

# KIC 008686761

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008686761-01	OBS	7904.01	374.955418	137.935114	270.8	17.091	8.7	8.7	2.91	5382	5.03	5.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008686761-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_SKYE—CENT_FEW_DIFFS—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.

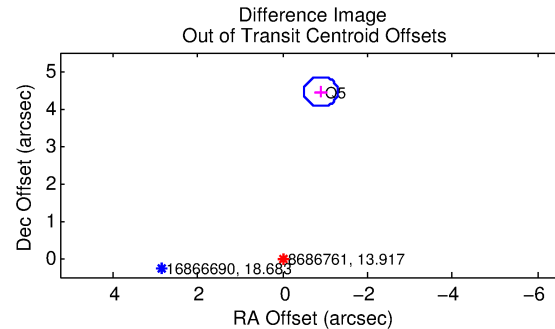
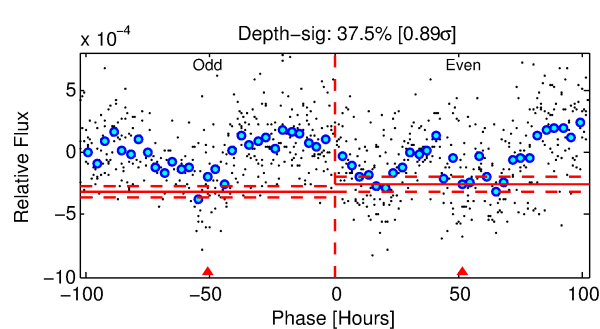
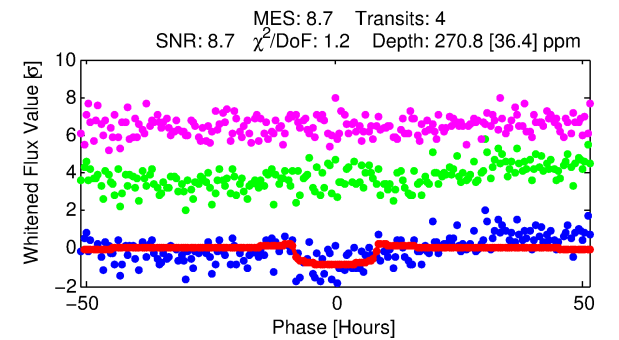
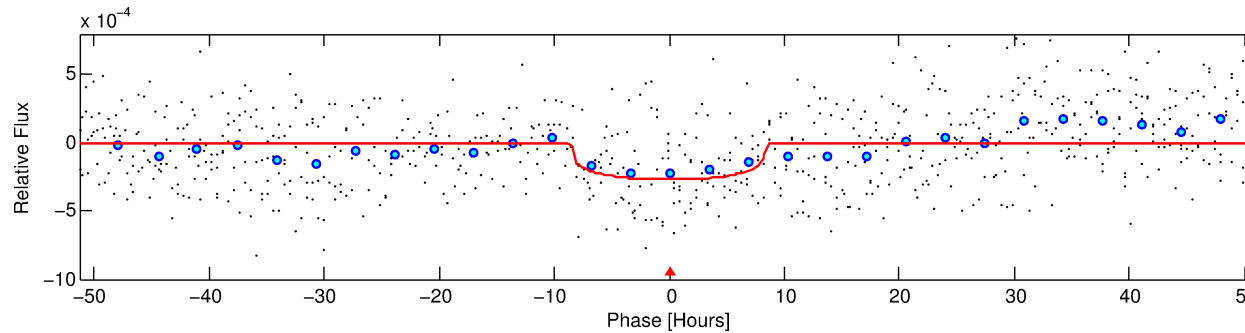
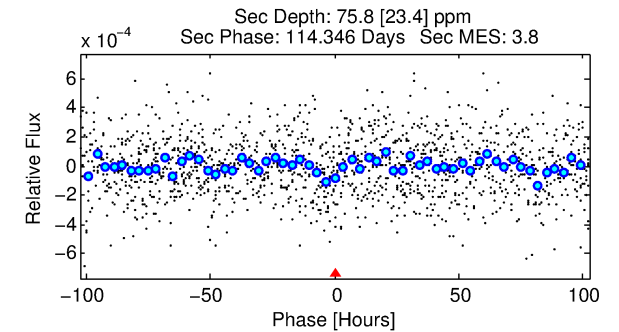
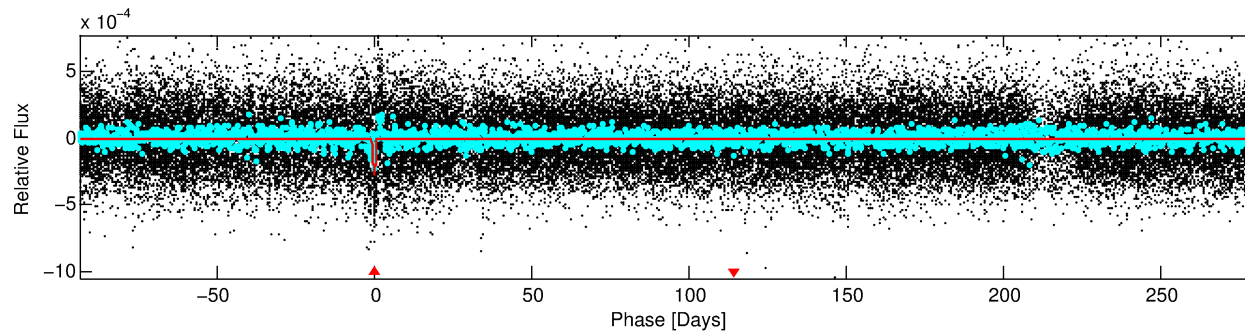
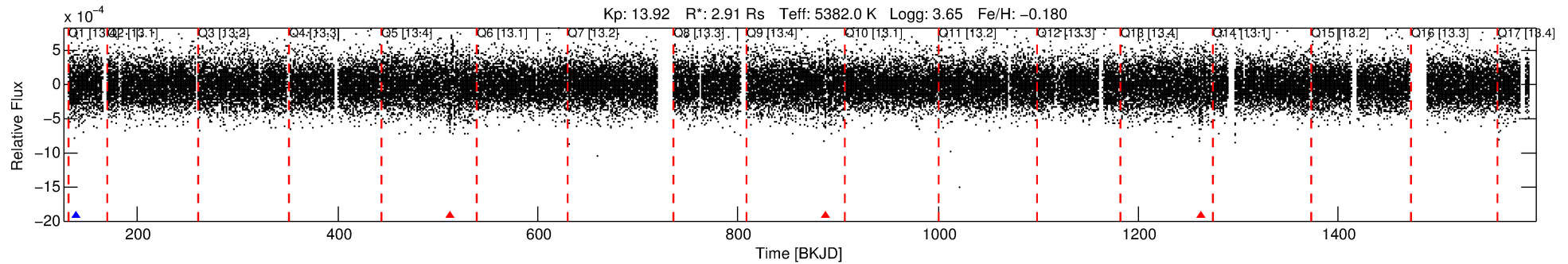
## Ephemeris Match Information For 008686761-01

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	$\sigma_P$	$\sigma_T$
008686761-01	8686761	008884796-01	8884796	1:1	1972.0	495	1	14.81	13.92	3.09	Col-Anomaly	1	4.29	1.67

