

# KIC 010686864

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010686864-01	OBS	1637.01	2.970397	133.396569	511.4	2.380	19.7	21.5	0.74	5068	2.06	228.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010686864-01	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.

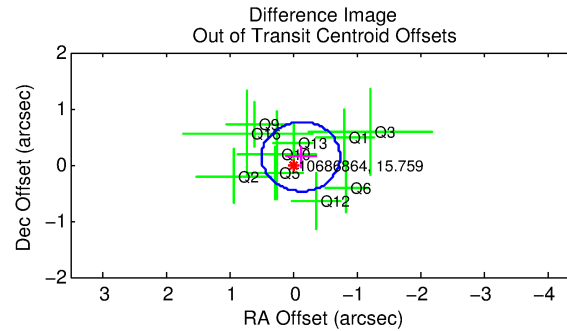
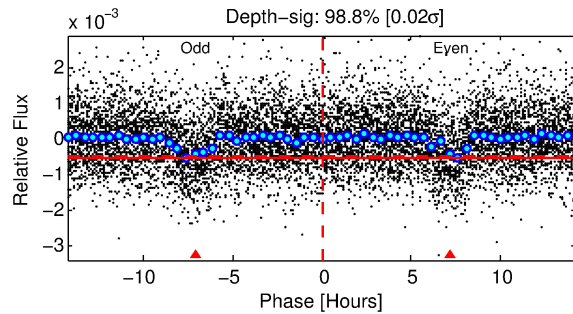
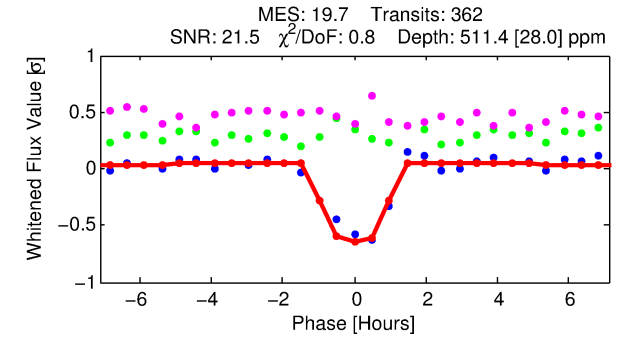
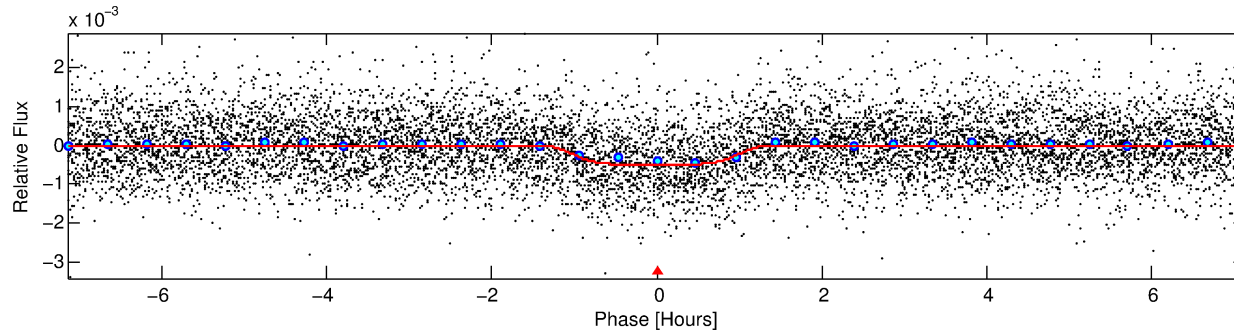
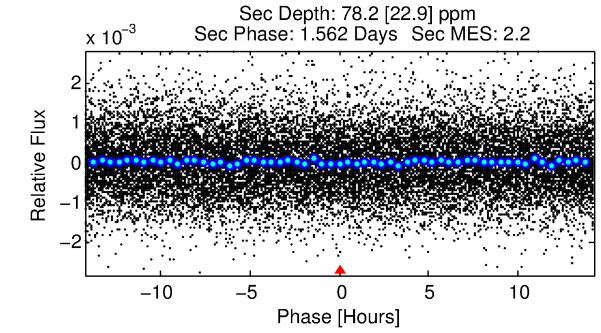
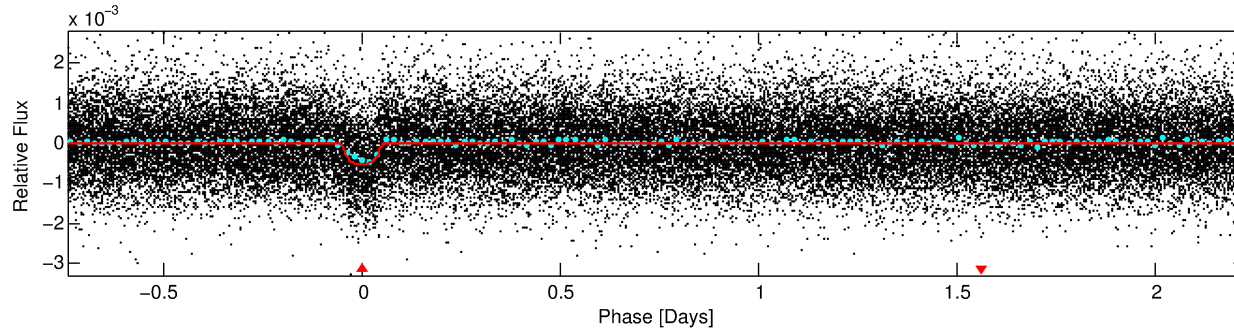
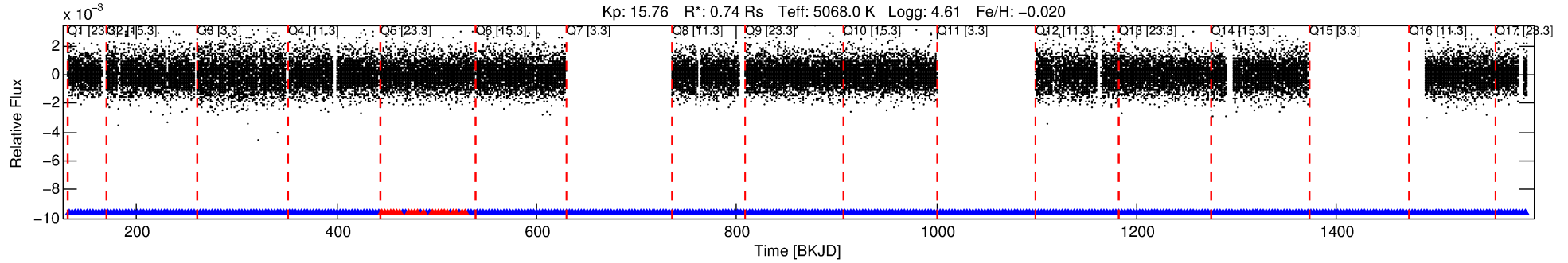
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010686864-01

No Significant Match Found

# DV One-Page Summary

KIC: 10686864 Candidate: 1 of 1 Period: 2.970 d  
KOI: K01637.01 Corr: 0.964



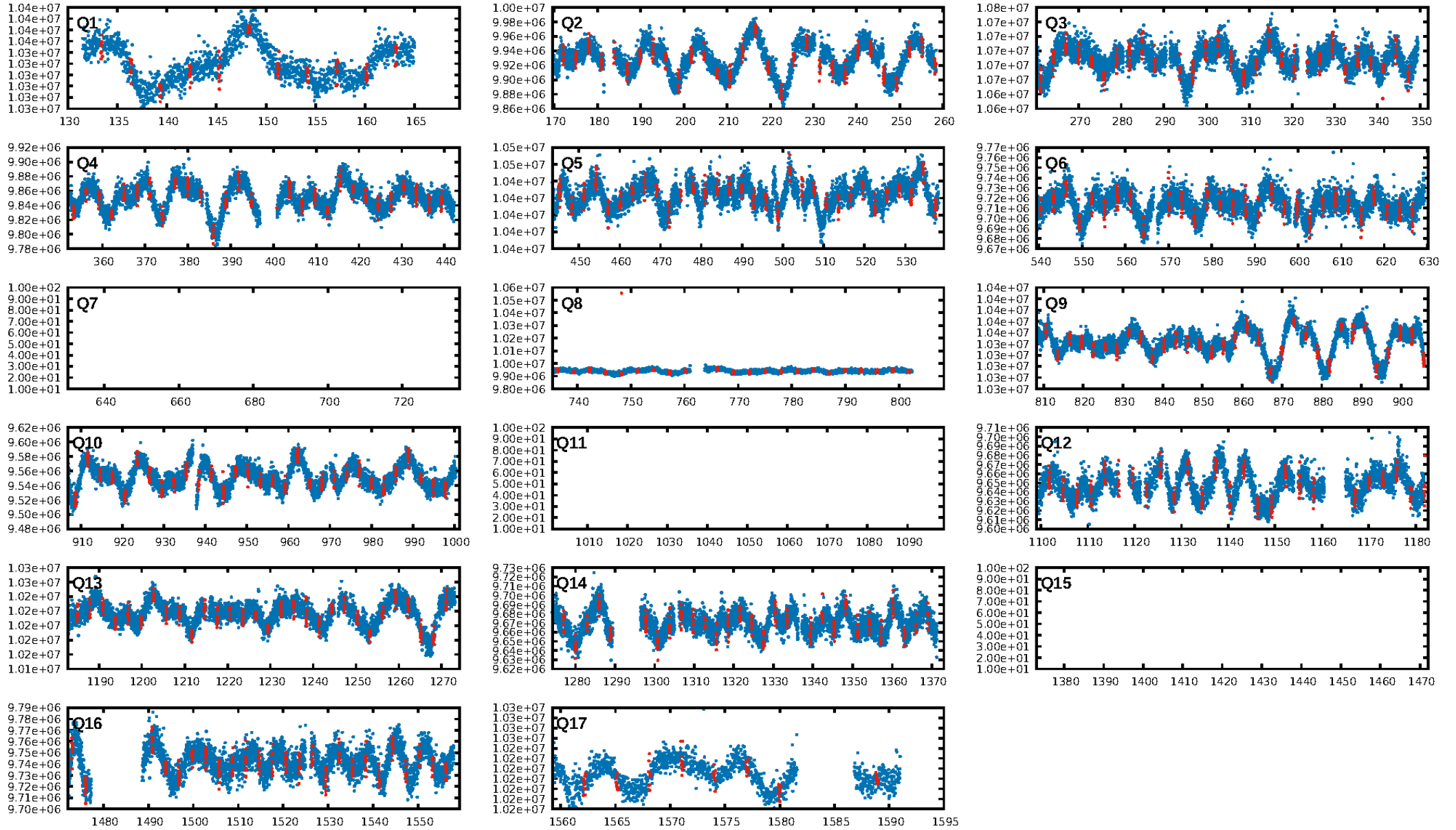
## DV Fit Results:

Period = 2.97040 [0.00001] d  
Epoch = 133.3966 [0.0017] BKJD  
Rp/R\* = 0.0254 [0.0052]  
a/R\* = 4.67 [3.58]  
b = 0.91 [0.16]  
Seff = 228.29 [46.42]  
Teq = 991 [50] K  
Rp = 2.06 [0.50] Re  
a = 0.0378 [0.0039] AU  
Ag = 14.47 [7.57] [1.78σ]  
Teffp = 2989 [390] K [5.08σ]

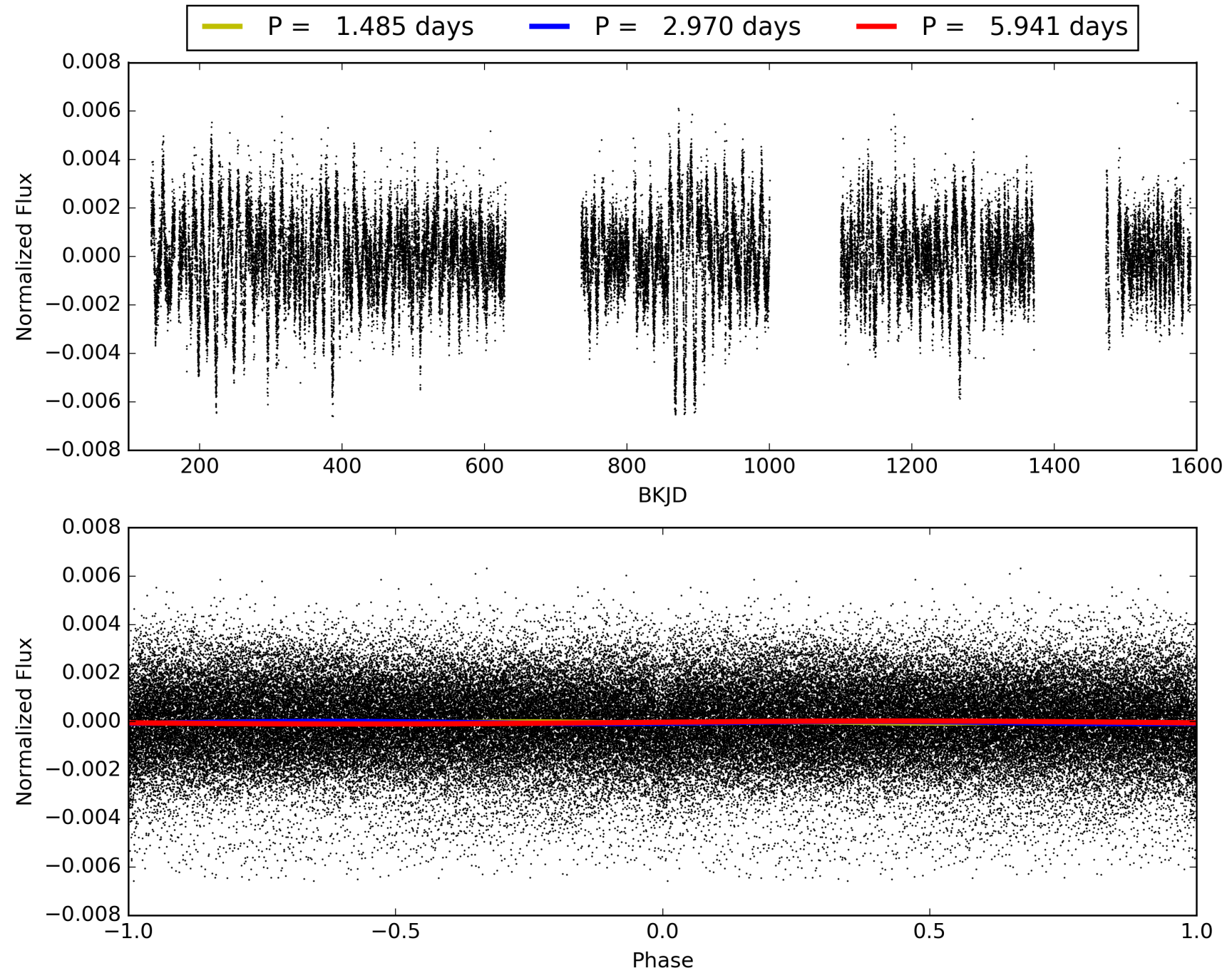
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.77e-85  
RollingBand-fgt: 0.94 [320/342]  
GhostDiagnostic-chr: -58.88  
Centroid-sig: 28.3%  
Centroid-so: 0.416 arcsec [0.63σ]  
OotOffset-rm: 0.190 arcsec [0.93σ]  
OotOffset-st: 3/1/2/4 [10]  
KicOffset-rm: 0.249 arcsec [1.24σ]  
KicOffset-st: 3/1/2/4 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 010686864-01, PDC Light Curves

