

# KIC 010415502

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010415502-01	OBS	No	0.739390	131.815007	18.3	2.570	10.2	6.3	1.52	7216	0.75	16612.32

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010415502-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

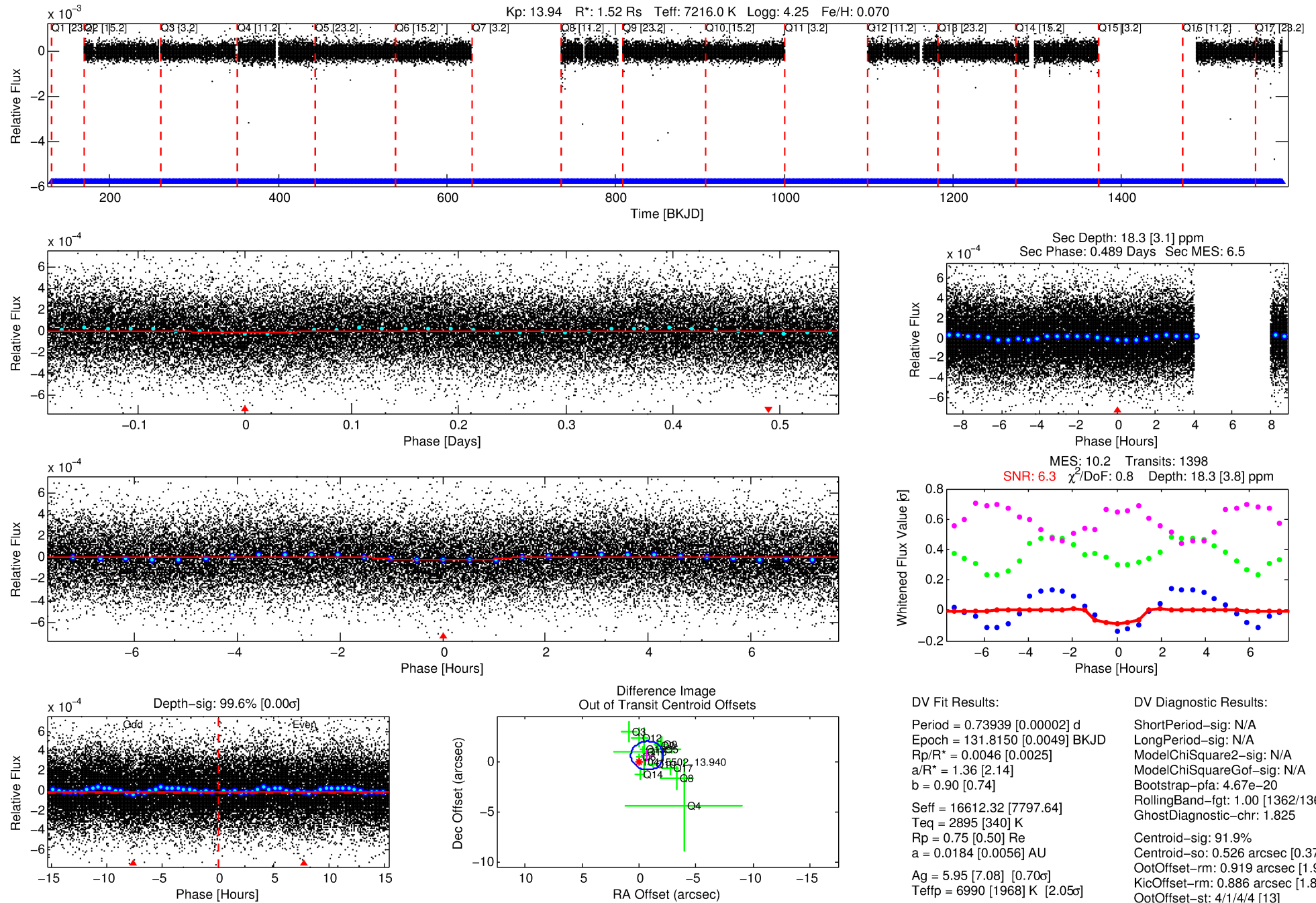
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010415502-01

No Significant Match Found

# DV One-Page Summary

KIC: 10415502 Candidate: 1 of 1 Period: 0.739 d



## DV Fit Results:

Period = 0.73939 [0.00002] d  
Epoch = 131.8150 [0.0049] BKJD  
Rp/R\* = 0.0046 [0.0025]  
a/R\* = 1.36 [2.14]  
b = 0.90 [0.74]  
Seff = 16612.32 [7797.64]  
Teq = 2895 [340] K  
Rp = 0.75 [0.50] Re  
a = 0.0184 [0.0056] AU  
Ag = 5.95 [7.08] [0.70 $\sigma$ ]  
Teffp = 6990 [1968] K [2.05 $\sigma$ ]

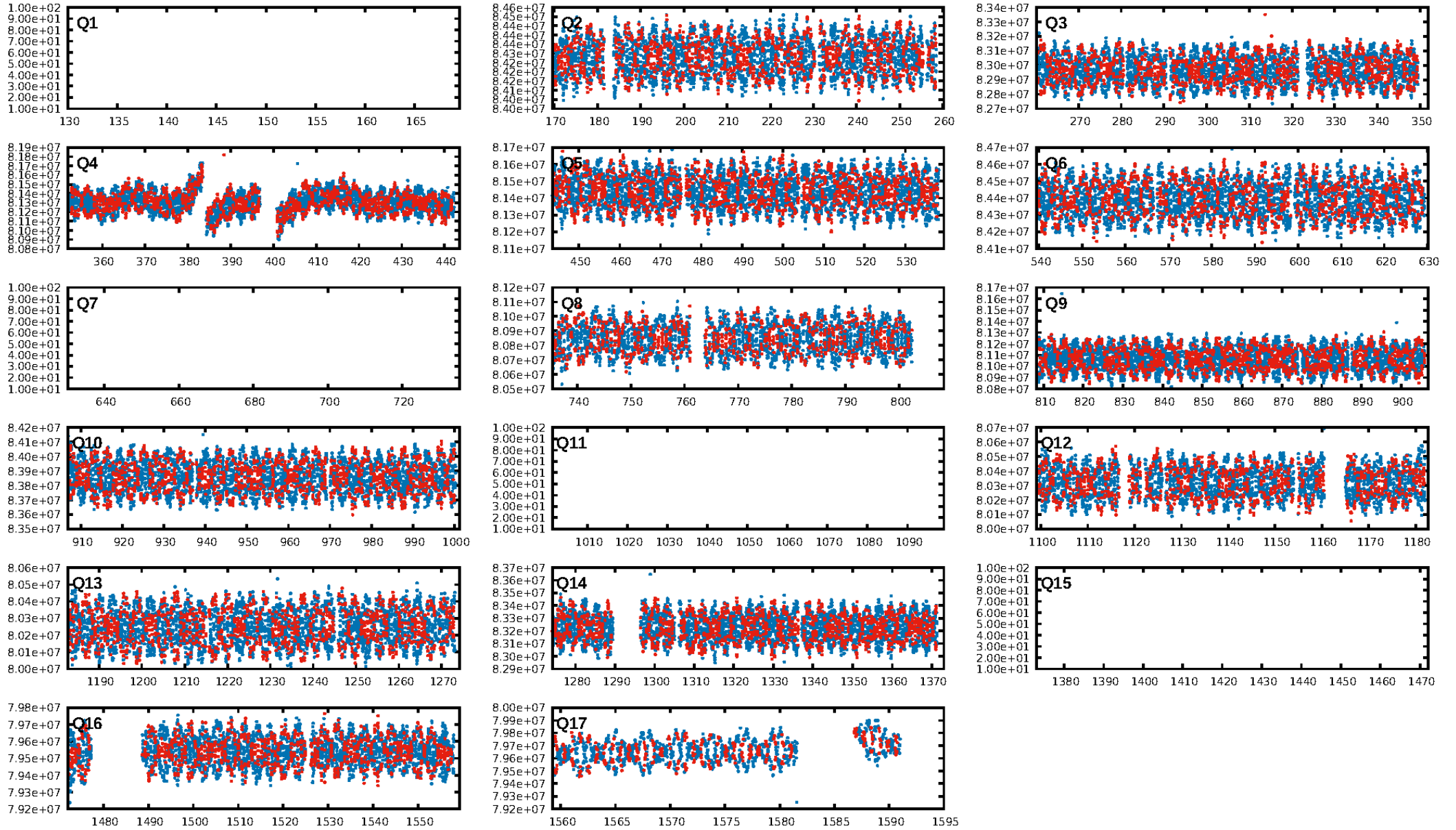
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.67e-20  
RollingBand-fgt: 1.00 [1362/1362]  
GhostDiagnostic-chr: 1.825  
Centroid-sig: 91.9%  
Centroid-so: 0.526 arcsec [0.37 $\sigma$ ]  
OotOffset-rm: 0.919 arcsec [1.92 $\sigma$ ]  
KicOffset-rm: 0.886 arcsec [1.85 $\sigma$ ]  
OotOffset-st: 4/1/4/4 [13]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 1.00 [13/13]

