

# KIC 009509296

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009509296-01	OBS	No	1.274191	132.046822	112.7	11.090	8.1	8.7	3.78	7619	4.12	50847.74

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009509296-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

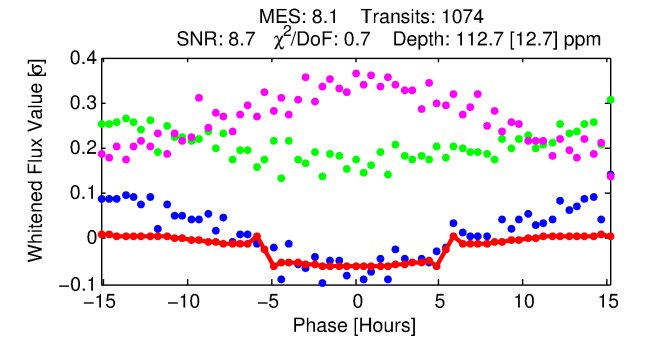
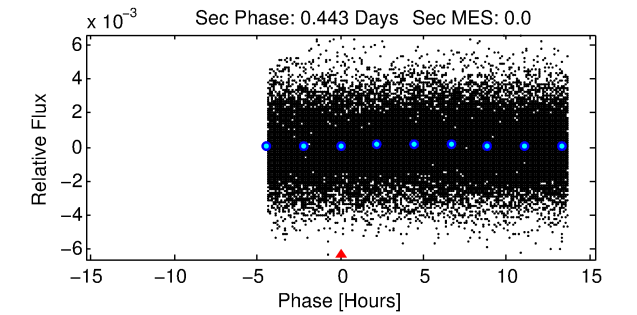
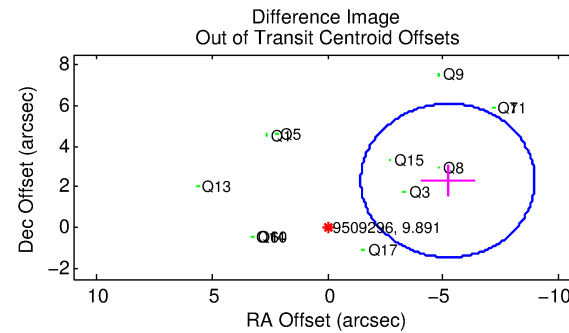
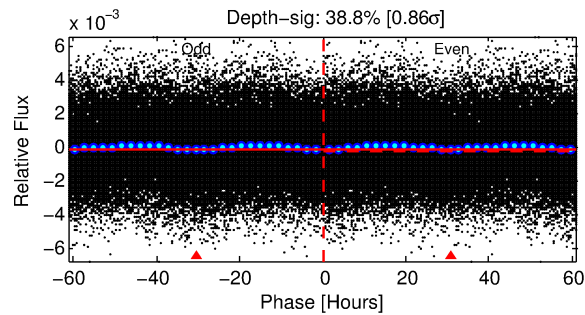
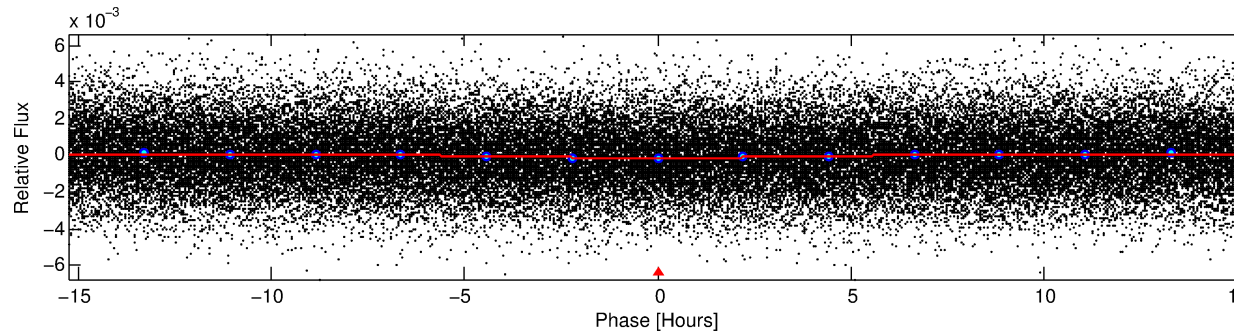
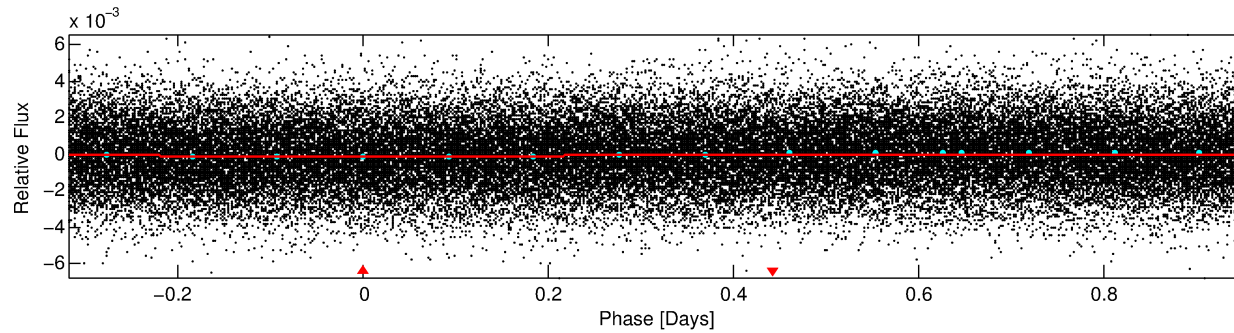
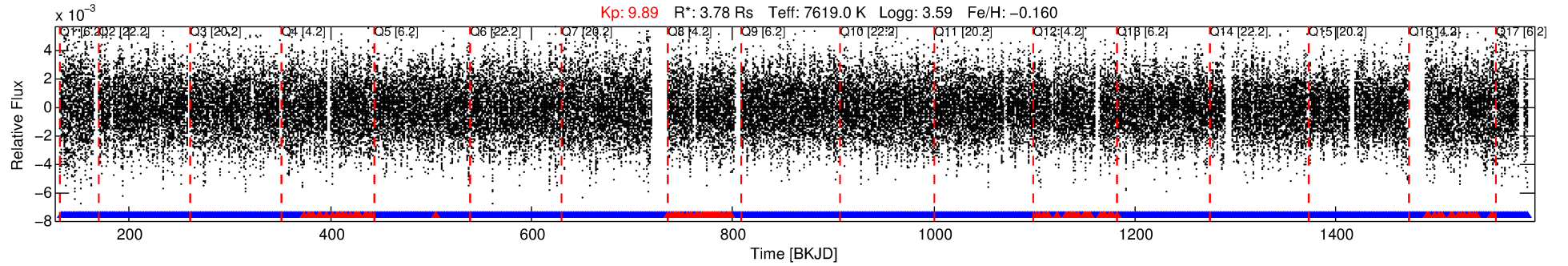
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009509296-01

No Significant Match Found

# DV One-Page Summary

KIC: 9509296 Candidate: 1 of 1 Period: 1.274 d



## DV Fit Results:

Period = 1.27419 [0.00003] d  
Epoch = 132.0468 [0.0056] BKJD  
 $R_p/R^* = 0.0100$  [0.0059]  
 $a/R^* = 1.09$  [0.56]  
 $b = 0.45$  [5.70]  
 $\text{Seff} = 50847.74$  [47745.59]  
 $T_{\text{eq}} = 3829$  [899] K  
 $R_p = 4.12$  [3.37]  $R_e$   
 $a = 0.0291$  [0.0165] AU  
 $\text{Ag} = \text{N/A}$   
 $T_{\text{eff}} = \text{N/A}$

