

# KIC 008112013

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008112013-01	OBS	6969.01	1.790523	132.936025	60512.1	3.310	10464.1	8129.4	1.22	6586	32.10	2771.68
008112013-02	OBS	No	219.366029	251.839148	783.2	2.500	17.3	-1.0	1.22	6586	3.44	4.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008112013-01	OBS	PC	0.28	0	0	0	0	NO_COMMENT
008112013-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

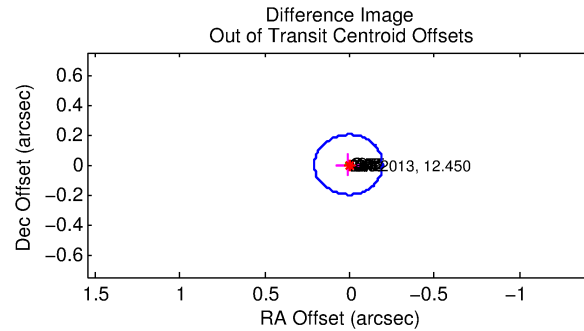
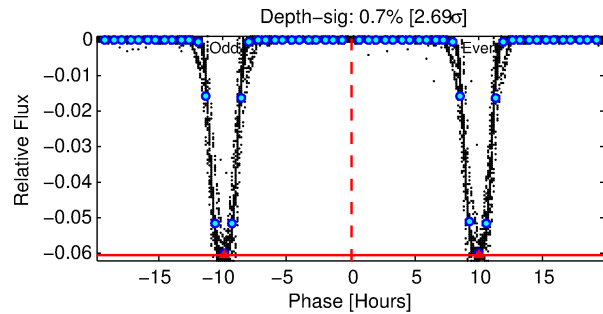
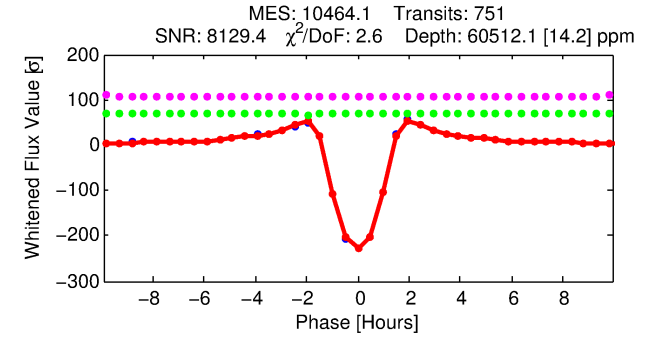
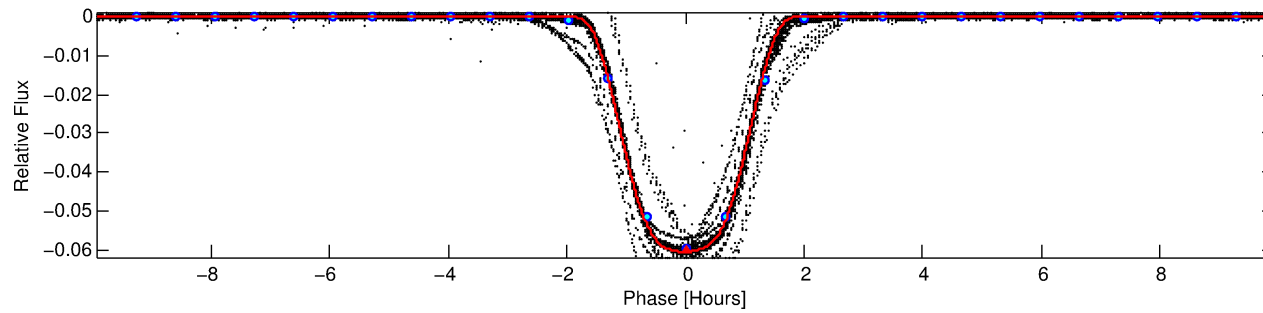
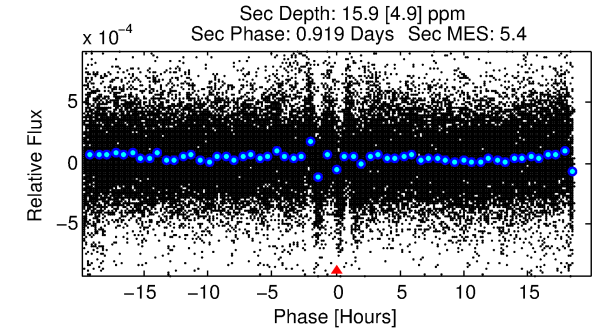
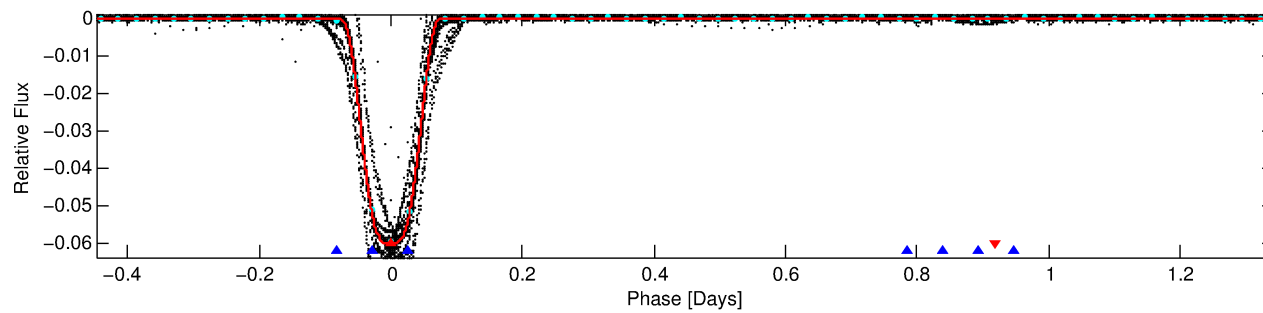
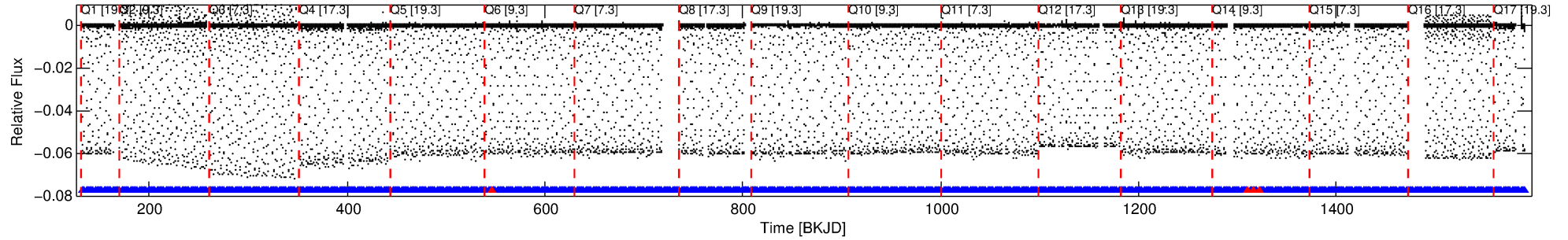
## Ephemeris Match Information For 008112013-01

No Significant Match Found

# DV One-Page Summary

KIC: 8112013 Candidate: 1 of 2 Period: 1.791 d  
KOI: K06969.01 Corr: 0.992

Kp: 12.45 R\*: 1.22 Rs Teff: 6586.0 K Logg: 4.32 Fe/H: -0.320



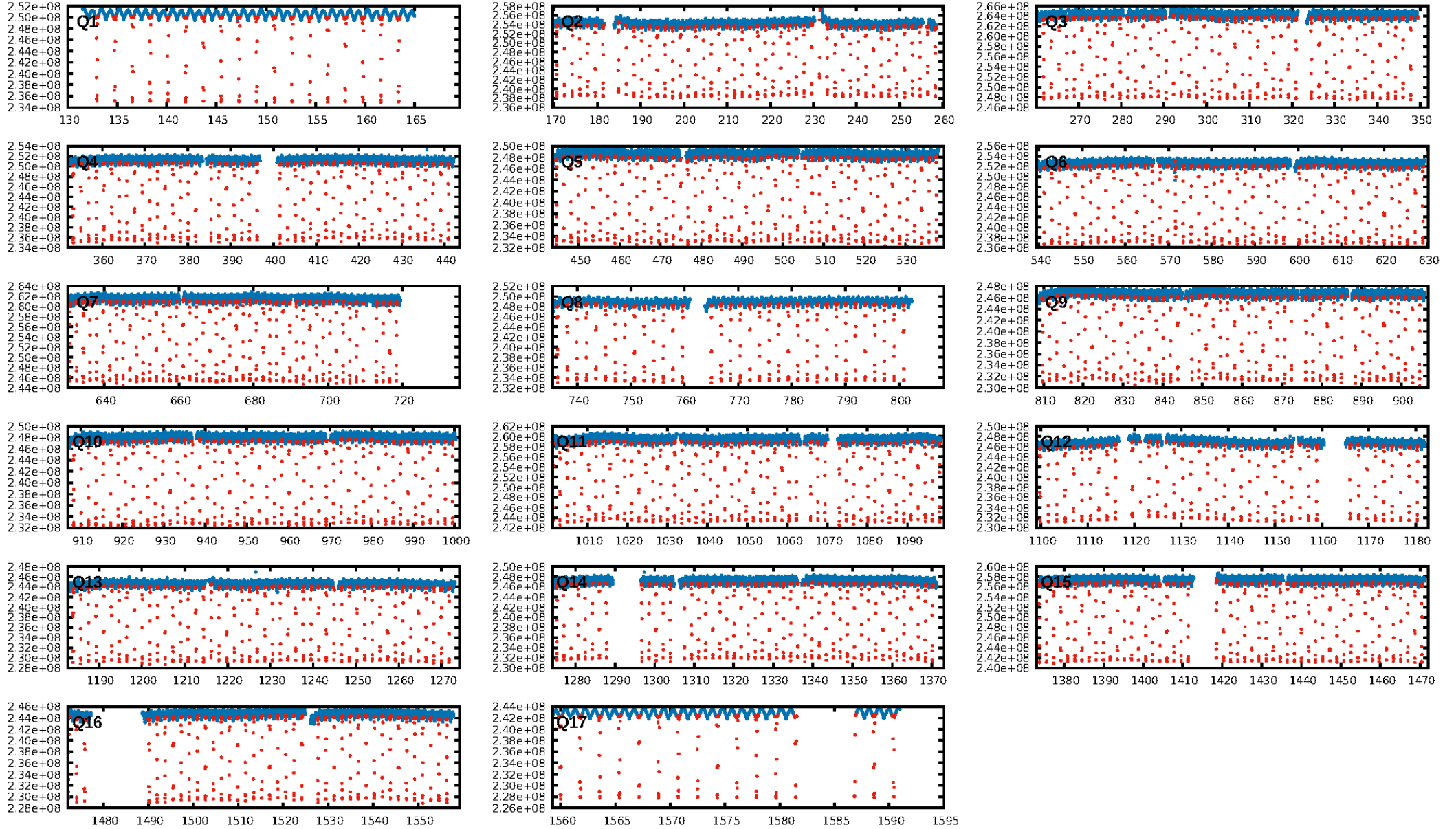
## DV Fit Results:

Period = 1.79052 [0.00000] d  
Epoch = 132.9360 [0.0000] BKJD  
Rp/R\* = 0.2413 [0.0000]  
a/R\* = 4.44 [0.00]  
b = 0.66 [0.00]  
Seff = 2771.68 [1028.93]  
Teq = 1850 [172] K  
Rp = 32.10 [9.64] Re  
a = 0.0301 [0.0074] AU  
Ag = 0.01 [0.00] [-277.50σ]  
Teffp = 846 [70] K [-5.42σ]

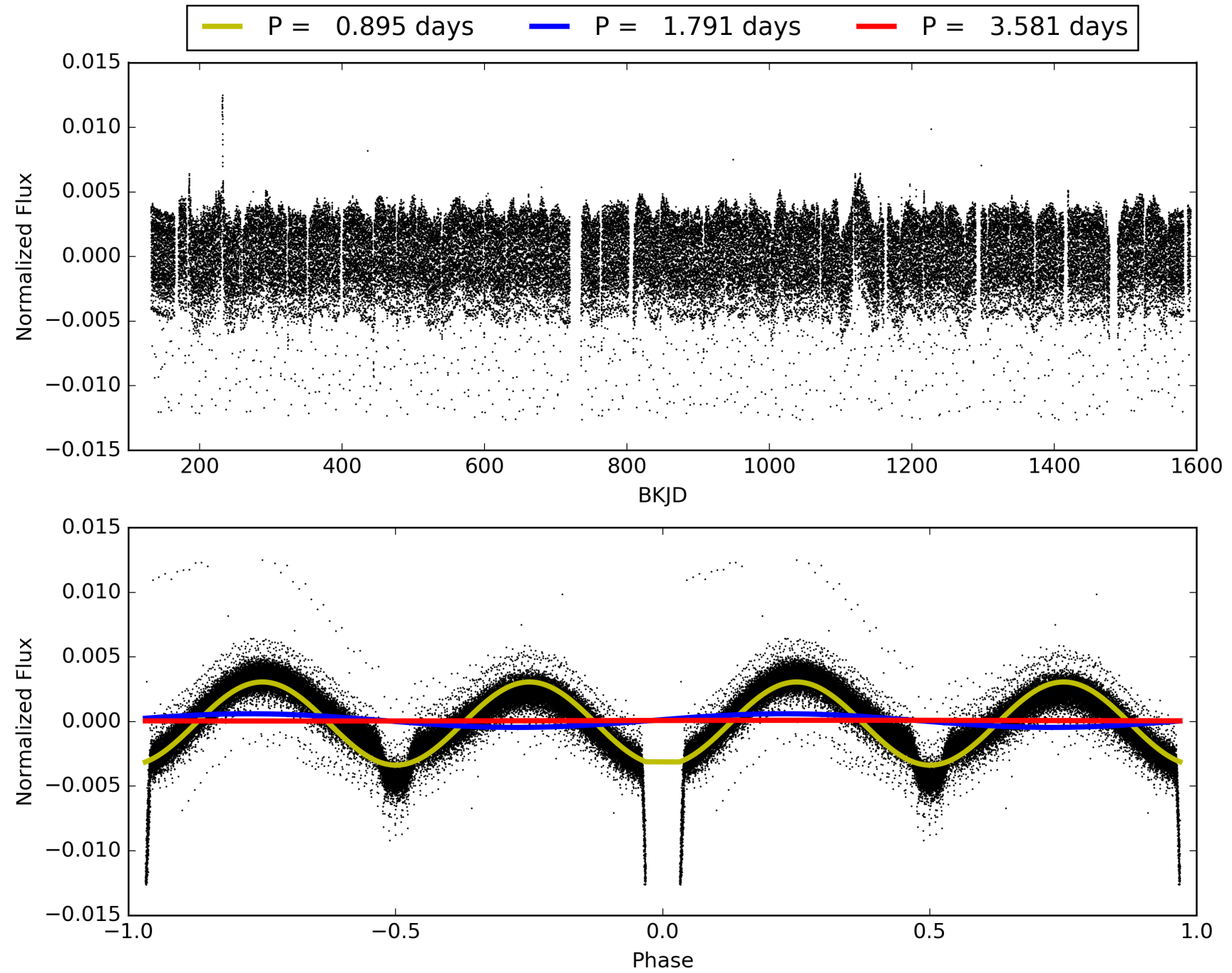
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [1258.78σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [713/717]  
GhostDiagnostic-chr: 3.002  
Centroid-sig: 0.0%  
Centroid-so: 0.035 arcsec [100.27σ]  
OotOffset-rm: 0.008 arcsec [0.12σ]  
KicOffset-rm: 0.104 arcsec [1.53σ]  
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 008112013-01, PDC Light Curves

