

# KIC 010227881

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010227881-01	OBS	5780.01	5.140808	135.008238	281.9	16.246	18.2	19.6	0.94	5893	2.92	275.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010227881-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—CENT_RESOLVED_OFFSET—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 010227881-01

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	$\sigma_P$	$\sigma_T$
010227881-01	10227881	3983.01	10227863	1:1	20.2	-4	3	13.75	15.52	0.57	Direct-PRF	0	0.61	0.73

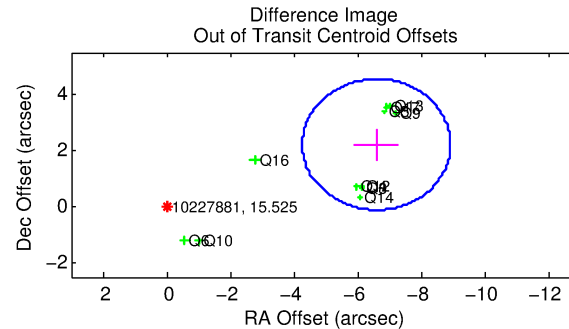
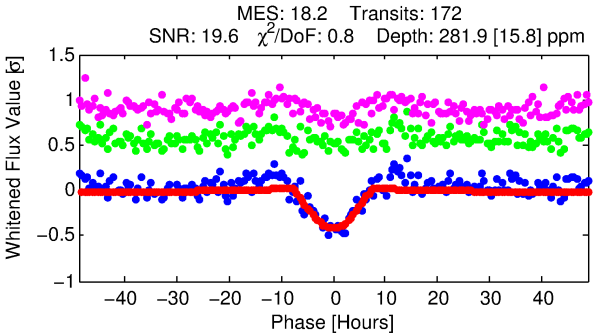
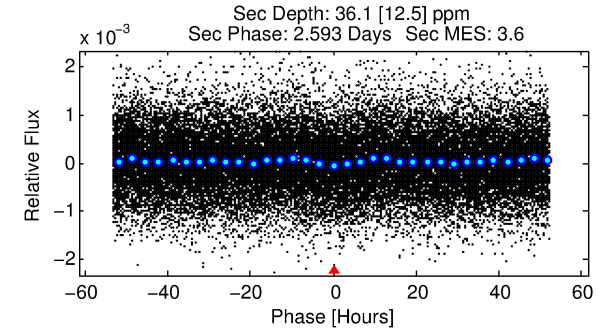
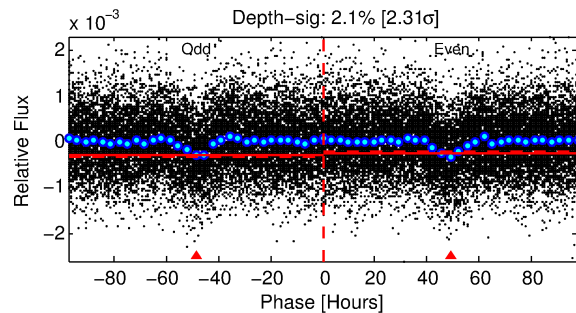
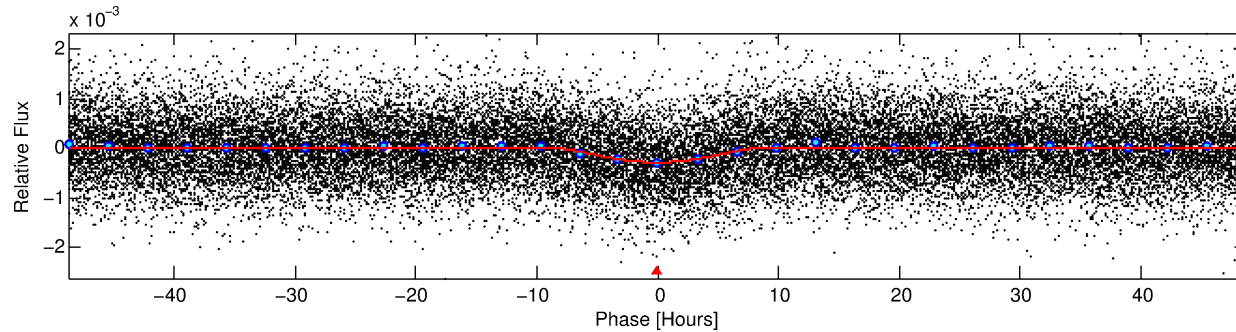
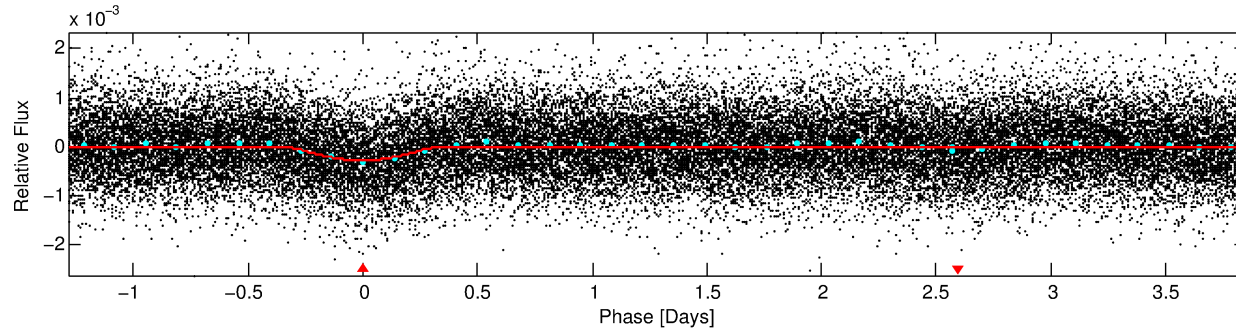
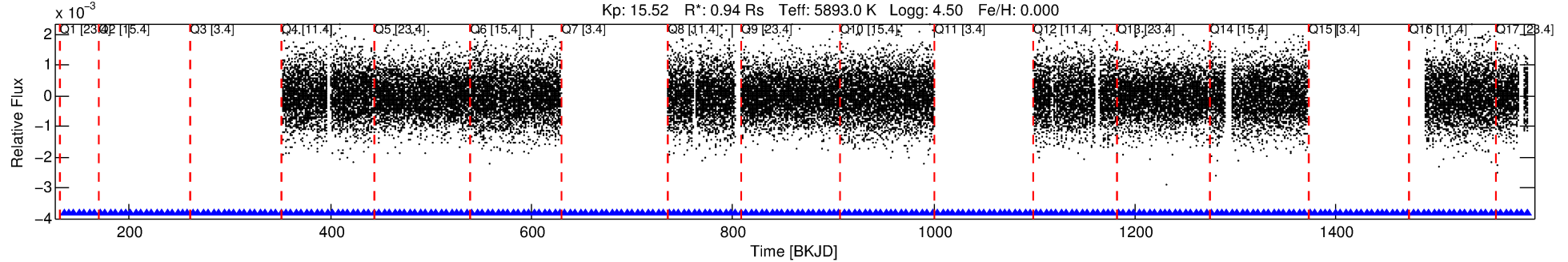
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  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: 10227881 Candidate: 1 of 1 Period: 5.141 d

KOI: K05780.01 Corr: 0.946

Kp: 15.52 R\*: 0.94 Rs Teff: 5893.0 K Logg: 4.50 Fe/H: 0.000



## DV Fit Results:

Period = 5.14081 [0.00013] d  
Epoch = 135.0082 [0.0225] BKJD  
Rp/R\* = 0.0284 [0.0339]  
a/R\* = 1.18 [0.08]  
b = 1.00 [0.05]  
Seff = 275.38 [116.42]  
Teq = 1039 [110] K  
Rp = 2.92 [3.60] Re  
a = 0.0589 [0.0159] AU  
Ag = 8.10 [19.78] [0.36σ]  
Teffp = 2709 [1634] K [1.02σ]

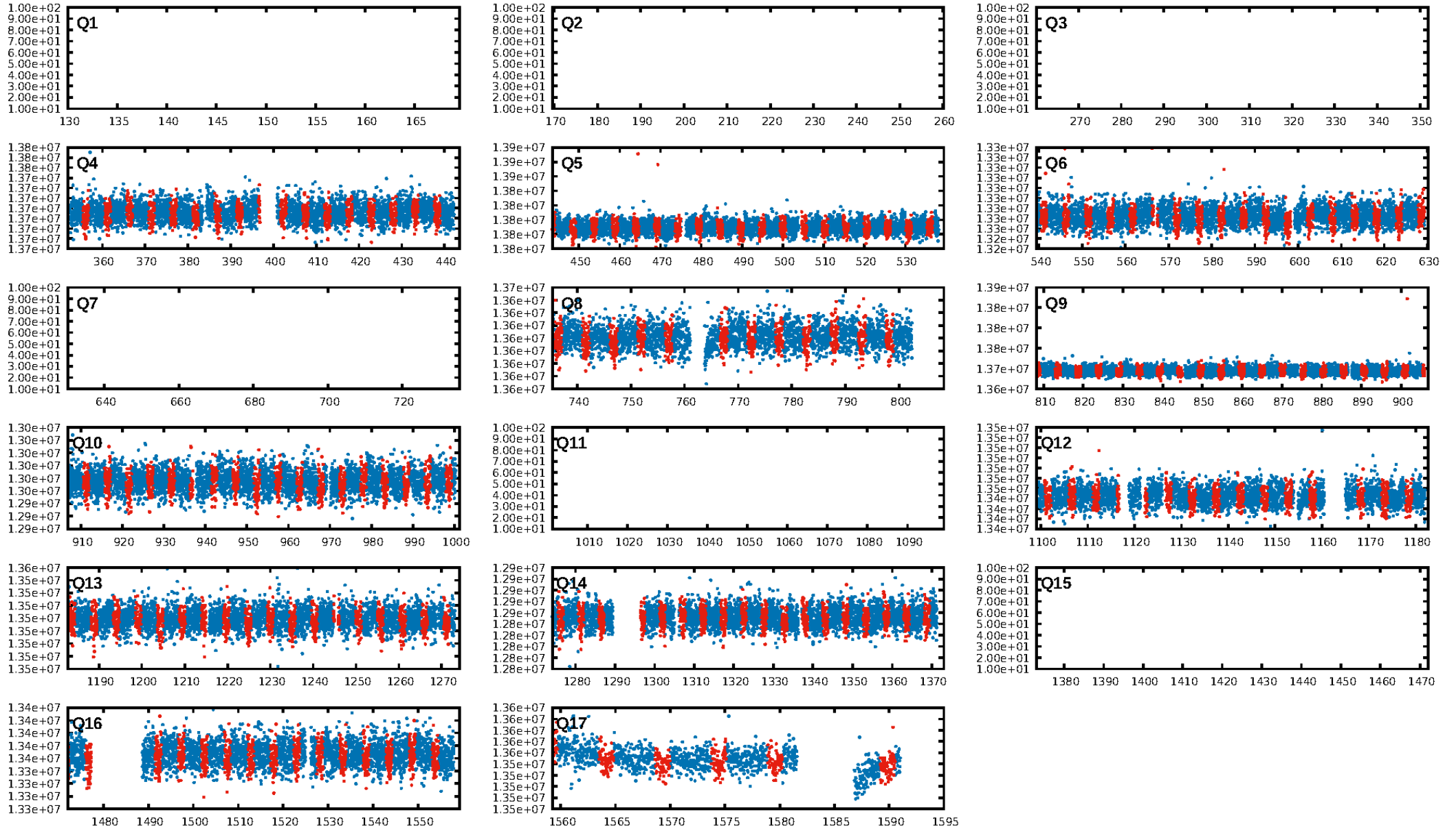
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 99.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.12e-71  
RollingBand-fgt: 1.00 [166/166]  
GhostDiagnostic-chr: -0.04252  
Centroid-sig: 0.0%  
Centroid-so: 6.230 arcsec [8.50σ]  
OotOffset-rm: 6.961 arcsec [8.96σ]  
KicOffset-rm: 7.062 arcsec [8.43σ]  
OotOffset-st: 3/0/4/4 [11]  
KicOffset-st: 3/0/4/4 [11]  
DiffImageQuality-fgm: 0.73 [8/11]  
DiffImageOverlap-fno: 1.00 [11/11]

