

# KIC 009008737

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009008737-01	OBS	2768.03	11.835676	137.350323	255.7	2.479	10.8	10.9	0.86	5639	1.64	66.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009008737-01	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.

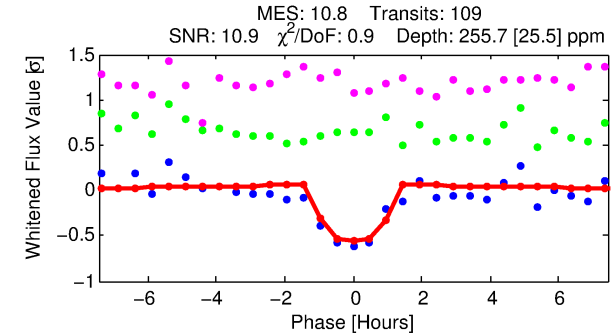
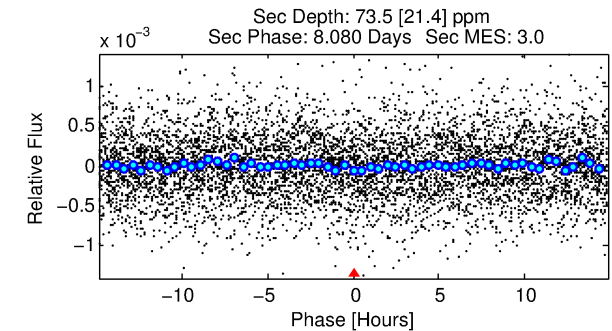
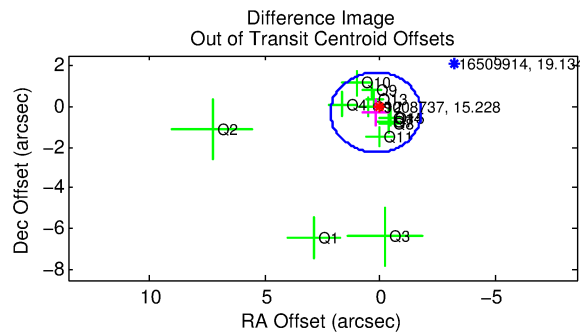
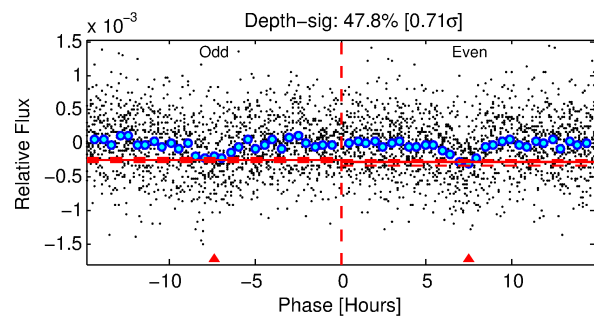
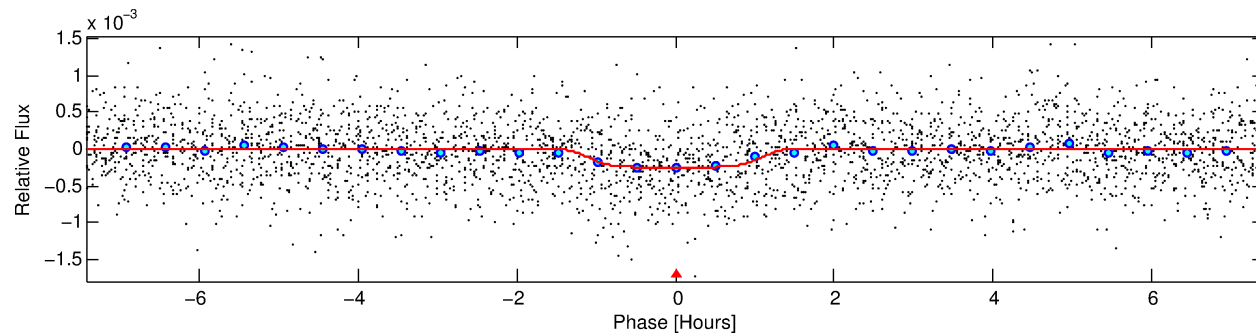
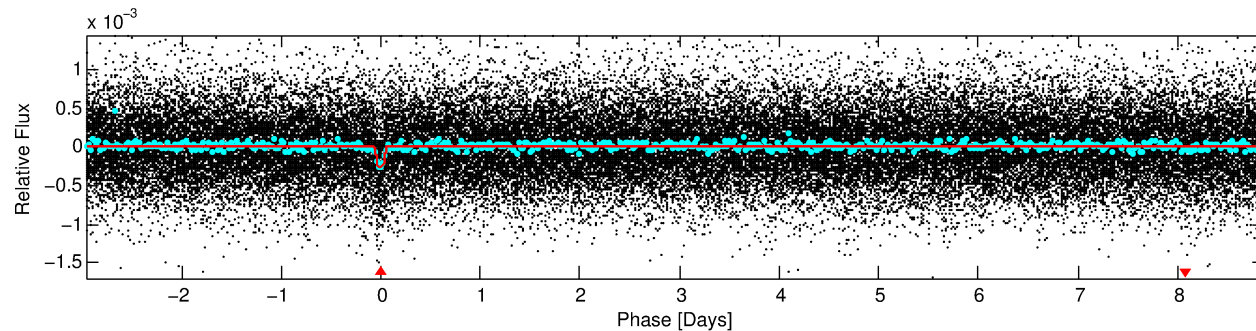
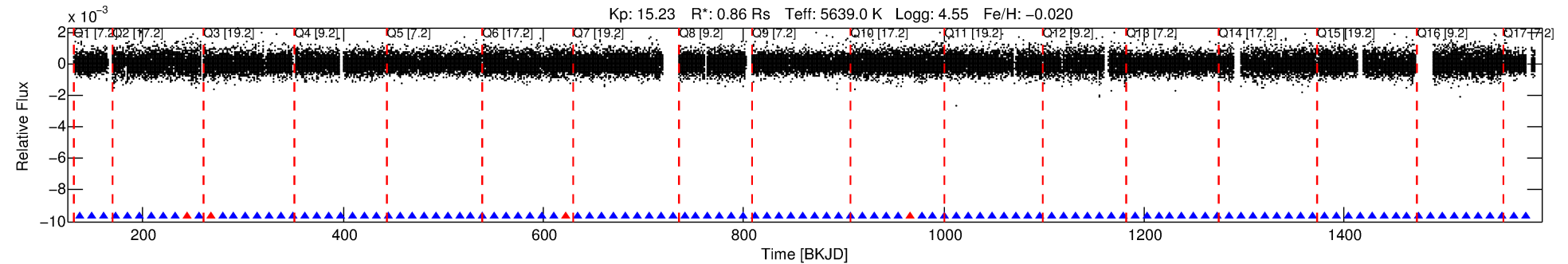
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009008737-01

No Significant Match Found

# DV One-Page Summary

KIC: 9008737 Candidate: 1 of 1 Period: 11.836 d  
KOI: K02768 Name: Kepler-404 Corr: No Ephemeris Match



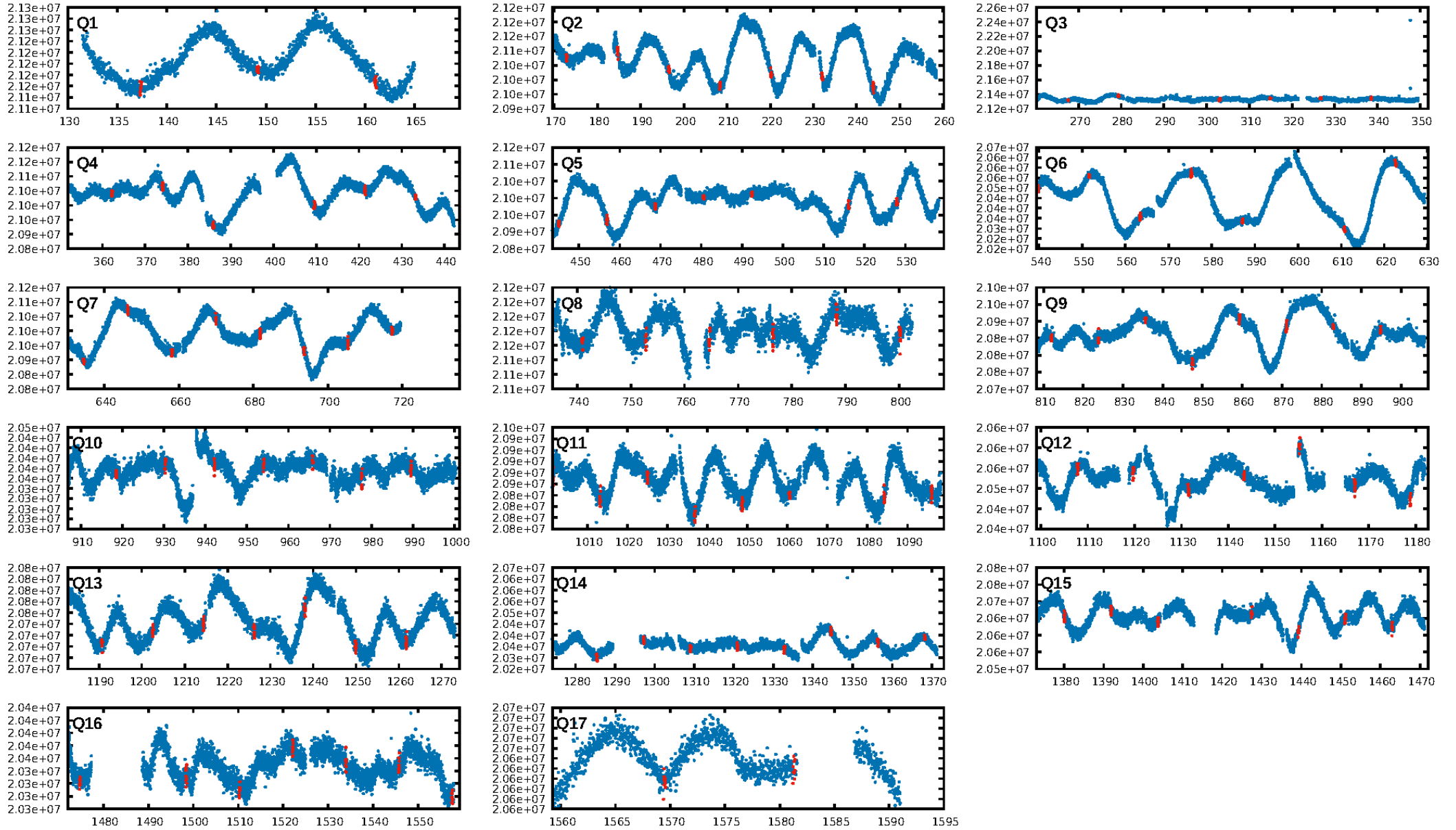
## DV Fit Results:

Period = 11.83568 [0.00008] d  
Epoch = 137.3503 [0.0051] BKJD  
Rp/R\* = 0.0175 [0.0089]  
a/R\* = 17.23 [39.80]  
b = 0.90 [0.49]  
Seff = 66.59 [22.89]  
Teq = 728 [63] K  
Rp = 1.64 [0.93] Re  
a = 0.1002 [0.0219] AU  
Ag = 150.13 [165.63] [0.90σ]  
Teffp = 3942 [1047] K [3.07σ]

