

# KIC 011404644

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011404644-01	OBS	6085.01	5.902597	136.388987	55303.6	5.586	2769.8	2369.1	1.09	6184	25.93	377.22
011404644-02	OBS	No	5.902579	133.454699	1823.8	5.535	96.4	102.8	1.09	6184	5.25	377.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011404644-01	OBS	FP	0.02	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
011404644-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

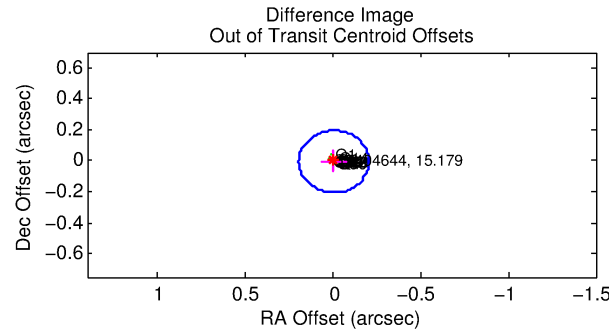
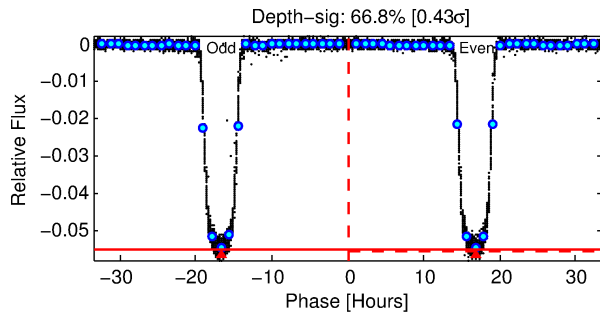
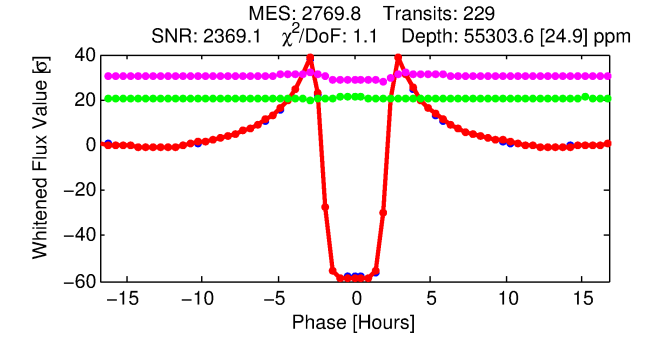
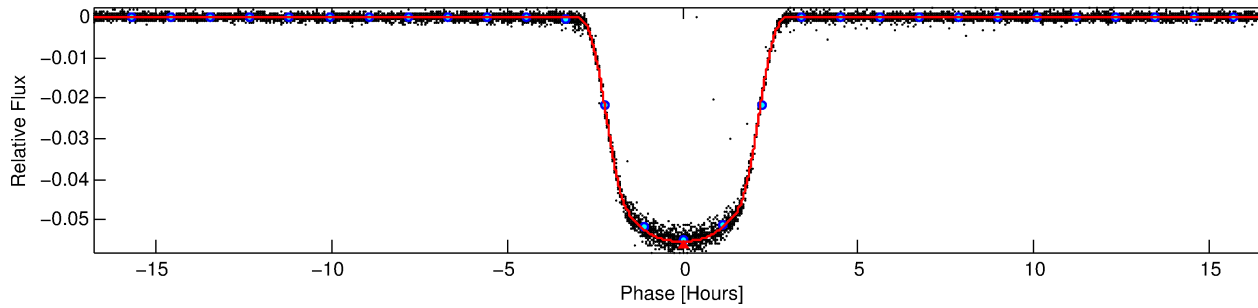
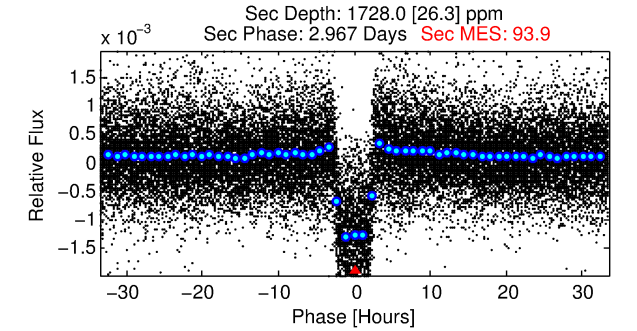
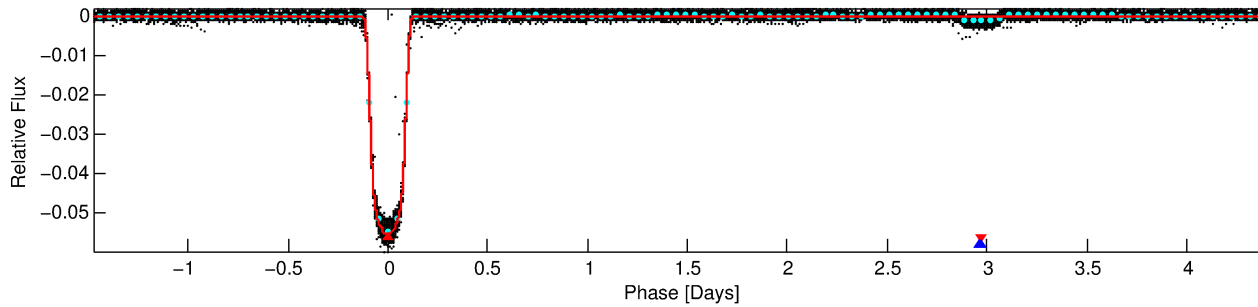
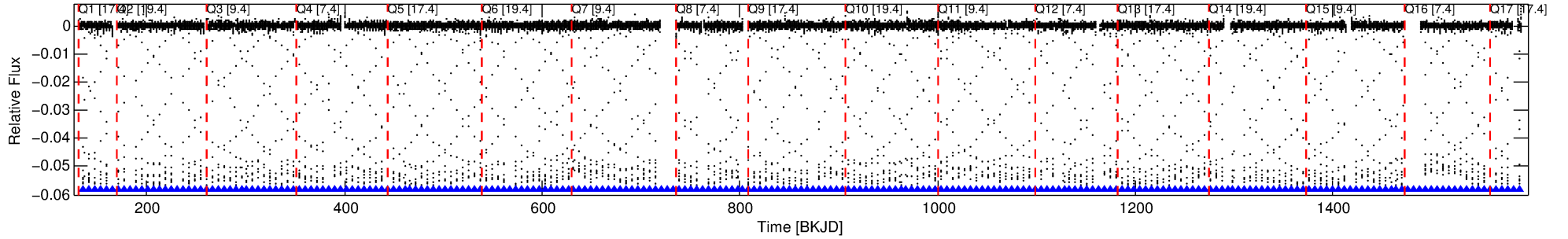
## Ephemeris Match Information For 011404644-01

No Significant Match Found

# DV One-Page Summary

KIC: 11404644 Candidate: 1 of 2 Period: 5.903 d  
KOI: K06085.01 Corr: 0.999

Kp: 15.18 R\*: 1.09 Rs Teff: 6184.0 K Logg: 4.37 Fe/H: -0.160



## DV Fit Results:

Period = 5.90260 [0.00000] d  
Epoch = 136.3890 [0.0000] BKJD  
Rp/R\* = 0.2172 [0.0001]  
a/R\* = 9.69 [0.01]  
b = 0.22 [0.00]  
Seff = 377.22 [156.50]  
Teq = 1124 [117] K  
Rp = 25.93 [8.48] Re  
a = 0.0645 [0.0175] AU  
Ag = 5.88 [2.29] [2.13σ]  
Teffp = 2706 [98] K [10.40σ]

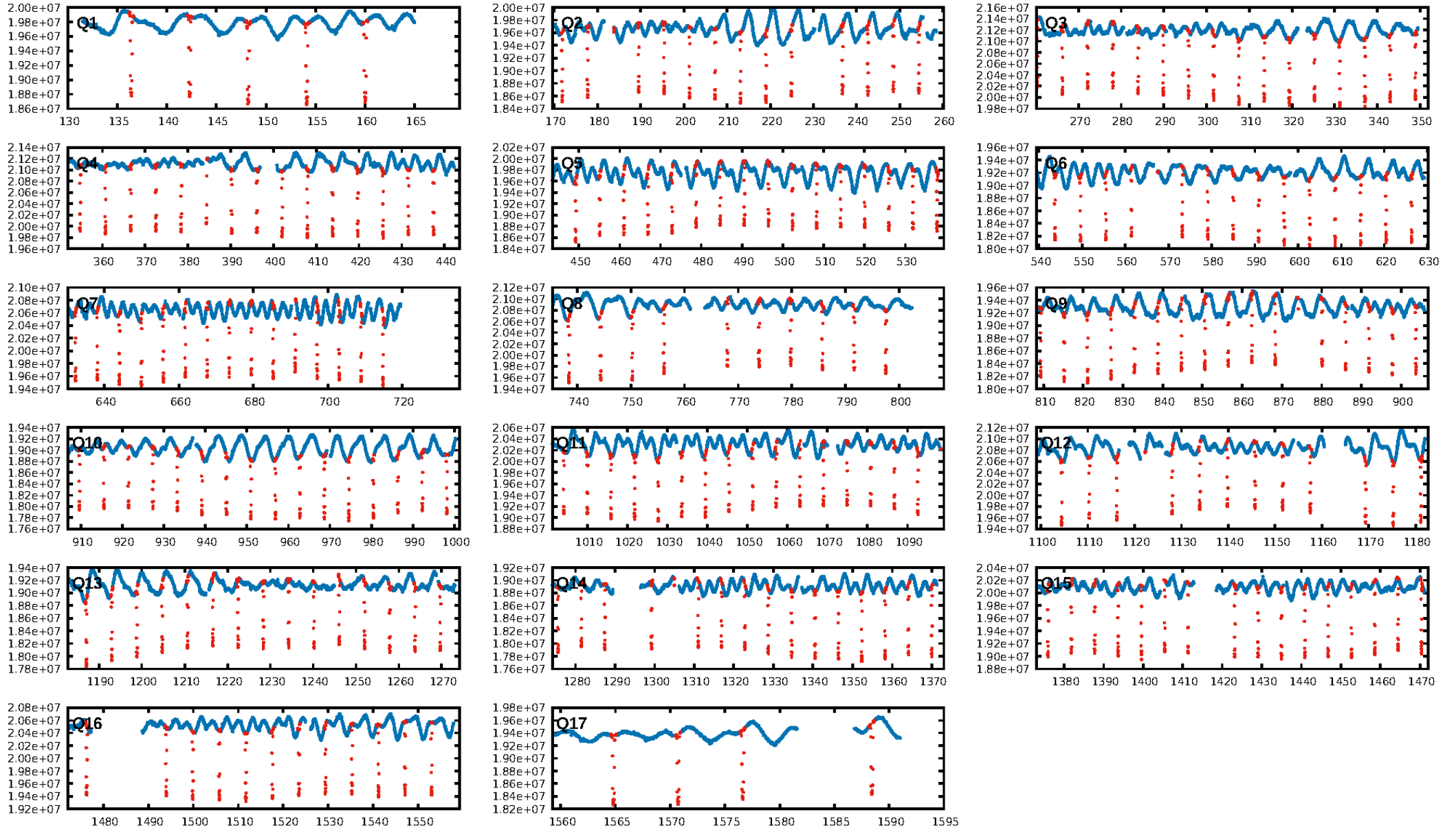
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [220/220]  
GhostDiagnostic-chr: 2.345  
Centroid-sig: 0.0%  
Centroid-so: 0.209 arcsec [81.34σ]  
OotOffset-rm: 0.007 arcsec [0.11σ]  
KicOffset-rm: 0.203 arcsec [2.97σ]  
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]

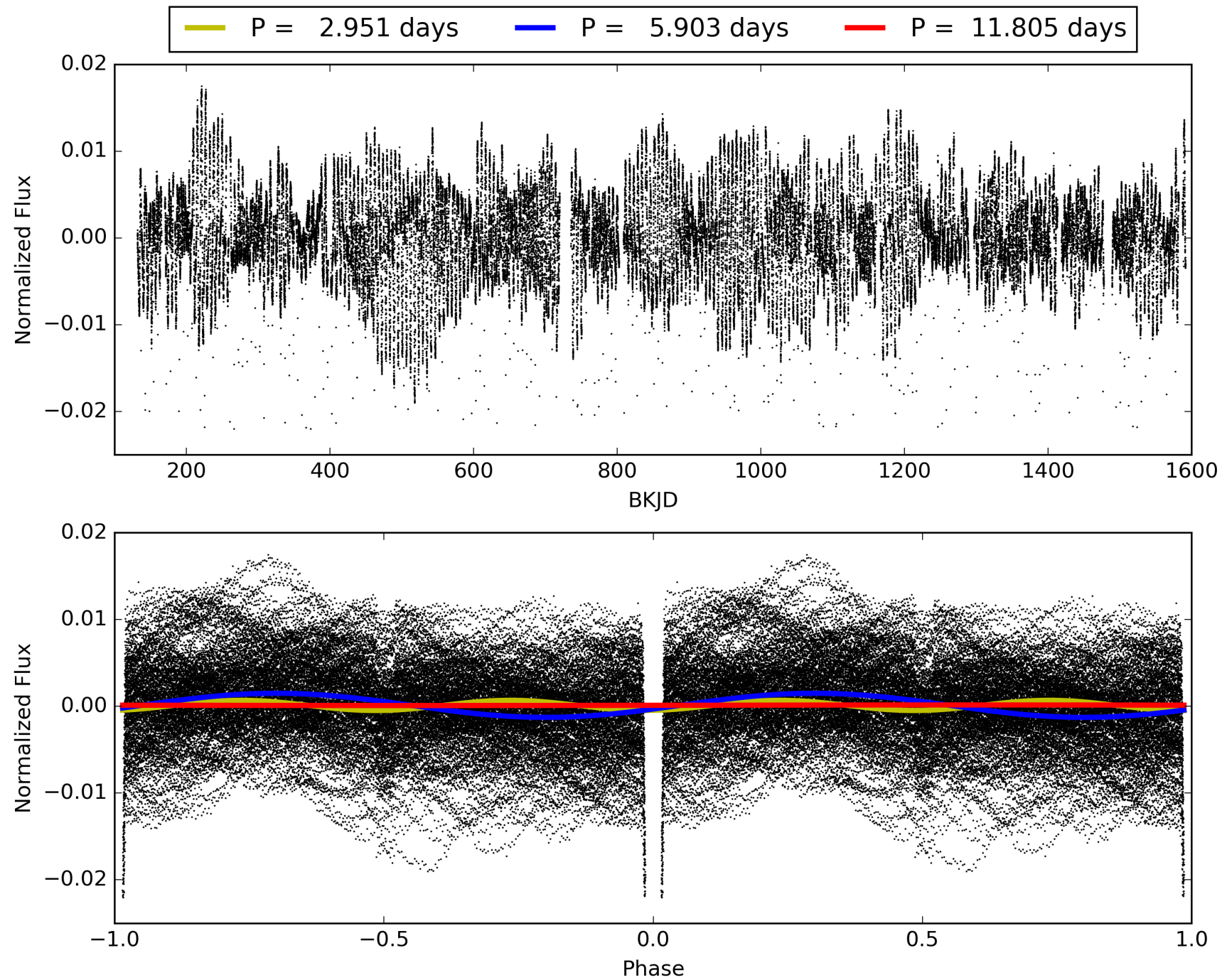
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:29:22 Z

