

# KIC 012116380

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012116380-01	OBS	2155.01	4.339433	132.806048	328.6	2.479	27.2	30.0	1.01	5330	2.19	300.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012116380-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

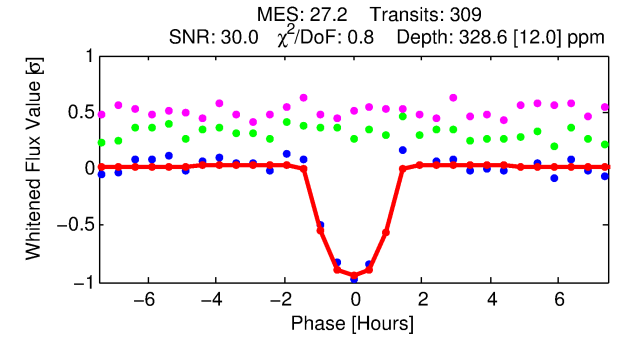
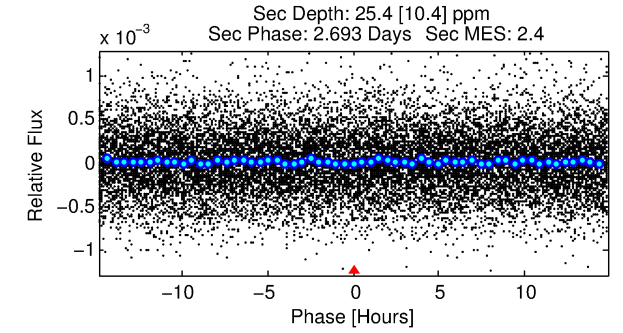
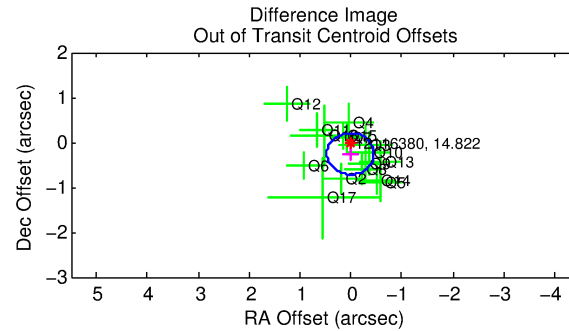
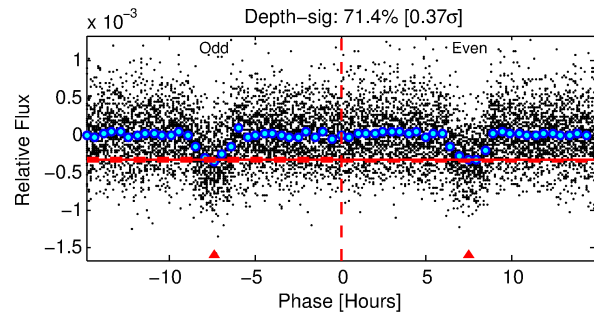
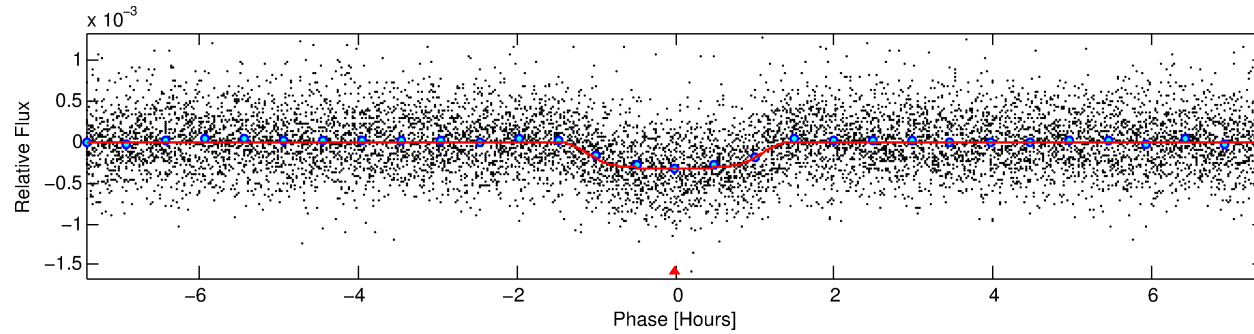
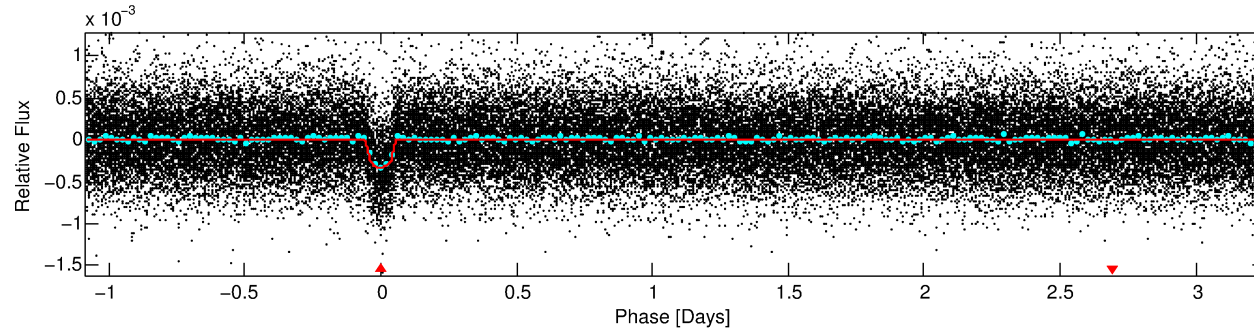
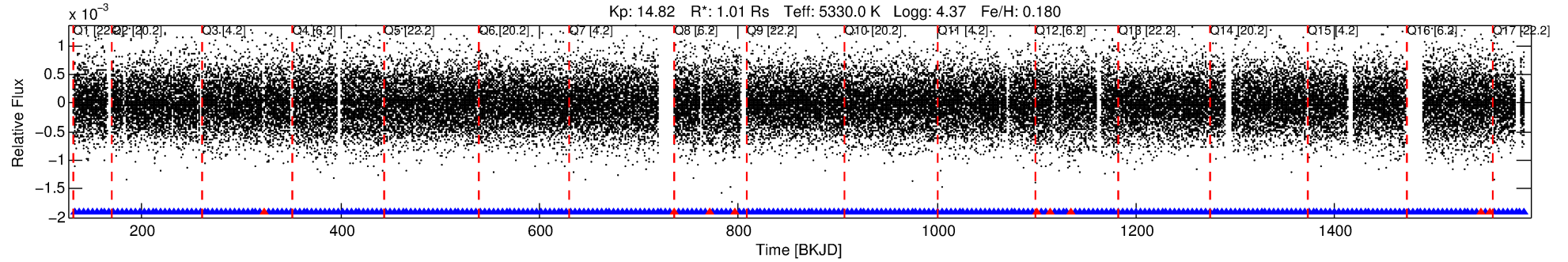
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012116380-01

No Significant Match Found

# DV One-Page Summary

KIC: 12116380 Candidate: 1 of 1 Period: 4.339 d  
KOI: K02155.01 Corr: 0.957



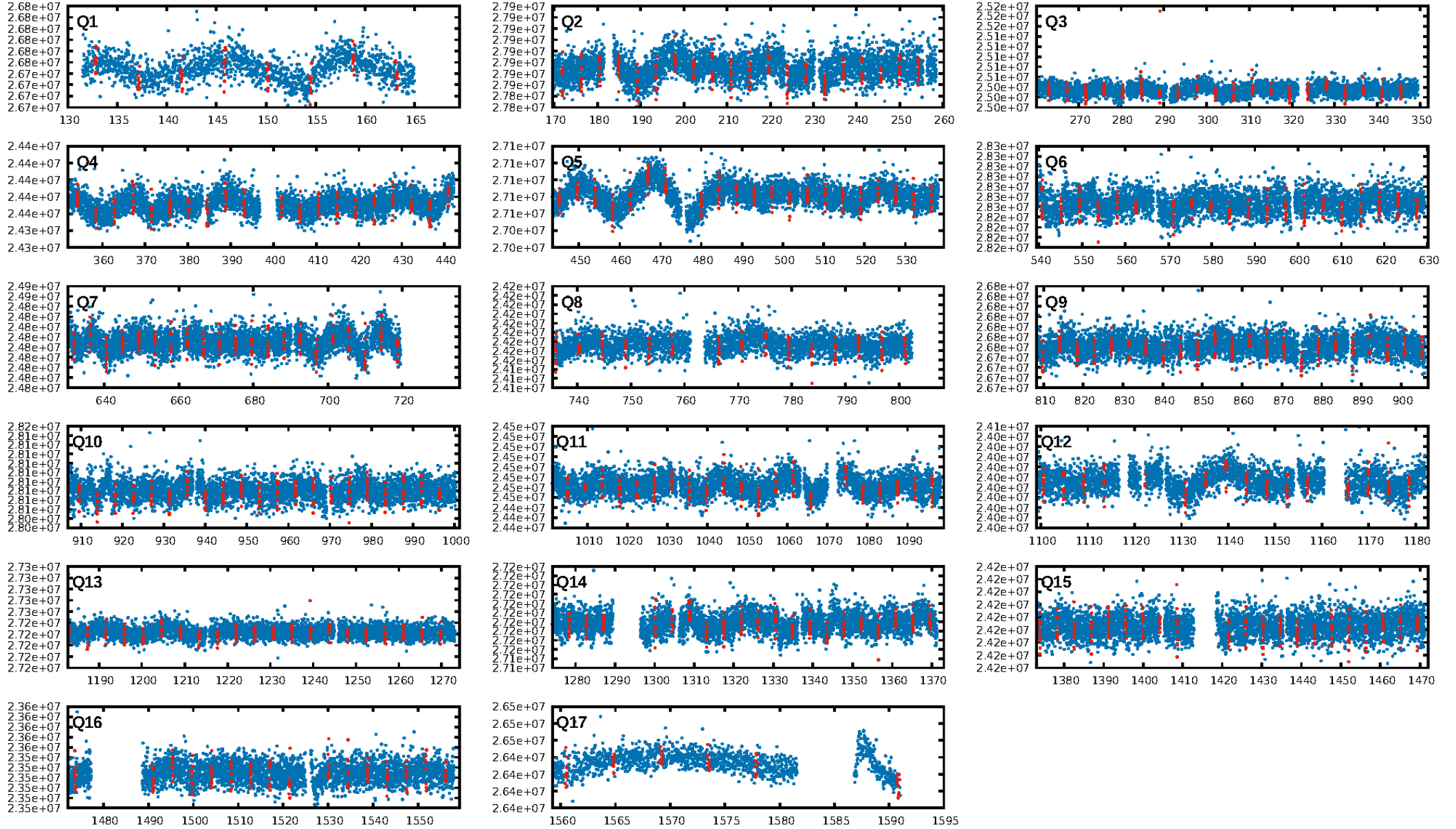
## DV Fit Results:

Period = 4.33943 [0.00001] d  
Epoch = 132.8060 [0.0015] BKJD  
Rp/R\* = 0.0198 [0.0049]  
a/R\* = 6.81 [6.73]  
b = 0.89 [0.25]  
Seff = 300.35 [69.11]  
Teff = 1062 [61] K  
Rp = 2.19 [0.62] Re  
a = 0.0497 [0.0068] AU  
Ag = 7.19 [4.86] [1.27 $\sigma$ ]  
Teffp = 2688 [431] K [3.74 $\sigma$ ]

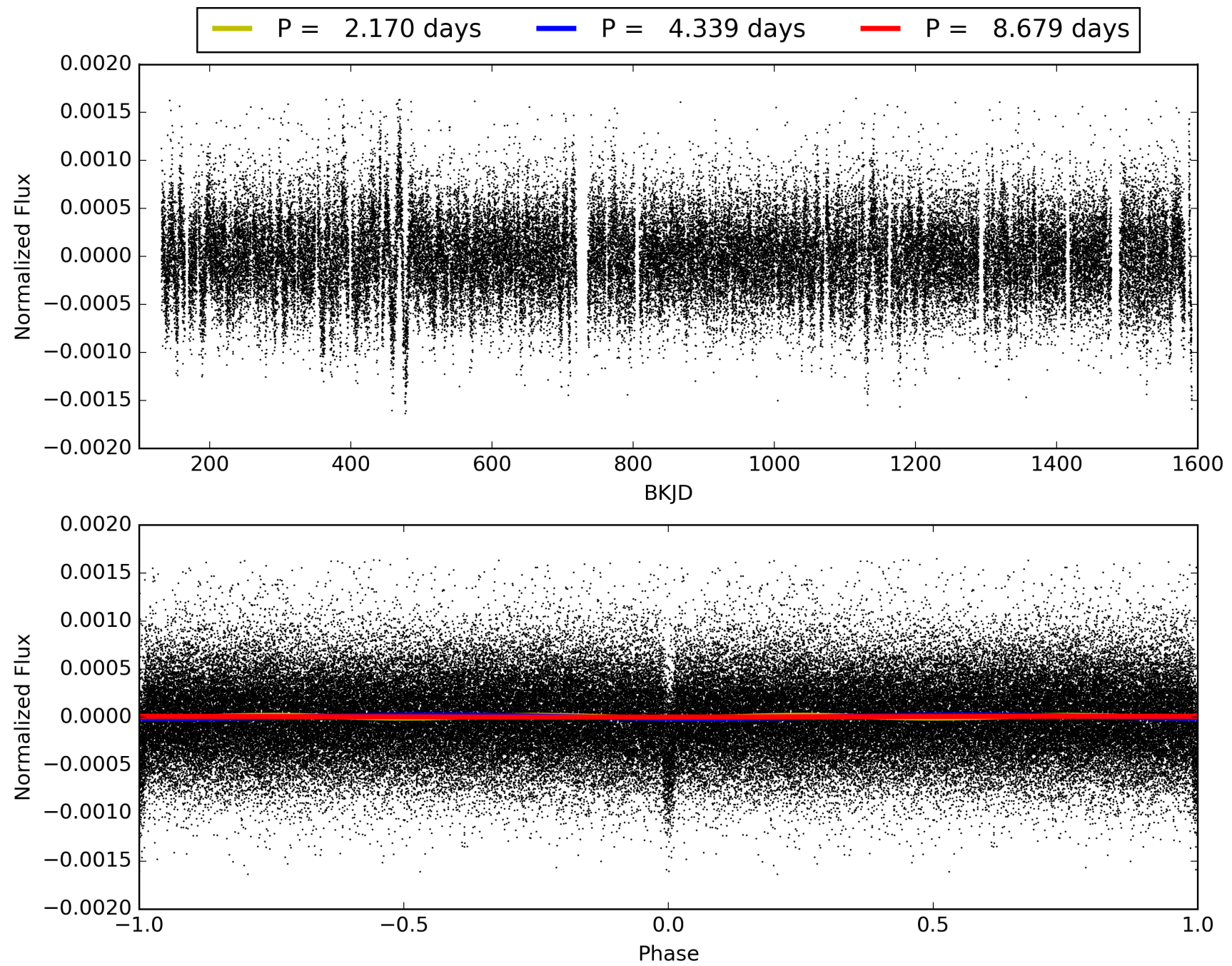
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.36e-157  
RollingBand-fgt: 0.97 [286/295]  
GhostDiagnostic-chr: 20.62  
Centroid-sig: 5.1%  
Centroid-so: 1.098 arcsec [2.28 $\sigma$ ]  
OotOffset-rm: 0.256 arcsec [1.66 $\sigma$ ]  
KicOffset-rm: 0.245 arcsec [1.69 $\sigma$ ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.88 [14/16]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012116380-01, PDC Light Curves



