

# KIC 007765374

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007765374-01	OBS	No	4.408214	133.100359	33.5	15.578	10.1	7.8	1.43	6761	0.94	1110.55
007765374-02	OBS	No	4.408089	134.176273	18.1	32.224	11.4	3.6	1.43	6761	0.61	1110.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007765374-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
007765374-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

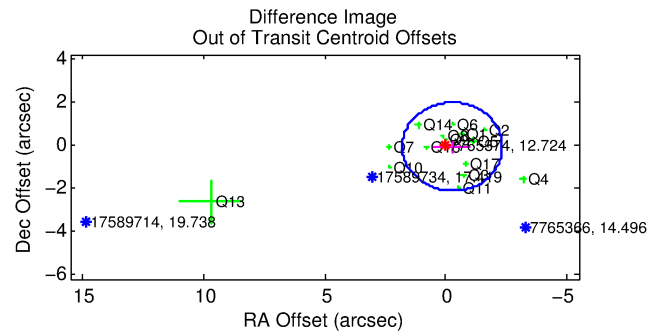
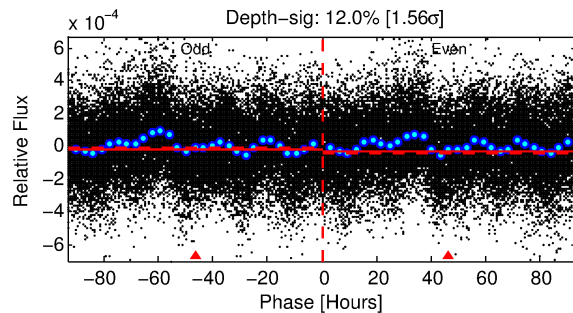
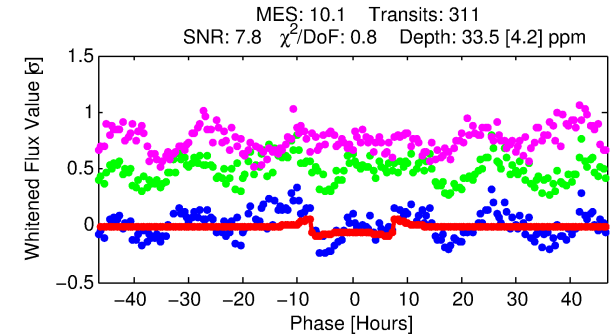
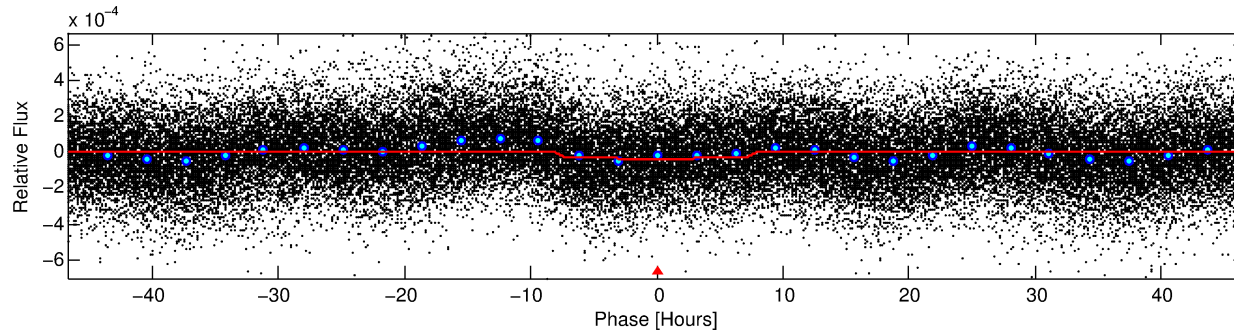
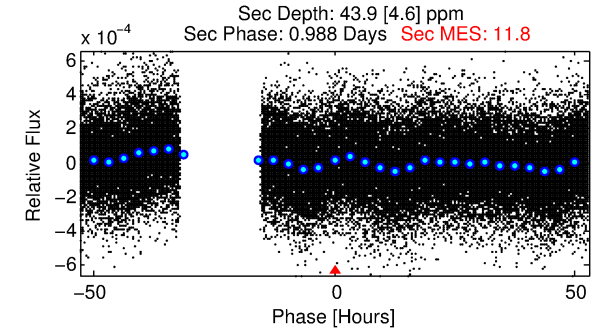
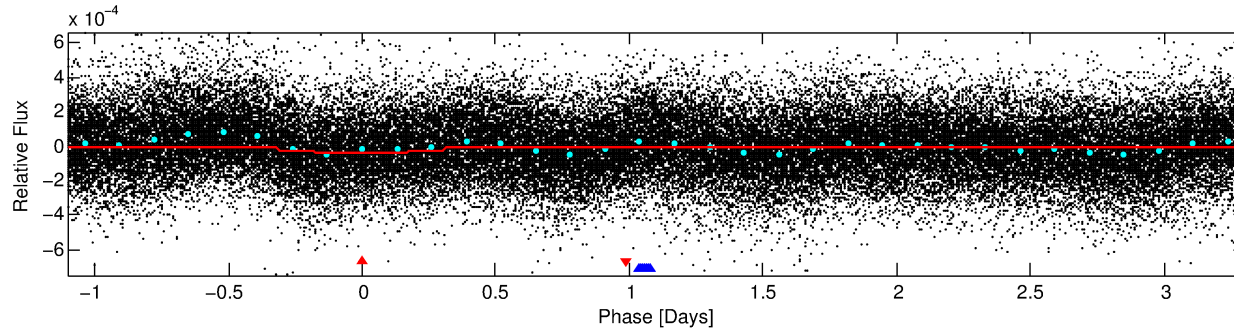
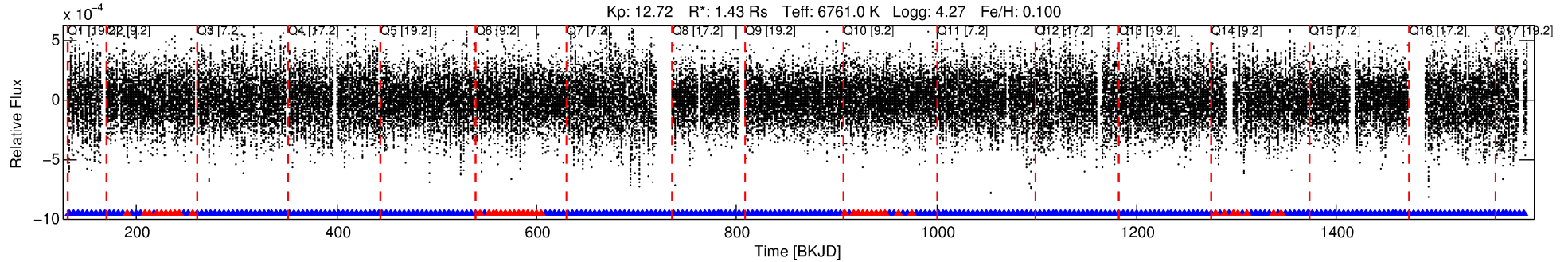
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007765374-01

No Significant Match Found

# DV One-Page Summary

KIC: 7765374 Candidate: 1 of 2 Period: 4.408 d



## DV Fit Results:

Period = 4.40821 [0.00005] d  
Epoch = 133.1004 [0.0070] BKJD  
Rp/R\* = 0.0060 [0.0008]  
a/R\* = 1.45 [0.45]  
b = 0.86 [0.18]  
Seff = 1110.55 [476.41]  
Teq = 1472 [158] K  
Rp = 0.94 [0.34] Re  
a = 0.0586 [0.0166] AU  
Ag = 94.03 [45.74] [2.03σ]  
**Teffp = 7087 [543] K [9.93σ]**

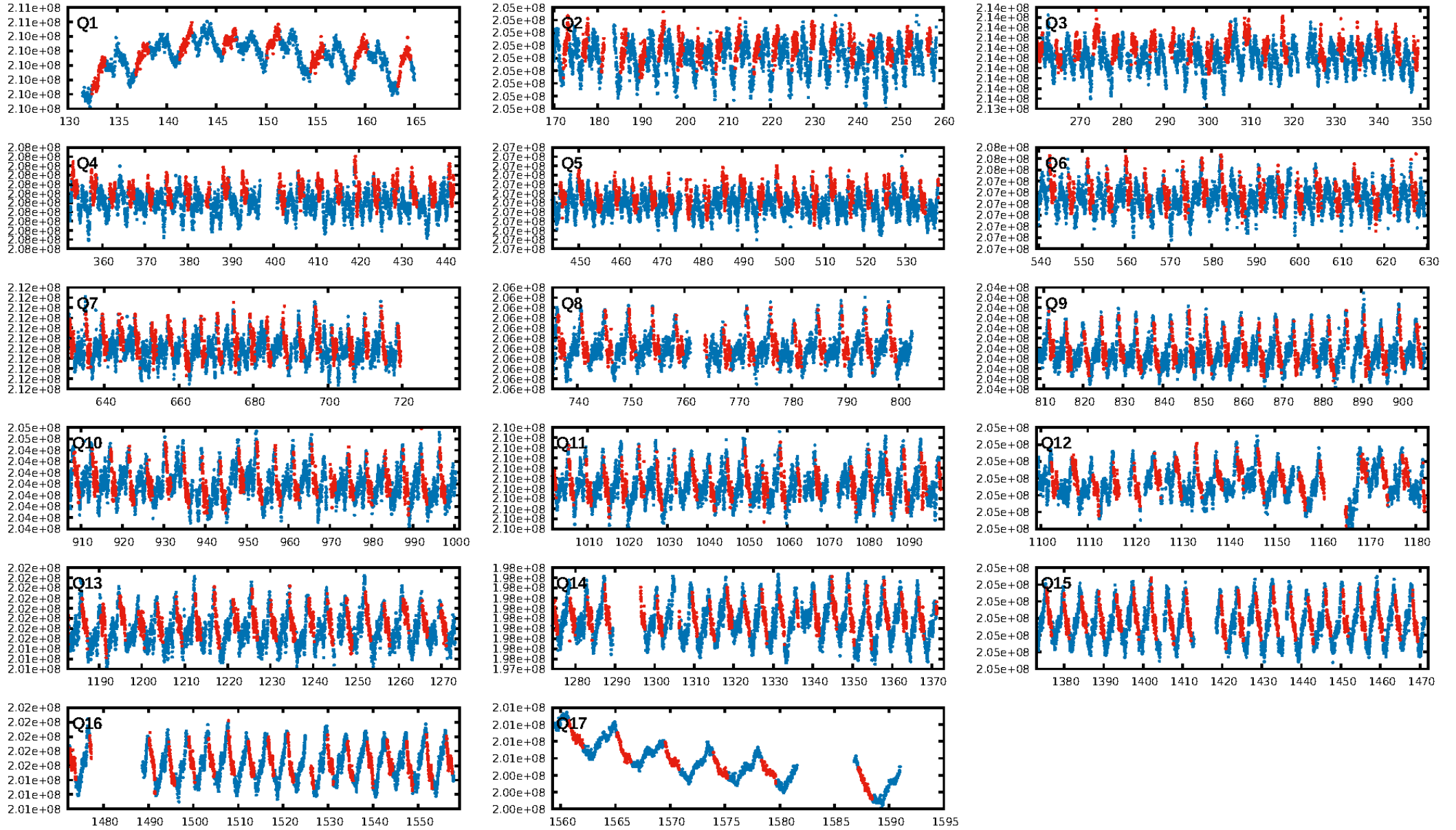
## DV Diagnostic Results:

**ShortPeriod-sig: 0.0% [0.00σ]**  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.86 [255/297]  
**GhostDiagnostic-chr: 0.8717**  
**Centroid-sig: 0.0%**  
**Centroid-so: 3.845 arcsec [3.28σ]**  
OotOffset-rm: 0.271 arcsec [0.39σ]  
OotOffset-st: 4/3/3/5 [15]  
KicOffset-rm: 0.587 arcsec [1.29σ]  
KicOffset-st: 4/3/3/5 [15]  
DiffImageQuality-fgm: 0.73 [11/15]  
DiffImageOverlap-fno: 0.00 [0/17]

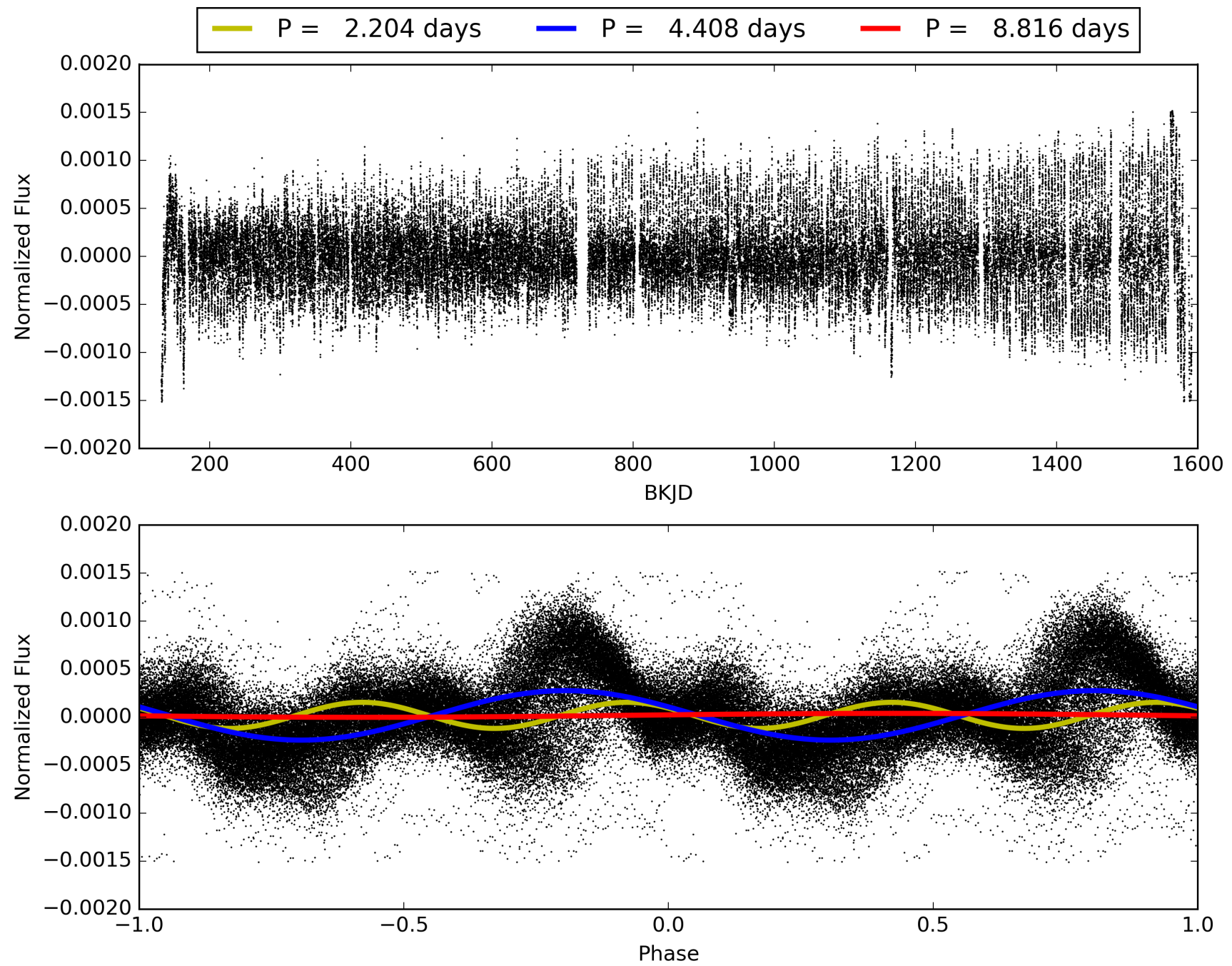
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:27:15 Z