**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: 8686761 Candidate: 1 of 1 Period: 374.955 d



## DV Fit Results:

Period = 374.95542 [0.01240] d  
Epoch = 137.9351 [0.0241] BKJD  
Rp/R\* = 0.0158 [0.0101]  
a/R\* = 131.12 [336.74]  
b = 0.65 [2.32]  
Seff = 4.99 [6.96]  
Teq = 381 [133] K  
Rp = 5.02 [4.62] Re  
a = 1.1285 [0.8937] AU  
Ag = 2102.00 [4006.44] [0.52σ]  
Teffp = 3991 [1312] K [2.74σ]

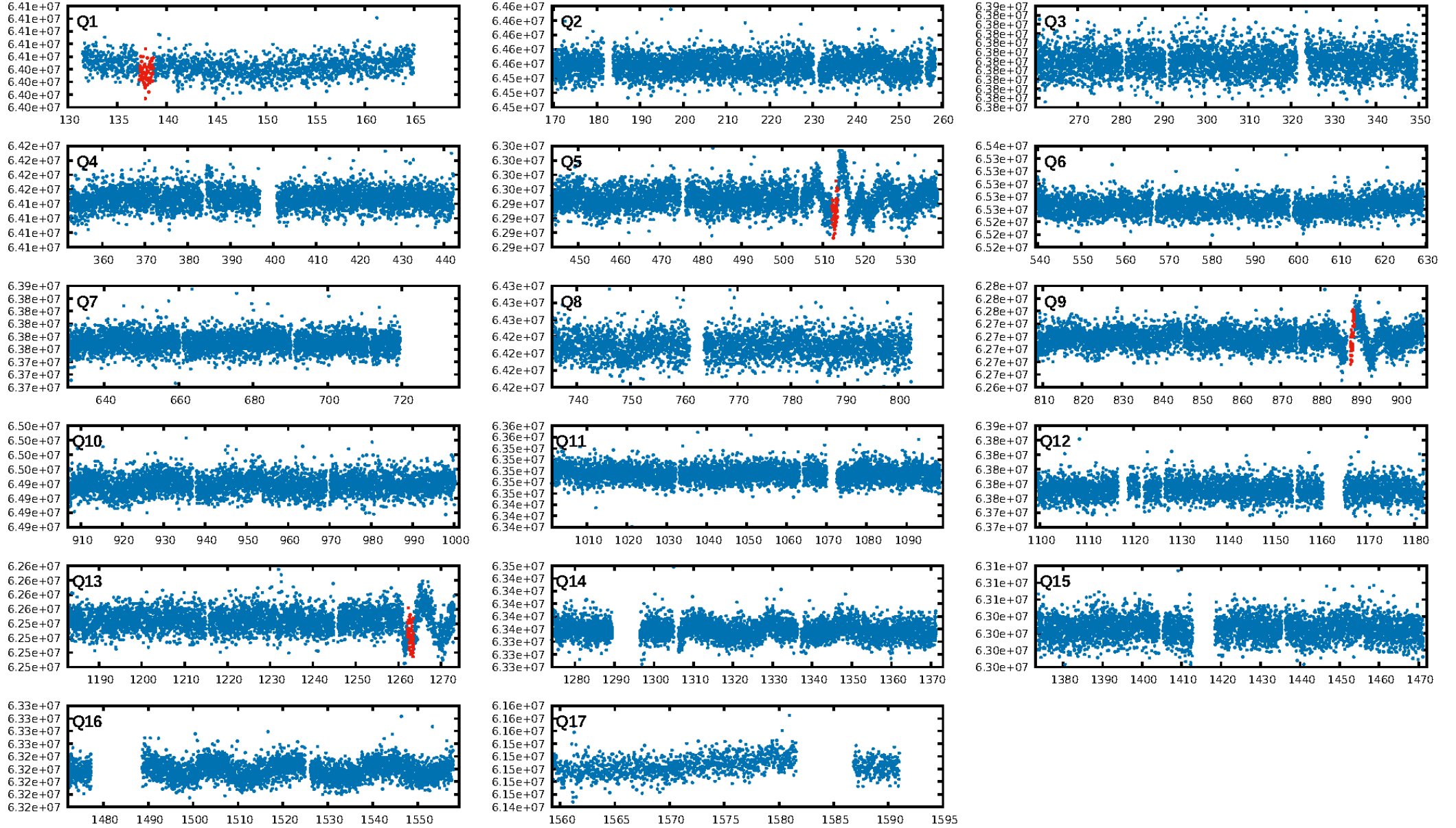
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.5%  
ModelChiSquareGof-sig: 99.5%  
Bootstrap-pfa: 2.83e-19  
RollingBand-fgt: 0.00 [0/3]  
GhostDiagnostic-chr: 71.19  
Centroid-sig: 15.3%  
Centroid-so: 2.330 arcsec [1.27σ]  
OotOffset-rm: 4.539 arcsec [34.19σ]  
KicOffset-rm: 4.641 arcsec [34.97σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

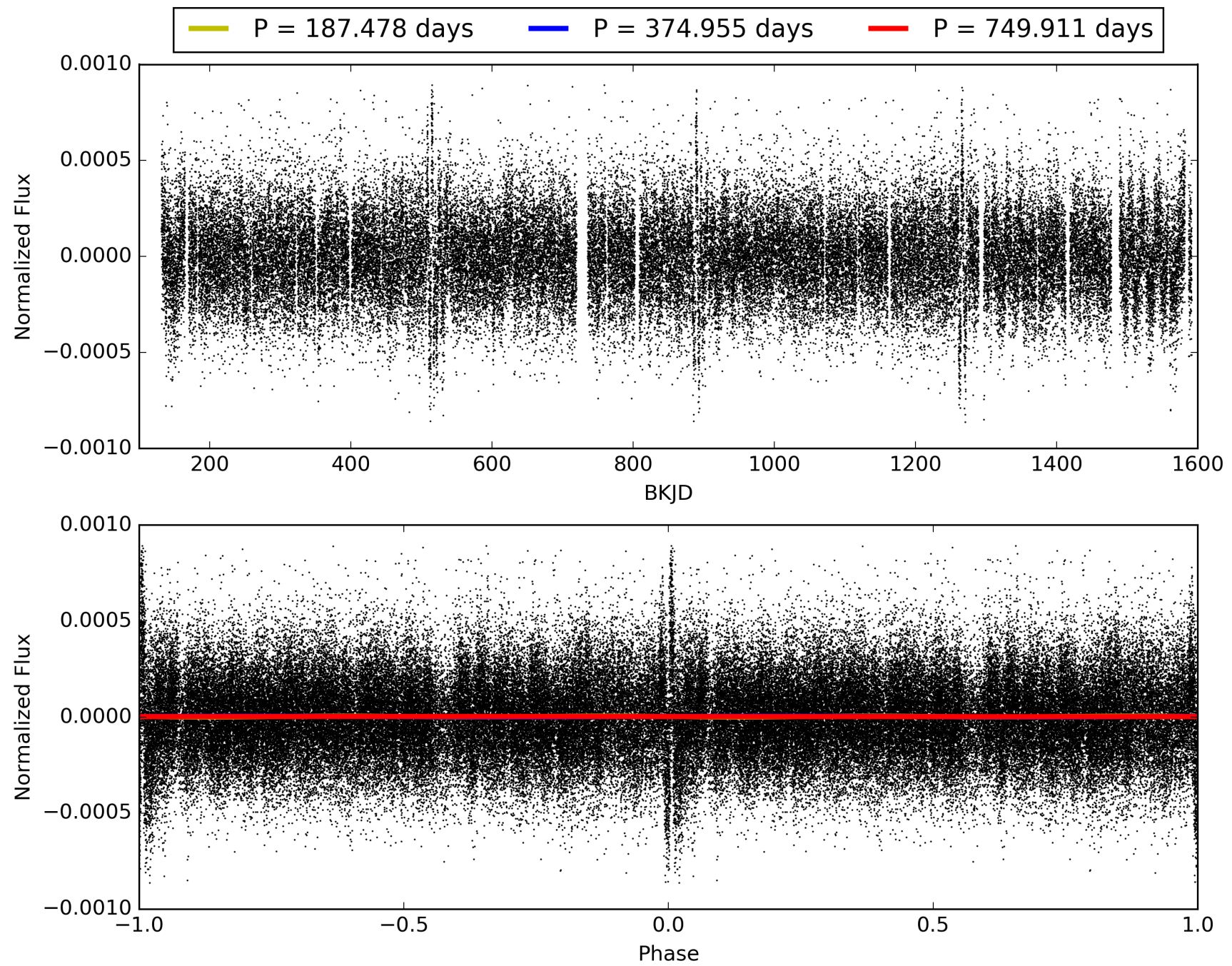
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:38:45 Z

