

# KIC 009427402

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009427402-01	OBS	1397.01	6.247012	132.019281	1477.8	1.710	36.7	43.4	0.49	3821	2.22	16.26

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009427402-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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

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

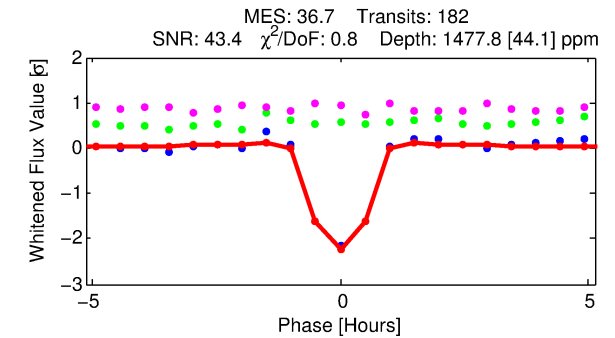
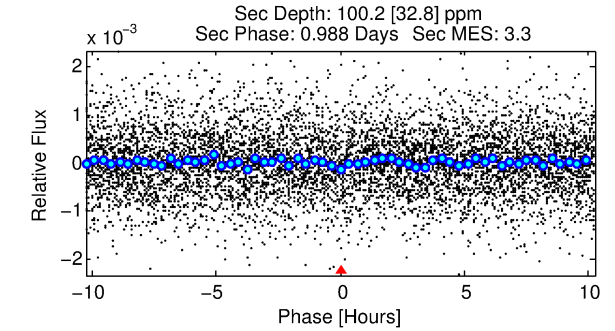
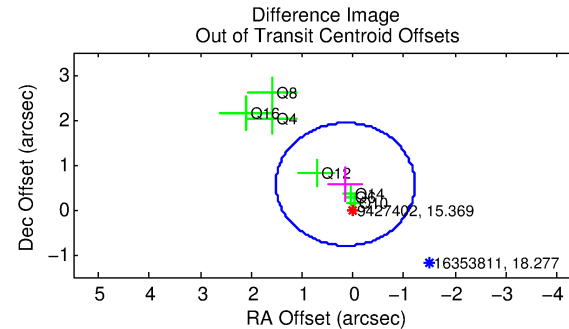
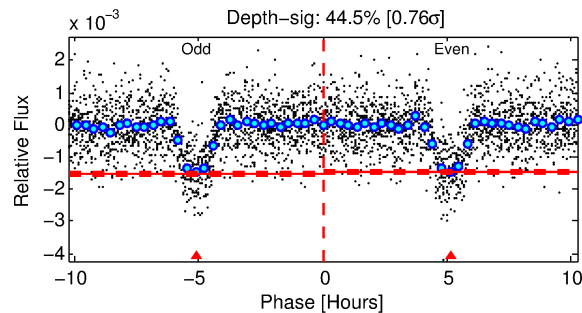
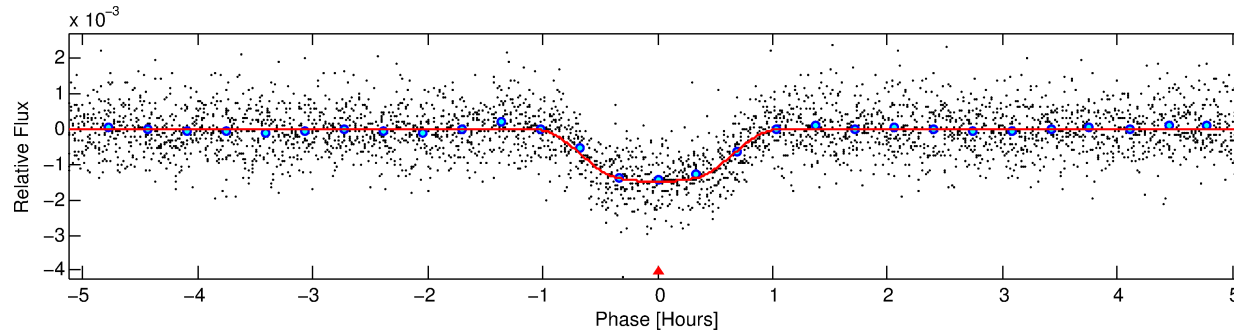
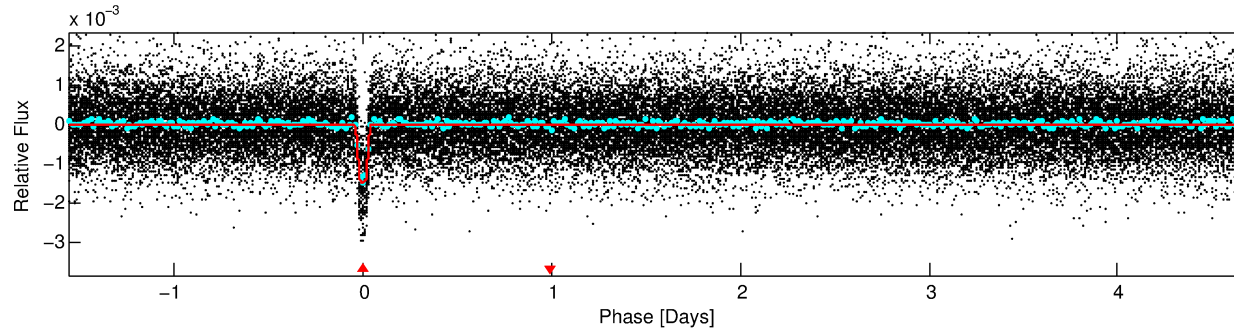
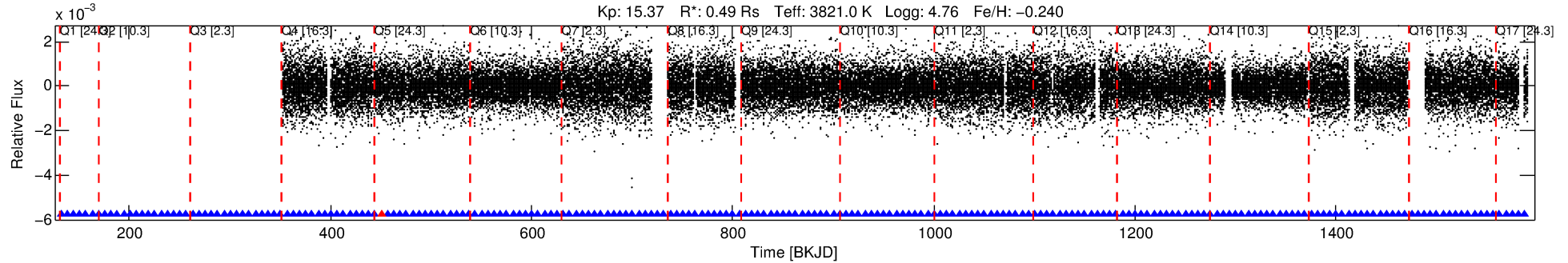
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009427402-01

No Significant Match Found

# DV One-Page Summary

KIC: 9427402 Candidate: 1 of 1 Period: 6.247 d  
KOI: K01397.01 Corr: 0.946



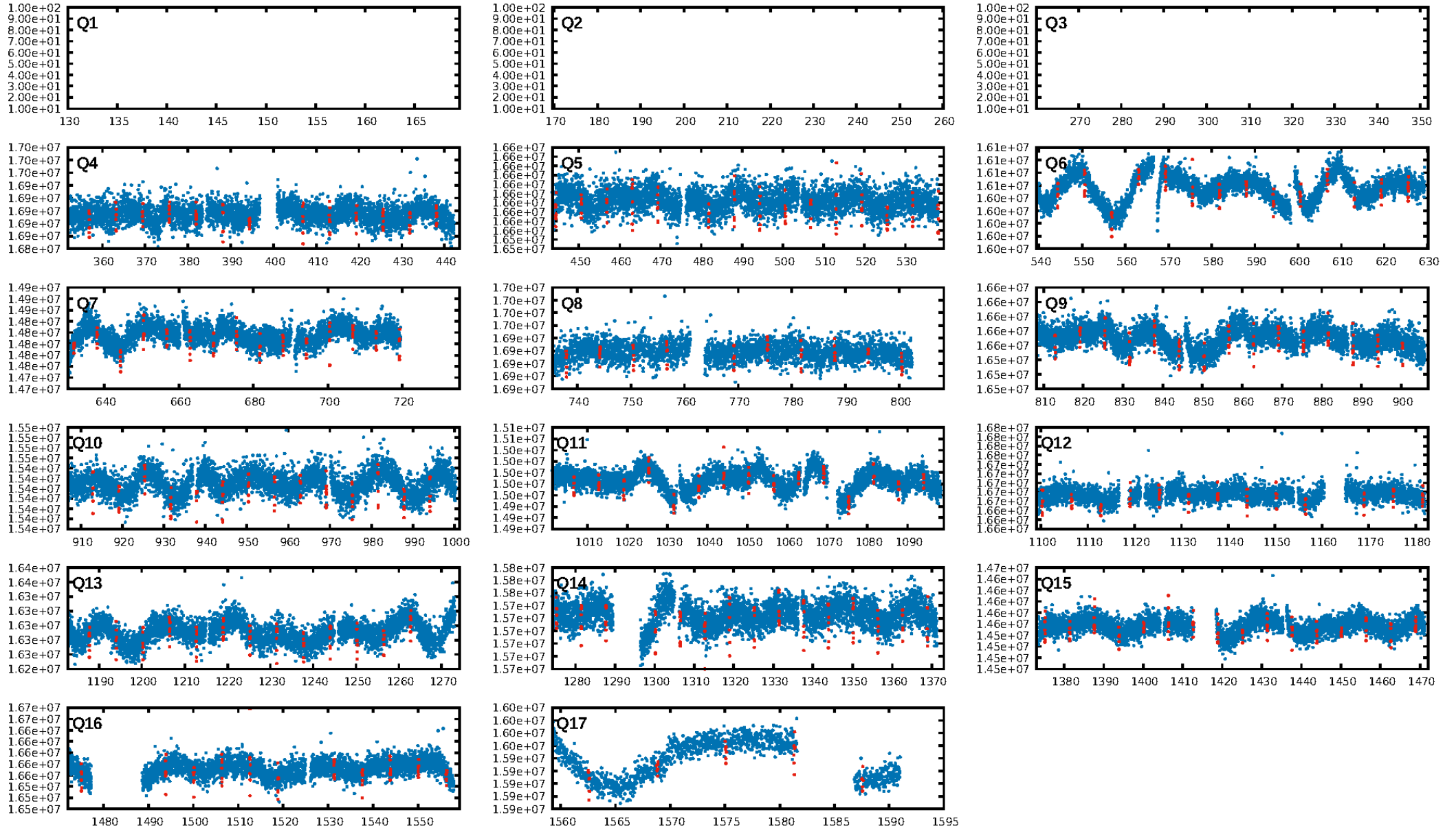
## DV Fit Results:

Period = 6.24701 [0.00001] d  
Epoch = 132.0193 [0.0009] BKJD  
Rp/R\* = 0.0418 [0.0026]  
a/R\* = 14.70 [3.86]  
b = 0.90 [0.06]  
Seff = 16.26 [2.14]  
Teq = 512 [17] K  
Rp = 2.22 [0.26] Re  
a = 0.0528 [0.0039] AU  
Ag = 31.13 [11.33] [2.66 $\sigma$ ]  
Teff = 1870 [169] K [8.00 $\sigma$ ]

