

# KIC 009456651

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009456651-01	OBS	No	10.274942	132.053964	89.0	26.667	8.5	8.7	0.81	4787	0.80	42.44

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009456651-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET

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

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

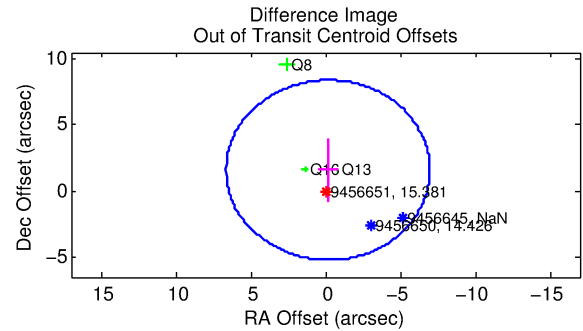
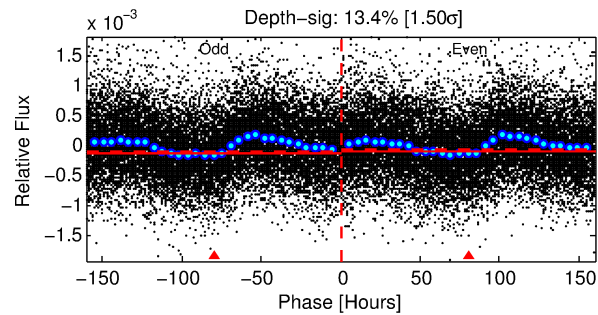
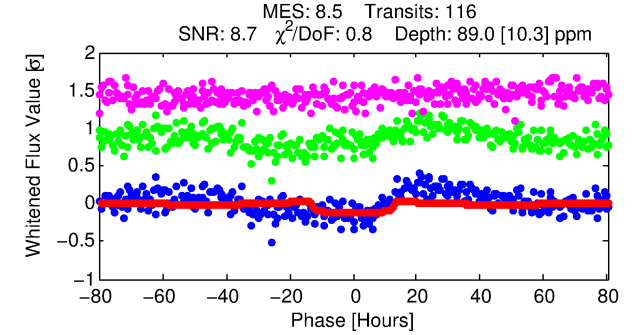
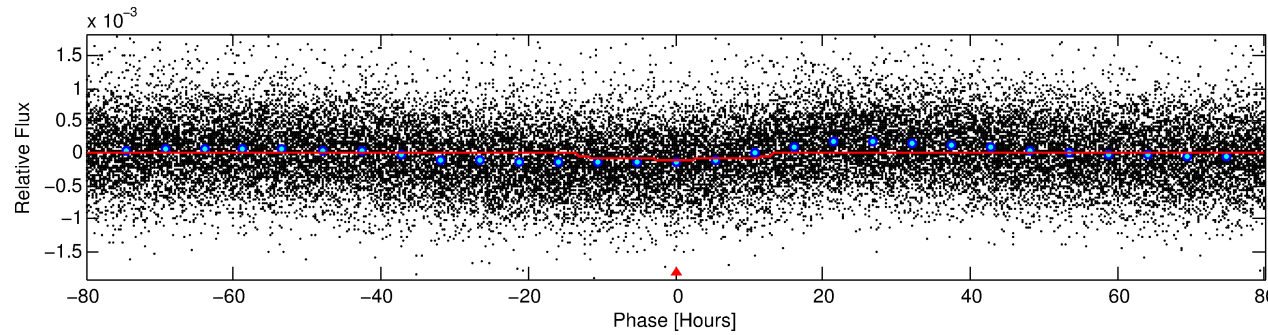
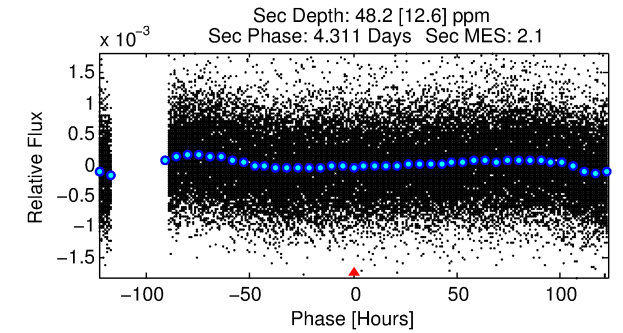
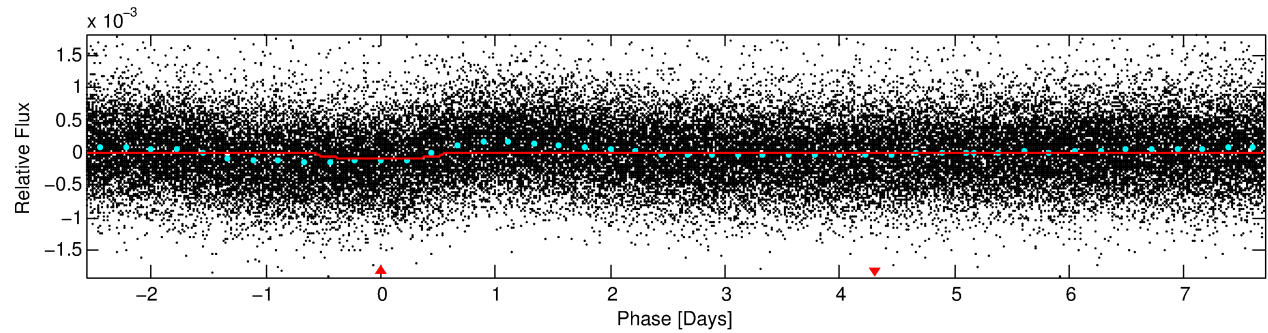
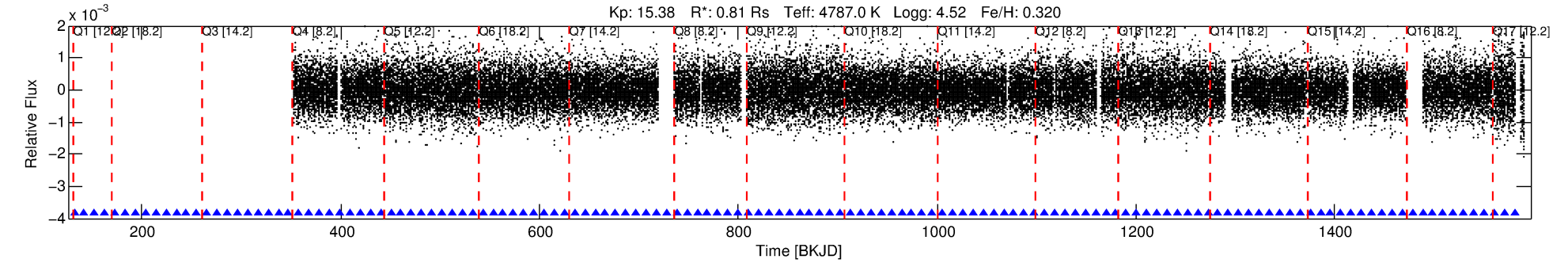
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009456651-01

No Significant Match Found

# DV One-Page Summary

KIC: 9456651 Candidate: 1 of 1 Period: 10.275 d



## DV Fit Results:

Period = 10.27494 [0.00045] d  
Epoch = 132.0540 [0.0390] BKJD  
Rp/R\* = 0.0090 [0.0041]  
a/R\* = 2.43 [2.97]  
b = 0.64 [1.39]  
Seff = 42.44 [8.83]  
Teff = 651 [34] K  
Rp = 0.80 [0.37] Re  
a = 0.0855 [0.0083] AU  
Ag = 305.03 [292.46] [1.04σ]  
Teffp = 4205 [1006] K [3.53σ]

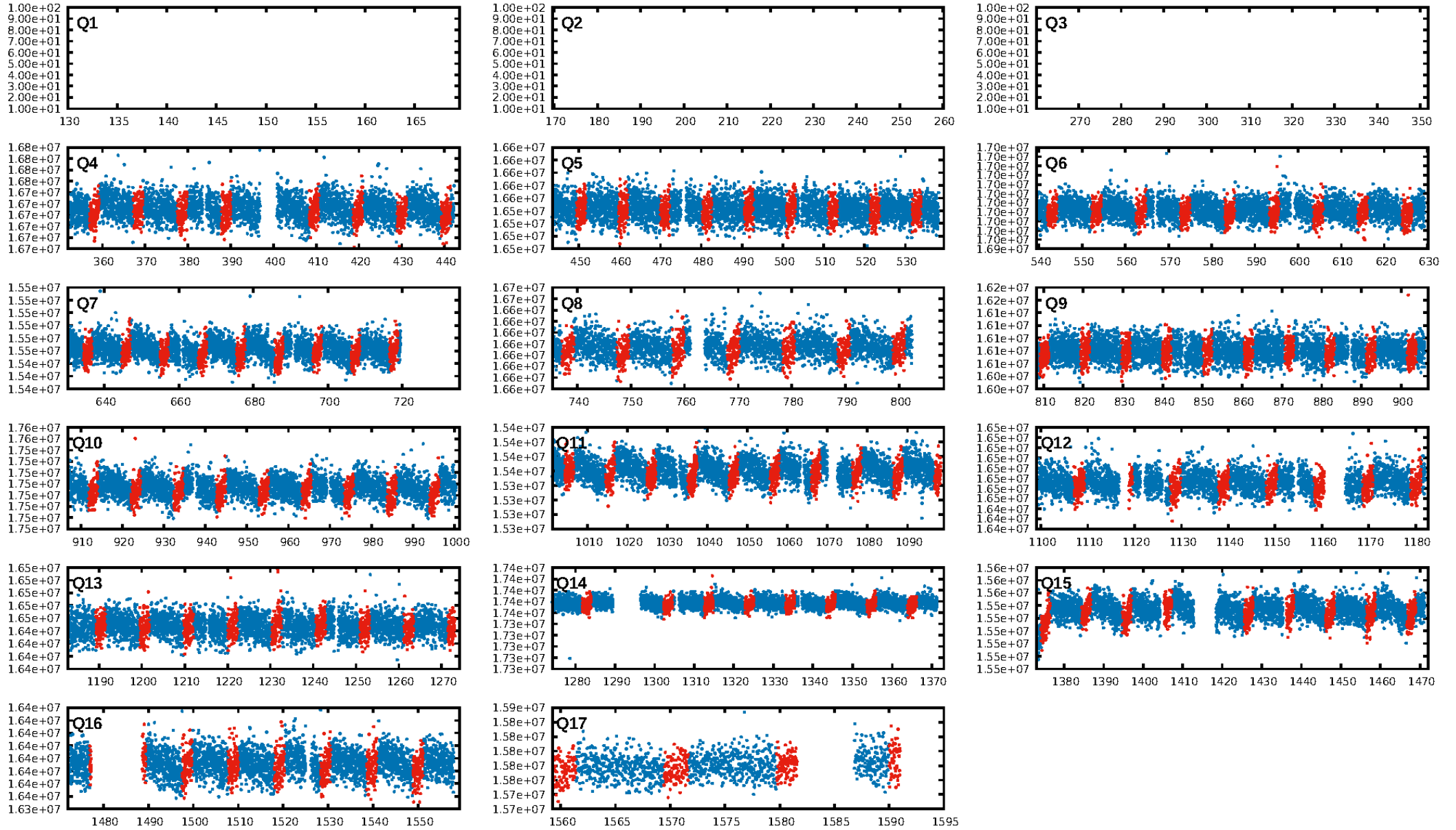
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.71e-16  
RollingBand-fgt: 1.00 [112/112]  
GhostDiagnostic-chr: 3.983  
Centroid-sig: 0.0%  
Centroid-so: 0.955 arcsec [0.80σ]  
OotOffset-rm: 1.599 arcsec [0.70σ]  
KicOffset-rm: 7.110 arcsec [3.44σ]  
OotOffset-st: 0/0/2/1 [3]  
KicOffset-st: 1/1/2/1 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 1.00 [14/14]

