

# KIC 012121118

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012121118-01	OBS	8235.01	495.061862	245.488559	365.1	17.367	7.3	7.4	0.97	6075	2.02	0.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012121118-01	OBS	FP	0.01	1	0	0	0	ALL_TRANS_CHASES—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.

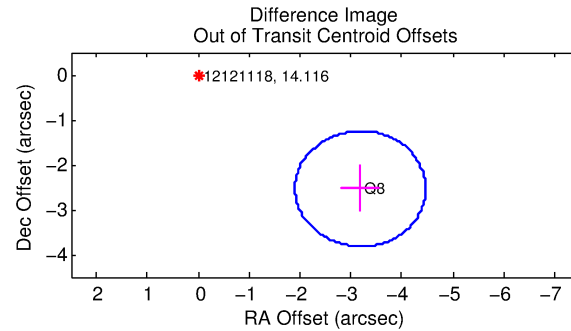
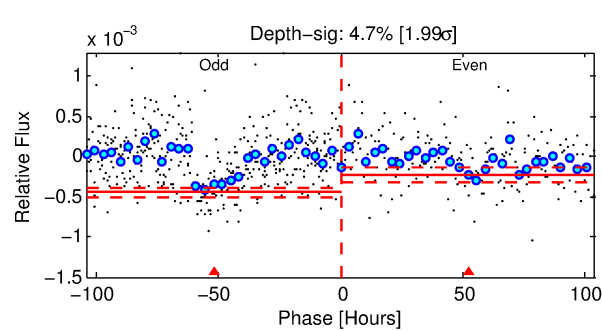
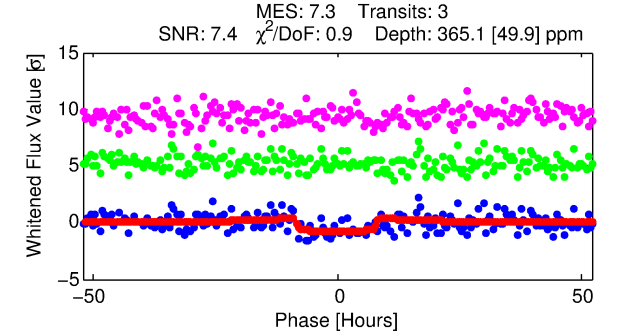
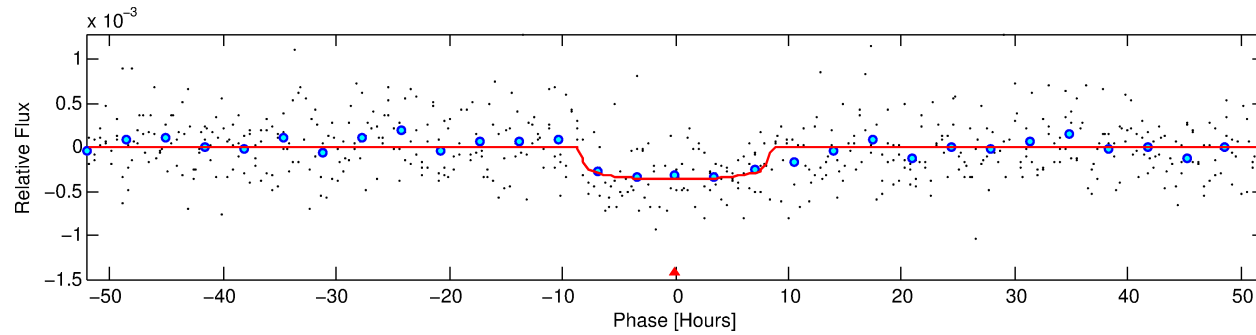
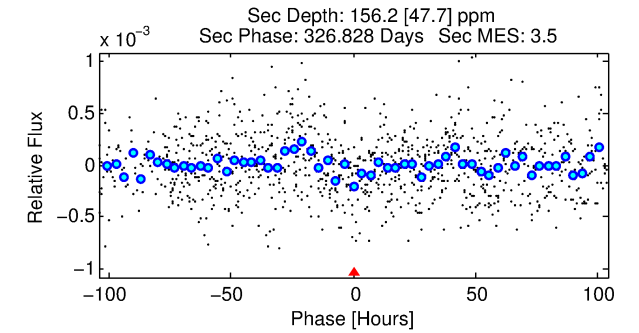
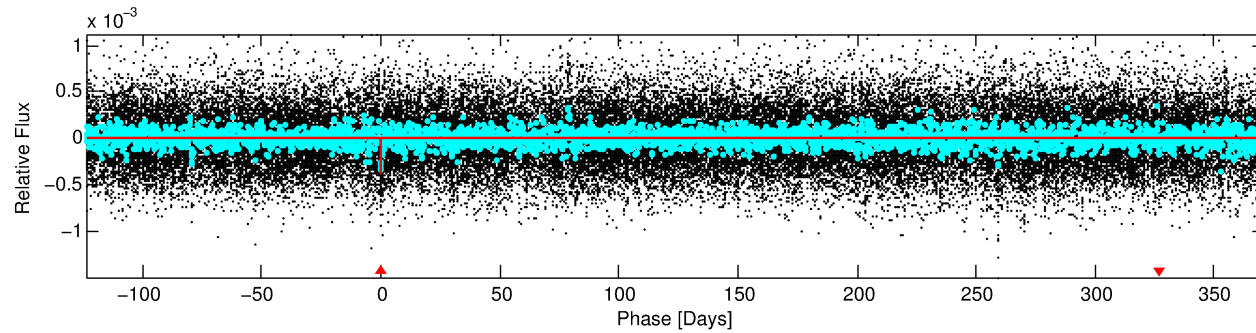
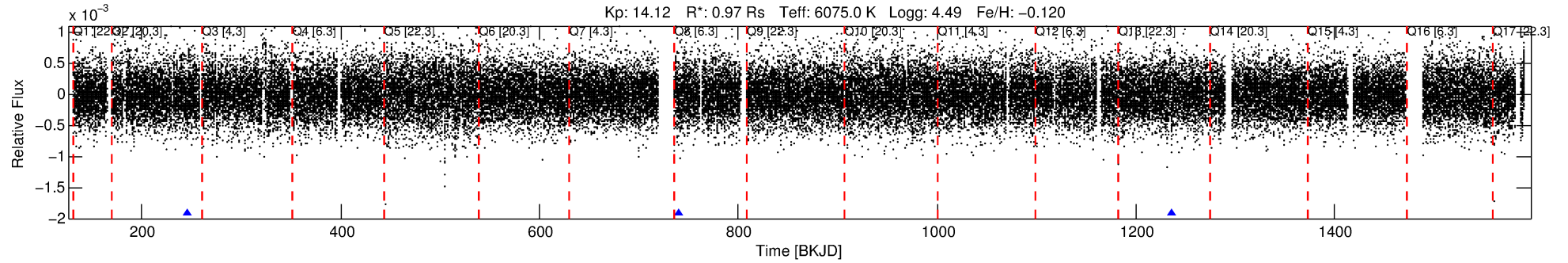
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012121118-01

