

# KIC 010724450

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010724450-01	OBS	No	0.745046	131.846903	5.6	4.116	7.5	3.9	0.94	5893	0.24	3617.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010724450-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_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.

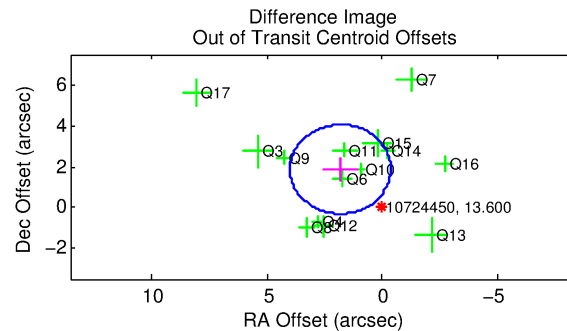
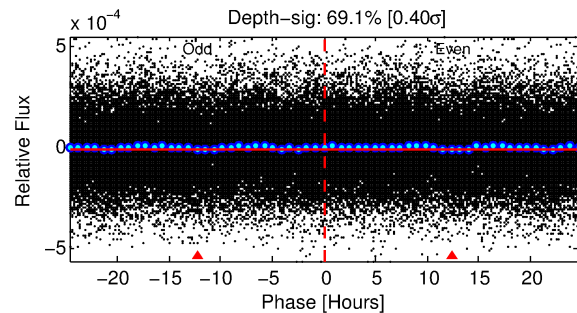
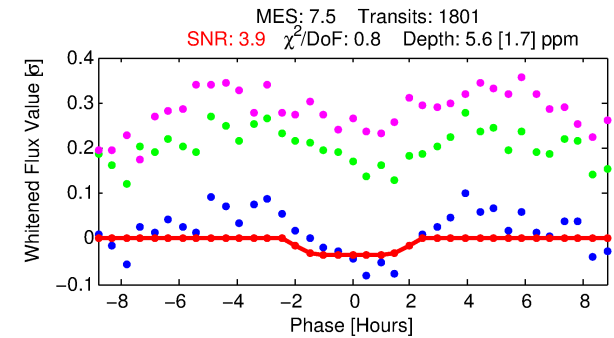
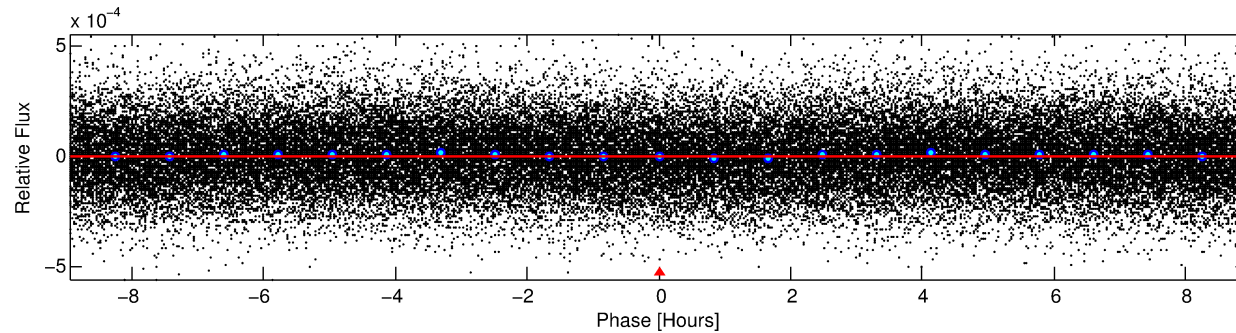
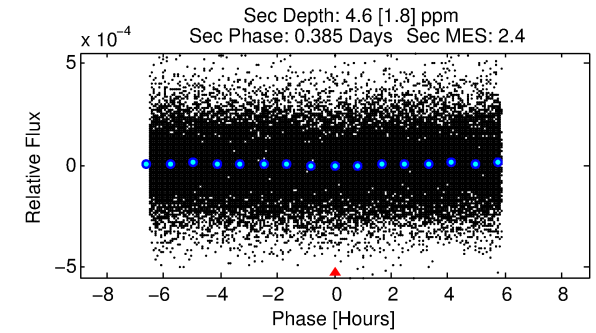
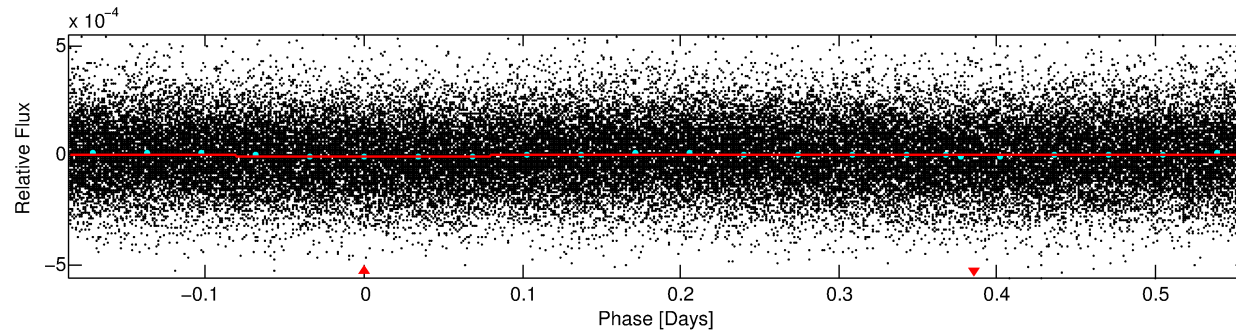
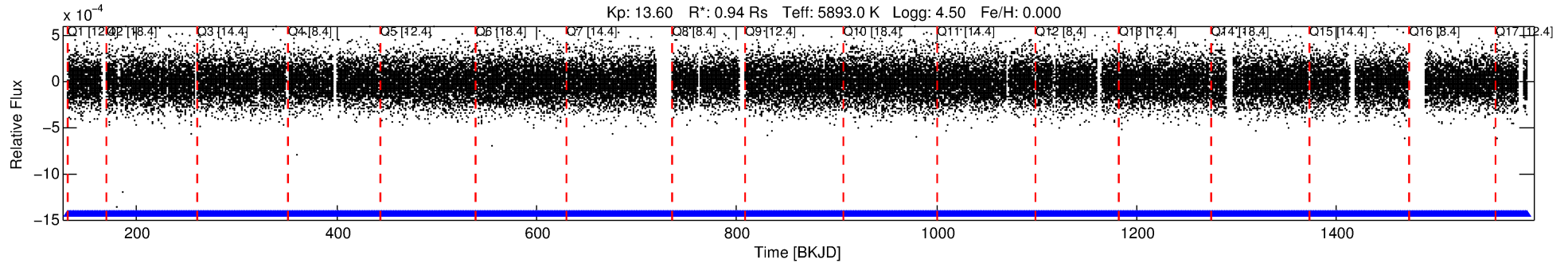
## Ephemeris Match Information For 010724450-01

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	$\sigma_P$	$\sigma_T$
010724450-01	10724450	010724551-01	10724551	1:1	109.8	-14	23	15.88	13.60	5.83	Direct-PRF	1	0.56	3.58

**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: 10724450 Candidate: 1 of 1 Period: 0.745 d



## DV Fit Results:

Period = 0.74505 [0.00003] d  
Epoch = 131.8469 [0.0125] BKJD  
Rp/R\* = 0.0023 [0.0015]  
a/R\* = 1.26 [1.38]  
b = 0.74 [1.83]  
Seff = 3617.34 [1351.30]  
Teq = 1978 [185] K  
Rp = 0.24 [0.17] Re  
a = 0.0163 [0.0039] AU  
Ag = 11.52 [16.12] [0.65σ]  
Teffp = 5633 [1916] K [1.90σ]

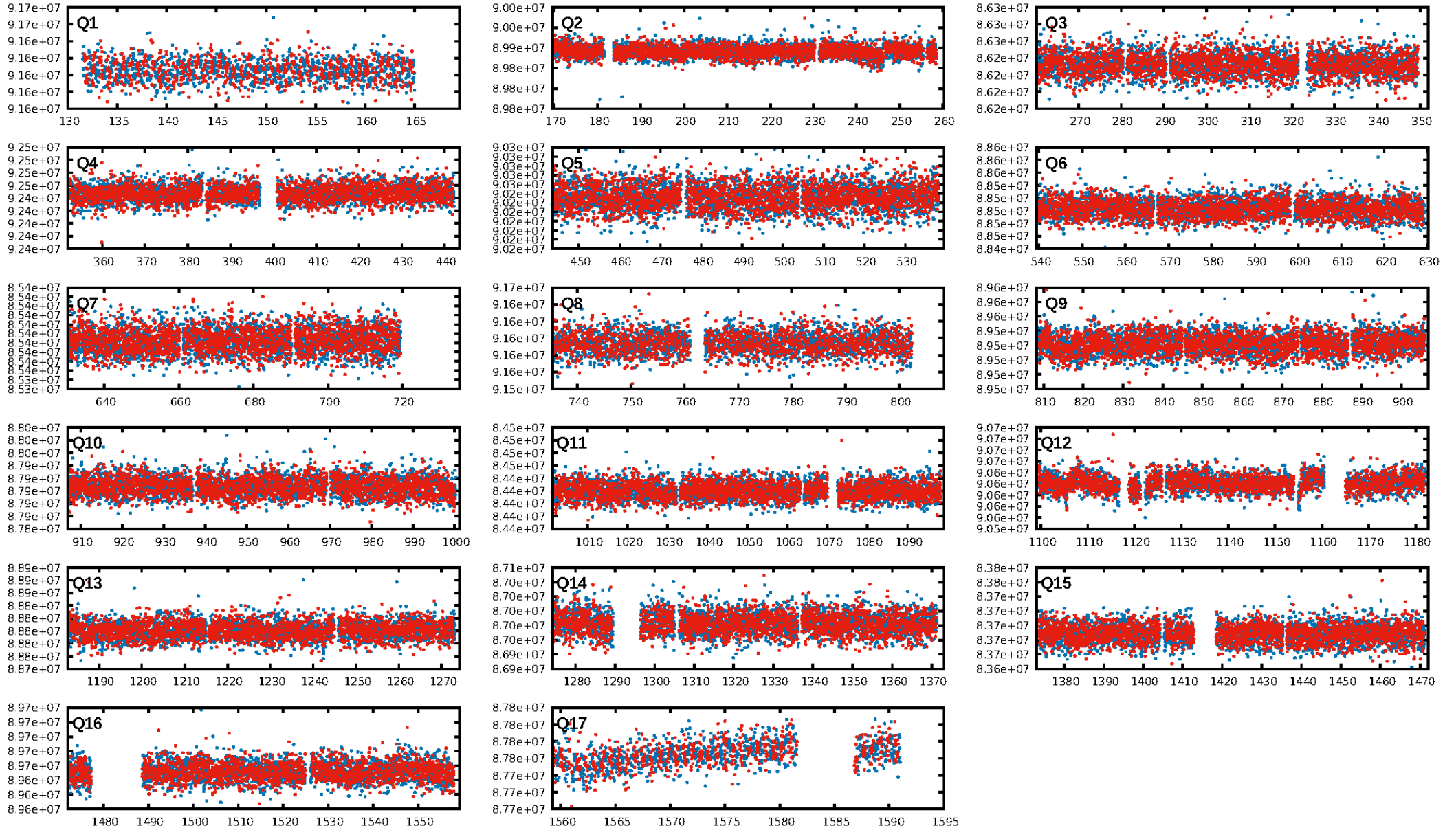
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.07e-10  
RollingBand-fgt: 1.00 [1720/1720]  
GhostDiagnostic-chr: -0.08841  
Centroid-sig: 66.0%  
Centroid-so: 1.762 arcsec [0.56σ]  
OotOffset-rm: 2.614 arcsec [3.59σ]  
KicOffset-rm: 2.601 arcsec [3.47σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.14 [2/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 02:19:21 Z