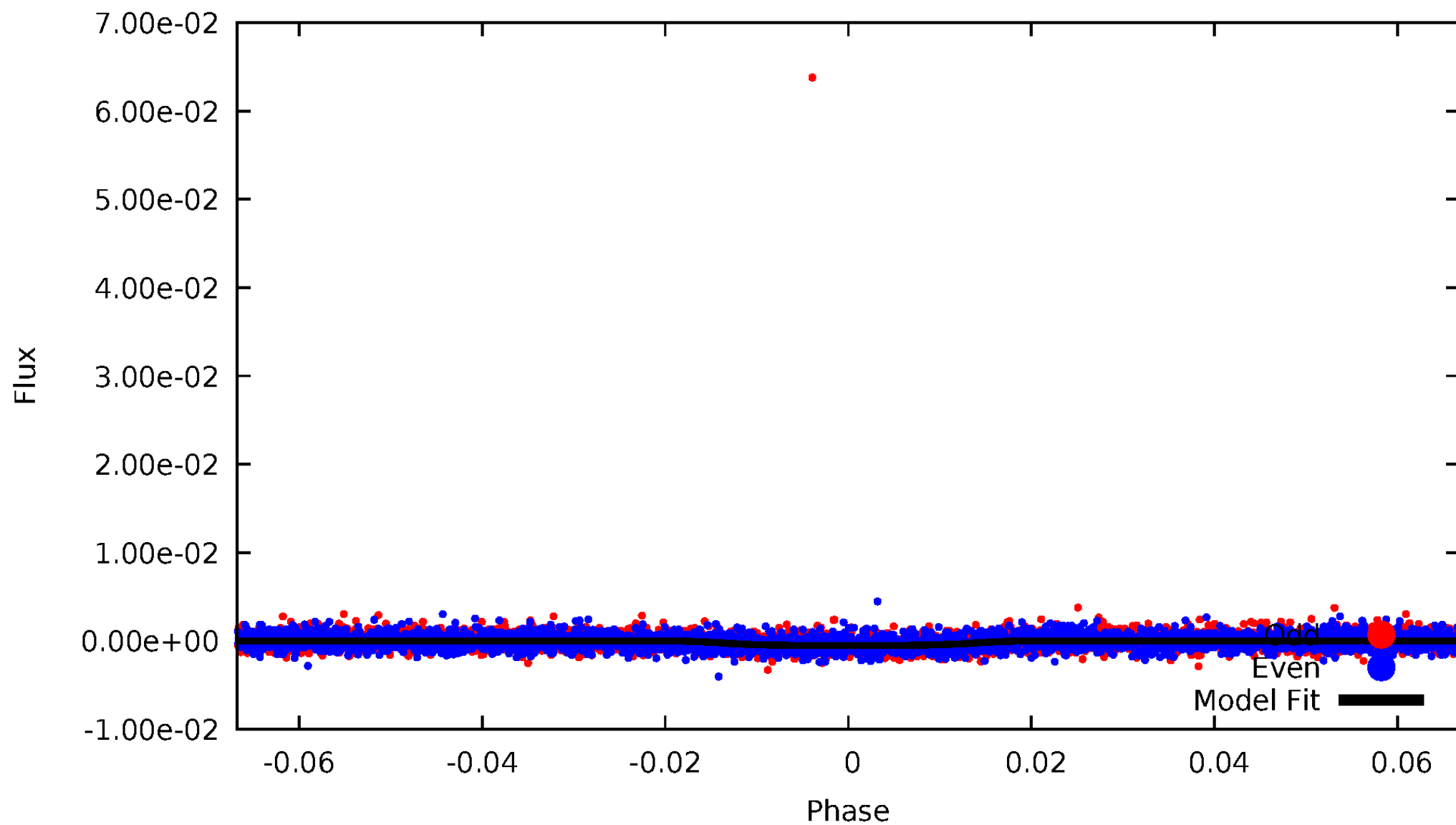


TCE 010686864-01



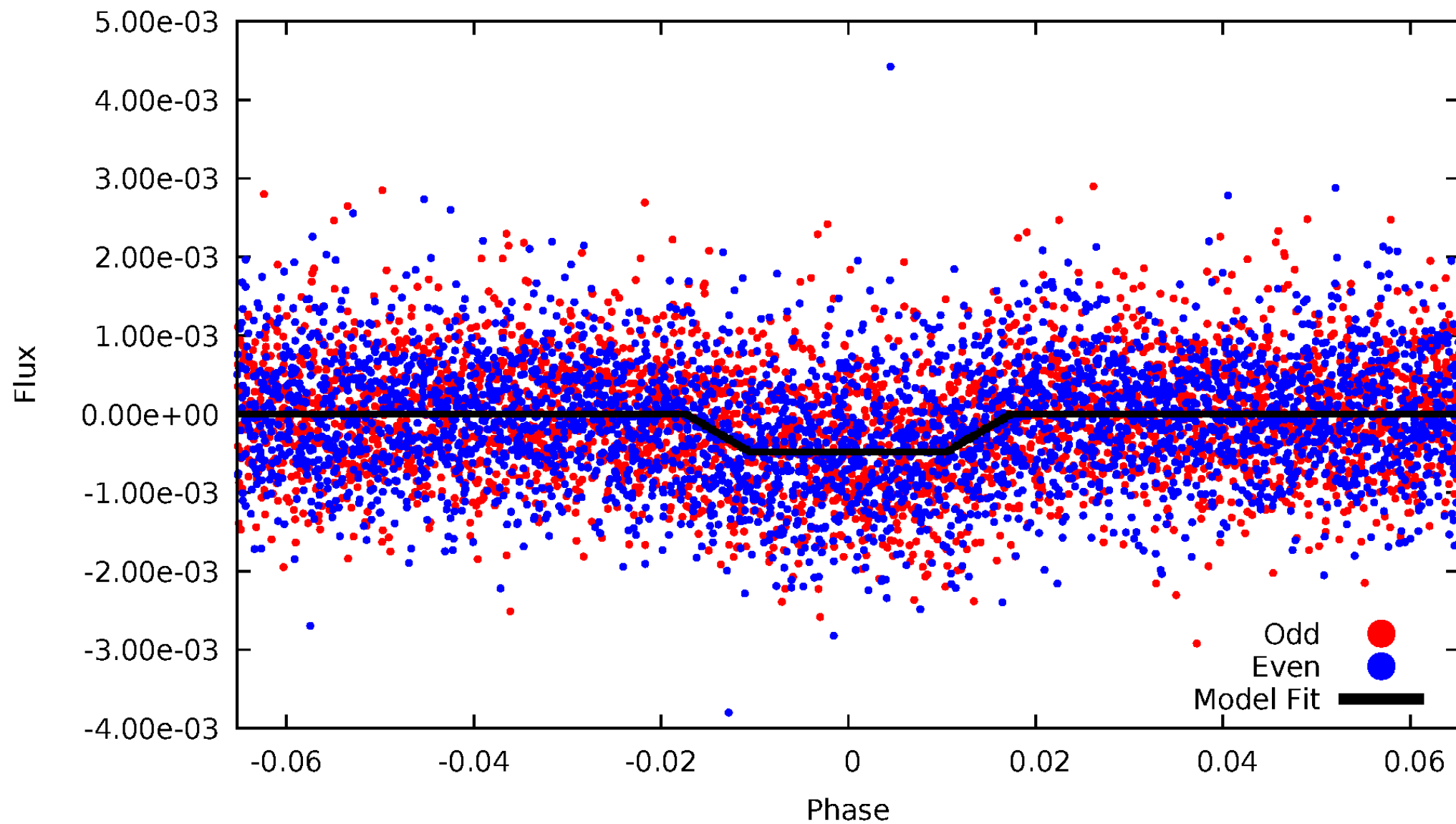
# DV Odd/Even

TCE 010686864-01



# ALT Odd/Even

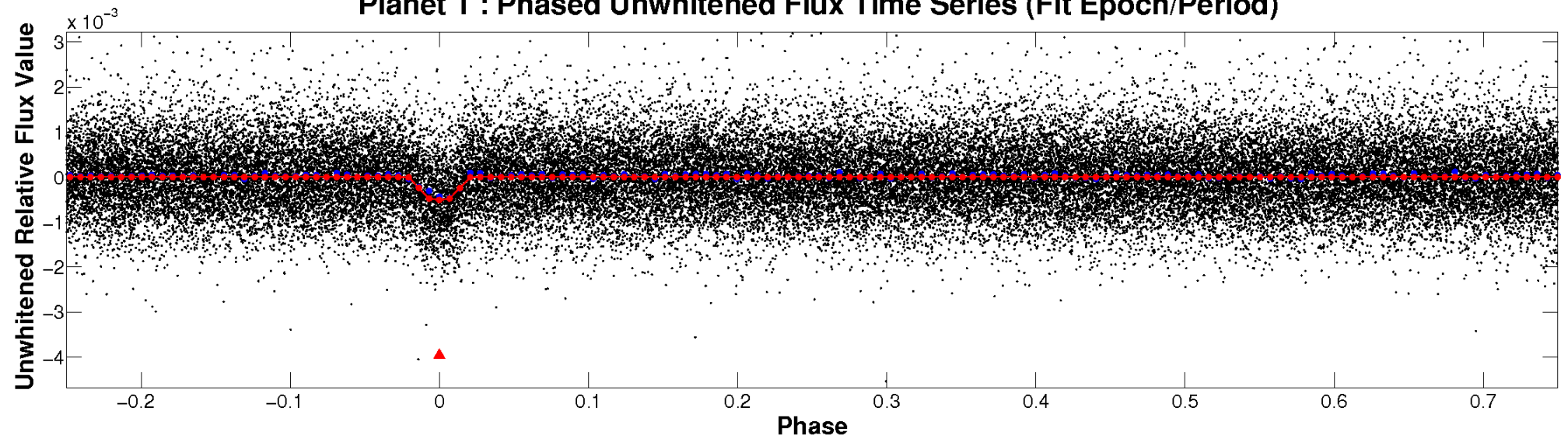
TCE 010686864-01



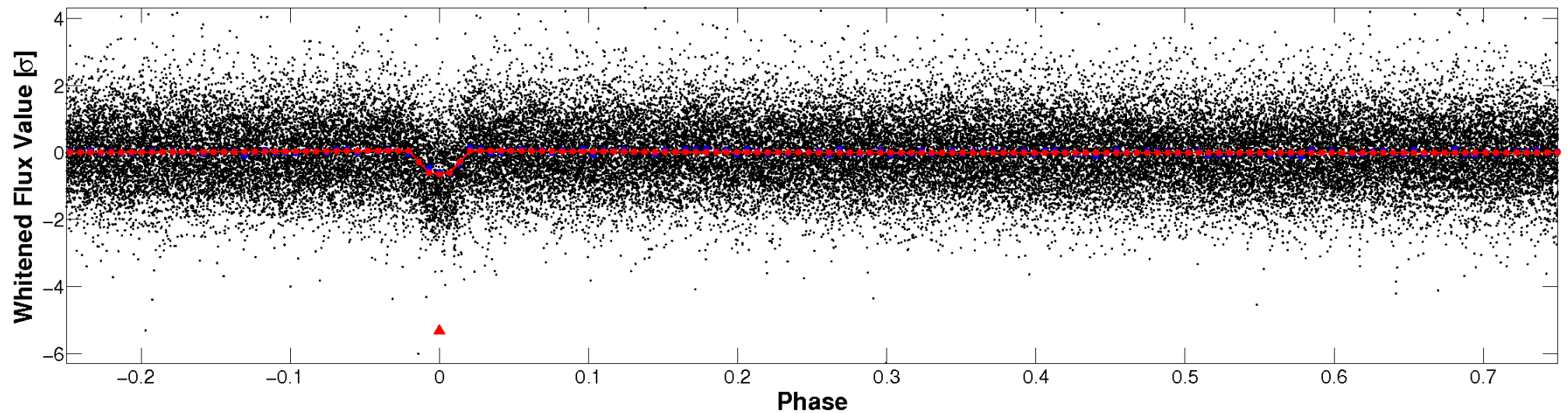


# Non-Whitened Vs. Whitened Light Curve

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

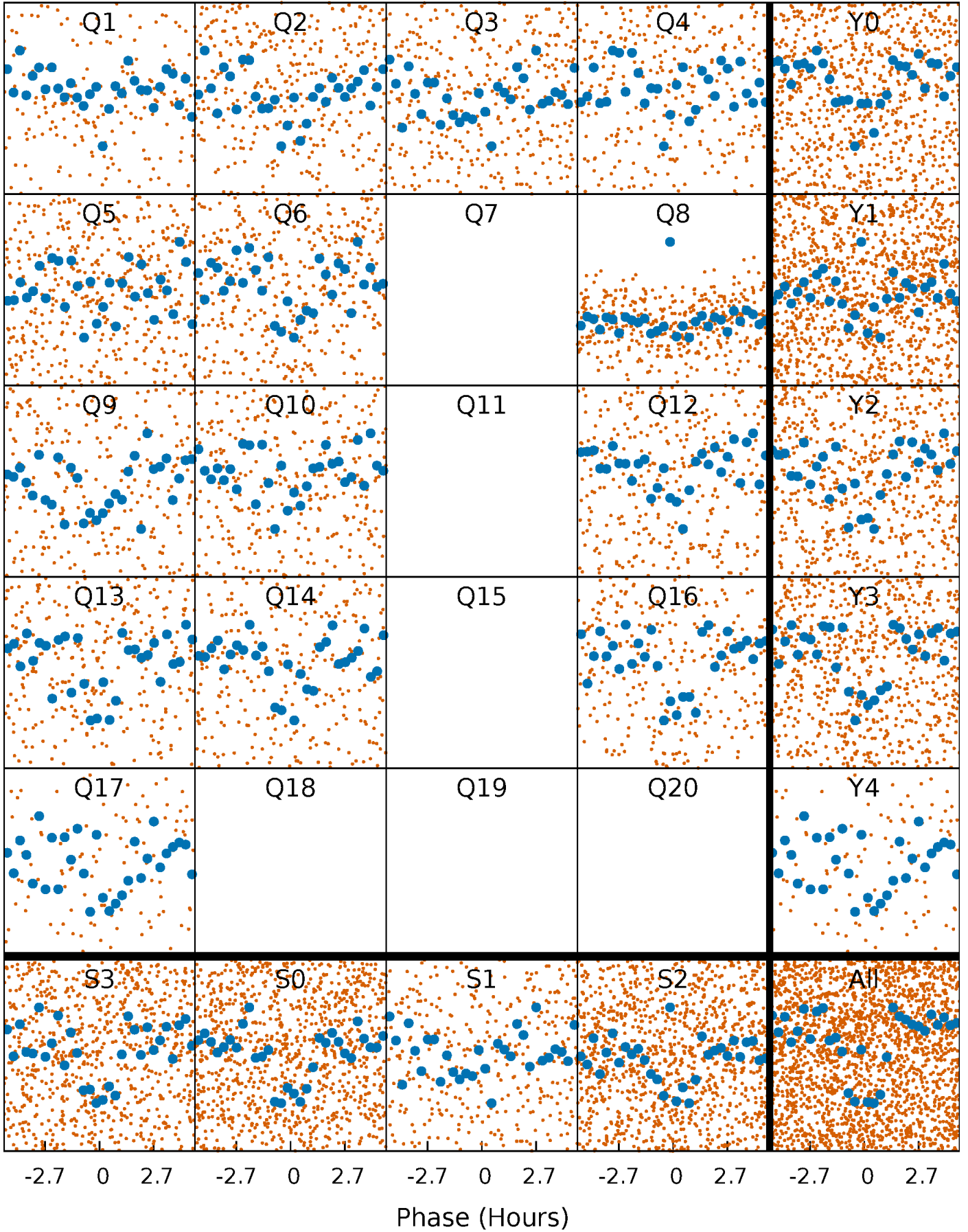


