

# KIC 008176161

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008176161-01	OBS	No	368.729451	233.837682	763.8	18.958	10.0	10.0	0.97	6106	5.12	1.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008176161-01	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—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.

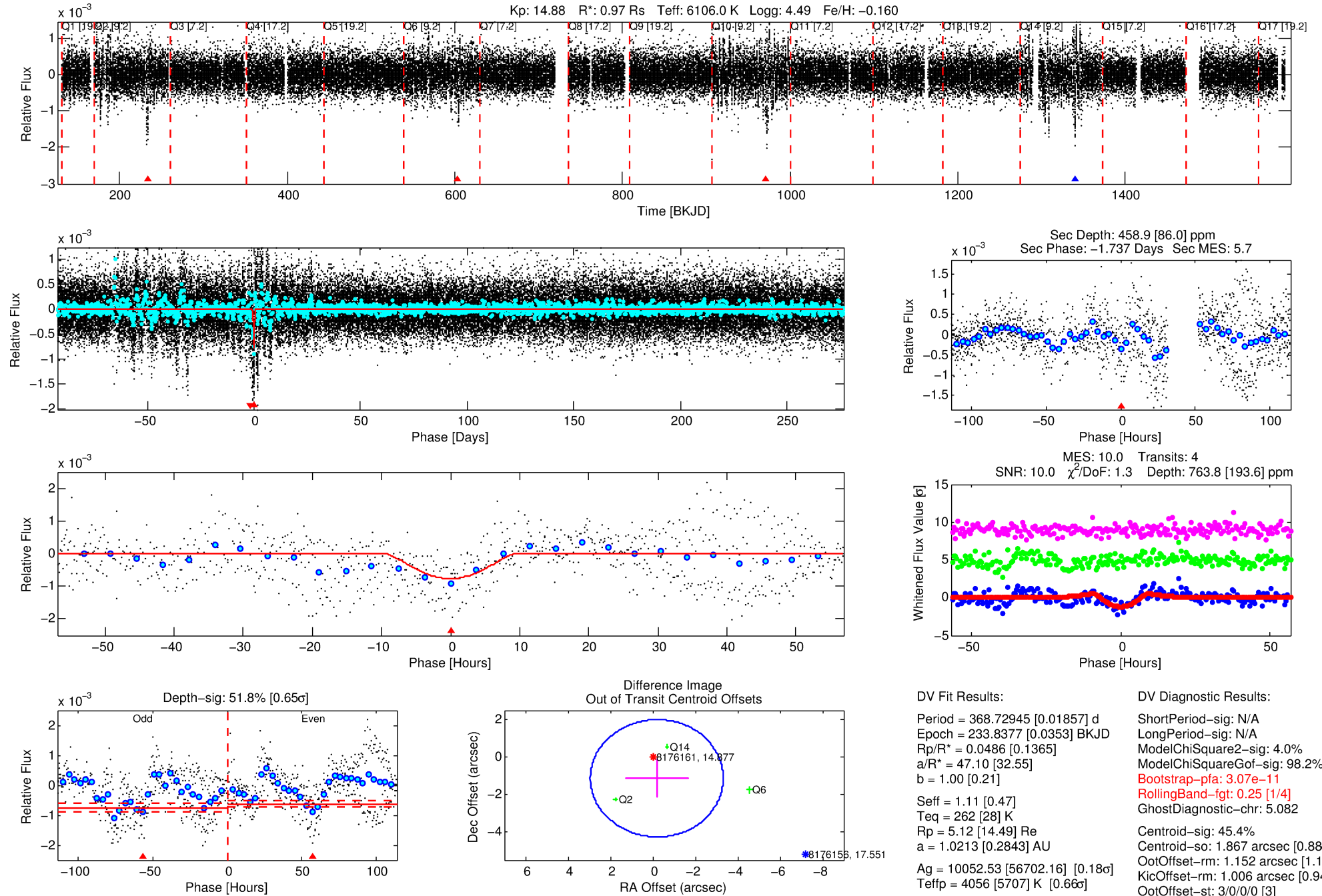
## Ephemeris Match Information For 008176161-01

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	$\sigma_P$	$\sigma_T$
008176161-01	8176161	008806072-02	8806072	1:1	24113.3	146	-130	14.86	14.88	0.92	Reflection	1	2.29	0.14

**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: 8176161 Candidate: 1 of 1 Period: 368.729 d



## DV Fit Results:

Period = 368.72945 [0.01857] d  
Epoch = 233.8377 [0.0353] BKJD  
Rp/R\* = 0.0486 [0.1365]  
a/R\* = 47.10 [32.55]  
b = 1.00 [0.21]  
Seff = 1.11 [0.47]  
Teq = 262 [28] K  
Rp = 5.12 [14.49] Re  
a = 1.0213 [0.2843] AU  
Ag = 10052.53 [56702.16] [0.18 $\sigma$ ]  
Teff = 4056 [5707] K [0.66 $\sigma$ ]

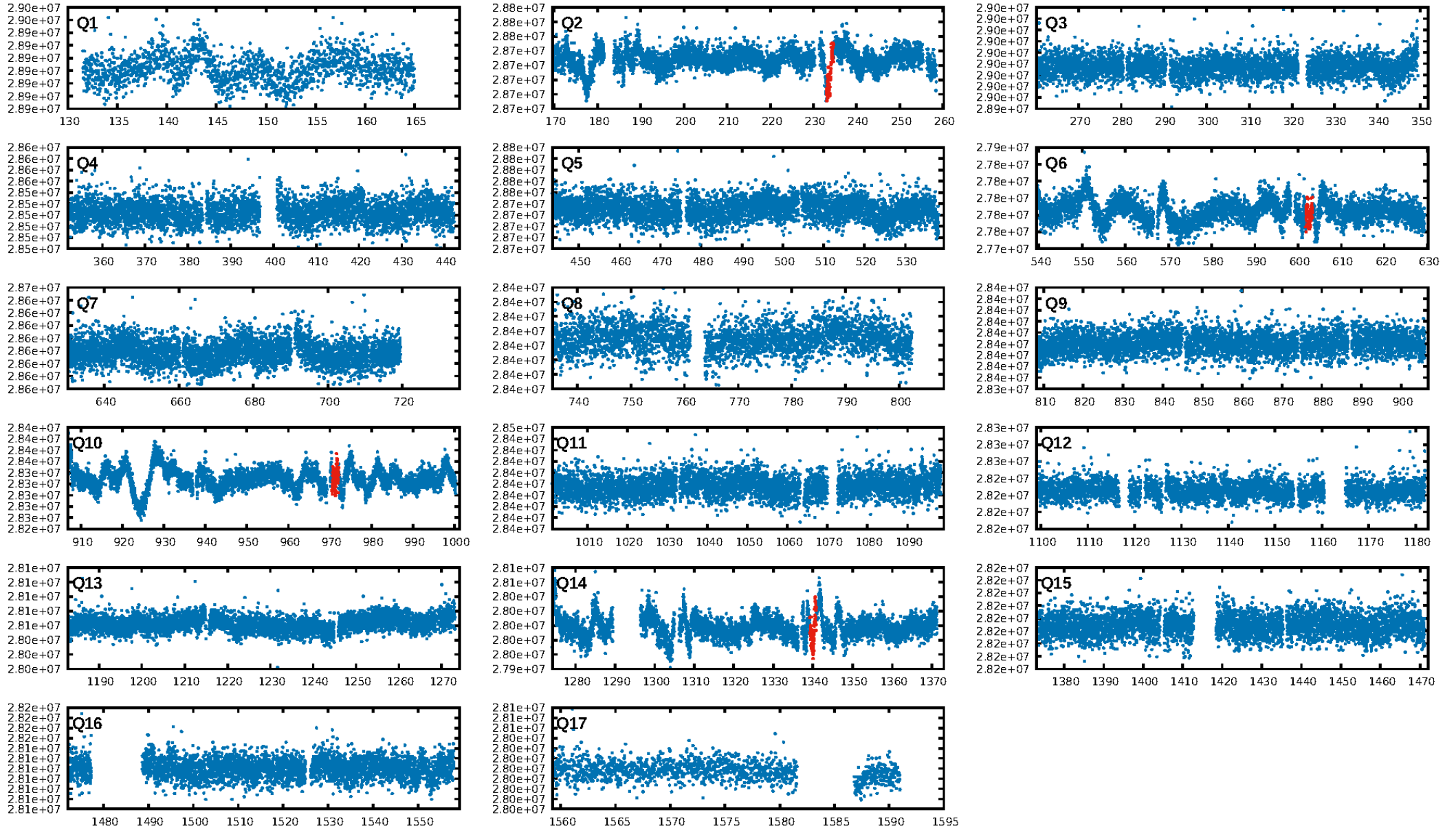
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.0%  
ModelChiSquareGof-sig: 98.2%  
Bootstrap-pfa: 3.07e-11  
RollingBand-fgt: 0.25 [1/4]  
GhostDiagnostic-chr: 5.082  
Centroid-sig: 45.4%  
Centroid-so: 1.867 arcsec [0.88 $\sigma$ ]  
OotOffset-rm: 1.152 arcsec [1.10 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 1.006 arcsec [0.94 $\sigma$ ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