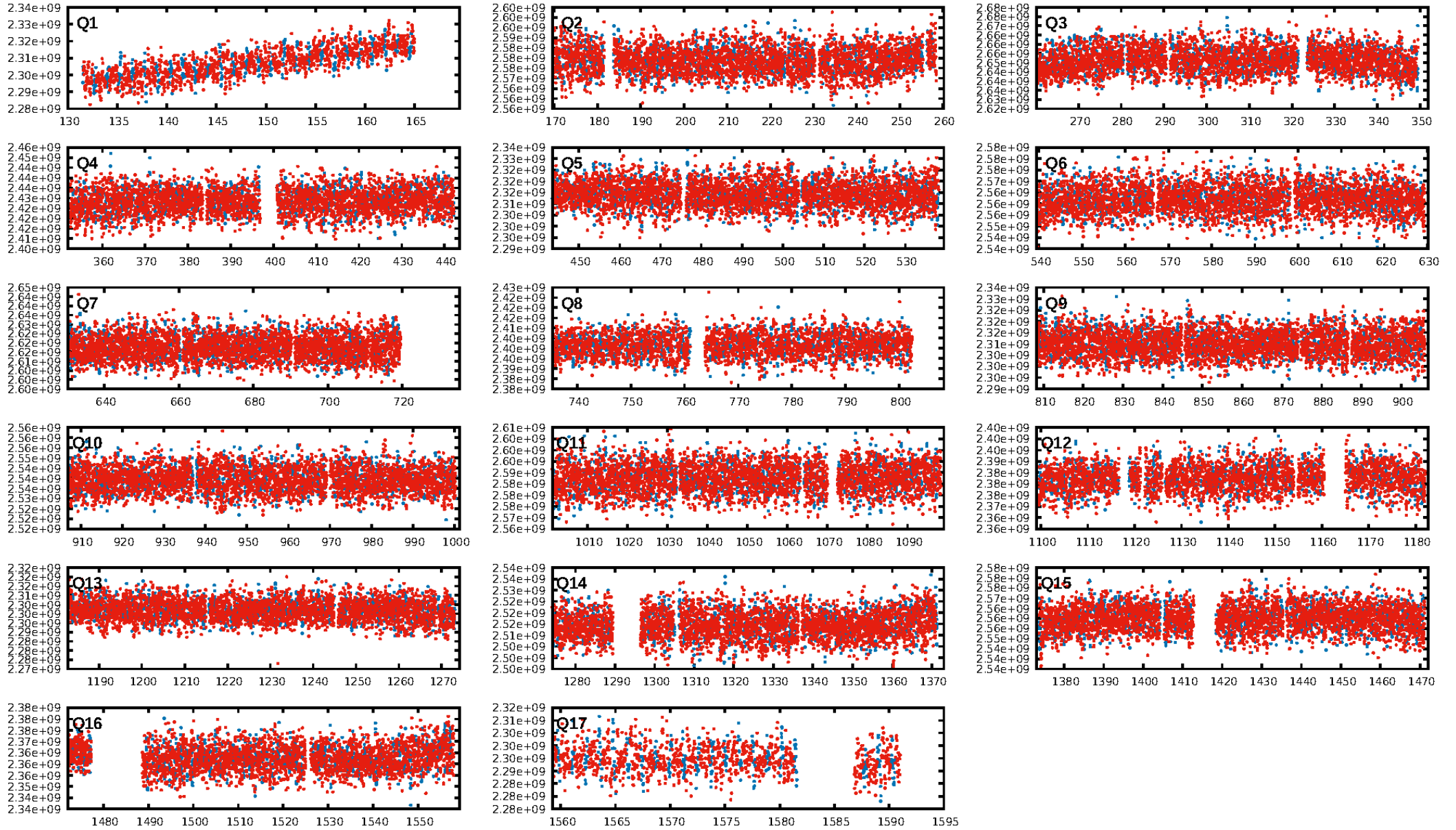
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.90 [920/1025]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 1.6%  
Centroid-so: 0.583 arcsec [2.39 $\sigma$ ]  
OotOffset-rm: 5.698 arcsec [4.54 $\sigma$ ]  
KicOffset-rm: 5.745 arcsec [4.04 $\sigma$ ]  
OotOffset-st: 3/4/1/5 [13]  
KicOffset-st: 3/4/1/5 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 1.00 [17/17]

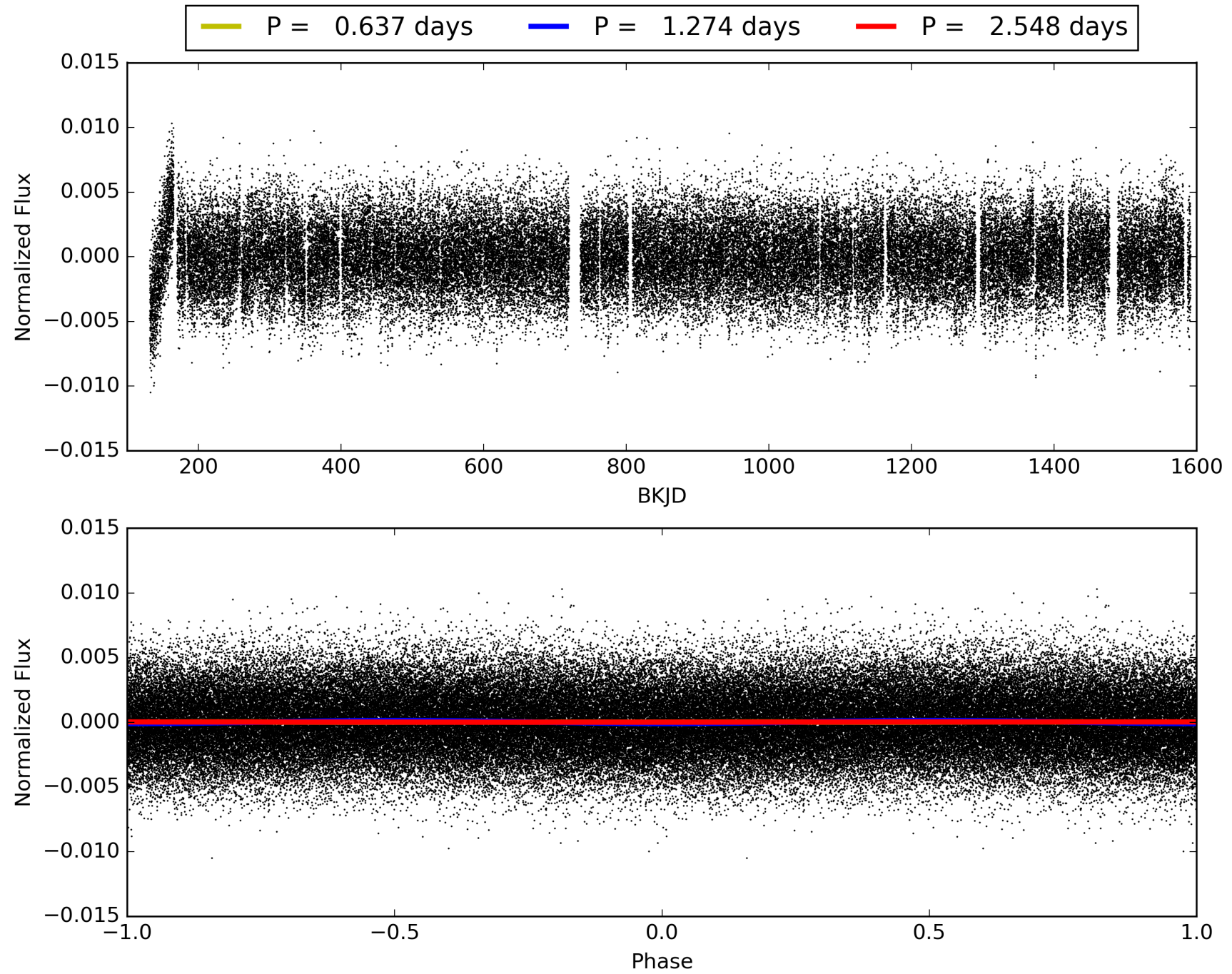
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 05:54:53 Z

