

# KIC 012470954

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012470954-01	OBS	0439.01	1.902205	132.406743	2328.8	2.434	343.8	343.7	0.94	5400	5.23	777.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012470954-01	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.

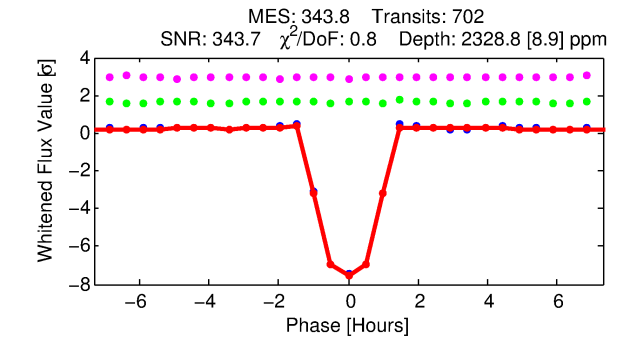
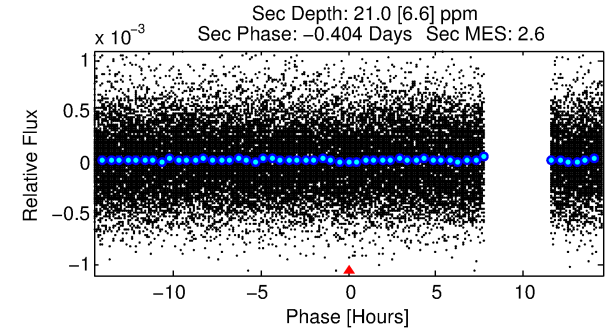
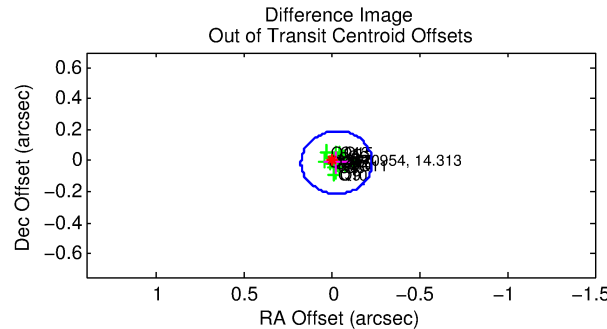
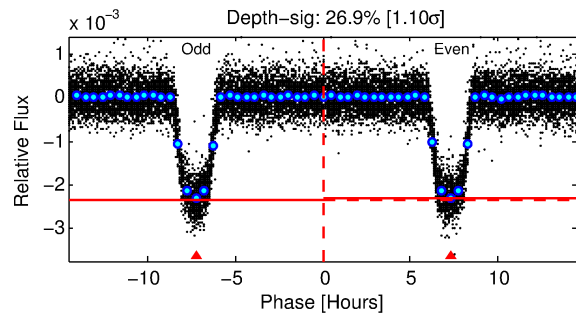
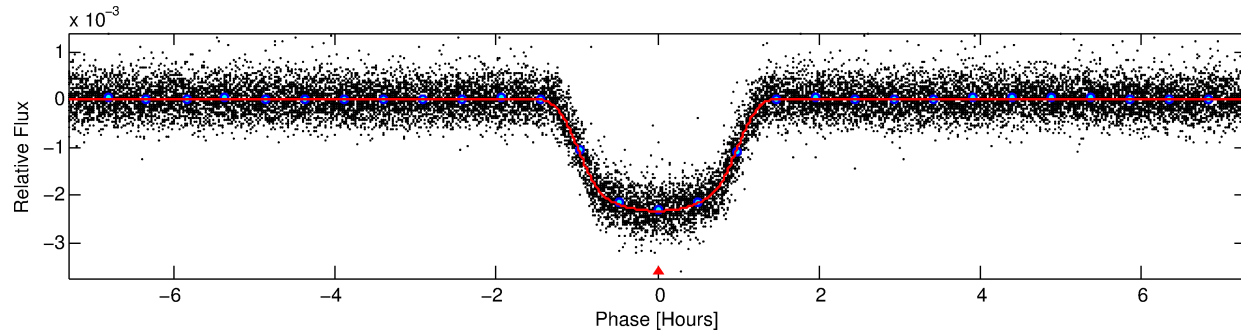
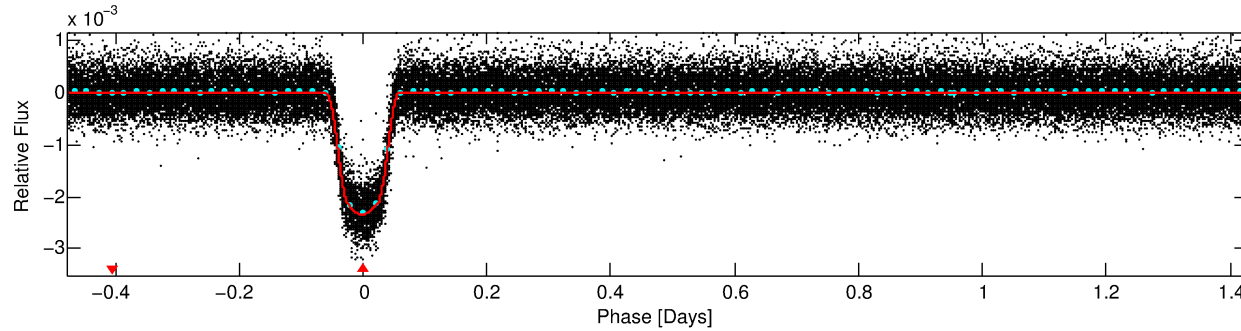
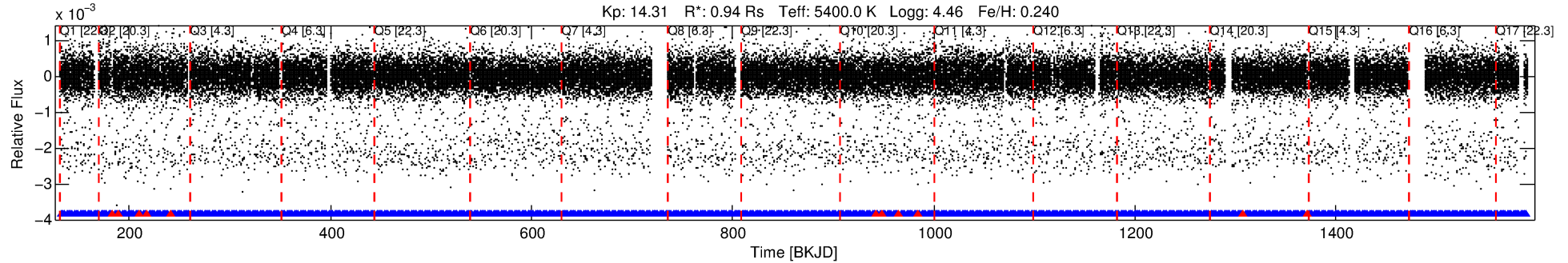
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012470954-01

No Significant Match Found

# DV One-Page Summary

KIC: 12470954 Candidate: 1 of 1 Period: 1.902 d  
KOI: K00439.01 Corr: 0.952



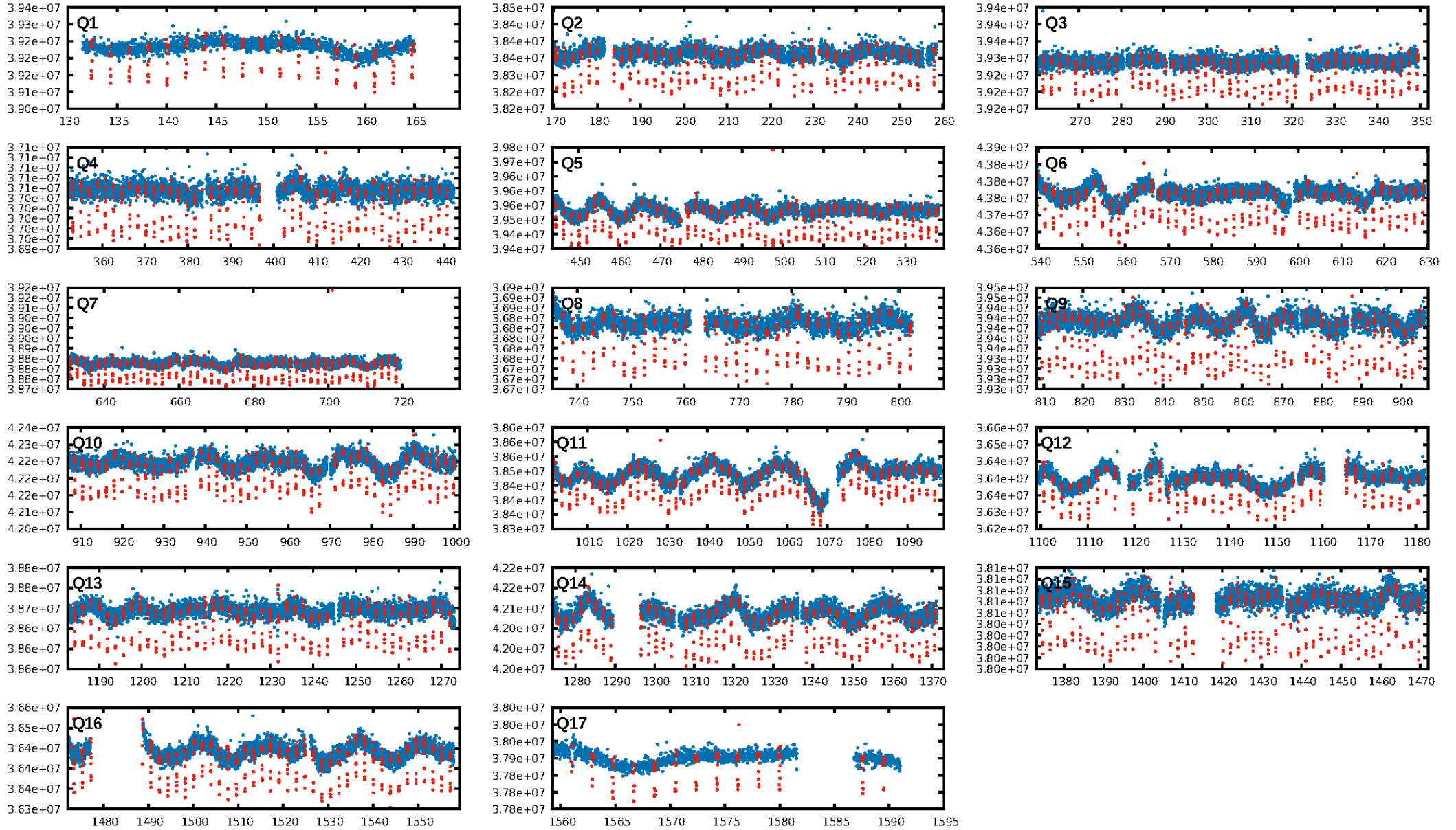
## DV Fit Results:

Period = 1.90220 [0.00000] d  
Epoch = 132.4067 [0.0001] BKJD  
Rp/R\* = 0.0512 [0.0005]  
a/R\* = 3.80 [0.12]  
b = 0.85 [0.01]  
Seff = 777.35 [145.26]  
Teff = 1346 [63] K  
Rp = 5.23 [0.63] Re  
a = 0.0293 [0.0032] AU  
Ag = 0.36 [0.13] [-4.92 $\sigma$ ]  
Teffp = 1617 [130] K [1.87 $\sigma$ ]

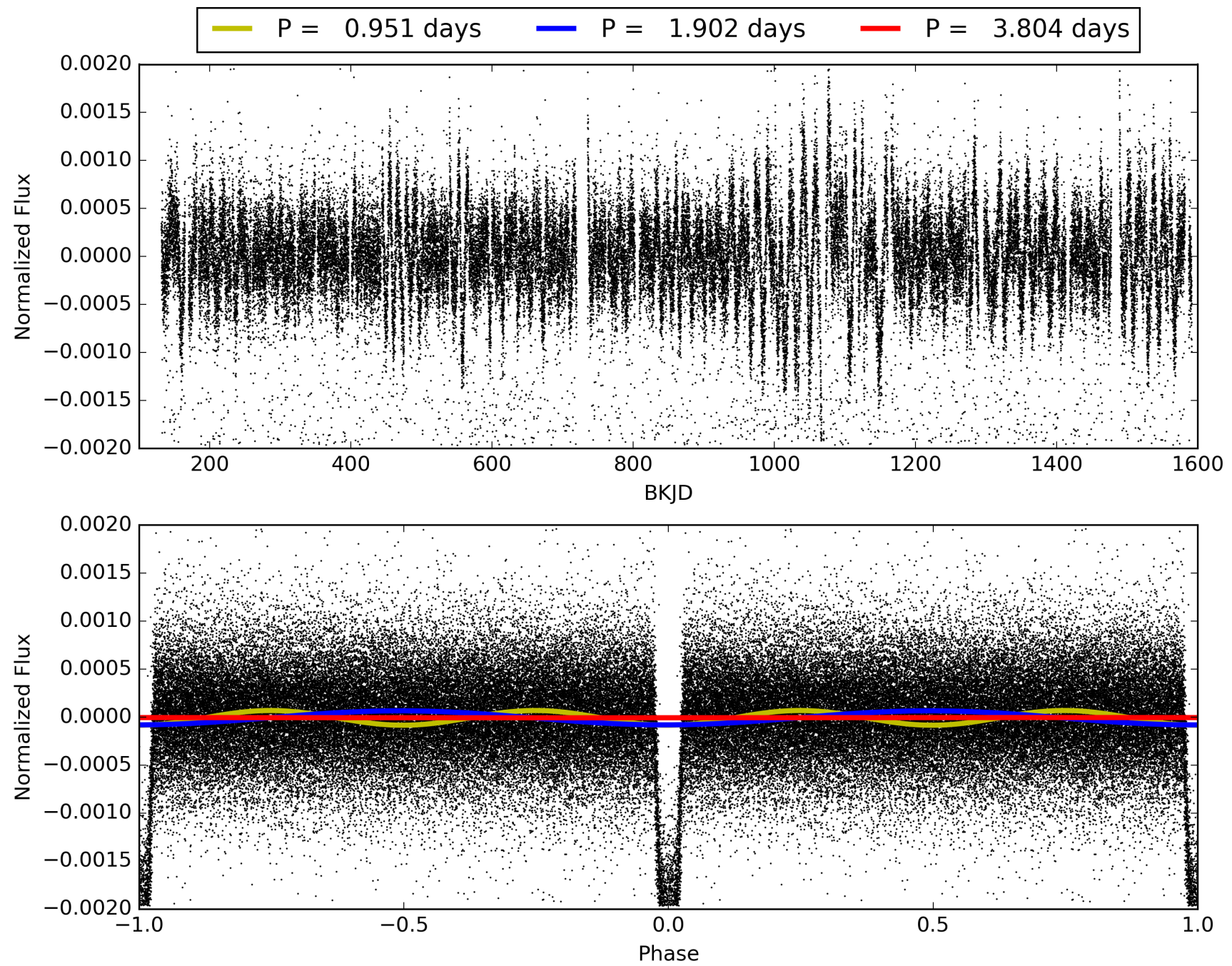
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.98 [660/671]  
GhostDiagnostic-chr: 5.859  
Centroid-sig: 0.1%  
Centroid-so: 1.226 arcsec [29.50 $\sigma$ ]  
OotOffset-rm: 0.030 arcsec [0.44 $\sigma$ ]  
KicOffset-rm: 0.309 arcsec [4.35 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 012470954-01, PDC Light Curves