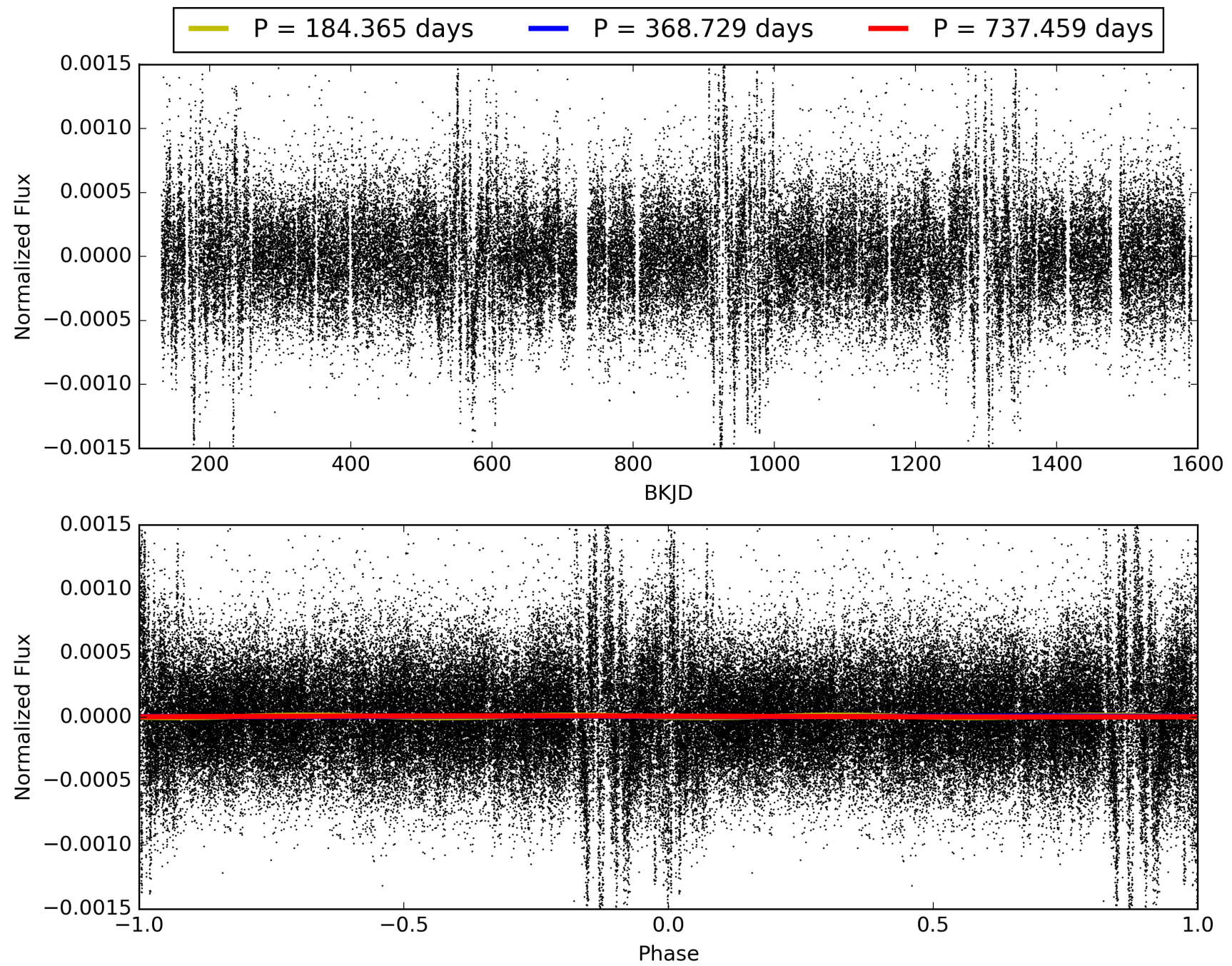
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:41:59 Z