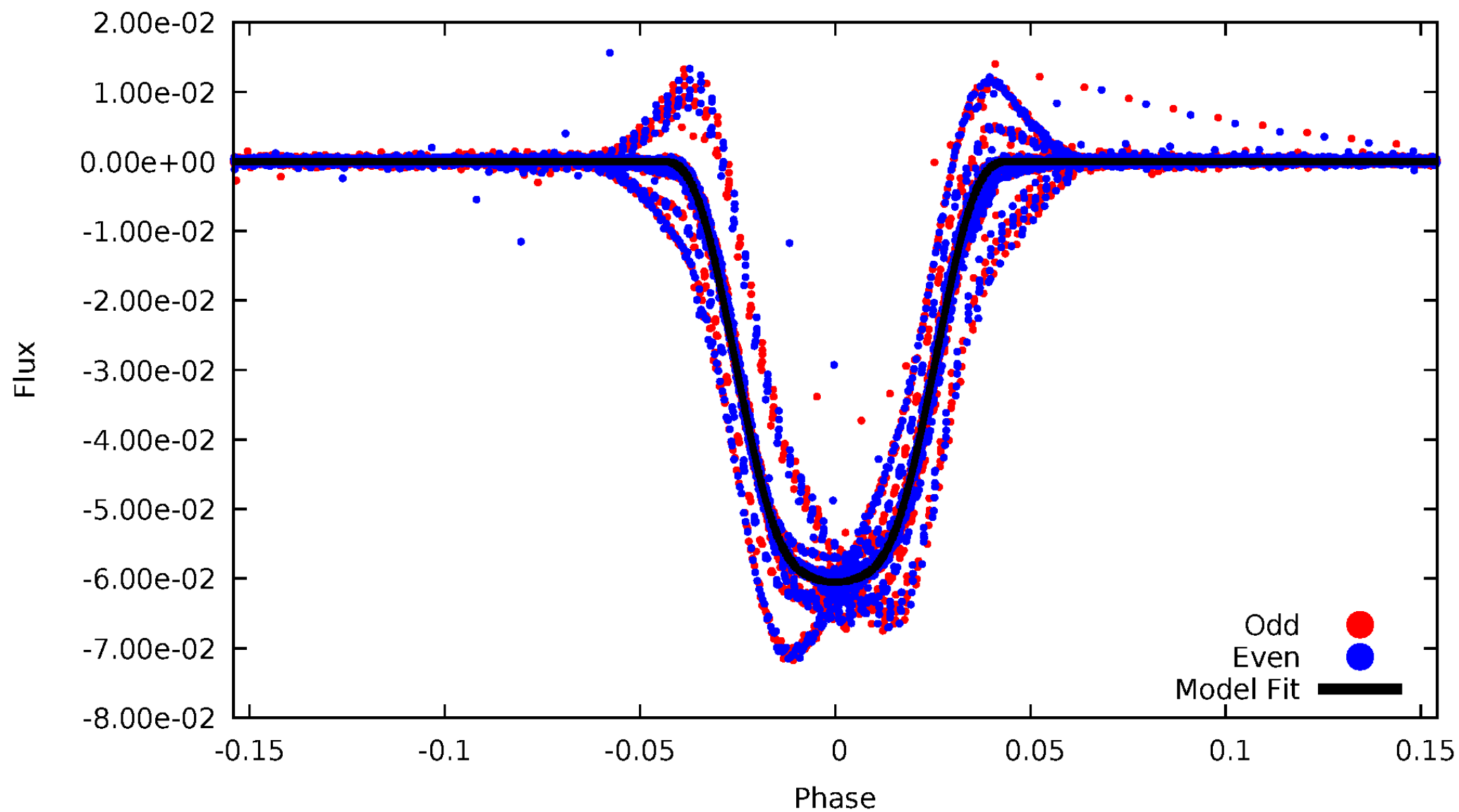


TCE 008112013-01



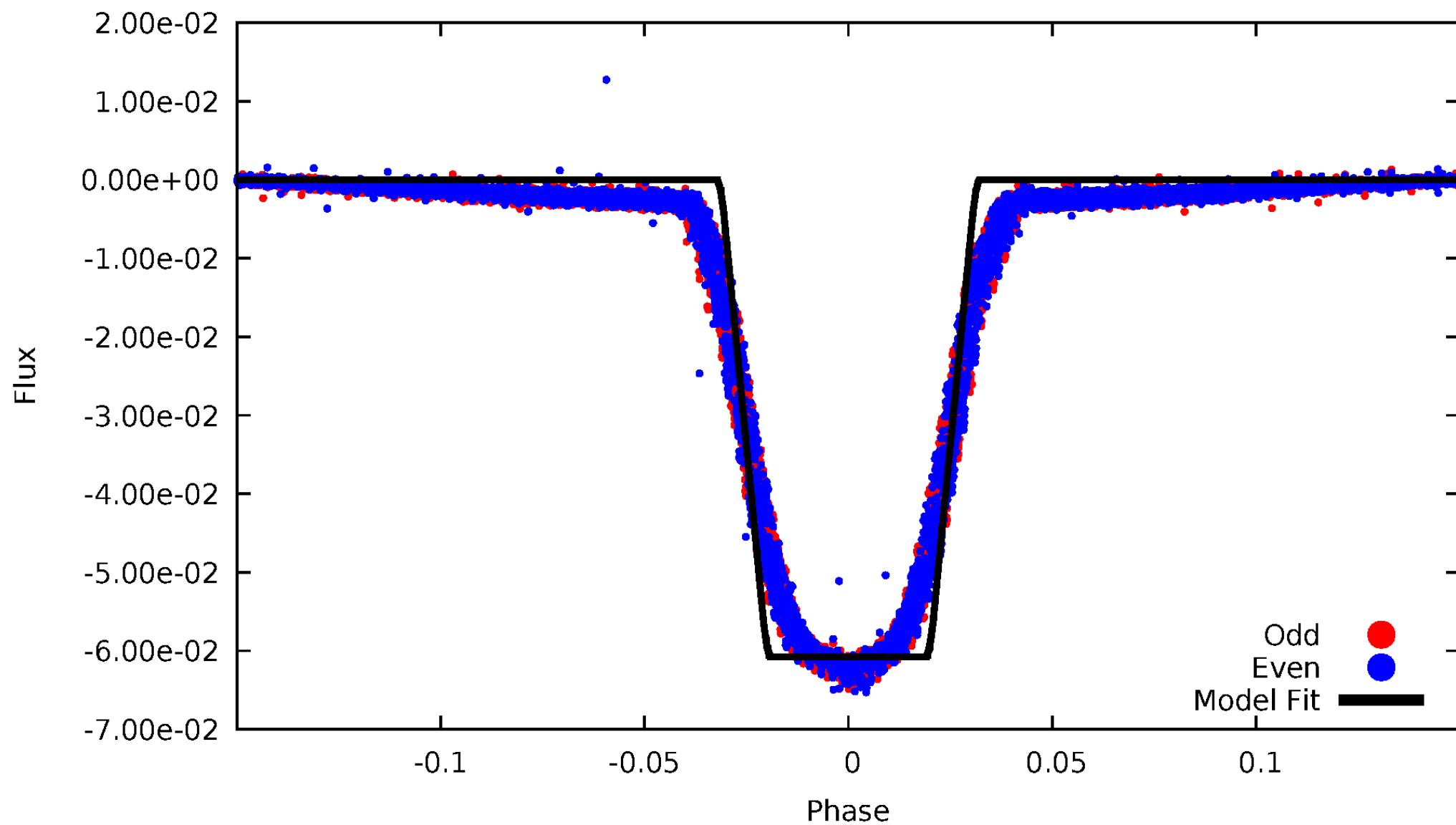
# DV Odd/Even

TCE 008112013-01



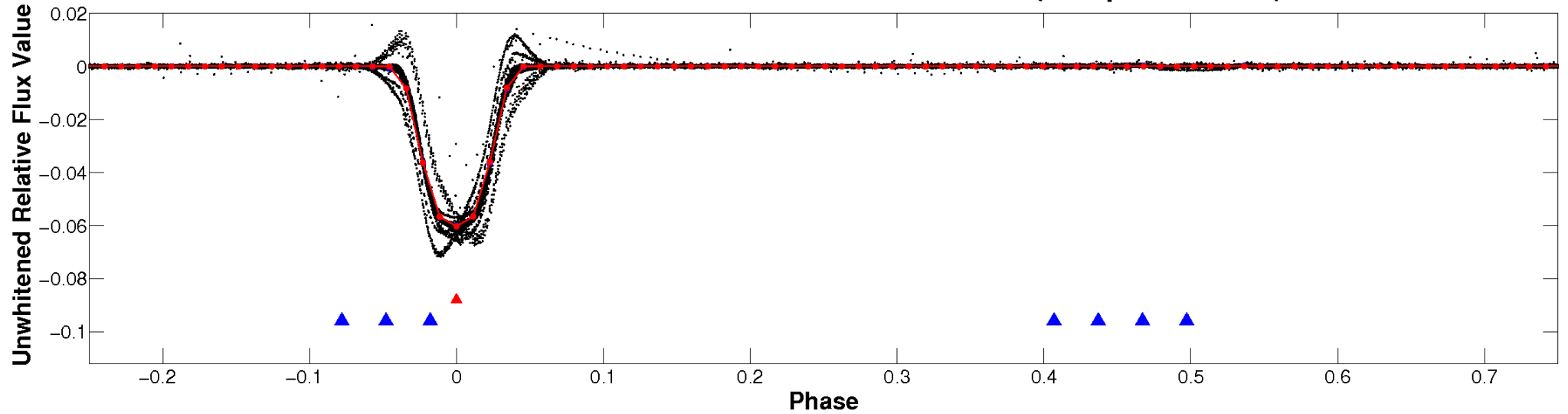
# ALT Odd/Even

TCE 008112013-01

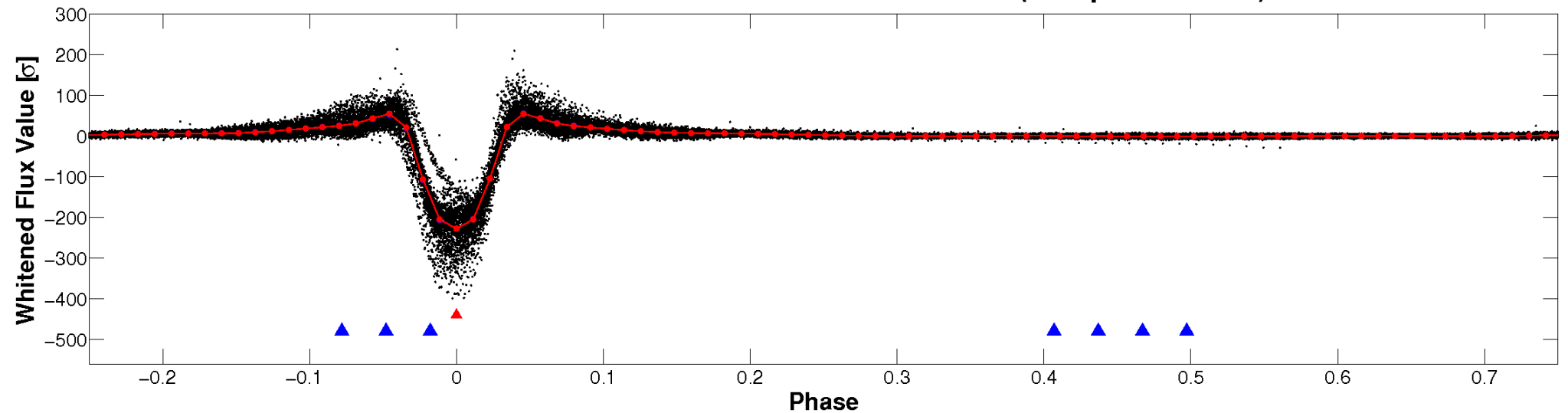


# Non-Whitened Vs. Whitened Light Curve

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

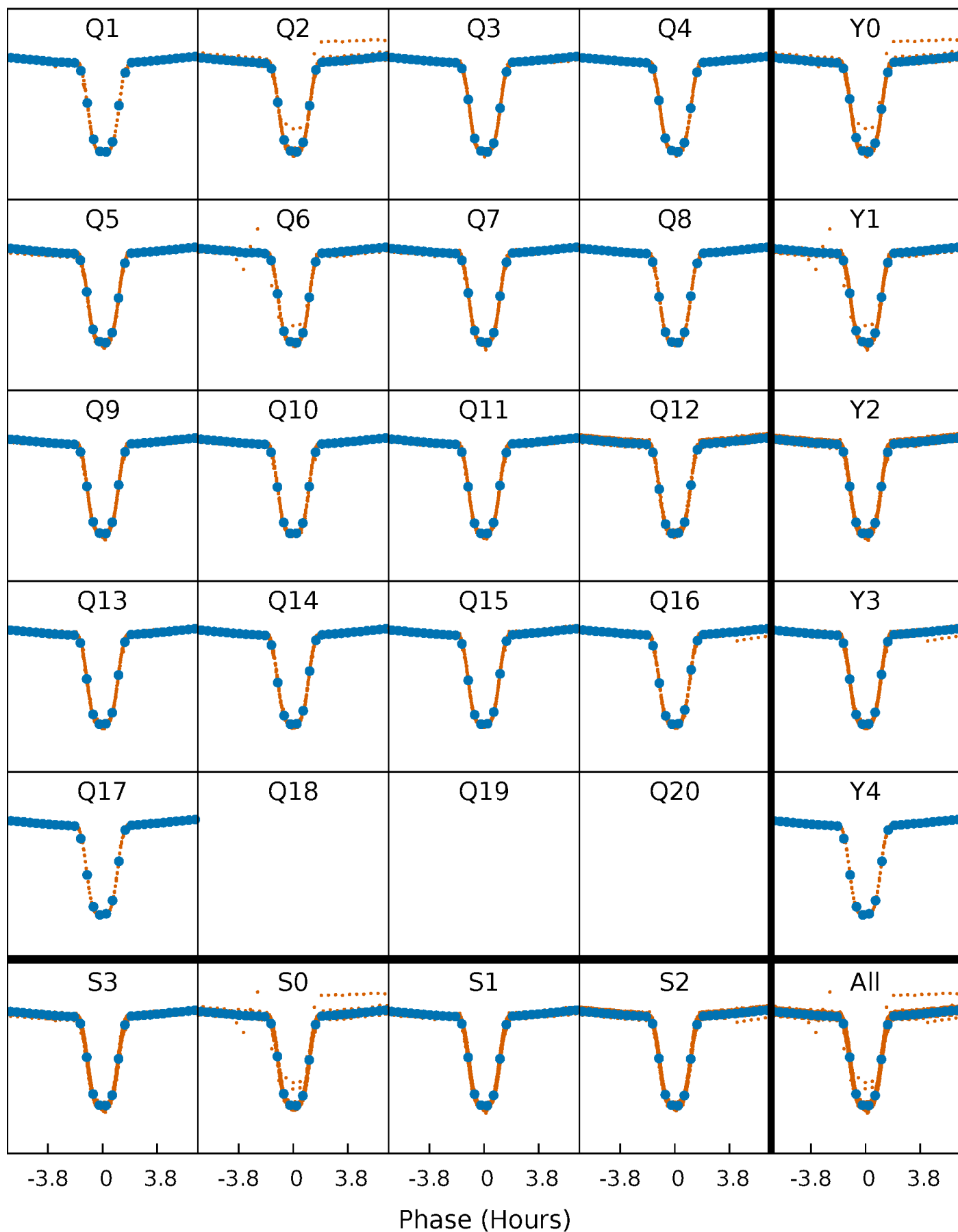


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



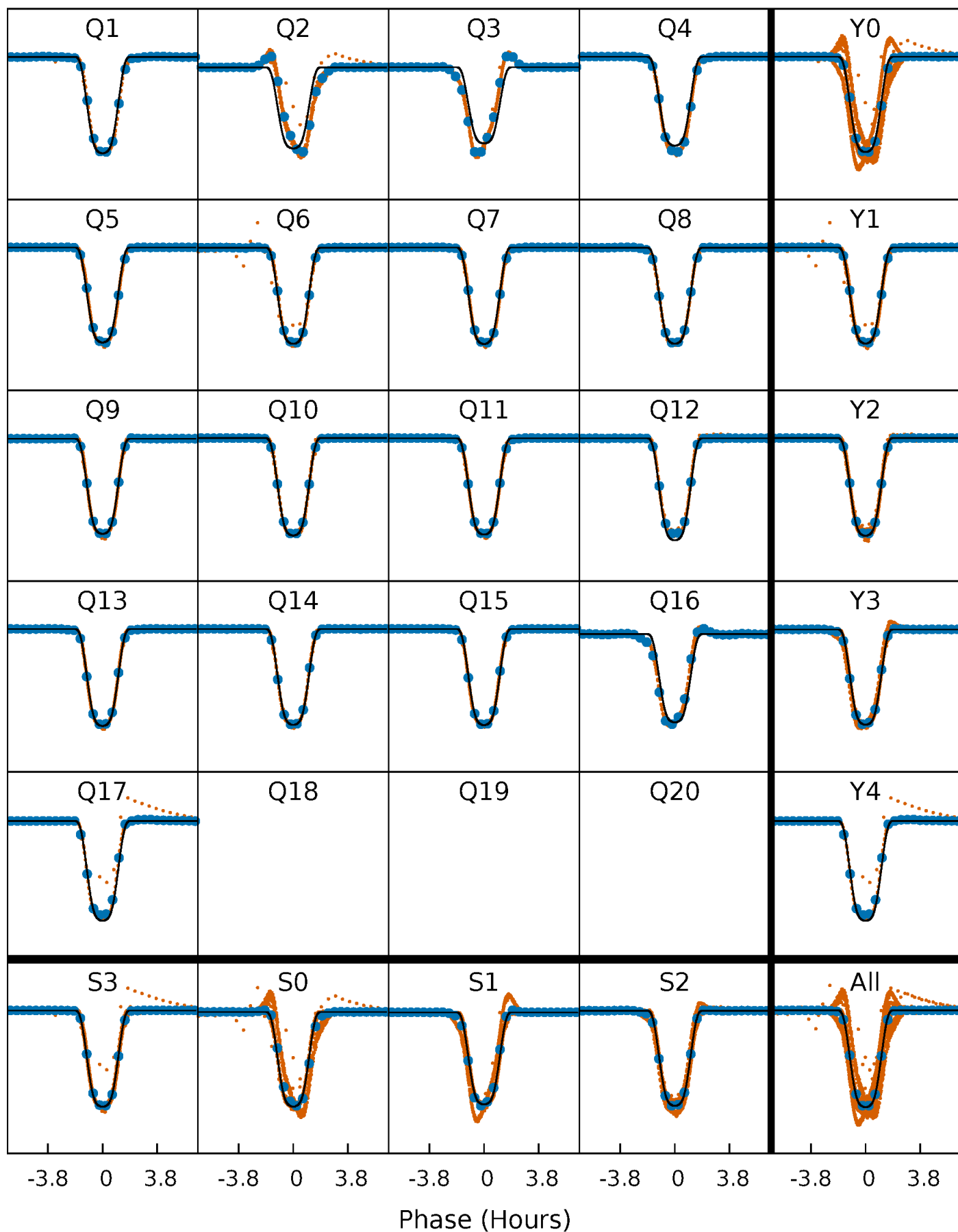
# PDC Quarter-Phased Transit Curves

TCE 008112013-01 P= 1.790523 Days  $T_0=132.936025$  (BKJD)



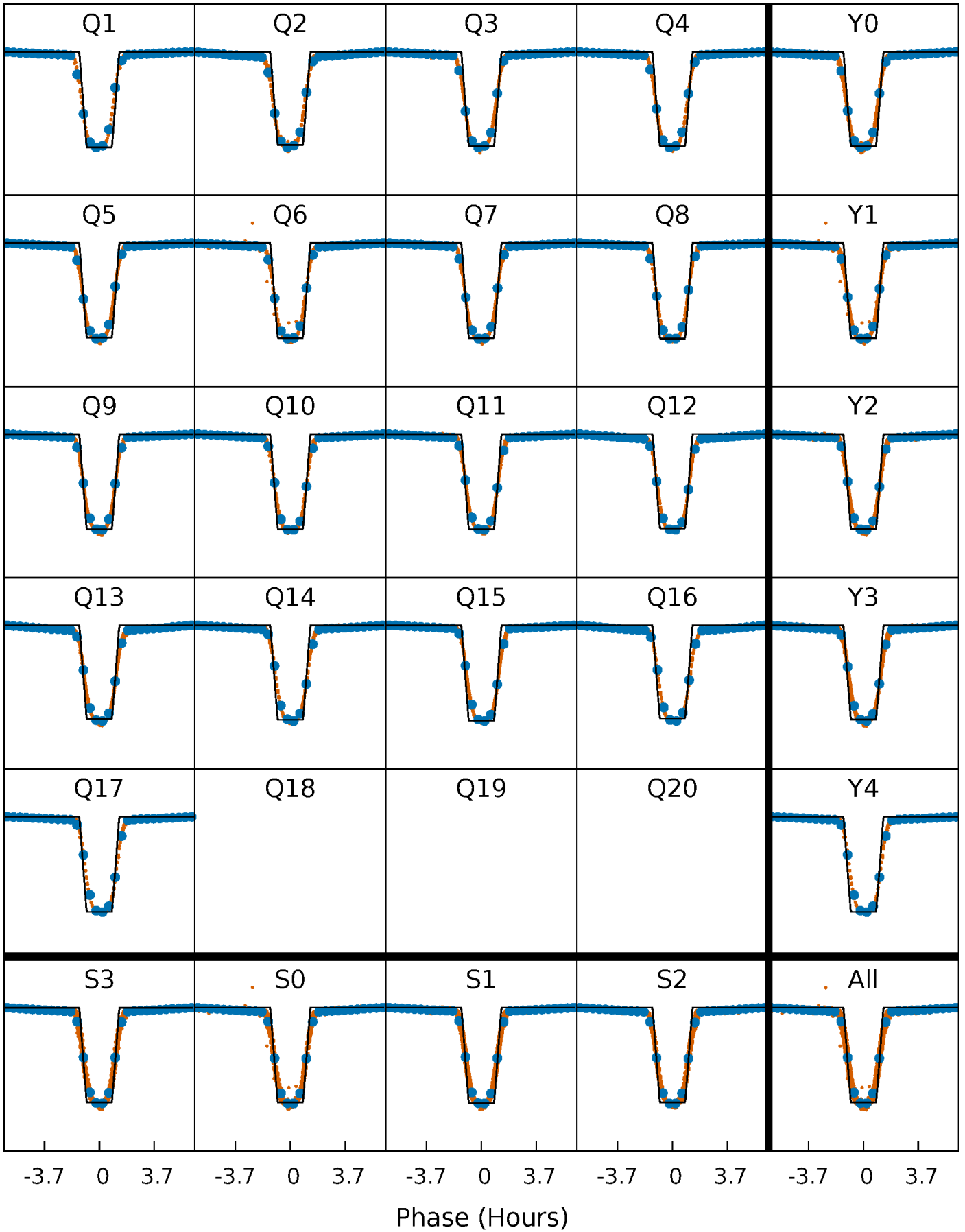
# DV Quarter-Phased Transit Curves

TCE 008112013-01 P= 1.790523 Days  $T_0=132.936025$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

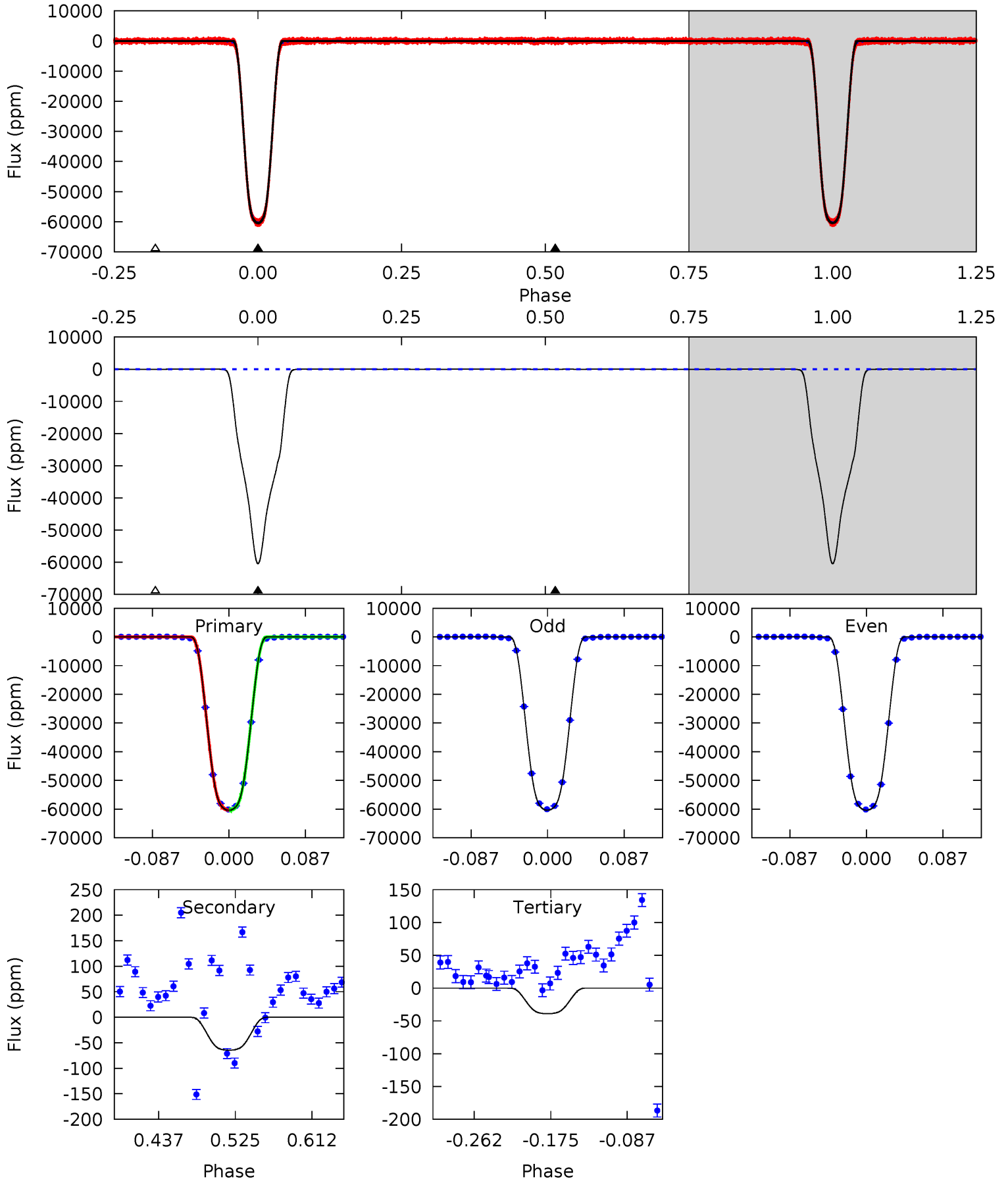
TCE 008112013-01 P= 1.790507 Days  $T_0=132.943076$  (BKJD)