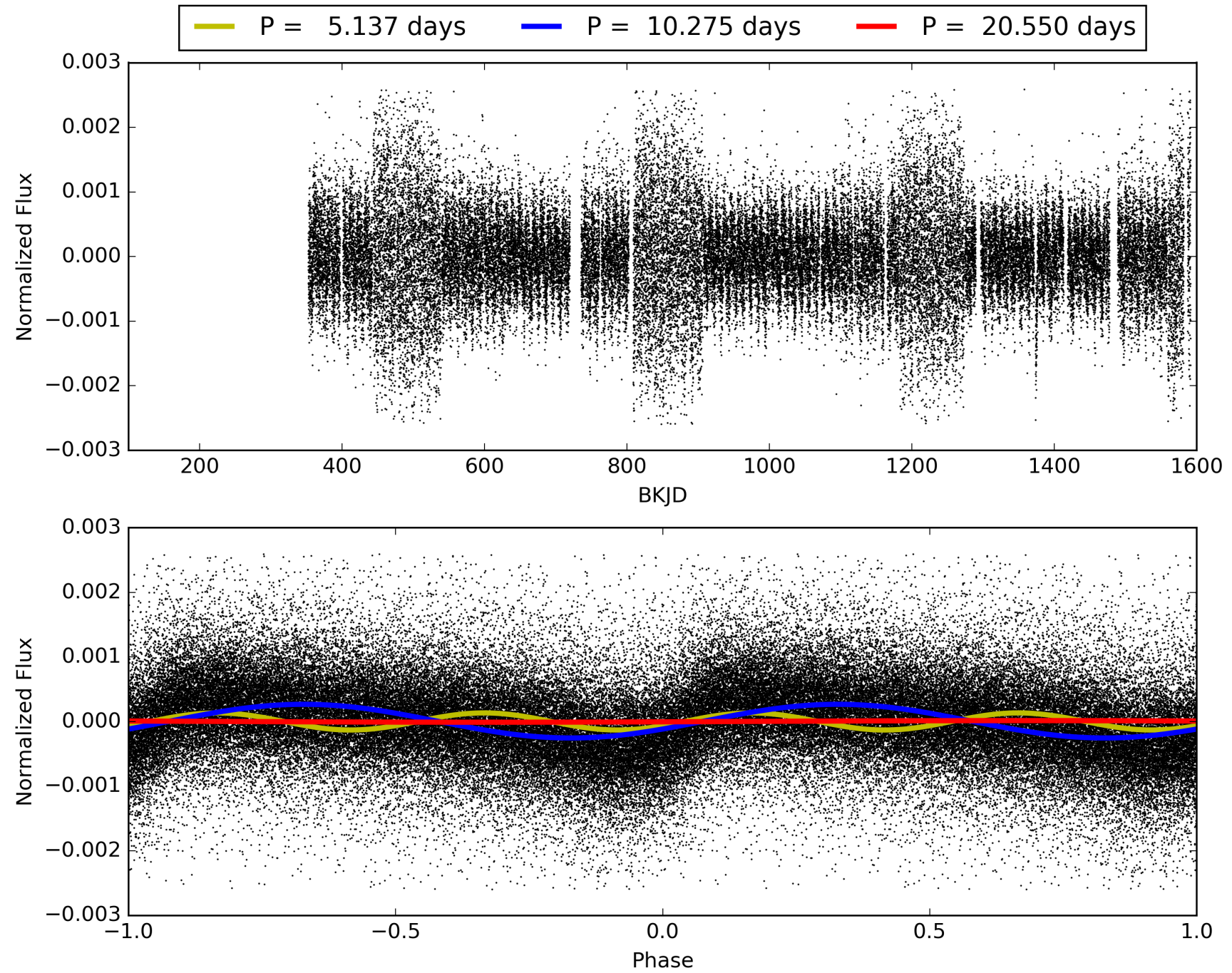
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:16:12 Z

