

# KIC 010130057

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010130057-01	OBS	4675.01	2.178144	132.026951	92.4	2.600	9.1	9.4	0.81	5426	0.83	500.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010130057-01	OBS	FP	0.00	0	0	1	1	HALO_GHOST—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.

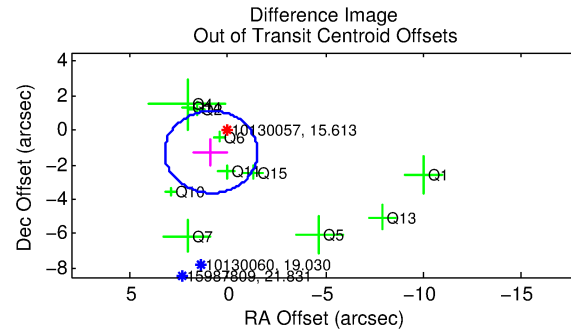
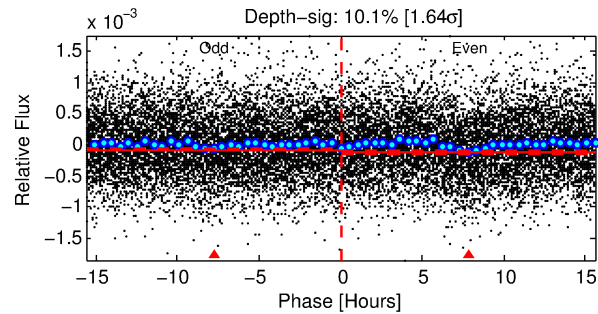
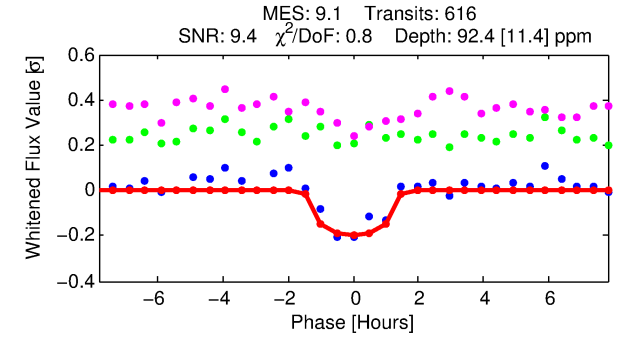
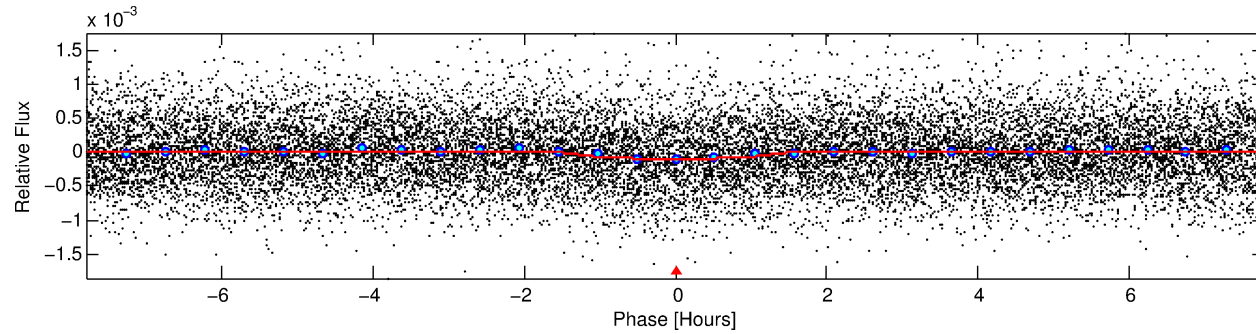
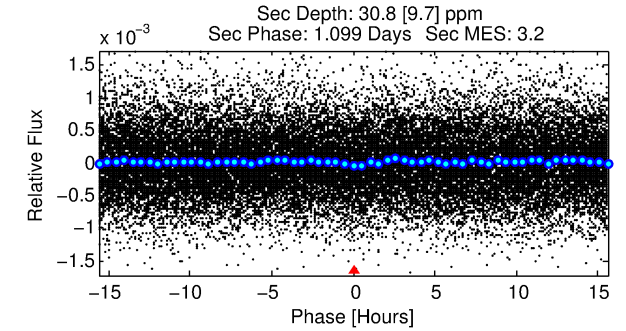
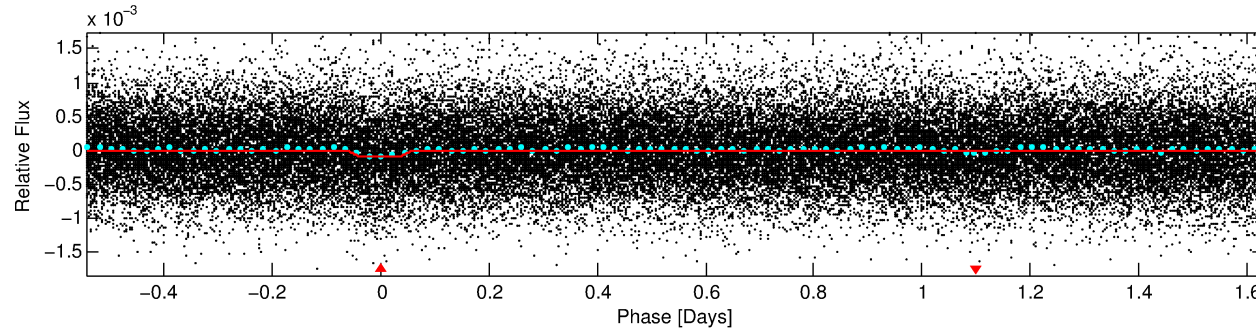
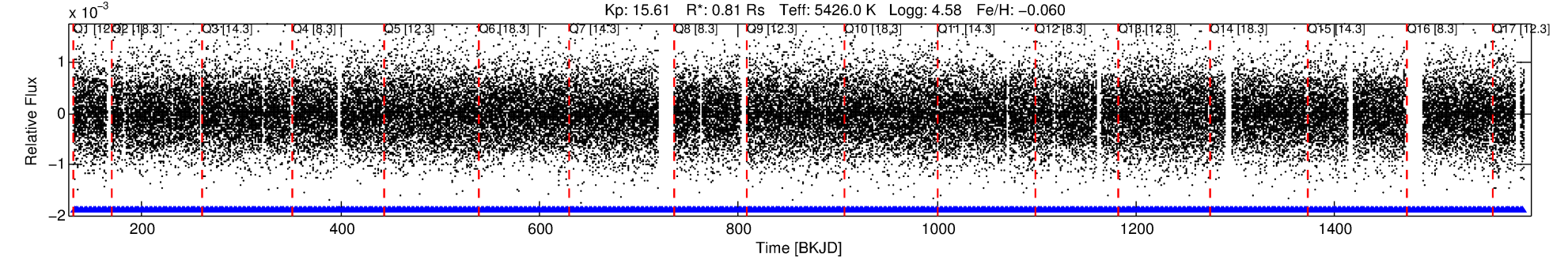
## Ephemeris Match Information For 010130057-01

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	$\sigma_P$	$\sigma_T$
010130057-01	10130057	FL-Lyr-pri	9641031	1:1	3770.8	-384	5	9.18	15.62	4728.90	Col-Anomaly	0	0.30	0.24

**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: 10130057 Candidate: 1 of 1 Period: 2.178 d  
KOI: K04675.01 Corr: 0.916



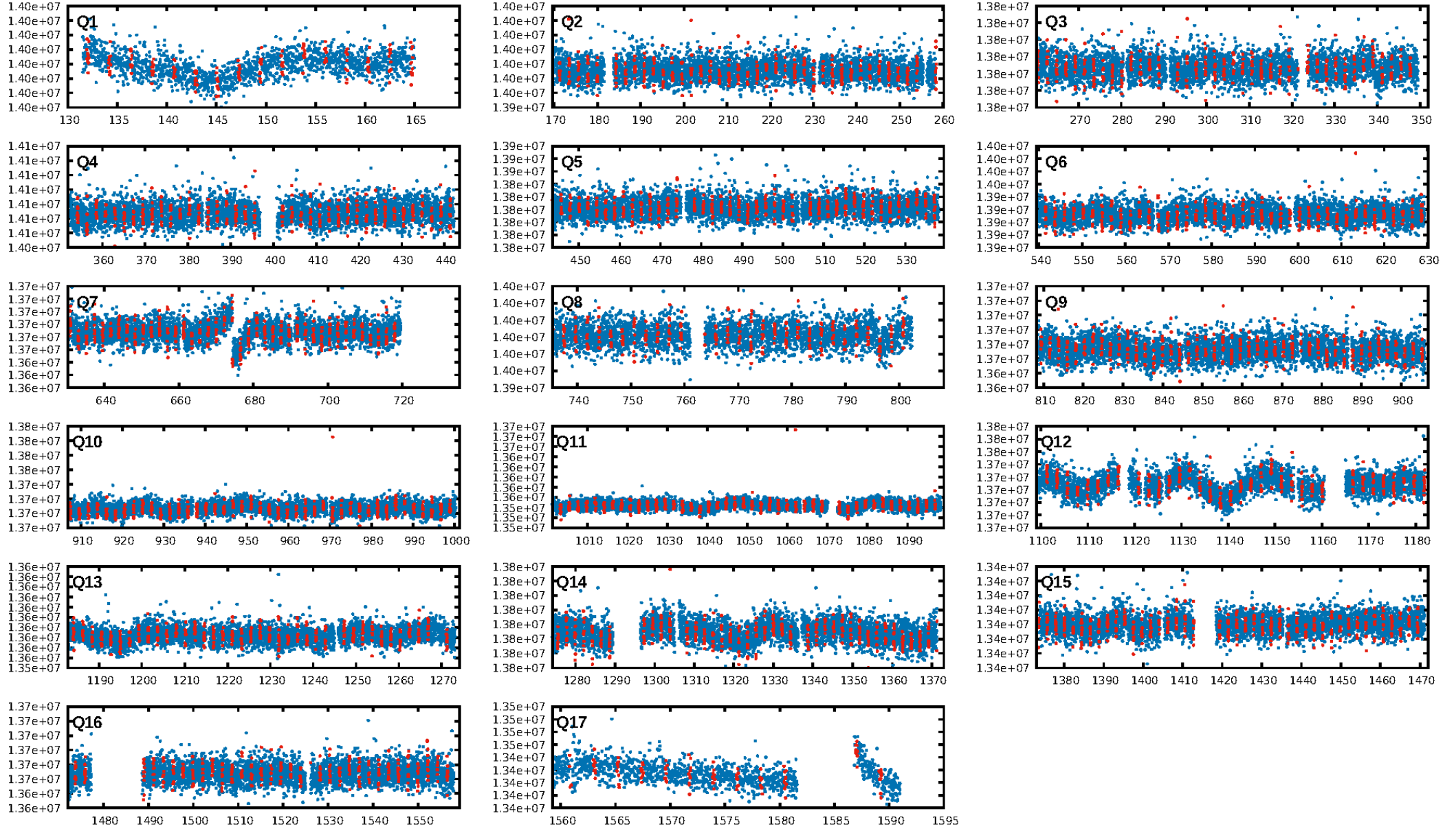
## DV Fit Results:

Period = 2.17814 [0.00002] d  
Epoch = 132.0270 [0.0044] BKJD  
Rp/R\* = 0.0095 [0.0078]  
a/R\* = 4.61 [14.53]  
b = 0.72 [2.27]  
Seff = 500.30 [137.02]  
Teff = 1206 [83] K  
Rp = 0.83 [0.71] Re  
a = 0.0317 [0.0053] AU  
Ag = 24.57 [41.89] [0.56σ]  
Teffp = 4151 [1755] K [1.68σ]

