

# KIC 012016517

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012016517-01	OBS	No	689.823307	139.767611	815.4	14.710	8.9	8.4	0.73	4719	2.29	0.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012016517-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—INCONSISTENT_TRANS—CENT_FEW_DIFFS

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

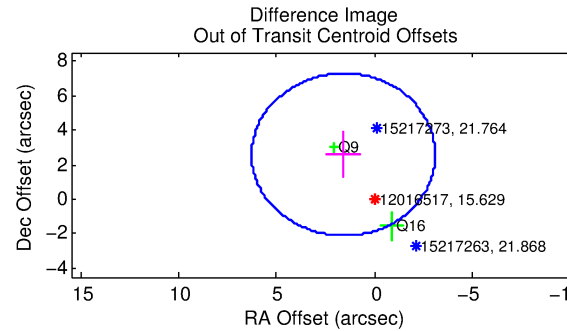
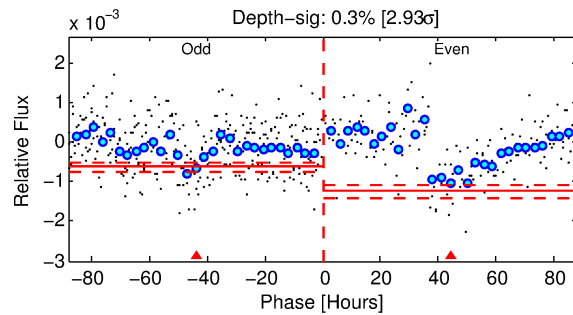
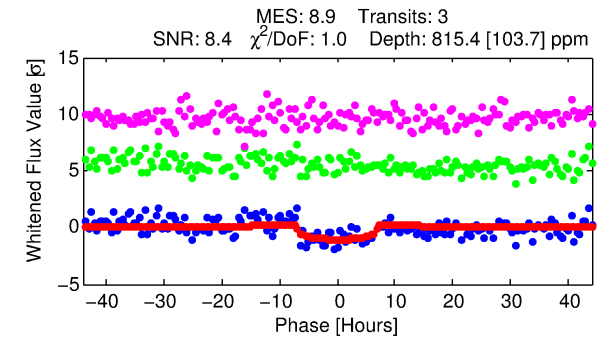
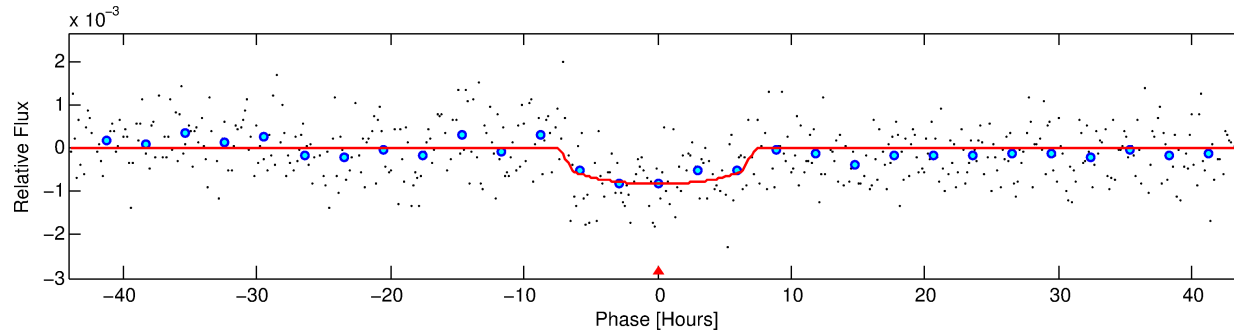
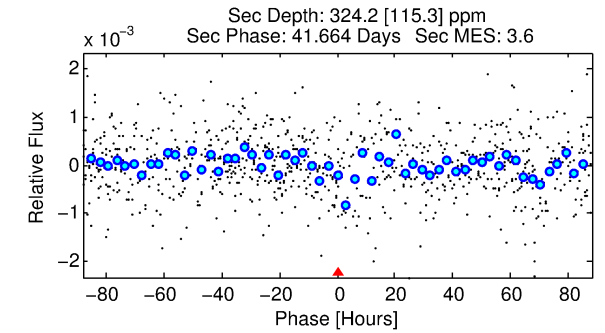
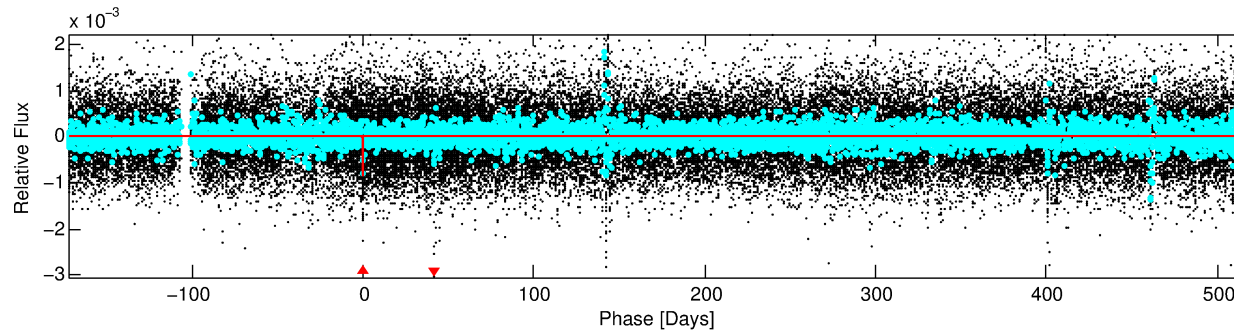
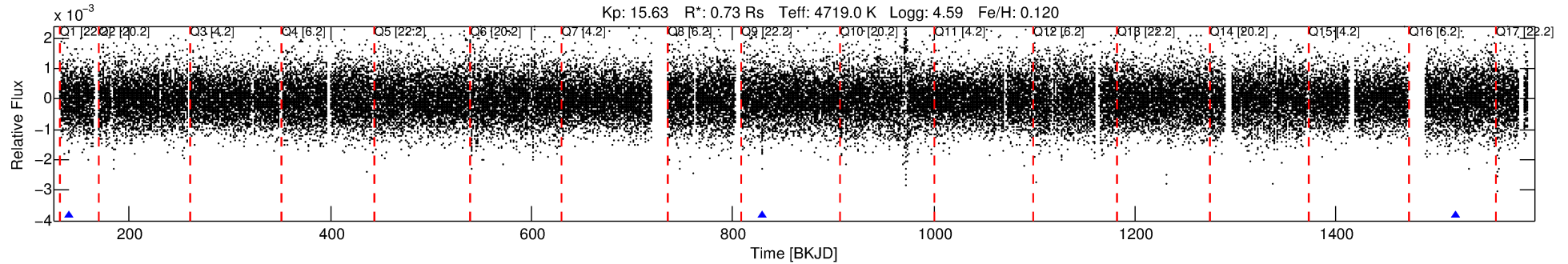
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012016517-01

No Significant Match Found

# DV One-Page Summary

KIC: 12016517 Candidate: 1 of 1 Period: 689.823 d



## DV Fit Results:

Period = 689.82331 [0.01813] d  
Epoch = 139.7676 [0.0229] BKJD  
Rp/R\* = 0.0285 [0.0109]  
a/R\* = 253.37 [313.19]  
b = 0.75 [0.75]  
Seff = 0.12 [0.02]  
Teq = 151 [5] K  
Rp = 2.29 [0.89] Re  
a = 1.3944 [0.0849] AU  
Ag = 66244.93 [56166.07] [1.18σ]  
Teffp = 3749 [799] K [4.50σ]