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

# TCE 007765374-01, PDC Light Curves



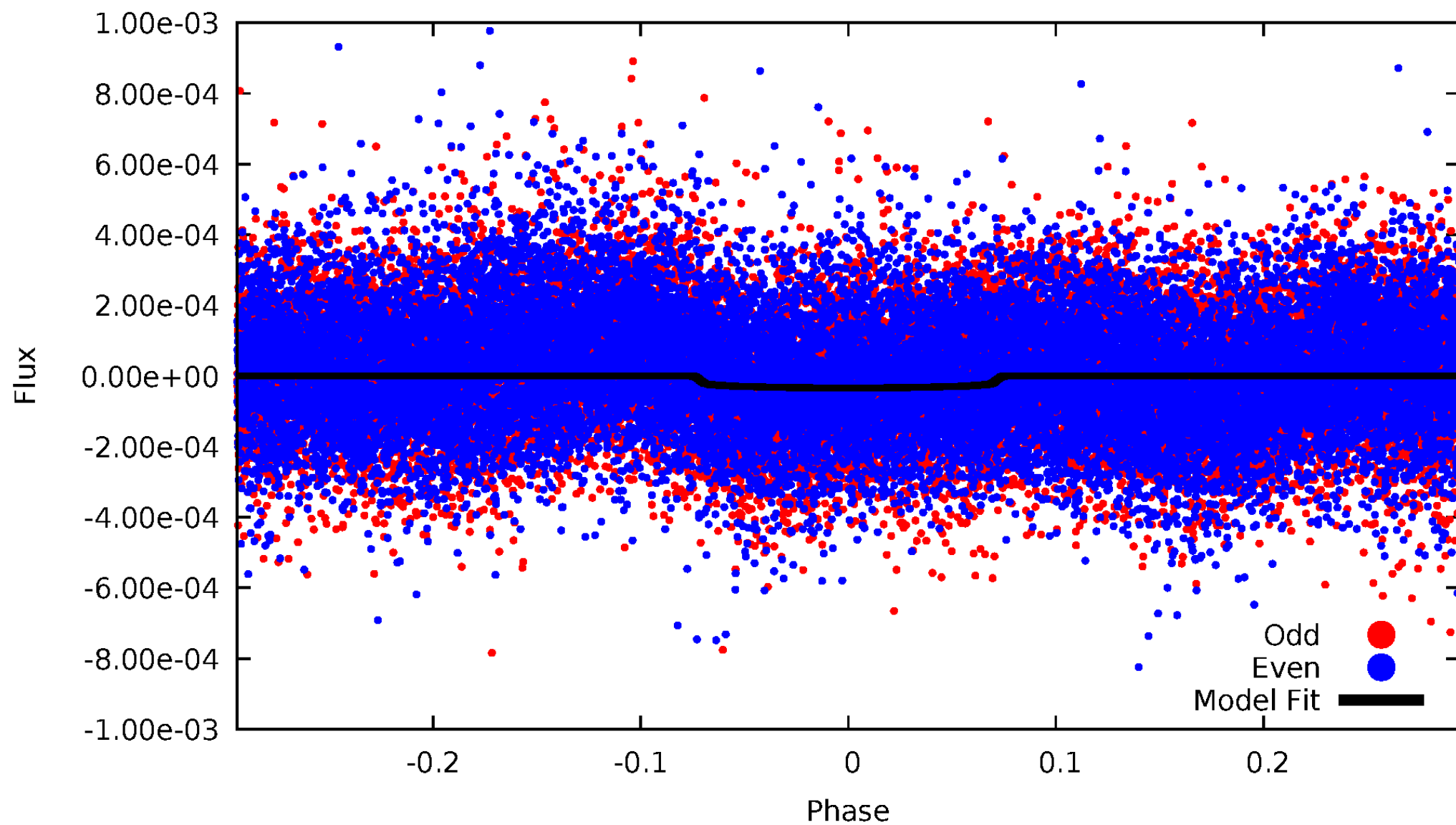
TCE 007765374-01





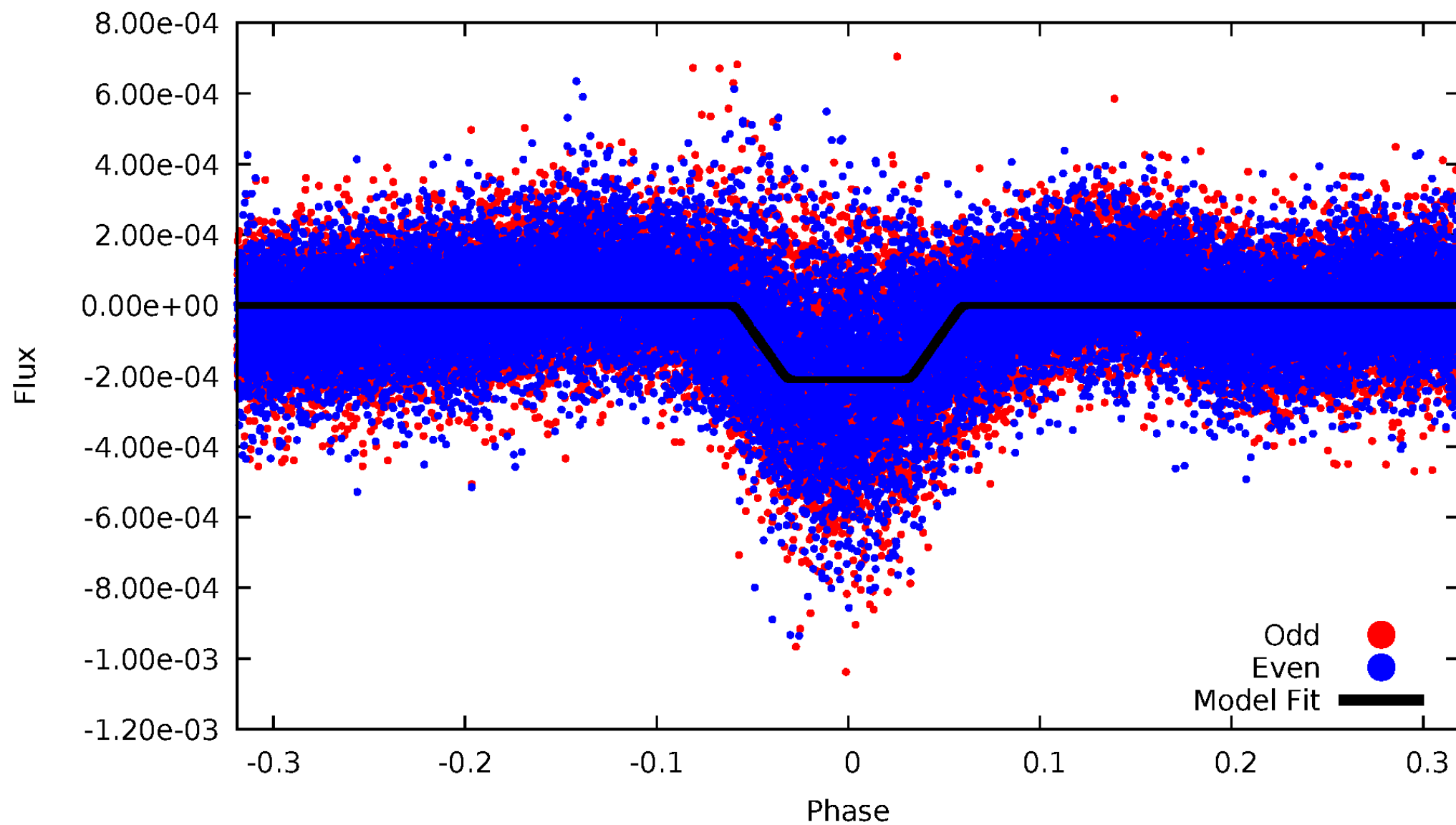
# DV Odd/Even

TCE 007765374-01



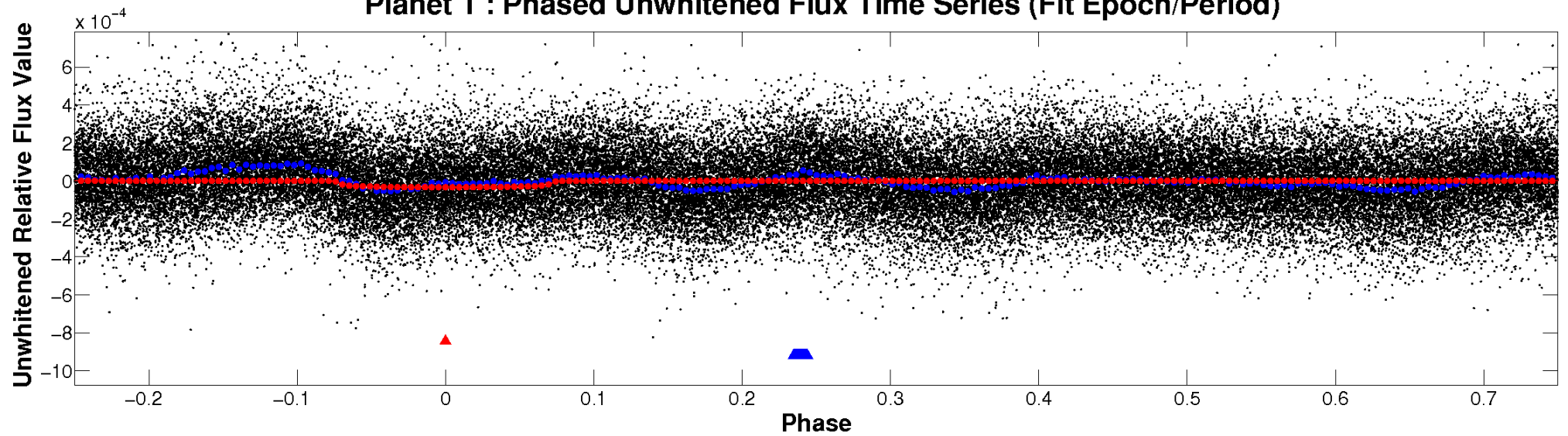
# ALT Odd/Even

TCE 007765374-01

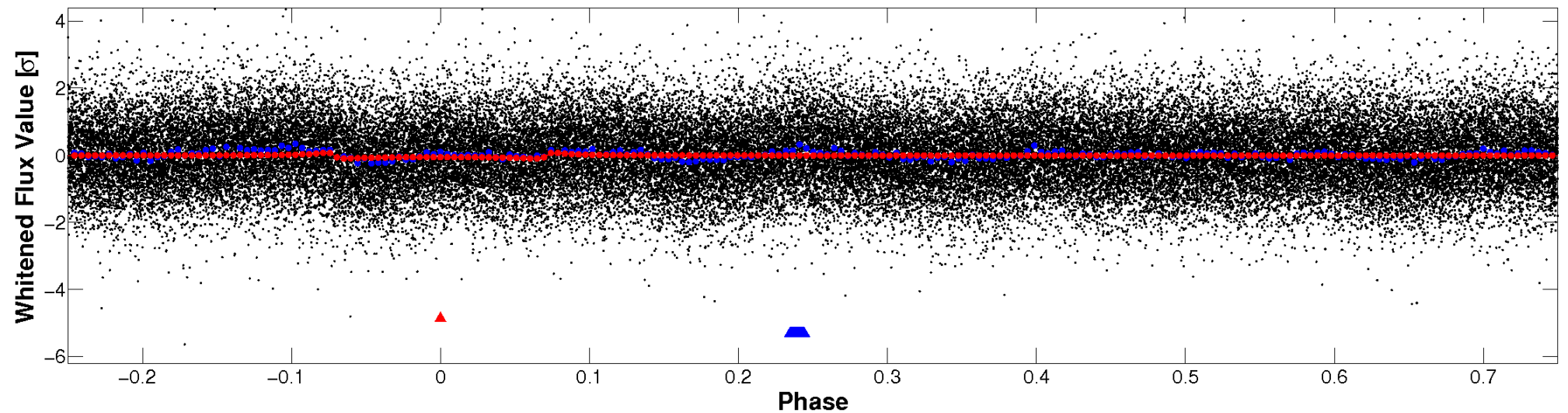


# Non-Whitened Vs. Whitened Light Curve

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

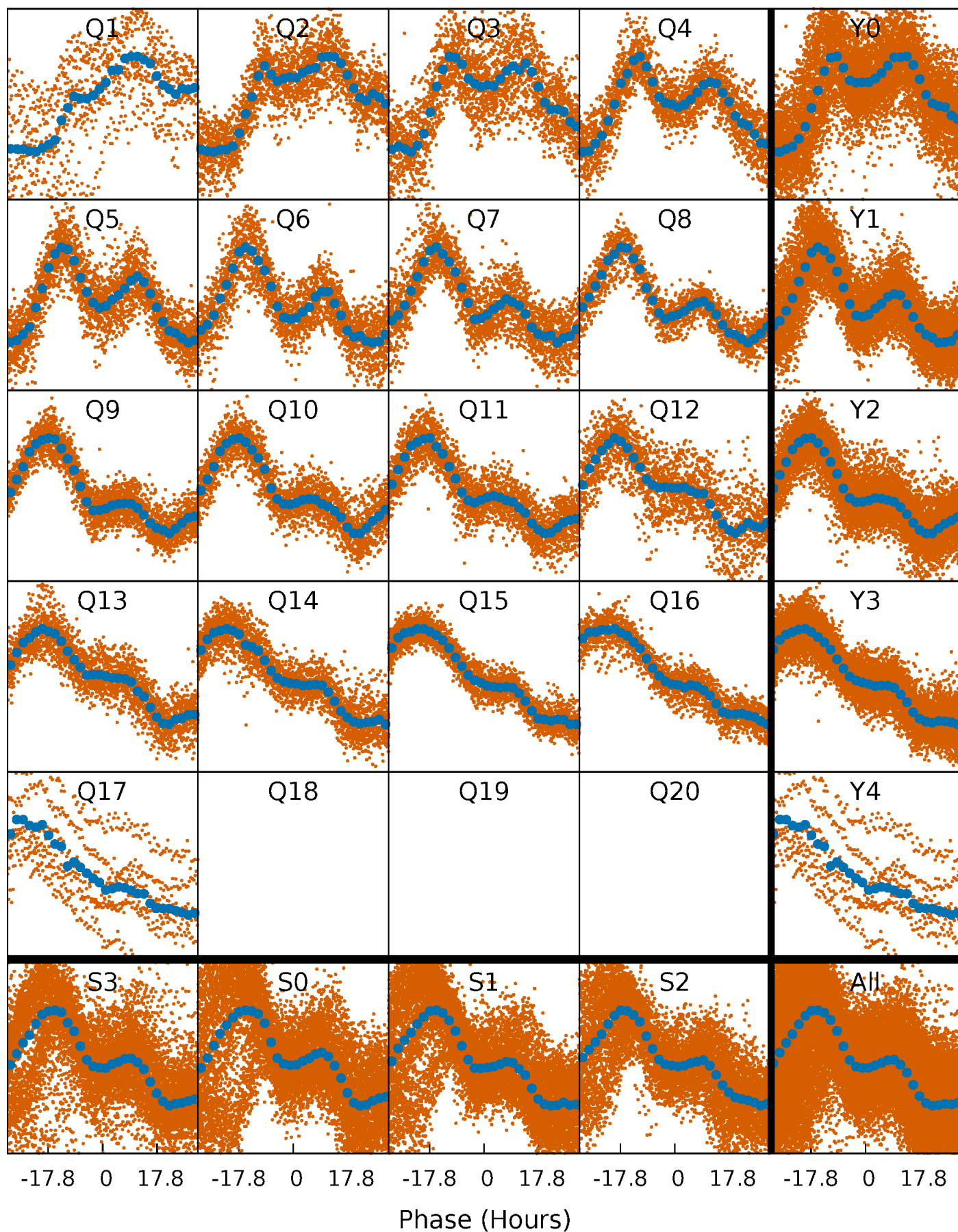


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

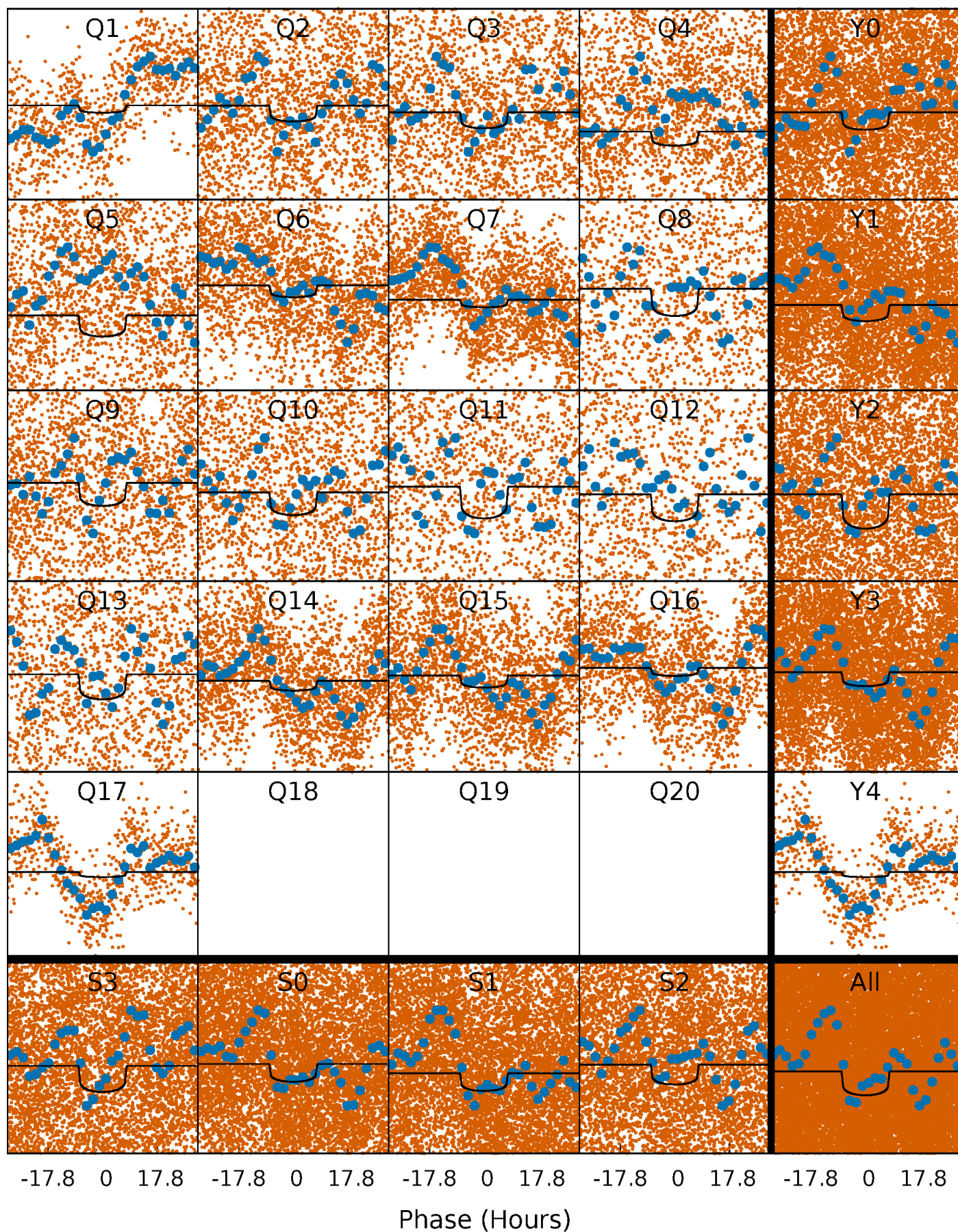
TCE 007765374-01 P= 4.408214 Days  $T_0=133.100359$  (BKJD)





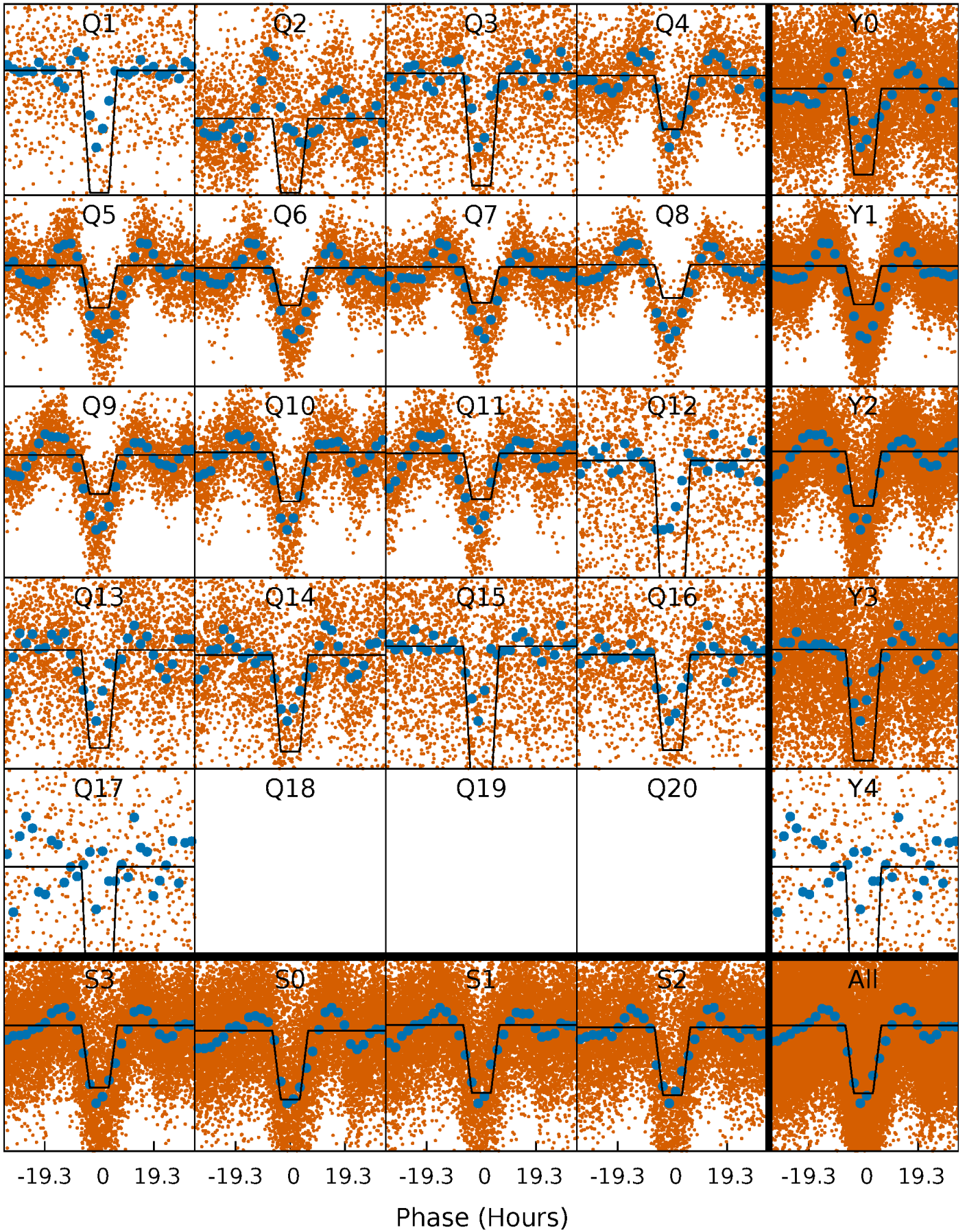
# DV Quarter-Phased Transit Curves

TCE 007765374-01 P= 4.408214 Days  $T_0=133.100359$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007765374-01 P= 4.408105 Days  $T_0=132.976932$  (BKJD)

