

# KIC 009049550

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009049550-01	OBS	5606.01	23.814799	135.927850	78923.9	2.036	516.6	480.3	1.89	5421	77.45	121.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009049550-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_DV—DEEP_V_SHAPED—CENT_FEW_DIFFS

**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.

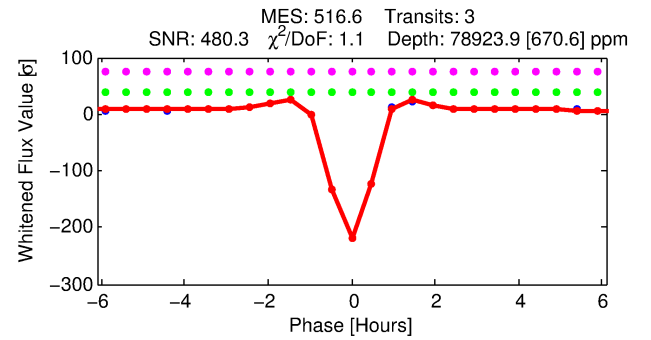
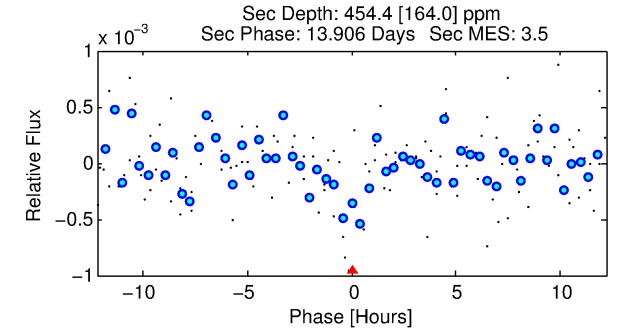
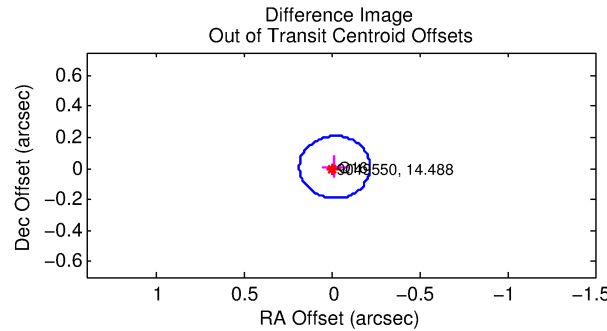
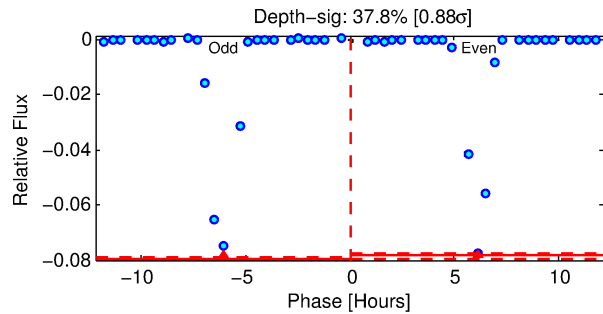
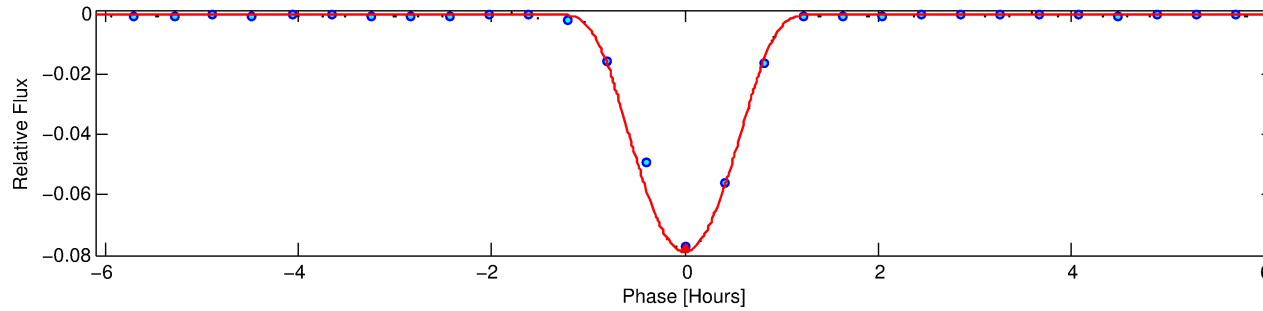
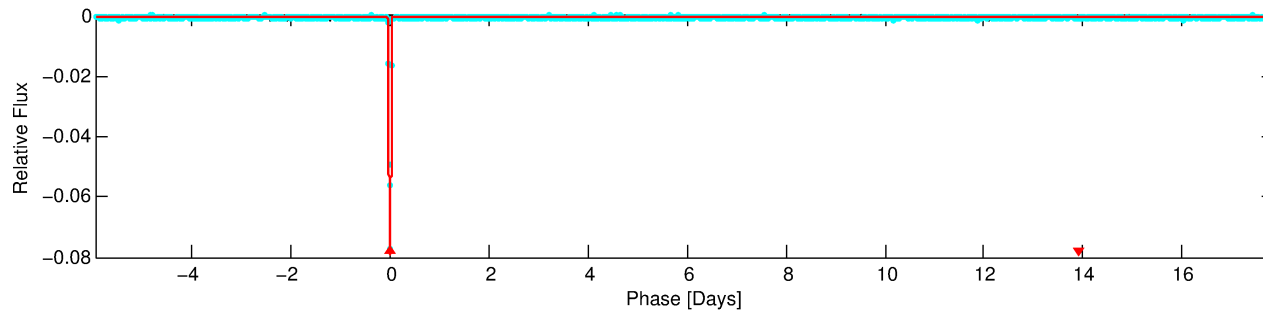
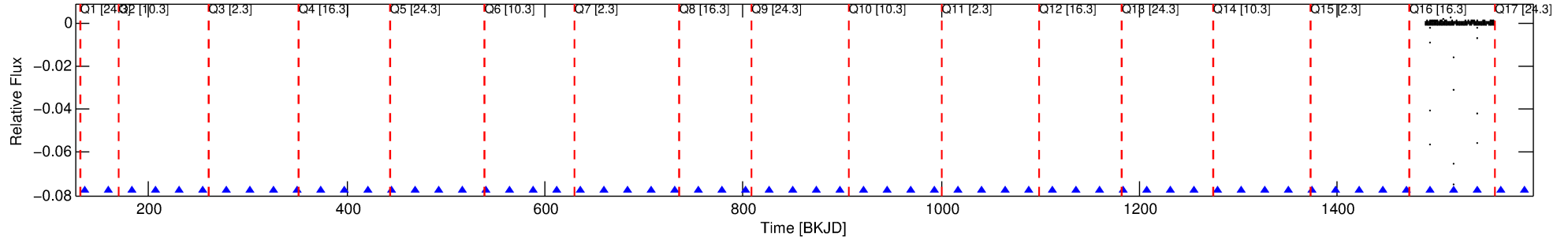
## Ephemeris Match Information For 009049550-01