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

# TCE 011404644-01, PDC Light Curves

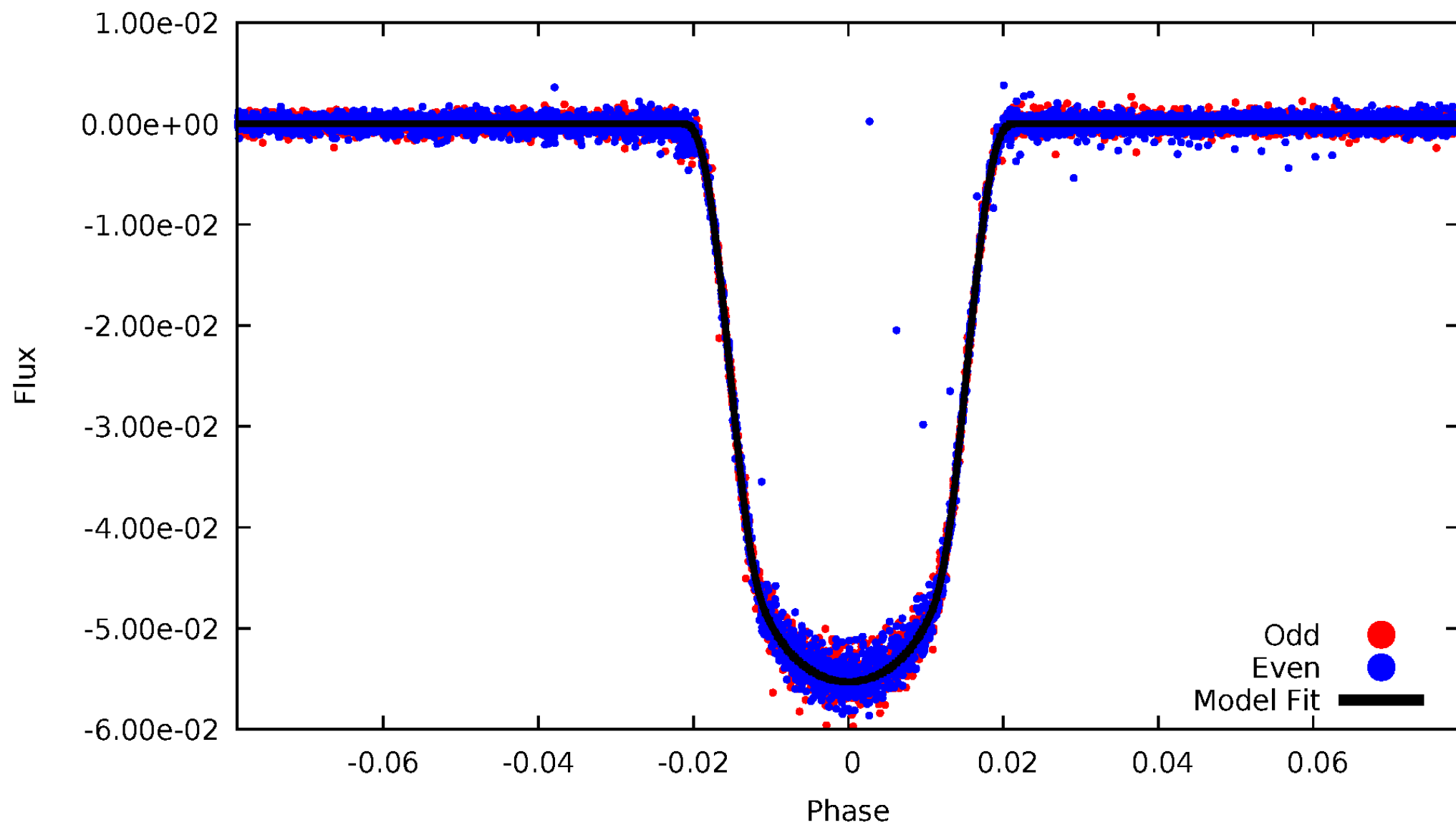


TCE 011404644-01



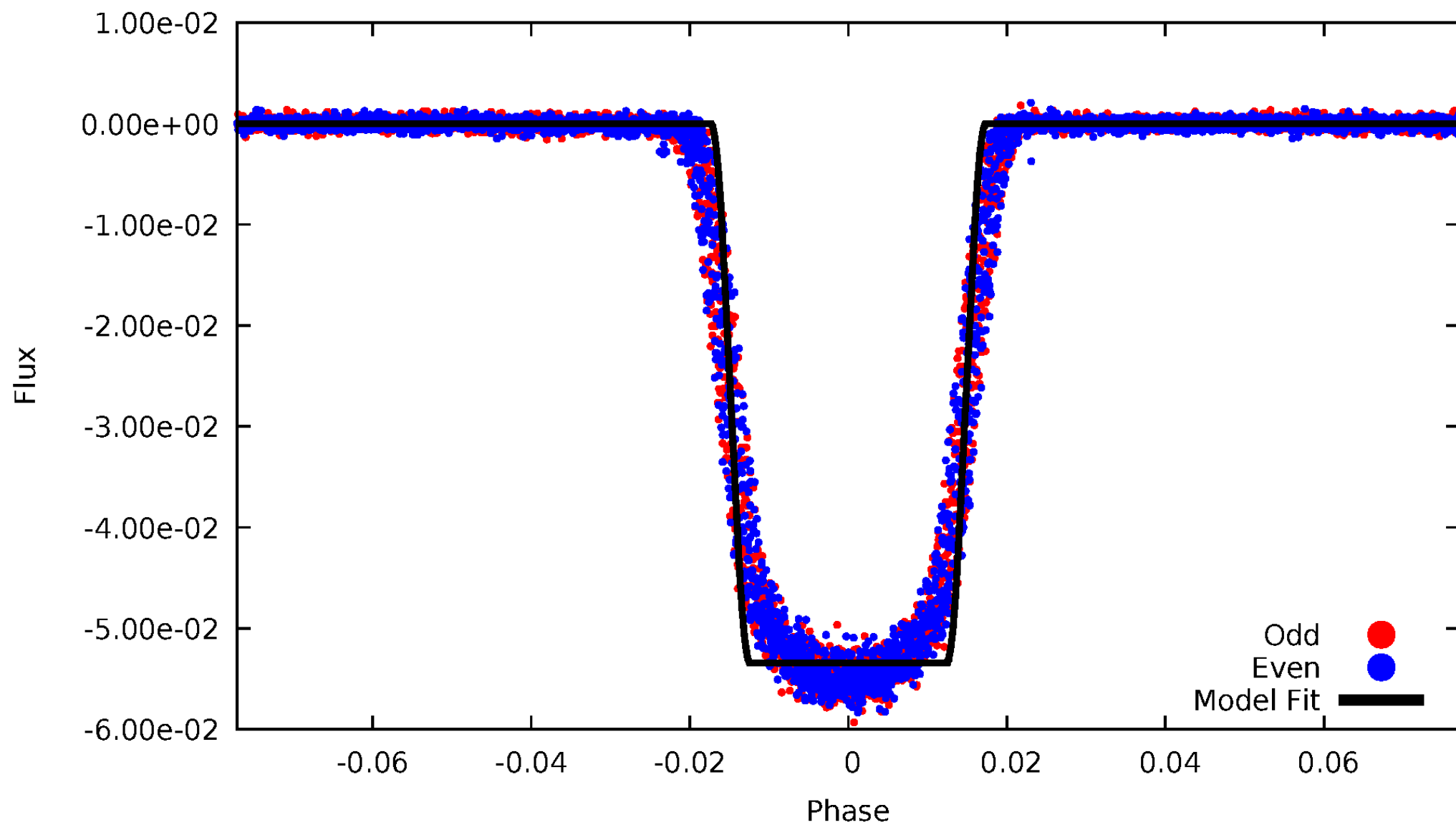
# DV Odd/Even

TCE 011404644-01



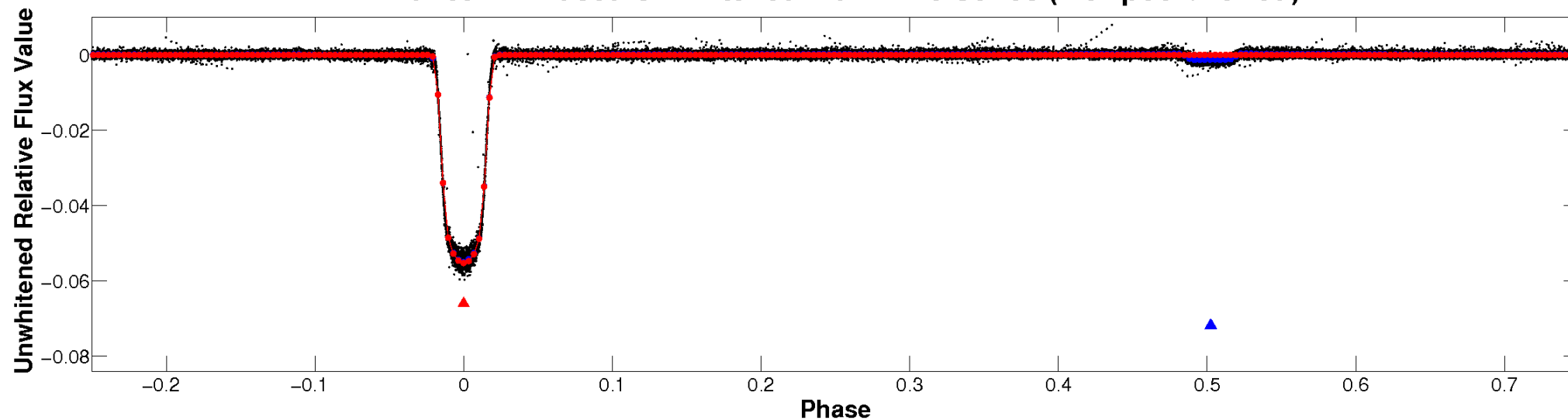
# ALT Odd/Even

TCE 011404644-01

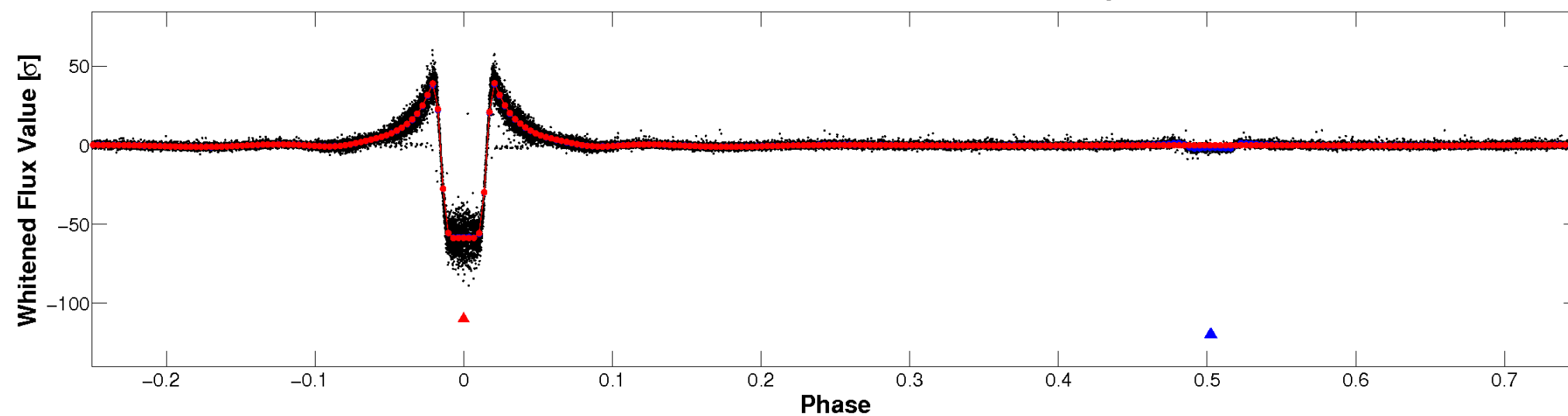


# Non-Whitened Vs. Whitened Light Curve

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



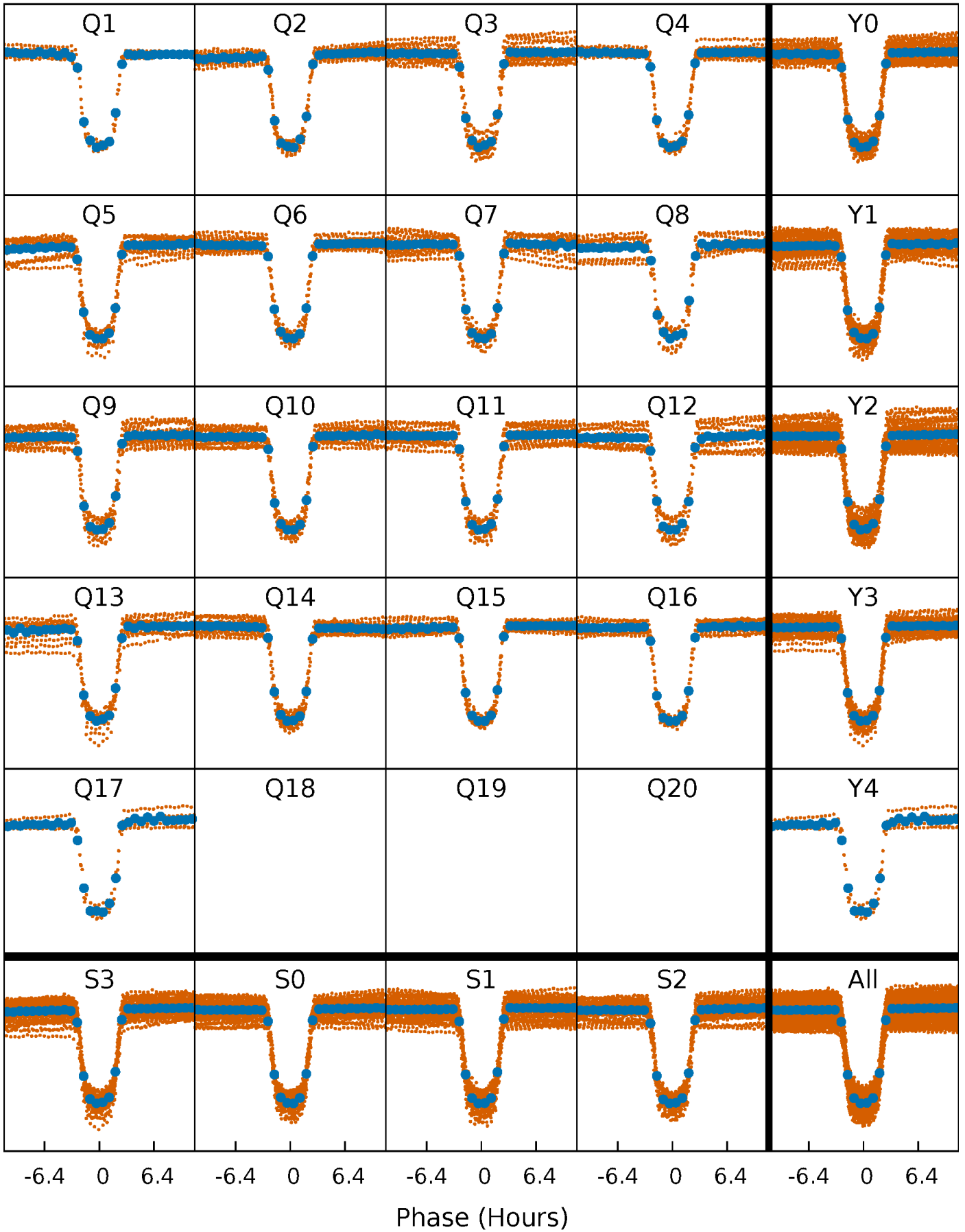
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

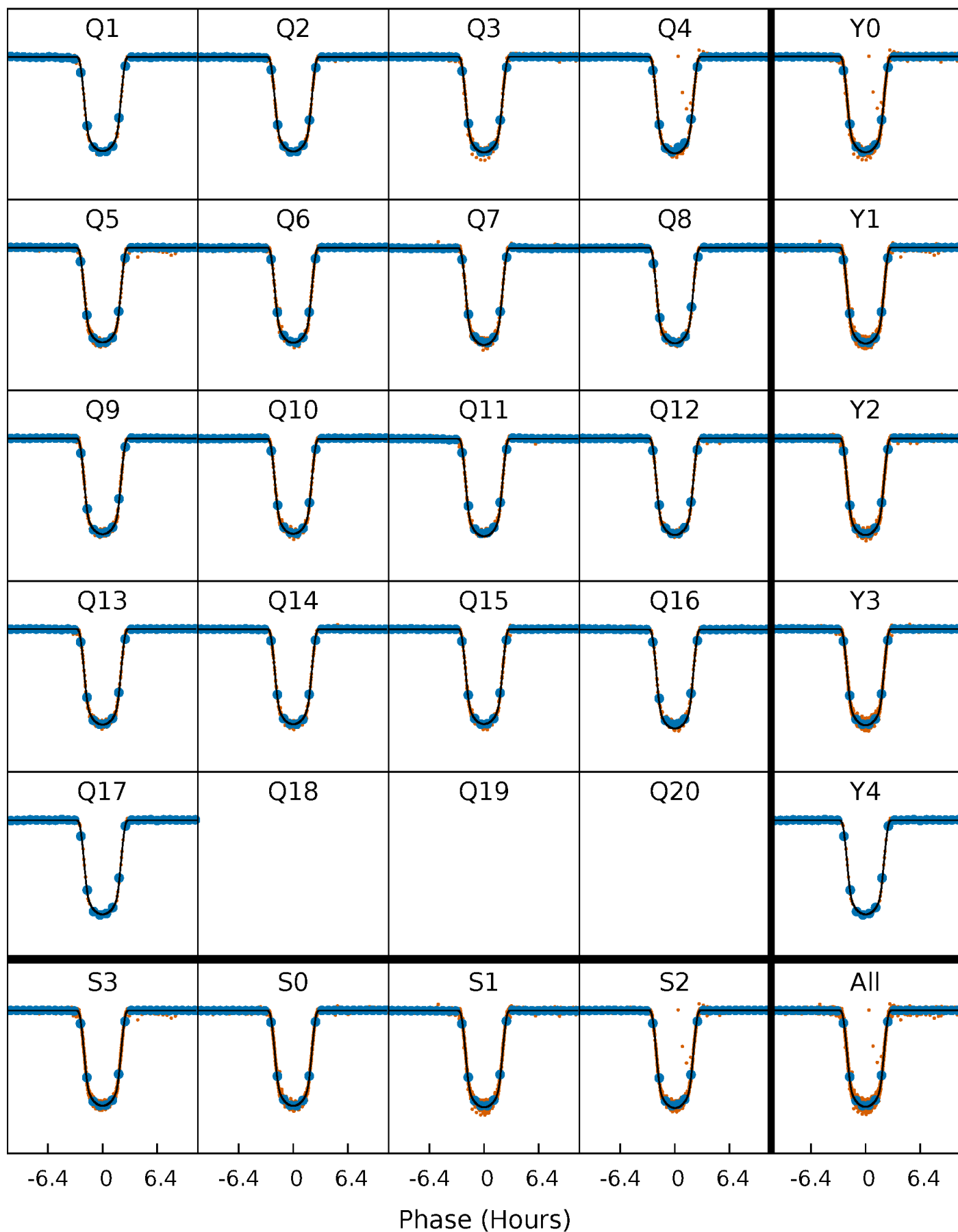
TCE 011404644-01 P= 5.902597 Days  $T_0=136.388987$  (BKJD)





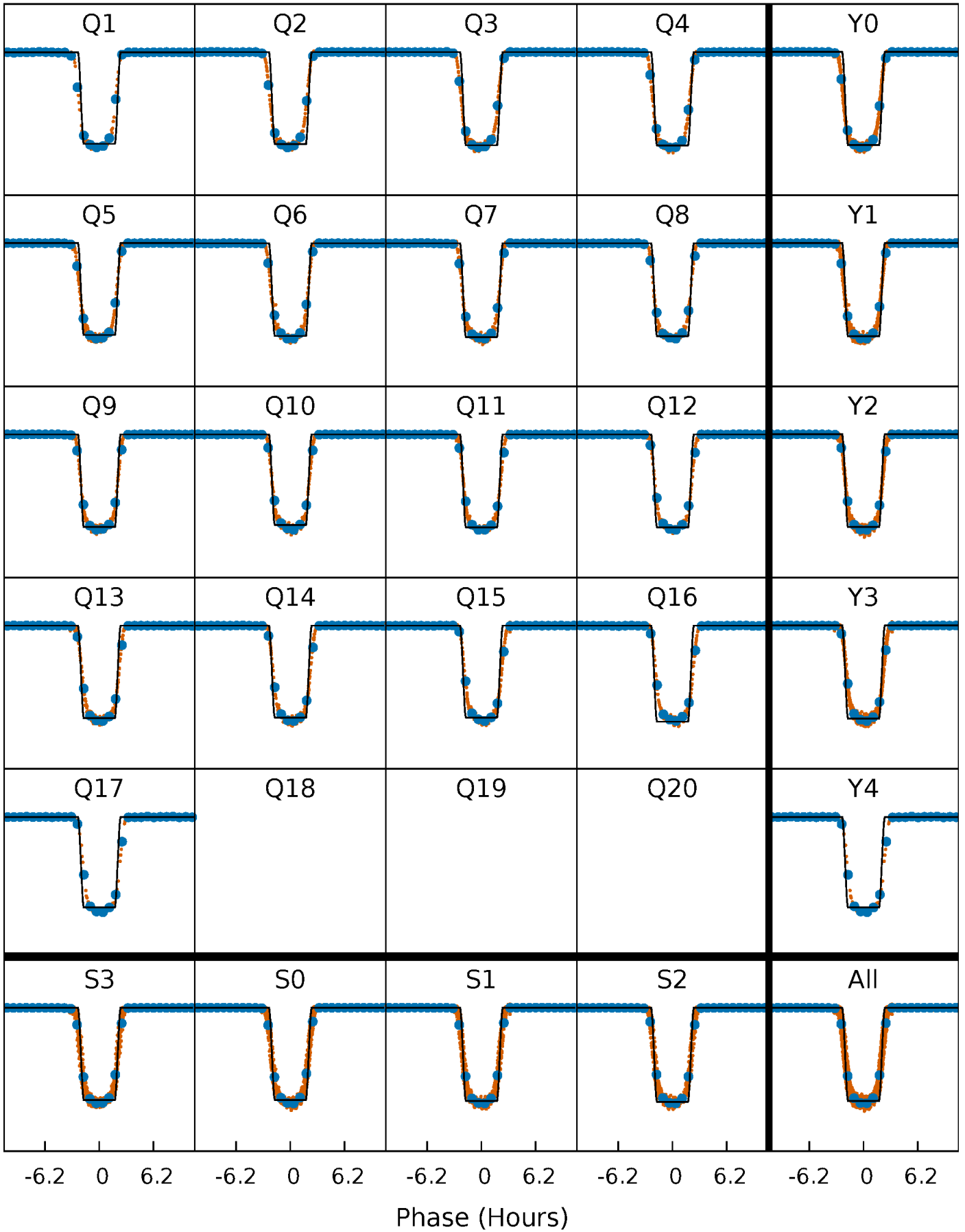
# DV Quarter-Phased Transit Curves

TCE 011404644-01 P= 5.902597 Days  $T_0=136.388987$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

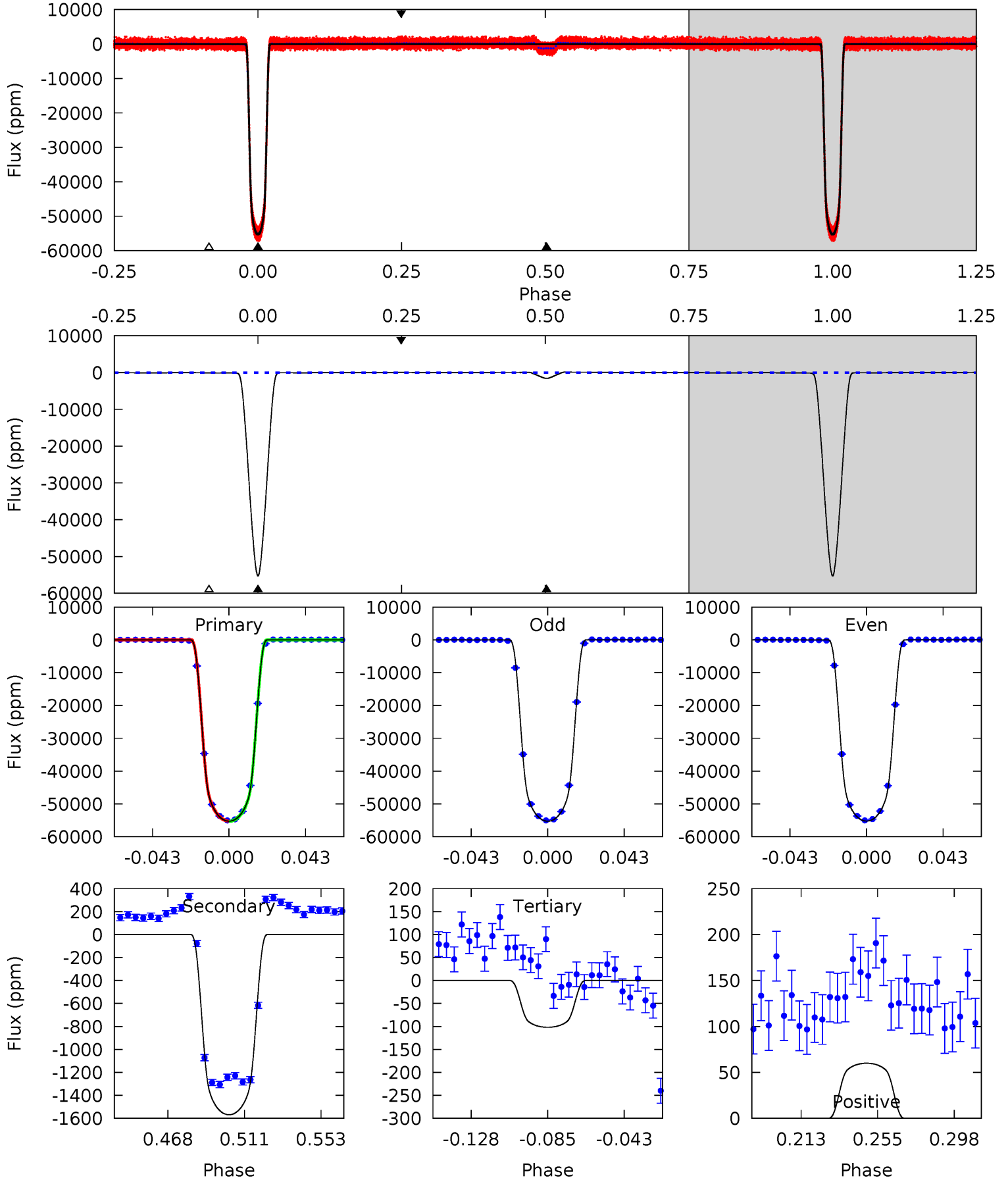
TCE 011404644-01 P= 5.902514 Days  $T_0=136.399174$  (BKJD)



