

# KIC 009591040

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009591040-01	OBS	No	281.019569	265.303023	240.4	3.552	7.5	7.0	2.13	6050	3.80	7.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009591040-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES

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

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

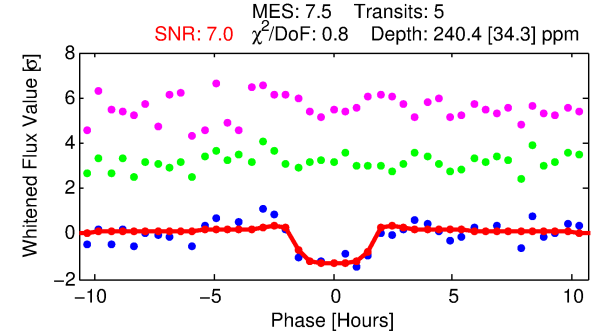
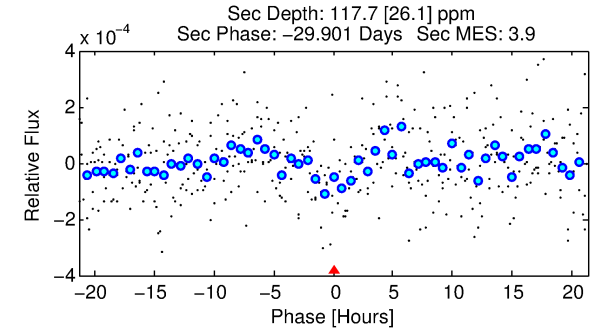
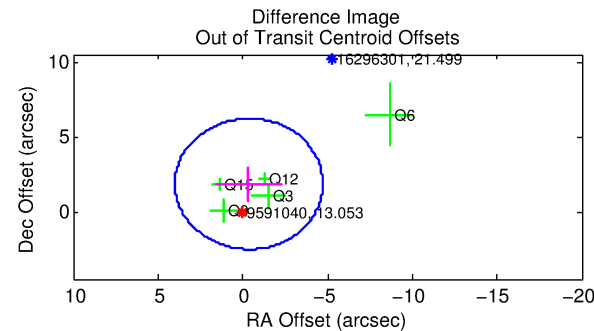
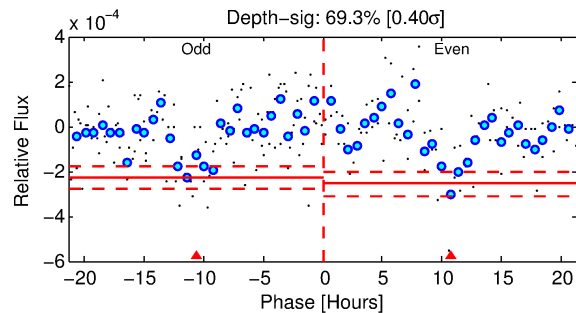
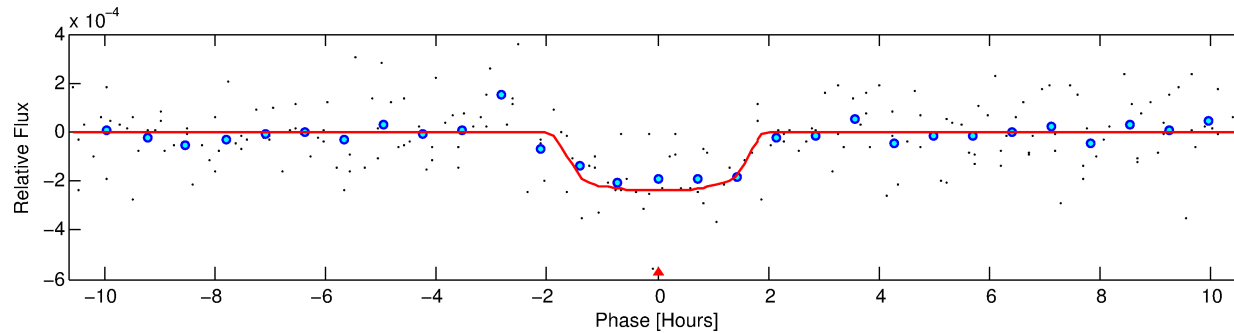
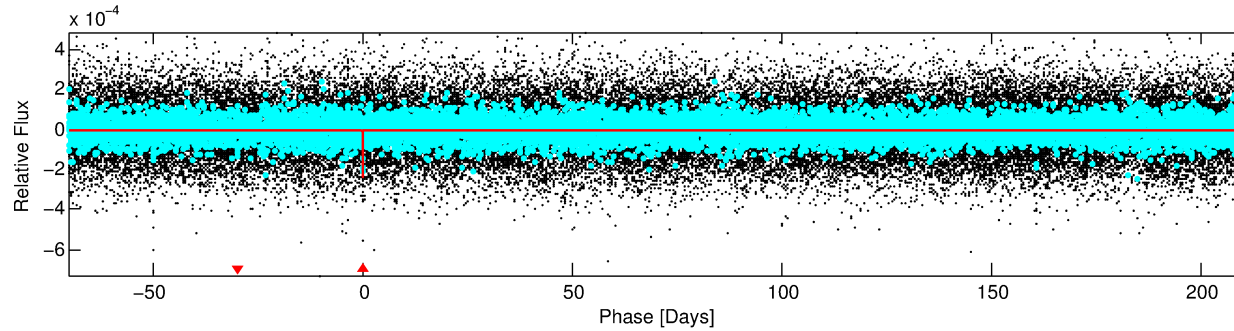
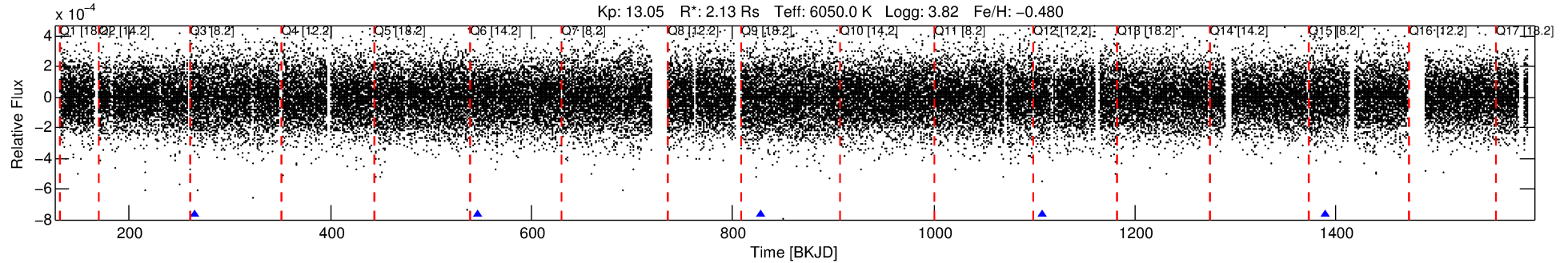
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009591040-01

No Significant Match Found

# DV One-Page Summary

KIC: 9591040 Candidate: 1 of 1 Period: 281.020 d



## DV Fit Results:

Period = 281.01957 [0.00303] d  
Epoch = 265.3030 [0.0073] BKJD  
Rp/R\* = 0.0163 [0.0117]  
a/R\* = 317.64 [1213.49]  
b = 0.87 [1.08]  
Seff = 7.32 [4.12]  
Teq = 419 [59] K  
Rp = 3.80 [3.07] Re  
a = 0.8645 [0.2997] AU  
Ag = 3352.40 [5223.99] [0.64 $\sigma$ ]  
Teffp = 4934 [1803] K [2.50 $\sigma$ ]

