

# KIC 005716244

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716244-01	OBS	6619.01	1.330340	132.769022	49821.9	4.110	2587.2	1623.9	0.91	5984	21.15	1689.13
005716244-02	OBS	No	1.330322	132.083238	22.6	5.133	12.5	1.1	0.91	5984	0.43	1689.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716244-01	OBS	PC	0.67	0	1	0	0	SWEET_EB—MOD_SEC_DV—PLANET_OCCULT_DV—MOD_SEC_ALT—HAS_SEC_TCE
005716244-02	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.

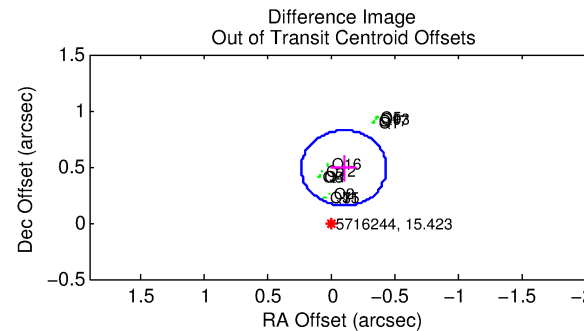
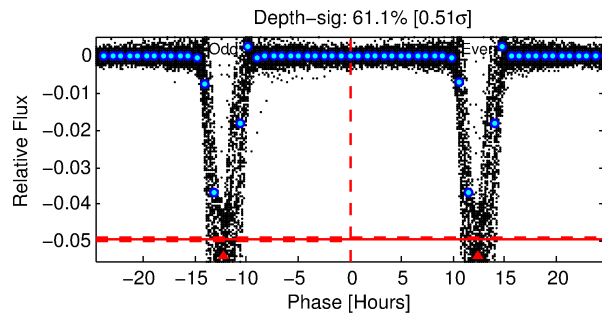
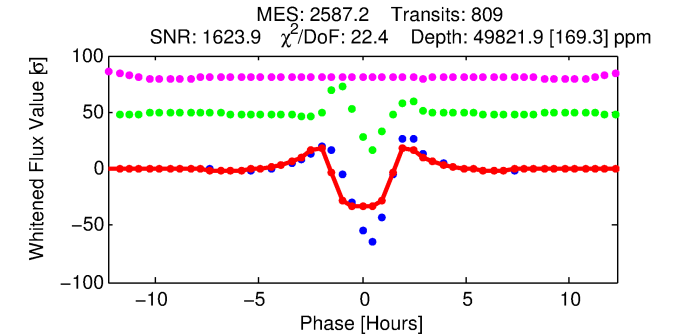
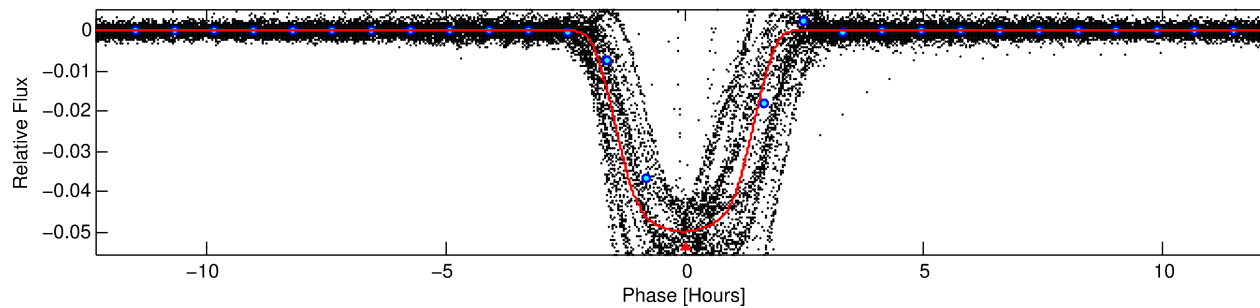
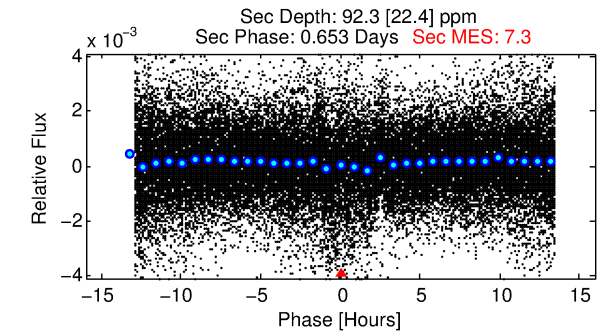
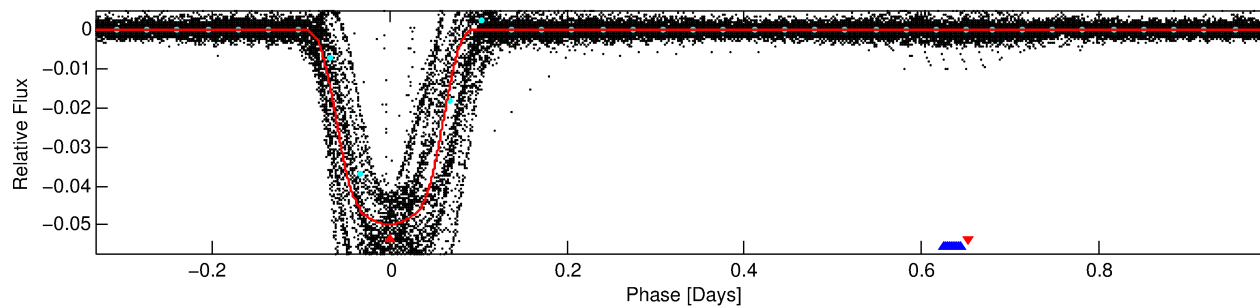
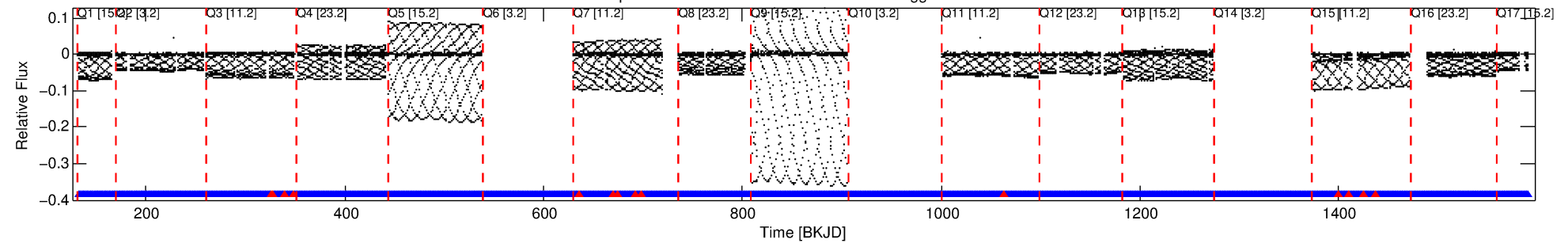
## Ephemeris Match Information For 005716244-01

No Significant Match Found

# DV One-Page Summary

KIC: 5716244 Candidate: 1 of 2 Period: 1.330 d  
KOI: K06619.01 Corr: 0.923

Kp: 15.42 R\*: 0.91 Rs Teff: 5984.0 K Logg: 4.52 Fe/H: -0.200



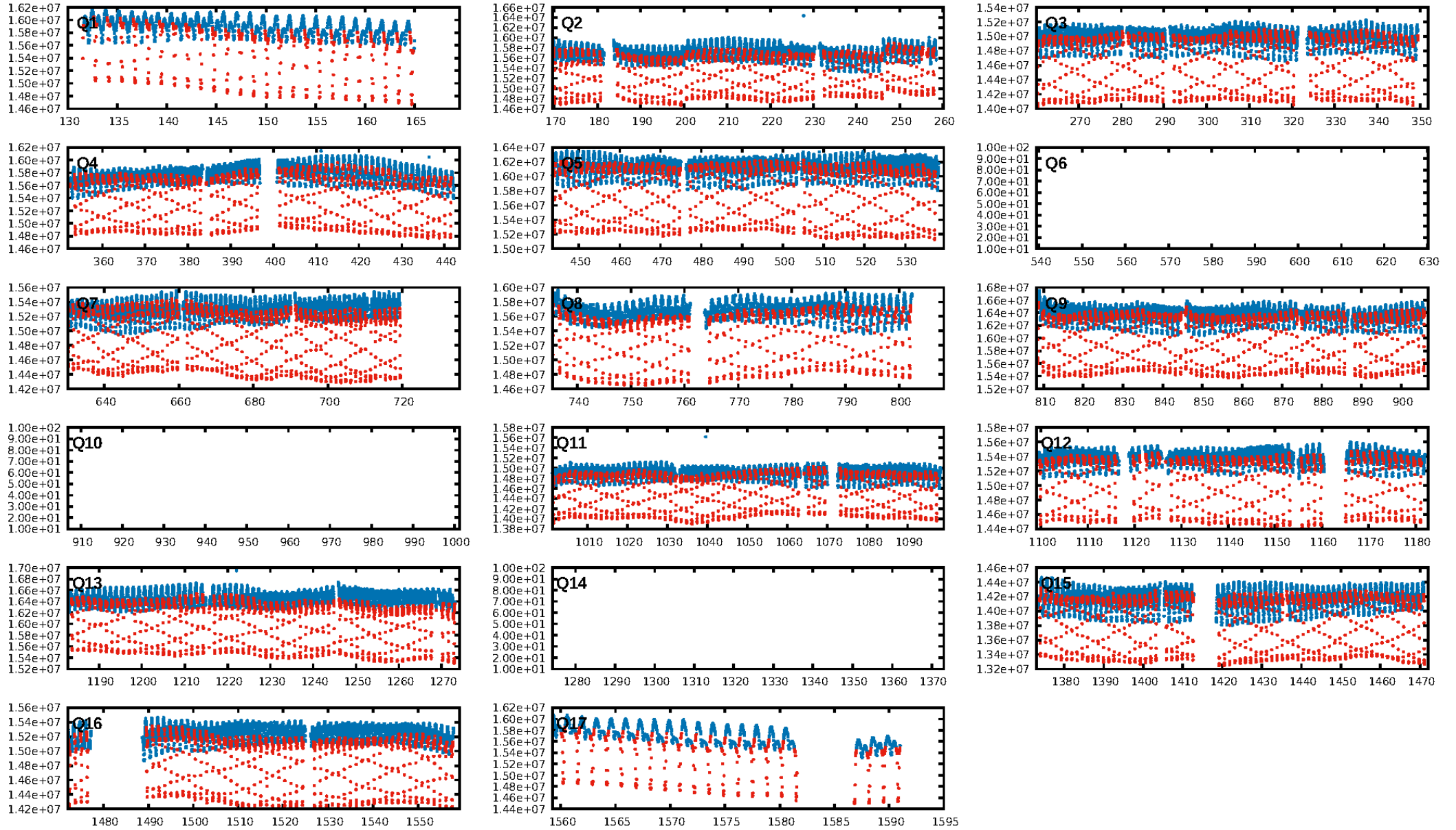
## DV Fit Results:

Period = 1.33034 [0.00000] d  
Epoch = 132.7690 [0.0001] BKJD  
Rp/R\* = 0.2139 [0.0005]  
a/R\* = 2.77 [0.01]  
b = 0.58 [0.01]  
Seff = 1689.13 [630.70]  
Teff = 1635 [153] K  
Rp = 21.15 [5.77] Re  
a = 0.0236 [0.0055] AU  
Ag = 0.06 [0.03] [-34.95 sigma]  
Teffp = 1268 [89] K [-2.08 sigma]

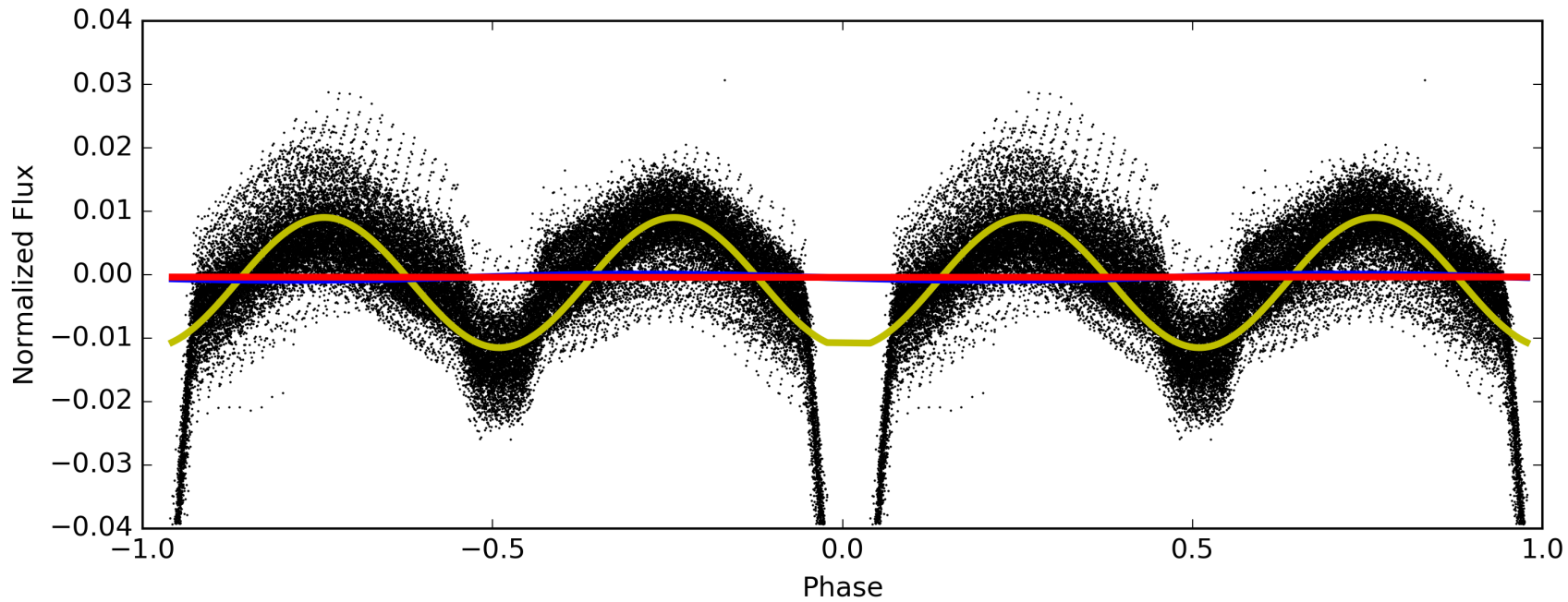
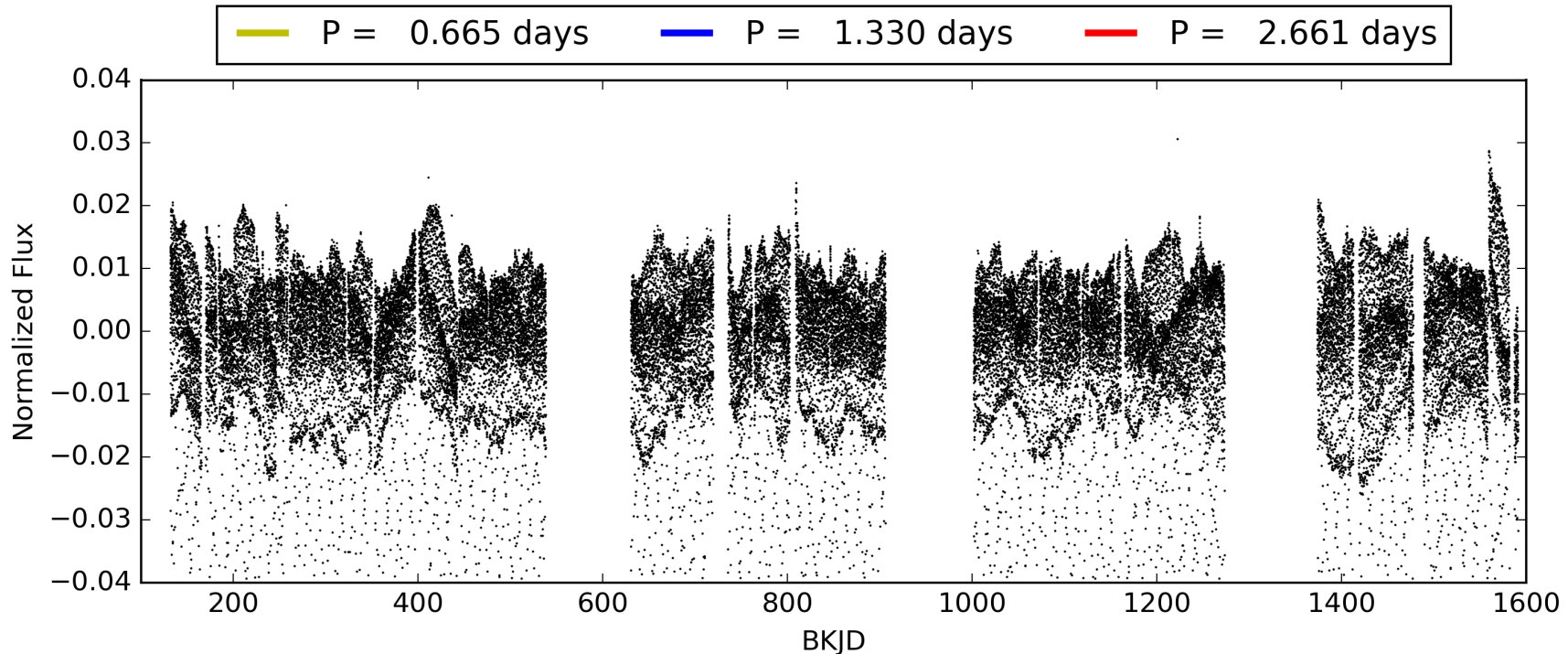
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 sigma]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.98 [748/762]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 0.064 arcsec [17.98 sigma]  
OotOffset-rm: 0.497 arcsec [4.45 sigma]  
KicOffset-rm: 0.056 arcsec [0.83 sigma]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 005716244-01, PDC Light Curves