# DV Model-Shift Uniqueness Test

011404644-01, P = 5.902597 Days, E = 130.486390 Days

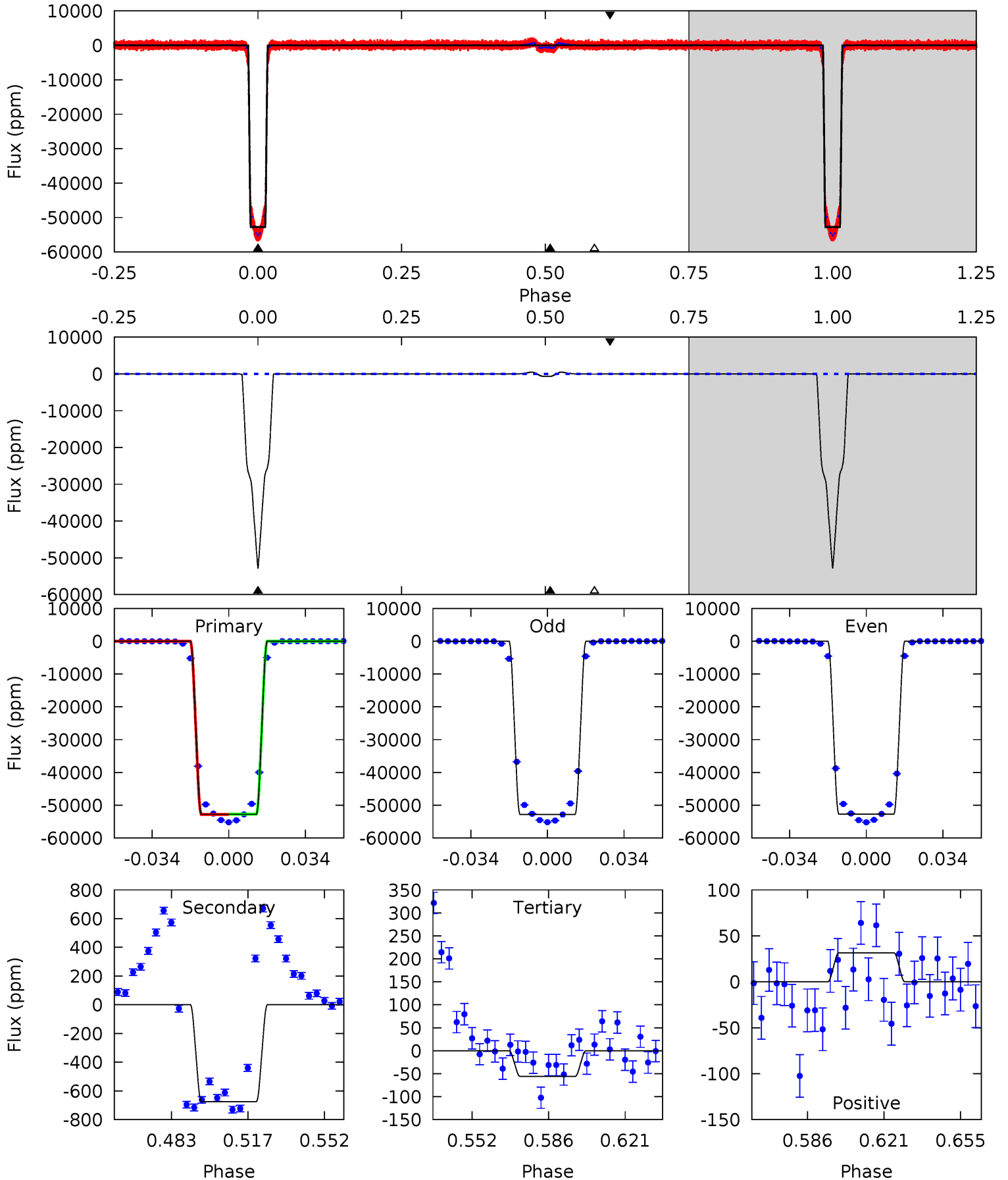
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5290	150.2	9.75	5.74	4.74	2.03	4.87	5280	5284	140.4	144.4	2.11	1.00	0.00	3.15



# Alt Model-Shift Uniqueness Test

011404644-01, P = 5.902514 Days, E = 130.496660 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
4843	61.9	5.13	2.89	4.78	2.11	3.64	4838	4841	56.8	59.0	6.23	1.00	0.01	0



### Stellar Parameters For KIC 011404644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6184^{+185}_{-222}$	$4.371^{+0.090}_{-0.210}$	$-0.160^{+0.250}_{-0.300}$	$1.094^{+0.358}_{-0.154}$	$1.022^{+0.169}_{-0.113}$	$1.100^{+0.519}_{-0.558}$
	+3%/-4%	+2%/-5%	+156%/-188%	+33%/-14%	+17%/-11%	+47%/-51%
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 011404644-01 / KOI 6085.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1569 \pm 10$	$26.55^{+4.62}_{-2.34}$	$1598^{+133}_{-93}$	$3199^{+60}_{-65}$	$5.064^{+0.917}_{-1.352}$
Alt.	$-675 \pm 11$	$28.40^{+4.76}_{-2.55}$	$1592^{+136}_{-89}$	$2745^{+46}_{-53}$	$1.922^{+0.349}_{-0.484}$

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

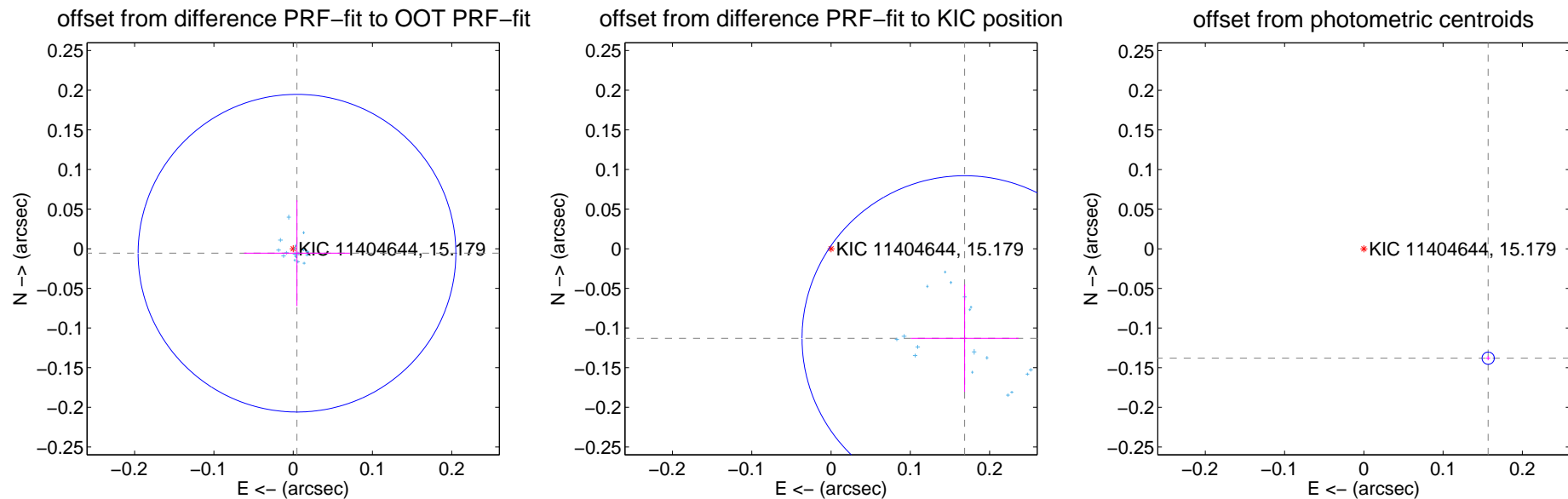
## DV Centroid Data

Supplemental centroid analysis for 011404644-01. Kepler magnitude: 15.18. Transit SNR 2369.13

There are 17 quarters with good PRF difference image offsets

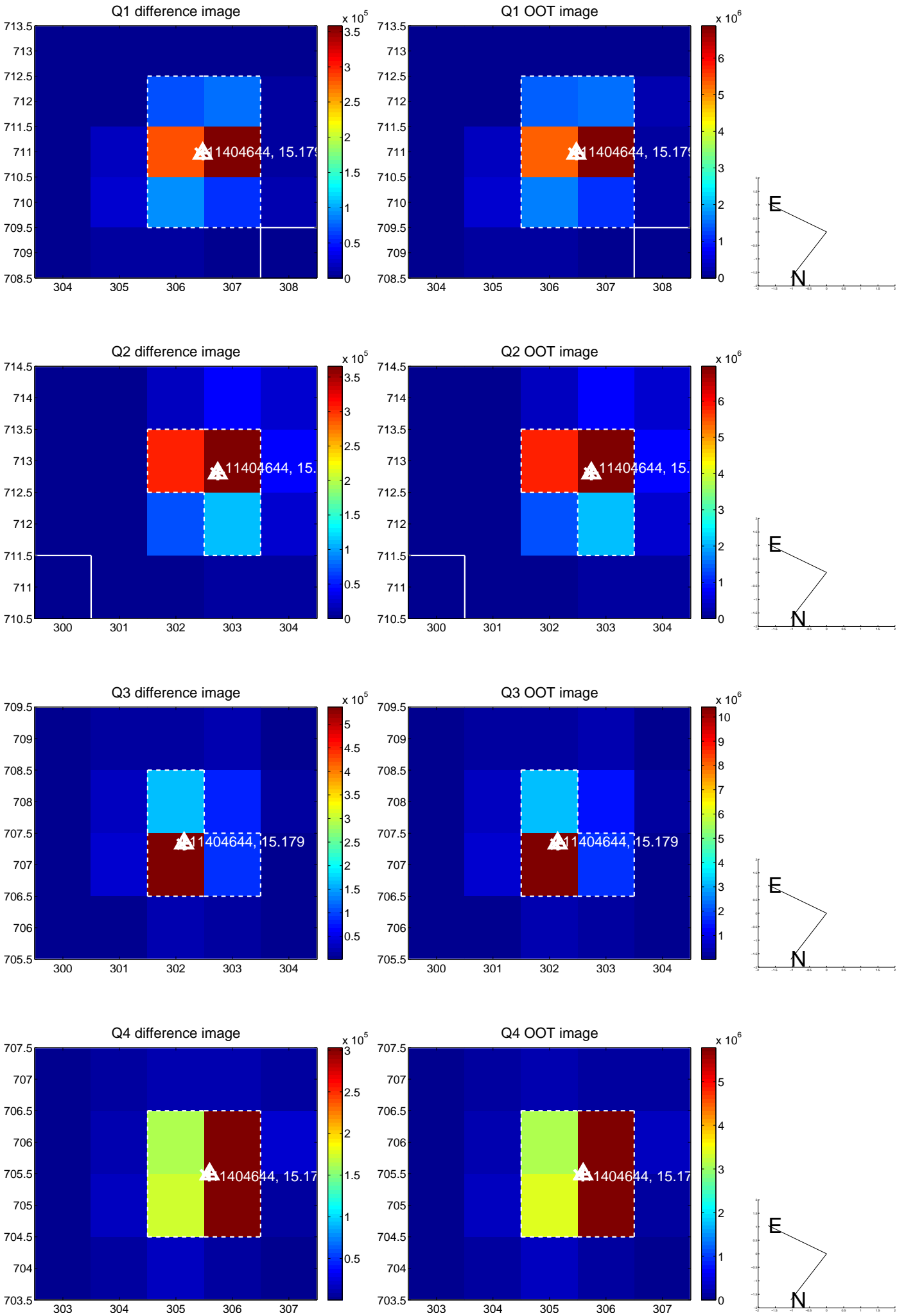
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.007 \pm 0.067$	0.11	$-0.005 \pm 0.067$	$-0.006 \pm 0.067$
PRF-fit source offset from KIC position	$0.203 \pm 0.068$	2.97	$-0.168 \pm 0.068$	$-0.113 \pm 0.068$
photometric centroid source offset	$0.21 \pm 0.00$	81.34	$-0.16 \pm 0.00$	$-0.14 \pm 0.00$



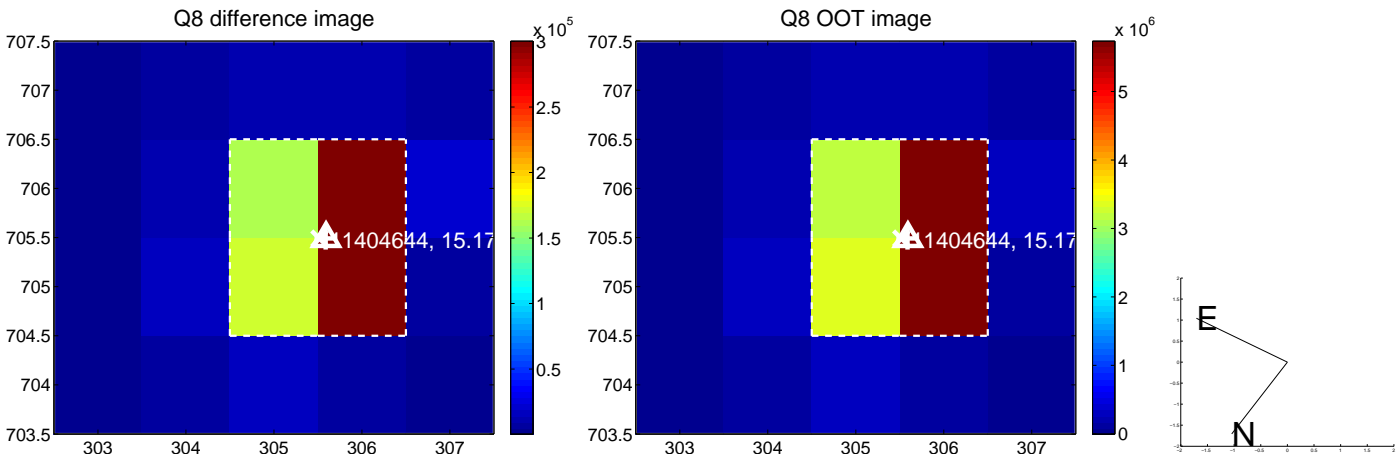
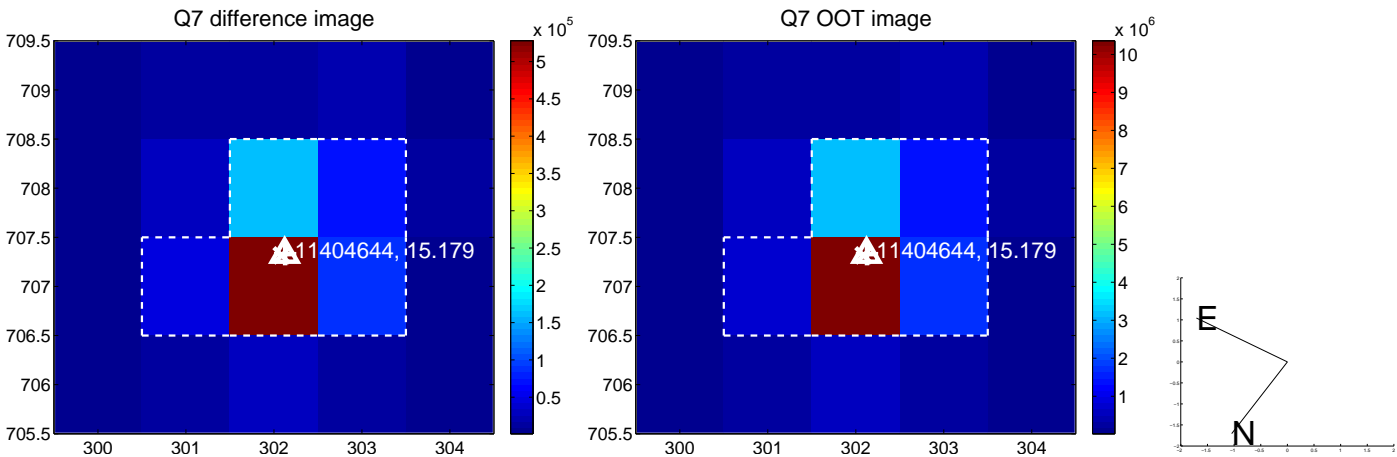
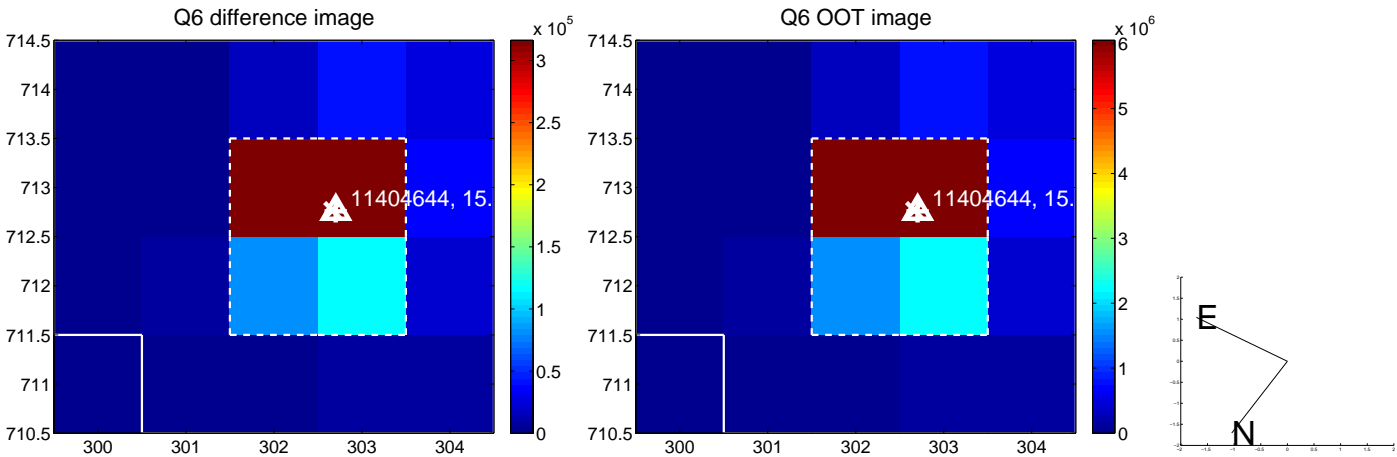
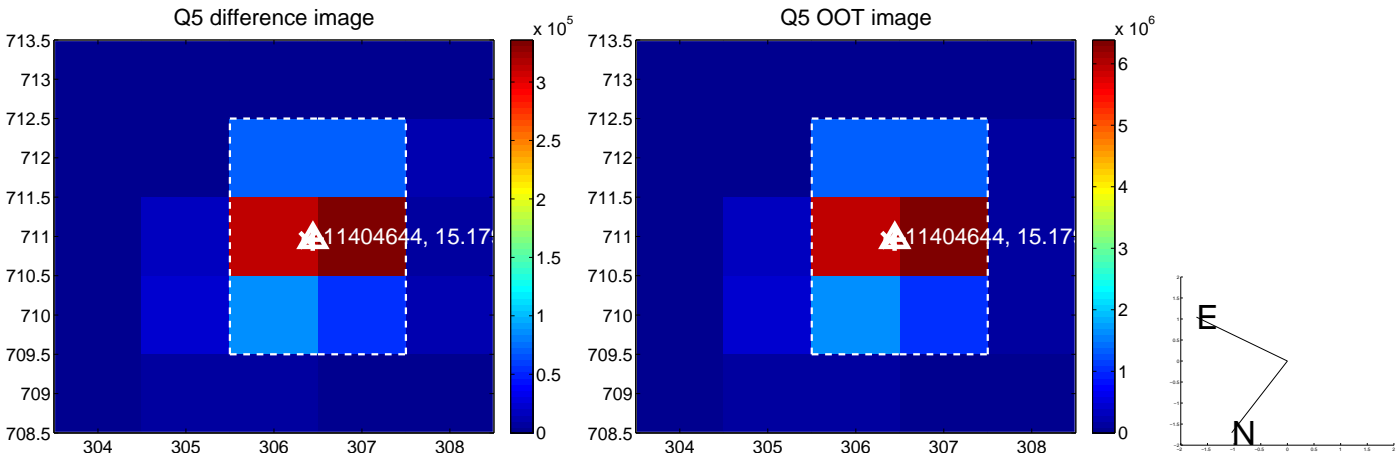
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