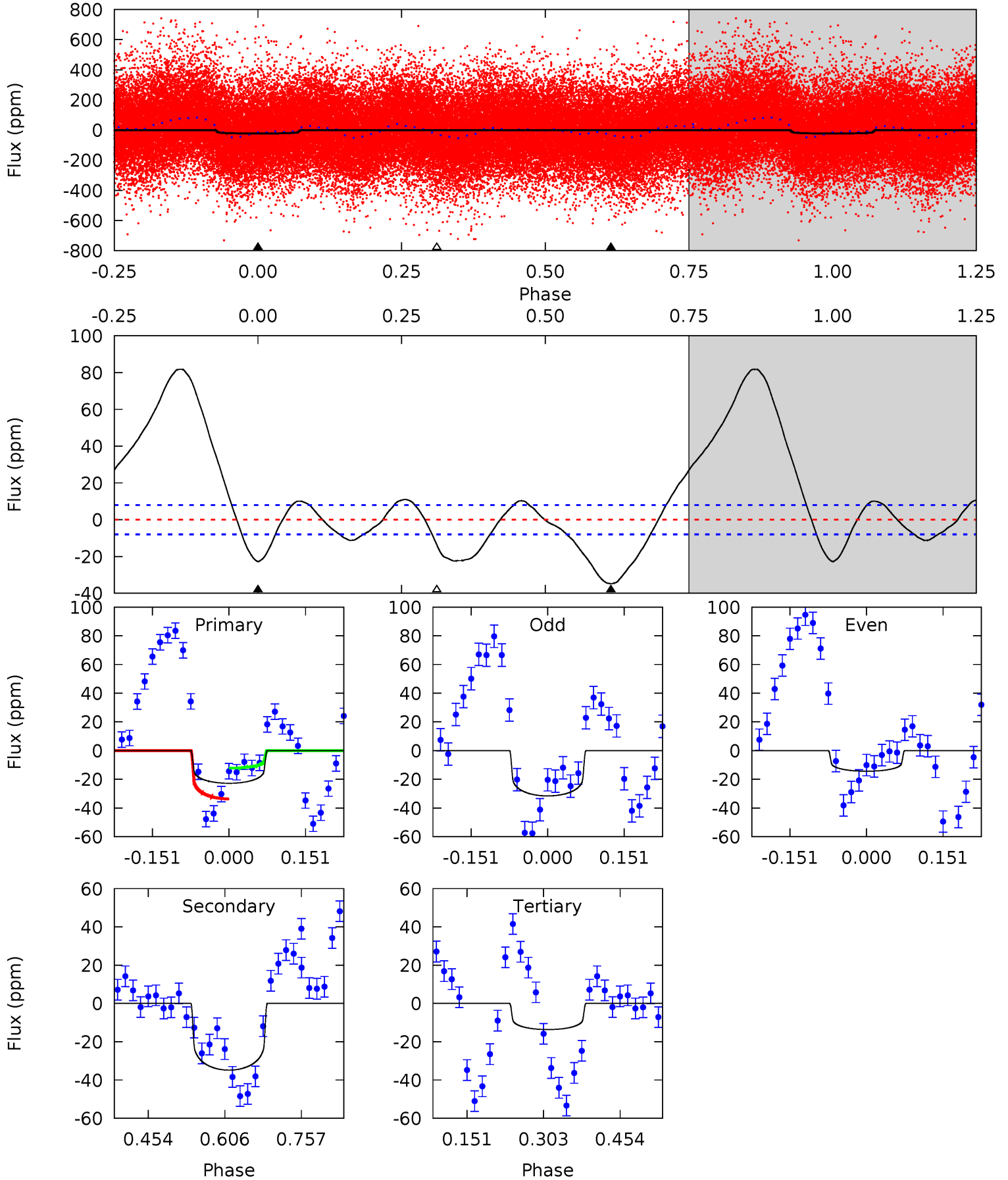




# DV Model-Shift Uniqueness Test

007765374-01, P = 4.408214 Days, E = 128.692145 Days

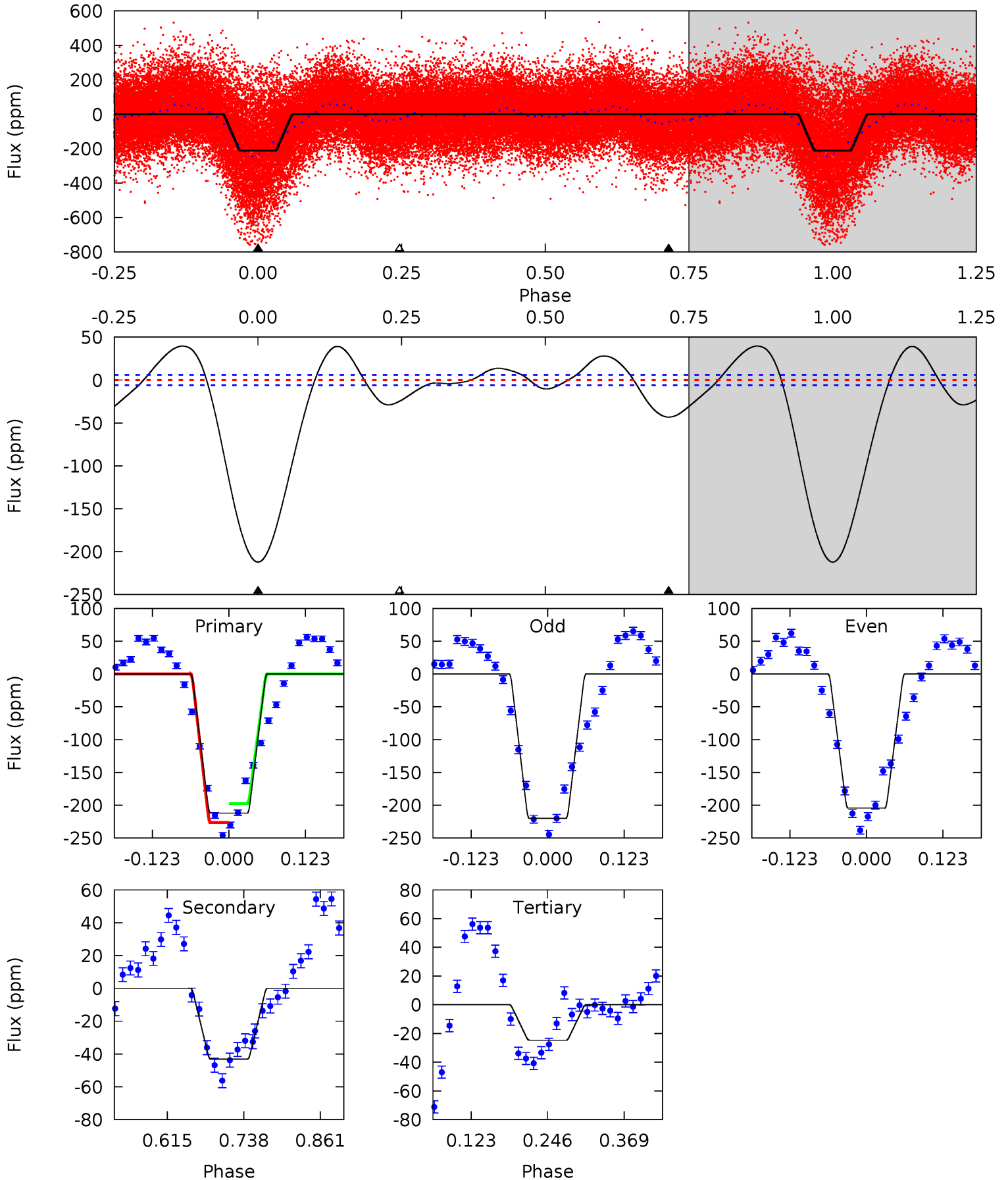
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	19.6	7.69	0	4.48	1.43	14.9	5.14	12.8	11.9	19.6	4.80	0.86	0.70	6.21



# Alt Model-Shift Uniqueness Test

007765374-01, P = 4.408105 Days, E = 128.568827 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
157.5	32.0	18.3	0	4.52	1.54	13.6	139.2	157.5	13.7	32.0	5.79	1.03	0.16	10.4





### Stellar Parameters For KIC 007765374

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6761^{+162}_{-243}$	$4.269^{+0.072}_{-0.217}$	$0.100^{+0.200}_{-0.350}$	$1.427^{+0.490}_{-0.210}$	$1.381^{+0.204}_{-0.204}$	$0.669^{+0.264}_{-0.358}$
	+2%/-4%	+2%/-5%	+200%/-350%	+34%/-15%	+15%/-15%	+39%/-53%
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 007765374-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-35 \pm 2$	$0.99^{+0.20}_{-0.18}$	$2098^{+168}_{-116}$	$6643^{+524}_{-450}$	$66^{+26}_{-19}$
Alt.	$-43 \pm 1$	$2.34^{+0.42}_{-0.26}$	$2094^{+169}_{-109}$	$4650^{+141}_{-149}$	$15^{+3}_{-4}$

$T_{\text{max}}$  = 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

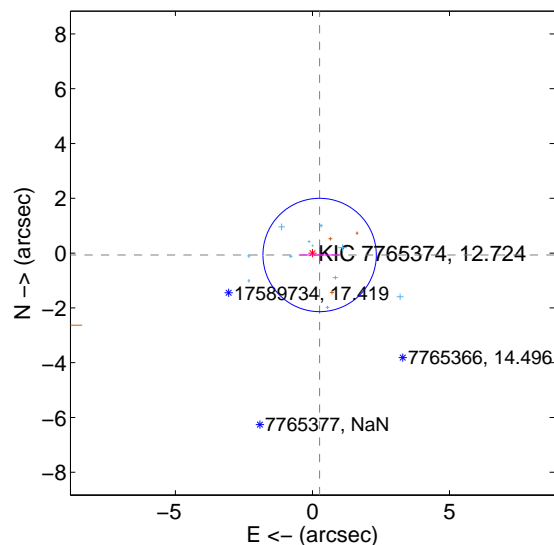
Supplemental centroid analysis for 007765374-01. Kepler magnitude: 12.72. Transit SNR 7.78

There are 11 quarters with good PRF difference image offsets

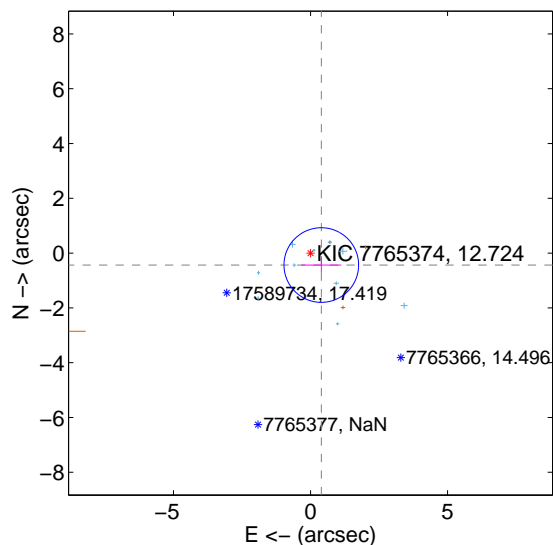
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.271 \pm 0.689$	0.39	$-0.262 \pm 0.735$	$-0.069 \pm 0.283$
PRF-fit source offset from KIC position	$0.587 \pm 0.454$	1.29	$-0.393 \pm 0.728$	$-0.436 \pm 0.271$
photometric centroid source offset	$3.85 \pm 1.17$	3.28	$3.10 \pm 1.10$	$2.27 \pm 1.29$

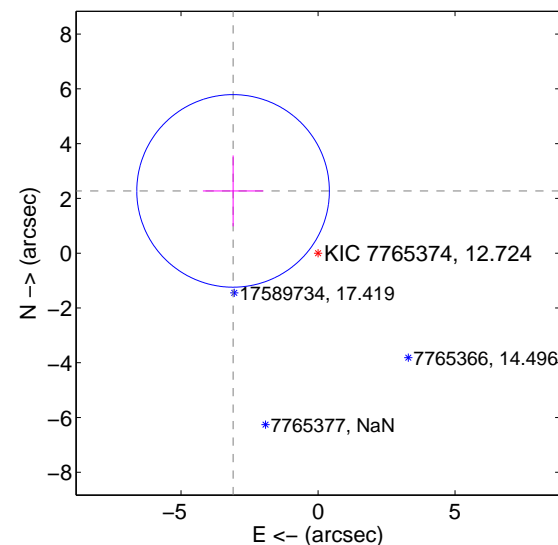
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

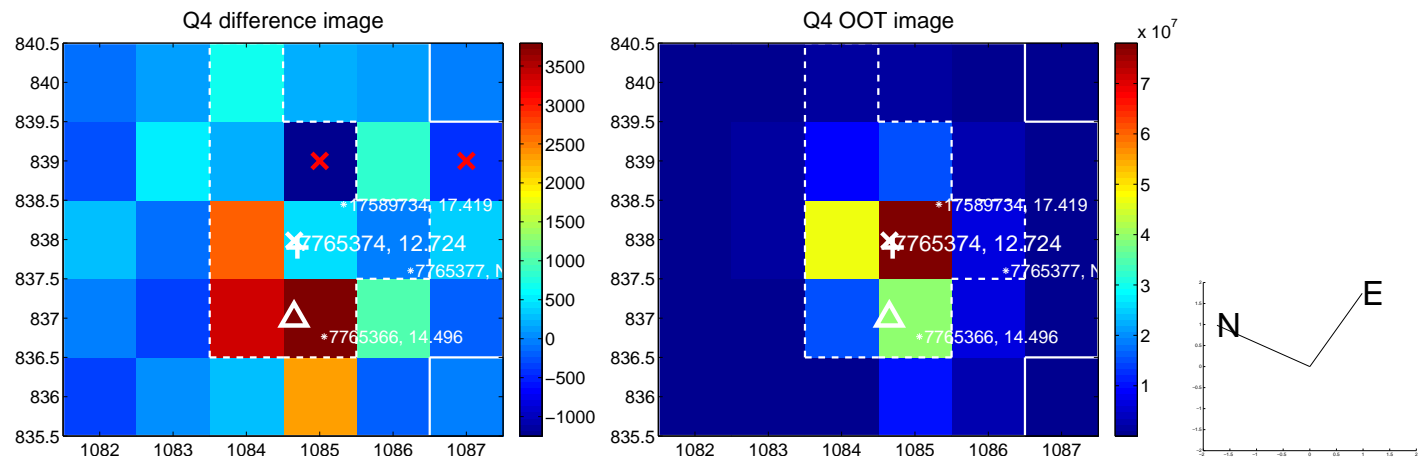
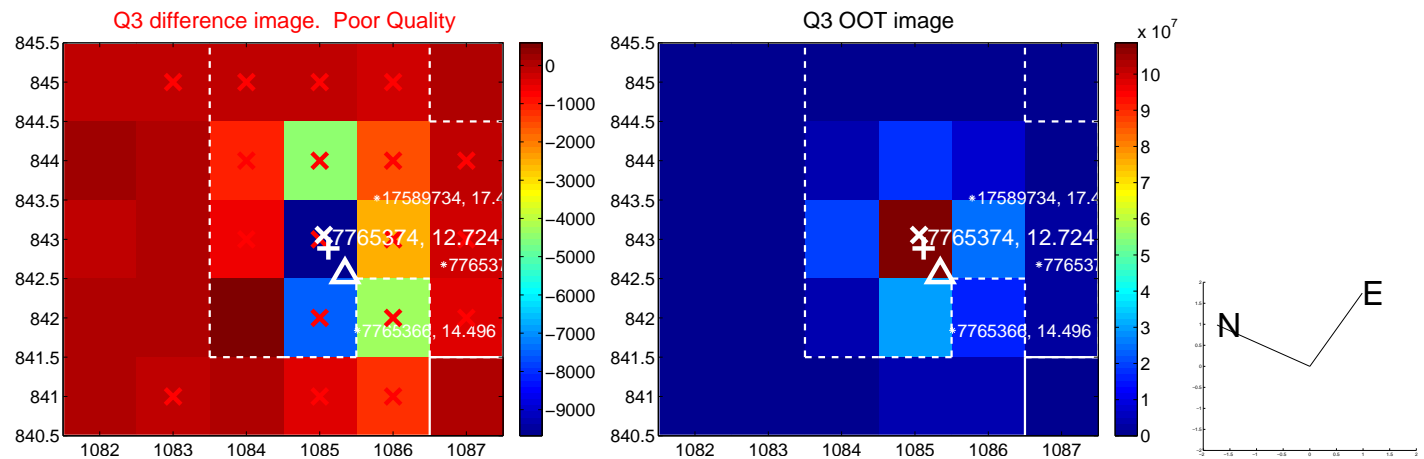
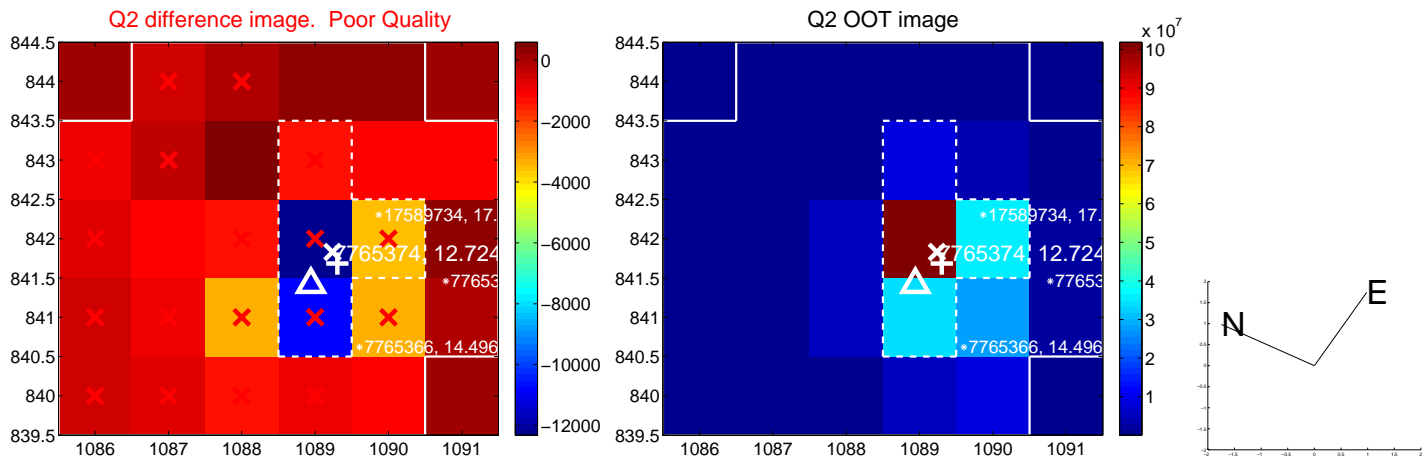
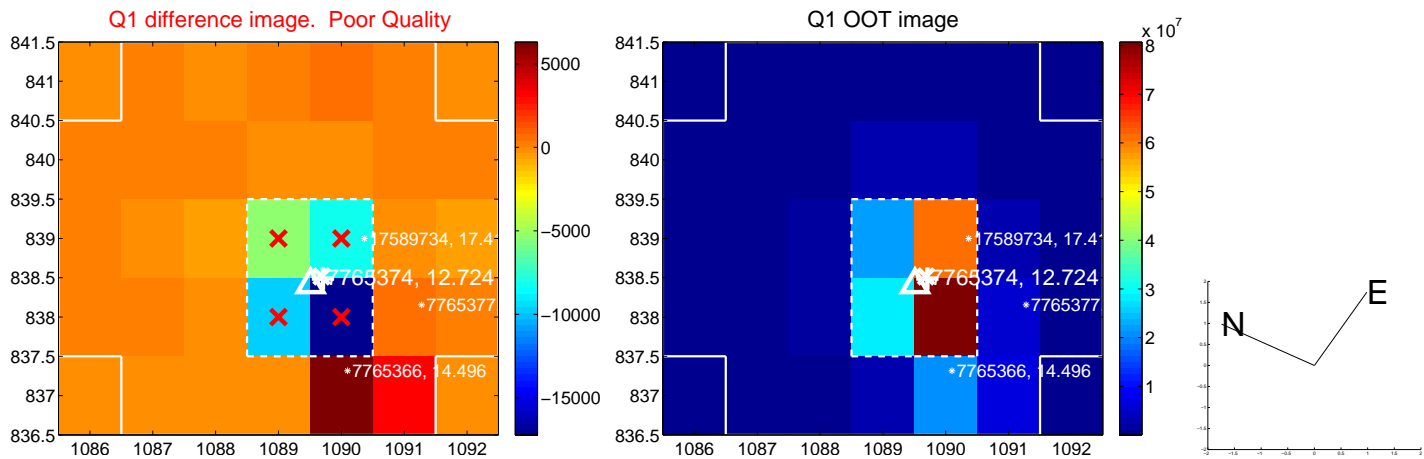


offset from photometric centroids



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.

