

# KIC 012416597

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012416597-01	OBS	4895.01	12.460412	139.234091	159.0	4.738	7.6	8.8	0.93	5435	1.61	65.90

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012416597-01	OBS	PC	0.92	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.

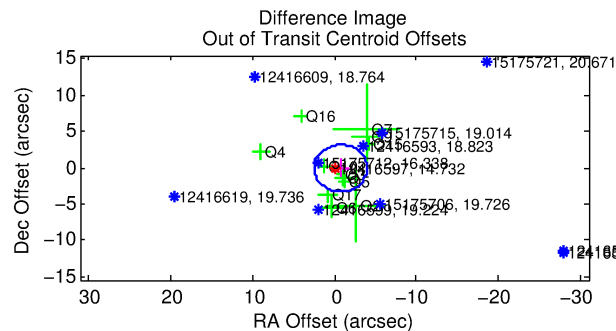
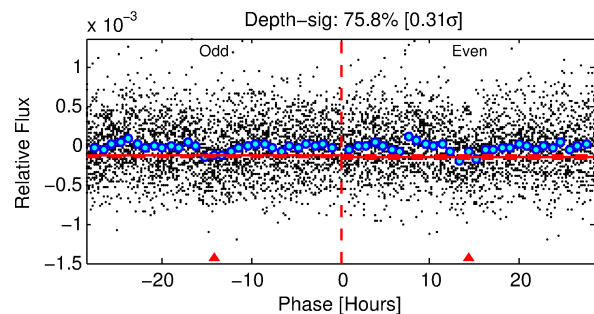
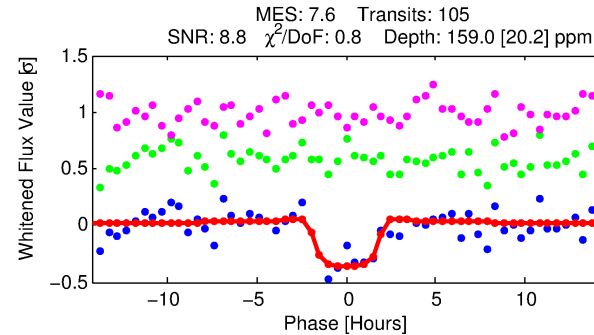
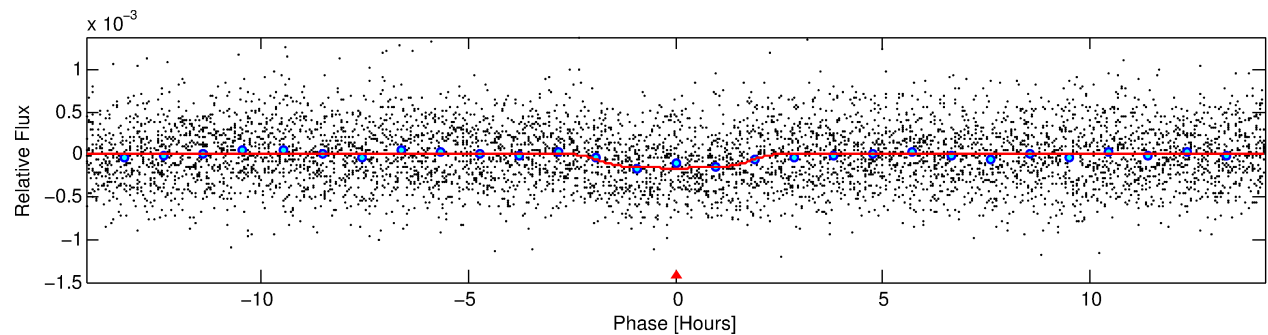
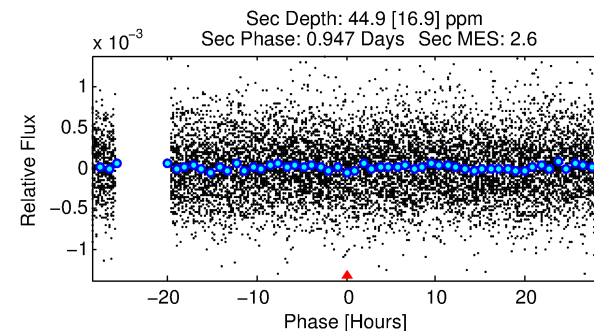
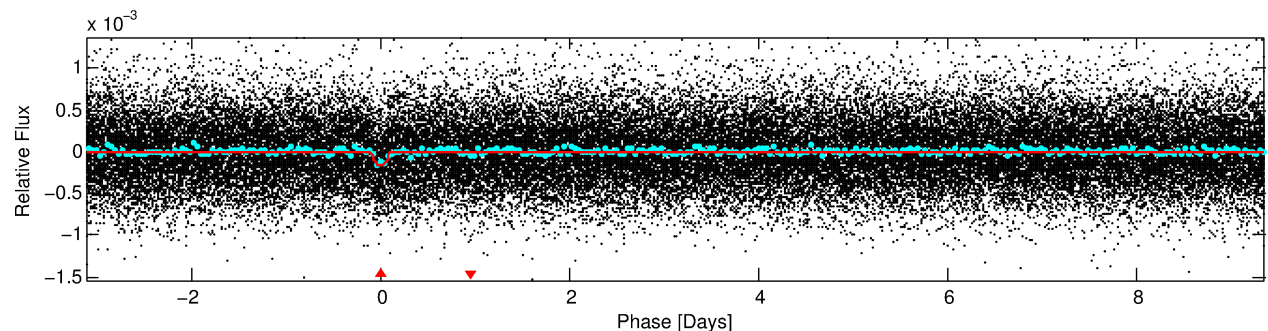
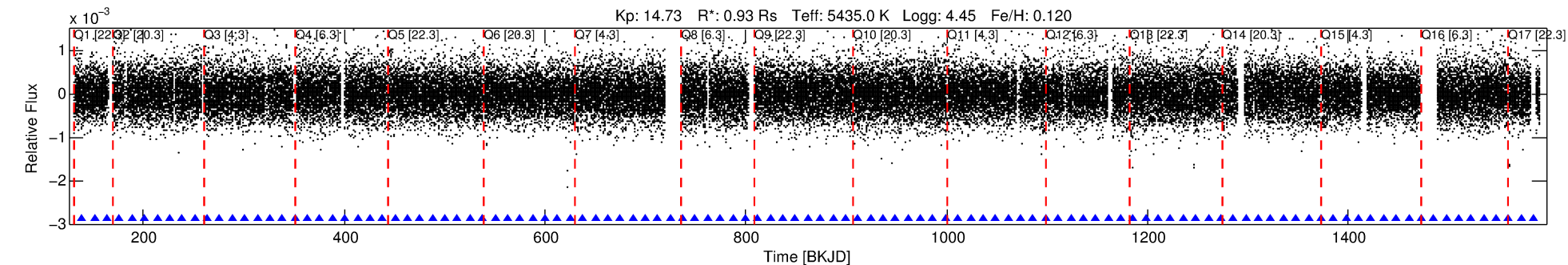
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012416597-01

No Significant Match Found

# DV One-Page Summary

KIC: 12416597 Candidate: 1 of 1 Period: 12.460 d  
KOI: K04895.01 Corr: 0.907



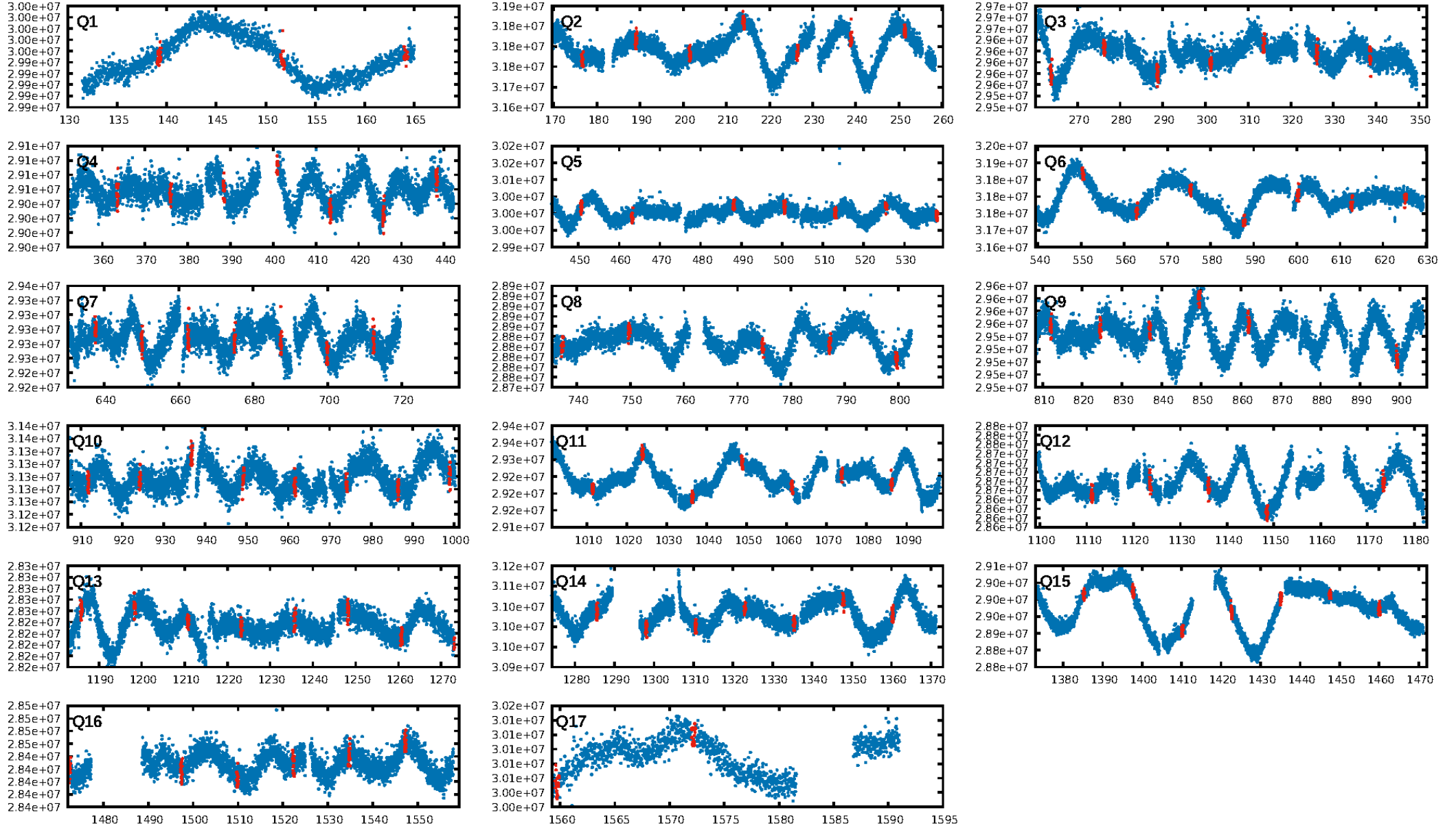
## DV Fit Results:

Period = 12.46041 [0.00016] d  
Epoch = 139.2341 [0.0104] BKJD  
Rp/R\* = 0.0158 [0.0016]  
a/R\* = 5.99 [1.92]  
b = 0.97 [0.02]  
Seff = 65.90 [10.56]  
Teq = 727 [29] K  
Rp = 1.61 [0.24] Re  
a = 0.1016 [0.0098] AU  
Ag = 98.74 [44.77] [2.18σ]  
Teffp = 3541 [383] K [7.33σ]