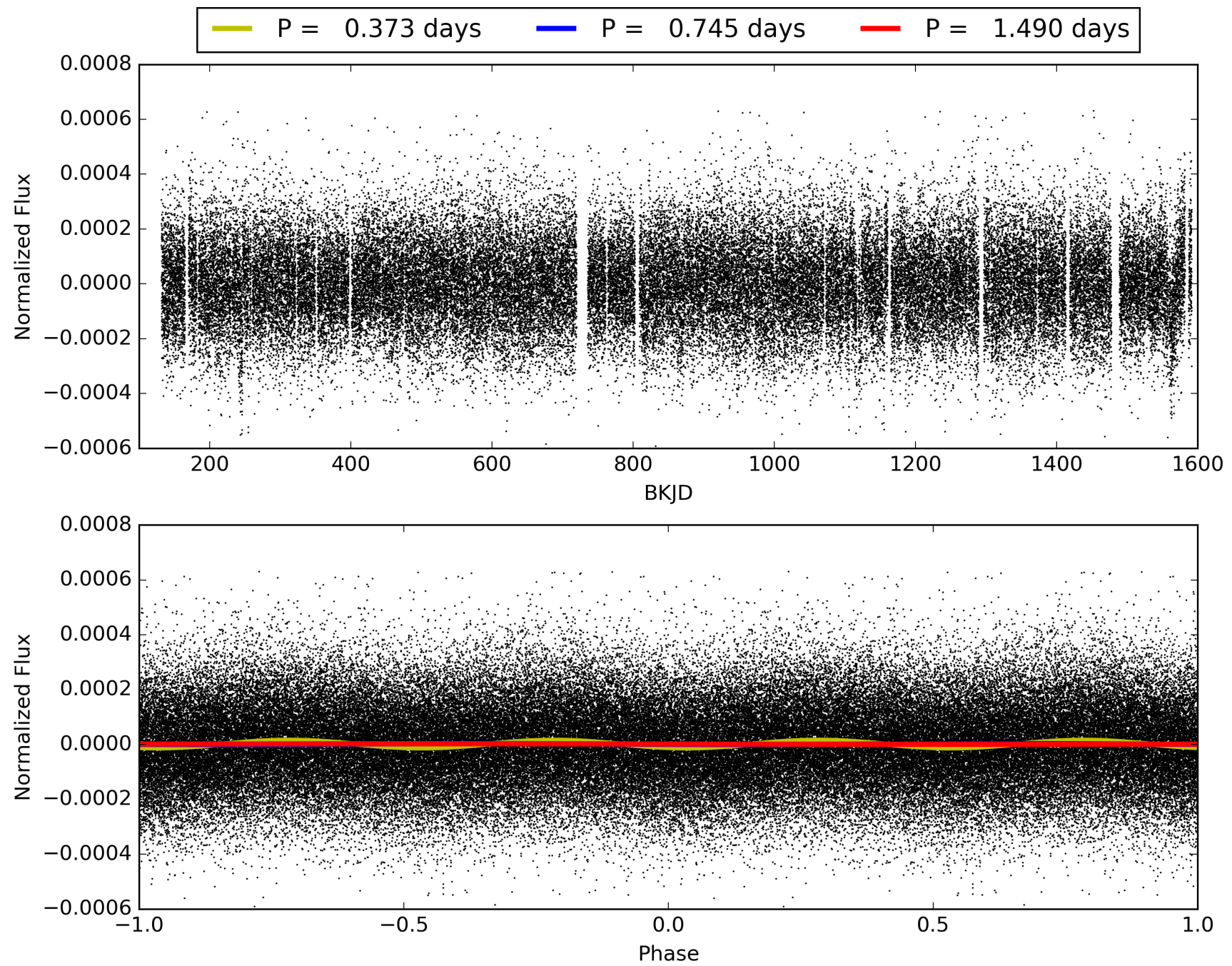
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010724450-01, PDC Light Curves



