

# KIC 012153613

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012153613-01	OBS	No	281.797081	386.473651	507.4	4.852	8.1	7.0	0.99	6014	2.52	1.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012153613-01	OBS	FP	0.00	1	0	0	0	<del>INDIV_TRANS_RUBBLE_MARSHALL_SKYE</del> <del>LPP_DV</del> <del>LPP_ALT</del> <del>MOD_NONUNIQ_ALT</del> <del>INCONSISTENT_TRANS</del> <del>CENT_FEW_DIFFS</del>

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

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

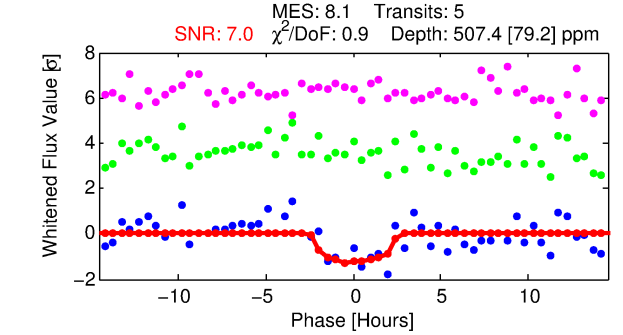
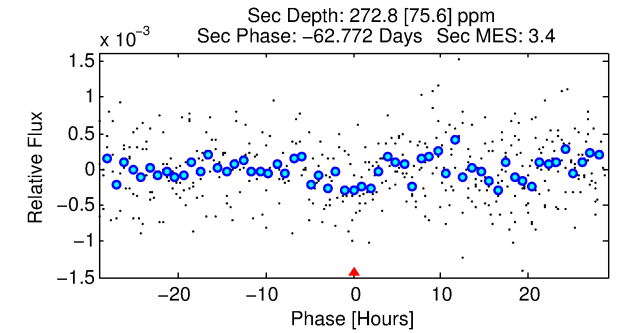
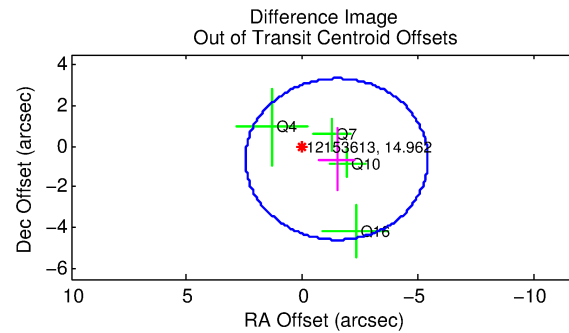
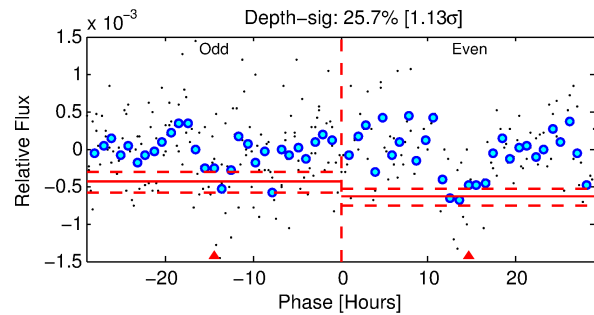
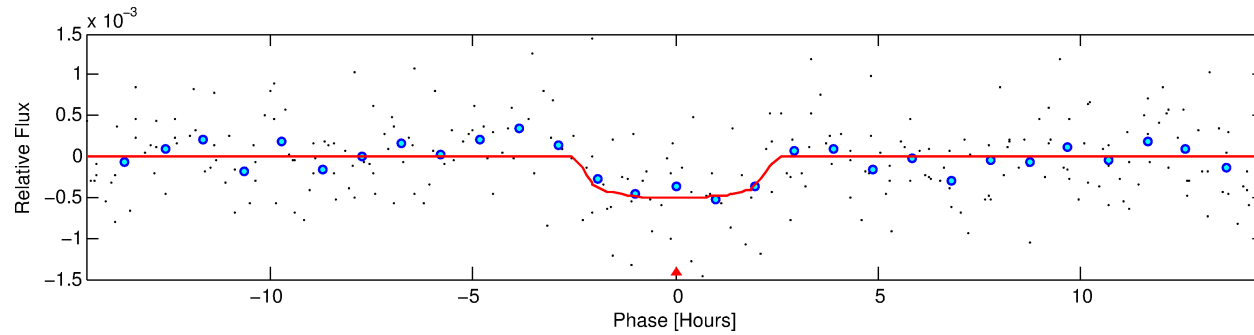
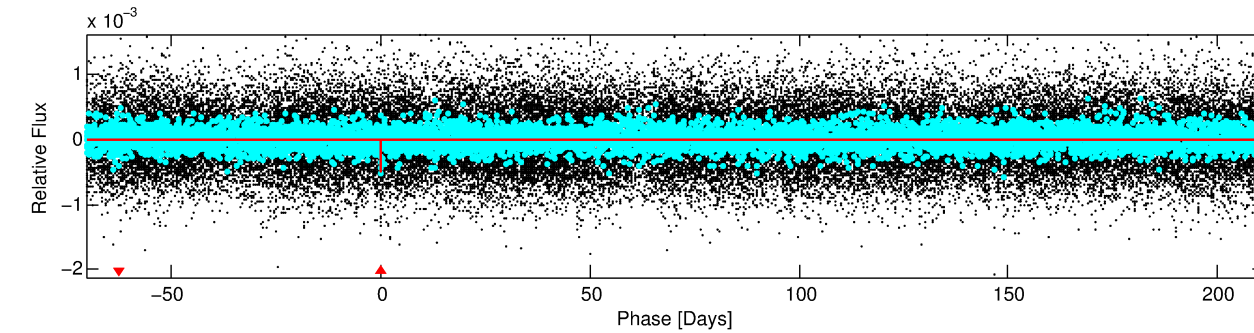
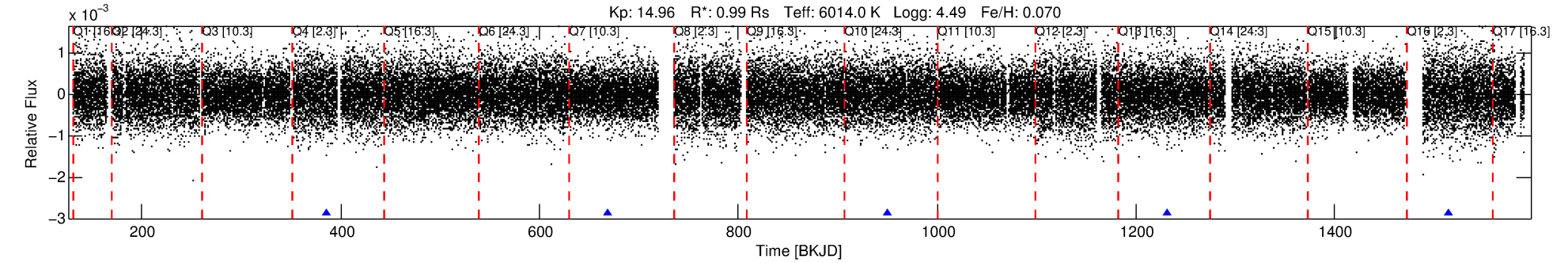
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012153613-01