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

# TCE 008176161-01, PDC Light Curves

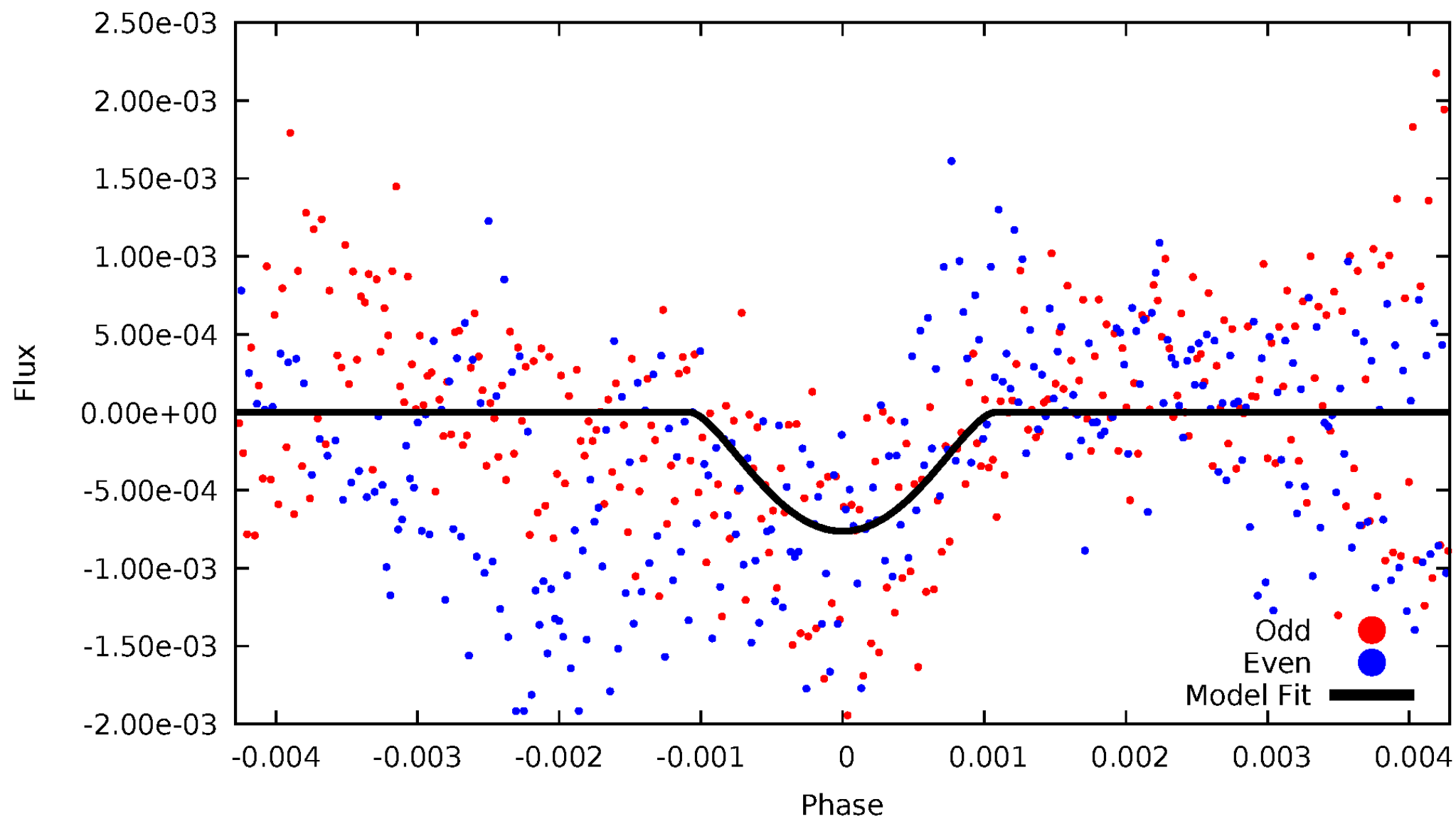


TCE 008176161-01



# DV Odd/Even

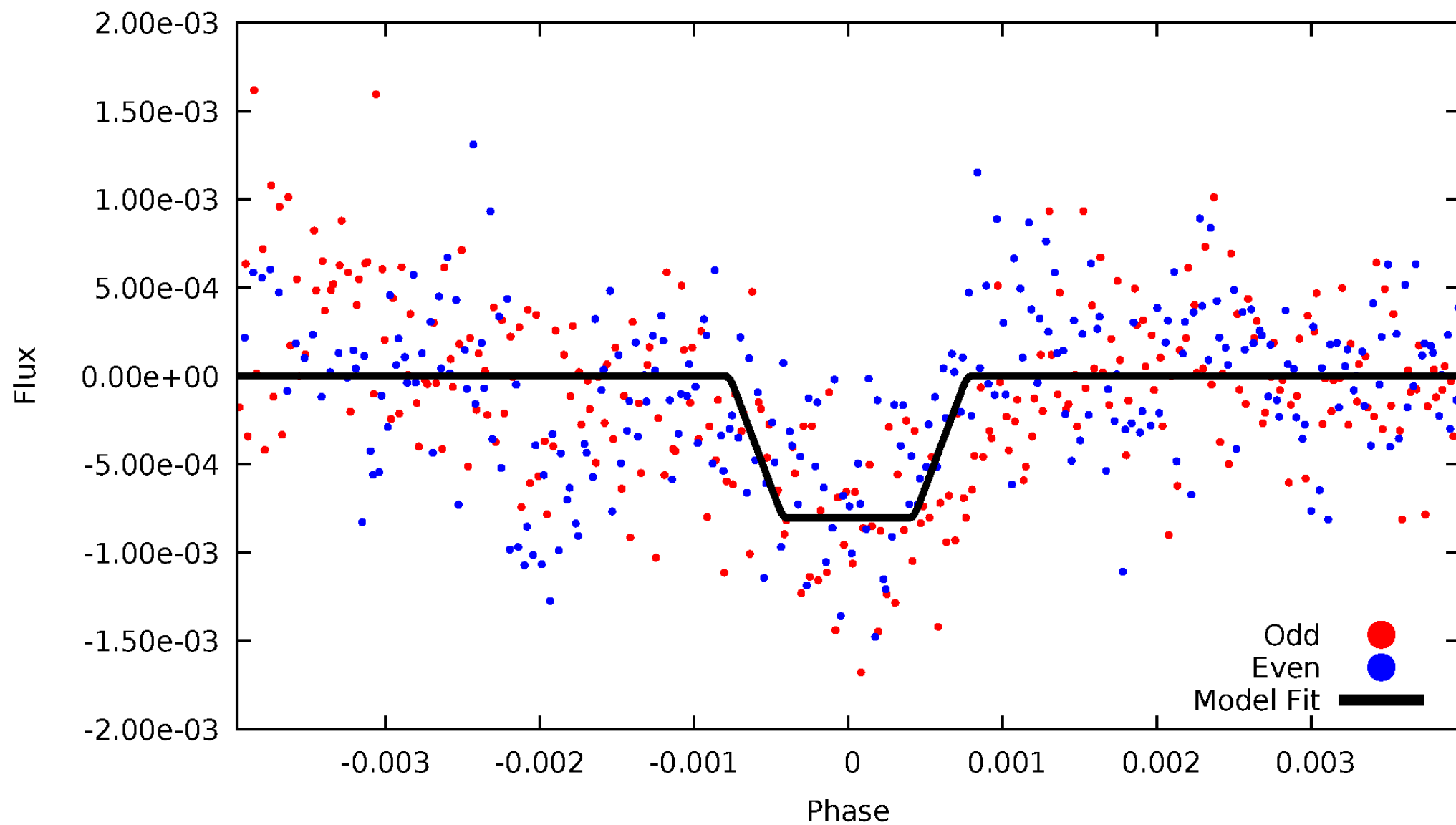
TCE 008176161-01





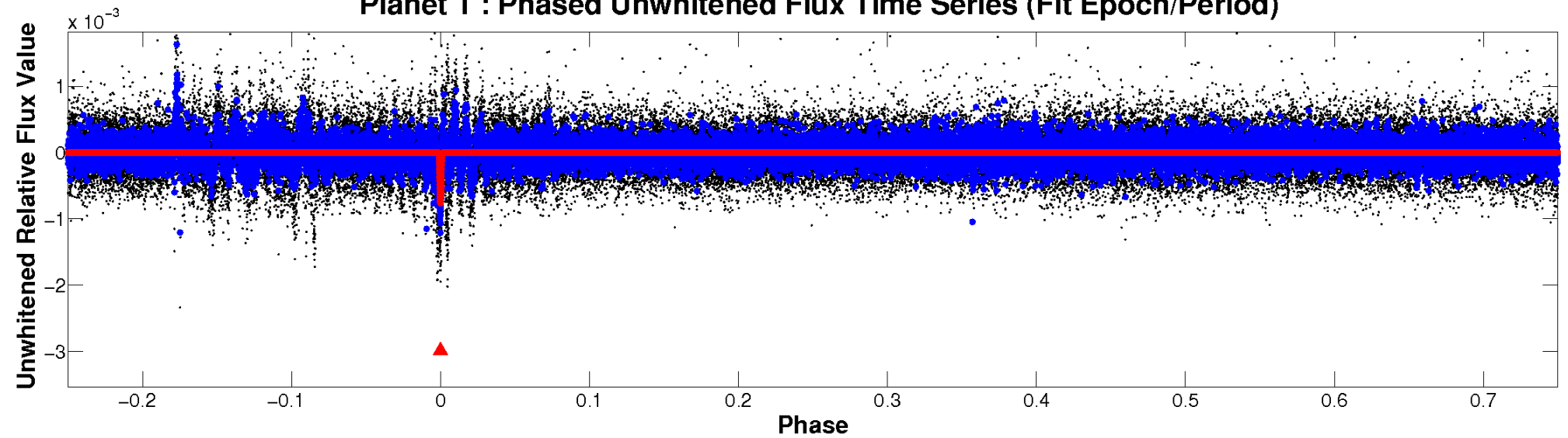
# ALT Odd/Even

TCE 008176161-01