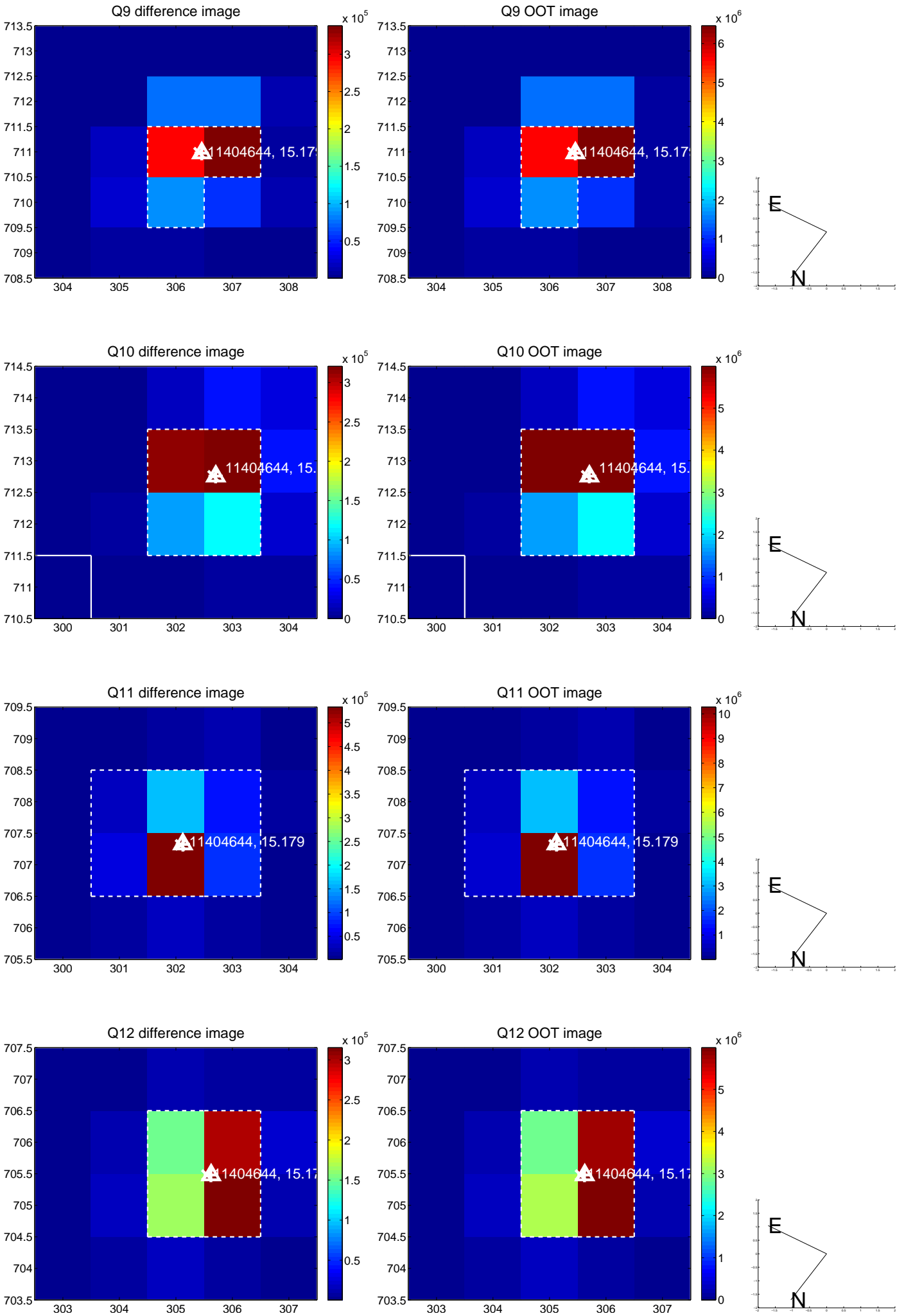




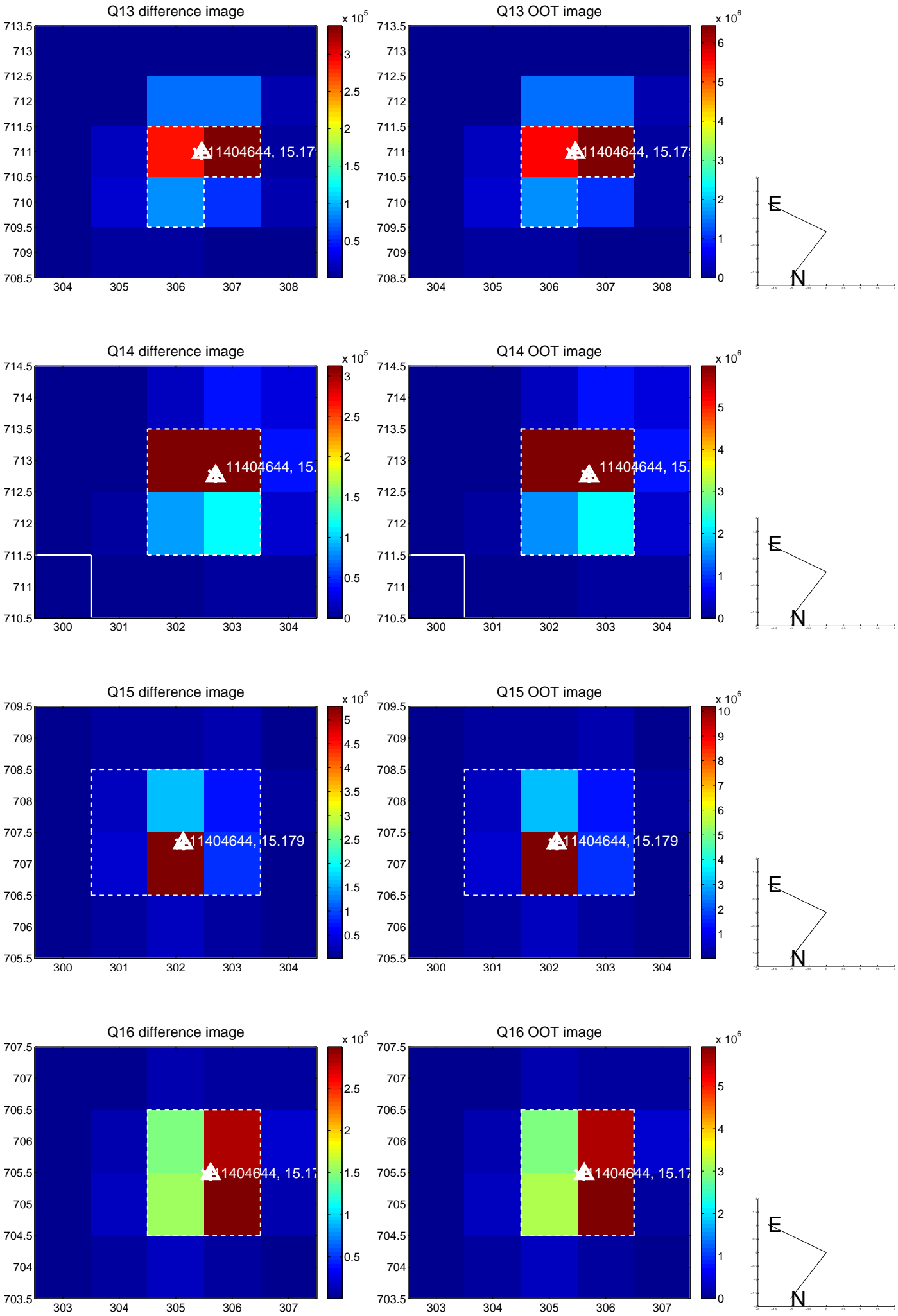
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



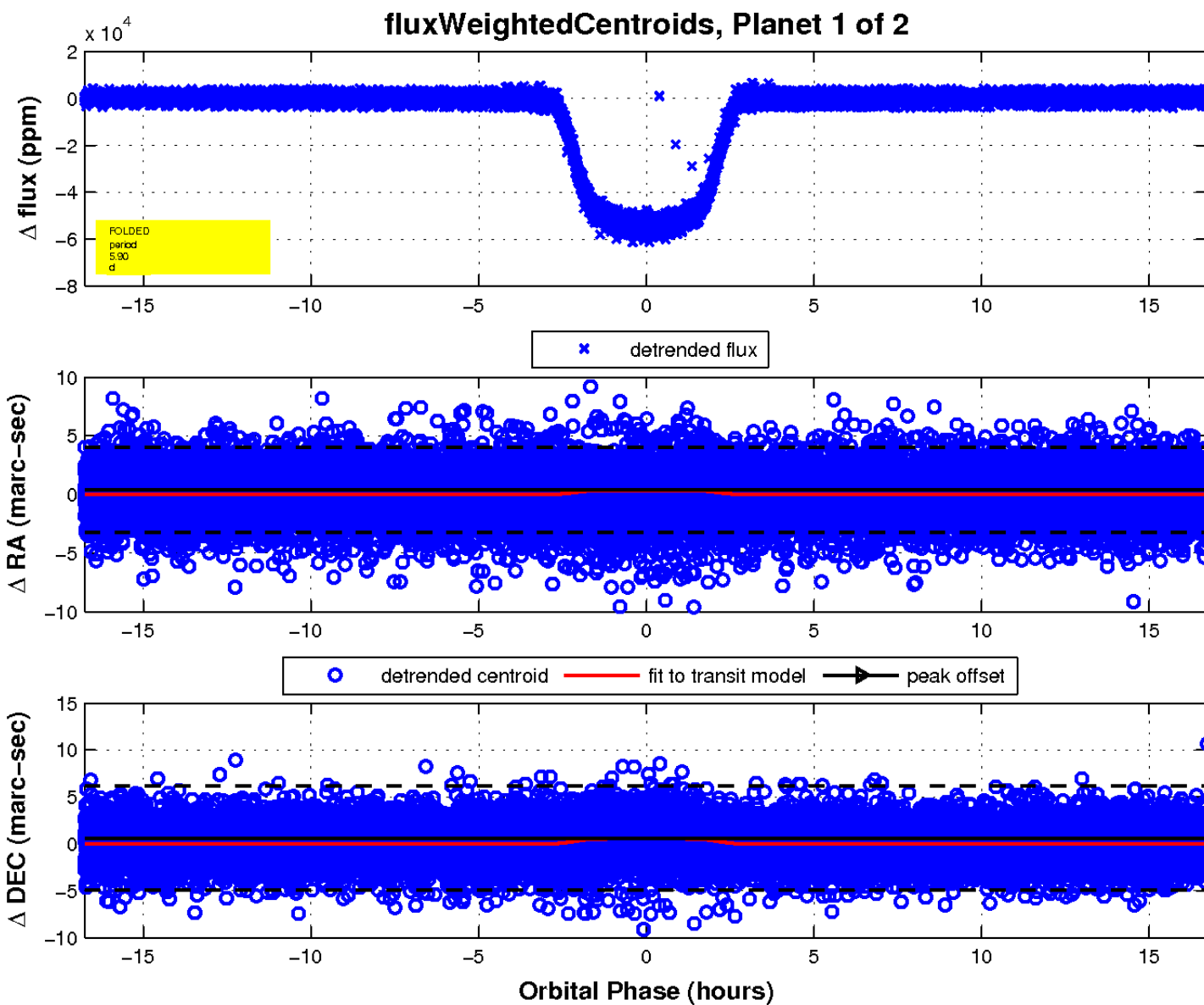
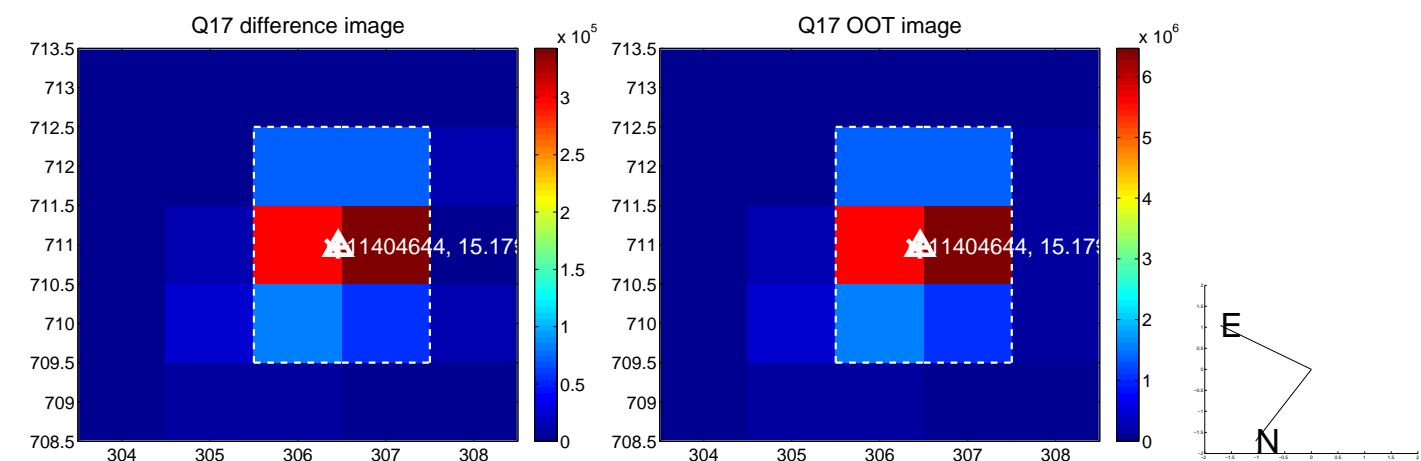
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

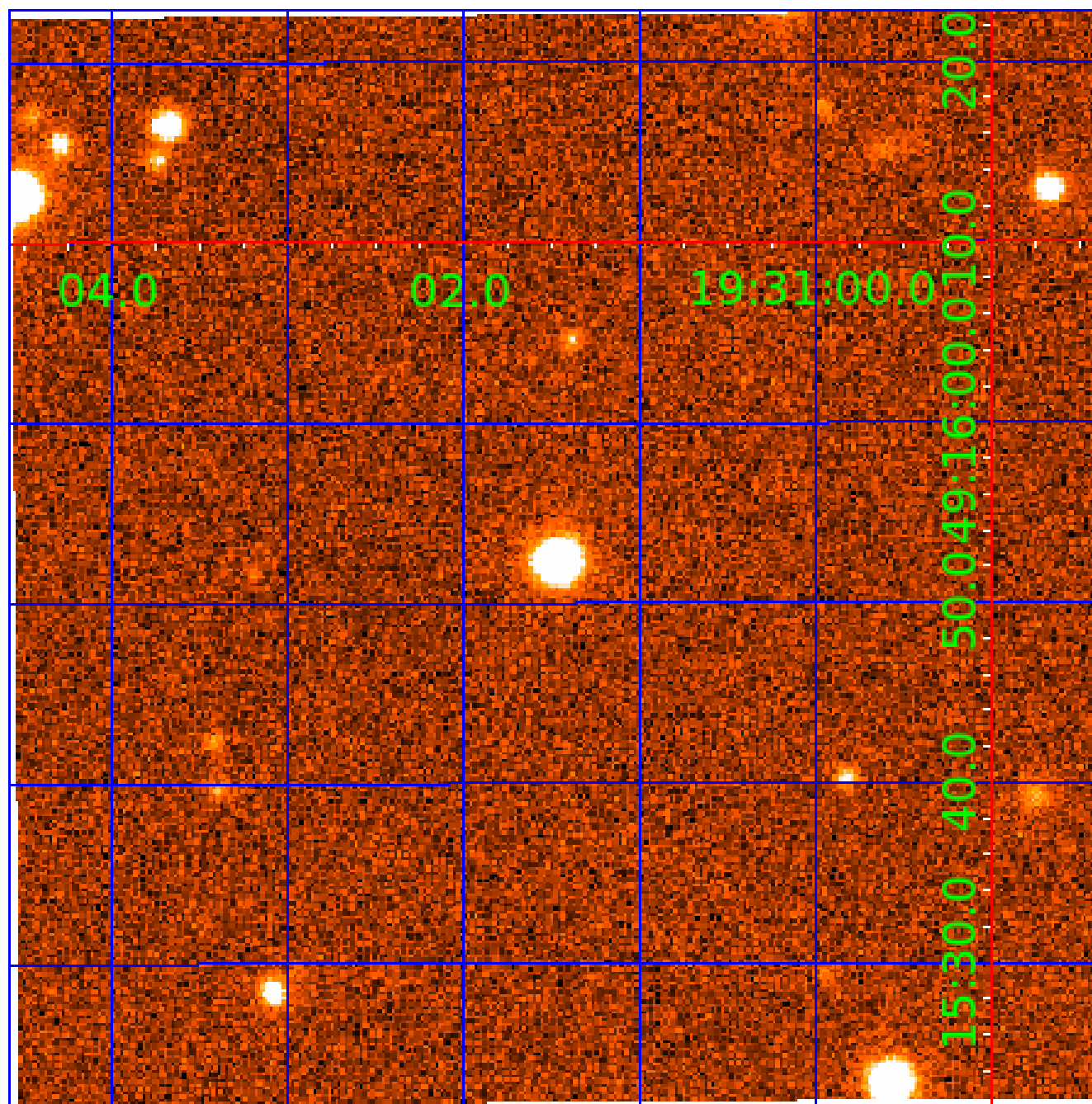


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011404644

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011404644-01	OBS	6085.01	5.902597	136.388987	55303.6	5.586	2769.8	2369.1	1.09	6184	25.93	377.22
011404644-02	OBS	No	5.902579	133.454699	1823.8	5.535	96.4	102.8	1.09	6184	5.25	377.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011404644-01	OBS	FP	0.02	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
011404644-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 011404644-02

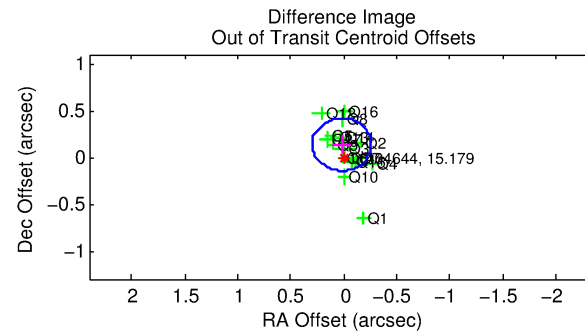
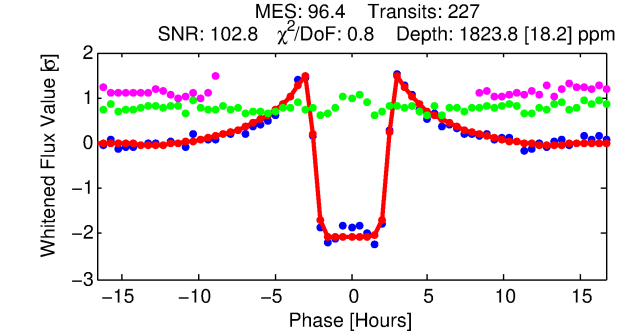
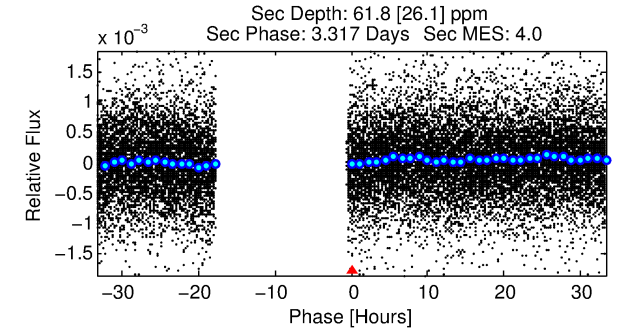
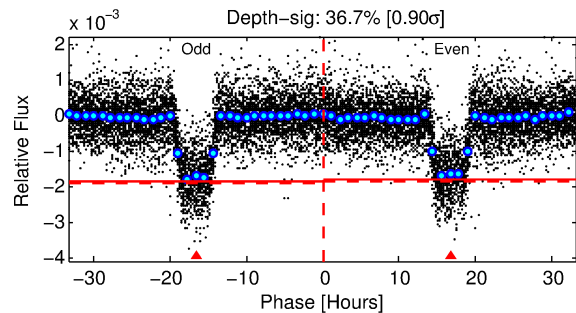
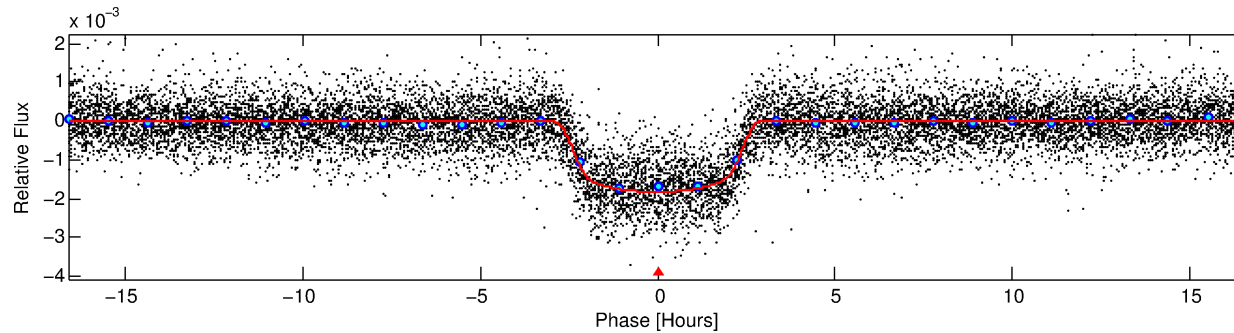
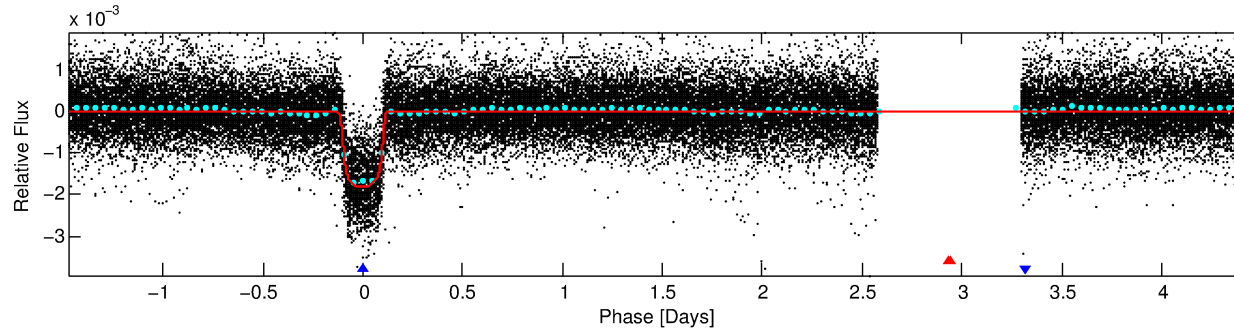
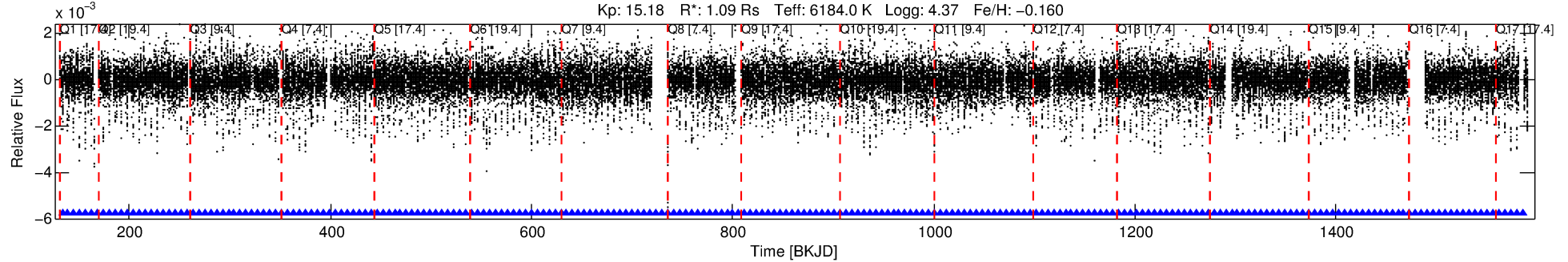
No Significant Match Found