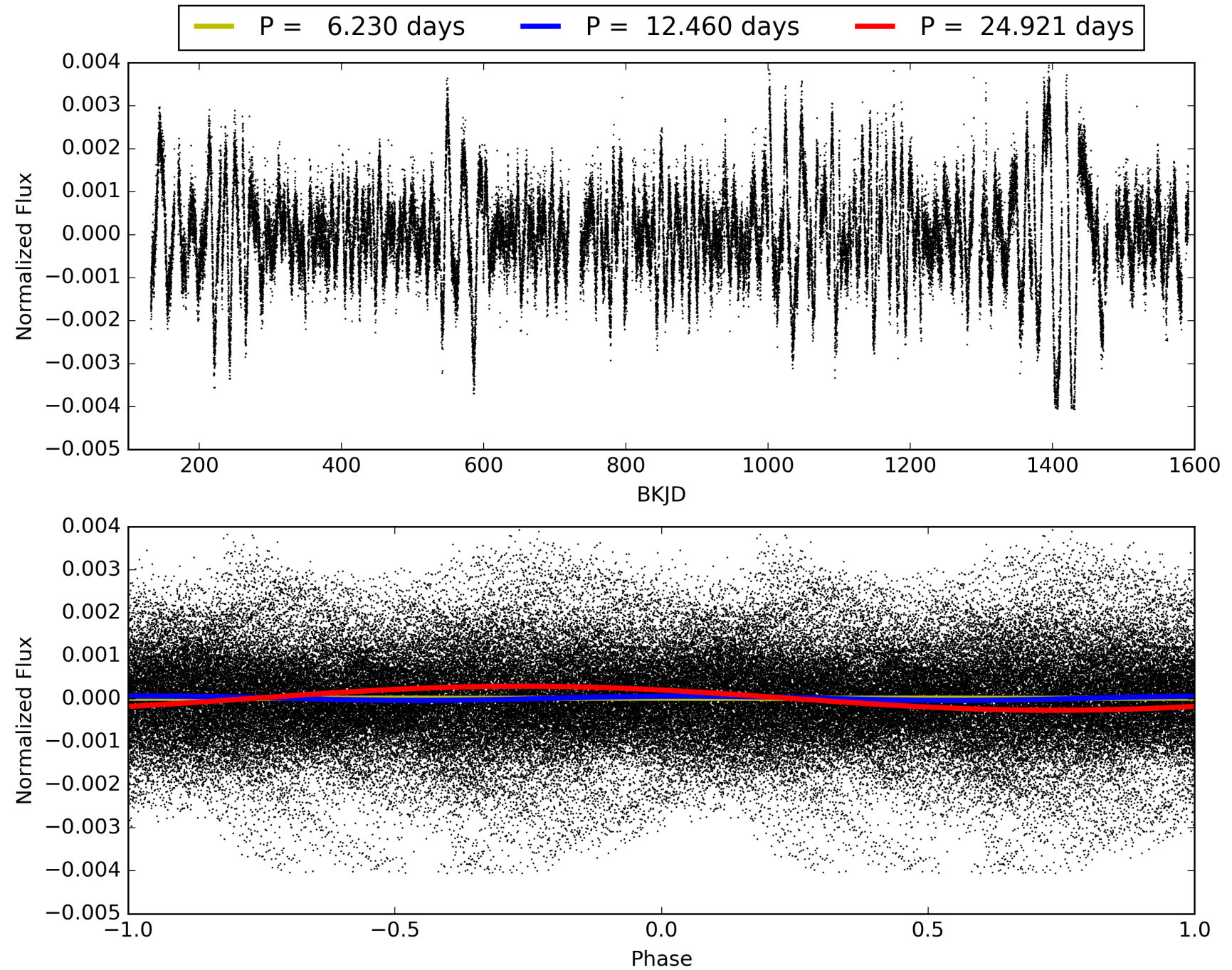
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 97.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.71e-14  
RollingBand-fgt: 1.00 [100/100]  
GhostDiagnostic-chr: -1.16  
Centroid-sig: 16.5%  
Centroid-so: 2.567 arcsec [1.92σ]  
OotOffset-rm: 0.747 arcsec [0.69σ]  
KicOffset-rm: 0.753 arcsec [0.78σ]  
OotOffset-st: 3/3/2/4 [12]  
KicOffset-st: 3/3/2/4 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012416597-01, PDC Light Curves

