

# KIC 008509361

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008509361-01	OBS	1280.01	6.099088	135.515024	210.6	3.867	31.3	32.9	1.97	5743	3.39	843.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008509361-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_OFFSET—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 008509361-01

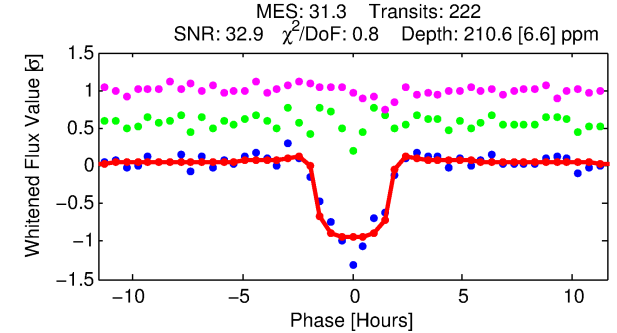
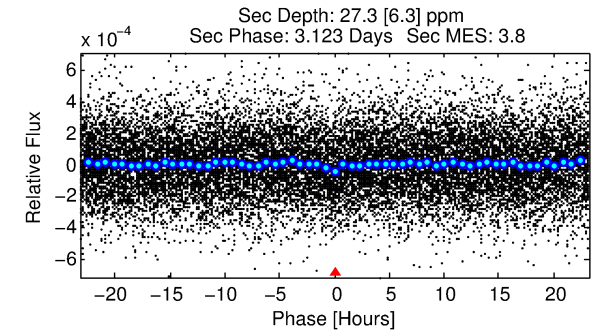
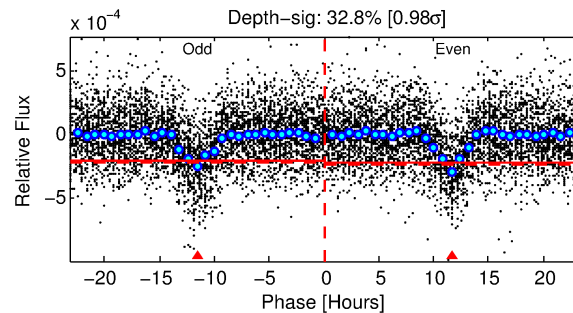
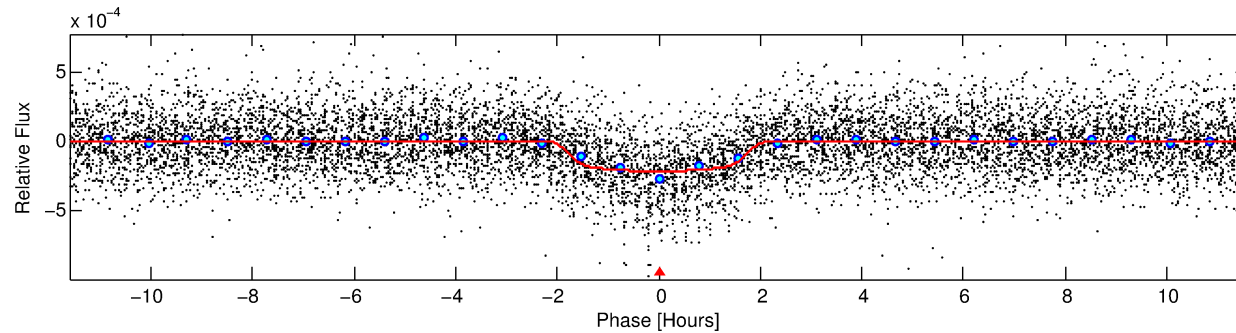
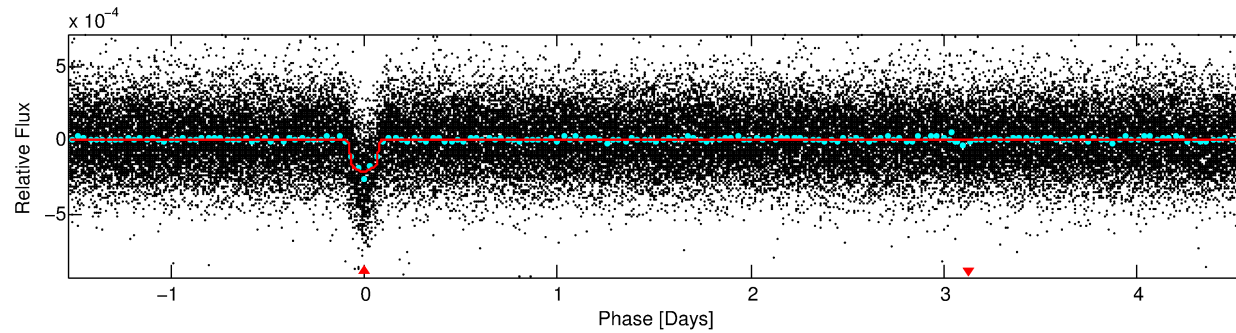
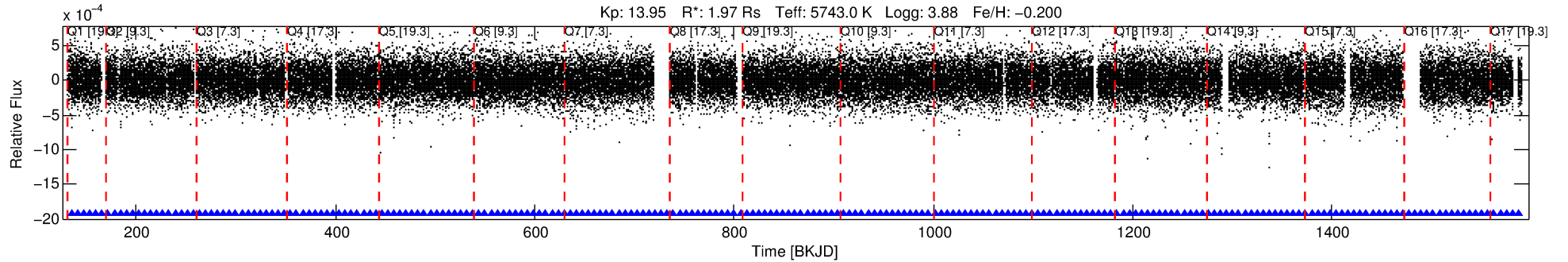
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008509361-01	8509361	008509346-01	8509346	1:1	12.2	-3	-1	13.74	13.95	262.41	Direct-PRF	0	0.42	0.28

**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: 8509361 Candidate: 1 of 1 Period: 6.099 d

KOI: K01280.01 Corr: 0.964



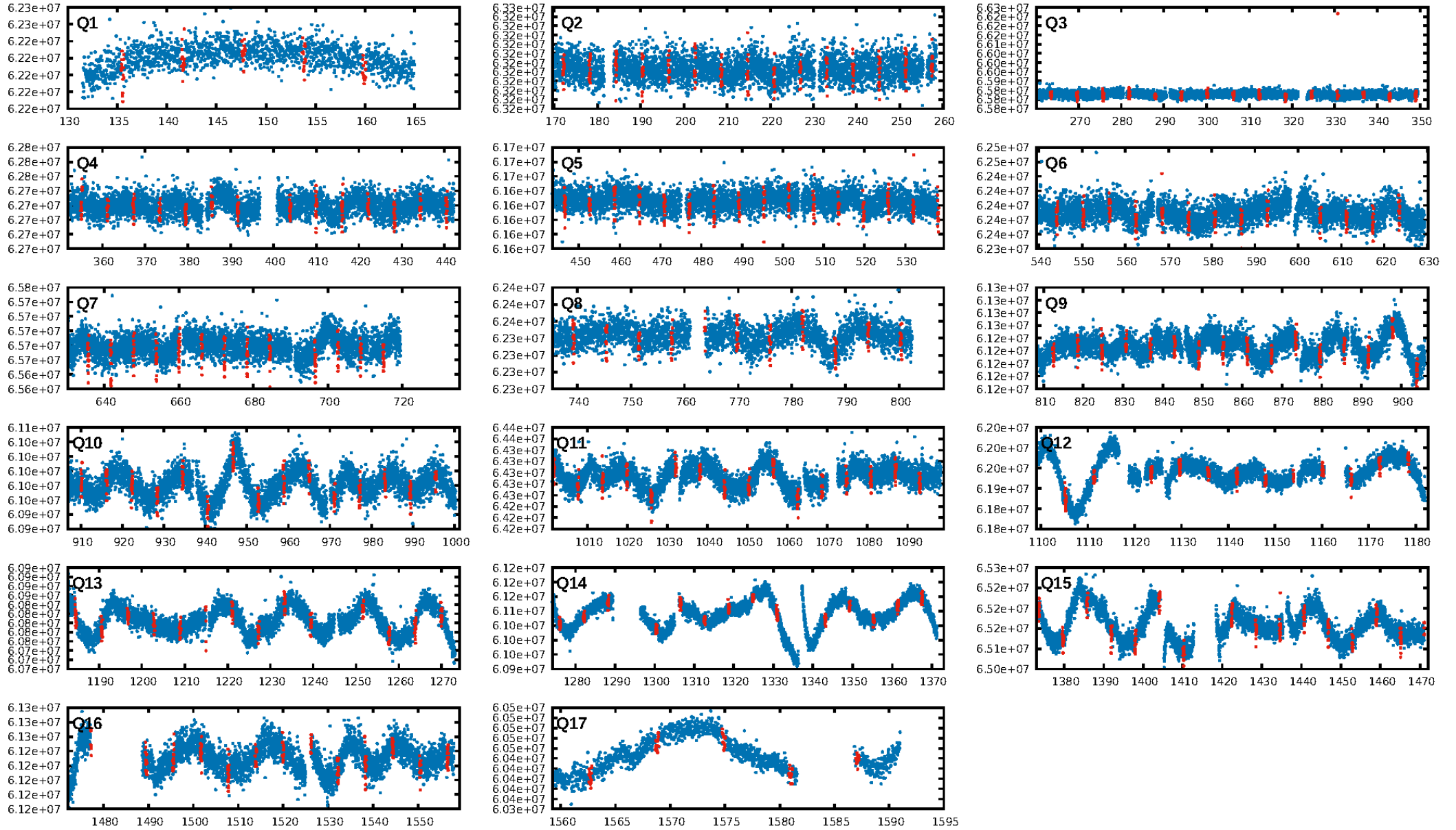
## DV Fit Results:

Period = 6.09909 [0.00002] d  
Epoch = 135.5150 [0.0019] BKJD  
Rp/R\* = 0.0158 [0.0019]  
a/R\* = 5.74 [3.17]  
b = 0.90 [0.12]  
Seff = 843.76 [732.54]  
Teq = 1374 [298] K  
Rp = 3.39 [1.73] Re  
a = 0.0670 [0.0346] AU  
Ag = 5.85 [5.39] [0.90 $\sigma$ ]  
Teffp = 3305 [291] K [4.63 $\sigma$ ]

