

# KIC 012404305

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012404305-01	OBS	0486.01	22.183314	147.312673	741.0	5.314	59.9	65.5	1.03	5565	3.09	41.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012404305-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

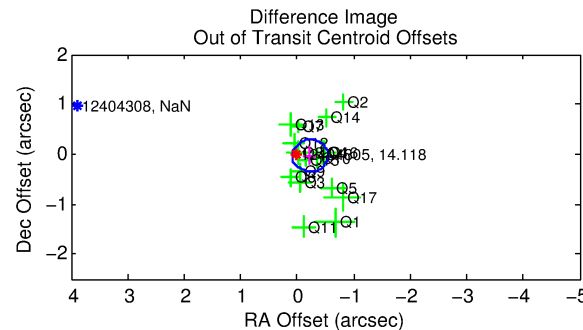
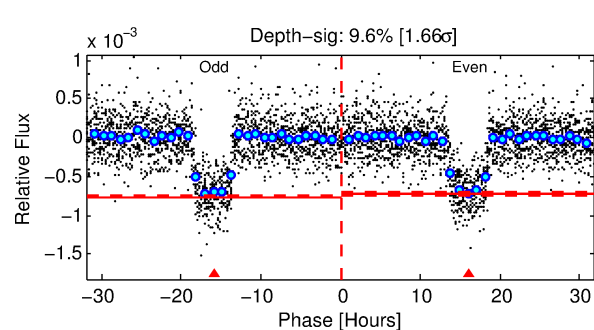
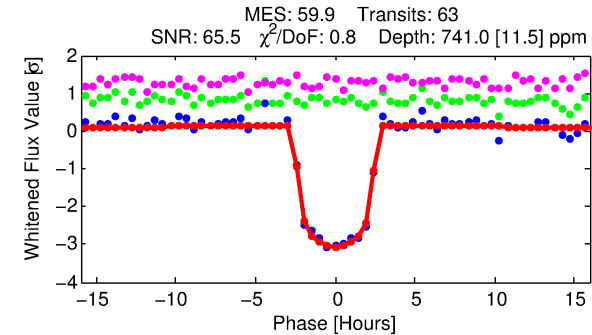
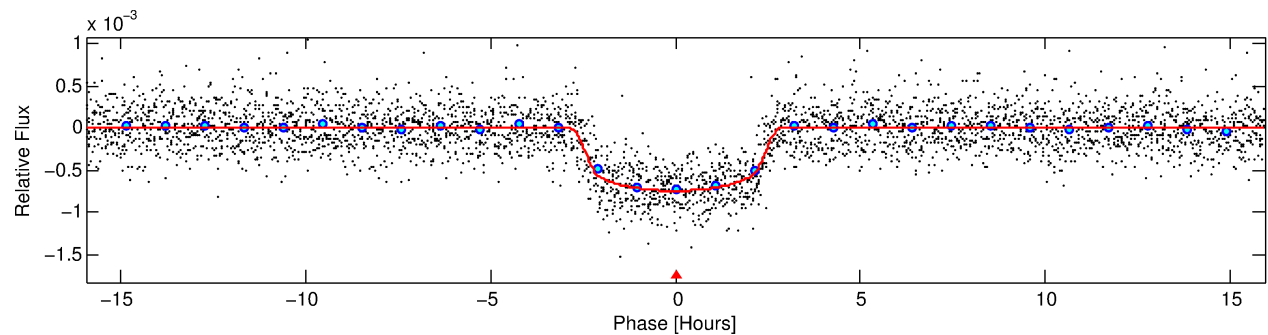
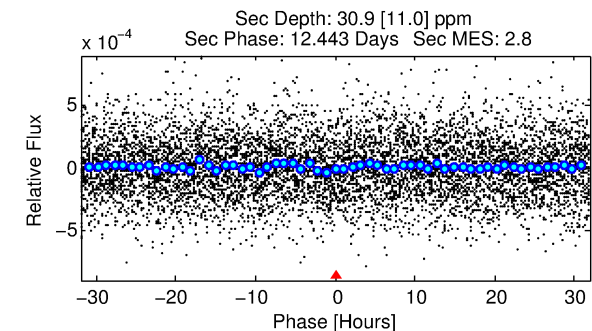
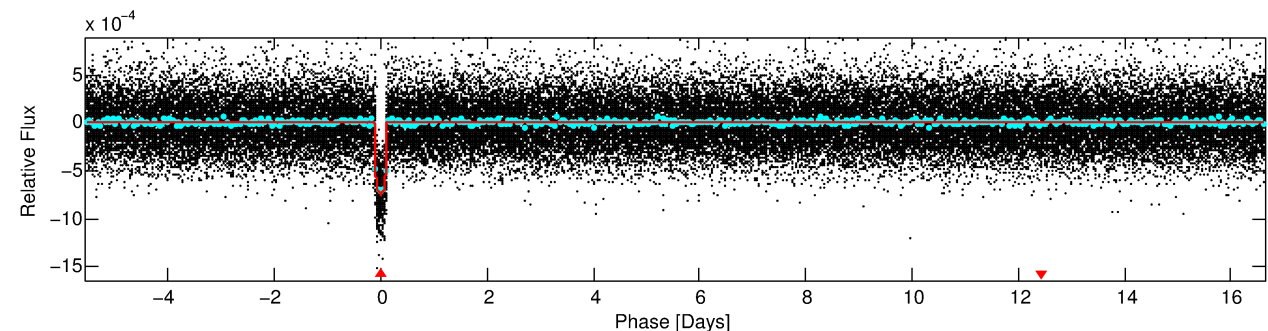
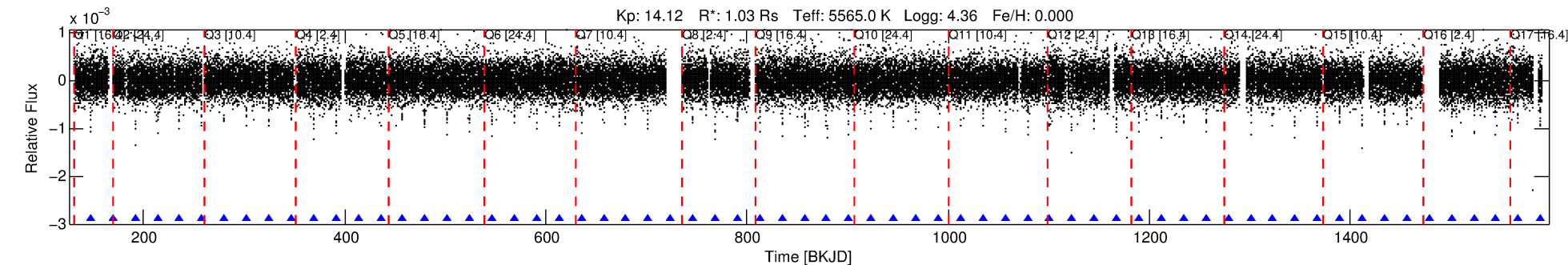
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012404305-01