# DV Model-Shift Uniqueness Test

008112013-01, P = 1.790523 Days, E = 131.145502 Days

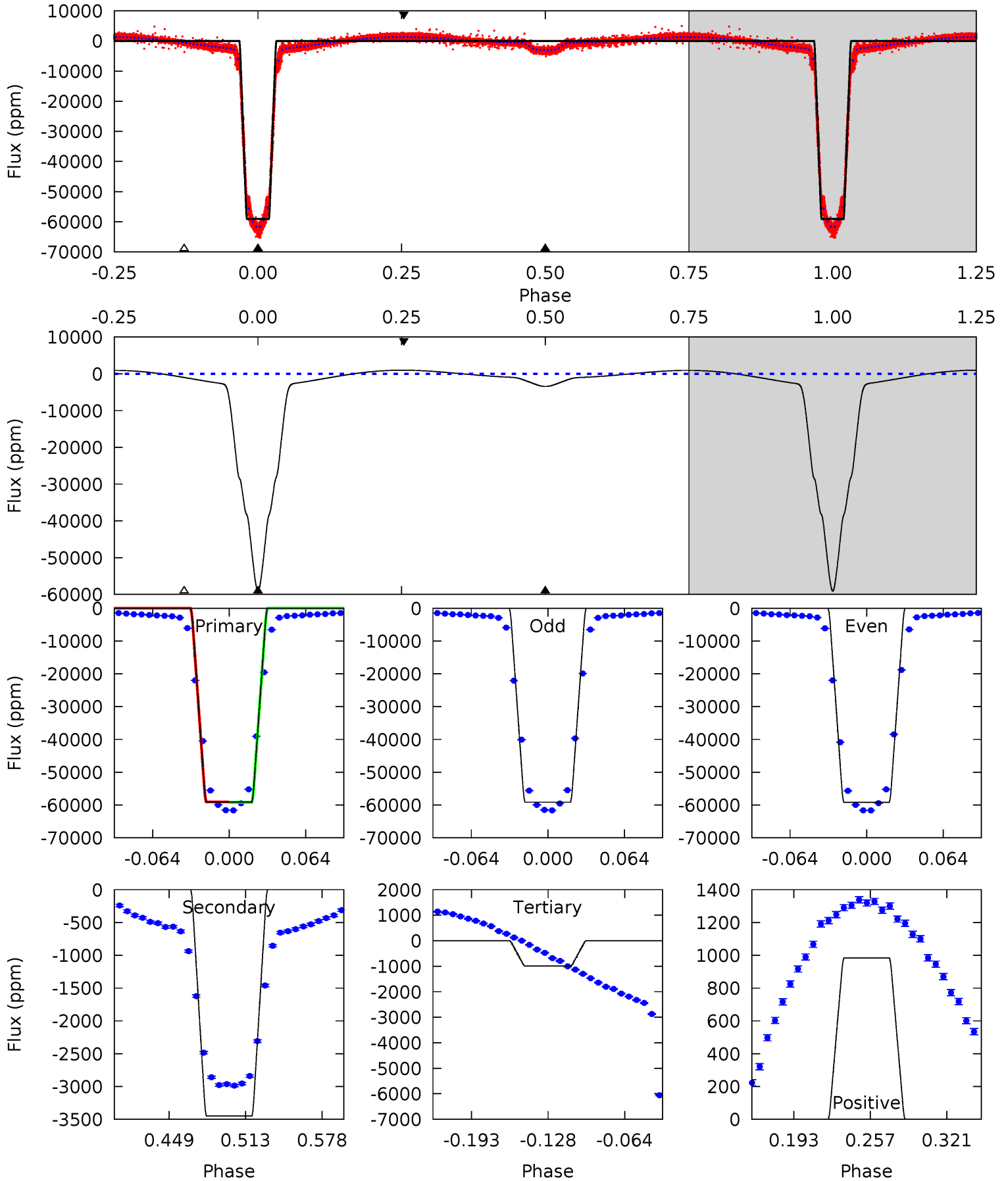
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13233	14.1	8.54	0	4.59	1.71	4.48	13225	13233	5.58	14.1	2.34	1.00	0.00	11.8



# Alt Model-Shift Uniqueness Test

008112013-01, P = 1.790507 Days, E = 131.152569 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
3284	191.8	55.2	54.7	4.66	1.85	53.4	3229	3230	136.6	137.1	0.55	1.00	0.02	2.93



### Stellar Parameters For KIC 008112013

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+148}_{-198}$	$4.319^{+0.101}_{-0.188}$	$-0.320^{+0.250}_{-0.300}$	$1.219^{+0.366}_{-0.183}$	$1.131^{+0.165}_{-0.150}$	$0.880^{+0.400}_{-0.439}$
	+2%/-3%	+2%/-4%	+78%/-94%	+30%/-15%	+15%/-13%	+45%/-50%
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 008112013-01 / KOI 6969.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-64 \pm 5$	$32.32^{+5.37}_{-2.84}$	$2599^{+184}_{-124}$	$-2811^{+80}_{-114}$	$0.030^{+0.006}_{-0.007}$
Alt.	$-3451 \pm 18$	$32.84^{+5.56}_{-2.56}$	$2606^{+186}_{-143}$	$3511^{+56}_{-72}$	$1.540^{+0.283}_{-0.340}$

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

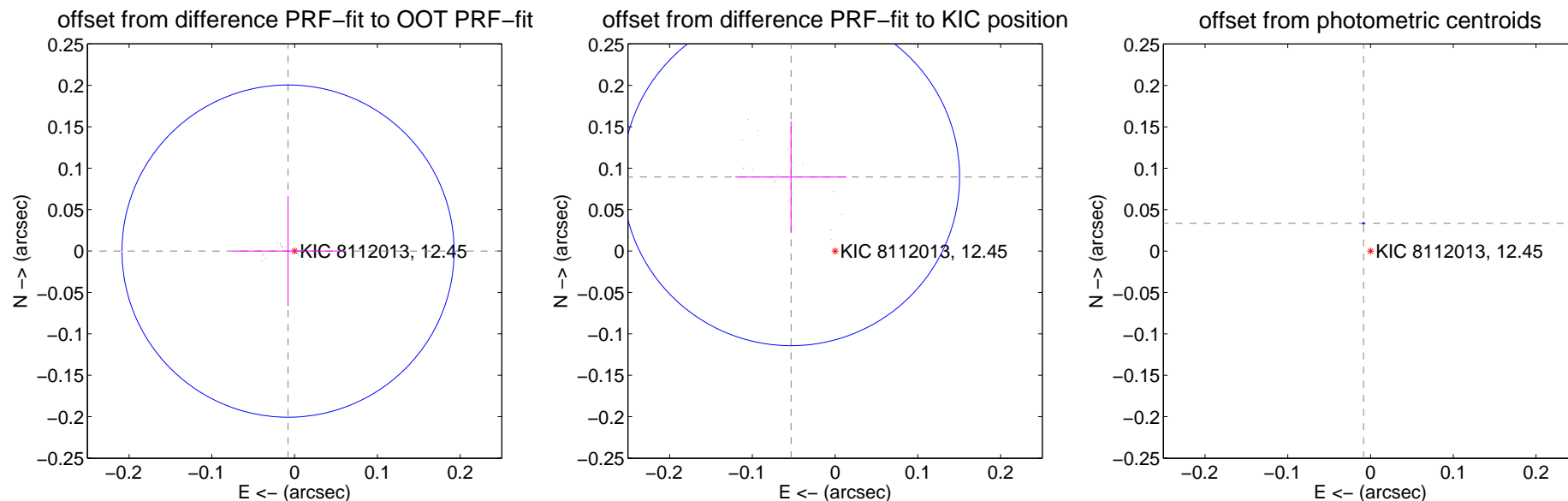
## DV Centroid Data

Supplemental centroid analysis for 008112013-01. Kepler magnitude: 12.45. Transit SNR 8129.38

There are 17 quarters with good PRF difference image offsets

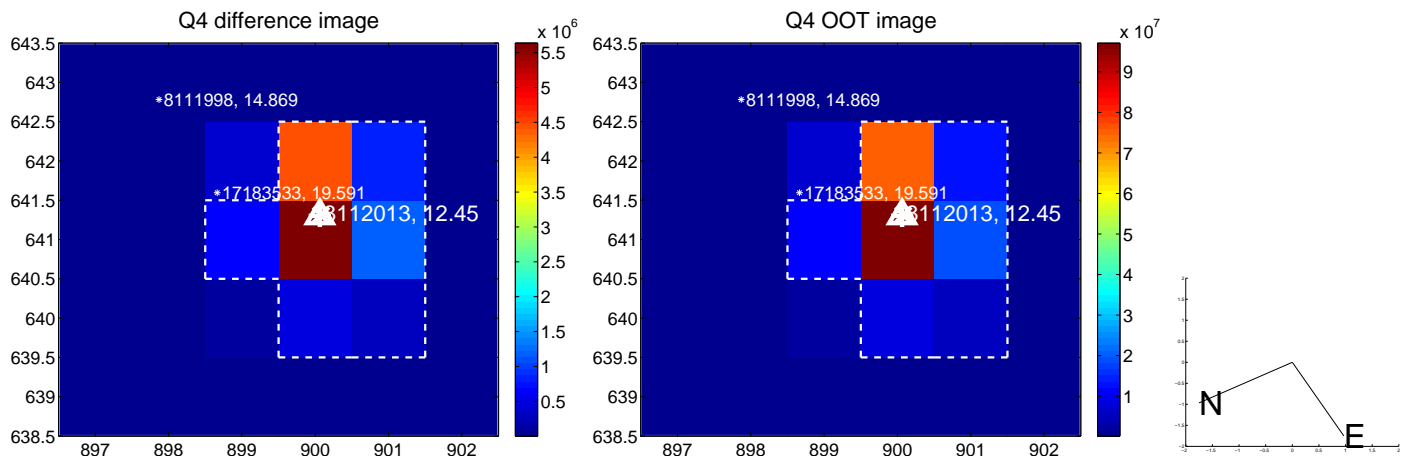
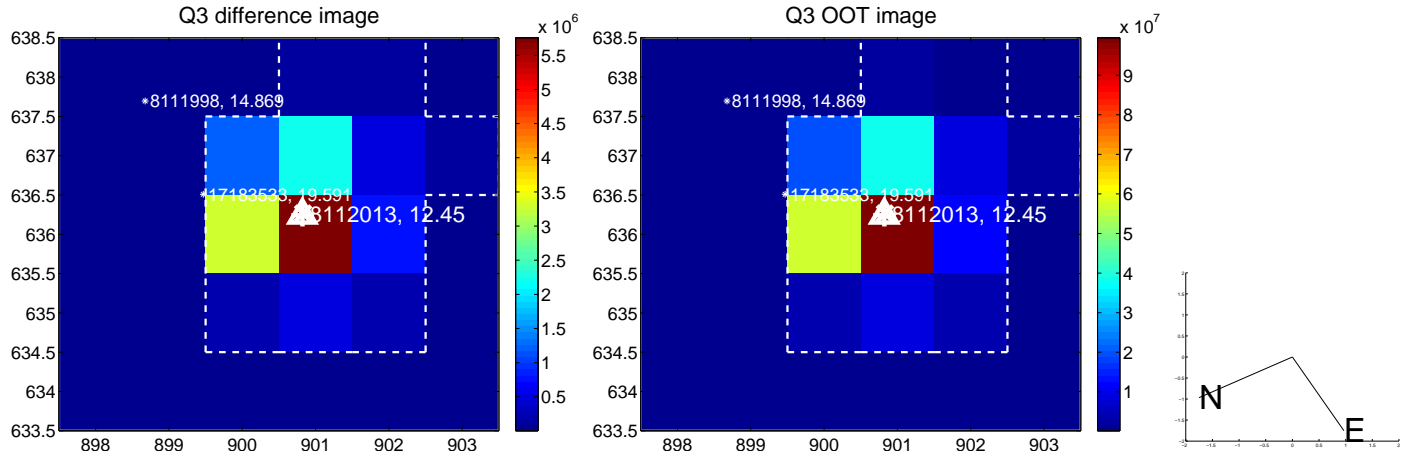
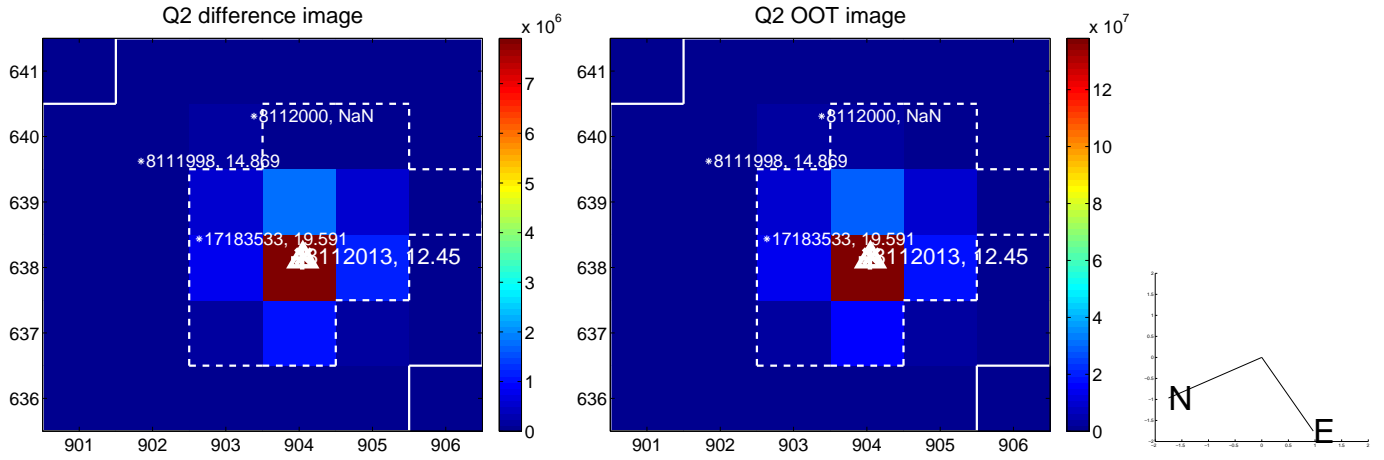
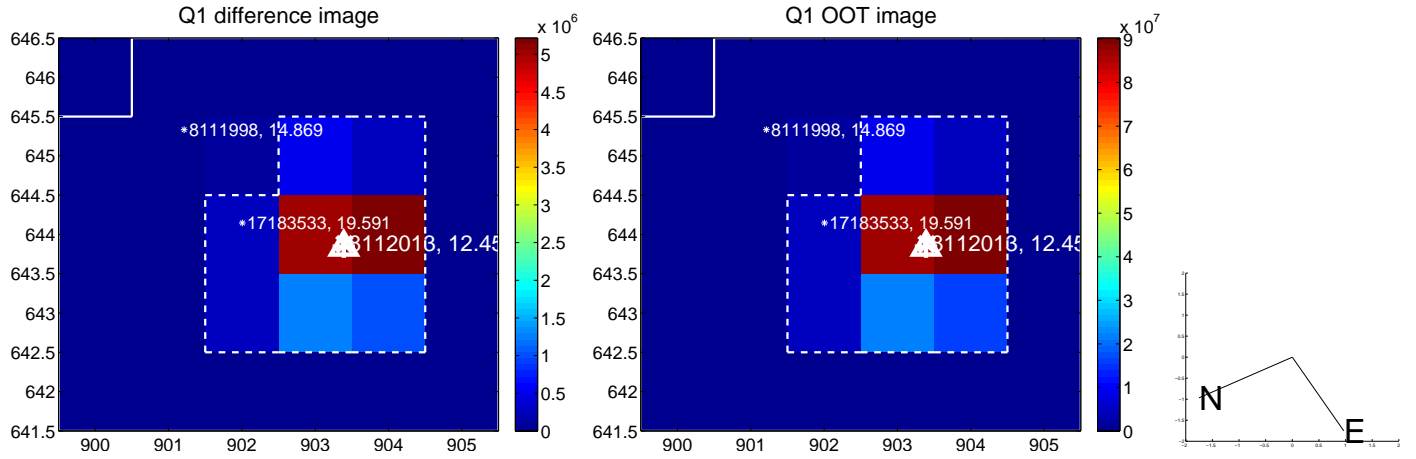
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.008 \pm 0.067$	0.12	$0.008 \pm 0.067$	$-0.000 \pm 0.067$
PRF-fit source offset from KIC position	$0.104 \pm 0.068$	1.53	$0.053 \pm 0.067$	$0.089 \pm 0.067$
photometric centroid source offset	$0.03 \pm 0.00$	100.27	$0.01 \pm 0.00$	$0.03 \pm 0.00$

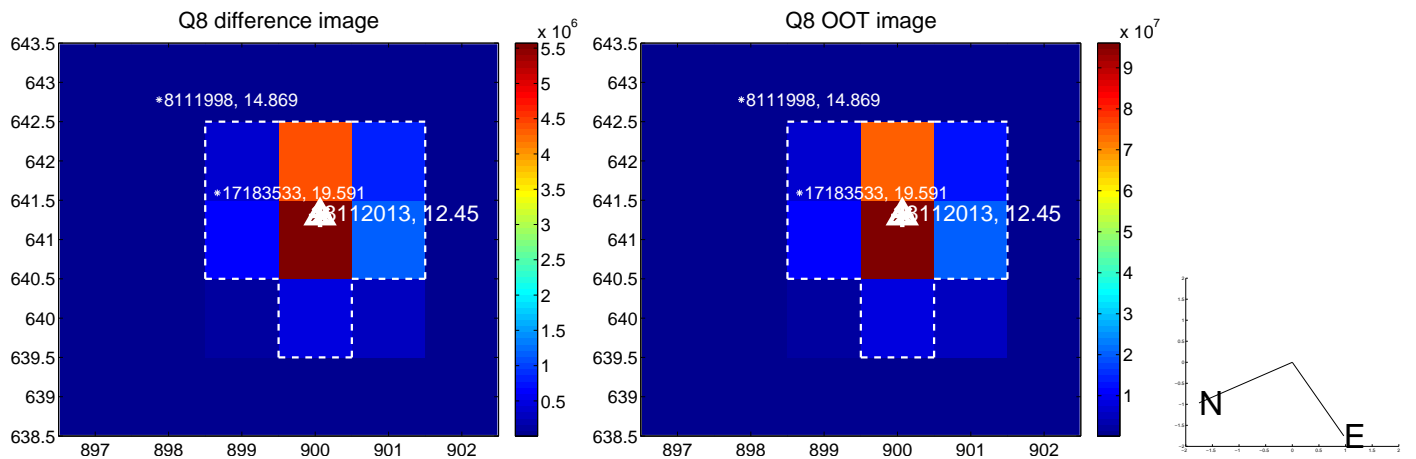
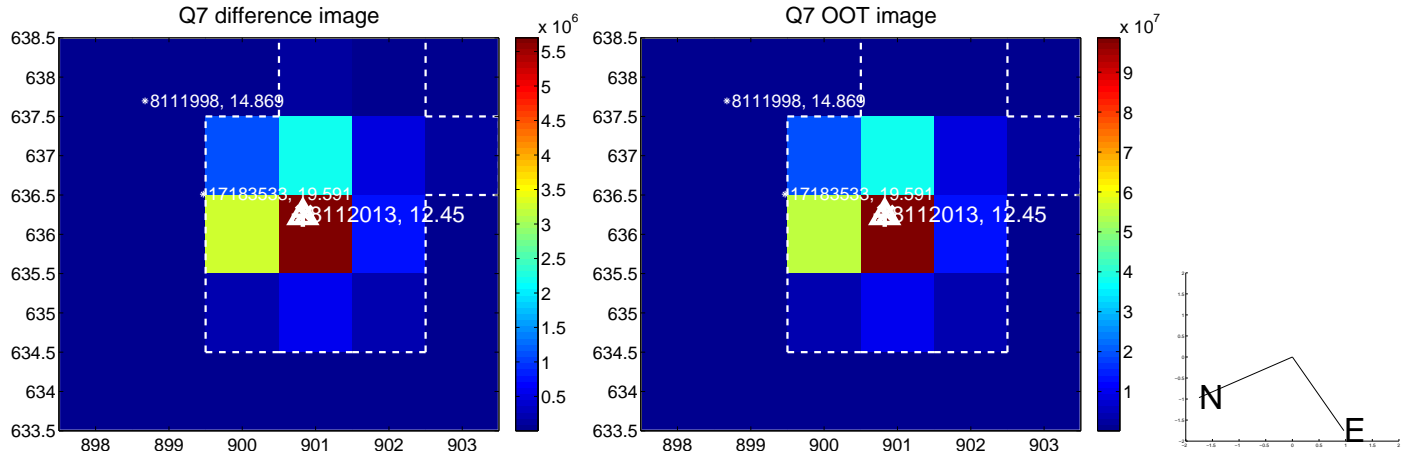
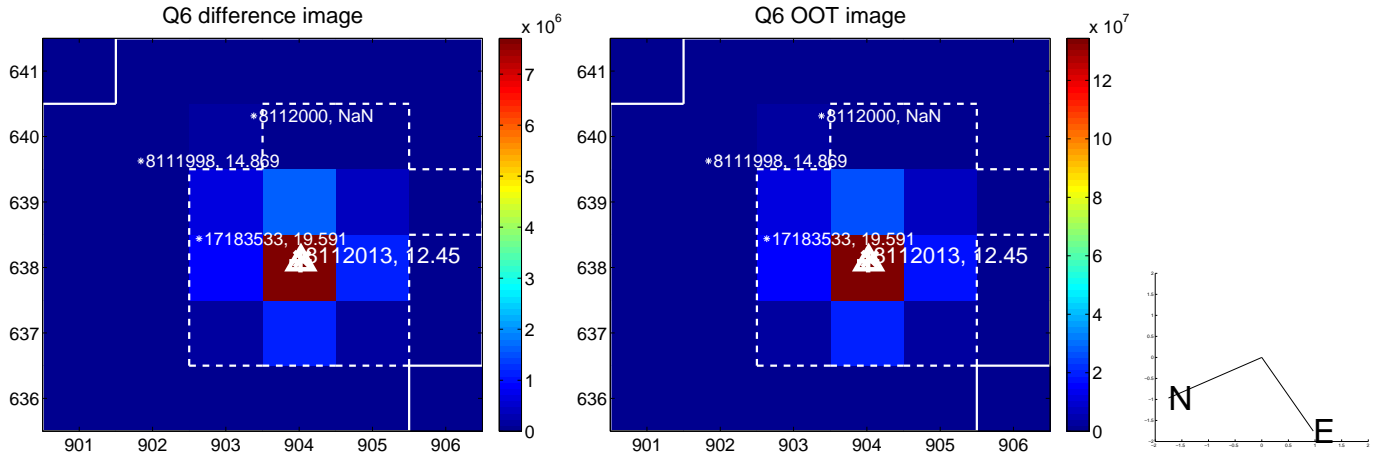
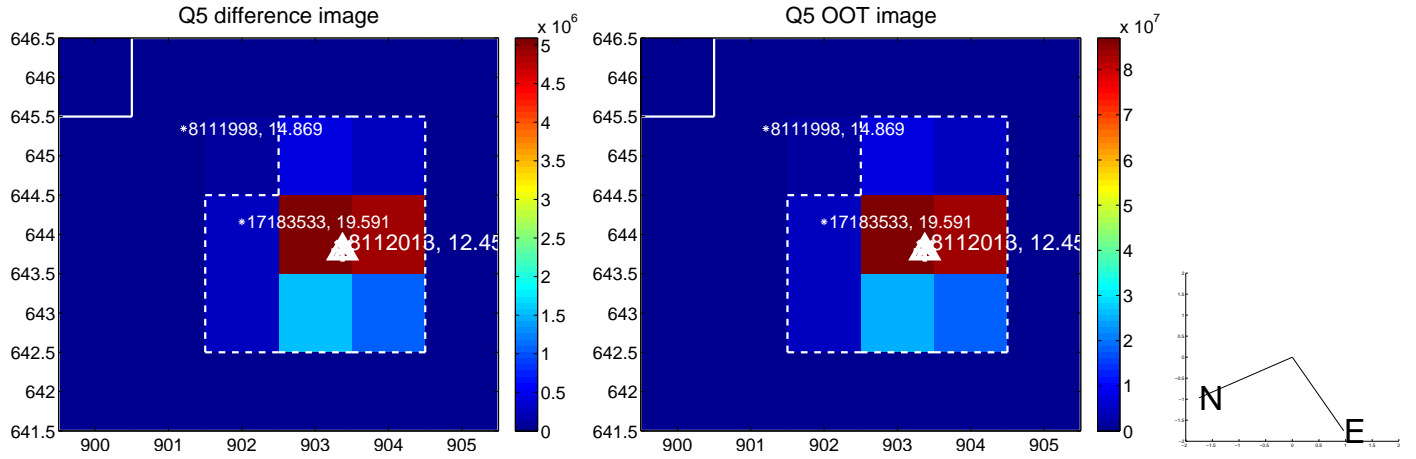