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

# TCE 008686761-01, PDC Light Curves

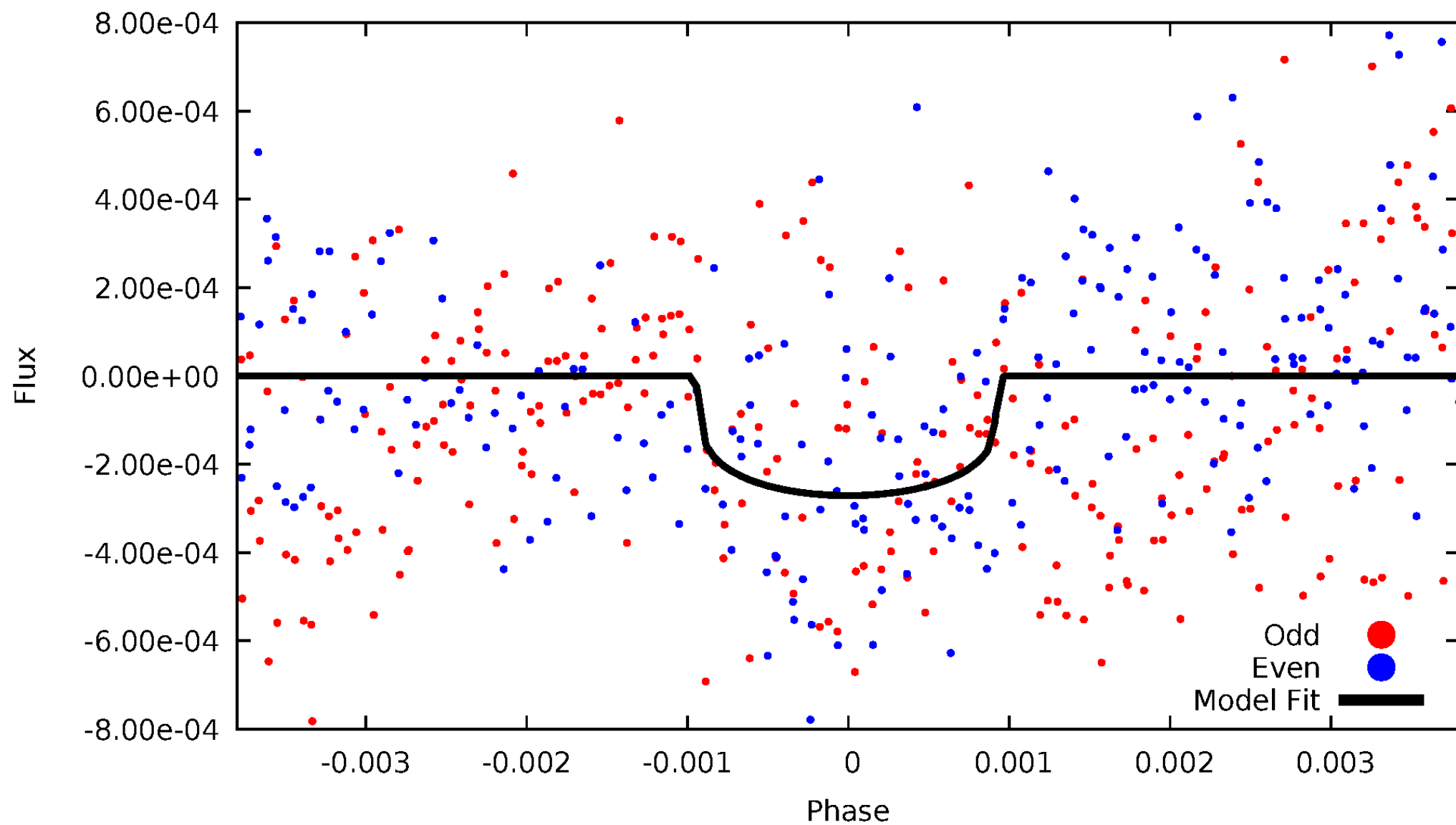


TCE 008686761-01



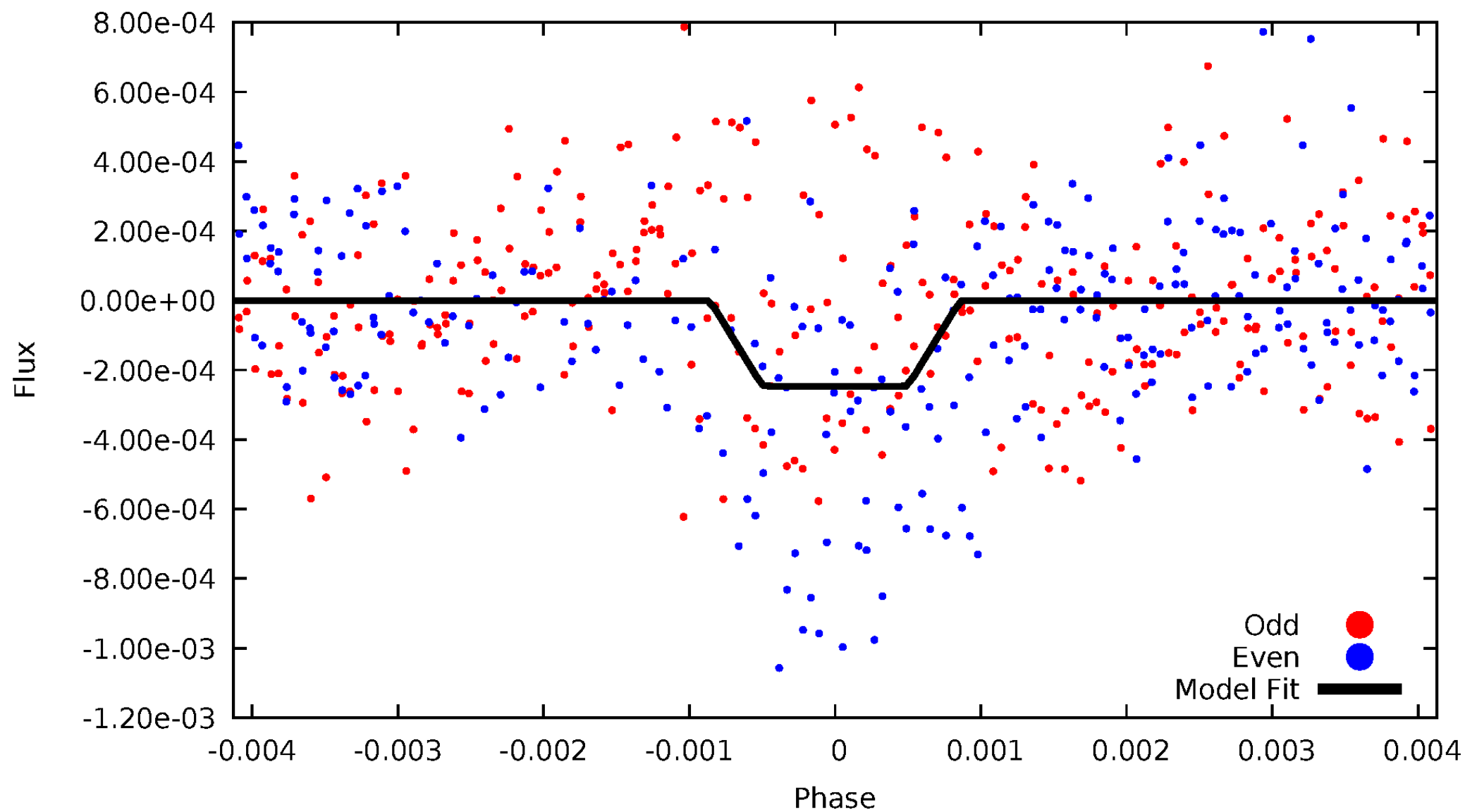
# DV Odd/Even

TCE 008686761-01



# ALT Odd/Even

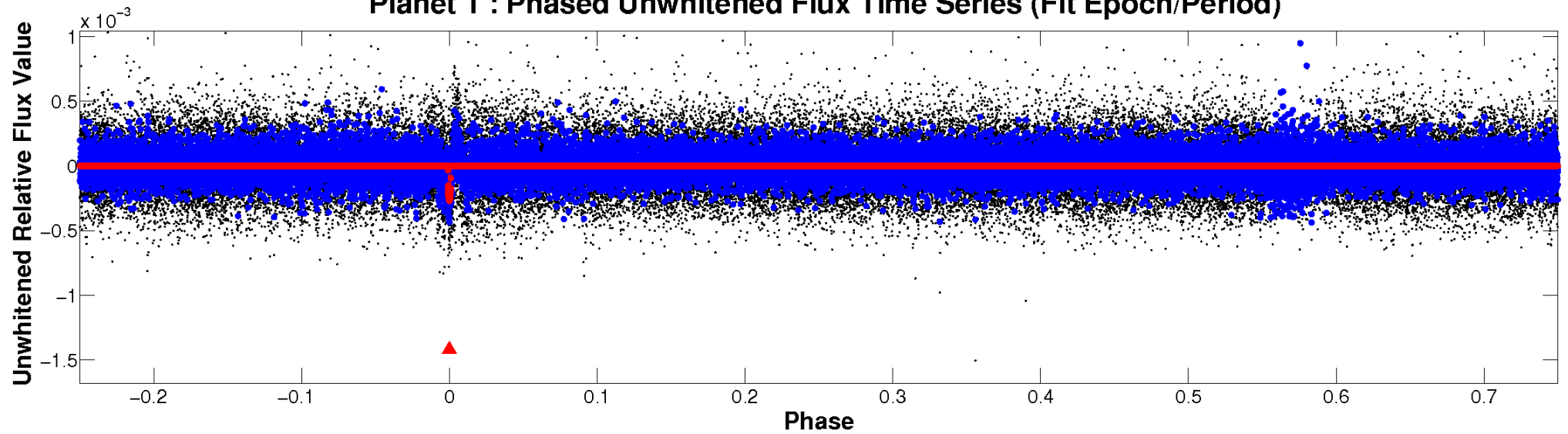
