

# KIC 008747972

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008747972-01	OBS	No	0.530949	131.727140	38.9	3.017	8.2	5.8	0.53	3892	0.35	522.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008747972-01	OBS	FP	0.00	1	0	0	1	LPP_DV—CENT_FEW_DIFFS—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.

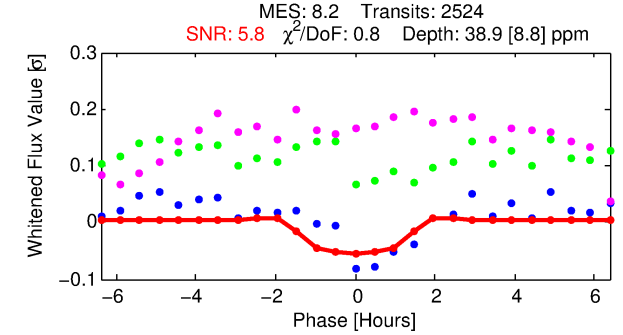
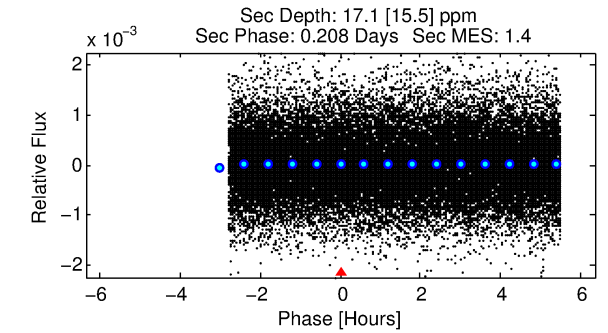
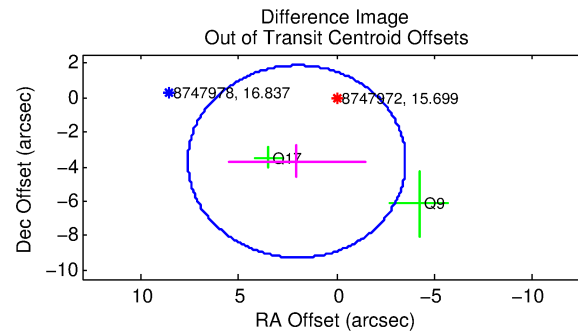
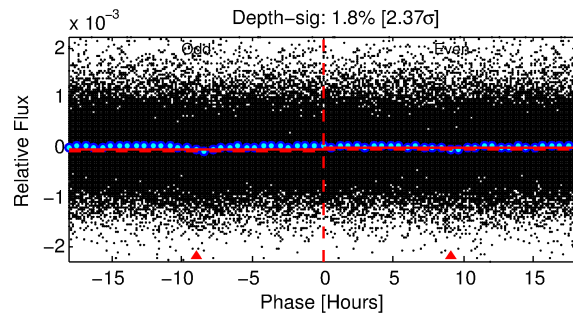
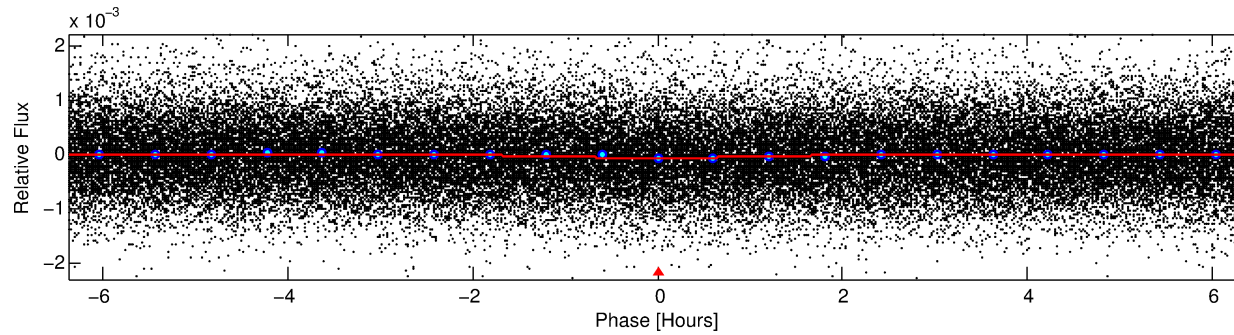
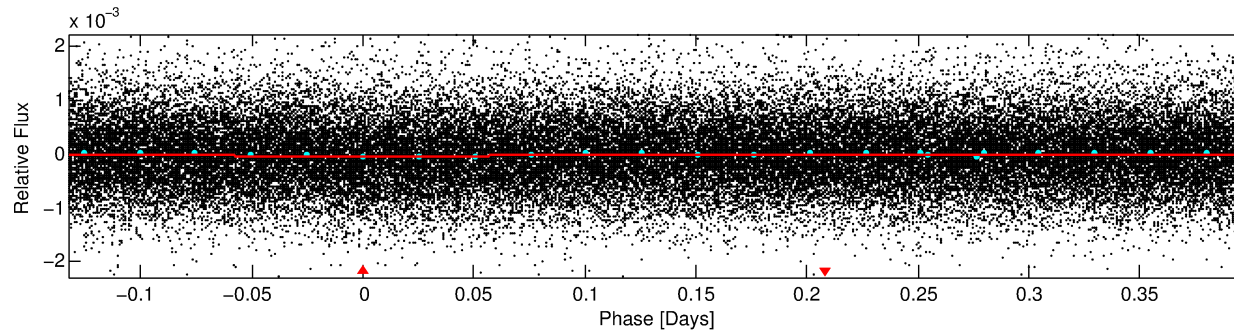
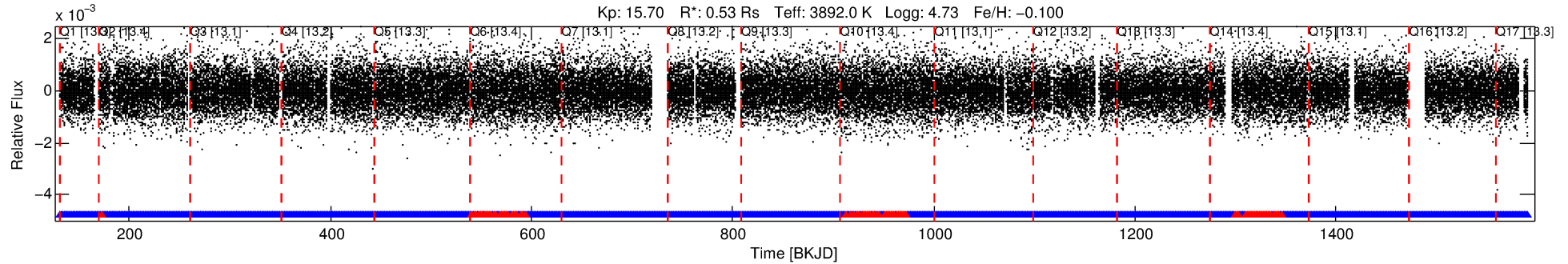
## Ephemeris Match Information For 008747972-01

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	$\sigma_P$	$\sigma_T$
008747972-01	8747972	7054.01	8552540	1:1	2341.0	589	2	10.29	15.70	9657.40	Col-Anomaly	0	3.96	0.16

**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: 8747972 Candidate: 1 of 1 Period: 0.531 d



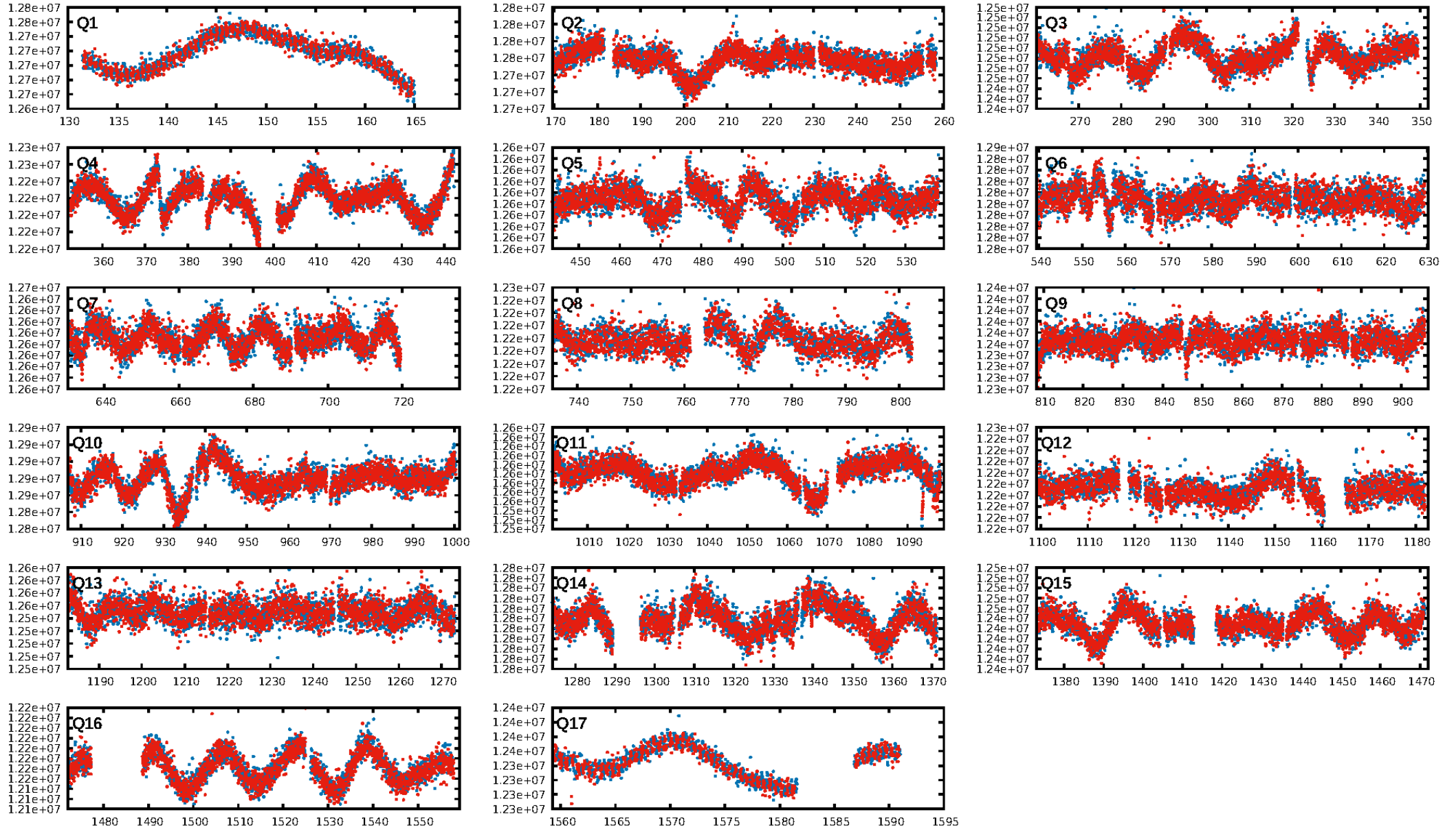
## DV Fit Results:

Period = 0.53095 [0.00002] d  
Epoch = 131.7271 [0.0058] BKJD  
Rp/R\* = 0.0061 [0.0071]  
a/R\* = 1.28 [2.47]  
b = 0.70 [3.70]  
Seff = 522.69 [35.51]  
Teff = 1219 [21] K  
Rp = 0.35 [0.41] Re  
a = 0.0105 [0.0004] AU  
Ag = 8.33 [20.68] [0.35 $\sigma$ ]  
Teffp = 3202 [1989] K [1.00 $\sigma$ ]