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

# TCE 009456651-01, PDC Light Curves

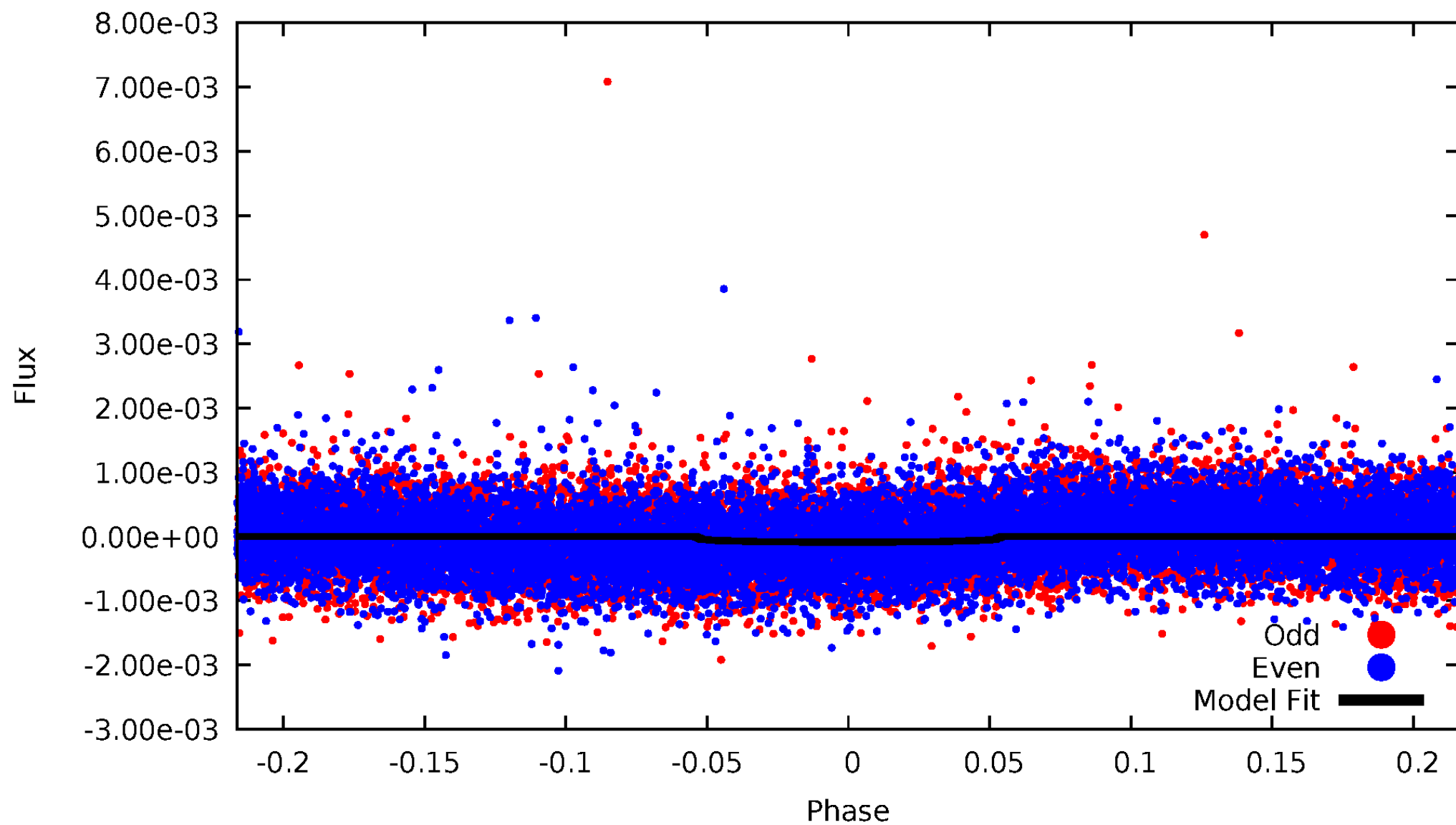


TCE 009456651-01



# DV Odd/Even

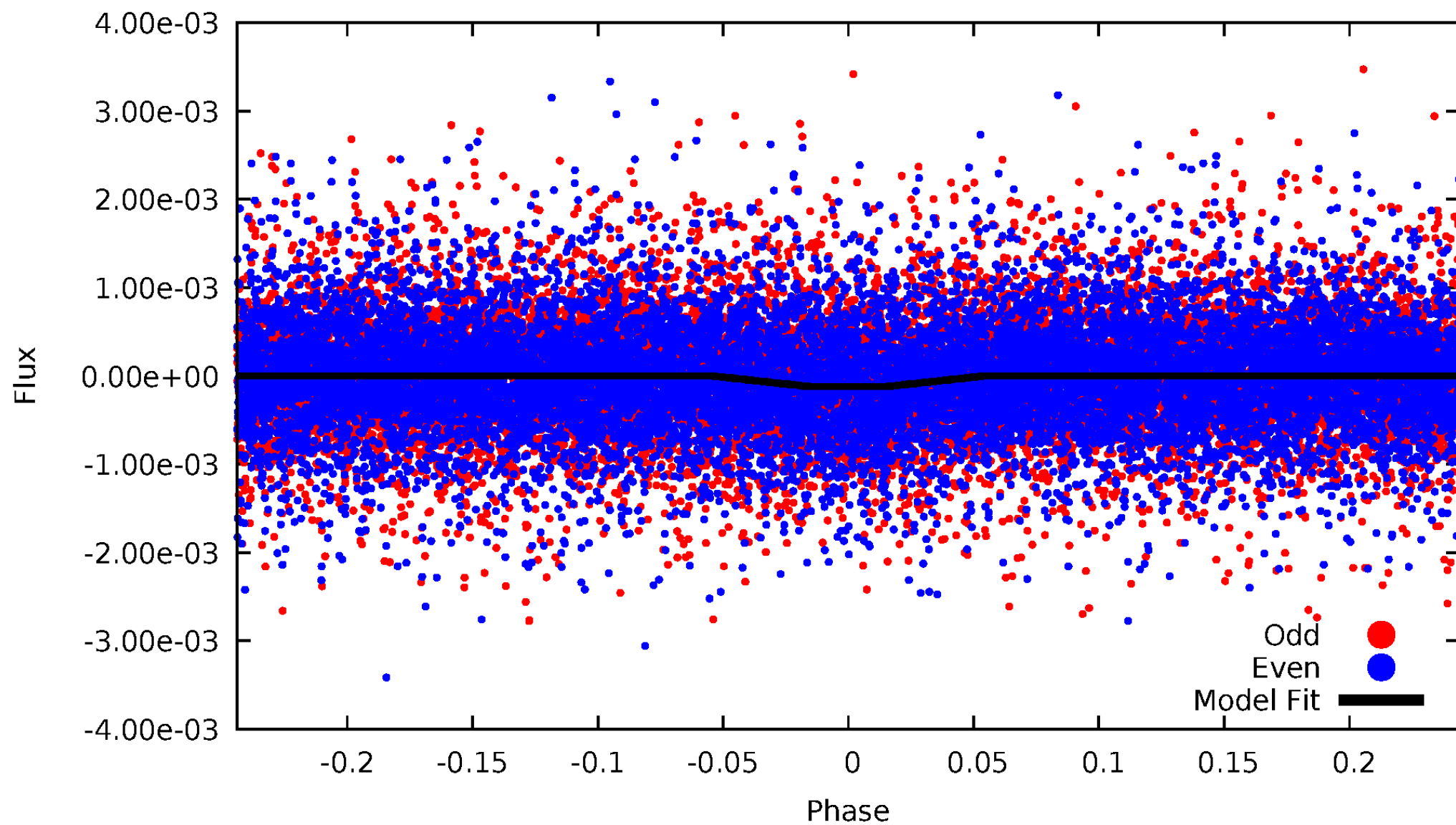
TCE 009456651-01



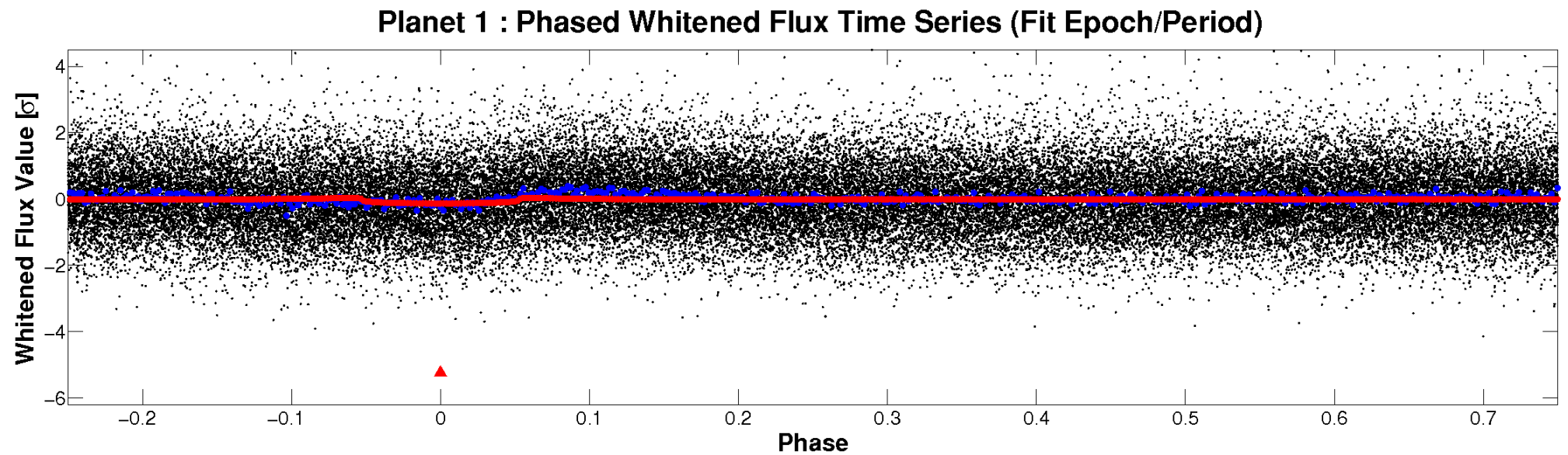
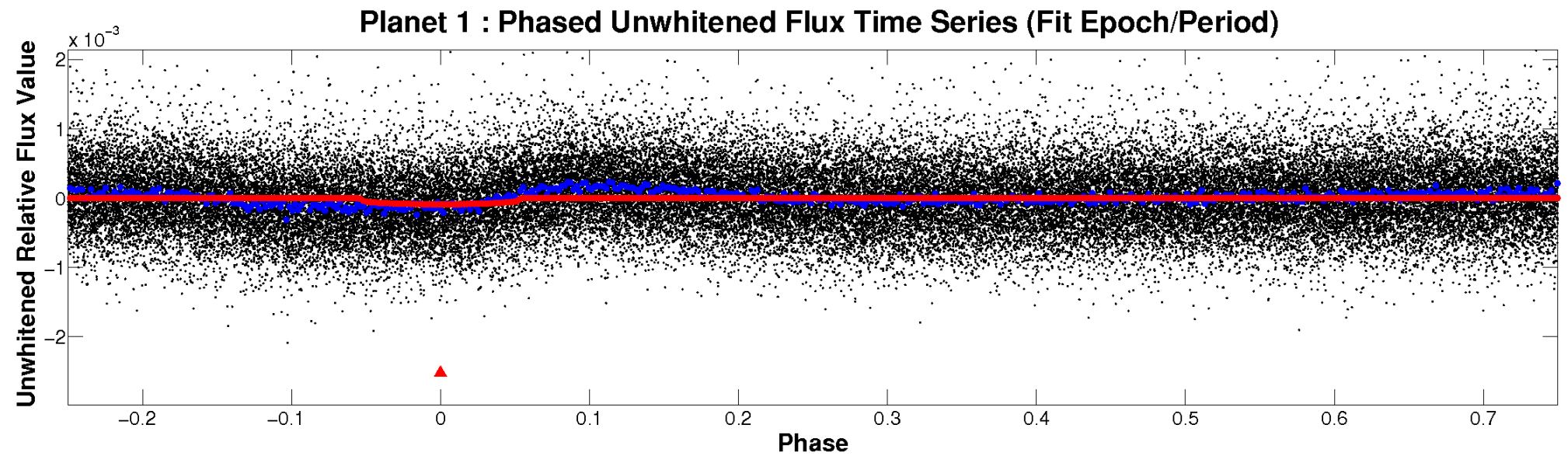