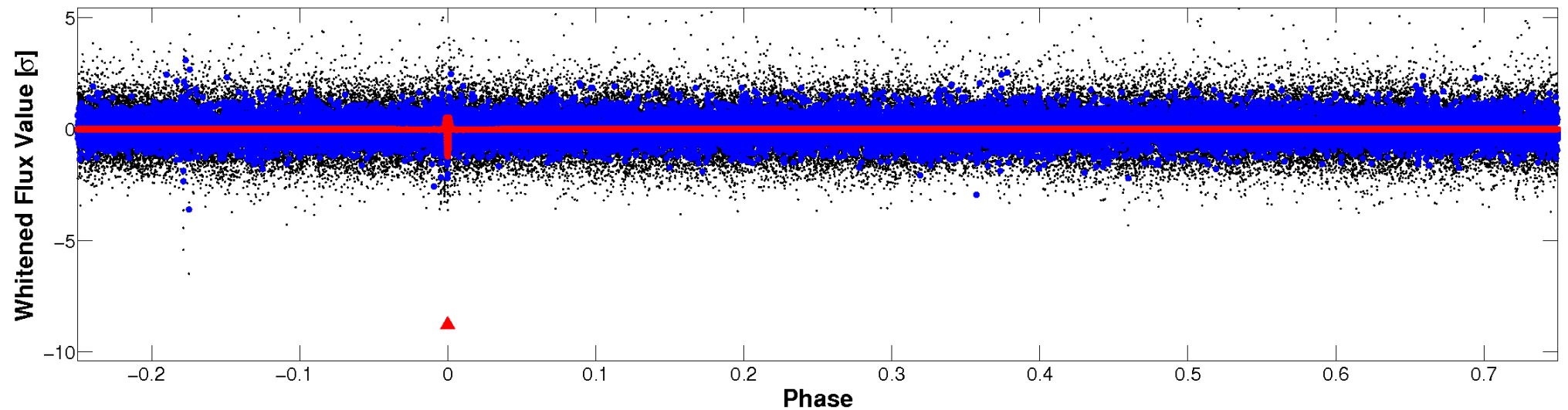


# Non-Whitened Vs. Whitened Light Curve

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

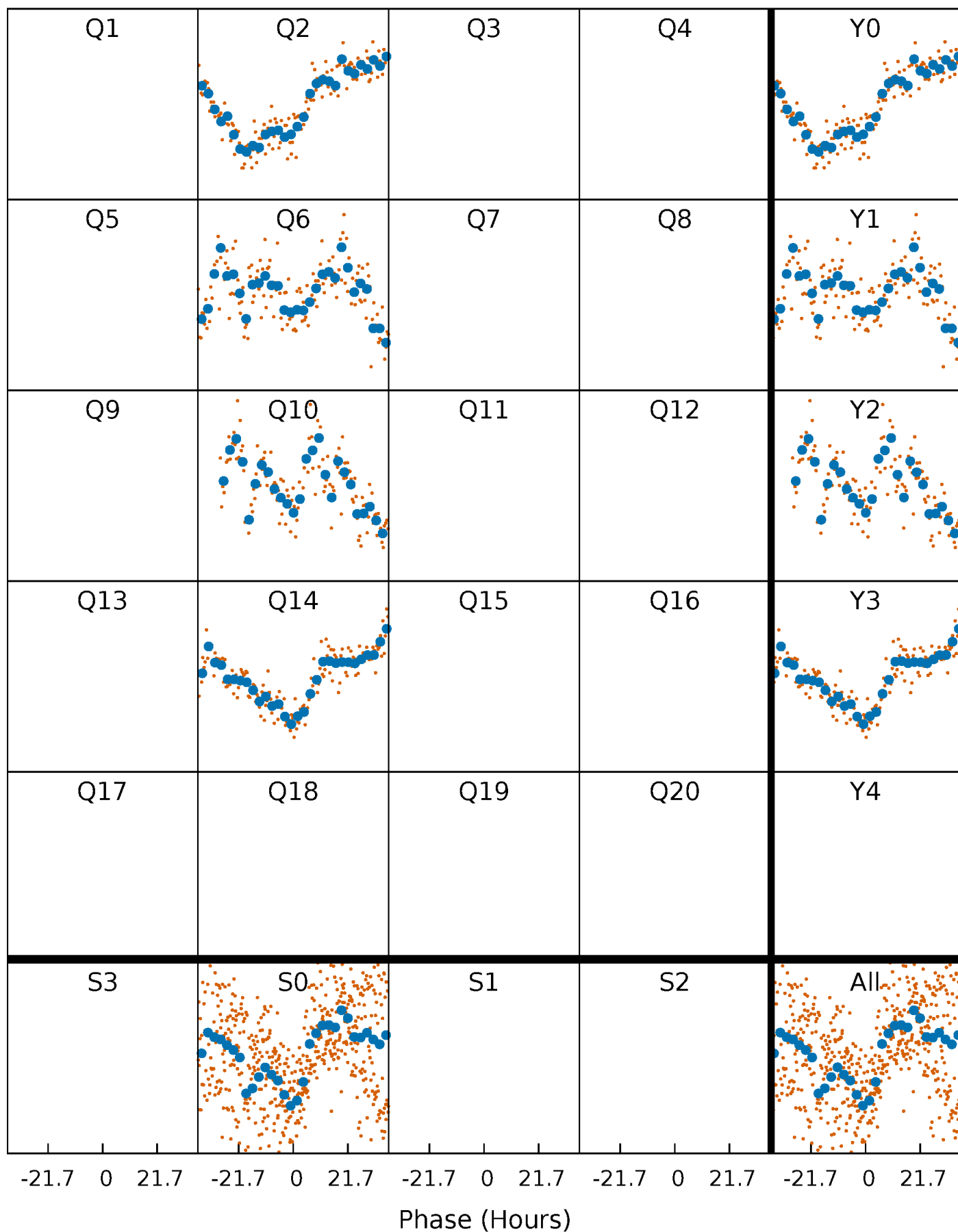


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

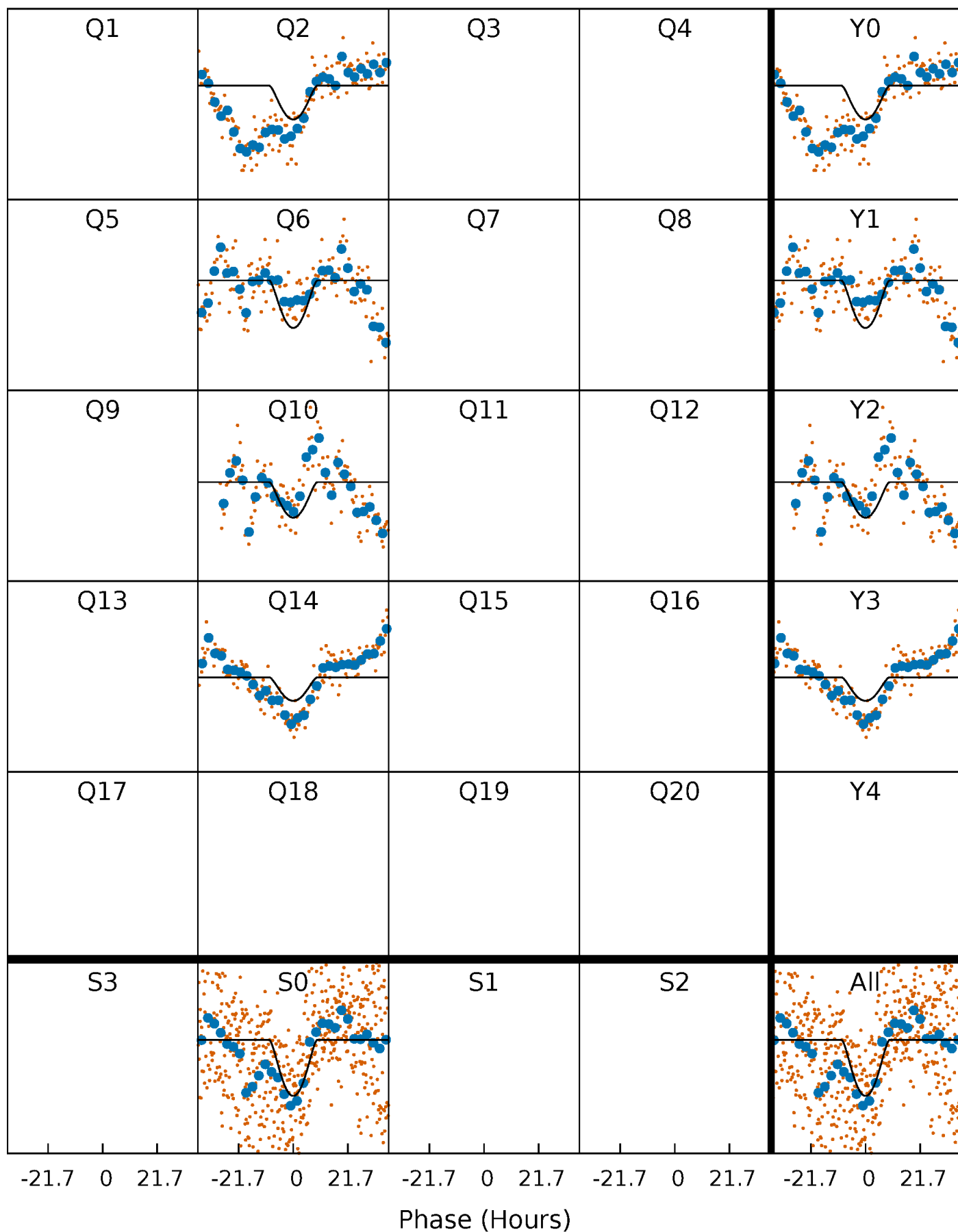
TCE 008176161-01 P=368.729451 Days  $T_0=233.837682$  (BKJD)





