

# KIC 010158418

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010158418-01	OBS	1784.01	5.007414	135.024186	4319.2	1.398	359.9	321.7	1.04	5957	8.96	364.84

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010158418-01	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.

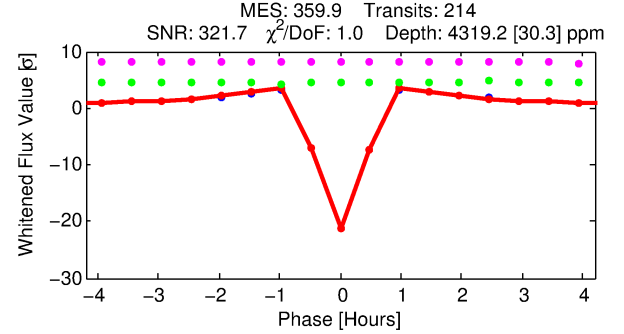
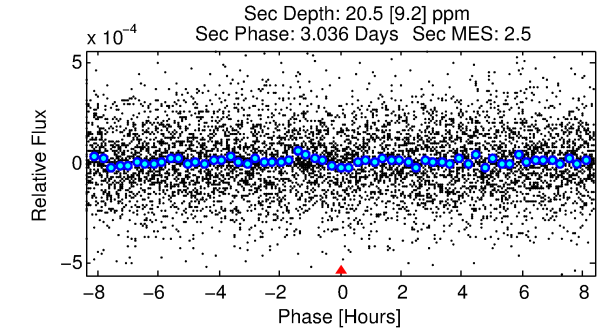
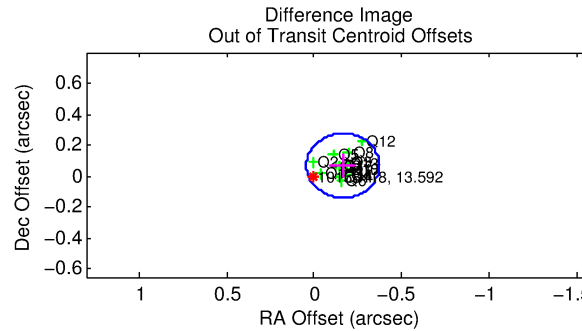
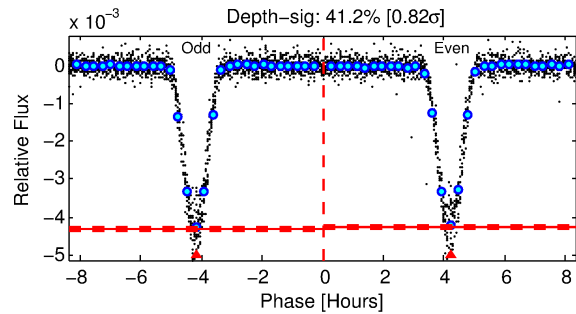
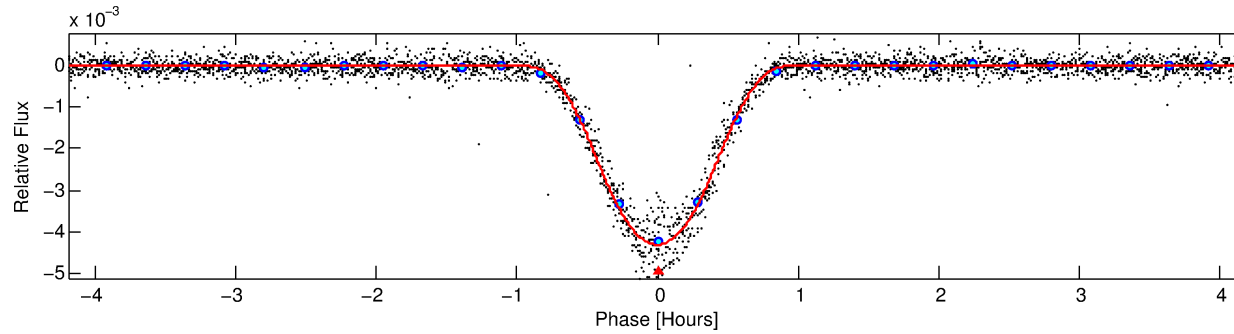
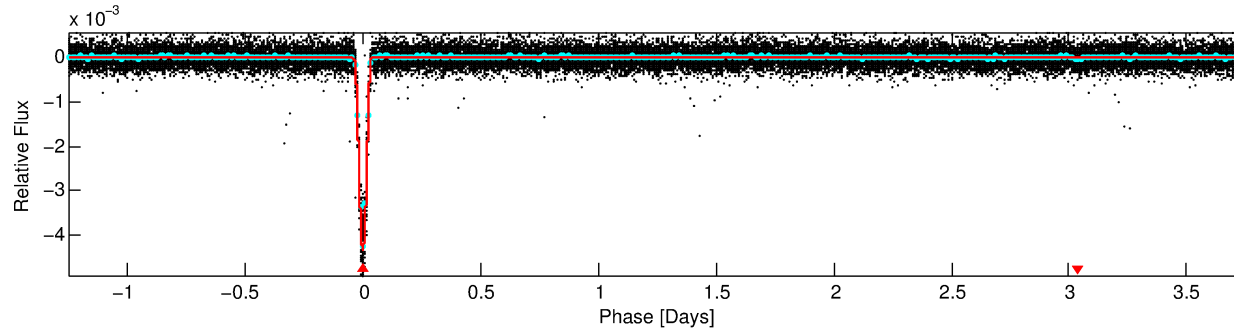
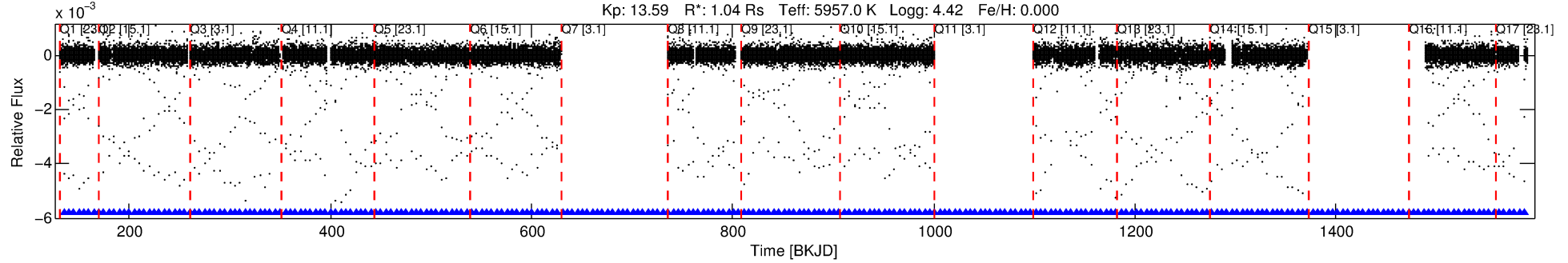
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010158418-01

No Significant Match Found

# DV One-Page Summary

KIC: 10158418 Candidate: 1 of 1 Period: 5.007 d  
KOI: K01784.01 Corr: 0.954



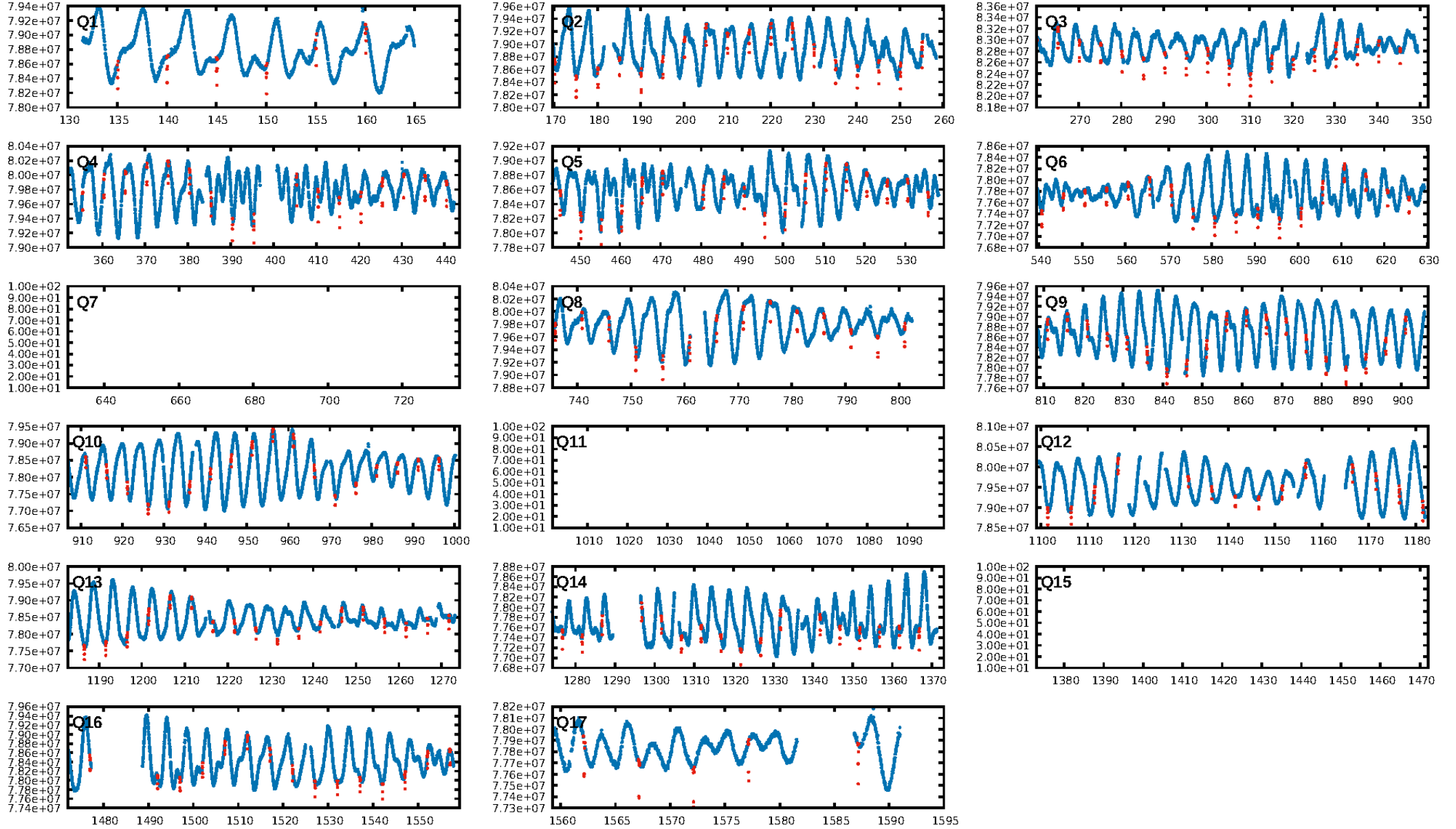
## DV Fit Results:

