

# KIC 009716563

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009716563-01	OBS	No	0.651359	131.683502	10.0	6.629	9.1	3.0	1.60	6982	1.04	22367.58

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716563-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS

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

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

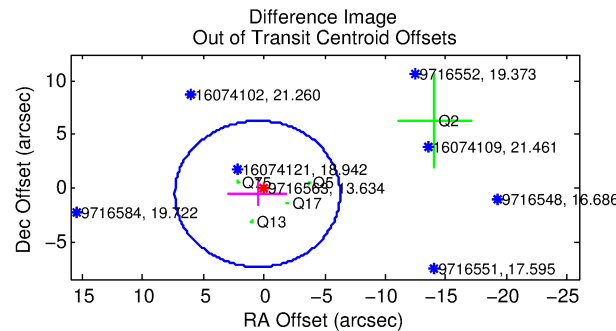
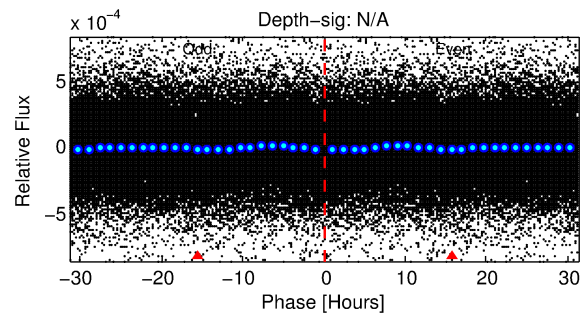
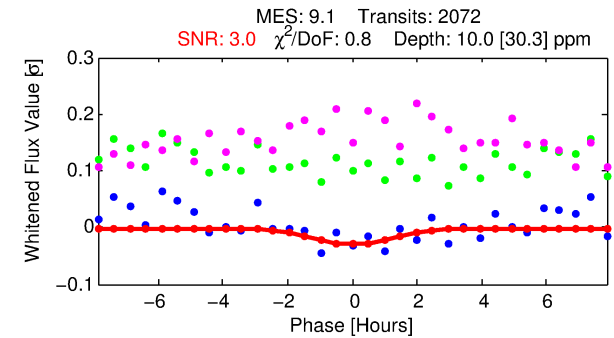
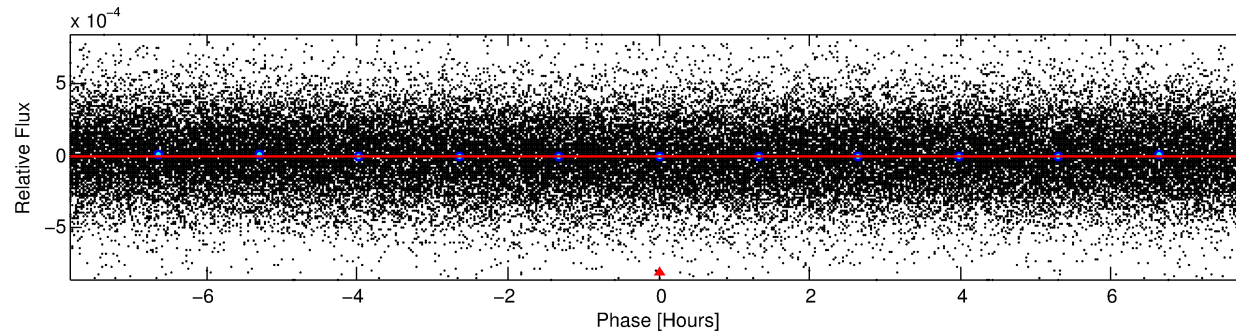
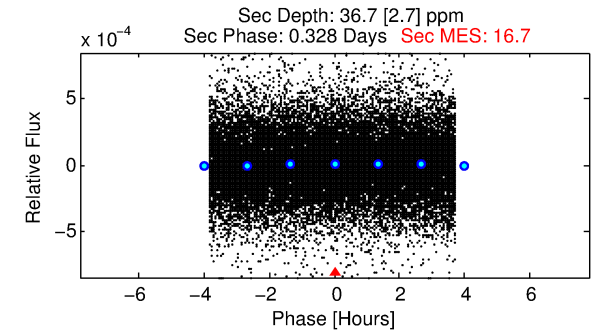
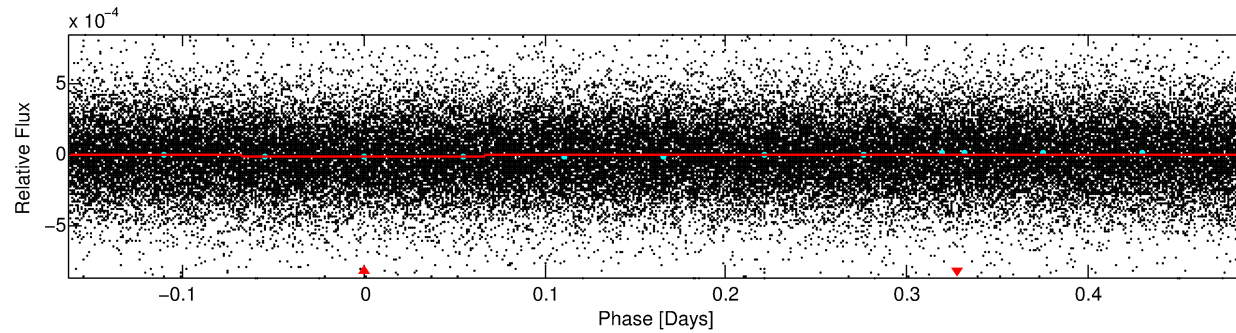
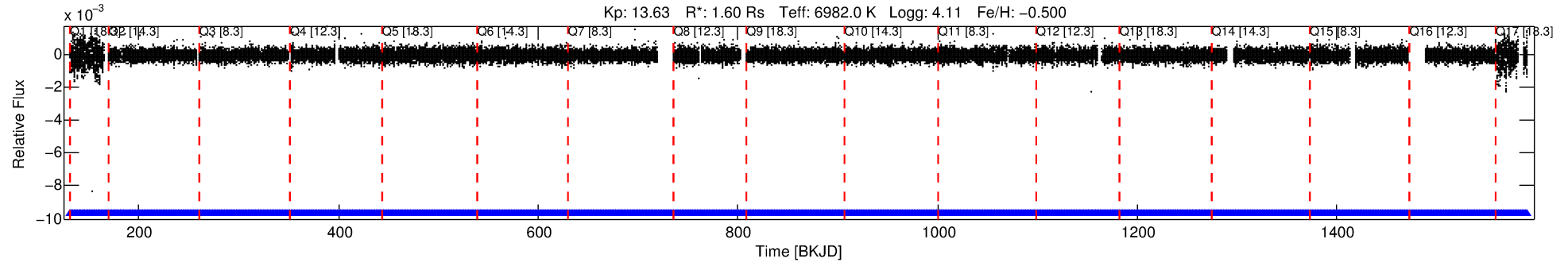
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009716563-01

No Significant Match Found

# DV One-Page Summary

KIC: 9716563 Candidate: 1 of 1 Period: 0.651 d



## DV Fit Results:

Period = 0.65136 [0.00004] d  
Epoch = 131.6835 [0.0264] BKJD  
Rp/R\* = 0.0060 [0.0275]  
a/R\* = 1.01 [0.02]  
b = 1.00 [0.05]  
Seff = 22367.58 [9759.14]  
Teq = 3118 [340] K  
Rp = 1.04 [4.81] Re  
a = 0.0156 [0.0040] AU  
Ag = 4.50 [41.41] [0.08σ]  
Teffp = 7022 [16145] K [0.24σ]

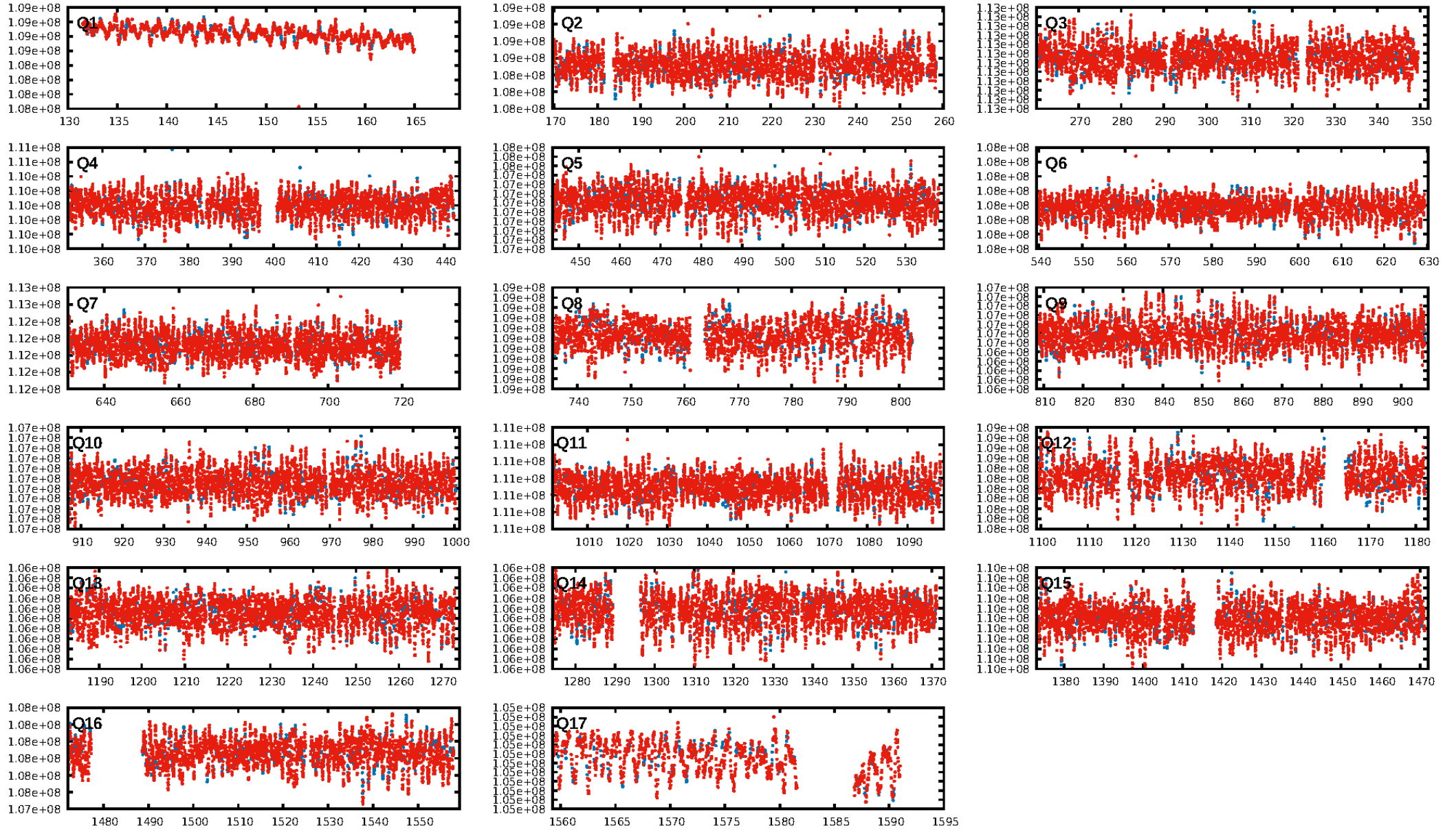
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1978/1978]  
GhostDiagnostic-chr: 7063  
Centroid-sig: 2.3%  
Centroid-so: 2.791 arcsec [1.67σ]  
OotOffset-rm: 0.766 arcsec [0.34σ]  
KicOffset-rm: 0.749 arcsec [0.32σ]  
OotOffset-st: 1/2/0/3 [6]  
KicOffset-st: 1/2/0/3 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 1.00 [17/17]