TCE 008686761-01



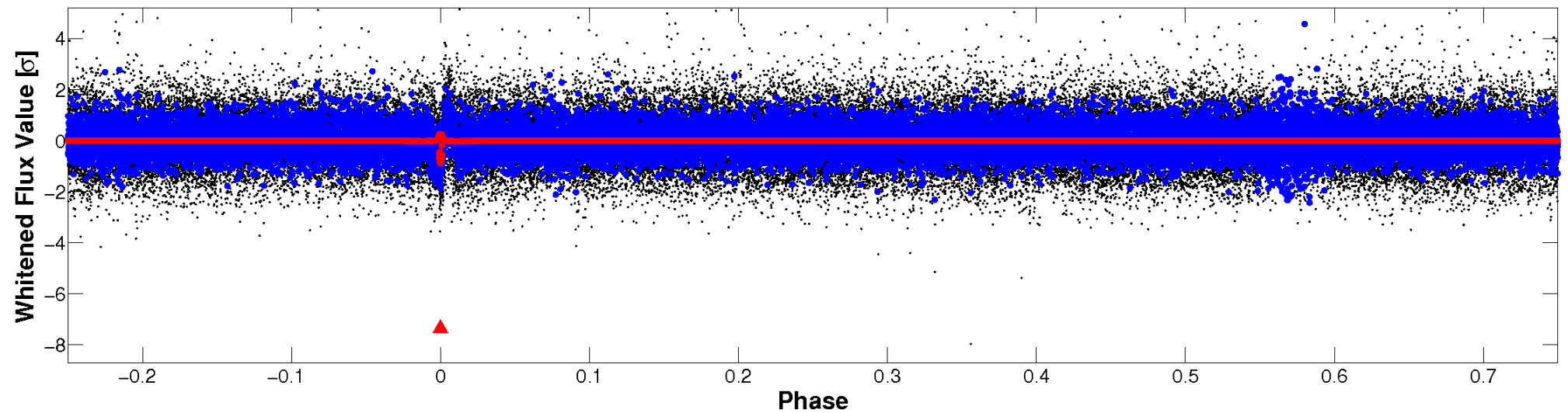


# Non-Whitened Vs. Whitened Light Curve

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

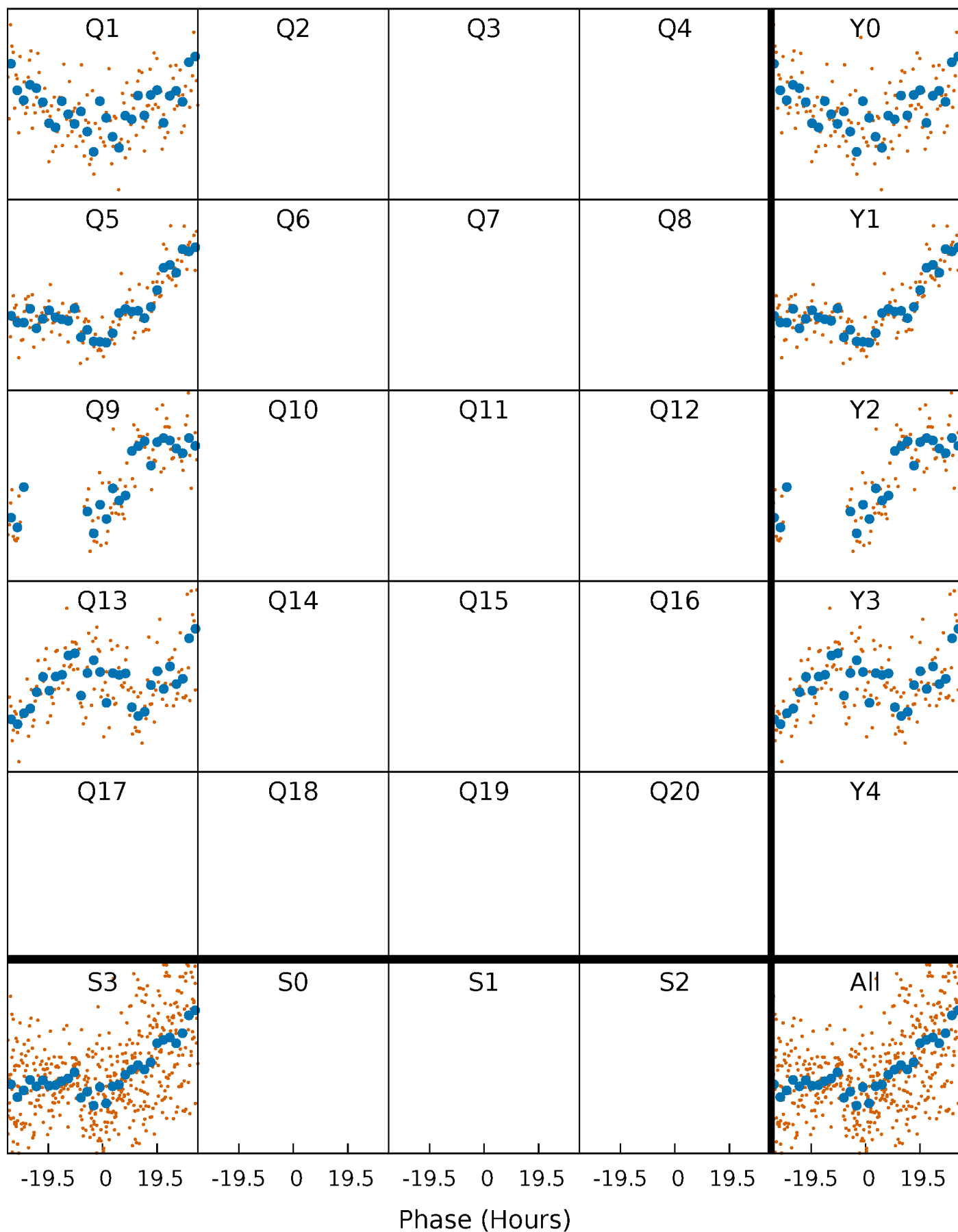


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