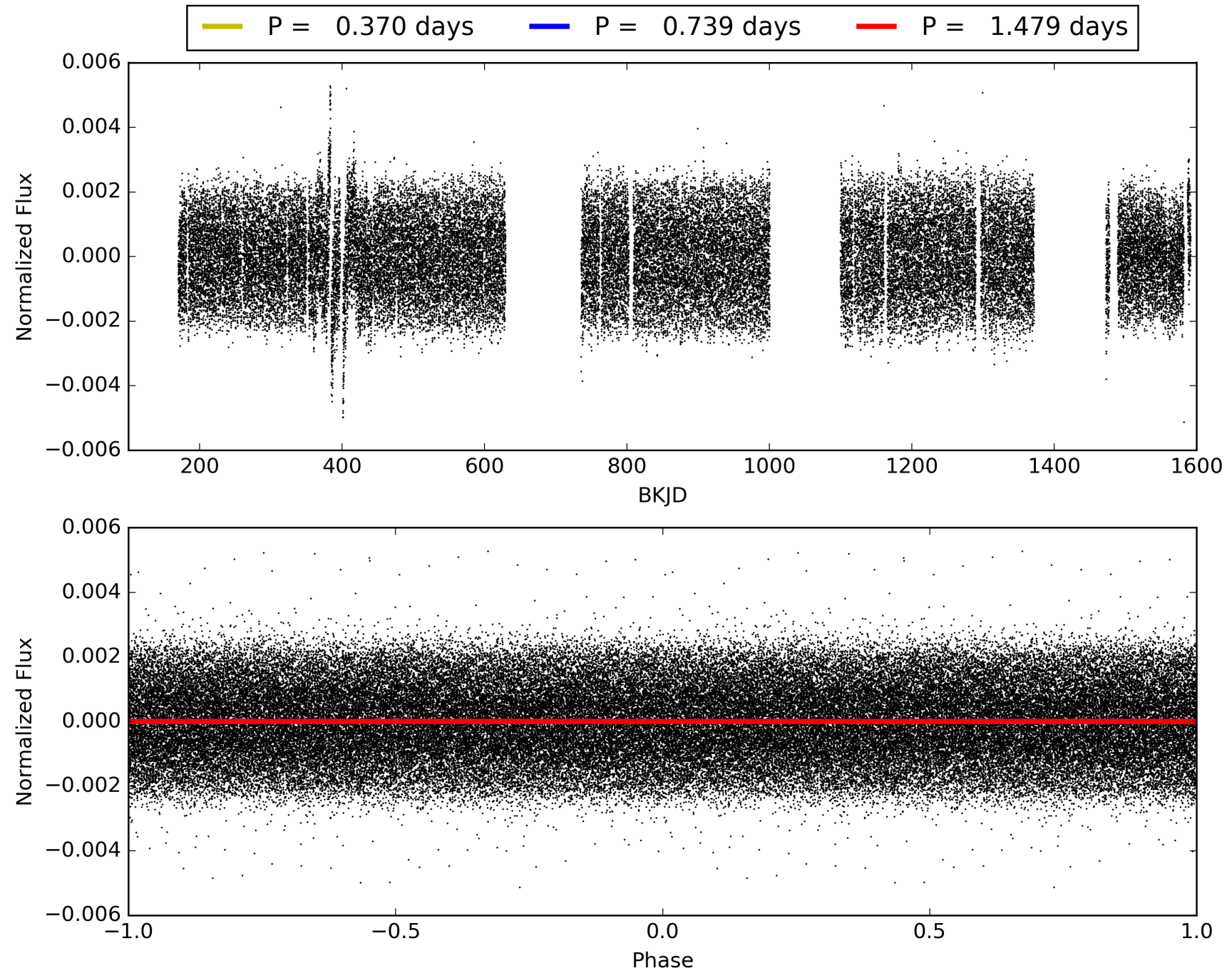
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:02:11 Z