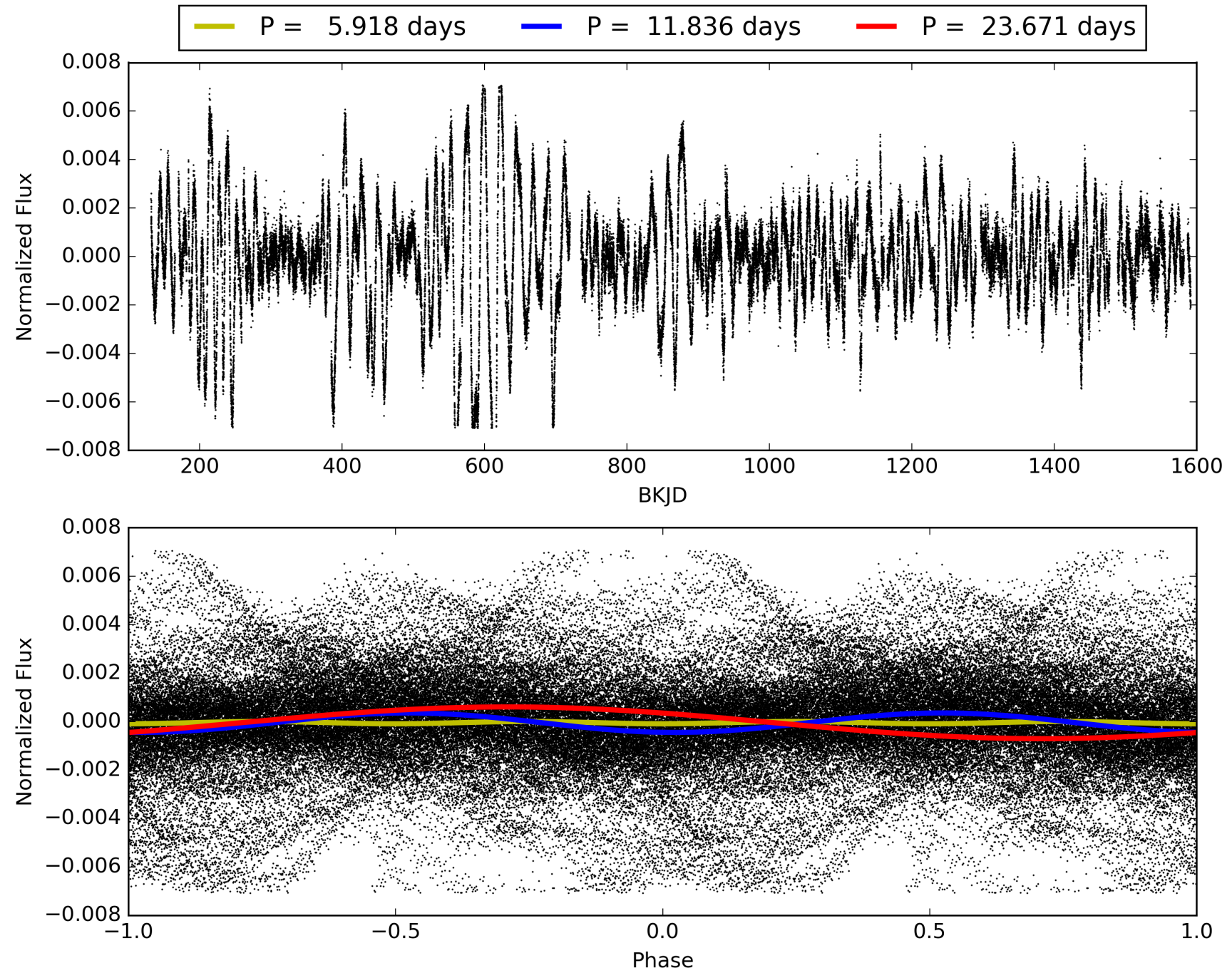
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 3.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.97e-27  
RollingBand-fgt: 0.96 [100/104]  
GhostDiagnostic-chr: 6.436  
Centroid-sig: 47.0%  
Centroid-so: 0.900 arcsec [0.76σ]  
OotOffset-rm: 0.358 arcsec [0.55σ]  
KicOffset-rm: 0.312 arcsec [0.48σ]  
OotOffset-st: 3/4/3/3 [13]  
KicOffset-st: 3/4/3/3 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009008737-01, PDC Light Curves

