

# KIC 007020234

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007020234-01	OBS	No	18.599698	146.940205	125.6	14.982	8.7	9.1	0.74	5605	1.09	29.68

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007020234-01	OBS	FP	0.00	1	0	0	0	LPP_DV

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

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

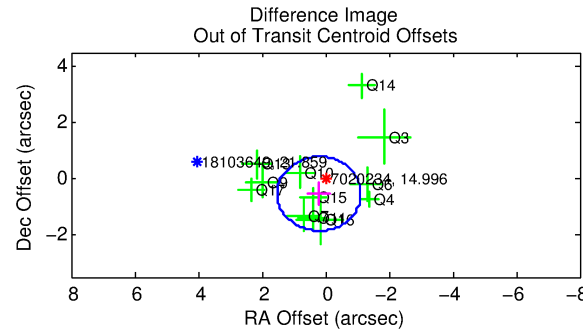
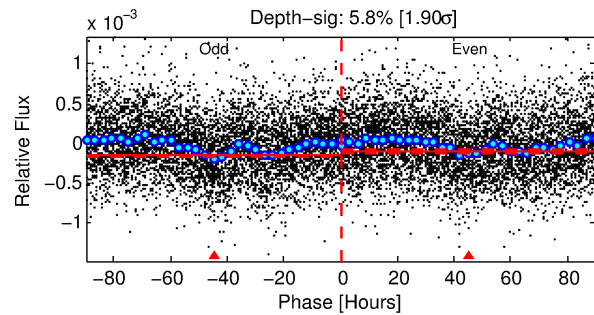
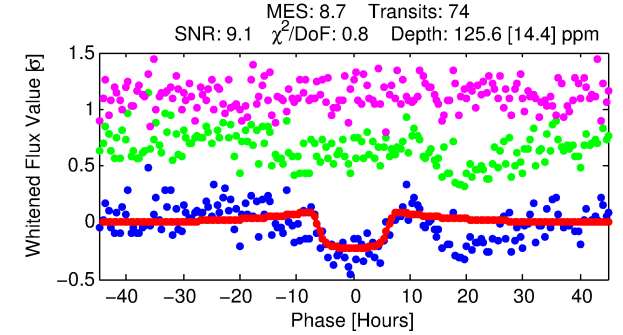
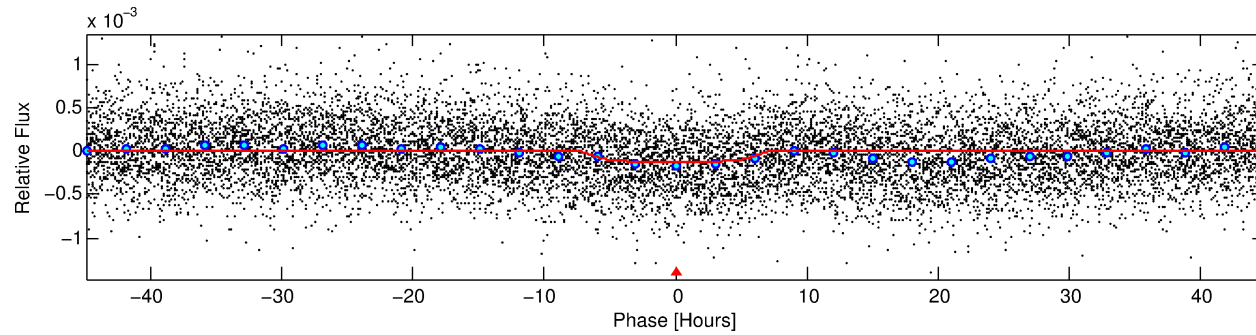
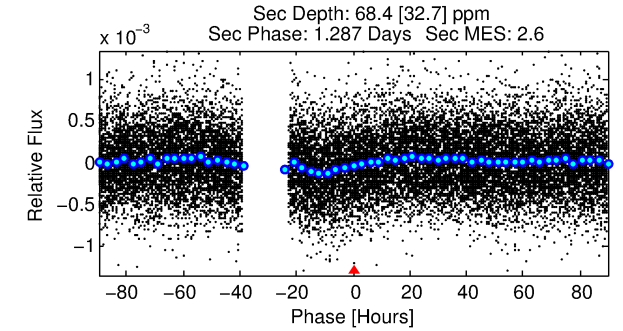
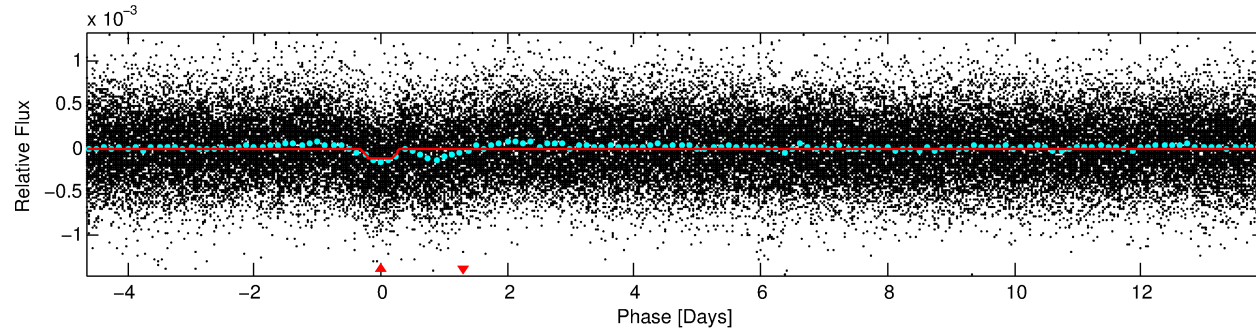
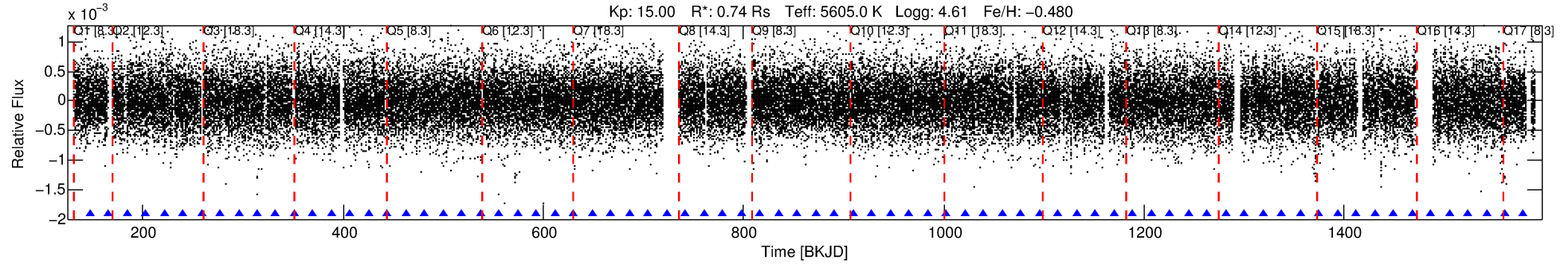
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007020234-01

No Significant Match Found

# DV One-Page Summary

KIC: 7020234 Candidate: 1 of 1 Period: 18.600 d



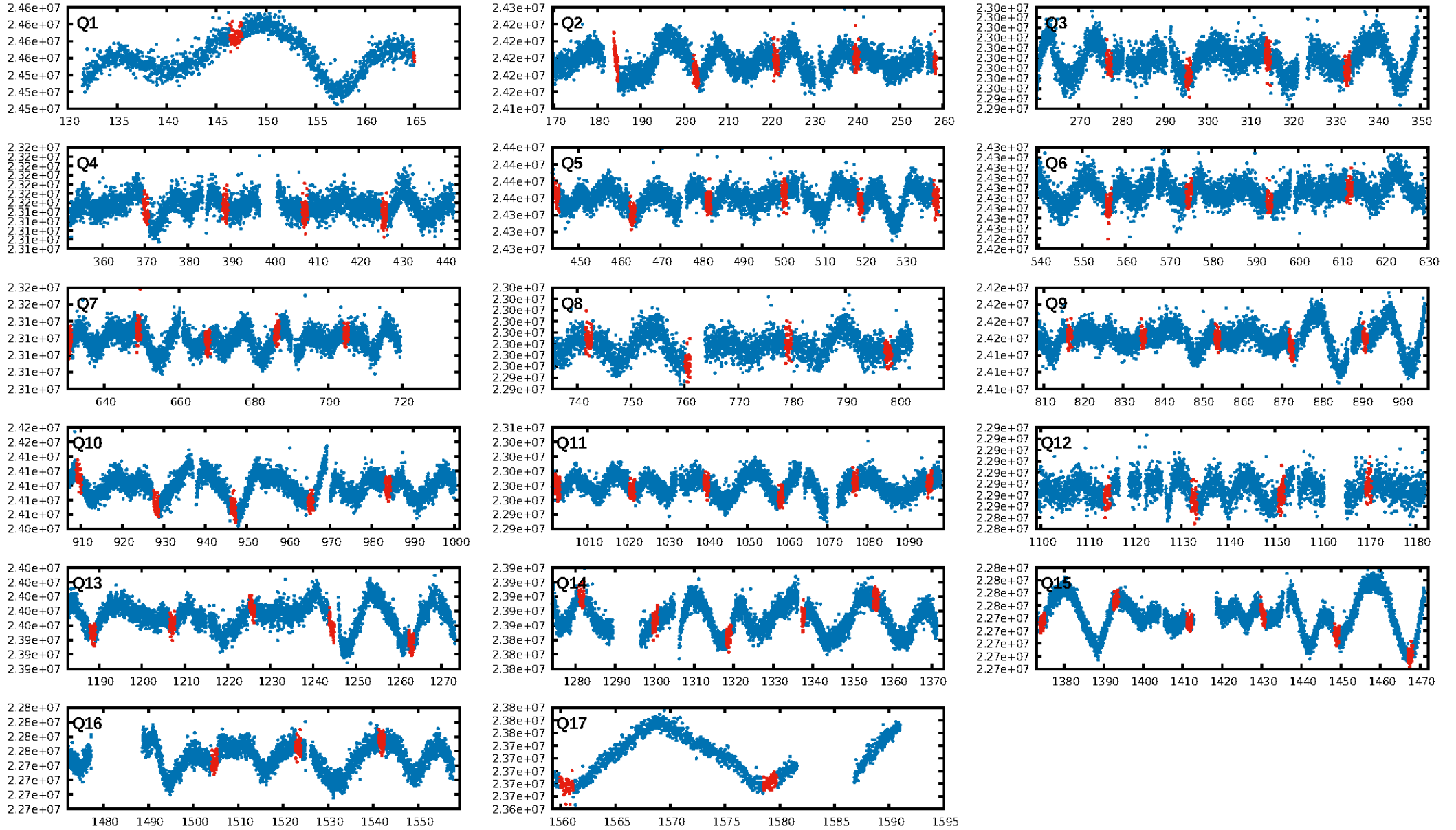
## DV Fit Results:

Period = 18.59970 [0.00062] d  
Epoch = 146.9402 [0.0275] BKJD  
Rp/R\* = 0.0135 [0.0011]  
a/R\* = 3.01 [0.71]  
b = 0.97 [0.02]  
Seff = 29.68 [8.20]  
Teff = 595 [41] K  
Rp = 1.09 [0.24] Re  
a = 0.1279 [0.0219] AU  
Ag = 514.48 [289.67] [1.77σ]  
Teffp = 4382 [569] K [6.64σ]

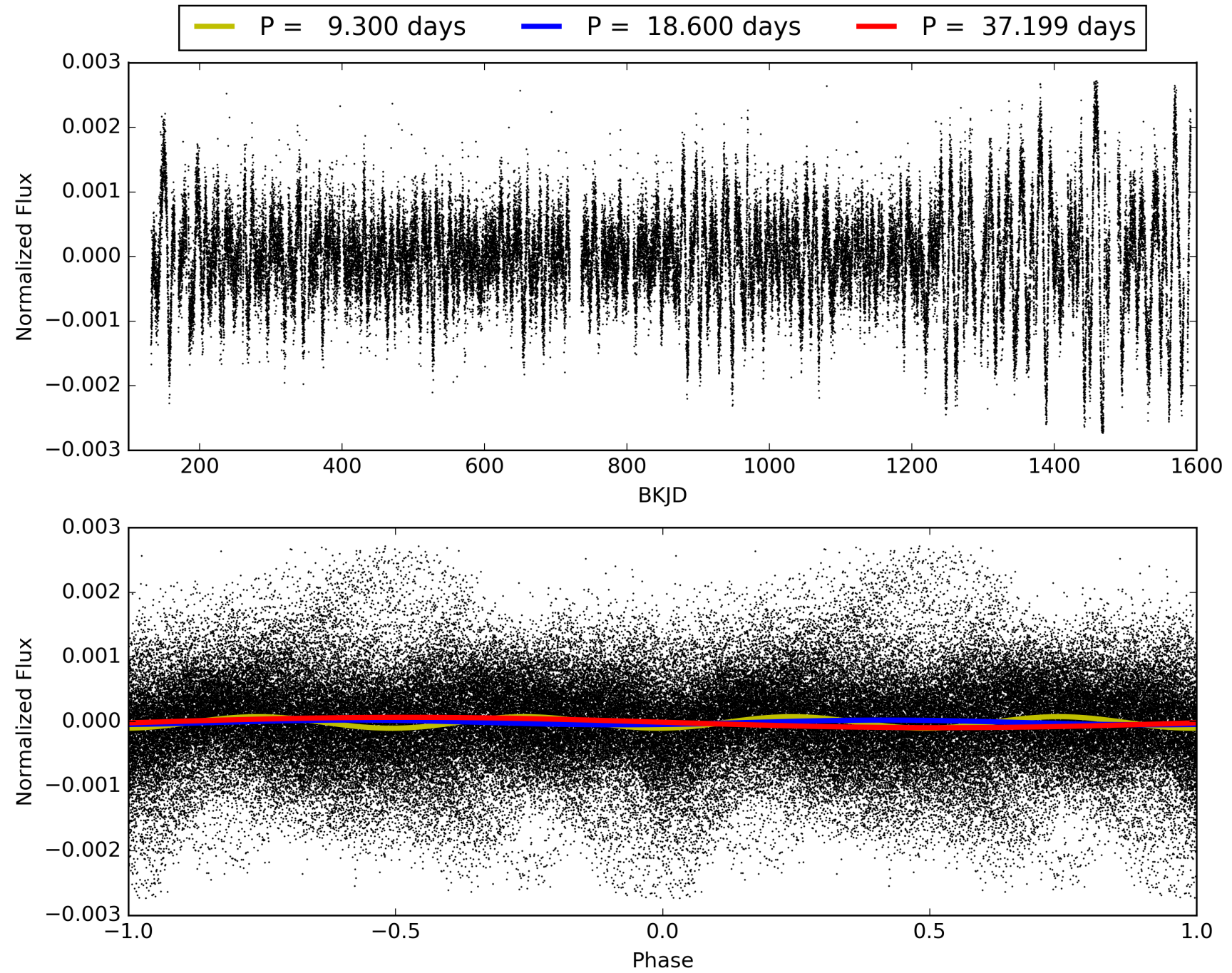
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.48e-16  
RollingBand-fgt: 1.00 [71/71]  
GhostDiagnostic-chr: 2.099  
Centroid-sig: 6.8%  
Centroid-so: 1.615 arcsec [1.62σ]  
OotOffset-rm: 0.576 arcsec [1.31σ]  
KicOffset-rm: 0.563 arcsec [1.37σ]  
OotOffset-st: 3/4/2/3 [12]  
KicOffset-st: 3/4/2/3 [12]  
DiffImageQuality-fgm: 0.83 [10/12]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007020234-01, PDC Light Curves