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

# TCE 010415502-01, PDC Light Curves

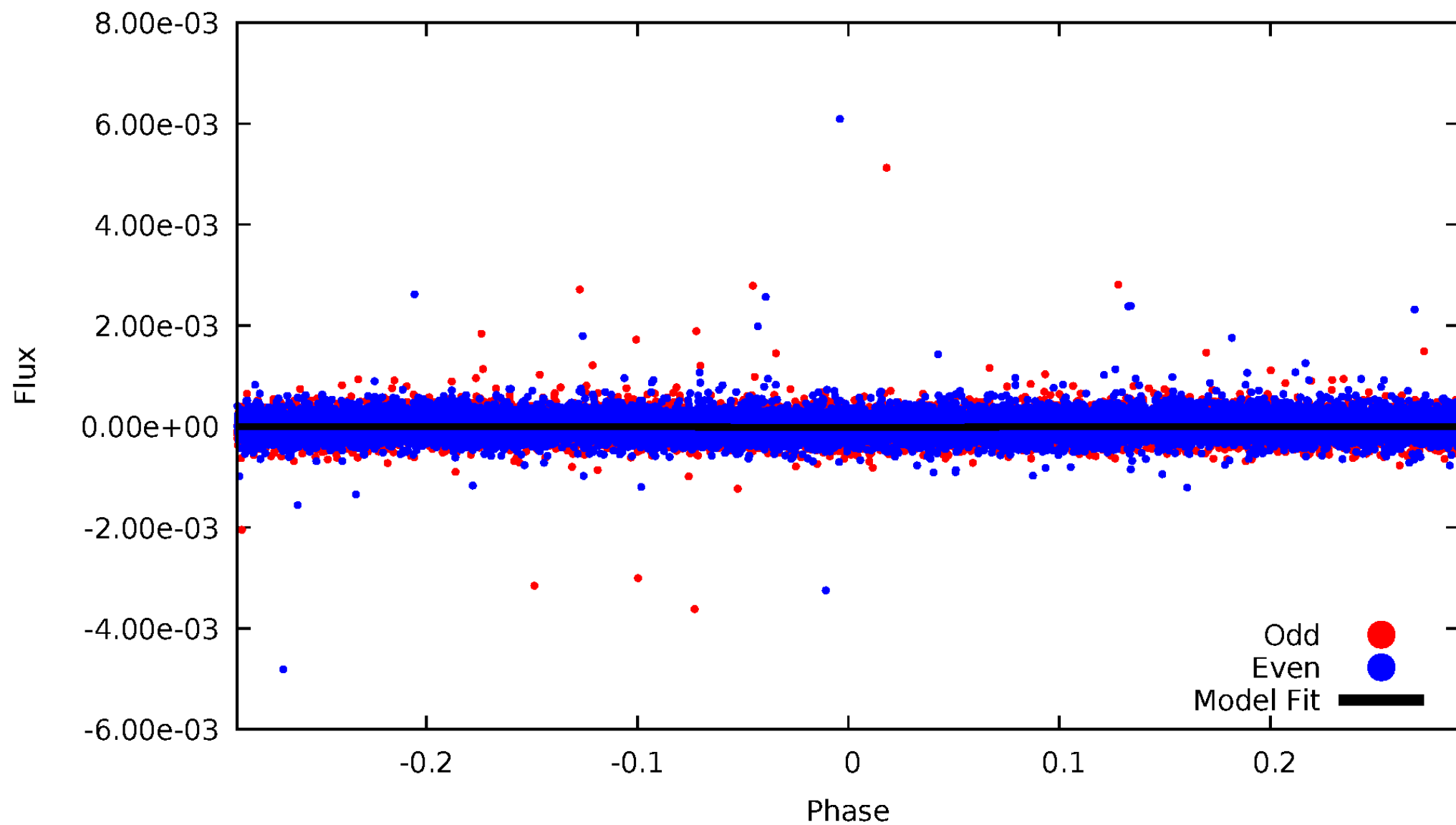


TCE 010415502-01



# DV Odd/Even

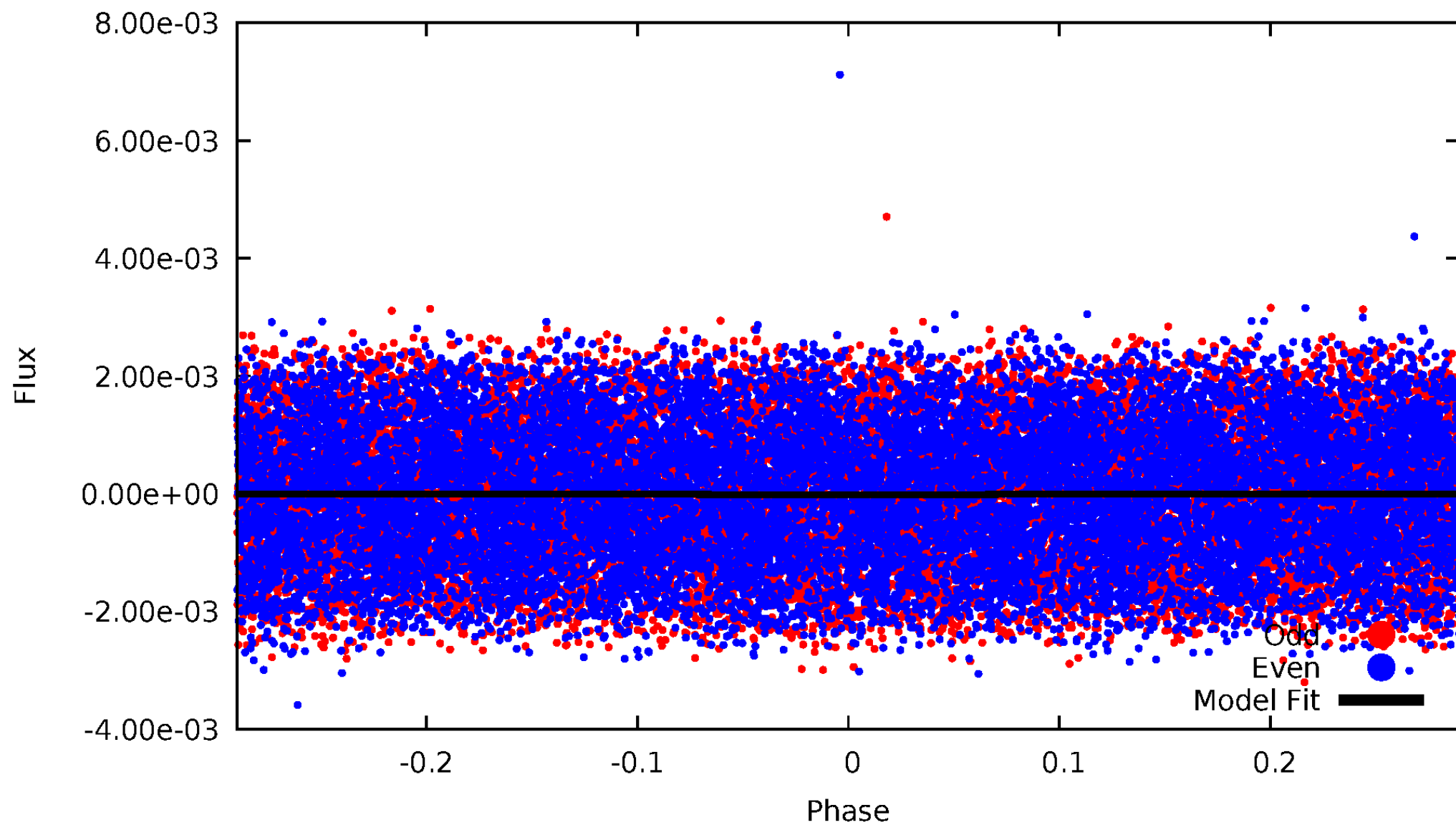
TCE 010415502-01





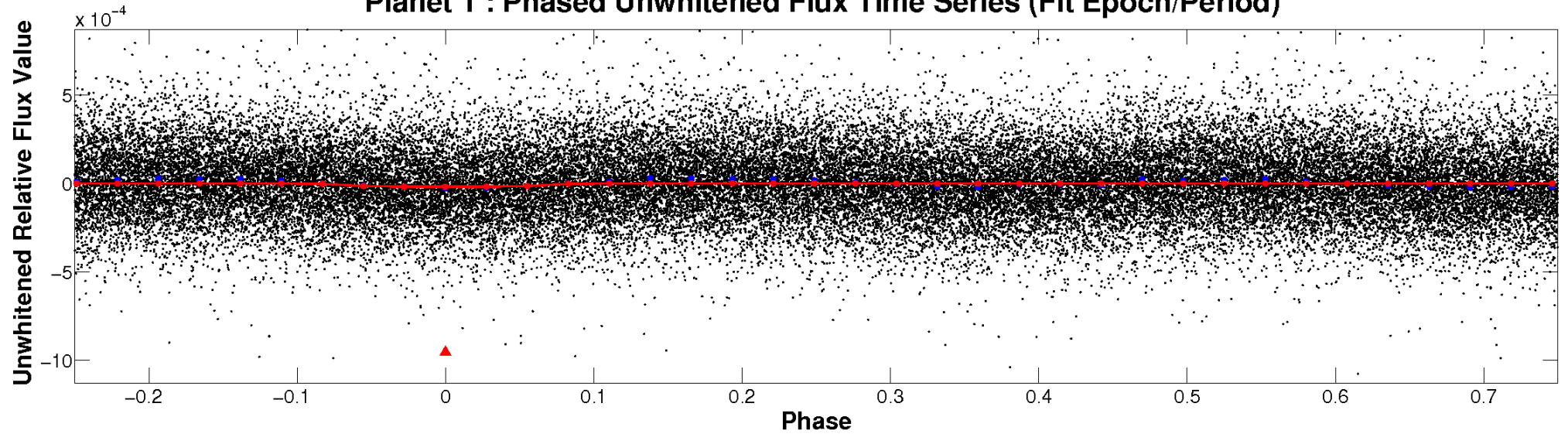
# ALT Odd/Even

TCE 010415502-01

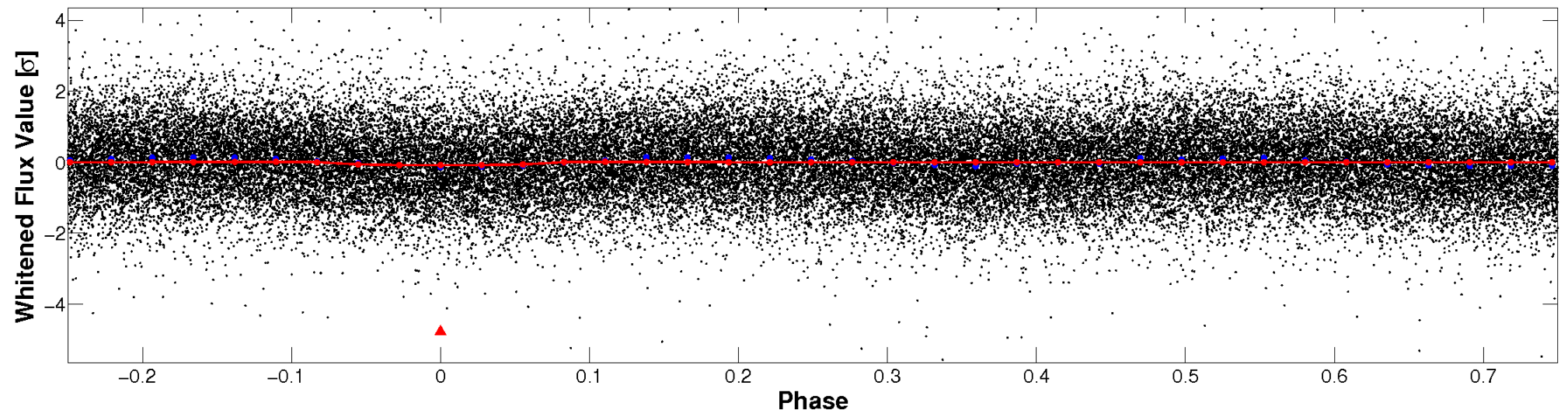


# Non-Whitened Vs. Whitened Light Curve

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