No Significant Match Found

# DV One-Page Summary

KIC: 12404305 Candidate: 1 of 1 Period: 22.183 d  
KOI: K00486.01 Corr: 0.976



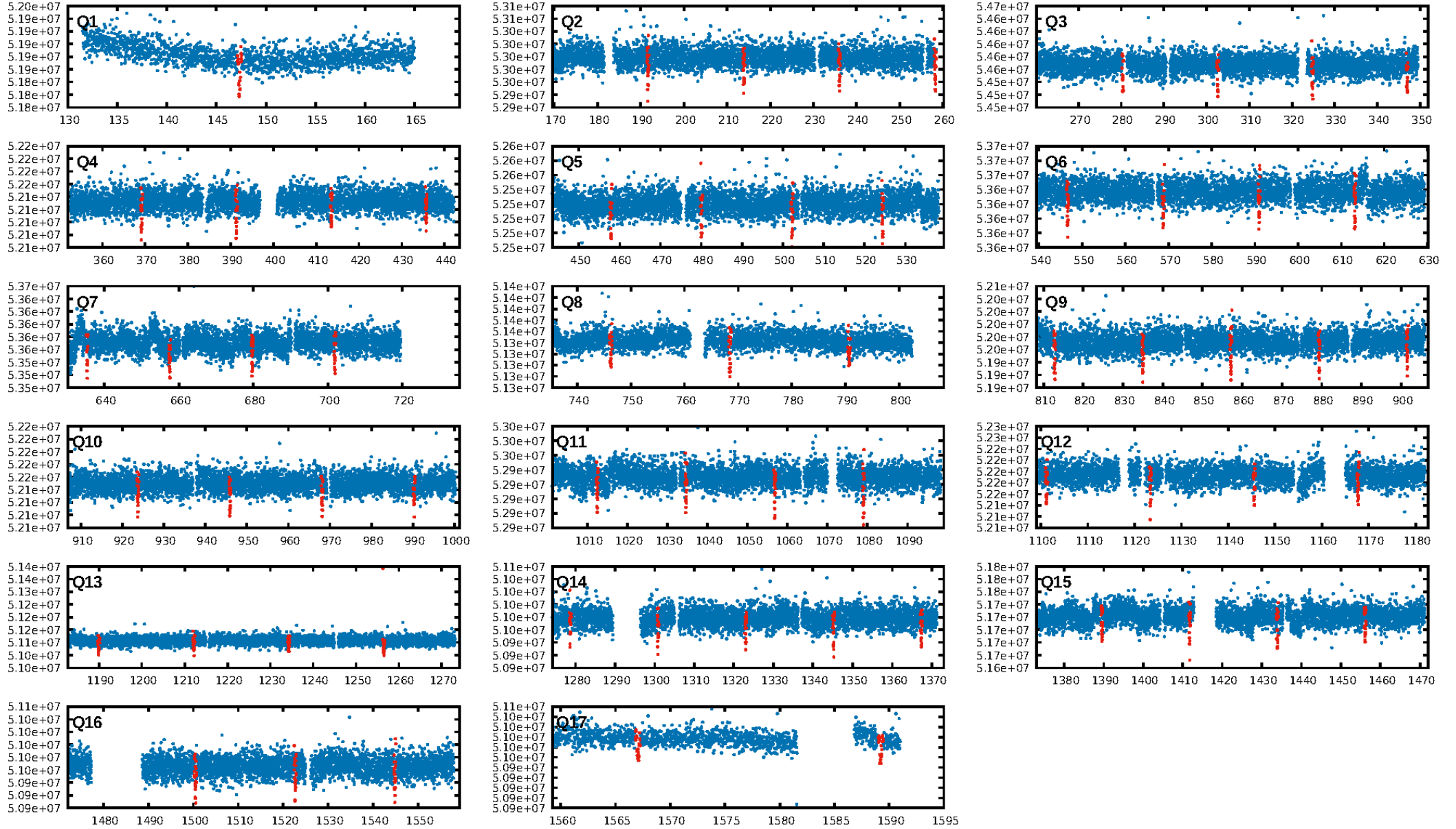
## DV Fit Results:

Period = 22.18331 [0.00005] d  
Epoch = 147.3127 [0.0017] BKJD  
Rp/R\* = 0.0275 [0.0024]  
a/R\* = 21.34 [7.72]  
b = 0.78 [0.19]  
Seff = 41.30 [10.11]  
Teq = 646 [40] K  
Rp = 3.09 [0.51] Re  
a = 0.1486 [0.0210] AU  
Ag = 39.33 [18.02] [2.13σ]  
Teffp = 2503 [252] K [7.27σ]

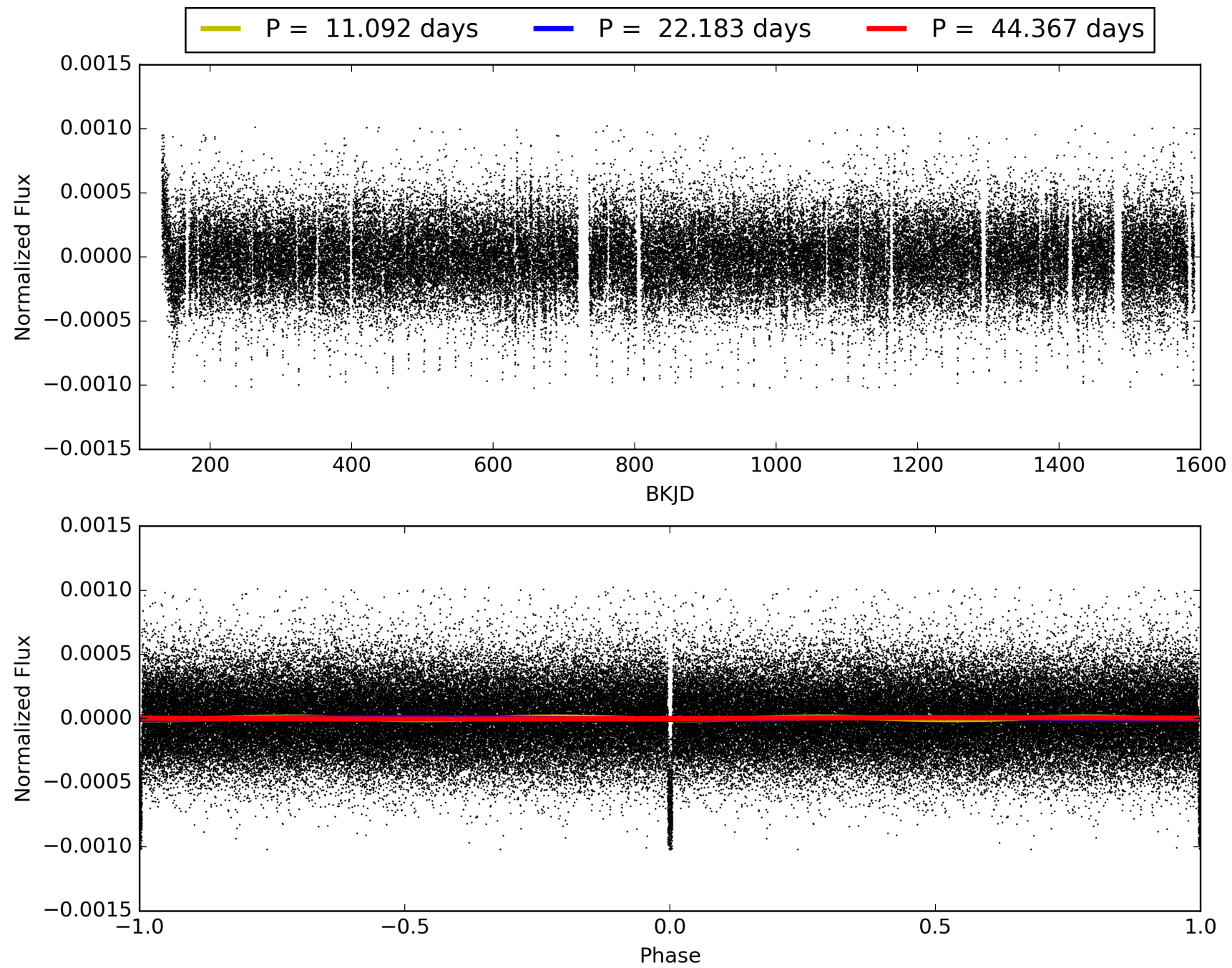
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [60/60]  
GhostDiagnostic-chr: 4.872  
Centroid-sig: 79.1%  
**Centroid-so: 0.811 arcsec [3.38σ]**  
OotOffset-rm: 0.230 arcsec [2.17σ]  
KicOffset-rm: 0.354 arcsec [2.06σ]  
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 012404305-01, PDC Light Curves