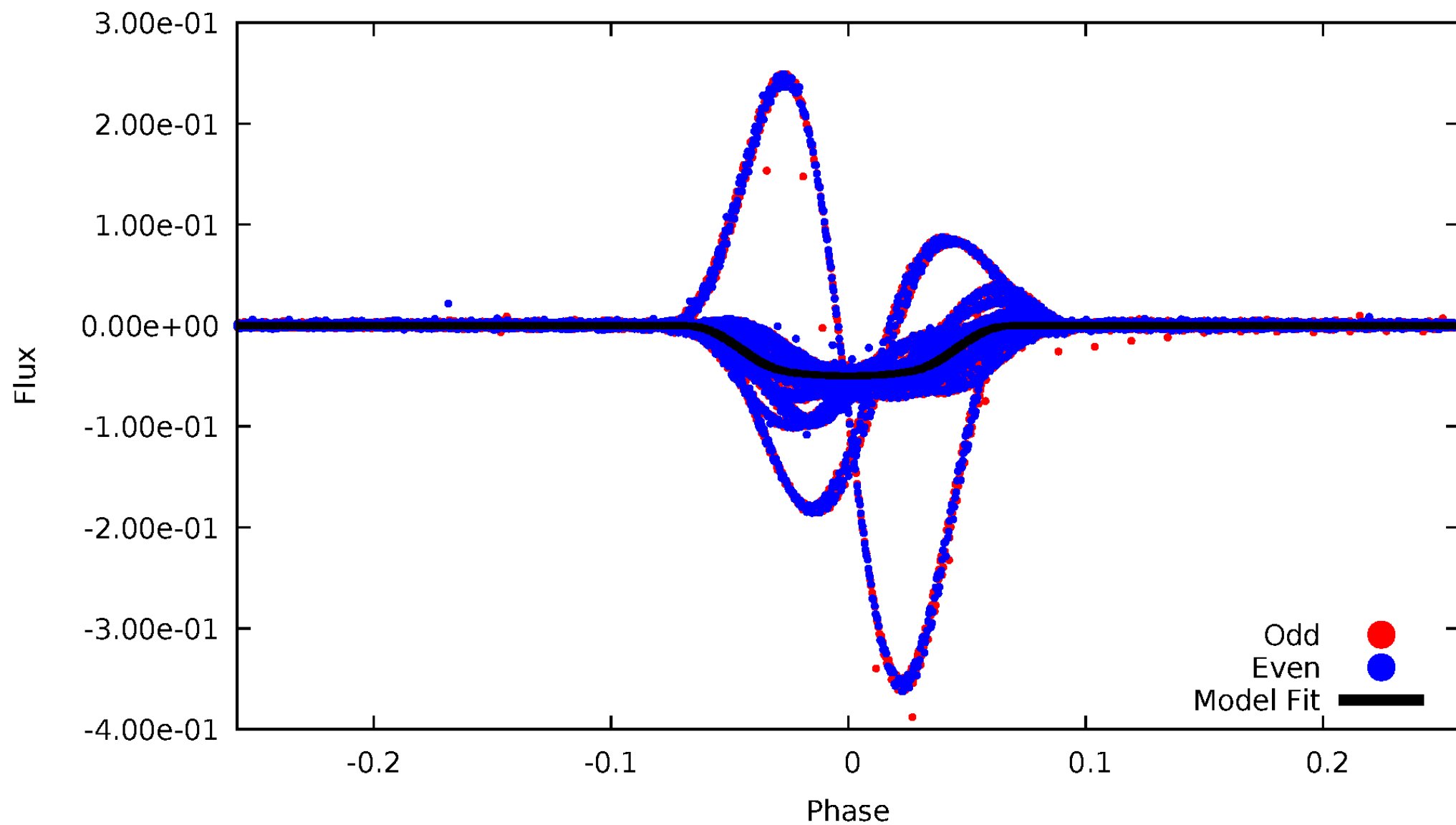


TCE 005716244-01



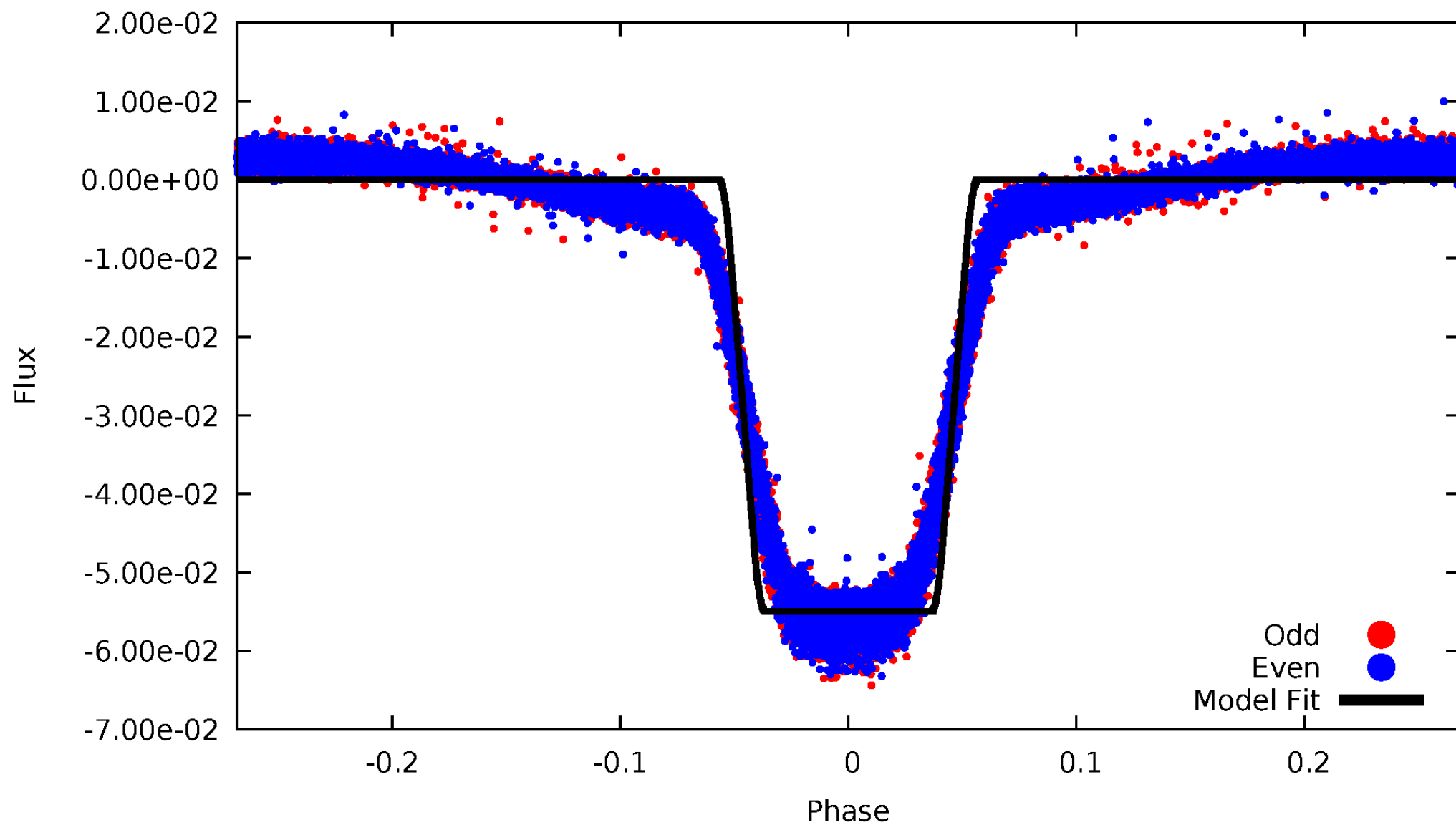
# DV Odd/Even

TCE 005716244-01



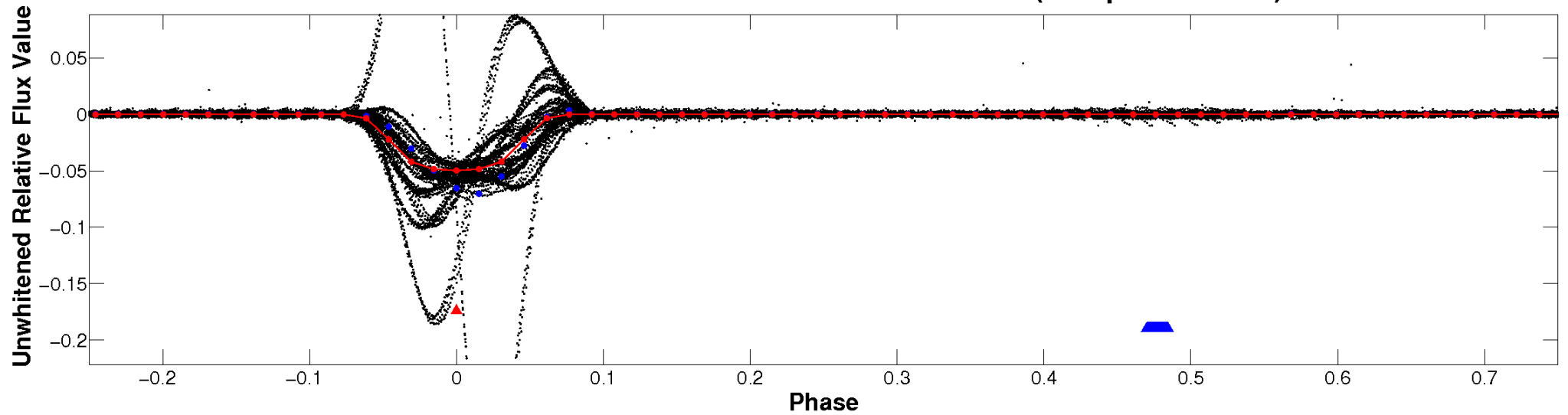
# ALT Odd/Even

TCE 005716244-01

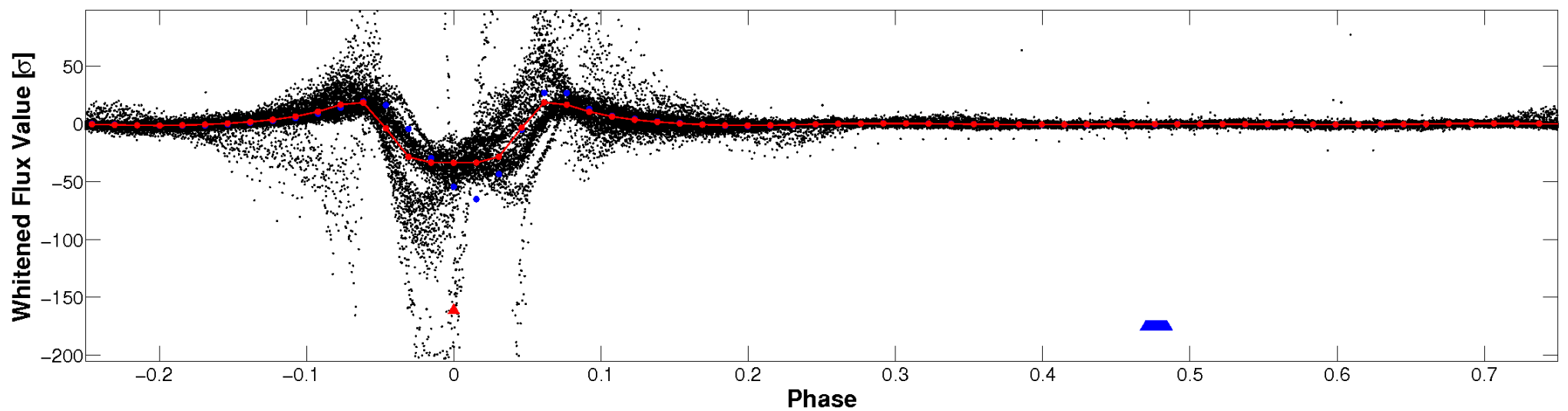


# Non-Whitened Vs. Whitened Light Curve

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



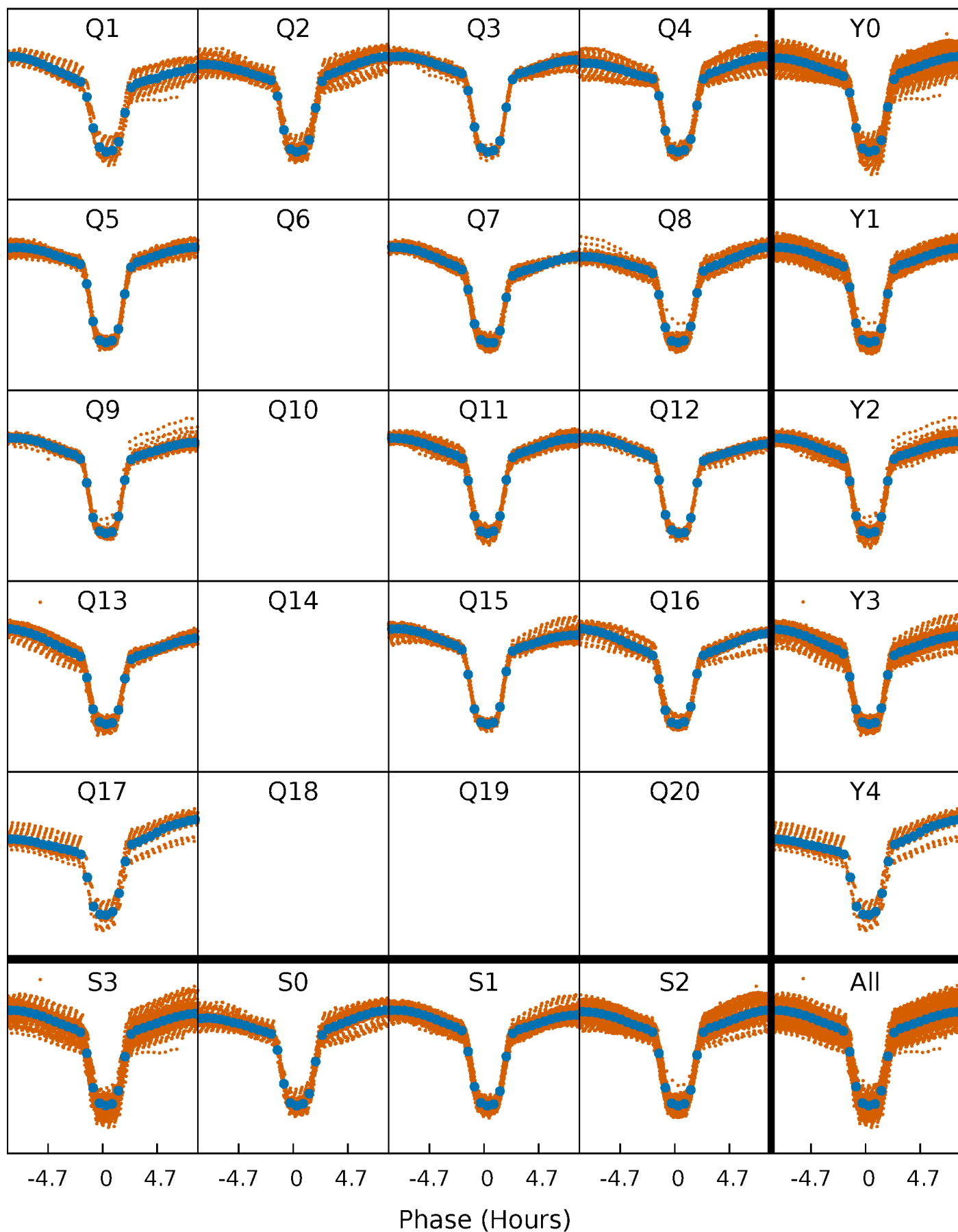
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

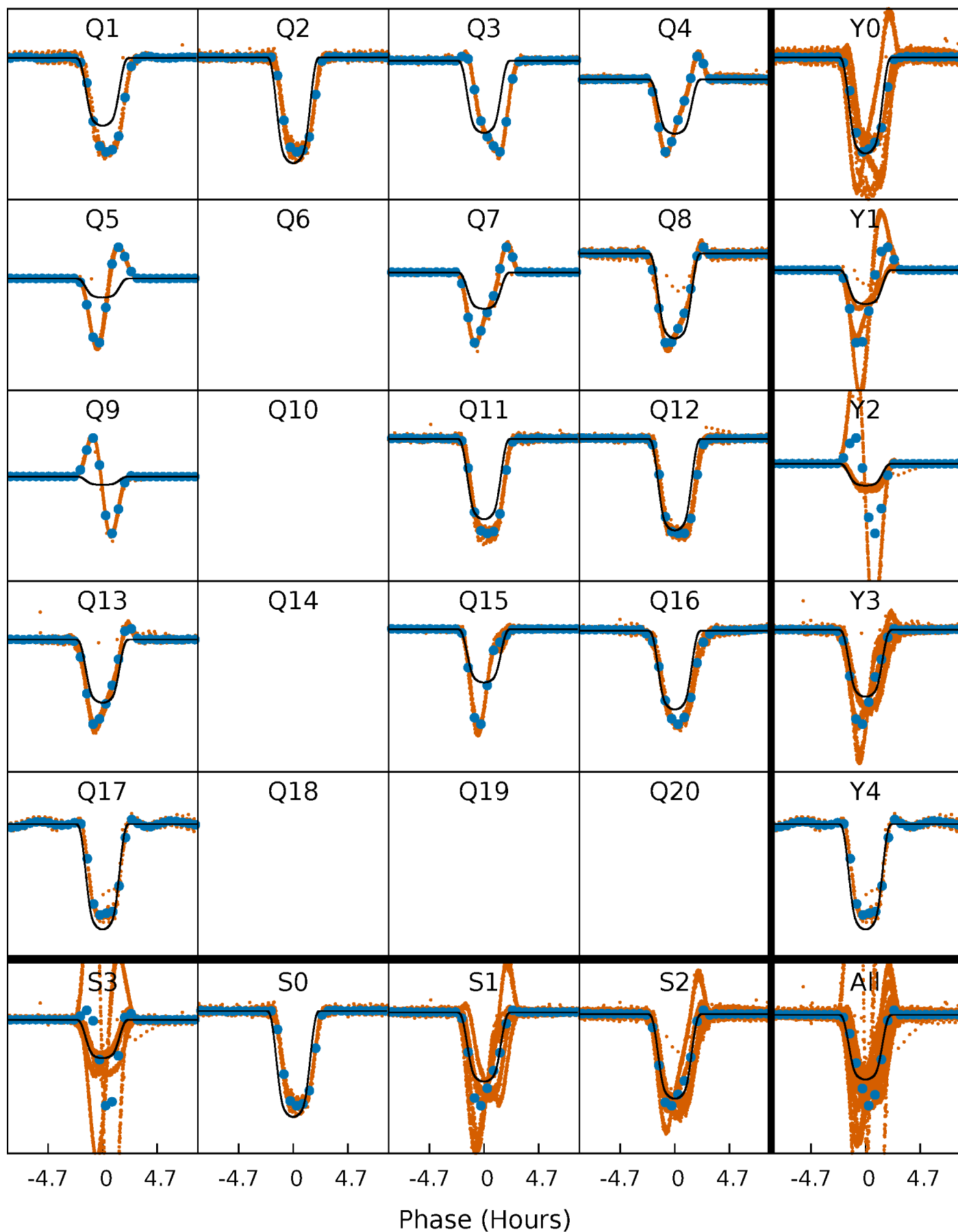
TCE 005716244-01   P= 1.330340 Days    $T_0=132.769022$  (BKJD)





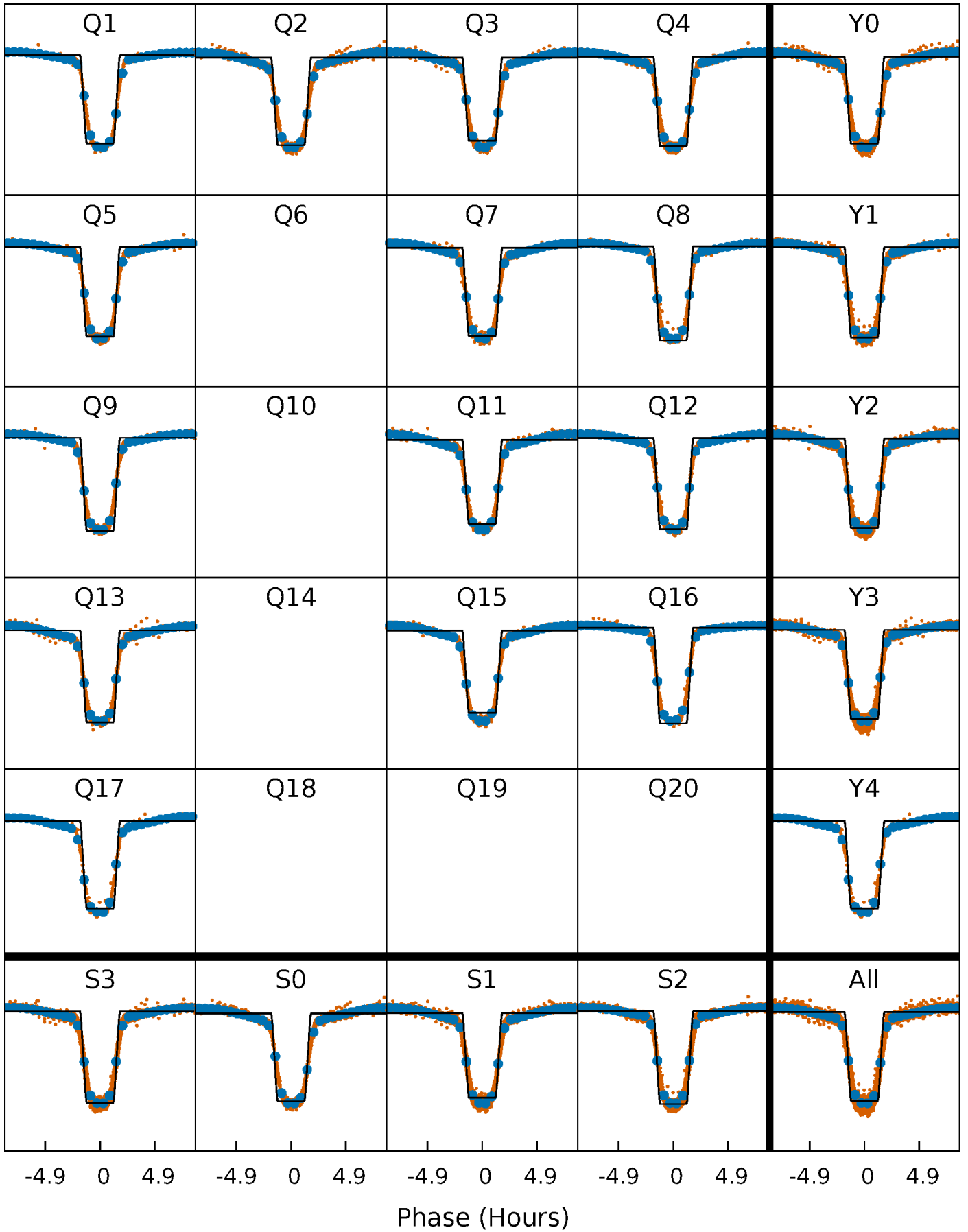
# DV Quarter-Phased Transit Curves

TCE 005716244-01 P= 1.330340 Days  $T_0=132.769022$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