Period = 5.00741 [0.00000] d  
Epoch = 135.0242 [0.0001] BKJD  
Rp/R\* = 0.0788 [0.0030]  
a/R\* = 14.70 [0.37]  
b = 0.94 [0.01]  
Seff = 364.84 [82.83]  
Teq = 1114 [63] K  
Rp = 8.96 [1.49] Re  
a = 0.0579 [0.0081] AU  
Ag = 0.47 [0.24] [-2.25 $\sigma$ ]  
Teffp = 1427 [165] K [1.77 $\sigma$ ]

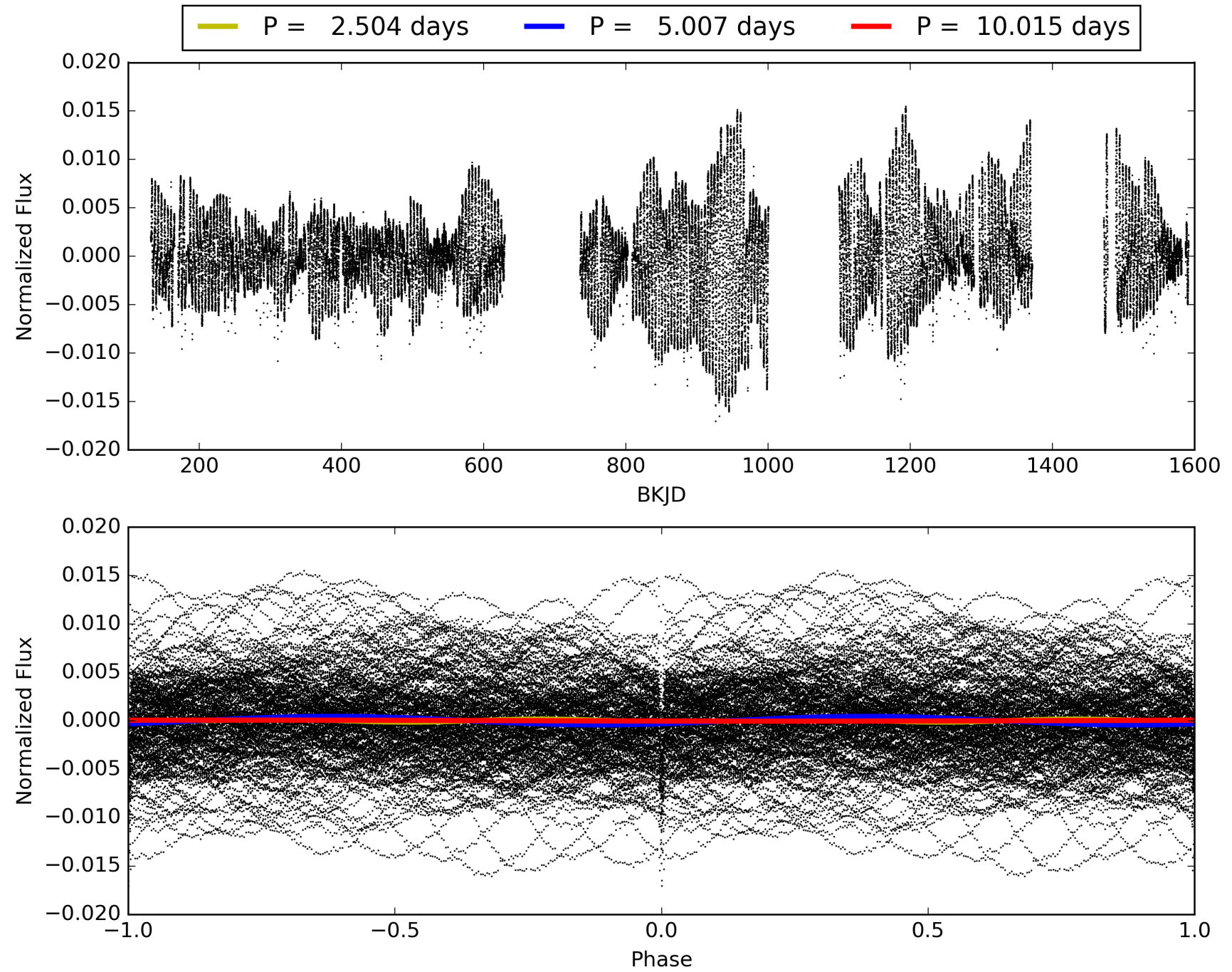
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [203/203]  
GhostDiagnostic-chr: 3.128  
Centroid-sig: 0.0%  
Centroid-so: 0.366 arcsec [12.41 $\sigma$ ]  
OotOffset-rm: 0.177 arcsec [2.56 $\sigma$ ]  
KicOffset-rm: 0.243 arcsec [3.35 $\sigma$ ]  
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 010158418-01, PDC Light Curves

