

# KIC 007220322

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007220322-01	OBS	1350.01	0.752169	131.785394	1033.5	2.026	467.9	101.4	1.18	5916	4.94	5798.00

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007220322-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—CENT_UNRESOLVED_OFFSET—HALO_GHOST—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 007220322-01

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	$\sigma_P$	$\sigma_T$
007220322-01	7220322	3775.01	7220320	1:1	4.5	0	-1	14.08	11.88	50.39	Direct-PRF	0	1.54	0.61

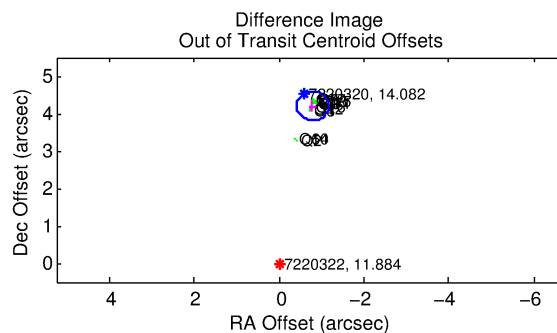
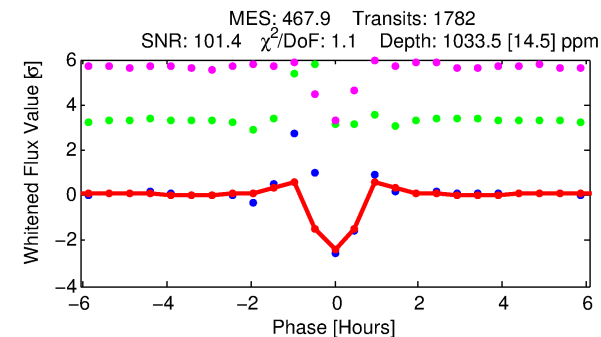
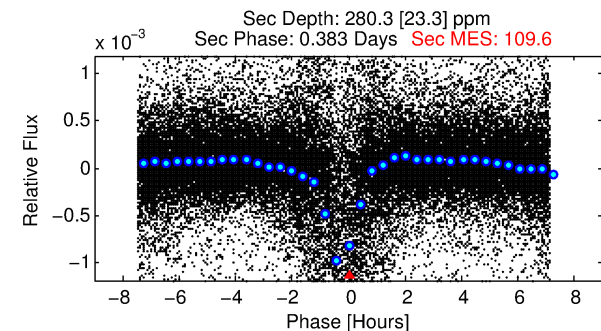
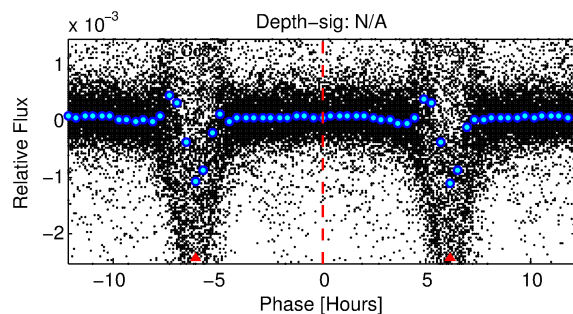
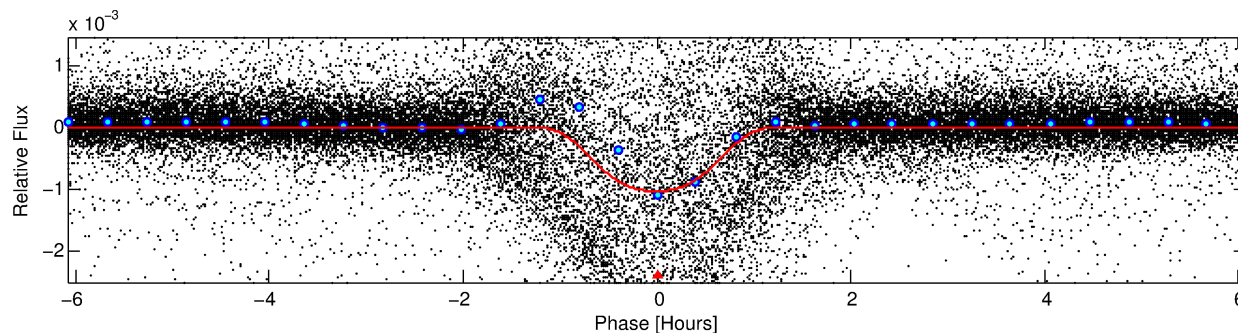
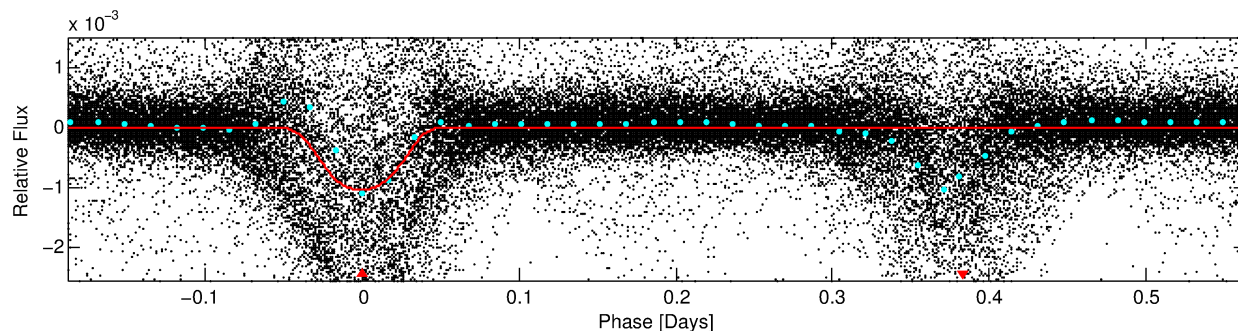
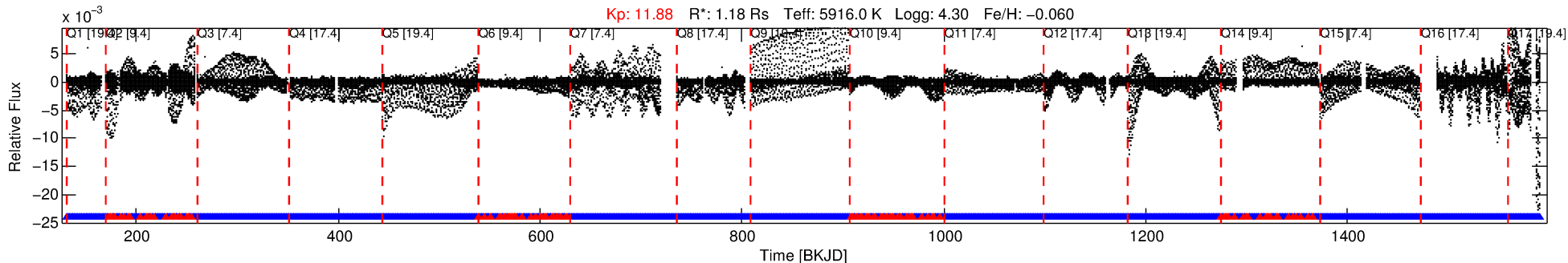
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  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: 7220322 Candidate: 1 of 1 Period: 0.752 d

KOI: K01350.01 Corr: 0.913

Kp: 11.88 R\*: 1.18 Rs Teff: 5916.0 K Logg: 4.30 Fe/H: -0.060



## DV Fit Results:

Period = 0.75217 [0.00000] d  
Epoch = 131.7854 [0.0001] BKJD  
Rp/R\* = 0.0385 [0.0004]  
a/R\* = 1.49 [0.01]  
b = 0.96 [0.00]  
Seff = 5798.00 [2210.11]  
Teq = 2225 [212] K  
Rp = 4.94 [1.45] Re  
a = 0.0162 [0.0040] AU  
Ag = 1.65 [0.60] [1.08σ]  
Teff = 3900 [159] K [6.32σ]

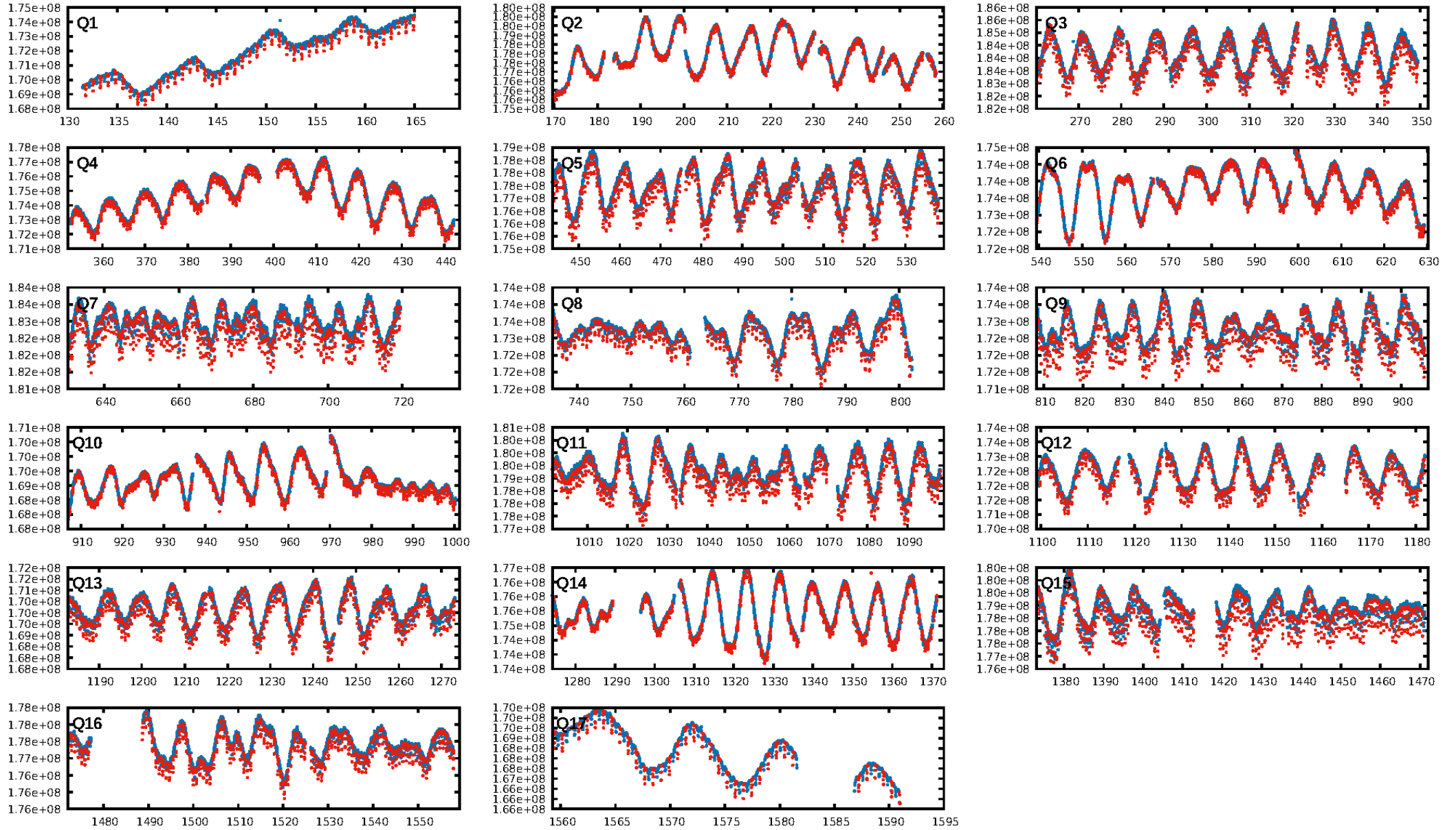
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [1593/1702]  
GhostDiagnostic-chr: 0.01975  
Centroid-sig: 0.0%  
Centroid-so: 21.955 arcsec [652.35σ]  
OotOffset-rm: 4.271 arcsec [33.47σ]  
KicOffset-rm: 4.645 arcsec [68.33σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

