

# KIC 011970050

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011970050-01	OBS	4893.01	13.175079	138.039324	415.5	2.013	9.2	10.4	0.99	6014	2.28	90.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011970050-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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 011970050-01

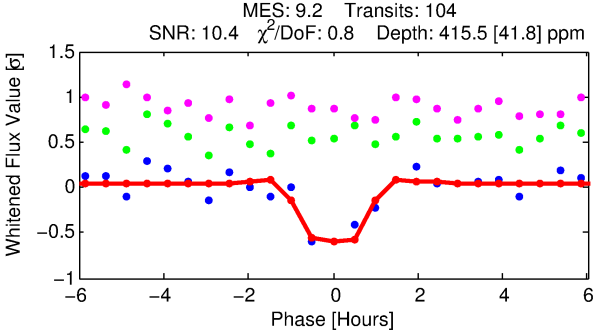
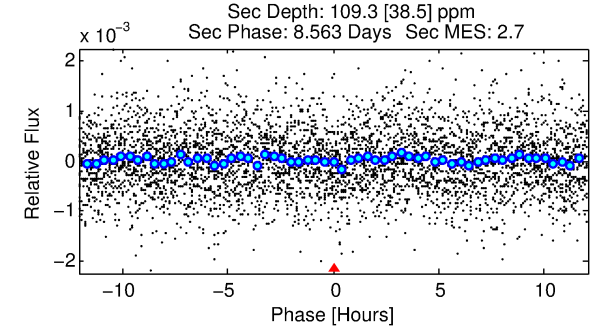
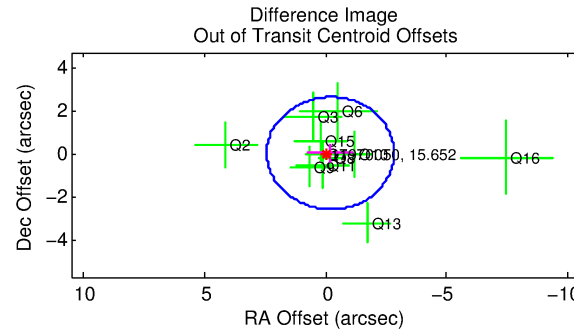
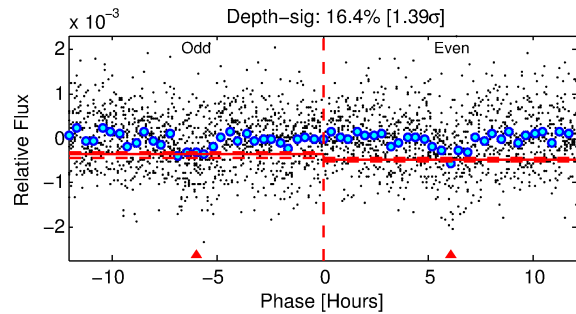
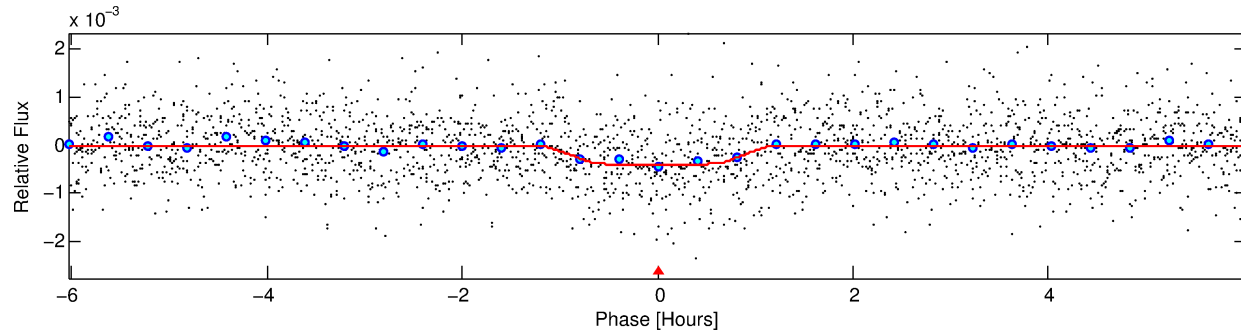
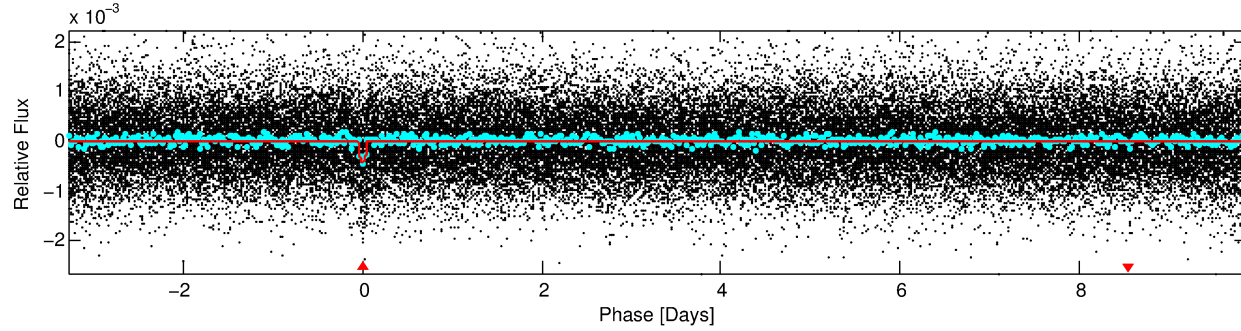
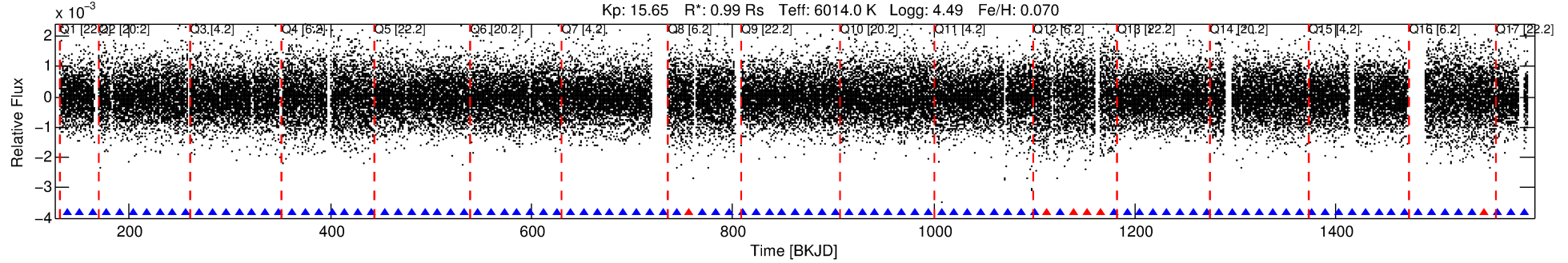
No Significant Match Found

# DV One-Page Summary

KIC: 11970050 Candidate: 1 of 1 Period: 13.175 d

KOI: K04893 Corr: No Ephemeris Match

Kp: 15.65 R\*: 0.99 Rs Teff: 6014.0 K Logg: 4.49 Fe/H: 0.070



## DV Fit Results:

Period = 13.17508 [0.00008] d  
Epoch = 138.0393 [0.0045] BKJD  
Rp/R\* = 0.0210 [0.0170]  
a/R\* = 29.97 [115.48]  
b = 0.83 [1.50]  
Seff = 90.89 [33.58]  
Teq = 787 [73] K  
Rp = 2.28 [1.94] Re  
a = 0.1128 [0.0262] AU  
Ag = 147.30 [249.17] [0.59σ]  
Teffp = 4241 [1761] K [1.96σ]

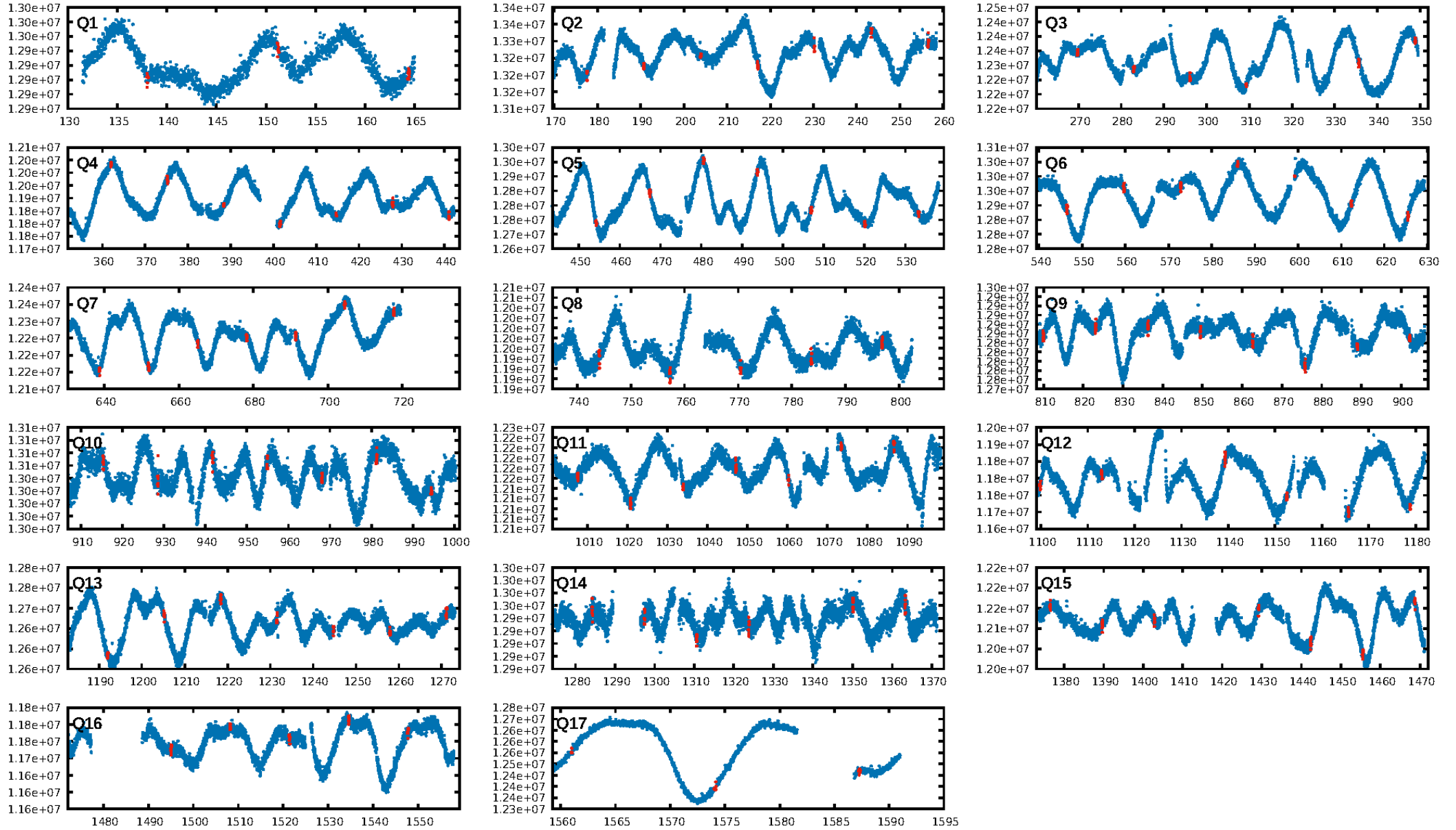
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.26e-19  
RollingBand-fgt: 0.94 [92/98]  
GhostDiagnostic-chr: 4.032  
Centroid-sig: 67.1%  
Centroid-so: 1.112 arcsec [0.88σ]  
OotOffset-rm: 0.204 arcsec [0.23σ]  
OotOffset-st: 3/4/2/2 [11]  
KicOffset-rm: 0.233 arcsec [0.29σ]  
KicOffset-st: 3/4/2/2 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 1.00 [17/17]