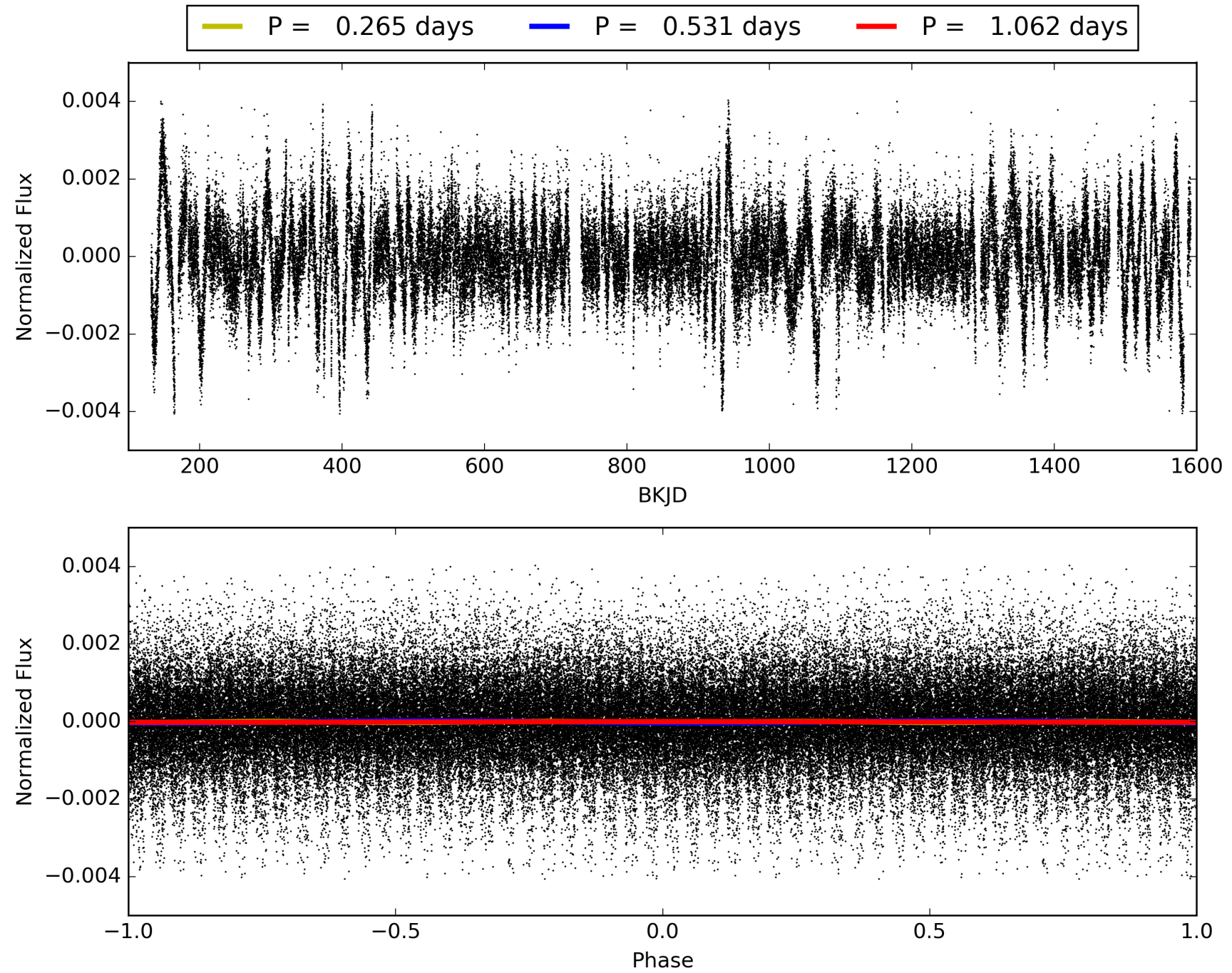
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.79e-12  
RollingBand-fgt: 0.94 [2262/2411]  
GhostDiagnostic-chr: -2.281  
Centroid-sig: 0.0%  
Centroid-so: 4.729 arcsec [2.53 $\sigma$ ]  
OotOffset-rm: 4.224 arcsec [2.28 $\sigma$ ]  
KicOffset-rm: 4.259 arcsec [2.35 $\sigma$ ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008747972-01, PDC Light Curves