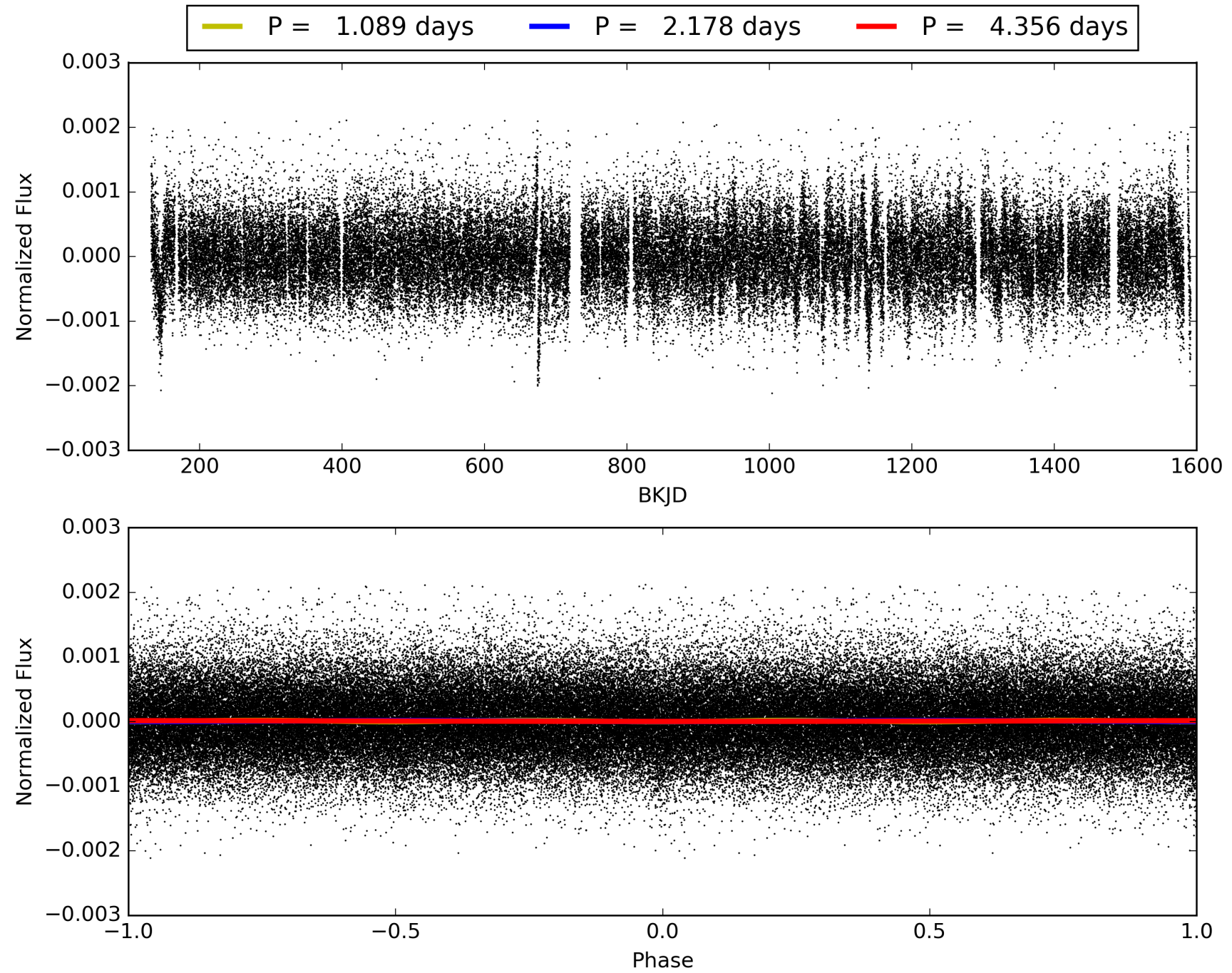
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.77e-20  
RollingBand-fgt: 1.00 [588/588]  
GhostDiagnostic-chr: -0.1177  
Centroid-sig: 25.8%  
Centroid-so: 1.793 arcsec [0.98σ]  
OotOffset-rm: 1.527 arcsec [1.93σ]  
KicOffset-rm: 1.771 arcsec [2.24σ]  
OotOffset-st: 4/3/1/3 [11]  
KicOffset-st: 4/3/1/3 [11]  
DiffImageQuality-fgm: 0.36 [4/11]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010130057-01, PDC Light Curves



