

# KIC 011124509

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011124509-01	OBS	7409.01	4.446455	135.730977	3410.0	2.659	349.9	172.8	0.89	5615	6.56	266.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011124509-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT

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

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

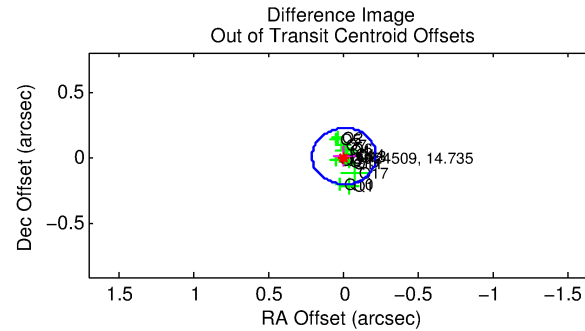
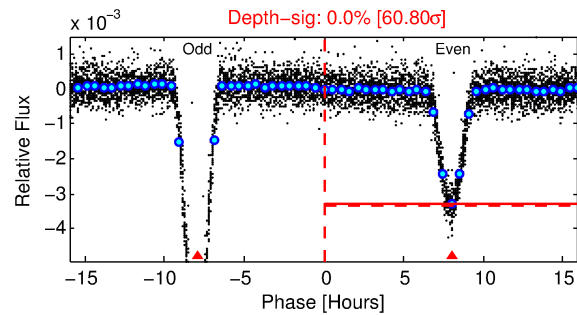
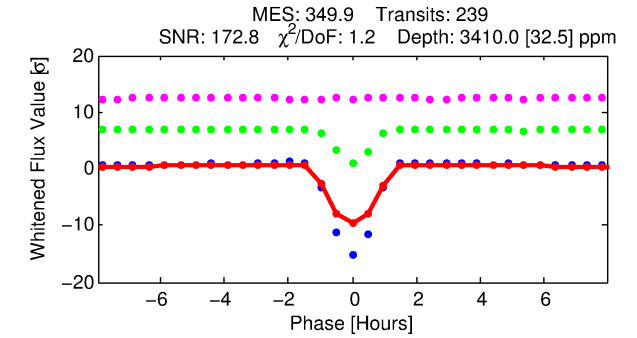
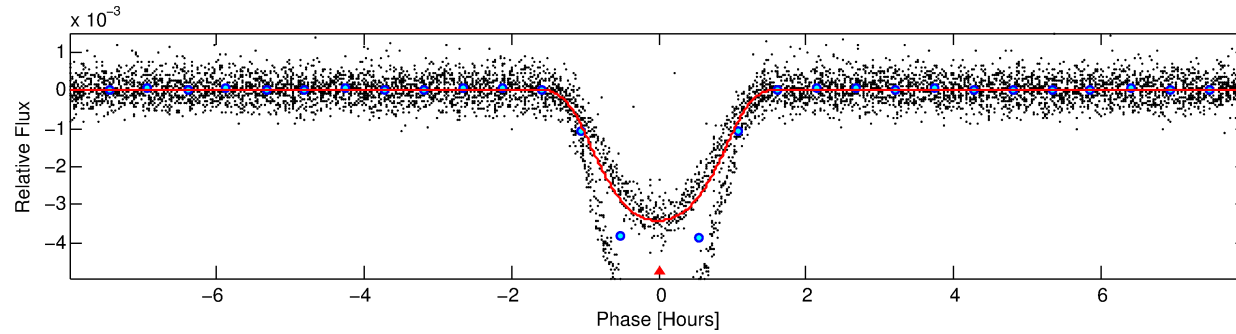
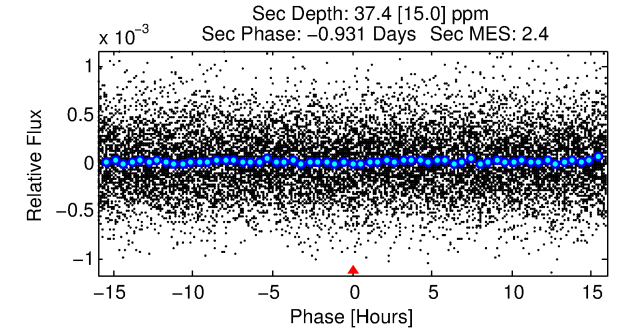
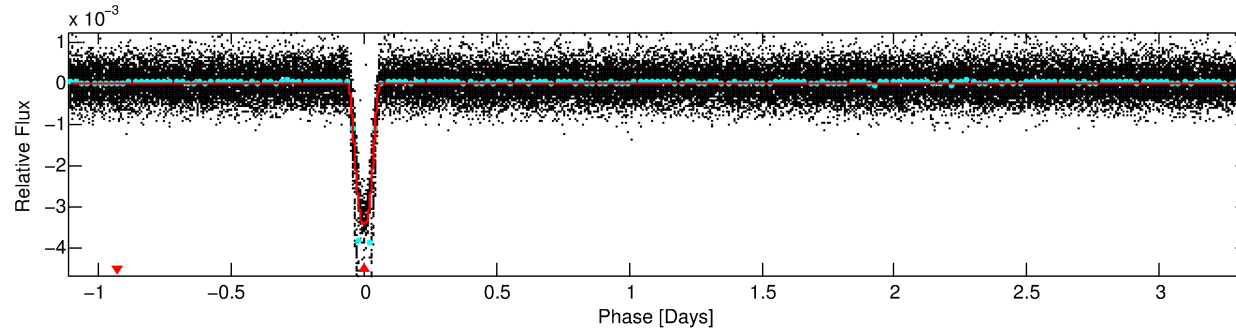
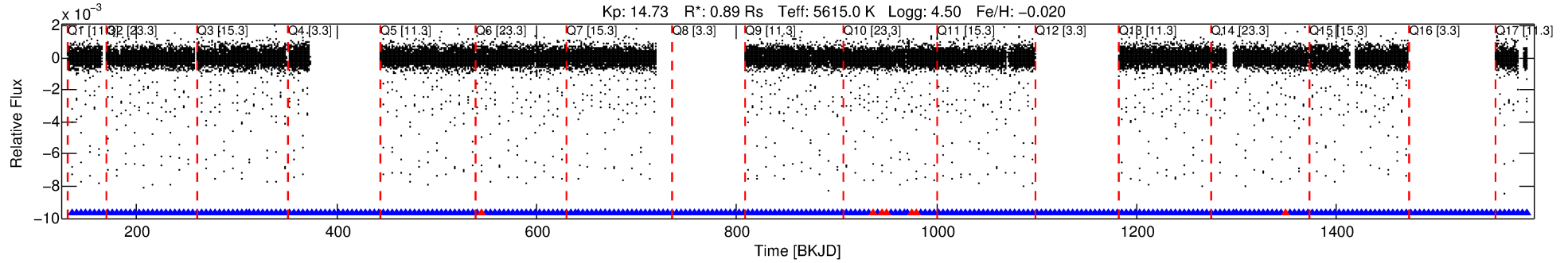
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011124509-01

No Significant Match Found

# DV One-Page Summary

KIC: 11124509 Candidate: 1 of 1 Period: 4.446 d  
KOI: K07409.01 Corr: 0.987



## DV Fit Results:

Period = 4.44645 [0.00000] d  
Epoch = 135.7310 [0.0003] BKJD  
Rp/R\* = 0.0673 [0.0006]  
a/R\* = 6.73 [0.09]  
b = 0.93 [0.00]  
Seff = 266.38 [92.30]  
Teq = 1030 [89] K  
Rp = 6.56 [1.68] Re  
a = 0.0516 [0.0113] AU  
Ag = 1.27 [0.66] [0.42 $\sigma$ ]  
Teffp = 1692 [178] K [3.33 $\sigma$ ]

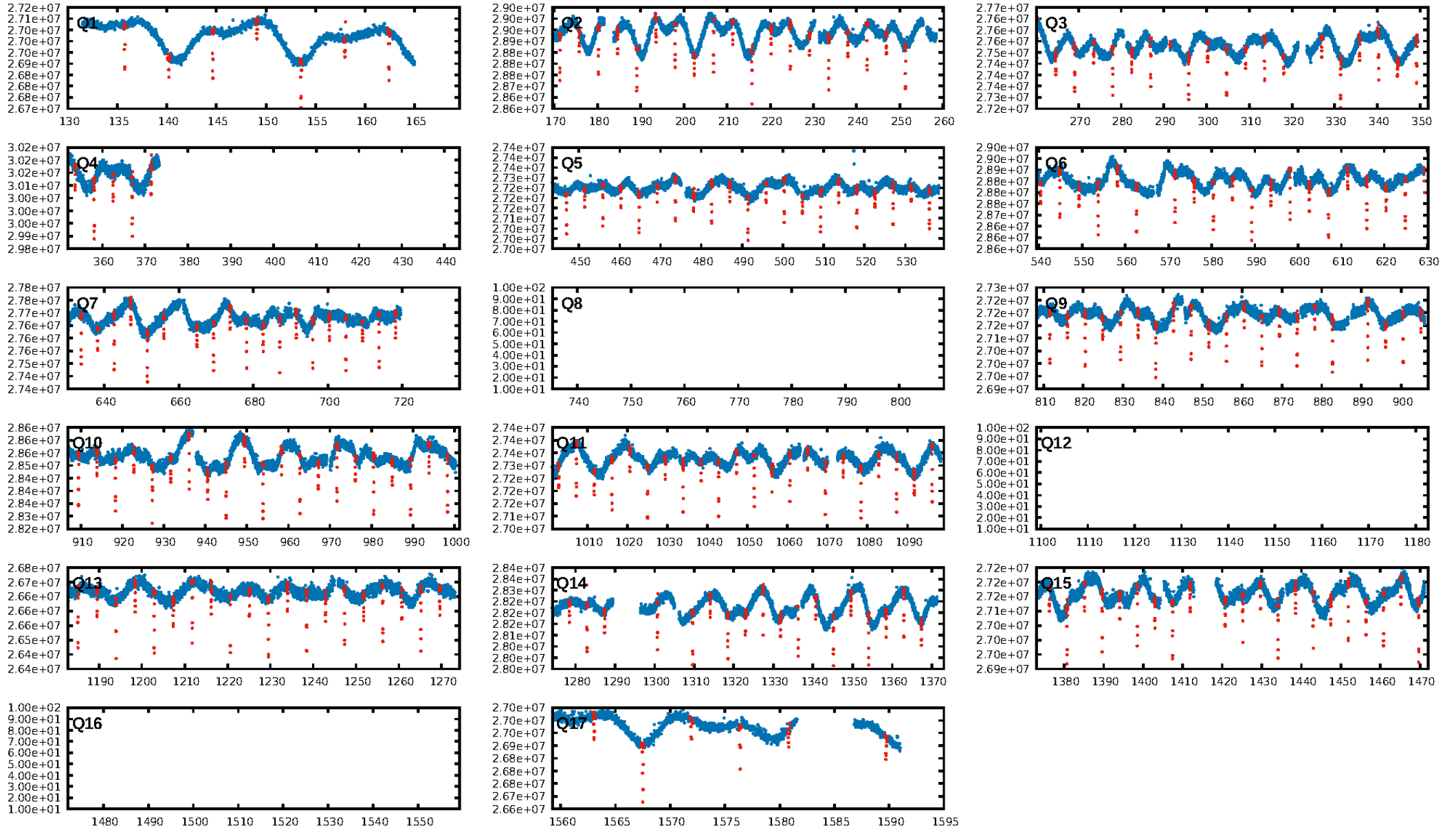
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.97 [214/221]  
GhostDiagnostic-chr: 2.309  
Centroid-sig: 96.8%  
Centroid-so: 0.205 arcsec [3.43 $\sigma$ ]  
OotOffset-rm: 0.017 arcsec [0.24 $\sigma$ ]  
KicOffset-rm: 0.257 arcsec [3.42 $\sigma$ ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

