

# KIC 004144236

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004144236-01	OBS	6109.01	22.913440	140.646822	247999.9	4.152	20960.9	8354.5	1.30	6621	83.05	102.43

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004144236-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED

**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.

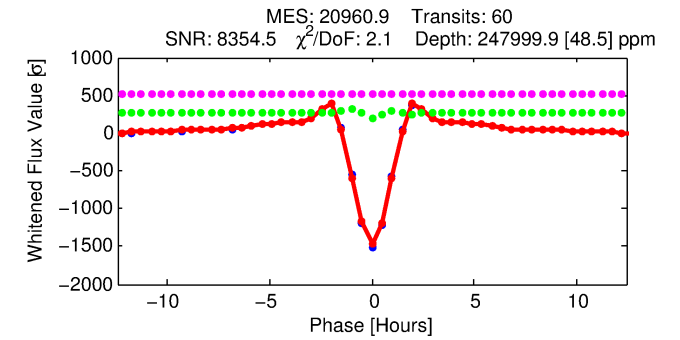
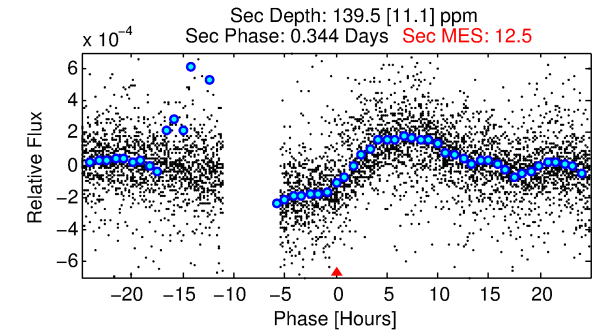
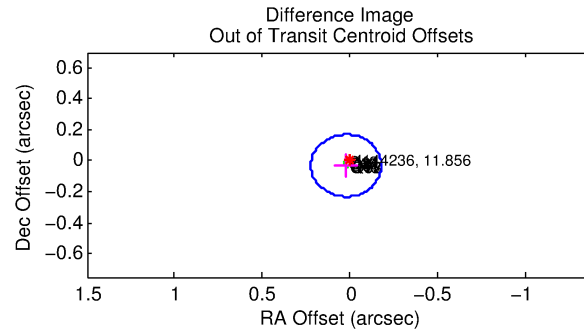
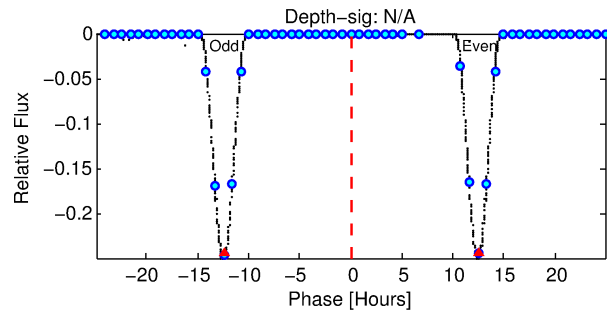
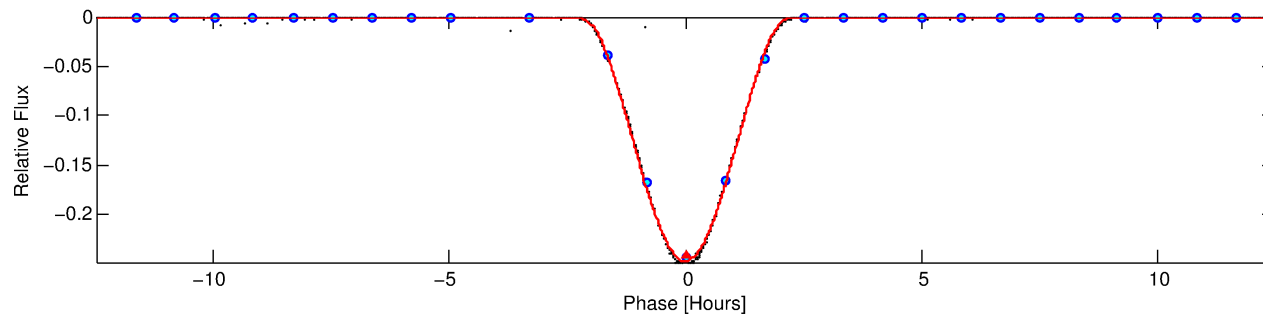
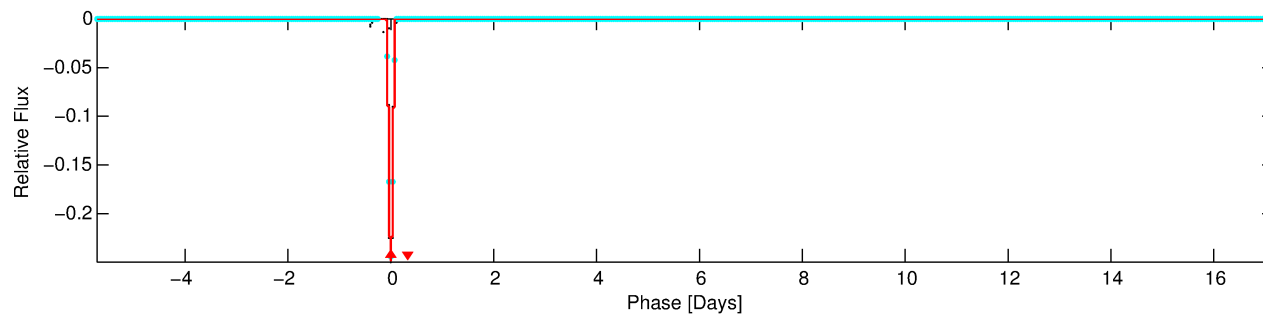
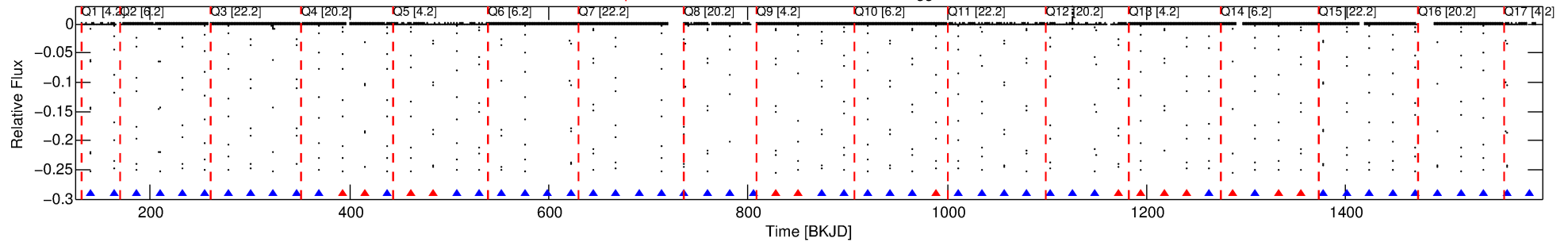
## Ephemeris Match Information For 004144236-01