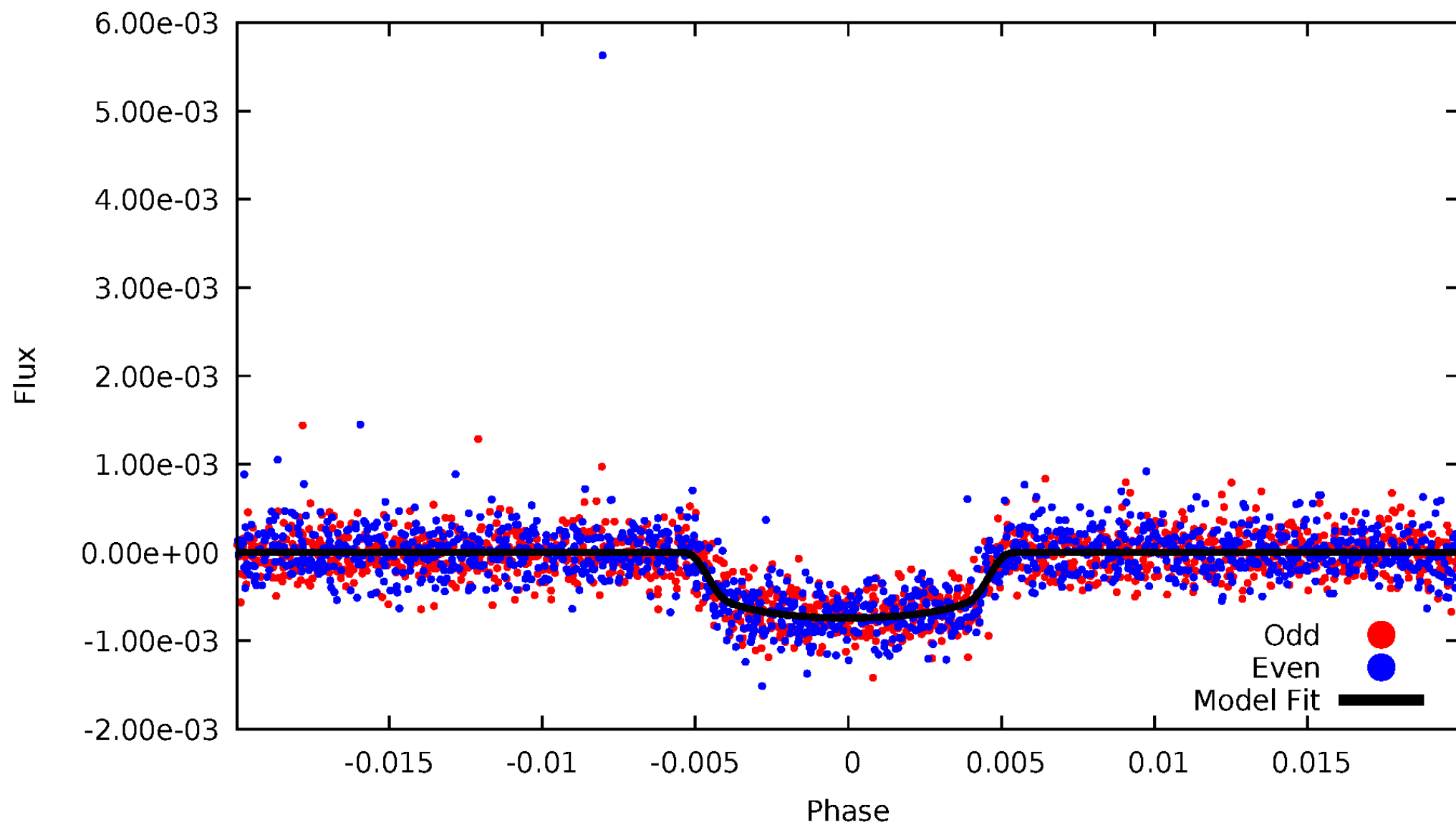


# TCE 012404305-01



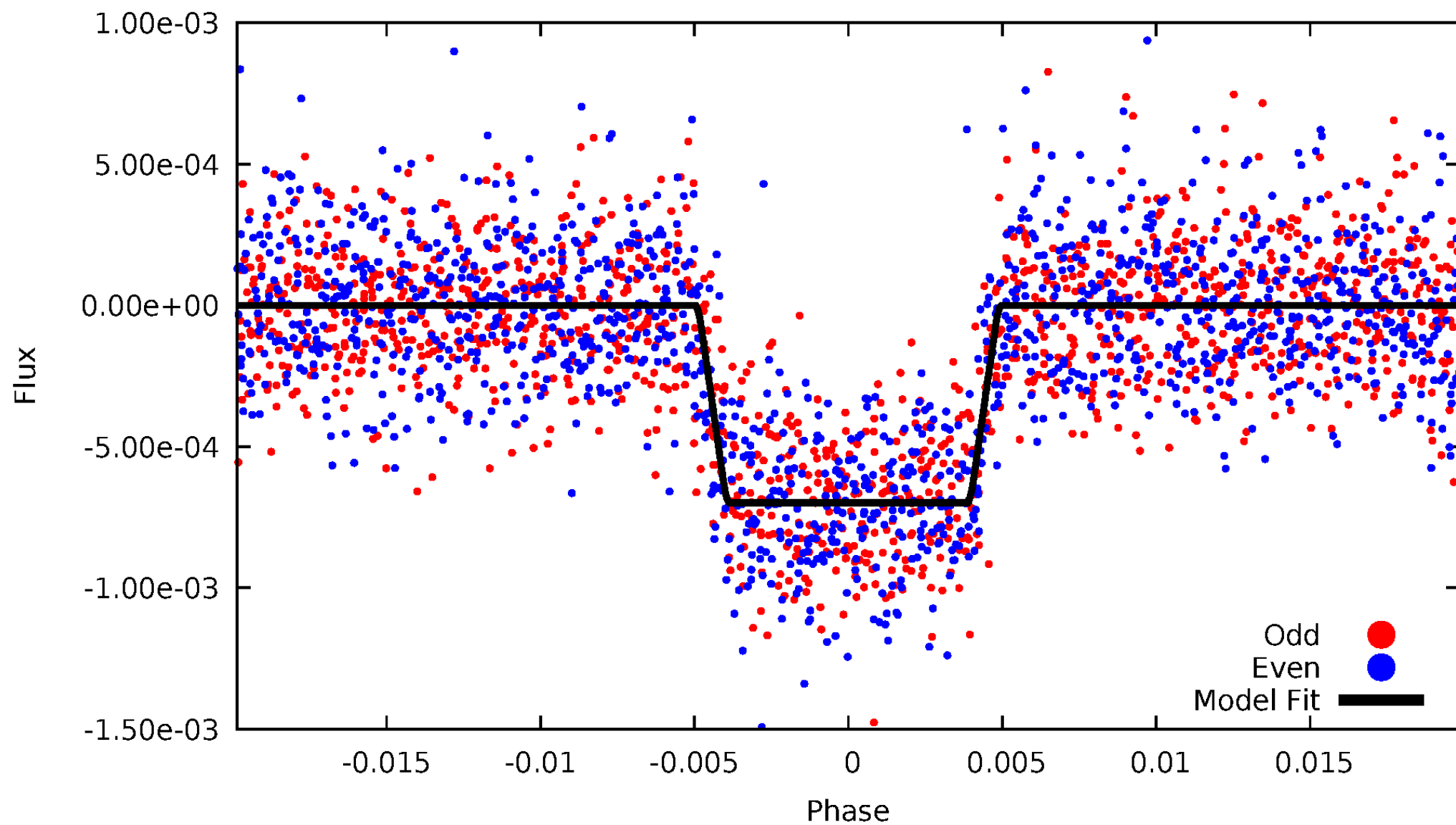
# DV Odd/Even

TCE 012404305-01



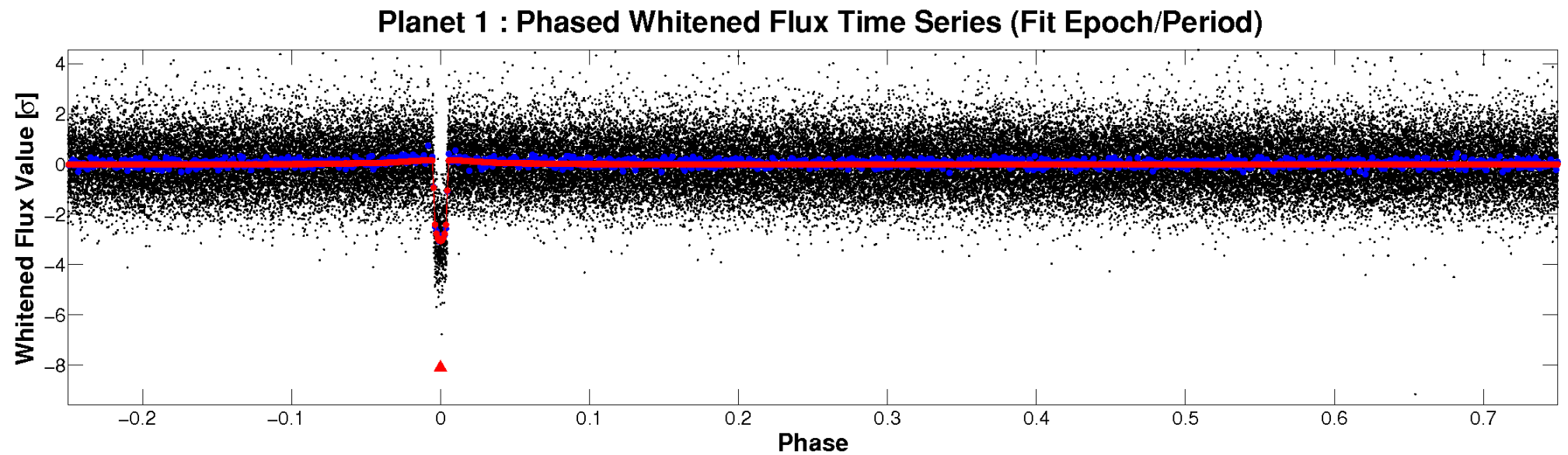
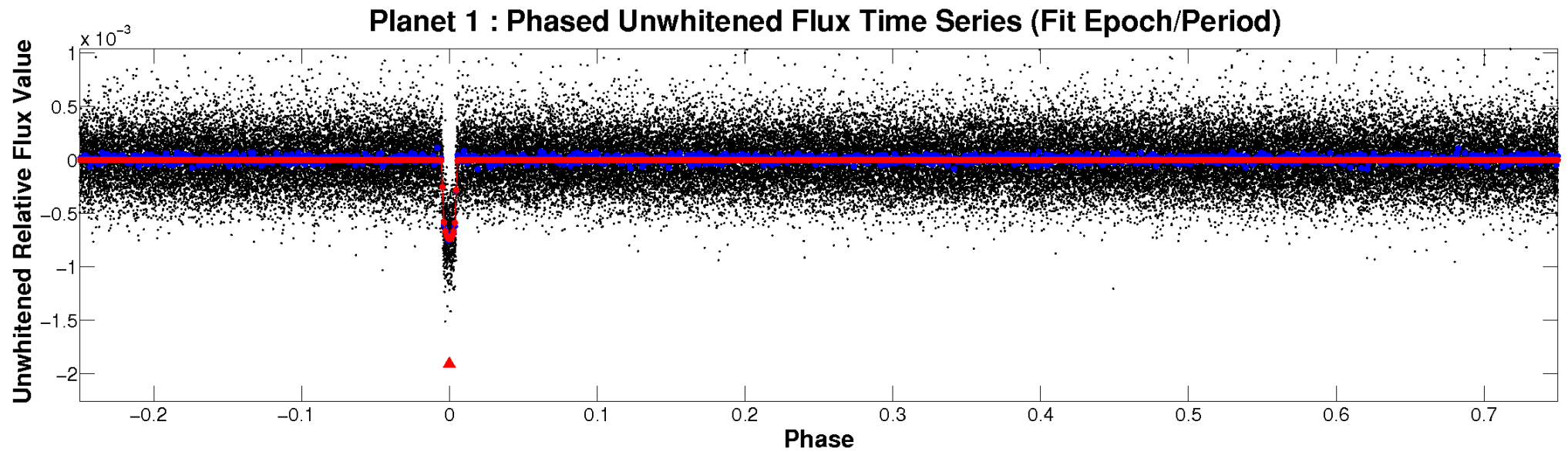
# ALT Odd/Even