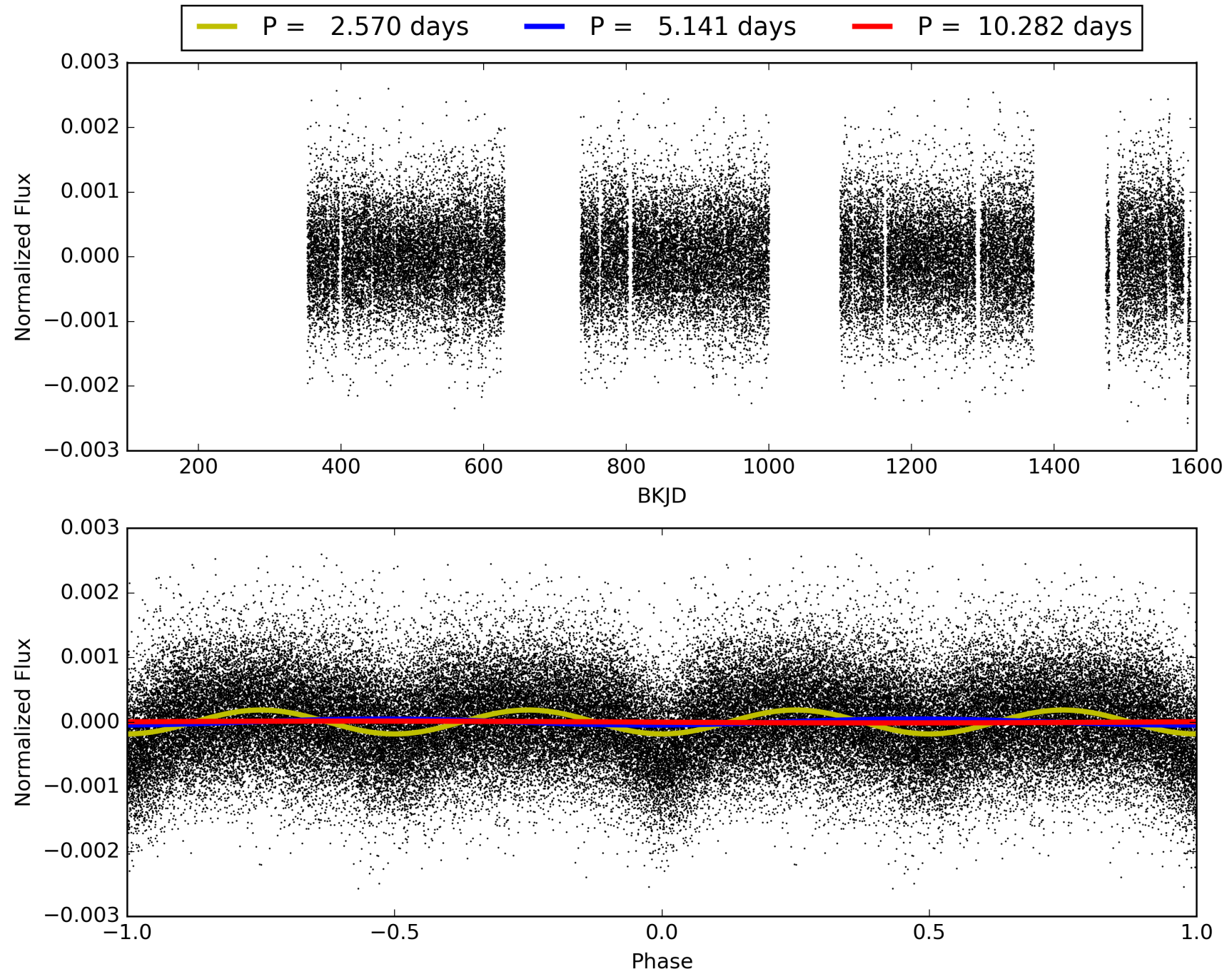
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:00:26 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010227881-01, PDC Light Curves