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

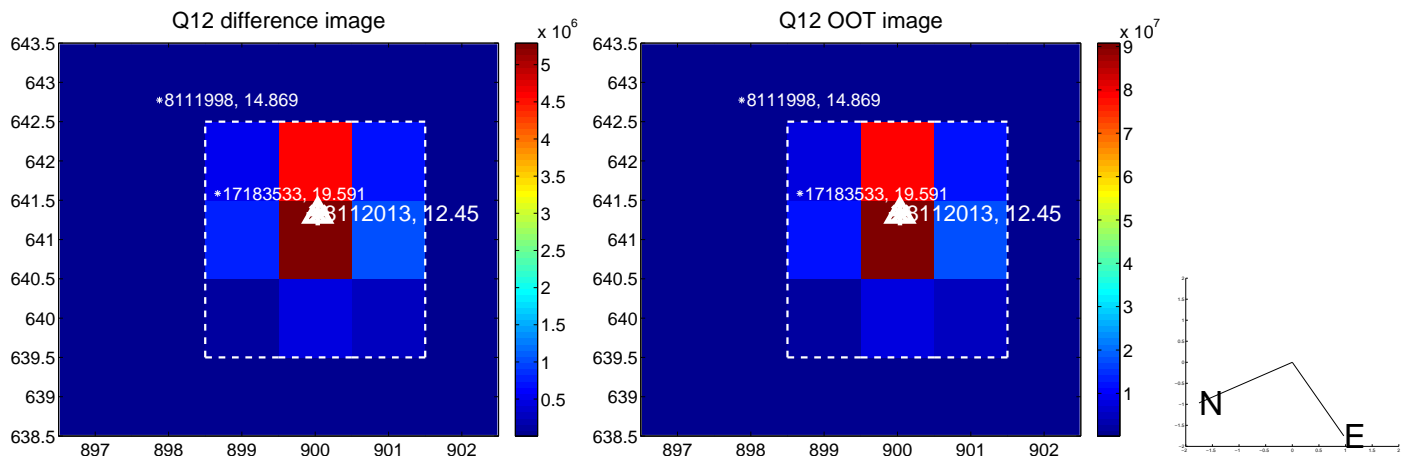
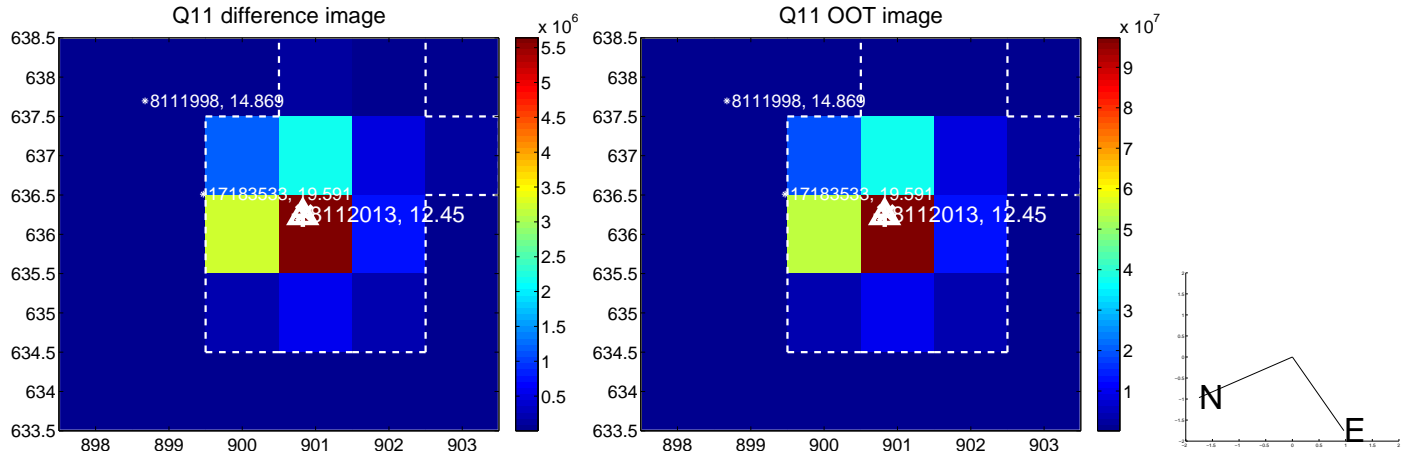
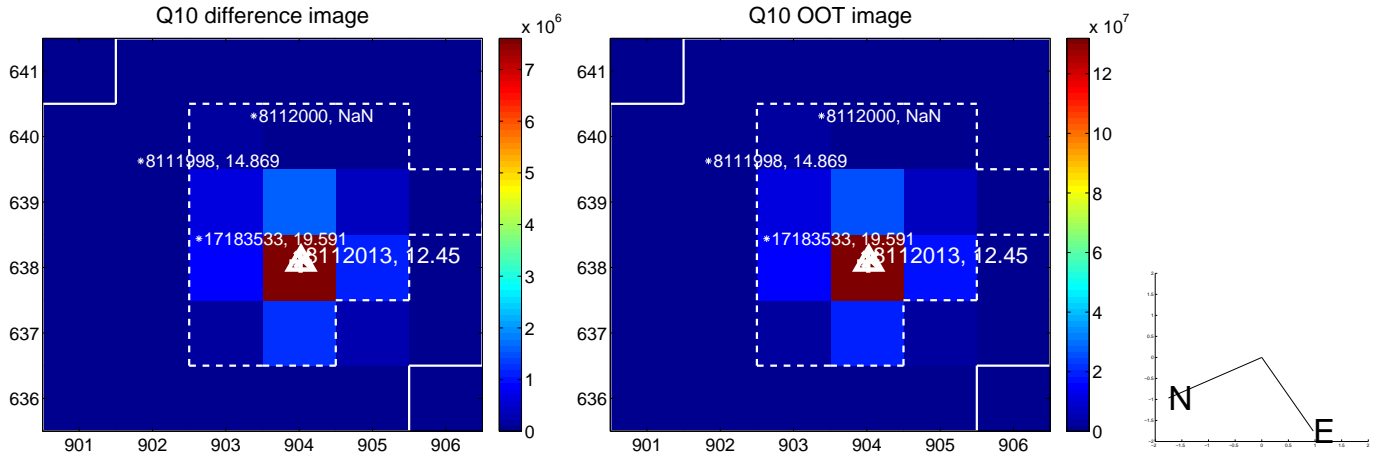
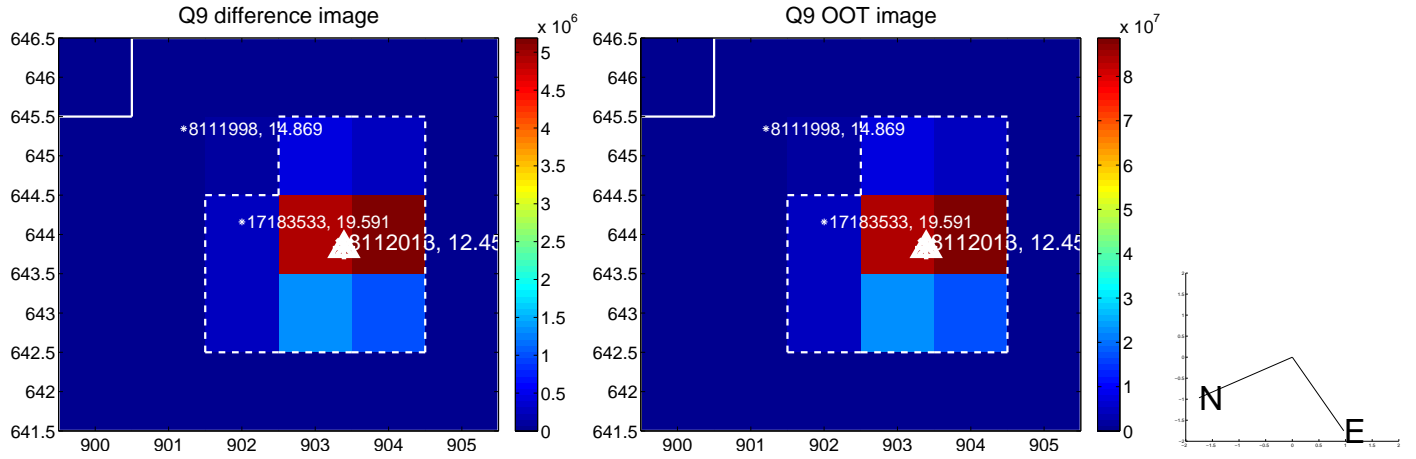
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



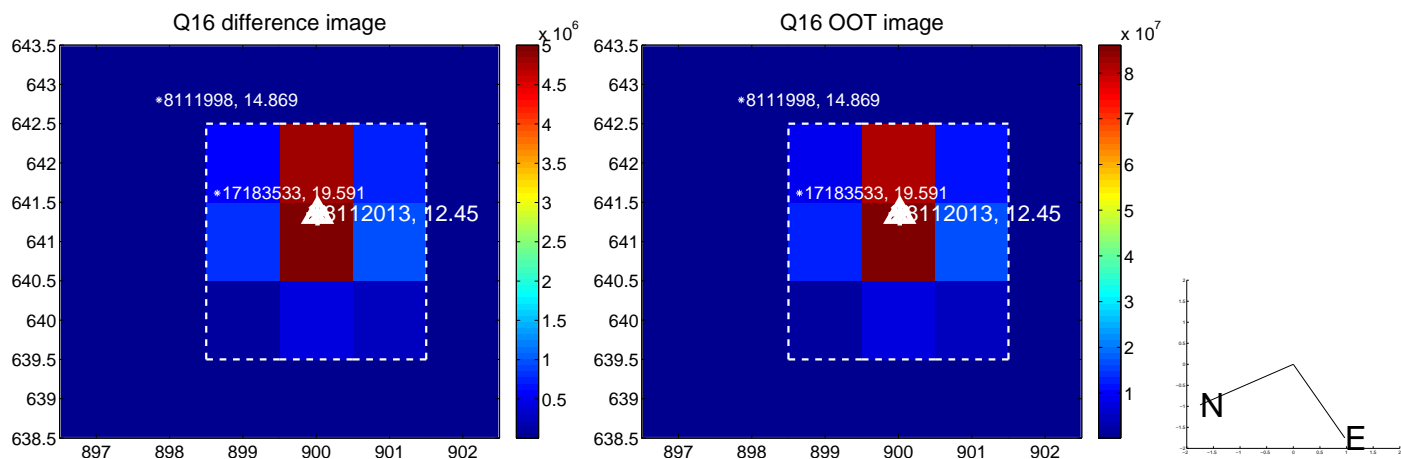
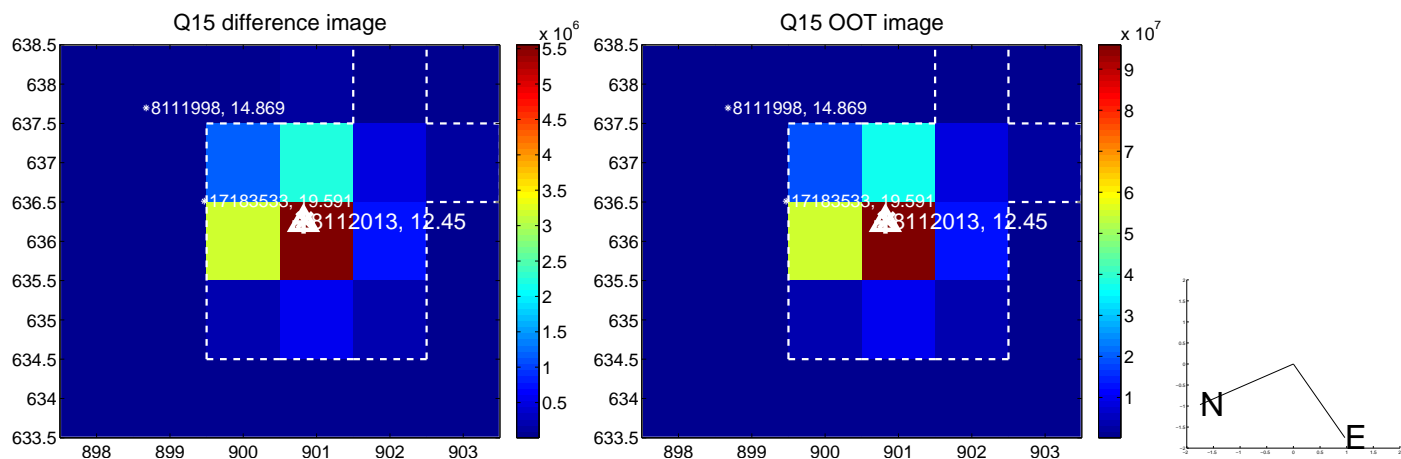
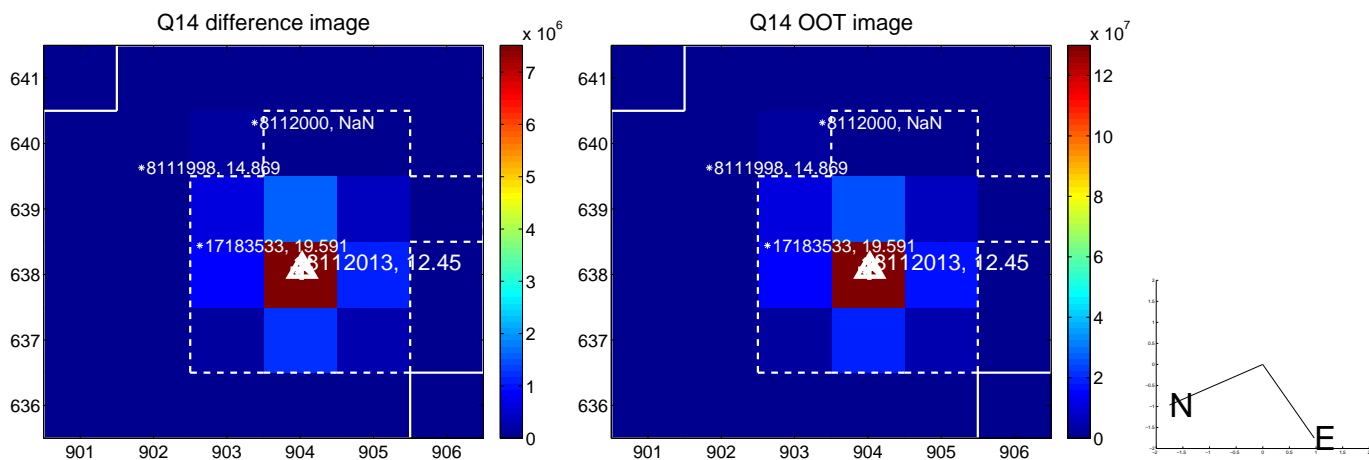
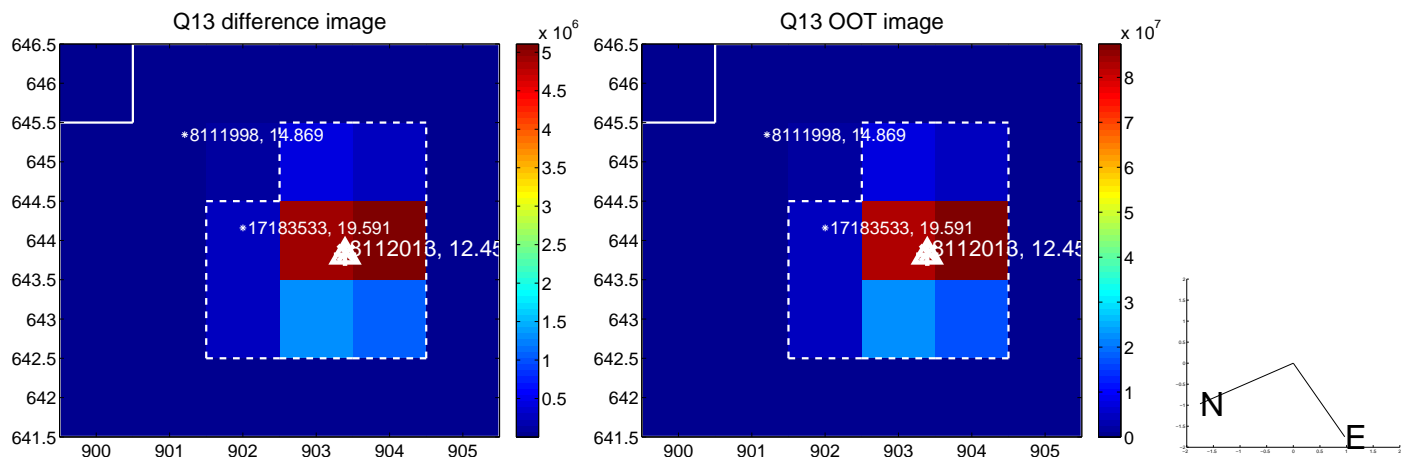
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