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

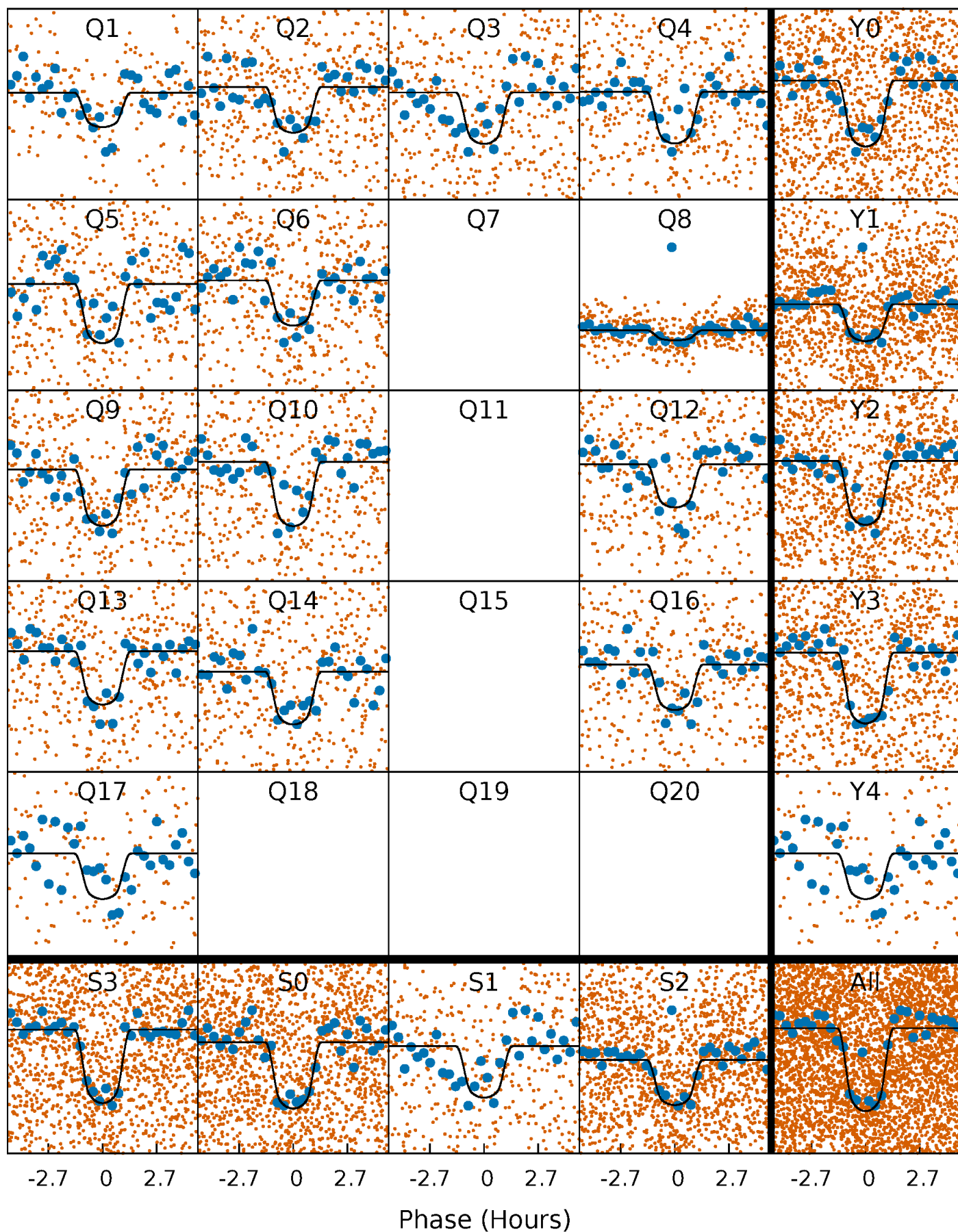
TCE 010686864-01 P= 2.970397 Days  $T_0=133.396569$  (BKJD)





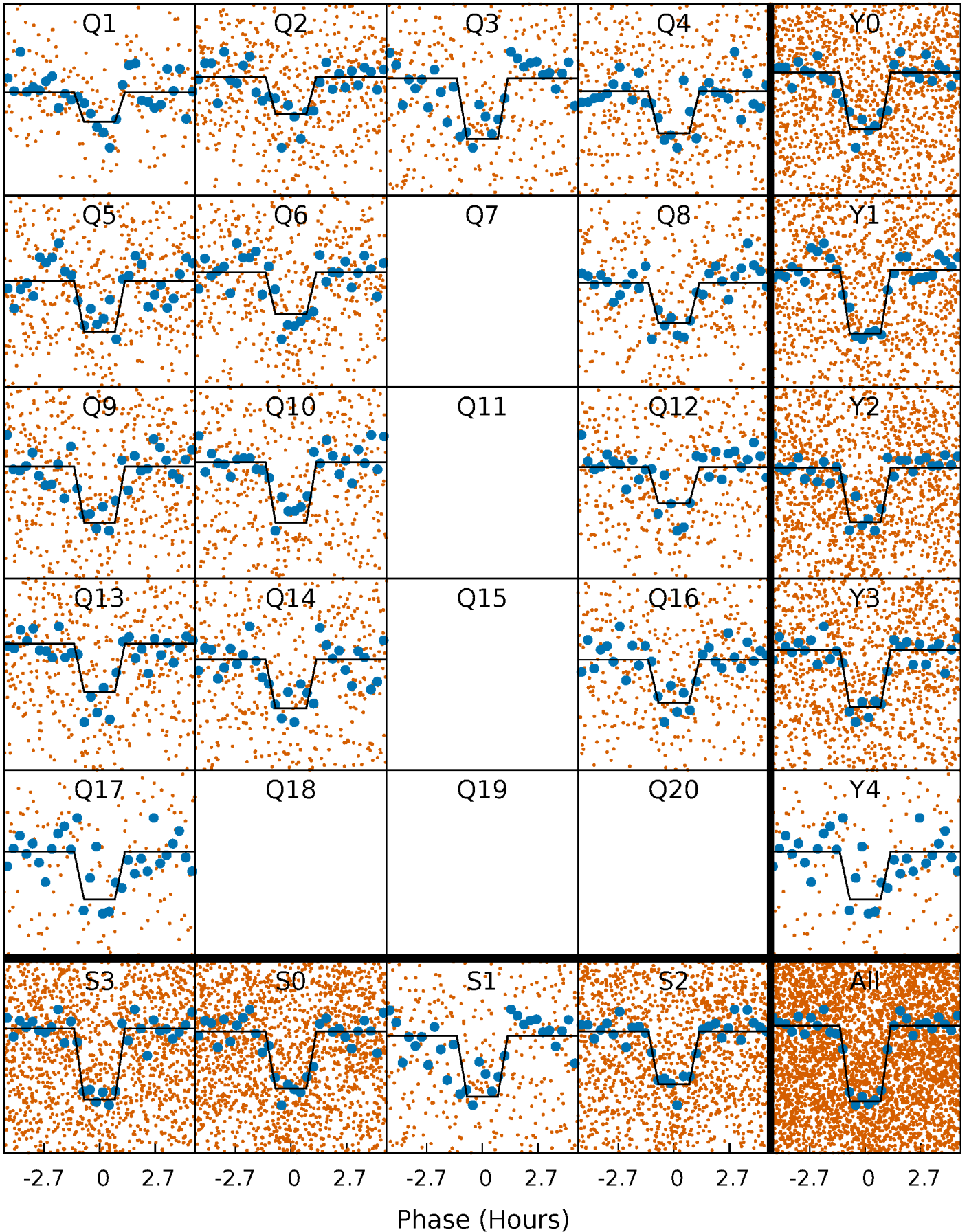
# DV Quarter-Phased Transit Curves

TCE 010686864-01 P= 2.970397 Days  $T_0=133.396569$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

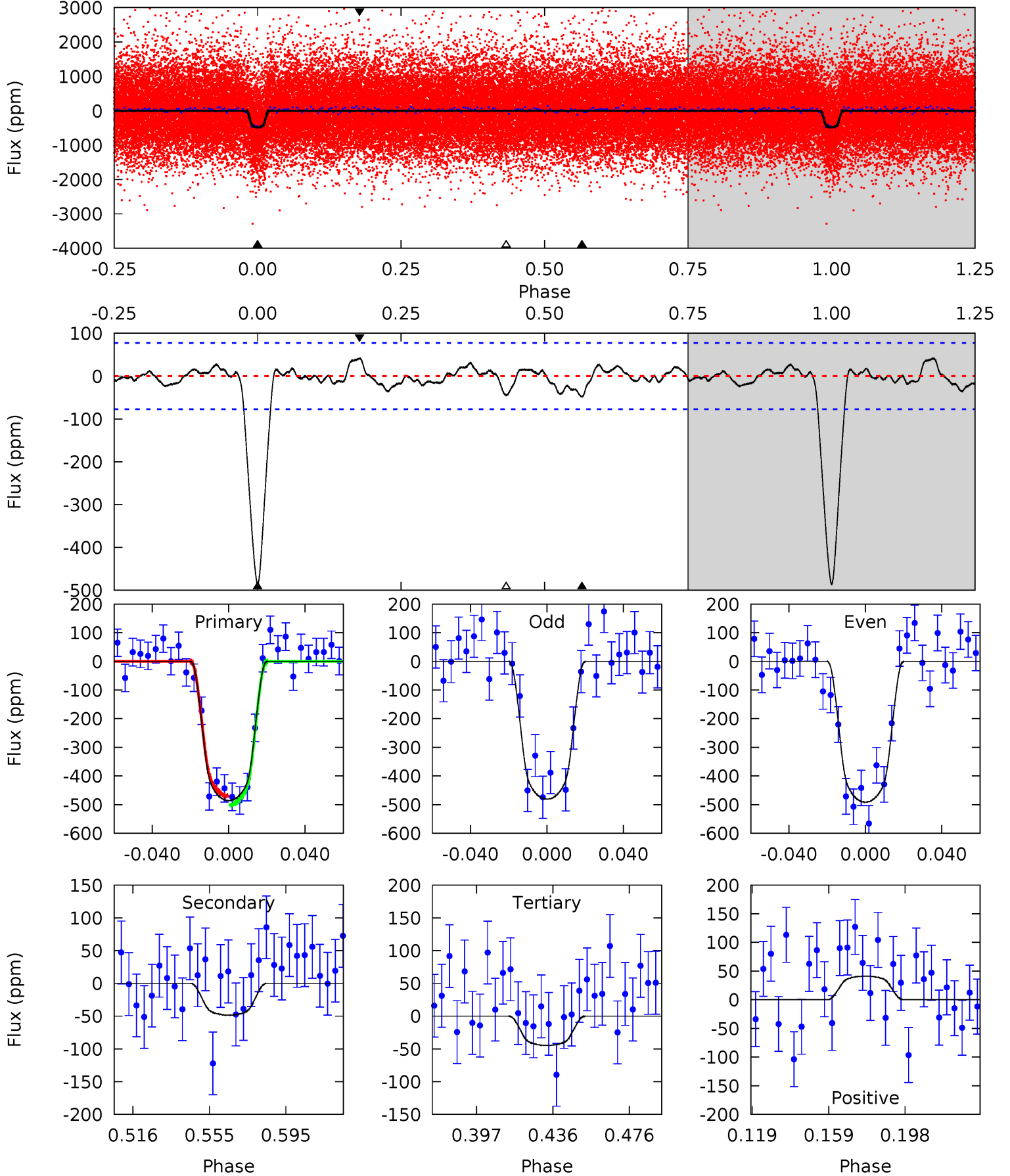
TCE 010686864-01 P= 2.970420 Days  $T_0=133.390791$  (BKJD)