# ALT Odd/Even

TCE 009456651-01

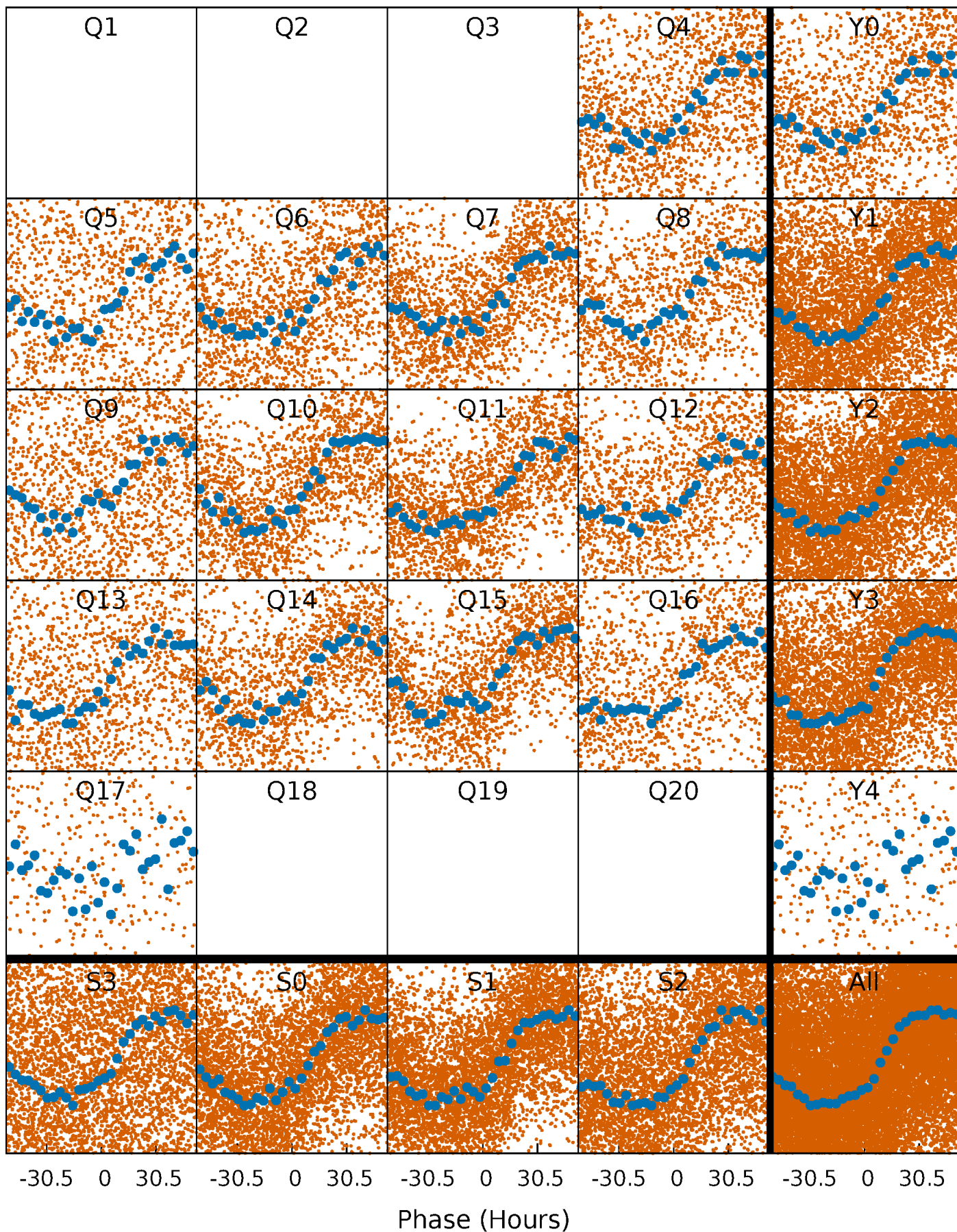


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

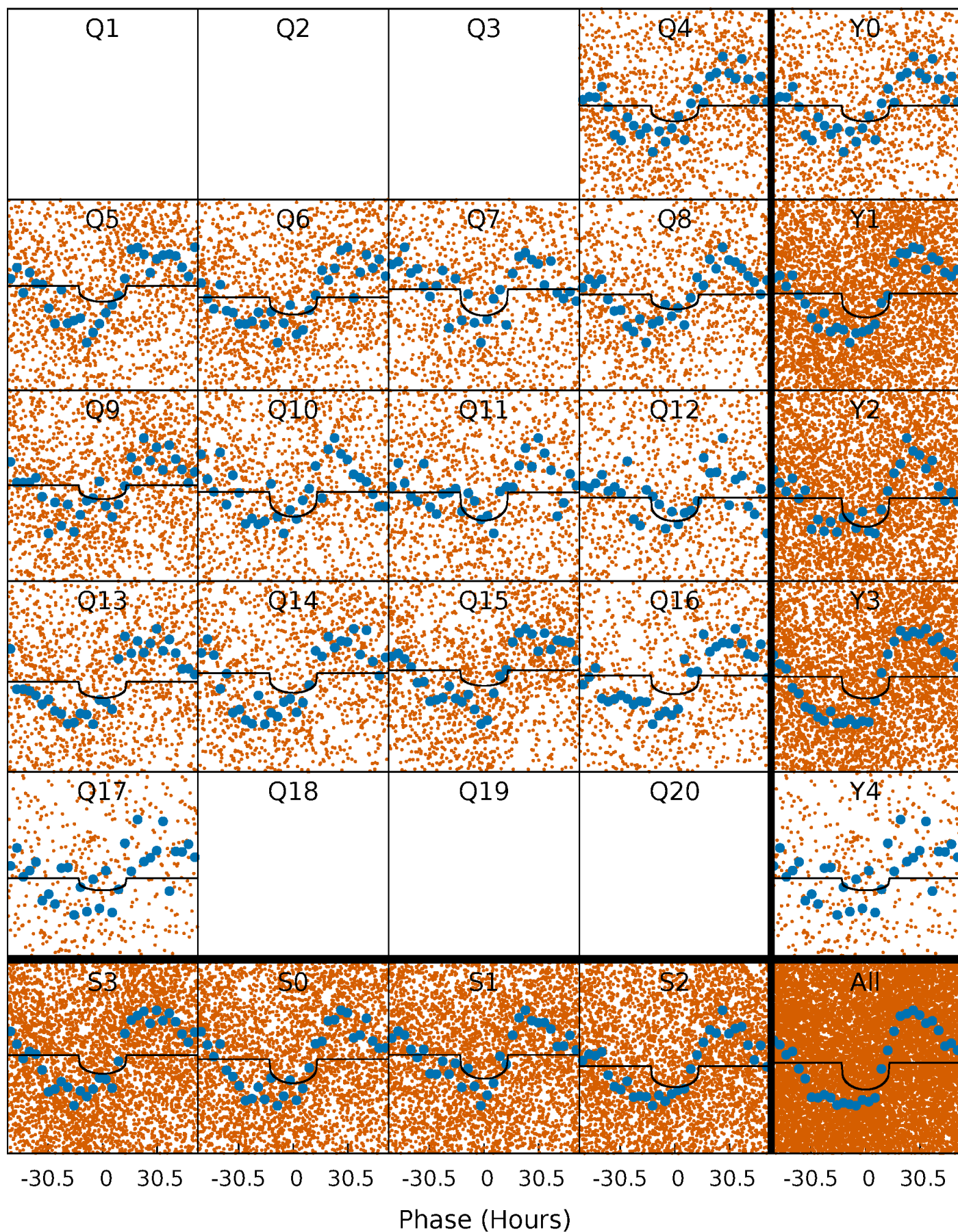
TCE 009456651-01 P= 10.274942 Days  $T_0=132.053964$  (BKJD)





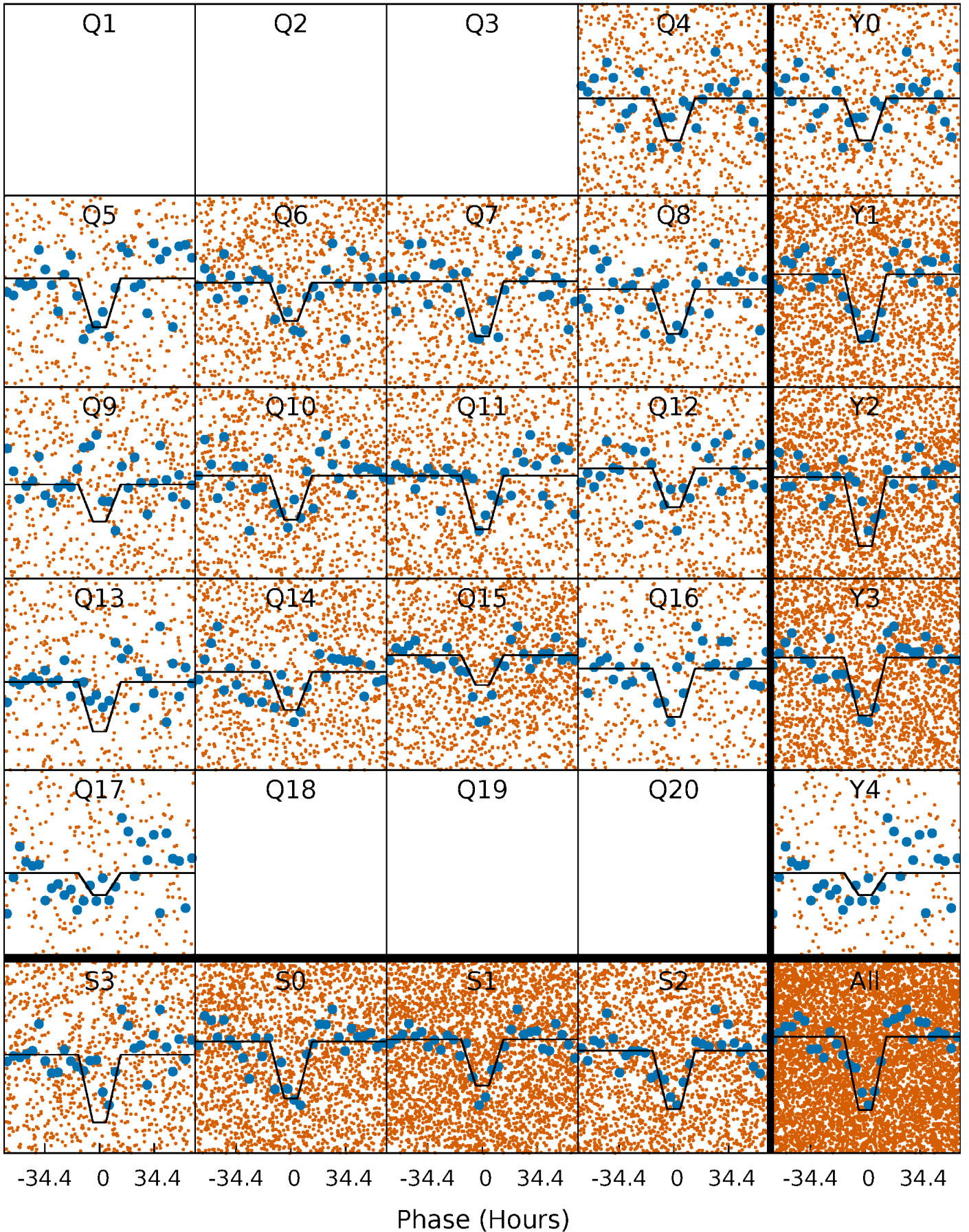
# DV Quarter-Phased Transit Curves

TCE 009456651-01 P= 10.274942 Days  $T_0=132.053964$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

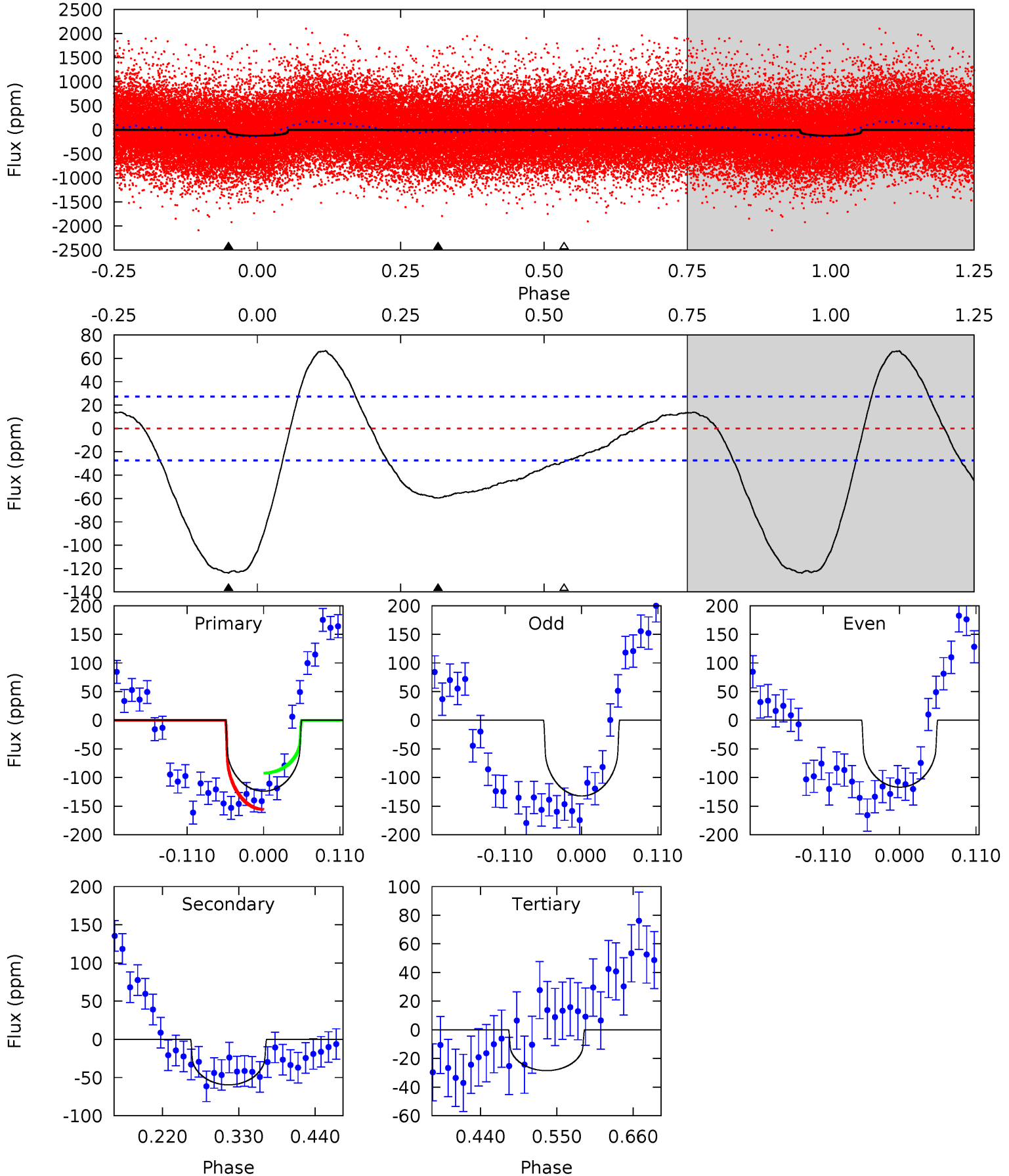
TCE 009456651-01 P= 10.274718 Days  $T_0=132.126606$  (BKJD)



# DV Model-Shift Uniqueness Test

009456651-01, P = 10.274942 Days, E = 132.053964 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
20.6	9.91	4.75	0	4.54	1.60	5.11	15.9	20.6	5.17	9.91	1.28	1.03	0.35	5.28

