

# KIC 004138654

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004138654-01	OBS	No	471.140464	578.601494	128.7	22.037	13.8	13.9	1.67	6191	2.14	2.51

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004138654-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_ZUMA—LPP_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

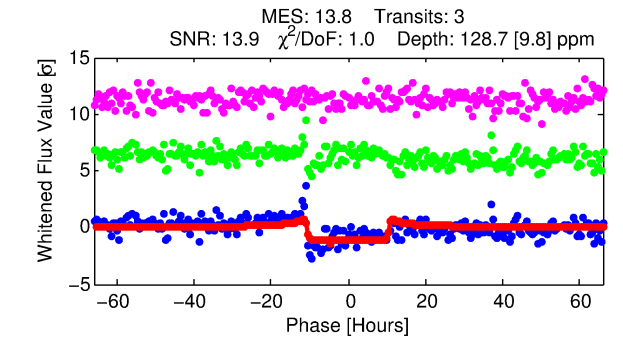
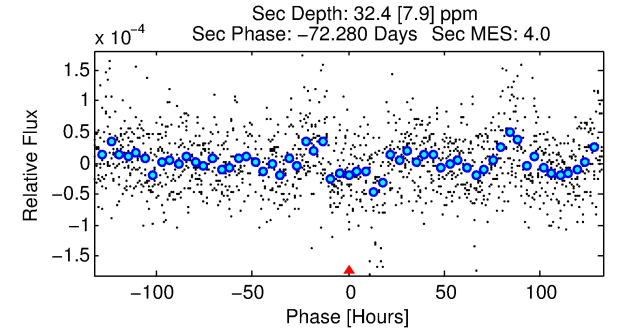
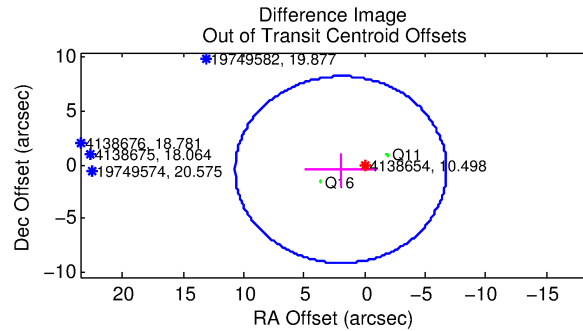
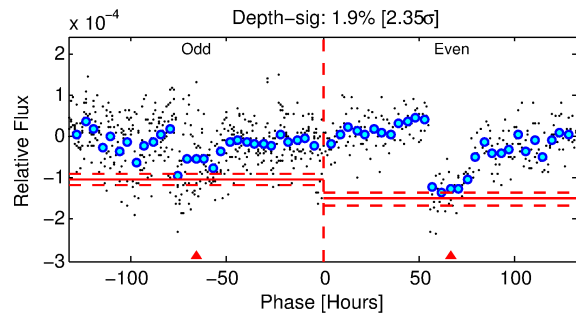
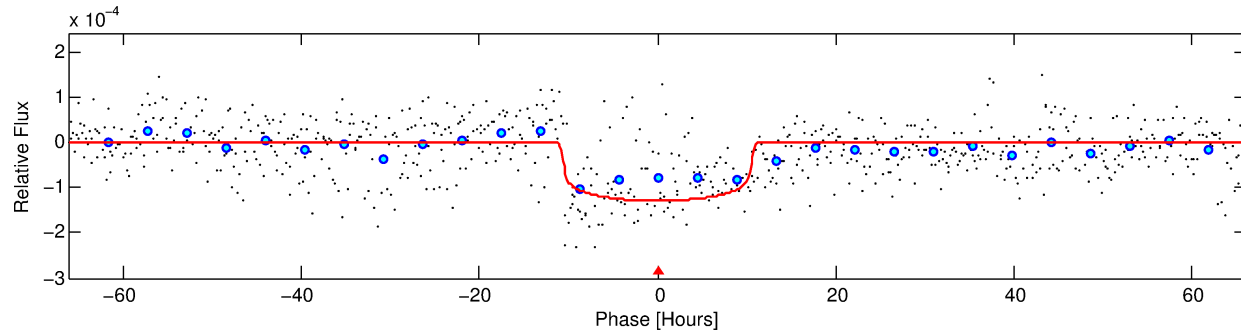
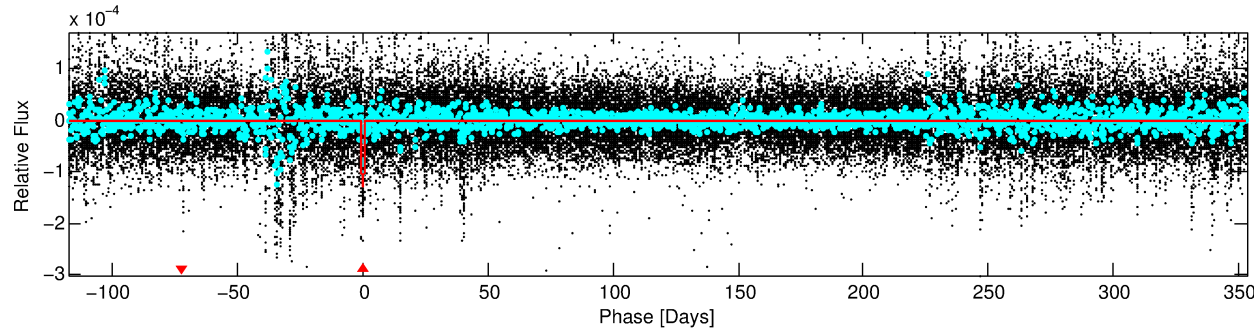
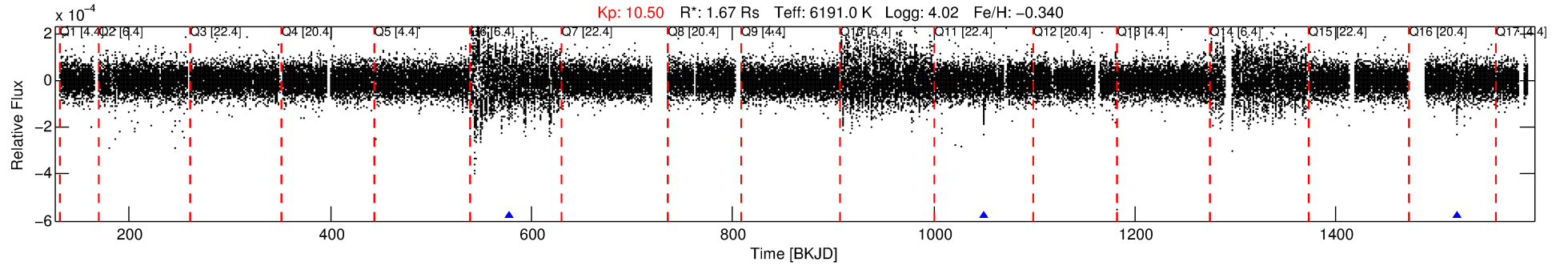
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004138654-01

No Significant Match Found

# DV One-Page Summary

KIC: 4138654 Candidate: 1 of 1 Period: 471.140 d



## DV Fit Results:

Period = 471.14046 [0.00942] d  
Epoch = 578.6015 [0.0136] BKJD  
Rp/R\* = 0.0118 [0.0009]  
a/R\* = 89.00 [29.76]  
b = 0.85 [0.11]  
Seff = 2.51 [1.67]  
Teq = 321 [53] K  
Rp = 2.14 [0.84] Re  
a = 1.2052 [0.4749] AU  
Ag = 5645.90 [4014.60] [1.41 $\sigma$ ]  
Teffp = 4302 [343] K [11.48 $\sigma$ ]