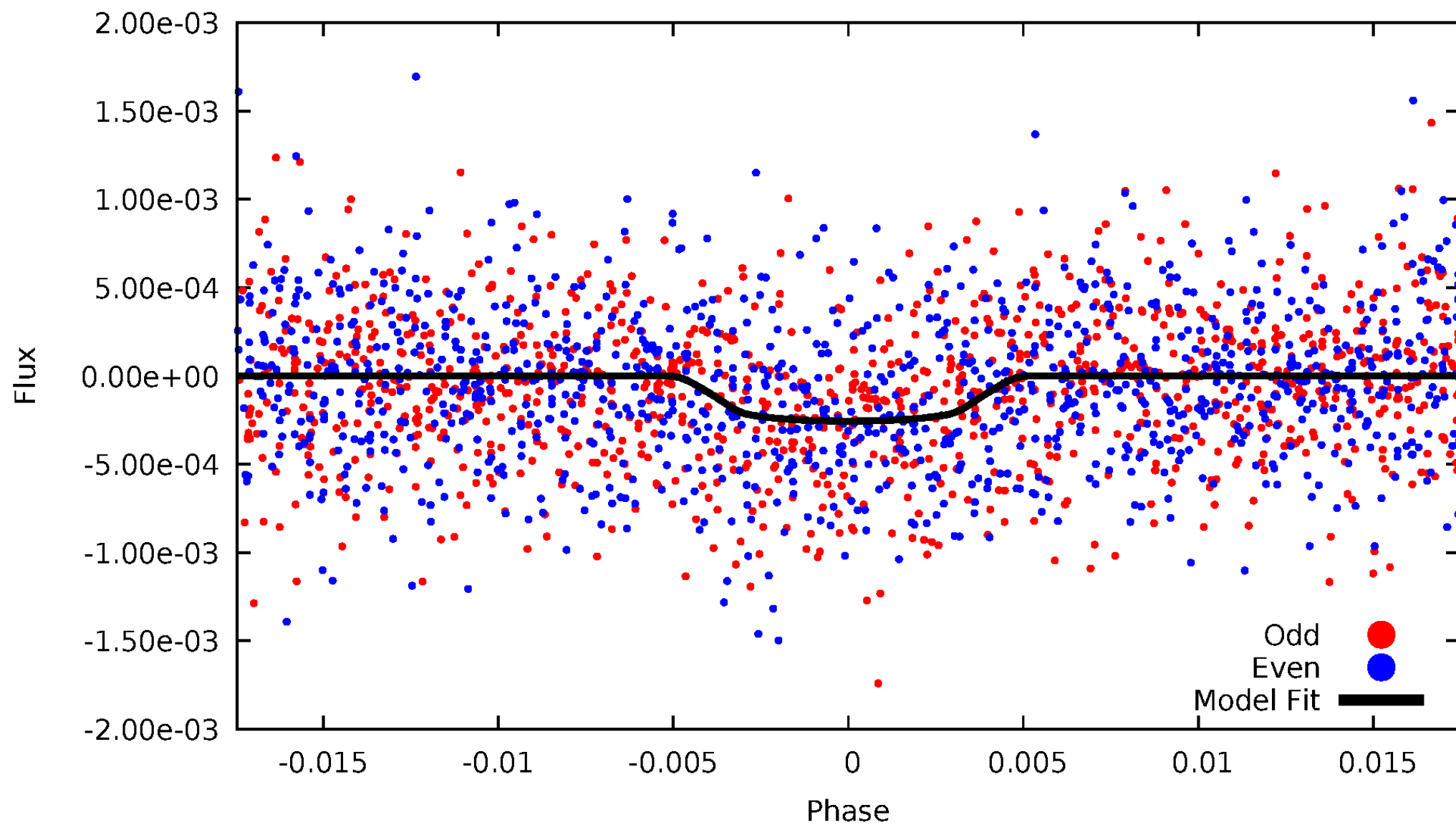


TCE 009008737-01



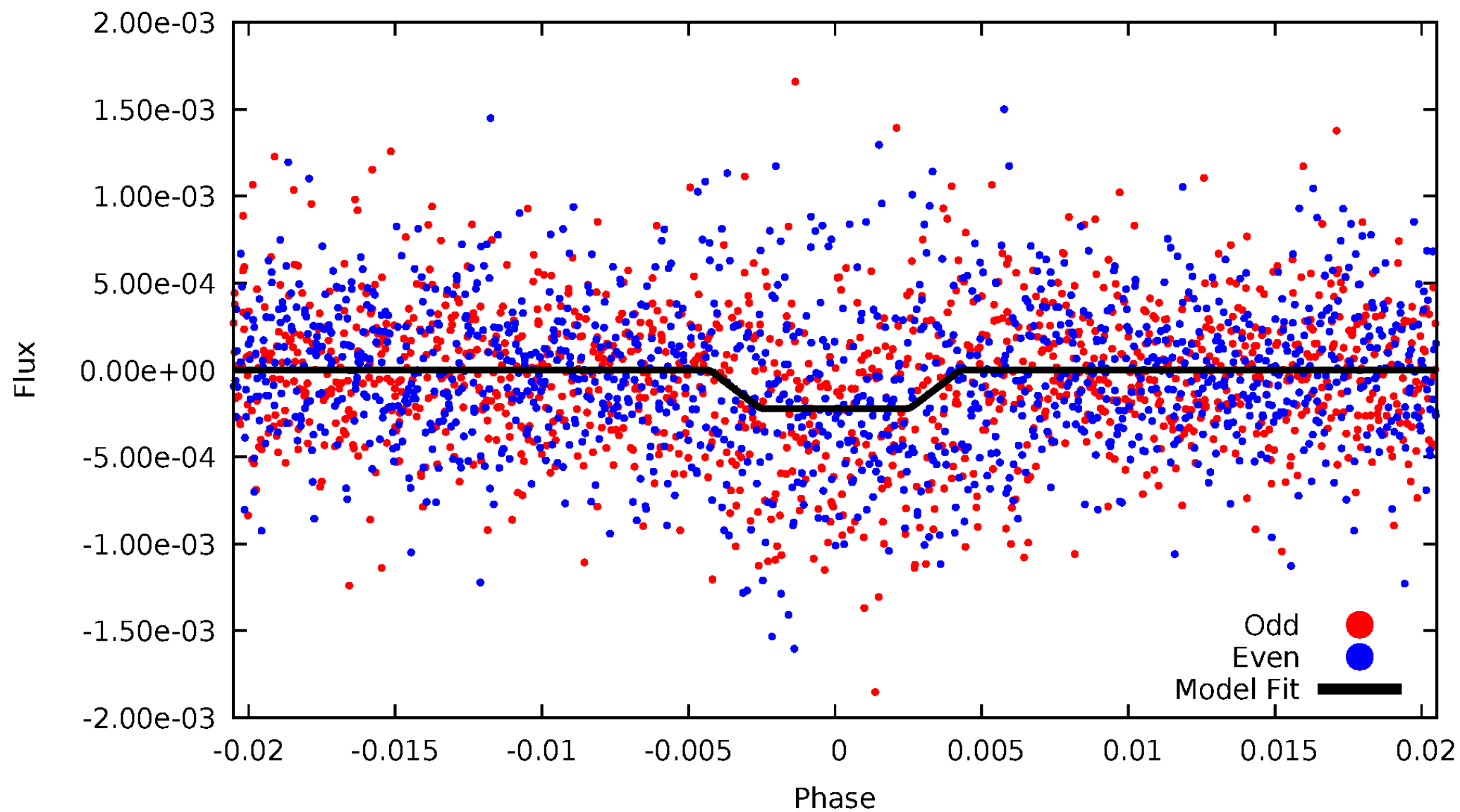
# DV Odd/Even

TCE 009008737-01



# ALT Odd/Even

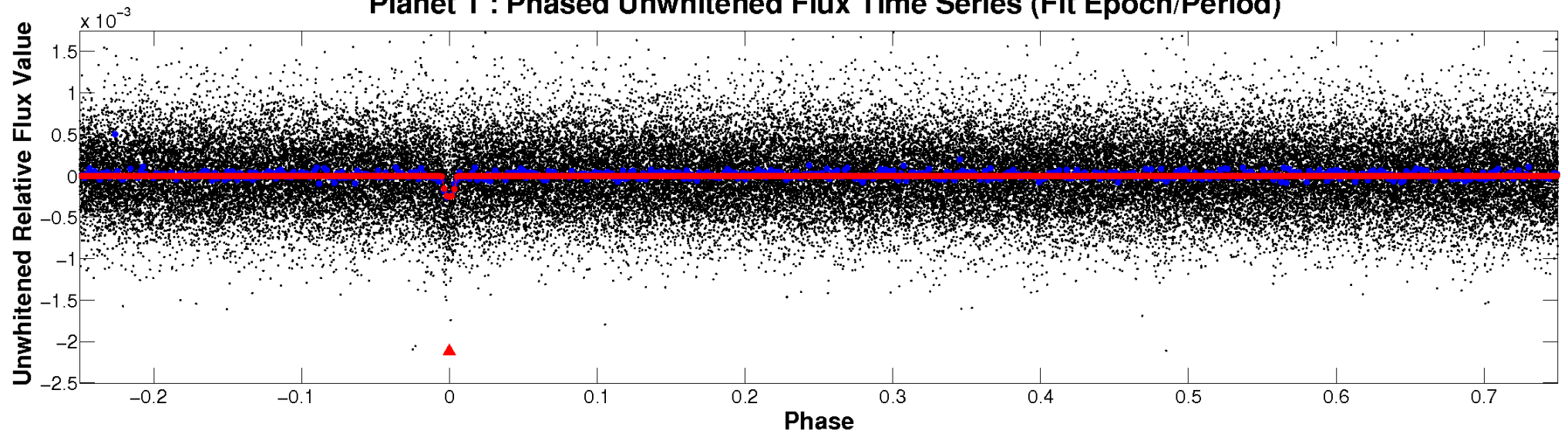
TCE 009008737-01



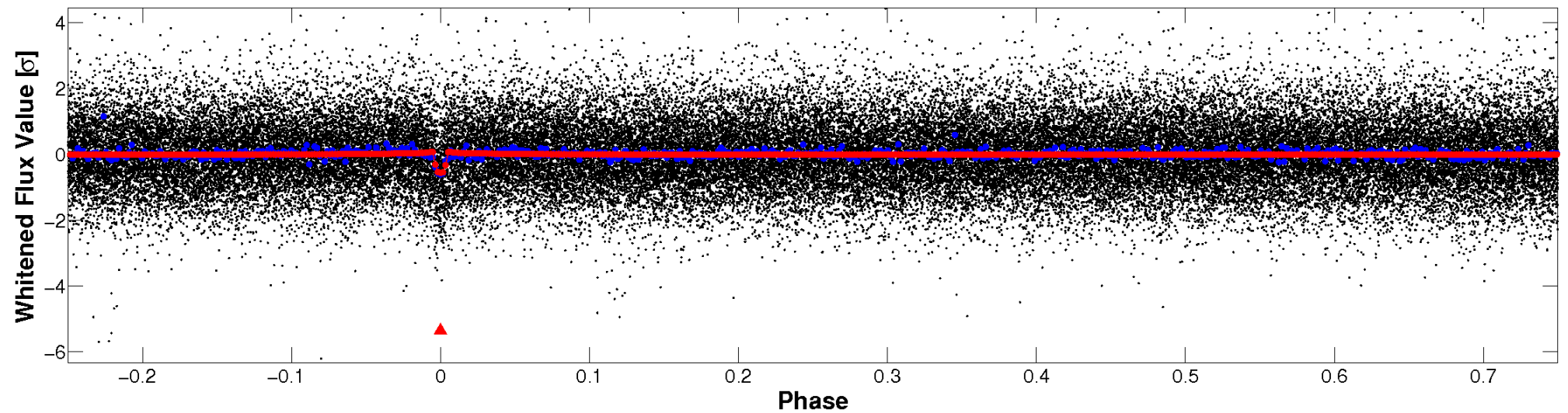


# Non-Whitened Vs. Whitened Light Curve

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

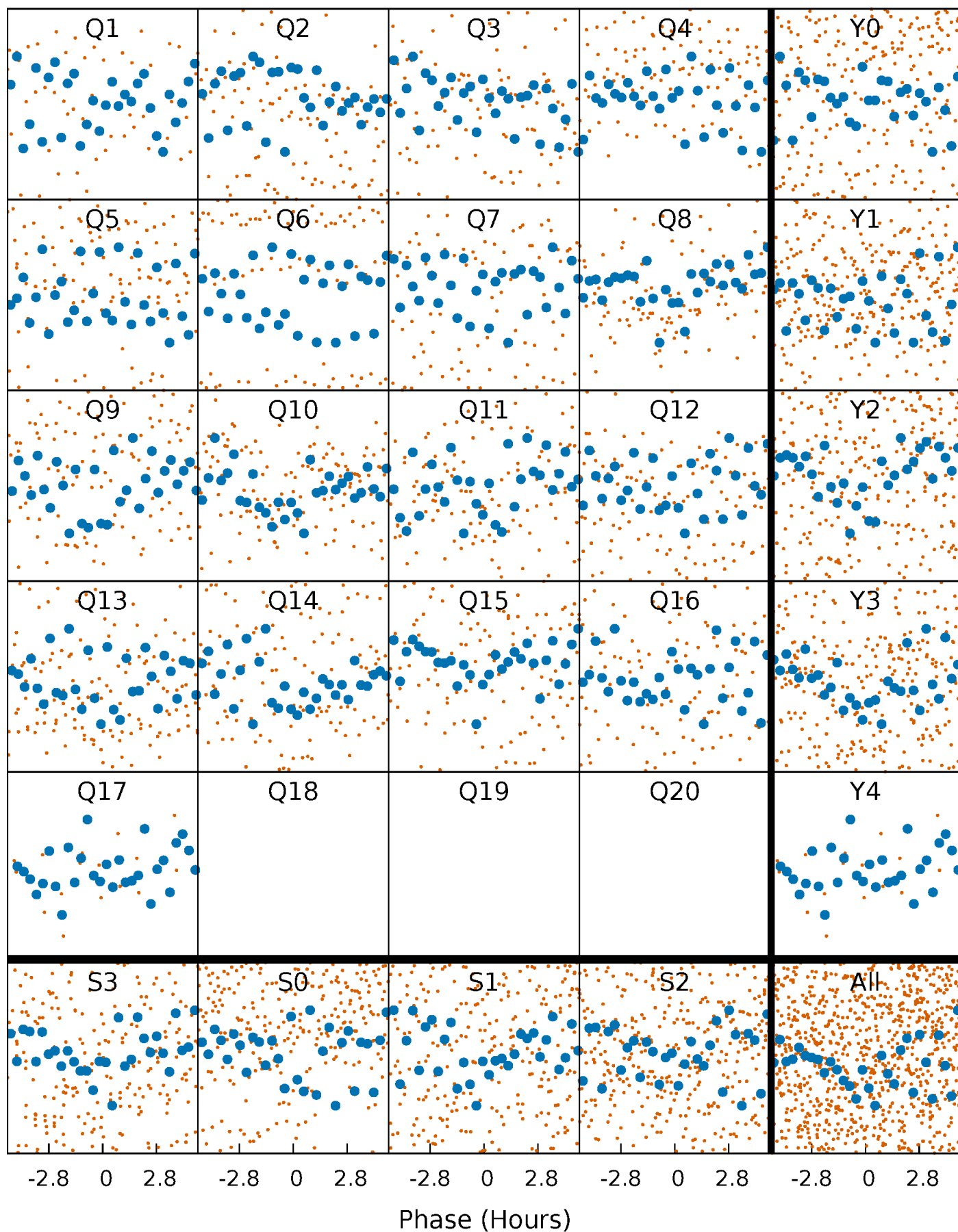


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

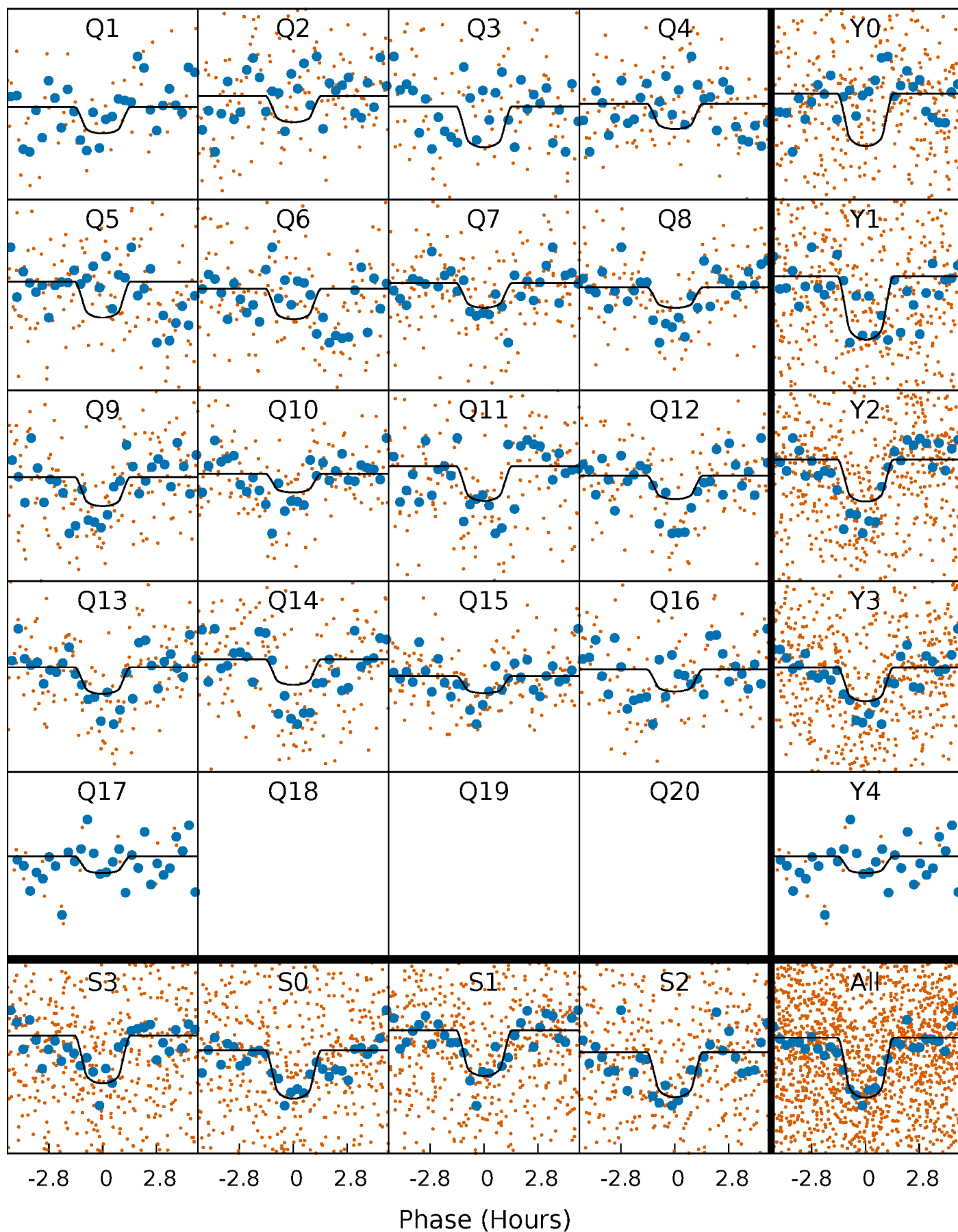
TCE 009008737-01 P= 11.835676 Days  $T_0=137.350323$  (BKJD)





