

# KIC 012647110

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012647110-01	OBS	8240.01	462.477294	583.101614	1080.0	5.517	7.4	7.5	2.80	5059	9.46	3.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012647110-01	OBS	FP	0.21	1	0	0	0	MOD_NONUNIQ_ALT

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

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

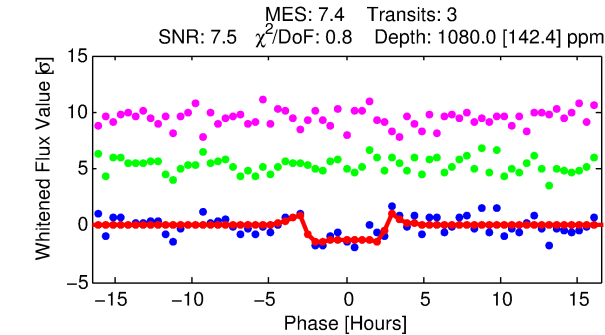
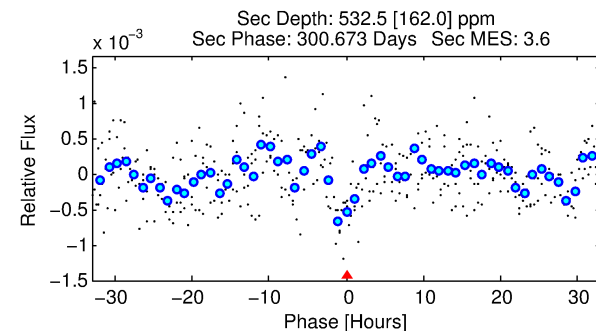
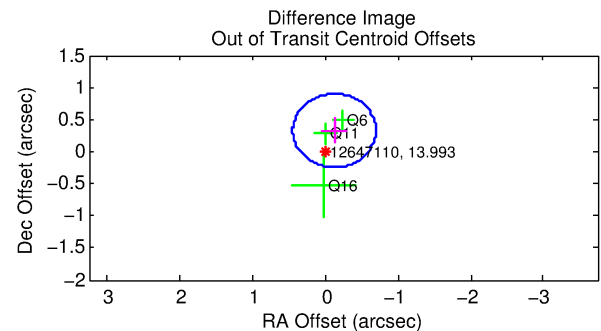
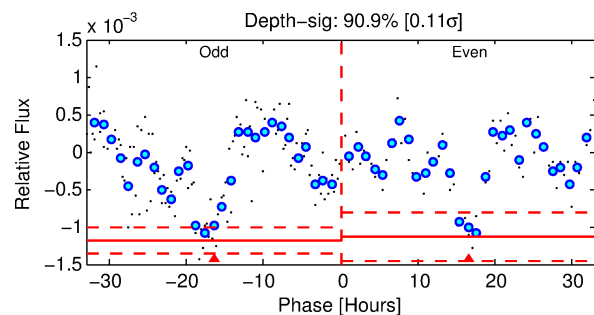
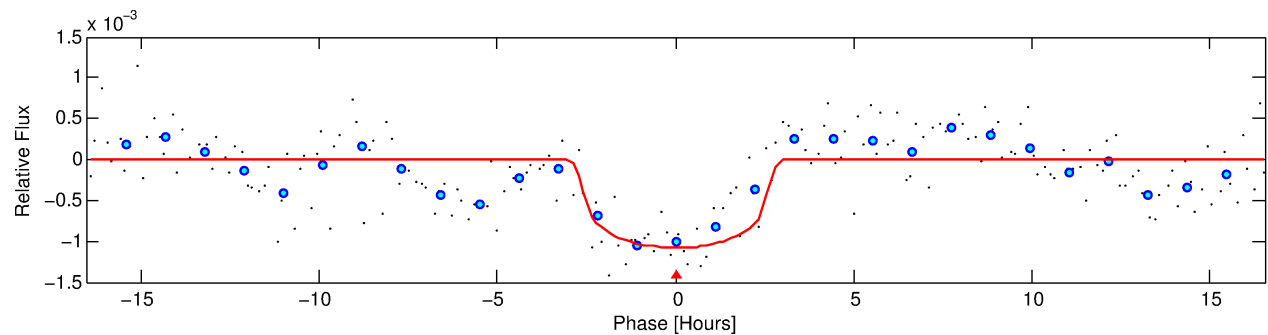
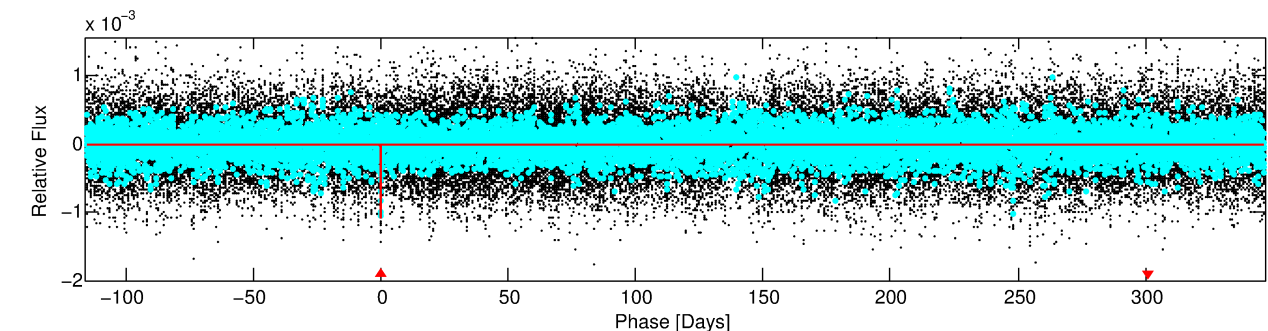
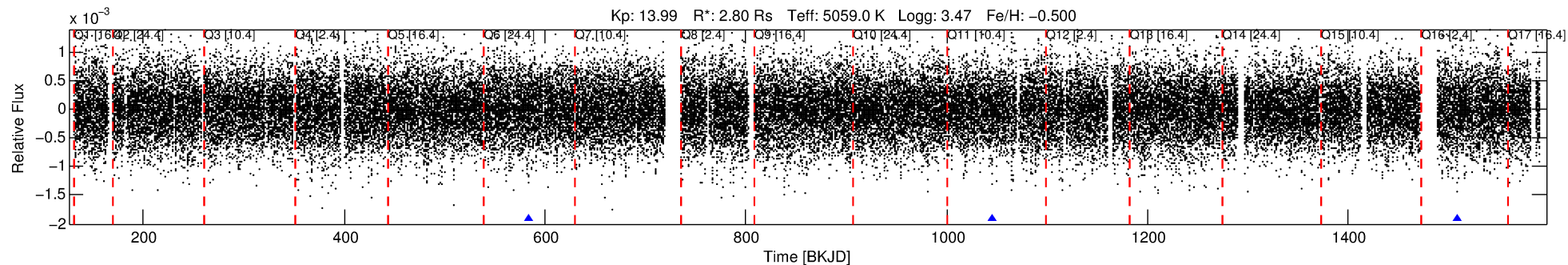
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012647110-01