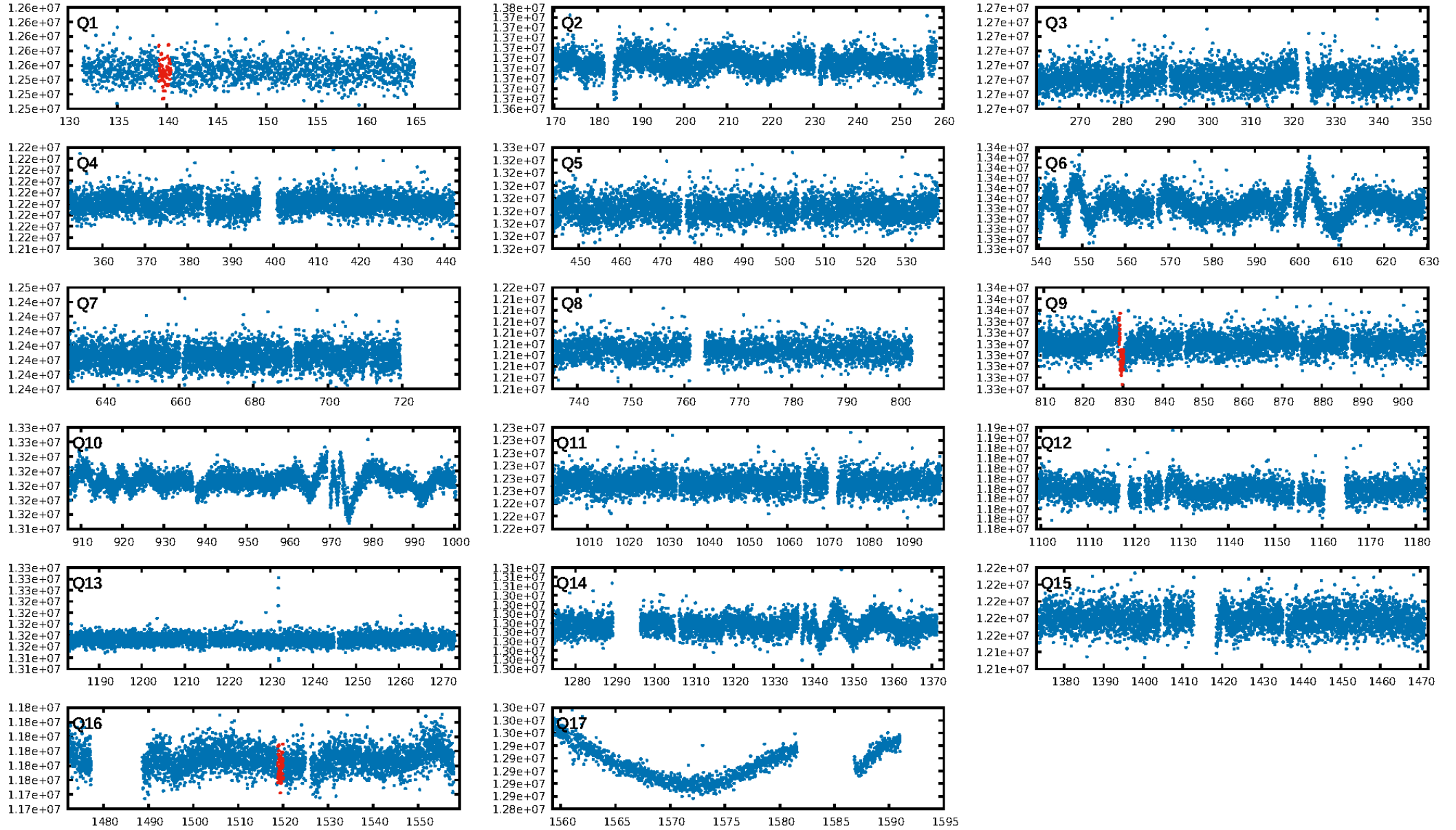
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.8%  
ModelChiSquareGof-sig: 99.8%  
**Bootstrap-pfa: 2.82e-10**  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 6.075  
Centroid-sig: 58.6%  
Centroid-so: 0.671 arcsec [0.47σ]  
OotOffset-rm: 3.028 arcsec [1.94σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-rm: 3.310 arcsec [2.32σ]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

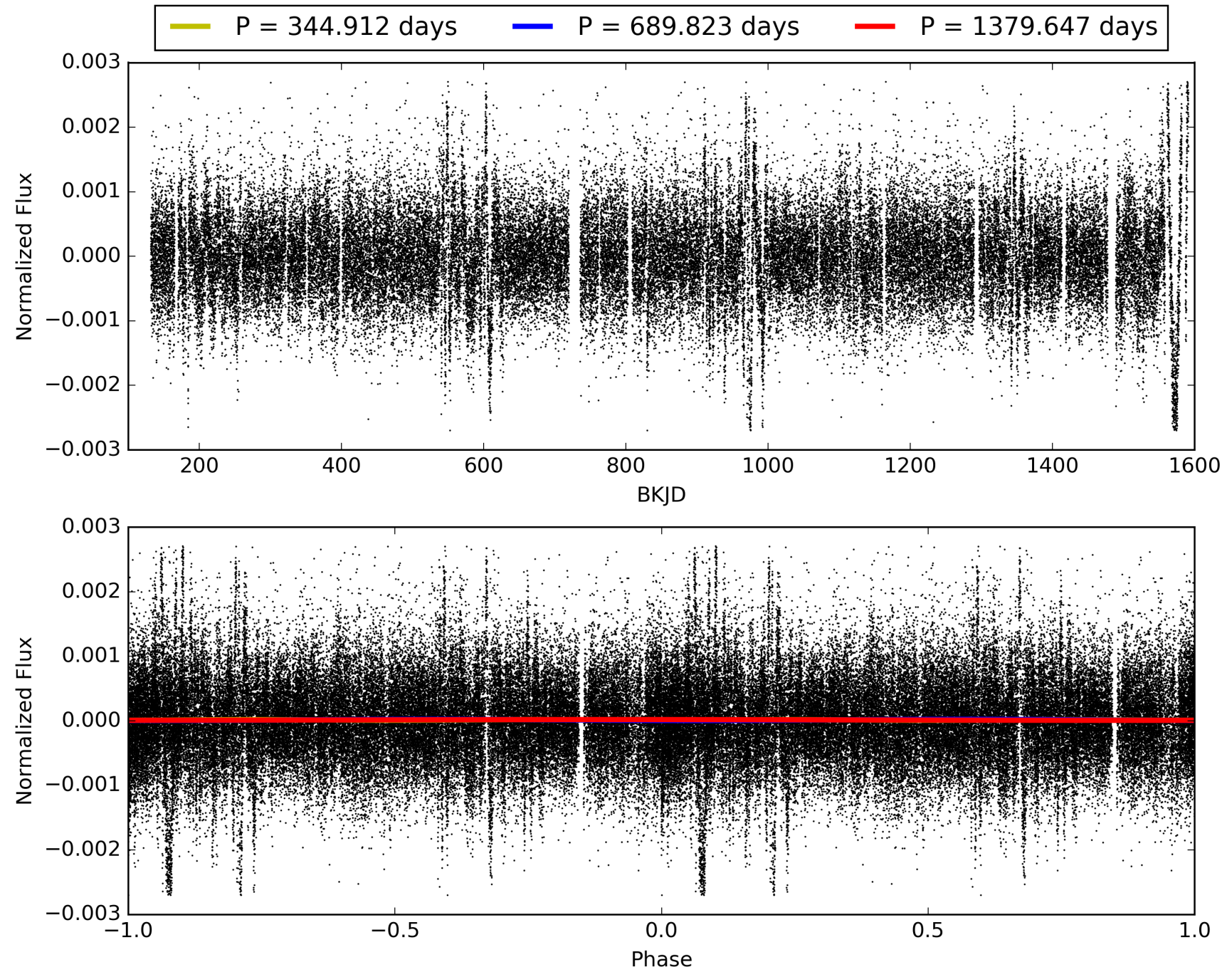
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:40:40 Z