TCE 012404305-01



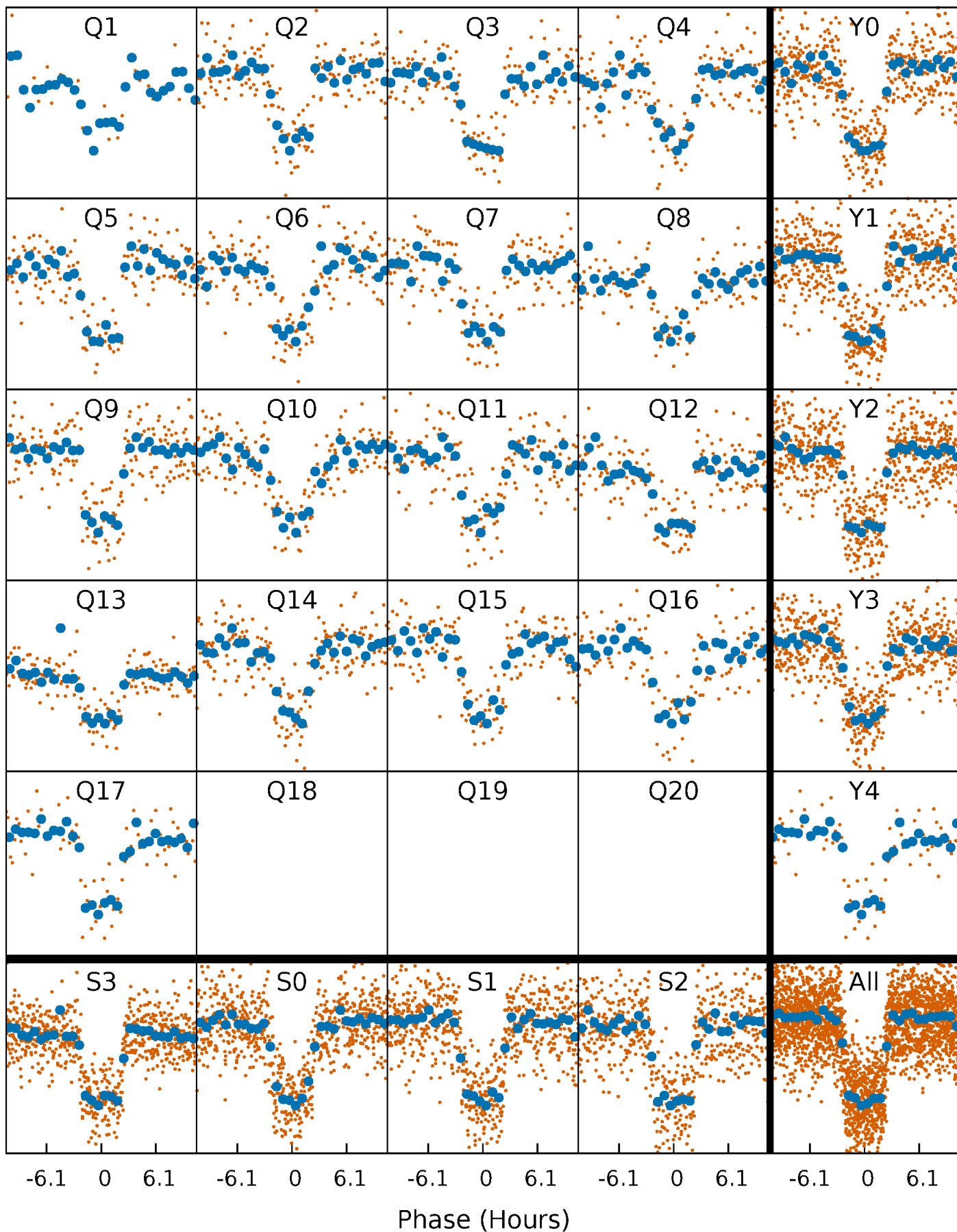


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

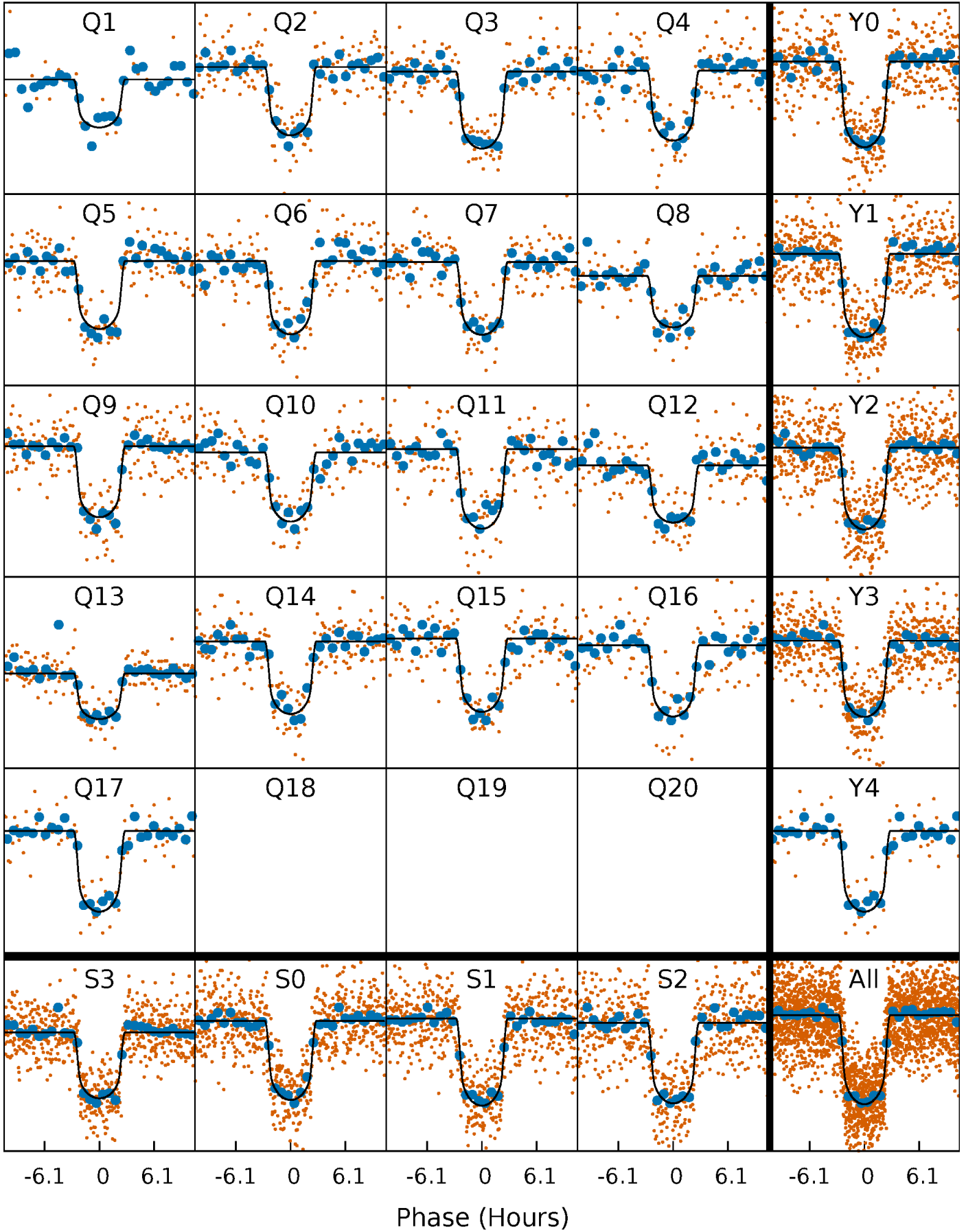
TCE 012404305-01 P= 22.183314 Days  $T_0=147.312673$  (BKJD)