No Significant Match Found

# DV One-Page Summary

KIC: 12647110 Candidate: 1 of 1 Period: 462.477 d



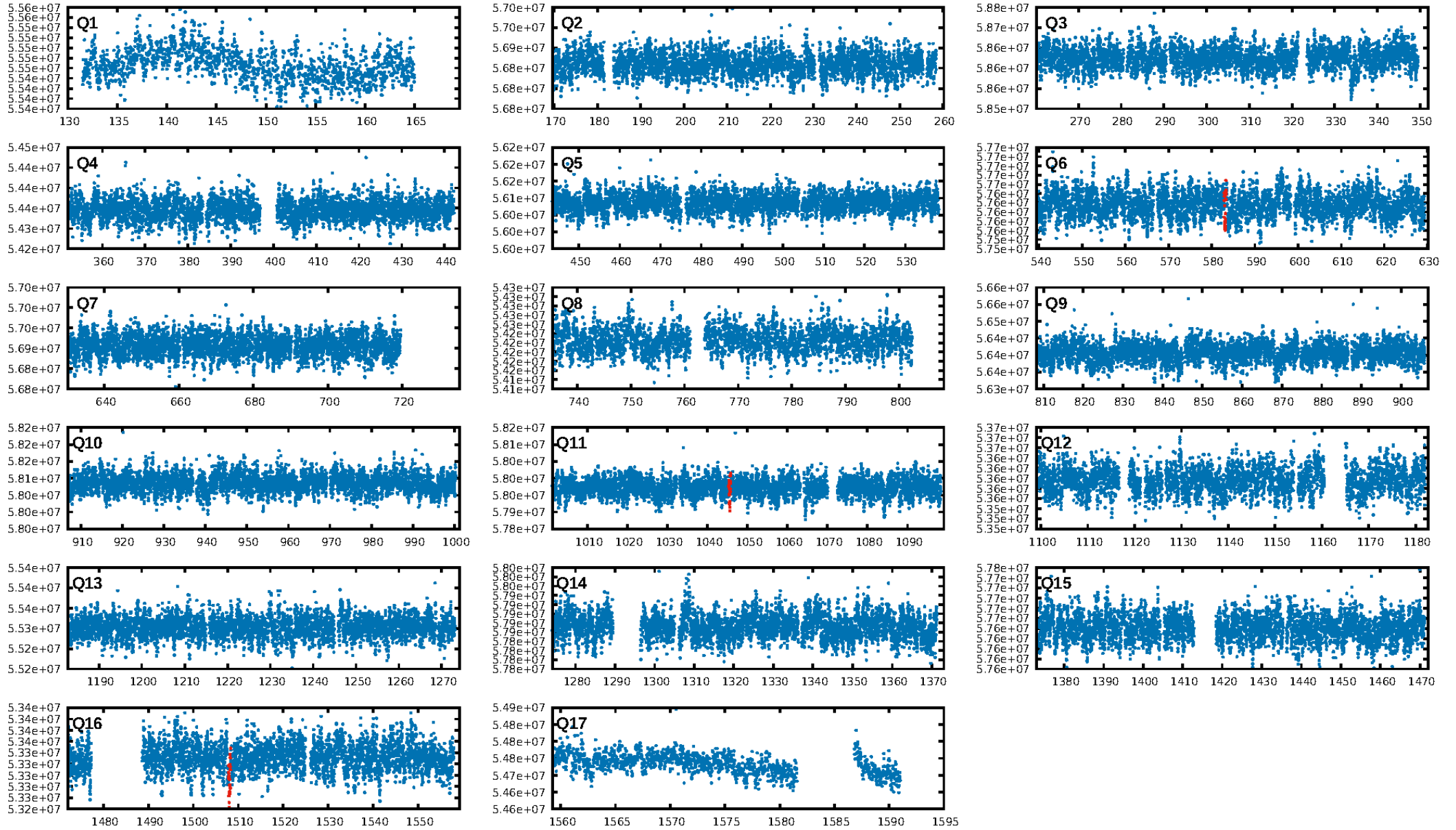
## DV Fit Results:

Period = 462.47729 [0.00433] d  
Epoch = 583.1016 [0.0052] BKJD  
Rp/R\* = 0.0310 [0.0210]  
a/R\* = 548.93 [1377.61]  
b = 0.57 [2.99]  
Seff = 3.78 [6.40]  
Teff = 356 [151] K  
Rp = 9.46 [9.29] Re  
a = 1.1026 [1.0357] AU  
Ag = 3977.50 [8701.83] [0.46 $\sigma$ ]  
Teffp = 4366 [1520] K [2.63 $\sigma$ ]

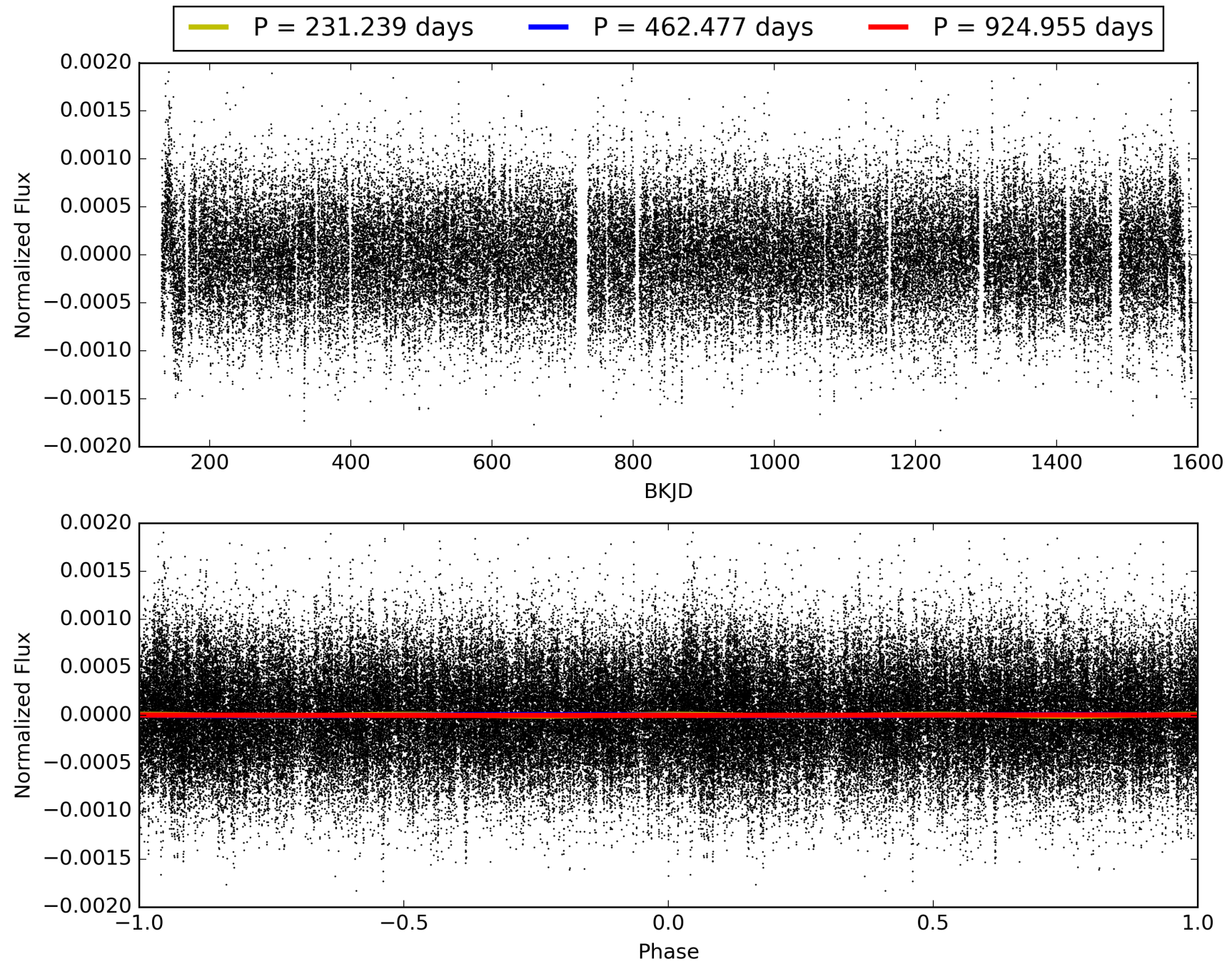
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 56.2%  
ModelChiSquareGof-sig: 99.5%  
**Bootstrap-pfa: 1.04e-11**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.87  
Centroid-sig: 33.0%  
Centroid-so: 0.184 arcsec [0.35 $\sigma$ ]  
OotOffset-rm: 0.351 arcsec [1.84 $\sigma$ ]  
KicOffset-rm: 0.221 arcsec [1.04 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 012647110-01, PDC Light Curves