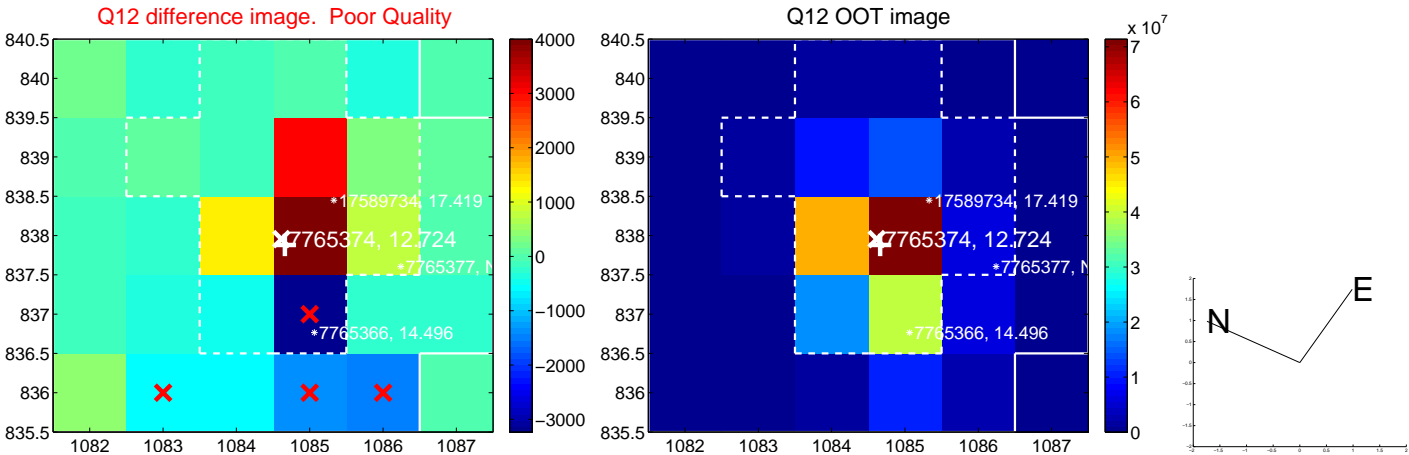
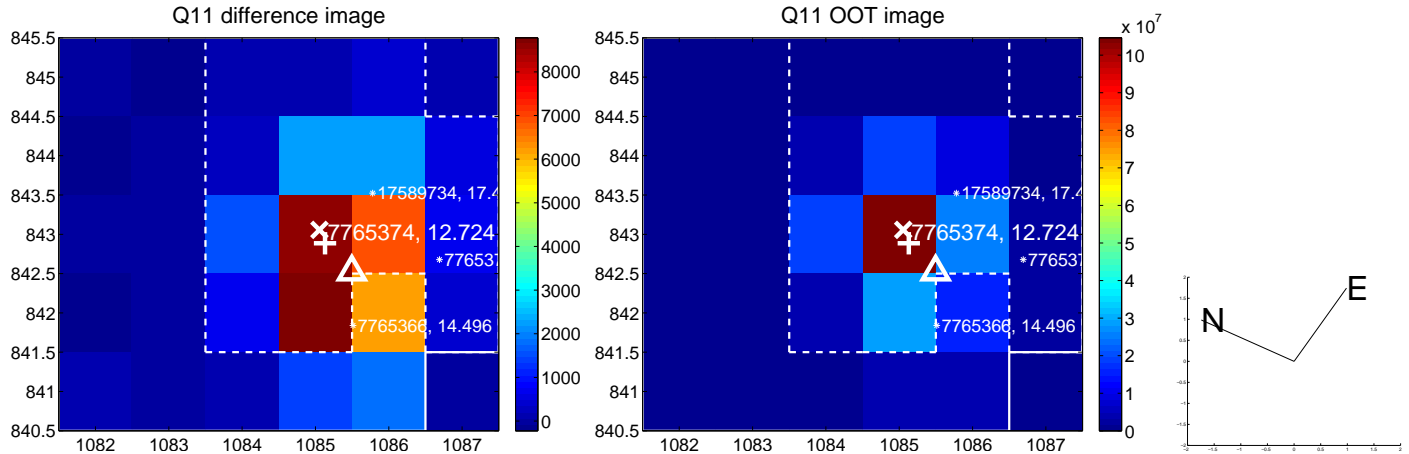
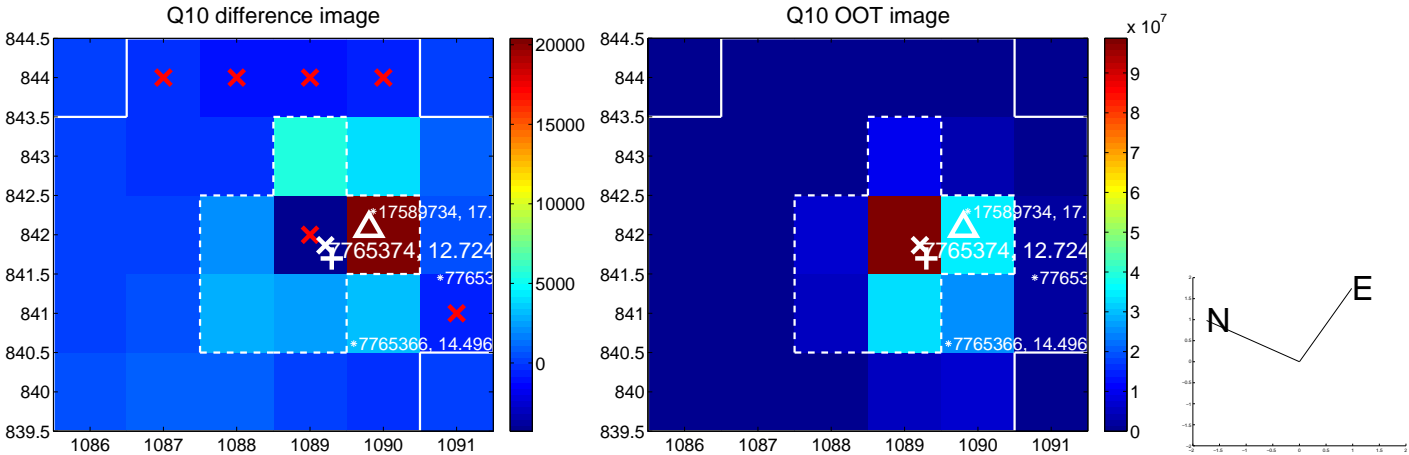
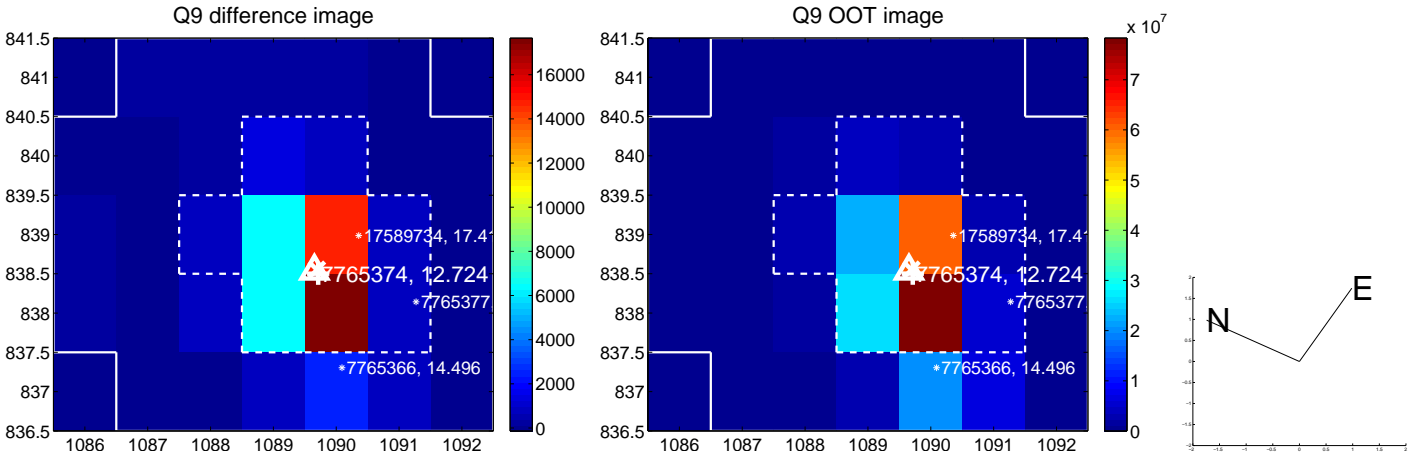
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





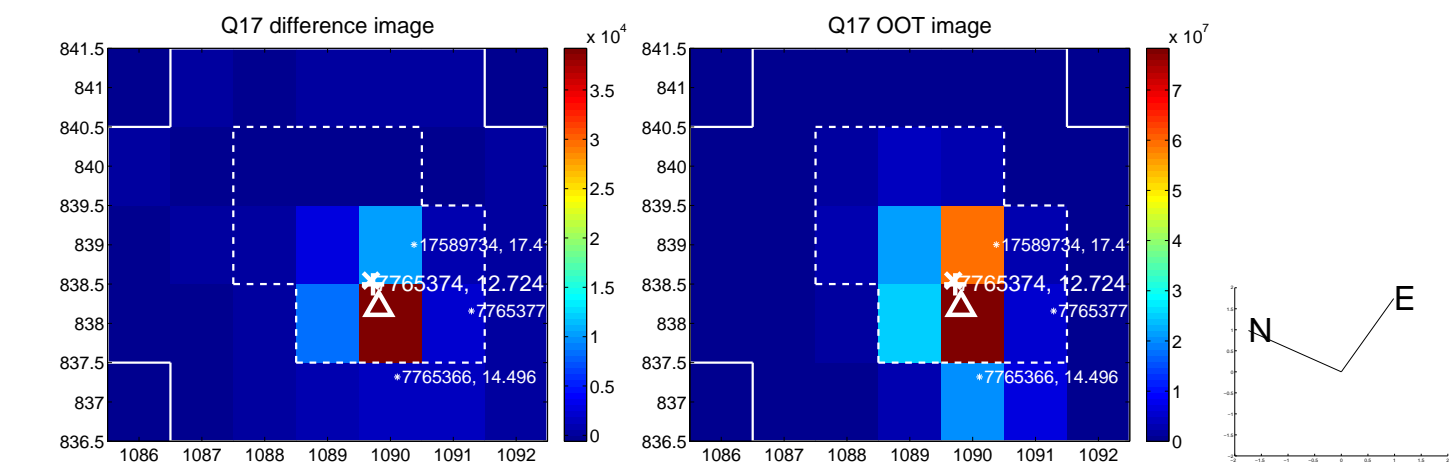


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

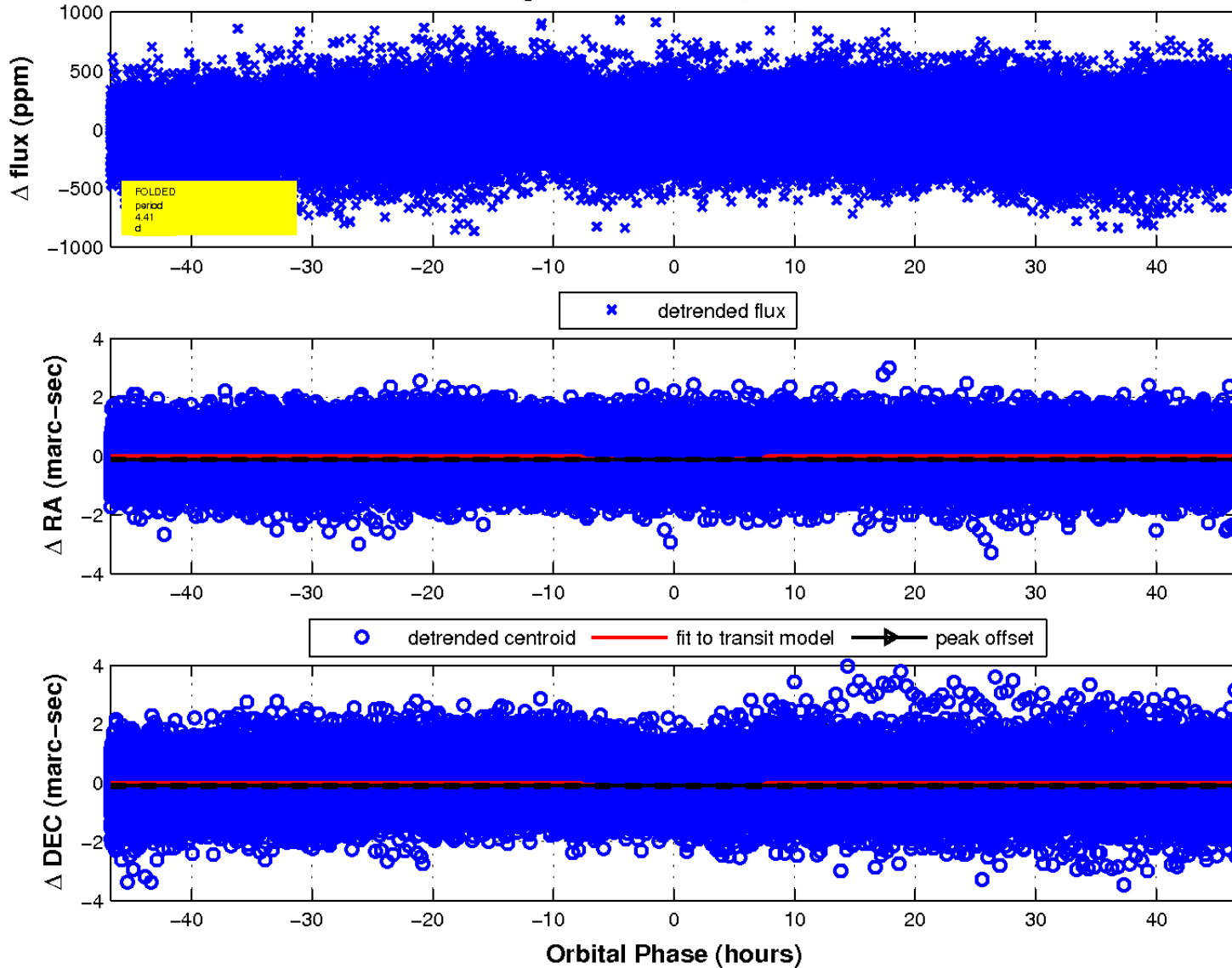




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

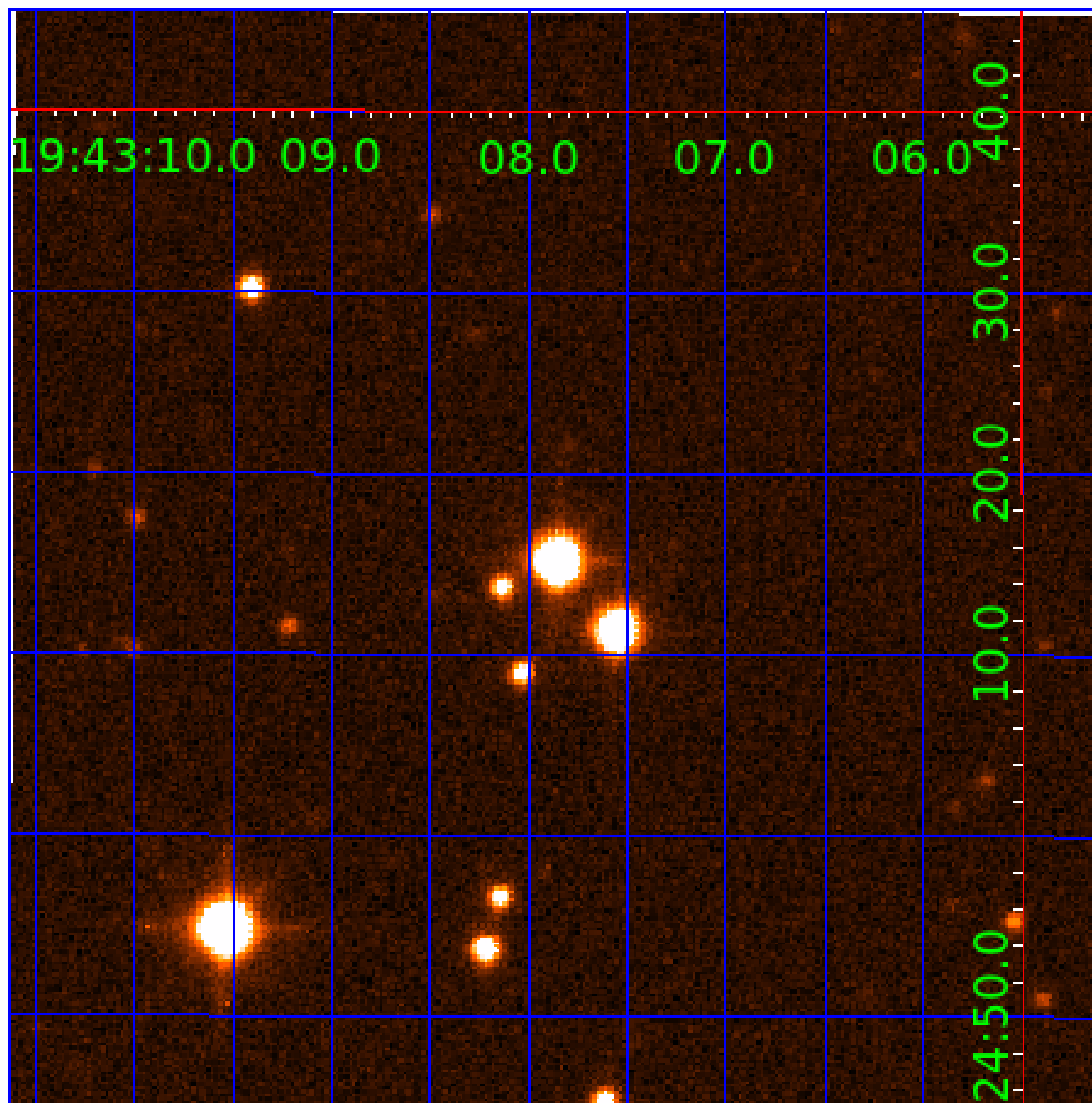


### fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 007765374

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007765374-01	OBS	No	4.408214	133.100359	33.5	15.578	10.1	7.8	1.43	6761	0.94	1110.55
007765374-02	OBS	No	4.408089	134.176273	18.1	32.224	11.4	3.6	1.43	6761	0.61	1110.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007765374-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
007765374-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

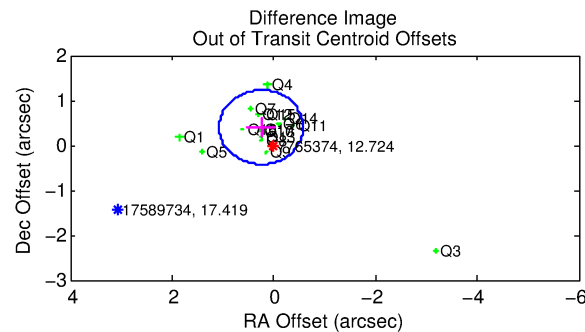
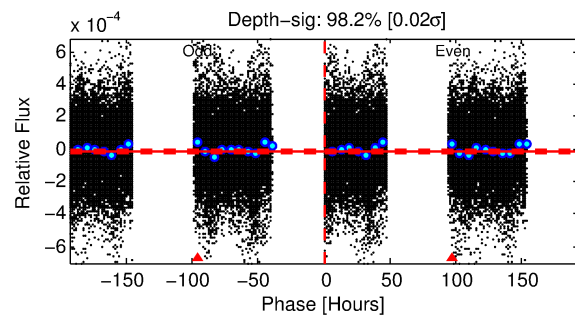
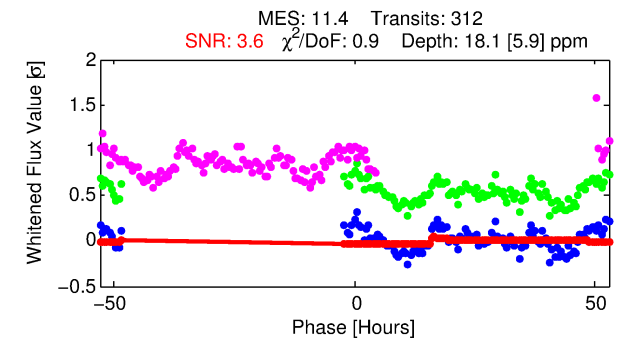
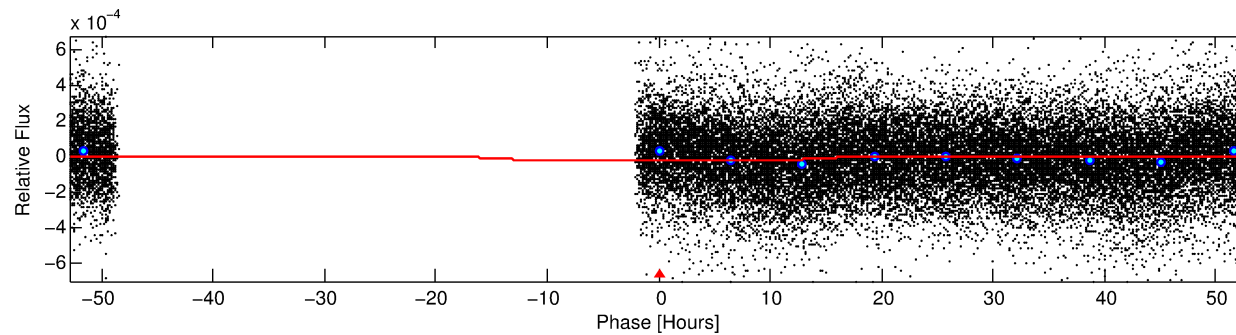
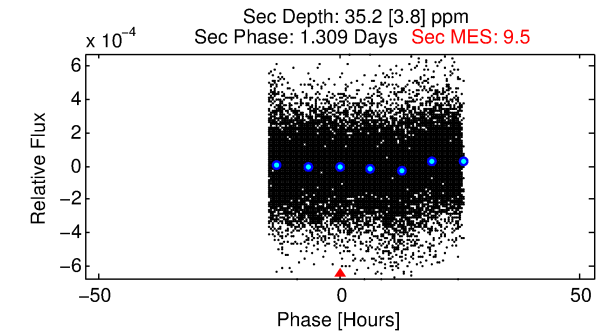
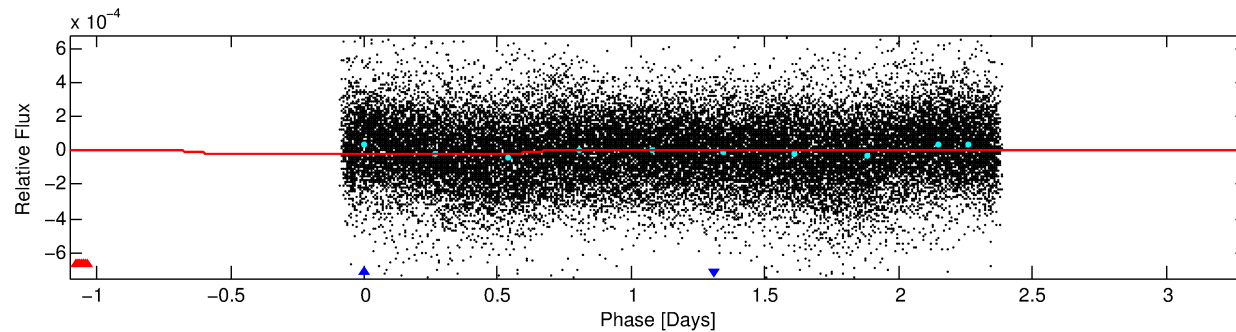
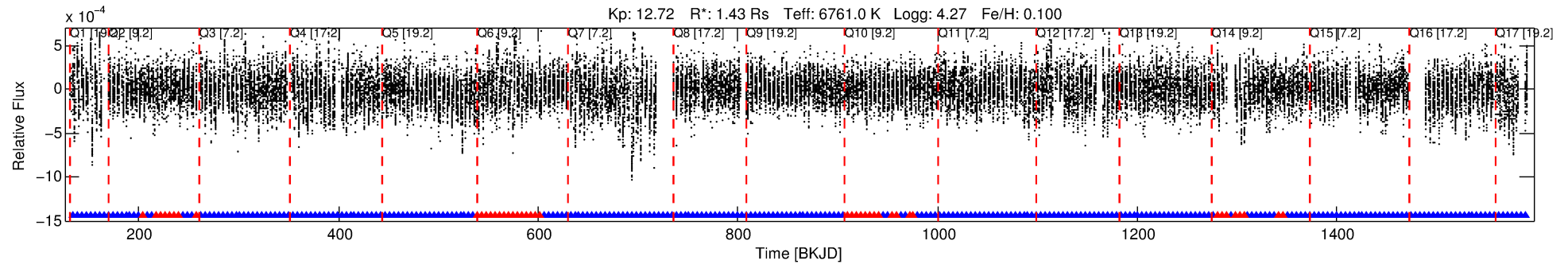
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007765374-02