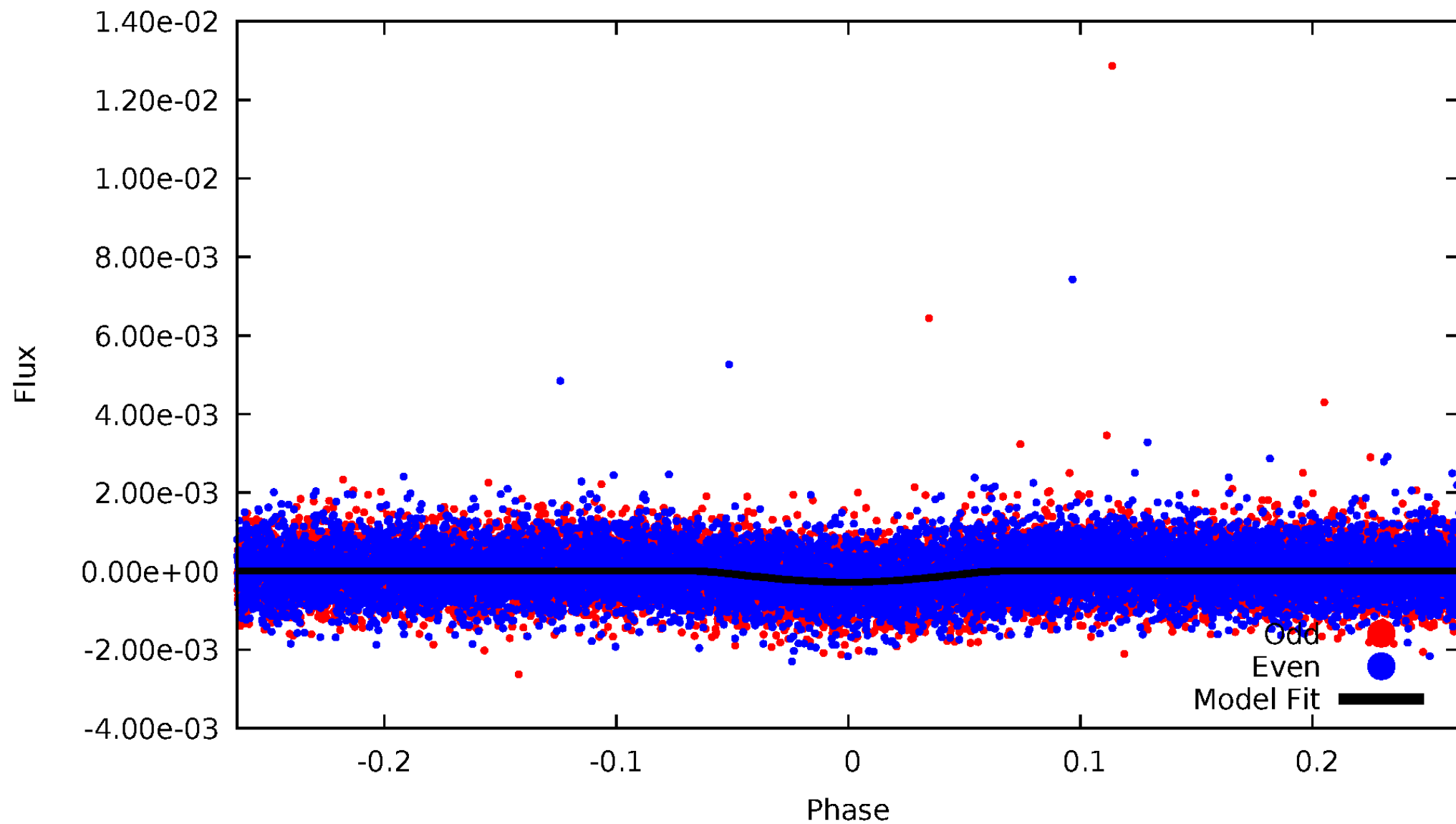


TCE 010227881-01



# DV Odd/Even

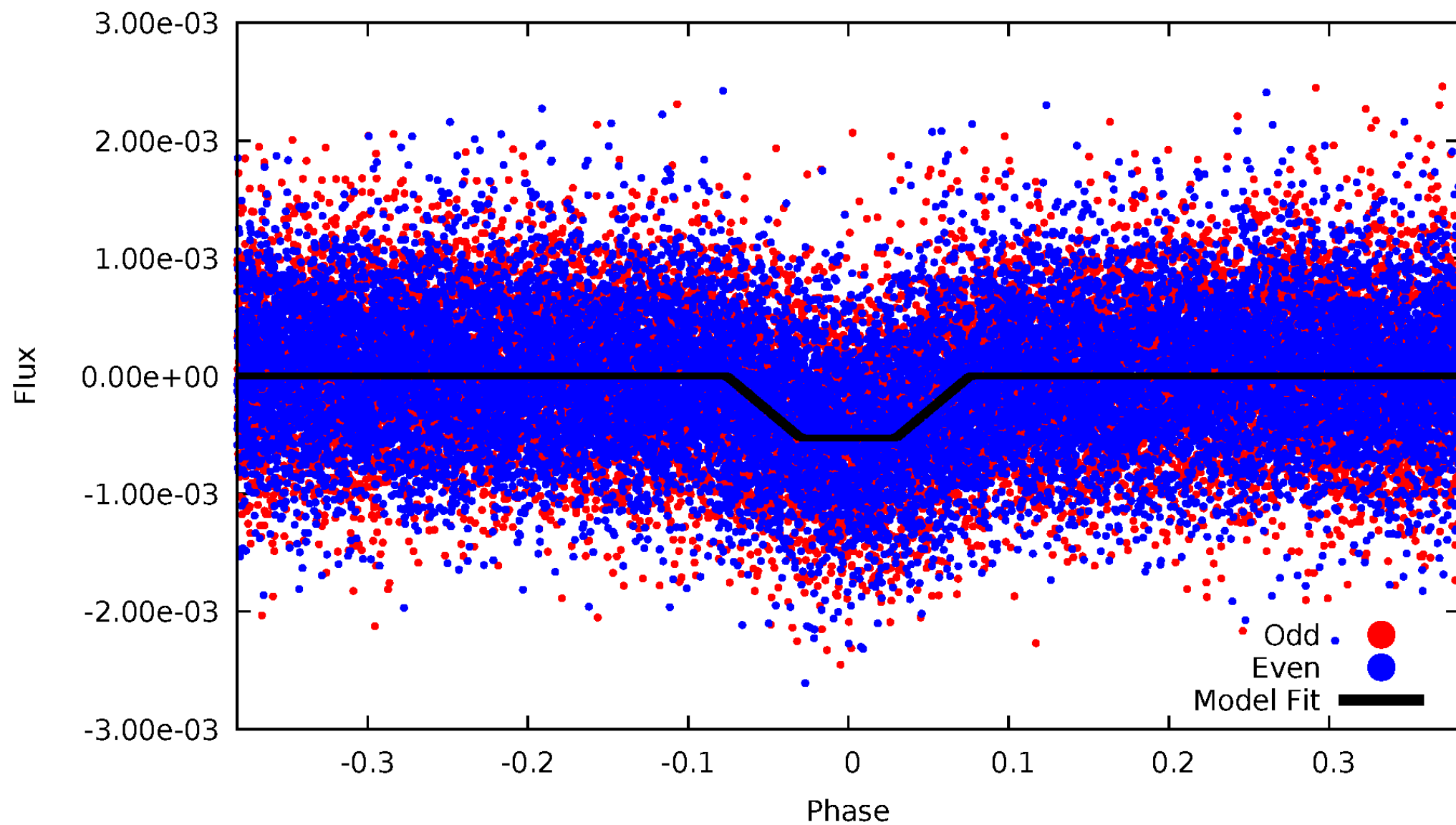
TCE 010227881-01



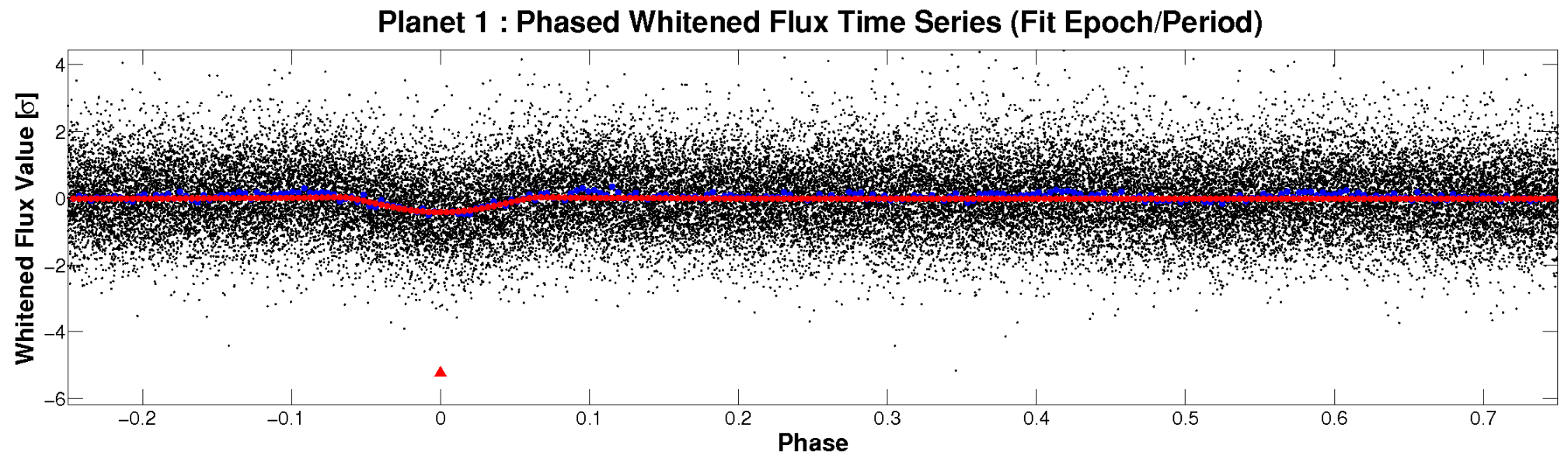
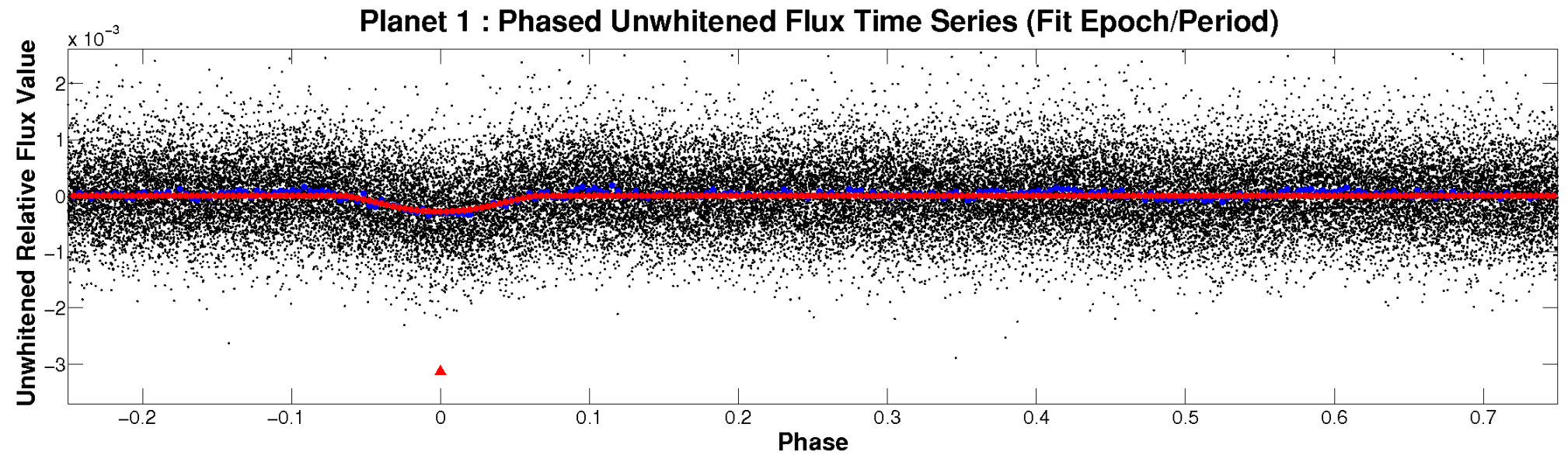