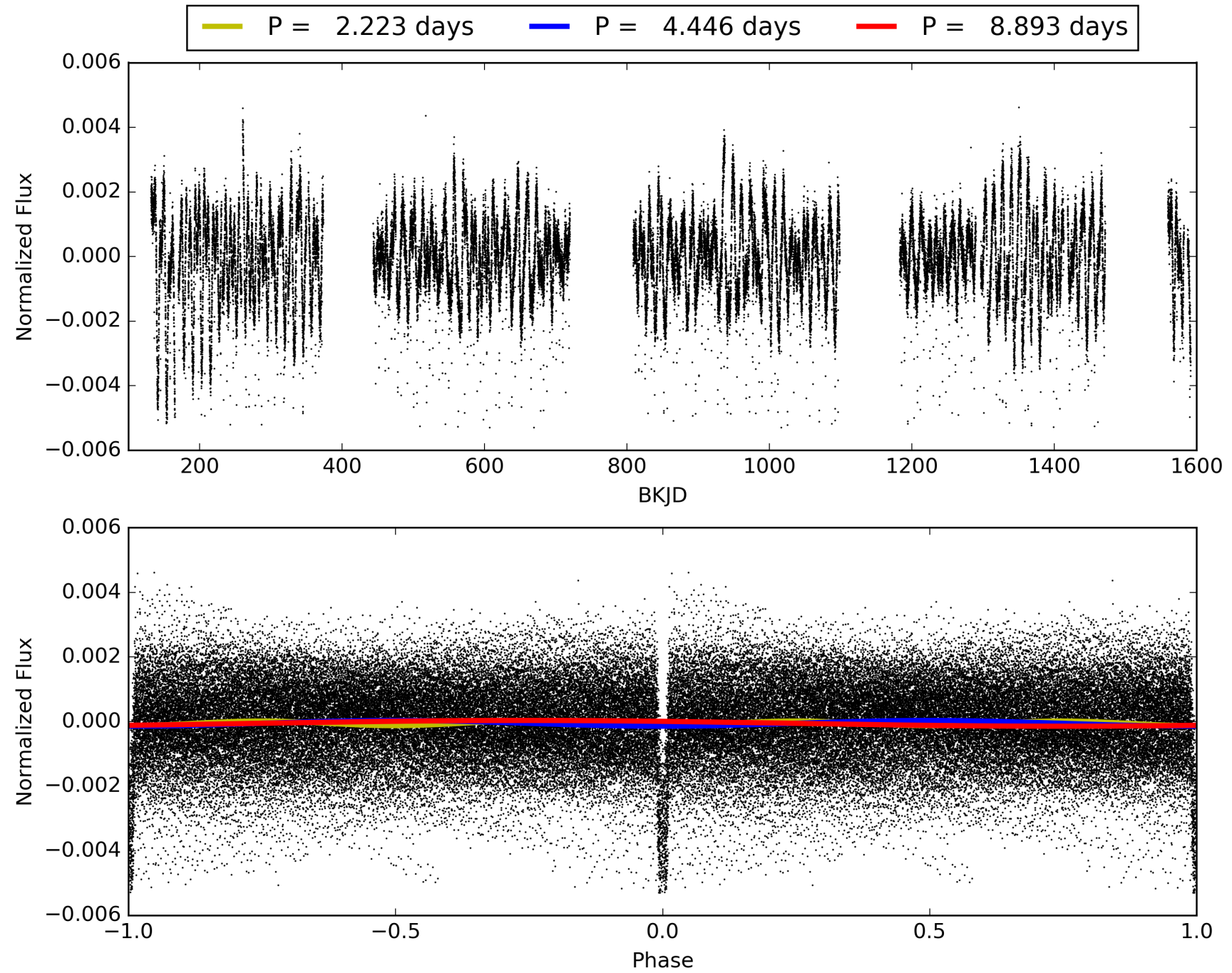
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:13:03 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011124509-01, PDC Light Curves