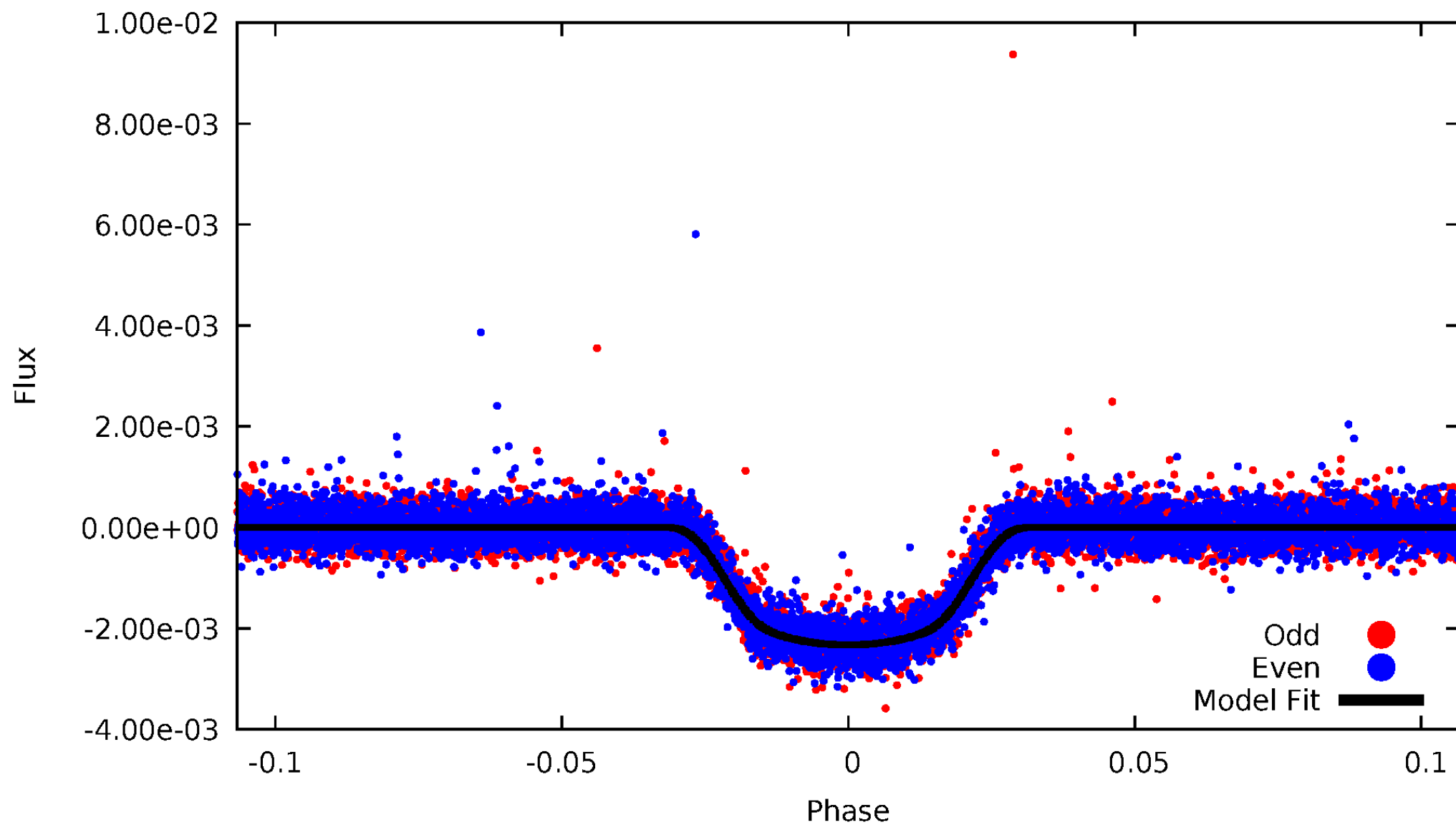


TCE 012470954-01



# DV Odd/Even

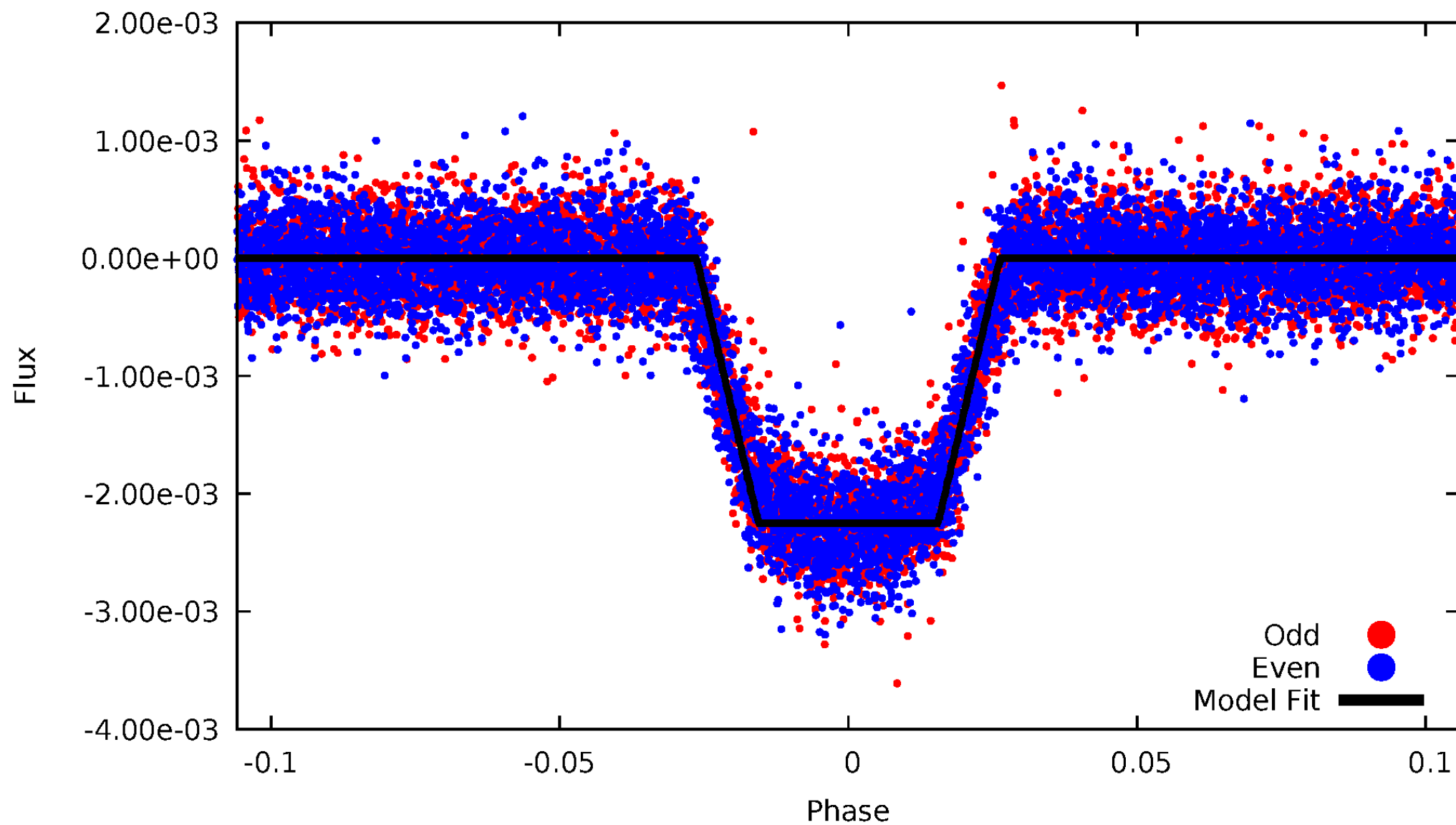
TCE 012470954-01





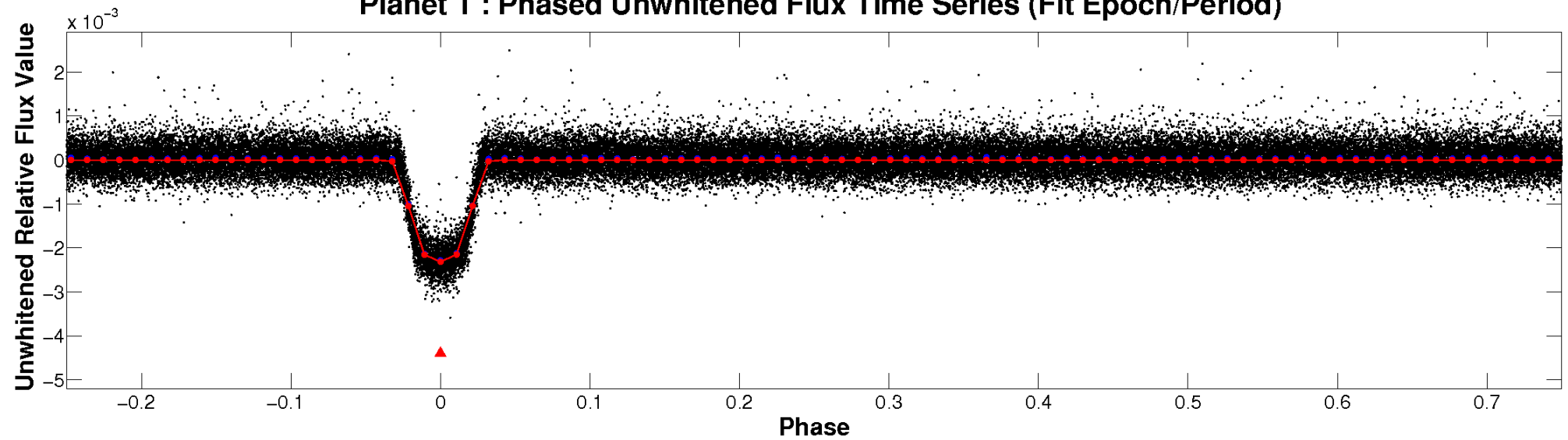
# ALT Odd/Even

TCE 012470954-01

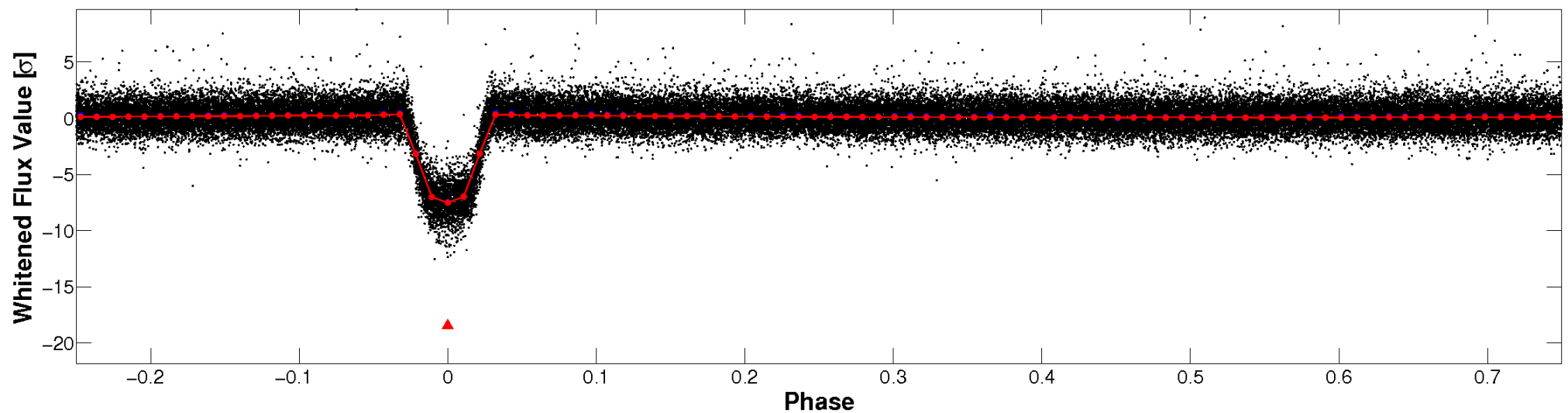


# Non-Whitened Vs. Whitened Light Curve

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

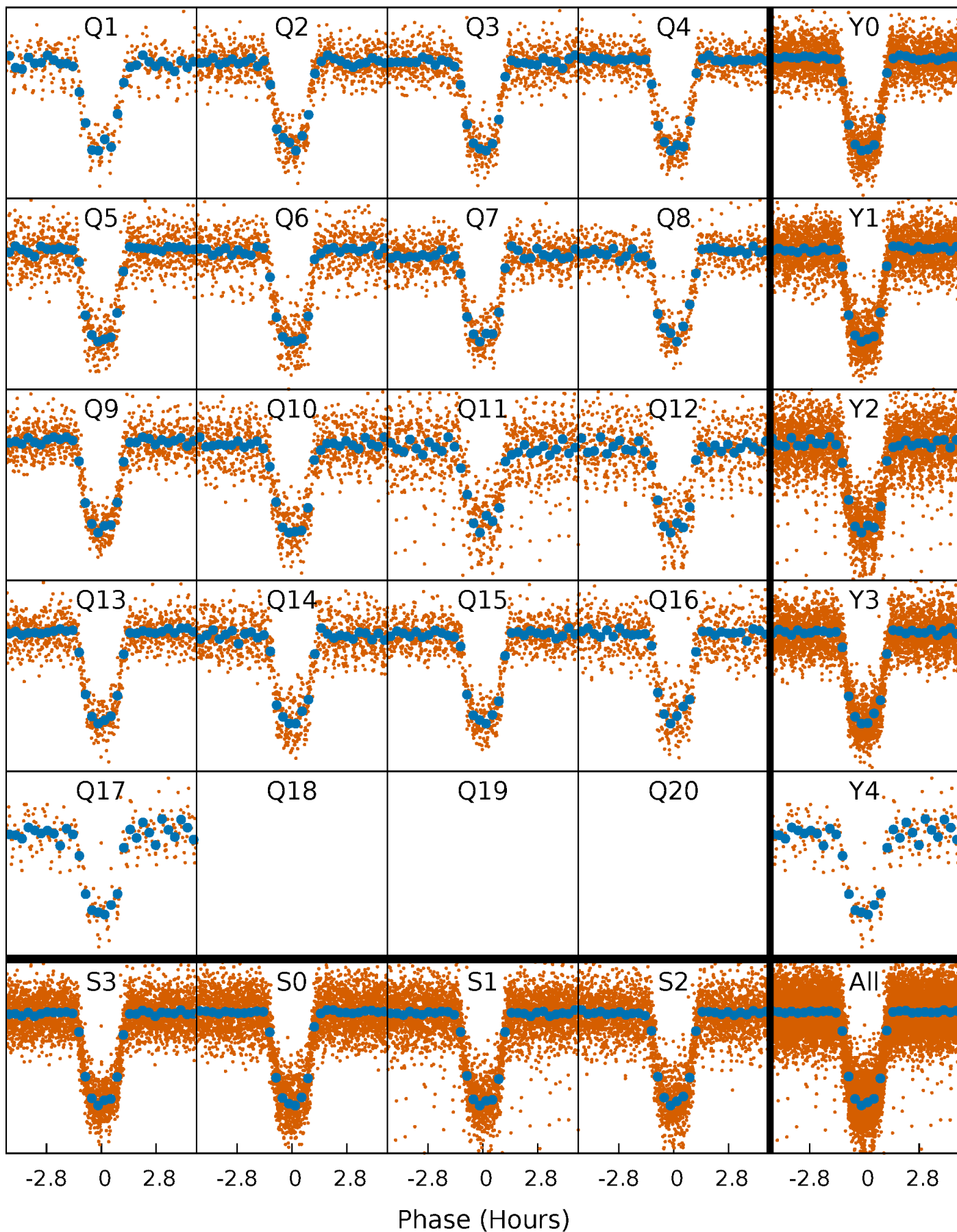