# ALT Odd/Even

TCE 010227881-01

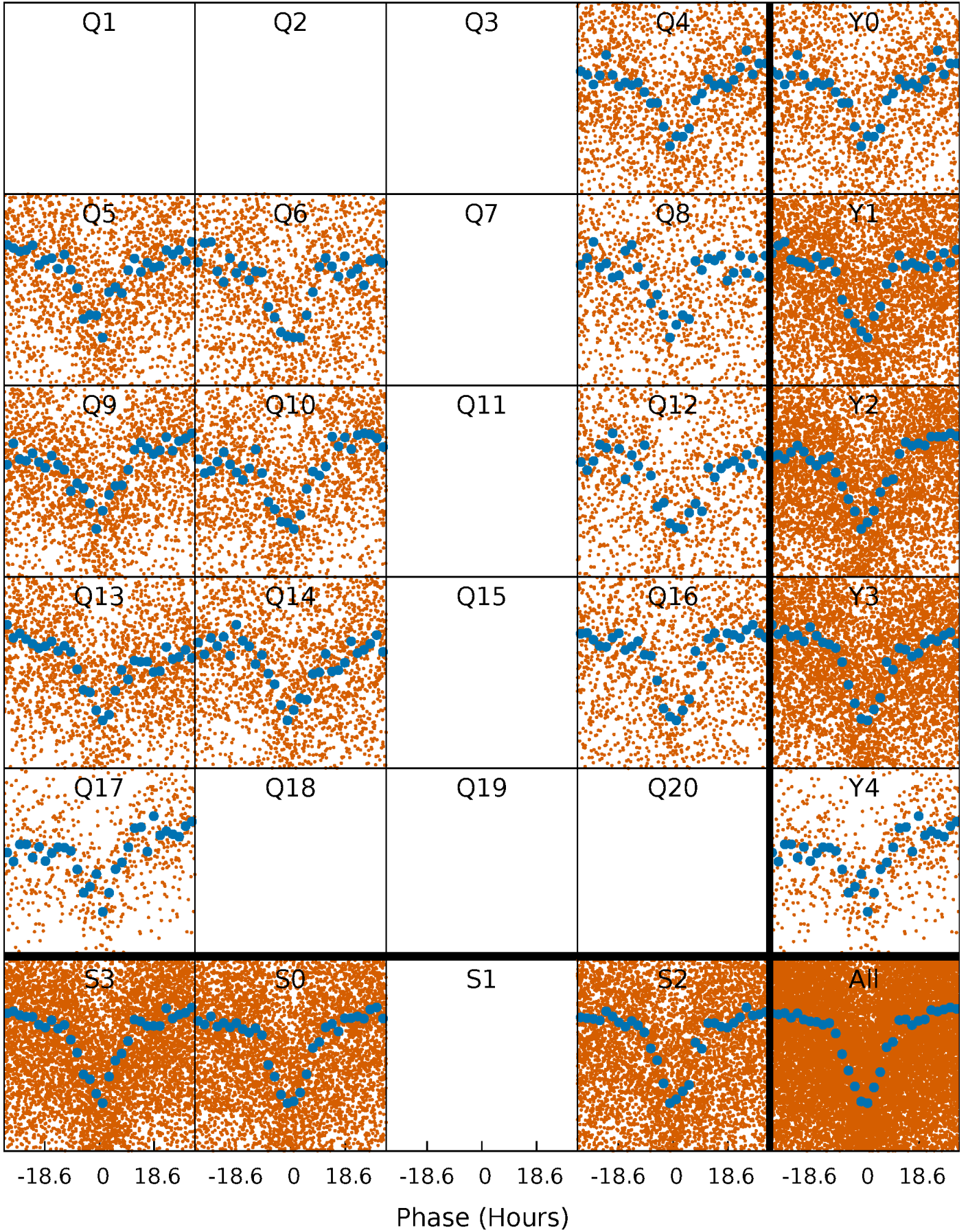


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

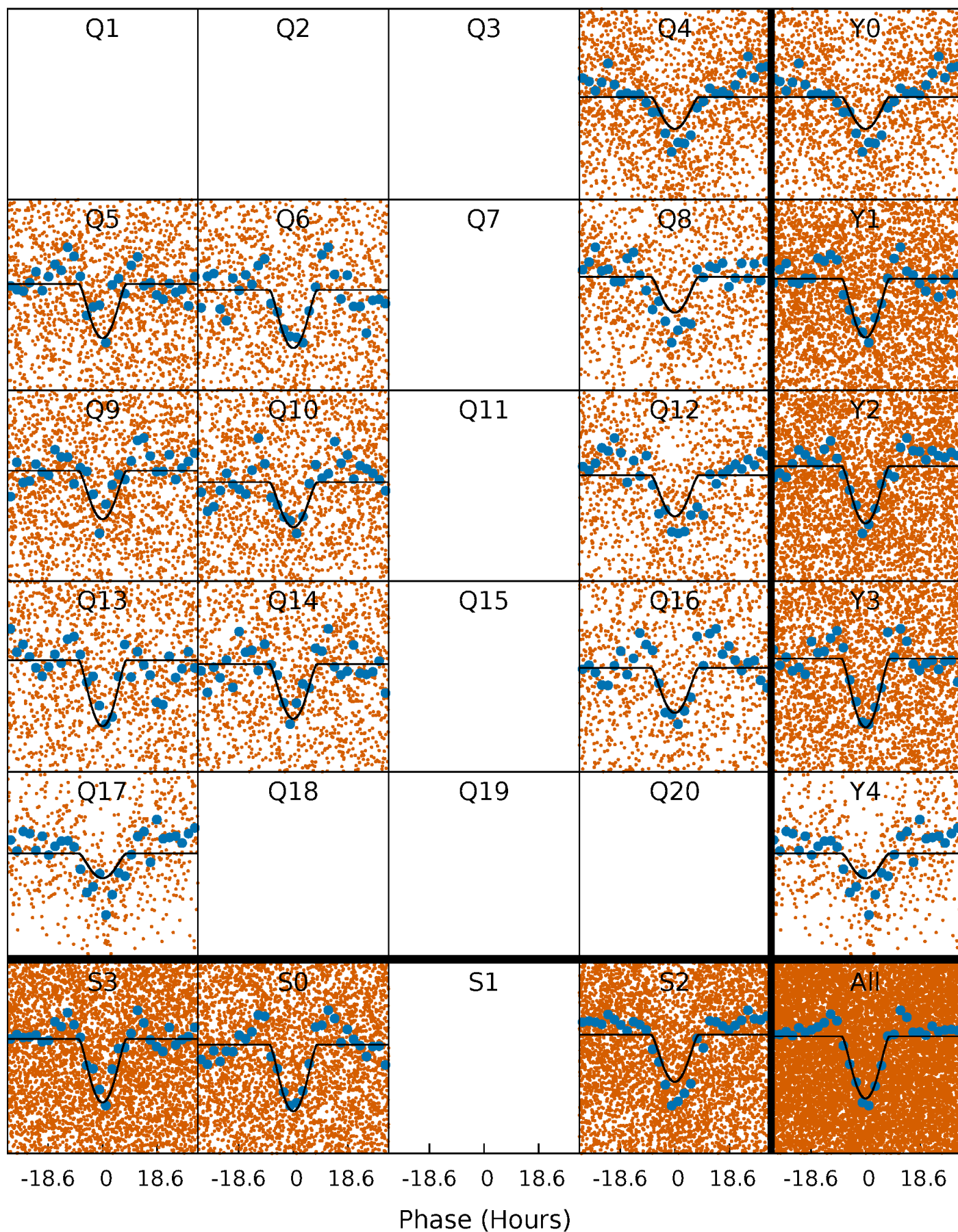
TCE 010227881-01 P= 5.140808 Days  $T_0=135.008238$  (BKJD)





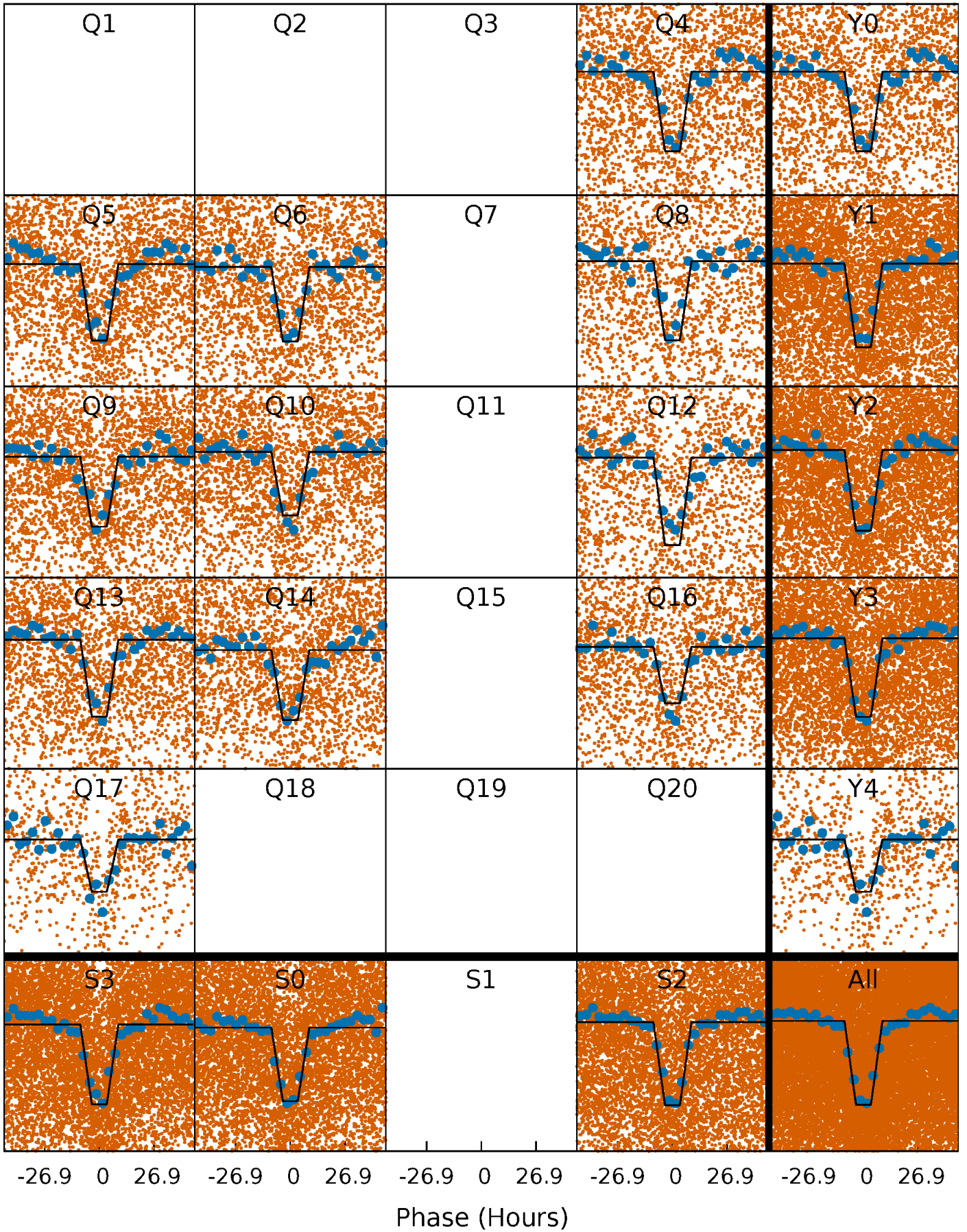
# DV Quarter-Phased Transit Curves

TCE 010227881-01 P= 5.140808 Days  $T_0=135.008238$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