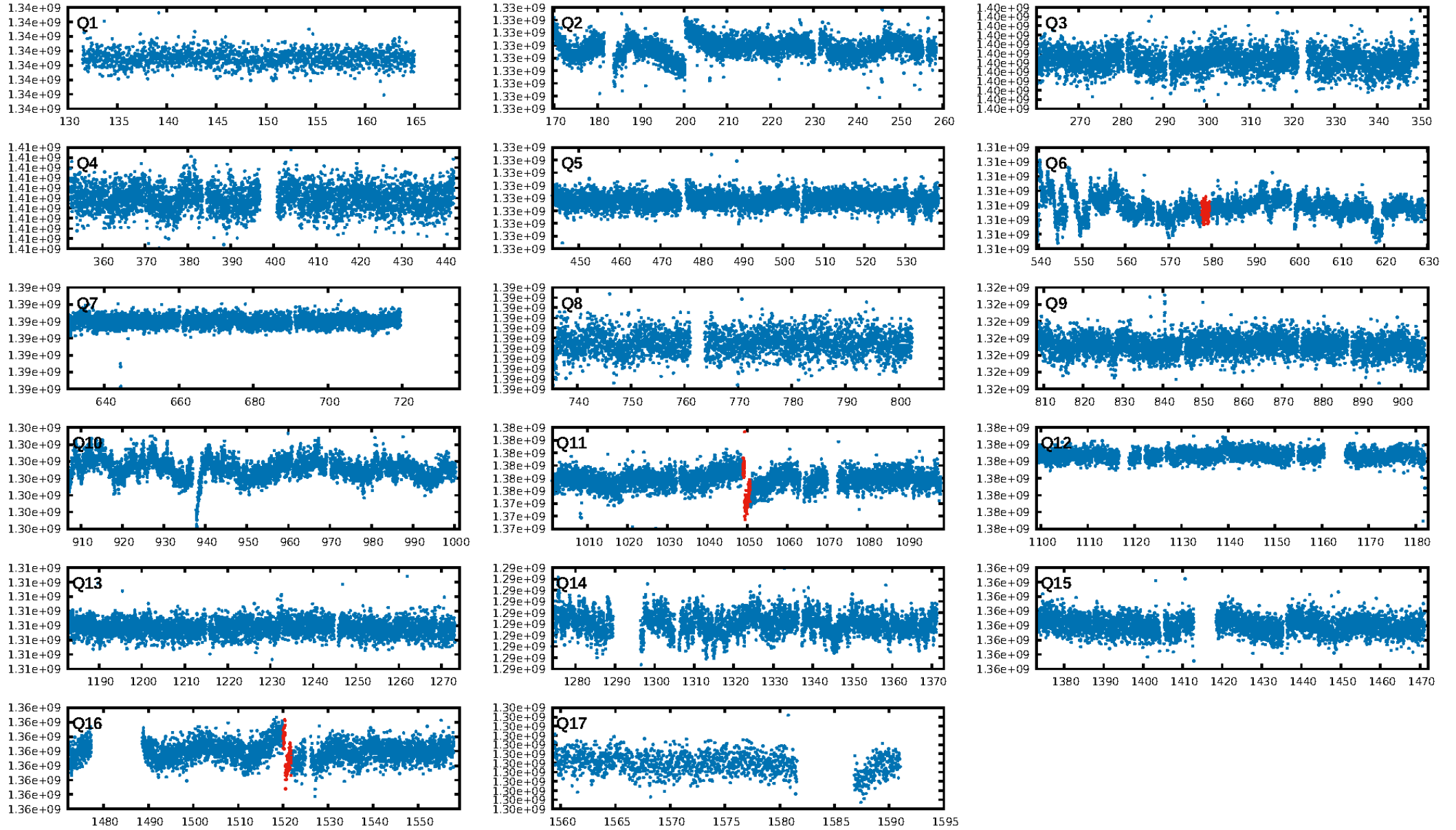
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 14.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.52e-31  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 7.034  
Centroid-sig: 13.7%  
Centroid-so: 1.732 arcsec [1.00 $\sigma$ ]  
OotOffset-rm: 2.025 arcsec [0.70 $\sigma$ ]  
KicOffset-rm: 1.968 arcsec [0.69 $\sigma$ ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 1.00 [3/3]

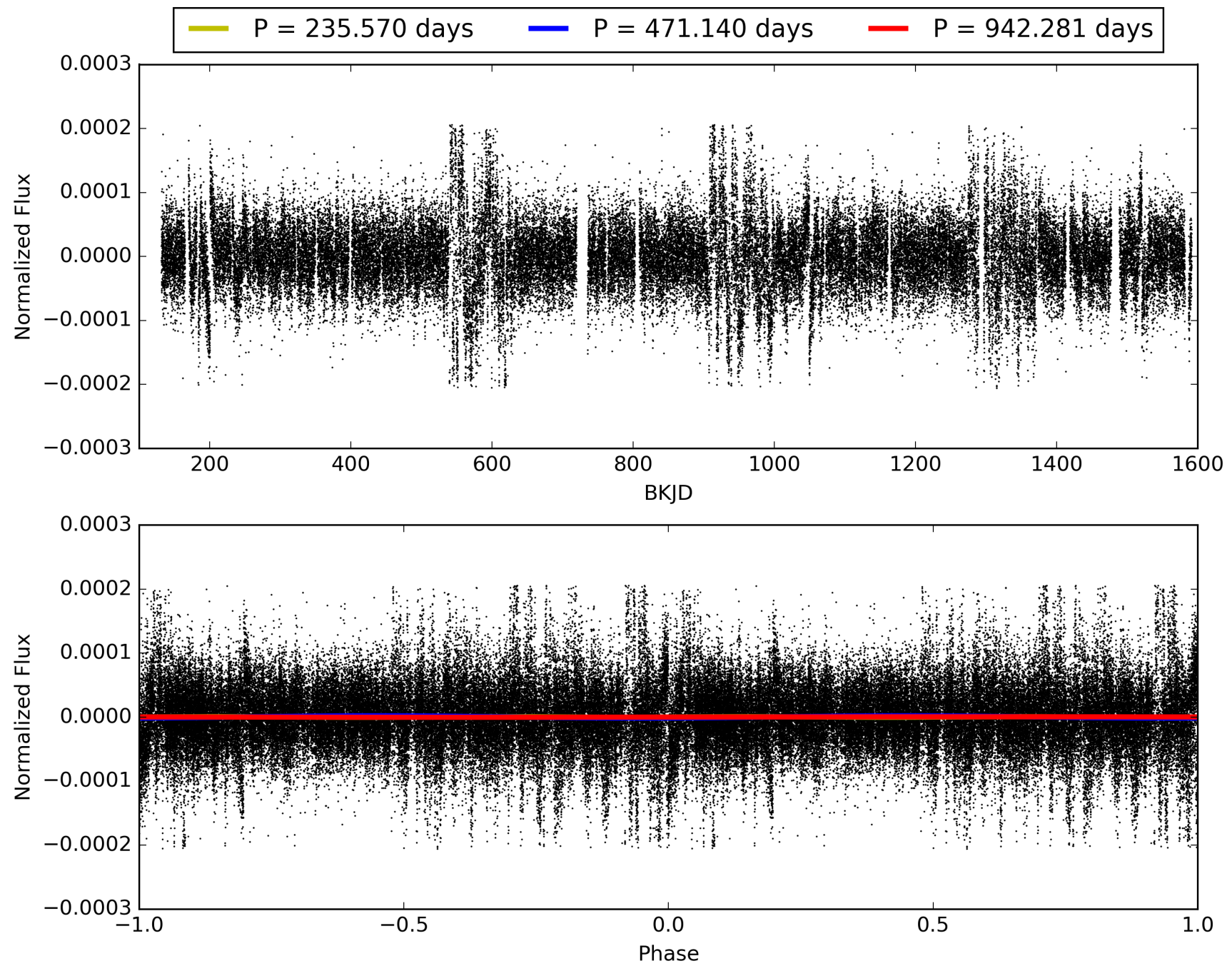
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:17:24 Z