TCE 008686761-01 P=374.955418 Days  $T_0=137.935114$  (BKJD)





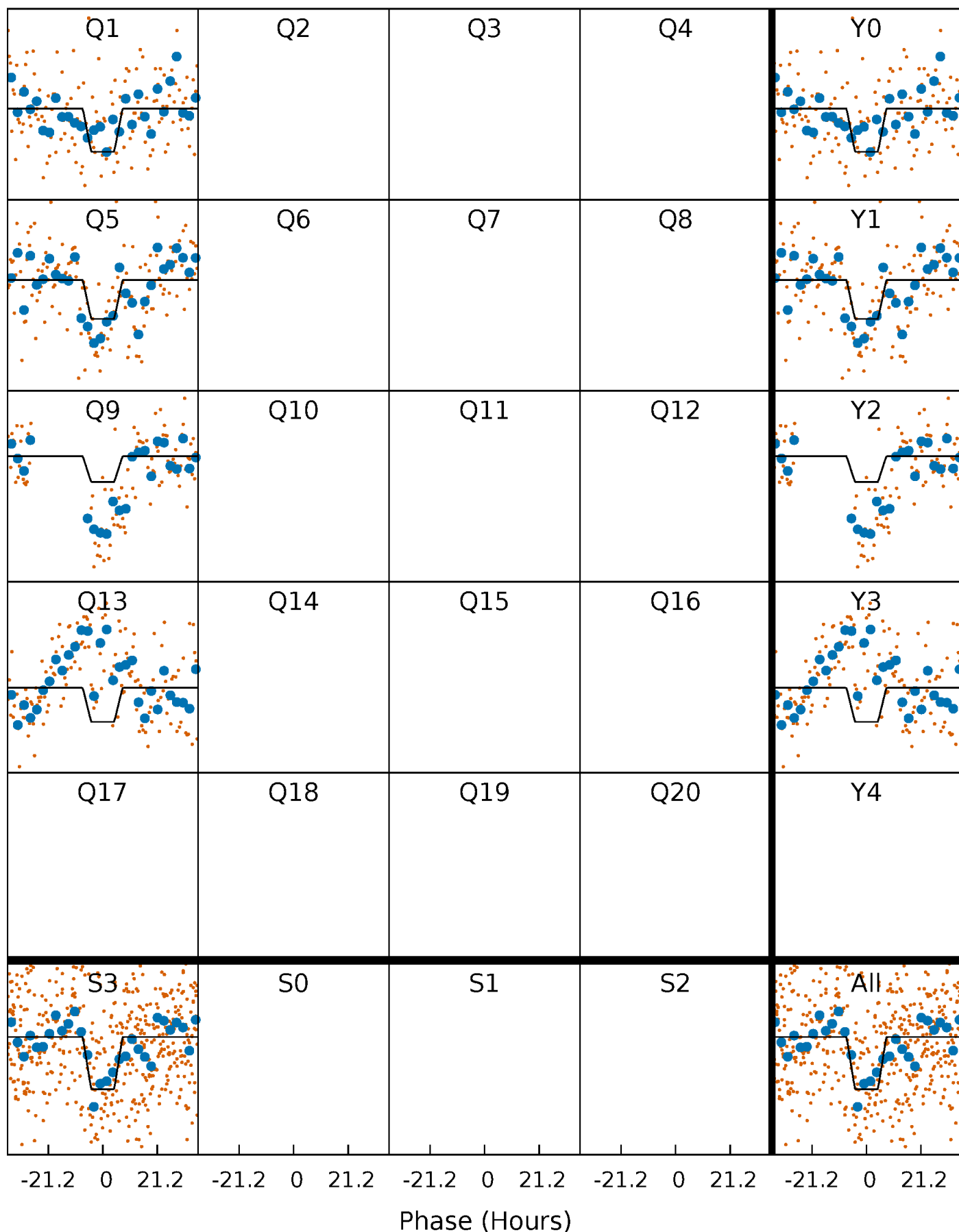
# DV Quarter-Phased Transit Curves

TCE 008686761-01 P=374.955418 Days  $T_0=137.935114$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