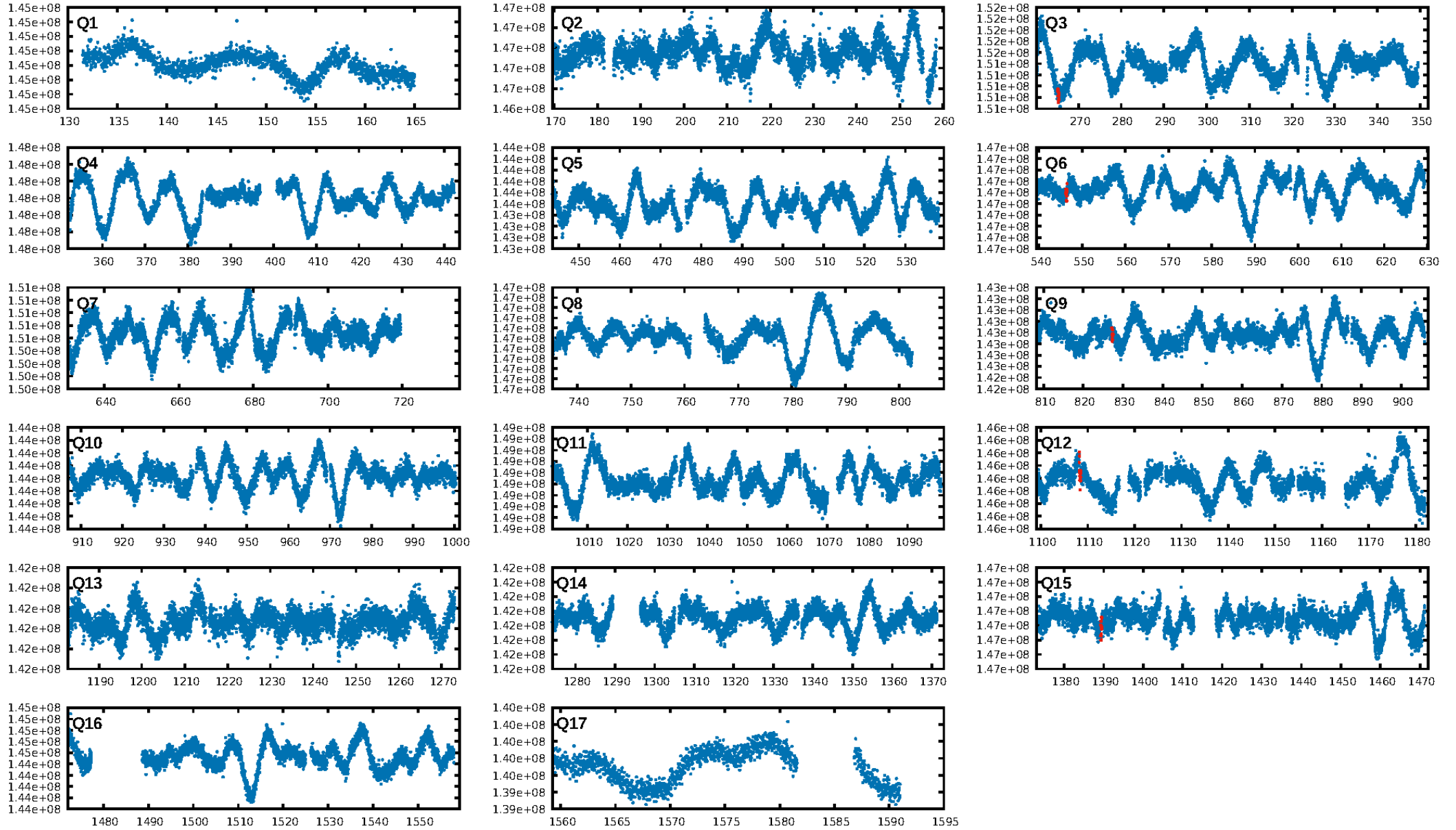
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 75.2%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 9.87e-12  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.8445  
Centroid-sig: 47.9%  
Centroid-so: 1.046 arcsec [0.85 $\sigma$ ]  
OotOffset-rm: 1.878 arcsec [1.29 $\sigma$ ]  
KicOffset-rm: 1.763 arcsec [1.27 $\sigma$ ]  
OotOffset-st: 1/2/1/1 [5]  
KicOffset-st: 1/2/1/1 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 1.00 [5/5]

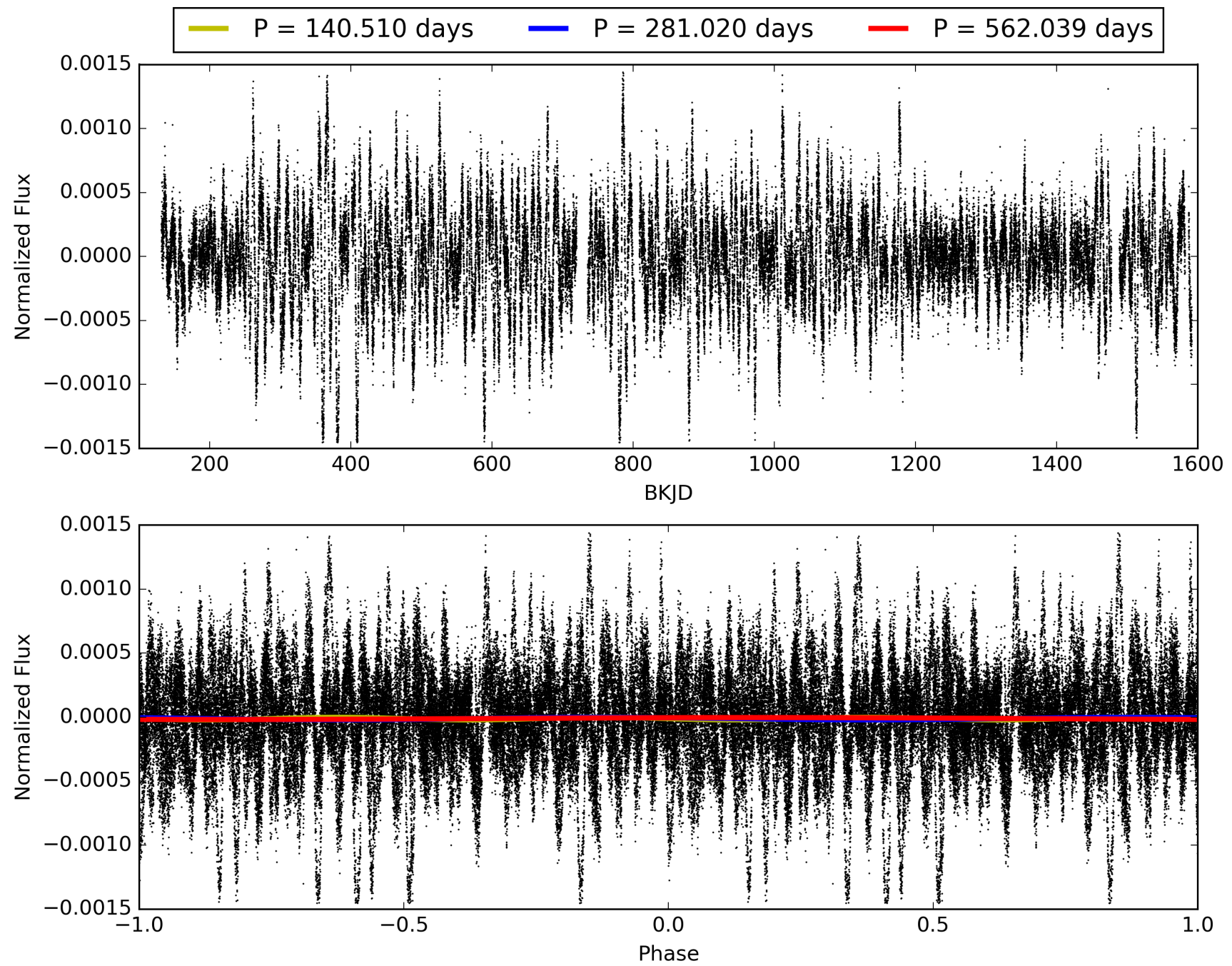
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:53:03 Z