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

# TCE 004138654-01, PDC Light Curves

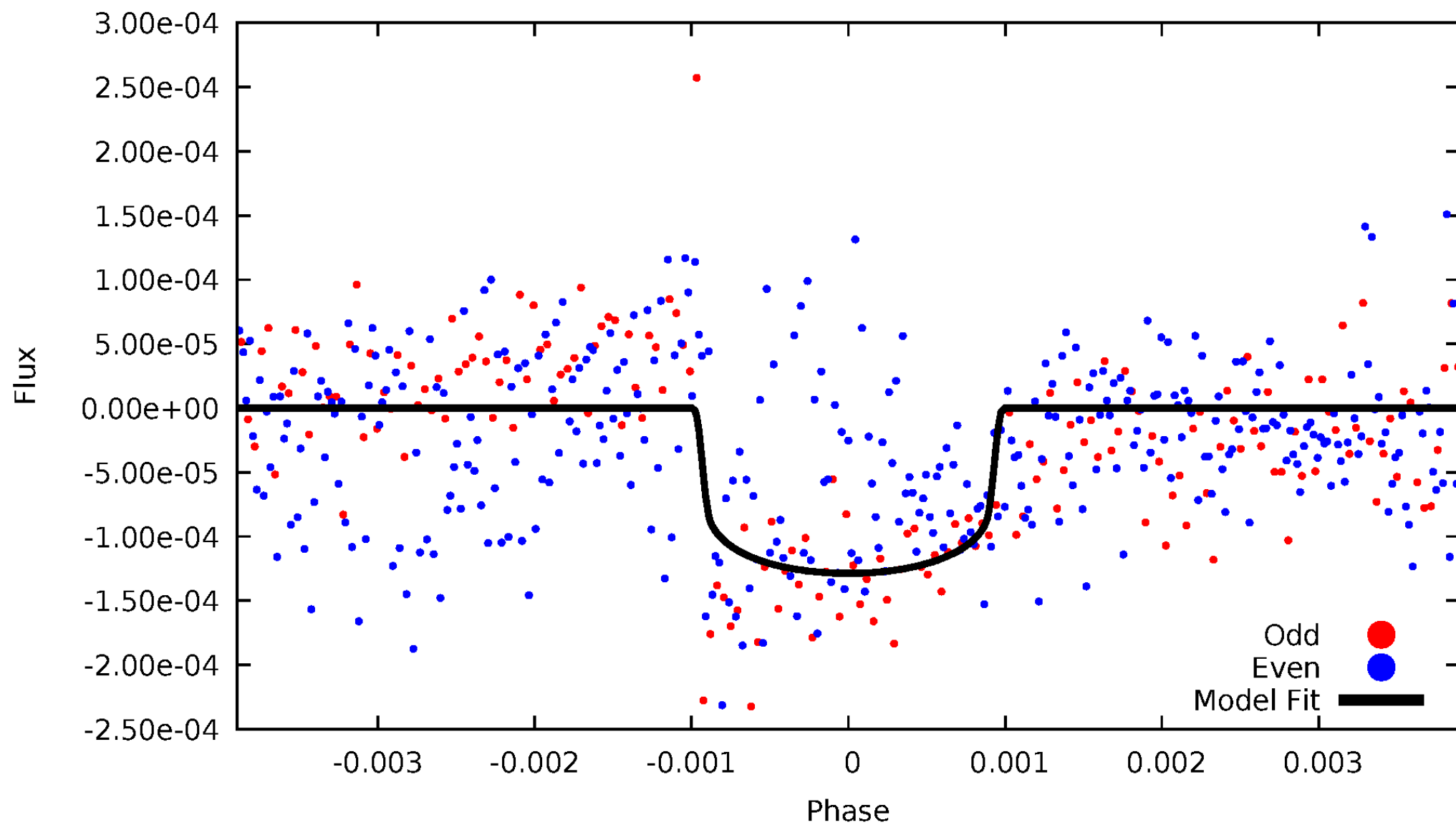


TCE 004138654-01



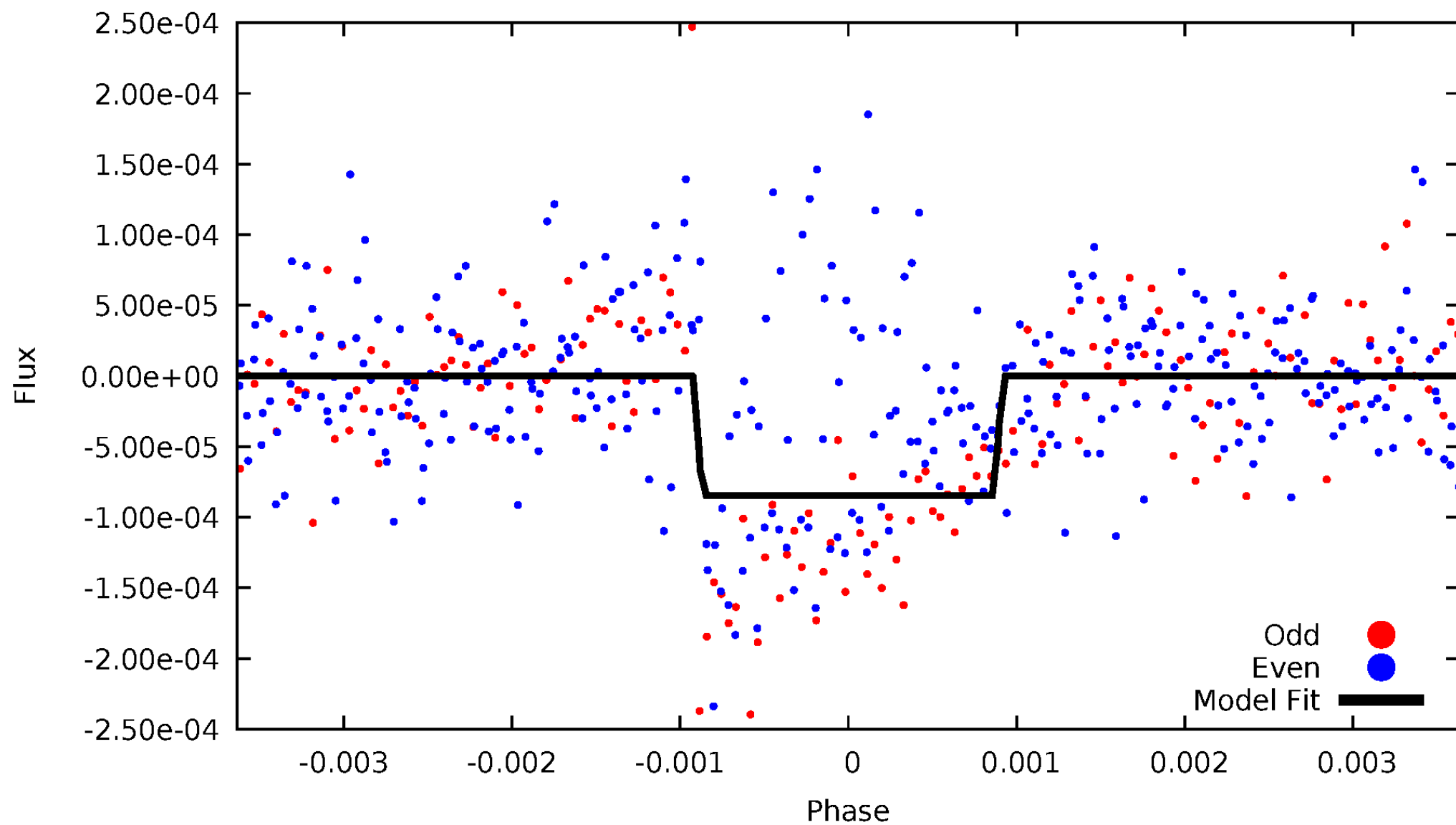
# DV Odd/Even

TCE 004138654-01



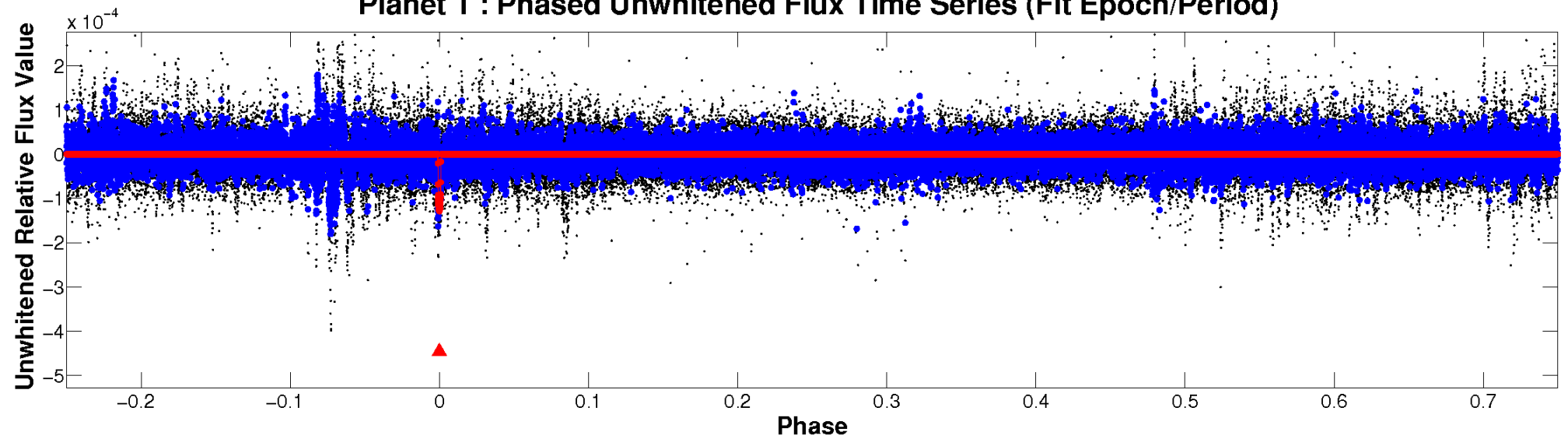
# ALT Odd/Even

TCE 004138654-01