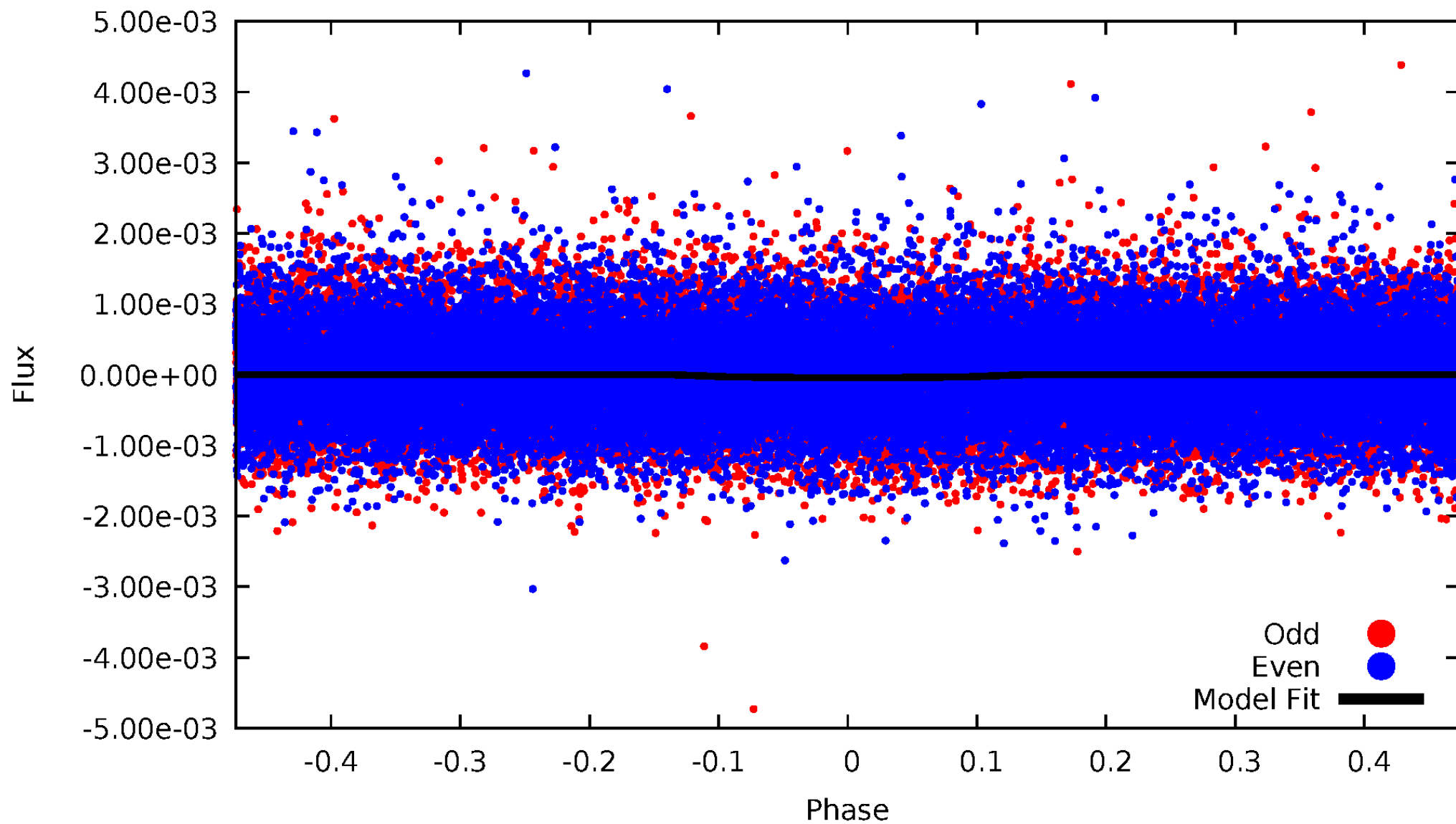
TCE 008747972-01





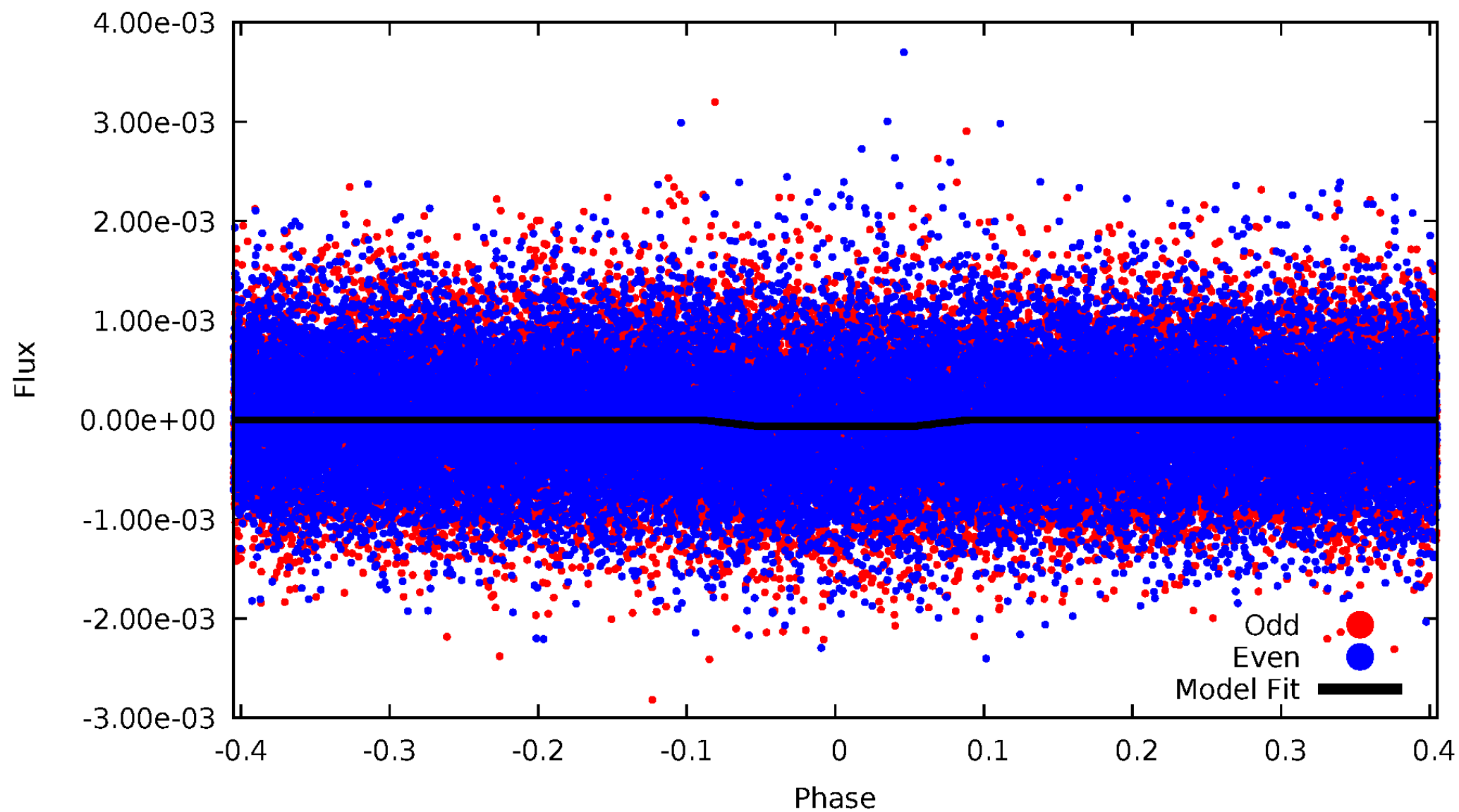
# DV Odd/Even

TCE 008747972-01



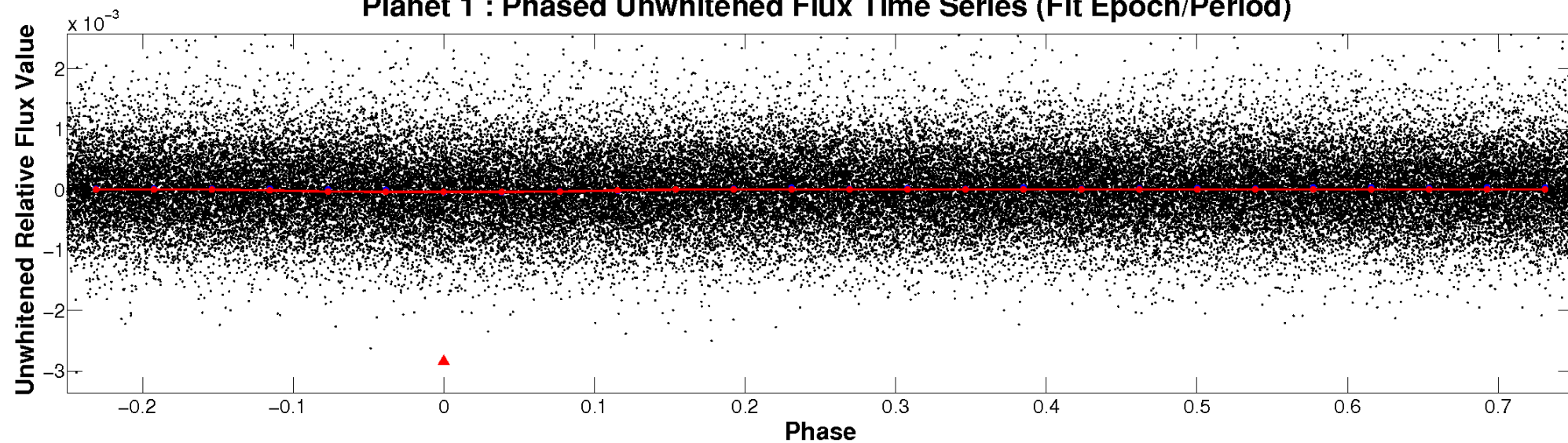
# ALT Odd/Even

TCE 008747972-01

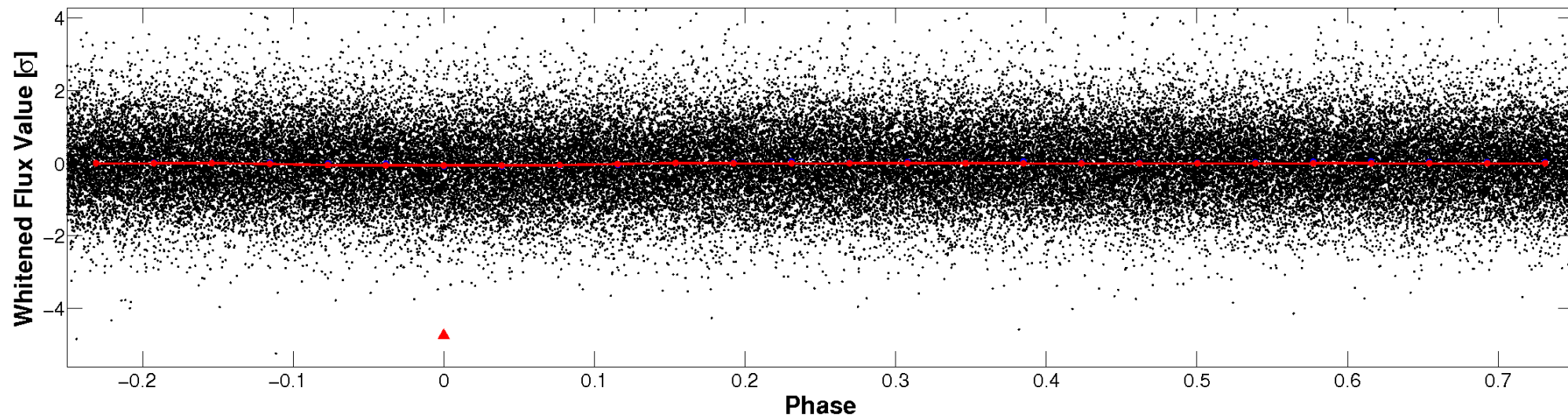


# Non-Whitened Vs. Whitened Light Curve

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

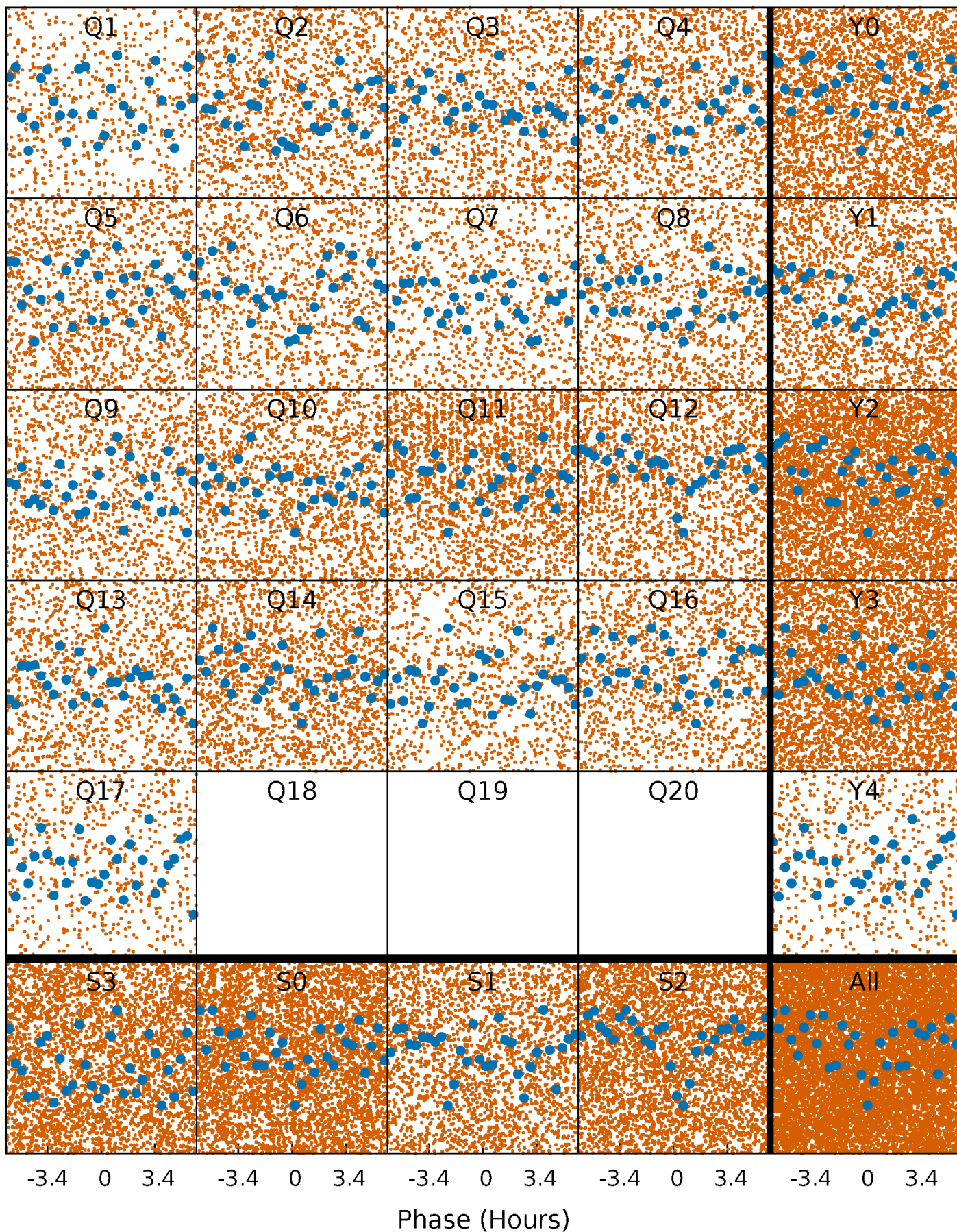


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

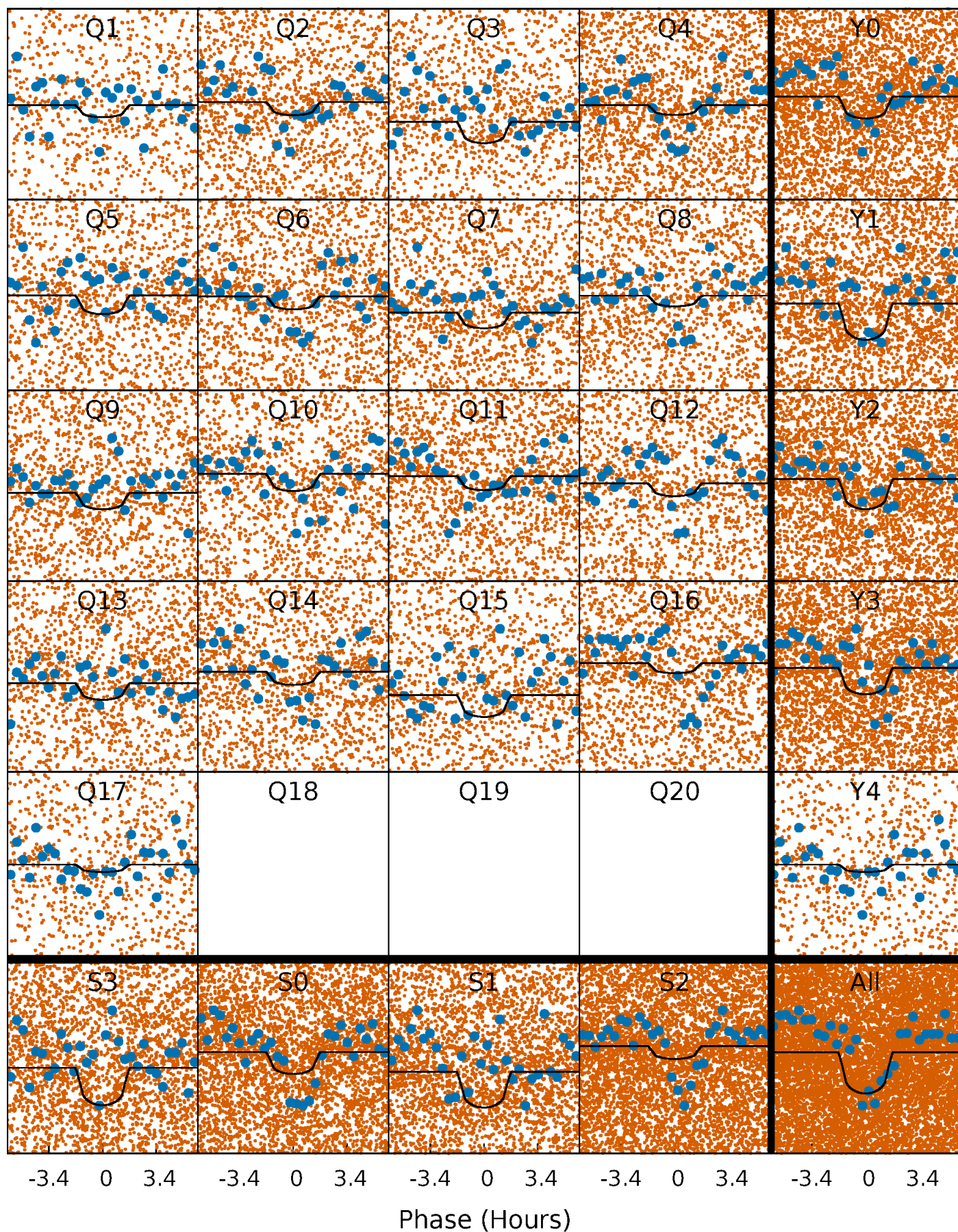
TCE 008747972-01 P= 0.530949 Days  $T_0=131.727140$  (BKJD)





