

# KIC 010058570

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010058570-01	OBS	No	202.686552	280.672935	232.4	3.505	7.6	7.6	0.59	4488	1.20	0.40

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010058570-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—CENT_KIC_POS—HALO_GHOST

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

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

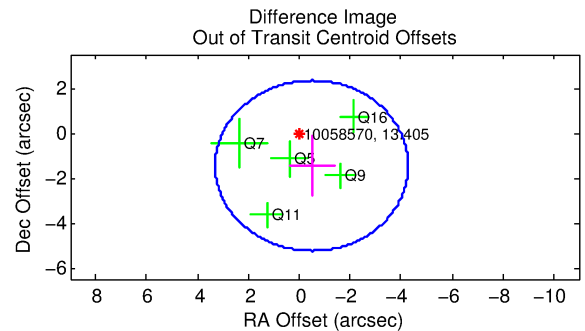
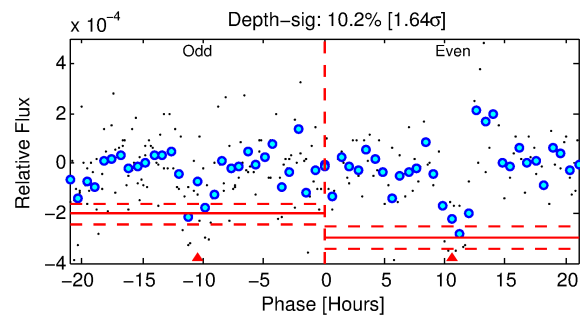
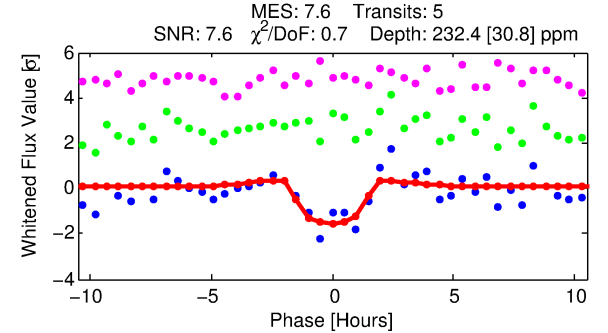
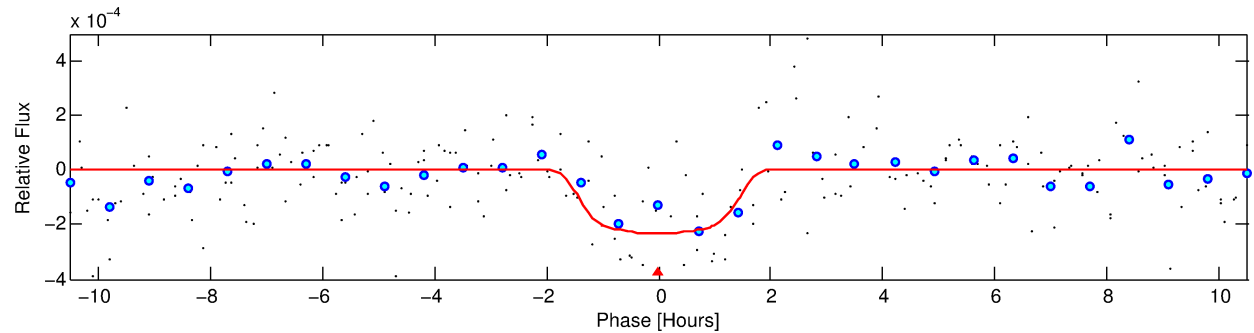
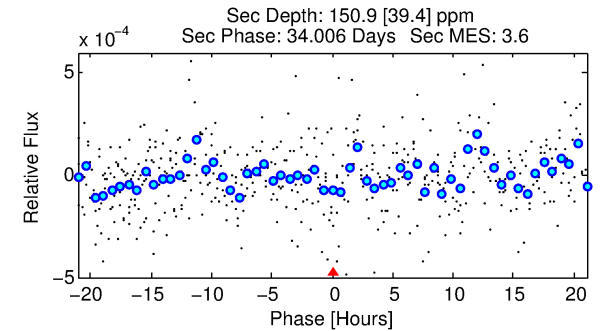
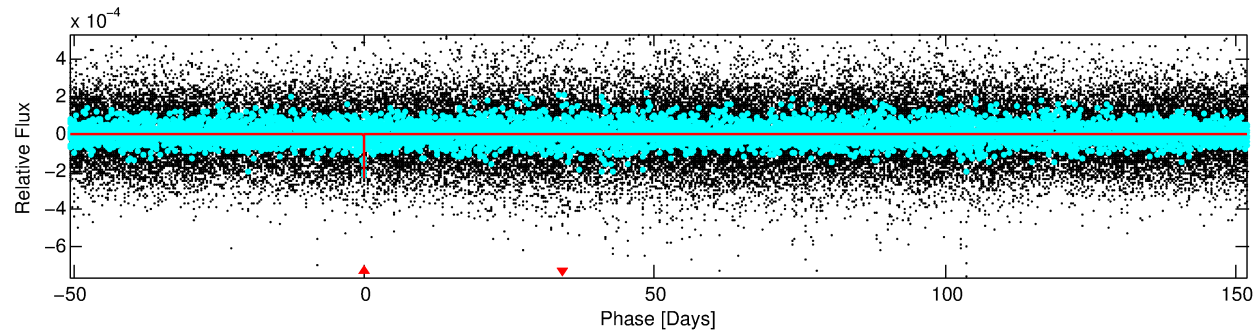
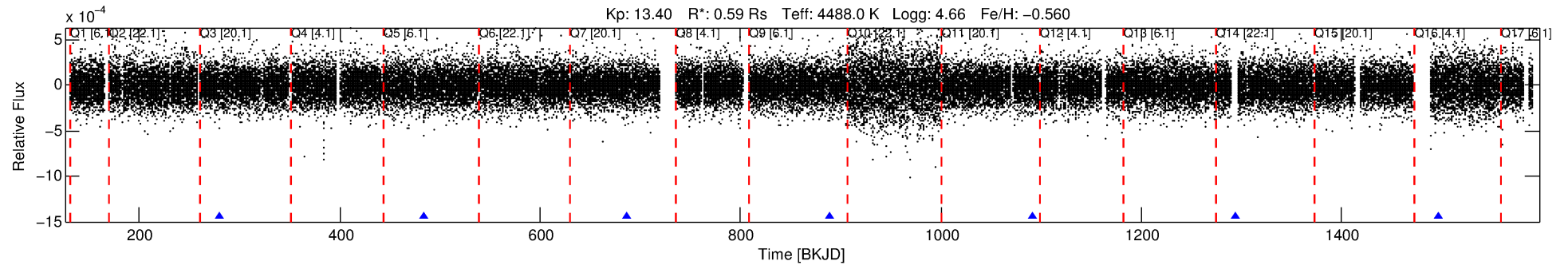
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010058570-01

No Significant Match Found

# DV One-Page Summary

KIC: 10058570 Candidate: 1 of 1 Period: 202.687 d



## DV Fit Results:

Period = 202.68655 [0.00302] d  
Epoch = 280.6729 [0.0104] BKJD  
Rp/R\* = 0.0186 [0.0041]  
a/R\* = 160.80 [139.07]  
b = 0.95 [0.09]  
Seff = 0.40 [0.06]  
Teq = 203 [8] K  
Rp = 1.20 [0.29] Re  
a = 0.5636 [0.0394] AU  
Ag = 18278.42 [9603.45] [1.90σ]  
Teffp = 3651 [484] K [7.13σ]

