

# KIC 009762514

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009762514-01	OBS	7227.01	7.515080	138.094366	204.3	2.601	9.4	10.7	0.70	4867	1.23	52.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009762514-01	OBS	FP	0.00	0	0	1	1	CENT_RESOLVED_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.

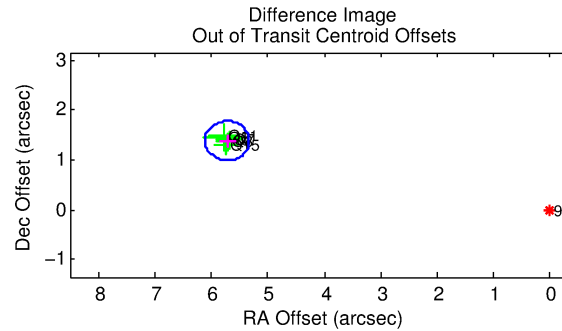
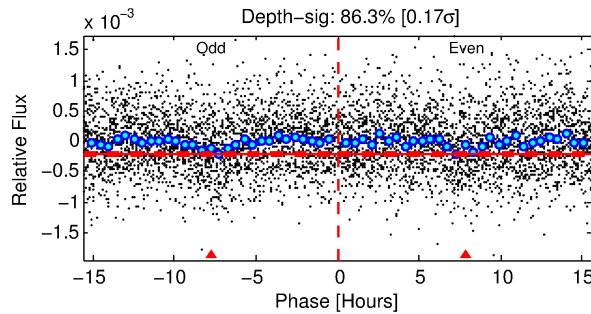
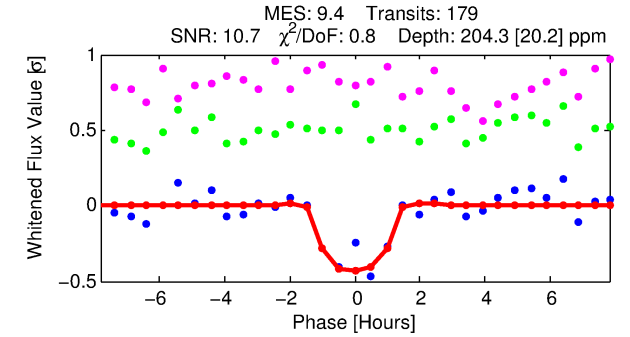
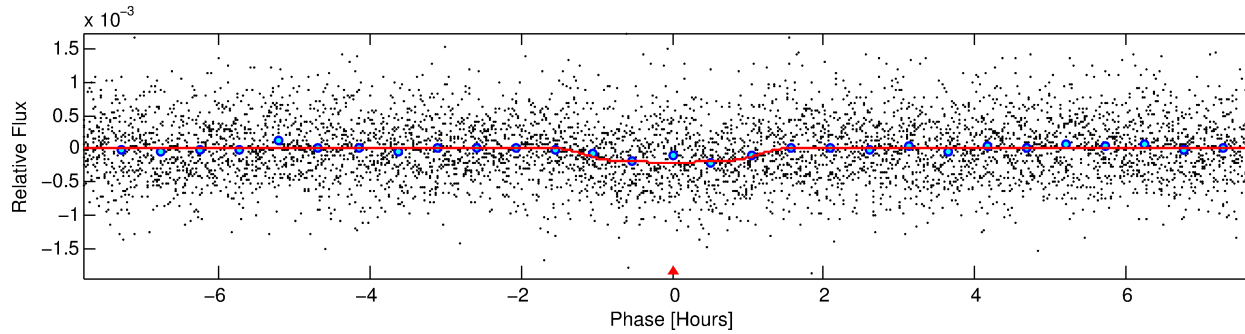
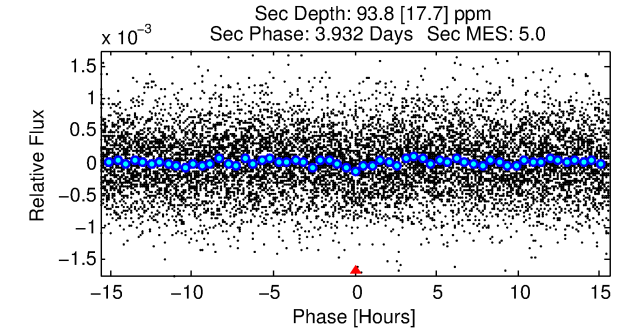
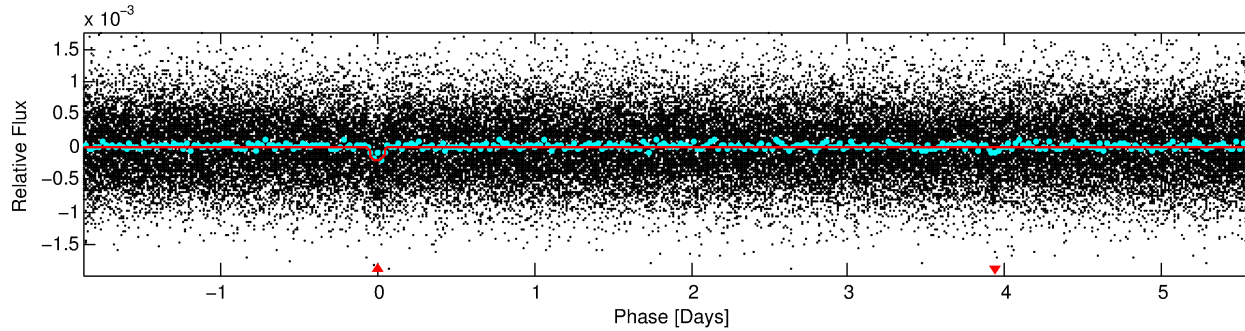
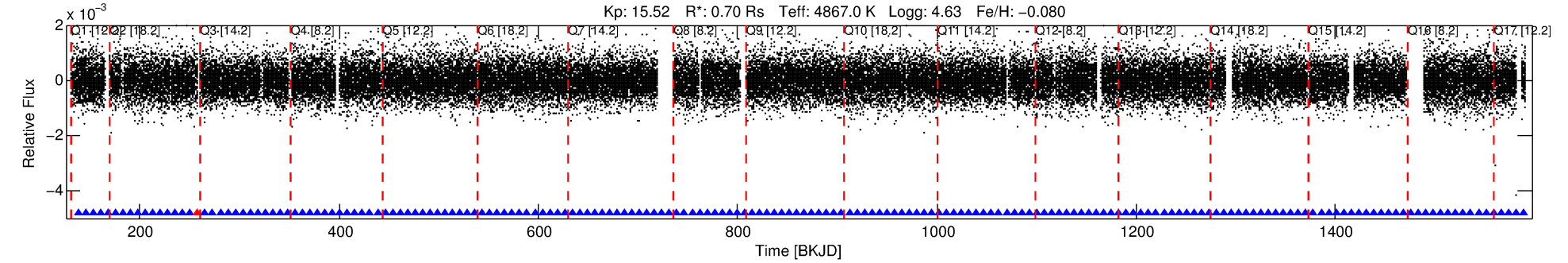
## Ephemeris Match Information For 009762514-01

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	$\sigma_P$	$\sigma_T$
009762514-01	9762514	7228.01	9762519	1:1	18.1	1	-4	13.71	15.52	592.06	Direct-PRF	0	0.38	0.51

**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: 9762514 Candidate: 1 of 1 Period: 7.515 d  
KOI: K07227.01 Corr: 0.947



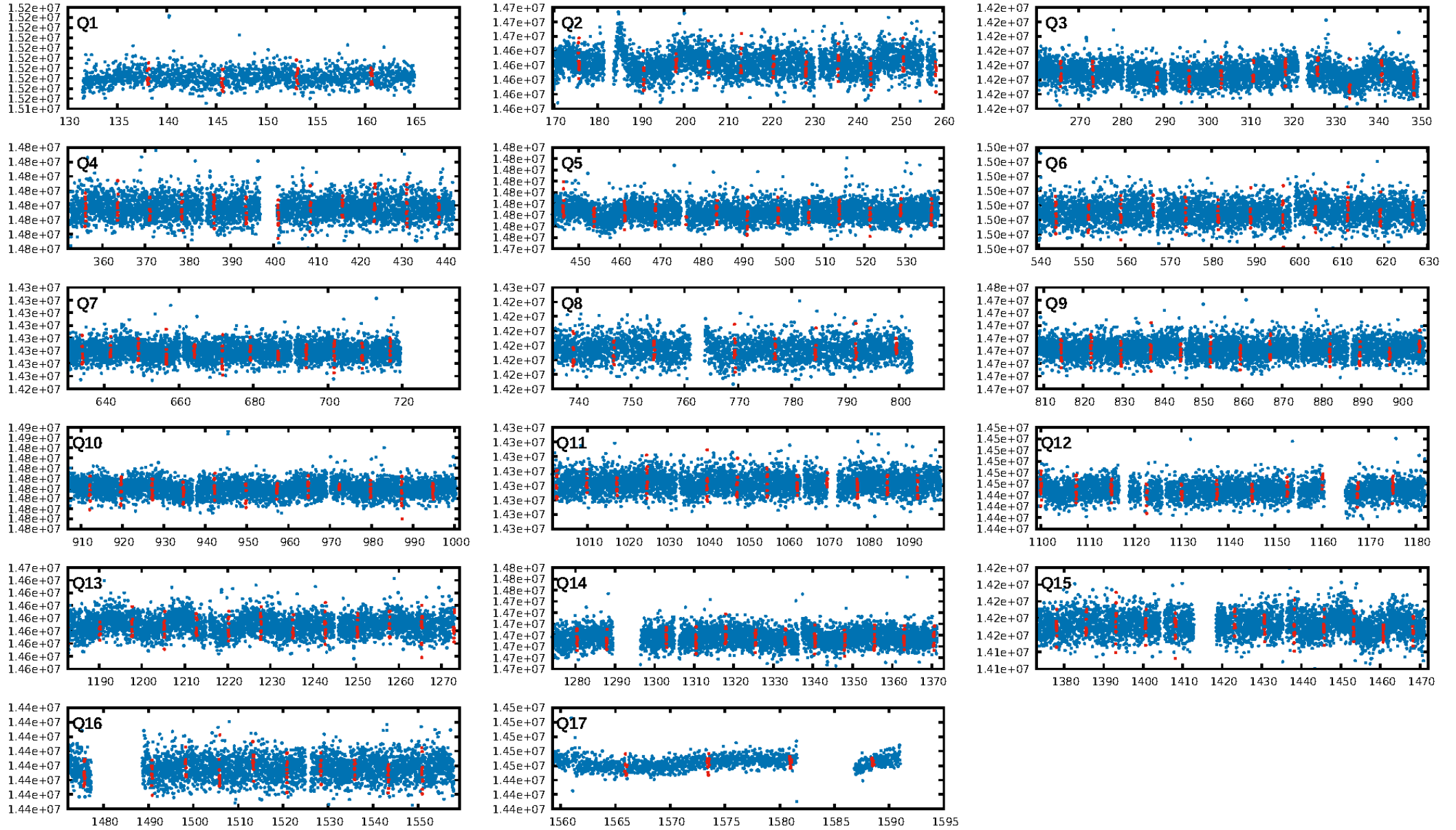
## DV Fit Results:

Period = 7.51508 [0.00005] d  
Epoch = 138.0944 [0.0053] BKJD  
Rp/R\* = 0.0162 [0.0108]  
a/R\* = 10.09 [26.54]  
b = 0.91 [0.53]  
Seff = 52.13 [9.02]  
Teff = 685 [30] K  
Rp = 1.23 [0.83] Re  
a = 0.0683 [0.0063] AU  
Ag = 159.49 [216.34] [0.73σ]  
Teffp = 3765 [1276] K [2.41σ]

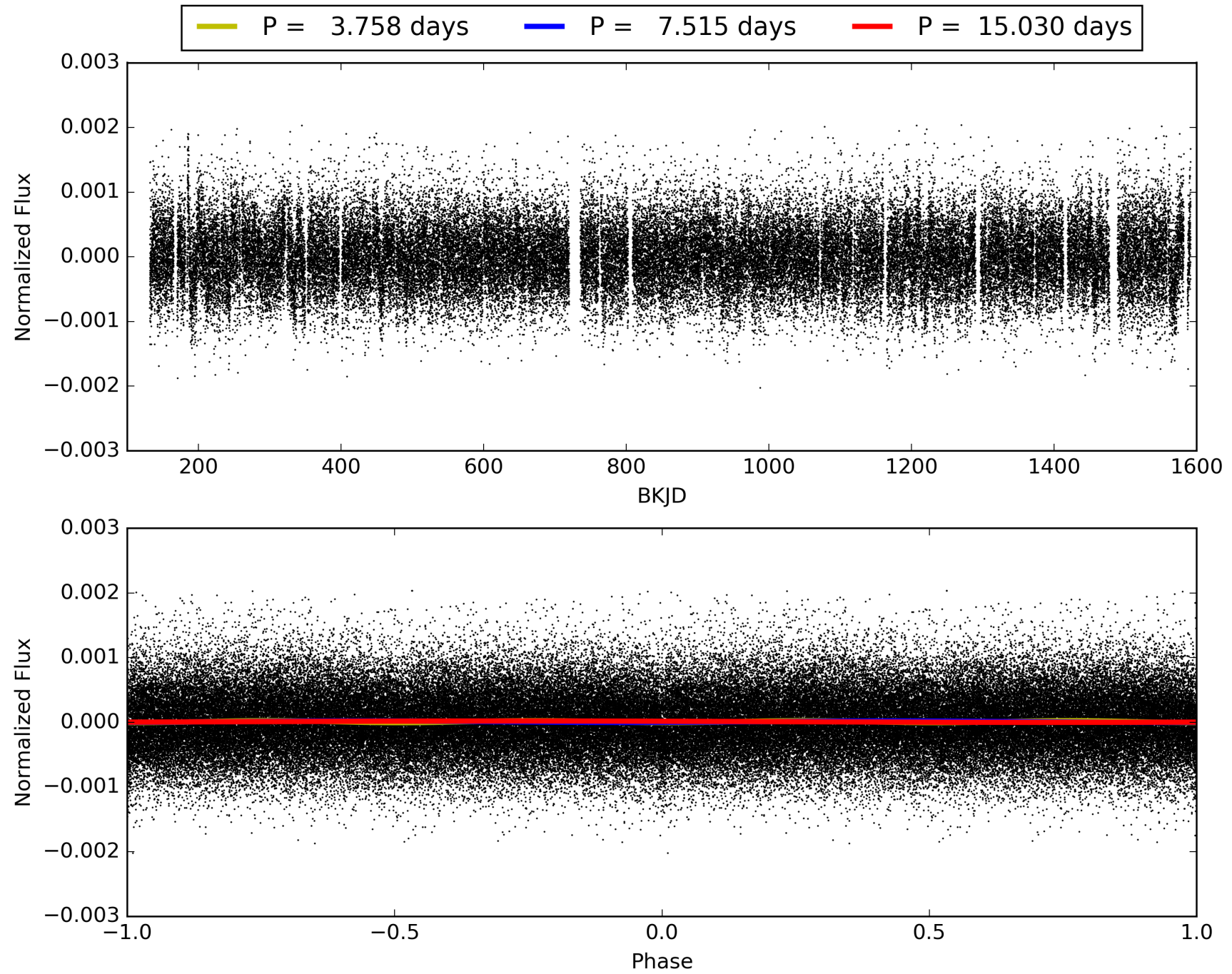
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 95.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.07e-21  
RollingBand-fgt: 0.99 [170/171]  
GhostDiagnostic-chr: -0.07974  
Centroid-sig: 0.0%  
Centroid-so: 31.734 arcsec [21.71σ]  
OotOffset-rm: 5.882 arcsec [44.93σ]  
KicOffset-rm: 6.137 arcsec [47.02σ]  
OotOffset-st: 1/4/0/0 [5]  
KicOffset-st: 1/4/0/0 [5]  
DiffImageQuality-fgm: 1.00 [5/5]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009762514-01, PDC Light Curves