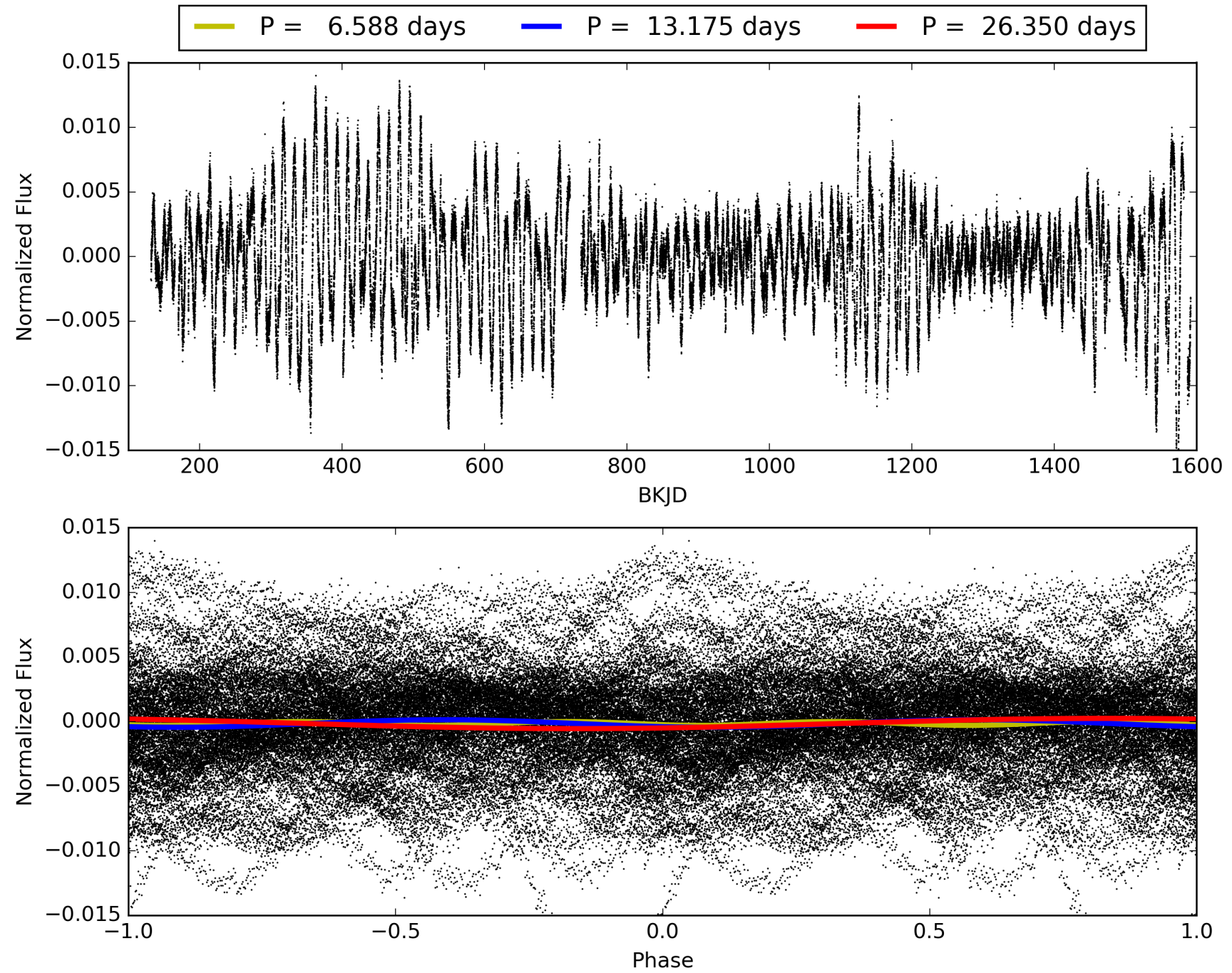
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 19:42:56 Z