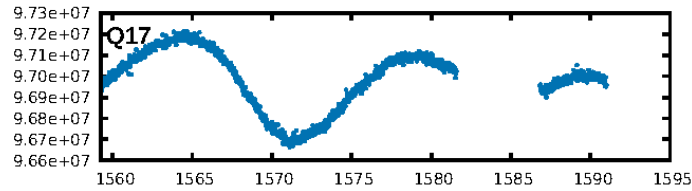
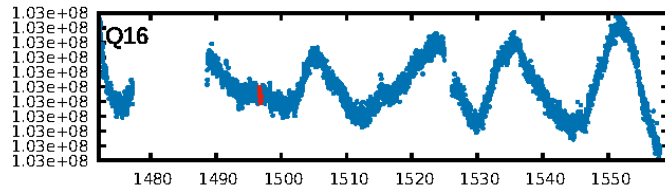
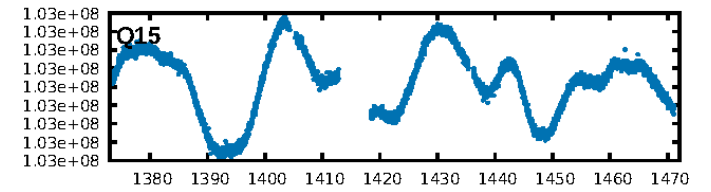
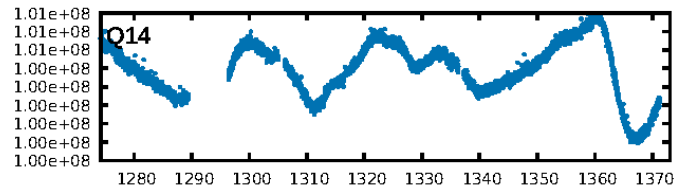
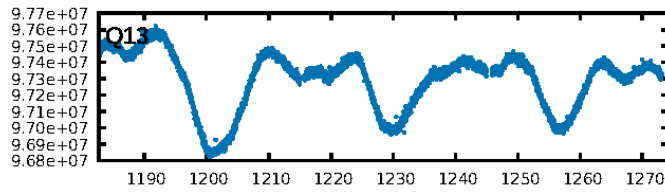
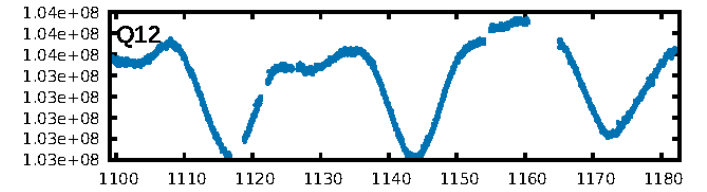
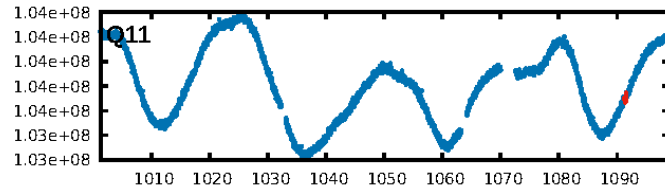
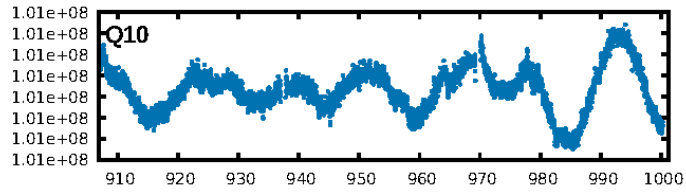
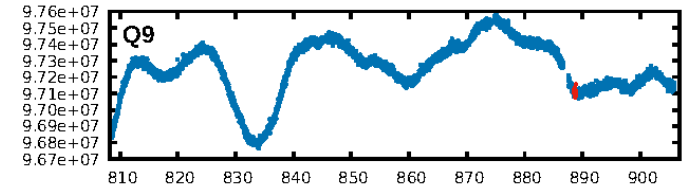
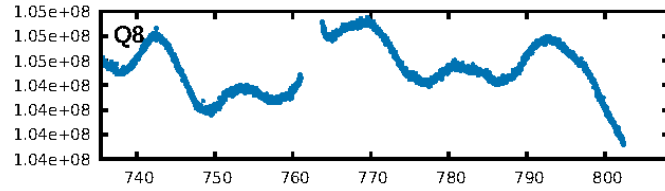
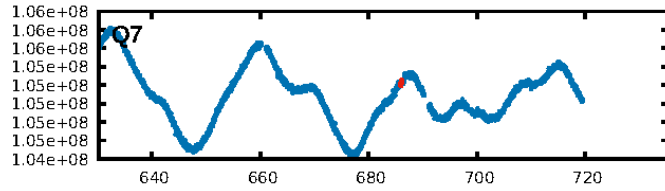
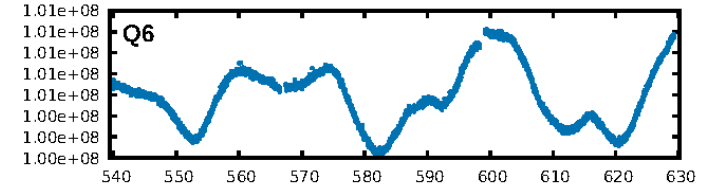
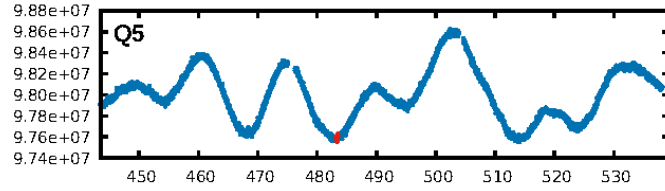
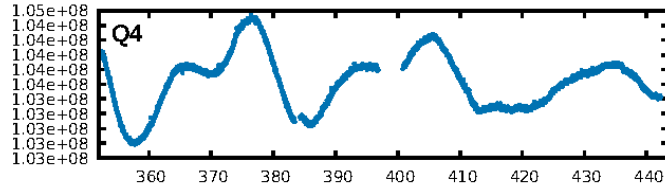
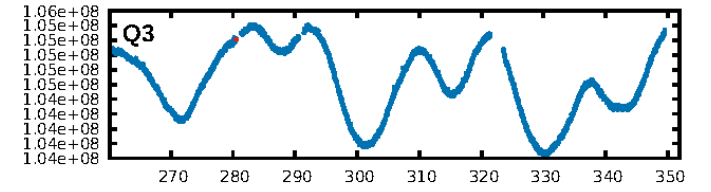
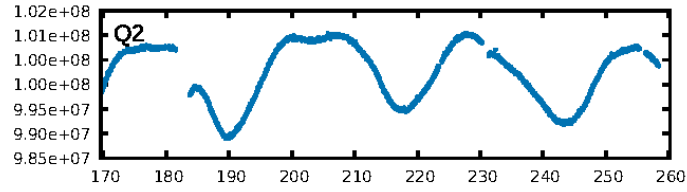
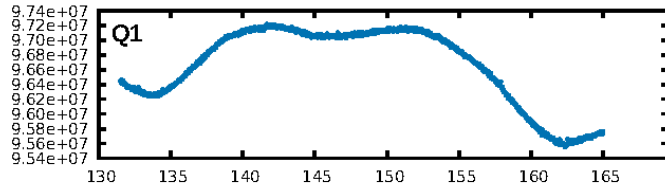
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 90.5%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: 2.25e-13  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 0.2092**  
Centroid-sig: 1.0%  
Centroid-so: 2.821 arcsec [1.79σ]  
OotOffset-rm: 1.538 arcsec [1.22σ]  
KicOffset-rm: 2.235 arcsec [2.11σ]  
OotOffset-st: 0/2/1/2 [5]  
KicOffset-st: 0/2/1/2 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 1.00 [5/5]

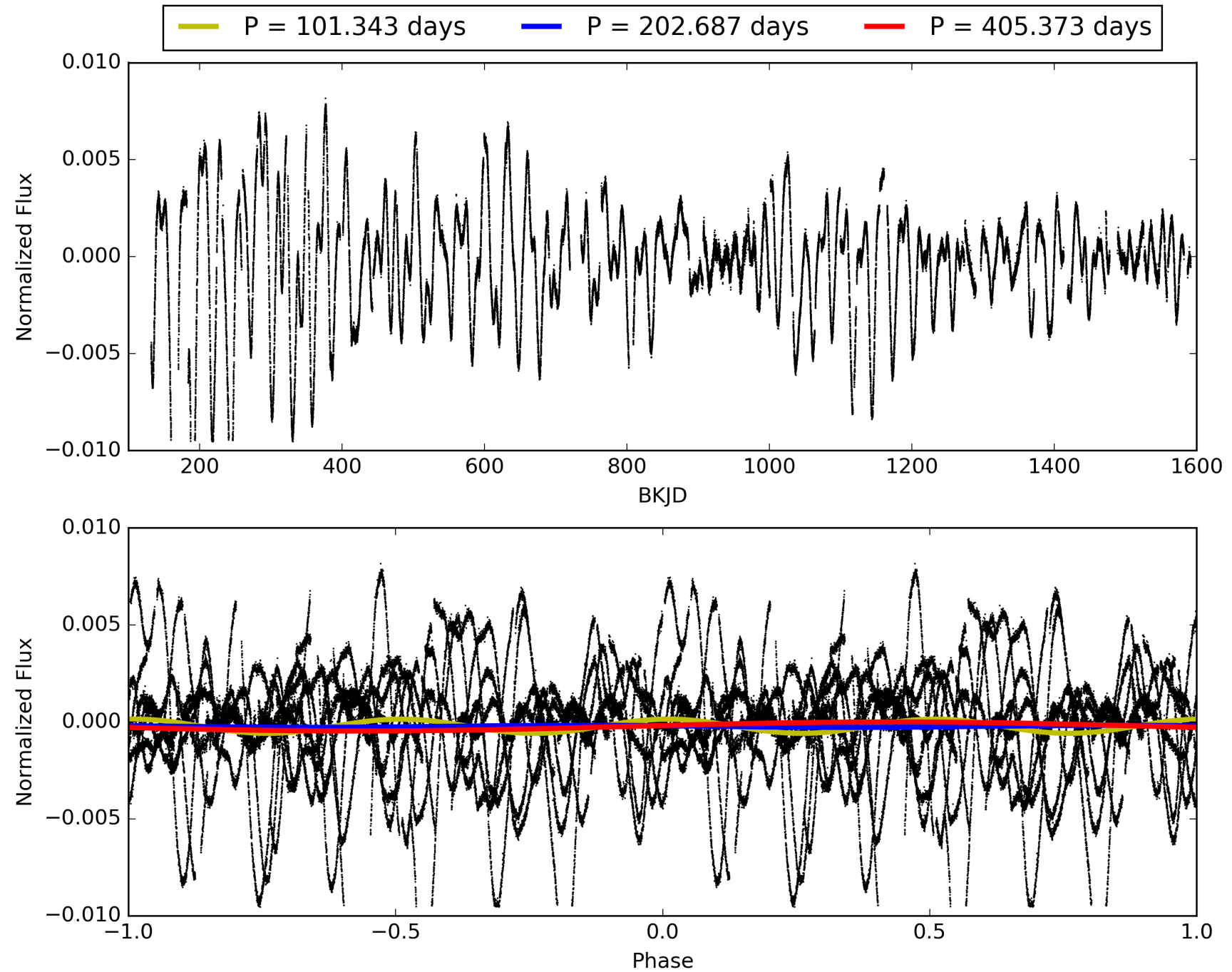
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 20:00:26 Z