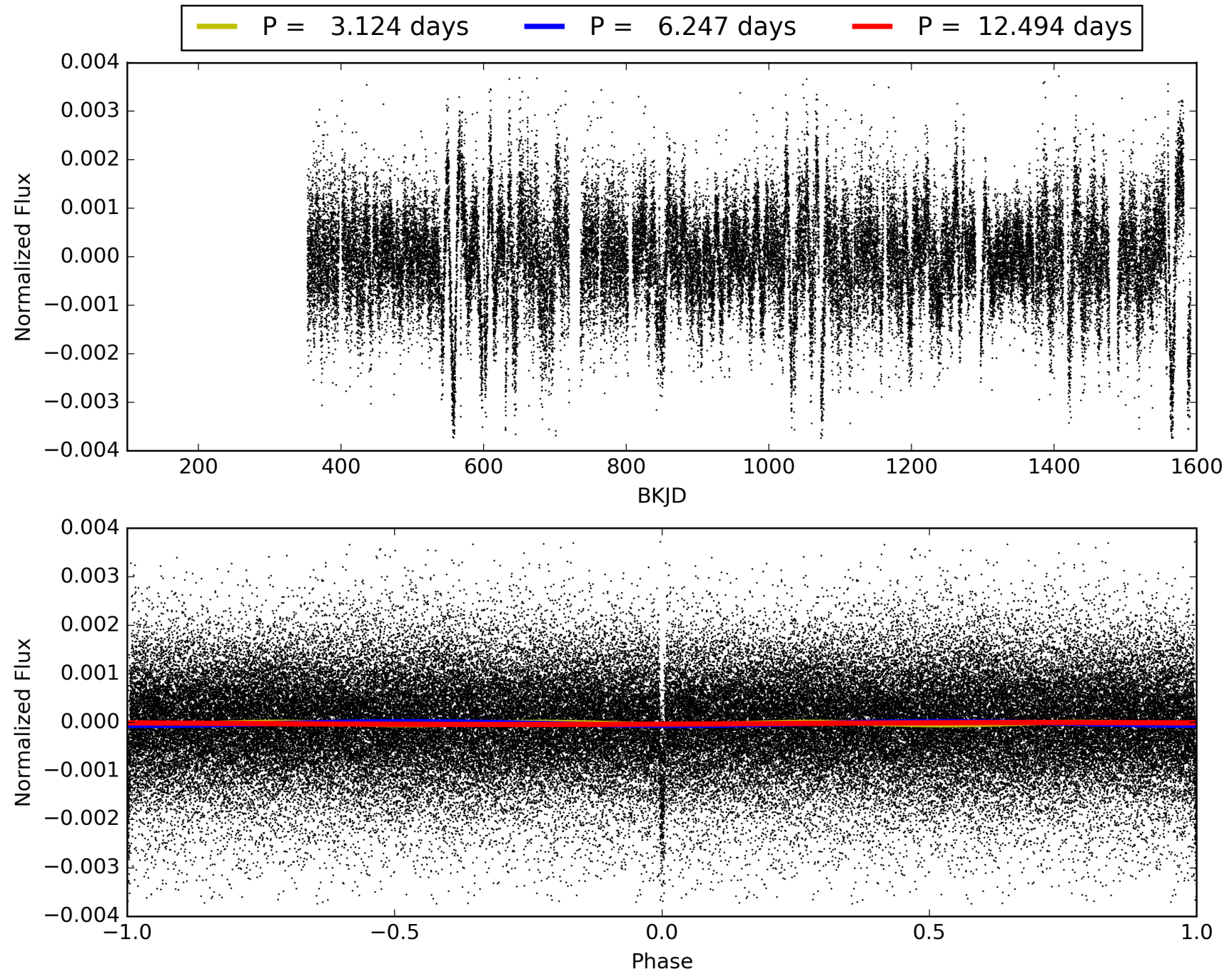
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.16e-284  
RollingBand-fgt: 0.99 [176/177]  
GhostDiagnostic-chr: 1.743  
Centroid-sig: 0.0%  
Centroid-so: 2.194 arcsec [19.33 $\sigma$ ]  
OotOffset-rm: 0.582 arcsec [1.28 $\sigma$ ]  
KicOffset-rm: 0.395 arcsec [2.58 $\sigma$ ]  
OotOffset-st: 3/0/4/0 [7]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 009427402-01, PDC Light Curves