No Significant Match Found

# DV One-Page Summary

KIC: 9049550 Candidate: 1 of 1 Period: 23.815 d  
KOI: K05606.01 Corr: 0.968

Kp: 14.49 R\*: 1.89 Rs Teff: 5421.0 K Logg: 3.79 Fe/H: -0.760



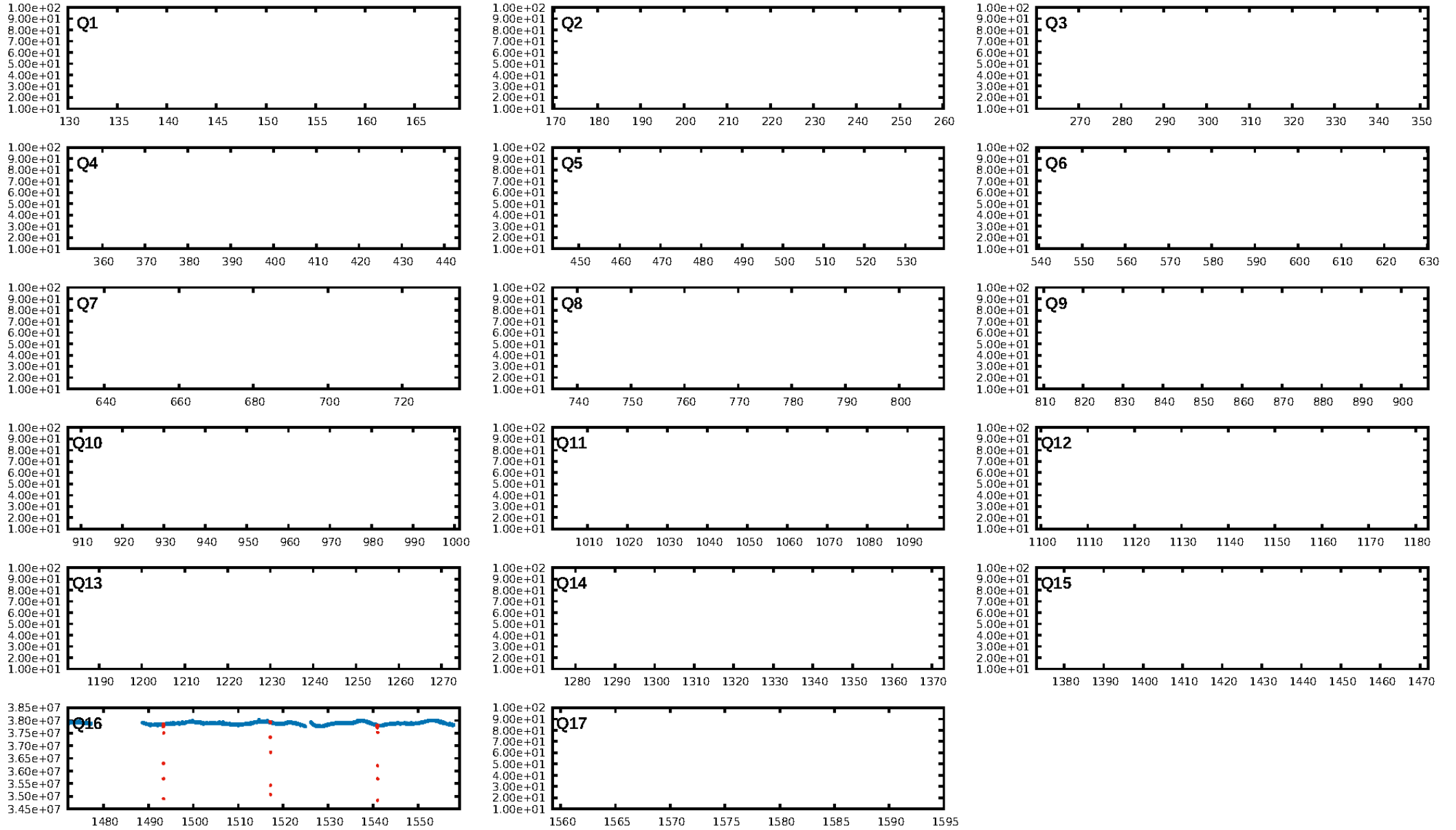
## DV Fit Results:

Period = 23.81480 [0.00005] d  
Epoch = 135.9279 [0.0031] BKJD  
Rp/R\* = 0.3755 [0.1114]  
a/R\* = 92.97 [1.24]  
b = 0.90 [0.17]  
Seff = 121.82 [175.93]  
Teq = 847 [306] K  
Rp = 77.45 [55.17] Re  
a = 0.1506 [0.1220] AU  
Ag = 0.95 [1.51] [-0.04σ]  
Teffp = 1292 [229] K [1.16σ]

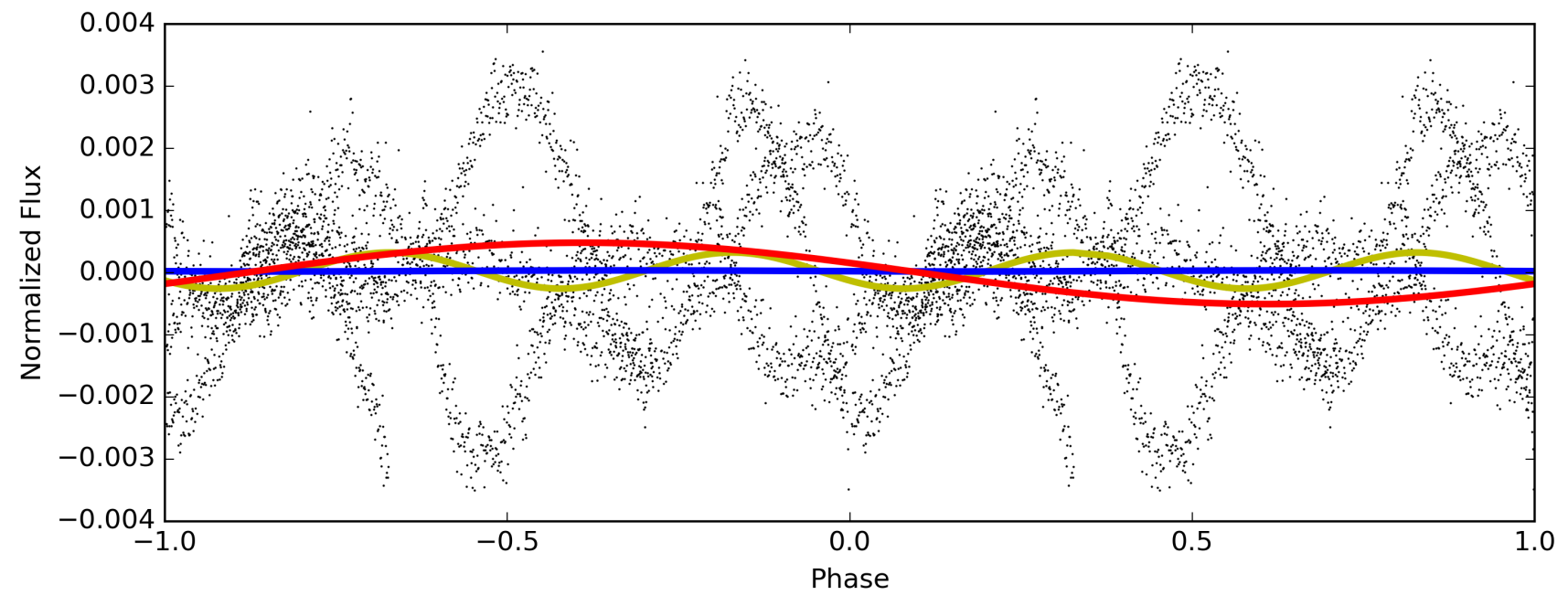
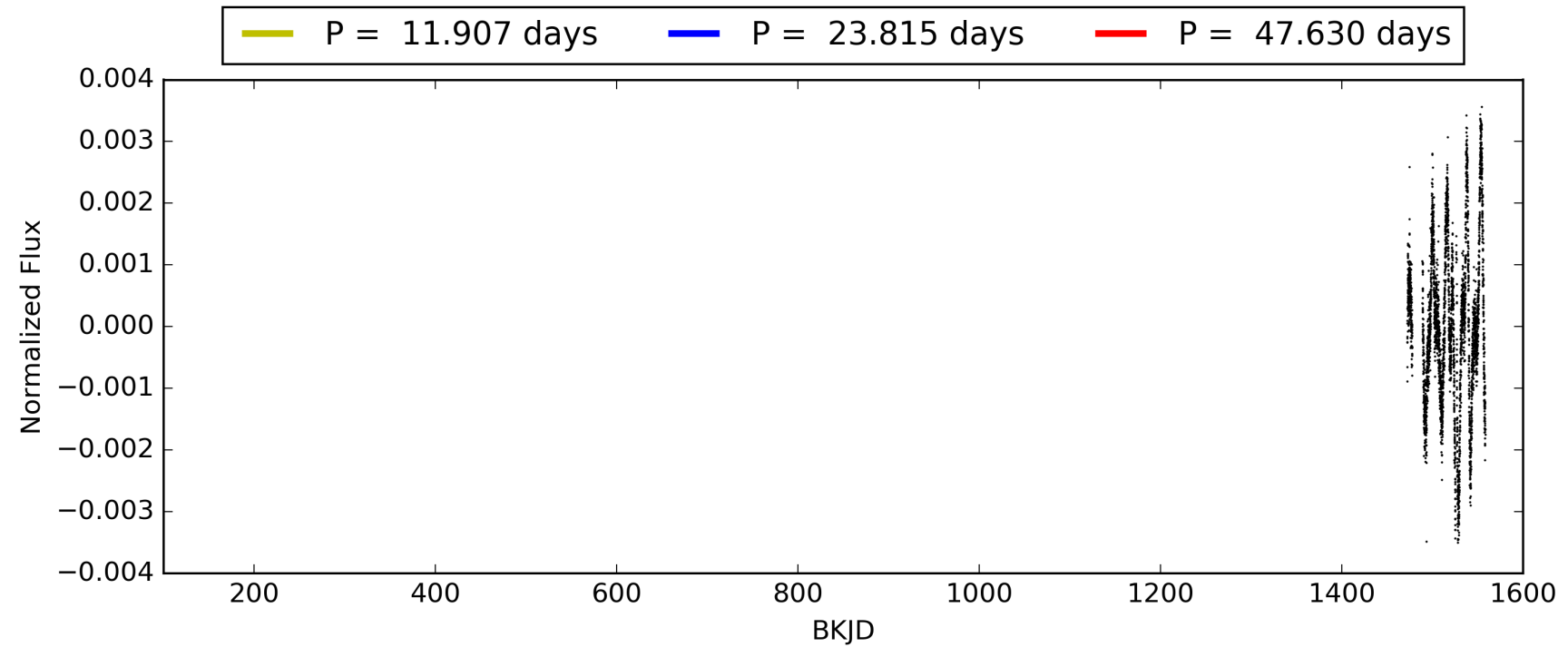
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 9.2%  
ModelChiSquareGof-sig: 78.7%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 7.81  
Centroid-sig: 0.0%  
Centroid-so: 0.766 arcsec [27.81σ]  
OotOffset-rm: 0.018 arcsec [0.26σ]  
KicOffset-rm: 0.881 arcsec [13.11σ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