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

# TCE 010058570-01, PDC Light Curves

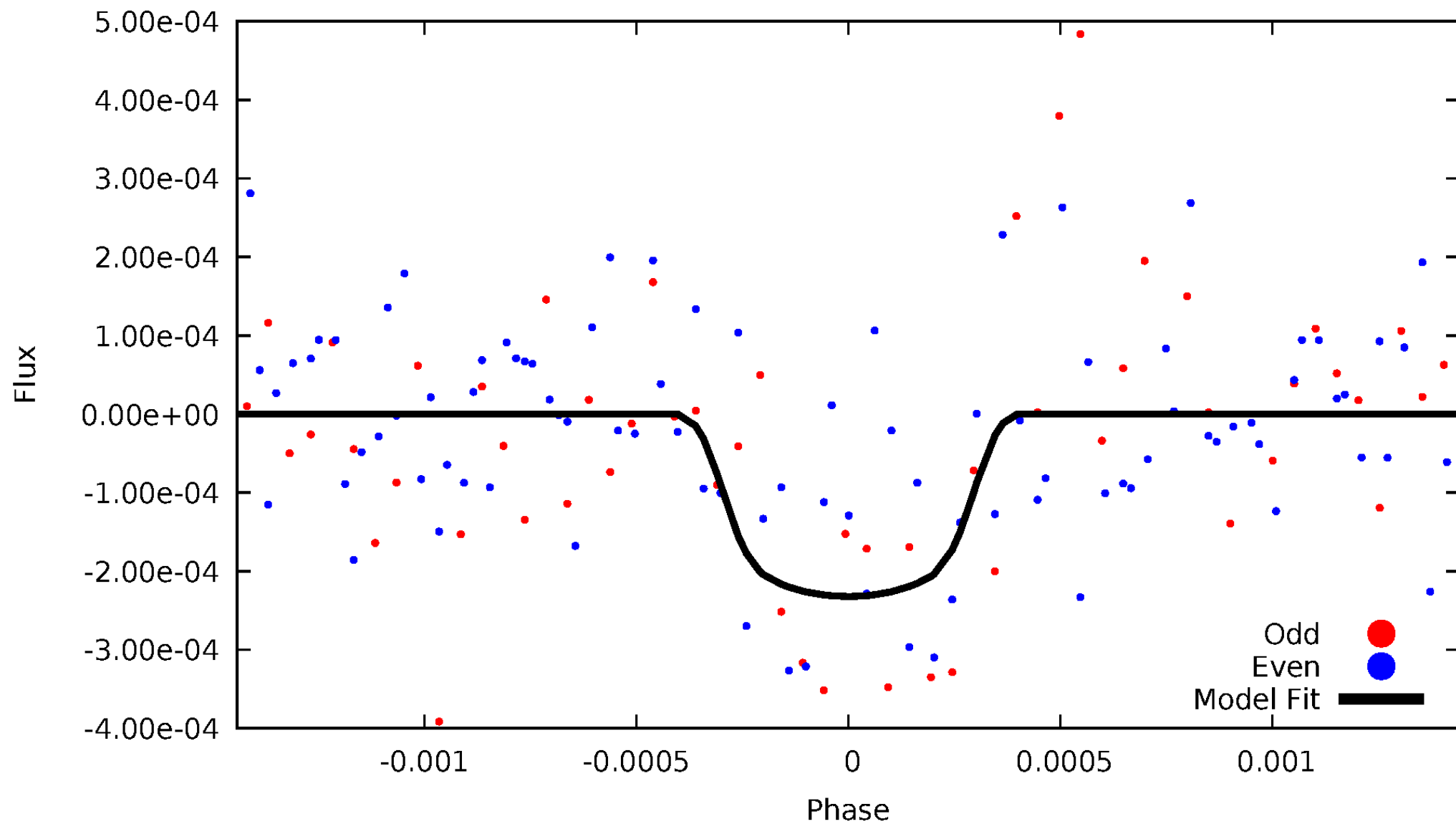


TCE 010058570-01



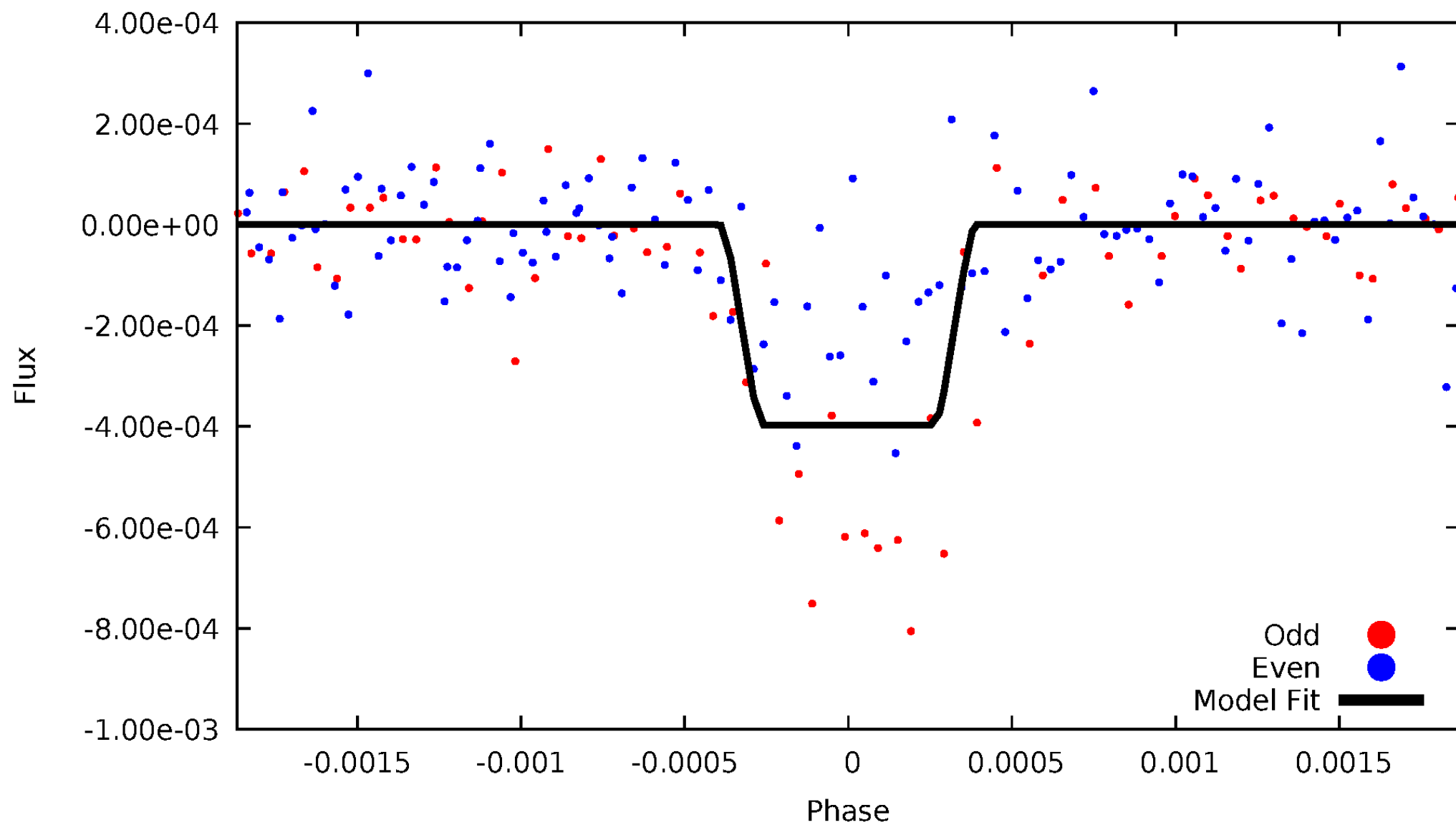
# DV Odd/Even

TCE 010058570-01



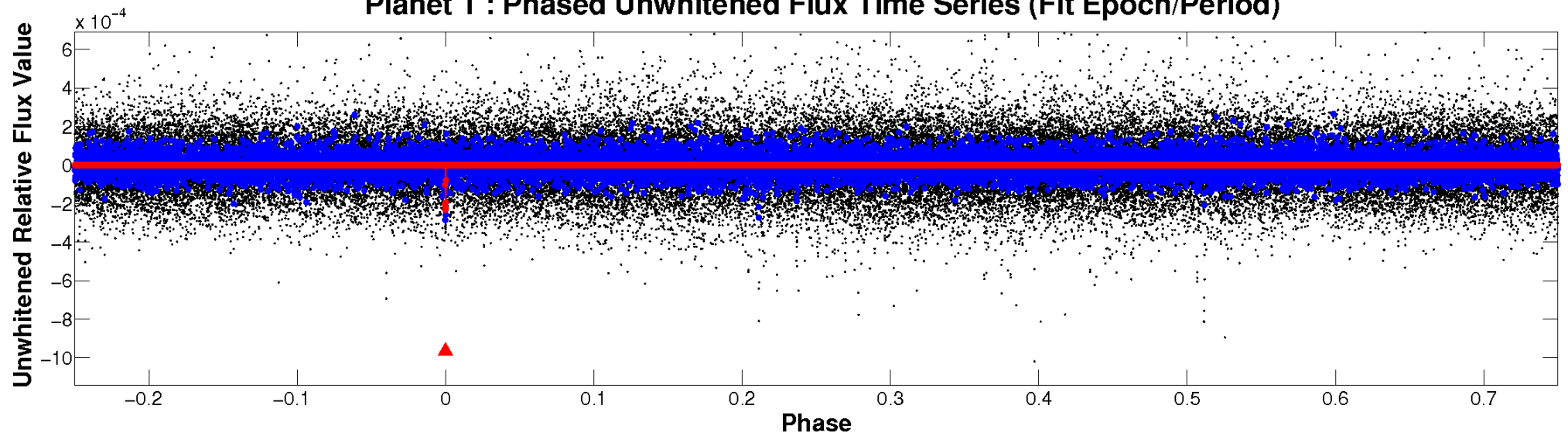
# ALT Odd/Even

TCE 010058570-01

