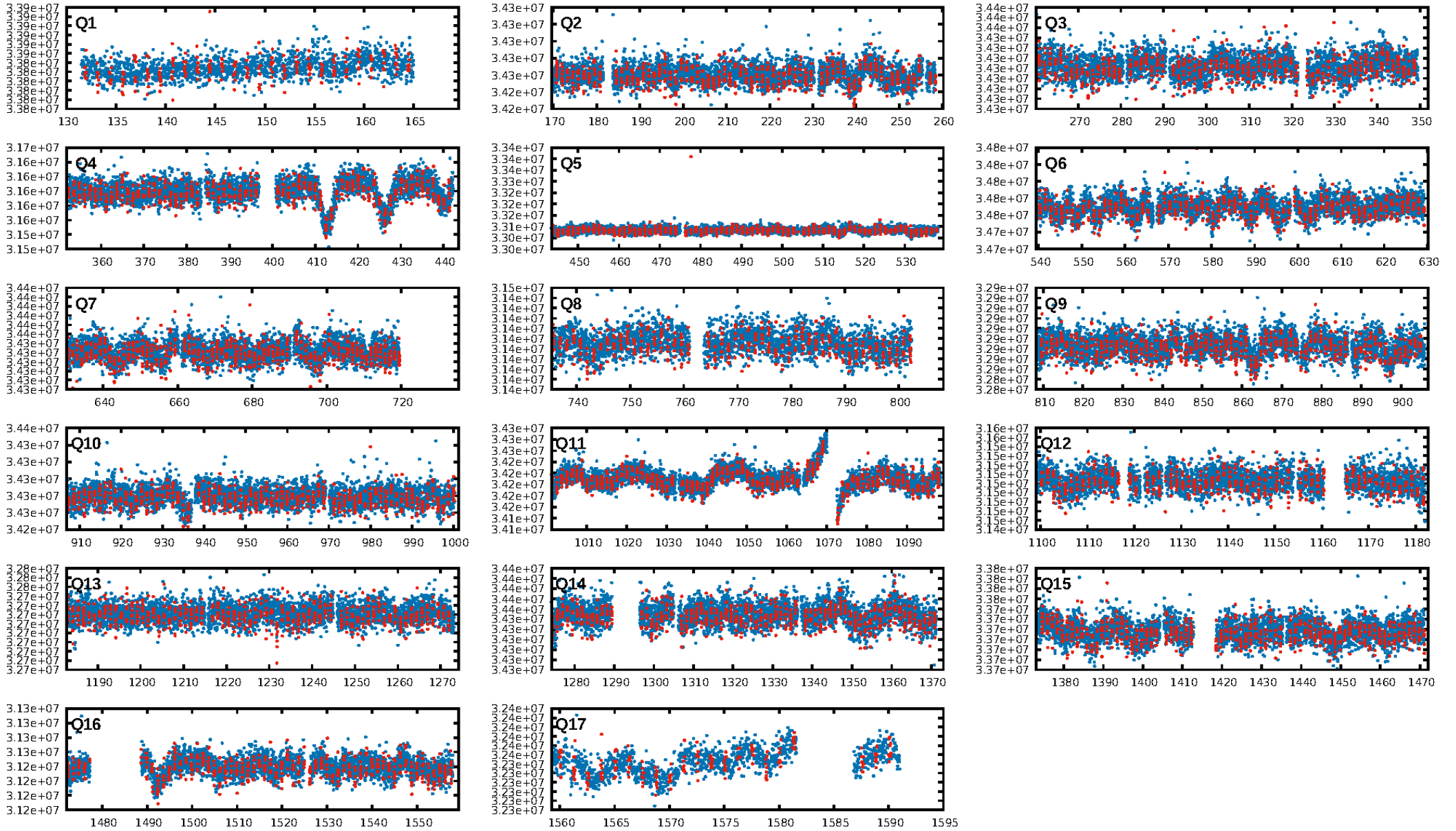
## DV Fit Results:

Period = 1.25274 [0.00000] d  
Epoch = 131.9192 [0.0010] BKJD  
Rp/R\* = 0.0142 [0.0031]  
a/R\* = 2.17 [1.85]  
b = 0.90 [0.23]  
Seff = 5533.87 [1892.48]  
Teq = 2199 [188] K  
Rp = 2.64 [0.84] Re  
a = 0.0239 [0.0051] AU  
Ag = 0.62 [0.54] [-0.69 $\sigma$ ]  
Teffp = 3023 [605] K [1.30 $\sigma$ ]

## DV Diagnostic Results:

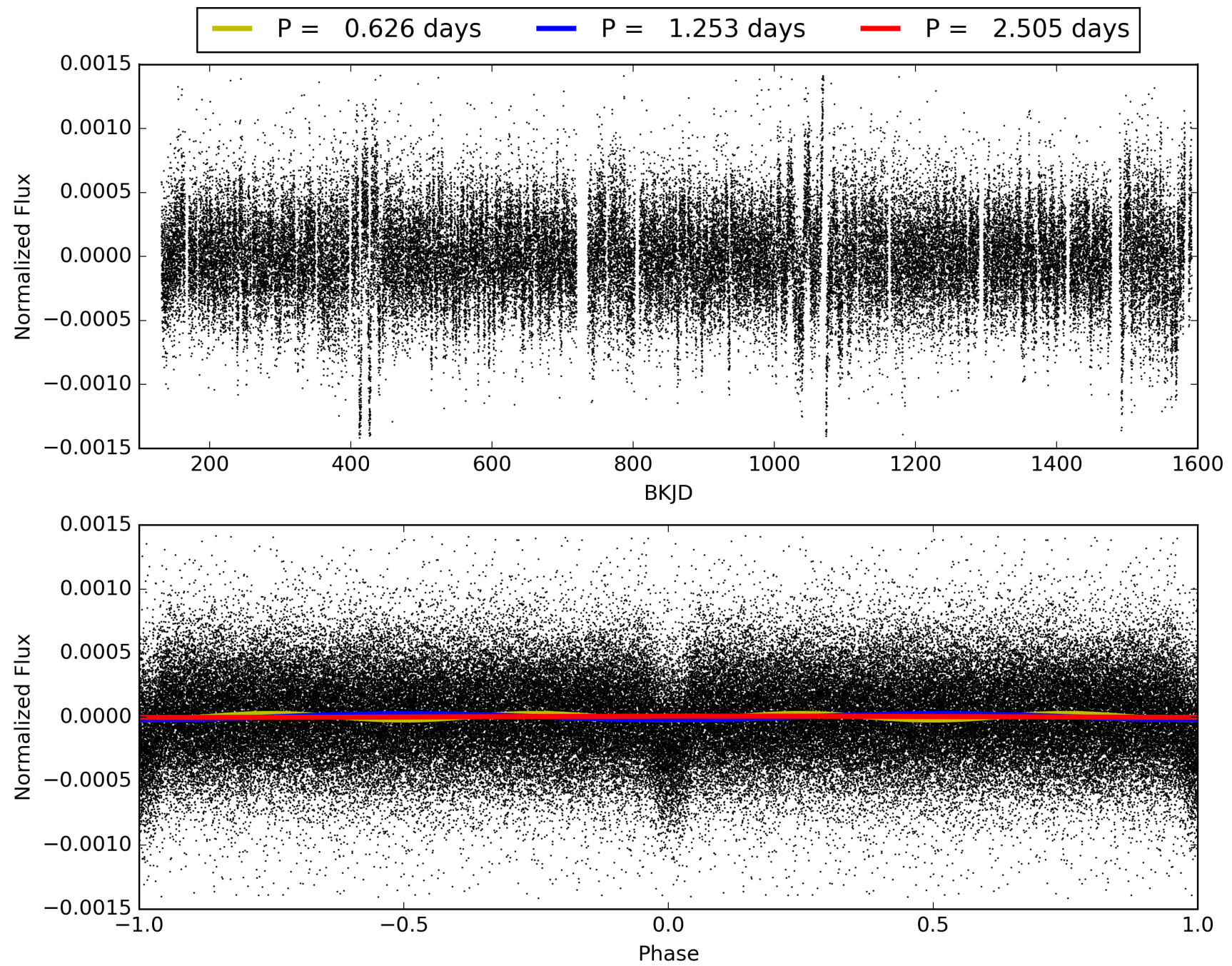
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.46e-130  
RollingBand-fgt: 1.00 [1021/1021]  
GhostDiagnostic-chr: 4.457  
Centroid-sig: 0.8%  
Centroid-so: 0.624 arcsec [1.58 $\sigma$ ]  
OotOffset-rm: 0.286 arcsec [1.82 $\sigma$ ]  
KicOffset-rm: 0.256 arcsec [1.41 $\sigma$ ]  
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 008164012-01, PDC Light Curves



