

# KIC 007285616

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007285616-01	OBS	6859.01	0.566783	131.808881	25.1	2.034	11.6	11.2	1.75	6487	1.03	22192.60

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007285616-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—EPHEM_MATCH

**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.

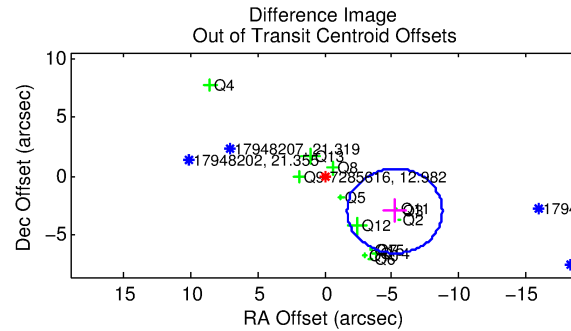
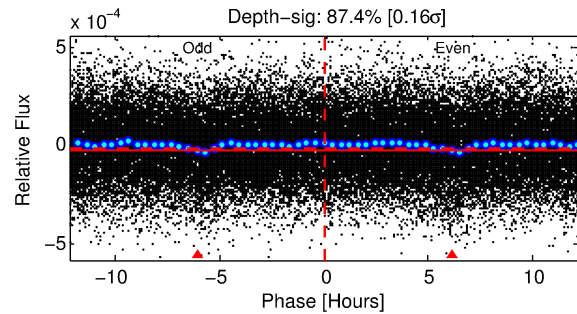
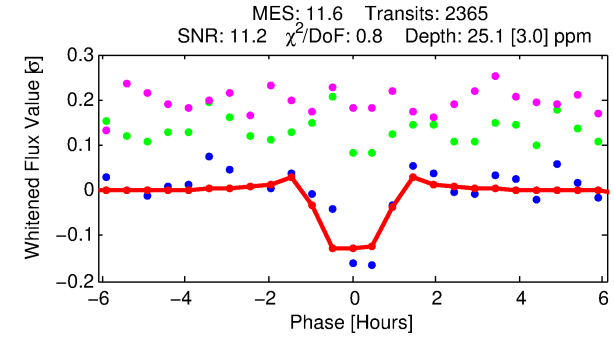
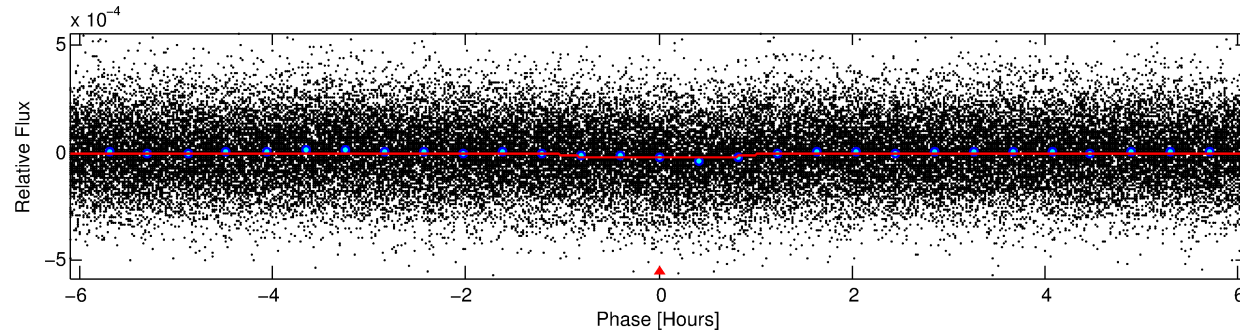
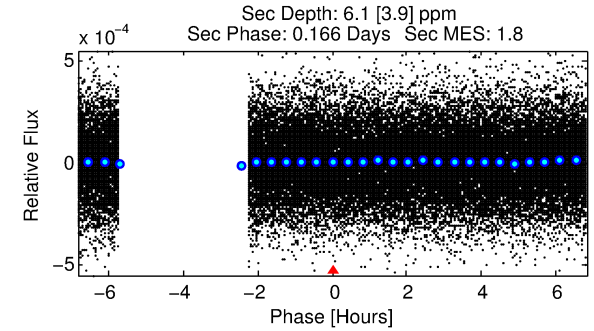
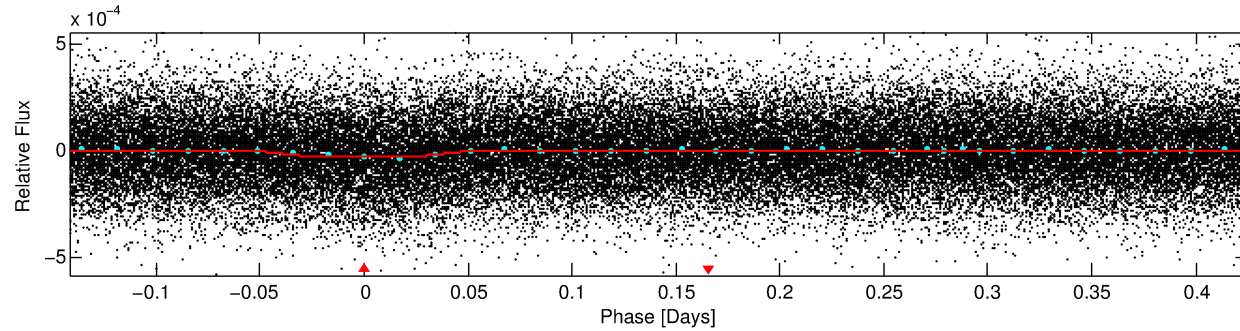
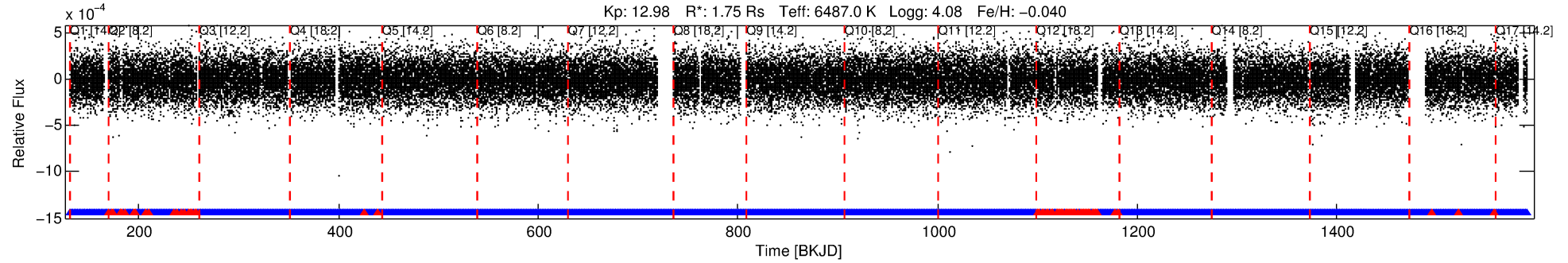
## Ephemeris Match Information For 007285616-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
007285616-01	7285616	RR-Lyr-pri	7198959	1:1	4106.4	495	-2	7.86	12.98	24932.00	Col-Anomaly	0	2.93	20.42

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 7285616 Candidate: 1 of 1 Period: 0.567 d  
KOI: K06859.01 Corr: 0.807



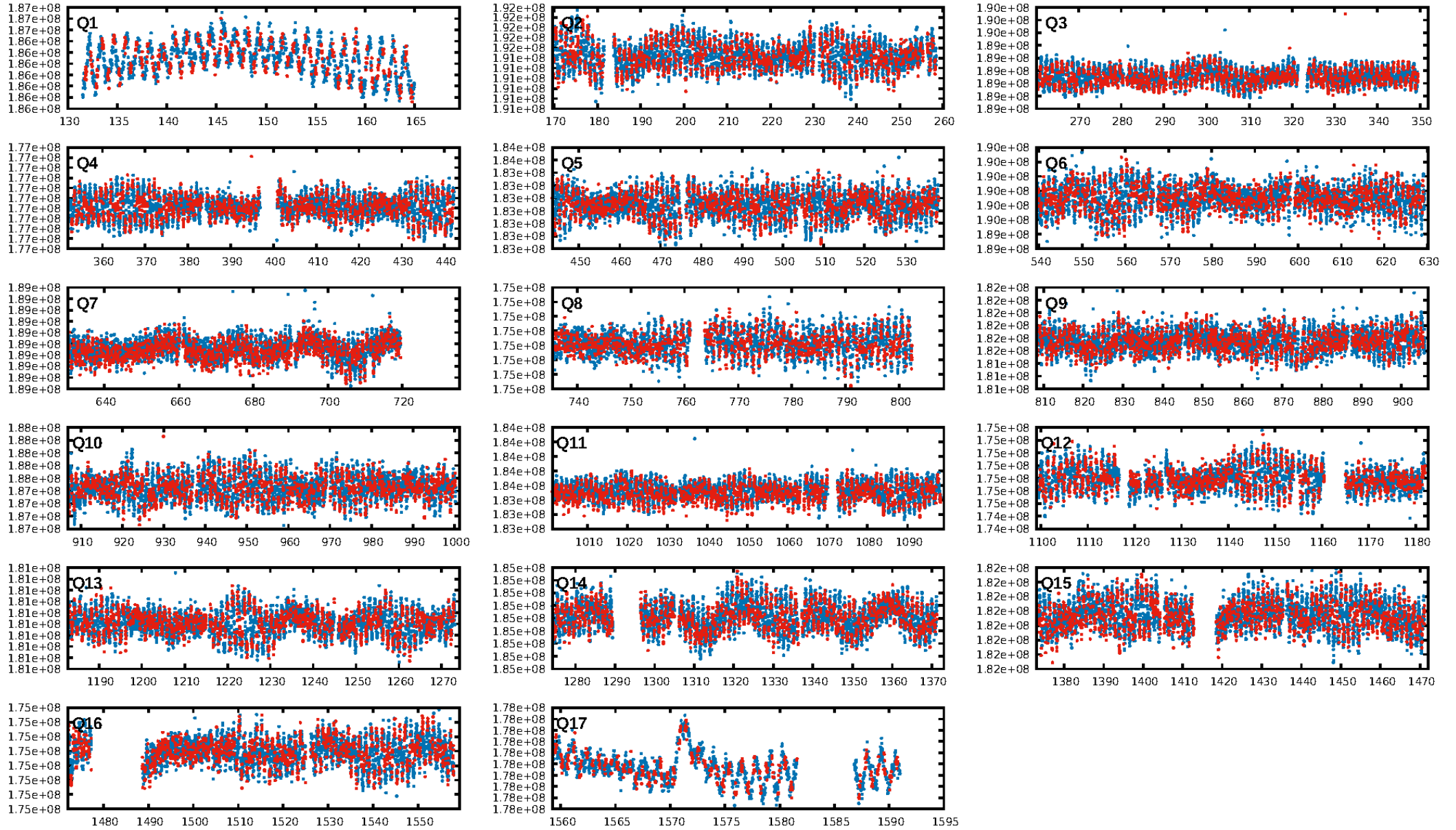
## DV Fit Results:

Period = 0.56678 [0.00001] d  
Epoch = 131.8089 [0.0019] BKJD  
Rp/R\* = 0.0054 [0.0018]  
a/R\* = 1.32 [1.07]  
b = 0.91 [0.38]  
Seff = 22192.60 [10368.72]  
Teq = 3112 [364] K  
Rp = 1.03 [0.47] Re  
a = 0.0148 [0.0043] AU  
Ag = 0.69 [0.70] [-0.44σ]  
Teffp = 4383 [1025] K [1.17σ]

## DV Diagnostic Results:

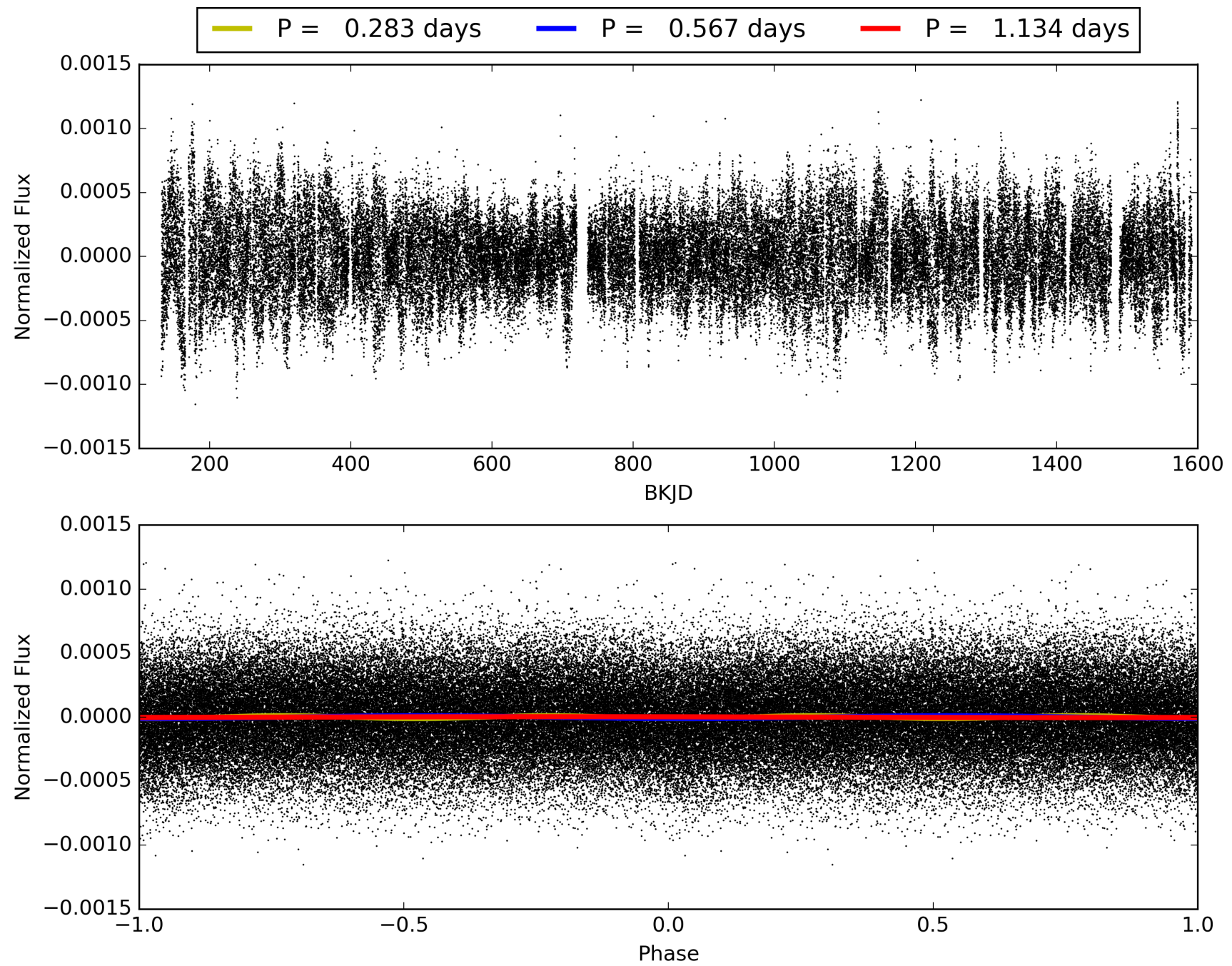
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.28e-24  
RollingBand-fgt: 0.97 [2188/2260]  
GhostDiagnostic-chr: -0.1158  
Centroid-sig: 0.2%  
Centroid-so: 1.050 arcsec [1.97σ]  
OotOffset-rm: 5.994 arcsec [5.04σ]  
KicOffset-rm: 5.994 arcsec [4.29σ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.21 [3/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007285616-01, PDC Light Curves



