

# KIC 010090219

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010090219-01	OBS	3978.01	2.286175	133.526538	155.8	5.931	22.7	24.7	1.01	6063	1.26	997.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010090219-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_ALT—CENT_RESOLVED_OFFSET—EPHEM_MATCH

**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 010090219-01

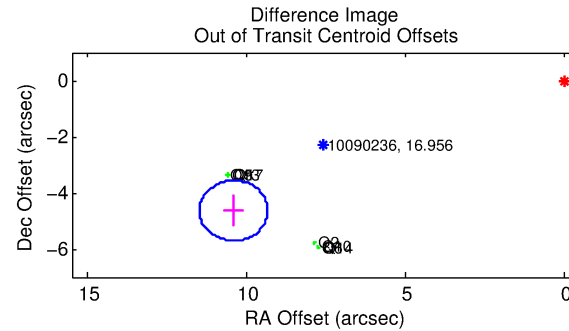
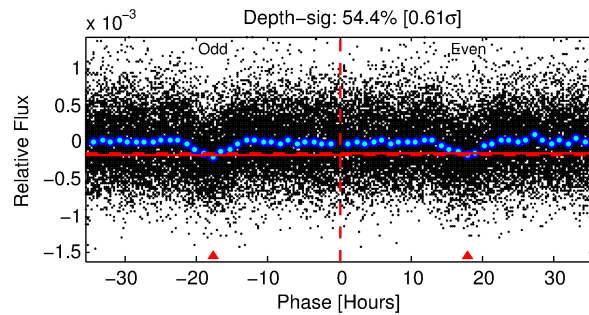
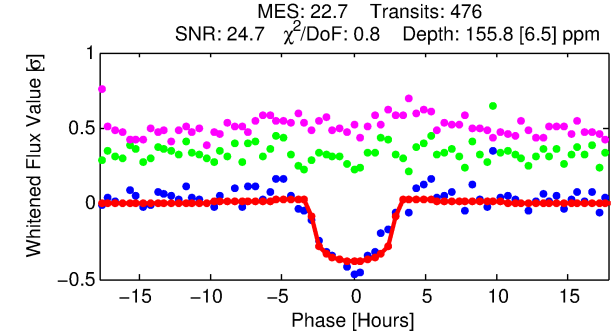
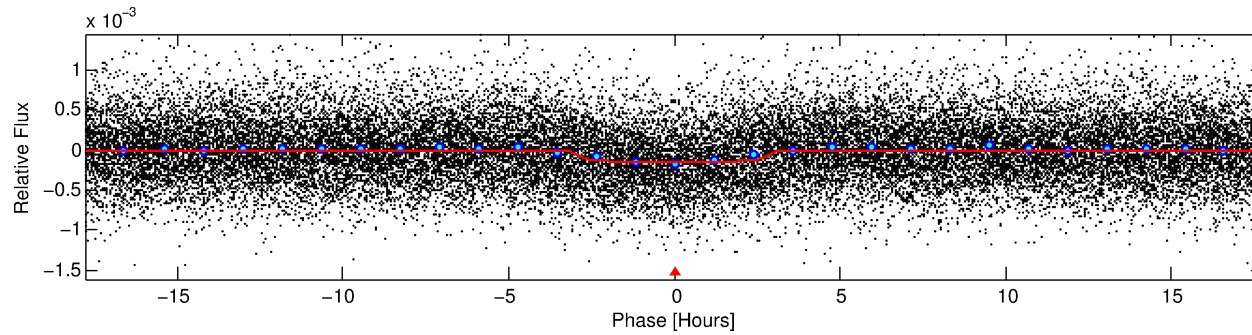
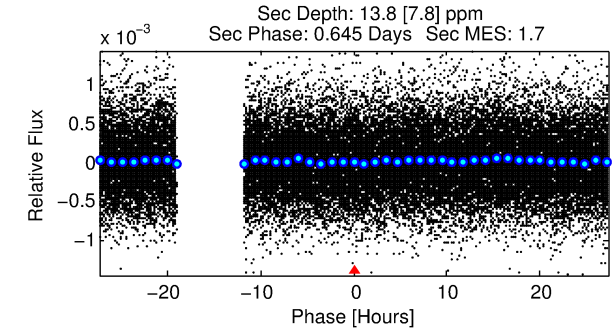
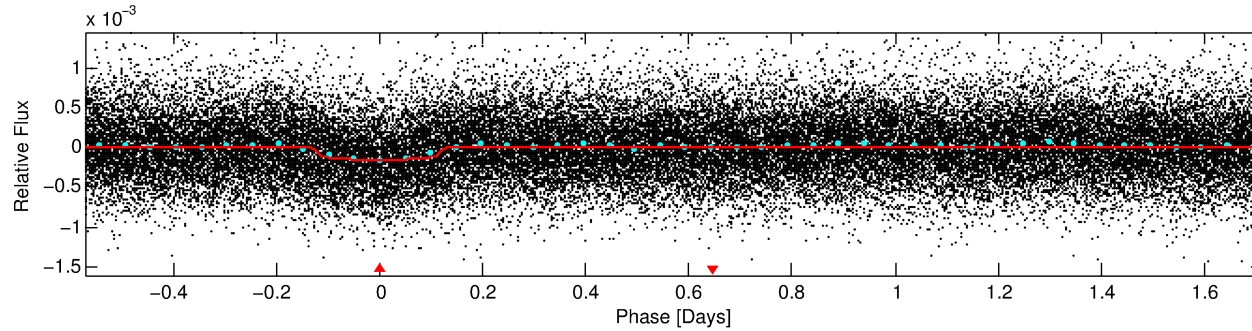
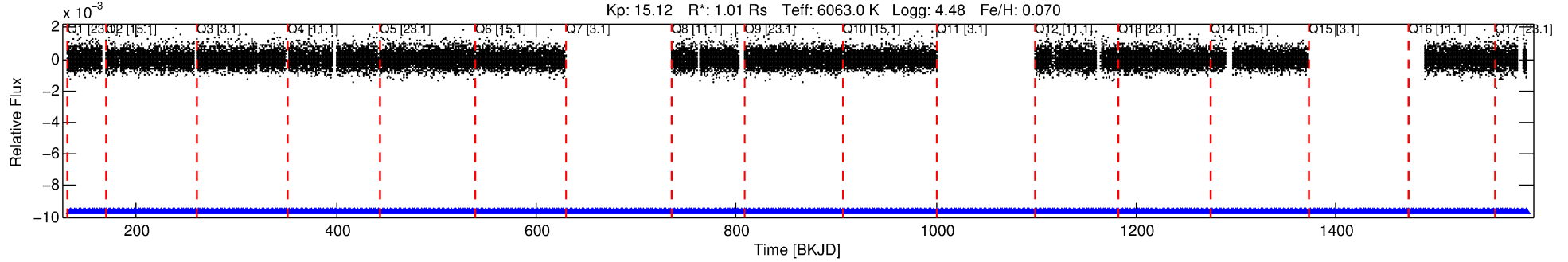
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
010090219-01	10090219	010090246-pri	10090246	1:1	16.7	-3	2	13.57	15.12	817.95	Direct-PRF	0	2.04	0.66

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 10090219 Candidate: 1 of 1 Period: 2.286 d  
KOI: K03978 Corr: No Ephemeris Match

Kp: 15.12 R\*: 1.01 Rs Teff: 6063.0 K Logg: 4.48 Fe/H: 0.070



## DV Fit Results:

Period = 2.28617 [0.00001] d  
Epoch = 133.5265 [0.0029] BKJD  
Rp/R\* = 0.0114 [0.0125]  
a/R\* = 3.00 [13.78]  
b = 0.16 [31.27]  
Seff = 997.59 [390.30]  
Teff = 1433 [140] K  
Rp = 1.26 [1.43] Re  
a = 0.0353 [0.0086] AU  
Ag = 5.93 [13.63] [0.36σ]  
Teffp = 3458 [1964] K [1.03σ]

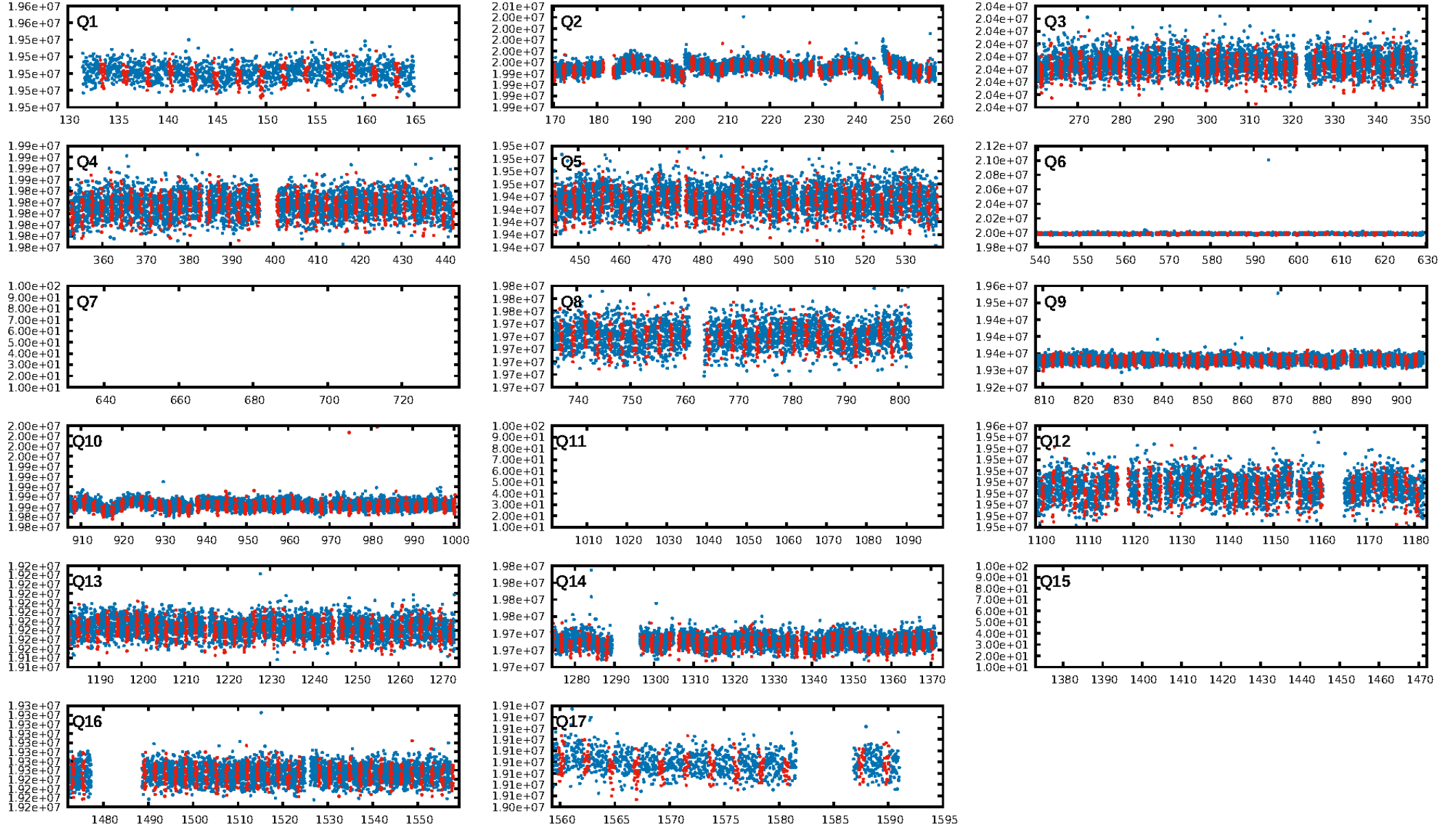
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.81e-99  
RollingBand-fgt: 1.00 [450/450]  
GhostDiagnostic-chr: -1.454  
Centroid-sig: 0.0%  
Centroid-so: 5.535 arcsec [7.65σ]  
OotOffset-rm: 11.399 arcsec [31.93σ]  
KicOffset-rm: 11.417 arcsec [32.89σ]  
OotOffset-st: 4/0/0/4 [8]  
KicOffset-st: 4/0/0/4 [8]  
DiffImageQuality-fgm: 1.00 [8/8]  
DiffImageOverlap-fno: 1.00 [14/14]