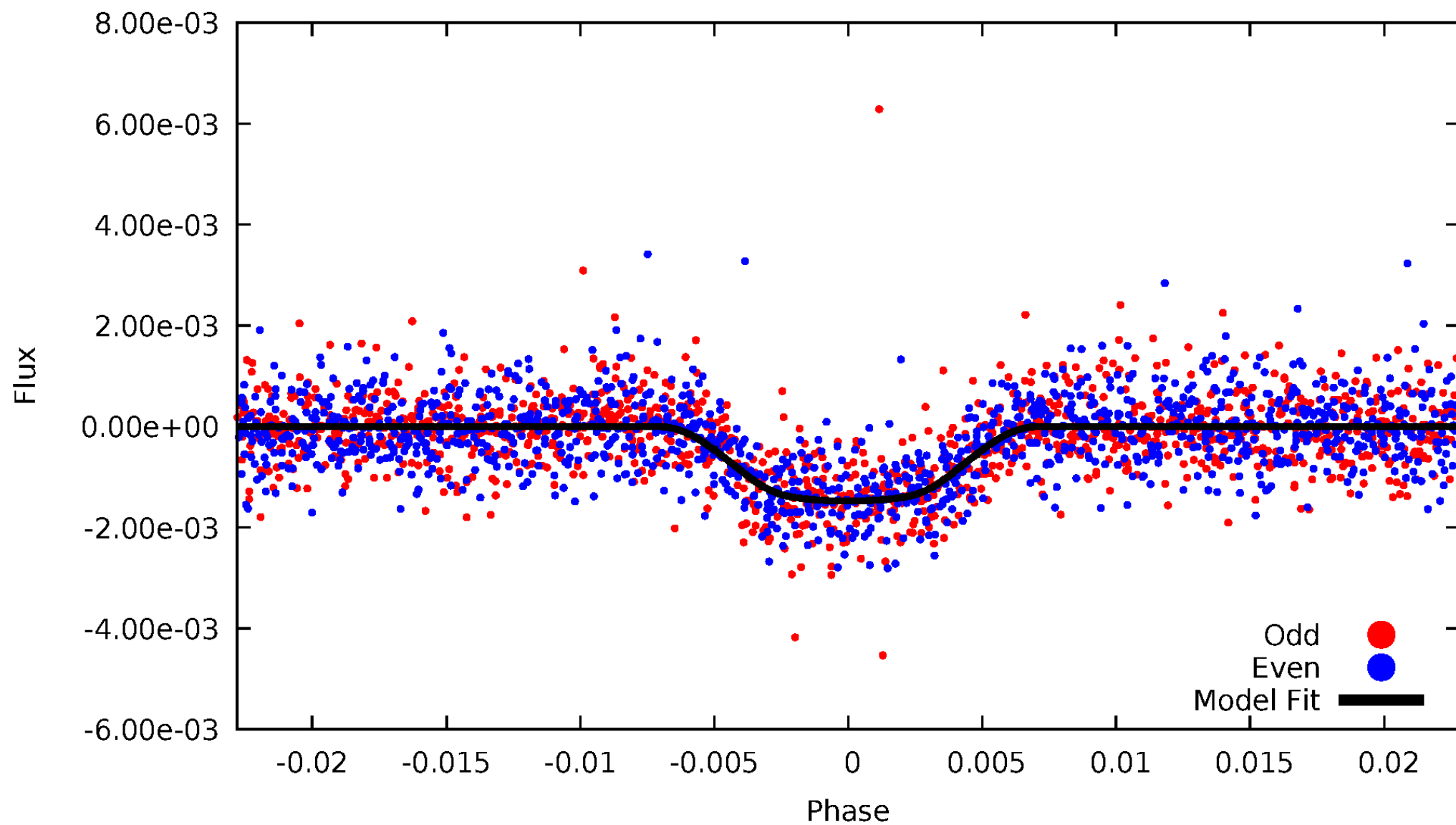


TCE 009427402-01



# DV Odd/Even

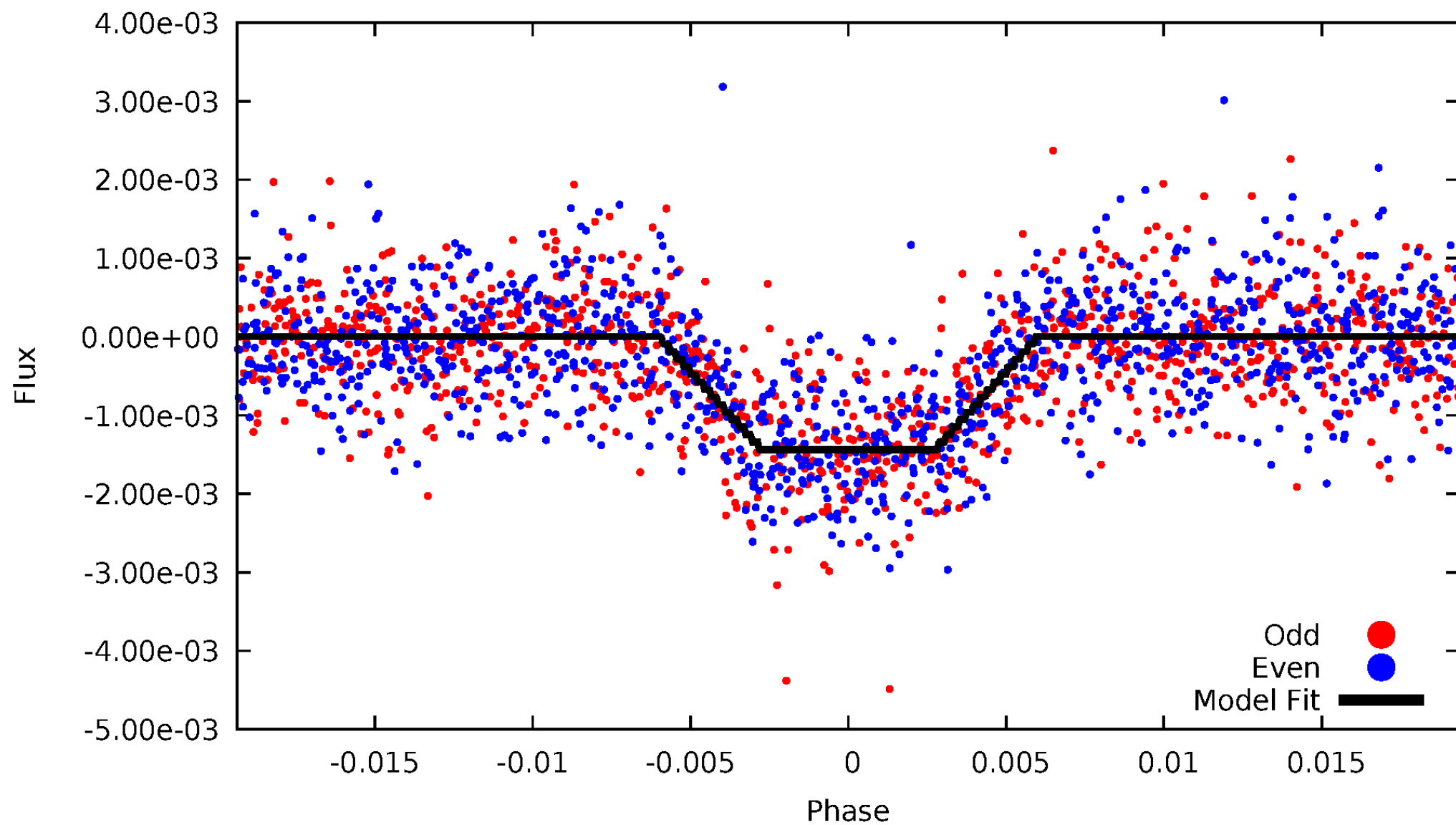
TCE 009427402-01





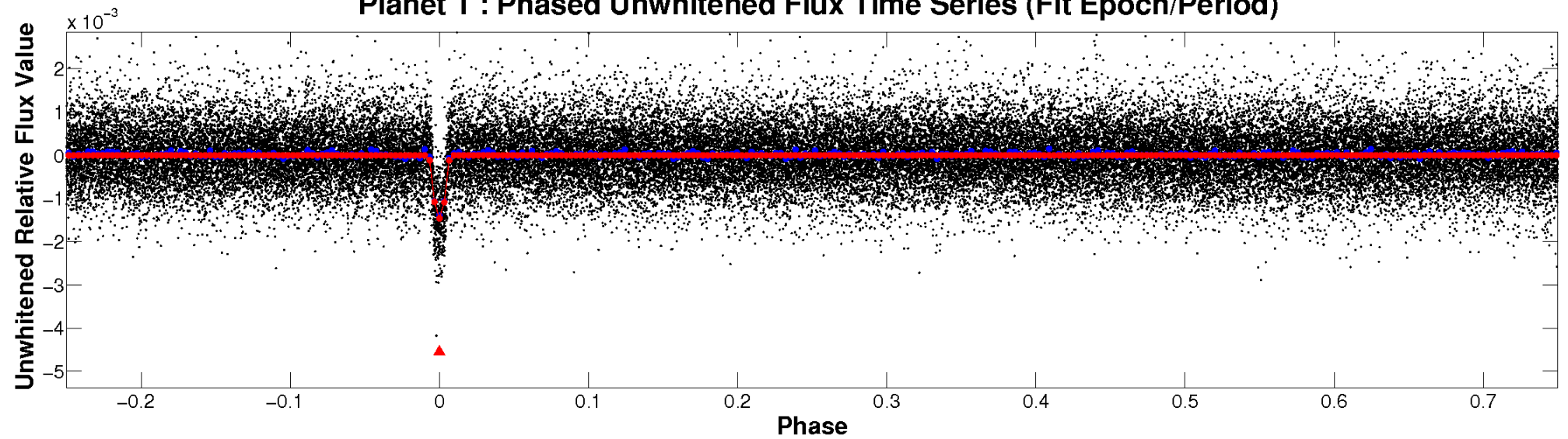
# ALT Odd/Even

TCE 009427402-01

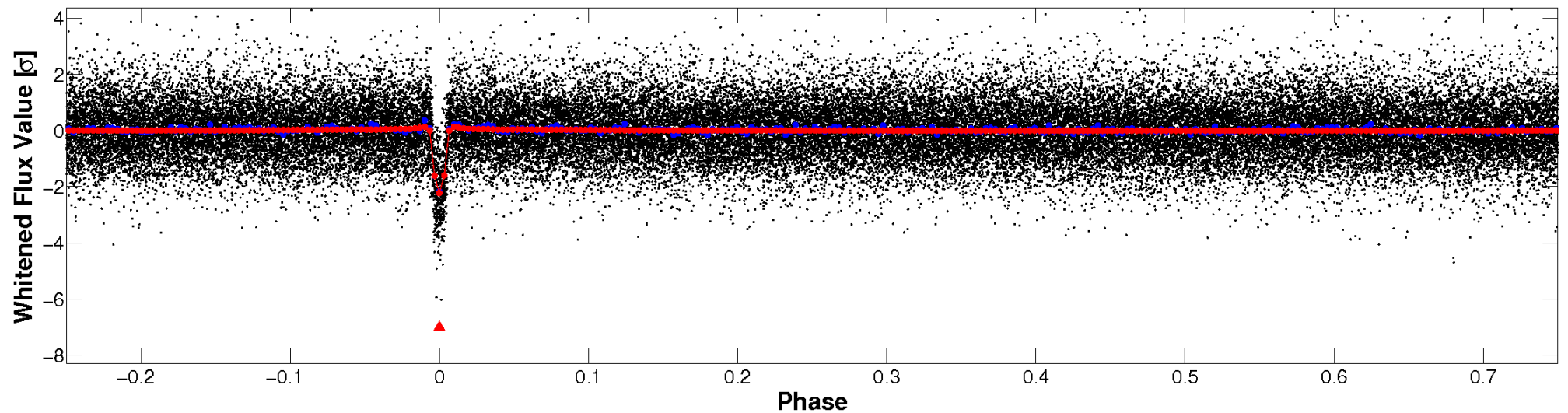


# Non-Whitened Vs. Whitened Light Curve

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

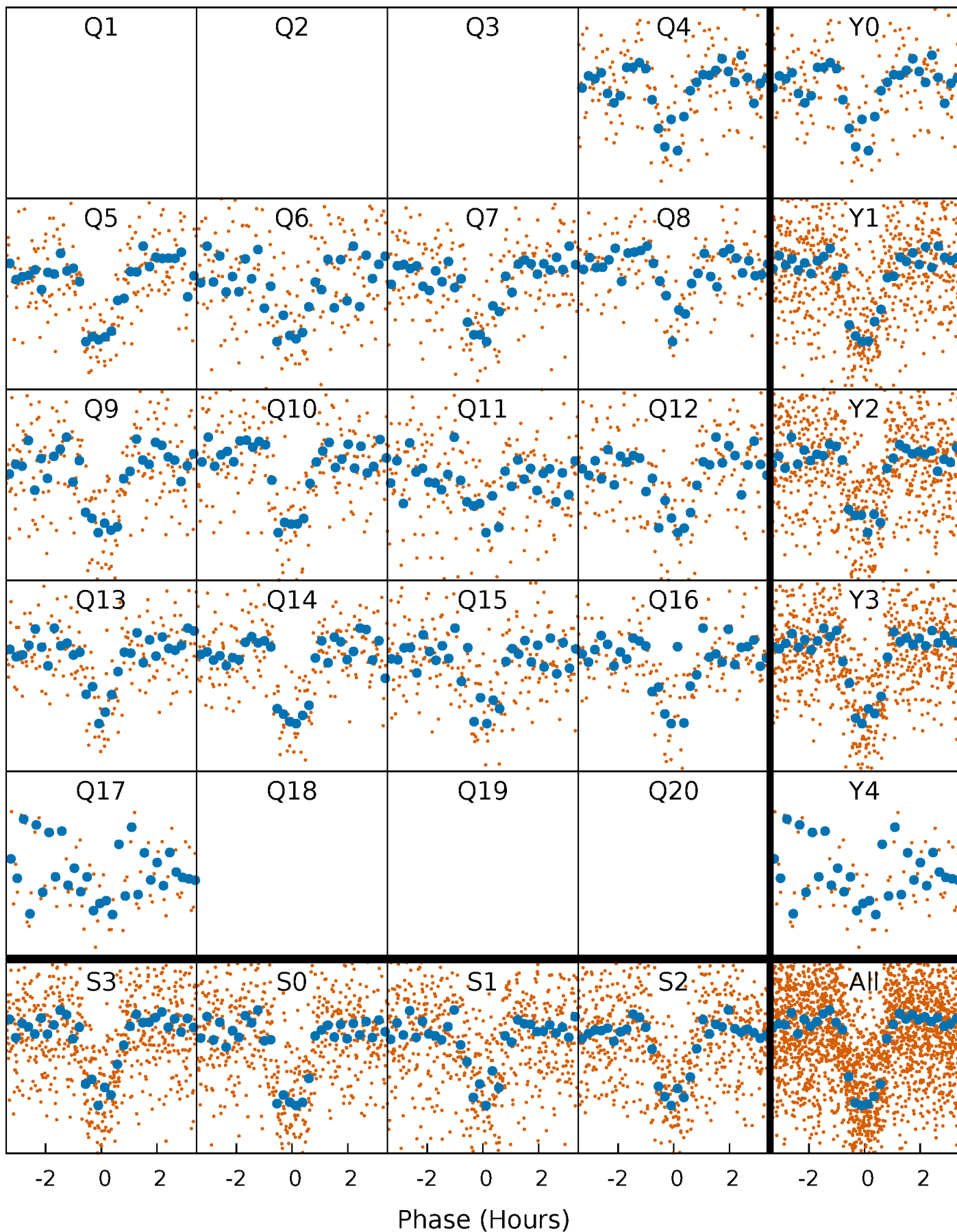


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

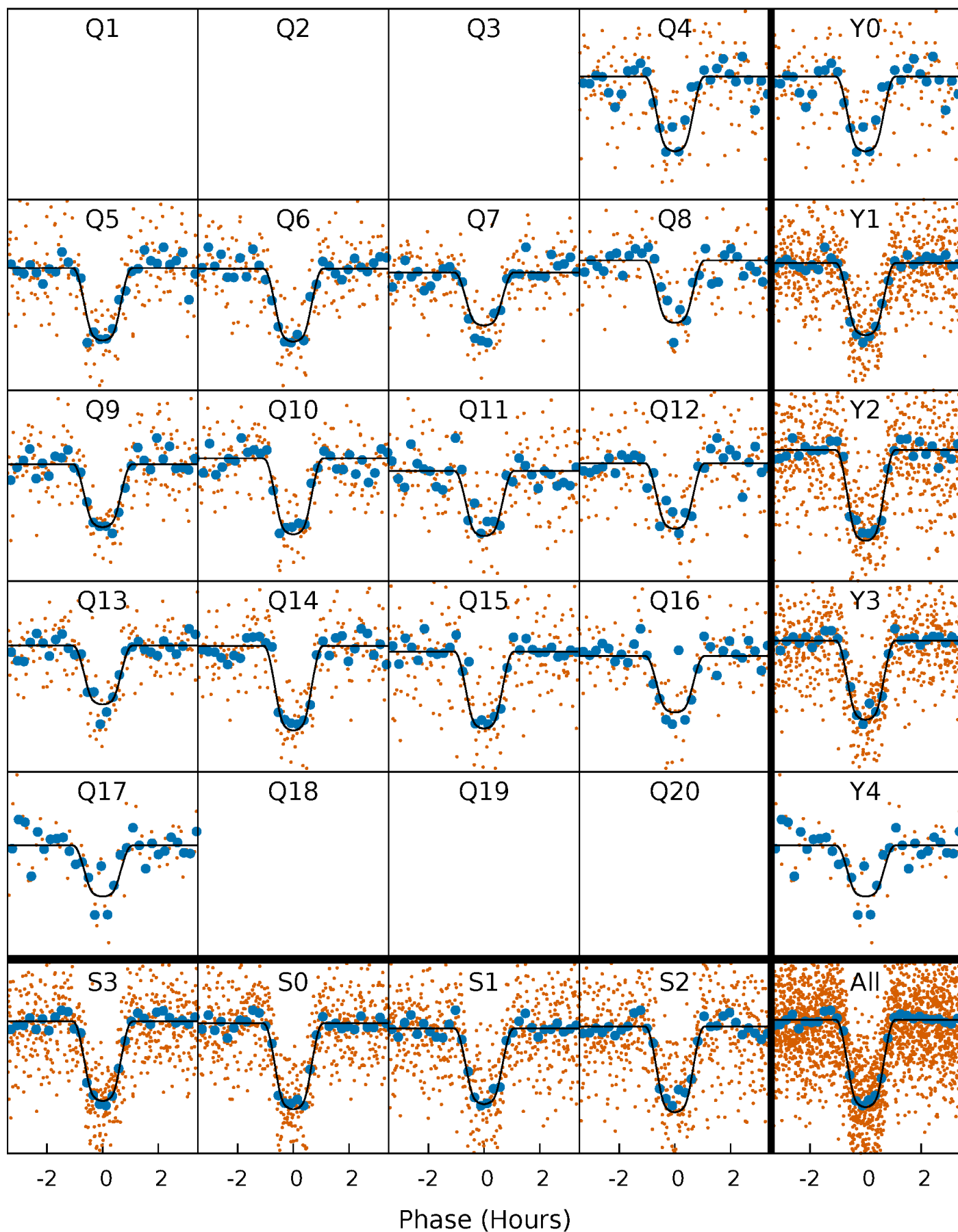
TCE 009427402-01 P= 6.247012 Days  $T_0=132.019281$  (BKJD)