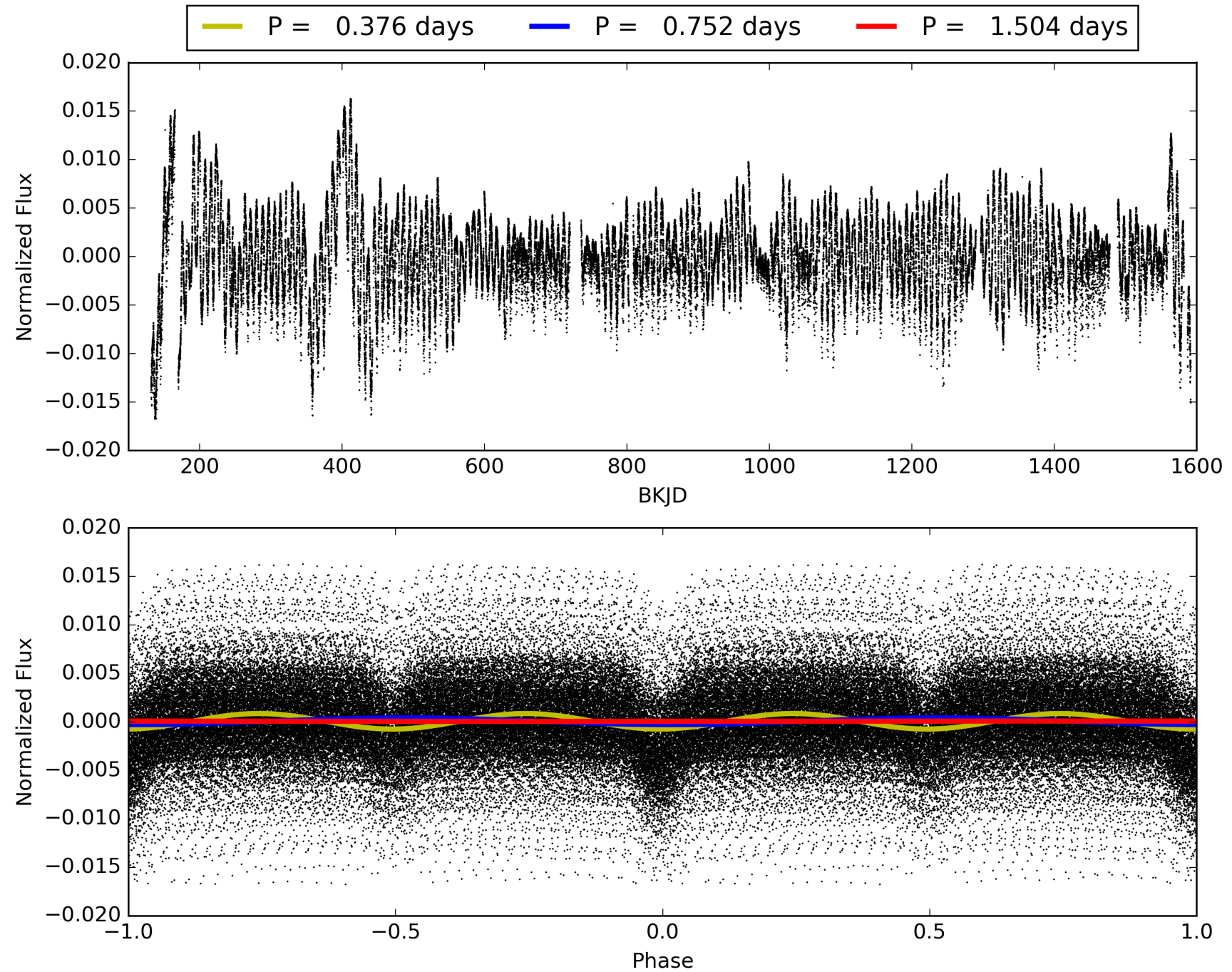
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:25:03 Z