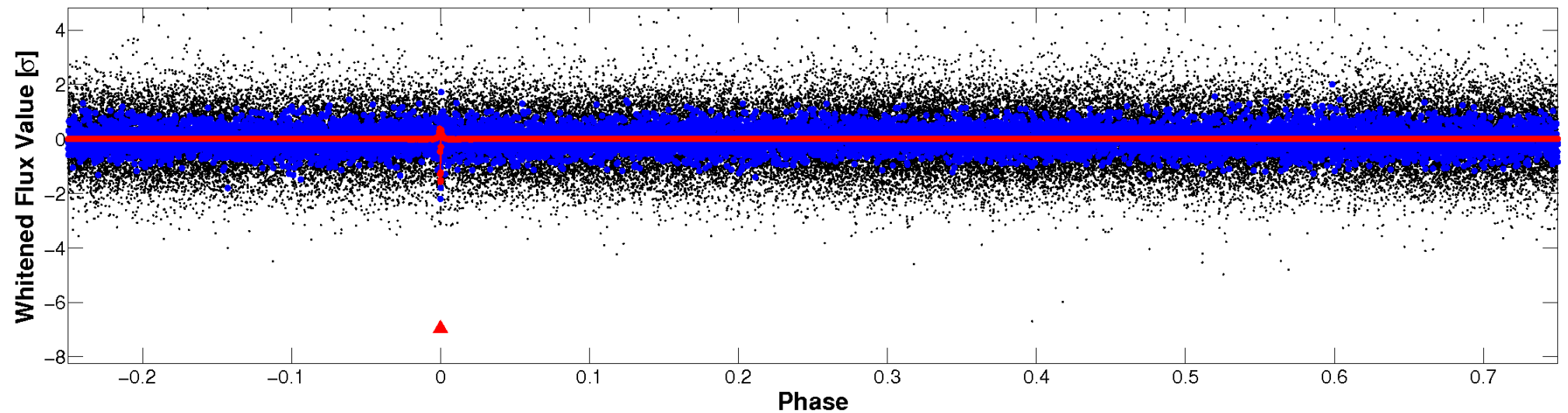


# Non-Whitened Vs. Whitened Light Curve

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

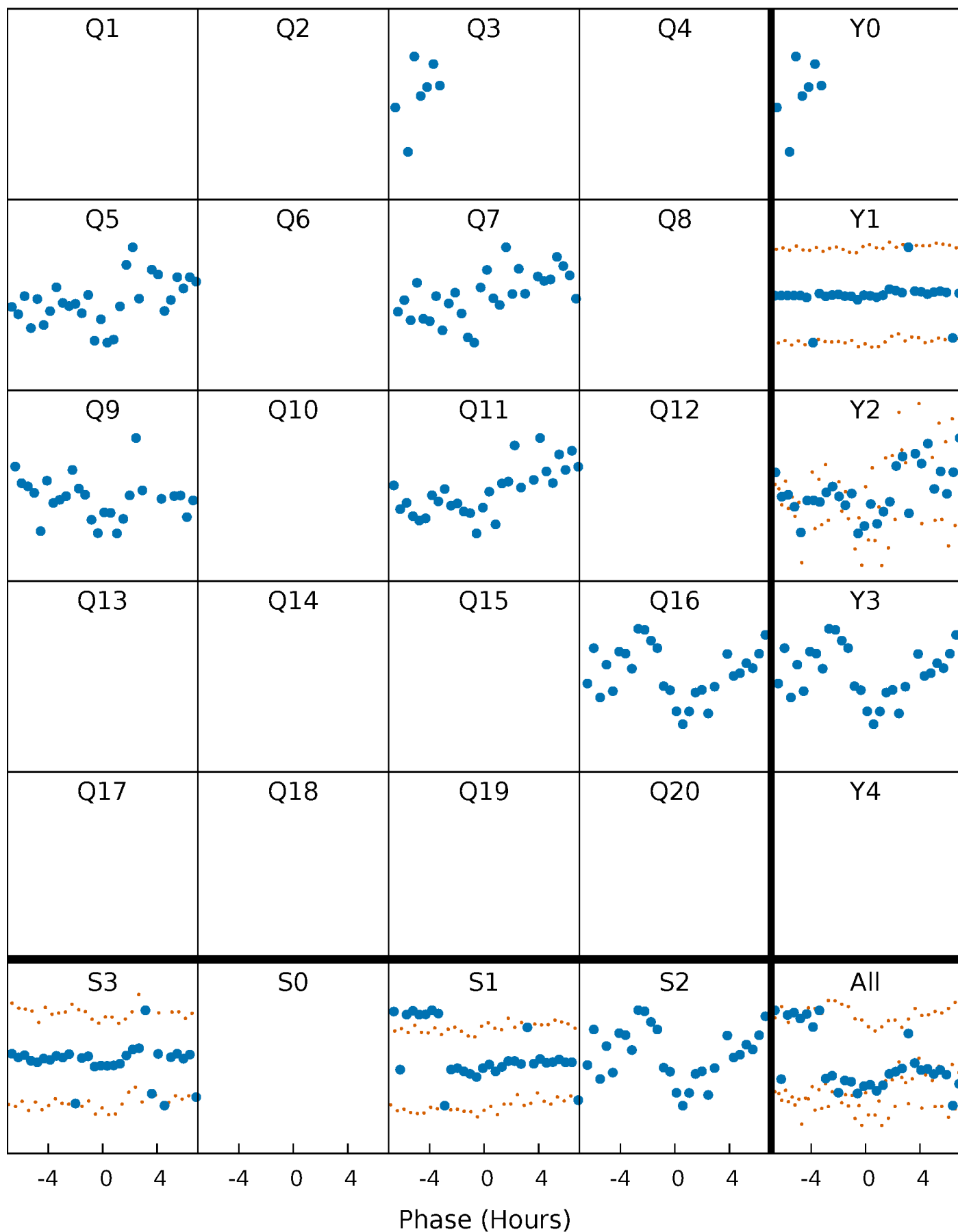


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

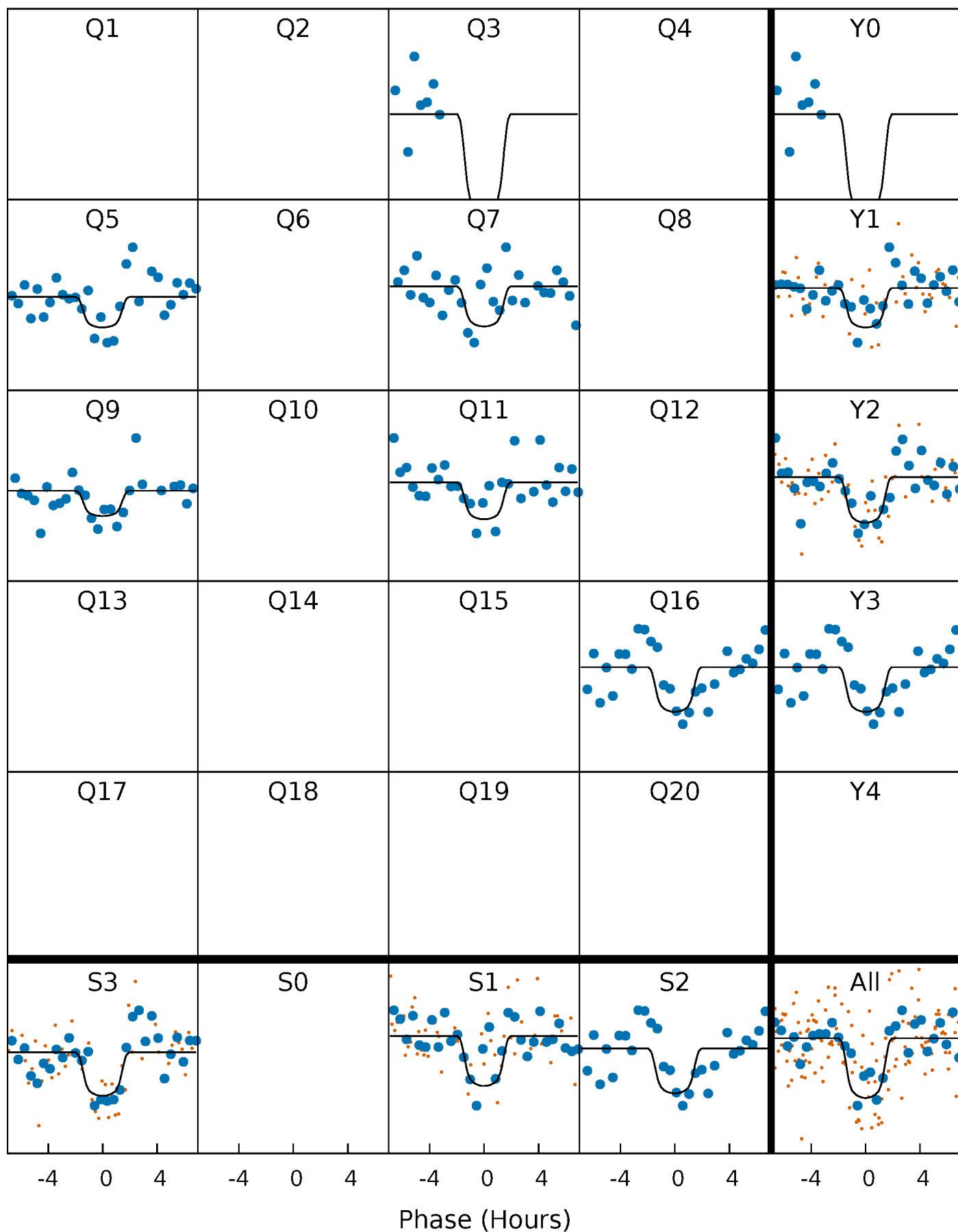
TCE 010058570-01 P=202.686552 Days  $T_0=280.672935$  (BKJD)





