

# KIC 005358212

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005358212-01	OBS	No	0.535935	131.927029	23.3	3.315	8.8	7.4	0.83	5644	0.41	3970.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005358212-01	OBS	FP	0.00	1	0	1	1	LPP_DV—LPP_ALT—CENT_UNRESOLVED_OFFSET—EPHEM_MATCH

**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.

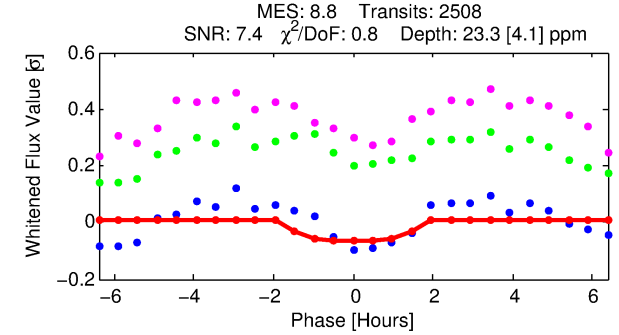
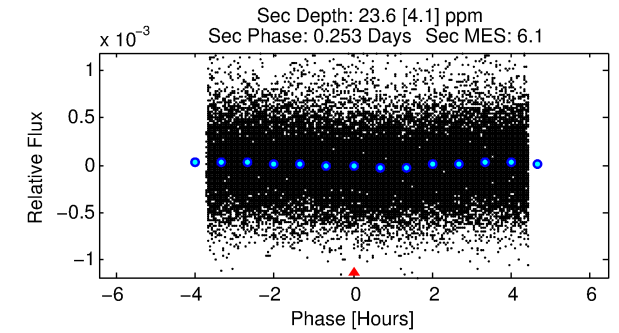
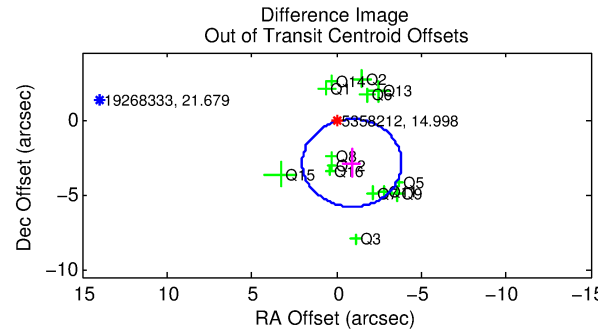
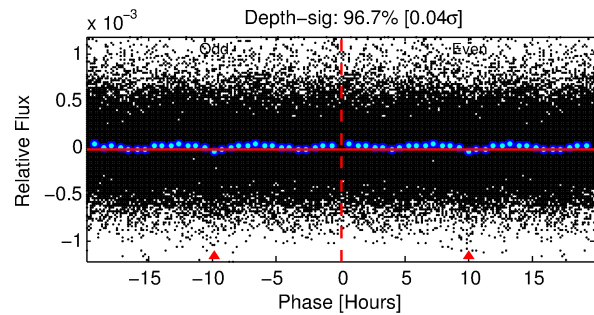
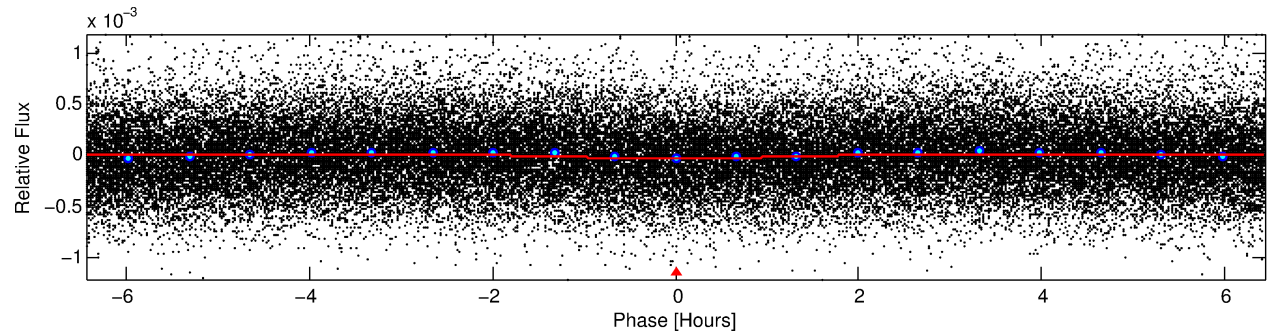
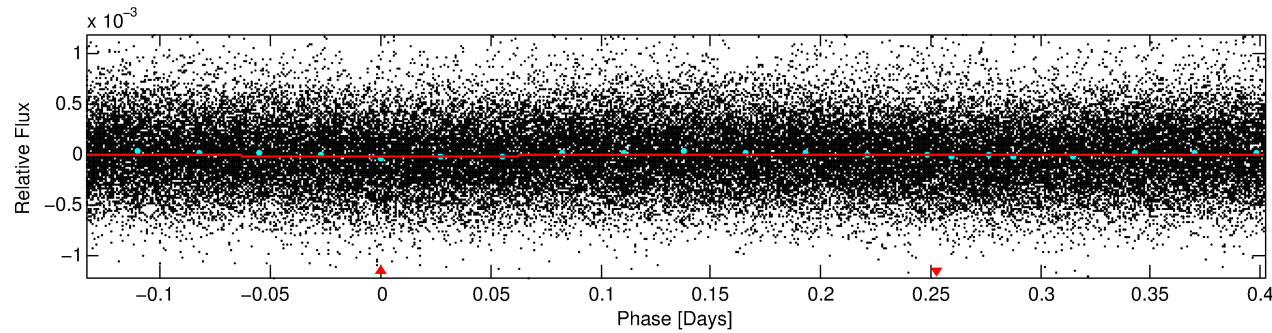
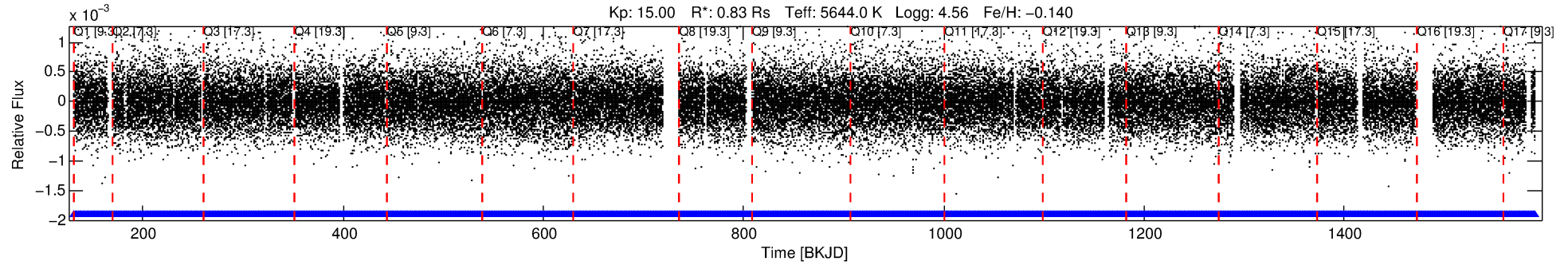
## Ephemeris Match Information For 005358212-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
005358212-01	5358212	005358200-pri	5358200	1:1	22.8	3	-5	15.01	15.00	18874.00	Direct-PRF	0	2.91	0.52

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5358212 Candidate: 1 of 1 Period: 0.536 d



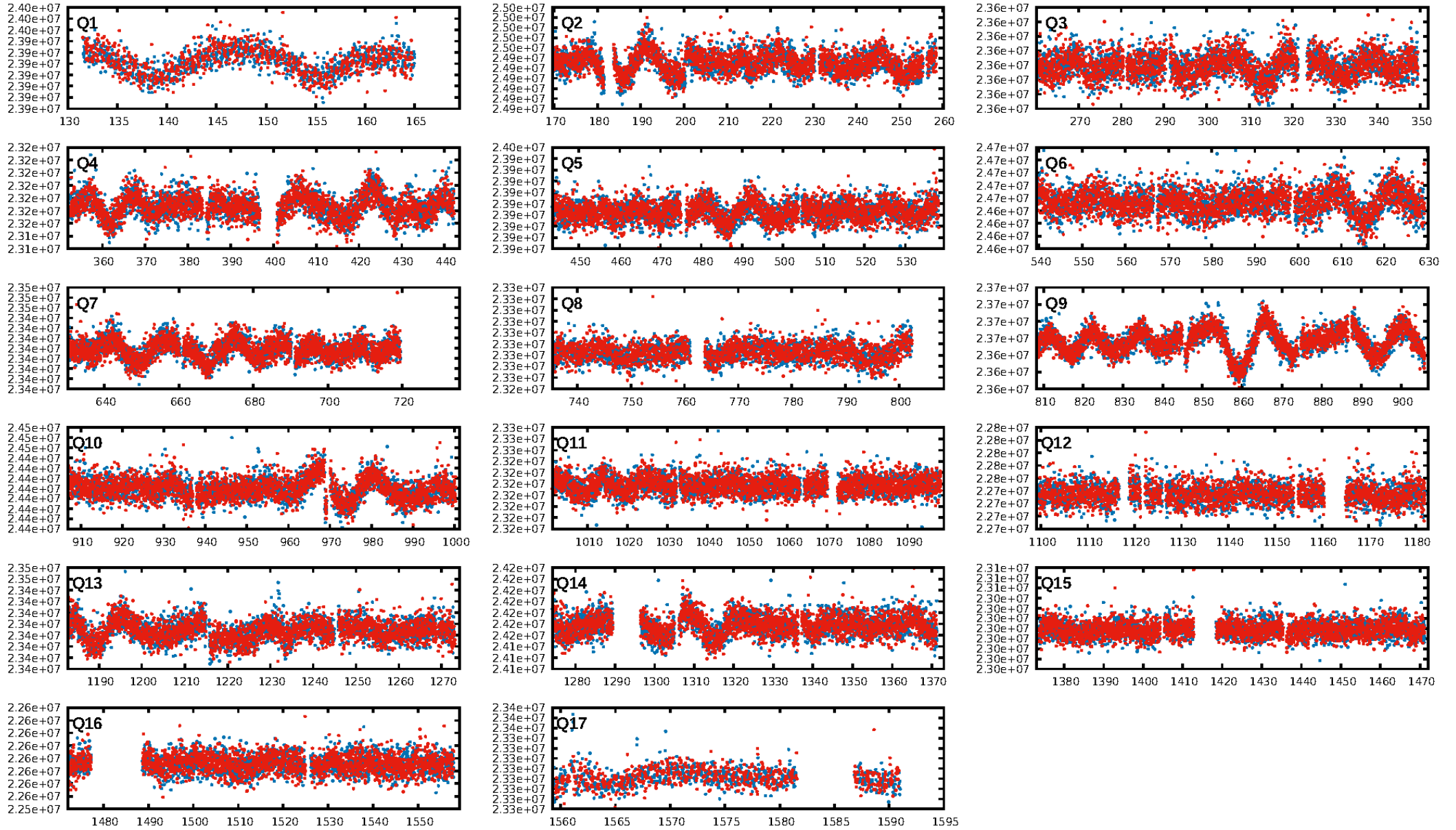
## DV Fit Results:

