

# KIC 003965242

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003965242-01	OBS	No	0.996648	131.945235	464.5	5.611	14.8	11.1	0.76	5332	1.69	1387.93
003965242-02	OBS	No	0.992167	131.569527	359.4	3.000	9.9	-1.0	0.76	5332	1.42	1396.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003965242-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
003965242-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—CENT_NOFITS

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

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

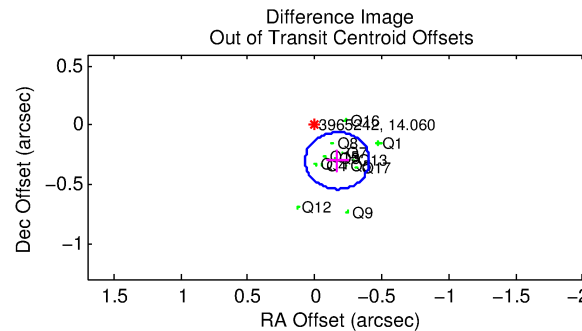
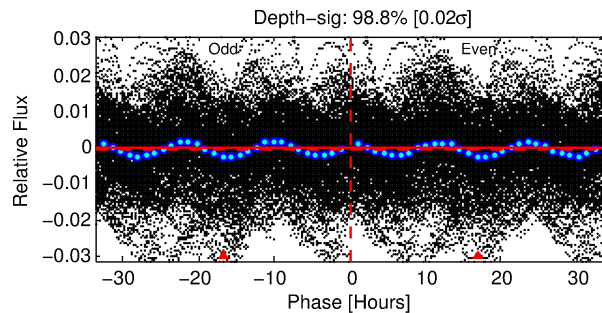
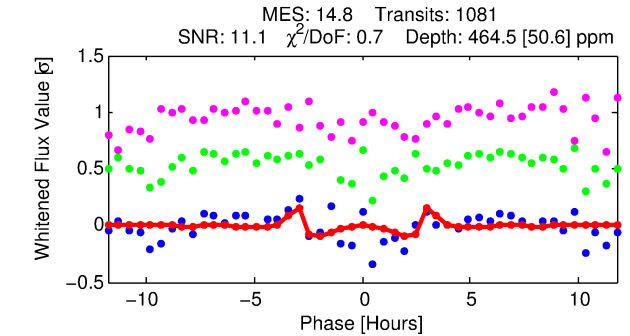
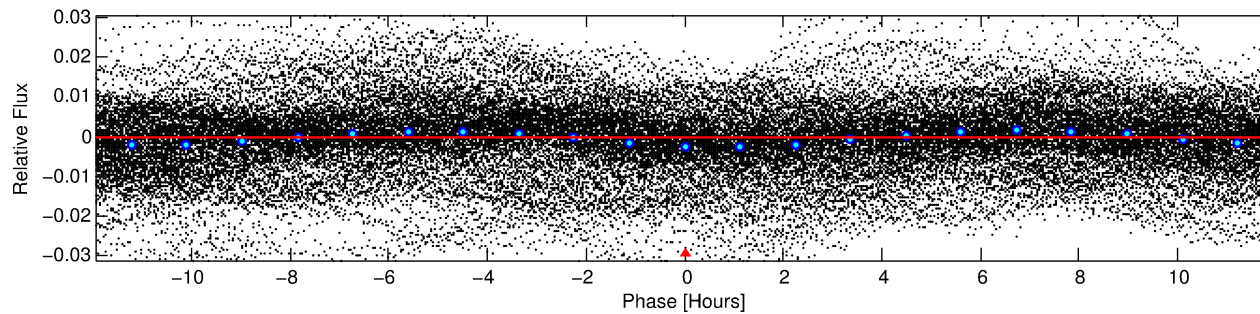
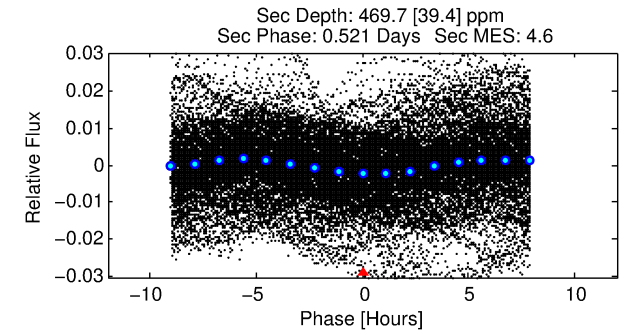
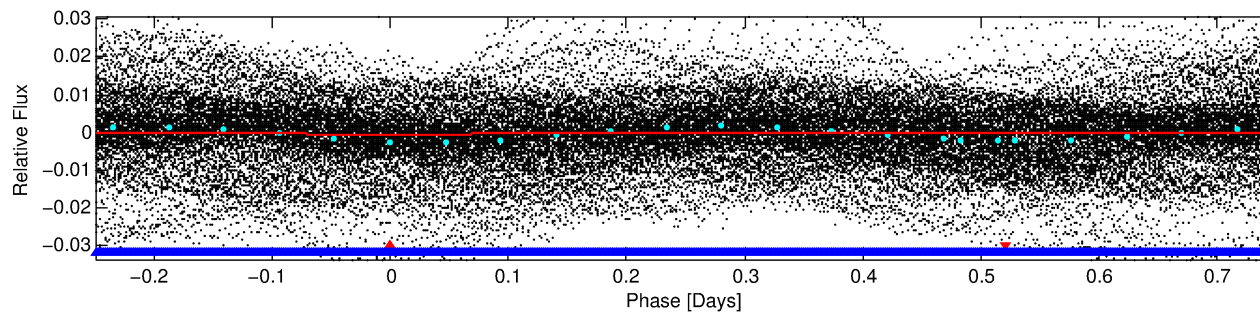
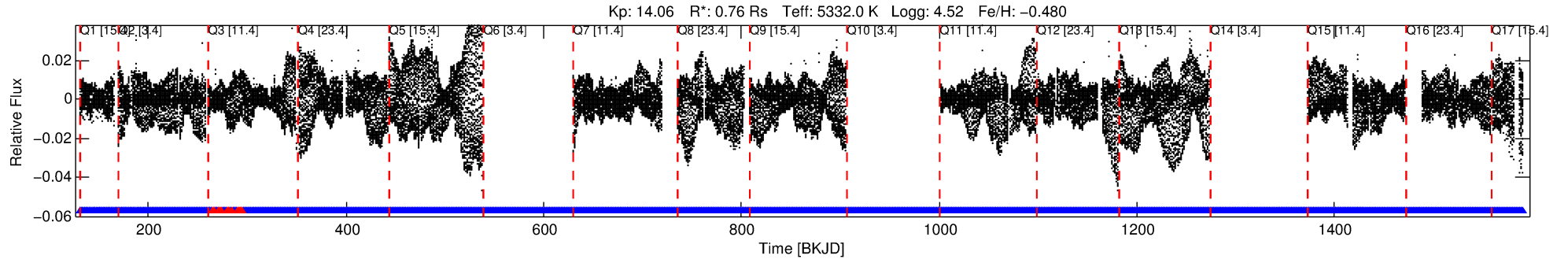
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003965242-01