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

# TCE 007220322-01, PDC Light Curves

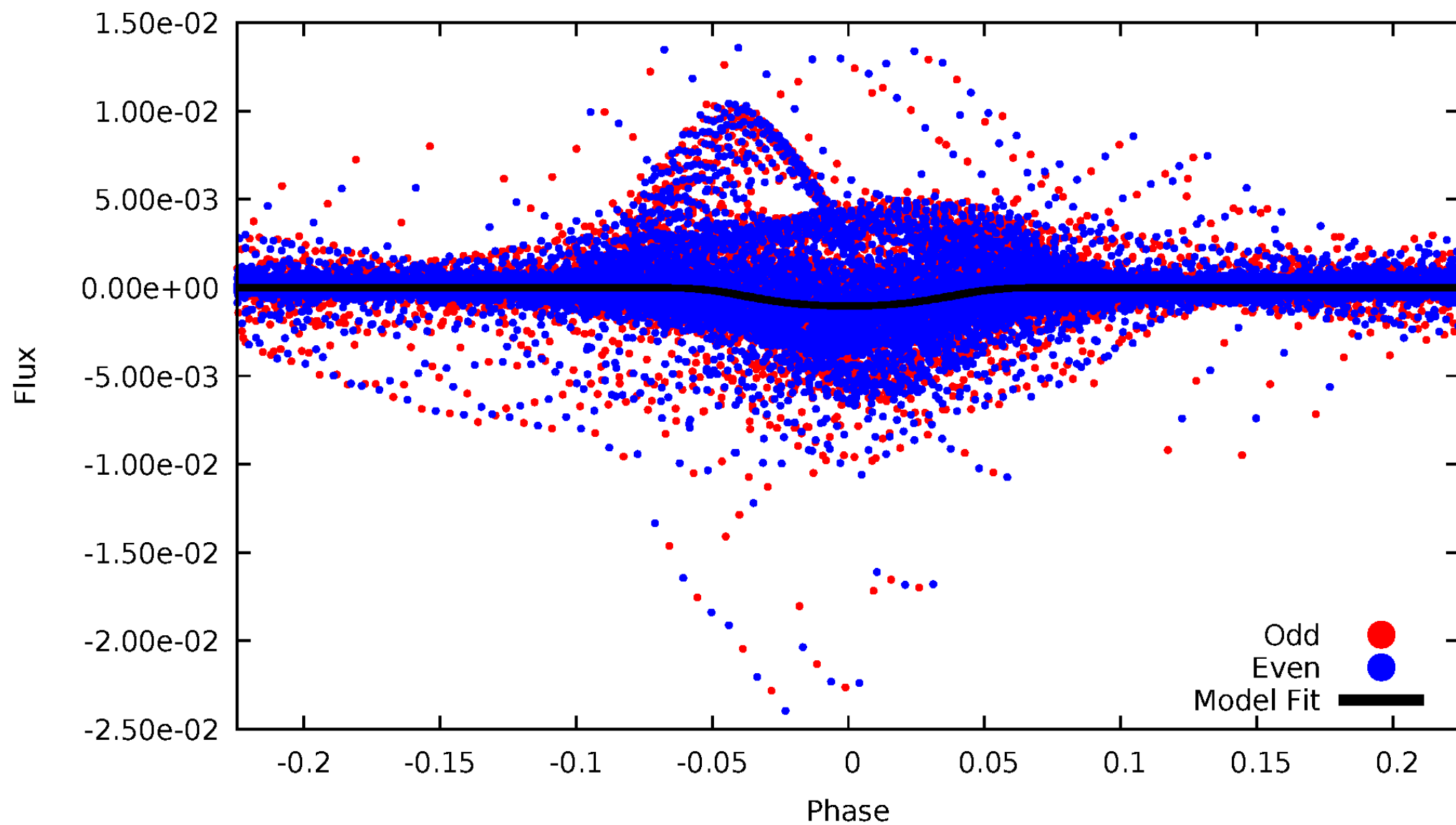


TCE 007220322-01



# DV Odd/Even

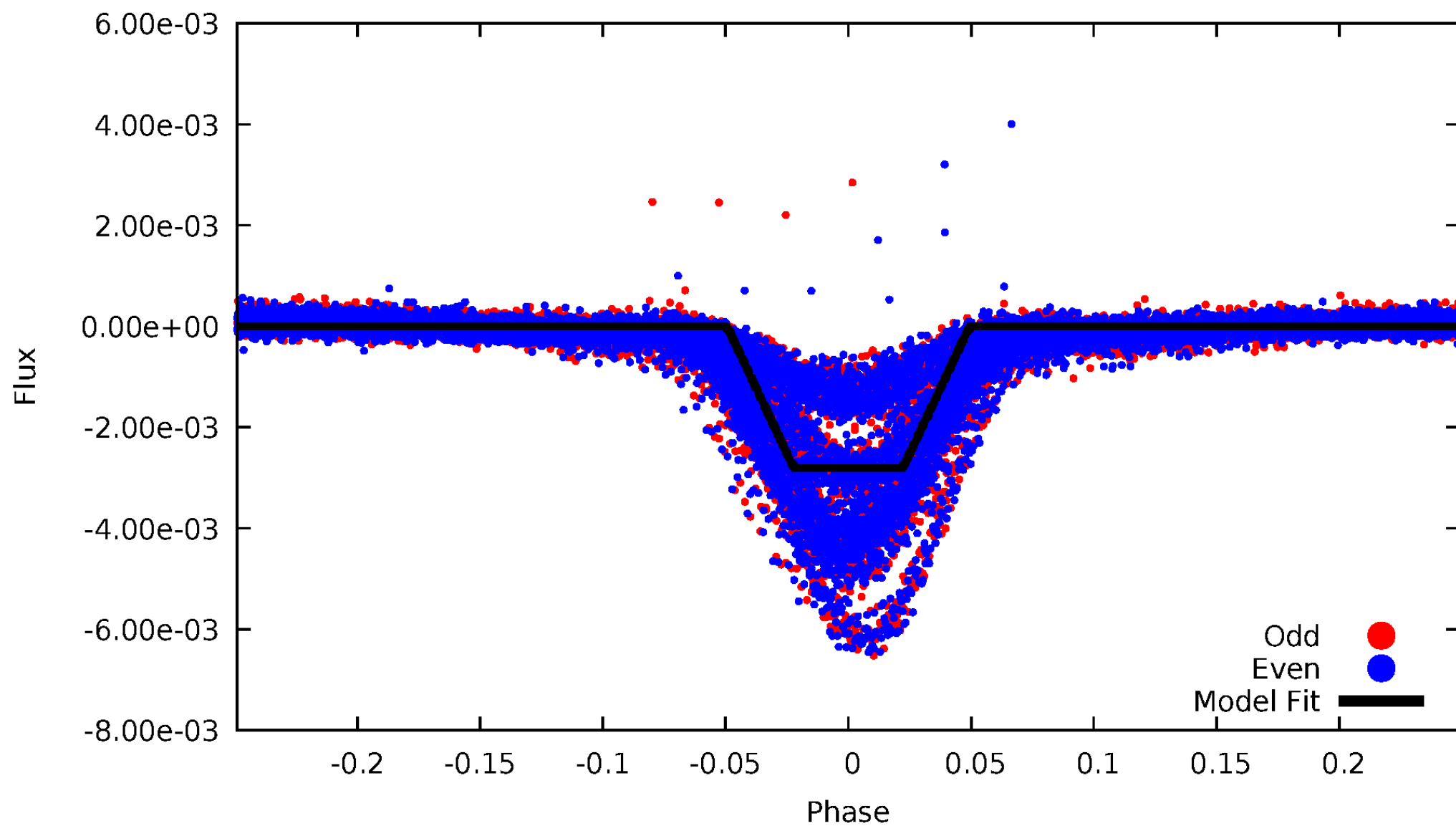
TCE 007220322-01





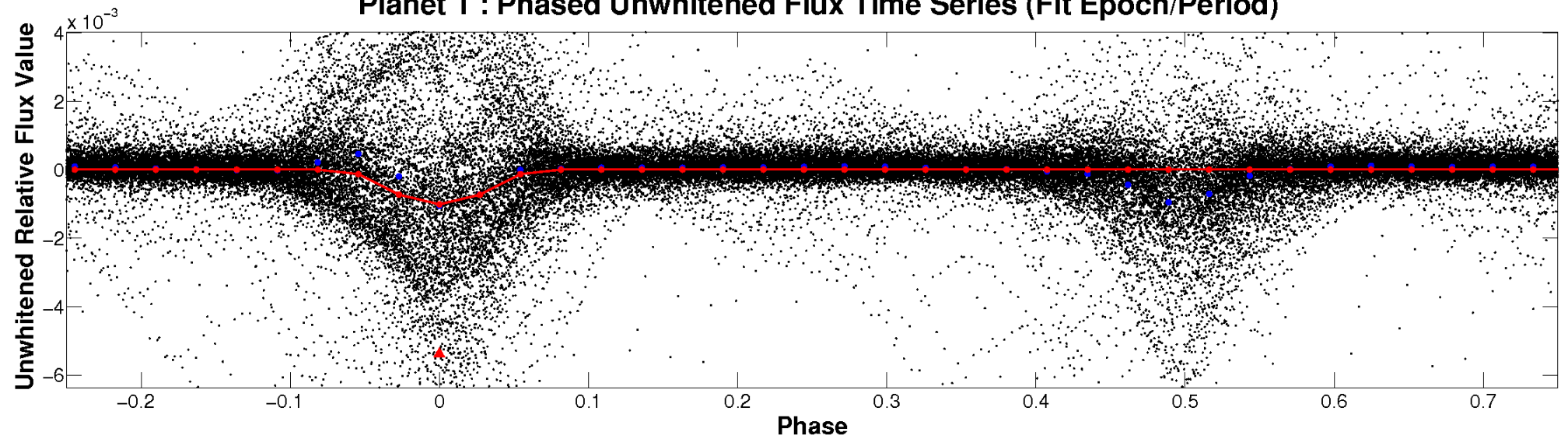
# ALT Odd/Even

TCE 007220322-01

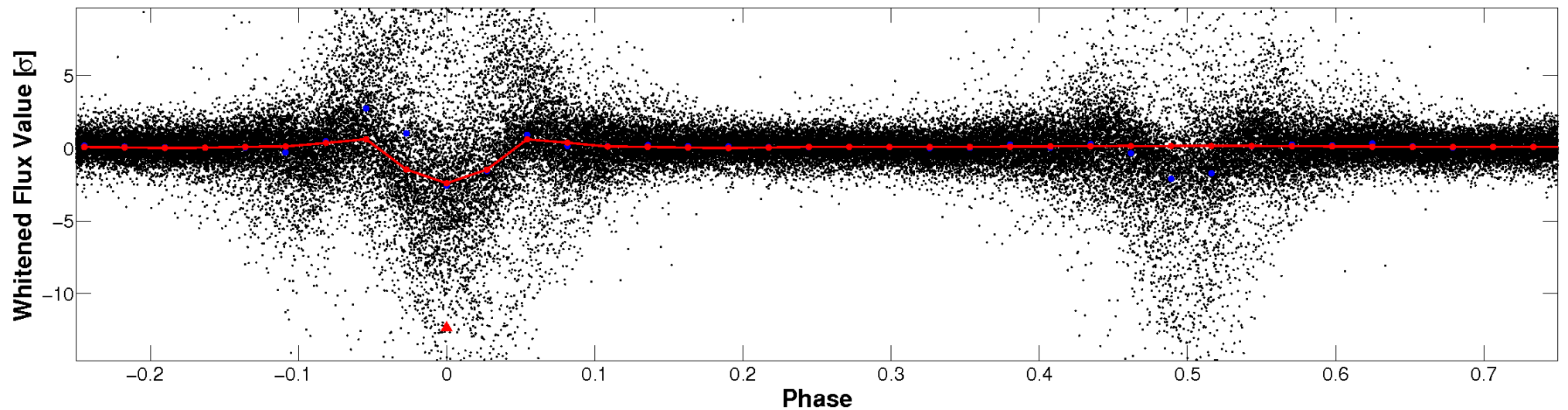


# Non-Whitened Vs. Whitened Light Curve

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