# TCE 009049550-01, PDC Light Curves

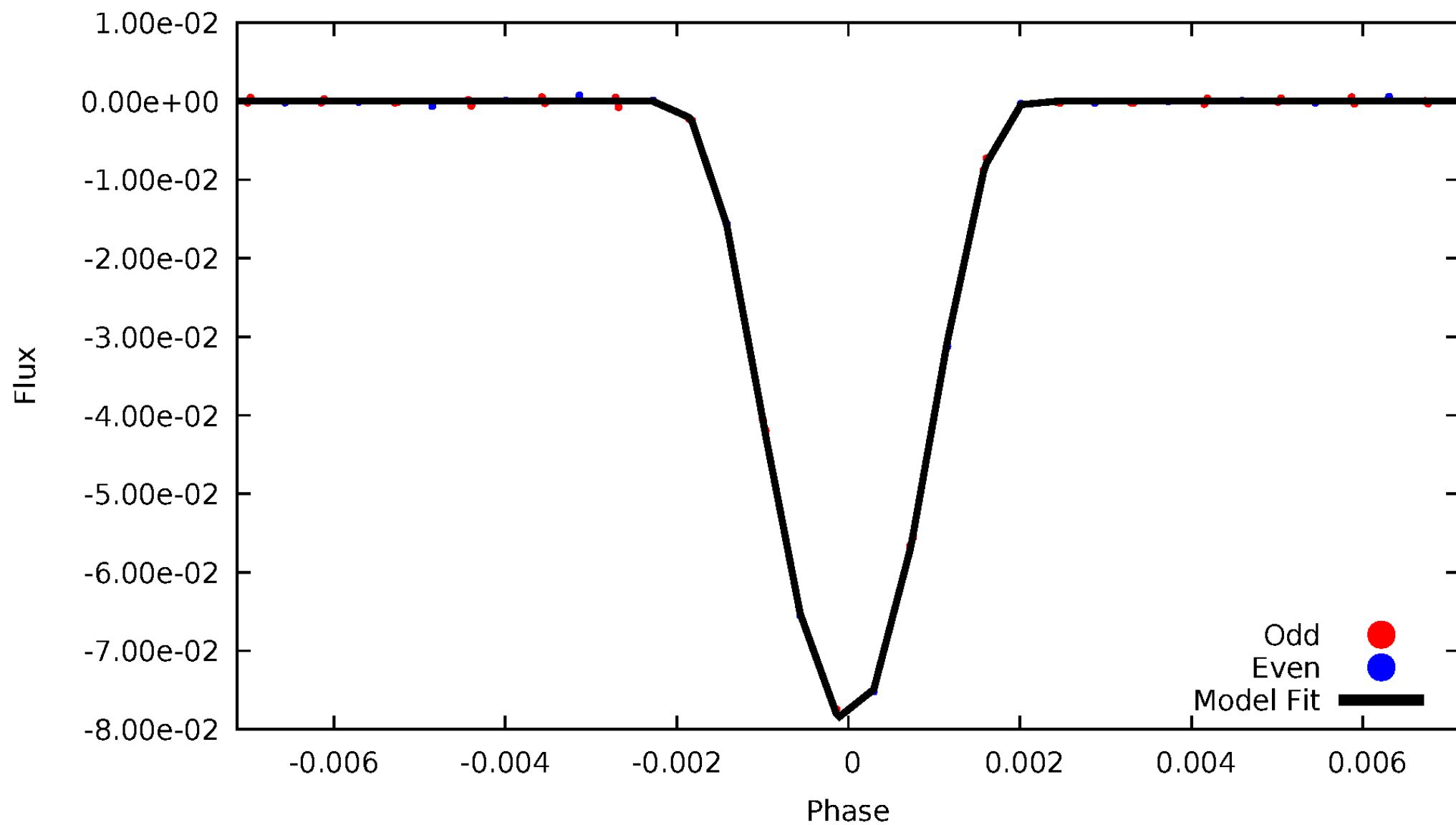


TCE 009049550-01



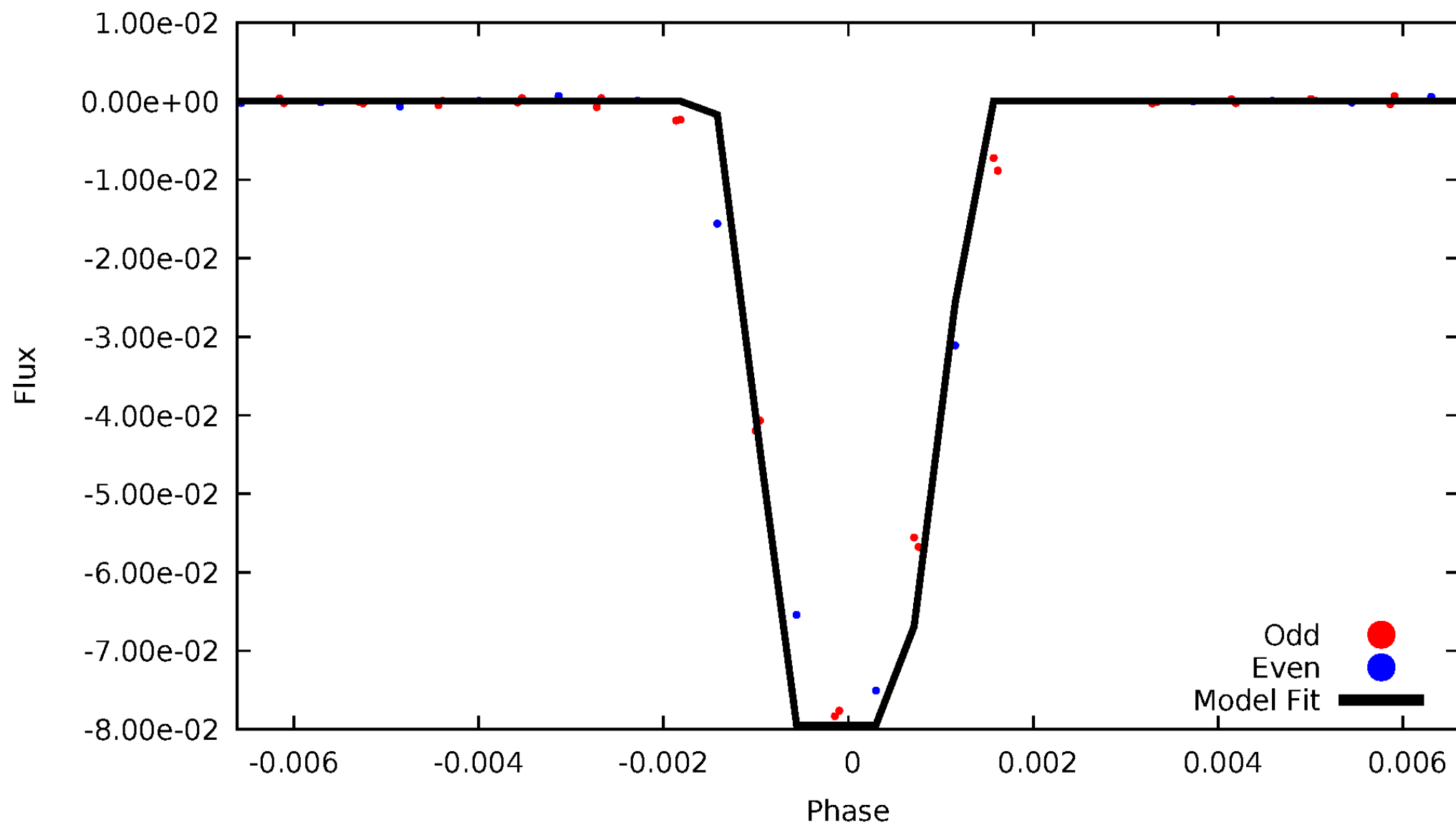
# DV Odd/Even

TCE 009049550-01



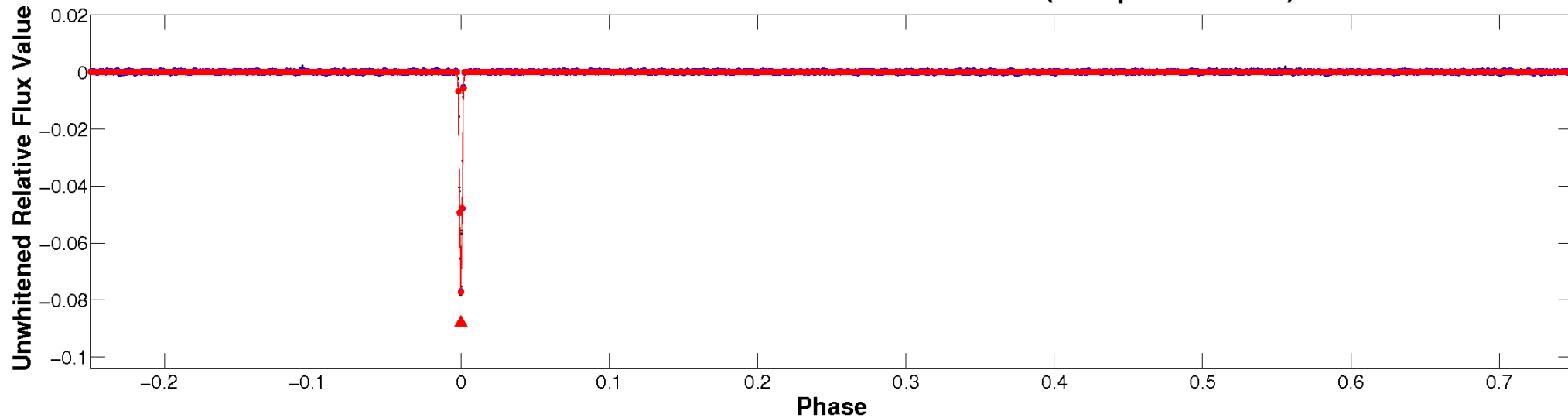
# ALT Odd/Even

TCE 009049550-01

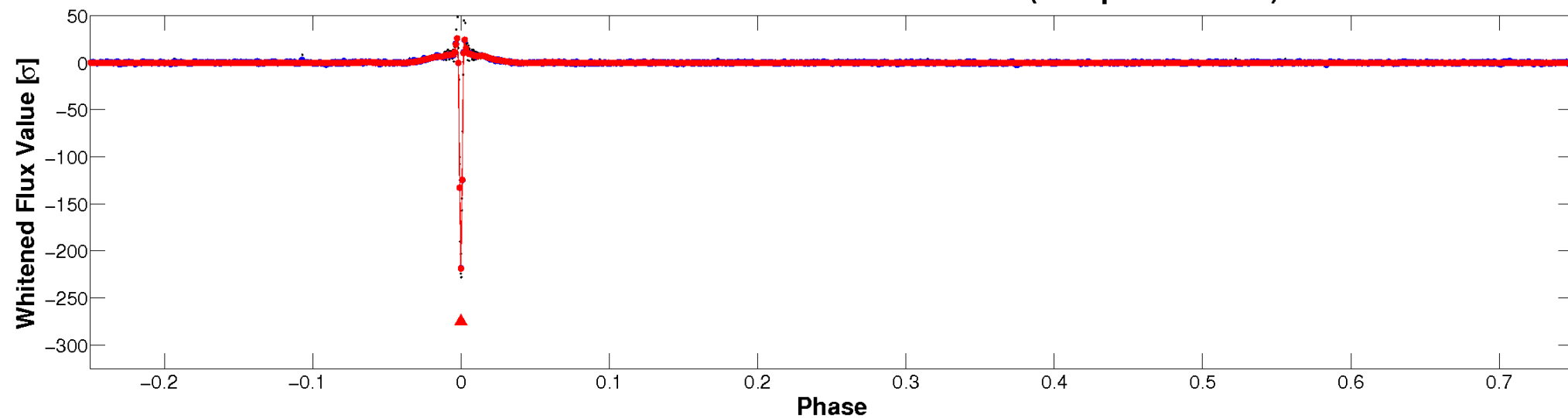