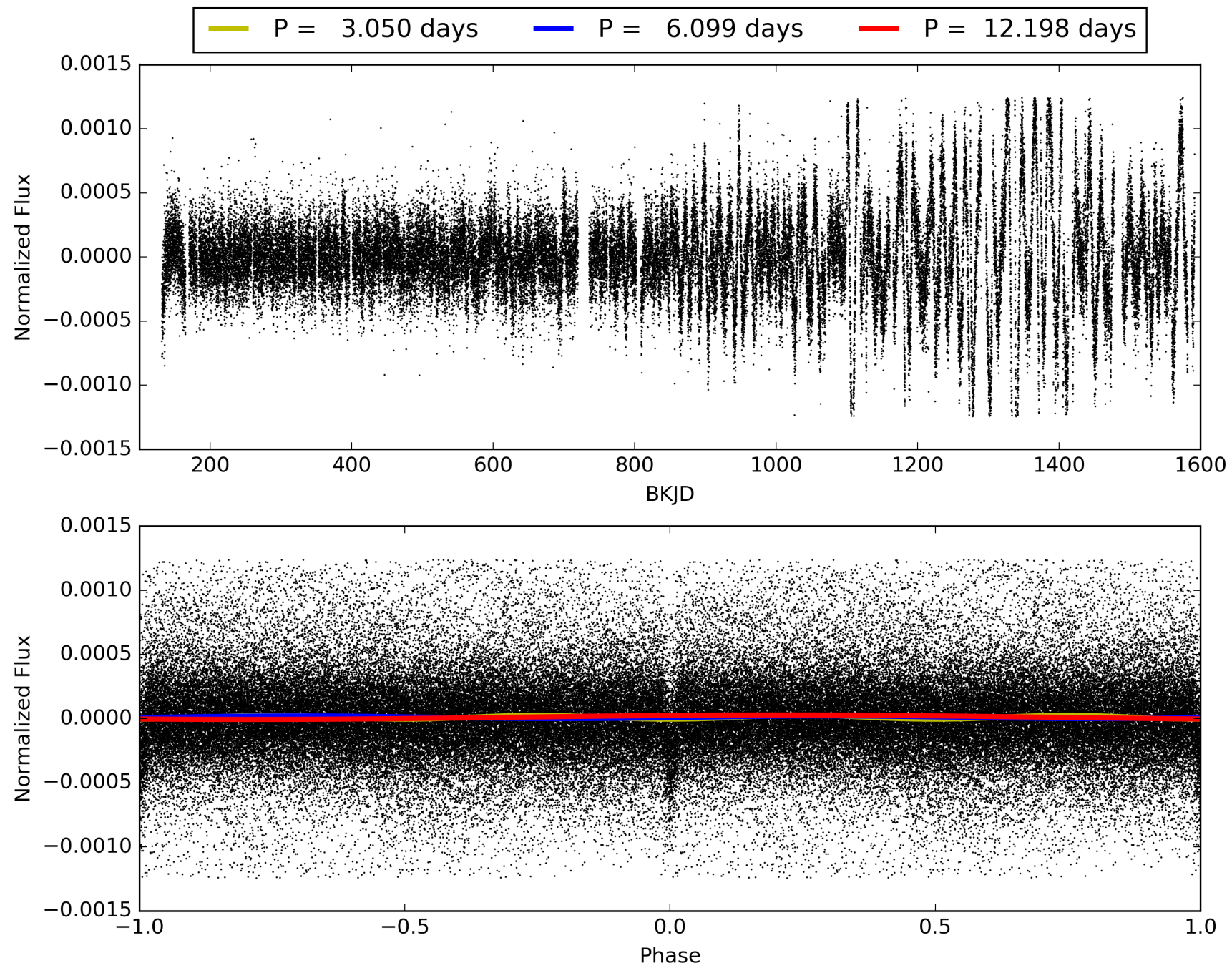
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.44e-205  
RollingBand-fgt: 1.00 [212/212]  
GhostDiagnostic-chr: -0.4072  
Centroid-sig: 0.0%  
Centroid-so: 160.470 arcsec [453.80 $\sigma$ ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008509361-01, PDC Light Curves