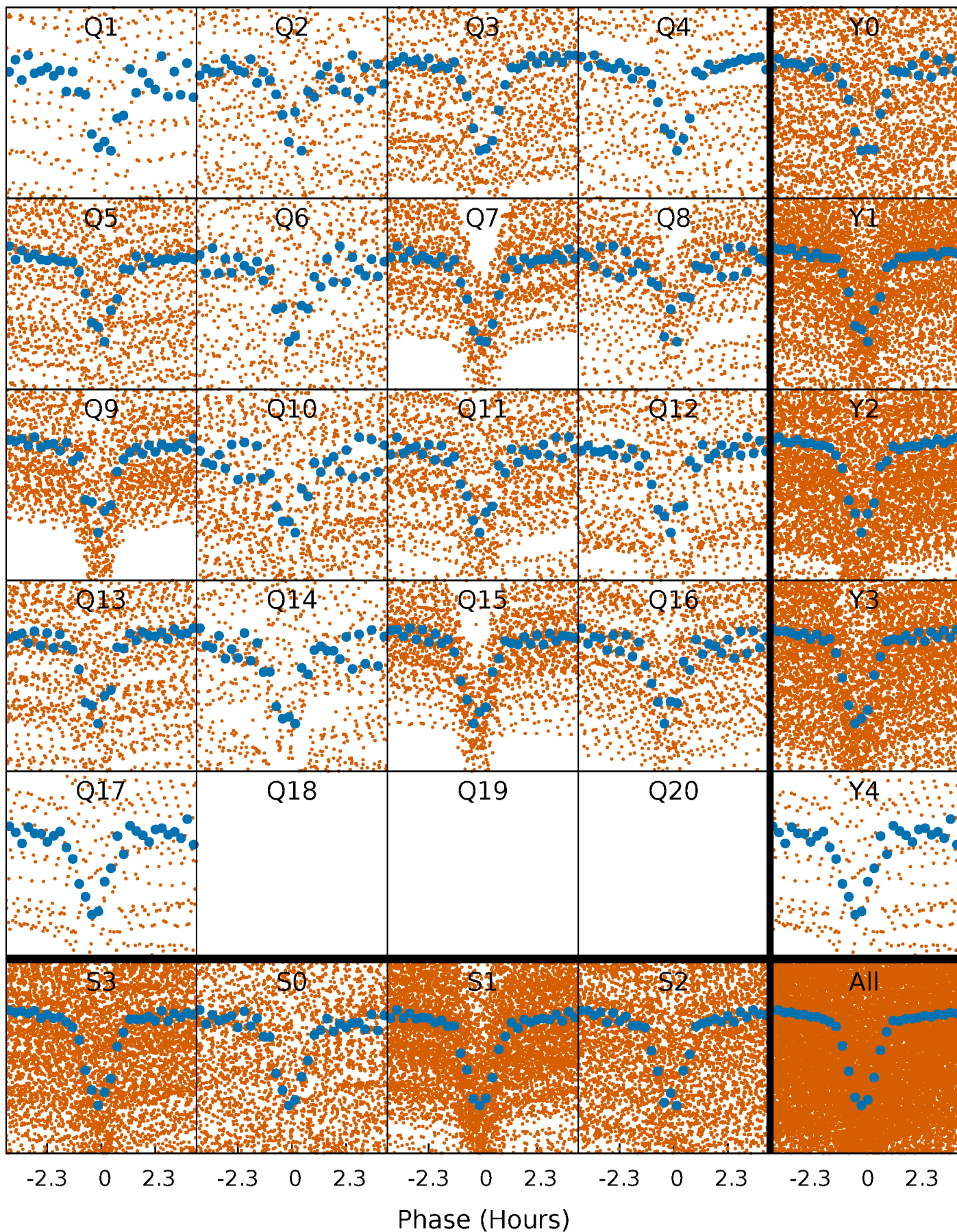


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

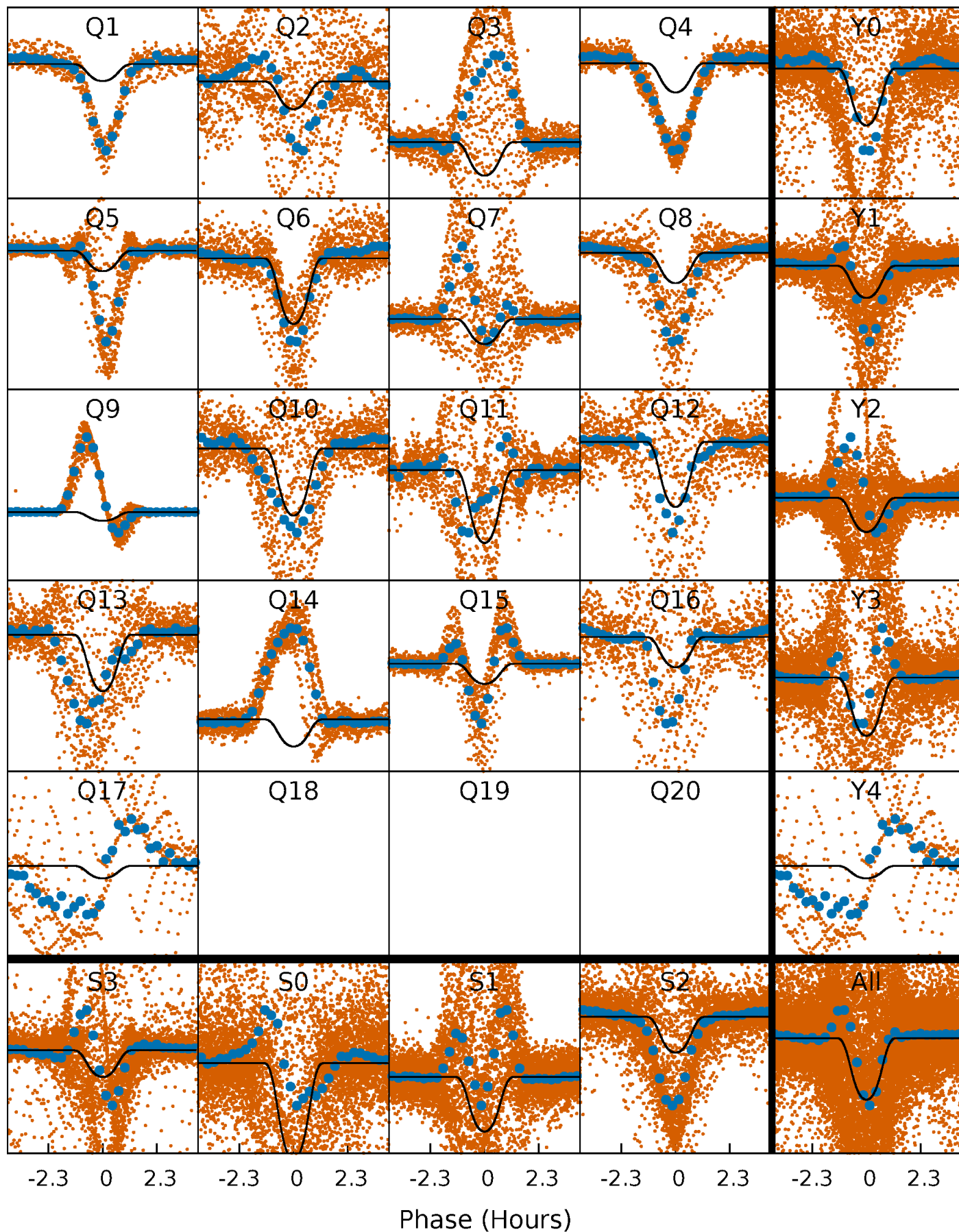
TCE 007220322-01 P= 0.752169 Days  $T_0=131.785394$  (BKJD)





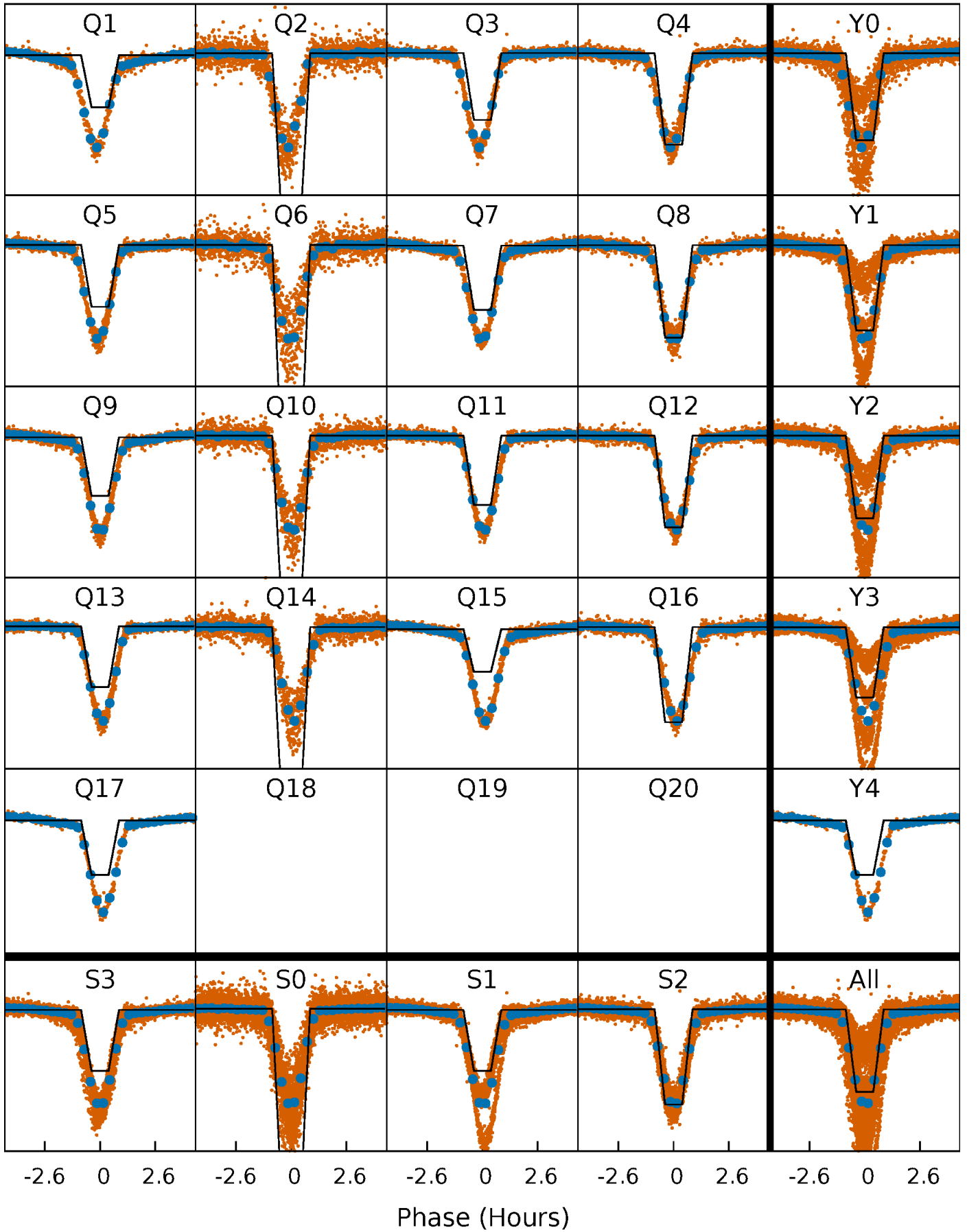
# DV Quarter-Phased Transit Curves

TCE 007220322-01 P= 0.752169 Days  $T_0=131.785394$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