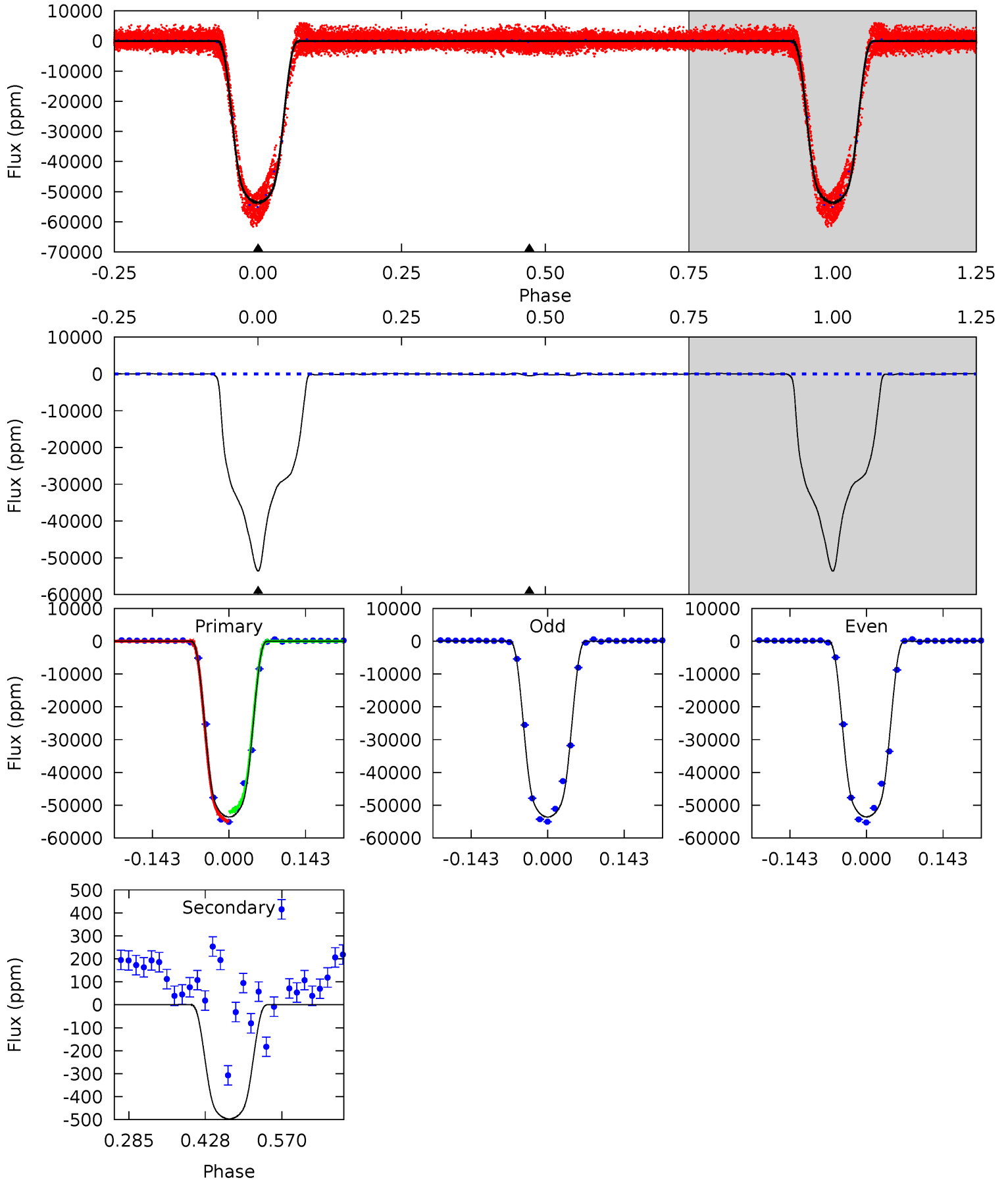
TCE 005716244-01 P= 1.330339 Days  $T_0=132.781804$  (BKJD)



# DV Model-Shift Uniqueness Test

005716244-01, P = 1.330340 Days, E = 131.438682 Days

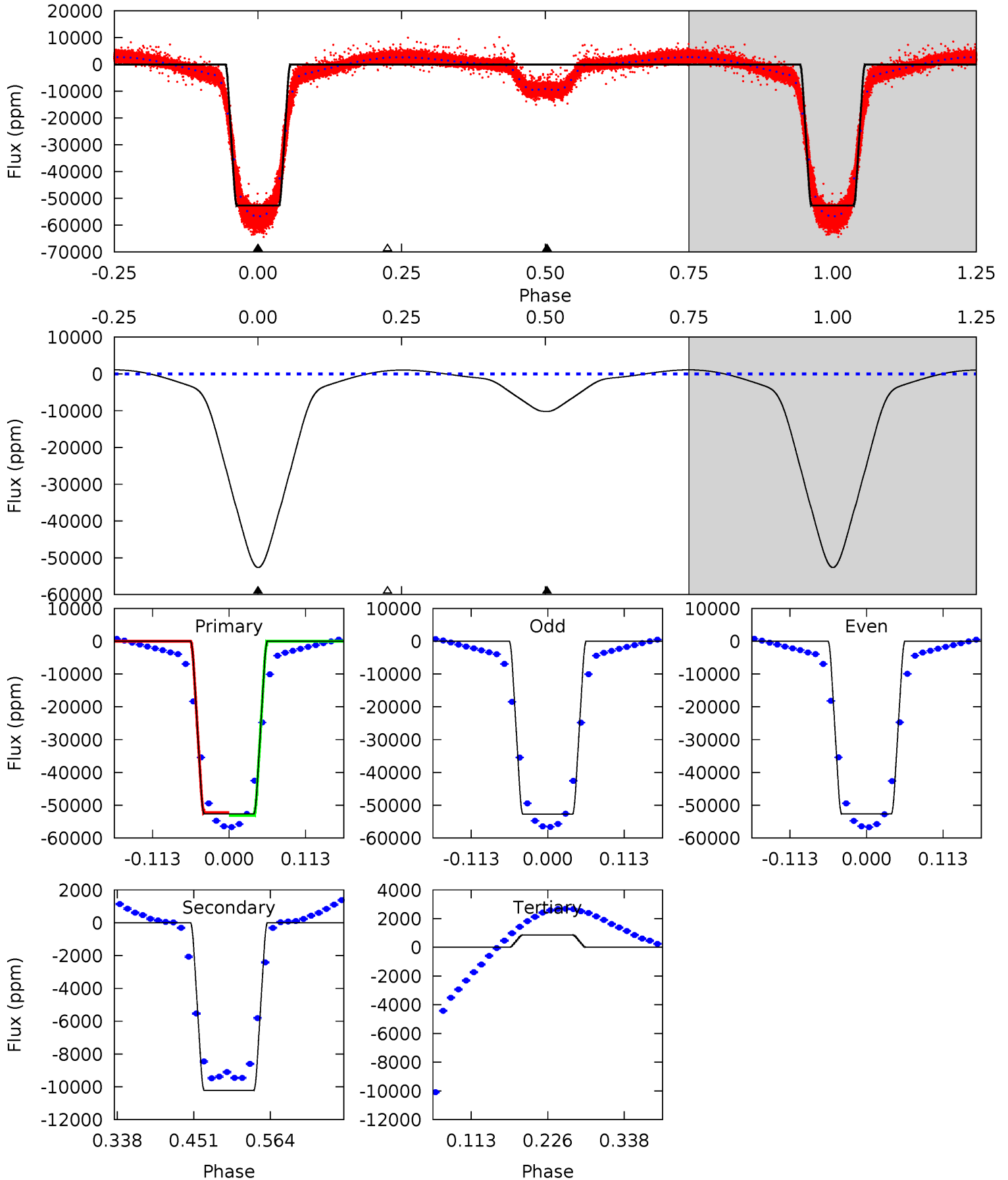
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2016	18.7	0	0	4.49	1.47	2.29	2016	2016	18.7	18.7	0.96	1.02	0.00	50.1



# Alt Model-Shift Uniqueness Test

005716244-01, P = 1.330339 Days, E = 131.451465 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
1963	381.3	-32.1	0	4.54	1.59	44.6	1996	1963	413.4	381.3	0.83	1.01	0.02	15.9



### Stellar Parameters For KIC 005716244

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5984^{+167}_{-209}$	$4.521^{+0.048}_{-0.192}$	$-0.200^{+0.300}_{-0.300}$	$0.906^{+0.247}_{-0.088}$	$0.993^{+0.118}_{-0.131}$	$1.883^{+0.465}_{-0.906}$
	+3%/-3%	+1%/-4%	+150%/-150%	+27%/-10%	+12%/-13%	+25%/-48%
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 005716244-01 / KOI 6619.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-497 \pm 27$	$21.70^{+3.14}_{-1.66}$	$2333^{+131}_{-119}$	$1939^{+271}_{-4165}$	$0.317^{+0.051}_{-0.068}$
Alt.	$-10222 \pm 27$	$23.60^{+3.89}_{-1.63}$	$2329^{+160}_{-114}$	$4154^{+90}_{-110}$	$5.520^{+0.729}_{-1.284}$

$T_{\text{max}}$  = 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

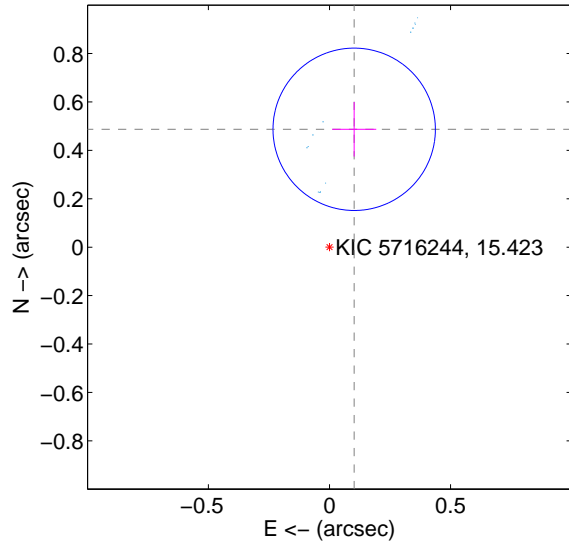
Supplemental centroid analysis for 005716244-01. Kepler magnitude: 15.42. Transit SNR 1623.93

There are 14 quarters with good PRF difference image offsets

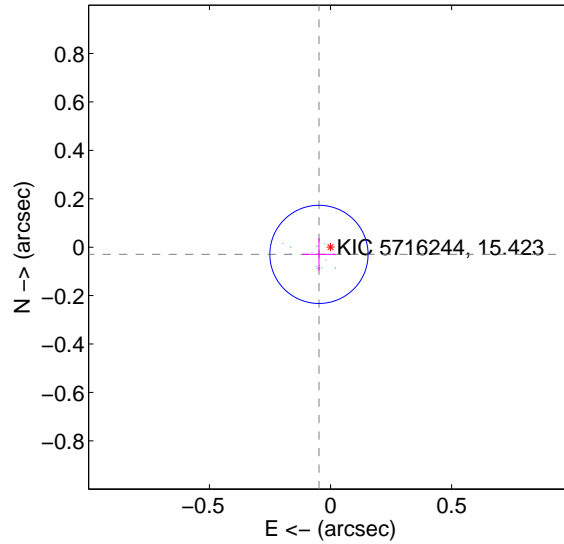
The direct PRF centroid is offset from the target star catalog position by about 1.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.497 \pm 0.112$	4.45	$-0.102 \pm 0.091$	$0.487 \pm 0.113$
PRF-fit source offset from KIC position	$0.056 \pm 0.068$	0.83	$0.048 \pm 0.068$	$-0.030 \pm 0.067$
photometric centroid source offset	$0.06 \pm 0.00$	17.98	$-0.03 \pm 0.00$	$-0.06 \pm 0.00$

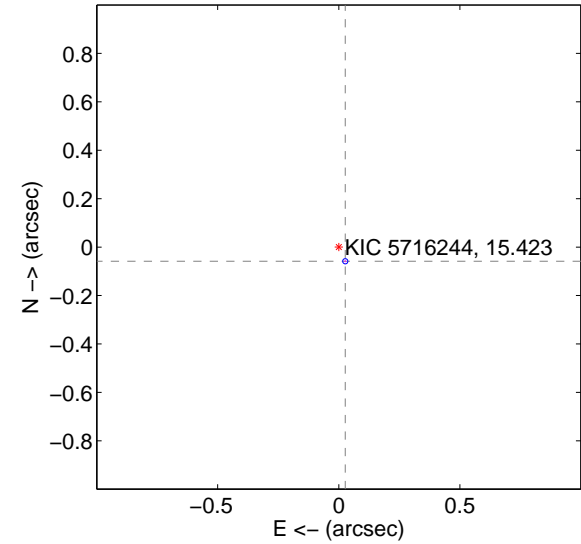
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

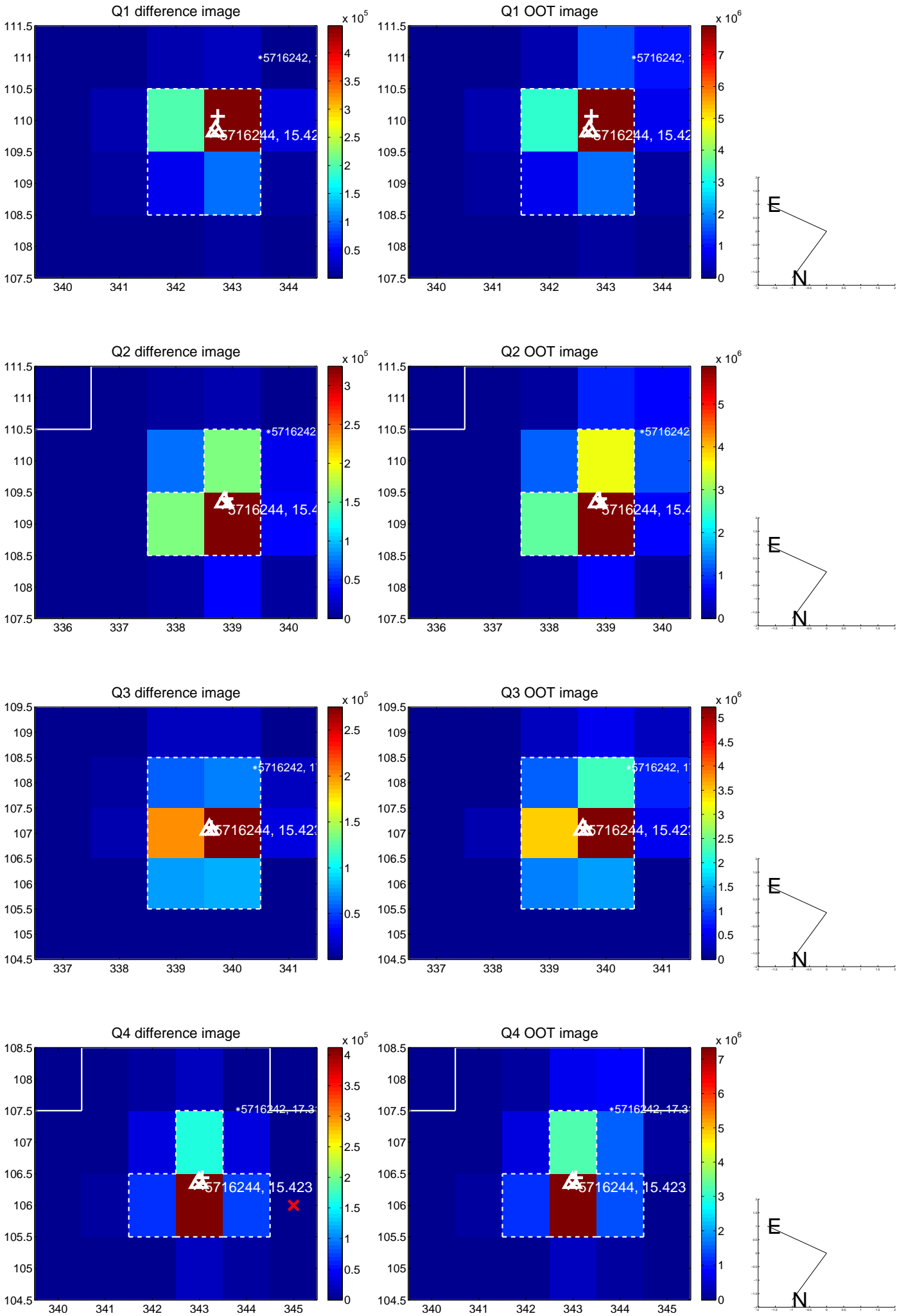


offset from photometric centroids



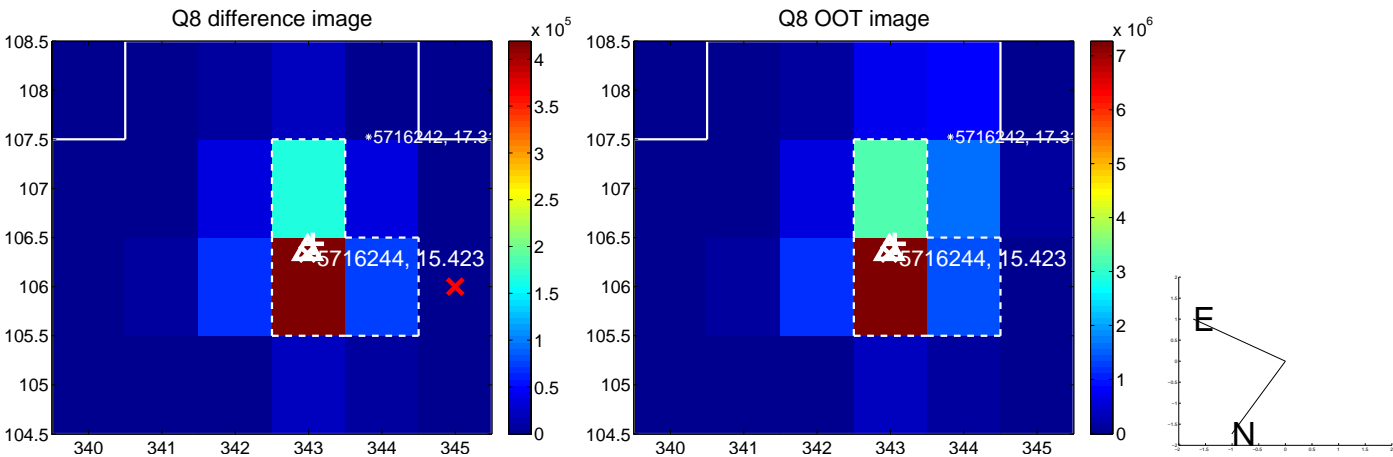
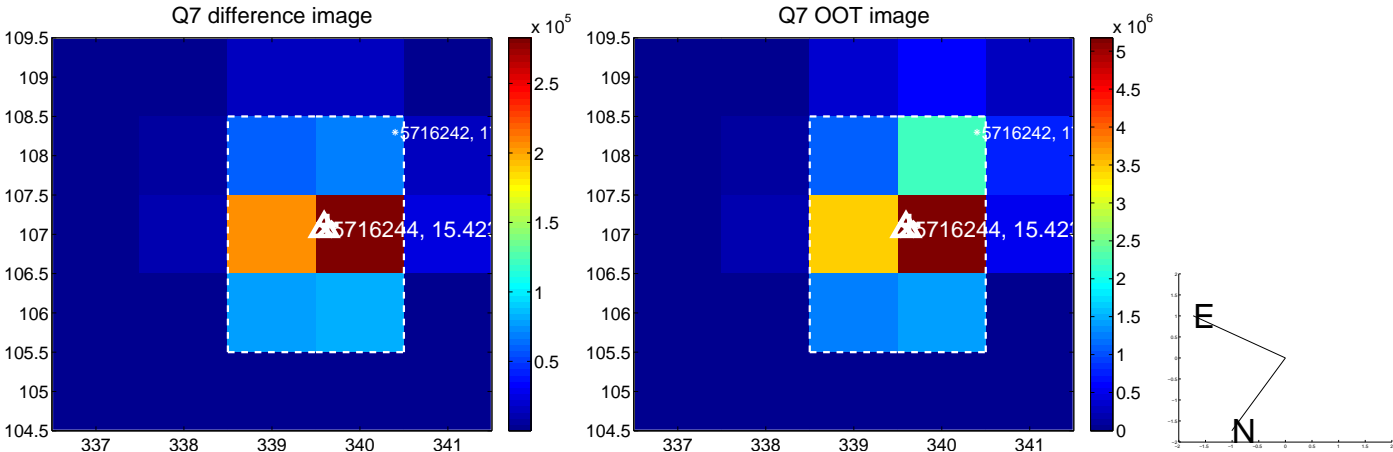
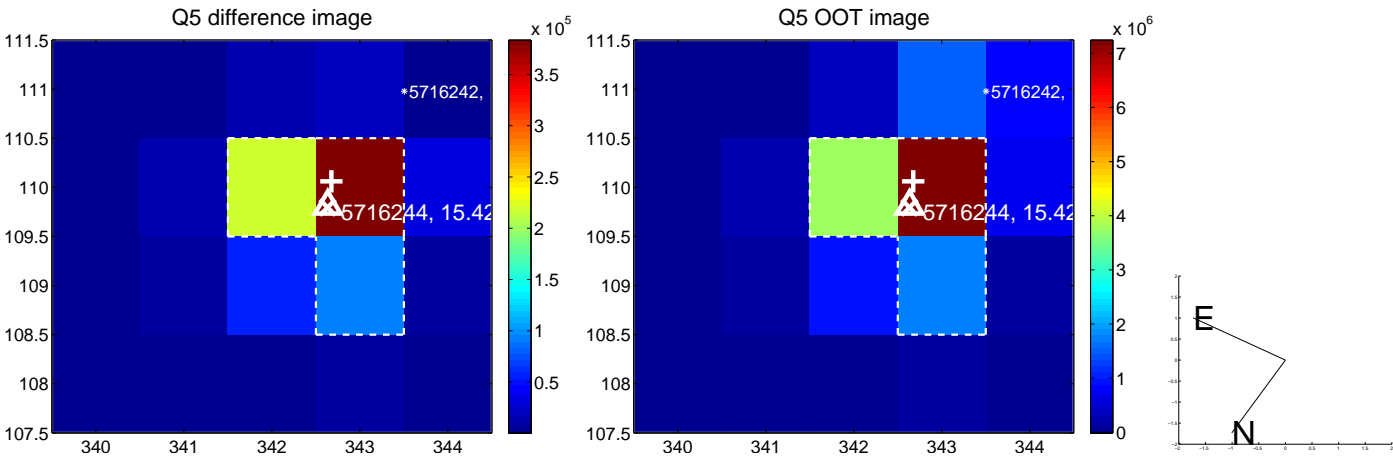
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