No Significant Match Found

# DV One-Page Summary

KIC: 3965242 Candidate: 1 of 2 Period: 0.997 d



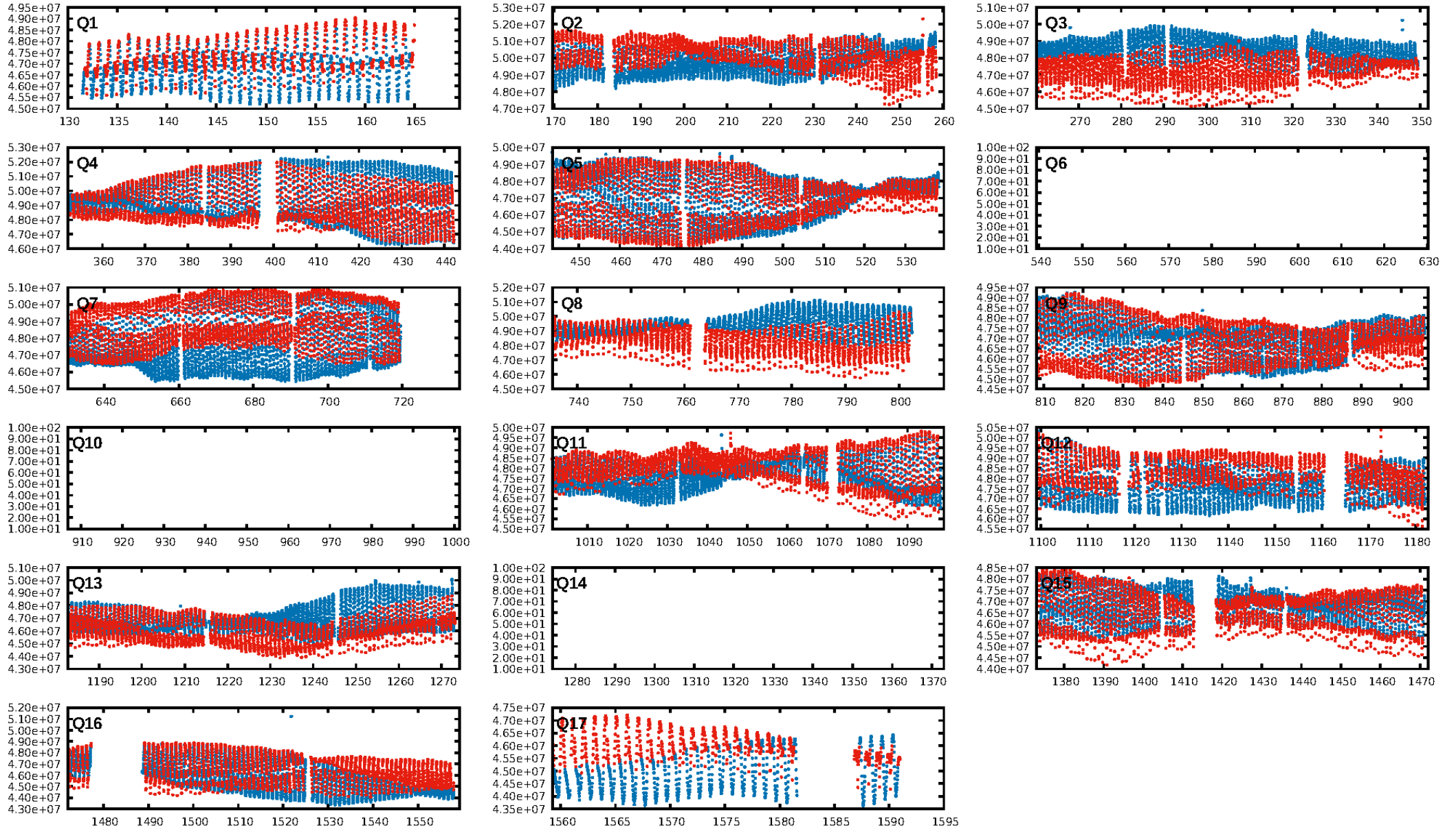
## DV Fit Results:

Period = 0.99665 [0.00001] d  
Epoch = 131.9452 [0.0011] BKJD  
Rp/R\* = 0.0203 [0.0049]  
a/R\* = 1.39 [0.65]  
b = 0.55 [1.23]  
Seff = 1387.93 [308.38]  
Teff = 1556 [86] K  
Rp = 1.69 [0.47] Re  
a = 0.0174 [0.0021] AU  
Ag = 27.47 [14.46] [1.83σ]  
Teffp = 5509 [697] K [5.63σ]