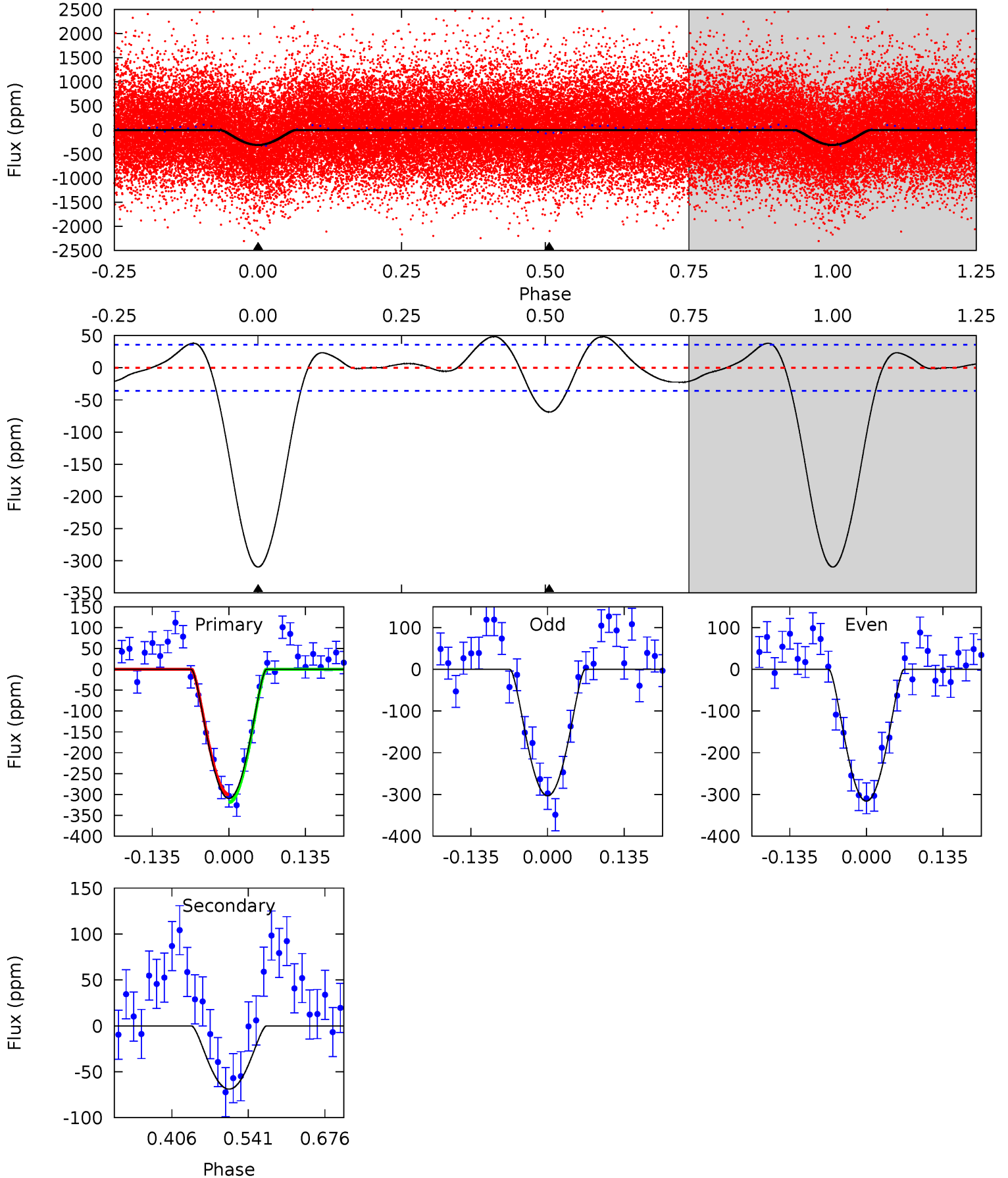
TCE 010227881-01 P= 5.140884 Days  $T_0=135.001521$  (BKJD)



# DV Model-Shift Uniqueness Test

010227881-01, P = 5.140808 Days, E = 135.008238 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
38.9	8.67	0	0	4.50	1.49	1.39	38.9	38.9	8.67	8.67	0.80	1.02	0.14	1.16

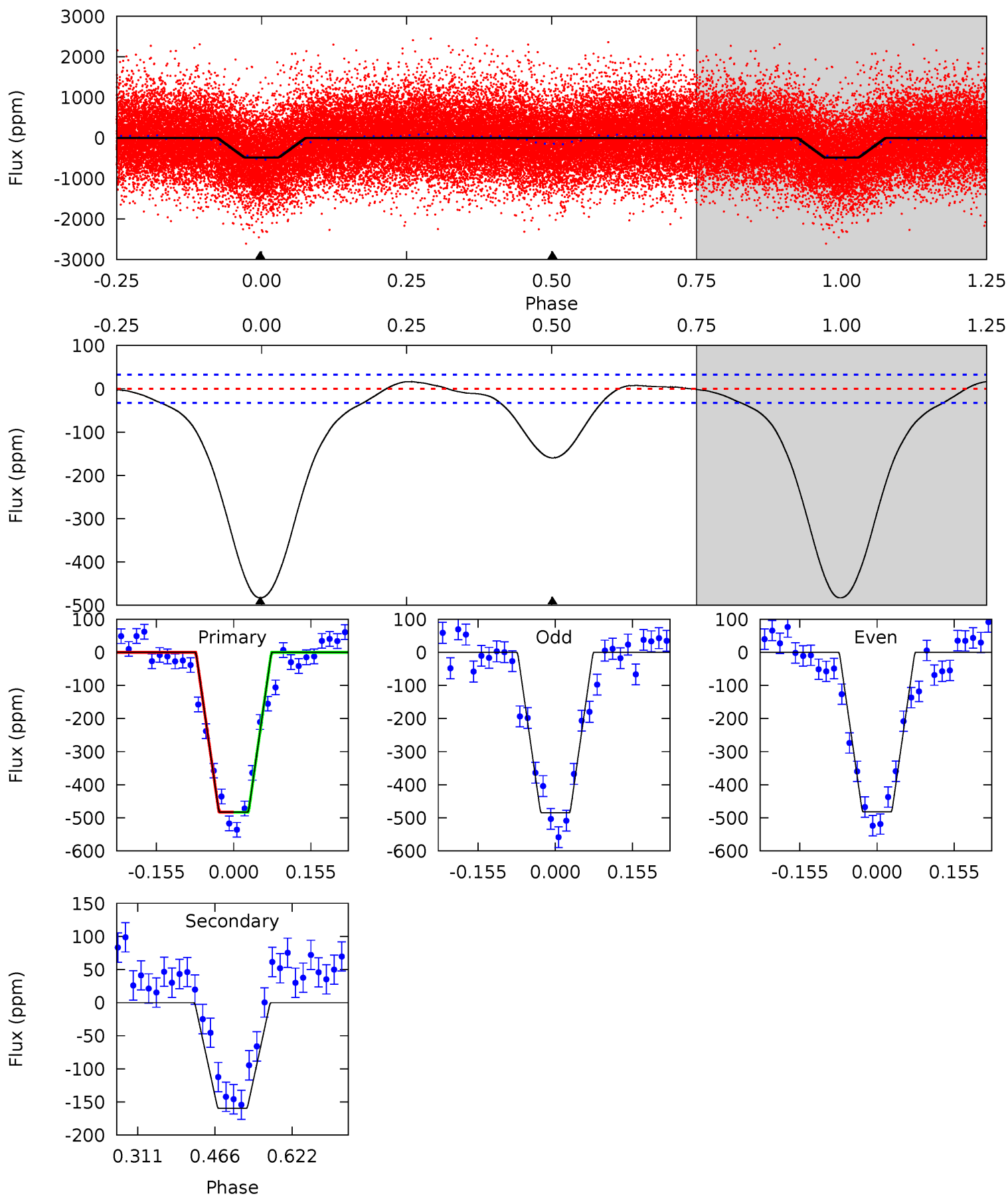




# Alt Model-Shift Uniqueness Test

010227881-01, P = 5.140884 Days, E = 135.001521 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
66.2	21.9	0	0	4.47	1.42	2.23	66.2	66.2	21.9	21.9	0.18	1.07	0.03	0.02





### Stellar Parameters For KIC 010227881

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5893^{+184}_{-205}$	$4.505^{+0.039}_{-0.221}$	$0.000^{+0.250}_{-0.300}$	$0.941^{+0.297}_{-0.099}$	$1.033^{+0.124}_{-0.138}$	$1.748^{+0.383}_{-0.956}$
	+3%/-3%	+1%/-5%	+inf%/-inf%	+32%/-11%	+12%/-13%	+22%/-55%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010227881-01 / KOI 5780.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-69 \pm 8$	$4.03^{+3.58}_{-2.54}$	$1496^{+118}_{-77}$	$3312^{+1418}_{-572}$	$7.887^{+46.619}_{-5.551}$
Alt.	$-160 \pm 7$	$3.69^{+3.34}_{-2.28}$	$1490^{+110}_{-76}$	$3944^{+1942}_{-778}$	$22^{+134}_{-16}$

$T_{max}$  = 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

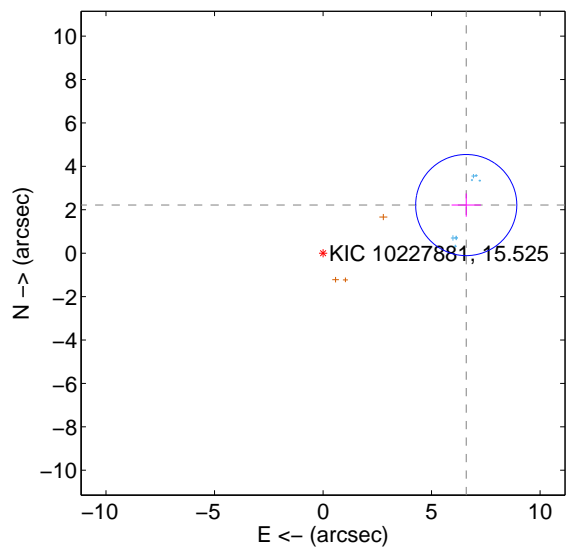
Supplemental centroid analysis for 010227881-01. Kepler magnitude: 15.53. Transit SNR 19.64

There are 8 quarters with good PRF difference image offsets

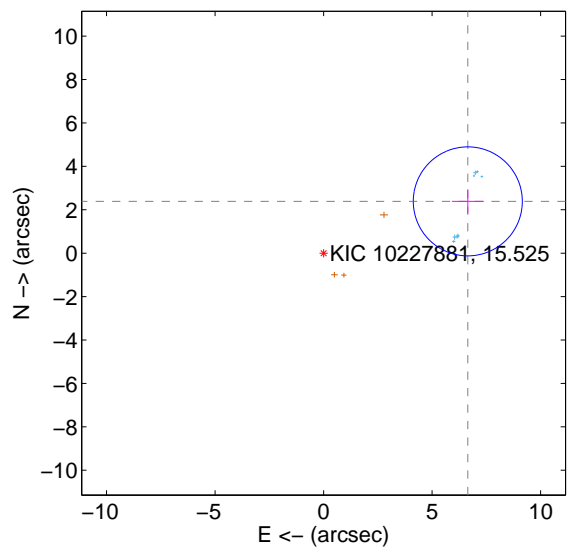
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$6.961 \pm 0.777$	8.96	$-6.599 \pm 0.673$	$2.217 \pm 0.537$
PRF-fit source offset from KIC position	$7.062 \pm 0.837$	8.43	$-6.646 \pm 0.733$	$2.387 \pm 0.554$
photometric centroid source offset	$6.23 \pm 0.73$	8.50	$-6.03 \pm 0.73$	$1.56 \pm 0.74$

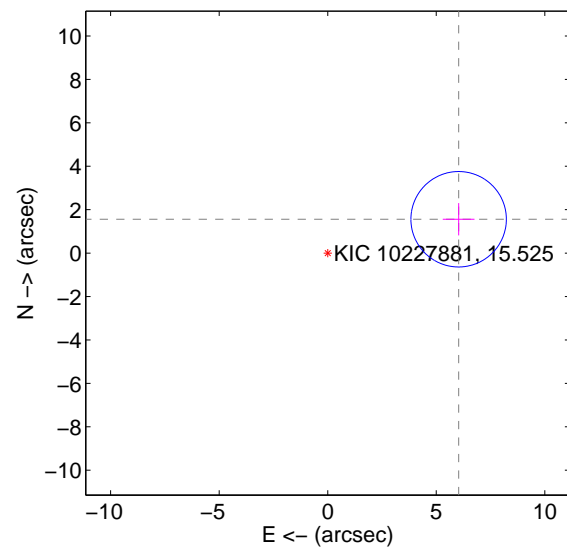
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