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

# TCE 009509296-01, PDC Light Curves



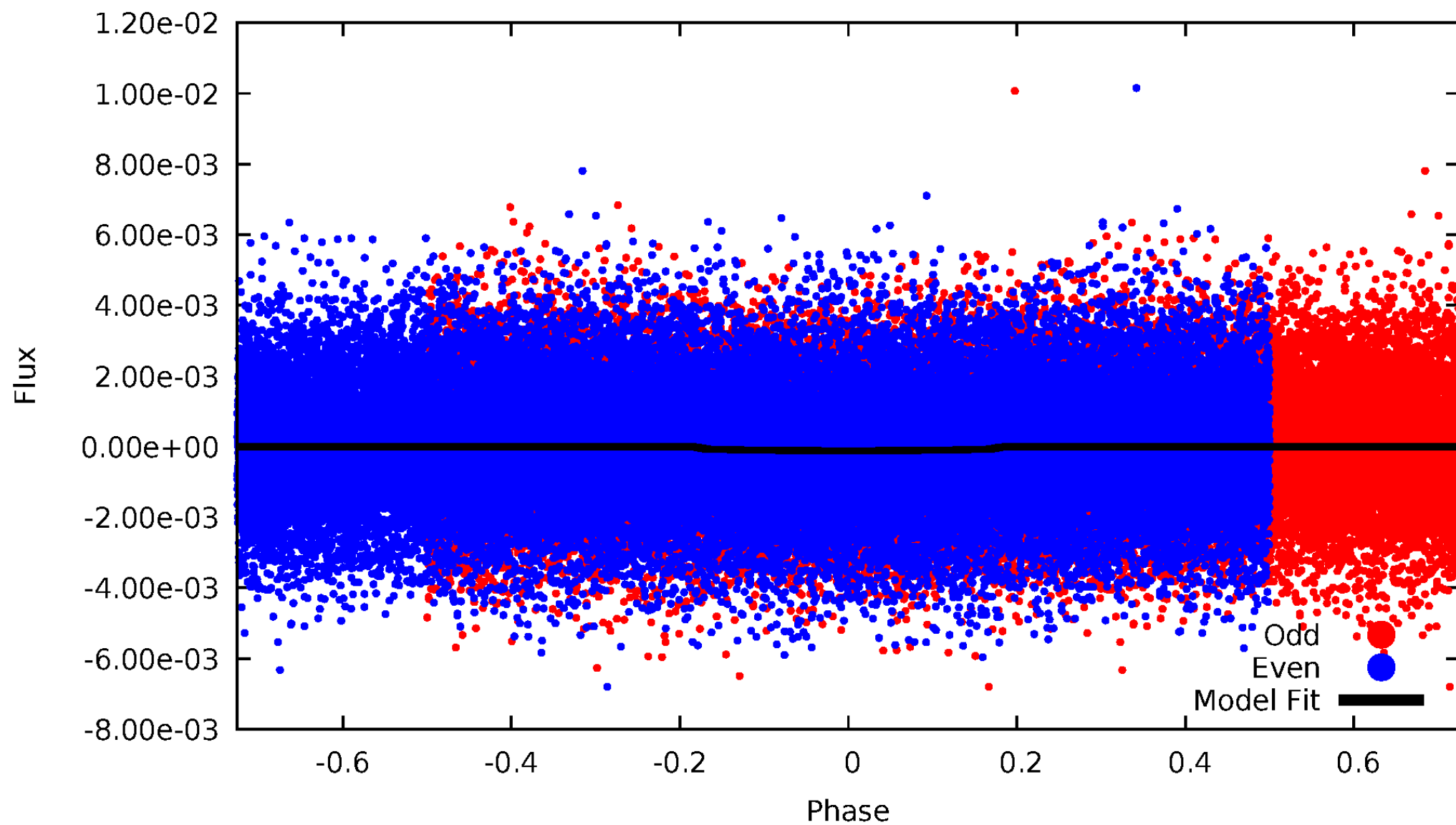
TCE 009509296-01





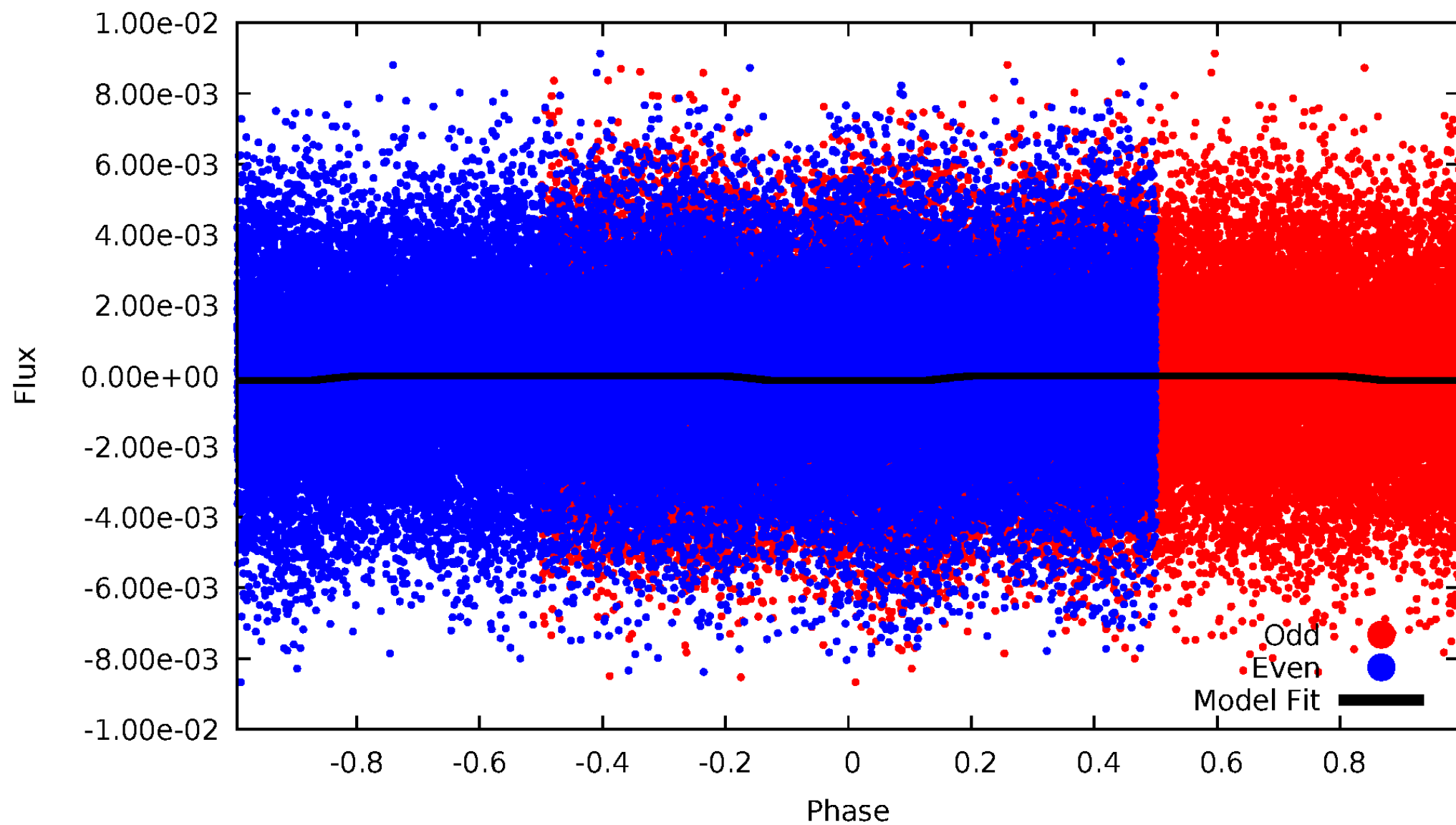
# DV Odd/Even

TCE 009509296-01

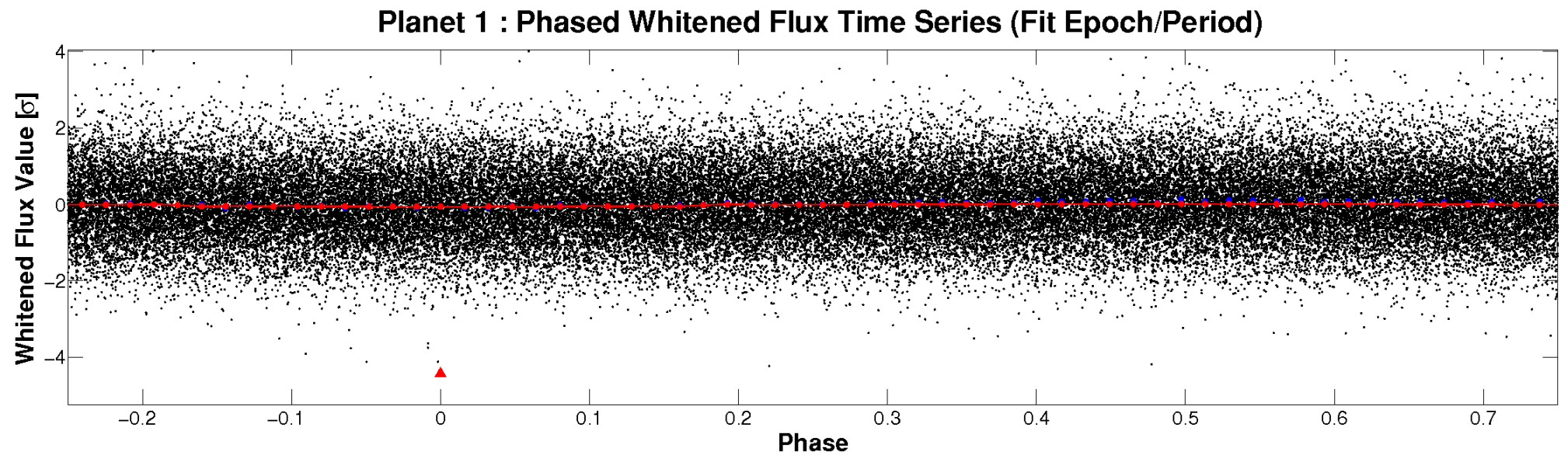
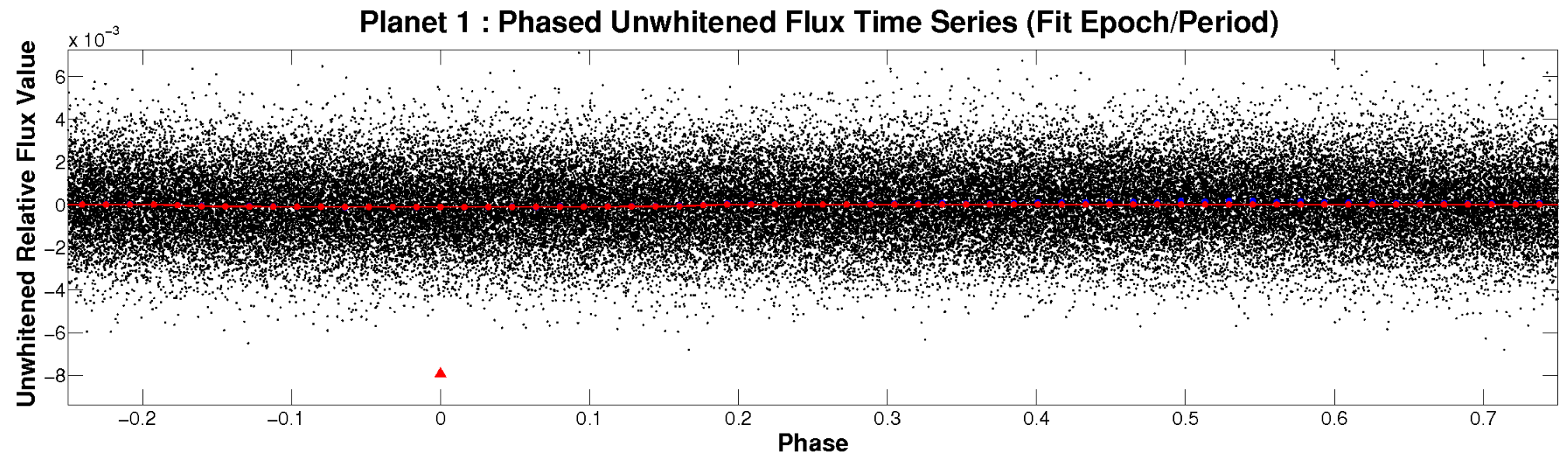