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

# TCE 009591040-01, PDC Light Curves

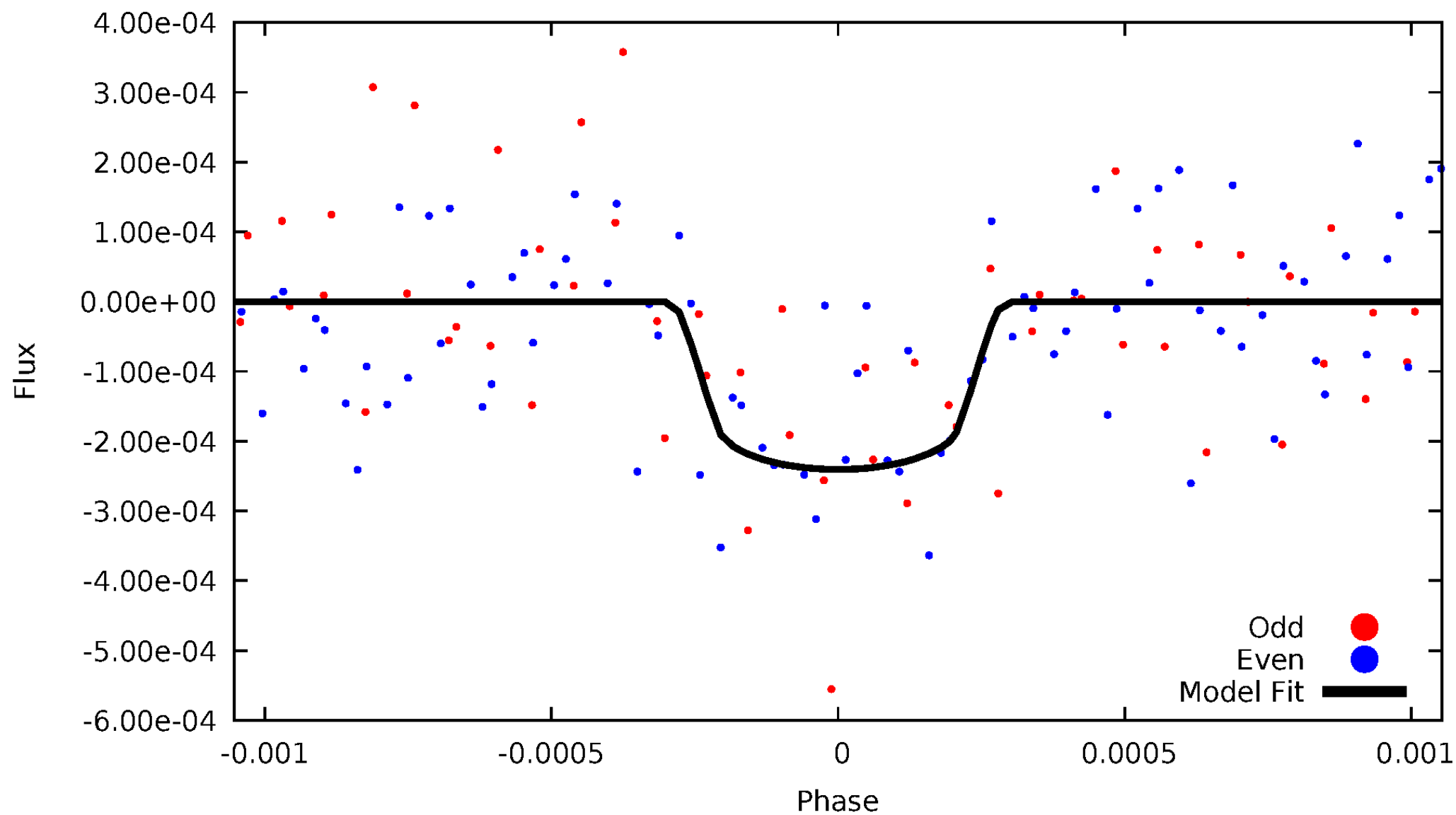


TCE 009591040-01



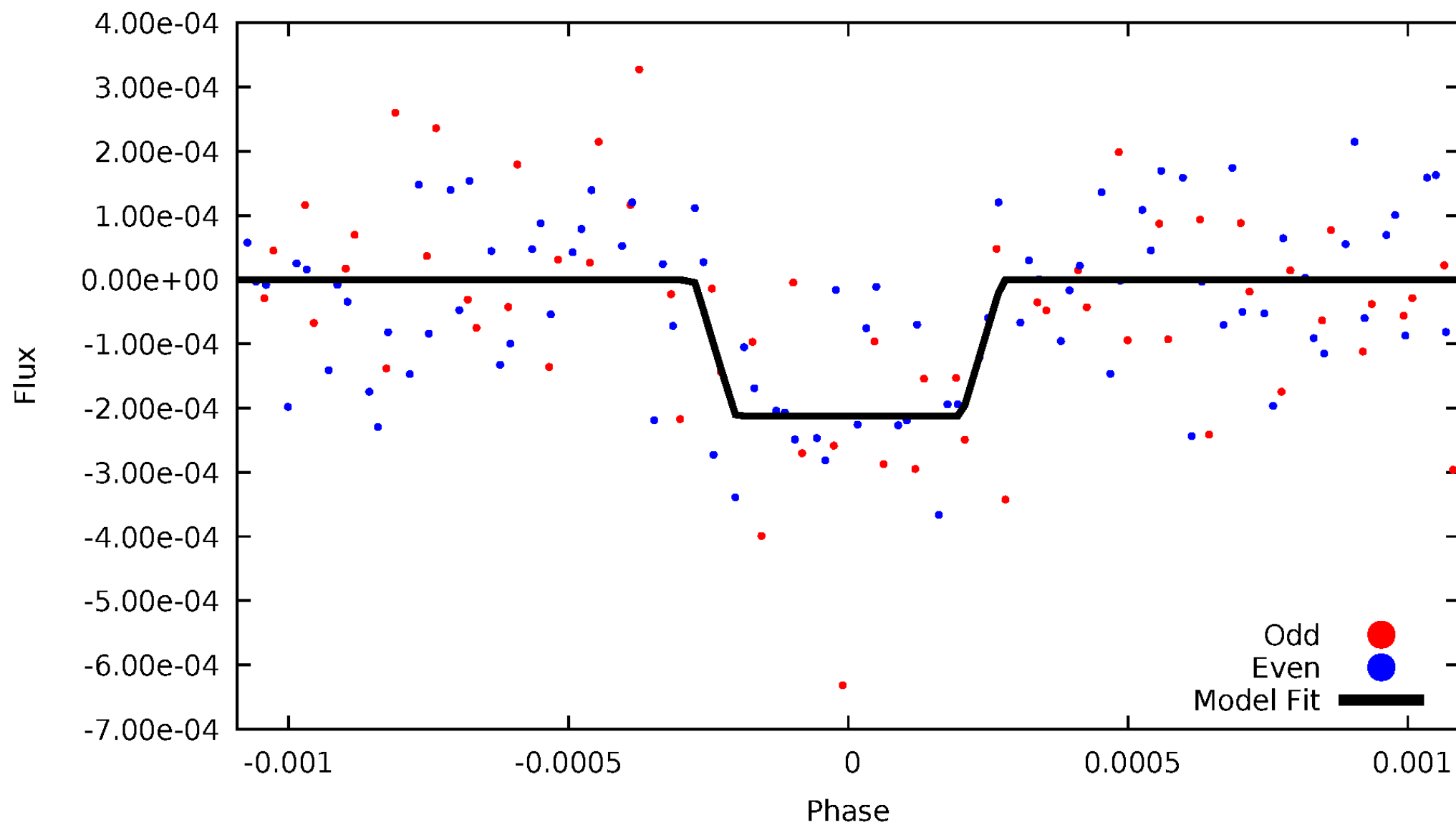
# DV Odd/Even

TCE 009591040-01

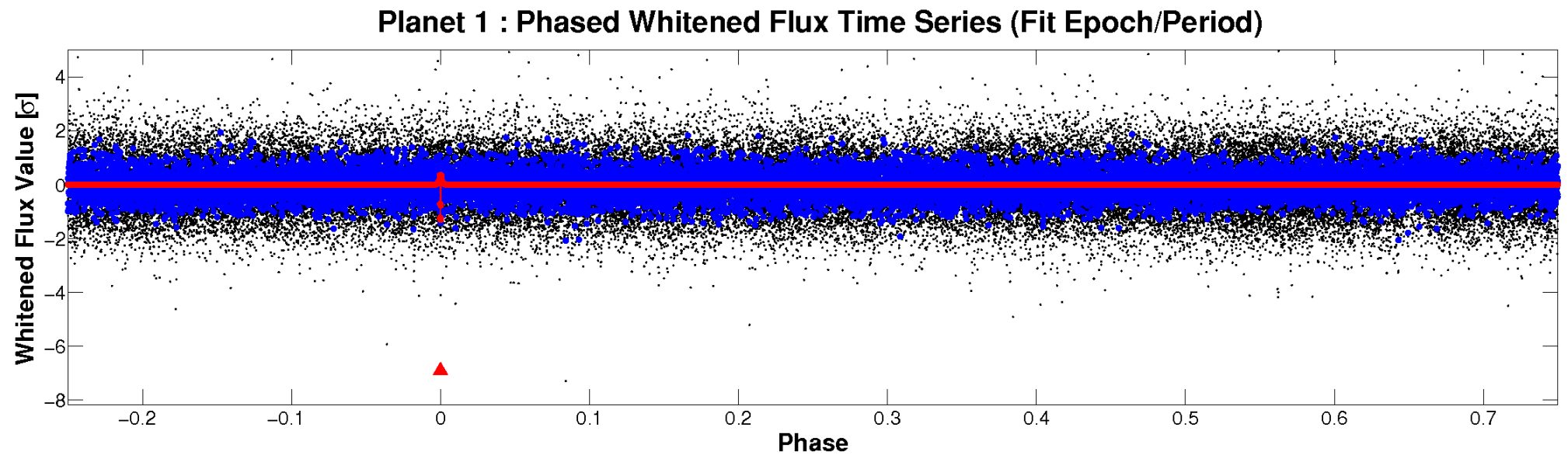
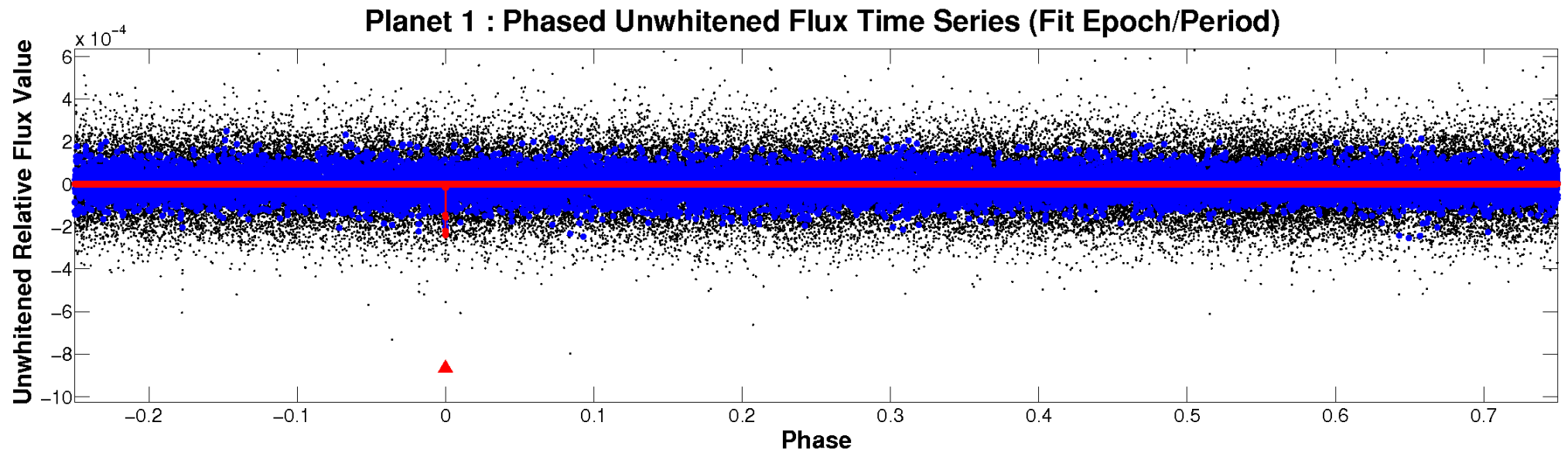