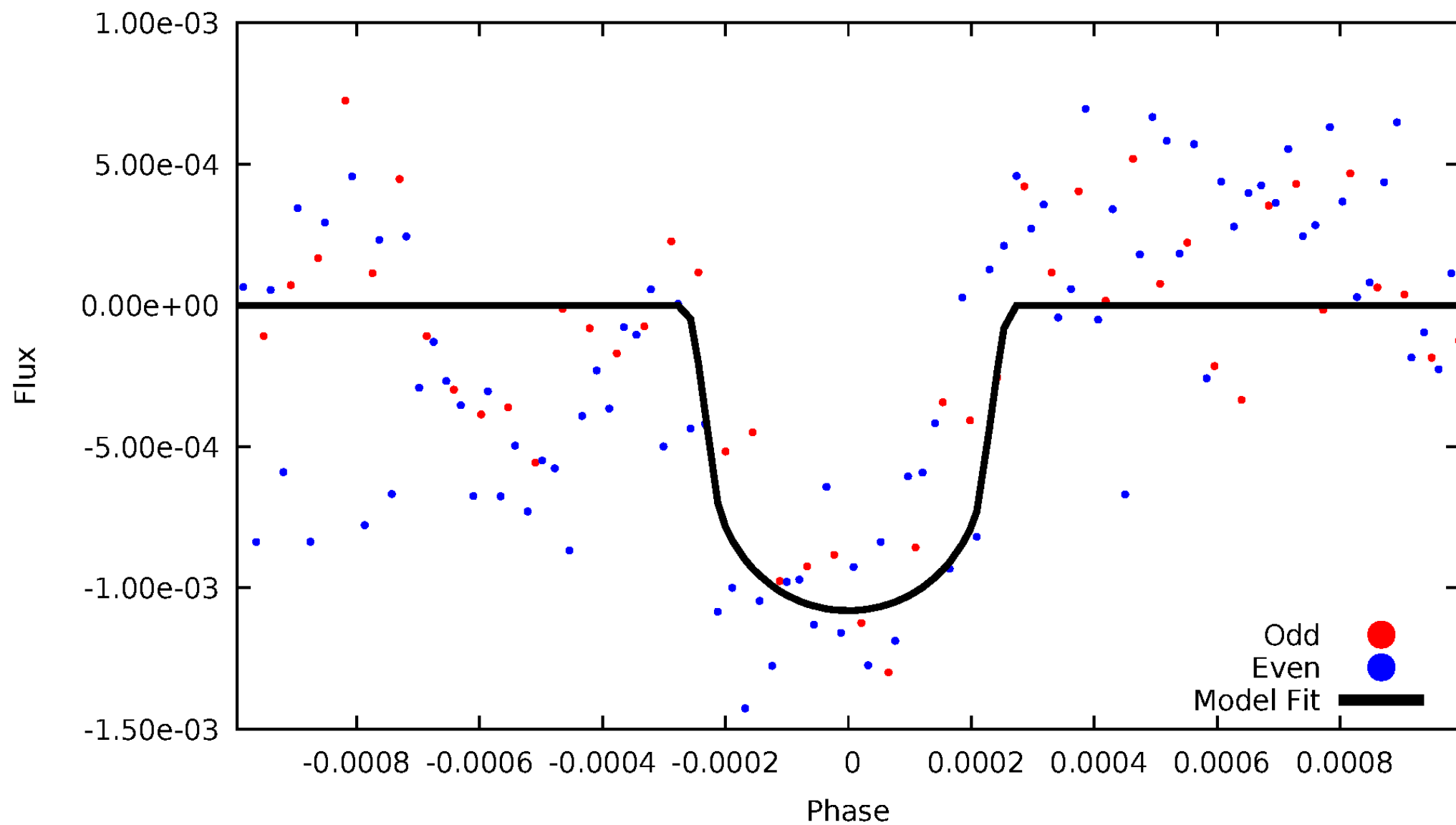


TCE 012647110-01



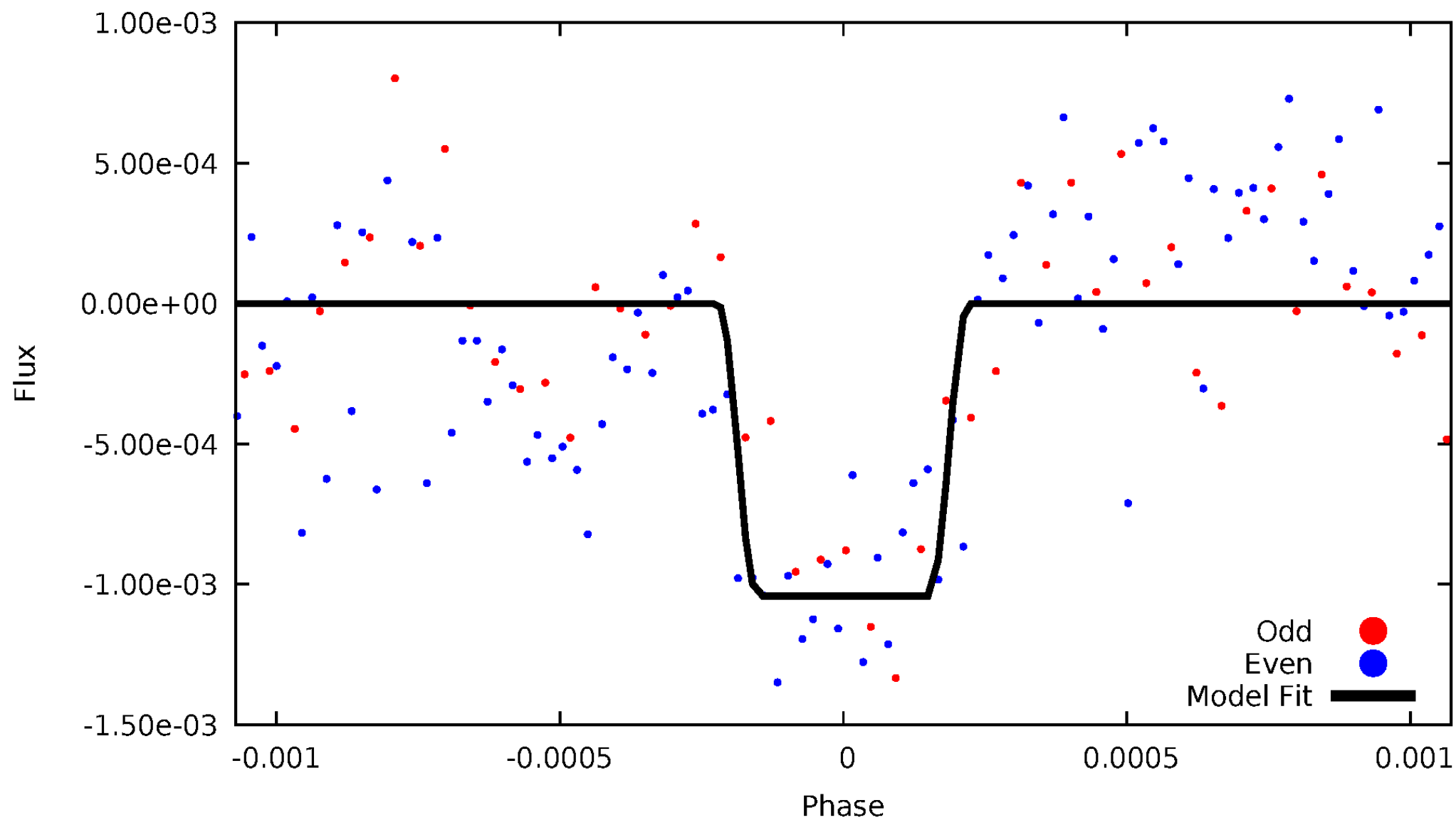
# DV Odd/Even

TCE 012647110-01



# ALT Odd/Even

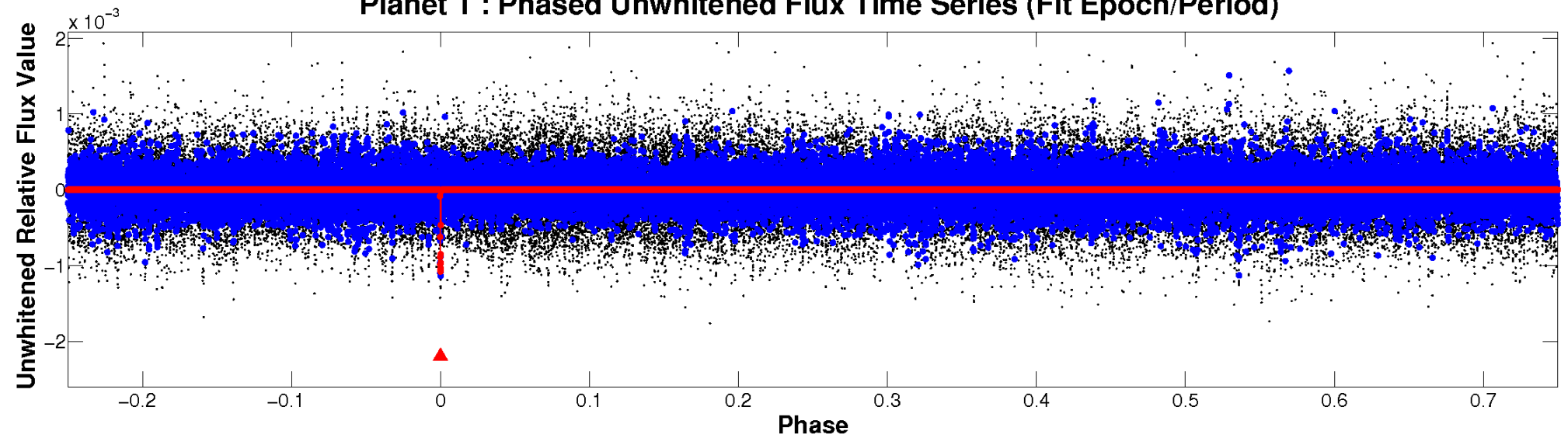
TCE 012647110-01



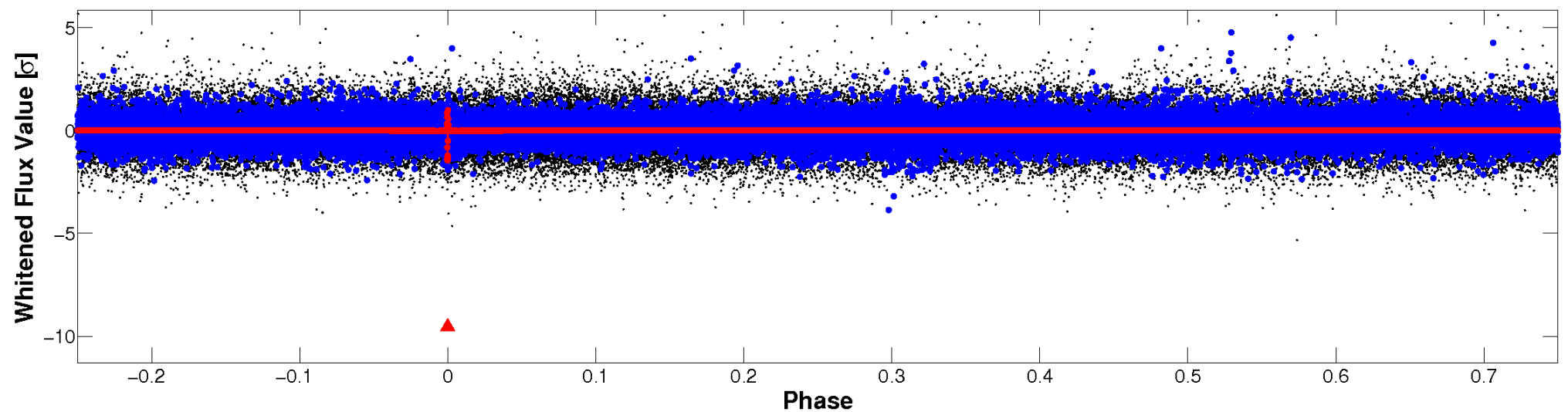