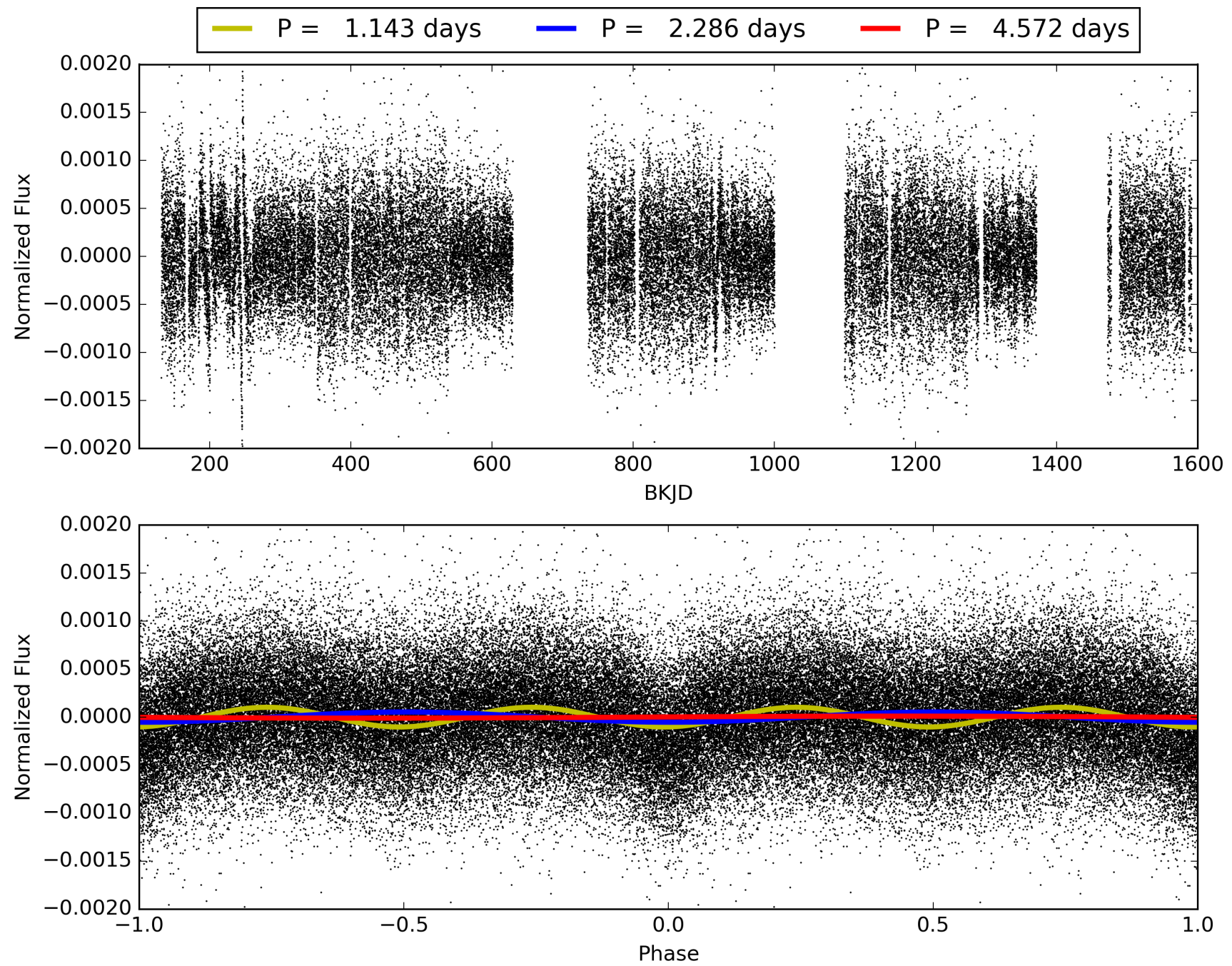
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 16:08:24 Z