# ALT Odd/Even

TCE 009509296-01

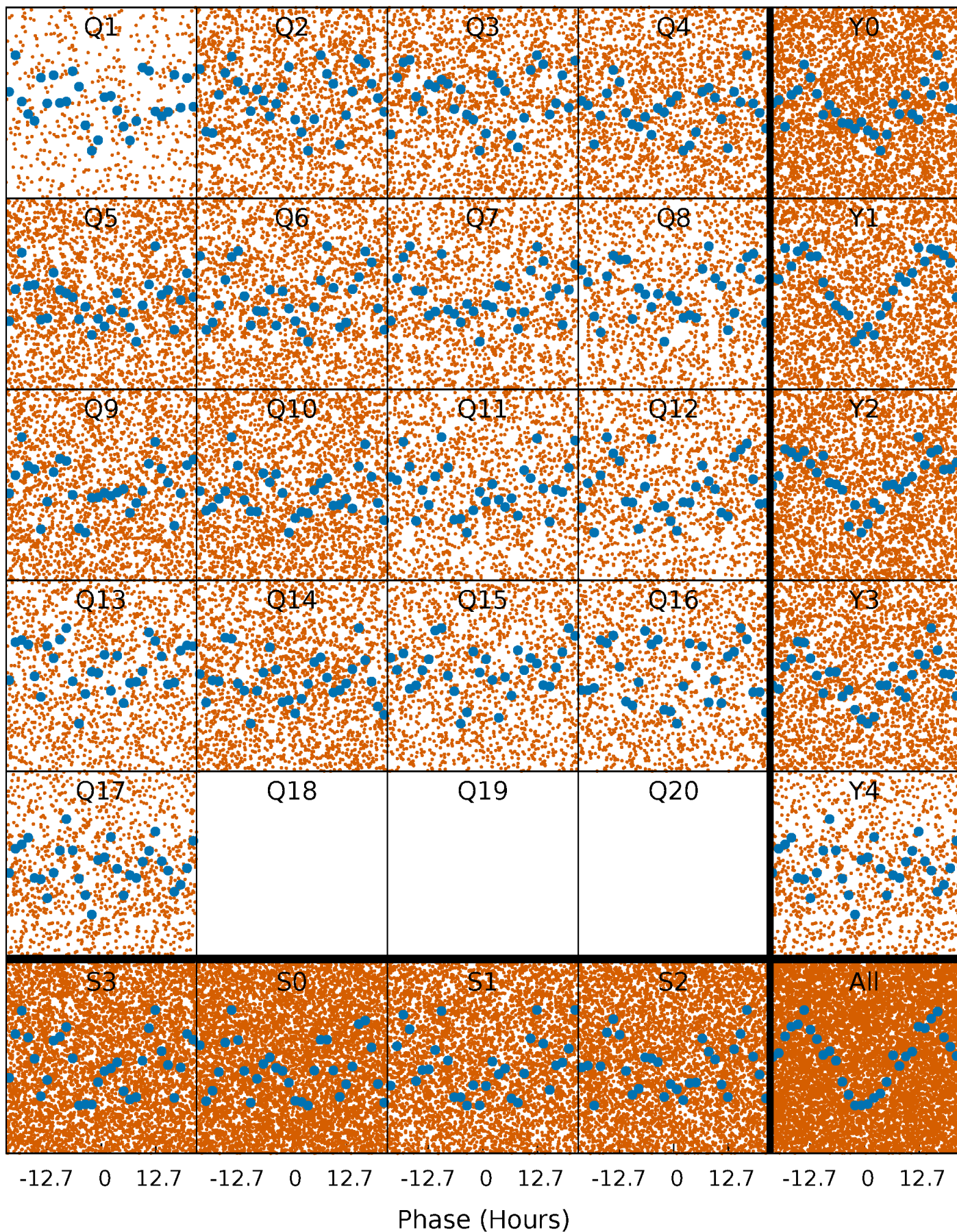


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

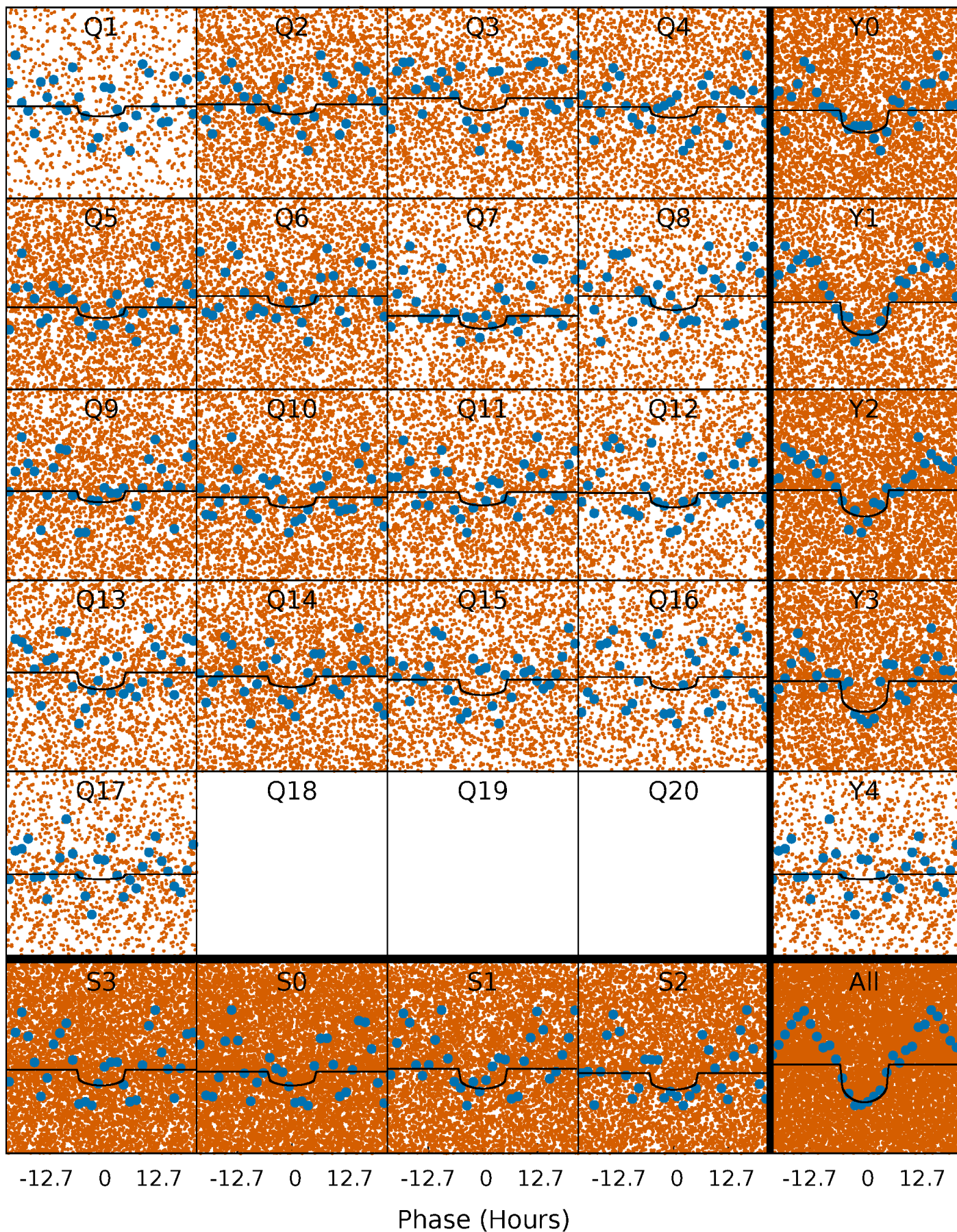
TCE 009509296-01 P= 1.274191 Days  $T_0=132.046822$  (BKJD)