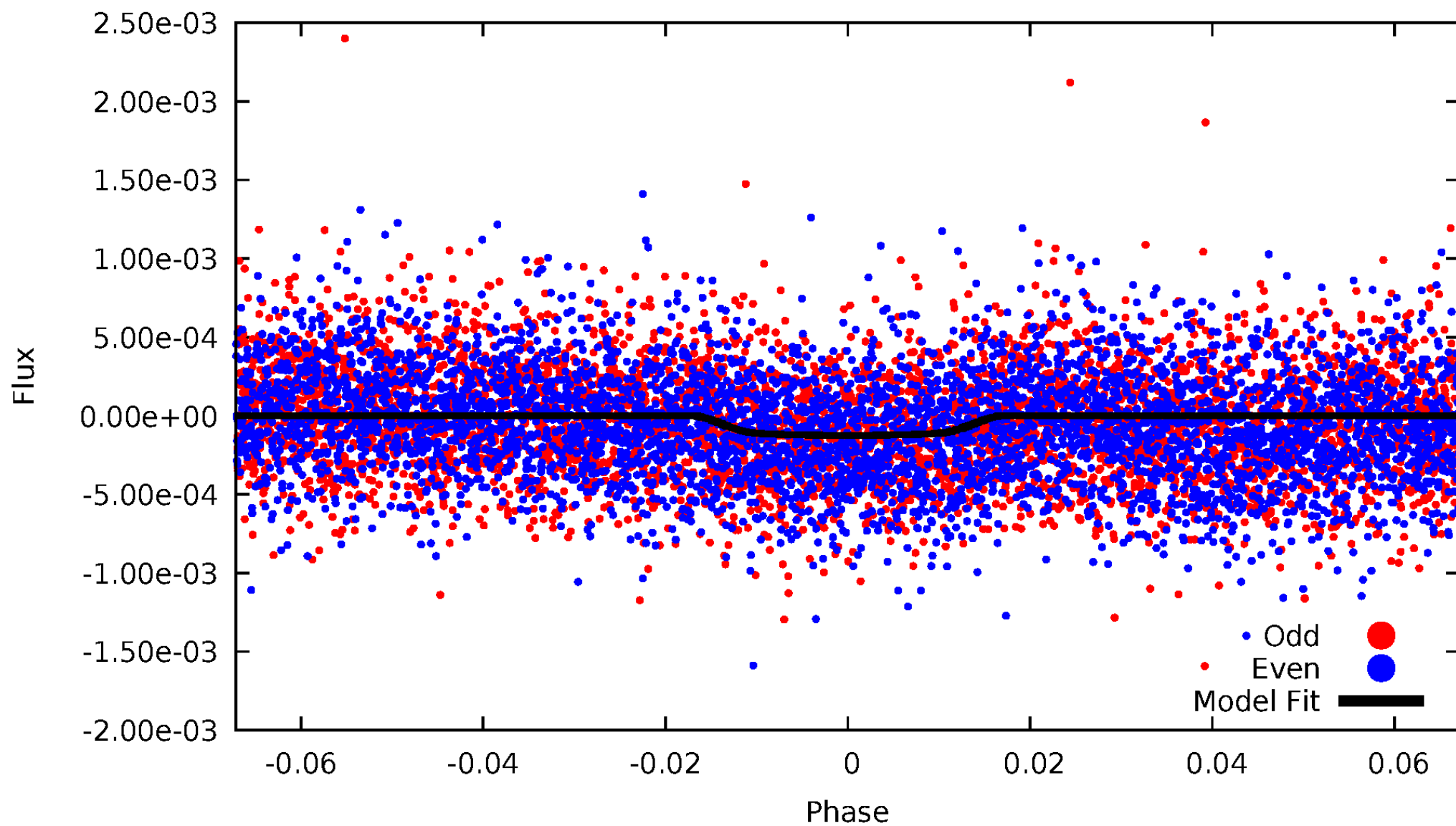
TCE 007020234-01





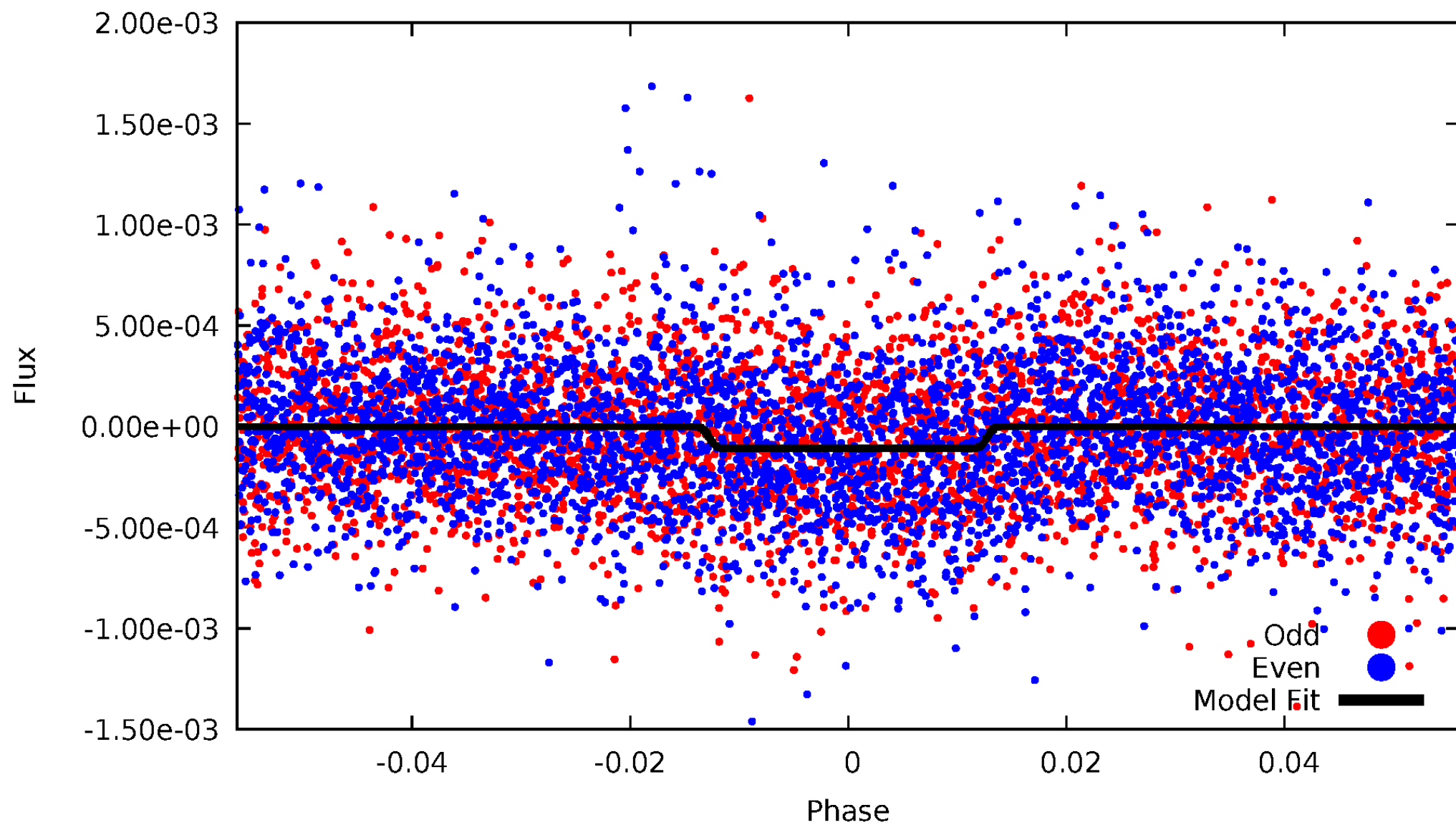
# DV Odd/Even

TCE 007020234-01



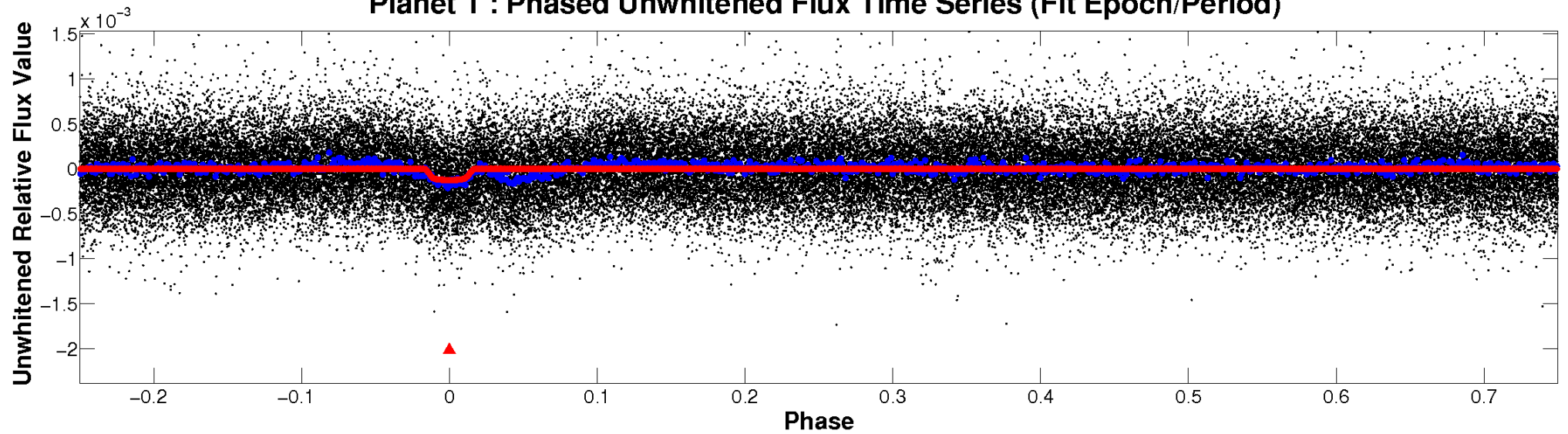
# ALT Odd/Even

TCE 007020234-01

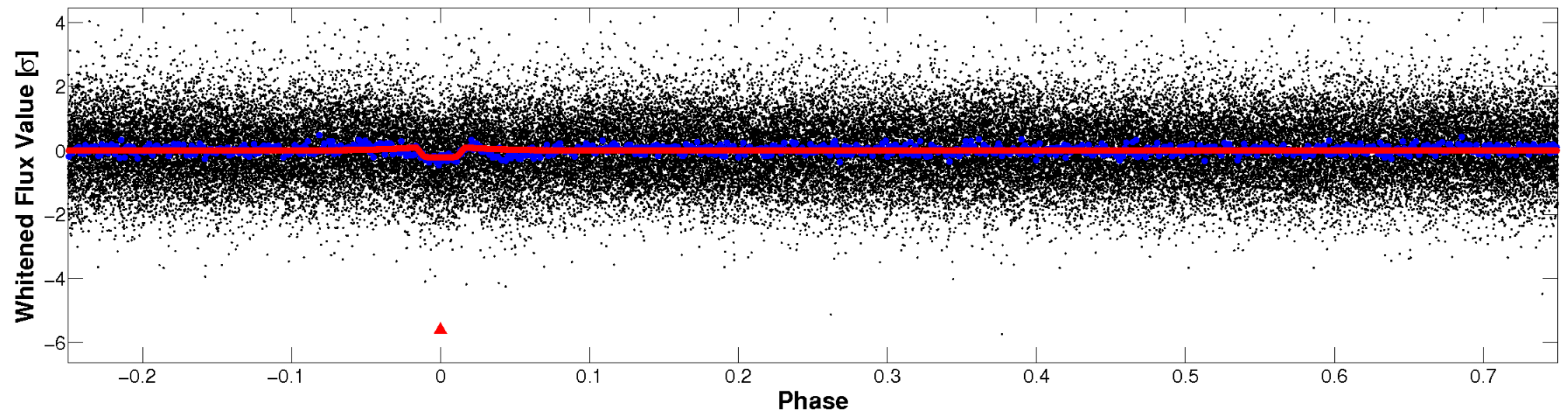


# Non-Whitened Vs. Whitened Light Curve

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

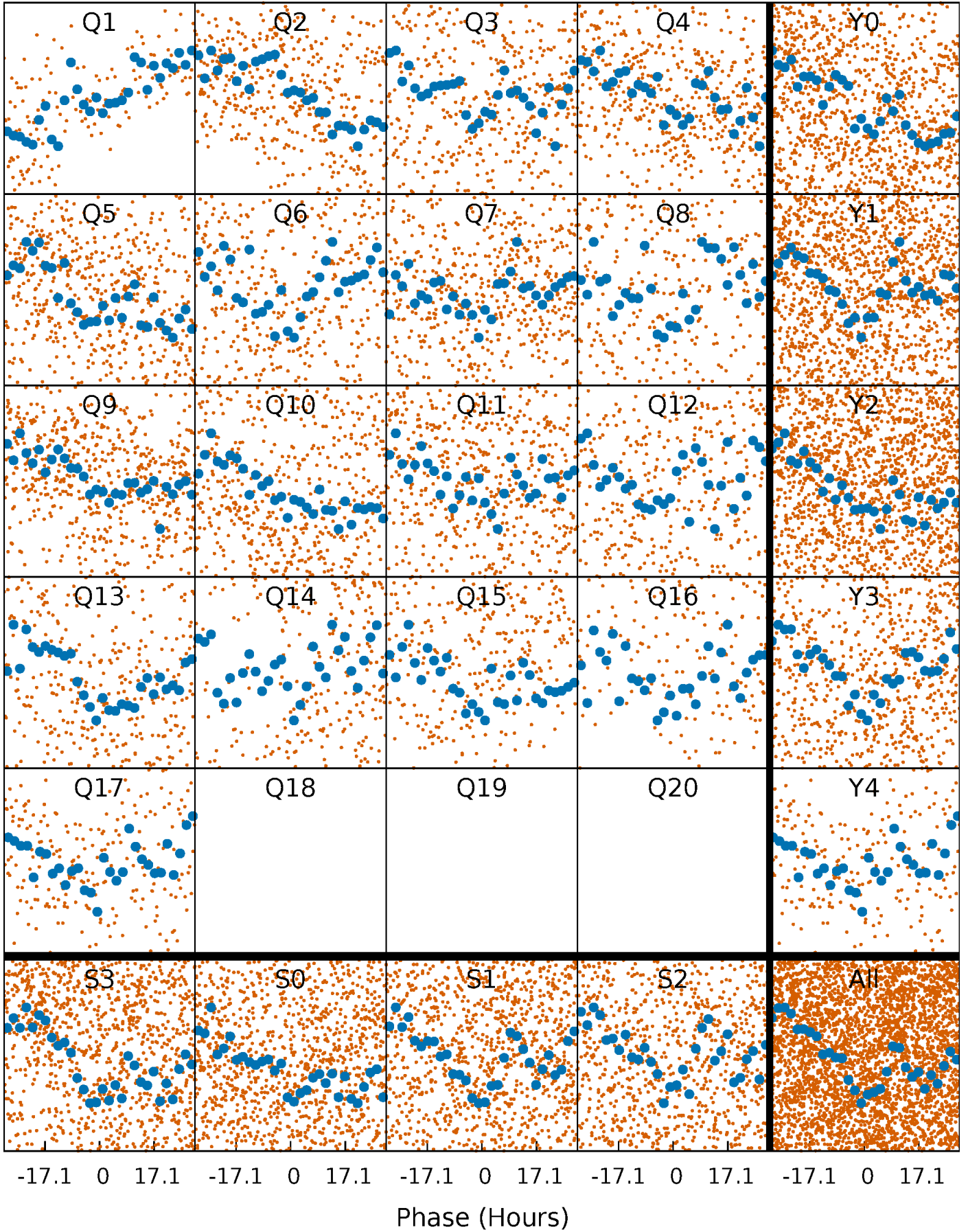