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

# TCE 011970050-01, PDC Light Curves

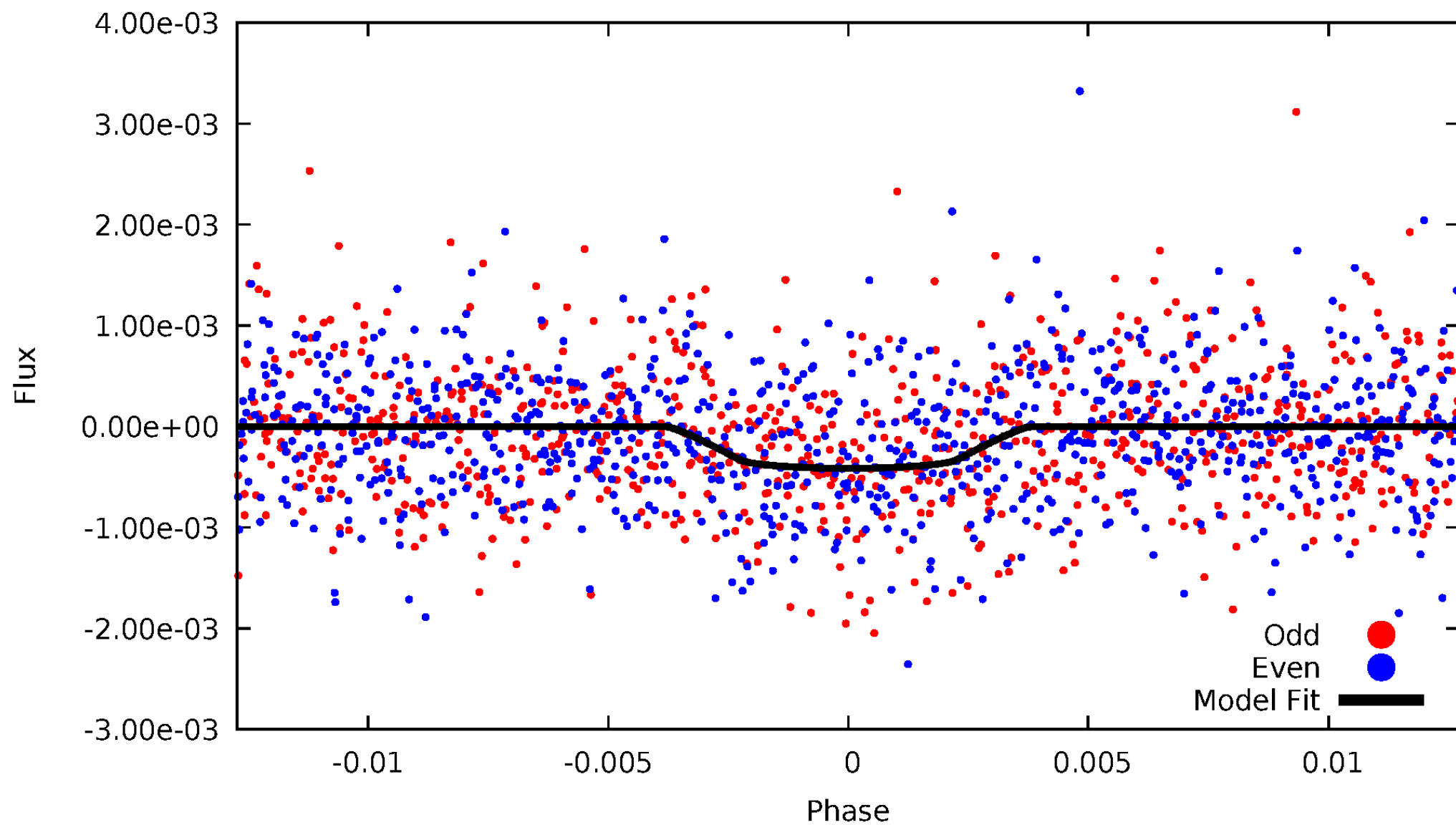


TCE 011970050-01



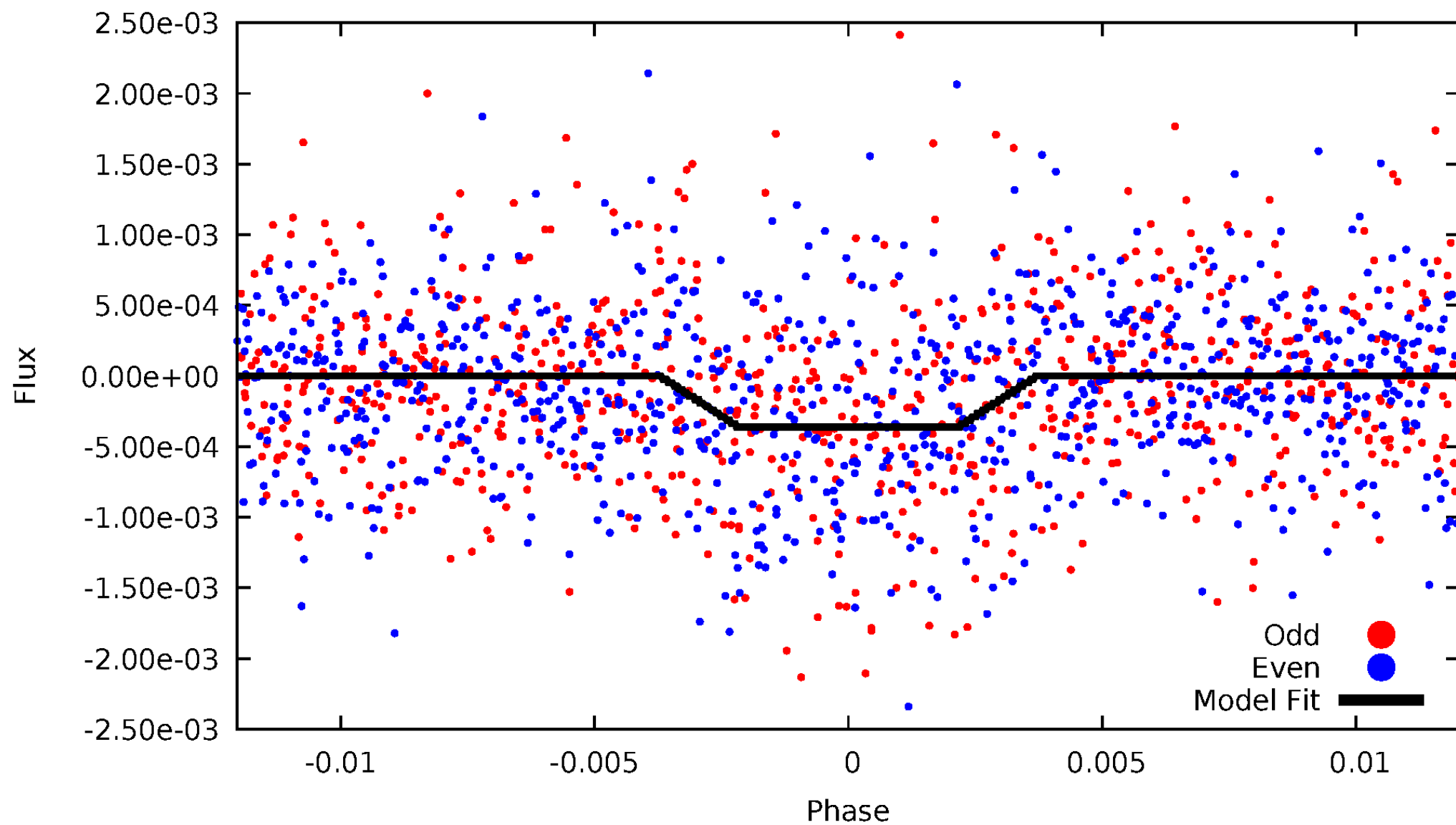
# DV Odd/Even

TCE 011970050-01



# ALT Odd/Even

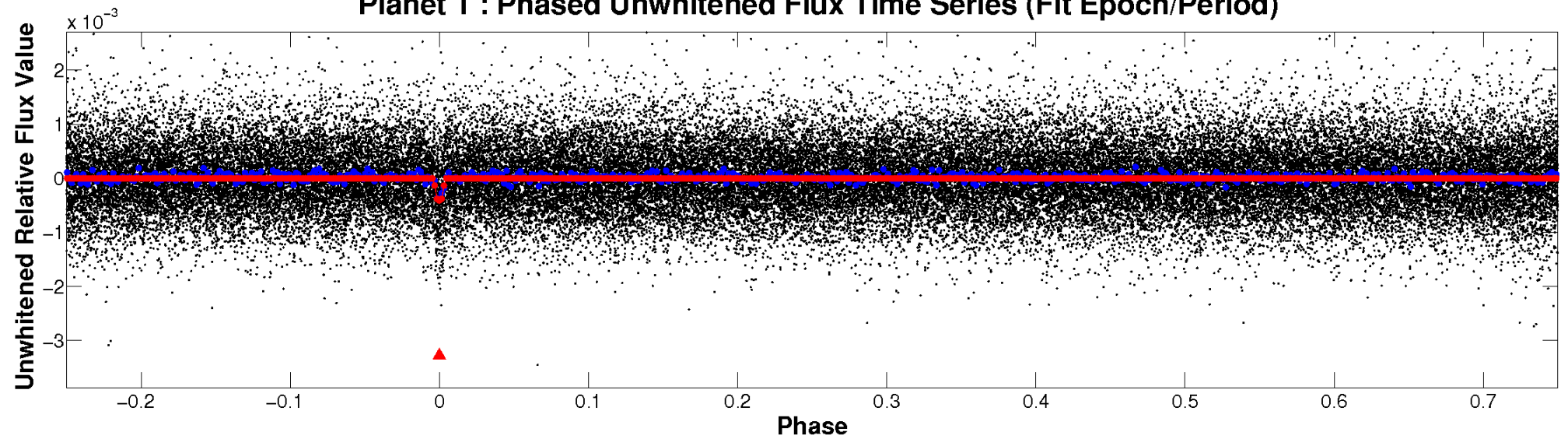
TCE 011970050-01



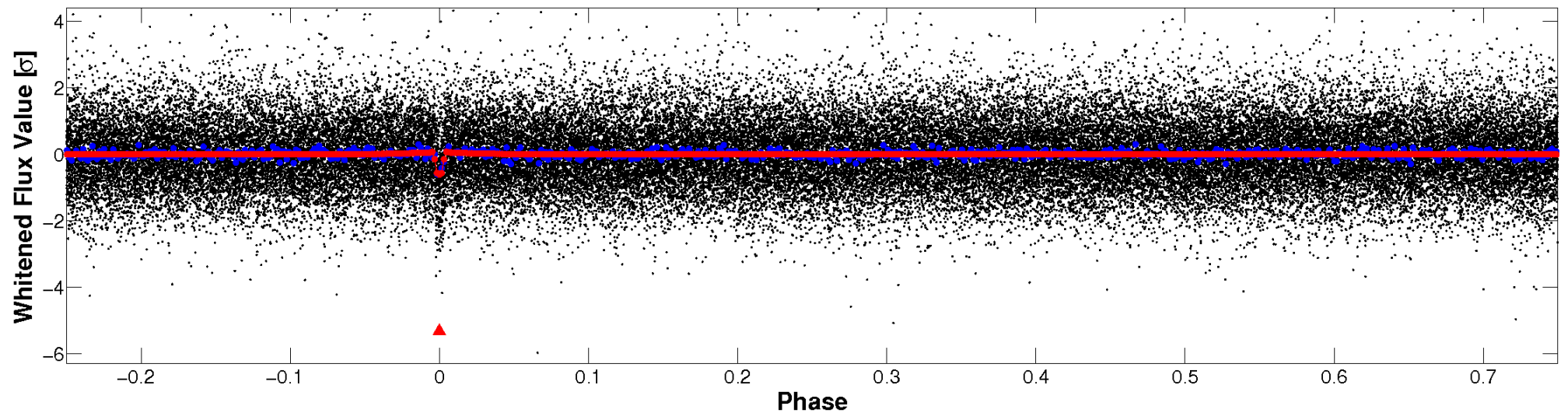


# Non-Whitened Vs. Whitened Light Curve

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

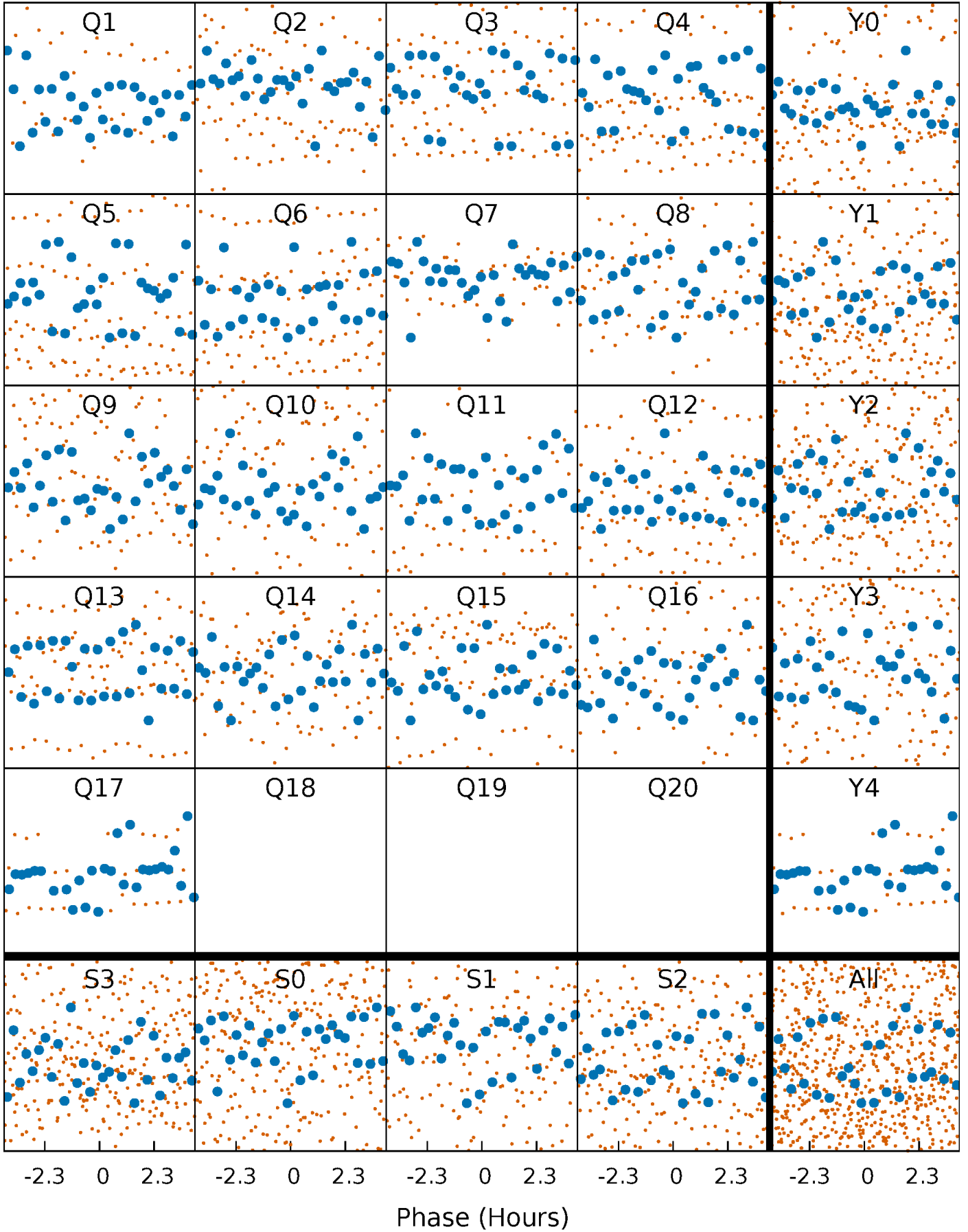