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

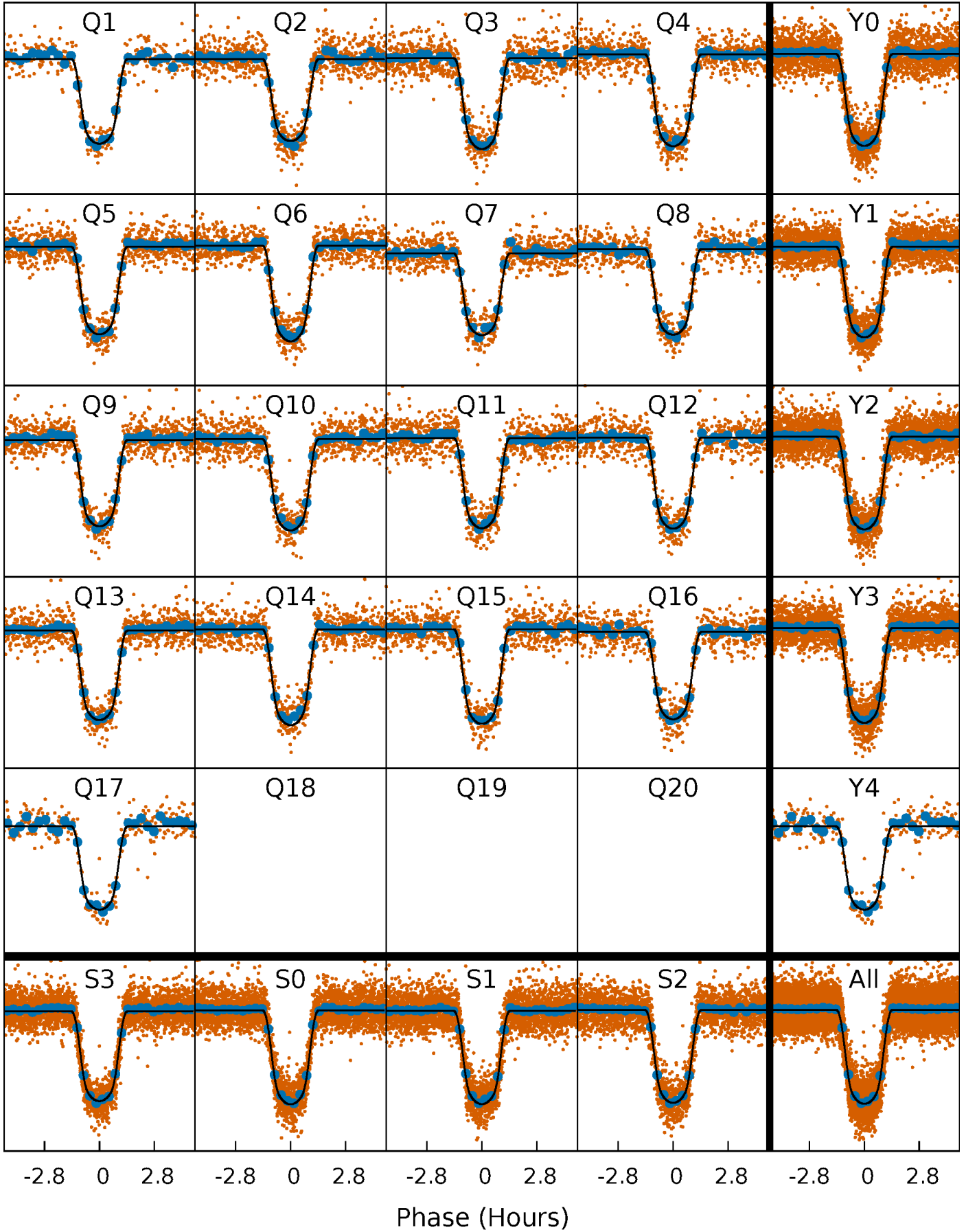
TCE 012470954-01 P= 1.902205 Days  $T_0=132.406743$  (BKJD)





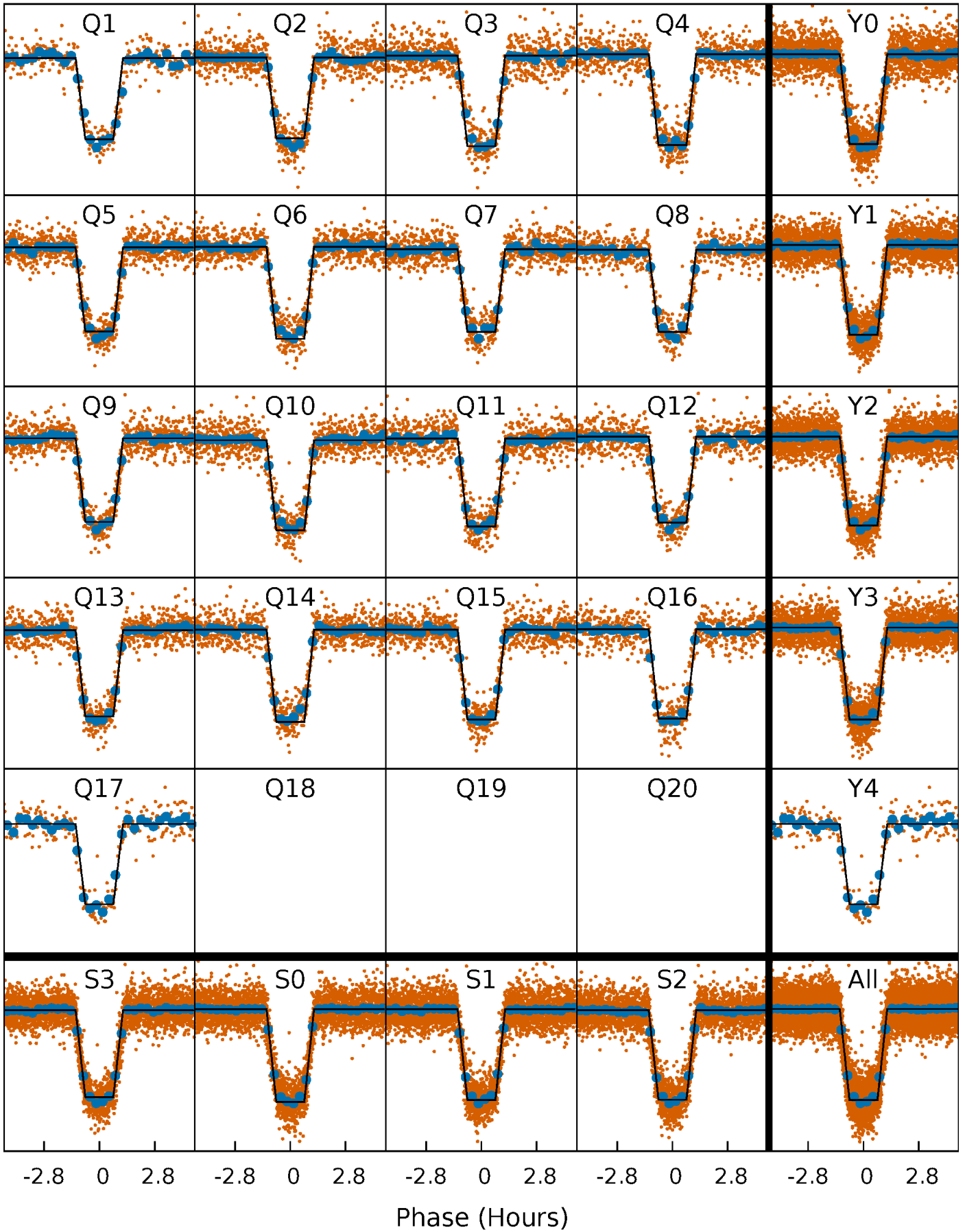
# DV Quarter-Phased Transit Curves

TCE 012470954-01 P= 1.902205 Days  $T_0=132.406743$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

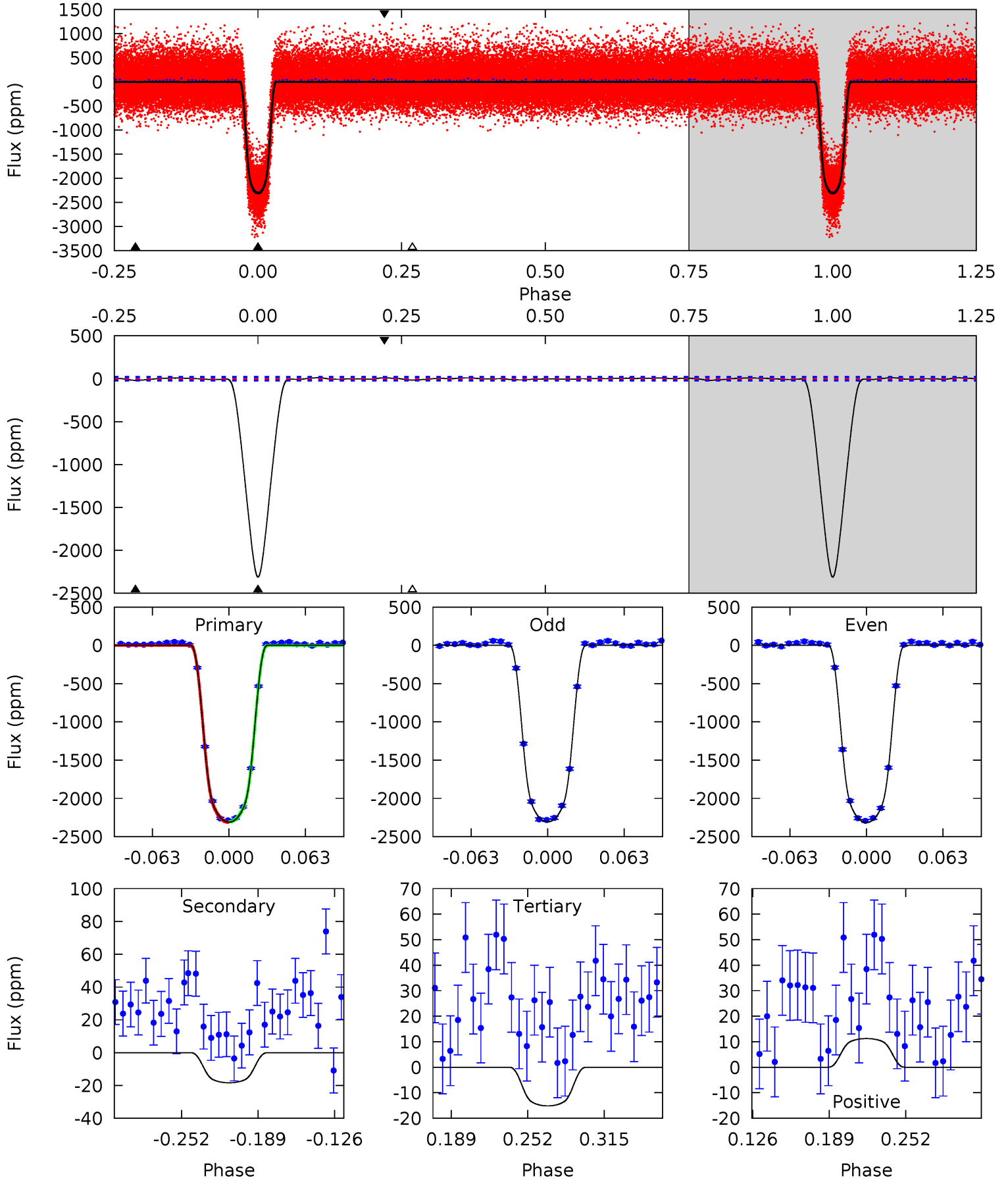
TCE 012470954-01 P= 1.902216 Days  $T_0=132.402739$  (BKJD)