No Significant Match Found

# DV One-Page Summary

KIC: 12153613 Candidate: 1 of 1 Period: 281.797 d



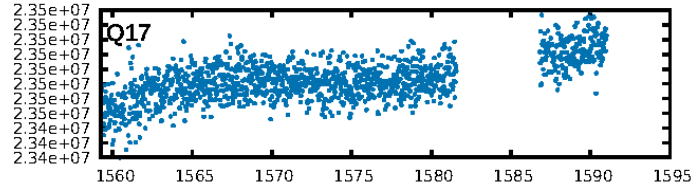
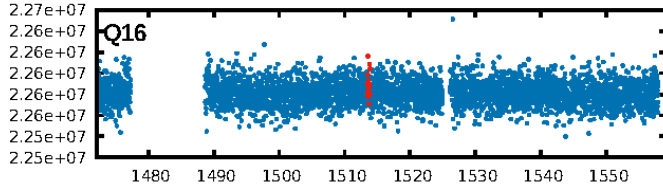
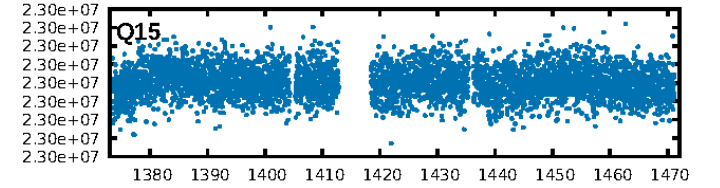
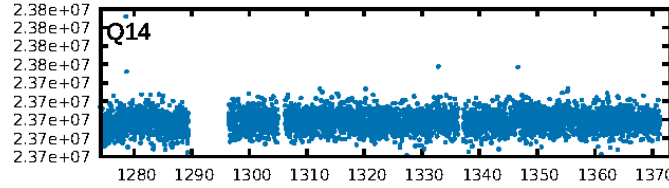
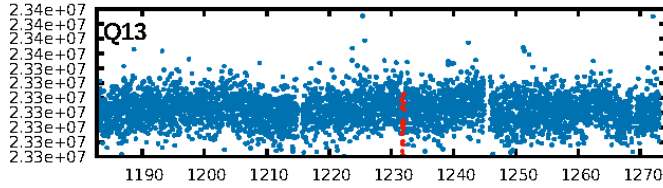
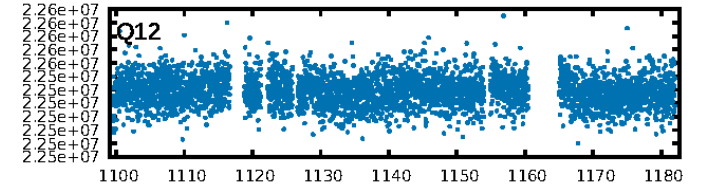
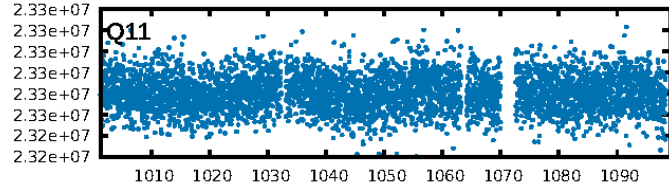
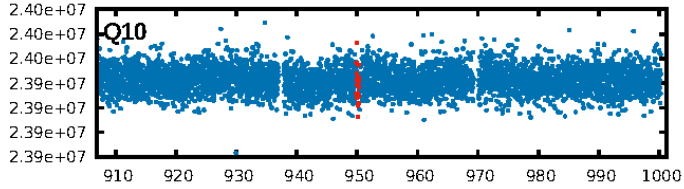
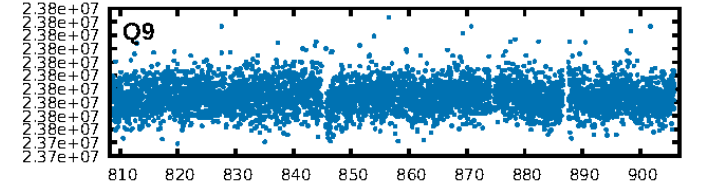
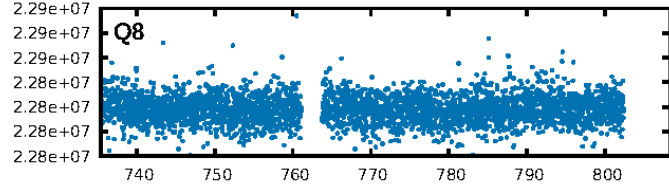
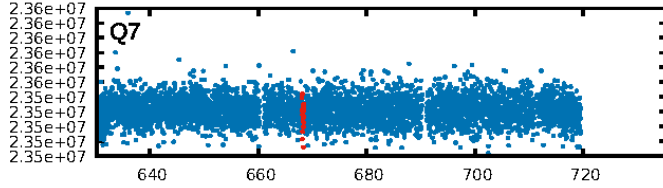
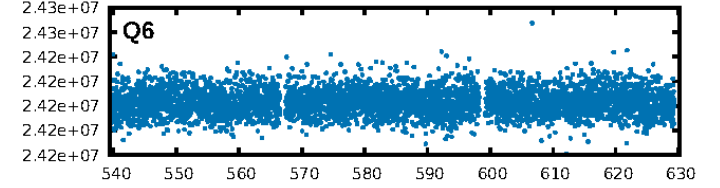
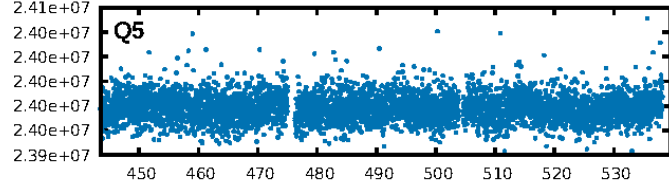
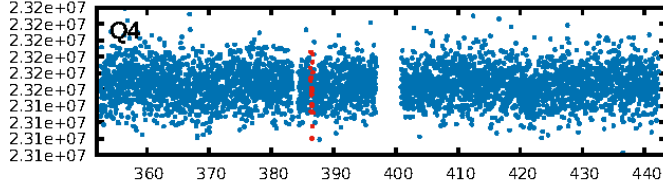
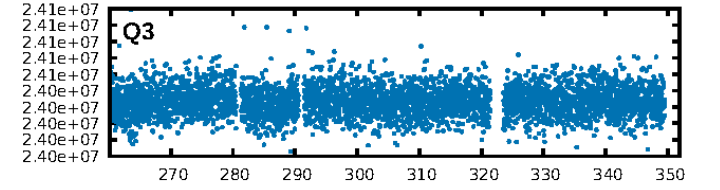
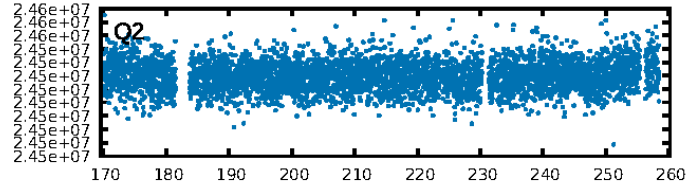
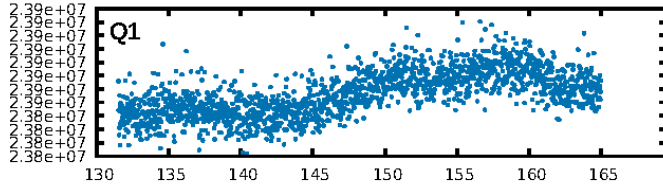
## DV Fit Results:

Period = 281.79708 [0.00722] d  
Epoch = 386.4737 [0.0141] BKJD  
Rp/R\* = 0.0232 [0.0238]  
a/R\* = 266.41 [1313.99]  
b = 0.83 [1.89]  
Seff = 1.53 [0.64]  
Teq = 284 [30] K  
Rp = 2.52 [2.69] Re  
a = 0.8689 [0.2297] AU  
Ag = 17906.41 [37744.95] [0.47 $\sigma$ ]  
Teff = 5073 [2632] K [1.82 $\sigma$ ]

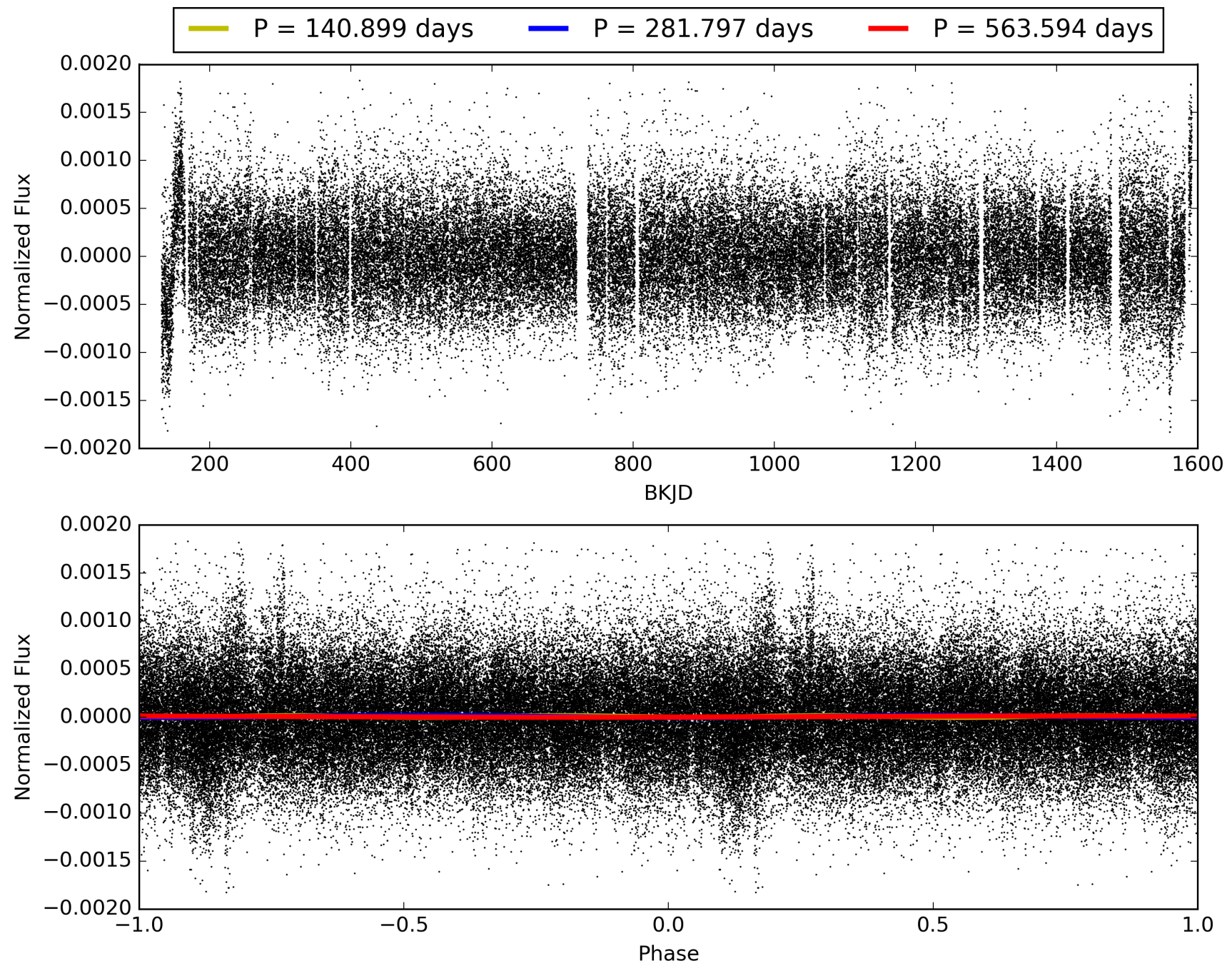
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 97.1%  
Bootstrap-pfa: 1.06e-15  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 1.222  
Centroid-sig: 96.8%  
Centroid-so: 1.070 arcsec [0.63 $\sigma$ ]  
OotOffset-rm: 1.619 arcsec [1.23 $\sigma$ ]  
KicOffset-rm: 1.753 arcsec [1.78 $\sigma$ ]  
OotOffset-st: 1/1/2/0 [4]  
KicOffset-st: 1/1/2/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