Period = 0.53593 [0.00001] d  
Epoch = 131.9270 [0.0053] BKJD  
Rp/R\* = 0.0045 [0.0049]  
a/R\* = 1.30 [2.47]  
b = 0.50 [7.03]  
Seff = 3970.33 [1290.75]  
Teff = 2024 [165] K  
Rp = 0.41 [0.45] Re  
a = 0.0126 [0.0026] AU  
Ag = 12.21 [26.71] [0.42 $\sigma$ ]  
Teffp = 5850 [3170] K [1.21 $\sigma$ ]

## DV Diagnostic Results:

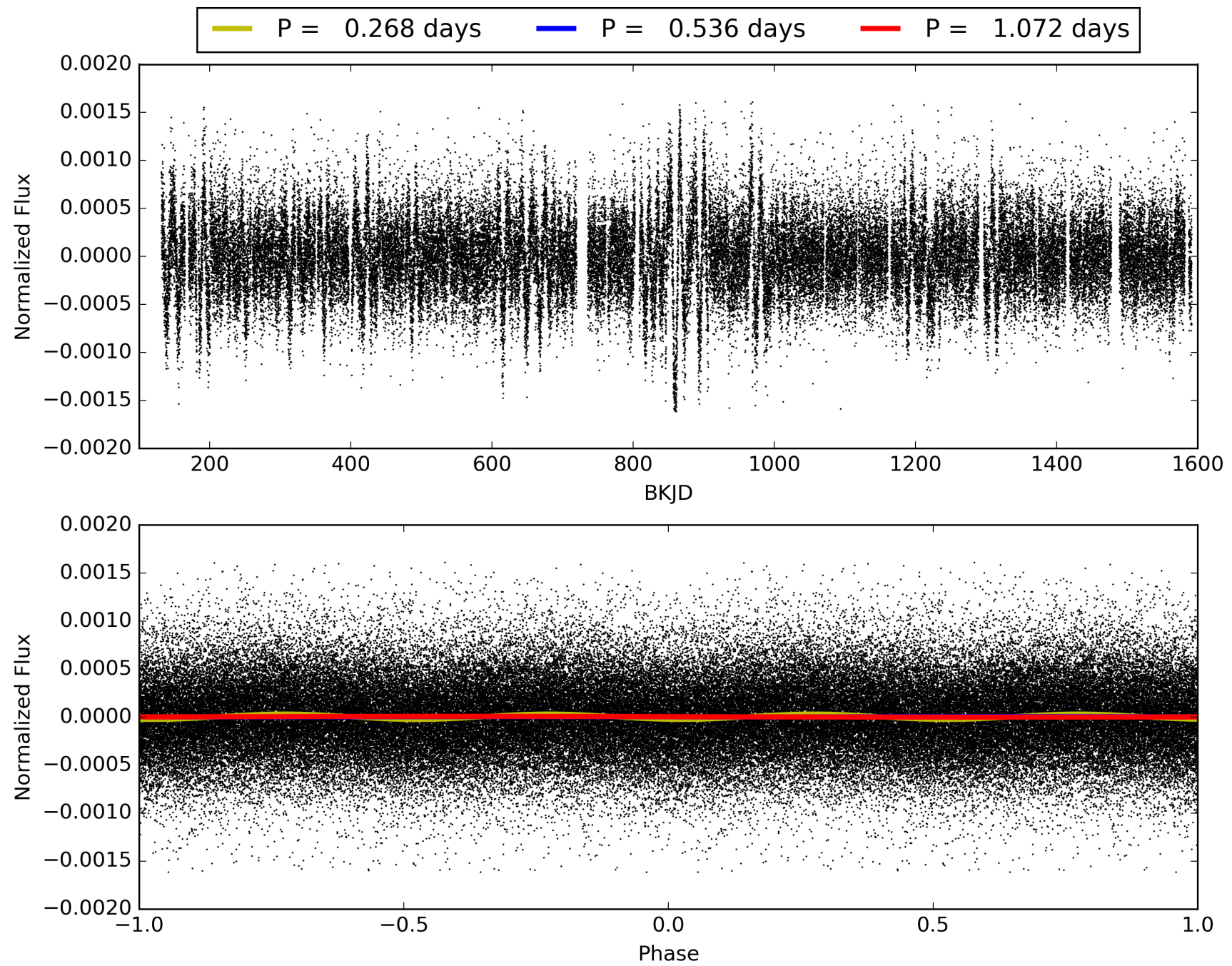
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.49e-19  
RollingBand-fgt: 1.00 [2396/2396]  
GhostDiagnostic-chr: -0.6467  
Centroid-sig: 0.1%  
Centroid-so: 4.911 arcsec [2.81 $\sigma$ ]  
OotOffset-rm: 3.030 arcsec [3.11 $\sigma$ ]  
KicOffset-rm: 3.104 arcsec [3.47 $\sigma$ ]  
OotOffset-st: 3/4/3/4 [14]  
KicOffset-st: 3/4/3/4 [14]  
DiffImageQuality-fgm: 0.36 [5/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 005358212-01, PDC Light Curves