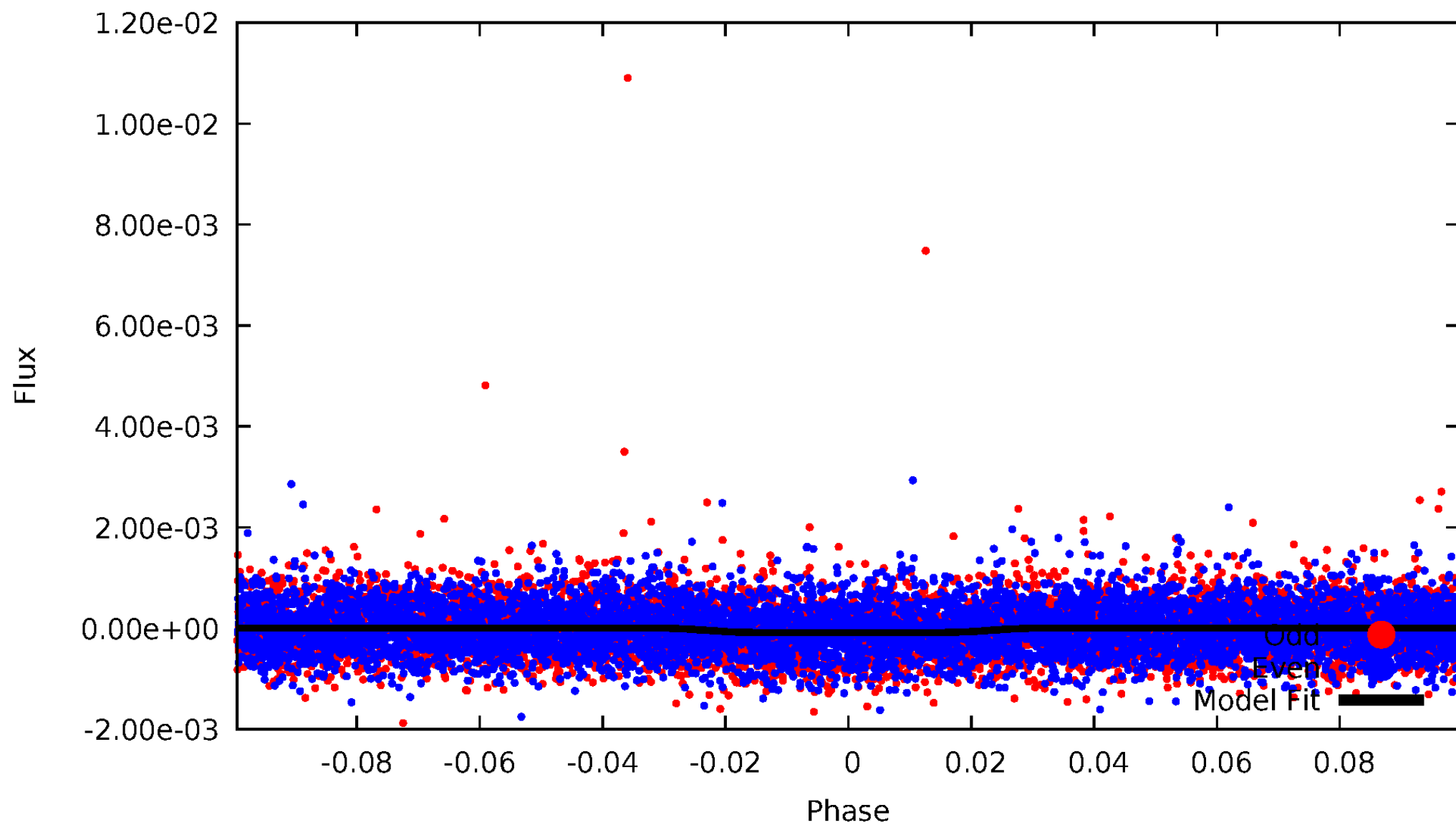
TCE 010130057-01





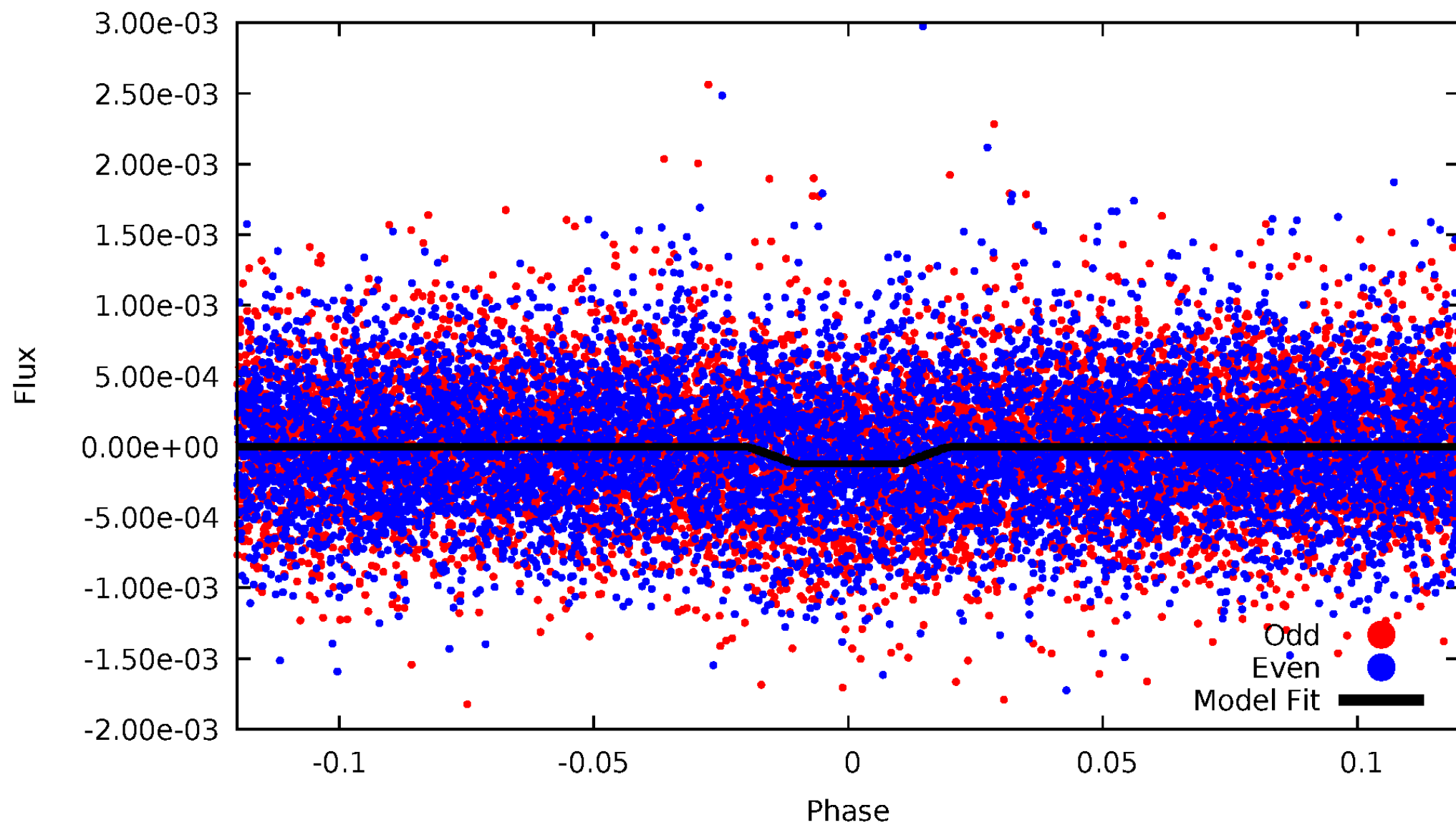
# DV Odd/Even

TCE 010130057-01



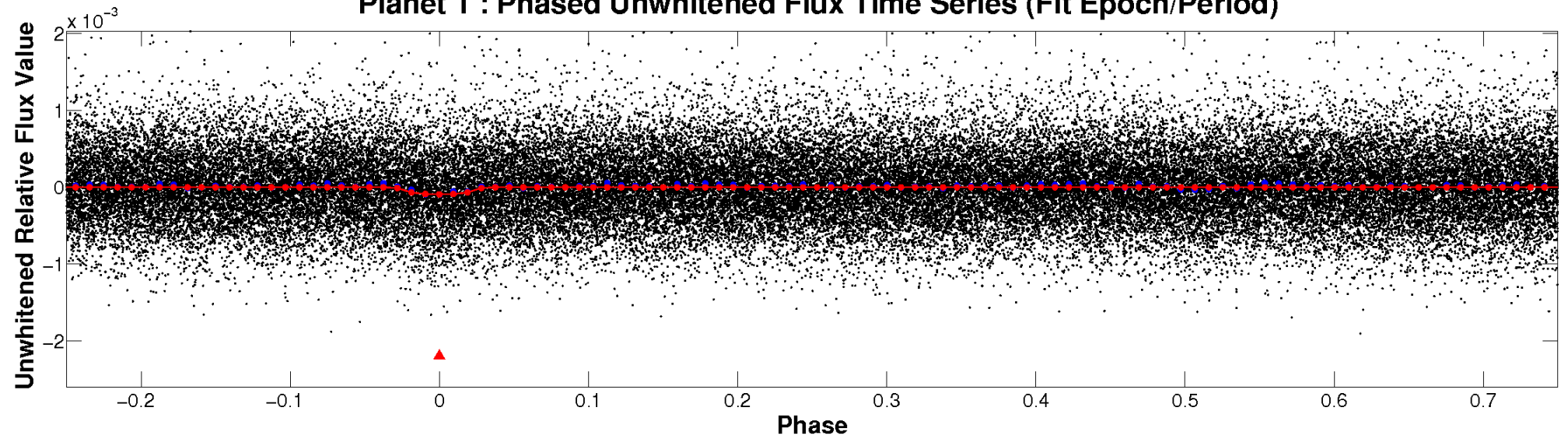
# ALT Odd/Even

TCE 010130057-01

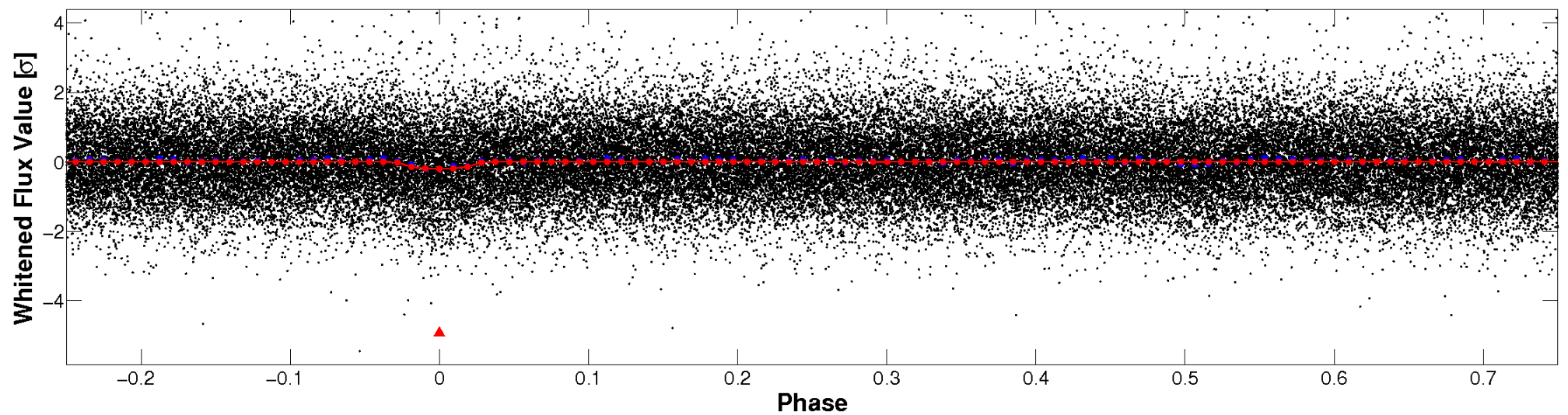


# Non-Whitened Vs. Whitened Light Curve

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

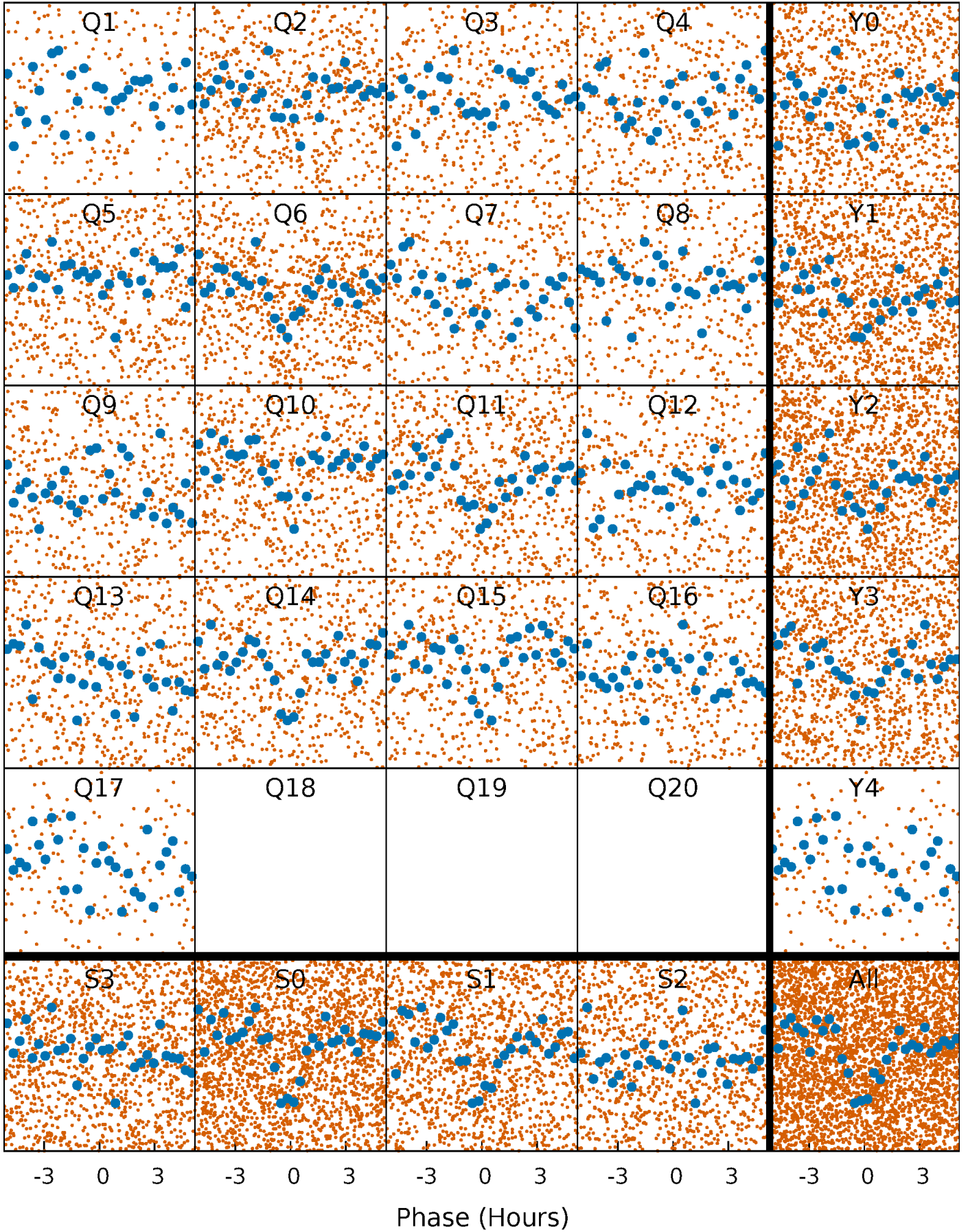


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

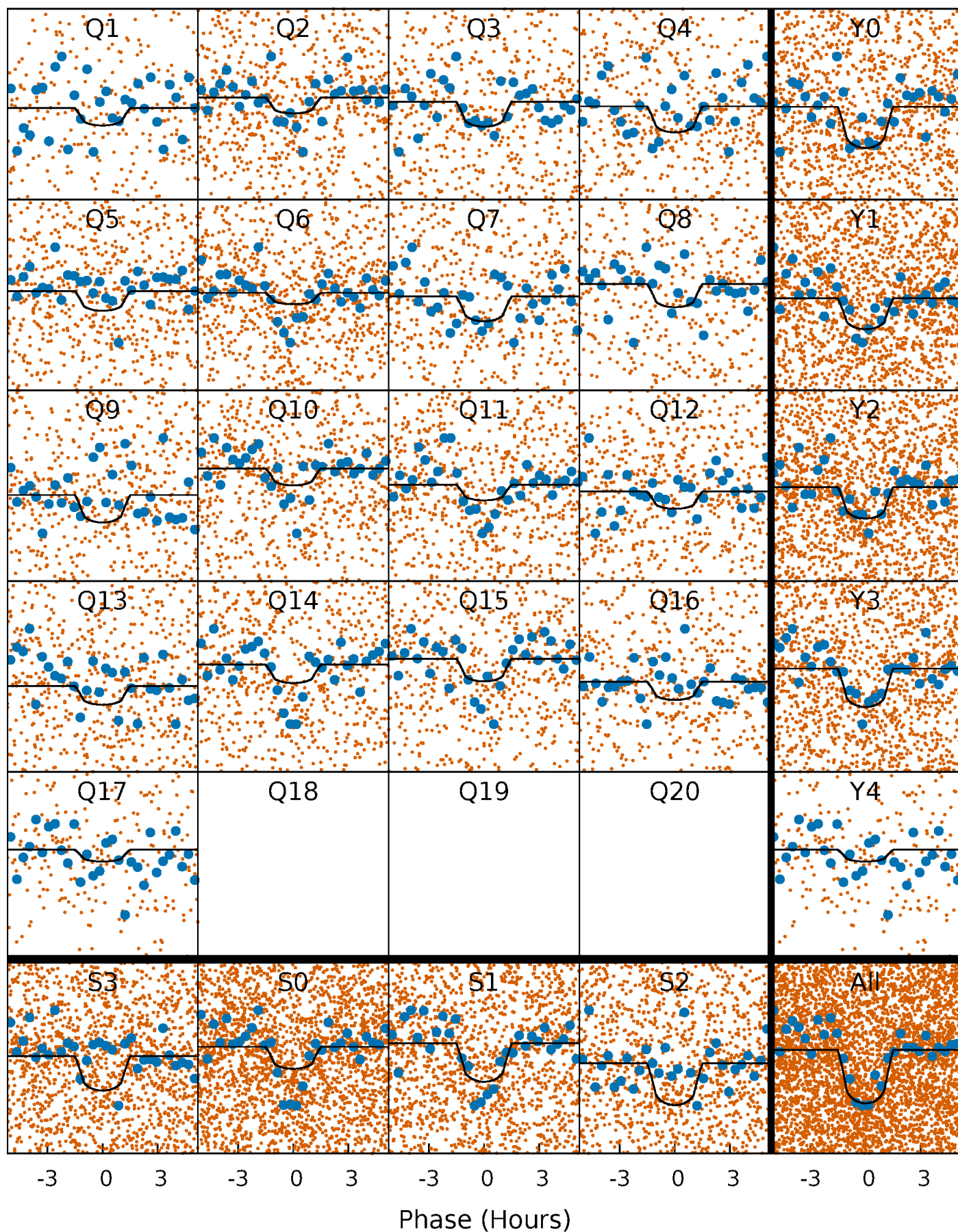
TCE 010130057-01 P= 2.178144 Days  $T_0=132.026951$  (BKJD)