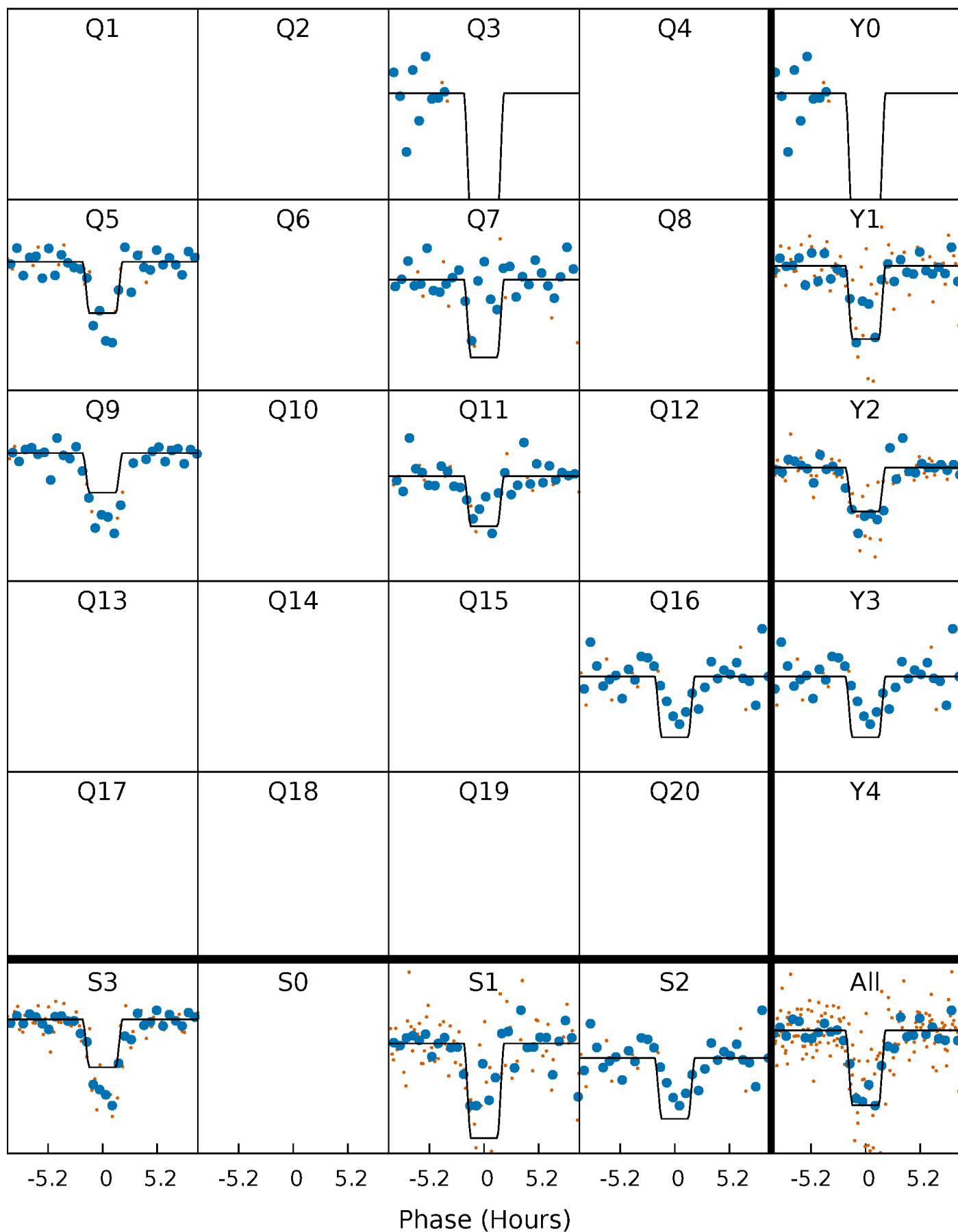
# DV Quarter-Phased Transit Curves

TCE 010058570-01 P=202.686552 Days  $T_0=280.672935$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

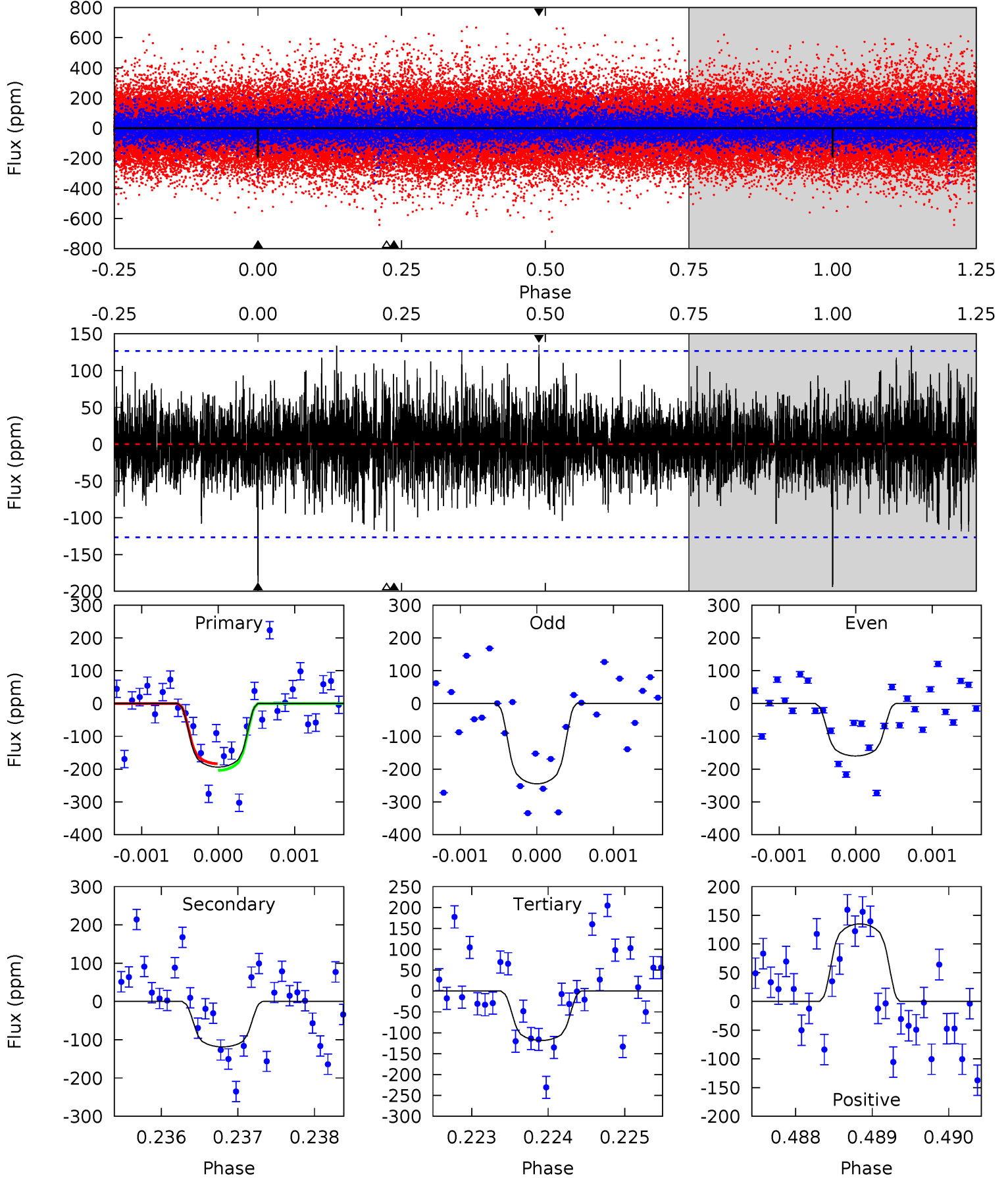
TCE 010058570-01 P=202.687523 Days  $T_0=280.680816$  (BKJD)



# DV Model-Shift Uniqueness Test

010058570-01, P = 202.686552 Days, E = 77.986383 Days

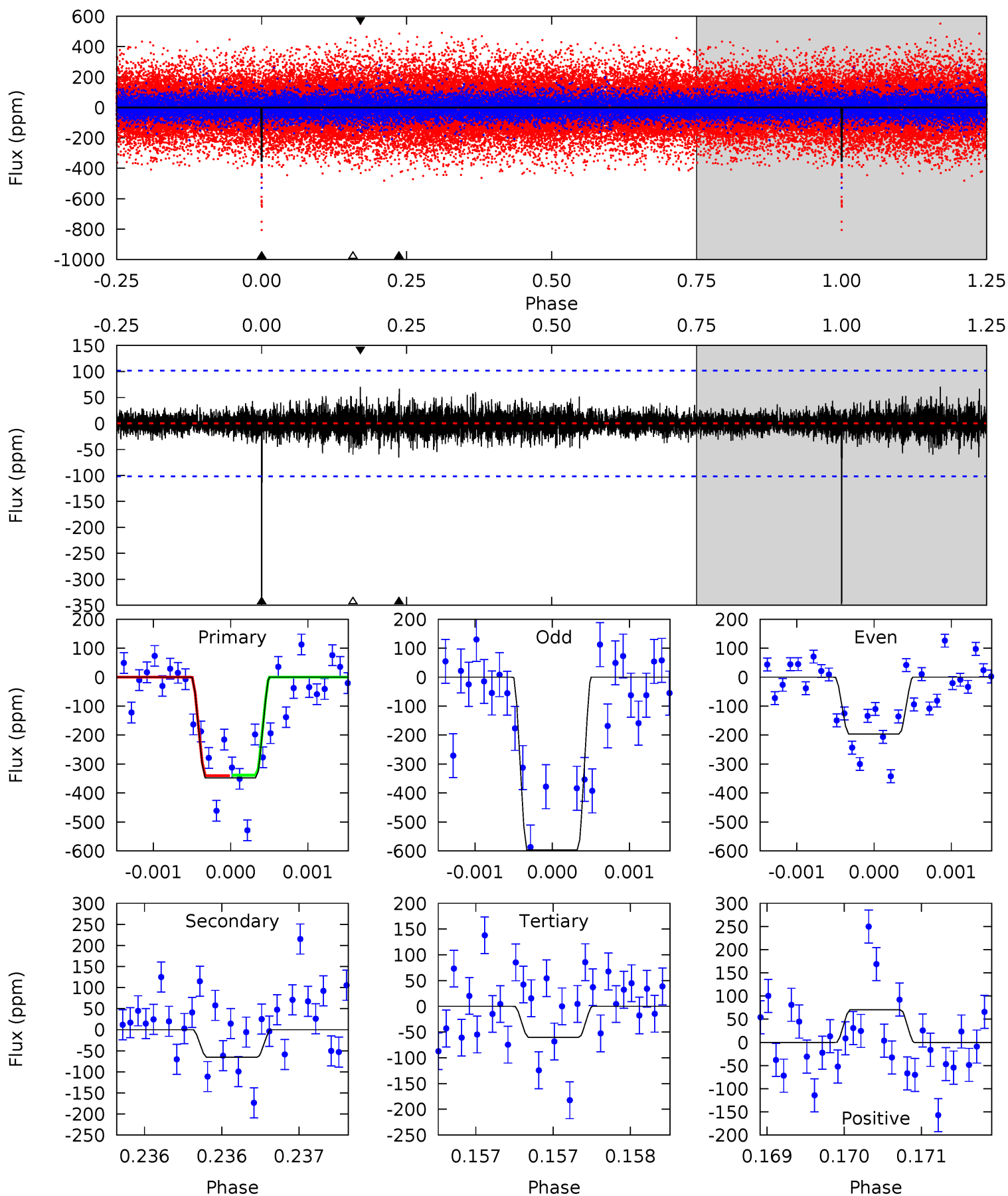
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.43	5.16	5.14	5.87	5.50	3.37	1.41	3.28	2.56	0.01	-0.71	1.80	1.03	0.41	0.44