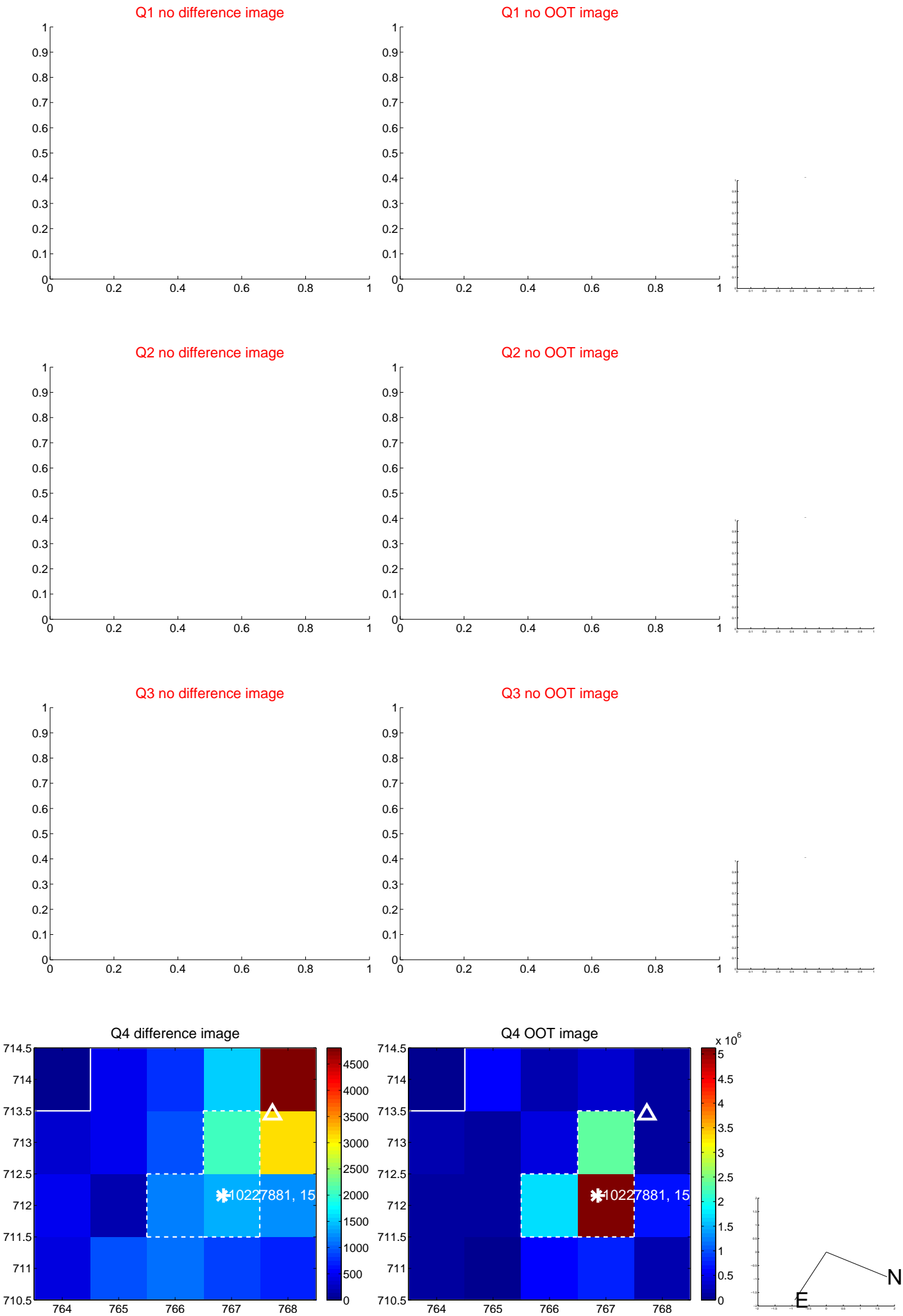


offset from photometric centroids

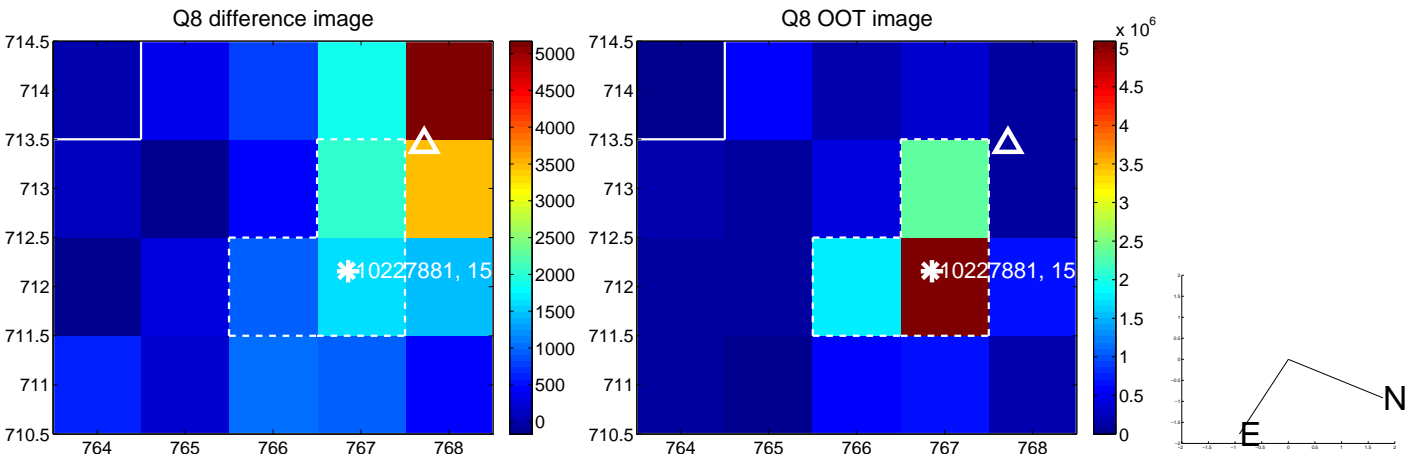
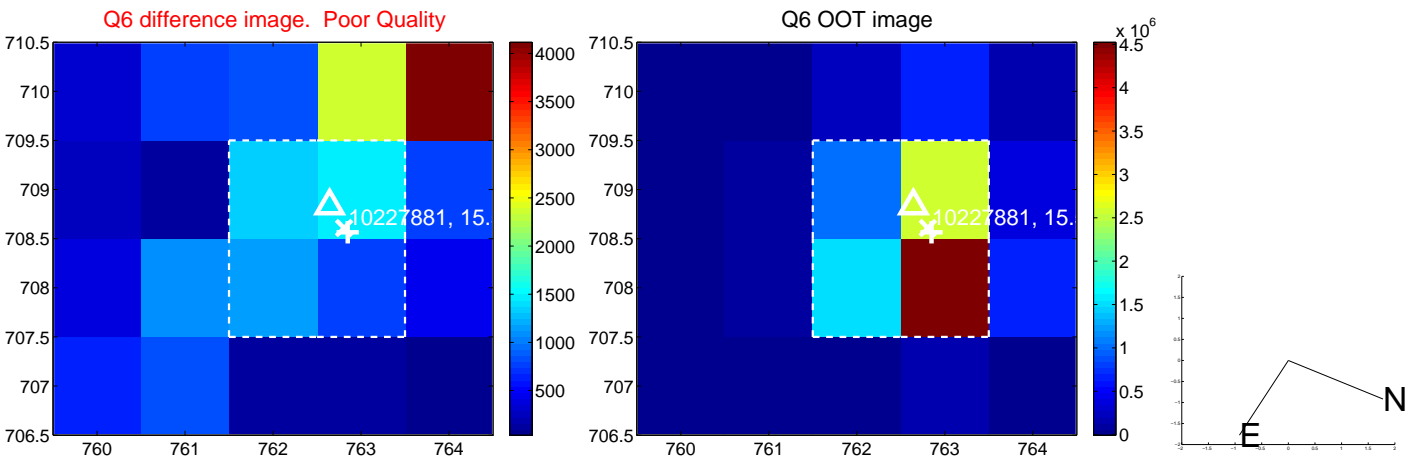
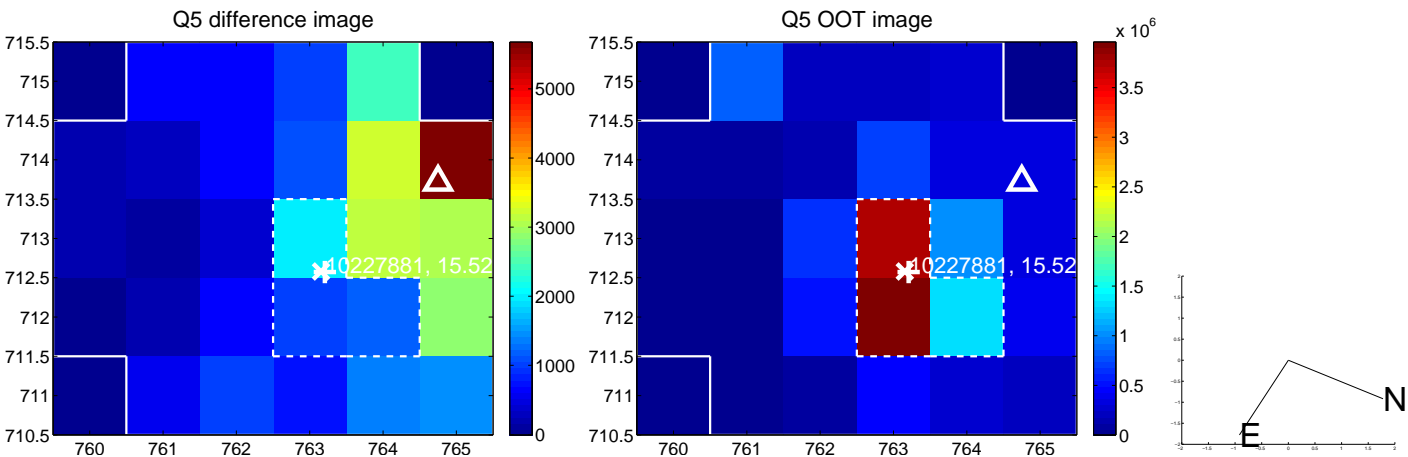