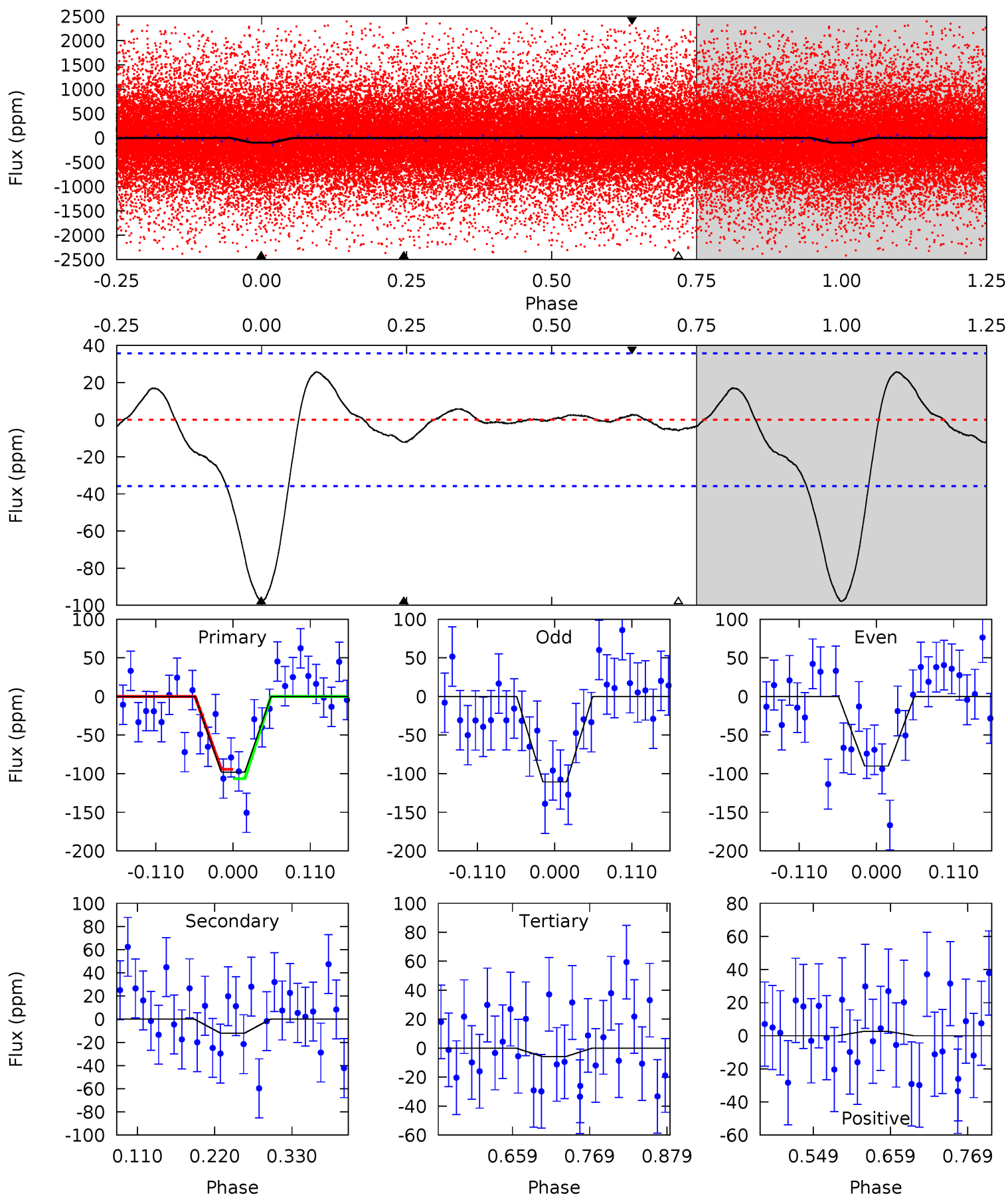




# Alt Model-Shift Uniqueness Test

009456651-01,  $P = 10.274718$  Days,  $E = 132.126606$  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
12.4	1.55	0.74	0.34	4.55	1.60	0.89	11.7	12.1	0.81	1.21	1.31	0.96	0.21	0.77





### Stellar Parameters For KIC 009456651

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4787^{+167}_{-167}$	$4.516^{+0.082}_{-0.090}$	$0.320^{+0.150}_{-0.300}$	$0.812^{+0.061}_{-0.084}$	$0.789^{+0.059}_{-0.053}$	$2.077^{+0.697}_{-0.430}$
	+3%/-3%	+2%/-2%	+47%/-94%	+8%/-10%	+7%/-7%	+34%/-21%
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 009456651-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-60 \pm 6$	$0.82^{+0.38}_{-0.33}$	$912^{+43}_{-42}$	$4465^{+1110}_{-595}$	$353^{+641}_{-184}$
Alt.	$-12 \pm 8$	$0.95^{+0.38}_{-0.37}$	$910^{+41}_{-40}$	$3204^{+673}_{-536}$	$51^{+105}_{-36}$

$T_{max}$  = 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

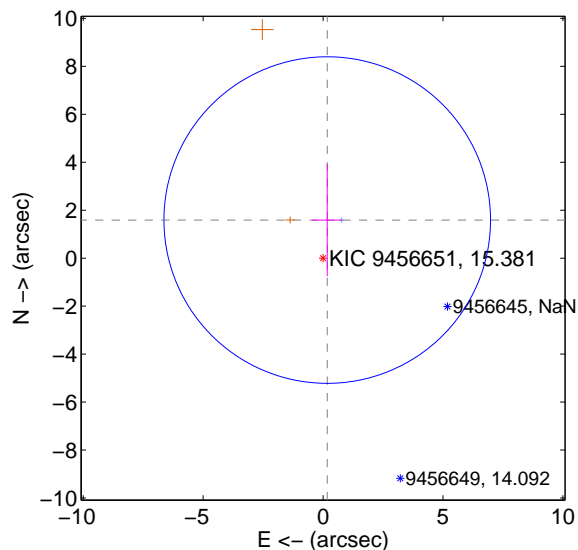
Supplemental centroid analysis for 009456651-01. Kepler magnitude: 15.38. Transit SNR 8.74

There are 2 quarters with good PRF difference image offsets

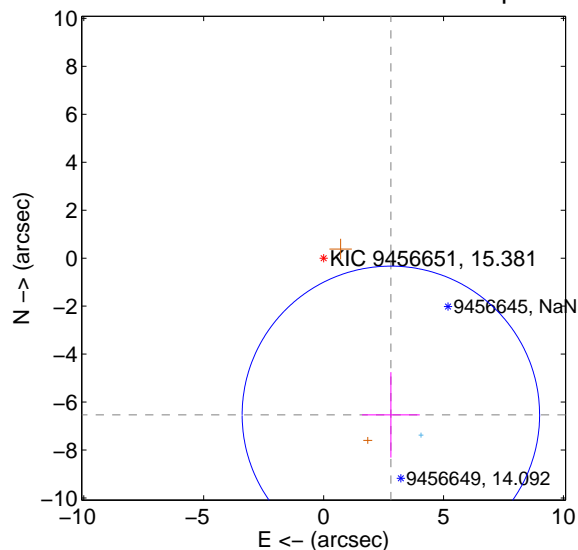
The OOT PRF centroid is offset from the target star catalog position by about 9.74 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.599 \pm 2.270$	0.70	$-0.173 \pm 0.636$	$1.589 \pm 2.336$
PRF-fit source offset from KIC position	$7.110 \pm 2.067$	3.44	$-2.805 \pm 1.203$	$-6.533 \pm 1.781$
photometric centroid source offset	$0.96 \pm 1.20$	0.80	$-0.12 \pm 0.58$	$0.95 \pm 1.21$

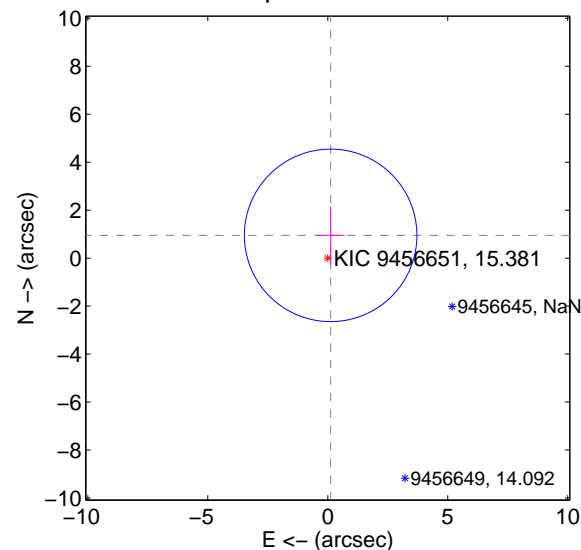
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