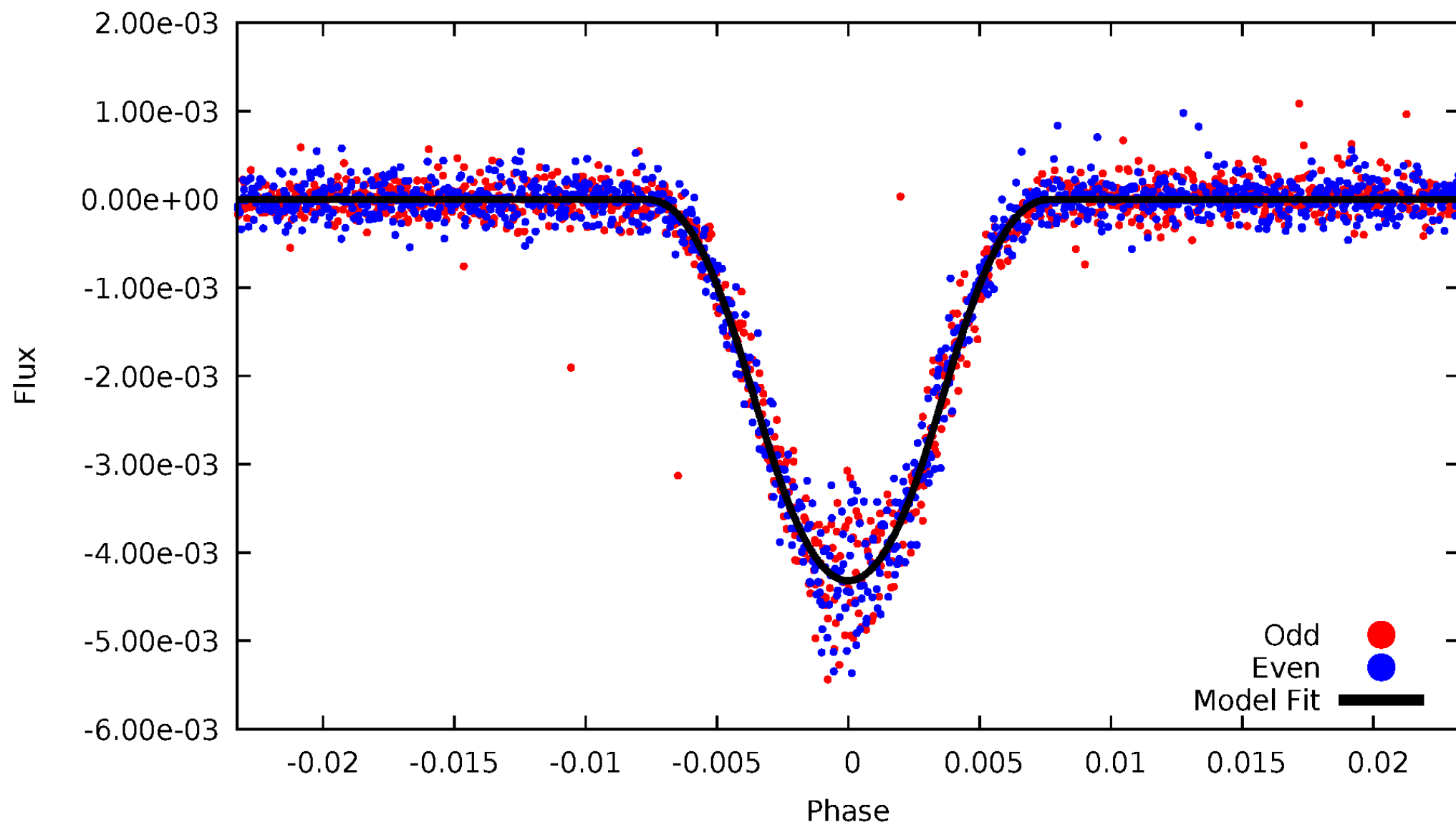


# TCE 010158418-01



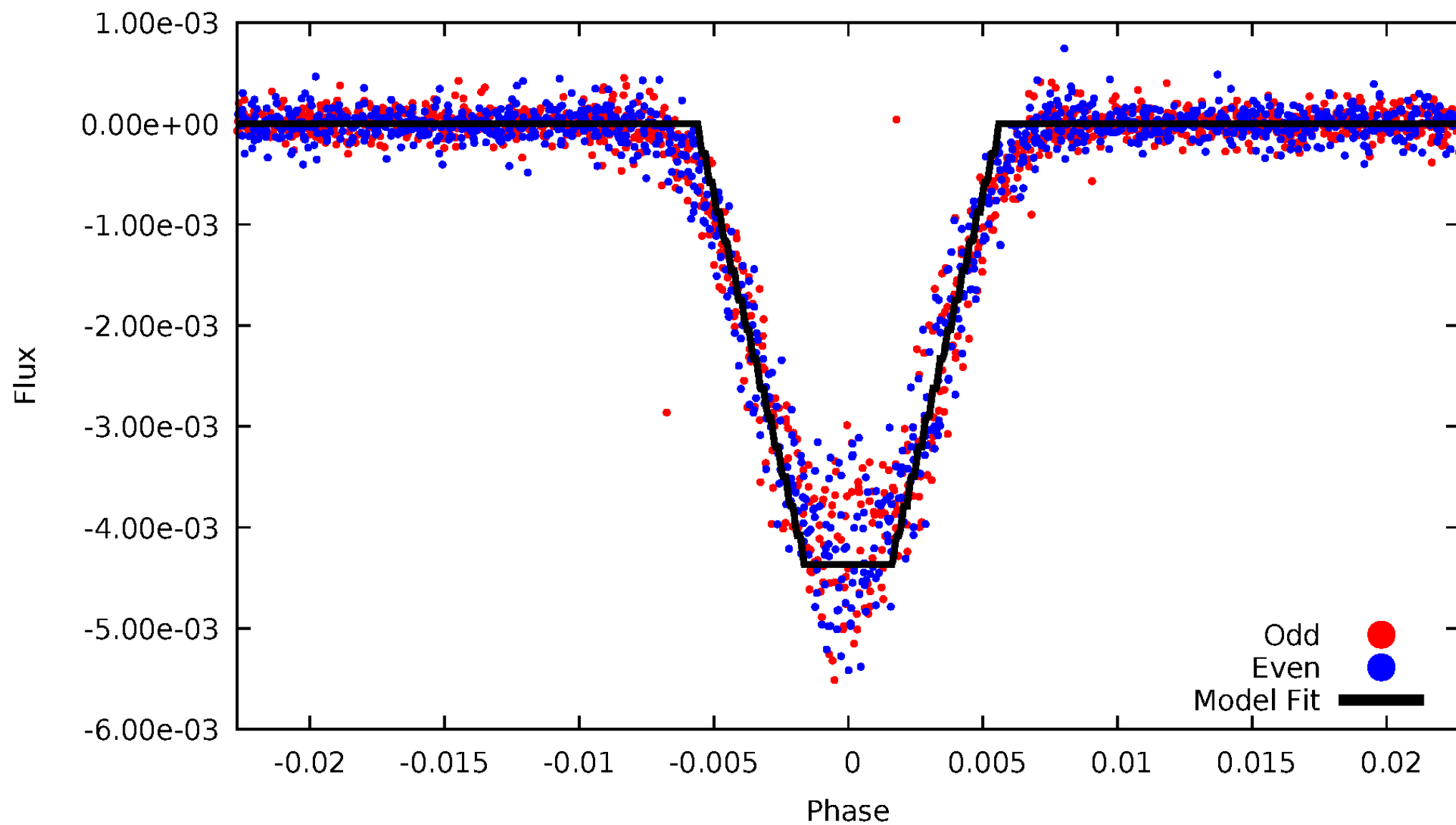
# DV Odd/Even

TCE 010158418-01



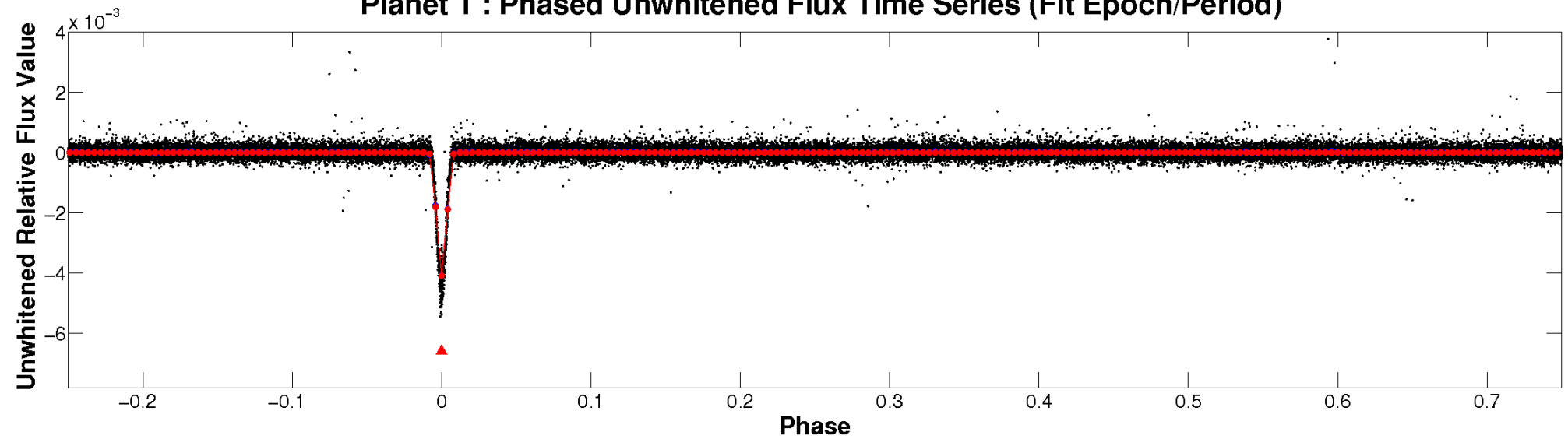
# ALT Odd/Even

TCE 010158418-01

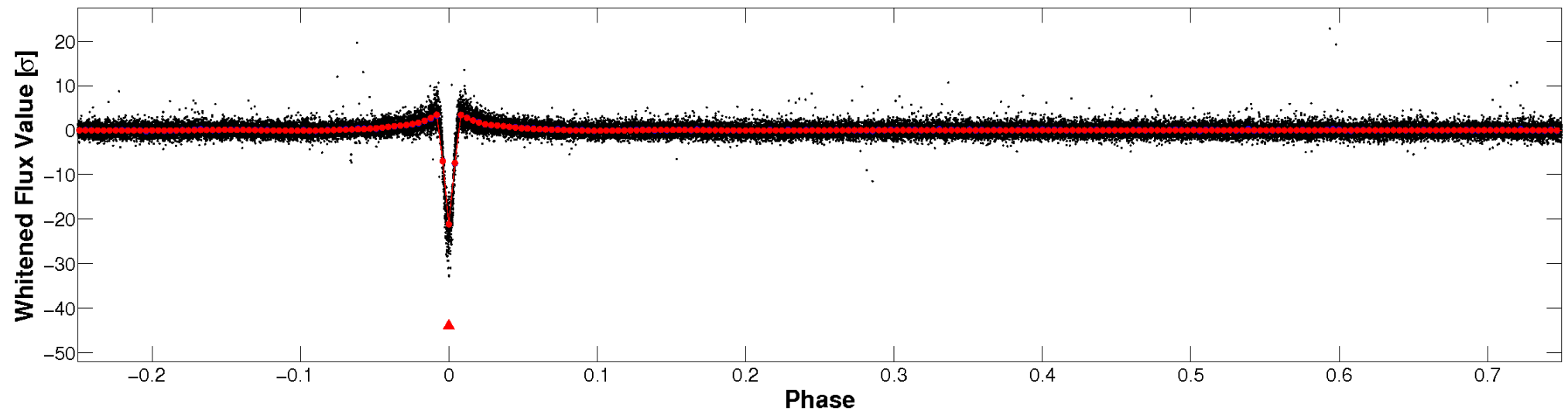