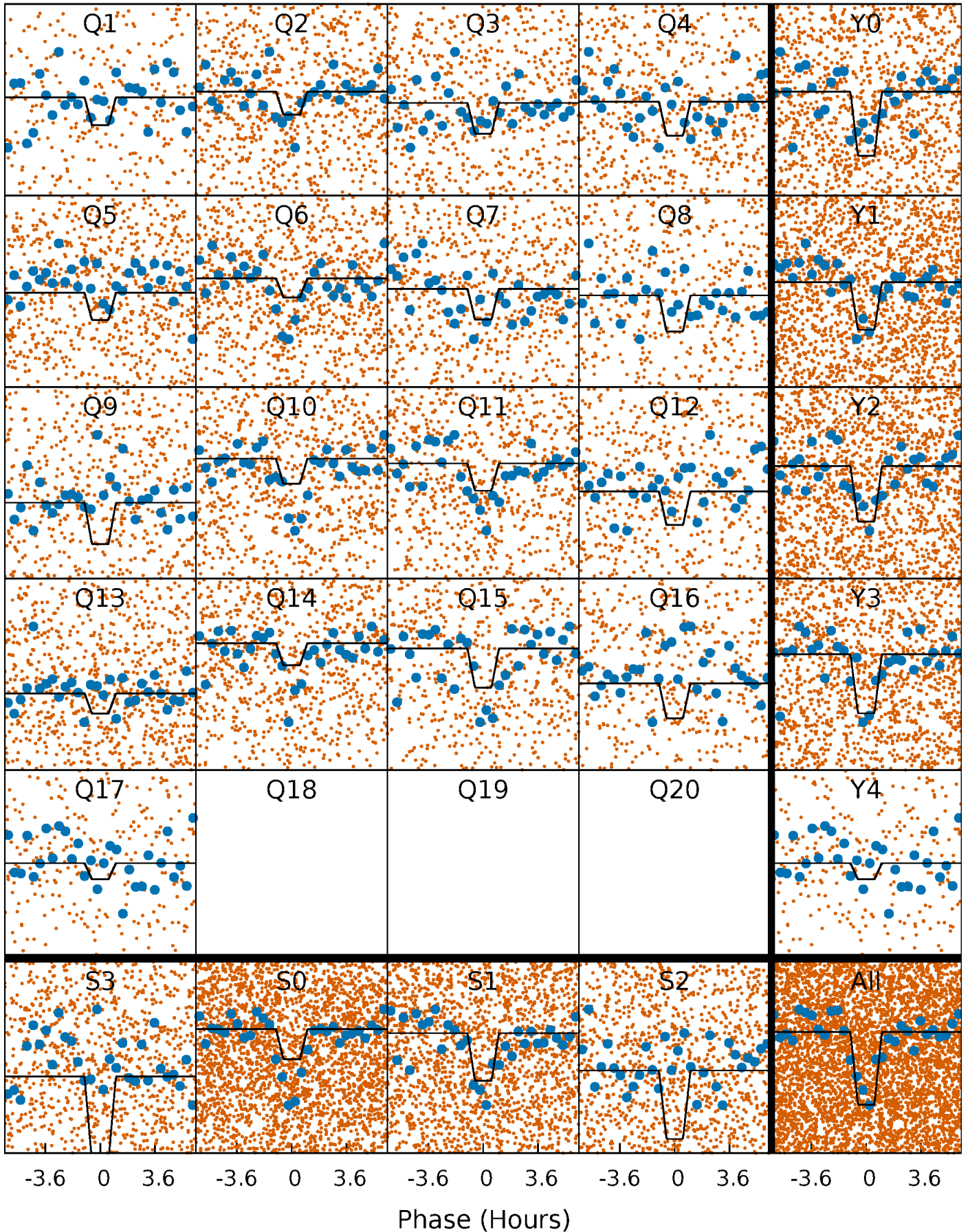
# DV Quarter-Phased Transit Curves

TCE 010130057-01 P= 2.178144 Days  $T_0=132.026951$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

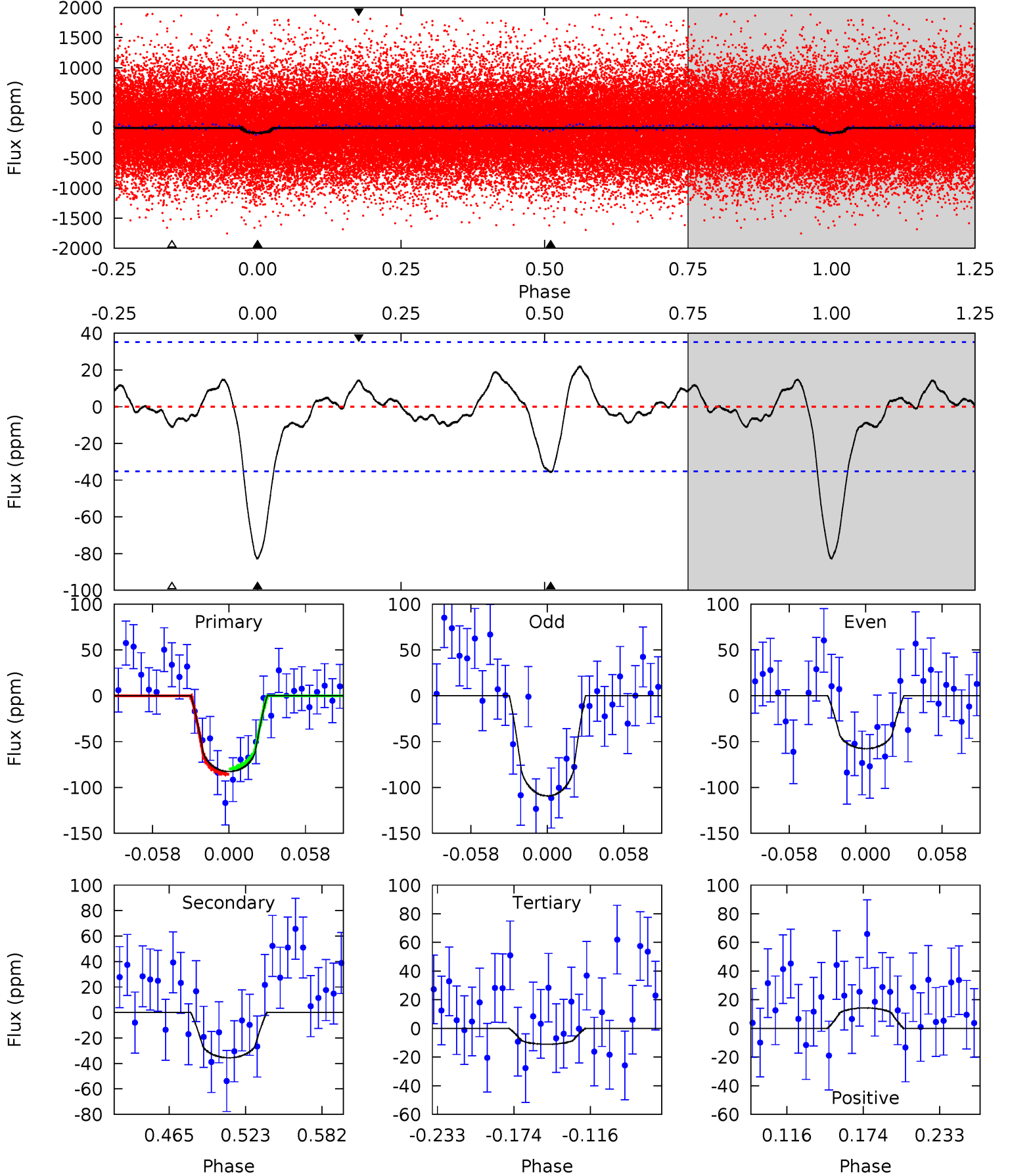
TCE 010130057-01 P= 2.178108 Days  $T_0=132.037444$  (BKJD)



# DV Model-Shift Uniqueness Test

010130057-01, P = 2.178144 Days, E = 129.848807 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
11.0	4.72	1.47	1.90	4.68	1.89	0.98	9.53	9.09	3.25	2.82	3.44	1.01	0.21	0.39