# Non-Whitened Vs. Whitened Light Curve

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

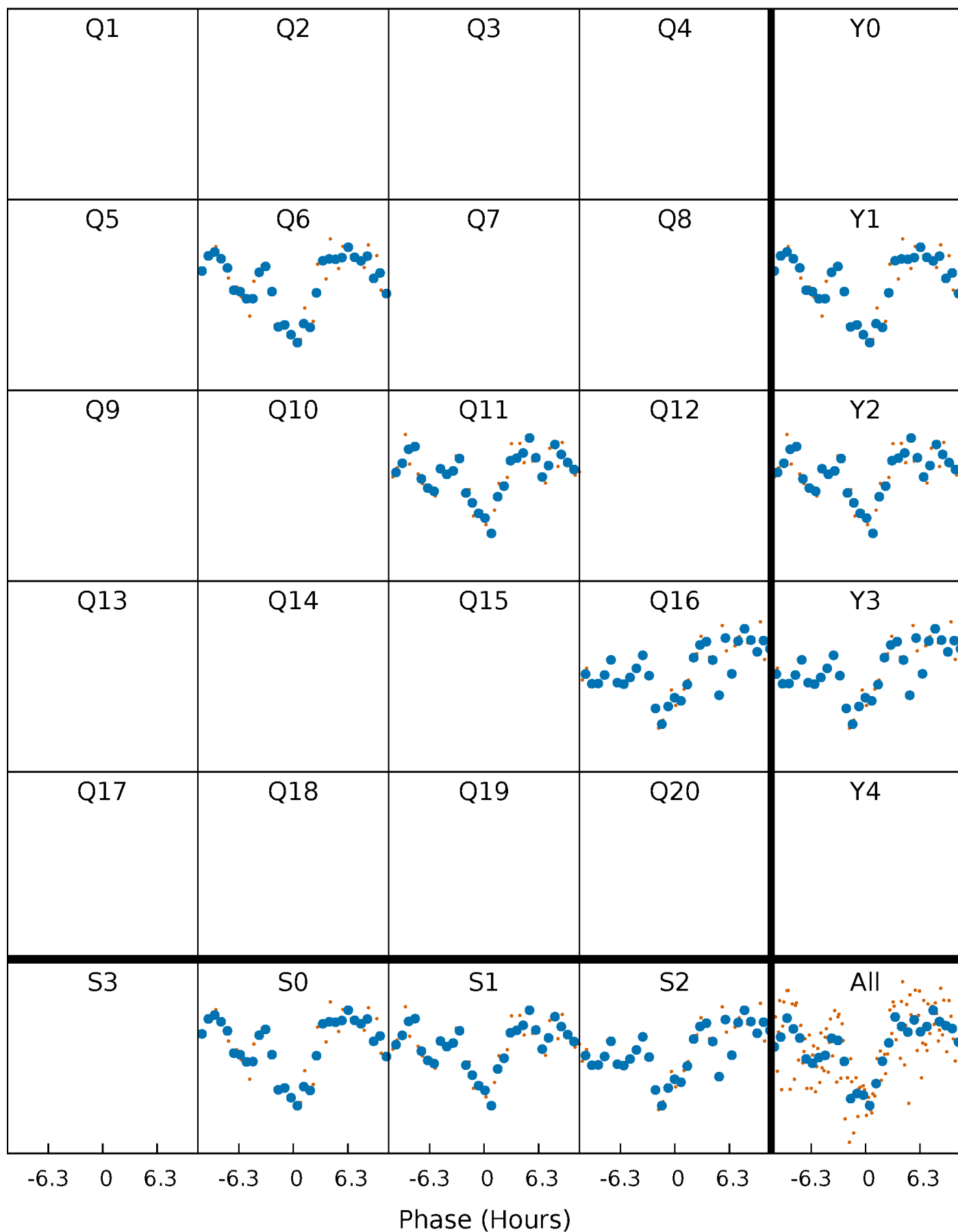


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

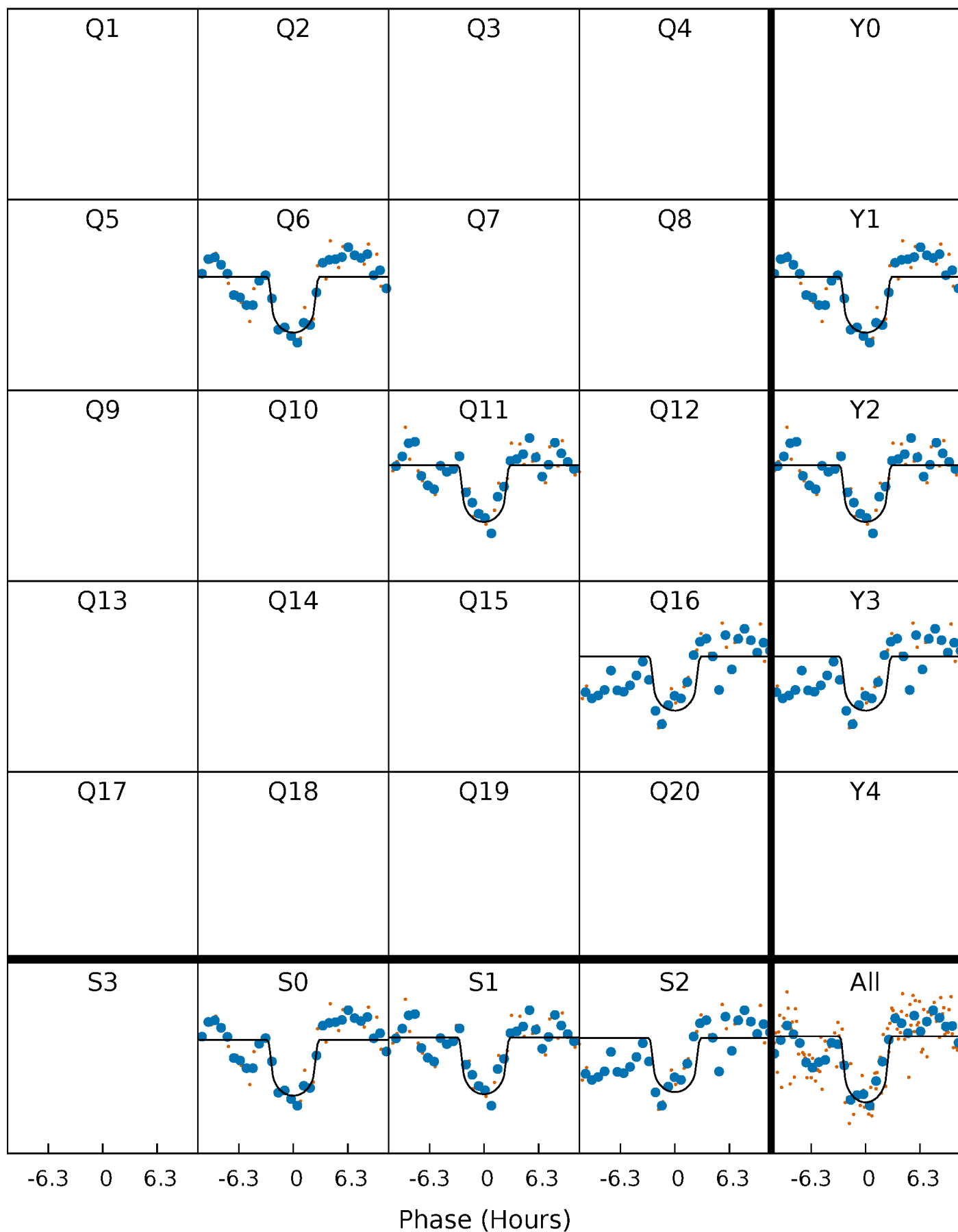
TCE 012647110-01 P=462.477294 Days  $T_0=583.101614$  (BKJD)