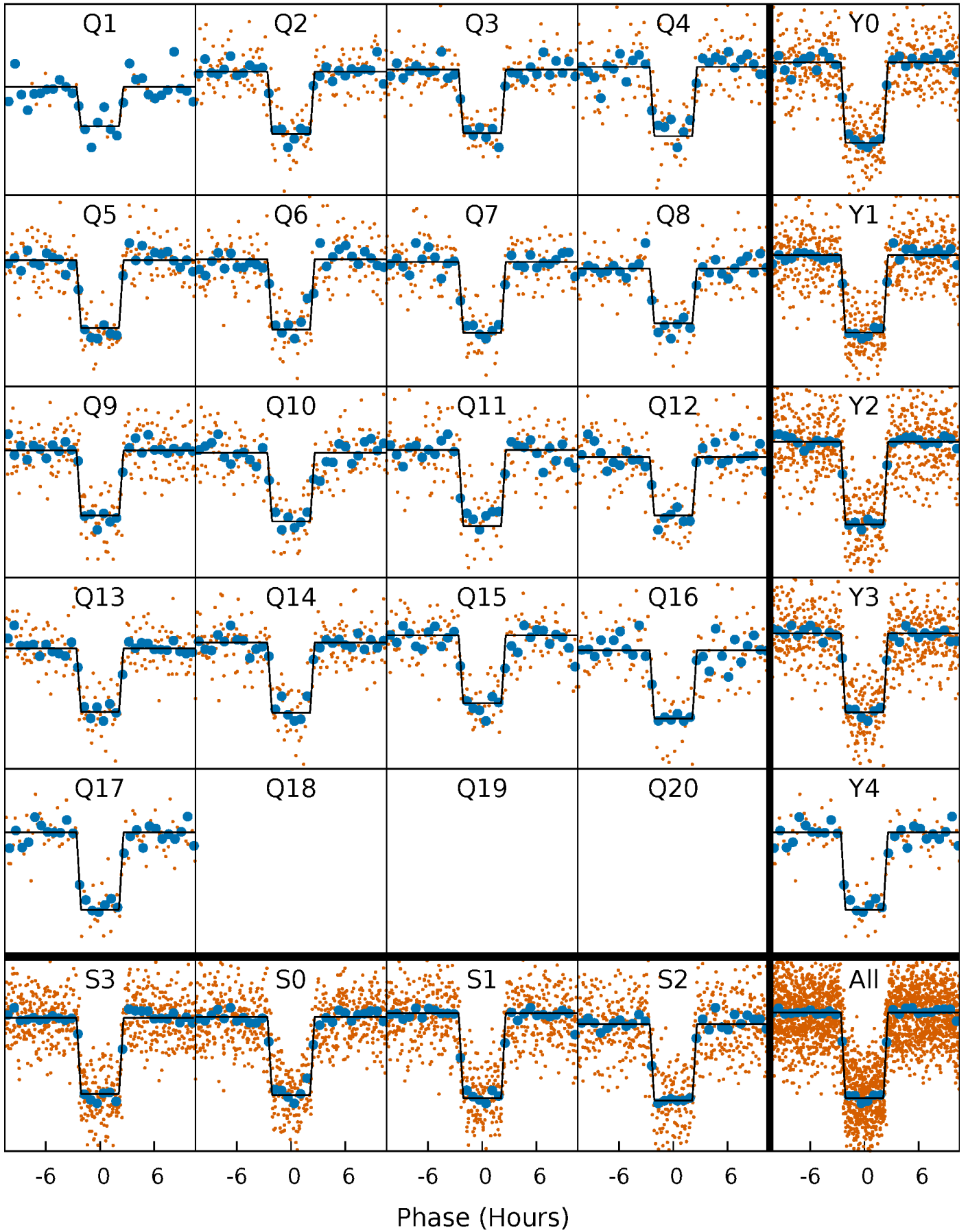
# DV Quarter-Phased Transit Curves

TCE 012404305-01 P= 22.183314 Days  $T_0=147.312673$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

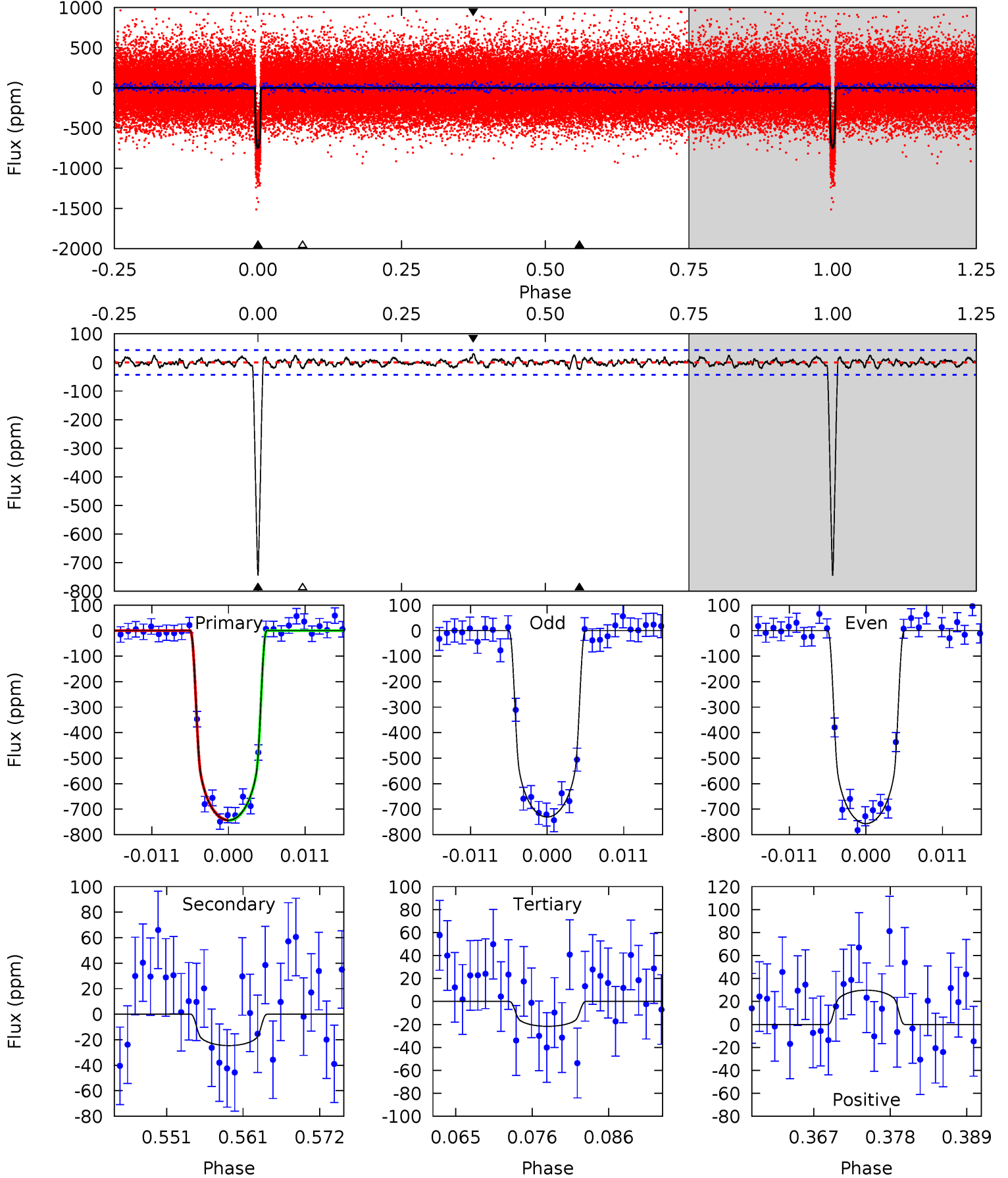
TCE 012404305-01 P= 22.183267 Days  $T_0=147.314610$  (BKJD)