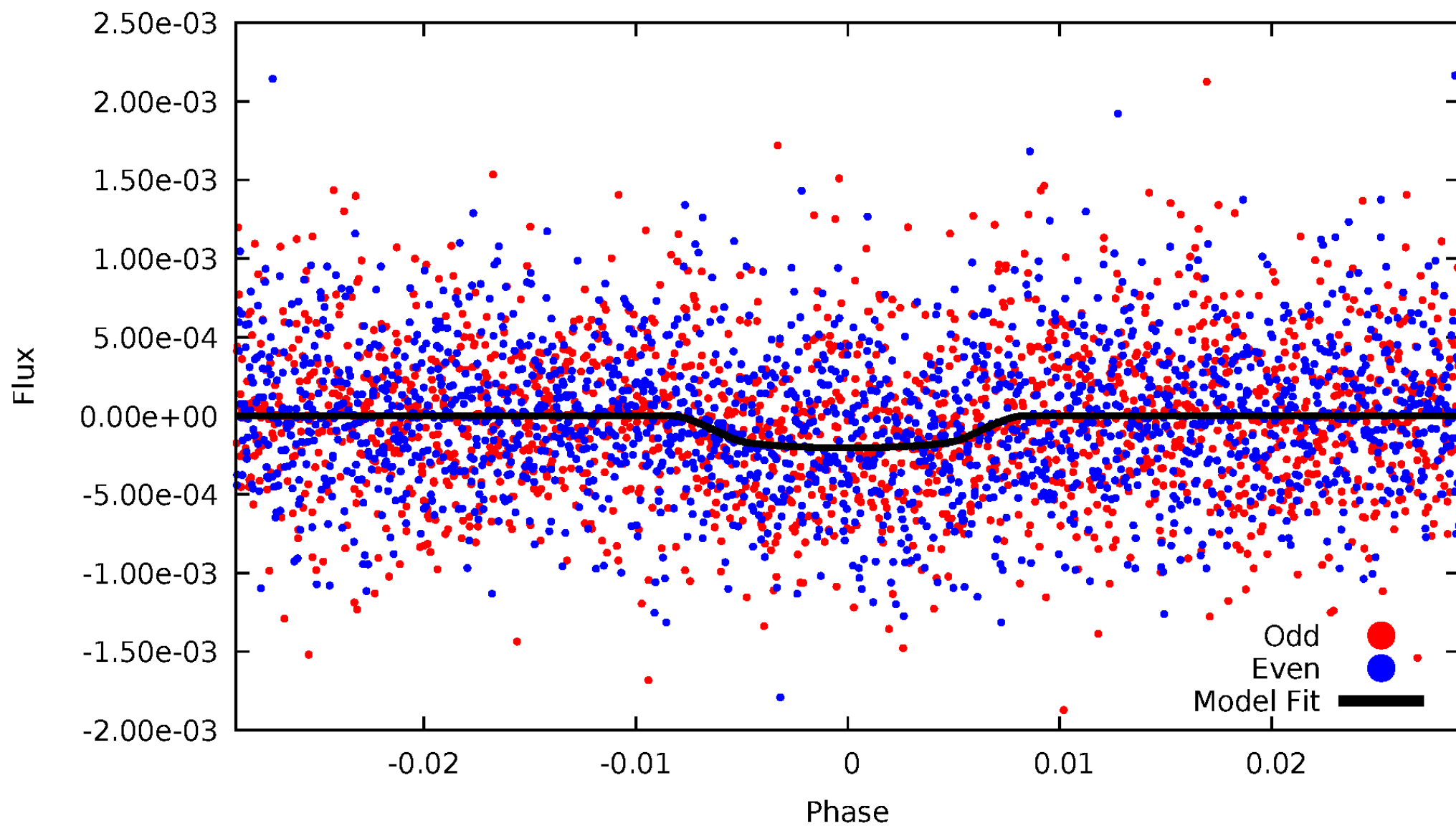


TCE 009762514-01



# DV Odd/Even

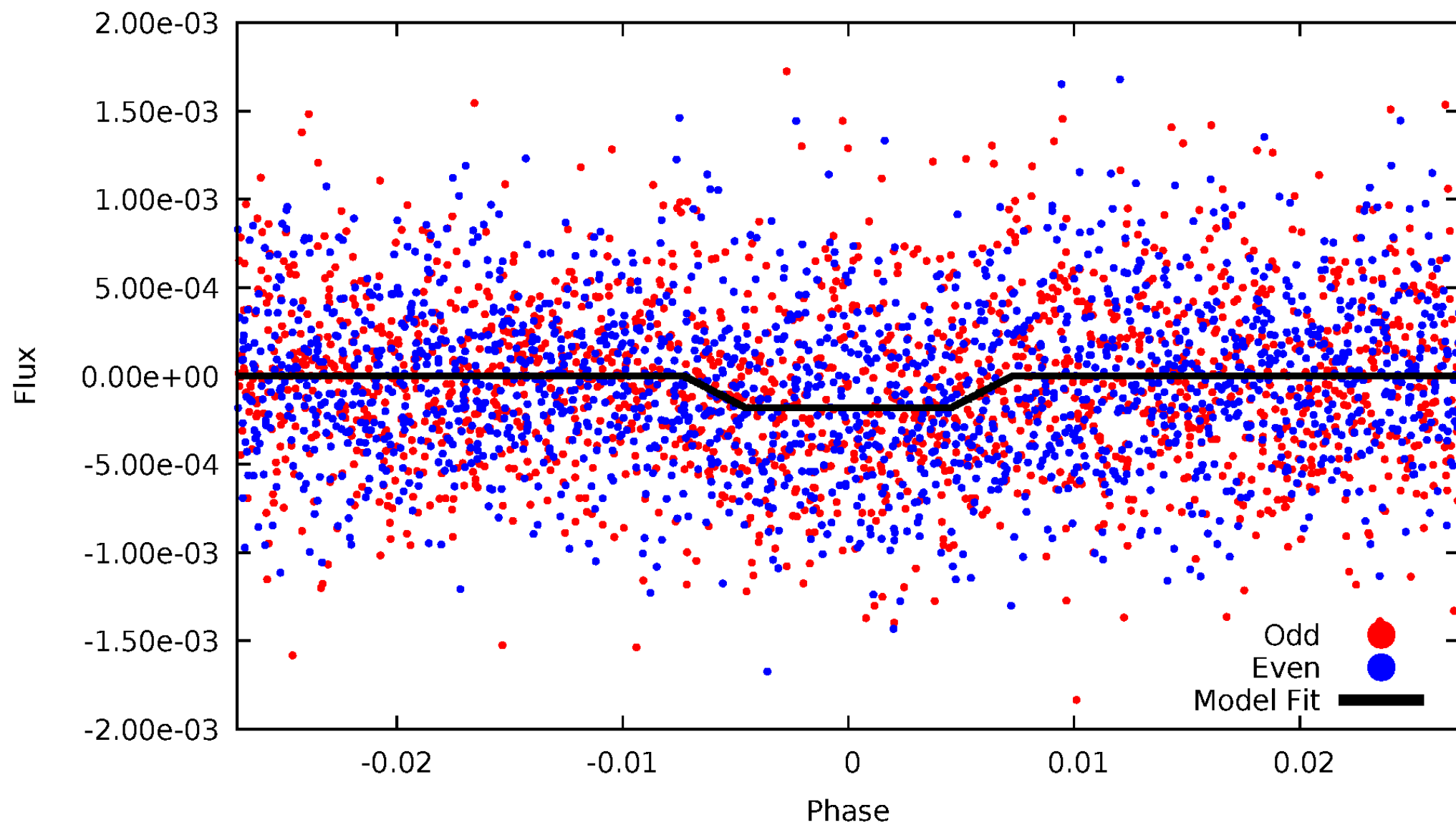
TCE 009762514-01





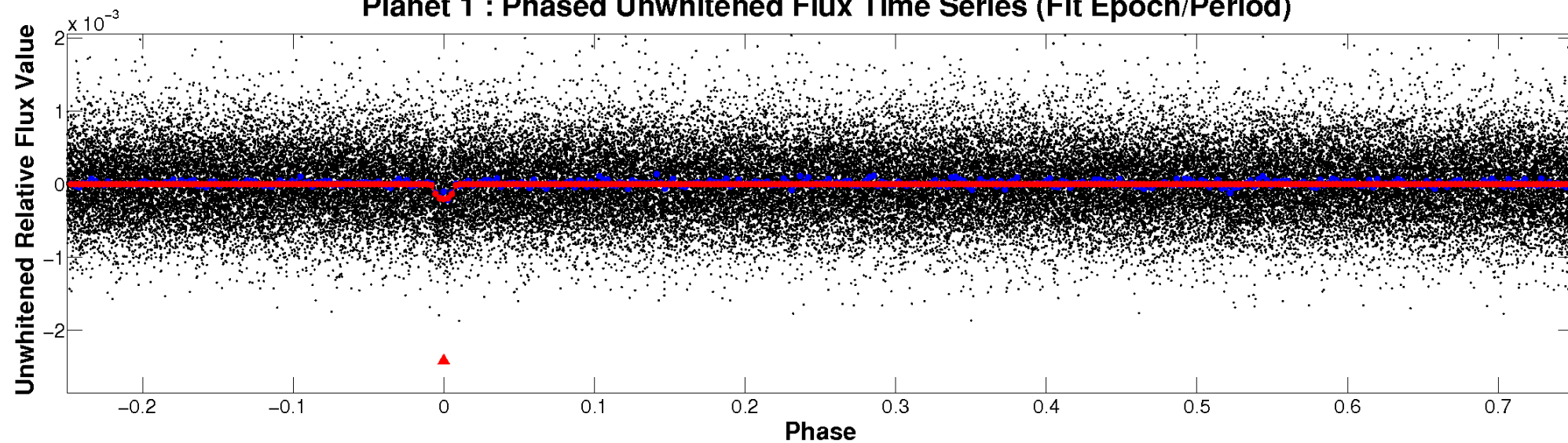
# ALT Odd/Even

TCE 009762514-01

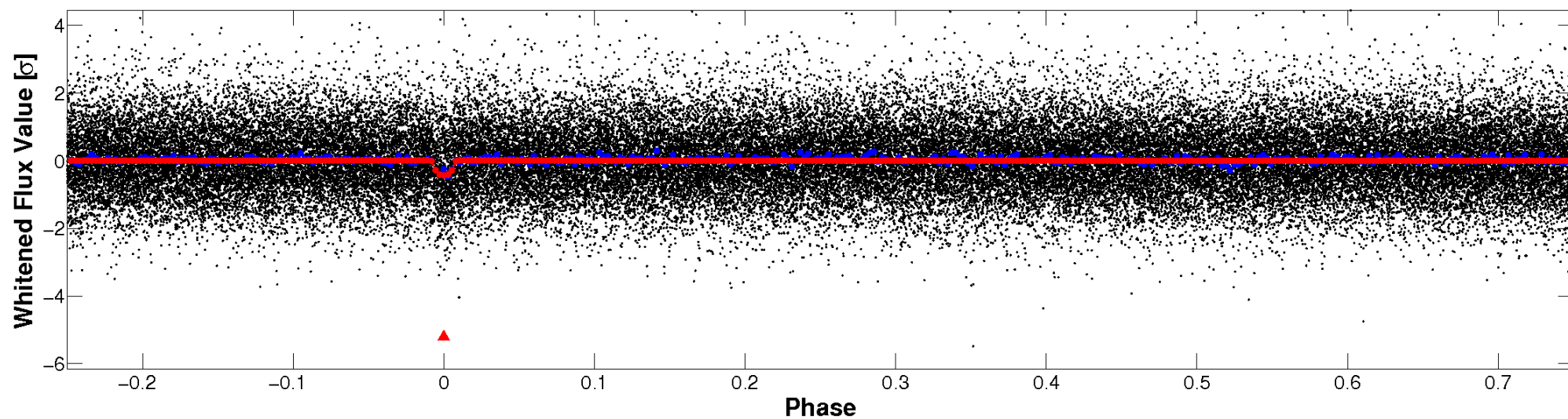


# Non-Whitened Vs. Whitened Light Curve

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