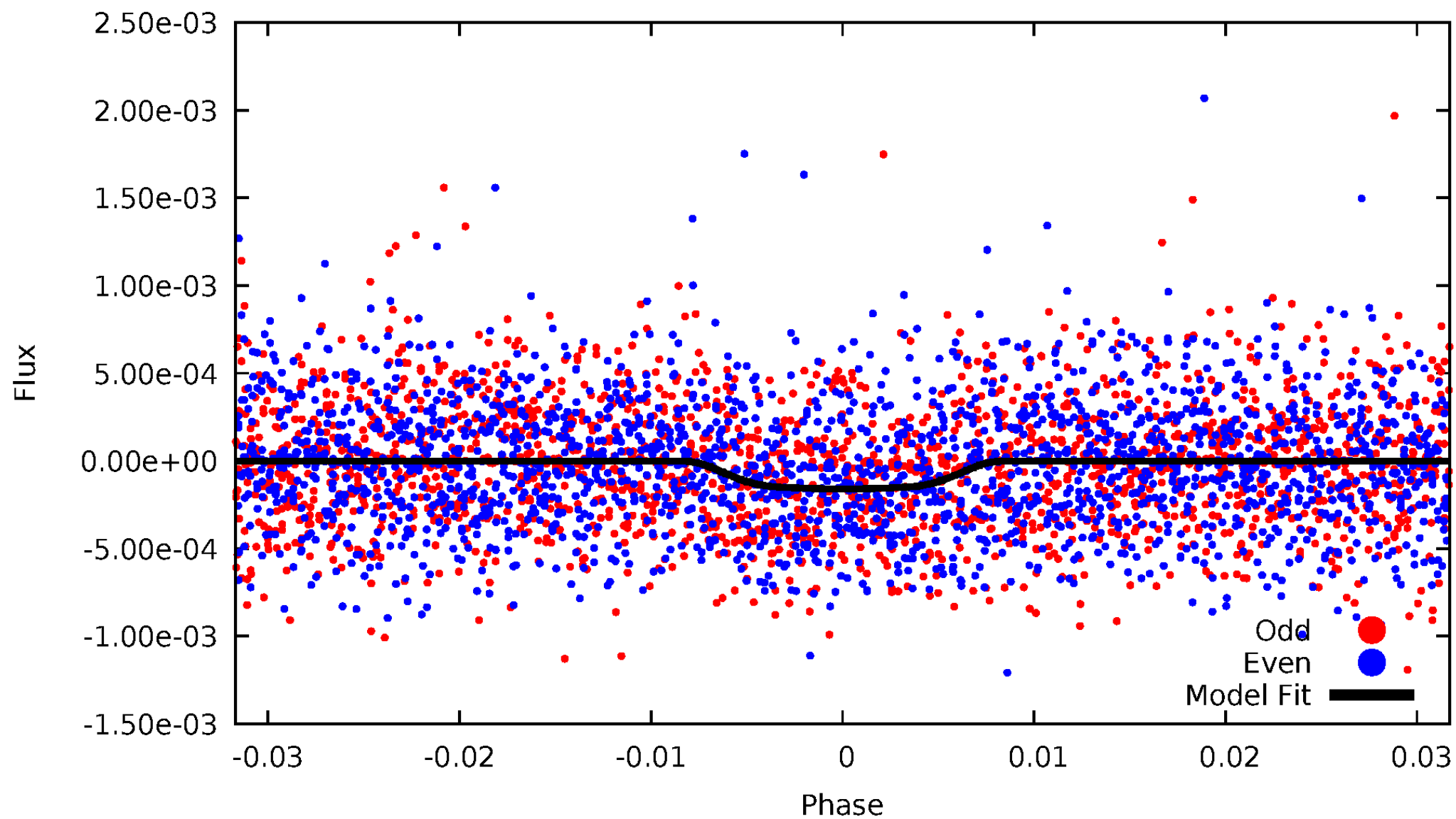


# TCE 012416597-01



DV Odd/Even

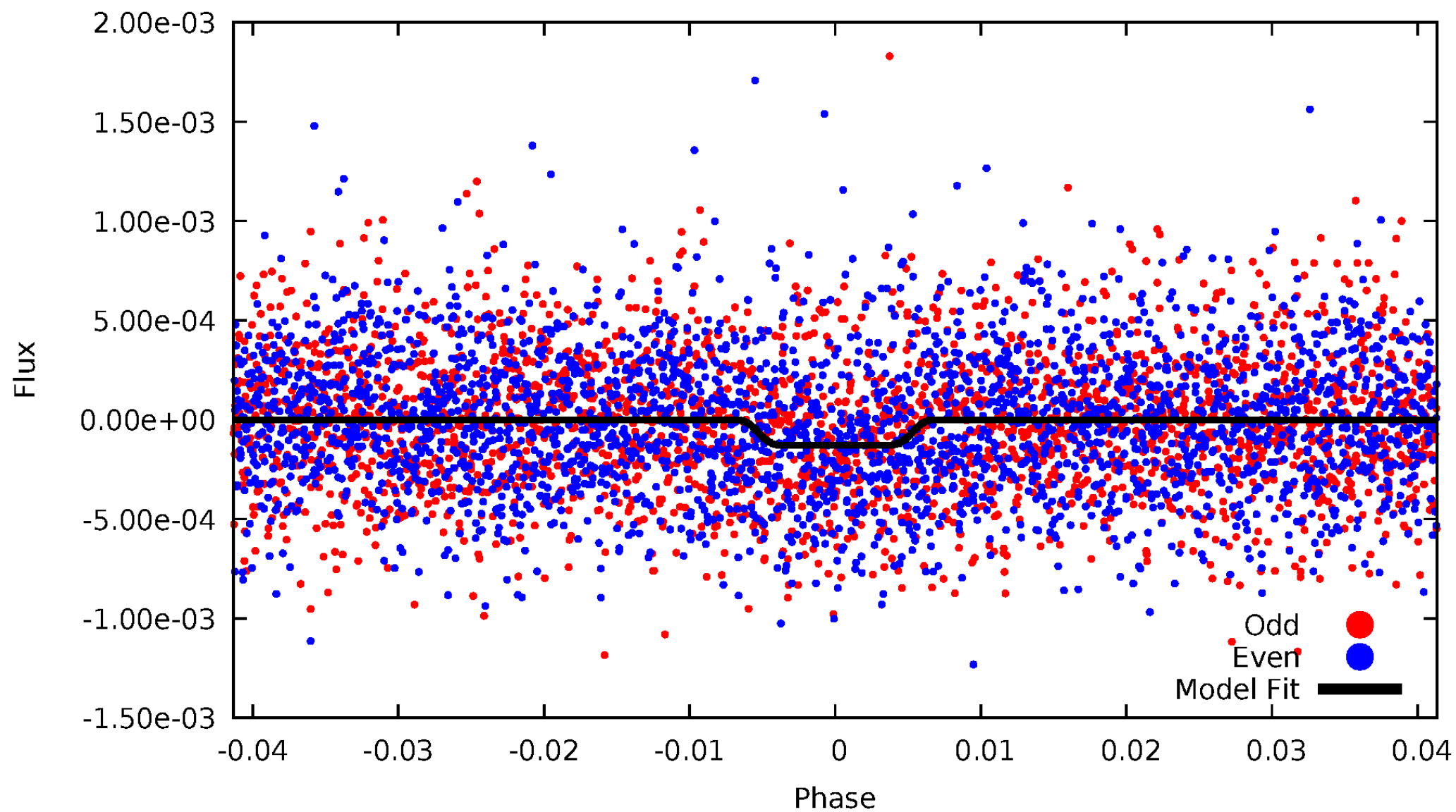
TCE 012416597-01



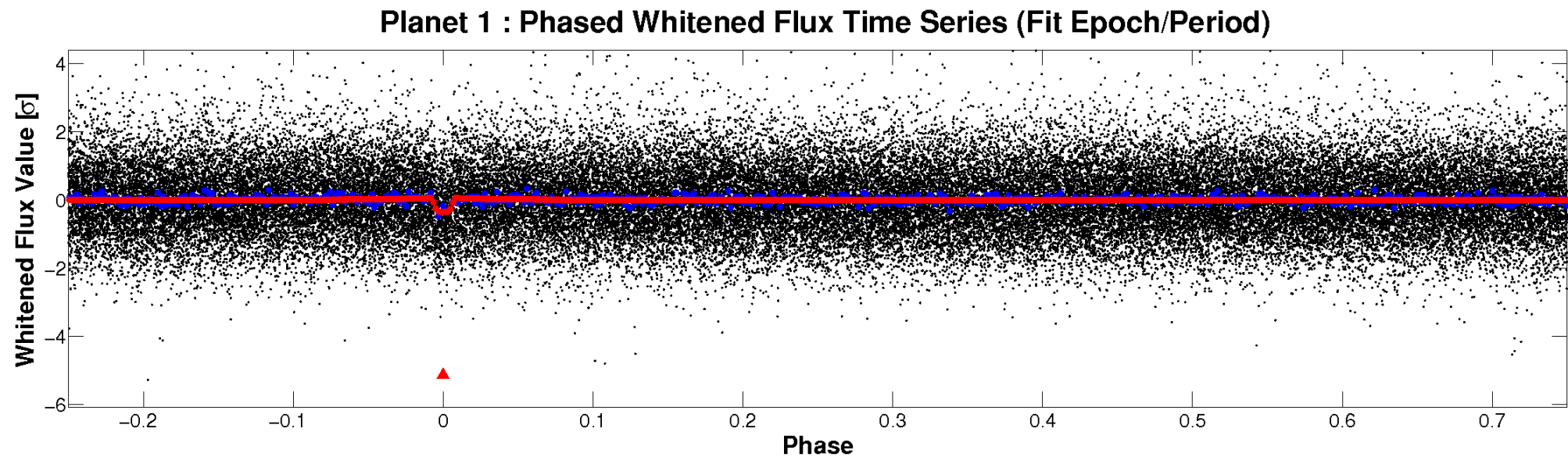
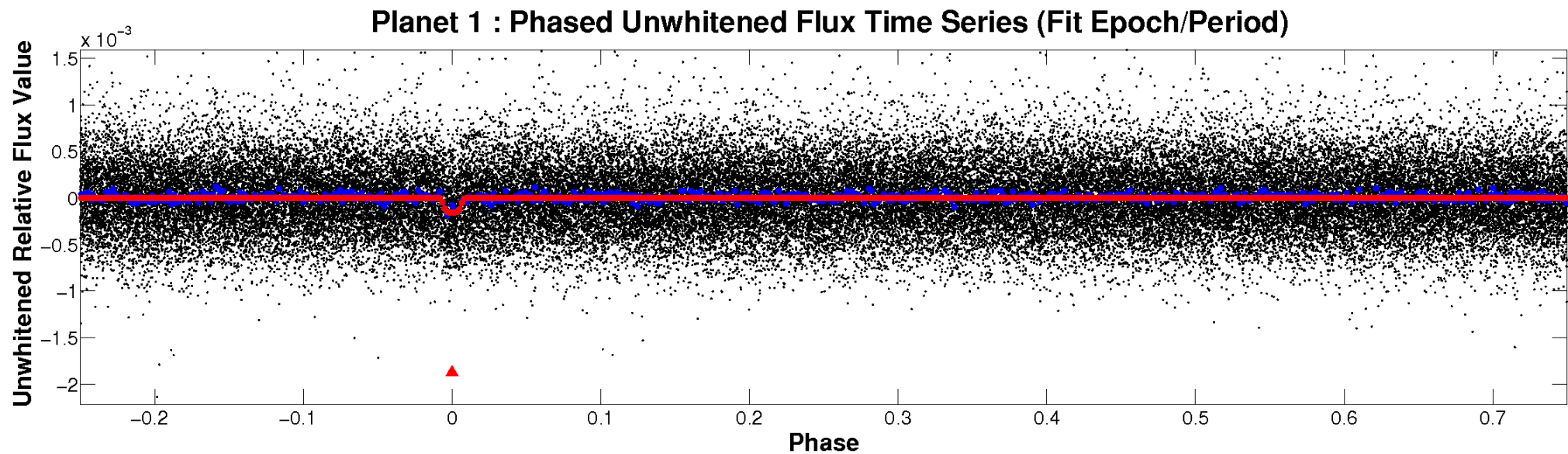


# ALT Odd/Even

TCE 012416597-01

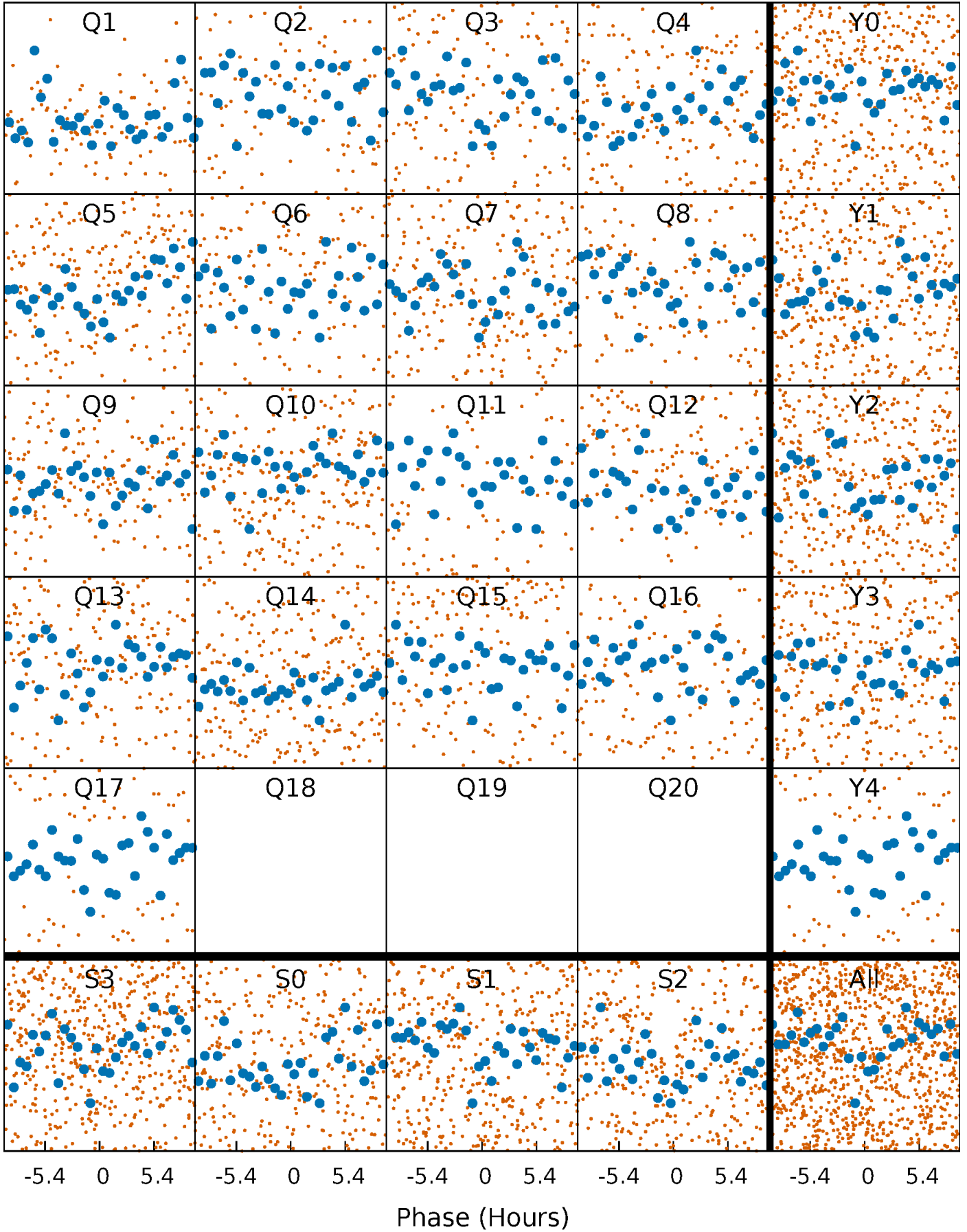


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

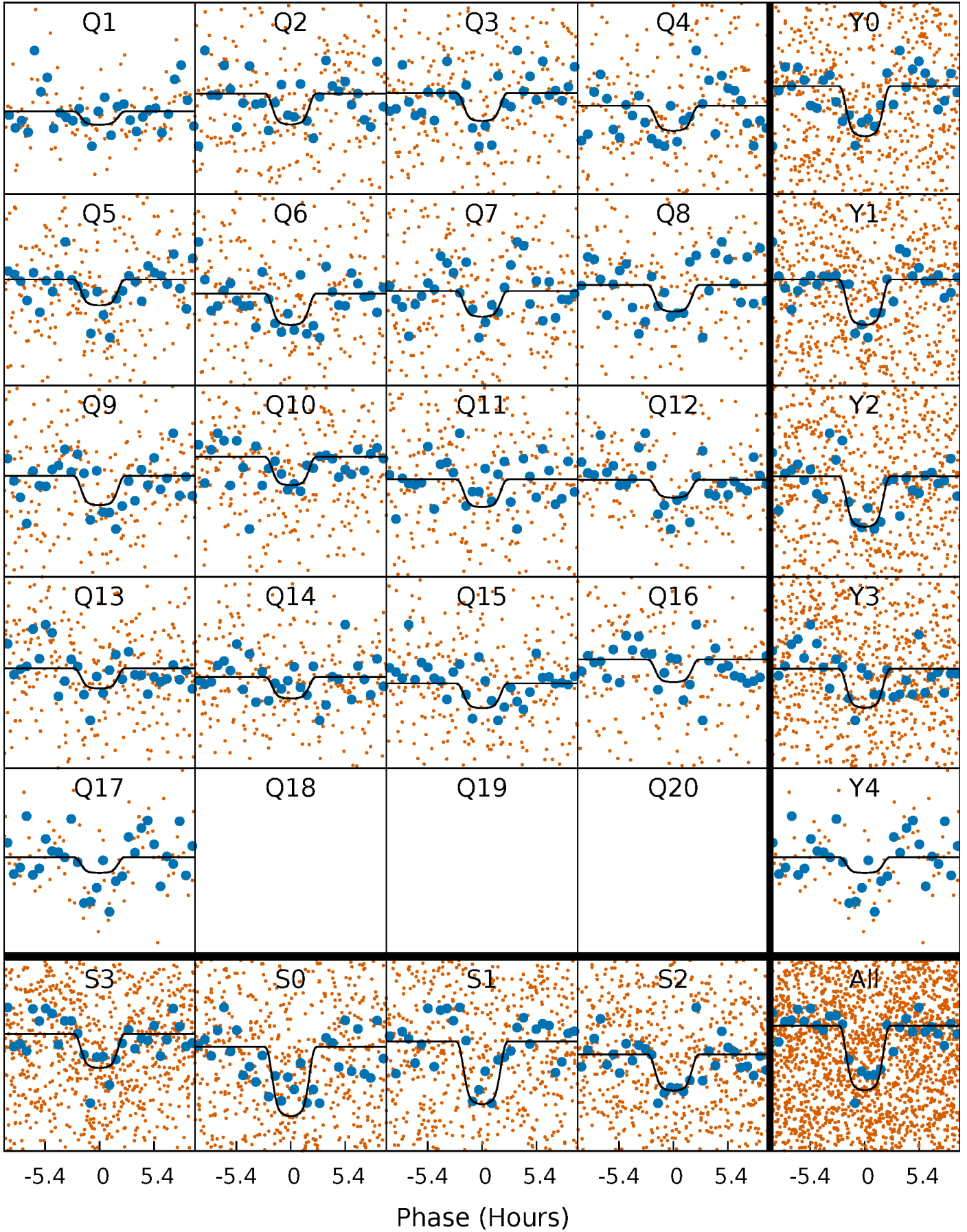
TCE 012416597-01 P= 12.460412 Days  $T_0=139.234091$  (BKJD)