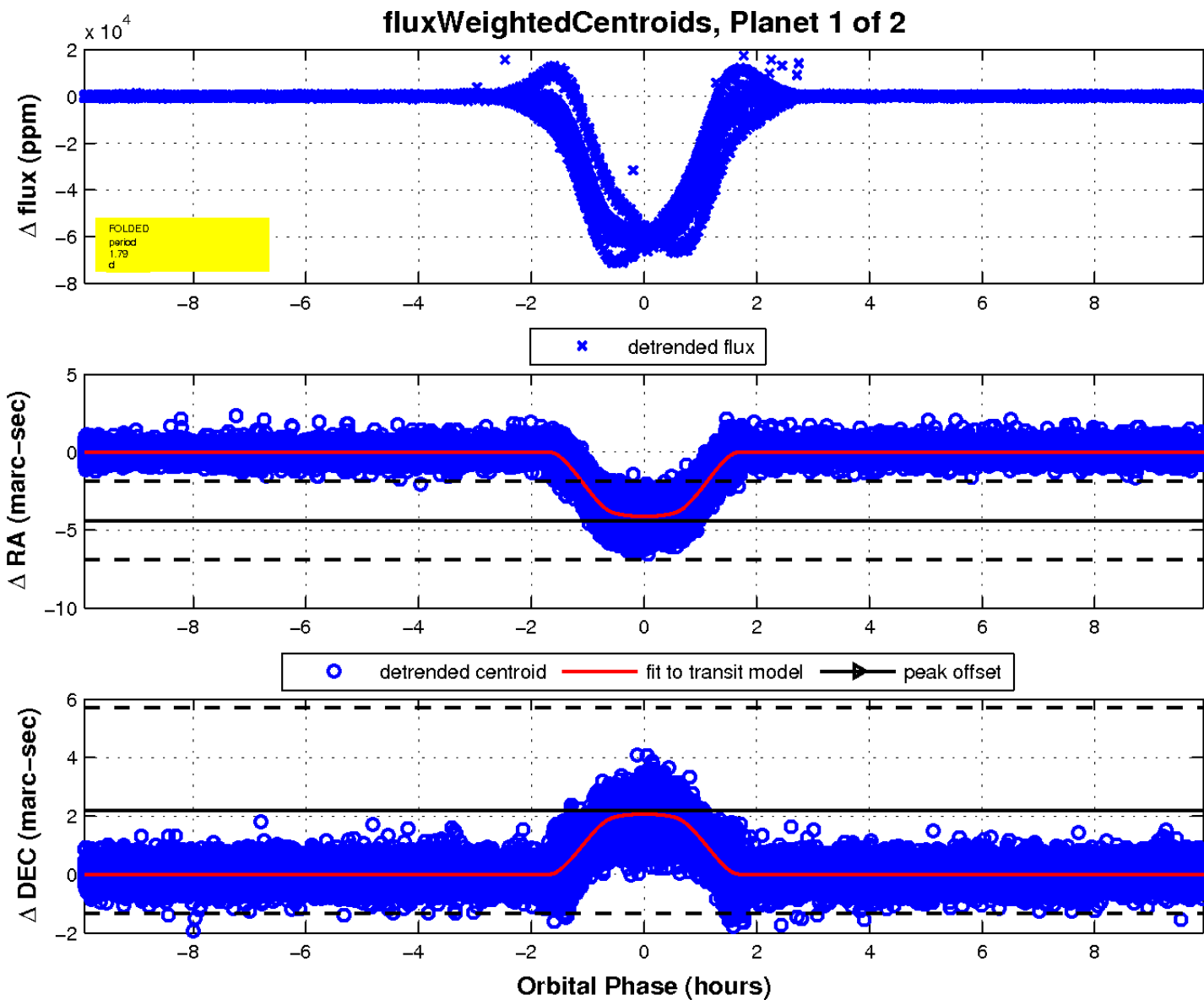
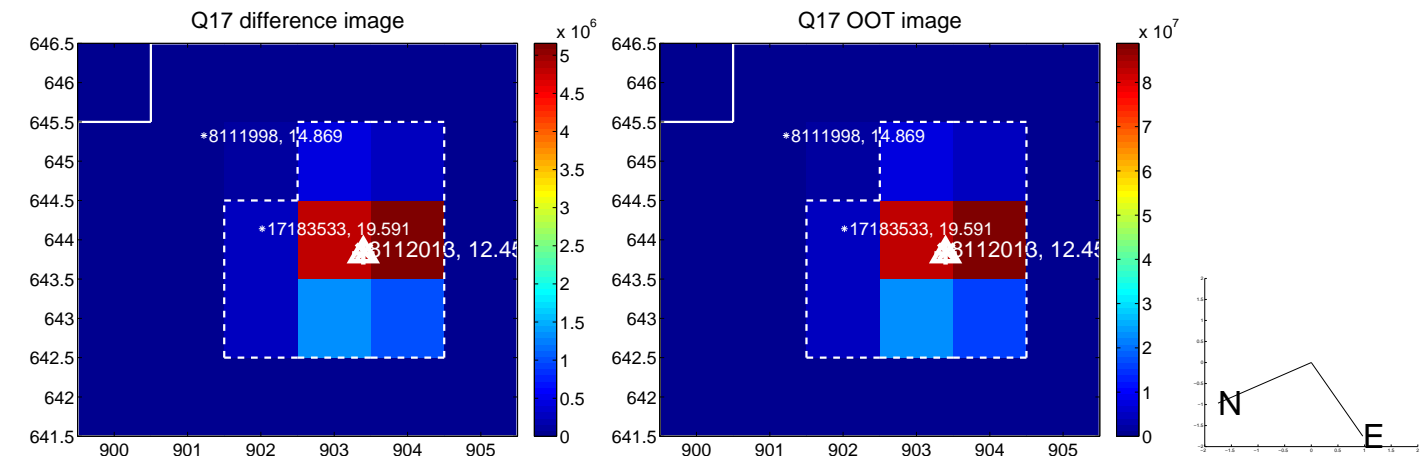
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

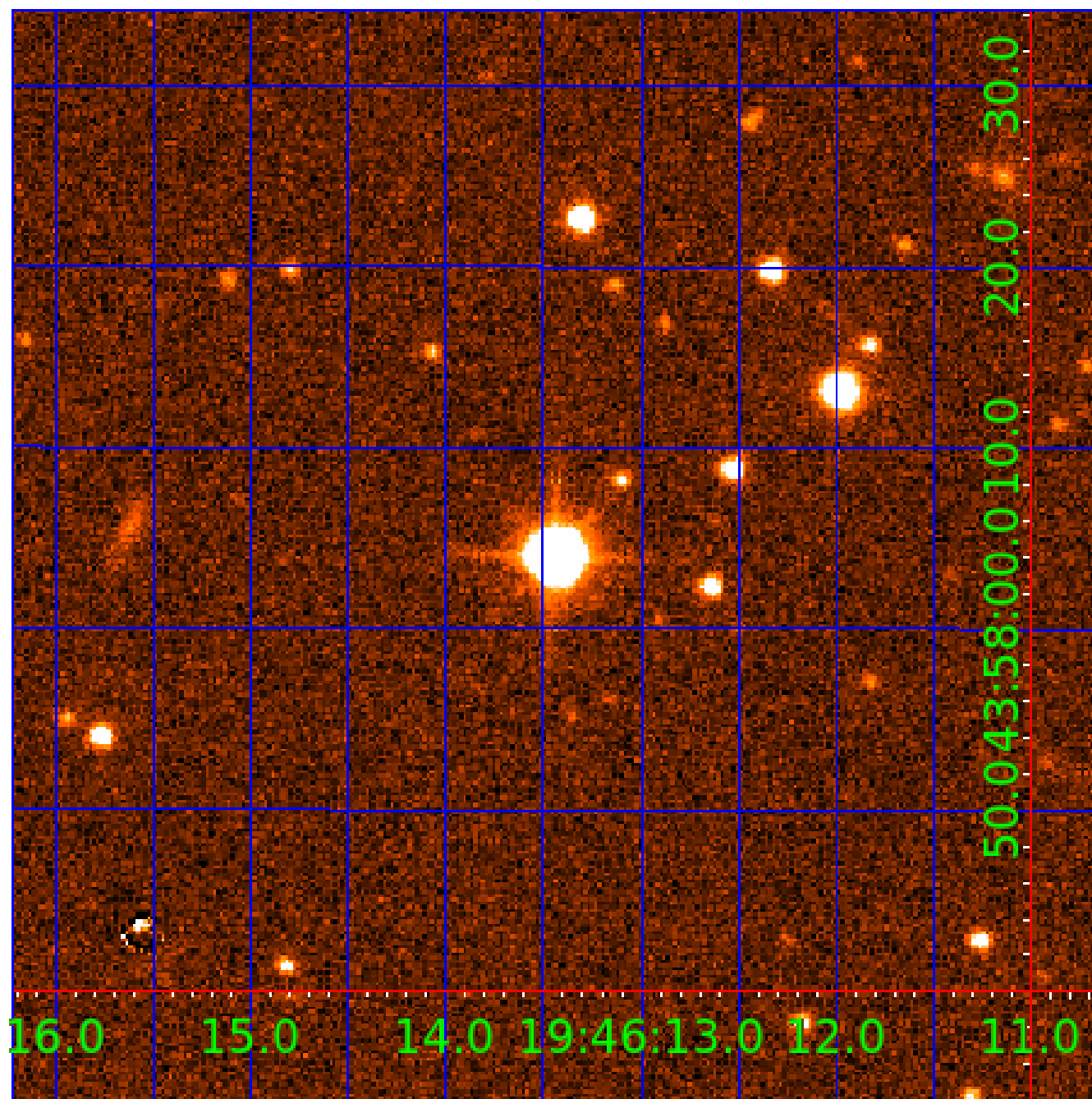


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008112013

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008112013-01	OBS	6969.01	1.790523	132.936025	60512.1	3.310	10464.1	8129.4	1.22	6586	32.10	2771.68
008112013-02	OBS	No	219.366029	251.839148	783.2	2.500	17.3	-1.0	1.22	6586	3.44	4.55

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008112013-01	OBS	PC	0.28	0	0	0	0	NO_COMMENT
008112013-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

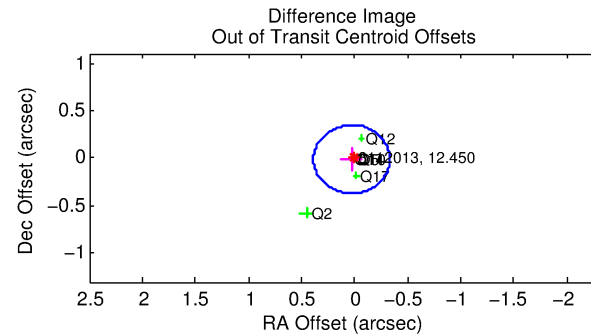
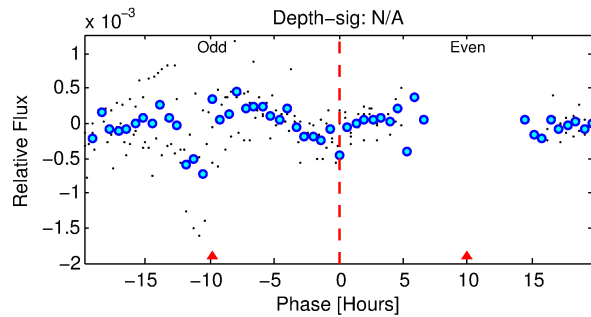
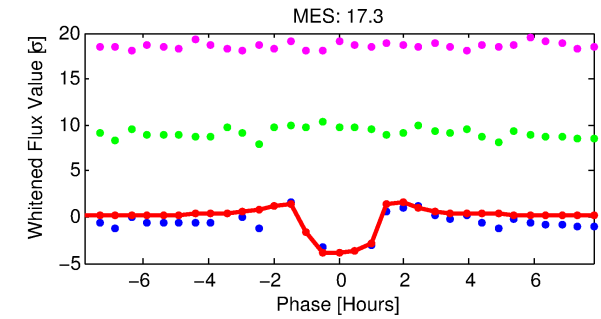
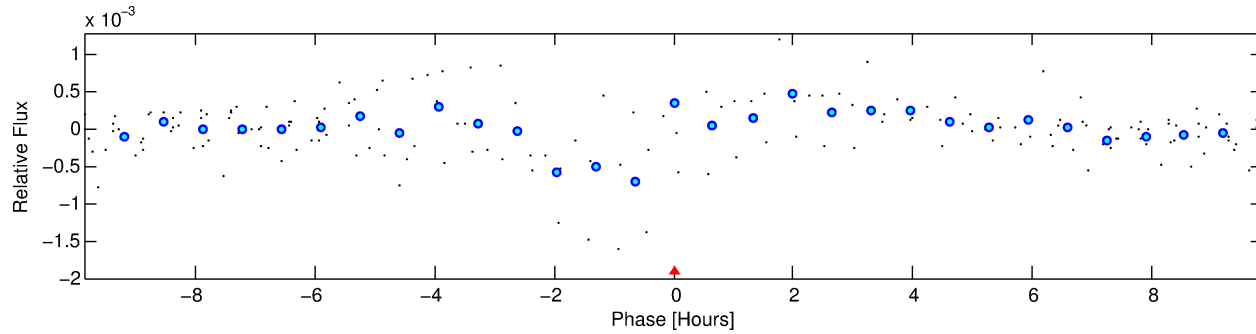
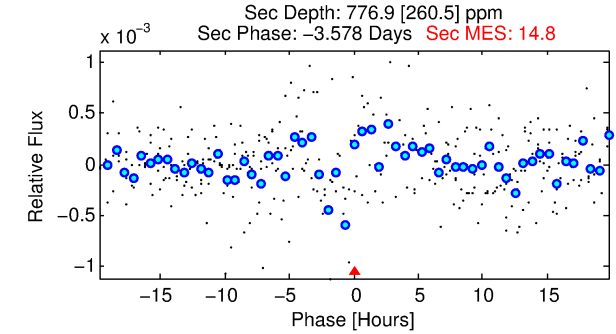
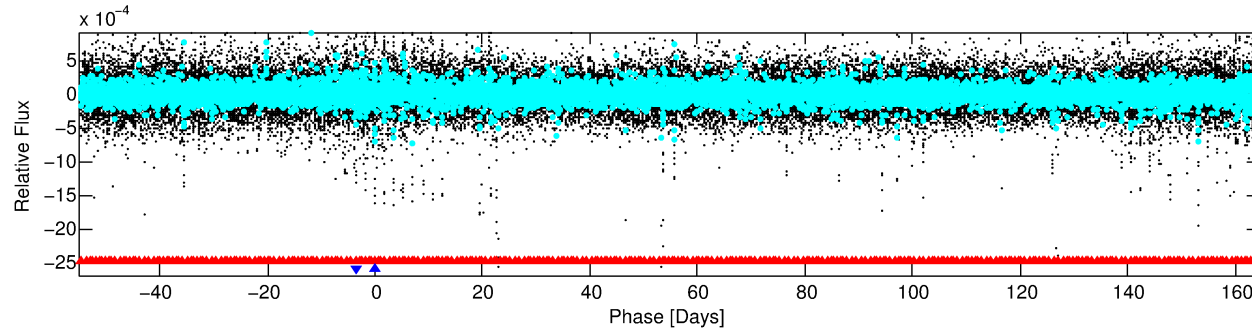
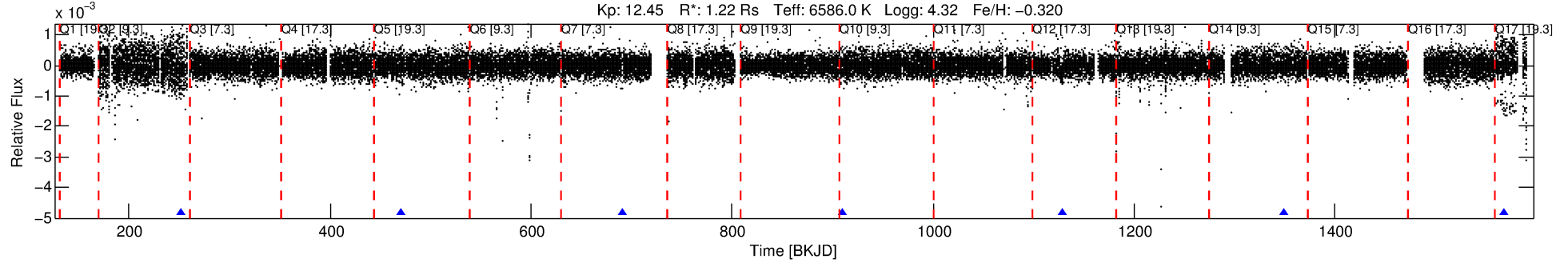
## Ephemeris Match Information For 008112013-02

No Significant Match Found

# DV One-Page Summary

KIC: 8112013 Candidate: 2 of 2 Period: 219.366 d  
KOI: K06969 Corr: No Ephemeris Match

Kp: 12.45 R\*: 1.22 Rs Teff: 6586.0 K Logg: 4.32 Fe/H: -0.320



## TPS TCE Results:

Period = 219.36603 d  
Epoch = 251.8391 BKJD

DV fit results are unavailable

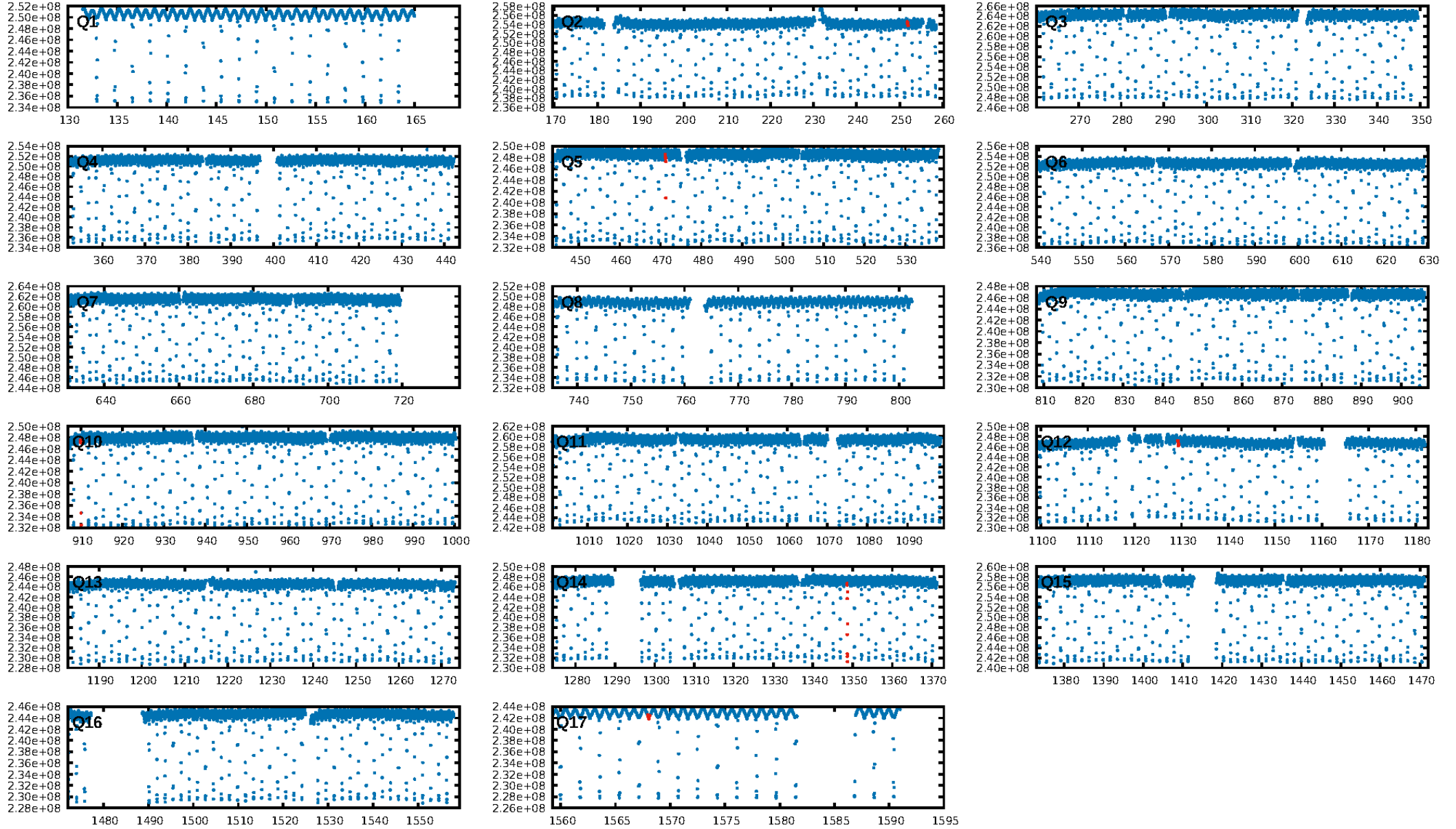
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1258.78σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -0.3884  
Centroid-sig: 63.7%  
Centroid-so: 0.115 arcsec [0.94σ]  
OotOffset-rm: 0.029 arcsec [0.25σ]  
KicOffset-rm: 0.143 arcsec [1.85σ]  
OotOffset-st: 3/0/1/2 [6]  
KicOffset-st: 3/0/1/2 [6]  
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DiffImageOverlap-fno: 0.50 [3/6]

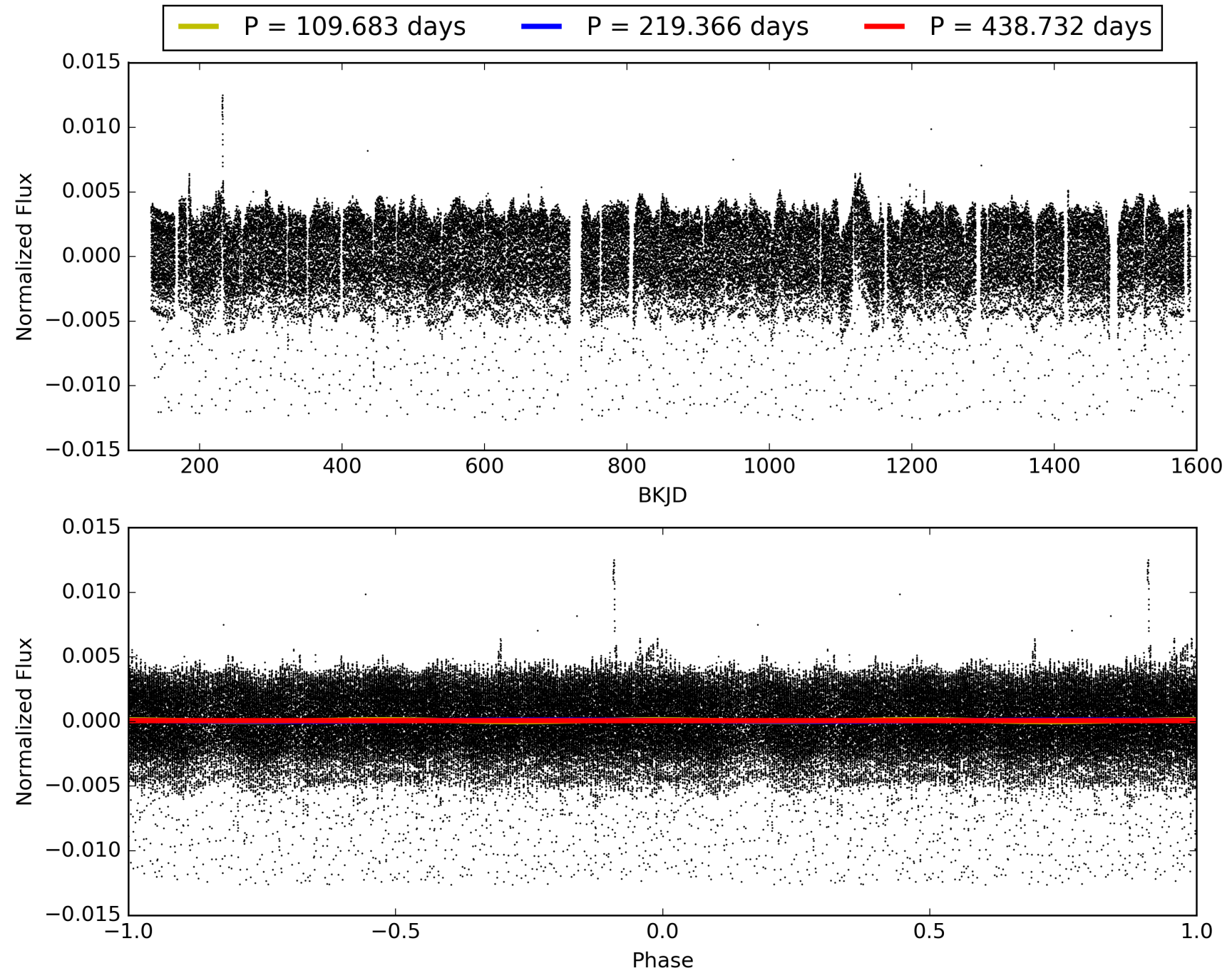
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:22:19 Z