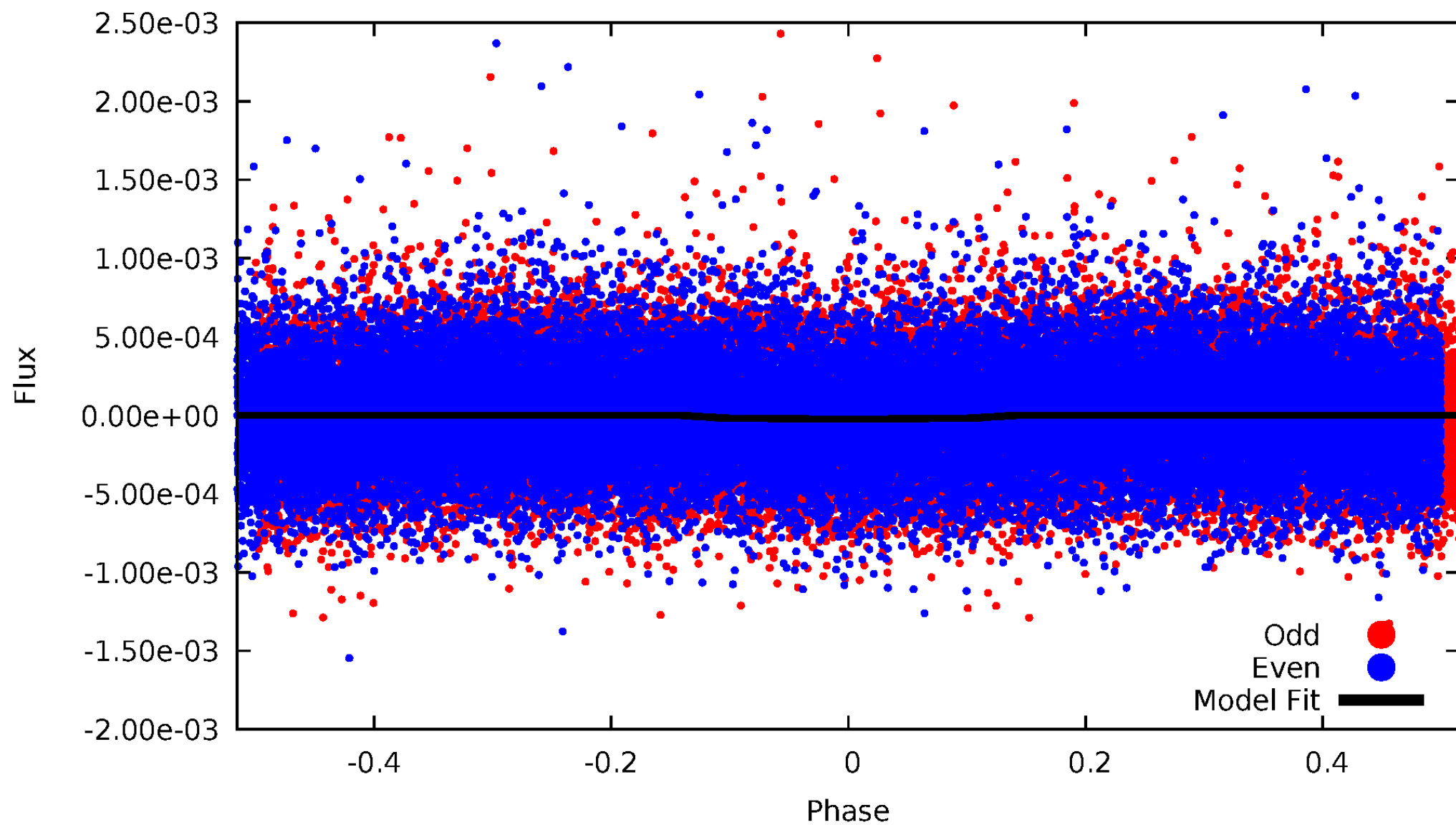


TCE 005358212-01



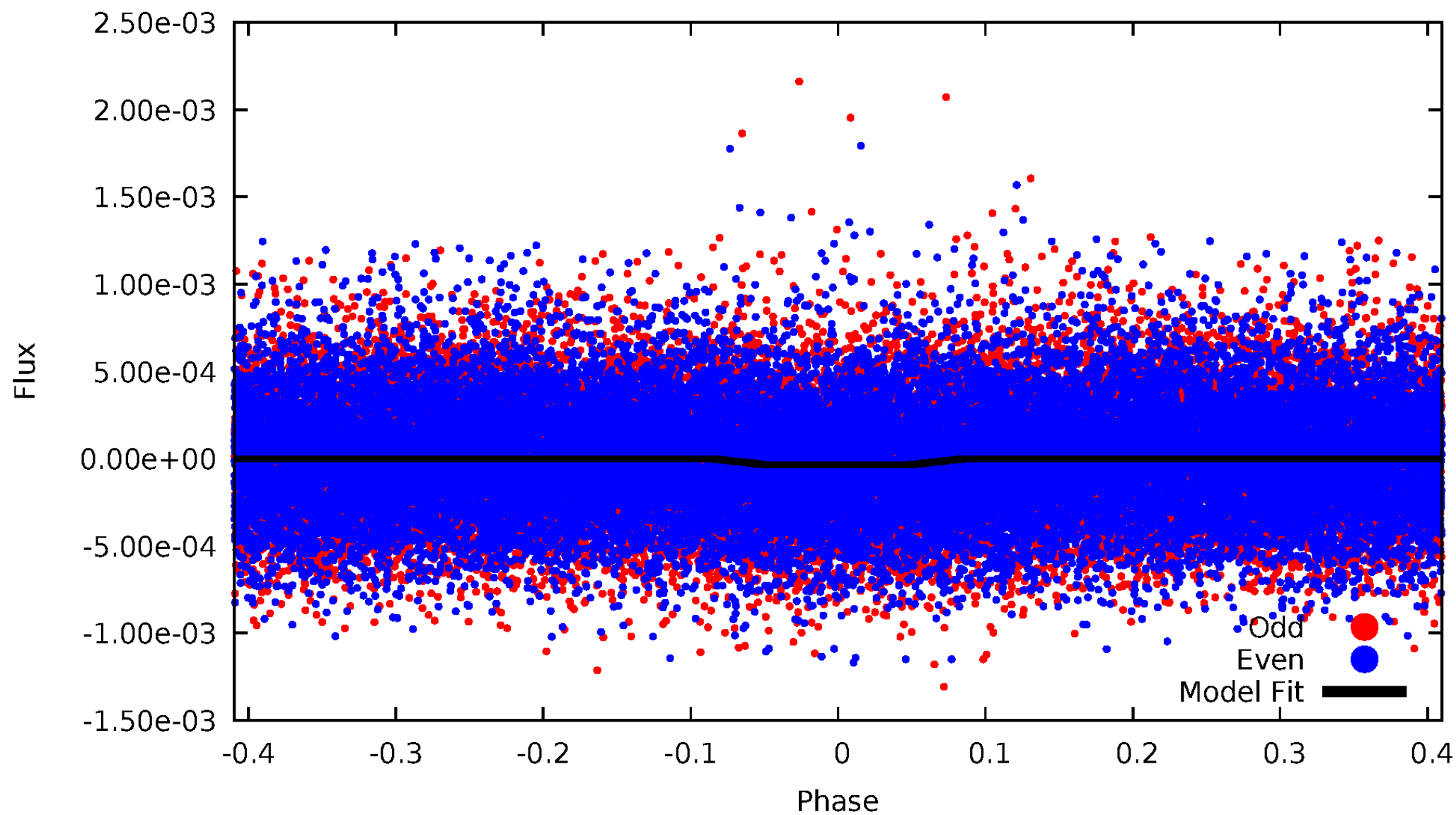
# DV Odd/Even

TCE 005358212-01



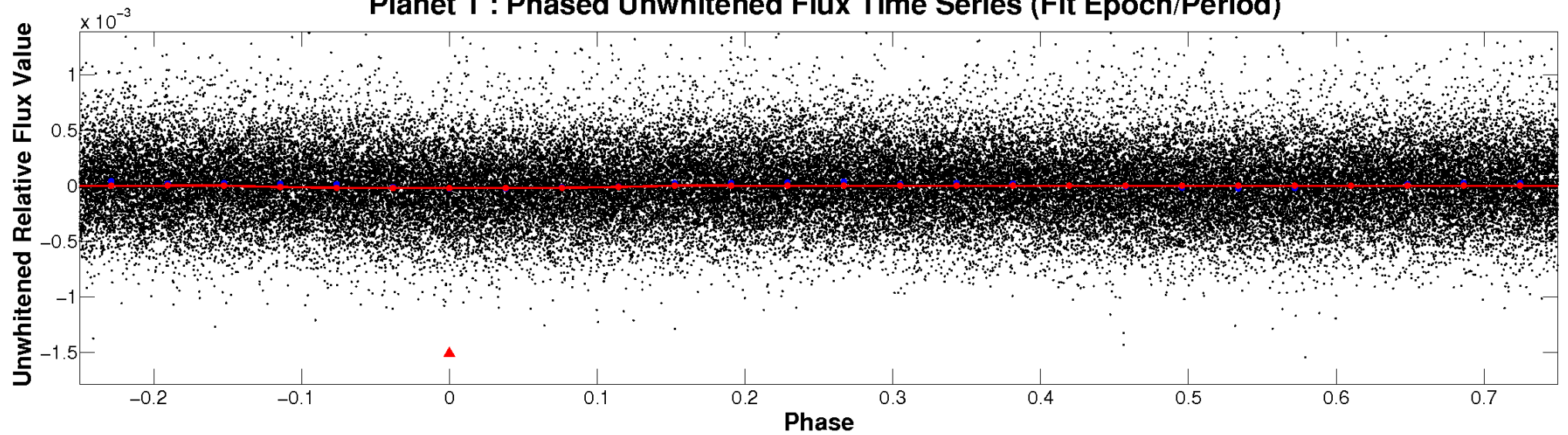
# ALT Odd/Even

TCE 005358212-01

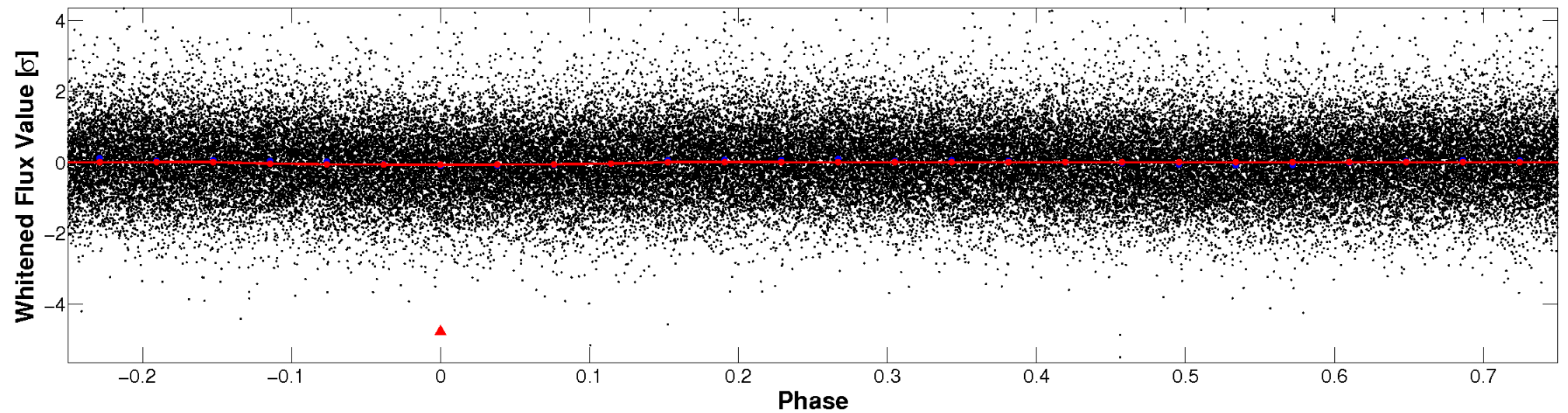


# Non-Whitened Vs. Whitened Light Curve

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



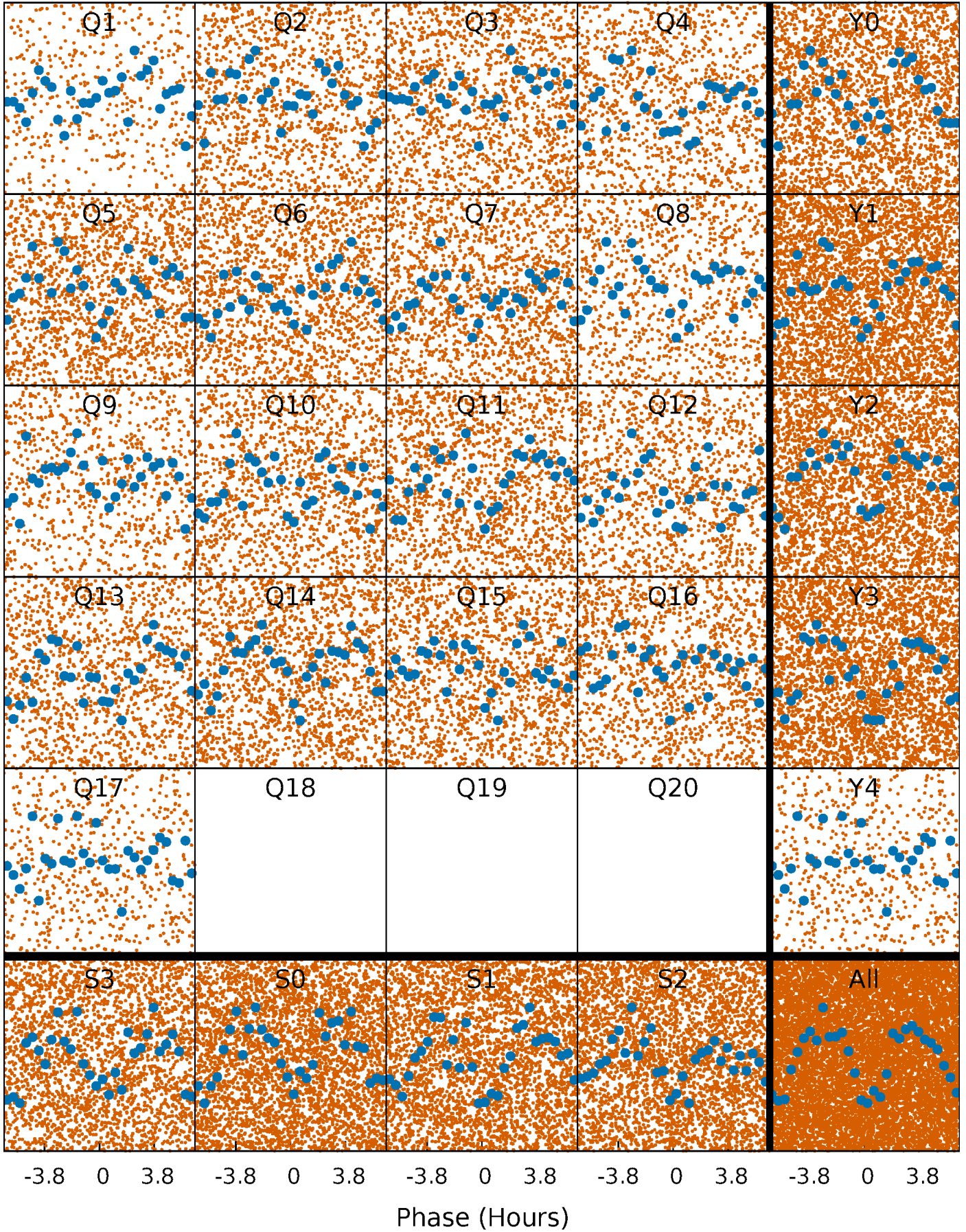
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

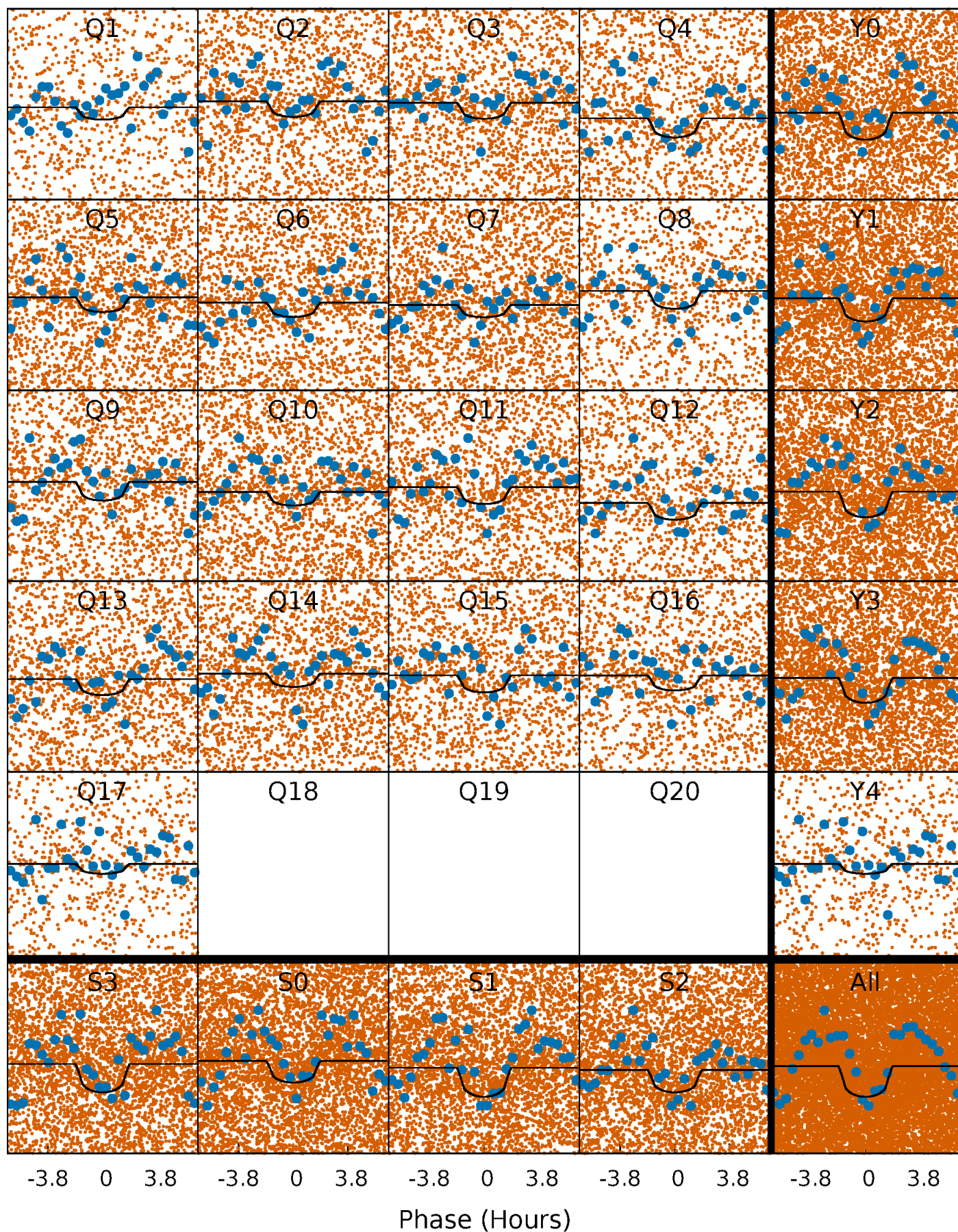
TCE 005358212-01 P= 0.535935 Days  $T_0=131.927029$  (BKJD)