## DV Diagnostic Results:

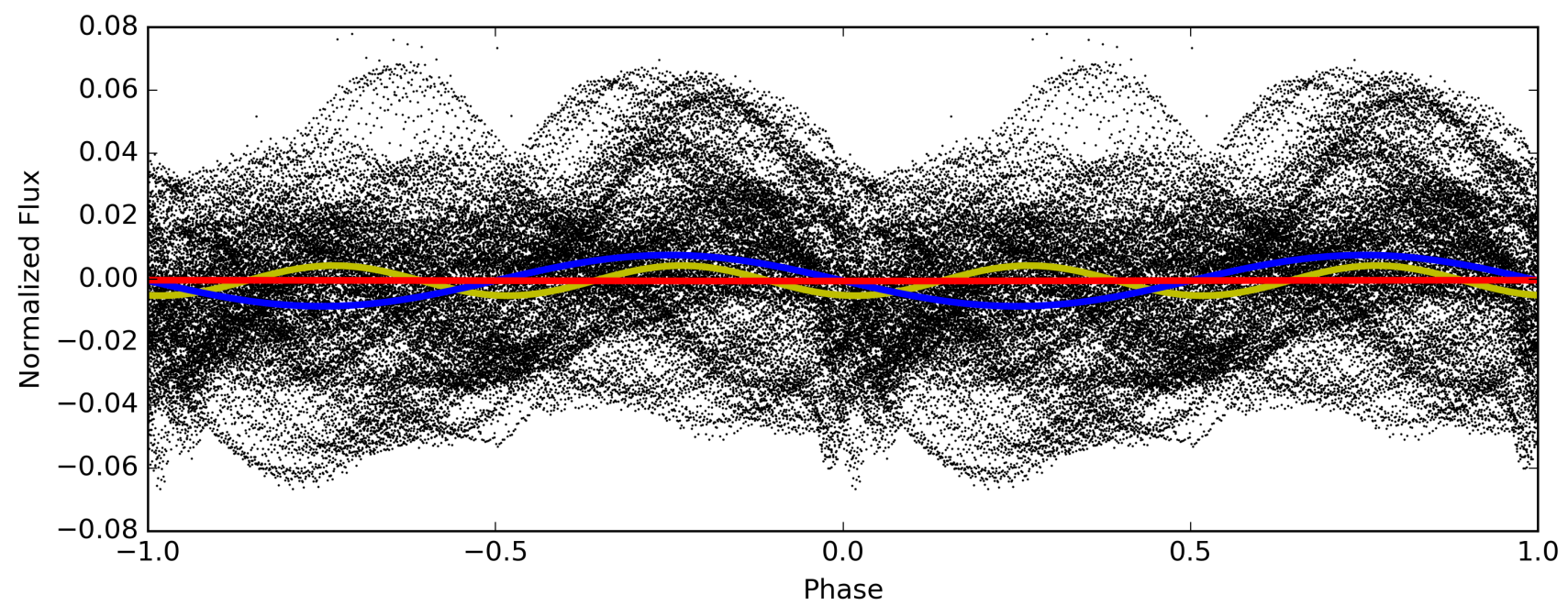
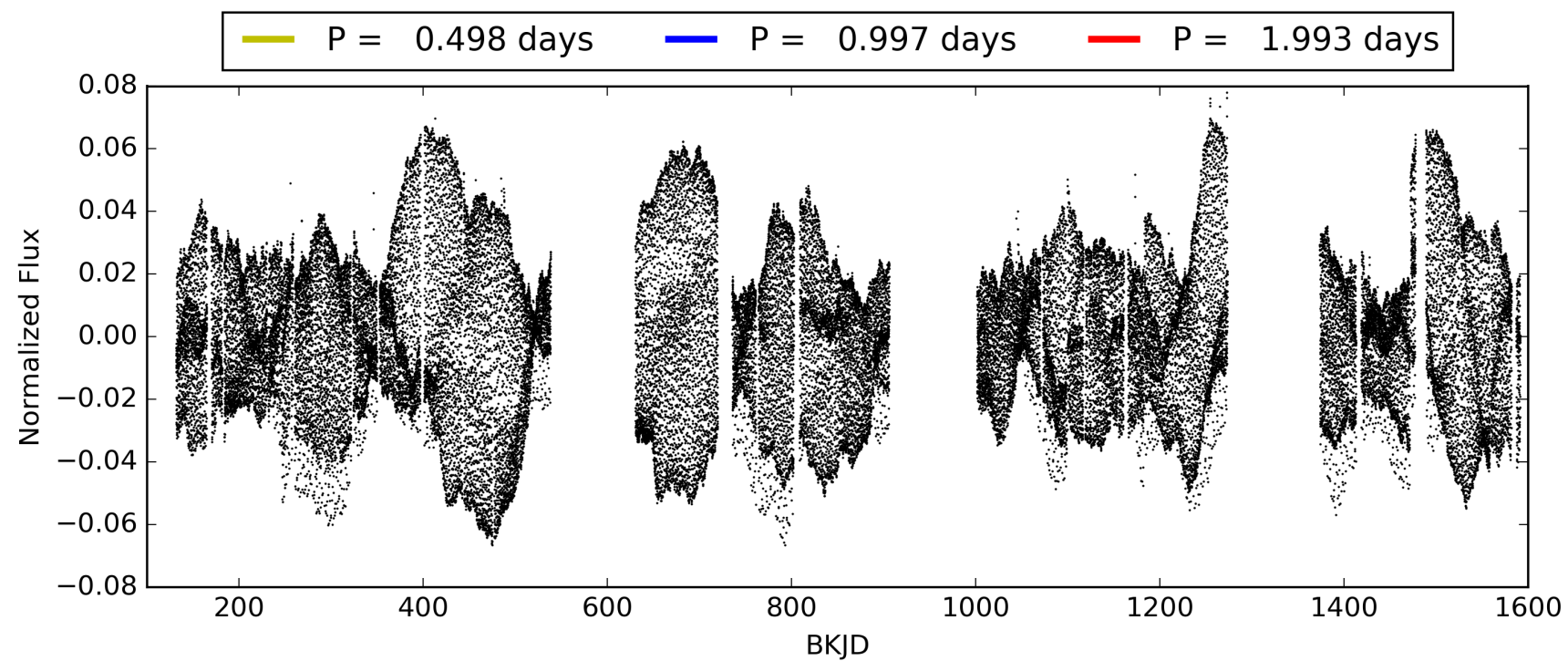
ShortPeriod-sig: 1.3% [0.02σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [1006/1019]  
**GhostDiagnostic-chr: 0.01856**  
Centroid-sig: 0.0%  
Centroid-so: 0.812 arcsec [5.67σ]  
OotOffset-rm: 0.344 arcsec [4.29σ]  
KicOffset-rm: 0.255 arcsec [3.21σ]  
OotOffset-st: 0/4/4/5 [13]  
KicOffset-st: 0/4/4/5 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 0.00 [0/14]