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

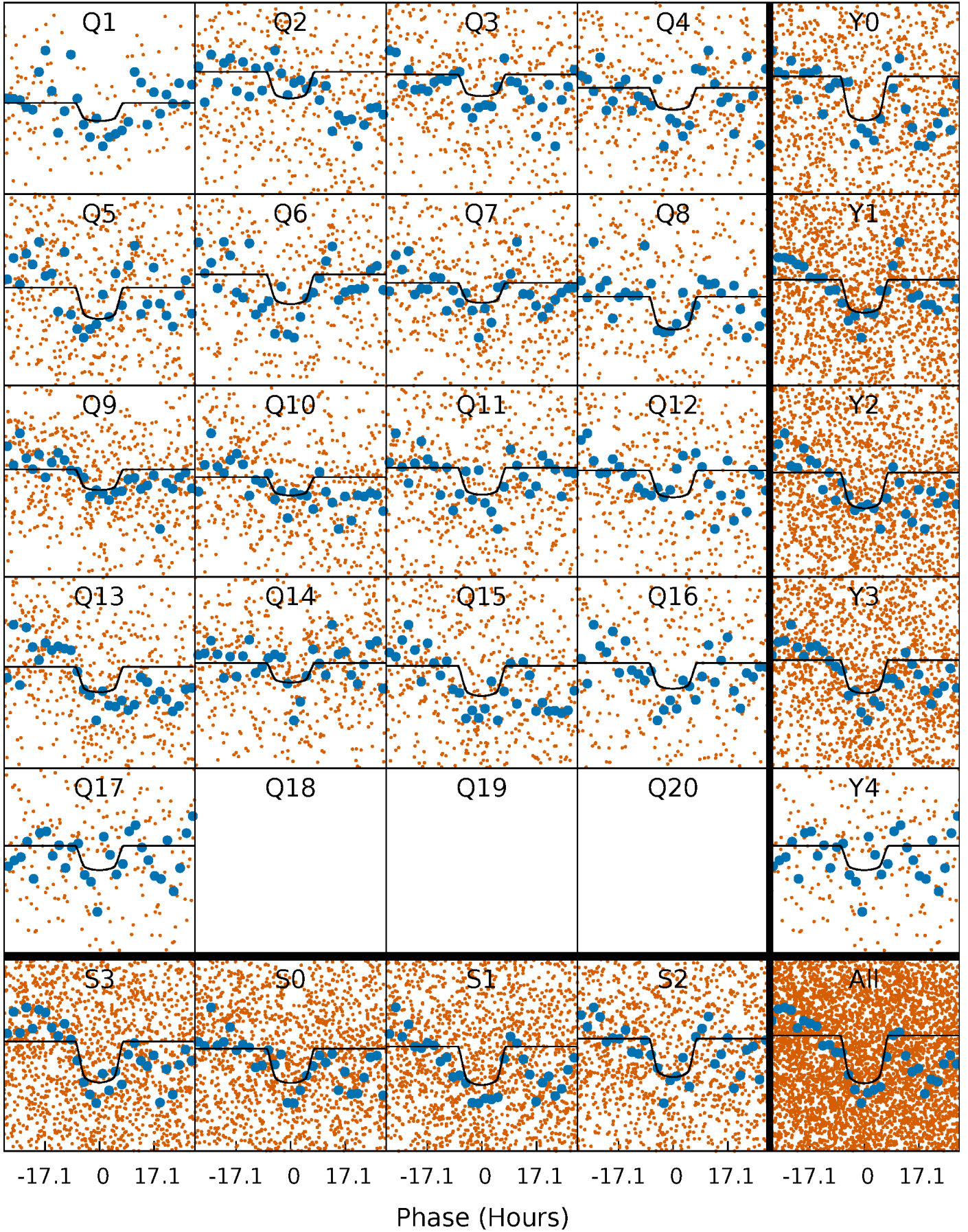
TCE 007020234-01 P= 18.599698 Days  $T_0=146.940205$  (BKJD)





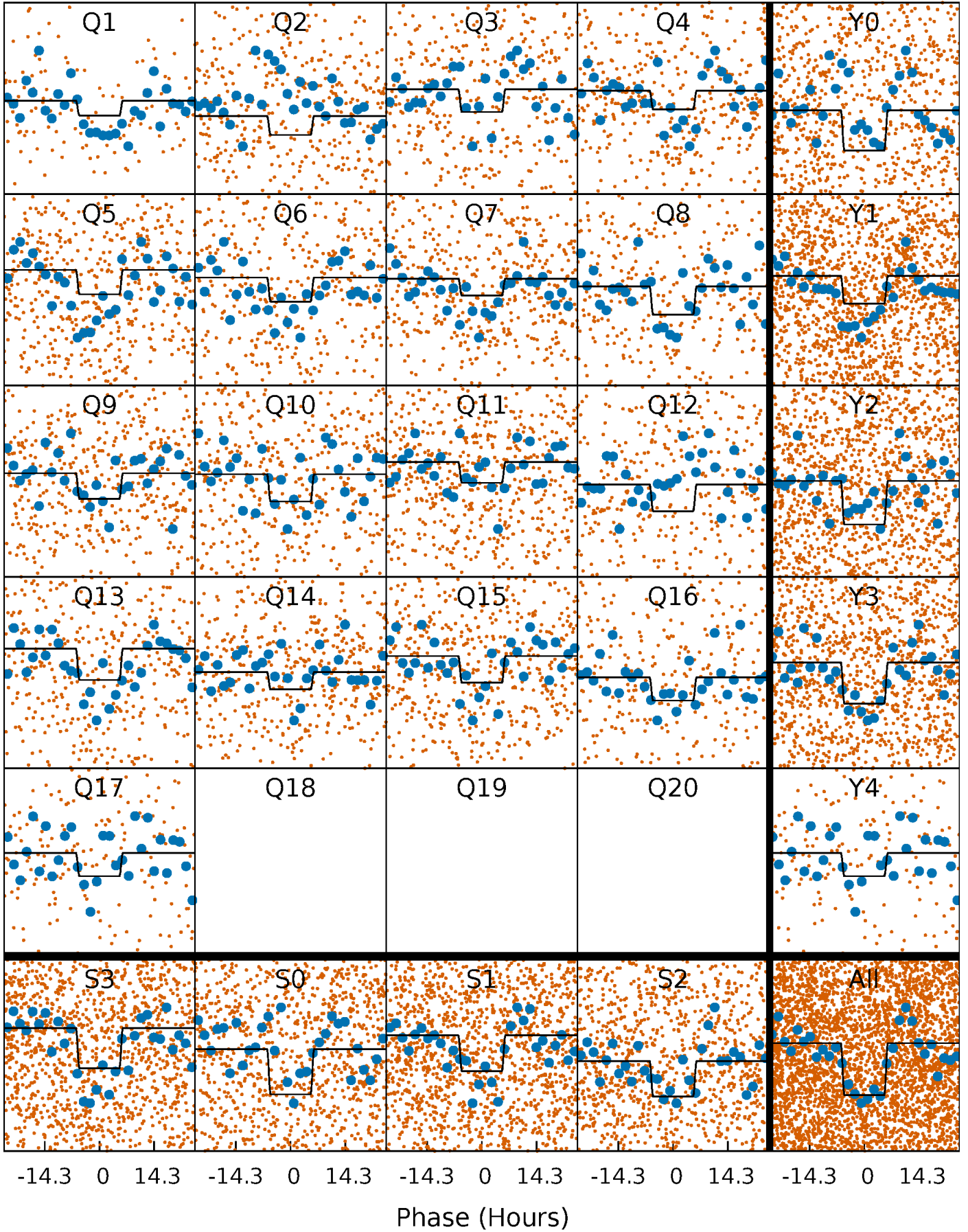
# DV Quarter-Phased Transit Curves

TCE 007020234-01 P= 18.599698 Days  $T_0=146.940205$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

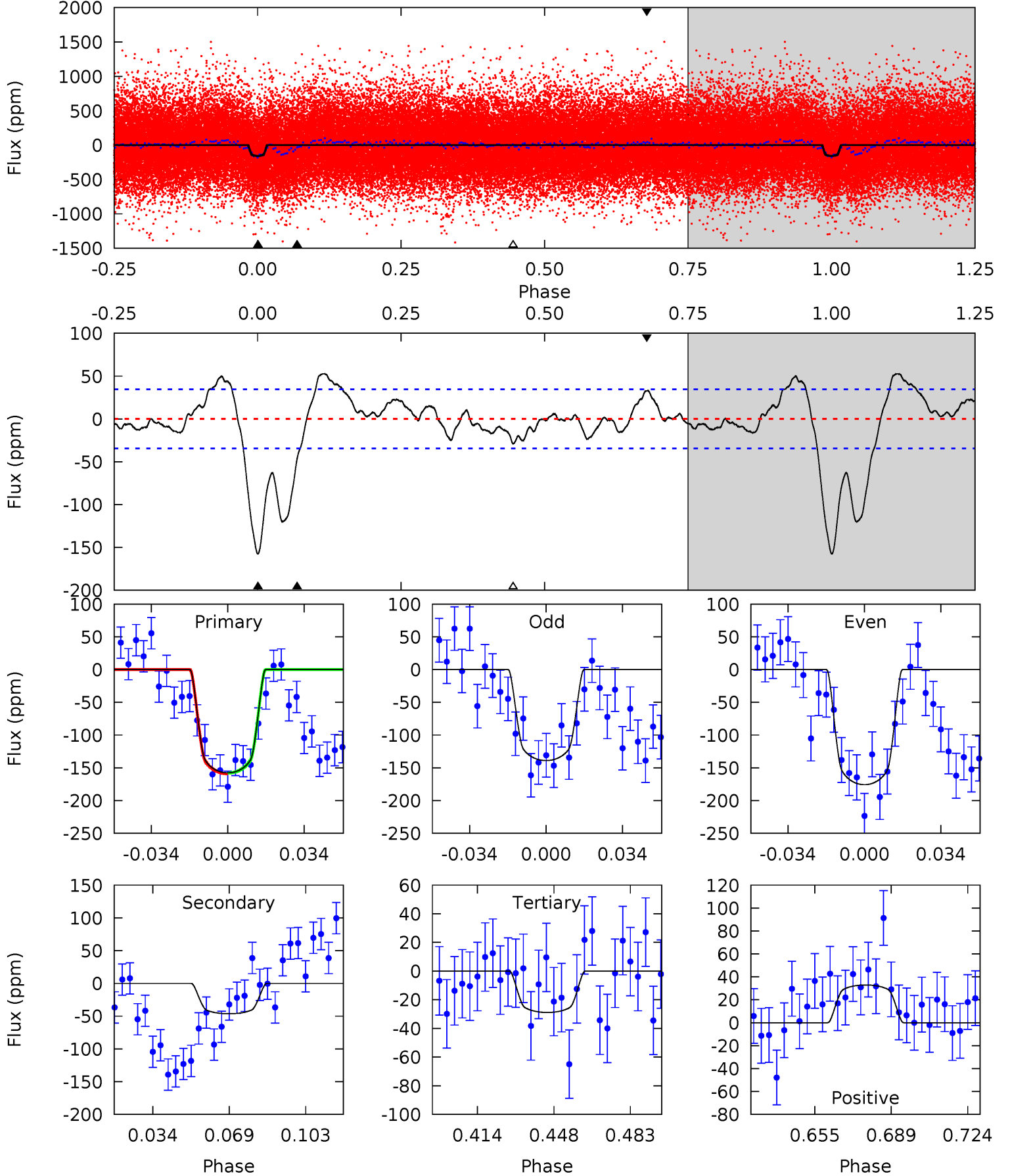
TCE 007020234-01 P= 18.600326 Days  $T_0=146.897734$  (BKJD)