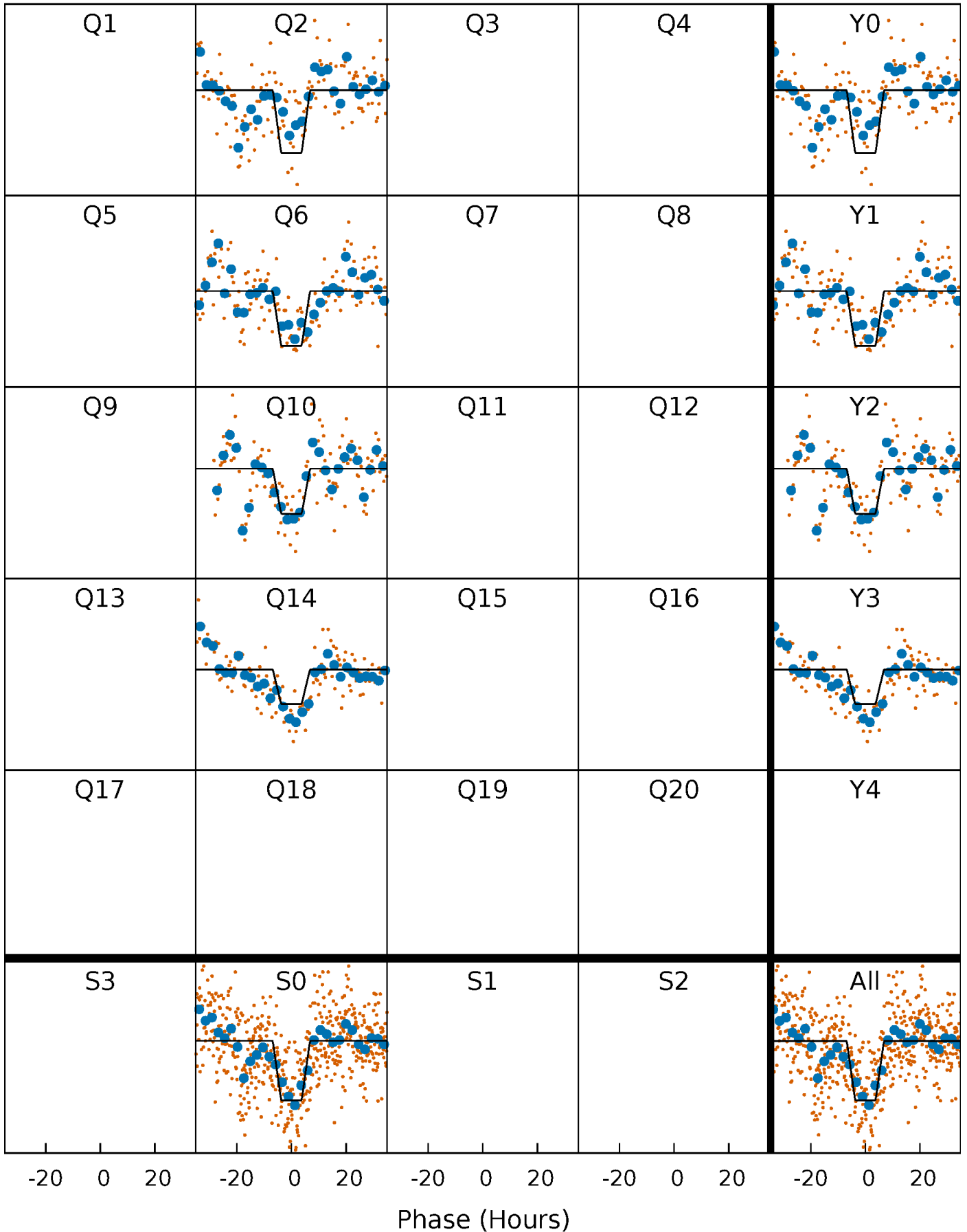
# DV Quarter-Phased Transit Curves

TCE 008176161-01 P=368.729451 Days  $T_0=233.837682$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

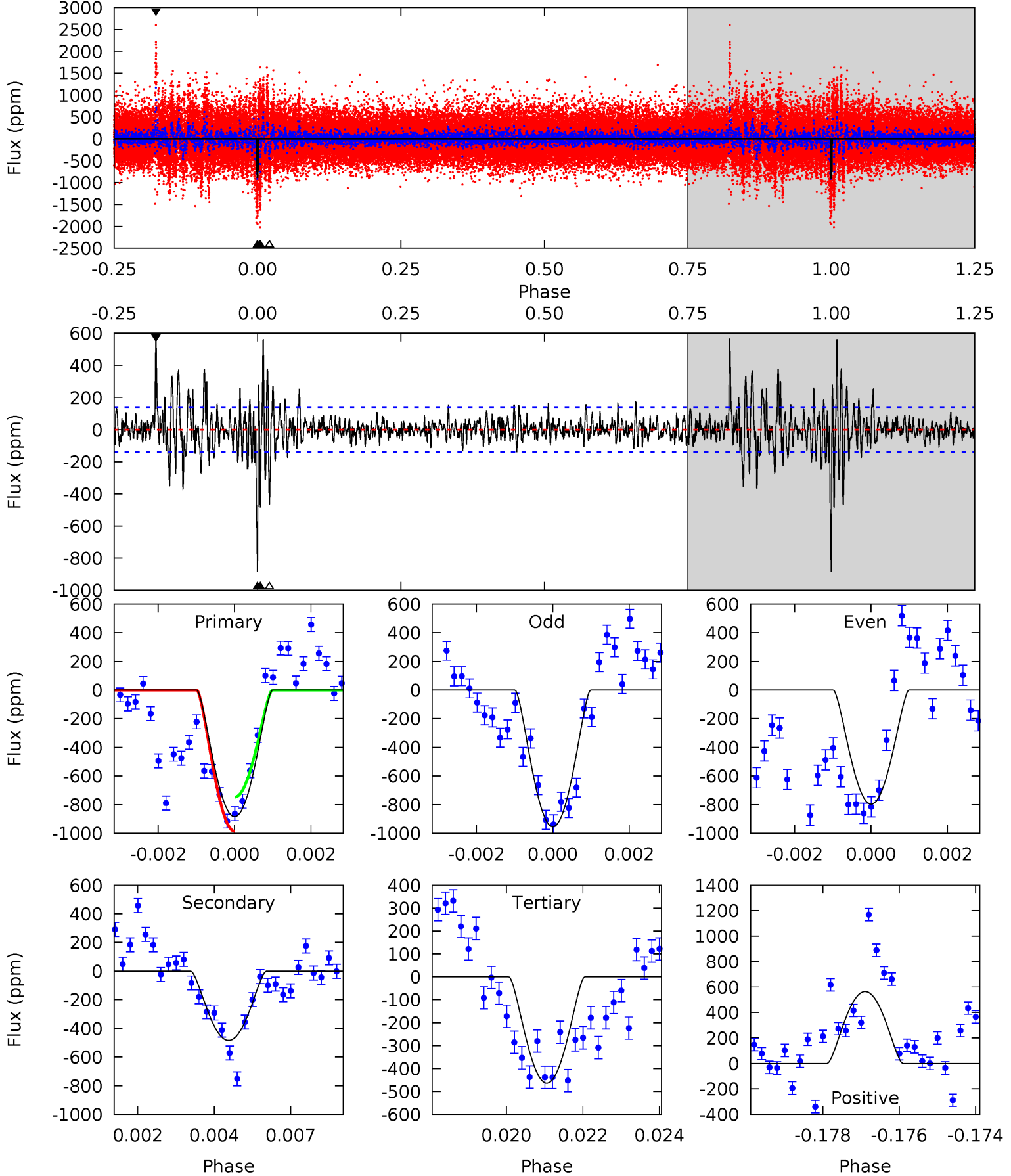
TCE 008176161-01 P=368.737213 Days  $T_0=233.796987$  (BKJD)