No Significant Match Found

# DV One-Page Summary

KIC: 12121118 Candidate: 1 of 1 Period: 495.062 d



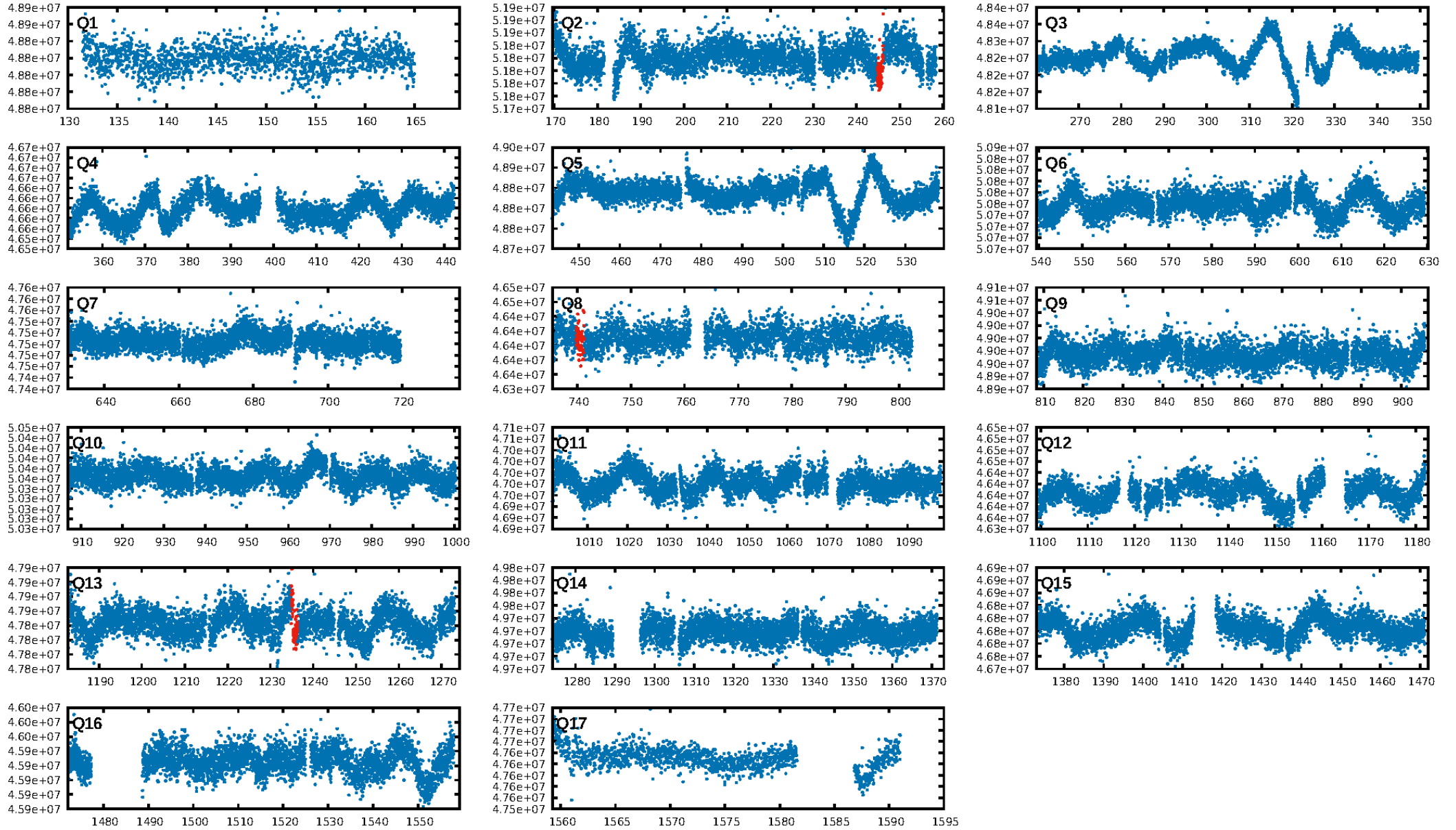
## DV Fit Results:

Period = 495.06186 [0.02106] d  
Epoch = 245.4886 [0.0230] BKJD  
Rp/R\* = 0.0191 [0.0049]  
a/R\* = 145.29 [173.07]  
b = 0.77 [0.64]  
Seff = 0.74 [0.29]  
Teff = 236 [23] K  
Rp = 2.02 [0.81] Re  
a = 1.2446 [0.3201] AU  
Ag = 32481.85 [22723.19] [1.43 $\sigma$ ]  
Teffp = 4908 [746] K [6.26 $\sigma$ ]

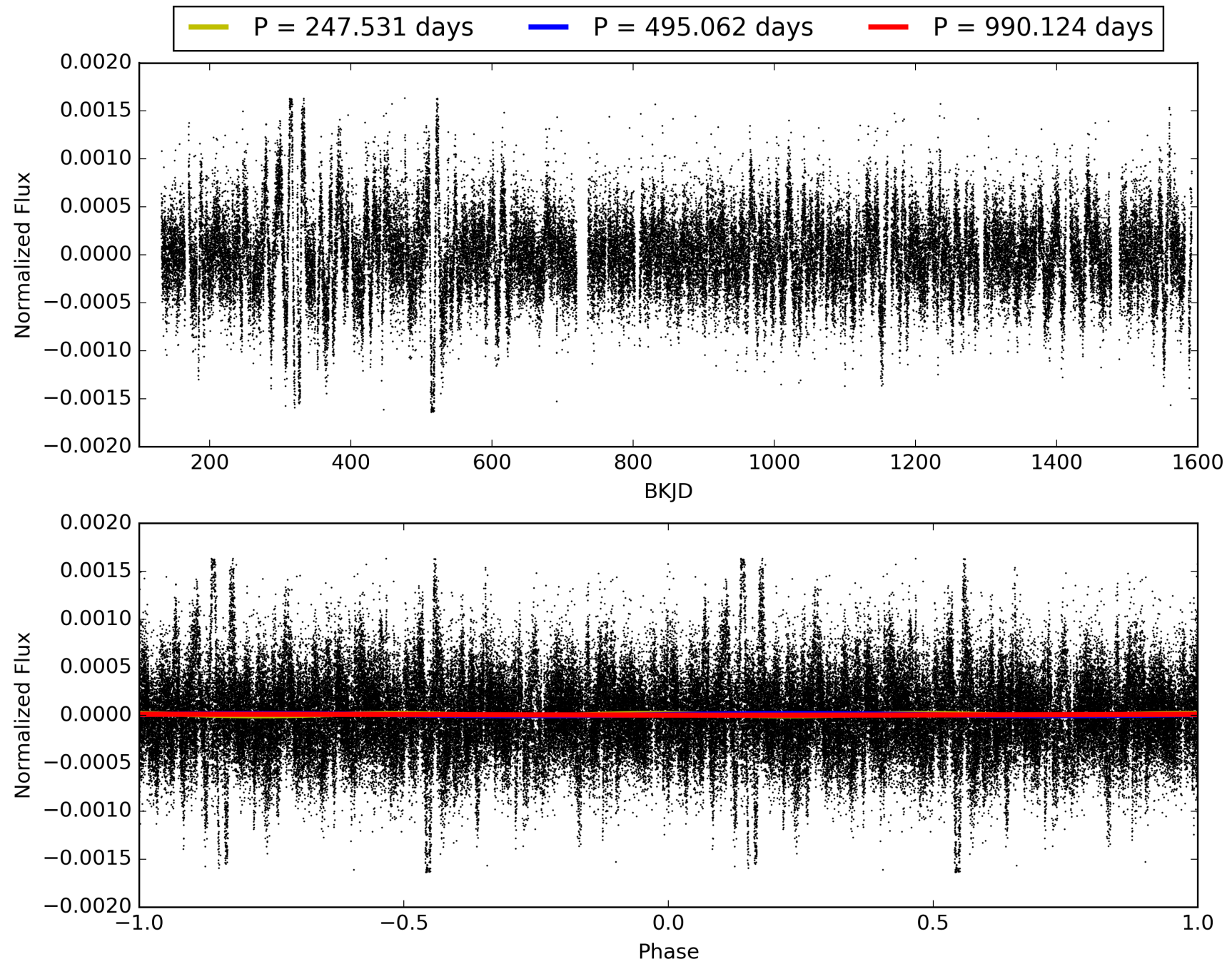
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 6.2%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.24e-12**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 15.18  
Centroid-sig: 1.0%  
Centroid-so: 2.239 arcsec [1.73 $\sigma$ ]  
**OotOffset-rm: 4.073 arcsec [9.51 $\sigma$ ]**  
**KicOffset-rm: 1.876 arcsec [4.61 $\sigma$ ]**  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [2/2]