# DV Model-Shift Uniqueness Test

007020234-01, P = 18.599698 Days, E = 128.340507 Days

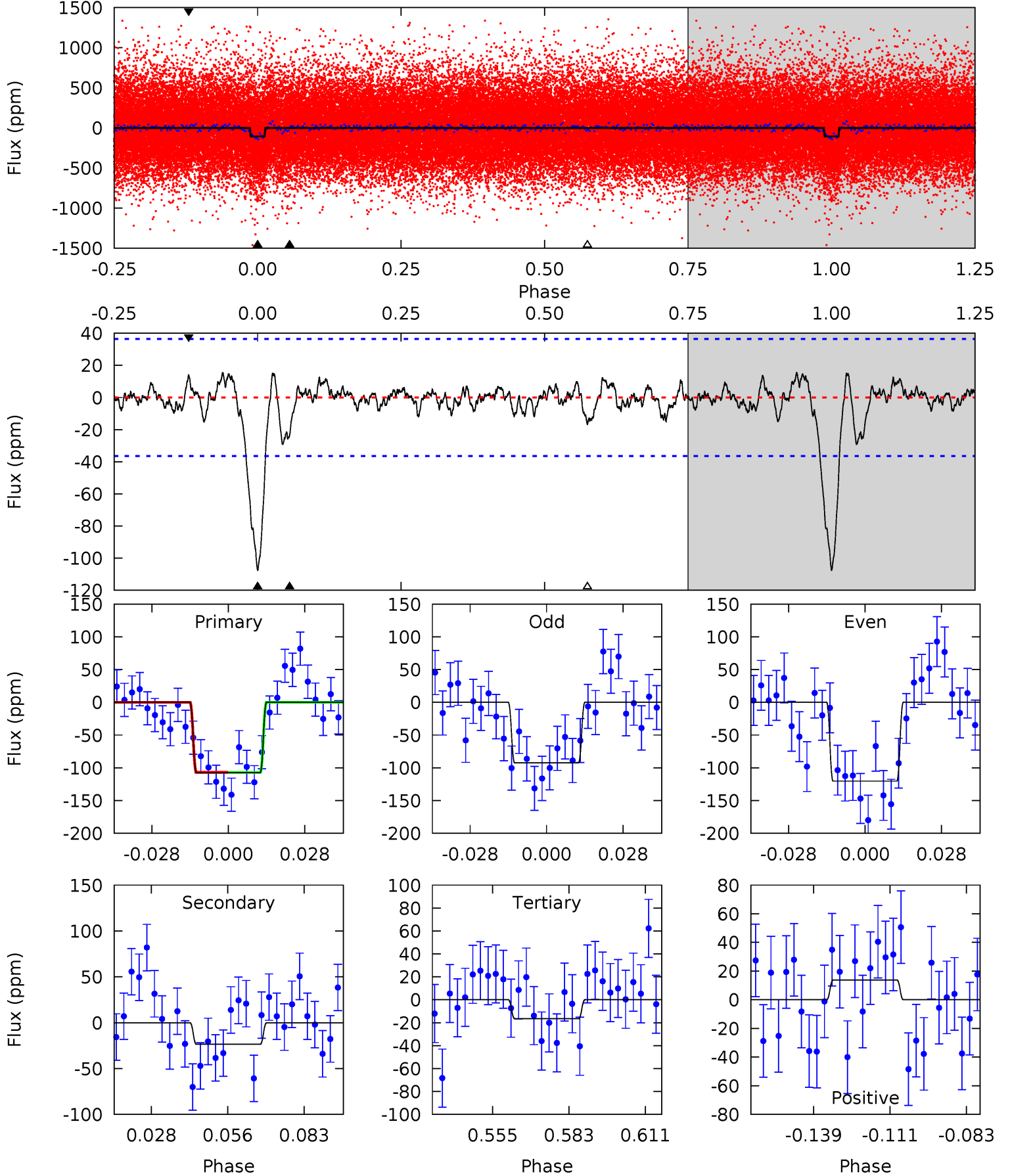
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	6.43	4.00	4.56	4.78	2.11	2.54	17.9	17.3	2.42	1.87	2.56	1.04	0.25	0.08



# Alt Model-Shift Uniqueness Test

007020234-01, P = 18.600326 Days, E = 128.297408 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
14.2	3.12	2.19	1.83	4.83	2.20	0.76	12.0	12.4	0.93	1.29	1.84	1.01	0.13	0.02





### Stellar Parameters For KIC 007020234

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5605^{+168}_{-168}$	$4.605^{+0.034}_{-0.136}$	$-0.480^{+0.300}_{-0.300}$	$0.741^{+0.151}_{-0.054}$	$0.826^{+0.079}_{-0.088}$	$2.860^{+0.415}_{-1.144}$
	+3%/-3%	+1%/-3%	+62%/-62%	+20%/-7%	+10%/-11%	+15%/-40%
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 007020234-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-46 \pm 7$	$1.13^{+0.14}_{-0.12}$	$848^{+40}_{-35}$	$4220^{+211}_{-207}$	$320^{+95}_{-77}$
Alt.	$-24 \pm 8$	$0.87^{+0.14}_{-0.11}$	$849^{+41}_{-36}$	$4102^{+301}_{-319}$	$275^{+130}_{-104}$

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

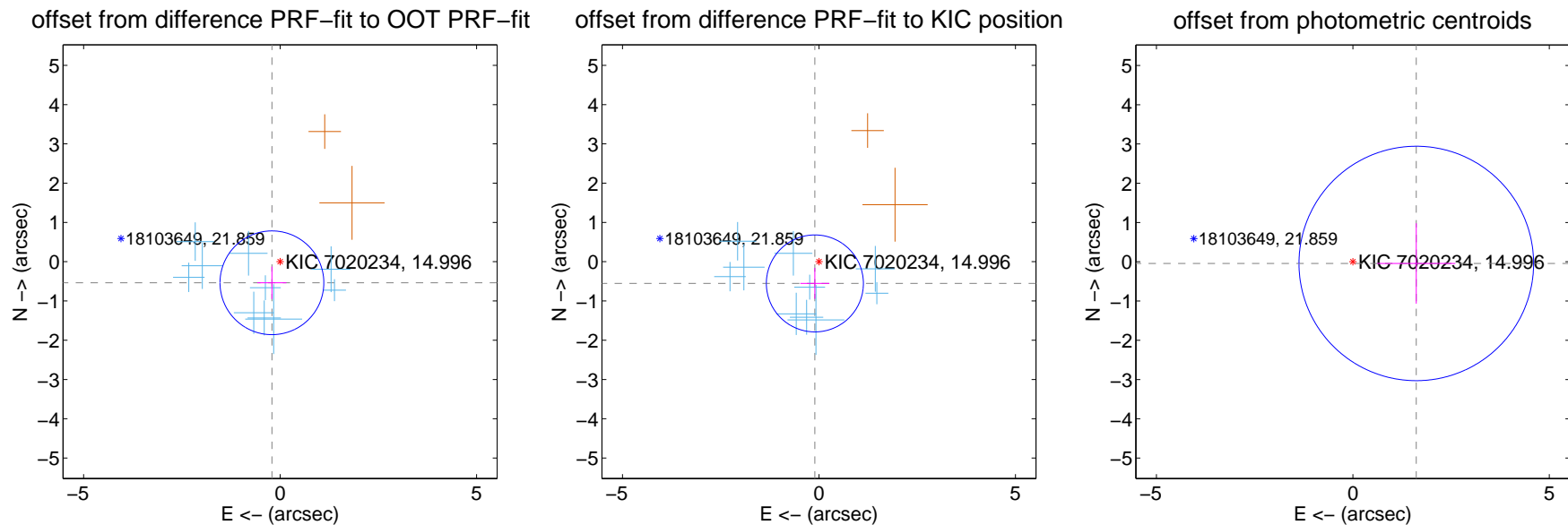
## DV Centroid Data

Supplemental centroid analysis for 007020234-01. Kepler magnitude: 15.00. Transit SNR 9.07