# TCE 012153613-01, PDC Light Curves

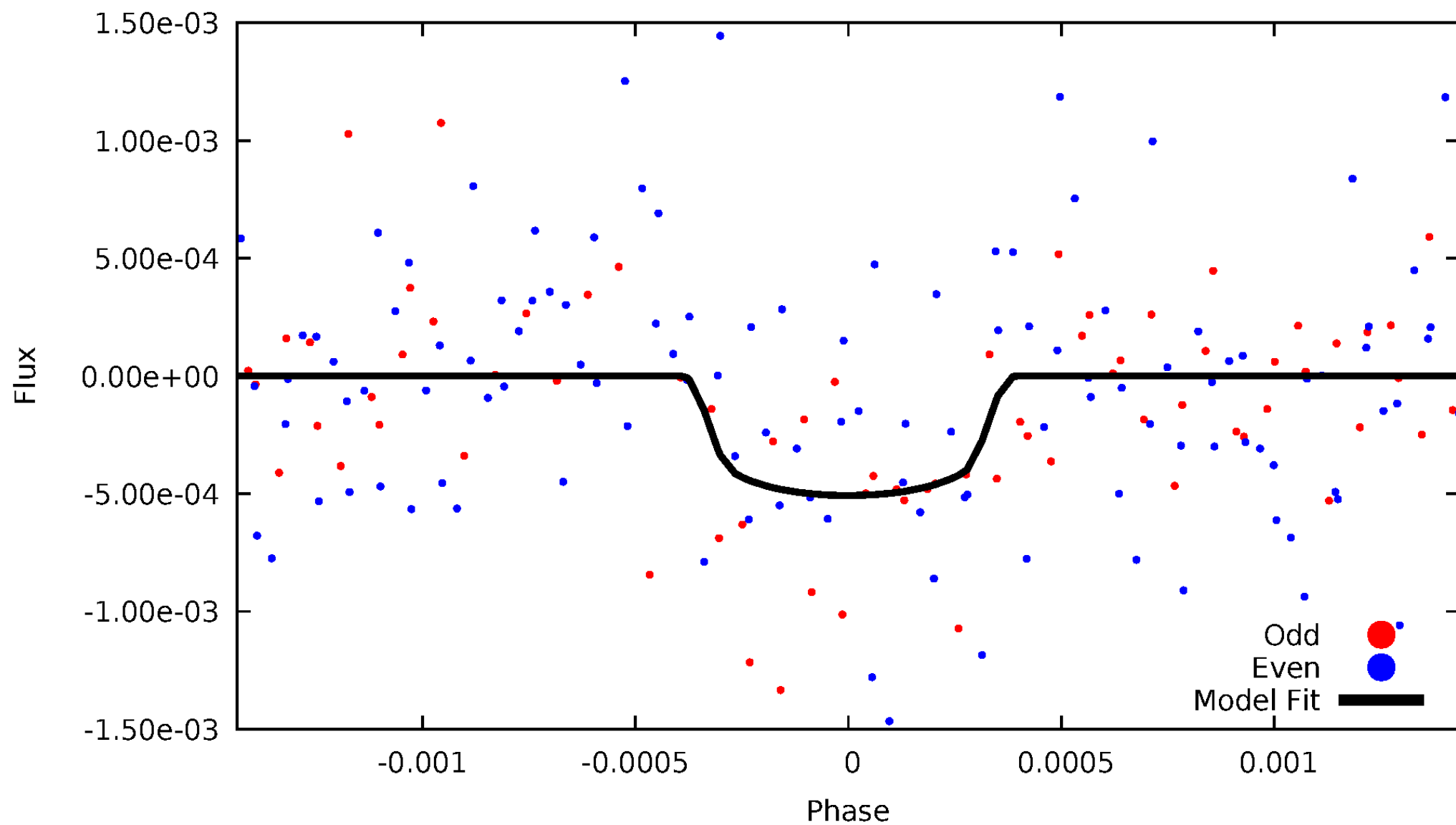


TCE 012153613-01



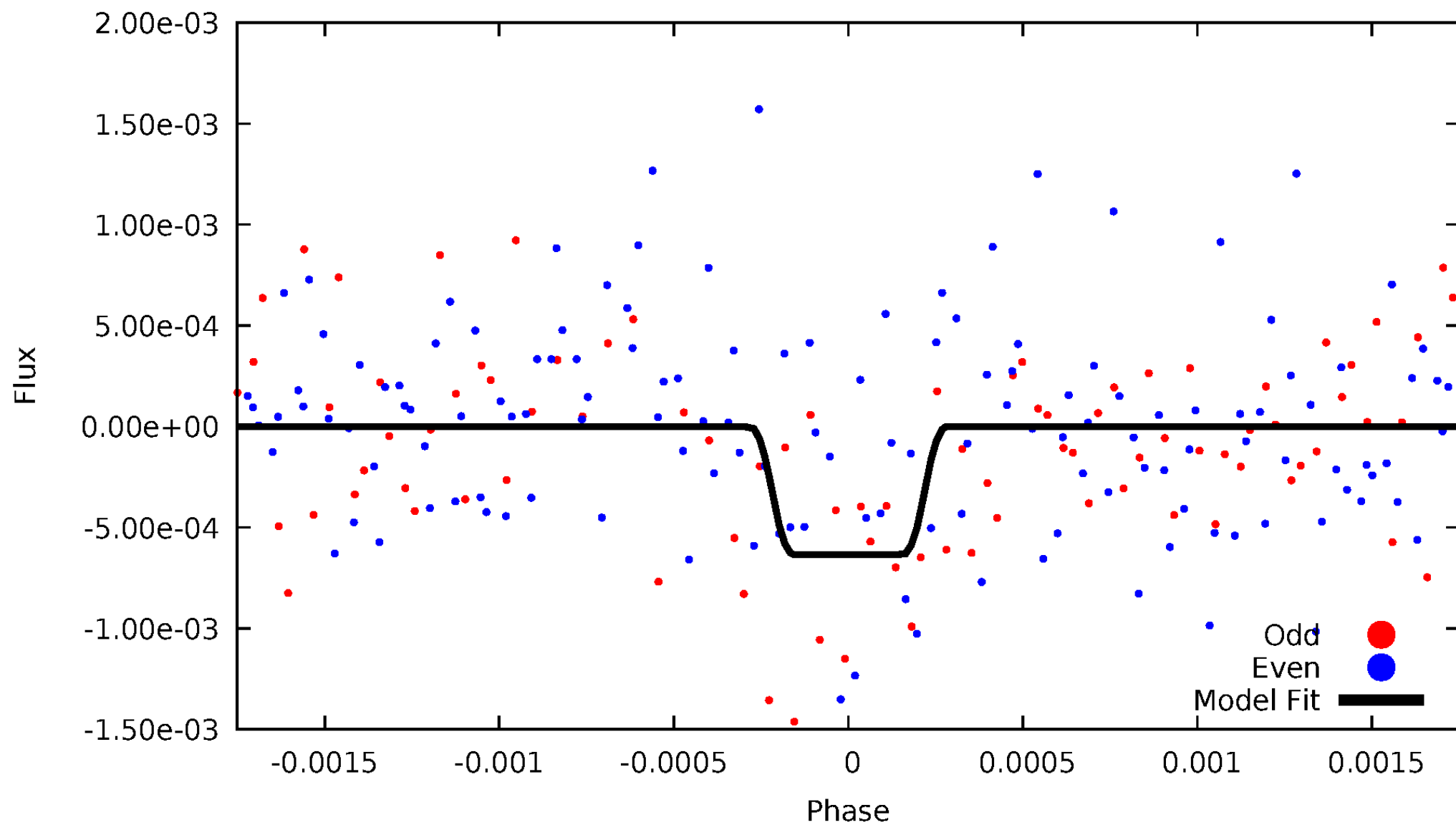
# DV Odd/Even

TCE 012153613-01



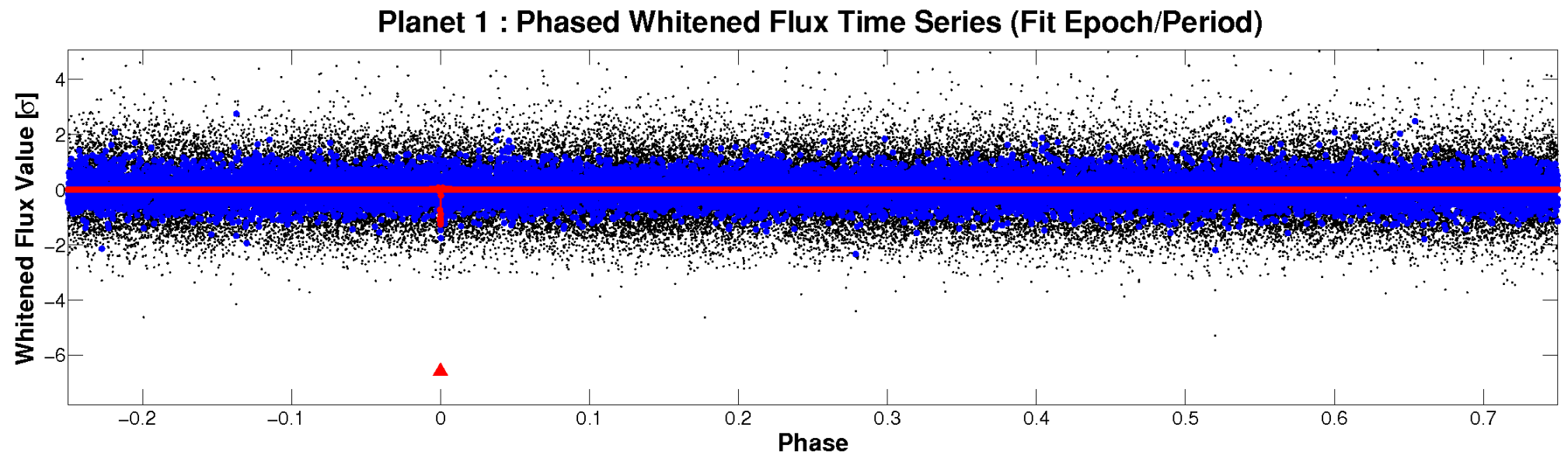
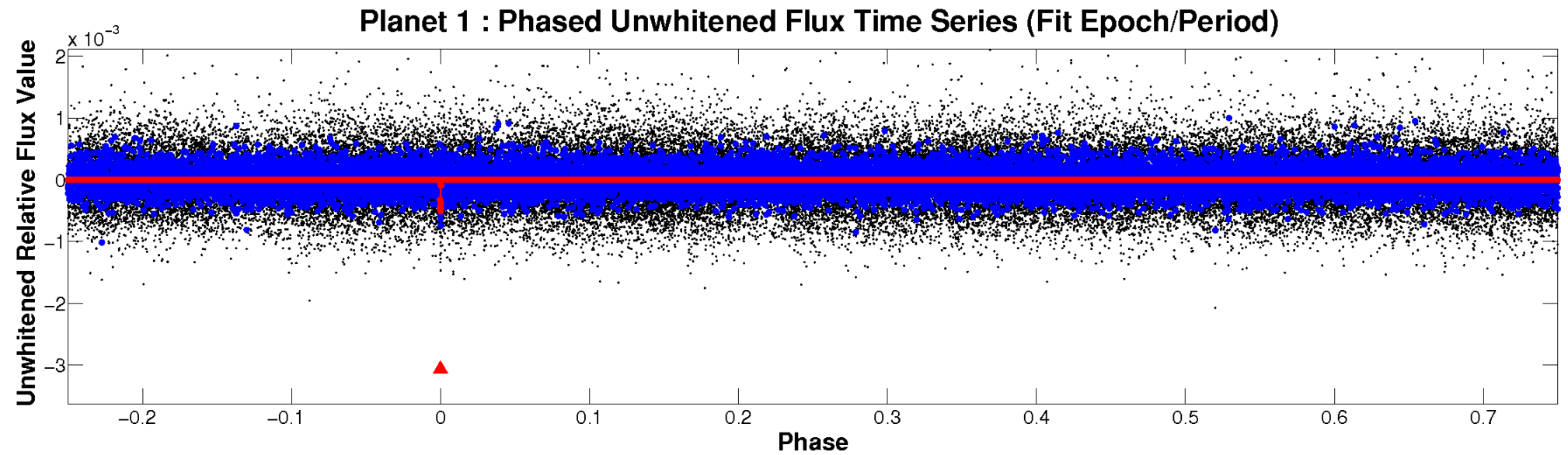