No Significant Match Found

# DV One-Page Summary

KIC: 4144236 Candidate: 1 of 1 Period: 22.913 d  
KOI: K06109.01 Corr: 0.998

Kp: 11.86 R\*: 1.30 Rs Teff: 6621.0 K Logg: 4.29 Fe/H: -0.180



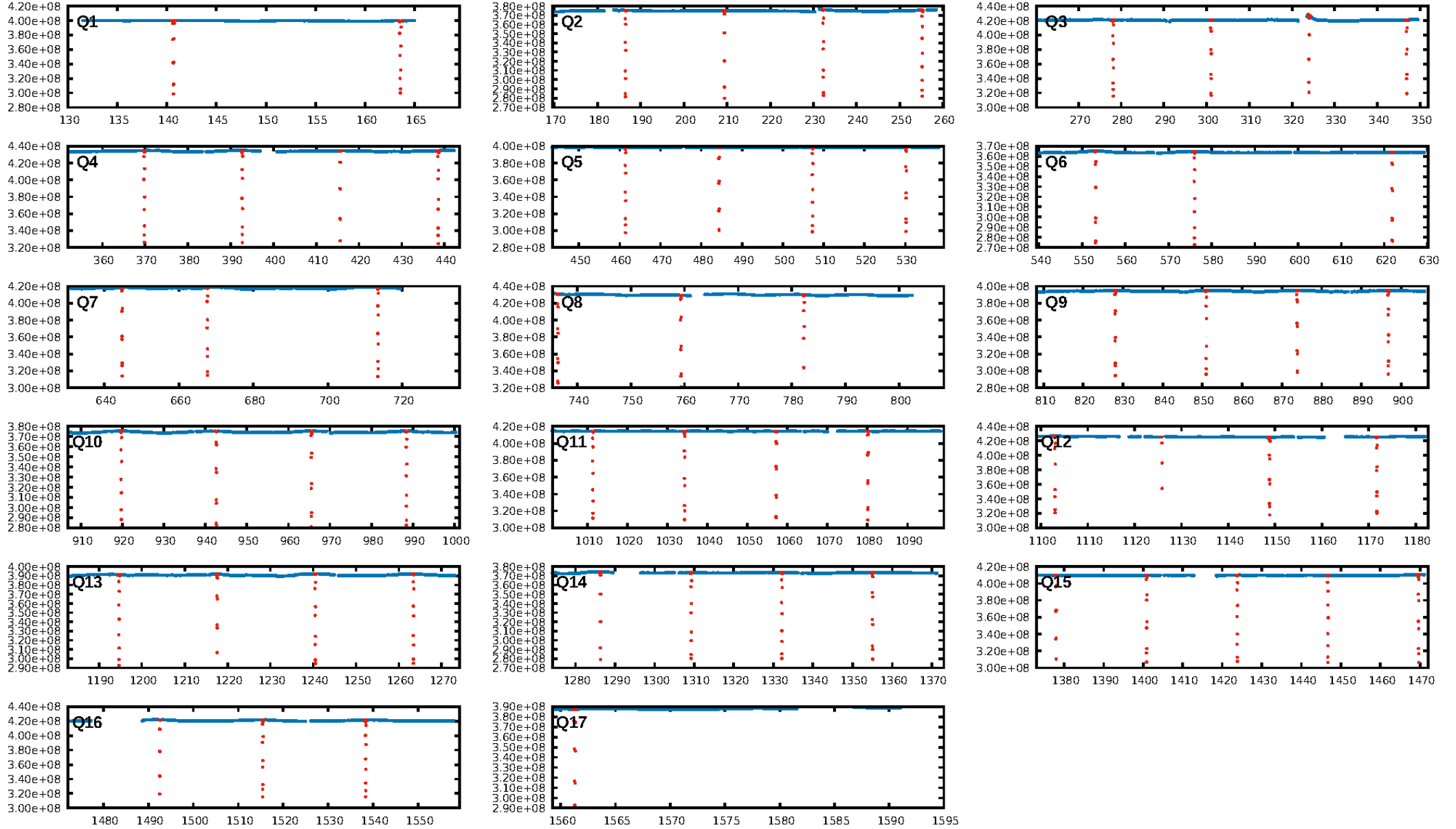
## DV Fit Results:

Period = 22.91344 [0.00000] d  
Epoch = 140.6468 [0.0000] BKJD  
Rp/R\* = 0.5868 [0.0126]  
a/R\* = 59.29 [0.18]  
b = 0.74 [0.02]  
Seff = 102.43 [29.49]  
Teq = 811 [58] K  
Rp = 83.05 [18.14] Re  
a = 0.1682 [0.0302] AU  
Ag = 0.31 [0.09] [-8.01σ]  
Teffp = 939 [37] K [1.85σ]

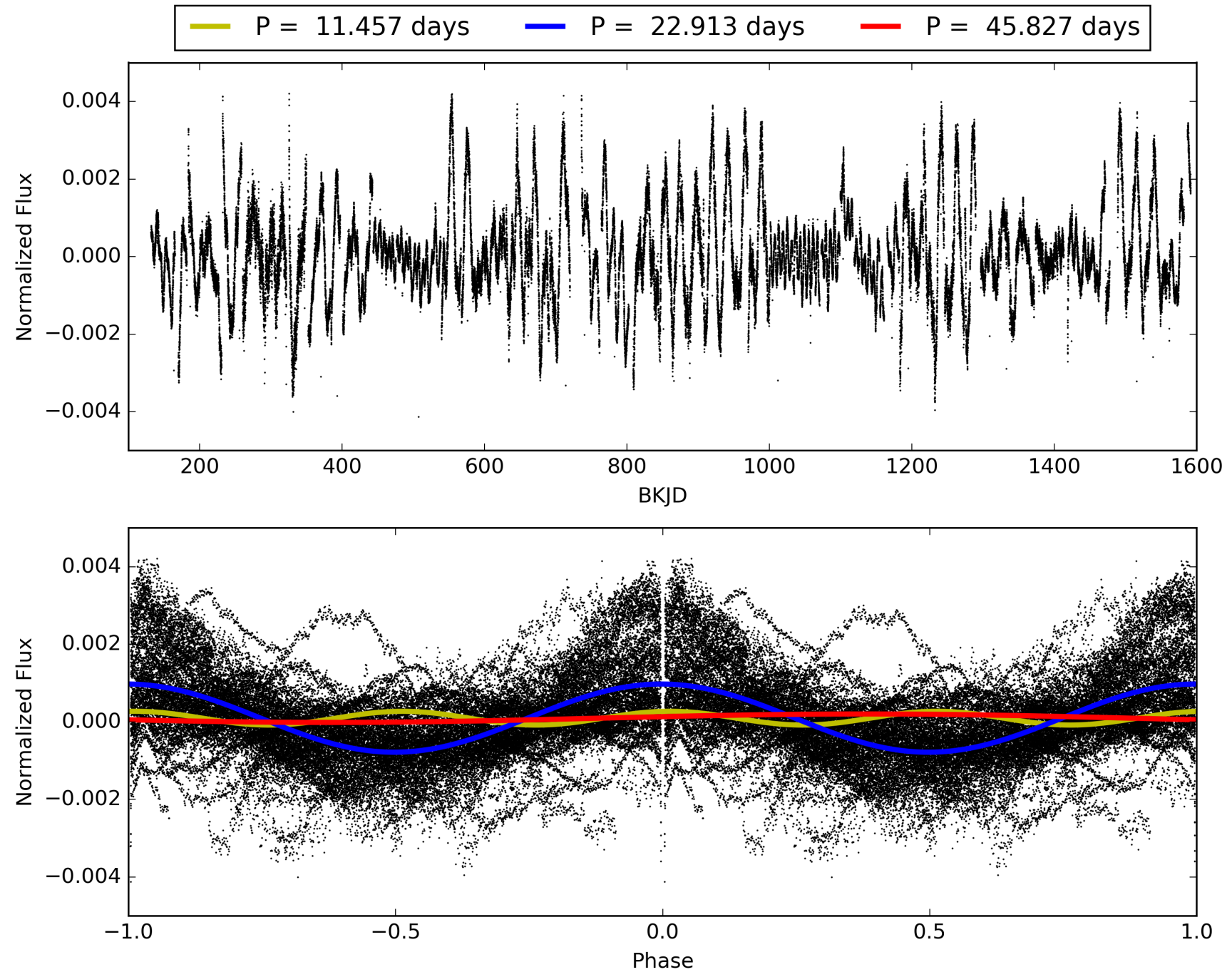
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.75 [43/57]  
GhostDiagnostic-chr: 10.42  
Centroid-sig: 0.0%  
Centroid-so: 0.192 arcsec [614.29σ]  
OotOffset-rm: 0.039 arcsec [0.58σ]  
KicOffset-rm: 0.097 arcsec [1.45σ]  
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 004144236-01, PDC Light Curves