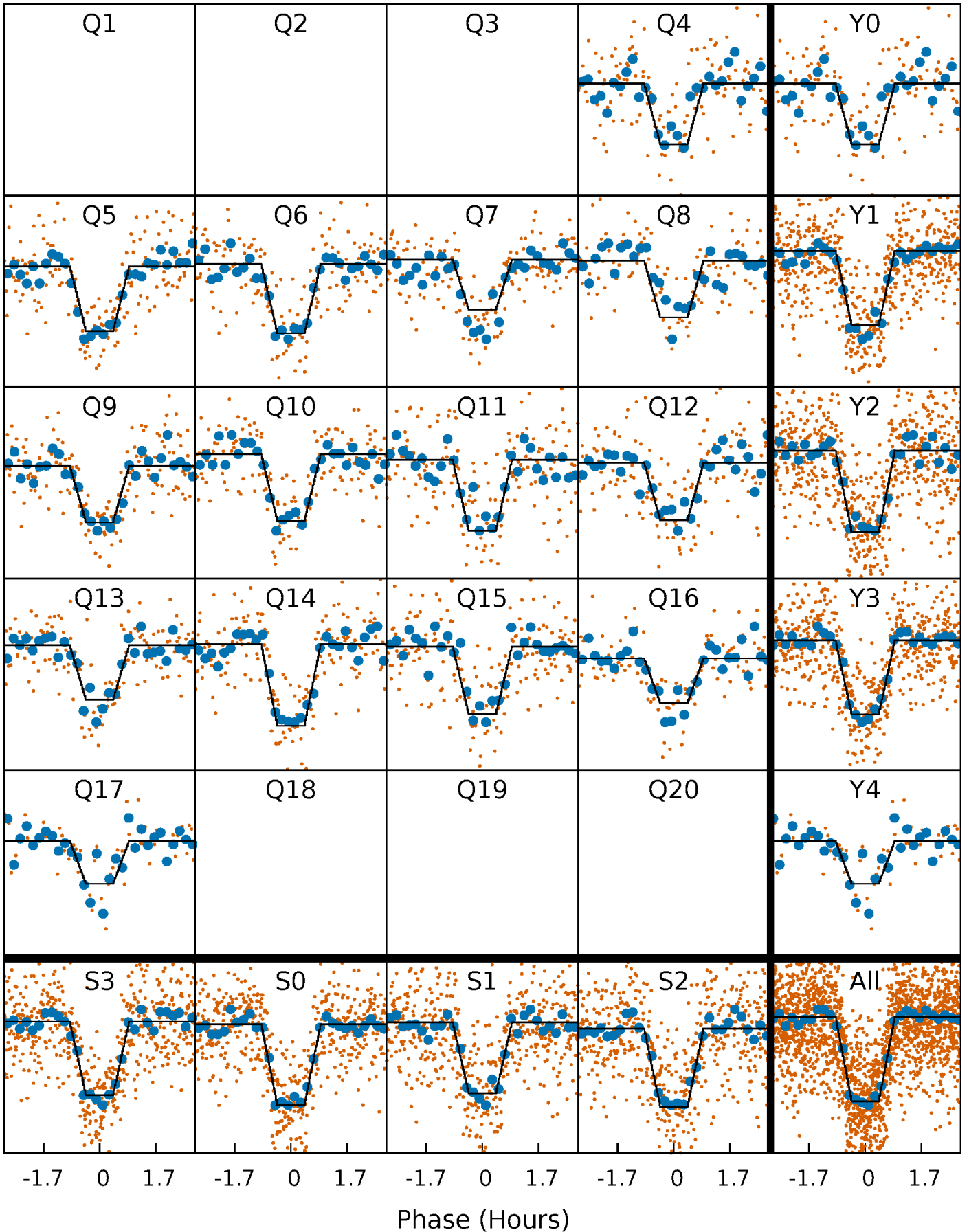
# DV Quarter-Phased Transit Curves

TCE 009427402-01 P= 6.247012 Days  $T_0=132.019281$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

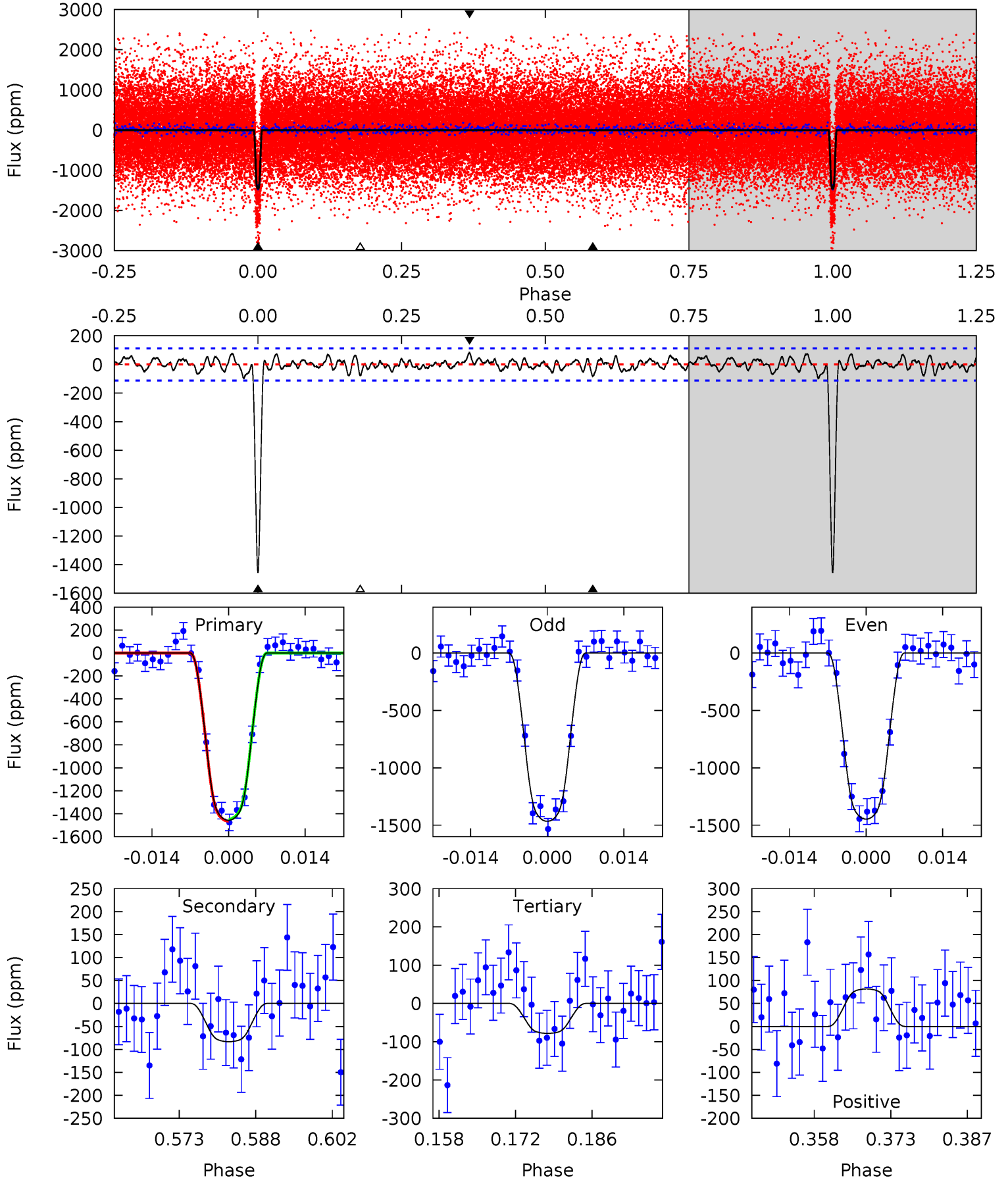
TCE 009427402-01 P= 6.247020 Days  $T_0=132.018437$  (BKJD)



# DV Model-Shift Uniqueness Test

009427402-01, P = 6.247012 Days, E = 132.019281 Days

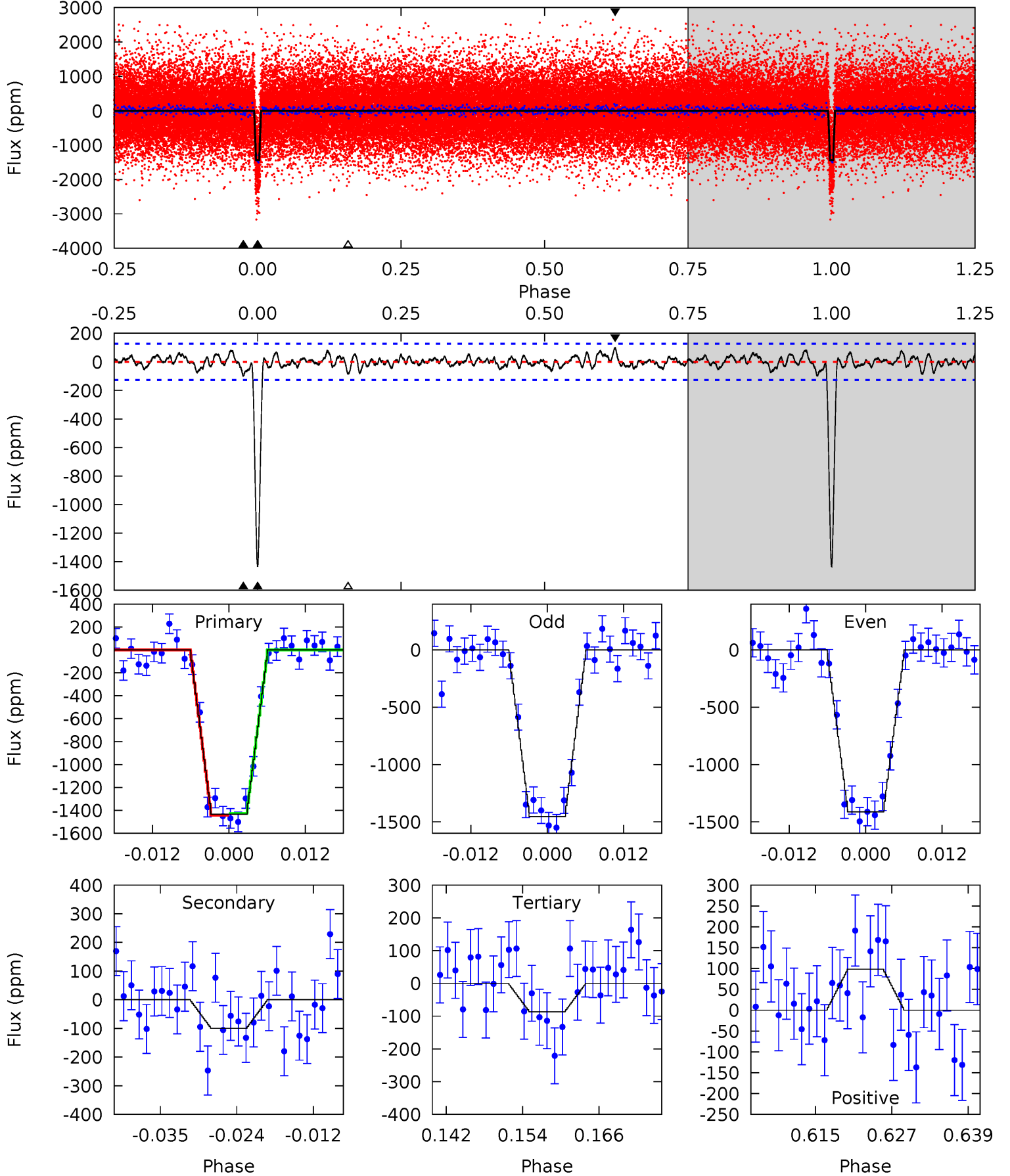
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
64.2	3.67	3.45	3.60	4.96	2.45	1.33	60.8	60.6	0.22	0.07	0.42	0.99	0.05	0.35