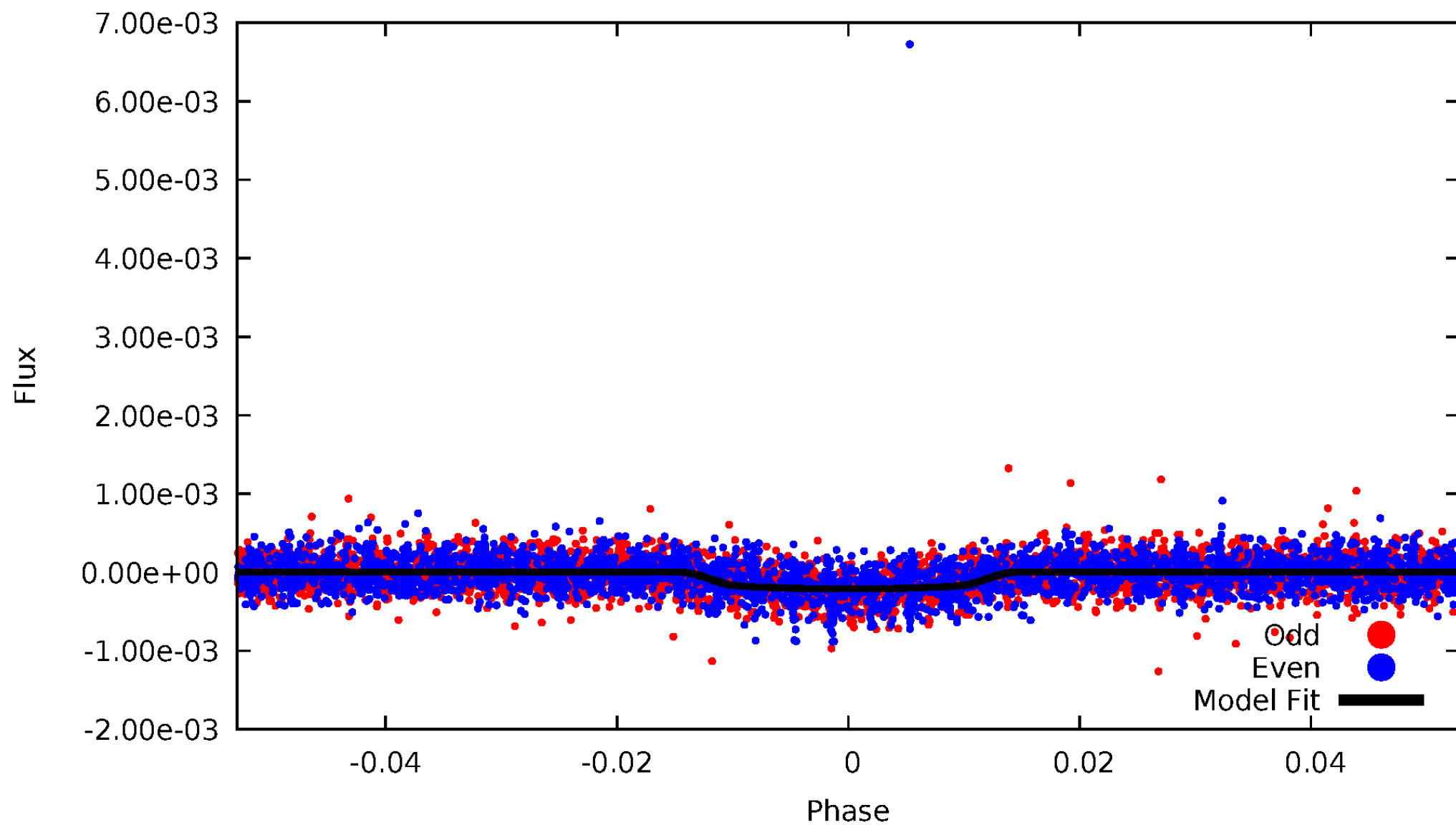


# TCE 008509361-01



# DV Odd/Even

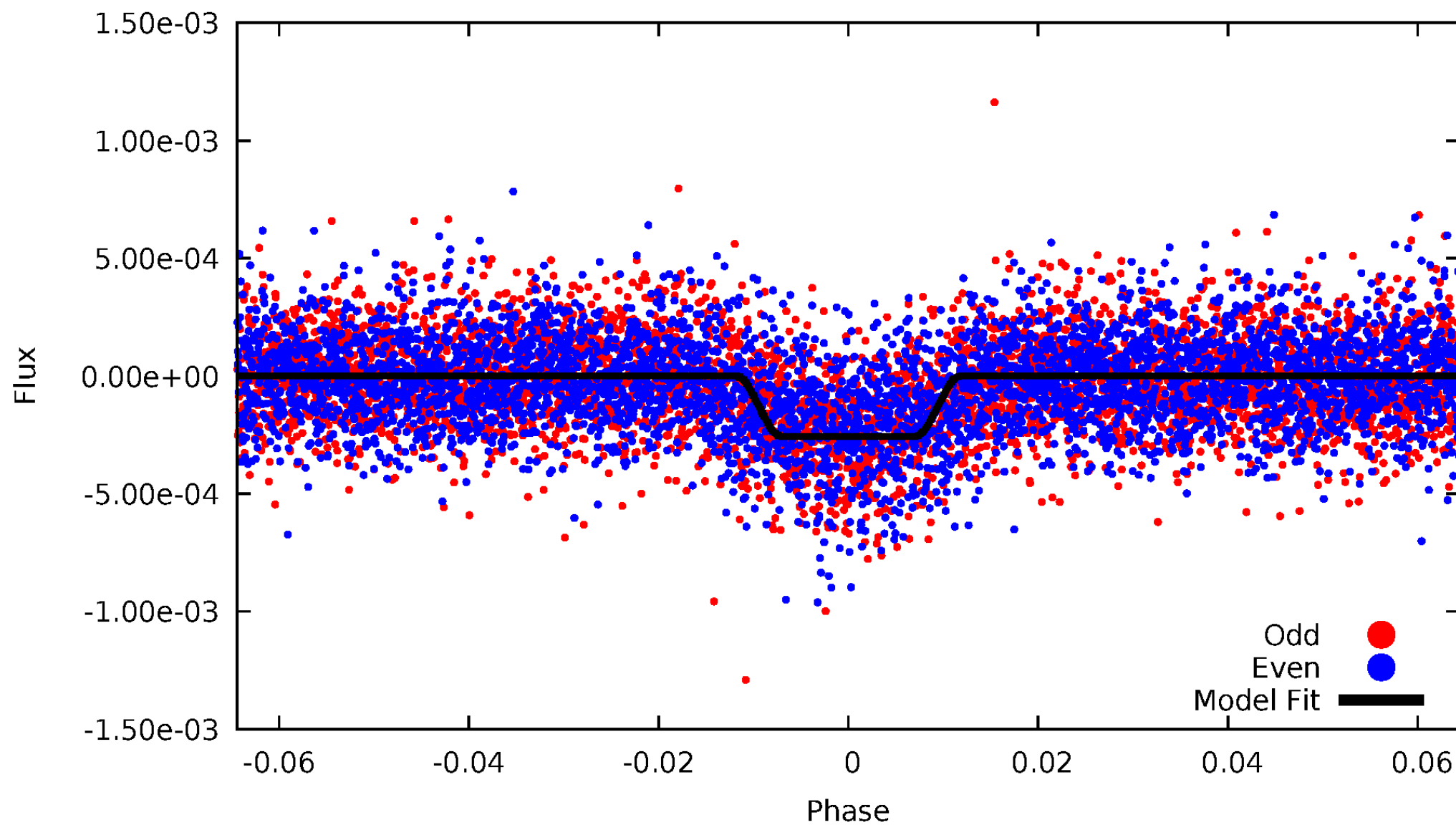
TCE 008509361-01



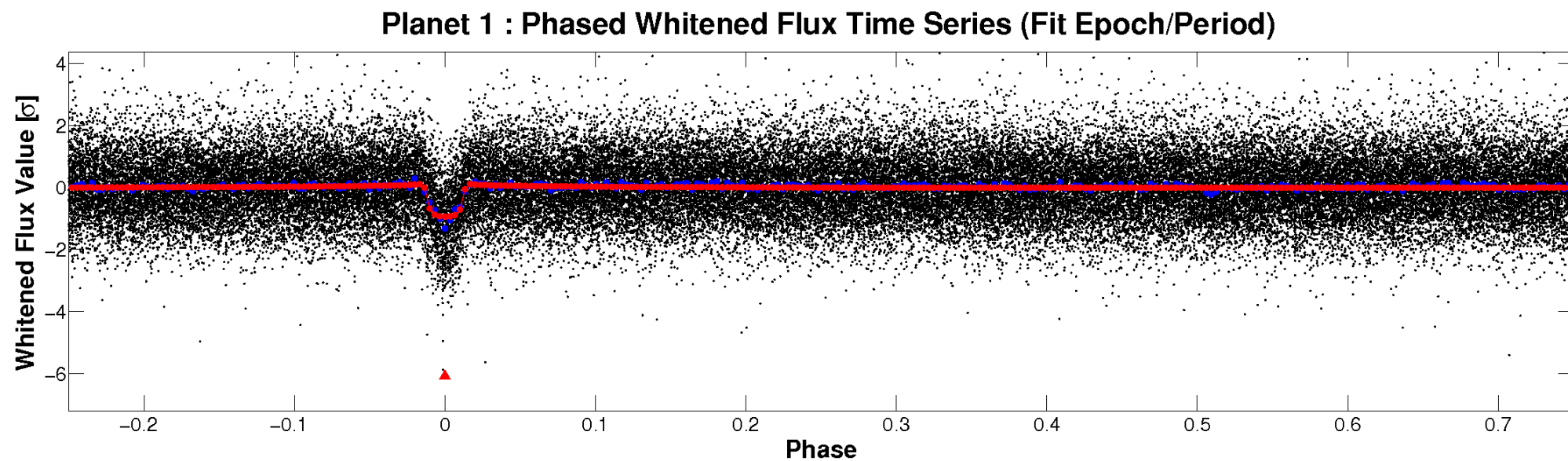
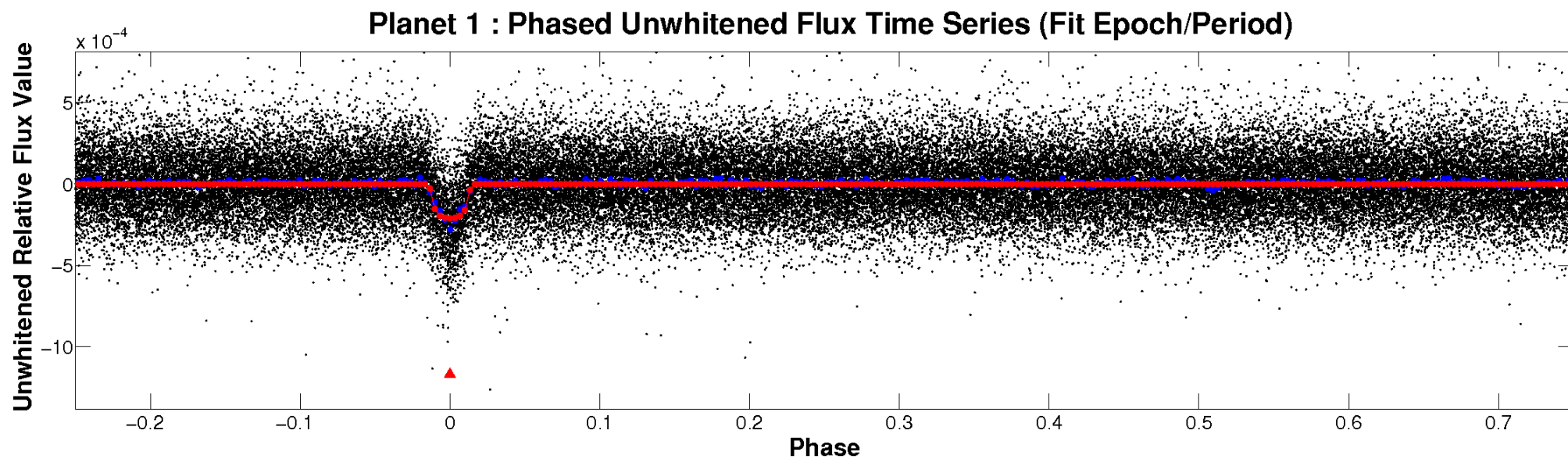