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

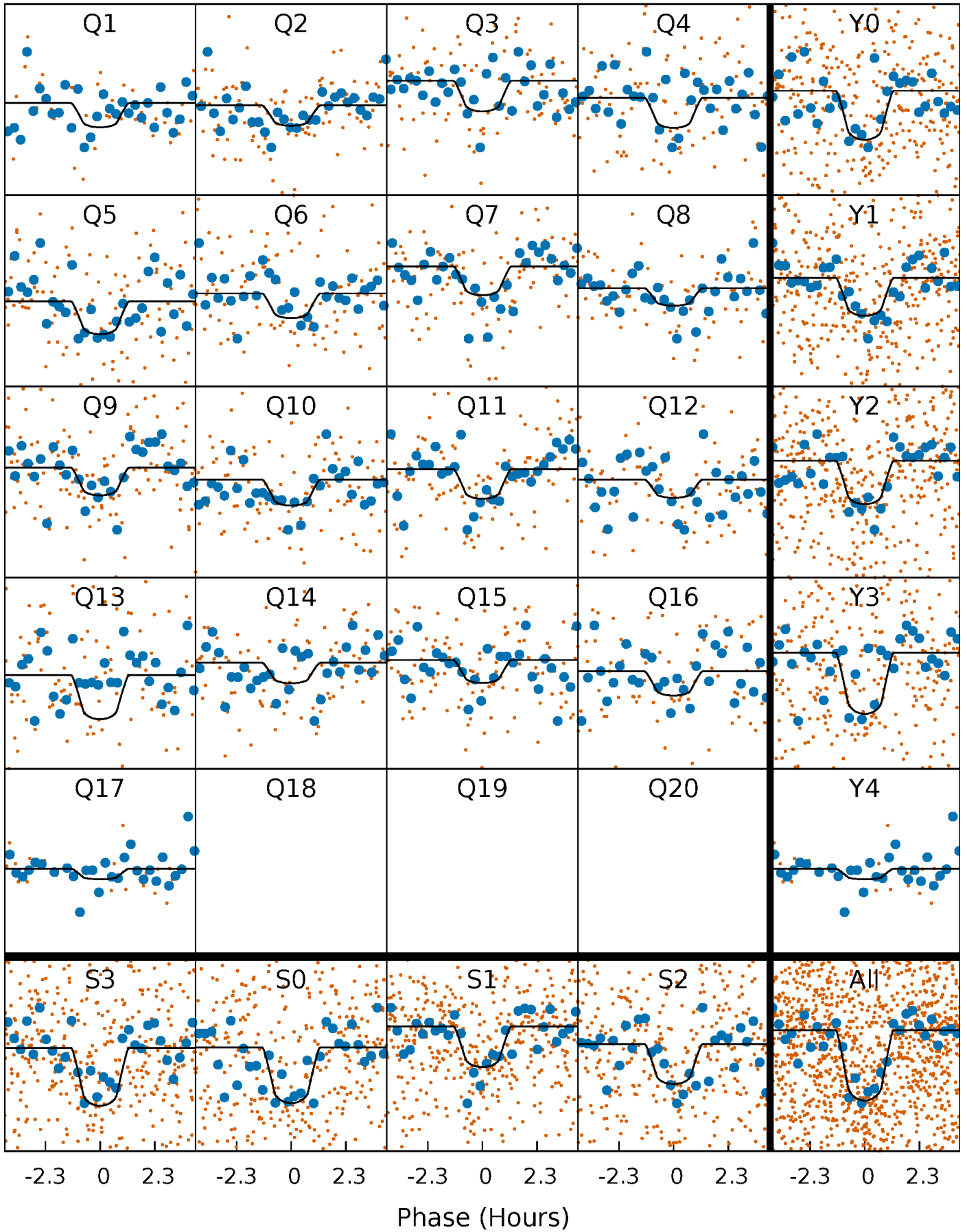
TCE 011970050-01 P= 13.175079 Days  $T_0=138.039324$  (BKJD)





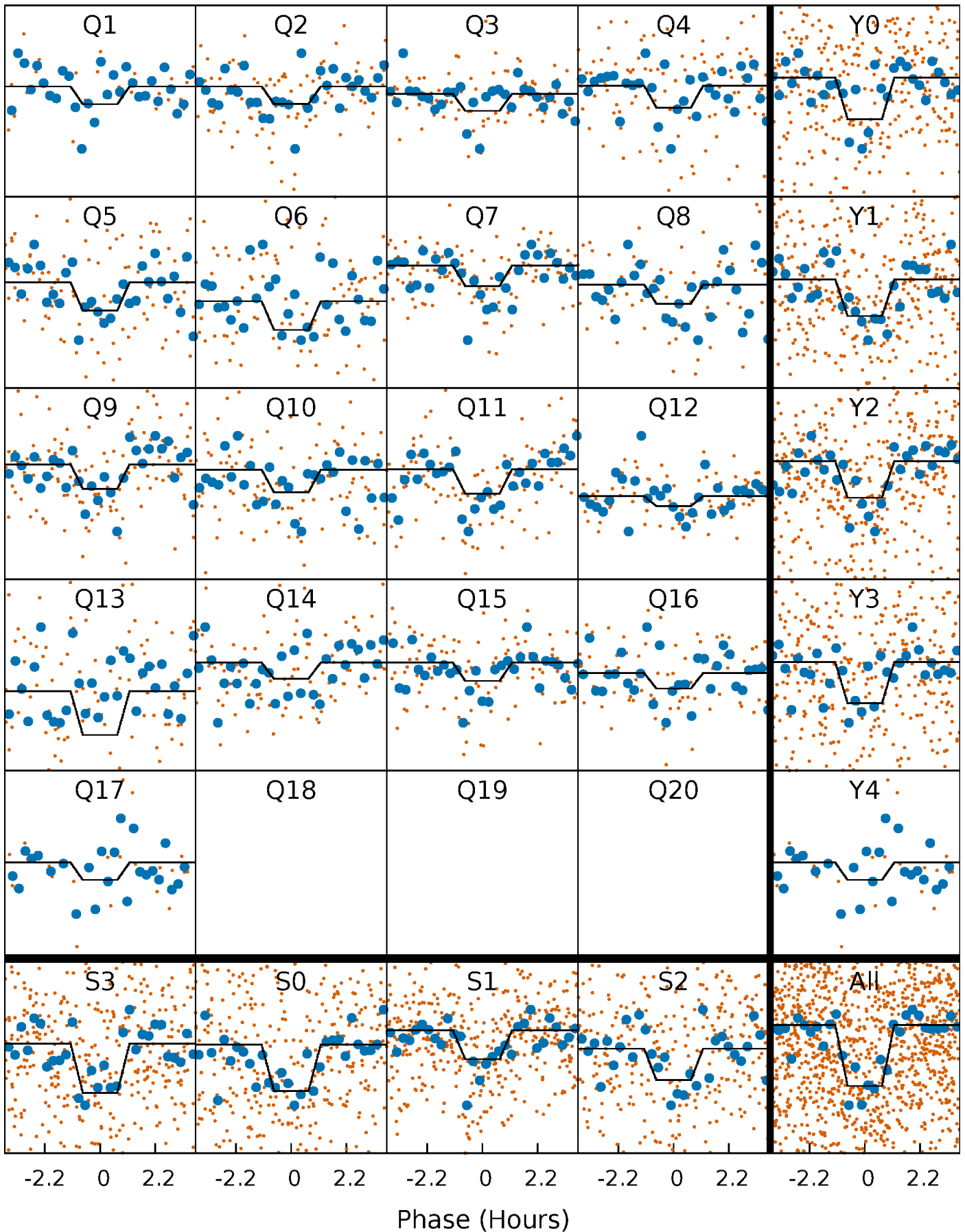
# DV Quarter-Phased Transit Curves

TCE 011970050-01 P= 13.175079 Days  $T_0=138.039324$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

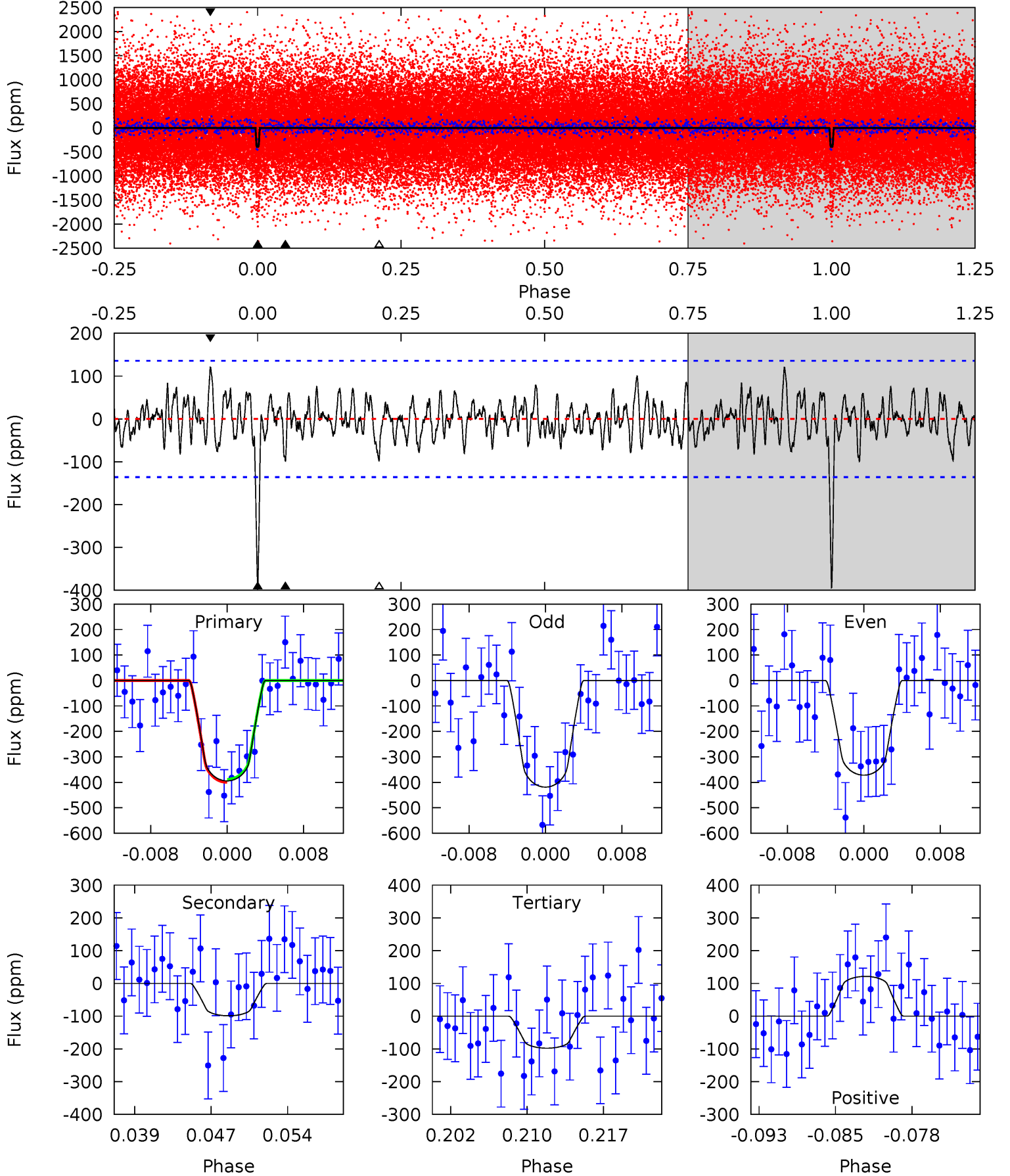
TCE 011970050-01 P= 13.175099 Days  $T_0=138.039249$  (BKJD)