# Non-Whitened Vs. Whitened Light Curve

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

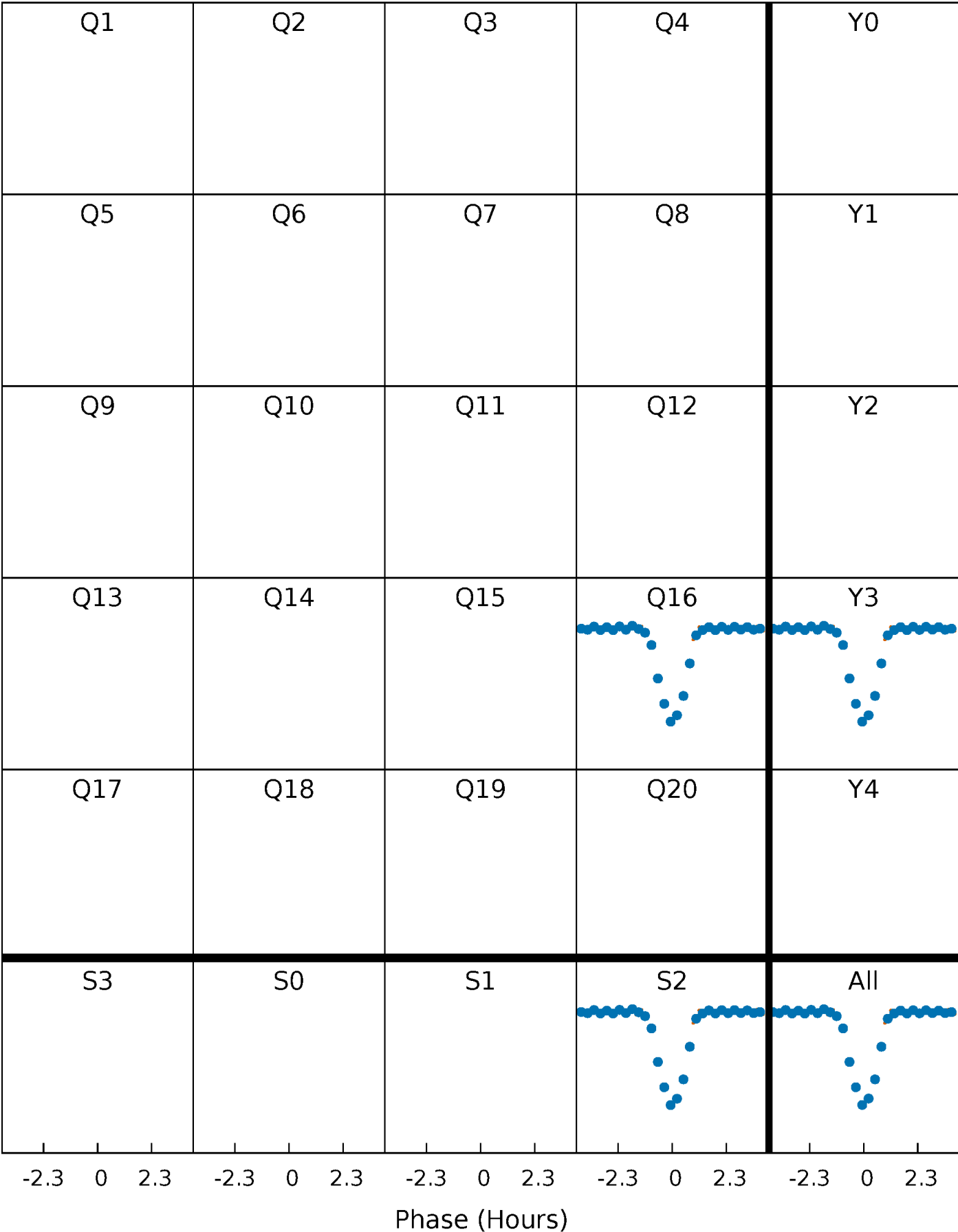


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



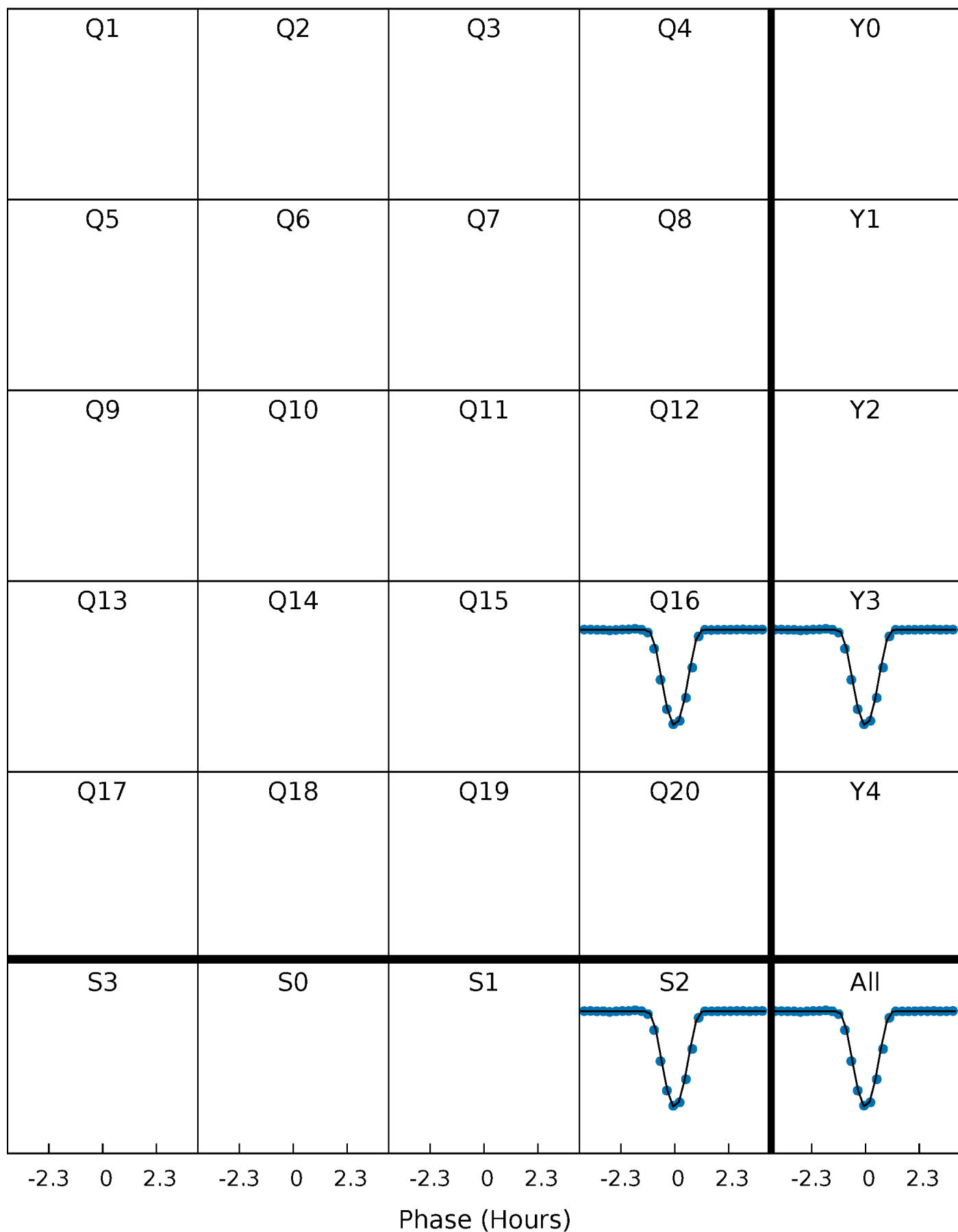
PDC Quarter-Phased Transit Curves

TCE 009049550-01    P= 23.814799 Days    T<sub>0</sub>=135.927851 (BKJD)