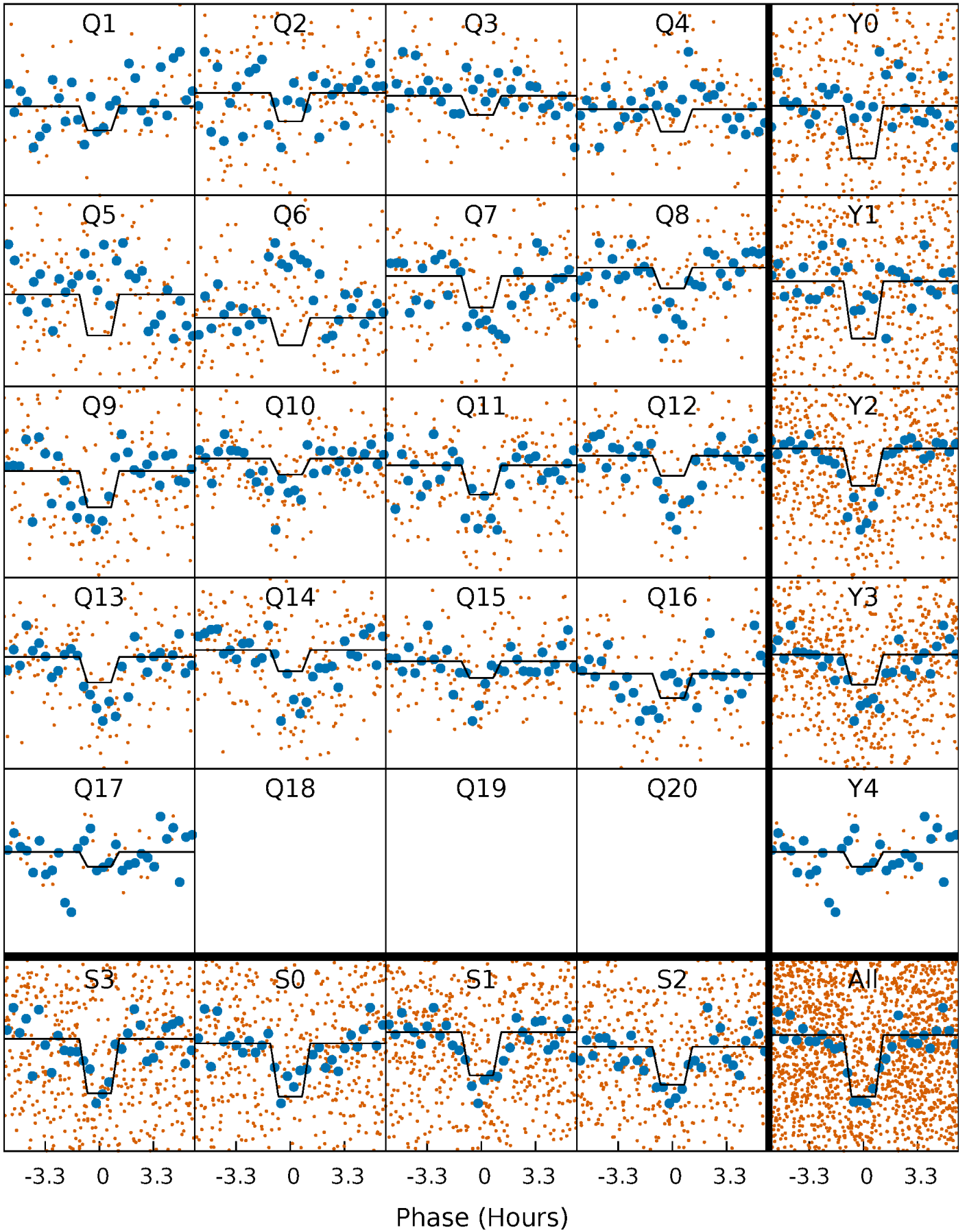
# DV Quarter-Phased Transit Curves

TCE 009008737-01 P= 11.835676 Days  $T_0=137.350323$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

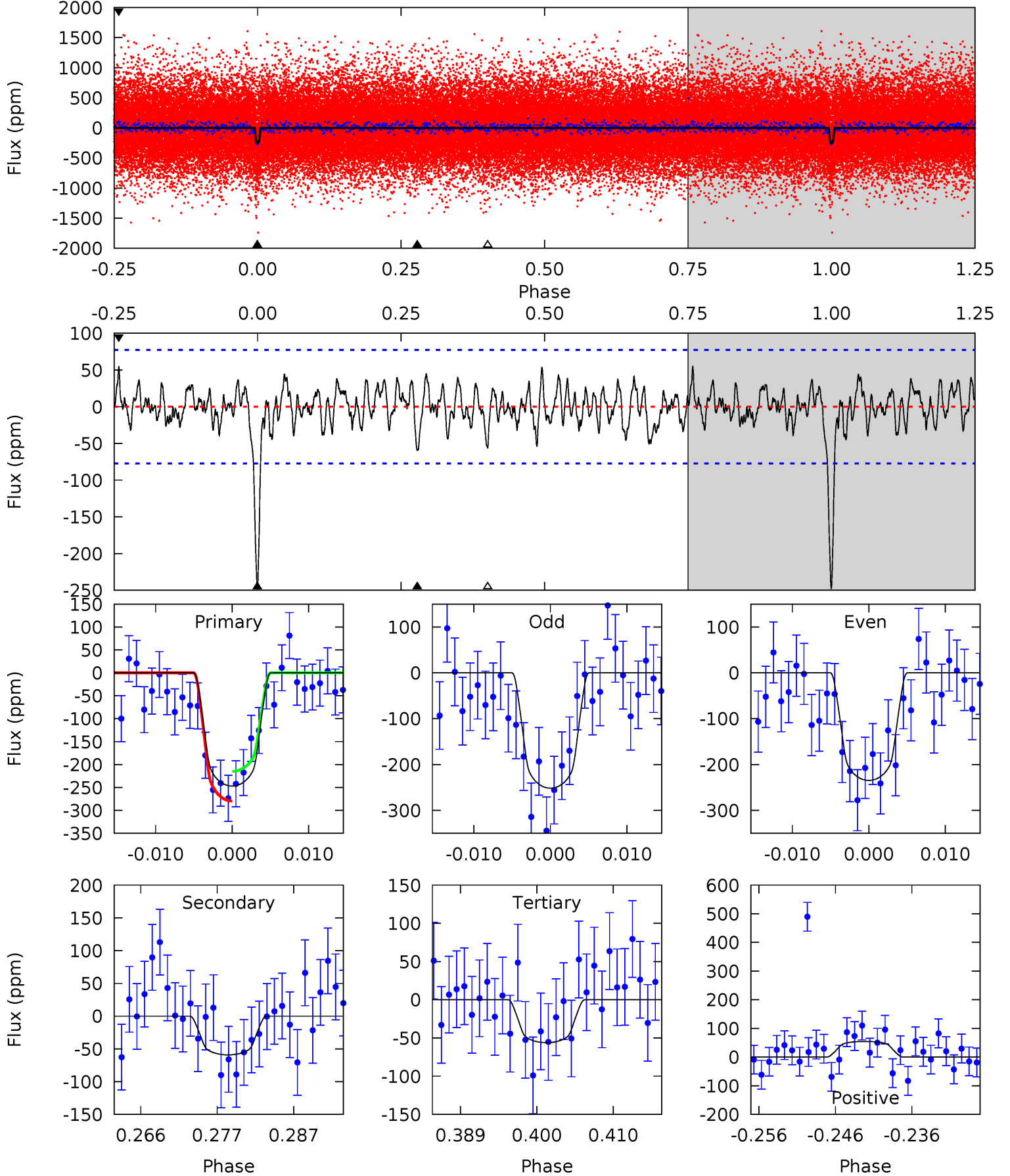
TCE 009008737-01 P= 11.835638 Days  $T_0=137.347535$  (BKJD)



# DV Model-Shift Uniqueness Test

009008737-01, P = 11.835676 Days, E = 125.514647 Days

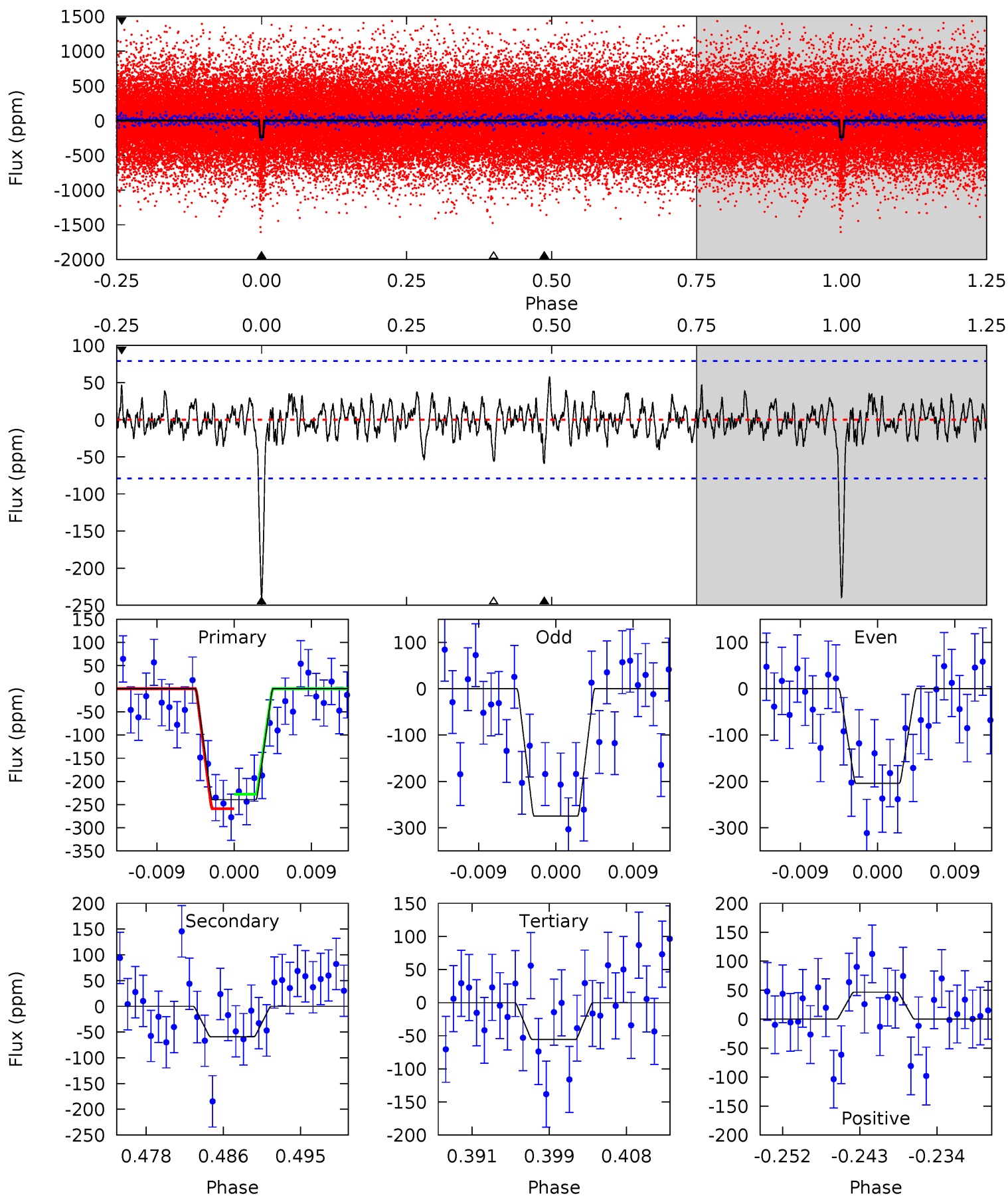
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	3.85	3.65	3.56	5.02	2.57	1.30	12.4	12.5	0.19	0.29	0.55	1.02	0.18	2.11