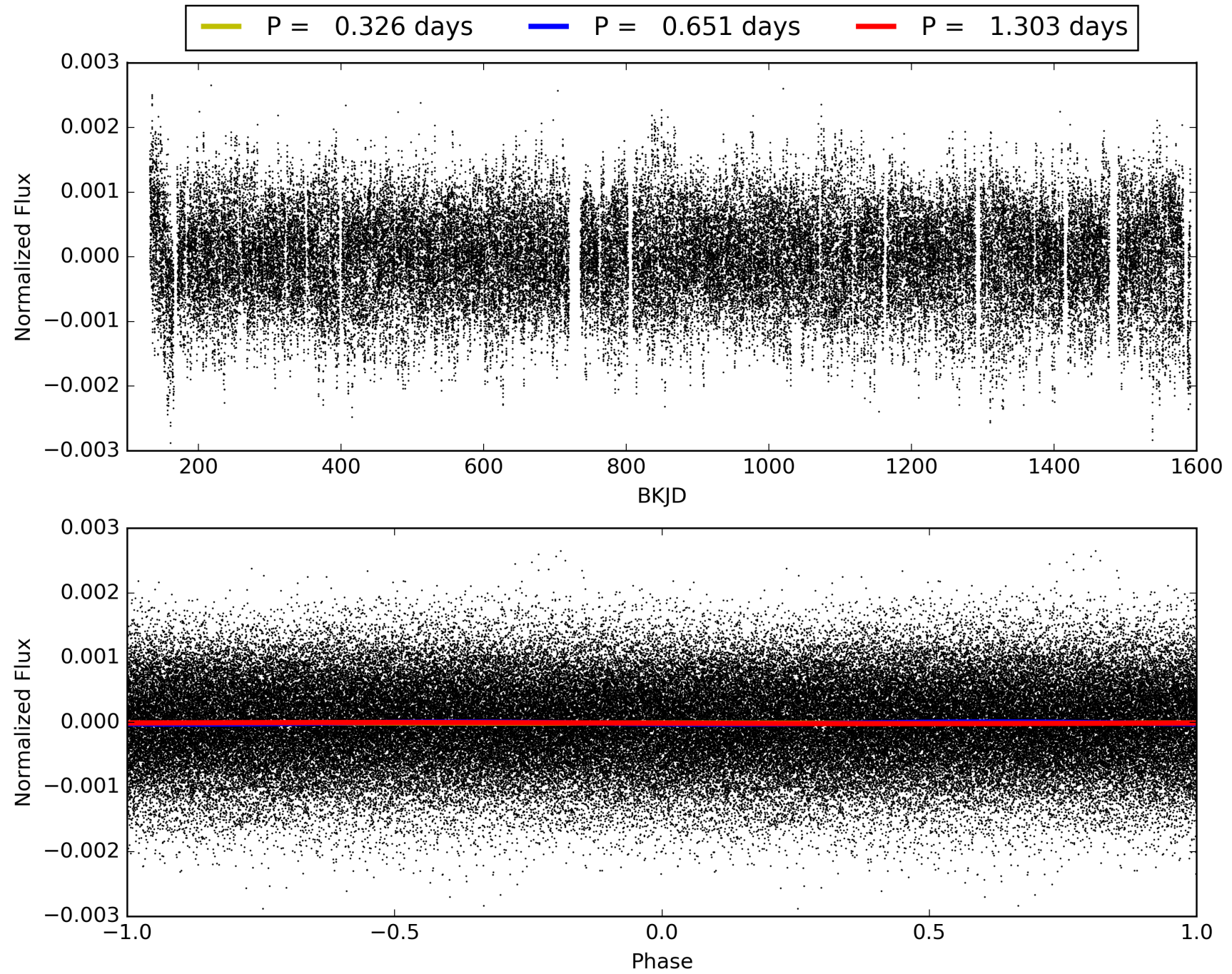
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:03:31 Z