# ALT Odd/Even

TCE 008509361-01

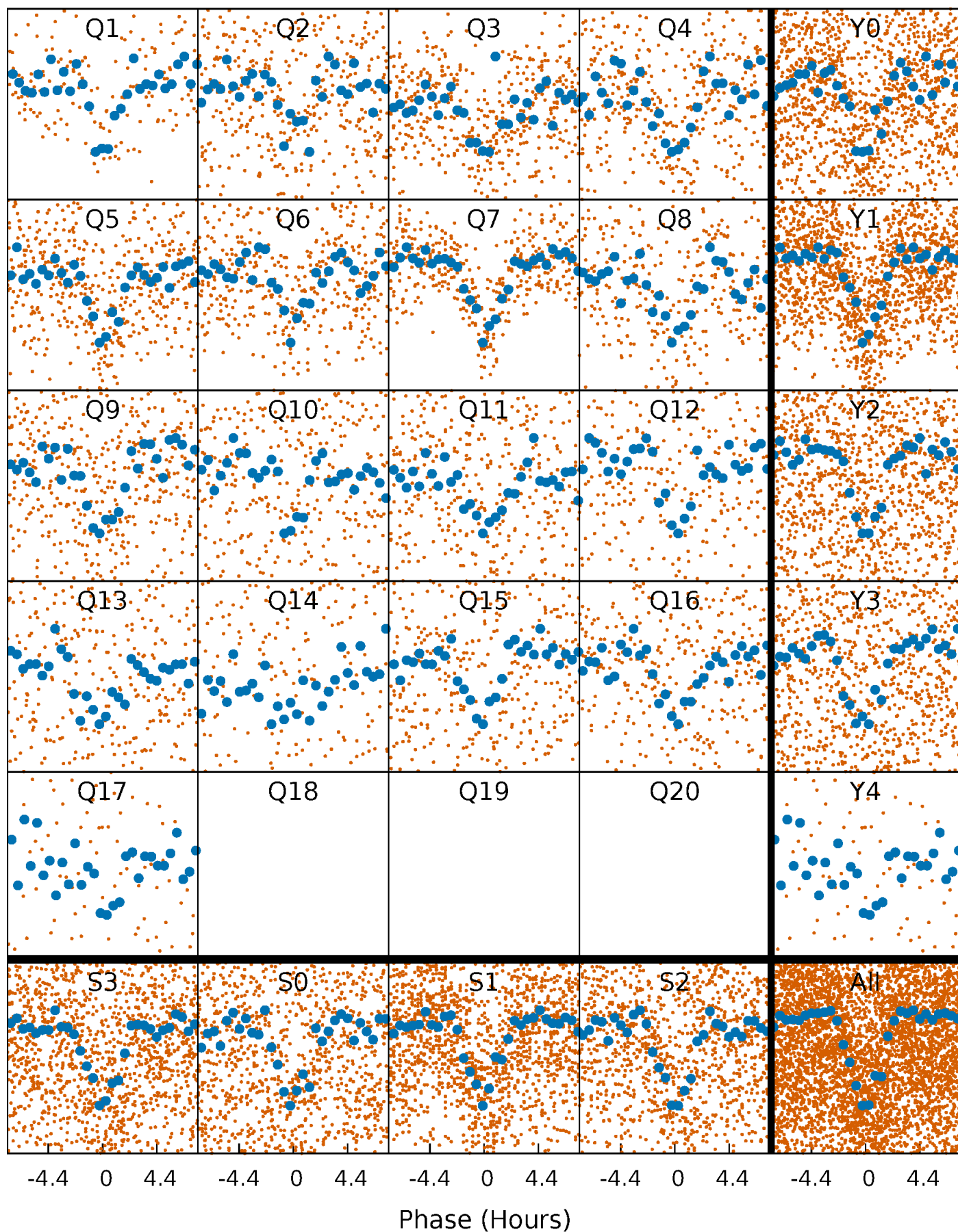


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

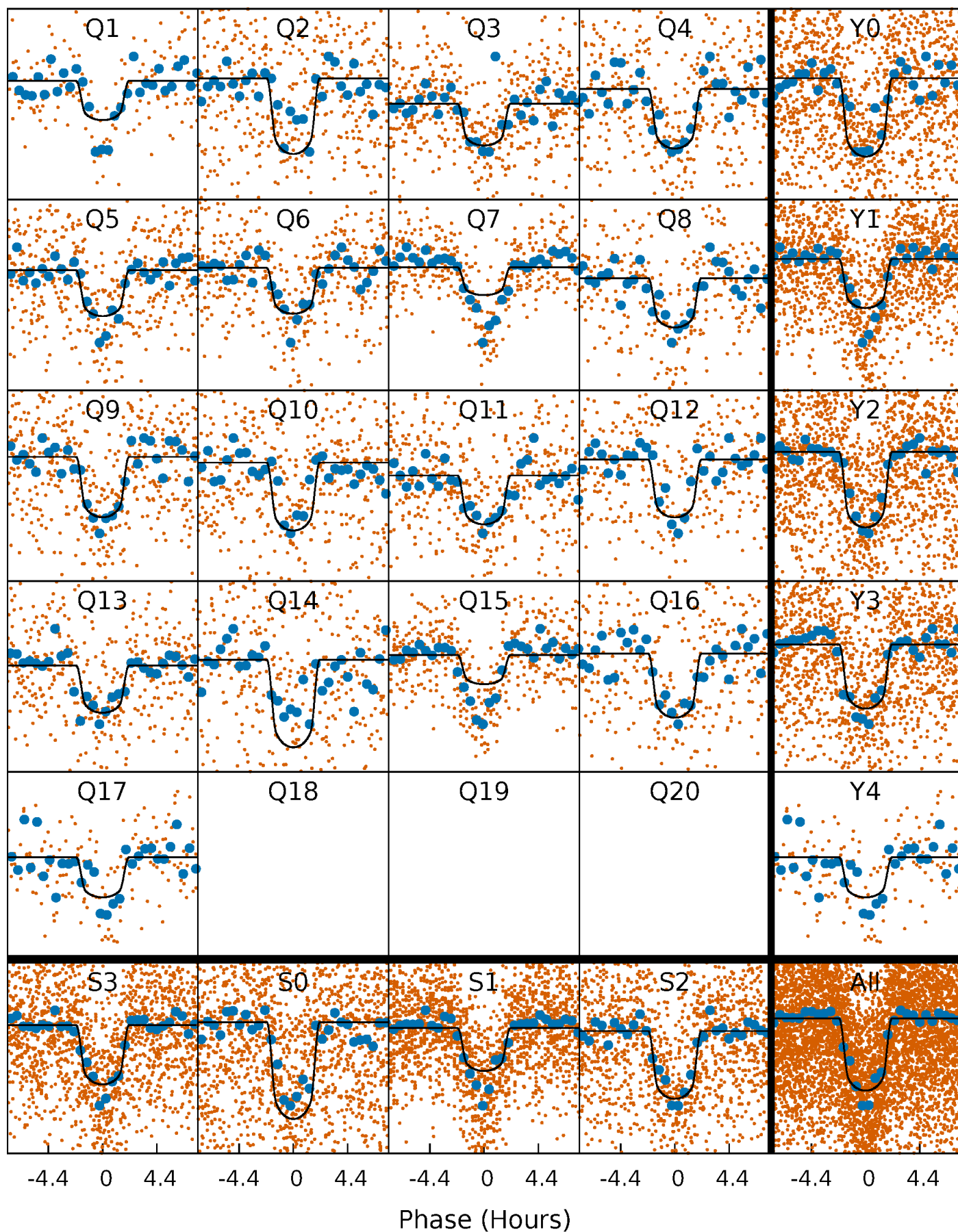
TCE 008509361-01 P= 6.099088 Days  $T_0=135.515024$  (BKJD)





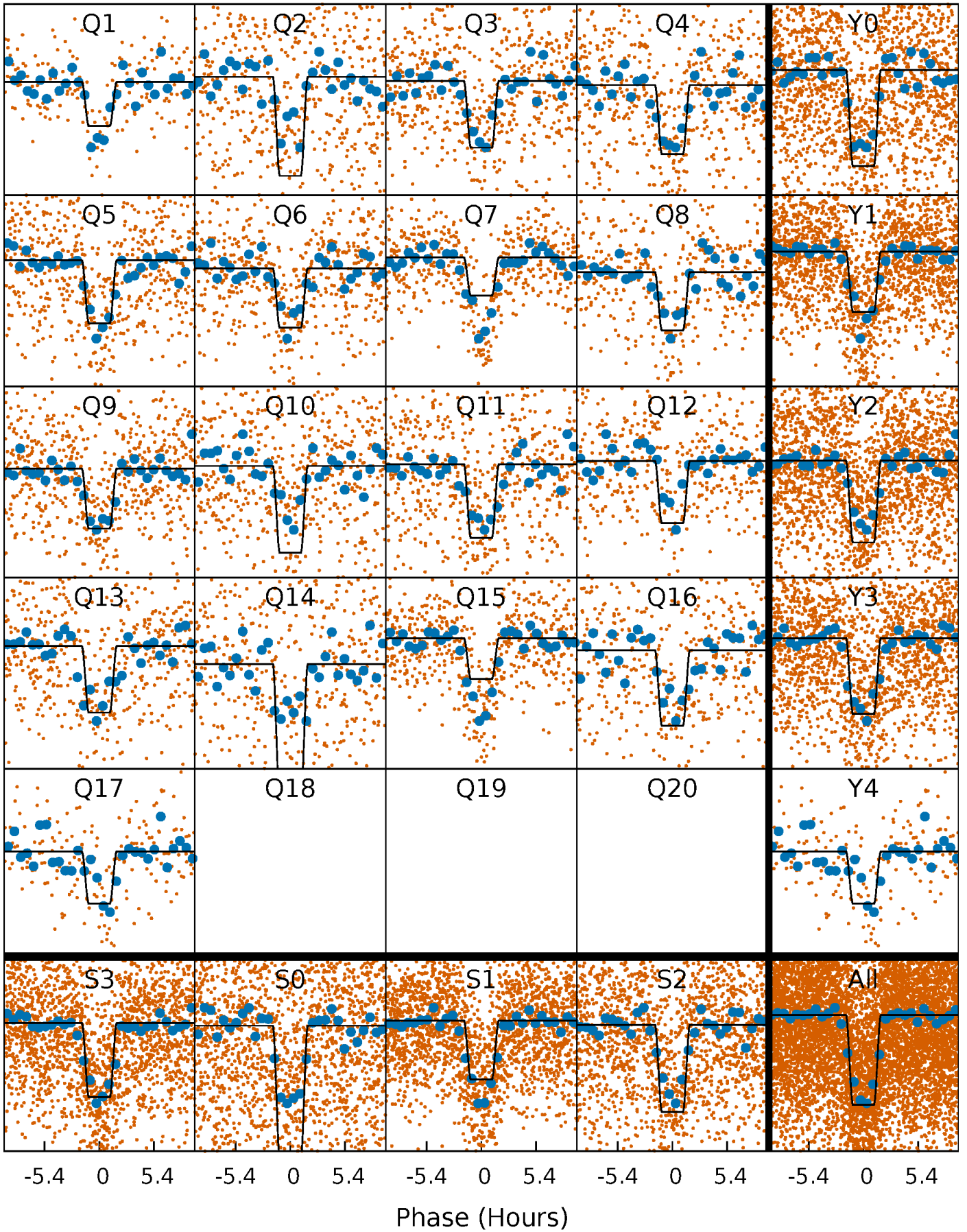
# DV Quarter-Phased Transit Curves

TCE 008509361-01 P= 6.099088 Days  $T_0=135.515024$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

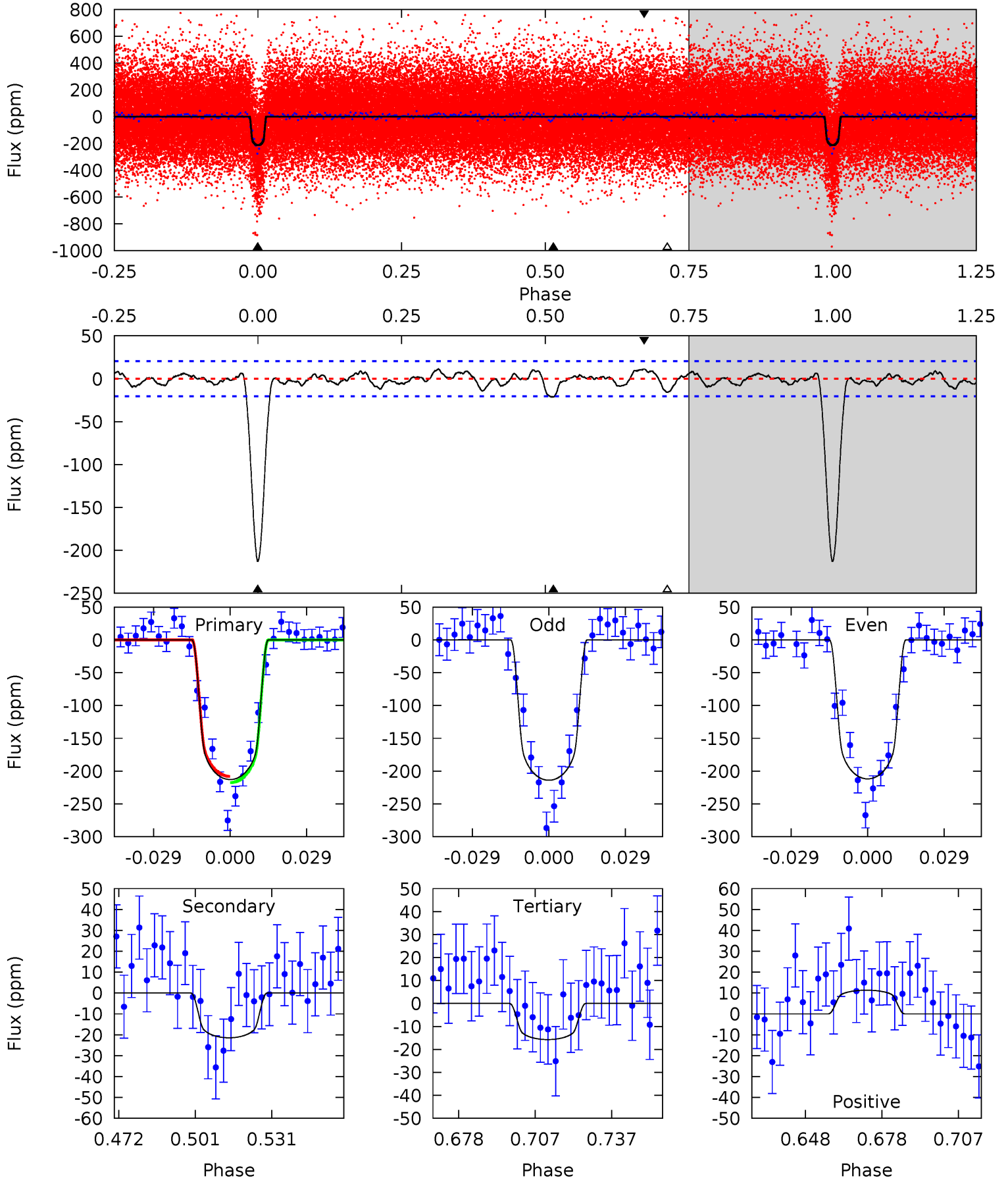
TCE 008509361-01 P= 6.098990 Days  $T_0=135.526573$  (BKJD)