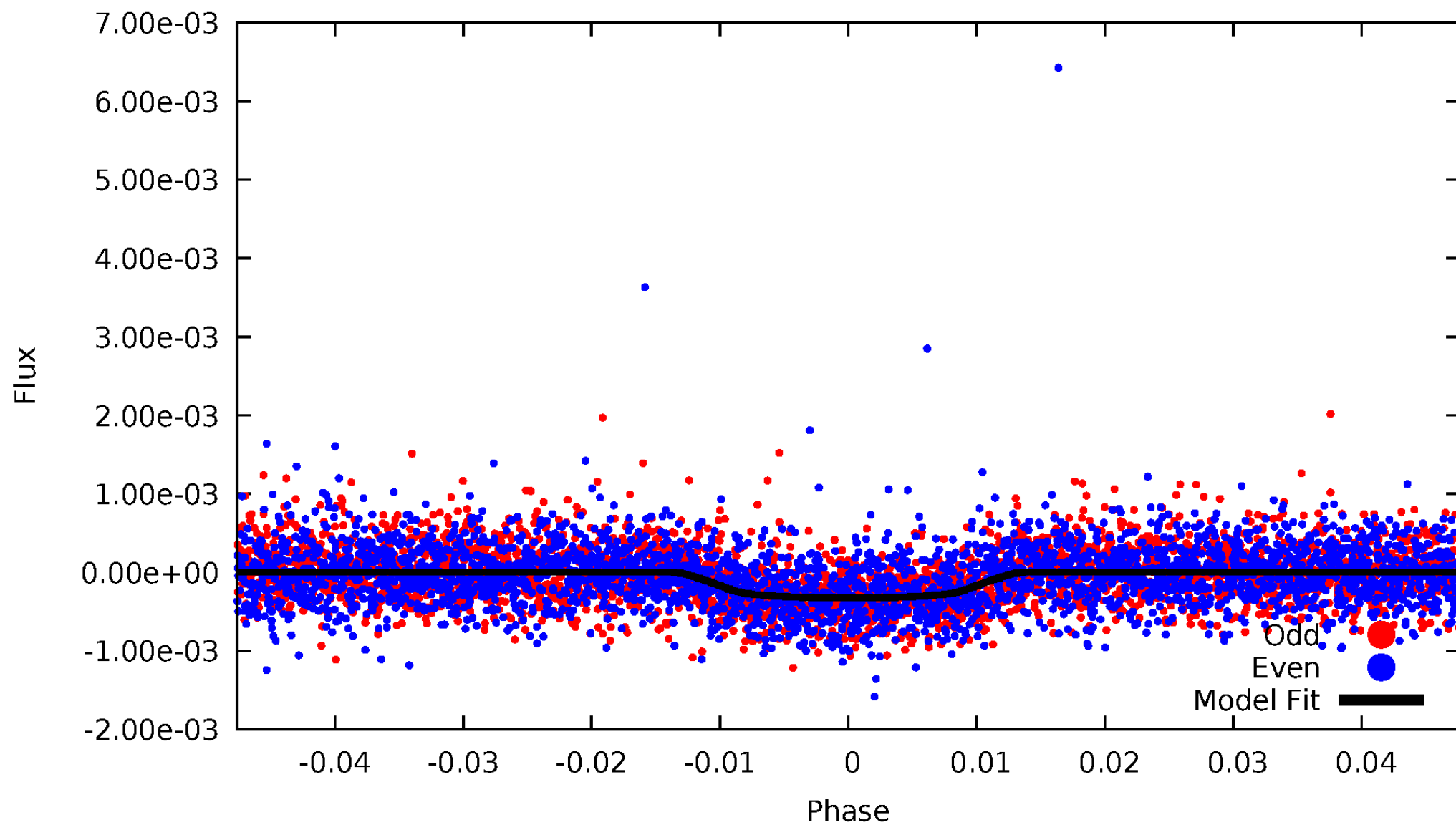
TCE 012116380-01





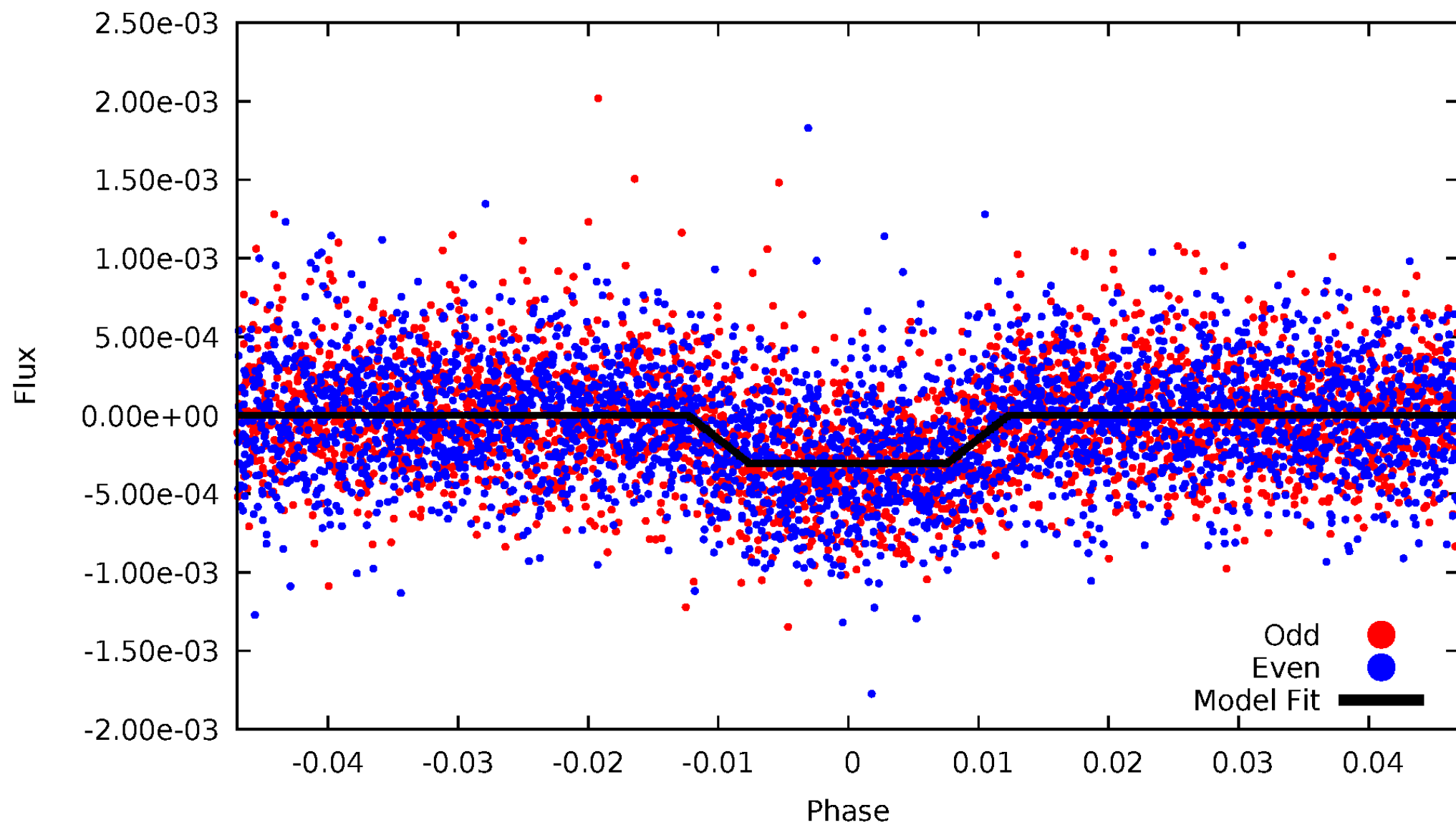
# DV Odd/Even

TCE 012116380-01



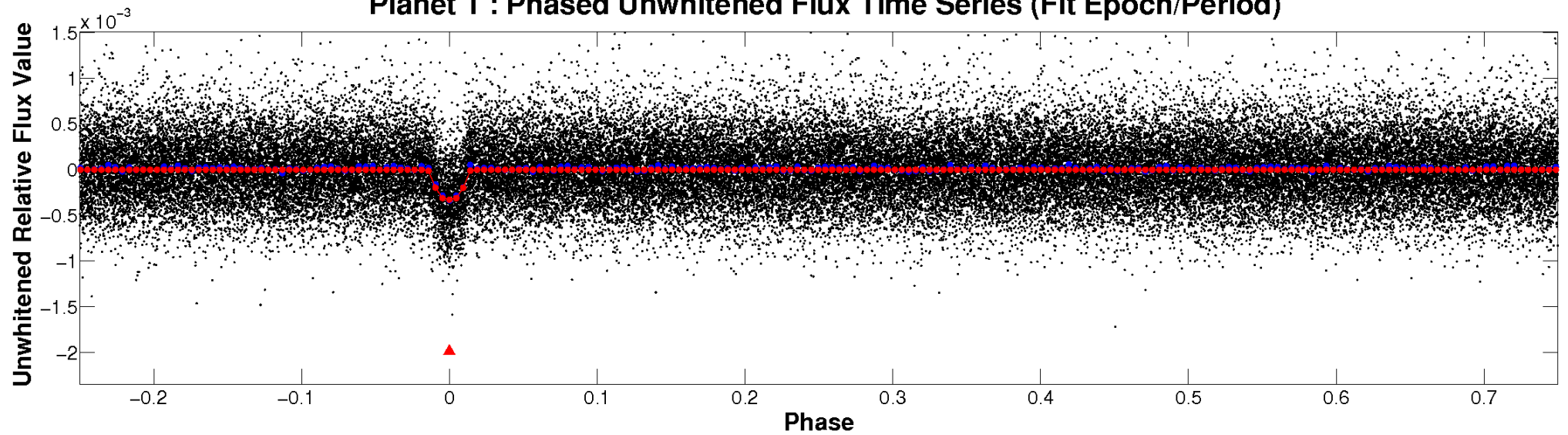
# ALT Odd/Even

TCE 012116380-01

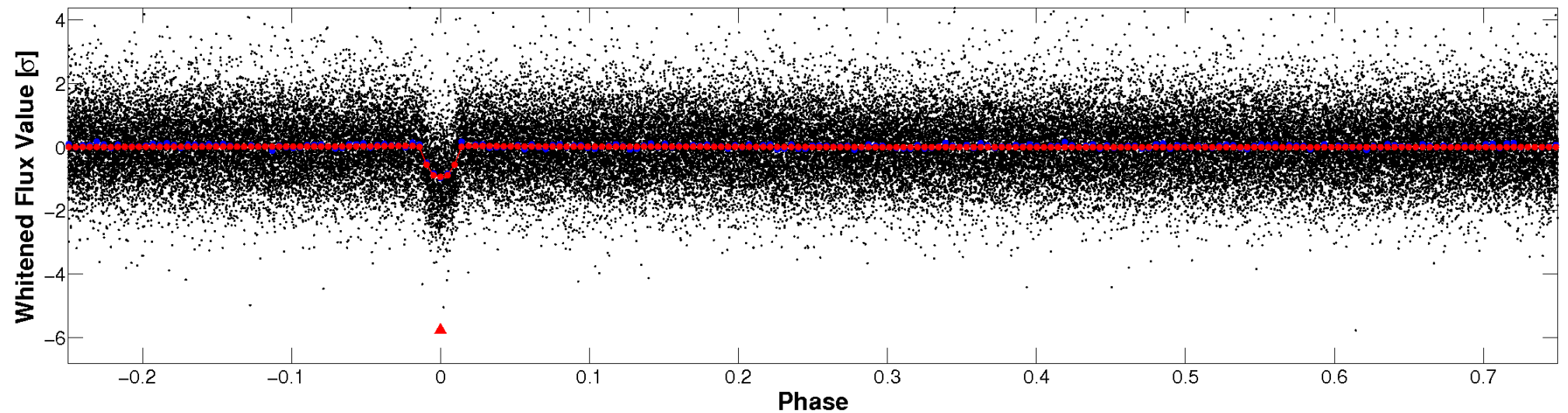


# Non-Whitened Vs. Whitened Light Curve

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

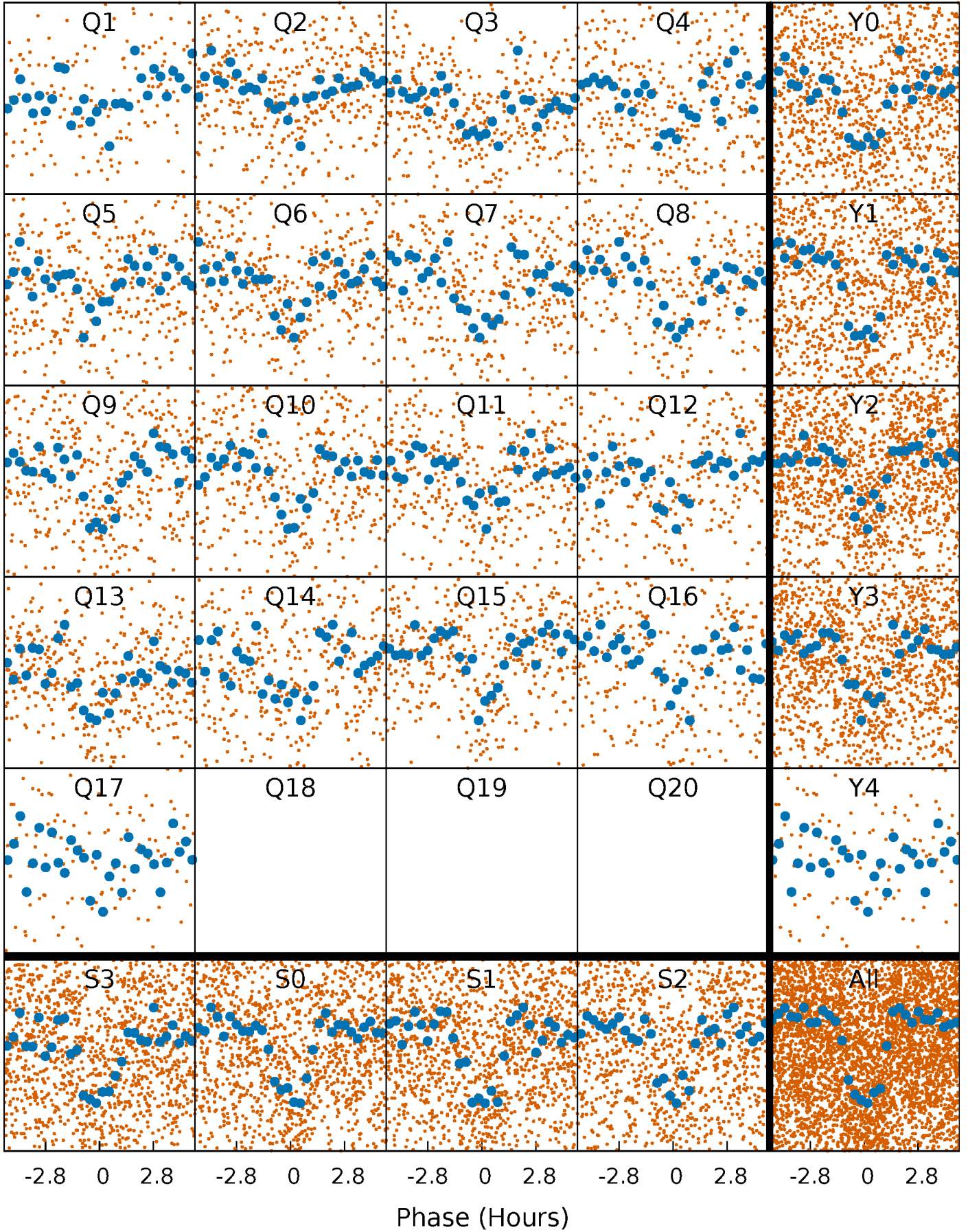


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