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

# TCE 009716563-01, PDC Light Curves



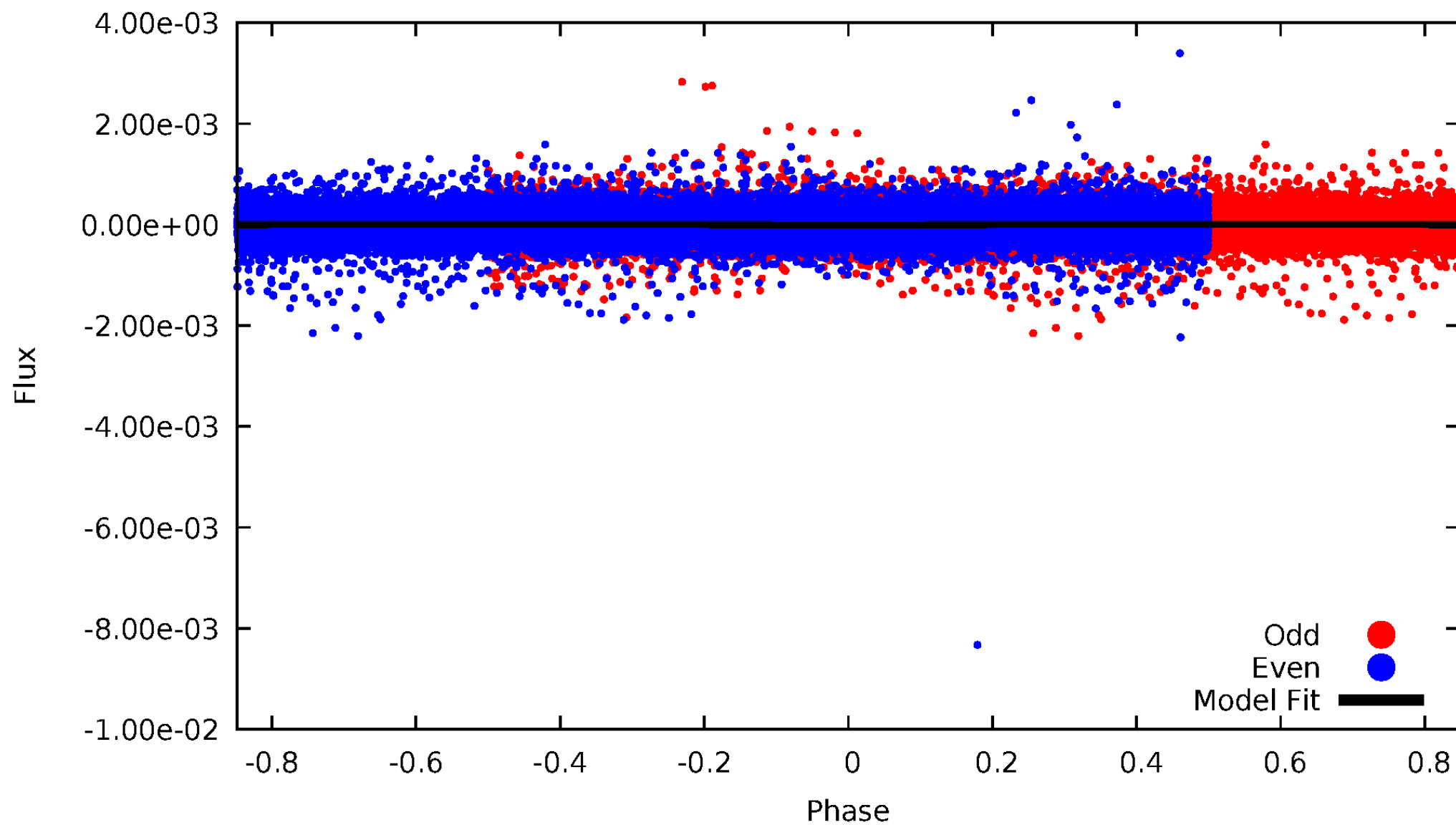
TCE 009716563-01





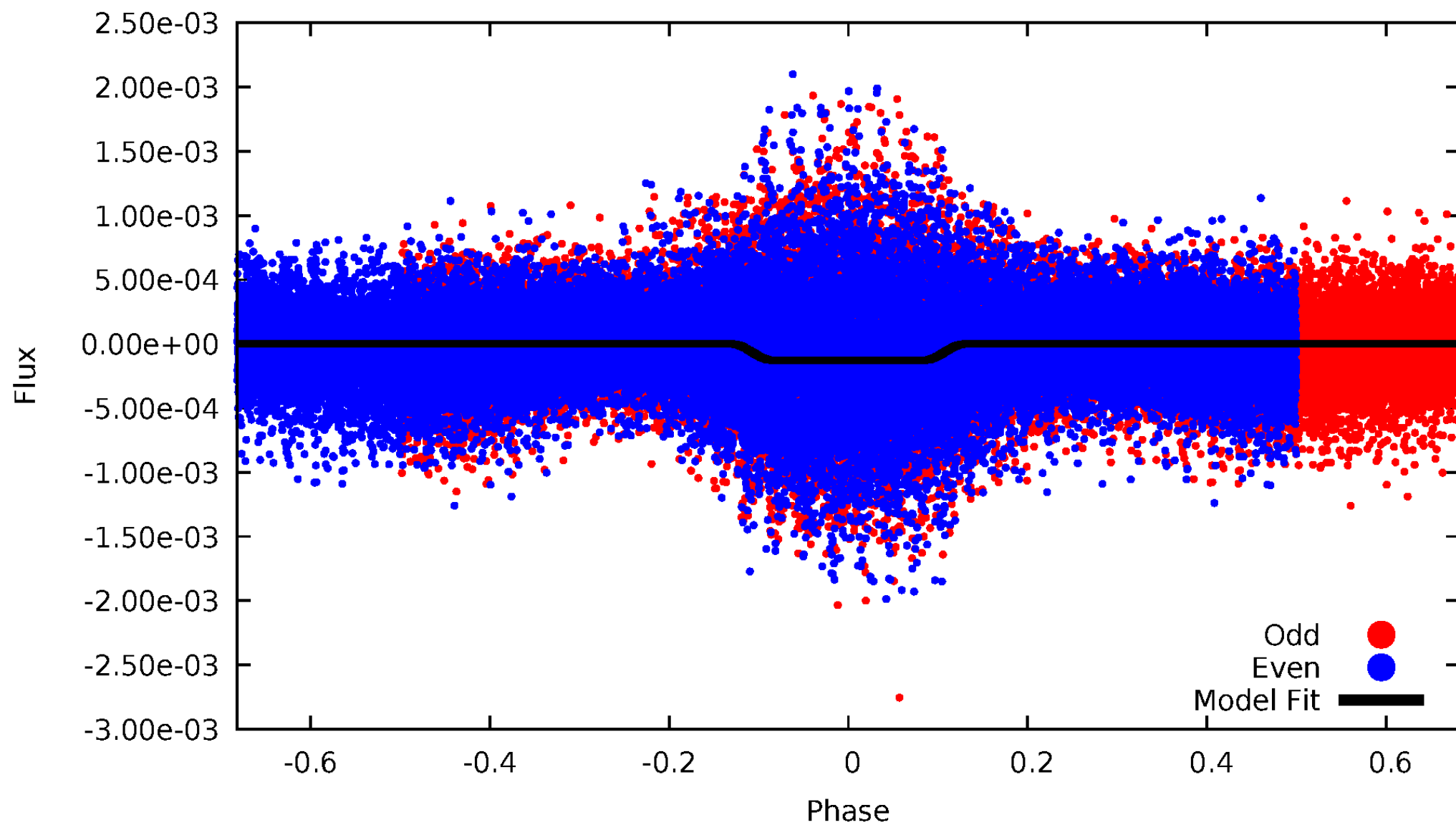
# DV Odd/Even

TCE 009716563-01



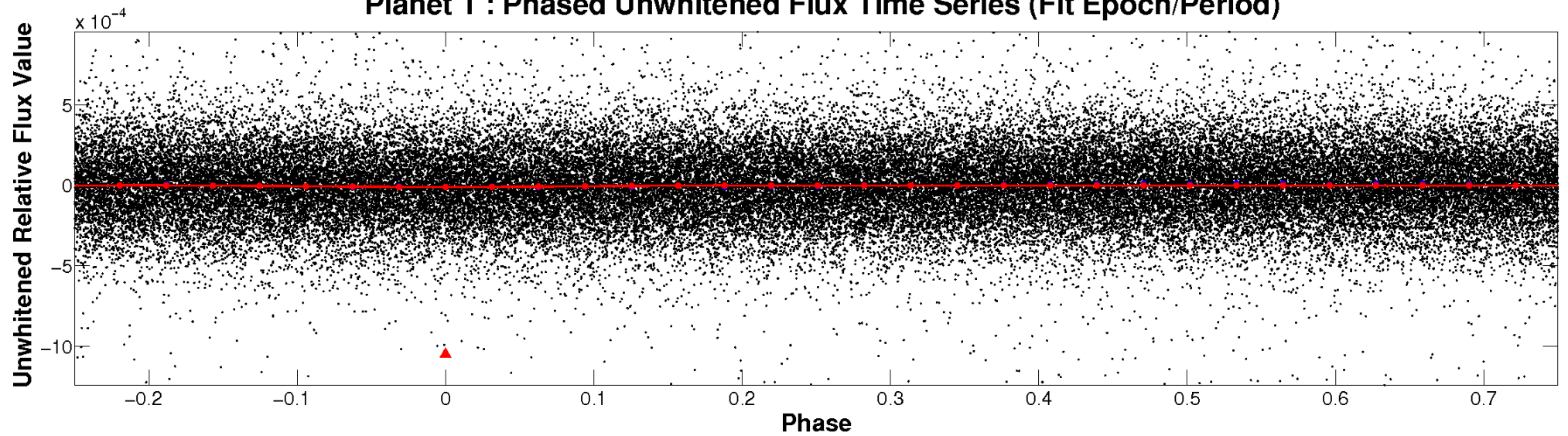
# ALT Odd/Even

TCE 009716563-01

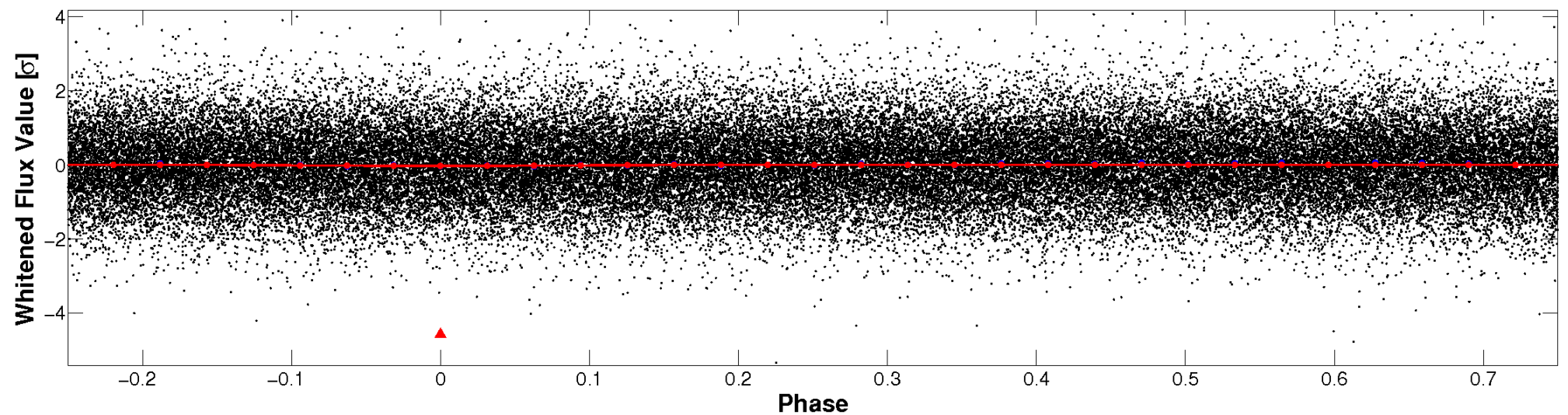


# Non-Whitened Vs. Whitened Light Curve

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