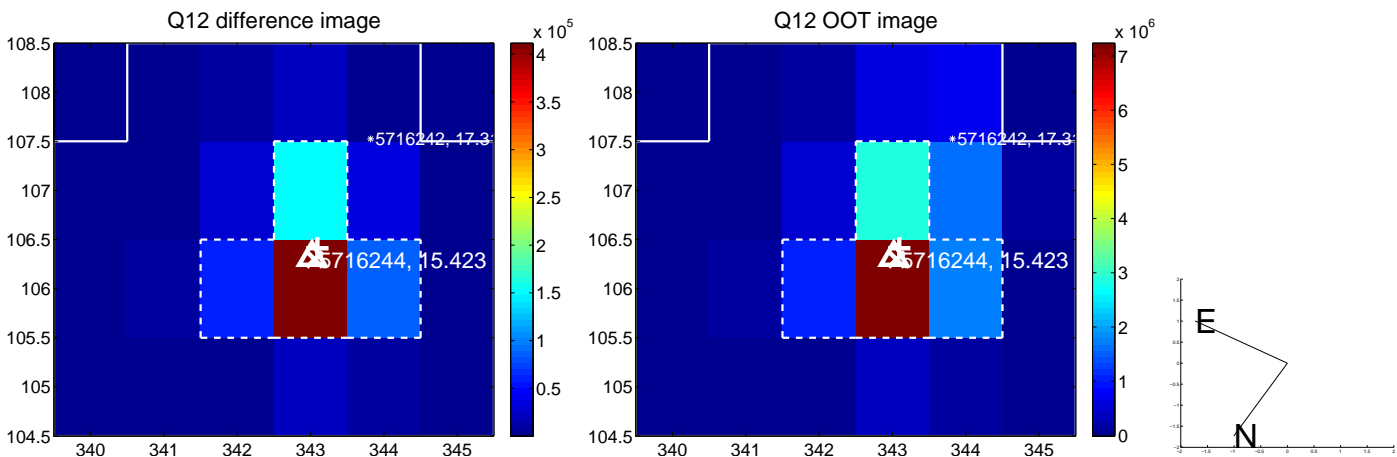
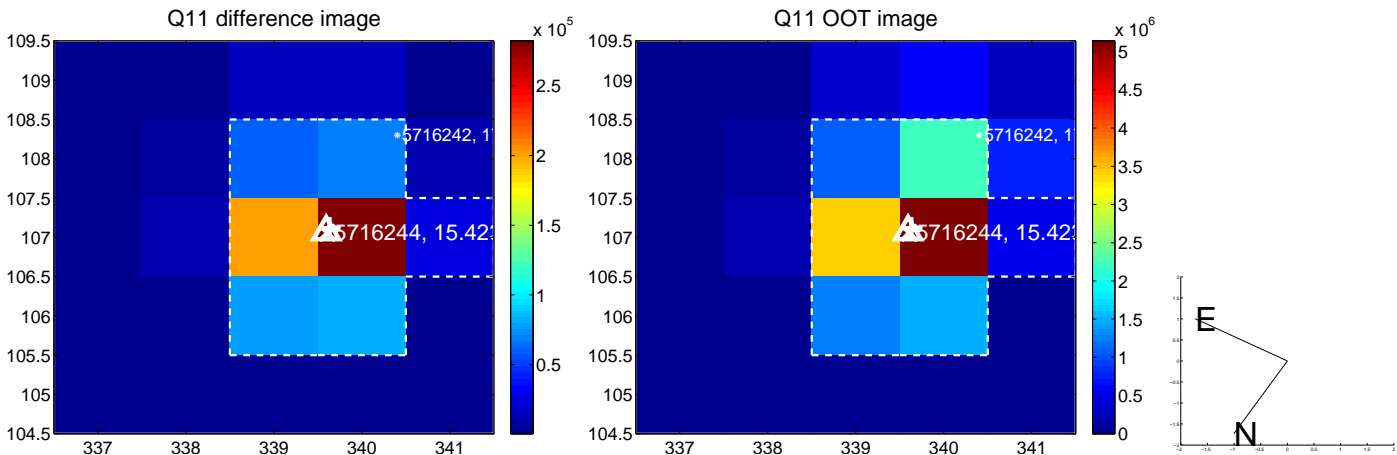
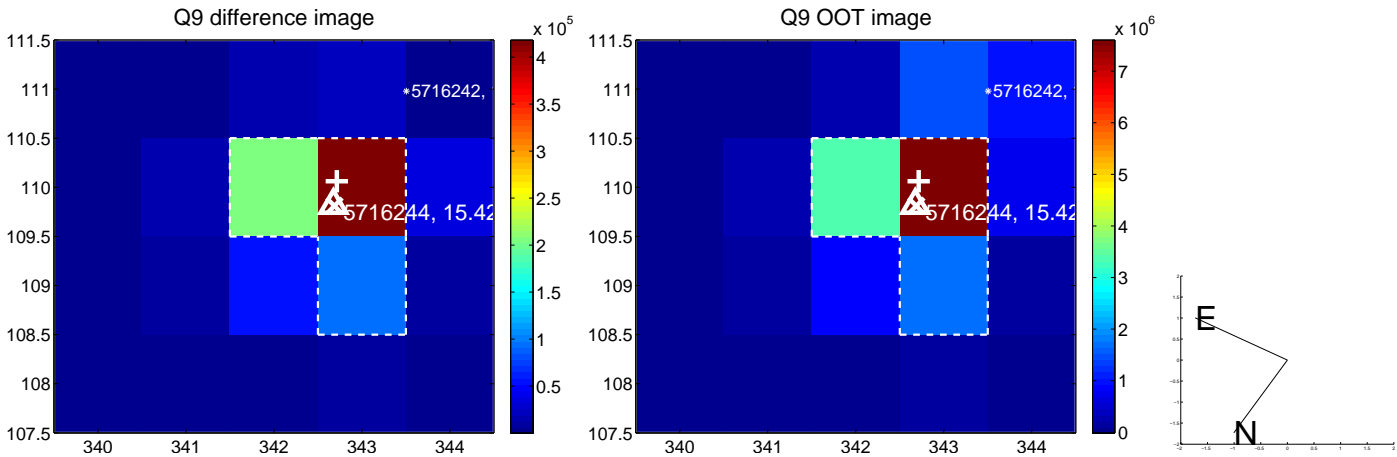




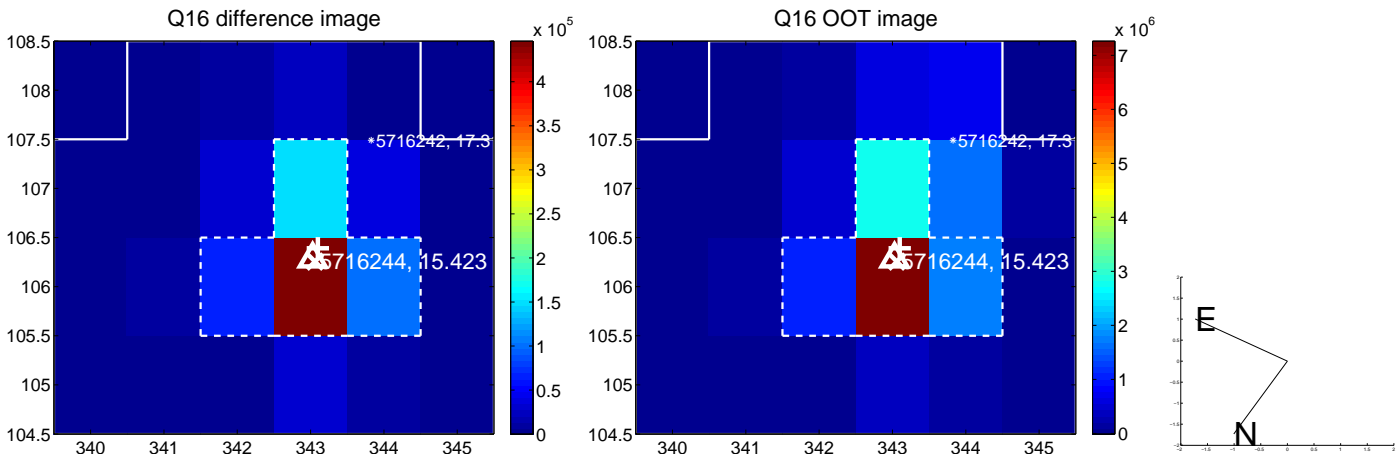
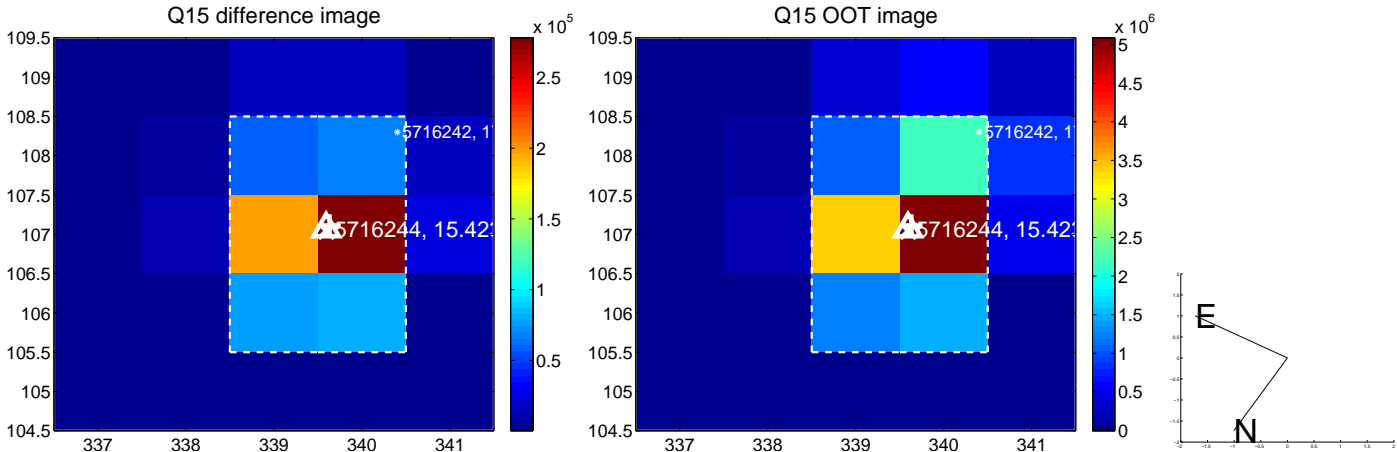
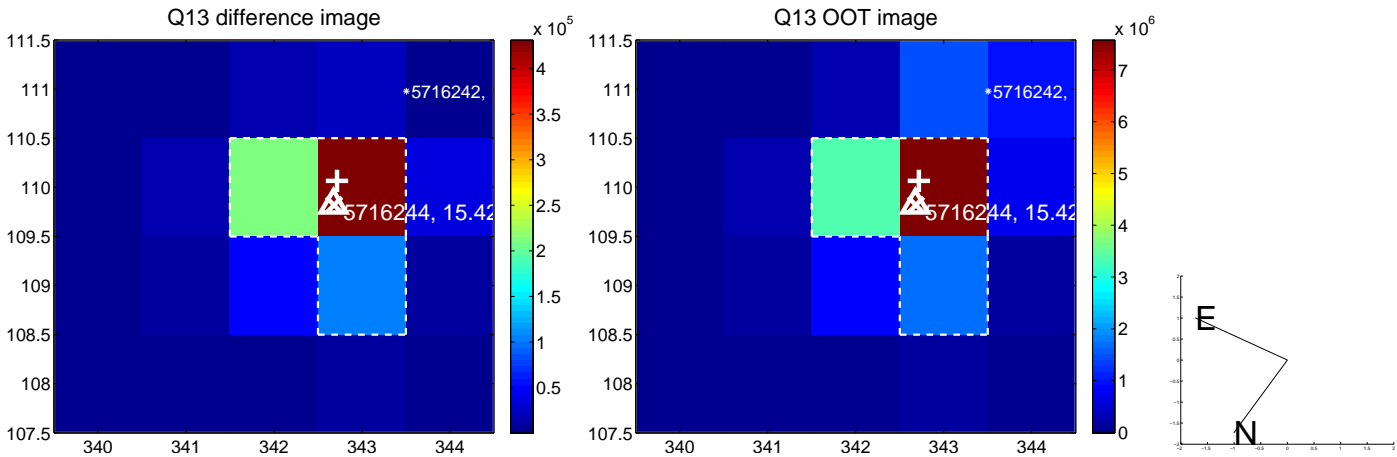
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



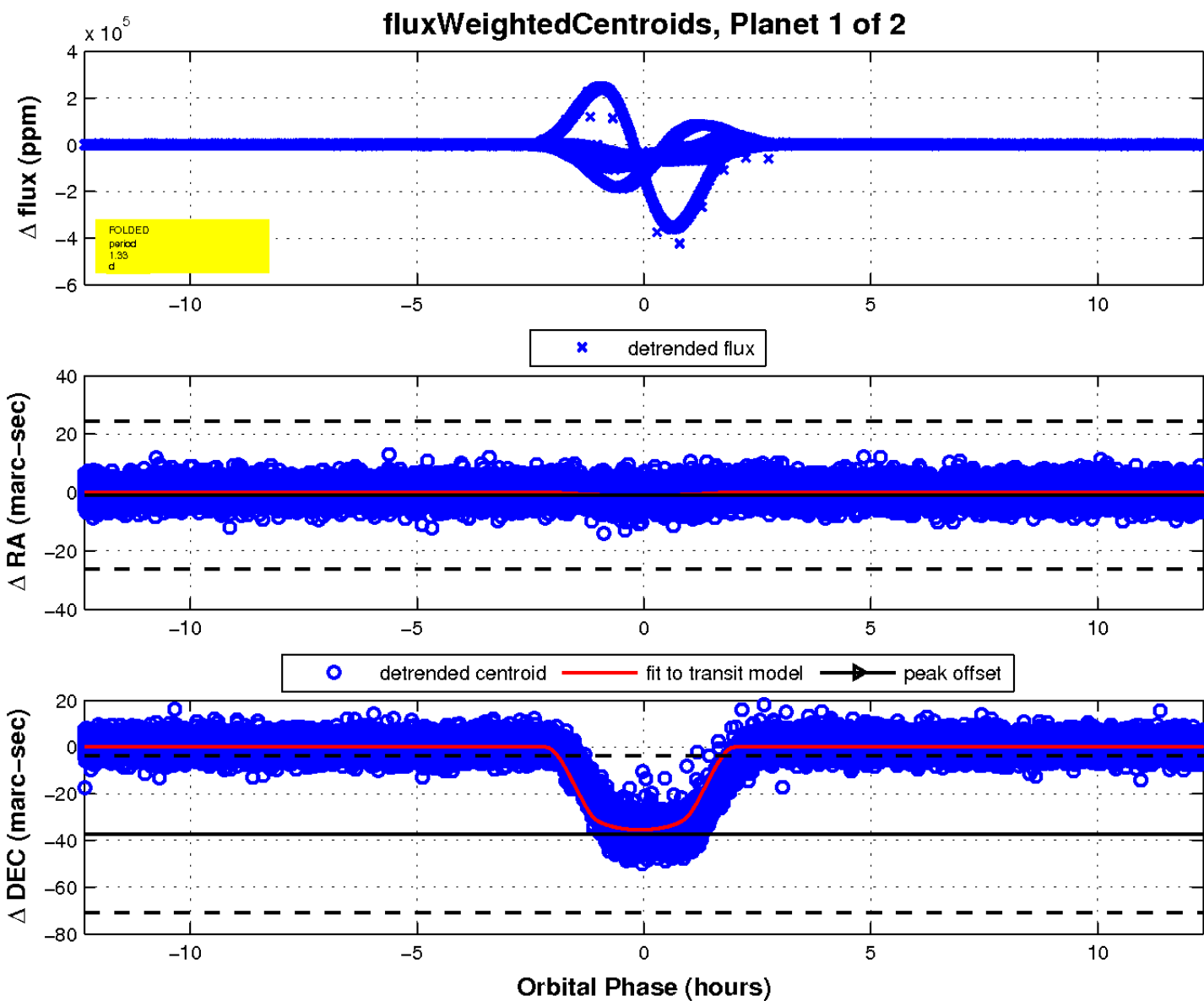
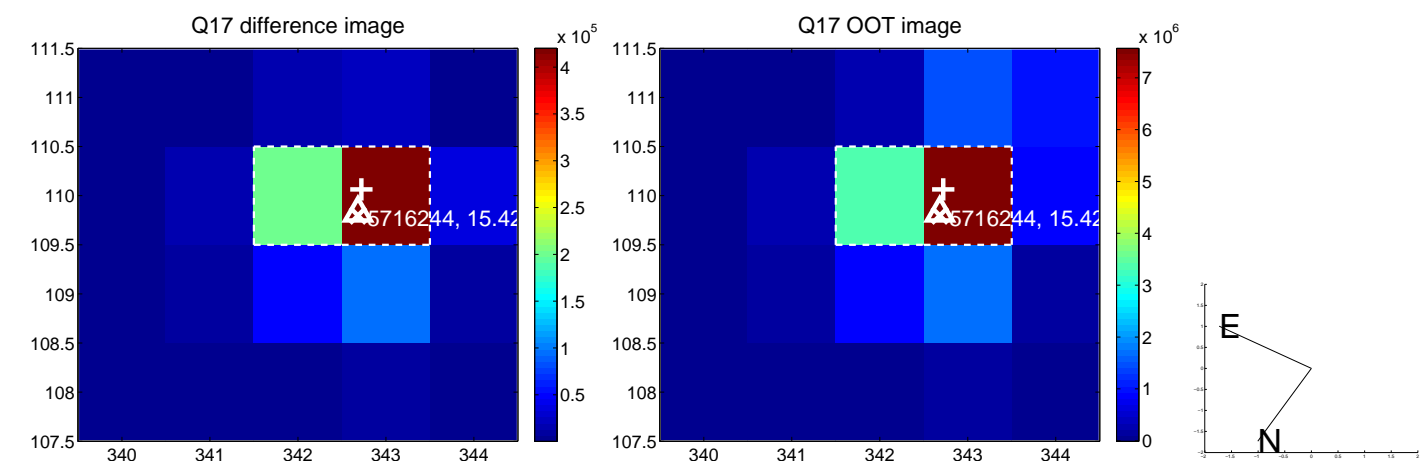
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

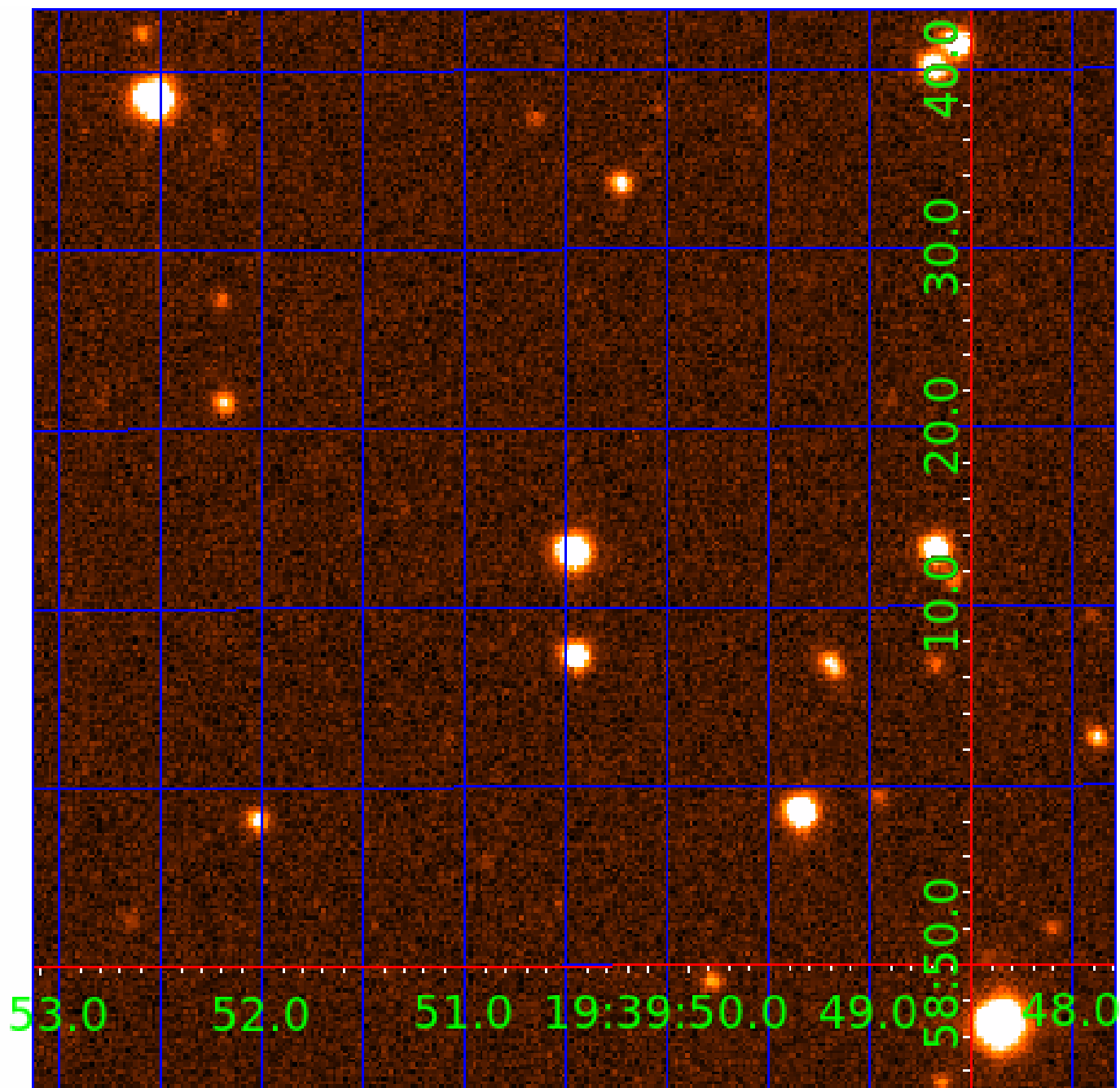


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005716244

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005716244-01	OBS	6619.01	1.330340	132.769022	49821.9	4.110	2587.2	1623.9	0.91	5984	21.15	1689.13
005716244-02	OBS	No	1.330322	132.083238	22.6	5.133	12.5	1.1	0.91	5984	0.43	1689.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005716244-01	OBS	PC	0.67	0	1	0	0	SWEET_EB—MOD_SEC_DV—PLANET_OCCULT_DV—MOD_SEC_ALT—HAS_SEC_TCE
005716244-02	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 005716244-02