# Non-Whitened Vs. Whitened Light Curve

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



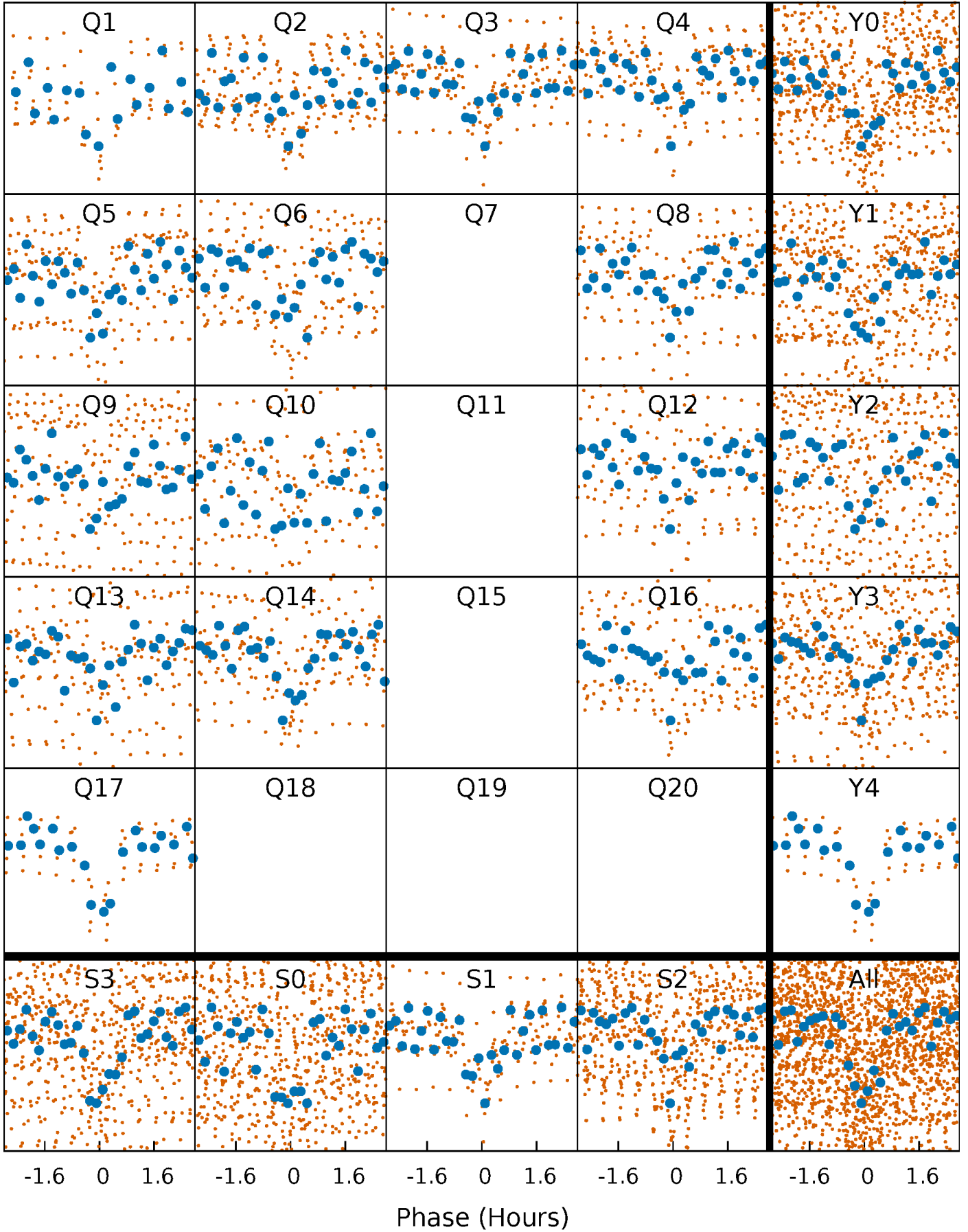
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

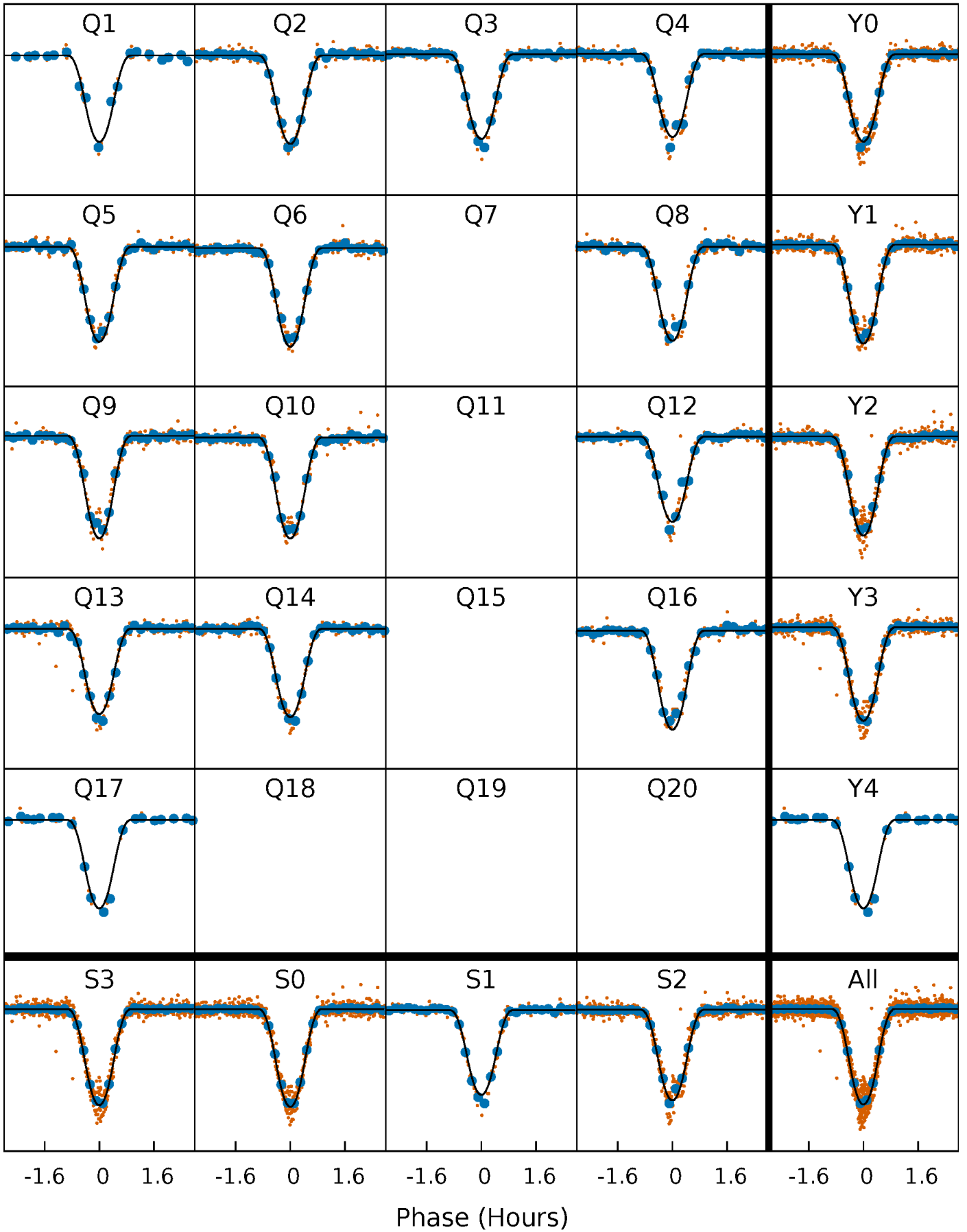
TCE 010158418-01   P= 5.007414 Days    $T_0=135.024186$  (BKJD)