# DV Quarter-Phased Transit Curves

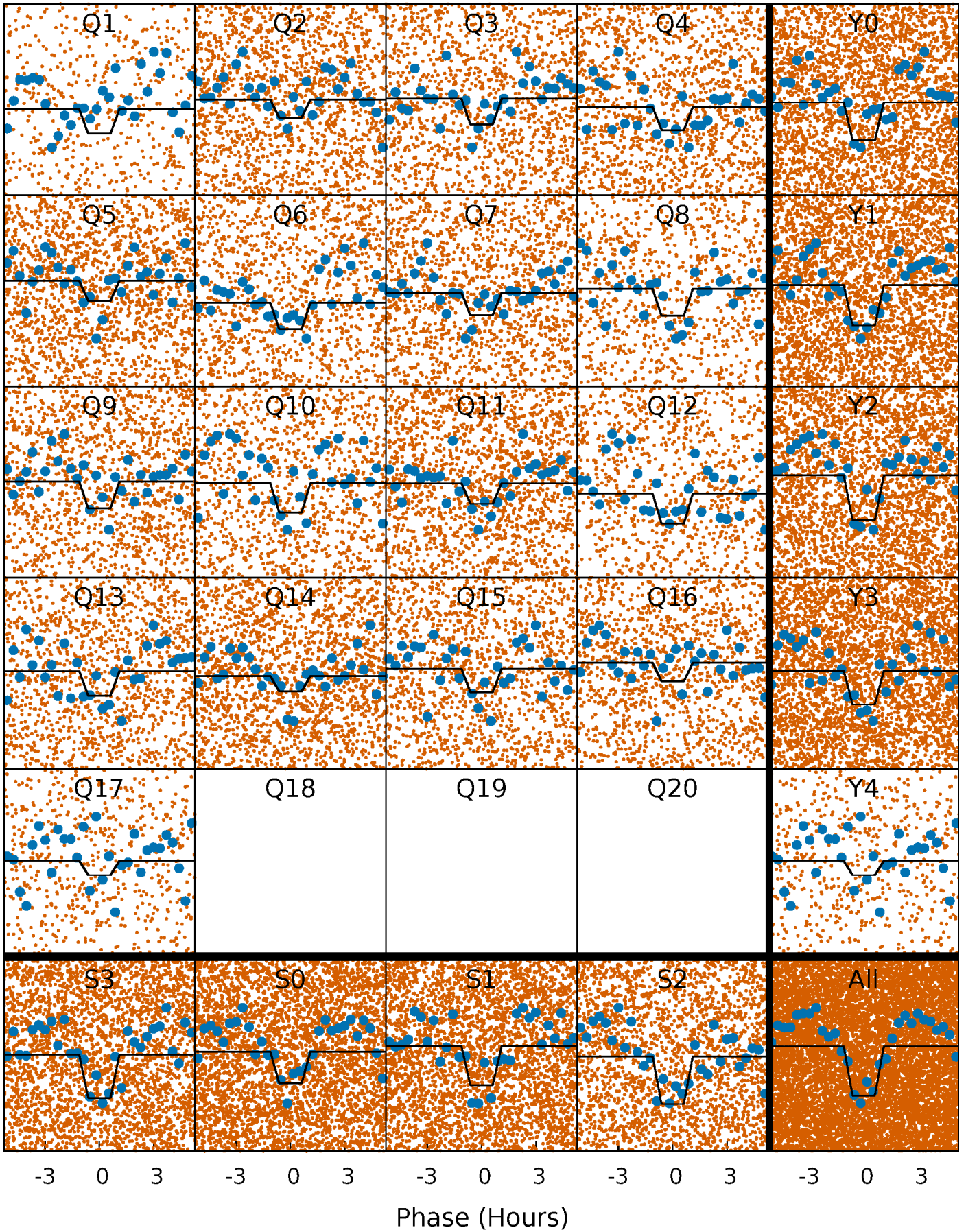
TCE 005358212-01 P= 0.535935 Days  $T_0=131.927029$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

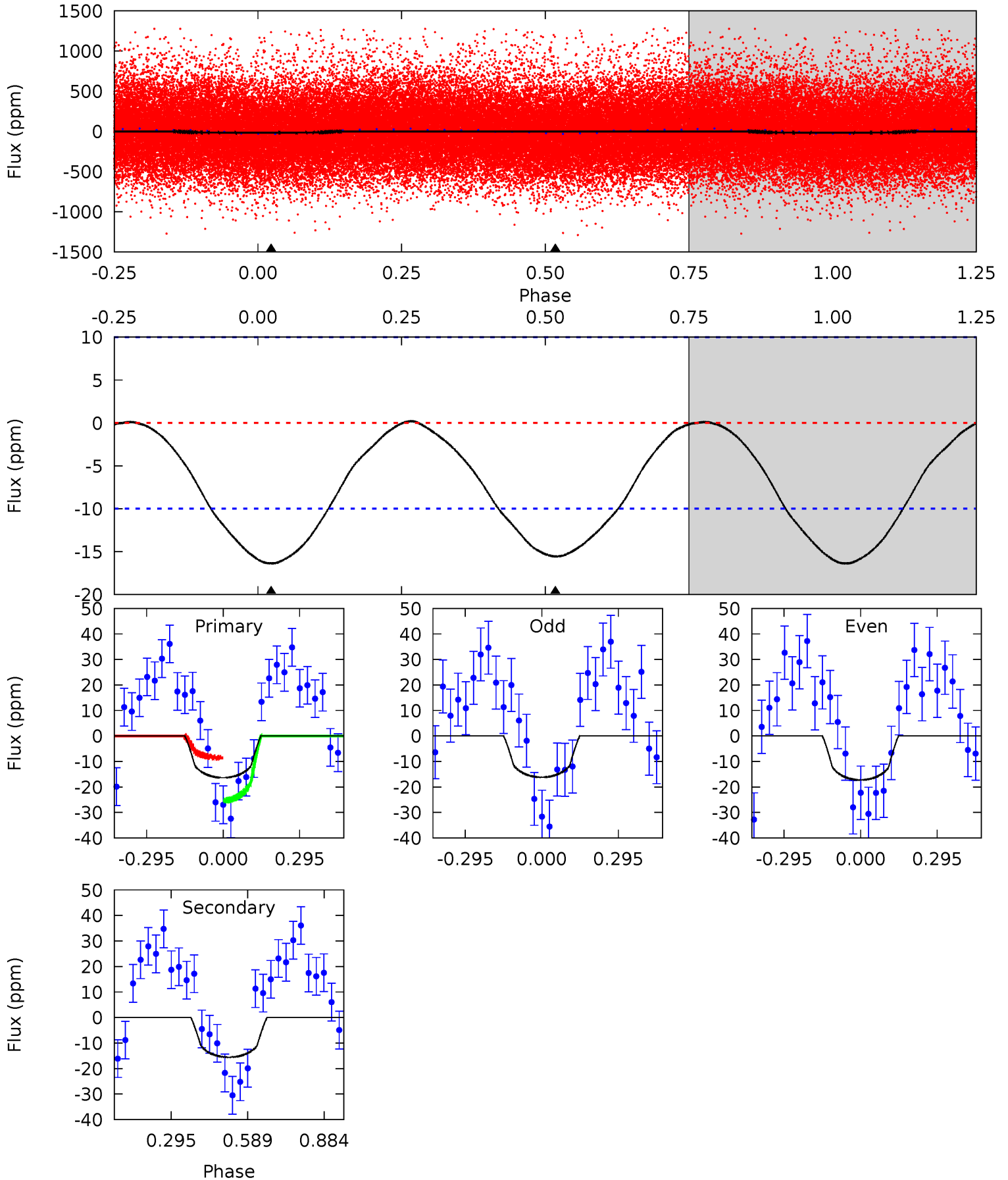
TCE 005358212-01 P= 0.535944 Days  $T_0=131.928074$  (BKJD)