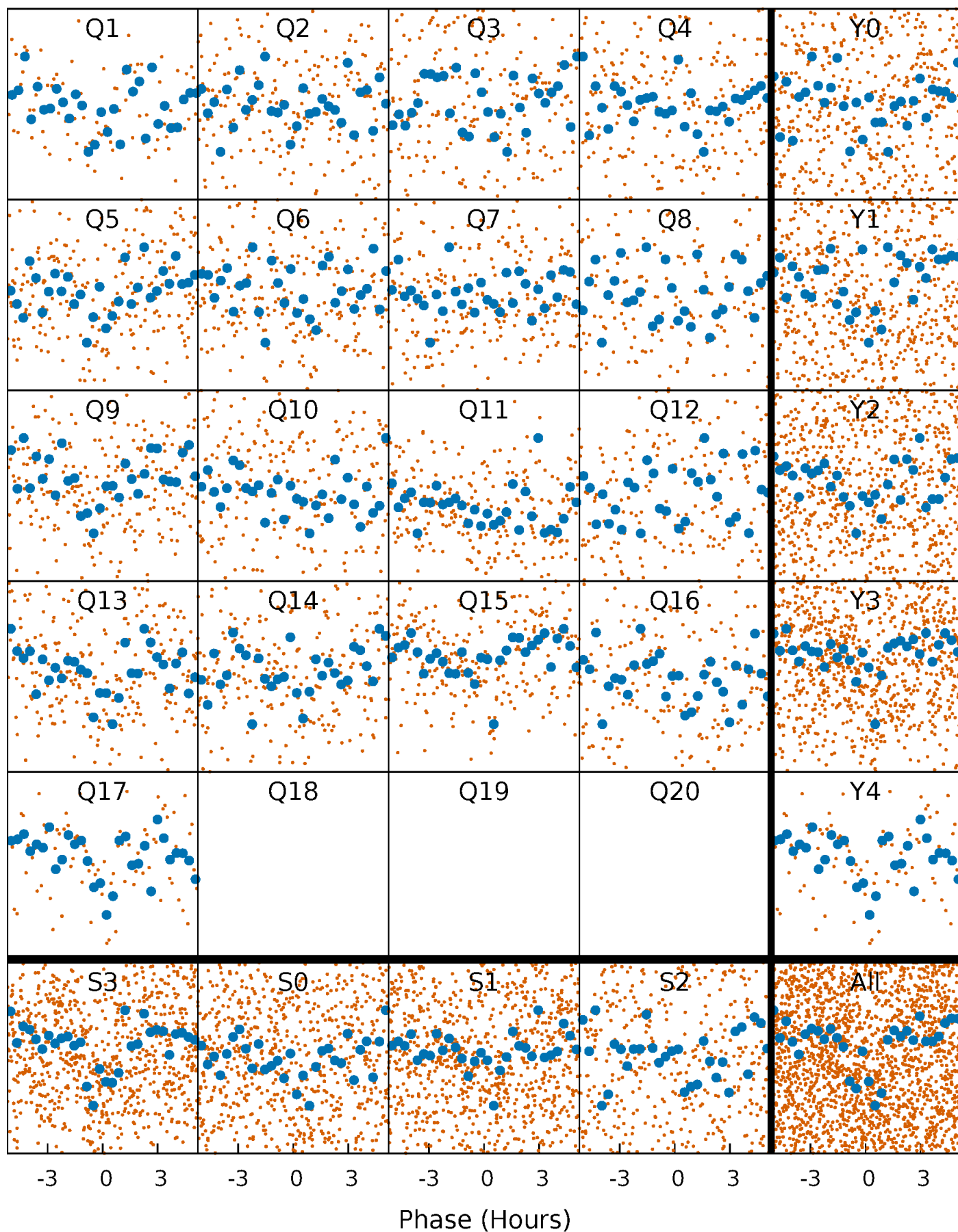


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

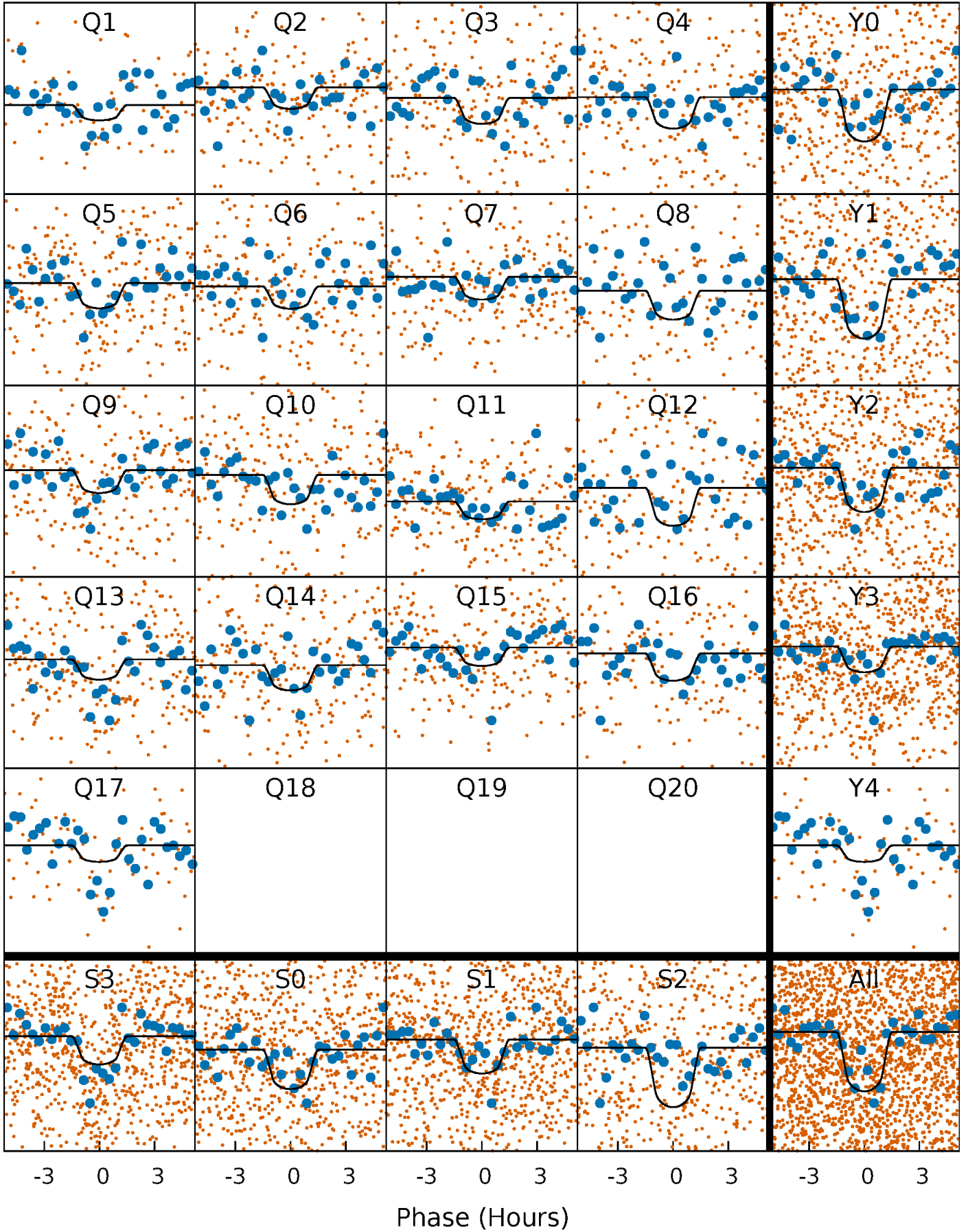
TCE 009762514-01 P= 7.515080 Days  $T_0=138.094366$  (BKJD)





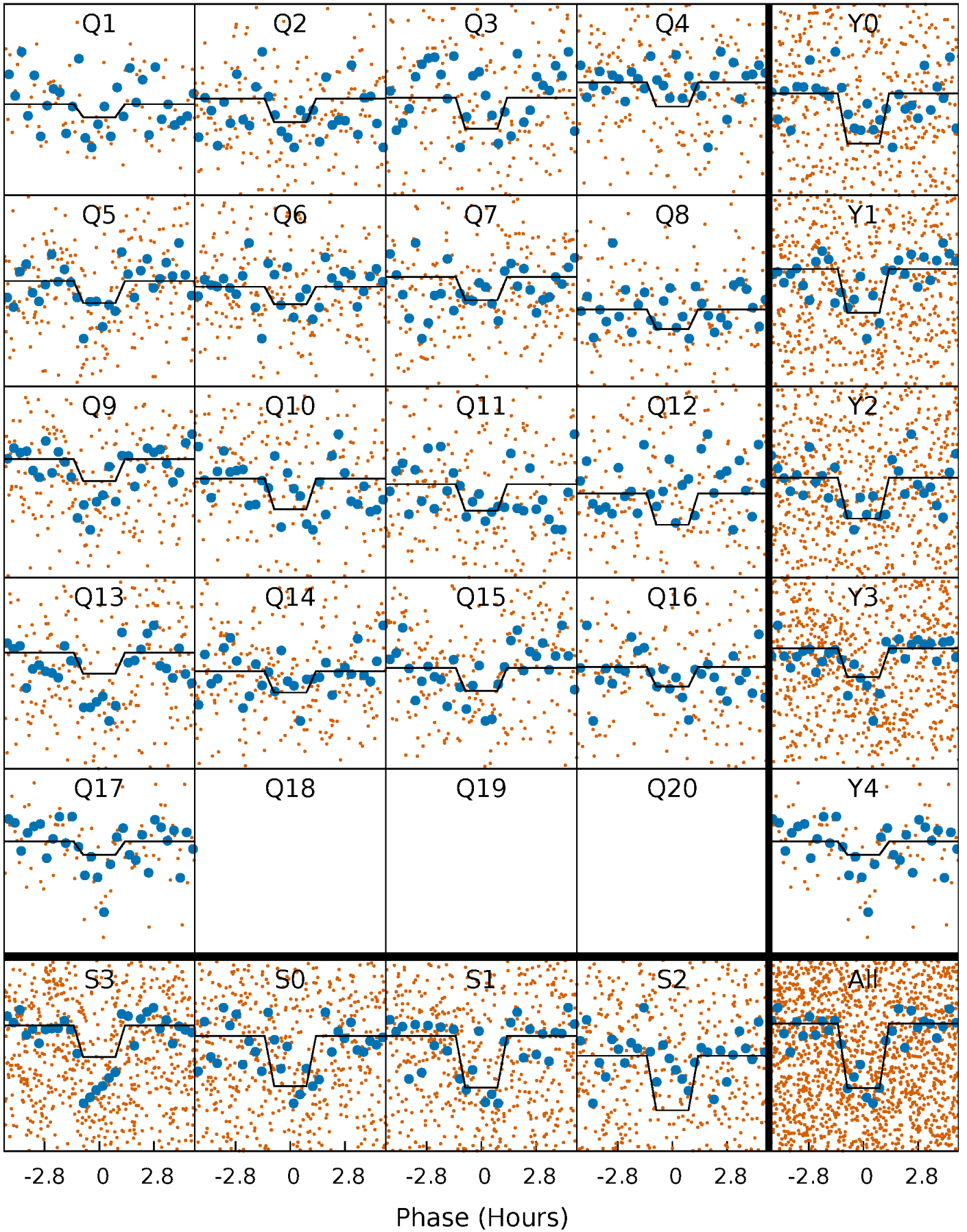
# DV Quarter-Phased Transit Curves

TCE 009762514-01 P= 7.515080 Days  $T_0=138.094366$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