# DV One-Page Summary

KIC: 11404644 Candidate: 2 of 2 Period: 5.903 d

KOI: K06085 Corr: No Ephemeris Match

Kp: 15.18 R\*: 1.09 Rs Teff: 6184.0 K Logg: 4.37 Fe/H: -0.160



## DV Fit Results:

Period = 5.90258 [0.00000] d  
Epoch = 133.4547 [0.0006] BKJD  
Rp/R\* = 0.0440 [0.0005]  
a/R\* = 5.22 [0.21]  
b = 0.83 [0.02]  
Seff = 377.22 [156.50]  
Teq = 1124 [117] K  
Rp = 5.25 [1.72] Re  
a = 0.0645 [0.0175] AU  
Ag = 5.13 [2.95] [1.40σ]  
Teffp = 2615 [292] K [4.75σ]

## DV Diagnostic Results:

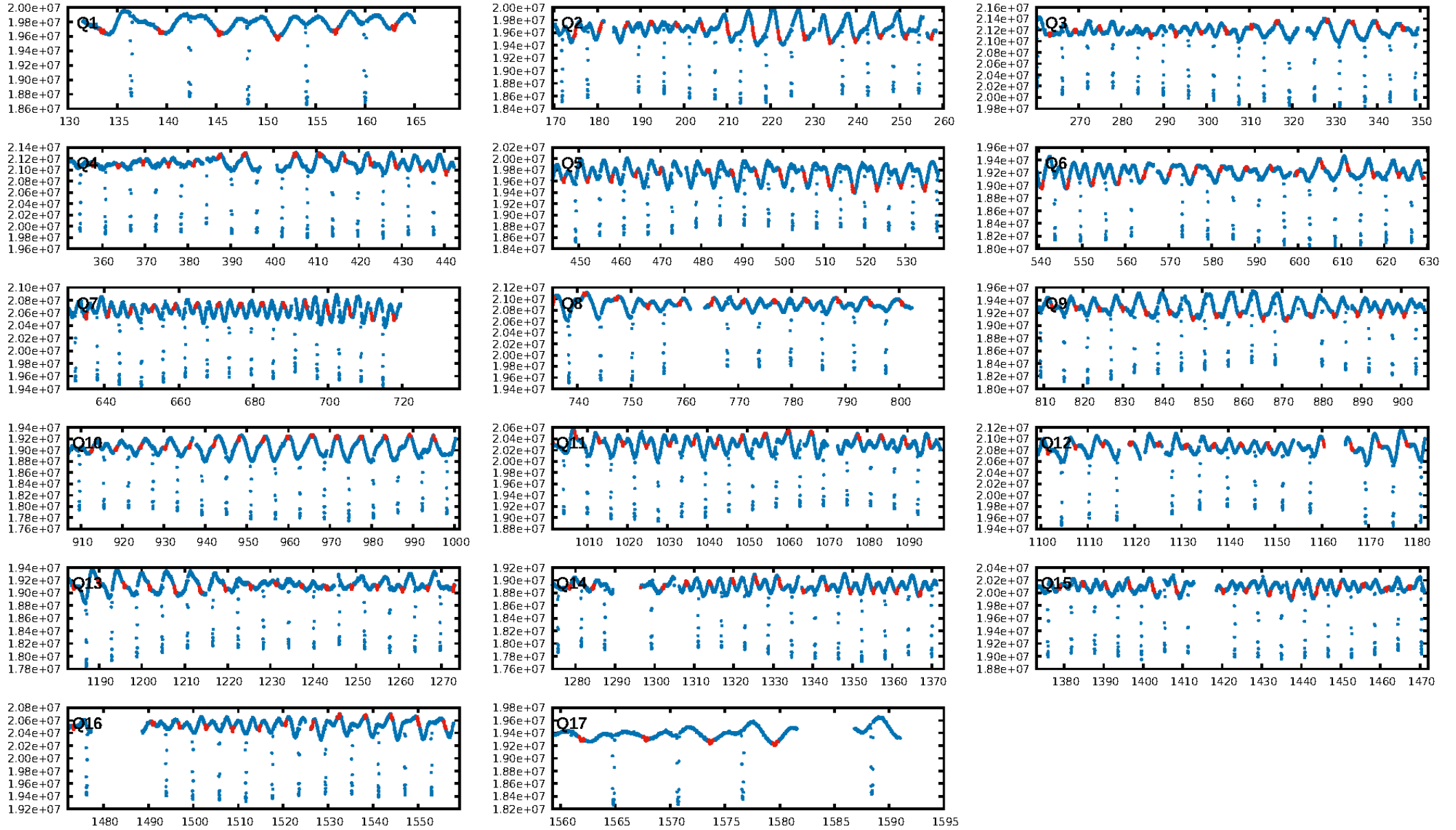
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [217/217]  
GhostDiagnostic-chr: 2.246  
Centroid-sig: 0.1%  
Centroid-so: 0.053 arcsec [0.75σ]  
OotOffset-rm: 0.138 arcsec [1.48σ]  
KicOffset-rm: 0.140 arcsec [1.93σ]  
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]

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

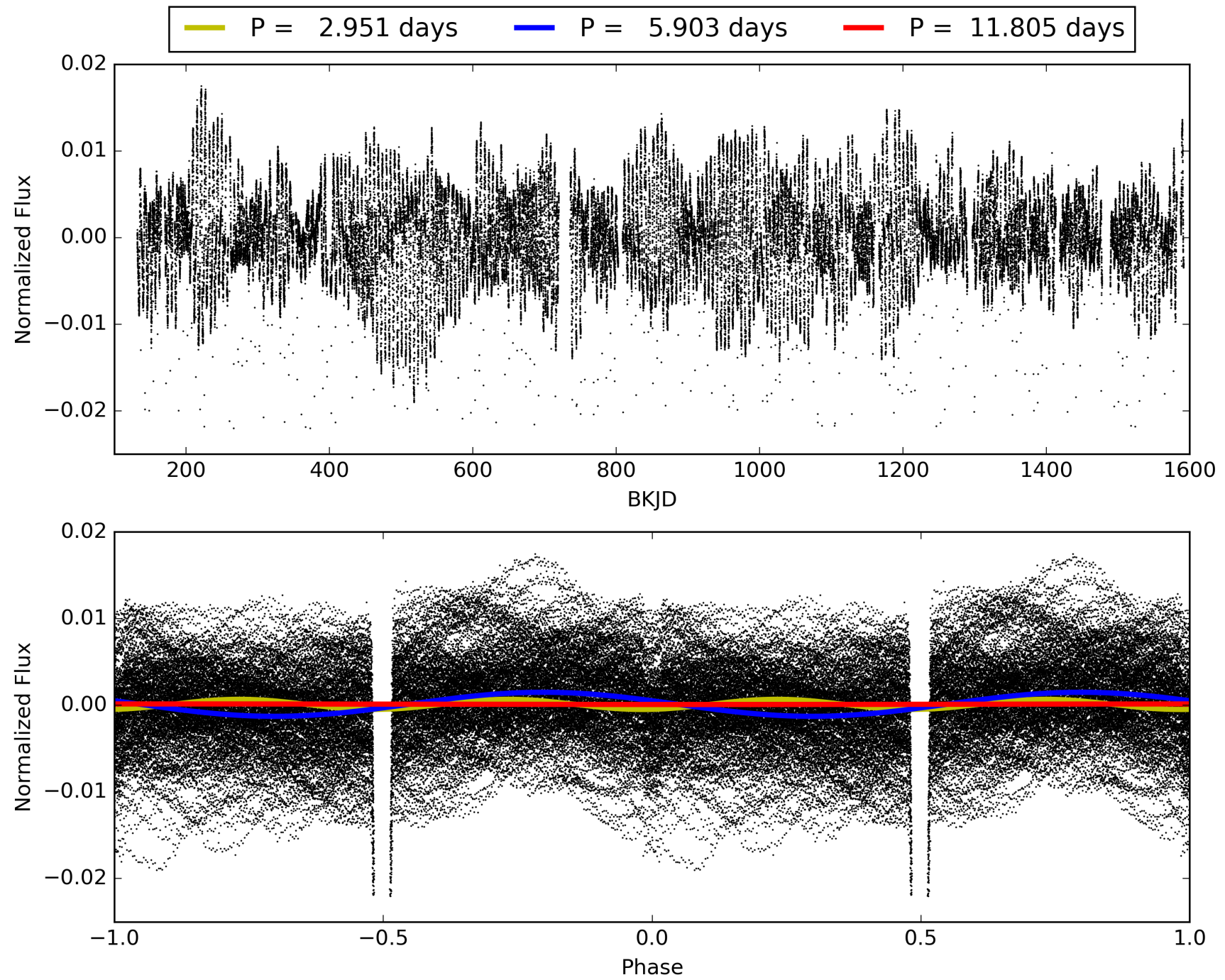
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011404644-02, PDC Light Curves