# DV Model-Shift Uniqueness Test

008509361-01, P = 6.099088 Days, E = 129.415936 Days

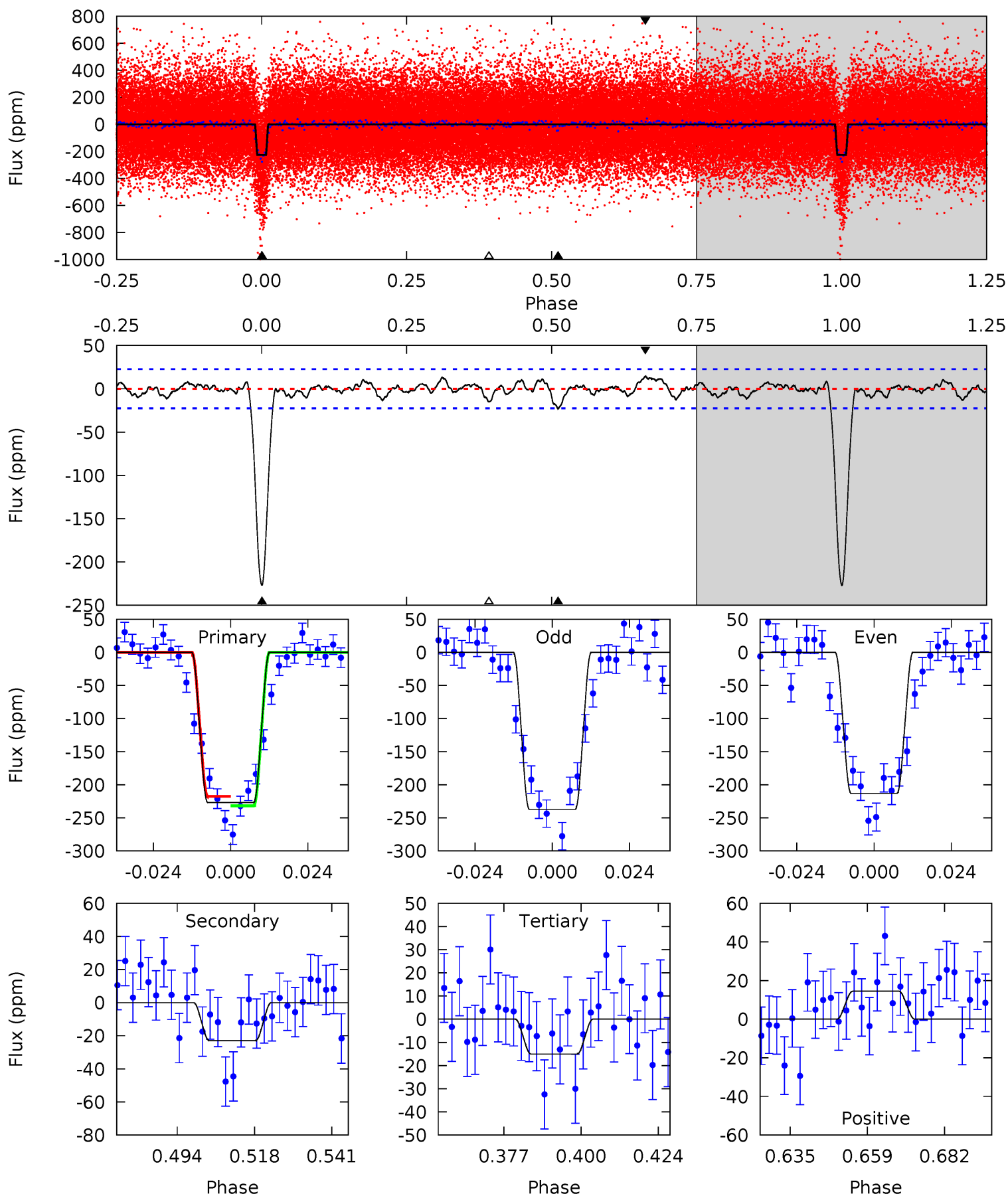
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.9	5.03	3.68	2.66	4.81	2.18	1.29	46.2	47.2	1.34	2.37	0.24	1.01	0.05	1.11



# Alt Model-Shift Uniqueness Test

008509361-01, P = 6.098990 Days, E = 129.427583 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
48.7	4.94	3.23	3.11	4.86	2.26	1.20	45.5	45.6	1.71	1.83	2.59	1.02	0.06	1.53



### Stellar Parameters For KIC 008509361

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5743^{+174}_{-156}$	$3.881^{+0.517}_{-0.138}$	$-0.200^{+0.300}_{-0.250}$	$1.971^{+0.451}_{-0.977}$	$1.077^{+0.140}_{-0.210}$	$0.198^{+1.296}_{-0.078}$
	+3%/-3%	+13%/-4%	+150%/-125%	+23%/-50%	+13%/-19%	+654%/-39%
Source	PHO1	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 008509361-01 / KOI 1280.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-21 \pm 4$	$3.21^{+0.71}_{-0.79}$	$1879^{+150}_{-219}$	$3524^{+215}_{-205}$	$5.217^{+3.990}_{-2.037}$
Alt.	$-23 \pm 5$	$3.29^{+0.72}_{-0.90}$	$1883^{+152}_{-242}$	$3556^{+208}_{-188}$	$5.258^{+4.956}_{-1.927}$

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



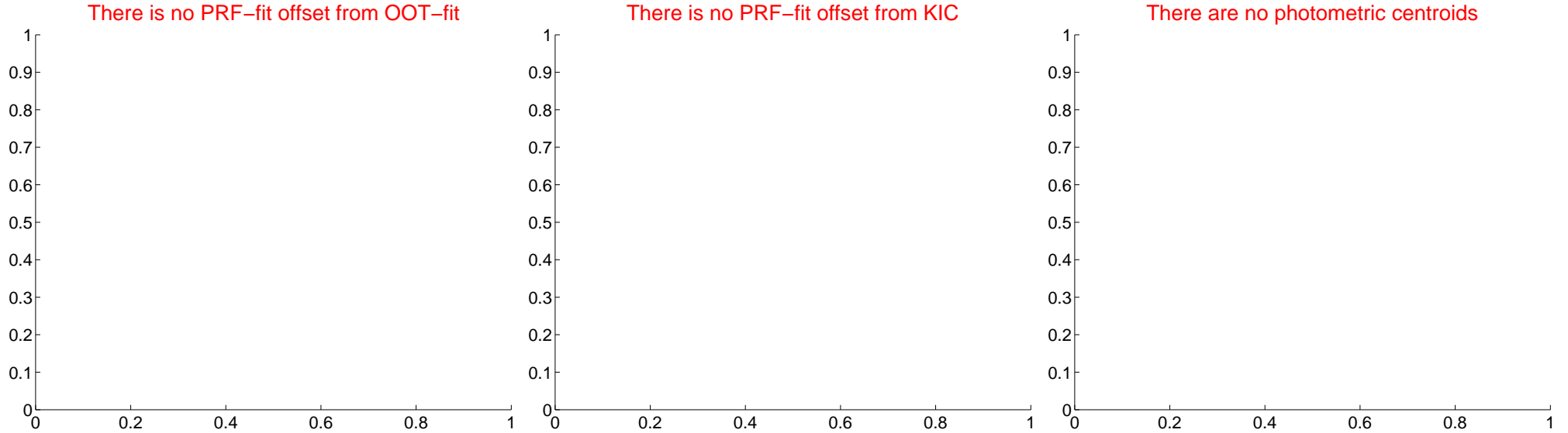
## DV Centroid Data

Supplemental centroid analysis for 008509361-01. Kepler magnitude: 13.95. Transit SNR 32.89