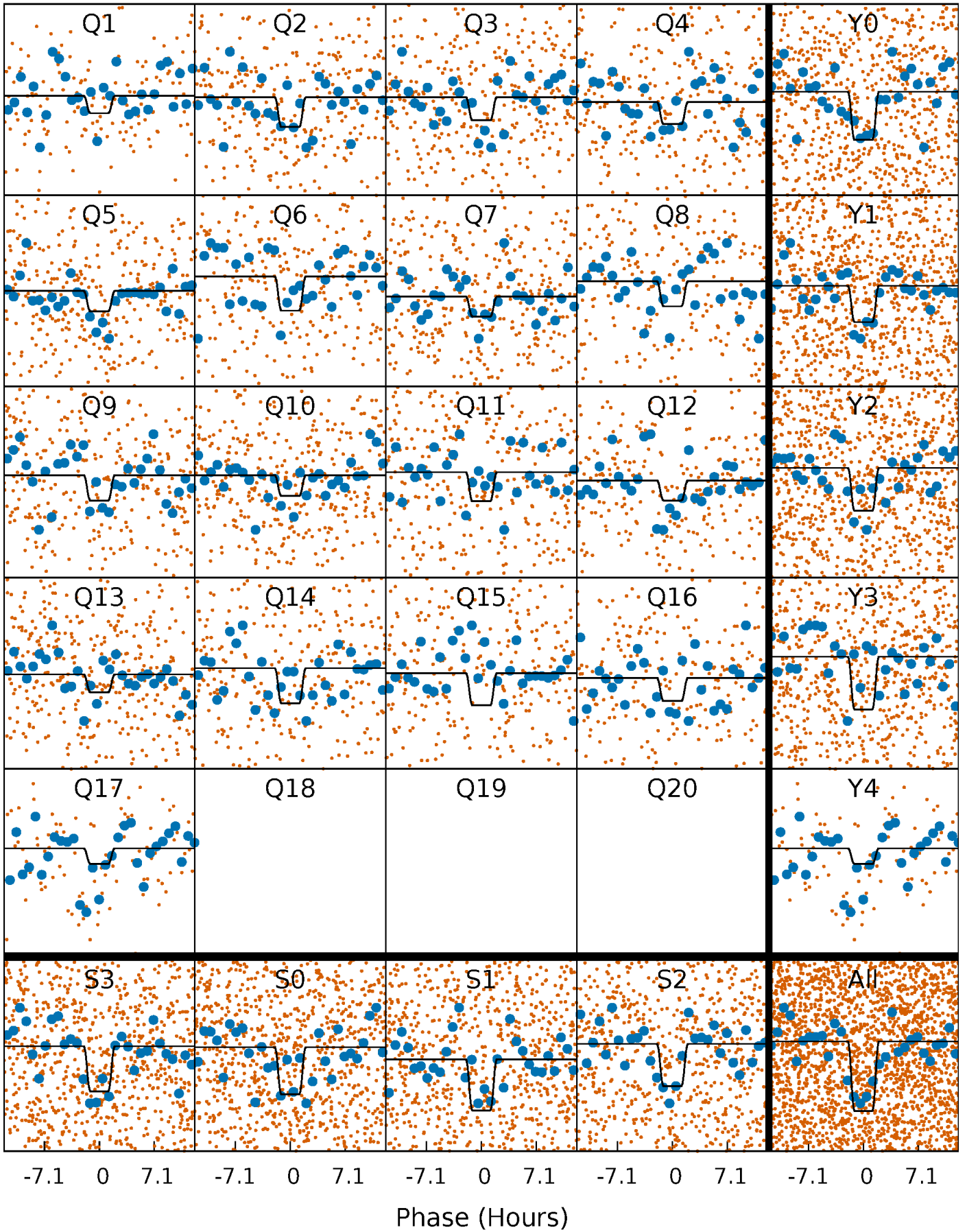
# DV Quarter-Phased Transit Curves

TCE 012416597-01 P= 12.460412 Days  $T_0=139.234091$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

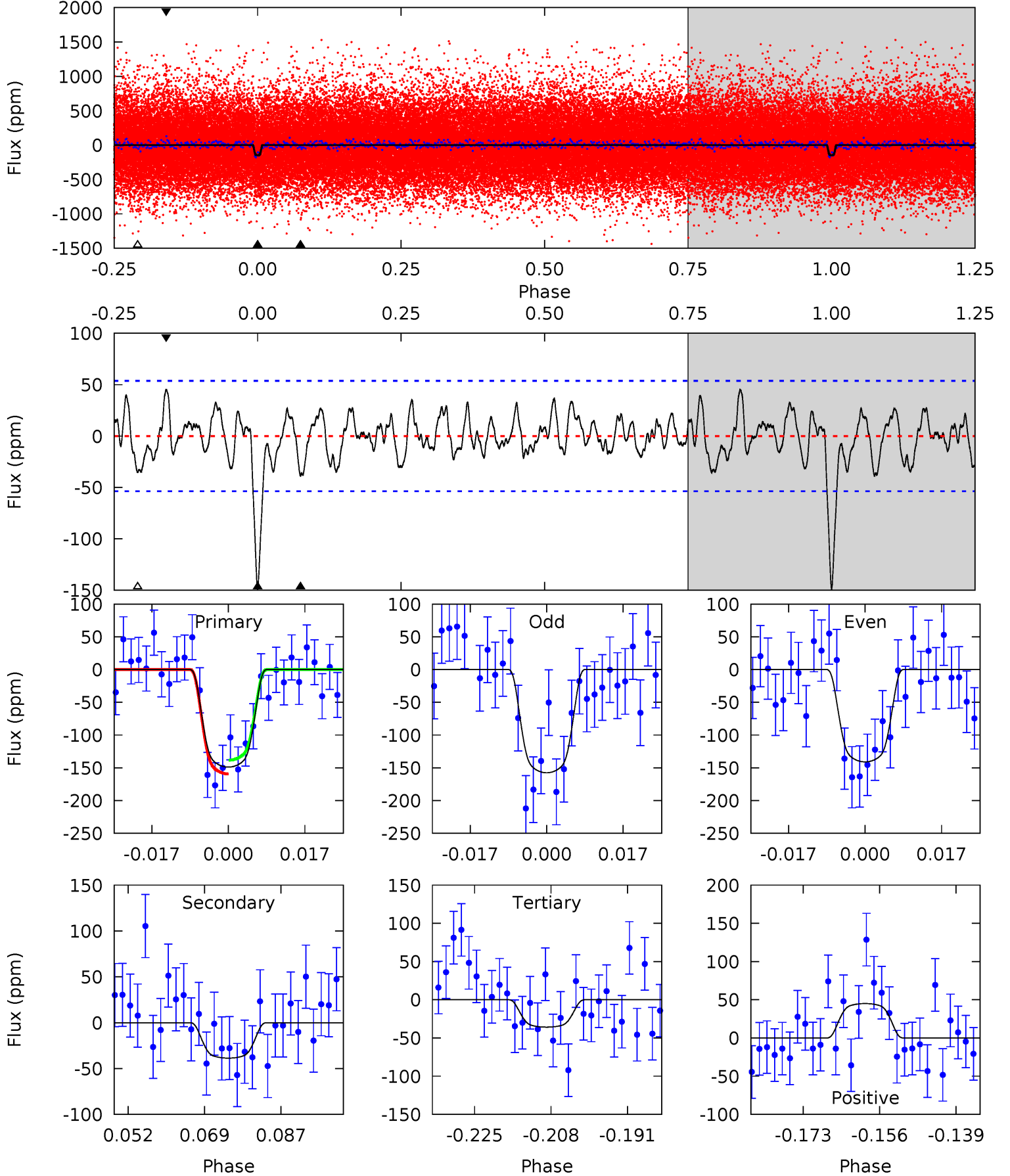
TCE 012416597-01   P= 12.460984 Days    $T_0=139.213644$  (BKJD)



# DV Model-Shift Uniqueness Test

012416597-01, P = 12.460412 Days, E = 126.773679 Days

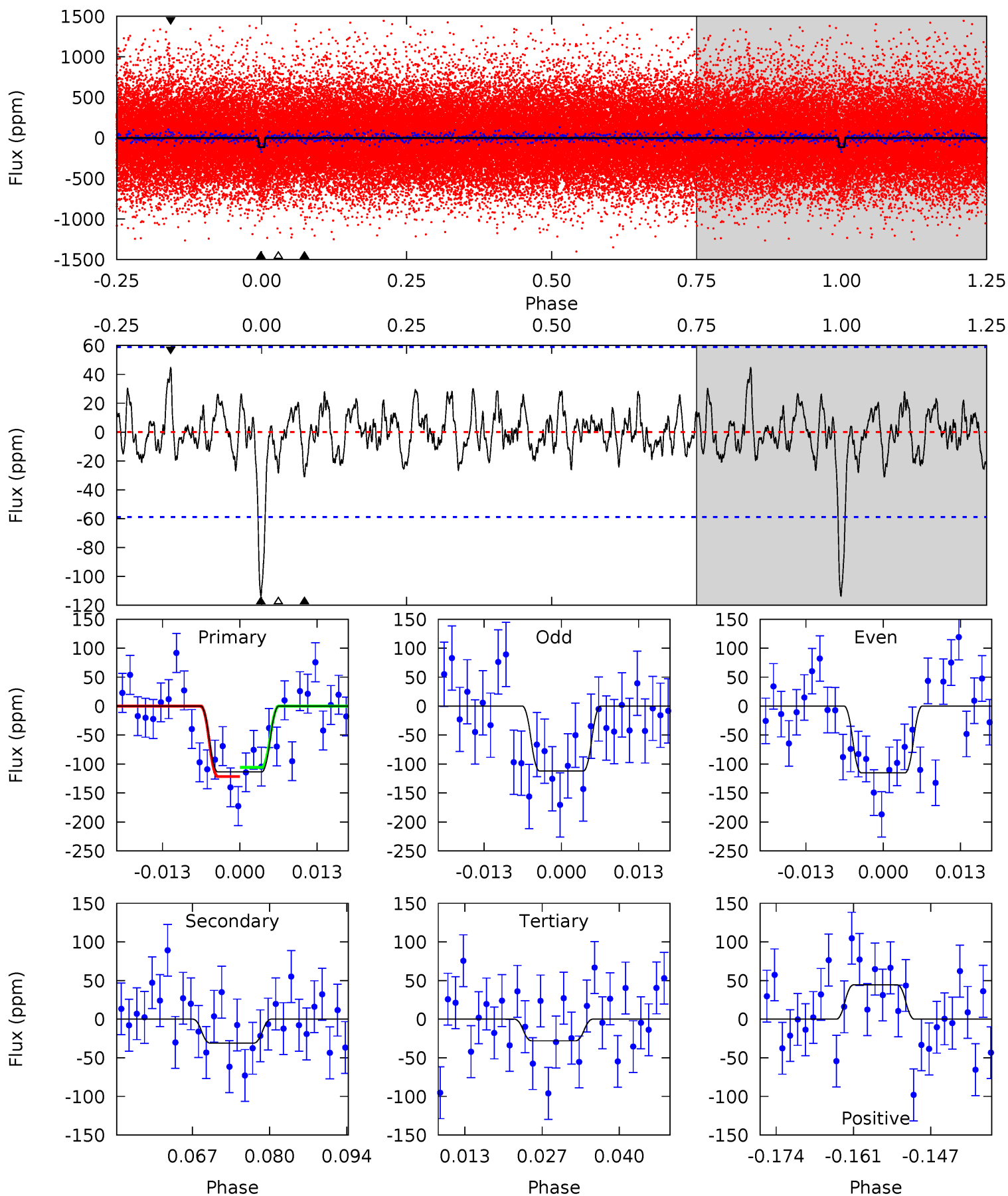
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	3.54	3.28	4.13	4.92	2.38	1.49	10.4	9.52	0.26	-0.59	0.76	0.88	0.23	0.96