There are 10 quarters with good PRF difference image offsets

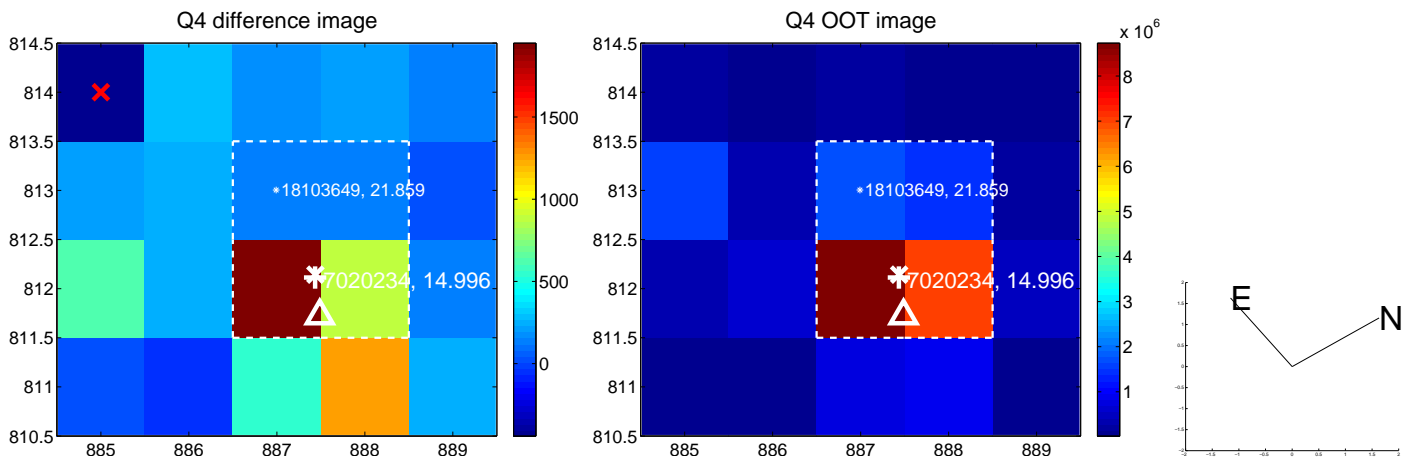
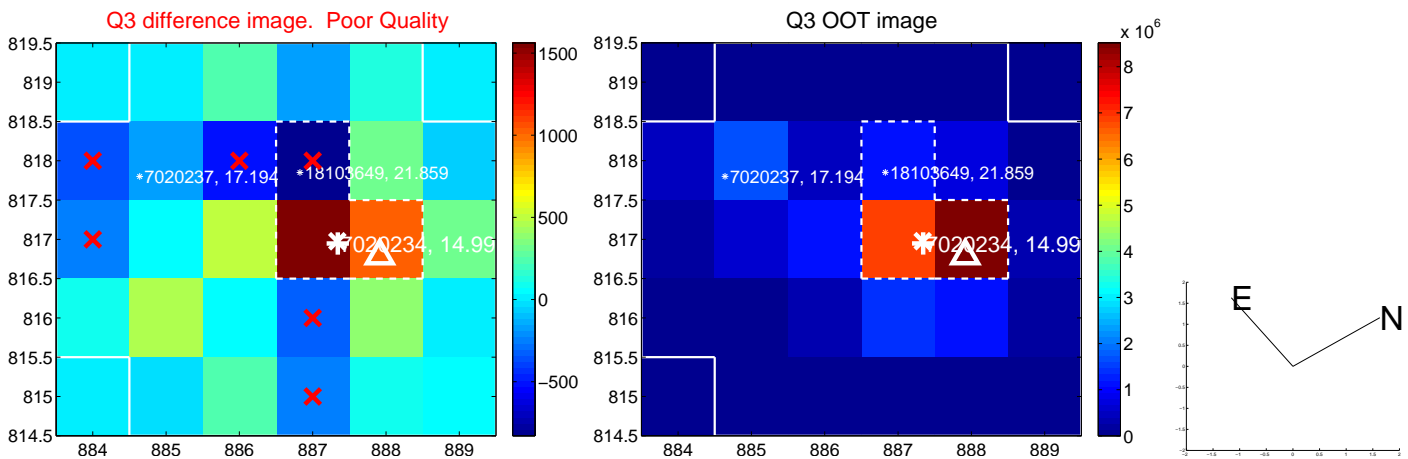
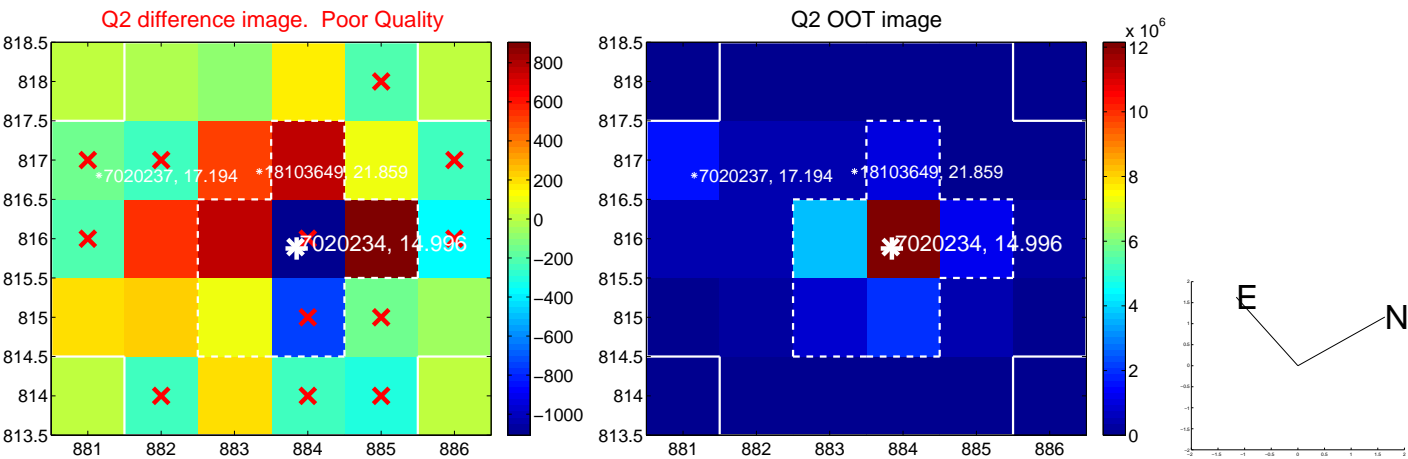
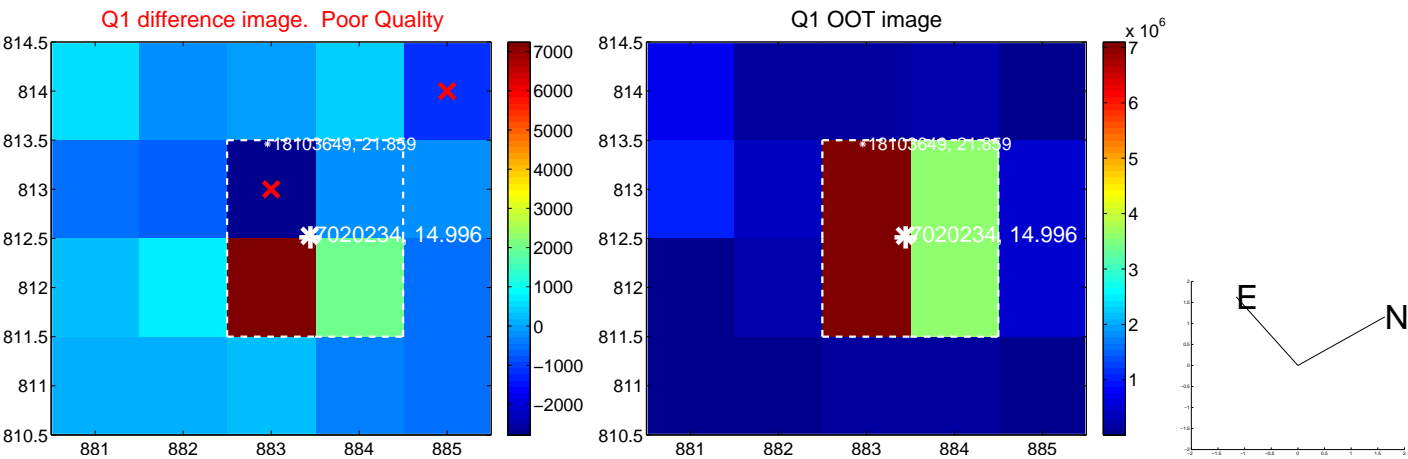
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.576 \pm 0.440$	1.31	$0.208 \pm 0.370$	$-0.537 \pm 0.413$
PRF-fit source offset from KIC position	$0.563 \pm 0.412$	1.37	$0.105 \pm 0.370$	$-0.553 \pm 0.394$
photometric centroid source offset	$1.62 \pm 1.00$	1.62	$-1.61 \pm 1.00$	$-0.04 \pm 1.02$