There are 0 quarters with good PRF difference image offsets

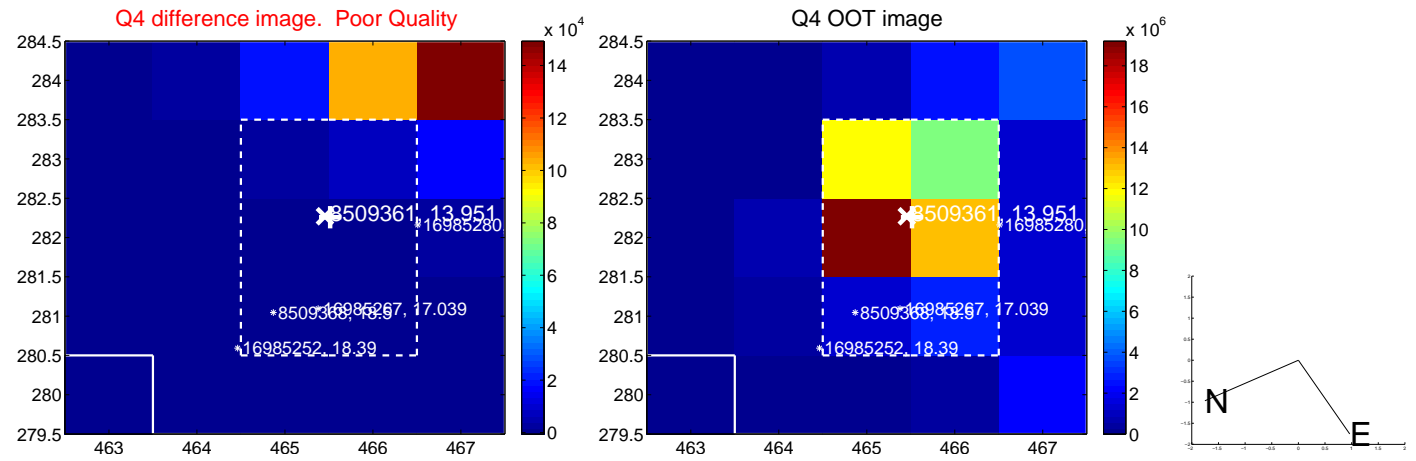
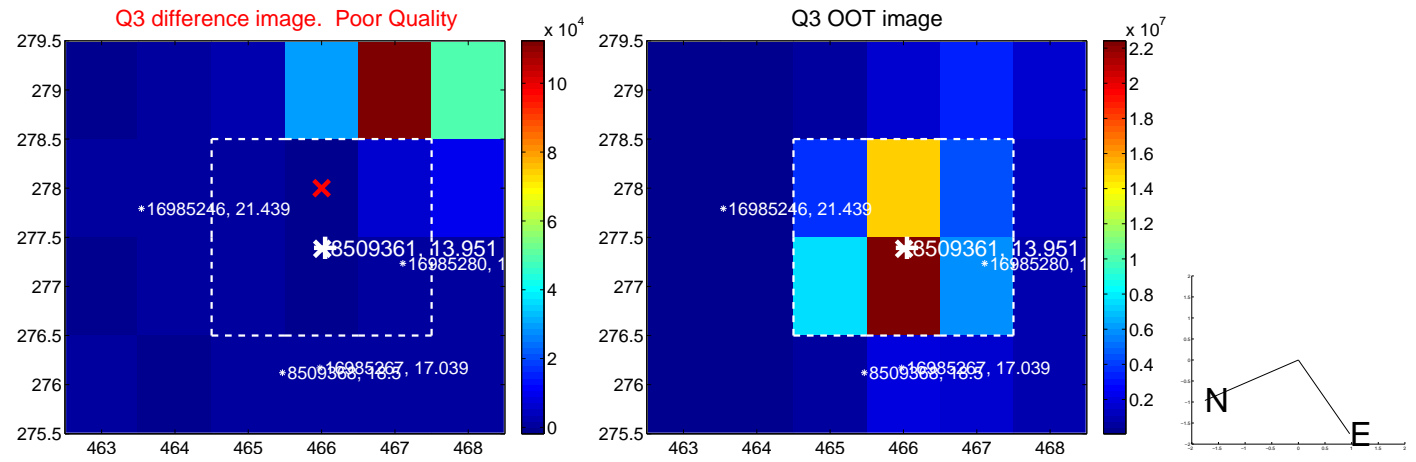
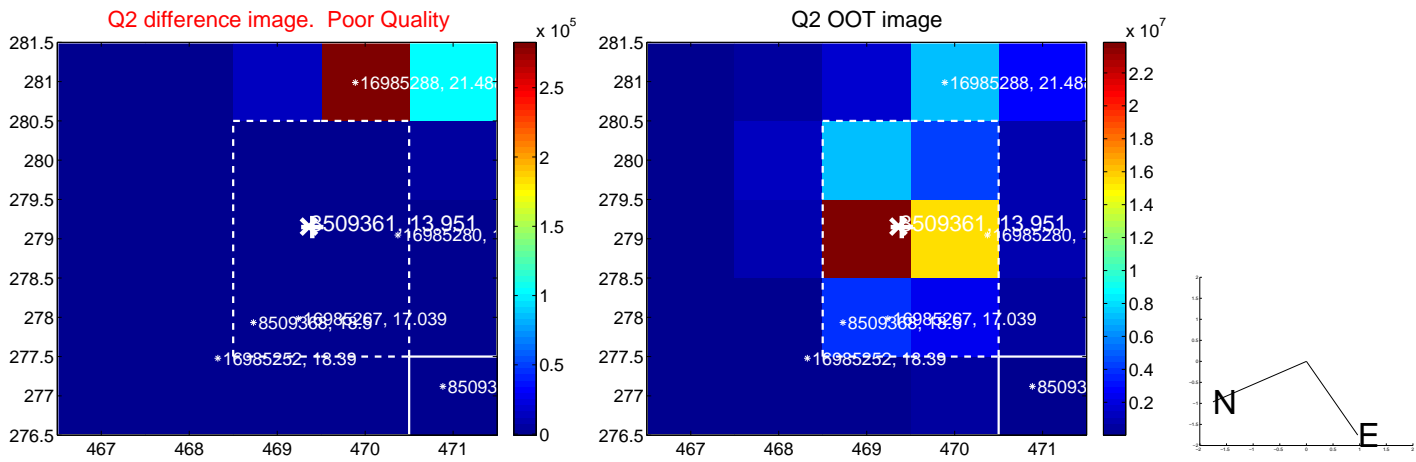
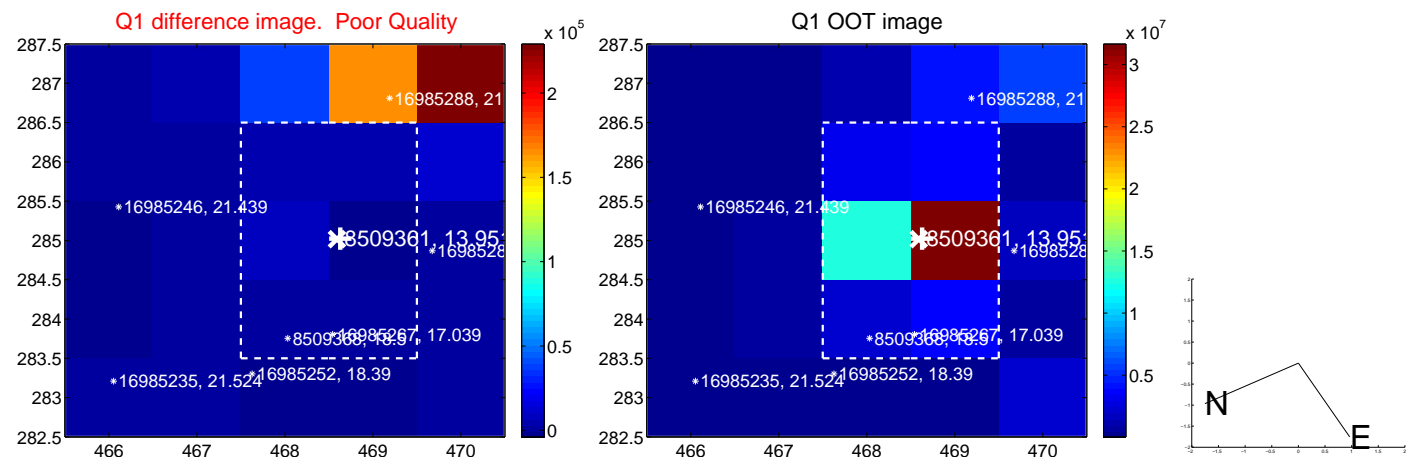
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	—	—	—	—