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

# TCE 008112013-02, PDC Light Curves

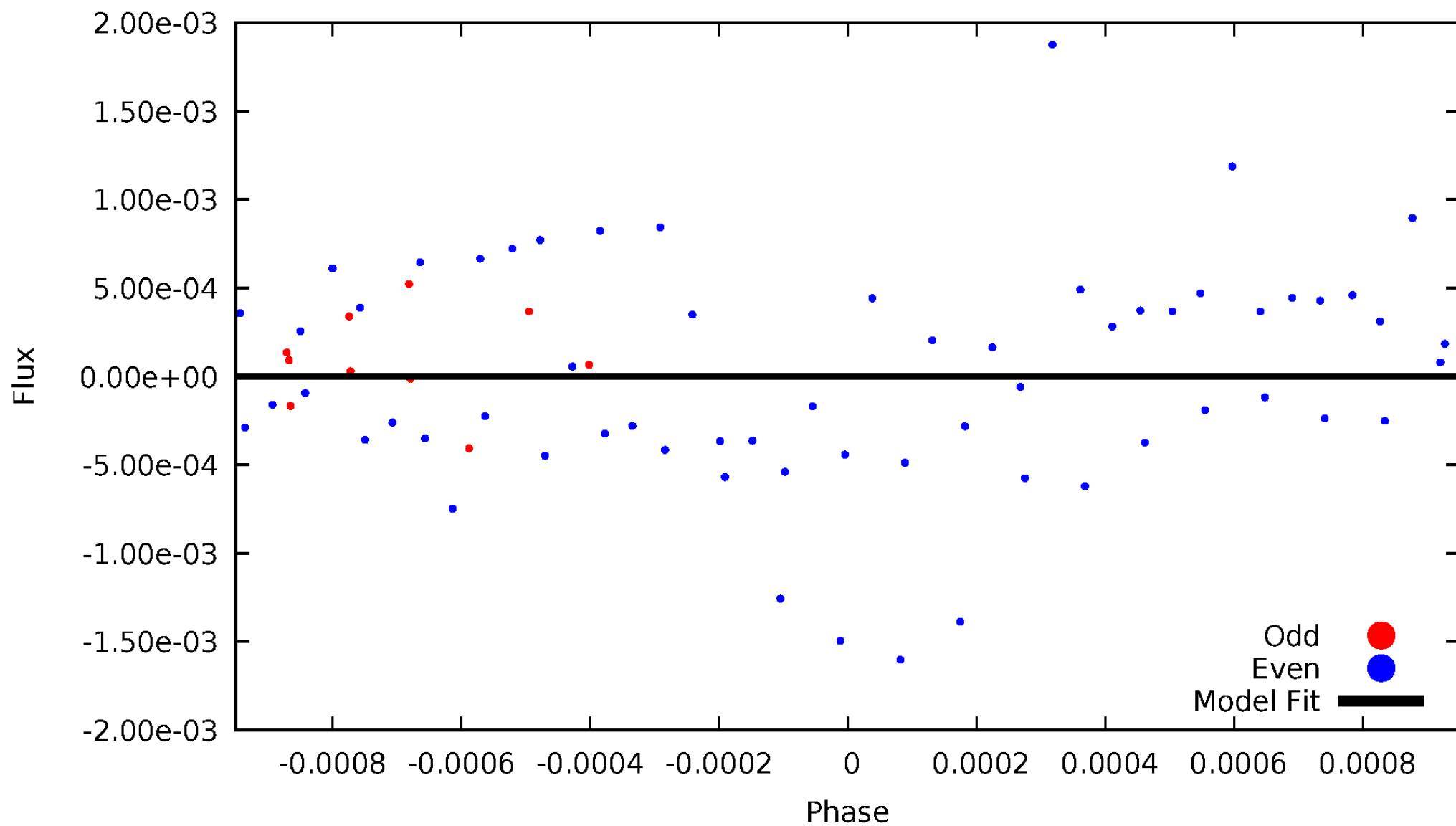


TCE 008112013-02



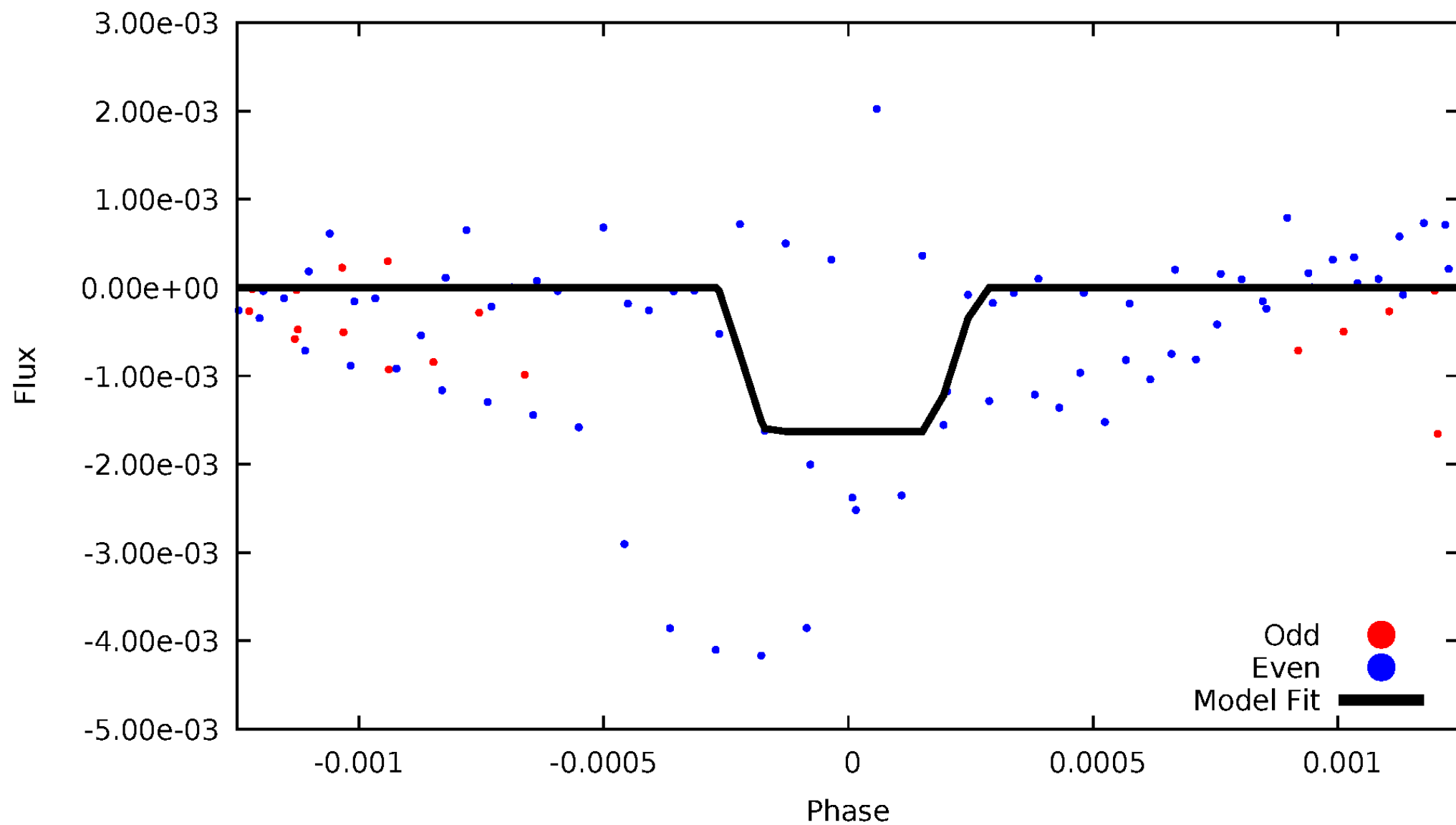
# DV Odd/Even

TCE 008112013-02



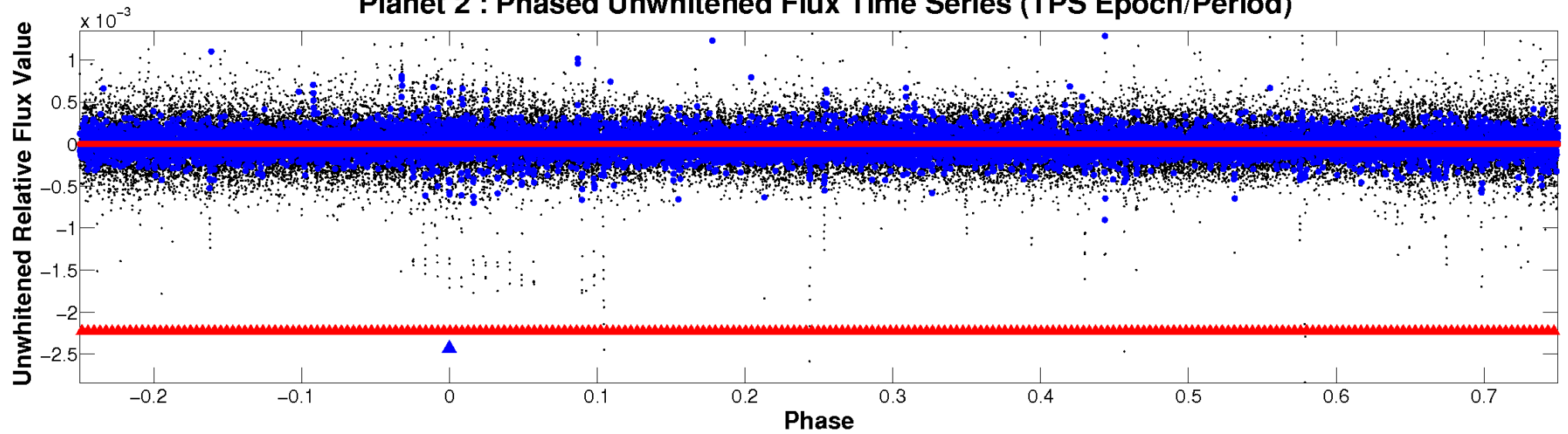
# ALT Odd/Even

TCE 008112013-02

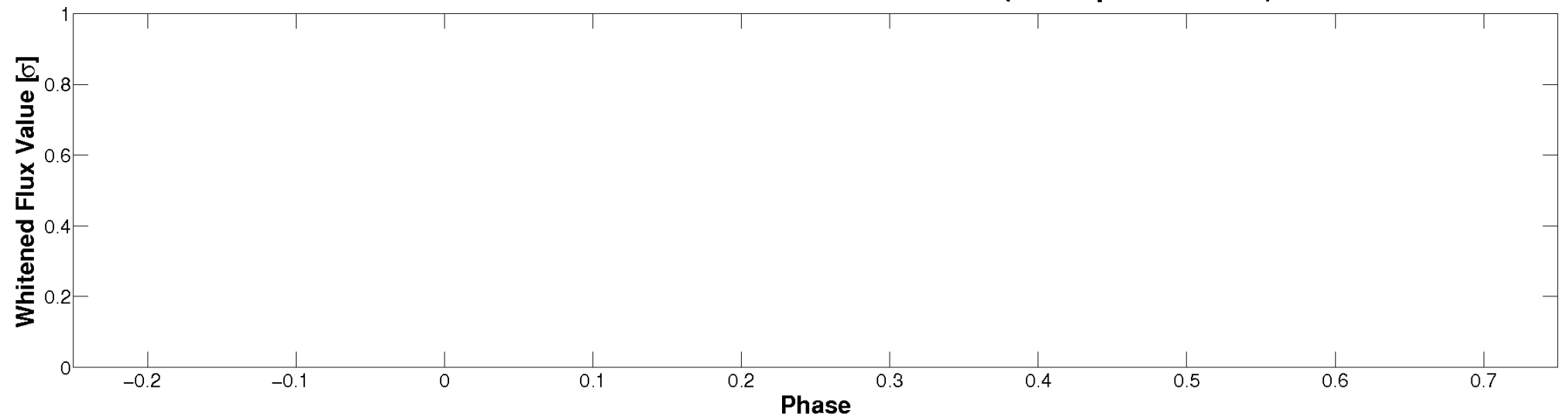


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

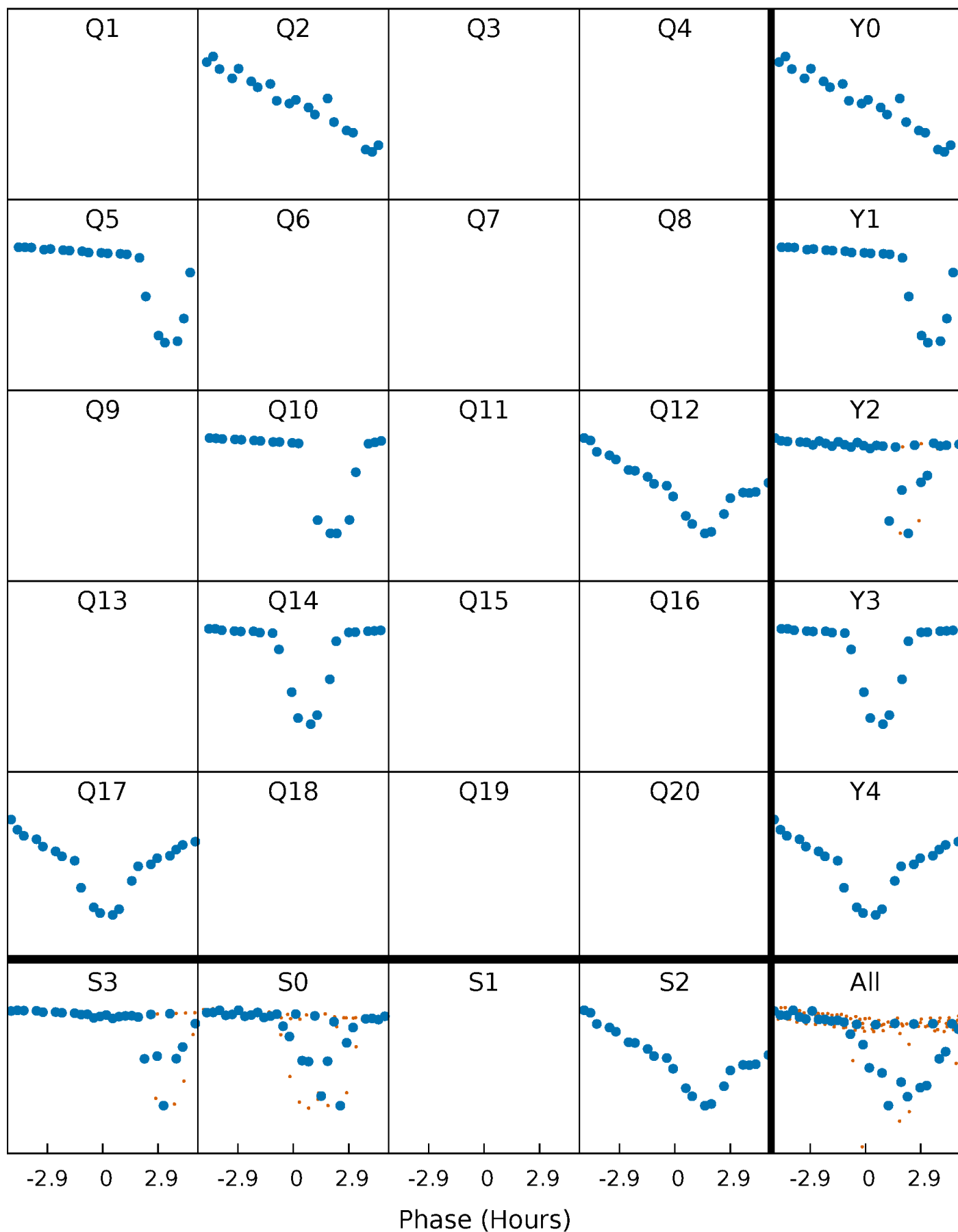


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



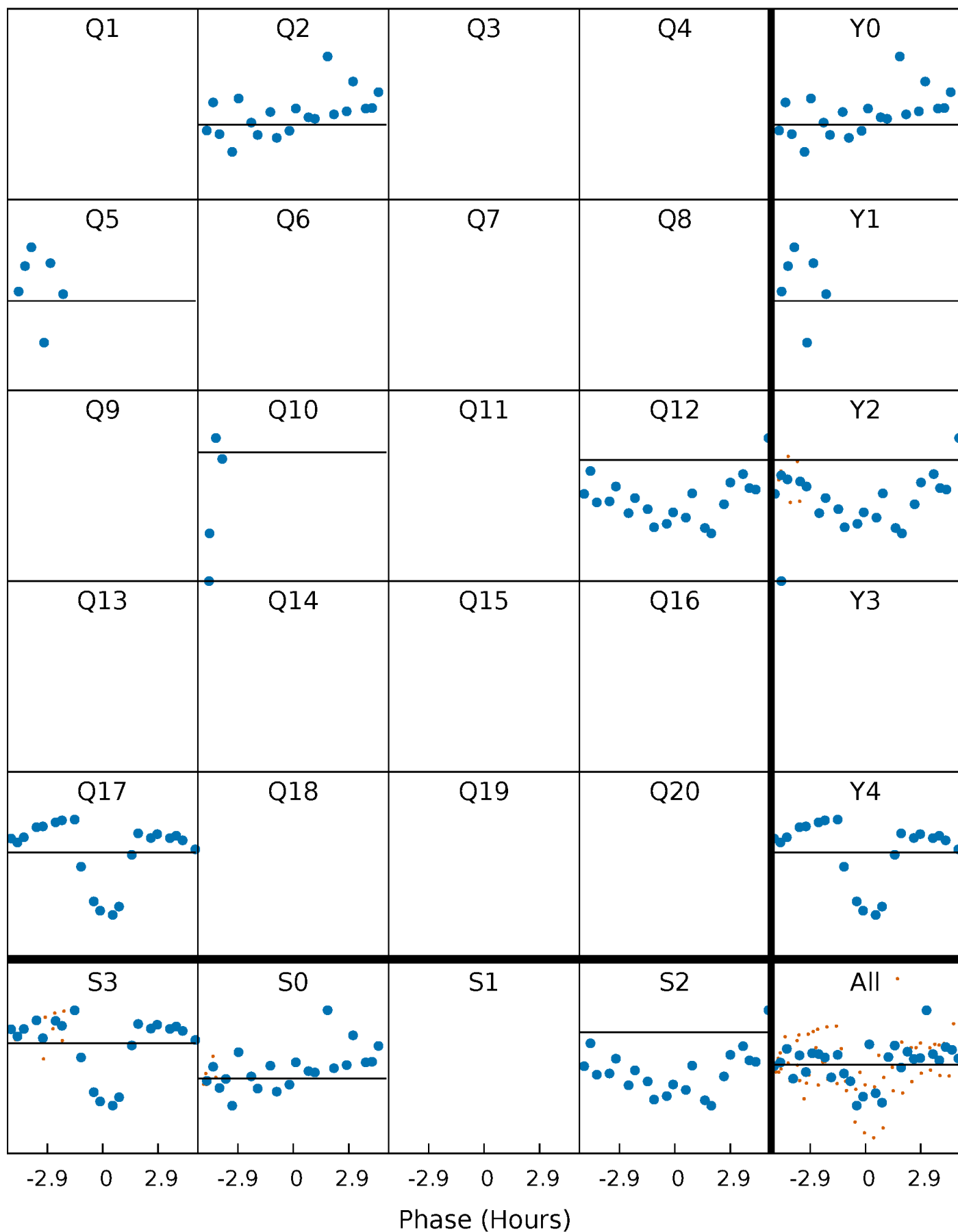
# PDC Quarter-Phased Transit Curves

TCE 008112013-02 P=219.366029 Days  $T_0=251.839147$  (BKJD)