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

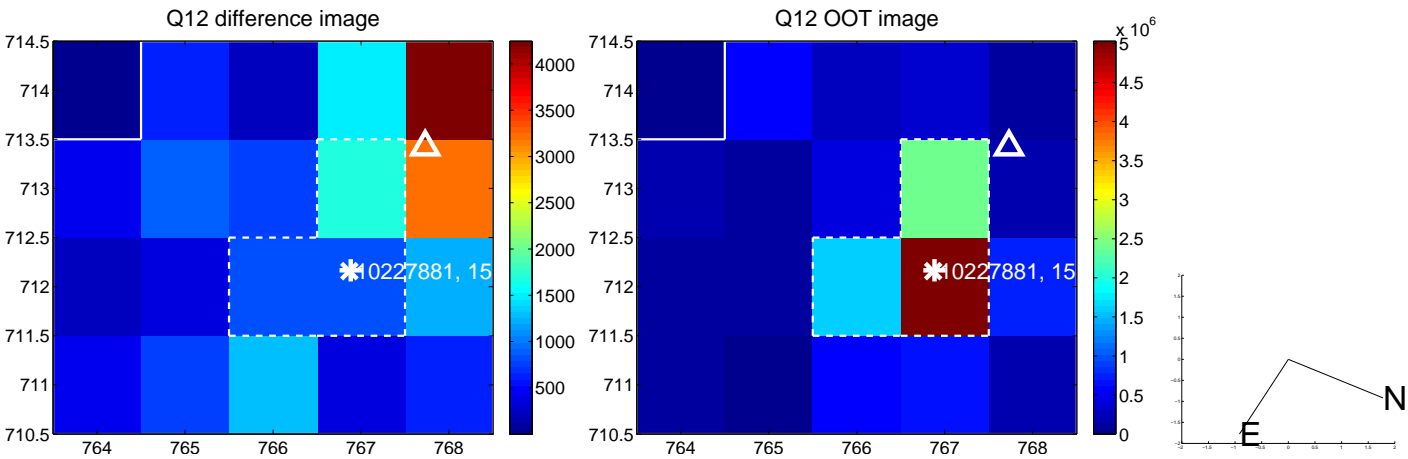
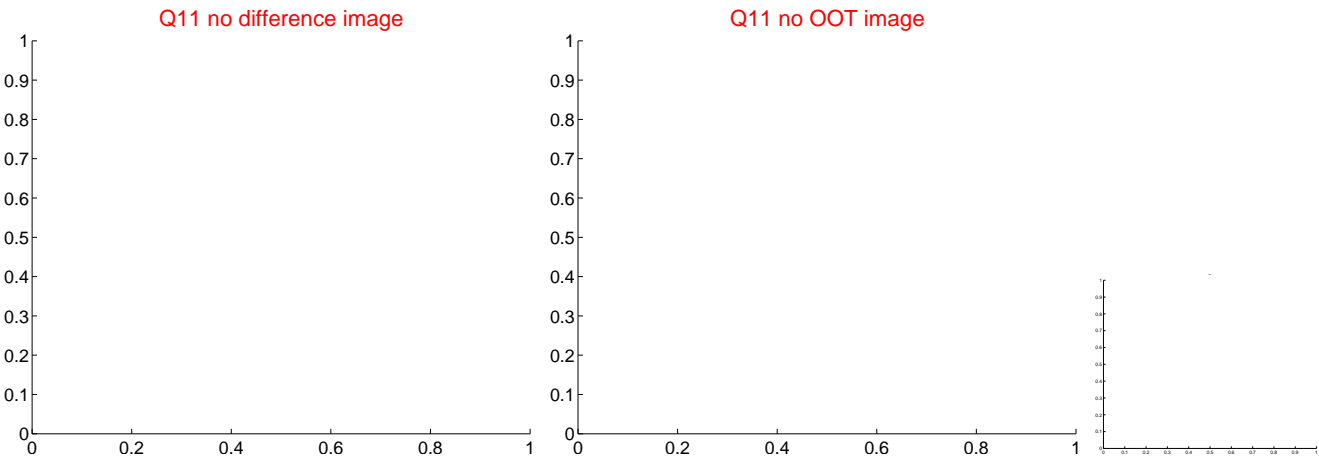
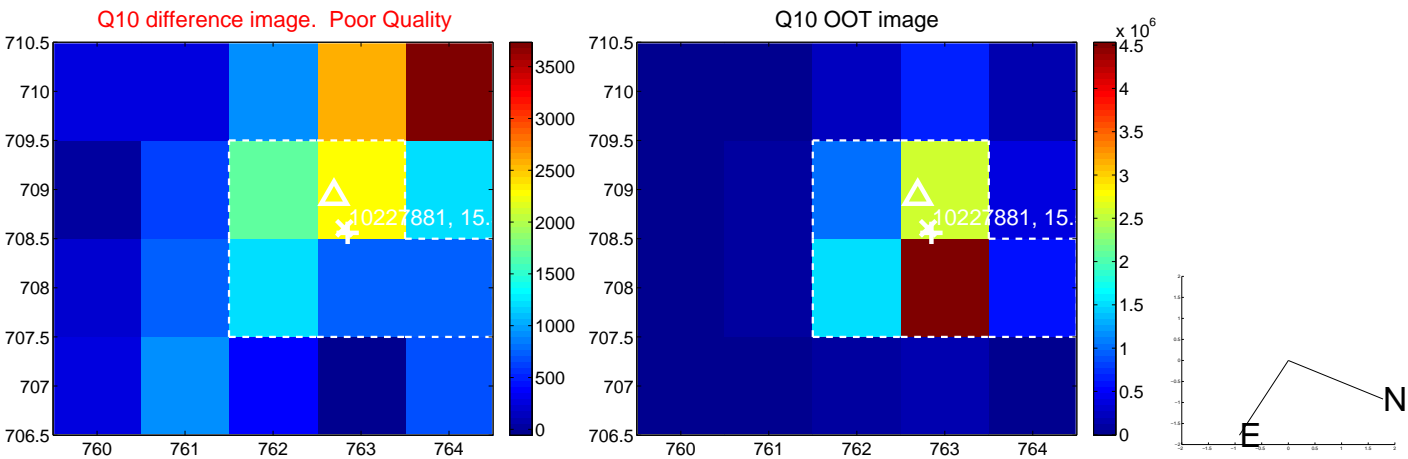
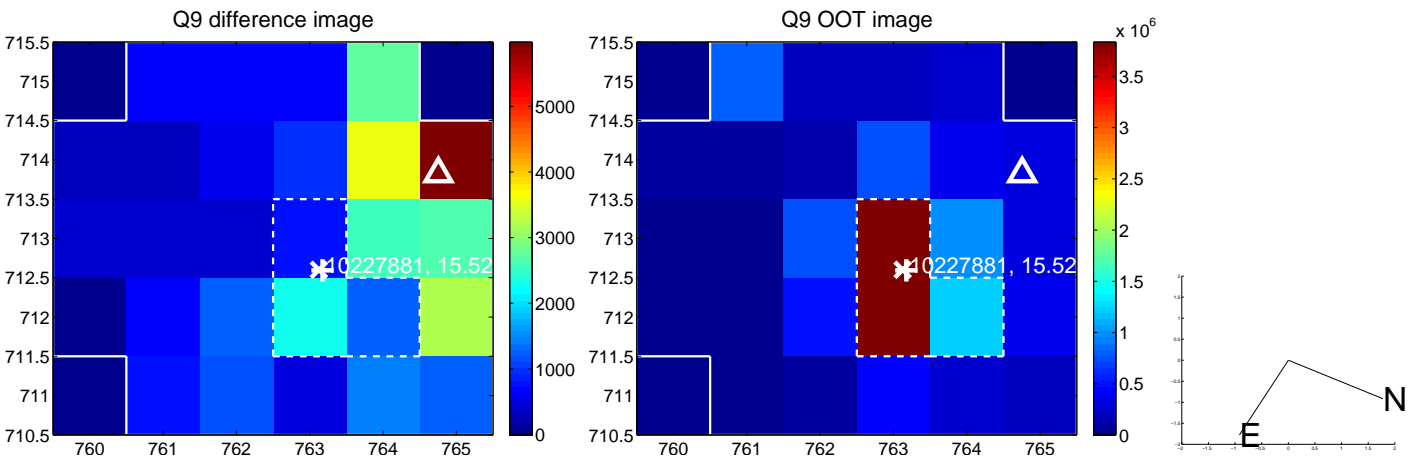