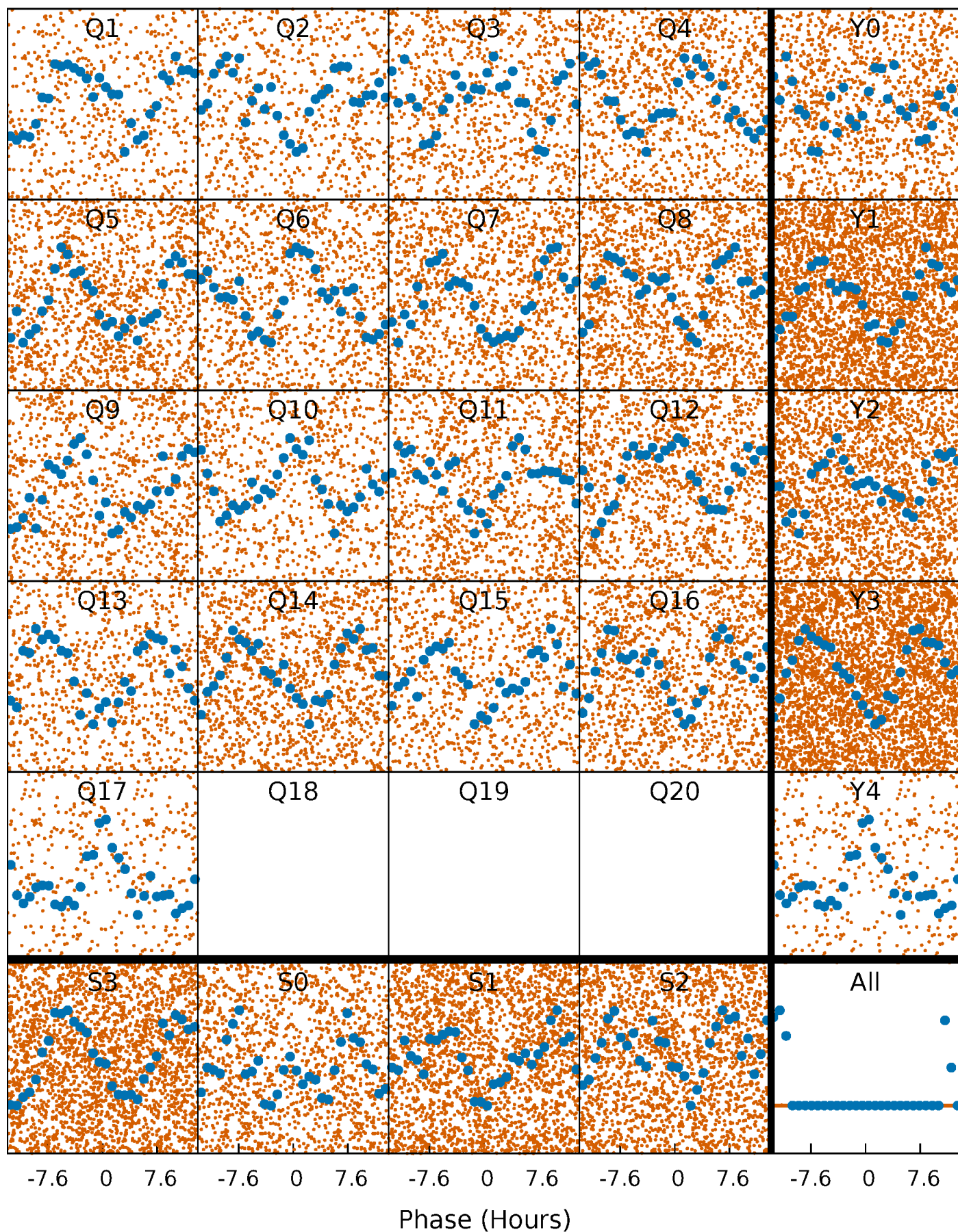


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

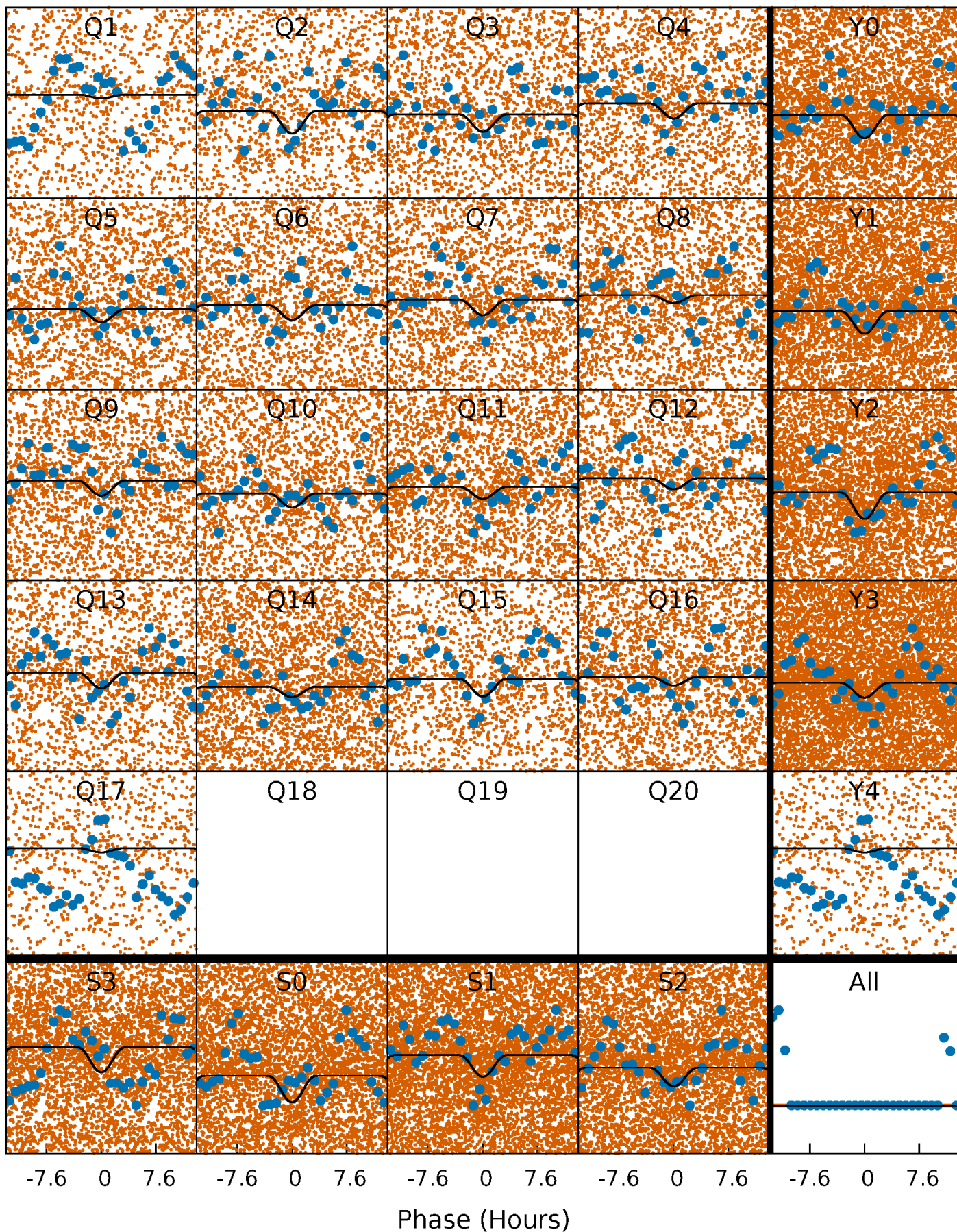
TCE 009716563-01 P= 0.651359 Days  $T_0=131.683502$  (BKJD)





# DV Quarter-Phased Transit Curves

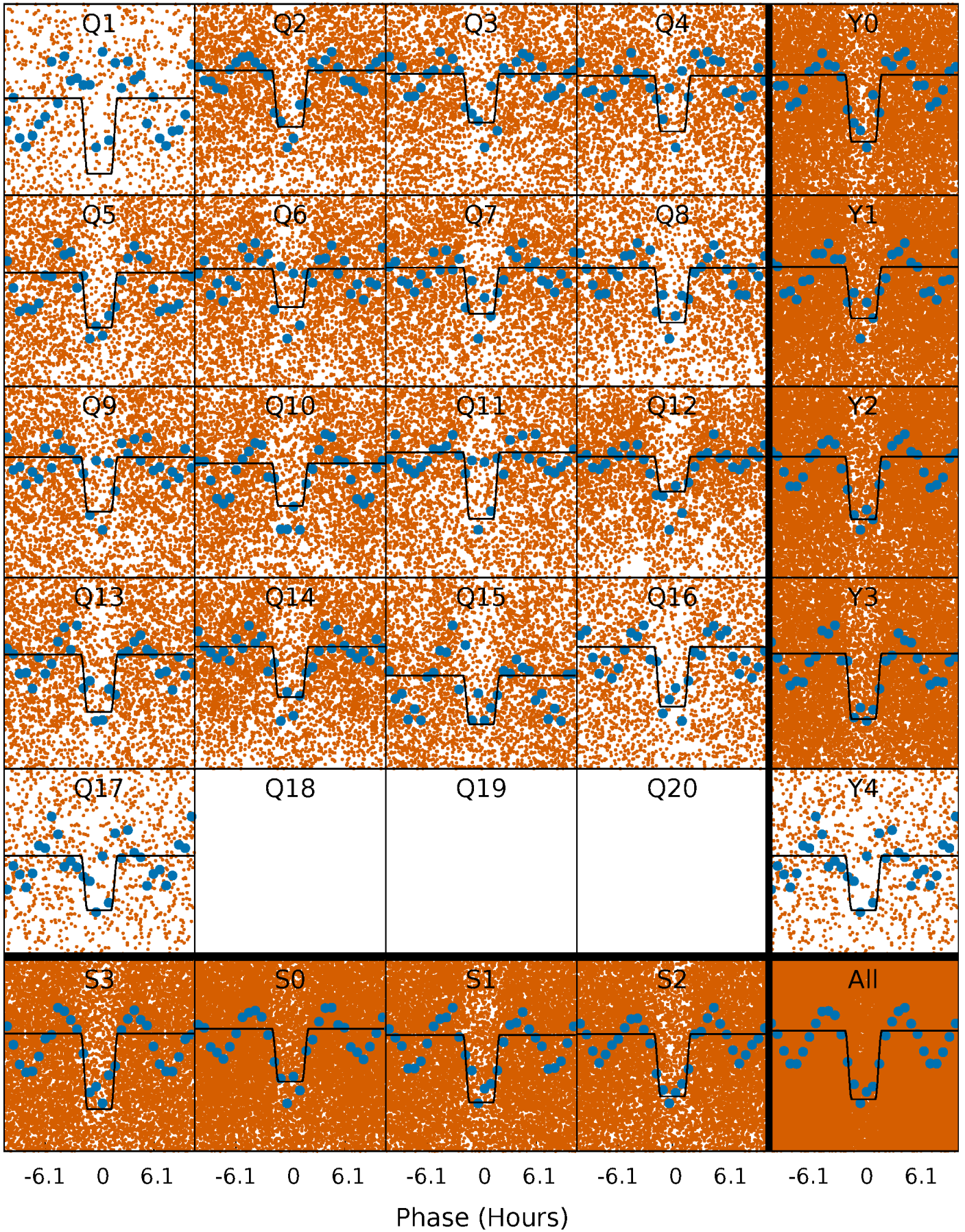
TCE 009716563-01 P= 0.651359 Days  $T_0=131.683502$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

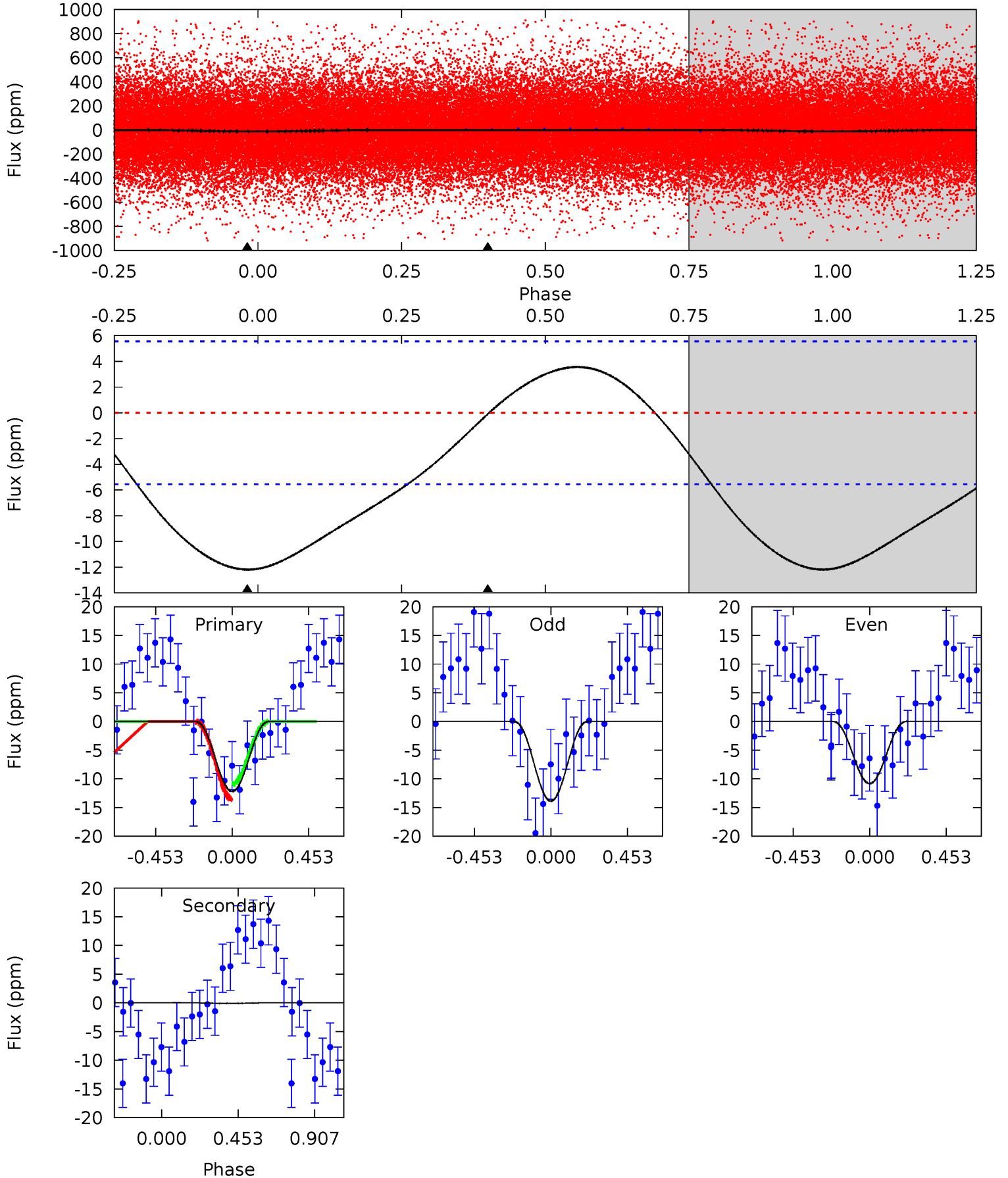
TCE 009716563-01 P= 0.653275 Days  $T_0=131.552666$  (BKJD)