# DV Model-Shift Uniqueness Test

005358212-01, P = 0.535935 Days, E = 131.391094 Days

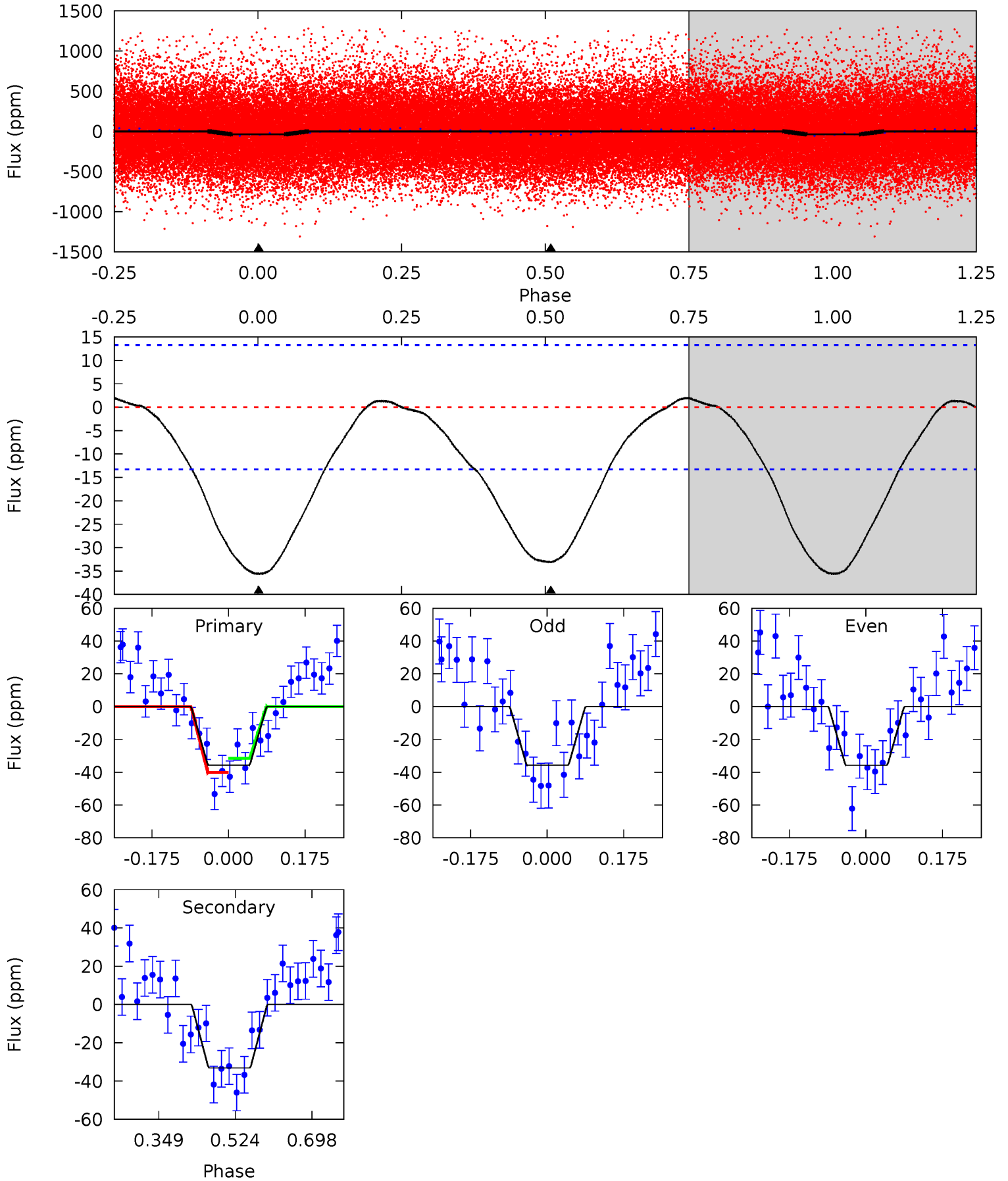
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.11	6.75	0	0	4.33	1.05	0.07	7.11	7.11	6.75	6.75	0.23	0.69	0.01	3.69



# Alt Model-Shift Uniqueness Test

005358212-01, P = 0.535944 Days, E = 131.392130 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
11.9	11.1	0	0	4.45	1.36	0.64	11.9	11.9	11.1	11.1	0.01	0.91	0.05	1.45





### Stellar Parameters For KIC 005358212

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5644^{+152}_{-152}$	$4.564^{+0.032}_{-0.168}$	$-0.140^{+0.300}_{-0.300}$	$0.831^{+0.207}_{-0.069}$	$0.928^{+0.094}_{-0.104}$	$2.279^{+0.382}_{-1.048}$
	+3%/-3%	+1%/-4%	+214%/-214%	+25%/-8%	+10%/-11%	+17%/-46%
Source	PHO1	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 005358212-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-16 \pm 2$	$0.54^{+0.44}_{-0.33}$	$2890^{+161}_{-116}$	$4753^{+3101}_{-1083}$	$4.602^{+26.625}_{-3.220}$
Alt.	$-33 \pm 3$	$0.62^{+0.42}_{-0.36}$	$2888^{+163}_{-109}$	$5294^{+3168}_{-1112}$	$7.287^{+36.034}_{-4.733}$

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

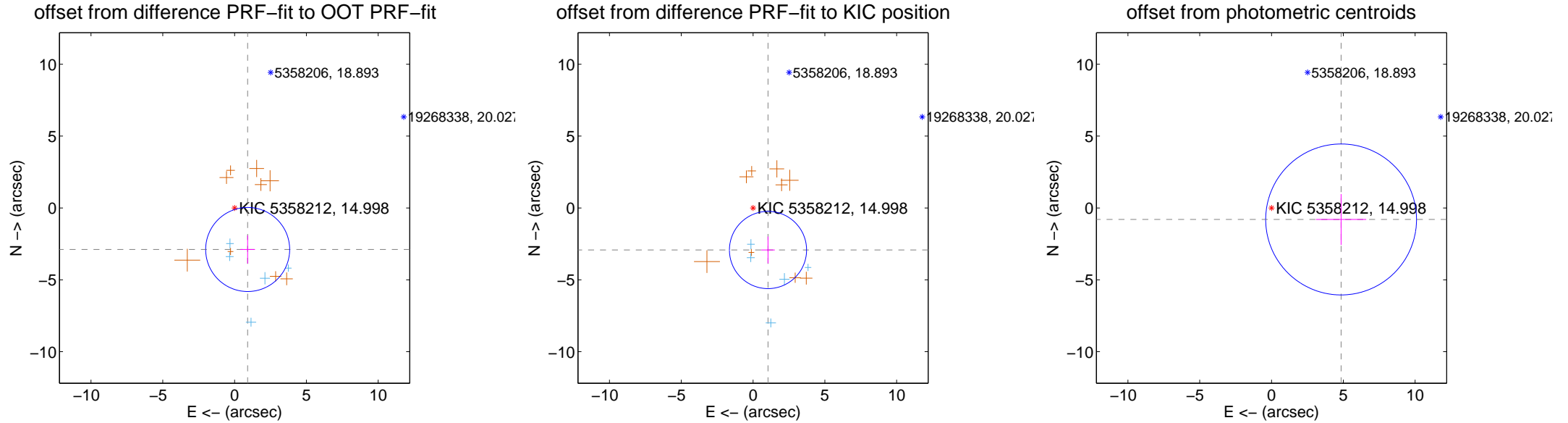
## DV Centroid Data

Supplemental centroid analysis for 005358212-01. Kepler magnitude: 15.00. Transit SNR 7.35

There are 5 quarters with good PRF difference image offsets

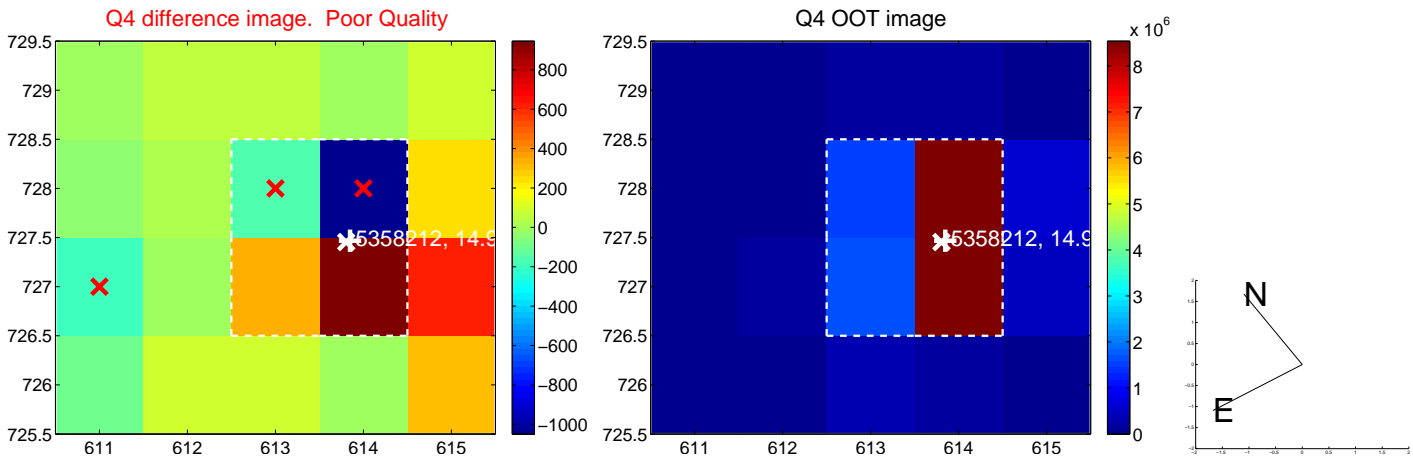
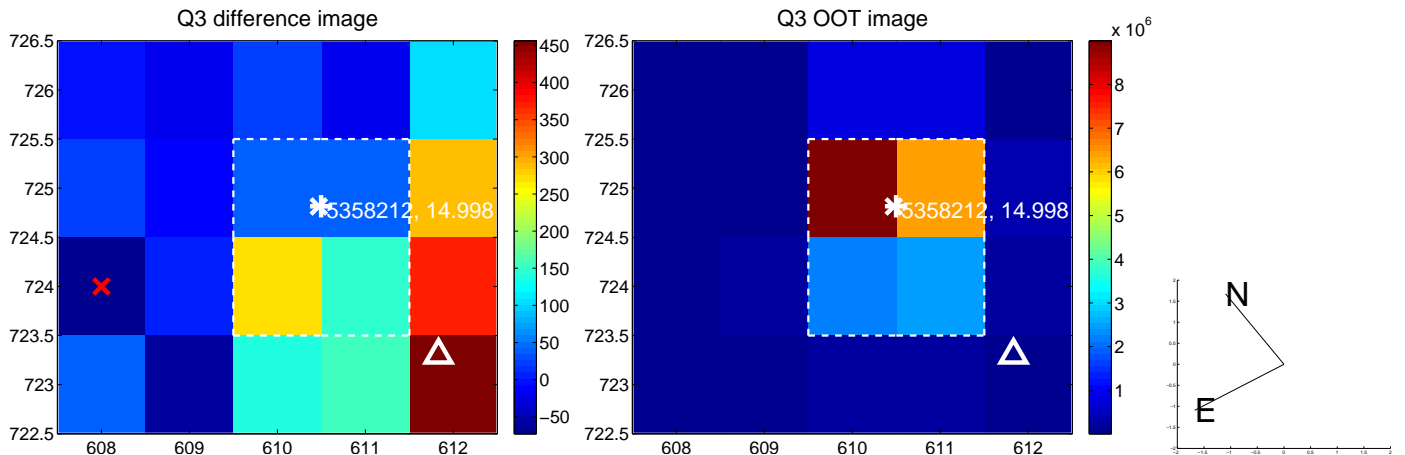
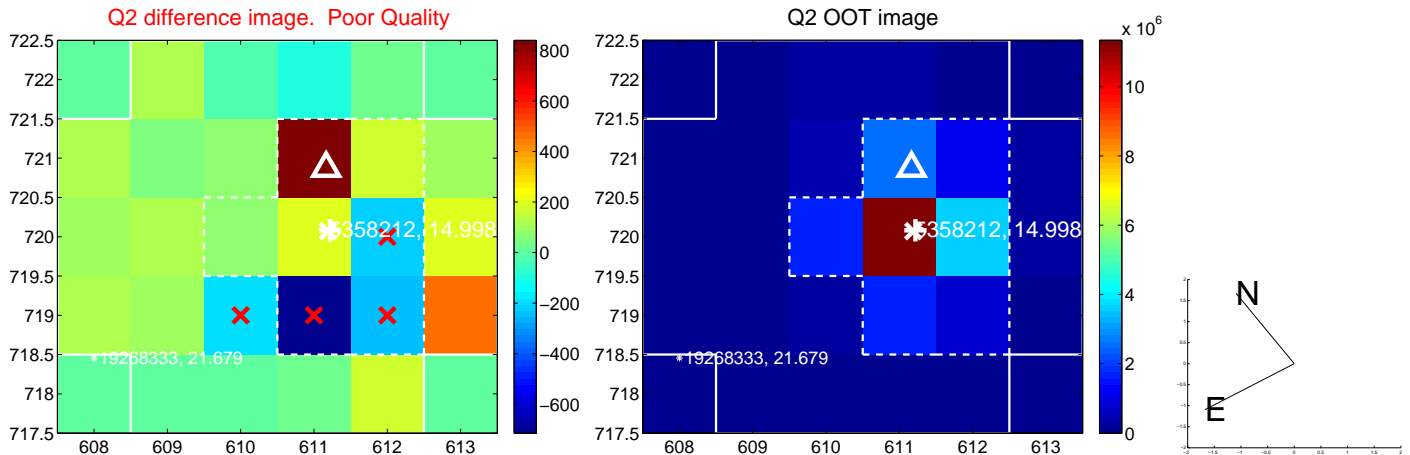
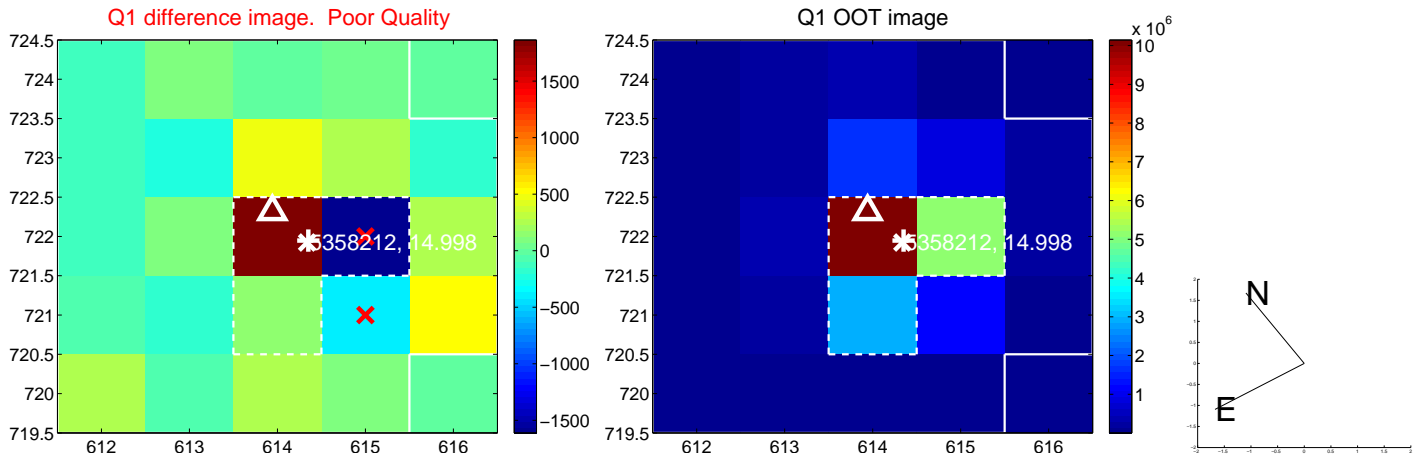
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.030 \pm 0.975$	$3.11$	$-0.912 \pm 0.511$	$-2.889 \pm 0.982$
PRF-fit source offset from KIC position	$3.104 \pm 0.895$	$3.47$	$-1.041 \pm 0.474$	$-2.924 \pm 0.935$
photometric centroid source offset	$4.91 \pm 1.75$	$2.81$	$-4.85 \pm 1.75$	$-0.80 \pm 1.77$