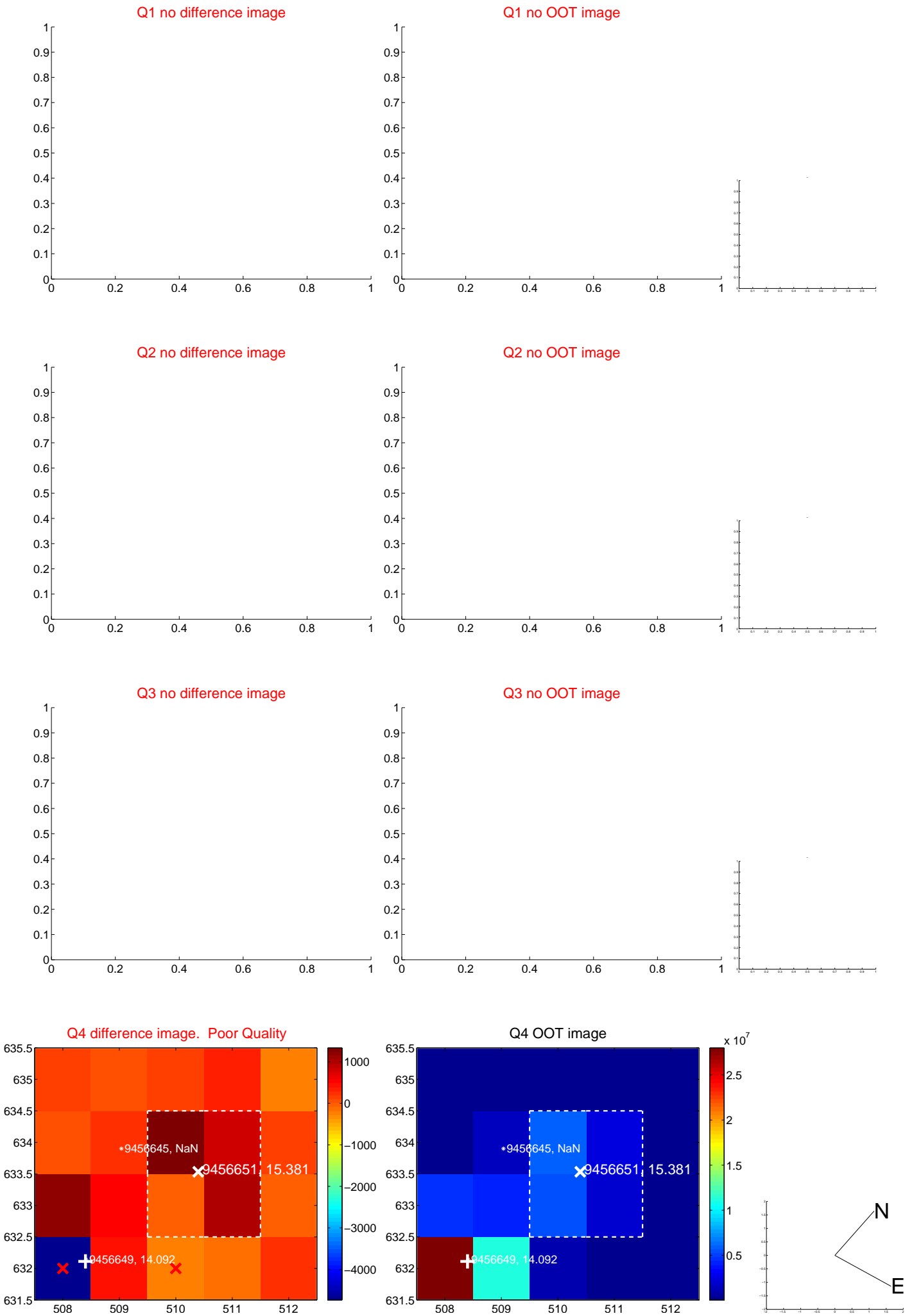


offset from photometric centroids

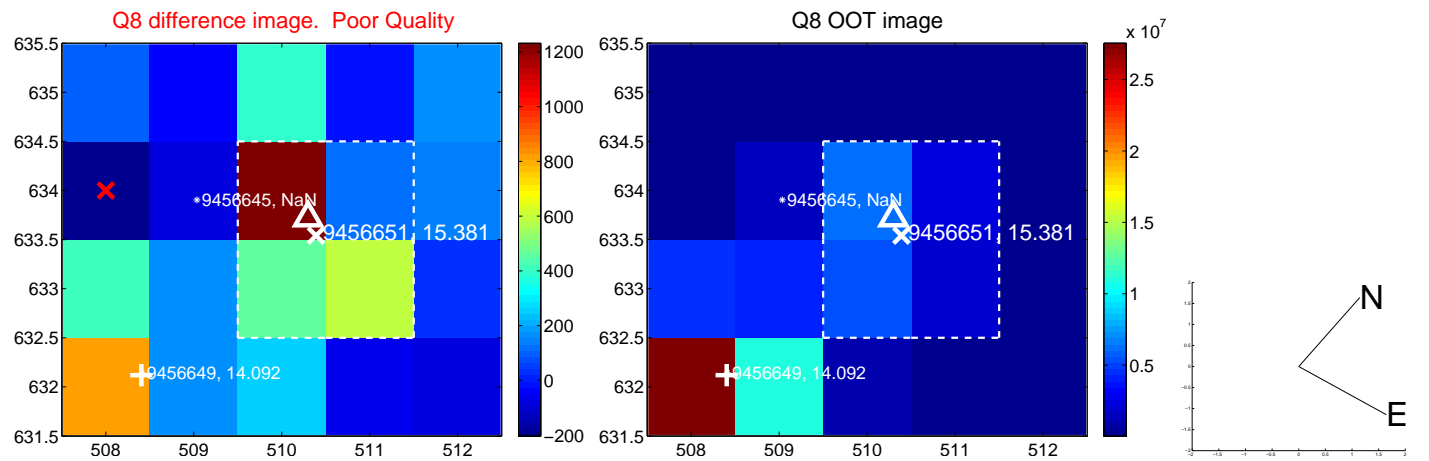
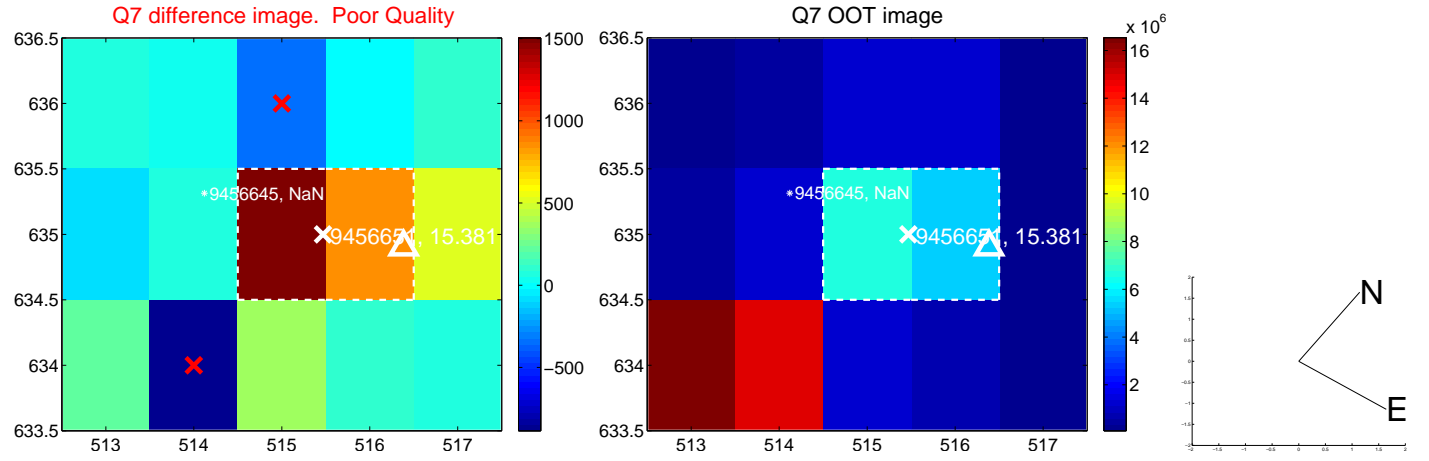
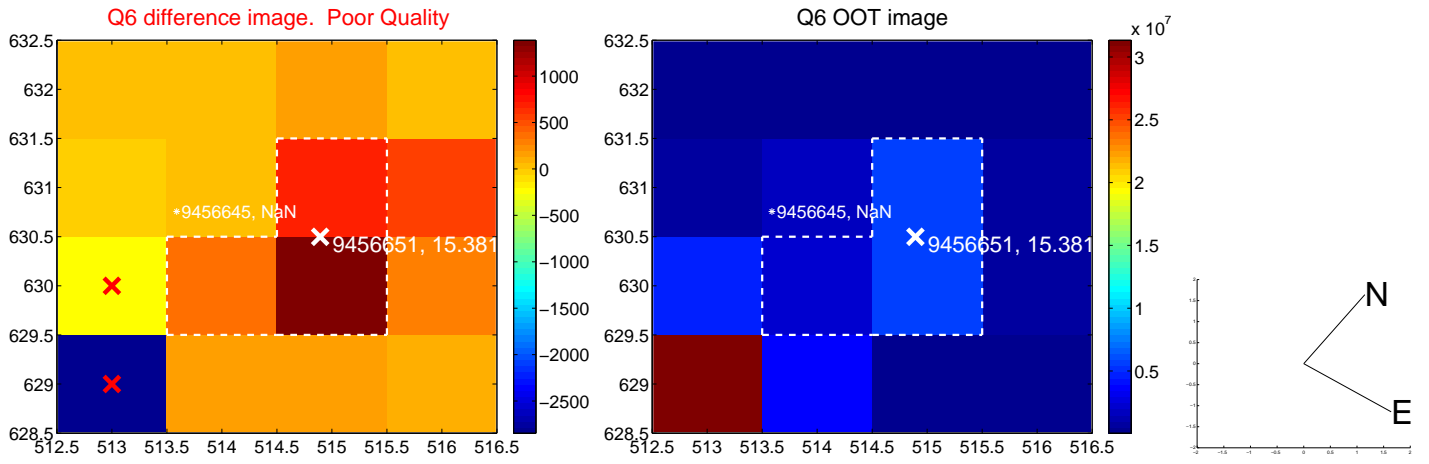
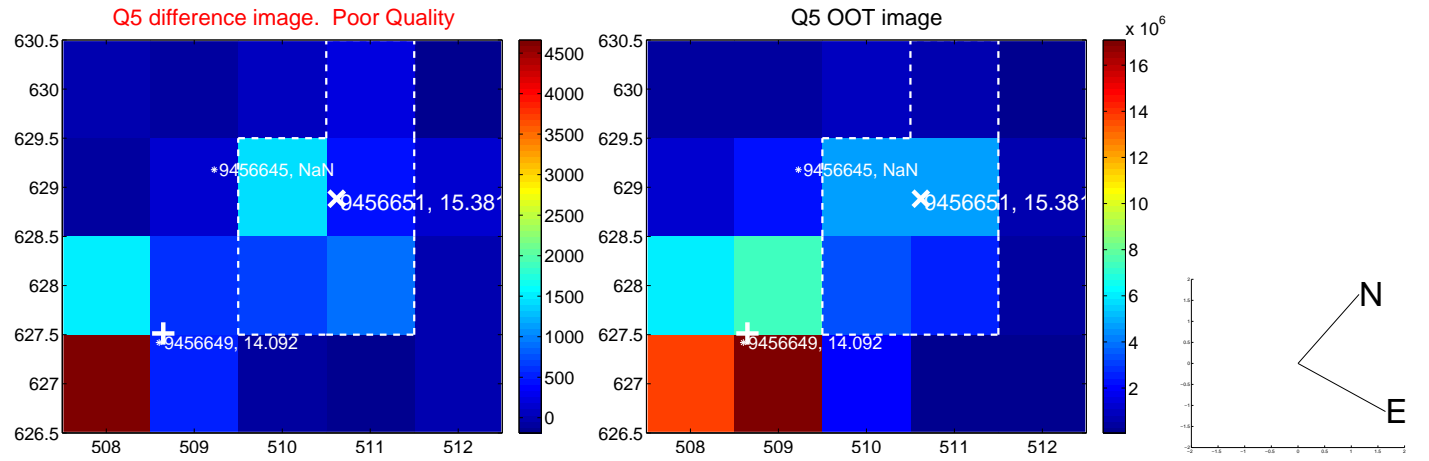