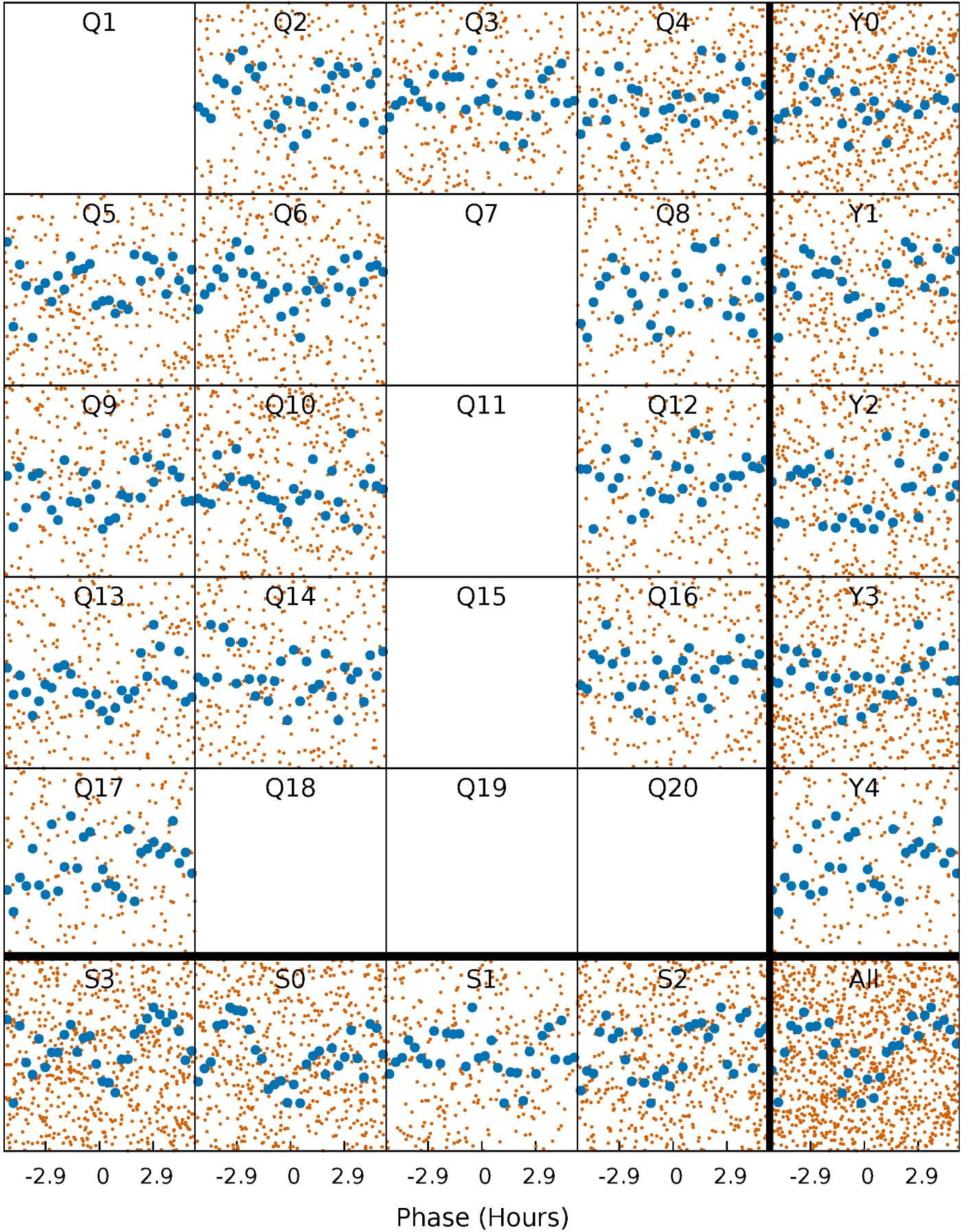


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

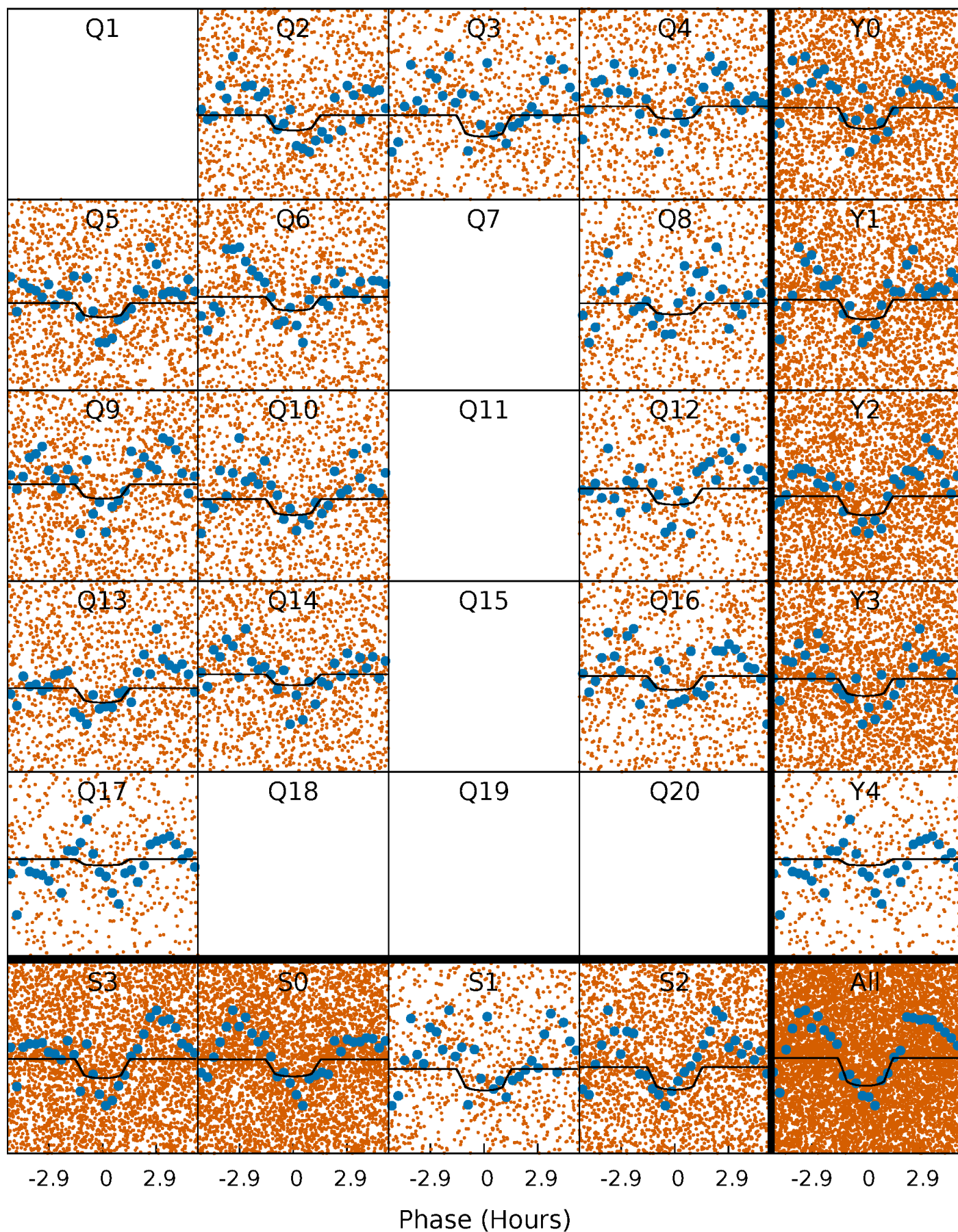
TCE 010415502-01 P= 0.739390 Days  $T_0=131.815007$  (BKJD)





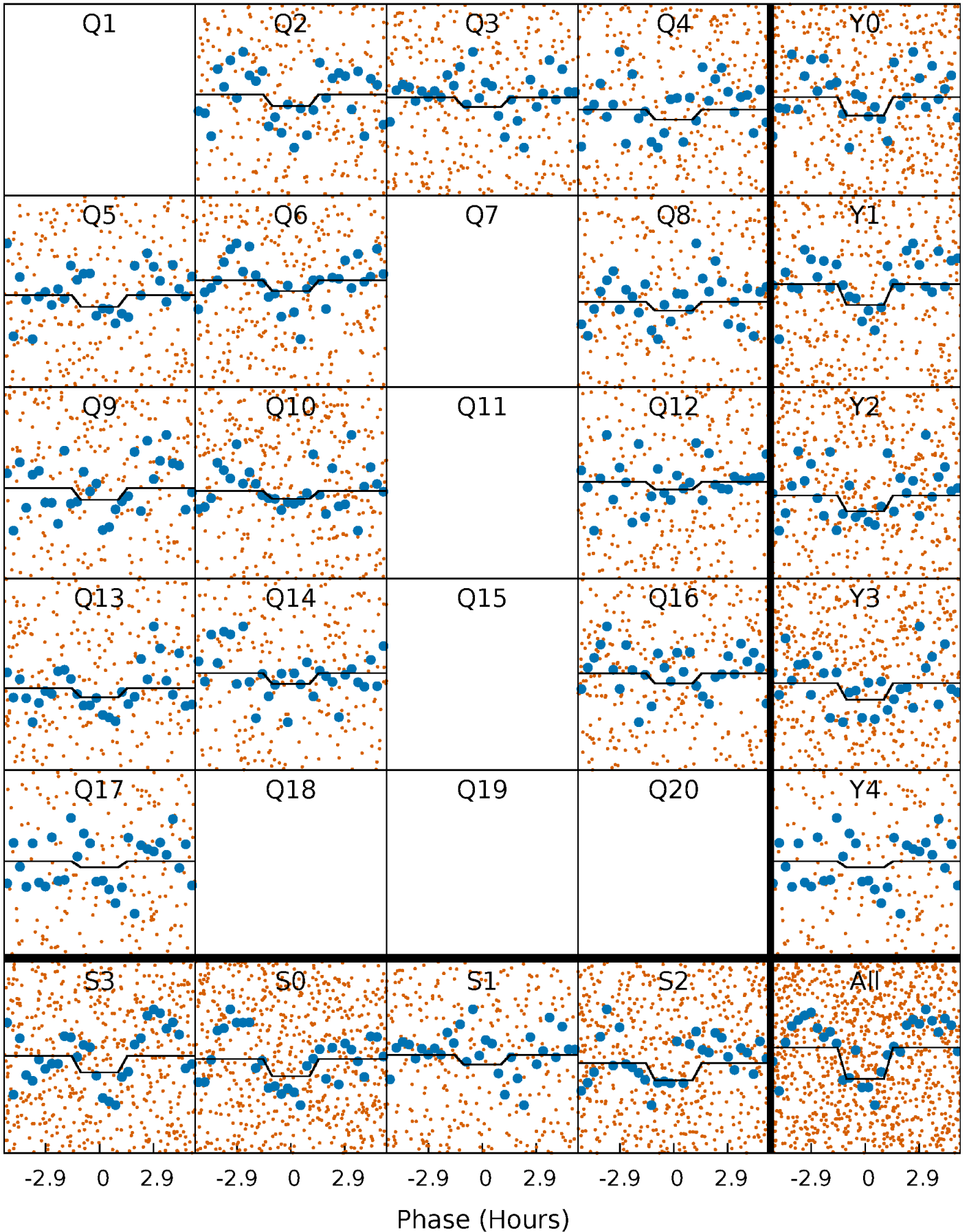
# DV Quarter-Phased Transit Curves

TCE 010415502-01 P= 0.739390 Days  $T_0=131.815007$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

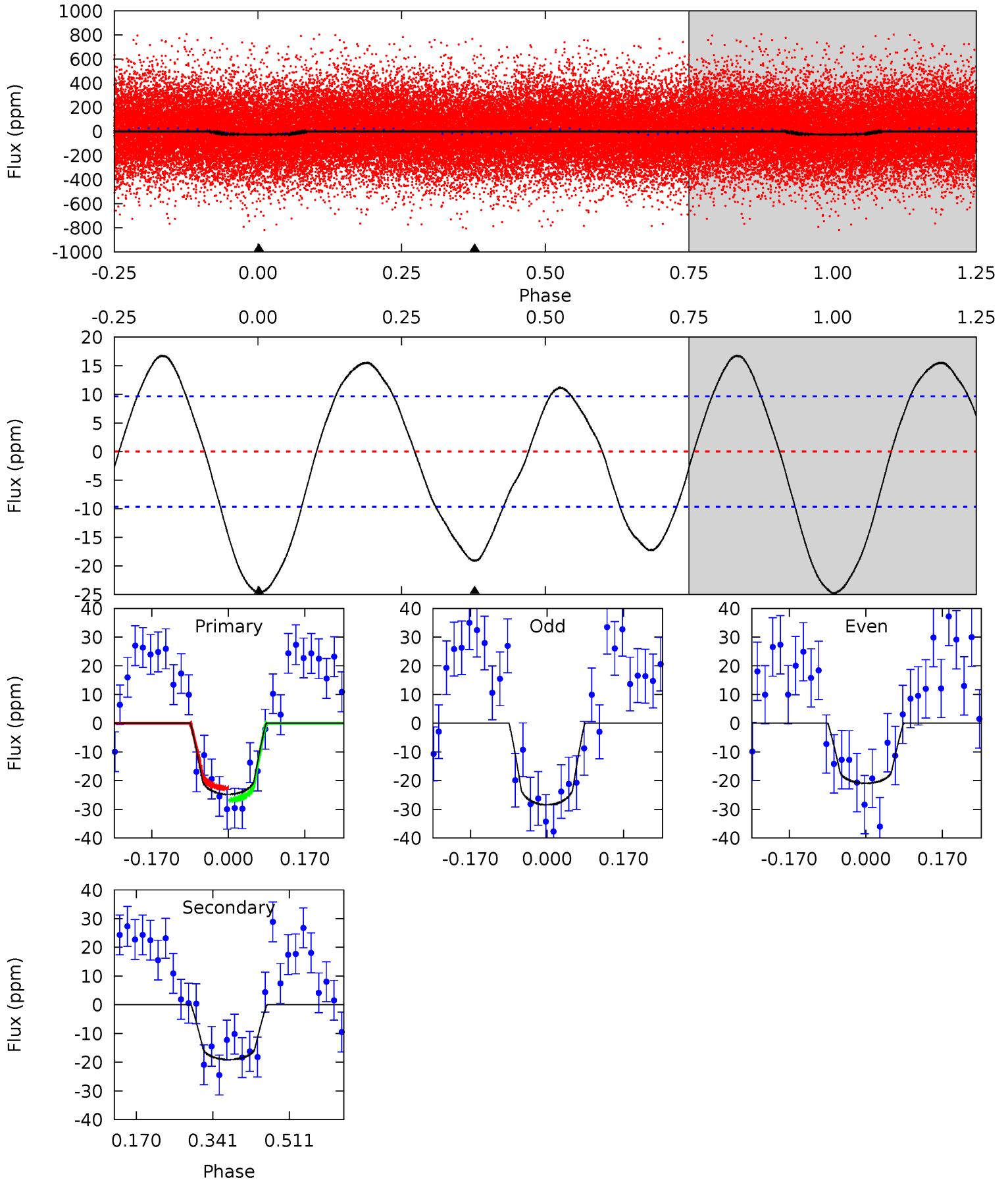
TCE 010415502-01 P= 0.739390 Days  $T_0=131.815002$  (BKJD)