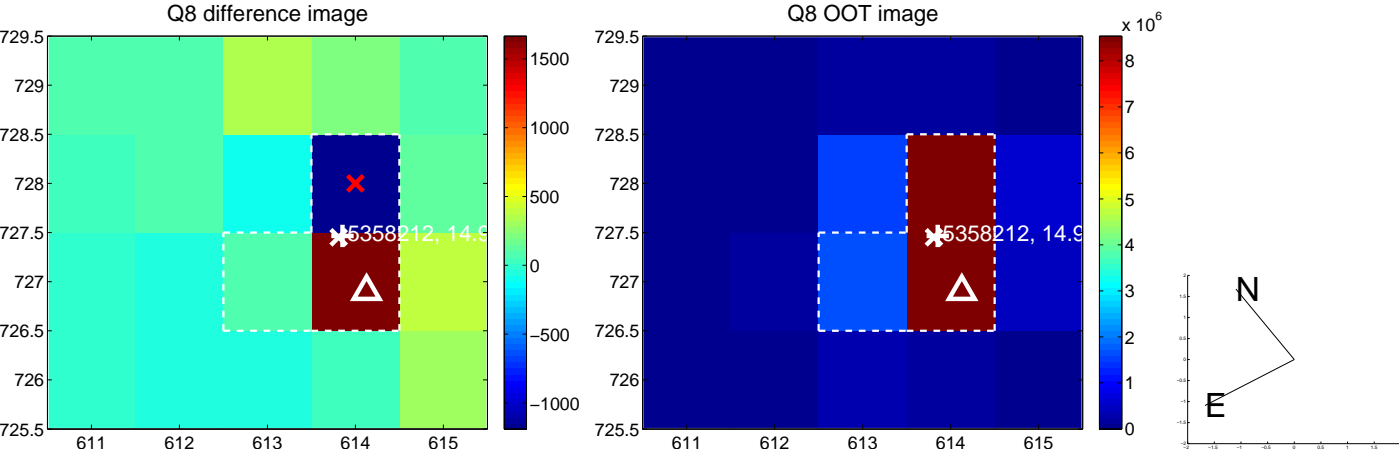
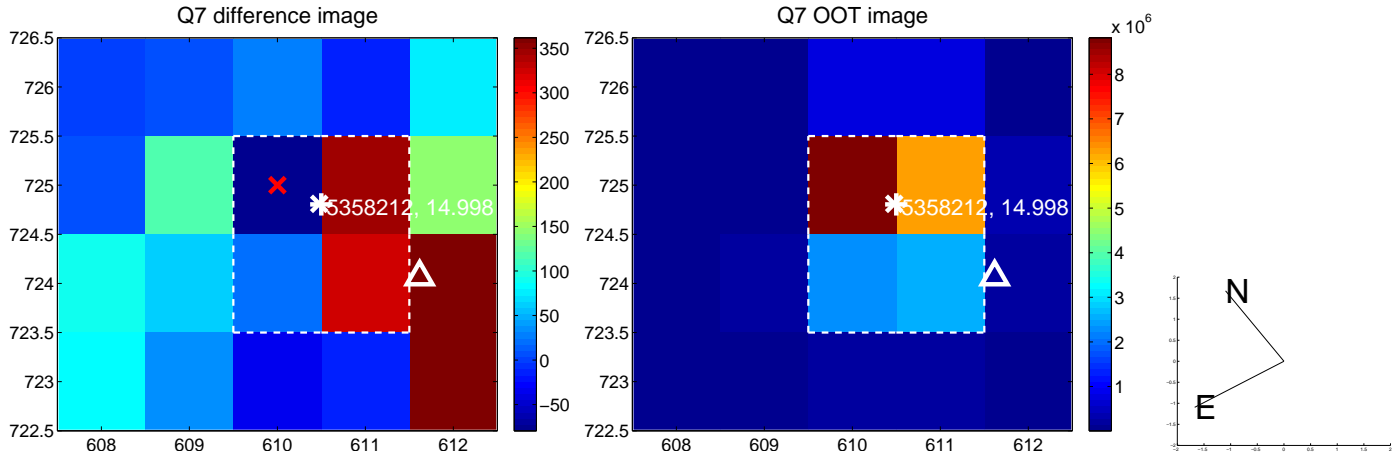
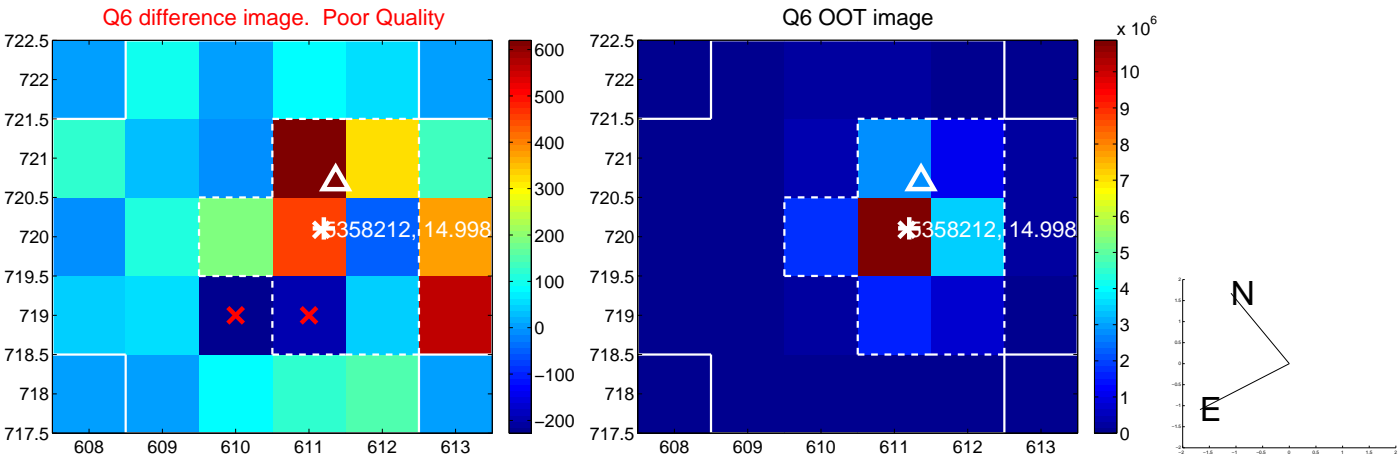
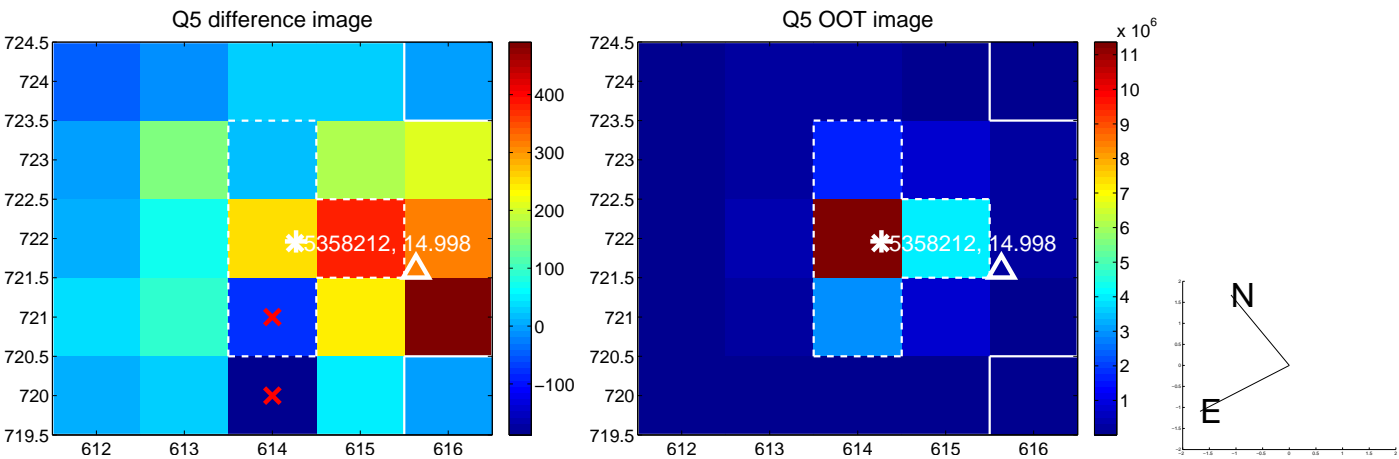