# Alt Model-Shift Uniqueness Test

009427402-01, P = 6.247020 Days, E = 132.018437 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
56.6	3.93	3.41	3.88	4.99	2.52	1.16	53.2	52.8	0.52	0.05	0.82	1.00	0.06	0.32



### Stellar Parameters For KIC 009427402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$3821^{+76}_{-84}$	$4.764^{+0.048}_{-0.036}$	$-0.240^{+0.150}_{-0.150}$	$0.487^{+0.039}_{-0.047}$	$0.503^{+0.036}_{-0.044}$	$6.121^{+1.414}_{-0.884}$
	+2%/-2%	+1%/-1%	+62%/-62%	+8%/-10%	+7%/-9%	+23%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

### Secondary Eclipse Parameters for KIC 009427402-01 / KOI 1397.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-83 \pm 23$	$2.22^{+0.16}_{-0.17}$	$714^{+19}_{-20}$	$2474^{+83}_{-113}$	$26^{+8}_{-8}$
Alt.	$-100 \pm 25$	$2.01^{+0.16}_{-0.17}$	$711^{+21}_{-19}$	$2583^{+96}_{-108}$	$38^{+12}_{-10}$

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



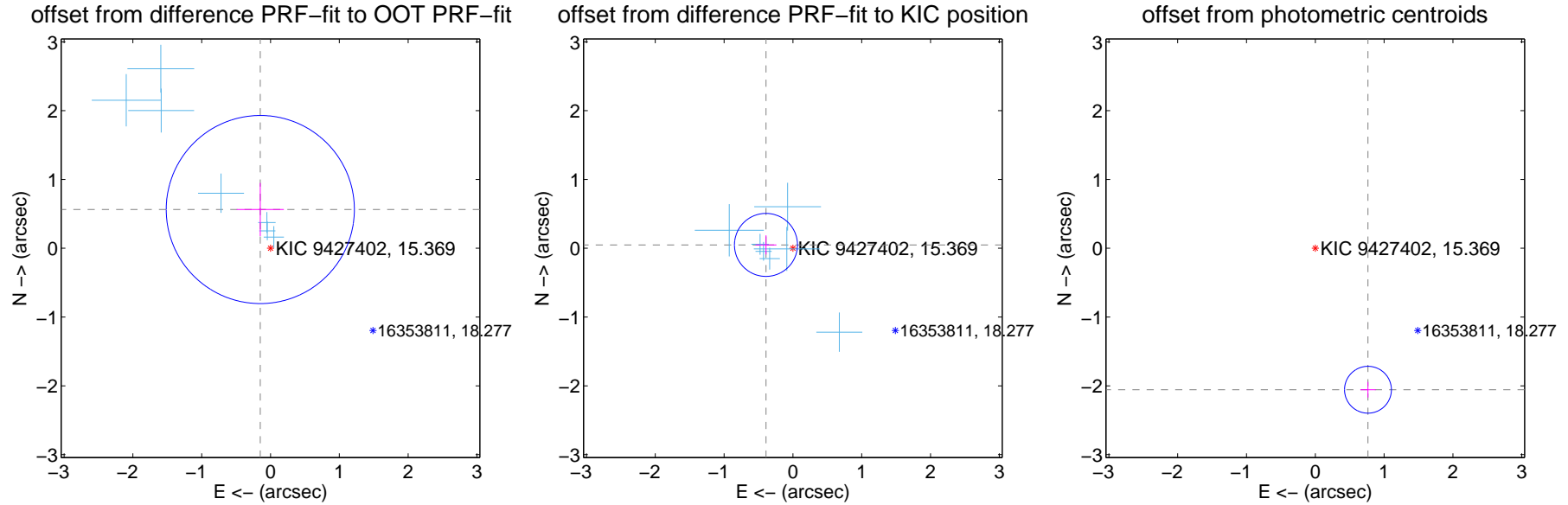
## DV Centroid Data

Supplemental centroid analysis for 009427402-01. Kepler magnitude: 15.37. Transit SNR 43.36

There are 14 quarters with good PRF difference image offsets

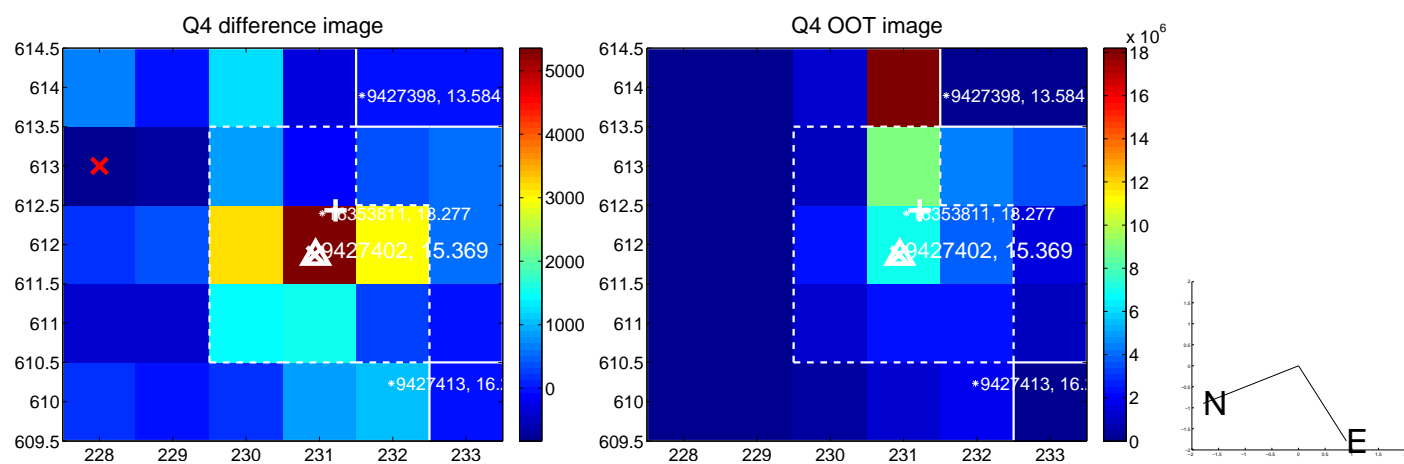
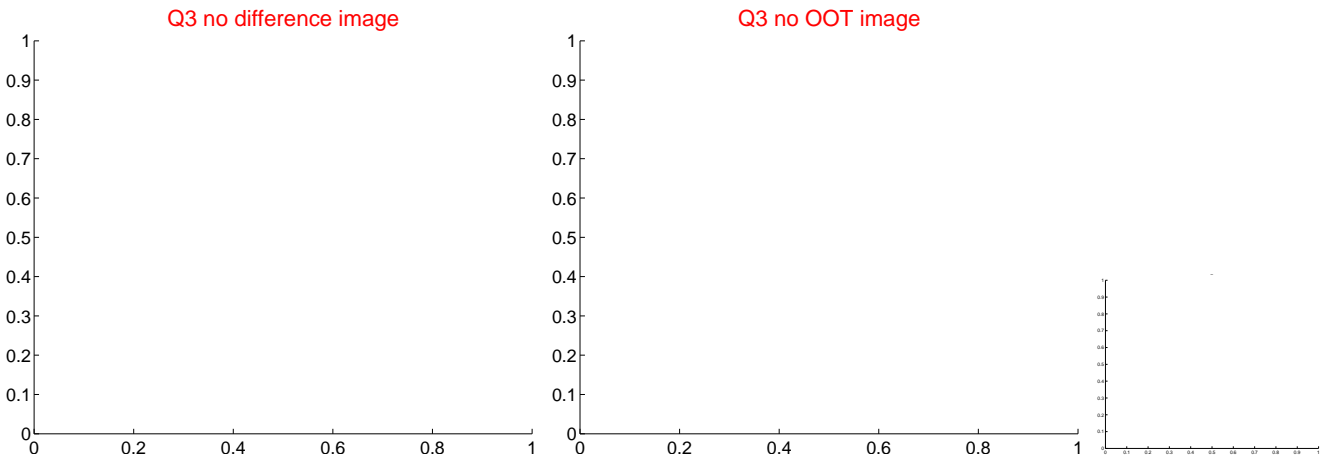
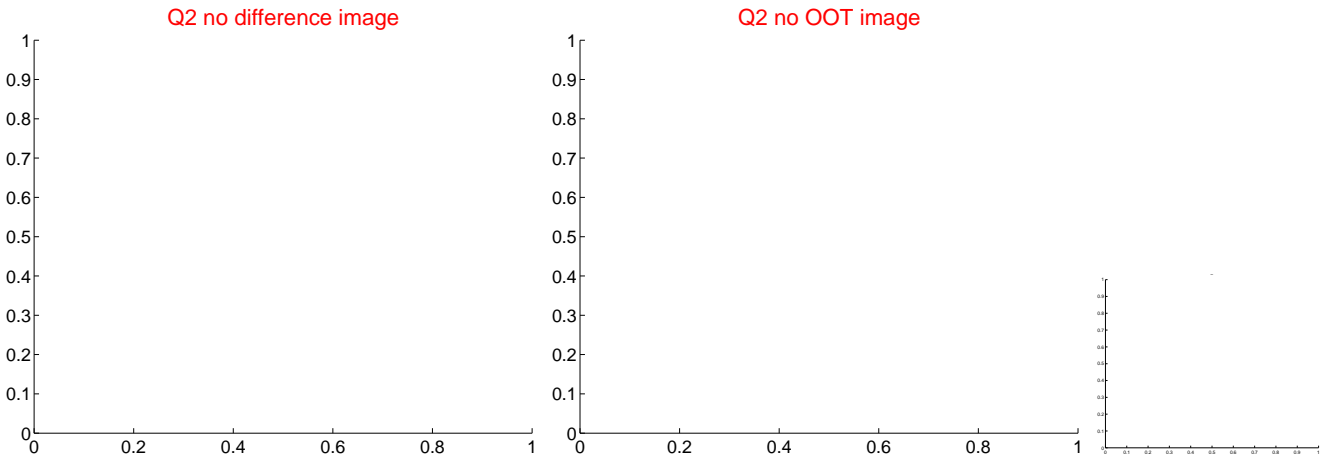
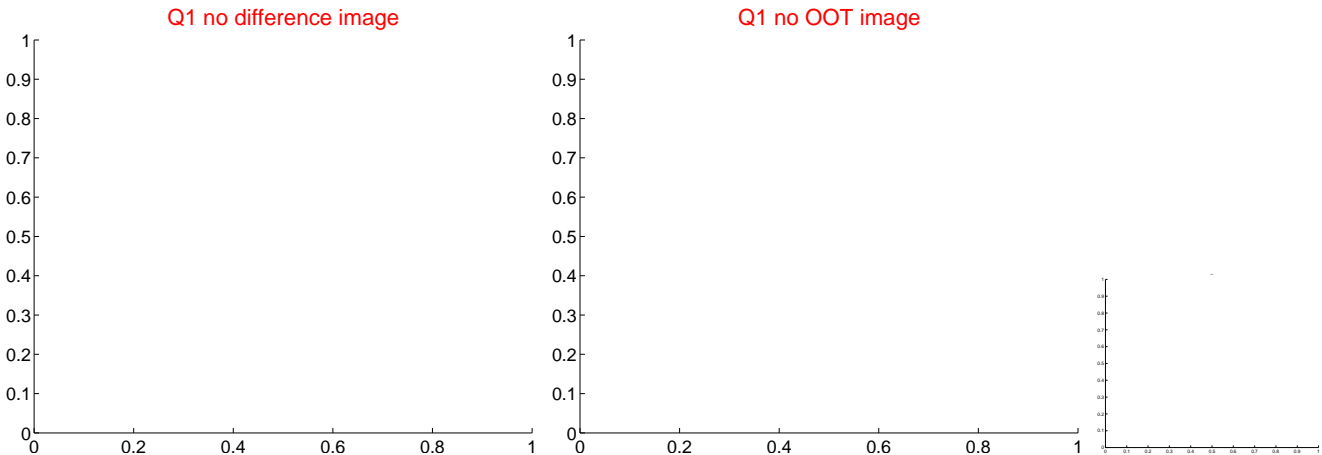
The OOT PRF centroid is offset from the target star catalog position by about 2.22 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.582 \pm 0.456$	1.28	$0.149 \pm 0.343$	$0.563 \pm 0.386$
PRF-fit source offset from KIC position	$0.395 \pm 0.153$	2.58	$0.392 \pm 0.151$	$0.049 \pm 0.139$
photometric centroid source offset	$2.19 \pm 0.11$	19.33	$-0.77 \pm 0.11$	$-2.06 \pm 0.11$