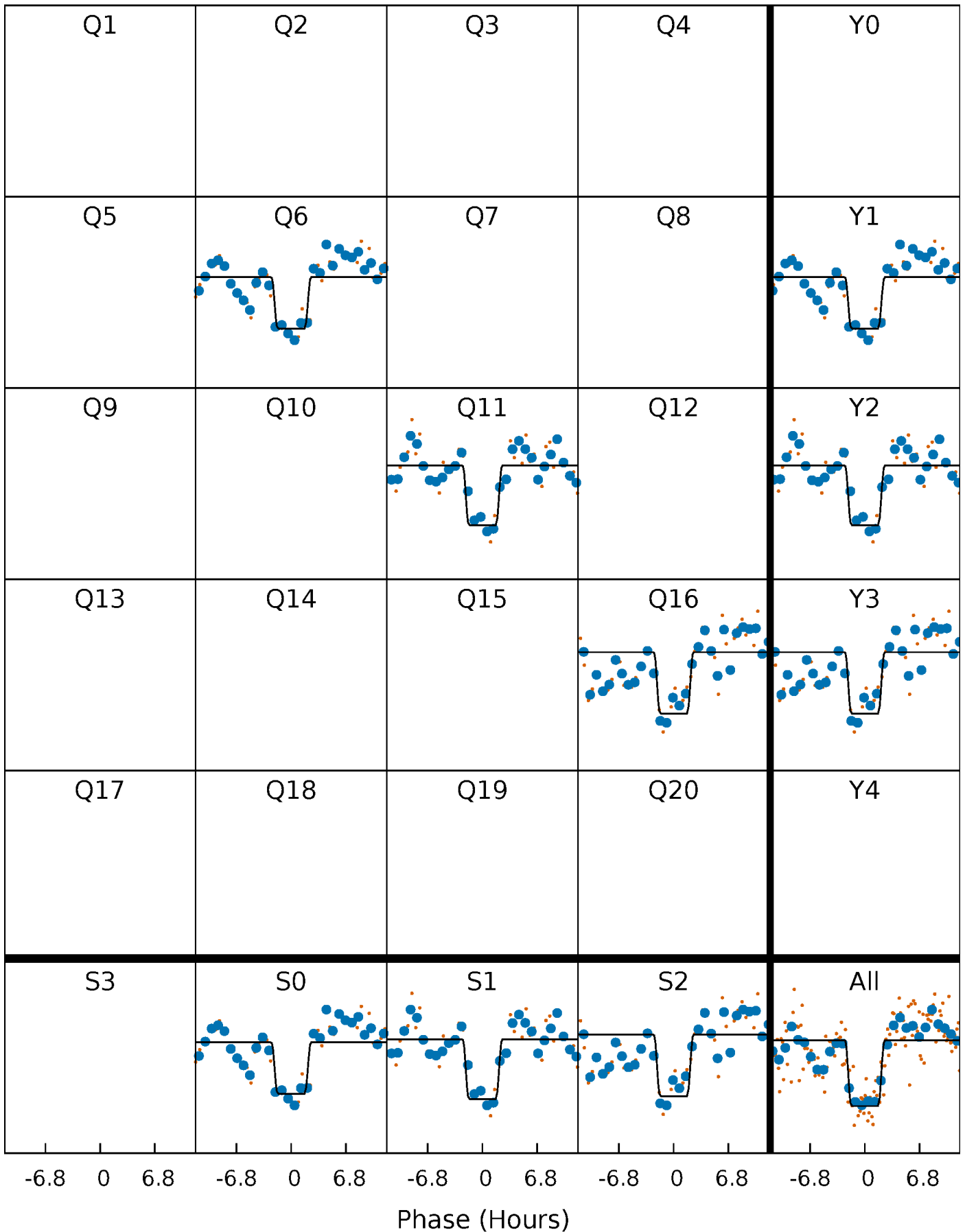
# DV Quarter-Phased Transit Curves

TCE 012647110-01 P=462.477294 Days  $T_0=583.101614$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

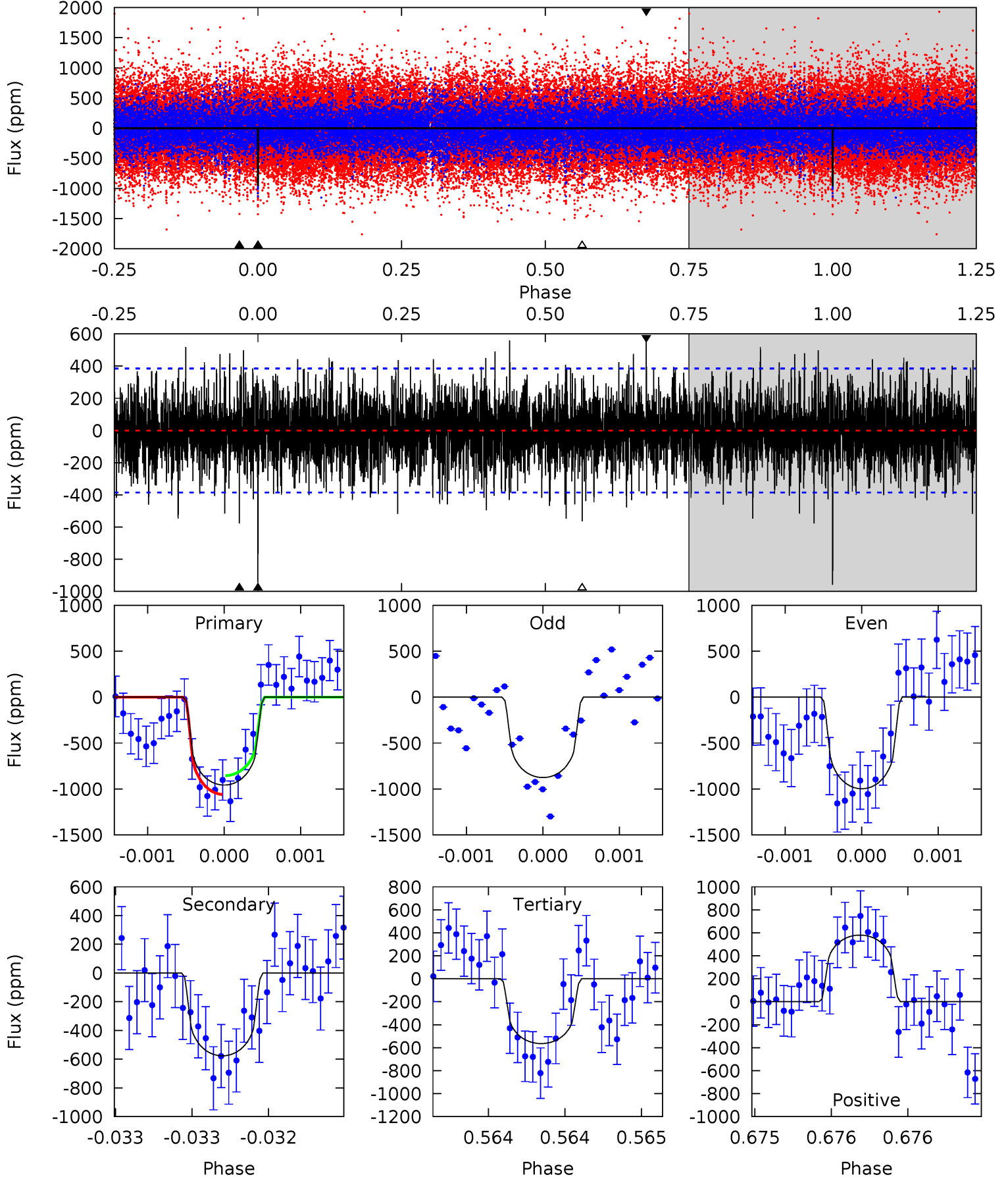
TCE 012647110-01 P=462.465952 Days  $T_0=583.100325$  (BKJD)