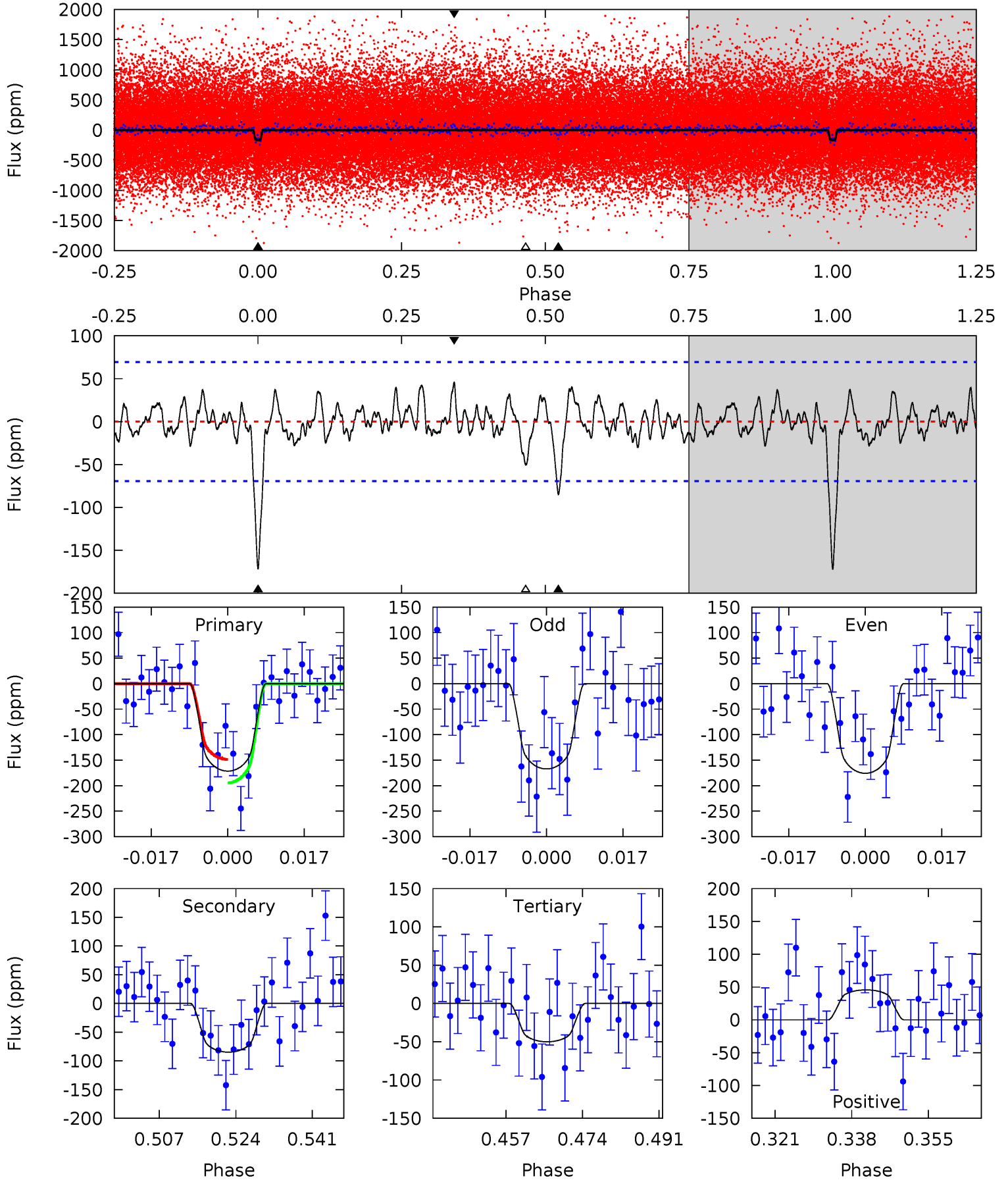
TCE 009762514-01 P= 7.515149 Days  $T_0=138.087216$  (BKJD)



# DV Model-Shift Uniqueness Test

009762514-01, P = 7.515080 Days, E = 130.579286 Days

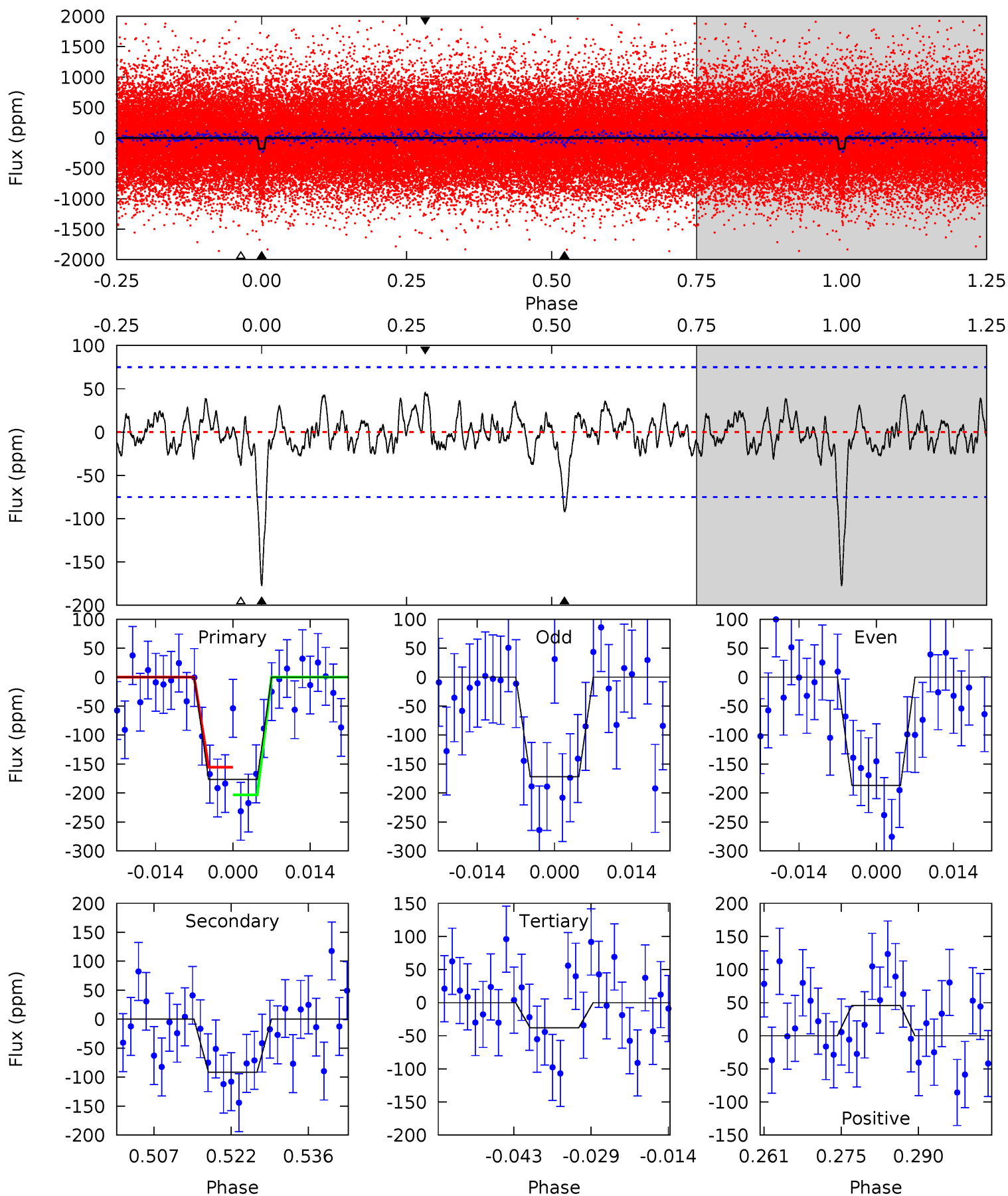
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	6.03	3.56	3.25	4.92	2.39	1.13	8.62	8.94	2.47	2.78	0.31	0.94	0.21	1.63



# Alt Model-Shift Uniqueness Test

009762514-01, P = 7.515149 Days, E = 130.572067 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
11.7	6.04	2.51	3.01	4.95	2.44	1.06	9.15	8.65	3.53	3.03	0.50	0.85	0.21	1.57



### Stellar Parameters For KIC 009762514

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4867^{+146}_{-131}$	$4.630^{+0.027}_{-0.063}$	$-0.080^{+0.300}_{-0.300}$	$0.696^{+0.082}_{-0.048}$	$0.780^{+0.054}_{-0.081}$	$3.261^{+0.410}_{-0.789}$
	+3%/-3%	+1%/-1%	+375%/-375%	+12%/-7%	+7%/-10%	+13%/-24%
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 009762514-01 / KOI 7227.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-85 \pm 14$	$1.27^{+0.89}_{-0.71}$	$968^{+34}_{-29}$	$3894^{+1403}_{-599}$	$128^{+511}_{-81}$
Alt.	$-92 \pm 15$	$1.19^{+0.80}_{-0.69}$	$966^{+35}_{-33}$	$4056^{+1832}_{-664}$	$169^{+755}_{-112}$

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



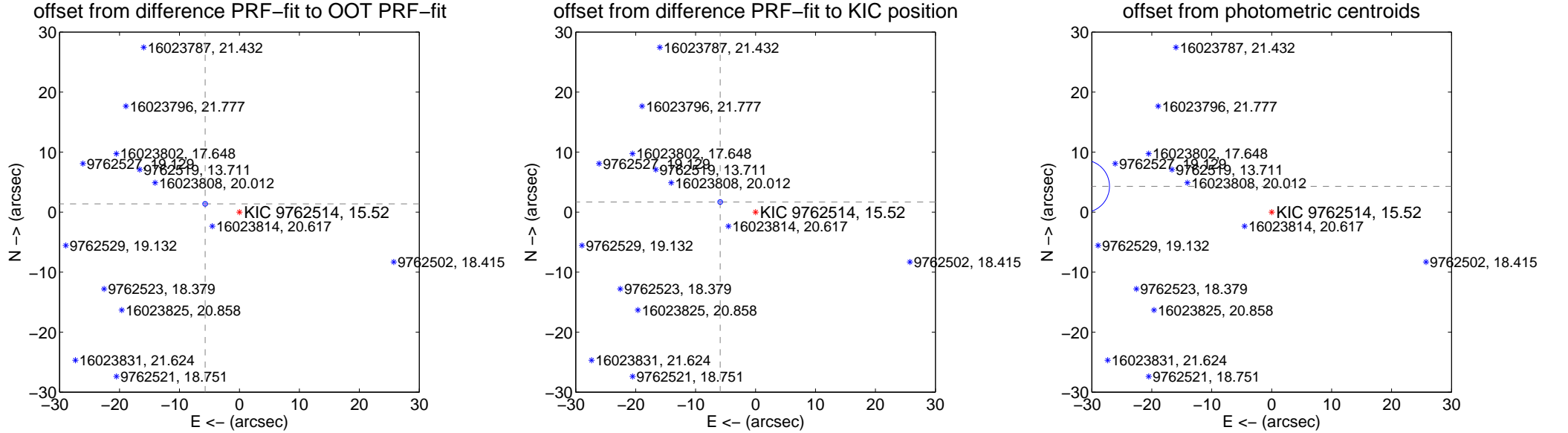
## DV Centroid Data

Supplemental centroid analysis for 009762514-01. Kepler magnitude: 15.52. Transit SNR 10.72