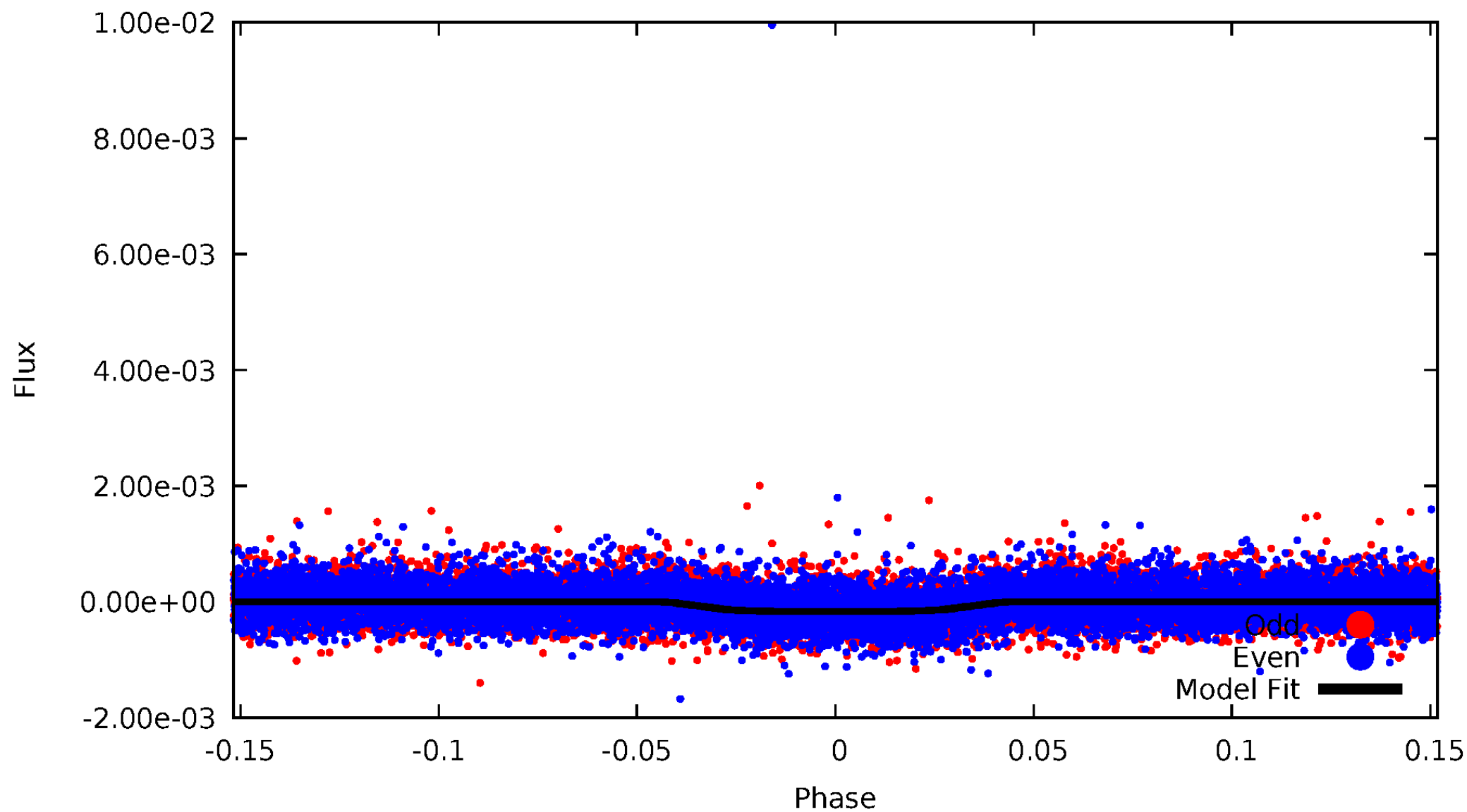


# TCE 008164012-01



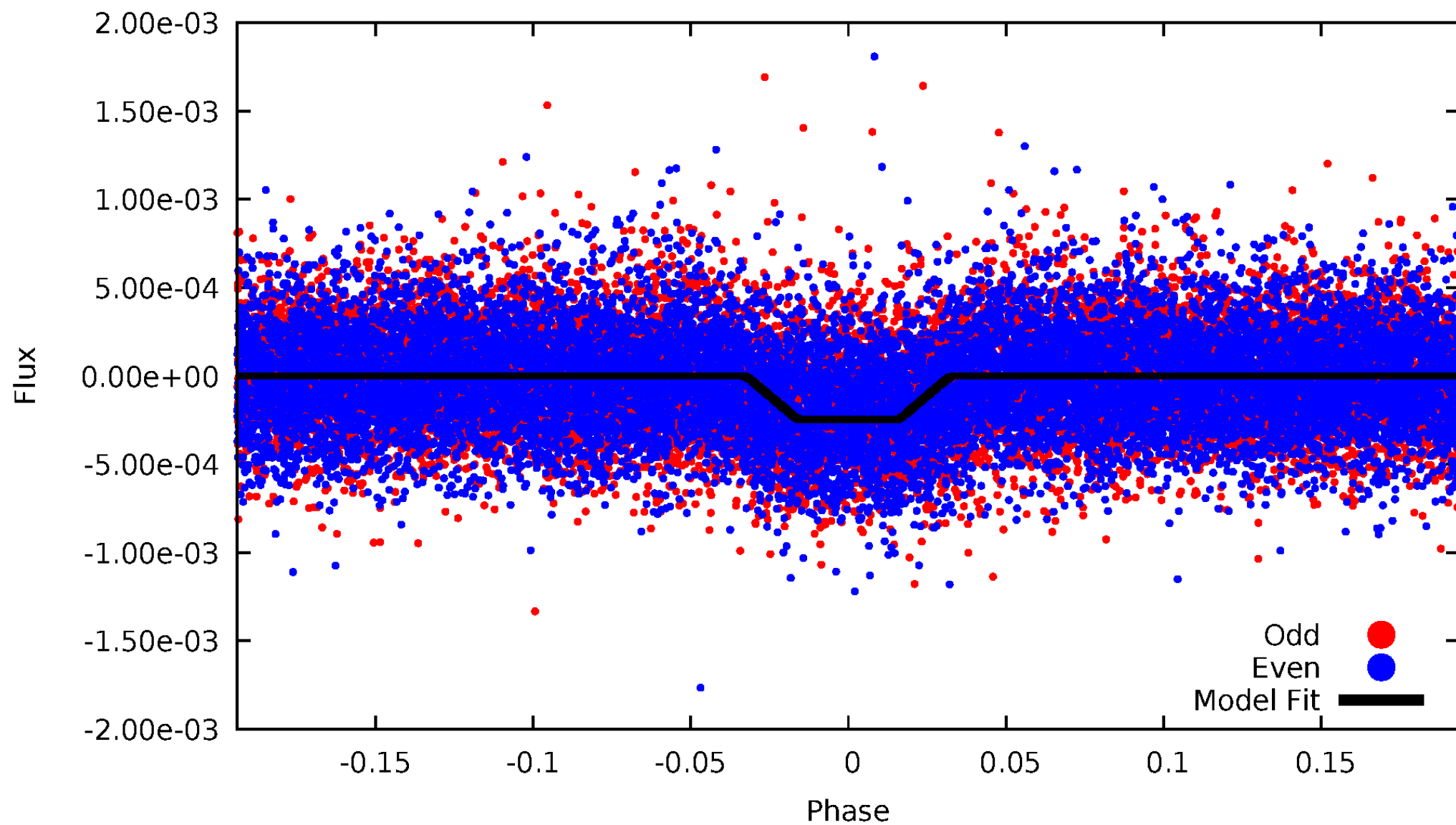
# DV Odd/Even

TCE 008164012-01



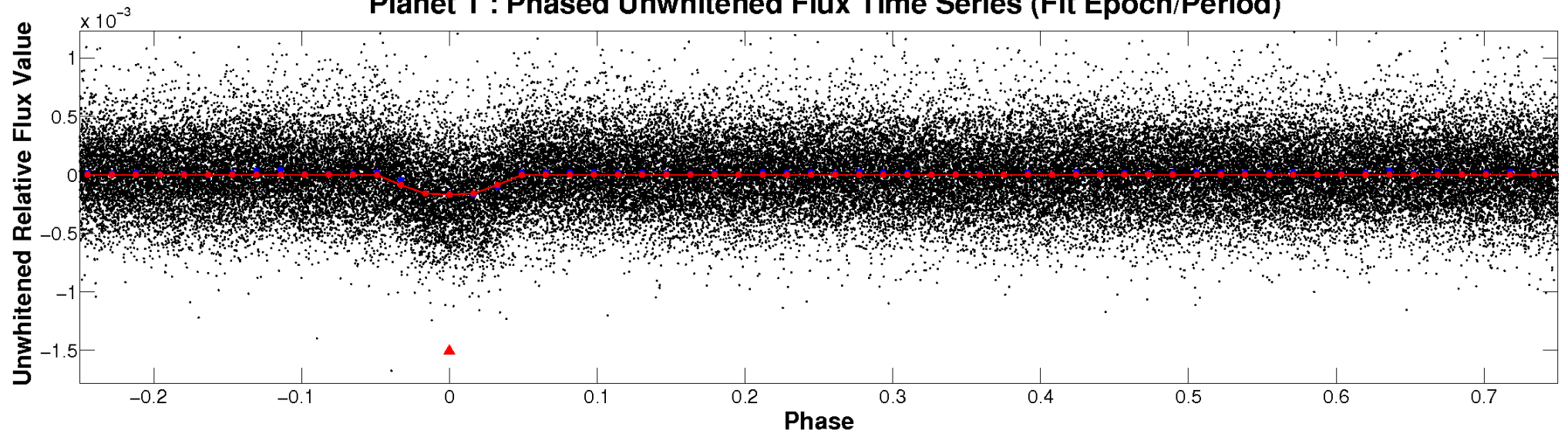
# ALT Odd/Even

TCE 008164012-01

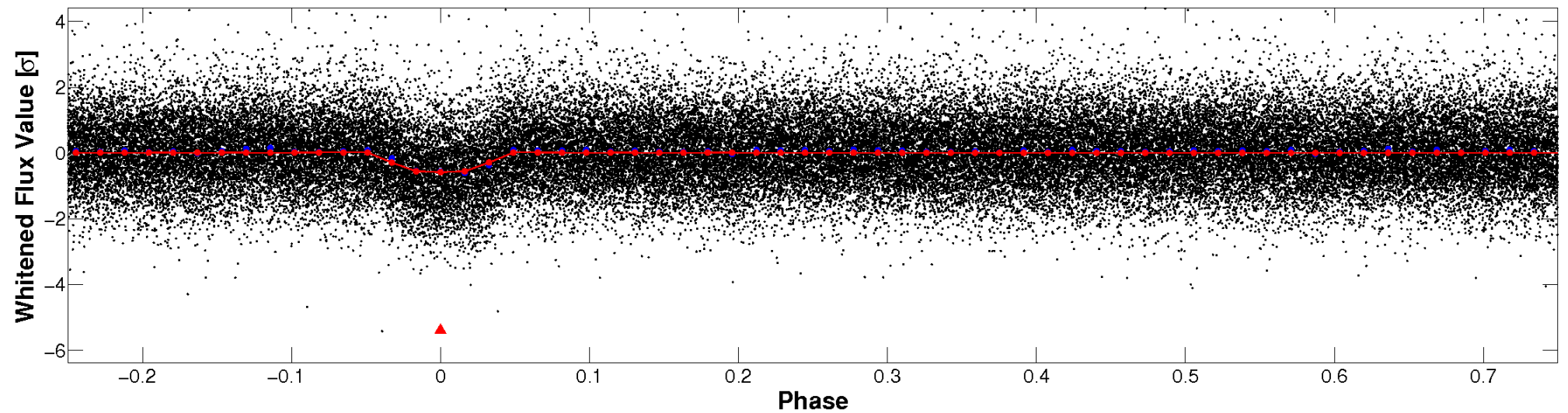