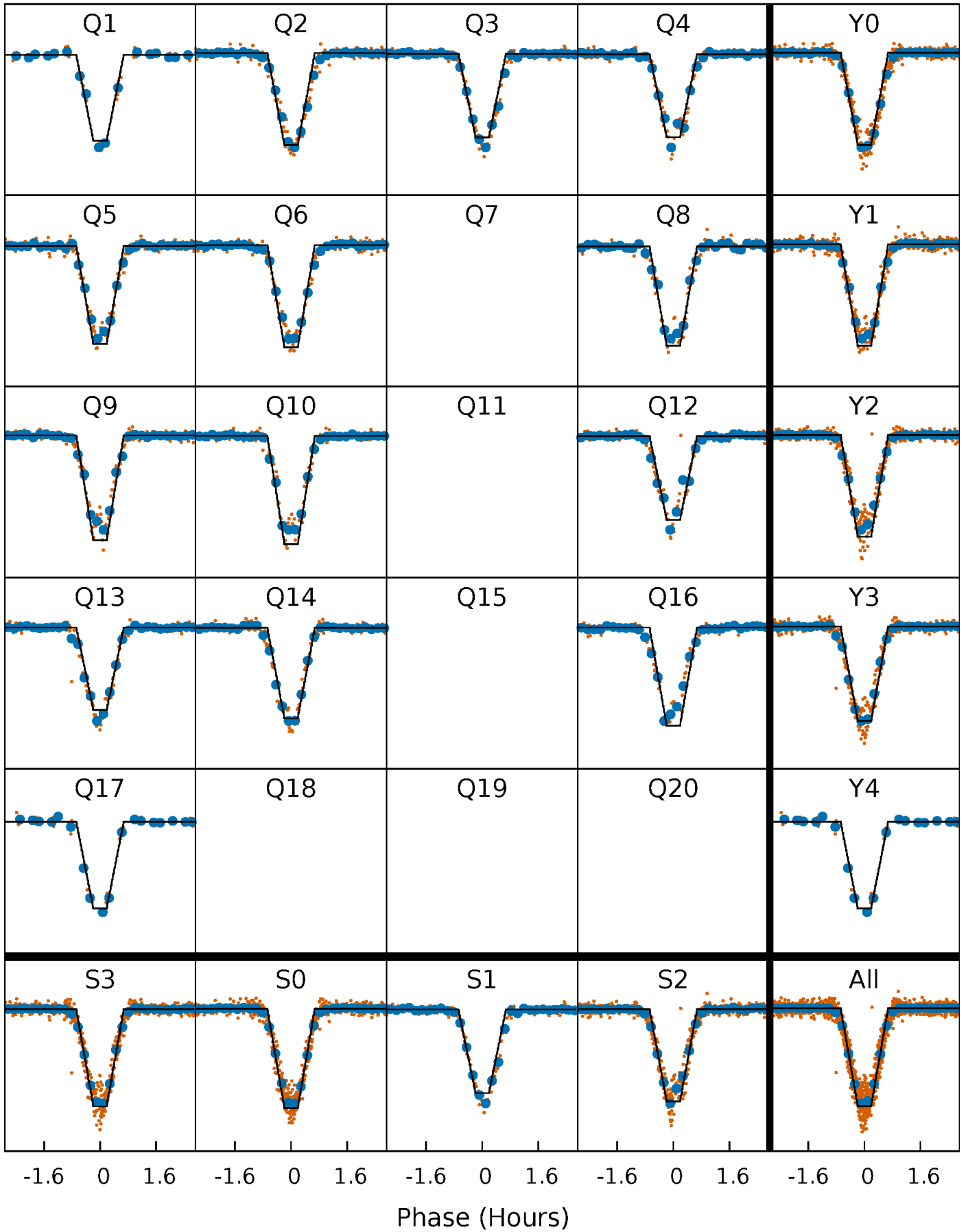
# DV Quarter-Phased Transit Curves

TCE 010158418-01 P= 5.007414 Days  $T_0=135.024186$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

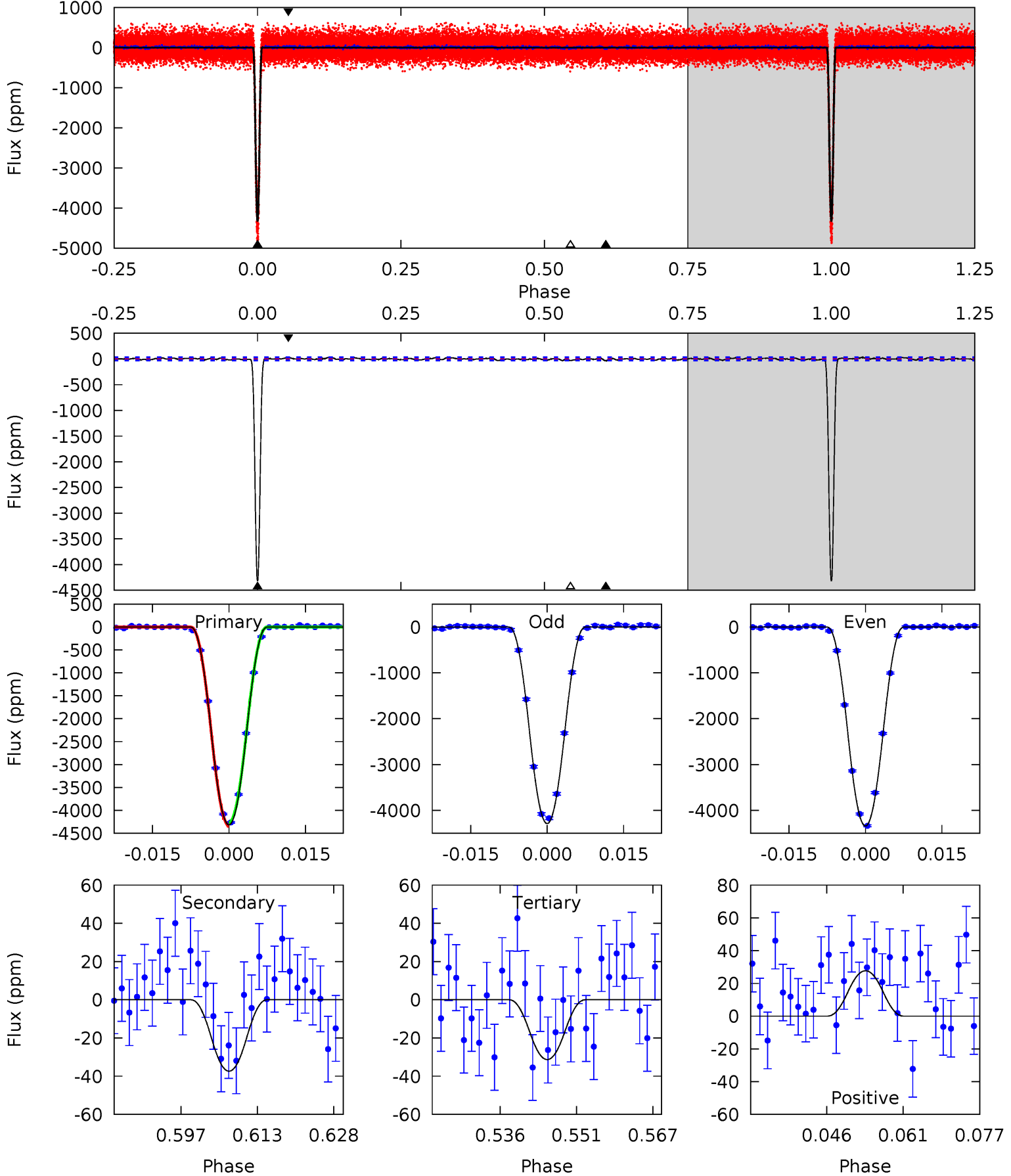
TCE 010158418-01 P= 5.007430 Days  $T_0=135.021907$  (BKJD)



# DV Model-Shift Uniqueness Test

010158418-01, P = 5.007414 Days, E = 130.016772 Days

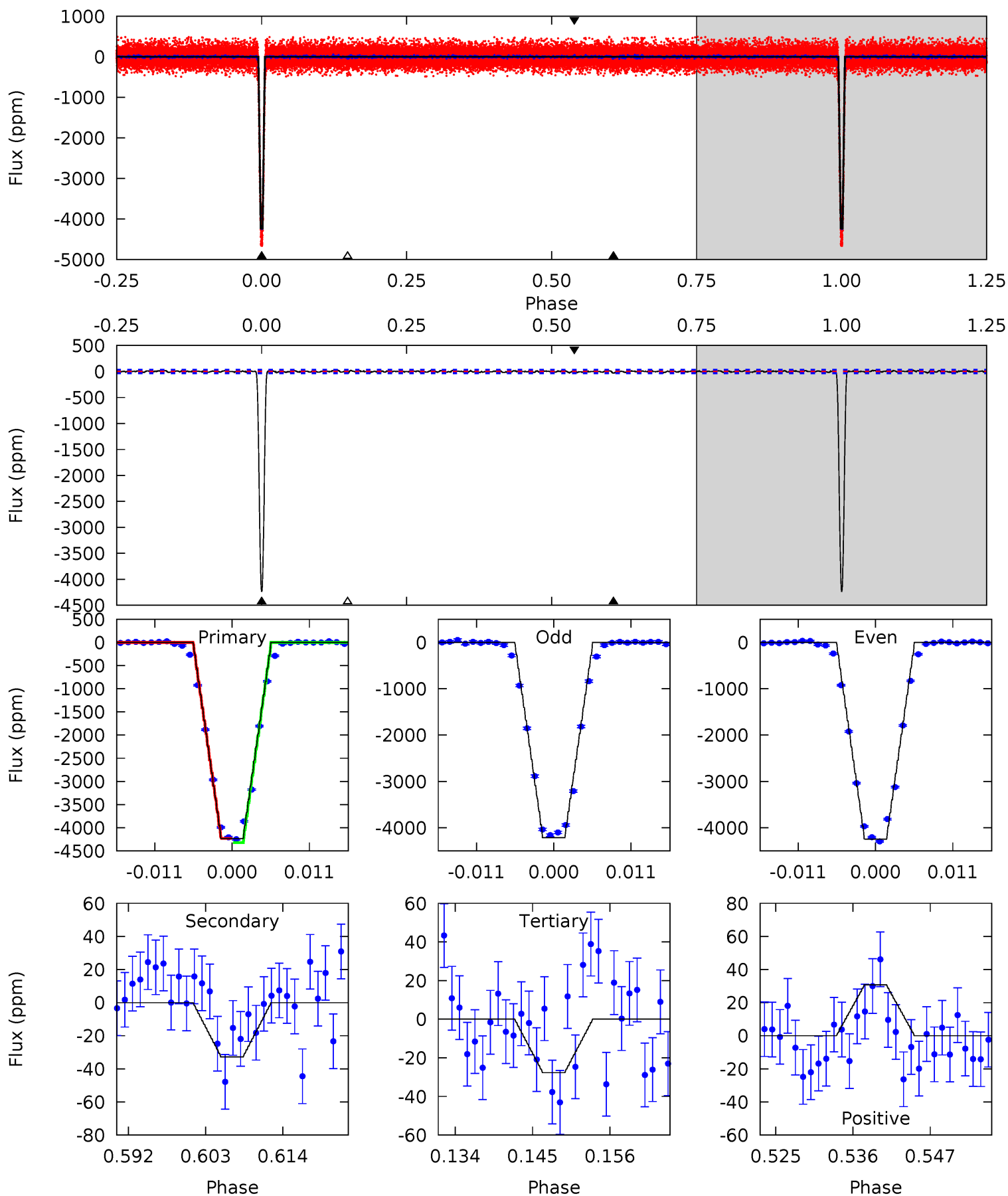
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
739.4	6.41	5.36	4.74	4.94	2.42	1.89	734.1	734.7	1.04	1.66	4.53	1.00	0.01	0