# DV Model-Shift Uniqueness Test

010686864-01, P = 2.970397 Days, E = 130.426172 Days

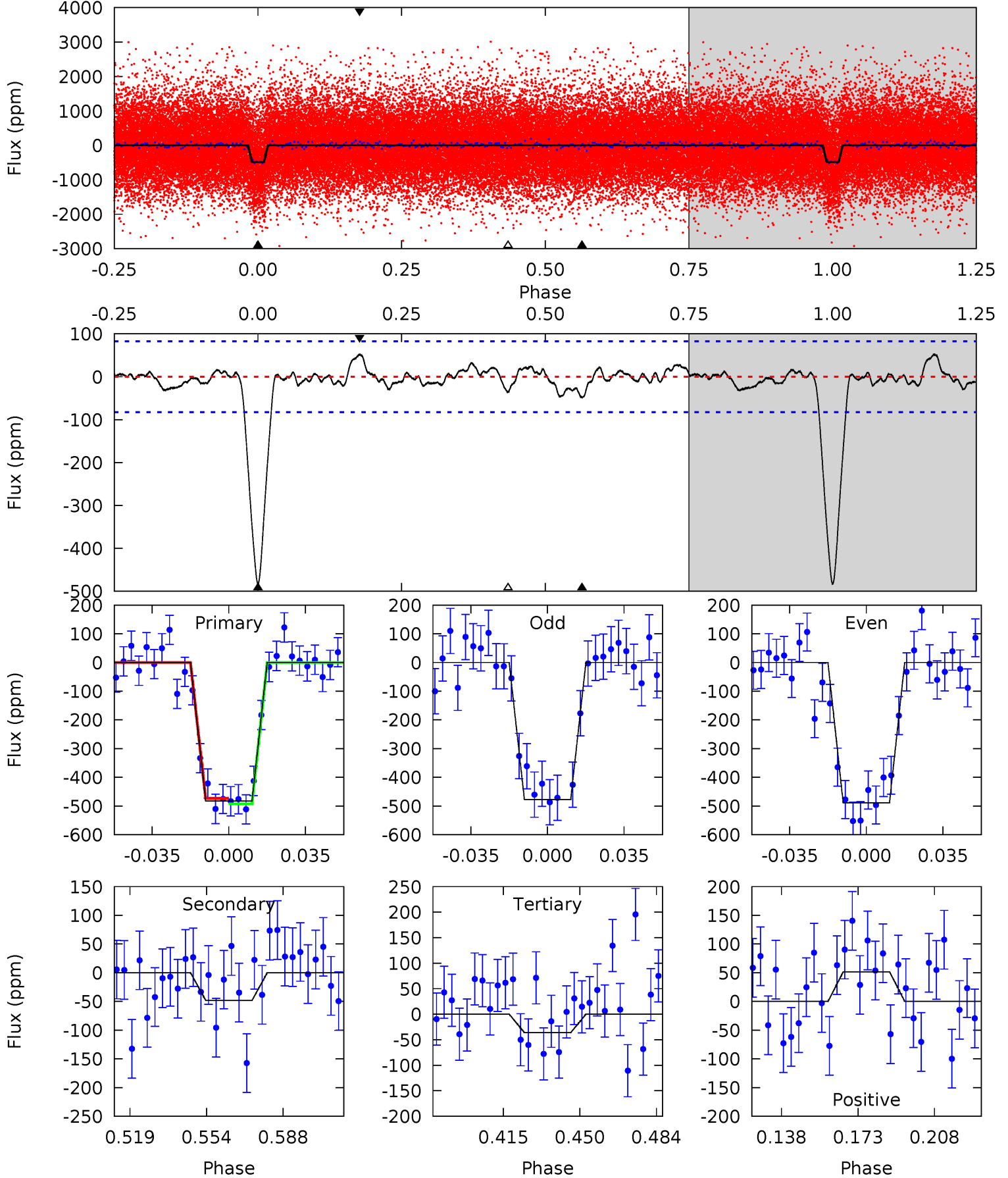
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.8	2.98	2.75	2.53	4.76	2.06	0.95	27.1	27.3	0.23	0.45	0.33	0.88	0.08	0.94



# Alt Model-Shift Uniqueness Test

010686864-01, P = 2.970420 Days, E = 130.420371 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
28.0	2.79	2.09	3.00	4.78	2.11	0.93	25.9	25.0	0.70	-0.20	0.33	0.93	0.10	0.55



### Stellar Parameters For KIC 010686864

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5068^{+179}_{-179}$	$4.608^{+0.028}_{-0.077}$	$-0.020^{+0.250}_{-0.300}$	$0.743^{+0.096}_{-0.059}$	$0.833^{+0.059}_{-0.088}$	$2.854^{+0.428}_{-0.795}$
	+4%/-4%	+1%/-2%	+1250%/-1500%	+13%/-8%	+7%/-11%	+15%/-28%
Source	KIC0	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 010686864-01 / KOI 1637.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-49 \pm 16$	$2.12^{+0.44}_{-0.43}$	$1404^{+60}_{-54}$	$3179^{+284}_{-250}$	$8.420^{+5.681}_{-3.361}$
Alt.	$-48 \pm 17$	$1.82^{+0.43}_{-0.44}$	$1406^{+59}_{-57}$	$3342^{+365}_{-305}$	$11^{+10}_{-5}$

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



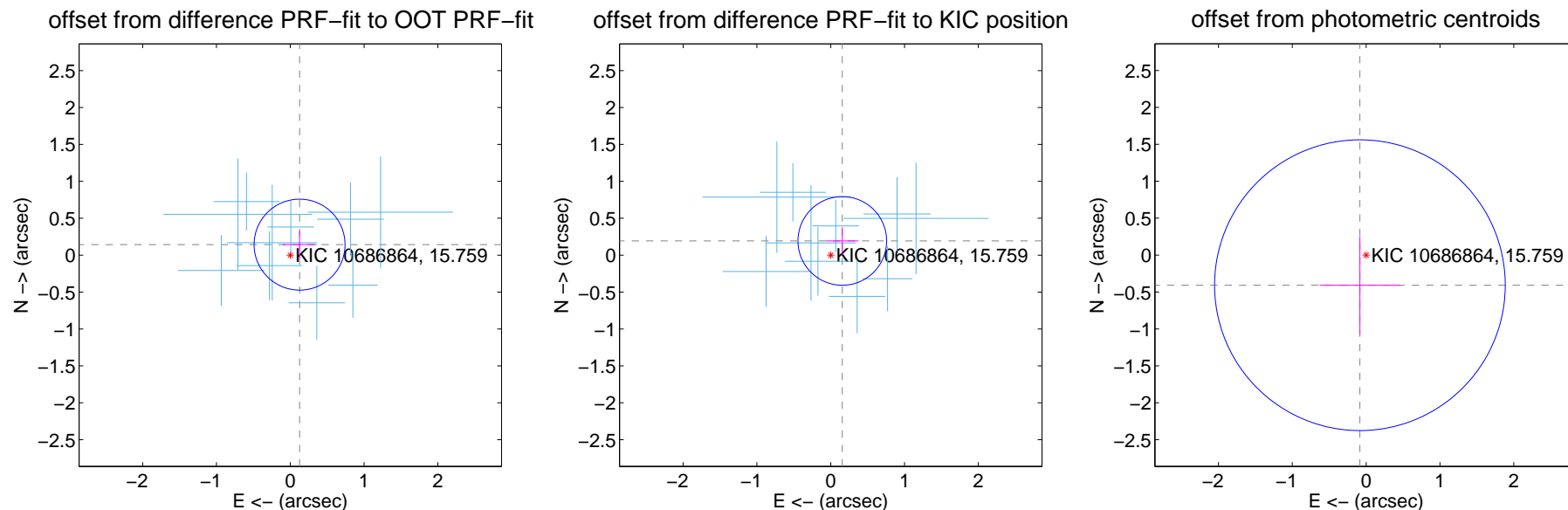
## DV Centroid Data

Supplemental centroid analysis for 010686864-01. Kepler magnitude: 15.76. Transit SNR 21.46