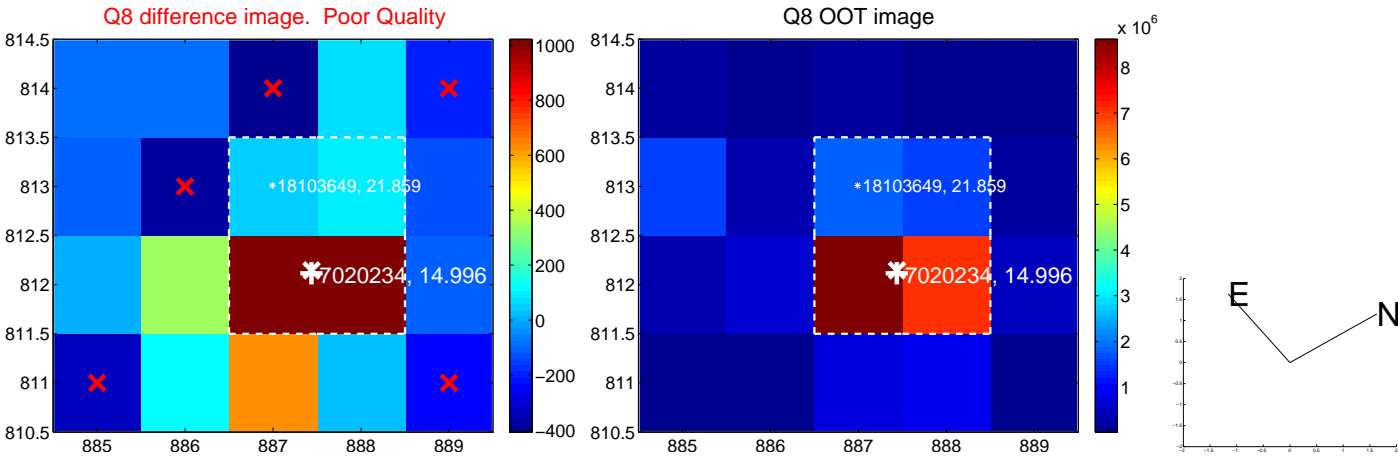
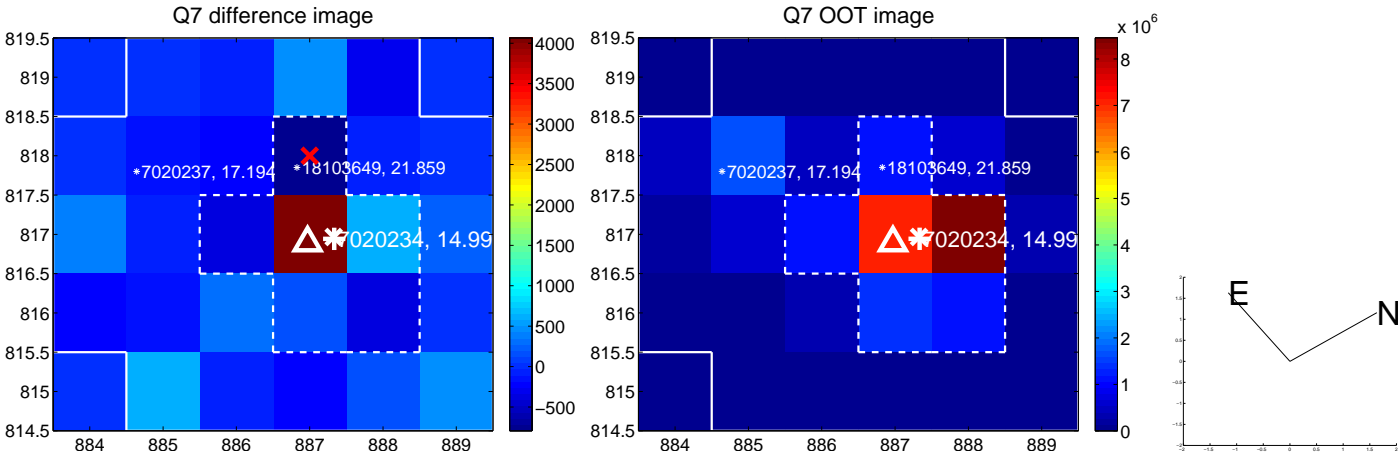
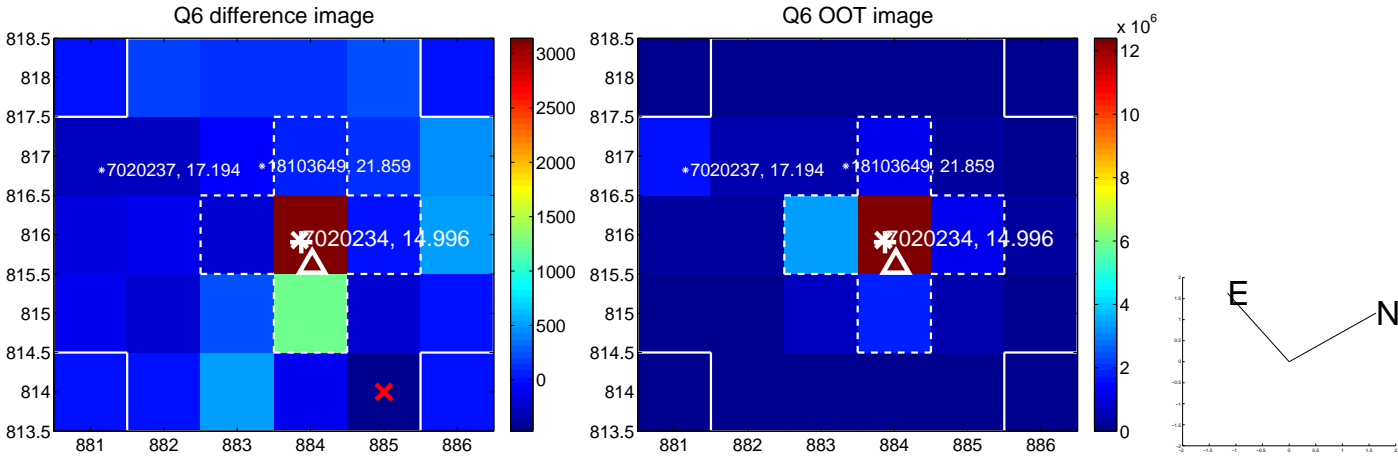
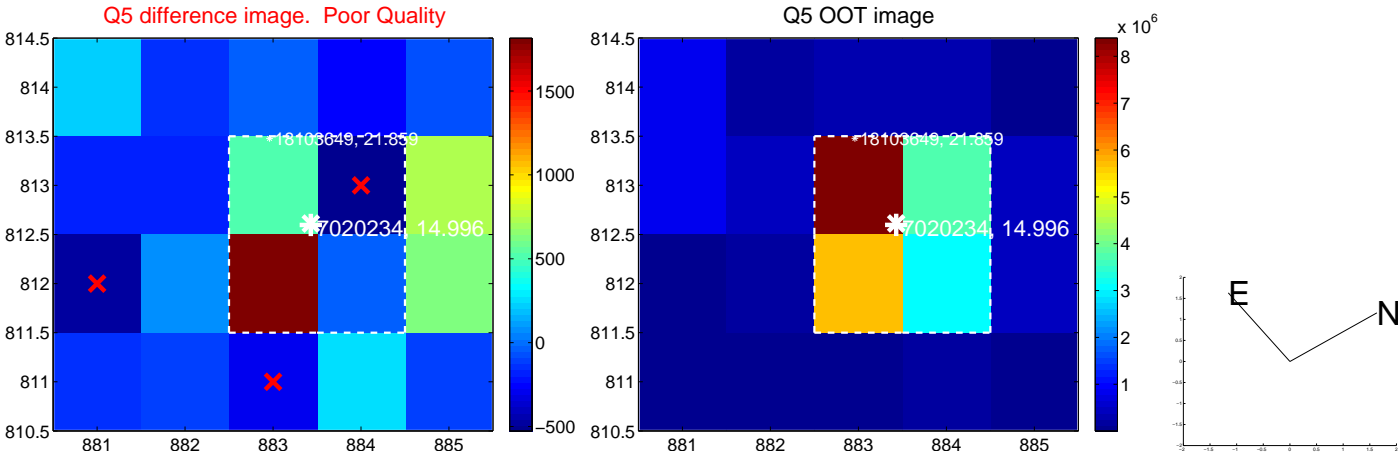