# Alt Model-Shift Uniqueness Test

010158418-01, P = 5.007430 Days, E = 130.014477 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
661.6	5.14	4.33	4.81	5.01	2.54	1.34	657.3	656.8	0.81	0.33	2.38	1.01	0.01	6.66



### Stellar Parameters For KIC 010158418

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5957^{+107}_{-131}$	$4.417^{+0.063}_{-0.117}$	$0.000^{+0.150}_{-0.150}$	$1.042^{+0.168}_{-0.084}$	$1.034^{+0.075}_{-0.068}$	$1.288^{+0.331}_{-0.448}$
	+2%/-2%	+1%/-3%	+inf%/-inf%	+16%/-8%	+7%/-7%	+26%/-35%
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 010158418-01 / KOI 1784.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-37 \pm 6$	$9.06^{+0.84}_{-0.65}$	$1565^{+67}_{-56}$	$2375^{+79}_{-89}$	$0.830^{+0.197}_{-0.170}$
Alt.	$-33 \pm 6$	$7.62^{+0.69}_{-0.54}$	$1567^{+64}_{-50}$	$2480^{+84}_{-108}$	$1.053^{+0.254}_{-0.251}$

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

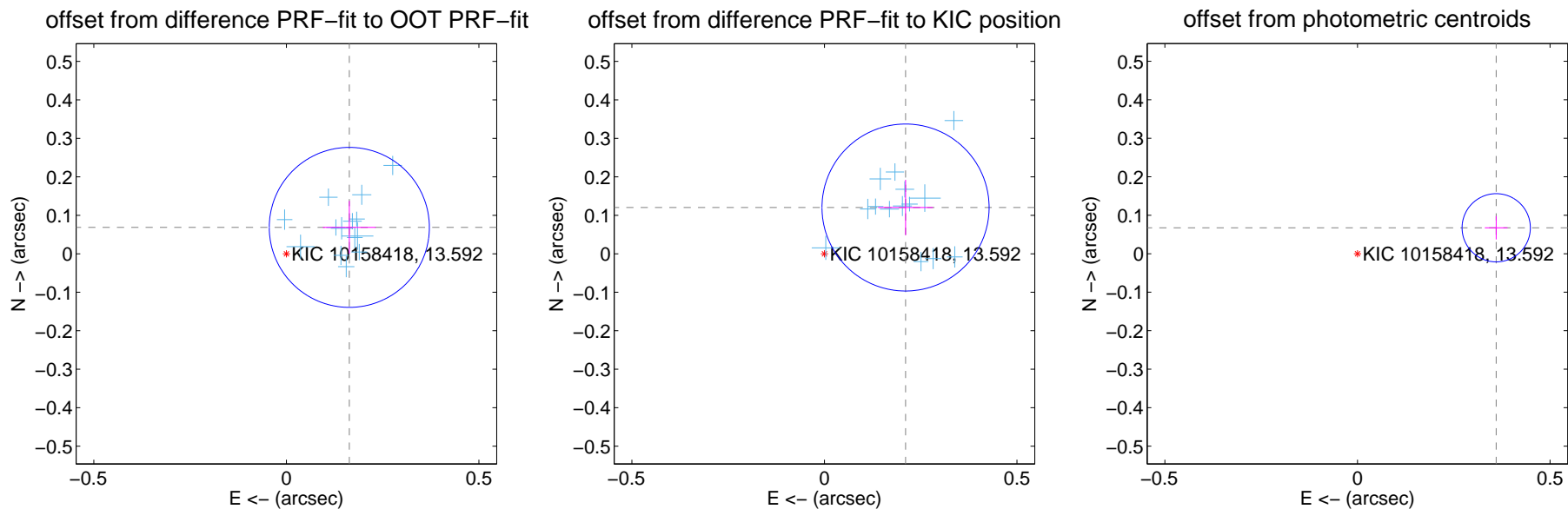
## DV Centroid Data

Supplemental centroid analysis for 010158418-01. Kepler magnitude: 13.59. Transit SNR 321.71

There are 14 quarters with good PRF difference image offsets

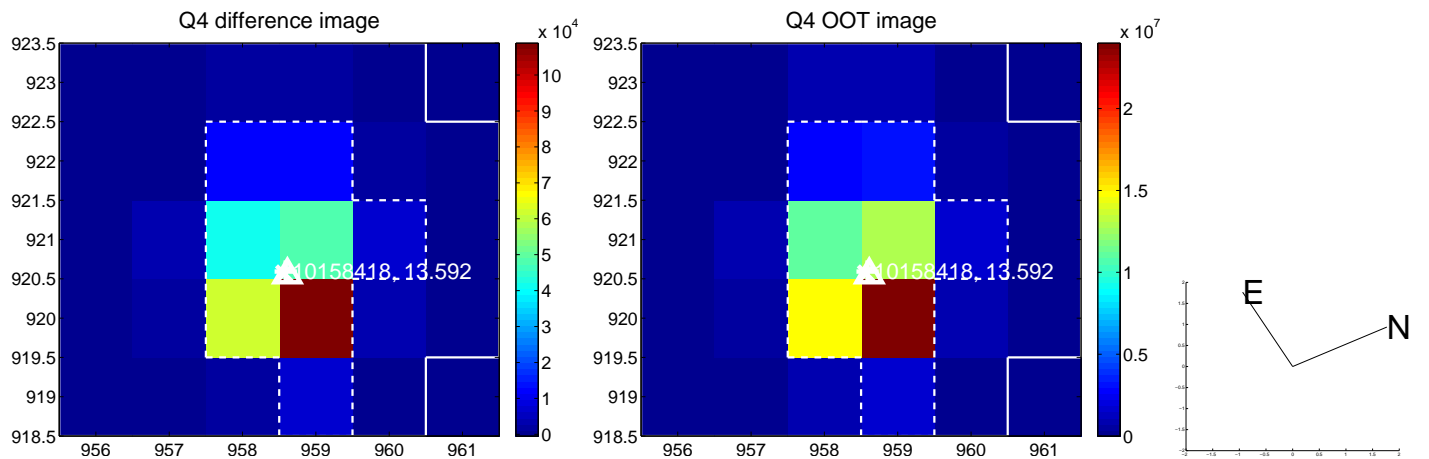
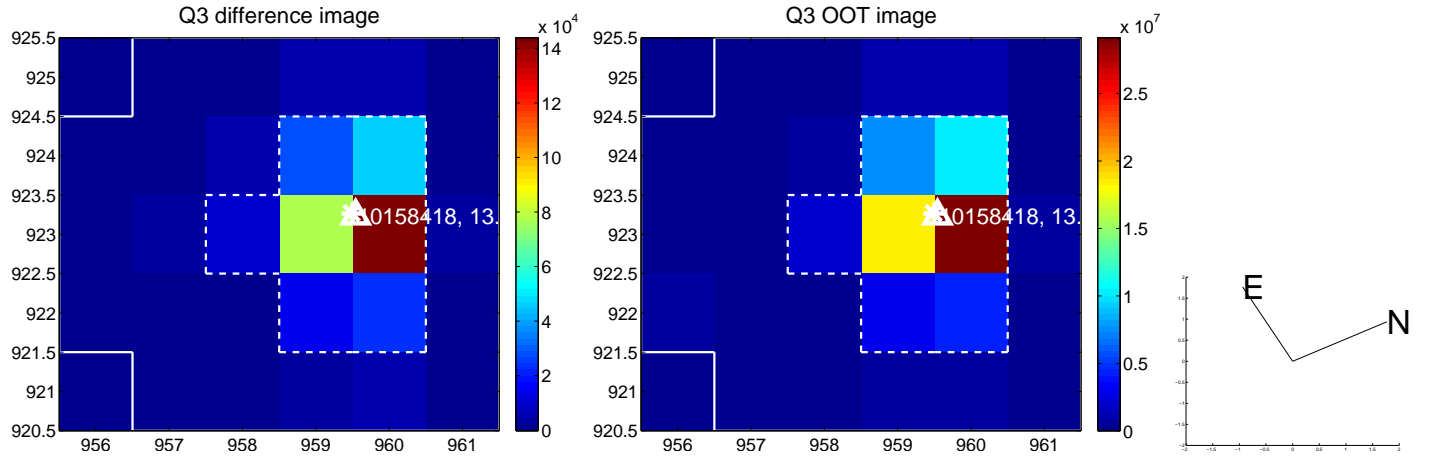
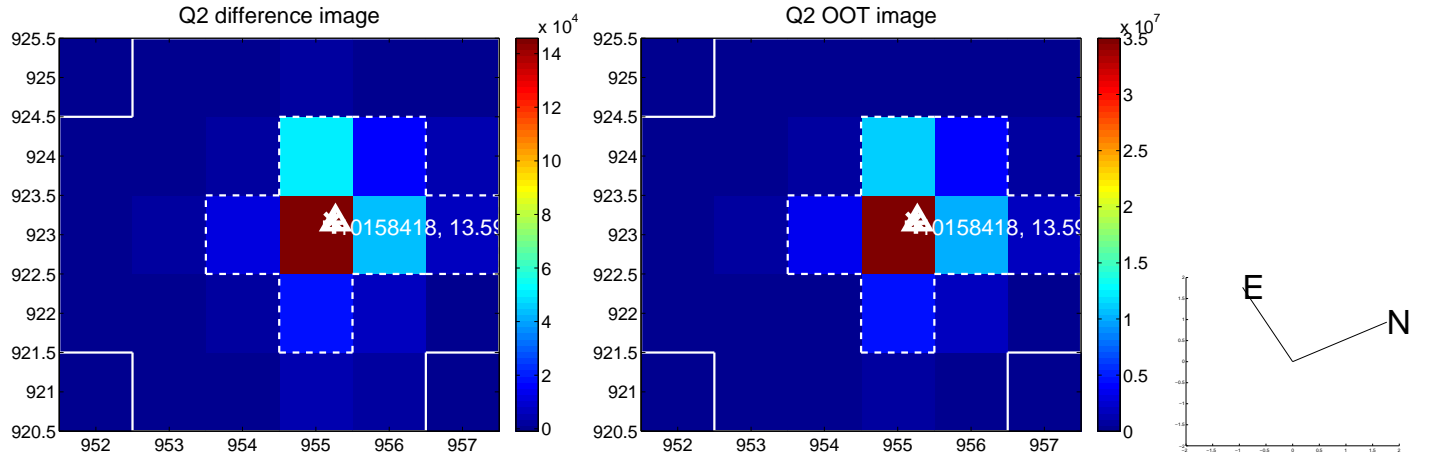
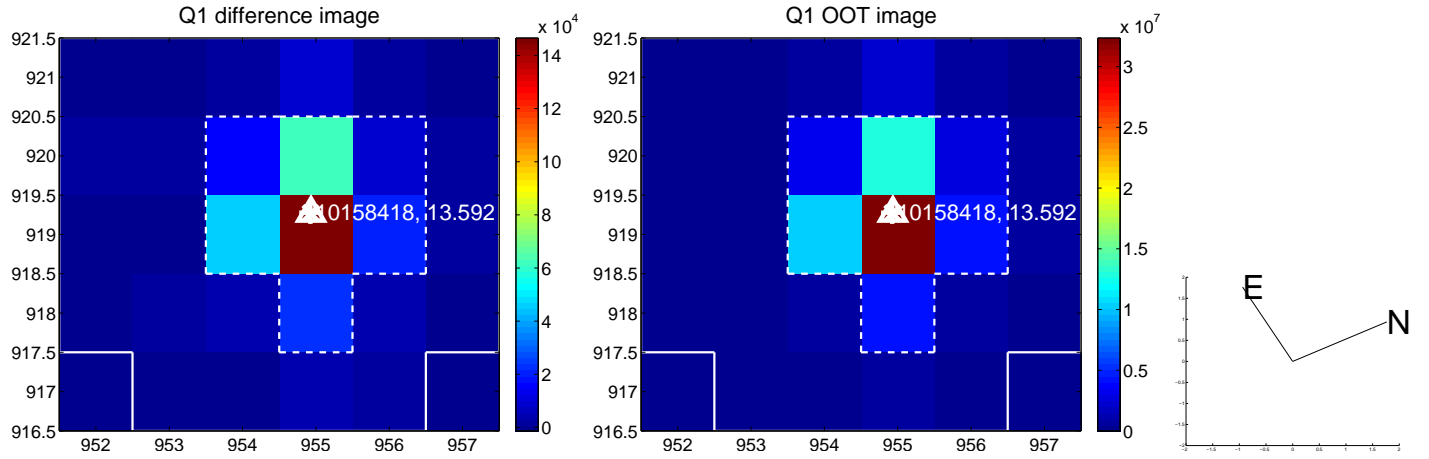
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.177 \pm 0.069$	2.56	$-0.163 \pm 0.069$	$0.069 \pm 0.069$
PRF-fit source offset from KIC position	$0.243 \pm 0.072$	3.35	$-0.211 \pm 0.071$	$0.120 \pm 0.072$
photometric centroid source offset	$0.37 \pm 0.03$	12.41	$-0.36 \pm 0.03$	$0.07 \pm 0.03$