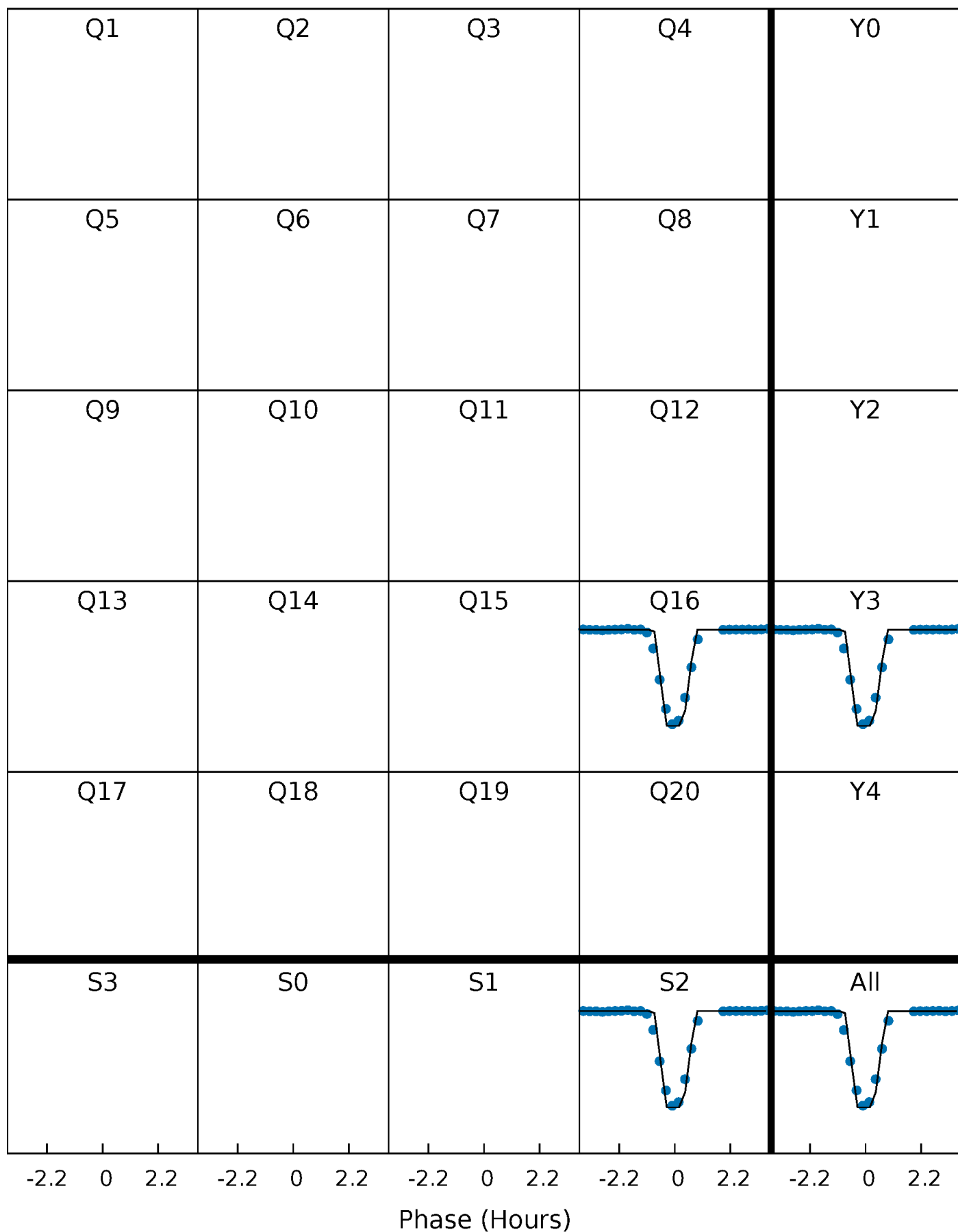
# DV Quarter-Phased Transit Curves

TCE 009049550-01 P= 23.814799 Days  $T_0=135.927851$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

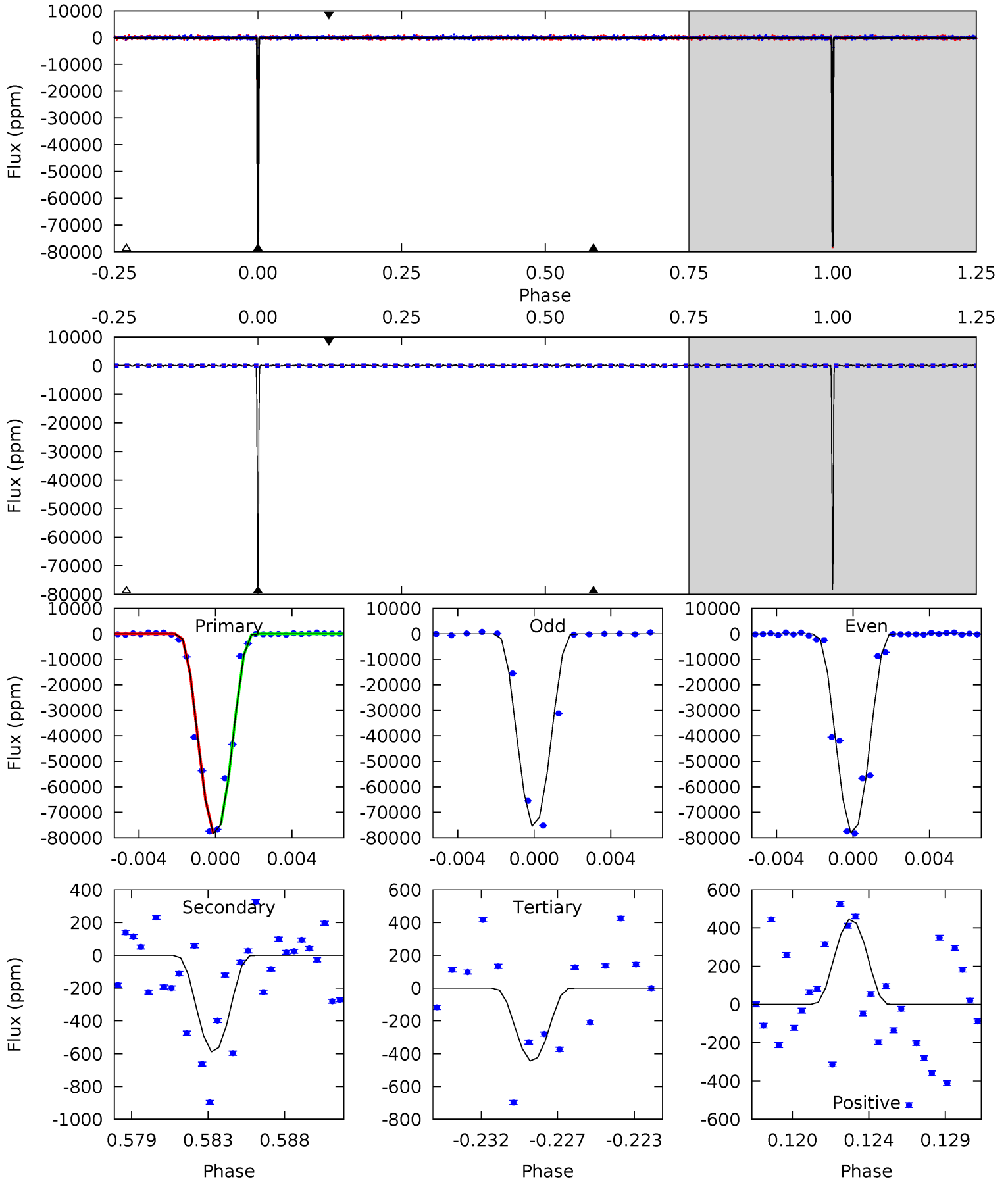
TCE 009049550-01 P= 23.815760 Days  $T_0=135.872079$  (BKJD)