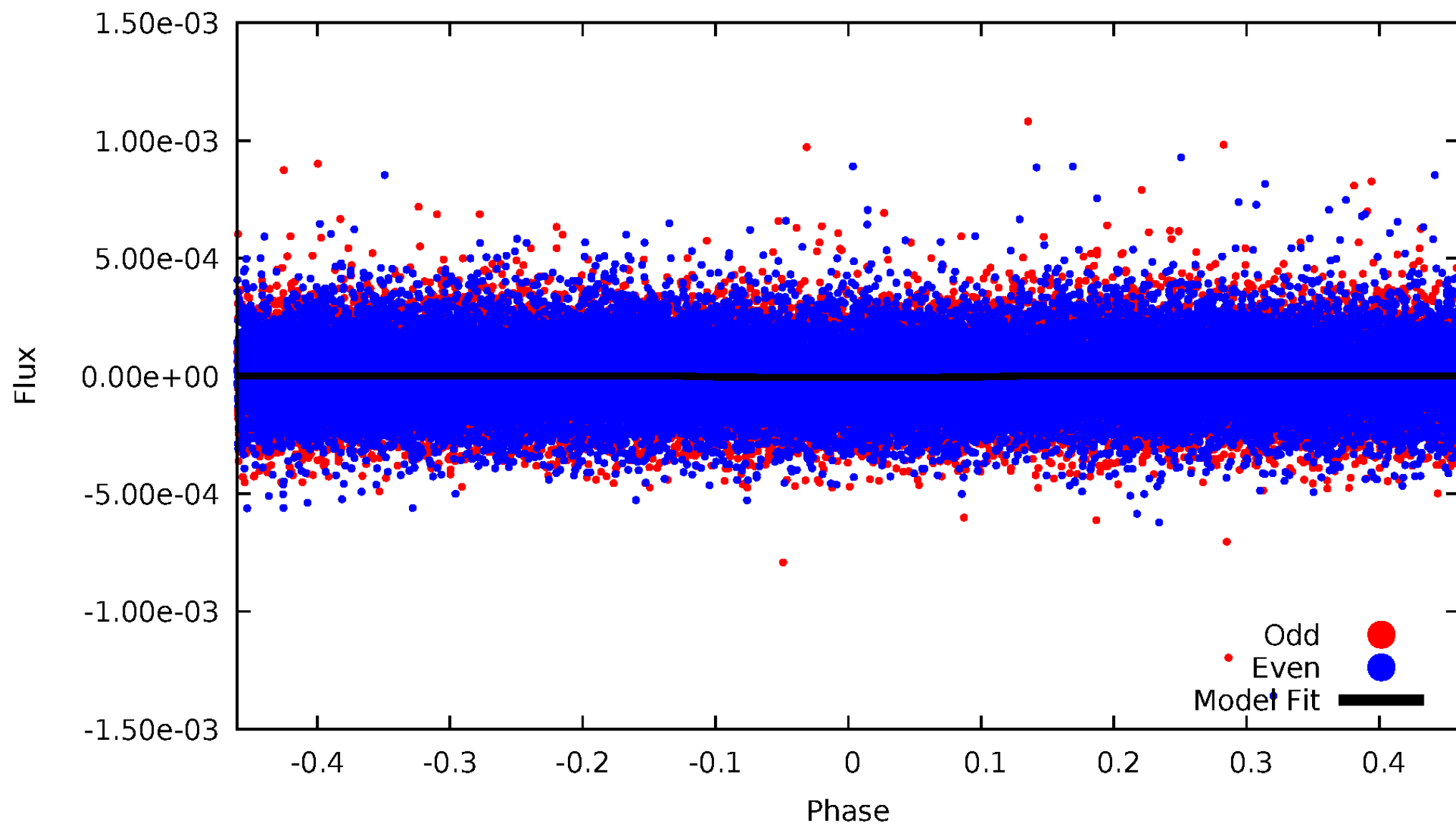


TCE 010724450-01



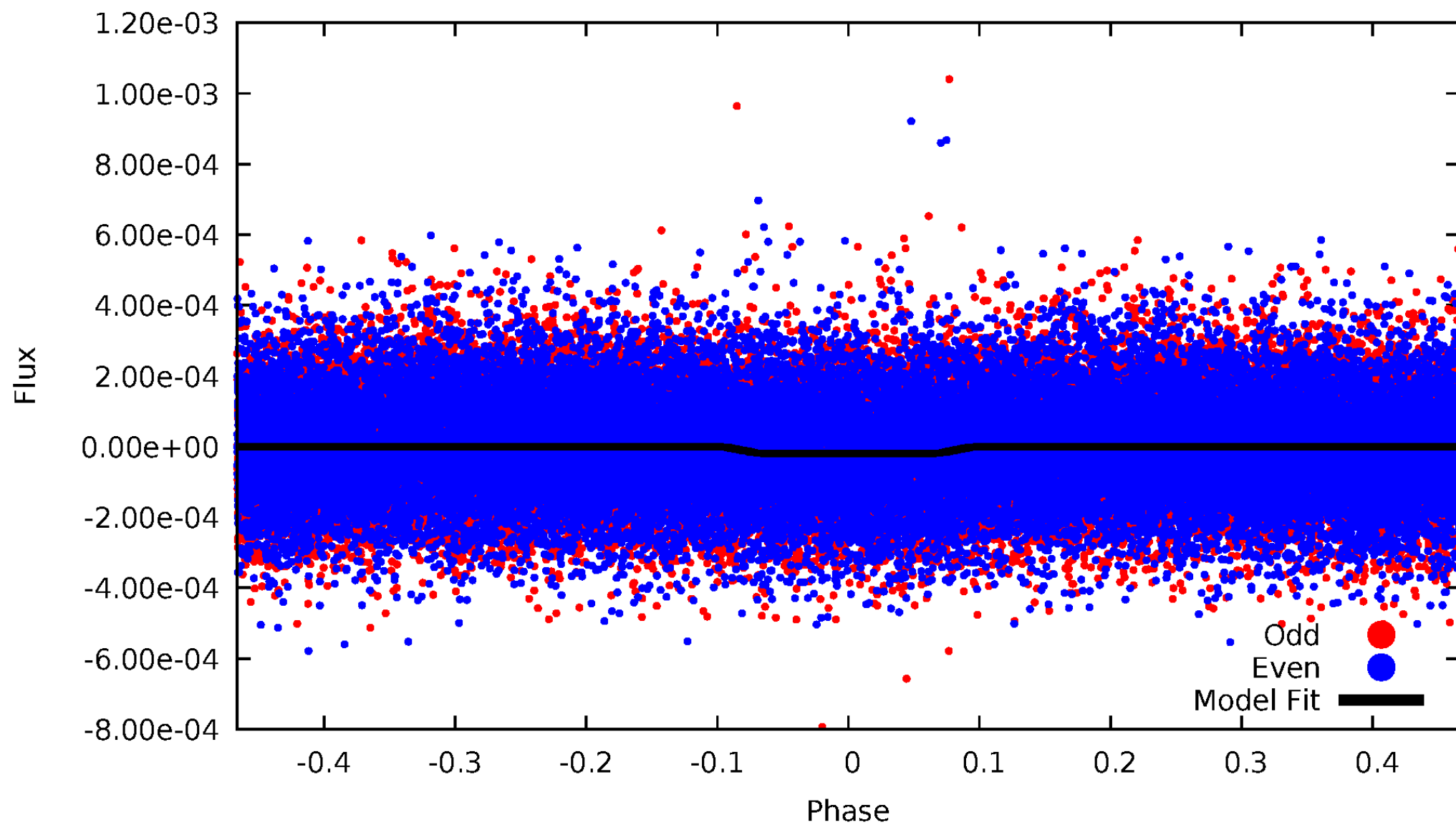
# DV Odd/Even

TCE 010724450-01



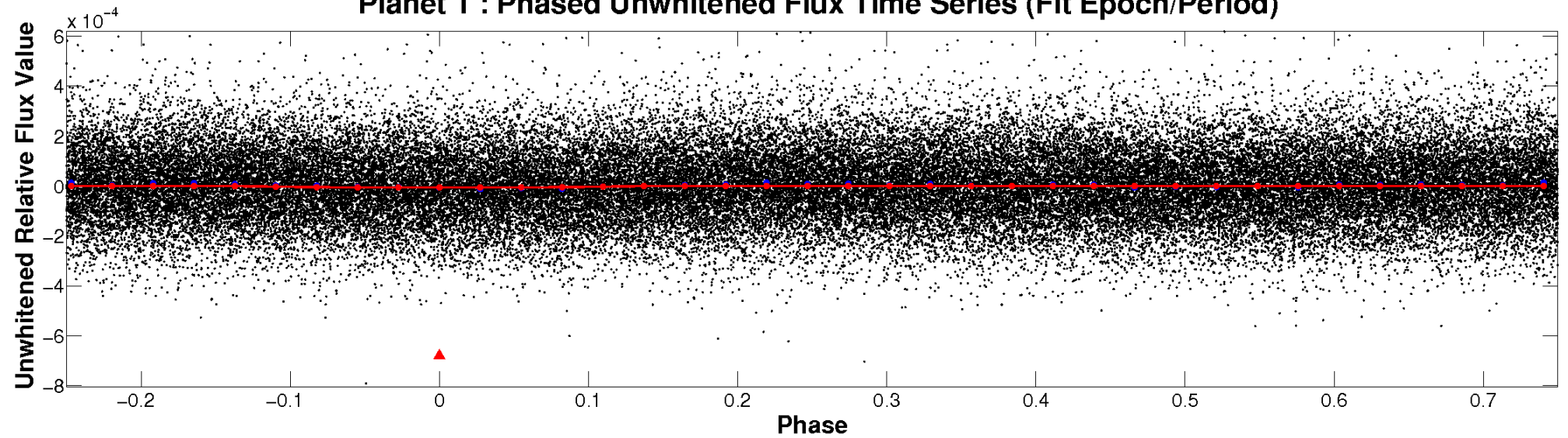
# ALT Odd/Even

TCE 010724450-01

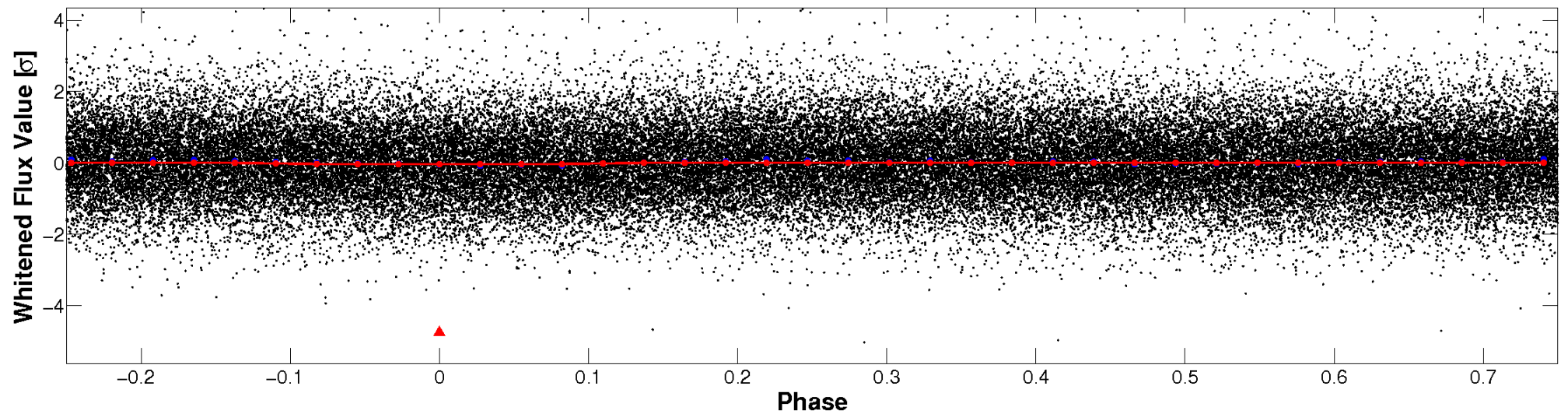


# Non-Whitened Vs. Whitened Light Curve

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



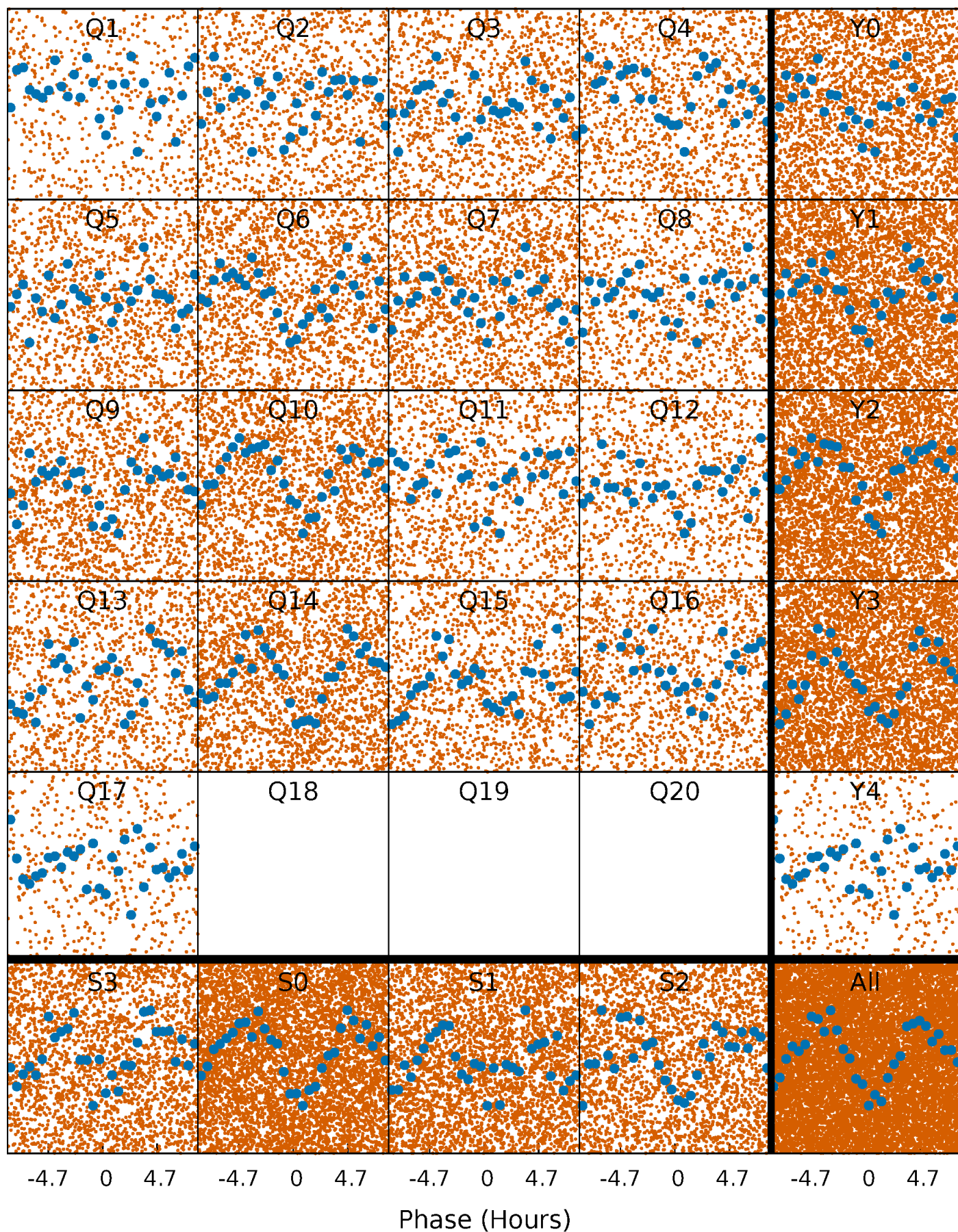
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

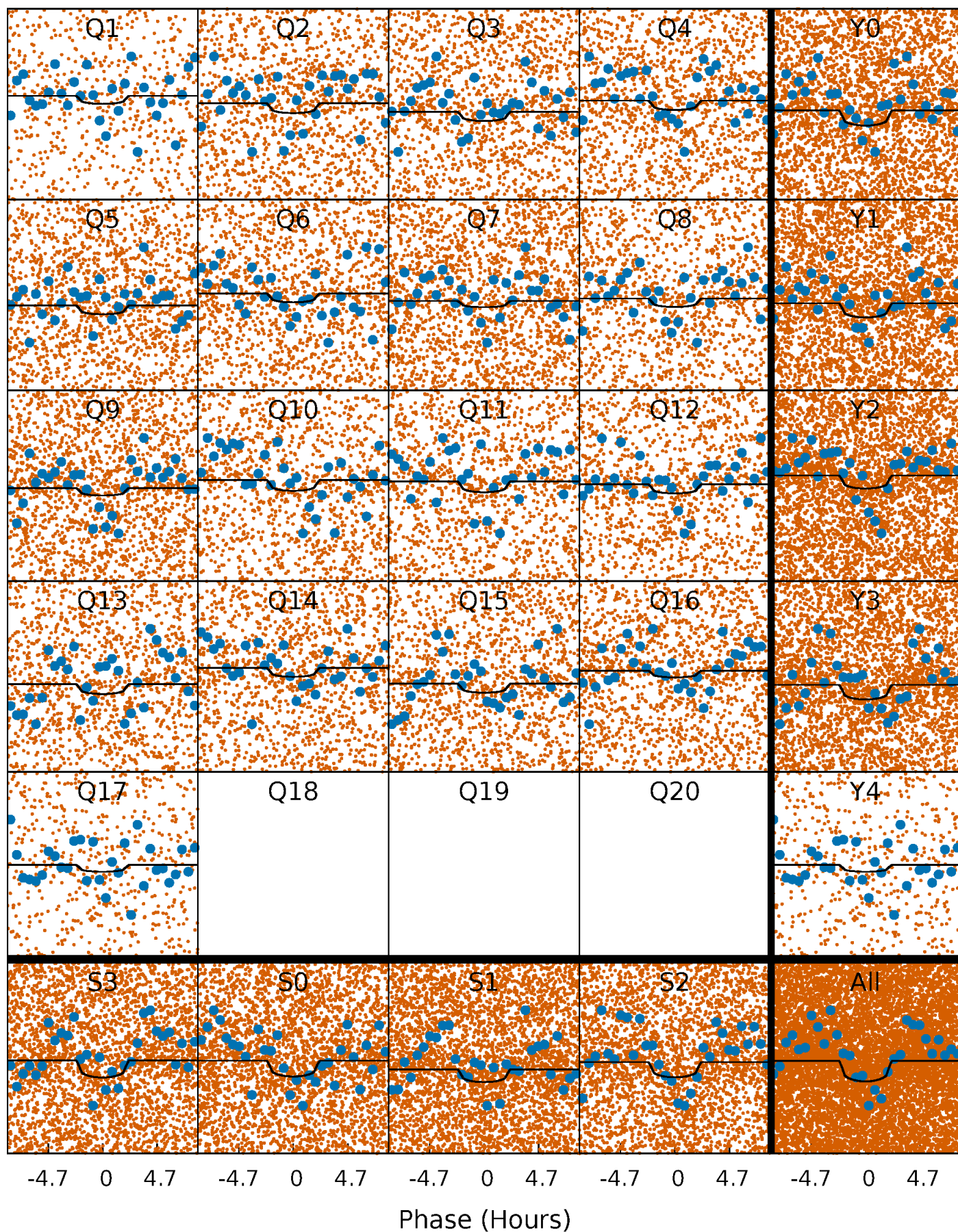
TCE 010724450-01 P= 0.745046 Days  $T_0=131.846903$  (BKJD)