# DV Model-Shift Uniqueness Test

009716563-01,  $P = 0.651359$  Days,  $E = 131.032143$  Days

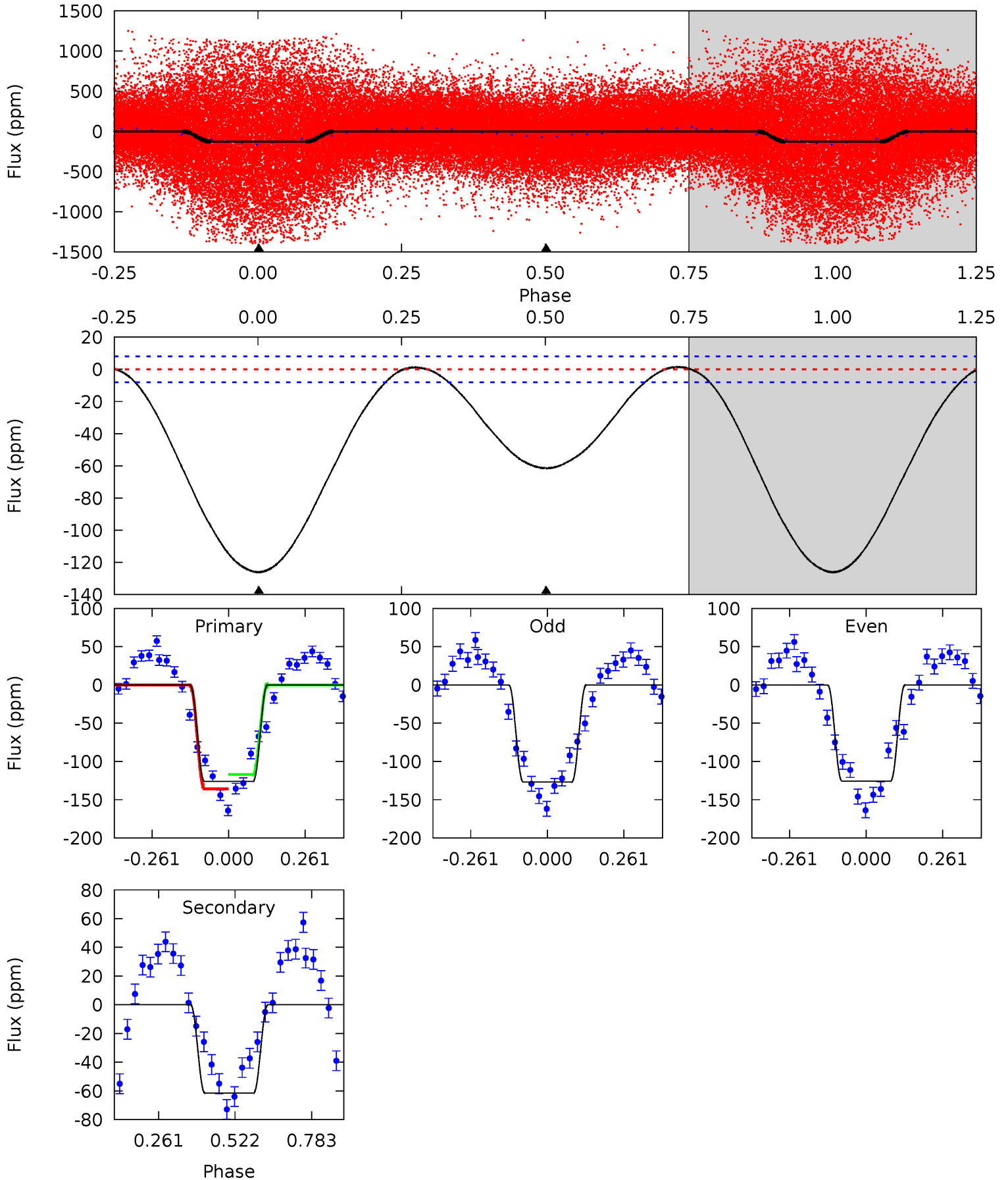
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.30	0.07	0	0	4.24	0.75	1.07	9.30	9.30	0.07	0.07	1.16	0.71	0.23	1.01



# Alt Model-Shift Uniqueness Test

009716563-01, P = 0.653275 Days, E = 130.899391 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
68.4	33.4	0	0	4.36	1.12	1.16	68.4	68.4	33.4	33.4	0.34	0.99	0.01	2.91





### Stellar Parameters For KIC 009716563

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6982^{+216}_{-288}$	$4.107^{+0.234}_{-0.156}$	$-0.500^{+0.250}_{-0.300}$	$1.599^{+0.443}_{-0.443}$	$1.193^{+0.189}_{-0.154}$	$0.411^{+0.519}_{-0.185}$
	+3%/-4%	+6%/-4%	+50%/-60%	+28%/-28%	+16%/-13%	+126%/-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 009716563-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-0 \pm 1$	$3.53^{+3.91}_{-2.44}$	$4318^{+333}_{-356}$	$-3868^{+284}_{-261}$	$0.000^{+0.030}_{-0.020}$
Alt.	$-61 \pm 2$	$3.94^{+3.77}_{-2.62}$	$4302^{+326}_{-337}$	$3672^{+3146}_{-7160}$	$0.521^{+4.234}_{-0.375}$

$T_{max}$  = 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

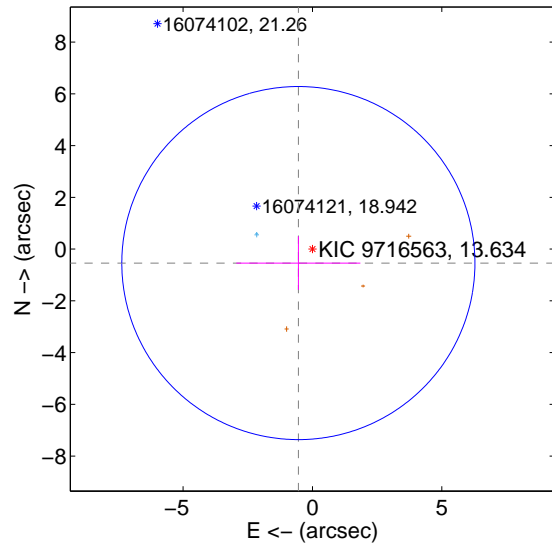
Supplemental centroid analysis for 009716563-01. Kepler magnitude: 13.63. Transit SNR 3.03

There are 2 quarters with good PRF difference image offsets

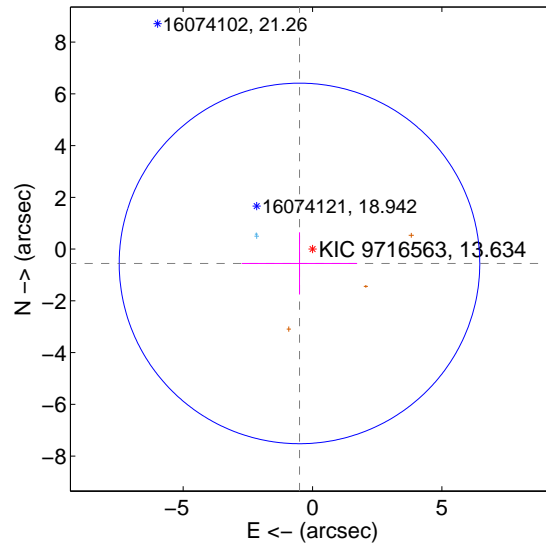
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.766 \pm 2.274$	0.34	$0.544 \pm 2.396$	$-0.540 \pm 1.032$
PRF-fit source offset from KIC position	$0.749 \pm 2.322$	0.32	$0.504 \pm 2.229$	$-0.554 \pm 1.201$
photometric centroid source offset	$2.79 \pm 1.67$	1.67	$-1.86 \pm 1.64$	$-2.08 \pm 1.69$

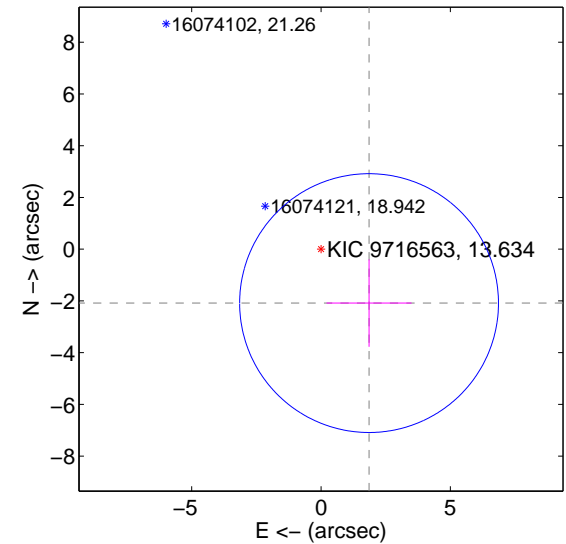
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