# DV Model-Shift Uniqueness Test

012470954-01, P = 1.902205 Days, E = 130.504538 Days

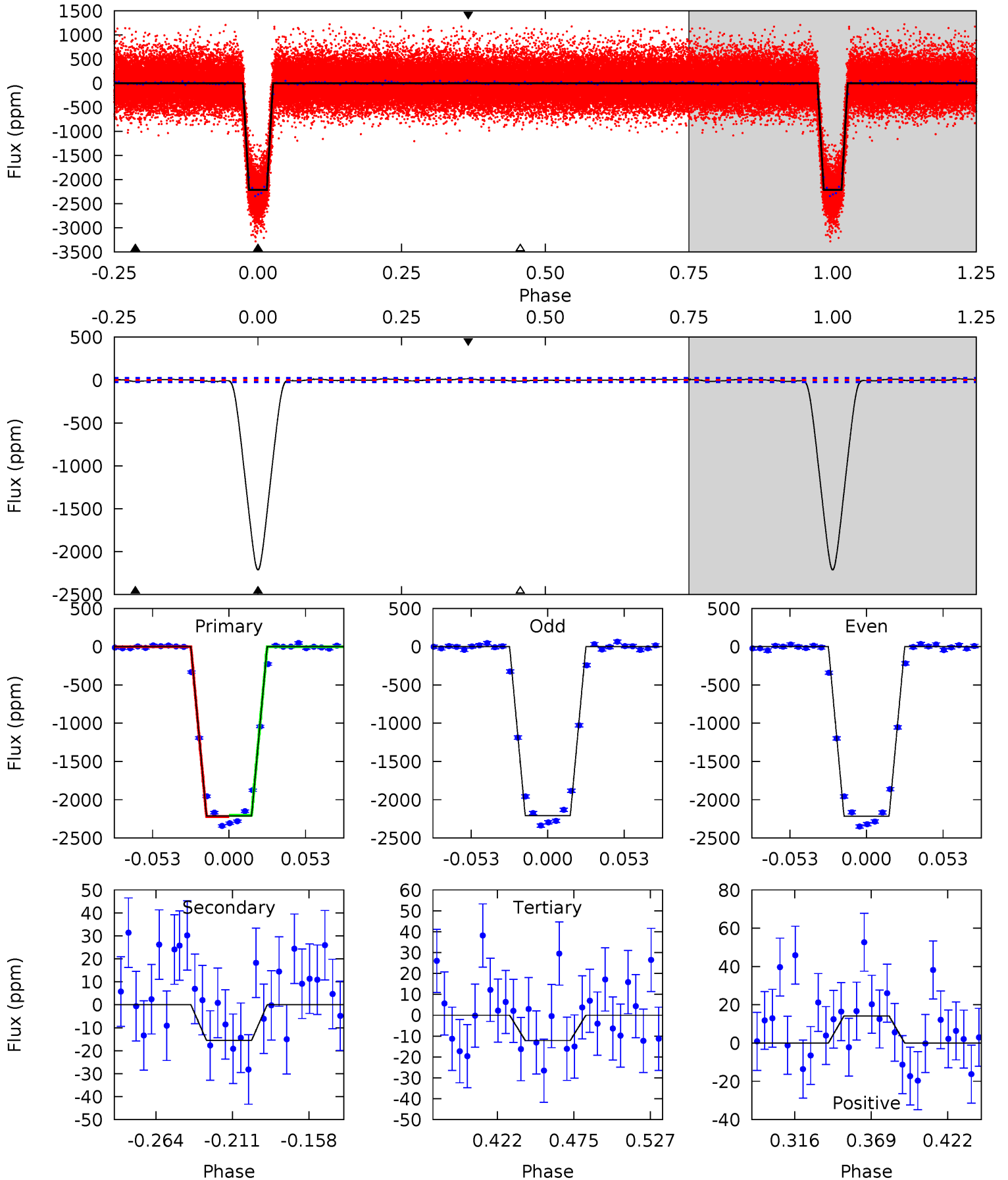
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
499.1	3.96	3.27	2.43	4.66	1.86	1.35	495.8	496.7	0.69	1.53	0.91	1.00	0.00	0.90



# Alt Model-Shift Uniqueness Test

012470954-01, P = 1.902216 Days, E = 130.500523 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
439.7	3.08	2.41	2.82	4.70	1.94	1.33	437.3	436.8	0.68	0.26	0.78	1.00	0.01	1.43



### Stellar Parameters For KIC 012470954

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5400^{+107}_{-107}$	$4.463^{+0.060}_{-0.097}$	$0.240^{+0.150}_{-0.150}$	$0.937^{+0.113}_{-0.070}$	$0.931^{+0.049}_{-0.049}$	$1.592^{+0.371}_{-0.428}$
	+2%/-2%	+1%/-2%	+62%/-62%	+12%/-7%	+5%/-5%	+23%/-27%
Source	SPE58	SPE58	SPE58	DSEP		

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

### Secondary Eclipse Parameters for KIC 012470954-01 / KOI 0439.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-18 \pm 5$	$5.26^{+0.37}_{-0.24}$	$1892^{+67}_{-58}$	$1668^{+433}_{-3761}$	$0.308^{+0.080}_{-0.083}$
Alt.	$-16 \pm 5$	$4.89^{+0.35}_{-0.25}$	$1890^{+71}_{-61}$	$1586^{+574}_{-3728}$	$0.304^{+0.102}_{-0.101}$

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



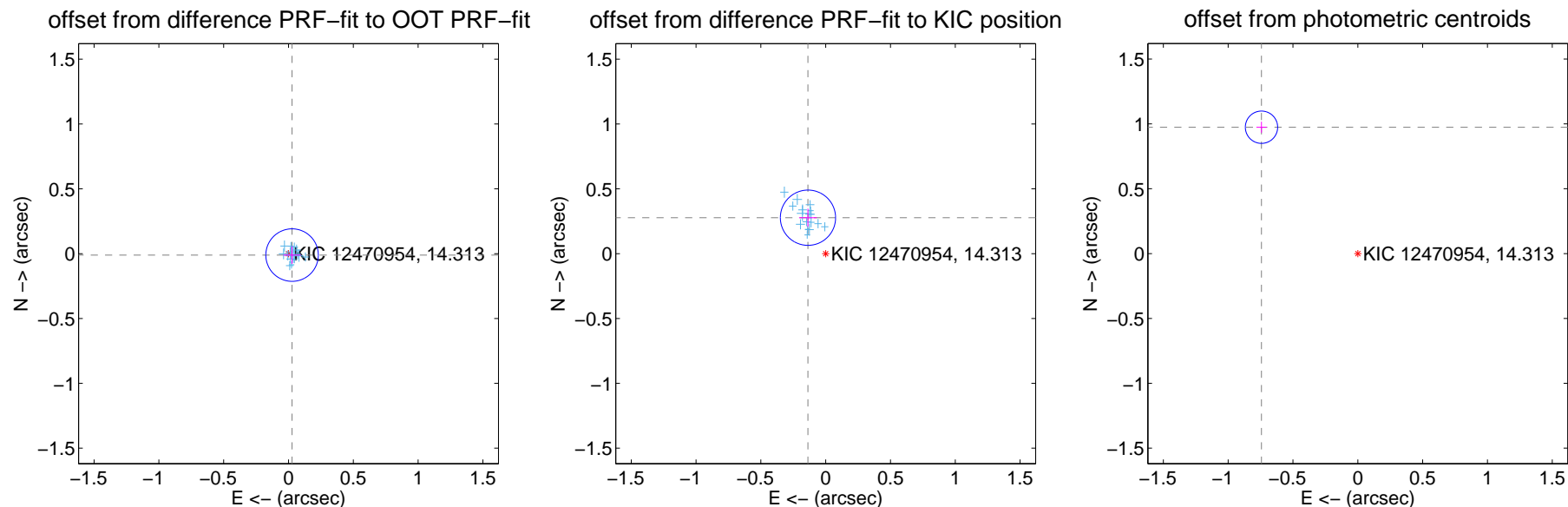
## DV Centroid Data

Supplemental centroid analysis for 012470954-01. Kepler magnitude: 14.31. Transit SNR 343.70

There are 17 quarters with good PRF difference image offsets

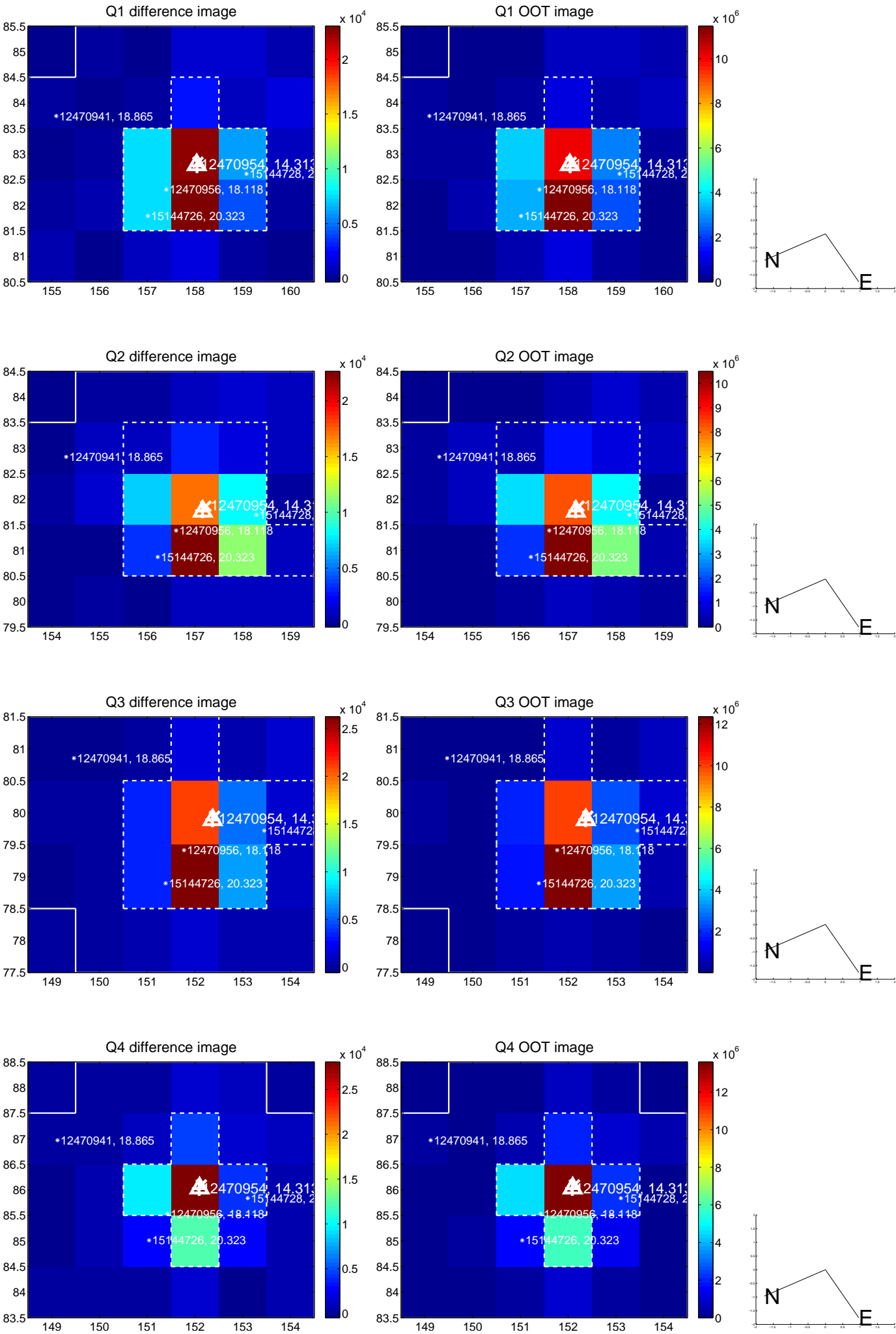
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.030 \pm 0.067$	0.44	$-0.028 \pm 0.067$	$-0.011 \pm 0.068$
PRF-fit source offset from KIC position	$0.309 \pm 0.071$	4.35	$0.136 \pm 0.069$	$0.277 \pm 0.070$
photometric centroid source offset	$1.23 \pm 0.04$	29.50	$0.74 \pm 0.04$	$0.97 \pm 0.04$