# DV Quarter-Phased Transit Curves

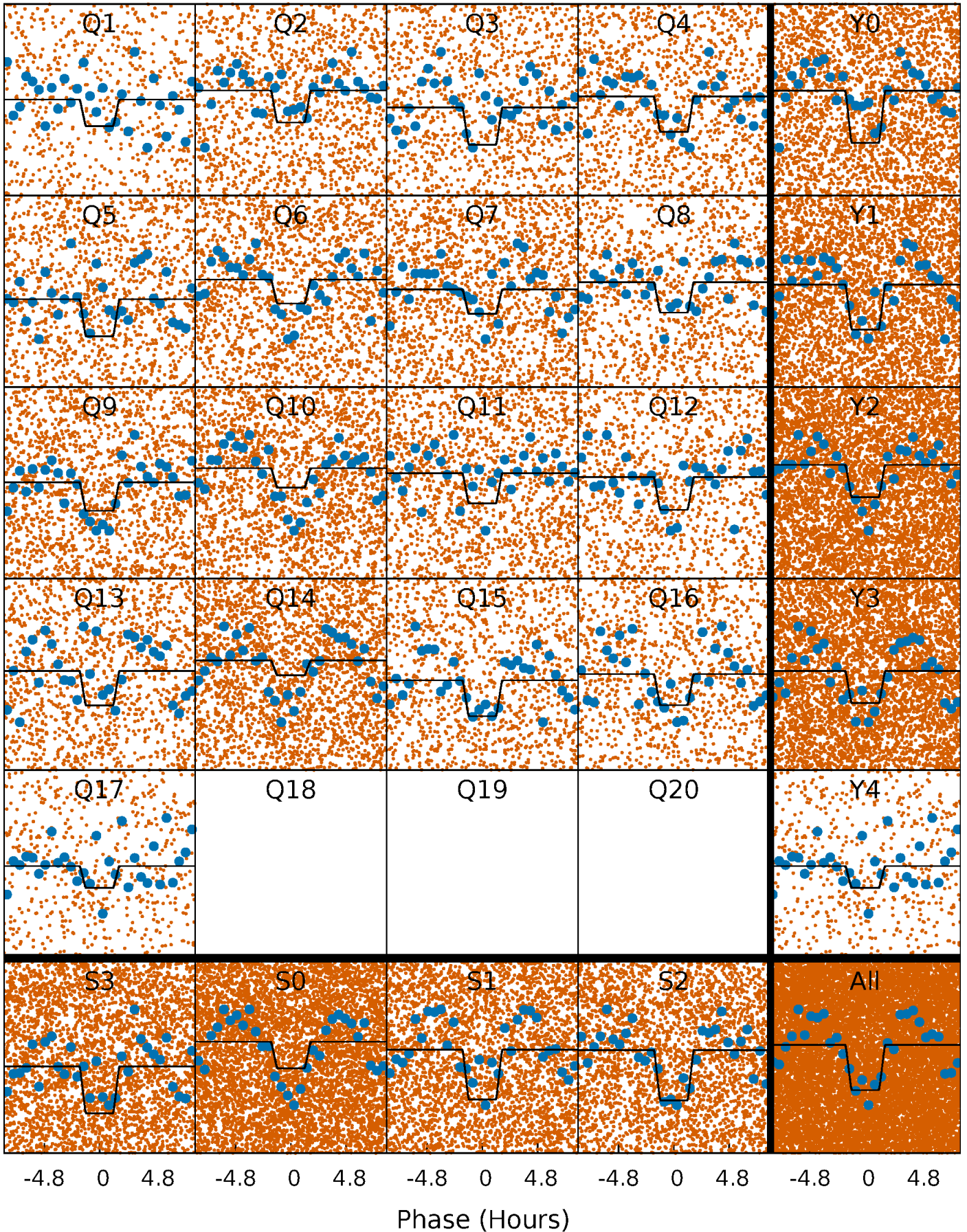
TCE 010724450-01 P= 0.745046 Days  $T_0=131.846903$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

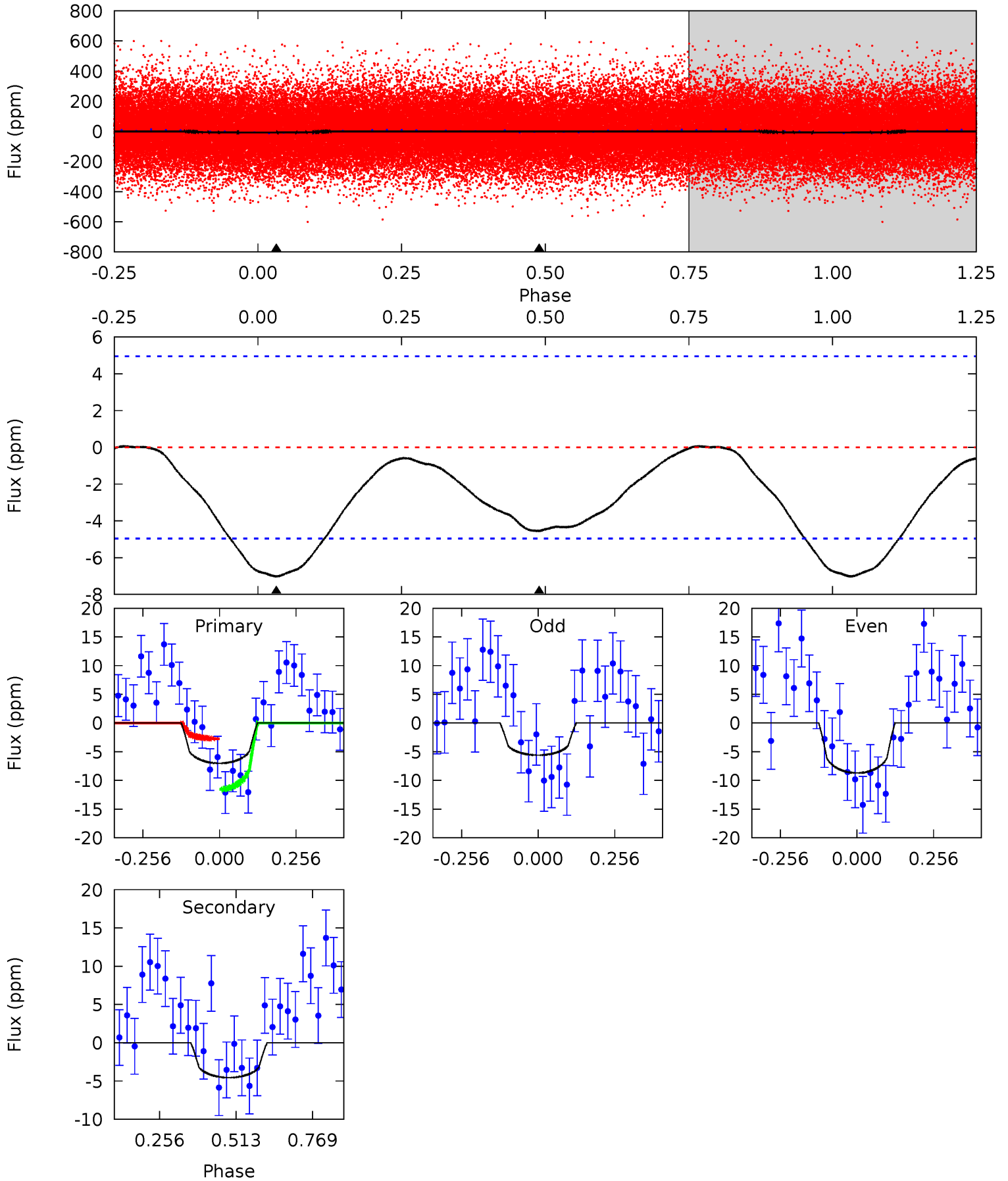
TCE 010724450-01 P= 0.745110 Days  $T_0=131.805518$  (BKJD)



# DV Model-Shift Uniqueness Test

010724450-01, P = 0.745046 Days, E = 131.101857 Days

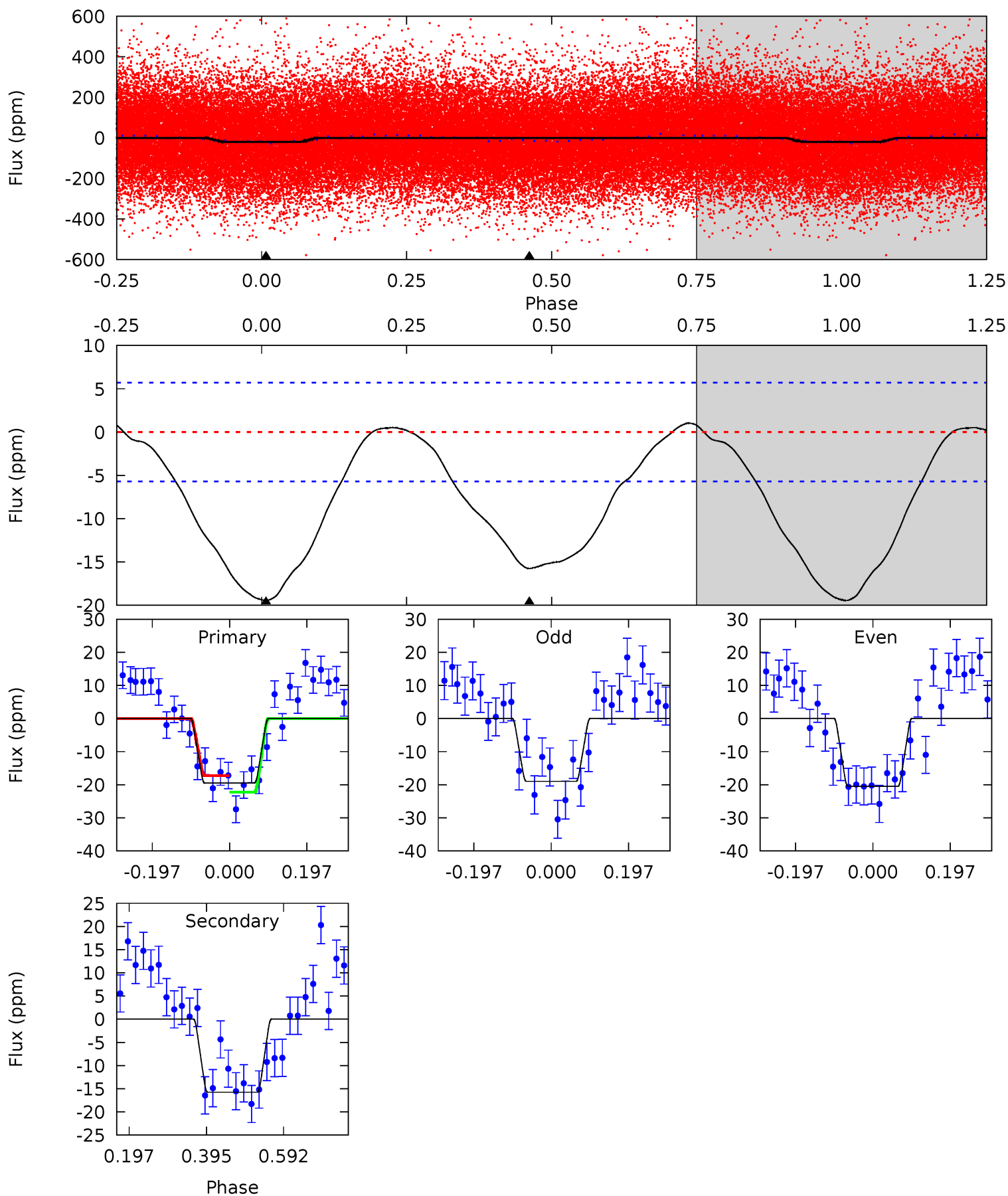
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.18	4.01	0	0	4.36	1.13	0.20	6.18	6.18	4.01	4.01	1.37	1.25	0.01	3.98