# ALT Odd/Even

TCE 009591040-01



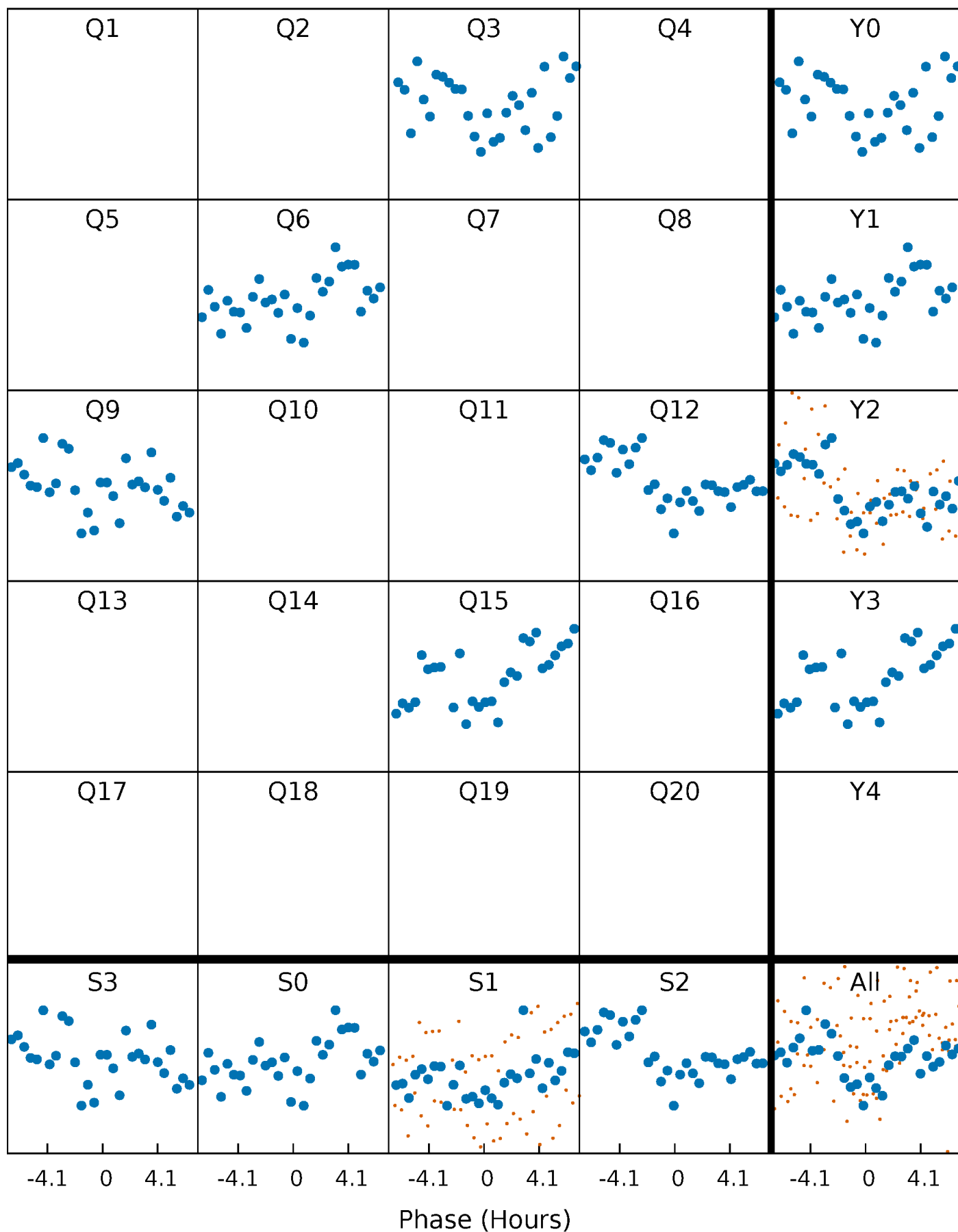
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

TCE 009591040-01 P=281.019569 Days  $T_0=265.303023$  (BKJD)





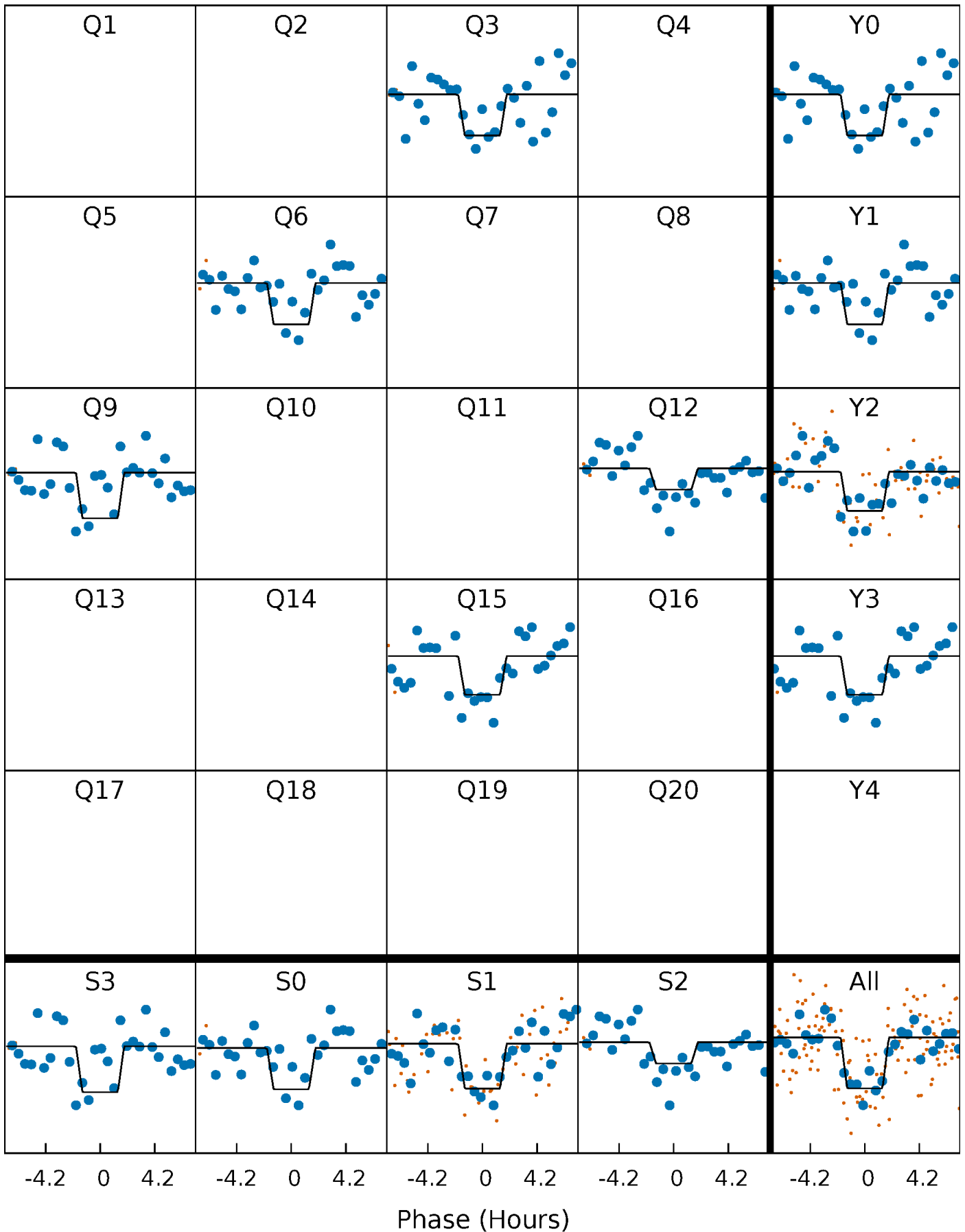
# DV Quarter-Phased Transit Curves

TCE 009591040-01 P=281.019569 Days  $T_0=265.303023$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