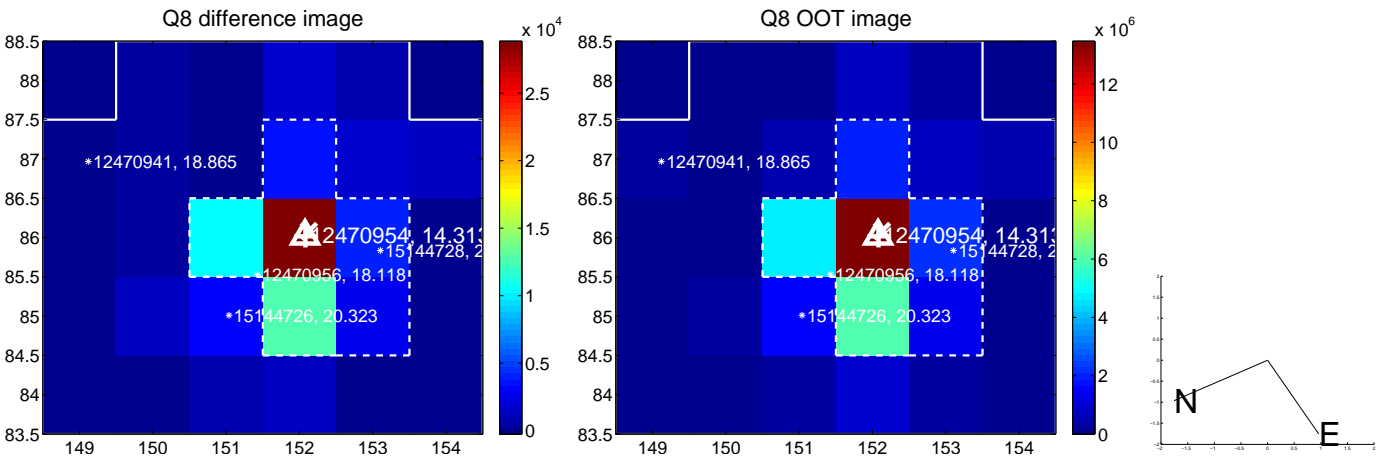
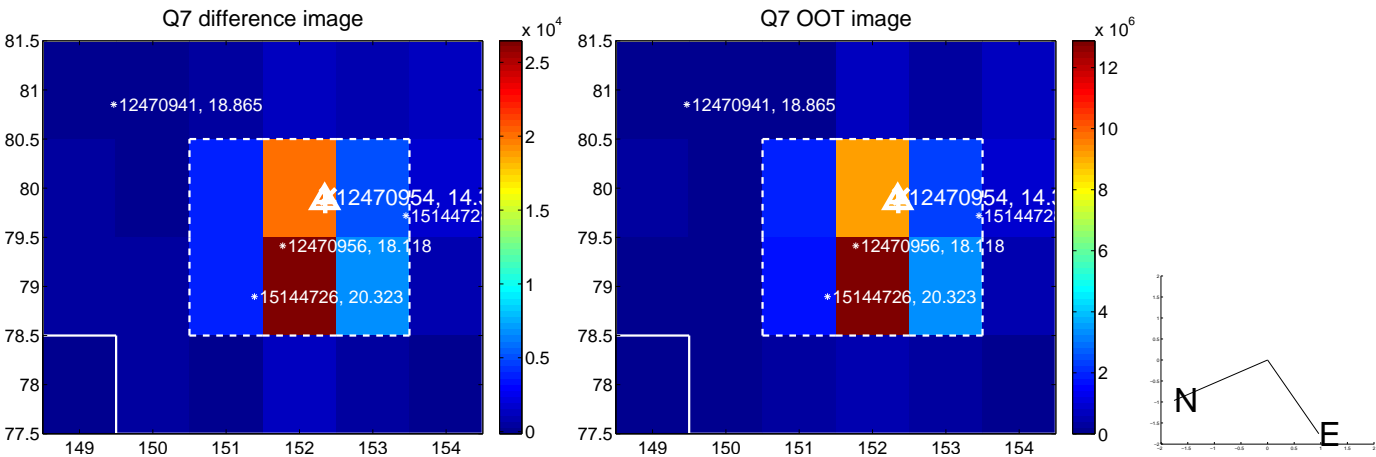
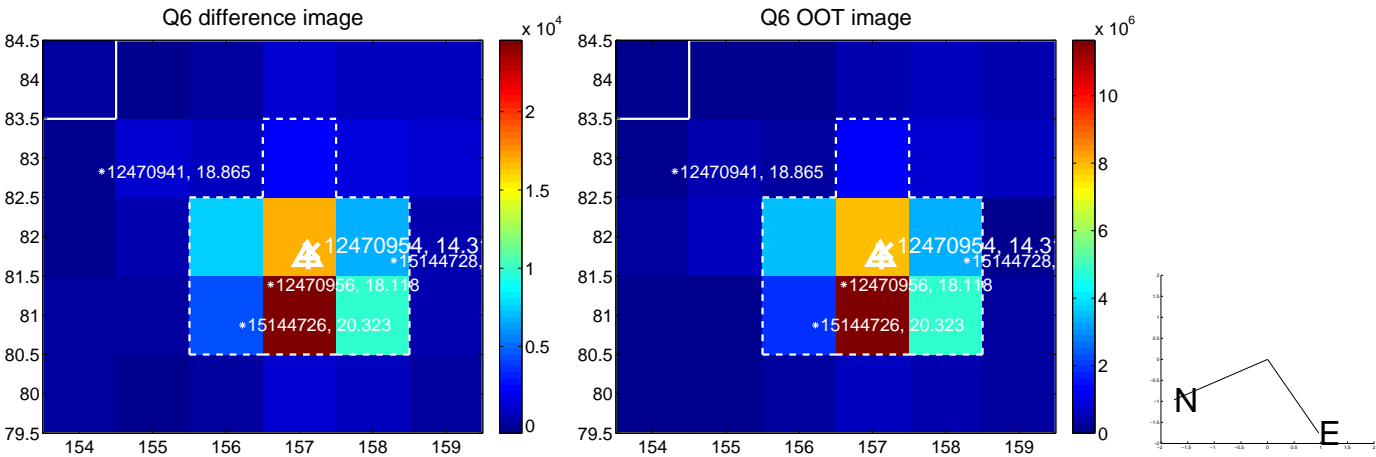
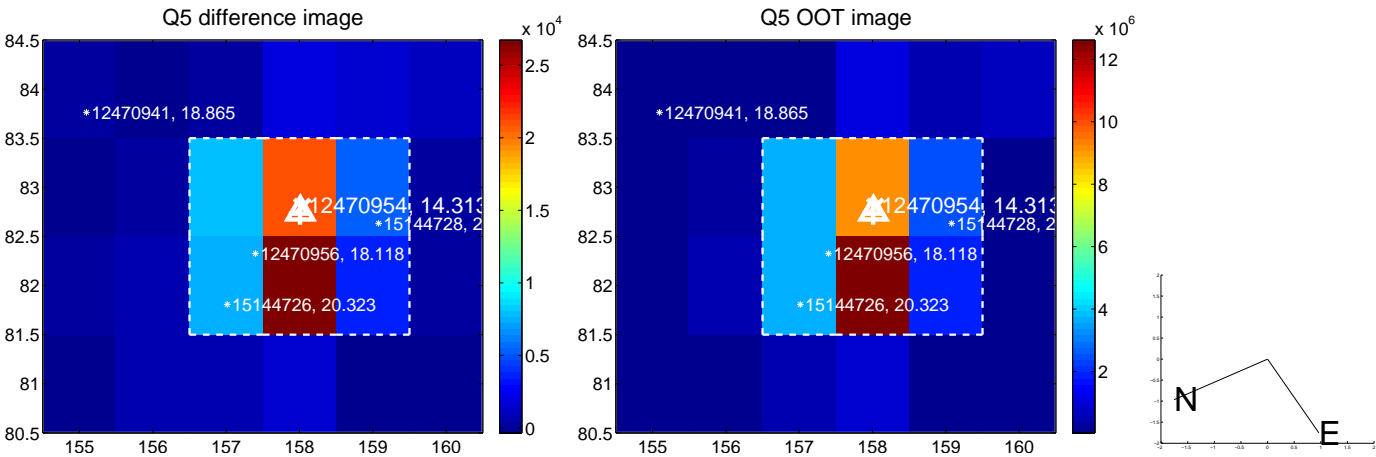