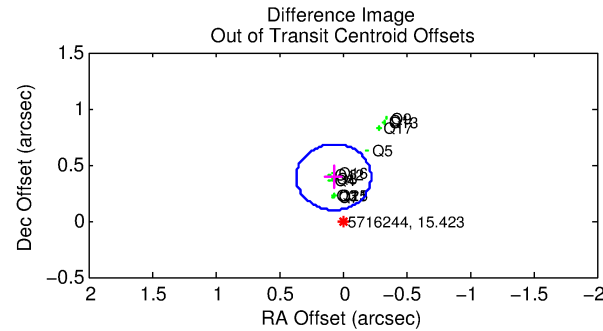
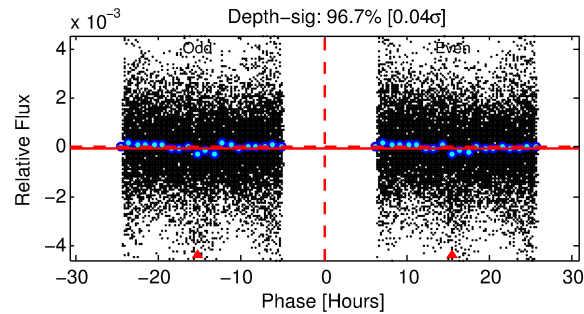
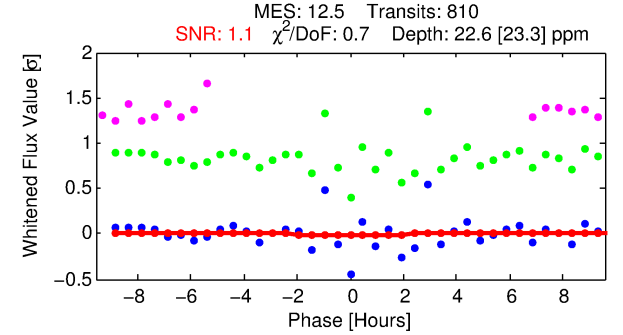
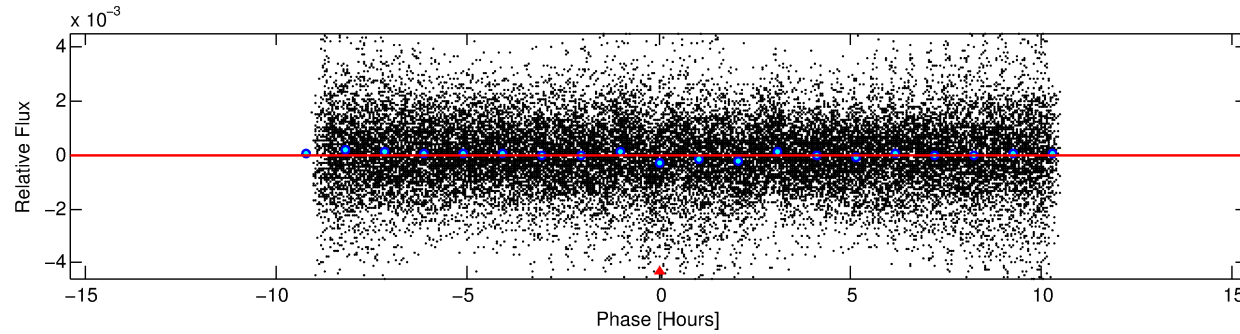
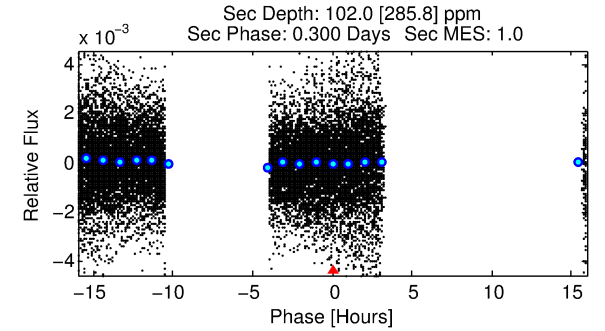
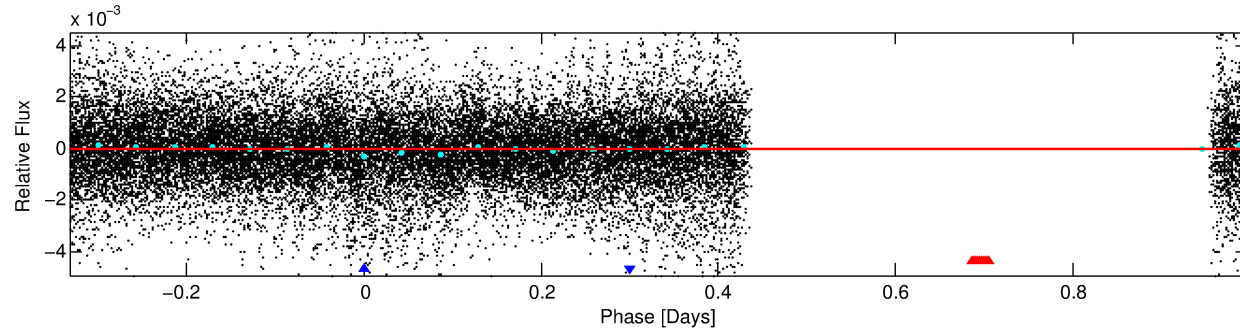
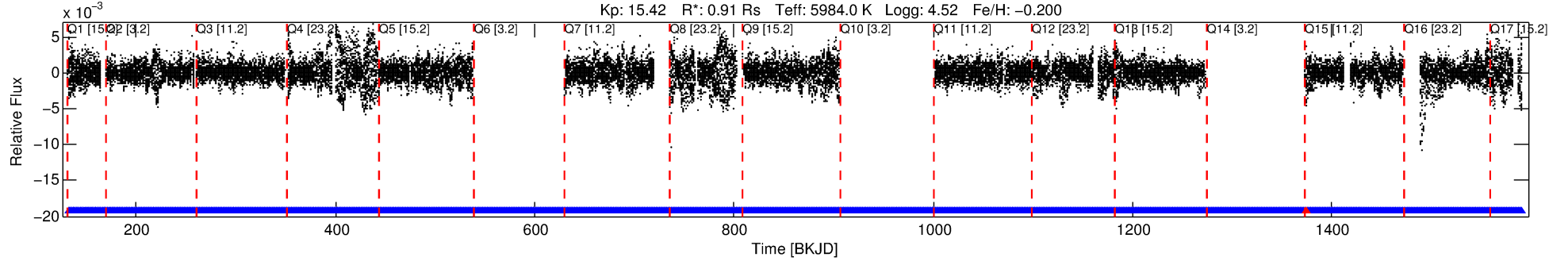
No Significant Match Found

# DV One-Page Summary

KIC: 5716244 Candidate: 2 of 2 Period: 1.330 d

KOI: K06619 Corr: No Ephemeris Match

Kp: 15.42 R\*: 0.91 Rs Teff: 5984.0 K Logg: 4.52 Fe/H: -0.200



## DV Fit Results:

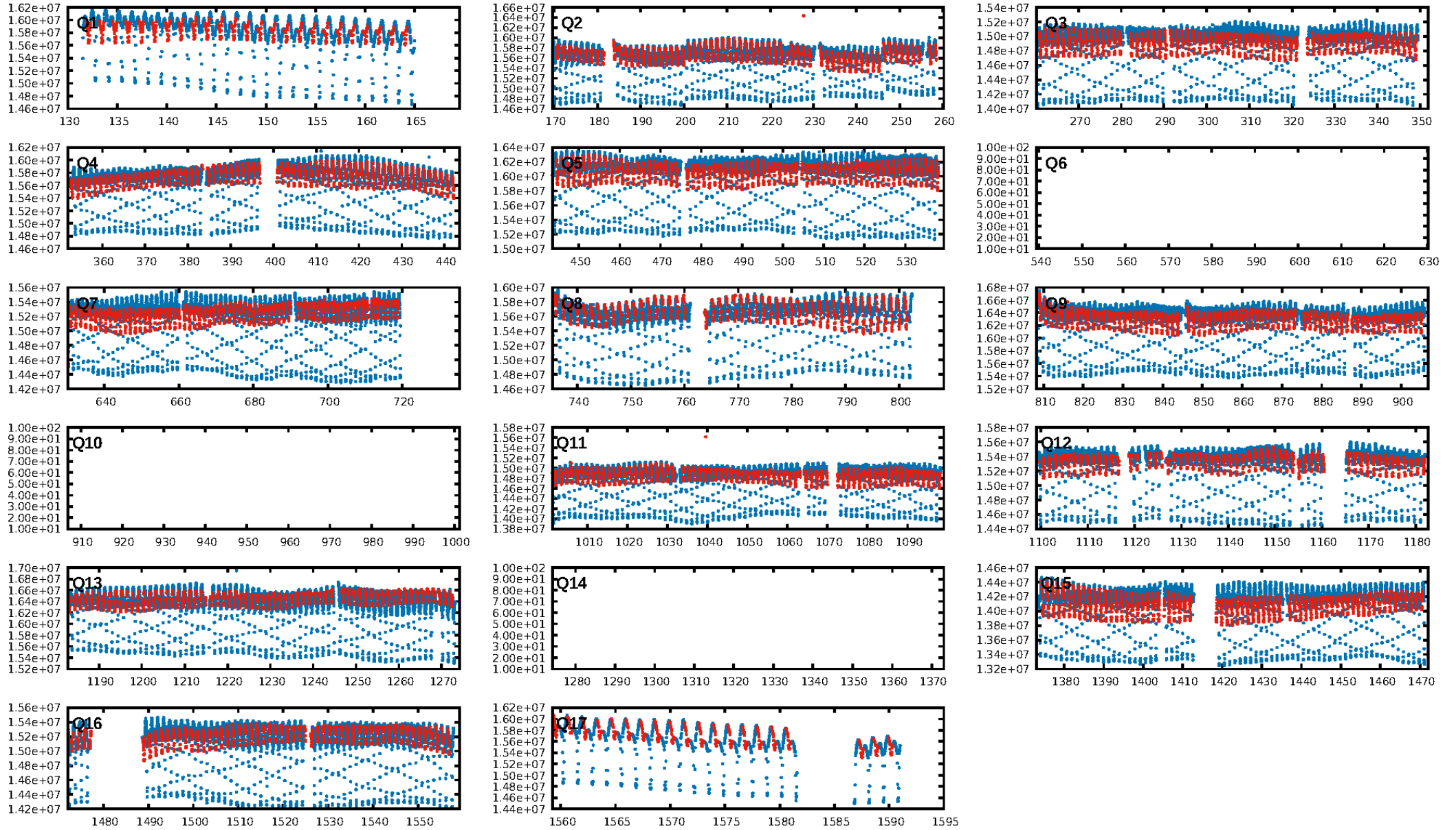
Period = 1.33032 [0.00010] d  
Epoch = 132.0832 [0.0220] BKJD  
Rp/R\* = 0.0043 [0.0293]  
a/R\* = 2.07 [51.72]  
b = 0.03 [1044.71]  
Seff = 1689.16 [630.71]  
Teq = 1635 [153] K  
Rp = 0.43 [2.90] Re  
a = 0.0236 [0.0055] AU  
Ag = 169.80 [2339.01] [0.07σ]  
Teff = 9124 [31412] K [0.24σ]

## DV Diagnostic Results:

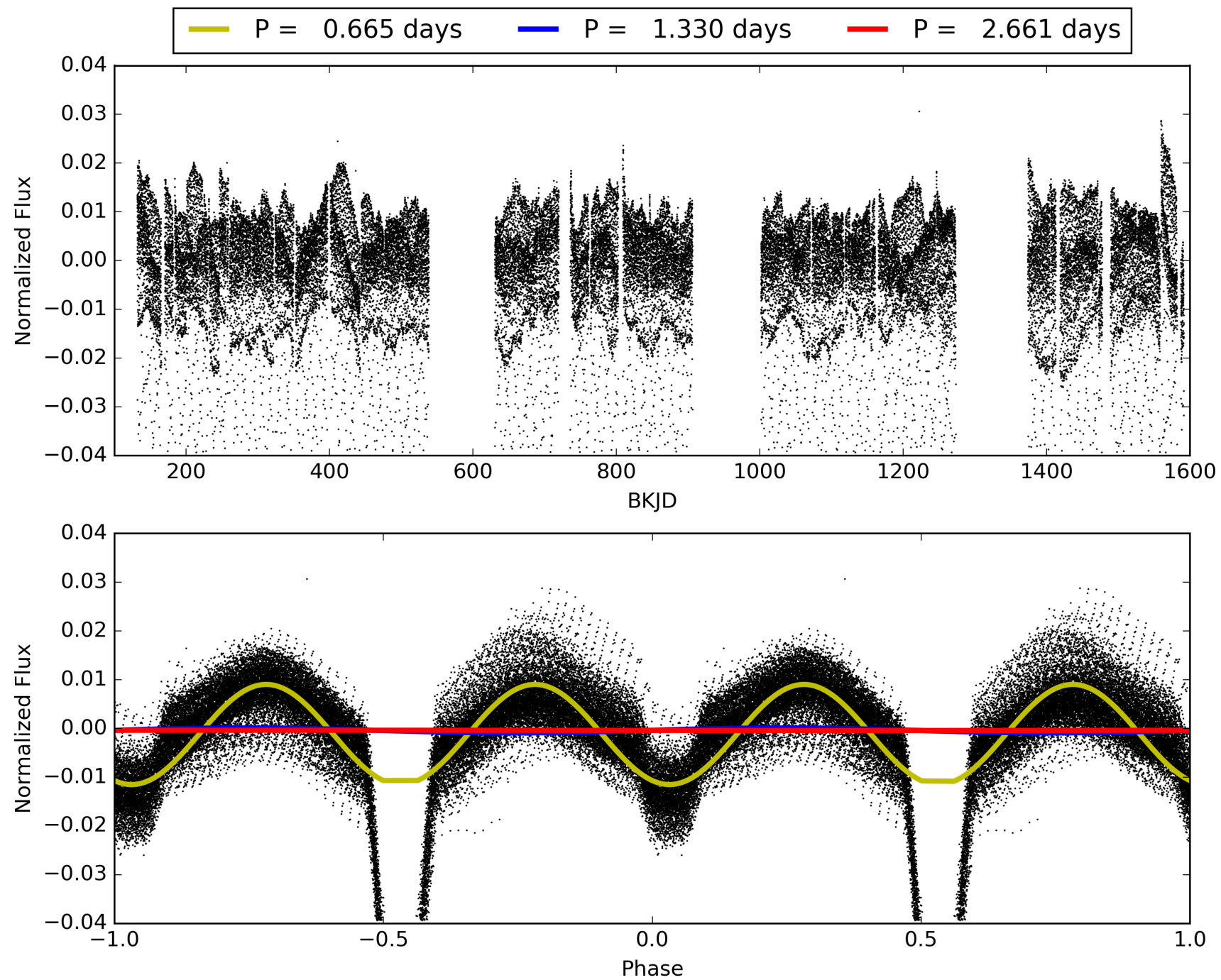
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.06e-32  
RollingBand-fgt: 1.00 [764/765]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 0.0%  
Centroid-so: 18.078 arcsec [2.95σ]  
OotOffset-rm: 0.396 arcsec [4.04σ]  
KicOffset-rm: 0.086 arcsec [1.25σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]