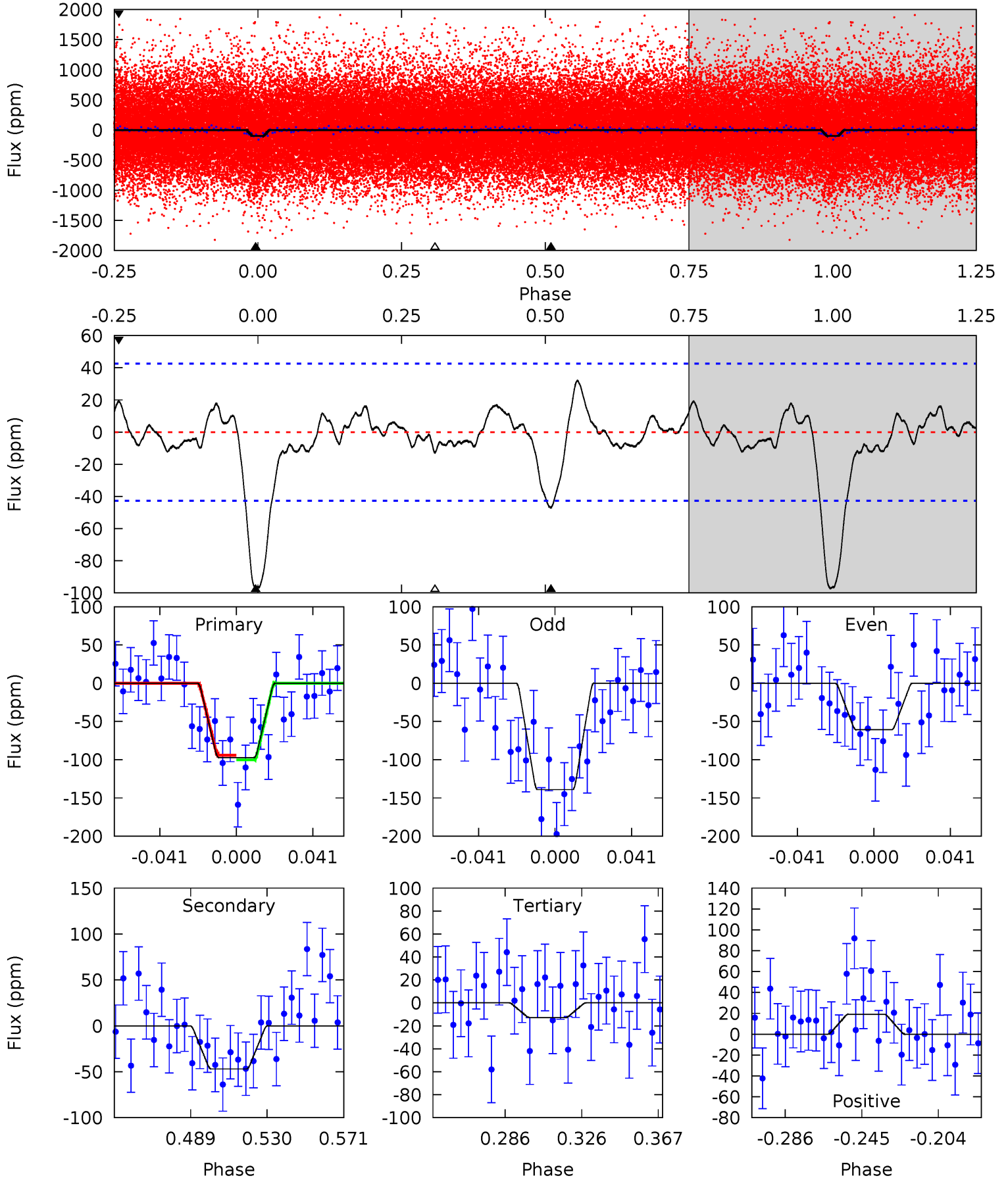




# Alt Model-Shift Uniqueness Test

010130057-01, P = 2.178108 Days, E = 129.859336 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
10.8	5.23	1.43	2.13	4.75	2.05	0.99	9.40	8.70	3.80	3.10	4.36	1.34	0.25	0.34





### Stellar Parameters For KIC 010130057

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5426^{+161}_{-161}$	$4.579^{+0.034}_{-0.136}$	$-0.060^{+0.300}_{-0.300}$	$0.805^{+0.159}_{-0.068}$	$0.903^{+0.072}_{-0.108}$	$2.436^{+0.431}_{-0.994}$
	+3%/-3%	+1%/-3%	+500%/-500%	+20%/-8%	+8%/-12%	+18%/-41%
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 010130057-01 / KOI 4675.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-36 \pm 8$	$0.95^{+0.64}_{-0.55}$	$1712^{+88}_{-67}$	$4301^{+1812}_{-764}$	$21^{+98}_{-14}$
Alt.	$-47 \pm 9$	$1.06^{+0.72}_{-0.60}$	$1715^{+89}_{-70}$	$4318^{+1877}_{-716}$	$22^{+94}_{-15}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

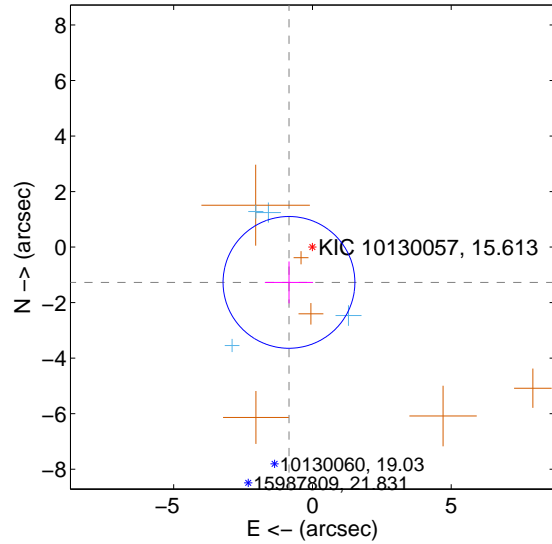
Supplemental centroid analysis for 010130057-01. Kepler magnitude: 15.61. Transit SNR 9.40

There are 4 quarters with good PRF difference image offsets

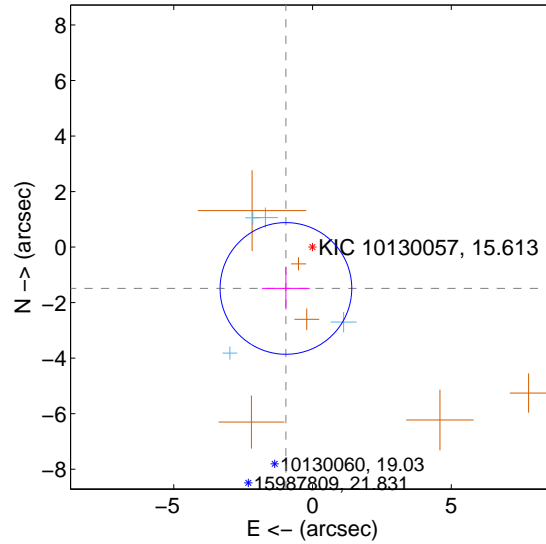
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.527 \pm 0.791$	1.93	$0.846 \pm 0.869$	$-1.271 \pm 0.754$
PRF-fit source offset from KIC position	$1.771 \pm 0.790$	2.24	$0.958 \pm 0.862$	$-1.489 \pm 0.759$
photometric centroid source offset	$1.79 \pm 1.82$	0.98	$0.81 \pm 1.75$	$-1.60 \pm 1.84$

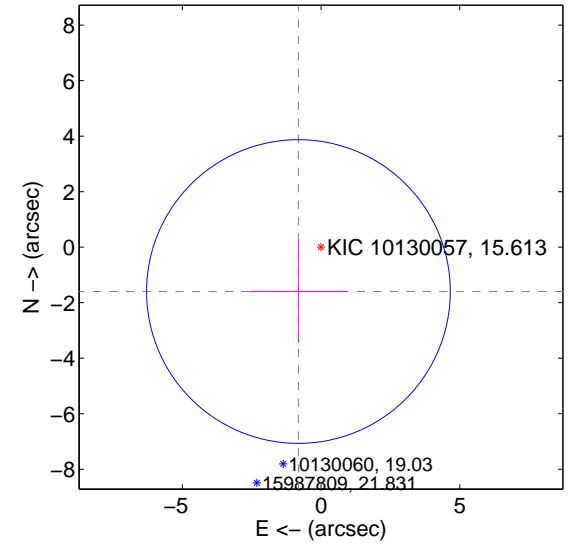
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

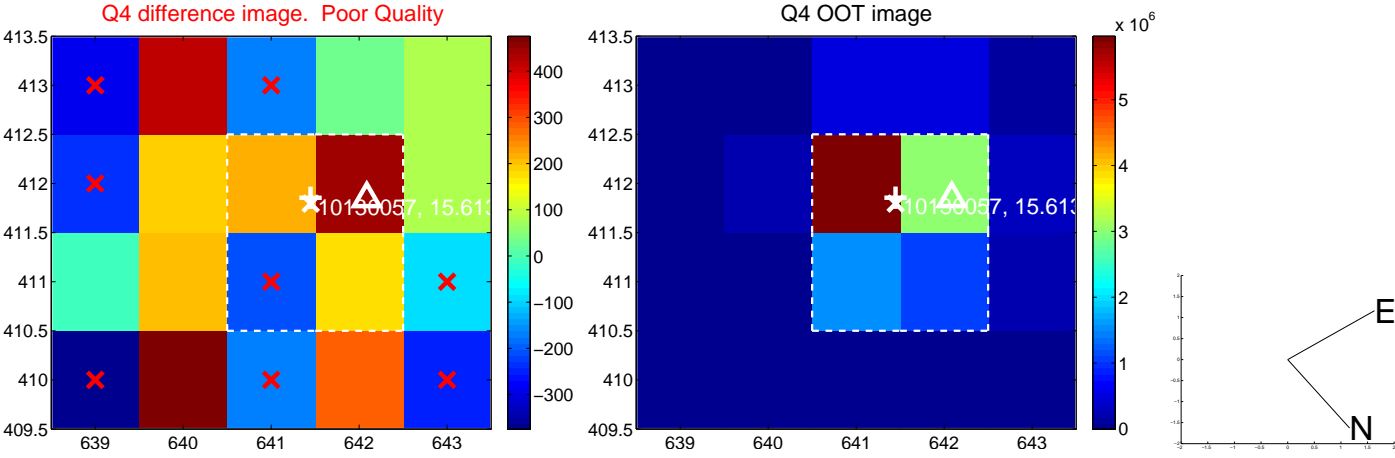
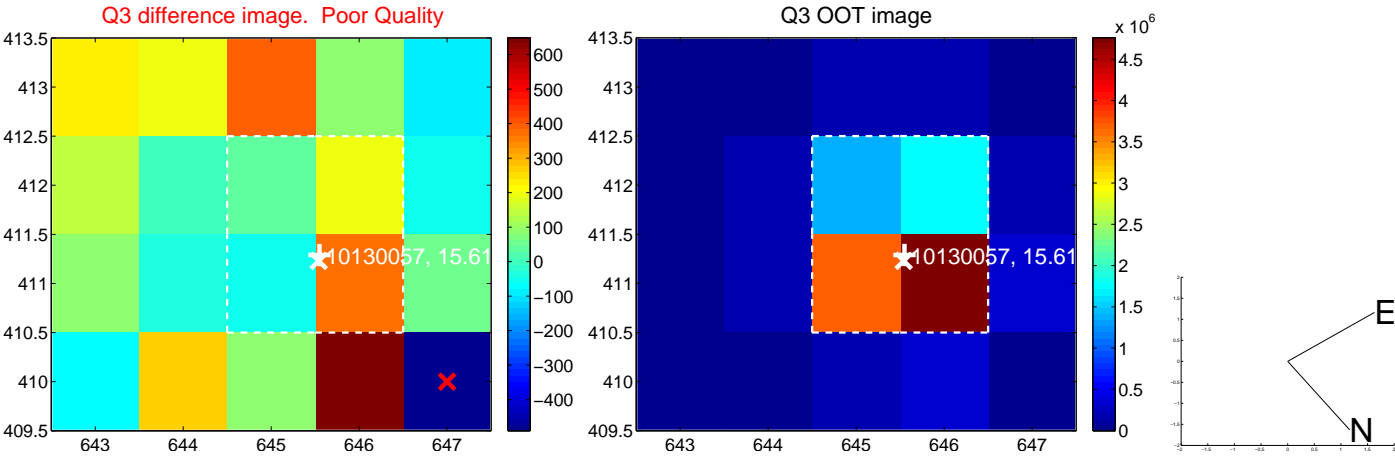
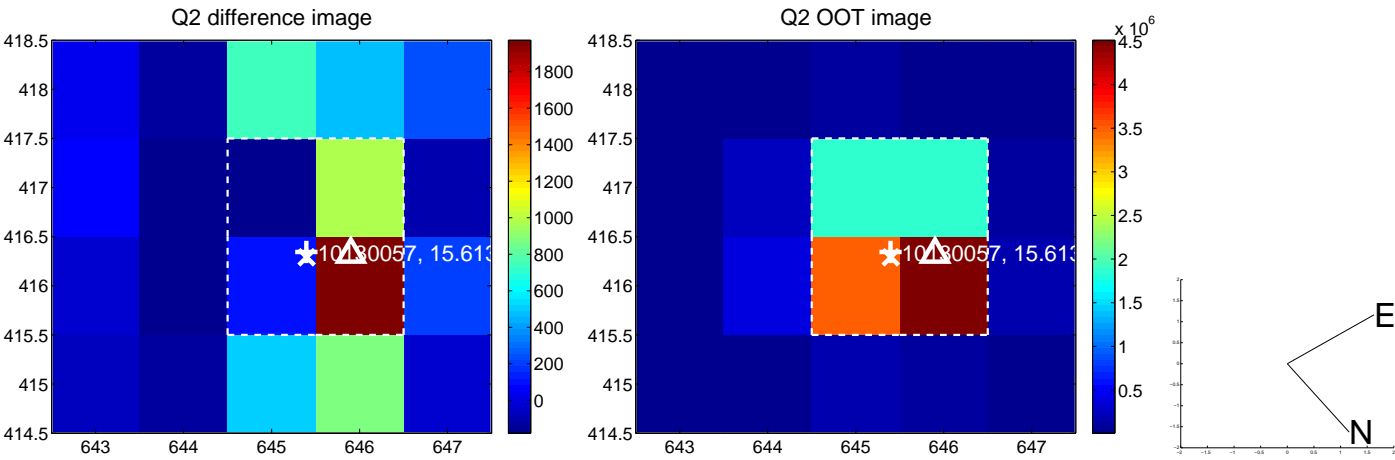
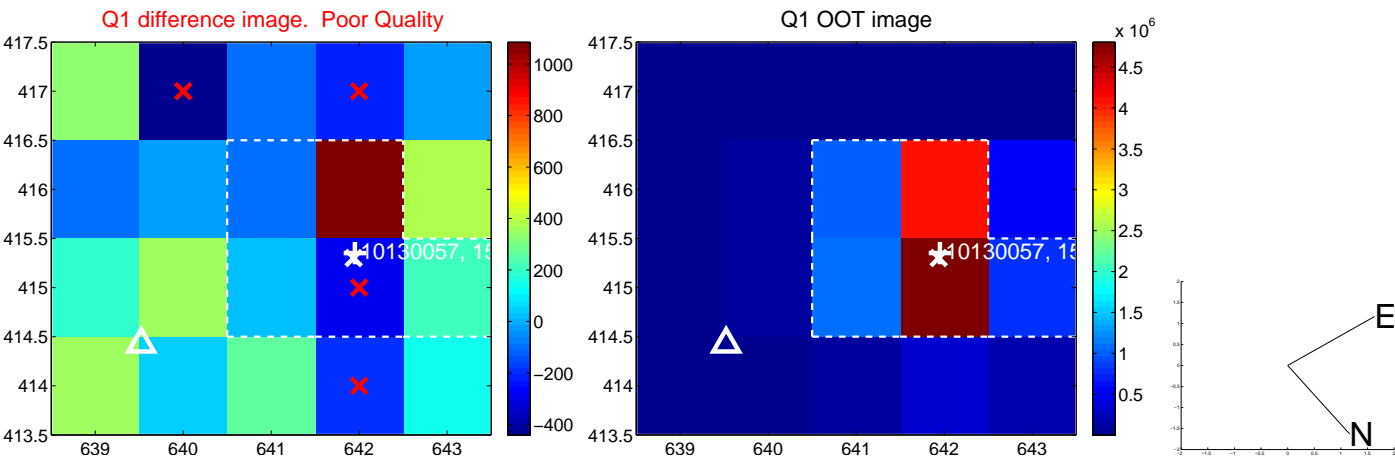