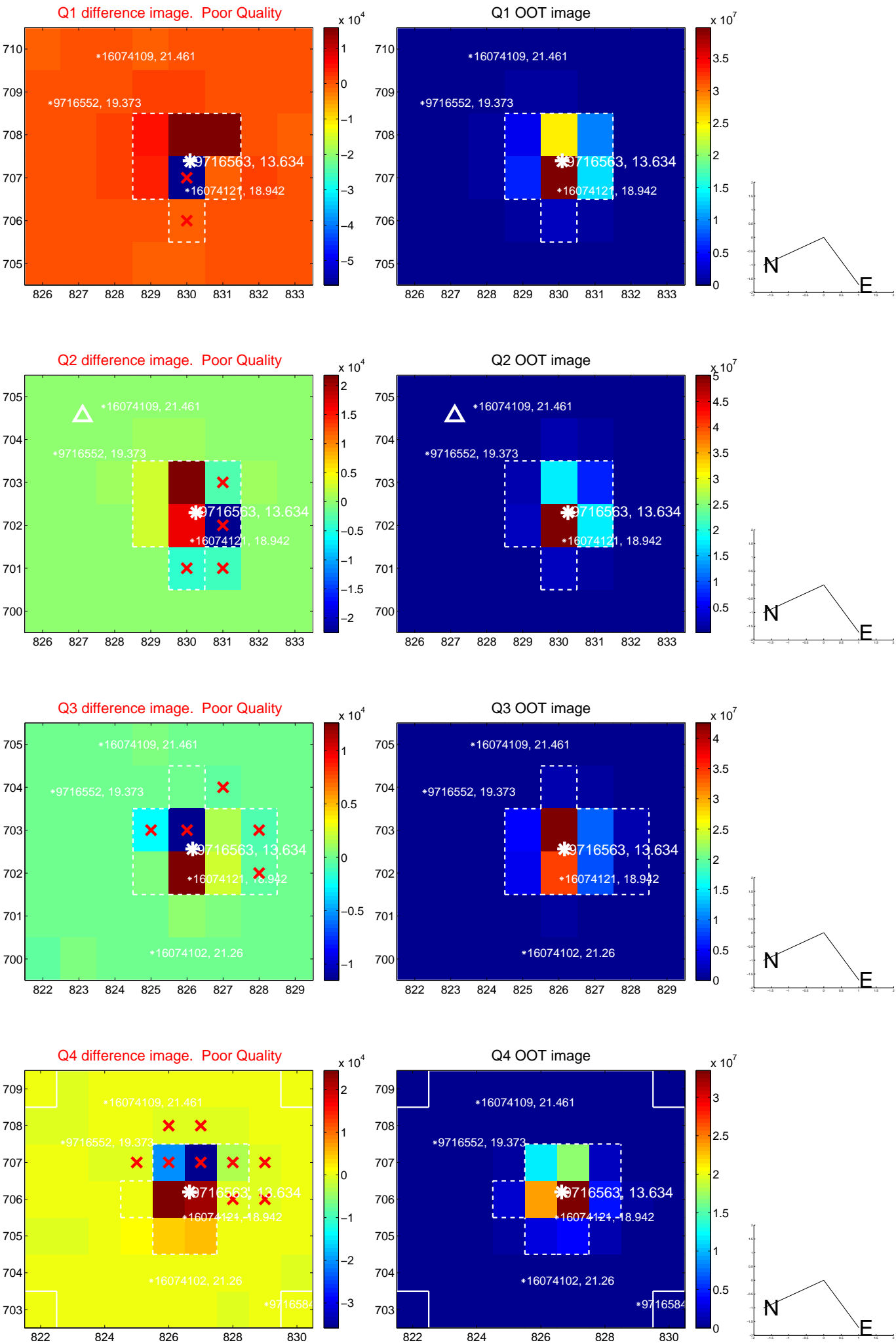


offset from photometric centroids

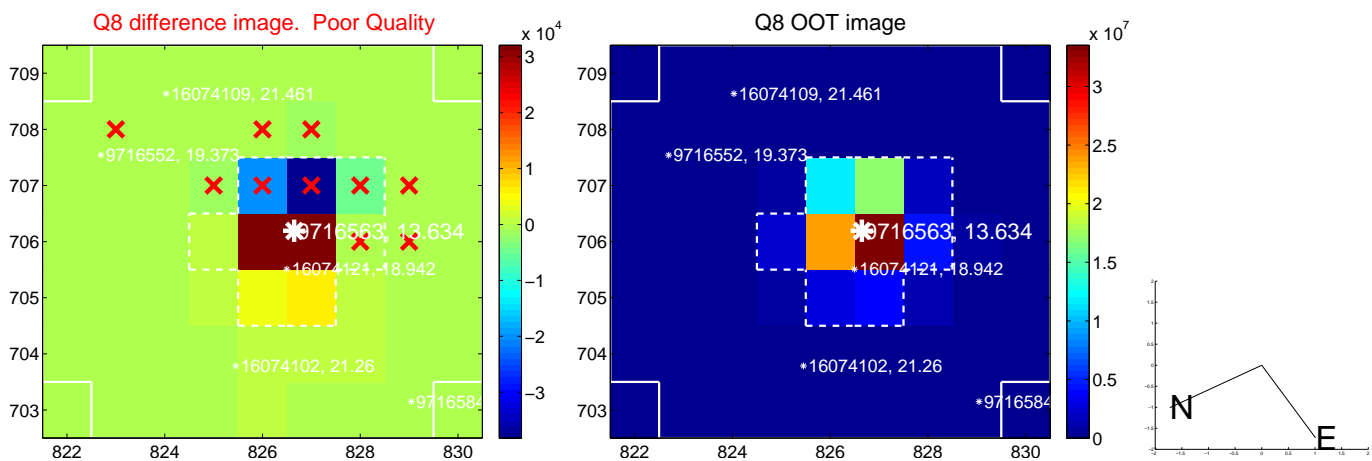
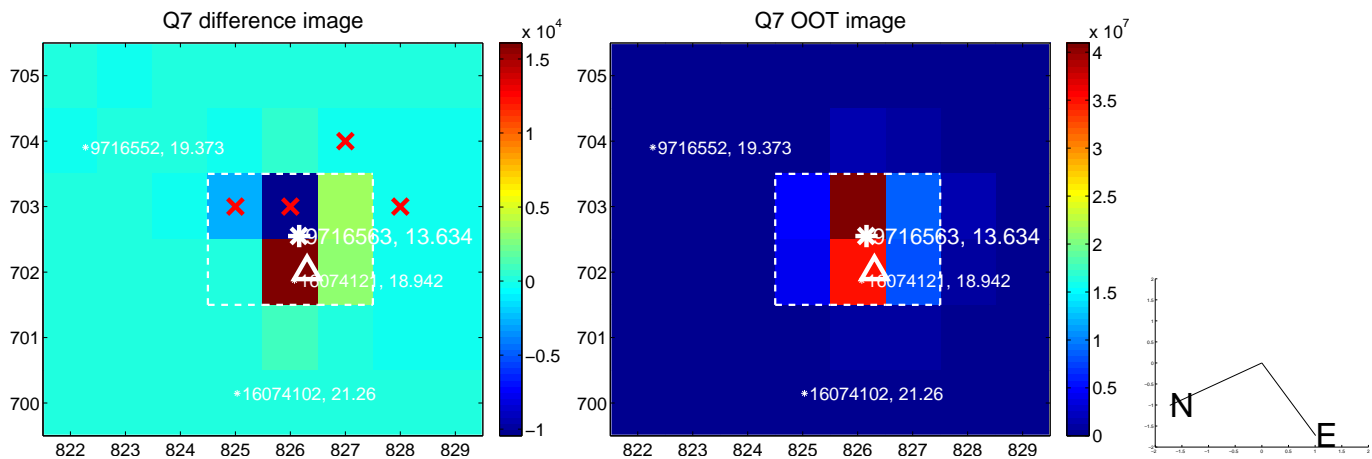
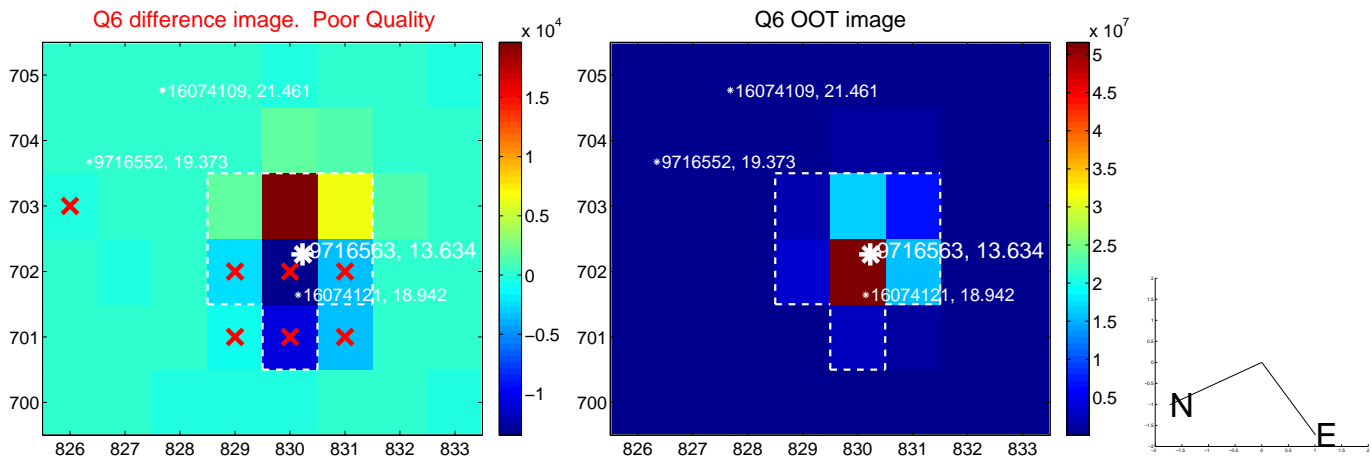
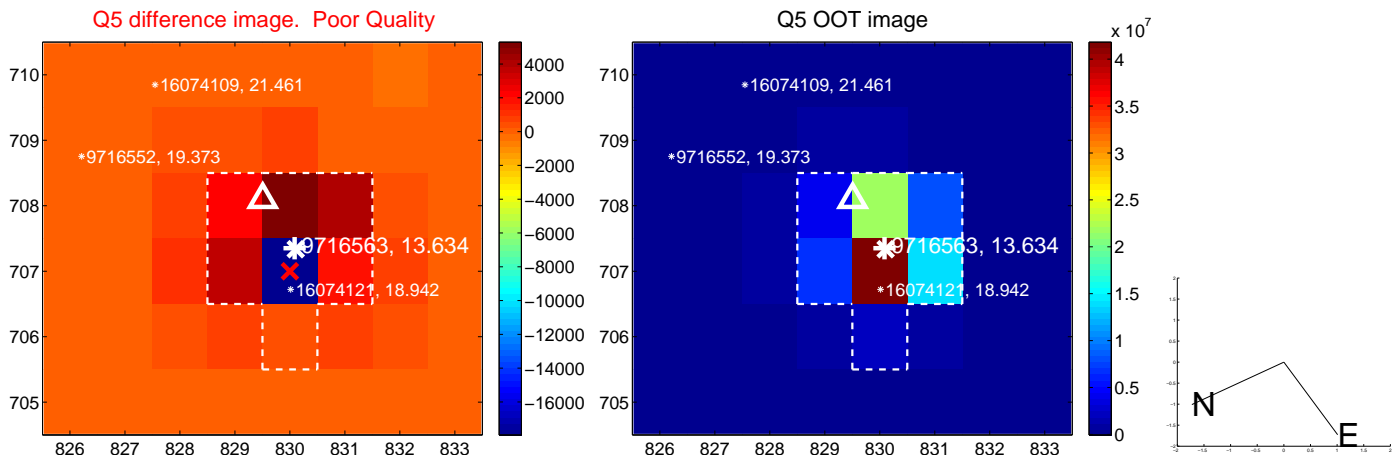