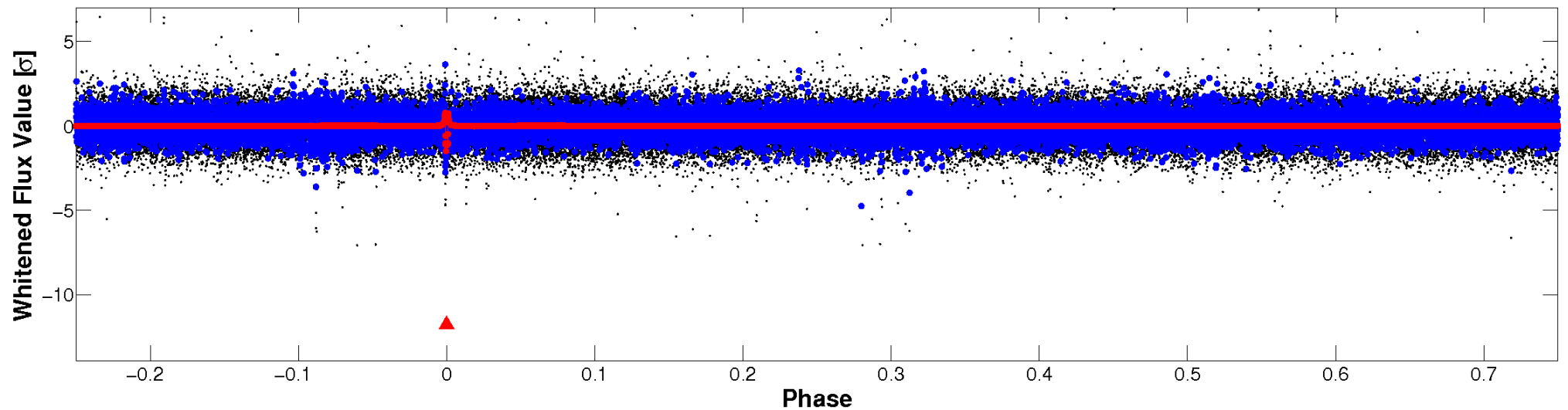


# Non-Whitened Vs. Whitened Light Curve

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



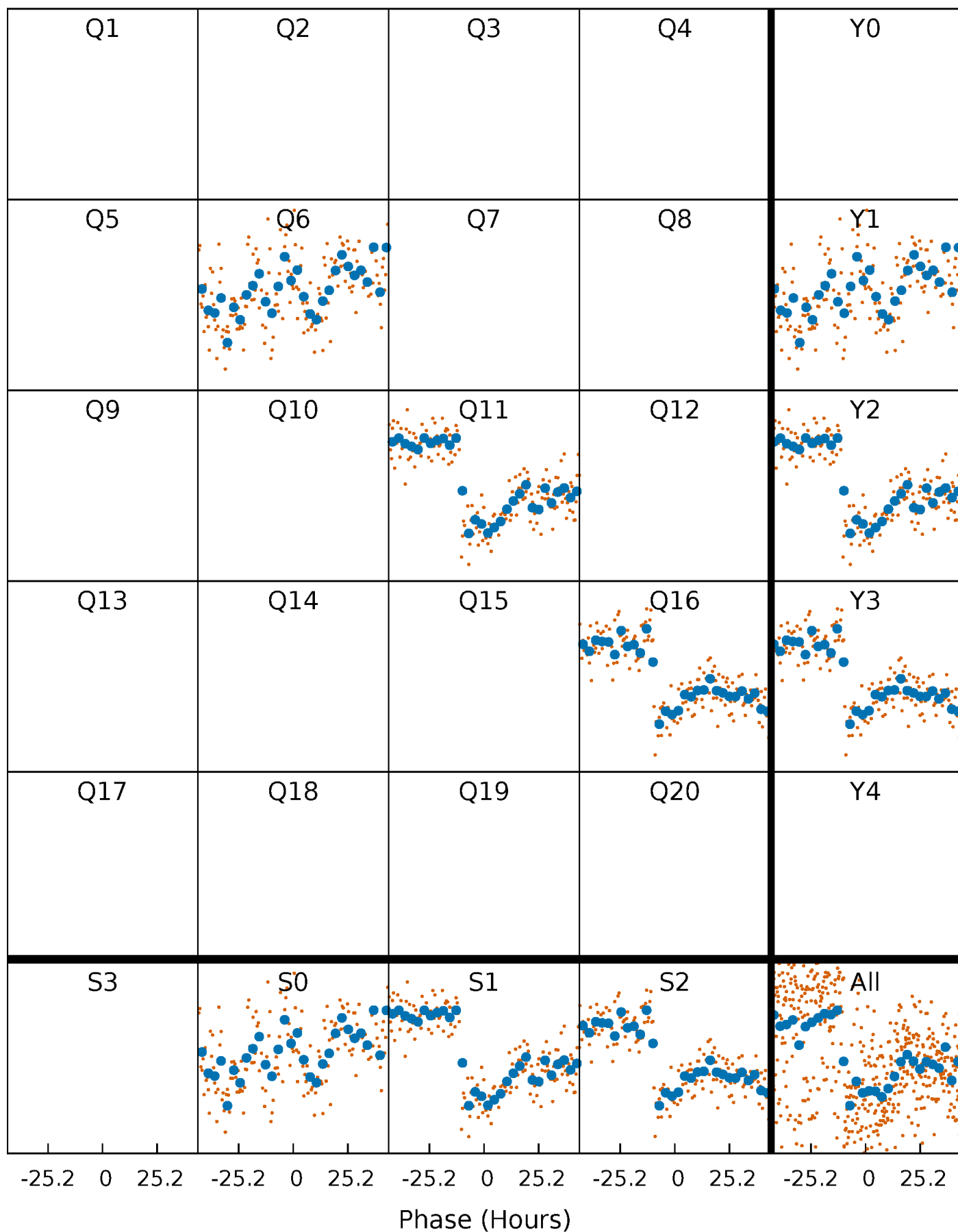
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

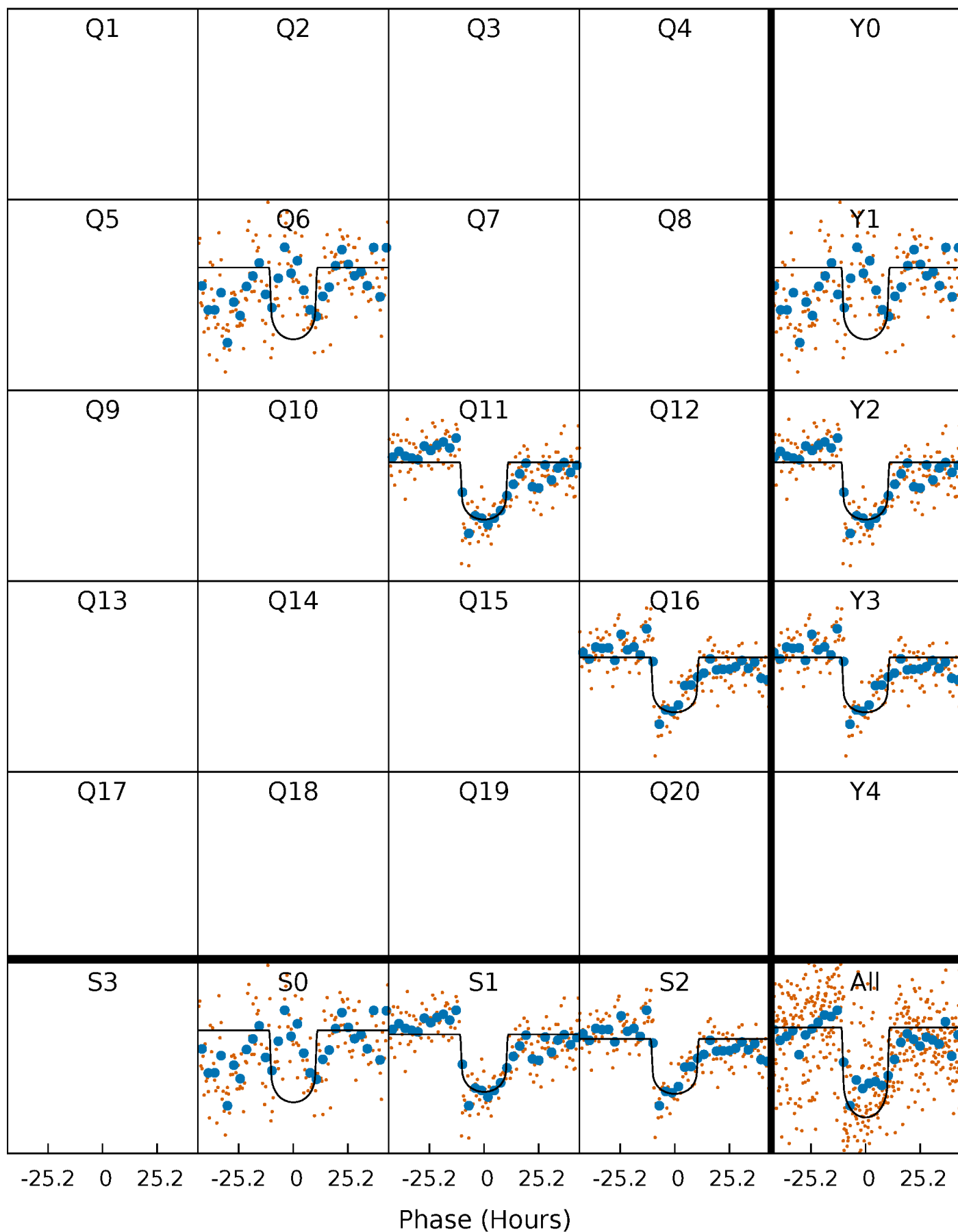
TCE 004138654-01 P=471.140464 Days  $T_0=578.601494$  (BKJD)