# DV Model-Shift Uniqueness Test

010415502-01, P = 0.739390 Days, E = 131.815007 Days

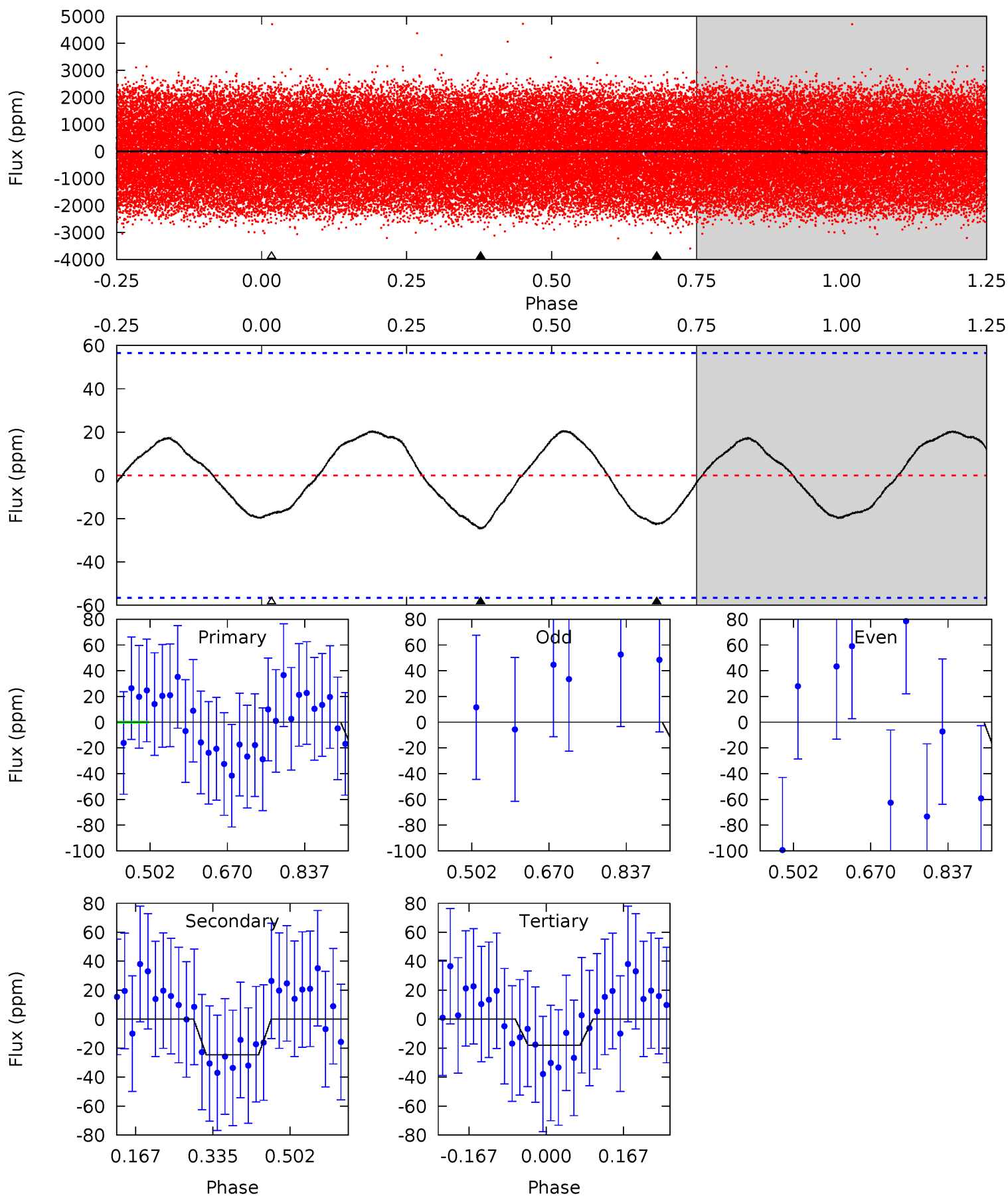
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	8.78	0	0	4.45	1.37	5.28	11.4	11.4	8.78	8.78	1.73	0.76	0.40	0.95



# Alt Model-Shift Uniqueness Test

010415502-01, P = 0.739390 Days, E = 131.815002 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
1.78	1.94	1.41	0	4.46	1.38	1.06	0.37	1.78	0.53	1.94	0.31	1.07	0.45	0.15



### Stellar Parameters For KIC 010415502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7216^{+200}_{-343}$	$4.254^{+0.060}_{-0.225}$	$0.070^{+0.200}_{-0.350}$	$1.518^{+0.580}_{-0.193}$	$1.510^{+0.211}_{-0.211}$	$0.608^{+0.241}_{-0.342}$
	+3%/-5%	+1%/-5%	+286%/-500%	+38%/-13%	+14%/-14%	+40%/-56%
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 010415502-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-19 \pm 2$	$0.83^{+0.45}_{-0.42}$	$4126^{+333}_{-260}$	$6739^{+3997}_{-1439}$	$5.036^{+15.806}_{-2.917}$
Alt.	$-25 \pm 13$	$0.84^{+0.43}_{-0.41}$	$4148^{+353}_{-243}$	$6985^{+4737}_{-1766}$	$5.588^{+20.225}_{-3.701}$

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



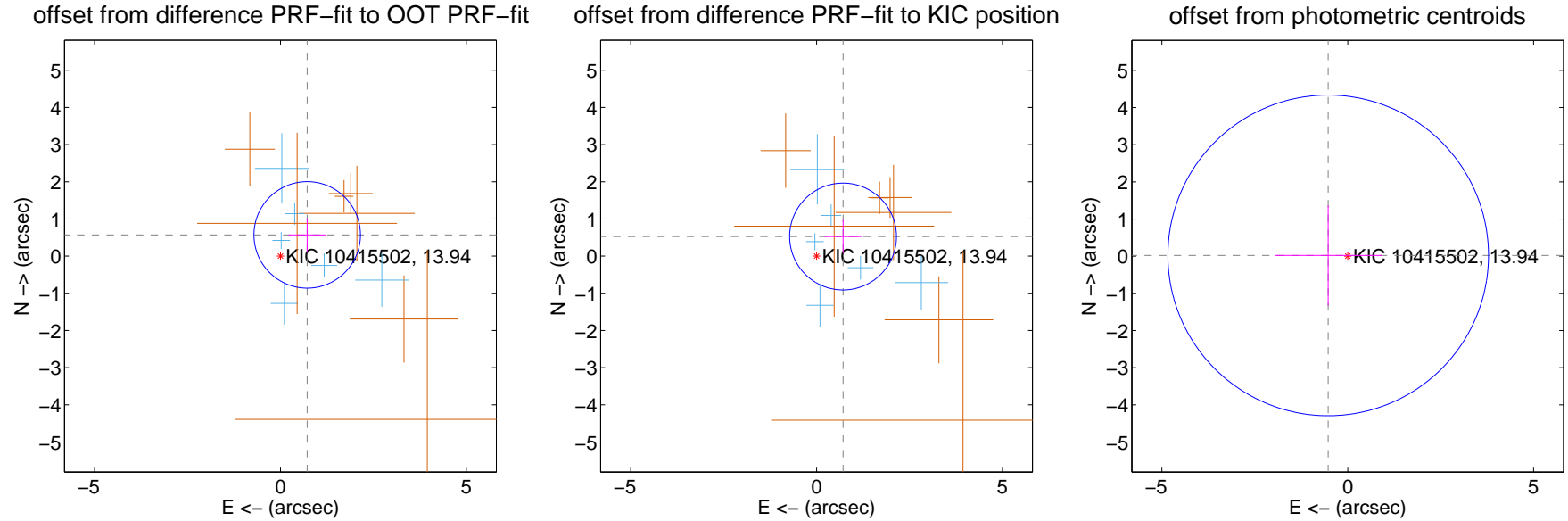
## DV Centroid Data

Supplemental centroid analysis for 010415502-01. Kepler magnitude: 13.94. Transit SNR 6.25