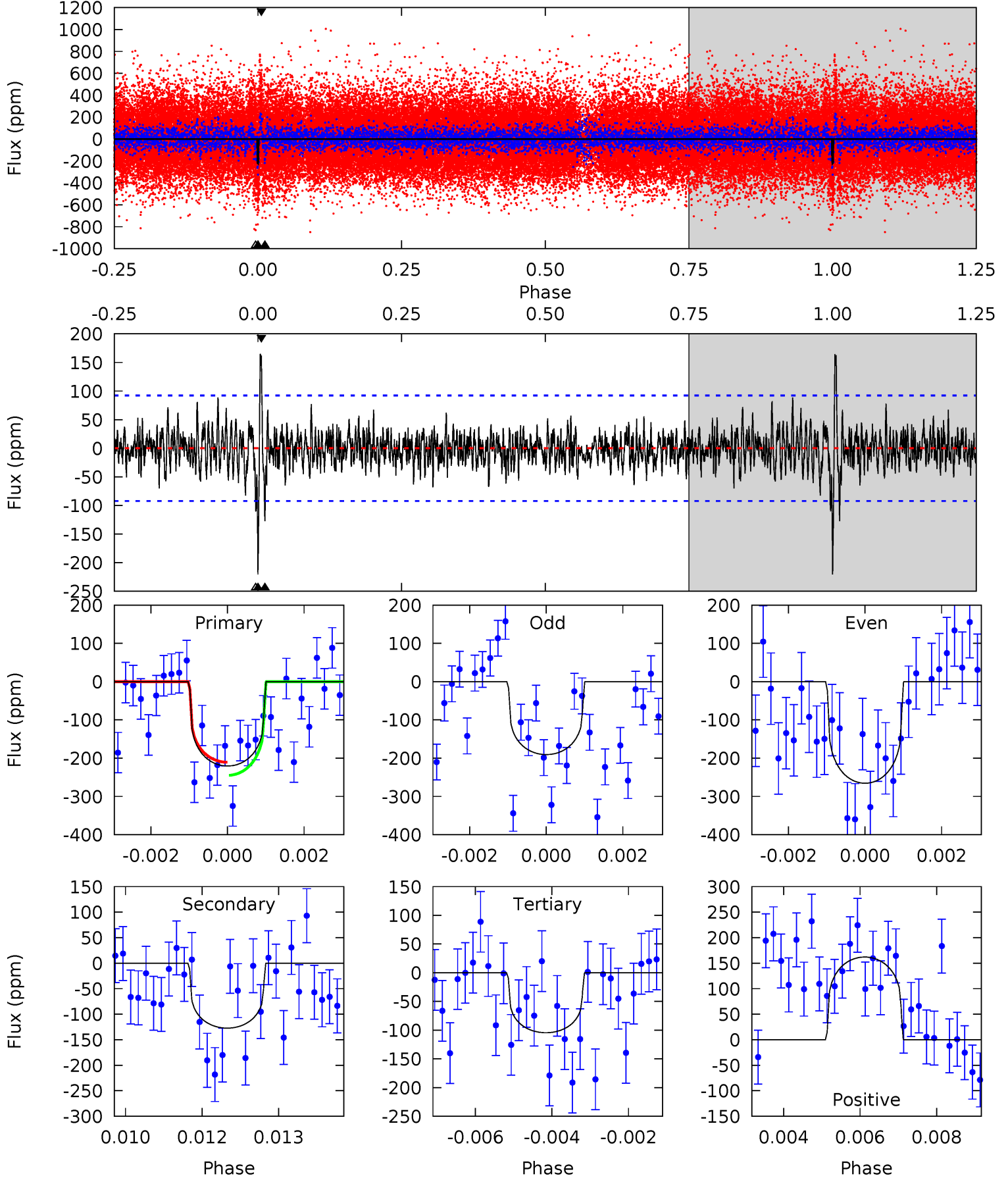
TCE 008686761-01 P=374.853658 Days  $T_0=138.094662$  (BKJD)



# DV Model-Shift Uniqueness Test

008686761-01, P = 374.955418 Days, E = 137.935114 Days

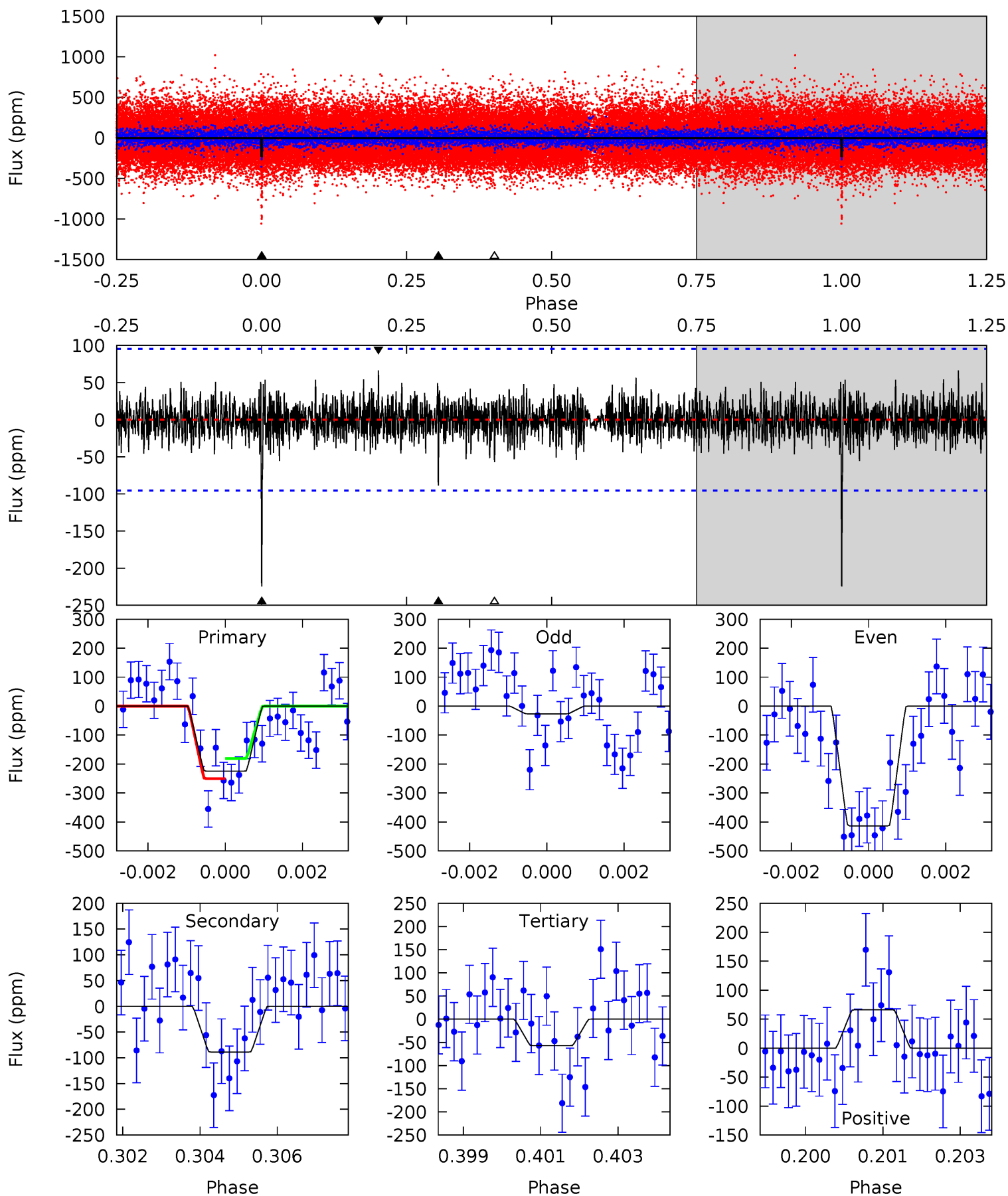
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	7.36	6.04	9.37	5.33	3.10	1.45	6.70	3.38	1.32	-2.01	2.16	0.88	0.43	0.98



# Alt Model-Shift Uniqueness Test

008686761-01, P = 374.853658 Days, E = 138.094662 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
12.6	4.97	3.20	3.70	5.35	3.12	0.98	9.38	8.88	1.77	1.27	10.8	1.00	0.23	1.93