There are 5 quarters with good PRF difference image offsets

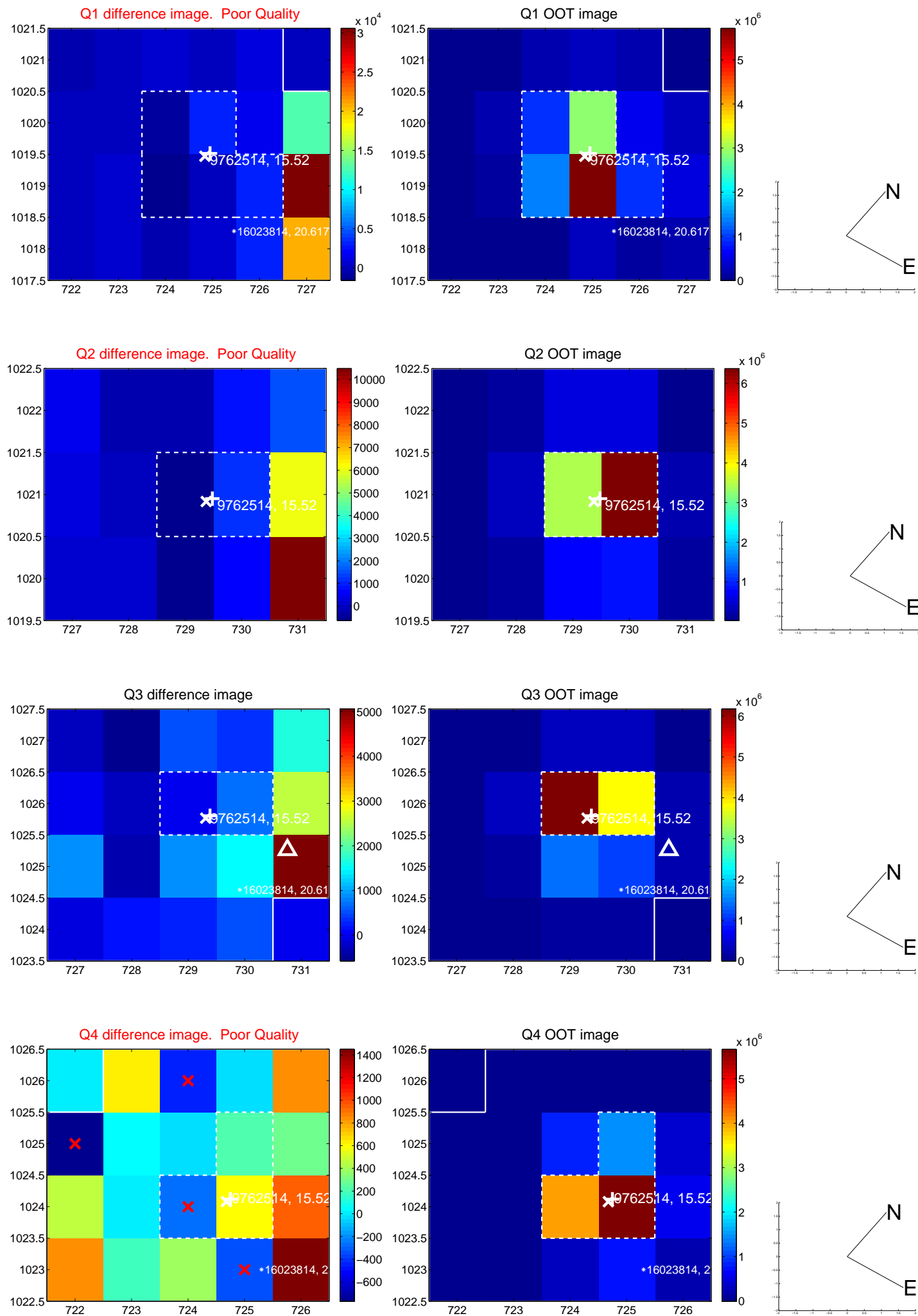
The direct PRF centroid is offset from the target star catalog position by about 0.38 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>5.882 <math>\pm</math> 0.131</b>	<b>44.93</b>	5.719 $\pm$ 0.132	1.376 $\pm$ 0.113
PRF-fit source offset from KIC position	<b>6.137 <math>\pm</math> 0.131</b>	<b>47.02</b>	5.901 $\pm$ 0.132	1.688 $\pm$ 0.113
photometric centroid source offset	<b>31.73 <math>\pm</math> 1.46</b>	<b>21.71</b>	31.44 $\pm$ 1.46	4.30 $\pm$ 1.28