There are 6 quarters with good PRF difference image offsets

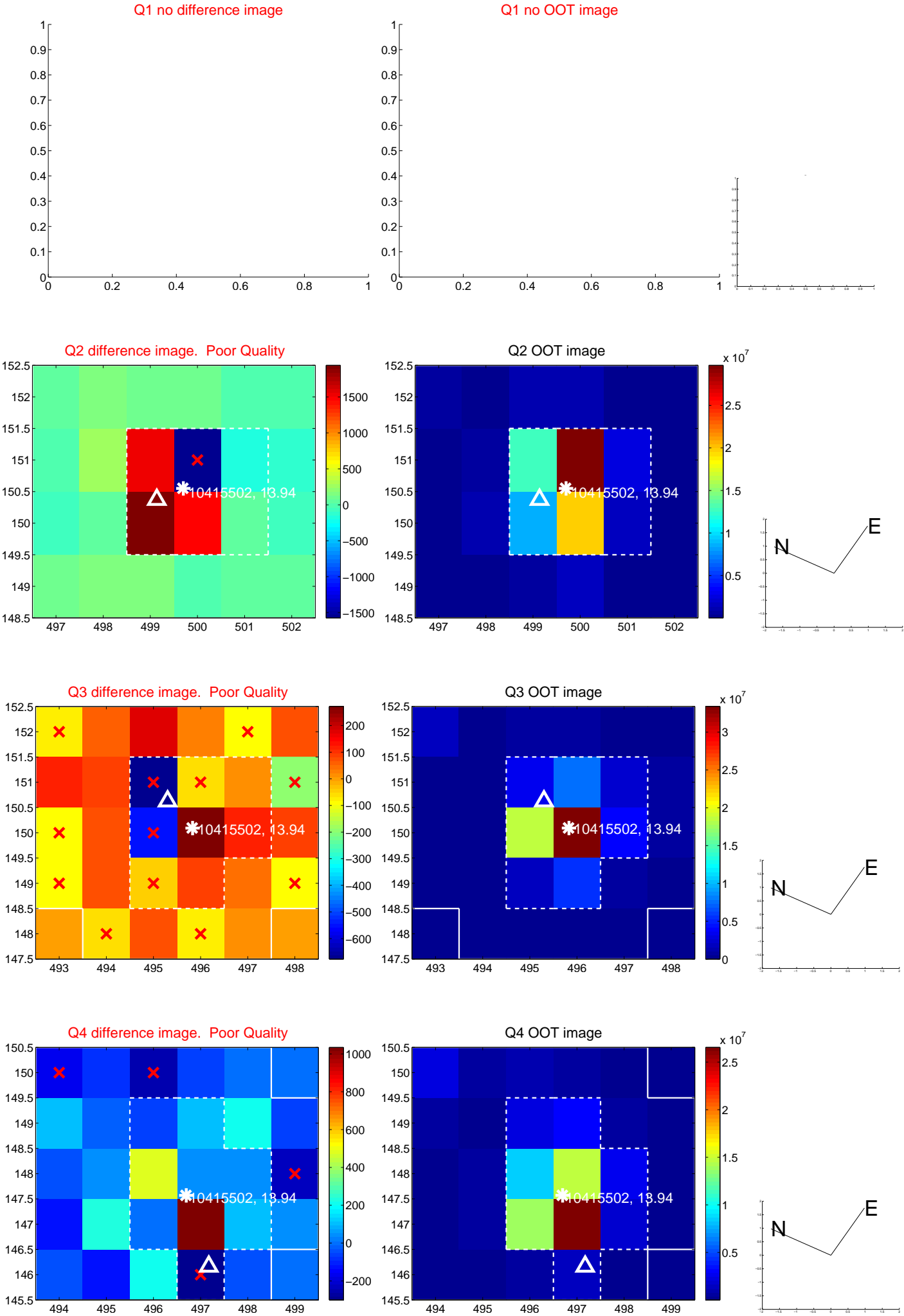
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.919 \pm 0.478$	1.92	$-0.720 \pm 0.495$	$0.571 \pm 0.448$
PRF-fit source offset from KIC position	$0.886 \pm 0.479$	1.85	$-0.712 \pm 0.495$	$0.527 \pm 0.448$
photometric centroid source offset	$0.53 \pm 1.44$	0.37	$0.53 \pm 1.44$	$0.02 \pm 1.35$

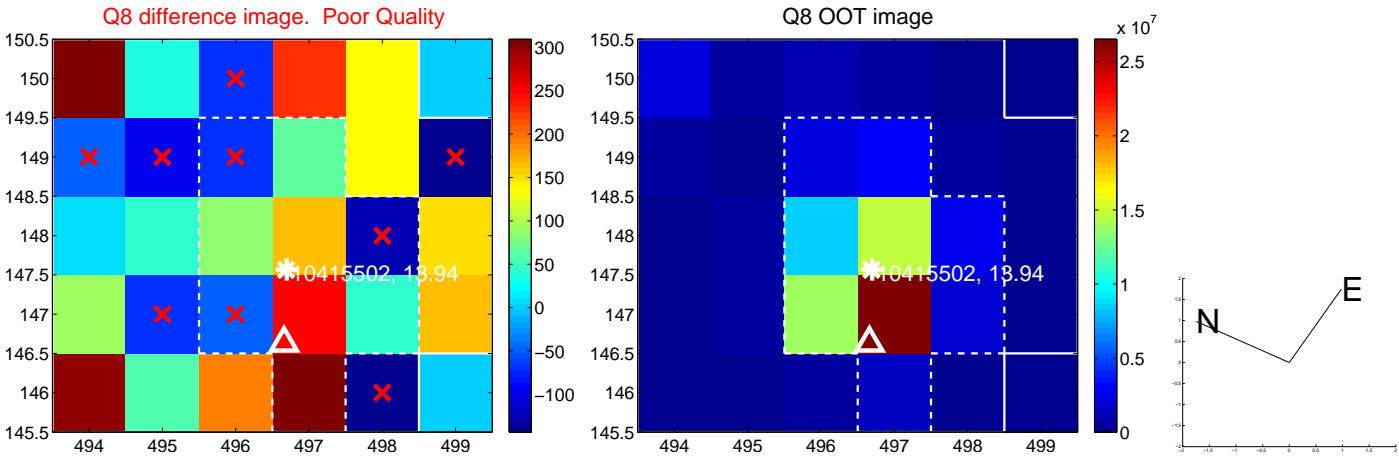
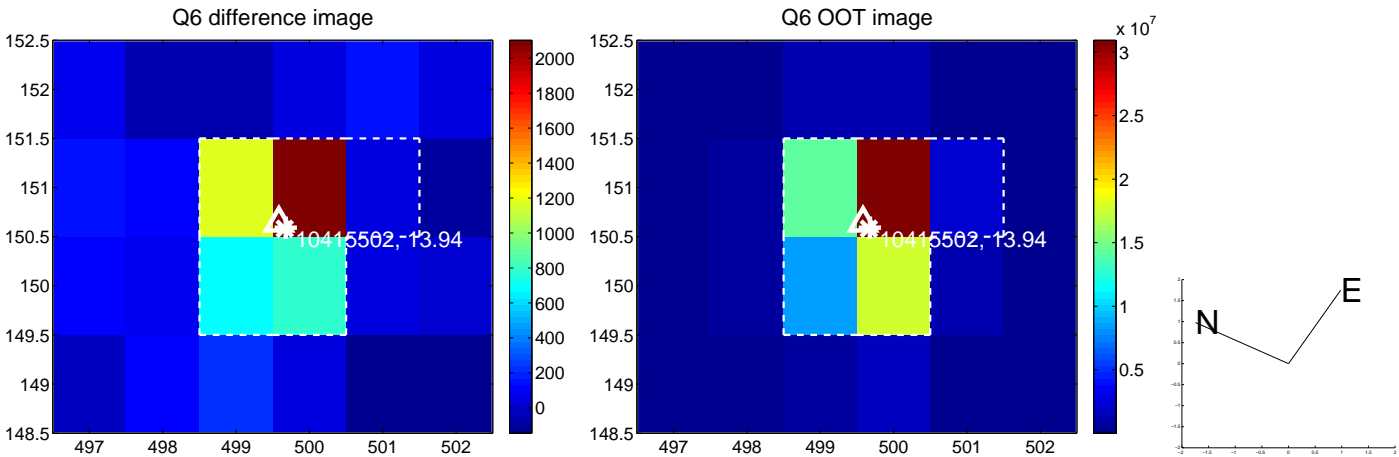
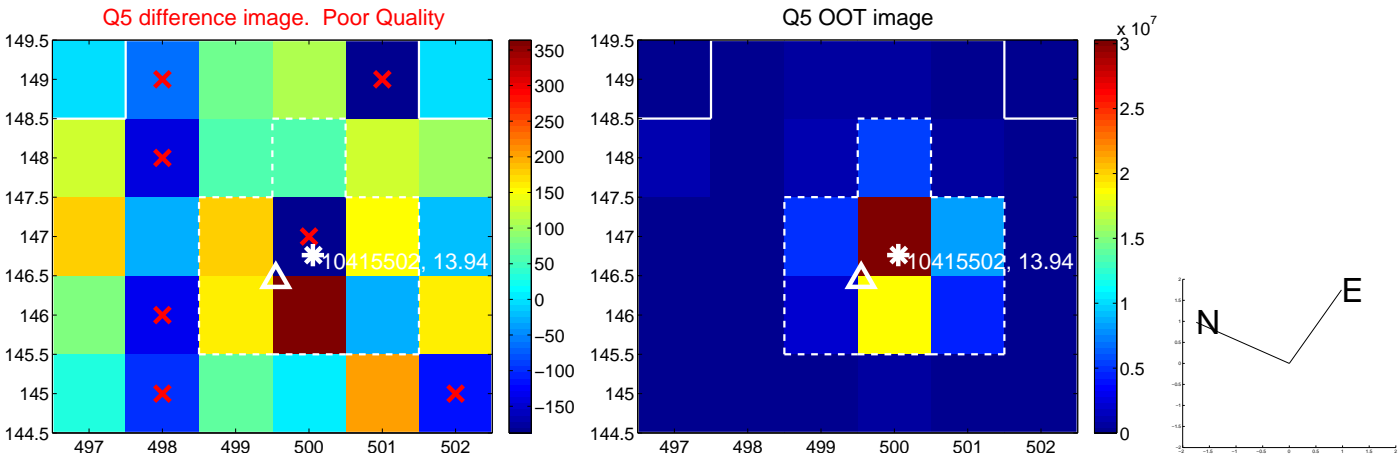