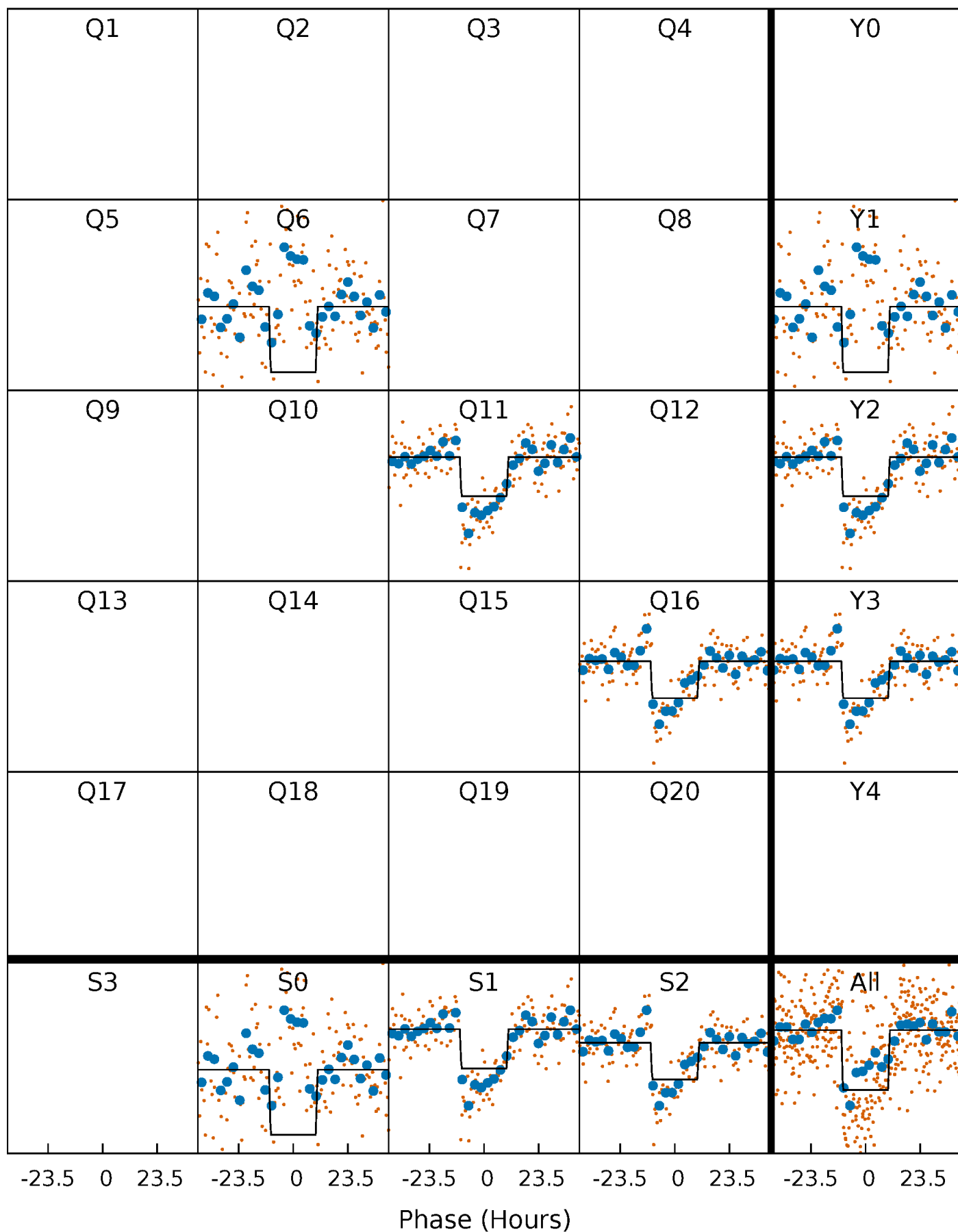
# DV Quarter-Phased Transit Curves

TCE 004138654-01 P=471.140464 Days  $T_0=578.601494$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

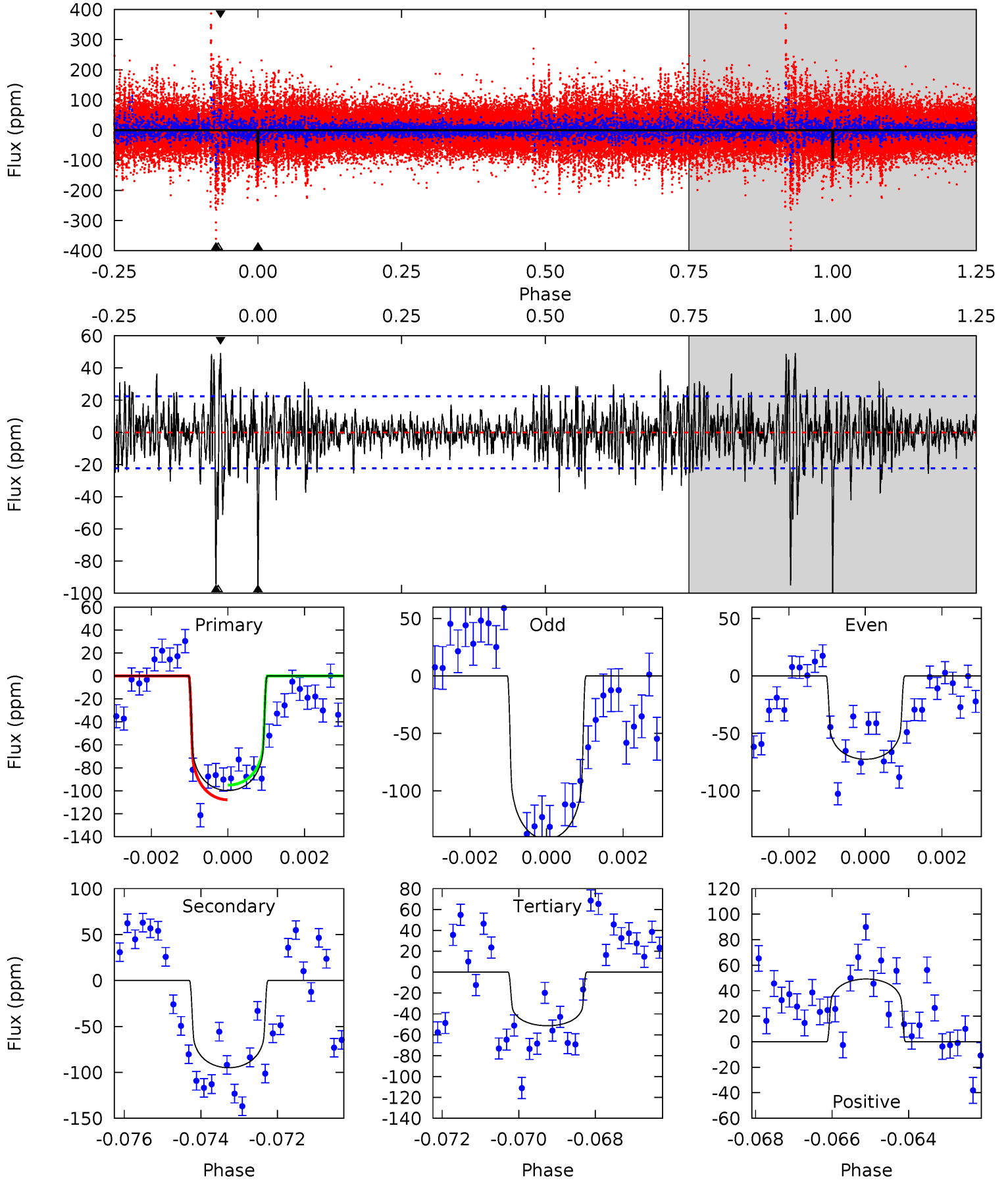
TCE 004138654-01 P=471.157026 Days  $T_0=578.566844$  (BKJD)