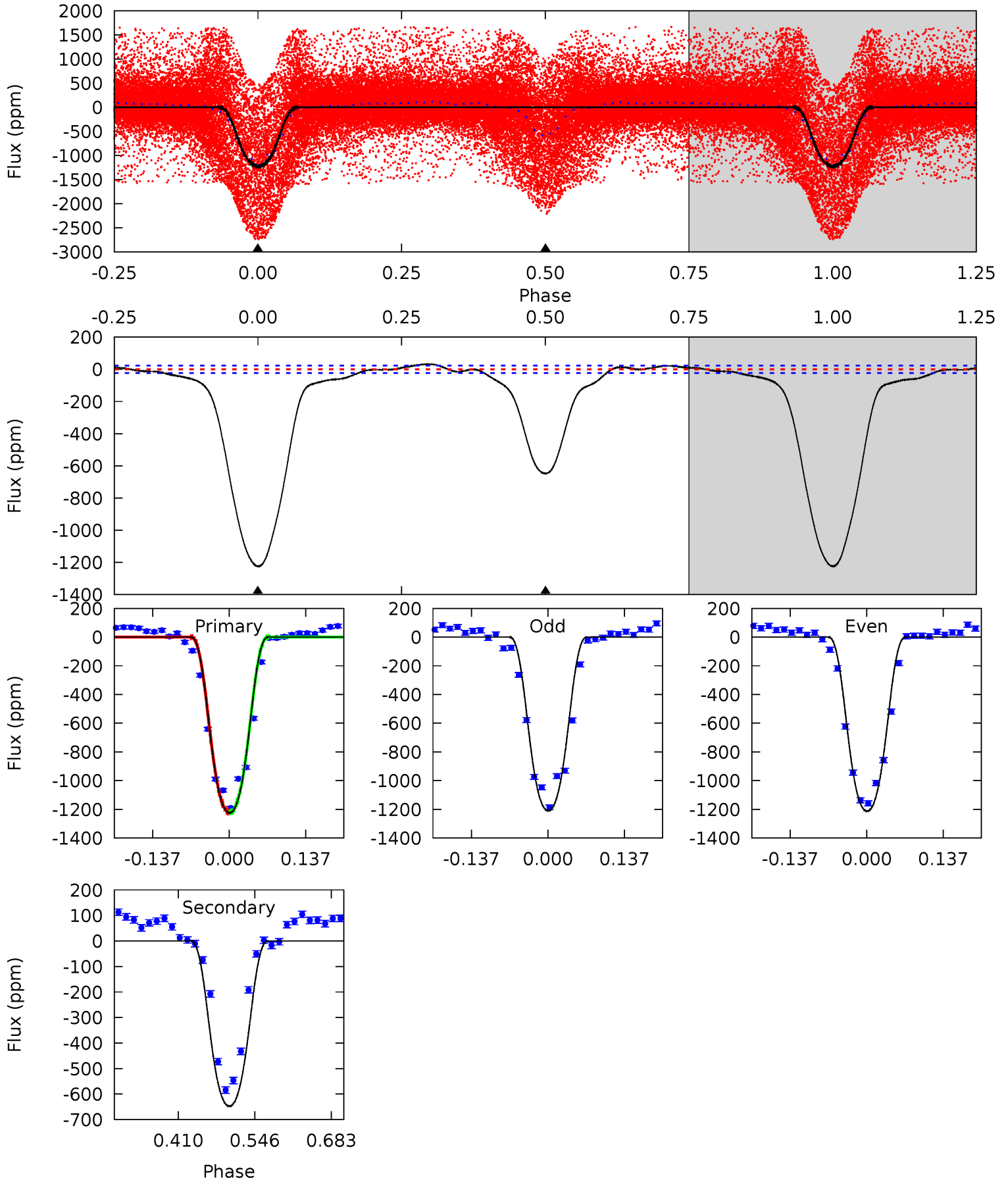
TCE 007220322-01 P= 0.752152 Days  $T_0=131.798038$  (BKJD)



# DV Model-Shift Uniqueness Test

007220322-01, P = 0.752169 Days, E = 131.033225 Days

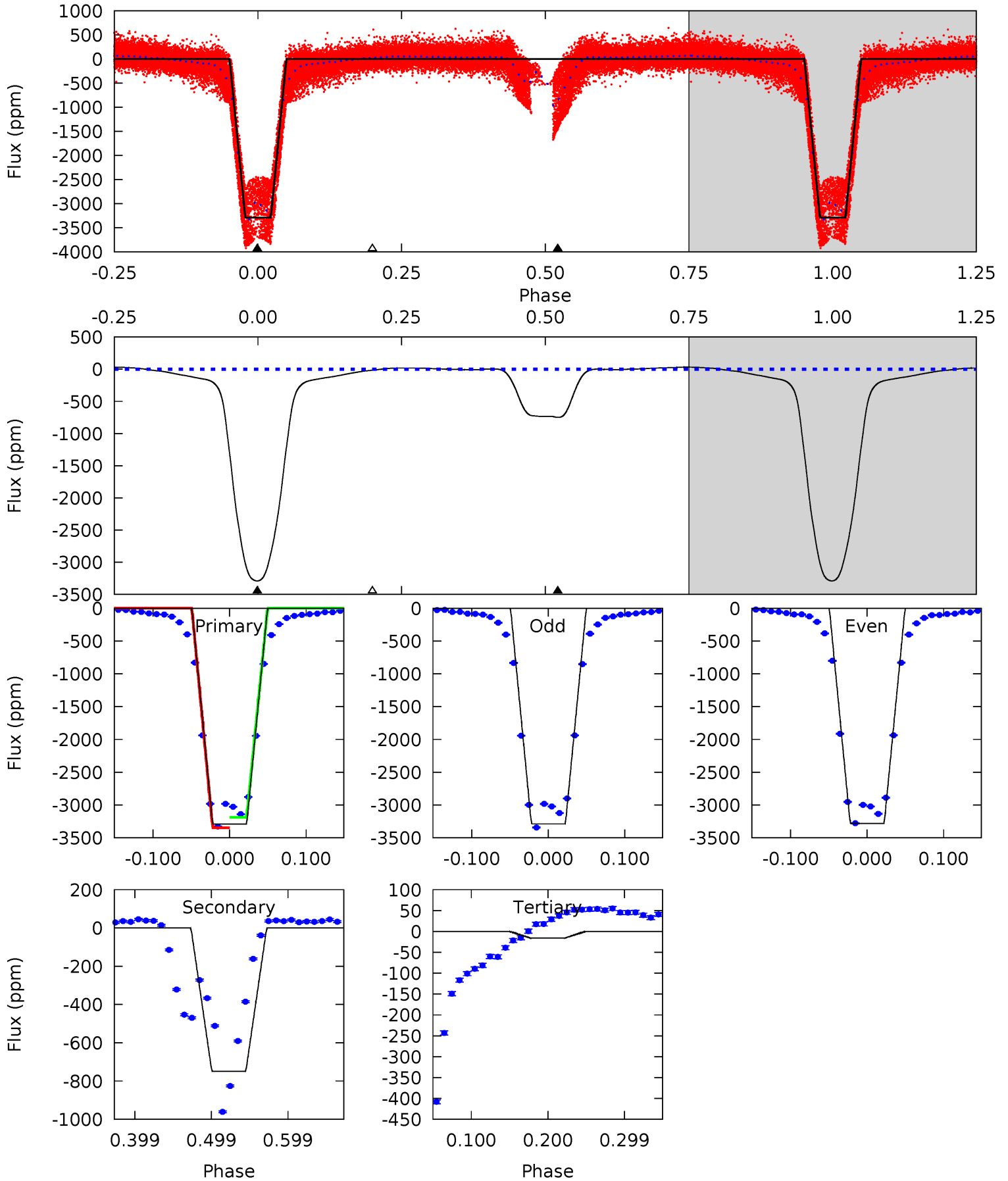
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
242.0	128.0	0	0	4.50	1.49	4.23	242.0	242.0	128.0	128.0	0.29	0.94	0.03	0.09



# Alt Model-Shift Uniqueness Test

007220322-01, P = 0.752152 Days, E = 131.045886 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
1399	318.5	6.75	0	4.57	1.65	20.6	1392	1399	311.7	318.5	1.50	0.90	0.01	34.0





### Stellar Parameters For KIC 007220322

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5916^{+184}_{-205}$	$4.296^{+0.175}_{-0.193}$	$-0.060^{+0.250}_{-0.300}$	$1.175^{+0.345}_{-0.259}$	$0.995^{+0.153}_{-0.115}$	$0.865^{+0.700}_{-0.452}$
	+3%/-3%	+4%/-4%	+417%/-500%	+29%/-22%	+15%/-12%	+81%/-52%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 007220322-01 / KOI 1350.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-648 \pm 5$	$4.93^{+0.82}_{-0.56}$	$3108^{+244}_{-212}$	$4829^{+133}_{-152}$	$3.806^{+1.037}_{-0.909}$
Alt.	$-749 \pm 2$	$6.85^{+1.08}_{-0.90}$	$3113^{+271}_{-217}$	$4330^{+117}_{-129}$	$2.304^{+0.661}_{-0.572}$

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

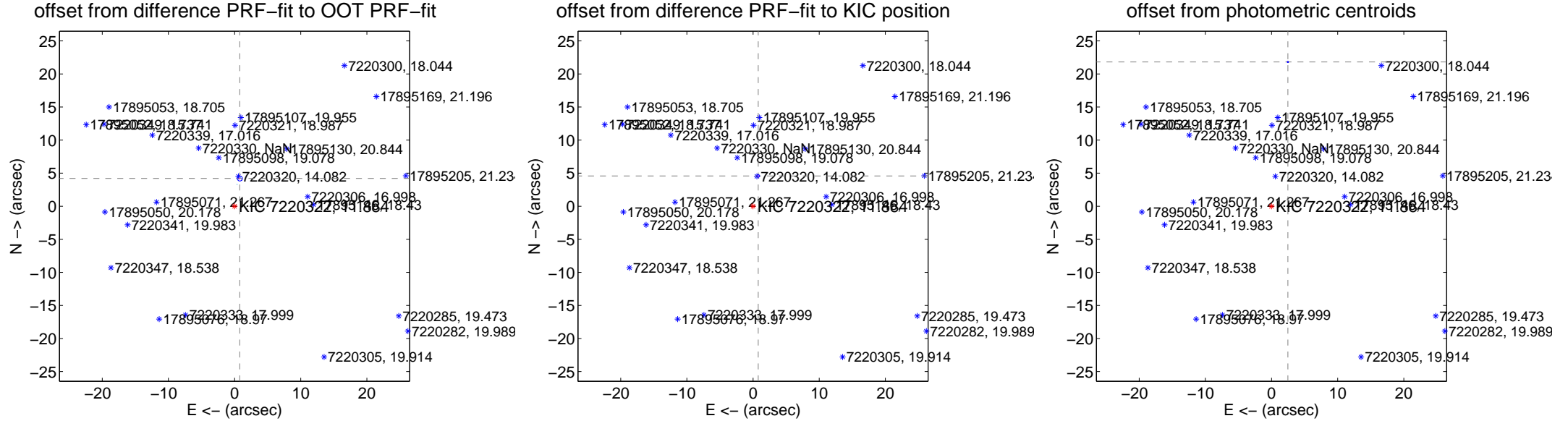
## DV Centroid Data

Supplemental centroid analysis for 007220322-01. **Kepler magnitude: 11.88.** Transit SNR 101.43