# TCE 012121118-01, PDC Light Curves

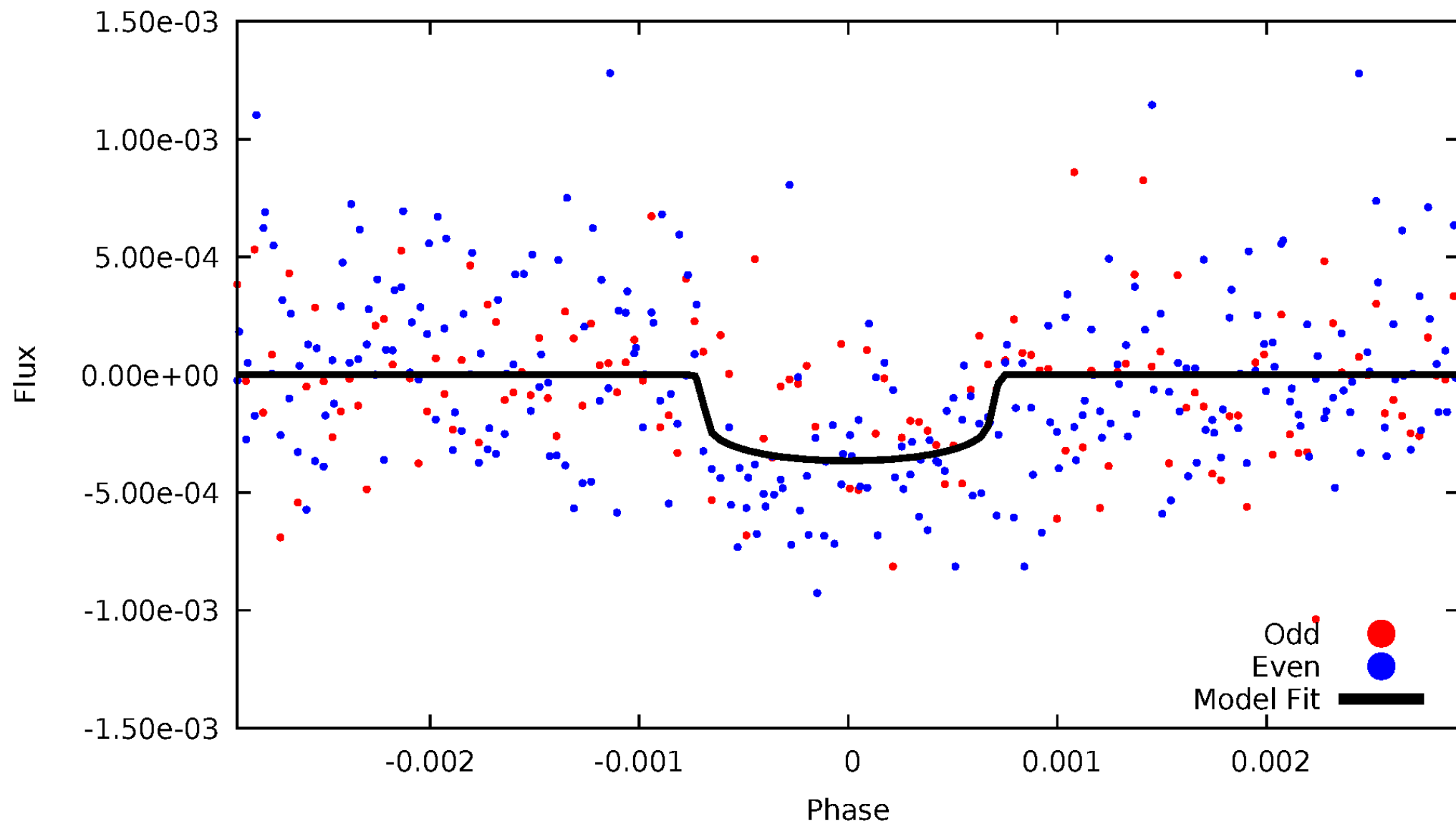


TCE 012121118-01



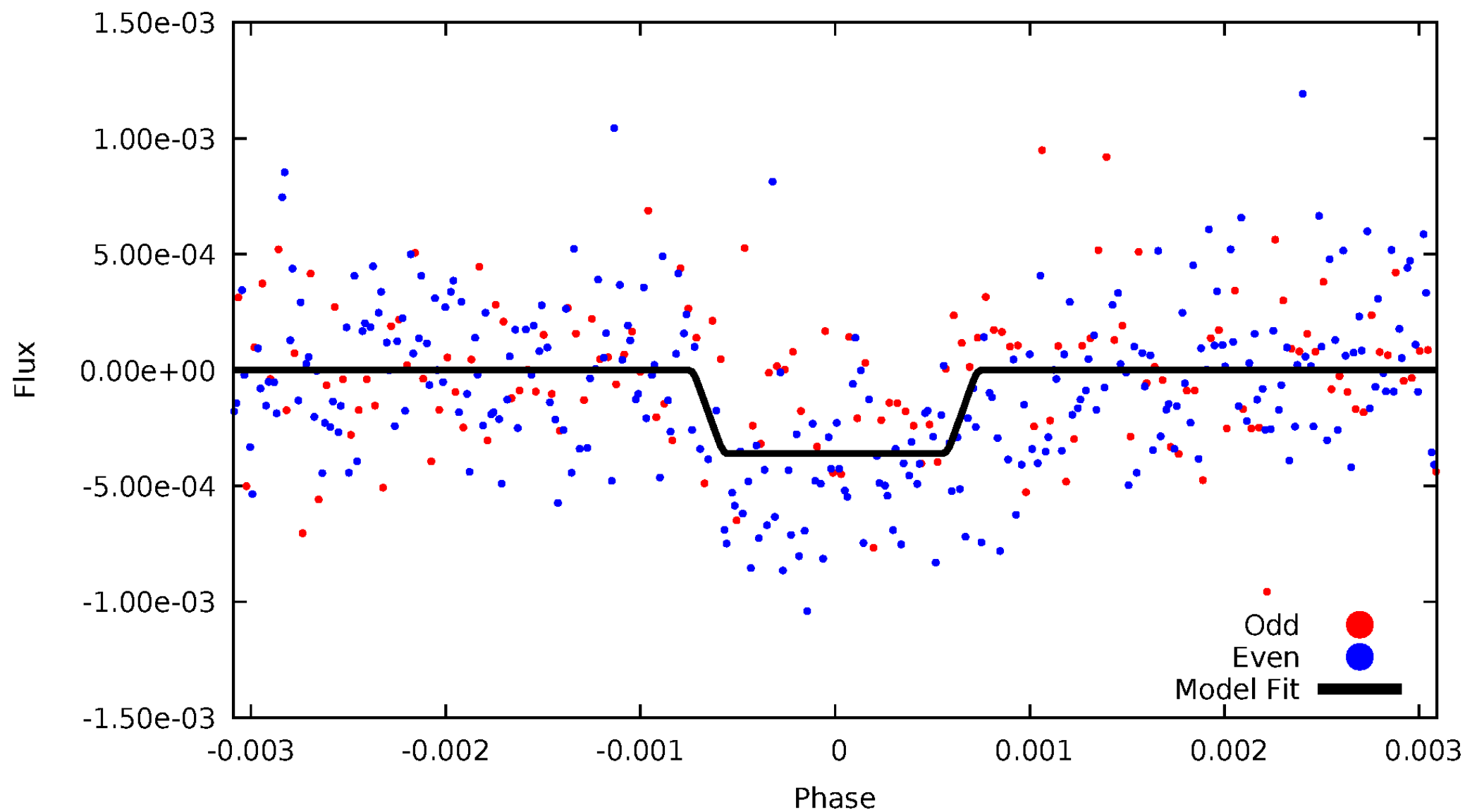