# DV Model-Shift Uniqueness Test

004138654-01, P = 471.140464 Days, E = 107.461030 Days

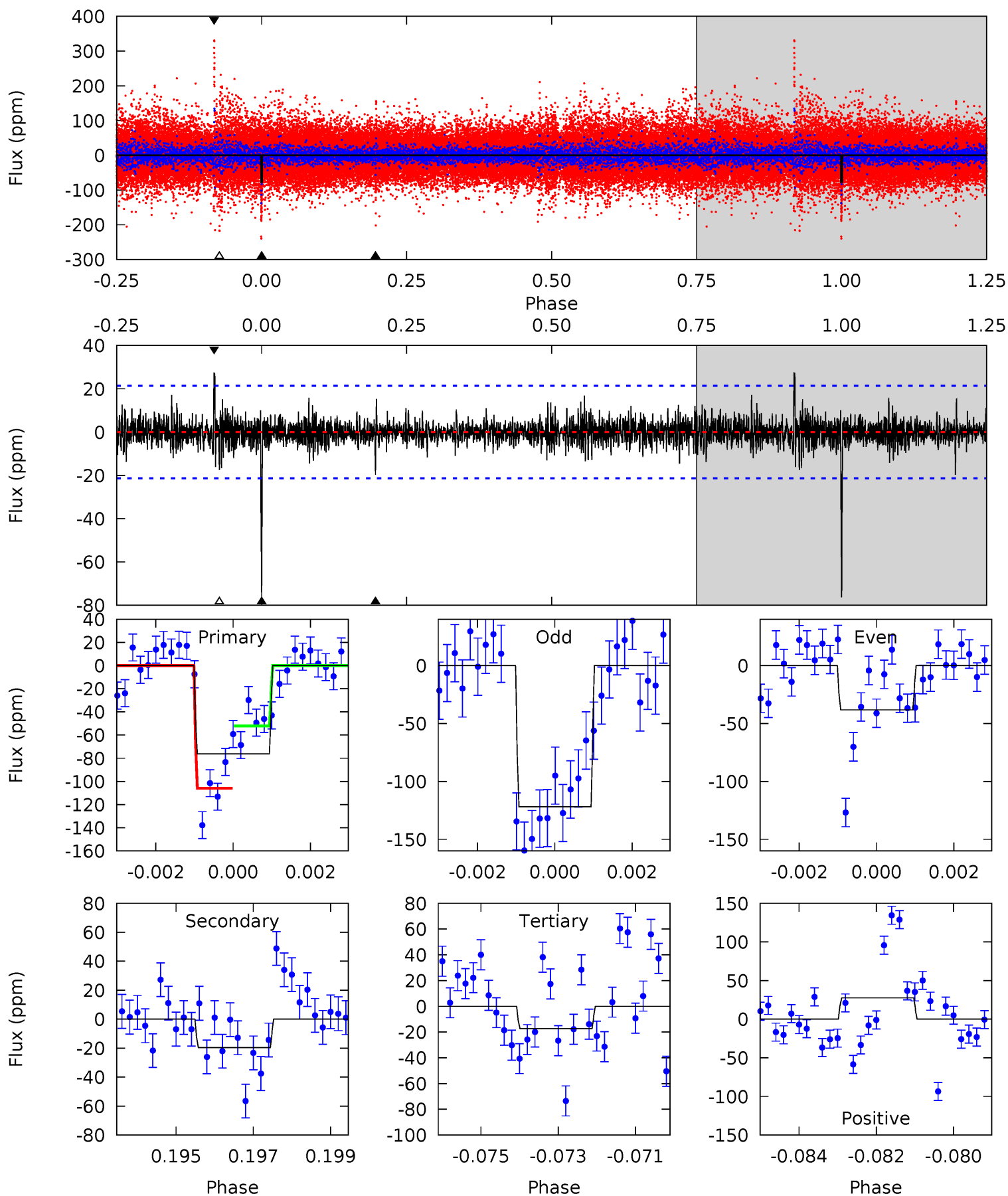
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	22.6	12.2	11.7	5.33	3.10	2.72	11.6	12.1	10.4	10.9	7.97	0.84	0.33	1.51



# Alt Model-Shift Uniqueness Test

004138654-01, P = 471.157026 Days, E = 107.409818 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
19.1	4.90	4.36	6.89	5.34	3.12	1.00	14.7	12.2	0.54	-1.99	10.3	0.69	0.27	6.65



### Stellar Parameters For KIC 004138654

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6191^{+219}_{-219}$	$4.017^{+0.390}_{-0.156}$	$-0.340^{+0.300}_{-0.300}$	$1.665^{+0.427}_{-0.640}$	$1.051^{+0.164}_{-0.164}$	$0.321^{+0.925}_{-0.144}$
	+4%/-4%	+10%/-4%	+88%/-88%	+26%/-38%	+16%/-16%	+288%/-45%
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 004138654-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-95 \pm 4$	$2.07^{+0.40}_{-0.45}$	$440^{+40}_{-44}$	$5638^{+306}_{-263}$	$17635^{+9653}_{-4912}$
Alt.	$-20 \pm 4$	$1.61^{+0.33}_{-0.34}$	$440^{+38}_{-46}$	$4483^{+295}_{-254}$	$6158^{+4180}_{-2185}$

$T_{max}$  = 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

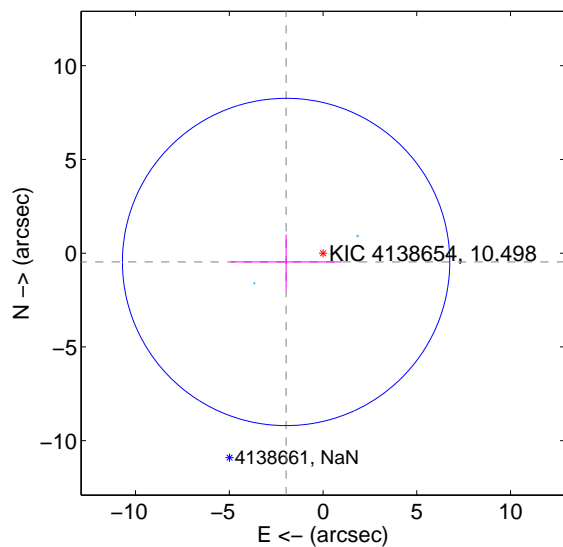
Supplemental centroid analysis for 004138654-01. **Kepler magnitude: 10.50.** Transit SNR 13.86

**There are 2 quarters with good PRF difference image offsets**

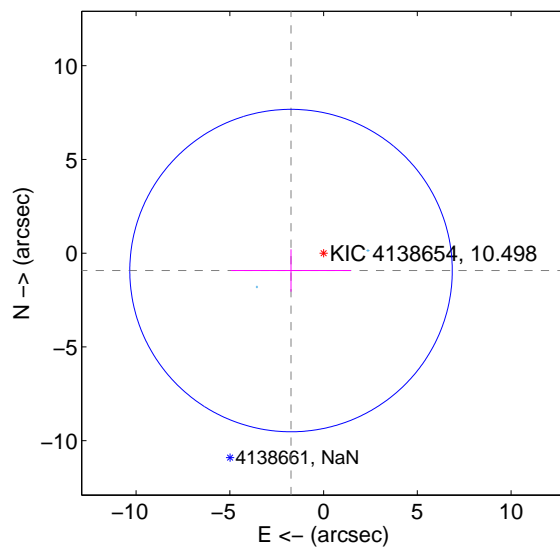
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.025 \pm 2.910$	0.70	$1.970 \pm 2.970$	$-0.468 \pm 1.466$
PRF-fit source offset from KIC position	$1.968 \pm 2.867$	0.69	$1.736 \pm 3.193$	$-0.927 \pm 1.131$
photometric centroid source offset	$1.73 \pm 1.73$	1.00	$-1.66 \pm 1.75$	$0.48 \pm 1.45$