# TCE 005716244-02, PDC Light Curves

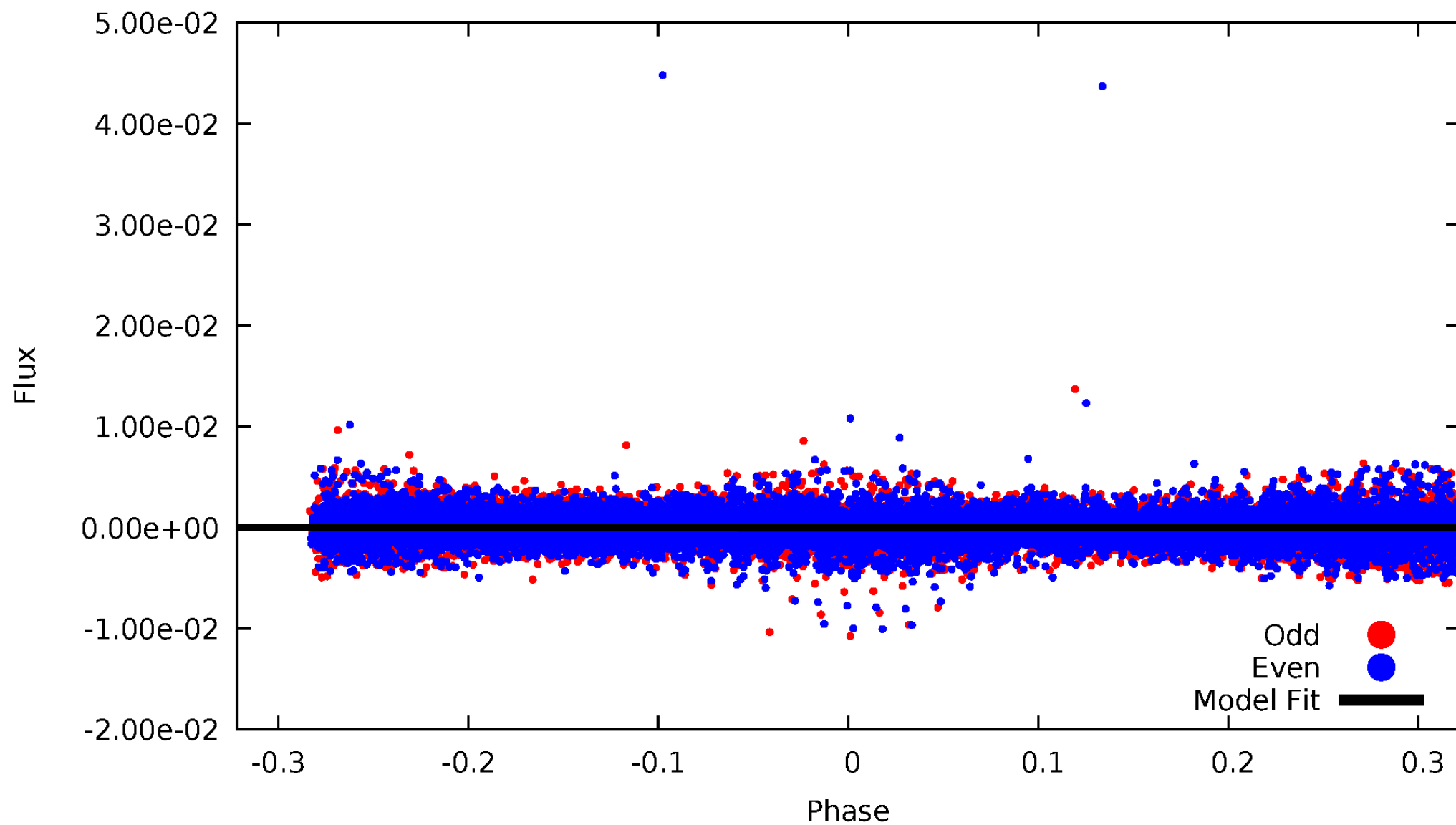


TCE 005716244-02



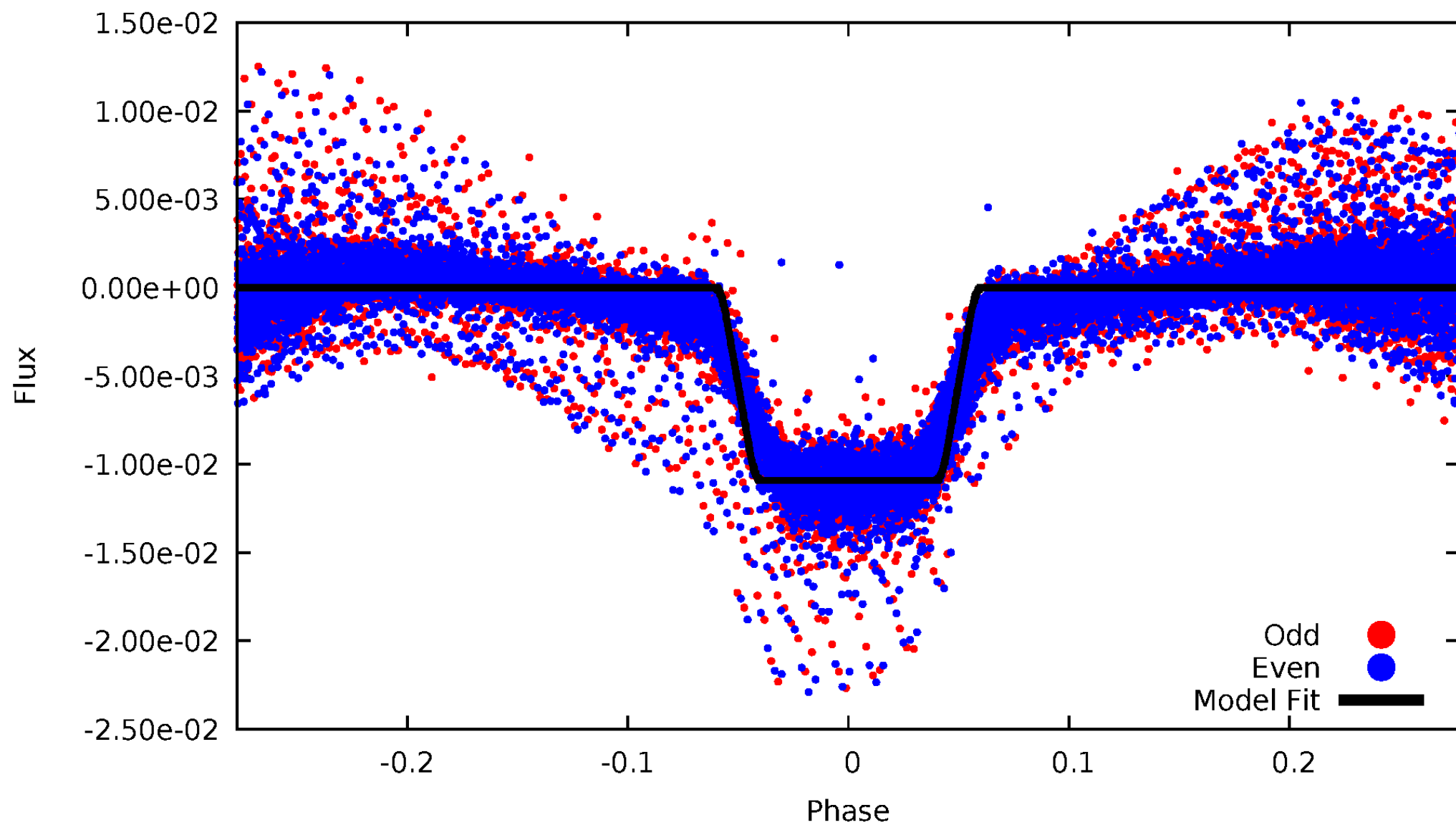
# DV Odd/Even

TCE 005716244-02



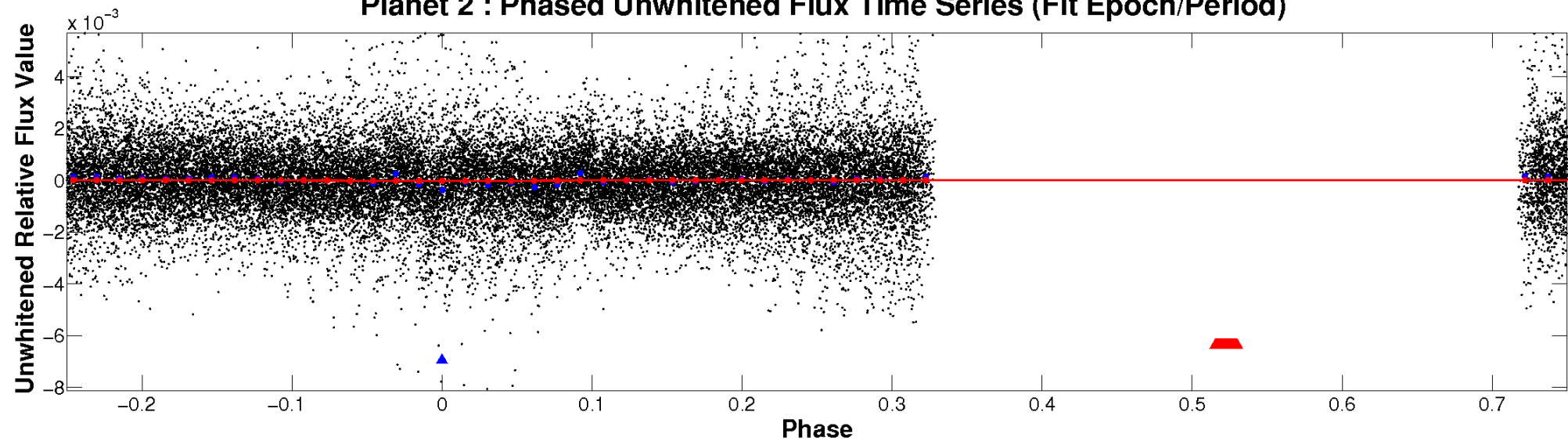
# ALT Odd/Even

TCE 005716244-02

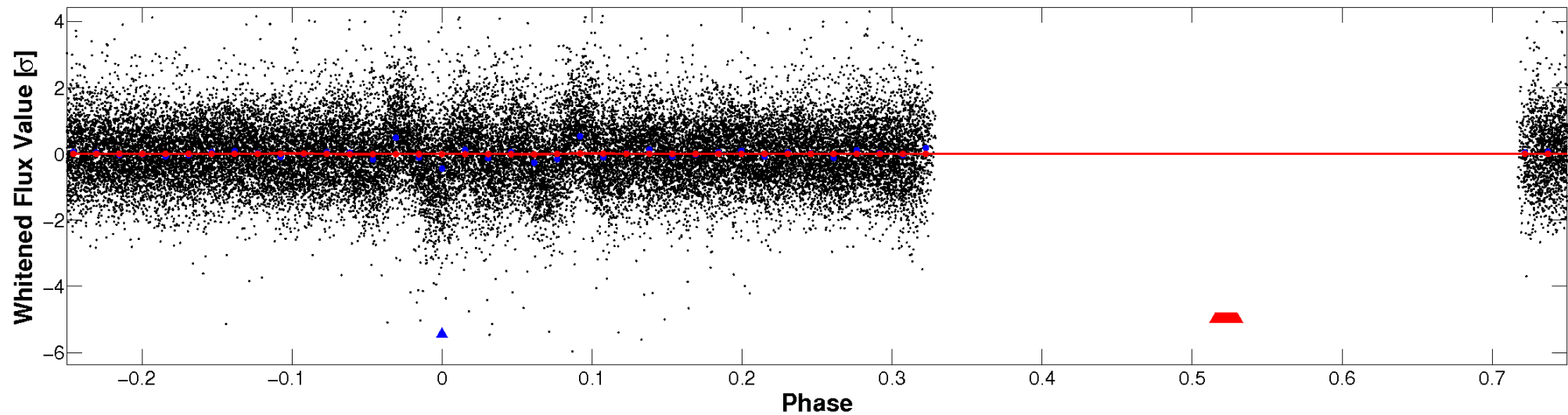


# Non-Whitened Vs. Whitened Light Curve

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

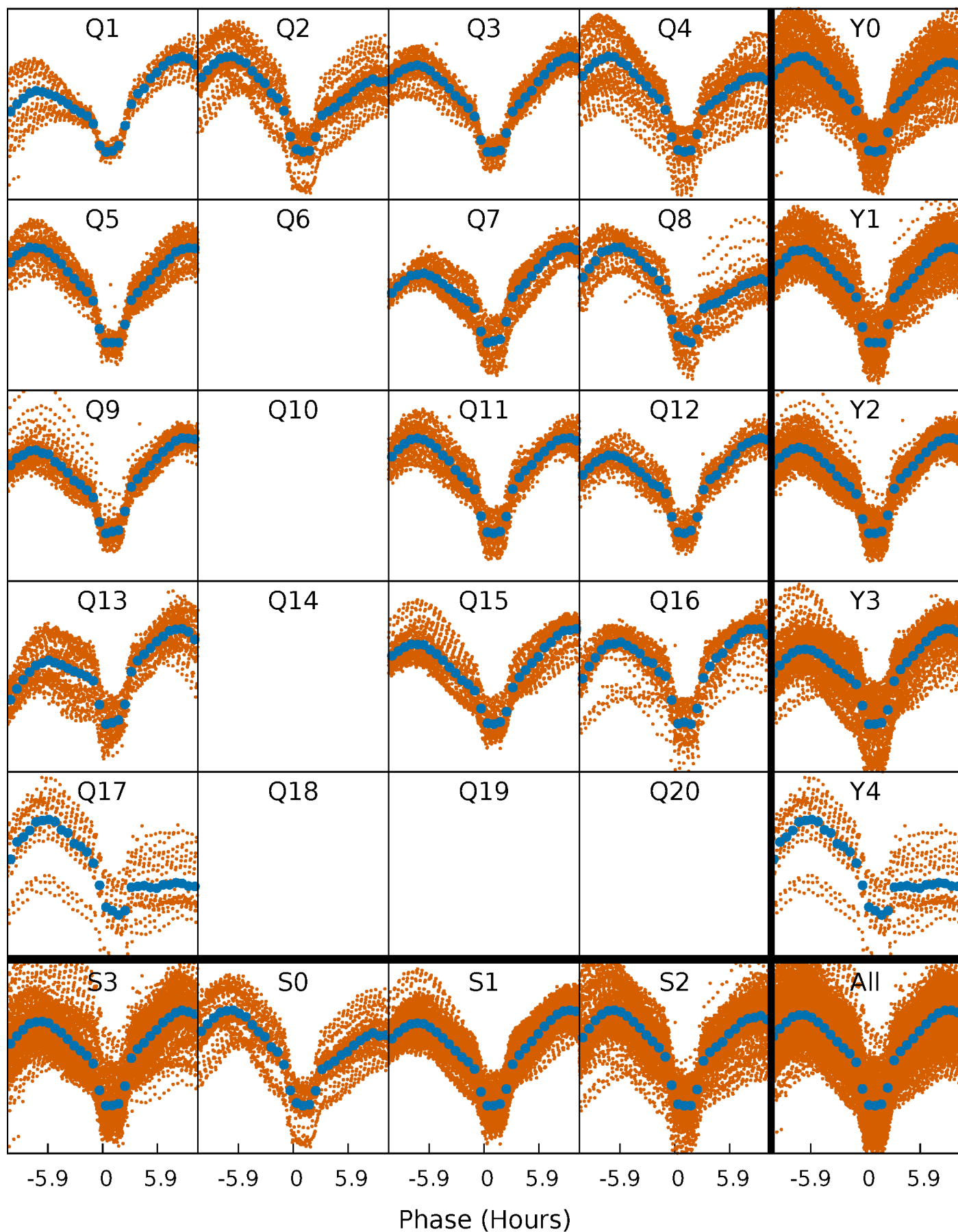


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

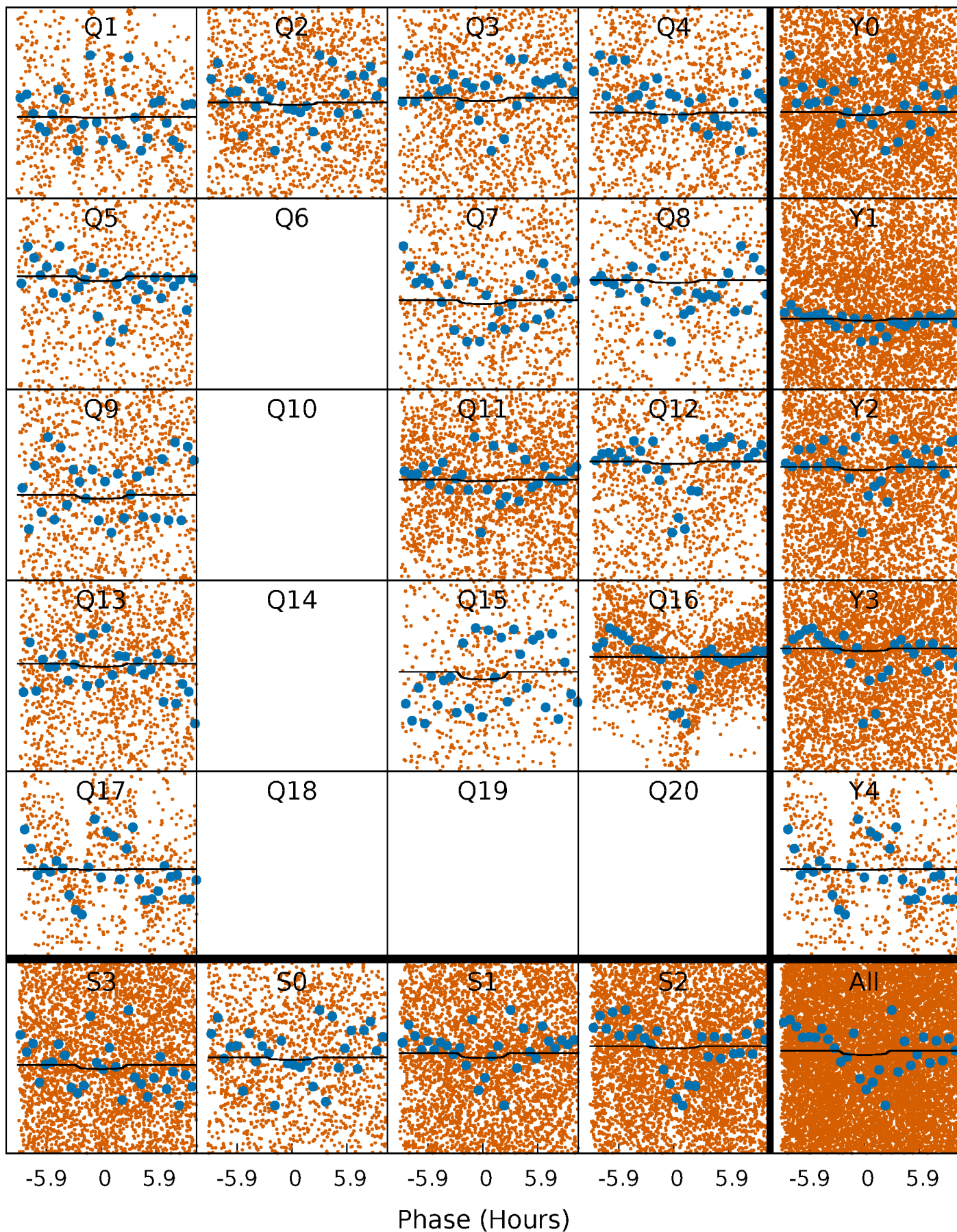
TCE 005716244-02   P= 1.330322 Days    $T_0=132.083238$  (BKJD)





# DV Quarter-Phased Transit Curves

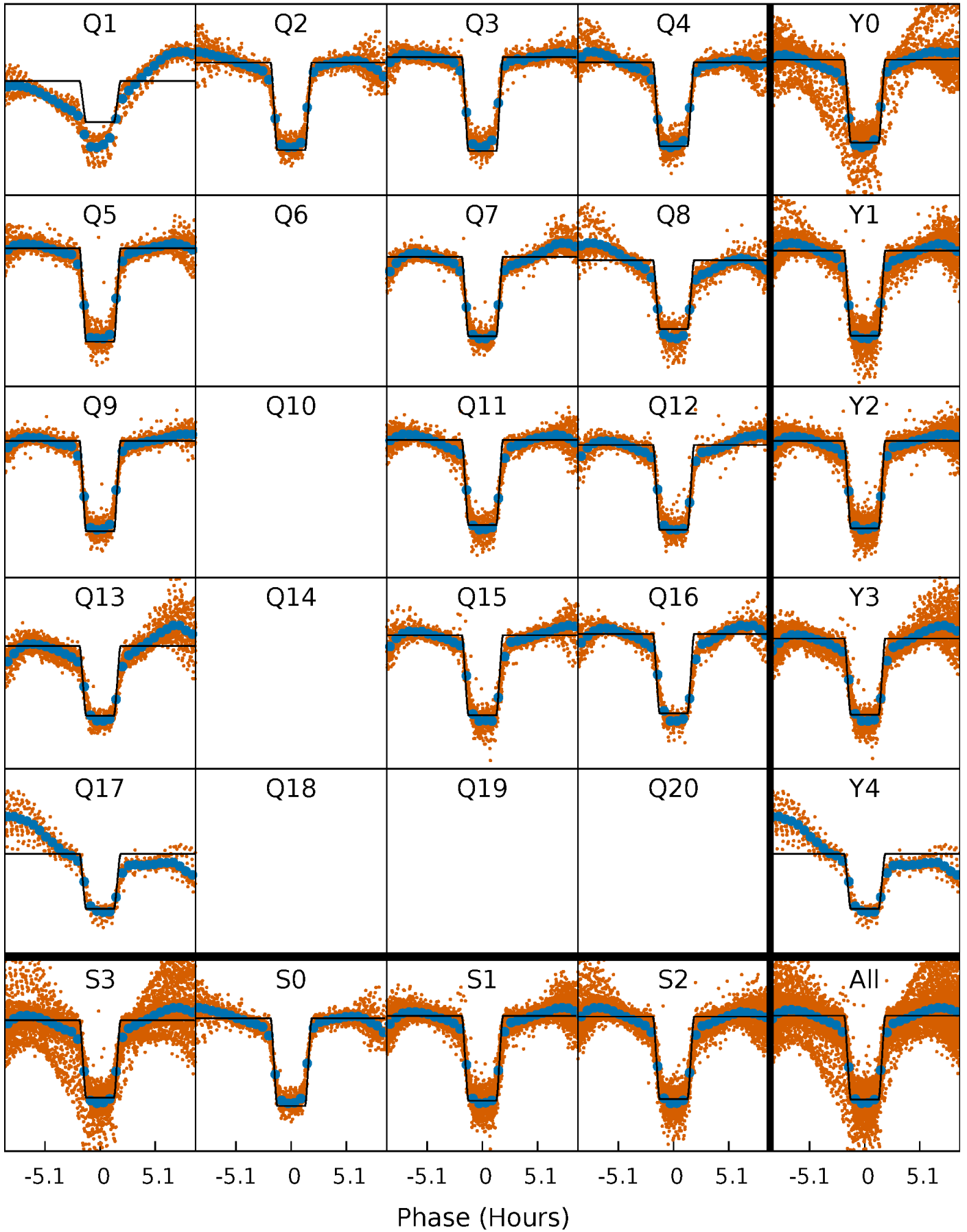
TCE 005716244-02   P= 1.330322 Days    $T_0=132.083238$  (BKJD)





## Alt. Detrend Quarter-Phased Transit Curves

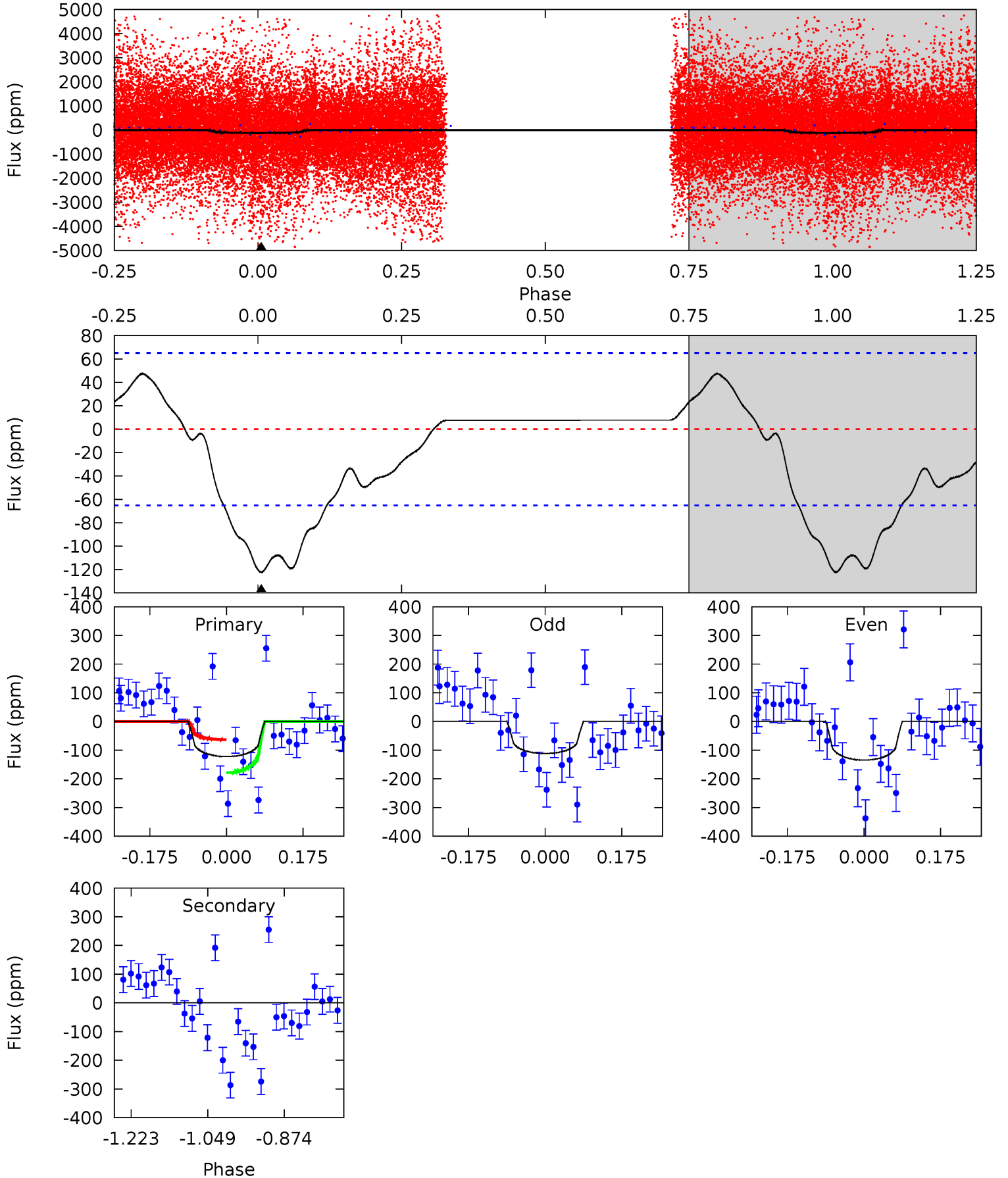
TCE 005716244-02   P= 1.330322 Days    $T_0=132.124641$  (BKJD)