# DV Odd/Even

TCE 012121118-01

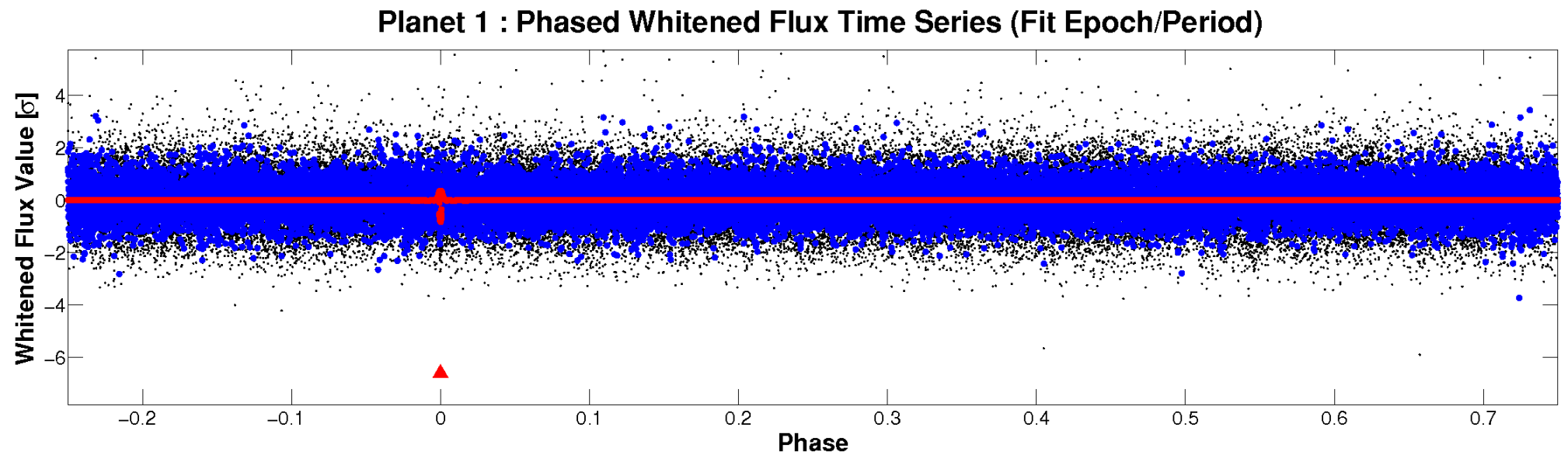
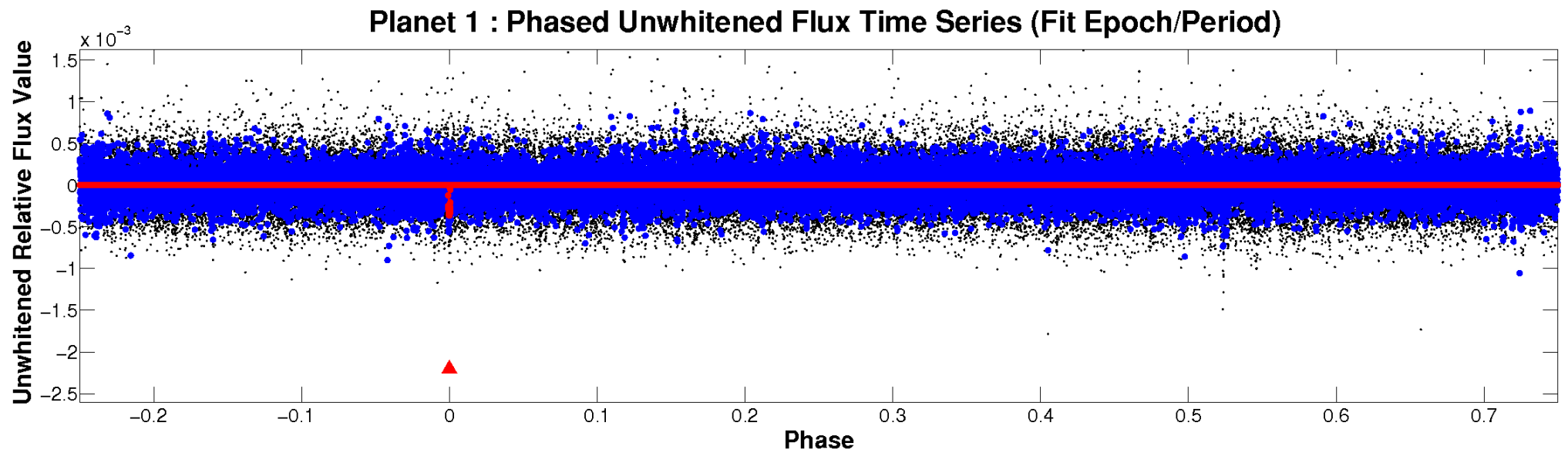