# DV Quarter-Phased Transit Curves

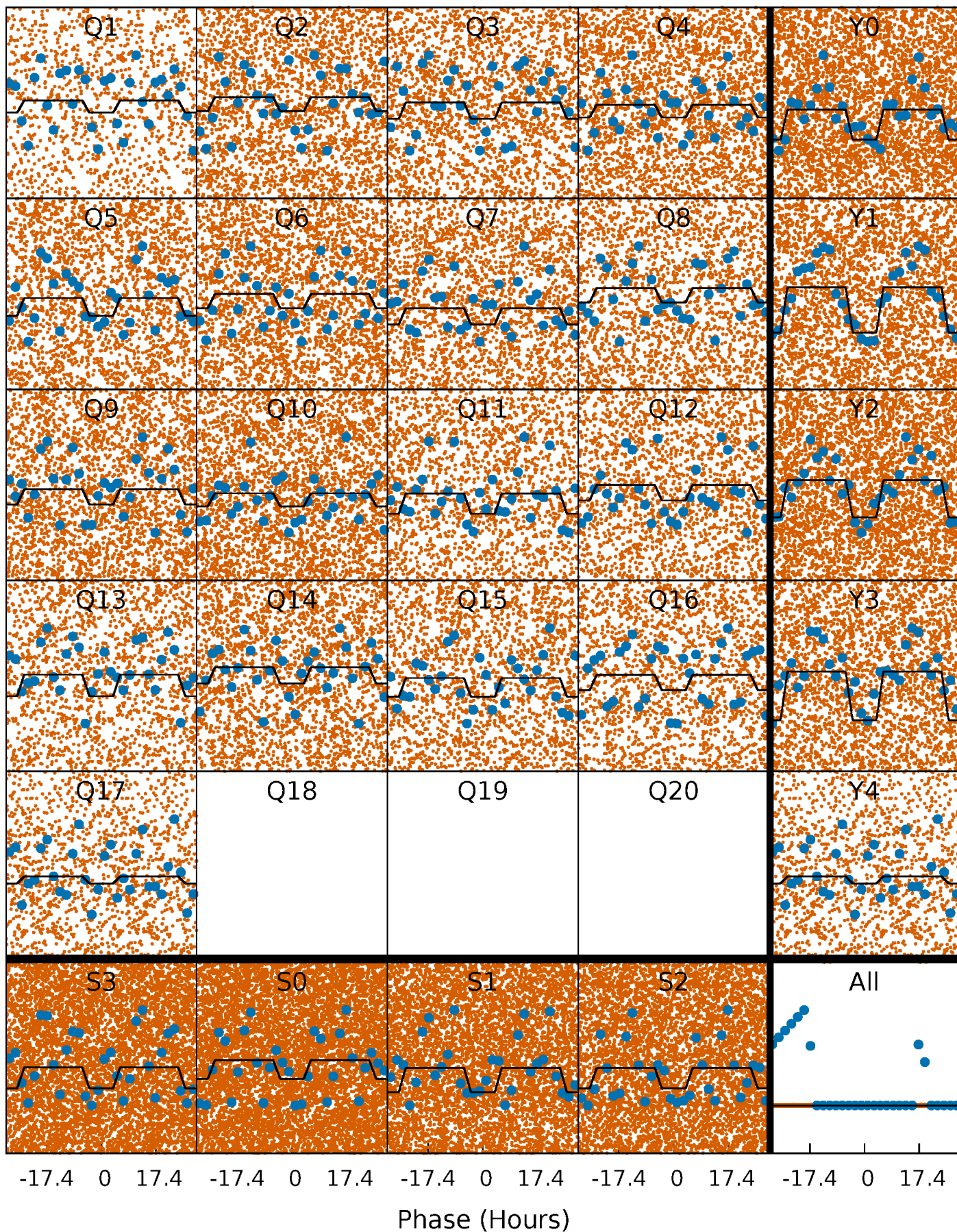
TCE 009509296-01   P= 1.274191 Days    $T_0=132.046822$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

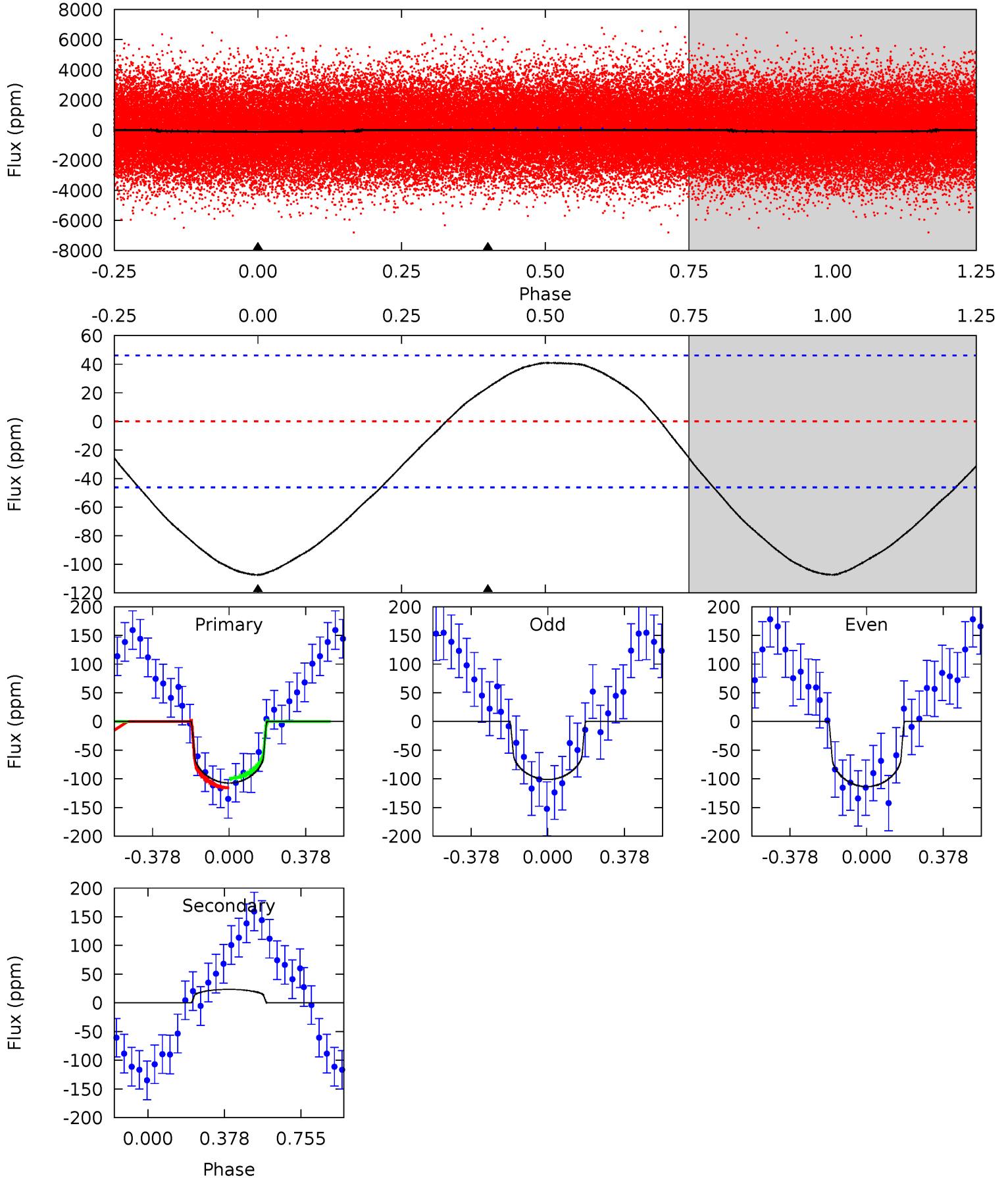
TCE 009509296-01 P= 1.274182 Days  $T_0=132.041243$  (BKJD)



# DV Model-Shift Uniqueness Test

009509296-01, P = 1.274191 Days, E = 130.772631 Days

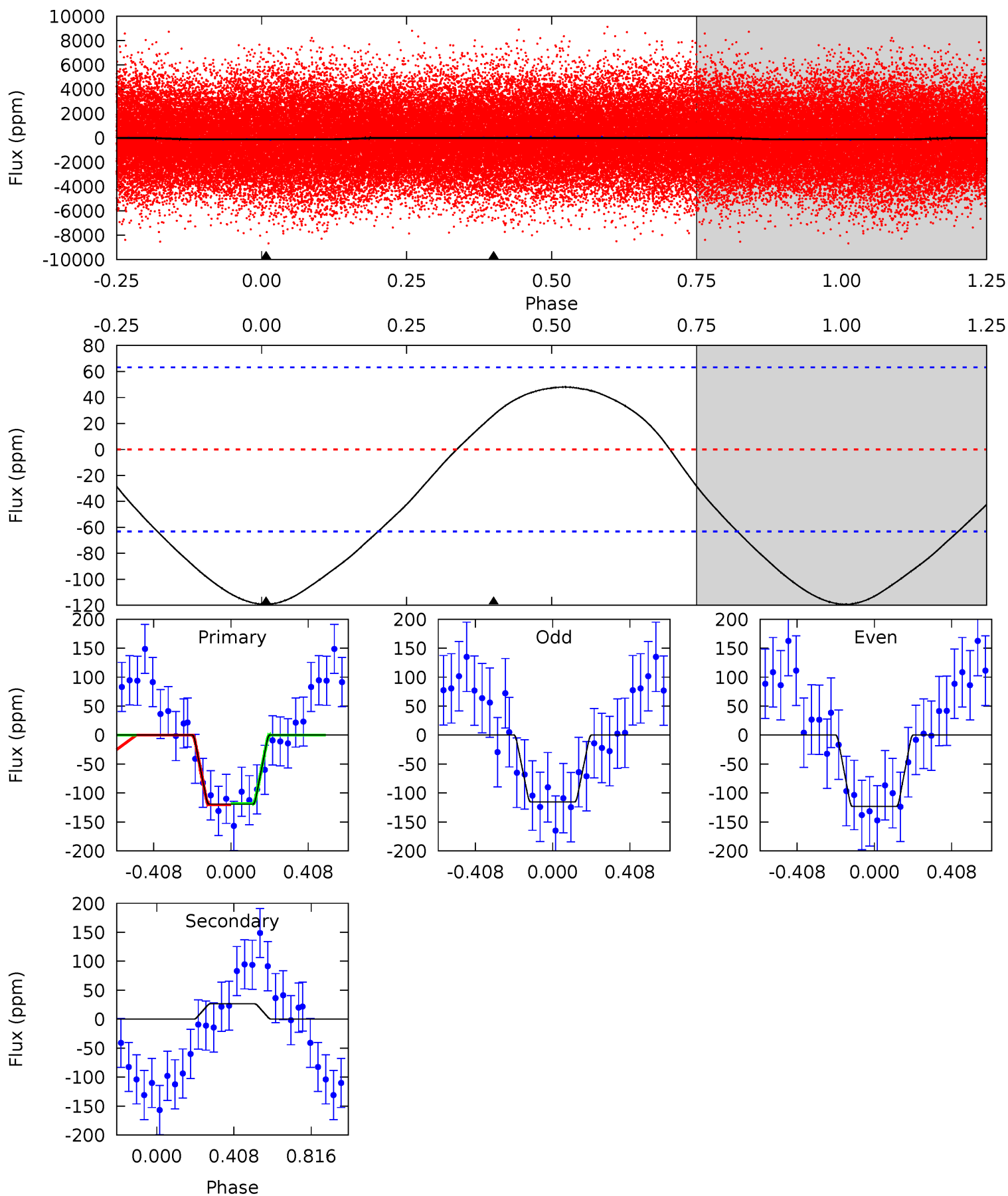
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.96	-2.19	0	0	4.28	0.88	1.30	9.96	9.96	-2.19	-2.19	0.58	0.88	0.28	0.76