# DV Model-Shift Uniqueness Test

012647110-01, P = 462.477294 Days, E = 120.624320 Days

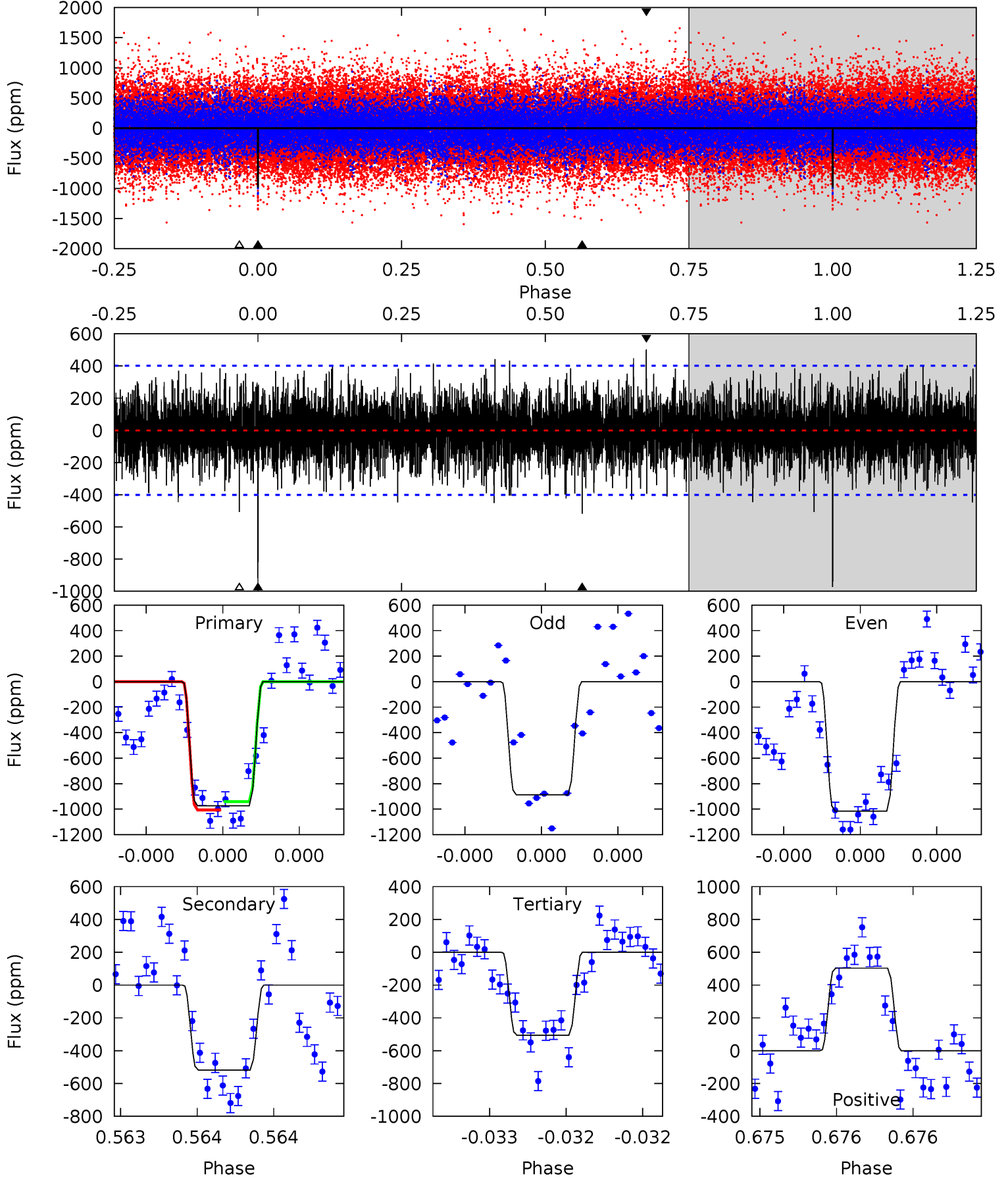
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	8.34	8.16	8.39	5.57	3.47	2.19	5.69	5.46	0.18	-0.05	0.82	1.09	0.38	1.48



# Alt Model-Shift Uniqueness Test

012647110-01, P = 462.465952 Days, E = 120.634373 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
13.6	7.22	7.06	7.01	5.60	3.52	1.79	6.50	6.55	0.15	0.21	0.83	1.04	0.34	0.45



### Stellar Parameters For KIC 012647110

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5059^{+126}_{-113}$	$3.466^{+1.057}_{-0.352}$	$-0.500^{+0.300}_{-0.200}$	$2.799^{+1.626}_{-1.988}$	$0.834^{+0.277}_{-0.161}$	$0.054^{+2.802}_{-0.031}$
	+2%/-2%	+30%/-10%	+60%/-40%	+58%/-71%	+33%/-19%	+5229%/-58%
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 012647110-01 / KOI 8240.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-576 \pm 69$	$9.06^{+8.29}_{-5.44}$	$487^{+84}_{-98}$	$4440^{+1872}_{-708}$	$4803^{+26811}_{-3422}$
Alt.	$-518 \pm 72$	$8.70^{+7.65}_{-5.15}$	$490^{+78}_{-106}$	$4439^{+1640}_{-748}$	$4883^{+22068}_{-3585}$

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

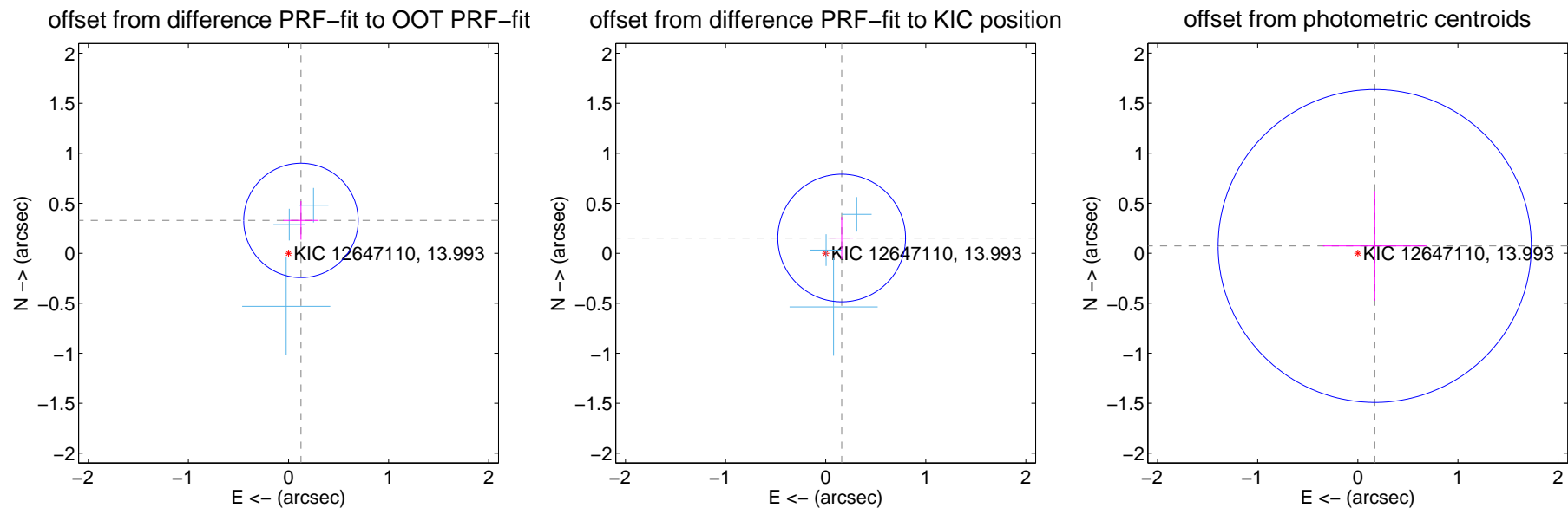
## DV Centroid Data

Supplemental centroid analysis for 012647110-01. Kepler magnitude: 13.99. Transit SNR 7.55