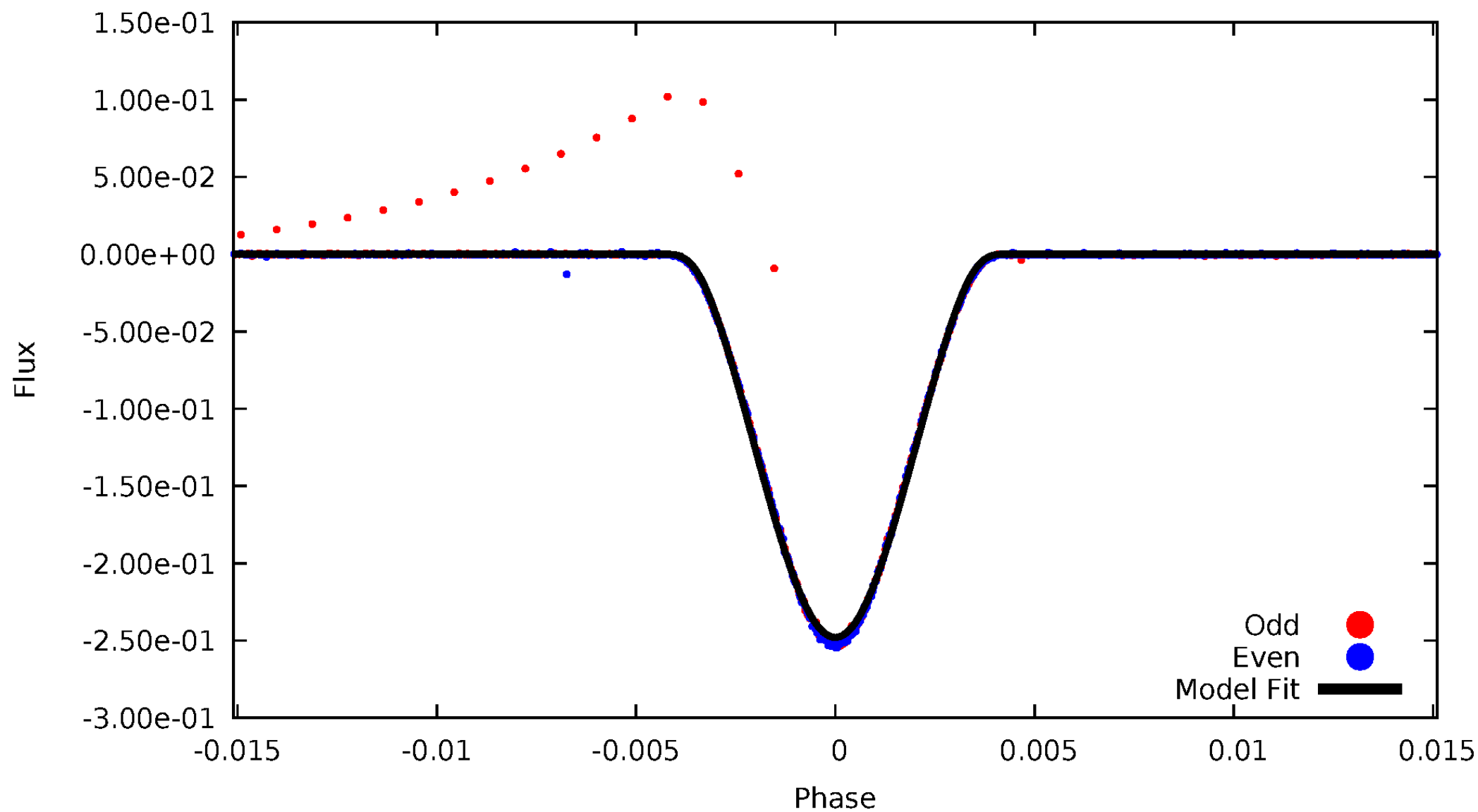


TCE 004144236-01



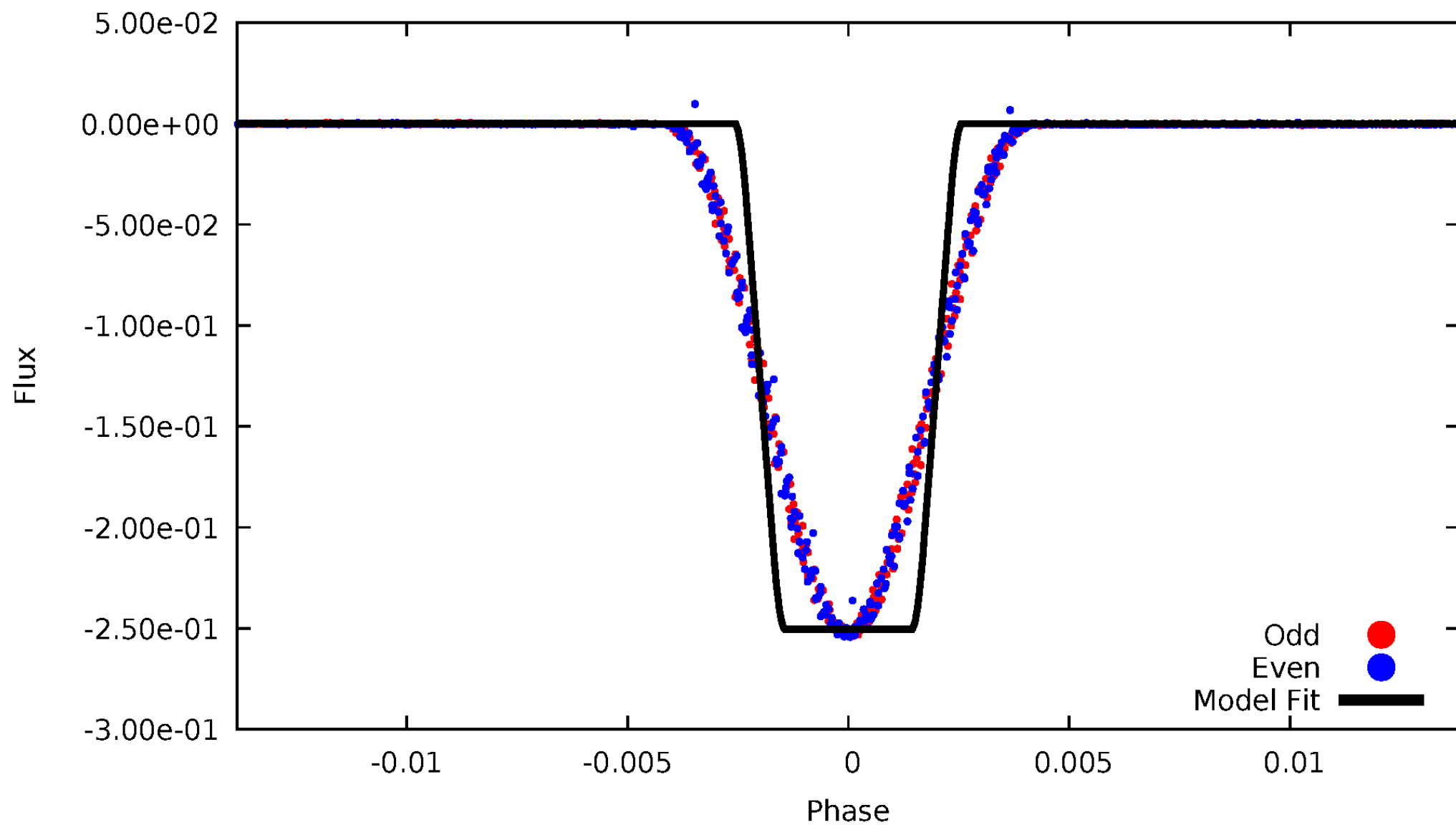
# DV Odd/Even

TCE 004144236-01



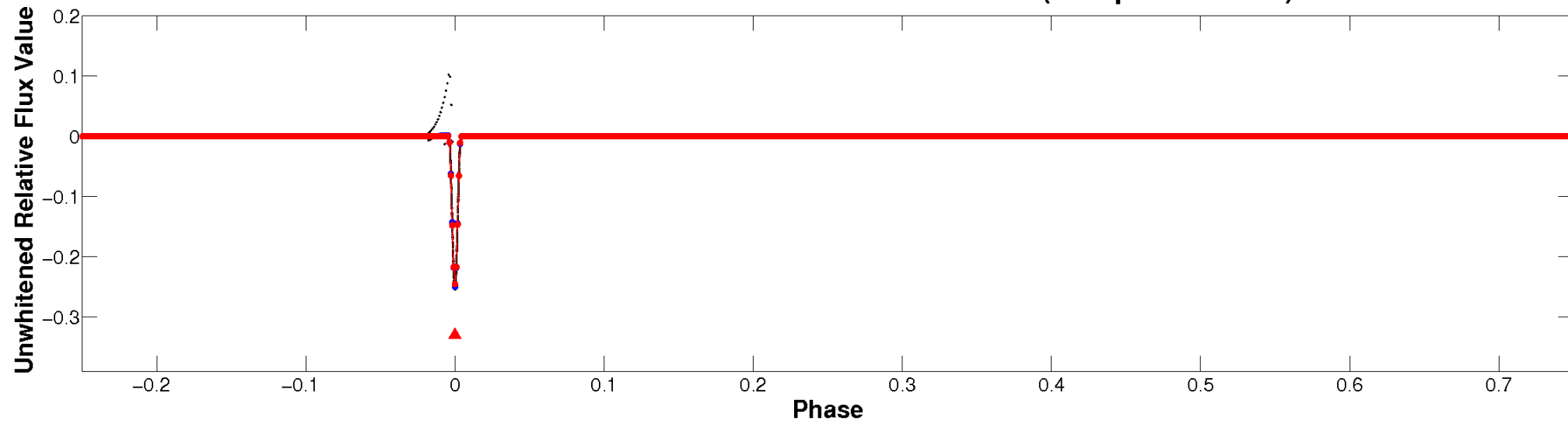
# ALT Odd/Even

TCE 004144236-01

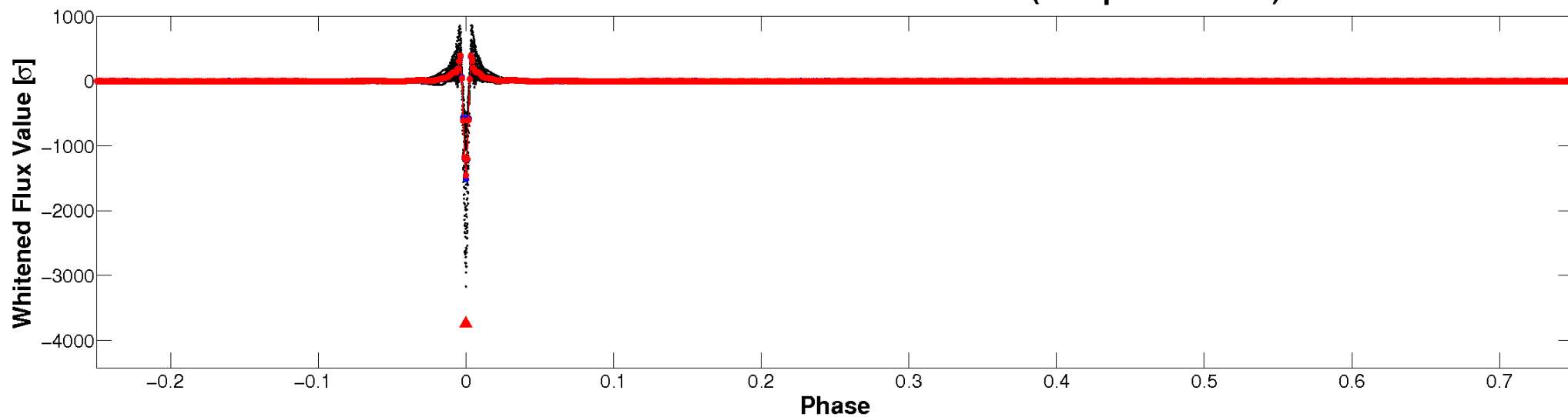