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

# TCE 012016517-01, PDC Light Curves

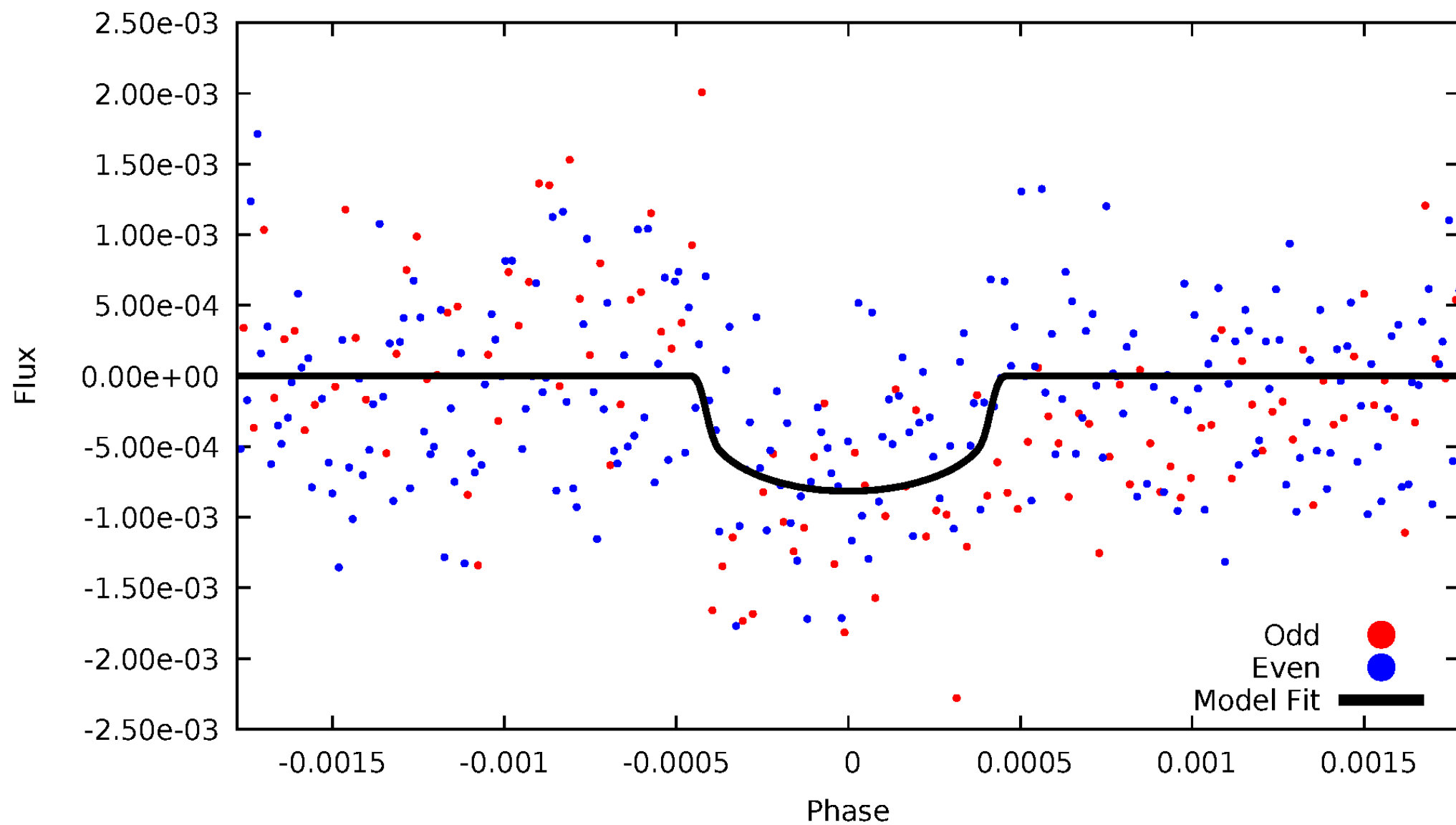


# TCE 012016517-01