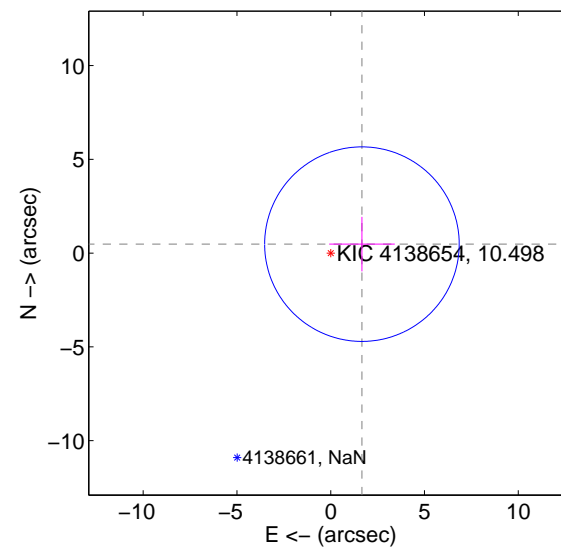
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



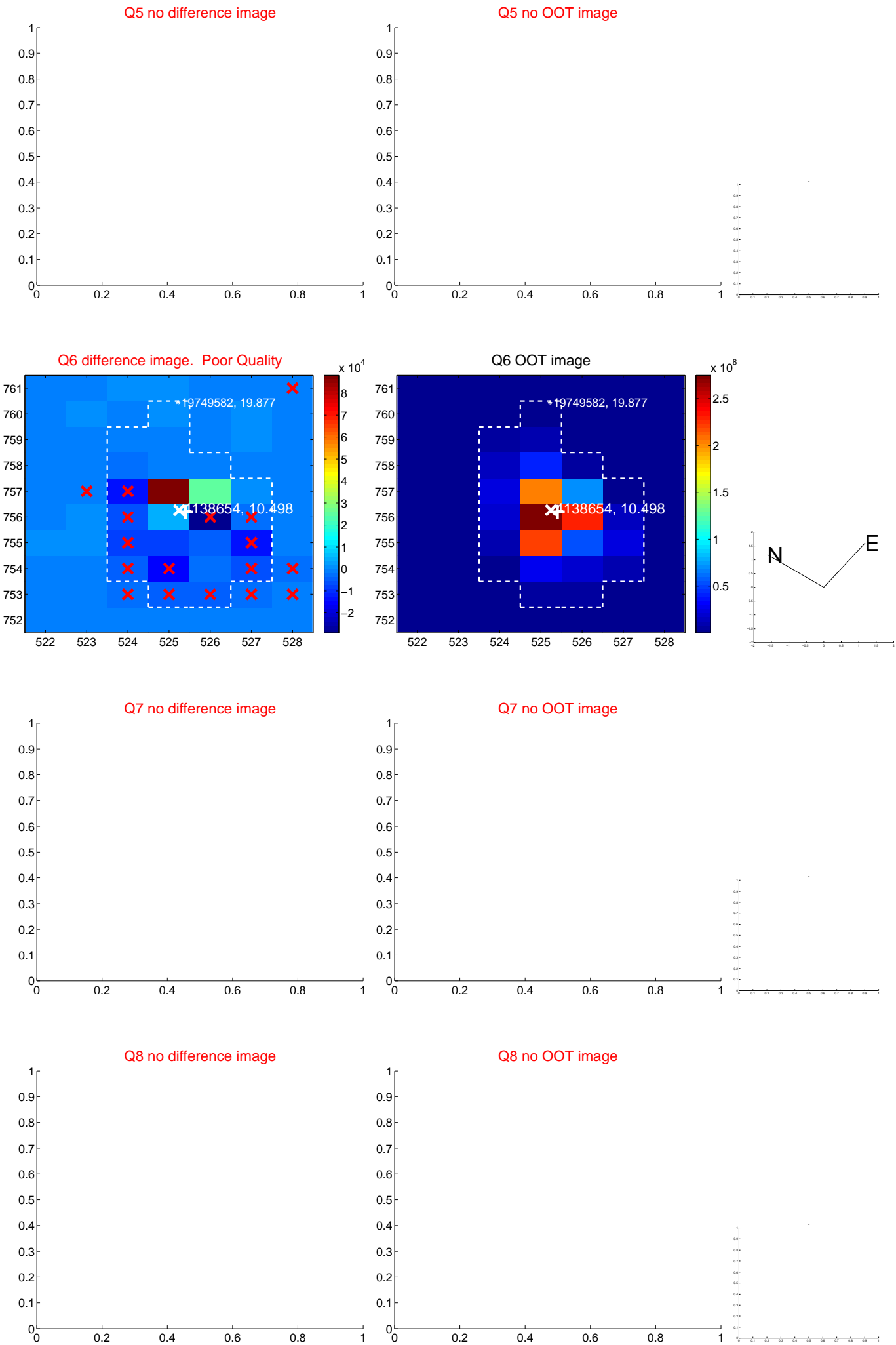
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