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

# TCE 010090219-01, PDC Light Curves

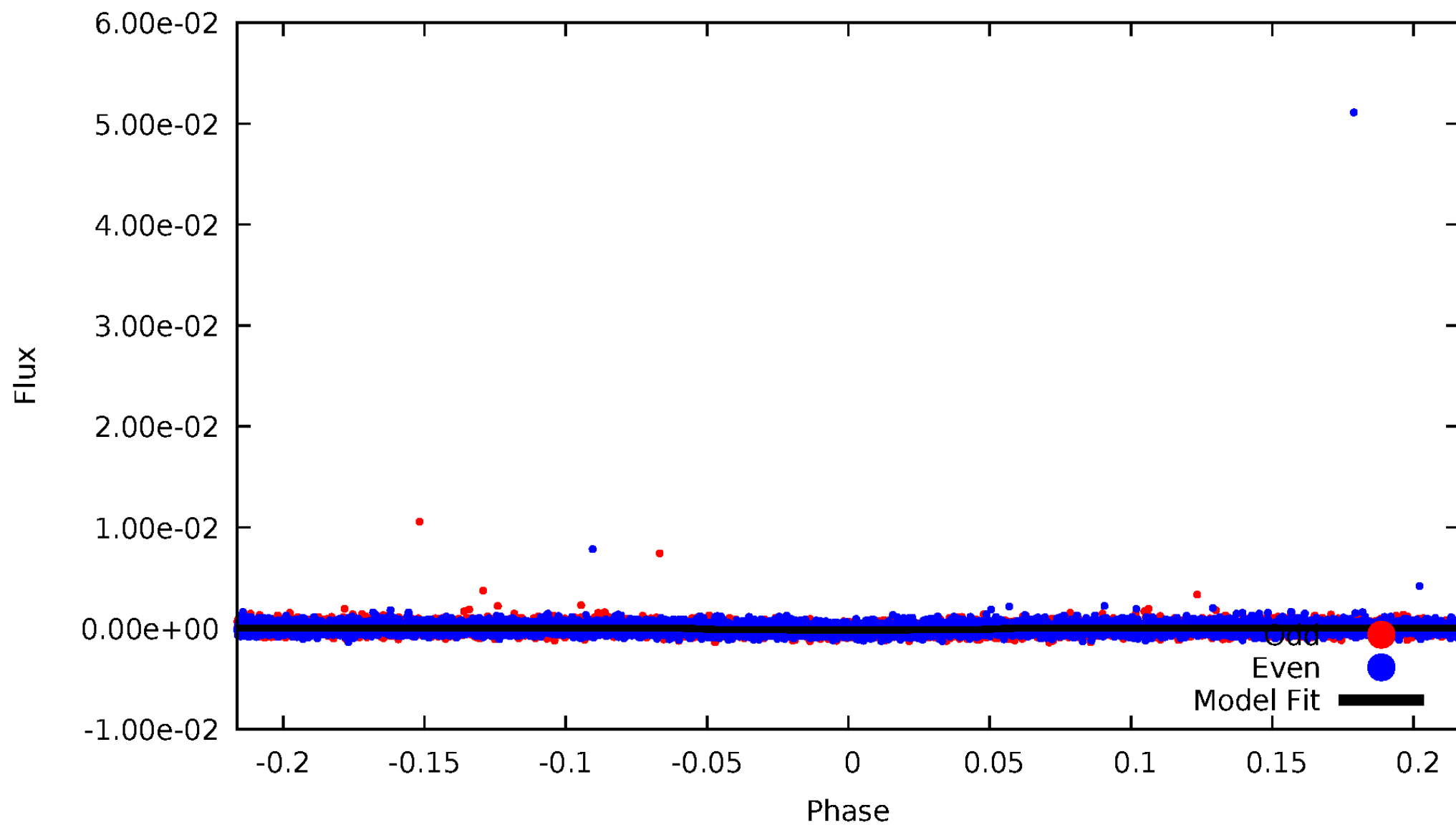


TCE 010090219-01



# DV Odd/Even

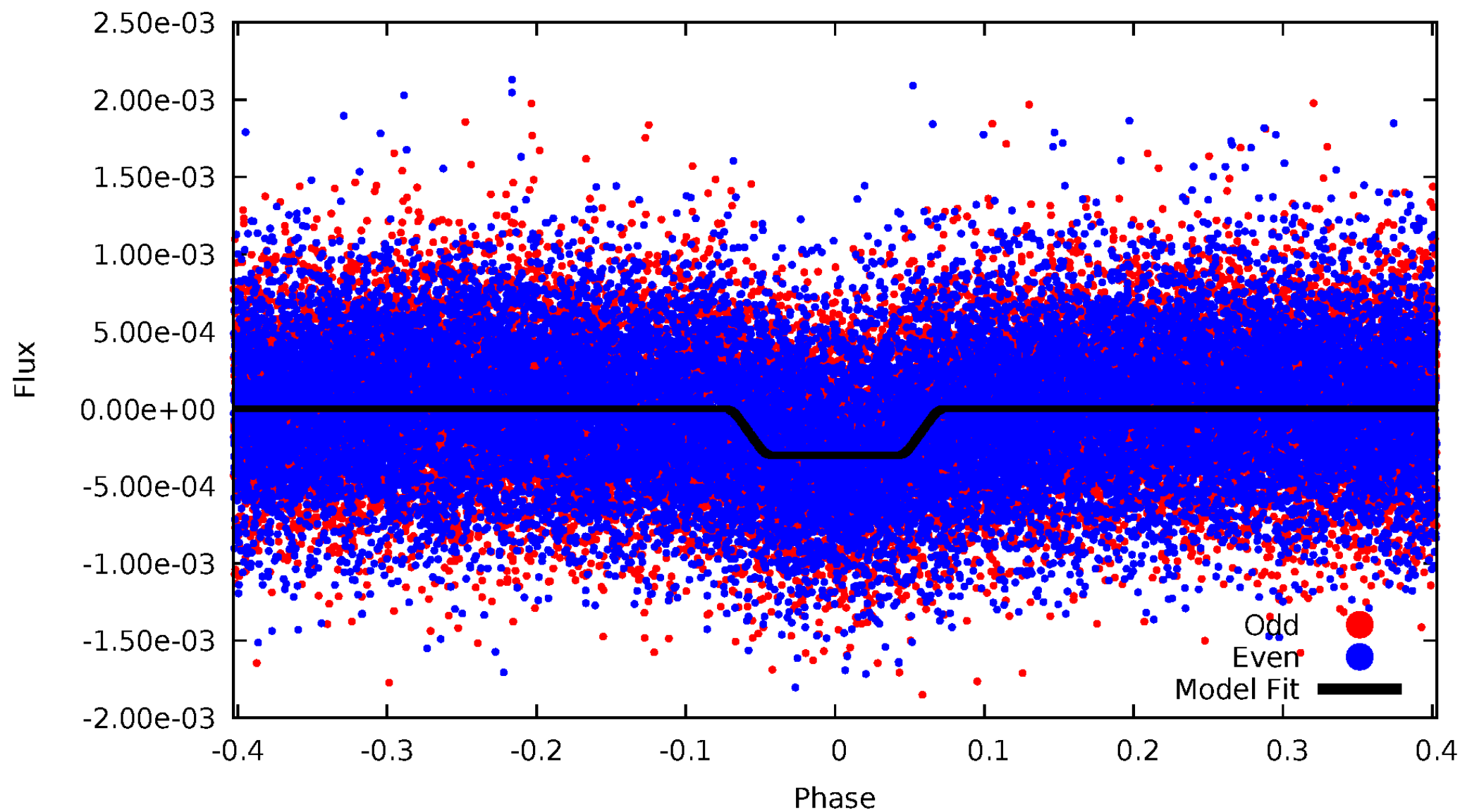
TCE 010090219-01





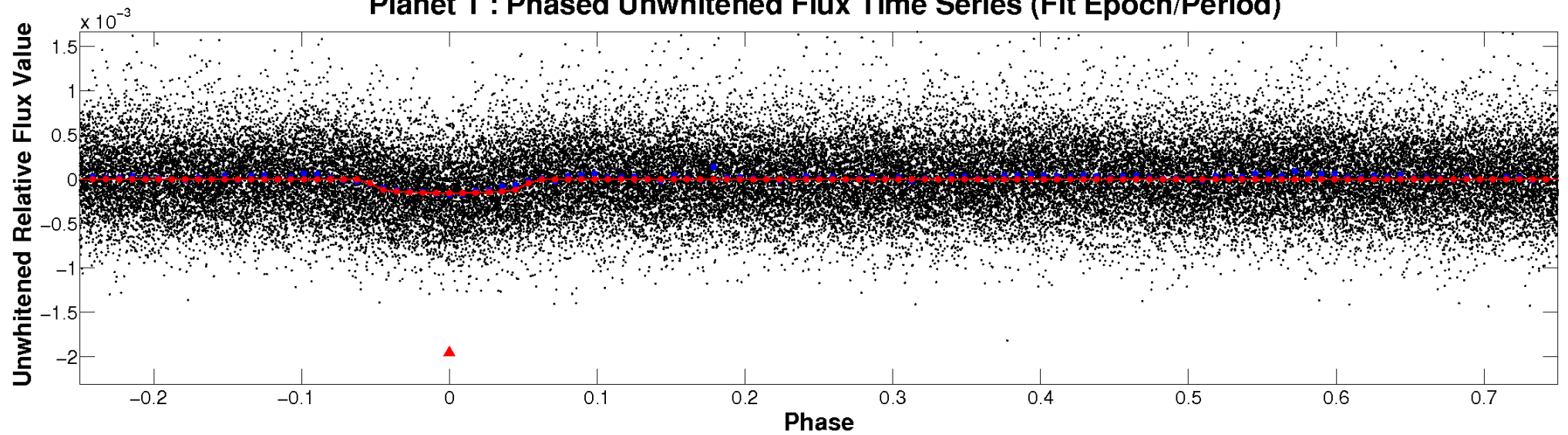
# ALT Odd/Even

TCE 010090219-01

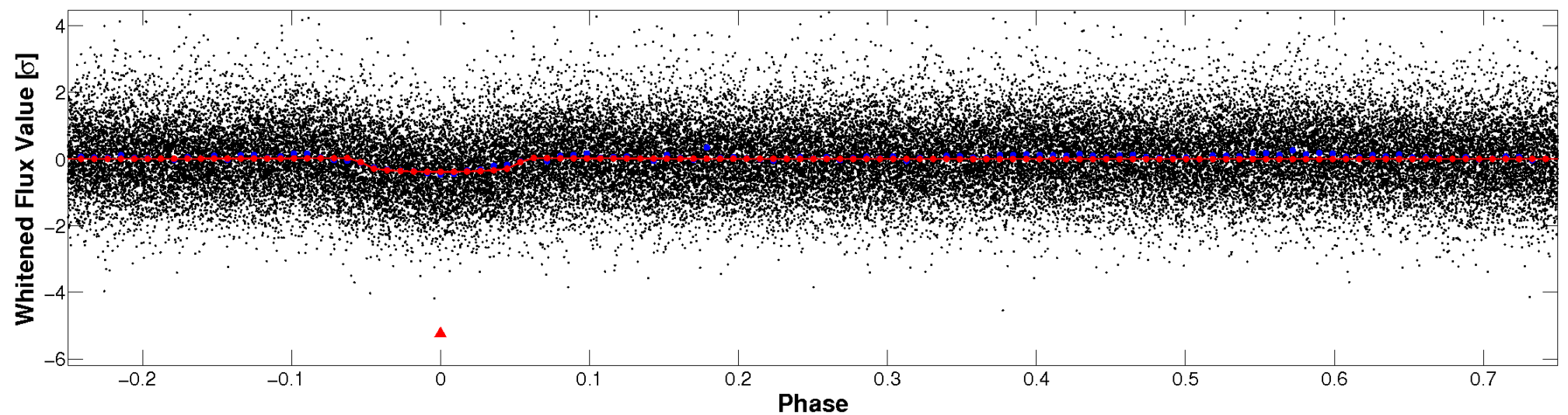


# Non-Whitened Vs. Whitened Light Curve

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