# DV Model-Shift Uniqueness Test

009049550-01, P = 23.814799 Days, E = 135.927851 Days

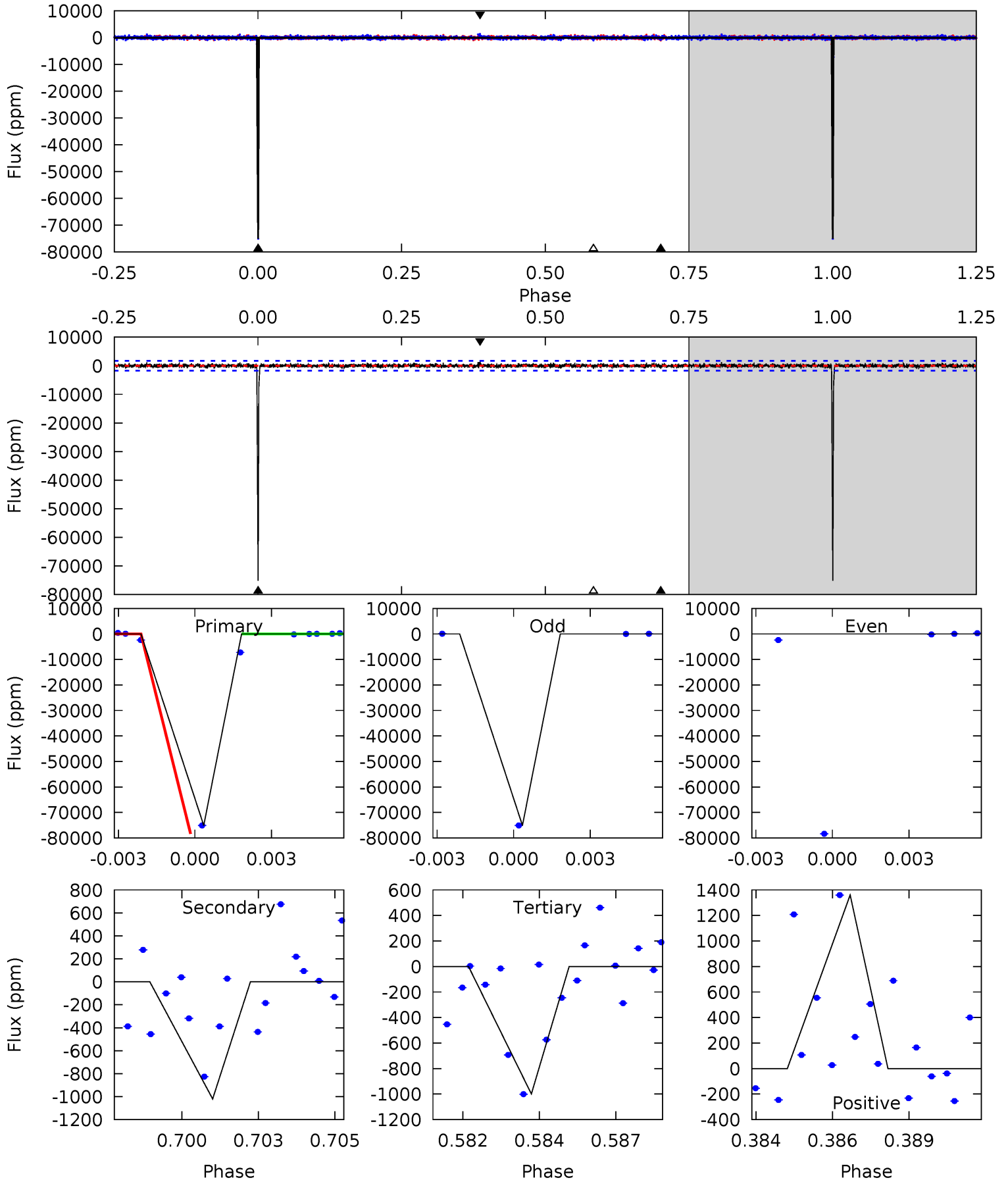
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
947.3	7.12	5.37	5.38	5.19	2.86	1.71	941.9	941.9	1.75	1.74	15.9	1.00	0.01	19.2



# Alt Model-Shift Uniqueness Test

009049550-01, P = 23.815760 Days, E = 135.872079 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
232.2	3.15	3.09	4.21	5.28	3.01	1.00	229.1	228.0	0.06	-1.05	0	0.99	0.02	0



### Stellar Parameters For KIC 009049550

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5421^{+192}_{-192}$	$3.790^{+0.893}_{-0.357}$	$-0.760^{+0.350}_{-0.300}$	$1.890^{+1.224}_{-1.224}$	$0.803^{+0.150}_{-0.122}$	$0.167^{+3.398}_{-0.129}$
	+4%/-4%	+24%/-9%	+46%/-39%	+65%/-65%	+19%/-15%	+2030%/-77%
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 009049550-01 / KOI 5606.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-588 \pm 83$	$69.95^{+39.40}_{-29.30}$	$1145^{+202}_{-217}$	$2222^{+234}_{-209}$	$1.483^{+2.941}_{-0.880}$
Alt.	$-1020 \pm 323$	$52.50^{+32.51}_{-24.68}$	$1169^{+189}_{-235}$	$2599^{+396}_{-274}$	$4.649^{+11.941}_{-3.135}$

$T_{max}$  = 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

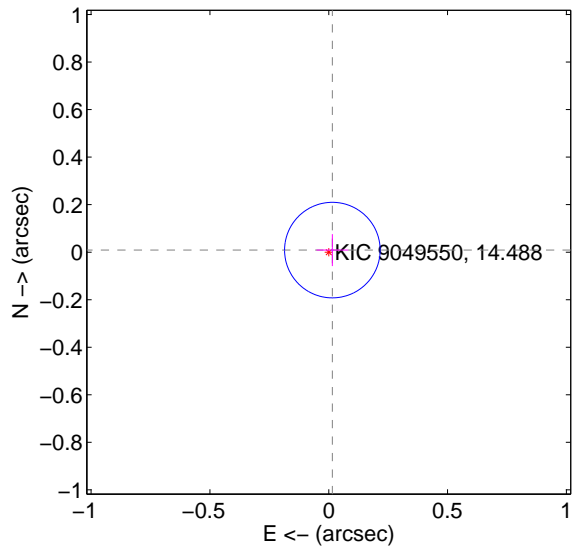
Supplemental centroid analysis for 009049550-01. Kepler magnitude: 14.49. Transit SNR 480.33