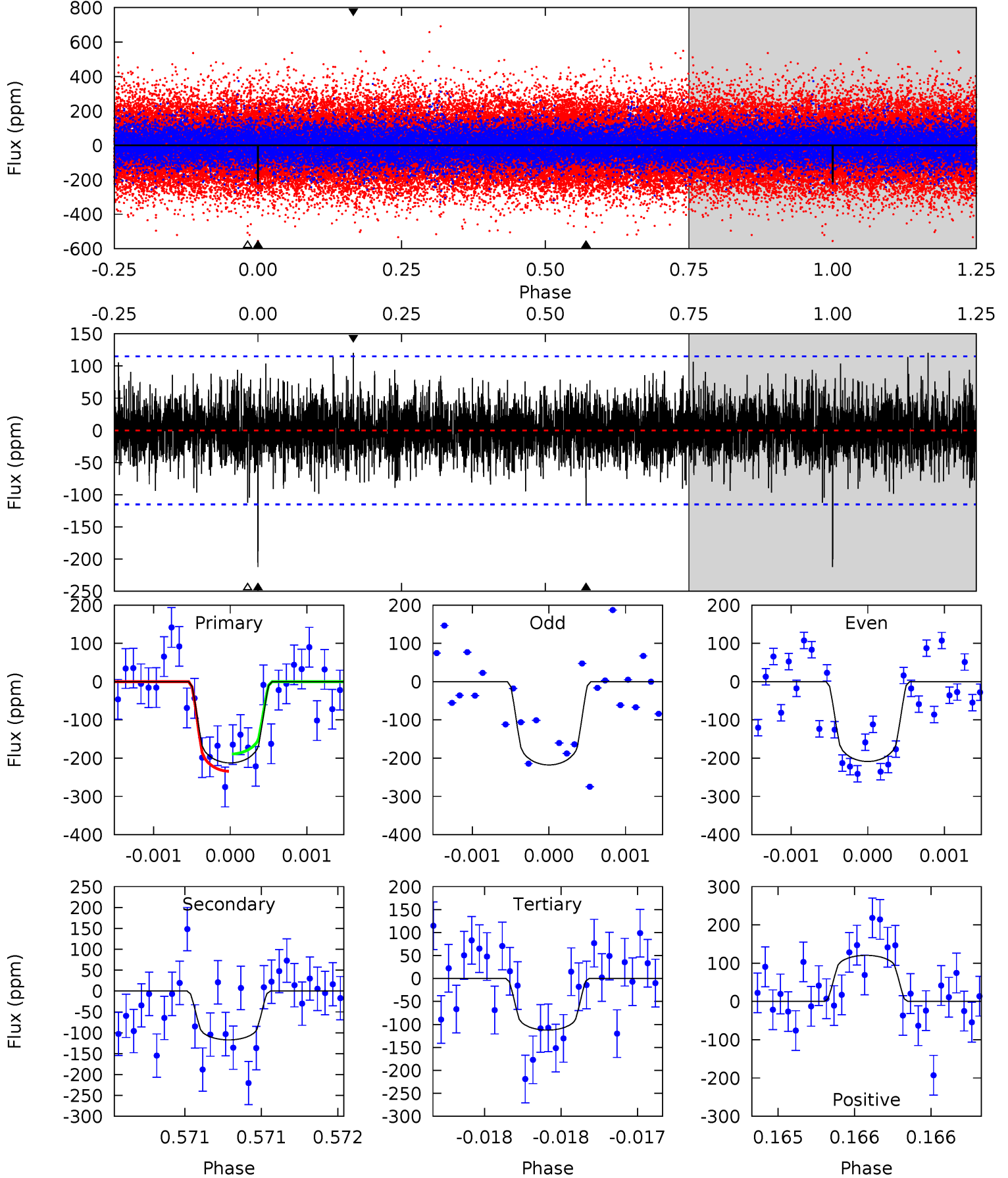
TCE 009591040-01 P=281.019199 Days  $T_0=265.303674$  (BKJD)



# DV Model-Shift Uniqueness Test

009591040-01, P = 281.019569 Days, E = 265.303023 Days

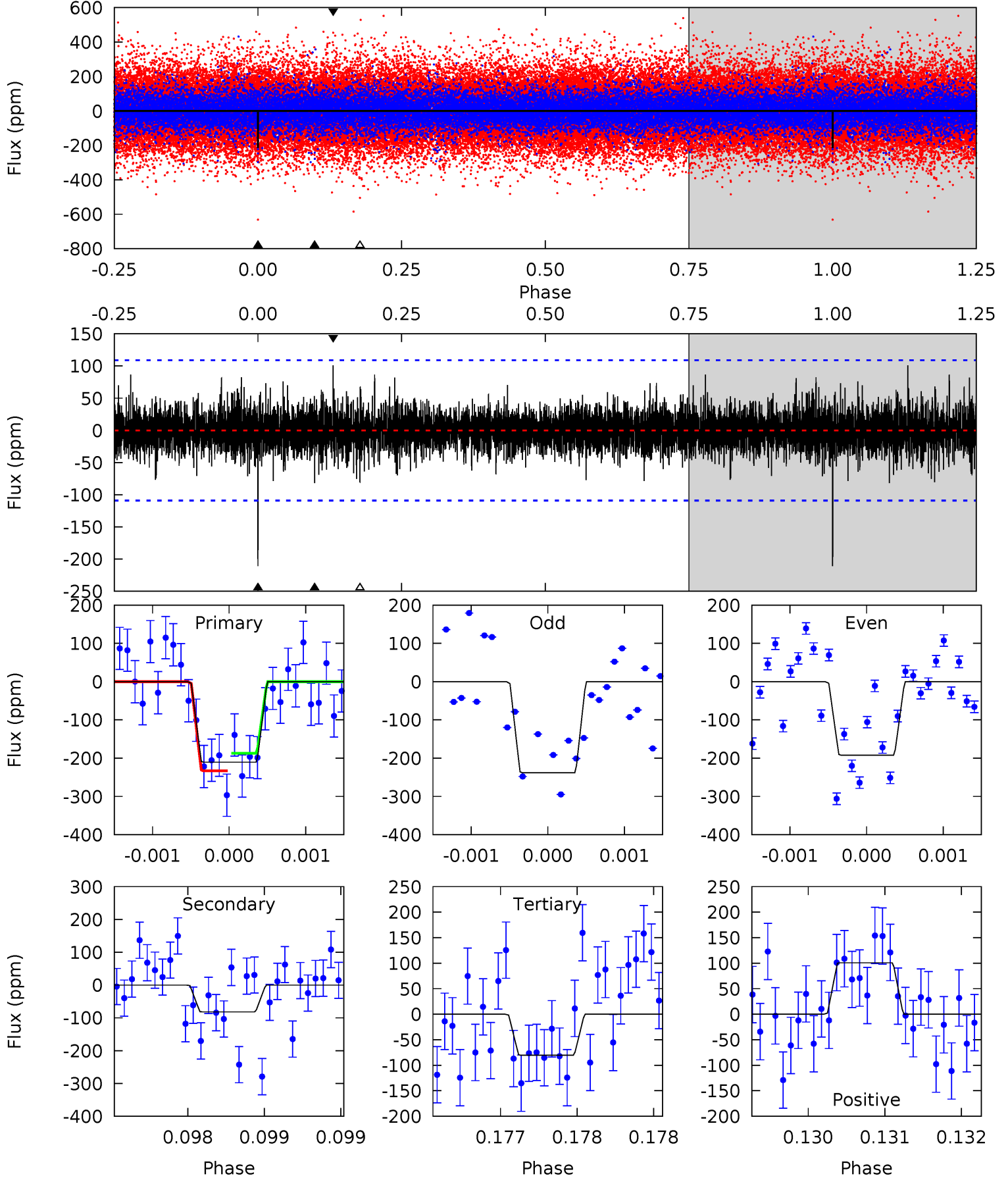
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	5.65	5.42	5.81	5.55	3.45	1.41	4.82	4.43	0.22	-0.17	0.21	0.96	0.36	1.09



# Alt Model-Shift Uniqueness Test

009591040-01, P = 281.019199 Days, E = 265.303674 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	4.17	4.09	5.14	5.55	3.45	1.08	6.64	5.59	0.08	-0.97	1.14	1.18	0.32	1.16



### Stellar Parameters For KIC 009591040

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6050^{+163}_{-163}$	$3.817^{+0.323}_{-0.108}$	$-0.480^{+0.350}_{-0.250}$	$2.135^{+0.418}_{-0.776}$	$1.092^{+0.165}_{-0.201}$	$0.158^{+0.327}_{-0.060}$
	+3%/-3%	+8%/-3%	+73%/-52%	+20%/-36%	+15%/-18%	+207%/-38%
Source	PHO1	FLK73	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 009591040-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-117 \pm 21$	$3.87^{+2.72}_{-2.18}$	$575^{+41}_{-47}$	$4837^{+2195}_{-862}$	$3192^{+13302}_{-2112}$
Alt.	$-82 \pm 20$	$3.53^{+2.70}_{-2.06}$	$575^{+38}_{-58}$	$4662^{+2217}_{-858}$	$2652^{+13251}_{-1826}$

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

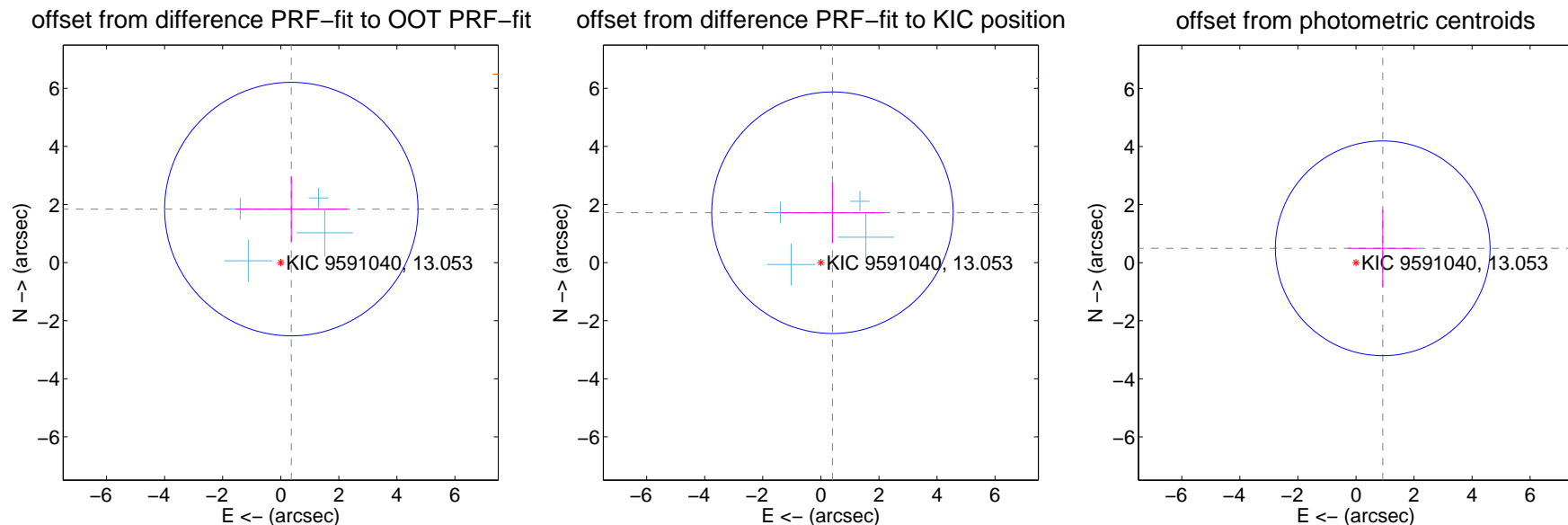
## DV Centroid Data

Supplemental centroid analysis for 009591040-01. Kepler magnitude: 13.05. Transit SNR 6.96