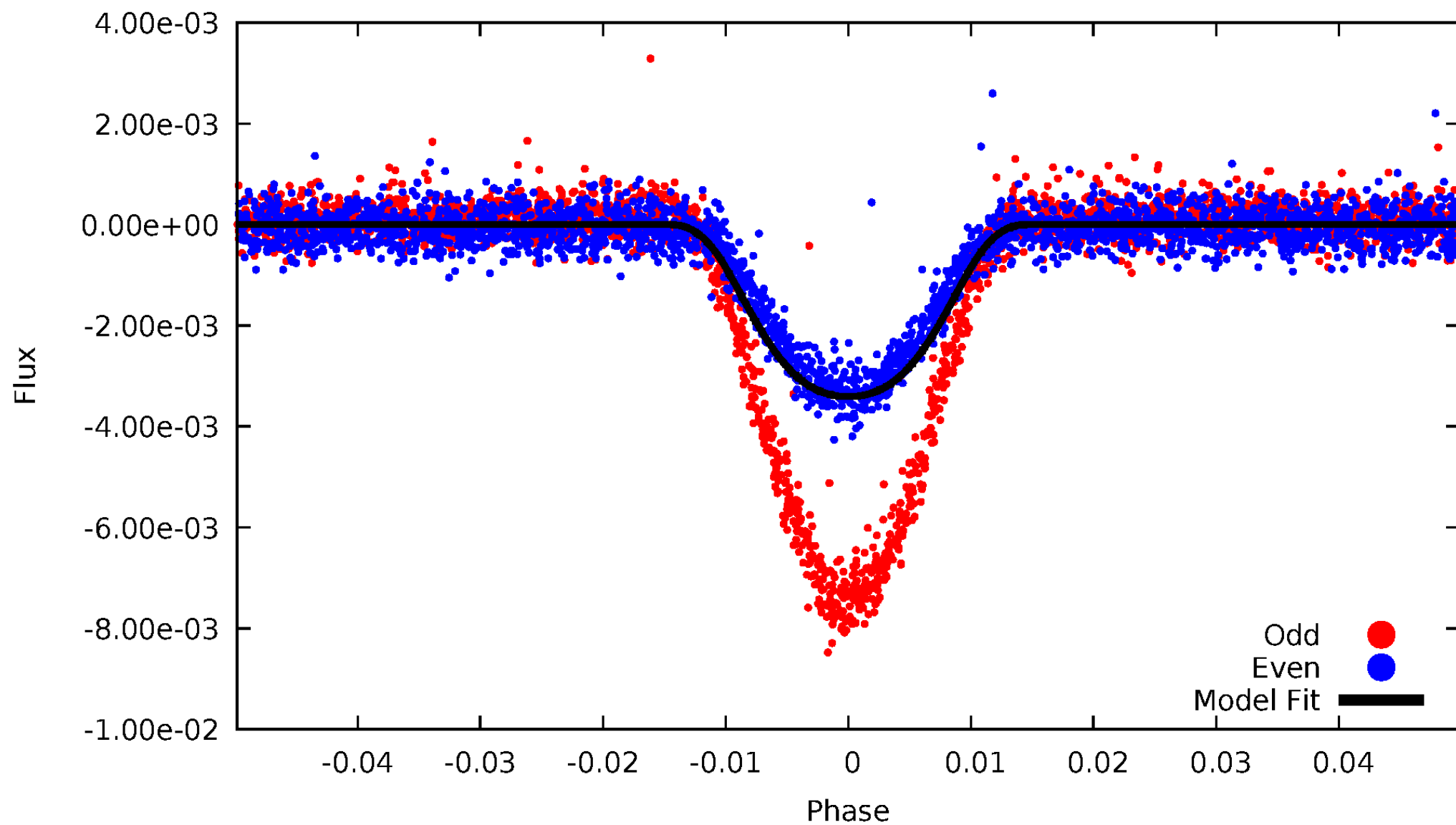


TCE 011124509-01



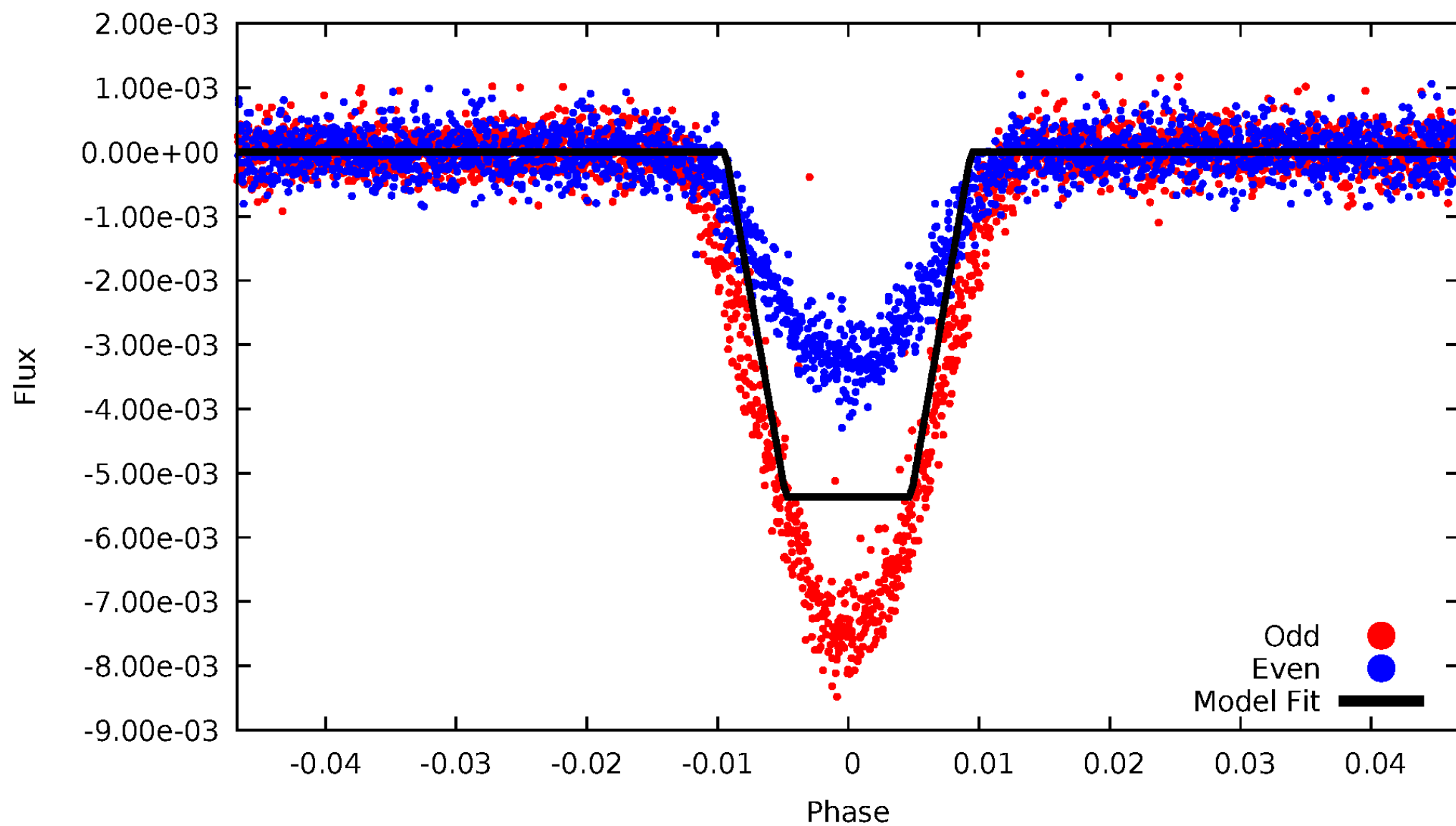
# DV Odd/Even

TCE 011124509-01



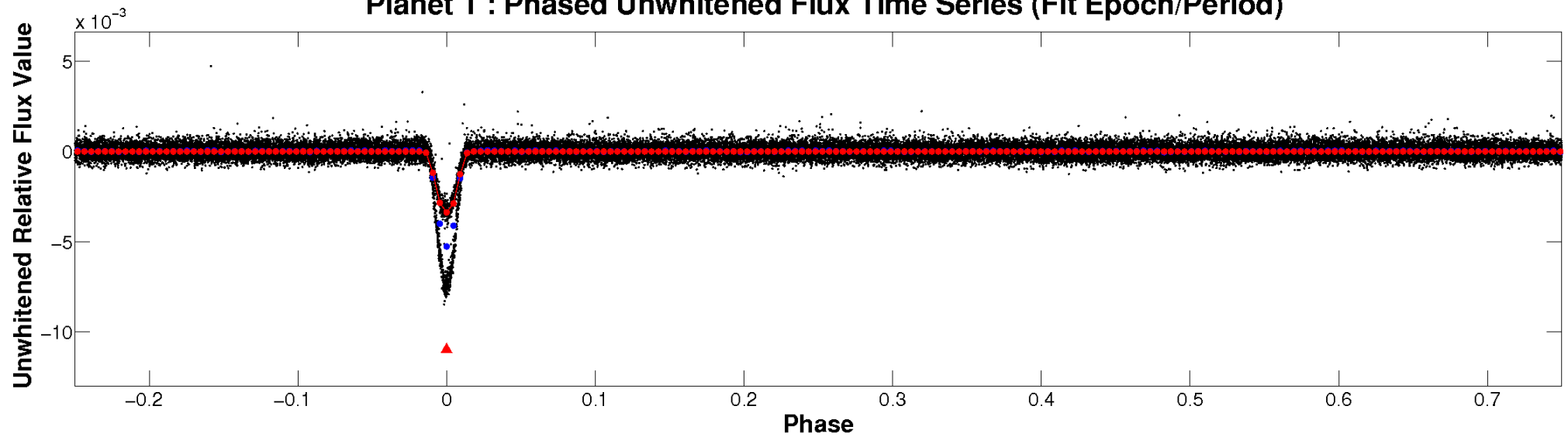
# ALT Odd/Even

TCE 011124509-01

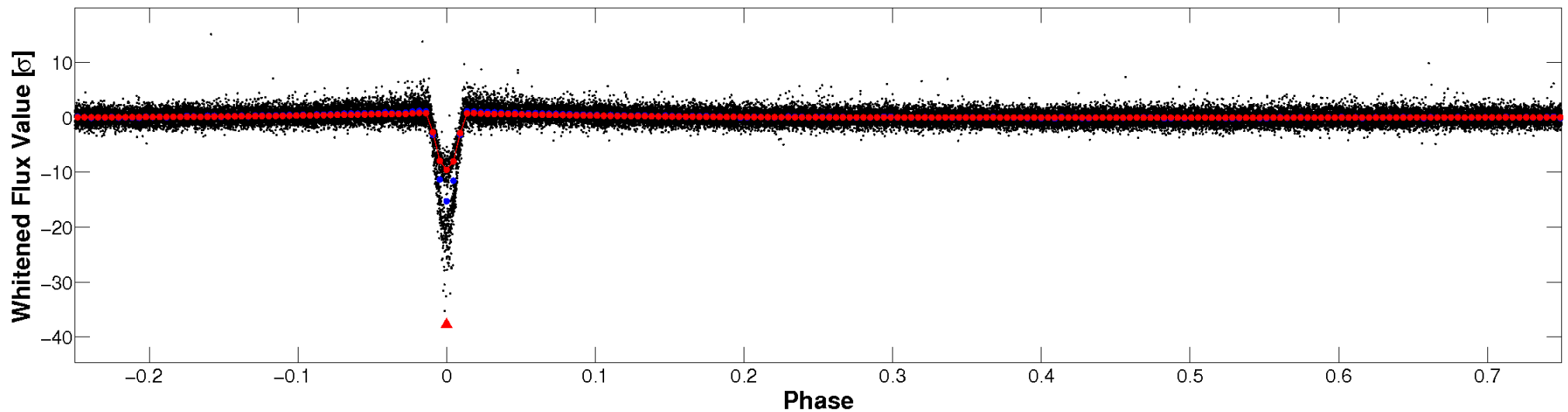


# Non-Whitened Vs. Whitened Light Curve

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



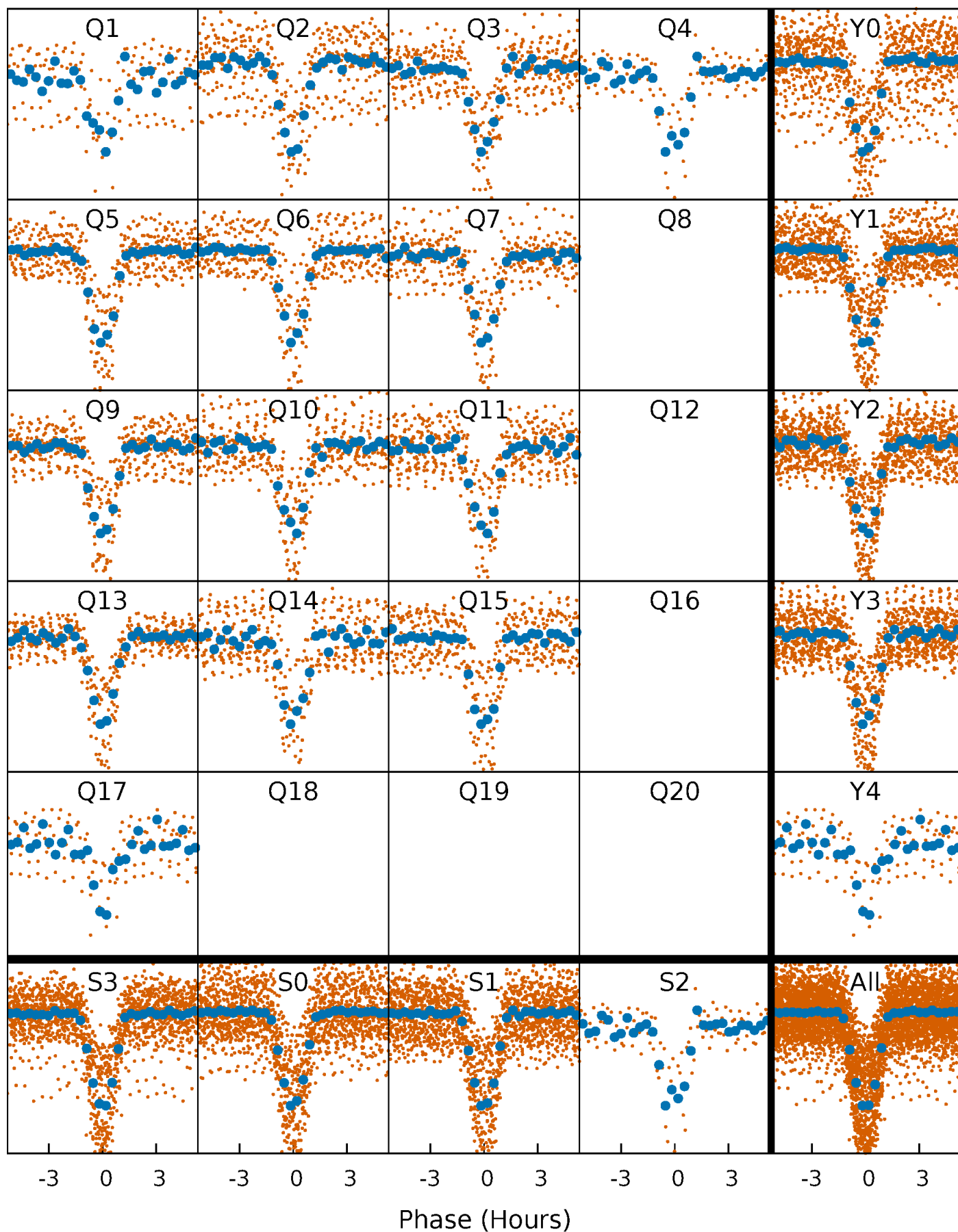
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