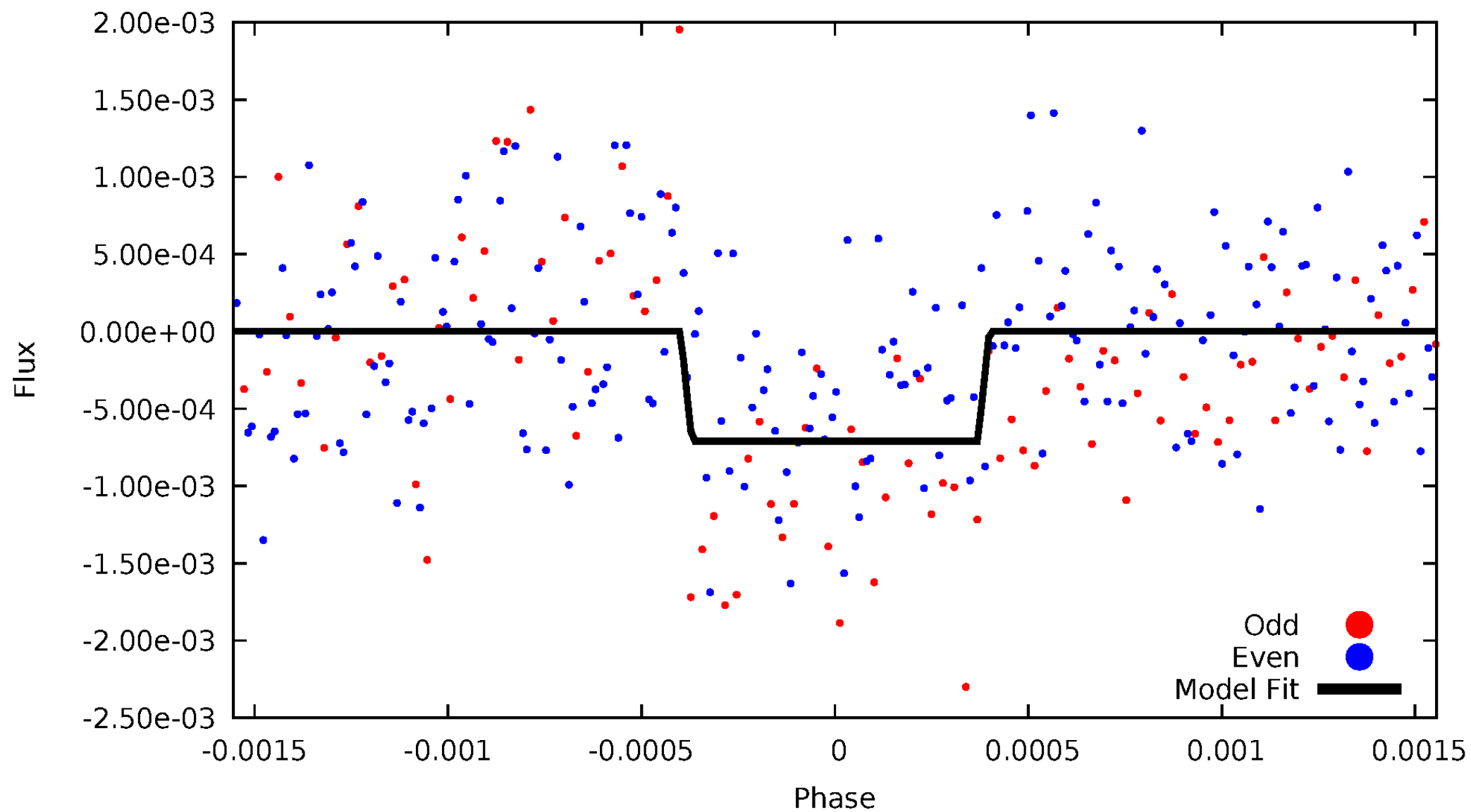
# DV Odd/Even

TCE 012016517-01



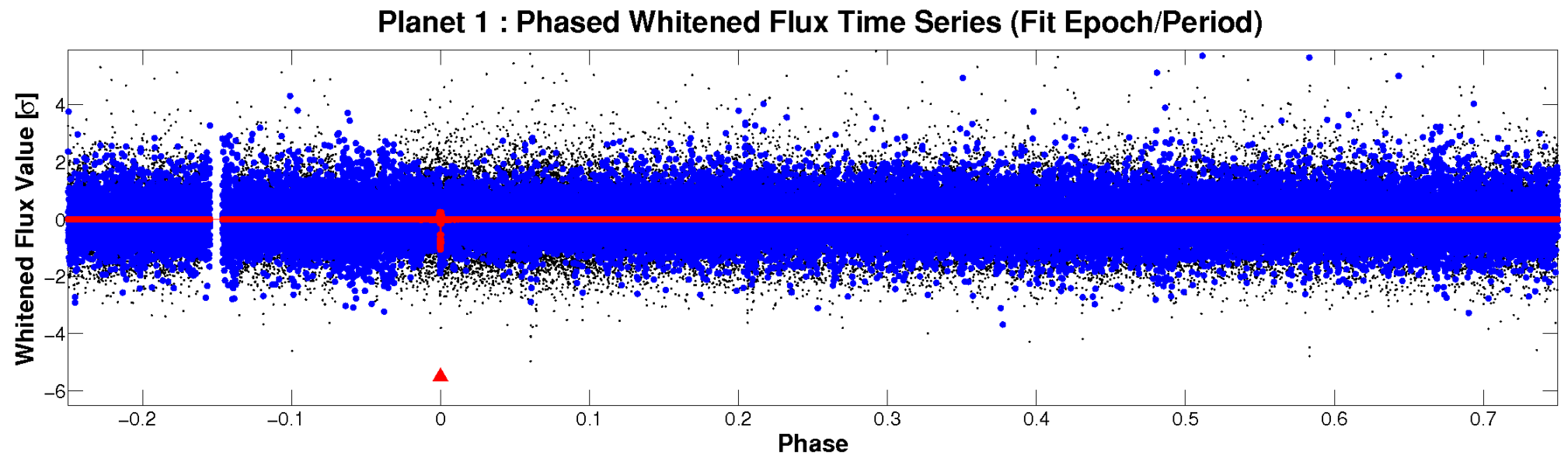
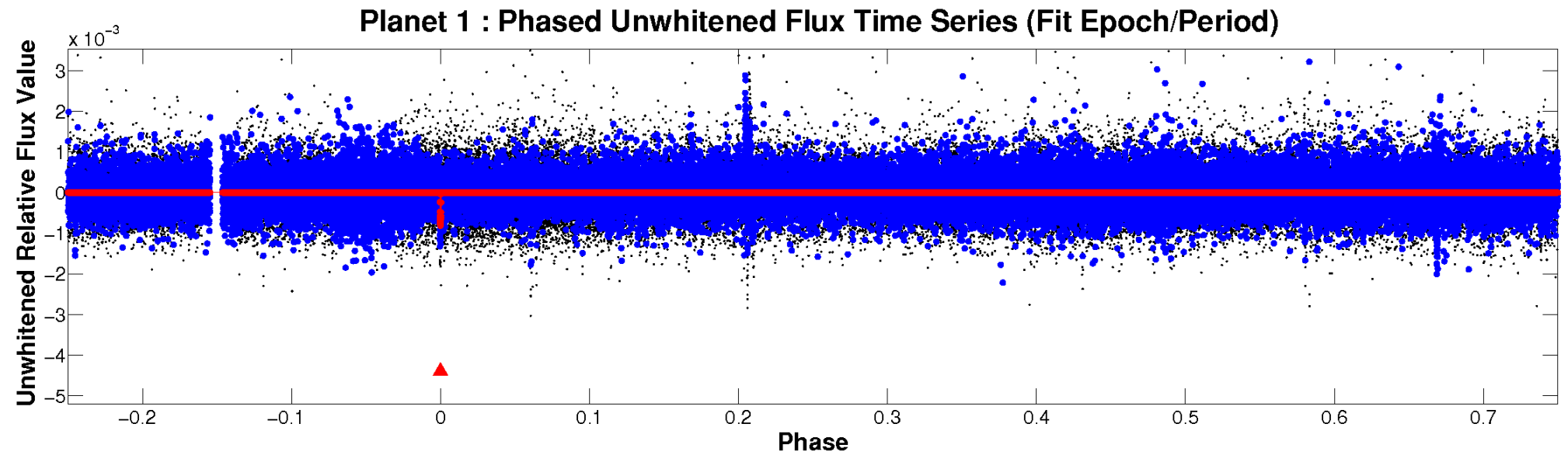
# ALT Odd/Even