# Non-Whitened Vs. Whitened Light Curve

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

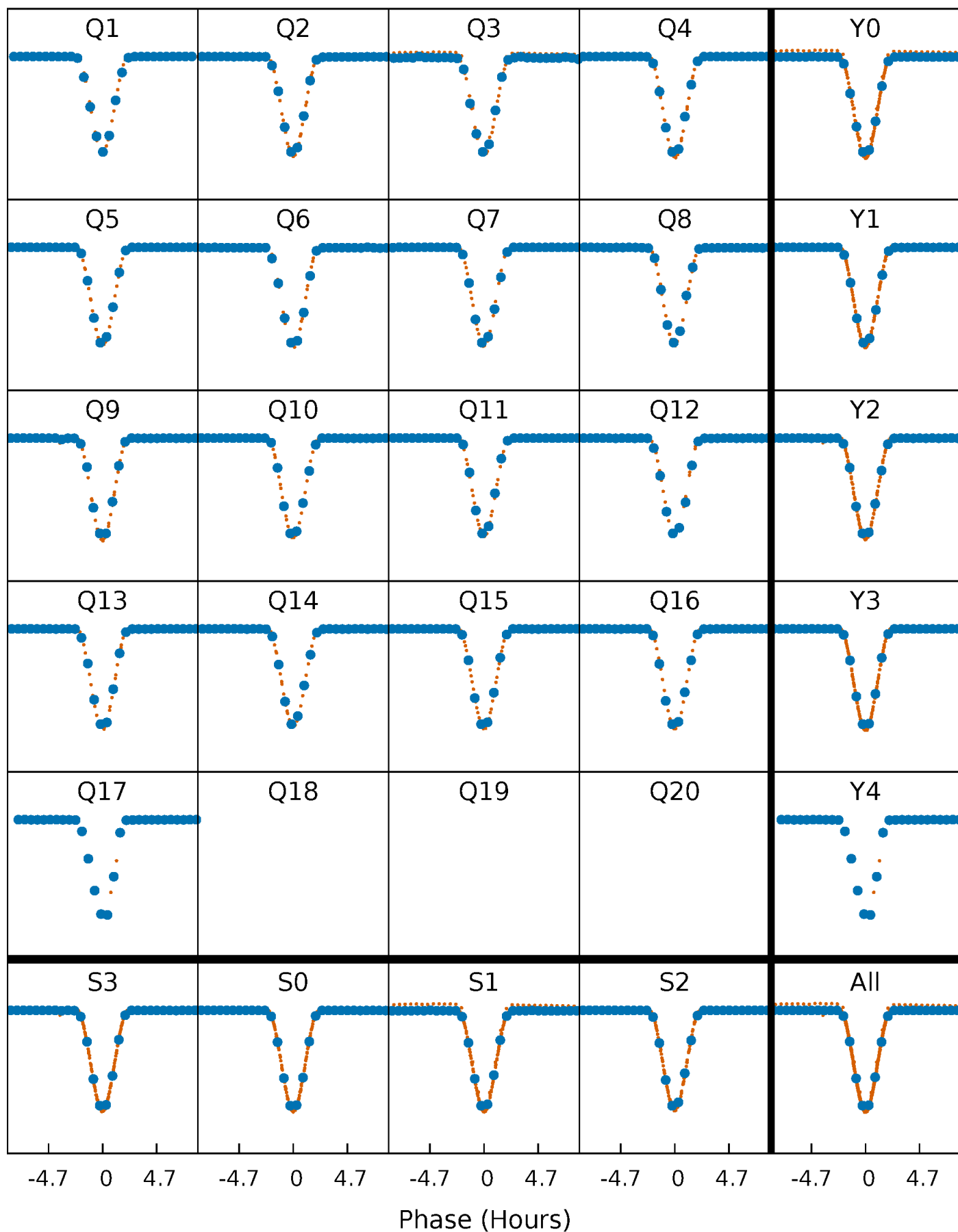


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

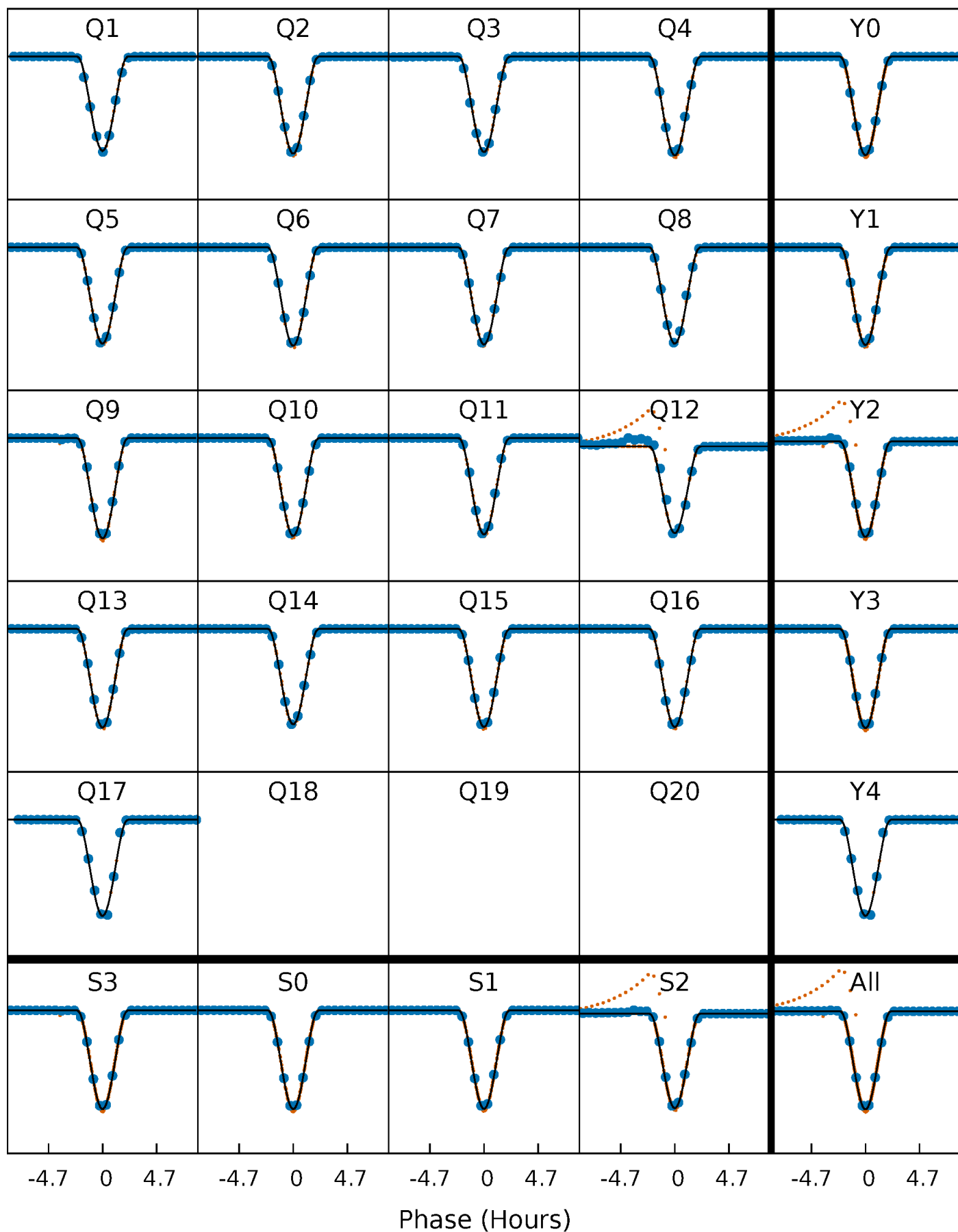
TCE 004144236-01 P= 22.913440 Days  $T_0=140.646822$  (BKJD)