There are 17 quarters with good PRF difference image offsets

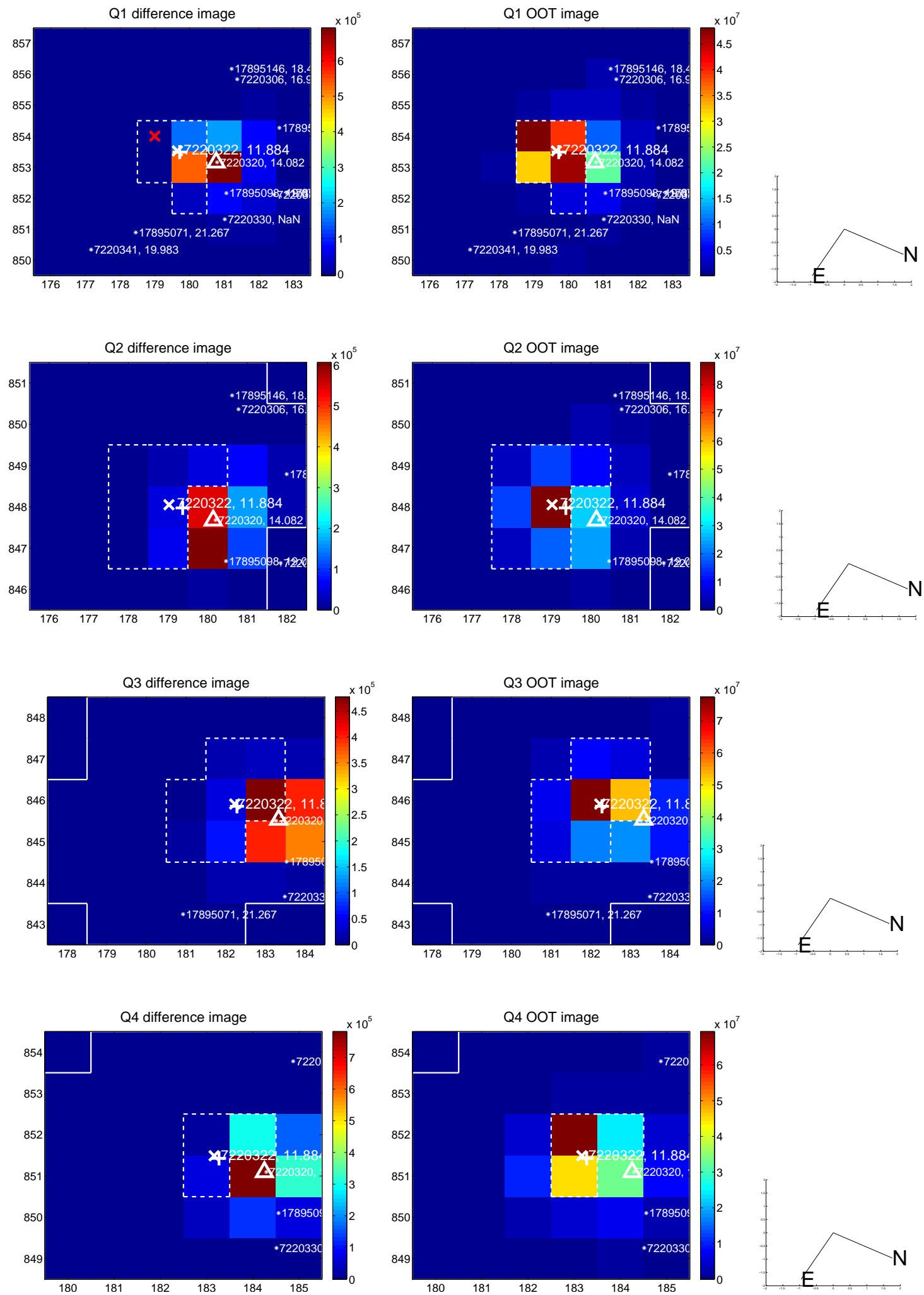
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.271 \pm 0.128</math></b>	<b>33.47</b>	$-0.788 \pm 0.082$	$4.197 \pm 0.122$
PRF-fit source offset from KIC position	<b><math>4.645 \pm 0.068</math></b>	<b>68.33</b>	$-0.777 \pm 0.067$	$4.579 \pm 0.068$
photometric centroid source offset	<b><math>21.95 \pm 0.03</math></b>	<b>652.35</b>	$-2.47 \pm 0.02$	$21.81 \pm 0.03$