# DV Model-Shift Uniqueness Test

011970050-01,  $P = 13.175079$  Days,  $E = 124.864245$  Days

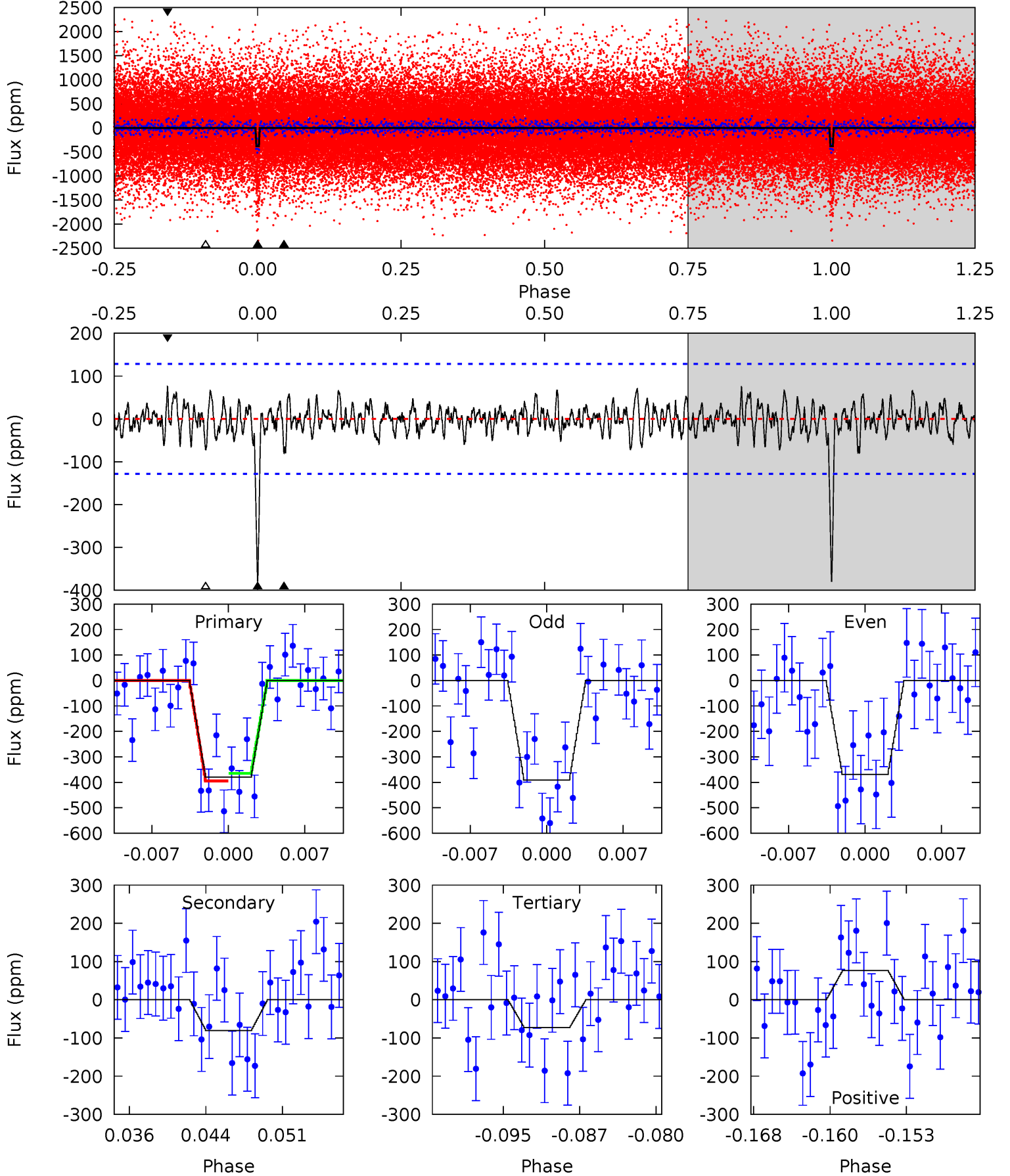
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	3.70	3.66	4.53	5.07	2.66	1.31	11.1	10.2	0.04	-0.83	0.88	0.86	0.24	0.21



# Alt Model-Shift Uniqueness Test

011970050-01,  $P = 13.175099$  Days,  $E = 124.864150$  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
15.0	3.18	2.88	3.03	5.09	2.68	1.01	12.2	12.0	0.30	0.15	0.43	0.89	0.17	0.59



### Stellar Parameters For KIC 011970050

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6014^{+181}_{-199}$	$4.486^{+0.048}_{-0.192}$	$0.070^{+0.200}_{-0.350}$	$0.993^{+0.267}_{-0.095}$	$1.101^{+0.116}_{-0.159}$	$1.584^{+0.396}_{-0.771}$
	+3%/-3%	+1%/-4%	+286%/-500%	+27%/-10%	+11%/-14%	+25%/-49%
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 011970050-01 / KOI 4893.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-99 \pm 27$	$2.62^{+1.69}_{-1.52}$	$1129^{+76}_{-60}$	$4203^{+1887}_{-690}$	$98^{+452}_{-64}$
Alt.	$-80 \pm 25$	$2.56^{+1.71}_{-1.54}$	$1121^{+75}_{-52}$	$4065^{+1859}_{-691}$	$83^{+414}_{-57}$

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



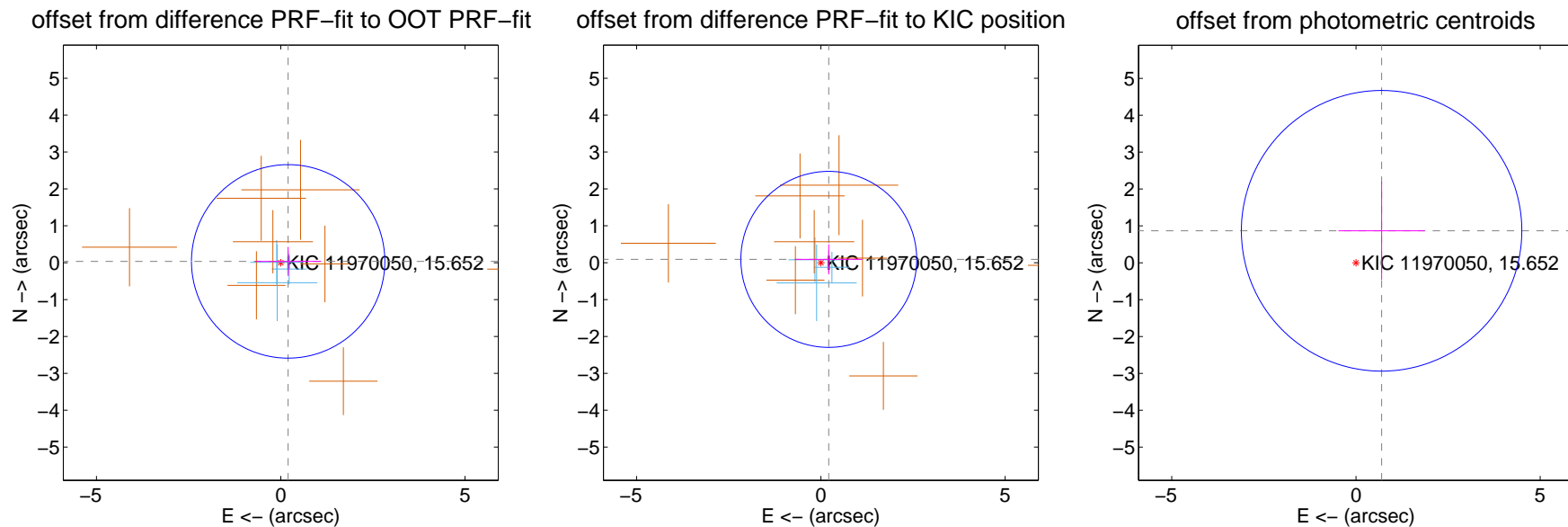
## DV Centroid Data

Supplemental centroid analysis for 011970050-01. Kepler magnitude: 15.65. Transit SNR 10.35