No Significant Match Found

# DV One-Page Summary

KIC: 7765374 Candidate: 2 of 2 Period: 4.408 d



## DV Fit Results:

Period = 4.40809 [0.00015] d  
Epoch = 134.1763 [0.0797] BKJD  
Rp/R\* = 0.0039 [0.0047]  
a/R\* = 1.23 [2.80]  
b = 0.05 [123.92]  
Seff = 1110.59 [476.43]  
Teq = 1472 [158] K  
Rp = 0.61 [0.77] Re  
a = 0.0586 [0.0166] AU  
Ag = 177.47 [434.97] [0.41σ]  
Teffp = 8307 [5029] K [1.36σ]

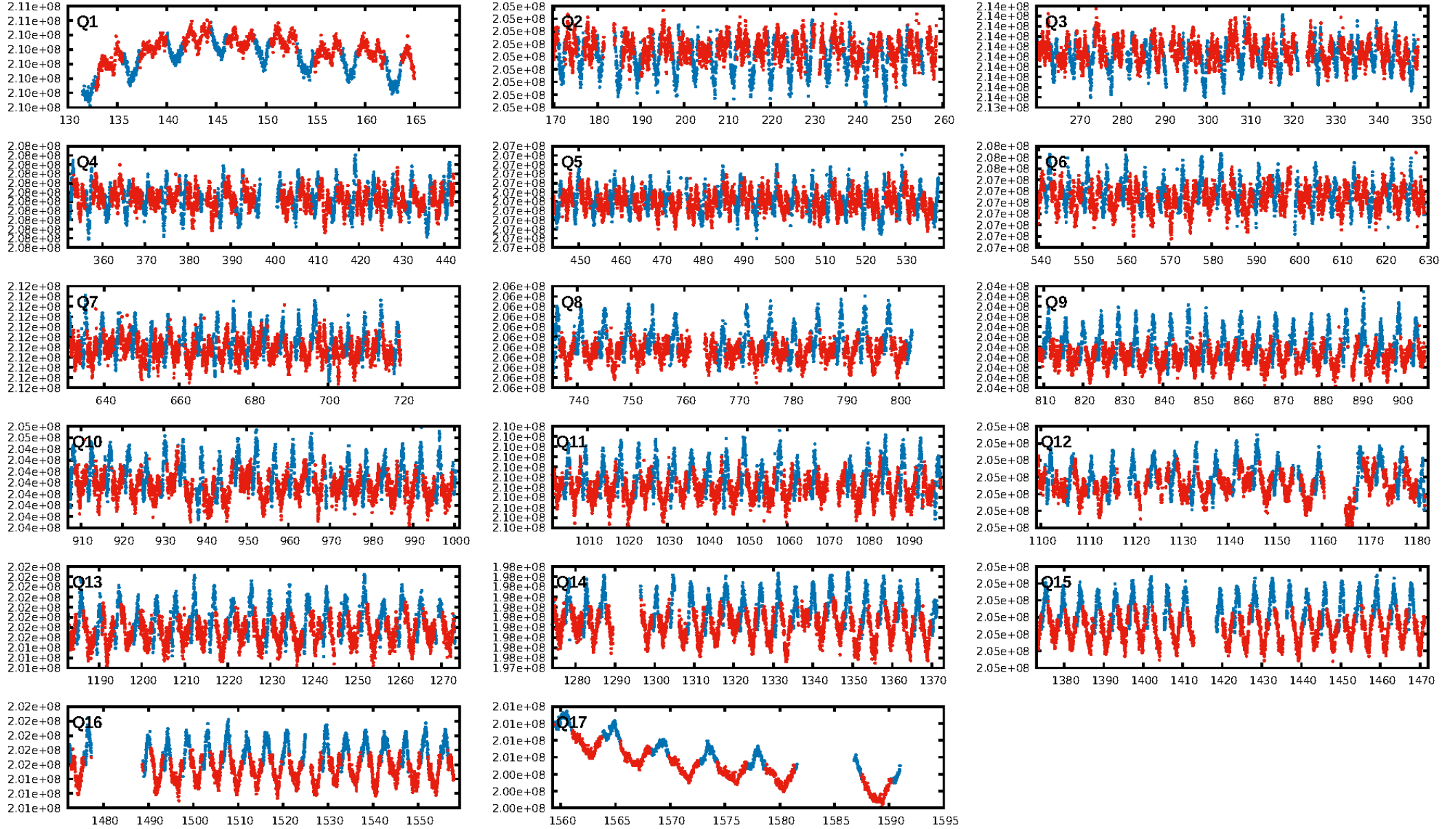
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.86 [255/298]  
**GhostDiagnostic-chr: -0.2518**  
**Centroid-sig: 0.0%**  
**Centroid-so: 4.720 arcsec [3.19σ]**  
OotOffset-rm: 0.470 arcsec [1.71σ]  
KicOffset-rm: 0.086 arcsec [0.28σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.94 [15/16]  
DiffImageOverlap-fno: 0.00 [0/17]

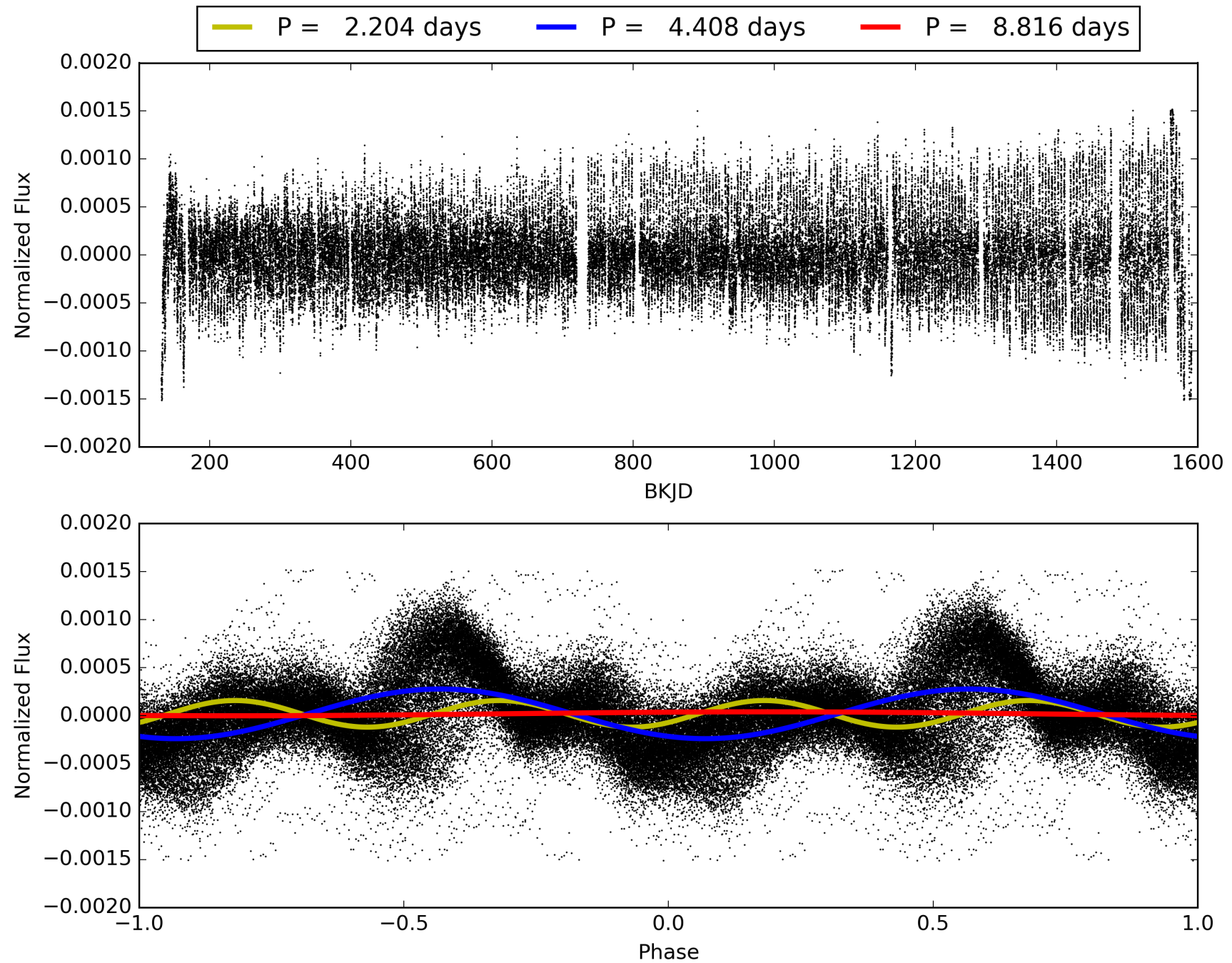
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:27:30 Z