# Alt Model-Shift Uniqueness Test

009509296-01, P = 1.274182 Days, E = 130.767061 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
8.04	-1.78	0	0	4.26	0.83	1.14	8.04	8.04	-1.78	-1.78	0.26	0.80	0.29	0.07





### Stellar Parameters For KIC 009509296

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7619^{+212}_{-318}$	$3.590^{+0.549}_{-0.061}$	$-0.160^{+0.200}_{-0.300}$	$3.777^{+0.505}_{-2.147}$	$2.025^{+0.229}_{-0.573}$	$0.053^{+0.326}_{-0.016}$
	+3%/-4%	+15%/-2%	+125%/-188%	+13%/-57%	+11%/-28%	+616%/-30%
Source	KIC0	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 009509296-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$24 \pm 11$	$3.54^{+2.53}_{-2.01}$	$5107^{+374}_{-742}$	$-5574^{+758}_{-2347}$	$-0.778^{+0.524}_{-3.472}$
Alt.	$26 \pm 15$	$4.12^{+2.67}_{-2.11}$	$5112^{+358}_{-694}$	$-5355^{+702}_{-1420}$	$-0.595^{+0.432}_{-2.215}$

$T_{max}$  = 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

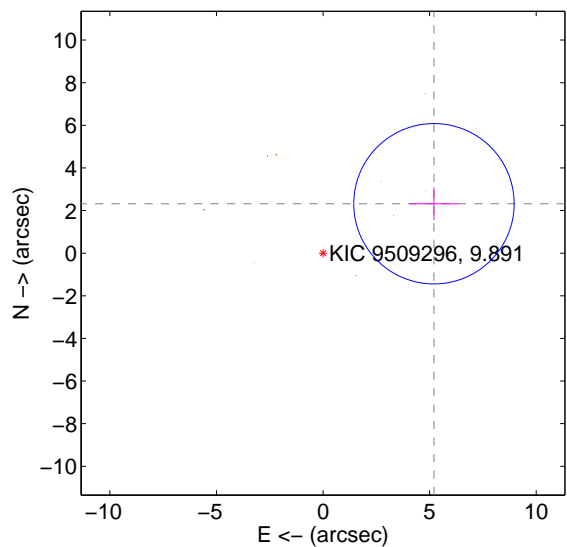
Supplemental centroid analysis for 009509296-01. **Kepler magnitude: 9.89.** Transit SNR 8.66

There are 6 quarters with good PRF difference image offsets

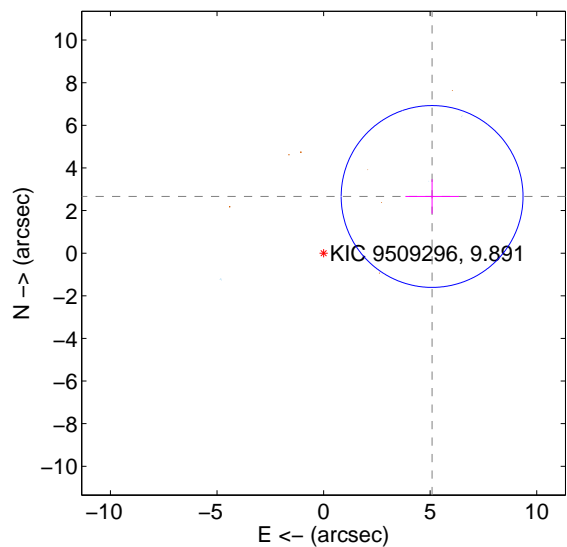
The direct PRF centroid is offset from the target star catalog position by about 1.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.698 \pm 1.255</math></b>	<b>4.54</b>	$-5.205 \pm 1.145$	$2.320 \pm 0.766$
PRF-fit source offset from KIC position	<b><math>5.745 \pm 1.422</math></b>	<b>4.04</b>	$-5.093 \pm 1.254$	$2.660 \pm 0.807$
photometric centroid source offset	$0.58 \pm 0.24$	2.39	$0.49 \pm 0.24$	$0.31 \pm 0.25$

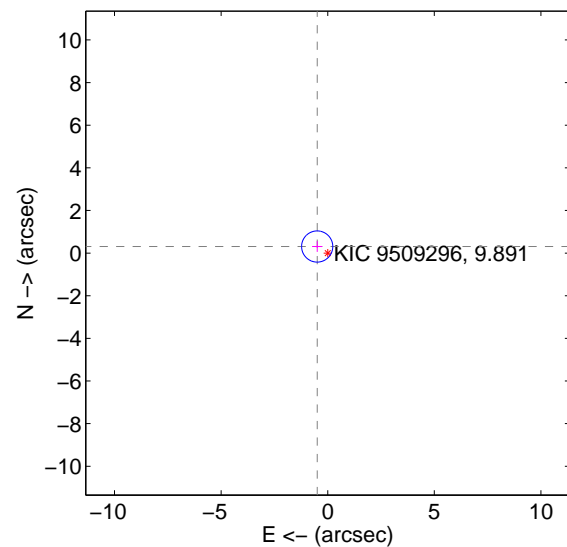
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