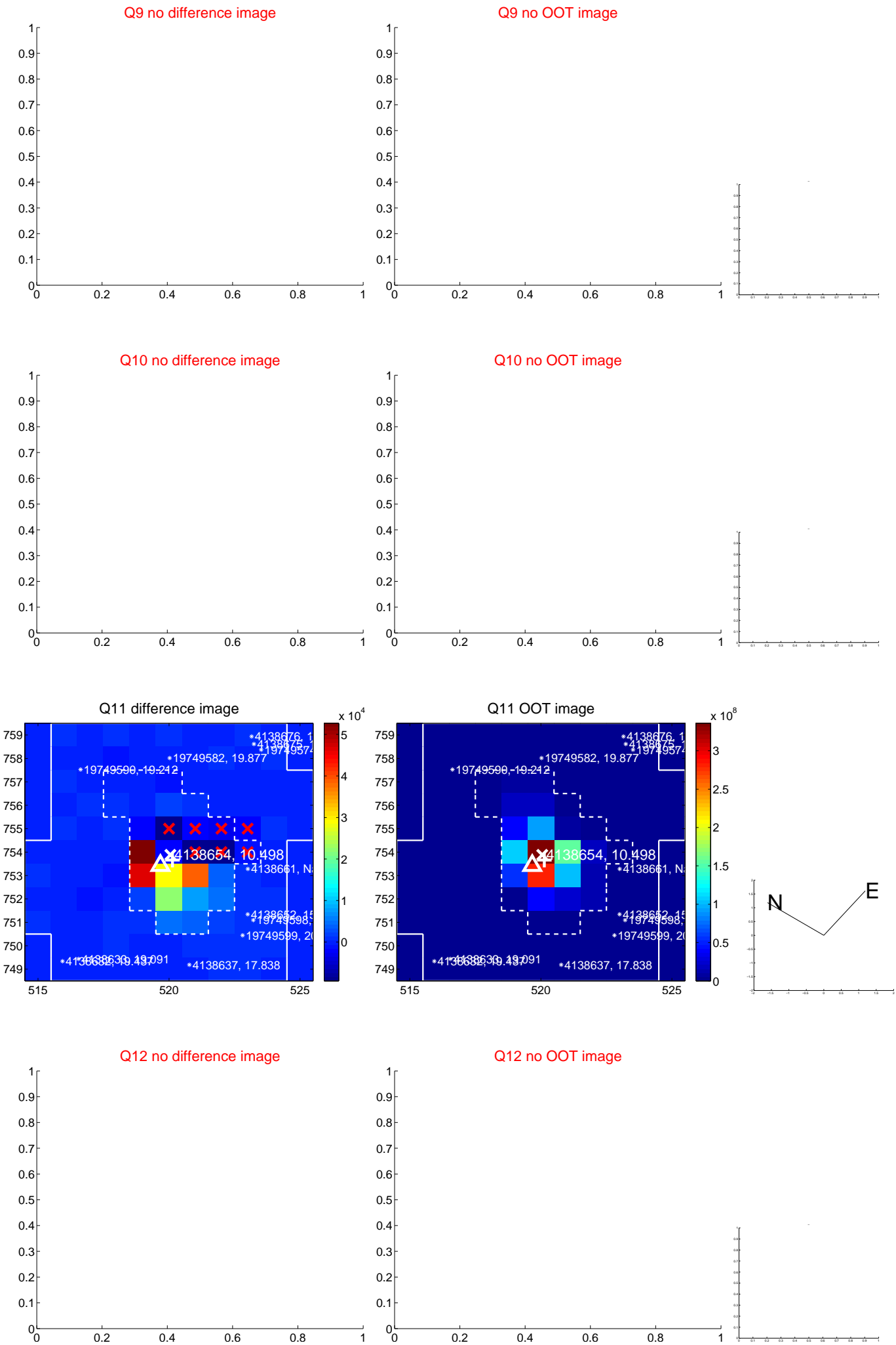




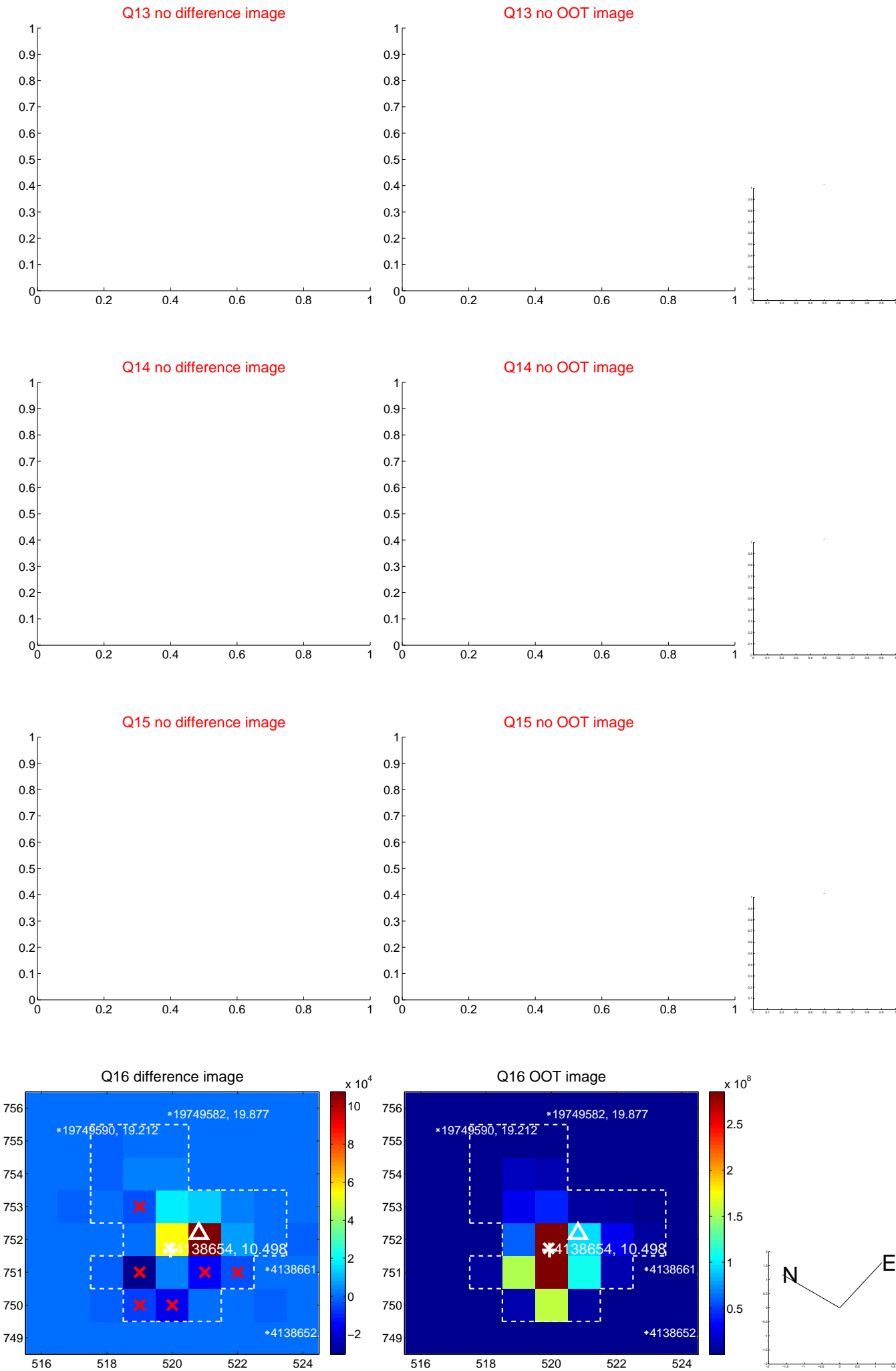
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



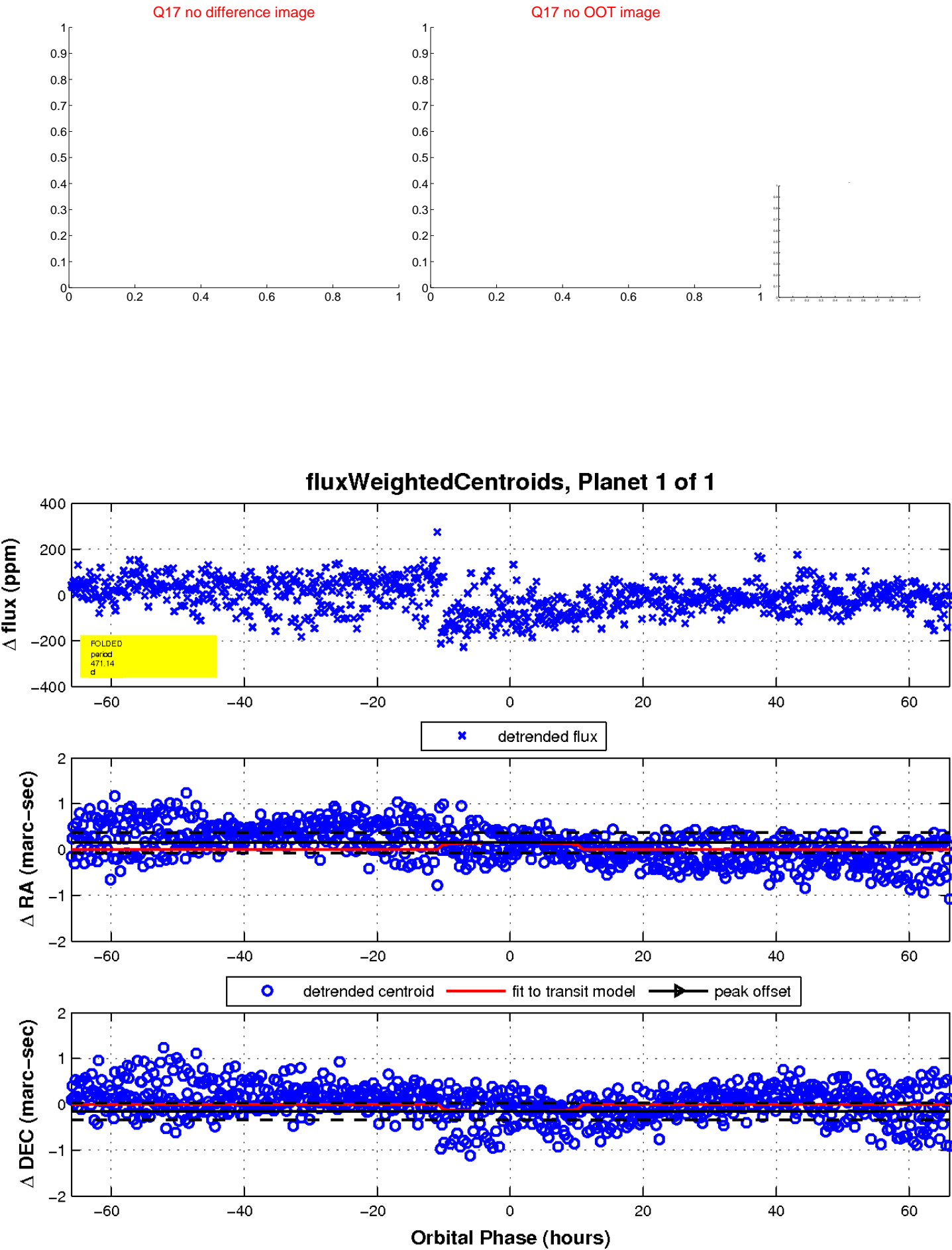
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