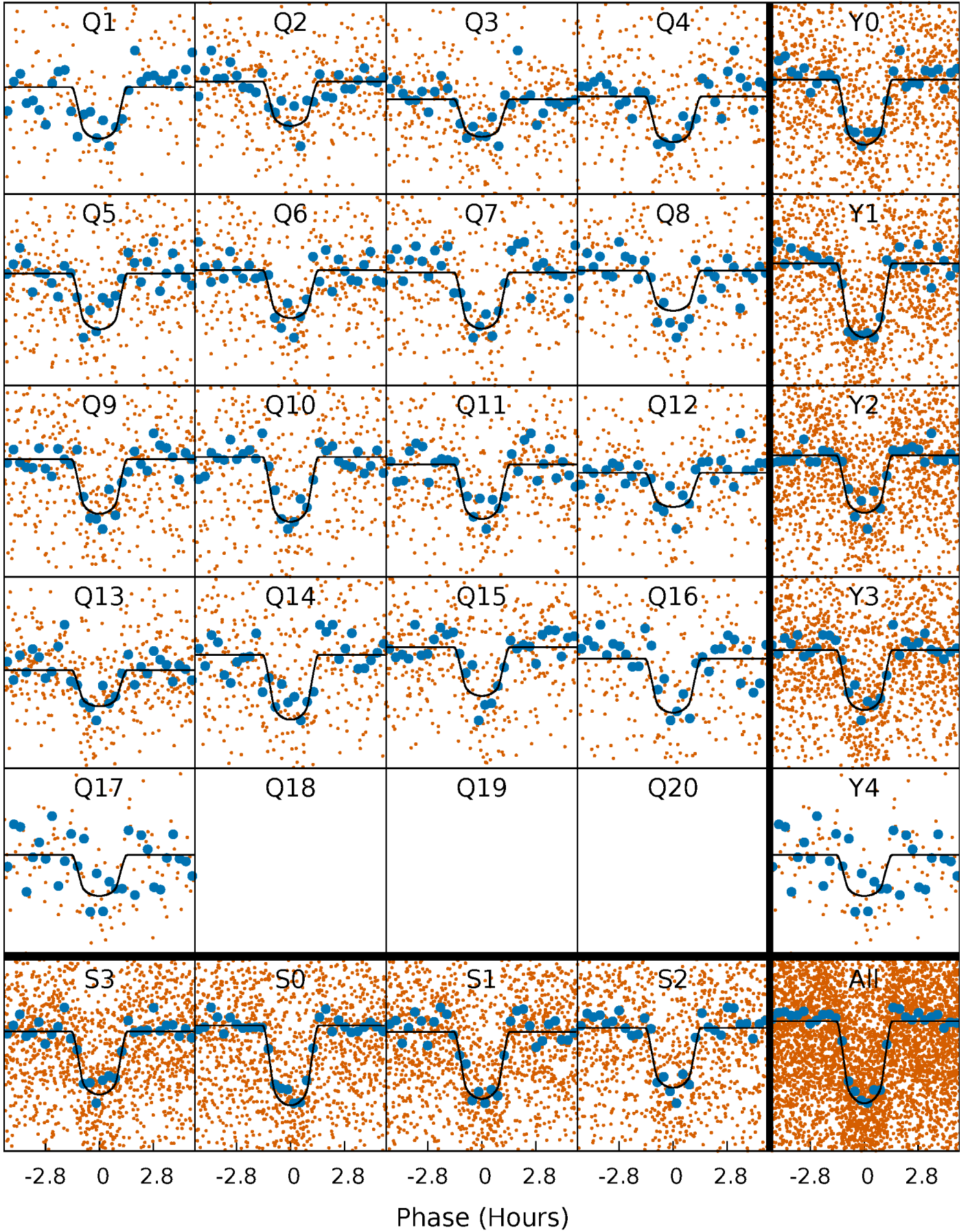
TCE 012116380-01 P= 4.339433 Days  $T_0=132.806048$  (BKJD)





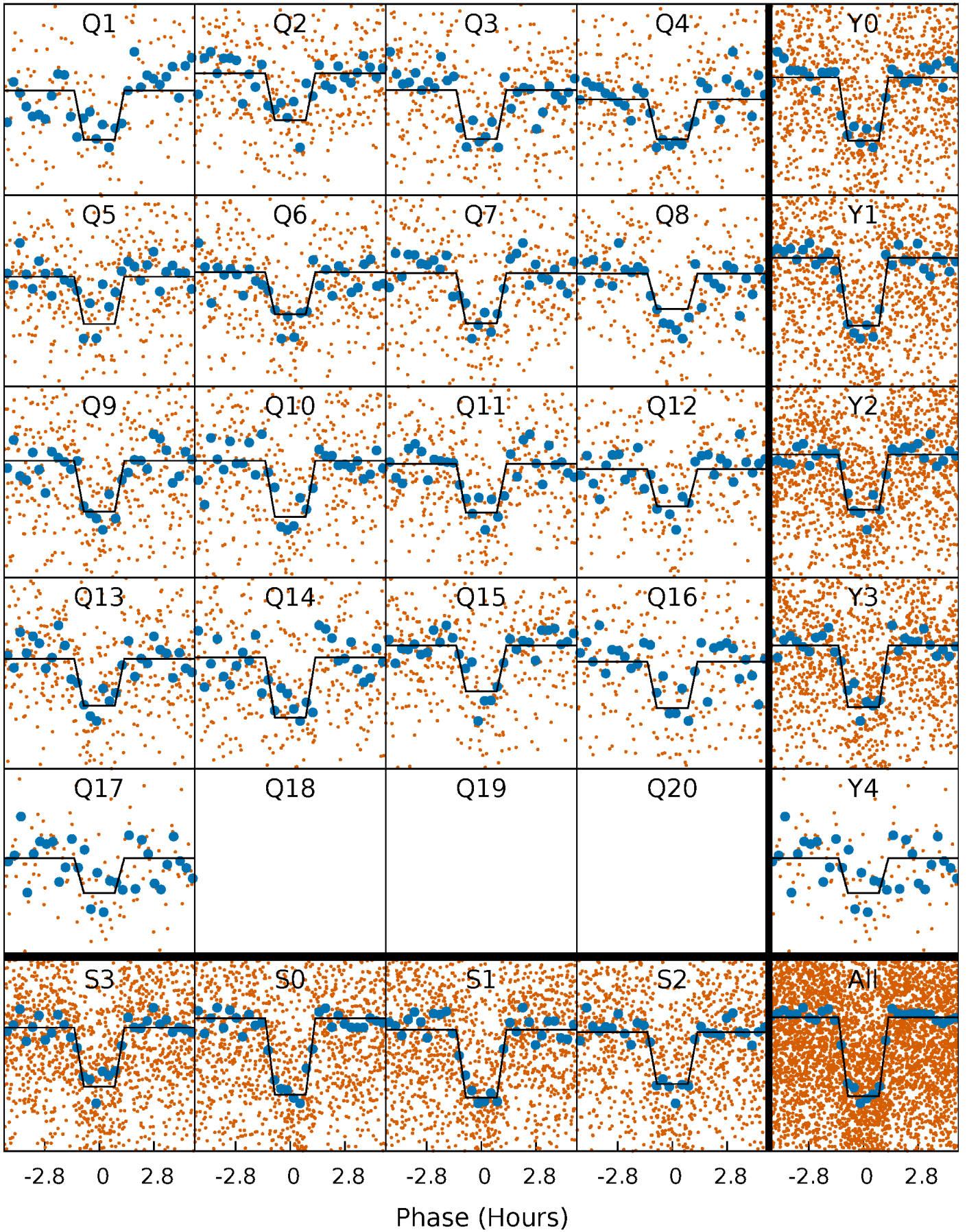
# DV Quarter-Phased Transit Curves

TCE 012116380-01   P= 4.339433 Days    $T_0=132.806048$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

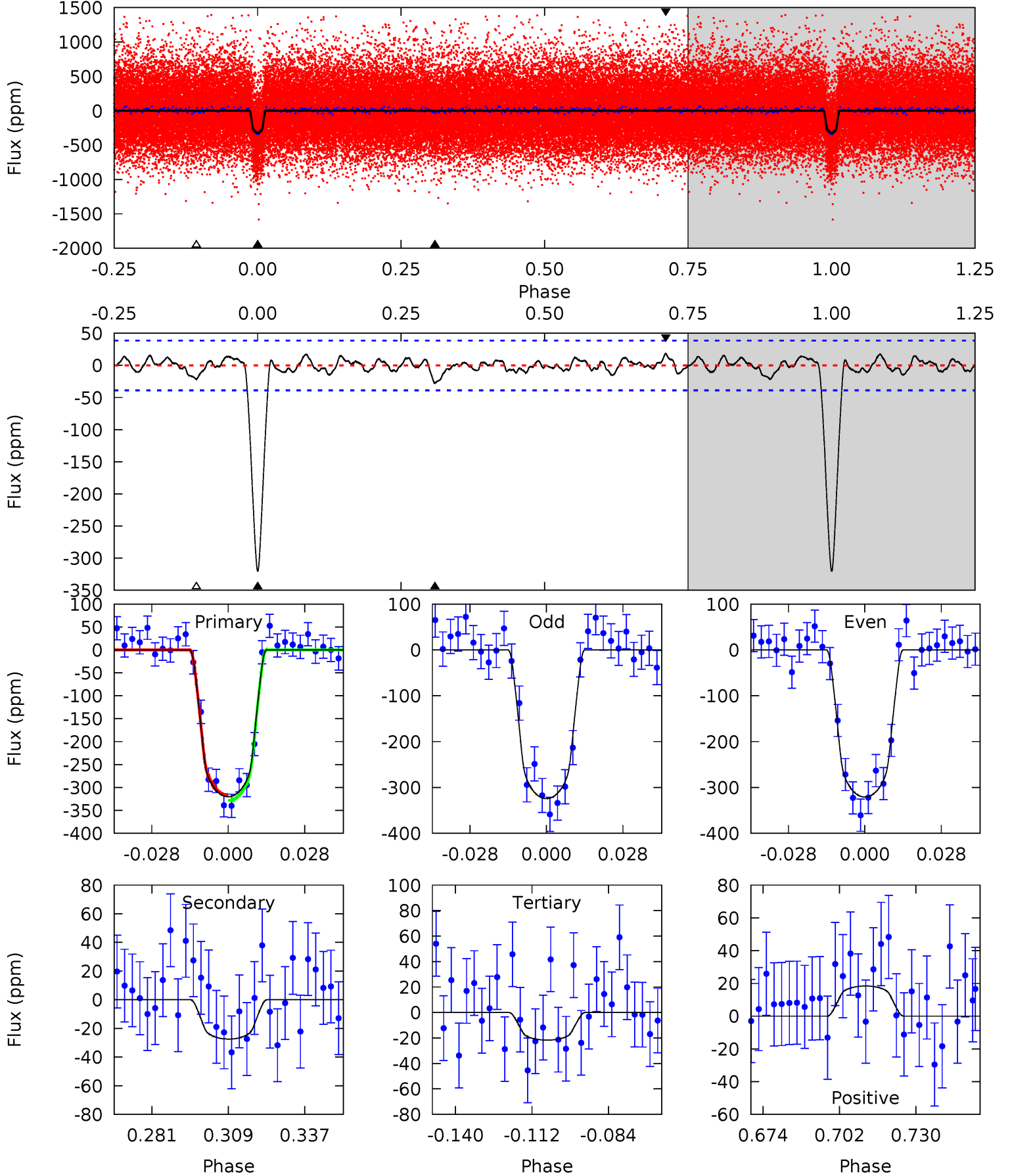
TCE 012116380-01 P= 4.339425 Days  $T_0=132.808201$  (BKJD)