offset from photometric centroids

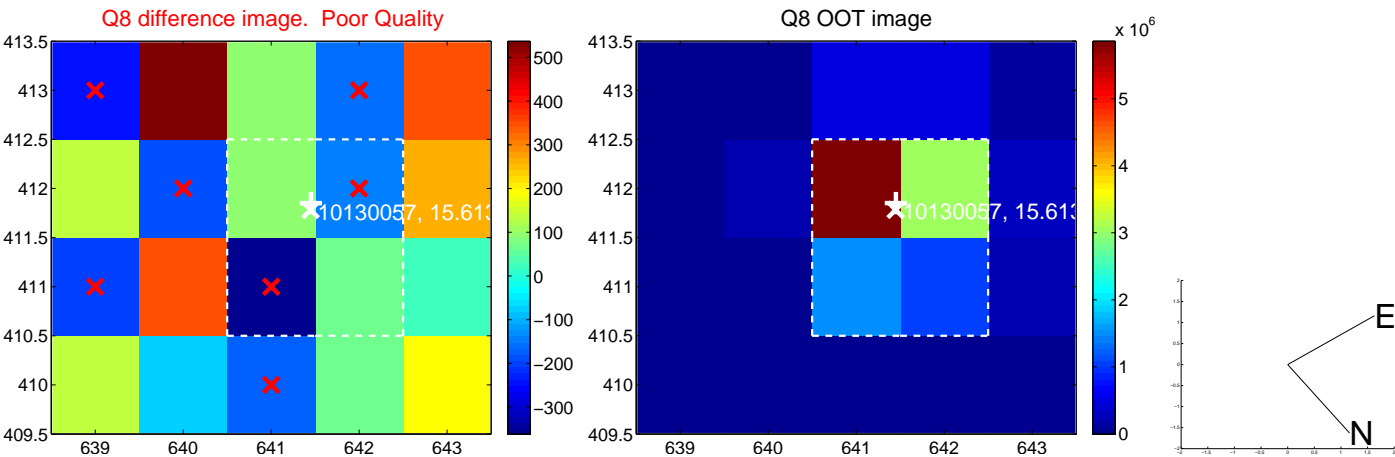
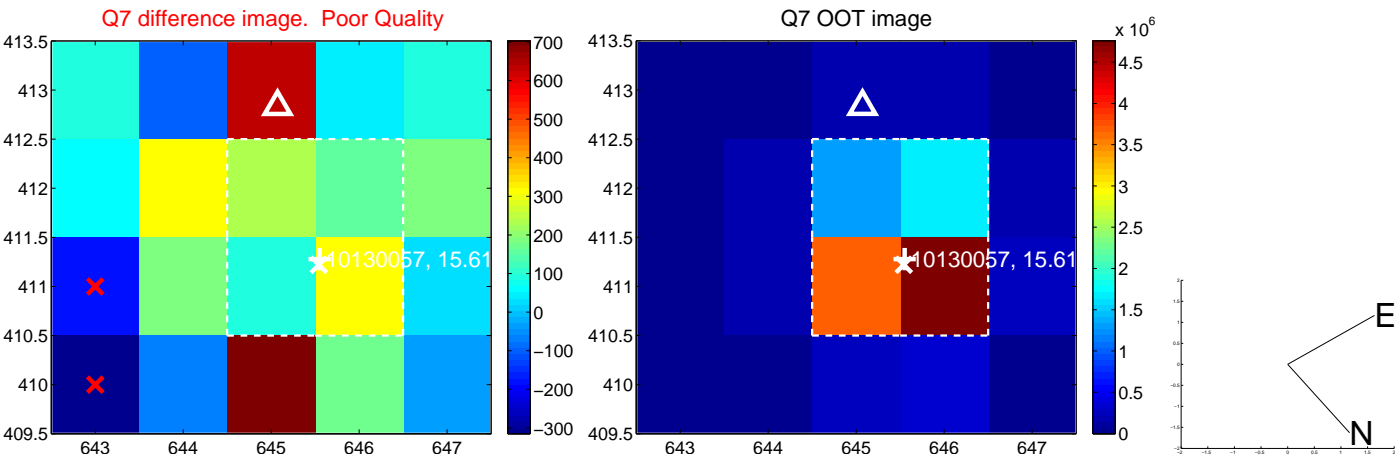
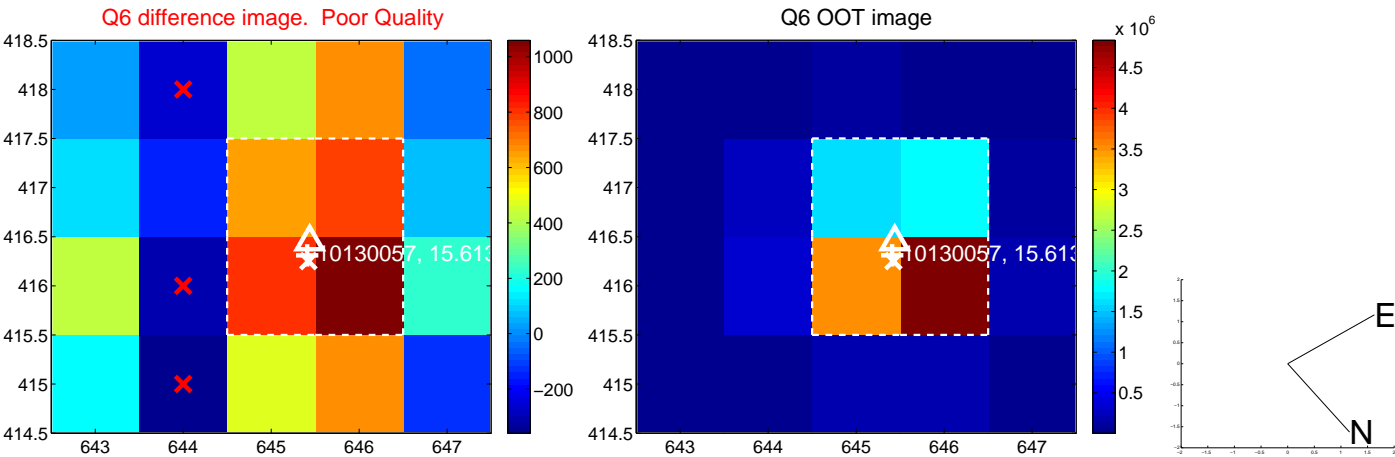
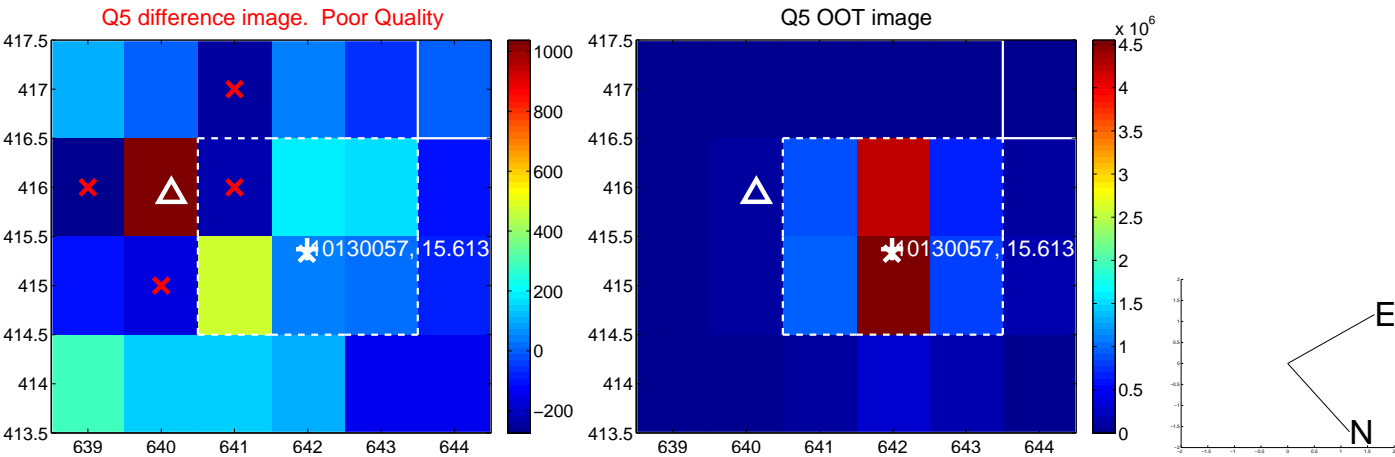