# Non-Whitened Vs. Whitened Light Curve

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



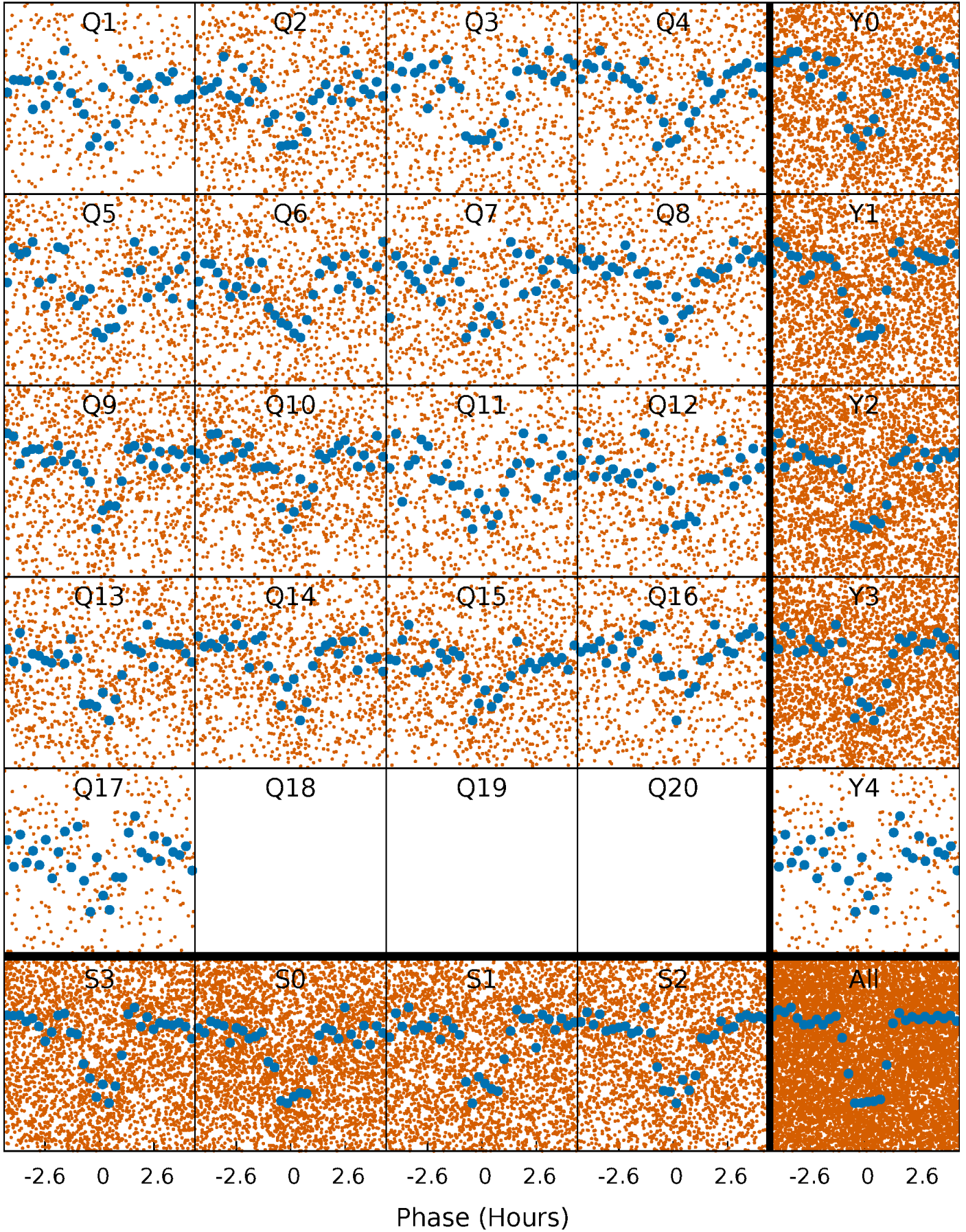
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

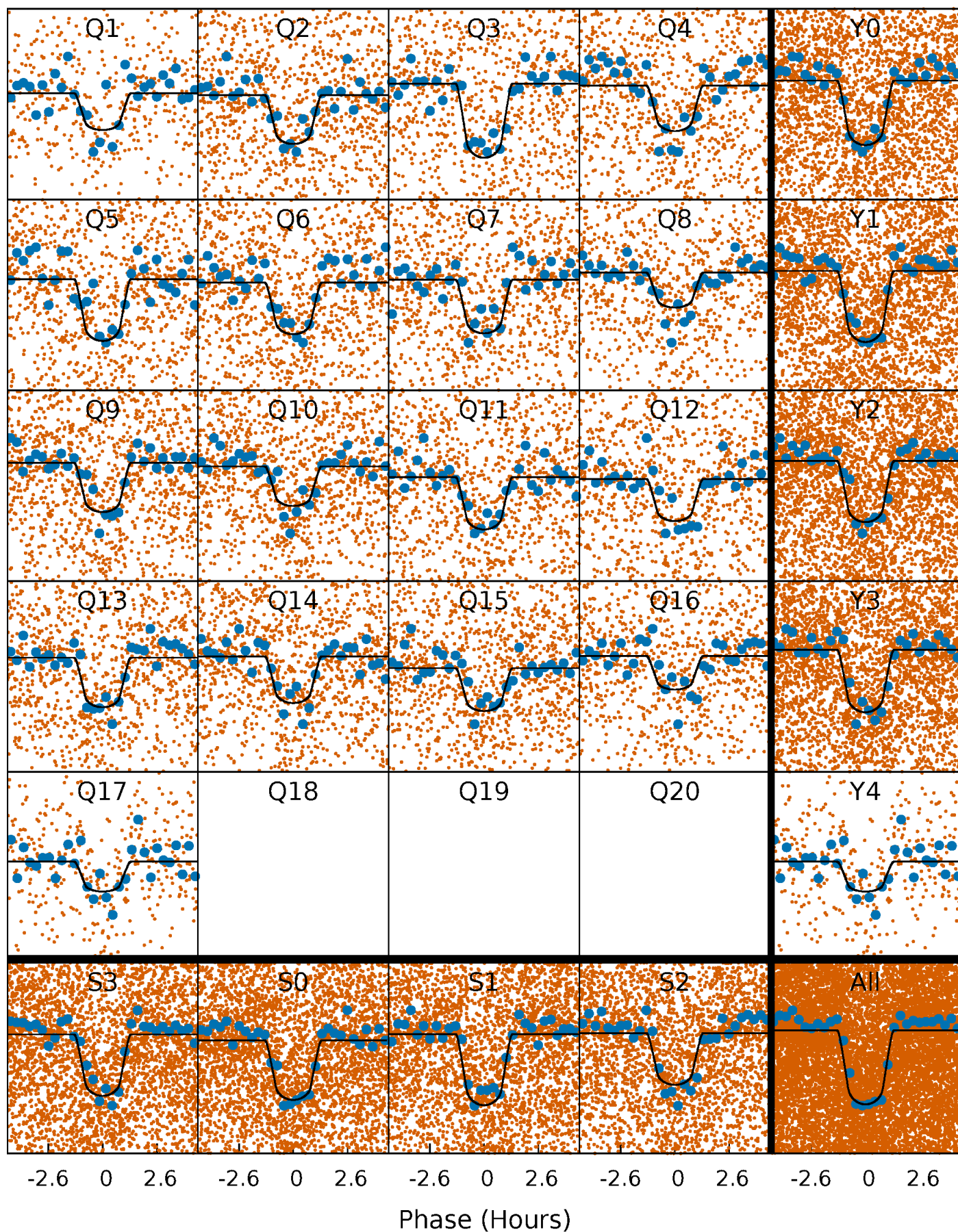
TCE 008164012-01 P= 1.252744 Days  $T_0=131.919191$  (BKJD)