# DV Model-Shift Uniqueness Test

012404305-01, P = 22.183314 Days, E = 125.129359 Days

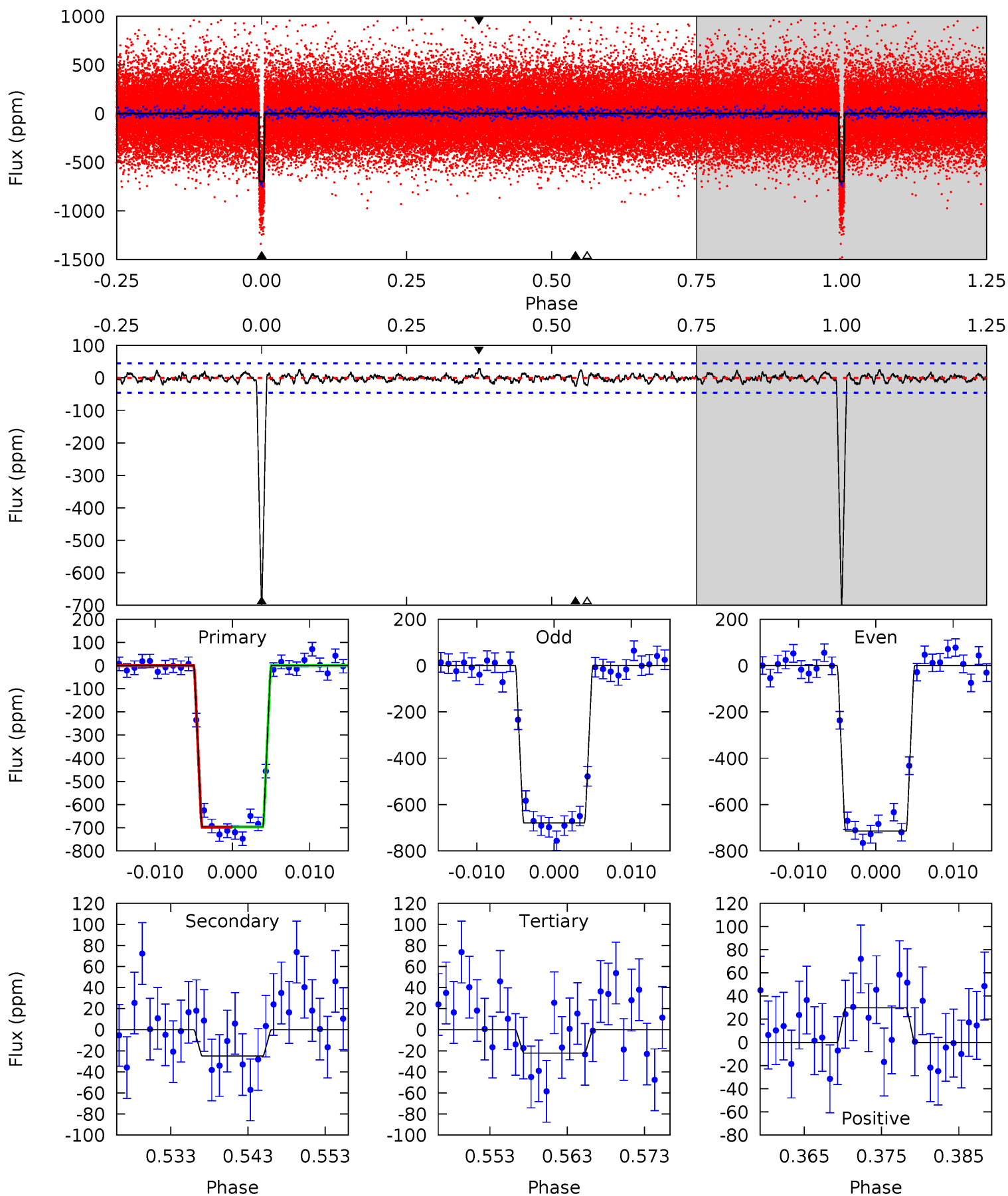
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
86.4	2.86	2.52	3.46	5.01	2.55	1.02	83.9	83.0	0.34	-0.61	1.51	0.98	0.04	0.06



# Alt Model-Shift Uniqueness Test

012404305-01,  $P = 22.183267$  Days,  $E = 125.131343$  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
77.6	2.79	2.47	3.32	5.03	2.58	0.92	75.1	74.2	0.31	-0.53	1.99	0.99	0.04	0.08



### Stellar Parameters For KIC 012404305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5565^{+111}_{-100}$	$4.361^{+0.138}_{-0.103}$	$0.000^{+0.150}_{-0.150}$	$1.030^{+0.144}_{-0.144}$	$0.889^{+0.072}_{-0.044}$	$1.145^{+0.626}_{-0.342}$
	+2%/-2%	+3%/-2%	+inf%/-inf%	+14%/-14%	+8%/-5%	+55%/-30%
Source	SPE57	SPE57	SPE57	DSEP		

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

### Secondary Eclipse Parameters for KIC 012404305-01 / KOI 0486.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-25 \pm 9$	$3.04^{+0.40}_{-0.32}$	$903^{+36}_{-43}$	$3017^{+159}_{-191}$	$32^{+14}_{-12}$
Alt.	$-25 \pm 9$	$2.92^{+0.39}_{-0.33}$	$898^{+42}_{-41}$	$3052^{+164}_{-190}$	$35^{+17}_{-14}$

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

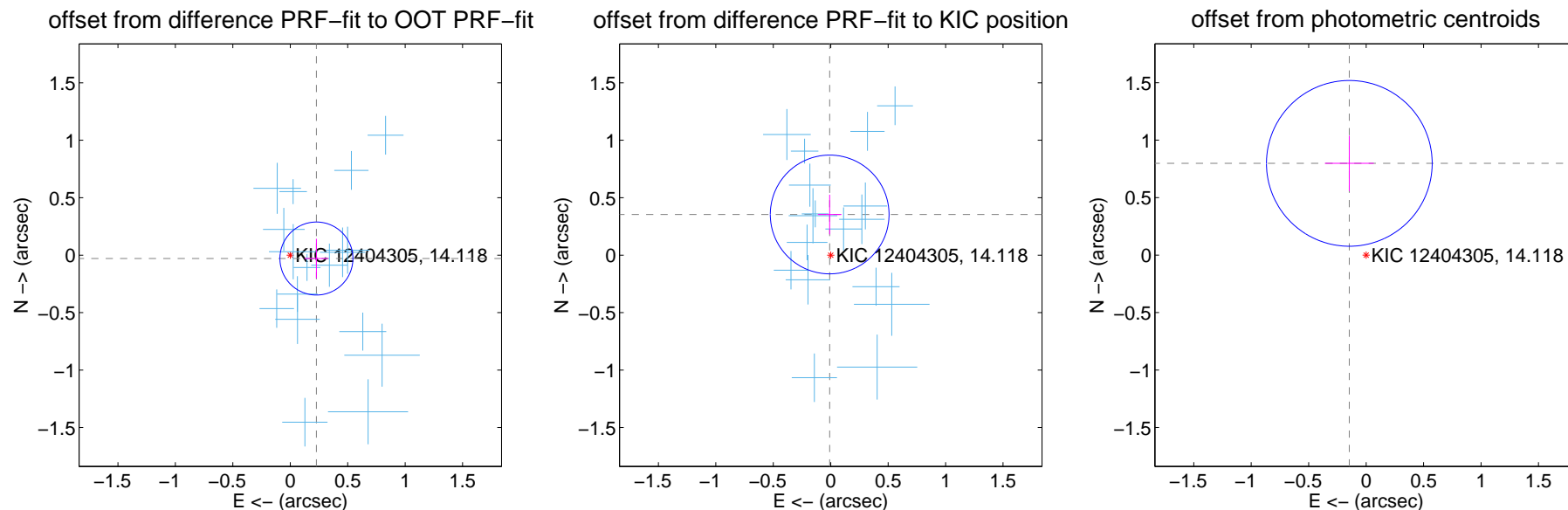
## DV Centroid Data

Supplemental centroid analysis for 012404305-01. Kepler magnitude: 14.12. Transit SNR 65.49