There are 3 quarters with good PRF difference image offsets

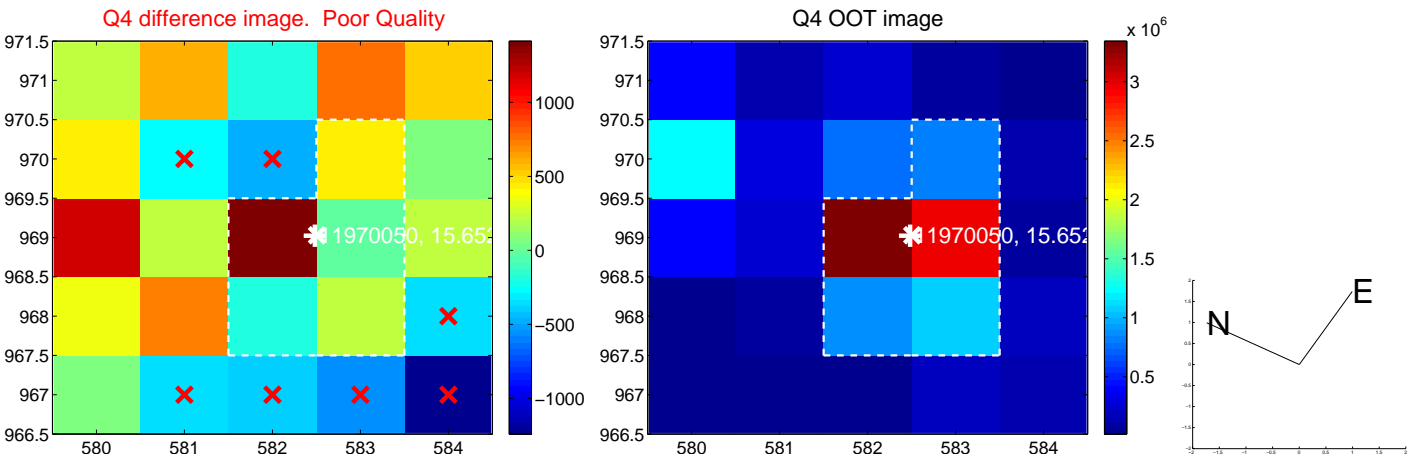
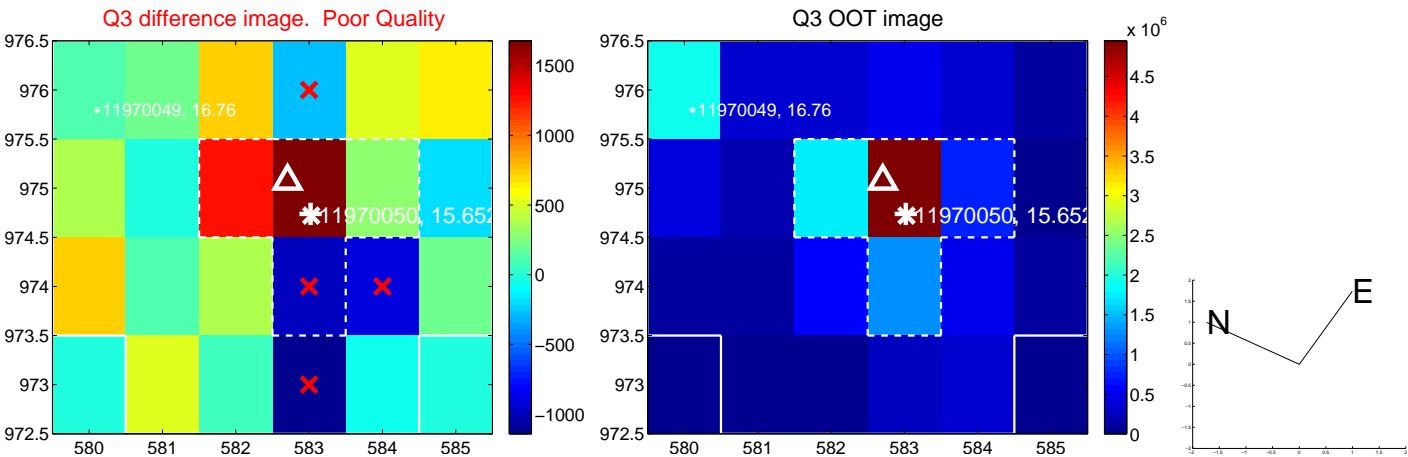
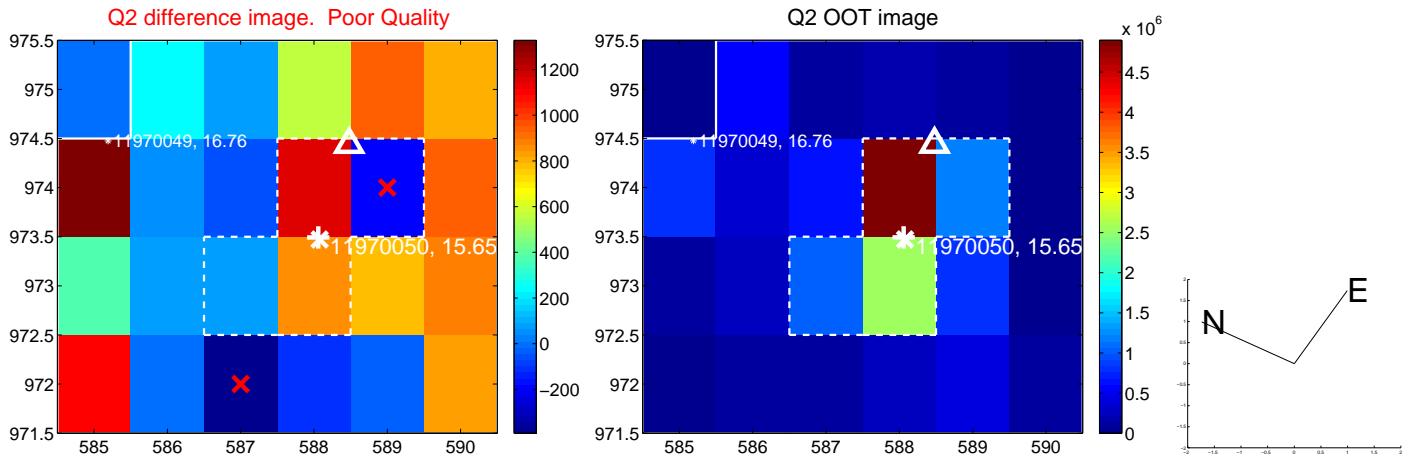
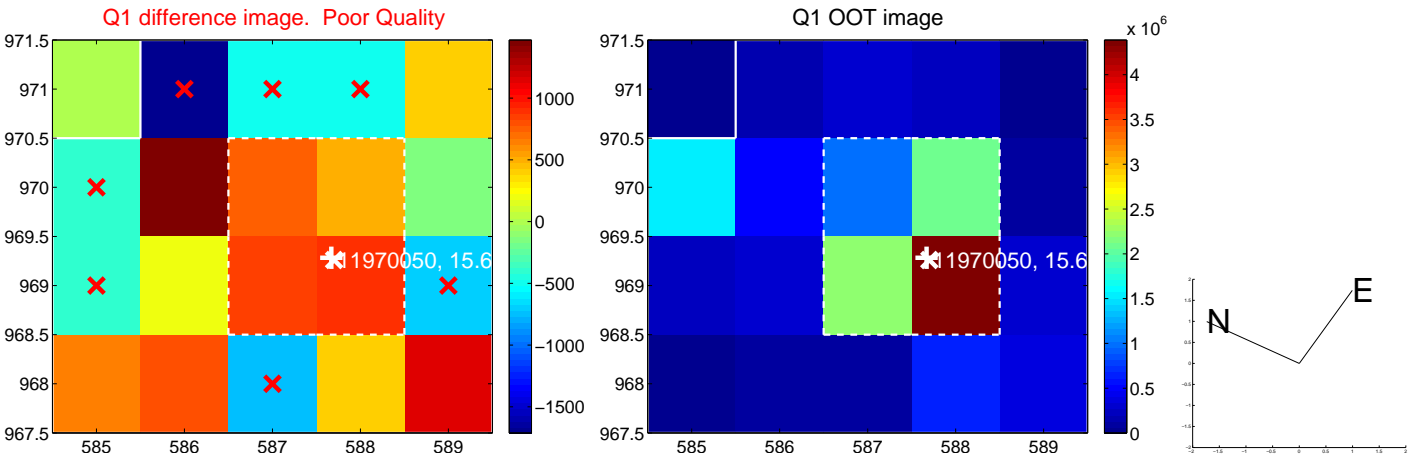
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.204 \pm 0.875$	0.23	$-0.201 \pm 0.897$	$0.035 \pm 0.394$
PRF-fit source offset from KIC position	$0.233 \pm 0.795$	0.29	$-0.215 \pm 0.913$	$0.090 \pm 0.406$
photometric centroid source offset	$1.11 \pm 1.27$	0.88	$-0.70 \pm 1.17$	$0.87 \pm 1.33$