# Alt Model-Shift Uniqueness Test

010724450-01, P = 0.745110 Days, E = 131.060408 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
15.1	12.2	0	0	4.42	1.29	0.77	15.1	15.1	12.2	12.2	0.60	1.00	0.05	1.97





### Stellar Parameters For KIC 010724450

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5893^{+146}_{-190}$	$4.505^{+0.048}_{-0.192}$	$0.000^{+0.250}_{-0.300}$	$0.941^{+0.268}_{-0.089}$	$1.033^{+0.117}_{-0.140}$	$1.748^{+0.434}_{-0.846}$
	+2%/-3%	+1%/-4%	+inf%/-inf%	+28%/-9%	+11%/-14%	+25%/-48%
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 010724450-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-5 \pm 1$	$0.27^{+0.16}_{-0.15}$	$2807^{+204}_{-120}$	$5407^{+2864}_{-1038}$	$8.958^{+35.772}_{-5.569}$
Alt.	$-16 \pm 1$	$0.48^{+0.18}_{-0.15}$	$2819^{+199}_{-124}$	$5518^{+1174}_{-700}$	$9.735^{+11.353}_{-4.407}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

## DV Centroid Data

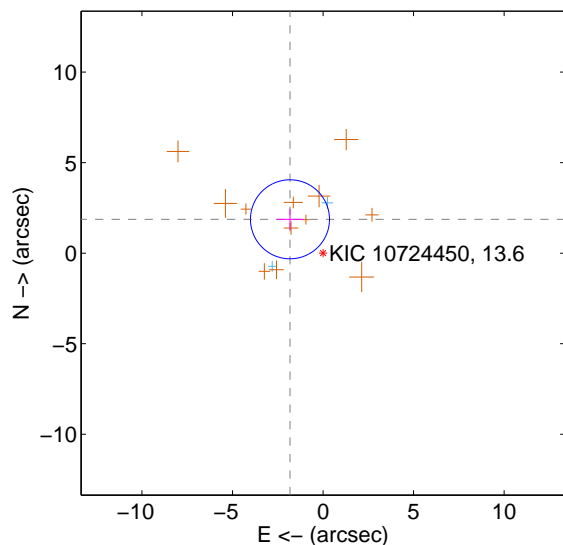
Supplemental centroid analysis for 010724450-01. Kepler magnitude: 13.60. Transit SNR 3.94

There are 2 quarters with good PRF difference image offsets

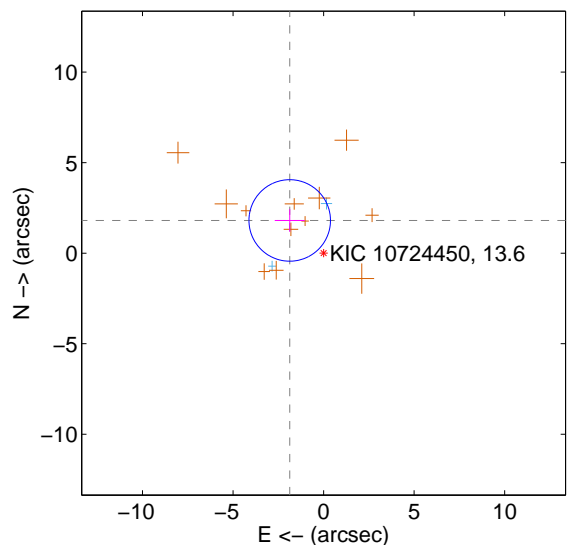
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.614 \pm 0.727$	$3.59$	$1.825 \pm 0.752$	$1.871 \pm 0.582$
PRF-fit source offset from KIC position	$2.601 \pm 0.750$	$3.47$	$1.870 \pm 0.828$	$1.808 \pm 0.624$
photometric centroid source offset	$1.76 \pm 3.12$	$0.56$	$-0.78 \pm 3.56$	$-1.58 \pm 3.01$

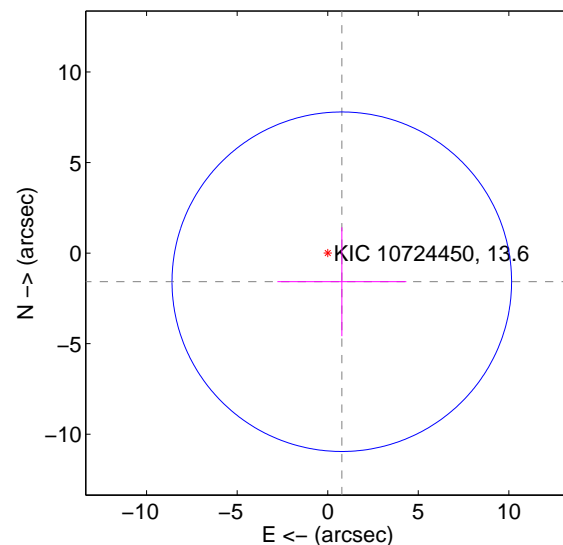
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

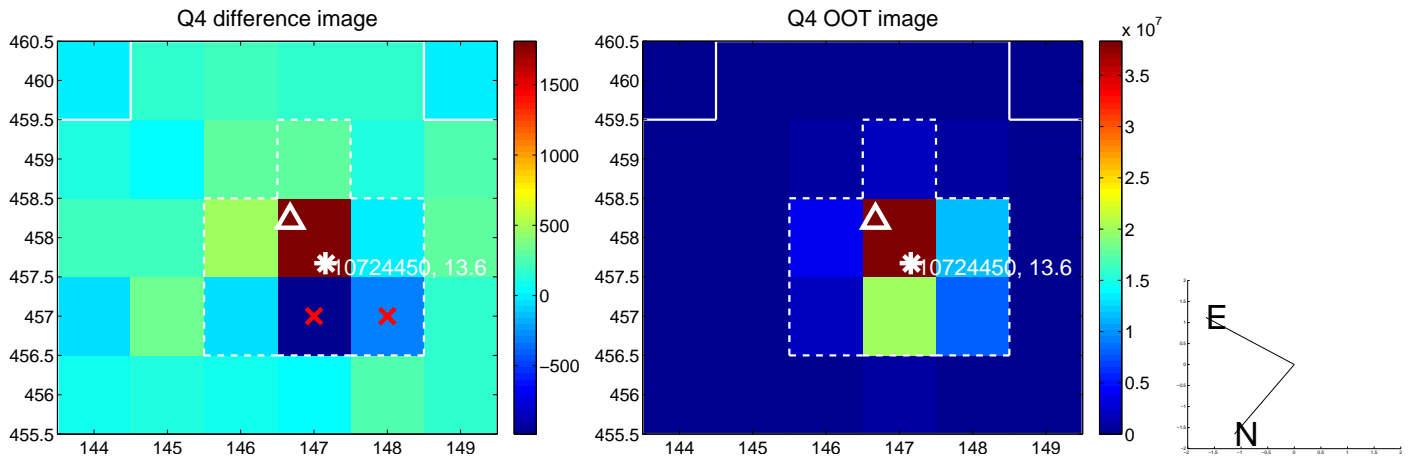
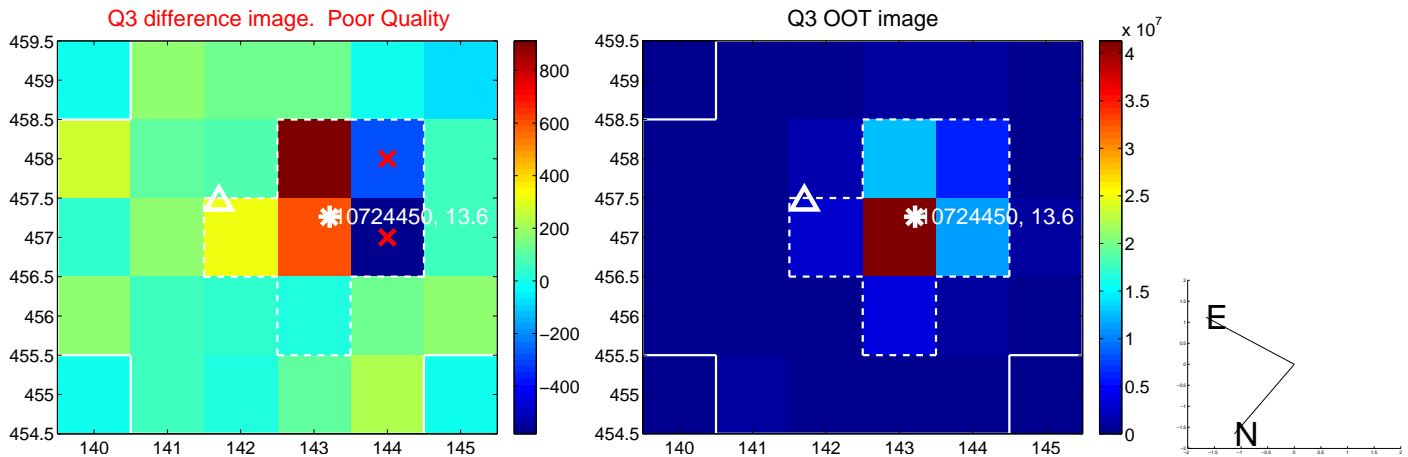
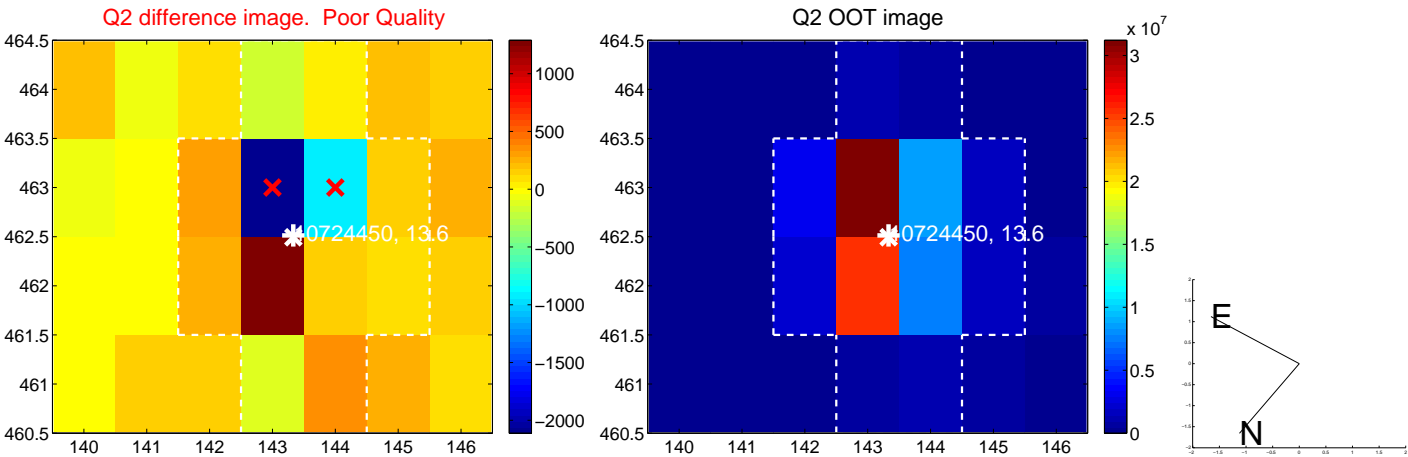
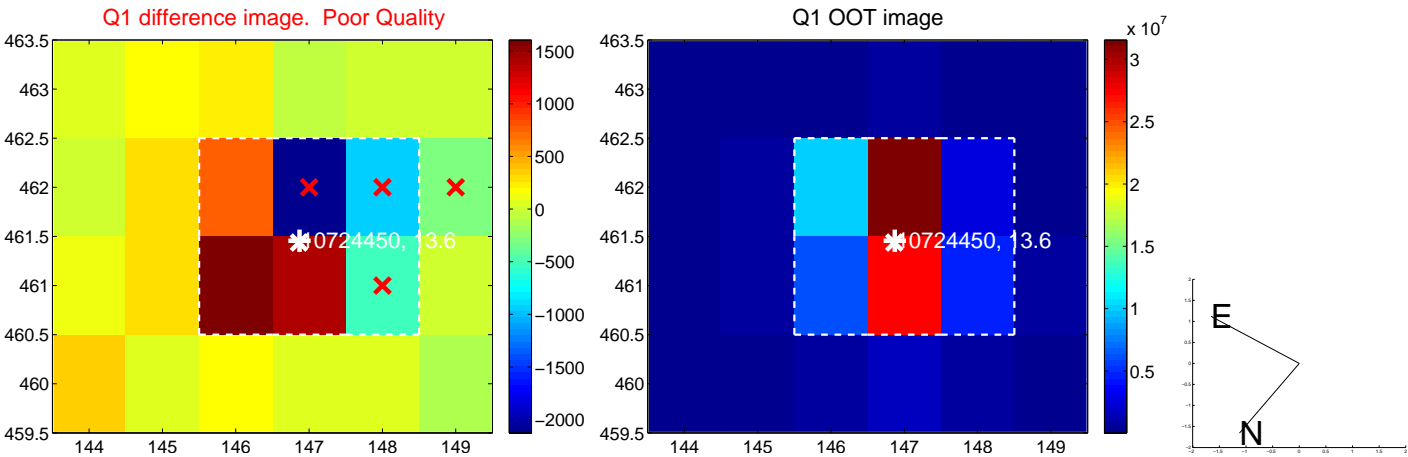