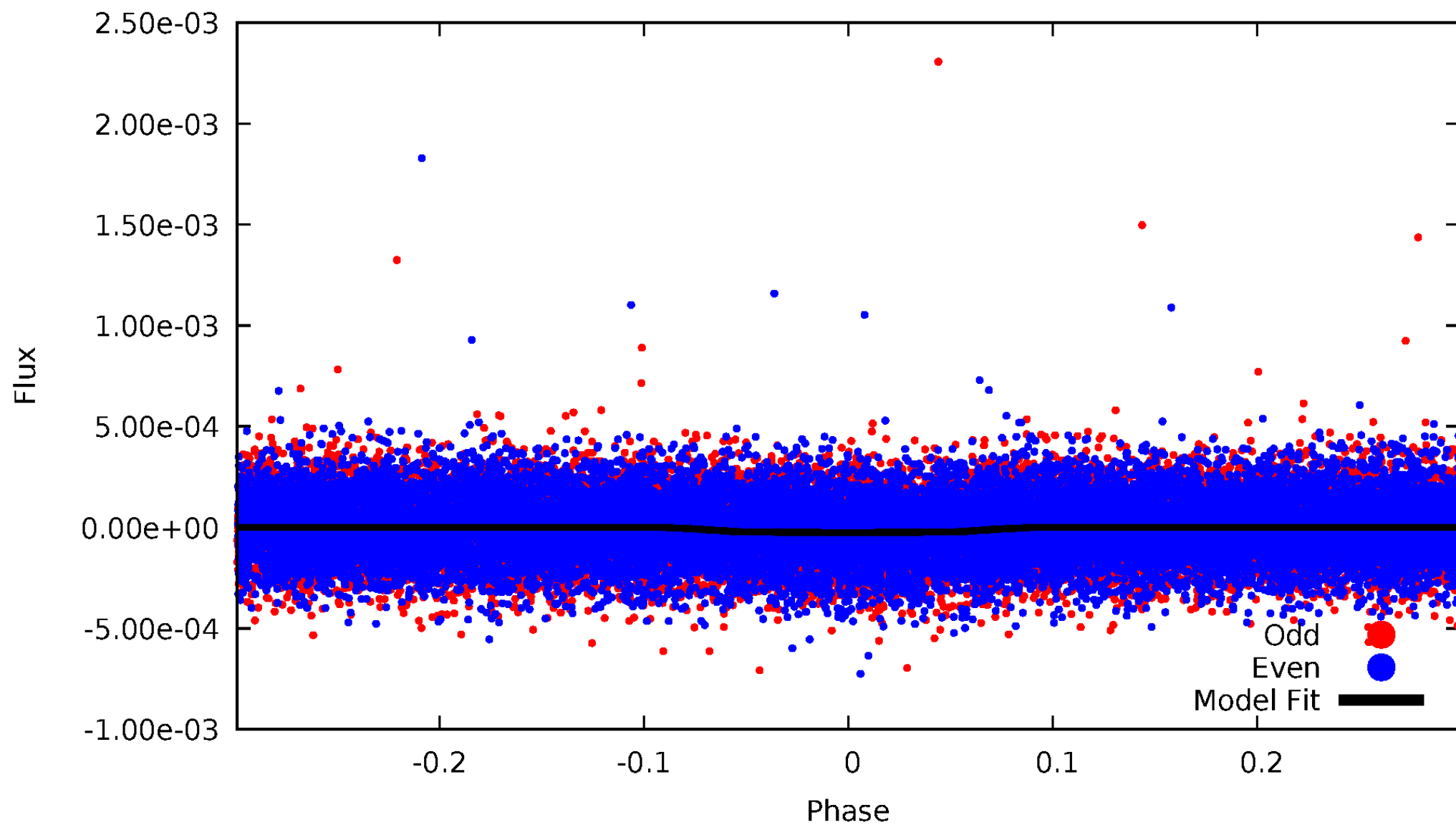


TCE 007285616-01



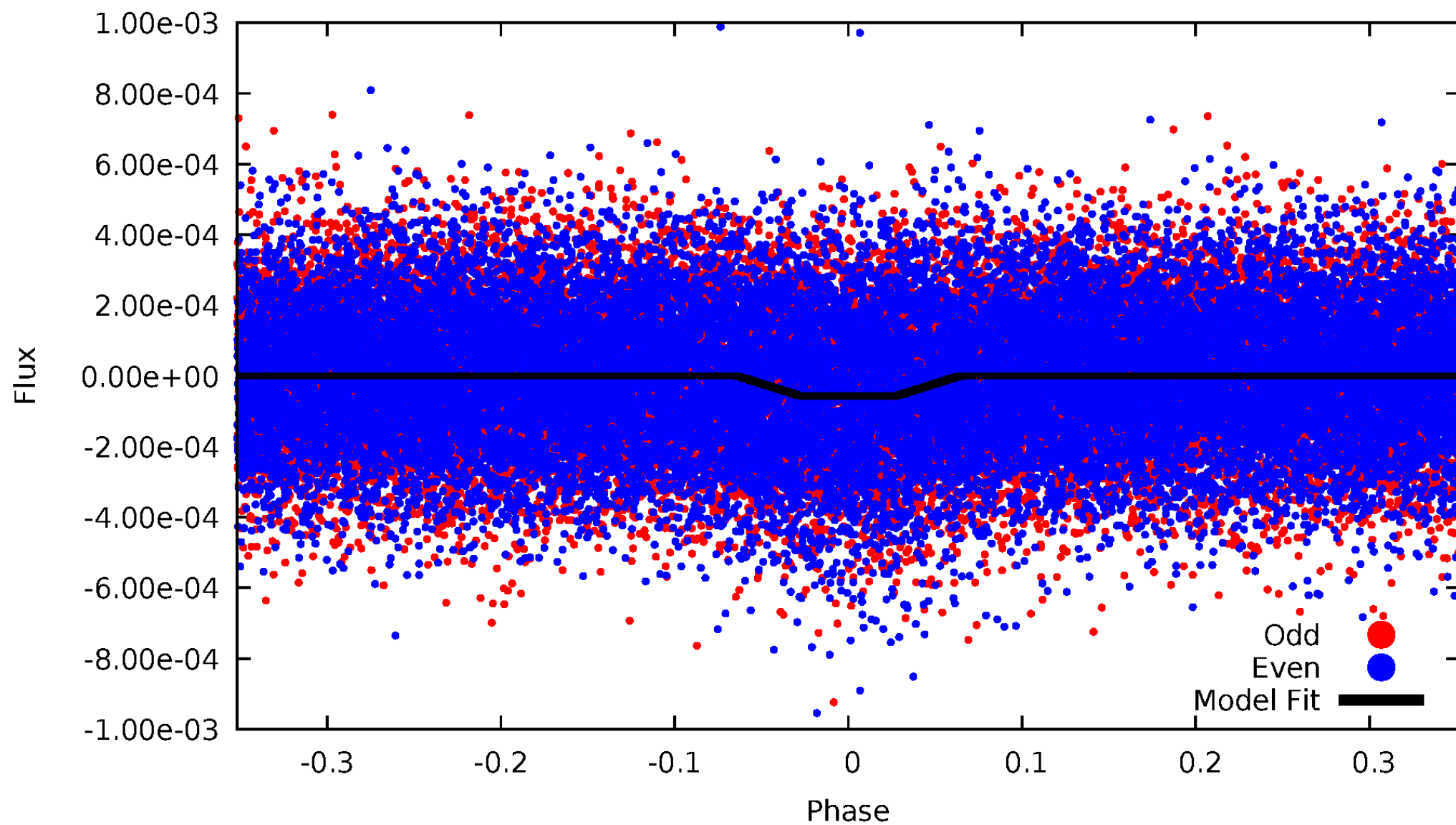
# DV Odd/Even

TCE 007285616-01



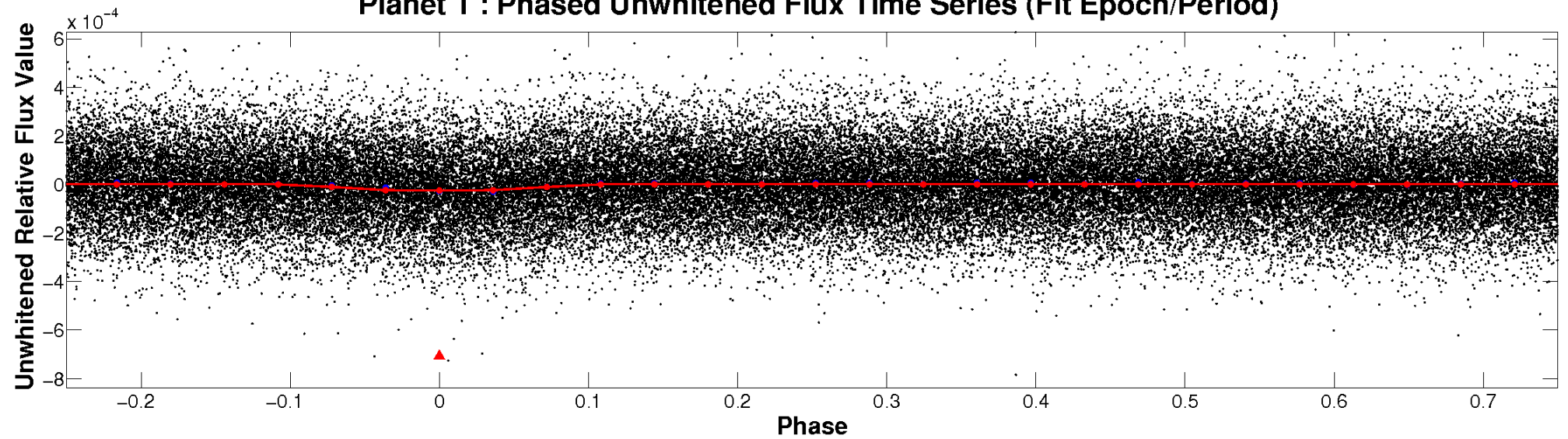
# ALT Odd/Even

TCE 007285616-01

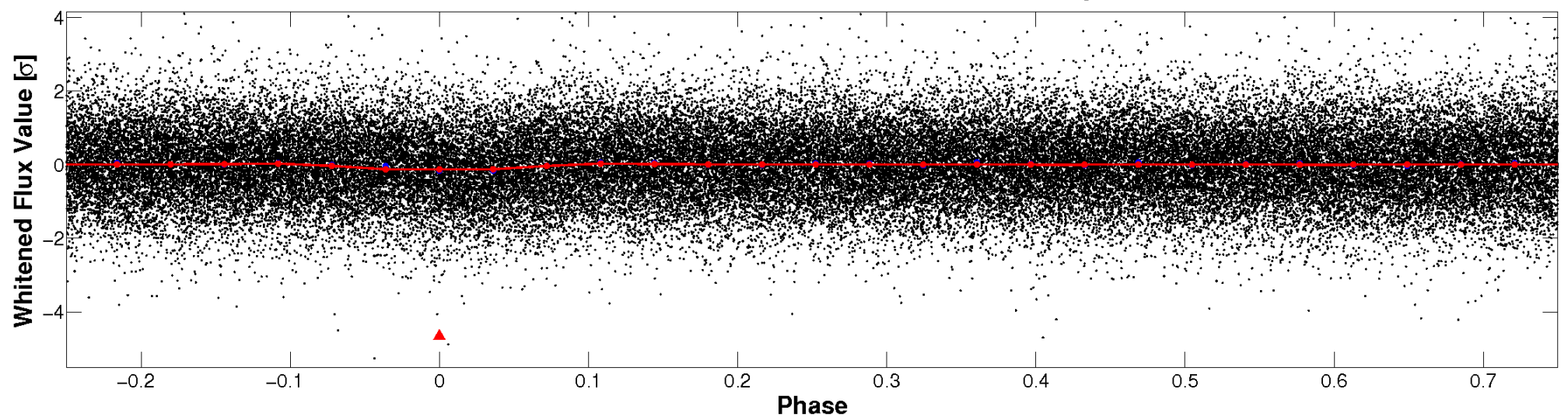


# Non-Whitened Vs. Whitened Light Curve

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



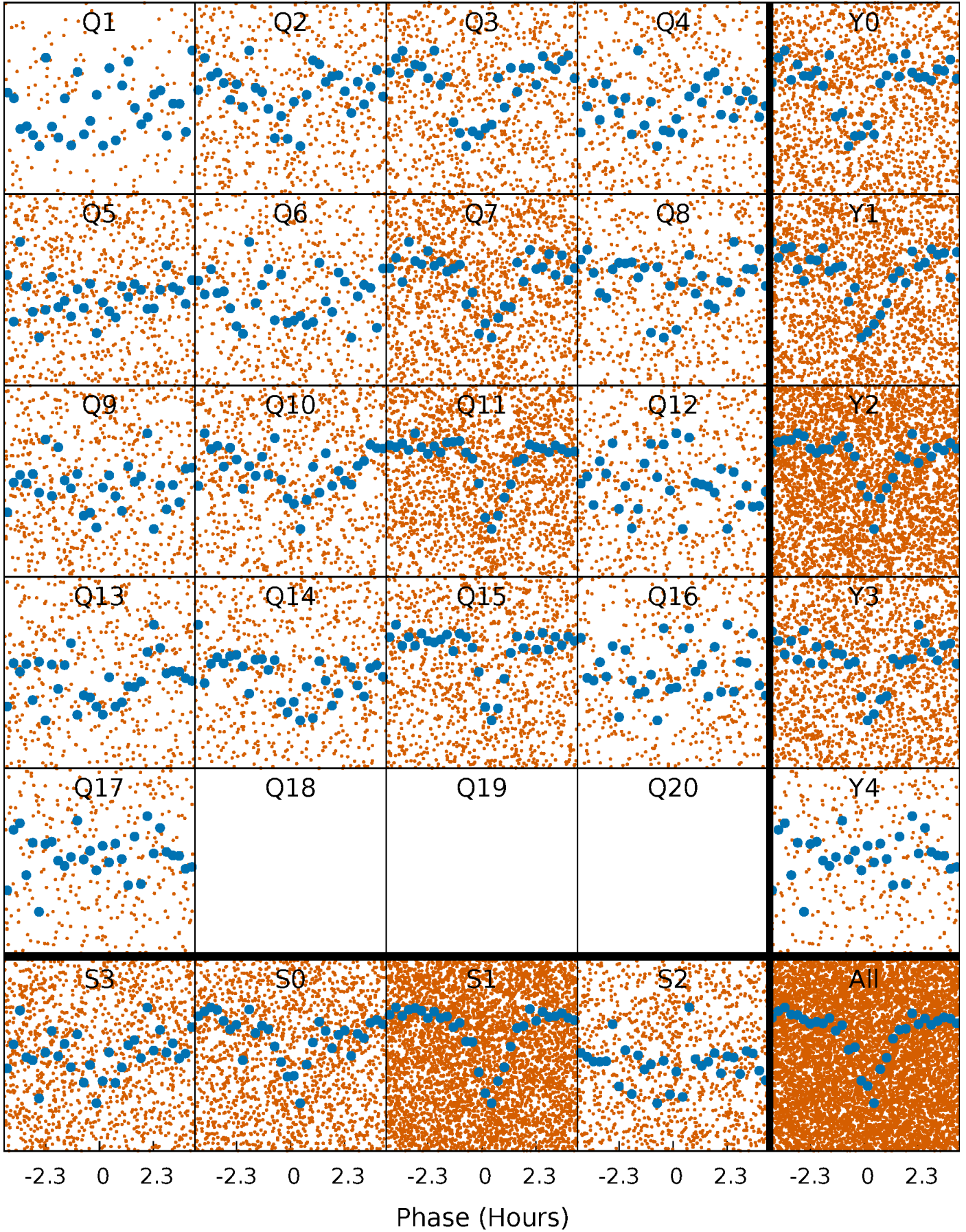
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