# Alt Model-Shift Uniqueness Test

009008737-01, P = 11.835638 Days, E = 125.511897 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
15.3	3.77	3.55	2.99	5.05	2.62	1.06	11.8	12.3	0.22	0.79	2.28	0.93	0.20	0.99



### Stellar Parameters For KIC 009008737

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5639^{+169}_{-169}$	$4.551^{+0.031}_{-0.178}$	$-0.020^{+0.250}_{-0.300}$	$0.859^{+0.220}_{-0.073}$	$0.959^{+0.094}_{-0.115}$	$2.131^{+0.364}_{-0.999}$
	+3%/-3%	+1%/-4%	+1250%/-1500%	+26%/-8%	+10%/-12%	+17%/-47%
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 009008737-01 / KOI 2768.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-59 \pm 15$	$1.77^{+0.95}_{-0.86}$	$1044^{+65}_{-43}$	$3978^{+1193}_{-515}$	$101^{+289}_{-58}$
Alt.	$-59 \pm 16$	$1.48^{+0.94}_{-0.76}$	$1044^{+64}_{-45}$	$4235^{+1486}_{-697}$	$141^{+486}_{-90}$

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



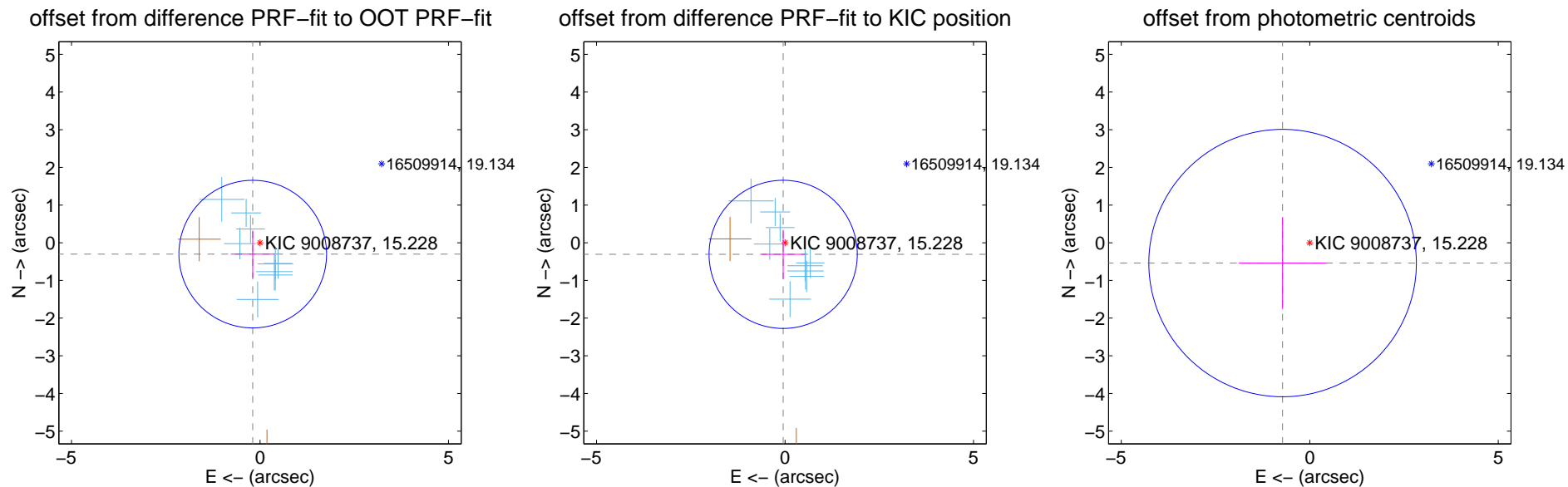
## DV Centroid Data

Supplemental centroid analysis for 009008737-01. Kepler magnitude: 15.23. Transit SNR 10.91

There are 9 quarters with good PRF difference image offsets

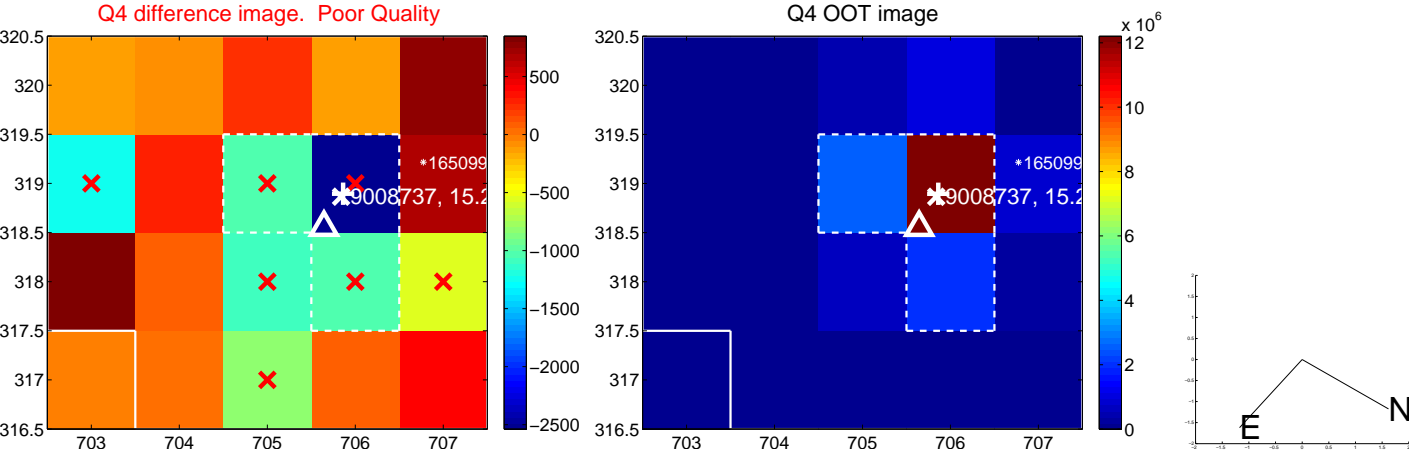
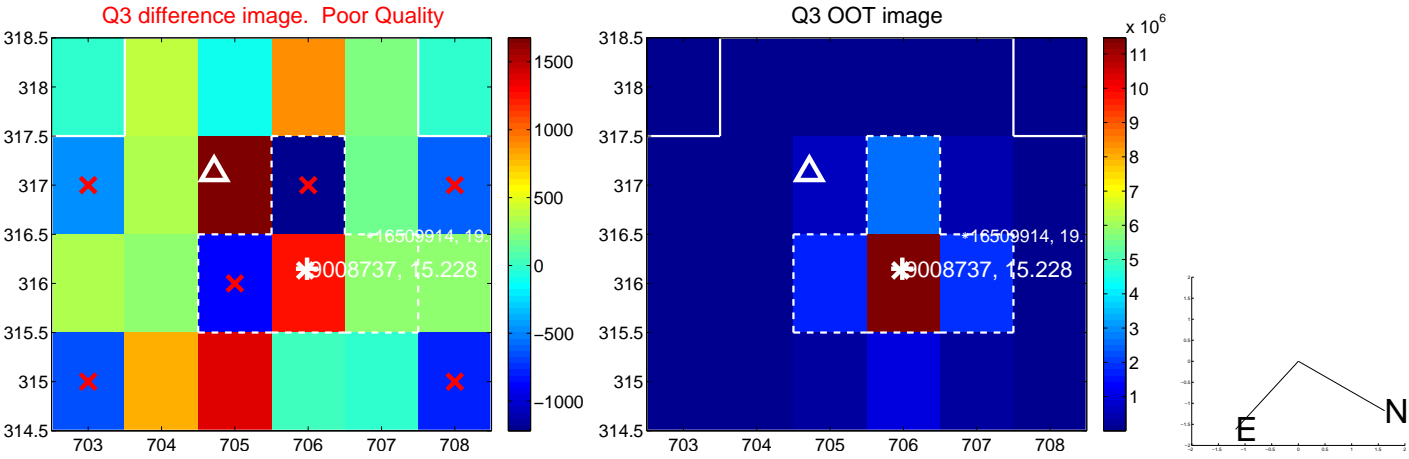
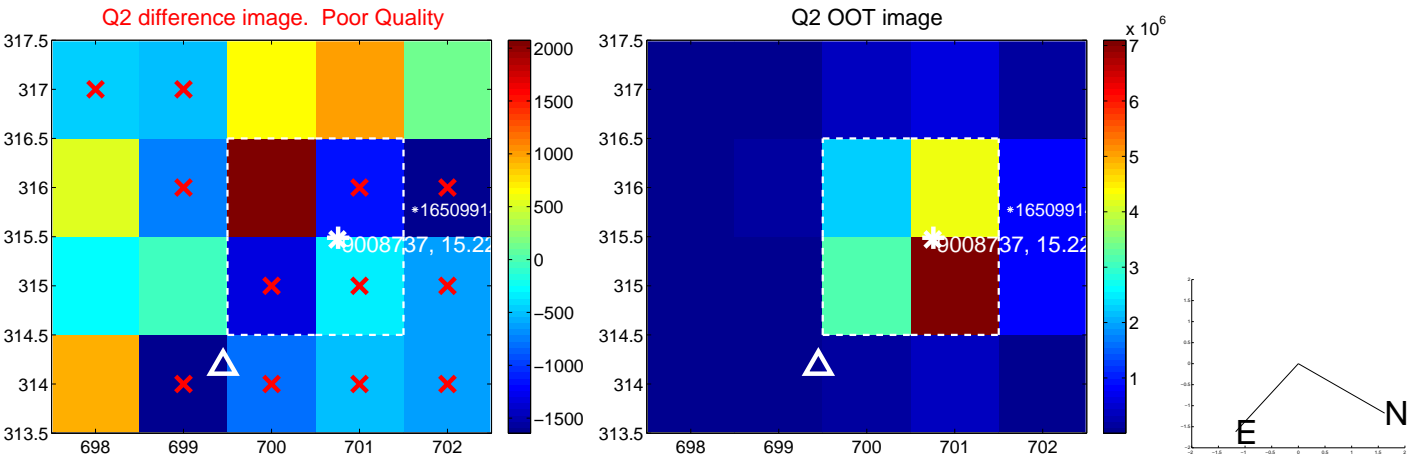
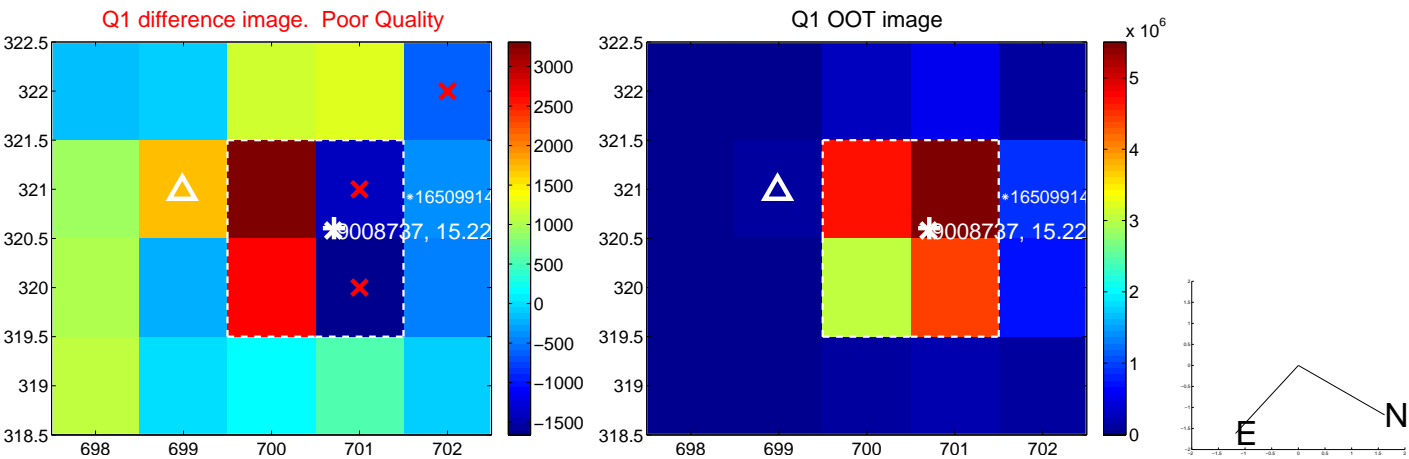
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.358 \pm 0.653$	0.55	$0.192 \pm 0.585$	$-0.301 \pm 0.627$
PRF-fit source offset from KIC position	$0.312 \pm 0.655$	0.48	$0.049 \pm 0.574$	$-0.308 \pm 0.650$
photometric centroid source offset	$0.90 \pm 1.18$	0.76	$0.72 \pm 1.16$	$-0.54 \pm 1.22$