# Alt Model-Shift Uniqueness Test

010058570-01,  $P = 202.687523$  Days,  $E = 77.993293$  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
18.8	3.53	3.25	3.79	5.49	3.36	0.78	15.5	15.0	0.28	-0.26	10.4	1.18	0.17	0.04



### Stellar Parameters For KIC 010058570

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4488^{+134}_{-134}$	$4.656^{+0.052}_{-0.028}$	$-0.560^{+0.300}_{-0.300}$	$0.593^{+0.051}_{-0.051}$	$0.581^{+0.066}_{-0.038}$	$3.922^{+0.898}_{-0.503}$
	+3%/-3%	+1%/-1%	+54%/-54%	+9%/-9%	+11%/-7%	+23%/-13%
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 010058570-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	-119±23	$1.20^{+0.28}_{-0.29}$	$283^{+10}_{-10}$	$3695^{+405}_{-276}$	$14402^{+11387}_{-5503}$
Alt.	-65±19	$1.30^{+0.27}_{-0.27}$	$283^{+9}_{-10}$	$3274^{+301}_{-236}$	$6595^{+5072}_{-2577}$

$T_{\text{max}}$  = 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

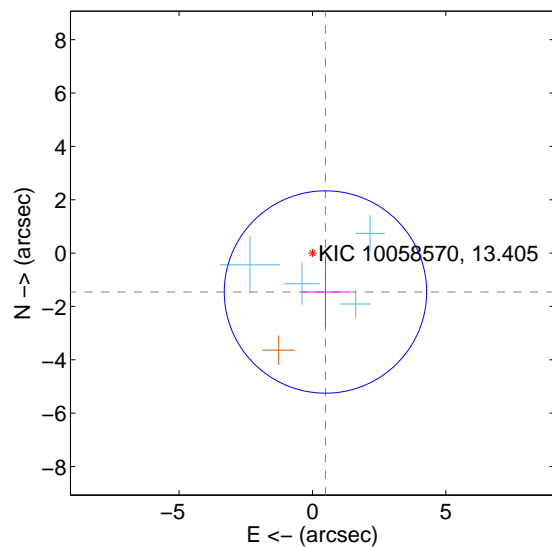
Supplemental centroid analysis for 010058570-01. Kepler magnitude: 13.40. Transit SNR 7.64

There are 4 quarters with good PRF difference image offsets

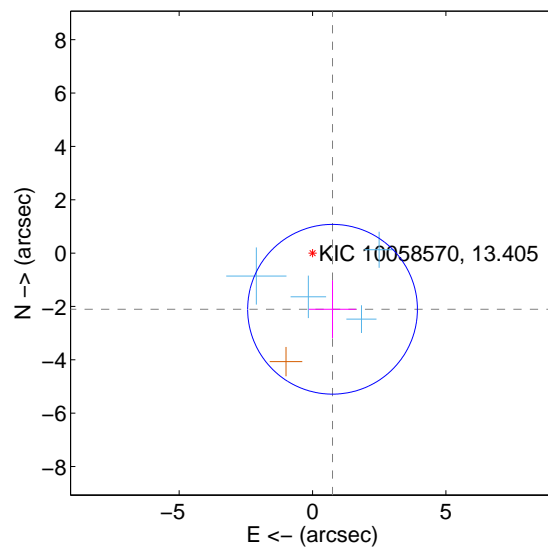
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.538 \pm 1.264$	1.22	$-0.488 \pm 0.881$	$-1.458 \pm 1.300$
PRF-fit source offset from KIC position	$2.235 \pm 1.060$	2.11	$-0.750 \pm 0.889$	$-2.105 \pm 1.080$
photometric centroid source offset	$2.82 \pm 1.58$	1.79	$0.49 \pm 1.58$	$-2.78 \pm 1.58$

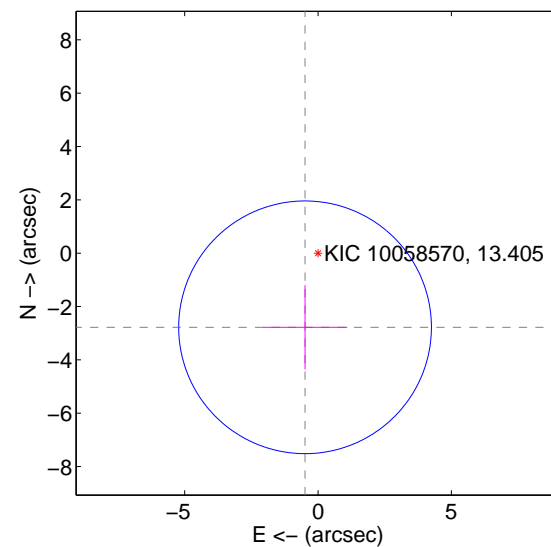
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