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

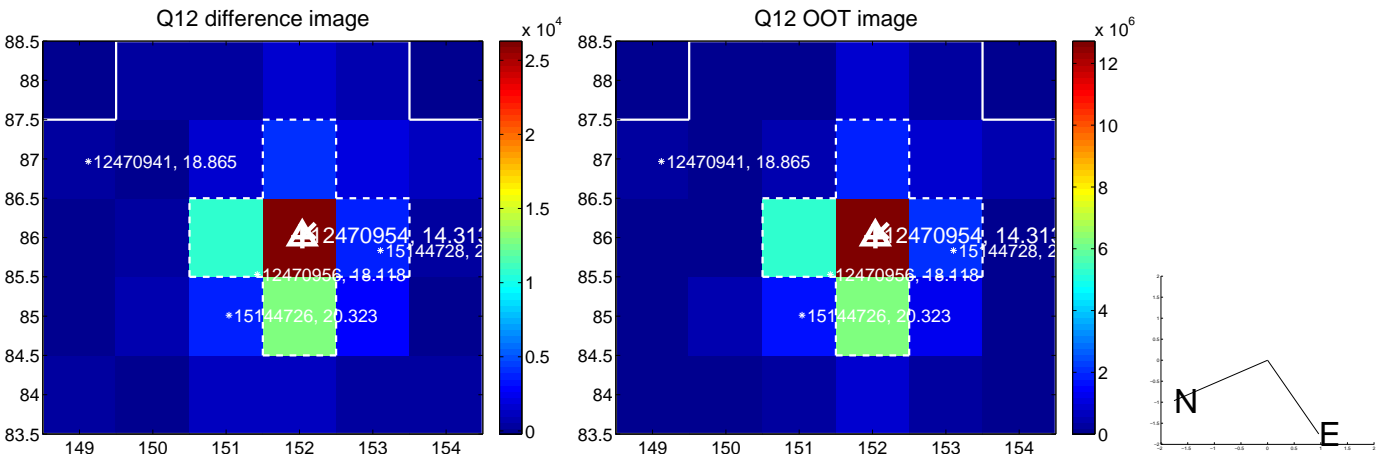
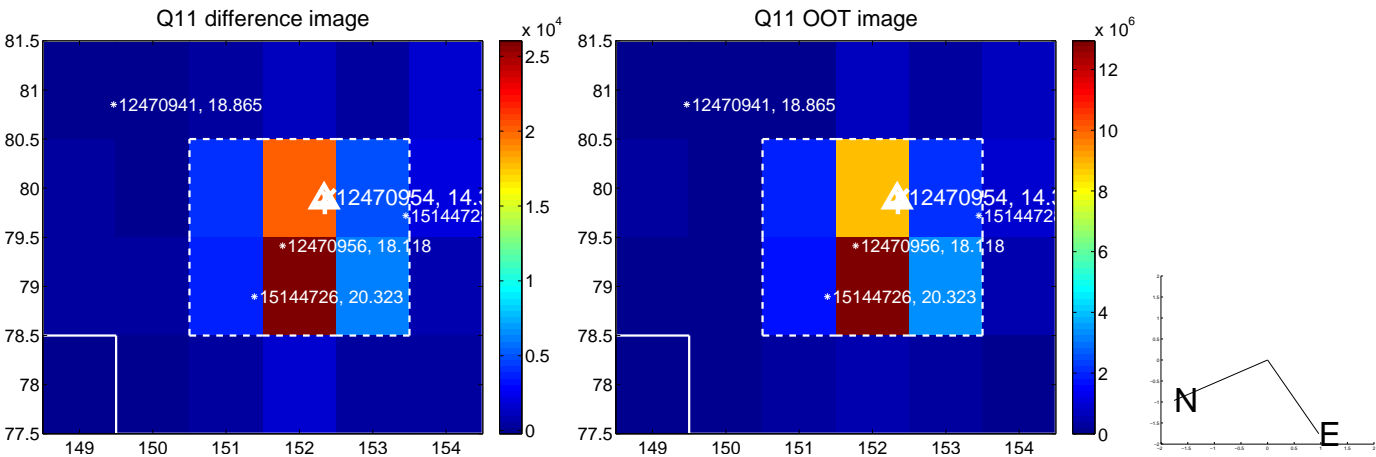
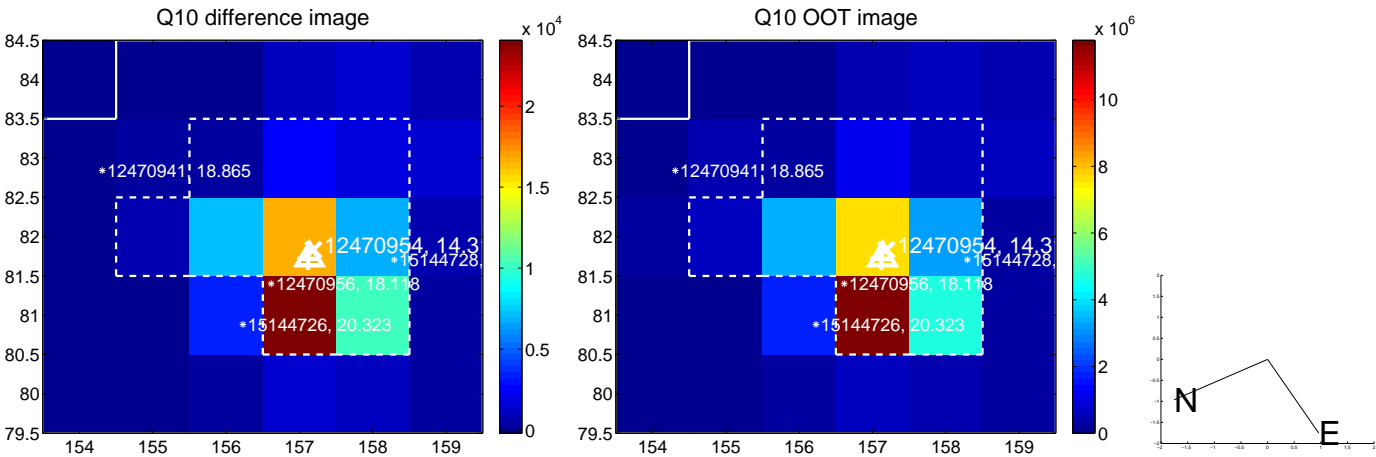
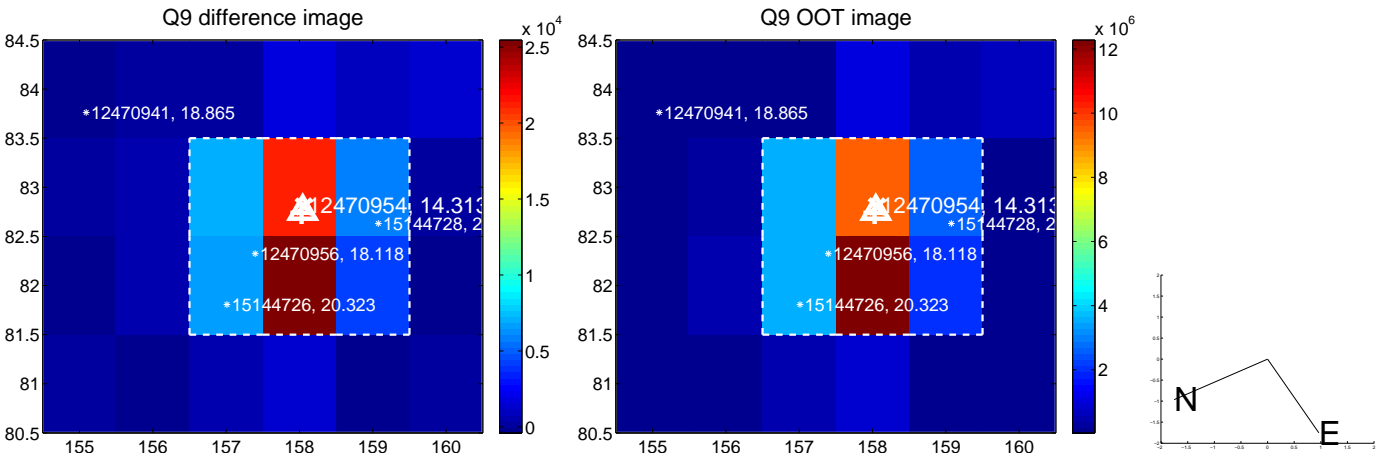
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