# DV Quarter-Phased Transit Curves

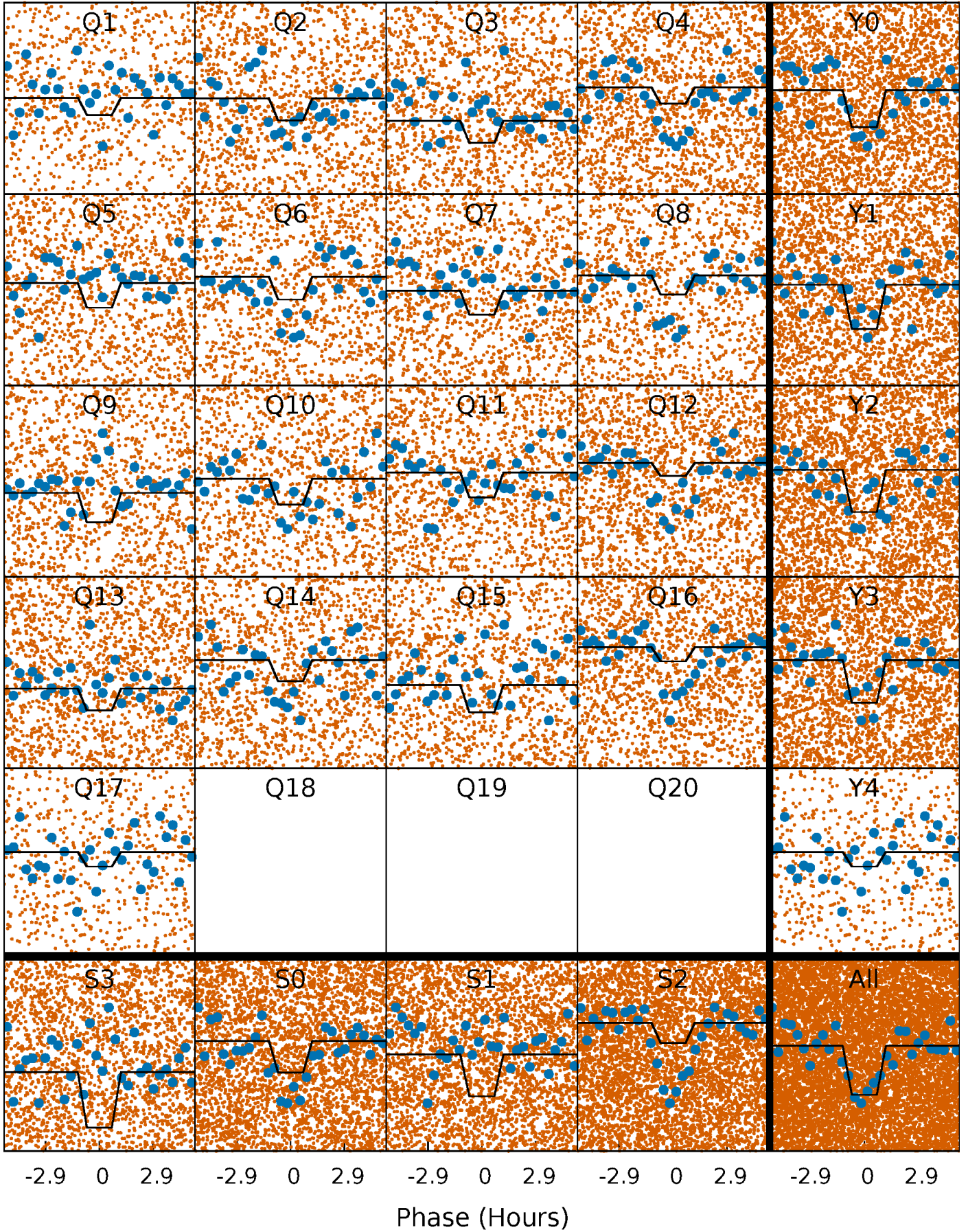
TCE 008747972-01 P= 0.530949 Days  $T_0=131.727140$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

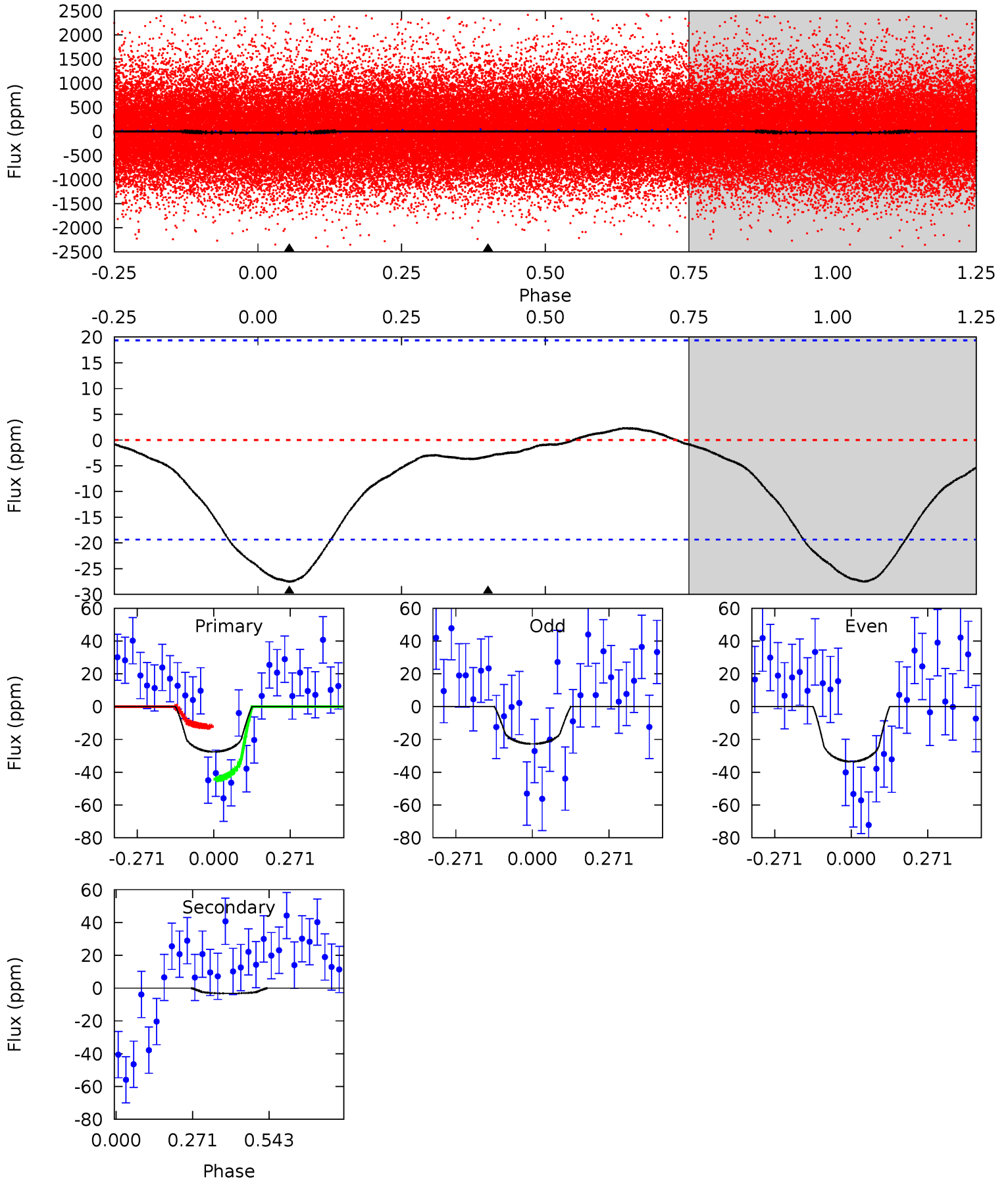
TCE 008747972-01 P= 0.530968 Days  $T_0=131.719858$  (BKJD)



# DV Model-Shift Uniqueness Test

008747972-01, P = 0.530949 Days, E = 131.196191 Days

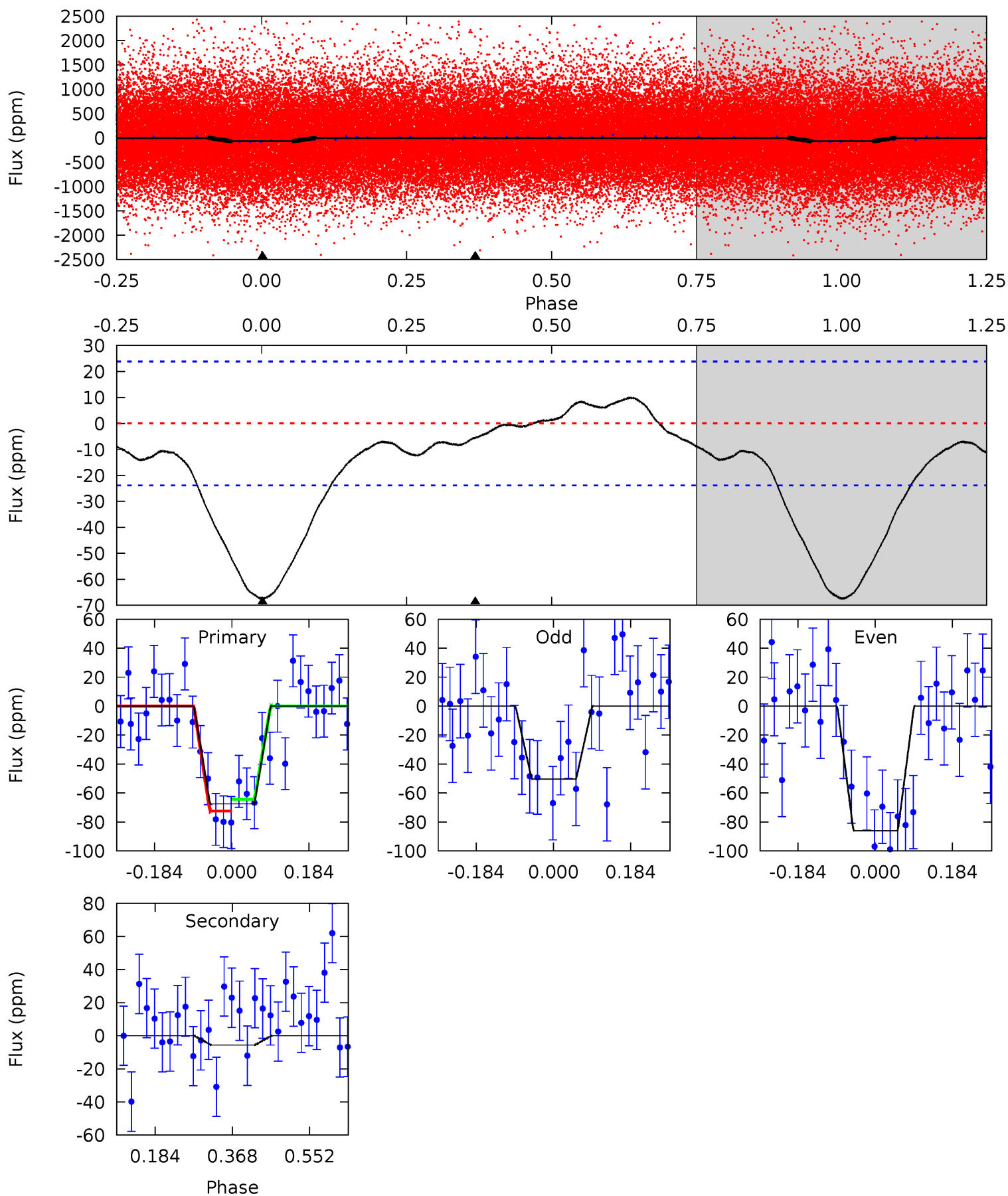
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.19	0.73	0	0	4.35	1.10	0.27	6.19	6.19	0.73	0.73	1.22	0.77	0.08	3.54