# DV Model-Shift Uniqueness Test

012116380-01, P = 4.339433 Days, E = 128.466615 Days

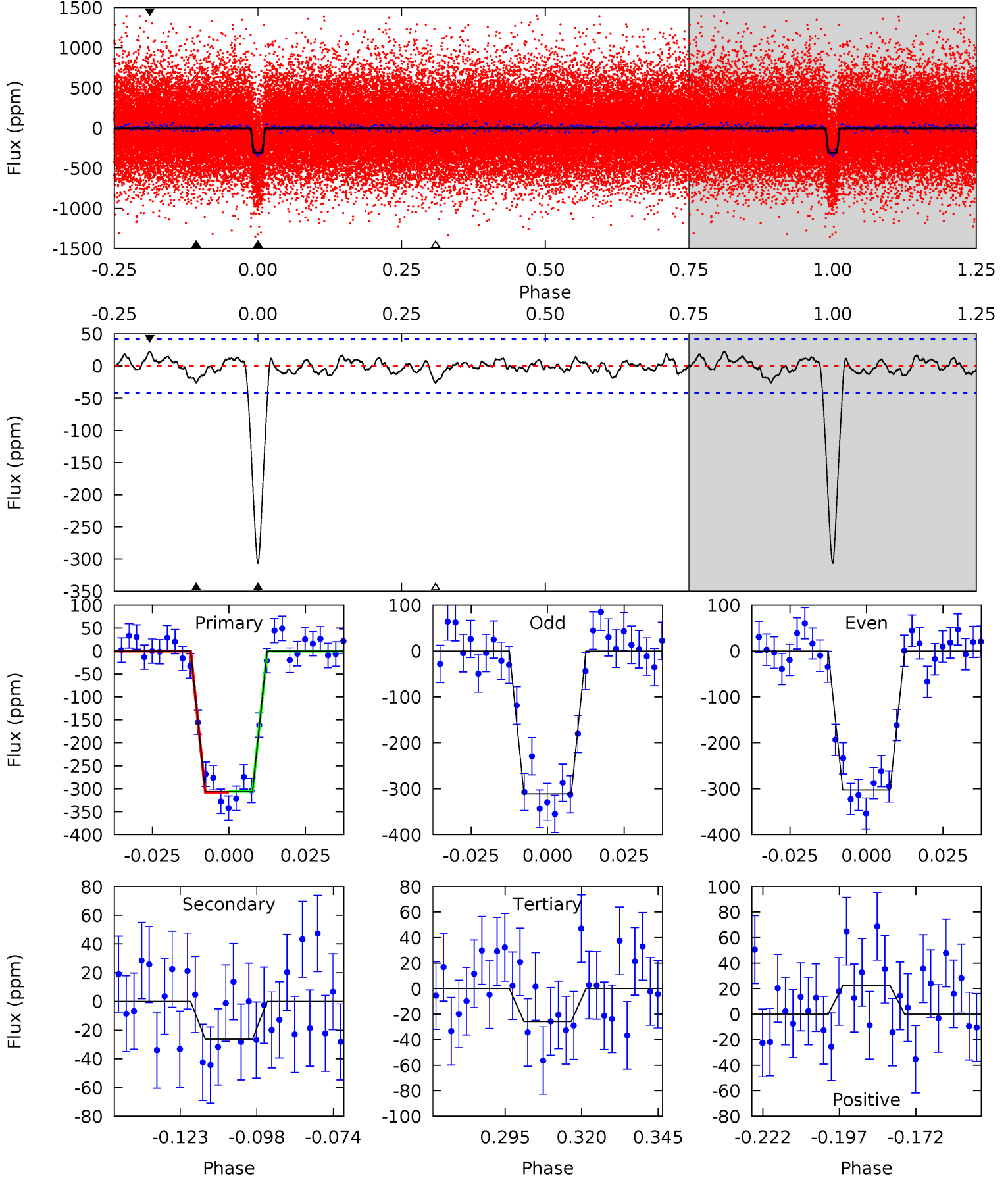
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.9	3.42	2.70	2.29	4.82	2.20	0.96	37.2	37.6	0.72	1.13	0.21	0.99	0.05	0.75



# Alt Model-Shift Uniqueness Test

012116380-01, P = 4.339425 Days, E = 128.468776 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
35.7	3.05	3.00	2.61	4.85	2.25	0.97	32.7	33.1	0.05	0.44	0.48	0.97	0.07	0.10





### Stellar Parameters For KIC 012116380

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5330^{+79}_{-79}$	$4.366^{+0.132}_{-0.108}$	$0.180^{+0.150}_{-0.100}$	$1.013^{+0.139}_{-0.139}$	$0.869^{+0.060}_{-0.034}$	$1.176^{+0.679}_{-0.366}$
	+1%/-1%	+3%/-2%	+83%/-56%	+14%/-14%	+7%/-4%	+58%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 012116380-01 / KOI 2155.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-27 \pm 8$	$2.19^{+0.56}_{-0.52}$	$1481^{+67}_{-63}$	$3256^{+308}_{-263}$	$7.786^{+5.636}_{-3.425}$
Alt.	$-26 \pm 9$	$1.94^{+0.51}_{-0.49}$	$1478^{+69}_{-62}$	$3351^{+422}_{-297}$	$9.415^{+9.752}_{-4.496}$

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

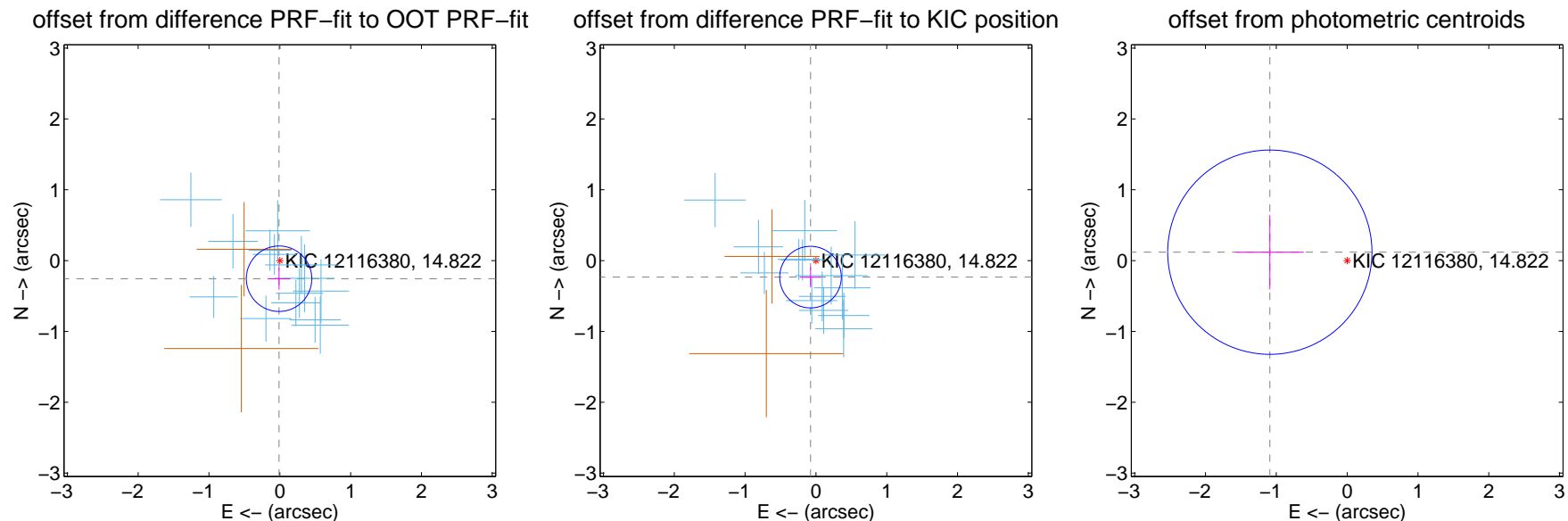
## DV Centroid Data

Supplemental centroid analysis for 012116380-01. Kepler magnitude: 14.82. Transit SNR 30.04