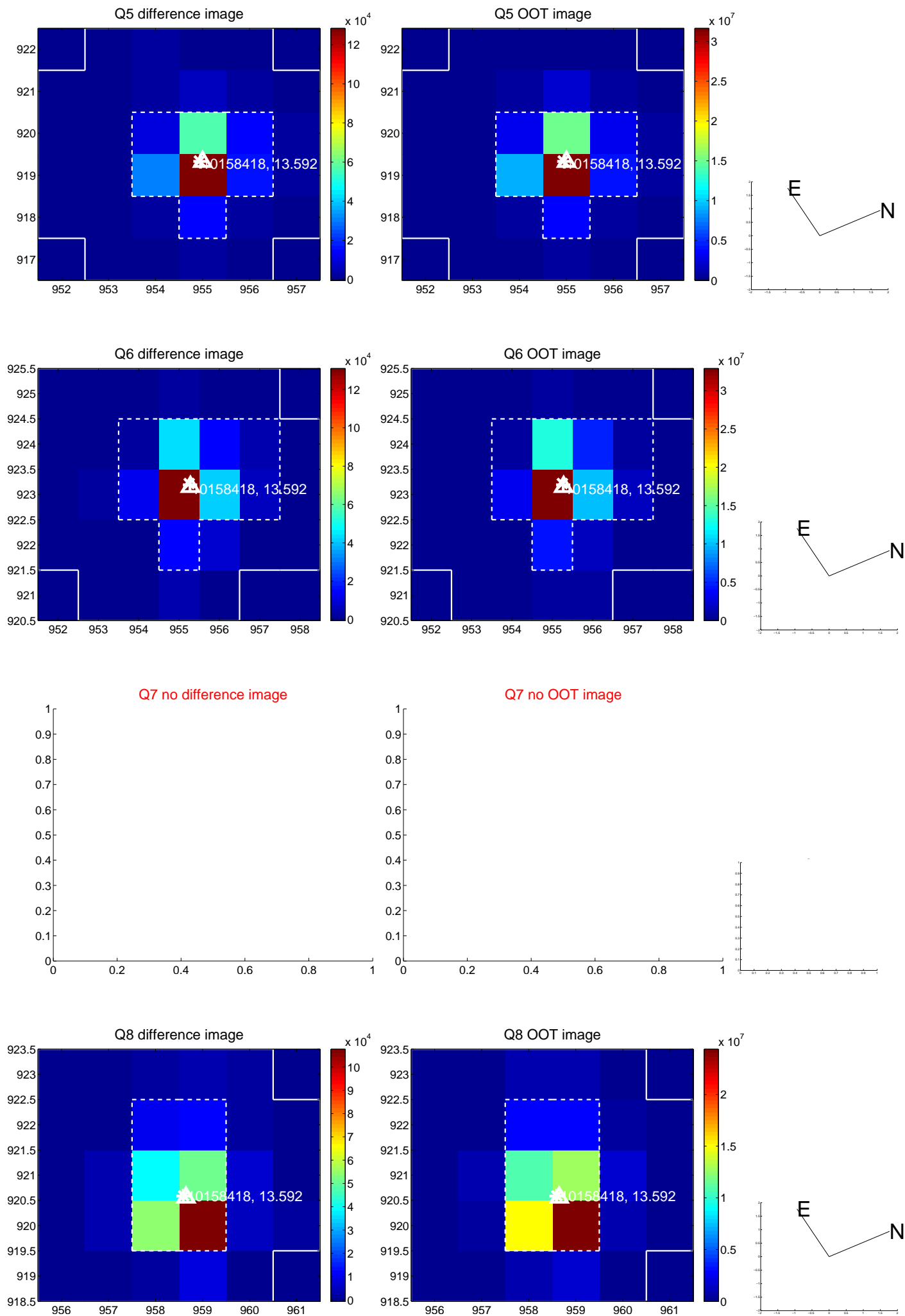
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