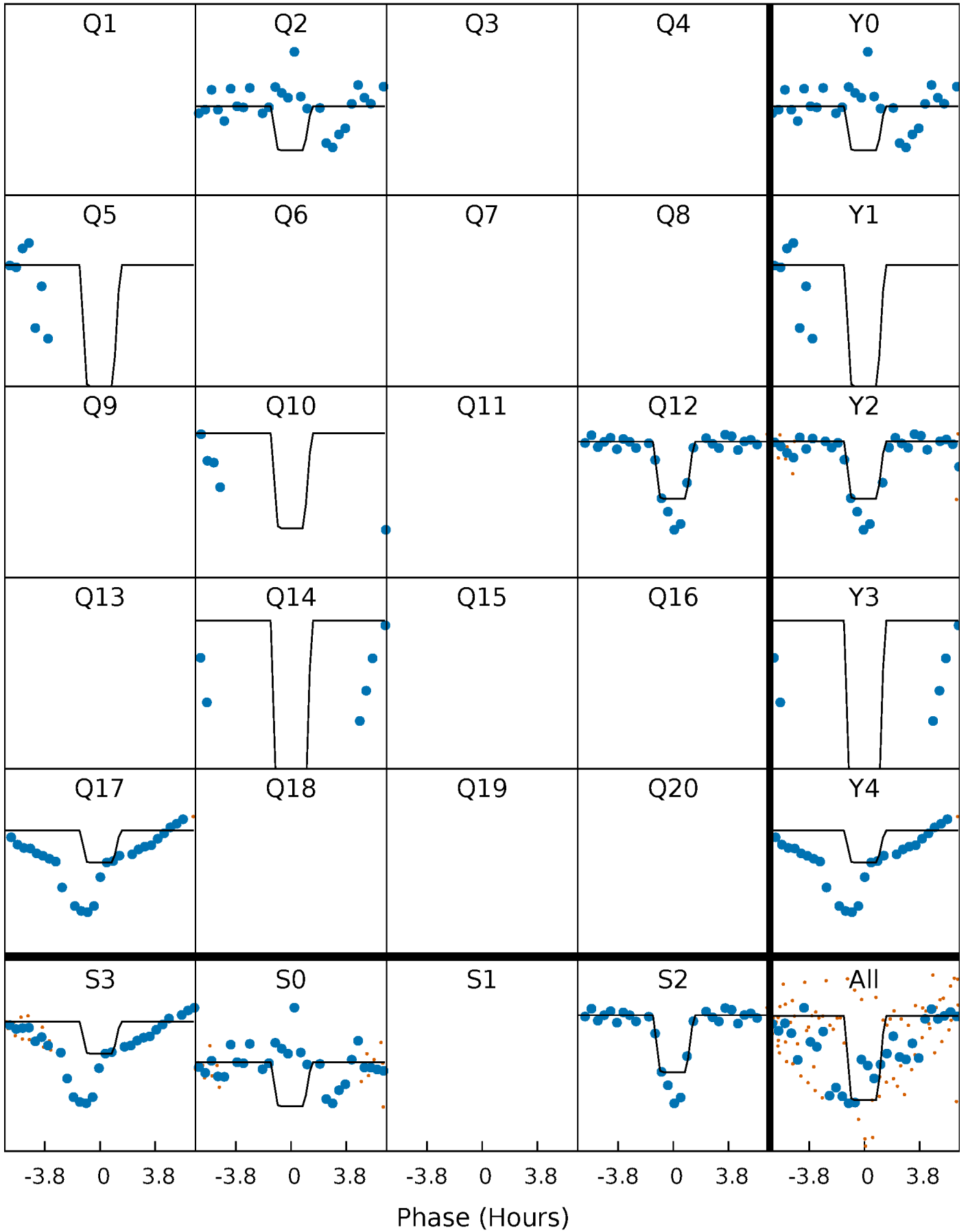
# DV Quarter-Phased Transit Curves

TCE 008112013-02 P=219.366029 Days  $T_0=251.839147$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

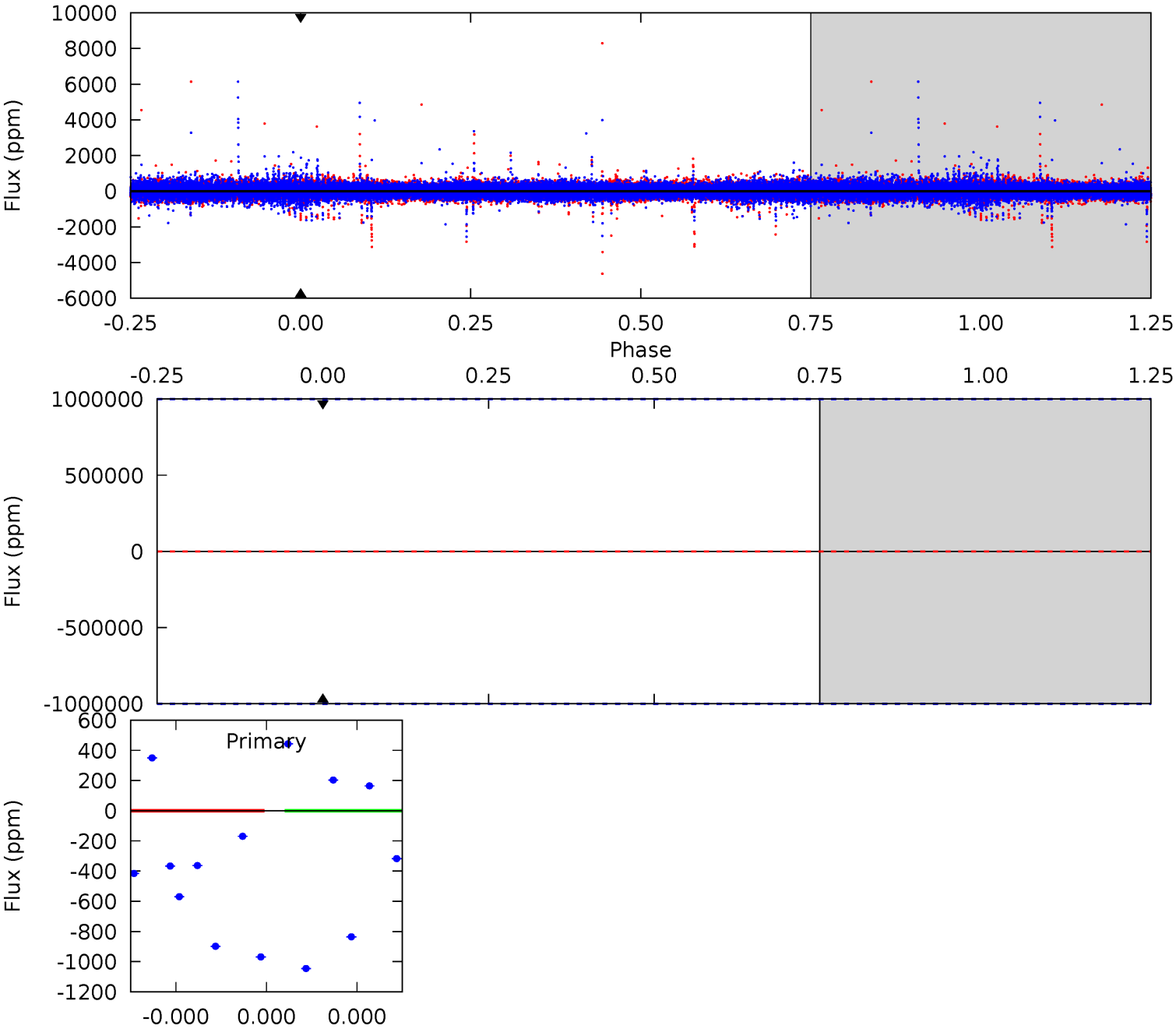
TCE 008112013-02 P=219.366029 Days  $T_0=251.896091$  (BKJD)



# DV Model-Shift Uniqueness Test

008112013-02, P = 219.366029 Days, E = 32.473118 Days

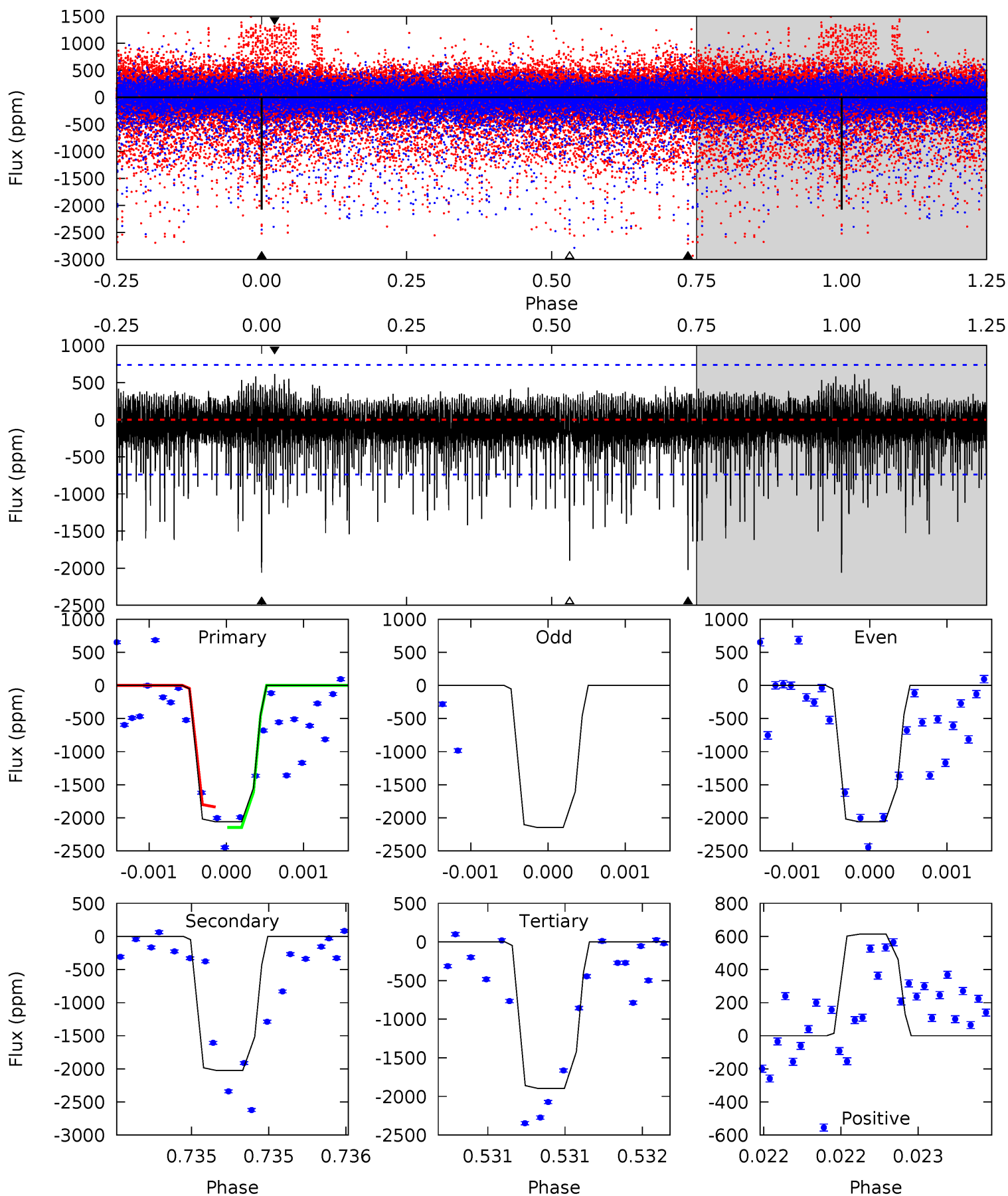
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008112013-02, P = 219.366029 Days, E = 32.530062 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
15.5	15.2	14.3	4.62	5.56	3.45	1.63	1.22	10.9	0.96	10.6	0.45	0.66	0.23	0



### Stellar Parameters For KIC 008112013

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6586^{+148}_{-198}$	$4.319^{+0.101}_{-0.188}$	$-0.320^{+0.250}_{-0.300}$	$1.219^{+0.366}_{-0.183}$	$1.131^{+0.165}_{-0.150}$	$0.880^{+0.400}_{-0.439}$
	+2%/-3%	+2%/-4%	+78%/-94%	+30%/-15%	+15%/-13%	+45%/-50%
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 008112013-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$10.64^{+10.49}_{-7.07}$	$525^{+38}_{-29}$	$5465^{+24010}_{-26892}$	$7076^{+583816}_{-344505}$
Alt.	$-2025 \pm 133$	$11.65^{+10.73}_{-7.76}$	$526^{+38}_{-28}$	$4909^{+3575}_{-1057}$	$4451^{+35110}_{-3236}$

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

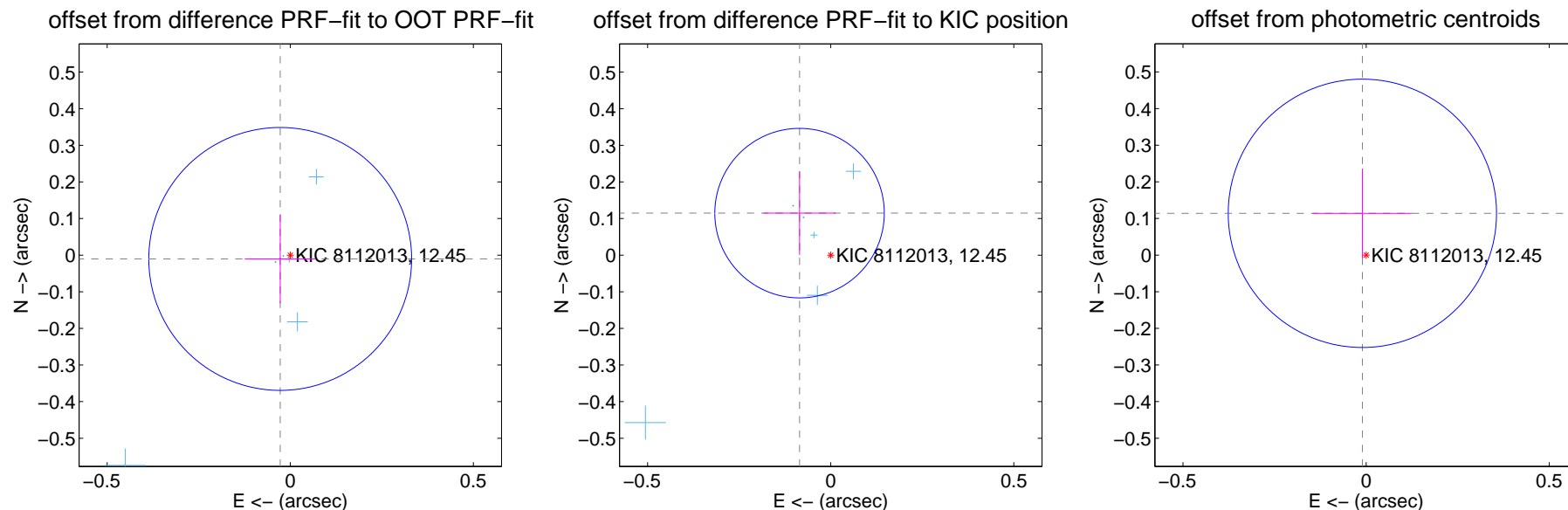
## DV Centroid Data

Supplemental centroid analysis for 008112013-02. Kepler magnitude: 12.45. Transit SNR -1.00

There are 6 quarters with good PRF difference image offsets

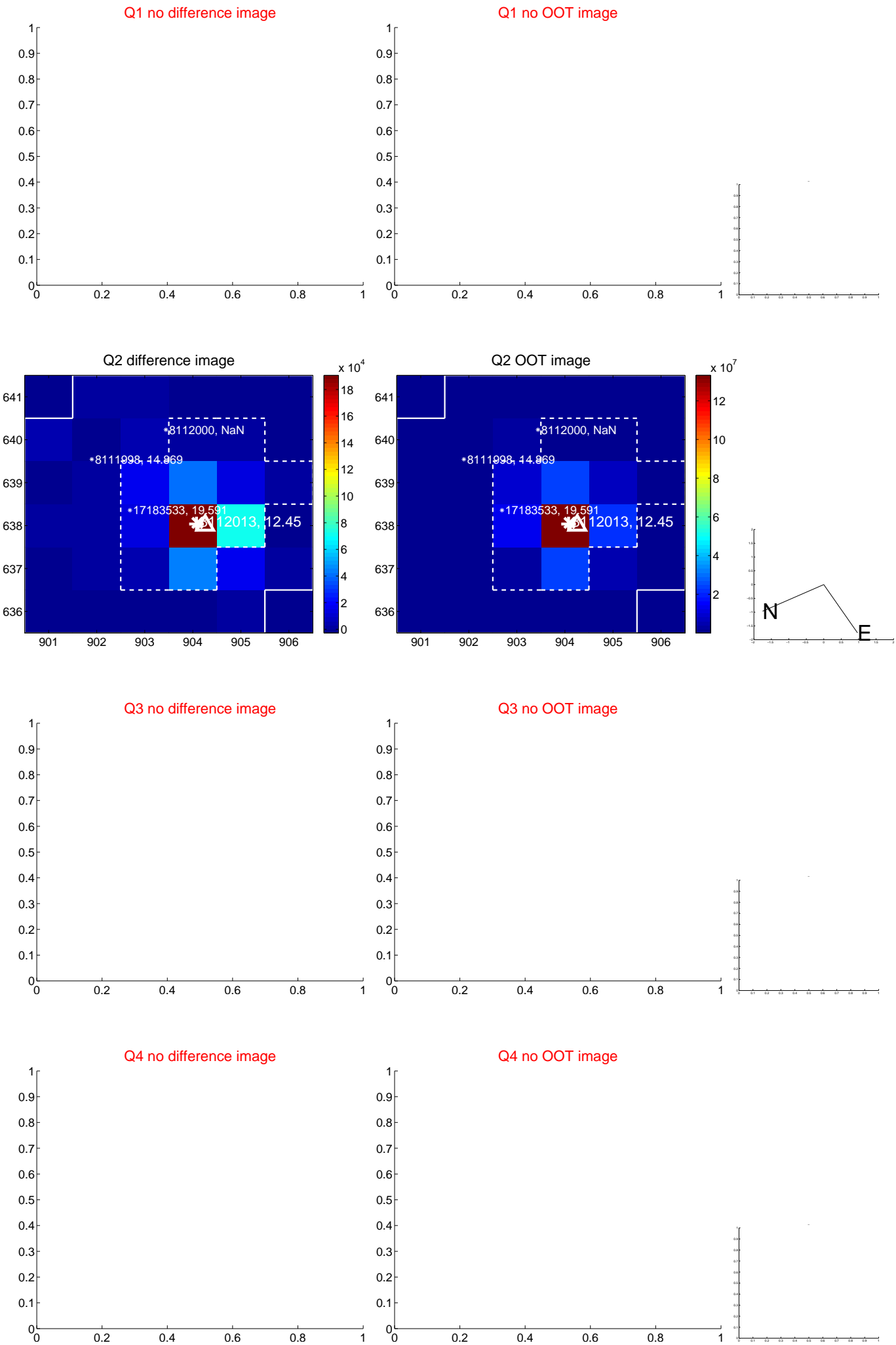
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.029 \pm 0.120$	0.25	$0.028 \pm 0.097$	$-0.010 \pm 0.121$
PRF-fit source offset from KIC position	$0.143 \pm 0.077$	1.85	$0.085 \pm 0.099$	$0.115 \pm 0.114$
photometric centroid source offset	$0.11 \pm 0.12$	0.94	$0.01 \pm 0.14$	$0.11 \pm 0.12$