# Alt Model-Shift Uniqueness Test

008747972-01, P = 0.530968 Days, E = 131.188890 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
12.6	1.04	0	0	4.44	1.33	1.59	12.6	12.6	1.04	1.04	3.32	0.98	0.13	0.76





### Stellar Parameters For KIC 008747972

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3892^{+46}_{-50}$	$4.730^{+0.020}_{-0.022}$	$-0.100^{+0.100}_{-0.100}$	$0.531^{+0.023}_{-0.021}$	$0.553^{+0.020}_{-0.027}$	$5.201^{+0.450}_{-0.502}$
	+1%/-1%	+0%/-0%	+100%/-100%	+4%/-4%	+4%/-5%	+9%/-10%
Source	PHO2	PHO2	PHO2	DSEP		

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

### Secondary Eclipse Parameters for KIC 008747972-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3 \pm 4$	$0.40^{+0.36}_{-0.25}$	$1703^{+25}_{-27}$	$2382^{+1004}_{-4736}$	$0.864^{+7.454}_{-1.069}$
Alt.	$-6 \pm 5$	$0.54^{+0.34}_{-0.32}$	$1704^{+26}_{-26}$	$2445^{+840}_{-4553}$	$1.019^{+5.576}_{-0.909}$

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

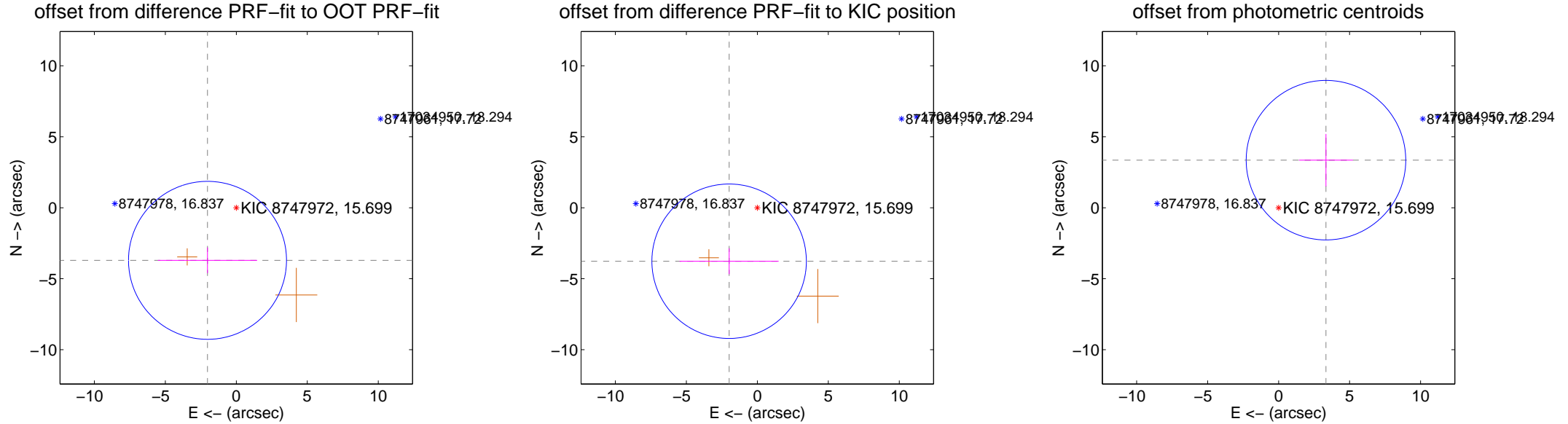
## DV Centroid Data

Supplemental centroid analysis for 008747972-01. Kepler magnitude: 15.70. Transit SNR 5.77

There are 0 quarters with good PRF difference image offsets

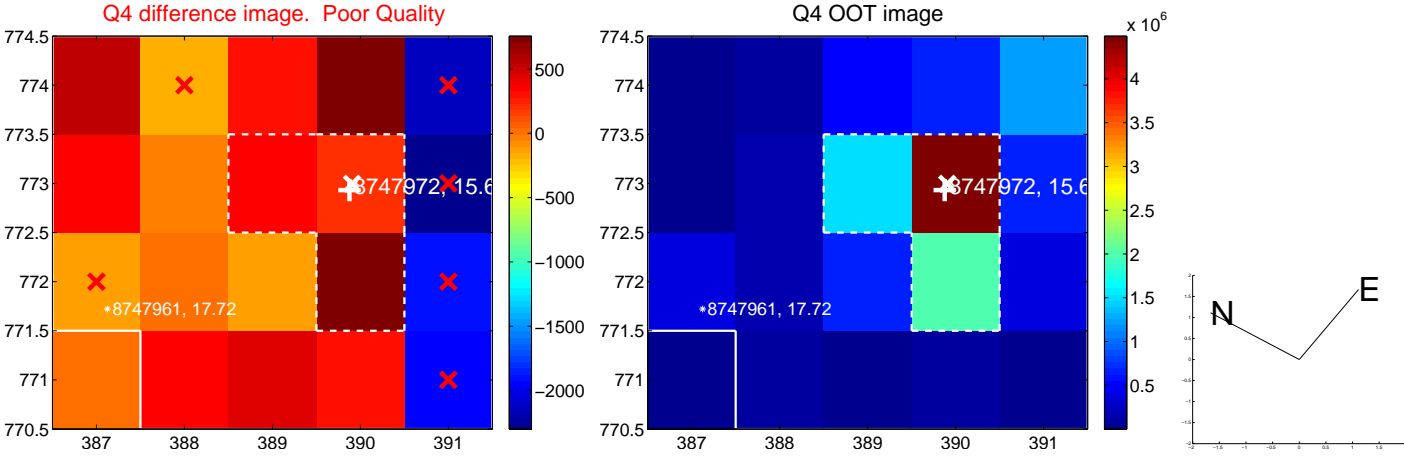
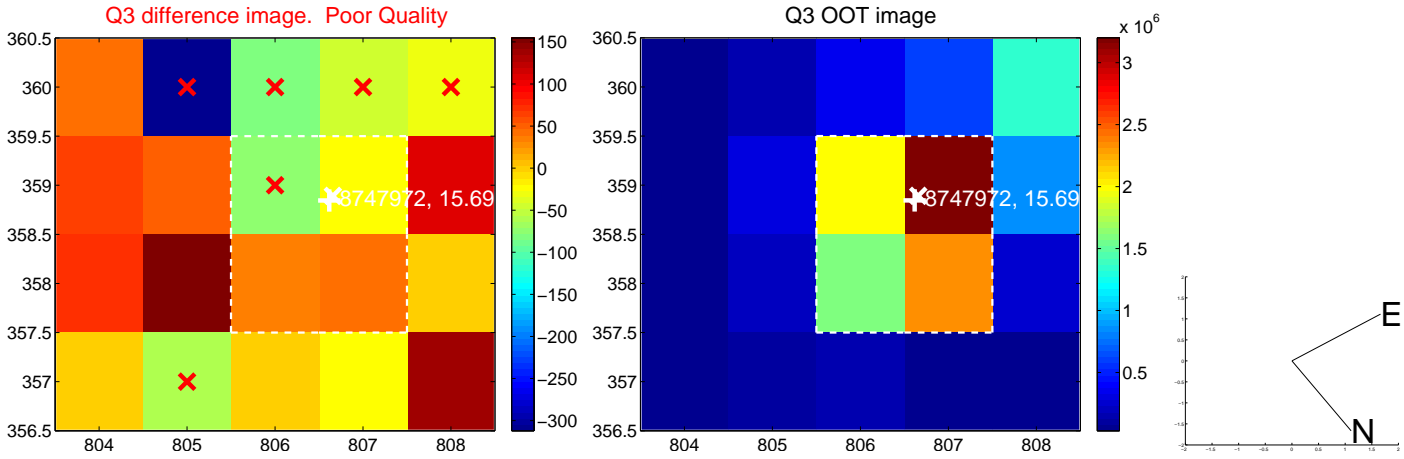
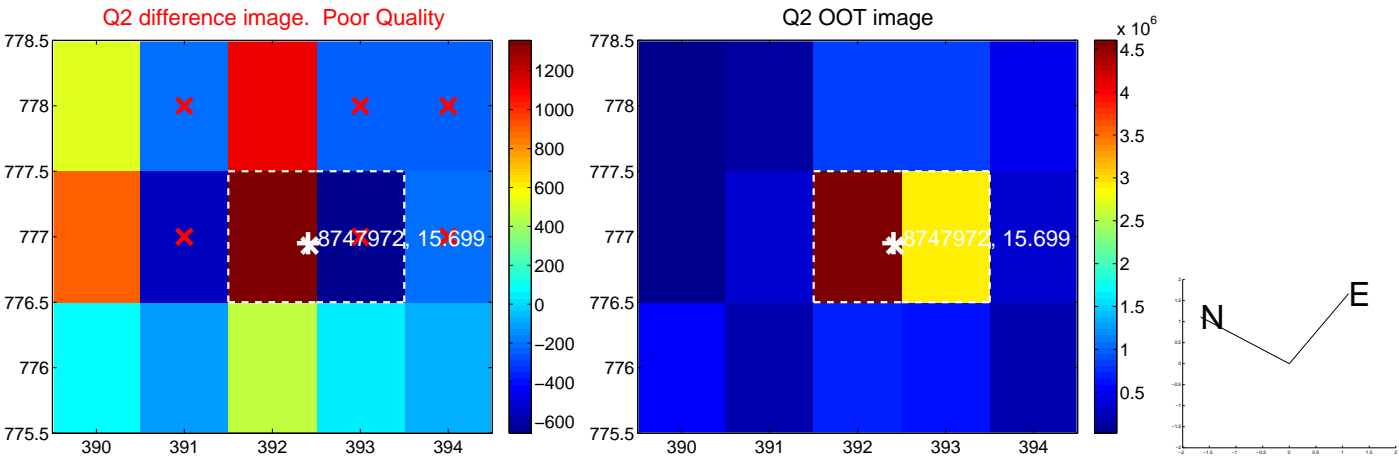
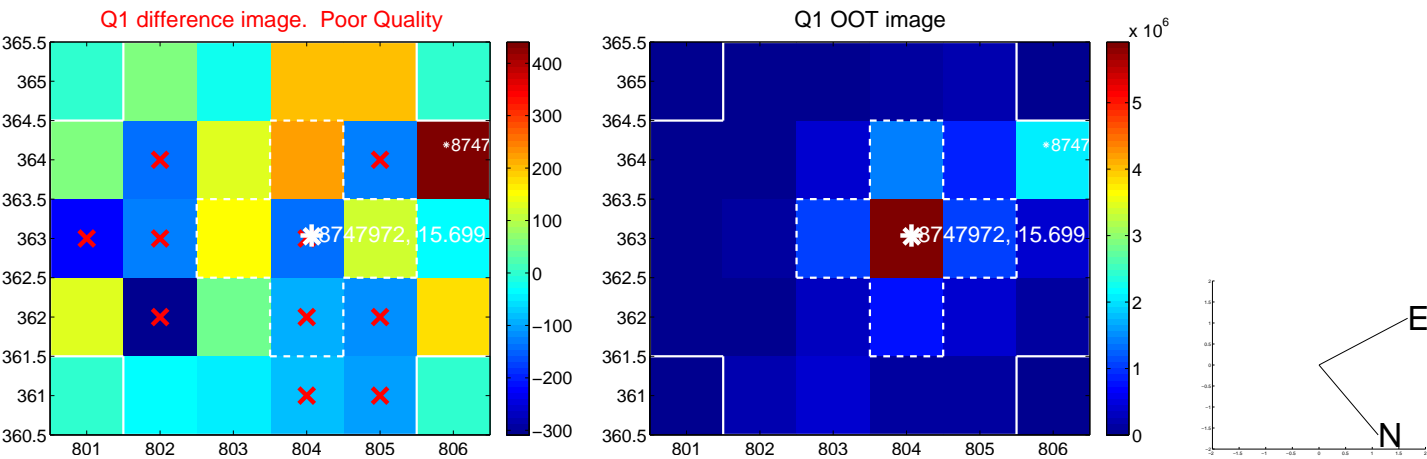
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.224 \pm 1.855$	2.28	$2.029 \pm 3.493$	$-3.705 \pm 0.902$
PRF-fit source offset from KIC position	$4.259 \pm 1.813$	2.35	$1.986 \pm 3.487$	$-3.768 \pm 0.908$
photometric centroid source offset	$4.73 \pm 1.87$	2.53	$-3.34 \pm 1.90$	$3.35 \pm 1.85$