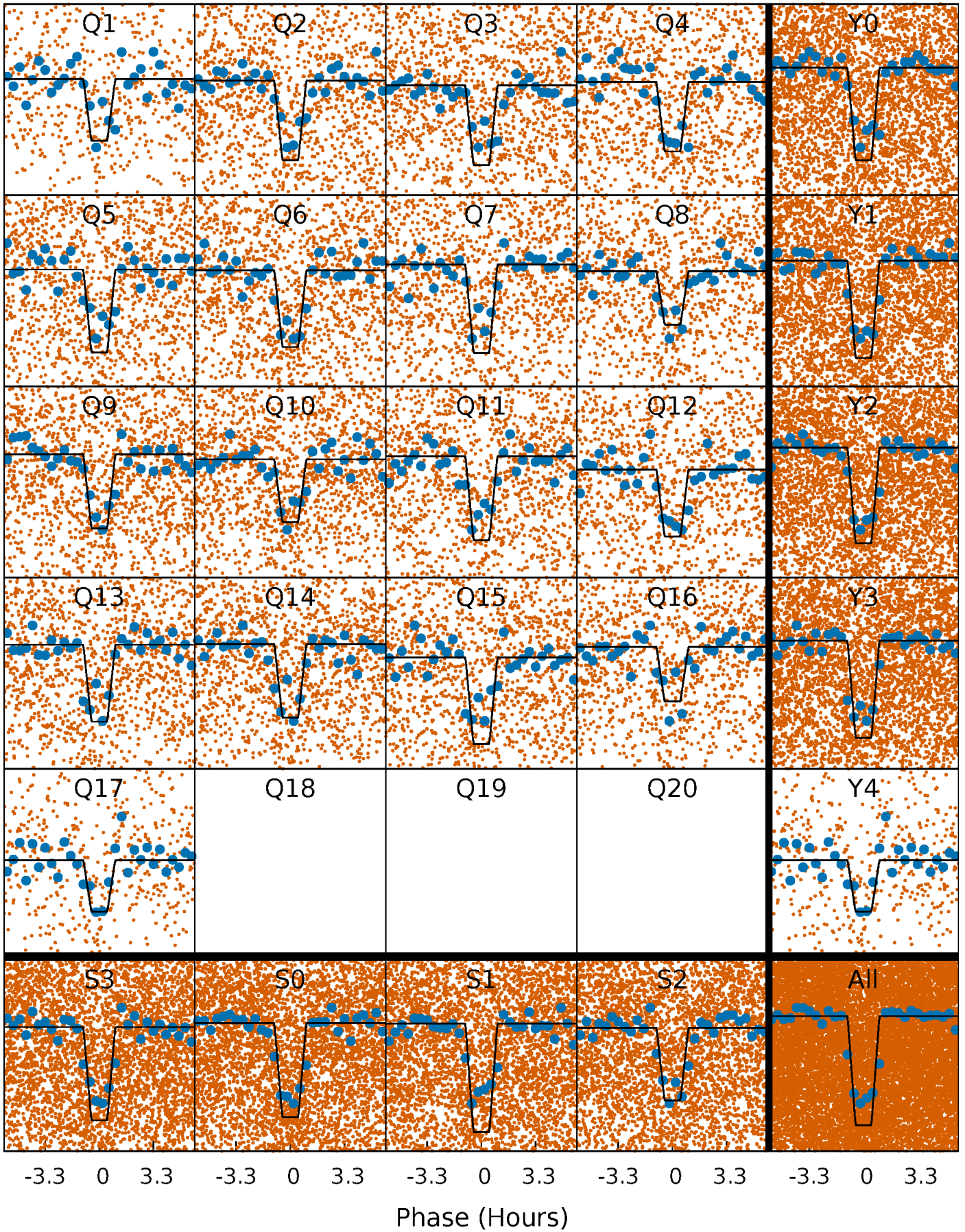
# DV Quarter-Phased Transit Curves

TCE 008164012-01 P= 1.252744 Days  $T_0=131.919191$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008164012-01 P= 1.252766 Days  $T_0=131.909264$  (BKJD)