### Stellar Parameters For KIC 008686761

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5382^{+169}_{-187}$	$3.645^{+0.856}_{-0.214}$	$-0.180^{+0.350}_{-0.300}$	$2.909^{+0.890}_{-1.929}$	$1.363^{+0.198}_{-0.494}$	$0.078^{+1.567}_{-0.039}$
	+3%/-3%	+23%/-6%	+194%/-167%	+31%/-66%	+15%/-36%	+2009%/-50%
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 008686761-01 / KOI 7904.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-127 \pm 17$	$4.58^{+3.70}_{-2.55}$	$520^{+55}_{-97}$	$4549^{+1639}_{-728}$	$4059^{+16250}_{-2793}$
Alt.	$-89 \pm 18$	$4.42^{+3.24}_{-2.49}$	$521^{+54}_{-91}$	$4277^{+1755}_{-644}$	$3133^{+12300}_{-2135}$

$T_{max}$  = 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

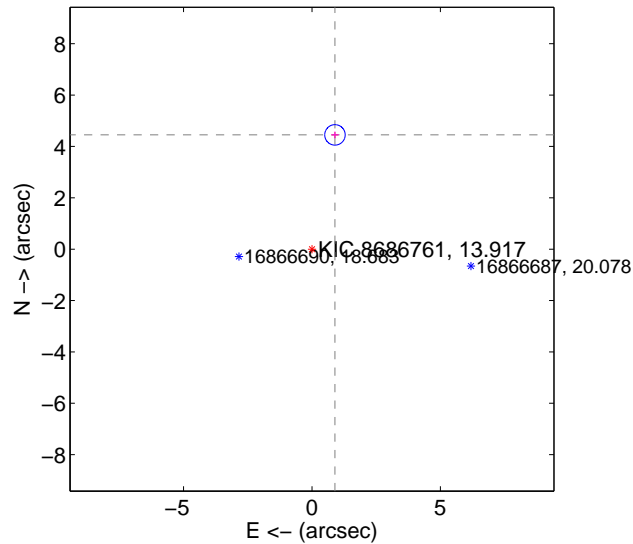
Supplemental centroid analysis for 008686761-01. Kepler magnitude: 13.92. Transit SNR 8.72

There are 0 quarters with good PRF difference image offsets

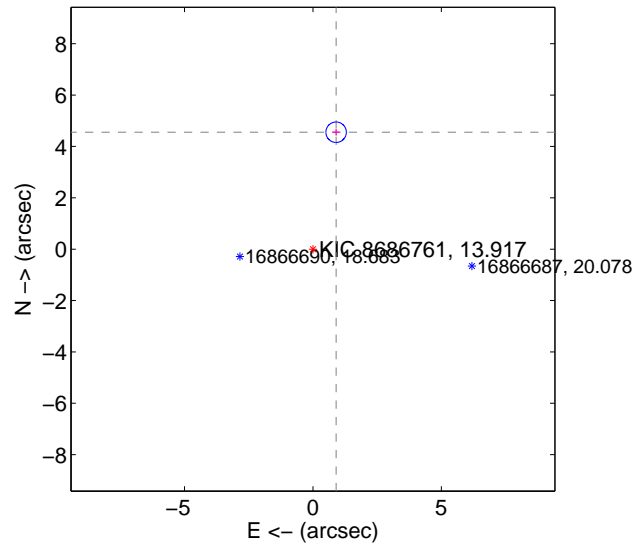
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.539 \pm 0.133$	34.19	$-0.895 \pm 0.145$	$4.450 \pm 0.132$
PRF-fit source offset from KIC position	$4.641 \pm 0.133$	34.97	$-0.902 \pm 0.145$	$4.553 \pm 0.132$
photometric centroid source offset	$2.33 \pm 1.84$	1.27	$-1.23 \pm 2.17$	$1.98 \pm 1.69$

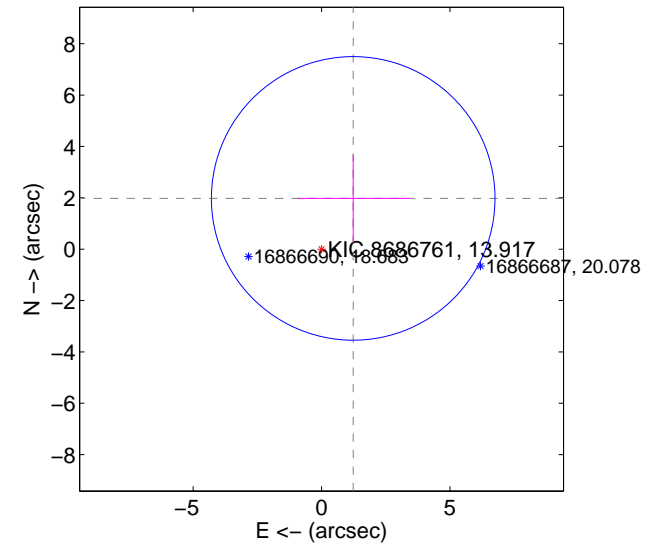
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