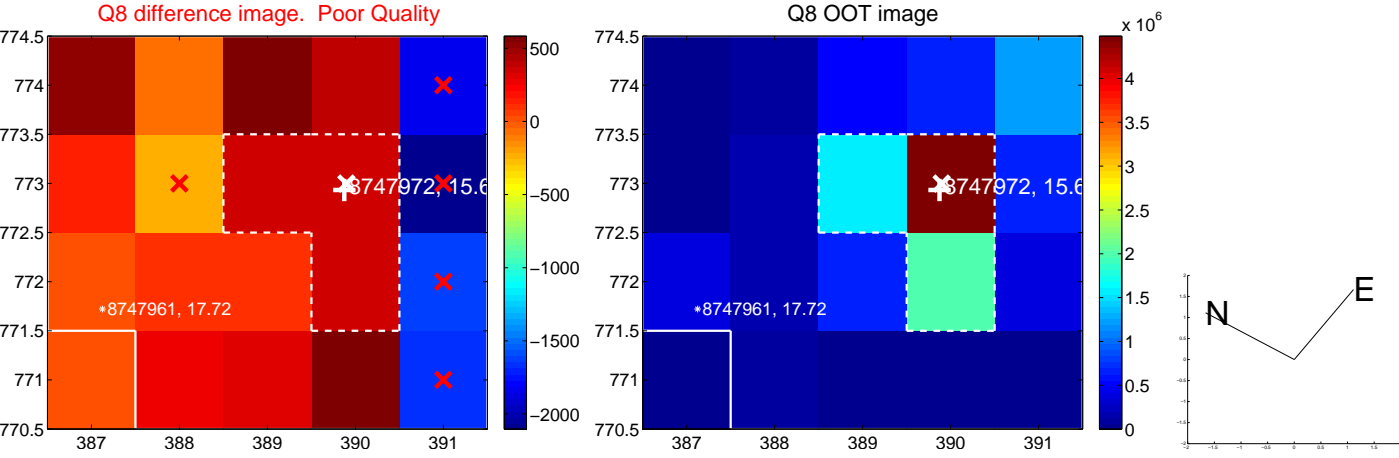
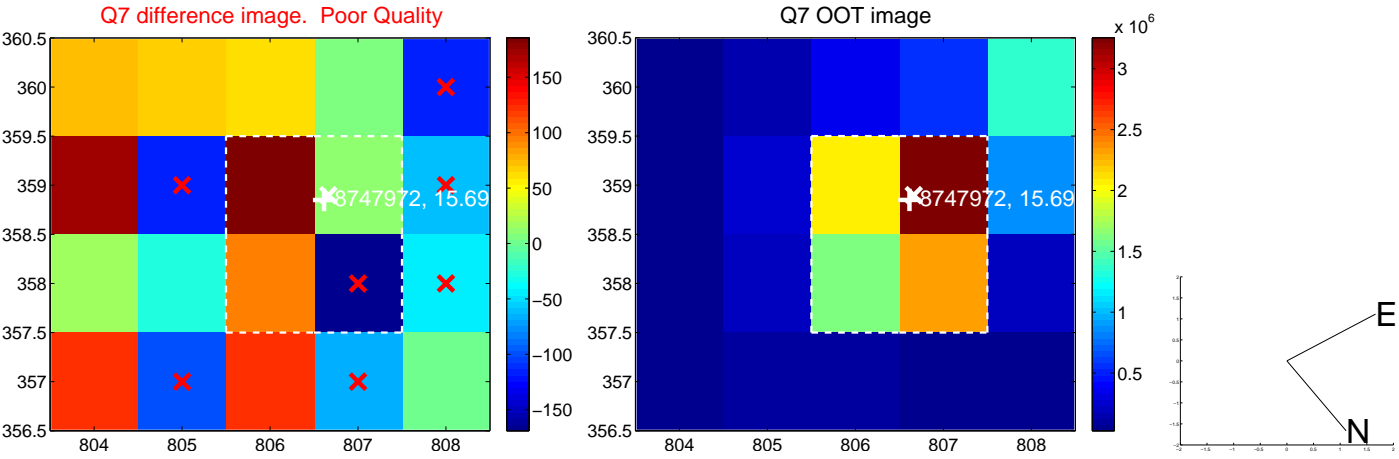
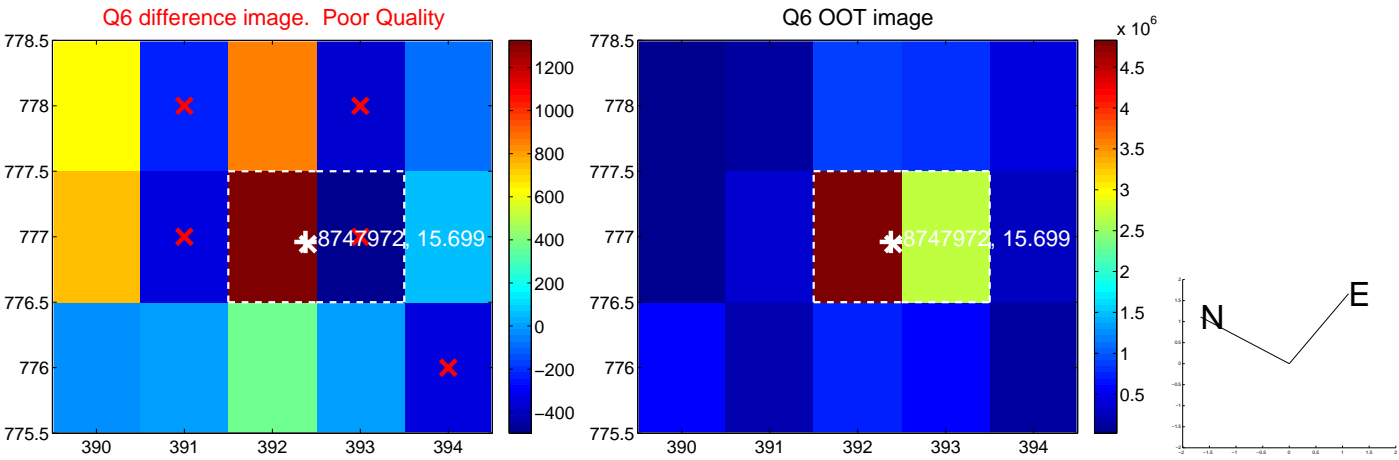
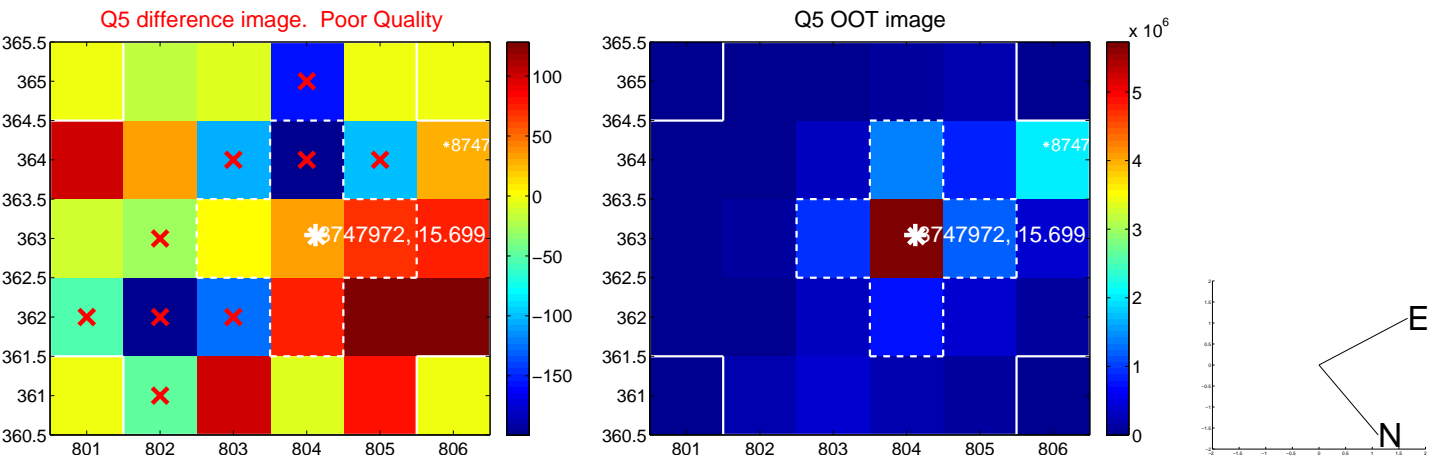