There are 10 quarters with good PRF difference image offsets

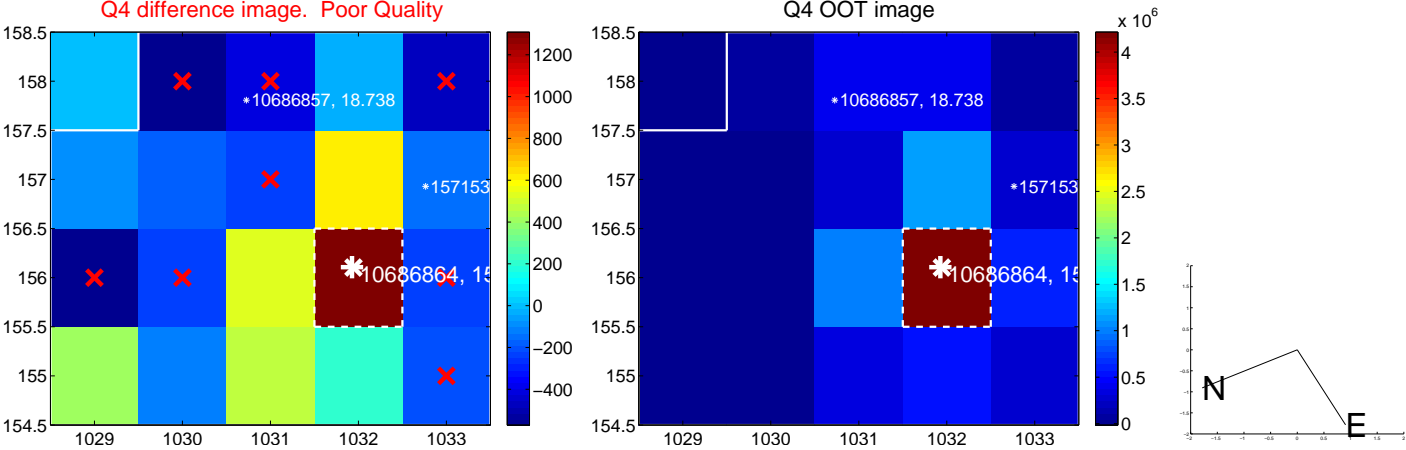
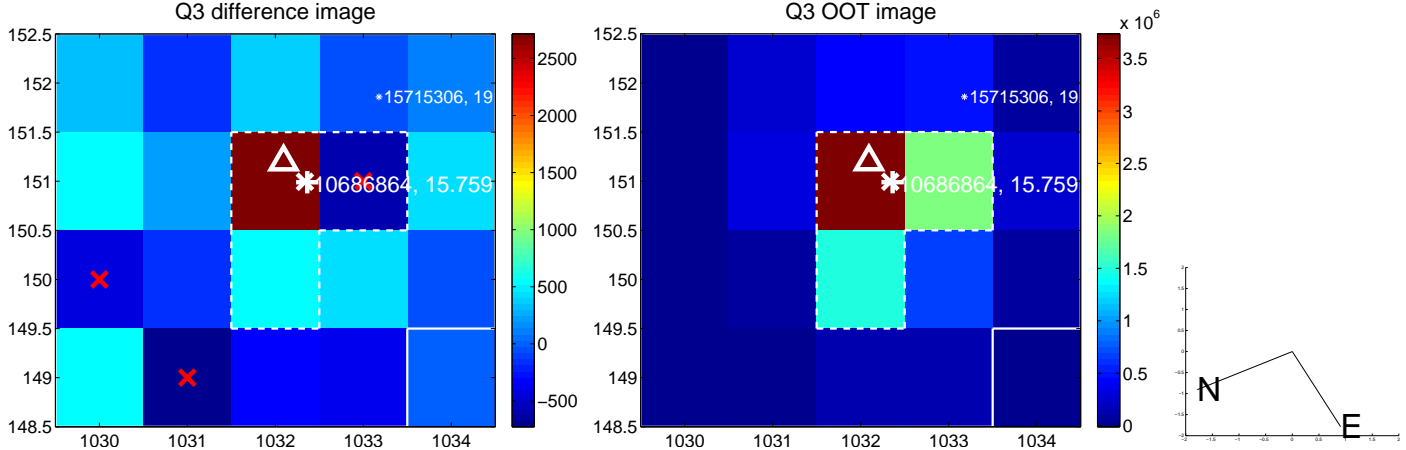
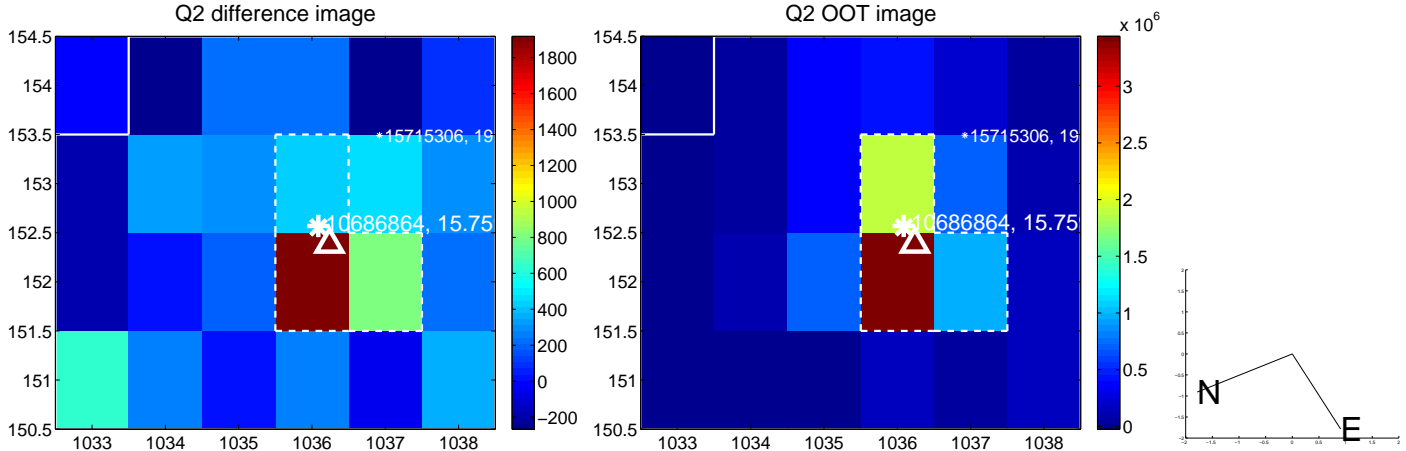
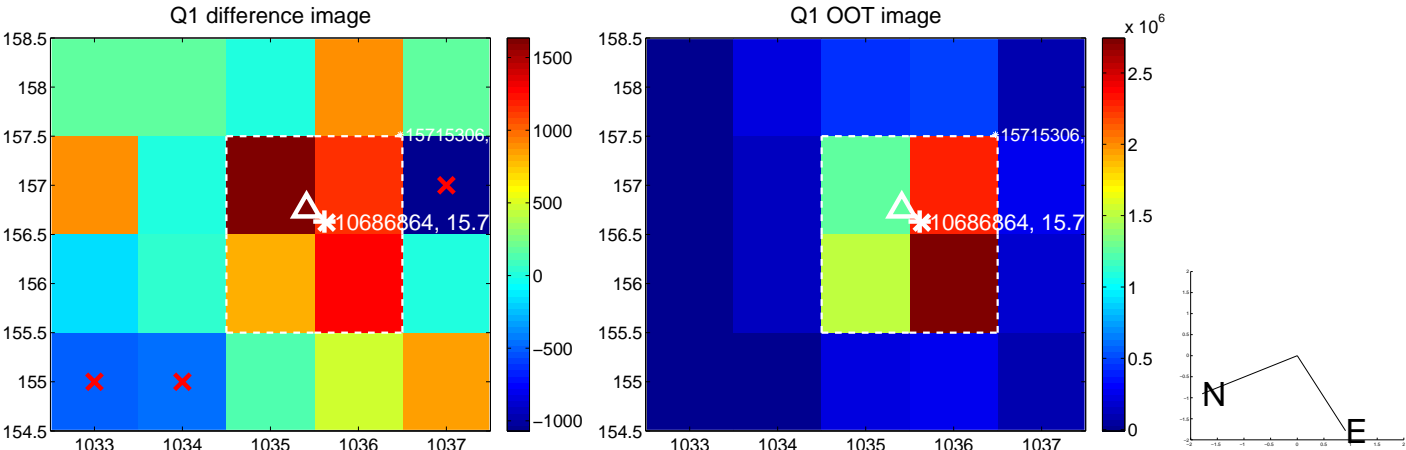
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.190 \pm 0.205$	0.93	$-0.126 \pm 0.230$	$0.142 \pm 0.184$
PRF-fit source offset from KIC position	$0.249 \pm 0.200$	1.24	$-0.157 \pm 0.220$	$0.193 \pm 0.186$
photometric centroid source offset	$0.42 \pm 0.66$	0.63	$0.08 \pm 0.55$	$-0.41 \pm 0.66$

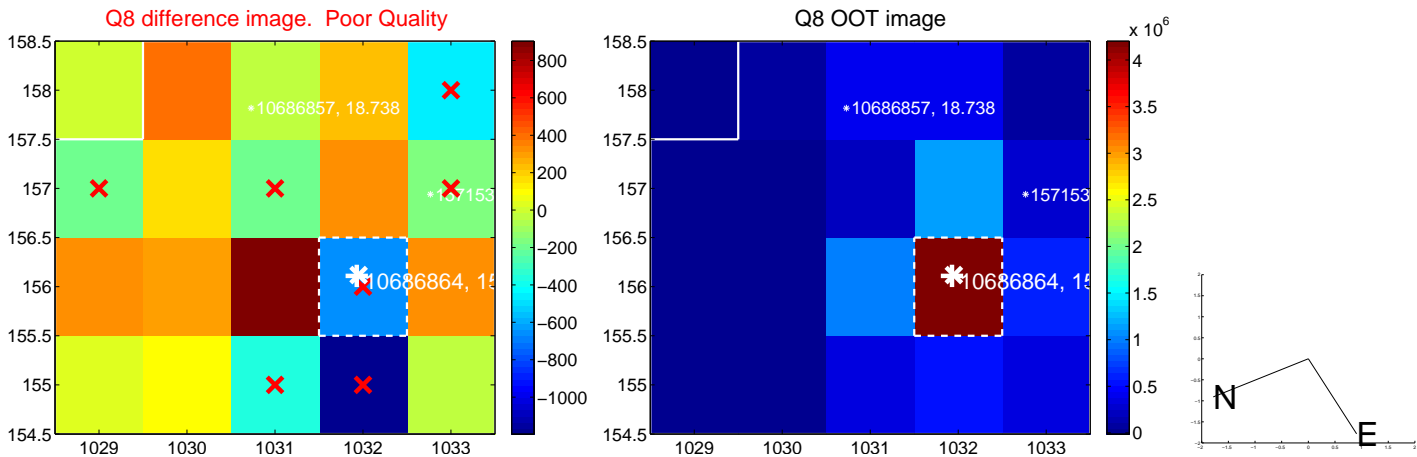
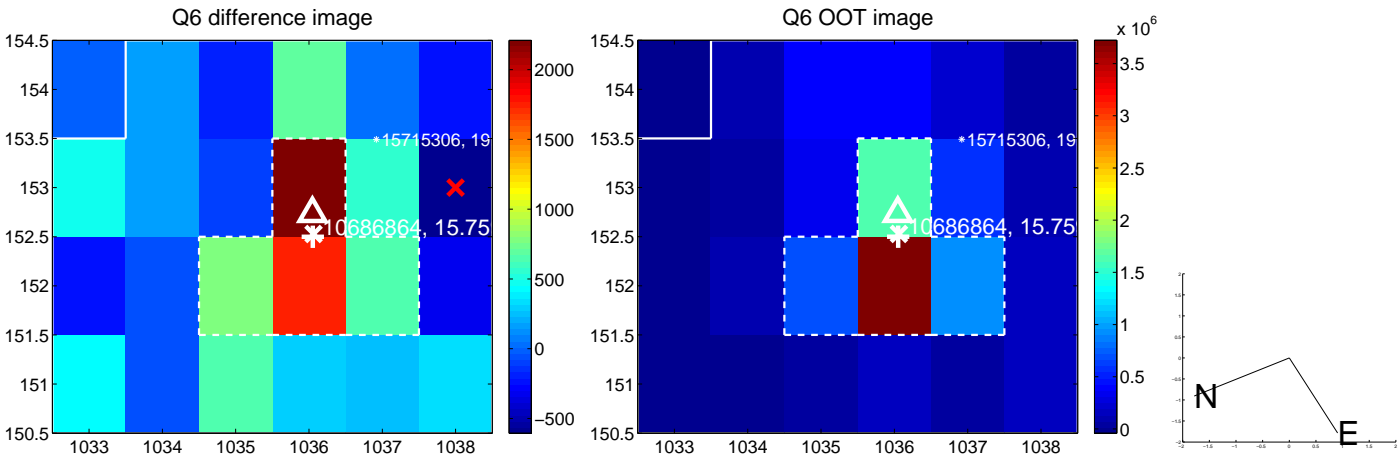
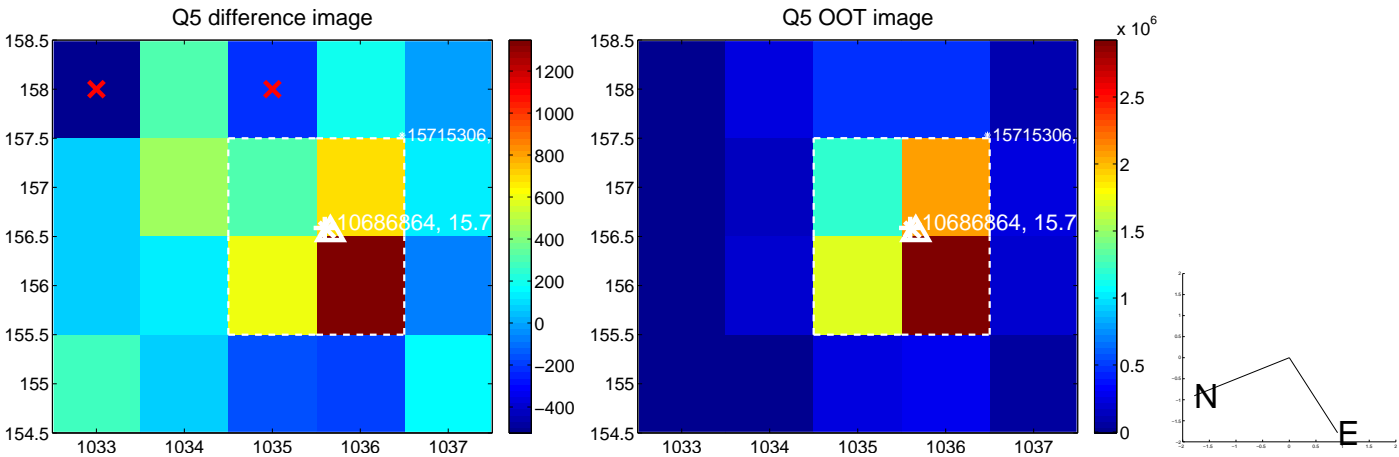