# ALT Odd/Even

TCE 012153613-01



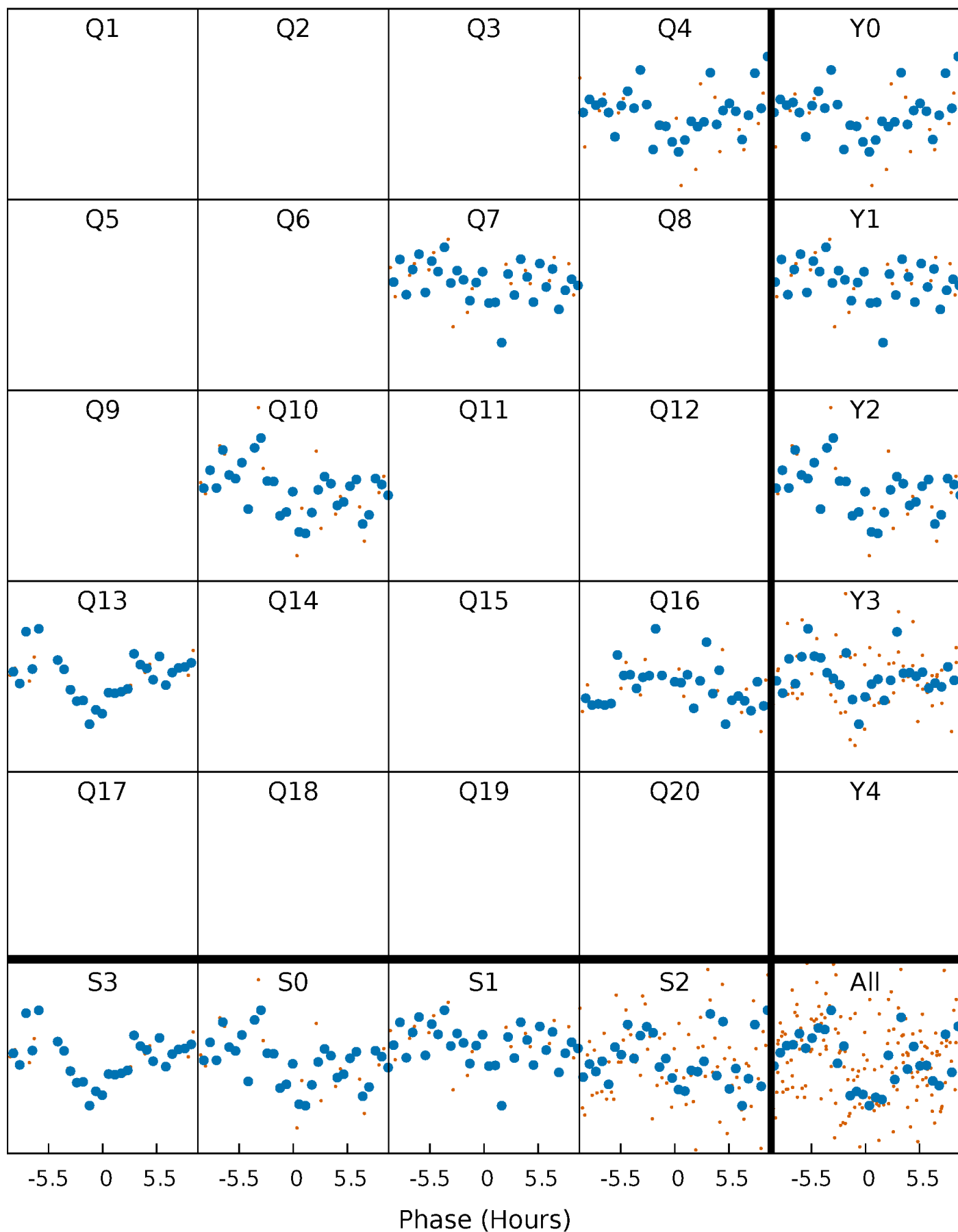


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

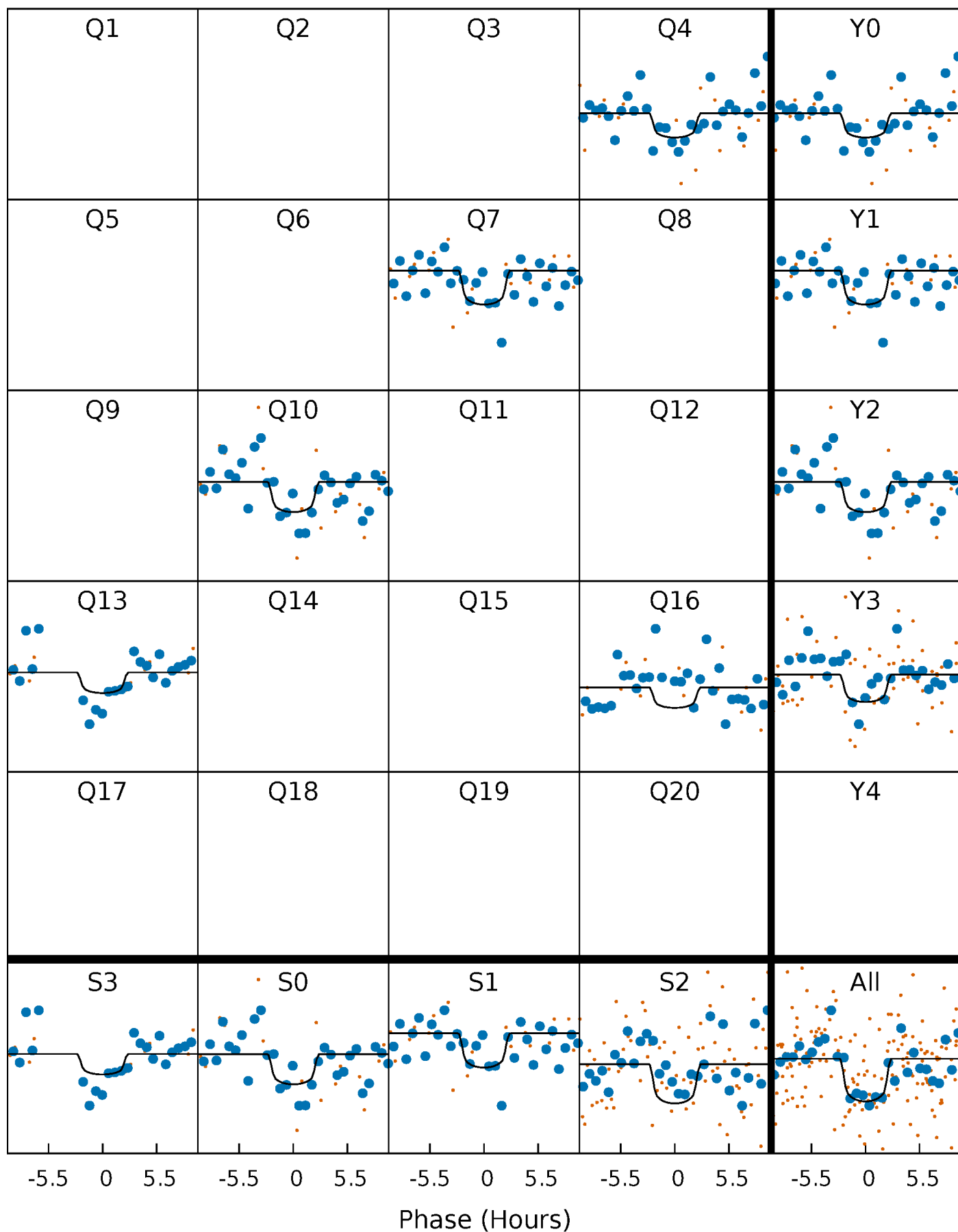
TCE 012153613-01 P=281.797081 Days  $T_0=386.473651$  (BKJD)