# DV Model-Shift Uniqueness Test

008176161-01, P = 368.729451 Days, E = 233.837682 Days

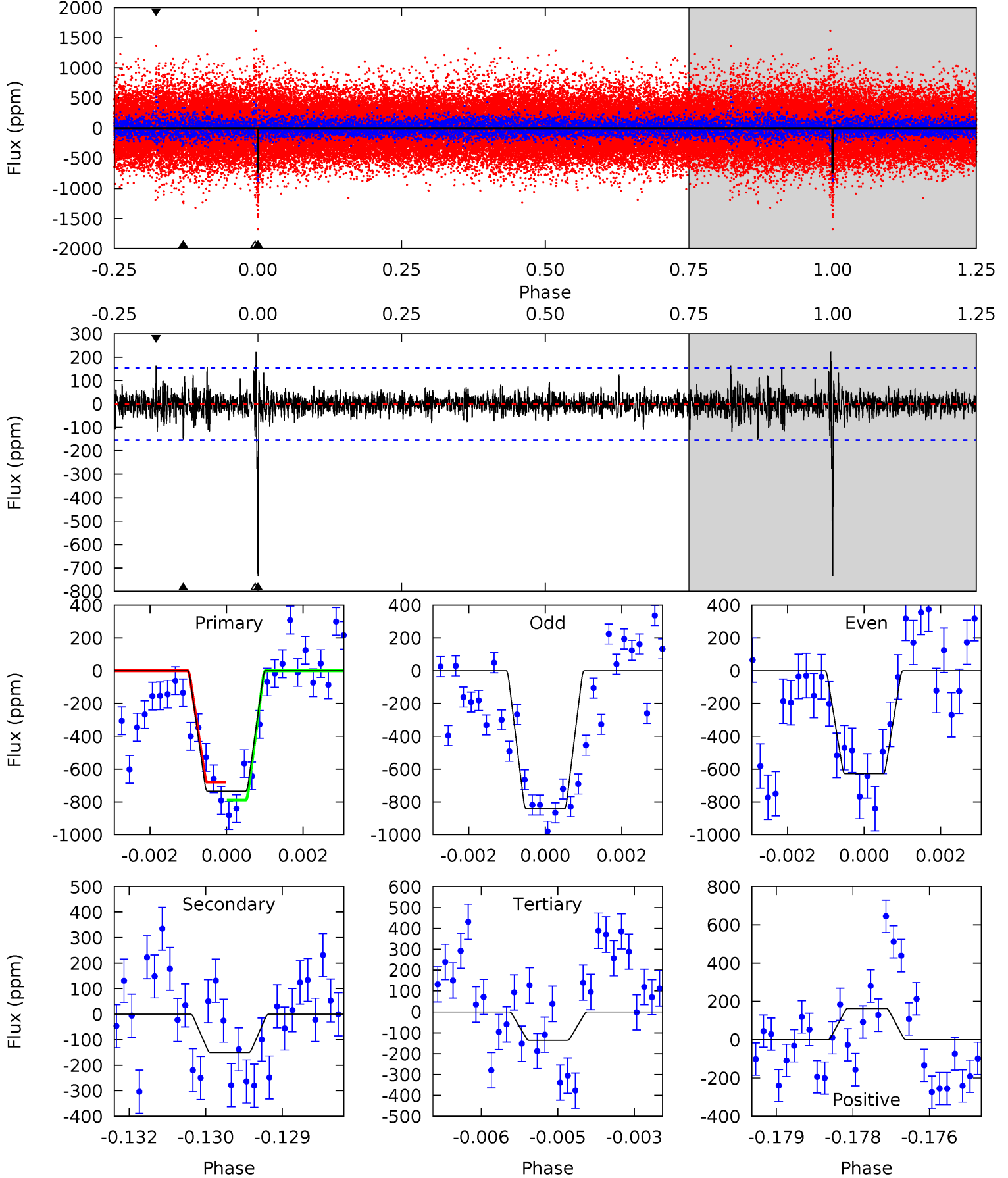
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.5	18.4	17.6	21.4	5.31	3.07	3.27	16.0	12.1	0.78	-3.03	2.99	1.09	0.39	4.50



# Alt Model-Shift Uniqueness Test

008176161-01, P = 368.737213 Days, E = 233.796987 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	5.26	4.75	5.72	5.37	3.16	1.11	20.9	20.0	0.52	-0.46	3.76	1.06	0.23	1.88



### Stellar Parameters For KIC 008176161

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6106^{+169}_{-211}$	$4.487^{+0.054}_{-0.216}$	$-0.160^{+0.300}_{-0.300}$	$0.966^{+0.324}_{-0.101}$	$1.043^{+0.135}_{-0.150}$	$1.631^{+0.381}_{-0.894}$
	+3%/-3%	+1%/-5%	+188%/-188%	+34%/-10%	+13%/-14%	+23%/-55%
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 008176161-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-484 \pm 26$	$13.07^{+12.01}_{-8.87}$	$374^{+28}_{-20}$	$3243^{+1548}_{-557}$	$1623^{+13681}_{-1193}$
Alt.	$-150 \pm 29$	$11.73^{+11.45}_{-7.96}$	$373^{+26}_{-20}$	$2829^{+1153}_{-474}$	$621^{+5134}_{-474}$

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

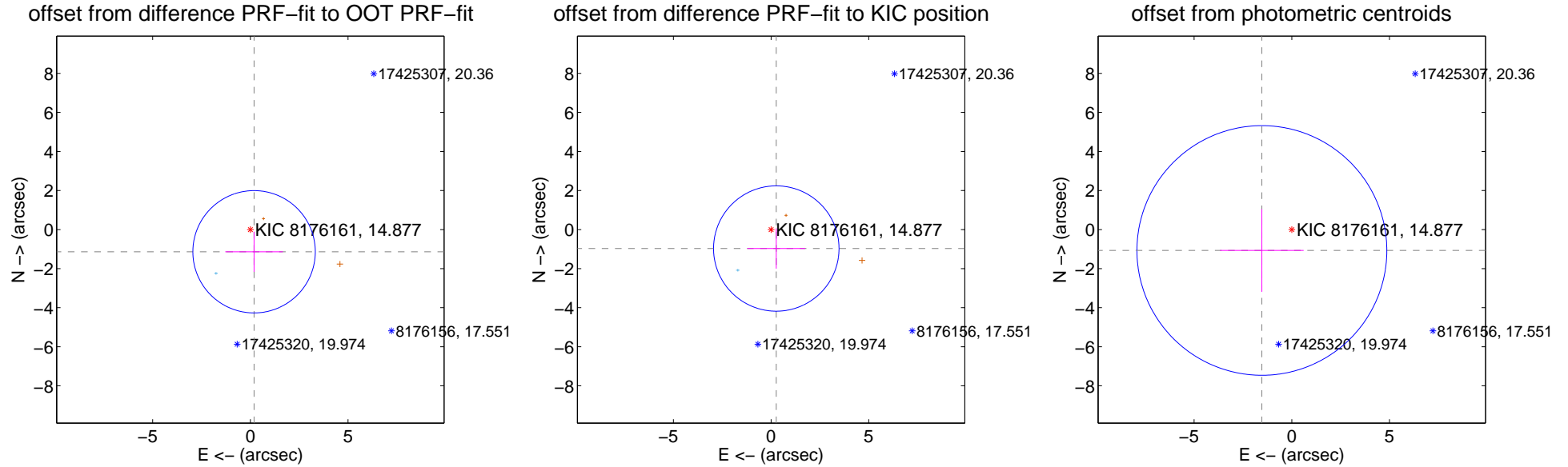
## DV Centroid Data

Supplemental centroid analysis for 008176161-01. Kepler magnitude: 14.88. Transit SNR 9.97