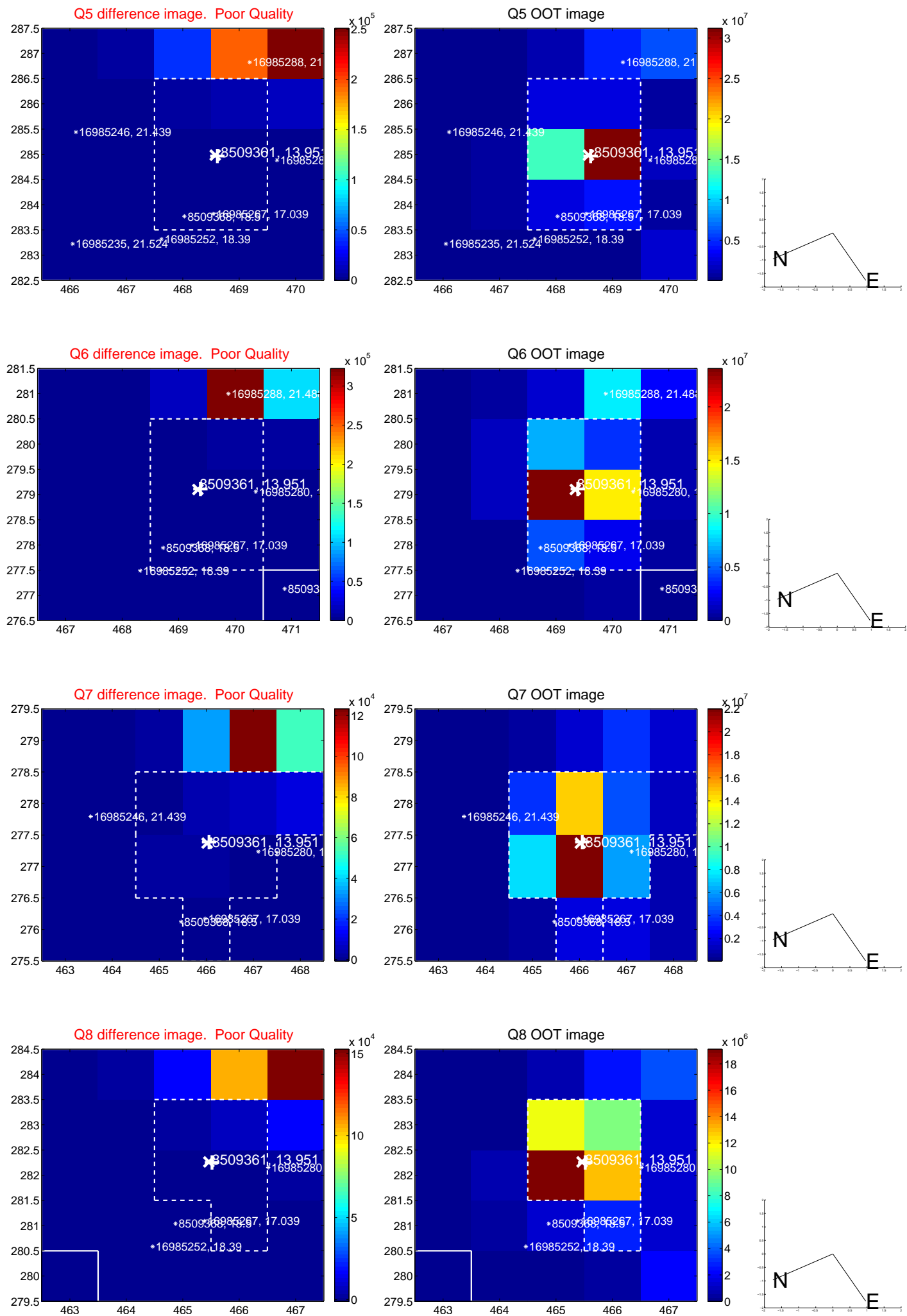


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

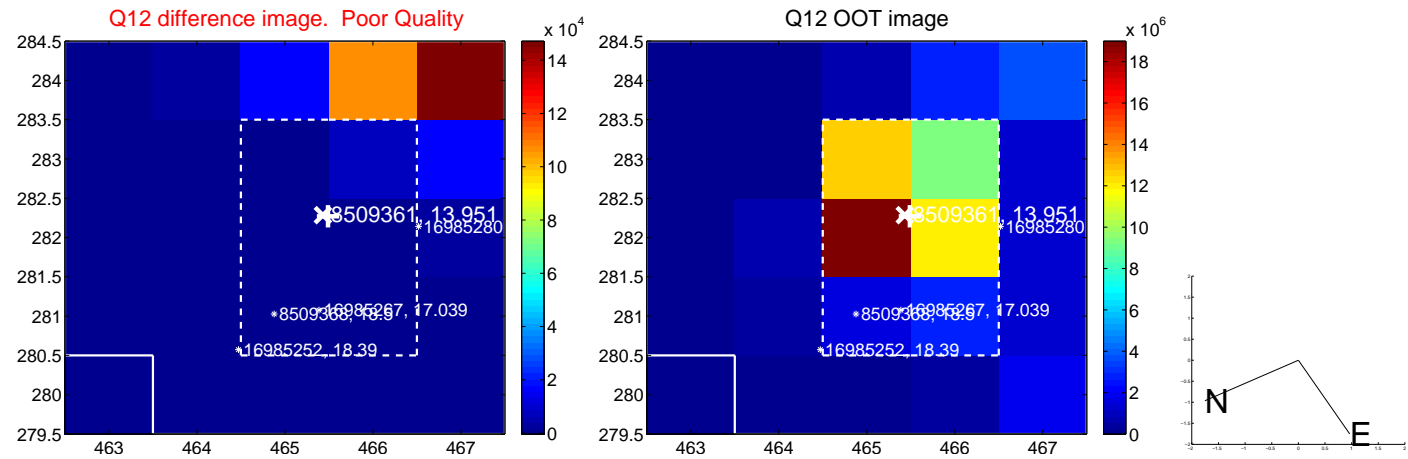
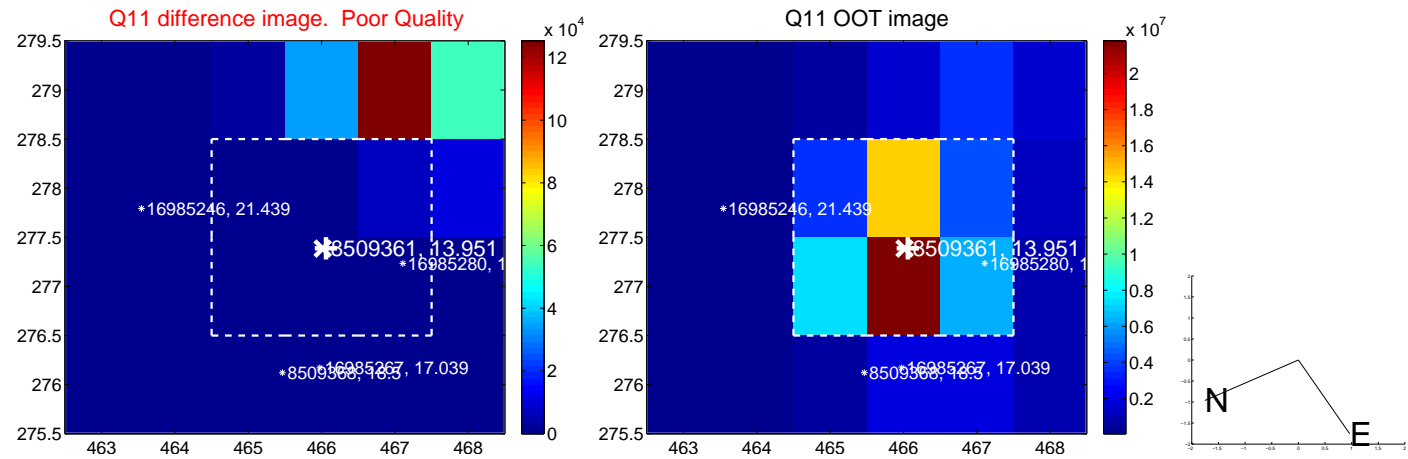
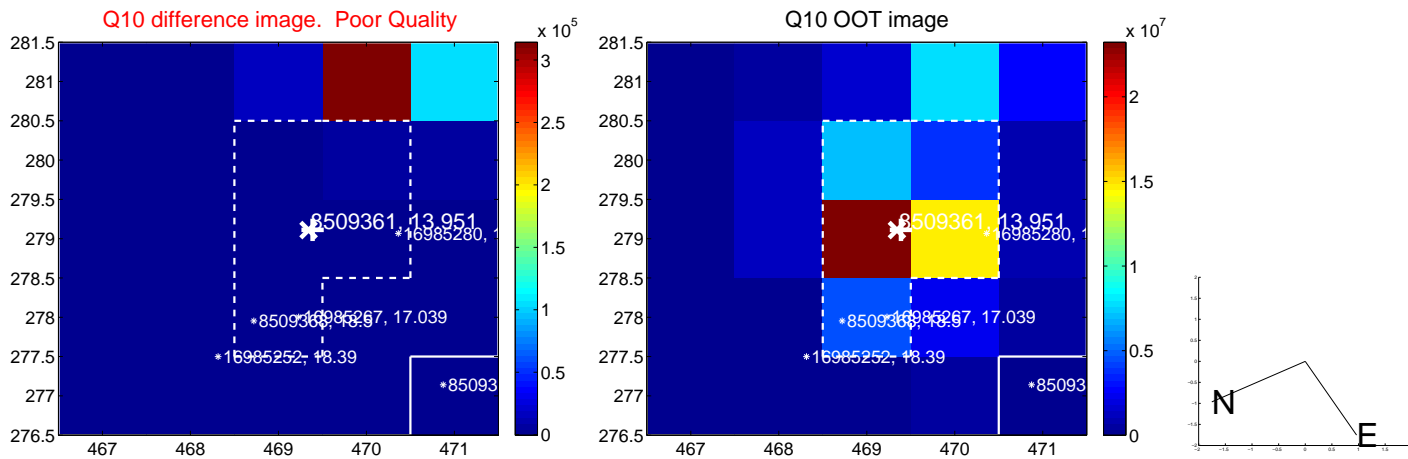
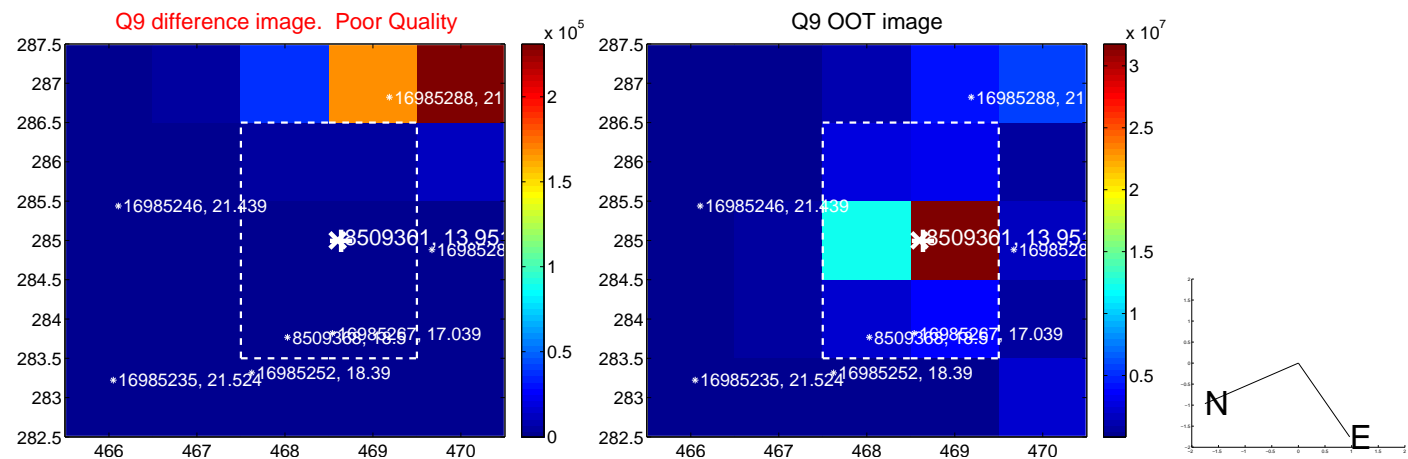
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