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

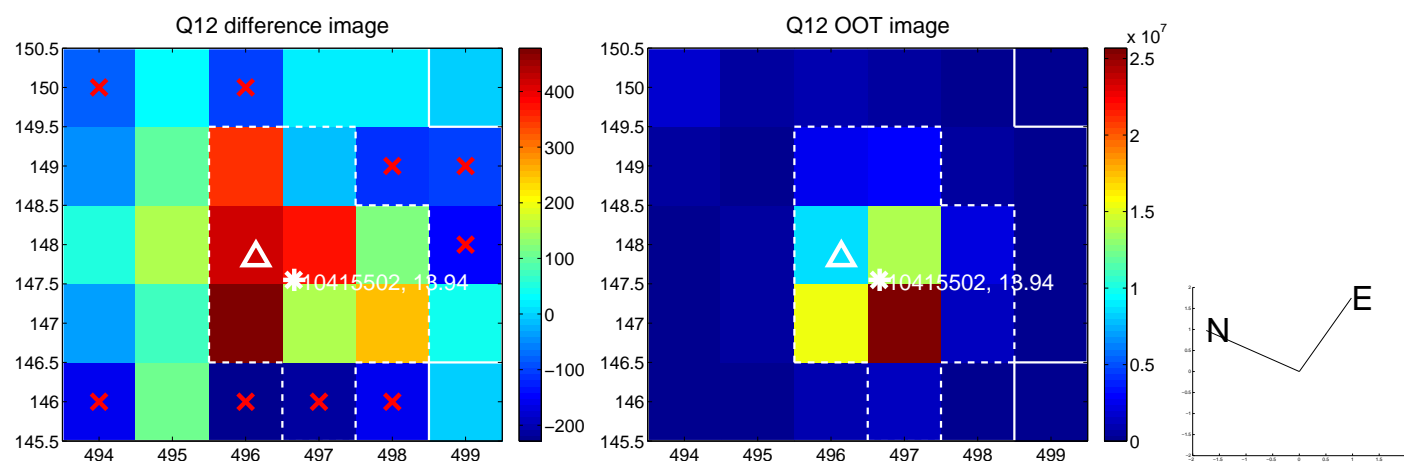
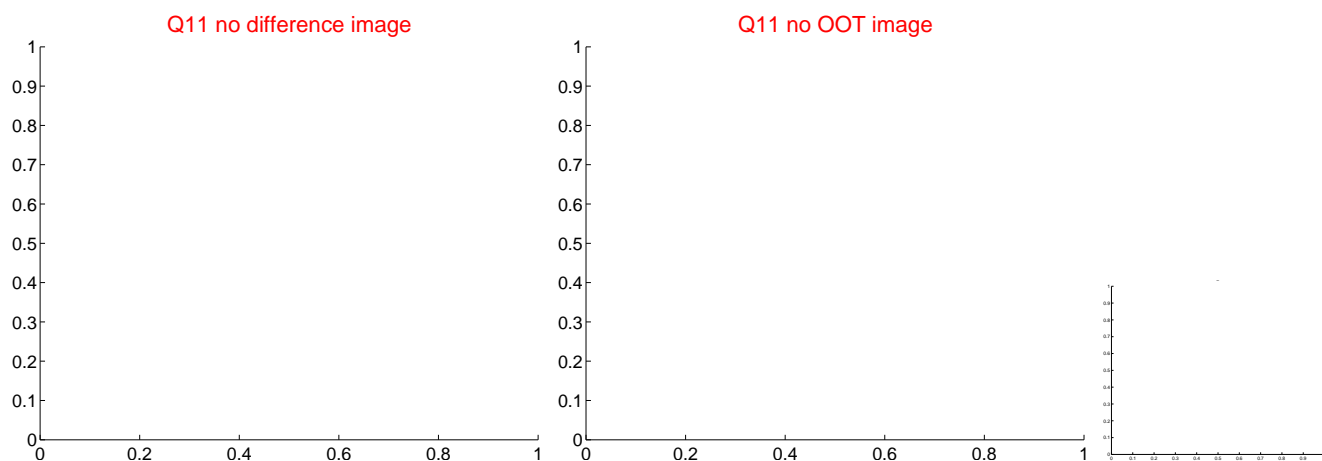
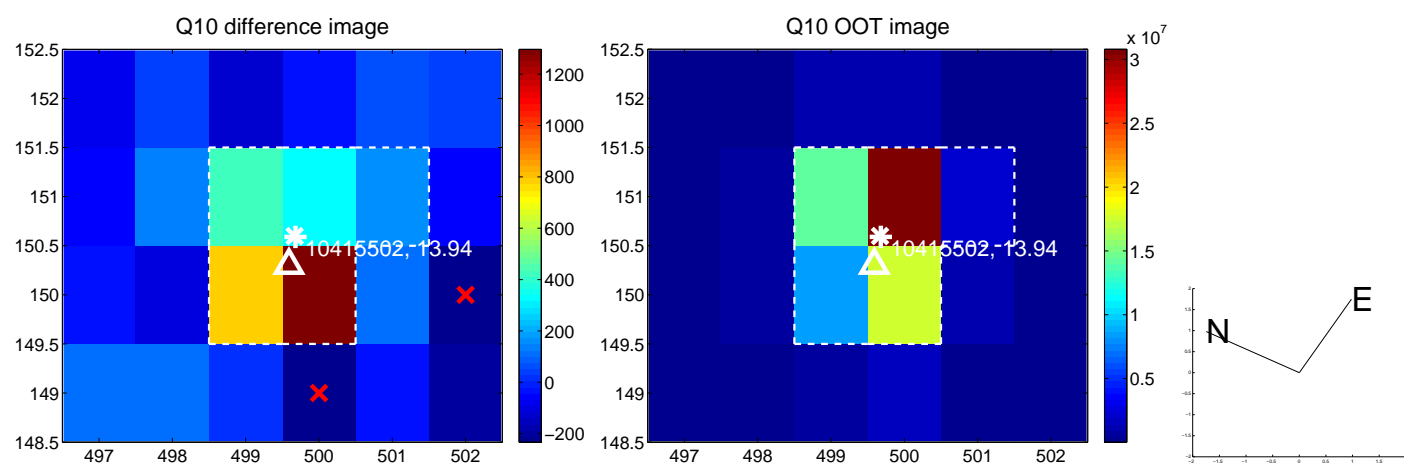
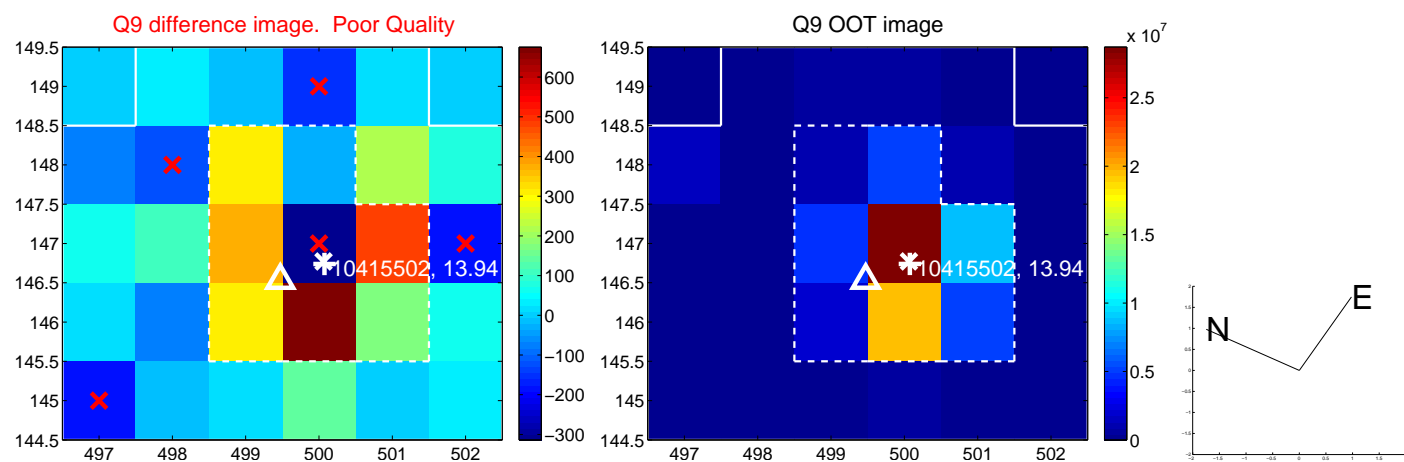
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