There are 17 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.52 arcsec

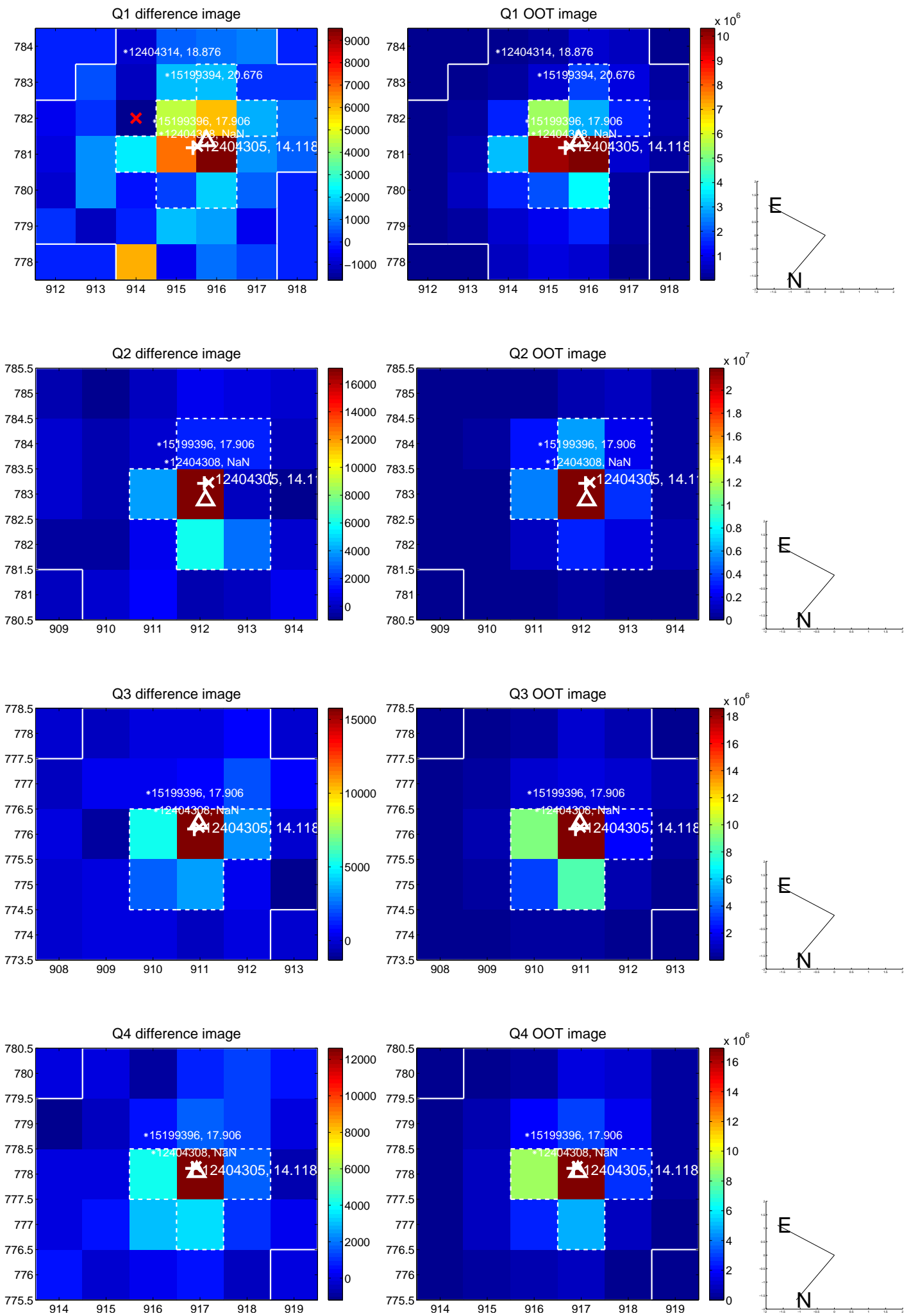
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.230 \pm 0.106$	2.17	$-0.228 \pm 0.104$	$-0.029 \pm 0.172$
PRF-fit source offset from KIC position	$0.354 \pm 0.172$	2.06	$0.009 \pm 0.103$	$0.354 \pm 0.172$
photometric centroid source offset	$0.81 \pm 0.24$	3.38	$0.15 \pm 0.21$	$0.80 \pm 0.24$



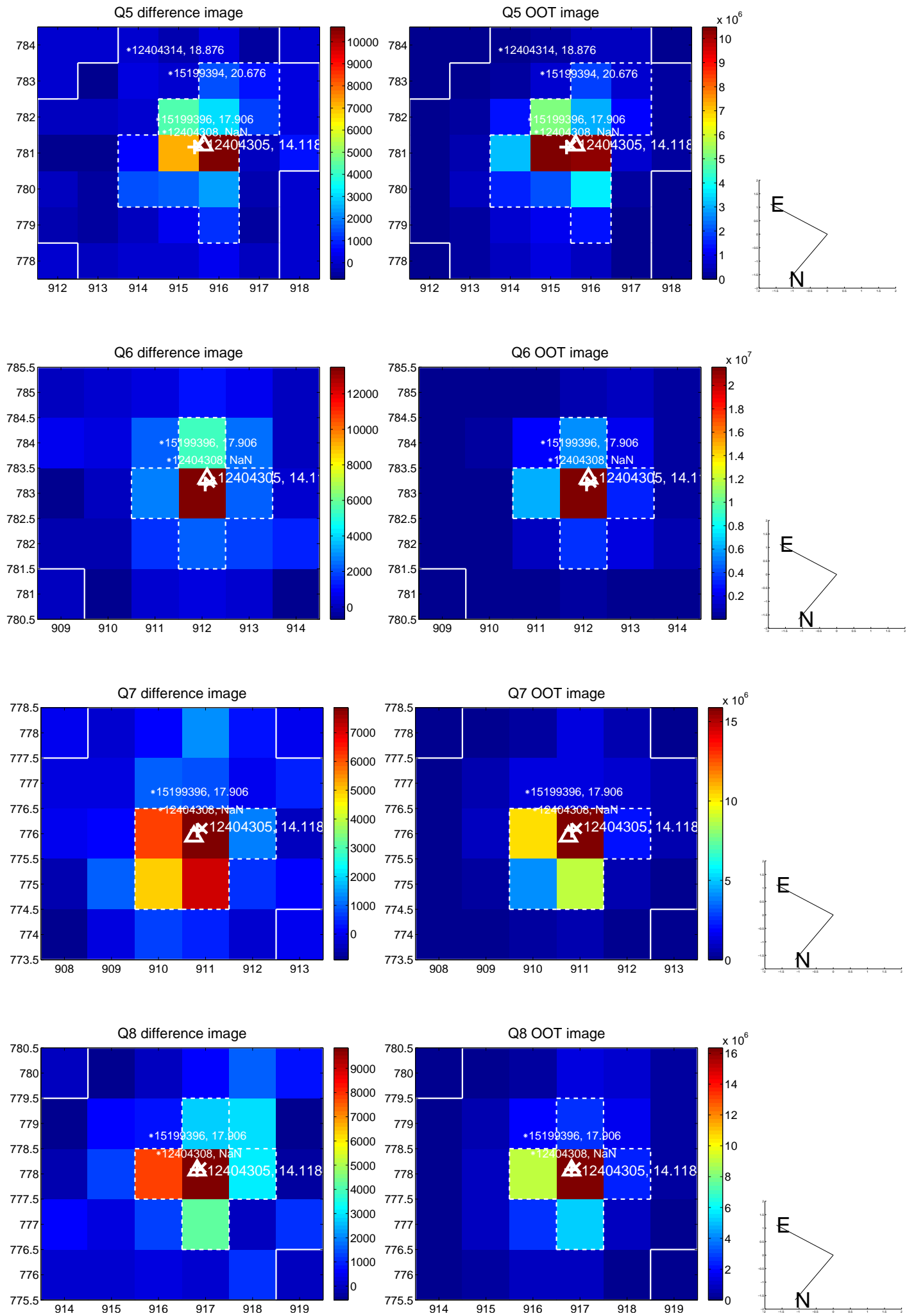
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



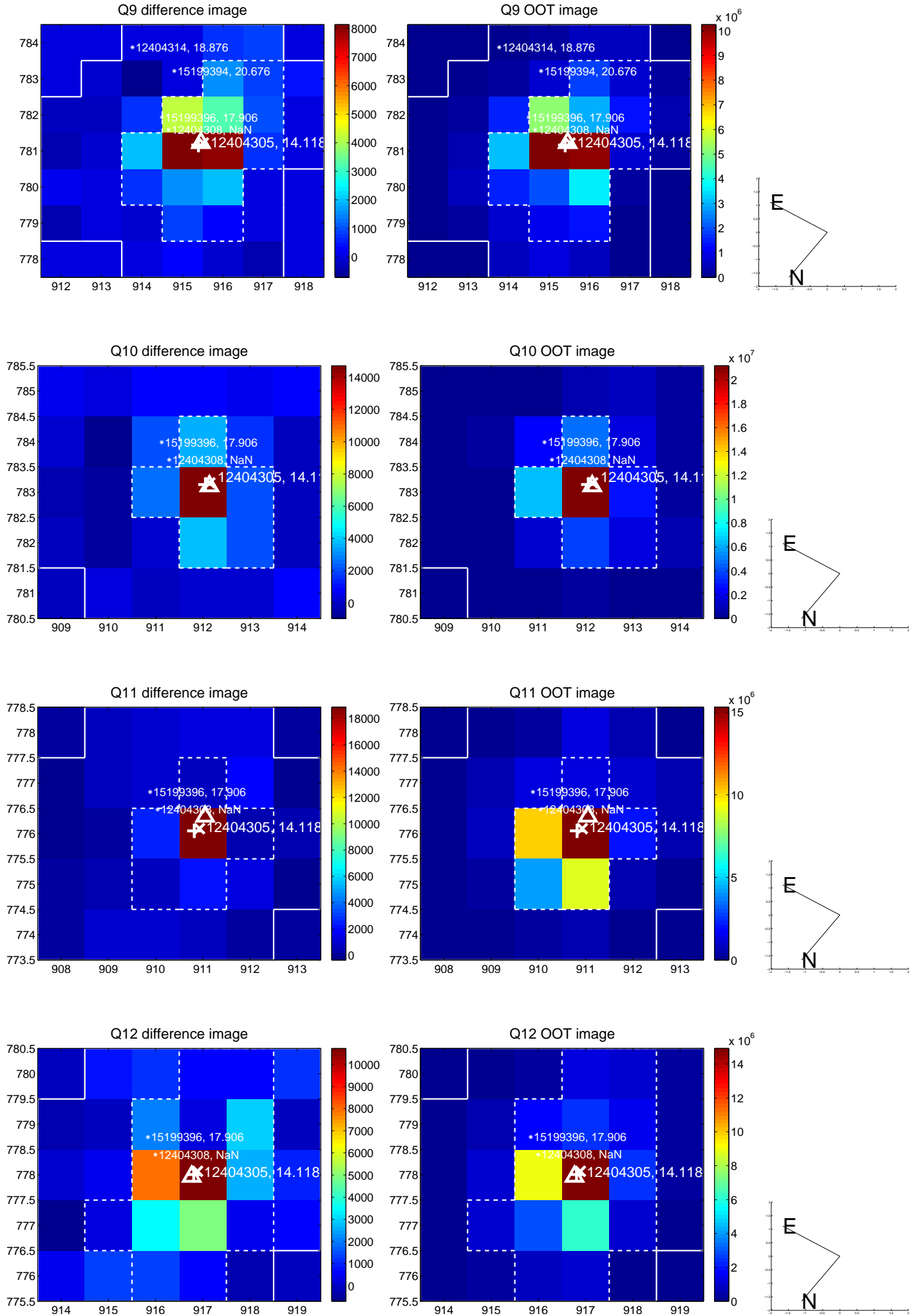
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