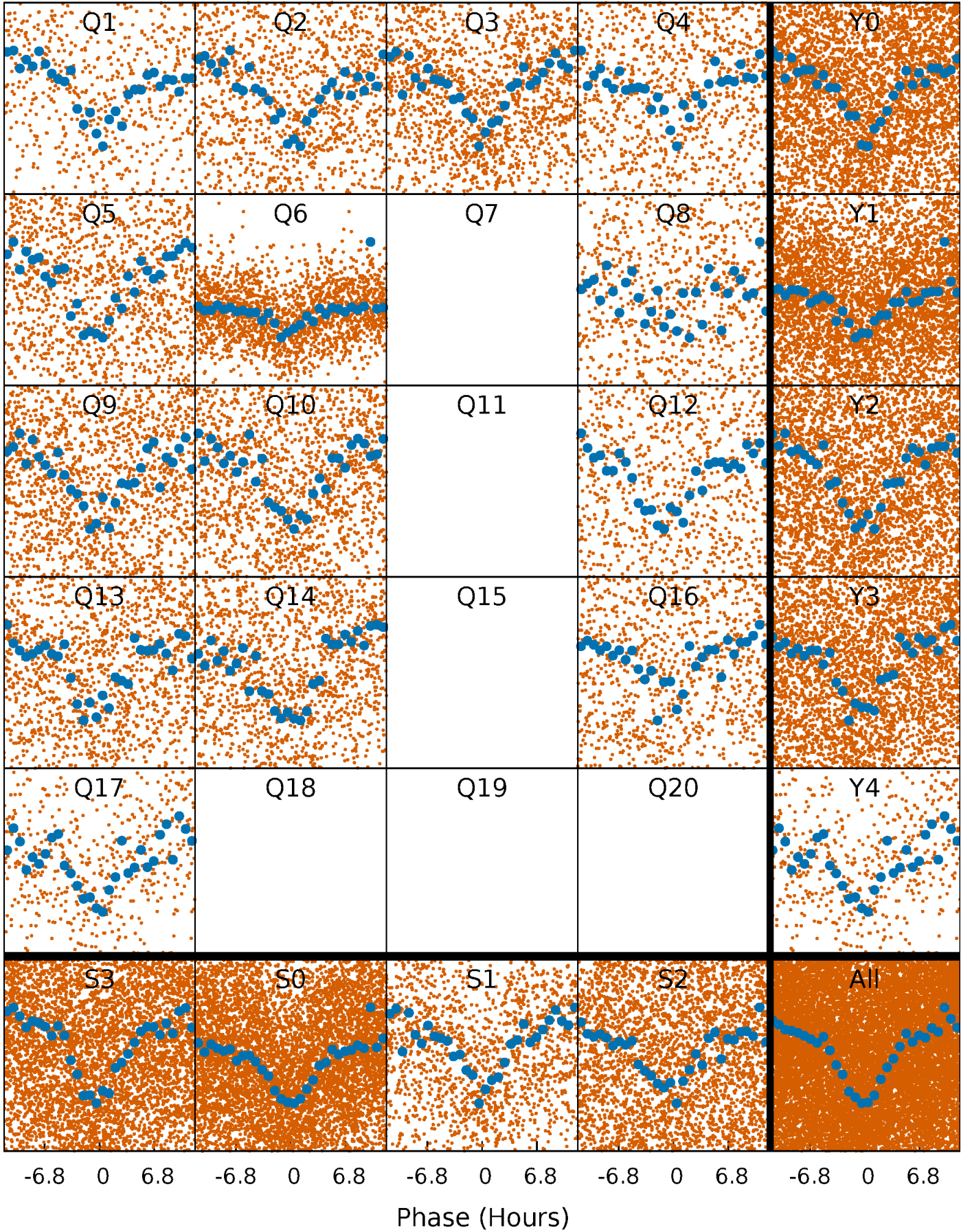


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

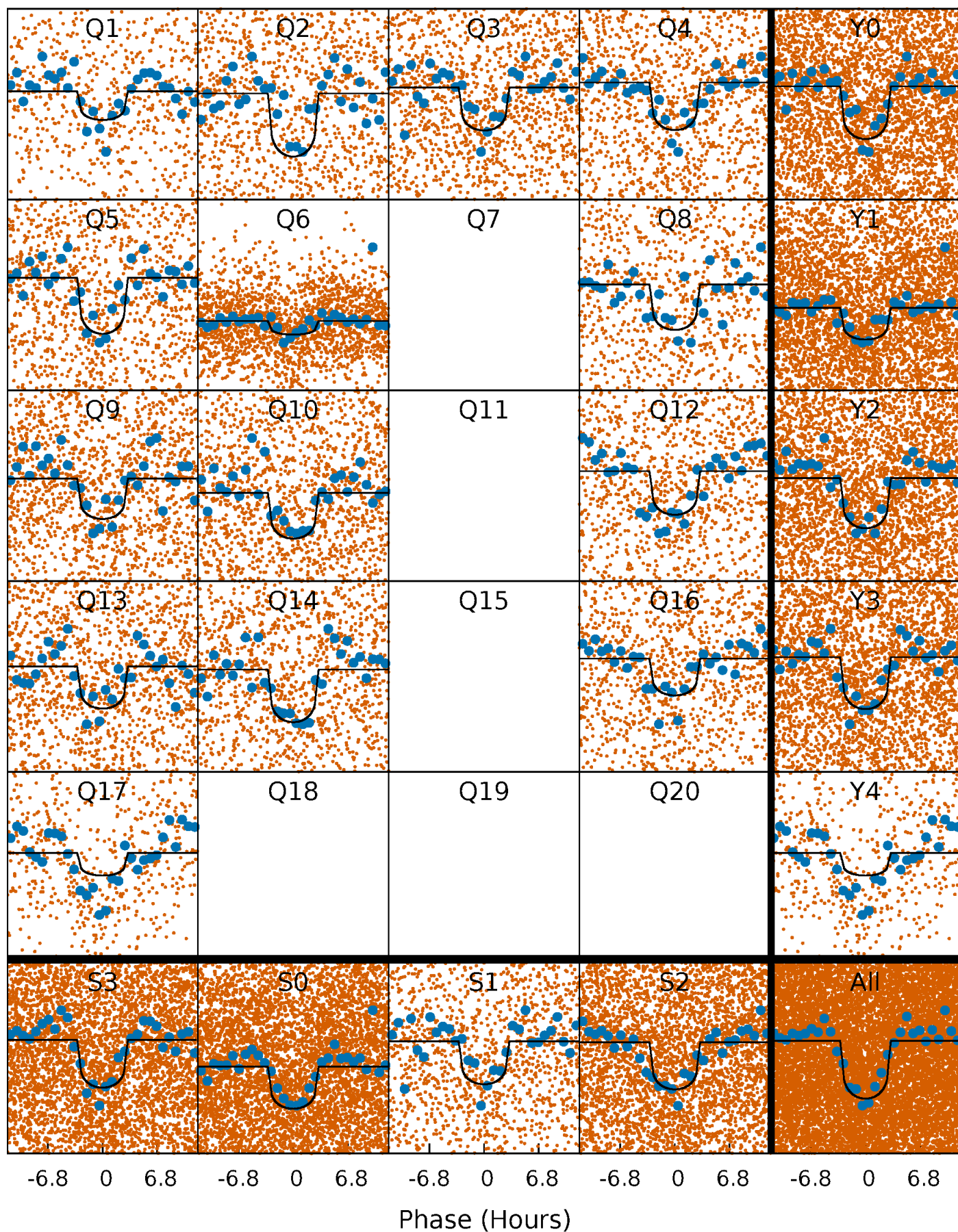
TCE 010090219-01   P= 2.286175 Days    $T_0=133.526538$  (BKJD)





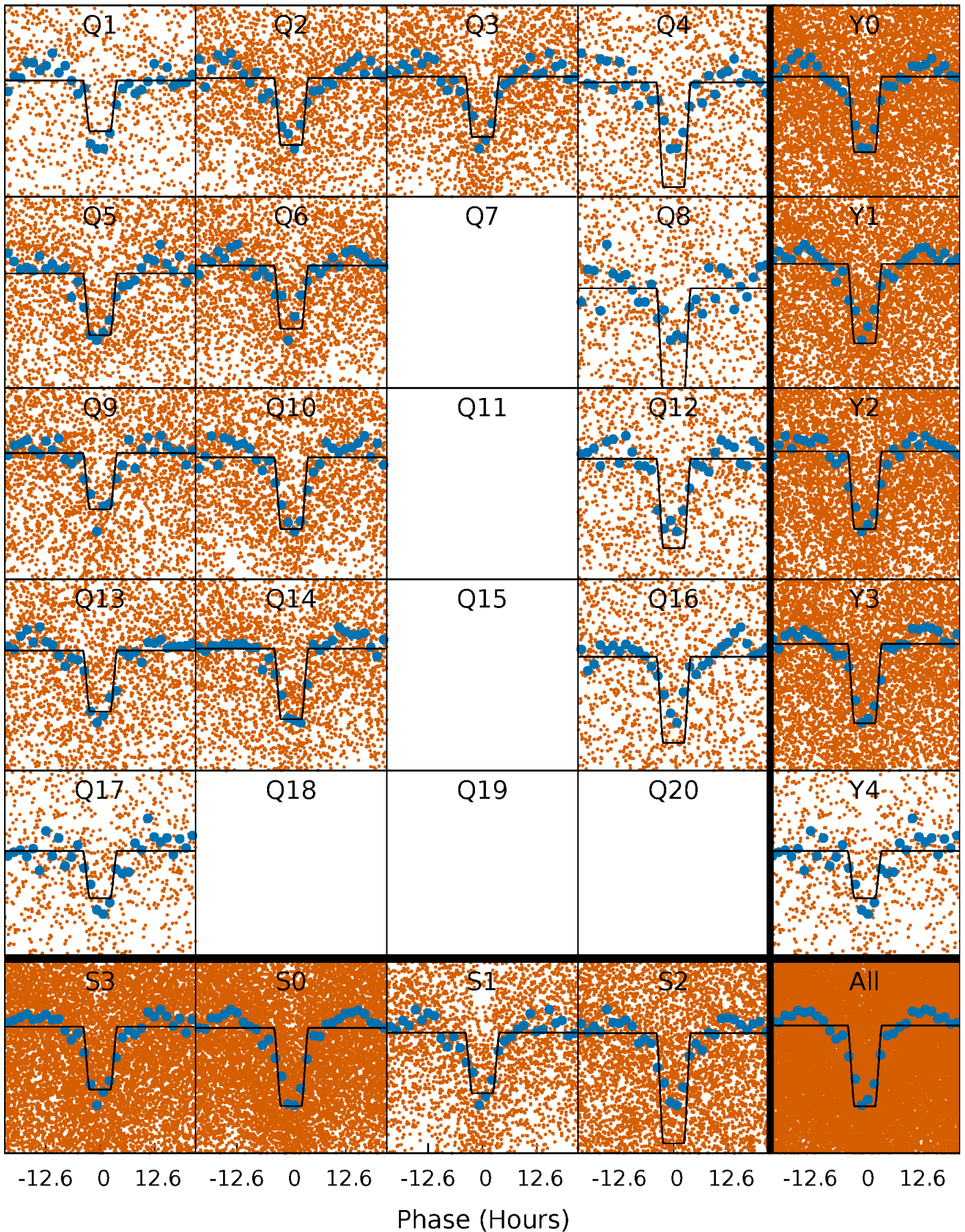
# DV Quarter-Phased Transit Curves

TCE 010090219-01 P= 2.286175 Days  $T_0=133.526538$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010090219-01 P= 2.286097 Days  $T_0=133.539996$  (BKJD)