# ALT Odd/Even

TCE 012121118-01



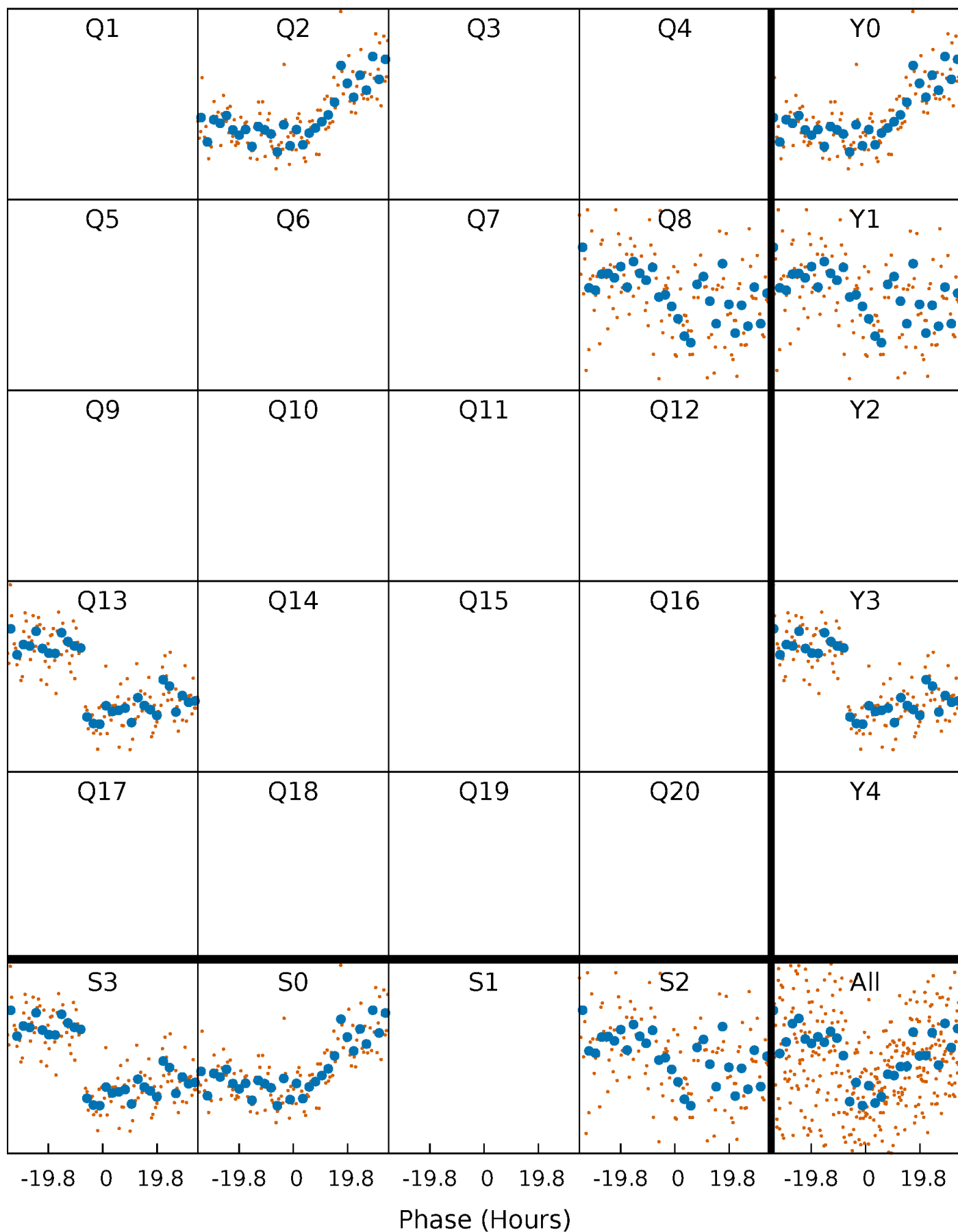
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

TCE 012121118-01 P=495.061862 Days  $T_0=245.488559$  (BKJD)





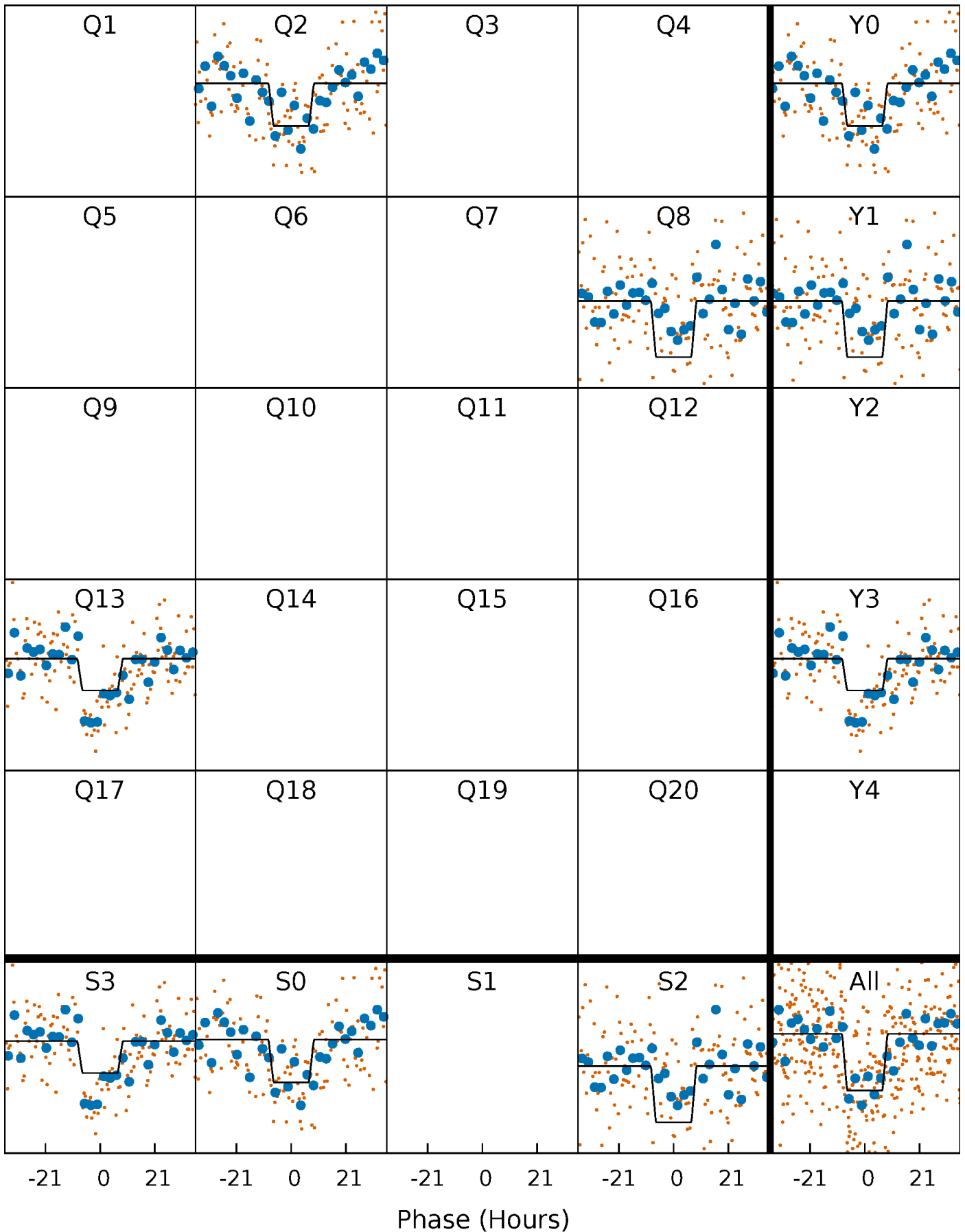
# DV Quarter-Phased Transit Curves

TCE 012121118-01 P=495.061862 Days  $T_0=245.488559$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