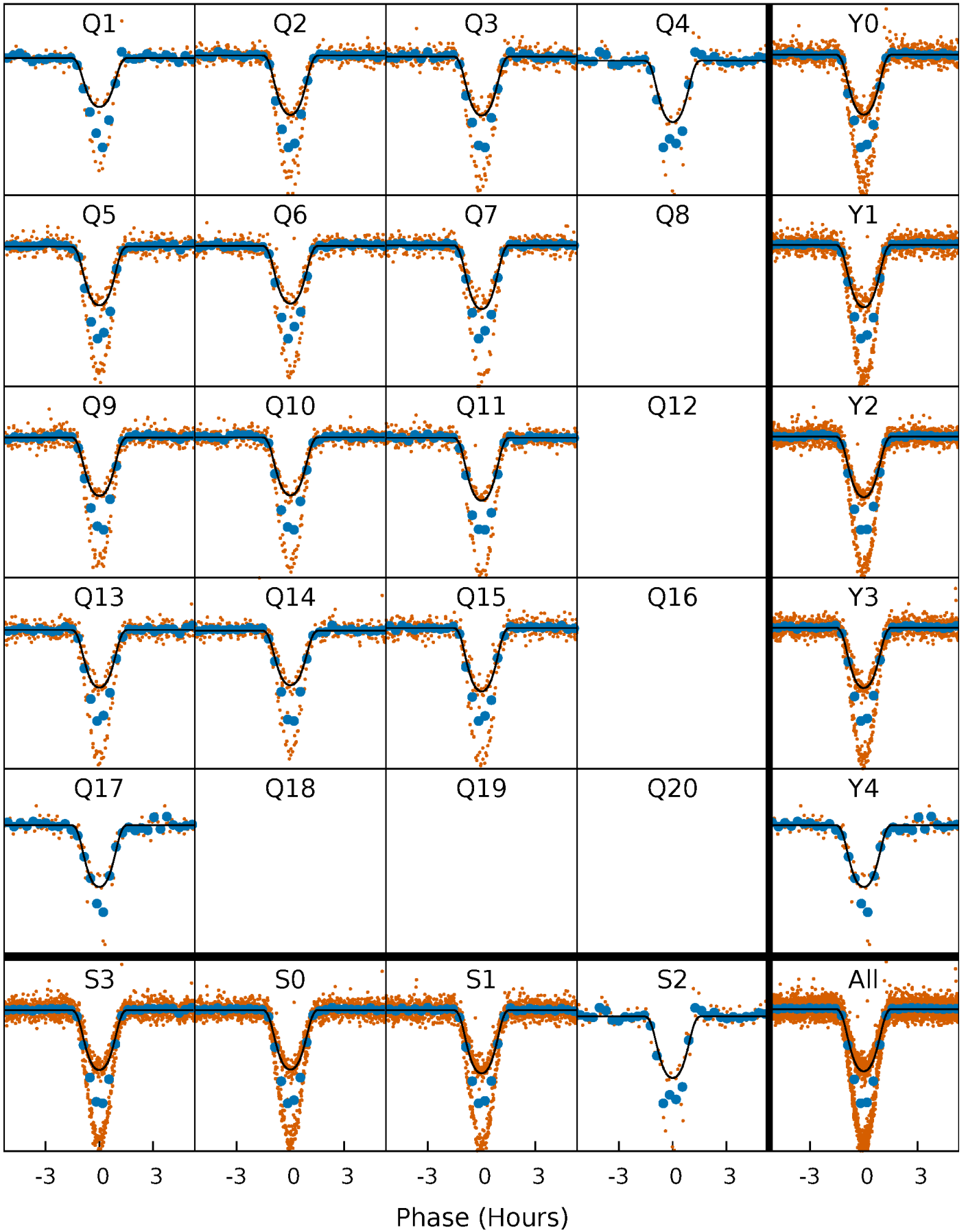
TCE 011124509-01 P= 4.446455 Days  $T_0=135.730977$  (BKJD)





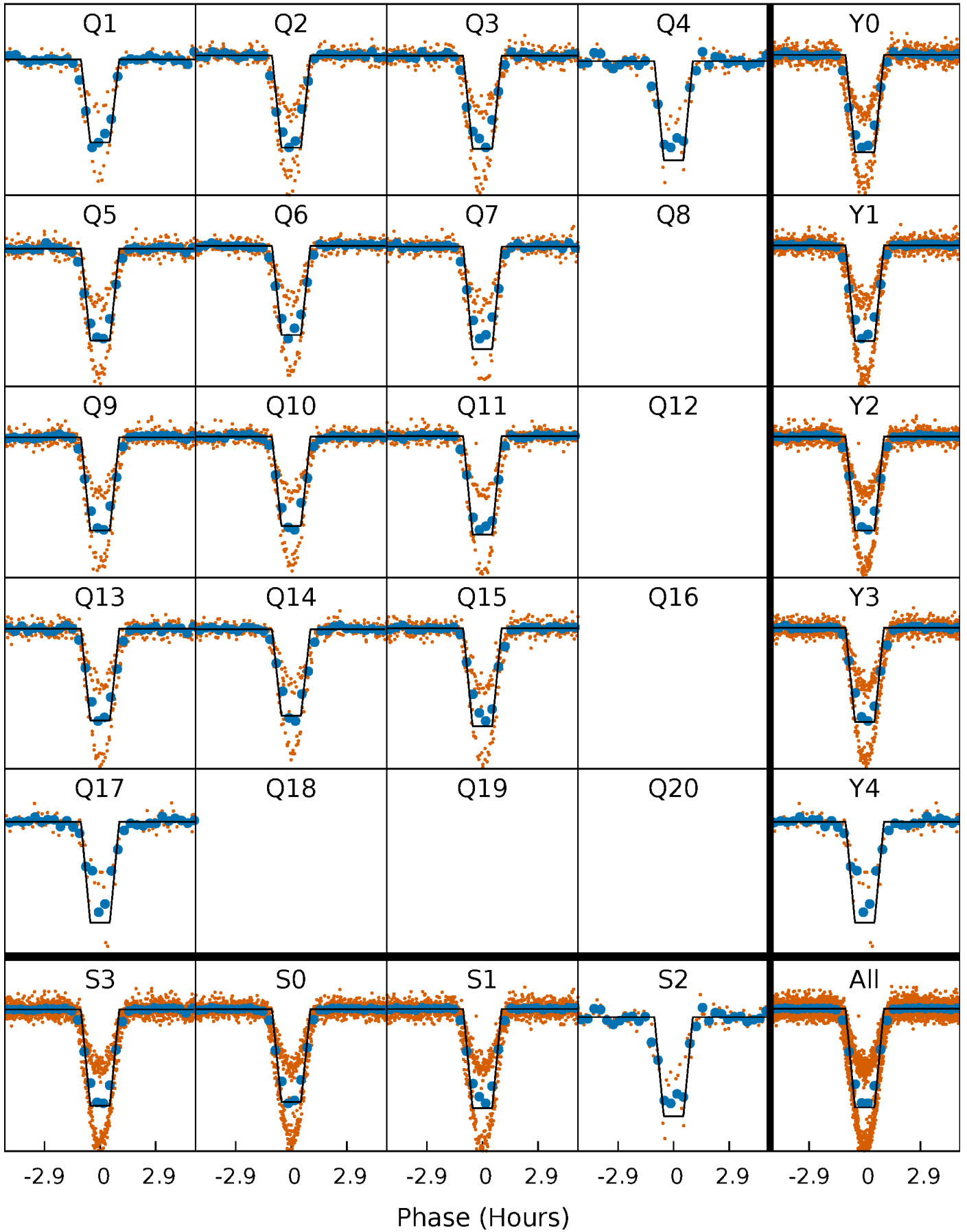
# DV Quarter-Phased Transit Curves

TCE 011124509-01 P= 4.446455 Days  $T_0=135.730977$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

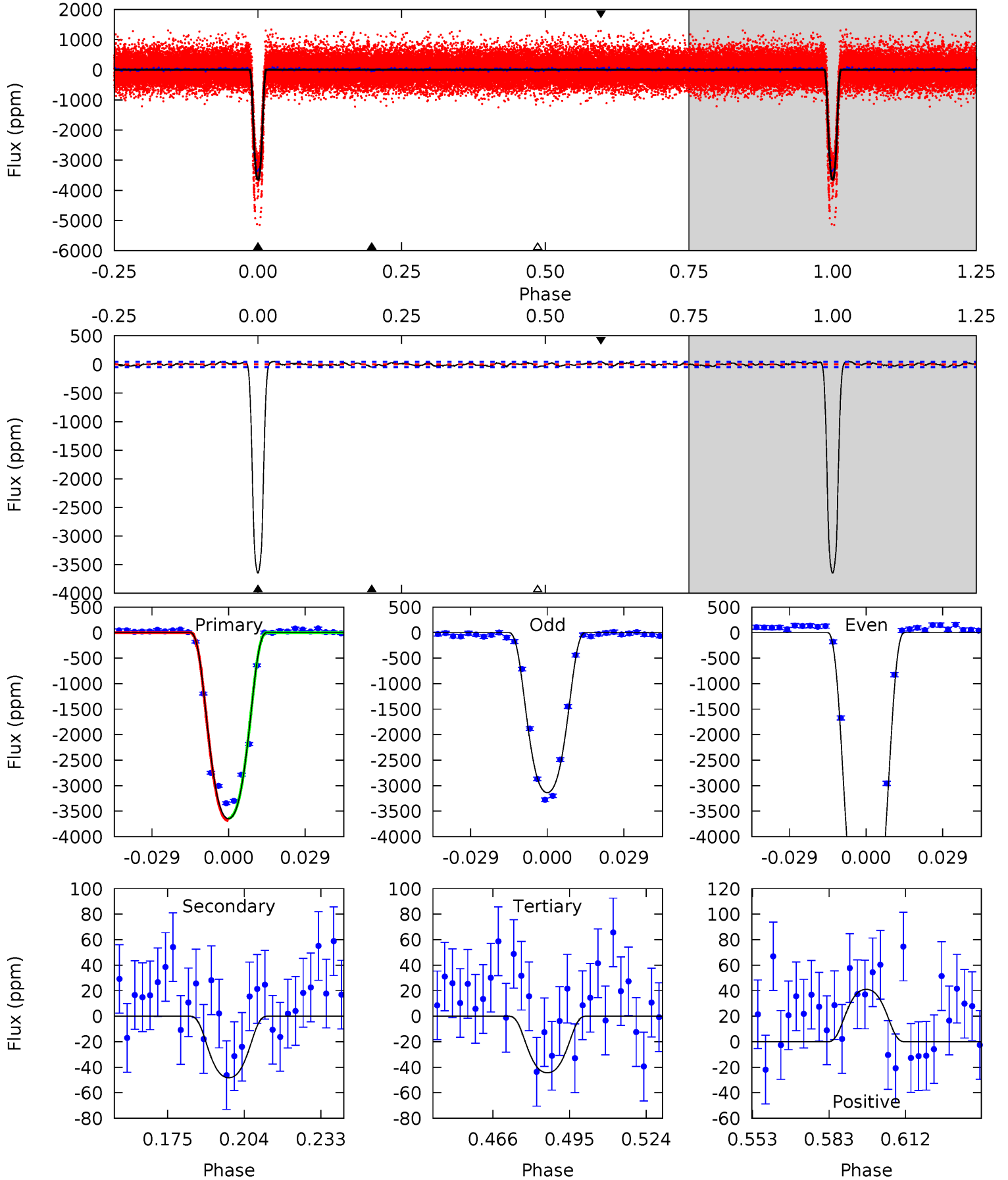
TCE 011124509-01 P= 4.446434 Days  $T_0=135.734188$  (BKJD)