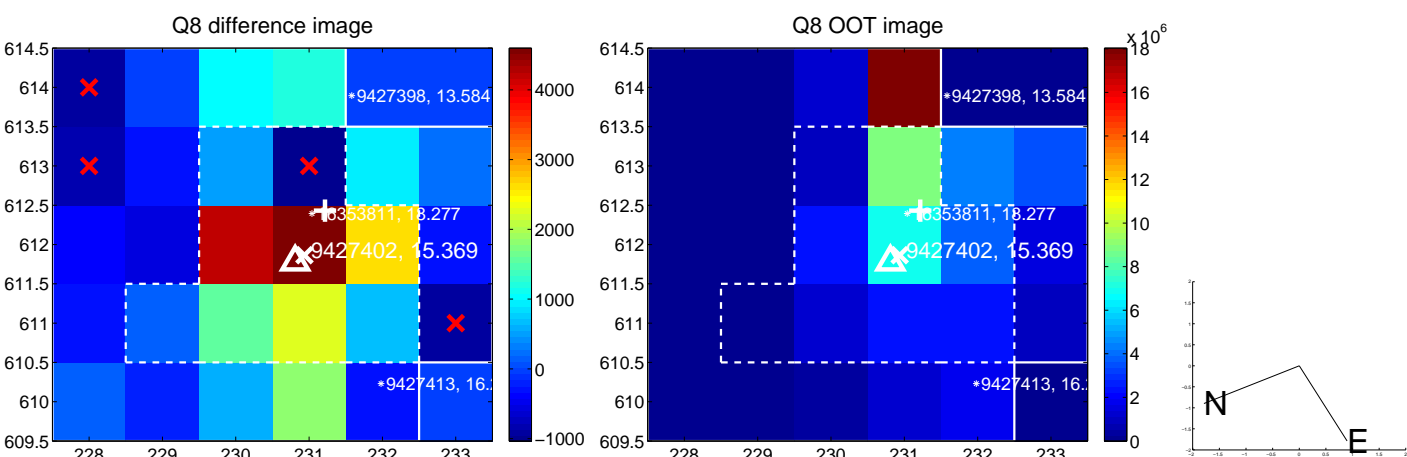
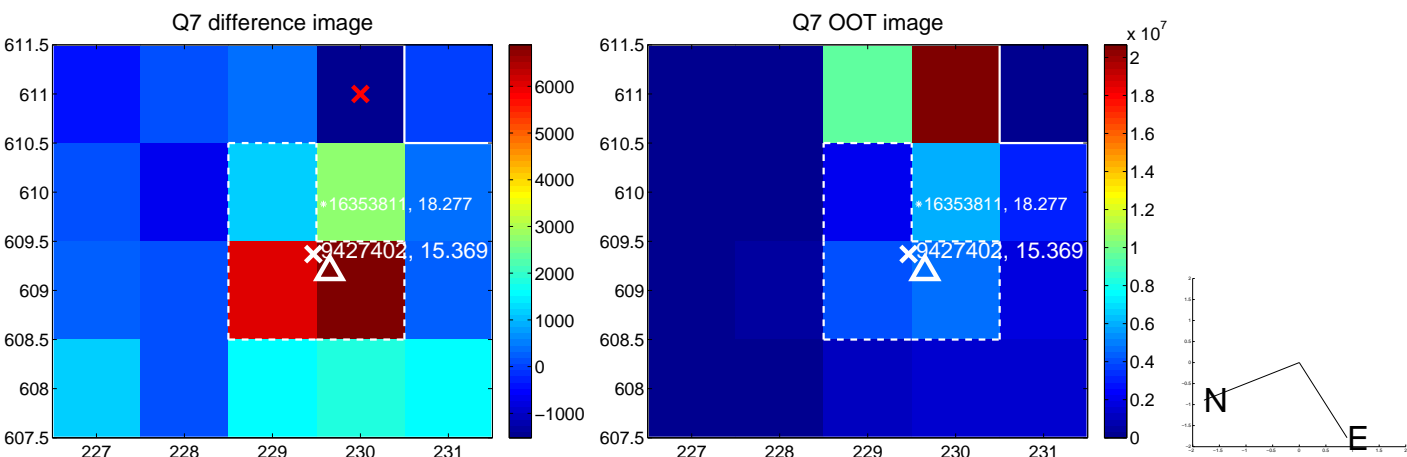
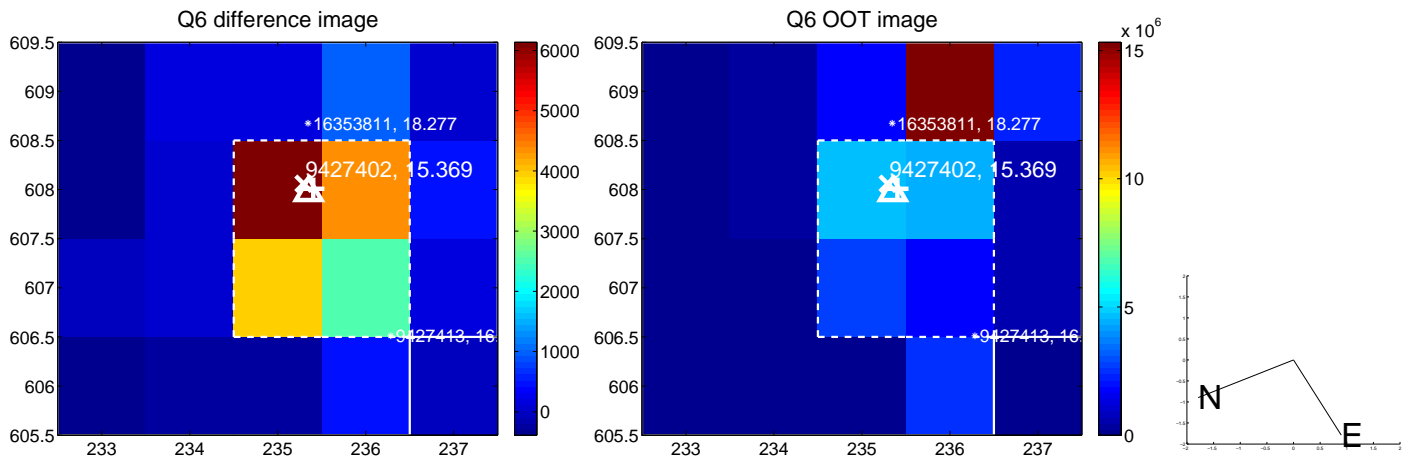
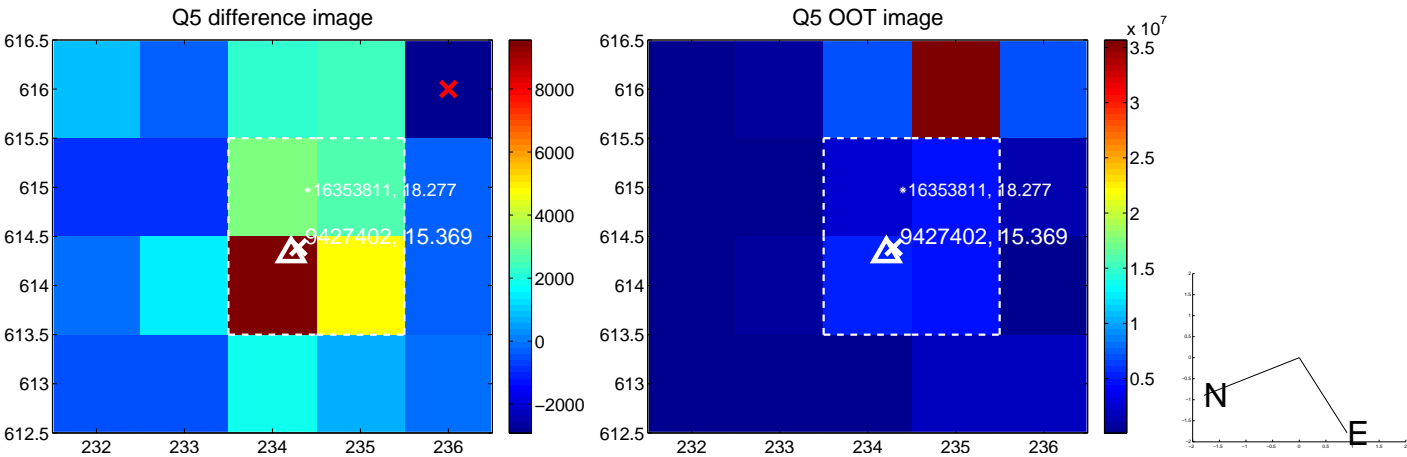