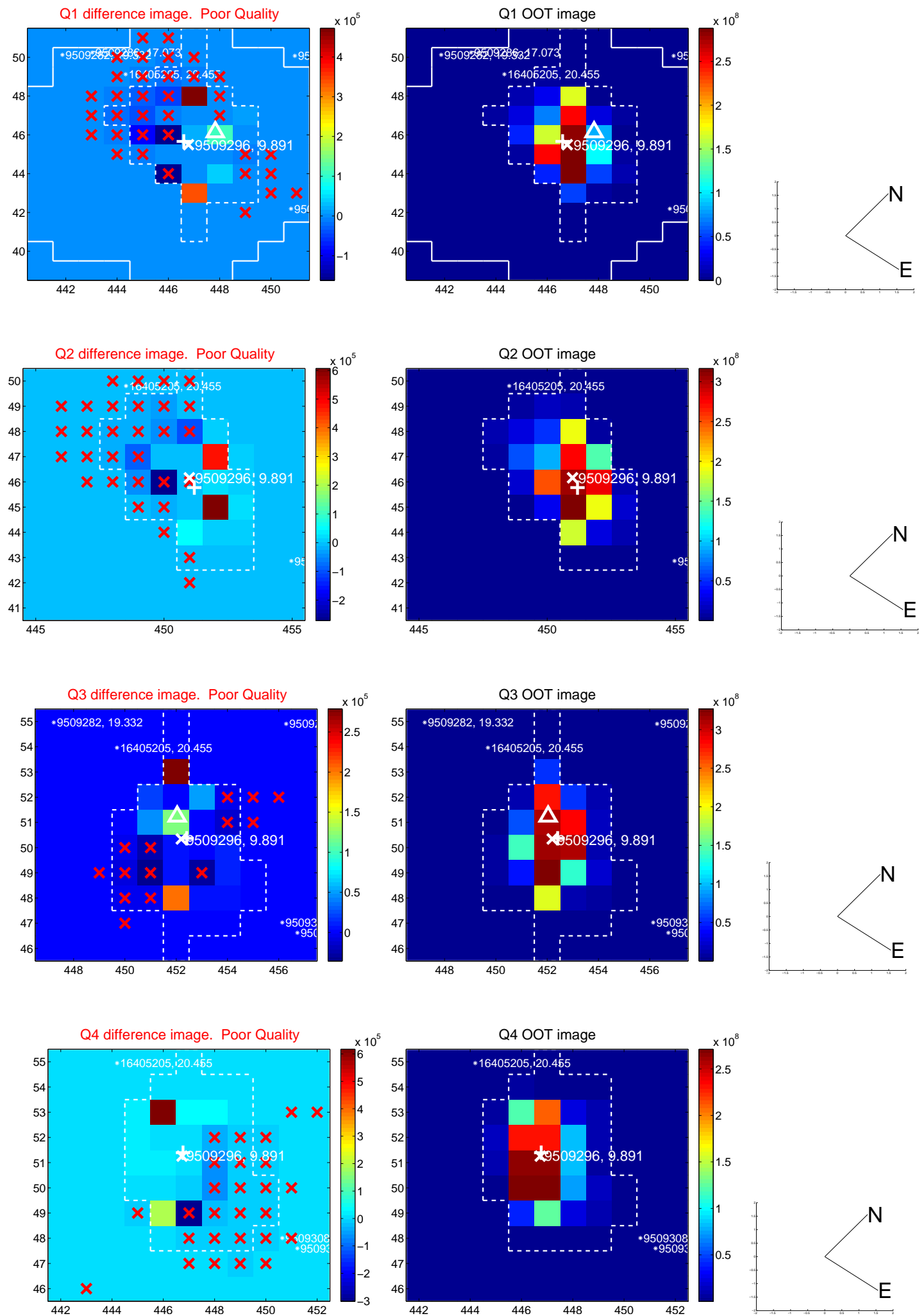


offset from photometric centroids

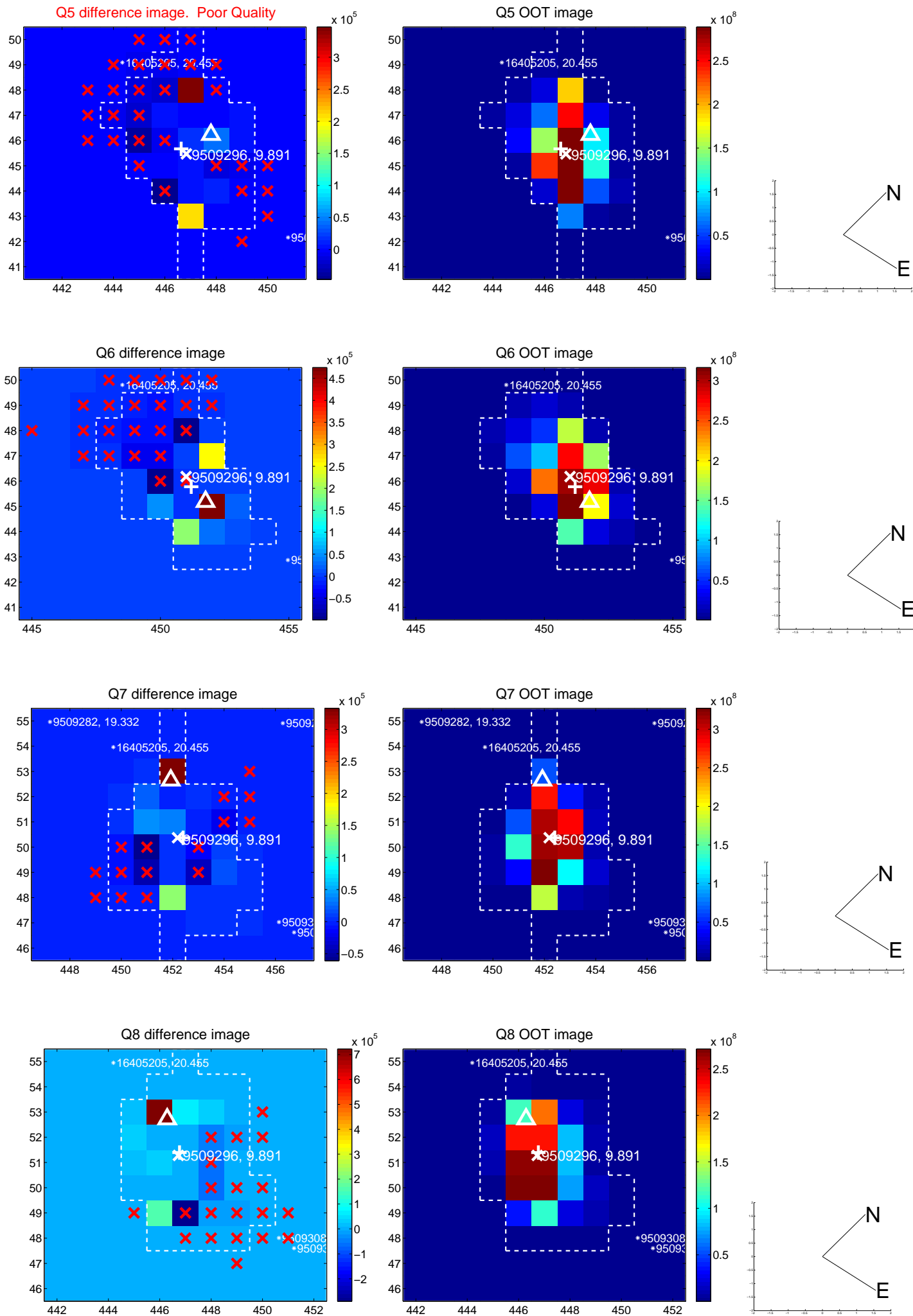


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

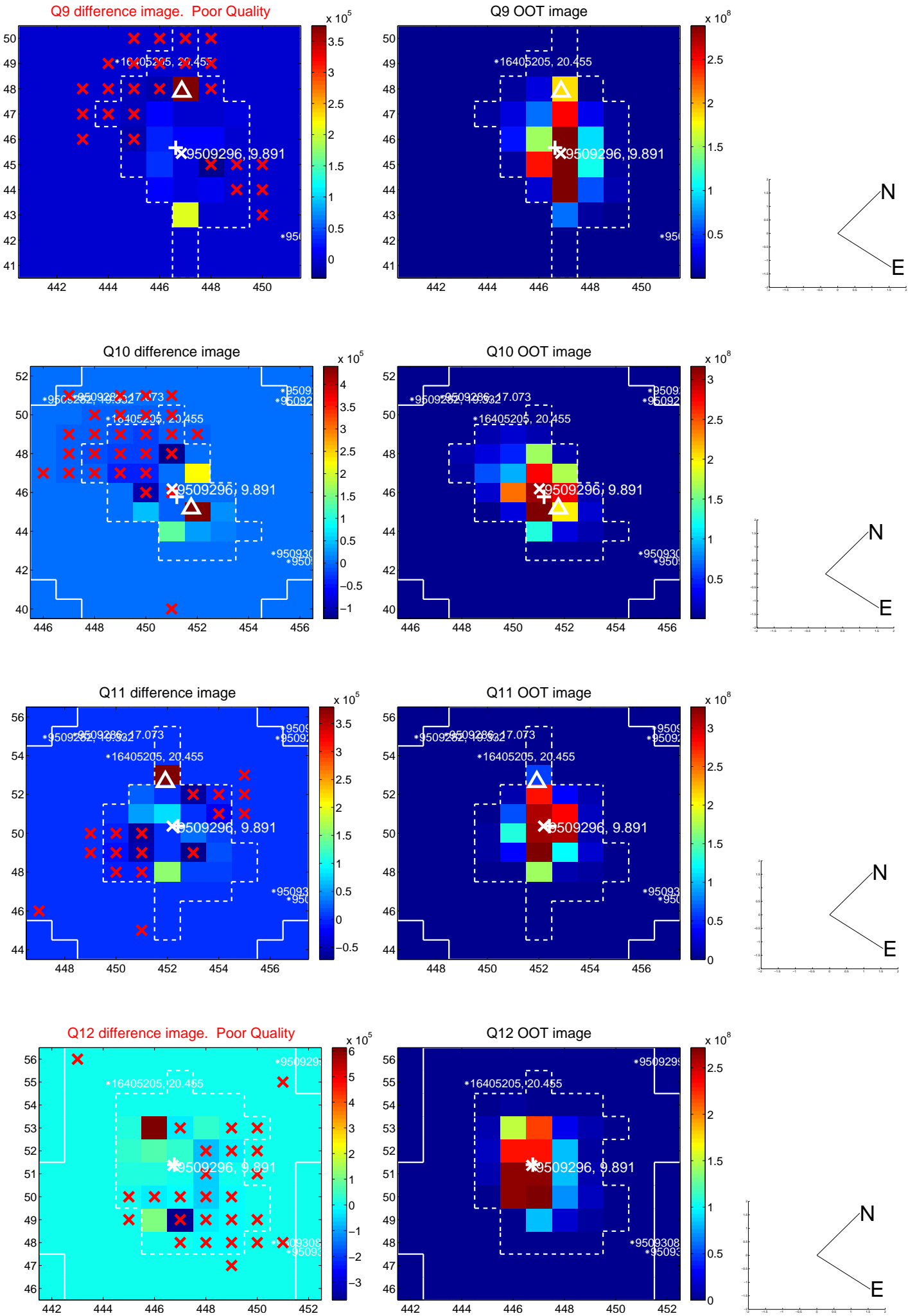