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

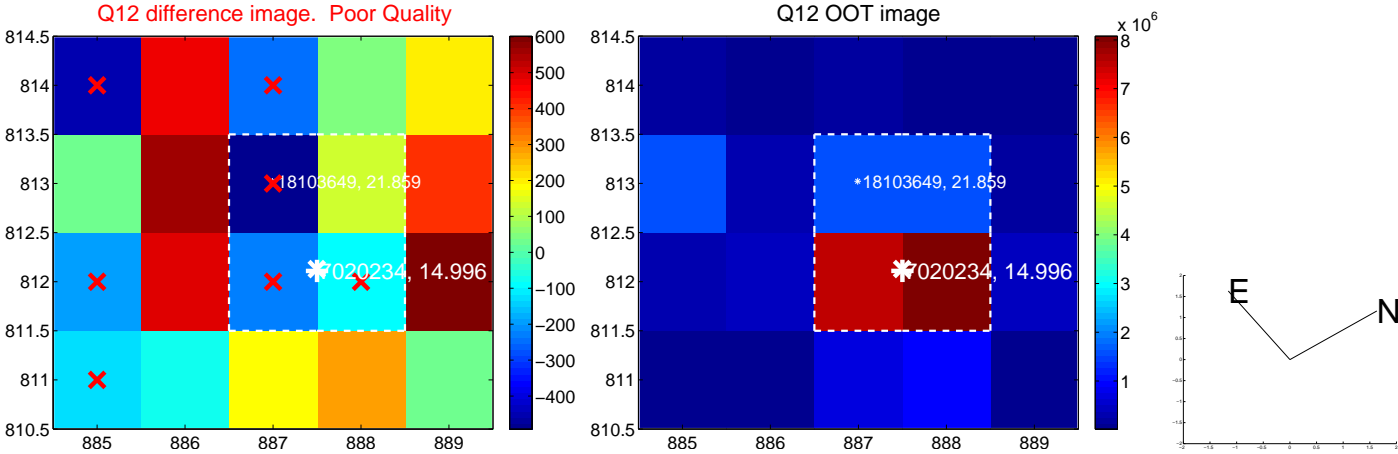
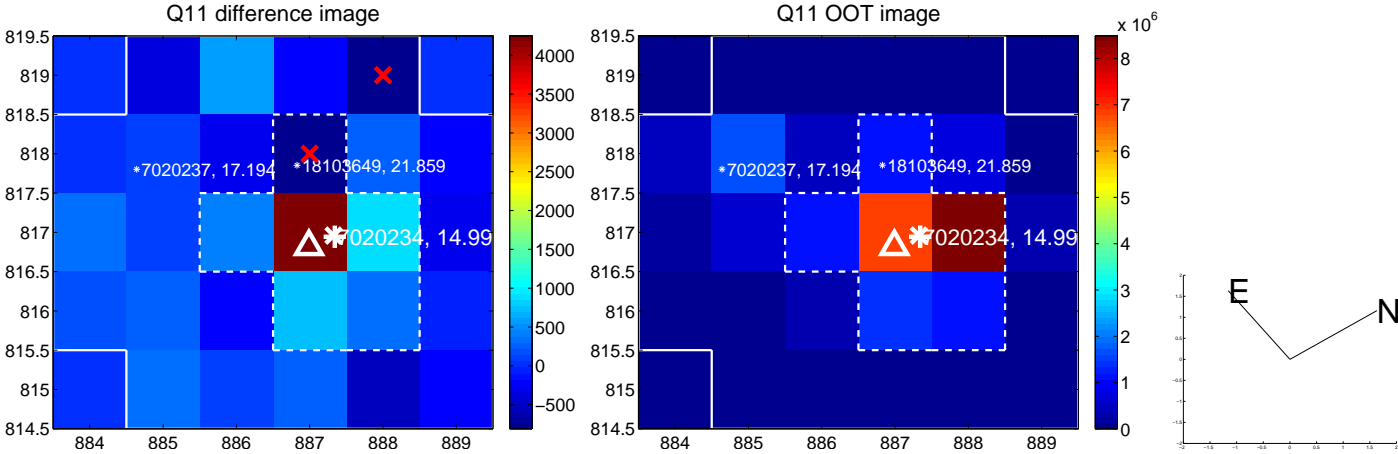
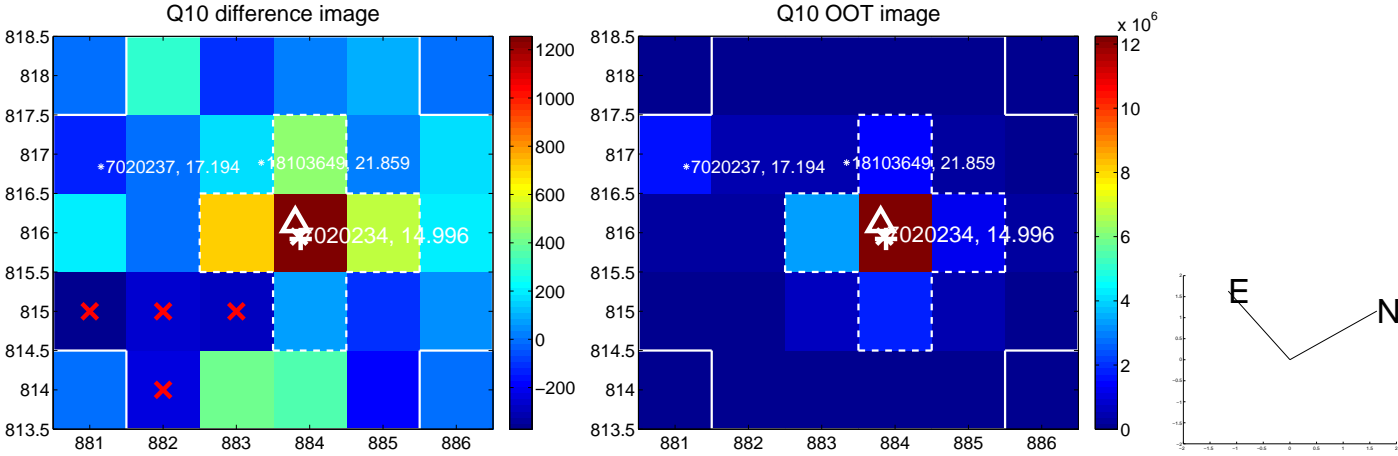
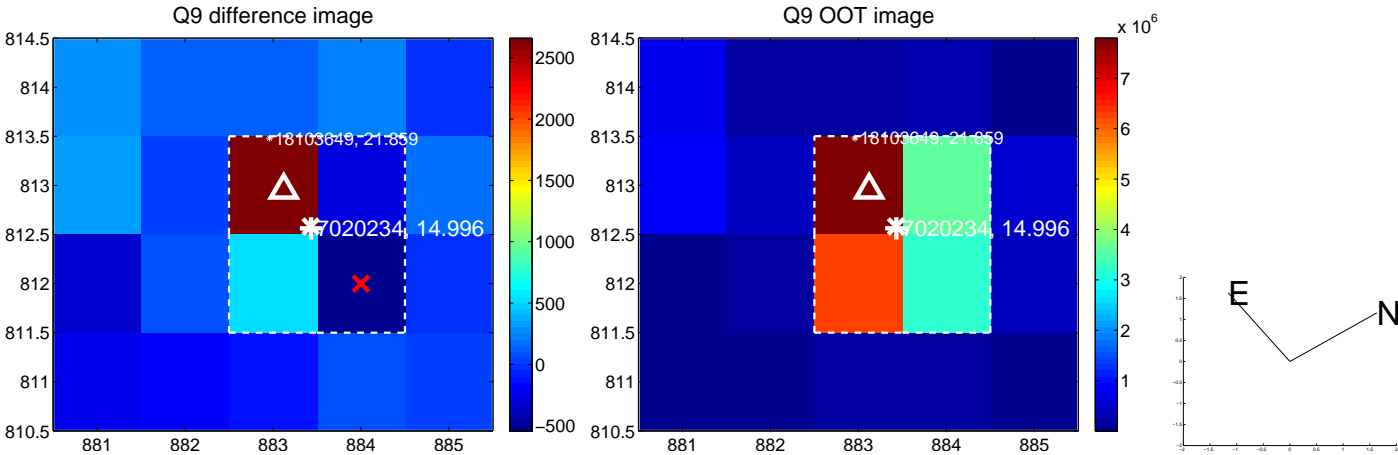


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



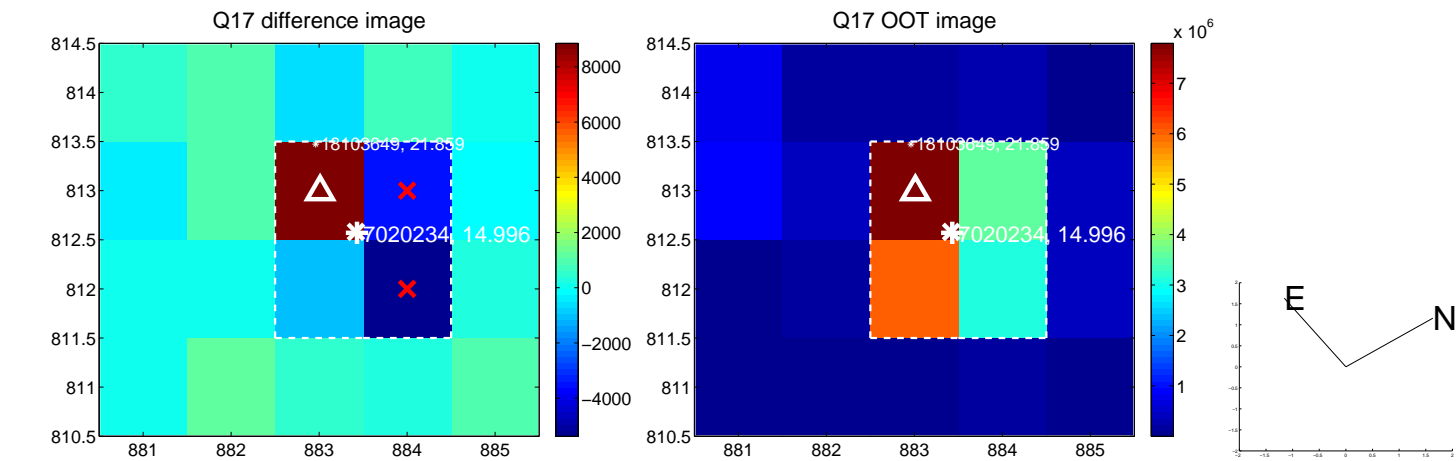


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

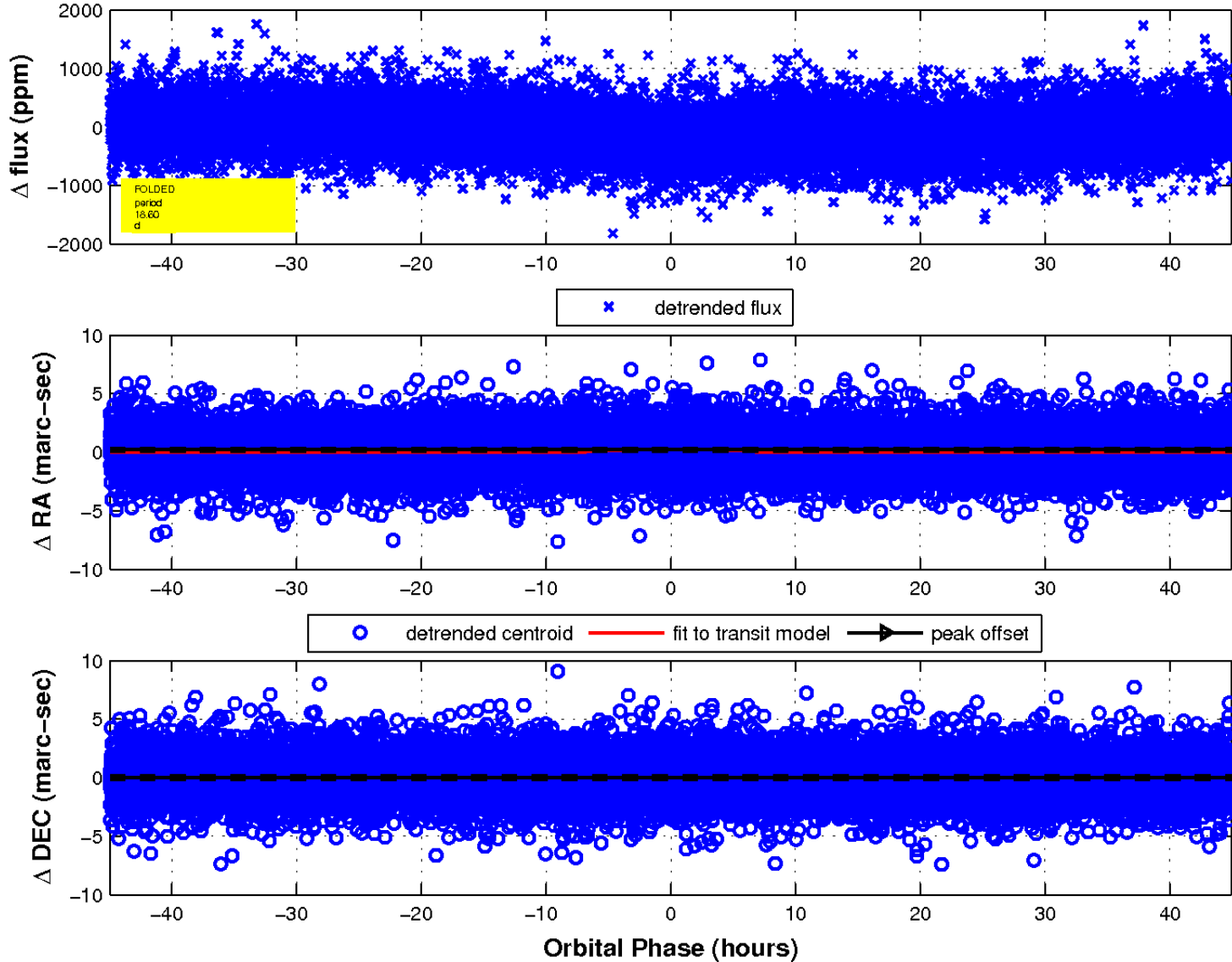




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