TCE 012016517-01



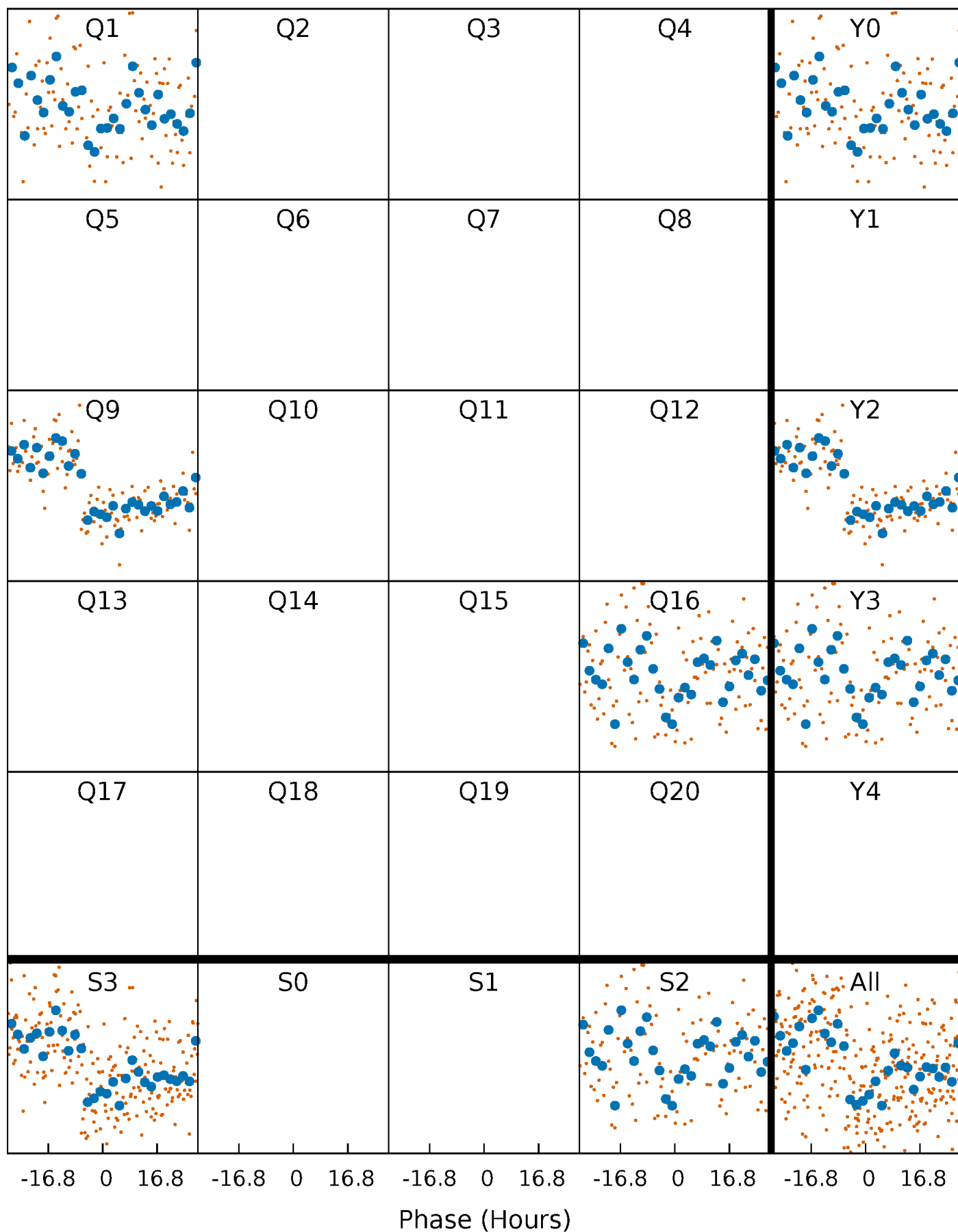


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

TCE 012016517-01 P=689.823307 Days  $T_0=139.767611$  (BKJD)





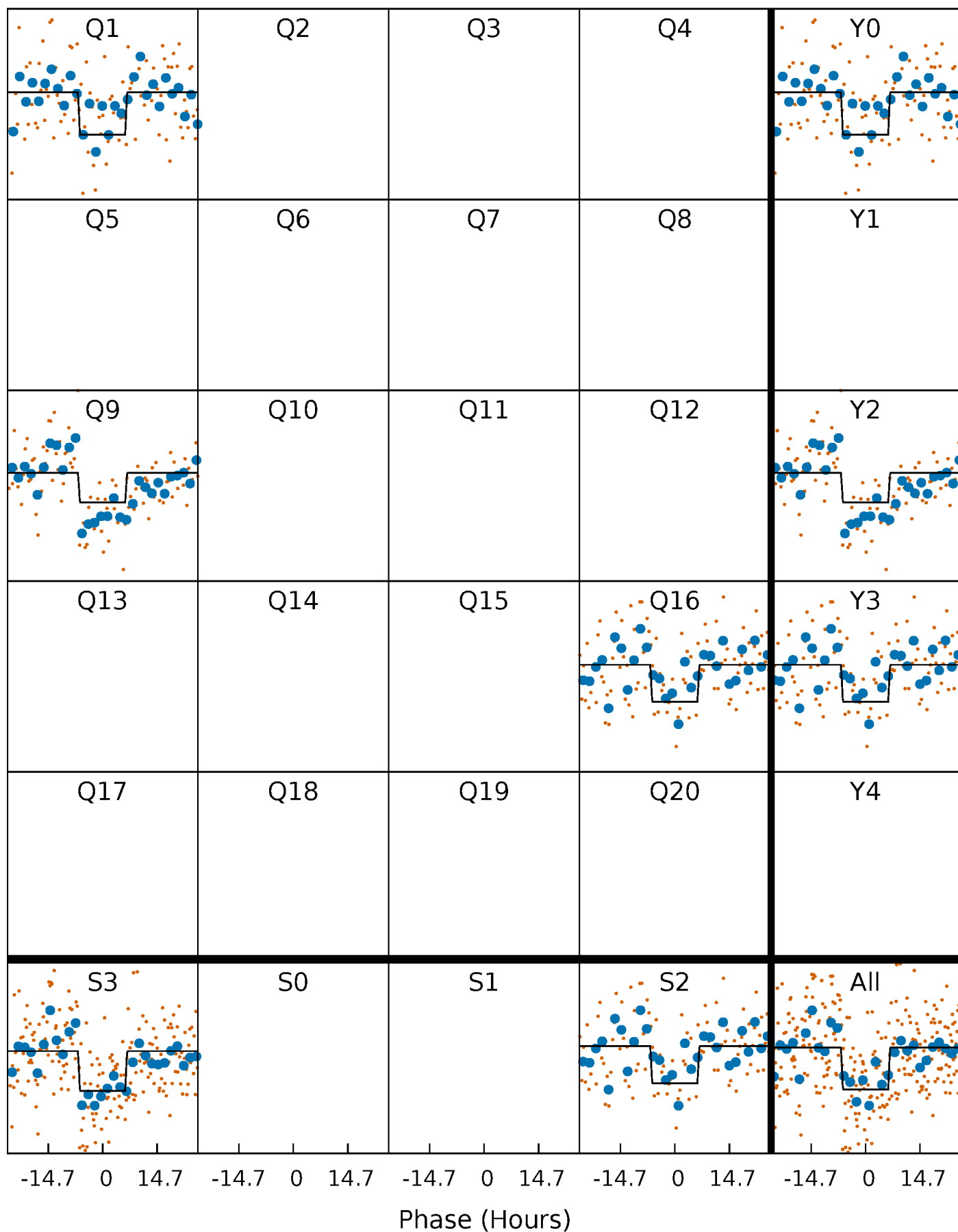
# DV Quarter-Phased Transit Curves

TCE 012016517-01 P=689.823307 Days  $T_0=139.767611$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