# DV Model-Shift Uniqueness Test

011124509-01, P = 4.446455 Days, E = 131.284522 Days

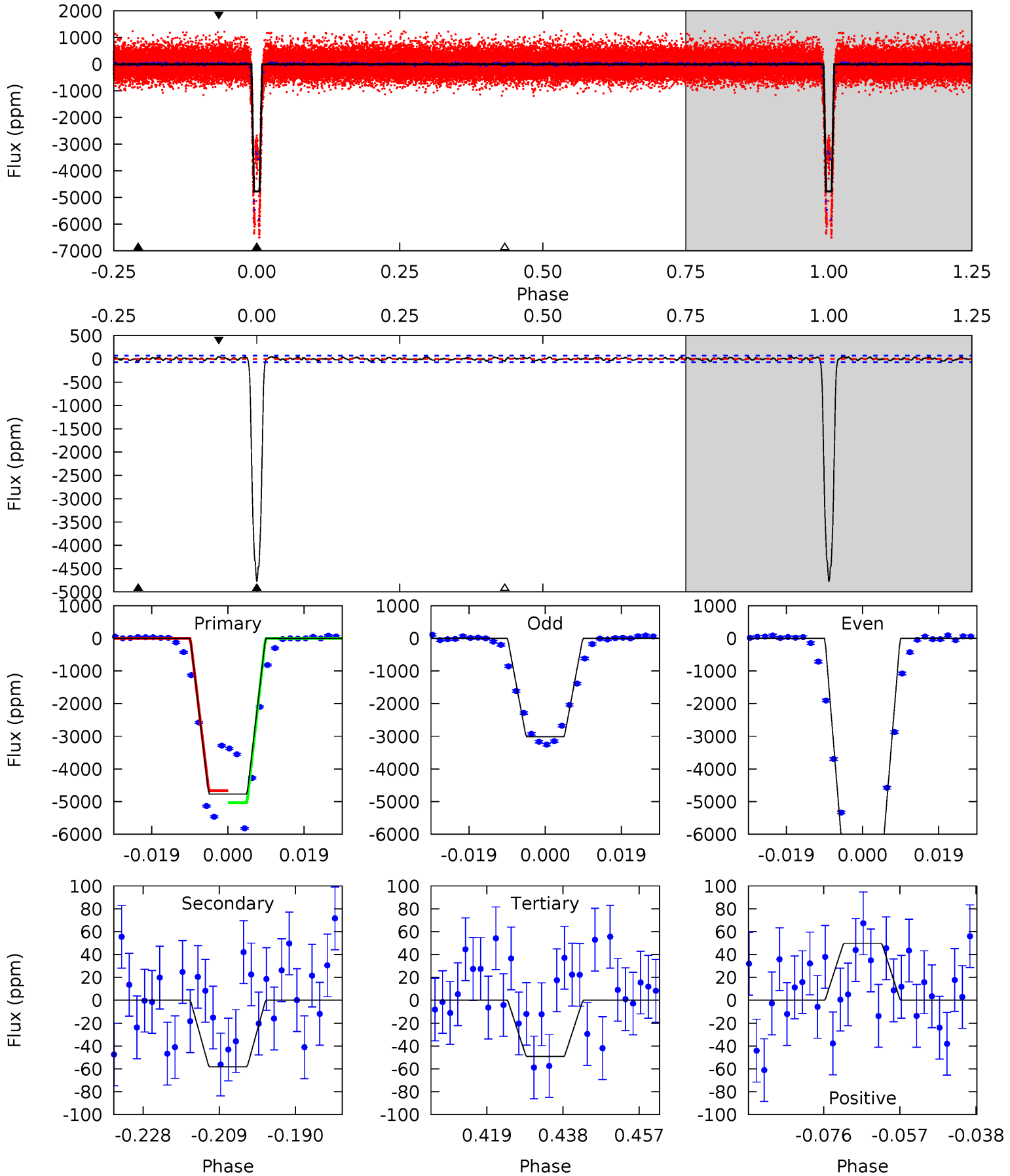
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
383.6	5.07	4.66	4.32	4.82	2.18	1.80	378.9	379.3	0.41	0.75	222.5	1.16	0.01	2.44



# Alt Model-Shift Uniqueness Test

011124509-01, P = 4.446434 Days, E = 131.287754 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
337.4	4.12	3.48	3.52	4.90	2.34	1.32	333.9	333.8	0.64	0.60	189.7	1.17	0.01	0



### Stellar Parameters For KIC 011124509

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5615^{+152}_{-169}$	$4.504^{+0.060}_{-0.180}$	$-0.020^{+0.300}_{-0.300}$	$0.893^{+0.229}_{-0.082}$	$0.929^{+0.095}_{-0.095}$	$1.839^{+0.454}_{-0.893}$
	+3%/-3%	+1%/-4%	+1500%/-1500%	+26%/-9%	+10%/-10%	+25%/-49%
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 011124509-01 / KOI 7409.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-48 \pm 10$	$6.59^{+0.99}_{-0.41}$	$1457^{+100}_{-60}$	$2535^{+86}_{-91}$	$1.520^{+0.426}_{-0.406}$
Alt.	$-58 \pm 14$	$7.20^{+1.00}_{-0.42}$	$1459^{+88}_{-69}$	$2544^{+100}_{-117}$	$1.556^{+0.494}_{-0.466}$

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

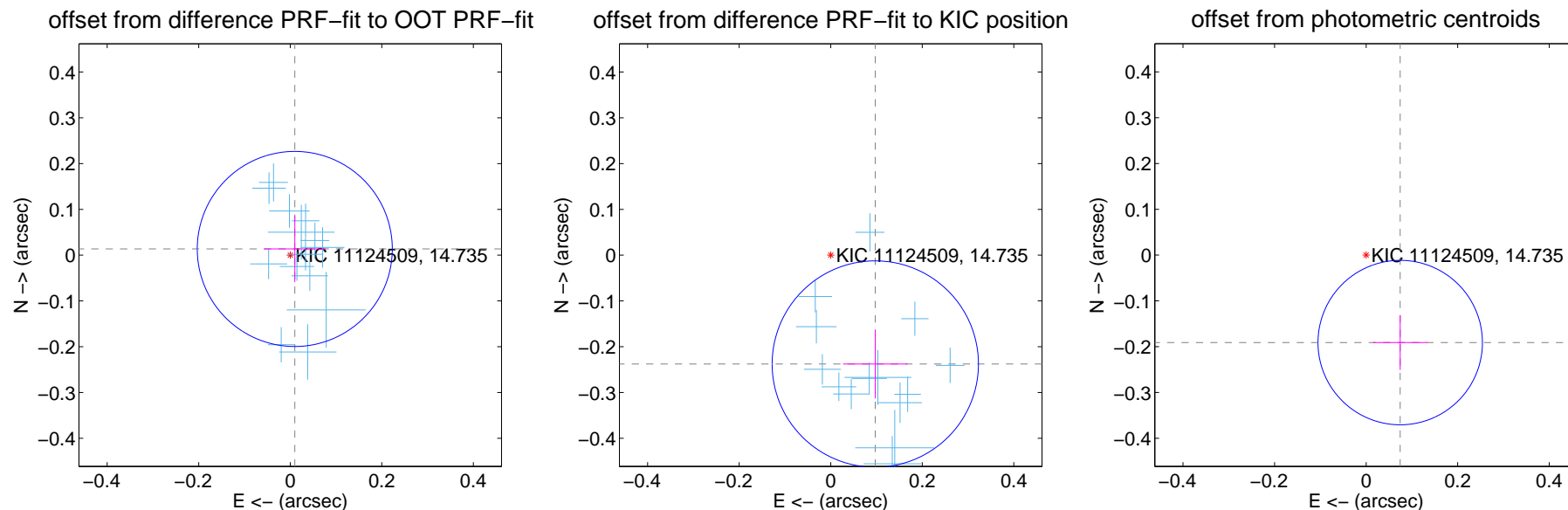
## DV Centroid Data

Supplemental centroid analysis for 011124509-01. Kepler magnitude: 14.73. Transit SNR 172.76