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

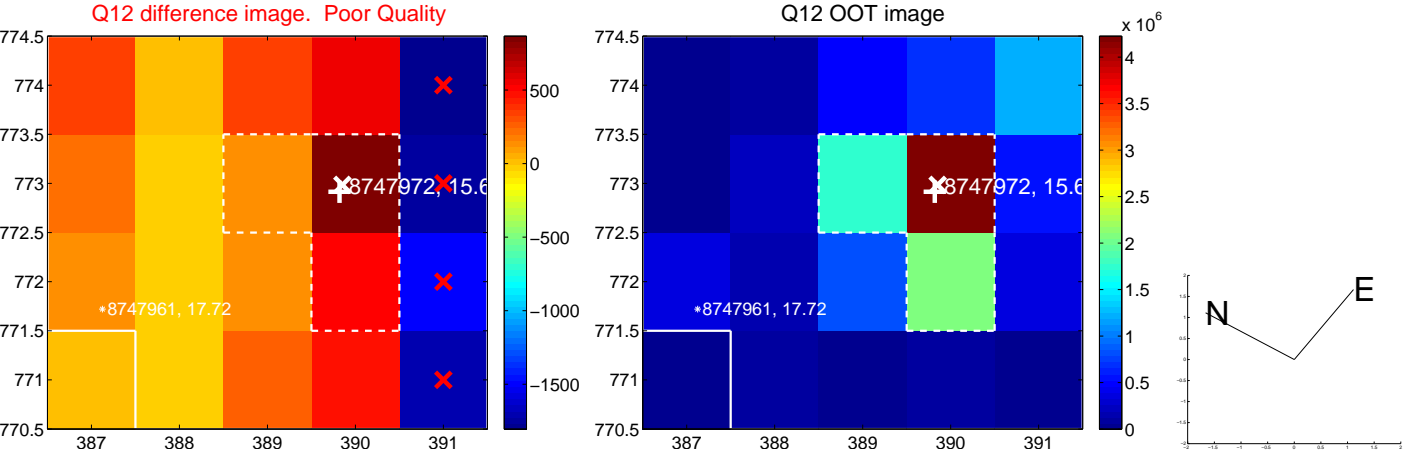
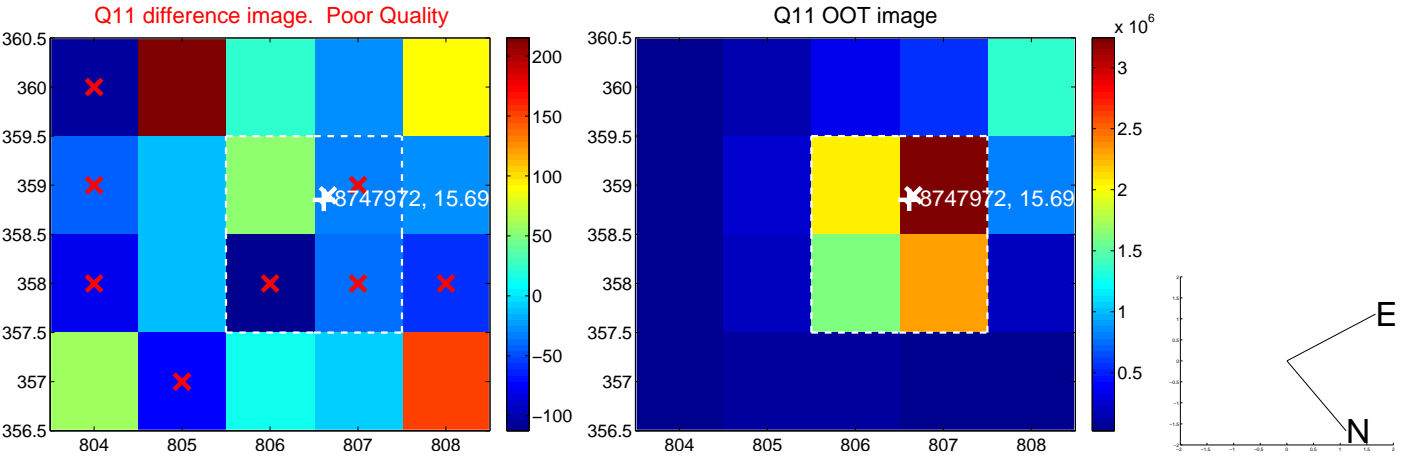
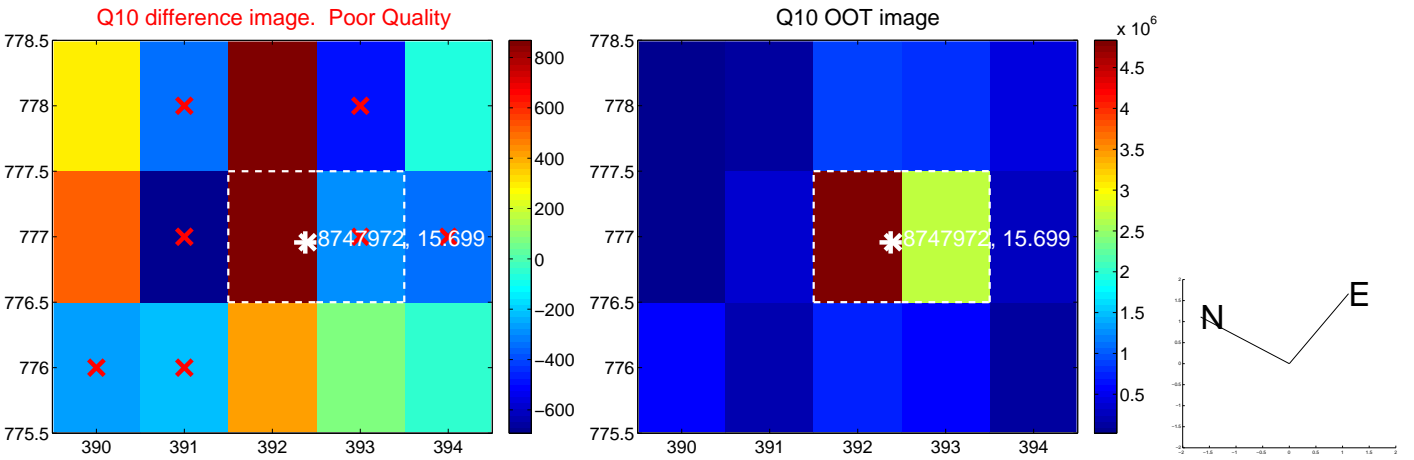
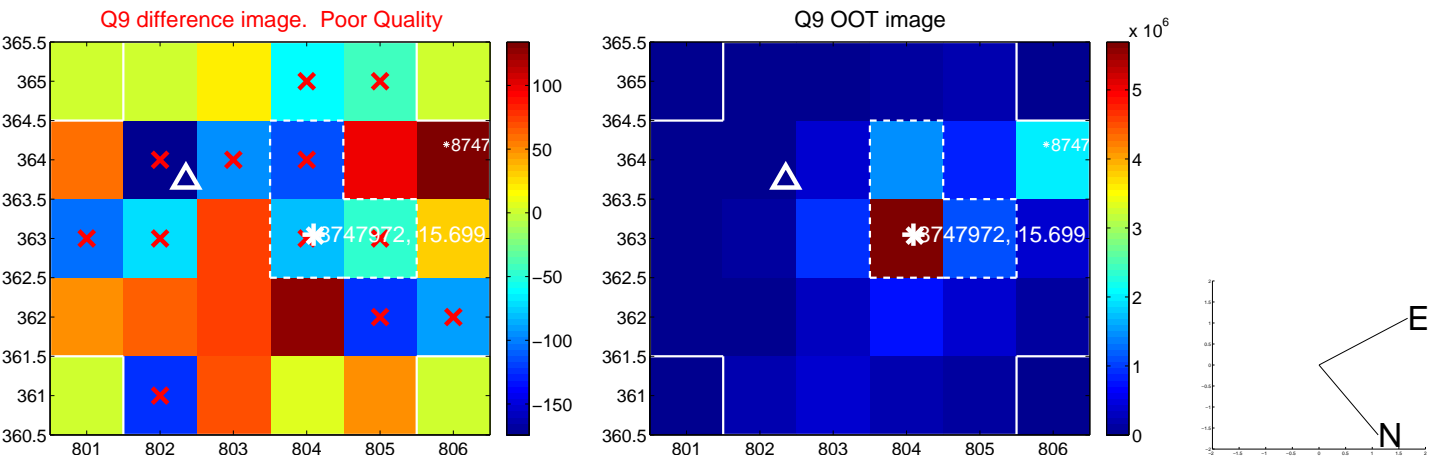