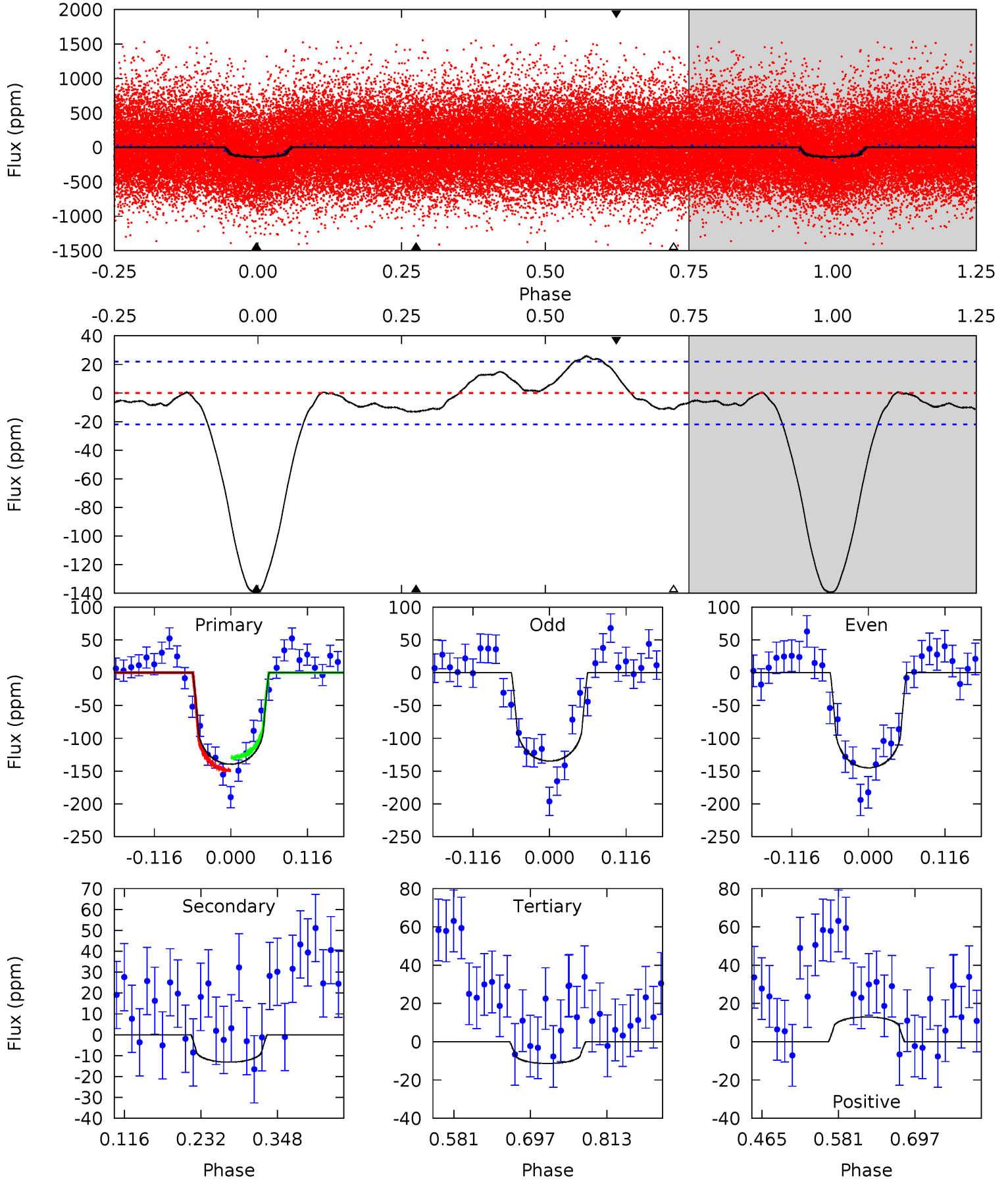




# DV Model-Shift Uniqueness Test

010090219-01, P = 2.286175 Days, E = 131.240363 Days

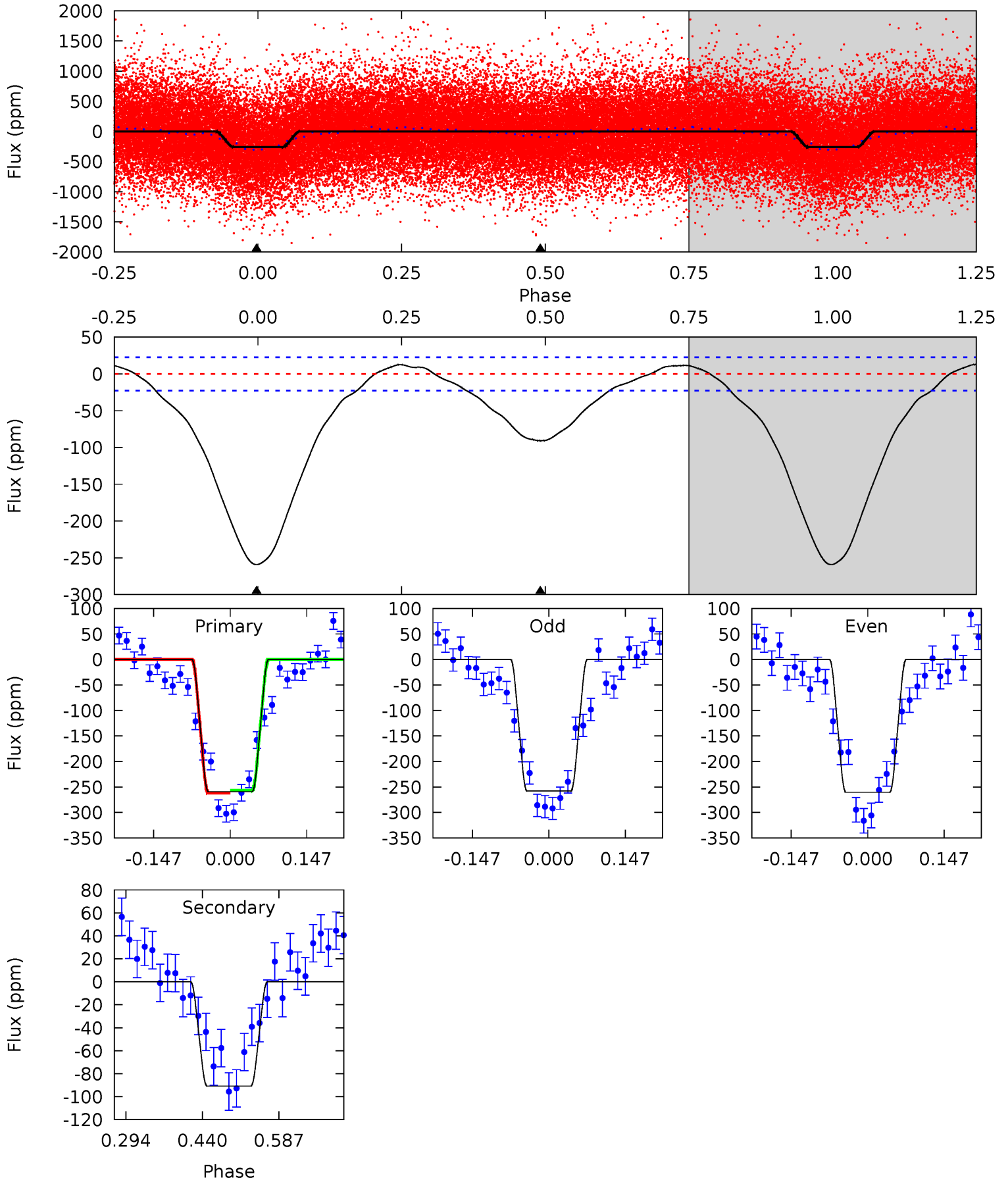
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.8	2.71	2.34	2.67	4.53	1.57	2.24	26.4	26.1	0.37	0.04	1.06	0.97	0.16	2.03



# Alt Model-Shift Uniqueness Test

010090219-01, P = 2.286097 Days, E = 131.253899 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
51.1	17.9	0	0	4.48	1.45	2.84	51.1	51.1	17.9	17.9	0.25	0.97	0.05	0.54





### Stellar Parameters For KIC 010090219

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6063^{+199}_{-217}$	$4.476^{+0.048}_{-0.204}$	$0.070^{+0.250}_{-0.350}$	$1.012^{+0.282}_{-0.101}$	$1.117^{+0.130}_{-0.159}$	$1.519^{+0.391}_{-0.754}$
	+3%/-4%	+1%/-5%	+357%/-500%	+28%/-10%	+12%/-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 010090219-01 / KOI 3978.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-13 \pm 5$	$1.70^{+1.32}_{-1.08}$	$2044^{+143}_{-99}$	$3410^{+1626}_{-673}$	$2.967^{+19.326}_{-2.114}$
Alt.	$-91 \pm 5$	$2.22^{+1.49}_{-1.25}$	$2052^{+141}_{-101}$	$4441^{+2006}_{-763}$	$12^{+53}_{-8}$

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

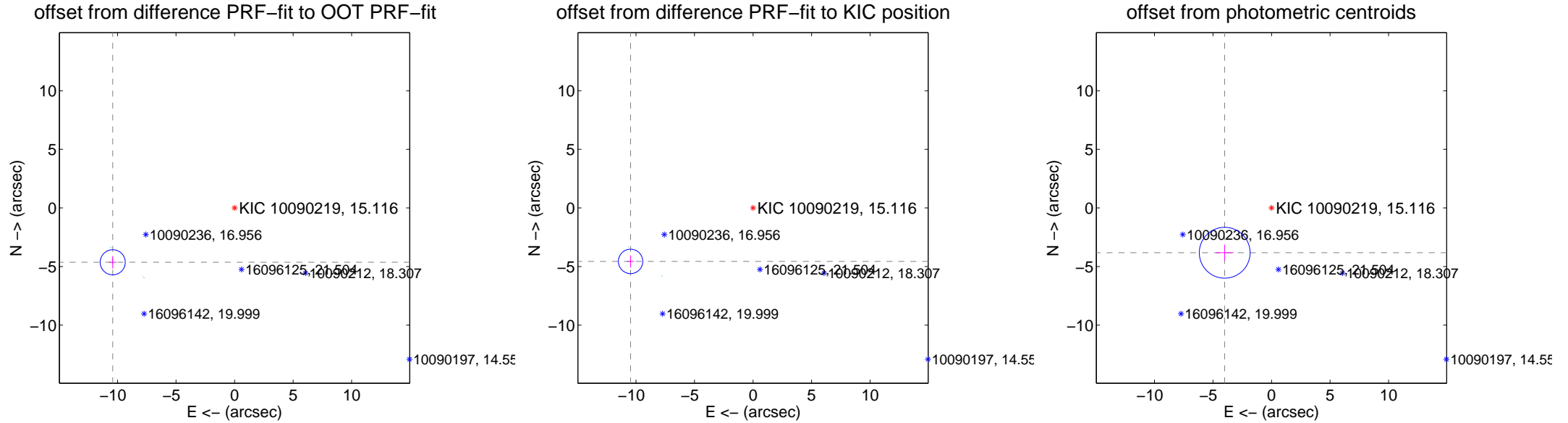
## DV Centroid Data

Supplemental centroid analysis for 010090219-01. Kepler magnitude: 15.12. Transit SNR 24.66

There are 8 quarters with good PRF difference image offsets

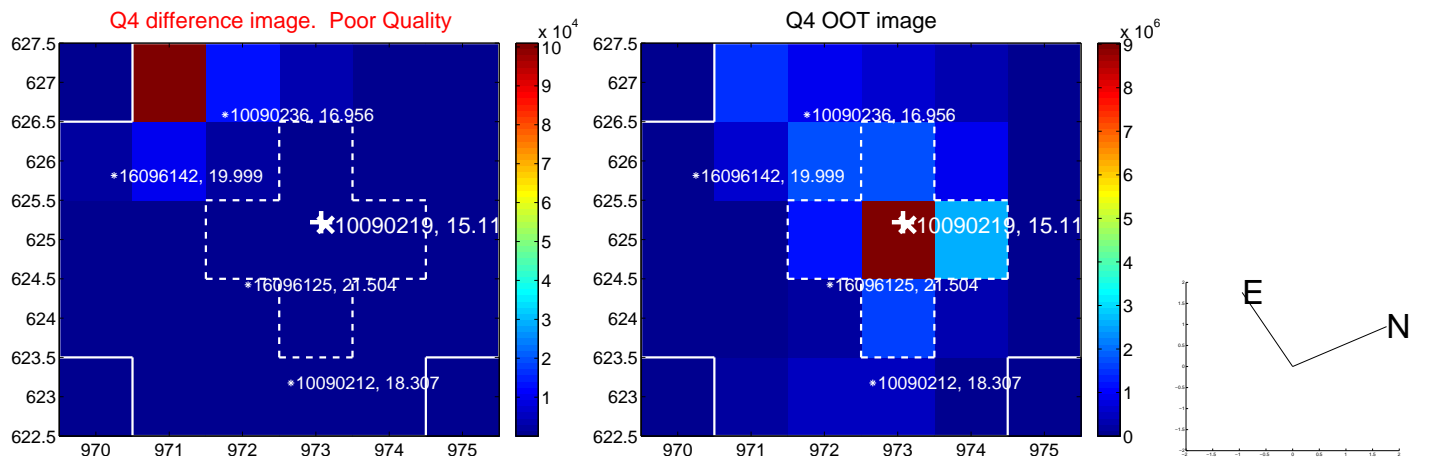
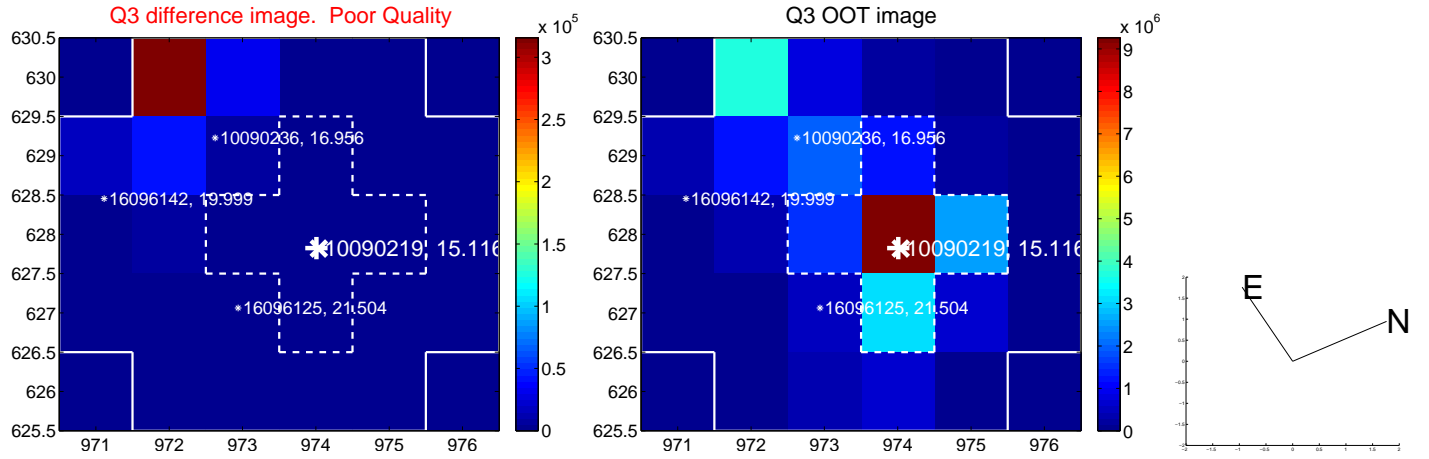
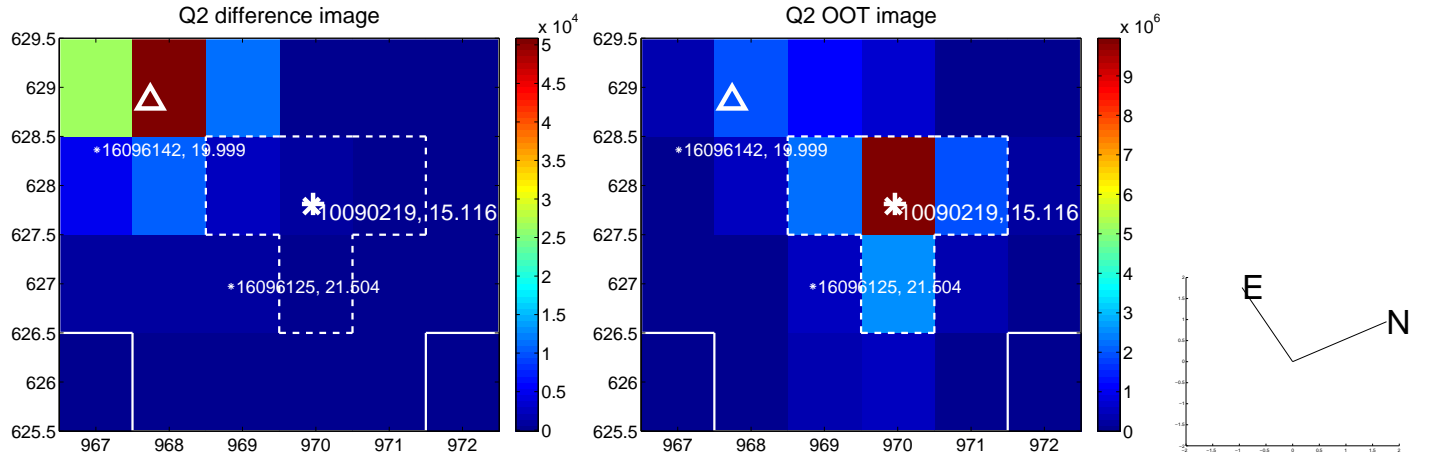
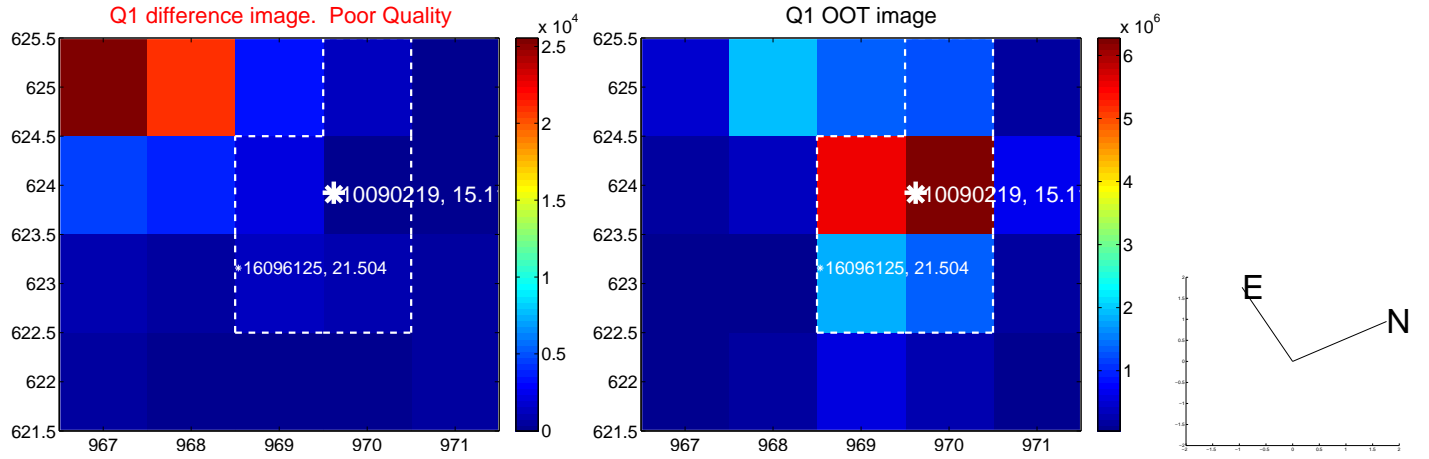
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$11.399 \pm 0.357$	31.93	$10.413 \pm 0.309$	$-4.638 \pm 0.537$
PRF-fit source offset from KIC position	$11.417 \pm 0.347$	32.89	$10.465 \pm 0.304$	$-4.563 \pm 0.517$
photometric centroid source offset	$5.54 \pm 0.72$	7.65	$4.00 \pm 0.75$	$-3.82 \pm 0.69$