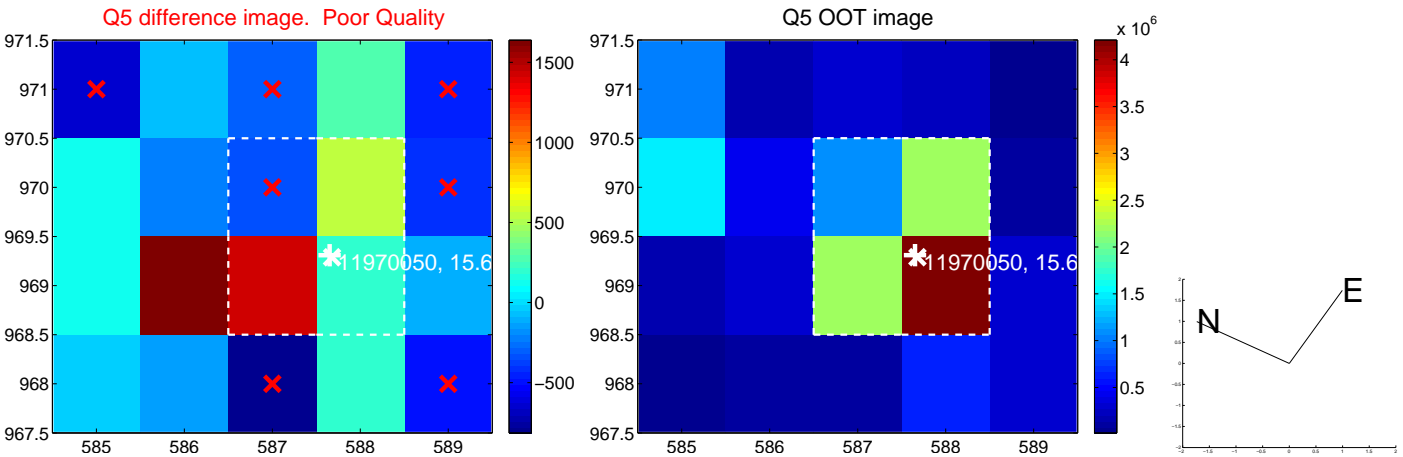


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

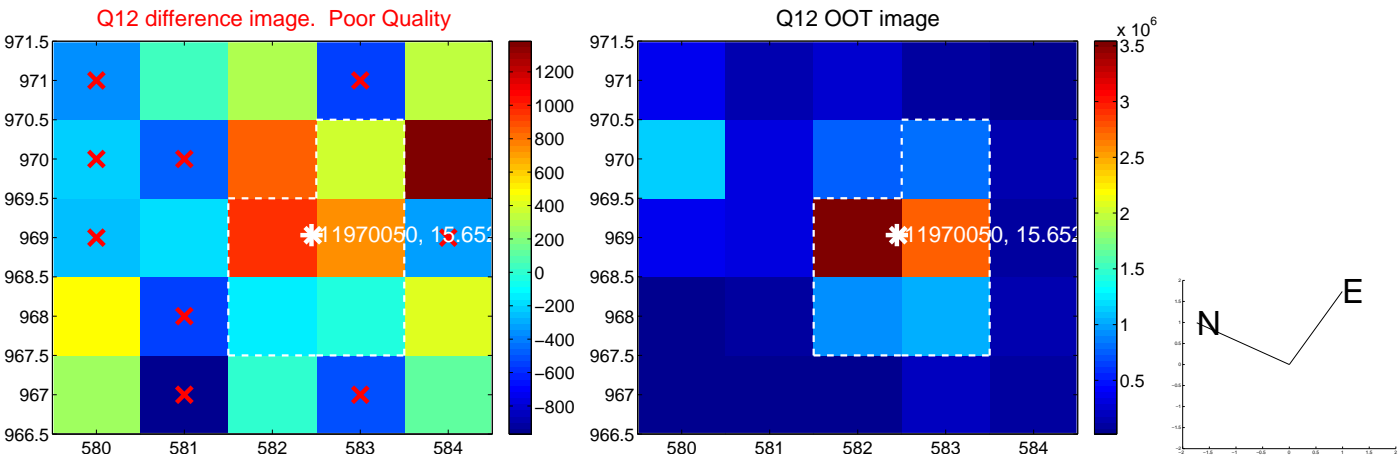
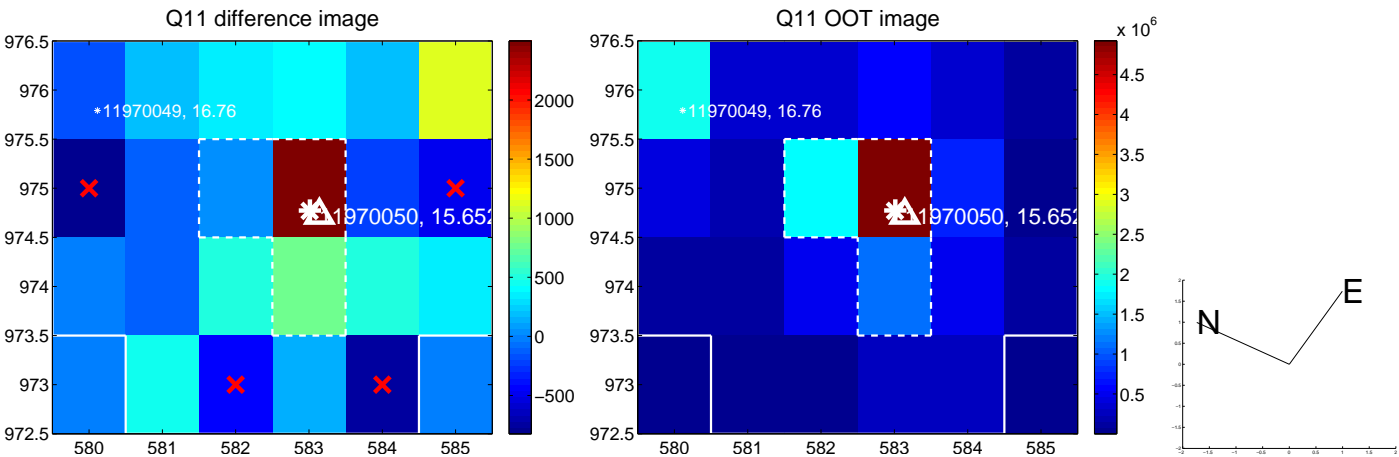
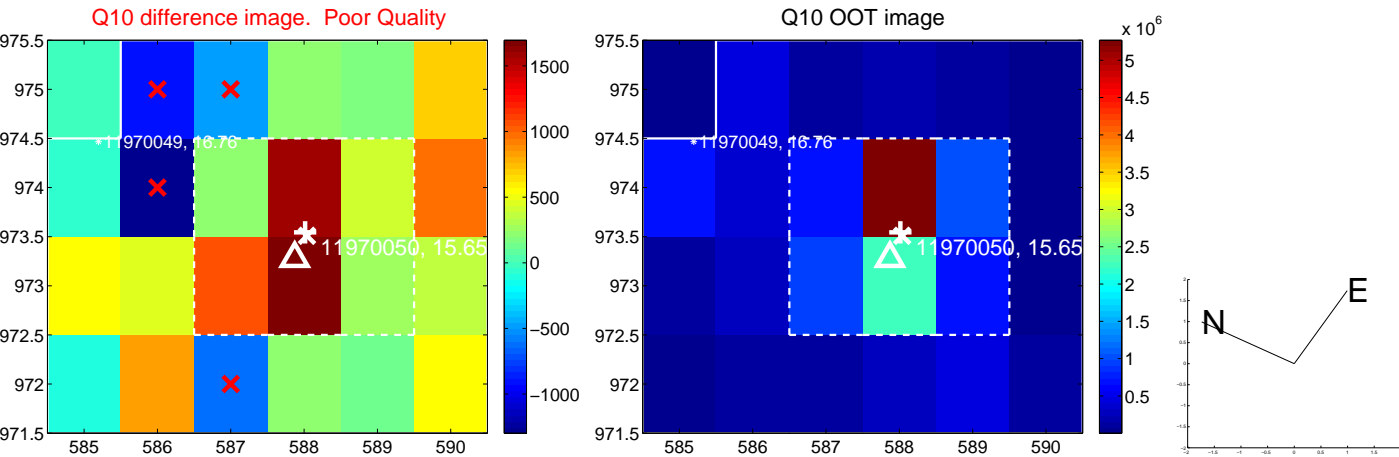
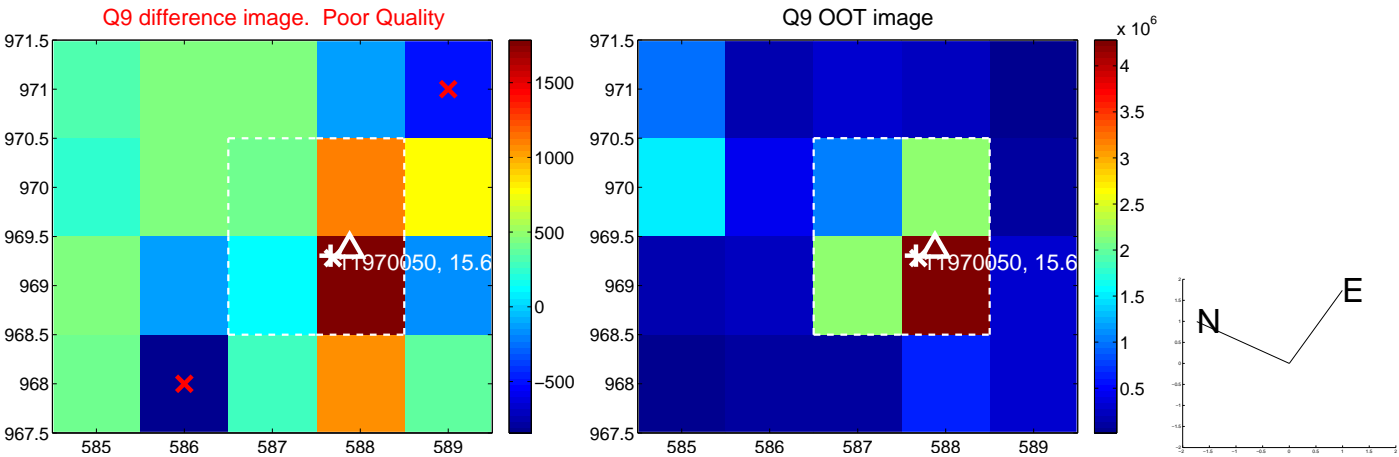
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