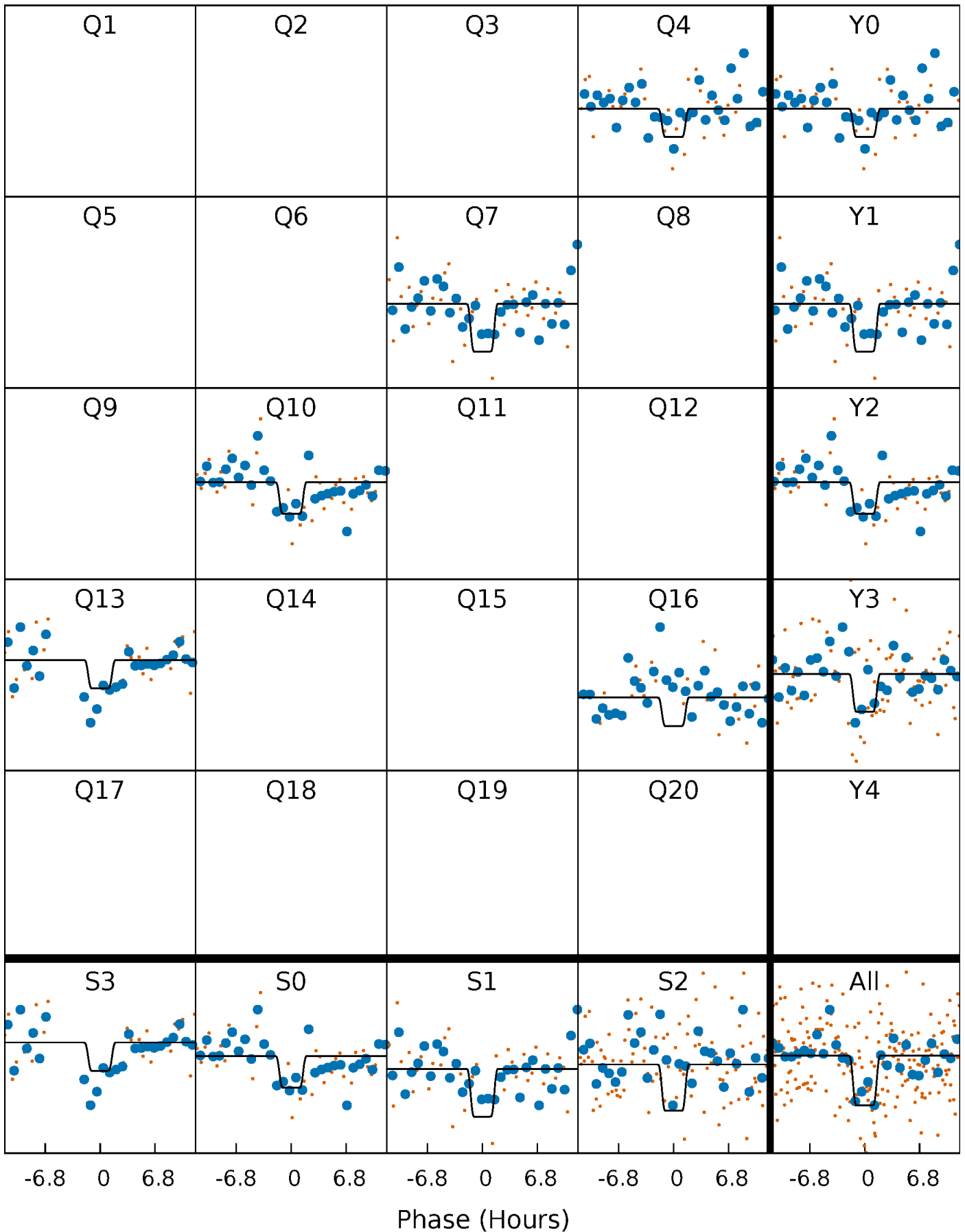
# DV Quarter-Phased Transit Curves

TCE 012153613-01 P=281.797081 Days  $T_0=386.473651$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

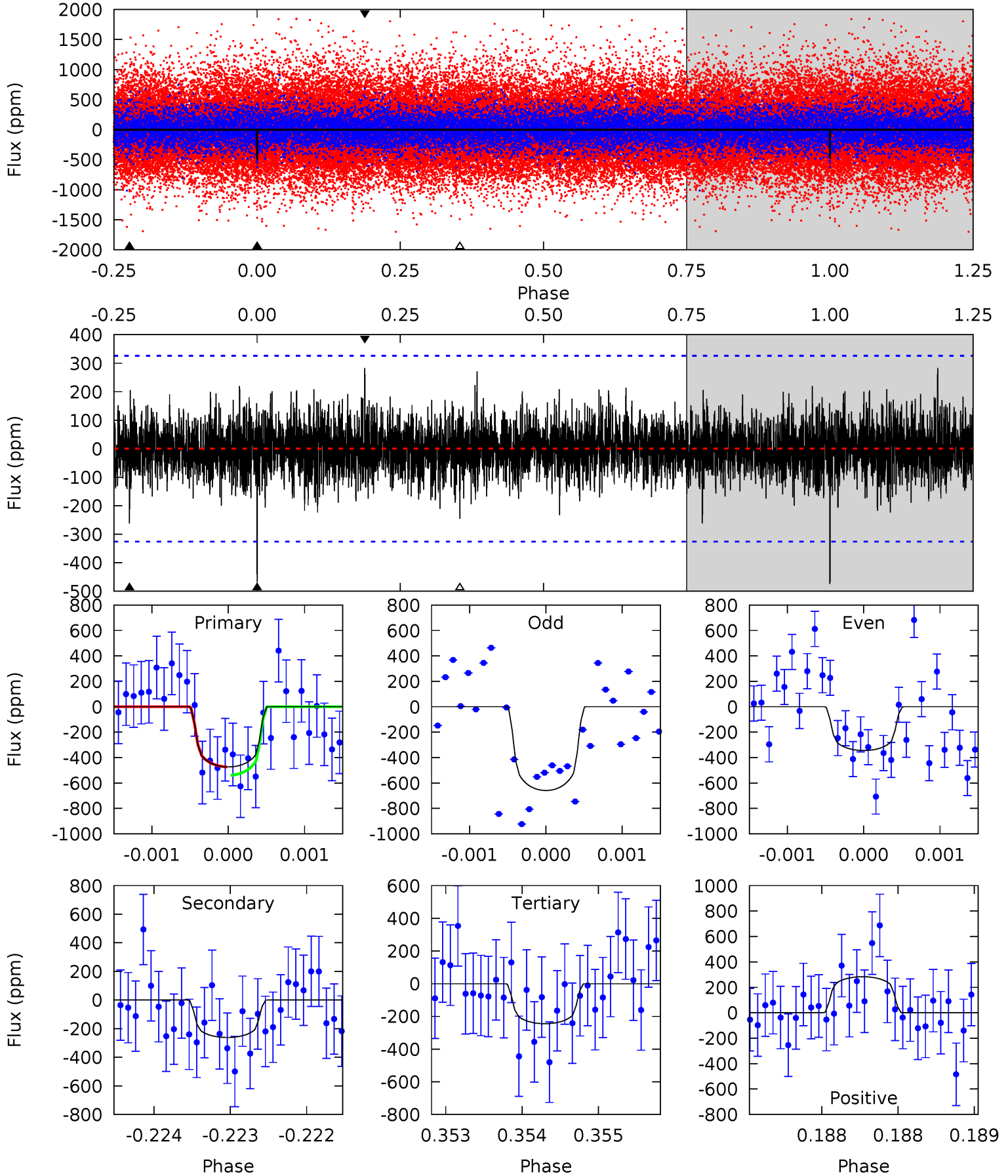
TCE 012153613-01 P=281.785604 Days  $T_0=386.506876$  (BKJD)