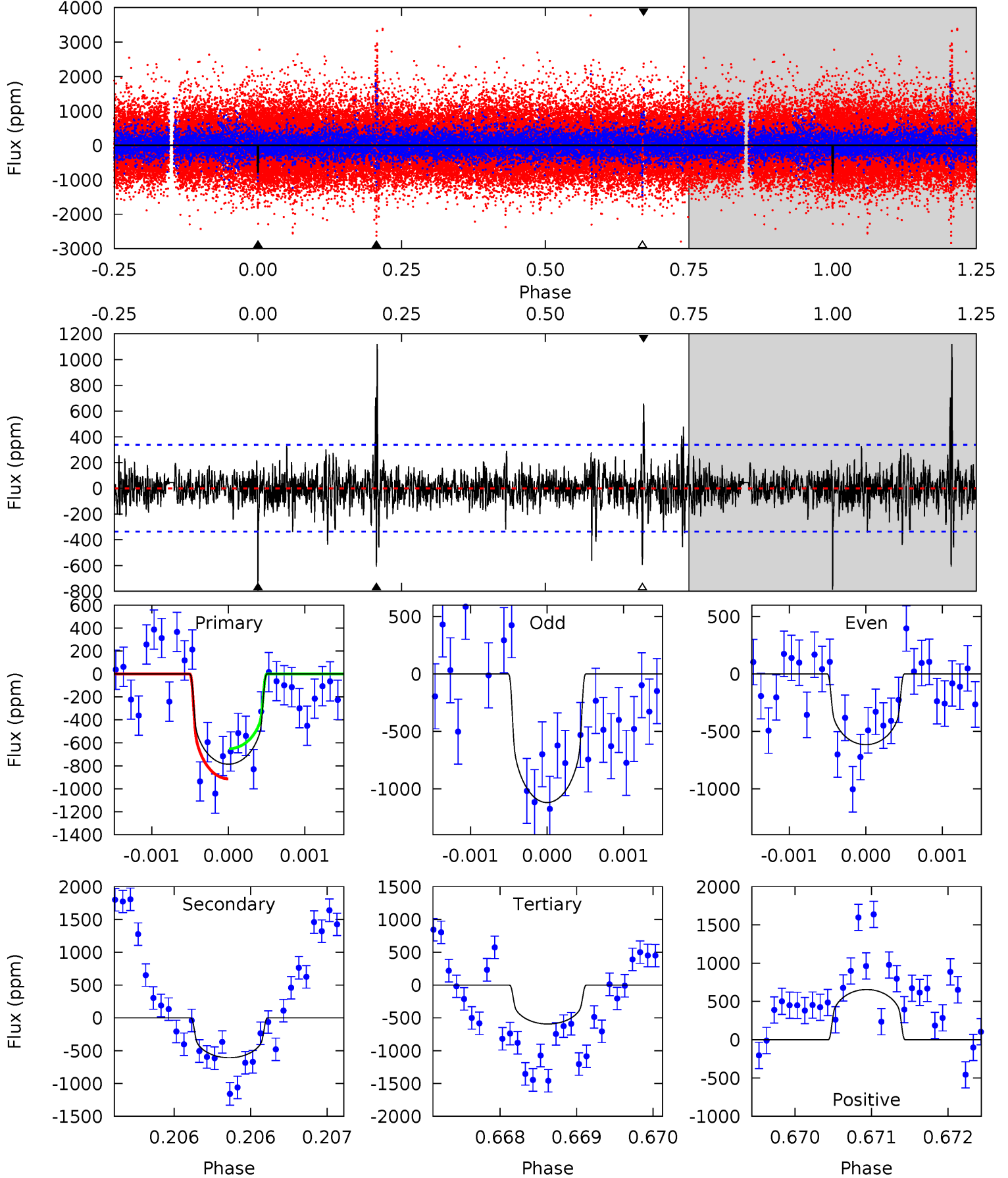
TCE 012016517-01 P=689.809741 Days  $T_0=139.765035$  (BKJD)



# DV Model-Shift Uniqueness Test

012016517-01, P = 689.823307 Days, E = 139.767611 Days

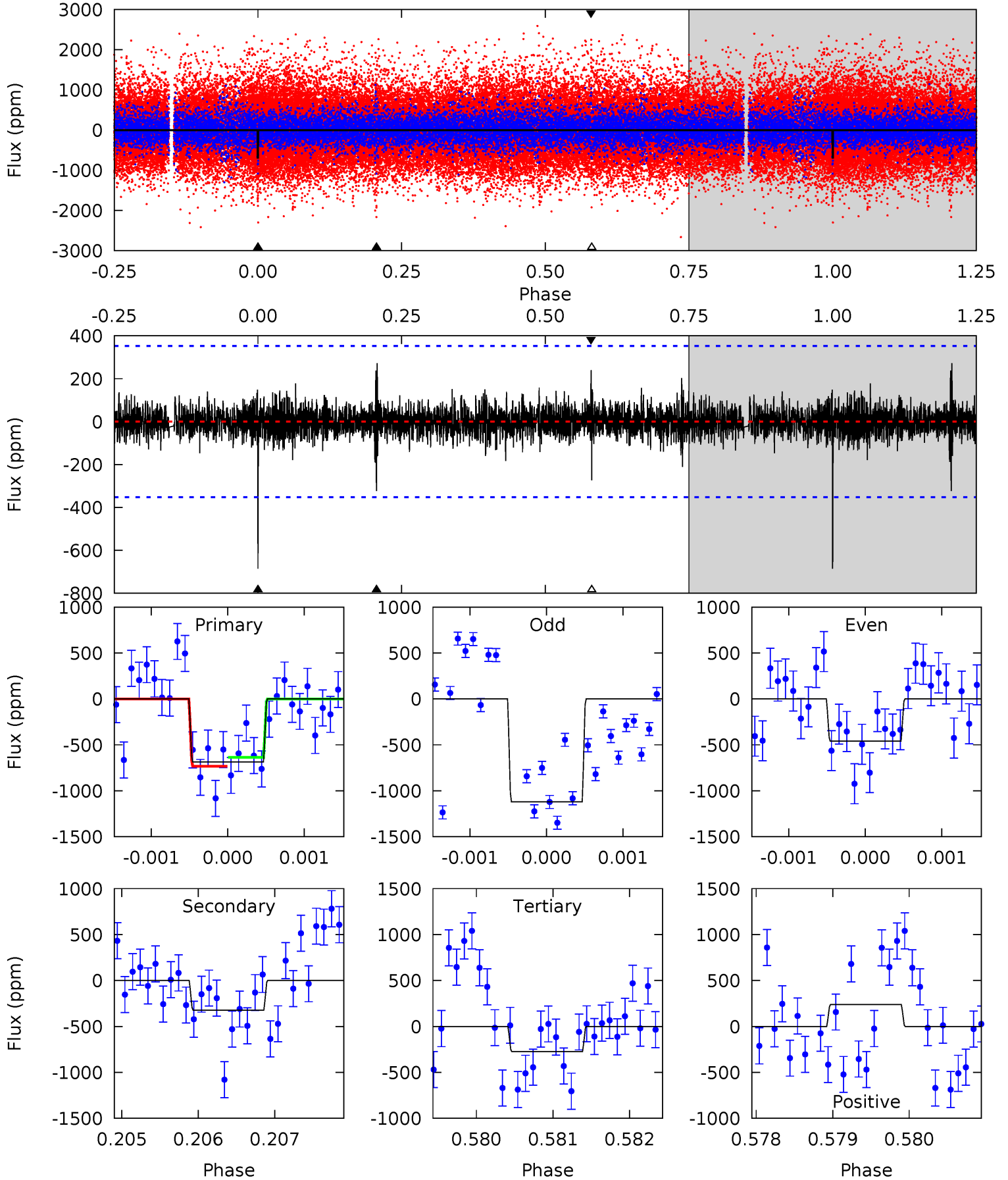
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	9.86	9.63	10.6	5.47	3.32	1.68	3.12	2.11	0.24	-0.77	3.83	1.20	0.59	2.13



# Alt Model-Shift Uniqueness Test

012016517-01, P = 689.809741 Days, E = 139.765035 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
10.7	5.04	4.27	3.73	5.49	3.36	0.73	6.43	6.96	0.77	1.31	4.85	1.46	0.28	0.76



### Stellar Parameters For KIC 012016517

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4719^{+140}_{-140}$	$4.586^{+0.040}_{-0.036}$	$0.120^{+0.250}_{-0.300}$	$0.735^{+0.047}_{-0.058}$	$0.760^{+0.052}_{-0.064}$	$2.696^{+0.521}_{-0.325}$
	+3%/-3%	+1%/-1%	+208%/-250%	+6%/-8%	+7%/-8%	+19%/-12%
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 012016517-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-608 \pm 62$	$2.29^{+0.92}_{-0.86}$	$211^{+7}_{-7}$	$4433^{+1016}_{-509}$	$124335^{+196834}_{-61801}$
Alt.	$-323 \pm 64$	$2.19^{+0.84}_{-0.88}$	$211^{+7}_{-7}$	$4037^{+839}_{-460}$	$71331^{+121399}_{-35427}$