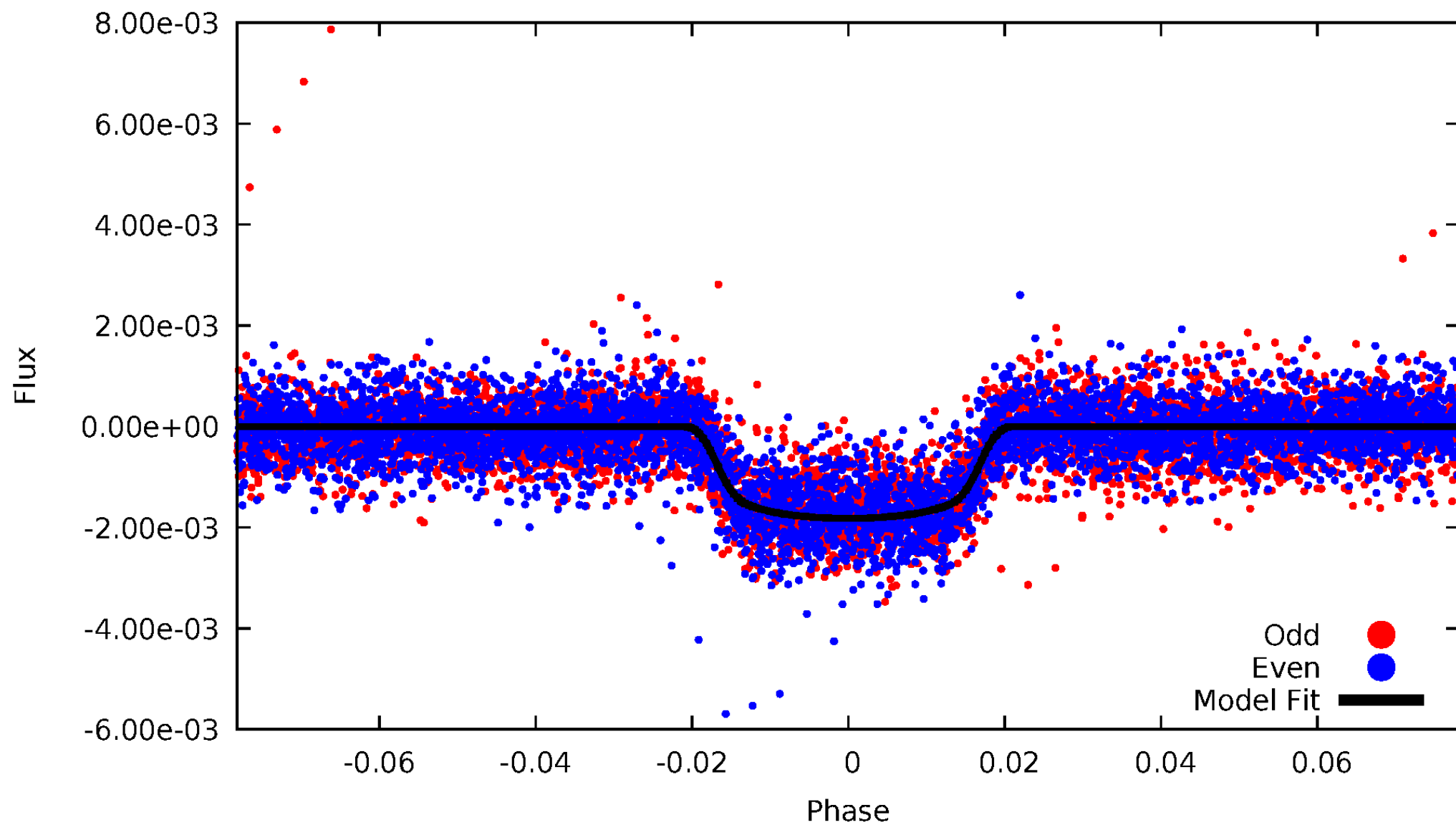


TCE 011404644-02



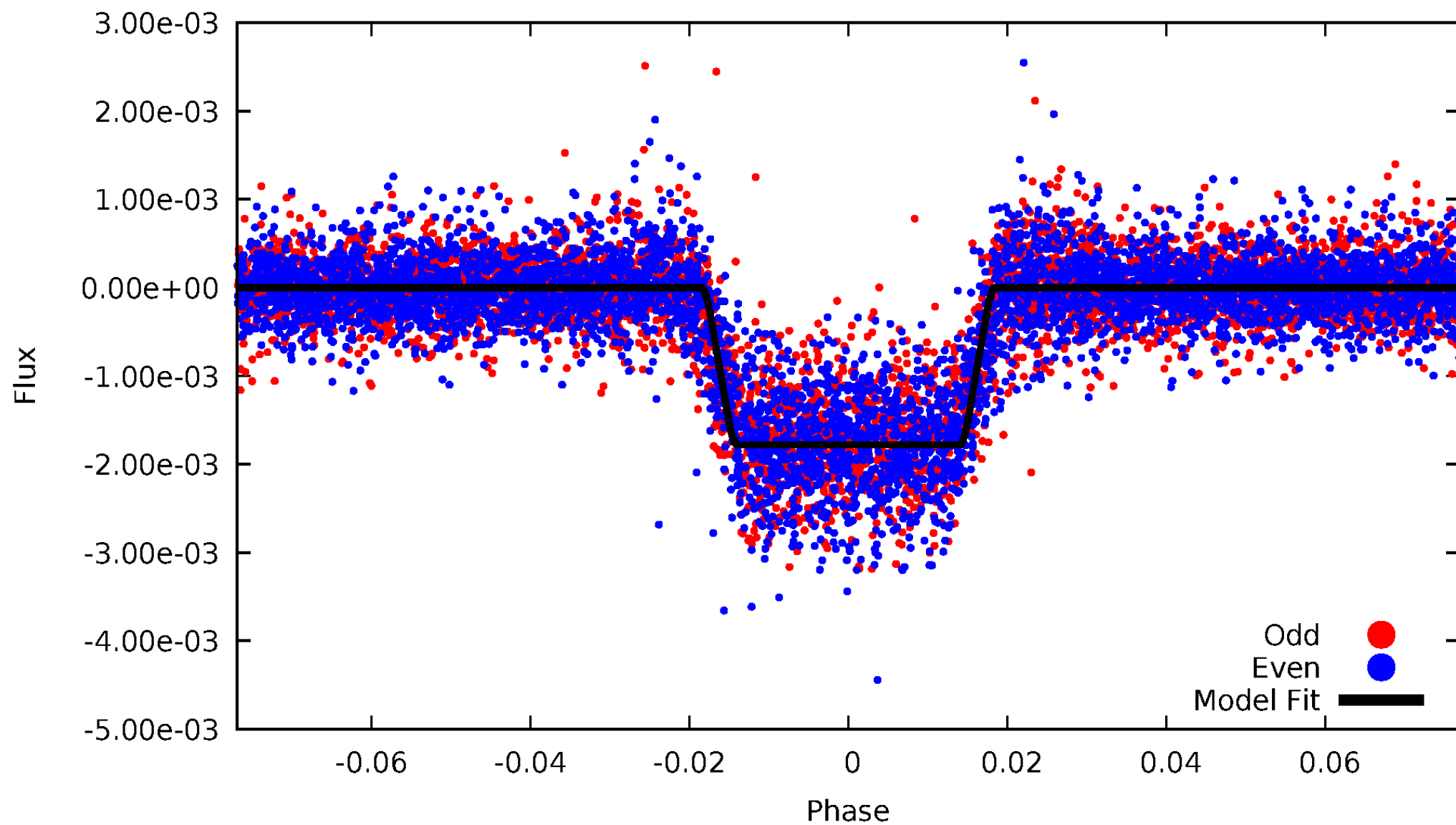
# DV Odd/Even

TCE 011404644-02



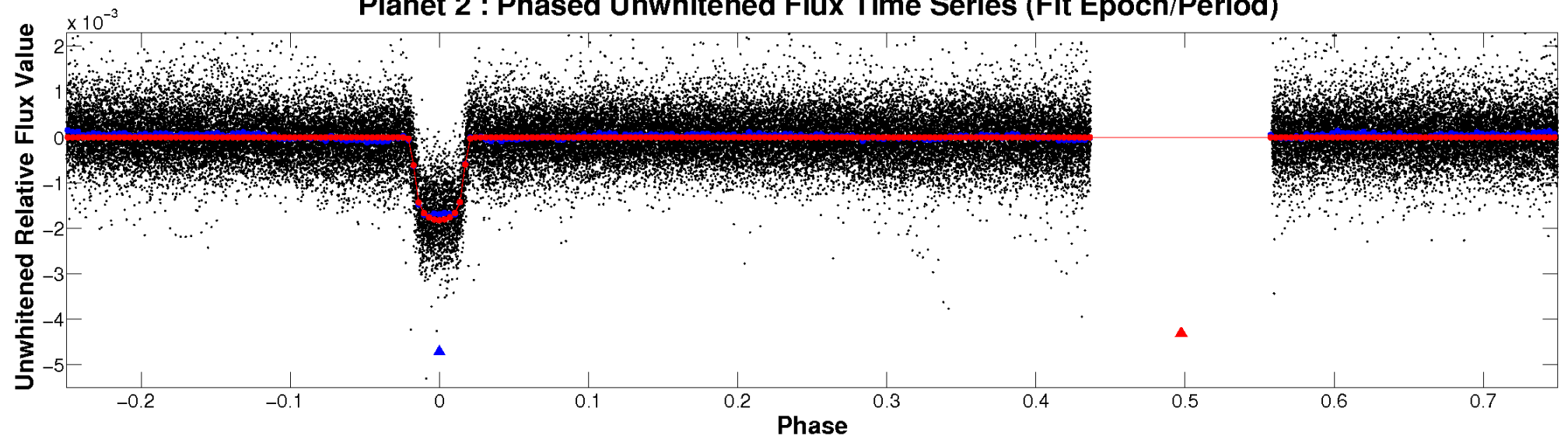
# ALT Odd/Even

TCE 011404644-02

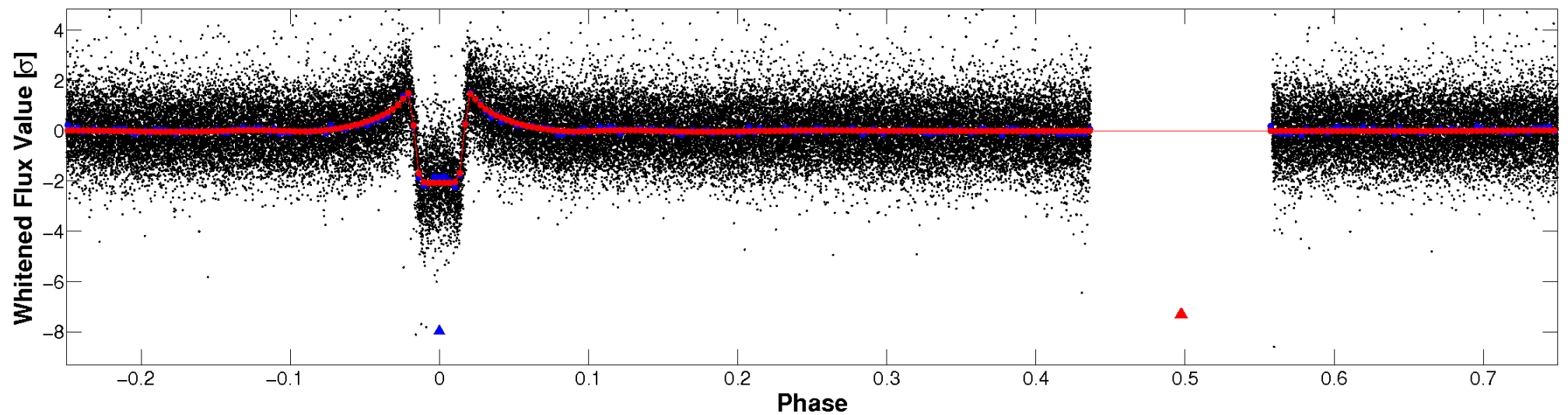


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



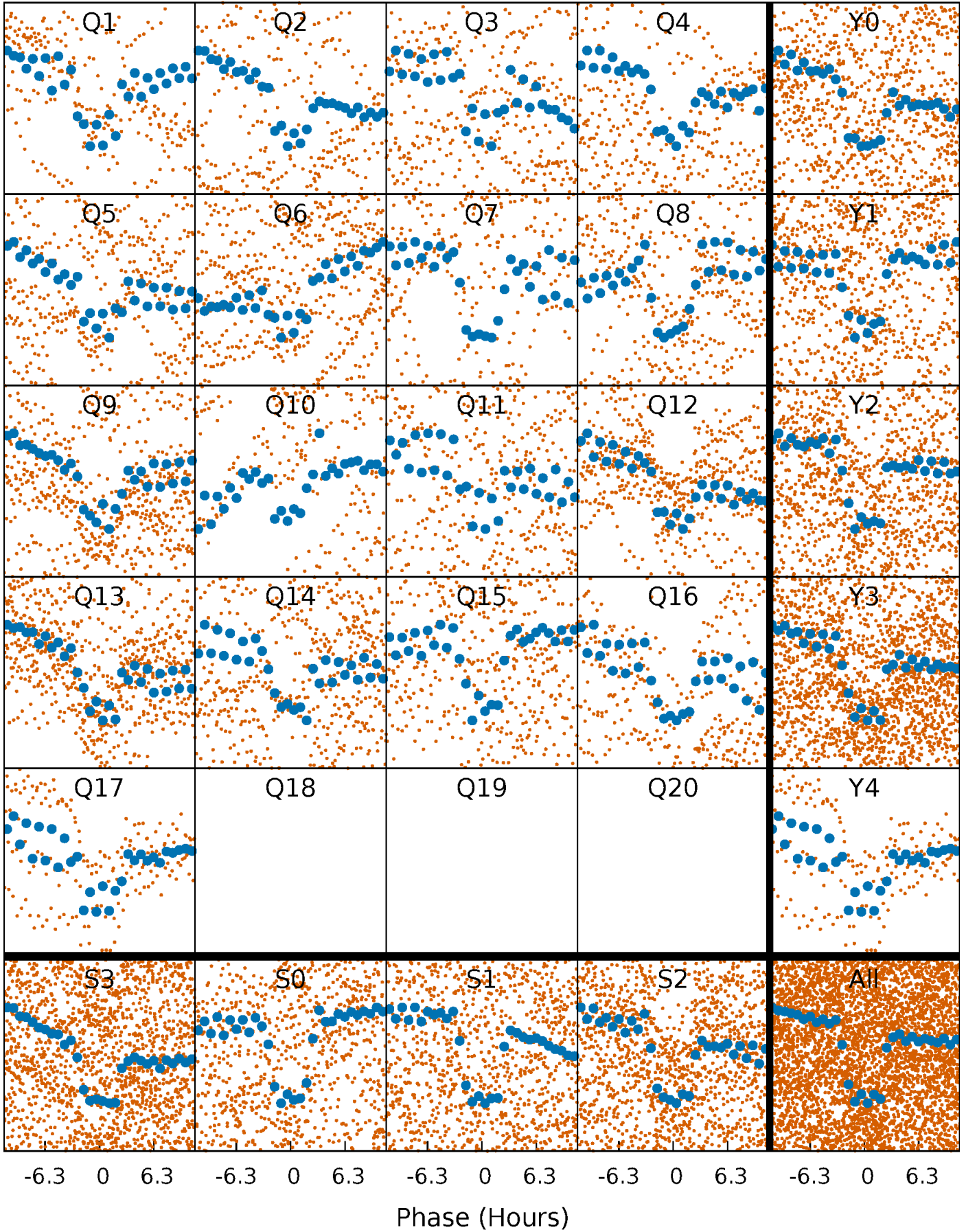
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





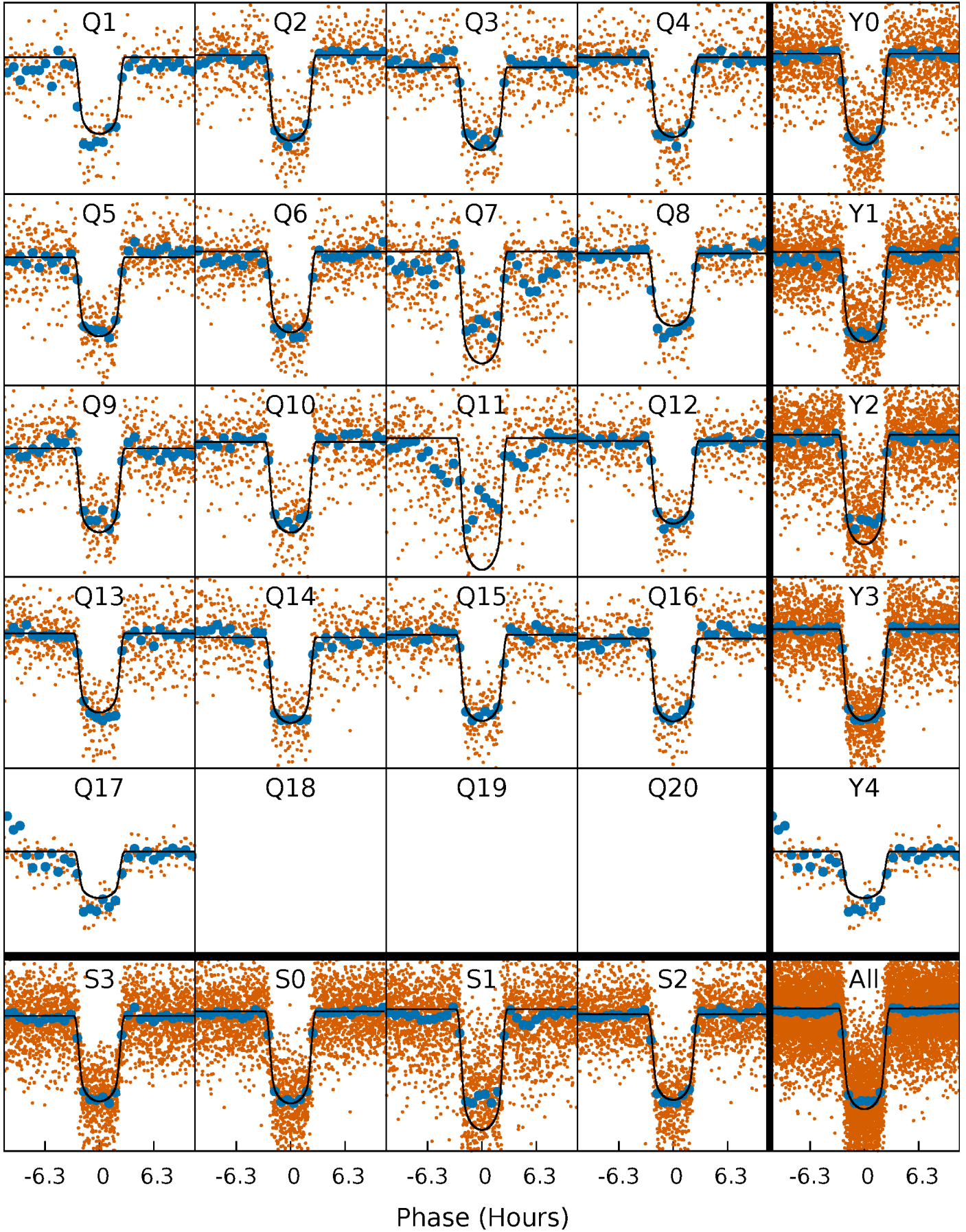
# PDC Quarter-Phased Transit Curves

TCE 011404644-02 P= 5.902579 Days  $T_0=133.454699$  (BKJD)



# DV Quarter-Phased Transit Curves

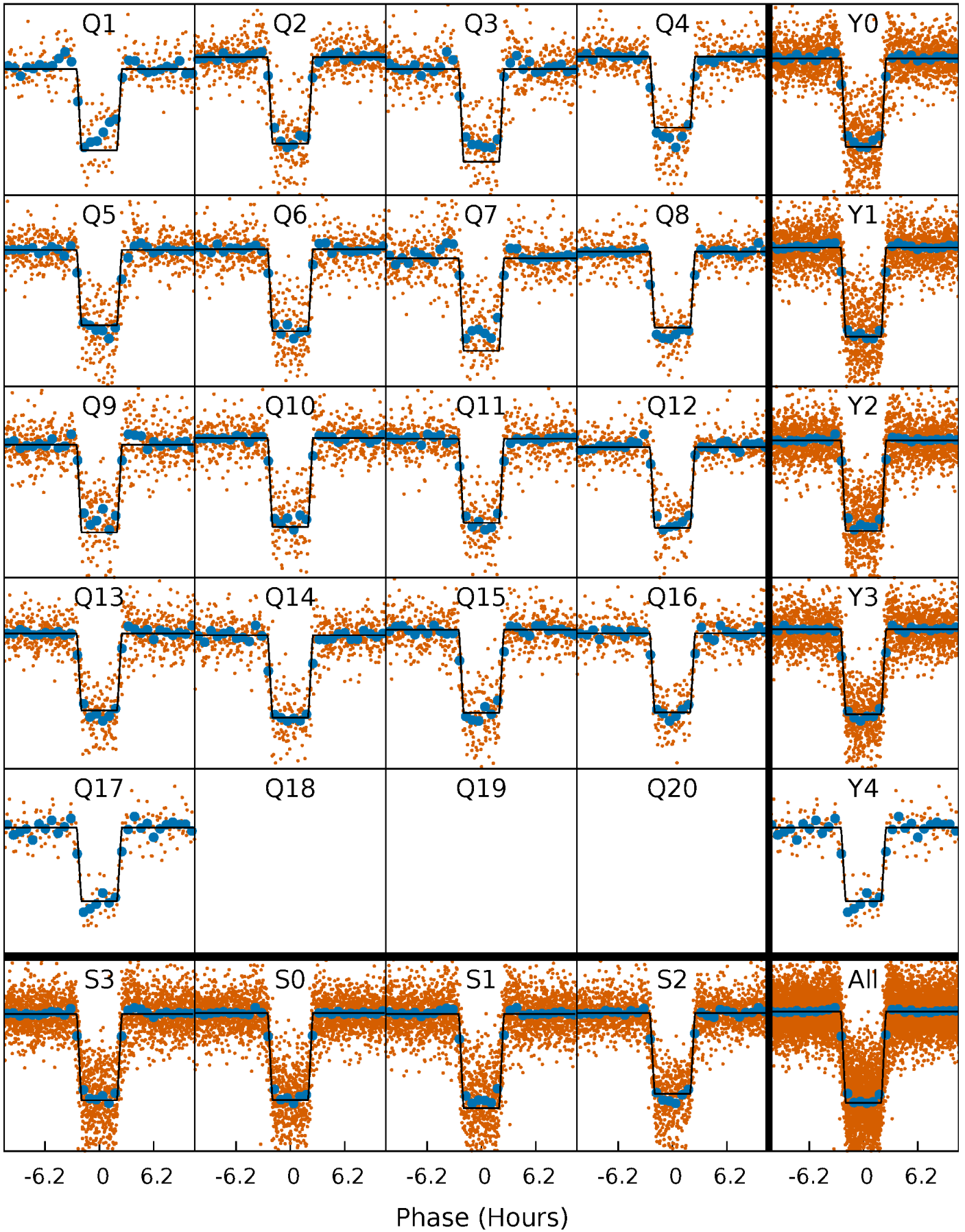
TCE 011404644-02   P= 5.902579 Days    $T_0=133.454699$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

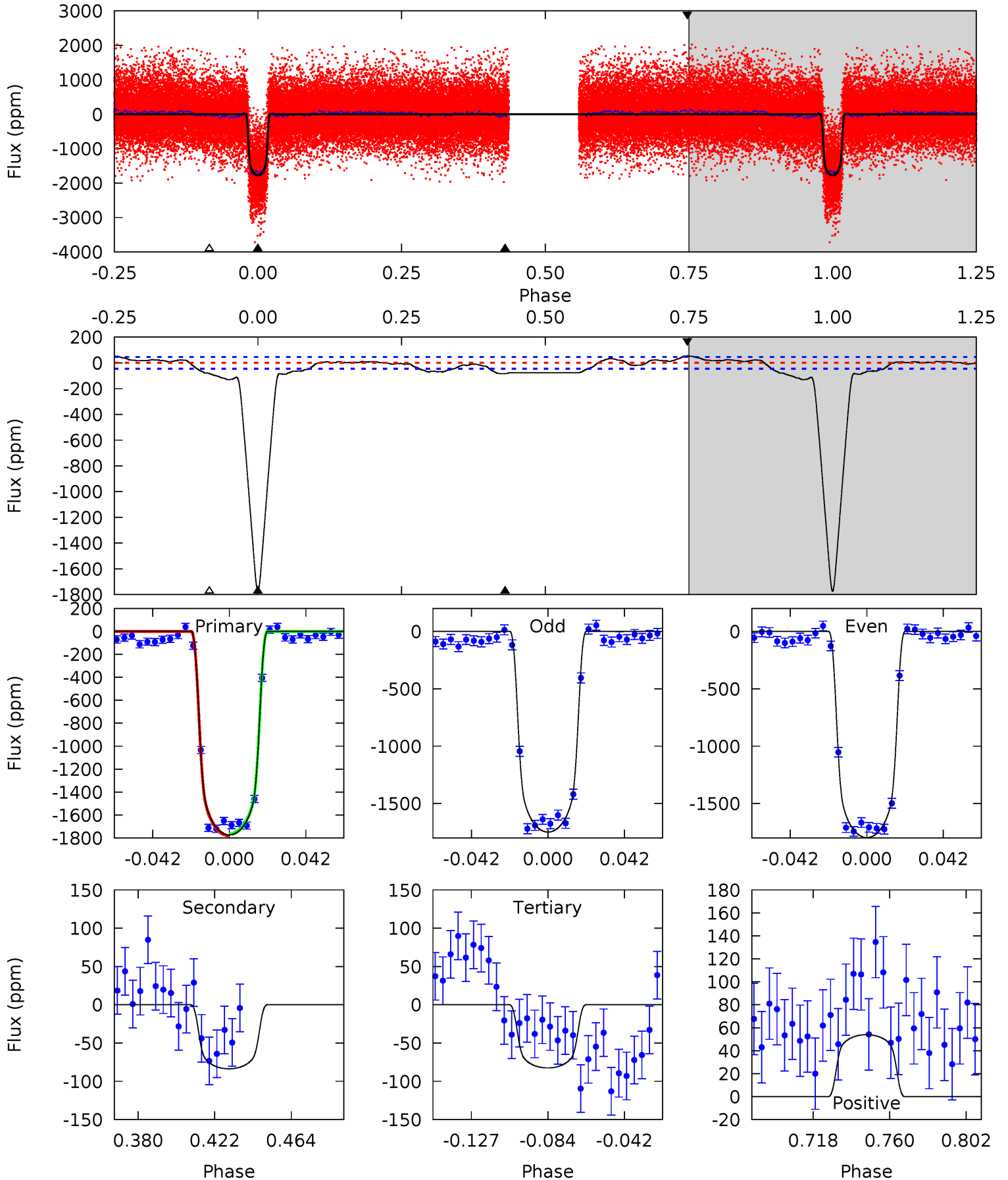
TCE 011404644-02 P= 5.902588 Days  $T_0=133.453508$  (BKJD)



# DV Model-Shift Uniqueness Test

011404644-02, P = 5.902579 Days, E = 127.552120 Days

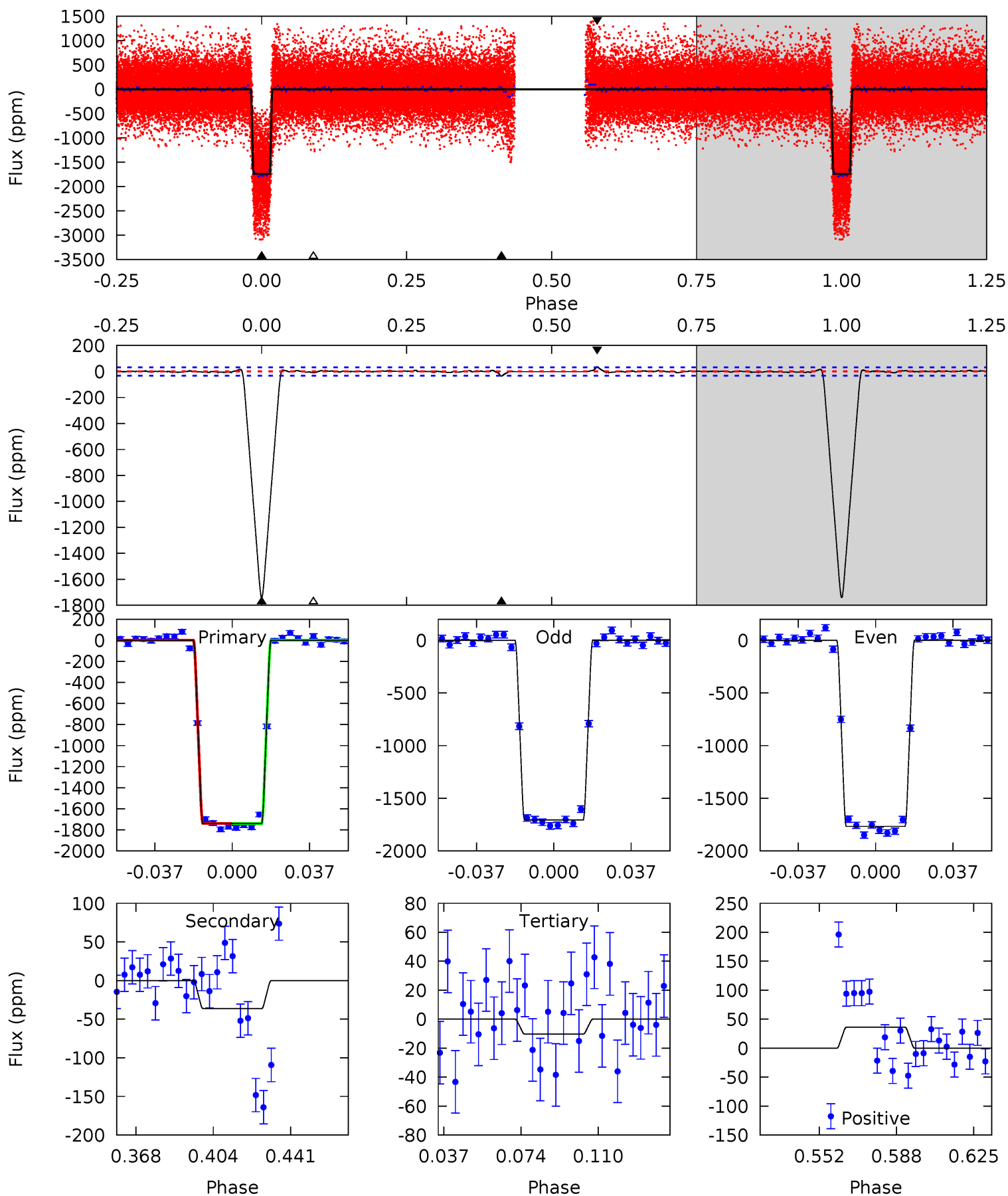
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
183.2	8.64	8.52	5.58	4.74	2.03	4.24	174.7	177.6	0.12	3.07	2.52	0.99	0.03	0.74



# Alt Model-Shift Uniqueness Test

011404644-02, P = 5.902588 Days, E = 127.550920 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
254.9	5.32	1.50	5.27	4.77	2.09	0.76	253.4	249.7	3.82	0.05	4.39	1.00	0.02	0.17



### Stellar Parameters For KIC 011404644

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6184^{+185}_{-222}$	$4.371^{+0.090}_{-0.210}$	$-0.160^{+0.250}_{-0.300}$	$1.094^{+0.358}_{-0.154}$	$1.022^{+0.169}_{-0.113}$	$1.100^{+0.519}_{-0.558}$
	+3%/-4%	+2%/-5%	+156%/-188%	+33%/-14%	+17%/-11%	+47%/-51%
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 011404644-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-84 \pm 10$	$5.42^{+0.92}_{-0.50}$	$1603^{+125}_{-93}$	$3332^{+91}_{-99}$	$6.364^{+1.771}_{-1.730}$
Alt.	$-36 \pm 7$	$5.15^{+0.88}_{-0.44}$	$1599^{+114}_{-89}$	$2951^{+98}_{-104}$	$2.990^{+0.819}_{-0.838}$