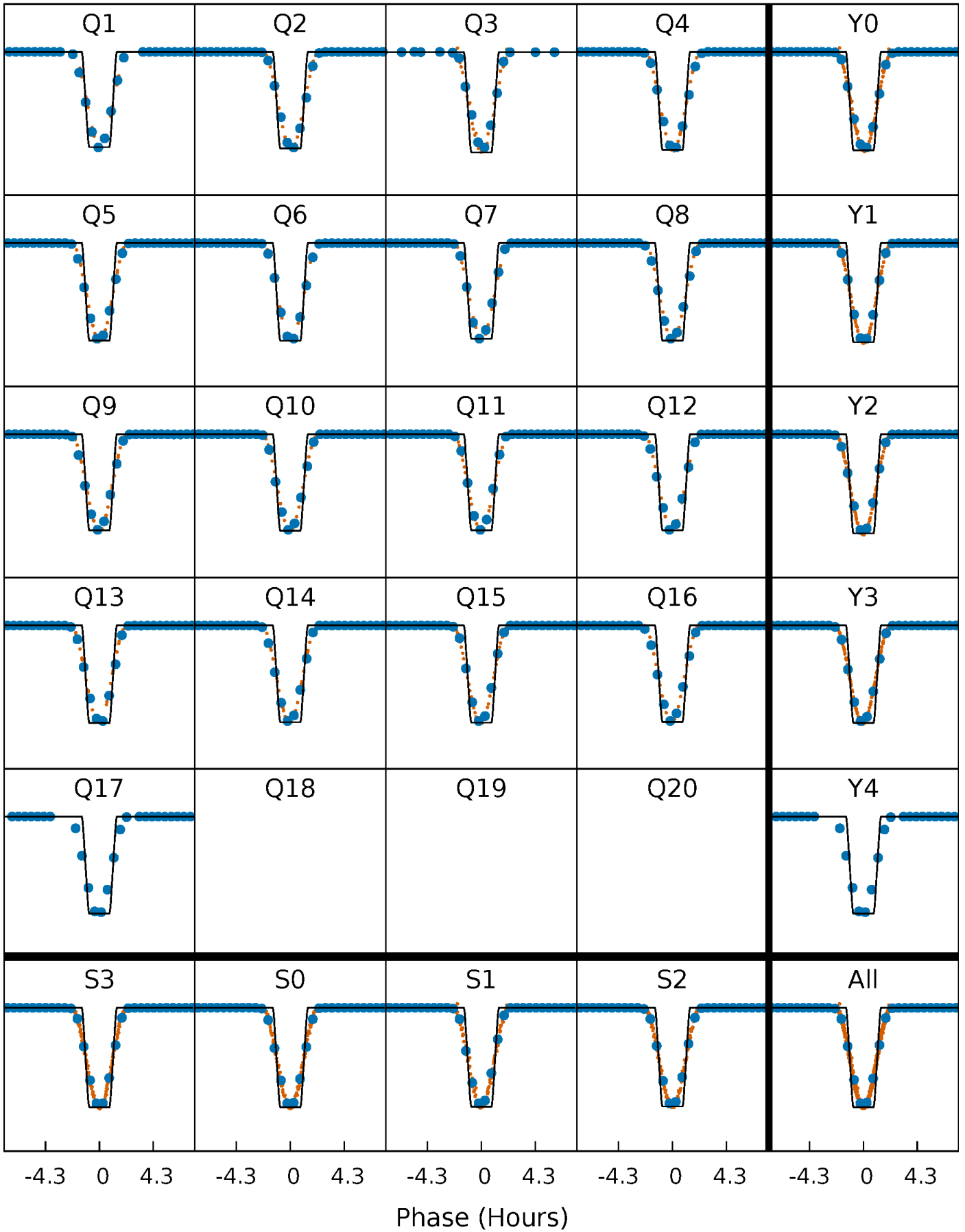
# DV Quarter-Phased Transit Curves

TCE 004144236-01 P= 22.913440 Days  $T_0=140.646822$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

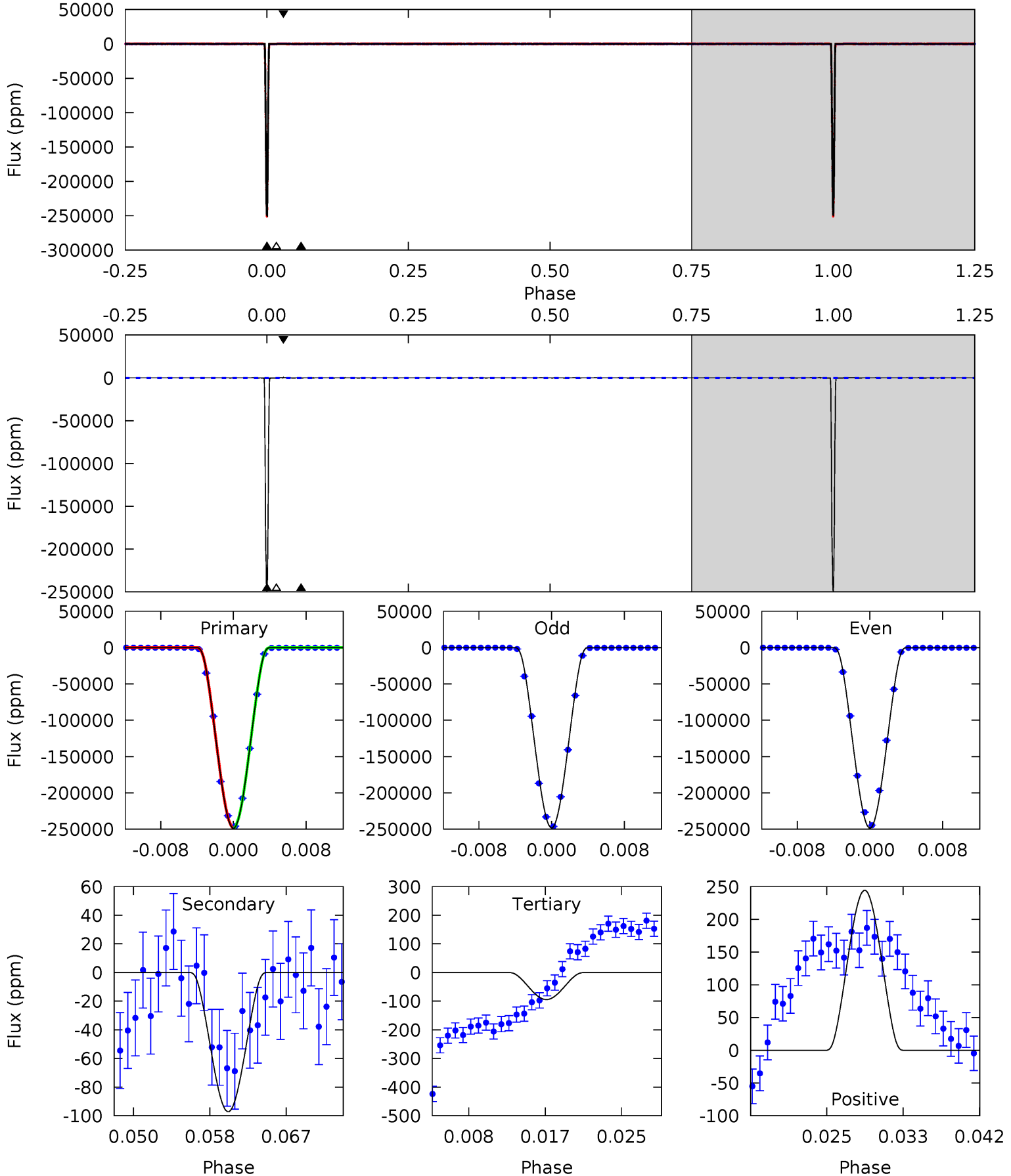
TCE 004144236-01 P= 22.913554 Days  $T_0=140.643574$  (BKJD)