# Alt Model-Shift Uniqueness Test

012416597-01,  $P = 12.460984$  Days,  $E = 126.752660$  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
9.59	2.61	2.37	3.75	4.97	2.47	1.07	7.22	5.85	0.24	-1.14	0.13	0.88	0.28	0.67



### Stellar Parameters For KIC 012416597

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5435^{+81}_{-81}$	$4.453^{+0.076}_{-0.085}$	$0.120^{+0.150}_{-0.150}$	$0.933^{+0.100}_{-0.073}$	$0.901^{+0.055}_{-0.041}$	$1.565^{+0.438}_{-0.406}$
	+1%/-1%	+2%/-2%	+125%/-125%	+11%/-8%	+6%/-5%	+28%/-26%
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 012416597-01 / KOI 4895.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-39 \pm 11$	$1.63^{+0.19}_{-0.20}$	$1015^{+35}_{-29}$	$3776^{+231}_{-231}$	$83^{+36}_{-26}$
Alt.	$-31 \pm 12$	$1.15^{+0.17}_{-0.15}$	$1017^{+29}_{-31}$	$4079^{+360}_{-394}$	$129^{+80}_{-55}$

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



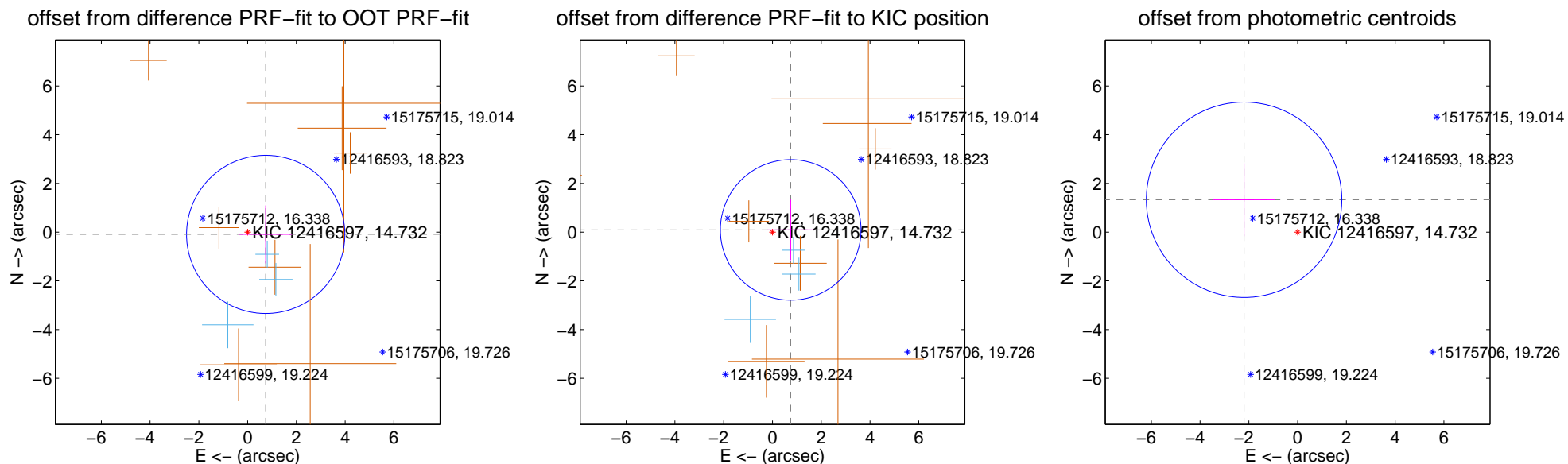
## DV Centroid Data

Supplemental centroid analysis for 012416597-01. Kepler magnitude: 14.73. Transit SNR 8.80

There are 3 quarters with good PRF difference image offsets

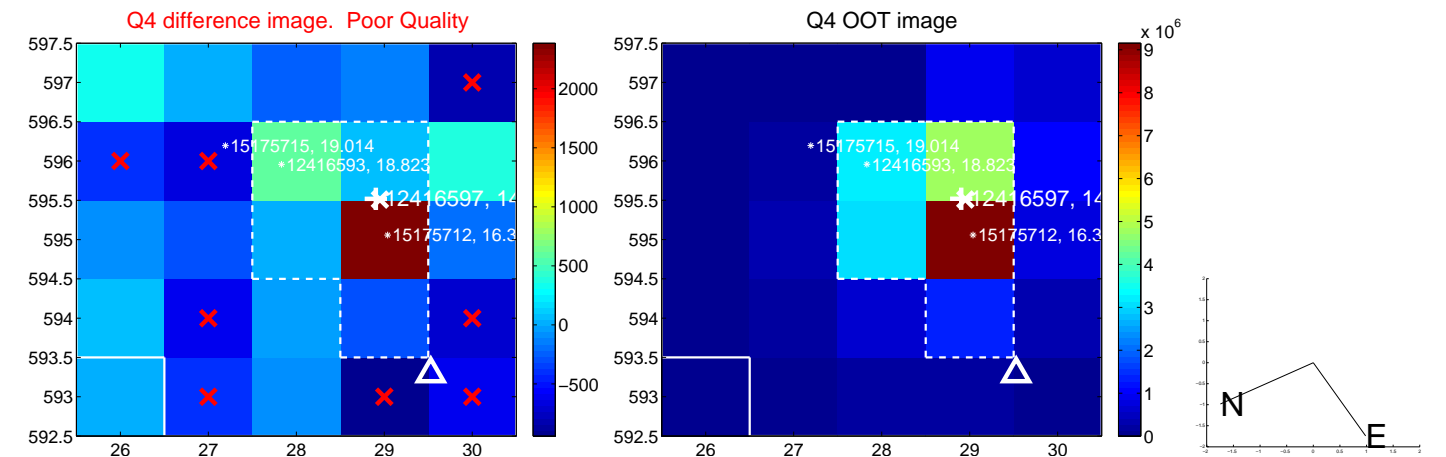
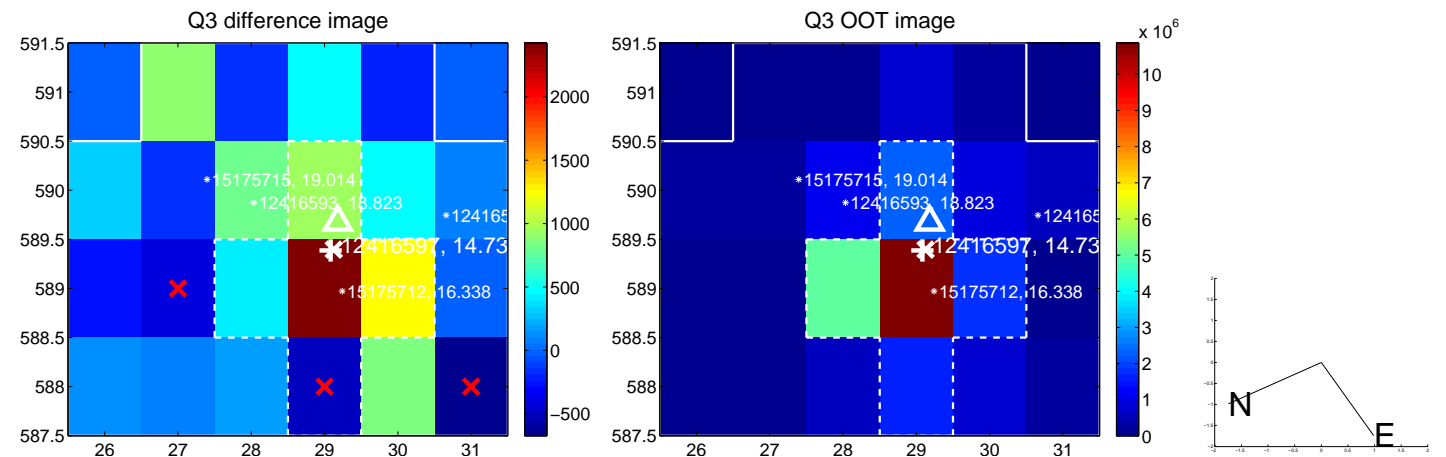
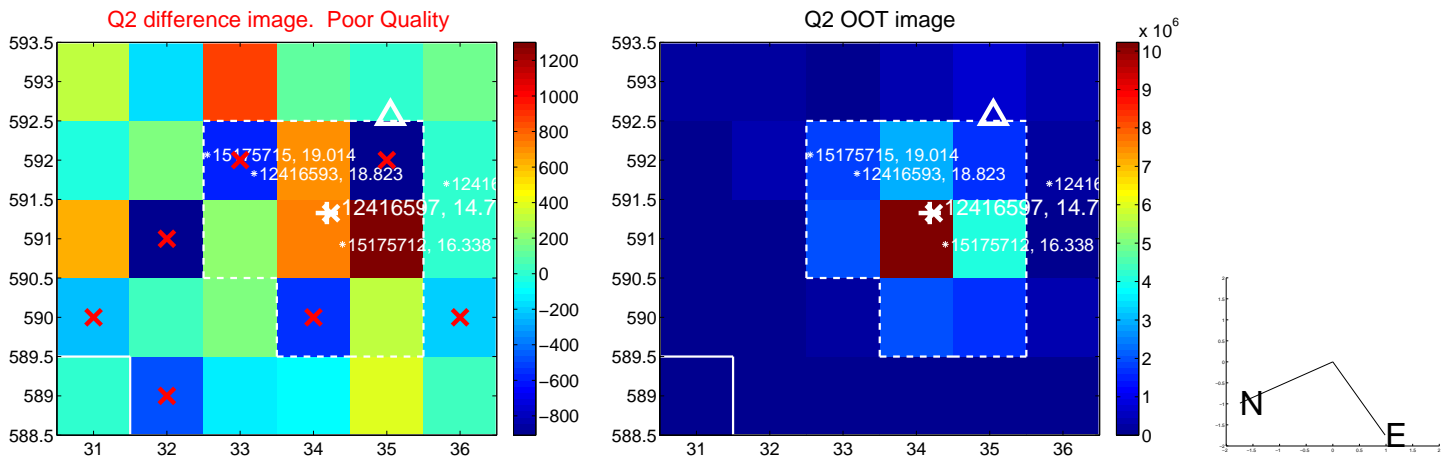
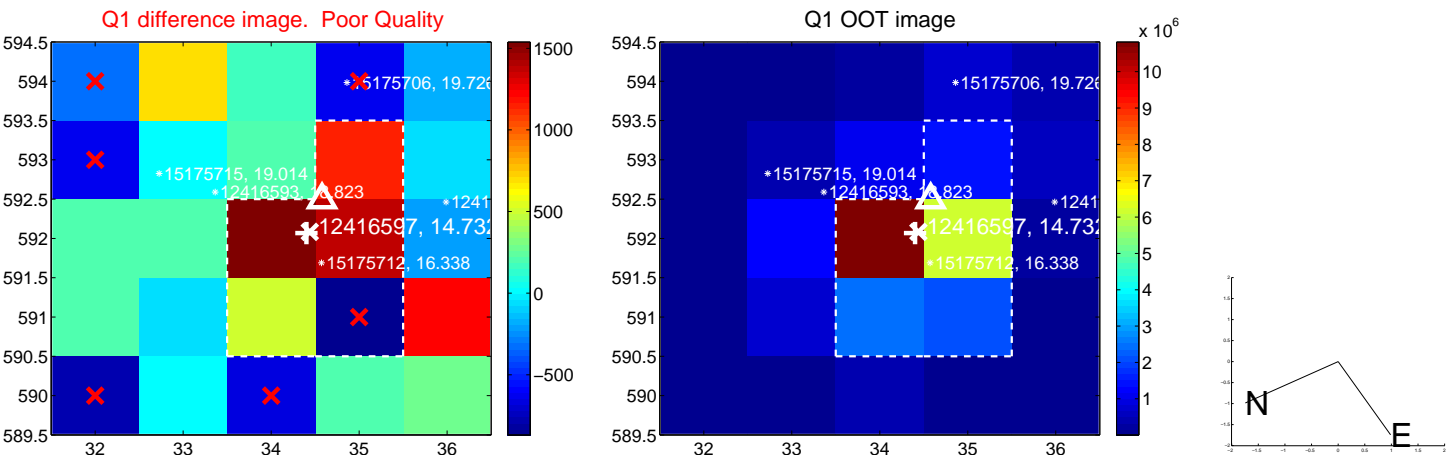
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.747 \pm 1.082$	0.69	$-0.741 \pm 1.079$	$-0.093 \pm 1.189$
PRF-fit source offset from KIC position	$0.753 \pm 0.961$	0.78	$-0.748 \pm 0.947$	$0.091 \pm 1.242$
photometric centroid source offset	$2.57 \pm 1.34$	1.92	$2.20 \pm 1.27$	$1.33 \pm 1.50$