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

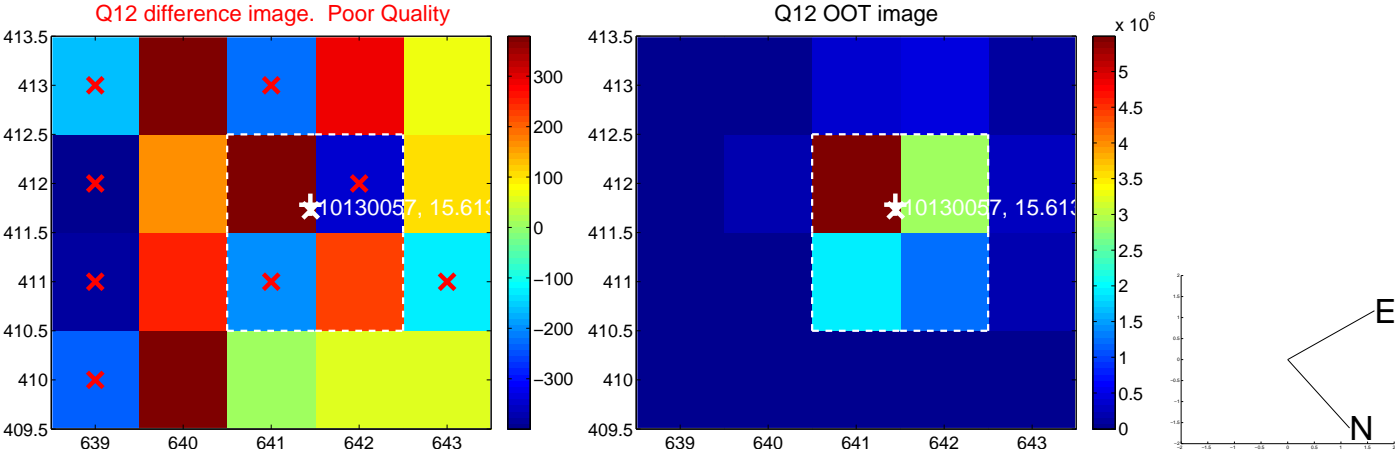
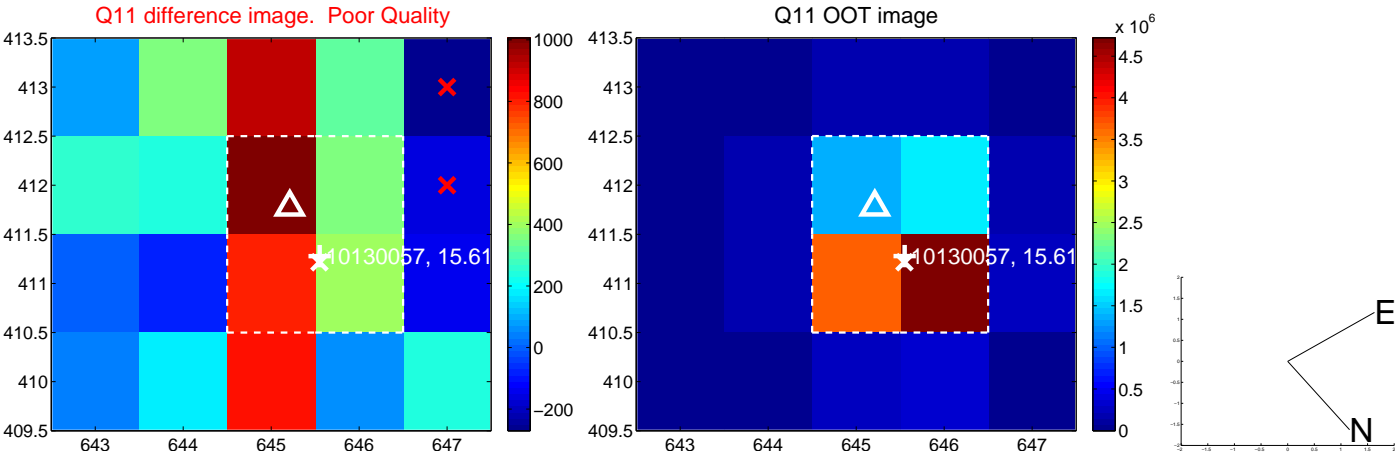
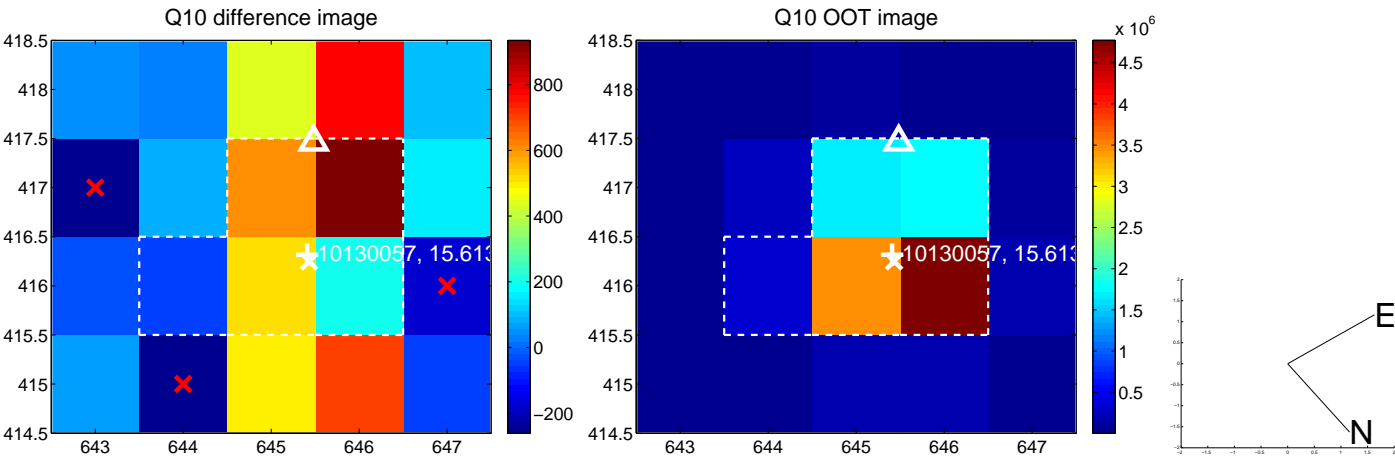
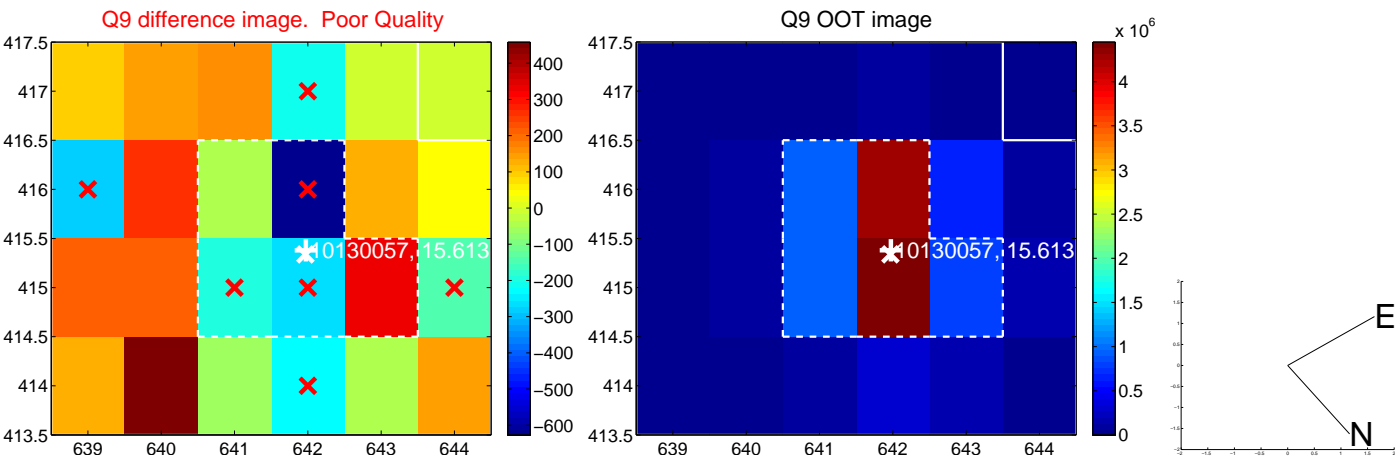