There are 4 quarters with good PRF difference image offsets

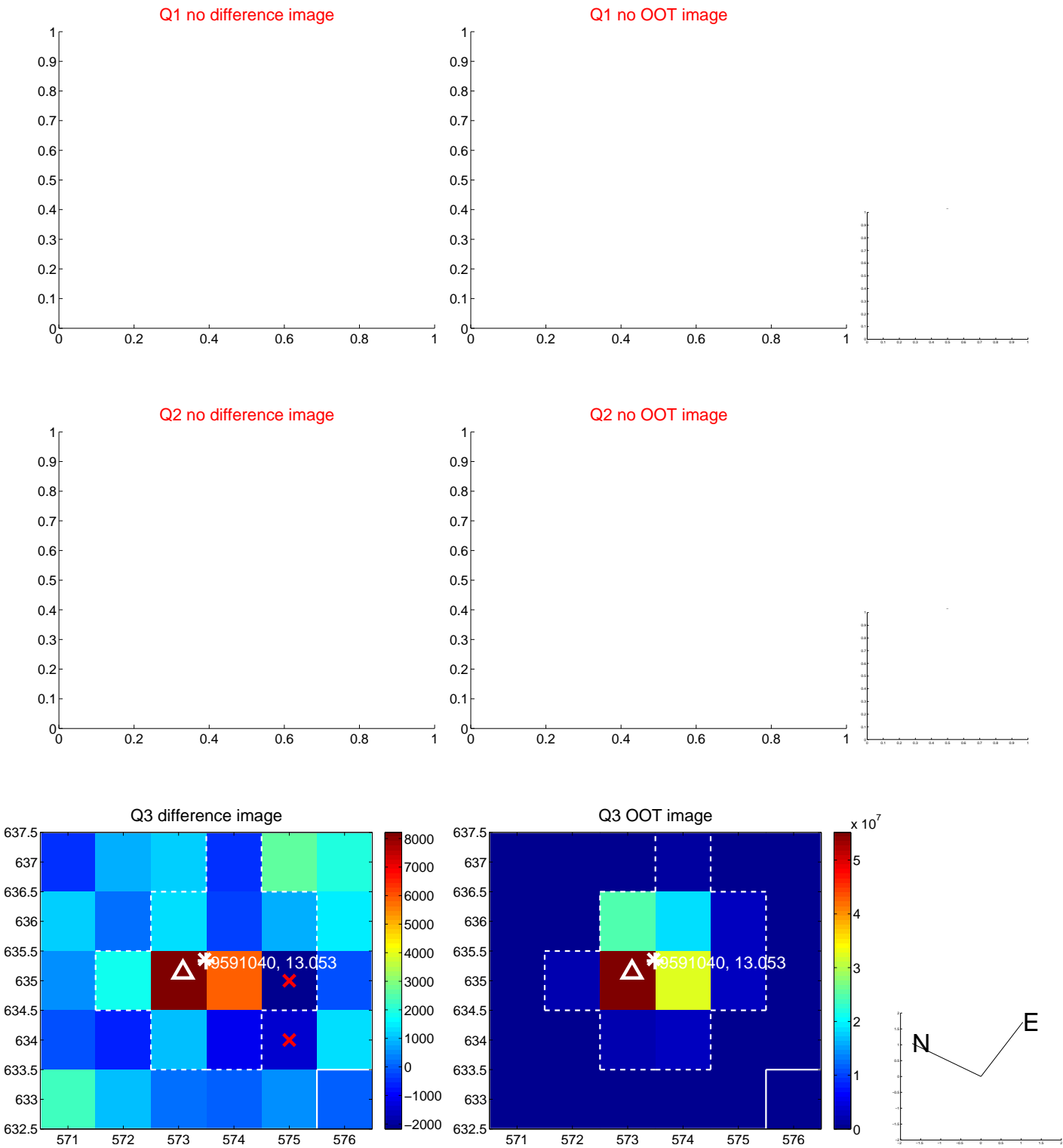
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.878 \pm 1.455$	1.29	$-0.364 \pm 1.934$	$1.843 \pm 1.118$
PRF-fit source offset from KIC position	$1.763 \pm 1.386$	1.27	$-0.399 \pm 1.791$	$1.717 \pm 1.040$
photometric centroid source offset	$1.05 \pm 1.23$	0.85	$-0.92 \pm 1.20$	$0.49 \pm 1.34$



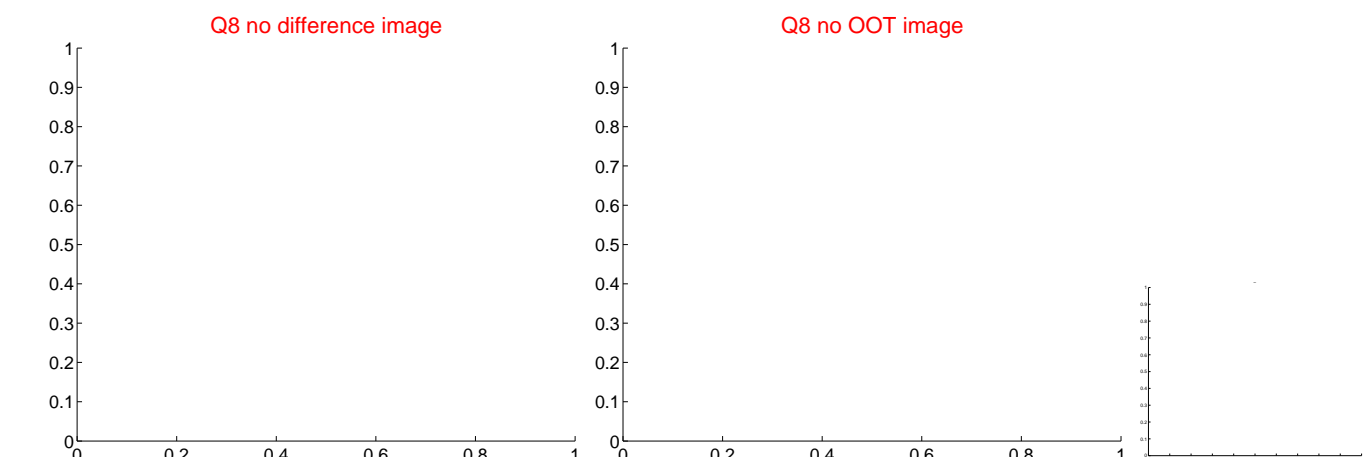
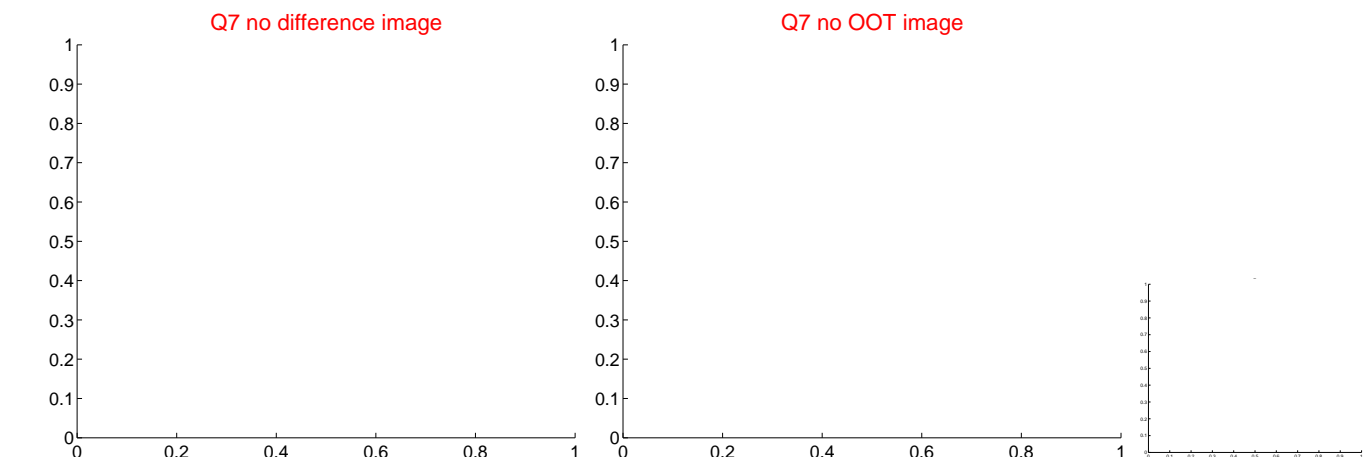
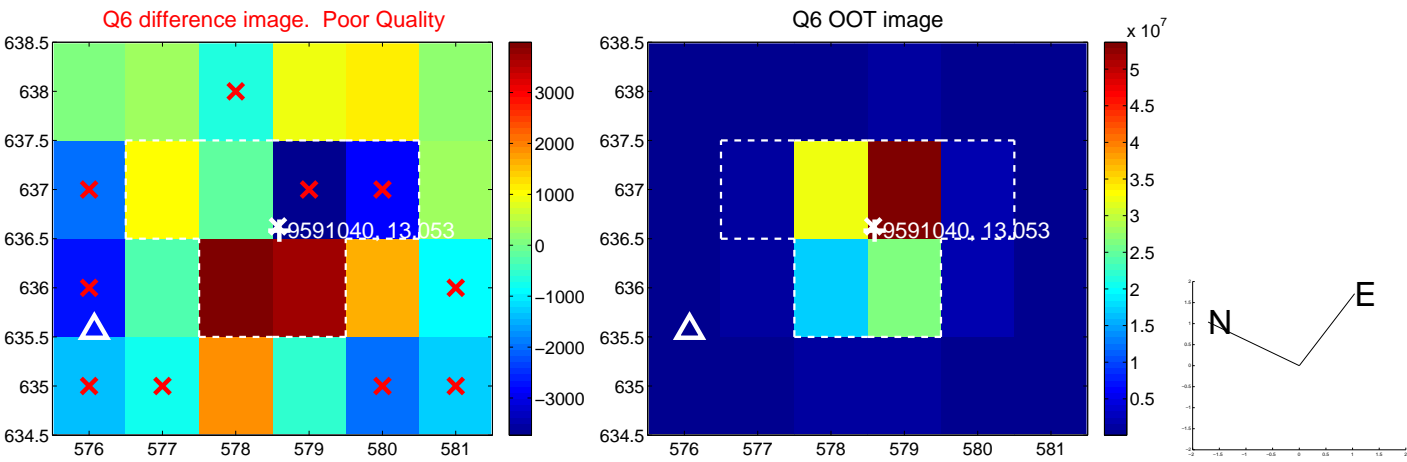
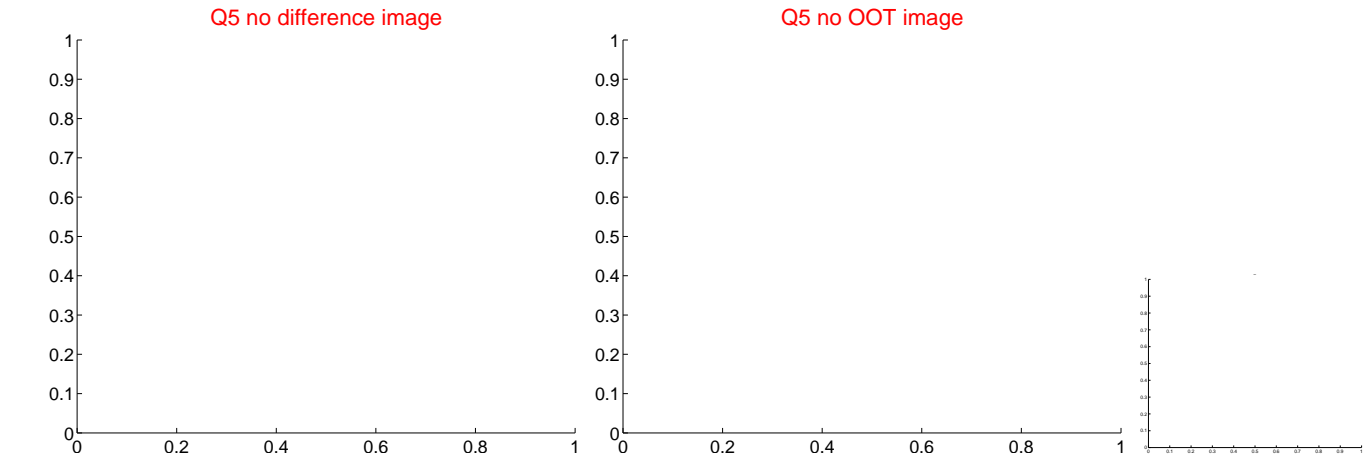
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