There are 14 quarters with good PRF difference image offsets

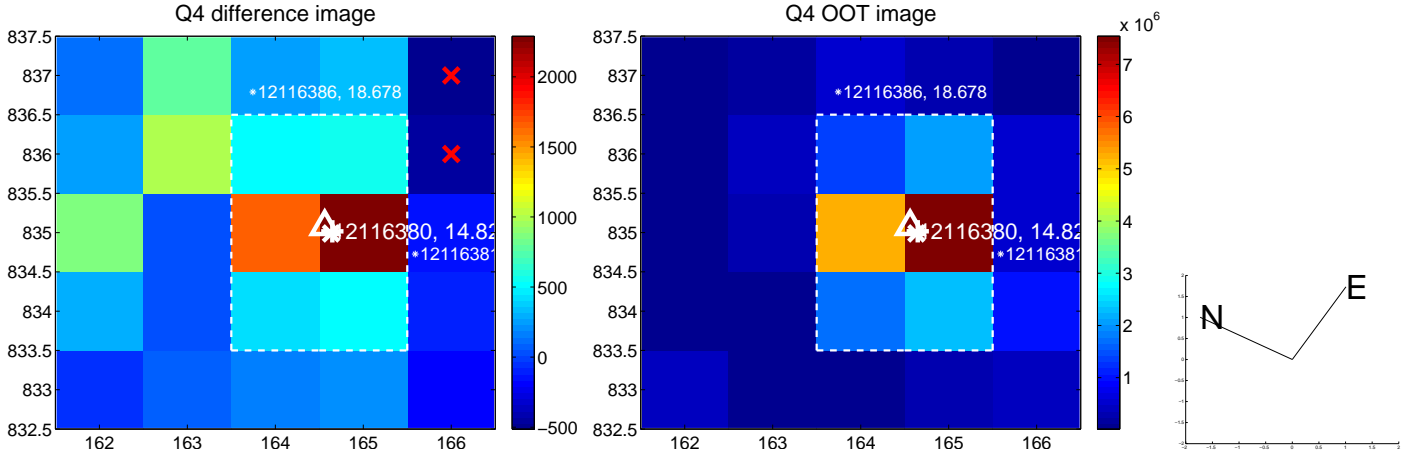
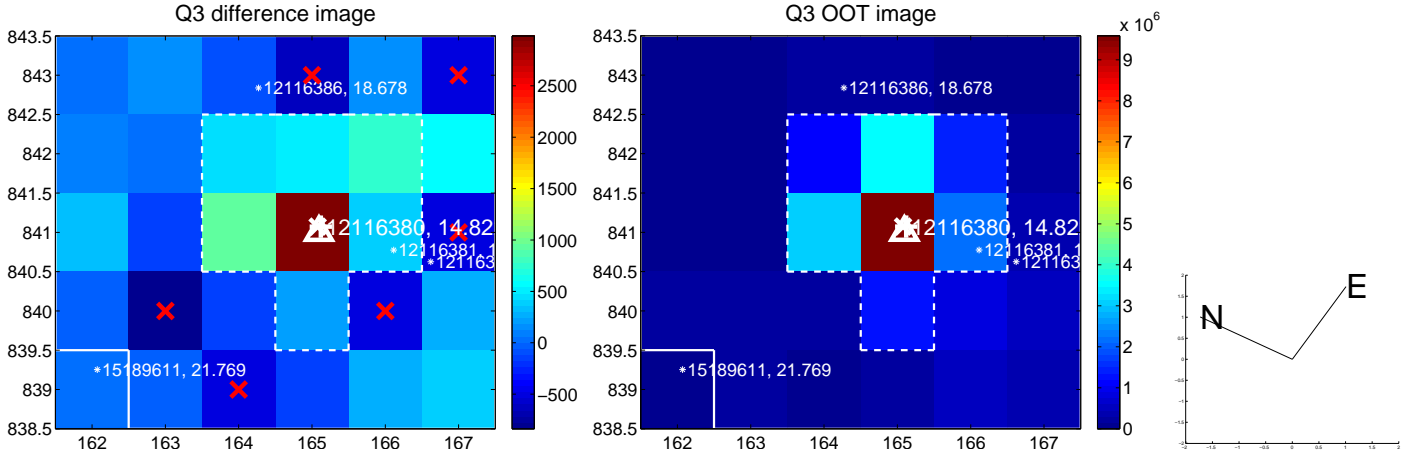
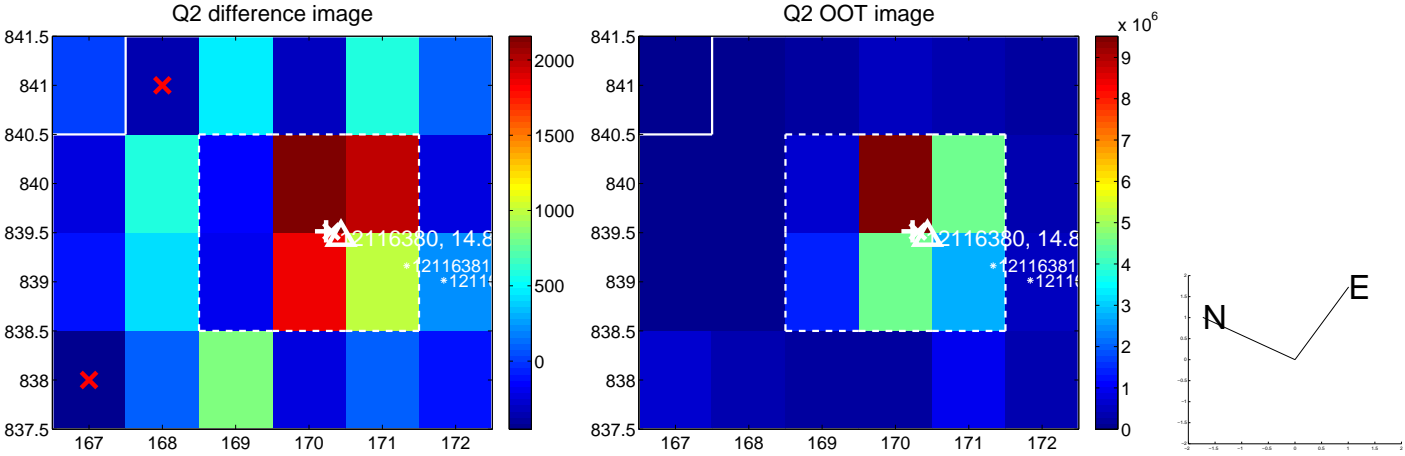
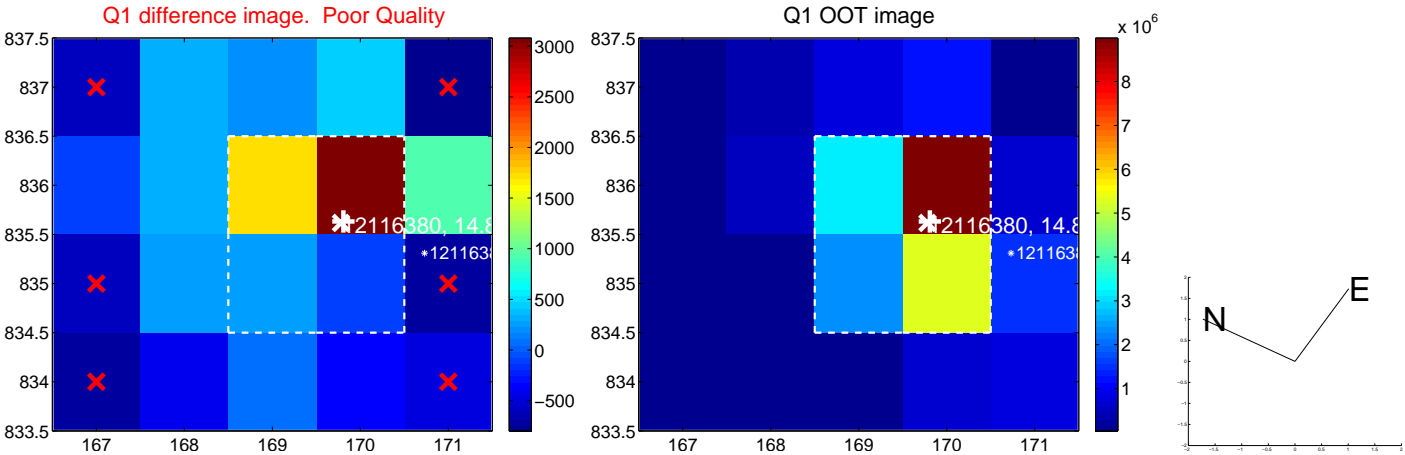
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.256 \pm 0.154$	1.66	$0.010 \pm 0.159$	$-0.256 \pm 0.154$
PRF-fit source offset from KIC position	$0.245 \pm 0.145$	1.69	$0.076 \pm 0.153$	$-0.233 \pm 0.144$
photometric centroid source offset	$1.10 \pm 0.48$	2.28	$1.09 \pm 0.48$	$0.12 \pm 0.52$

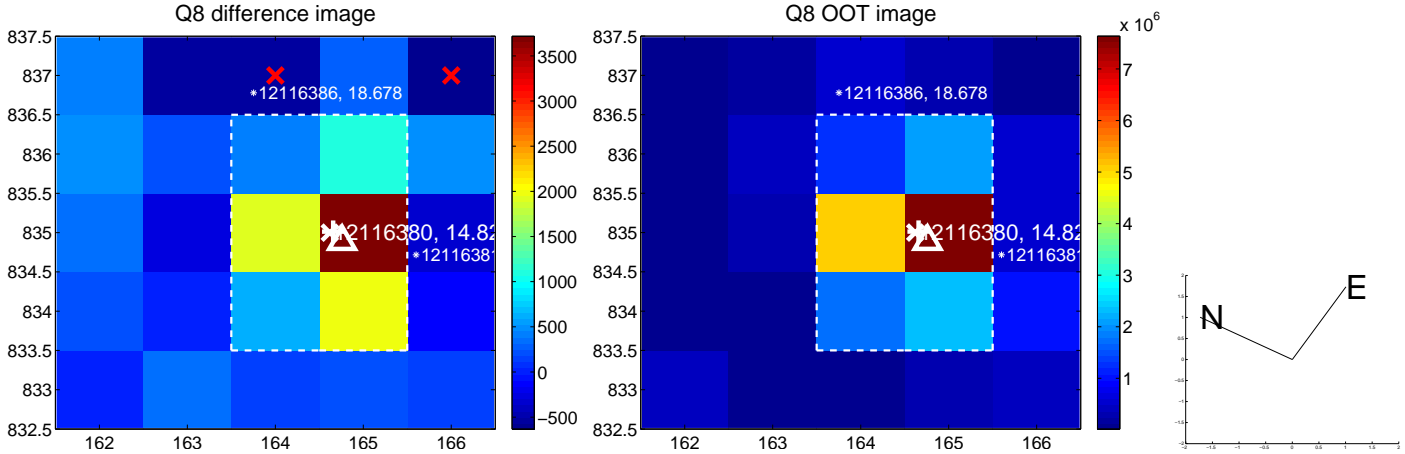
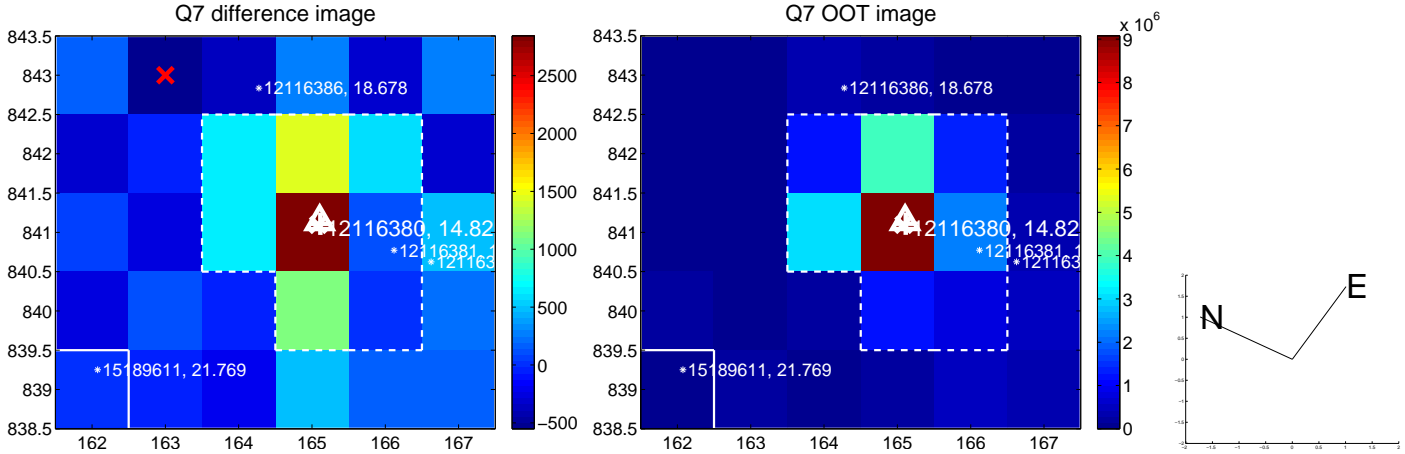
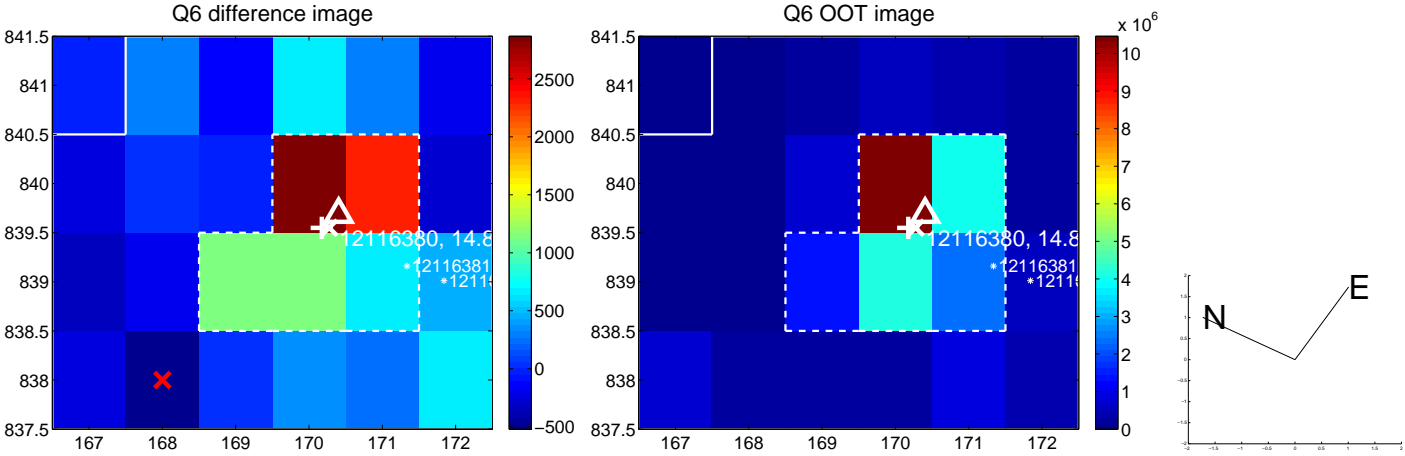
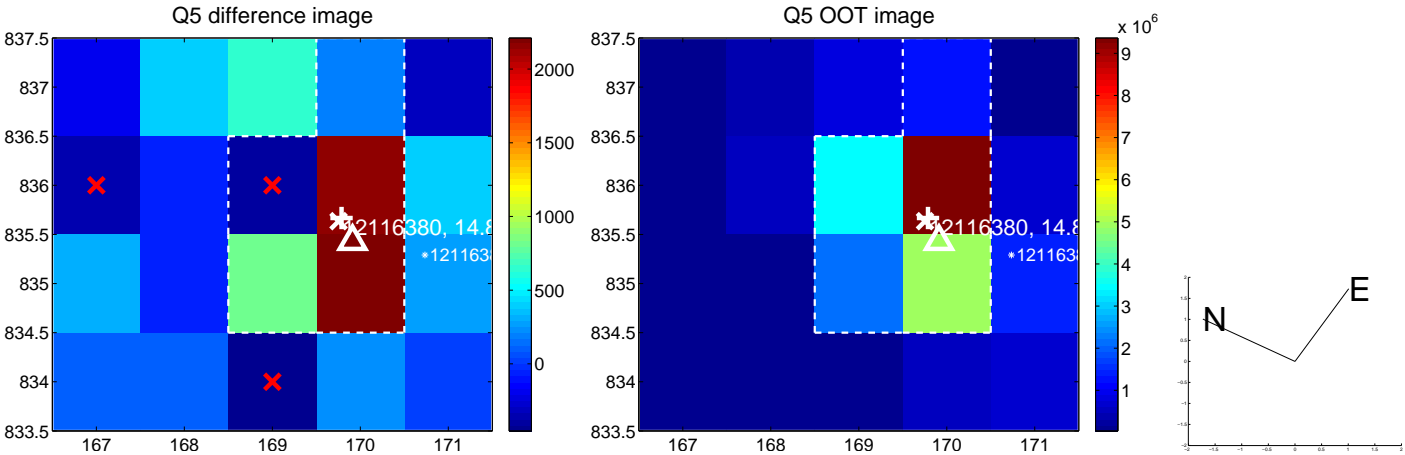