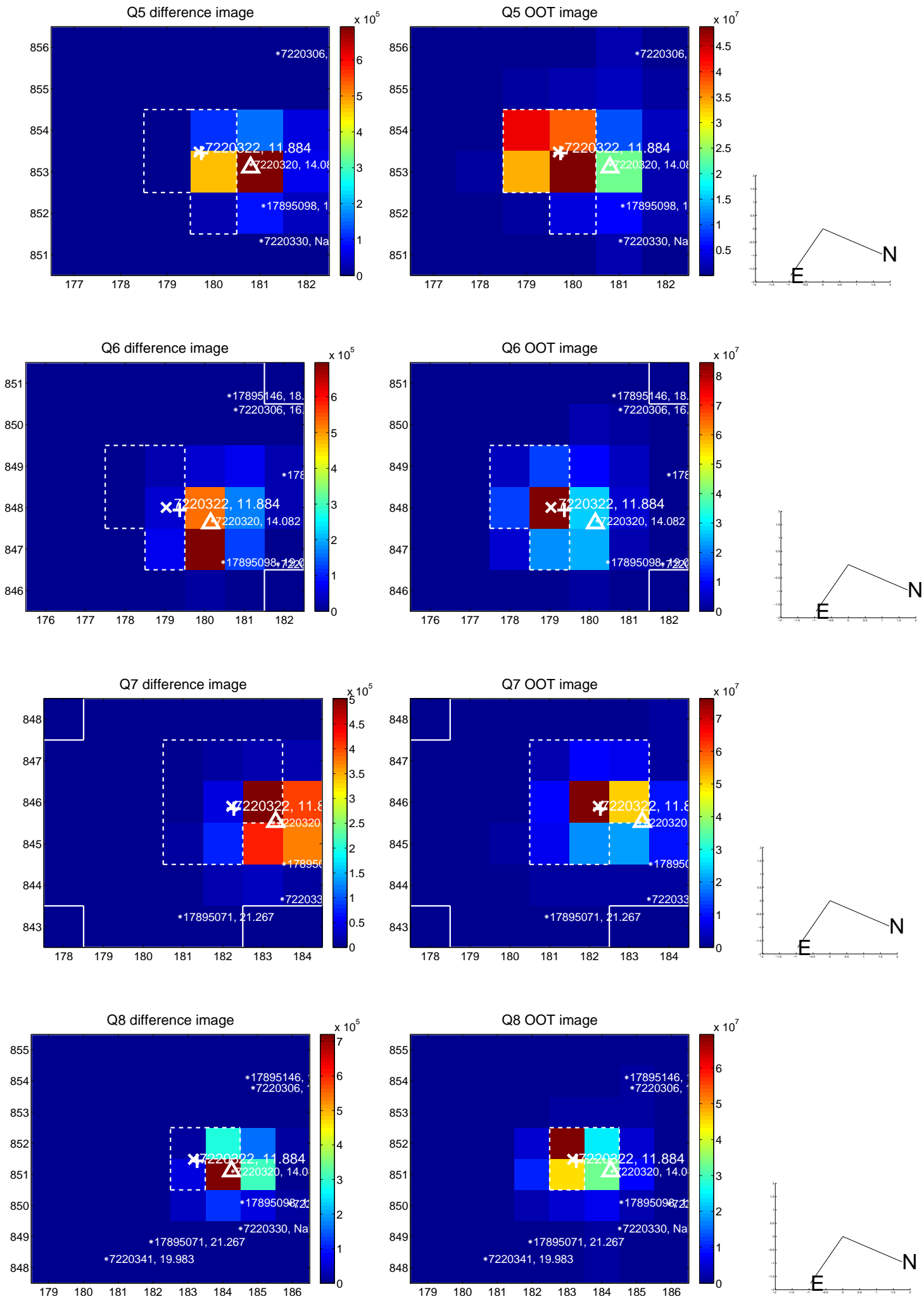


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

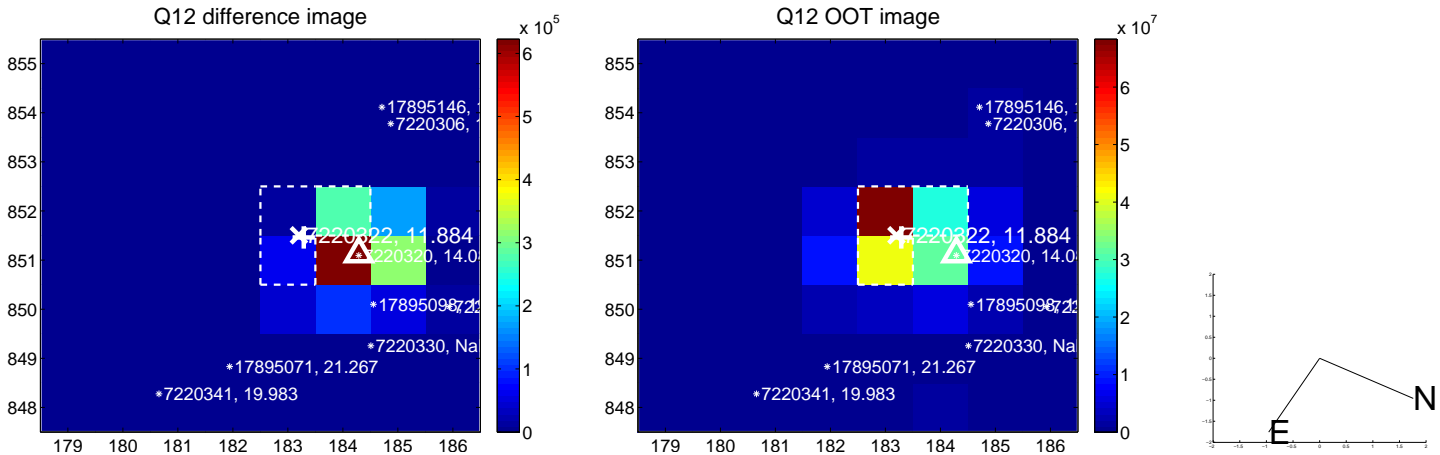
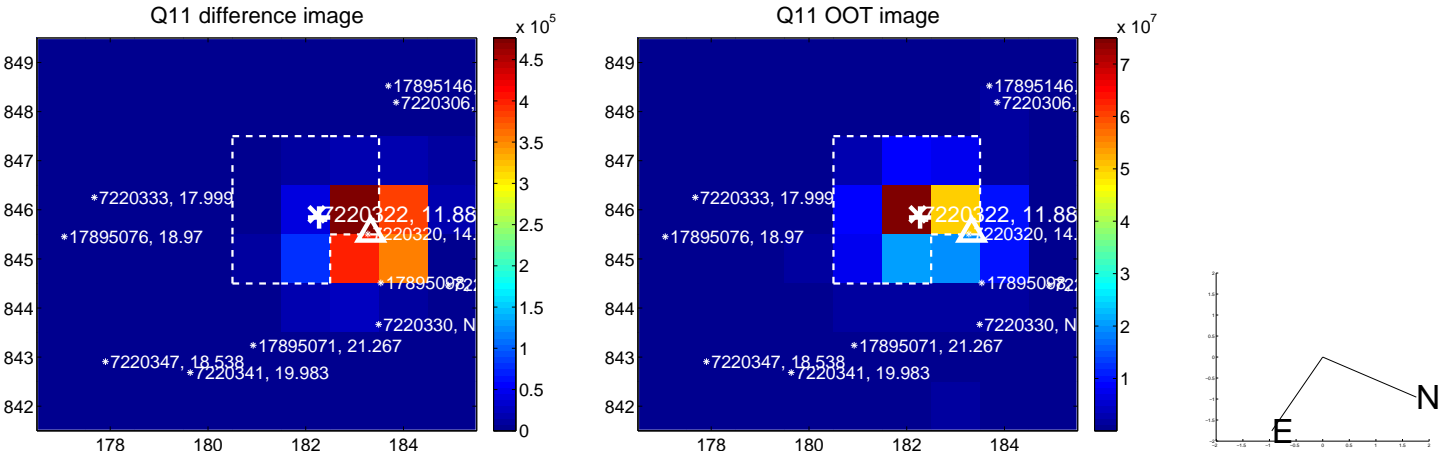
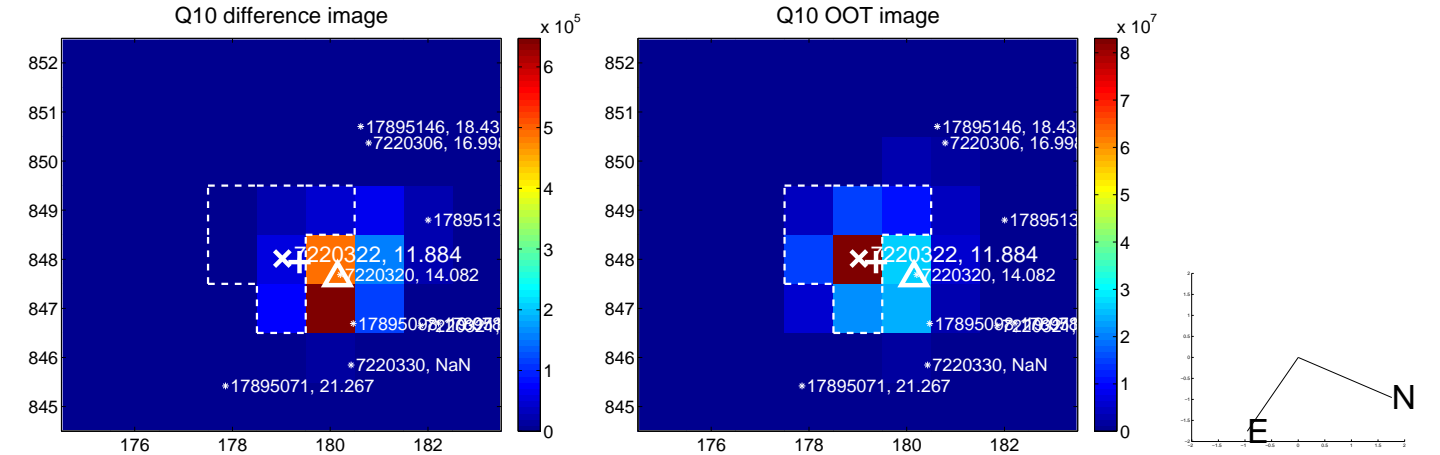
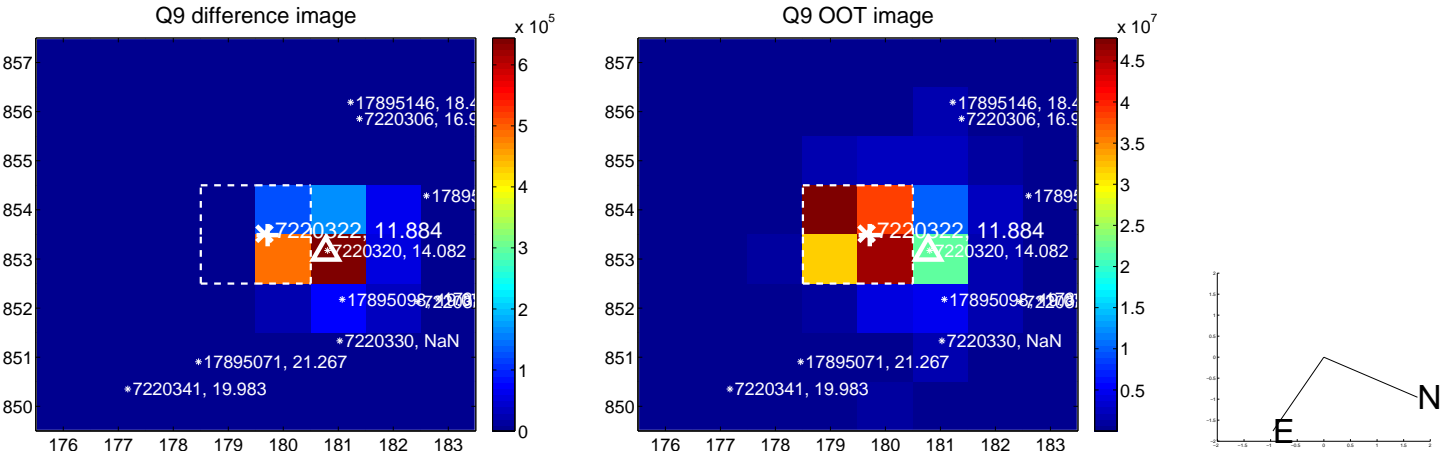