offset from photometric centroids

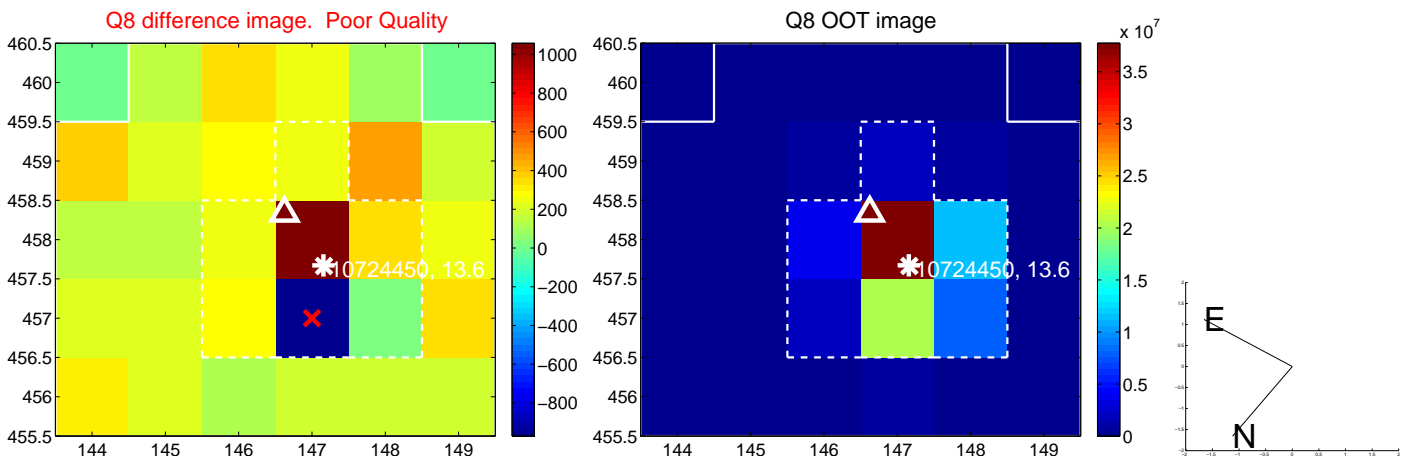
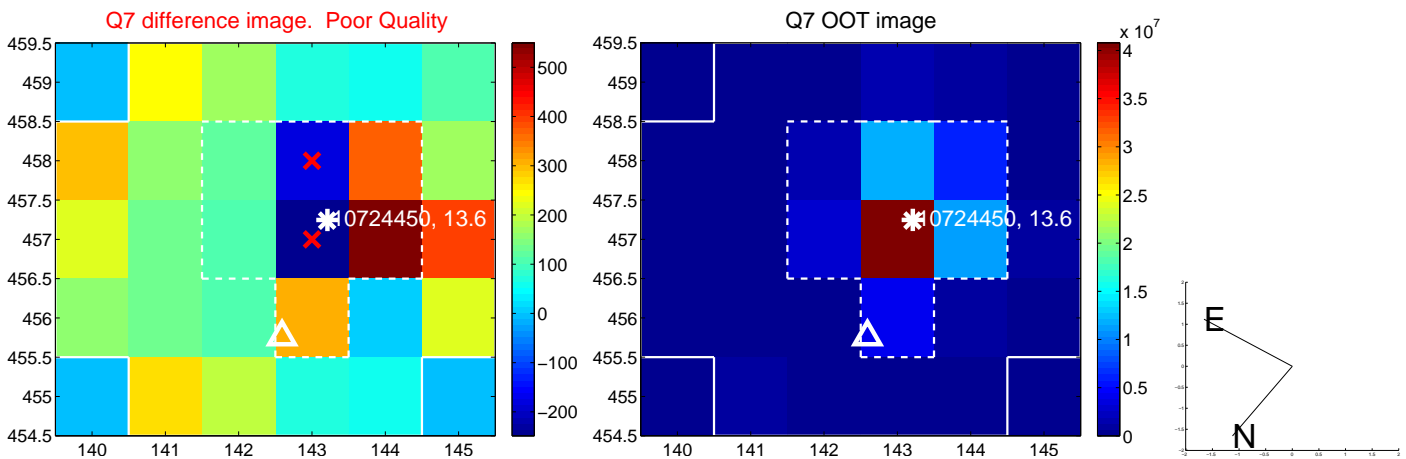
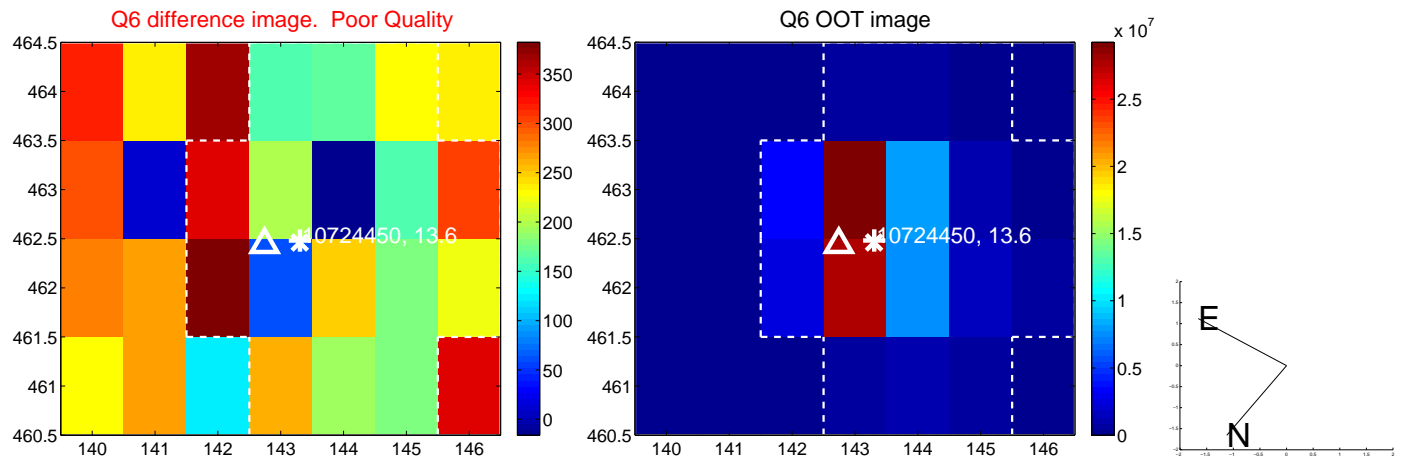
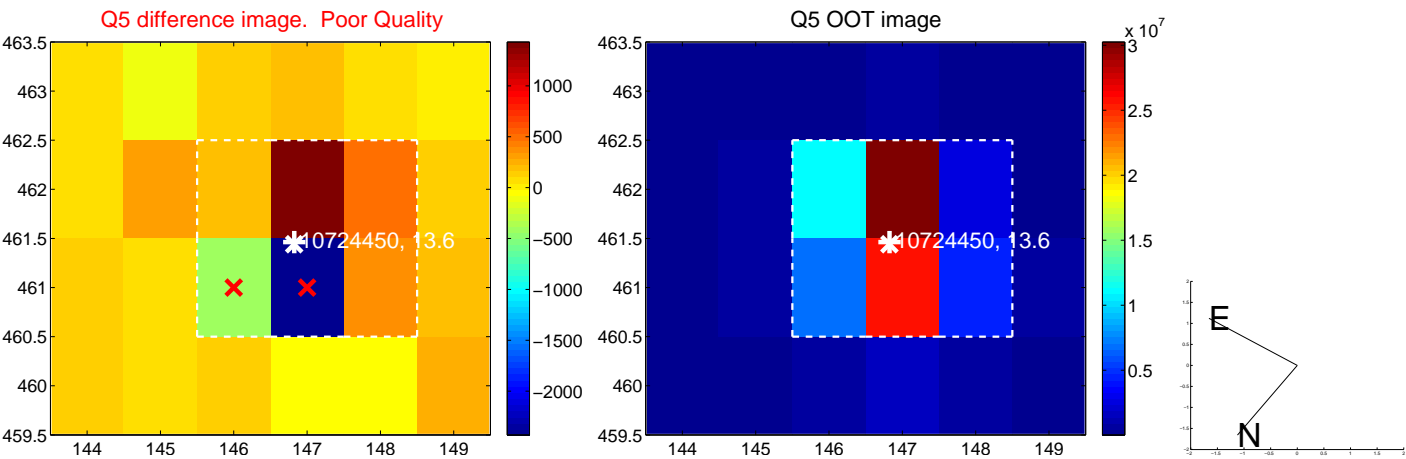