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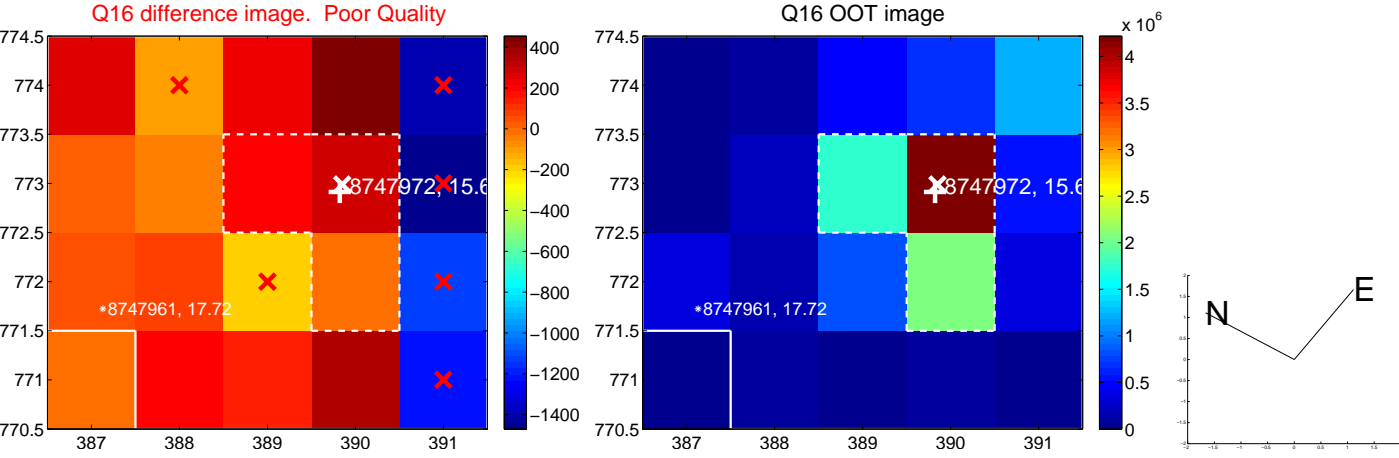
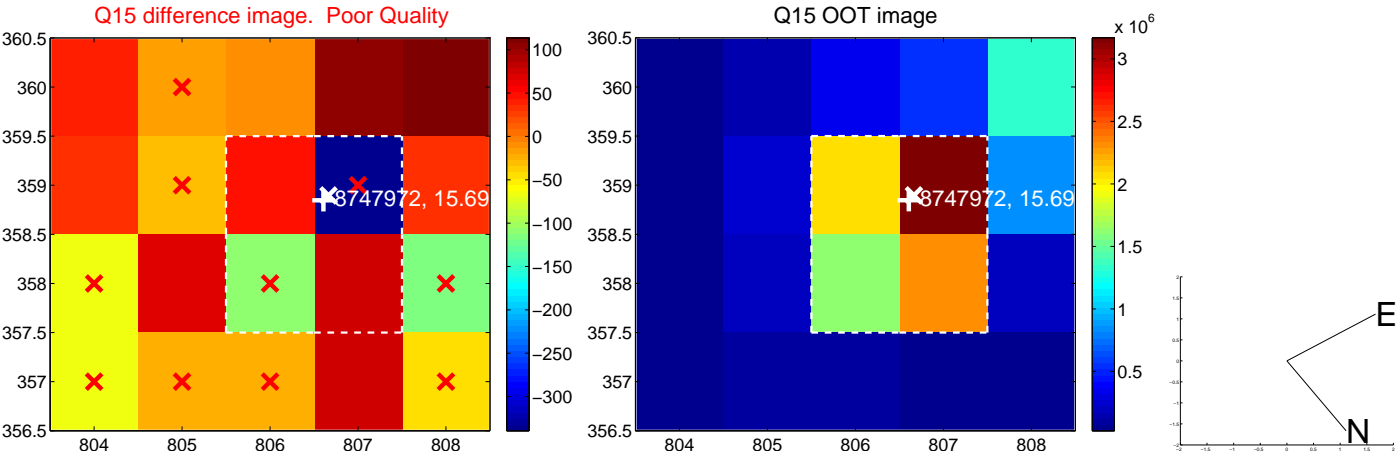
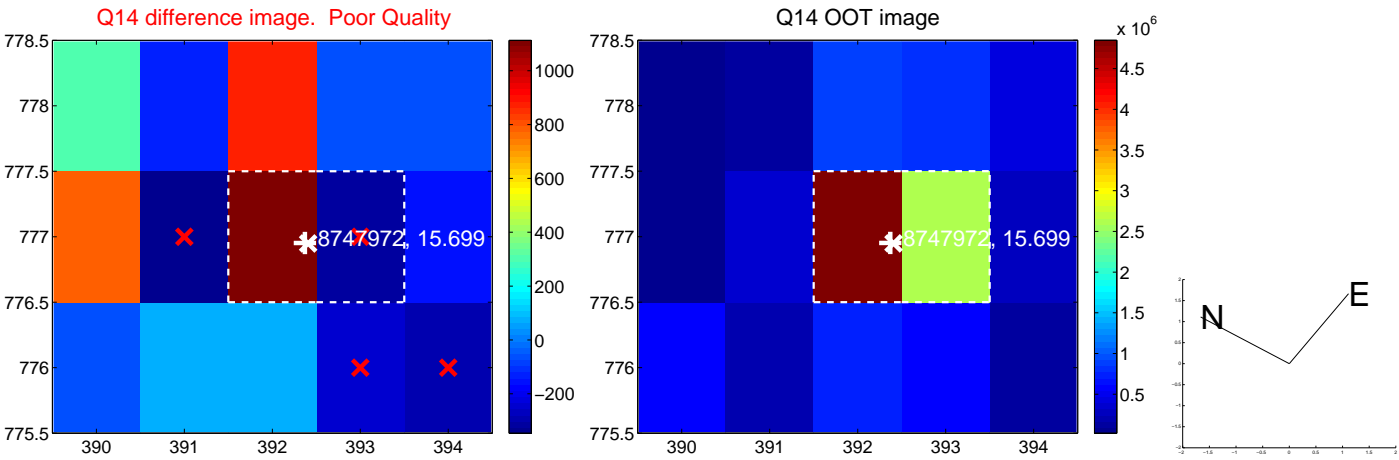
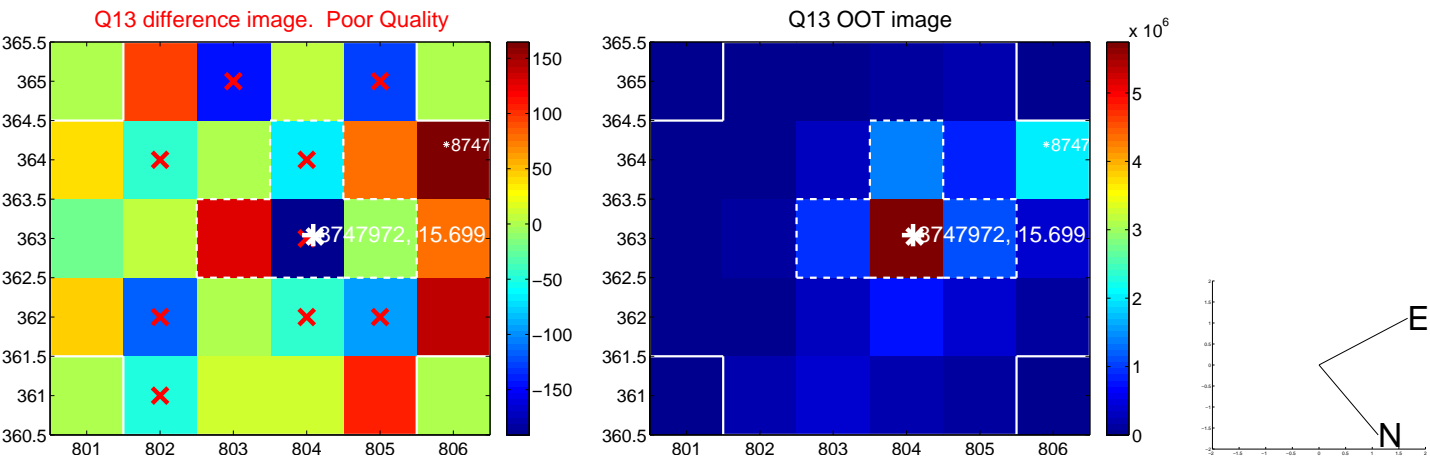




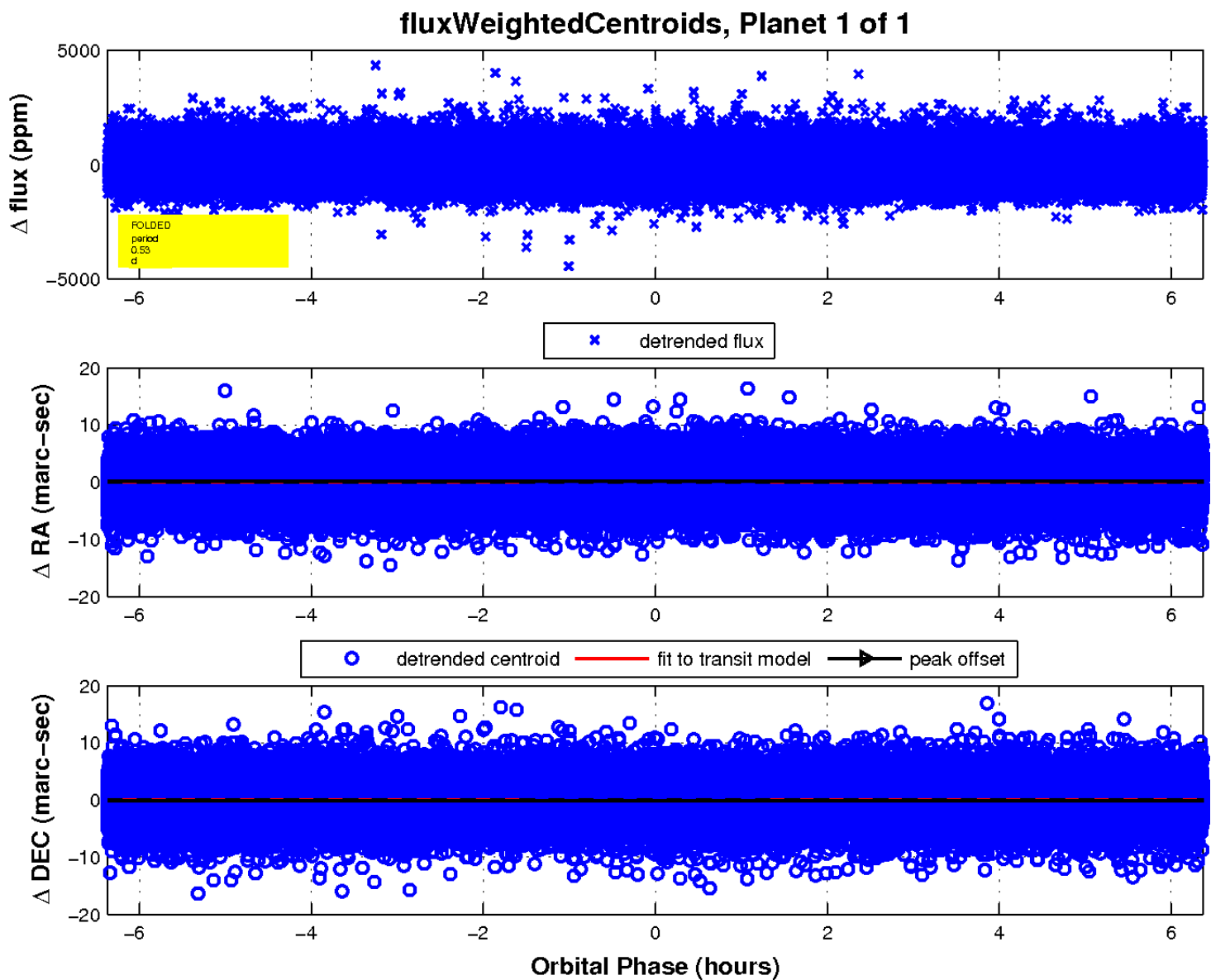
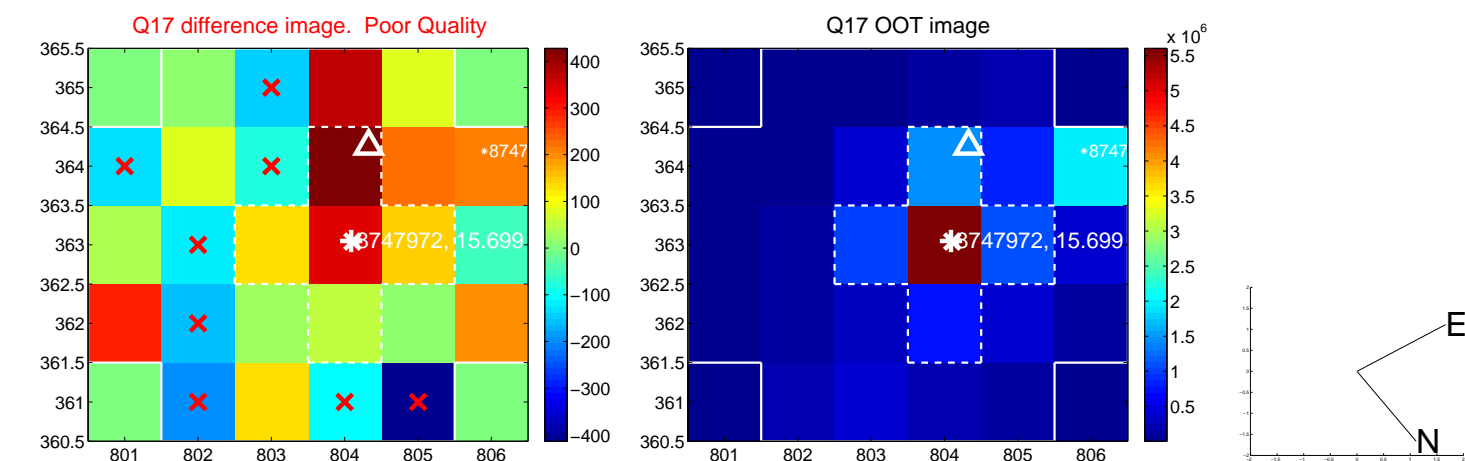
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