# DV Model-Shift Uniqueness Test

004144236-01, P = 22.913440 Days, E = 117.733382 Days

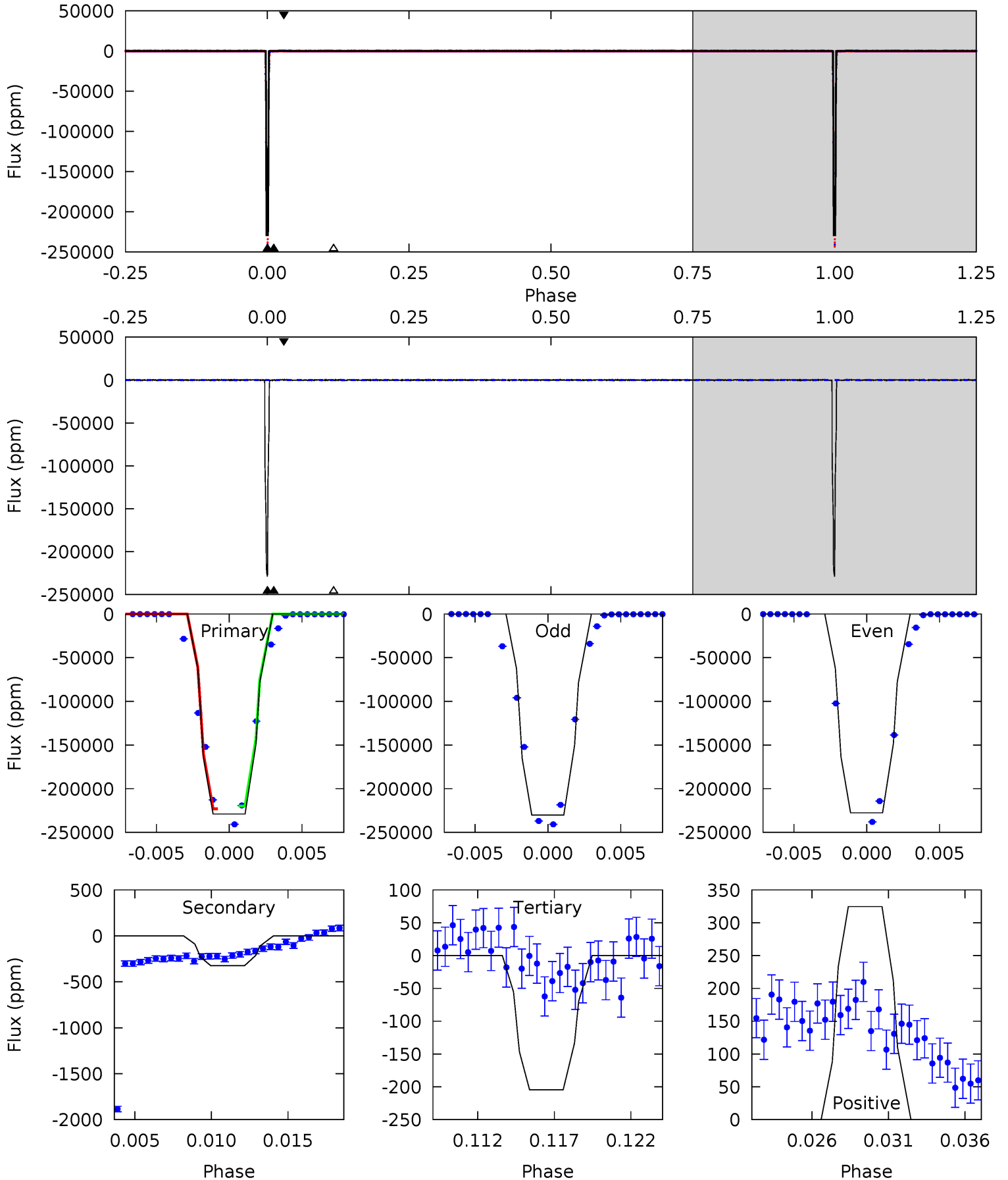
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23346	9.13	8.86	22.9	5.06	2.64	4.17	23337	23323	0.27	-13.8	16.2	0.98	0.00	0



# Alt Model-Shift Uniqueness Test

004144236-01, P = 22.913554 Days, E = 117.730020 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
5429	7.71	4.85	7.70	5.15	2.80	1.32	5425	5422	2.87	0.02	27.5	0.99	0.00	0



### Stellar Parameters For KIC 004144236

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6621^{+149}_{-216}$	$4.294^{+0.092}_{-0.138}$	$-0.180^{+0.250}_{-0.300}$	$1.297^{+0.282}_{-0.188}$	$1.213^{+0.142}_{-0.174}$	$0.784^{+0.329}_{-0.321}$
	+2%/-3%	+2%/-3%	+139%/-167%	+22%/-14%	+12%/-14%	+42%/-41%
Source	PHO1	FLK73	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 004144236-01 / KOI 6109.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-97 \pm 11$	$83.05^{+10.16}_{-7.26}$	$1135^{+62}_{-52}$	$-1725^{+139}_{-92}$	$0.213^{+0.048}_{-0.041}$
Alt.	$-325 \pm 42$	$71.28^{+8.49}_{-6.31}$	$1142^{+58}_{-59}$	$2114^{+54}_{-56}$	$0.980^{+0.247}_{-0.209}$

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

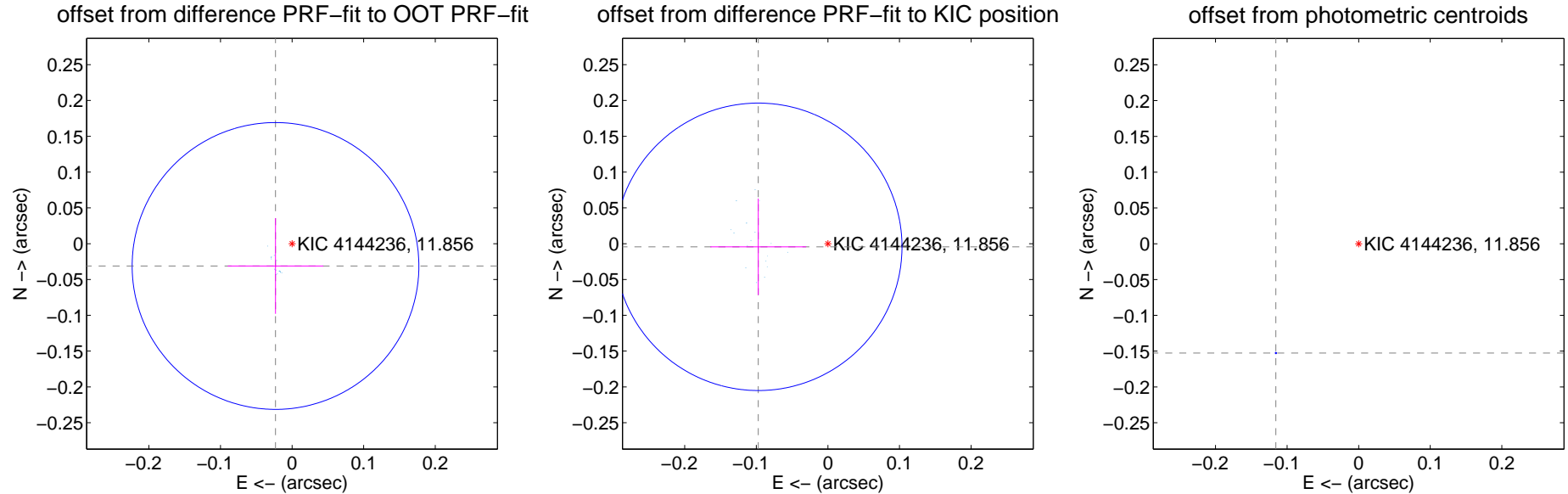
## DV Centroid Data

Supplemental centroid analysis for 004144236-01. **Kepler magnitude: 11.86.** Transit SNR 8354.54