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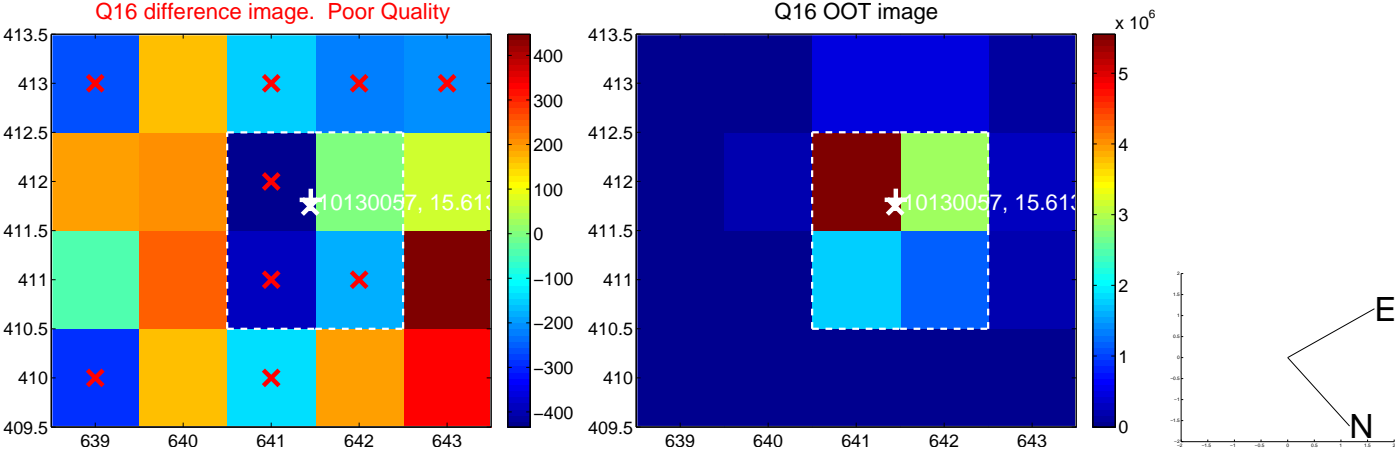
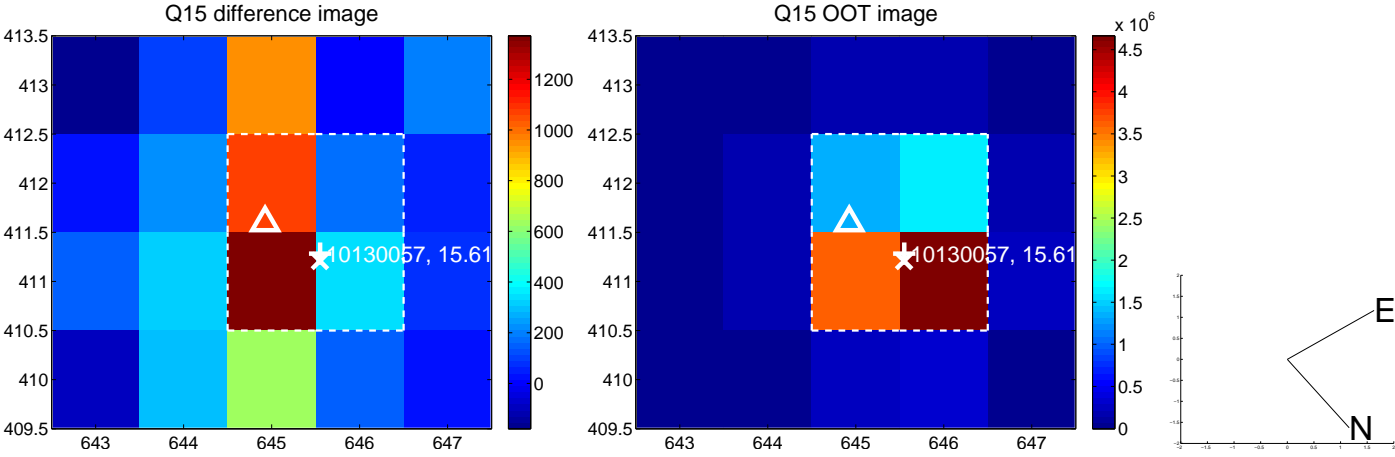
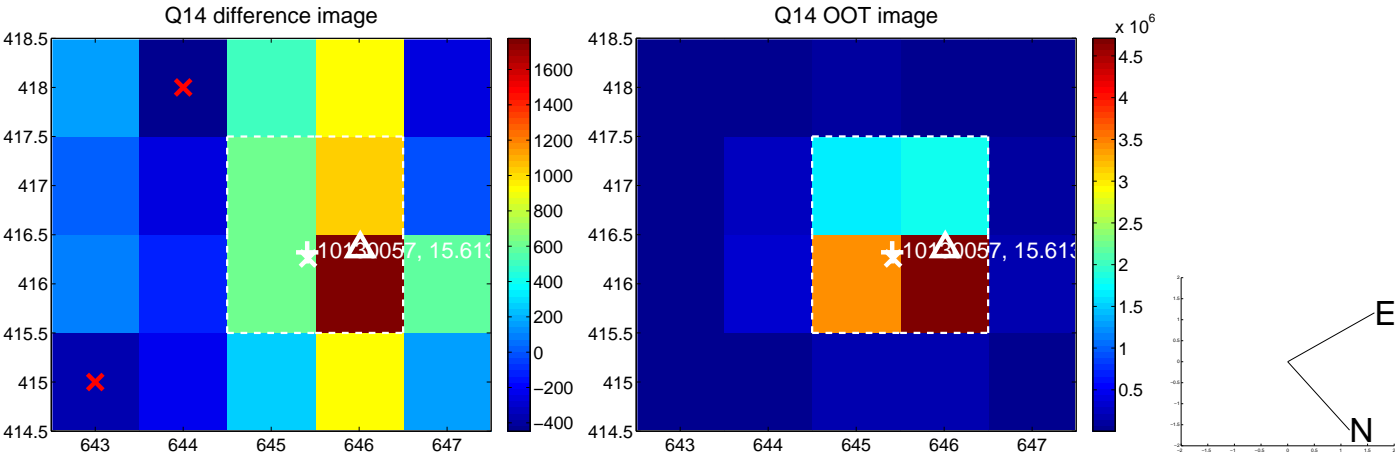
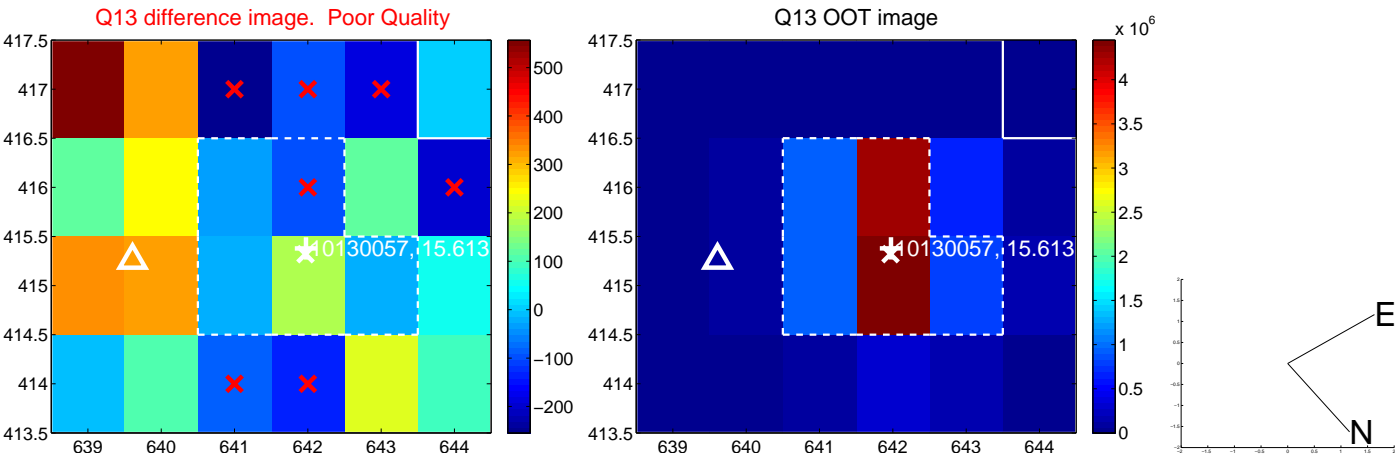




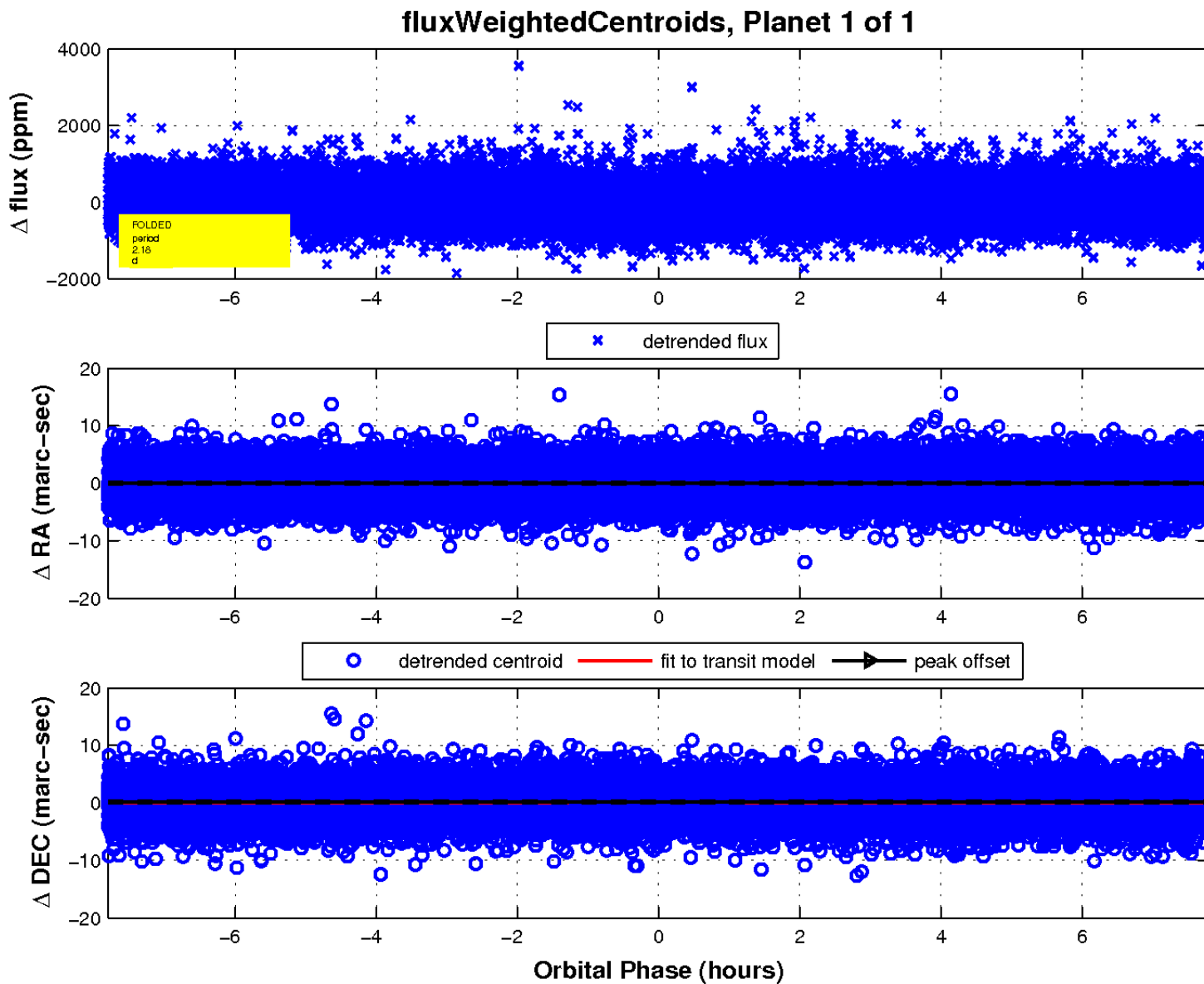
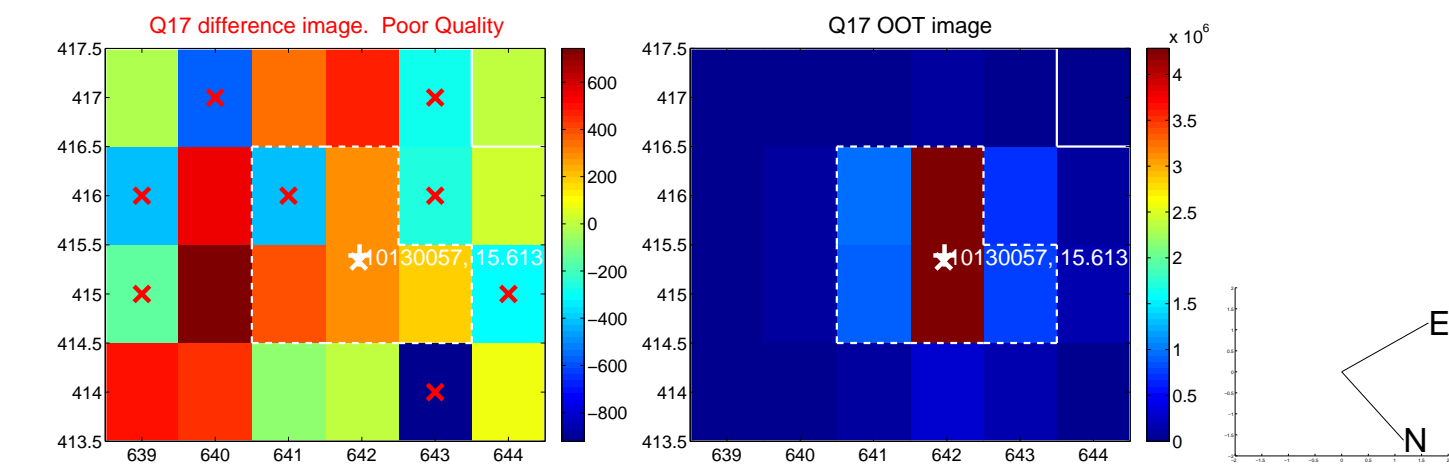
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