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

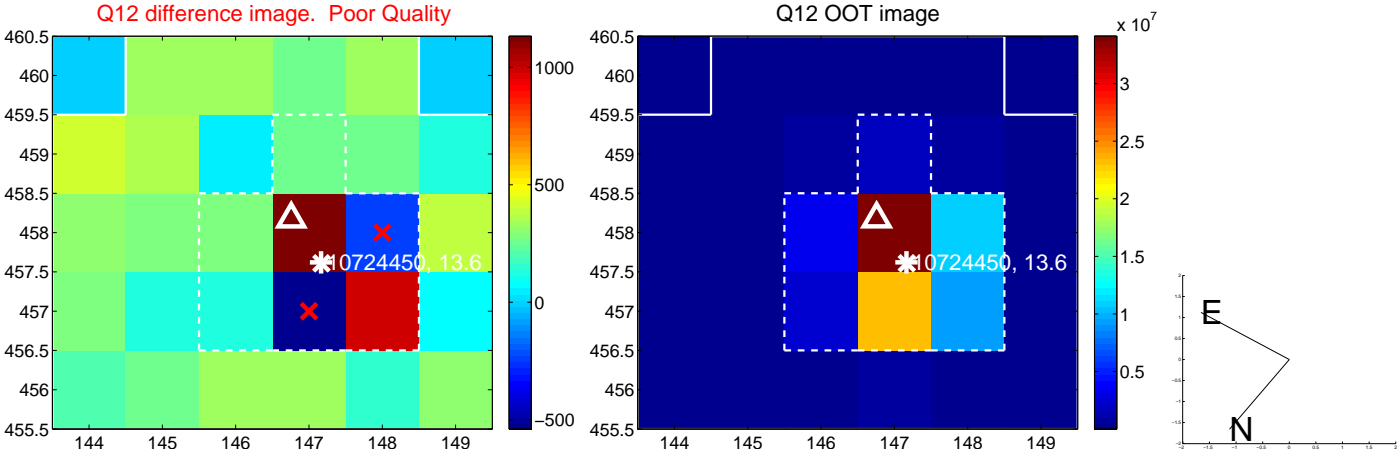
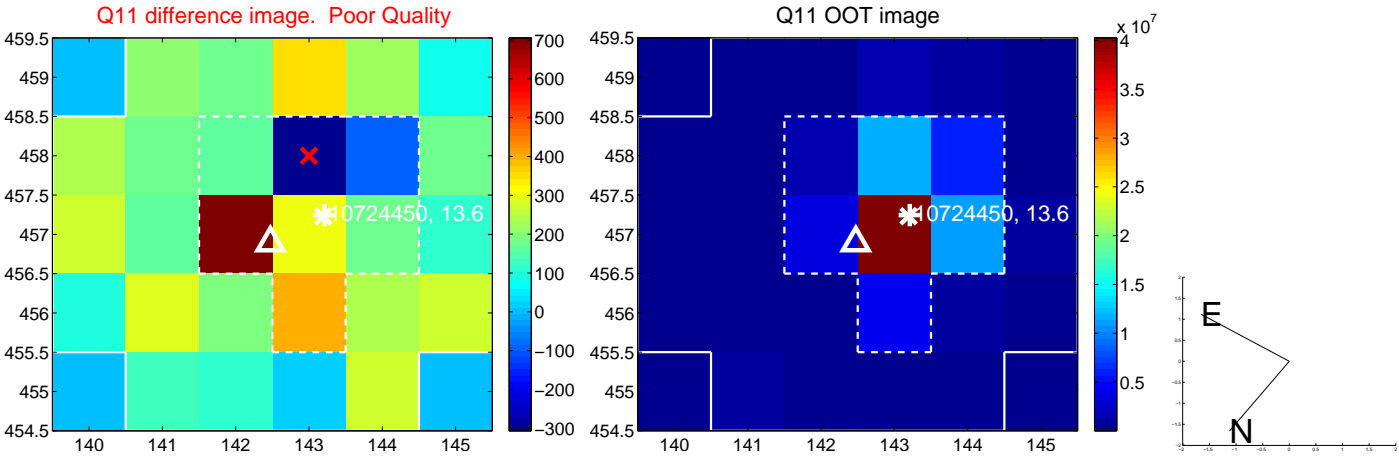
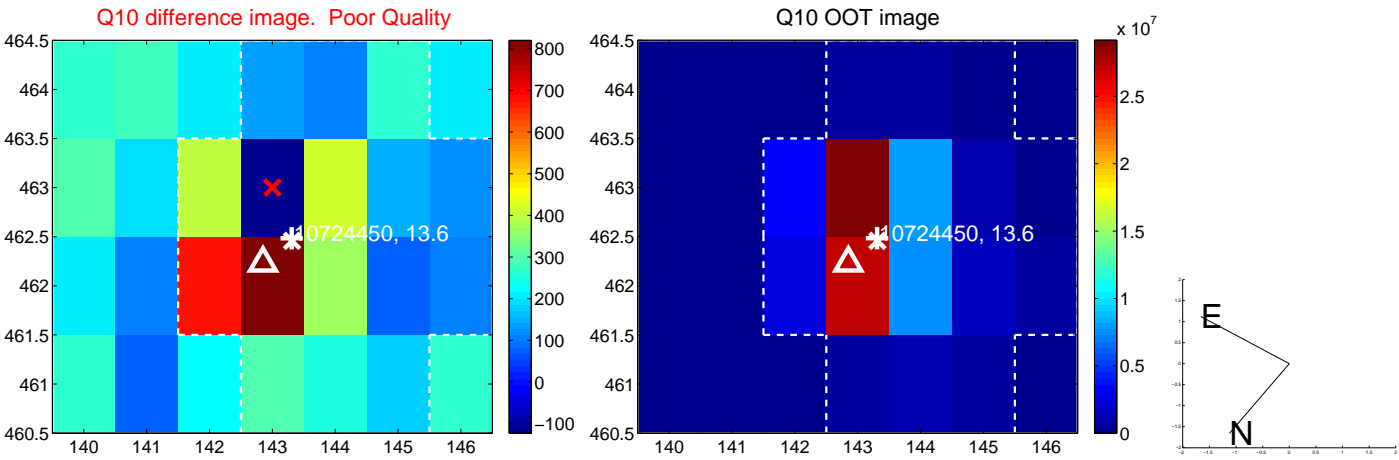
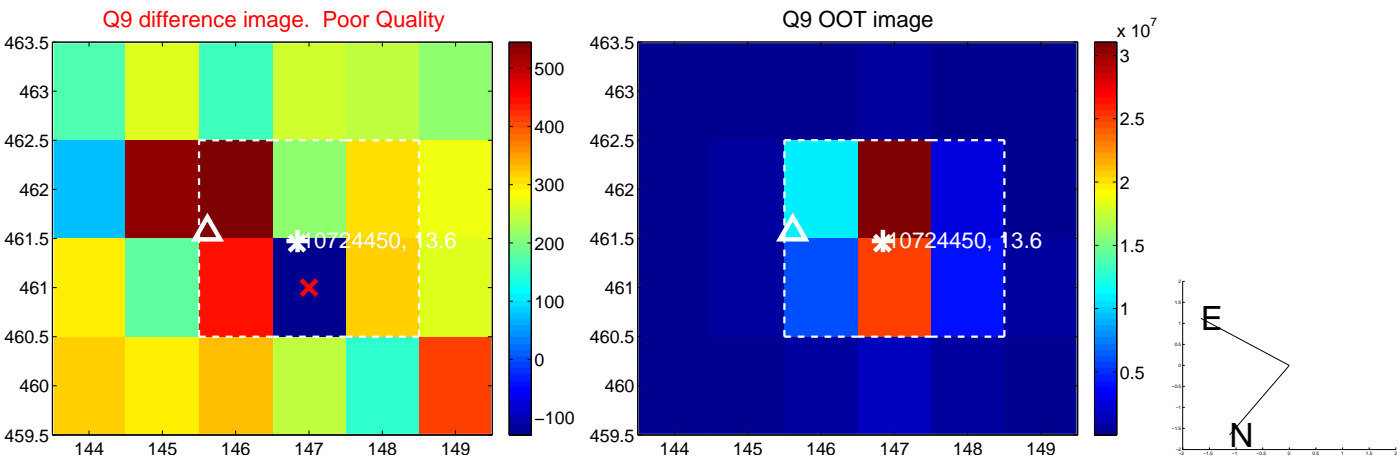