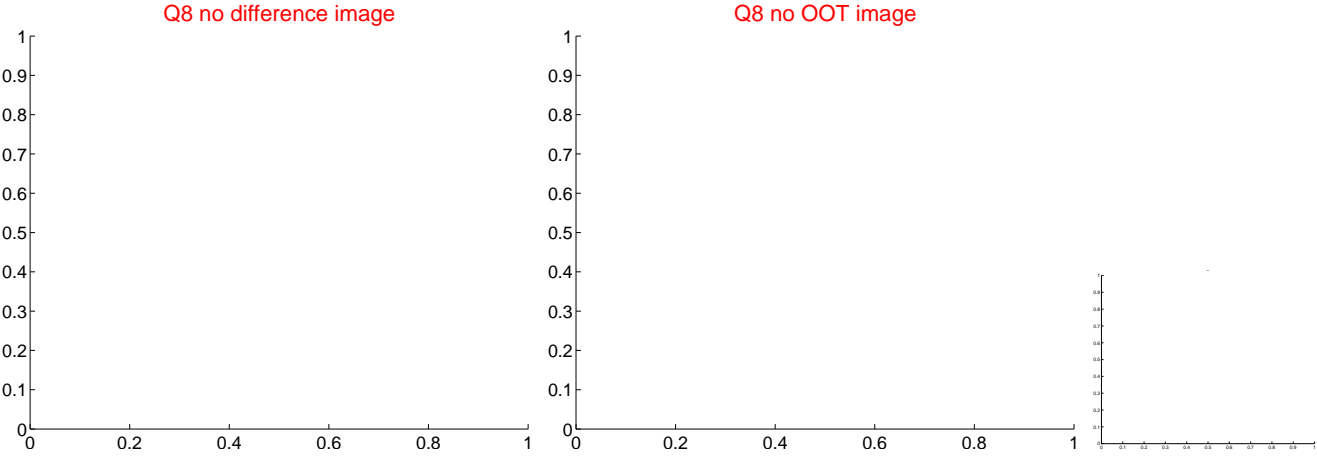
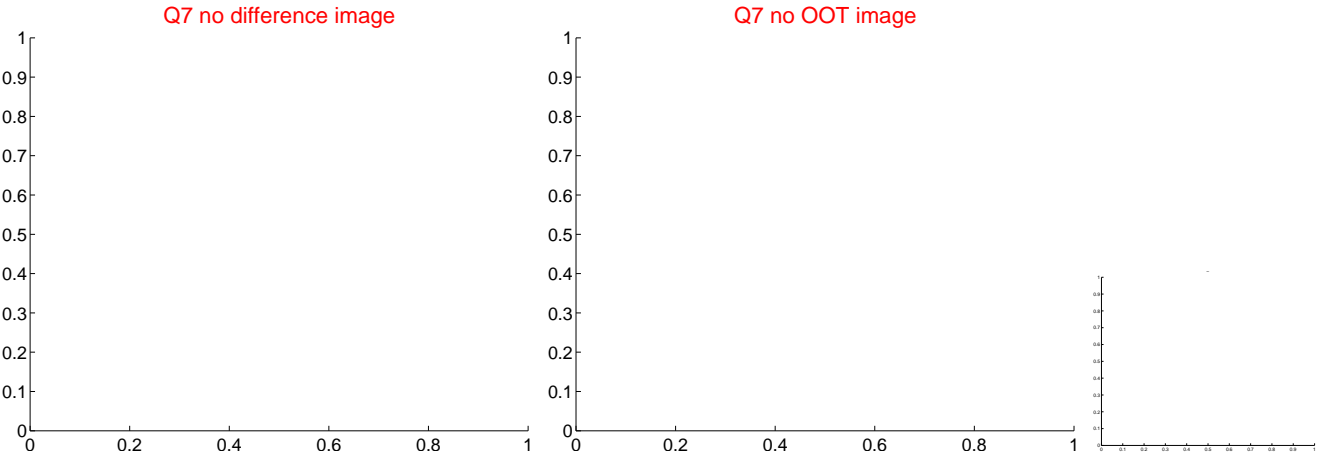
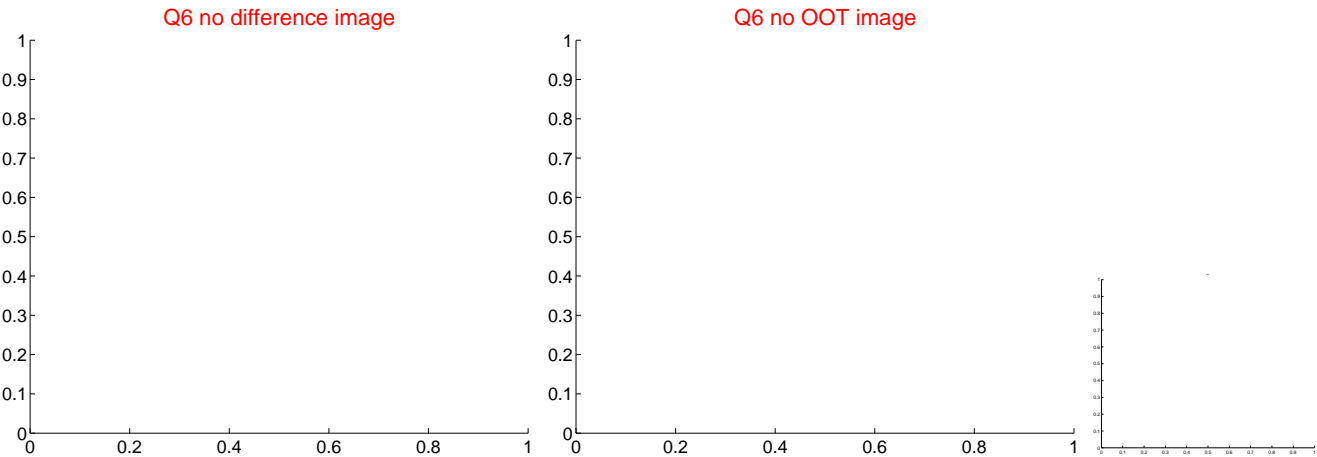
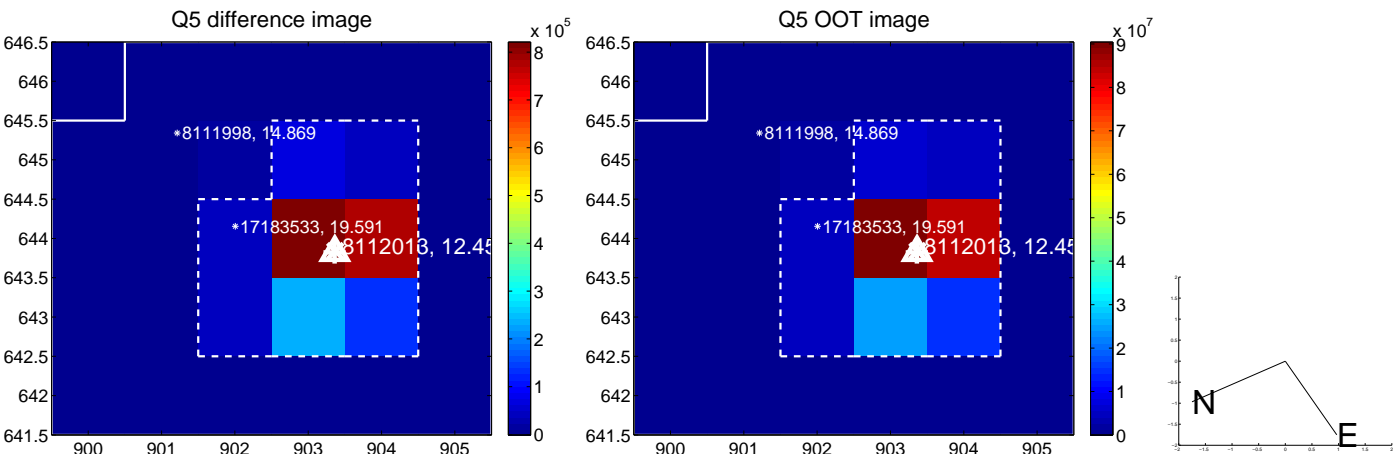


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

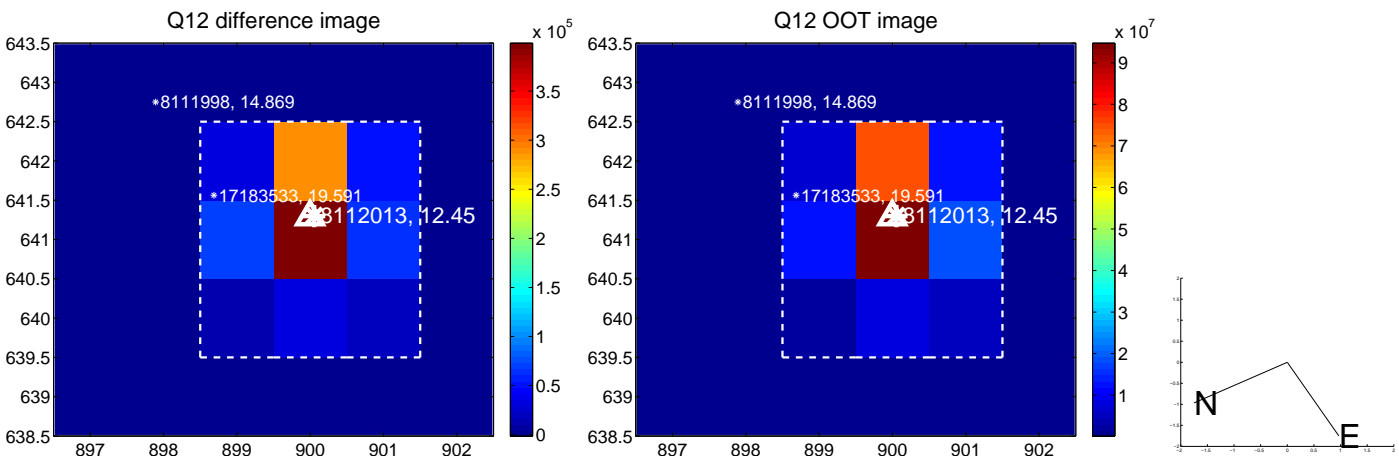
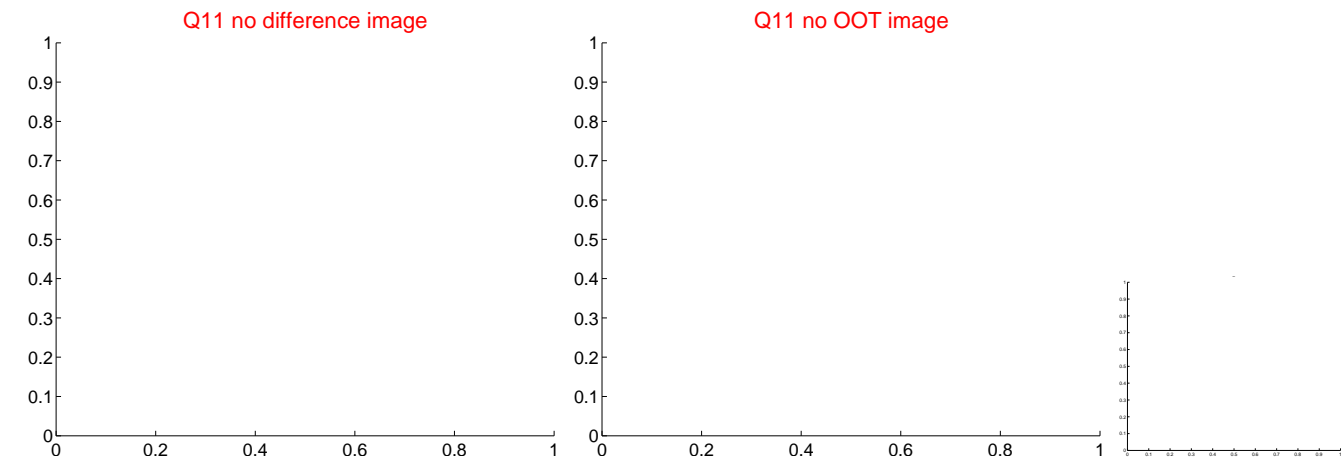
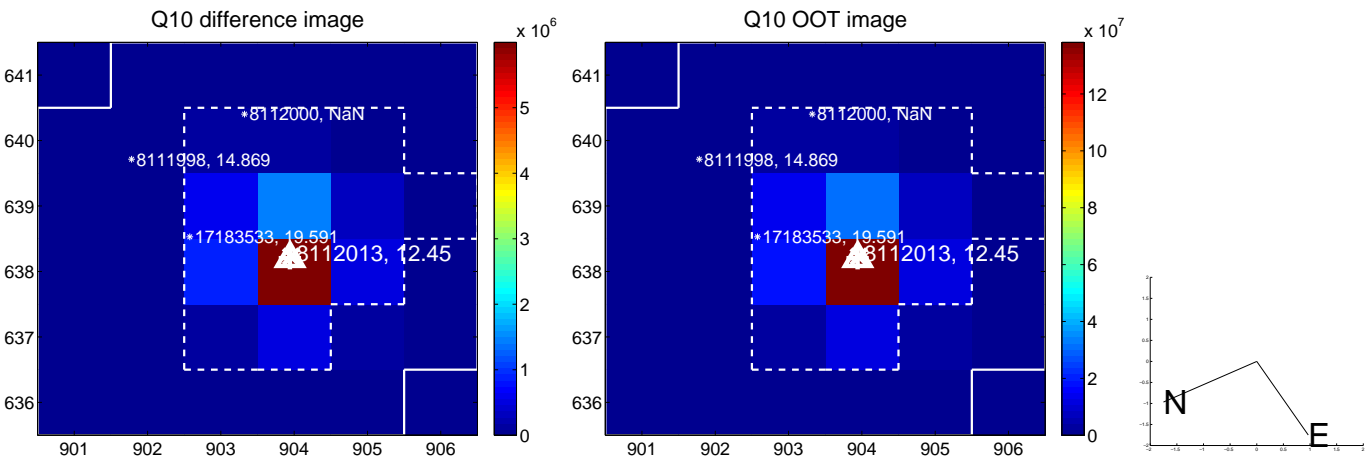
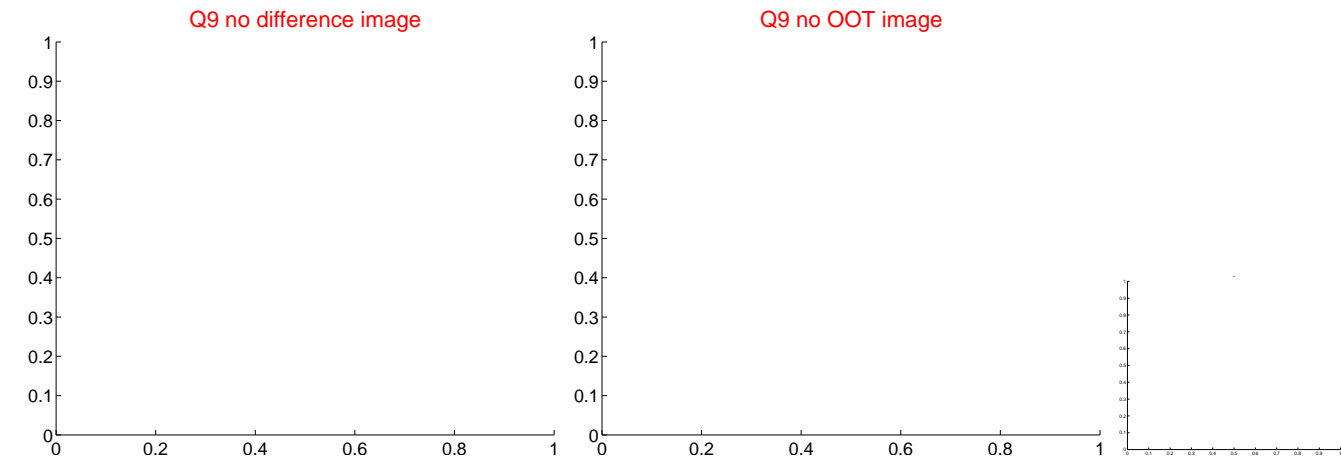
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



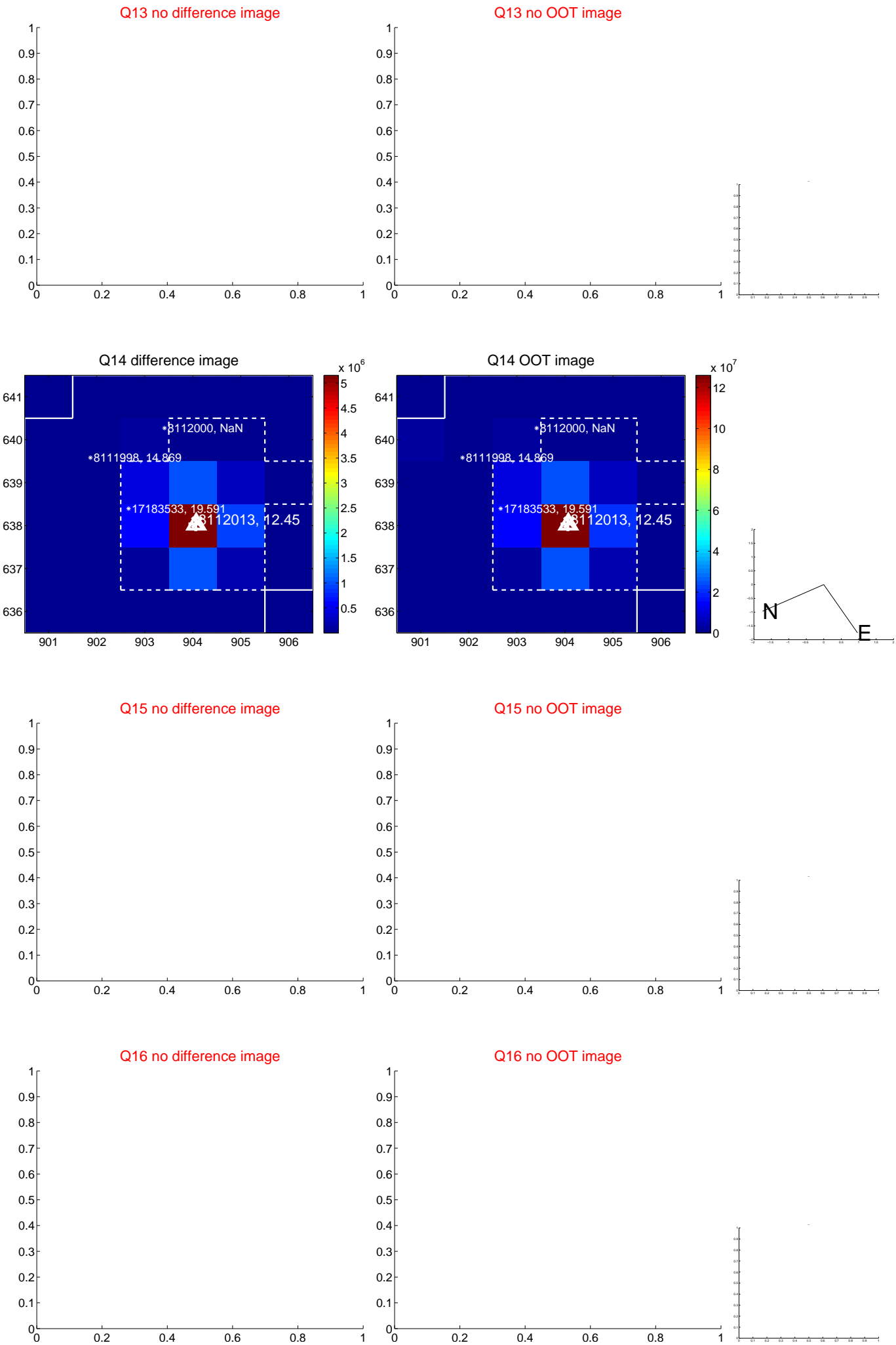
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



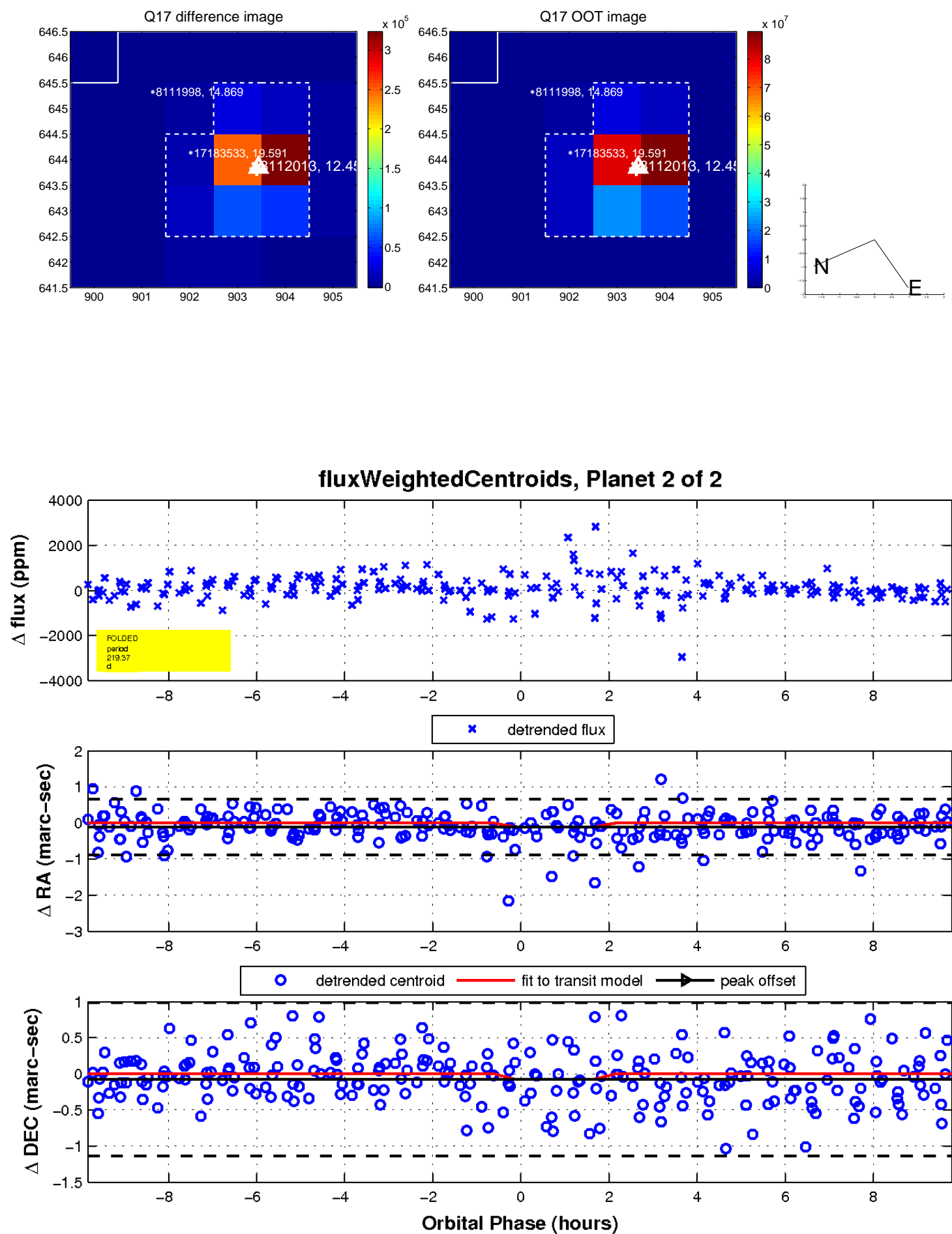
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