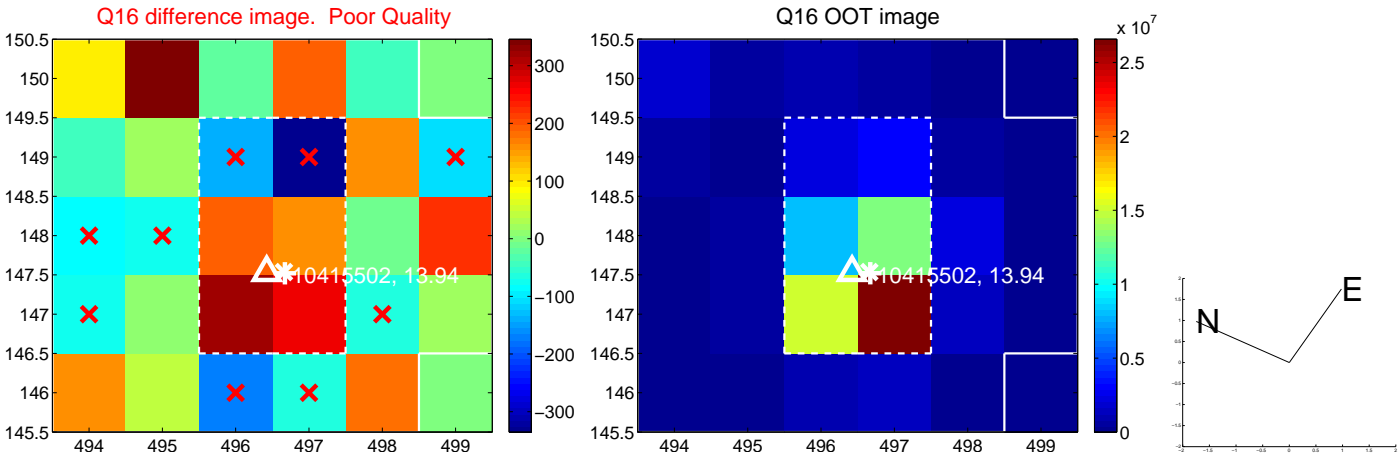
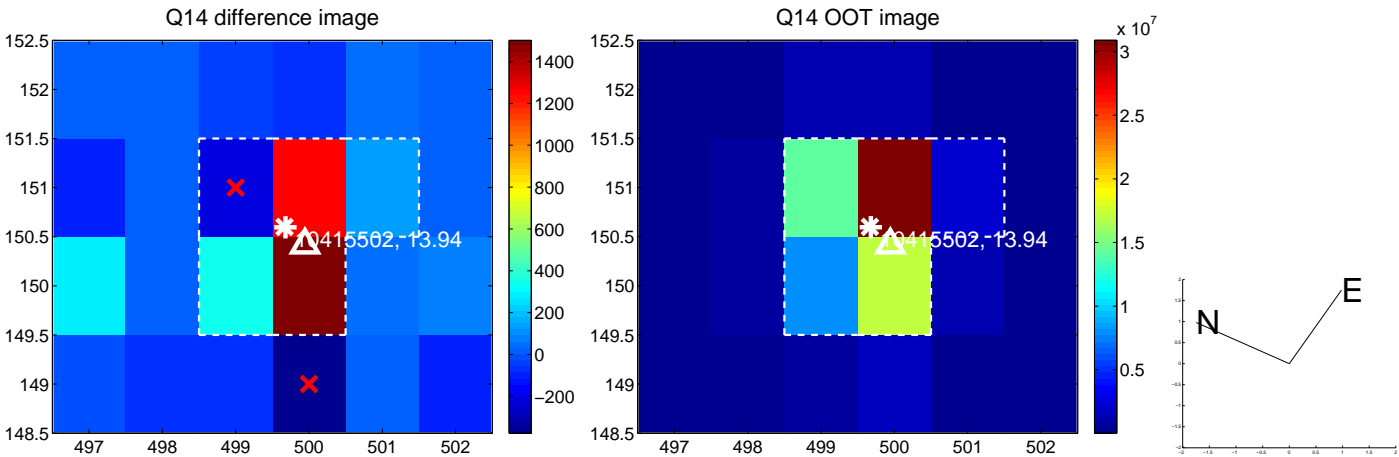
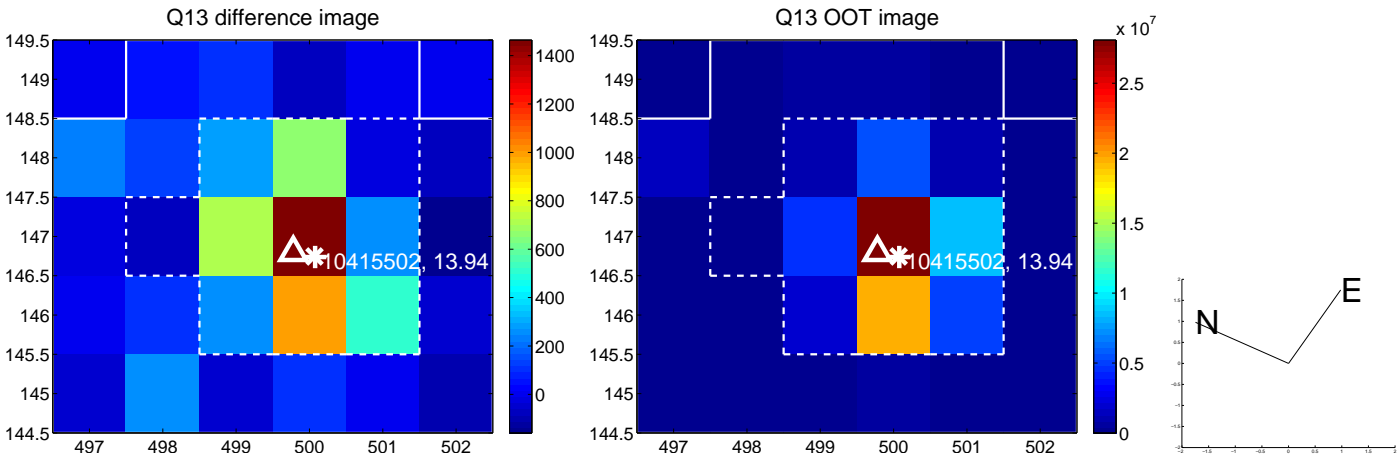
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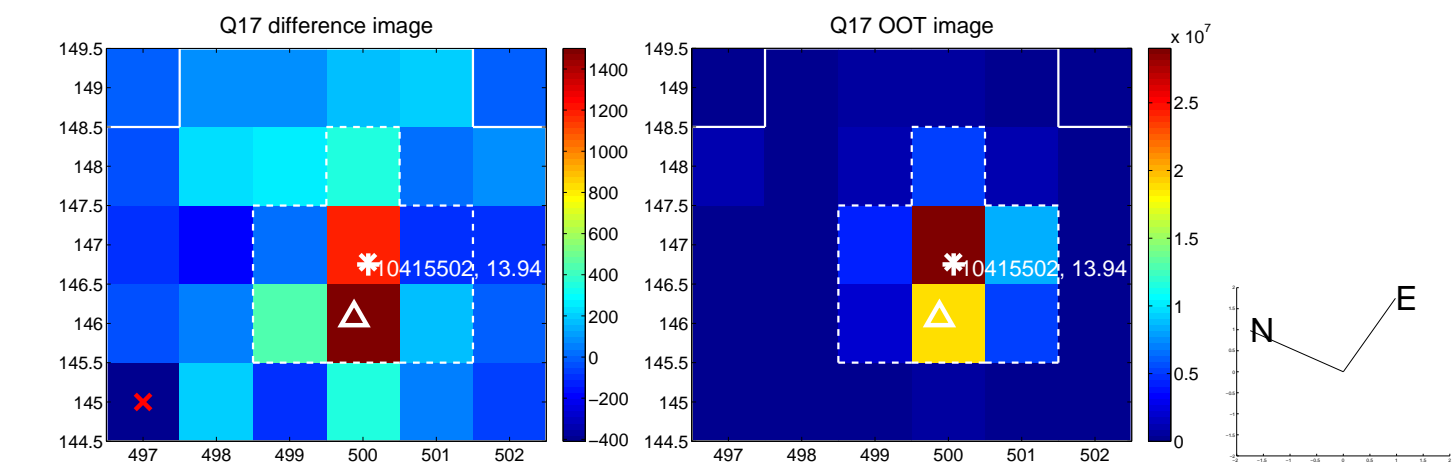


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

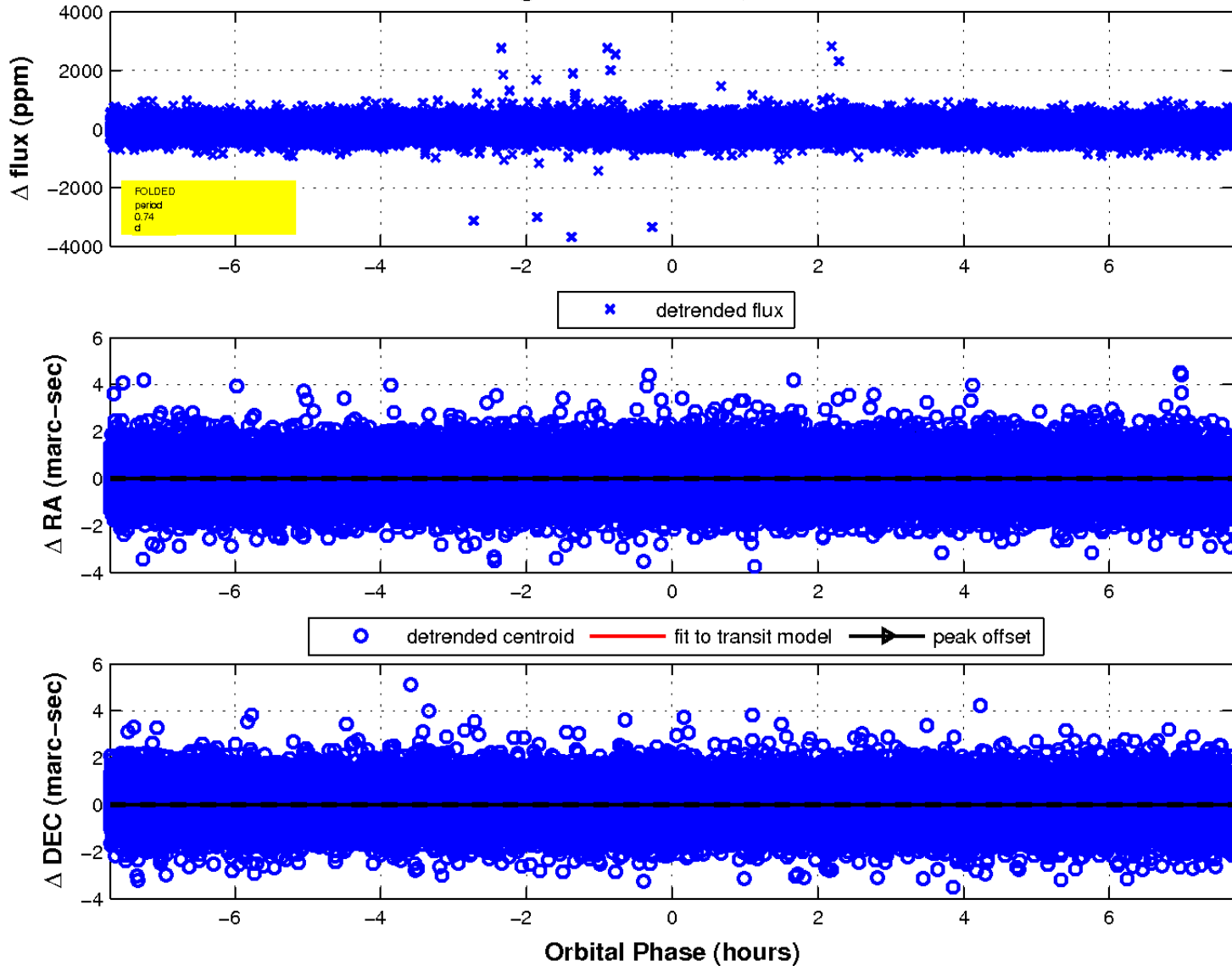




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