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

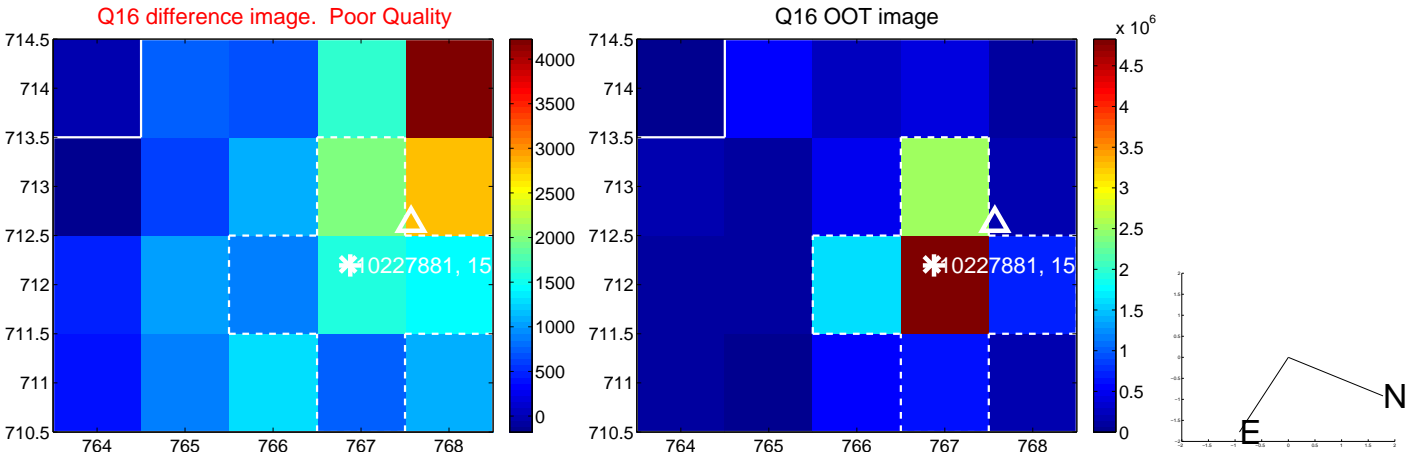
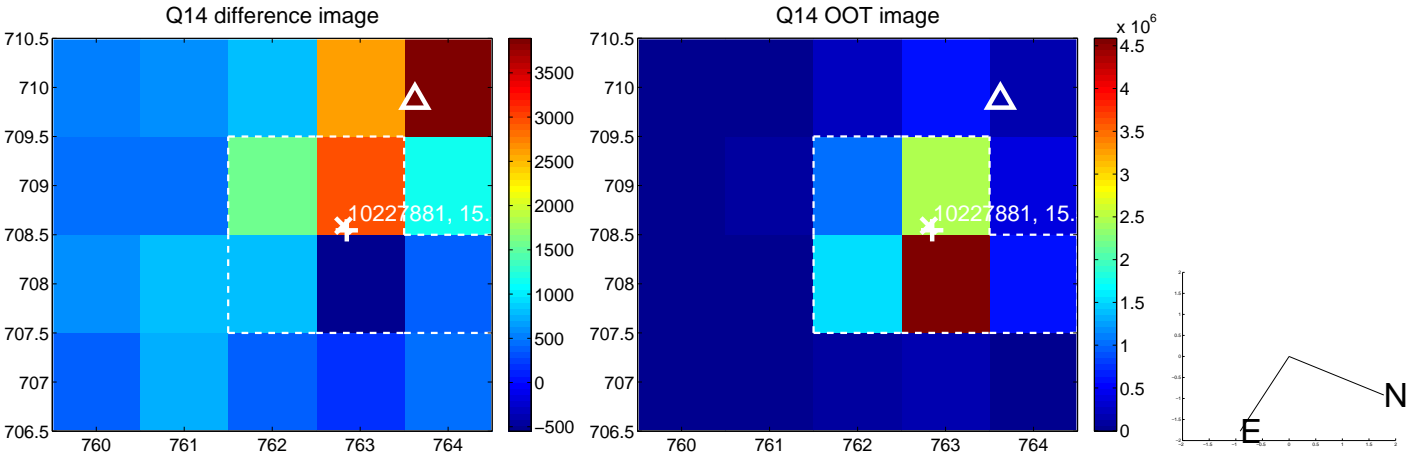
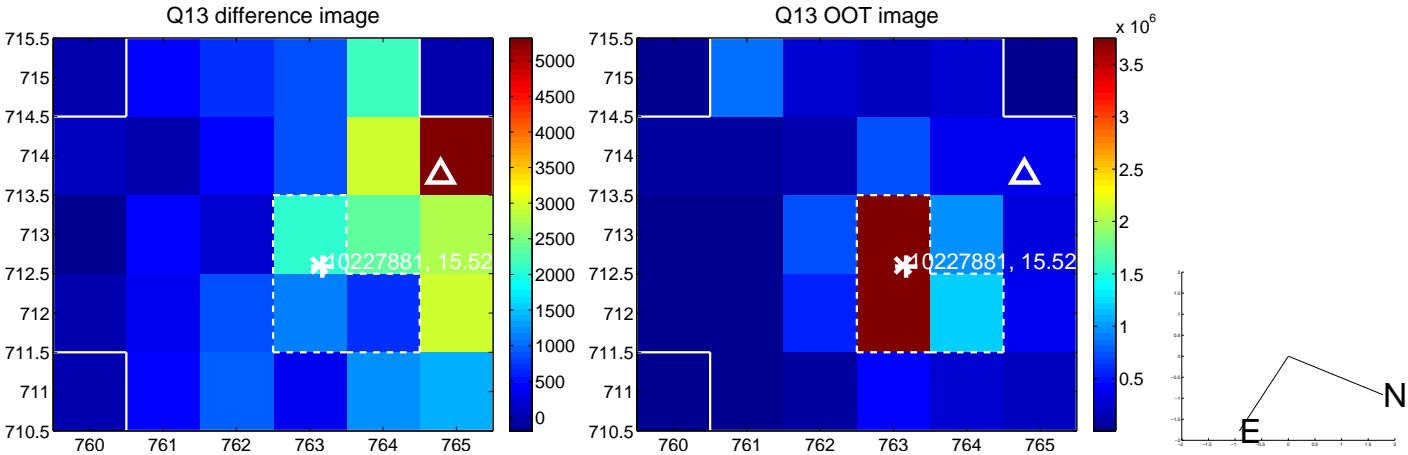




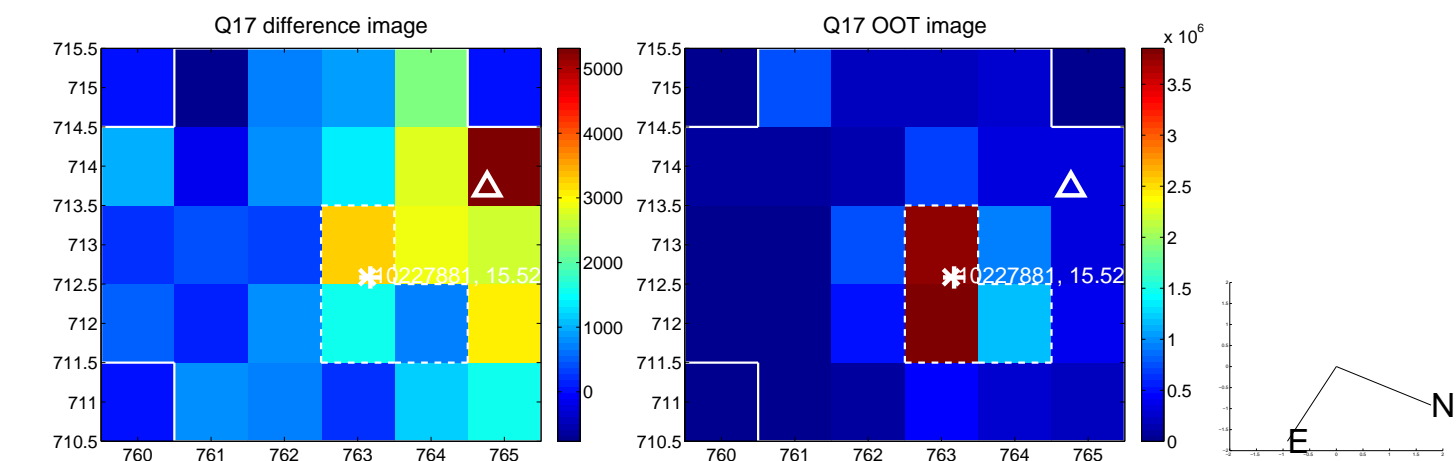
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



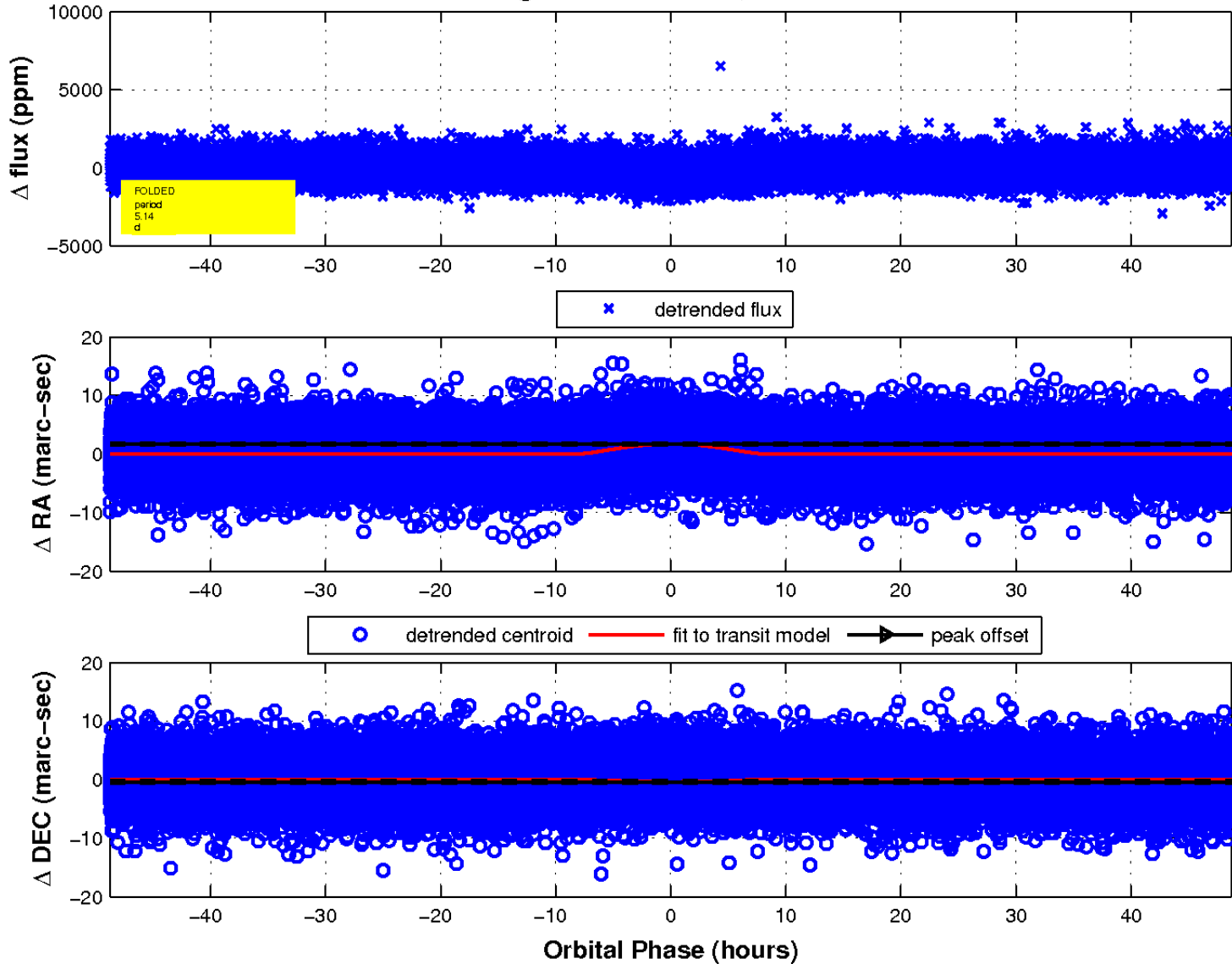
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