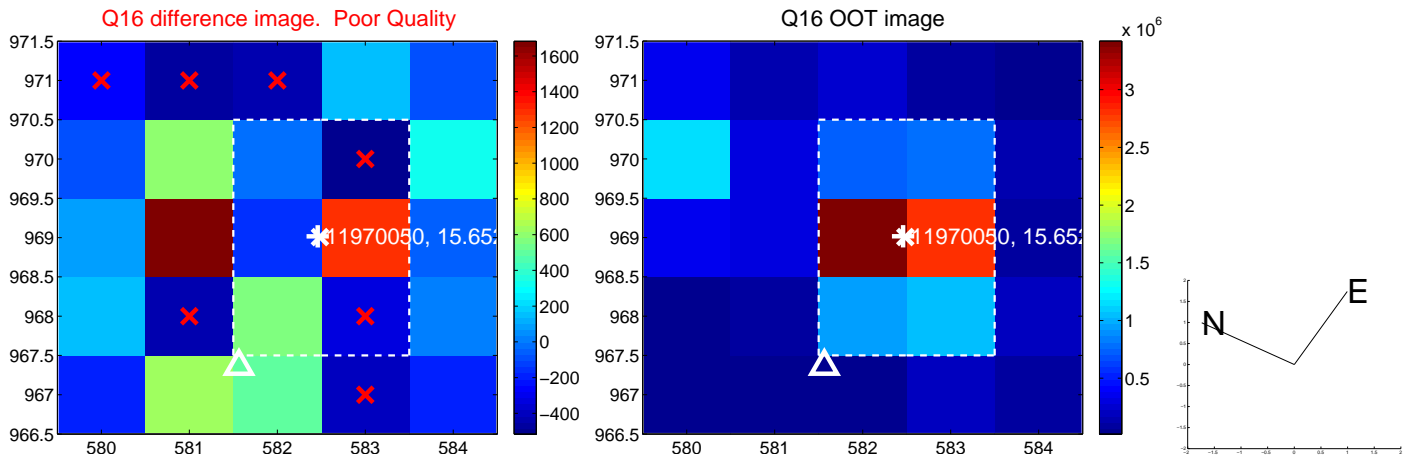
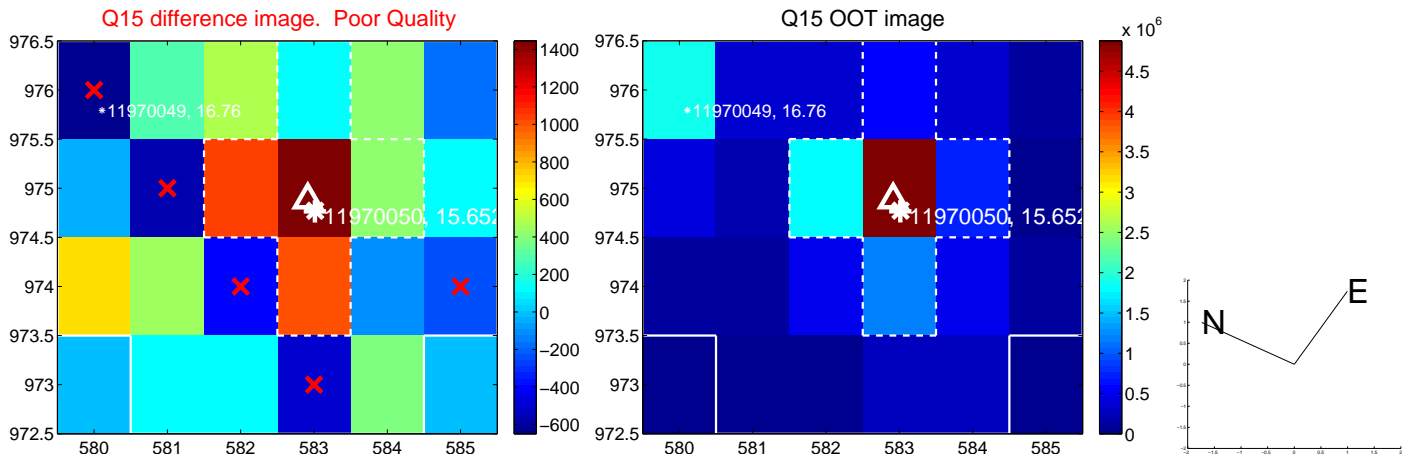
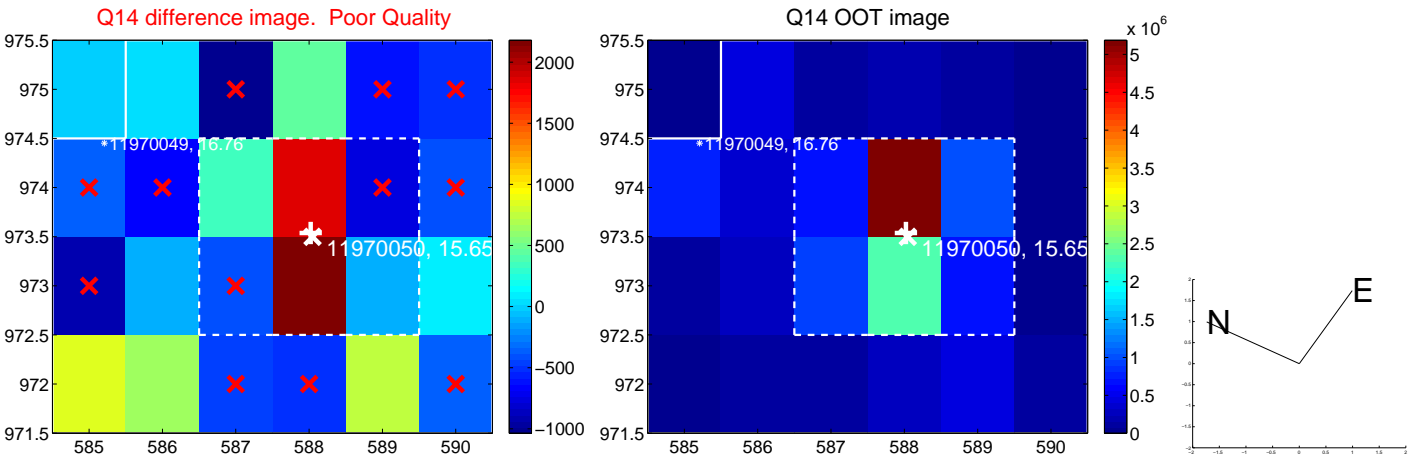
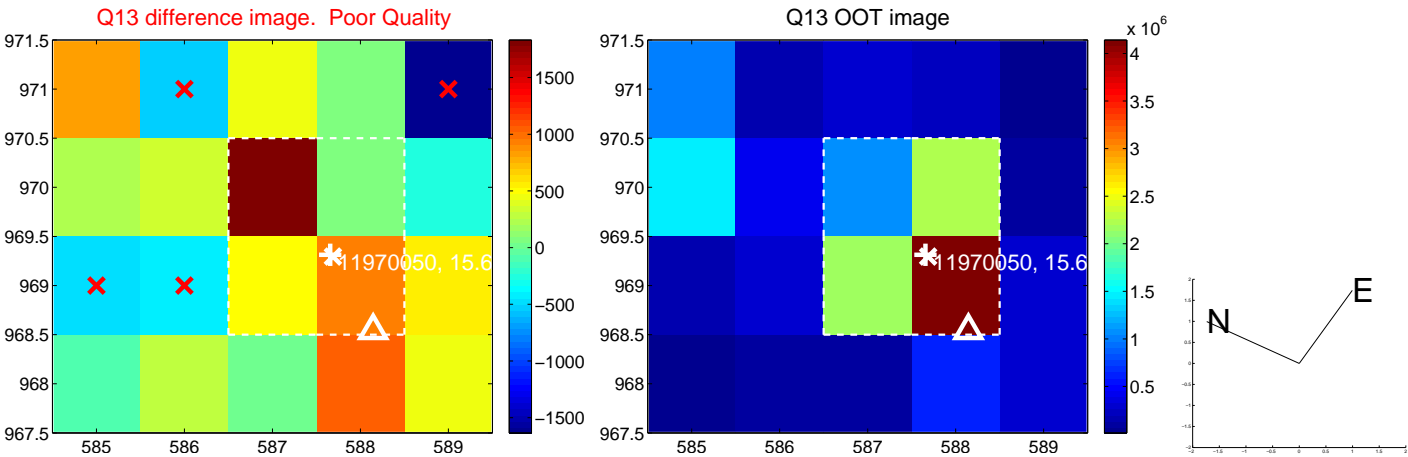
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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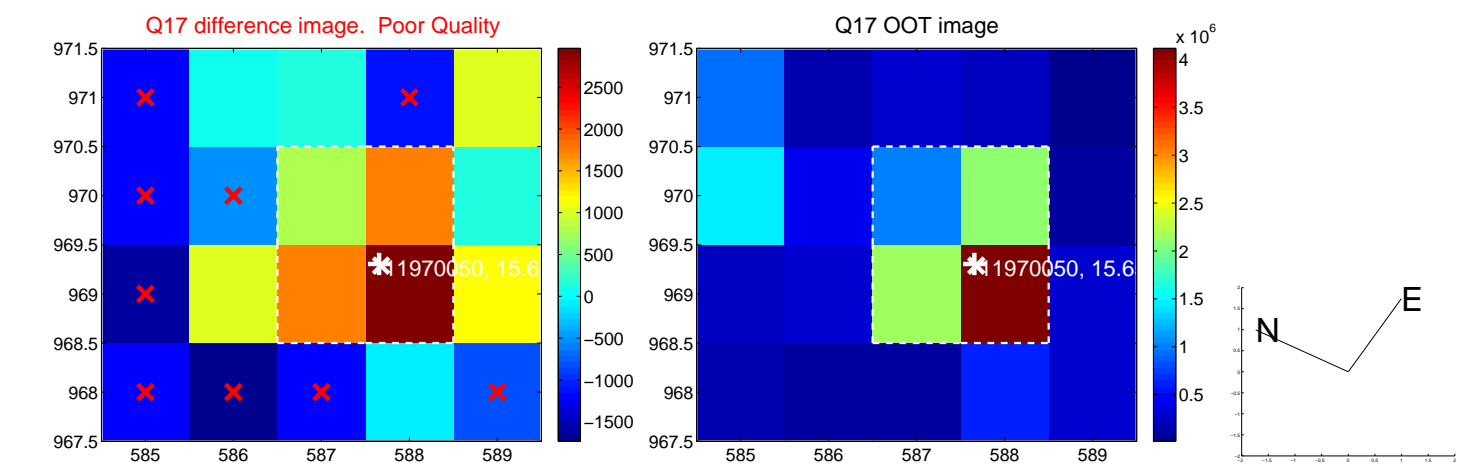


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

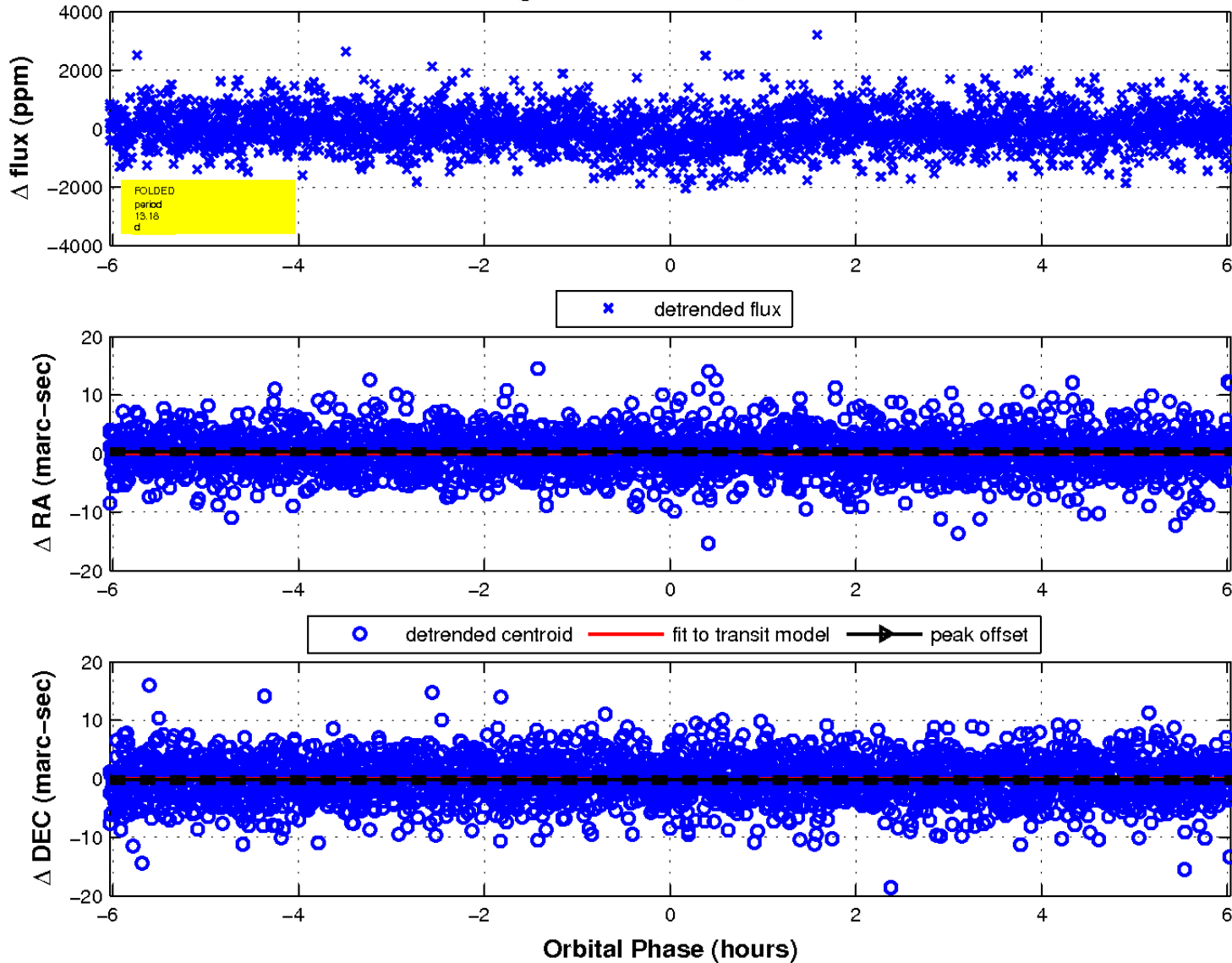




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