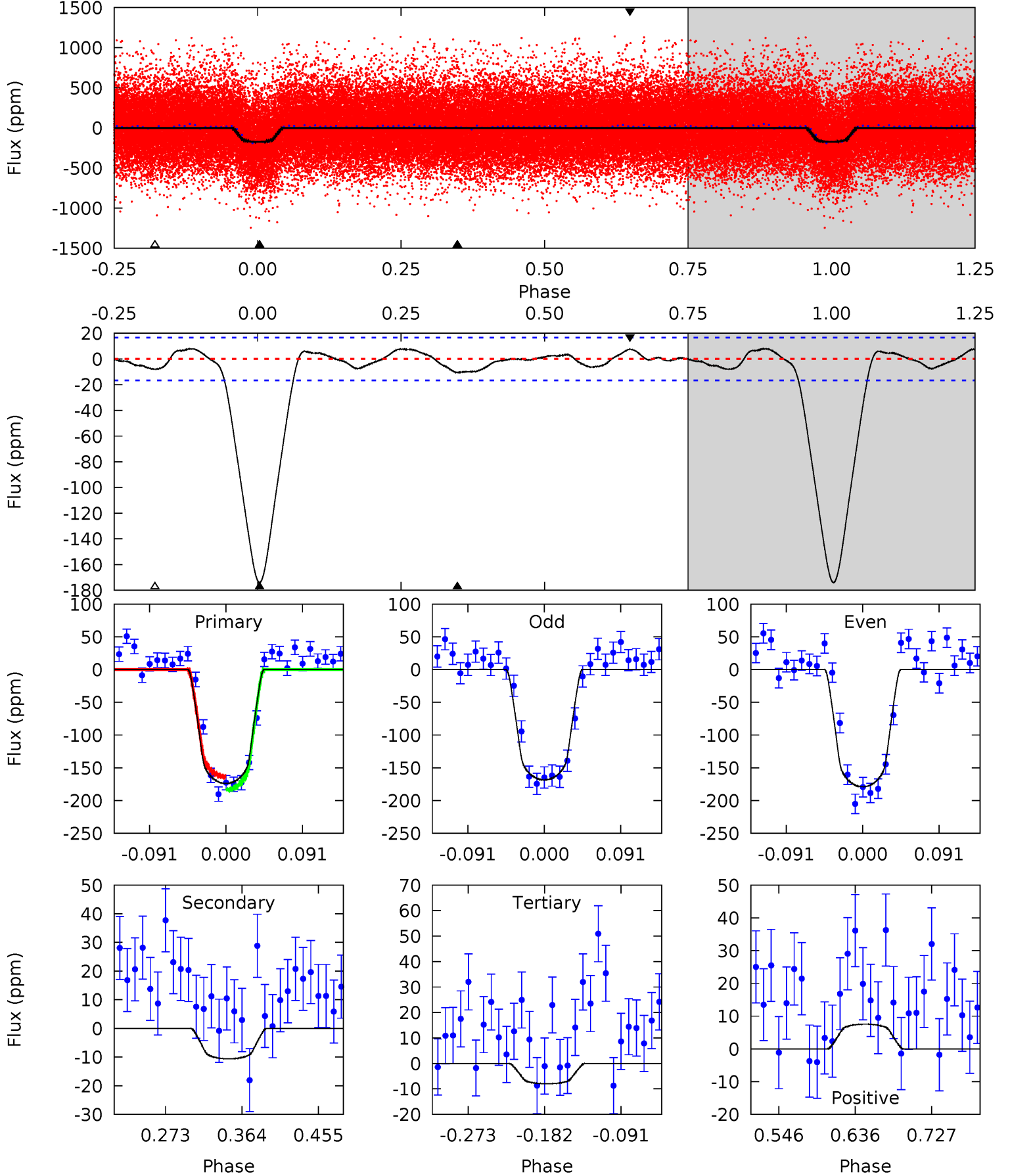




# DV Model-Shift Uniqueness Test

008164012-01, P = 1.252744 Days, E = 130.666447 Days

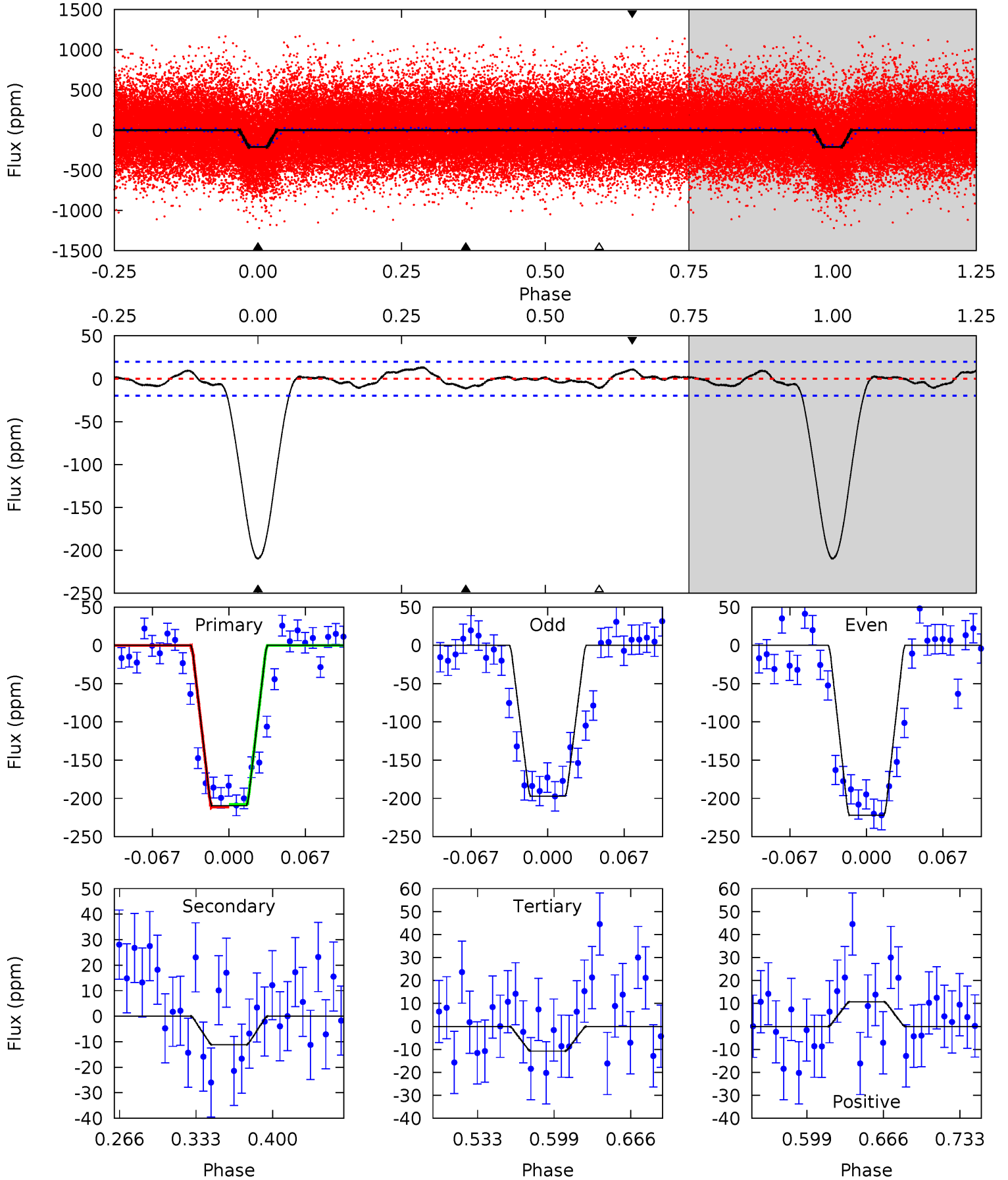
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.8	2.92	2.20	2.07	4.58	1.69	1.17	45.6	45.7	0.72	0.85	1.43	0.97	0.04	2.77



# Alt Model-Shift Uniqueness Test

008164012-01, P = 1.252766 Days, E = 130.656498 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.1	2.62	2.52	2.52	4.65	1.83	1.32	46.6	46.6	0.10	0.10	2.93	0.93	0.06	0.38





### Stellar Parameters For KIC 008164012

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5907^{+80}_{-80}$	$4.041^{+0.196}_{-0.084}$	$0.160^{+0.150}_{-0.150}$	$1.705^{+0.261}_{-0.392}$	$1.165^{+0.132}_{-0.108}$	$0.331^{+0.329}_{-0.090}$
	+1%/-1%	+5%/-2%	+94%/-94%	+15%/-23%	+11%/-9%	+99%/-27%
Source	SPE90	SPE90	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 008164012-01 / KOI 2116.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-11 \pm 4$	$2.57^{+0.65}_{-0.61}$	$3049^{+124}_{-177}$	$2946^{+505}_{-5156}$	$0.518^{+0.409}_{-0.238}$
Alt.	$-11 \pm 4$	$2.83^{+0.72}_{-0.61}$	$3048^{+126}_{-181}$	$2766^{+548}_{-5300}$	$0.425^{+0.344}_{-0.189}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

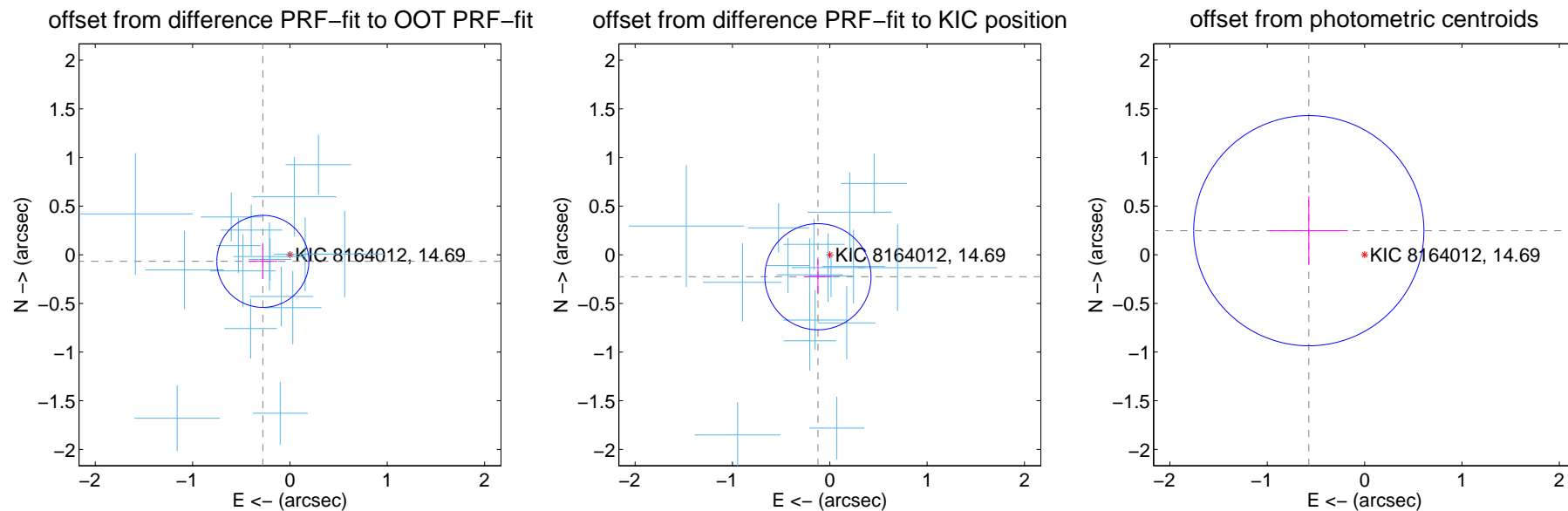
## DV Centroid Data

Supplemental centroid analysis for 008164012-01. Kepler magnitude: 14.69. Transit SNR 33.80