# DV Model-Shift Uniqueness Test

005716244-02, P = 1.330322 Days, E = 130.752916 Days

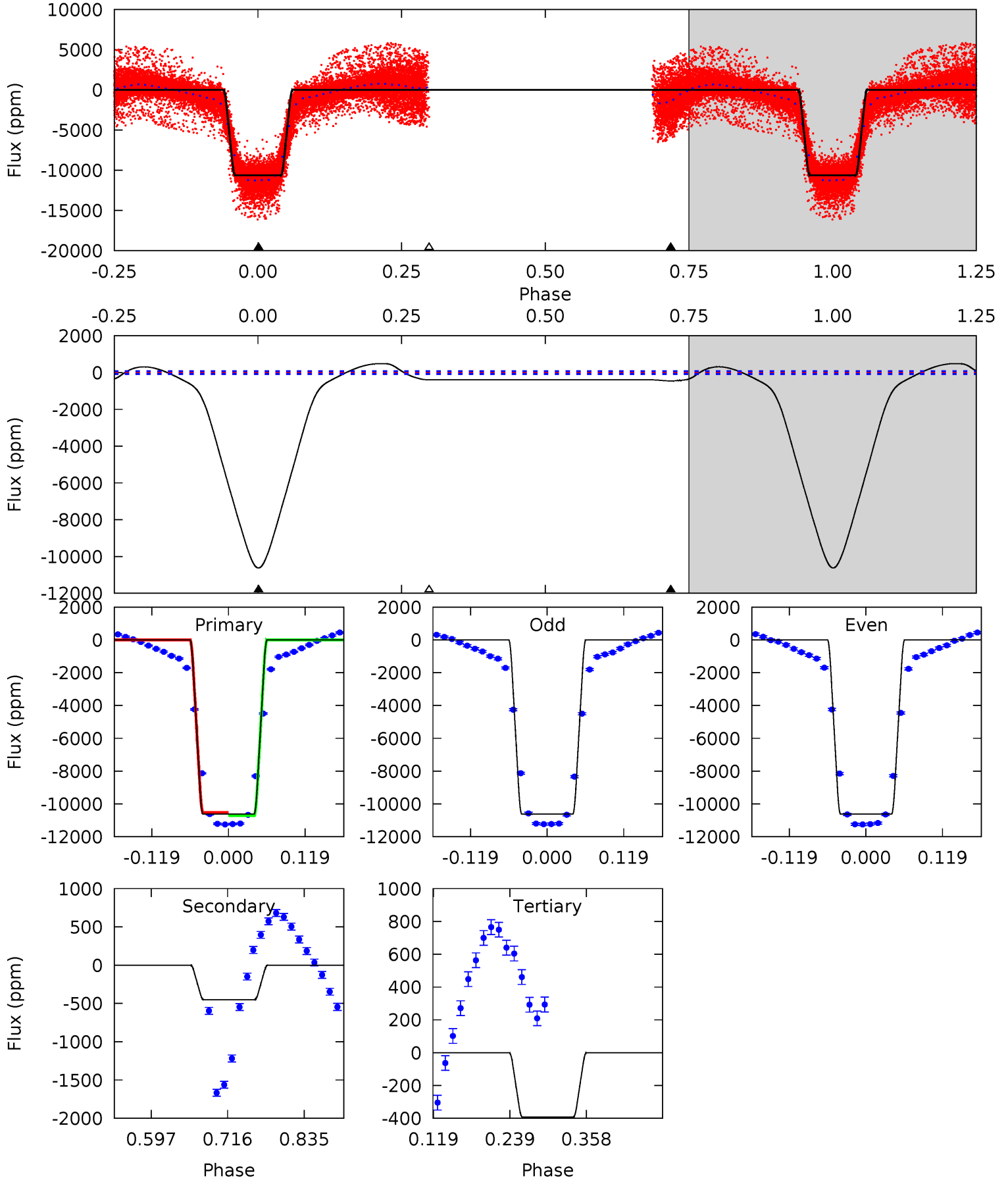
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.35	0	0	0	4.45	1.36	2.21	8.35	8.35	0	0	0.80	2.94	0.28	4.07



# Alt Model-Shift Uniqueness Test

005716244-02, P = 1.330322 Days, E = 130.794319 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
611.6	26.0	22.6	0	4.53	1.56	19.0	589.0	611.6	3.39	26.0	0.16	1.02	0.04	7.45



### Stellar Parameters For KIC 005716244

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5984^{+167}_{-209}$	$4.521^{+0.048}_{-0.192}$	$-0.200^{+0.300}_{-0.300}$	$0.906^{+0.247}_{-0.088}$	$0.993^{+0.118}_{-0.131}$	$1.883^{+0.465}_{-0.906}$
	+3%/-3%	+1%/-4%	+150%/-150%	+27%/-10%	+12%/-13%	+25%/-48%
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 005716244-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 15$	$2.34^{+2.25}_{-1.68}$	$2321^{+144}_{-105}$	$-2707^{+5982}_{-702}$	$0.008^{+1.467}_{-1.187}$
Alt.	$-451 \pm 17$	$10.74^{+3.41}_{-3.11}$	$2314^{+157}_{-97}$	$3127^{+407}_{-334}$	$1.179^{+1.161}_{-0.488}$

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

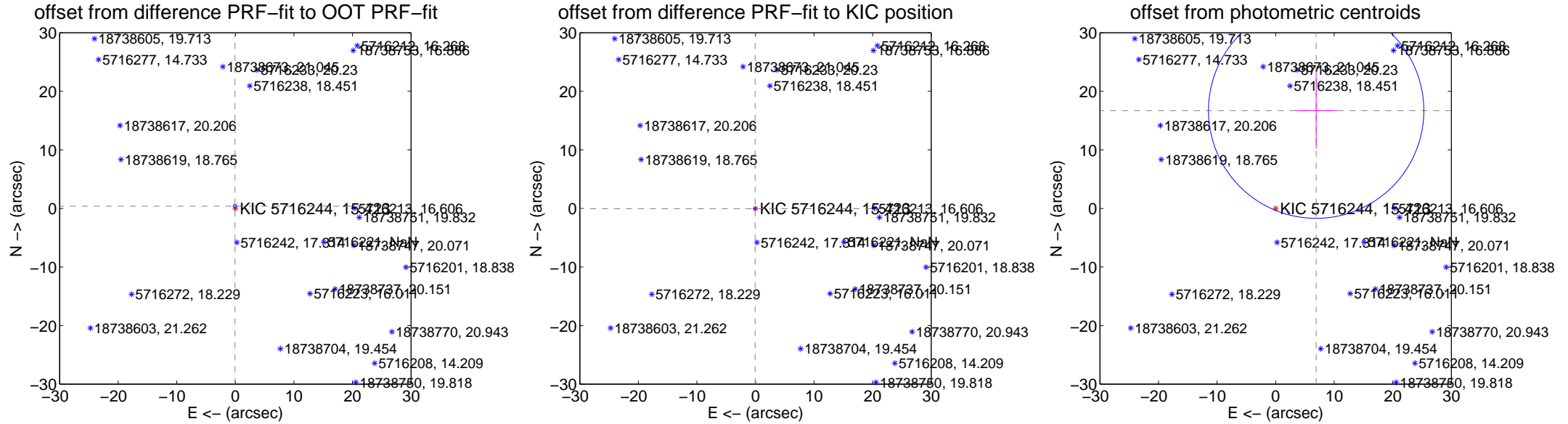
## DV Centroid Data

Supplemental centroid analysis for 005716244-02. Kepler magnitude: 15.42. Transit SNR 1.06

There are 14 quarters with good PRF difference image offsets

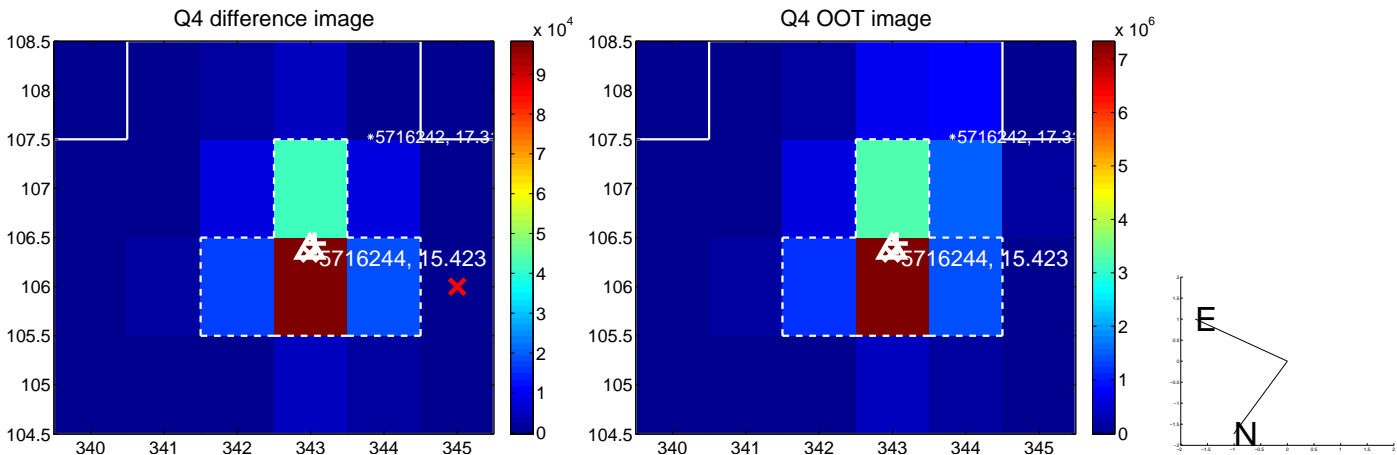
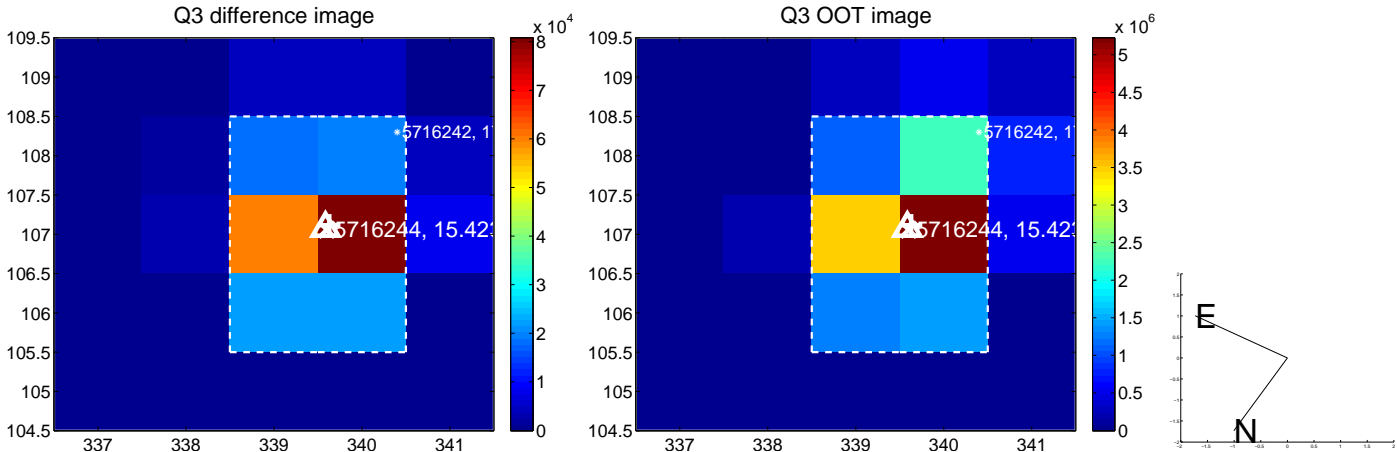
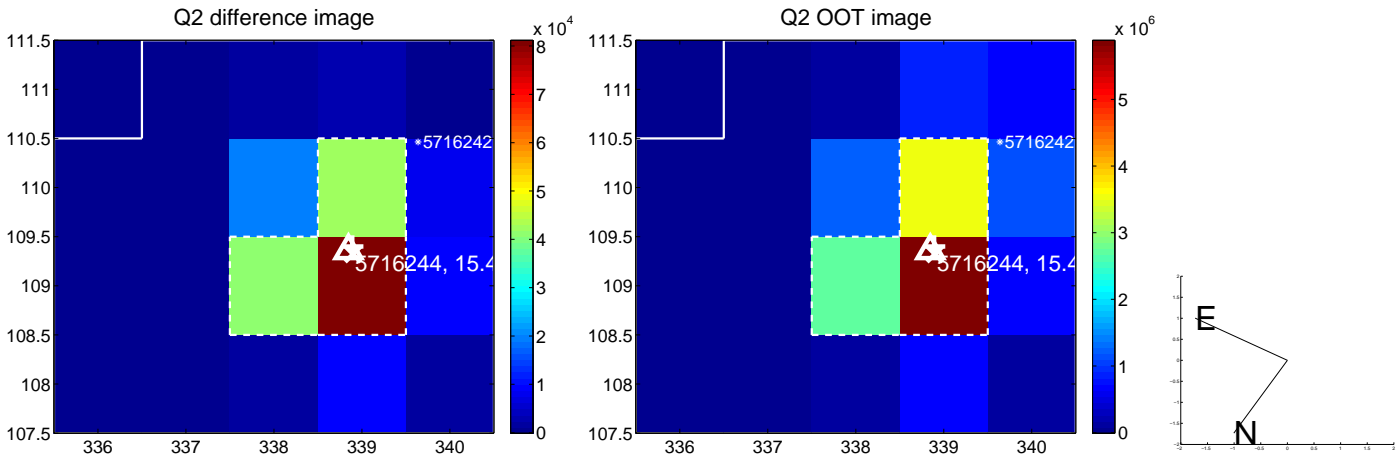
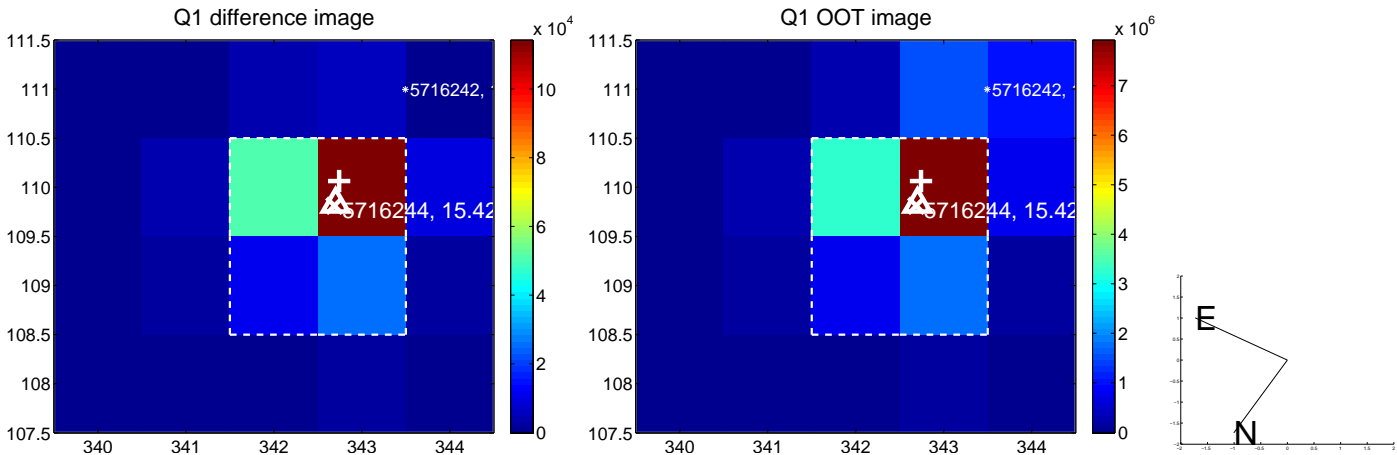
The direct PRF centroid is offset from the target star catalog position by about 1.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.396 <math>\pm</math> 0.098</b>	<b>4.04</b>	0.071 $\pm$ 0.068	0.389 $\pm$ 0.099
PRF-fit source offset from KIC position	0.086 $\pm$ 0.069	1.25	0.070 $\pm$ 0.069	-0.051 $\pm$ 0.068
photometric centroid source offset	18.08 $\pm$ 6.13	2.95	-6.92 $\pm$ 3.60	16.70 $\pm$ 6.46

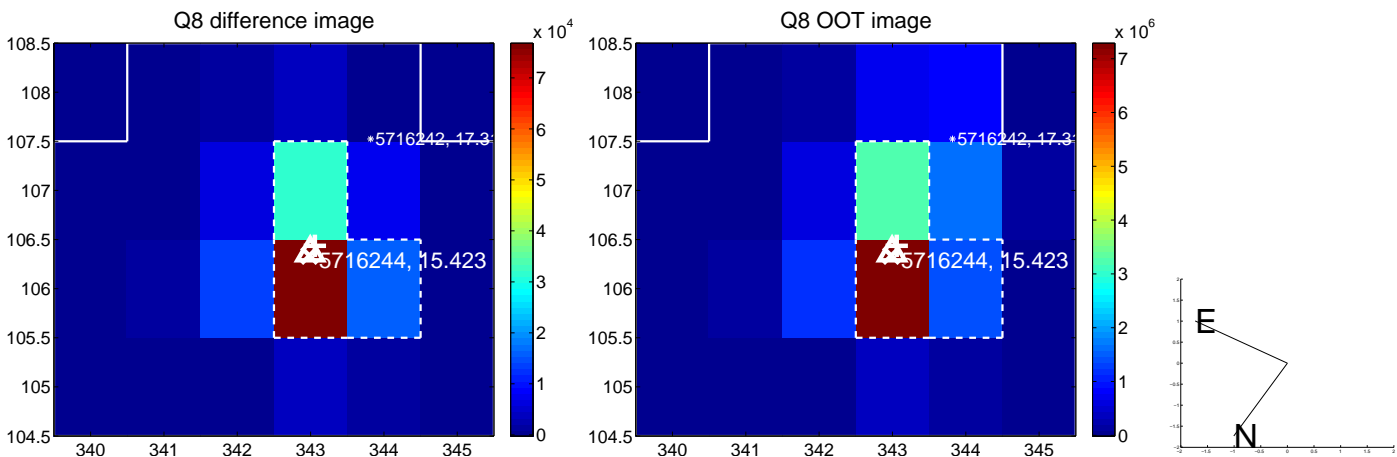
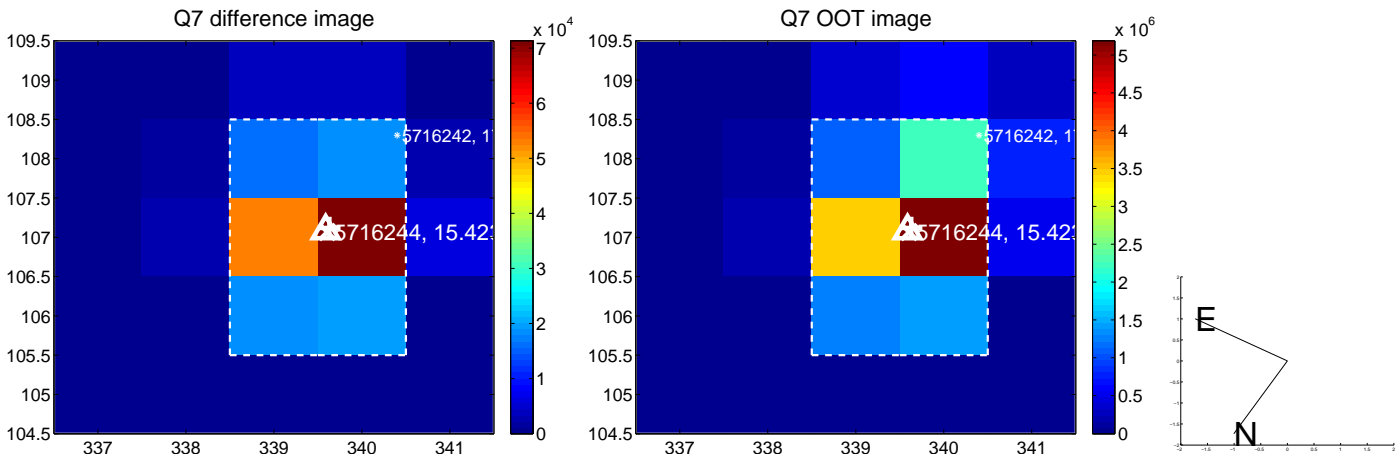
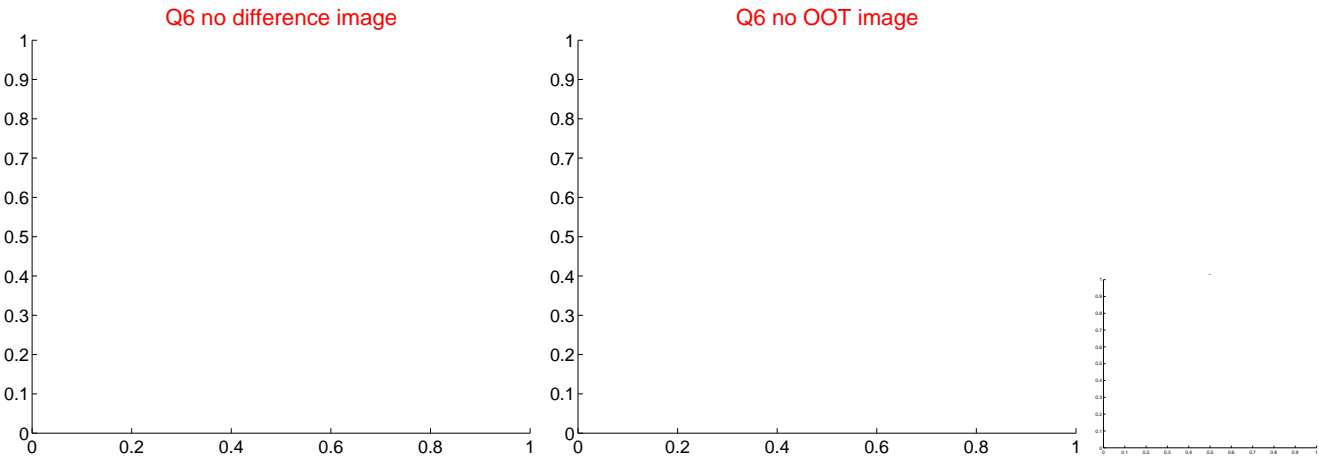
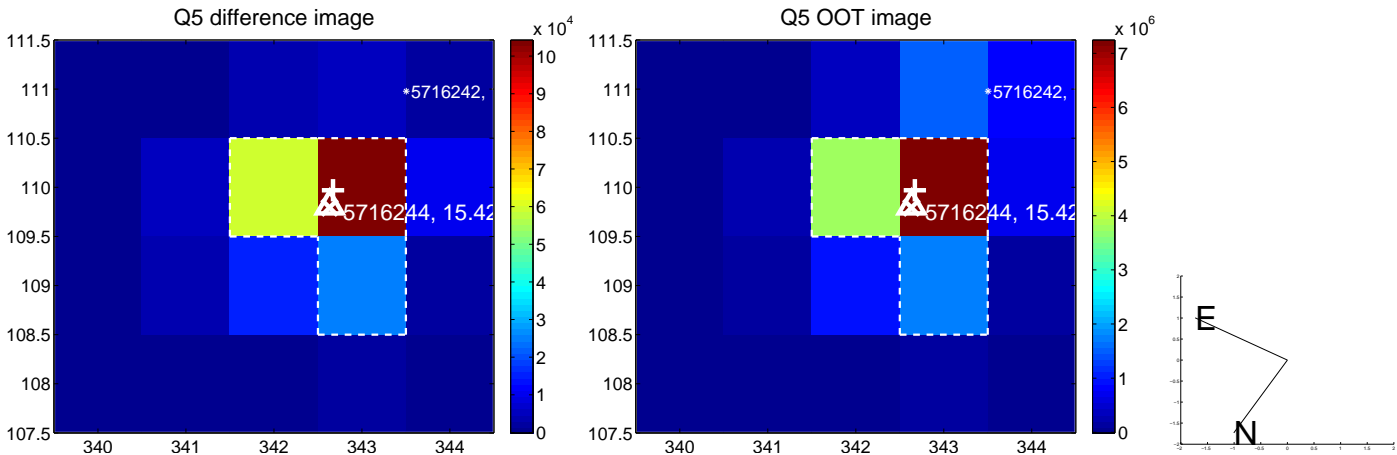