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

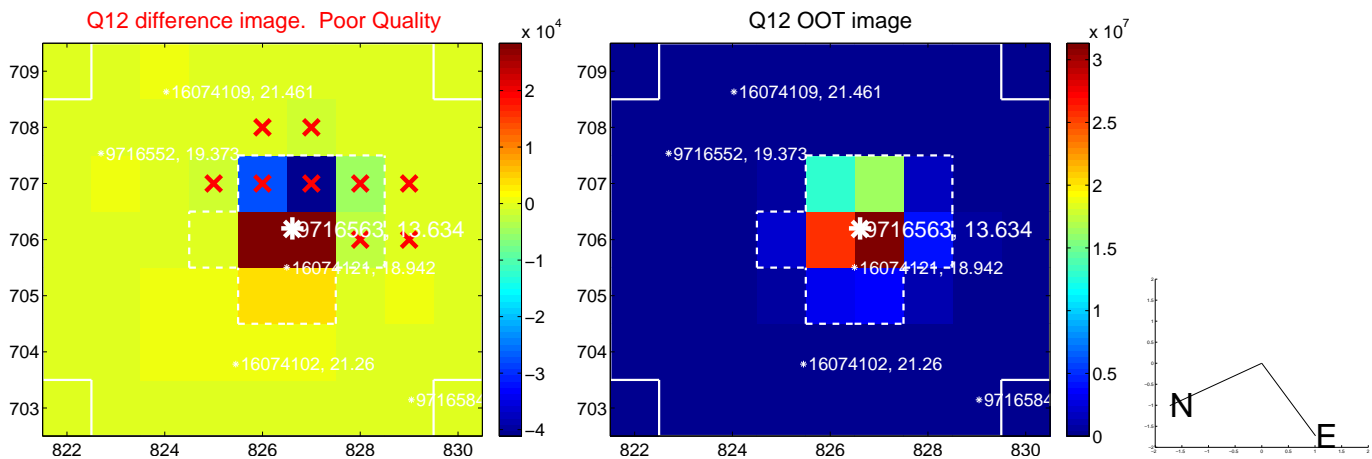
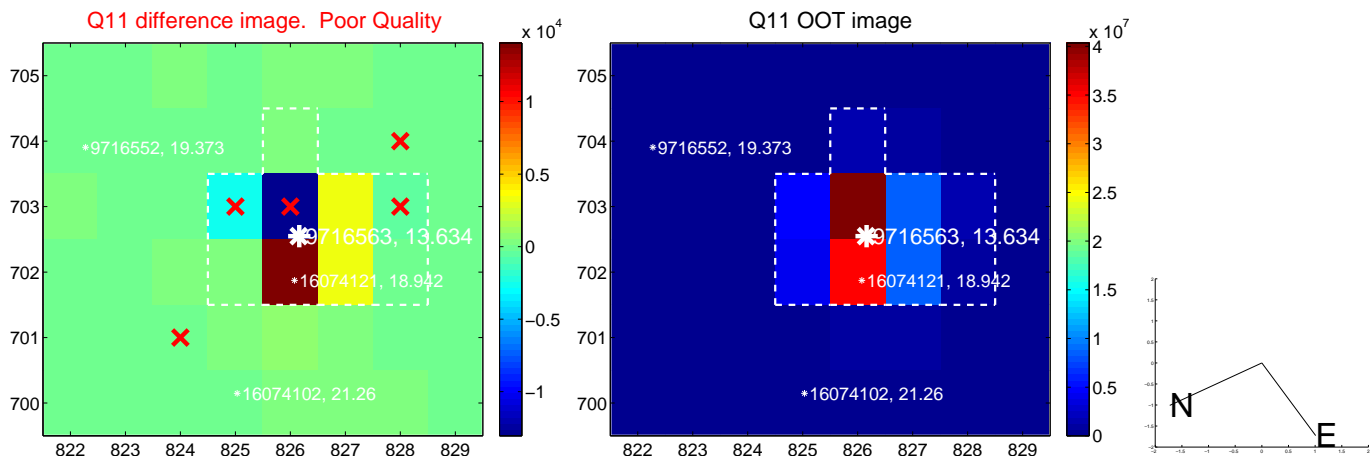
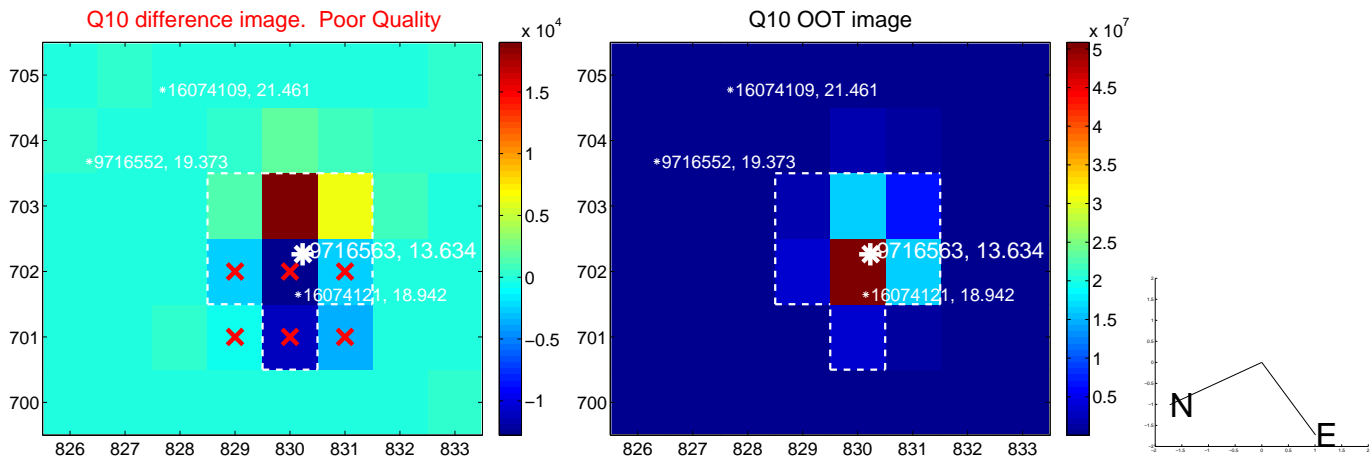
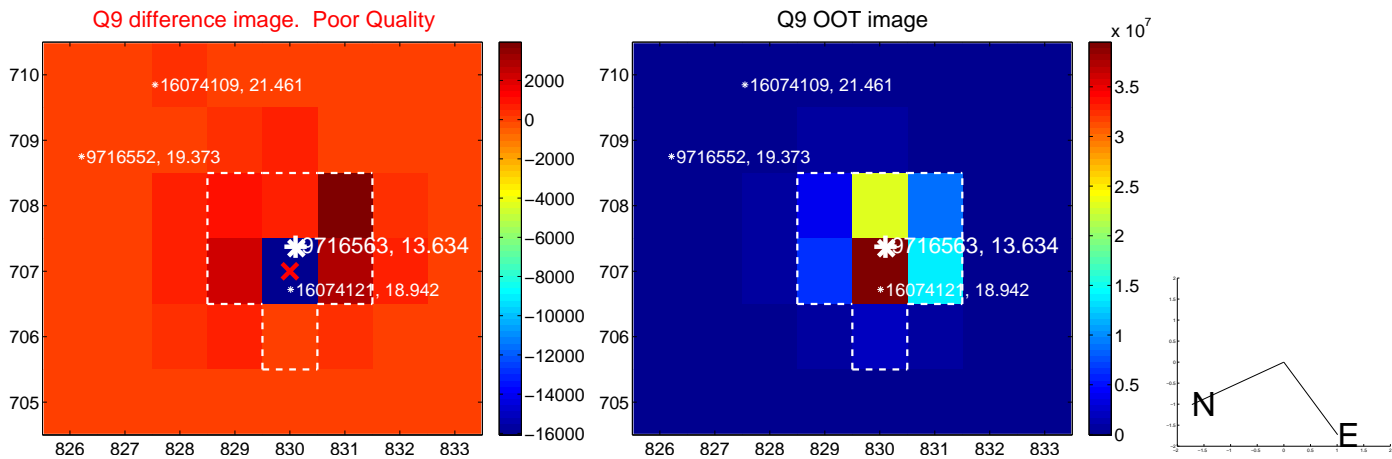