There are 17 quarters with good PRF difference image offsets

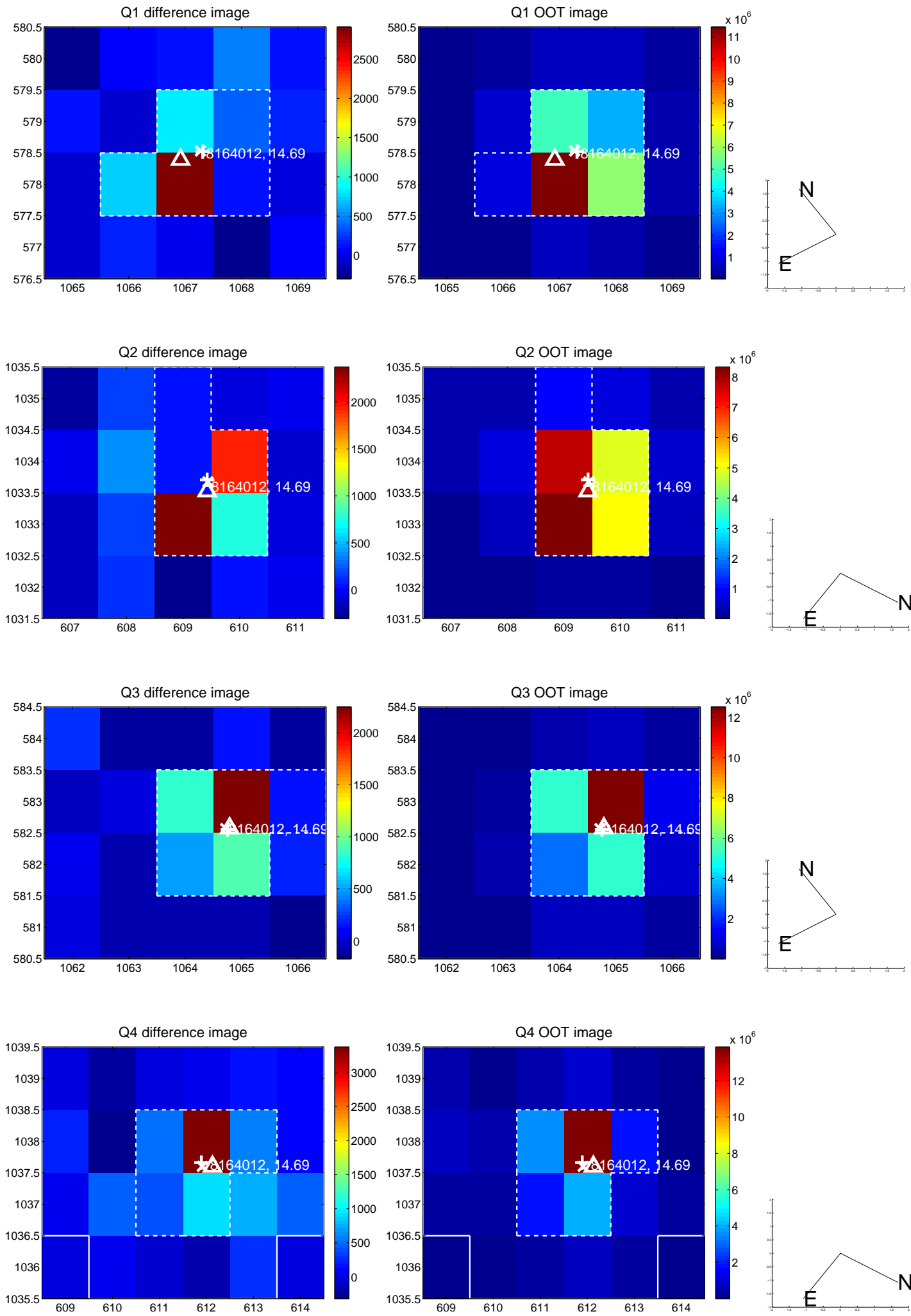
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.286 \pm 0.158$	1.82	$0.278 \pm 0.148$	$-0.068 \pm 0.179$
PRF-fit source offset from KIC position	$0.256 \pm 0.182$	1.41	$0.122 \pm 0.139$	$-0.226 \pm 0.180$
photometric centroid source offset	$0.62 \pm 0.39$	1.58	$0.57 \pm 0.40$	$0.25 \pm 0.35$

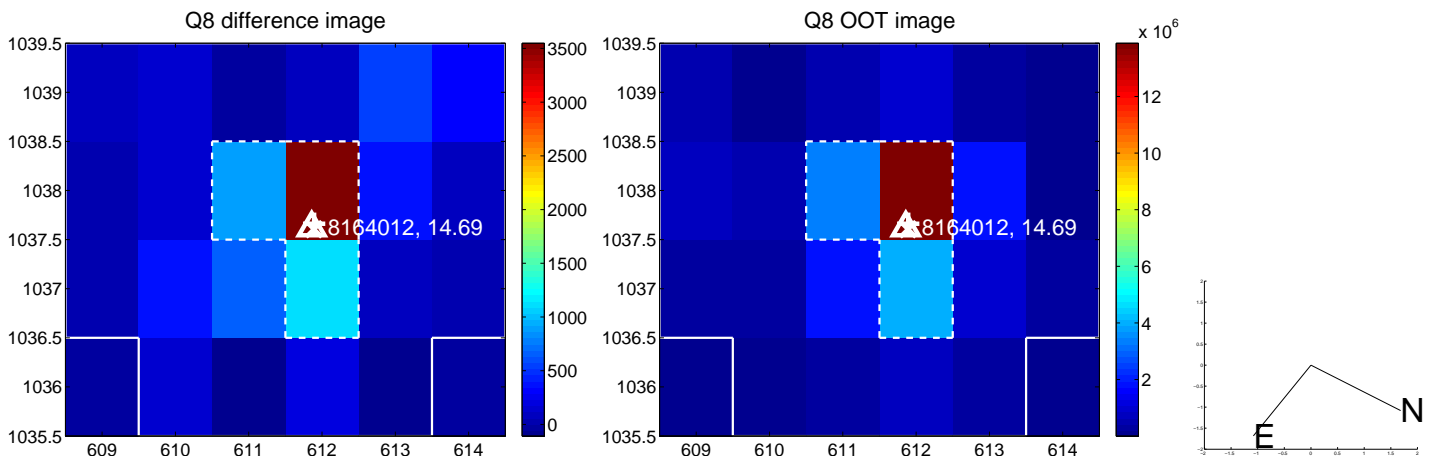
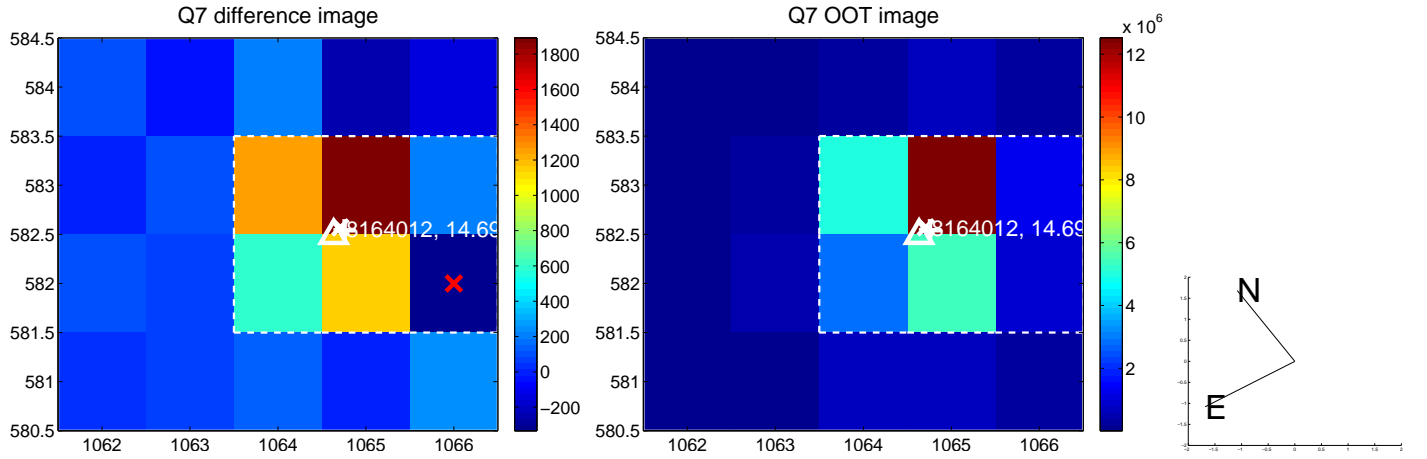
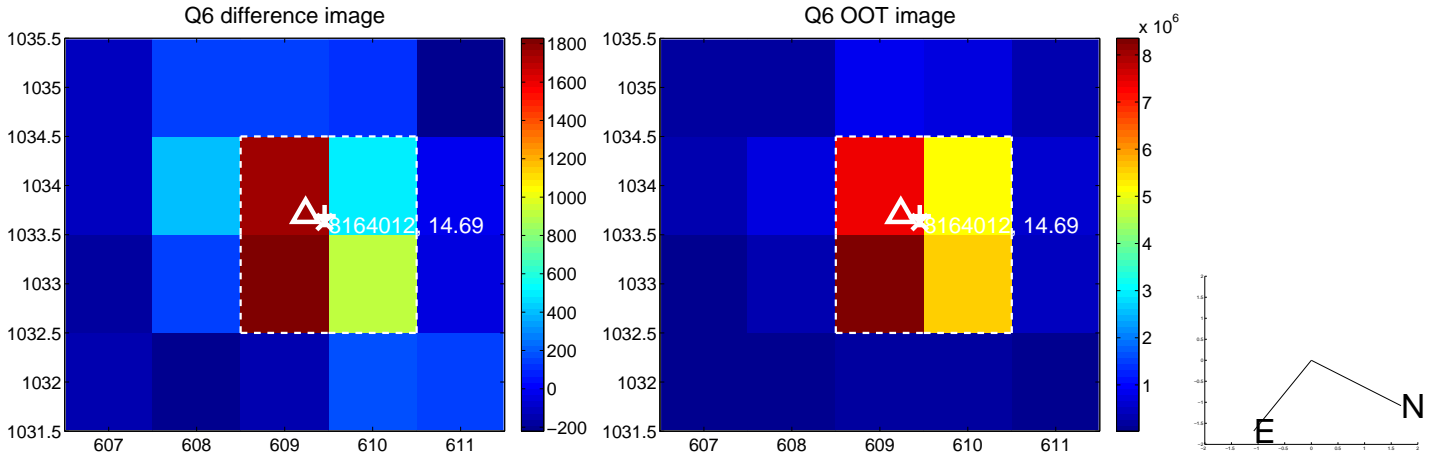
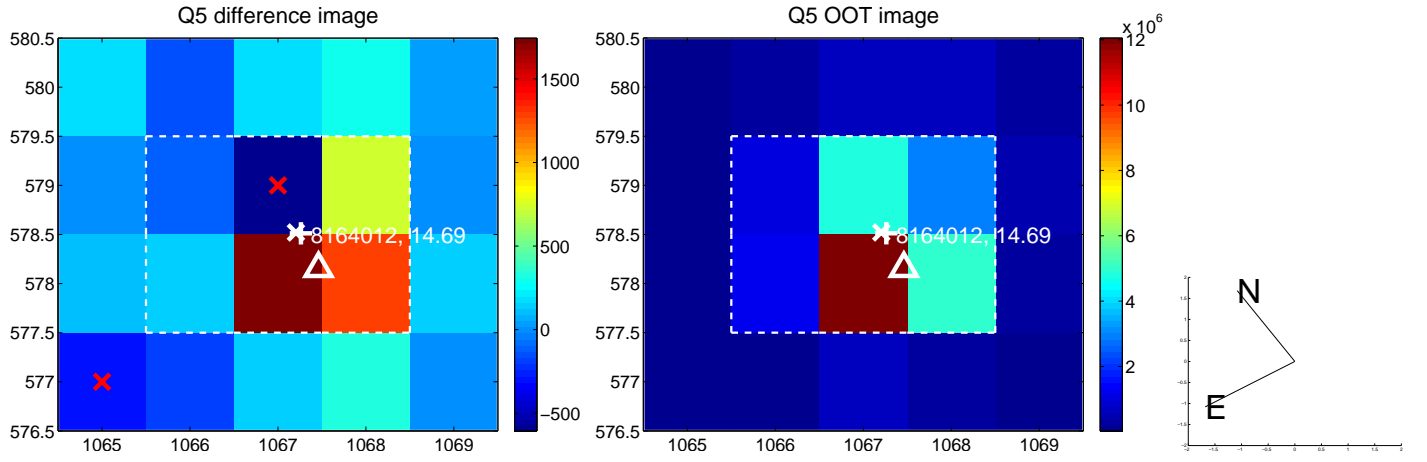