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

# TCE 007765374-02, PDC Light Curves

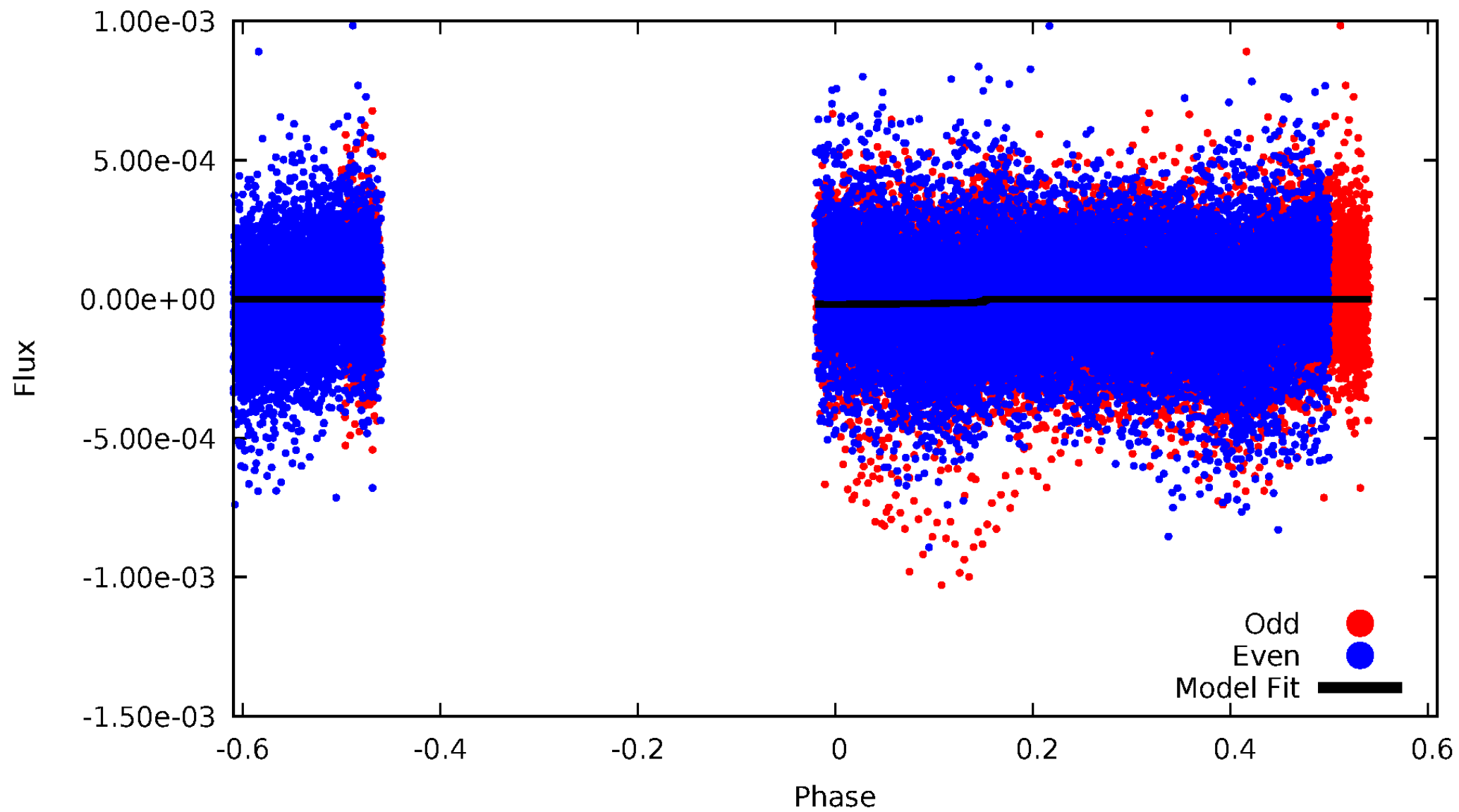


TCE 007765374-02



DV Odd/Even

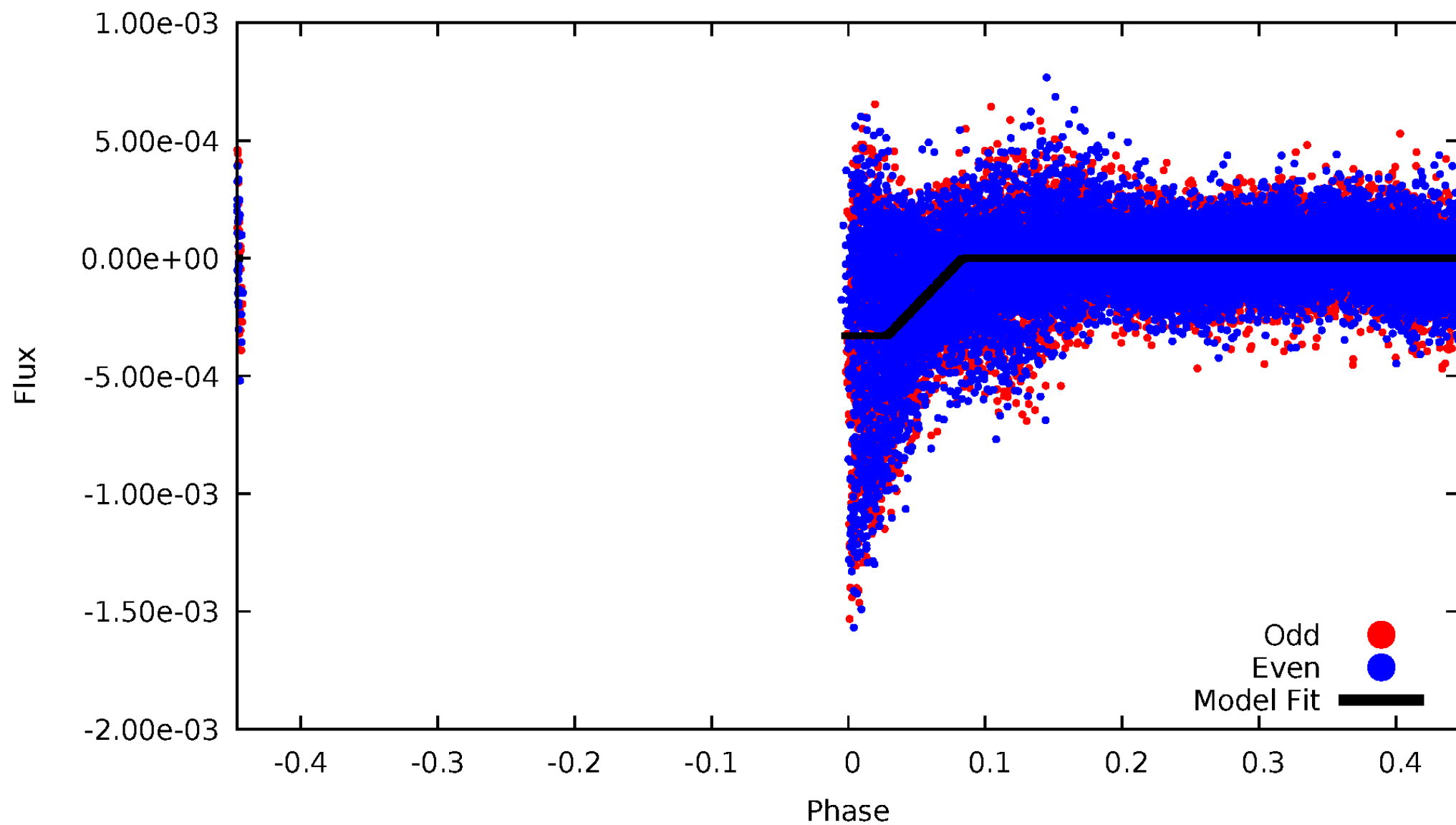
TCE 007765374-02





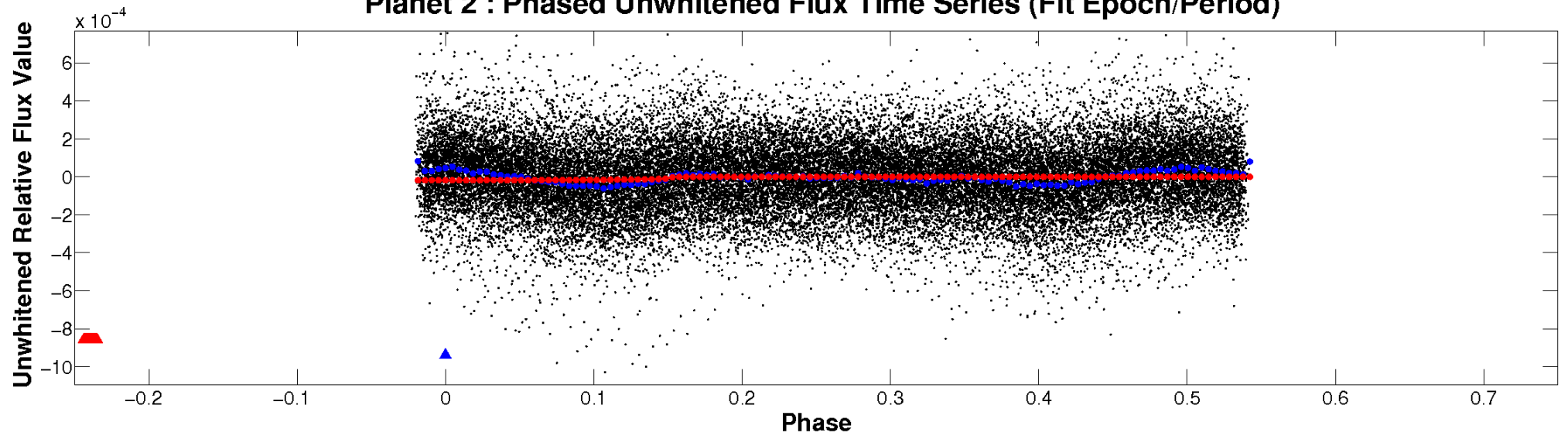
# ALT Odd/Even

TCE 007765374-02

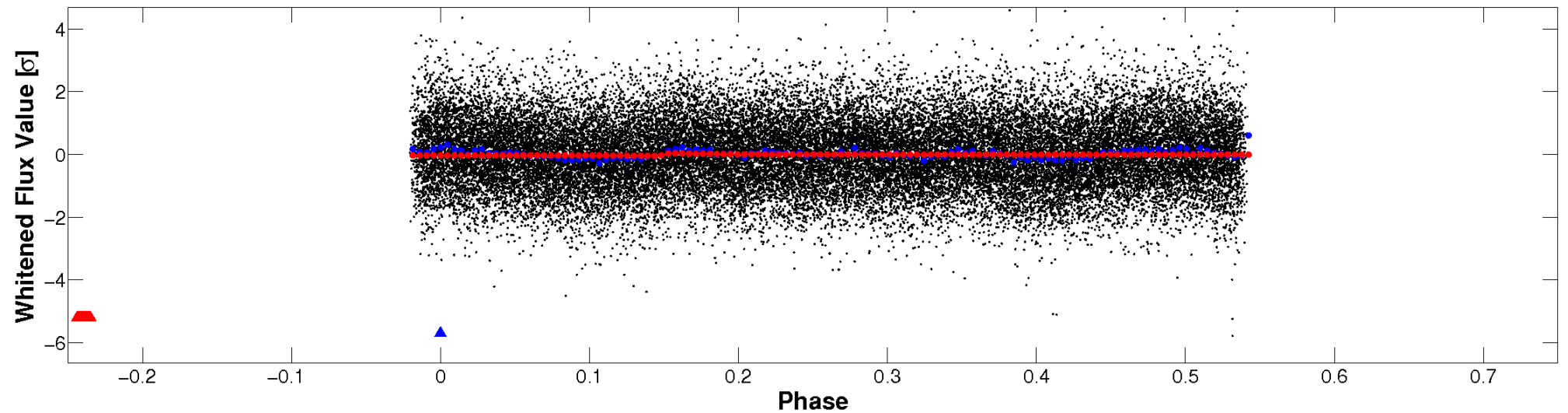


# Non-Whitened Vs. Whitened Light Curve

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

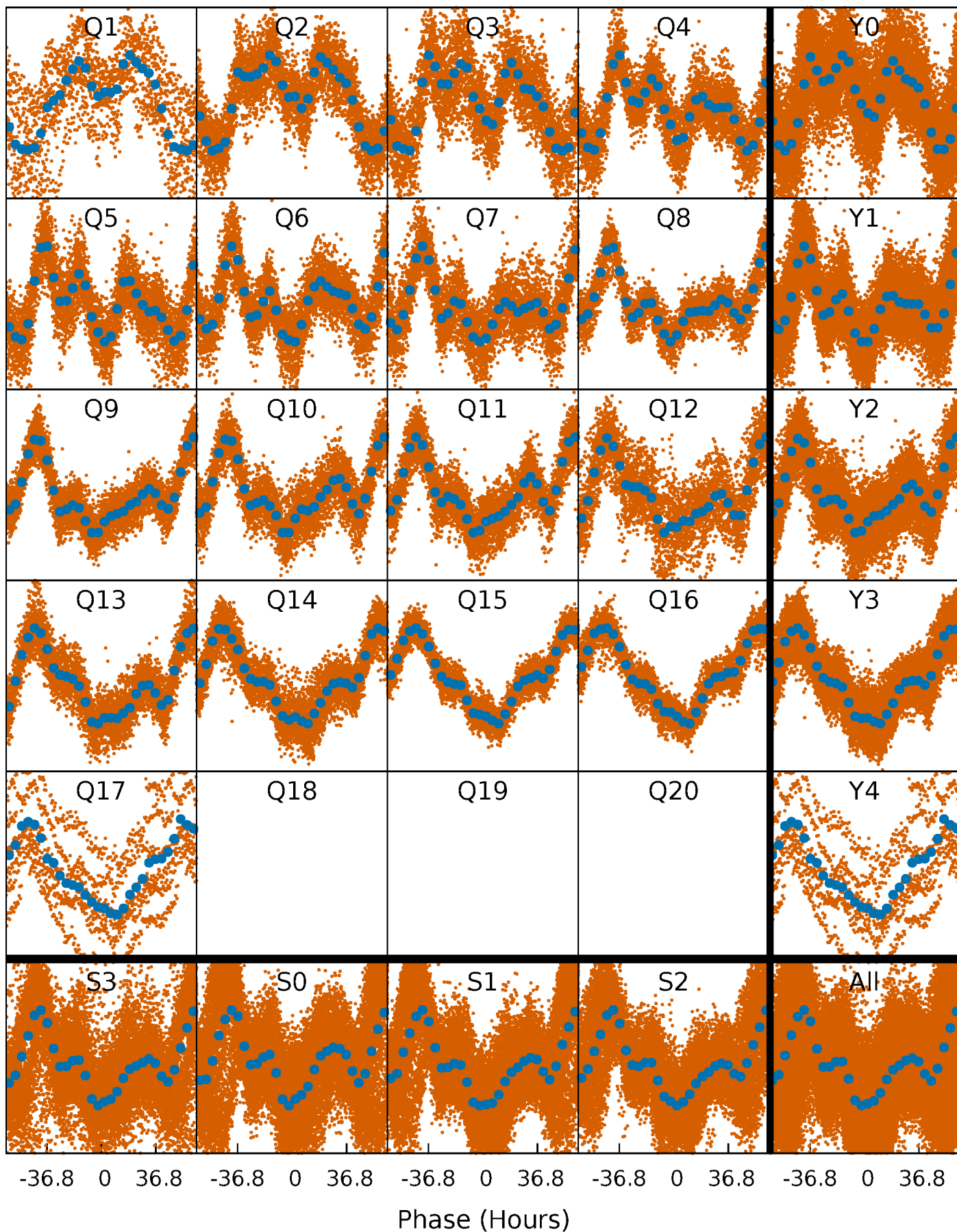


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



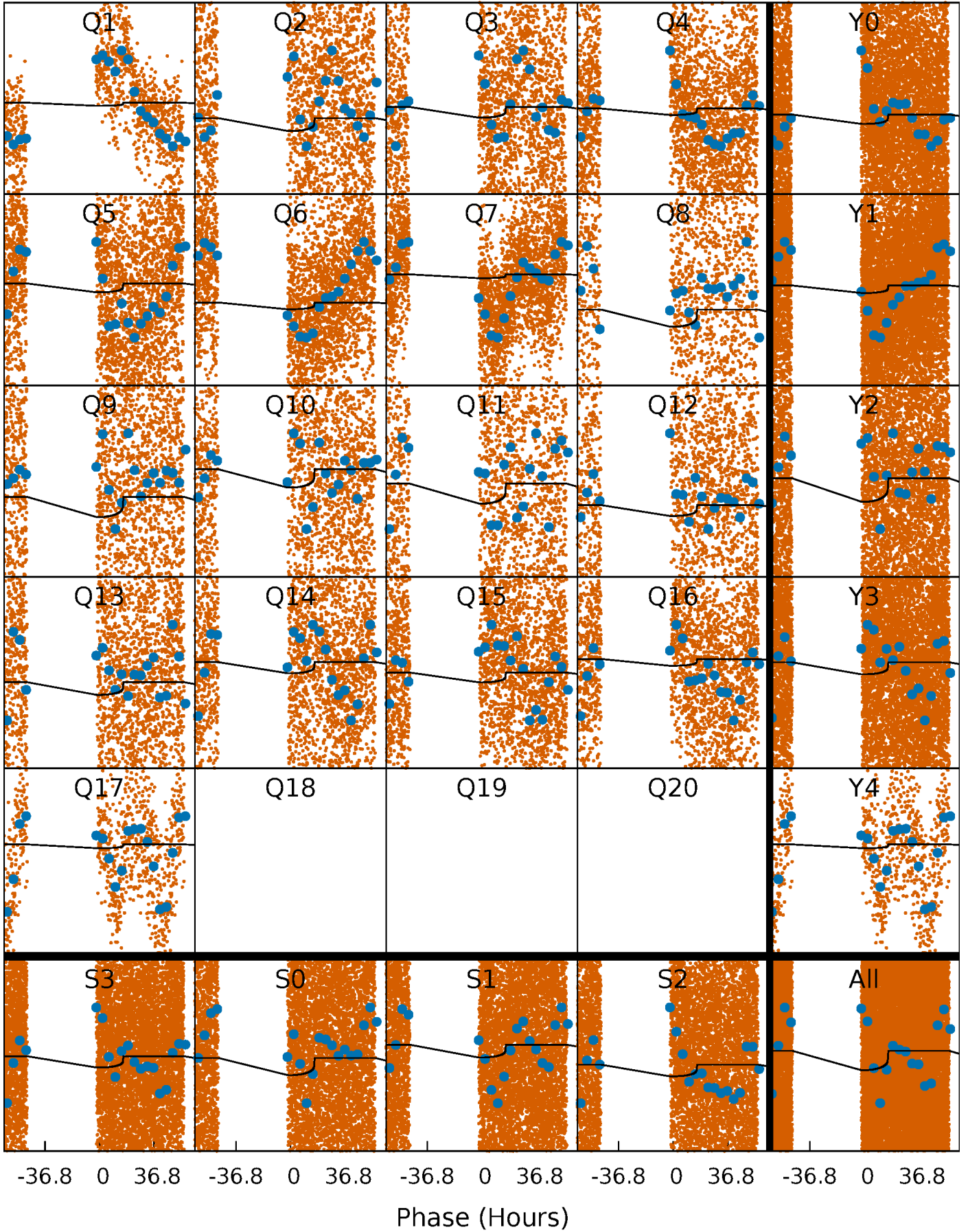
# PDC Quarter-Phased Transit Curves

TCE 007765374-02   P= 4.408089 Days    $T_0=134.176273$  (BKJD)



# DV Quarter-Phased Transit Curves

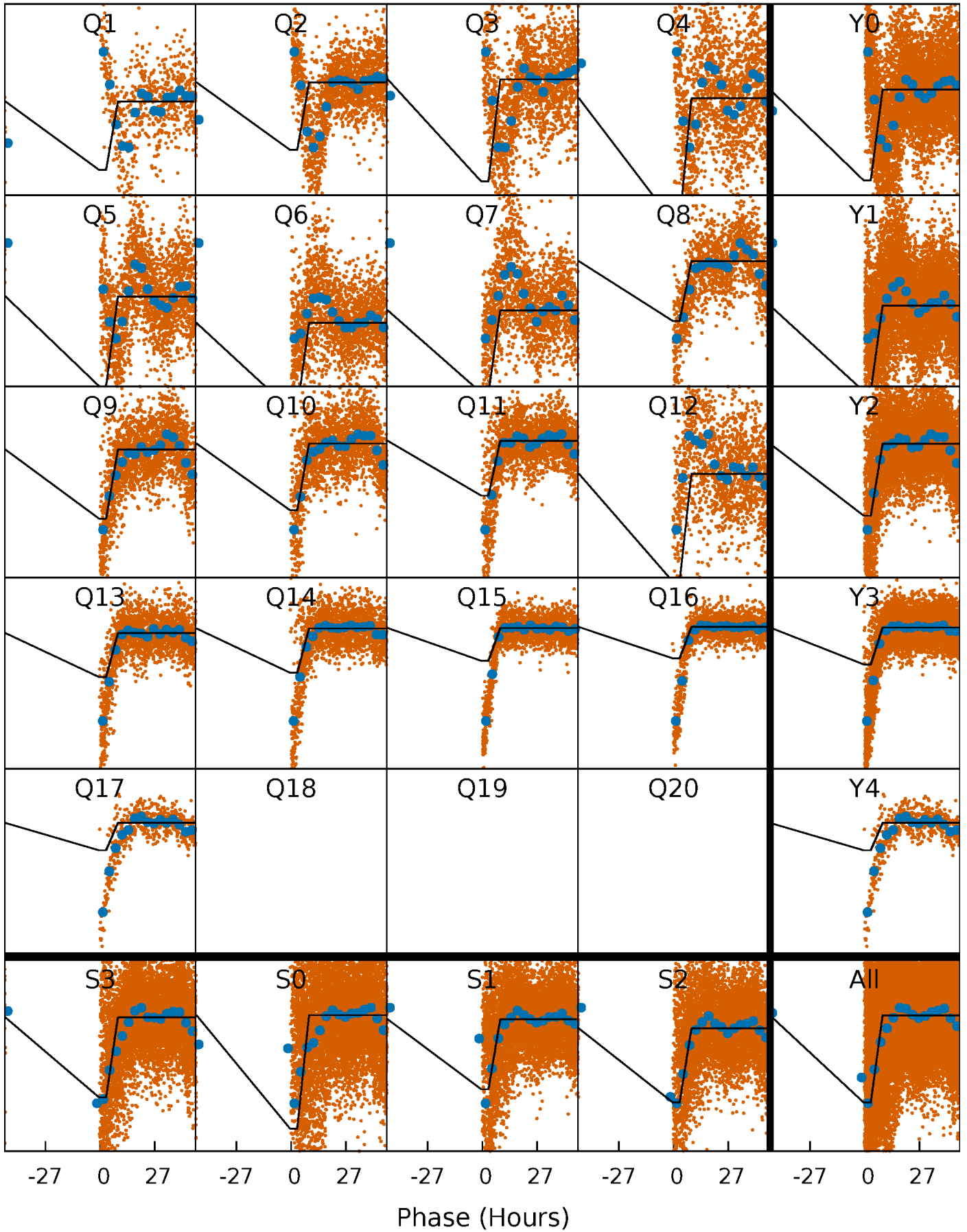
TCE 007765374-02   P= 4.408089 Days    $T_0=134.176273$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007765374-02   P= 4.408355 Days    $T_0=134.064688$  (BKJD)

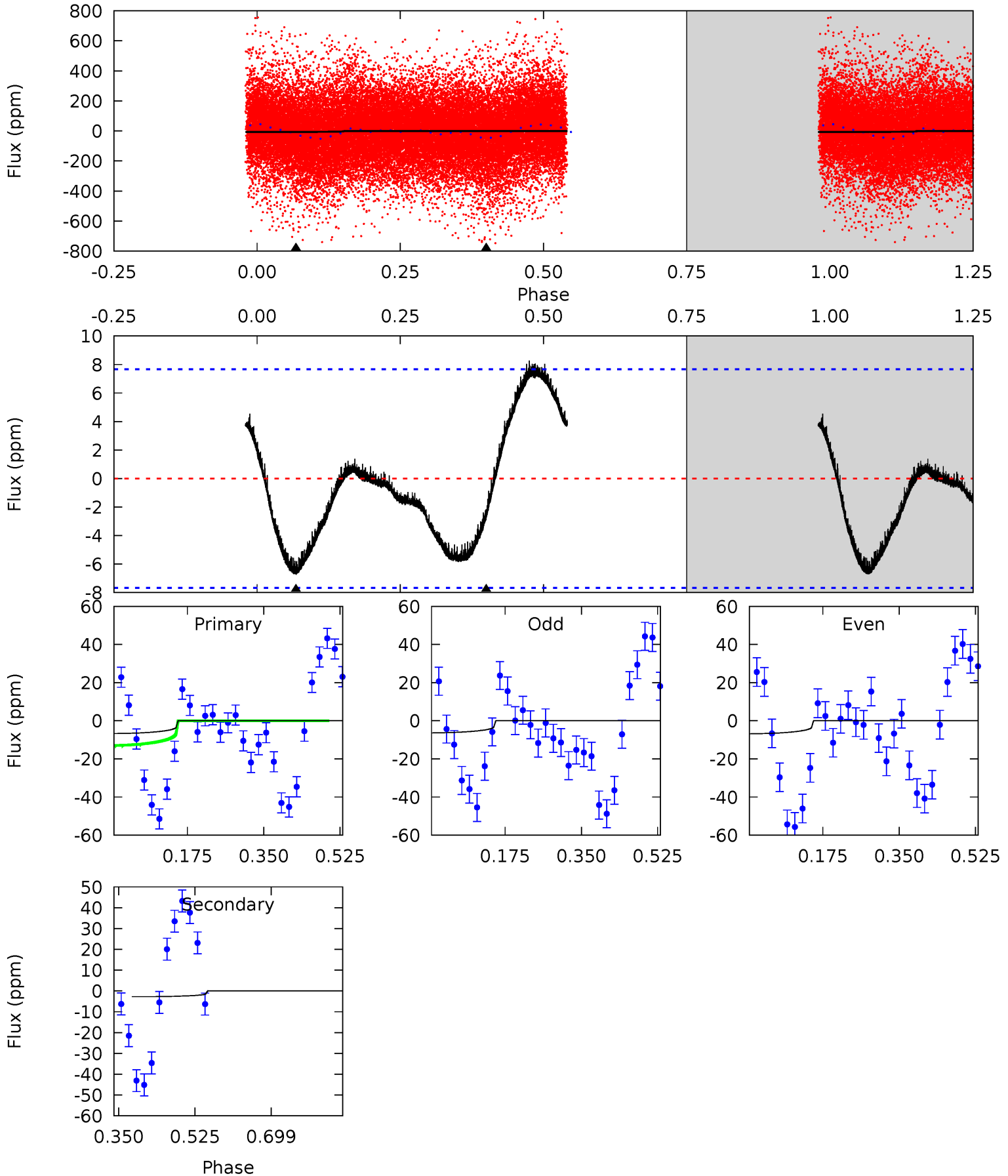




# DV Model-Shift Uniqueness Test

007765374-02, P = 4.408089 Days, E = 129.768184 Days

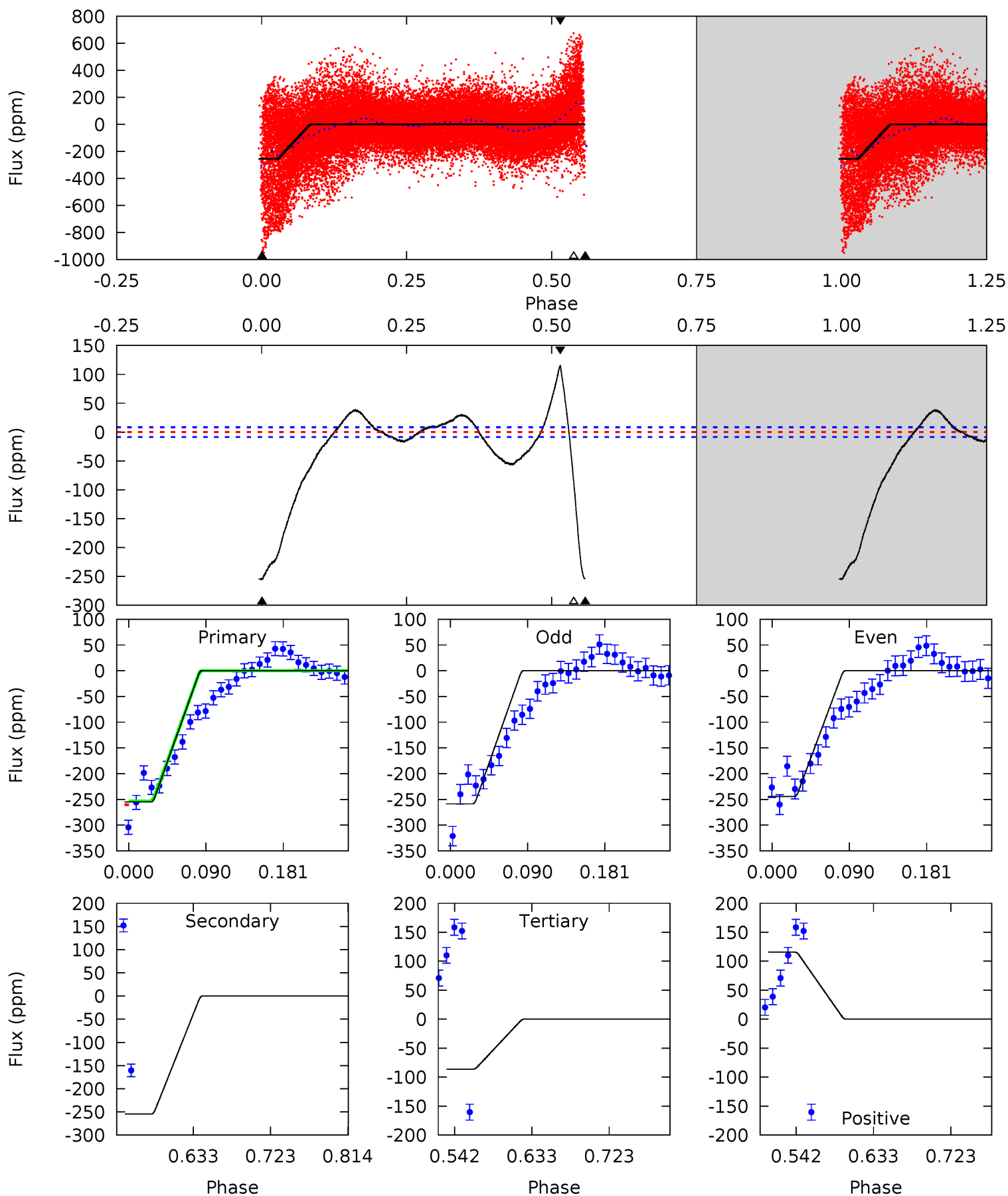
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.89	1.60	0	0	4.45	1.36	1.80	3.89	3.89	1.60	1.60	0.14	-2.10	0.55	4.33