There are 1 quarters with good PRF difference image offsets

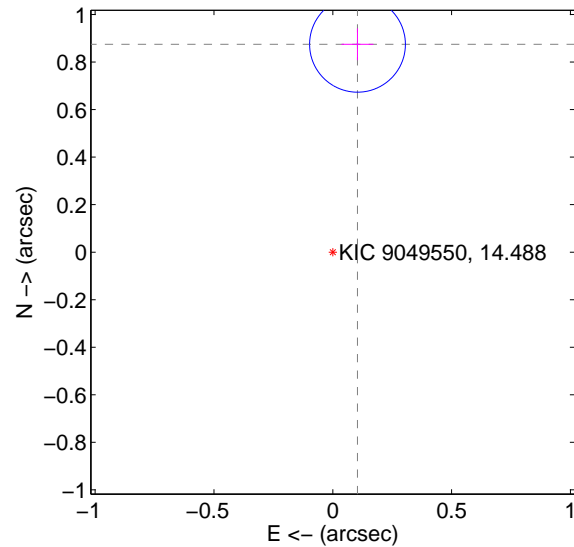
The direct PRF centroid is offset from the target star catalog position by about 0.87 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.018 \pm 0.067$	0.26	$-0.015 \pm 0.067$	$0.009 \pm 0.067$
PRF-fit source offset from KIC position	$0.881 \pm 0.067$	13.11	$-0.104 \pm 0.067$	$0.875 \pm 0.067$
photometric centroid source offset	$0.77 \pm 0.03$	27.81	$-0.06 \pm 0.04$	$0.76 \pm 0.03$

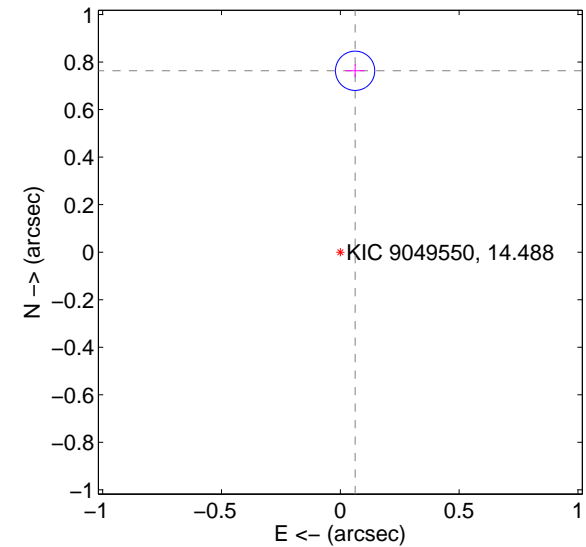
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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.

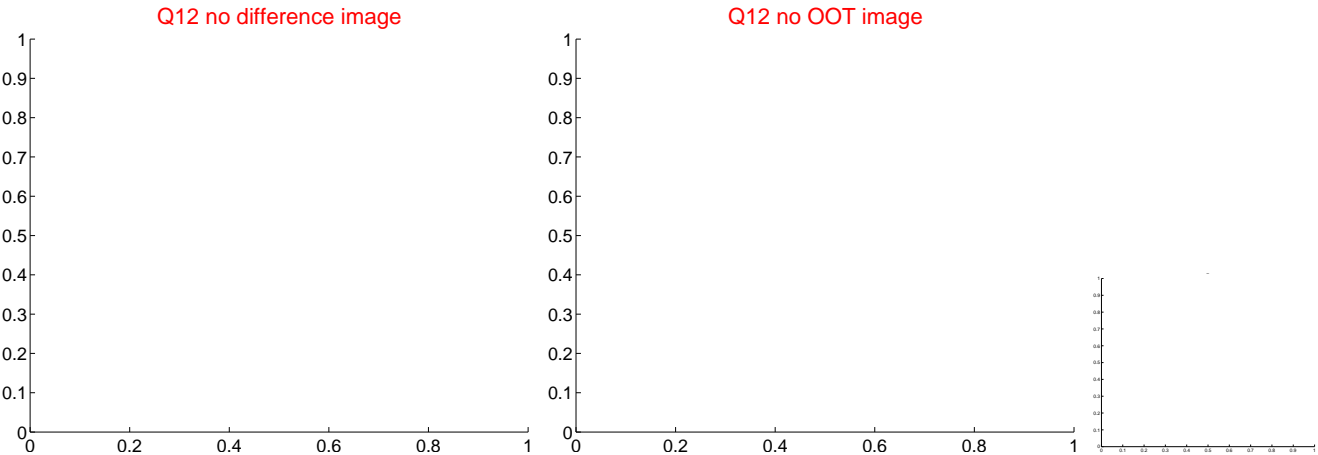
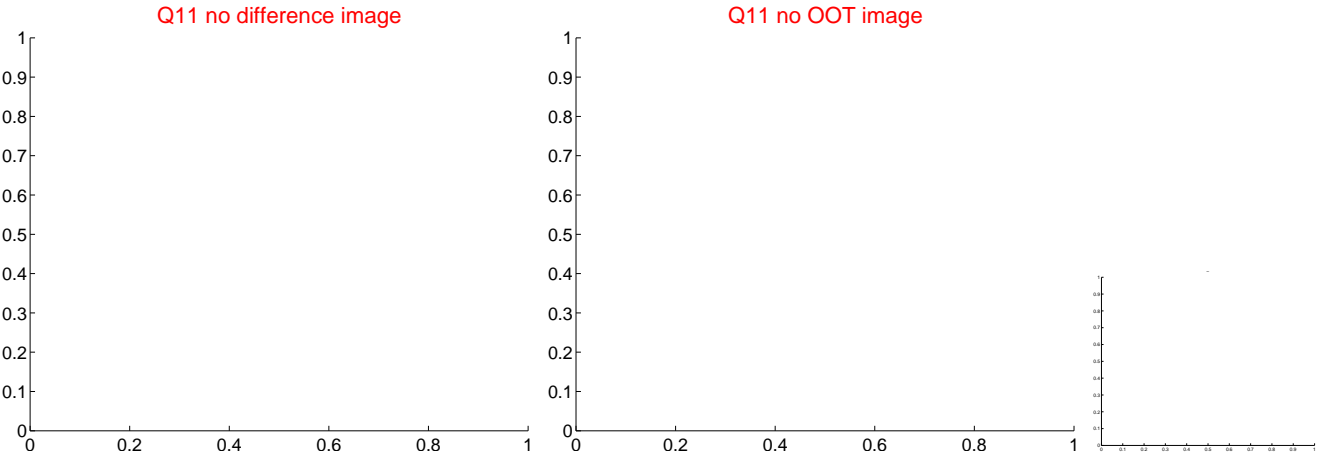
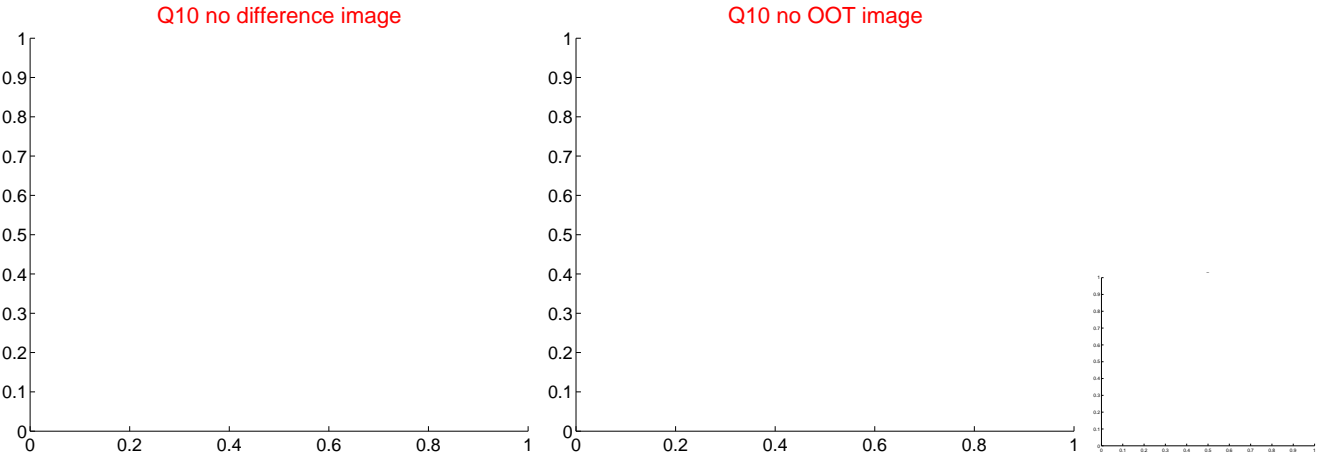
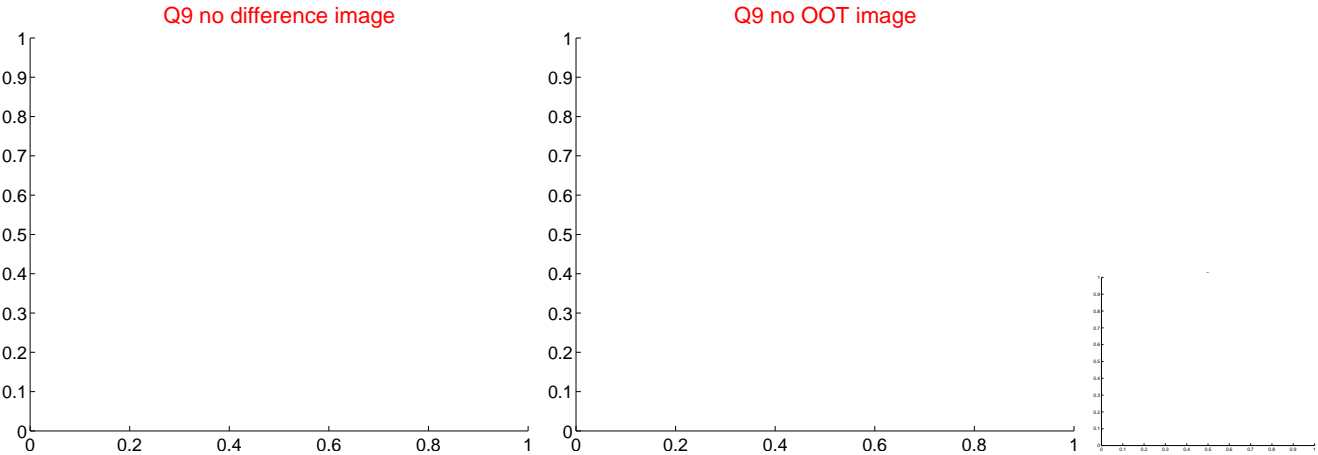
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