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

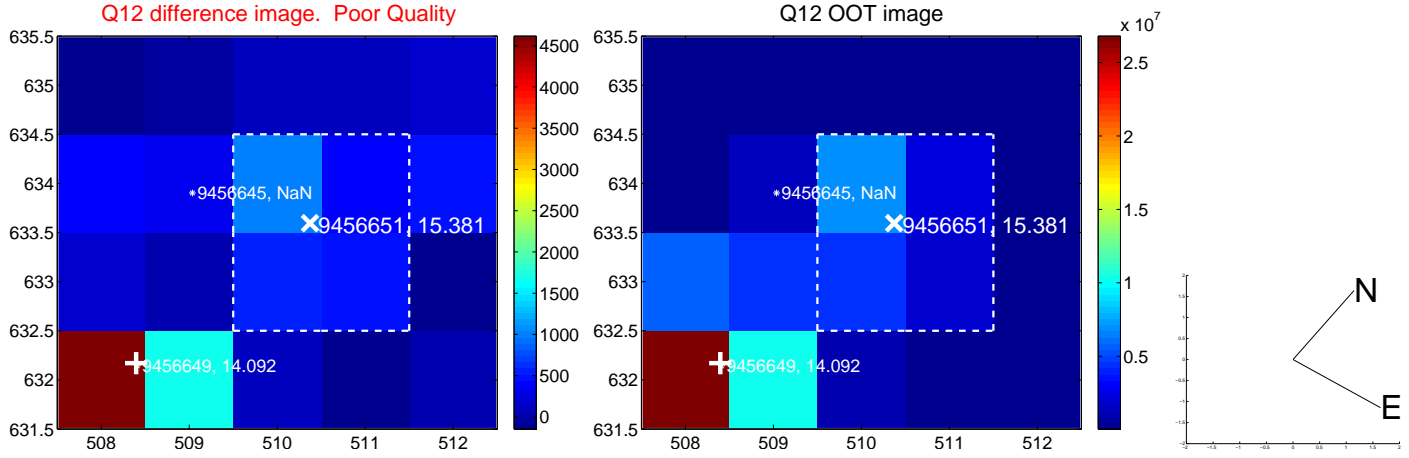
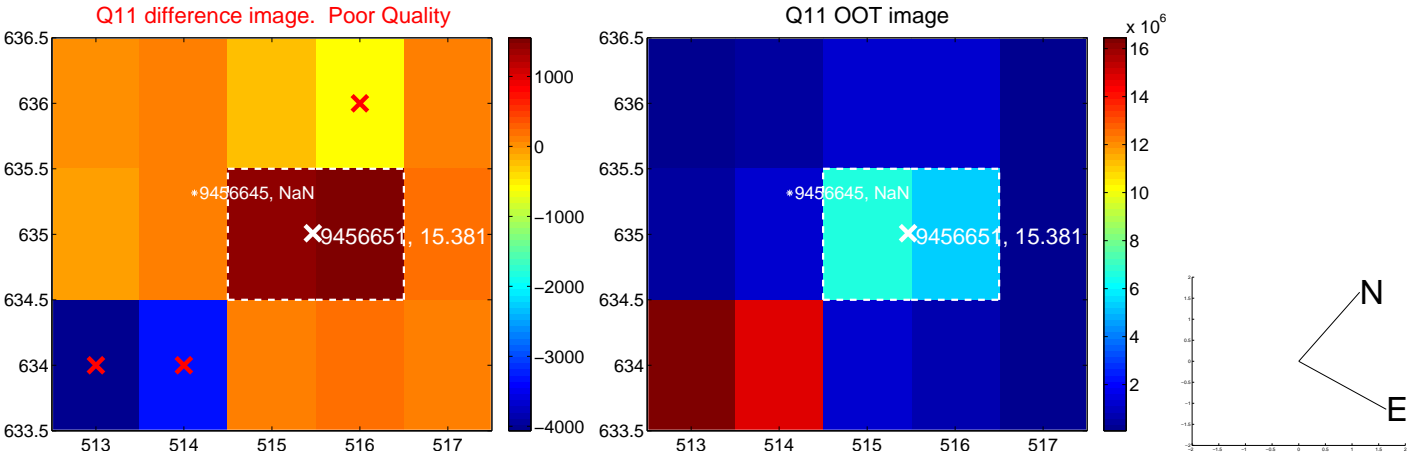
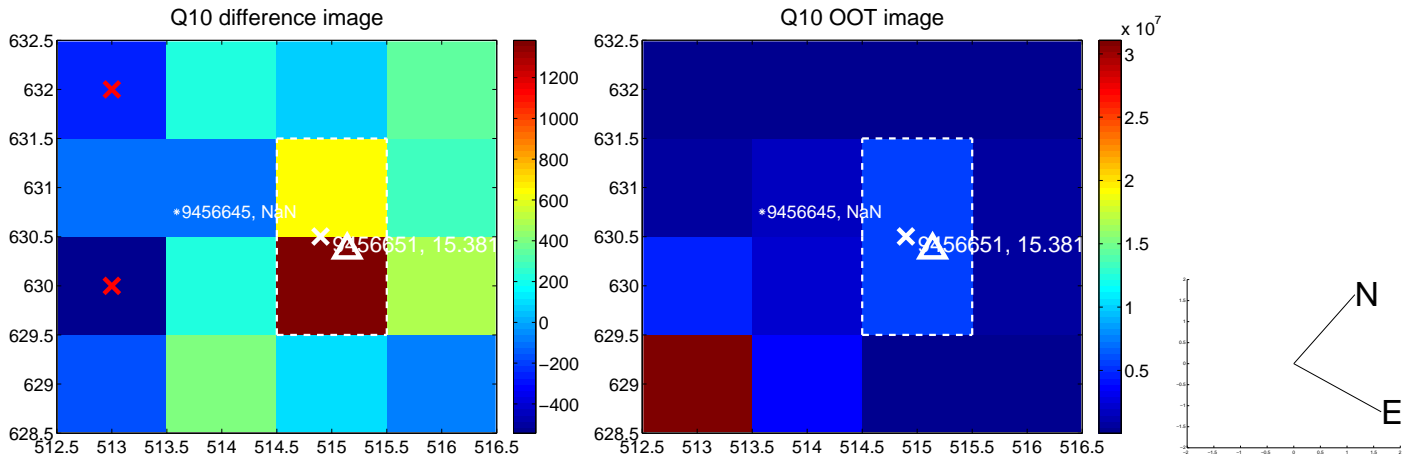
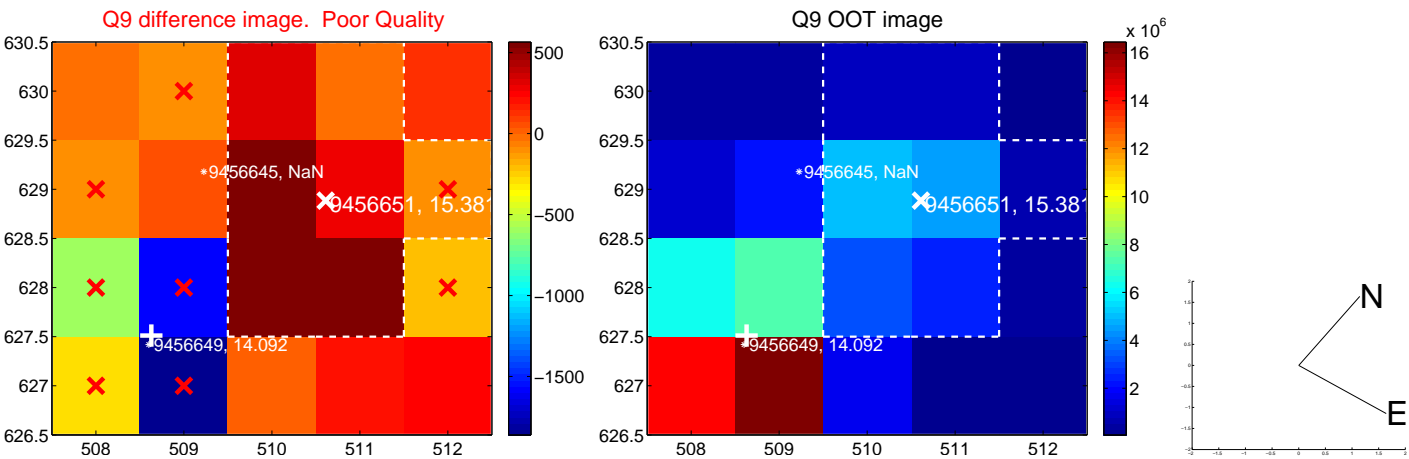