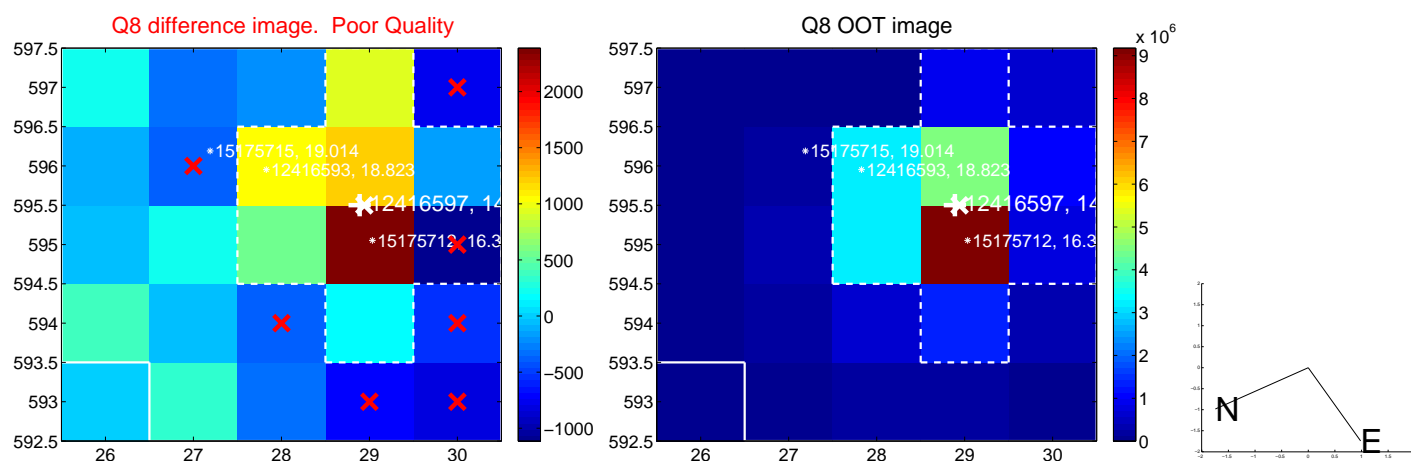
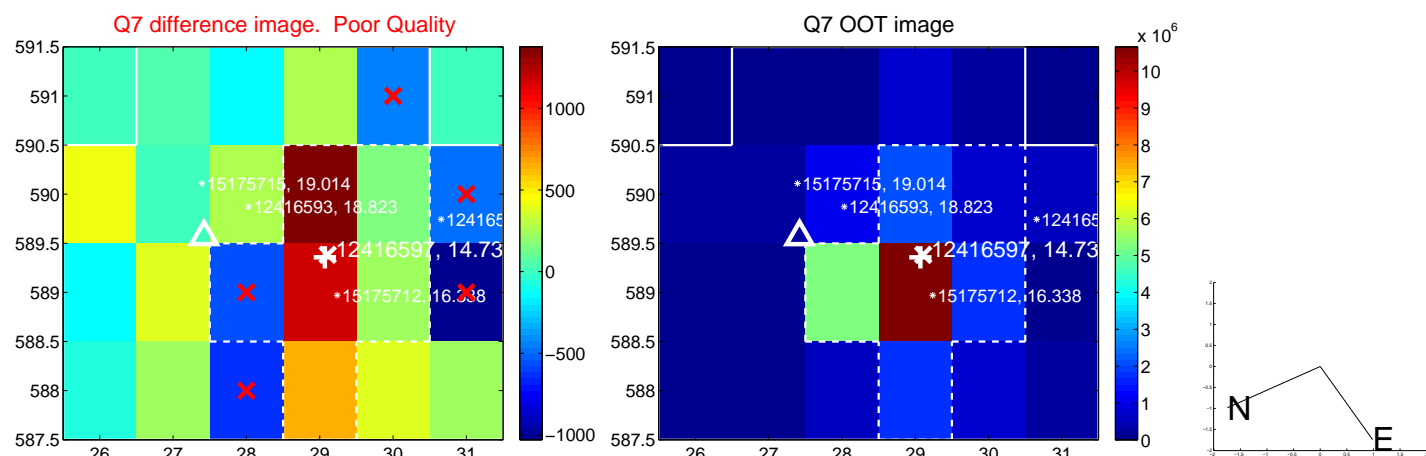
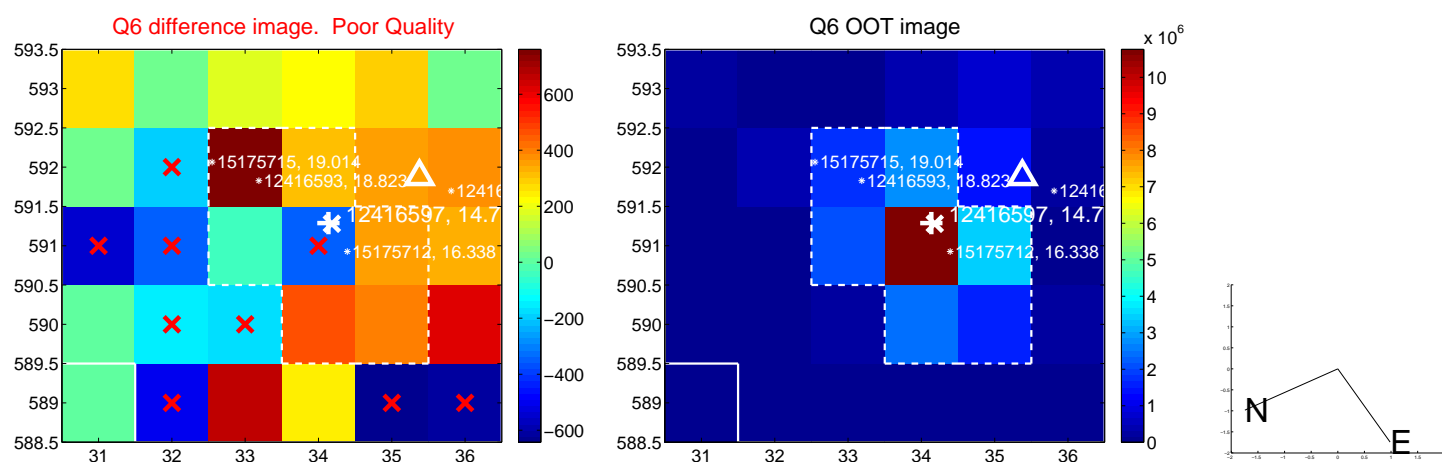
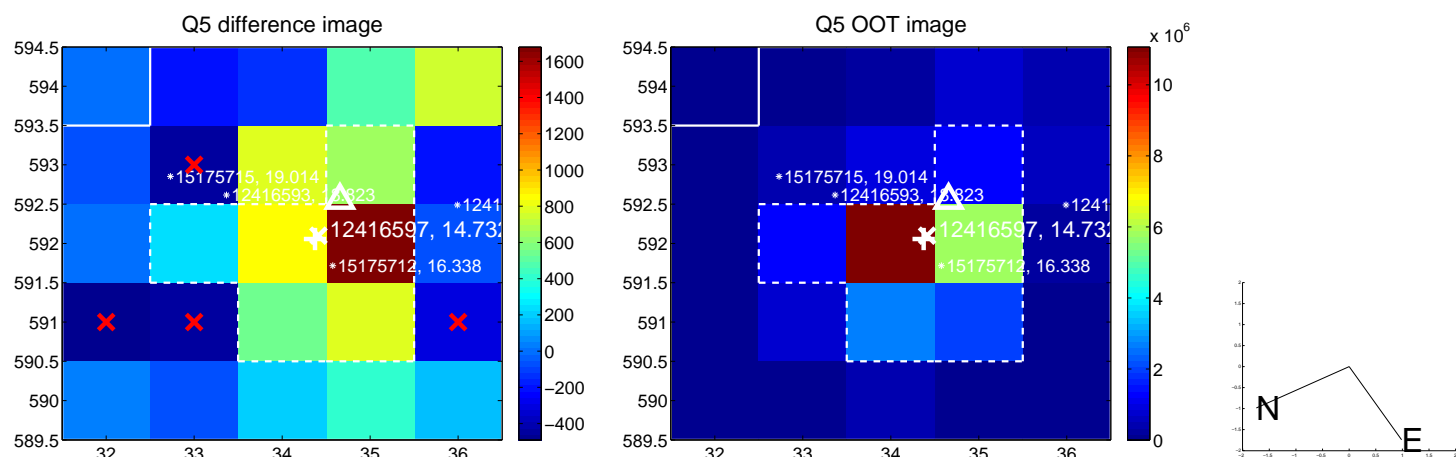