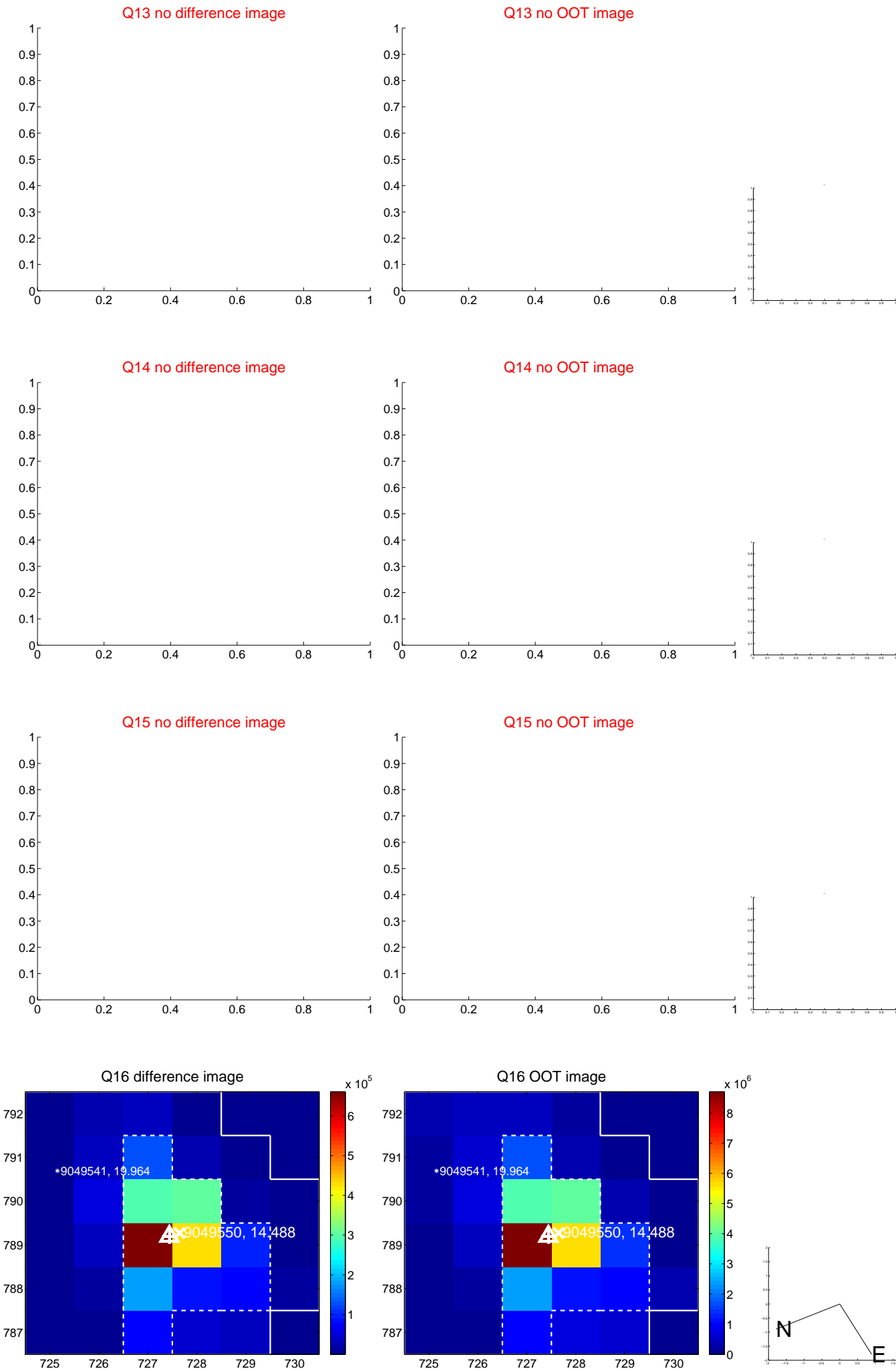
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



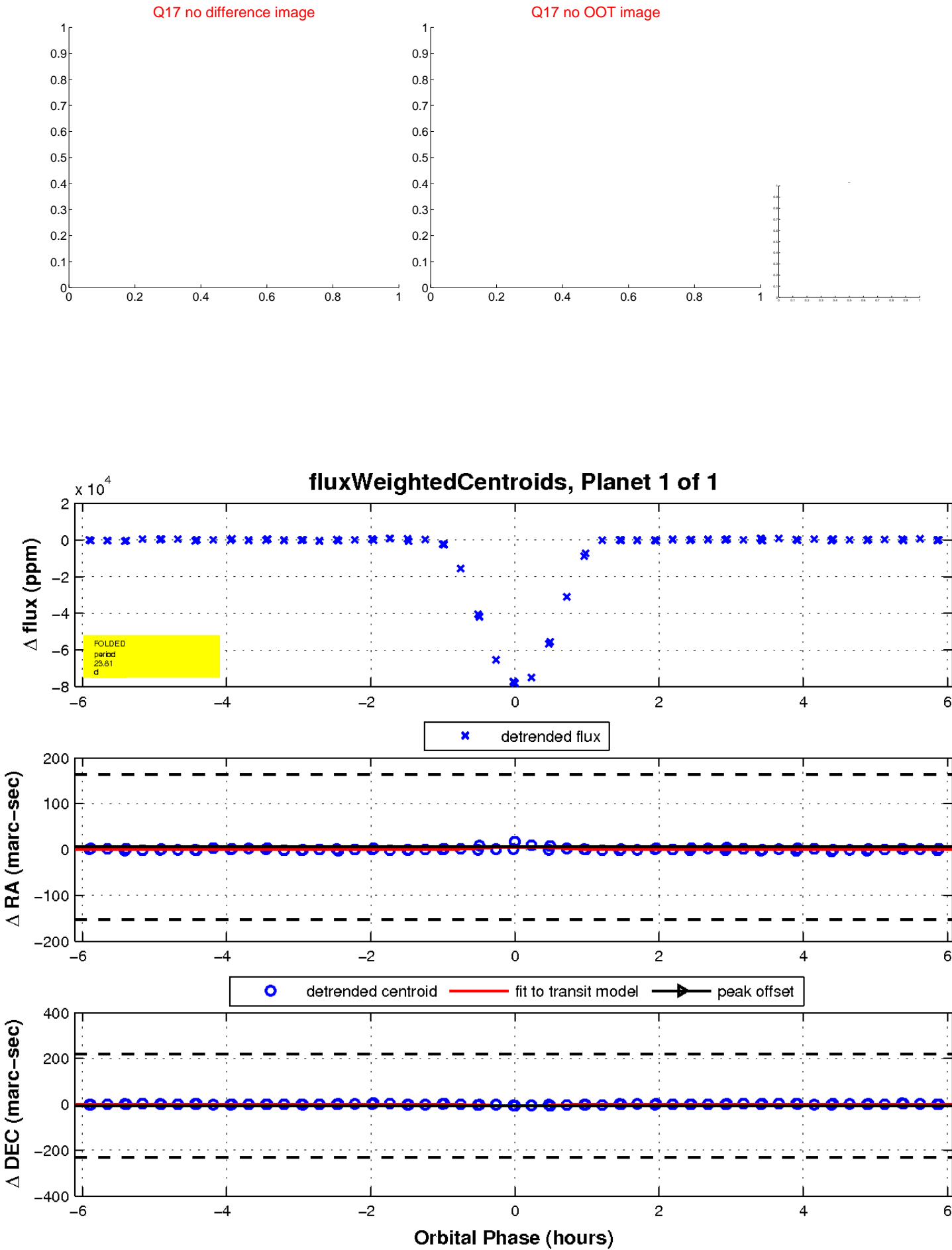
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