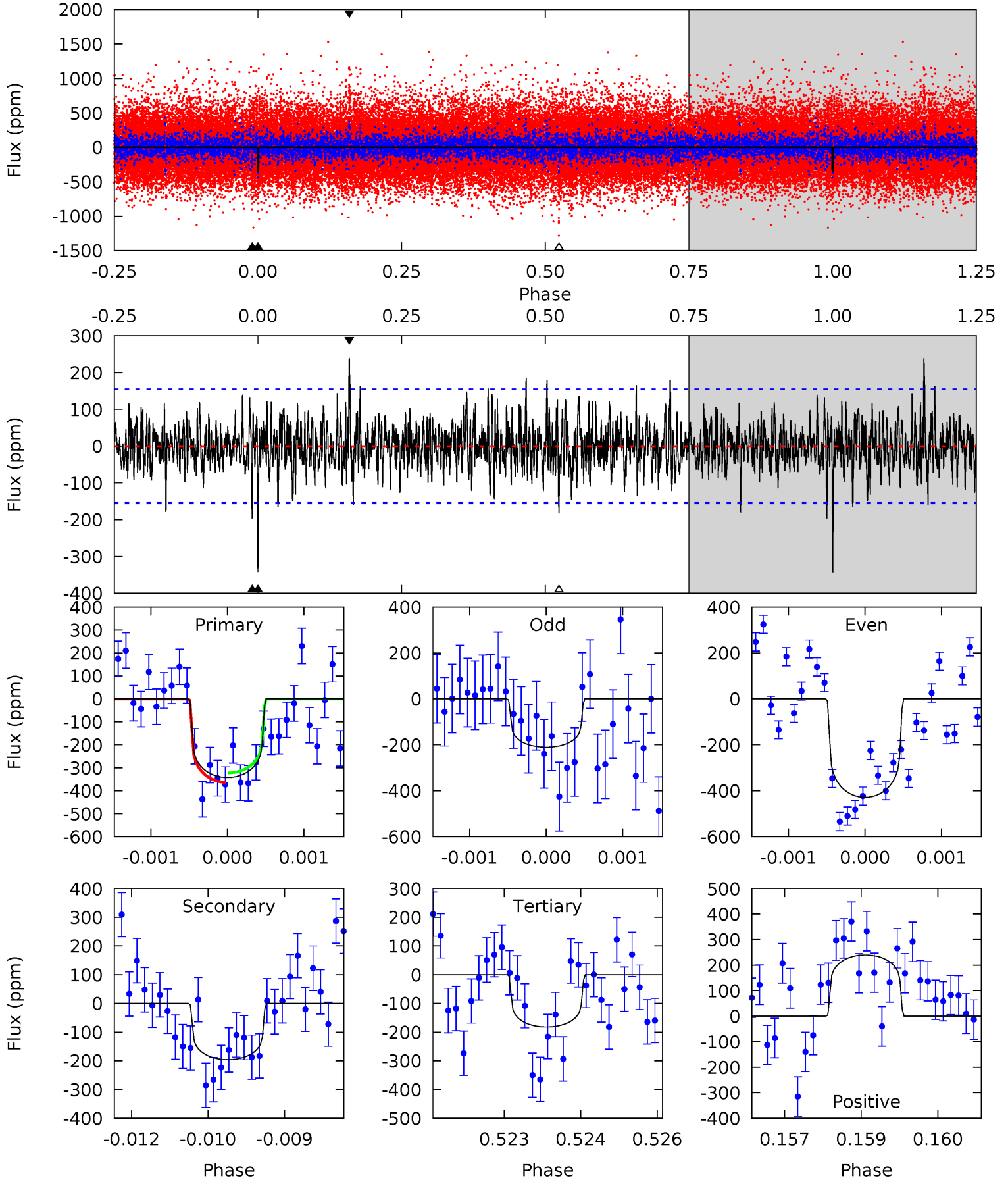
TCE 012121118-01 P=495.050669 Days  $T_0=245.508477$  (BKJD)



# DV Model-Shift Uniqueness Test

012121118-01, P = 495.061862 Days, E = 245.488559 Days

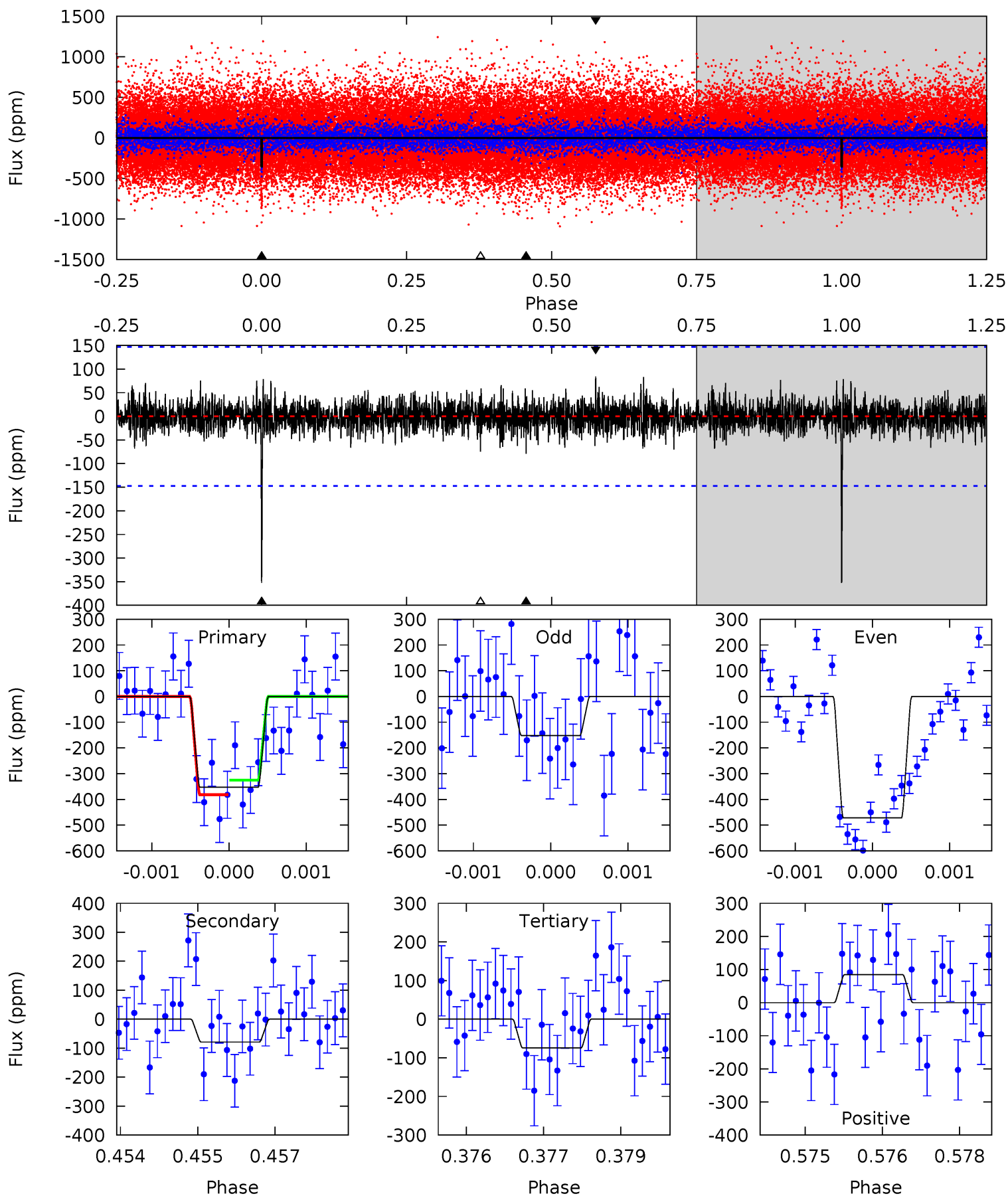
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	6.81	6.33	8.34	5.38	3.18	1.76	5.57	3.56	0.48	-1.53	3.56	1.05	0.41	0.72