There are 14 quarters with good PRF difference image offsets

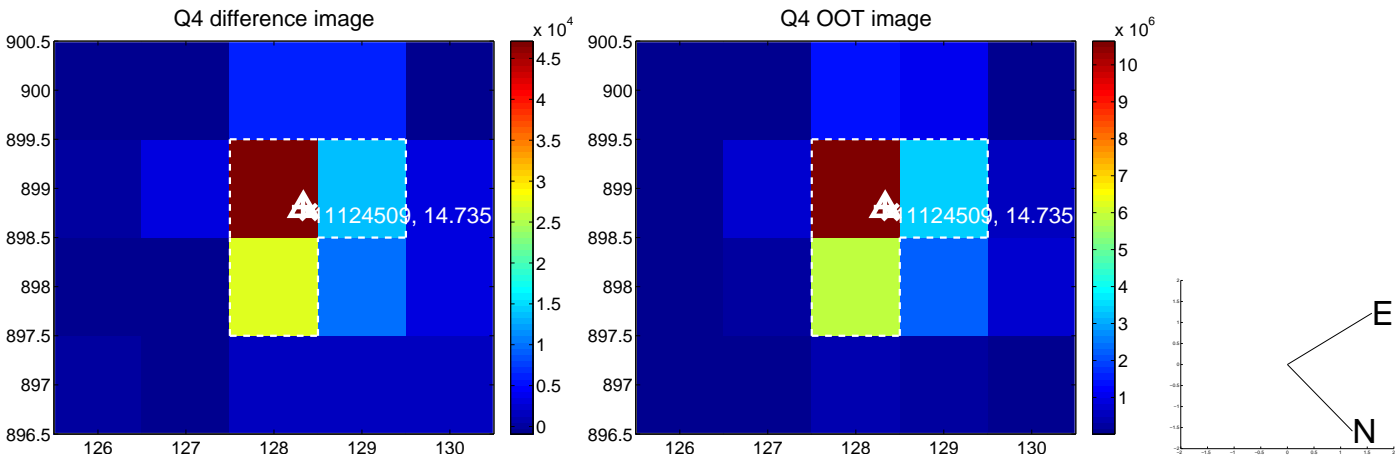
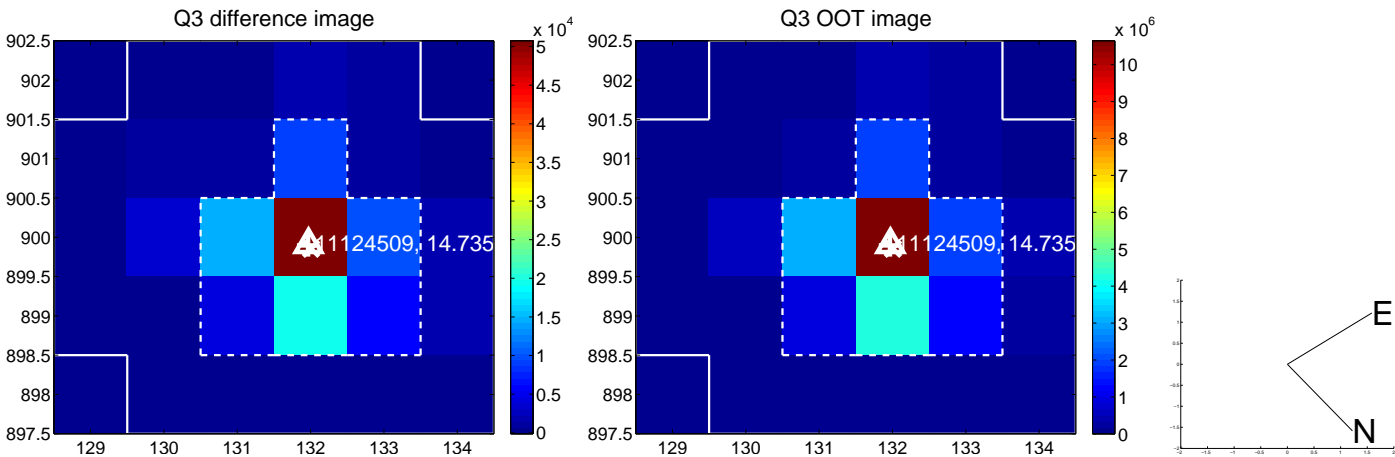
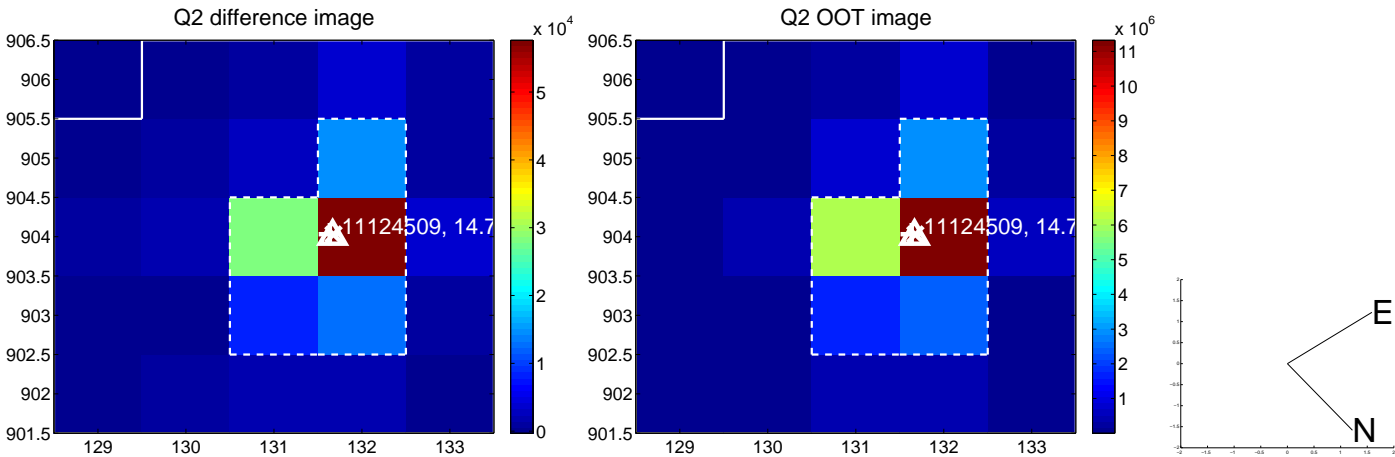
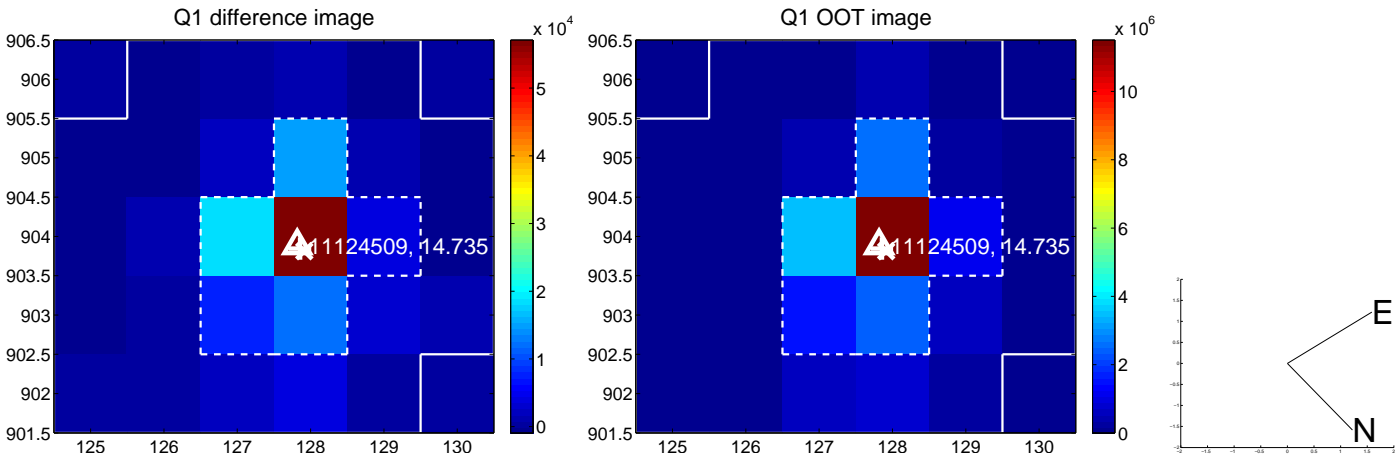
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.017 \pm 0.071$	0.24	$-0.010 \pm 0.068$	$0.014 \pm 0.073$
PRF-fit source offset from KIC position	$0.257 \pm 0.075$	3.42	$-0.097 \pm 0.070$	$-0.238 \pm 0.075$
photometric centroid source offset	$0.21 \pm 0.06$	3.43	$-0.07 \pm 0.06$	$-0.19 \pm 0.06$



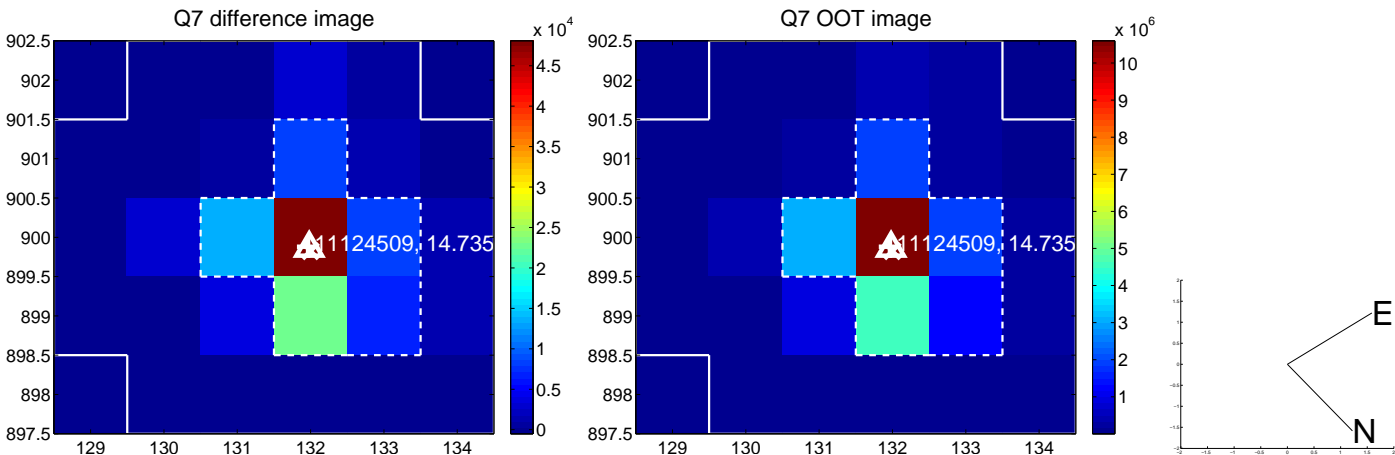
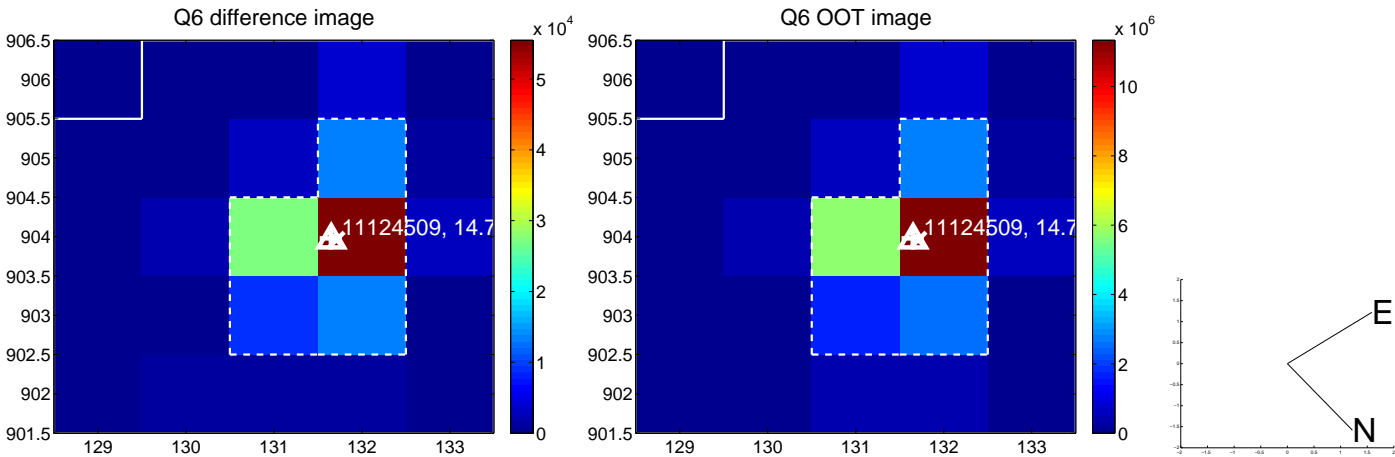
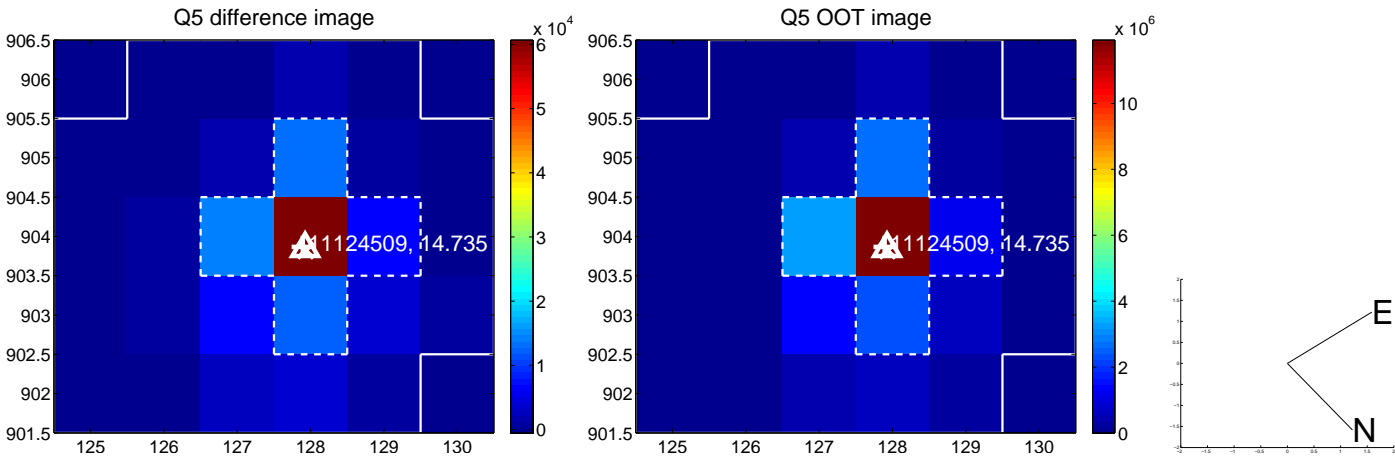
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