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

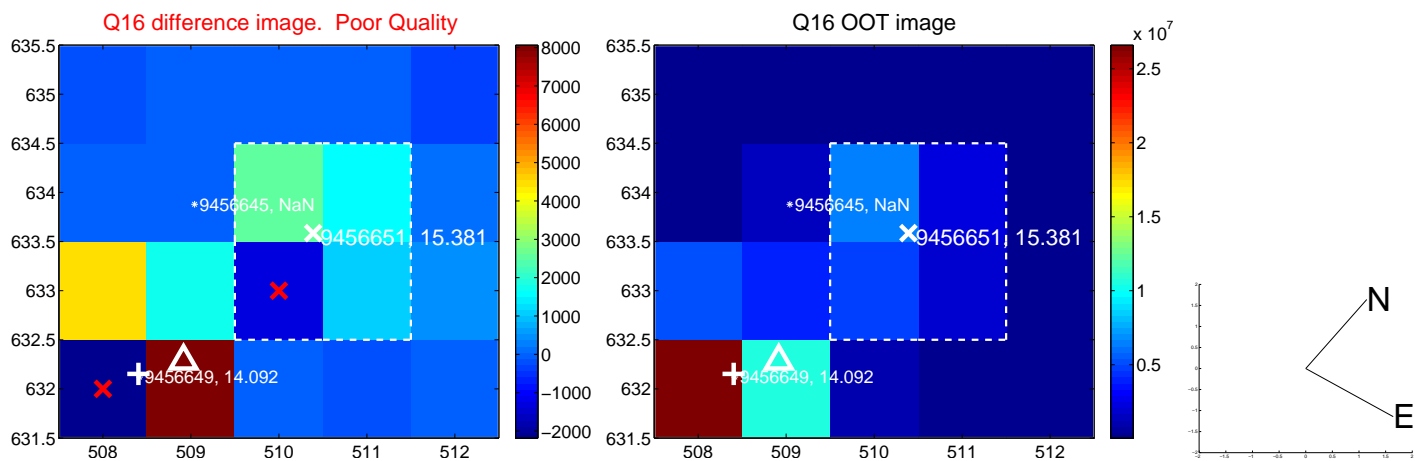
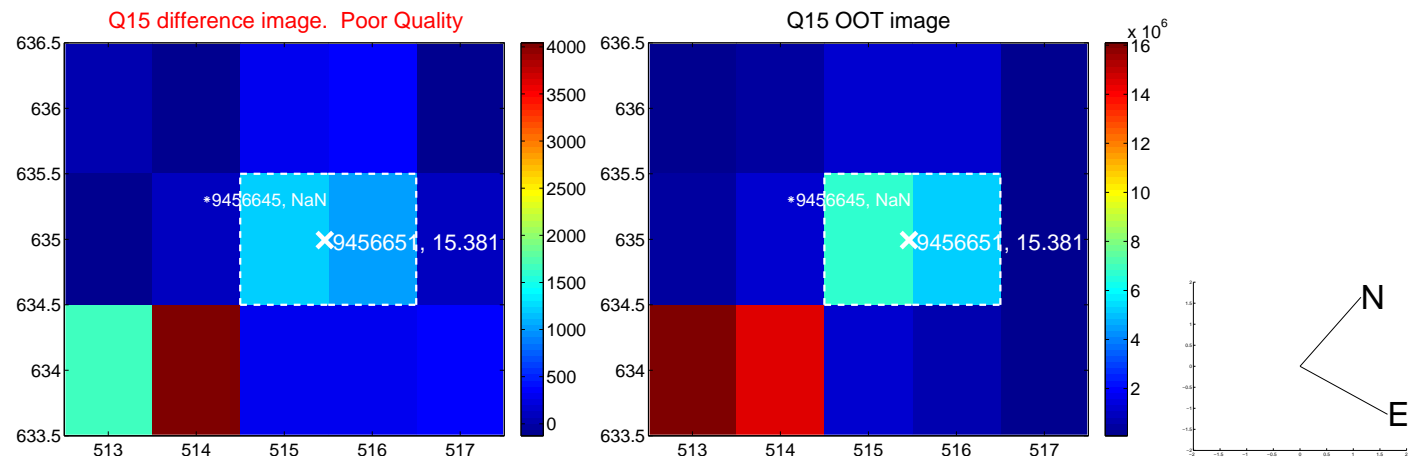
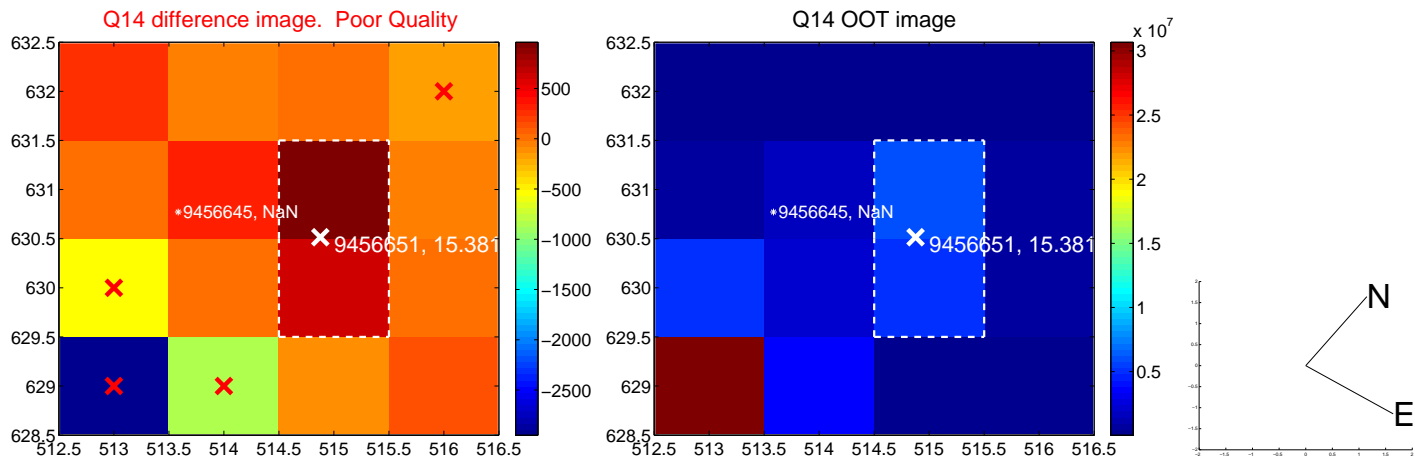
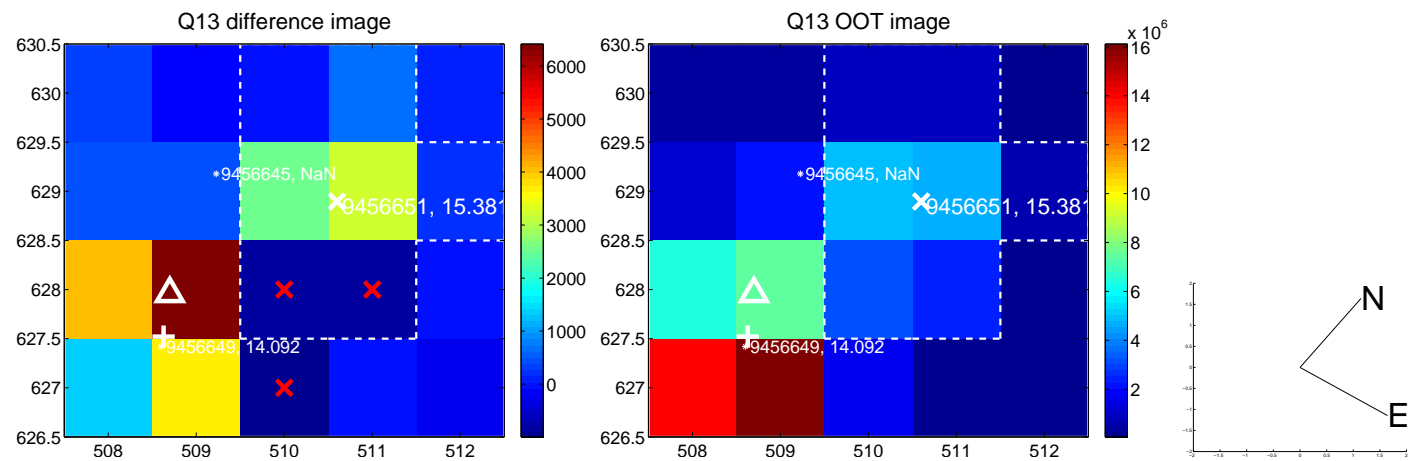




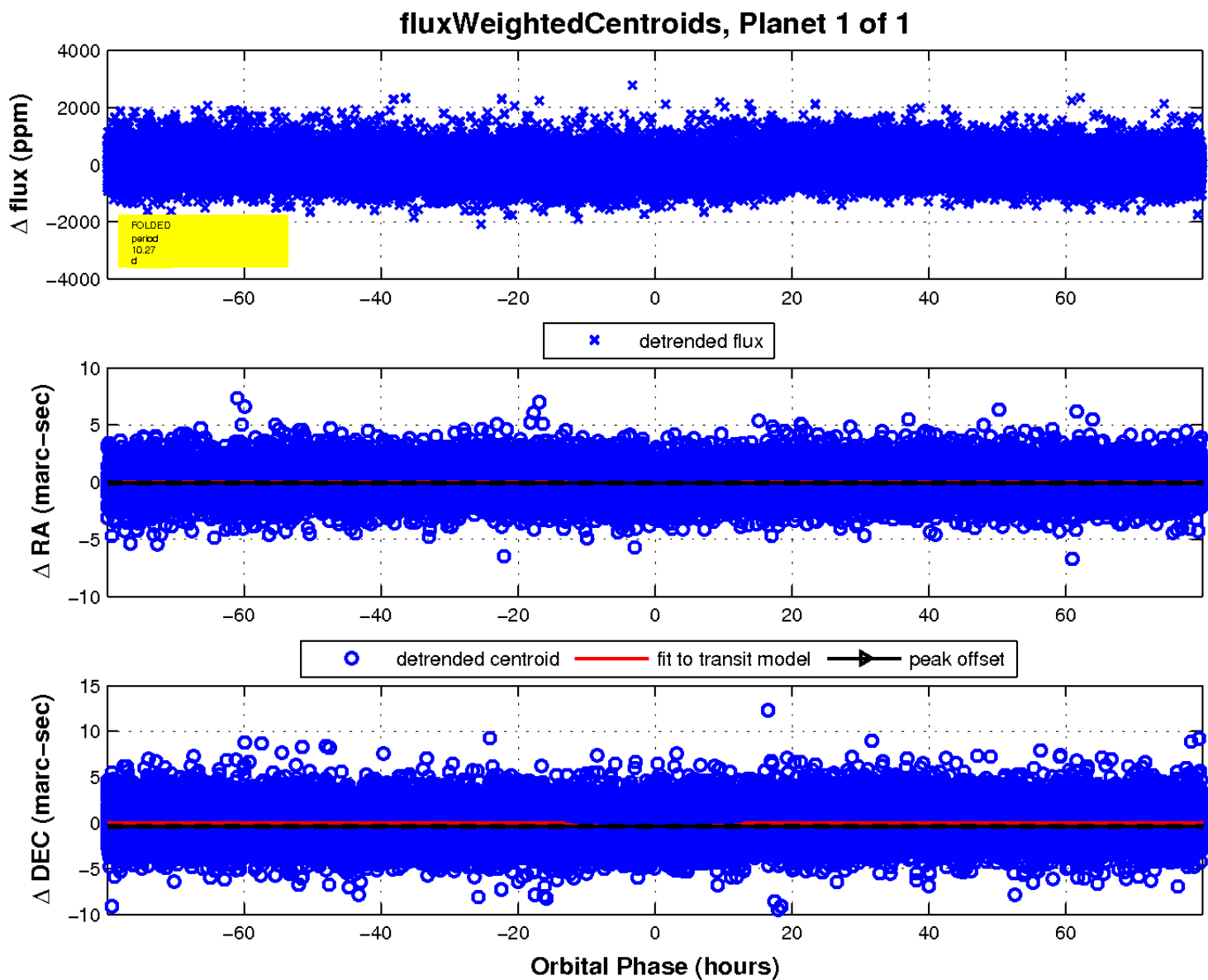
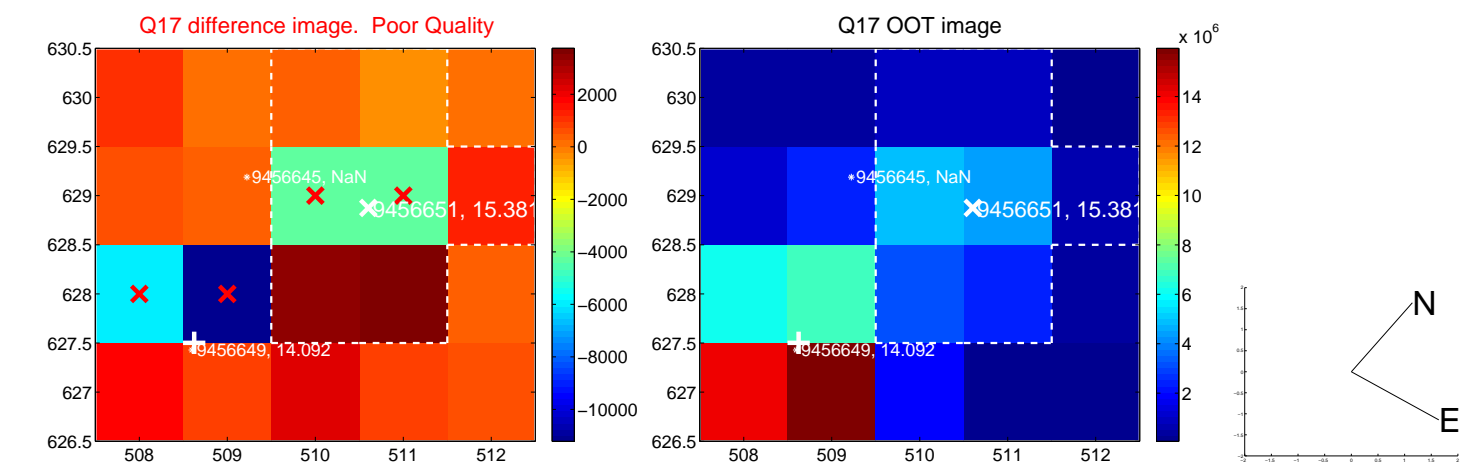
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