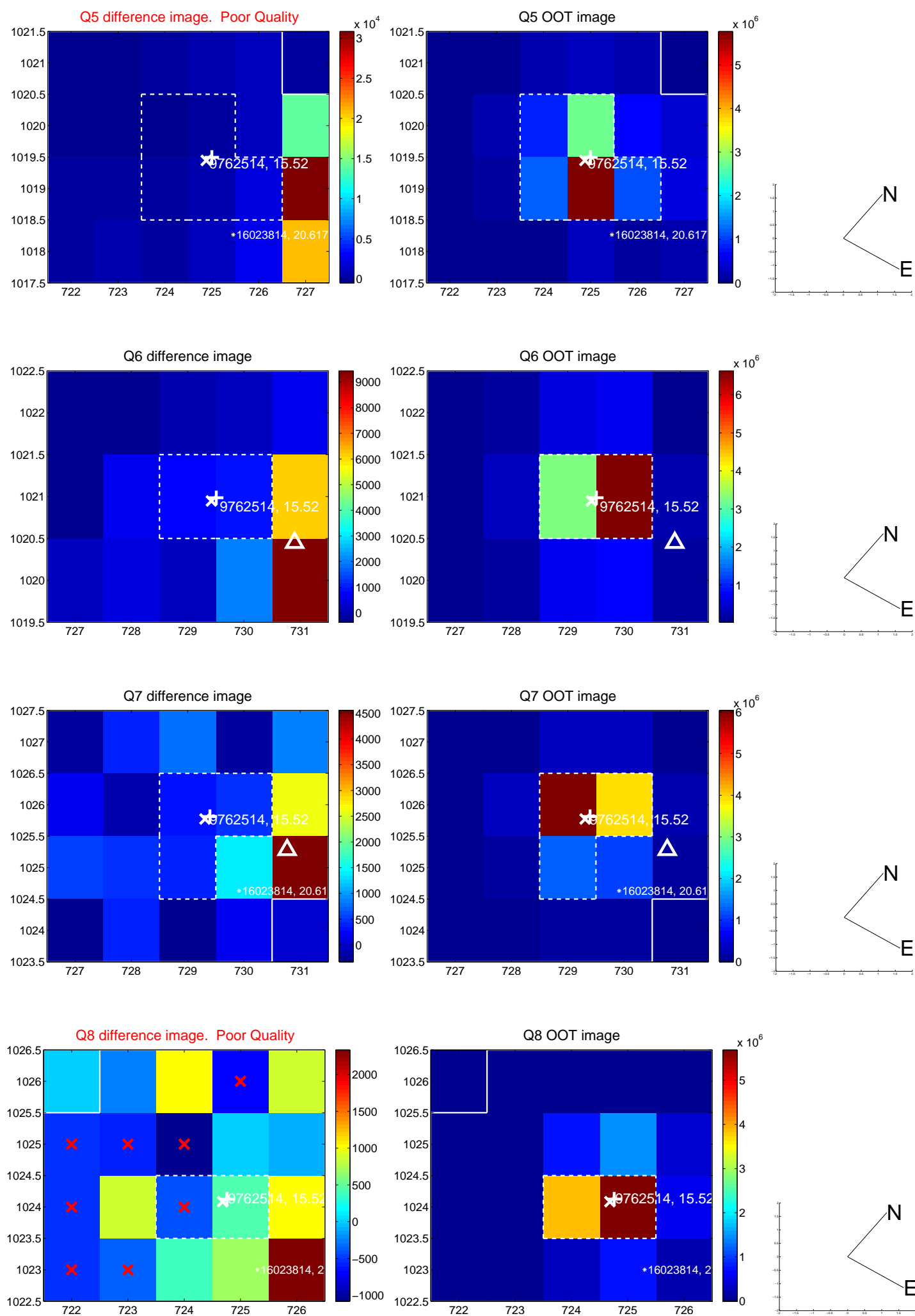


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

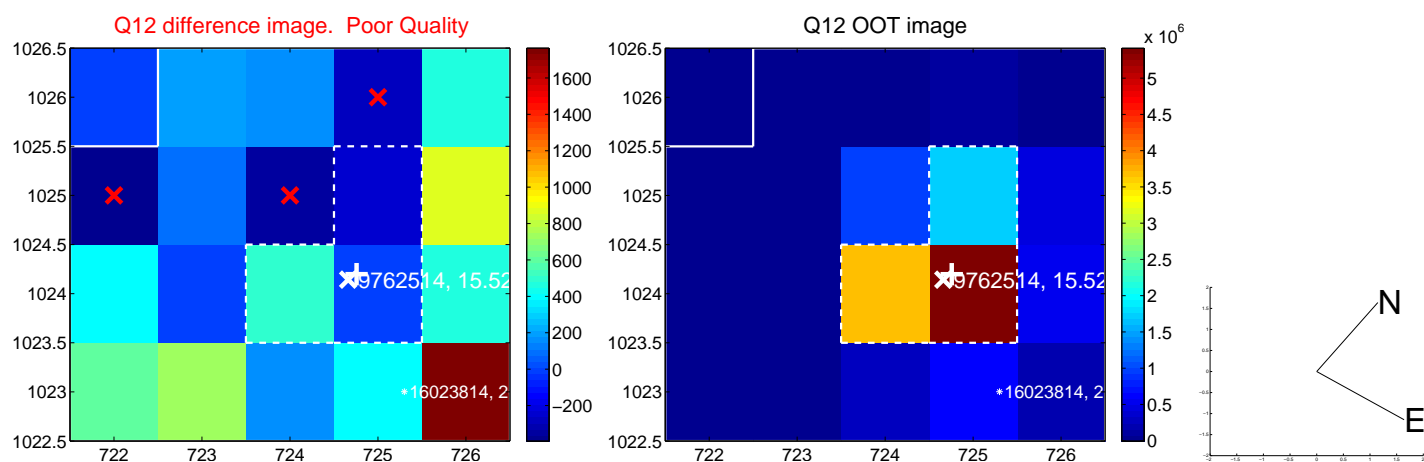
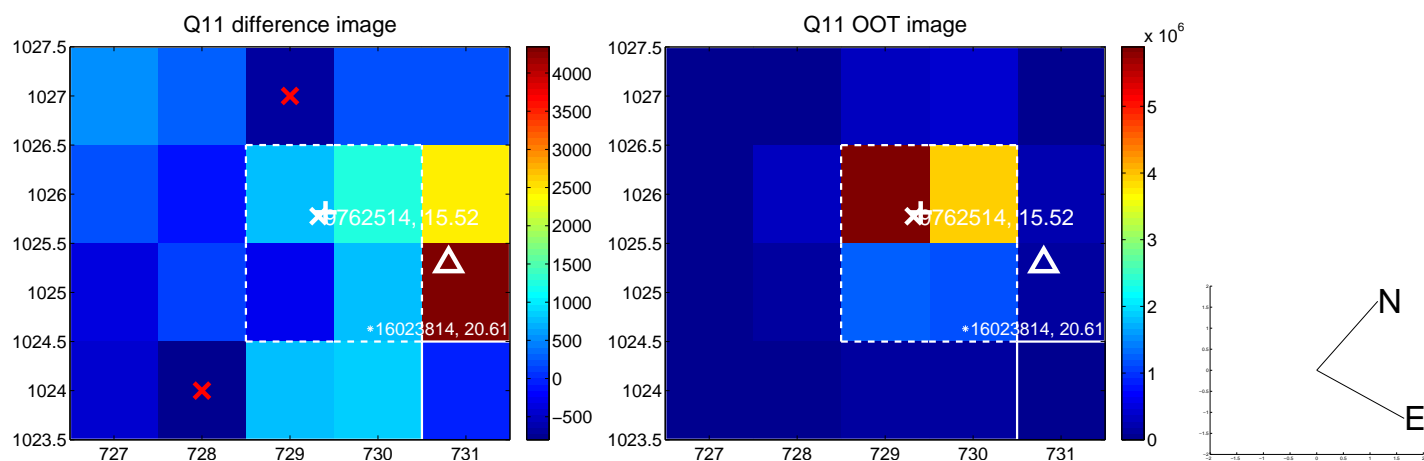
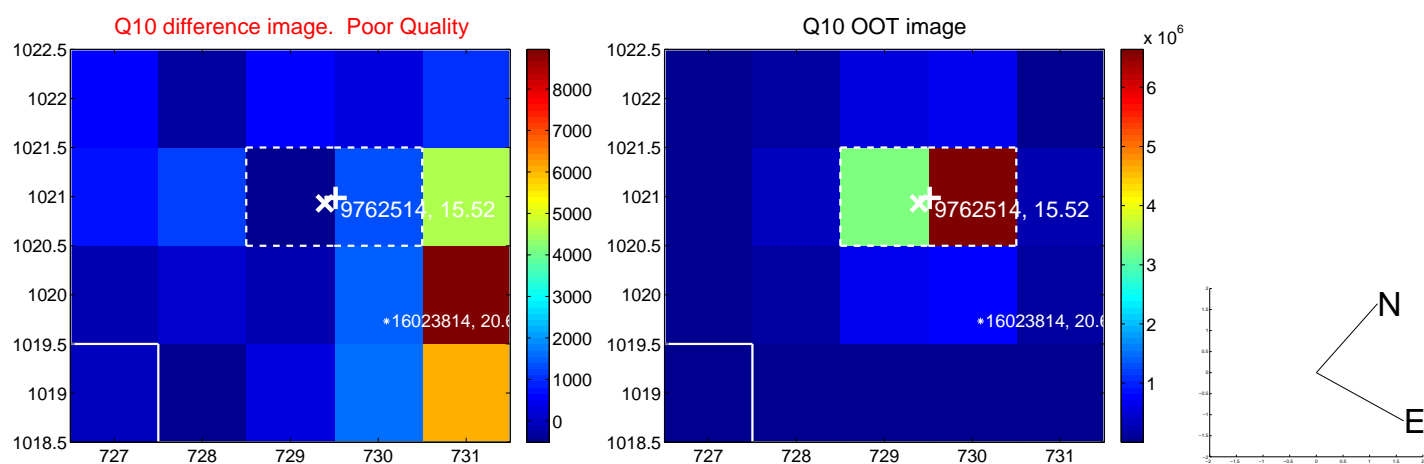
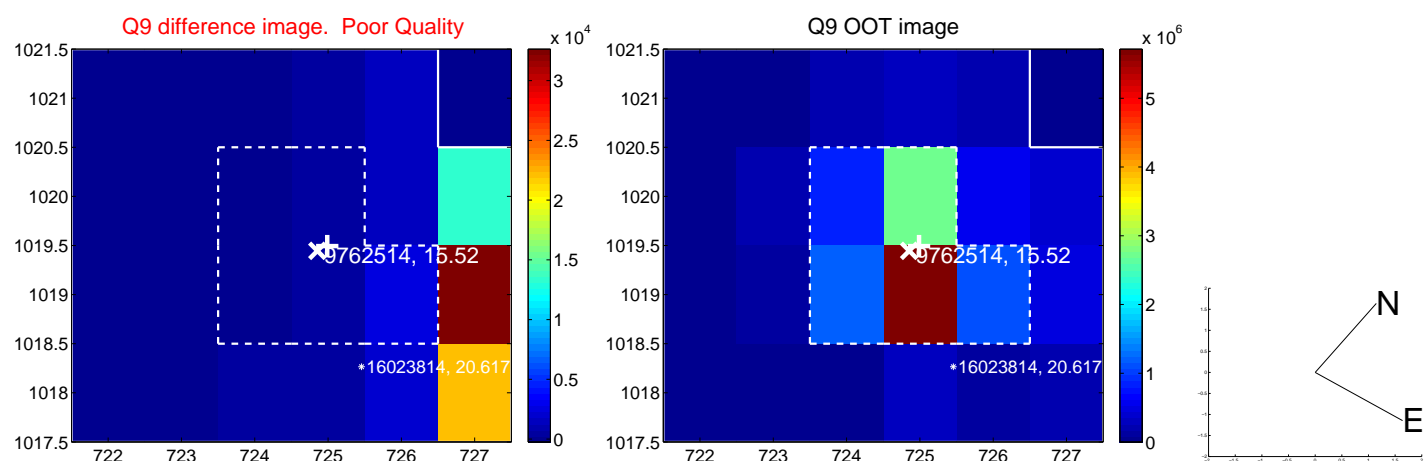
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