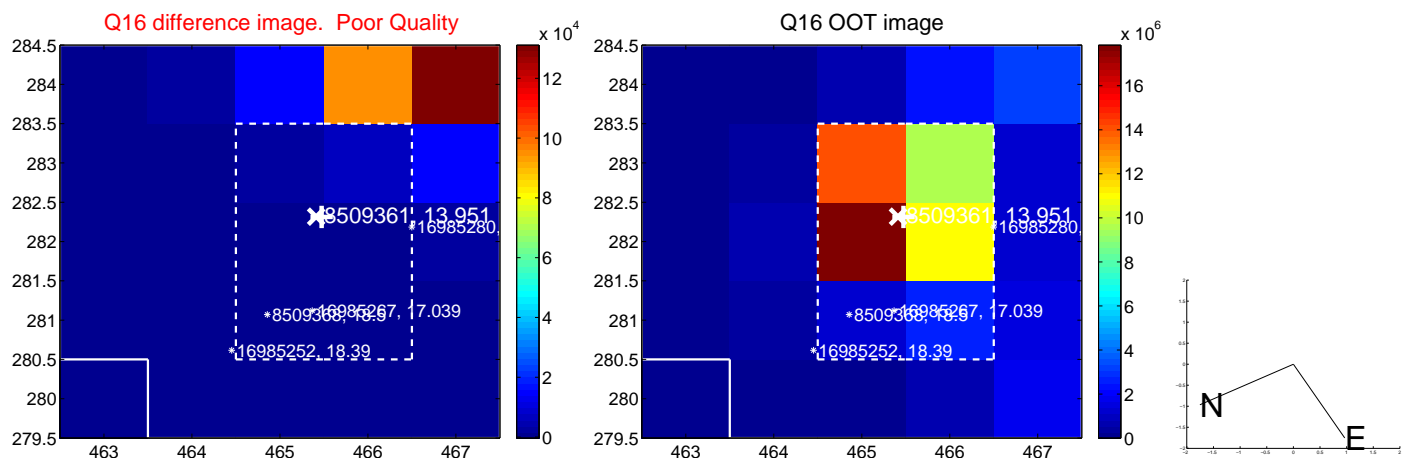
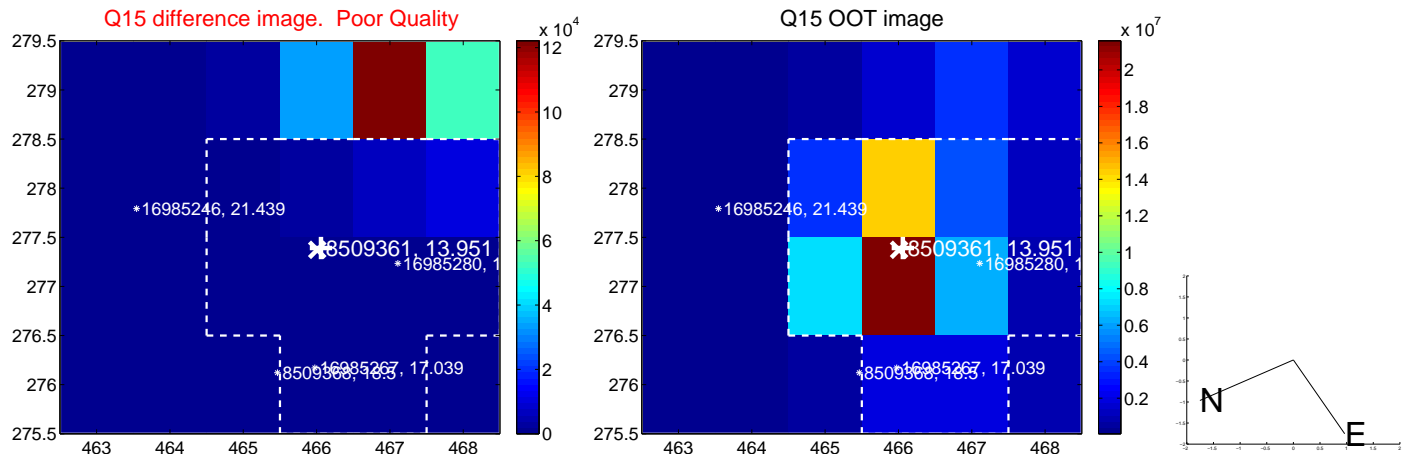
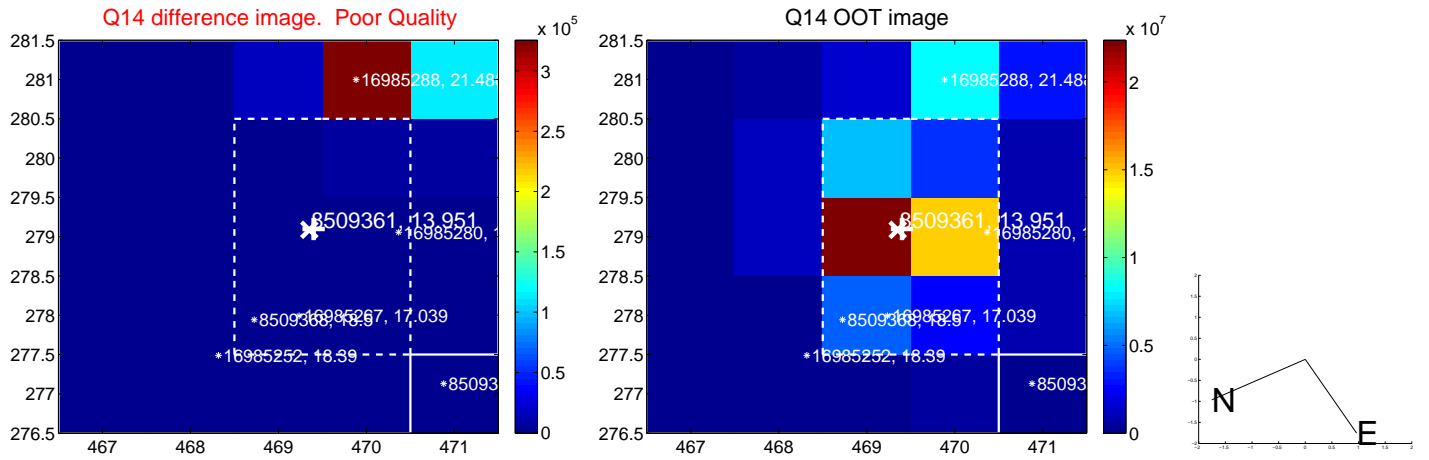
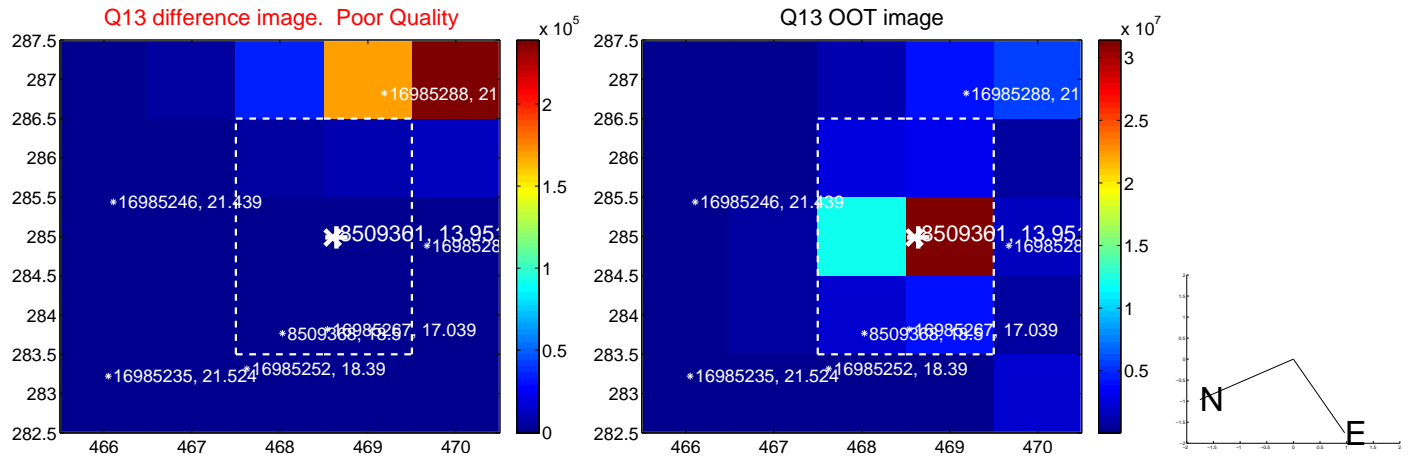
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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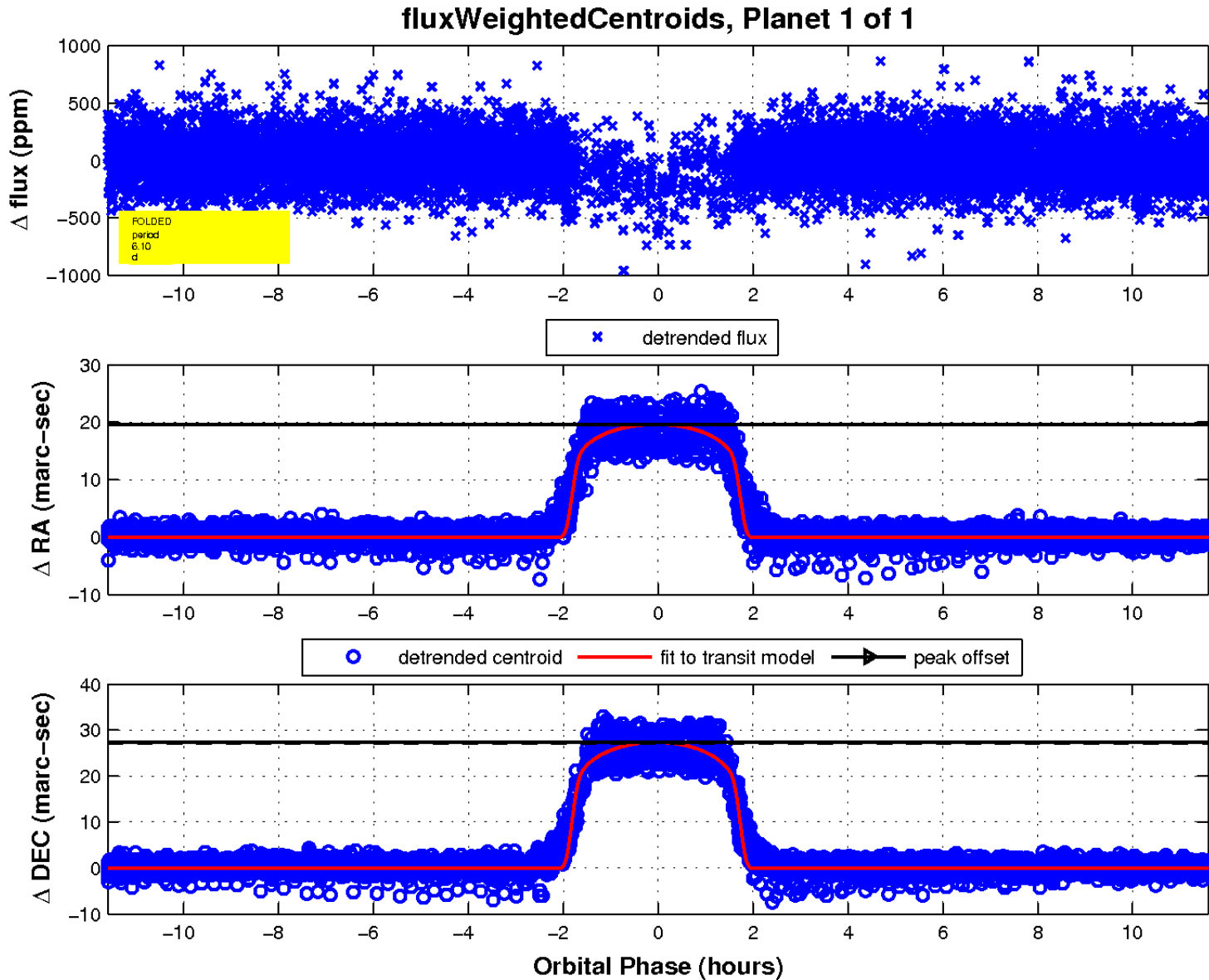
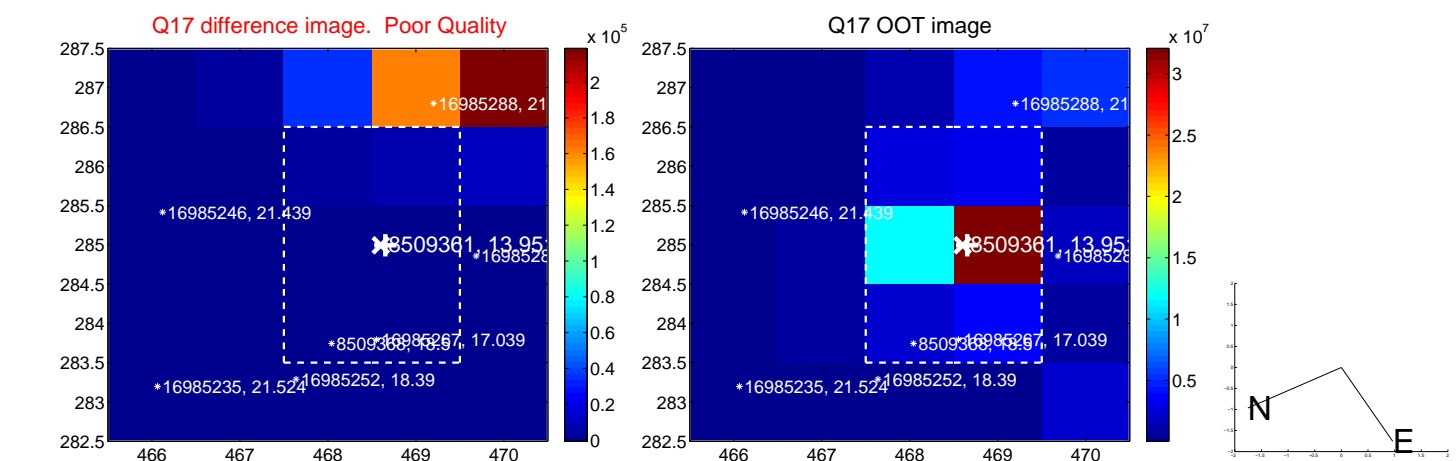


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