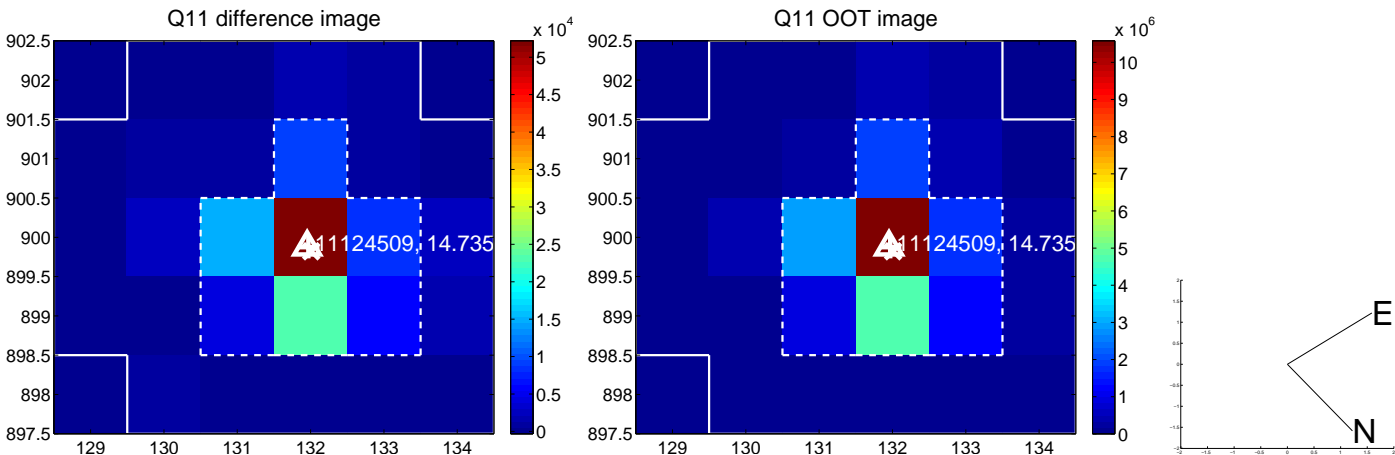
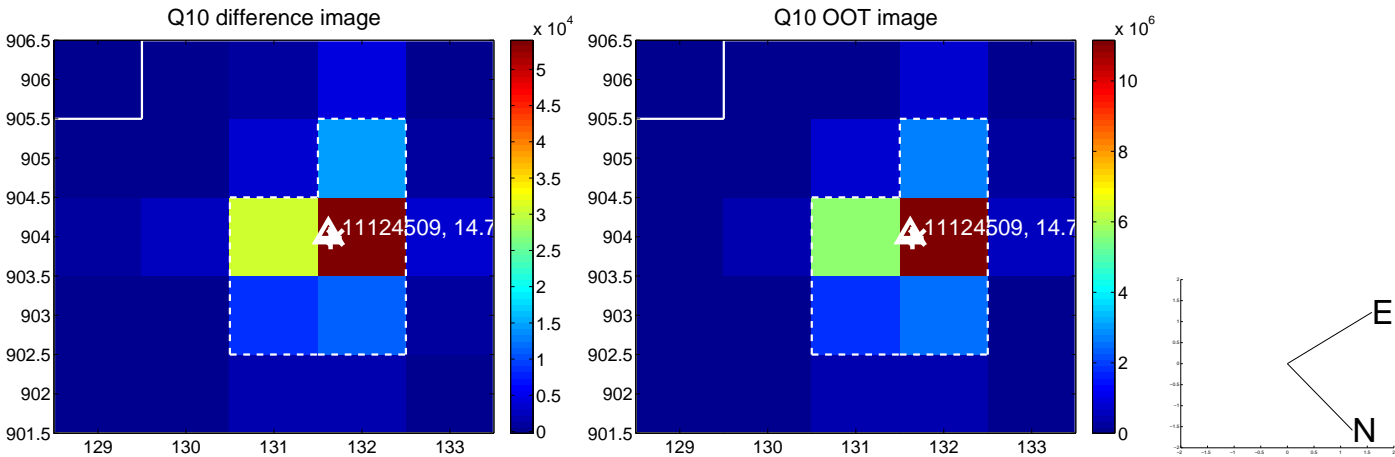
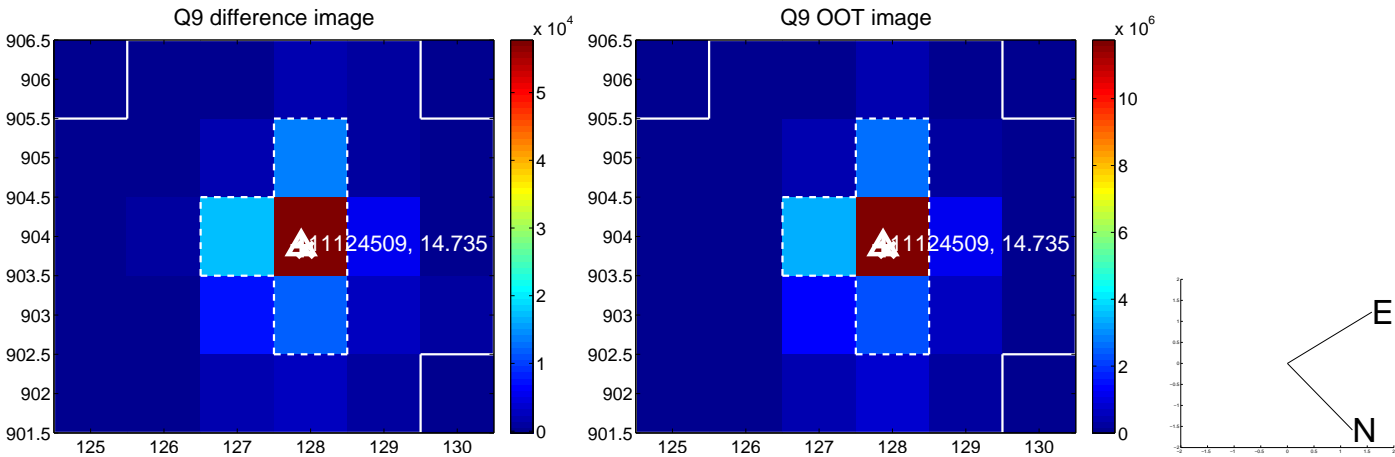