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

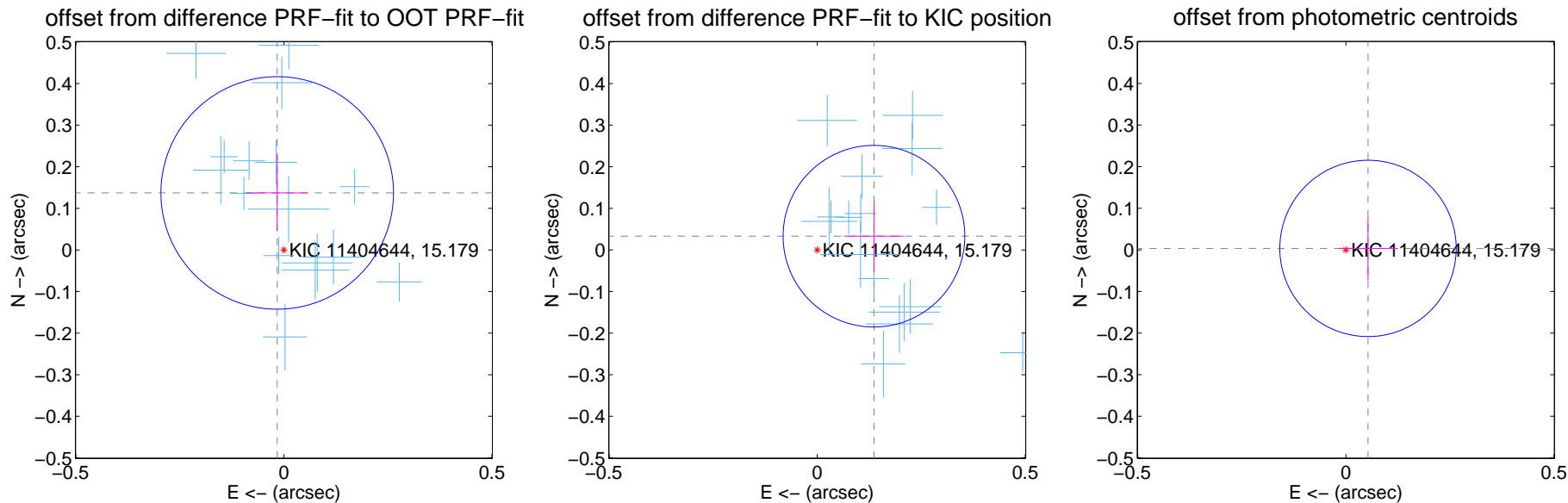
## DV Centroid Data

Supplemental centroid analysis for 011404644-02. Kepler magnitude: 15.18. Transit SNR 102.78

There are 17 quarters with good PRF difference image offsets

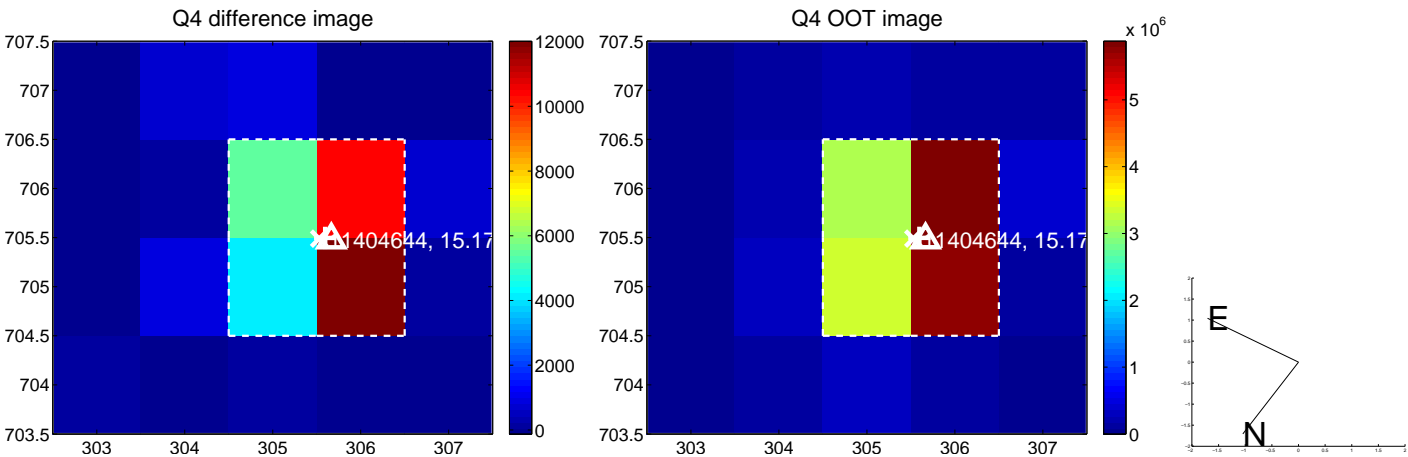
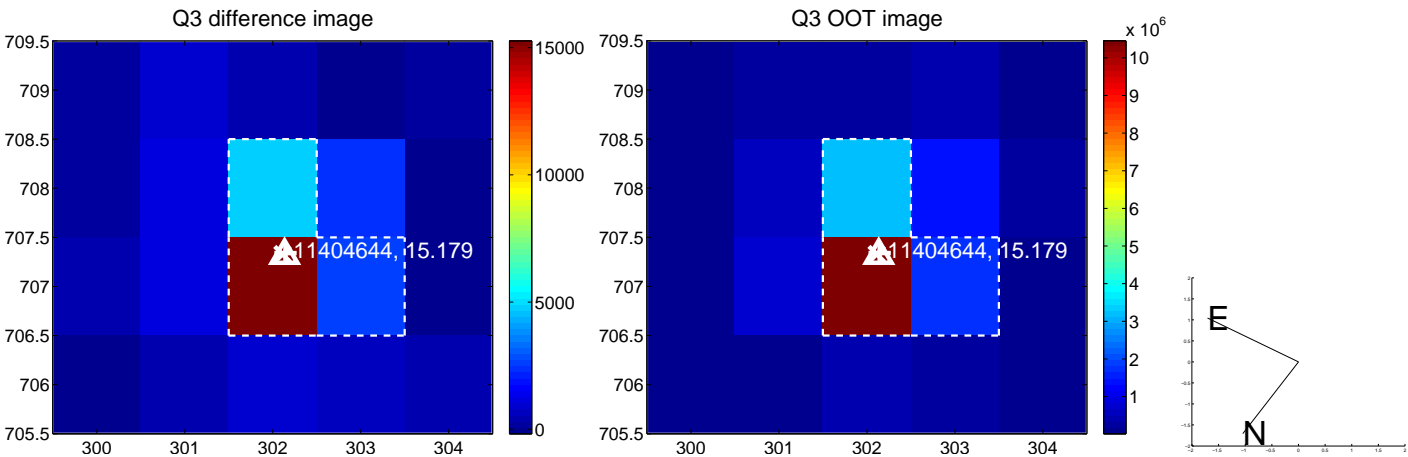
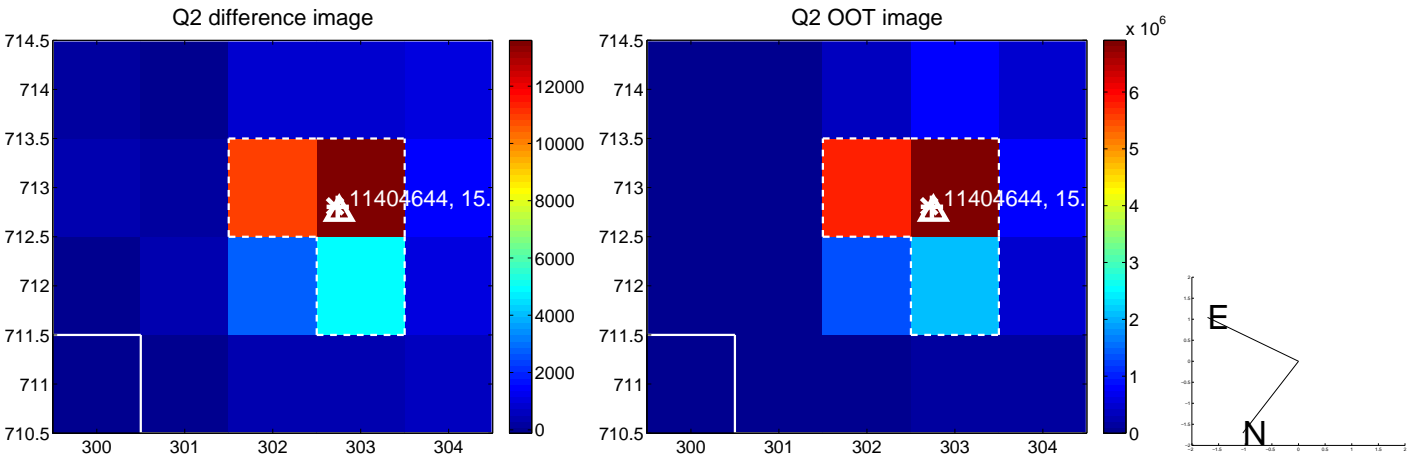
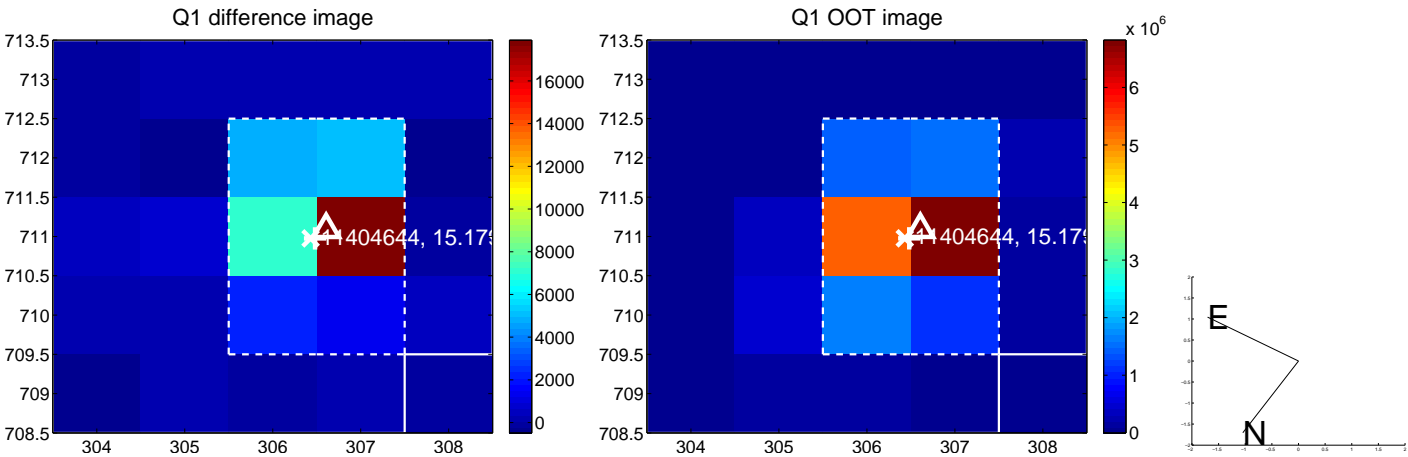
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.138 \pm 0.093$	1.48	$0.016 \pm 0.074$	$0.137 \pm 0.092$
PRF-fit source offset from KIC position	$0.140 \pm 0.073$	1.93	$-0.136 \pm 0.072$	$0.033 \pm 0.084$
photometric centroid source offset	$0.05 \pm 0.07$	0.75	$-0.05 \pm 0.07$	$0.00 \pm 0.08$

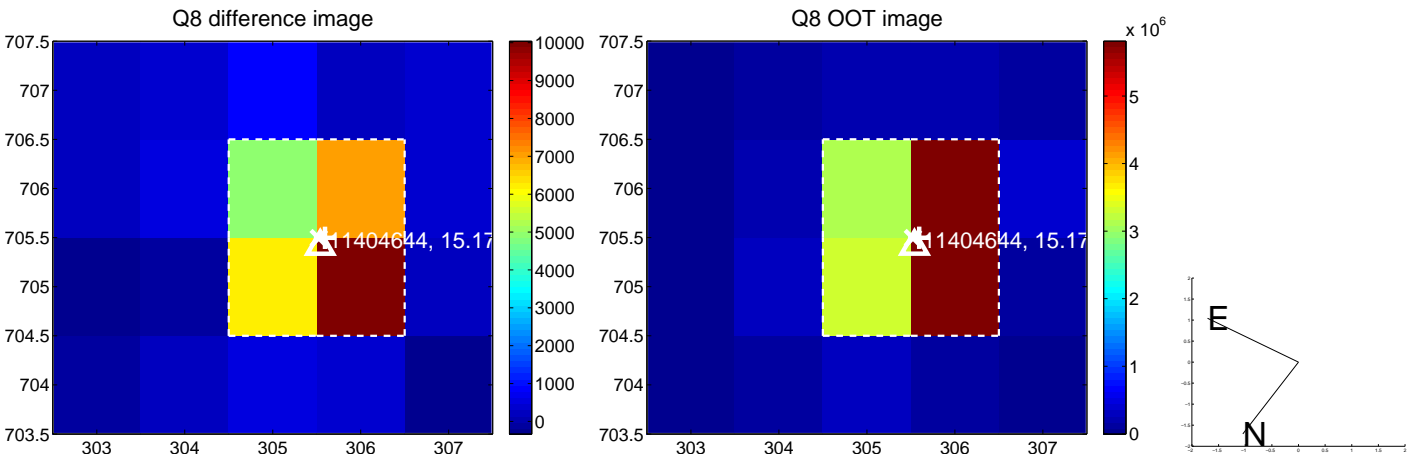
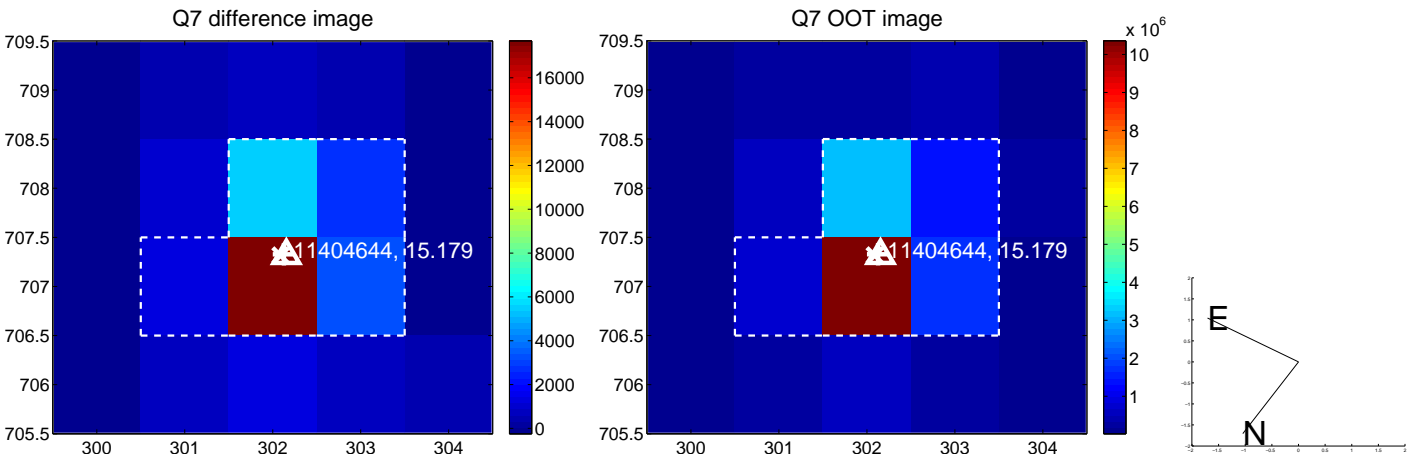
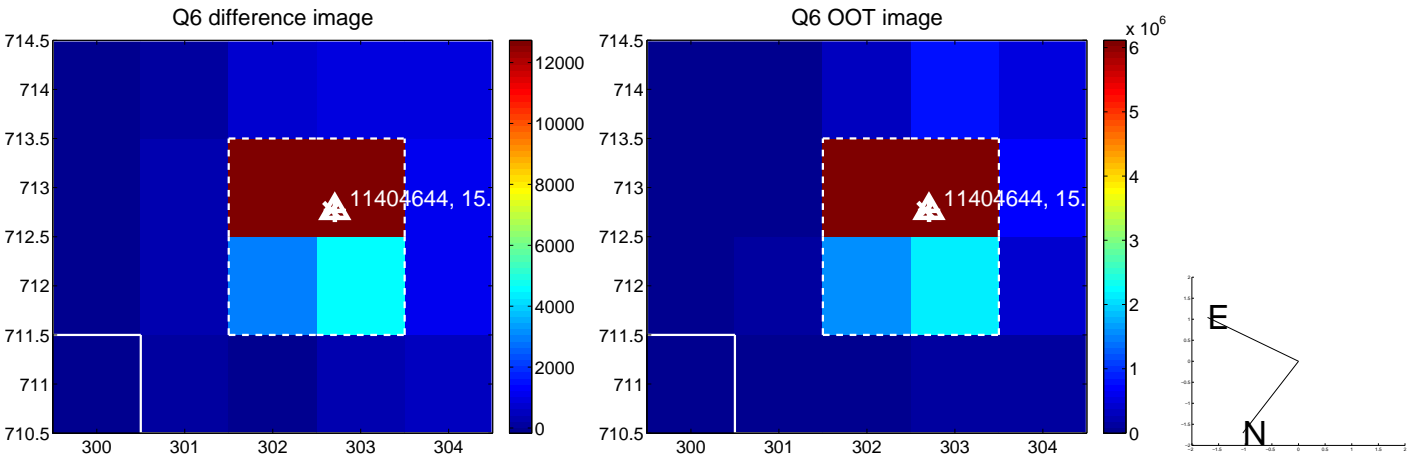
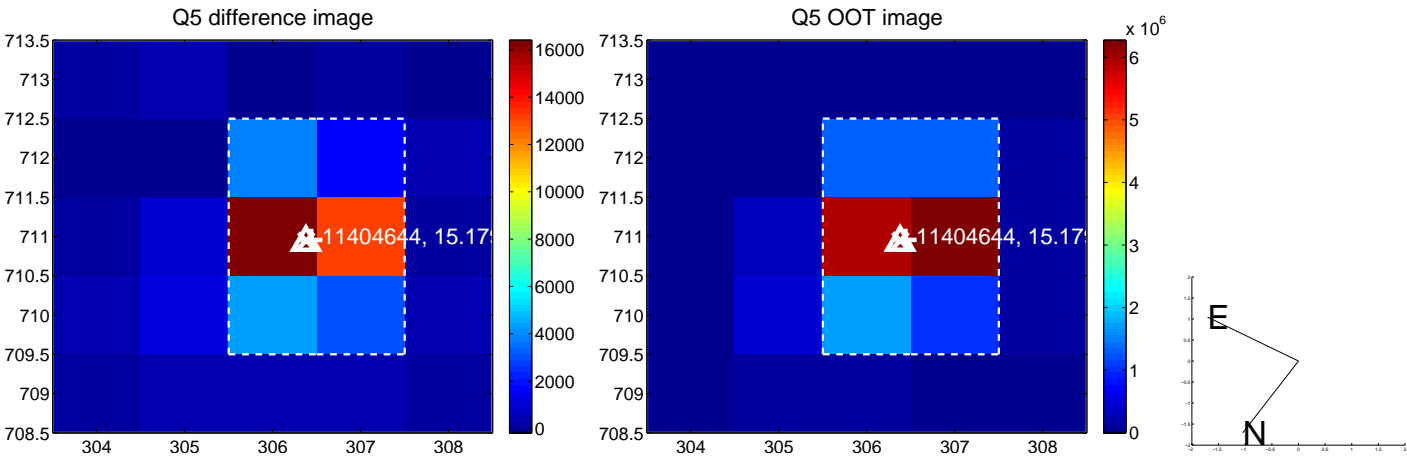