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

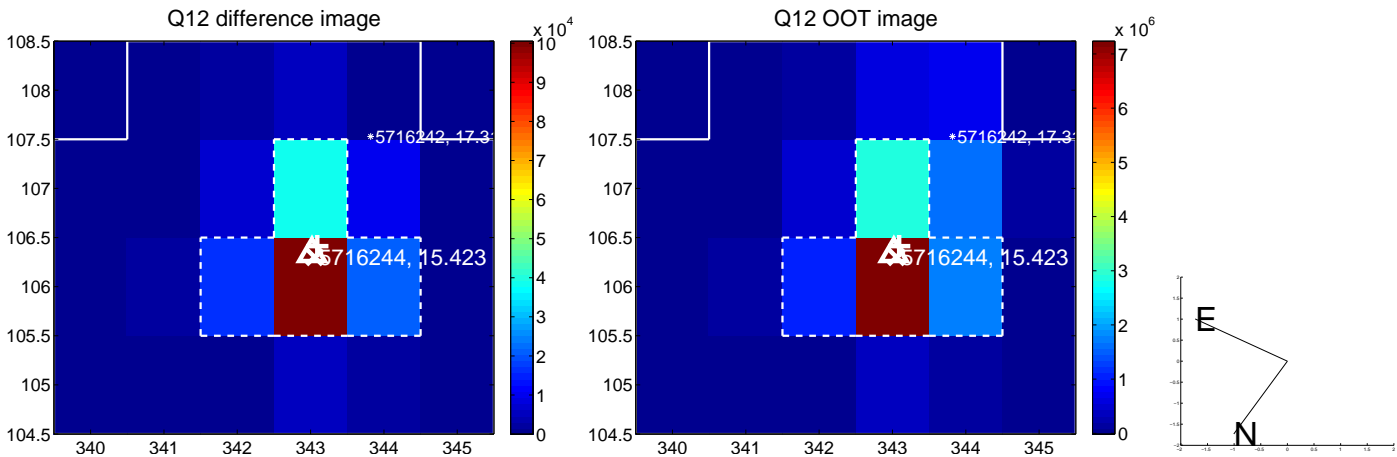
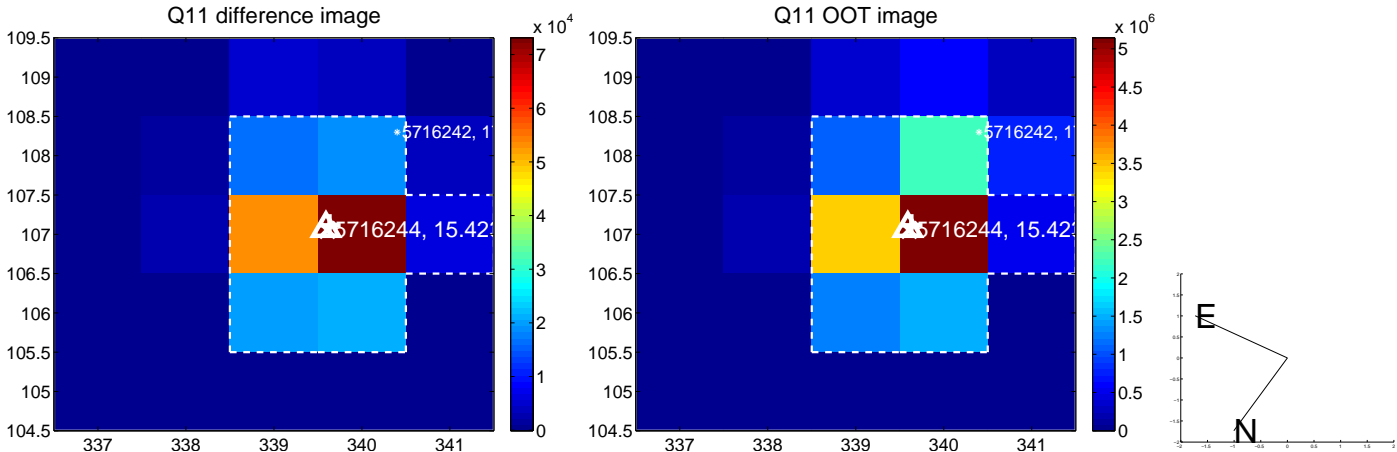
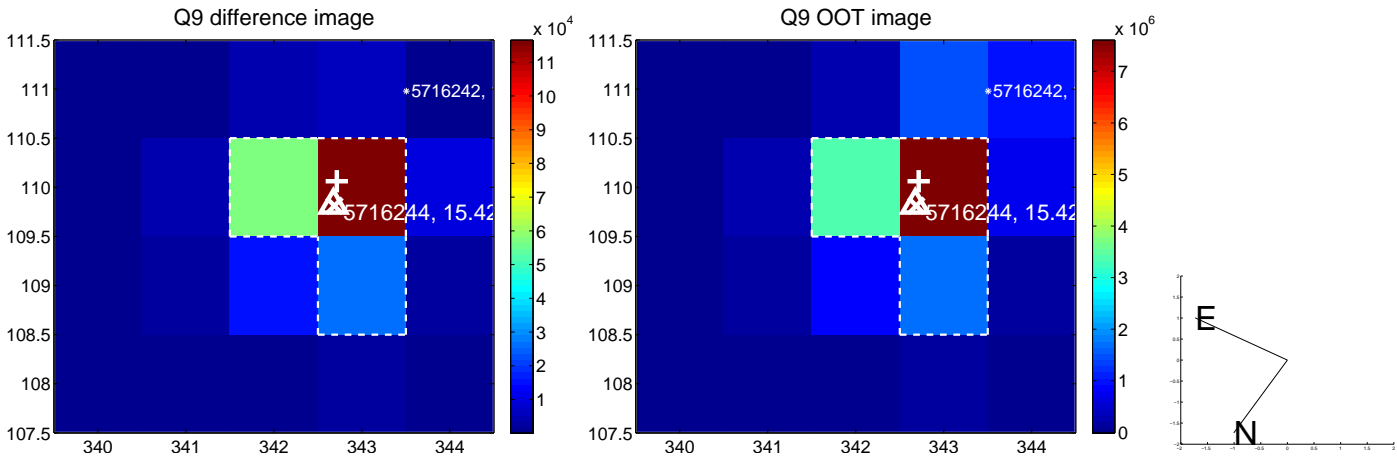


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

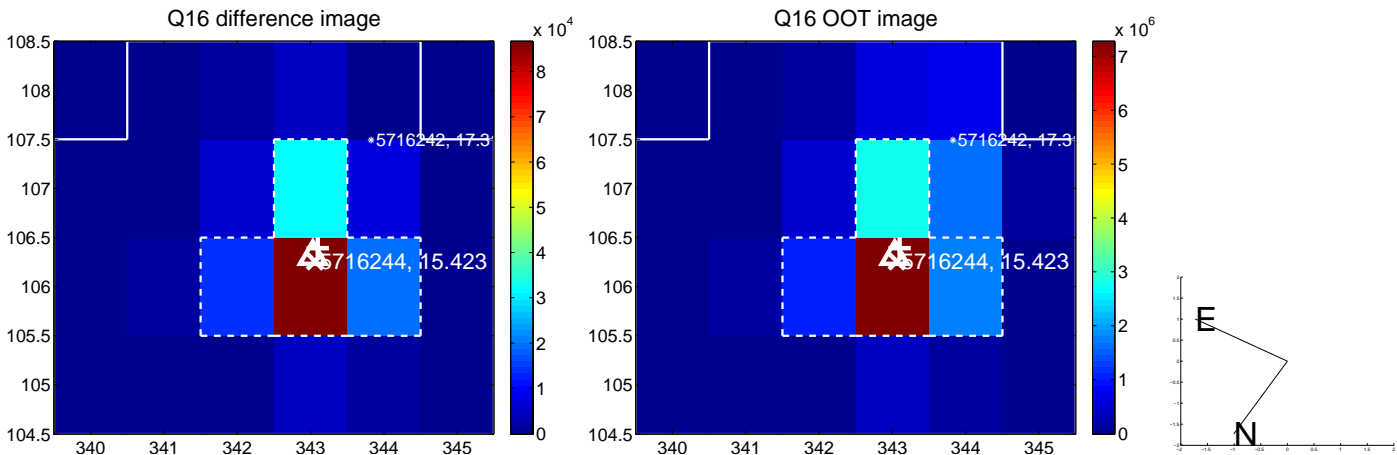
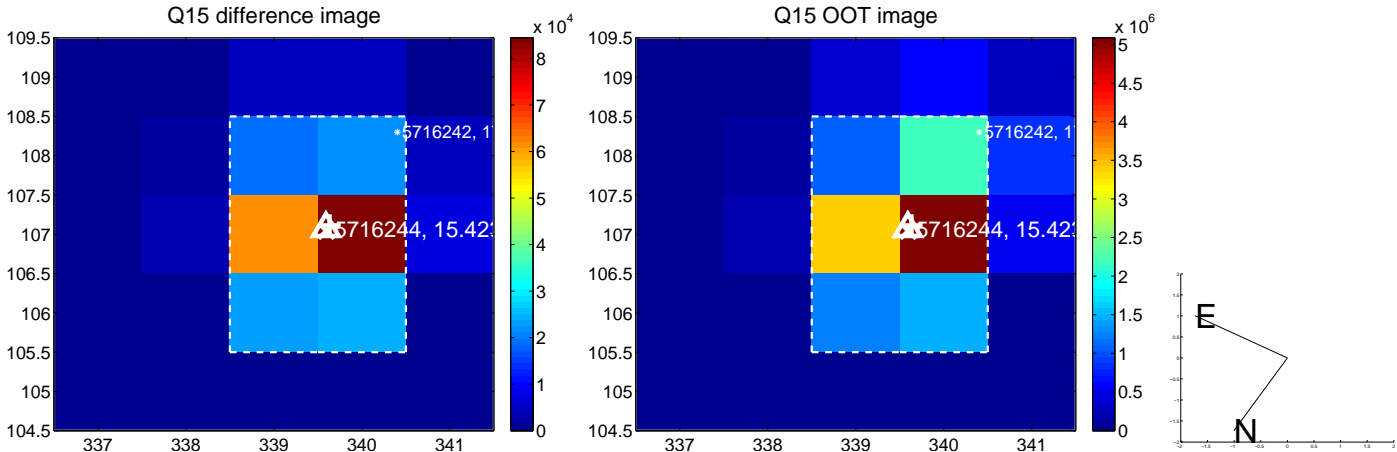
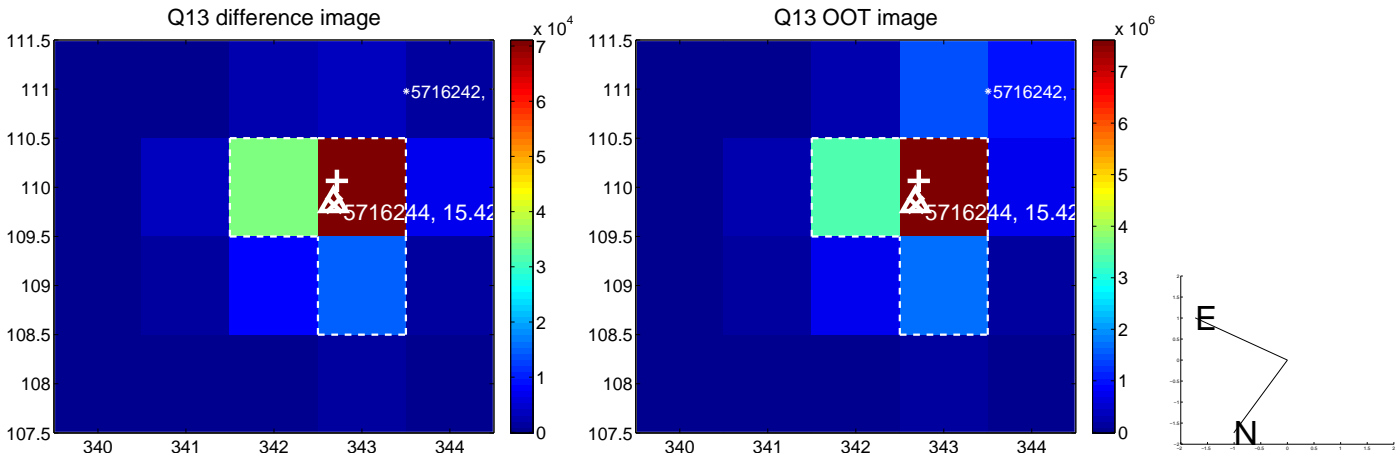




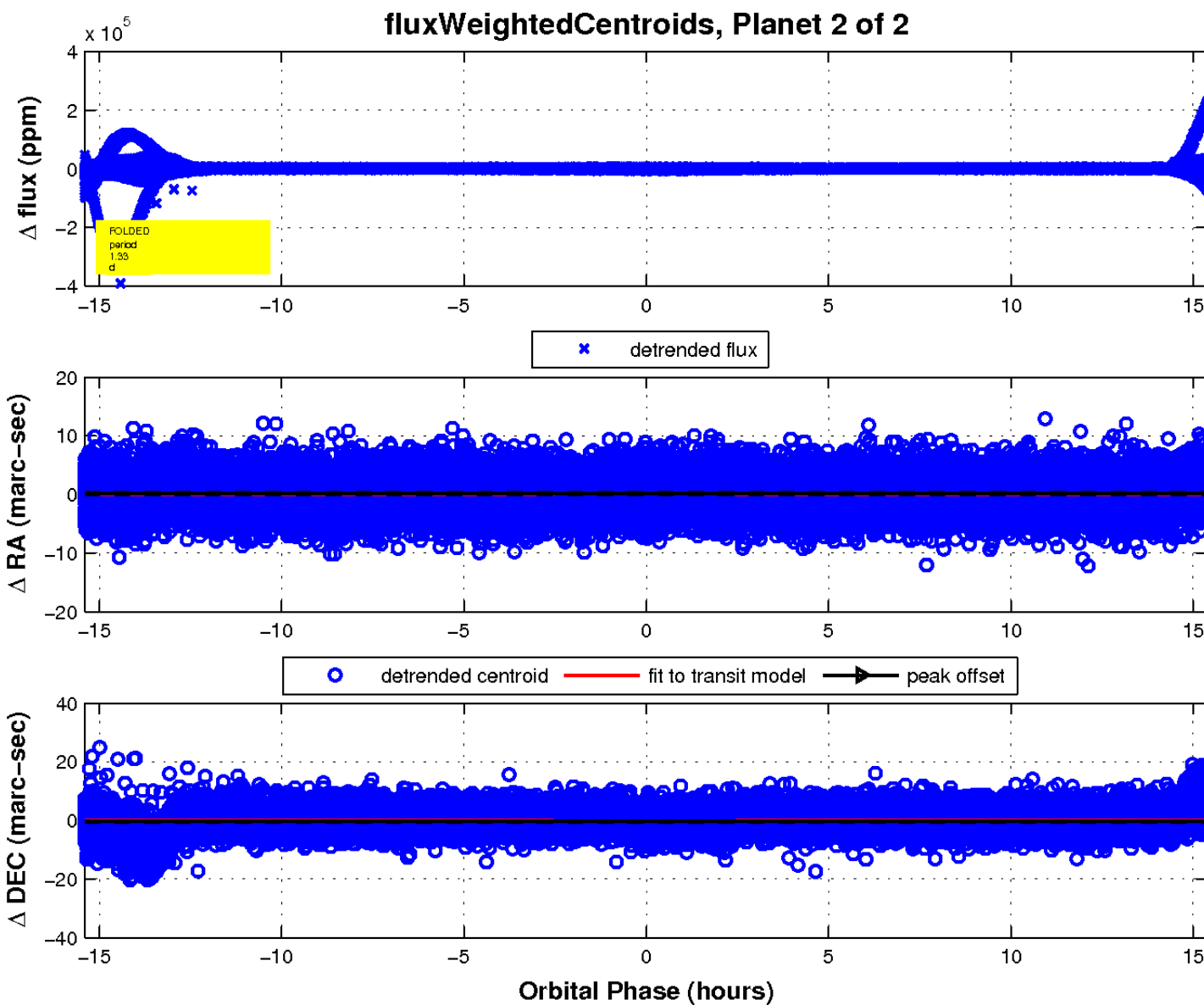
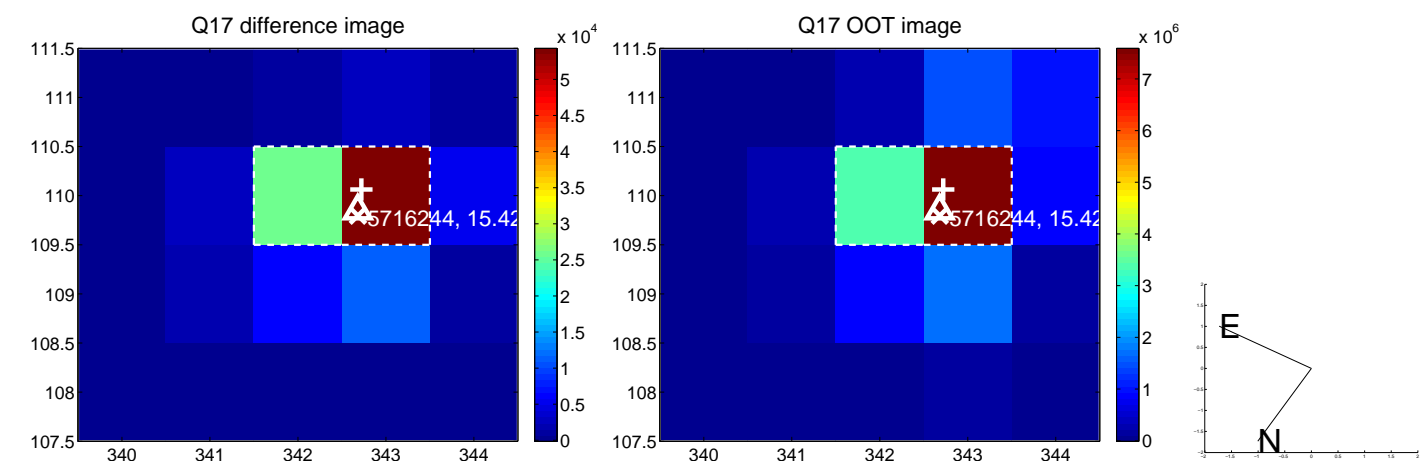
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