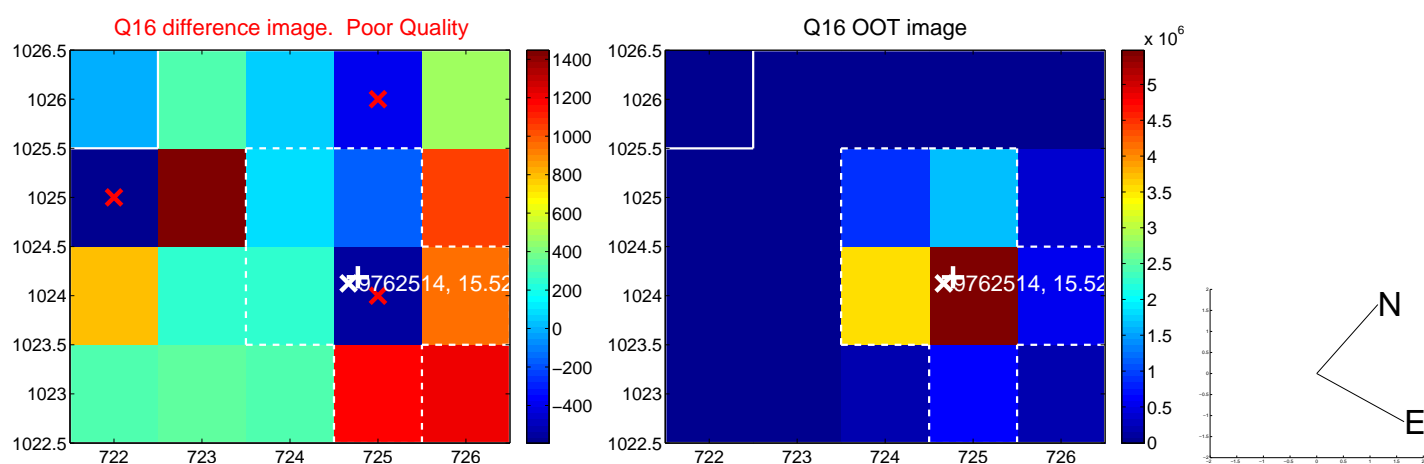
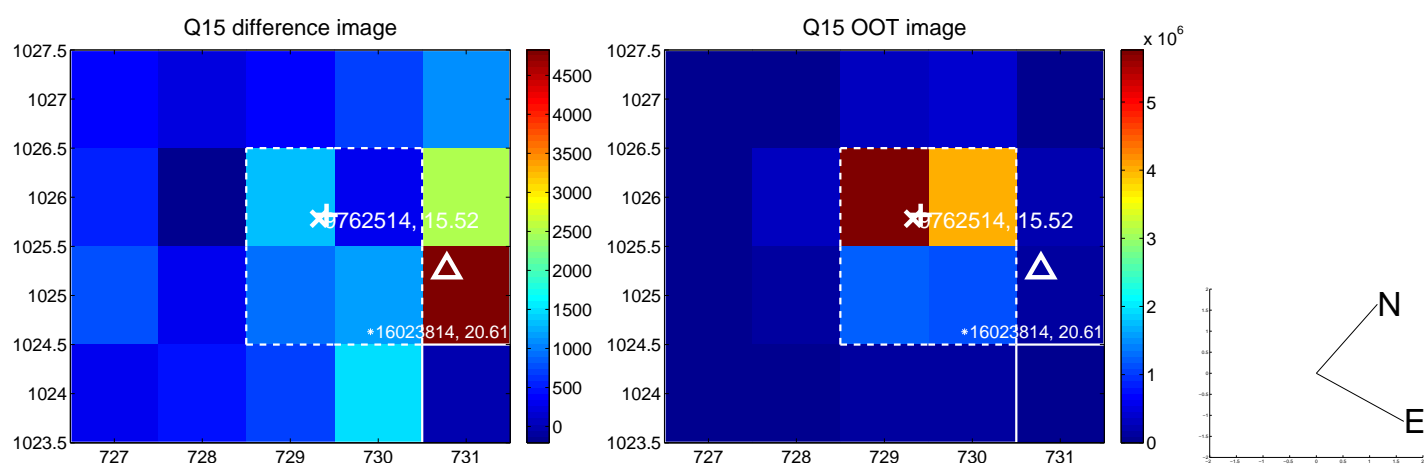
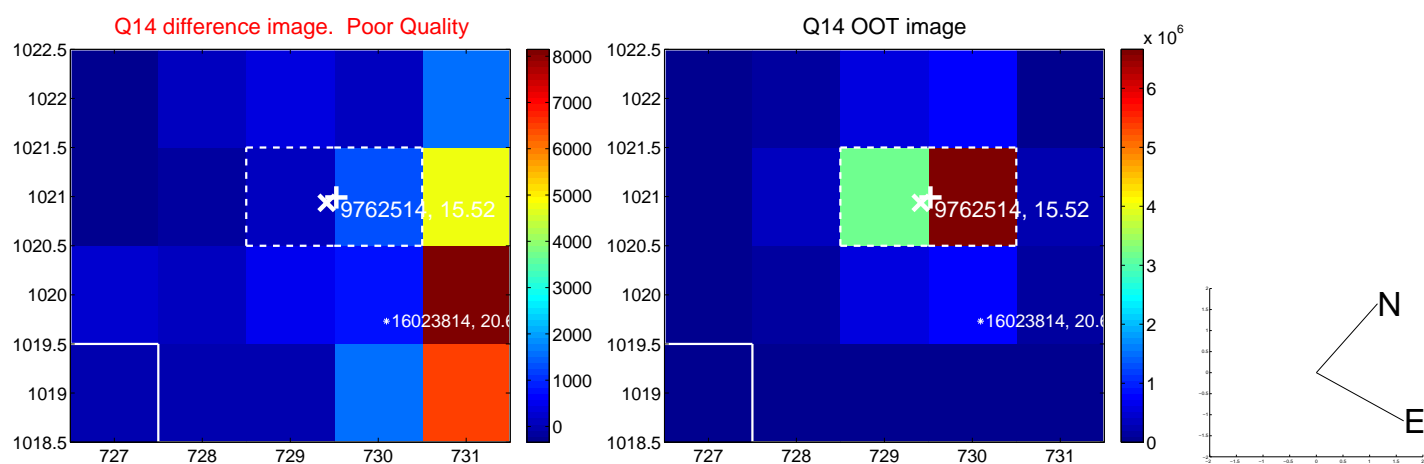
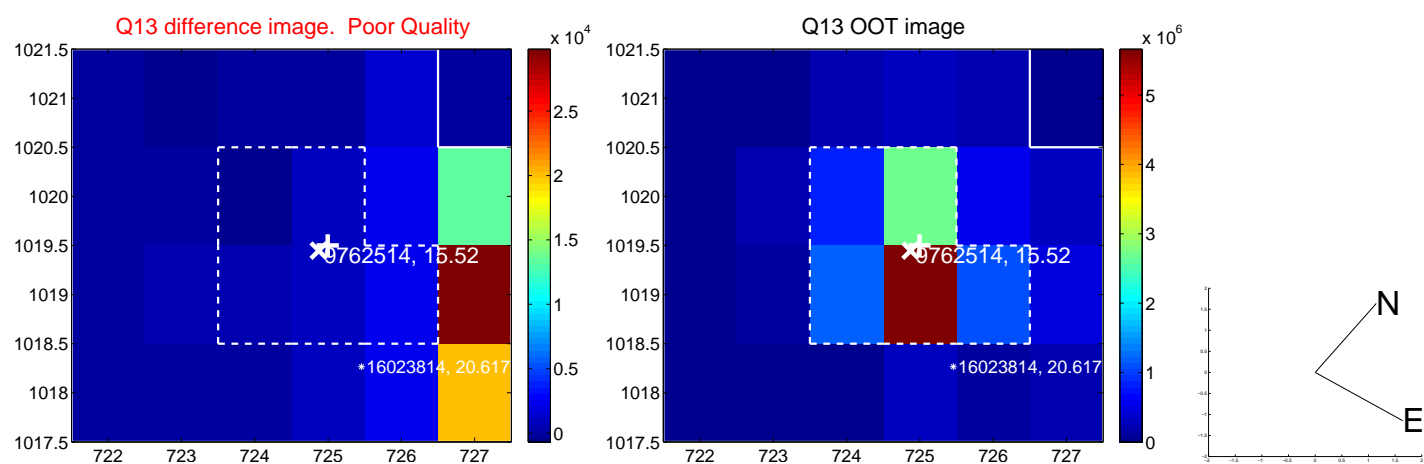
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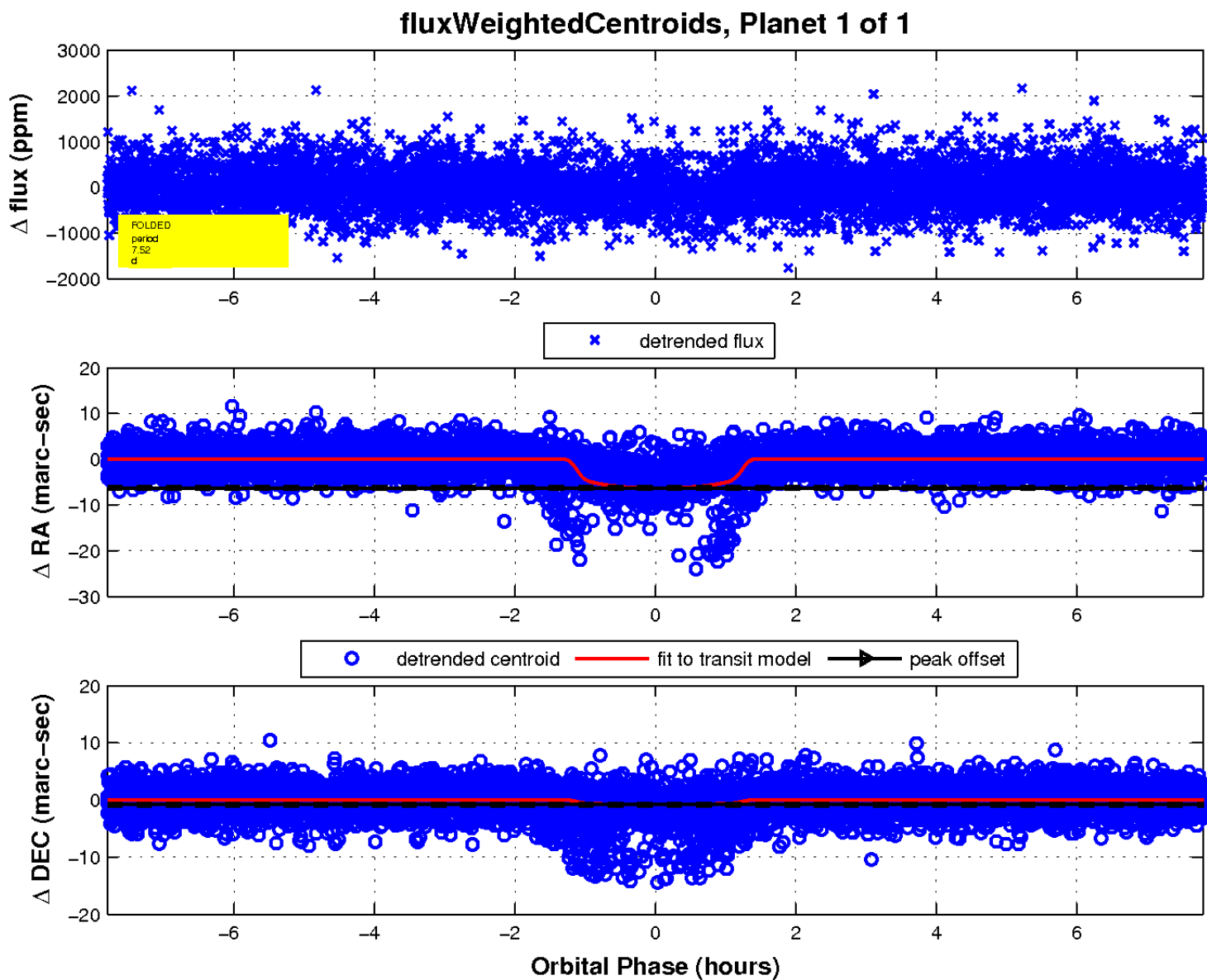
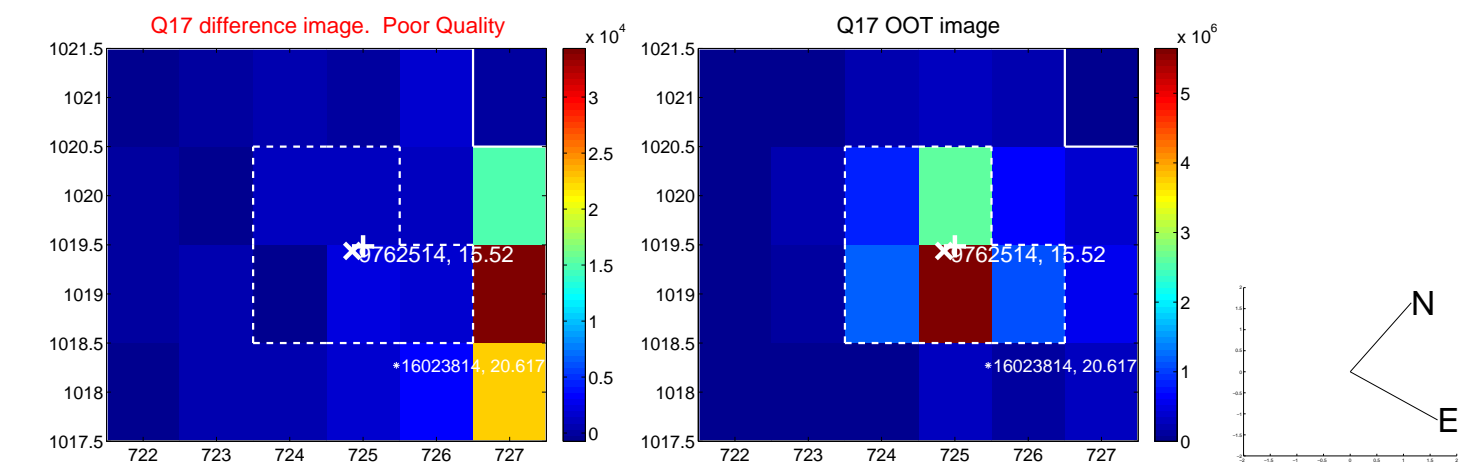


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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UKIRT Image

Declination