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

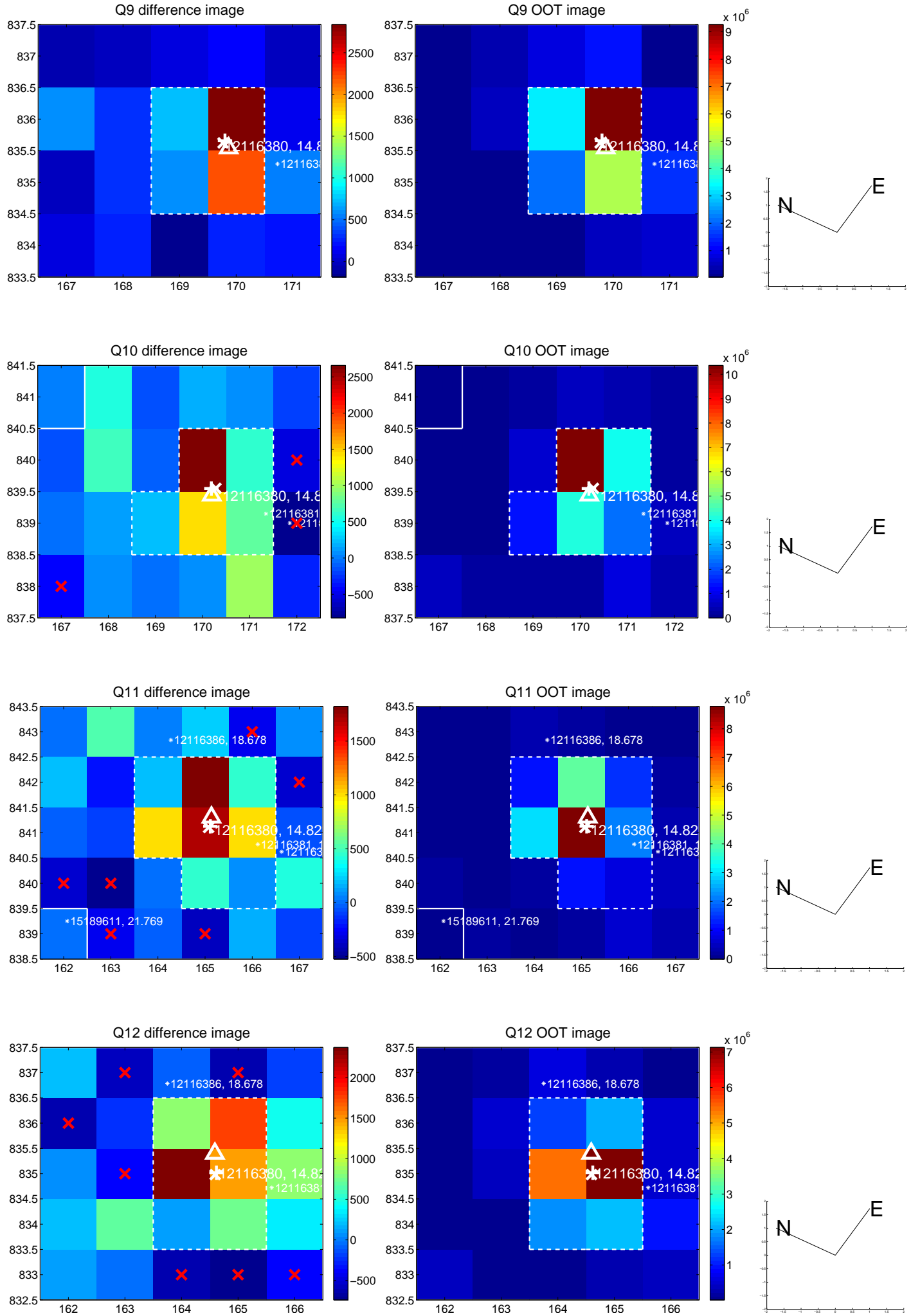


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

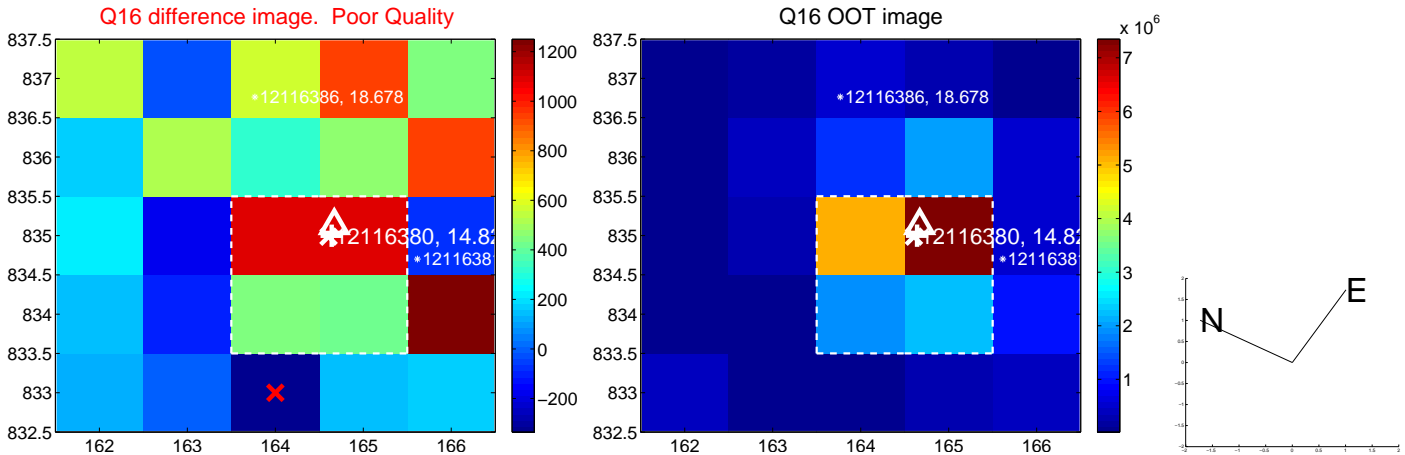
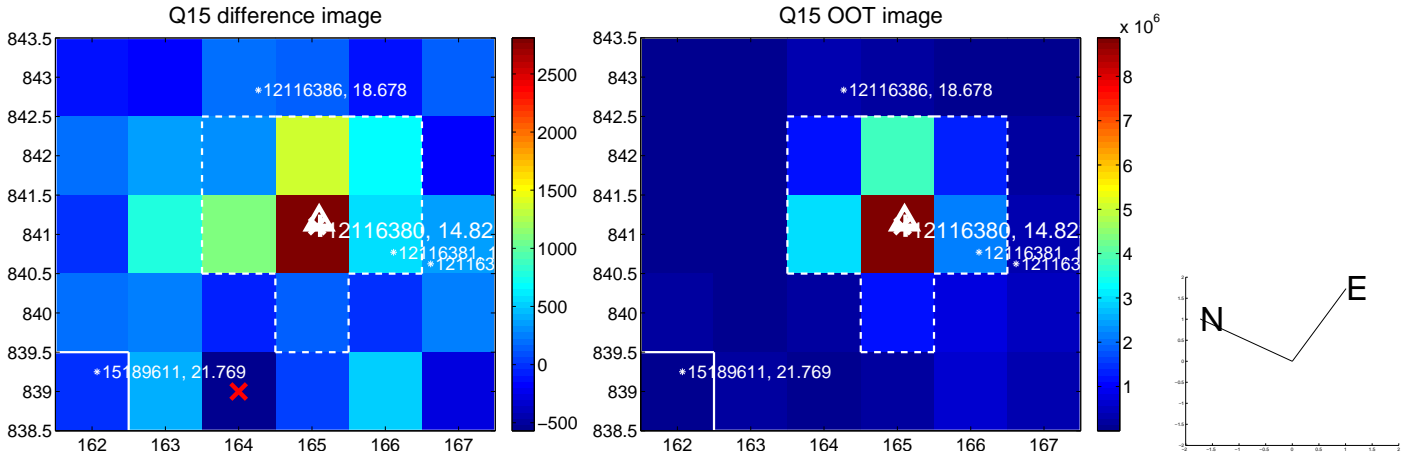