# Alt Model-Shift Uniqueness Test

007765374-02, P = 4.408355 Days, E = 129.656333 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
139.1	138.7	47.0	63.1	4.59	1.69	22.3	92.1	76.0	91.7	75.6	3.86	1.62	0.31	0.14



### Stellar Parameters For KIC 007765374

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6761^{+162}_{-243}$	$4.269^{+0.072}_{-0.217}$	$0.100^{+0.200}_{-0.350}$	$1.427^{+0.490}_{-0.210}$	$1.381^{+0.204}_{-0.204}$	$0.669^{+0.264}_{-0.358}$
	+2%/-4%	+2%/-5%	+200%/-350%	+34%/-15%	+15%/-15%	+39%/-53%
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 007765374-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3 \pm 2$	$0.81^{+0.78}_{-0.53}$	$2097^{+158}_{-108}$	$4032^{+2363}_{-976}$	$6.930^{+53.057}_{-5.504}$
Alt.	$-254 \pm 2$	$2.91^{+0.95}_{-0.79}$	$2091^{+150}_{-111}$	$6326^{+1212}_{-709}$	$56^{+47}_{-24}$

$T_{\text{max}}$  = 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

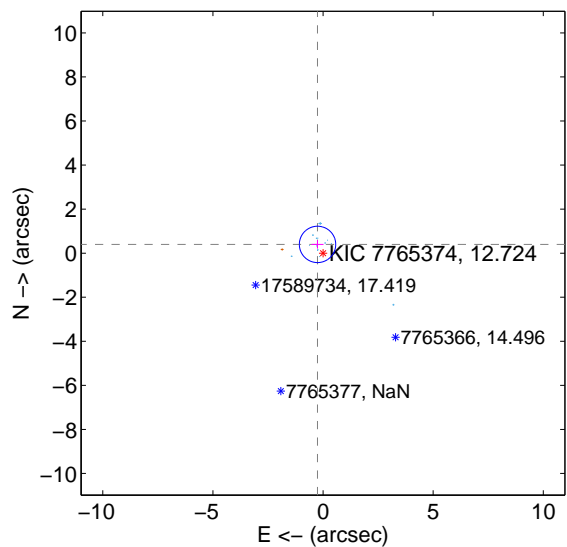
Supplemental centroid analysis for 007765374-02. Kepler magnitude: 12.72. Transit SNR 3.58

There are 15 quarters with good PRF difference image offsets

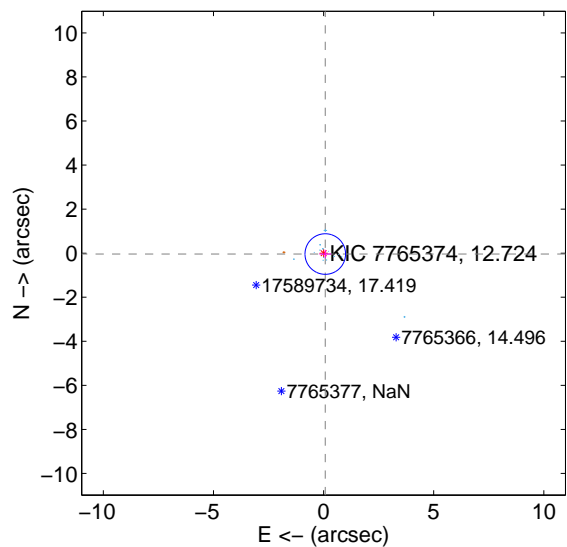
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.470 \pm 0.275$	1.71	$0.250 \pm 0.271$	$0.398 \pm 0.194$
PRF-fit source offset from KIC position	$0.086 \pm 0.307$	0.28	$-0.077 \pm 0.271$	$-0.039 \pm 0.194$
photometric centroid source offset	$4.72 \pm 1.48$	3.19	$3.16 \pm 1.36$	$3.51 \pm 1.57$

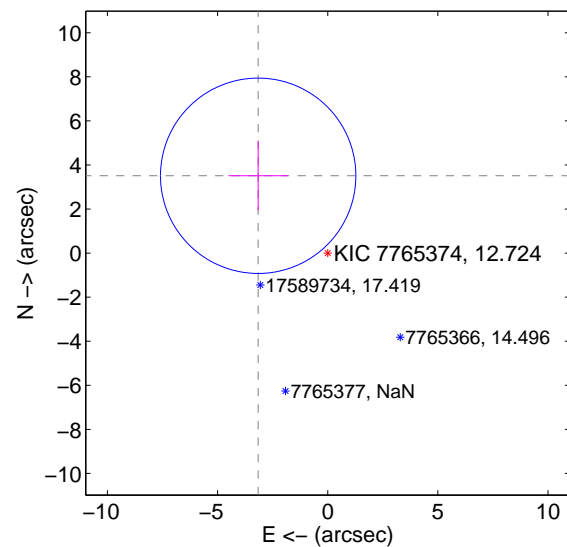
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

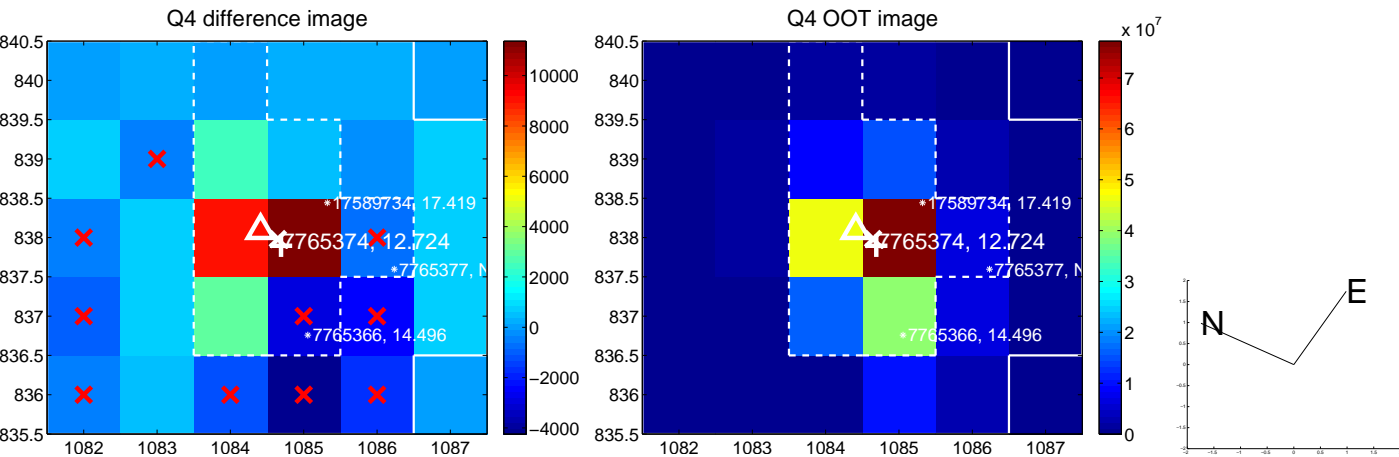
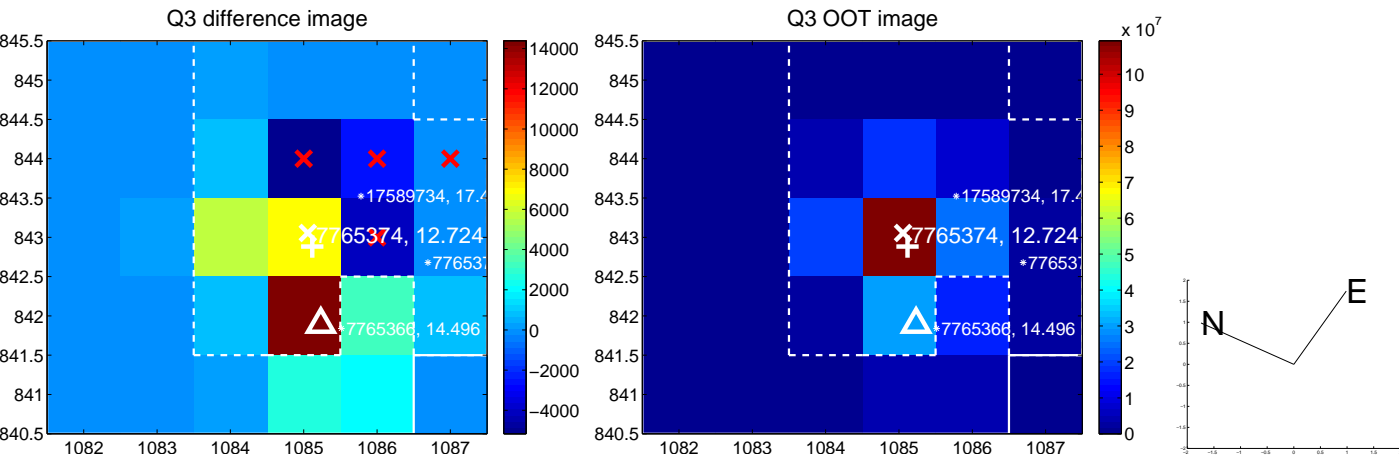
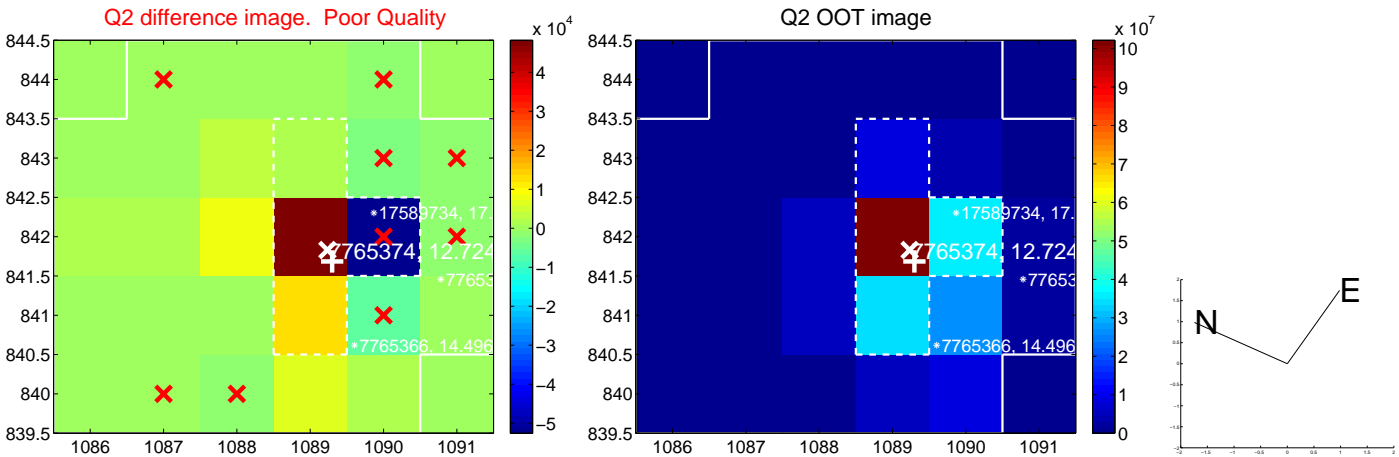
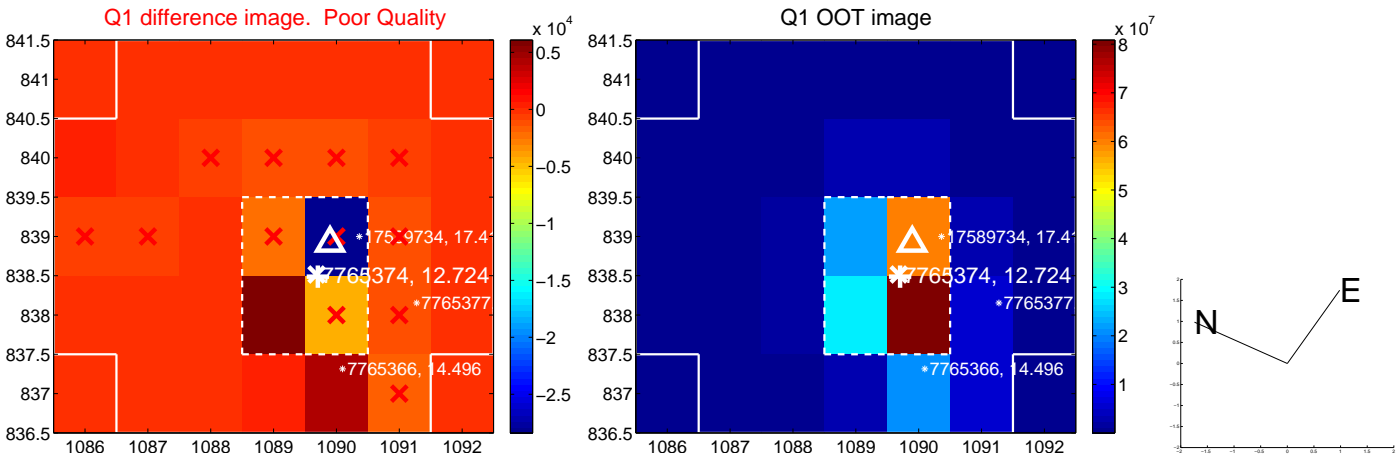


offset from photometric centroids



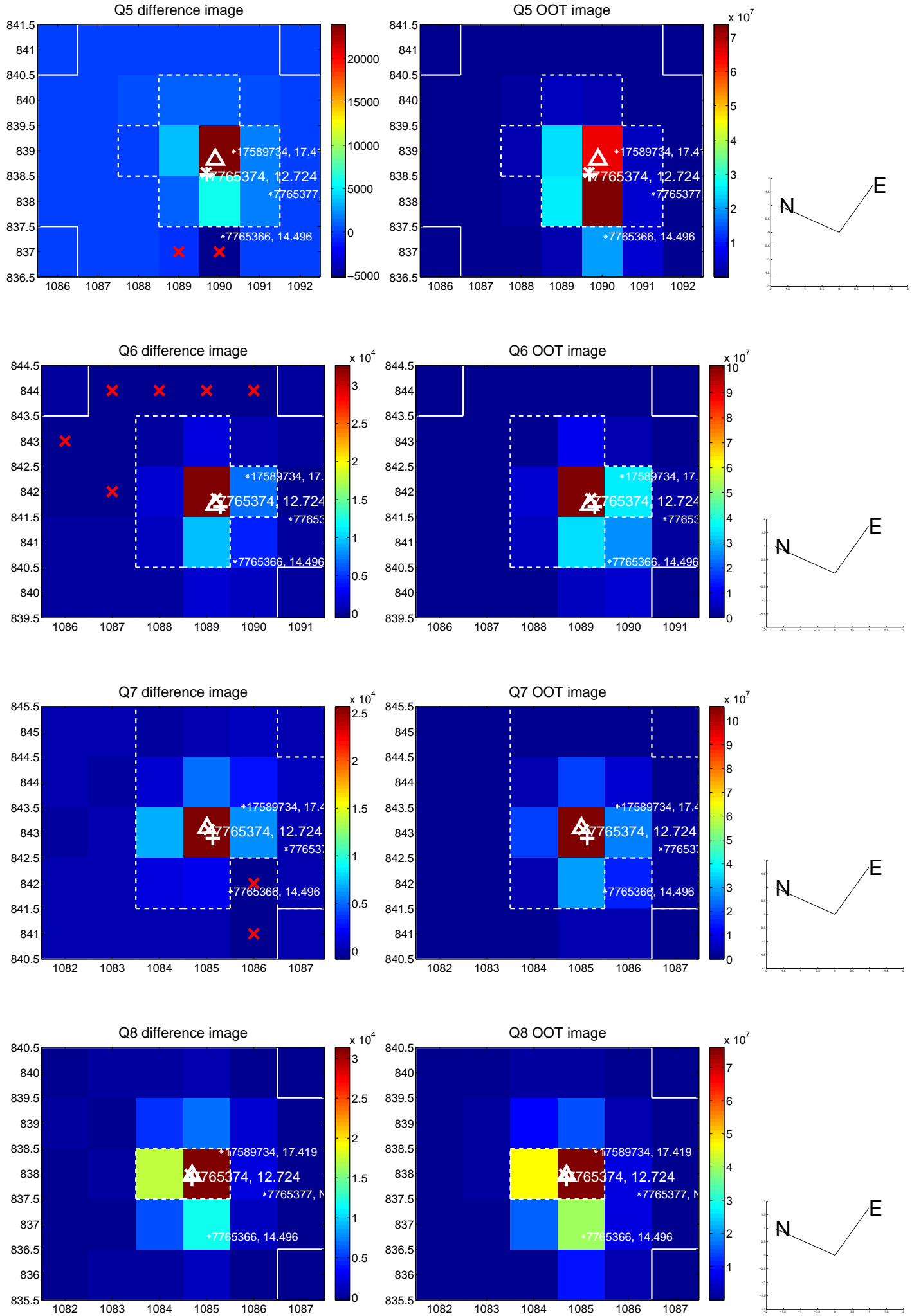
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