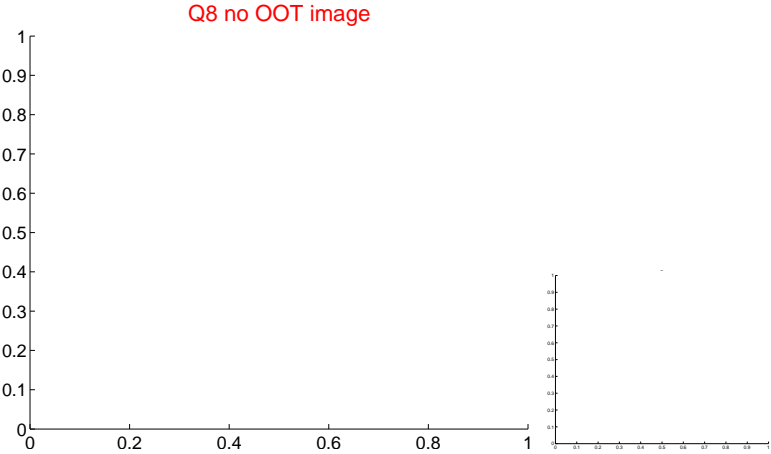
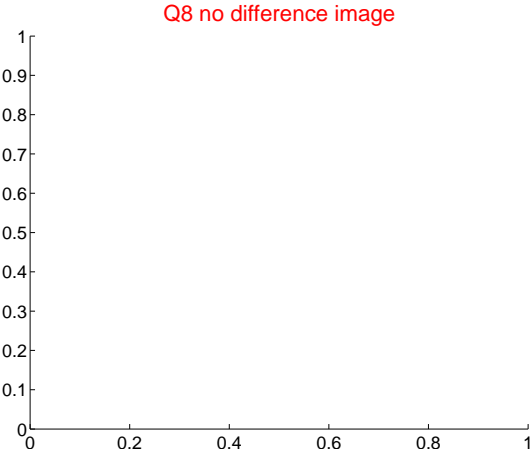
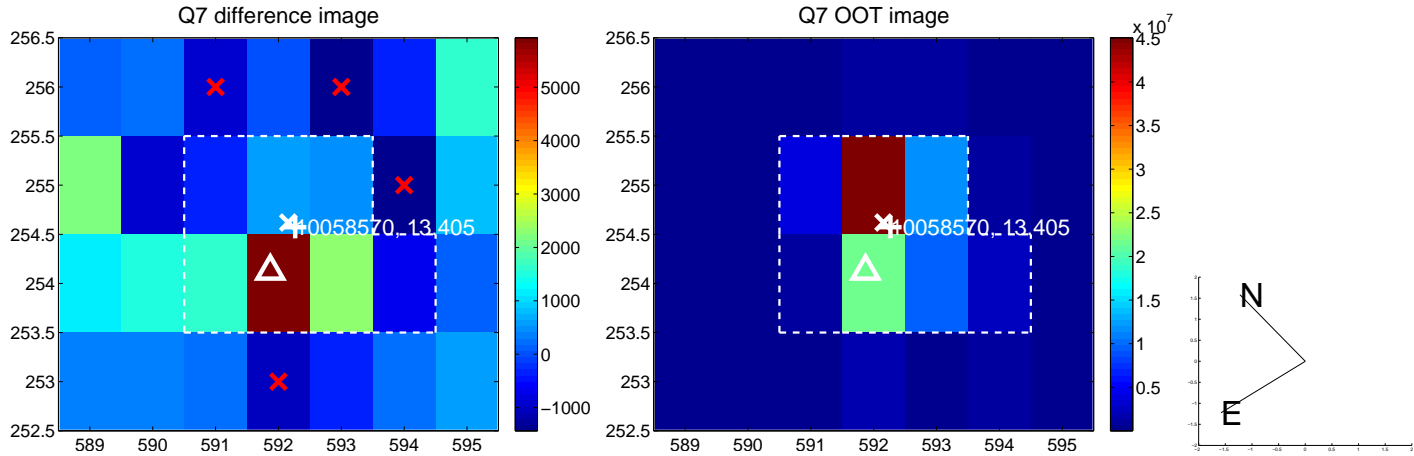
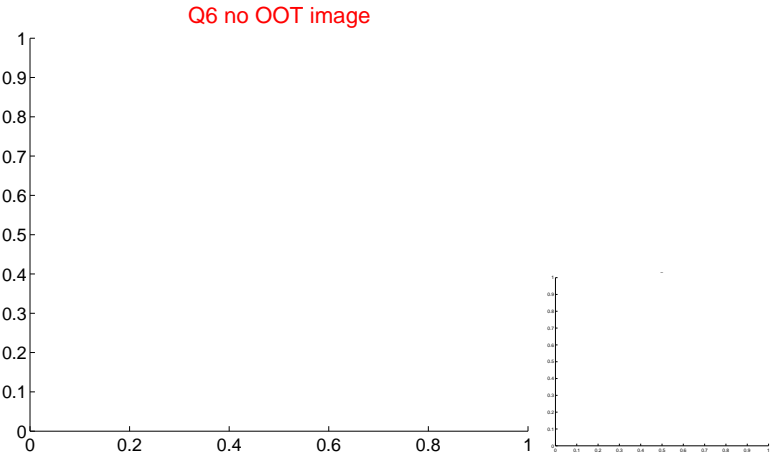
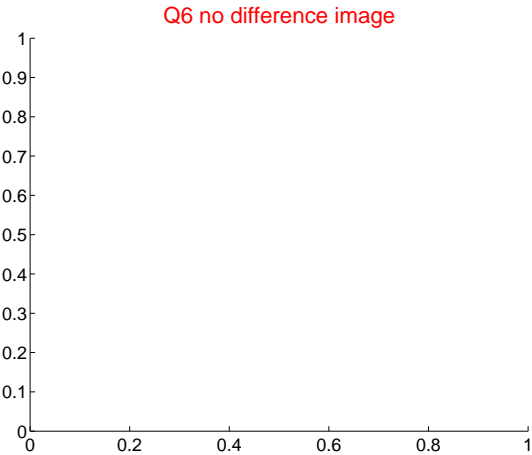
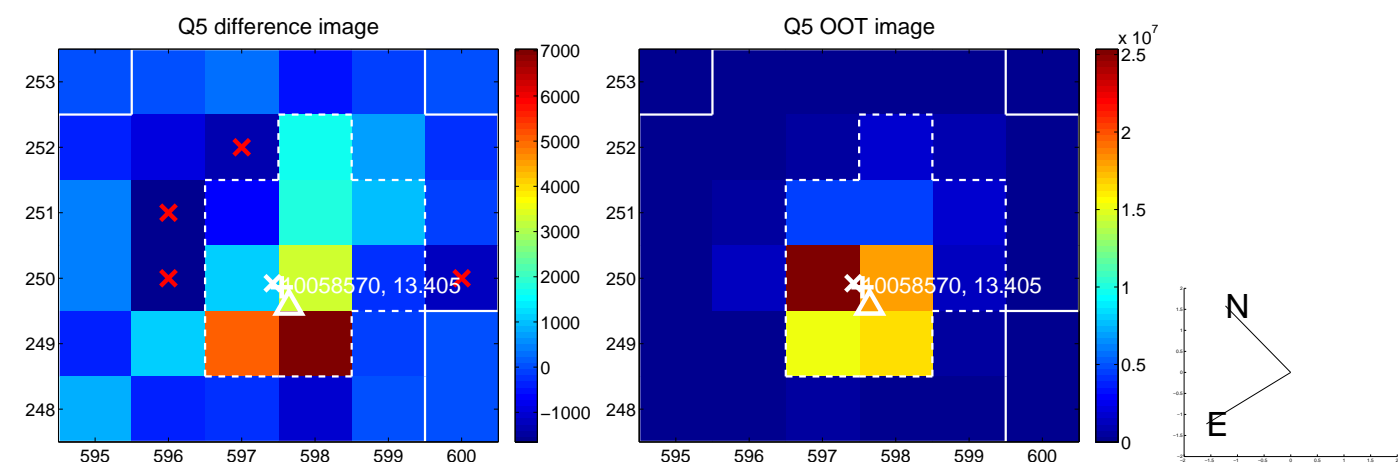


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

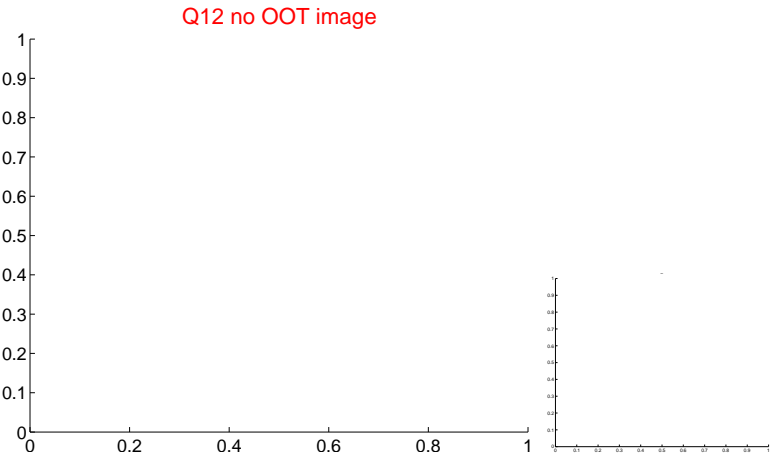
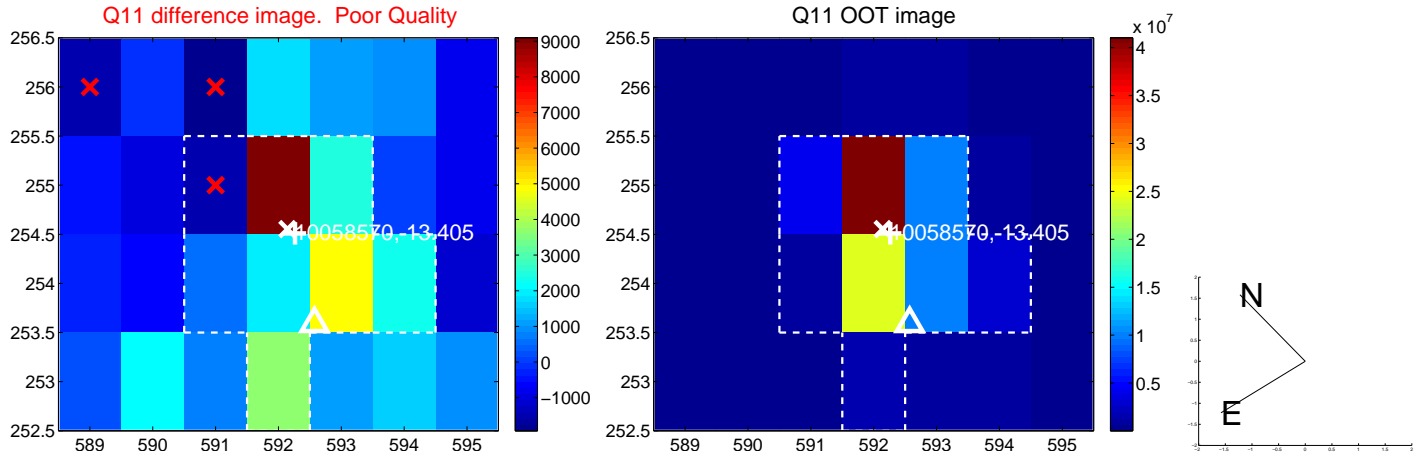
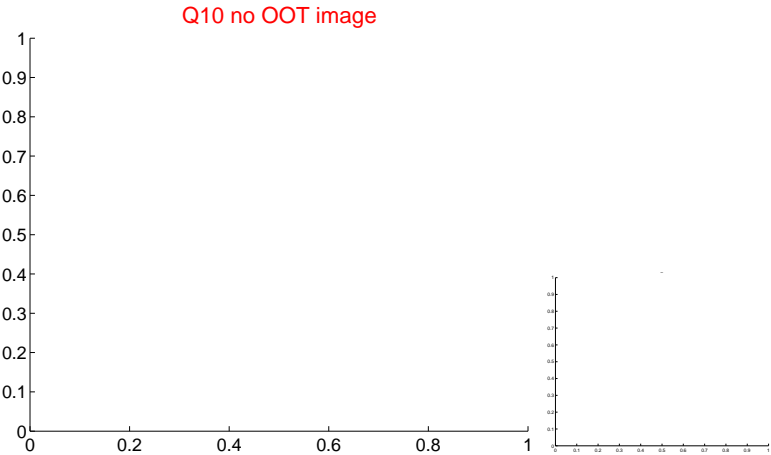
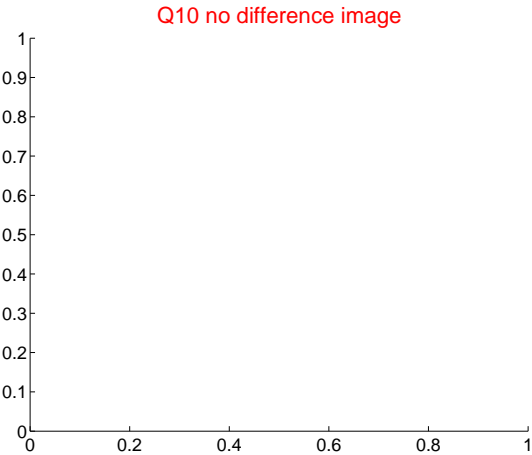
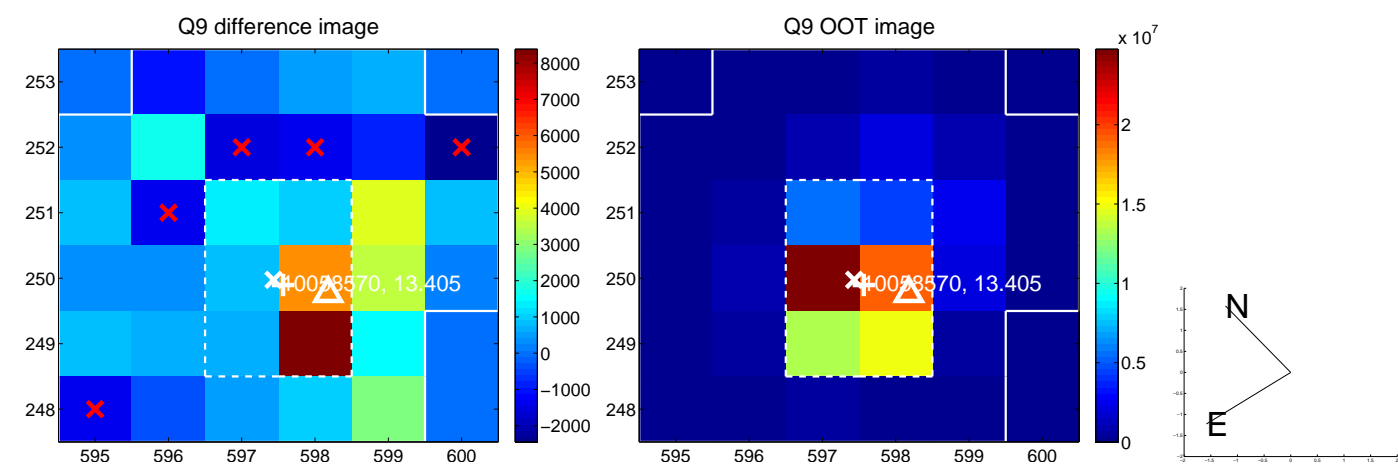