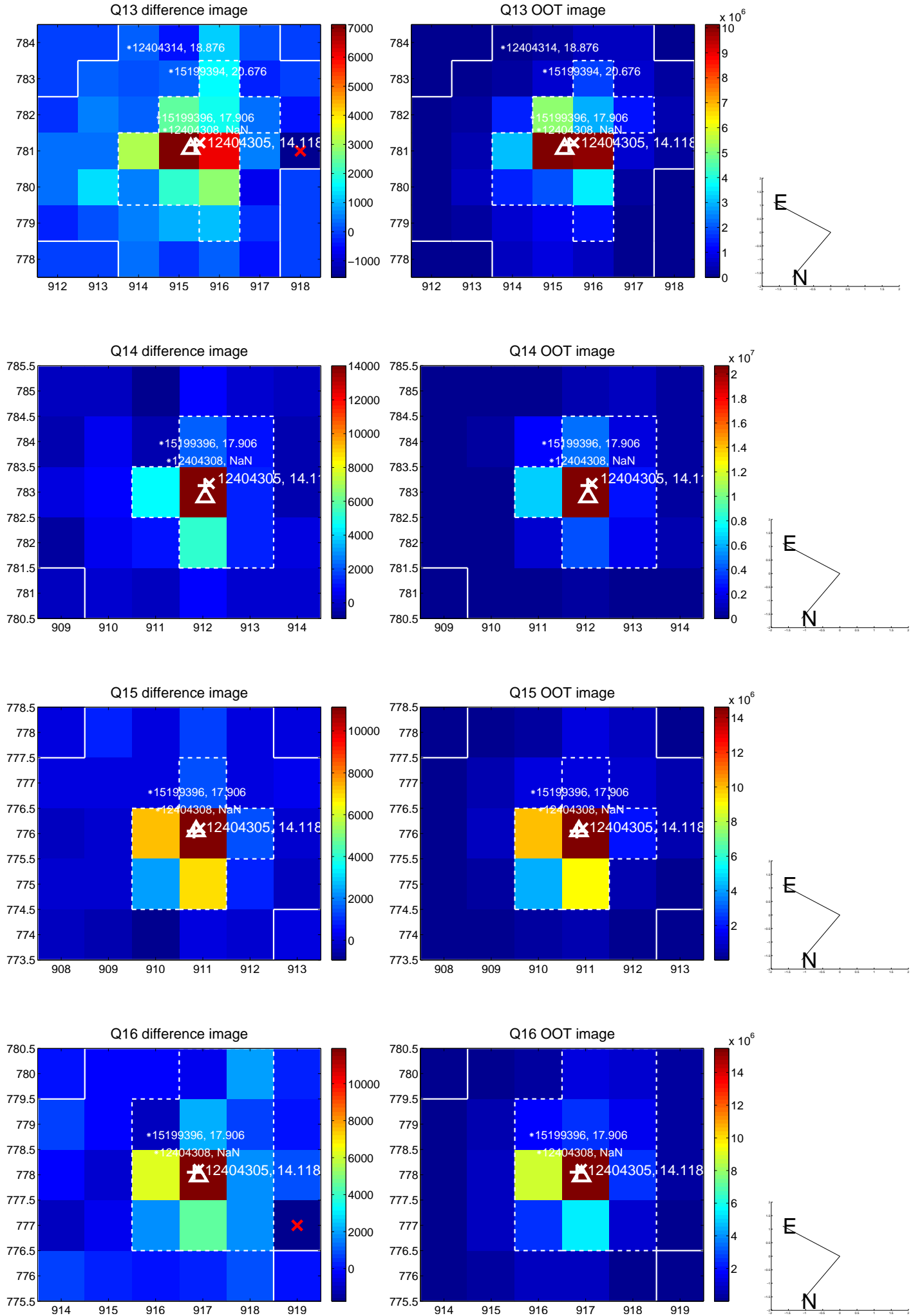
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



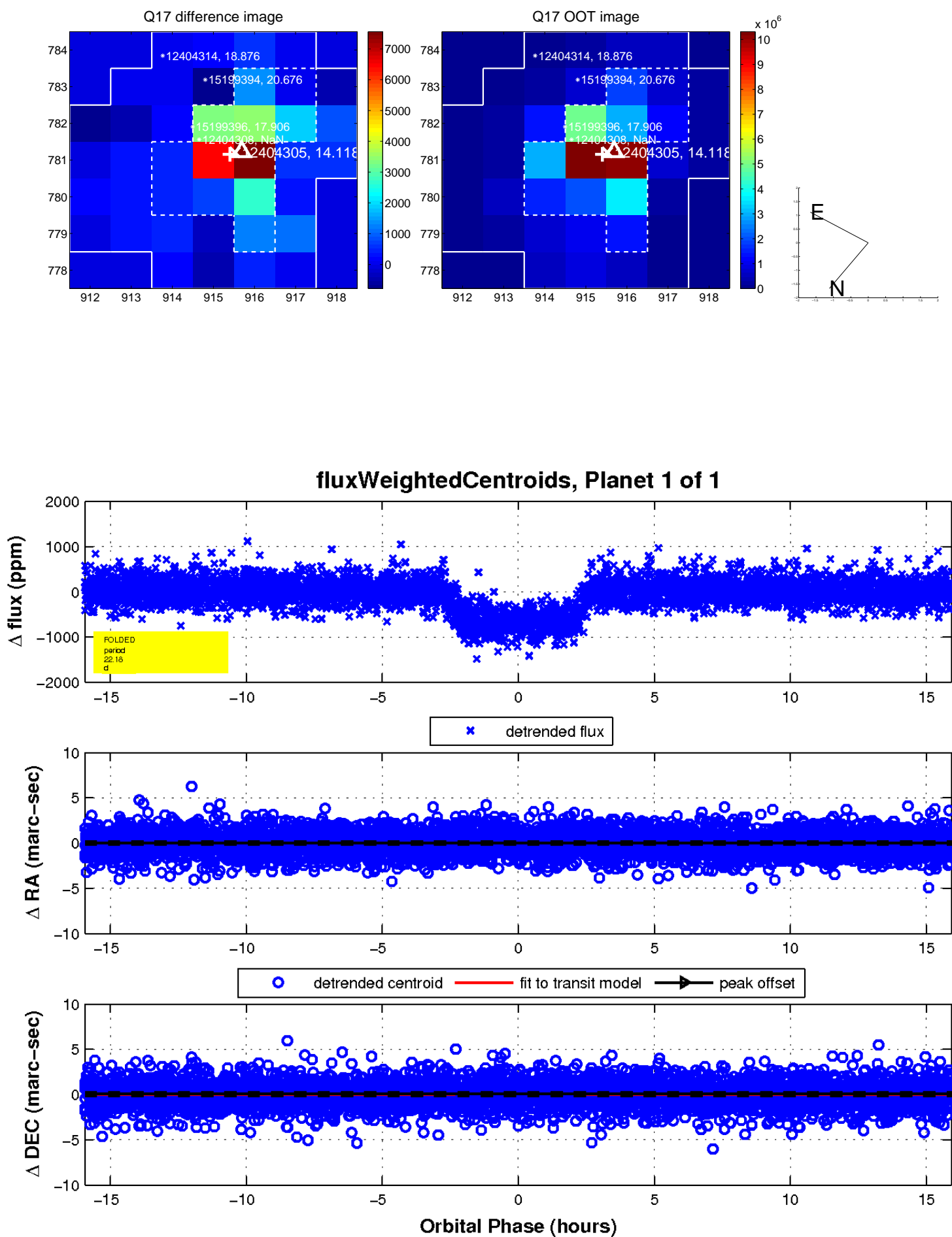
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