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

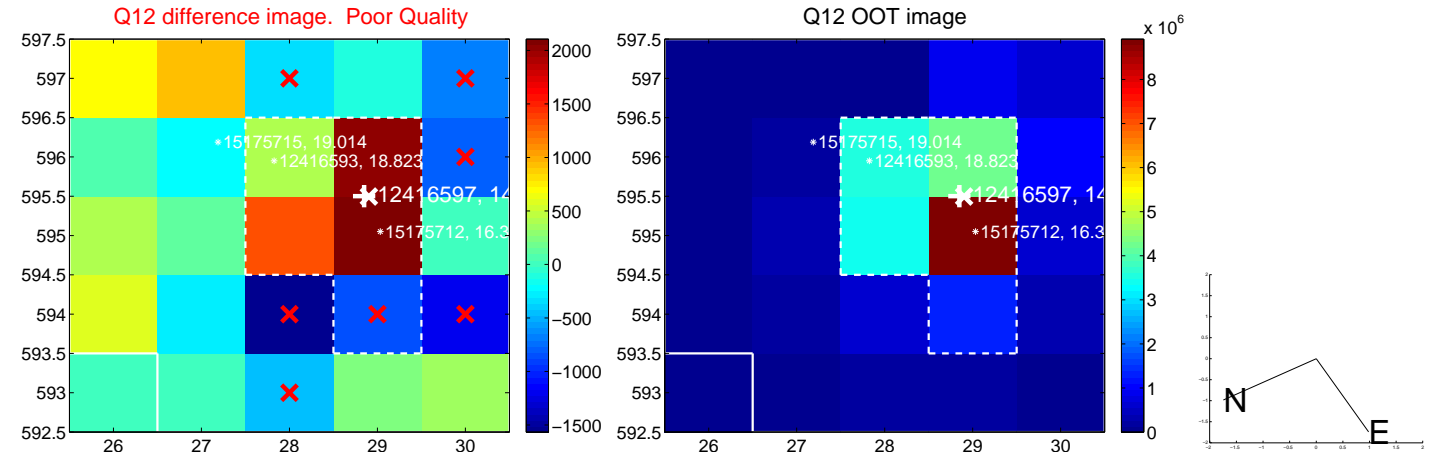
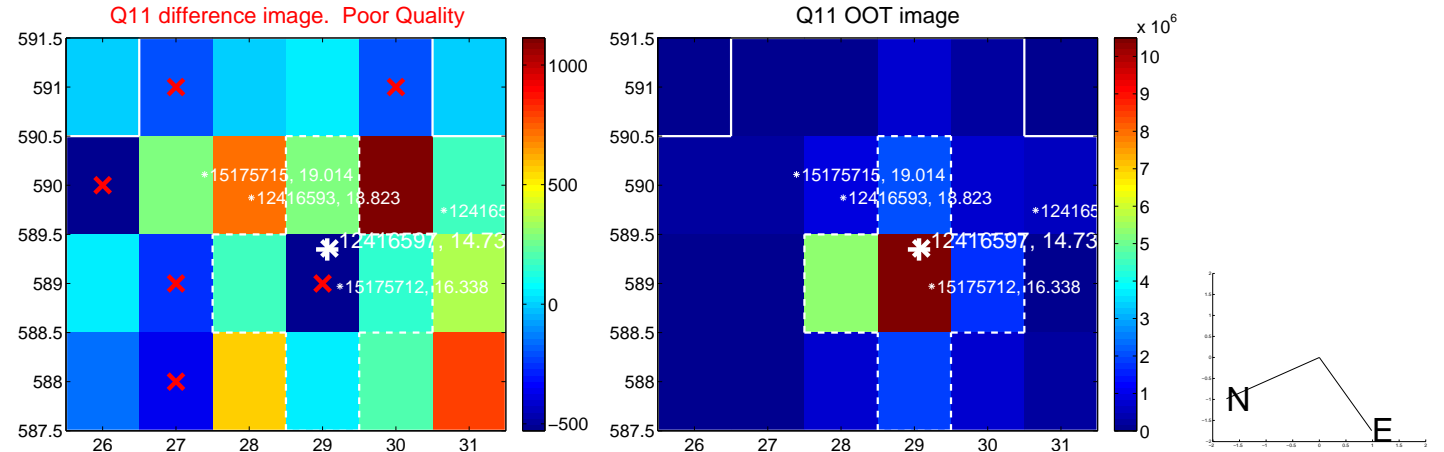
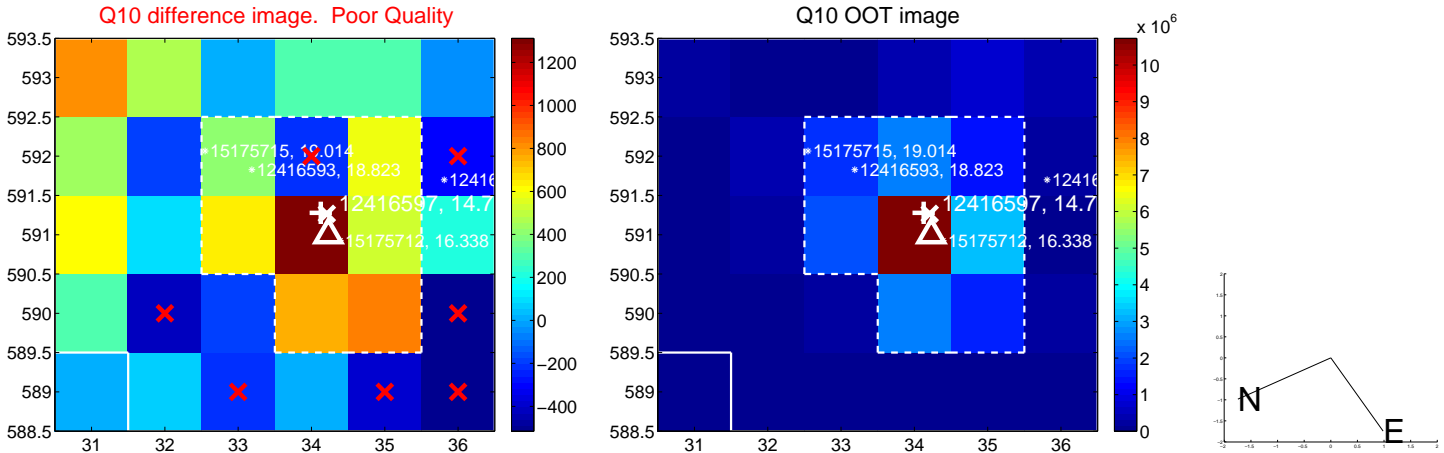
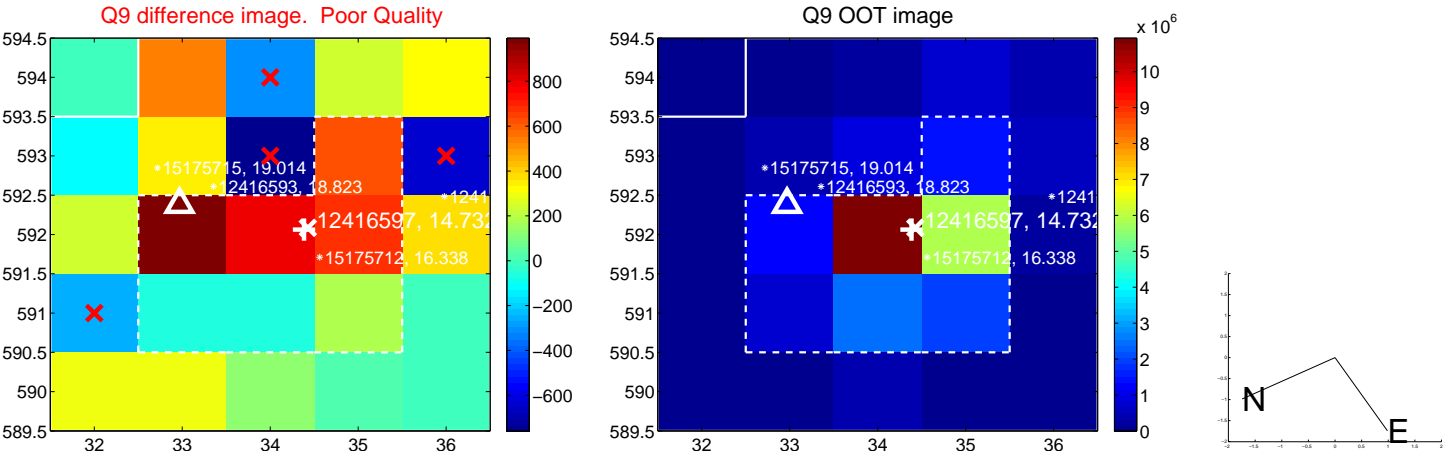
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