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

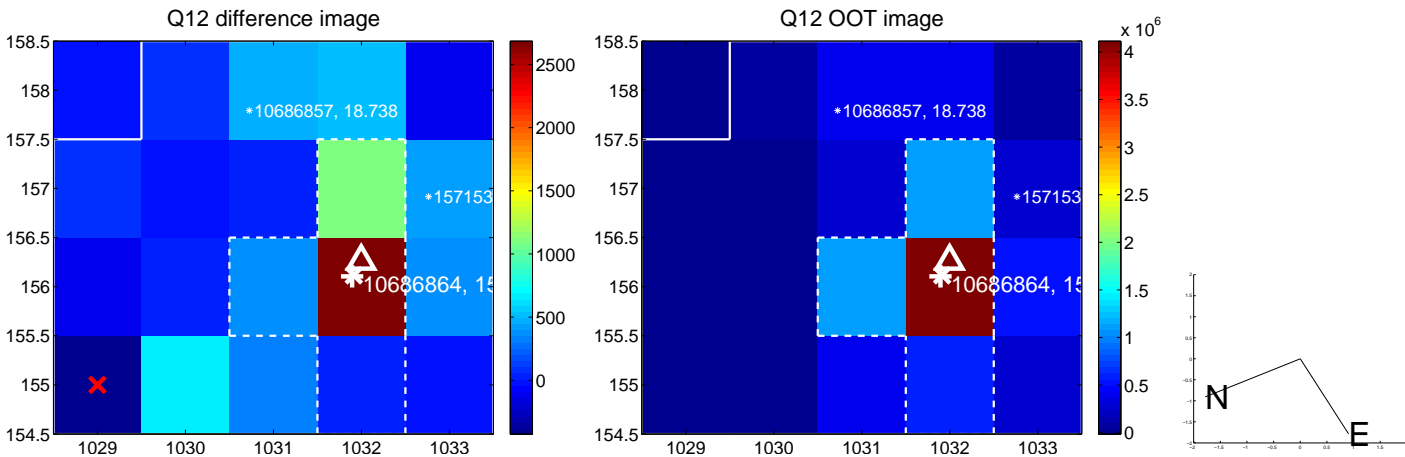
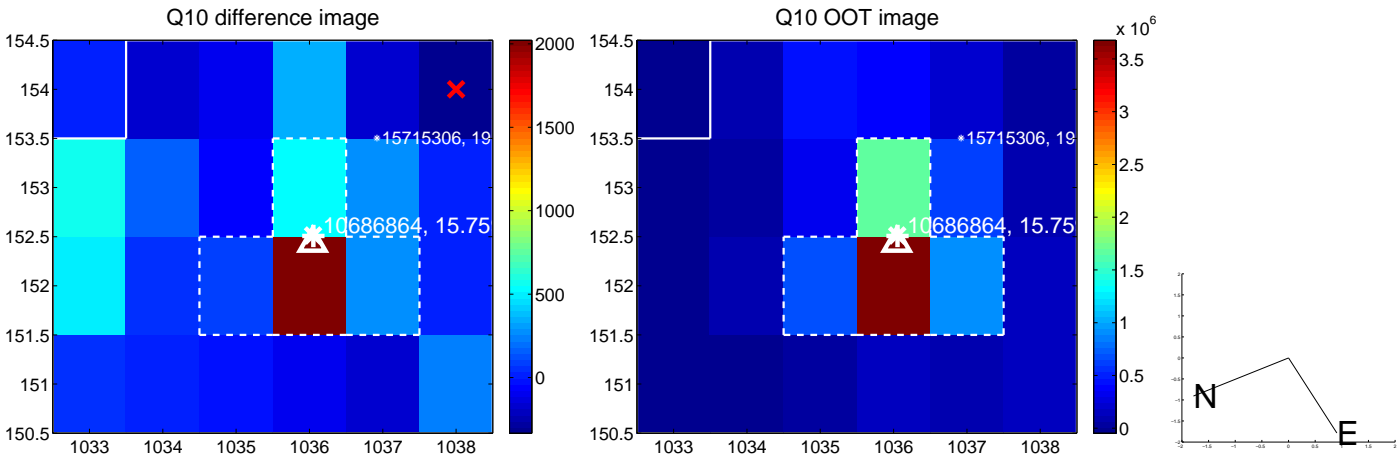
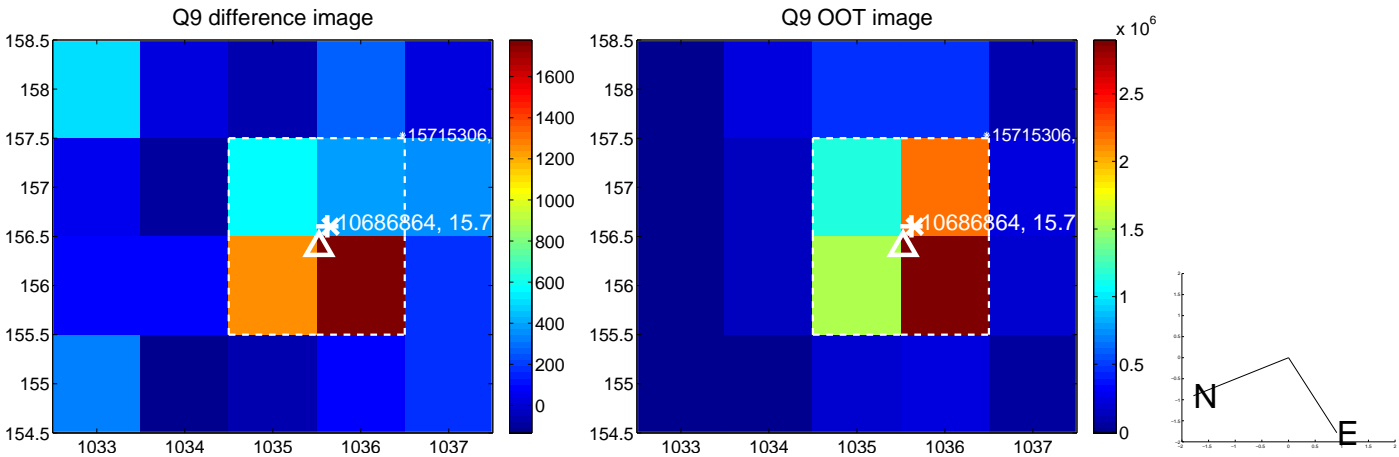
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