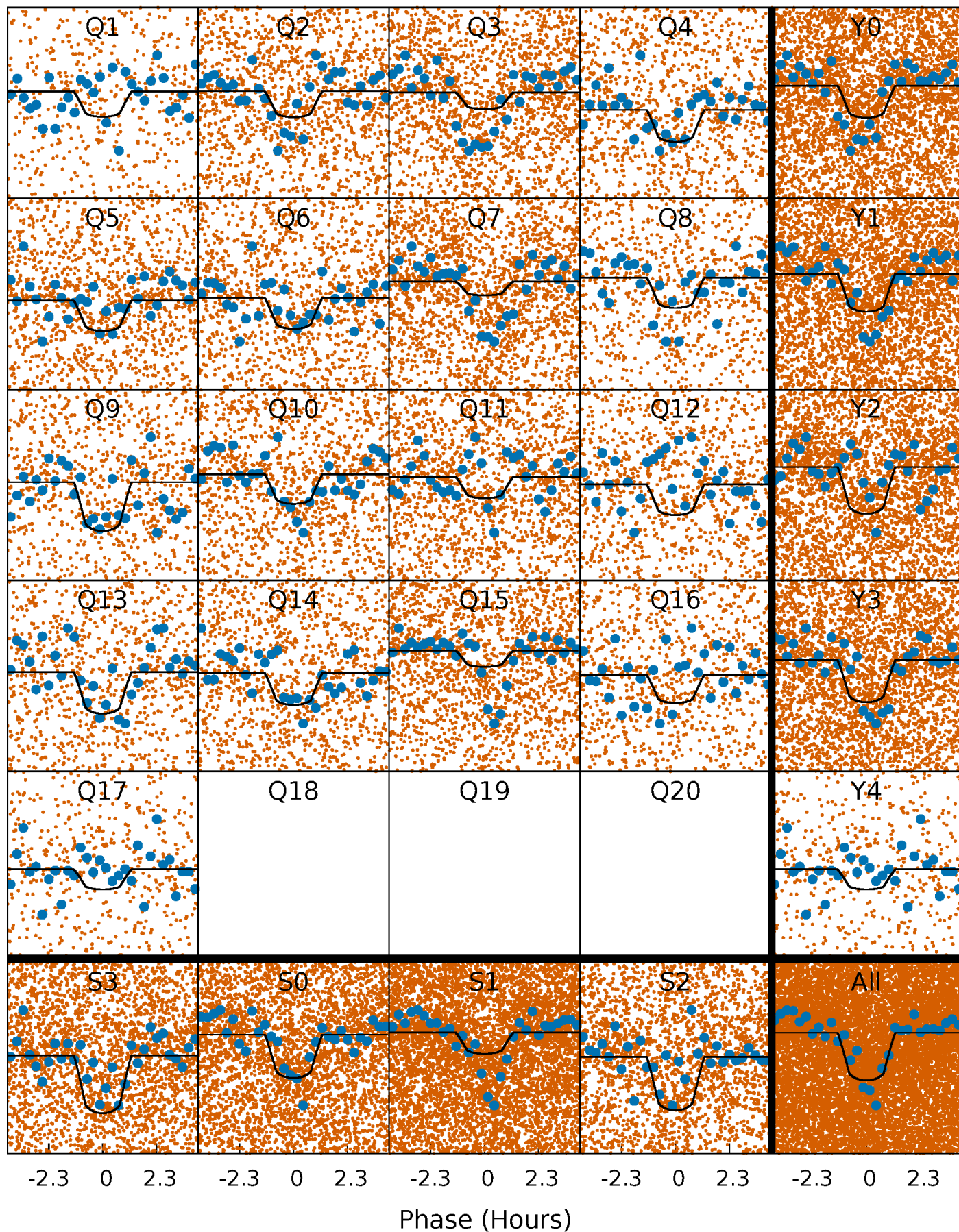
TCE 007285616-01 P= 0.566783 Days  $T_0=131.808881$  (BKJD)





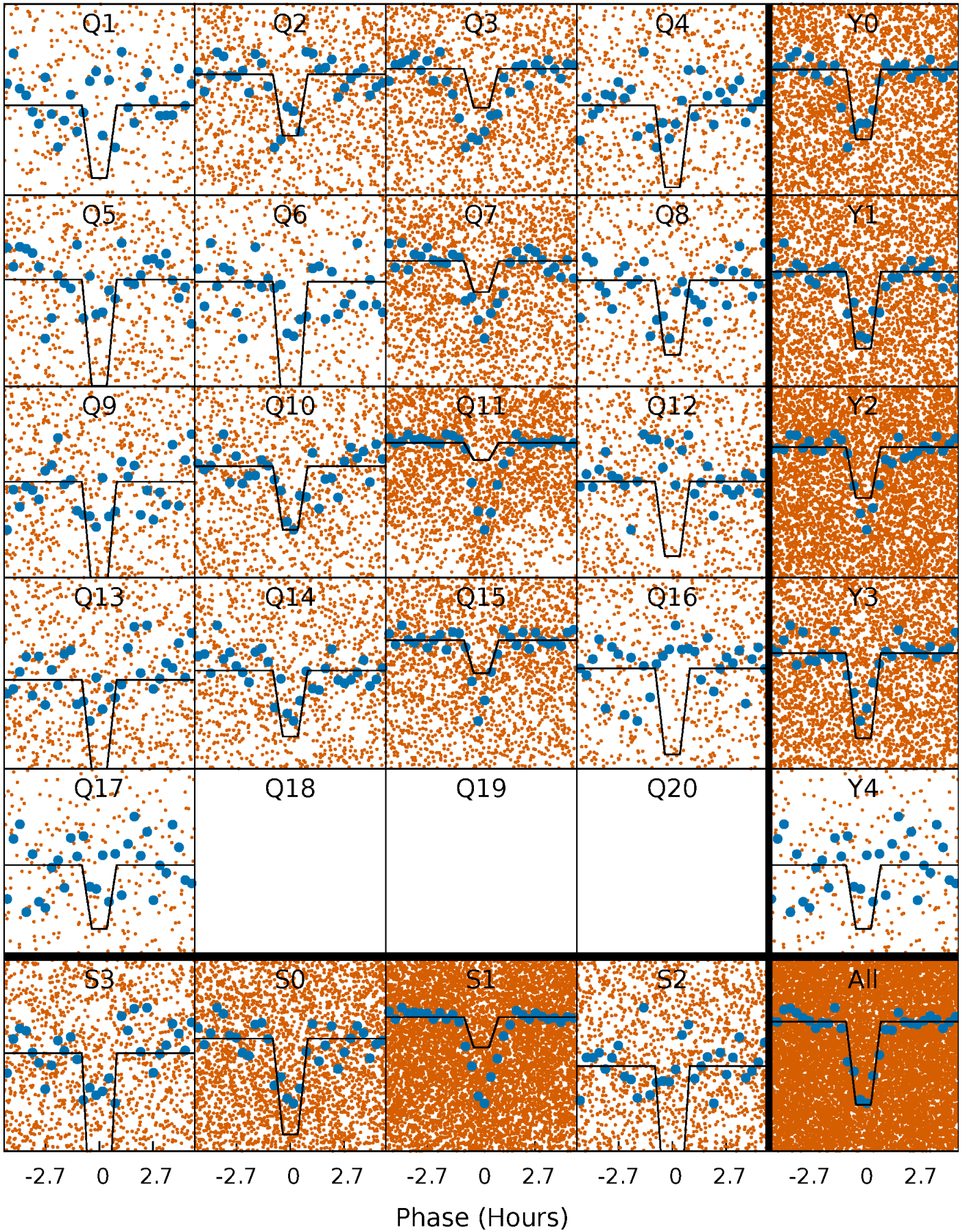
# DV Quarter-Phased Transit Curves

TCE 007285616-01 P= 0.566783 Days  $T_0=131.808881$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007285616-01 P= 0.566794 Days  $T_0=131.806207$  (BKJD)