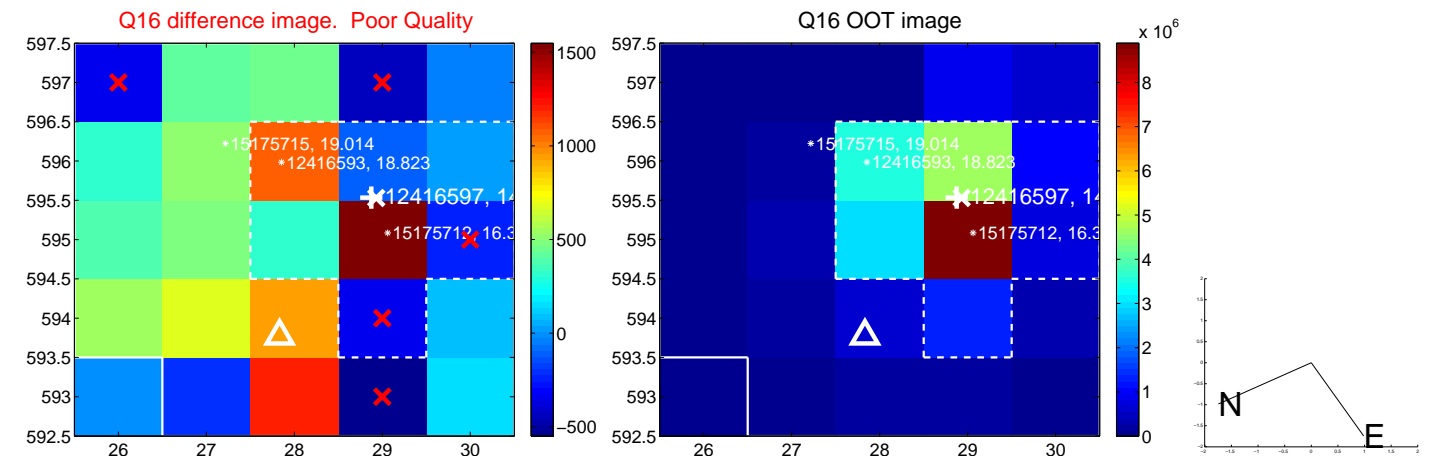
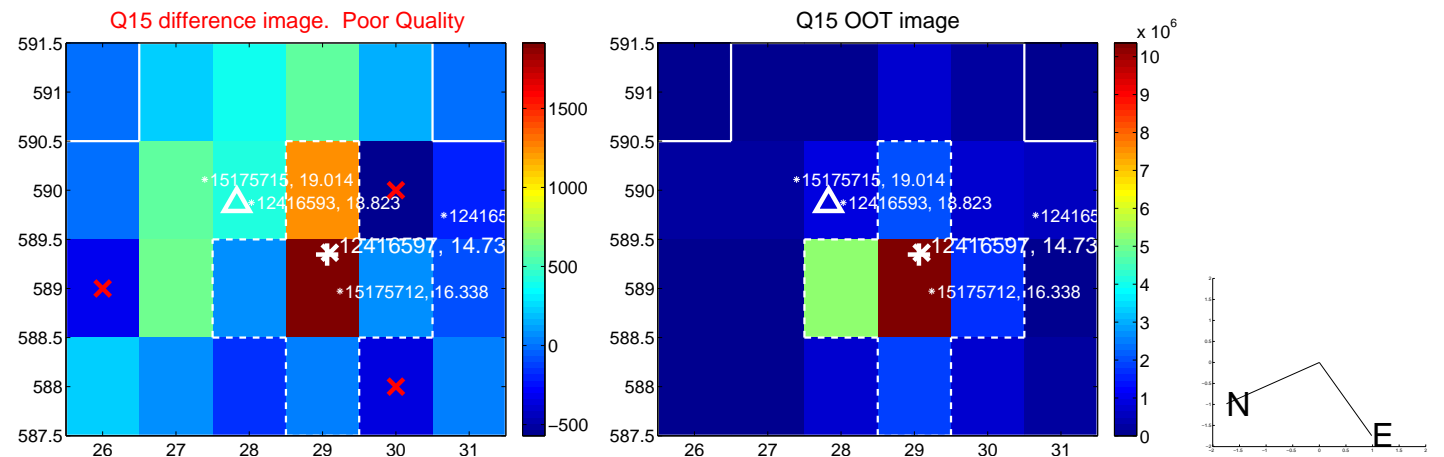
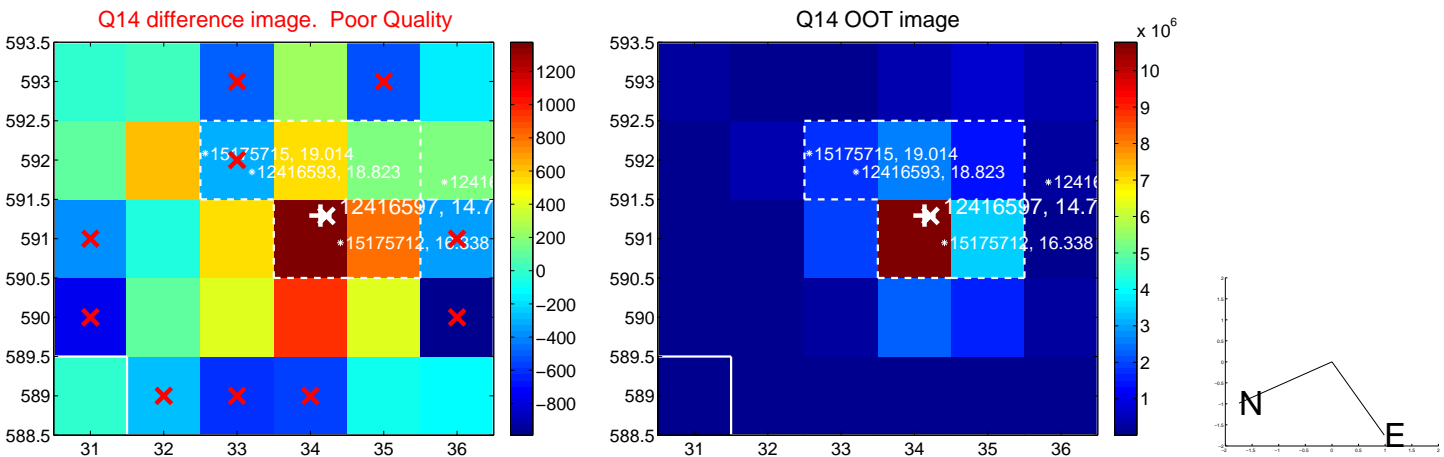
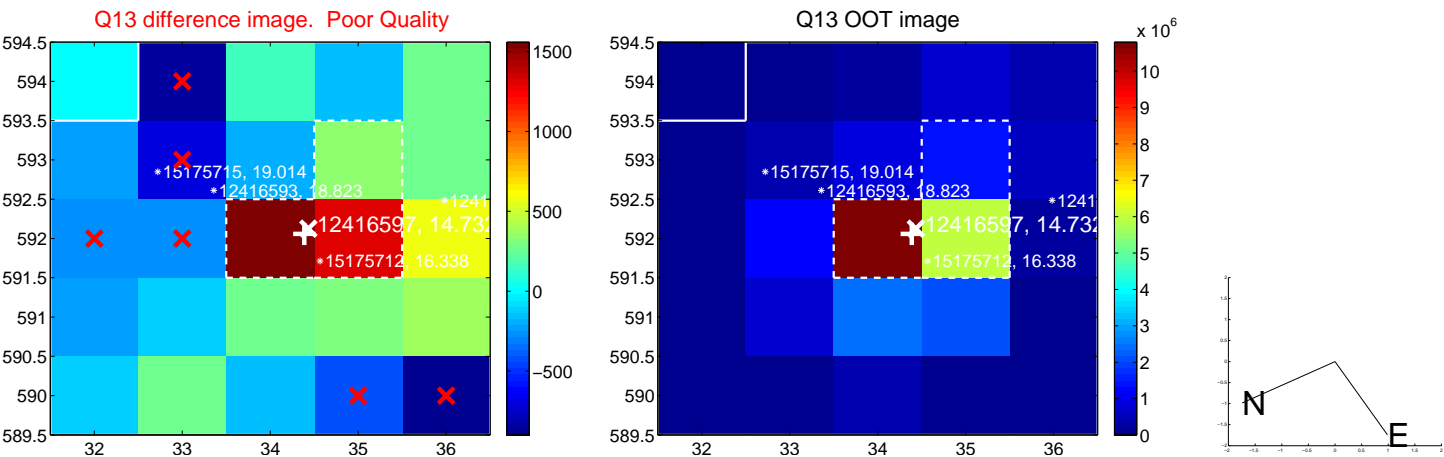
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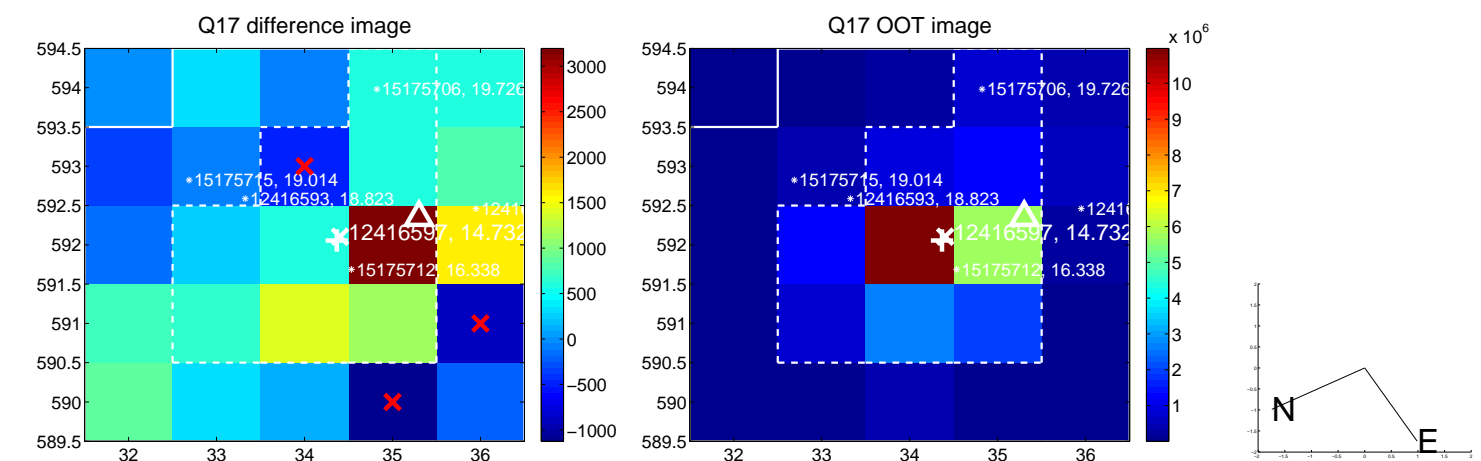


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

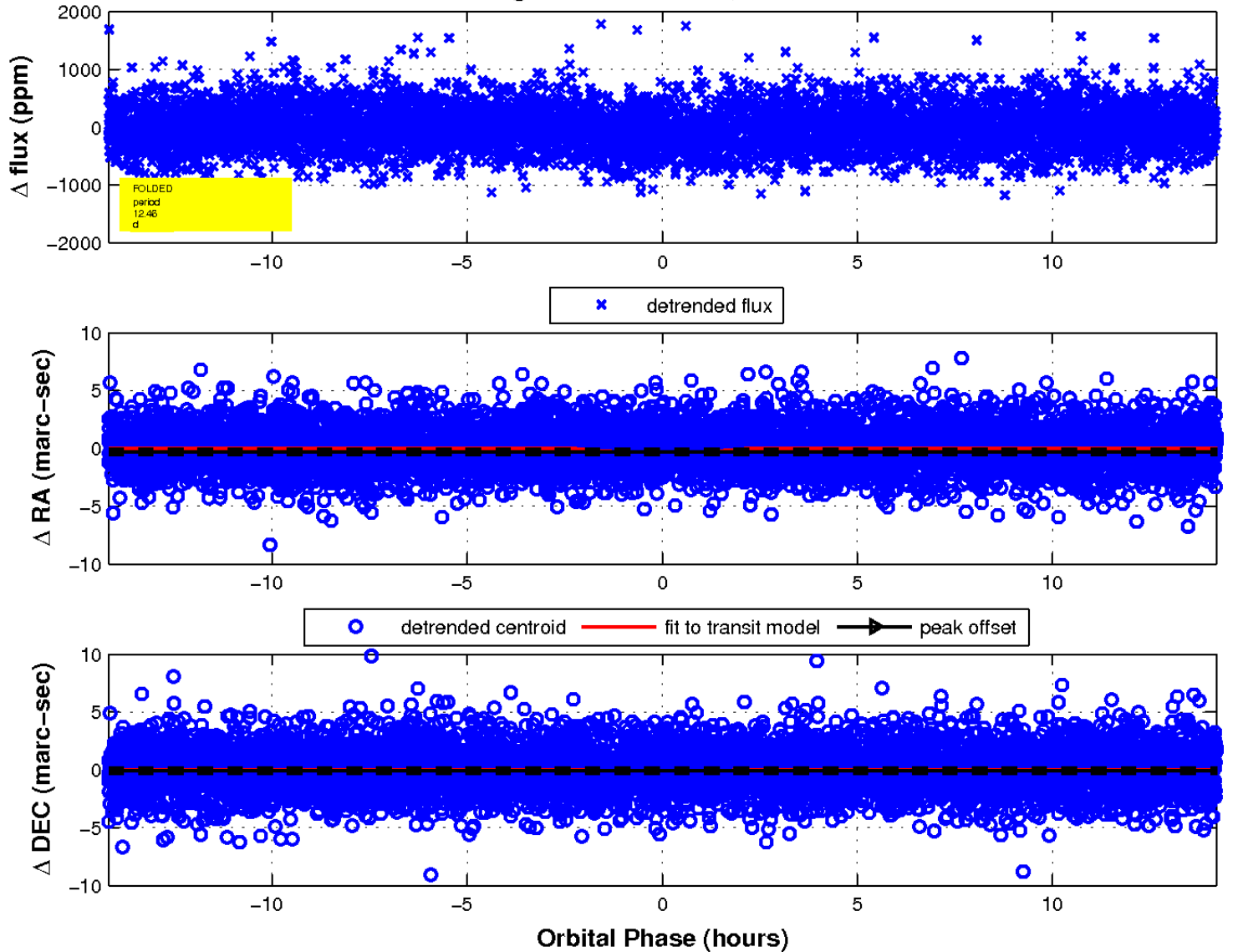




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