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

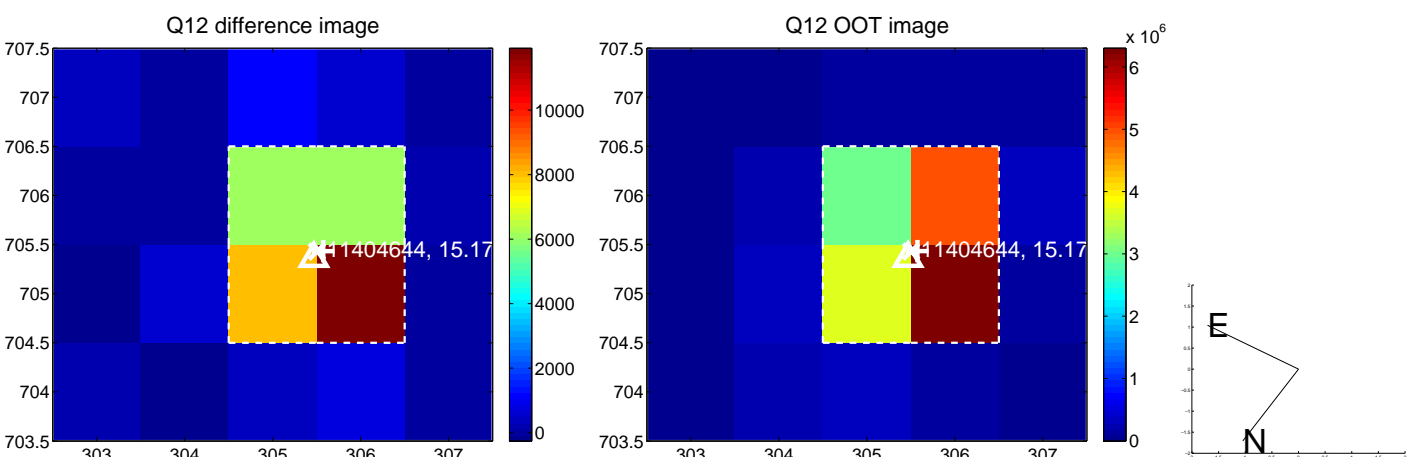
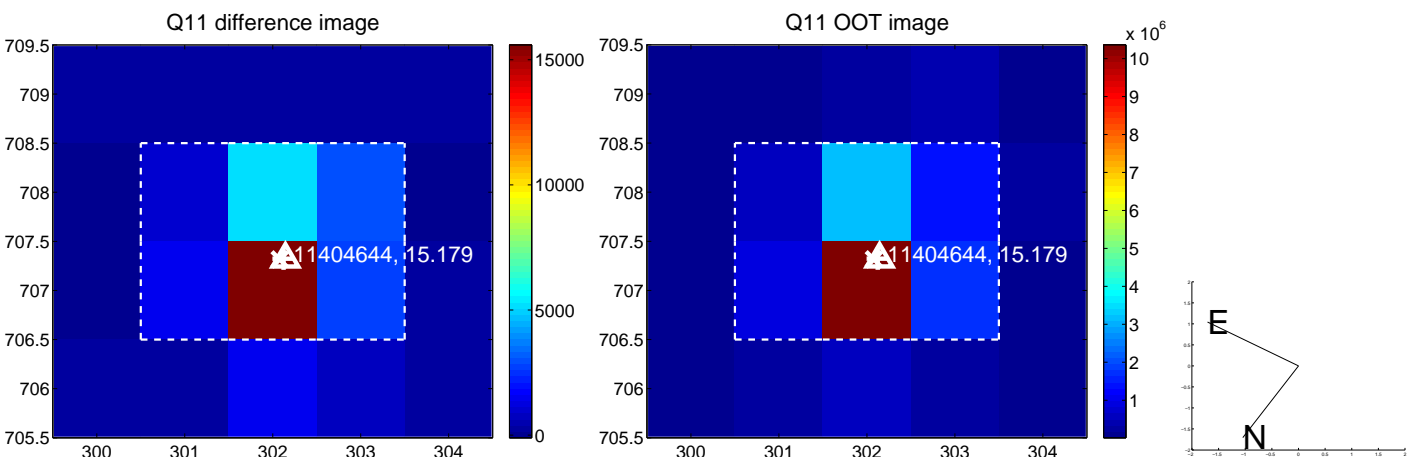
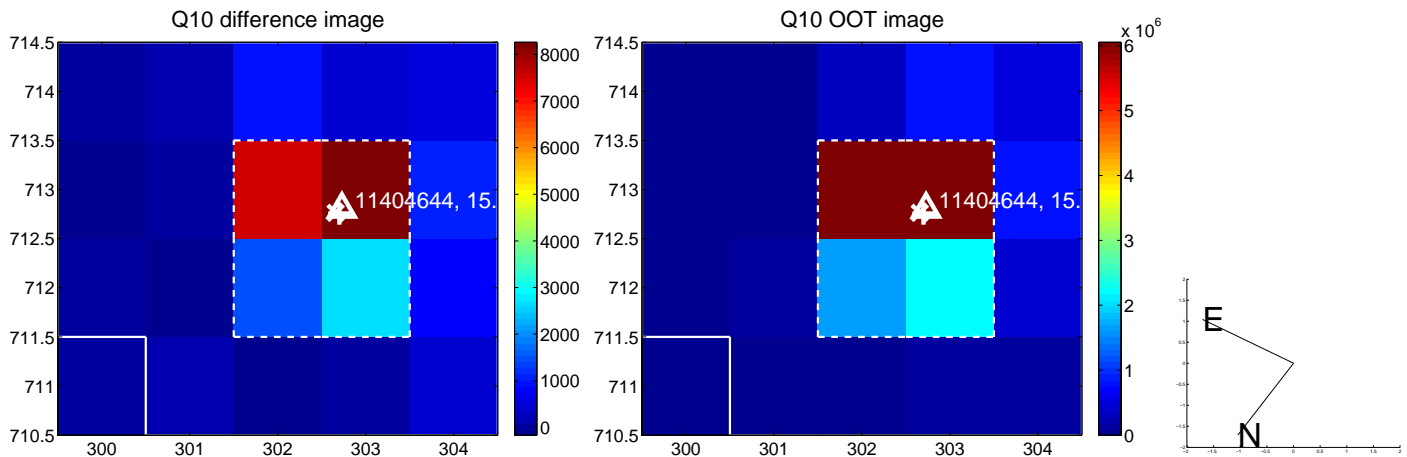
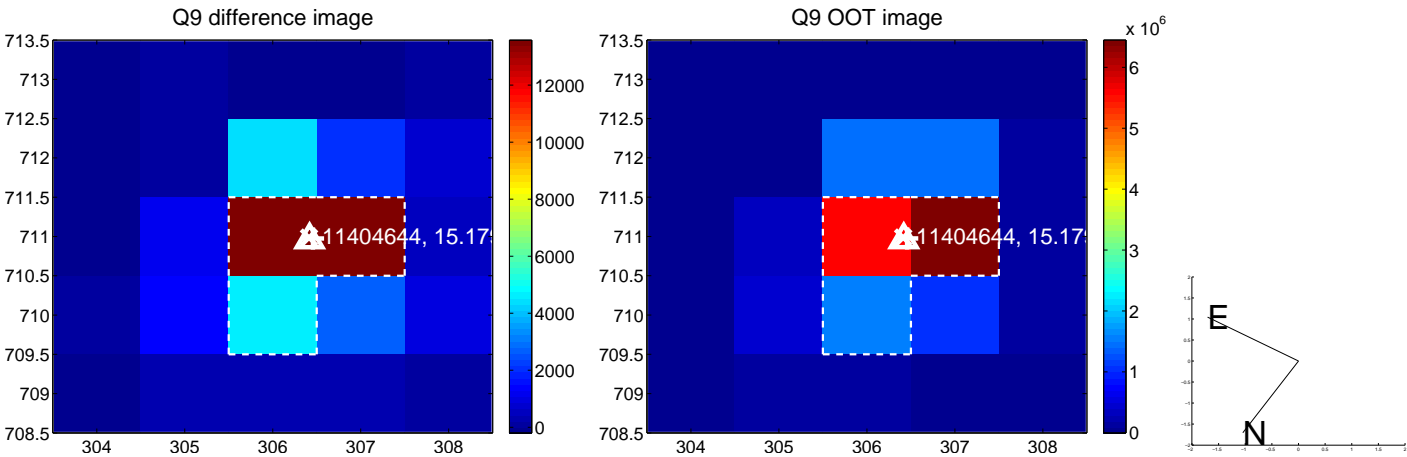


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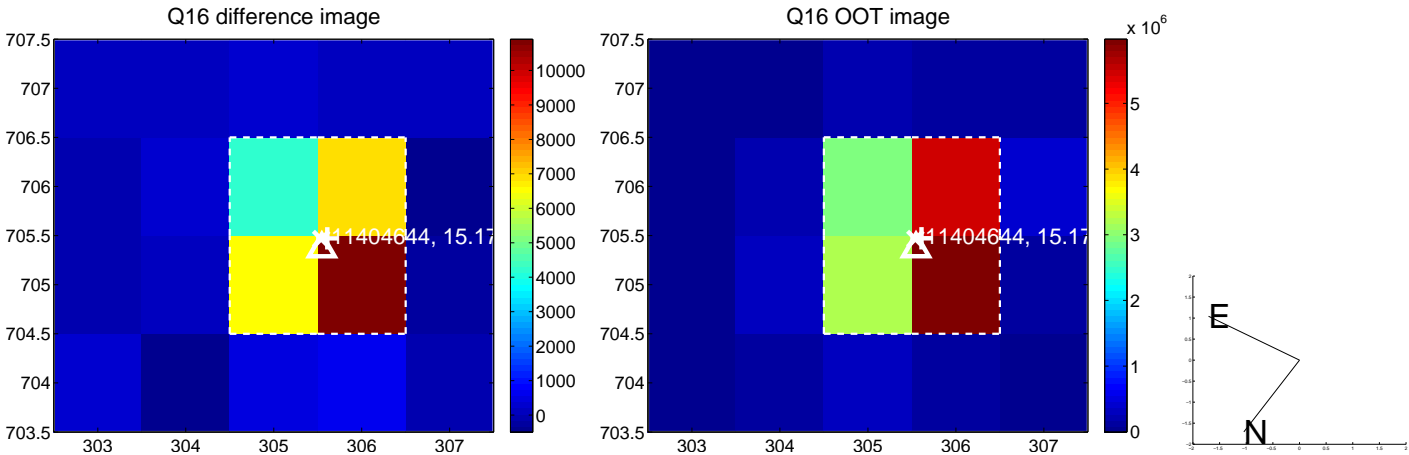
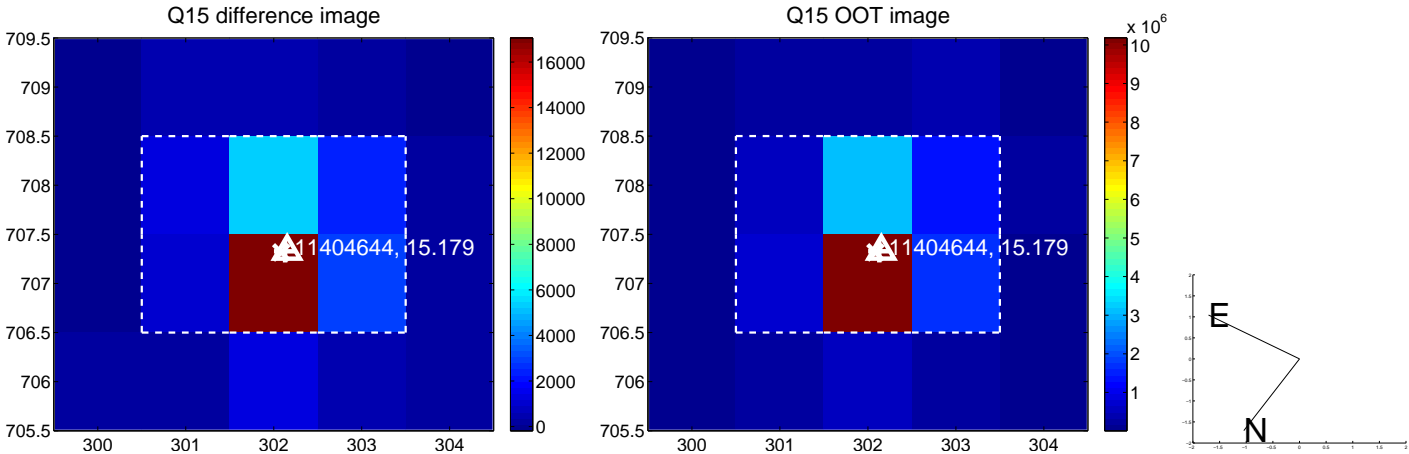
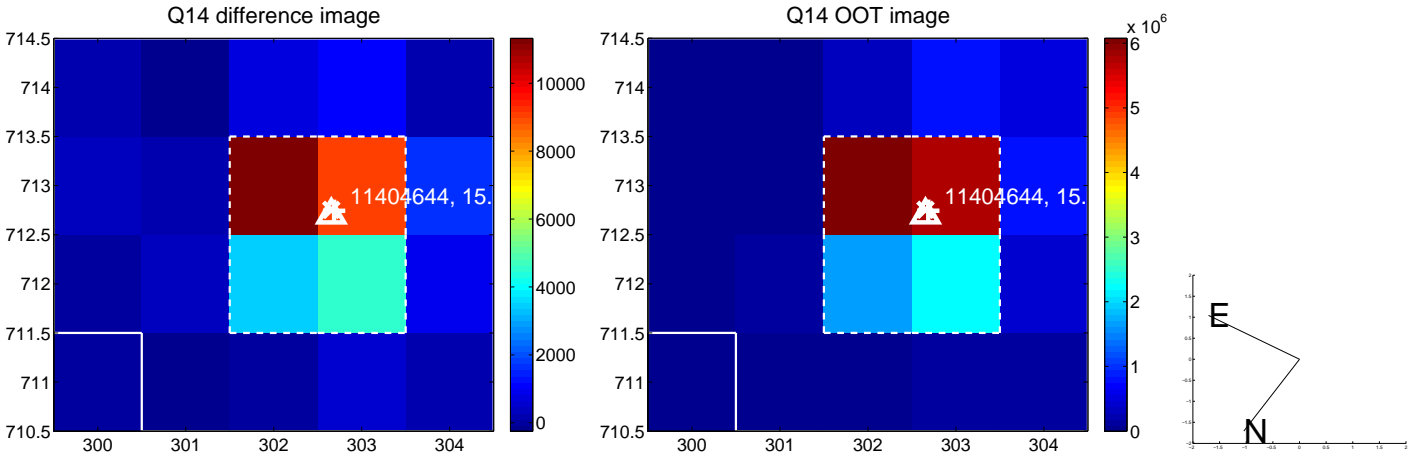
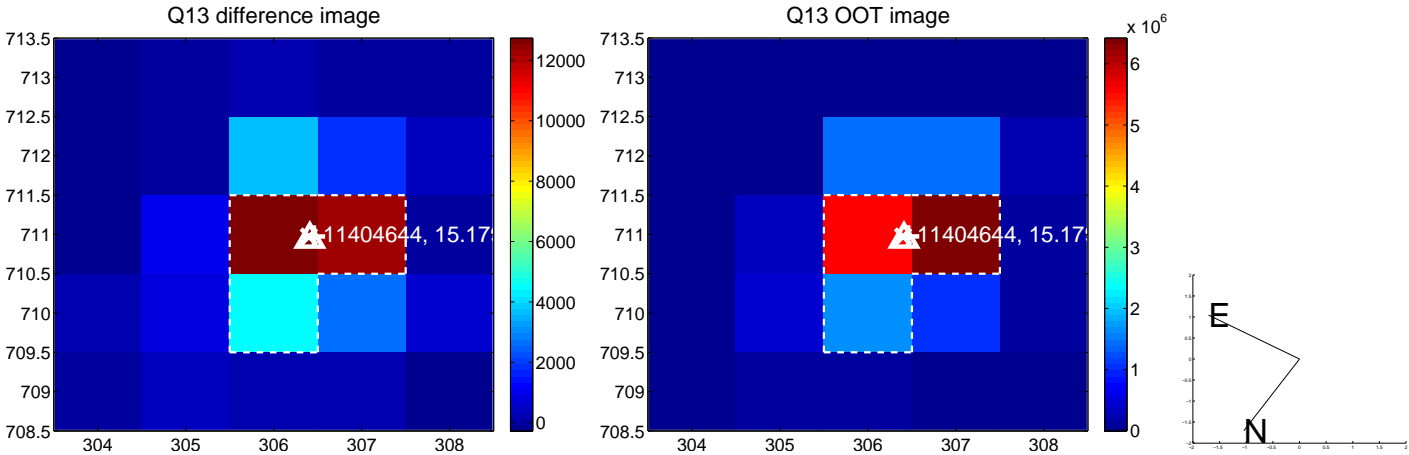




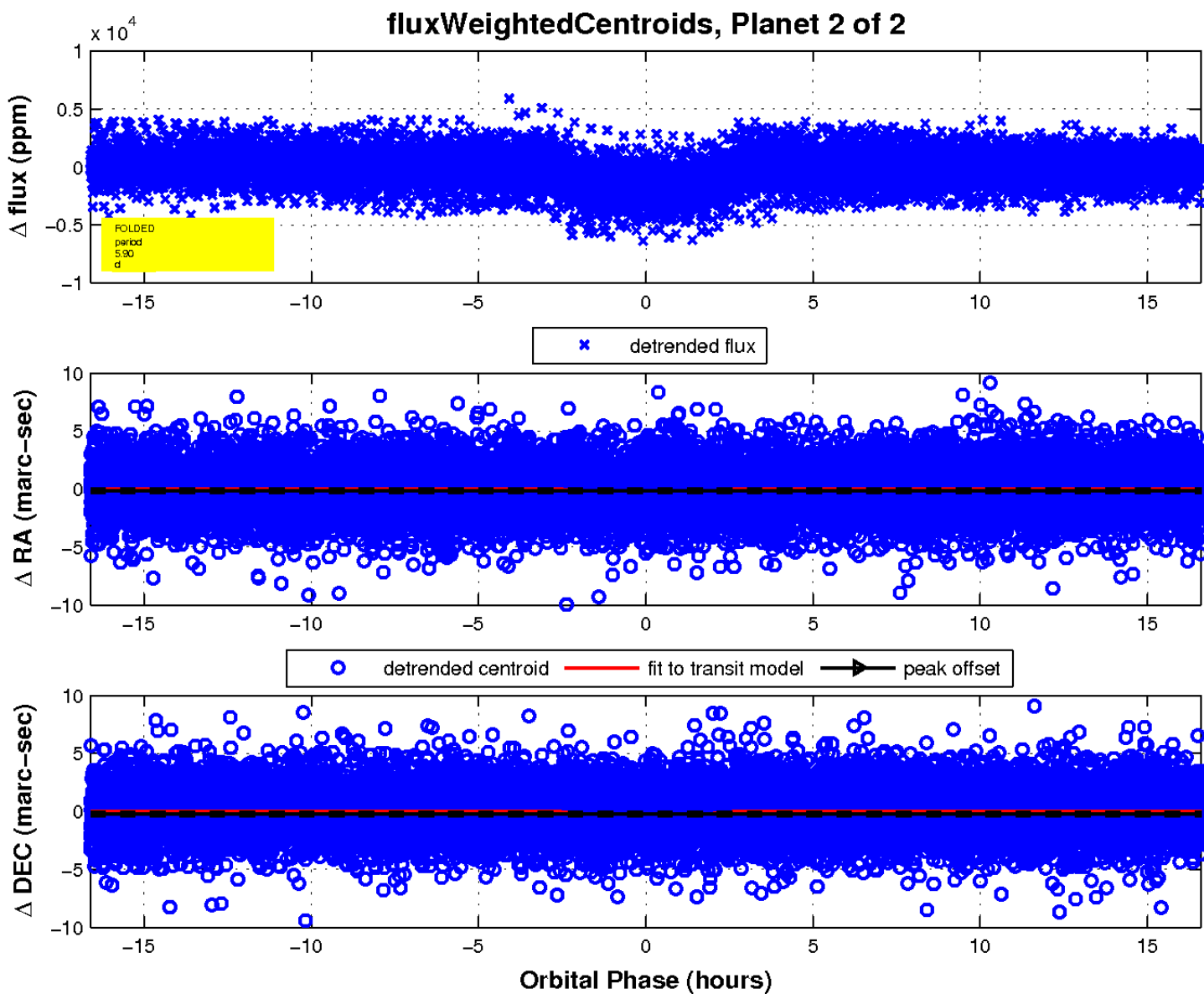
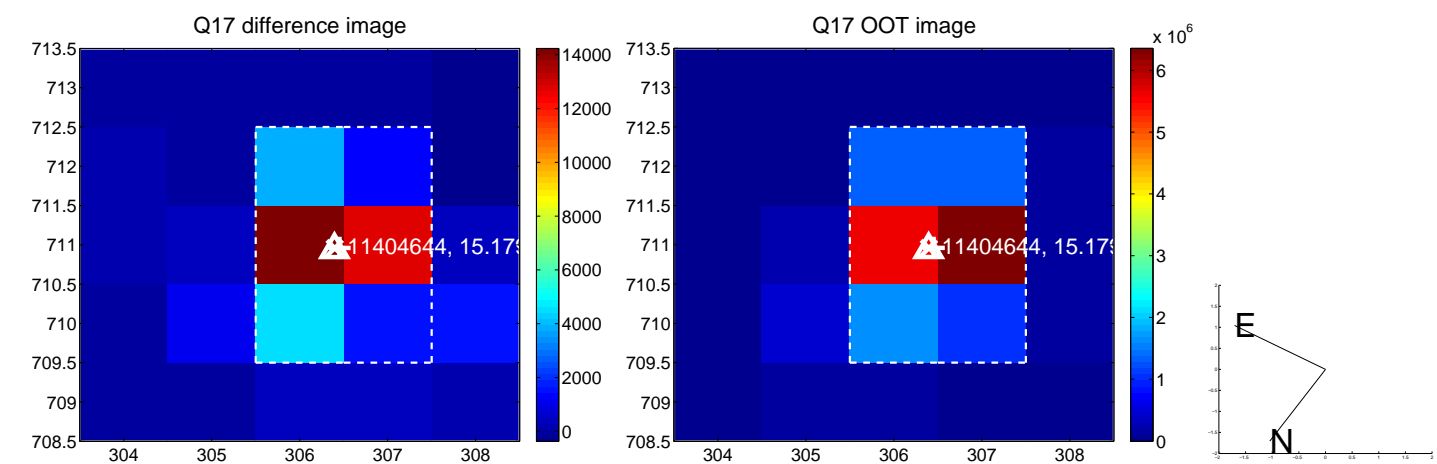
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