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

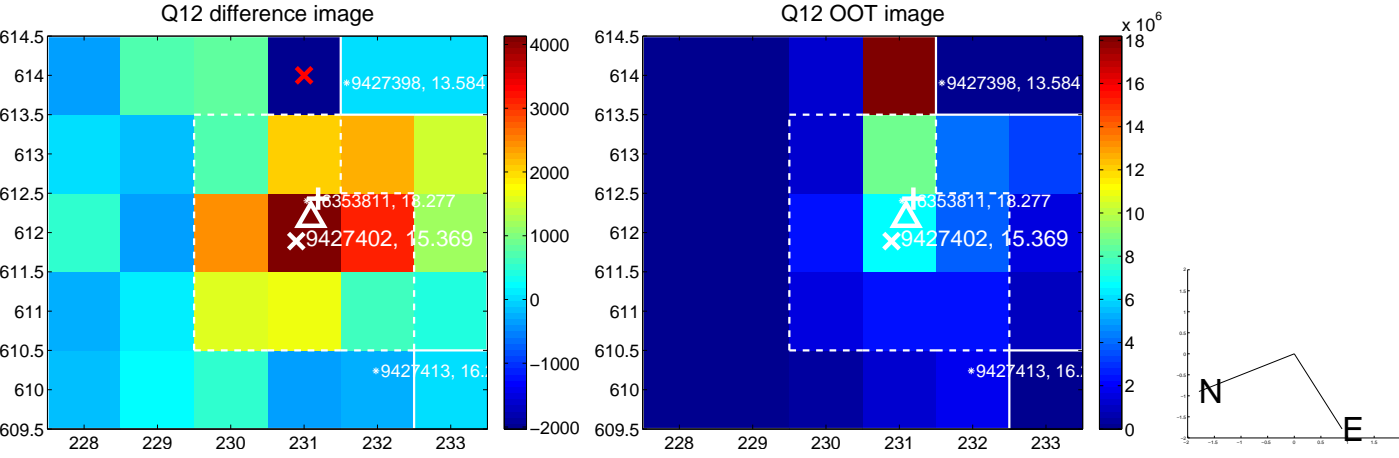
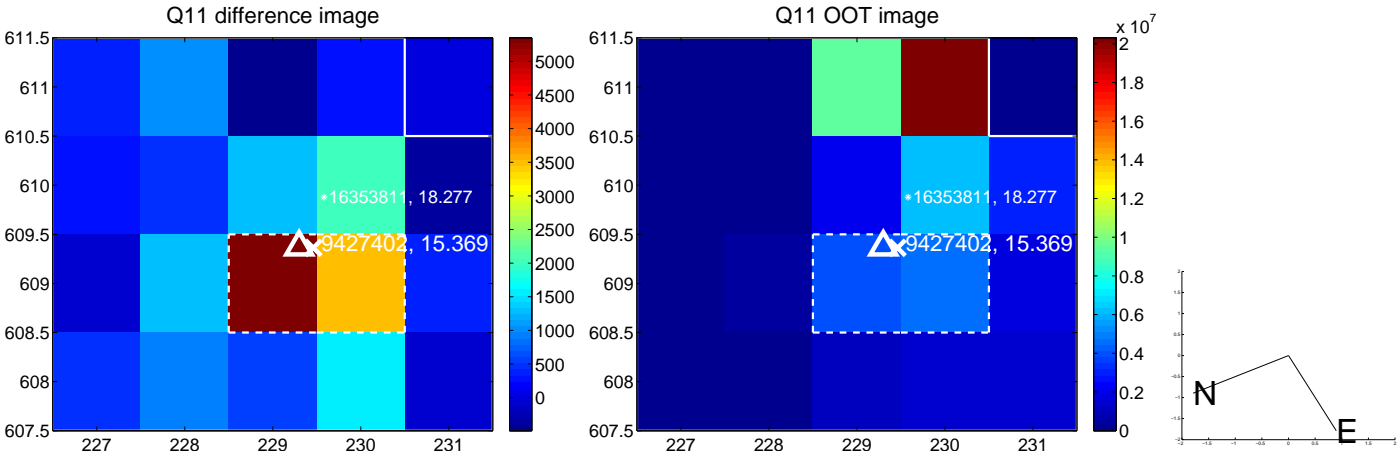
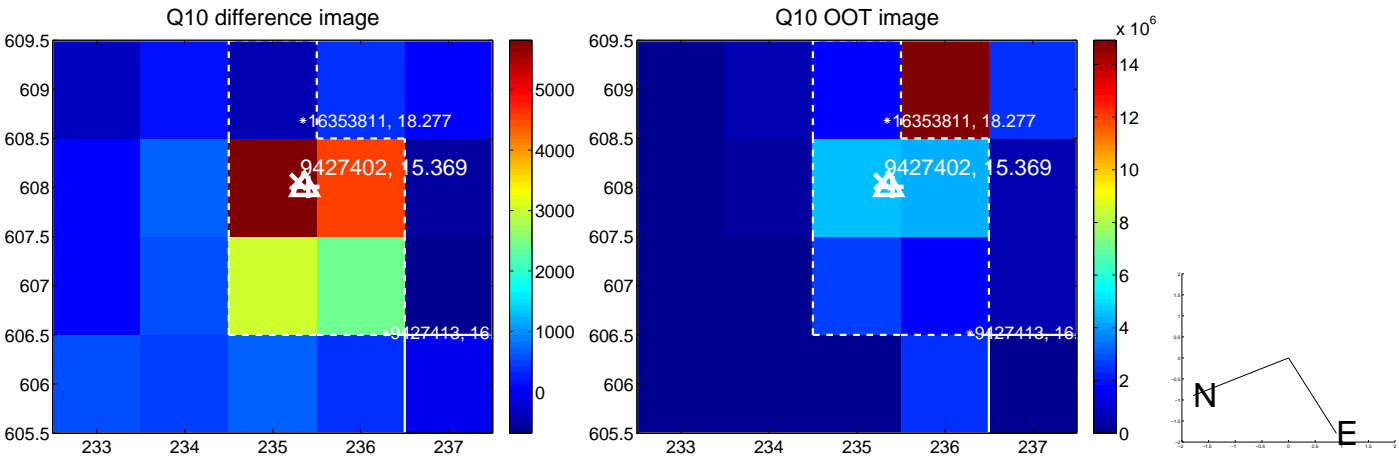
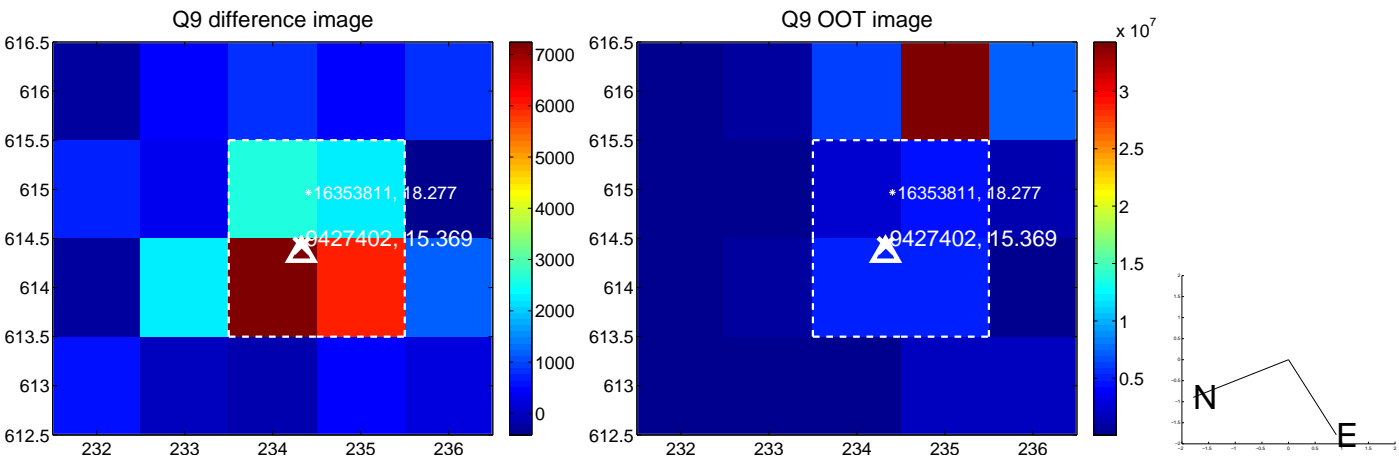
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