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

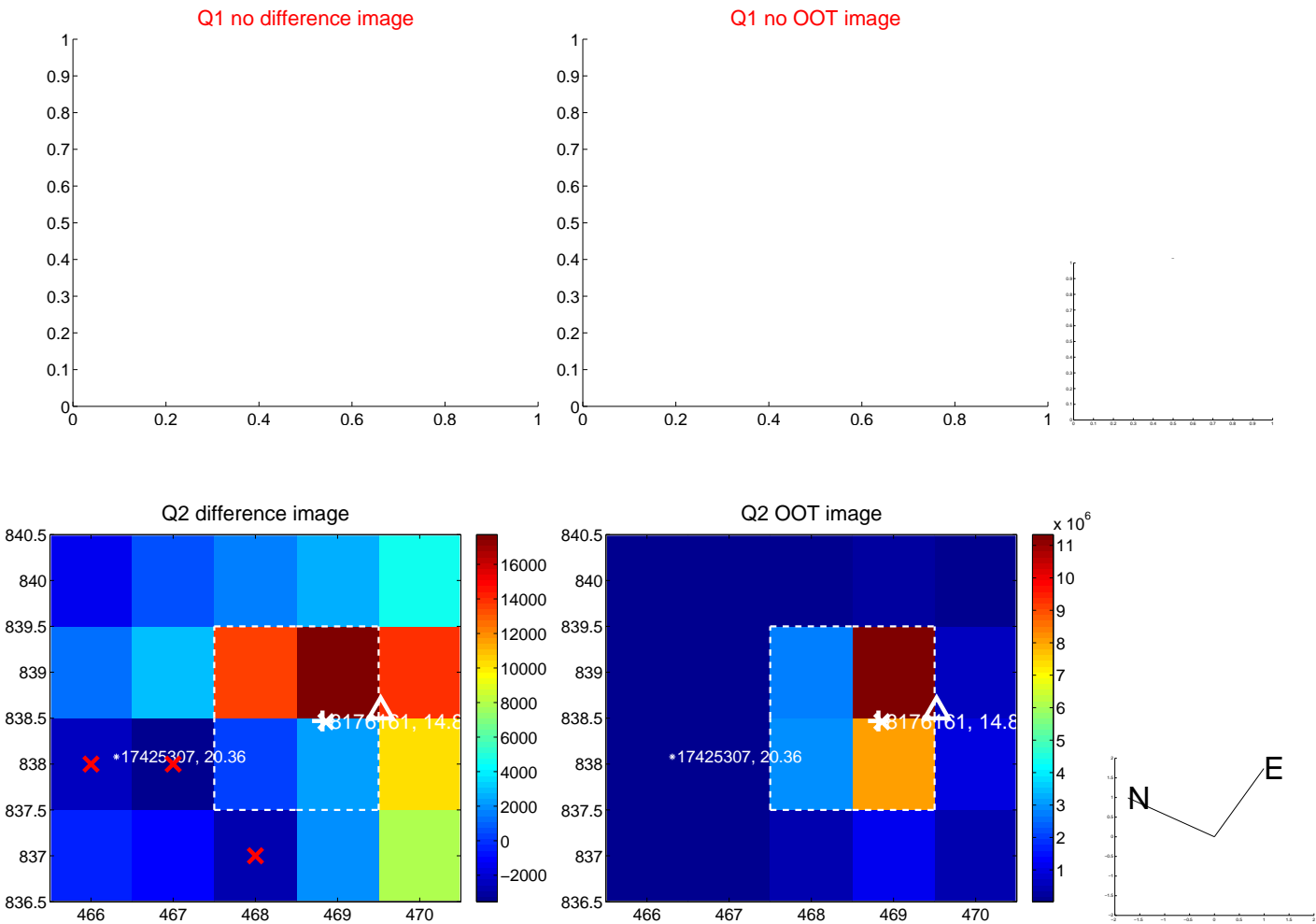
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.152 \pm 1.044$	1.10	$-0.191 \pm 1.472$	$-1.137 \pm 1.030$
PRF-fit source offset from KIC position	$1.006 \pm 1.070$	0.94	$-0.267 \pm 1.479$	$-0.970 \pm 1.033$
photometric centroid source offset	$1.87 \pm 2.13$	0.88	$1.53 \pm 2.14$	$-1.07 \pm 2.12$



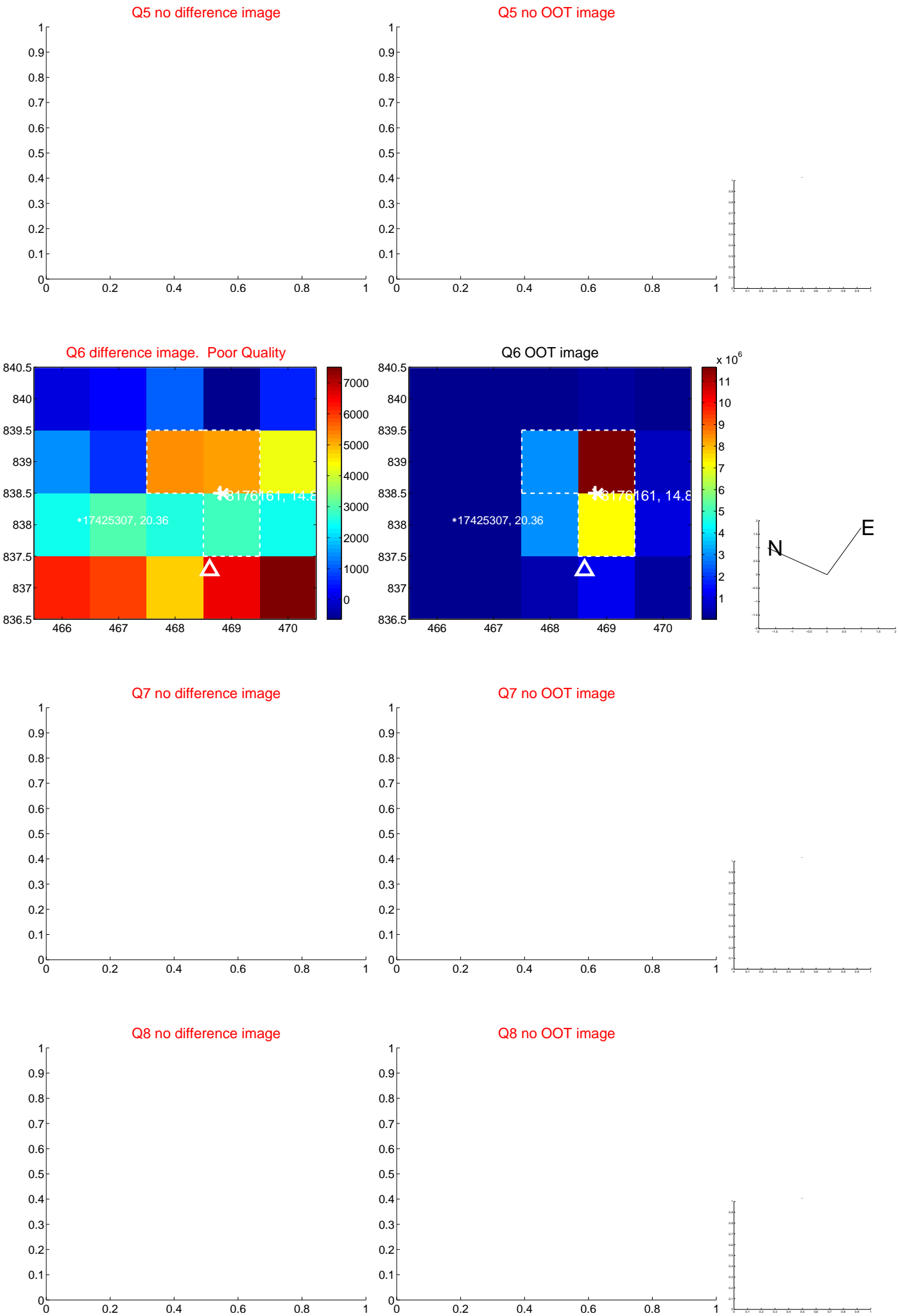
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