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.351 \pm 0.191$	1.84	$-0.124 \pm 0.177$	$0.329 \pm 0.193$
PRF-fit source offset from KIC position	$0.221 \pm 0.213$	1.04	$-0.160 \pm 0.114$	$0.153 \pm 0.211$
photometric centroid source offset	$0.18 \pm 0.52$	0.35	$-0.17 \pm 0.52$	$0.07 \pm 0.55$



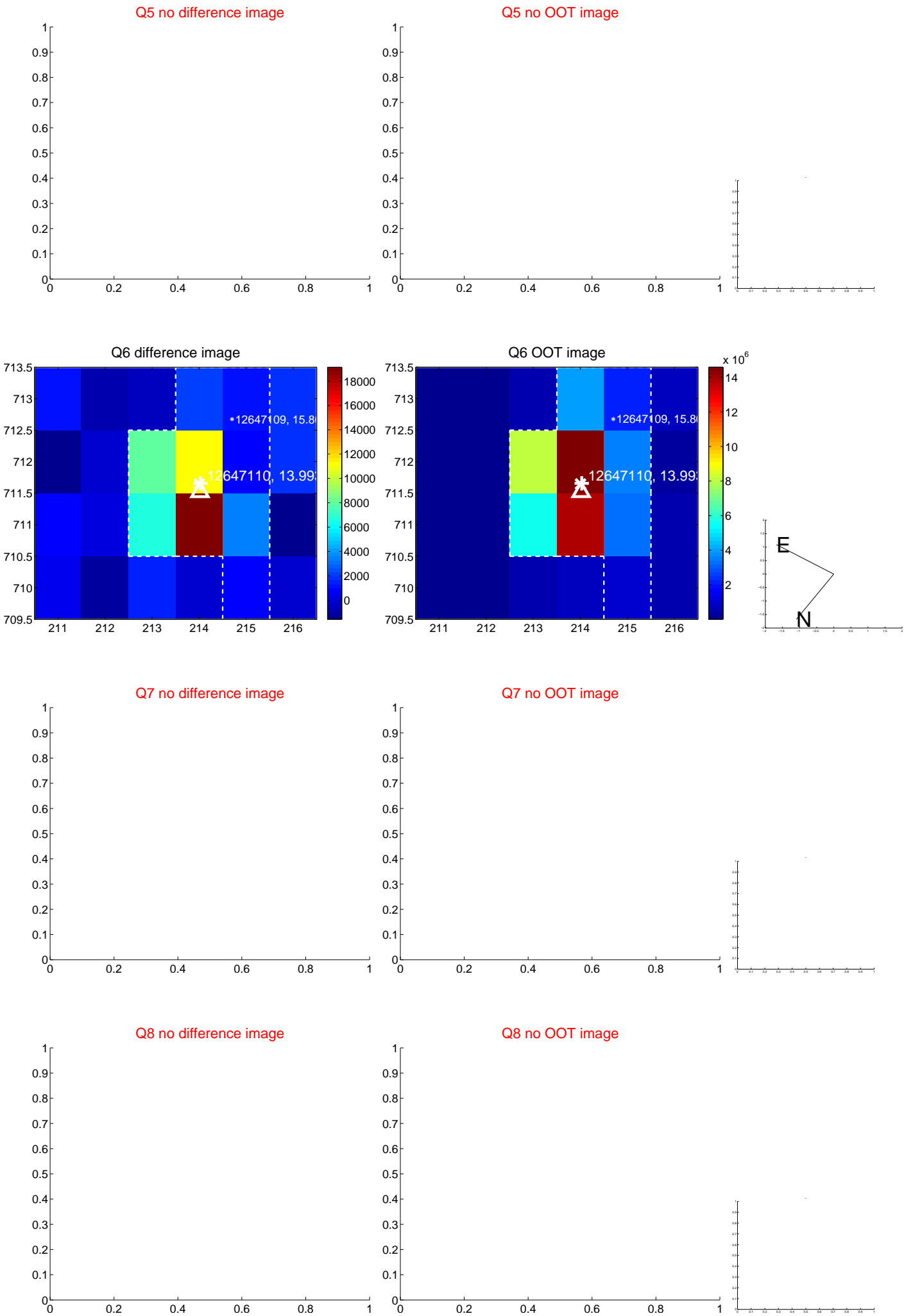
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