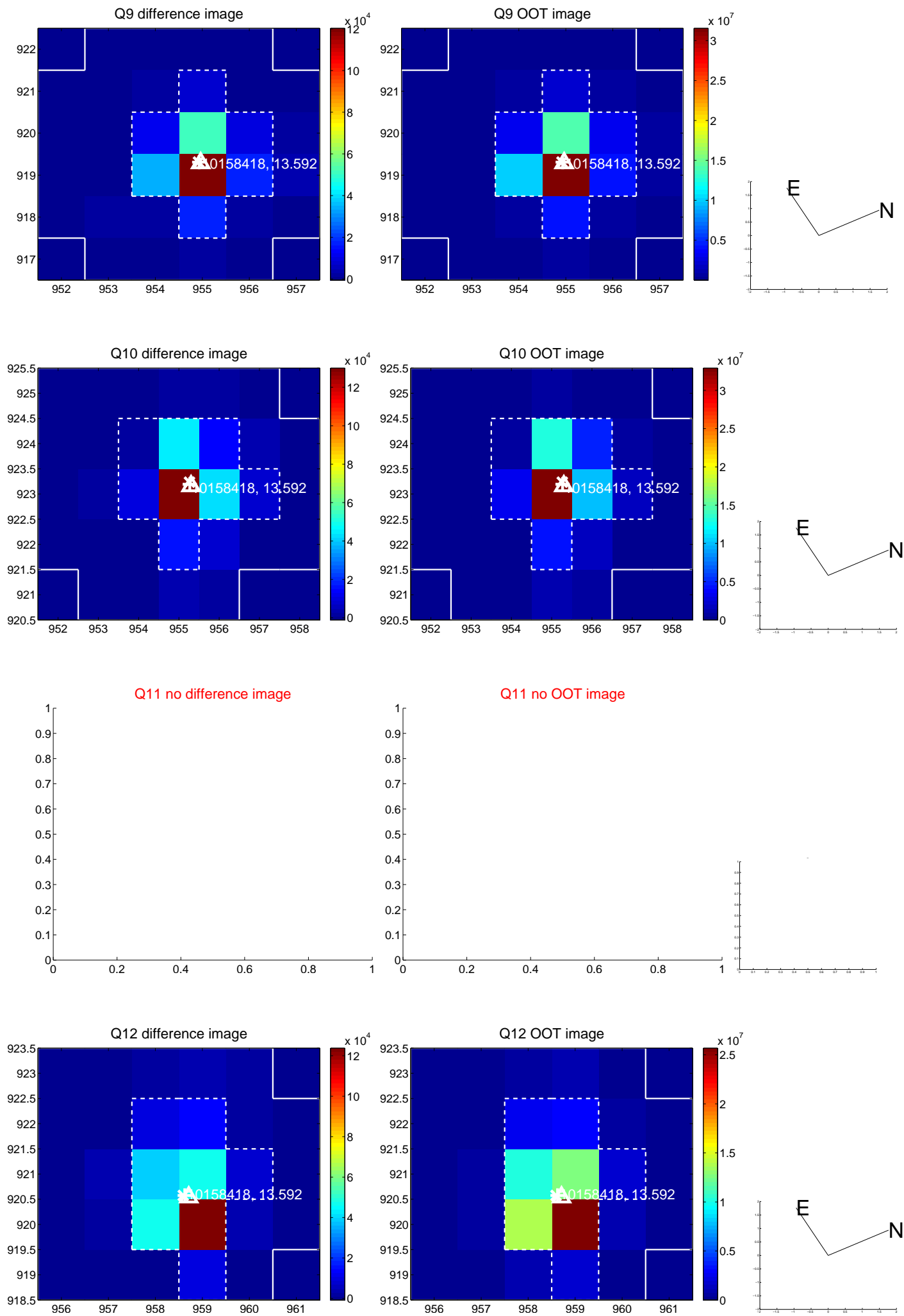




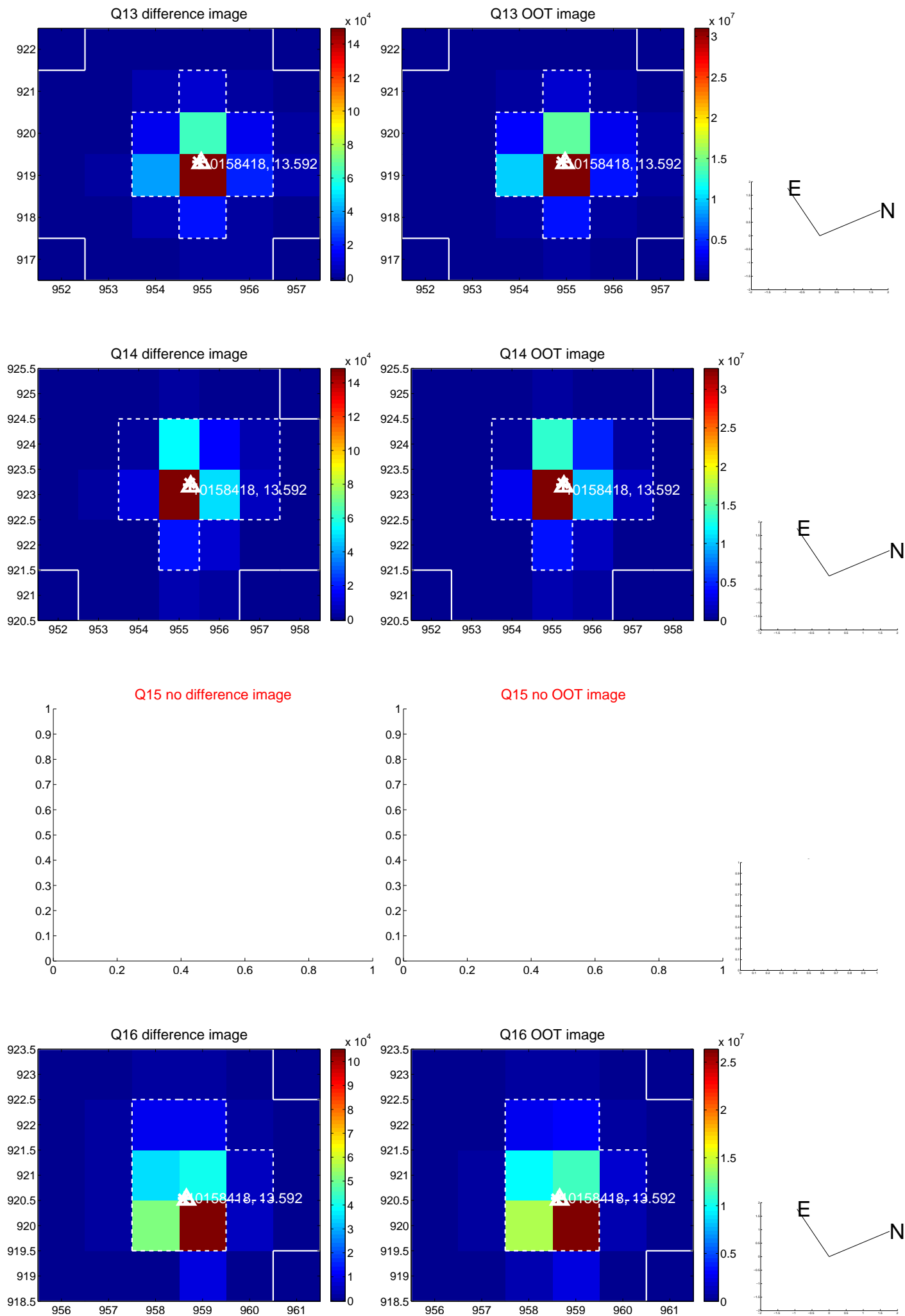
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



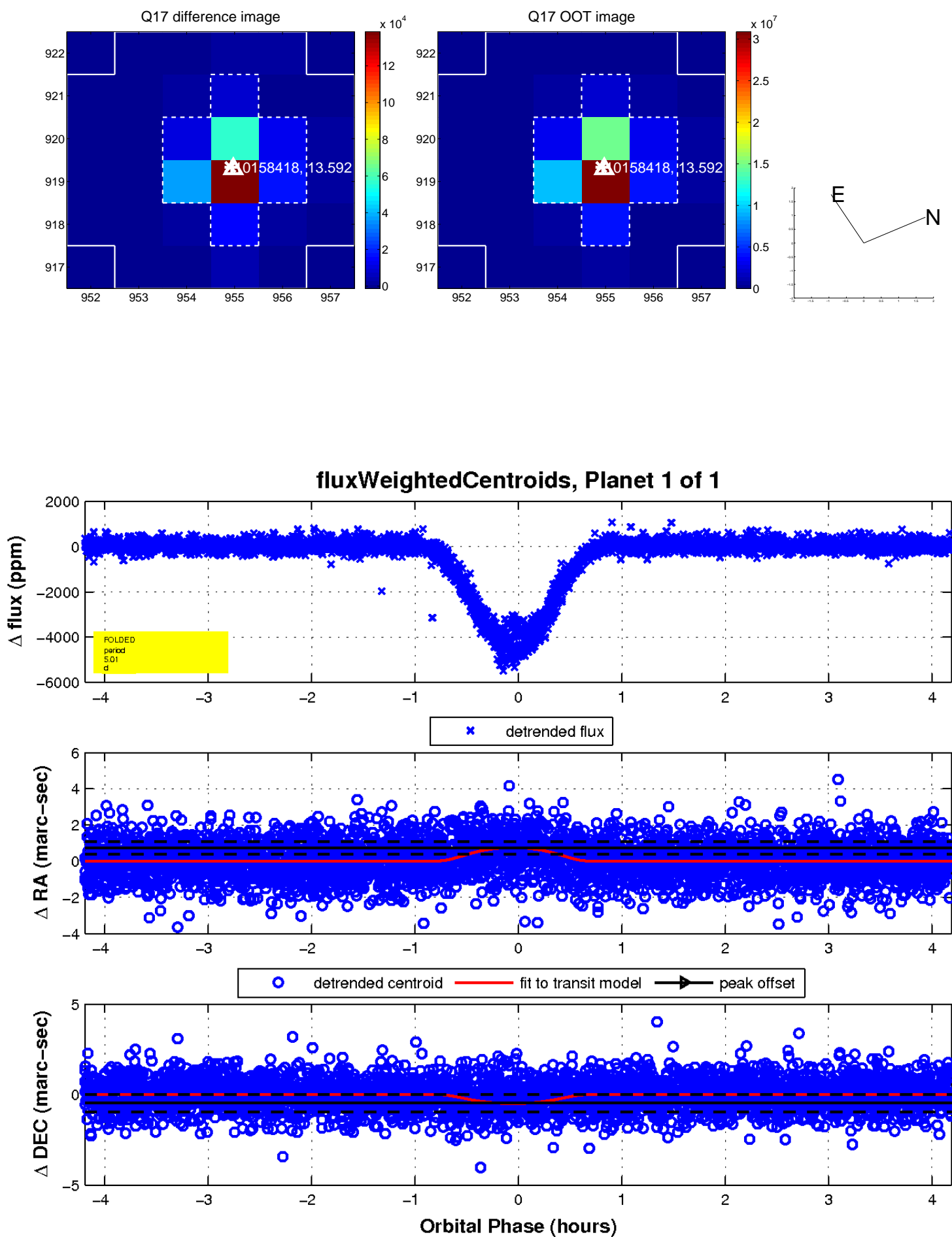
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