There are 17 quarters with good PRF difference image offsets

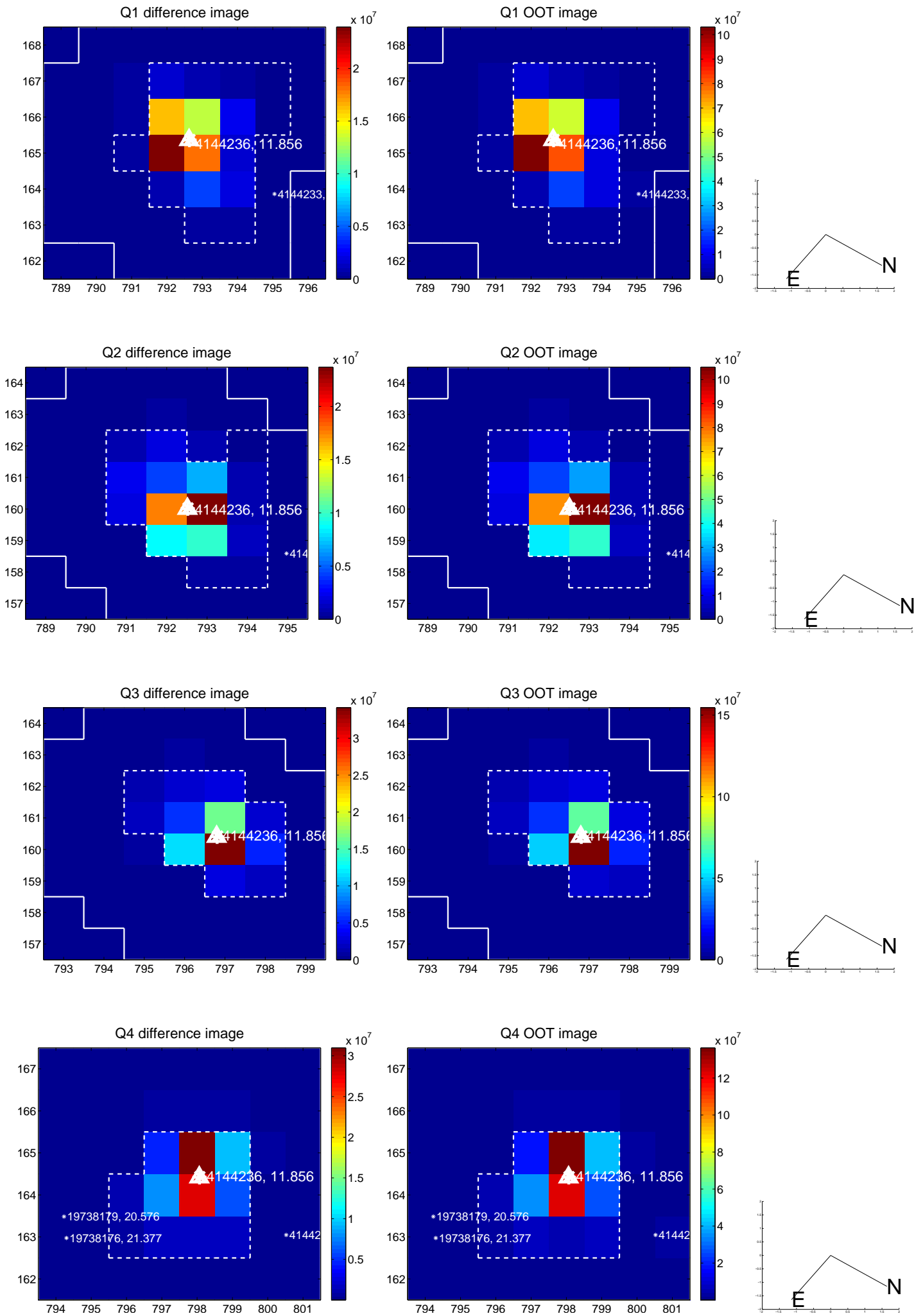
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.039 \pm 0.067$	0.58	$0.023 \pm 0.067$	$-0.031 \pm 0.067$
PRF-fit source offset from KIC position	$0.097 \pm 0.067$	1.45	$0.097 \pm 0.067$	$-0.004 \pm 0.067$
photometric centroid source offset	<b><math>0.19 \pm 0.00</math></b>	<b>614.29</b>	$0.12 \pm 0.00$	$-0.15 \pm 0.00$