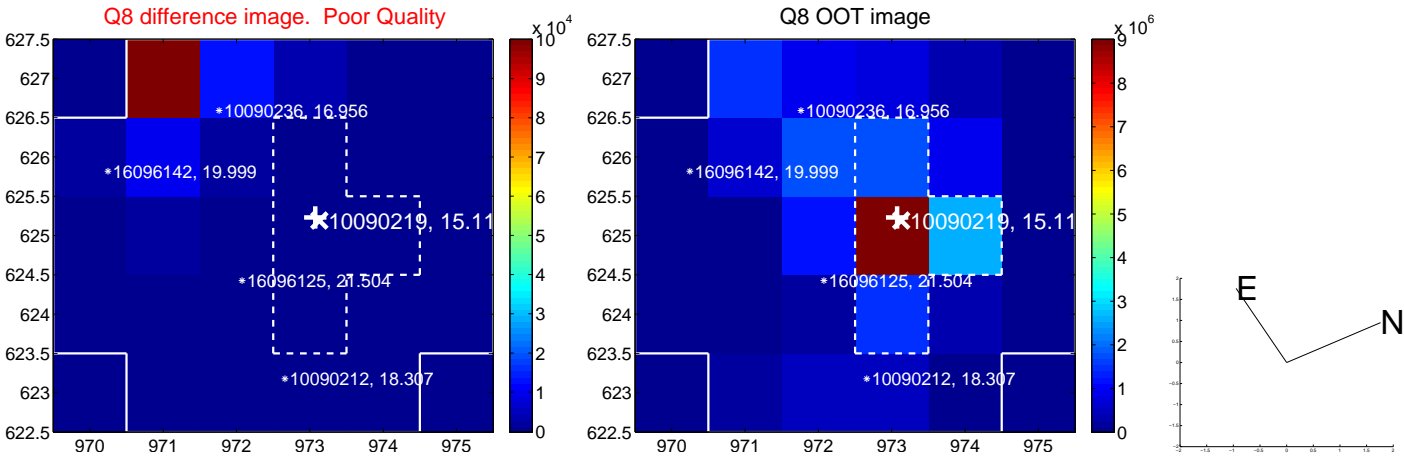
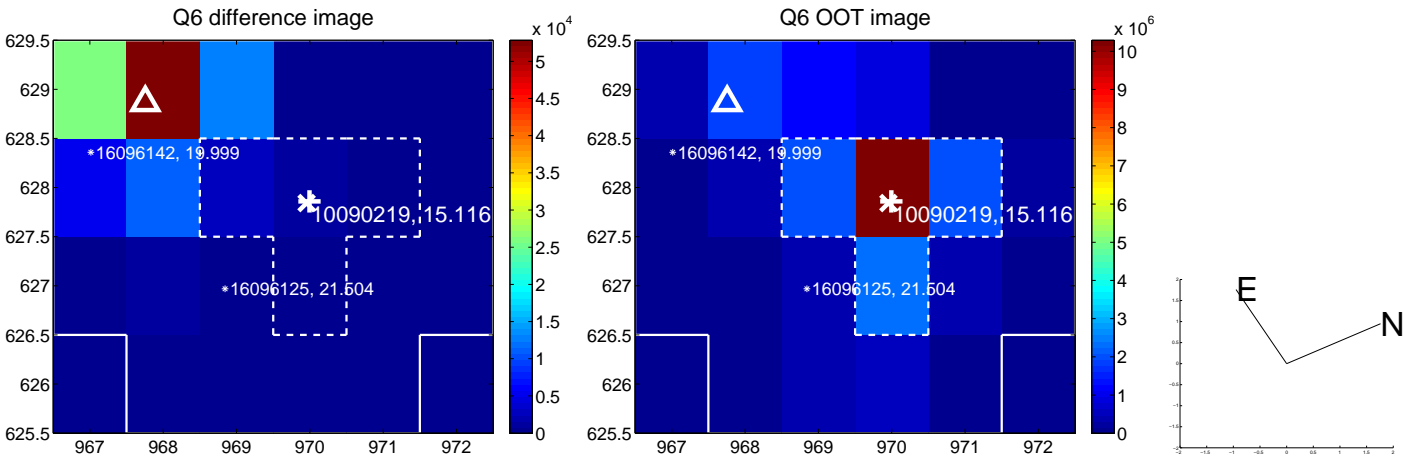
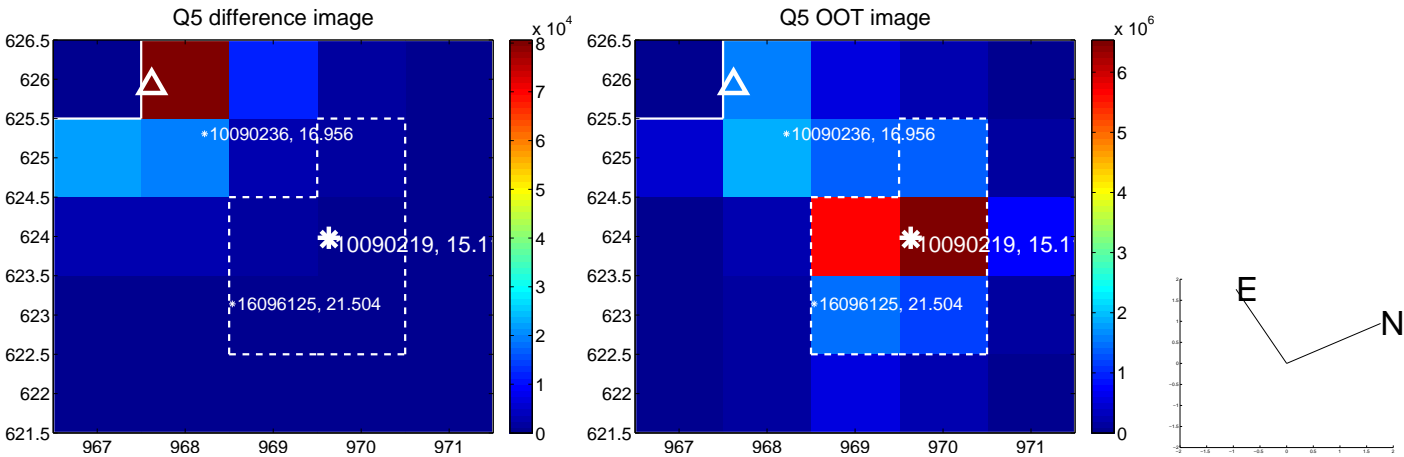