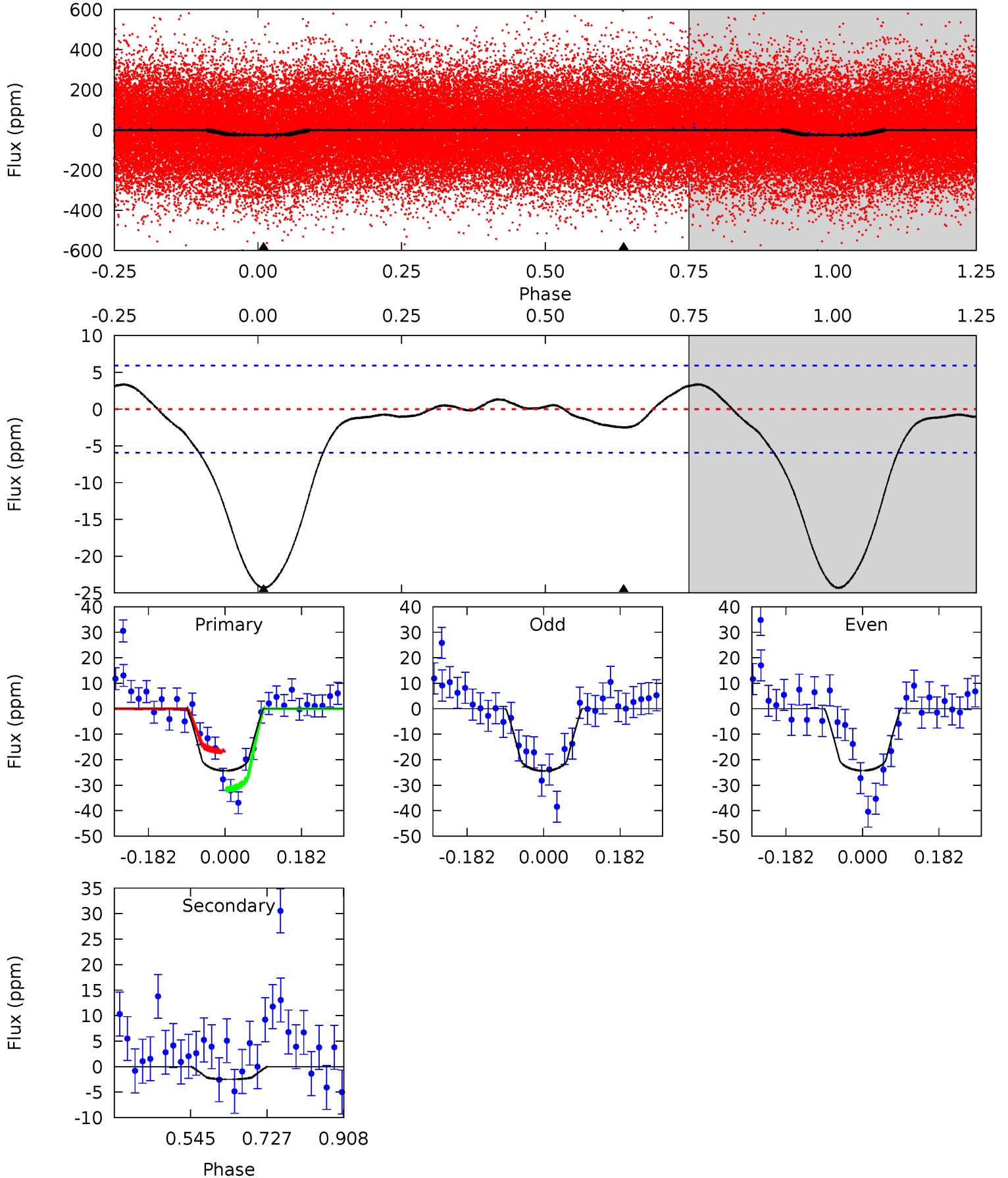




# DV Model-Shift Uniqueness Test

007285616-01, P = 0.566783 Days, E = 131.242098 Days

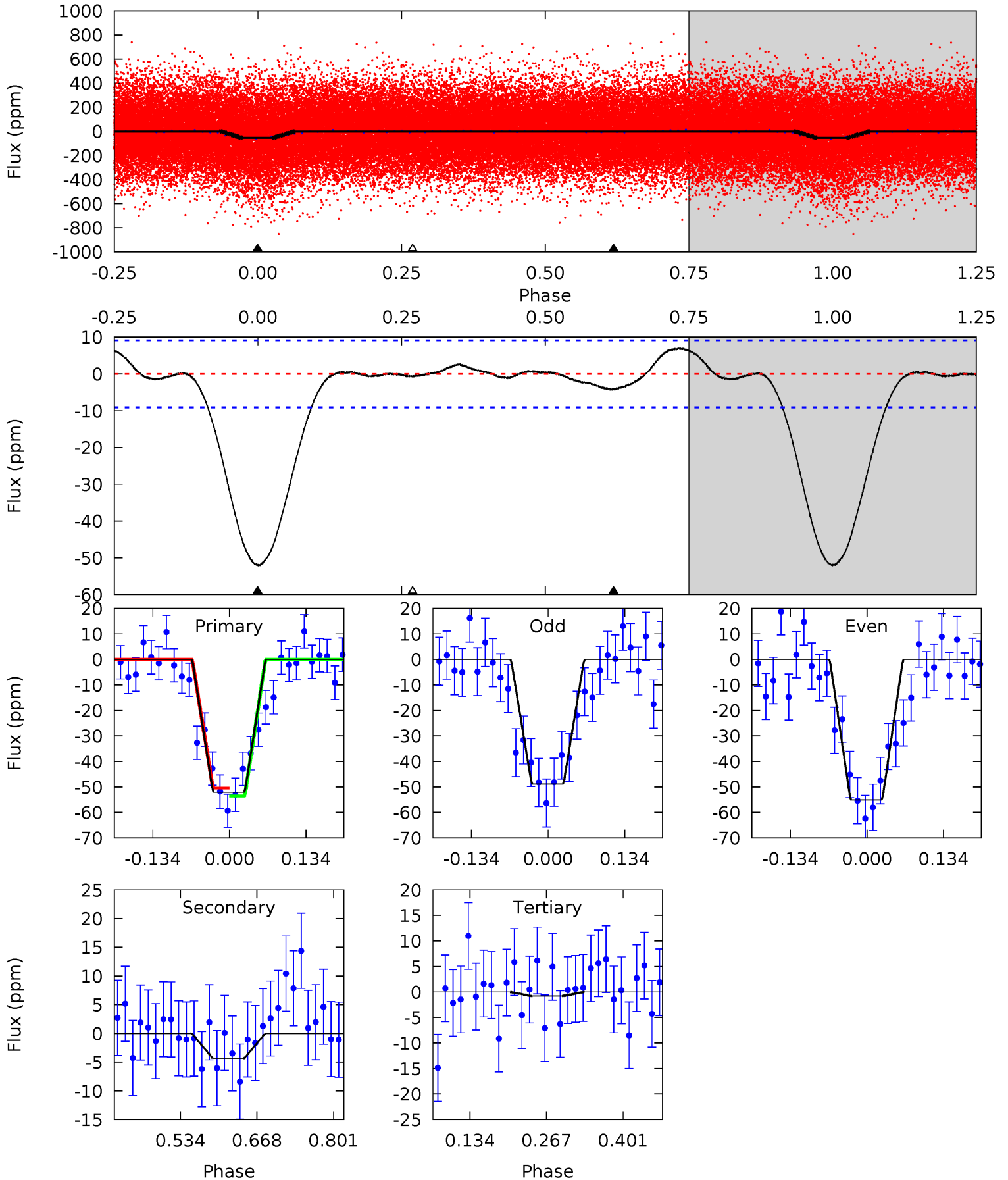
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.2	1.87	0	0	4.44	1.34	0.56	18.2	18.2	1.87	1.87	0.05	1.13	0.12	5.54



# Alt Model-Shift Uniqueness Test

007285616-01, P = 0.566794 Days, E = 131.239413 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
25.7	2.12	0.38	0	4.50	1.50	0.70	25.3	25.7	1.74	2.12	1.52	1.17	0.12	0.76





### Stellar Parameters For KIC 007285616

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6487^{+179}_{-247}$	$4.080^{+0.252}_{-0.168}$	$-0.040^{+0.250}_{-0.300}$	$1.748^{+0.508}_{-0.559}$	$1.343^{+0.175}_{-0.263}$	$0.354^{+0.554}_{-0.163}$
	+3%/-4%	+6%/-4%	+625%/-750%	+29%/-32%	+13%/-20%	+157%/-46%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 007285616-01 / KOI 6859.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2 \pm 1$	$1.00^{+0.39}_{-0.37}$	$4326^{+356}_{-403}$	$-2636^{+6763}_{-1080}$	$0.279^{+0.490}_{-0.181}$
Alt.	$-4 \pm 2$	$1.39^{+0.43}_{-0.37}$	$4314^{+347}_{-337}$	$-2880^{+6554}_{-798}$	$0.257^{+0.302}_{-0.150}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

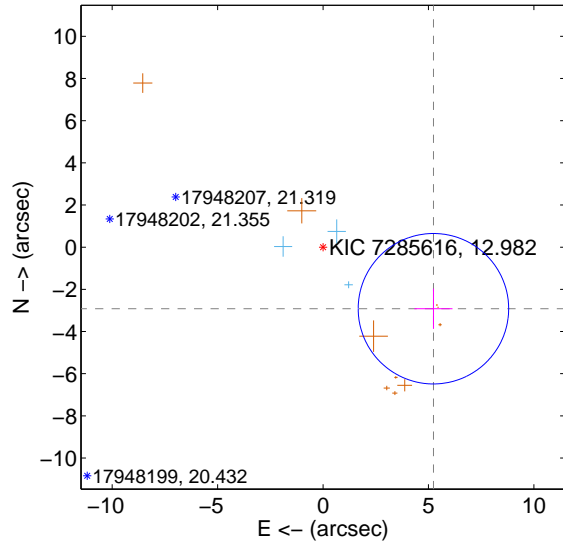
Supplemental centroid analysis for 007285616-01. Kepler magnitude: 12.98. Transit SNR 11.21

There are 3 quarters with good PRF difference image offsets

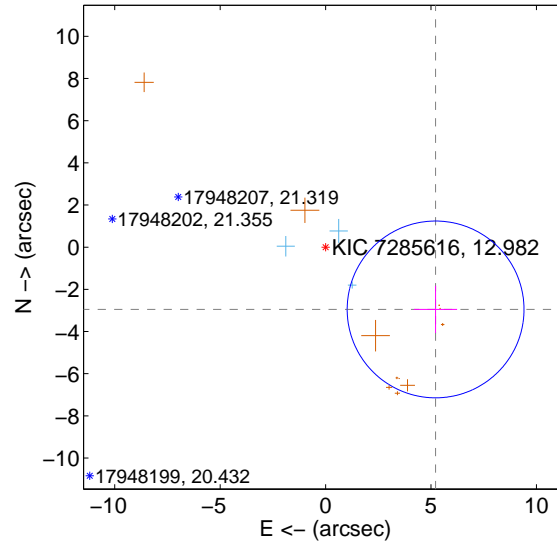
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.994 \pm 1.189$	5.04	$-5.235 \pm 0.902$	$-2.919 \pm 0.956$
PRF-fit source offset from KIC position	$5.994 \pm 1.397$	4.29	$-5.217 \pm 1.020$	$-2.952 \pm 1.125$
photometric centroid source offset	$1.05 \pm 0.53$	1.97	$0.28 \pm 0.59$	$-1.01 \pm 0.53$

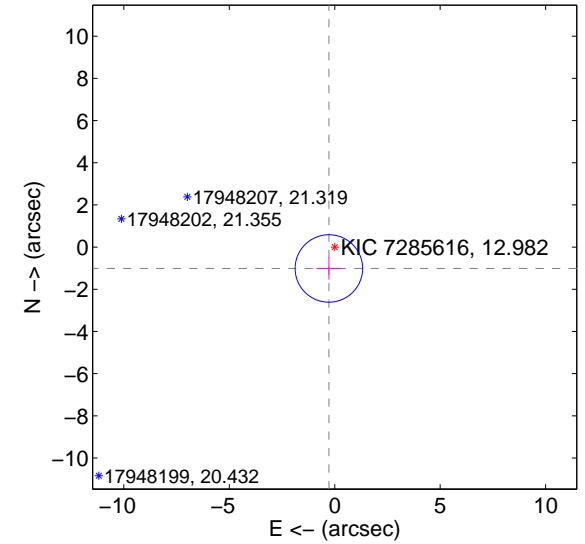
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