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

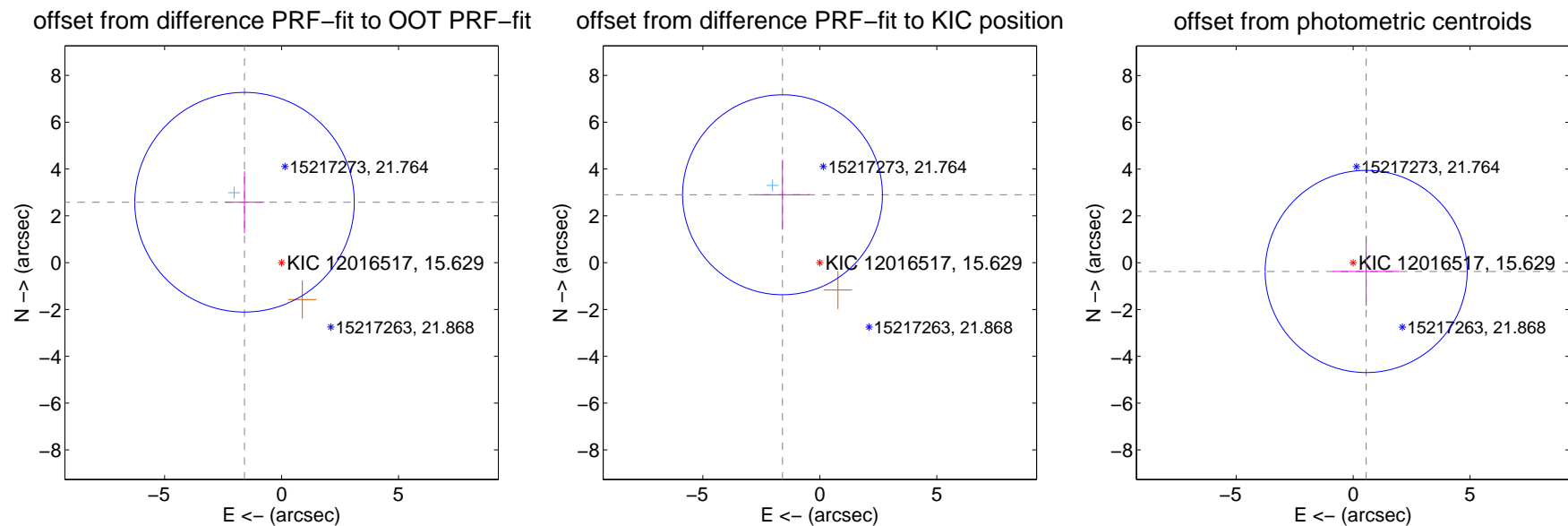
## DV Centroid Data

Supplemental centroid analysis for 012016517-01. Kepler magnitude: 15.63. Transit SNR 8.36

There are 1 quarters with good PRF difference image offsets

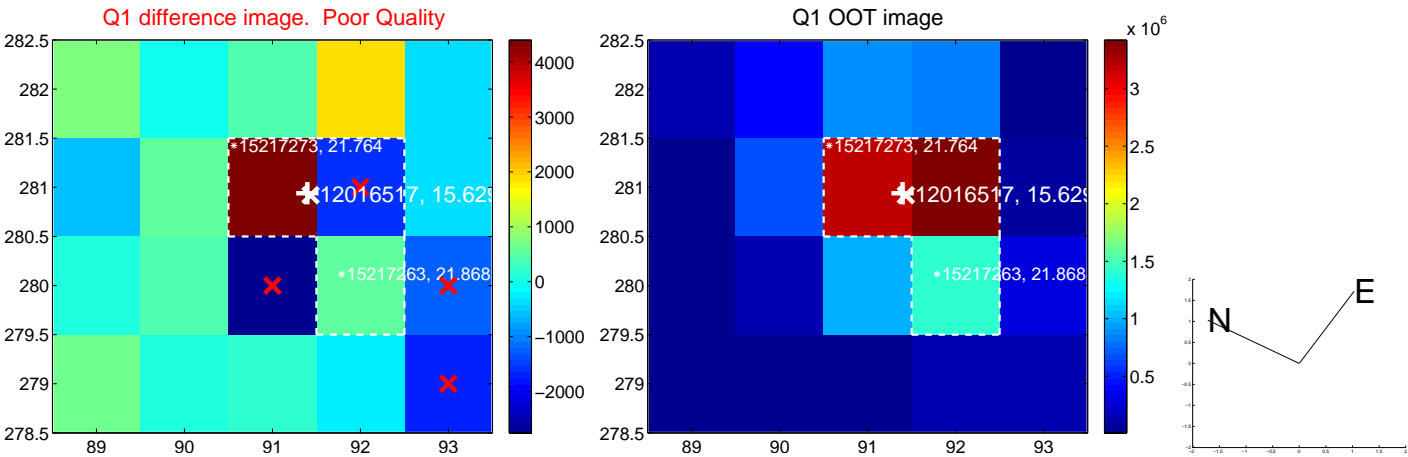
The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.028 \pm 1.564$	1.94	$1.583 \pm 0.843$	$2.581 \pm 1.319$
PRF-fit source offset from KIC position	$3.310 \pm 1.424$	2.32	$1.596 \pm 1.175$	$2.899 \pm 1.491$
photometric centroid source offset	$0.67 \pm 1.44$	0.47	$-0.56 \pm 1.43$	$-0.37 \pm 1.47$



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.