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

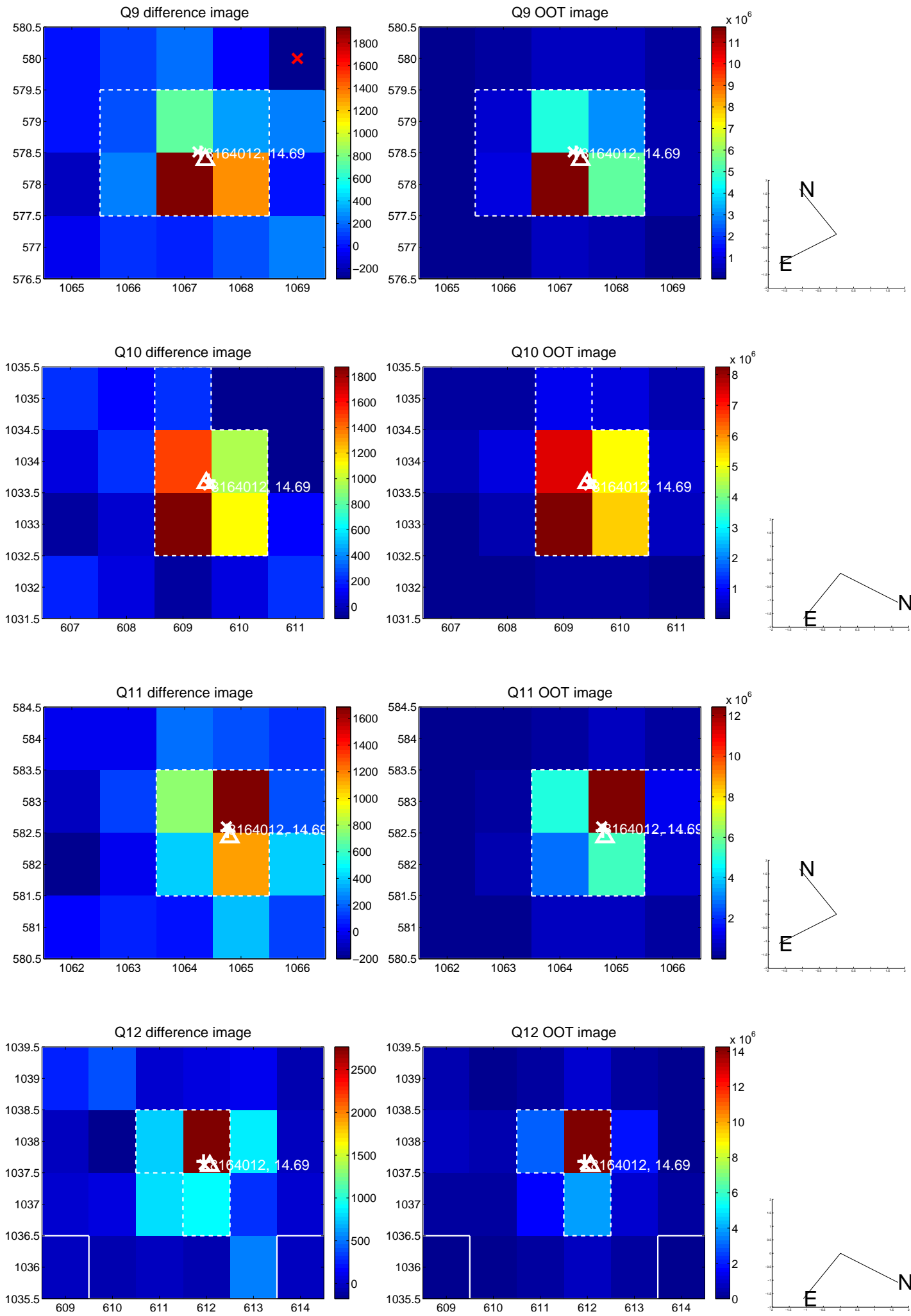


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

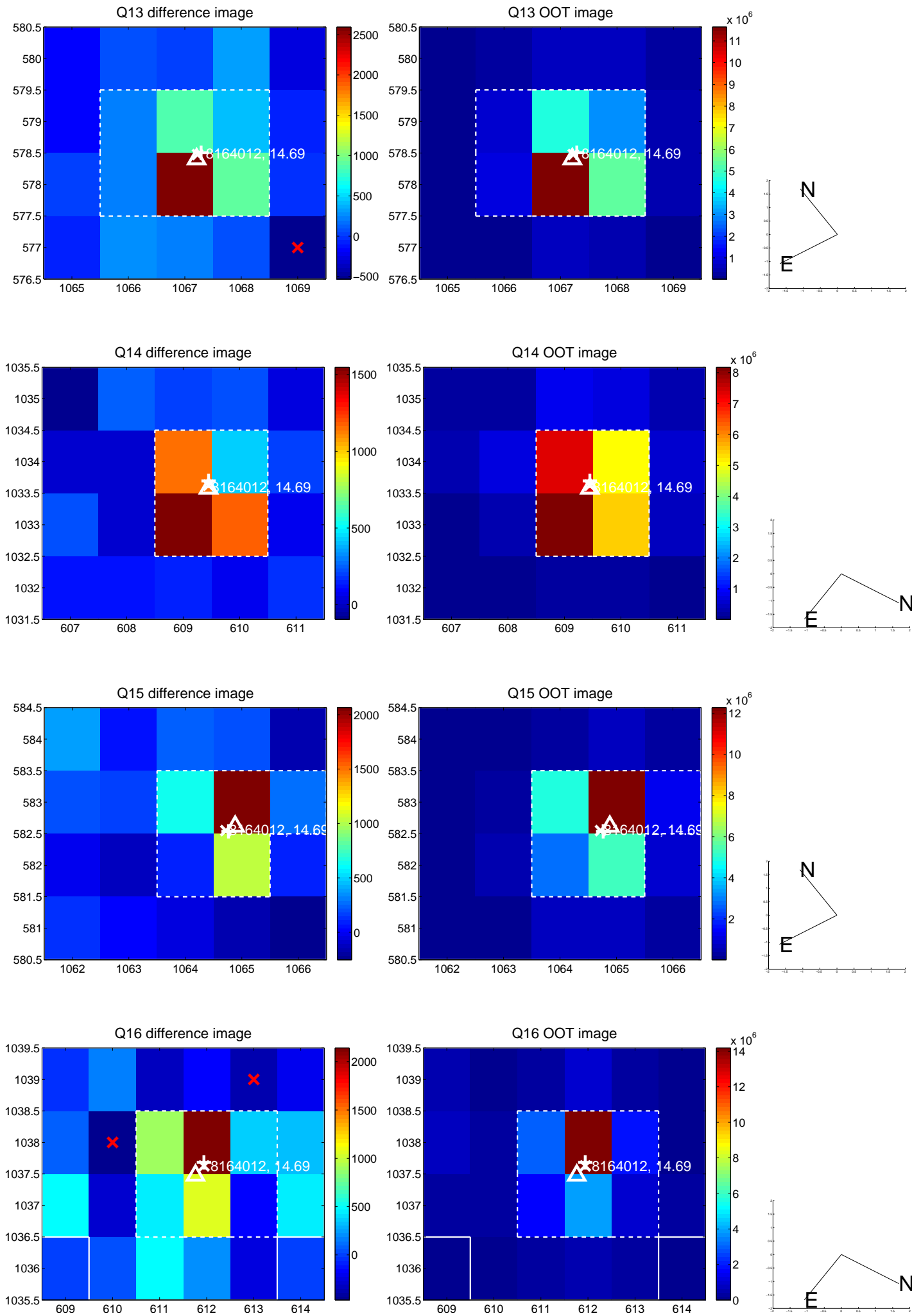