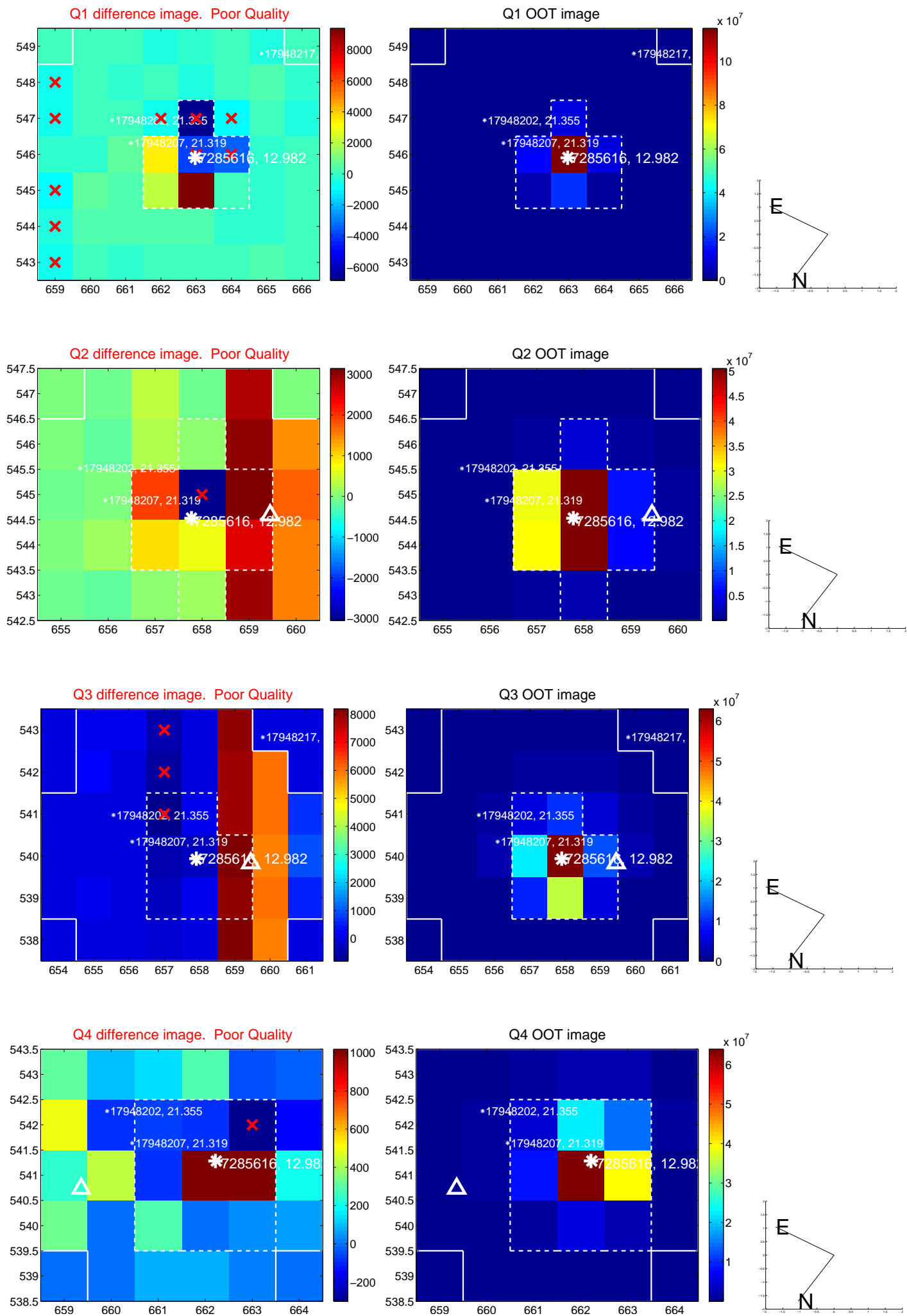


offset from photometric centroids

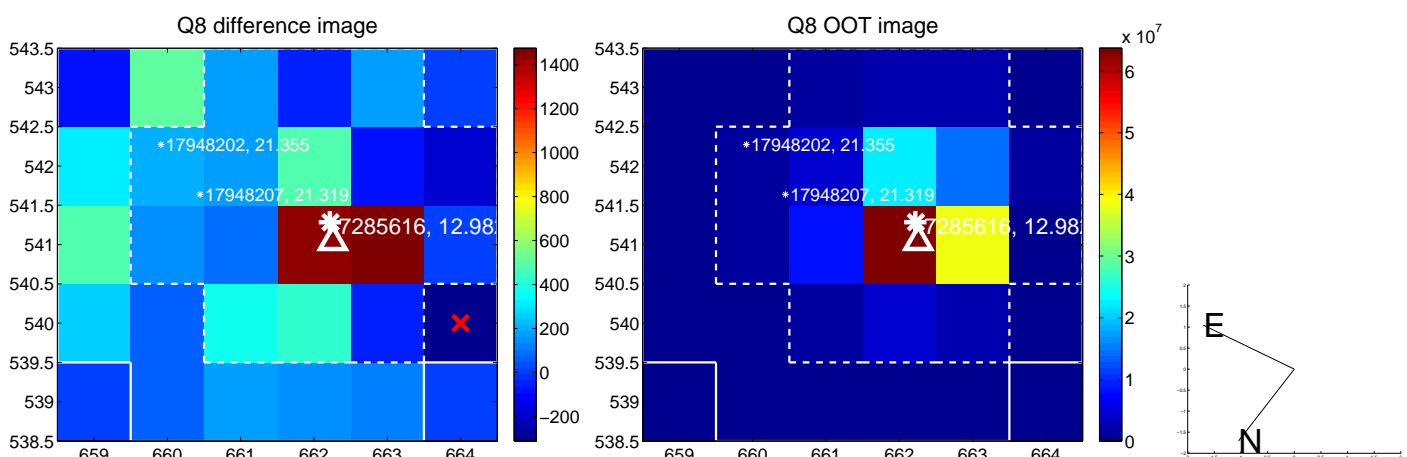
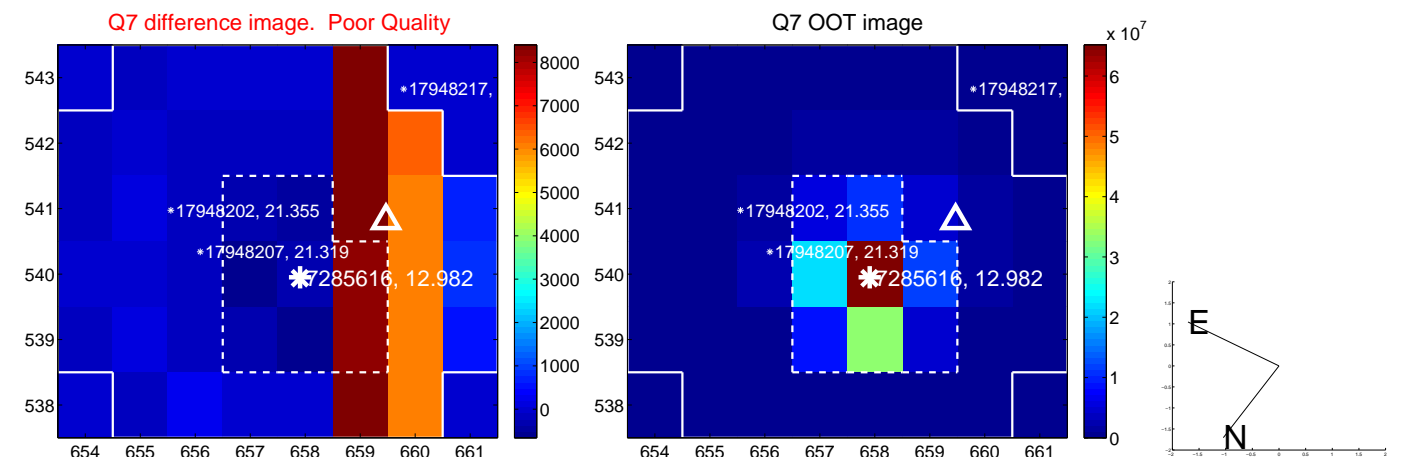
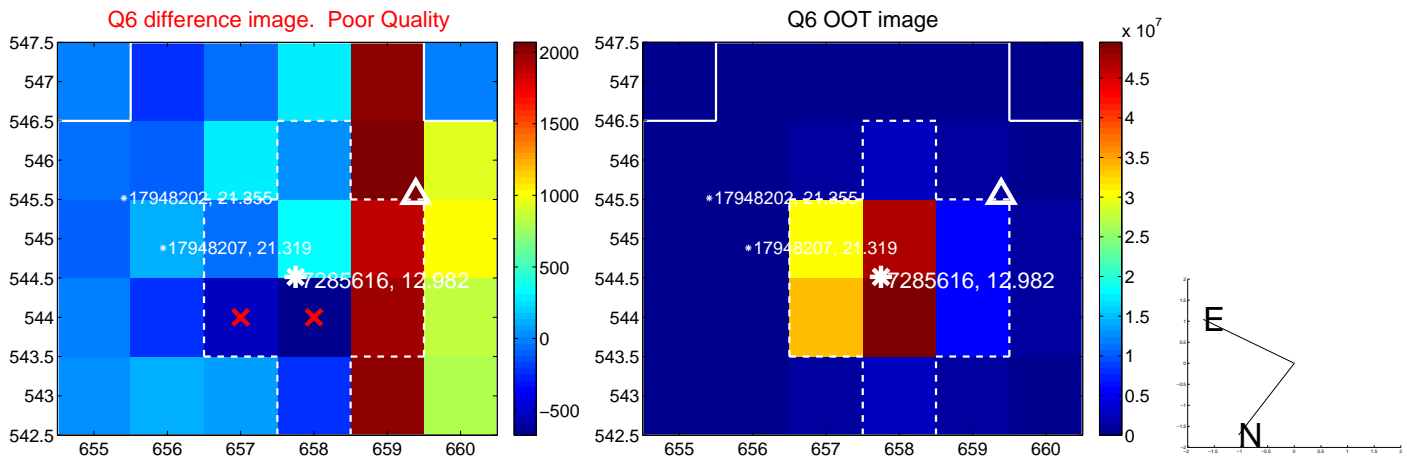
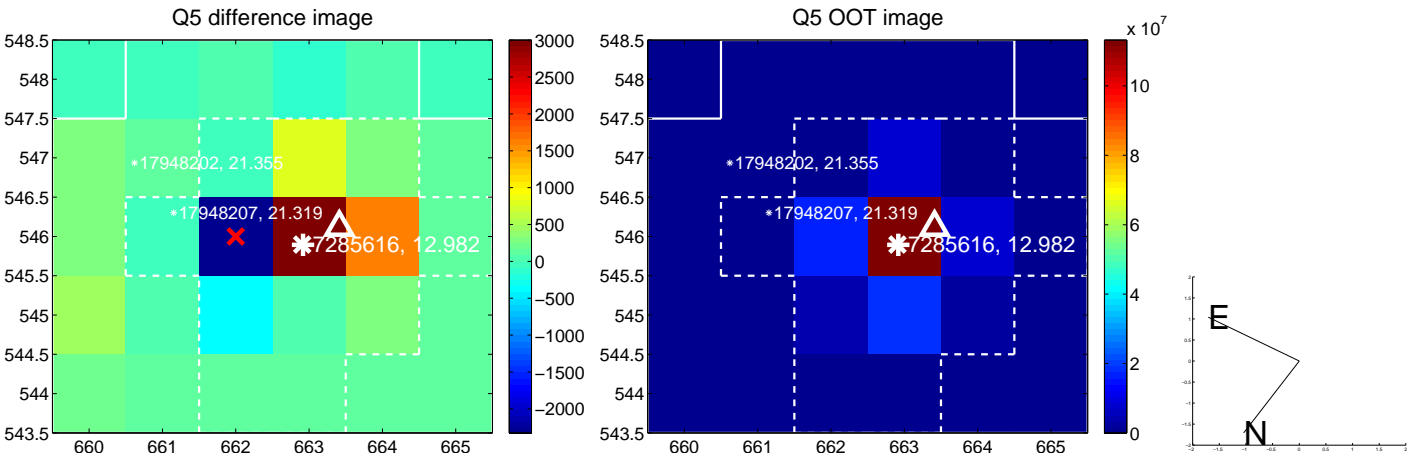