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

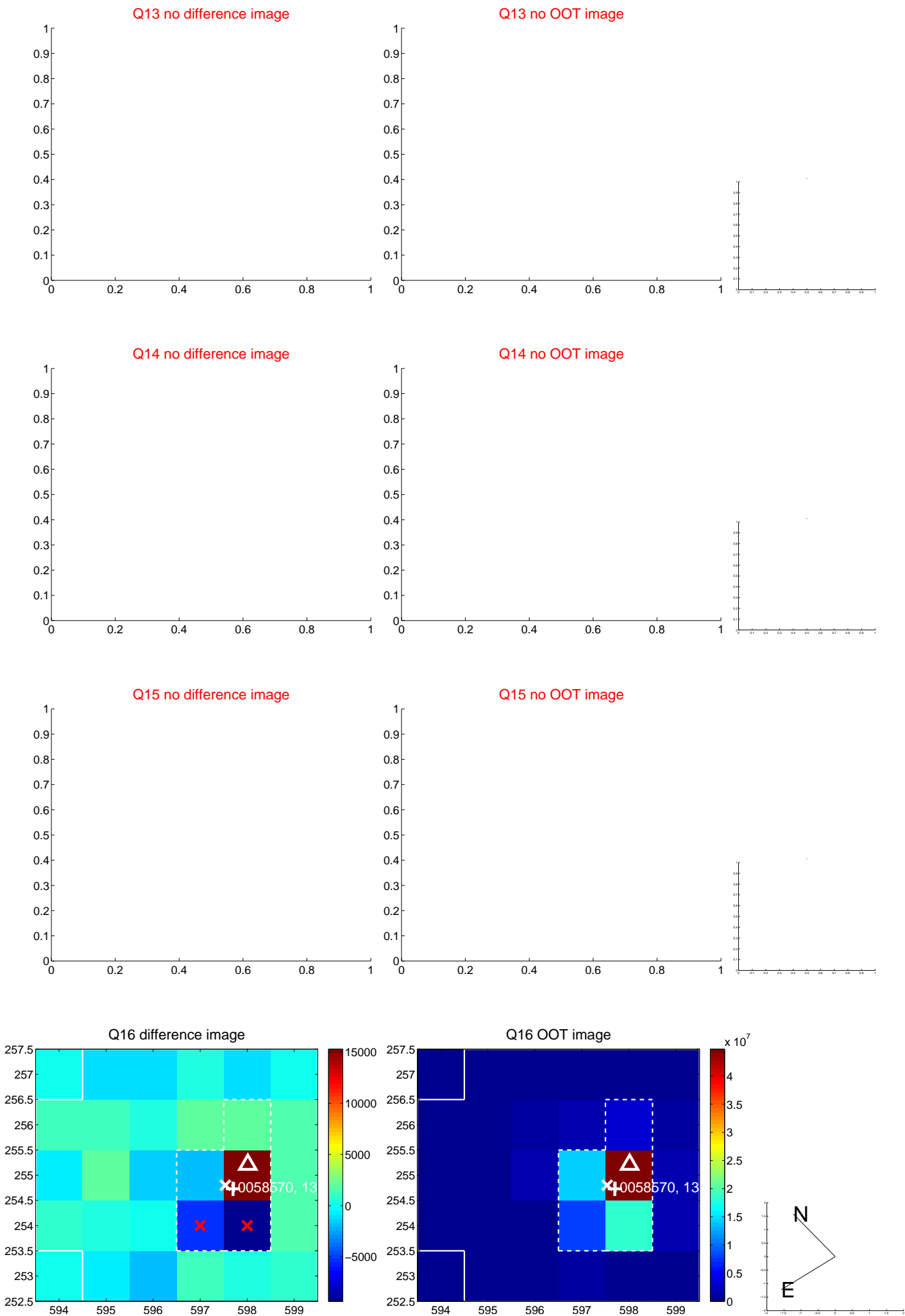




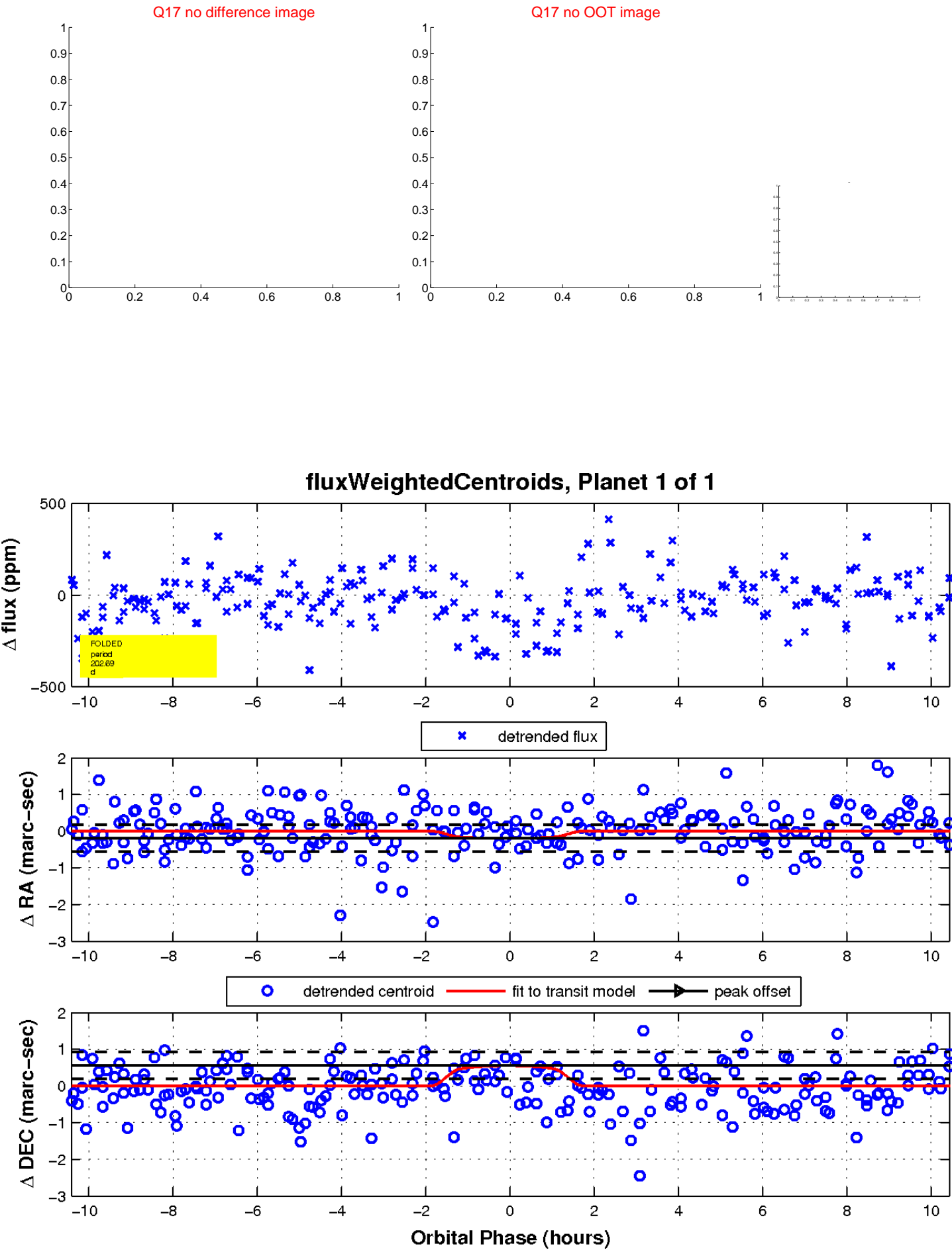
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