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

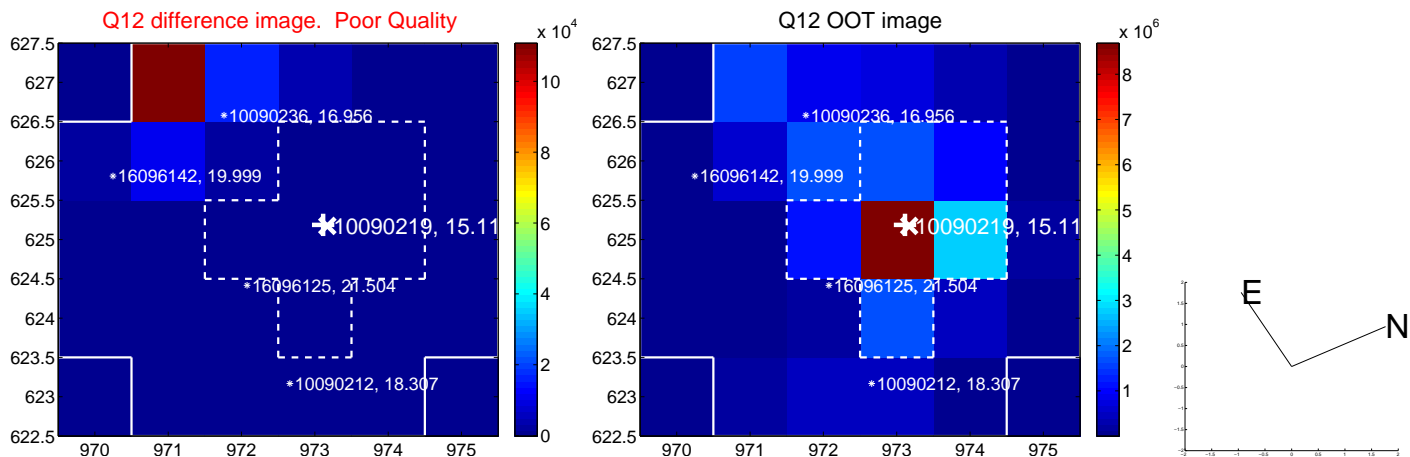
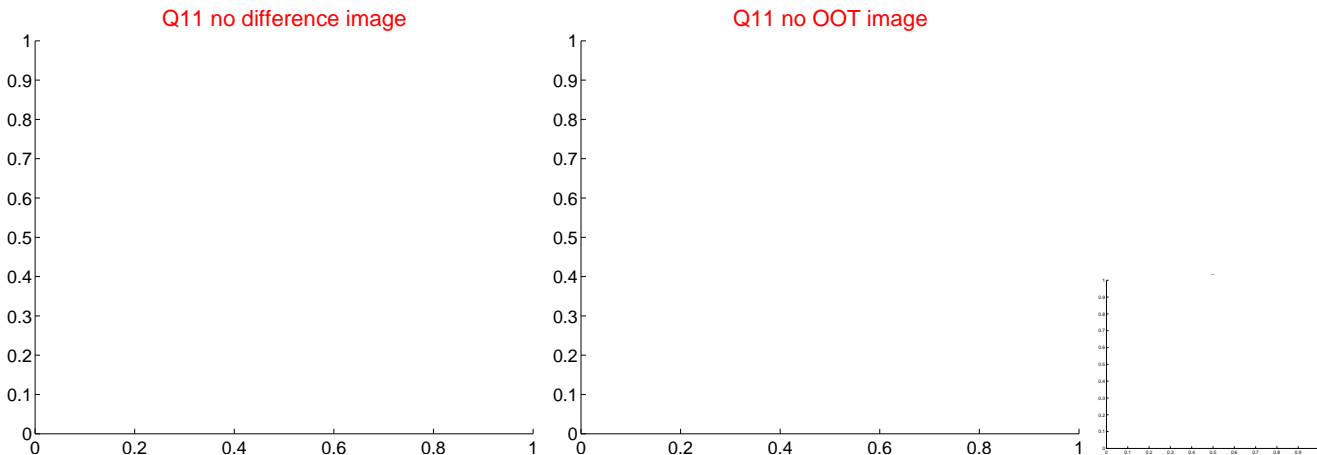
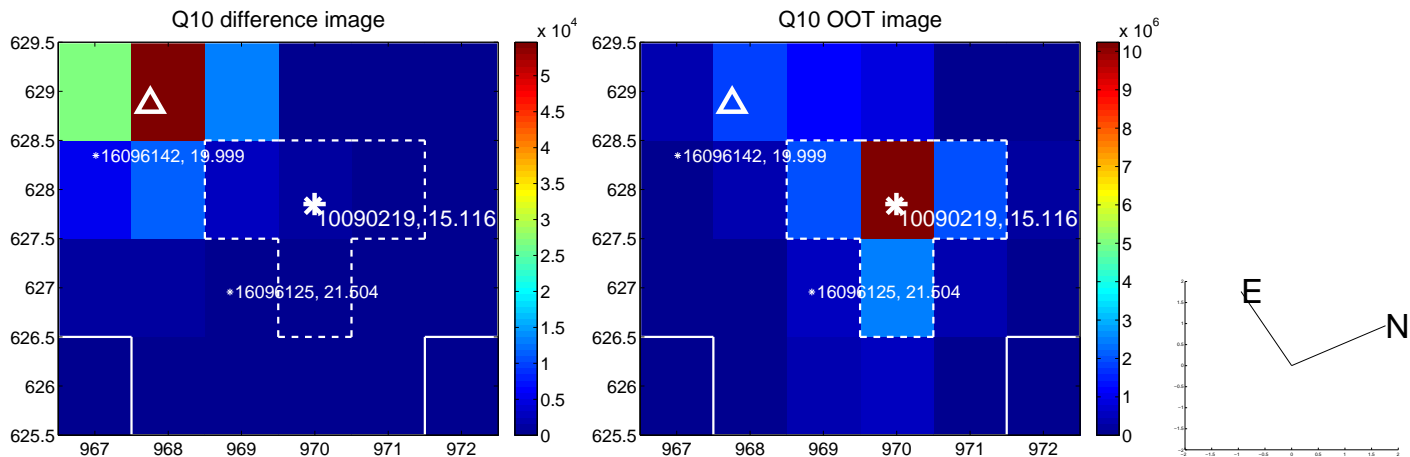
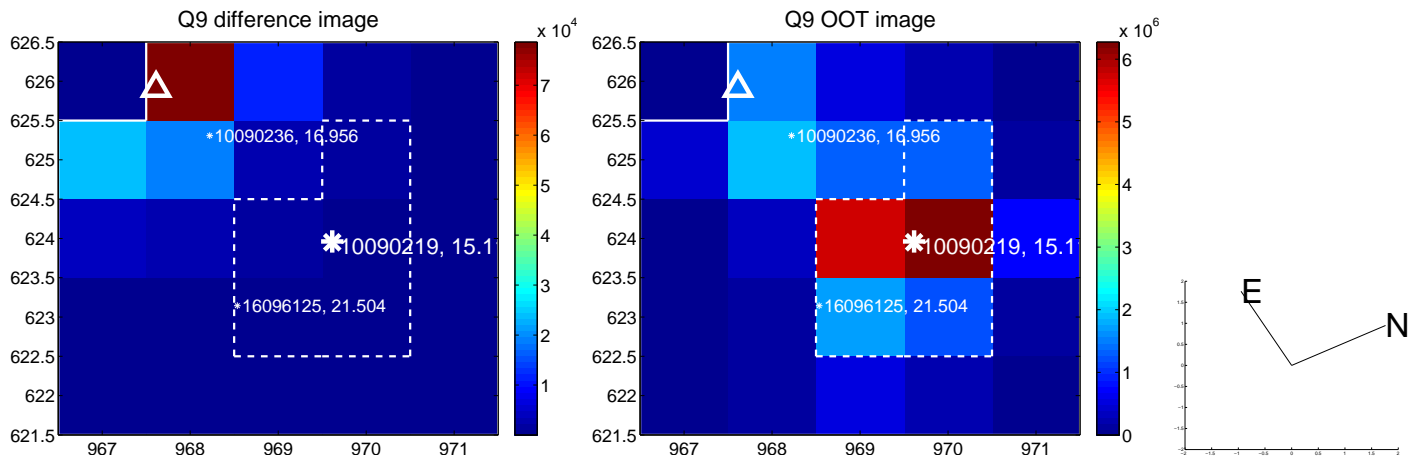