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

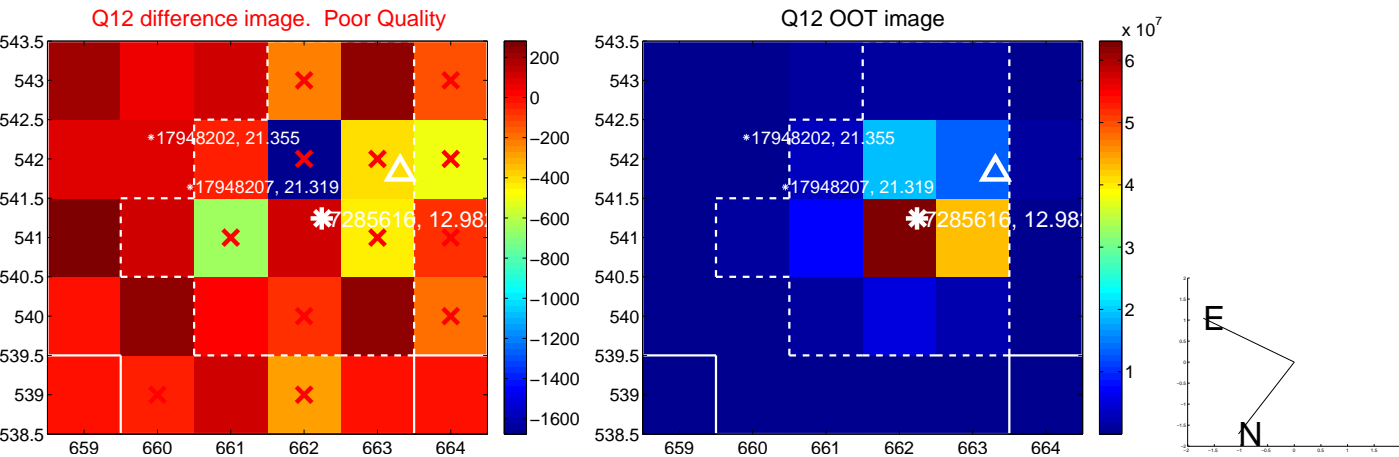
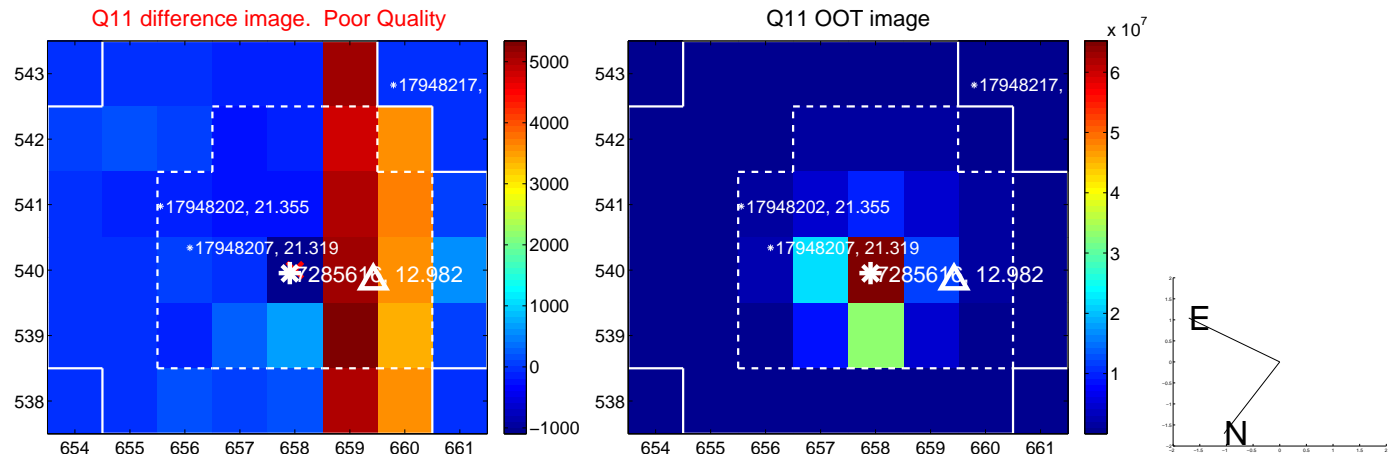
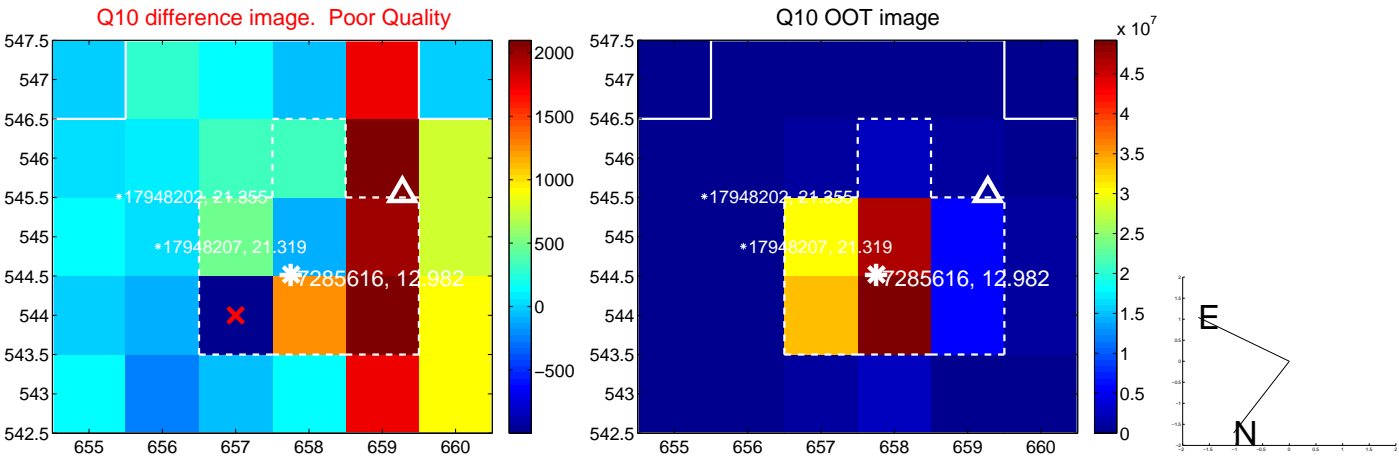
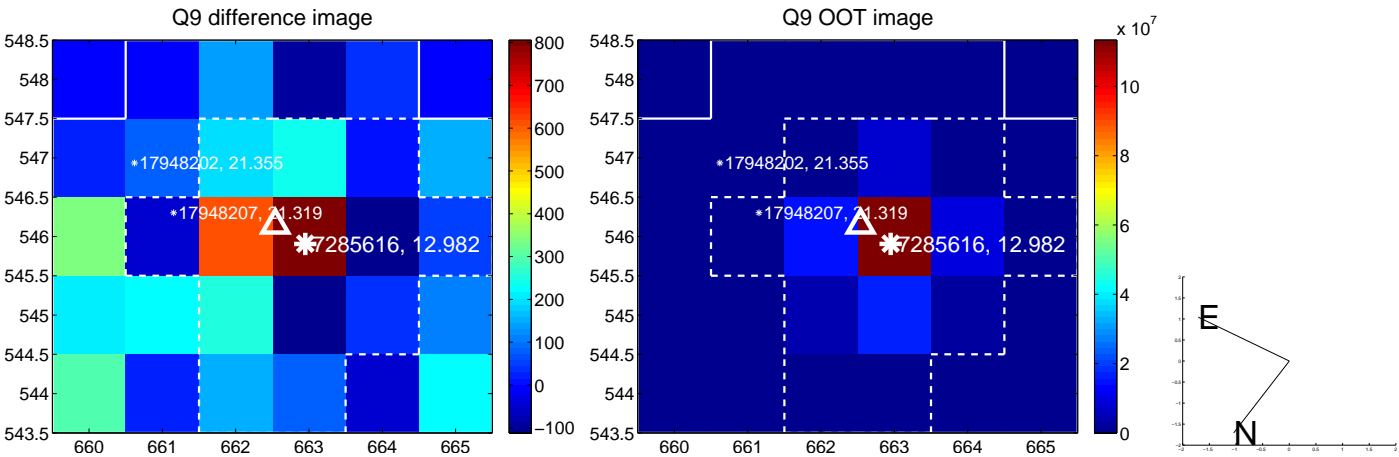