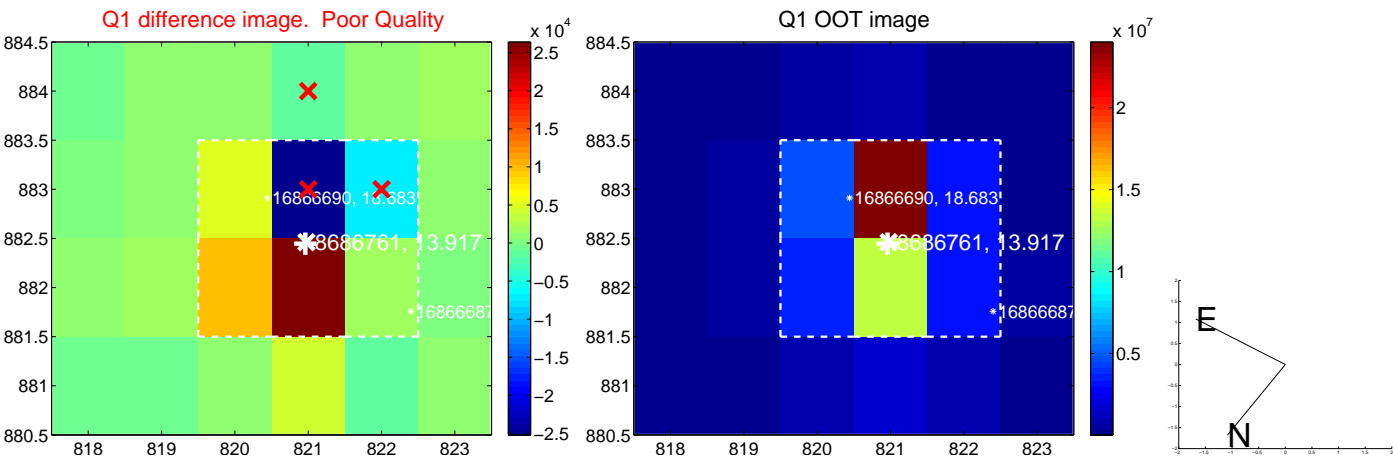
offset from photometric centroids



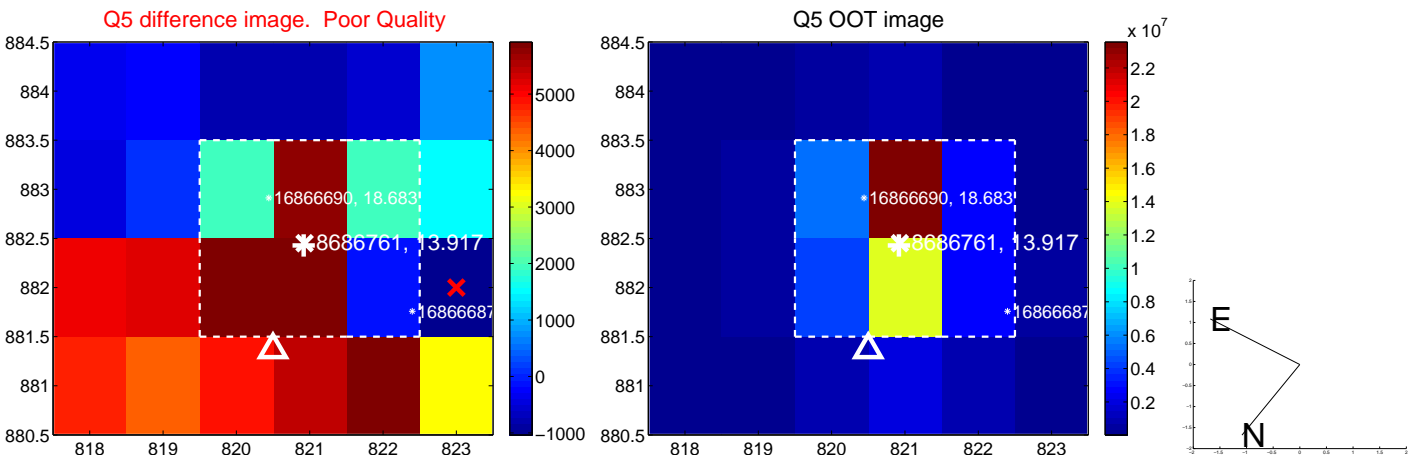
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



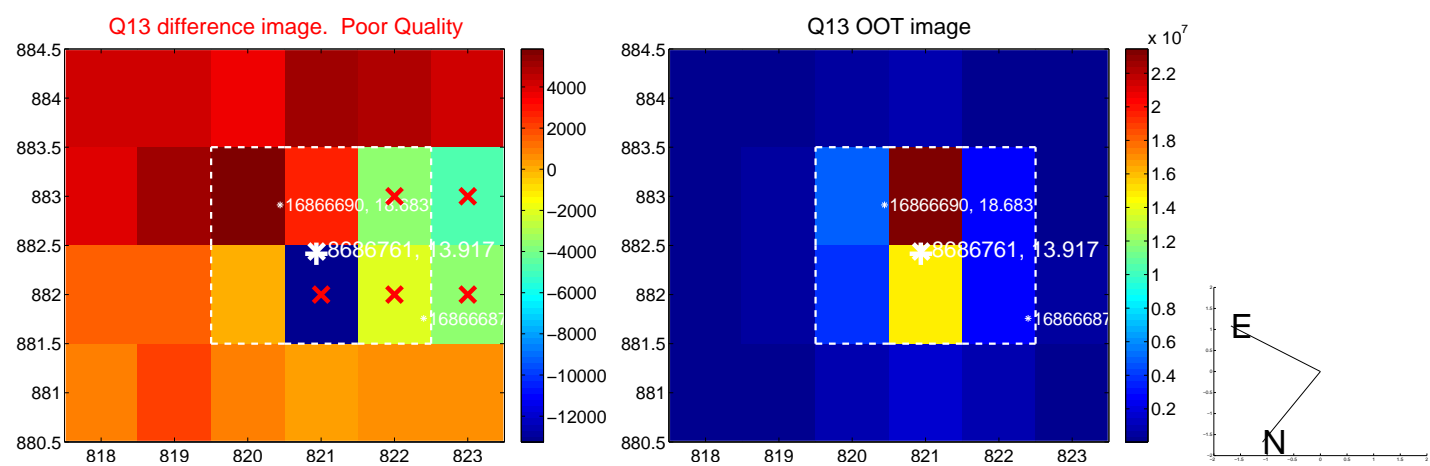
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



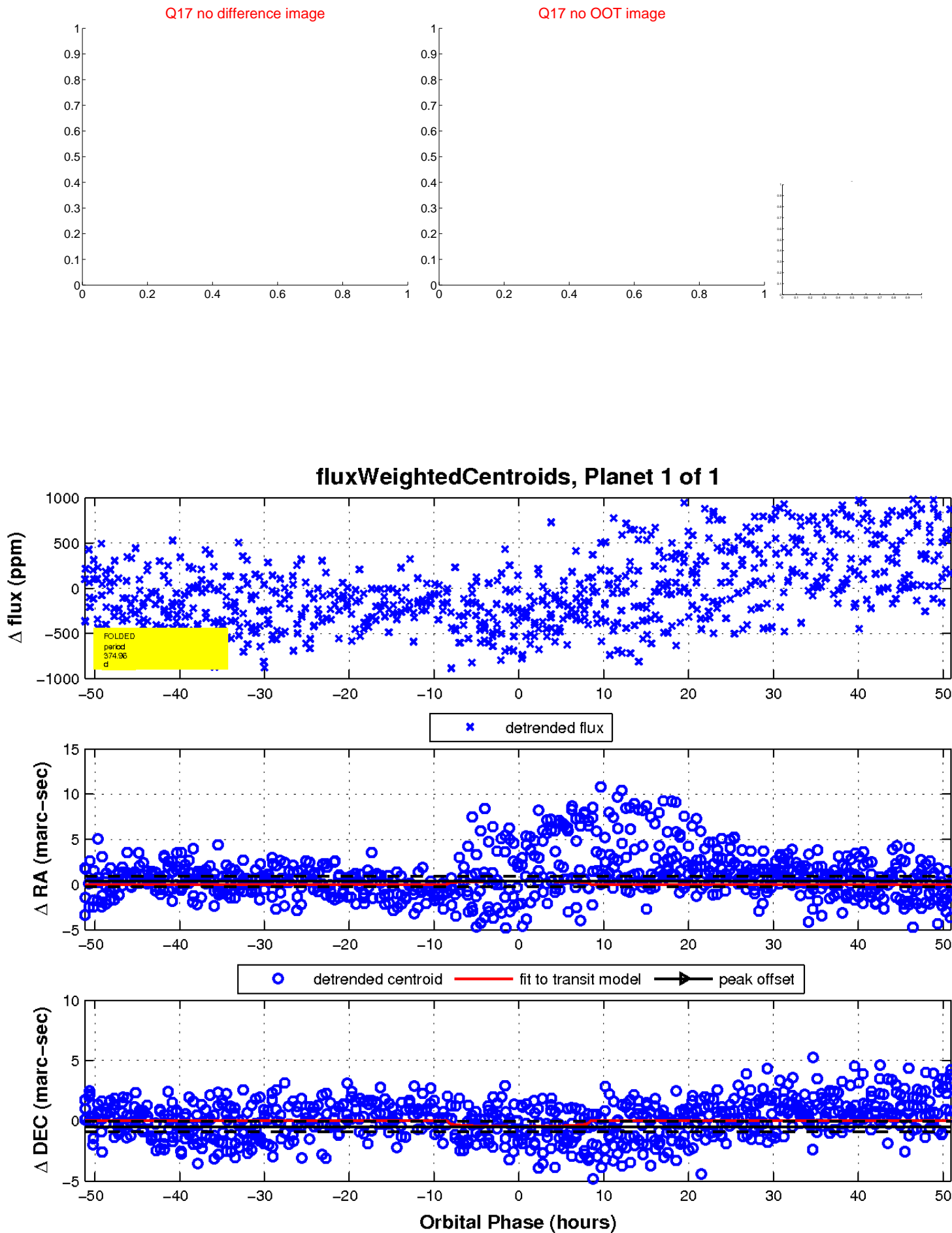
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



# UKIRT Image

Declination