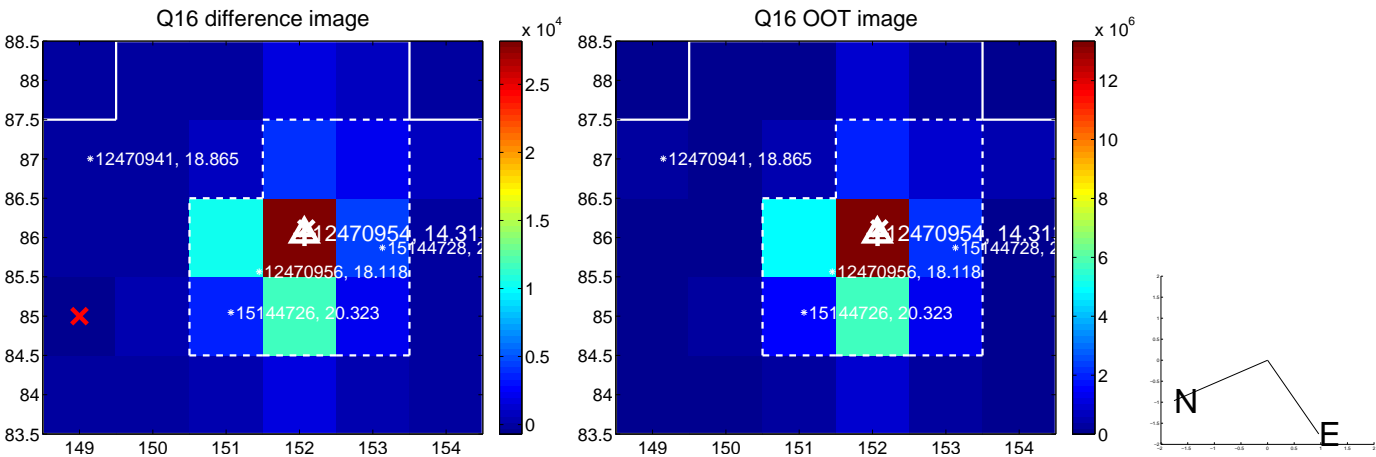
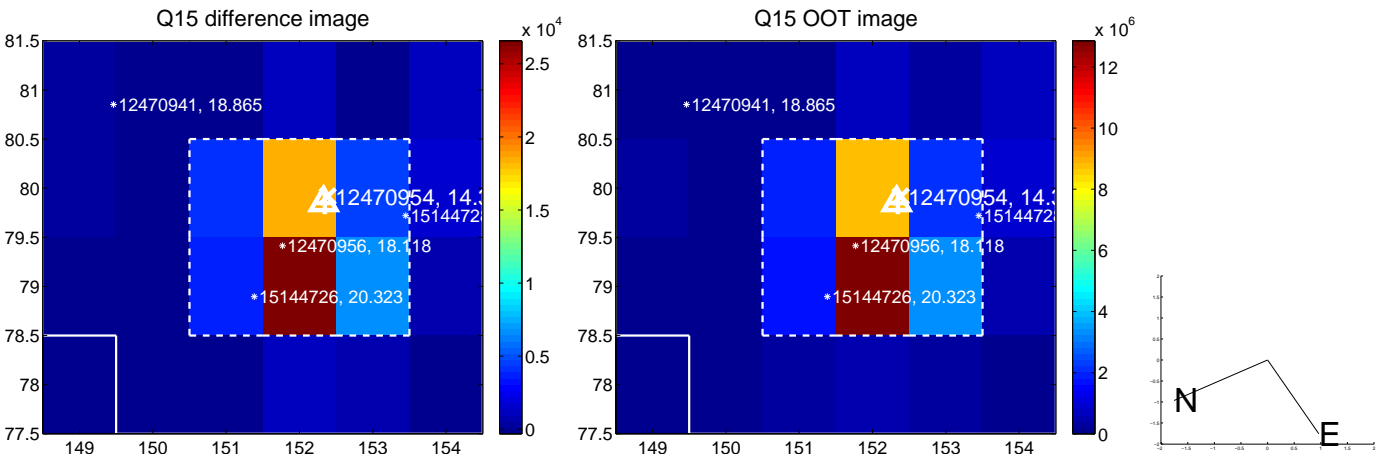
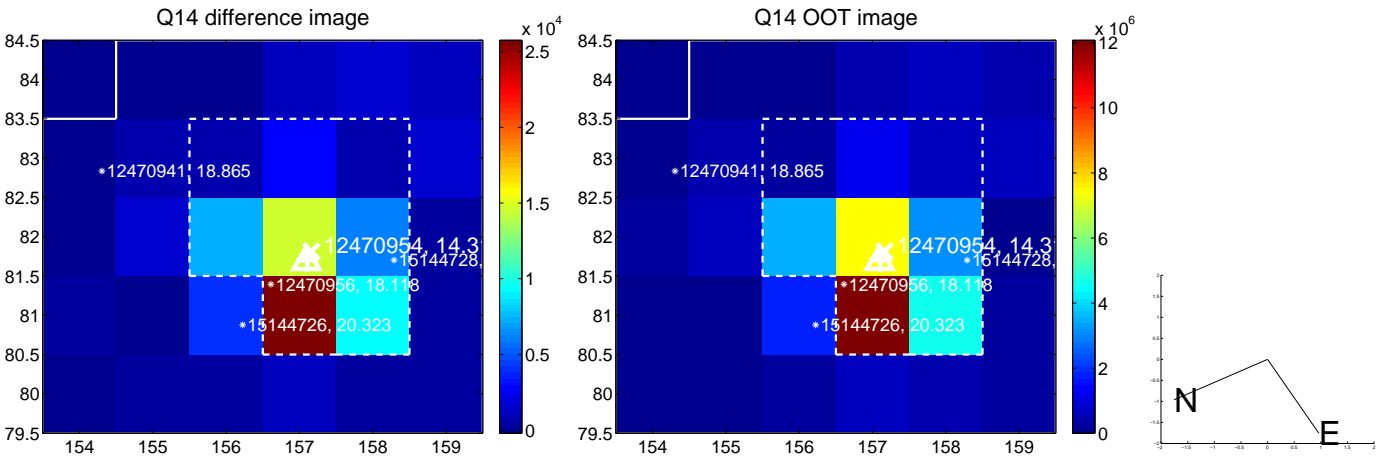
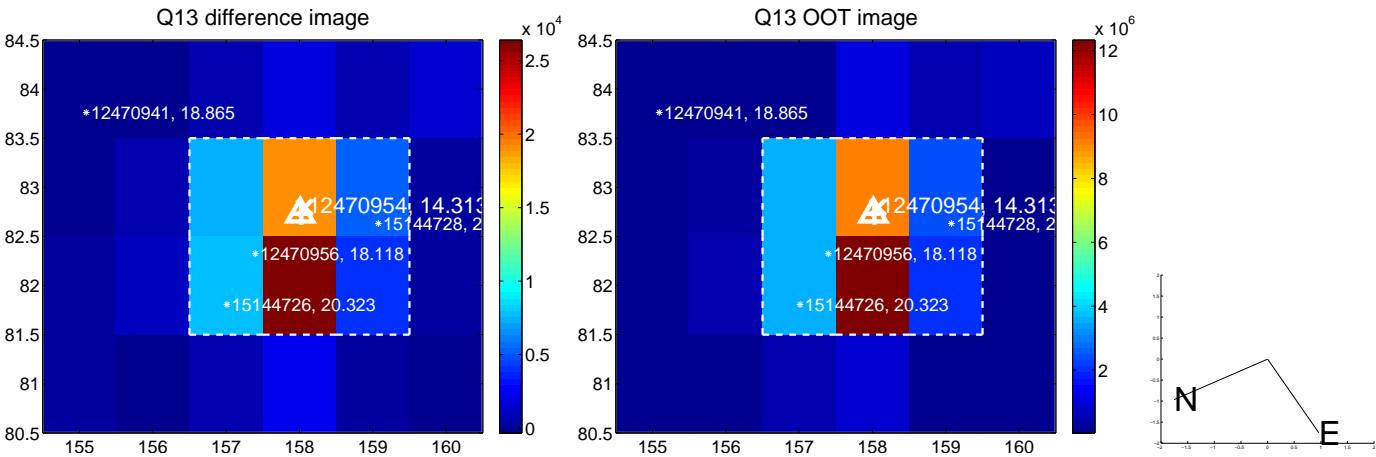
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

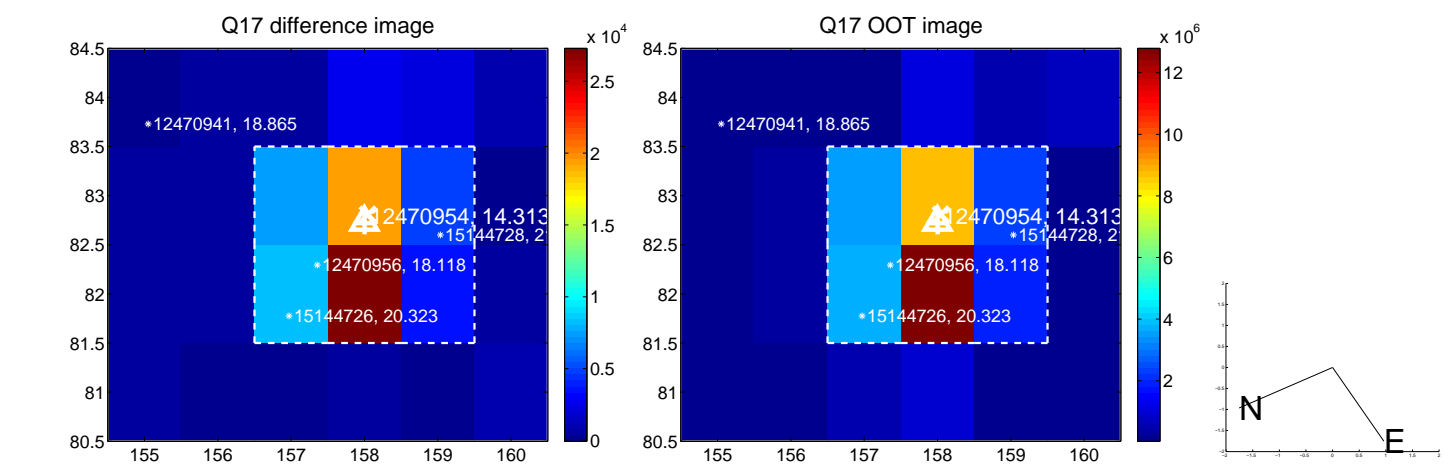


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

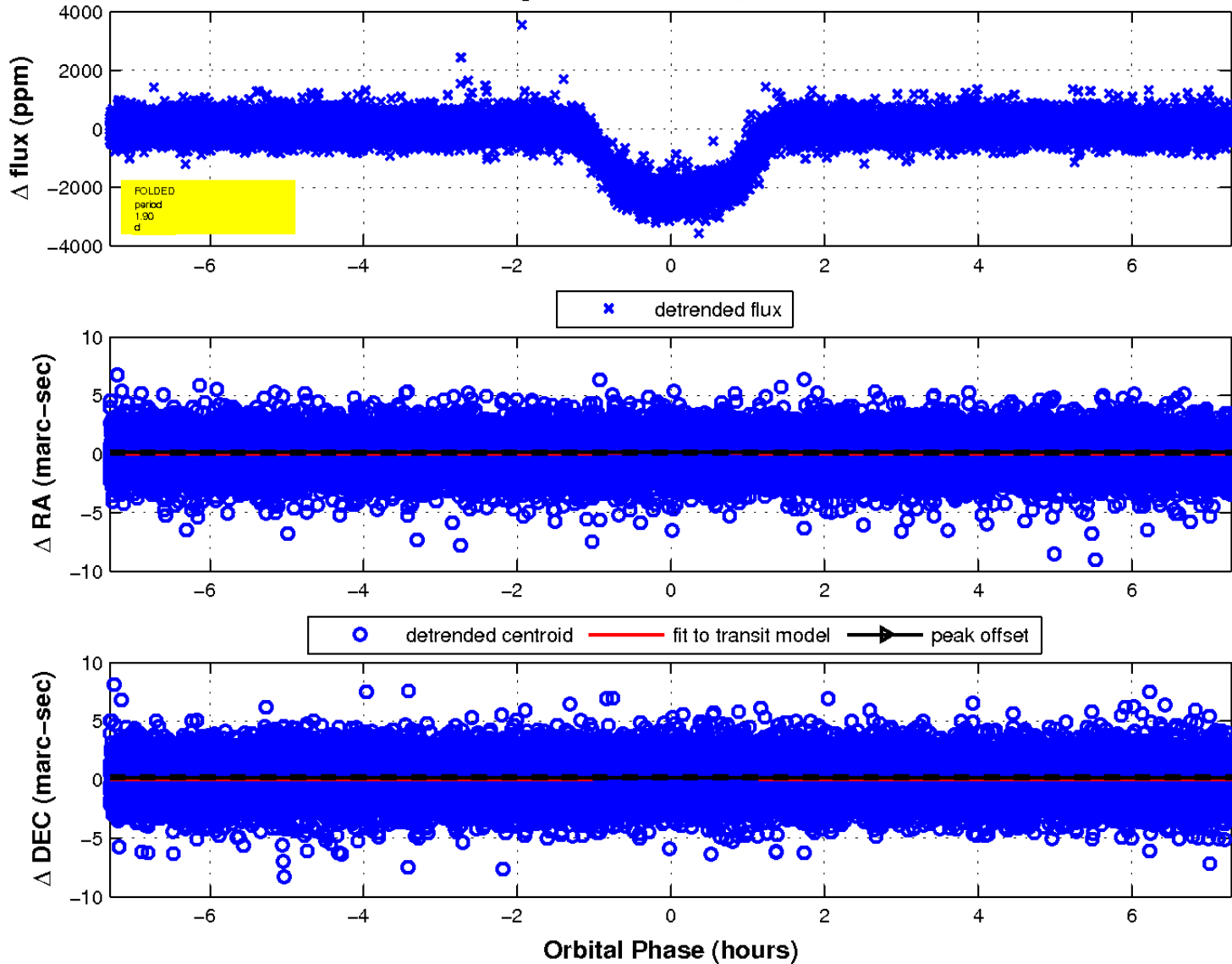




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