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

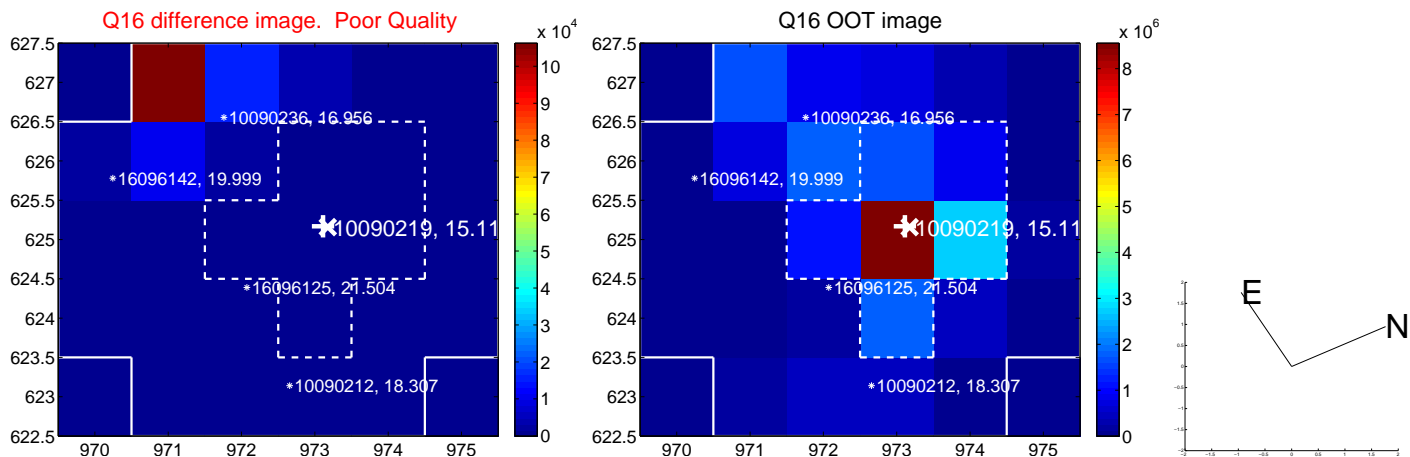
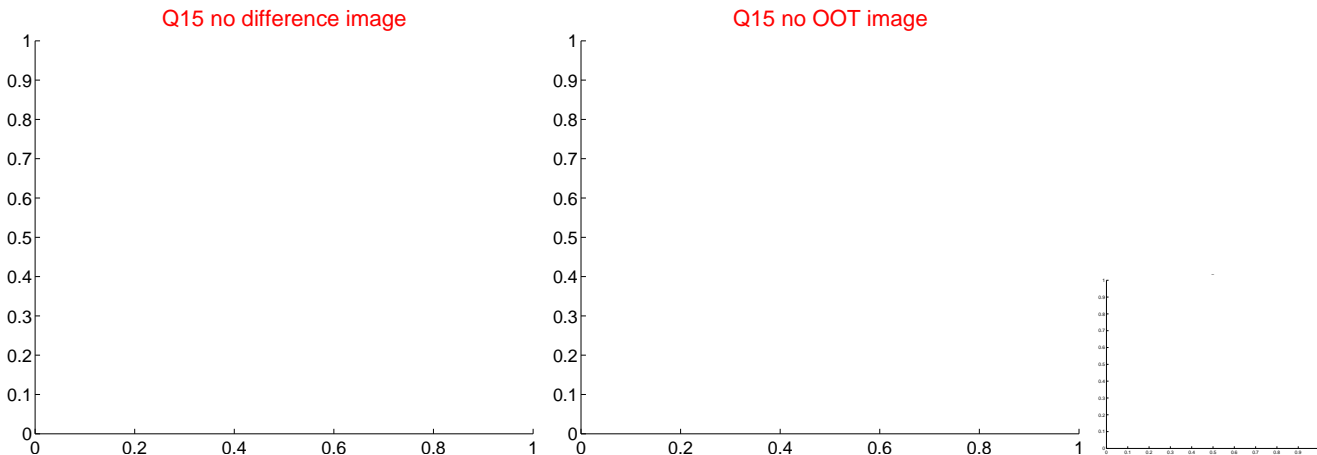
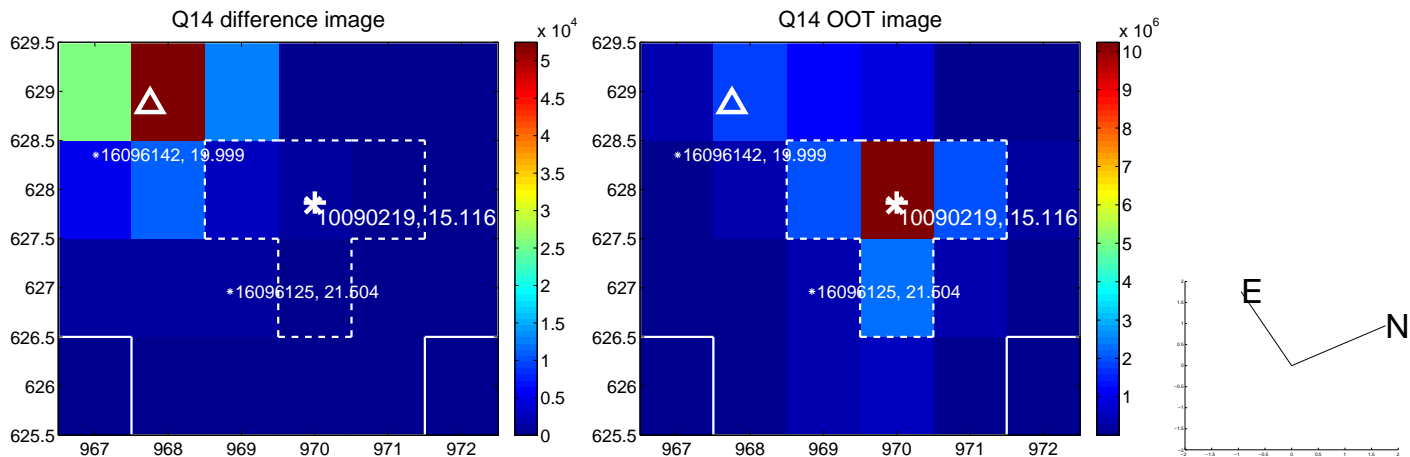
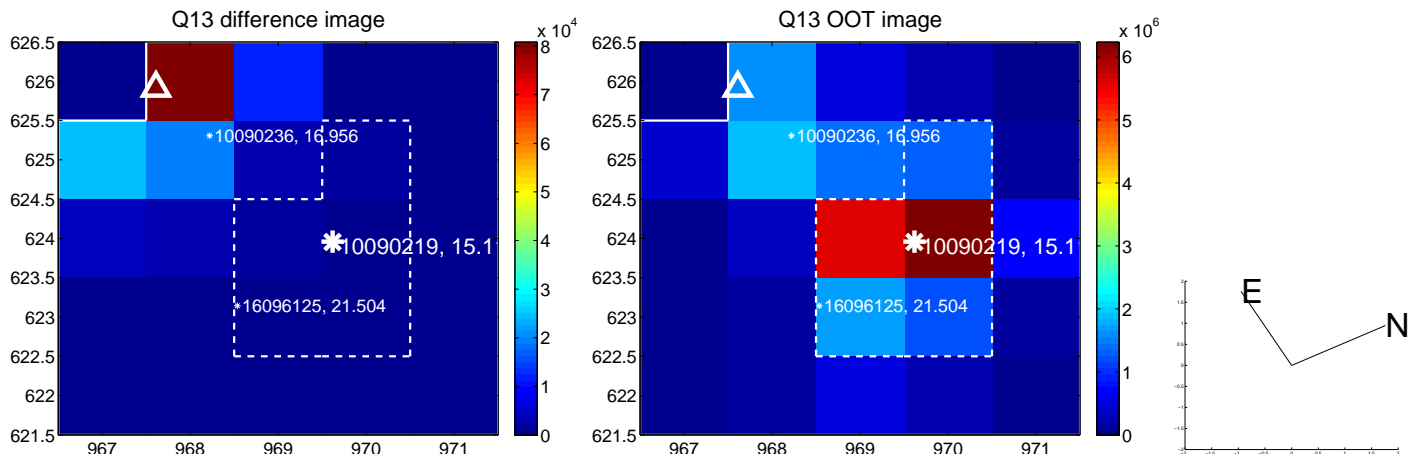




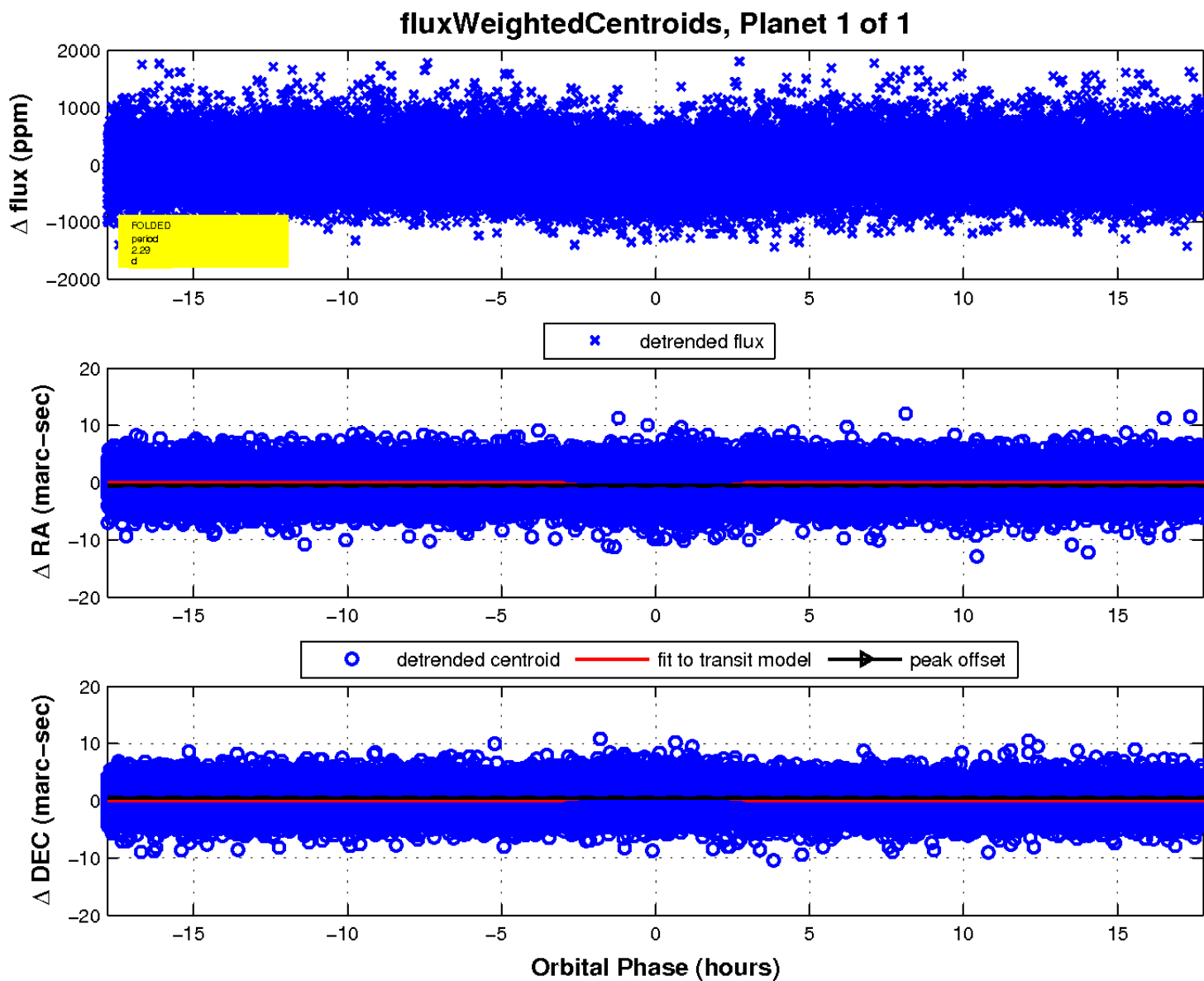
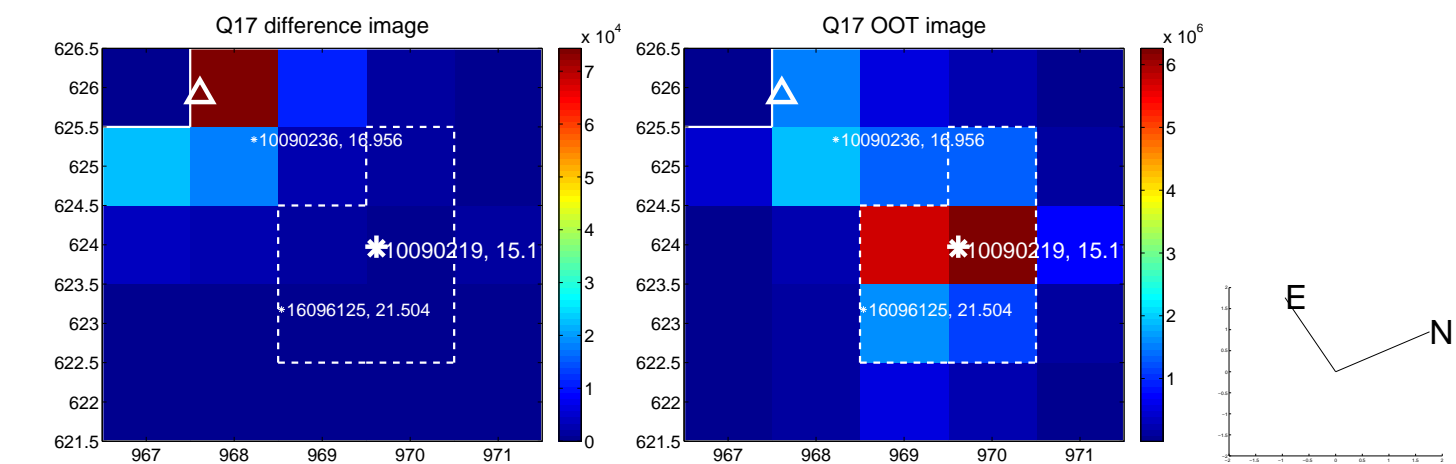
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