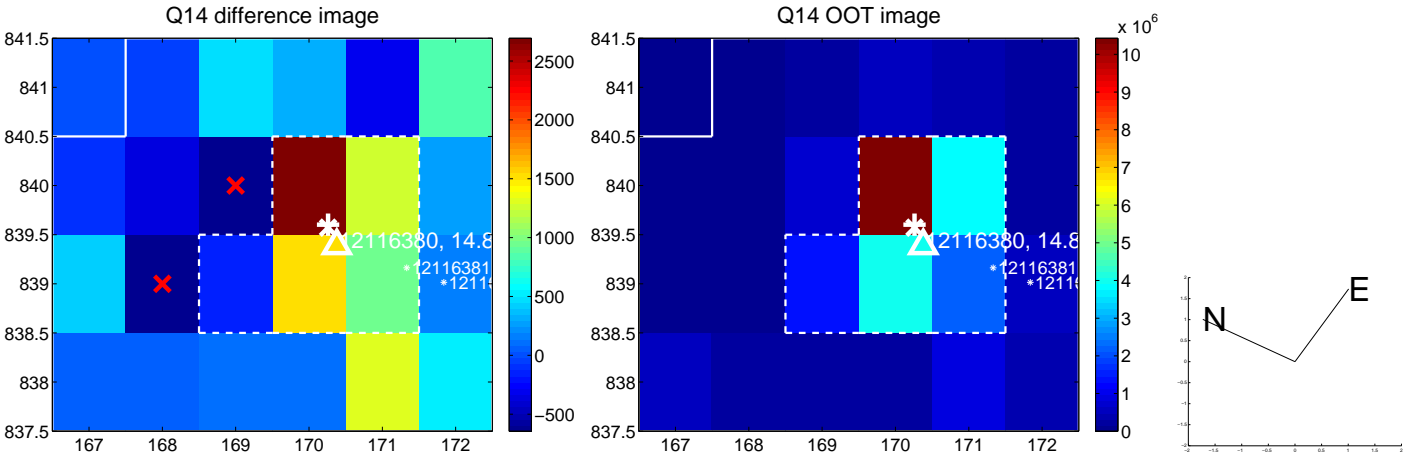
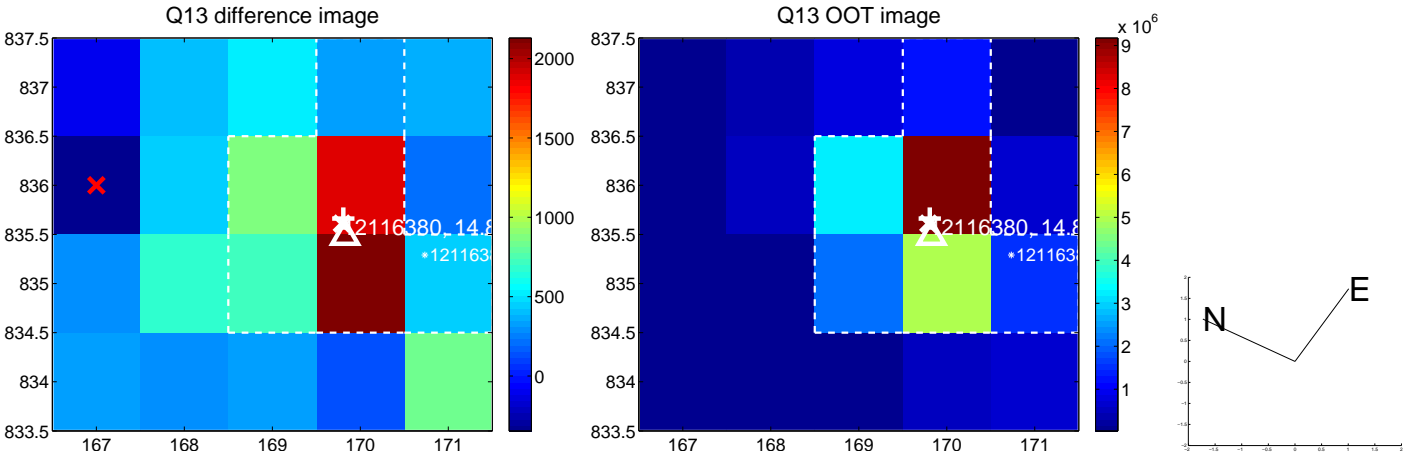




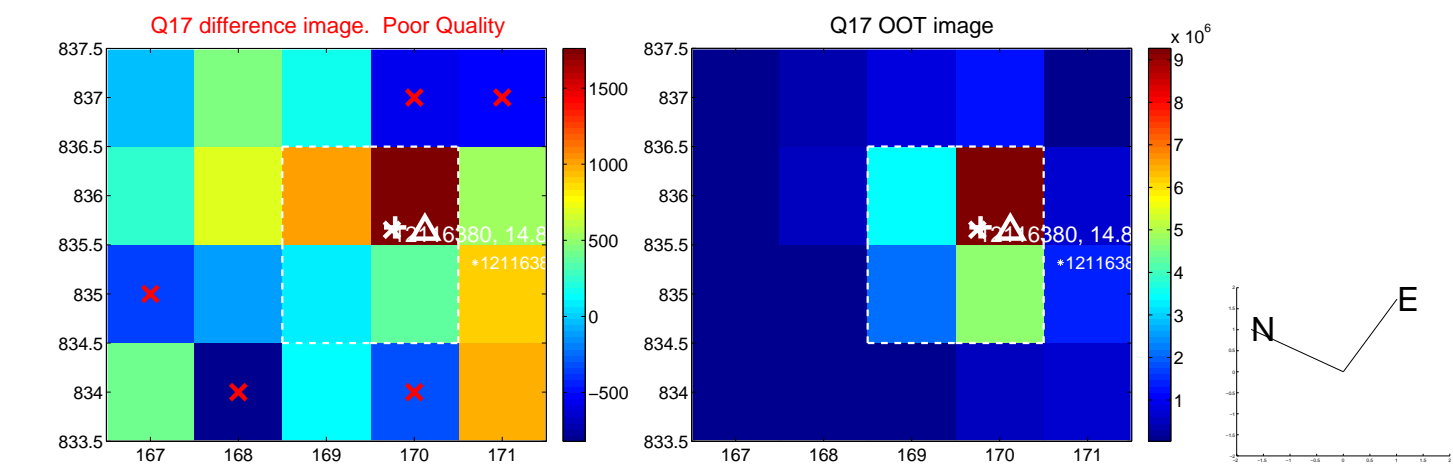
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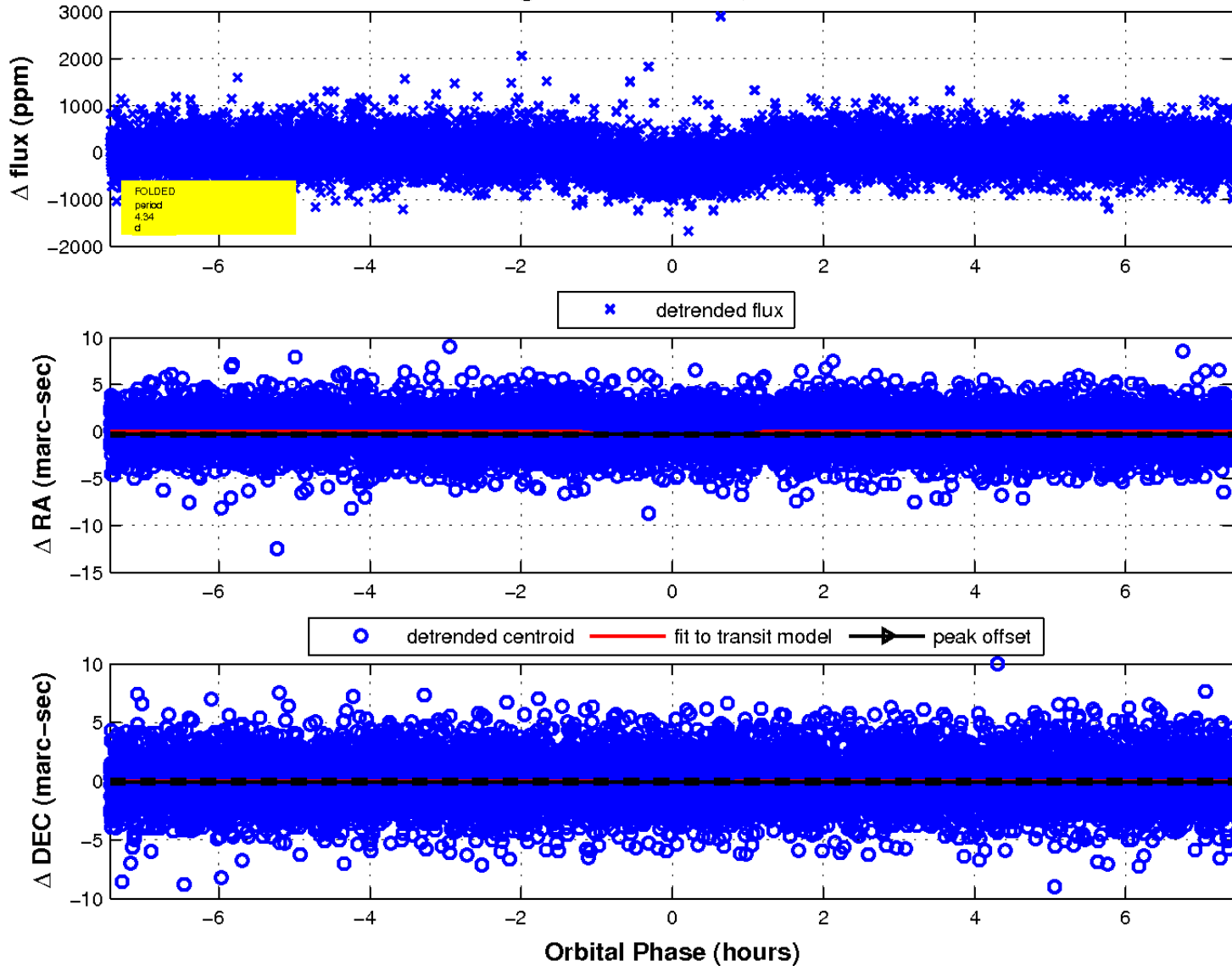
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