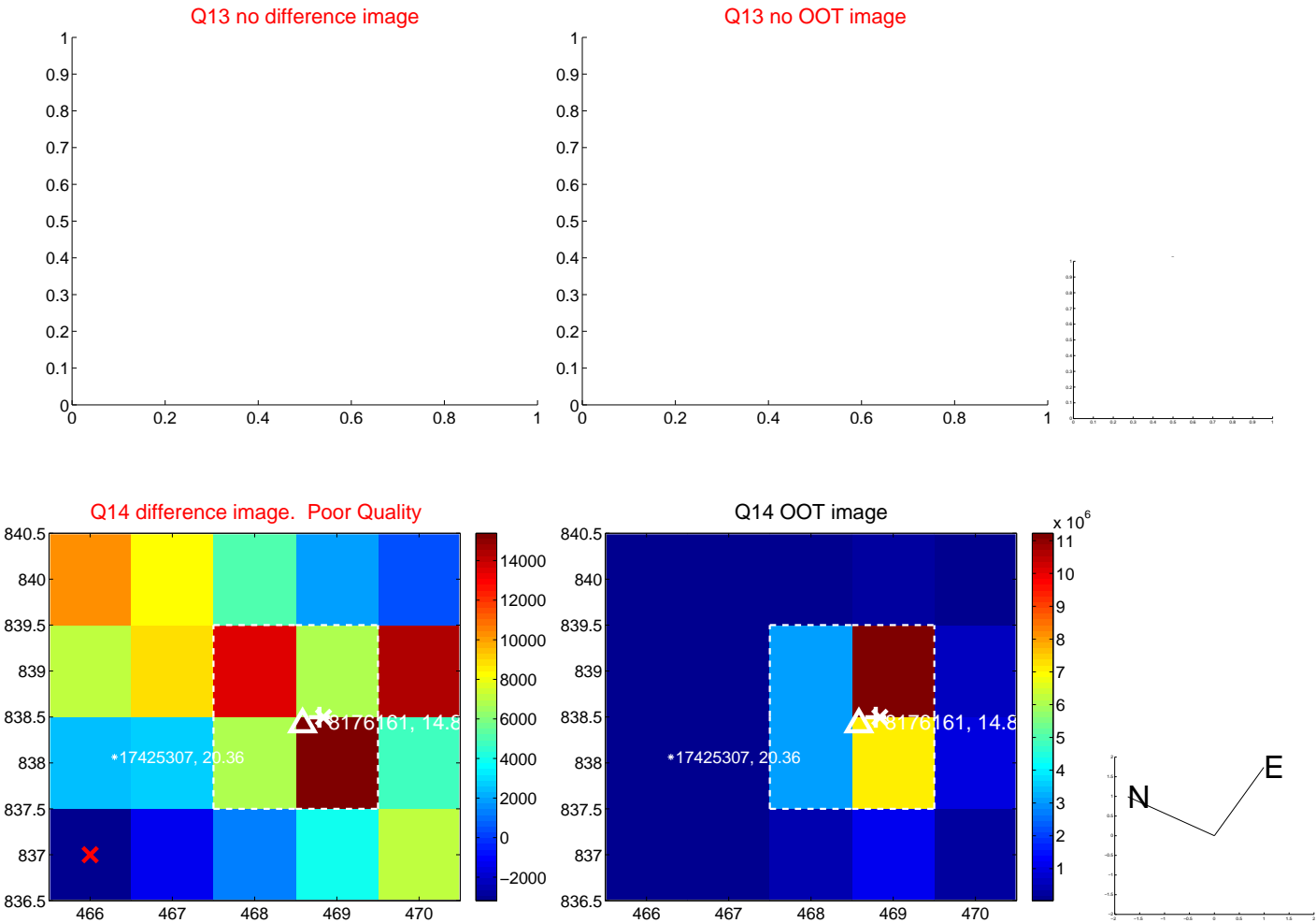
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



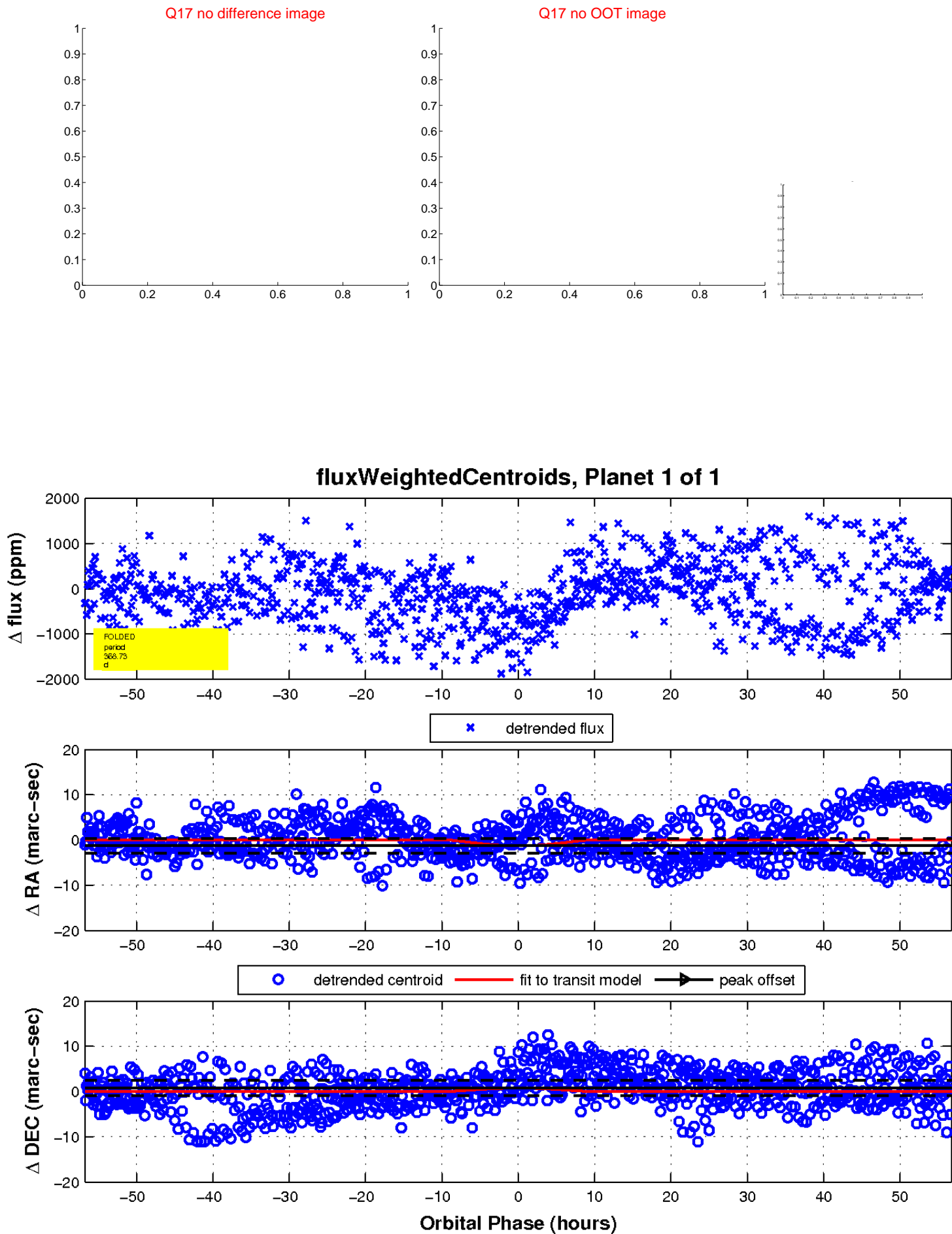
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