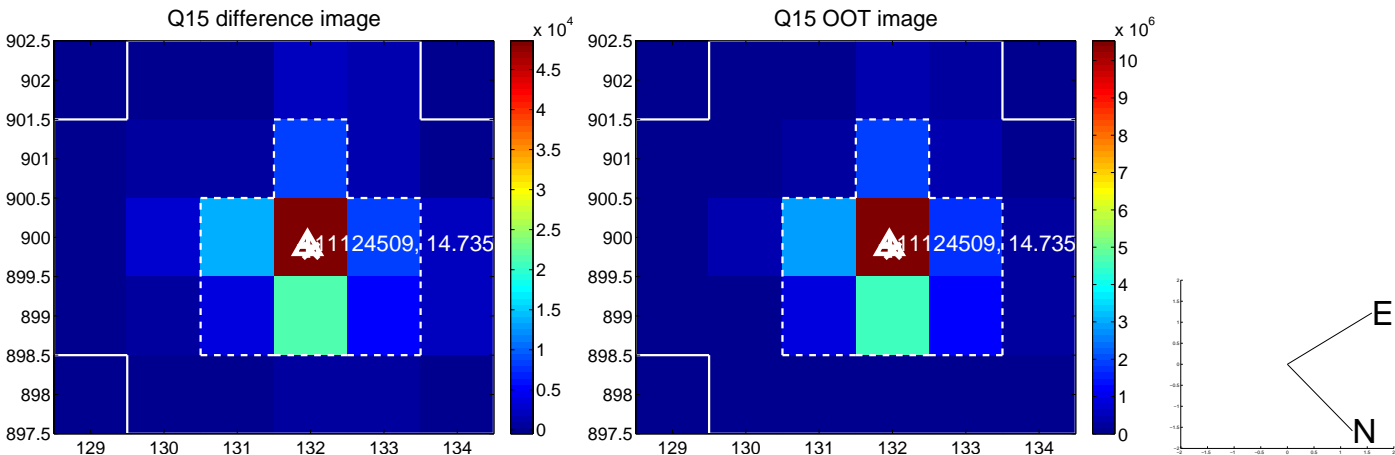
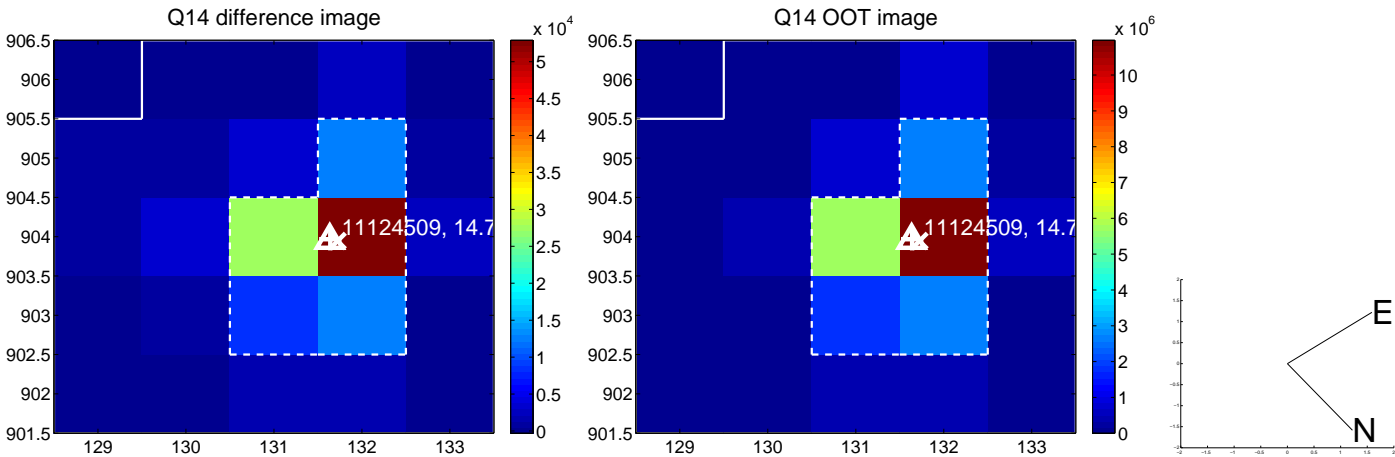
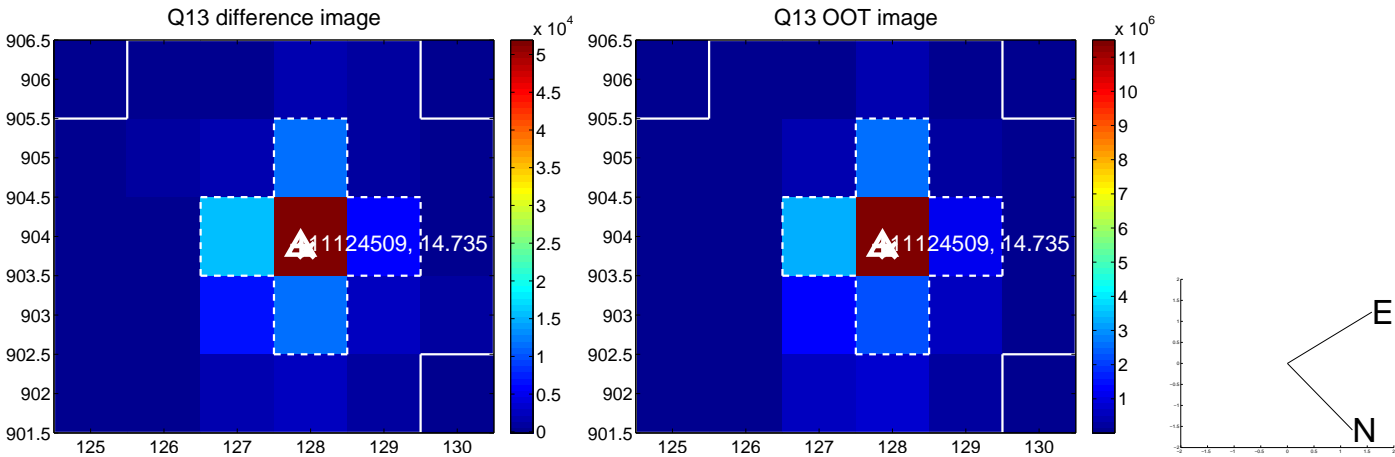
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



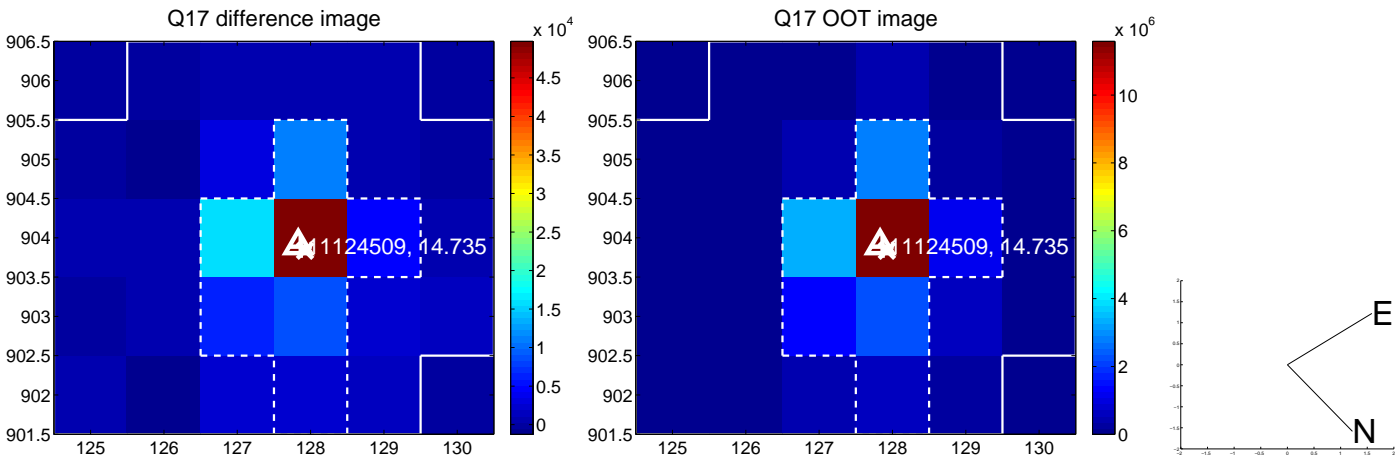
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



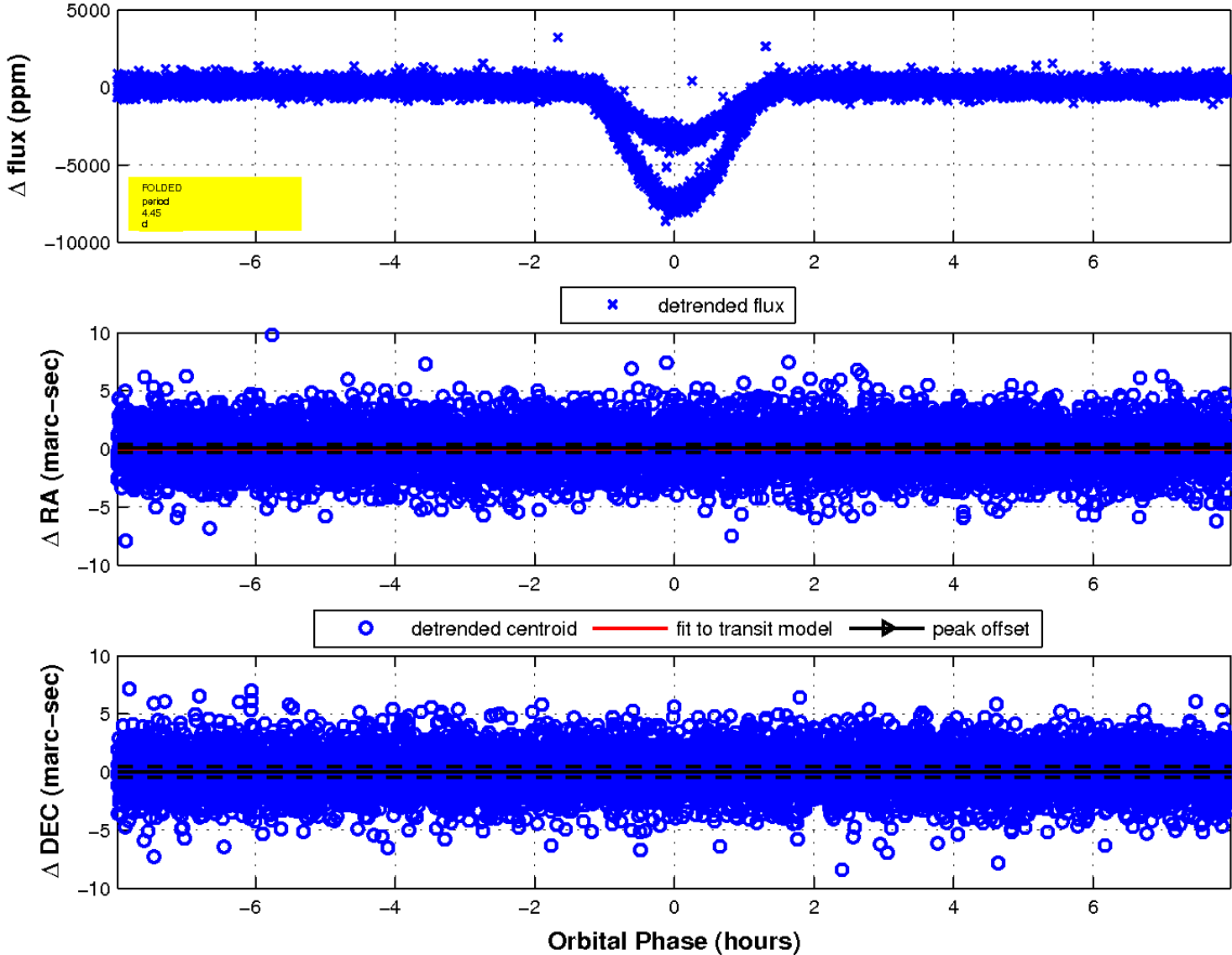
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