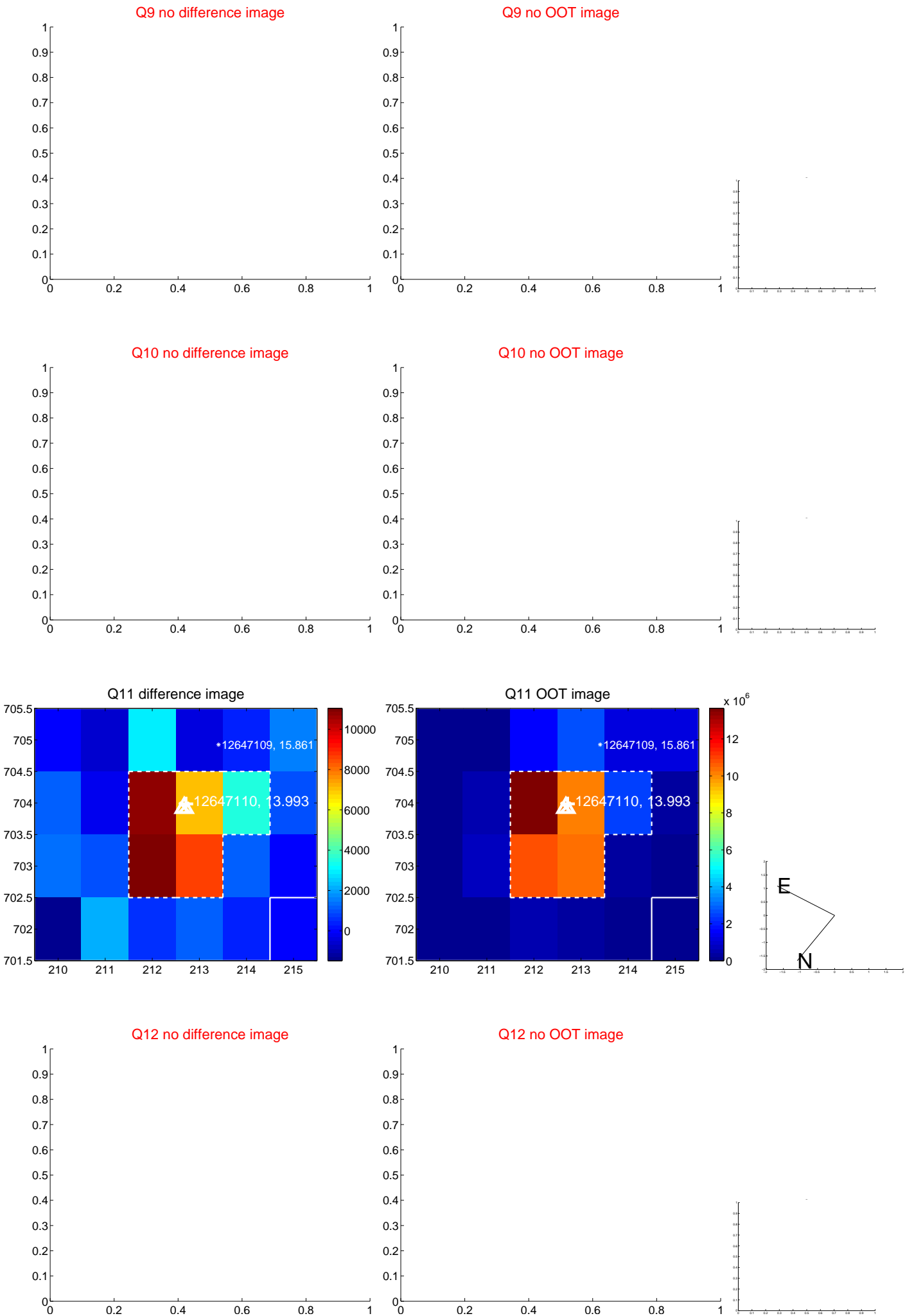




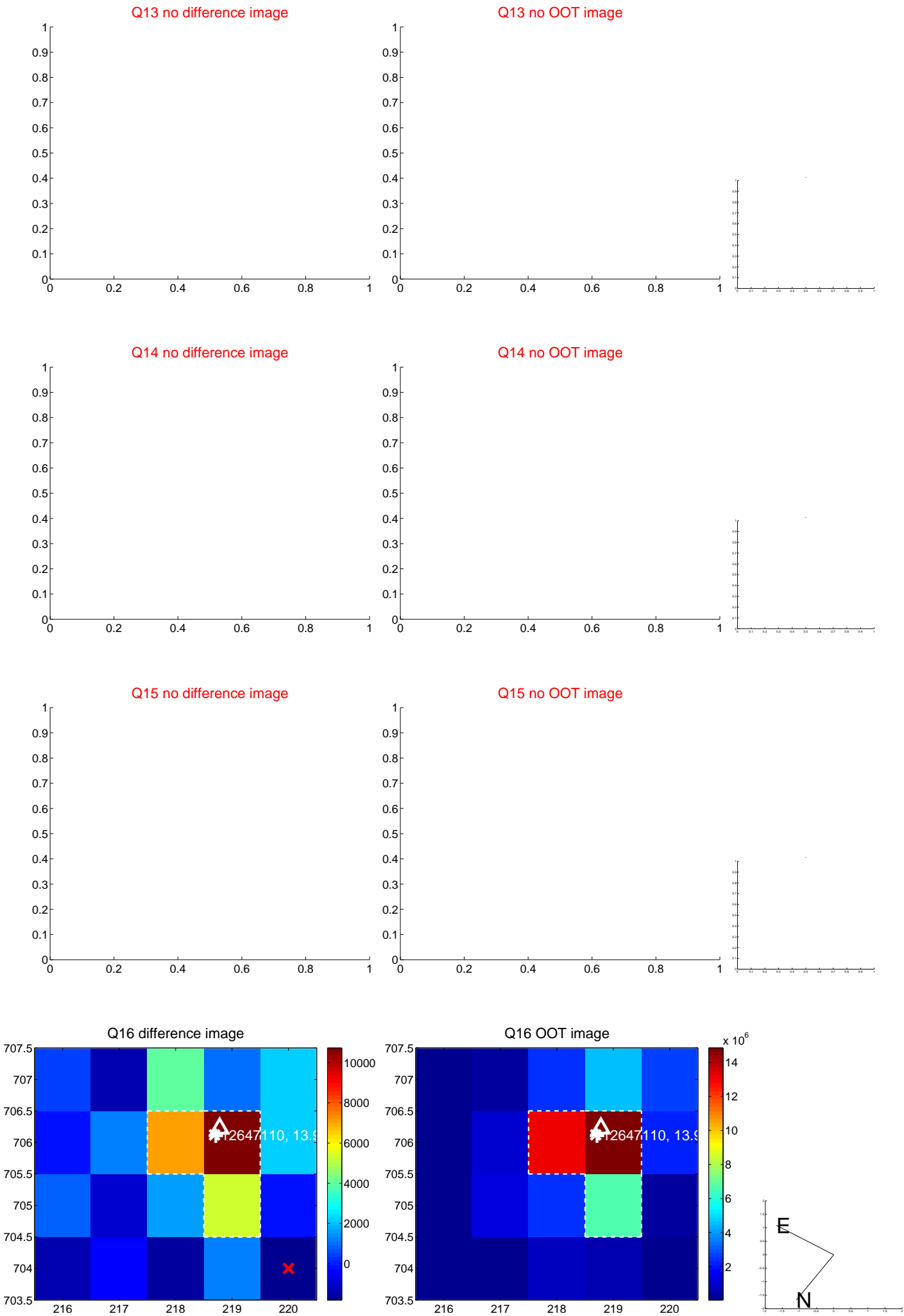
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



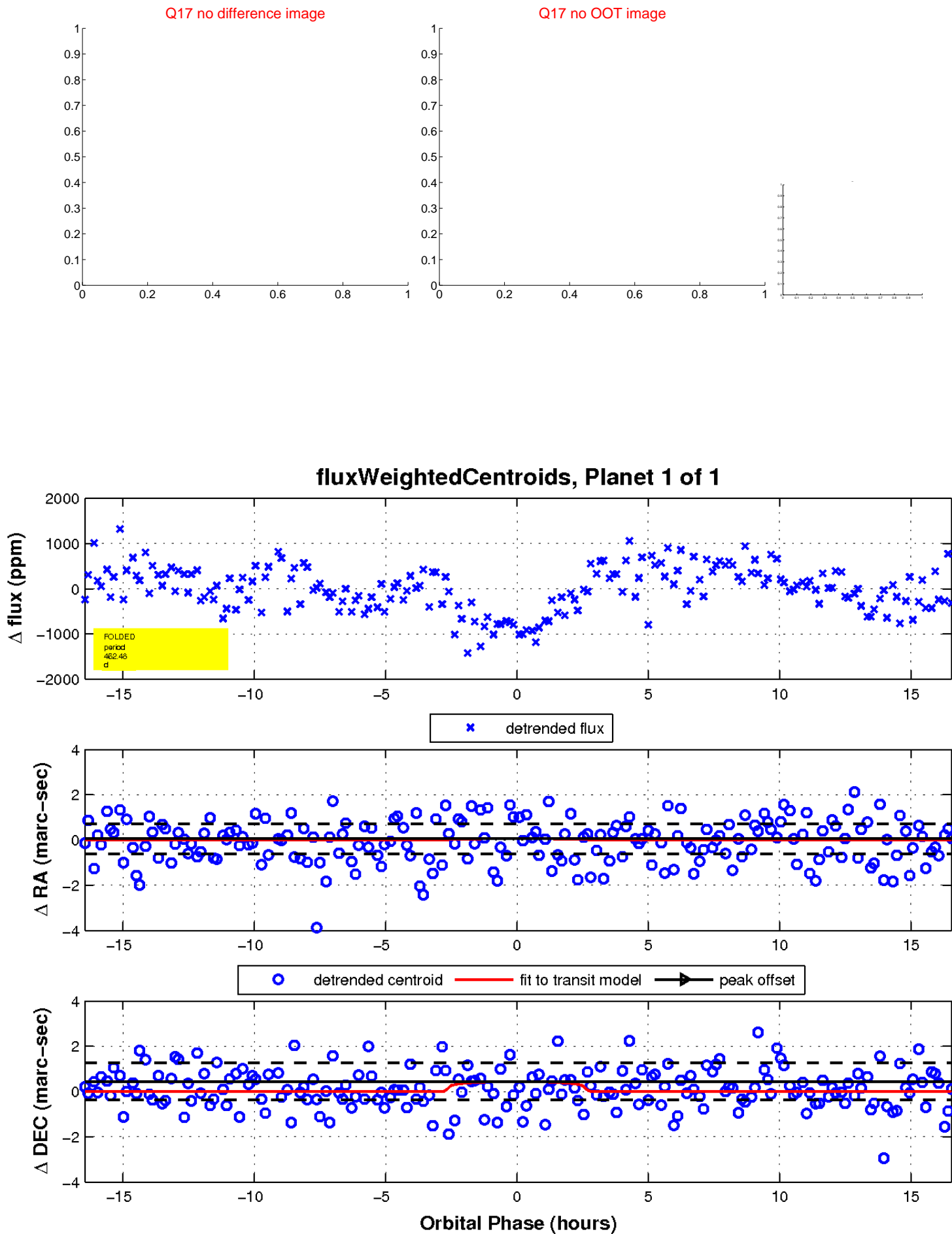
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image

Declination