# DV Model-Shift Uniqueness Test

012153613-01, P = 281.797081 Days, E = 104.676570 Days

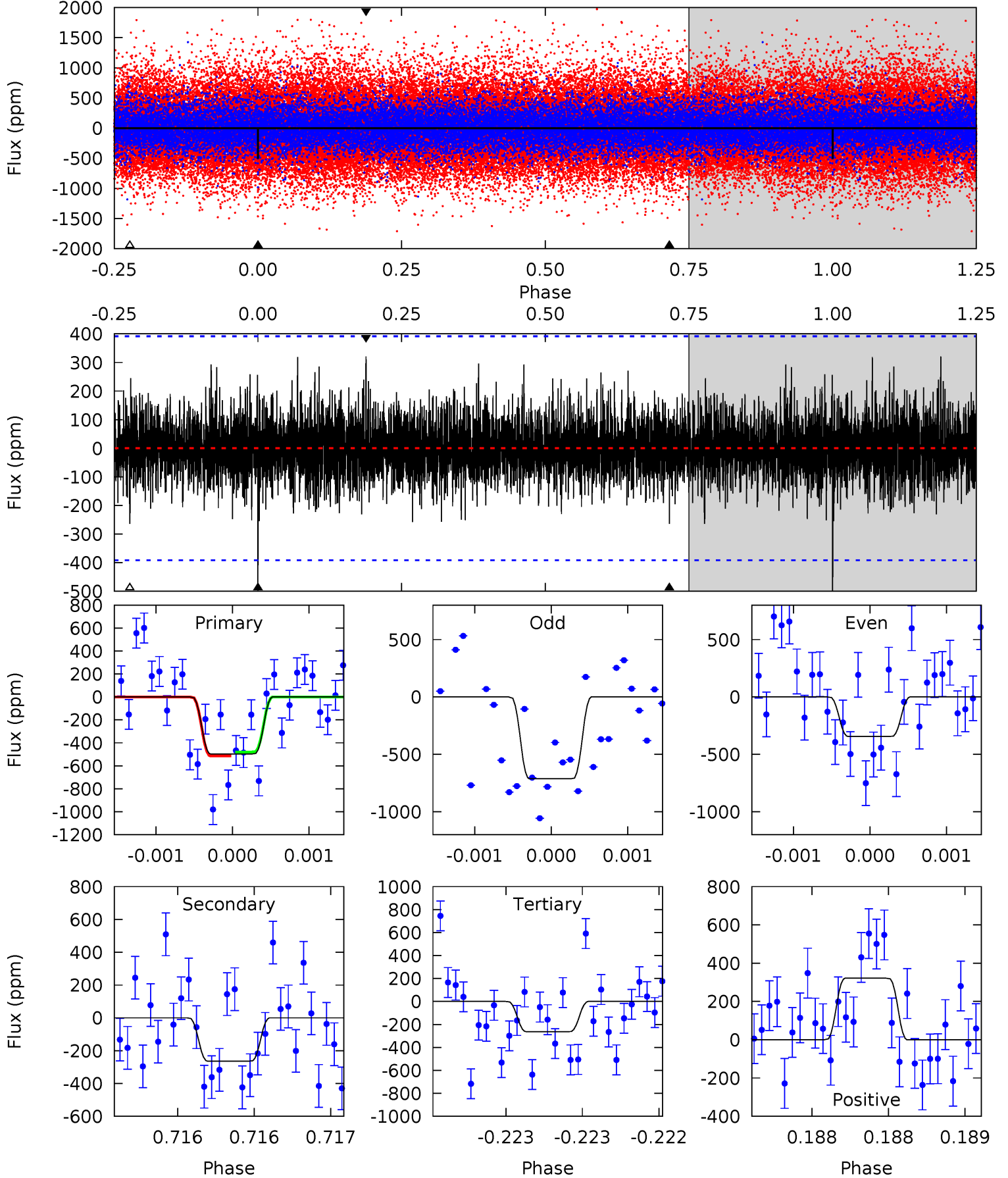
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.00	4.42	4.13	4.79	5.50	3.36	1.13	3.86	3.21	0.28	-0.37	2.63	0.74	0.37	0.55



# Alt Model-Shift Uniqueness Test

012153613-01, P = 281.785604 Days, E = 104.721272 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
7.06	3.75	3.75	4.56	5.56	3.46	1.09	3.32	2.50	0.00	-0.81	2.62	0.81	0.39	0.25



### Stellar Parameters For KIC 012153613

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6014^{+169}_{-211}$	$4.486^{+0.039}_{-0.221}$	$0.070^{+0.250}_{-0.350}$	$0.993^{+0.302}_{-0.101}$	$1.101^{+0.116}_{-0.159}$	$1.584^{+0.343}_{-0.866}$
	+3%/-4%	+1%/-5%	+357%/-500%	+30%/-10%	+11%/-14%	+22%/-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 012153613-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-262 \pm 59$	$3.37^{+2.50}_{-2.05}$	$406^{+31}_{-18}$	$4602^{+2707}_{-822}$	$9121^{+55009}_{-6057}$
Alt.	$-264 \pm 70$	$3.45^{+2.65}_{-2.26}$	$405^{+27}_{-20}$	$4596^{+2923}_{-897}$	$9359^{+59336}_{-6769}$

$T_{max}$  = 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

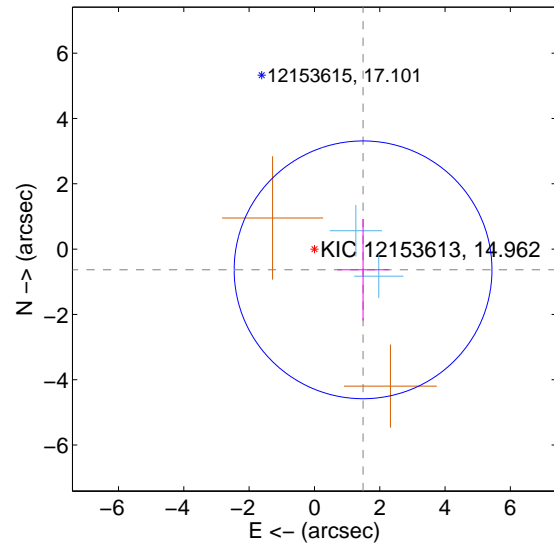
Supplemental centroid analysis for 012153613-01. Kepler magnitude: 14.96. Transit SNR 7.03

There are 2 quarters with good PRF difference image offsets

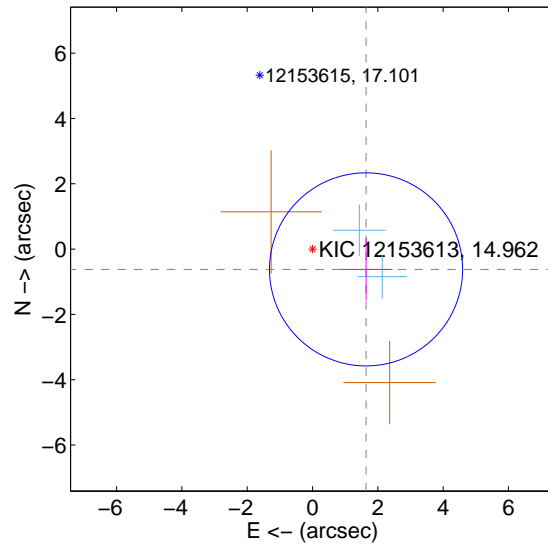
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.619 \pm 1.316$	1.23	$-1.489 \pm 0.793$	$-0.635 \pm 1.555$
PRF-fit source offset from KIC position	$1.753 \pm 0.986$	1.78	$-1.640 \pm 0.805$	$-0.622 \pm 0.957$
photometric centroid source offset	$1.07 \pm 1.70$	0.63	$-0.43 \pm 1.91$	$0.98 \pm 1.66$

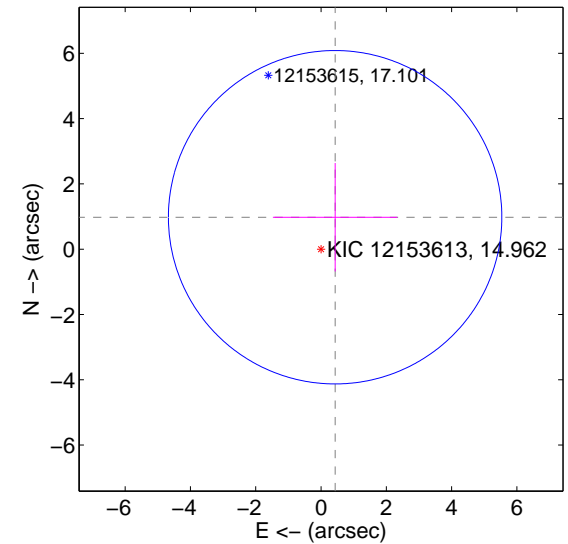
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