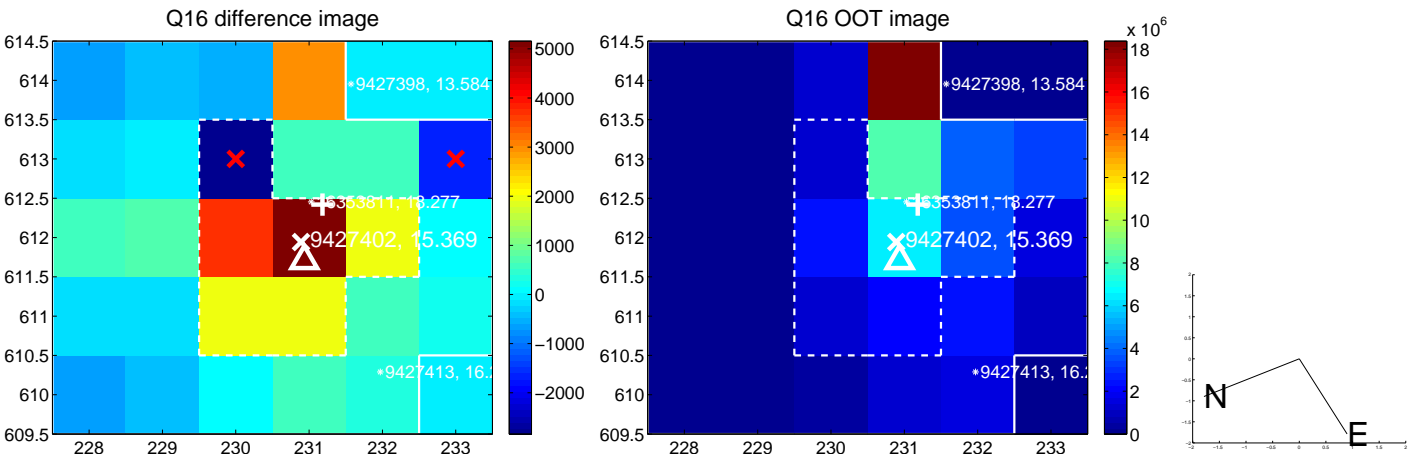
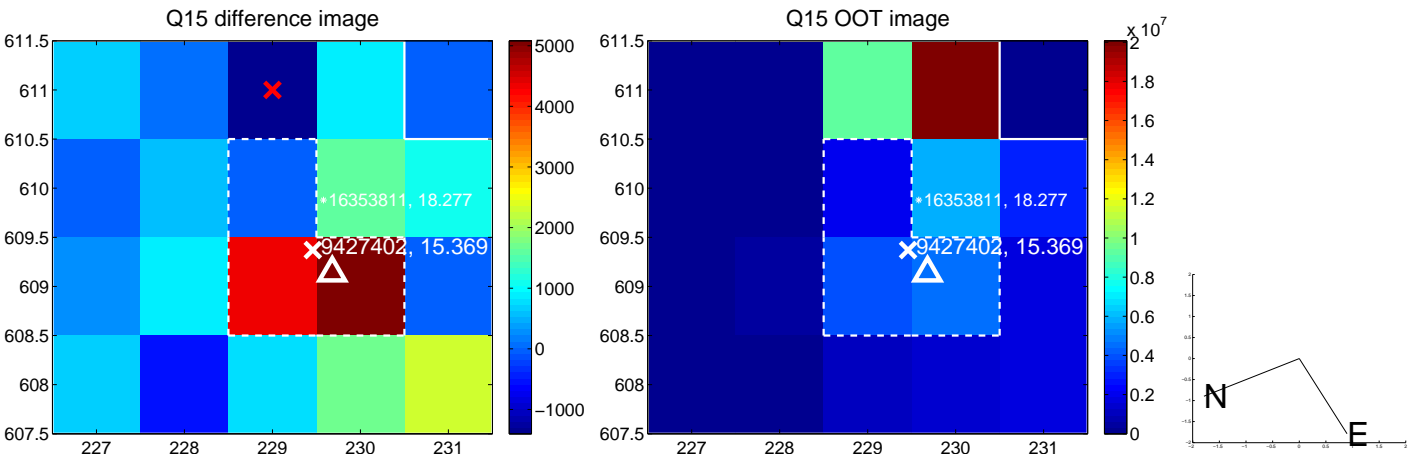
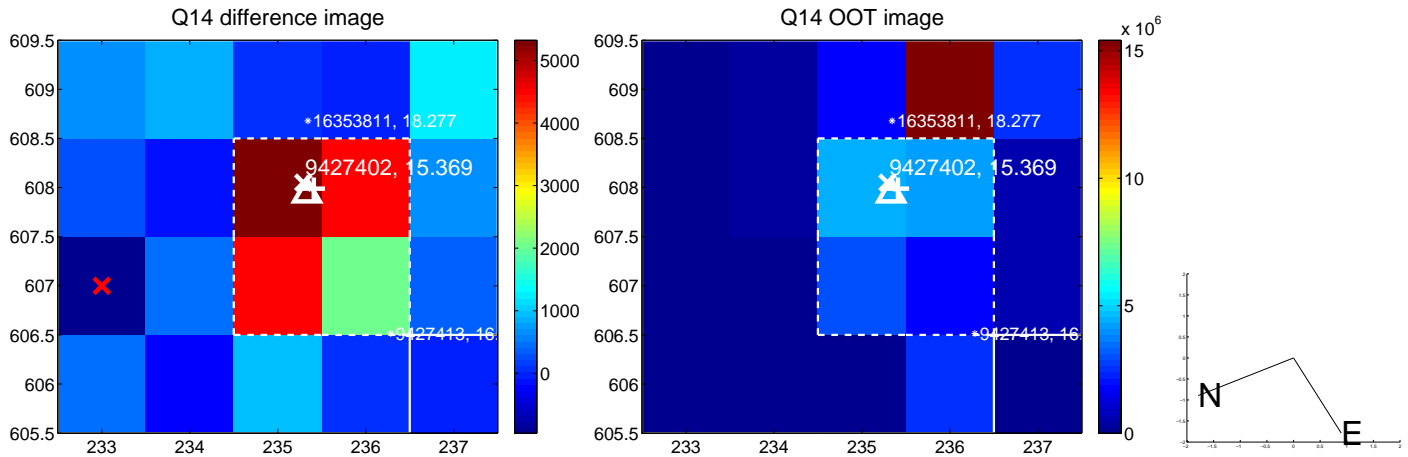
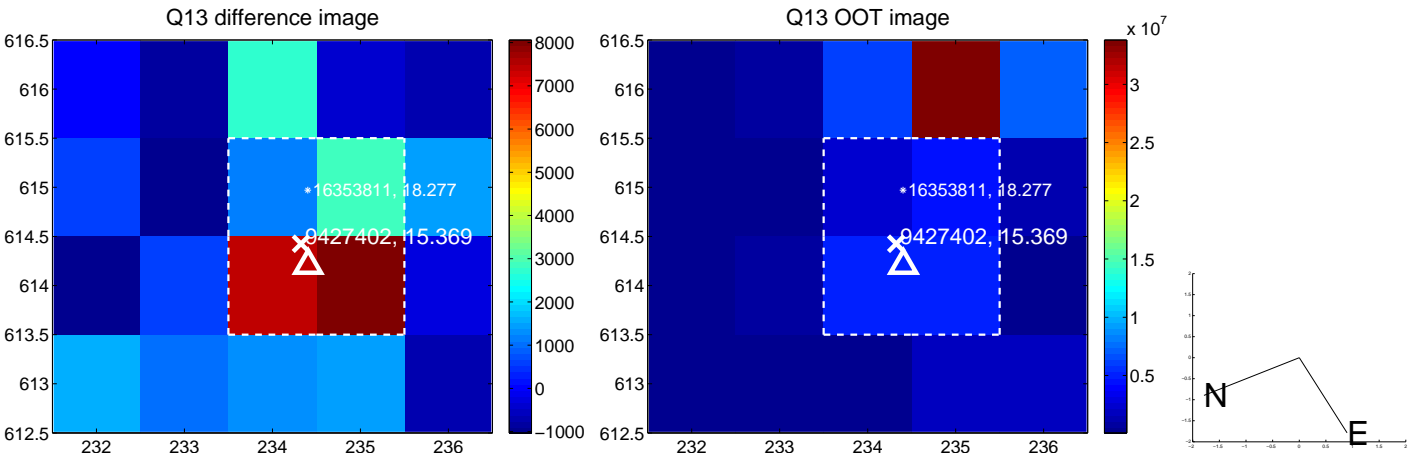
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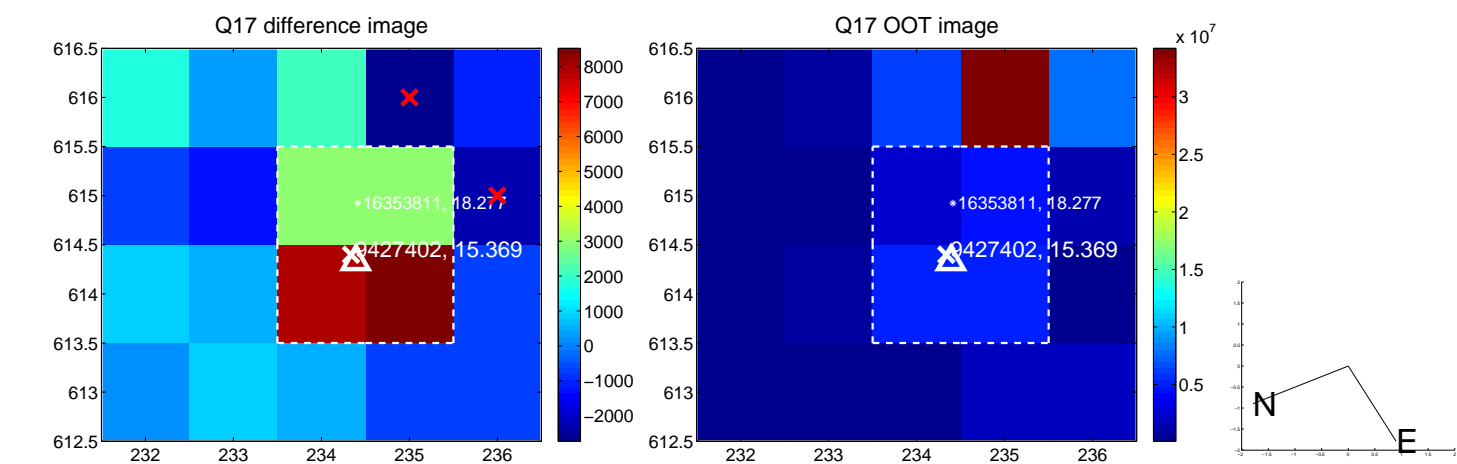


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

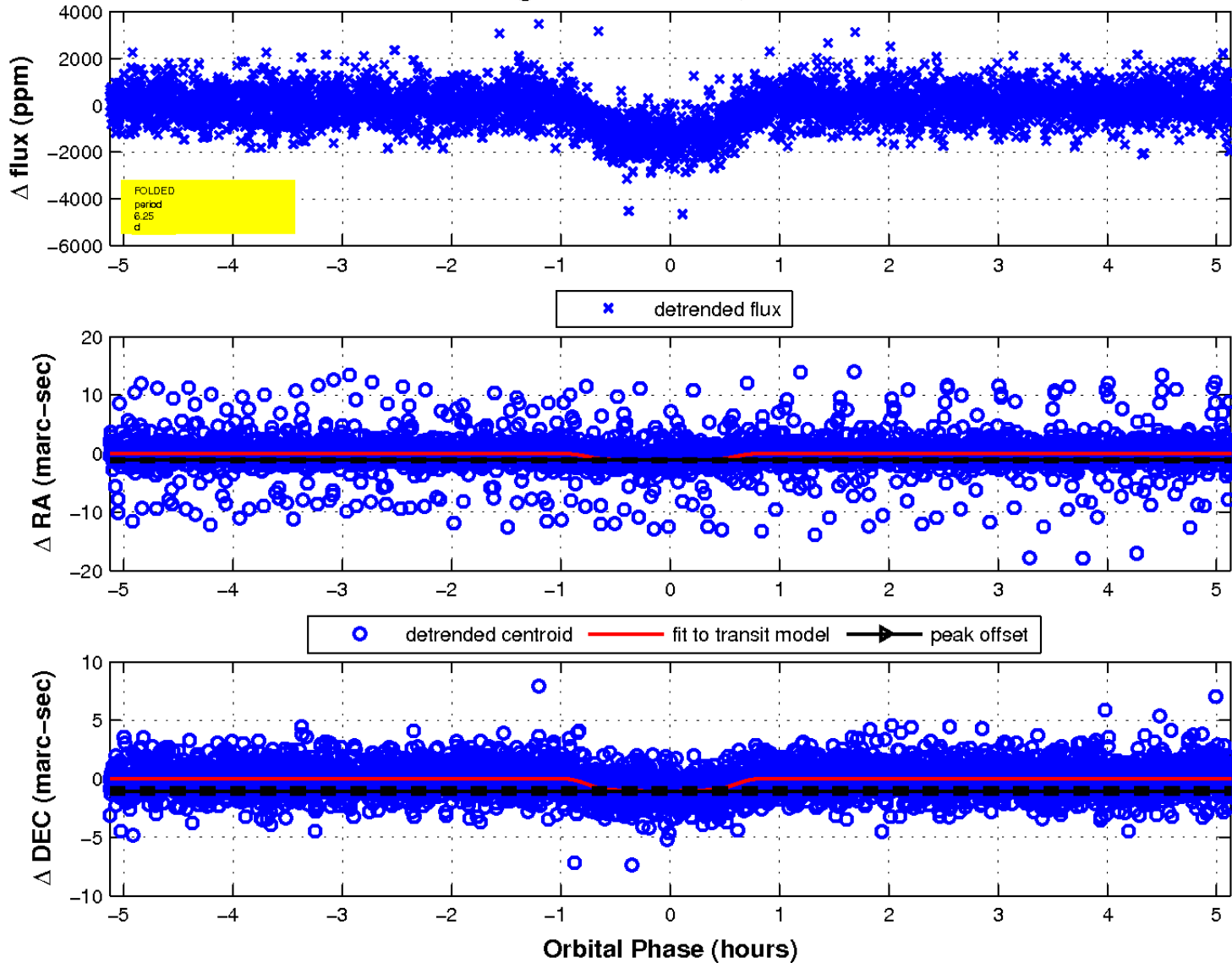




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