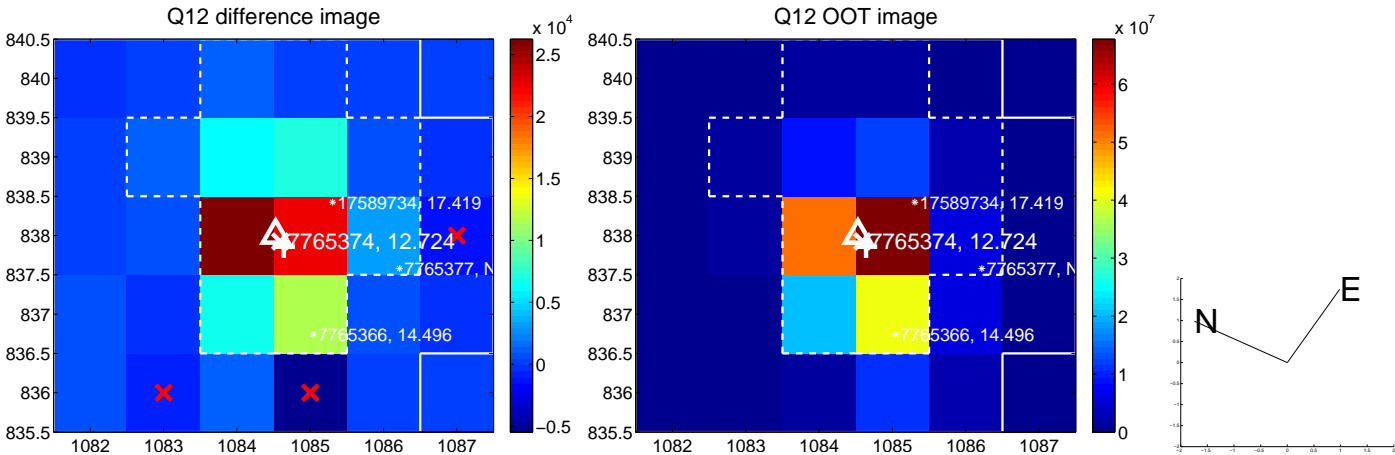
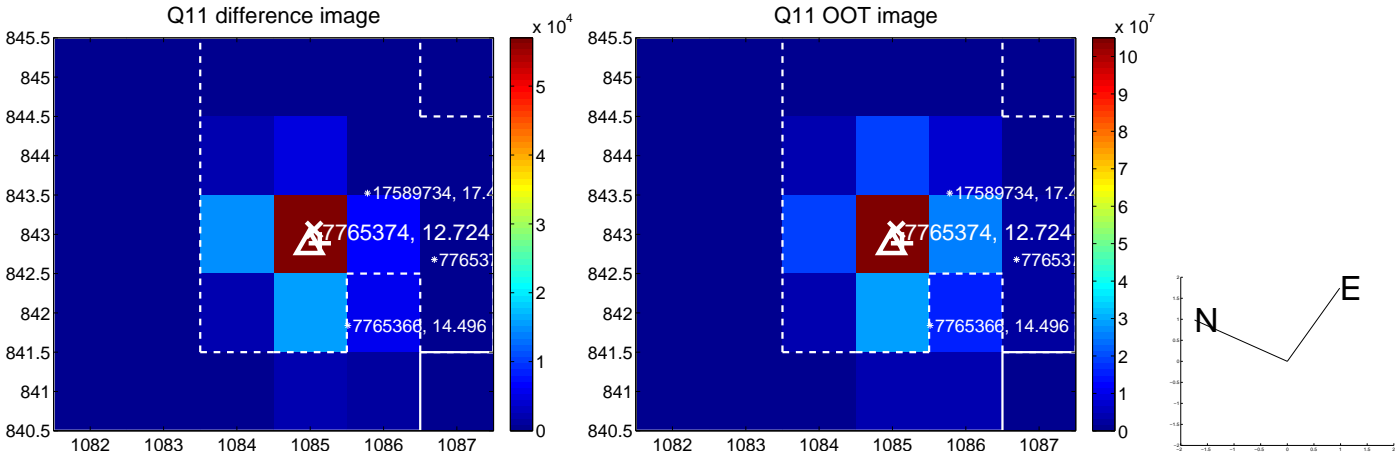
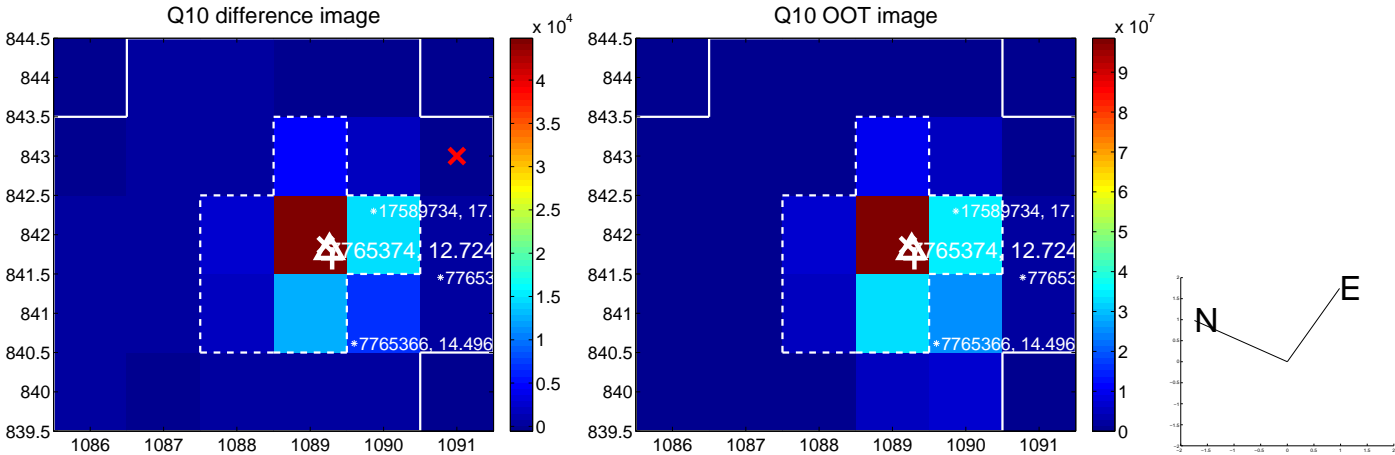
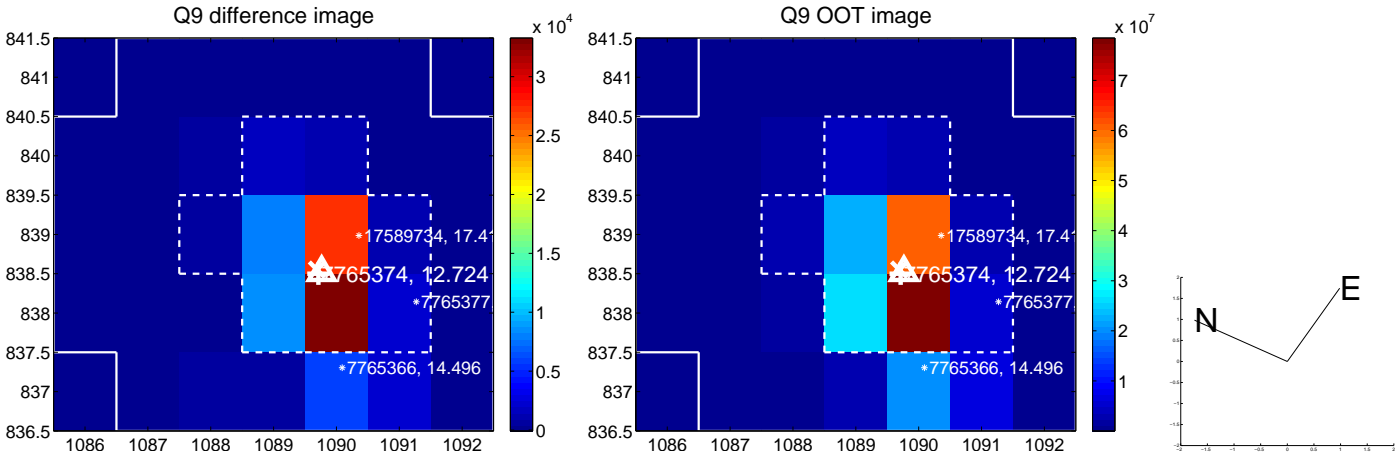




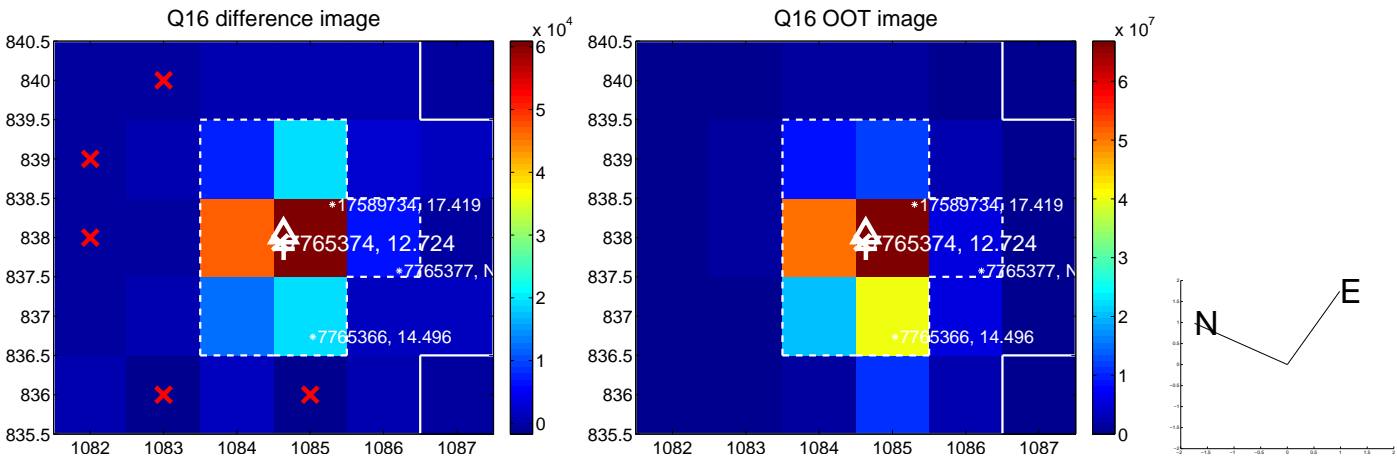
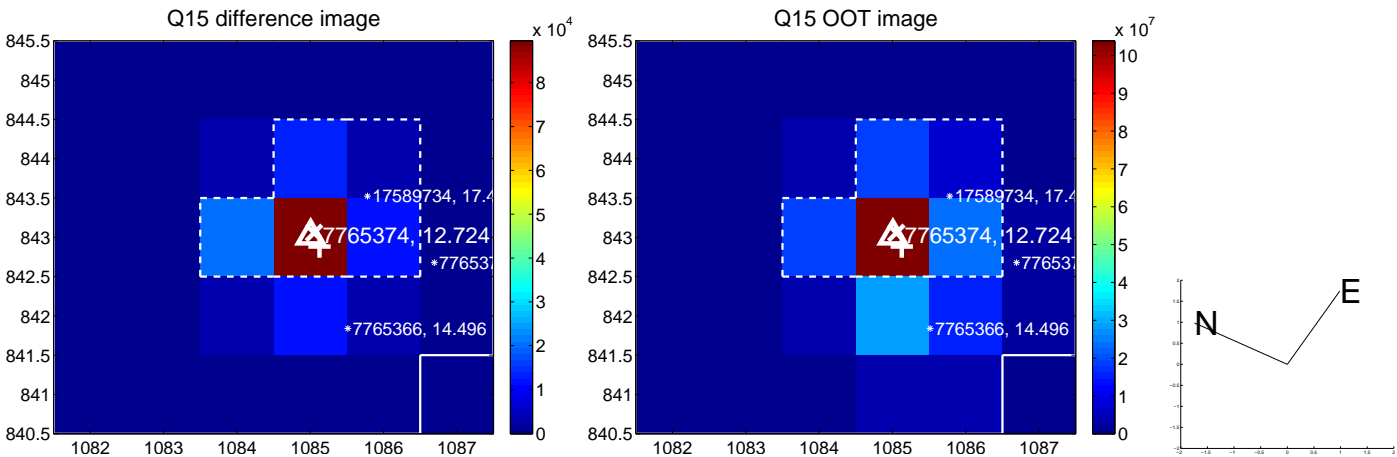
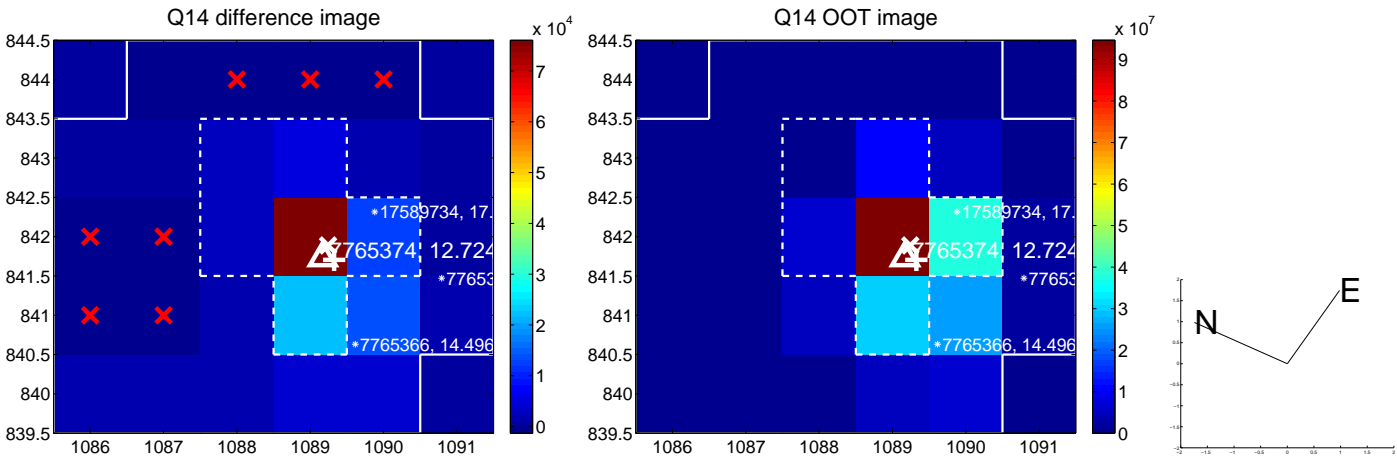
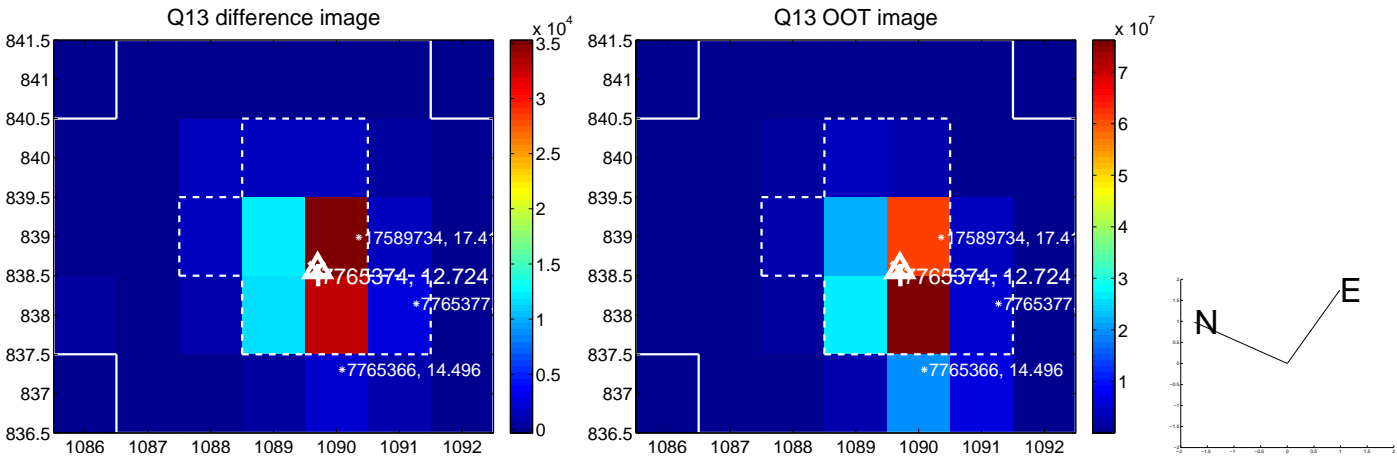
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



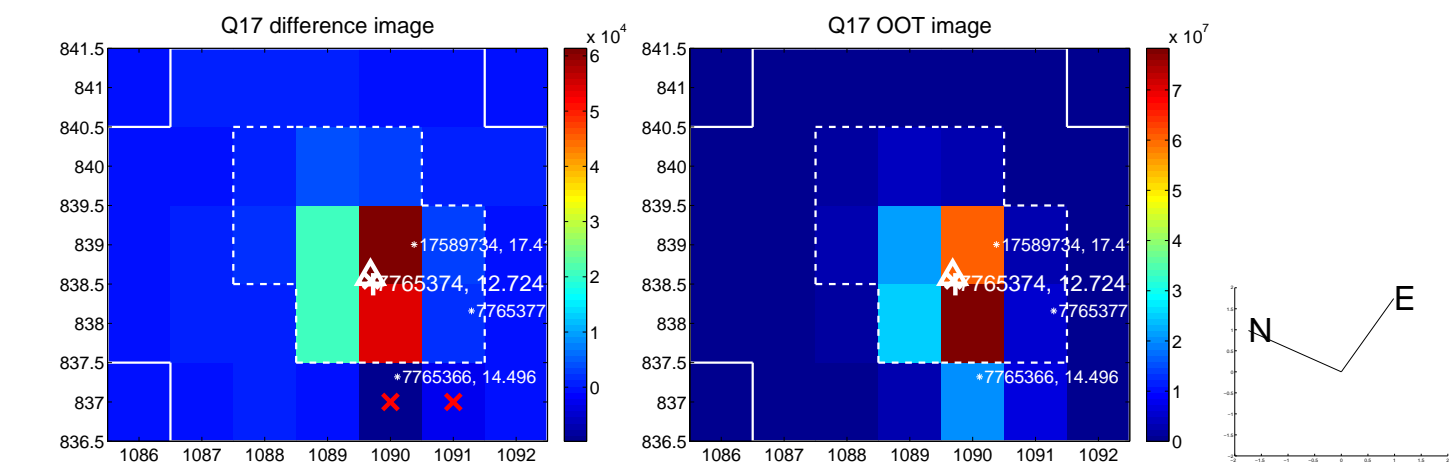
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



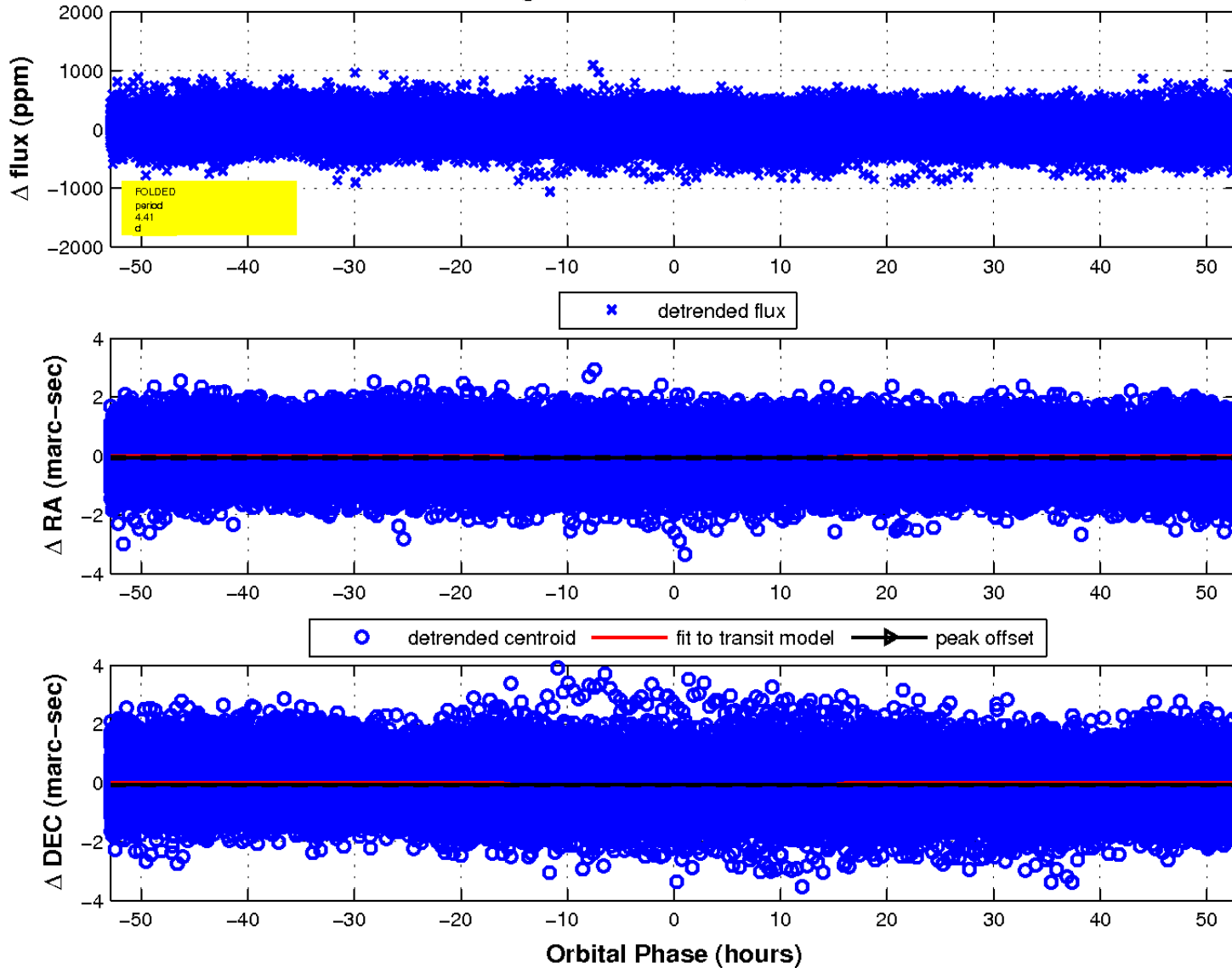
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