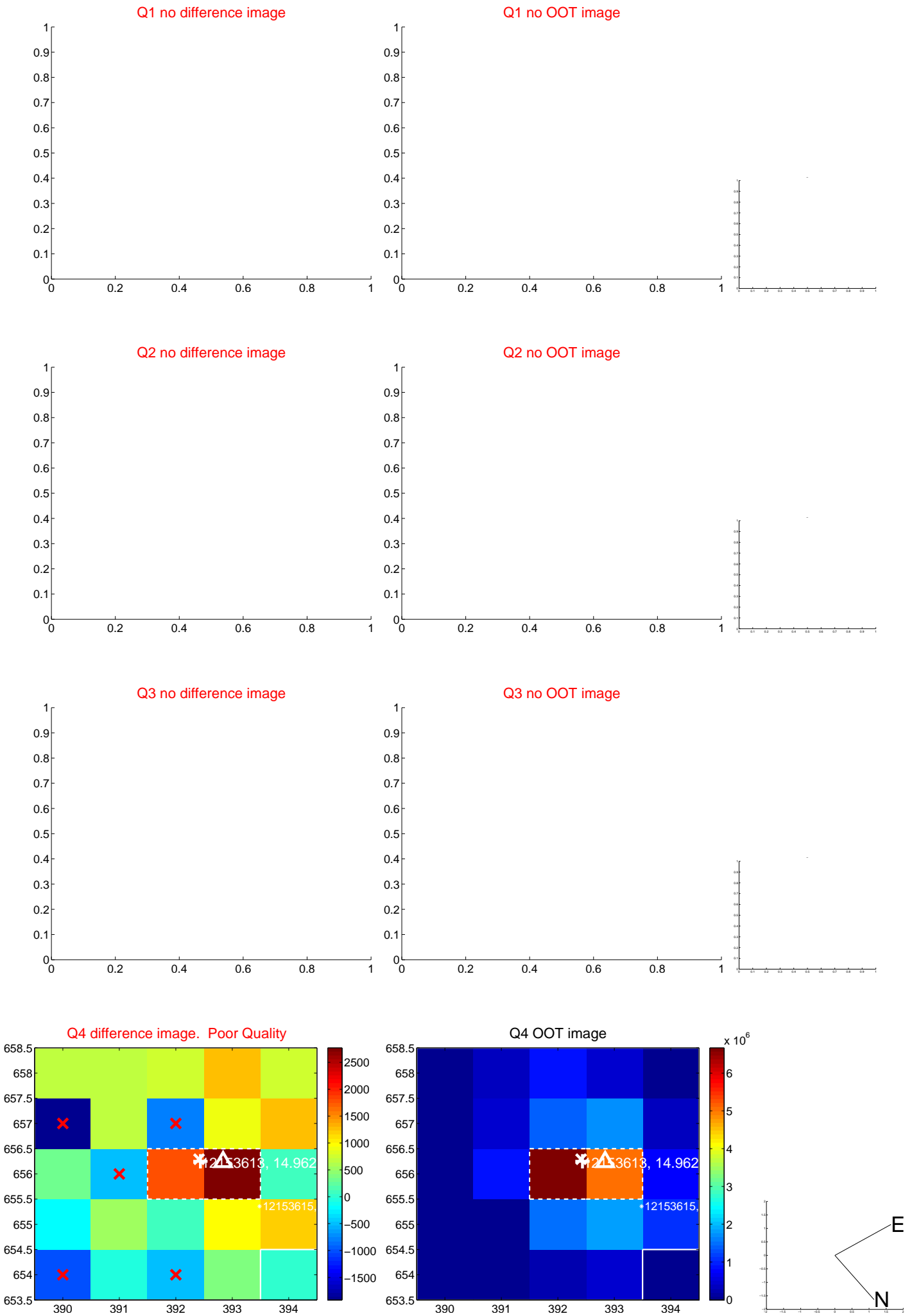
offset from photometric centroids



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.