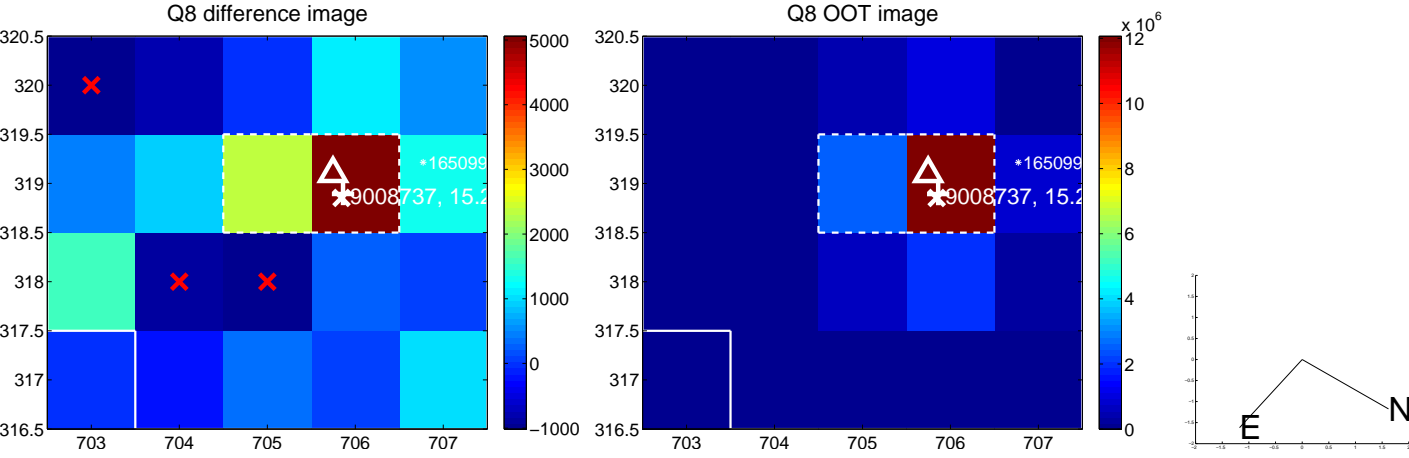
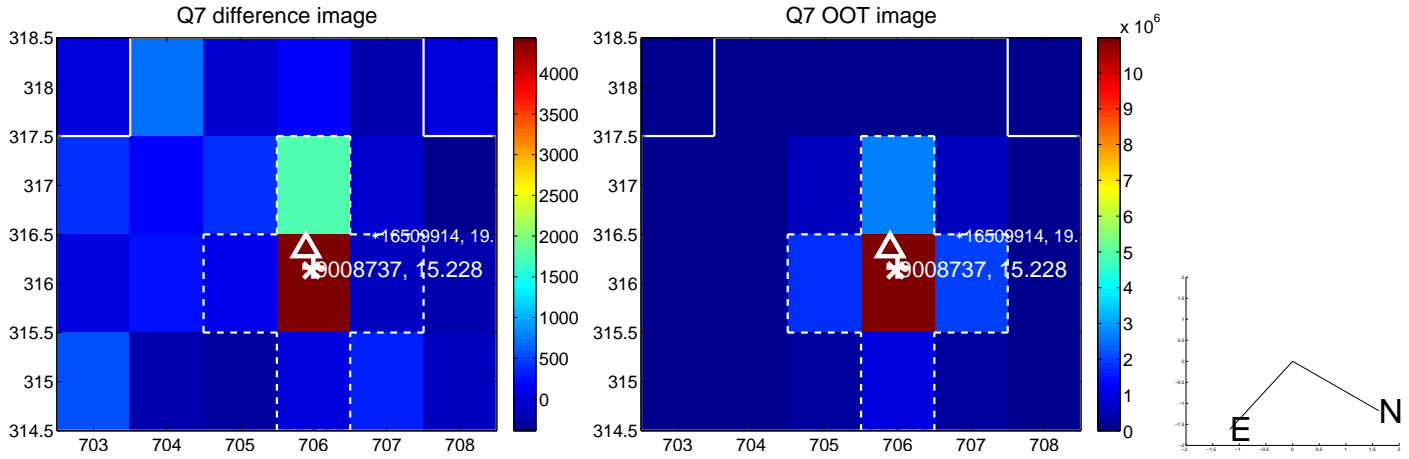
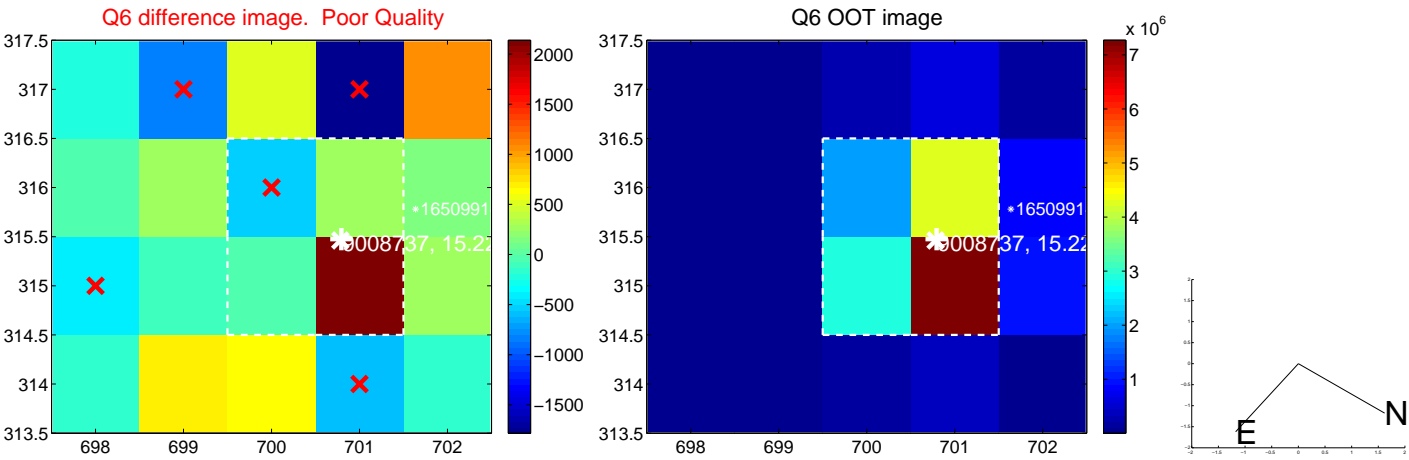
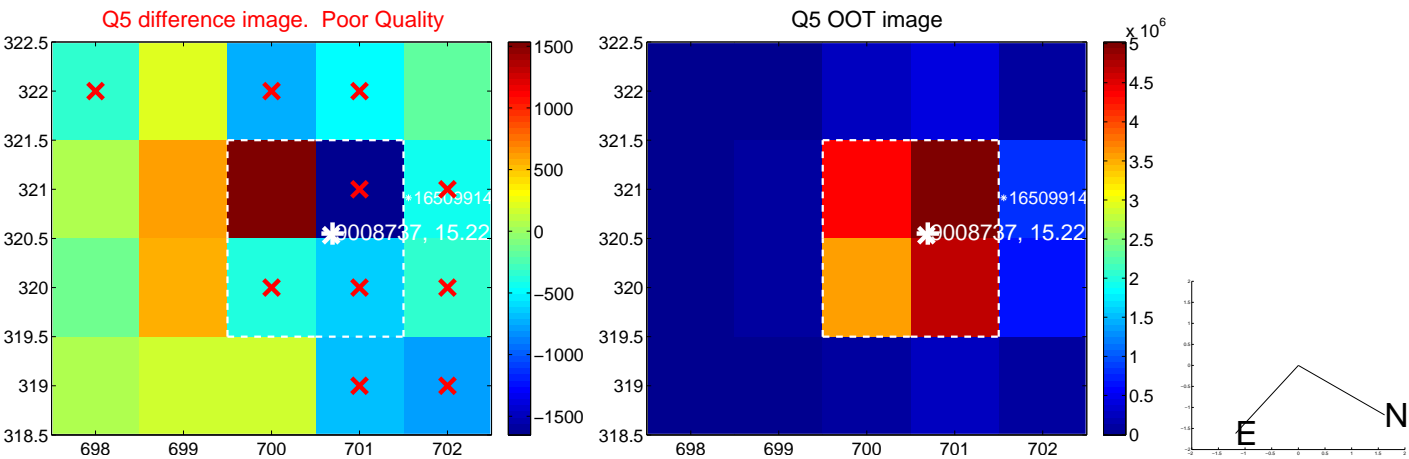