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

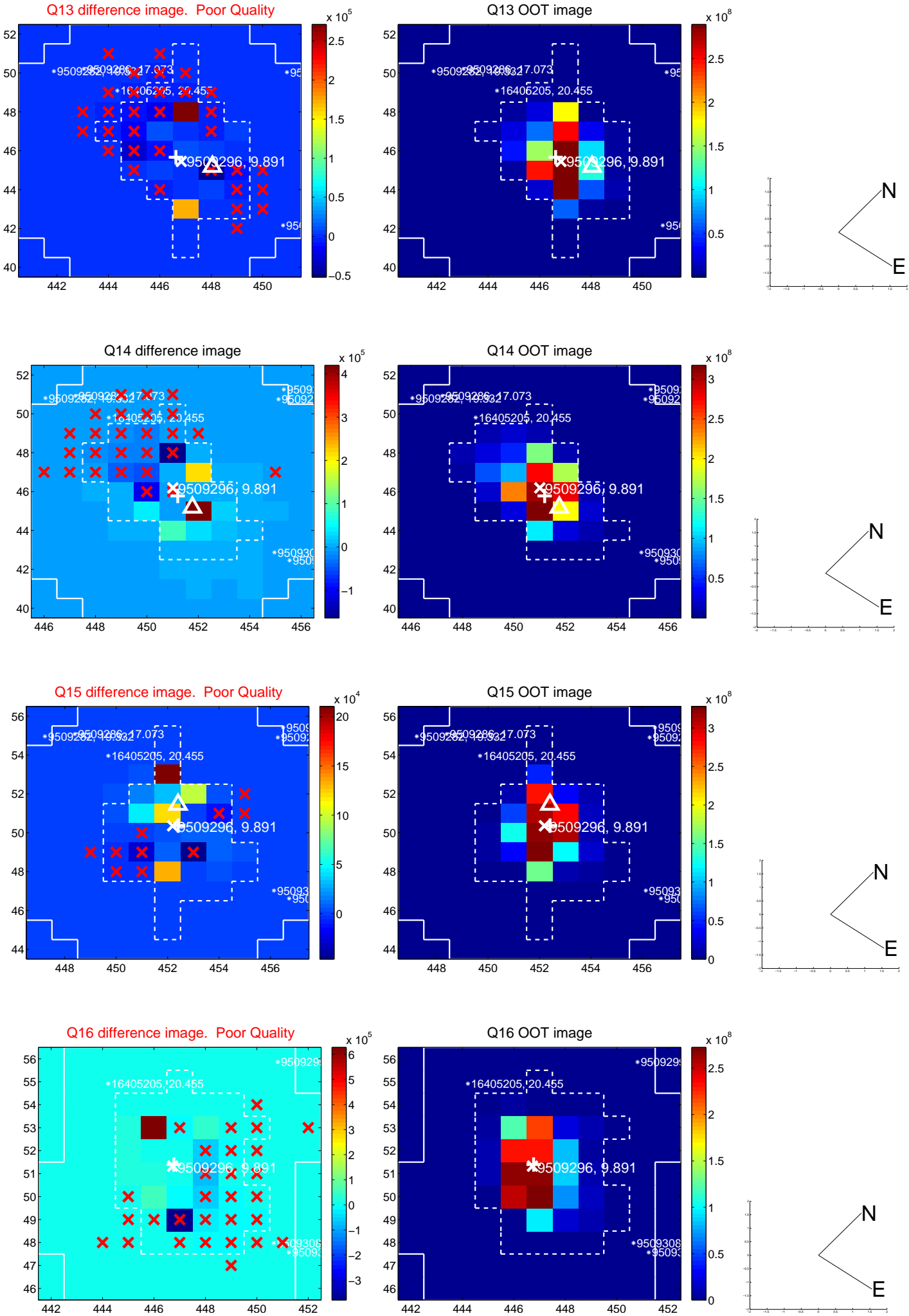




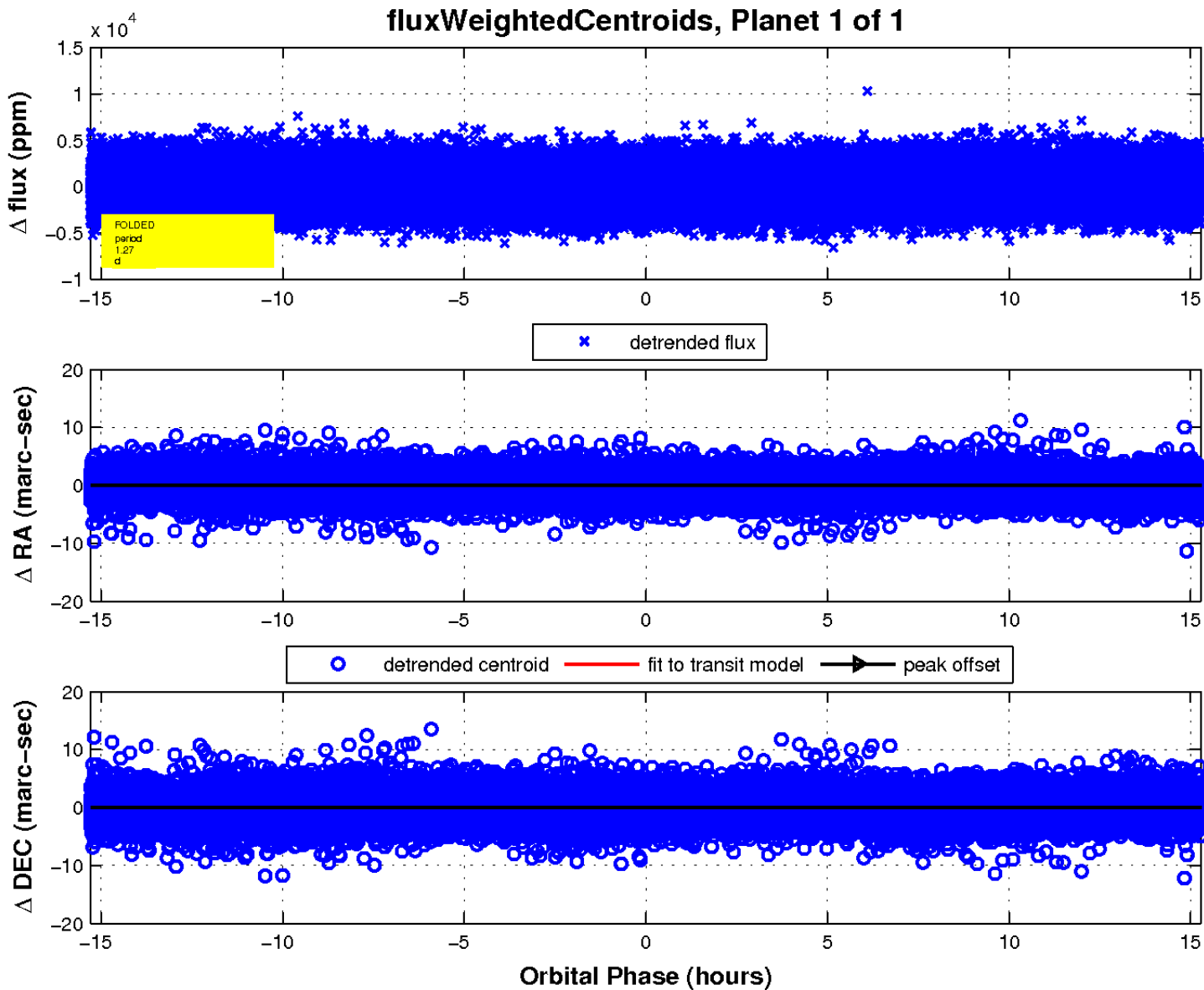
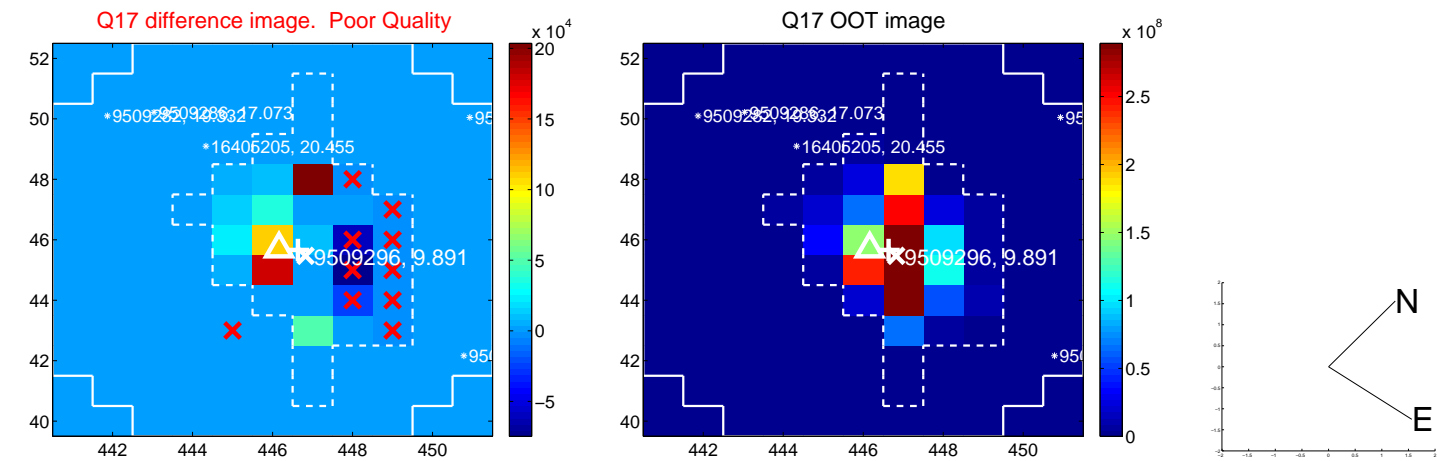
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

Declination