# Alt Model-Shift Uniqueness Test

012121118-01, P = 495.050669 Days, E = 245.508477 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
12.9	2.88	2.72	3.08	5.38	3.18	0.76	10.1	9.80	0.16	-0.19	5.49	1.02	0.19	1.04



### Stellar Parameters For KIC 012121118

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6075^{+180}_{-198}$	$4.486^{+0.050}_{-0.200}$	$-0.120^{+0.300}_{-0.300}$	$0.969^{+0.300}_{-0.100}$	$1.048^{+0.142}_{-0.142}$	$1.622^{+0.424}_{-0.808}$
	+3%/-3%	+1%/-4%	+250%/-250%	+31%/-10%	+14%/-14%	+26%/-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 012121118-01 / KOI 8235.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-196 \pm 29$	$2.12^{+0.61}_{-0.56}$	$337^{+25}_{-16}$	$5233^{+759}_{-508}$	$36234^{+29959}_{-14768}$
Alt.	$-79 \pm 27$	$2.16^{+0.62}_{-0.56}$	$338^{+25}_{-16}$	$4349^{+599}_{-477}$	$13947^{+14050}_{-6836}$

$T_{\text{max}}$  = 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

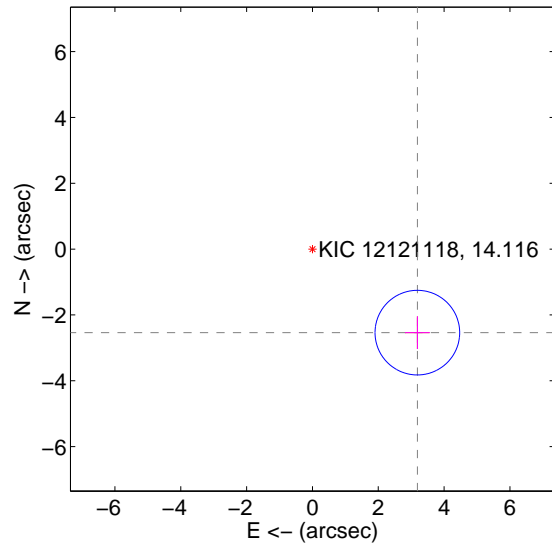
Supplemental centroid analysis for 012121118-01. Kepler magnitude: 14.12. Transit SNR 7.44

There are 0 quarters with good PRF difference image offsets

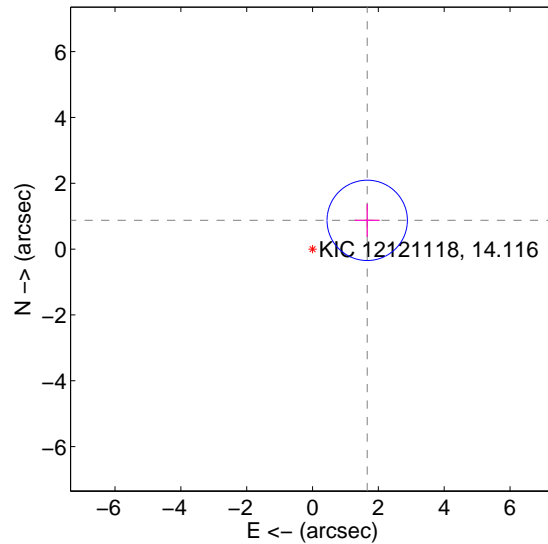
The OOT PRF centroid is offset from the target star catalog position by about 3.74 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.073 \pm 0.428$	9.51	$-3.186 \pm 0.377$	$-2.537 \pm 0.498$
PRF-fit source offset from KIC position	$1.876 \pm 0.407$	4.61	$-1.661 \pm 0.377$	$0.873 \pm 0.498$
photometric centroid source offset	$2.24 \pm 1.30$	1.73	$0.10 \pm 1.06$	$2.24 \pm 1.30$

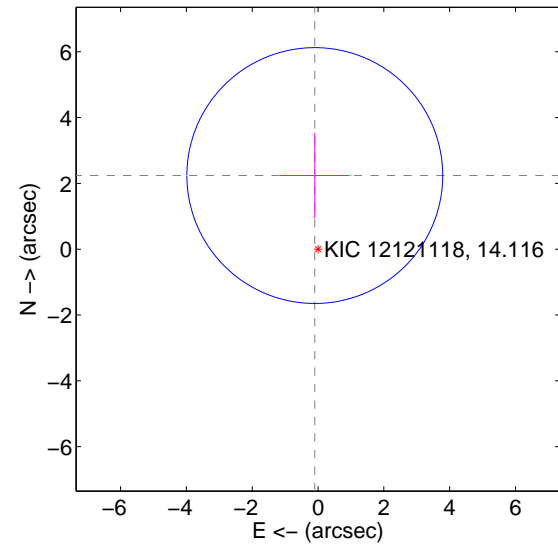
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