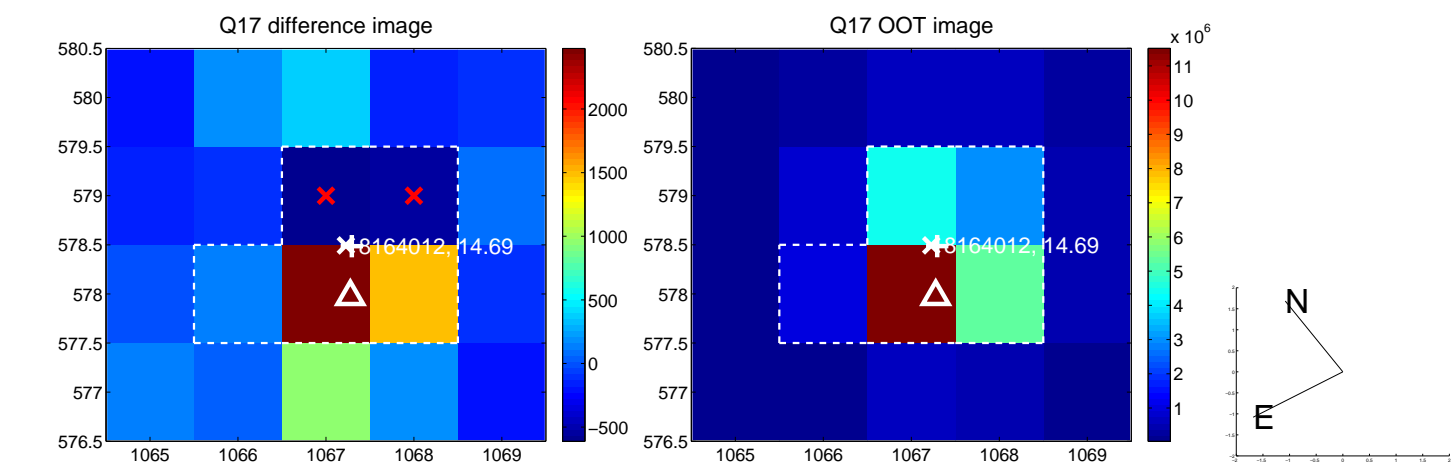
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



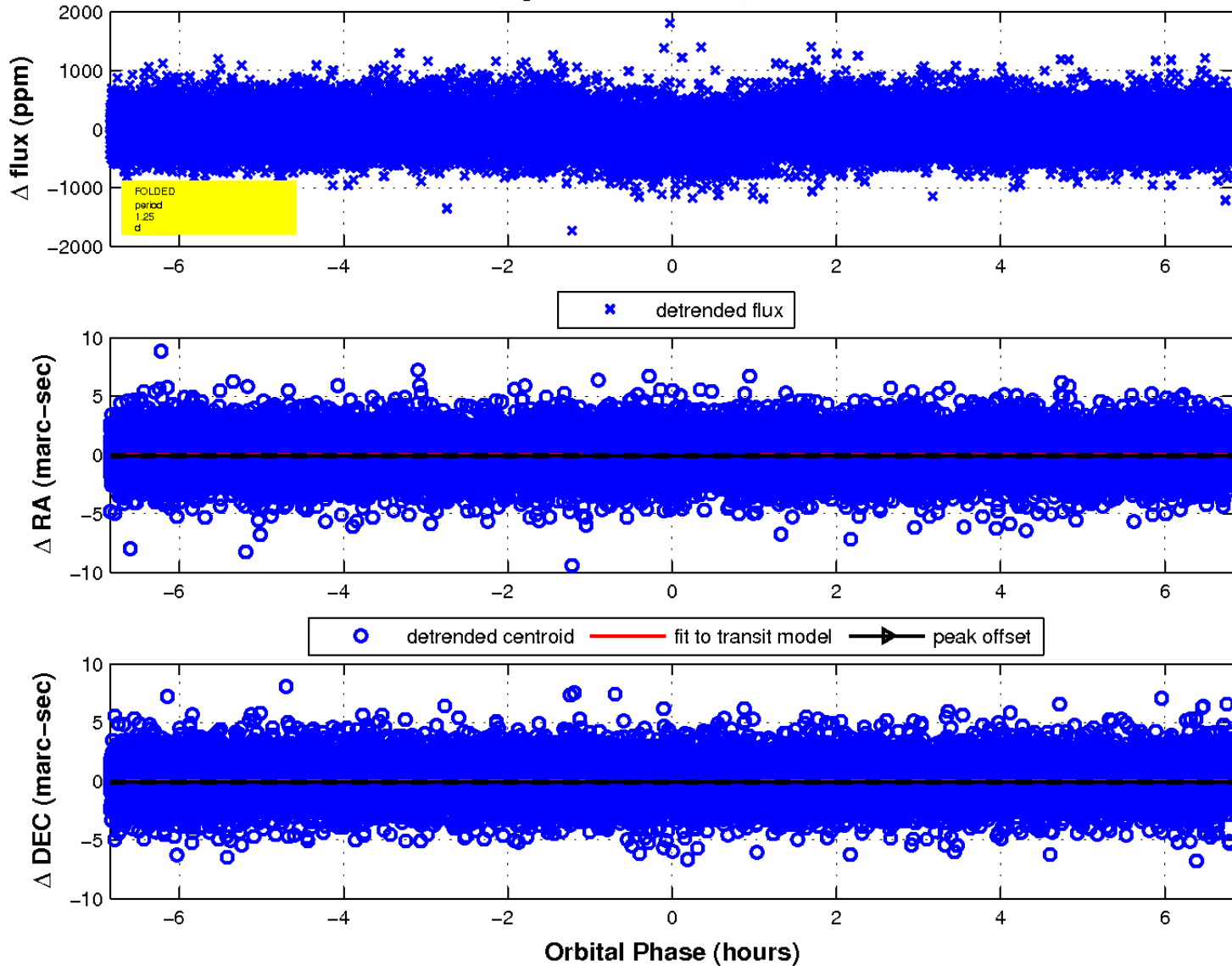
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