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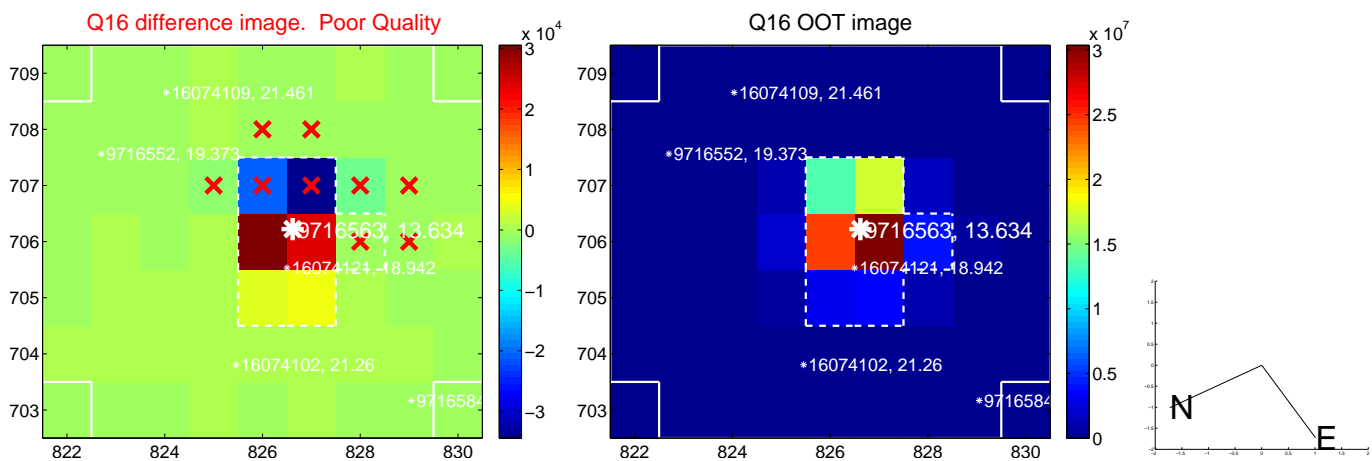
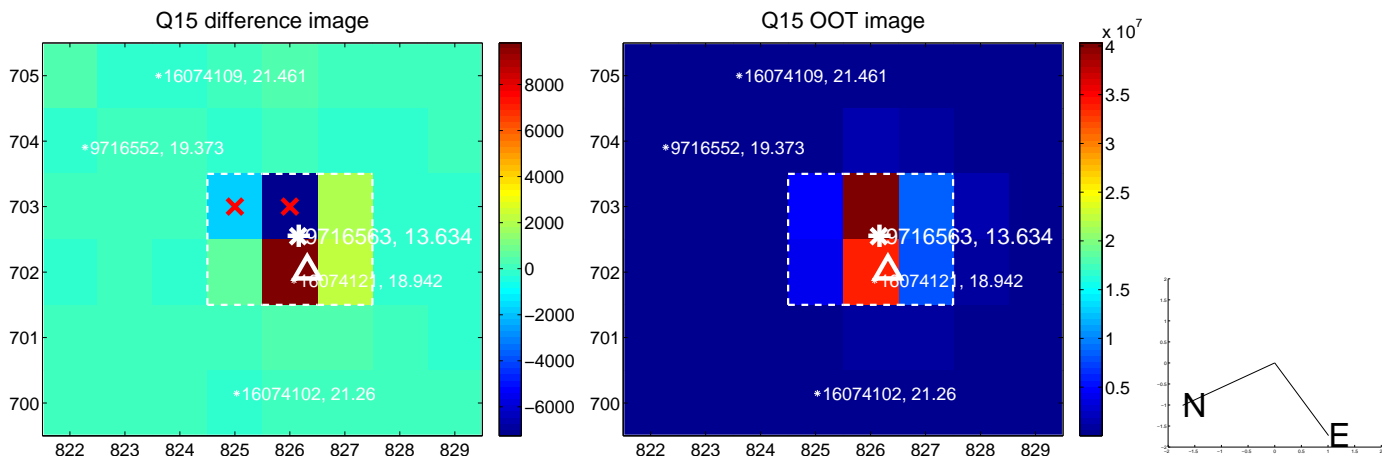
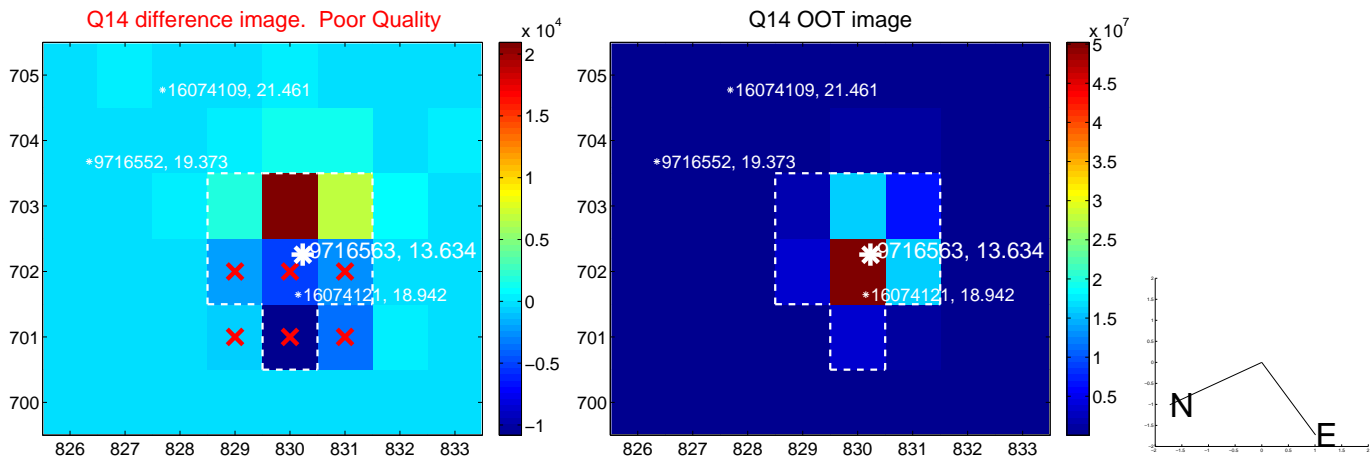
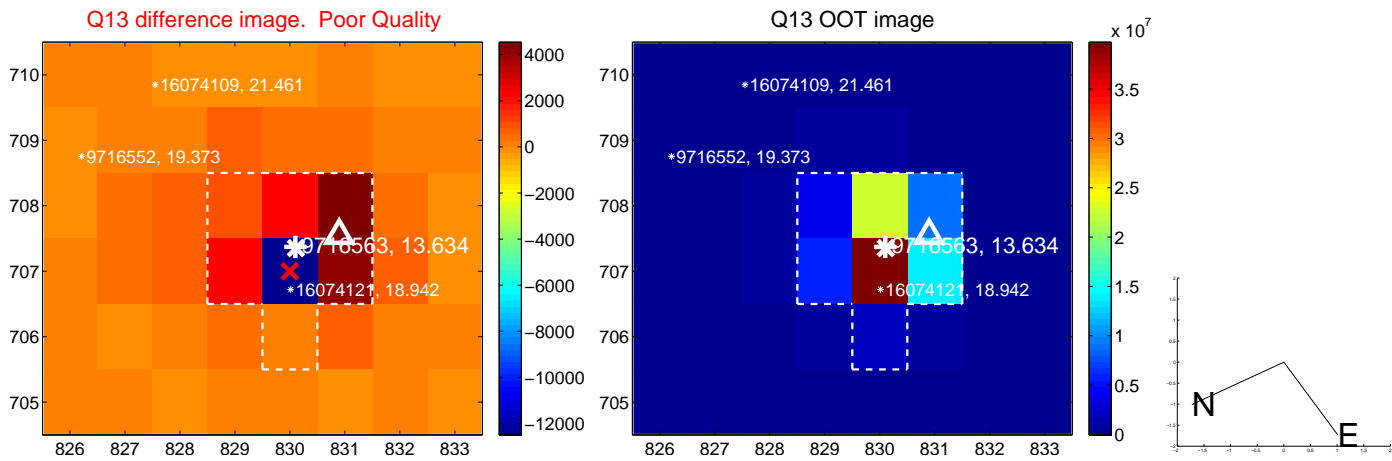




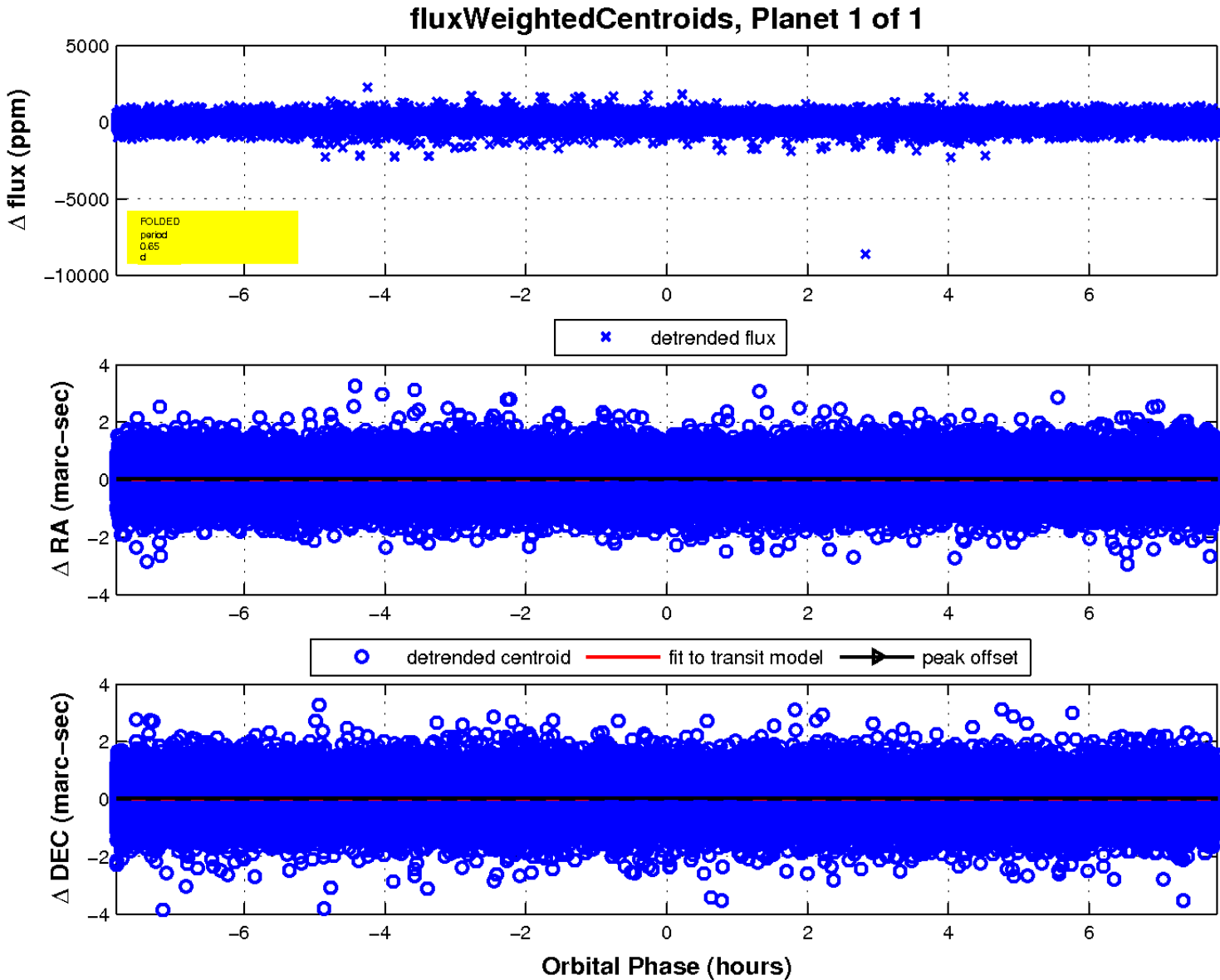
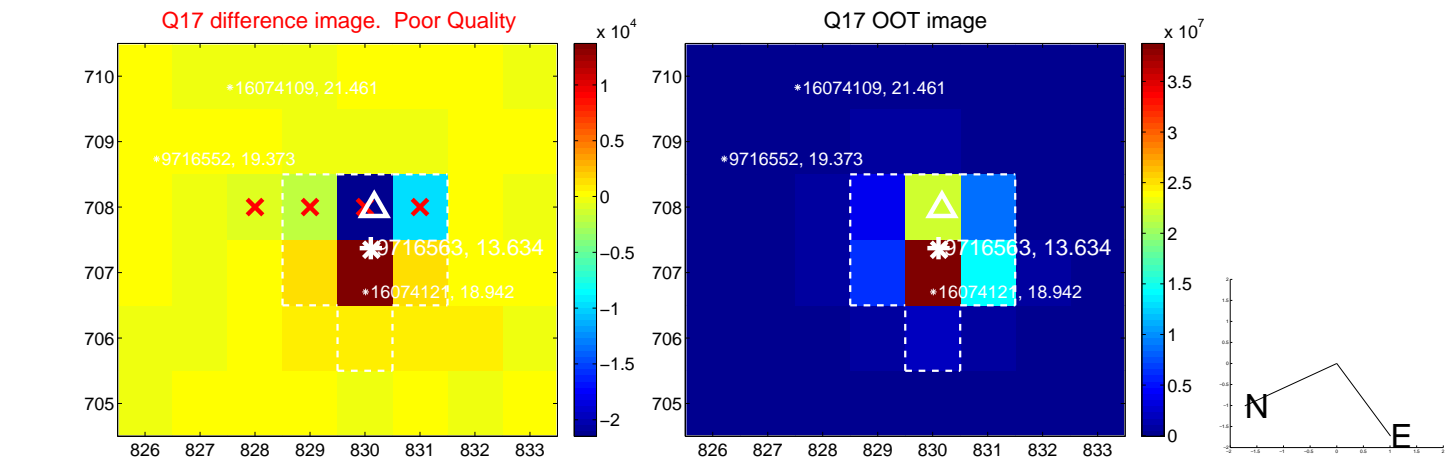
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