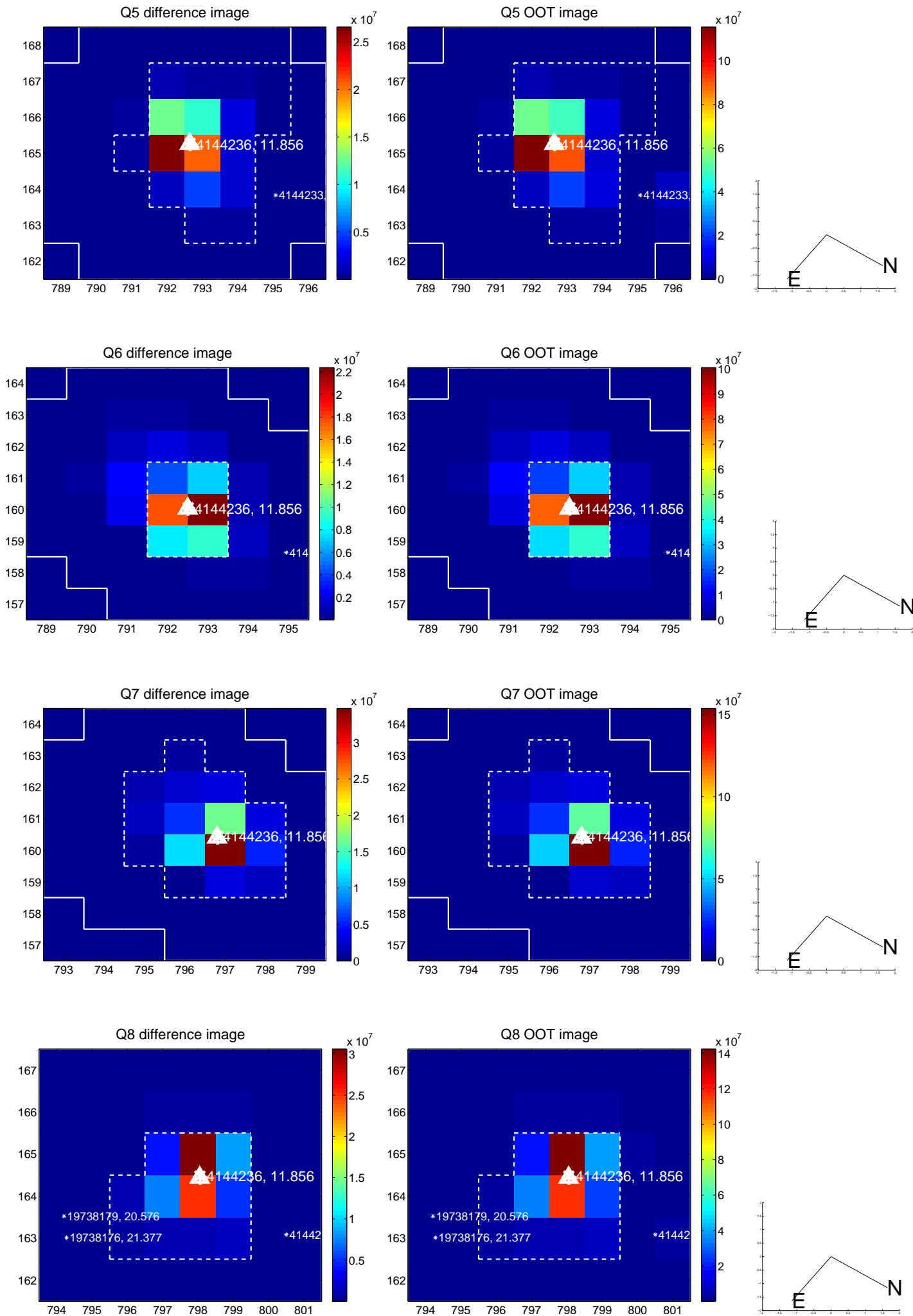


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

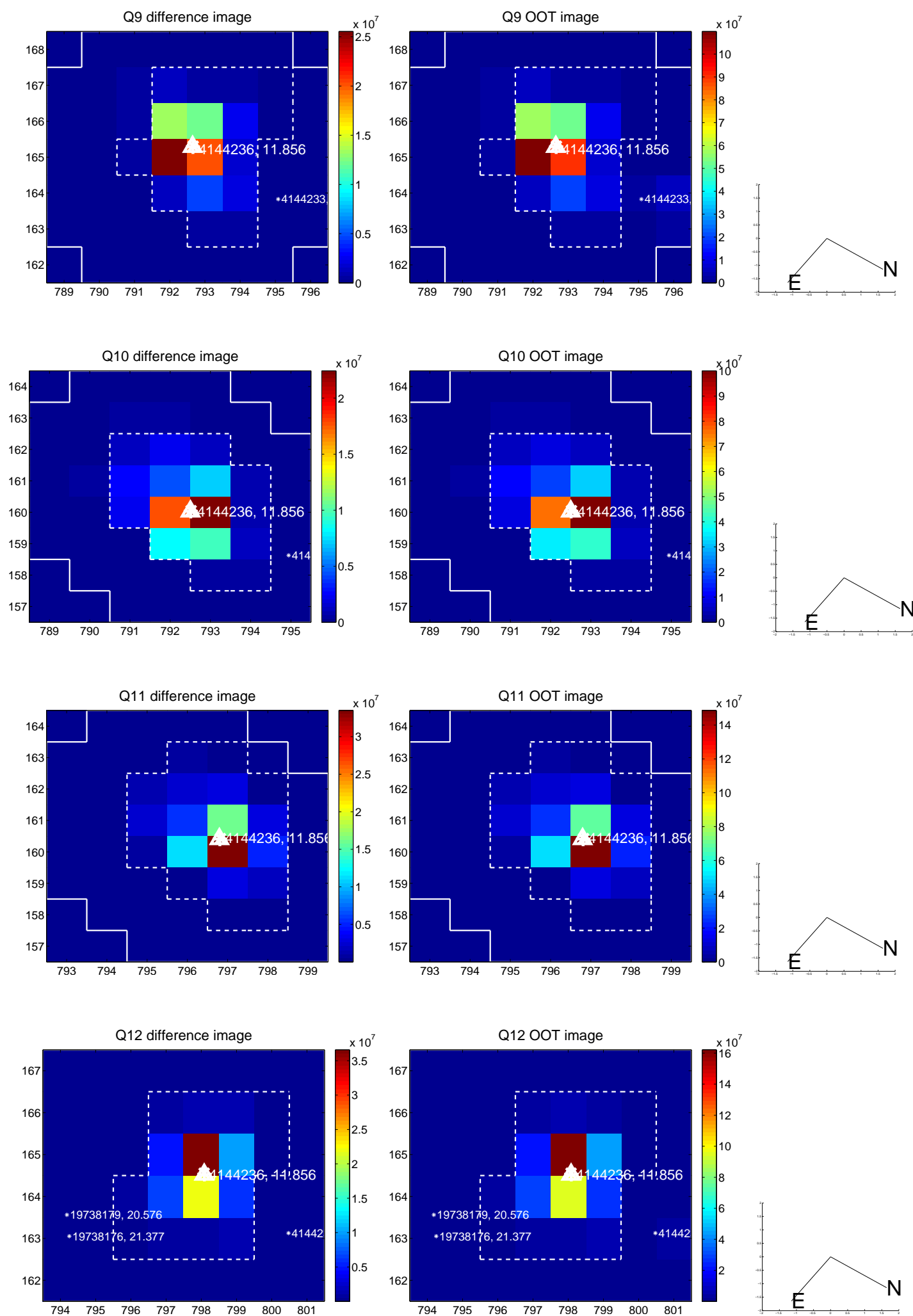


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

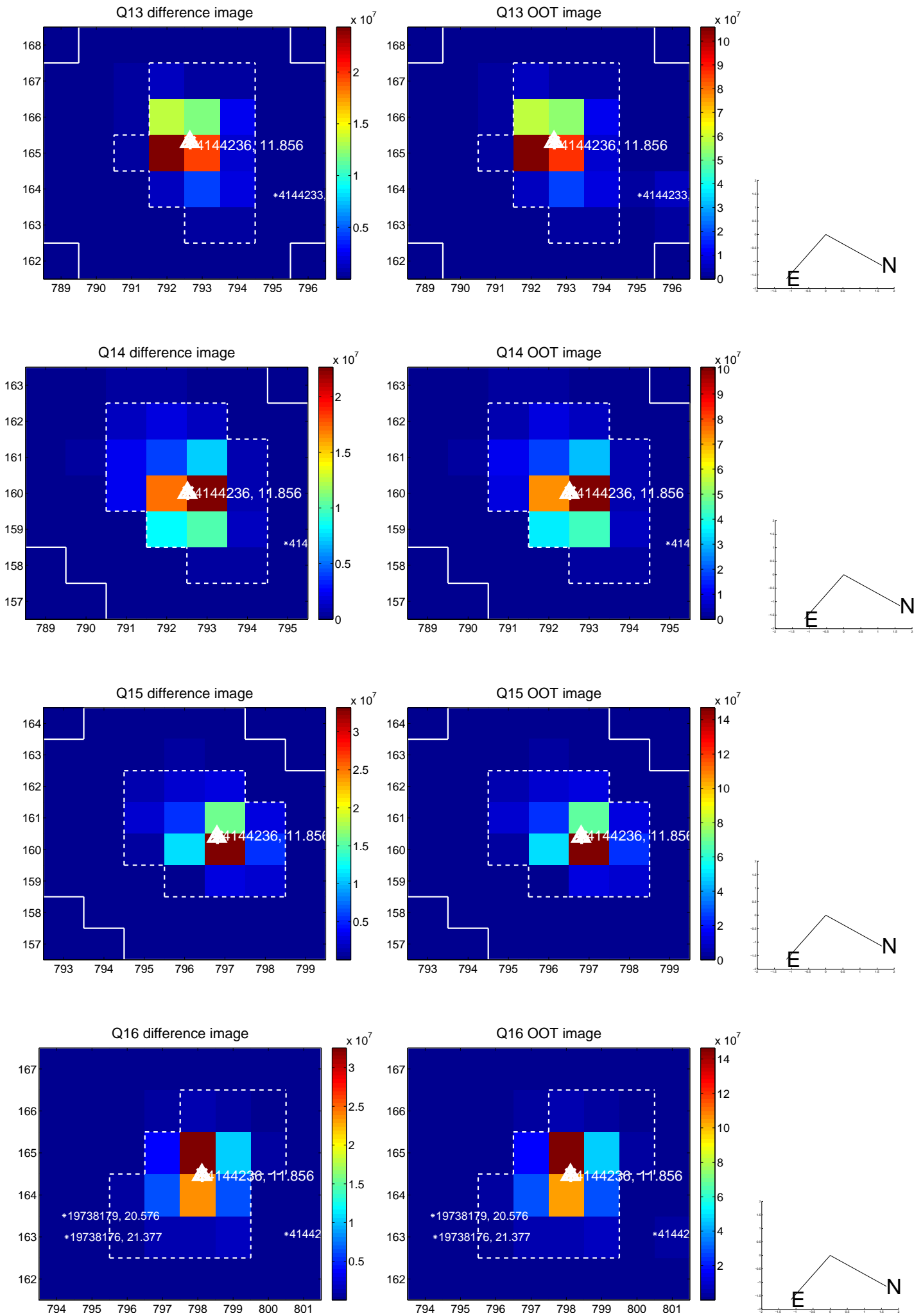




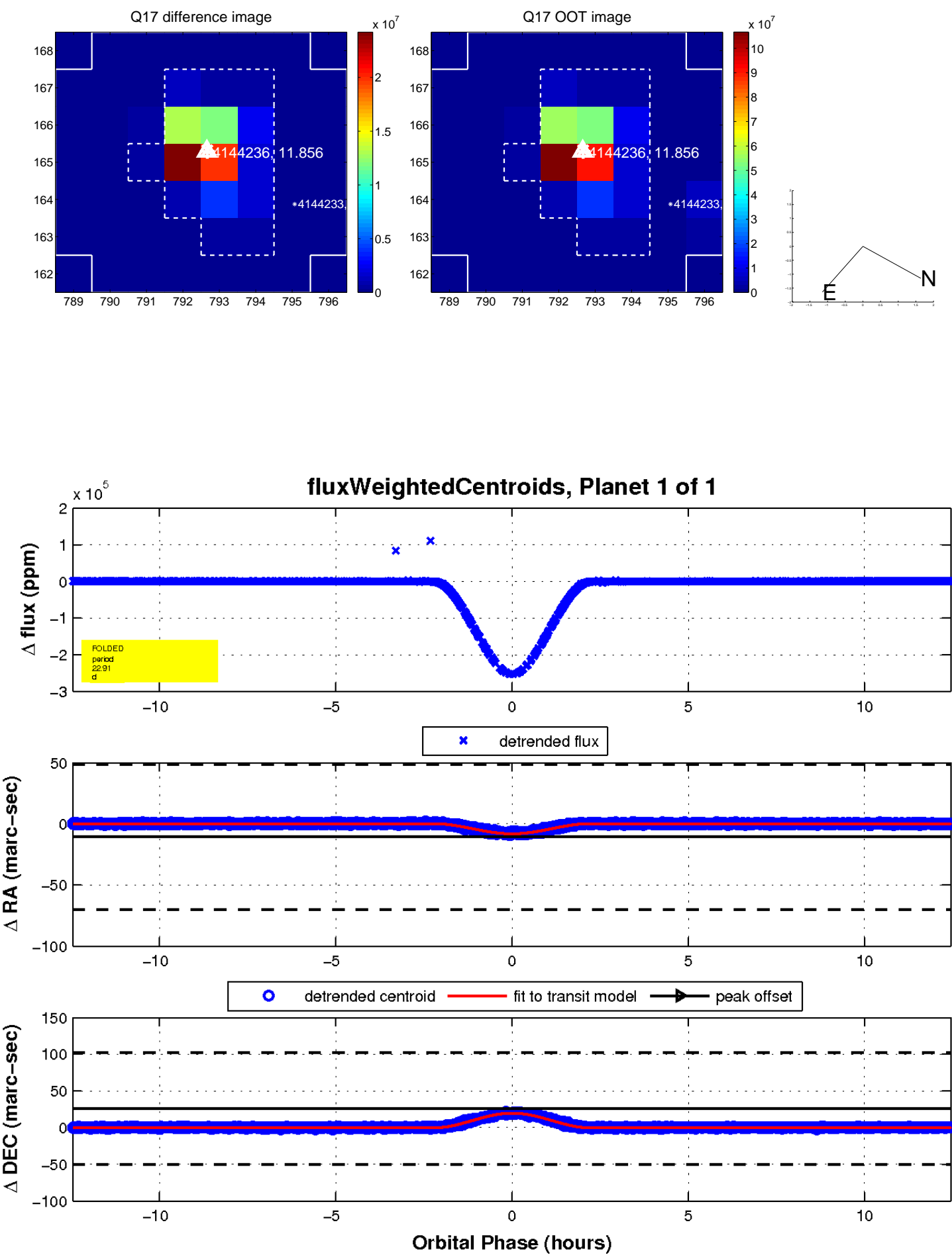
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