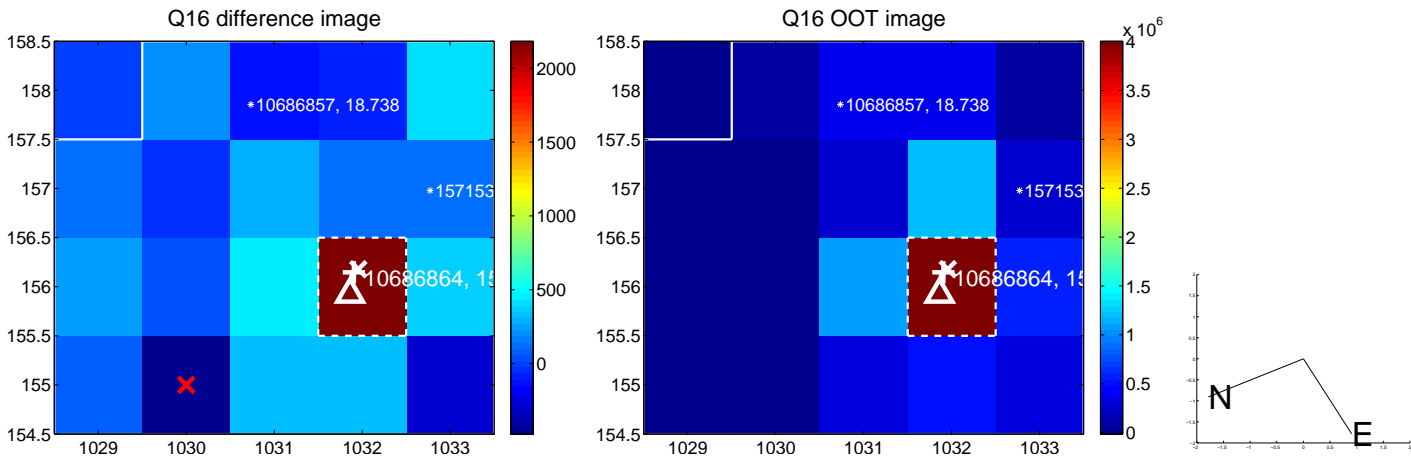
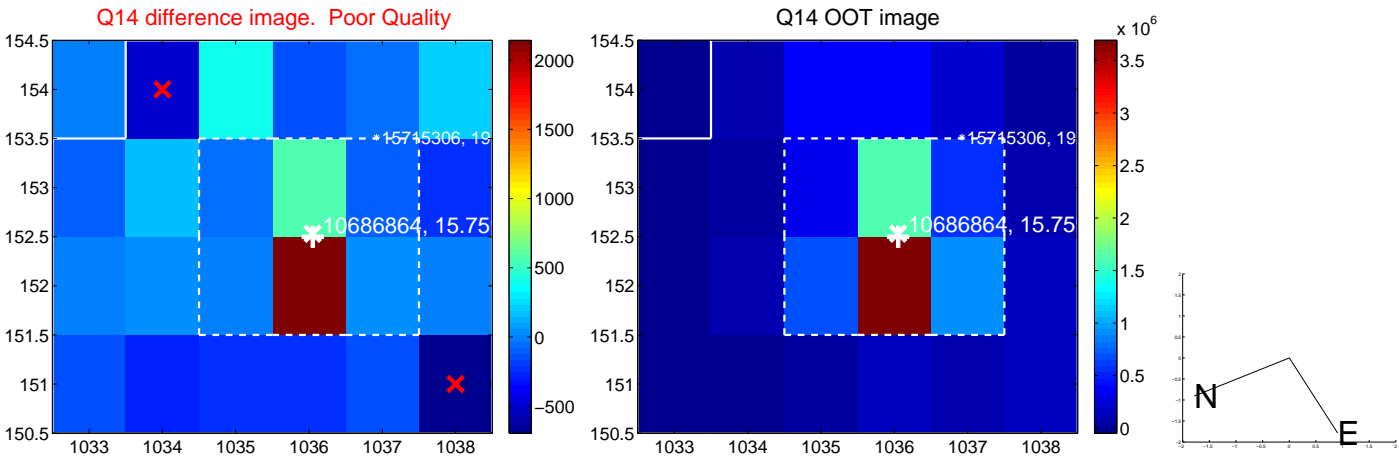
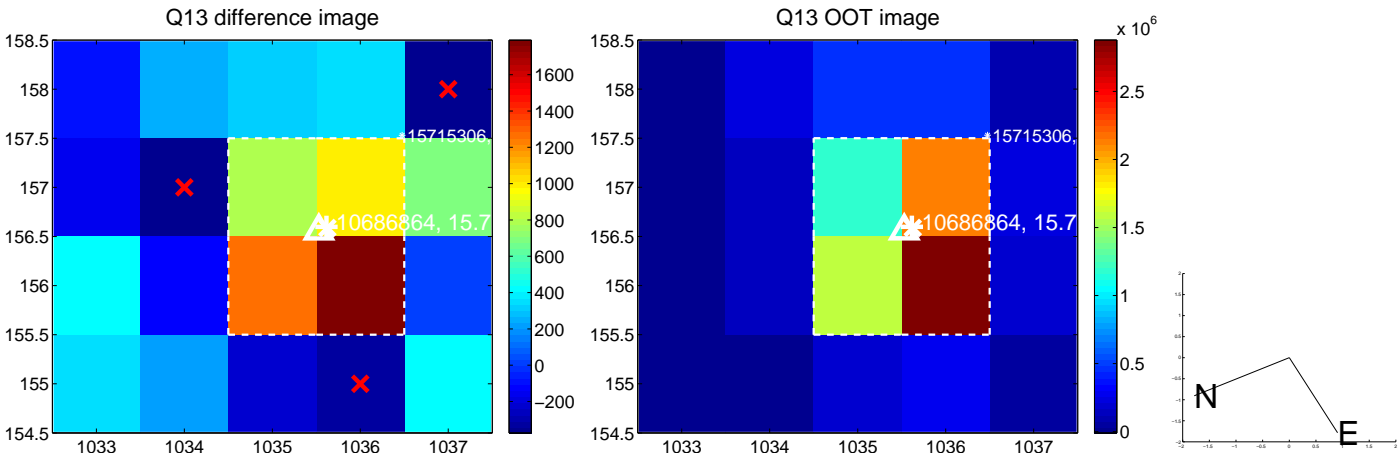
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

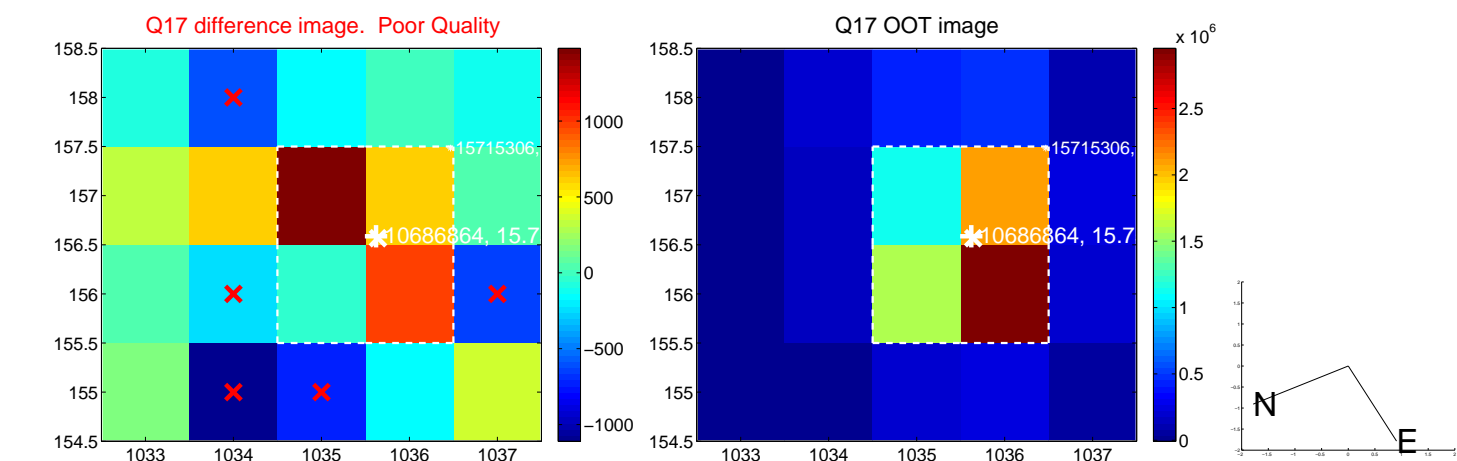


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

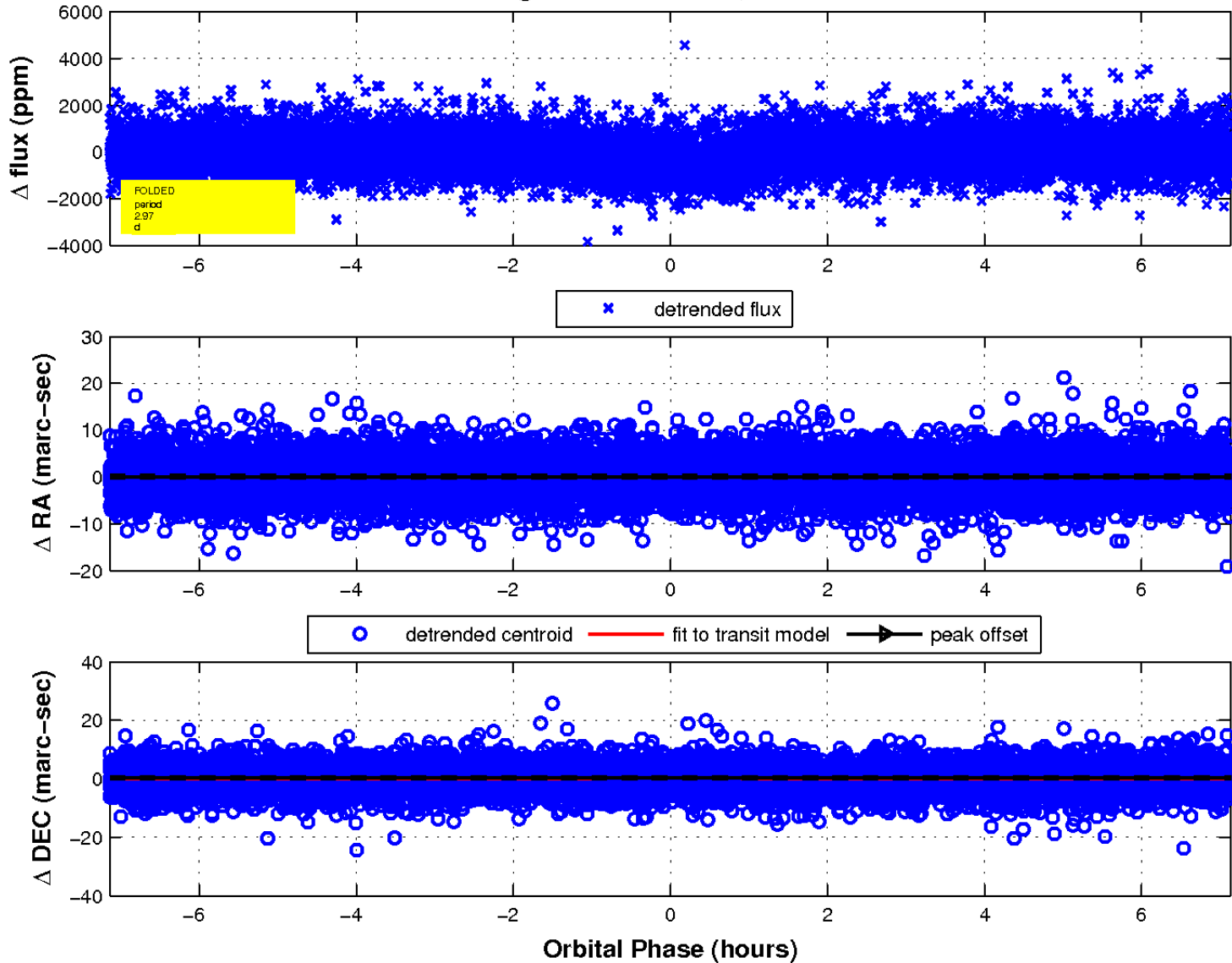




white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