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

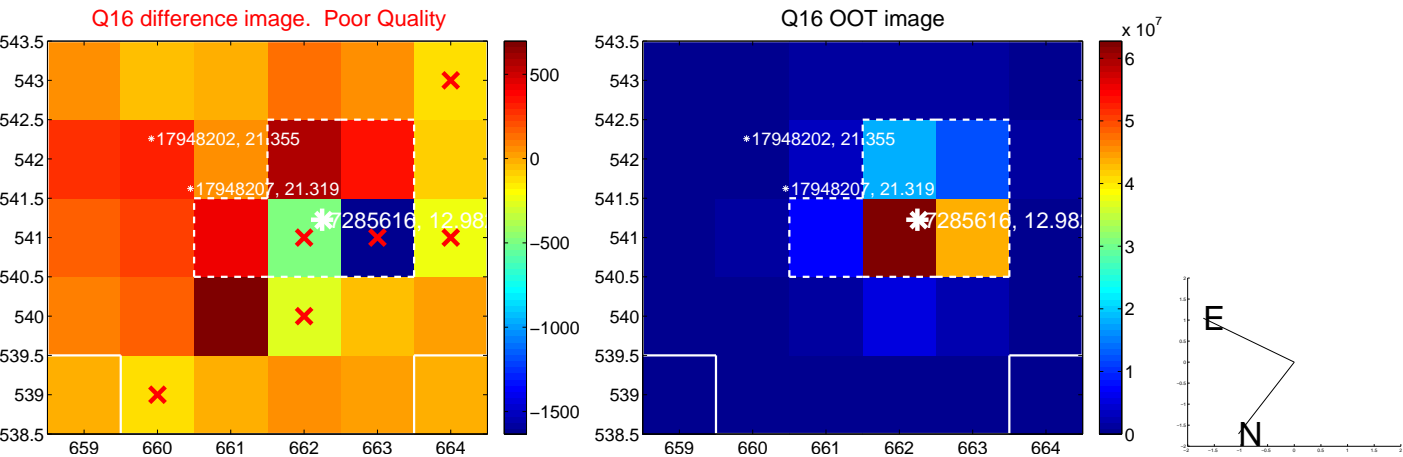
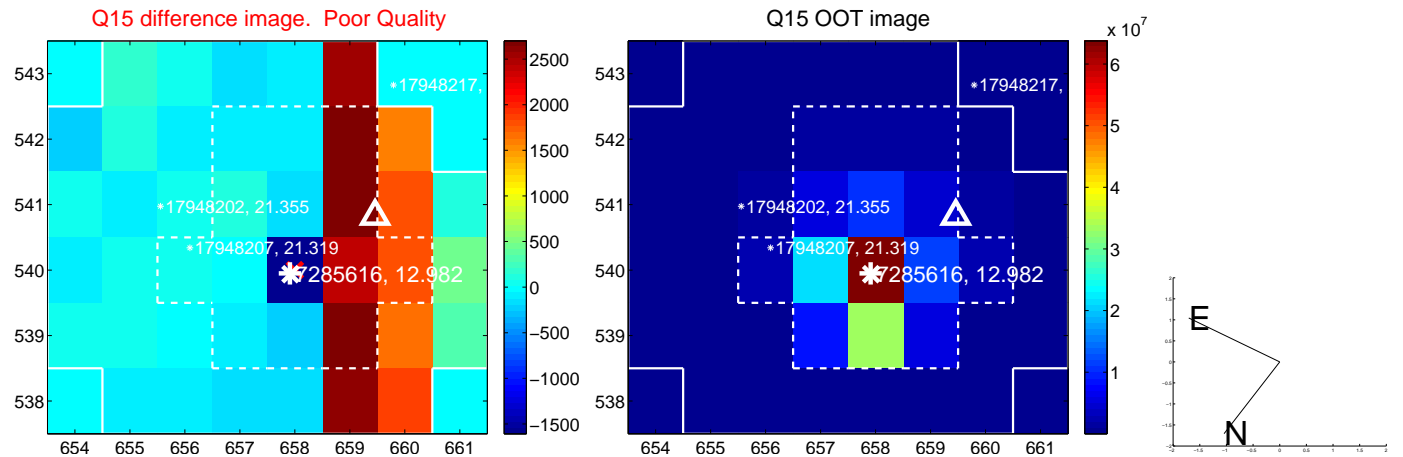
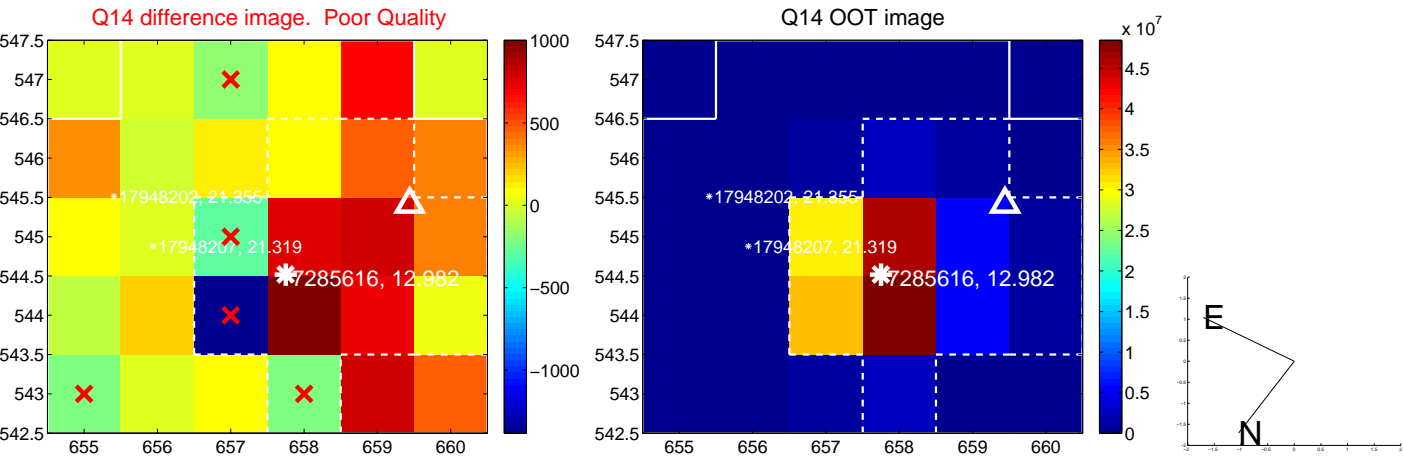
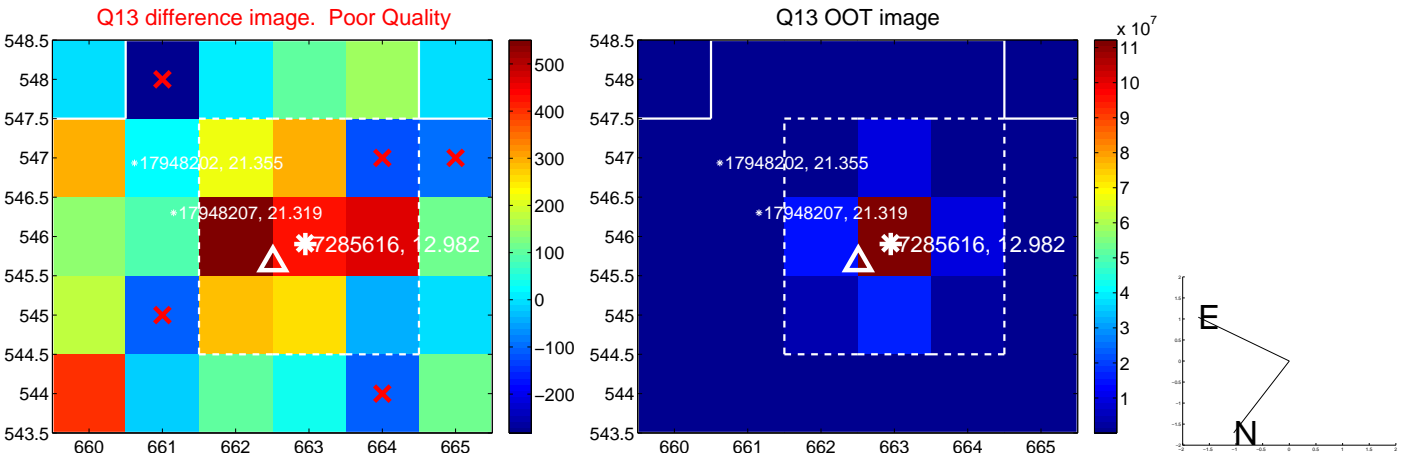




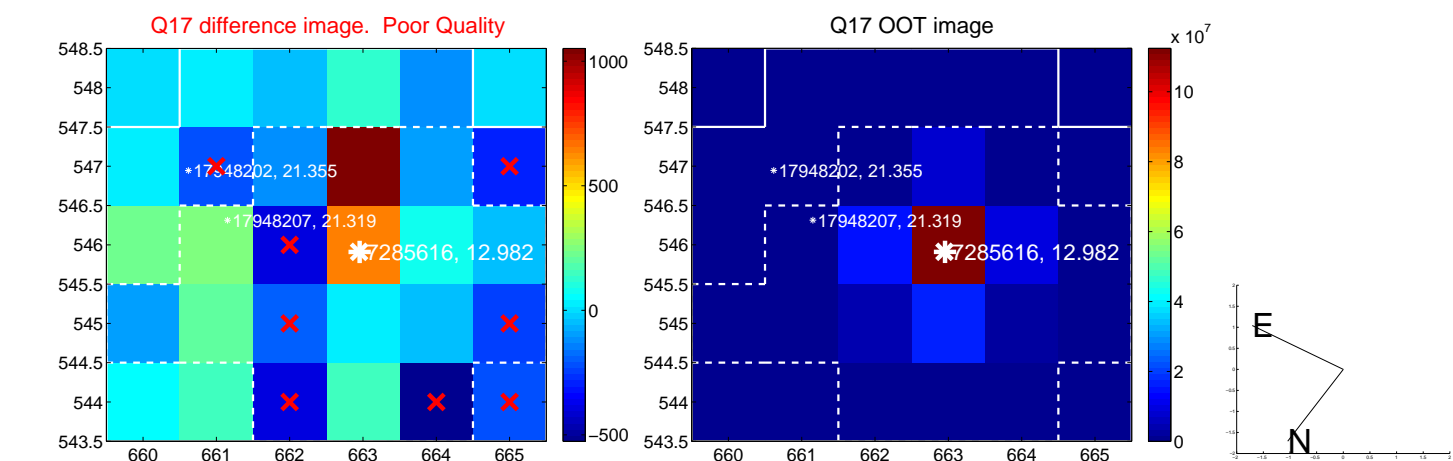
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



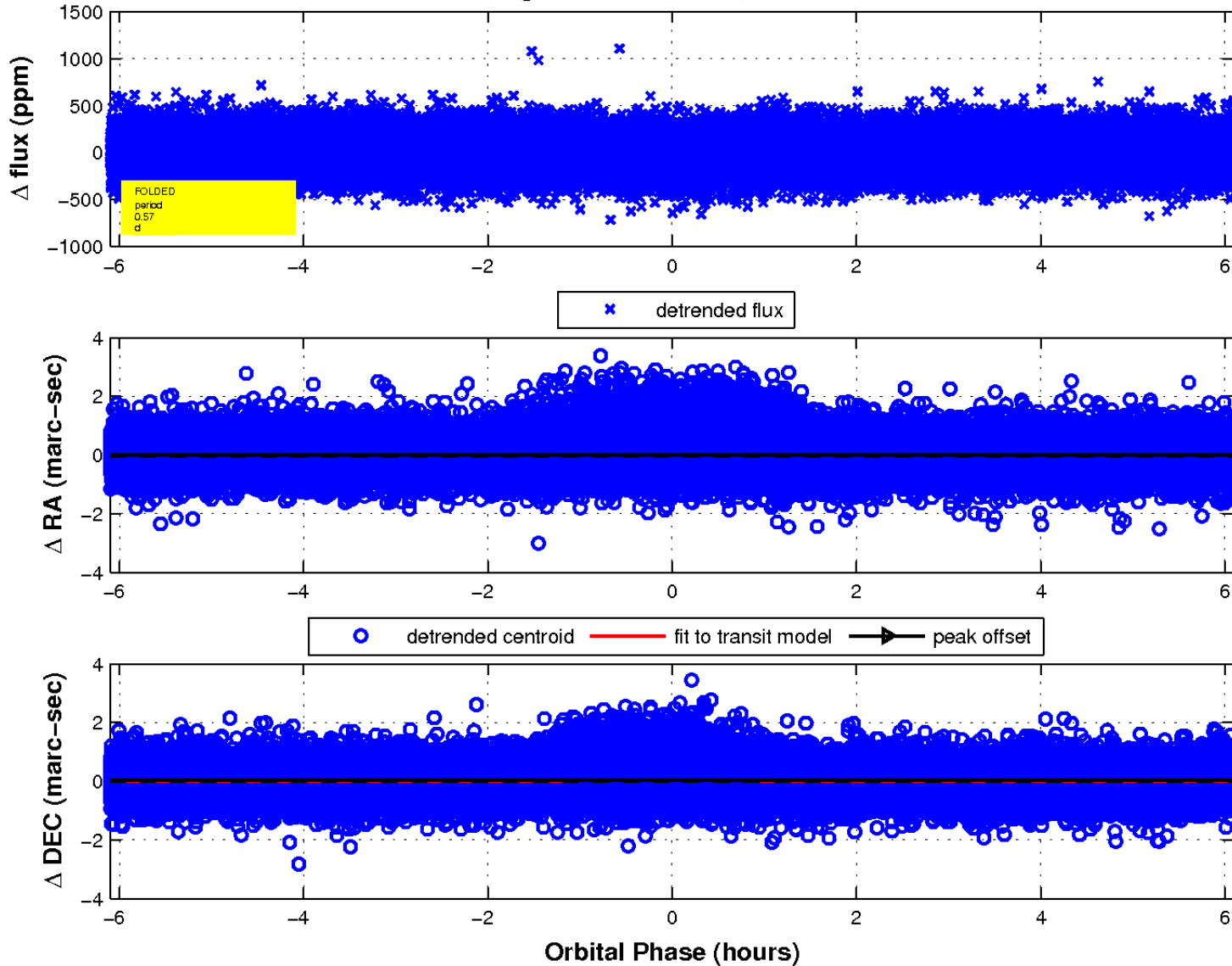
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