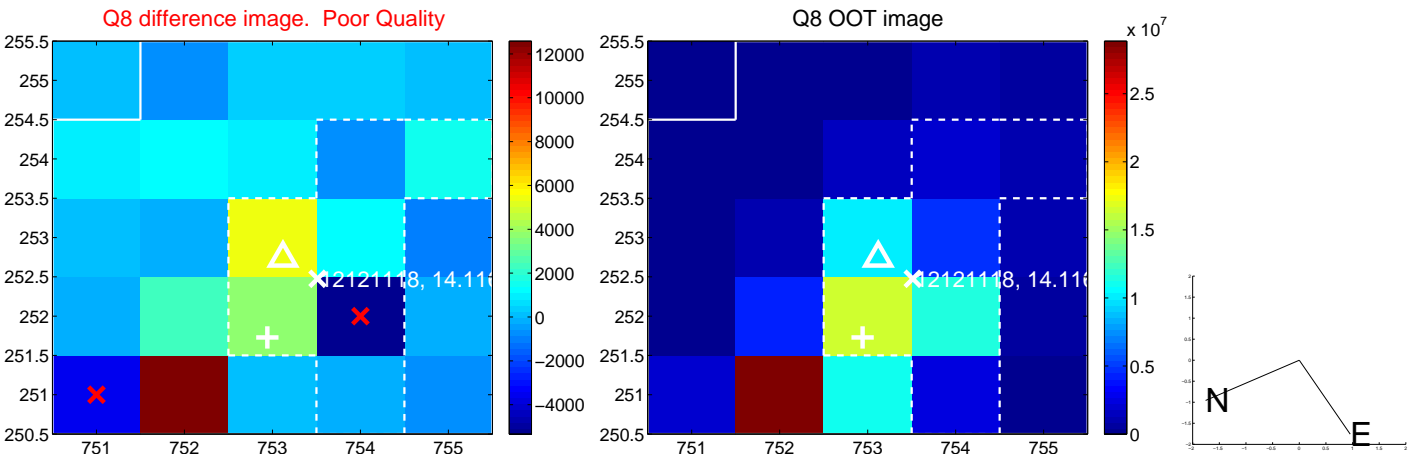
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





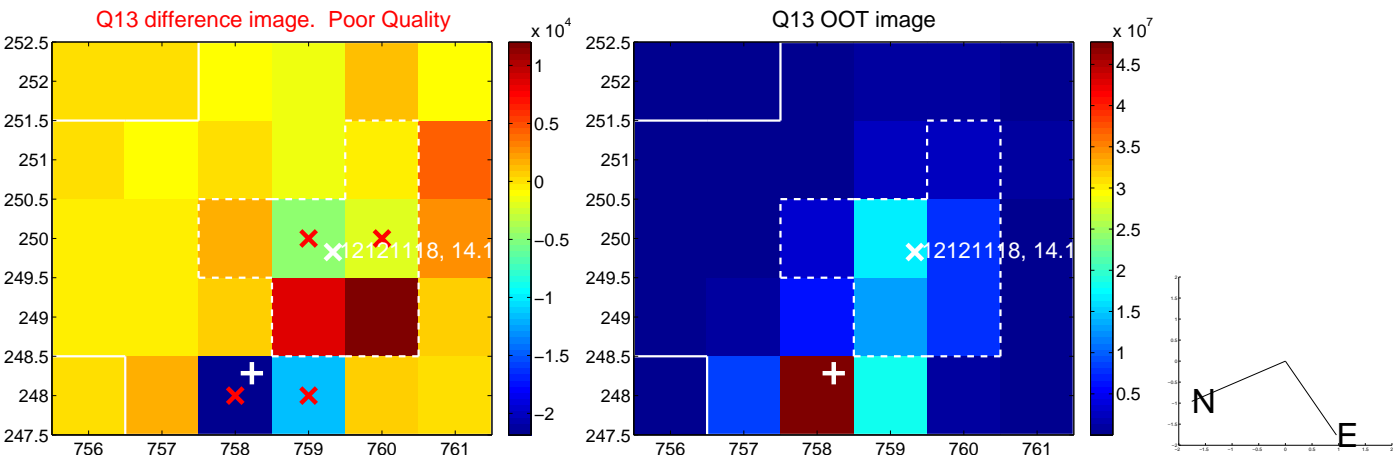
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



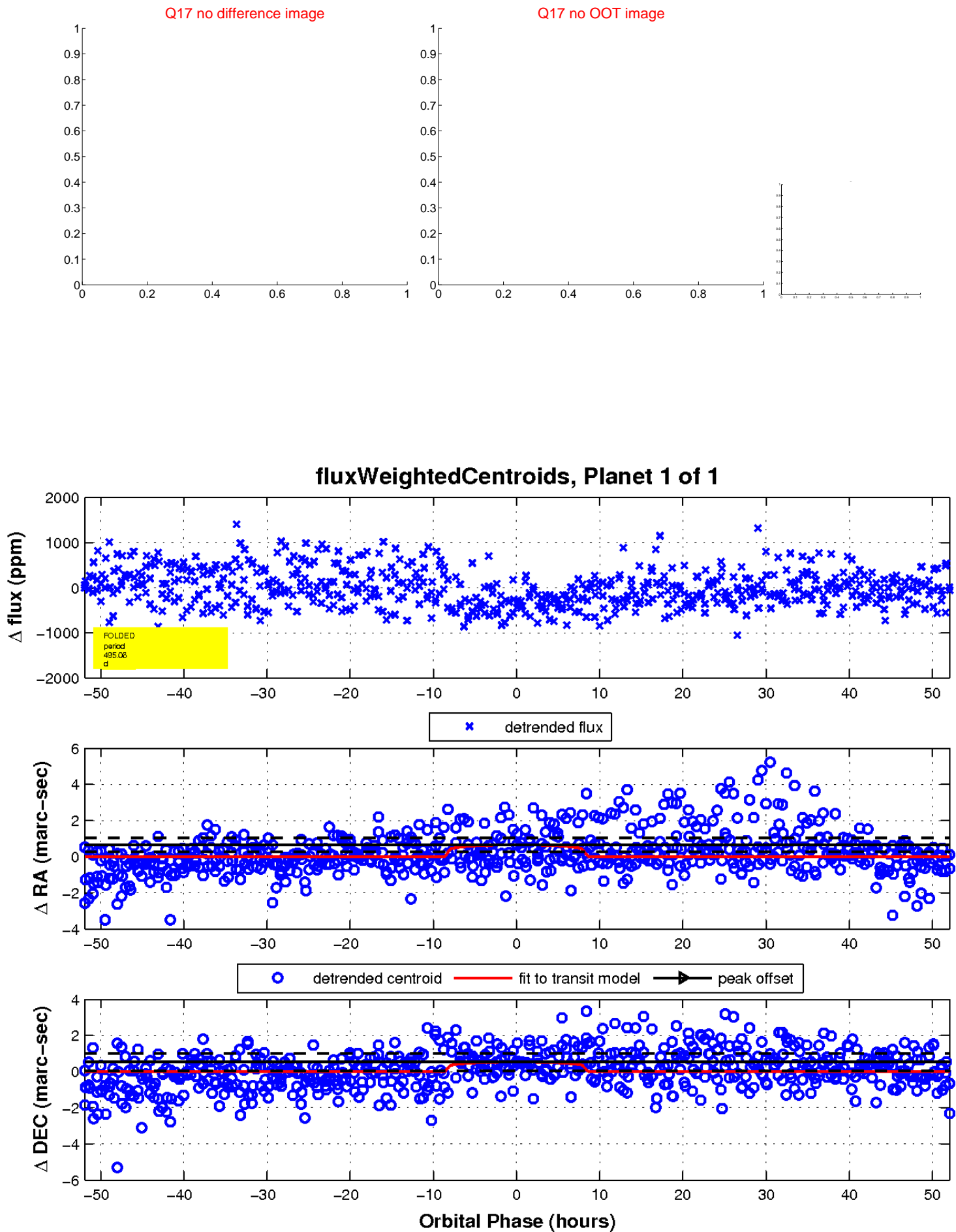
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