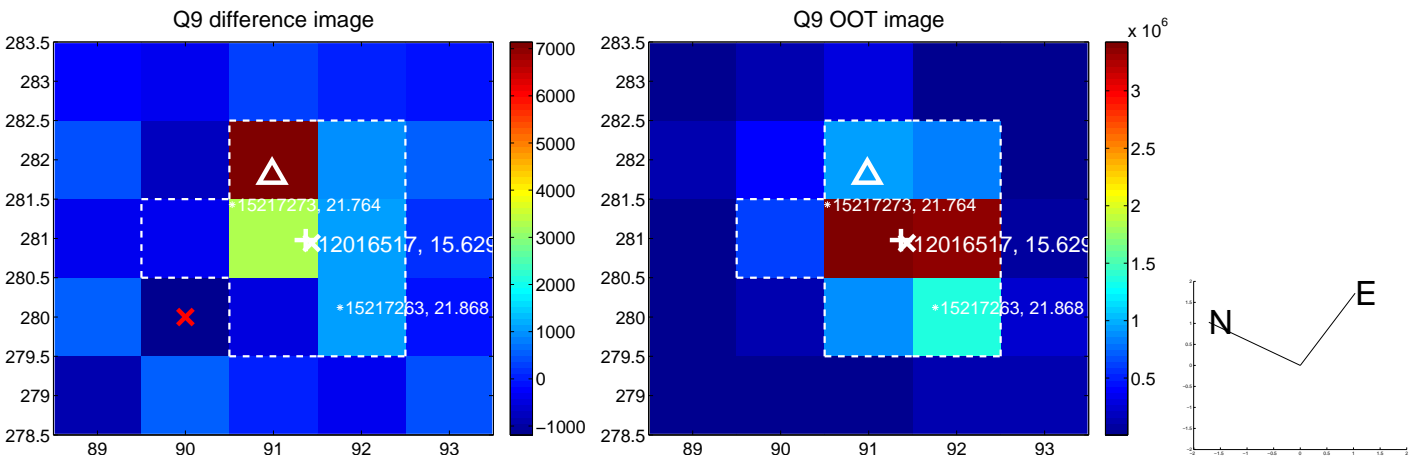




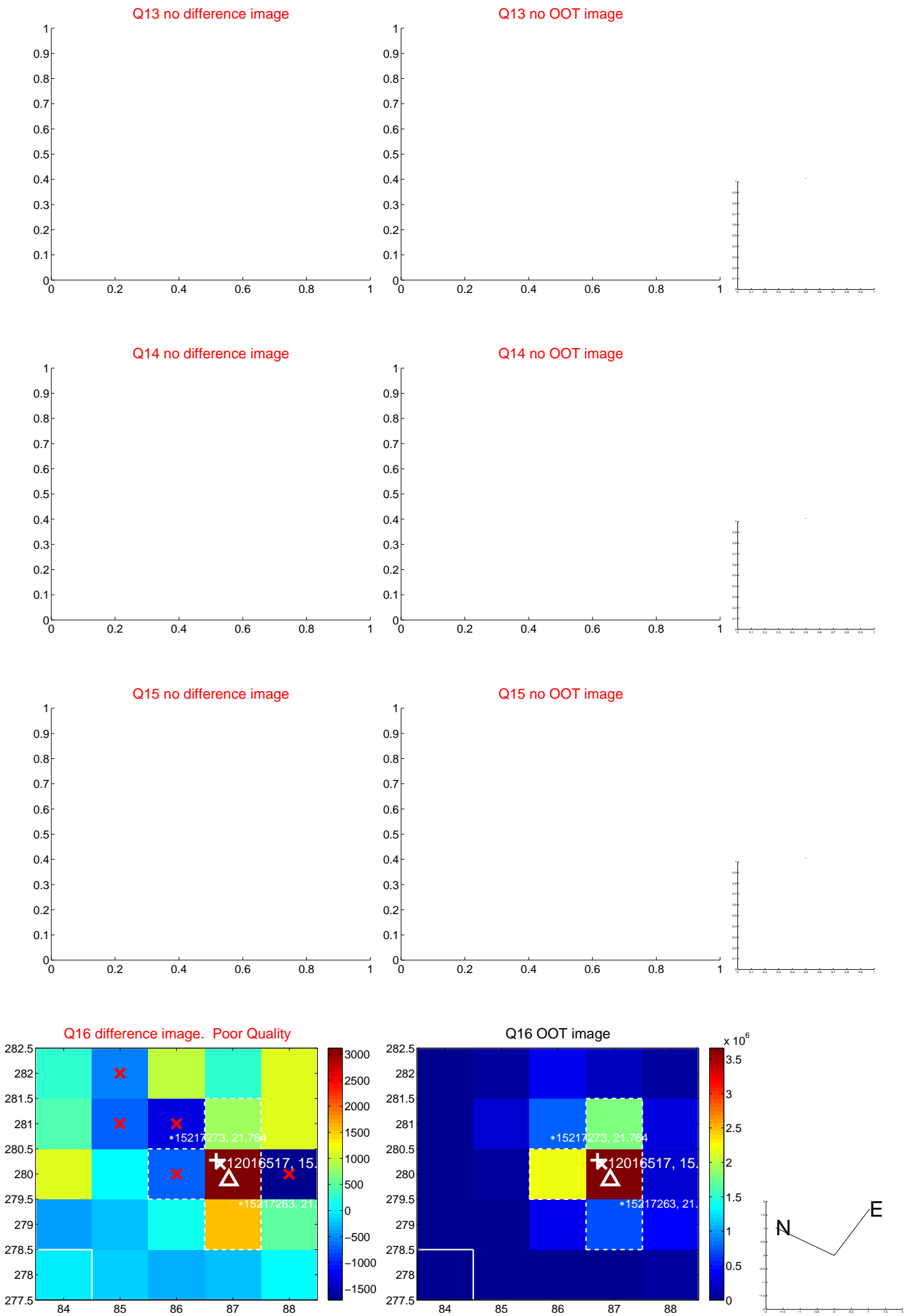
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



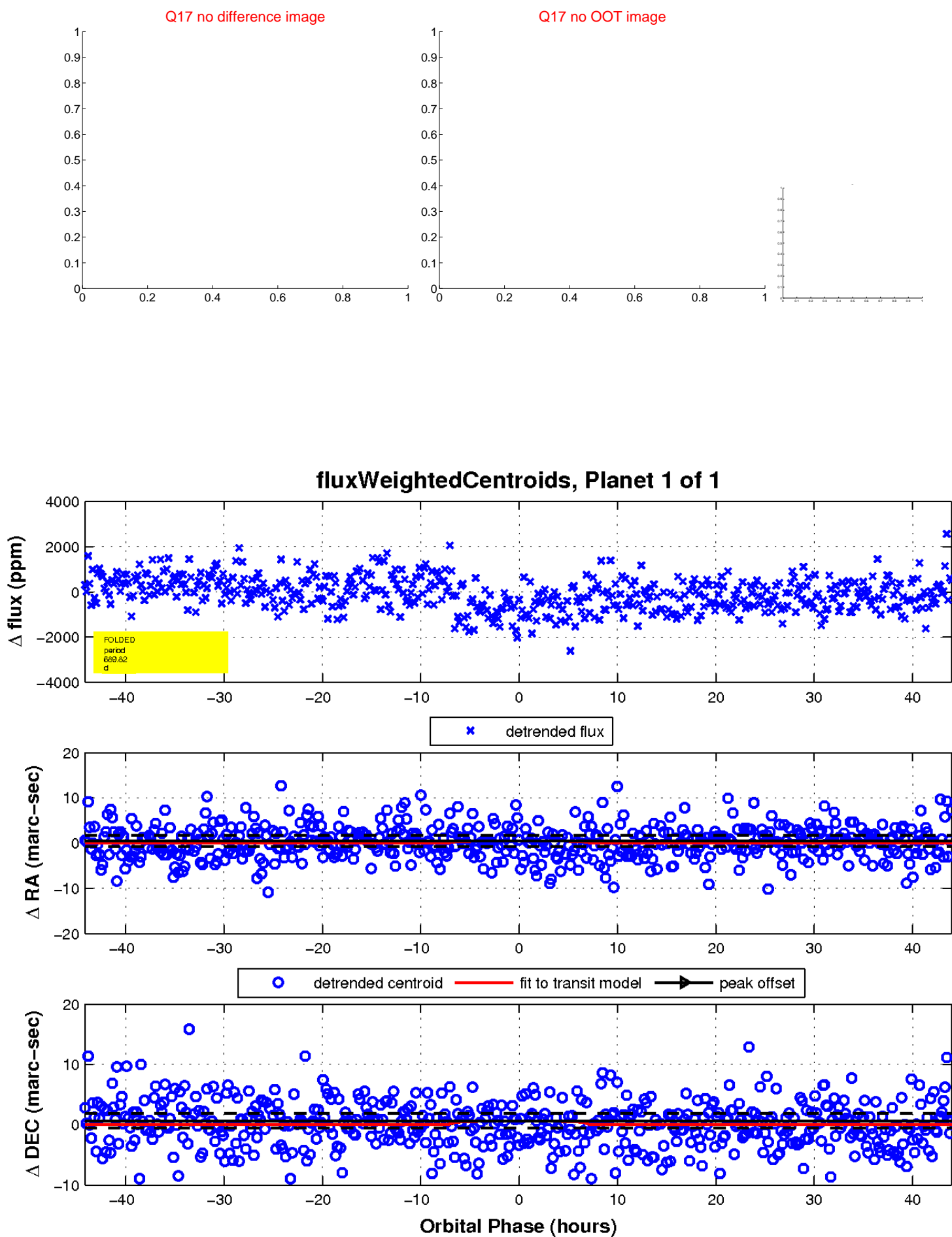
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