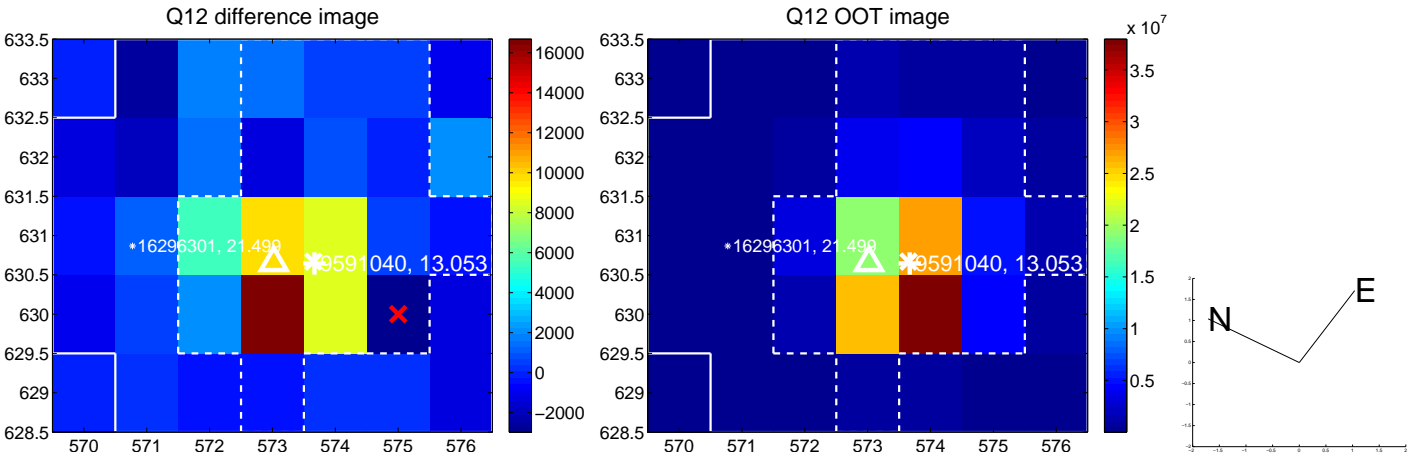
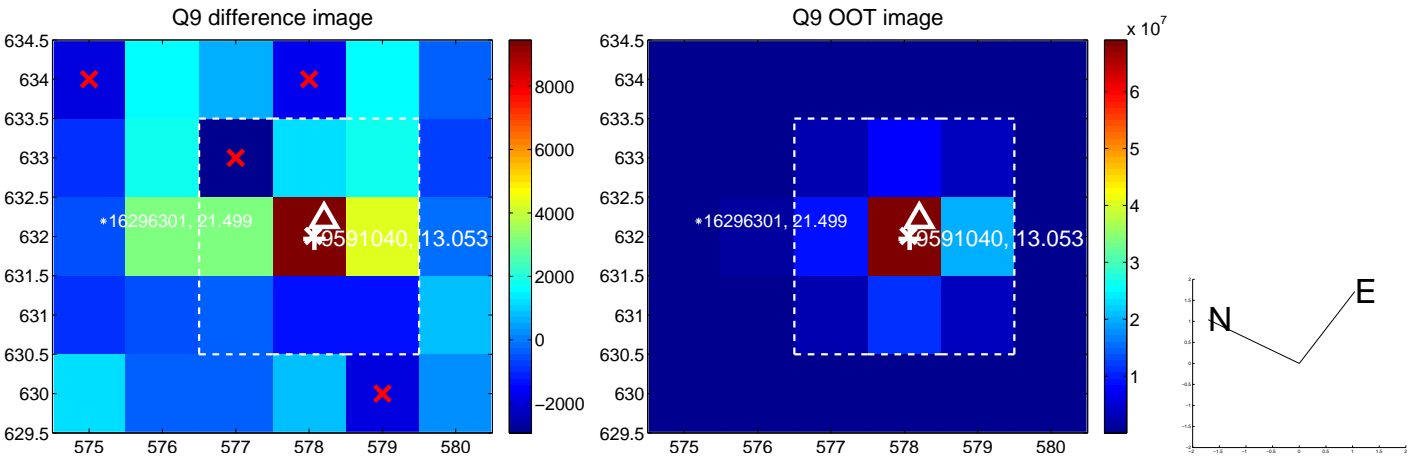