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

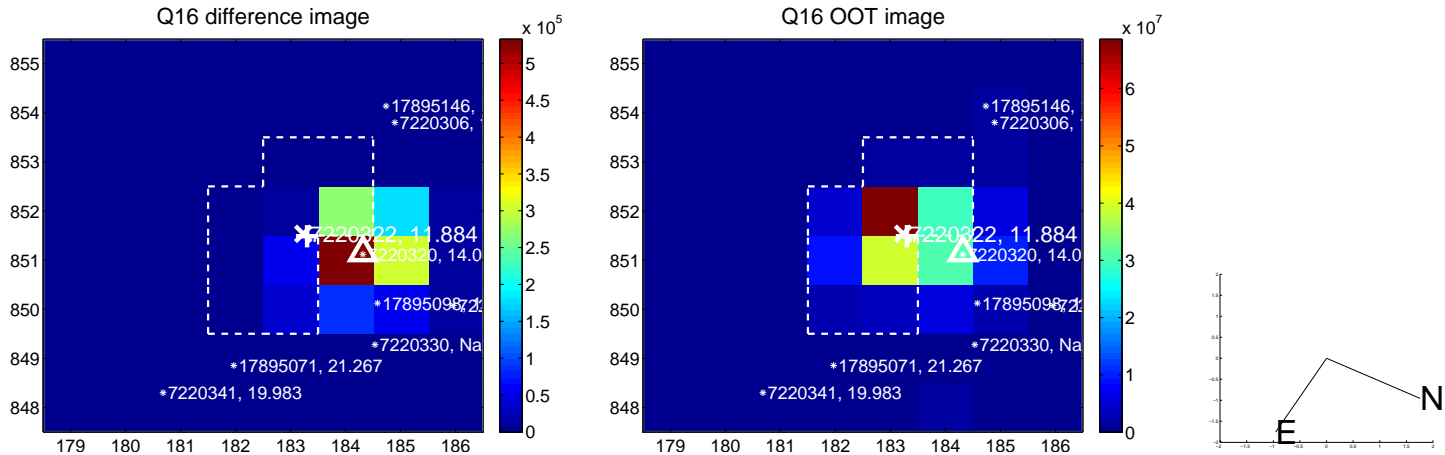
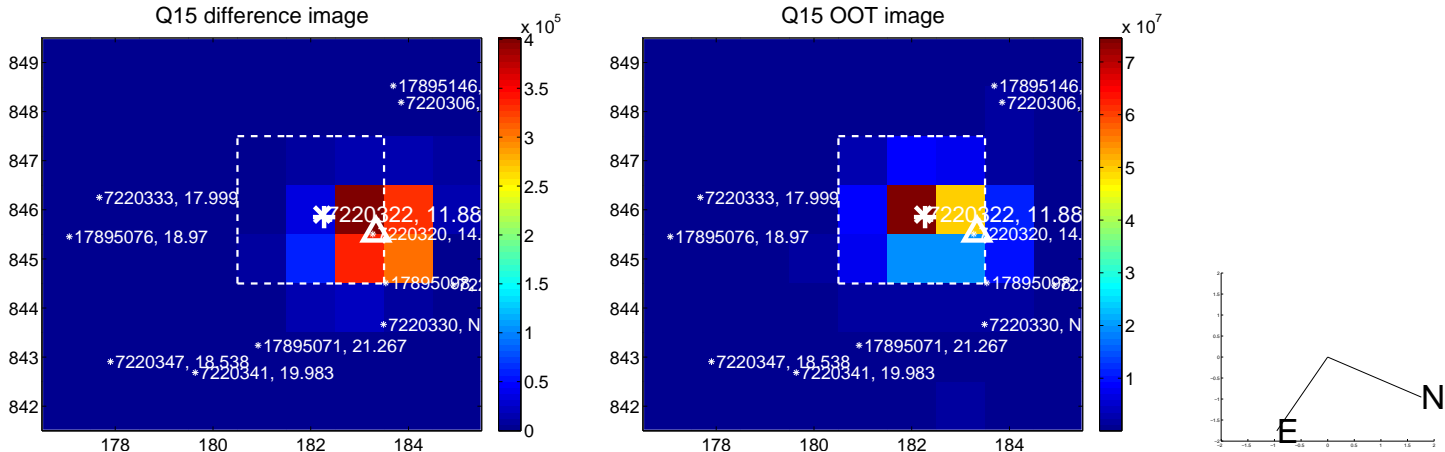
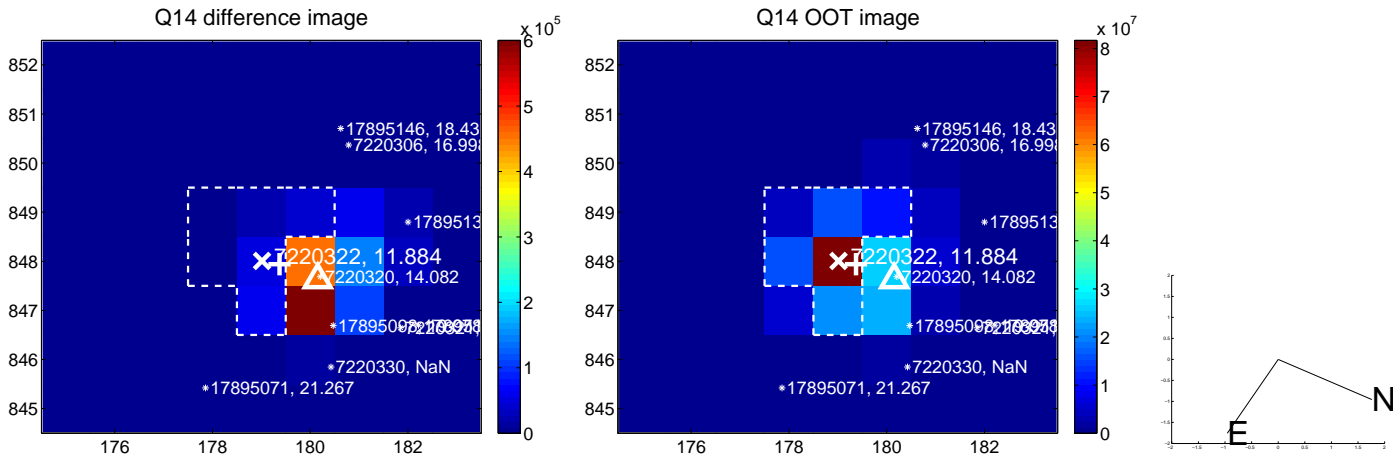
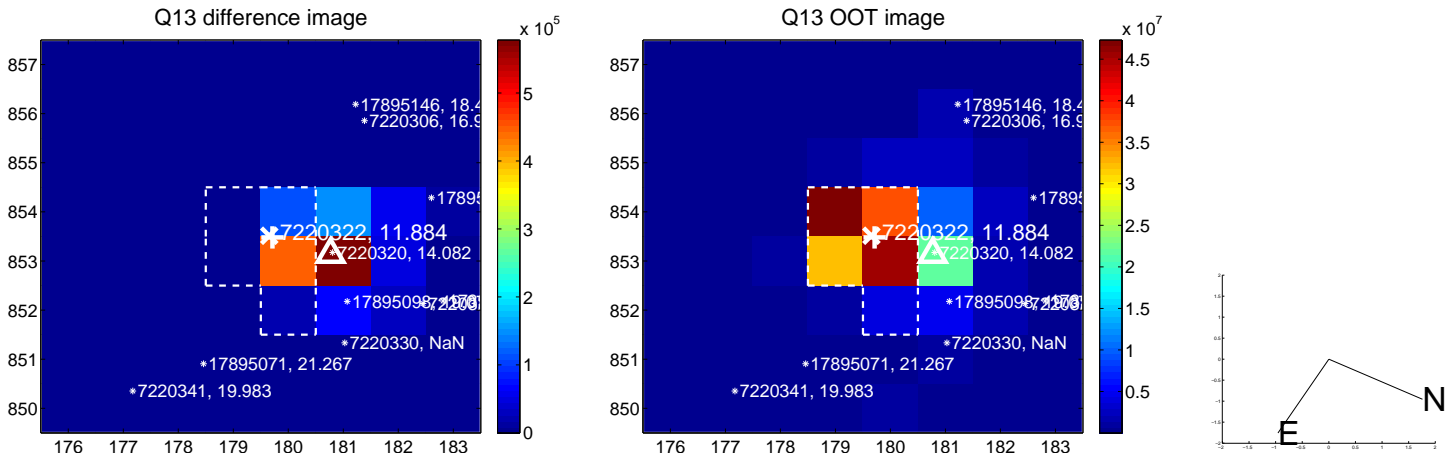




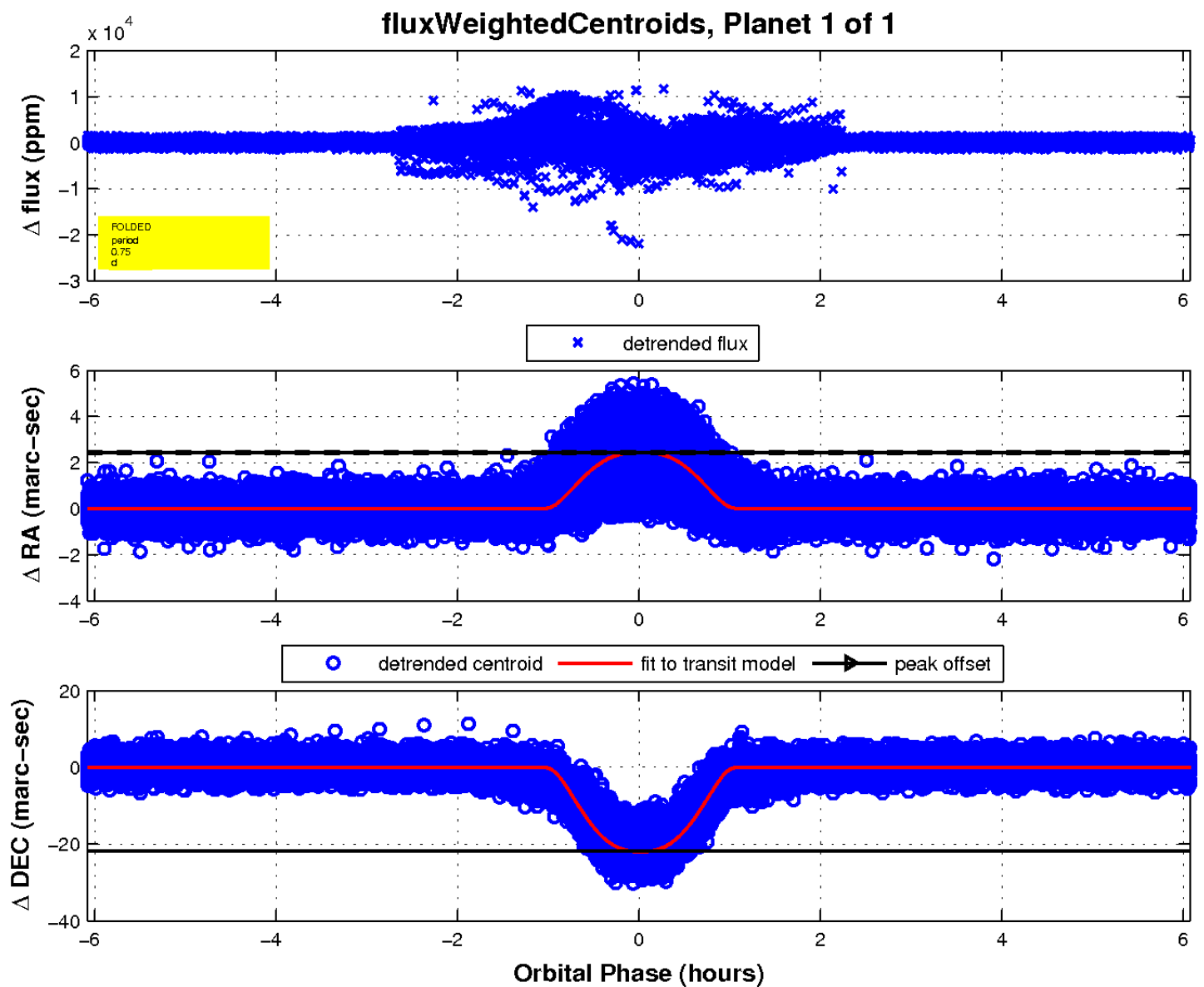
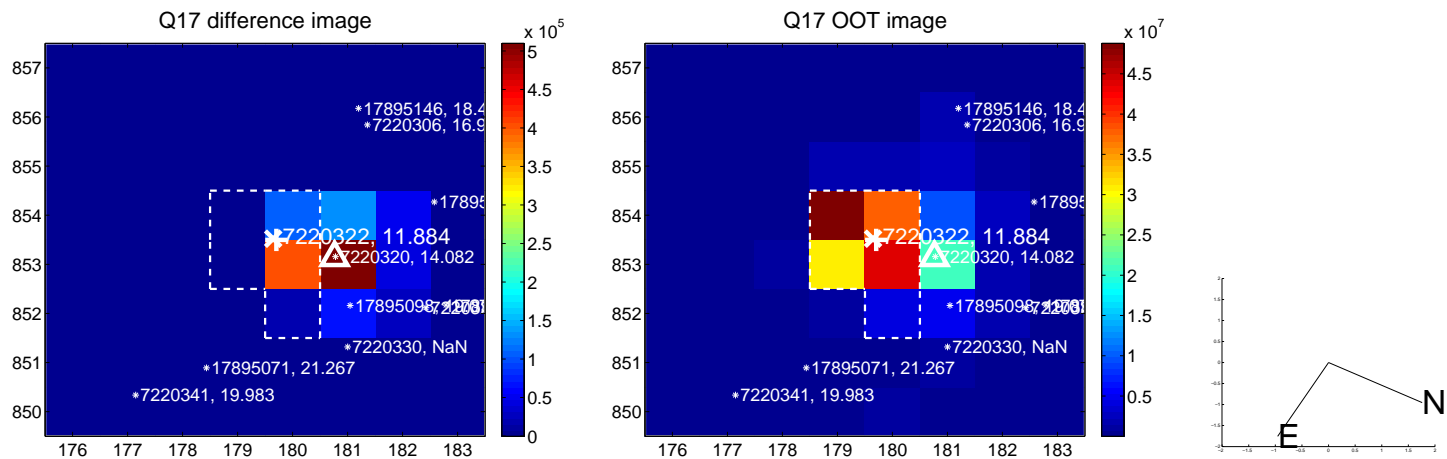
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