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

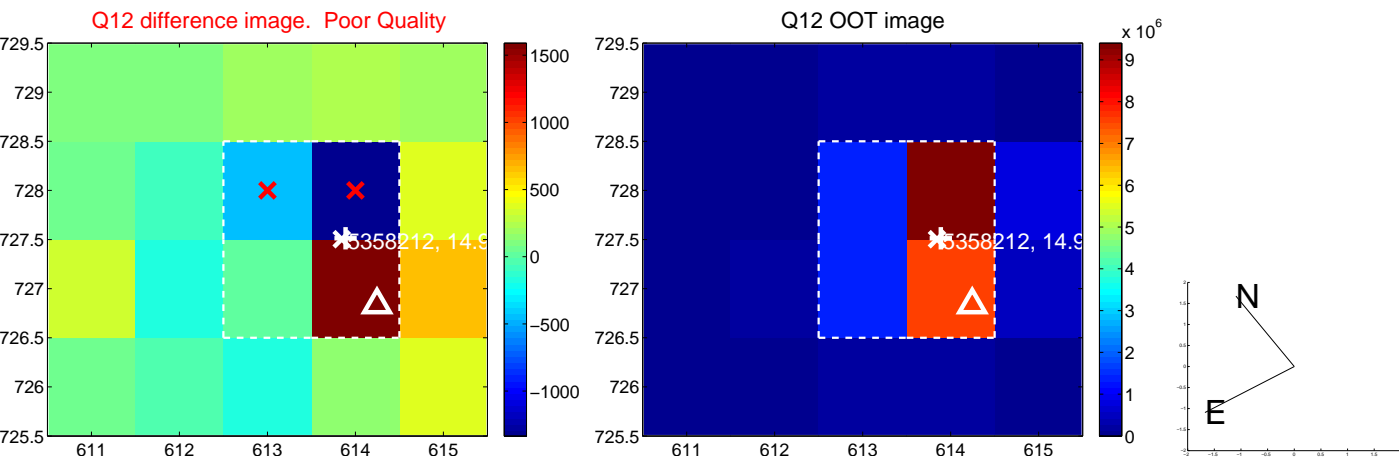
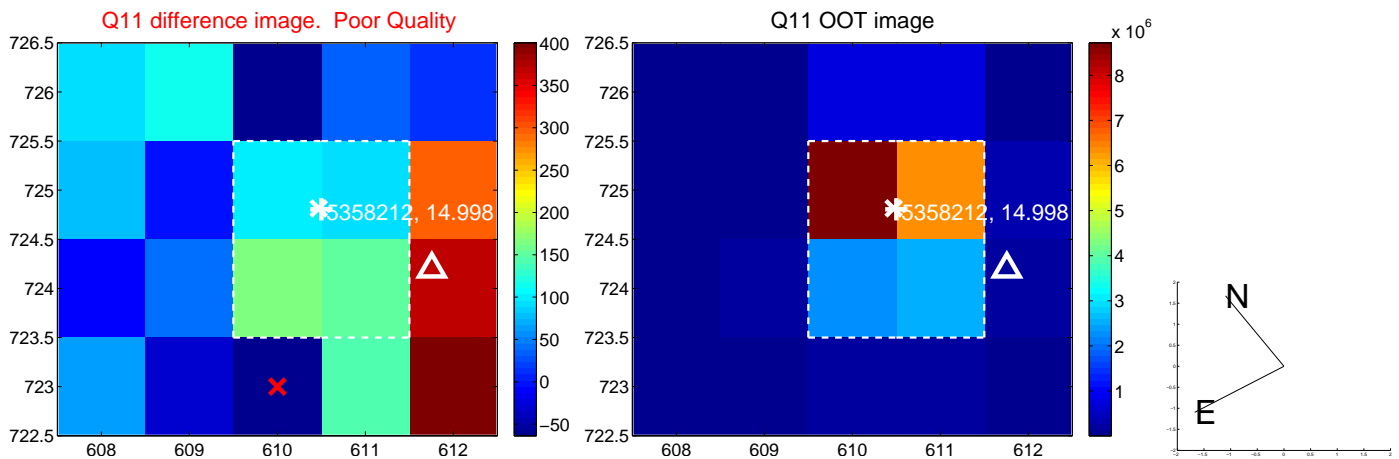
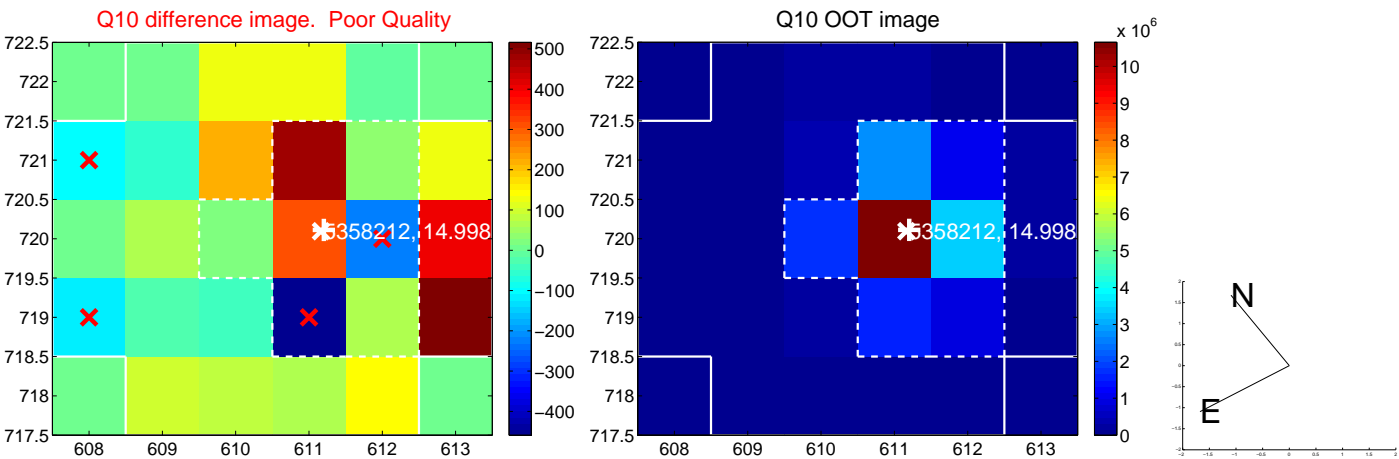
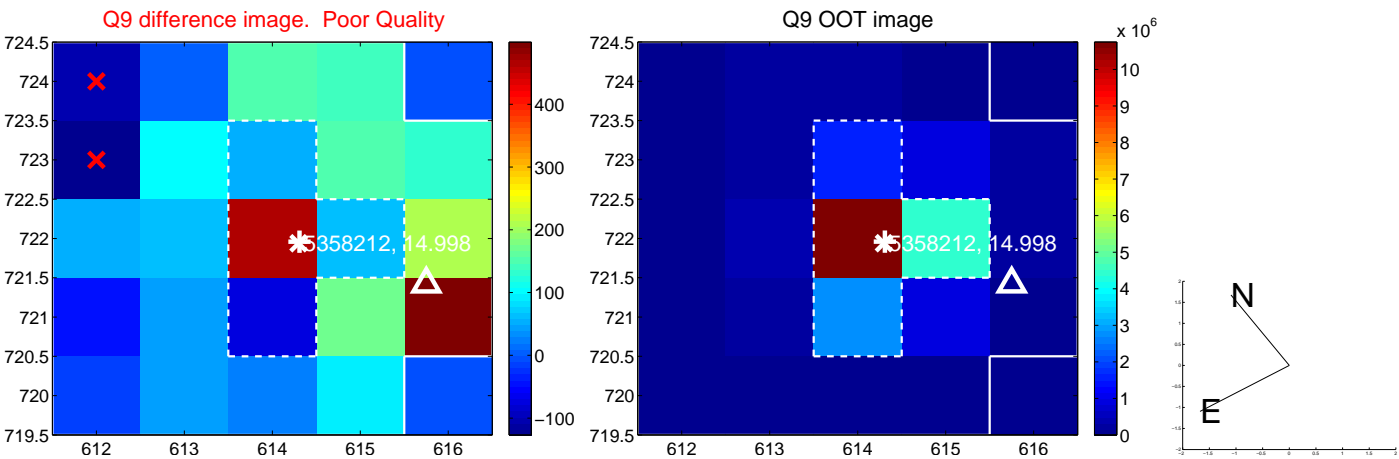