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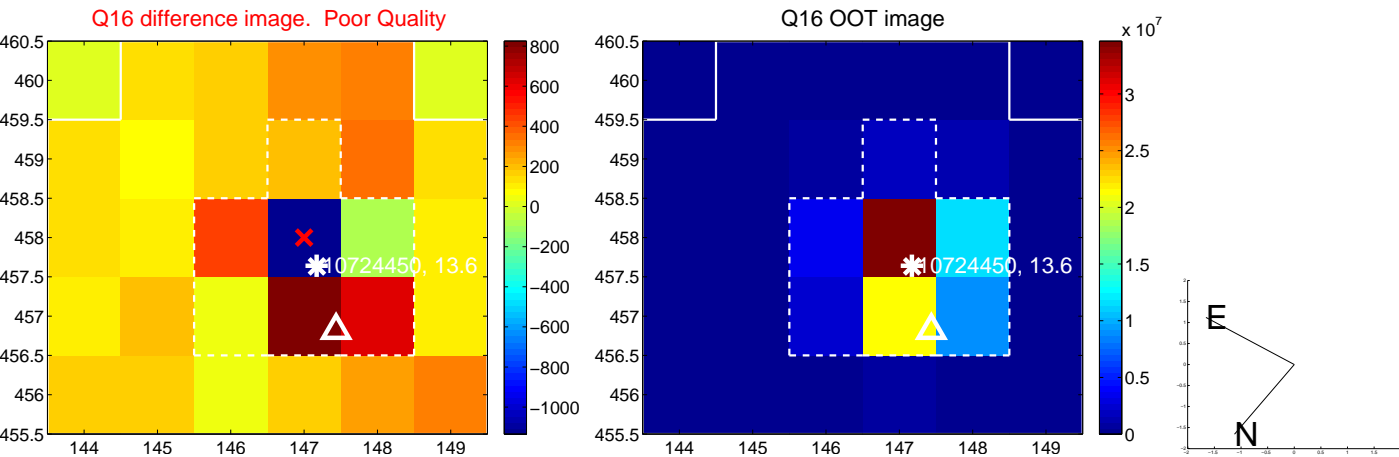
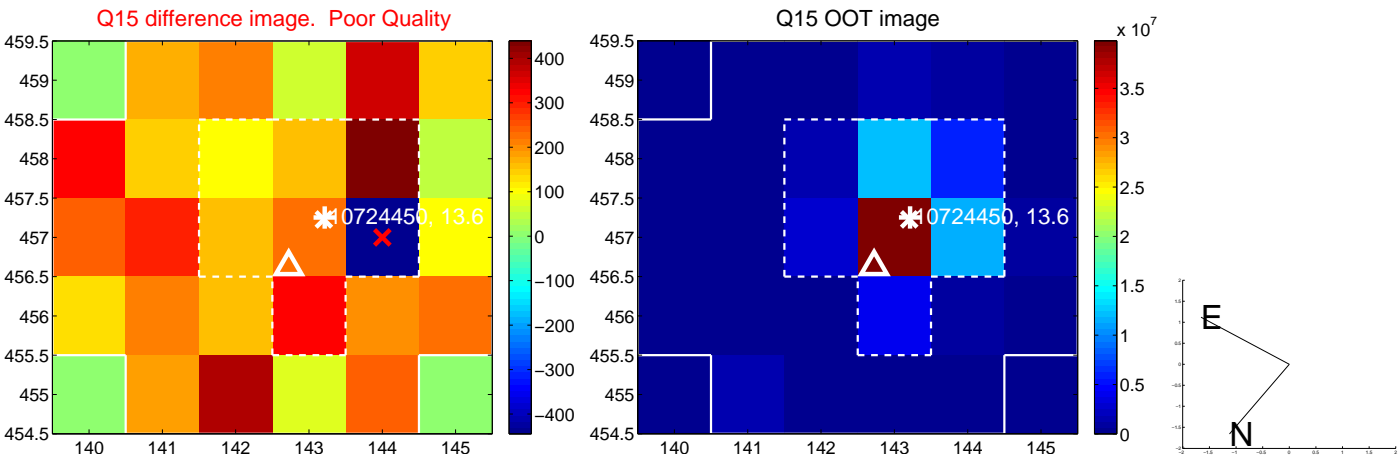
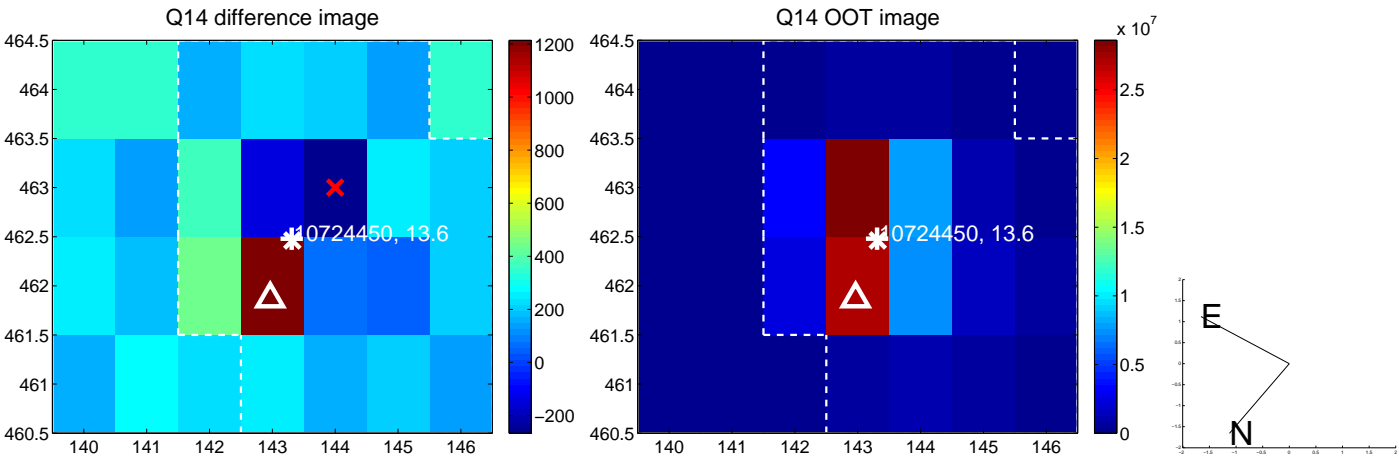
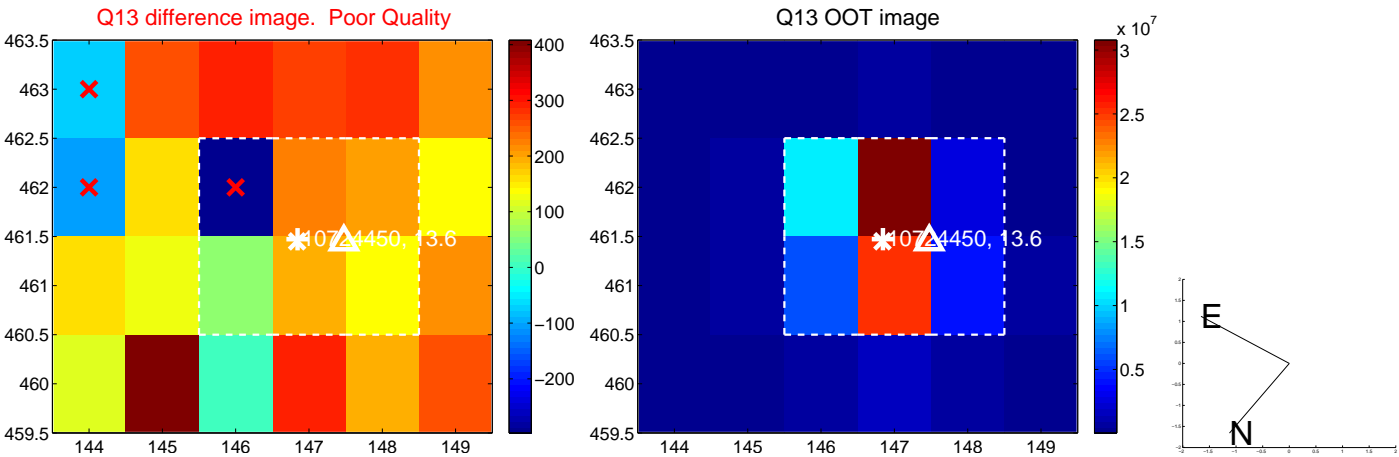




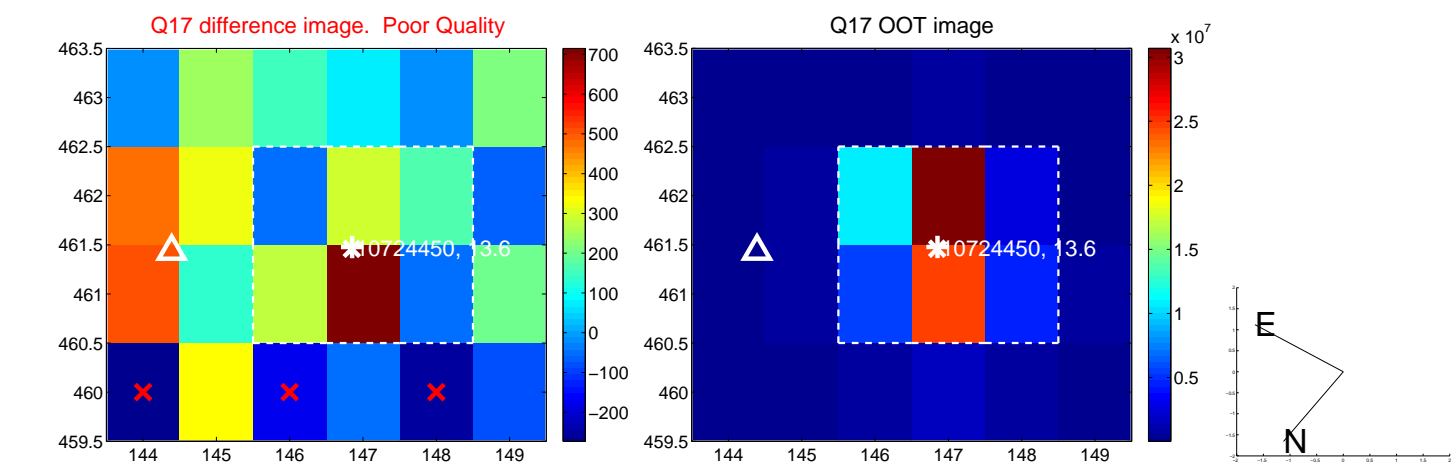
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



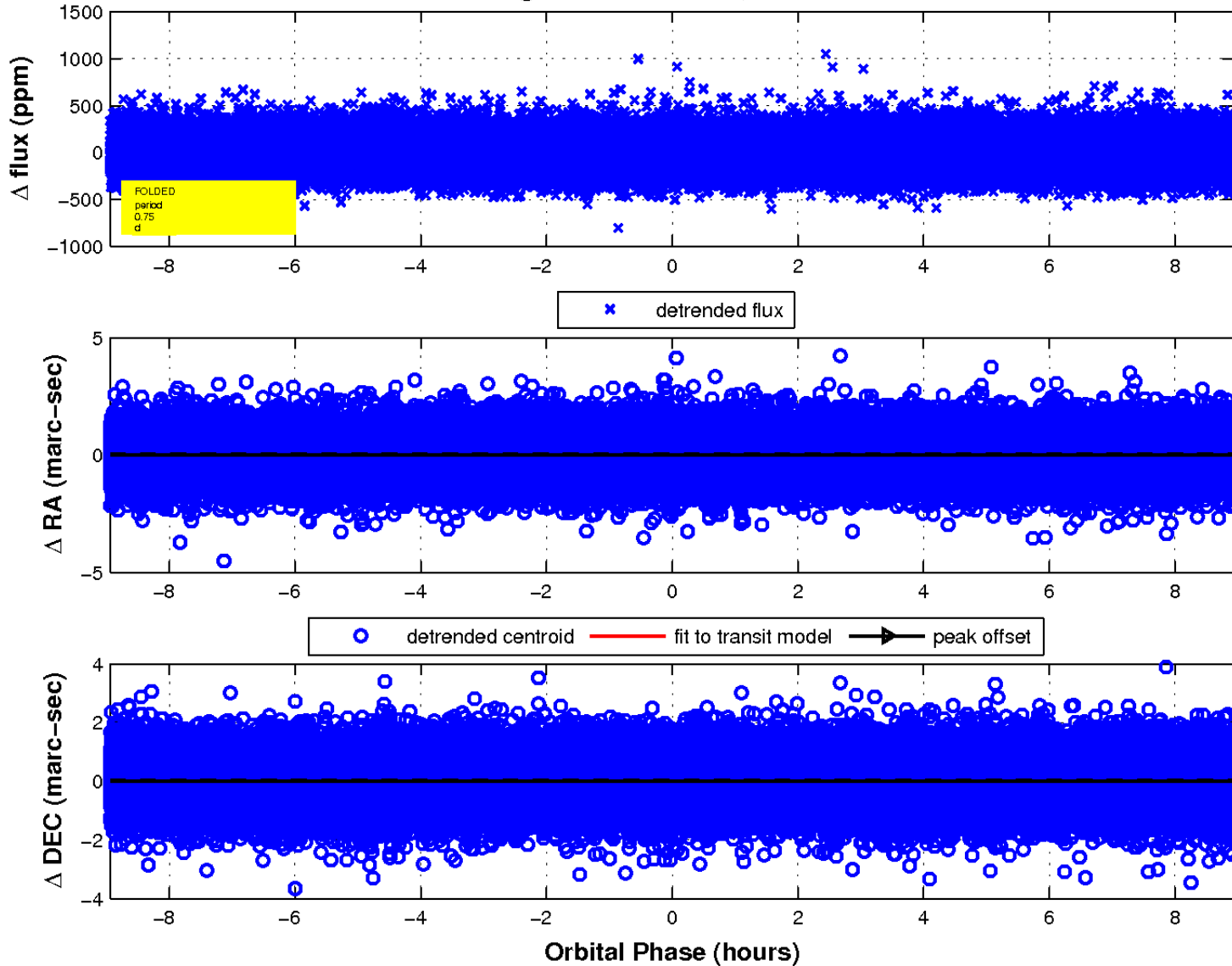
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