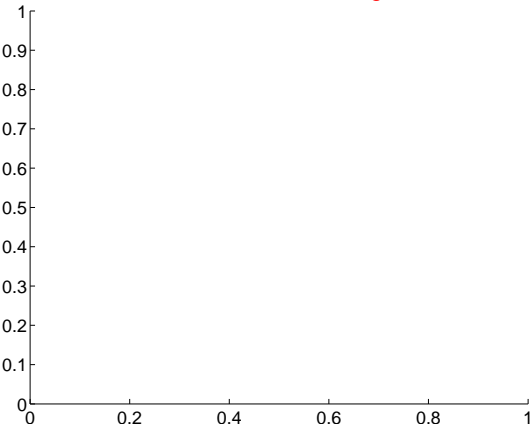


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

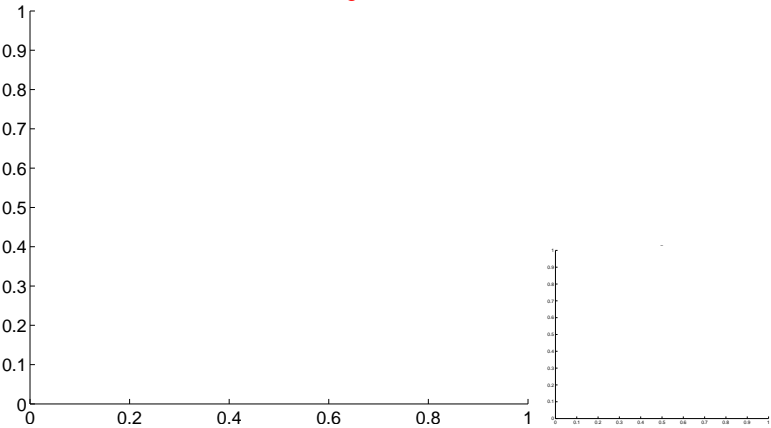


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

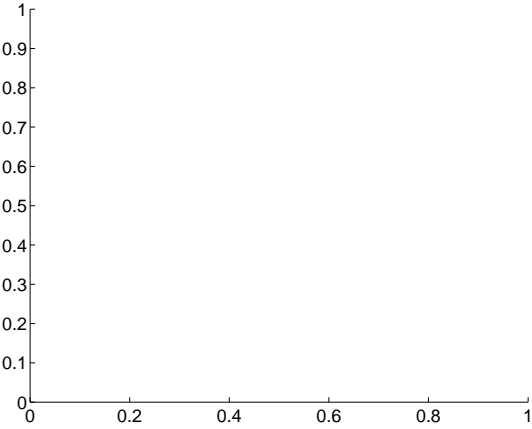
Q5 no difference image



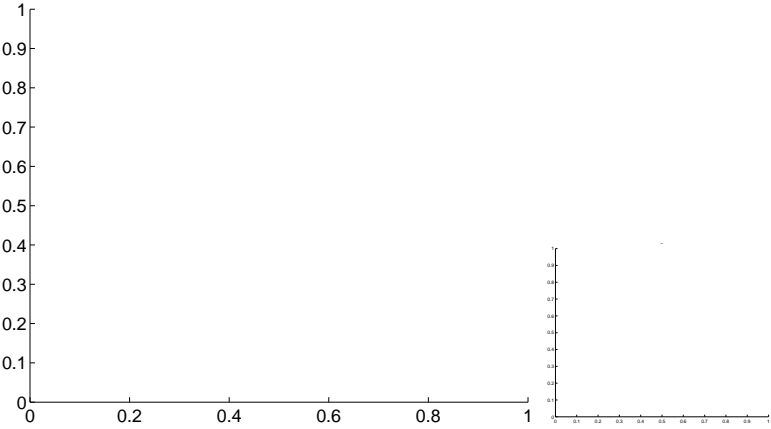
Q5 no OOT image



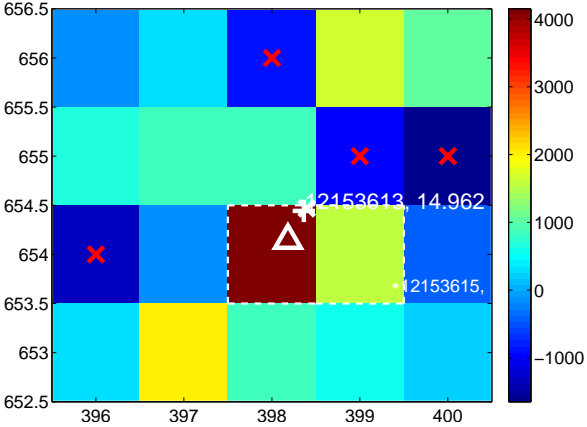
Q6 no difference image



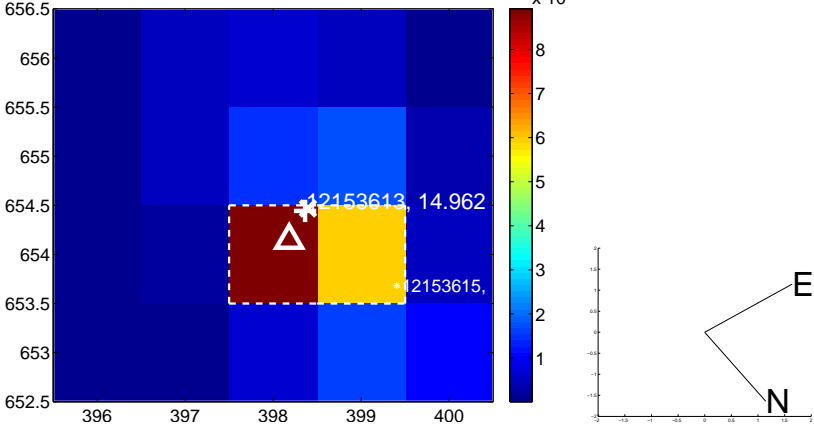
Q6 no OOT image



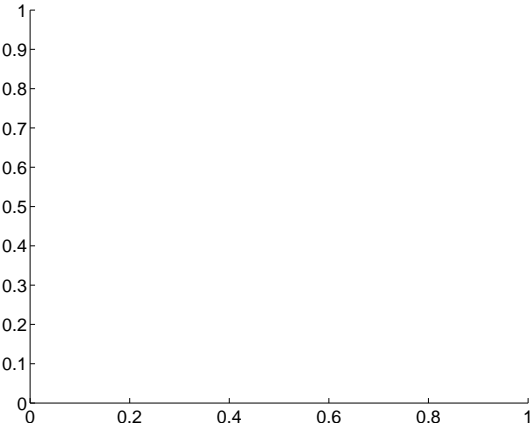
Q7 difference image



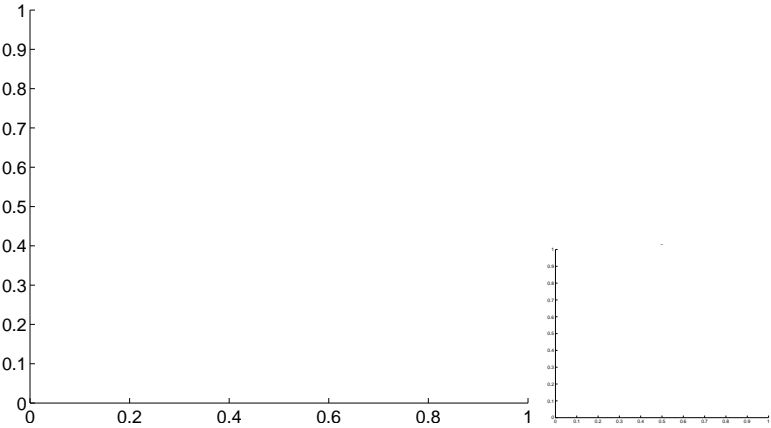
Q7 OOT image



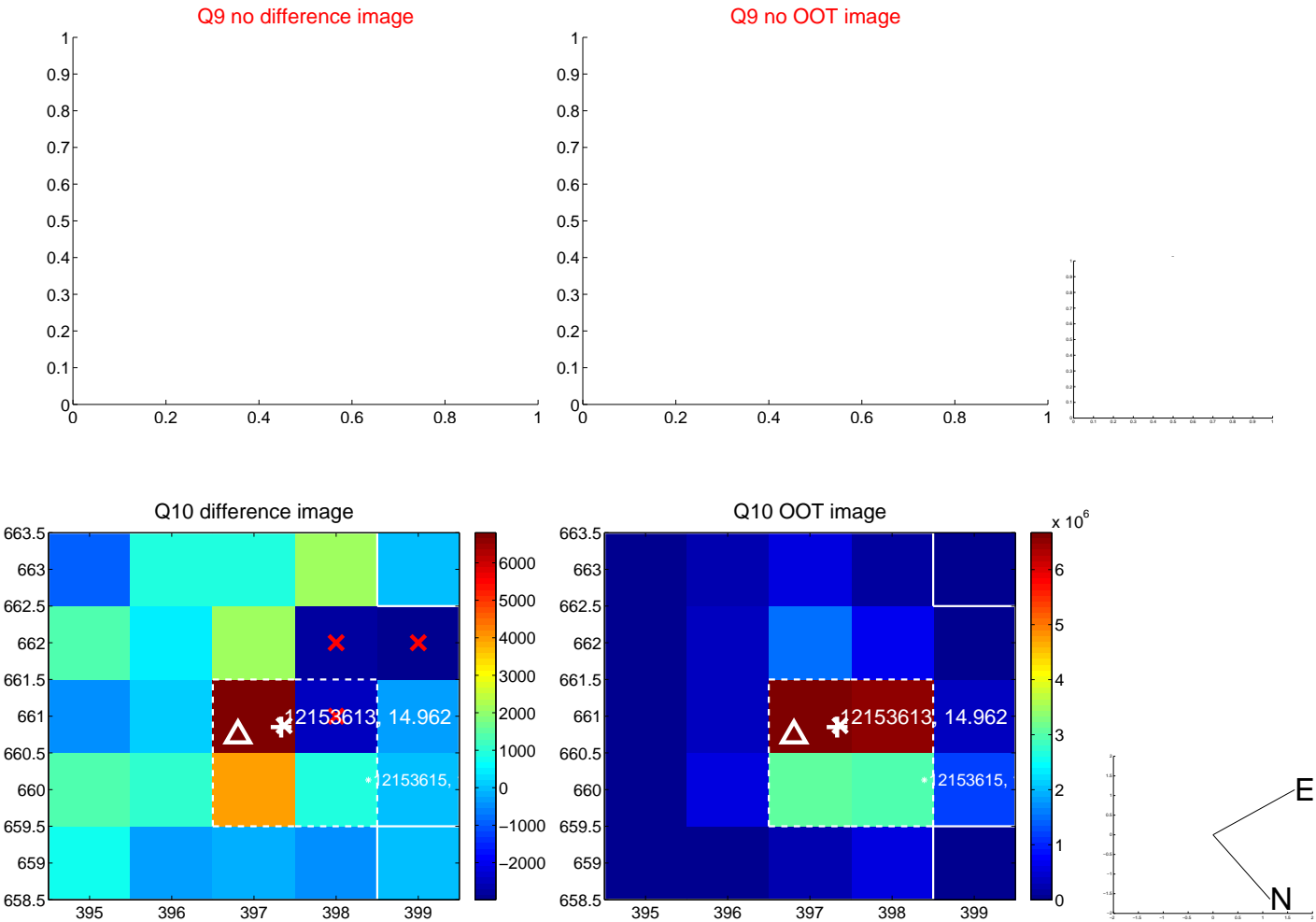
Q8 no difference image



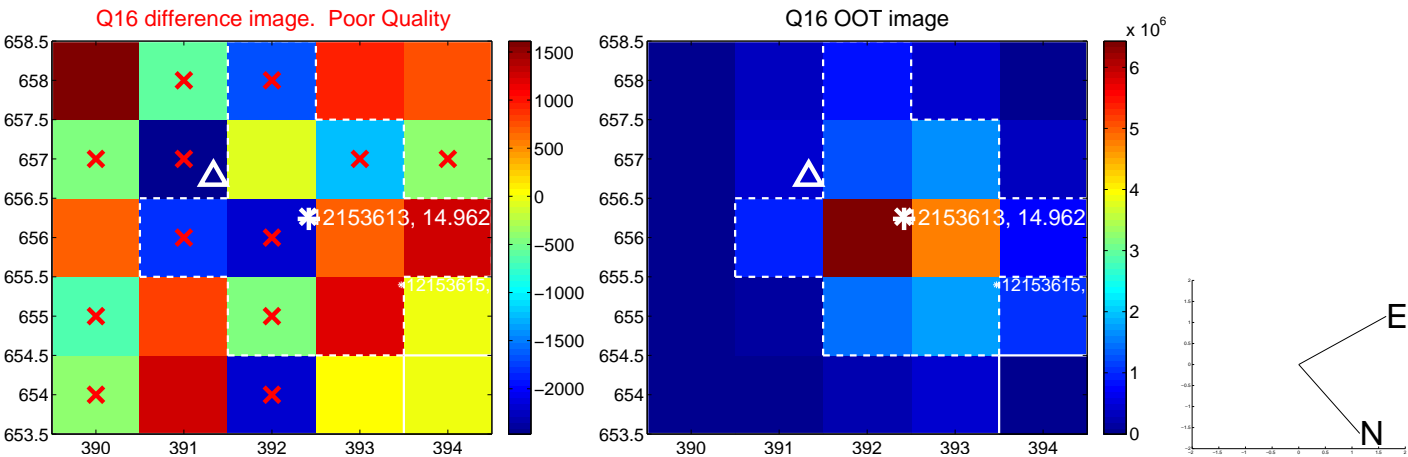
Q8 no OOT image



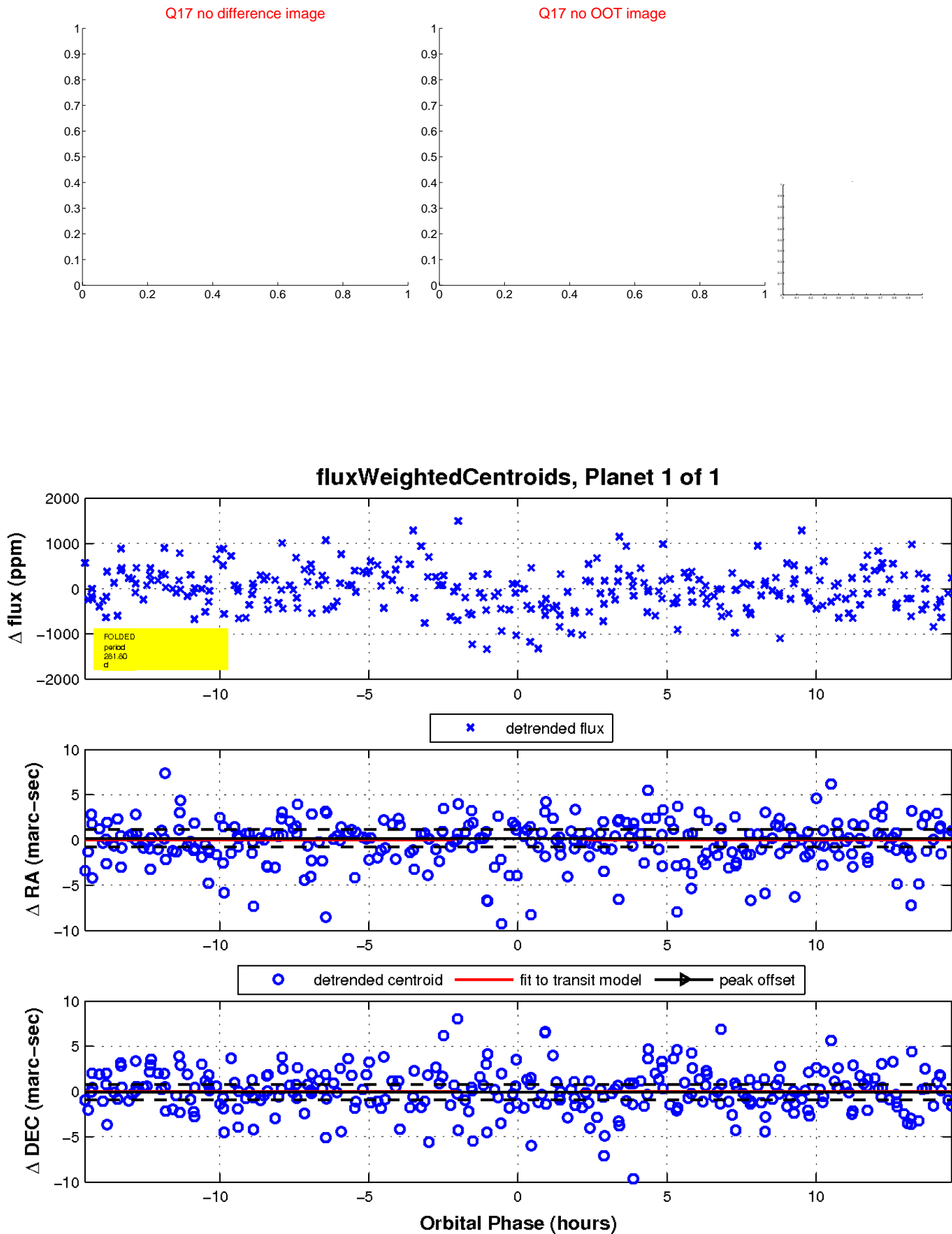
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