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

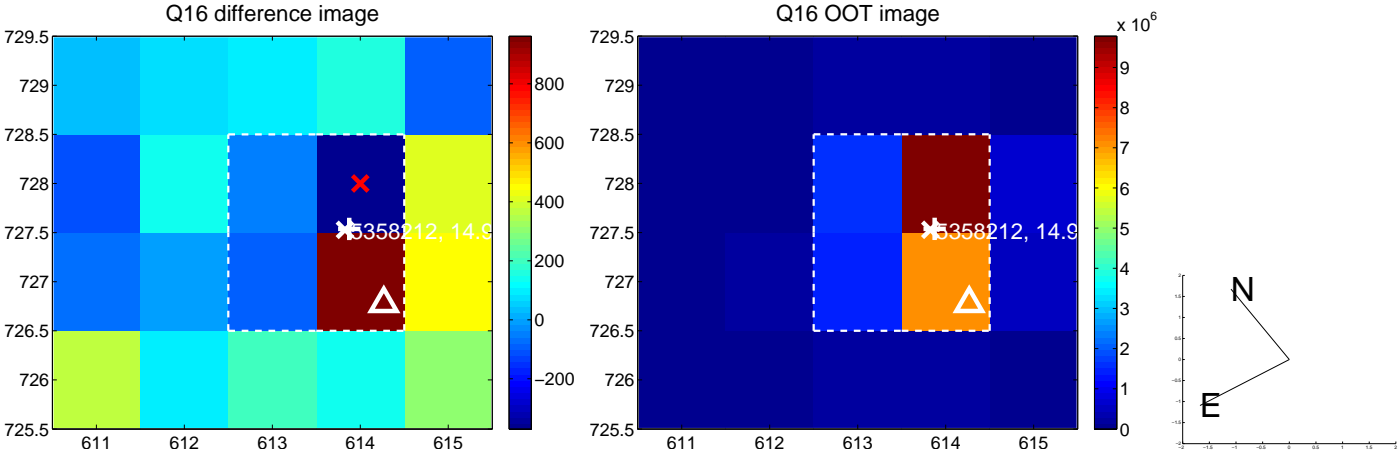
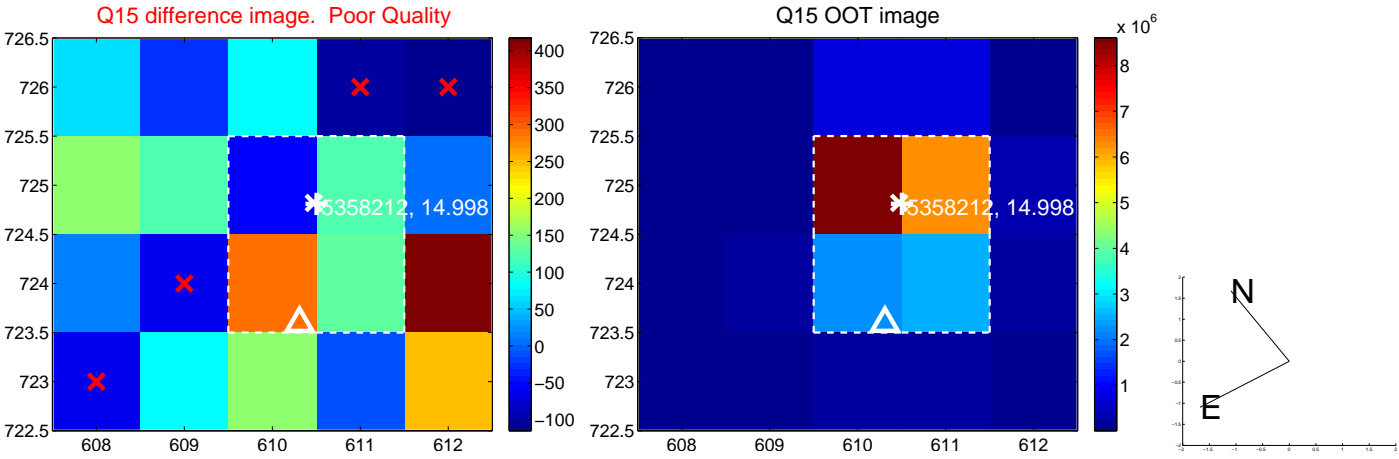
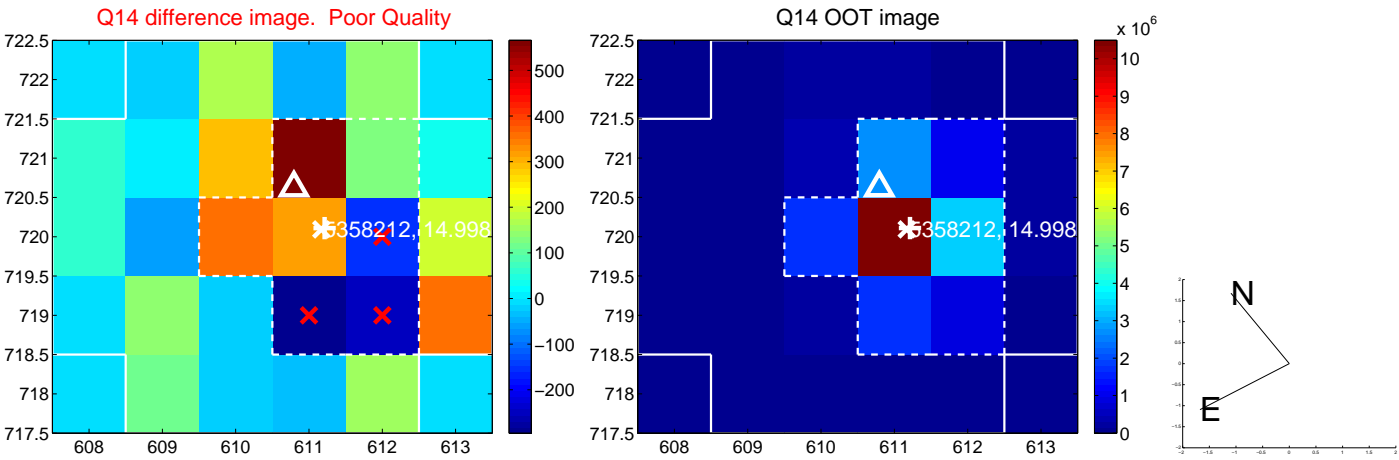
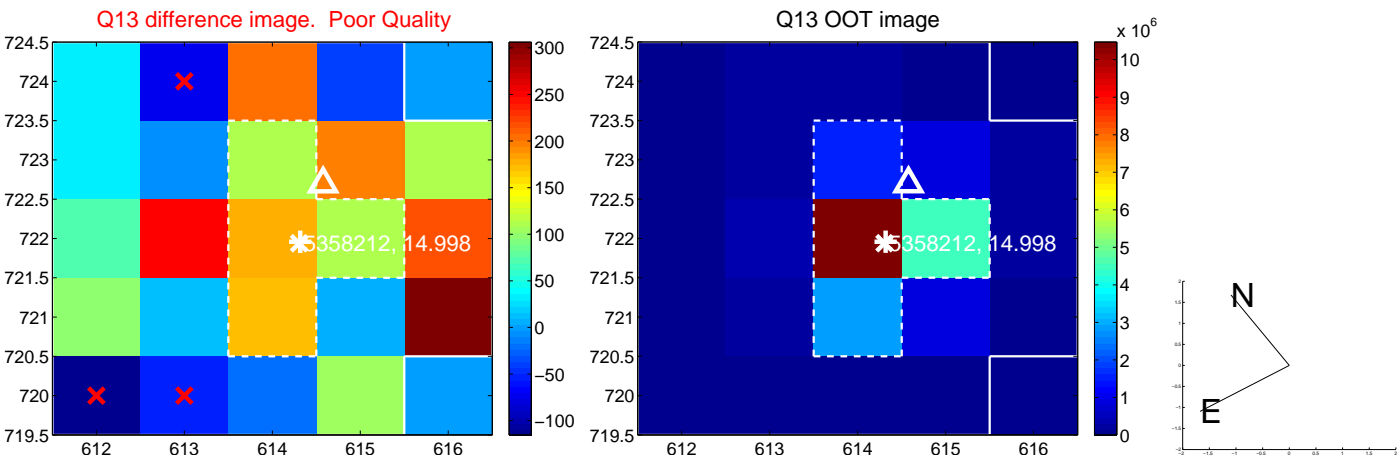




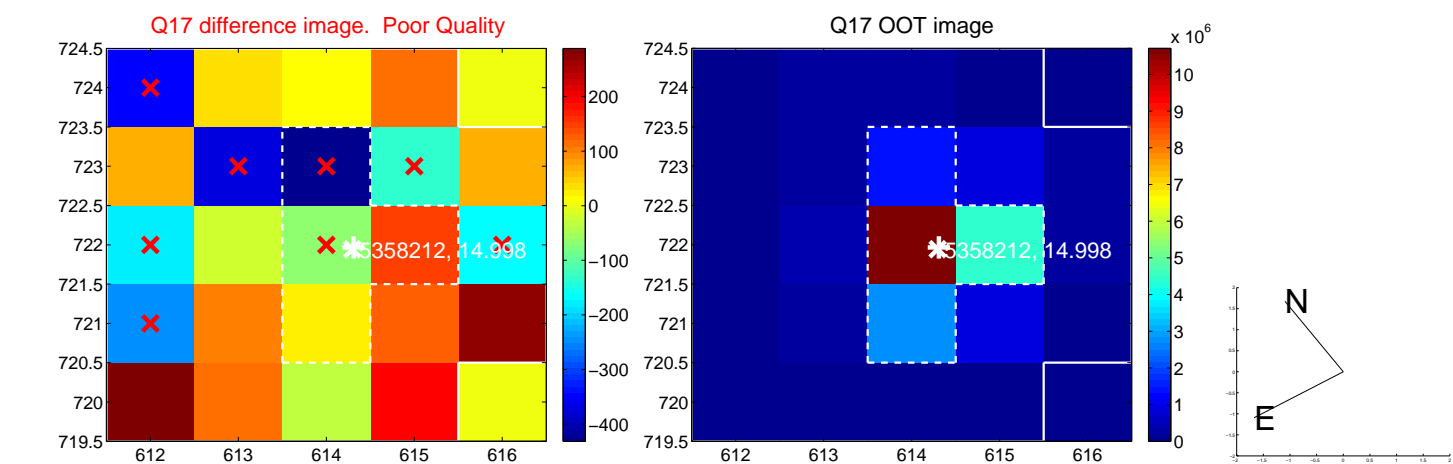
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



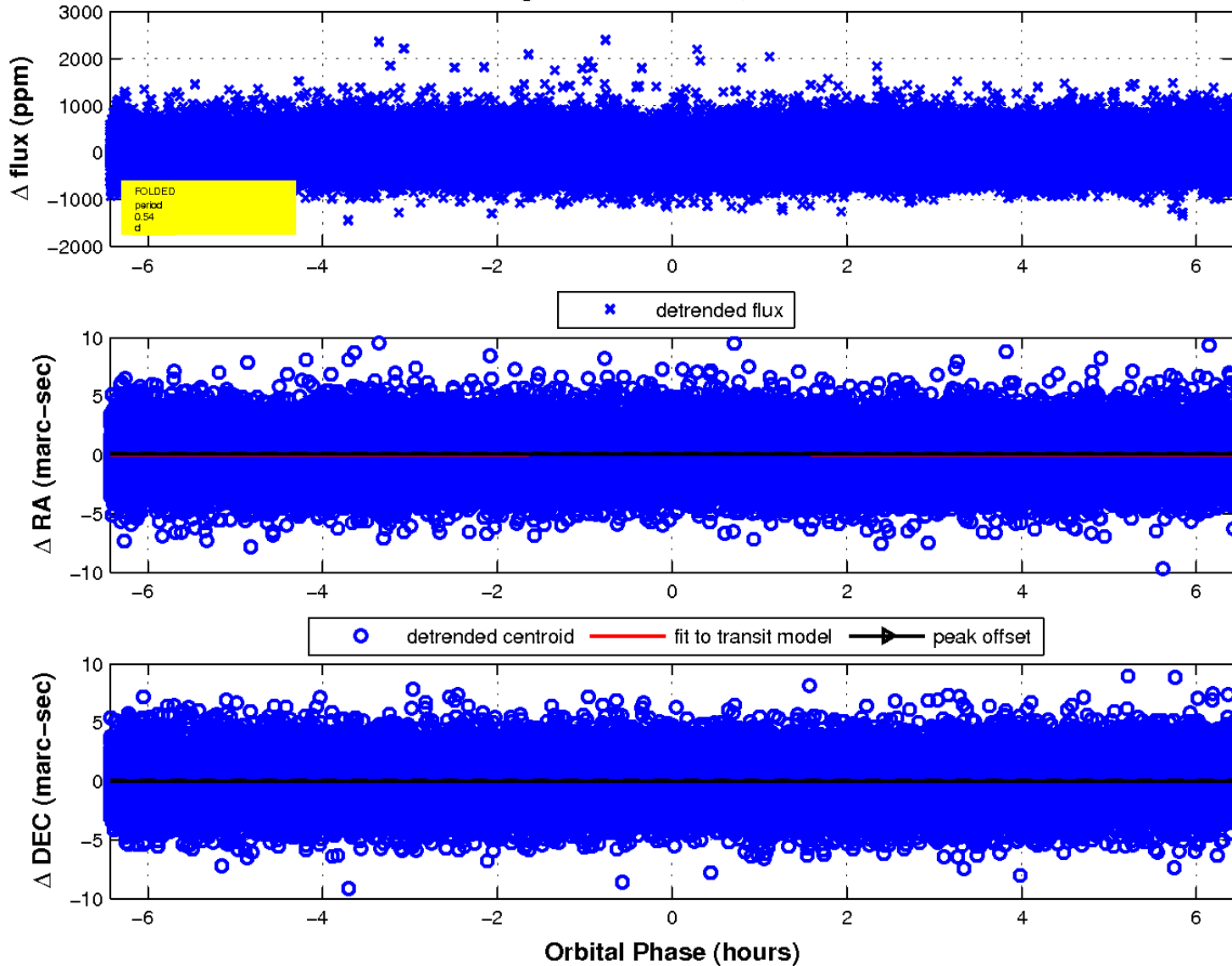
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