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

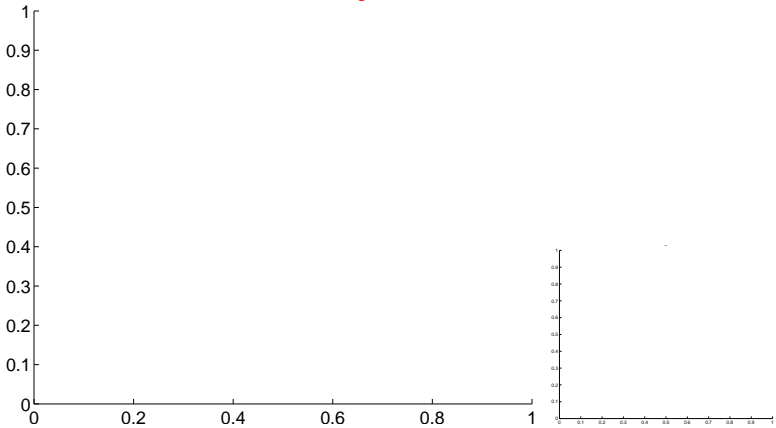


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

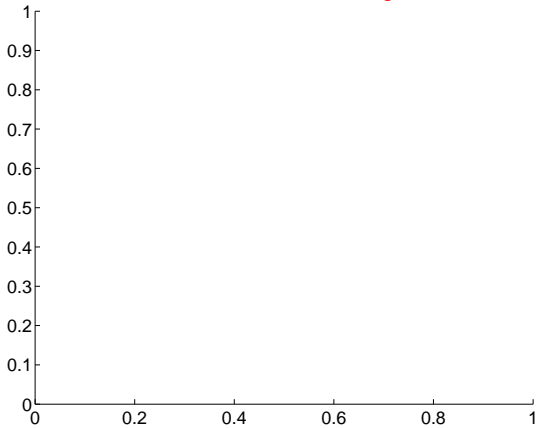
Q13 no difference image



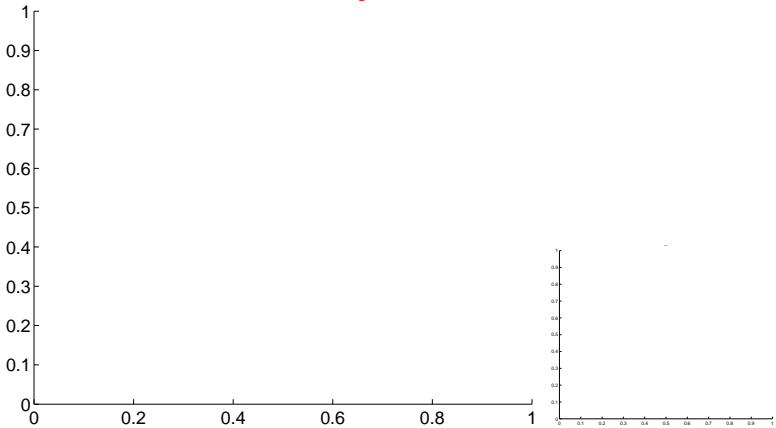
Q13 no OOT image



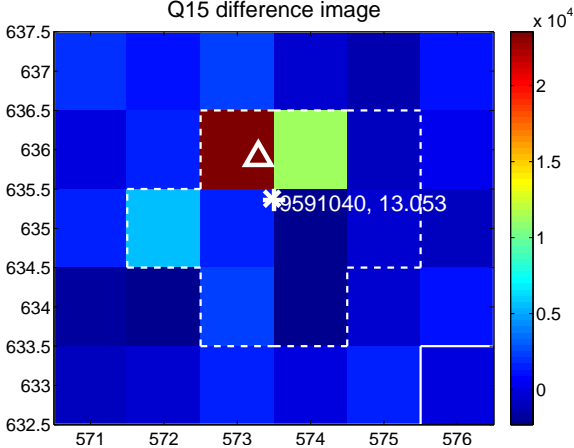
Q14 no difference image



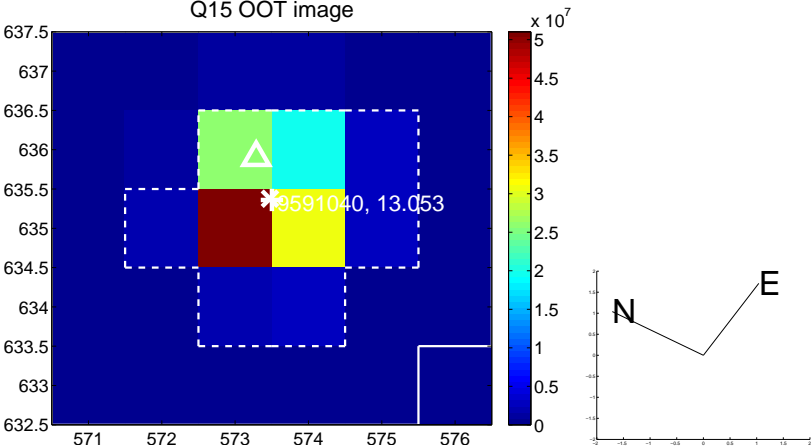
Q14 no OOT image



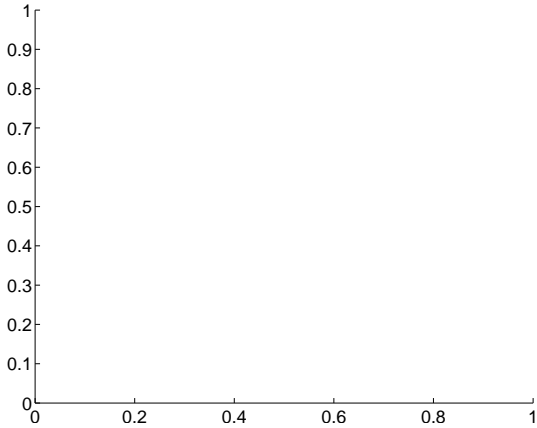
Q15 difference image



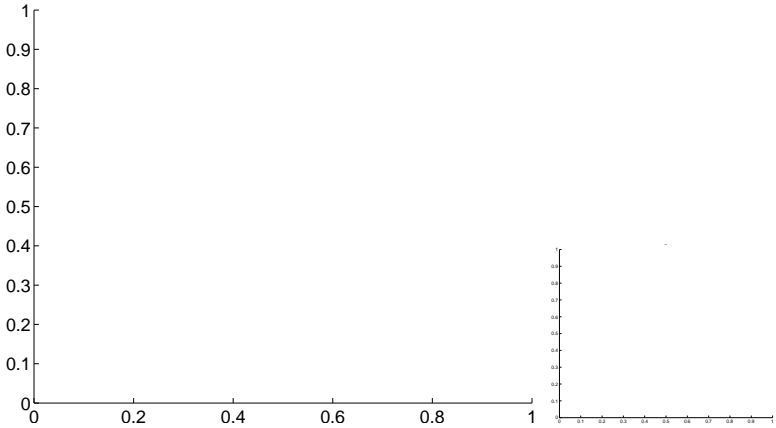
Q15 OOT image



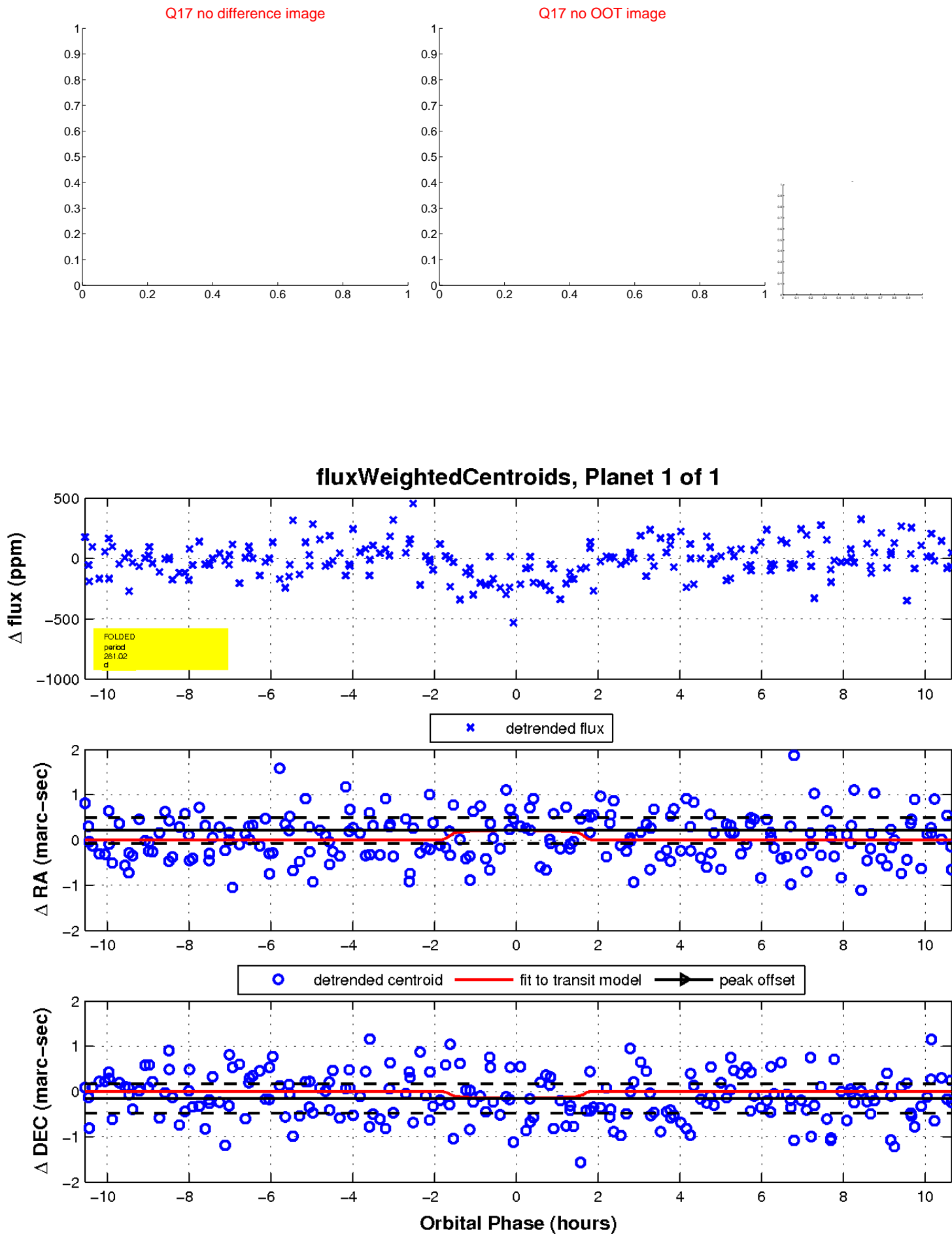
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