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

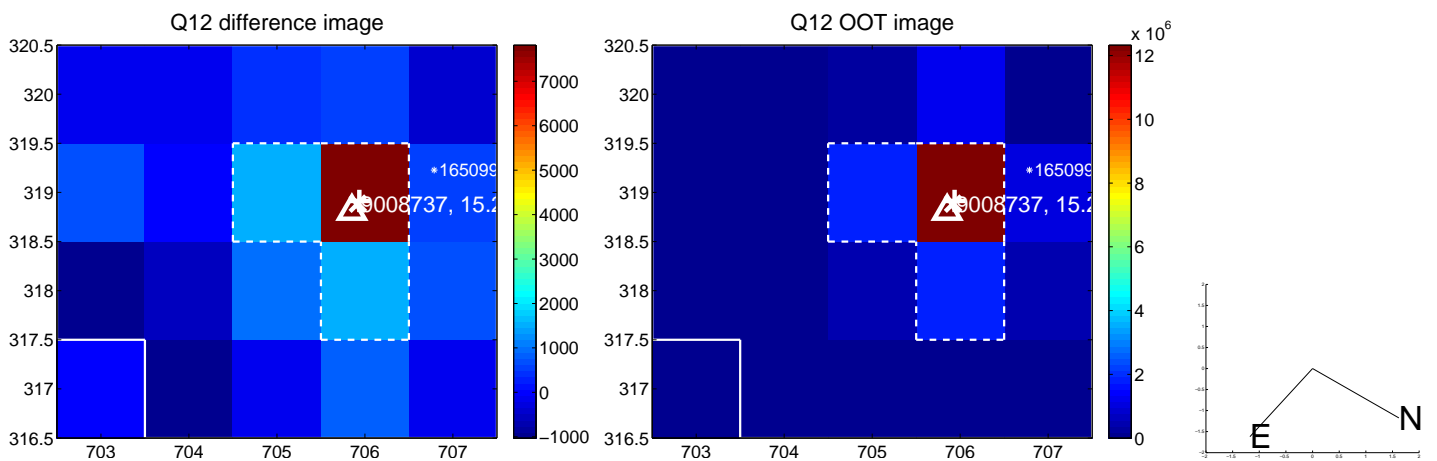
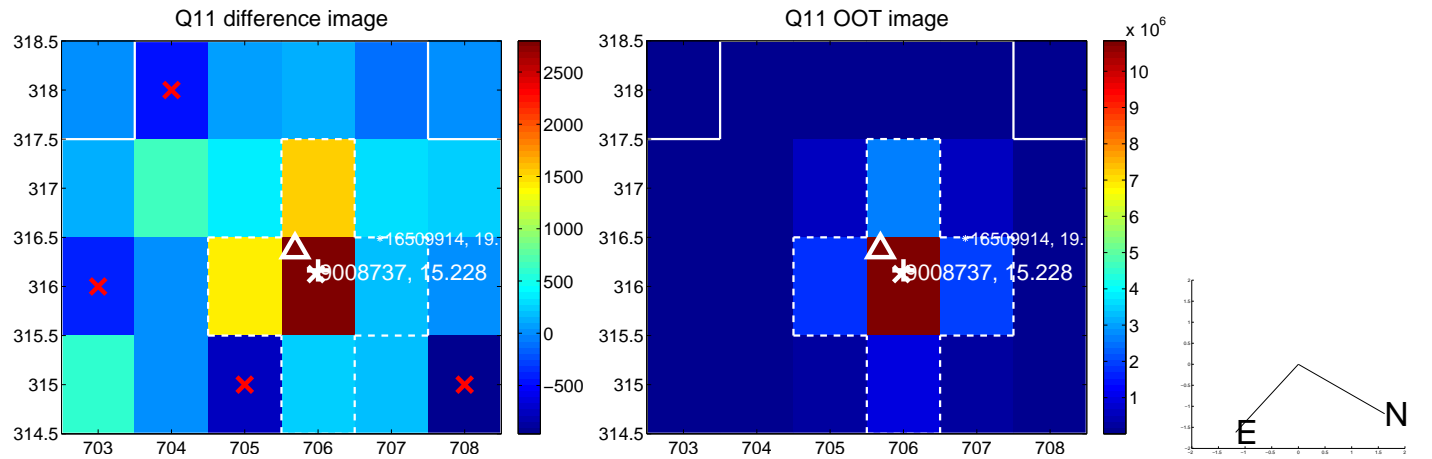
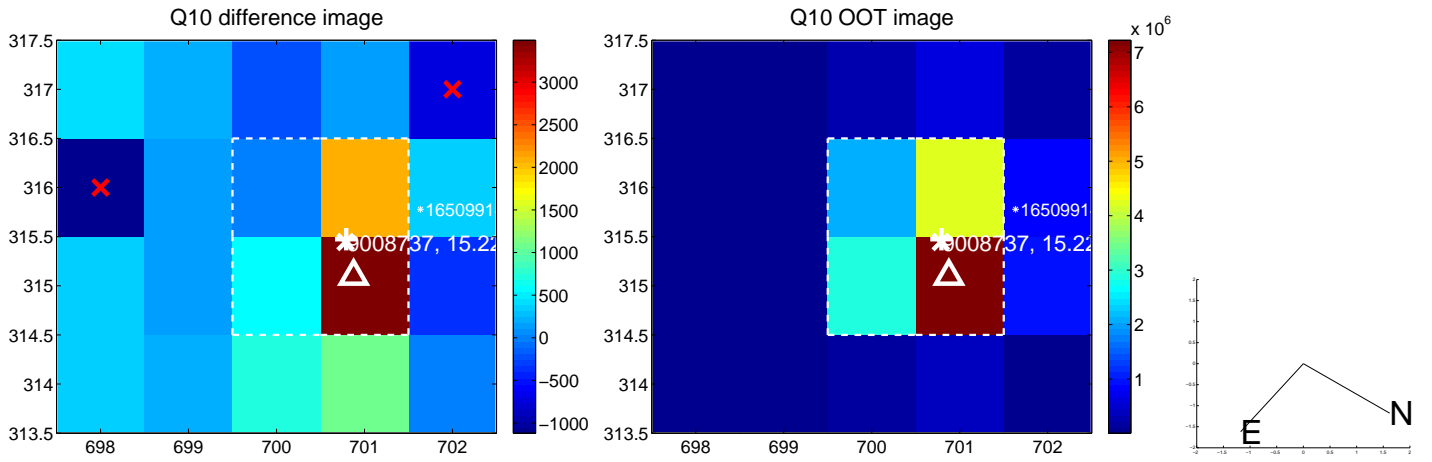
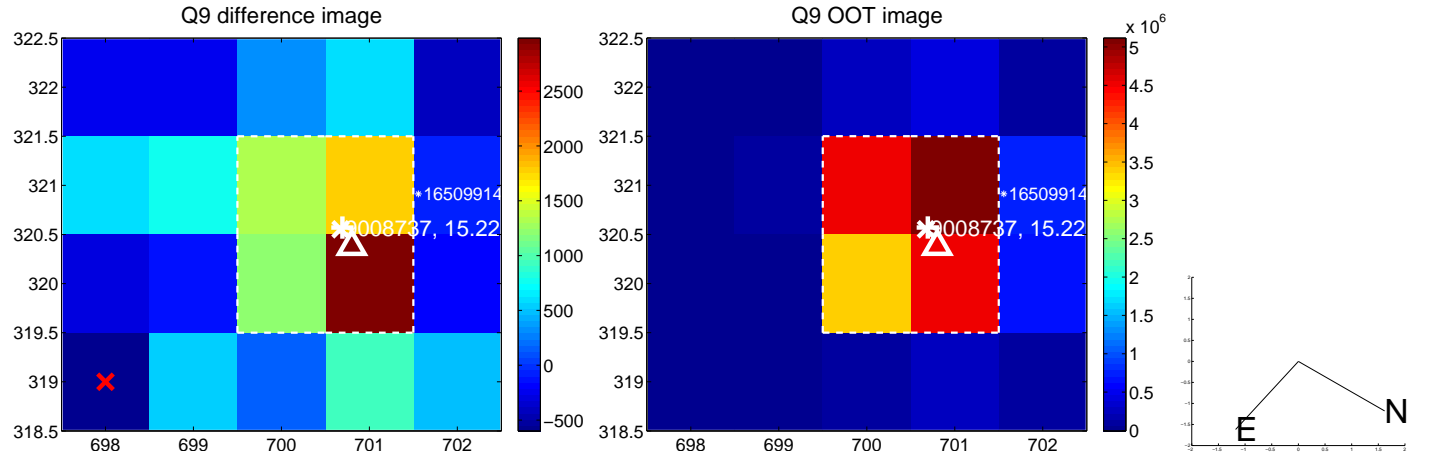
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



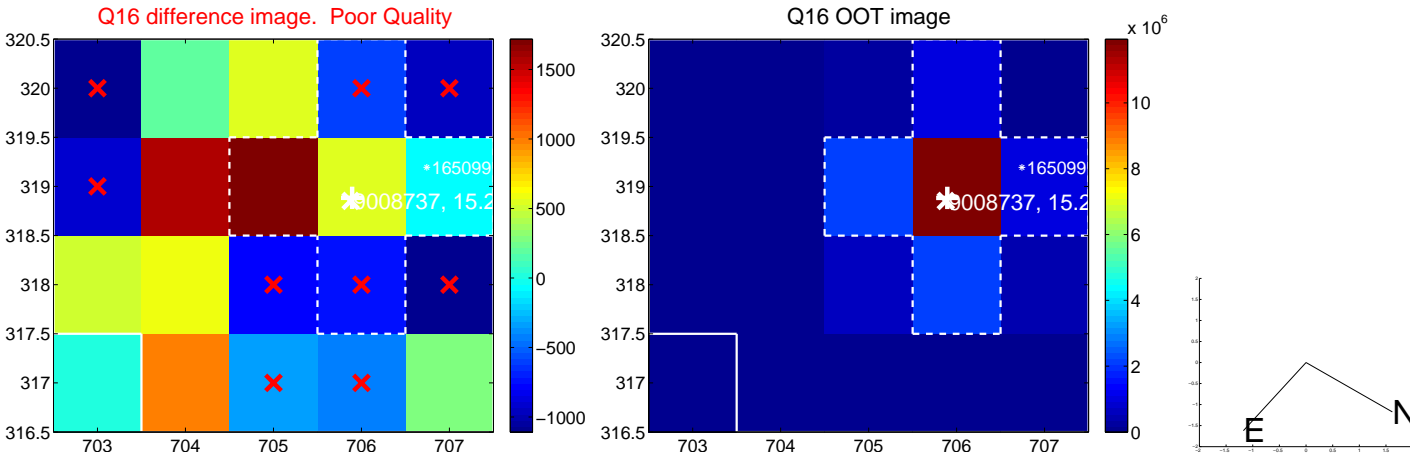
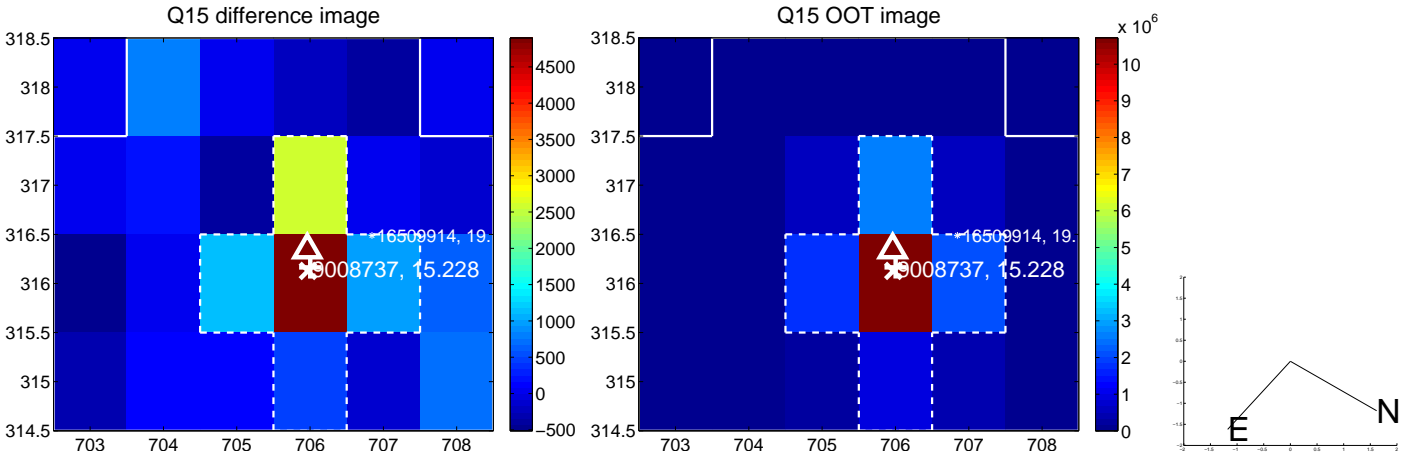
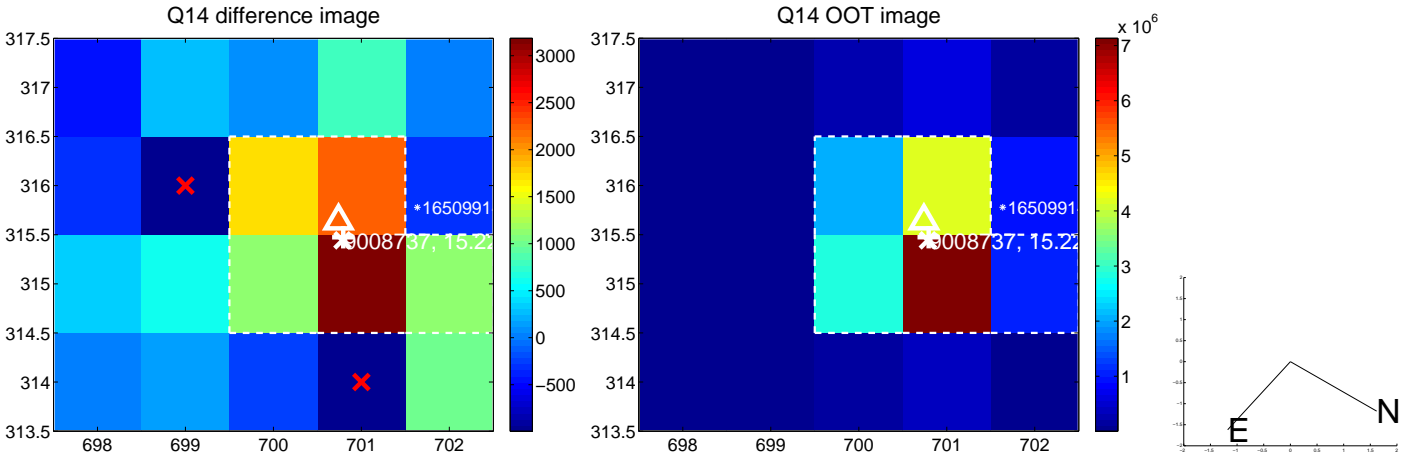
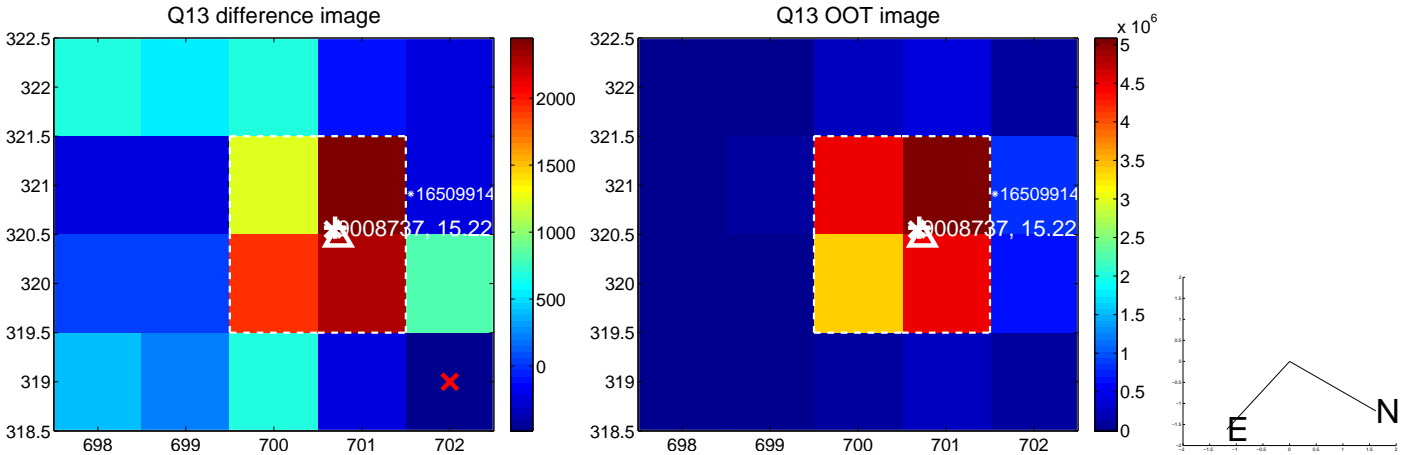
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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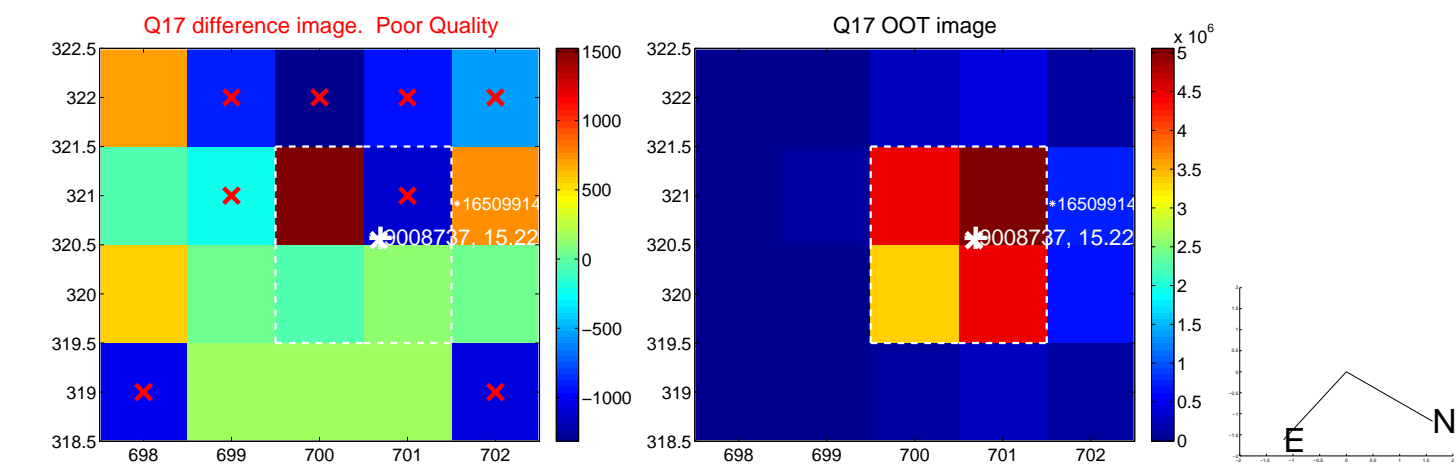


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

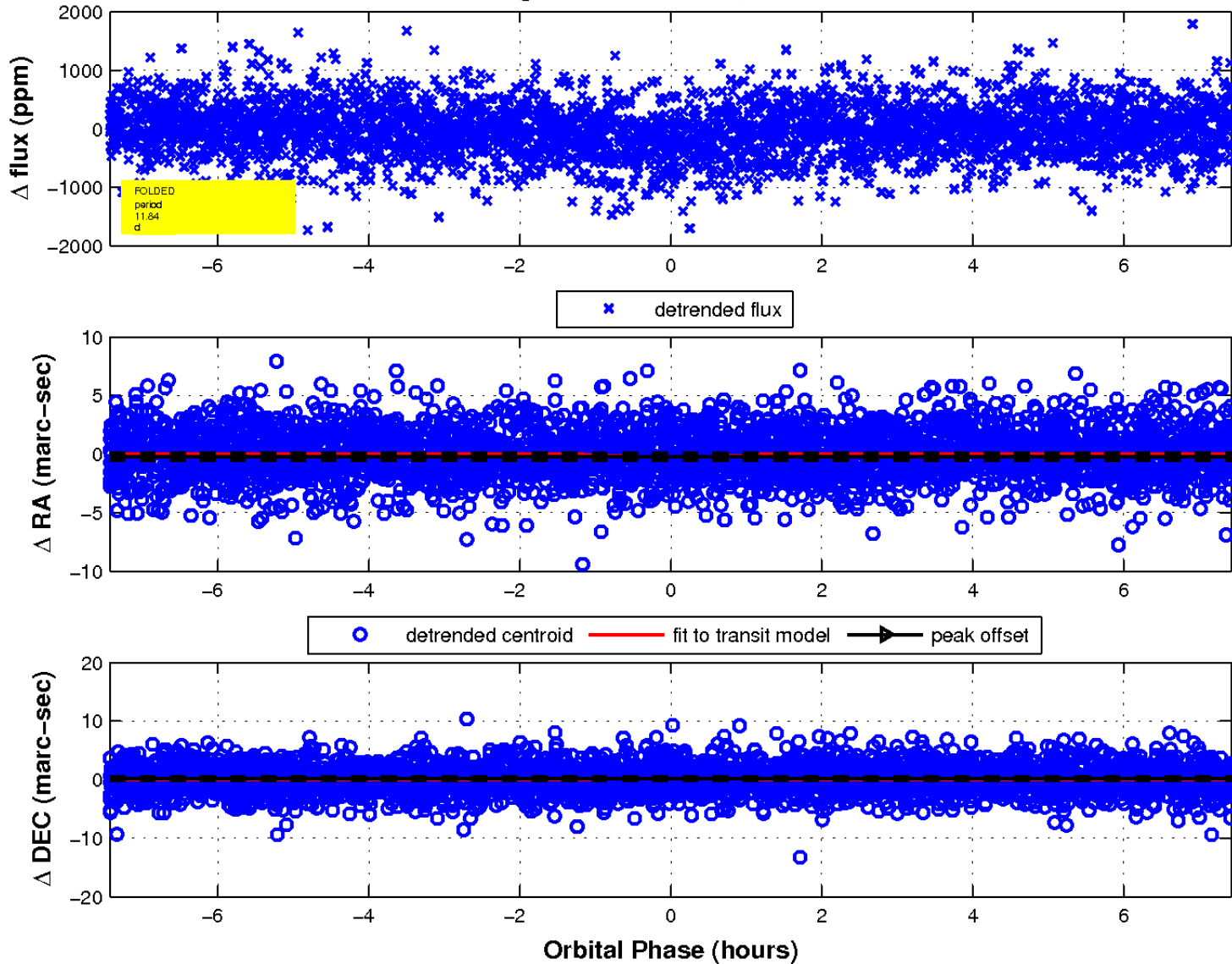




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