# TCE 003965242-01, PDC Light Curves



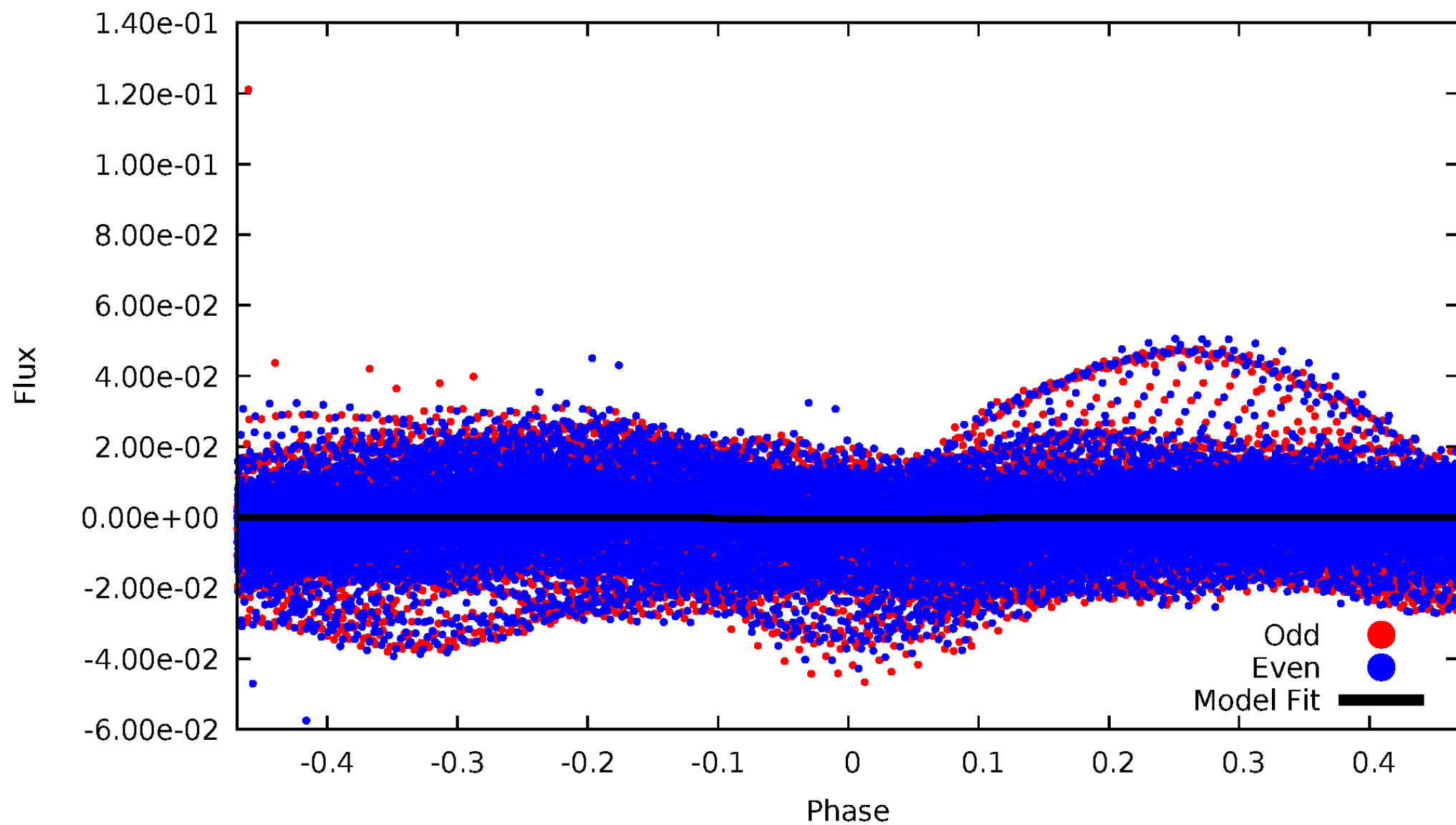


TCE 003965242-01



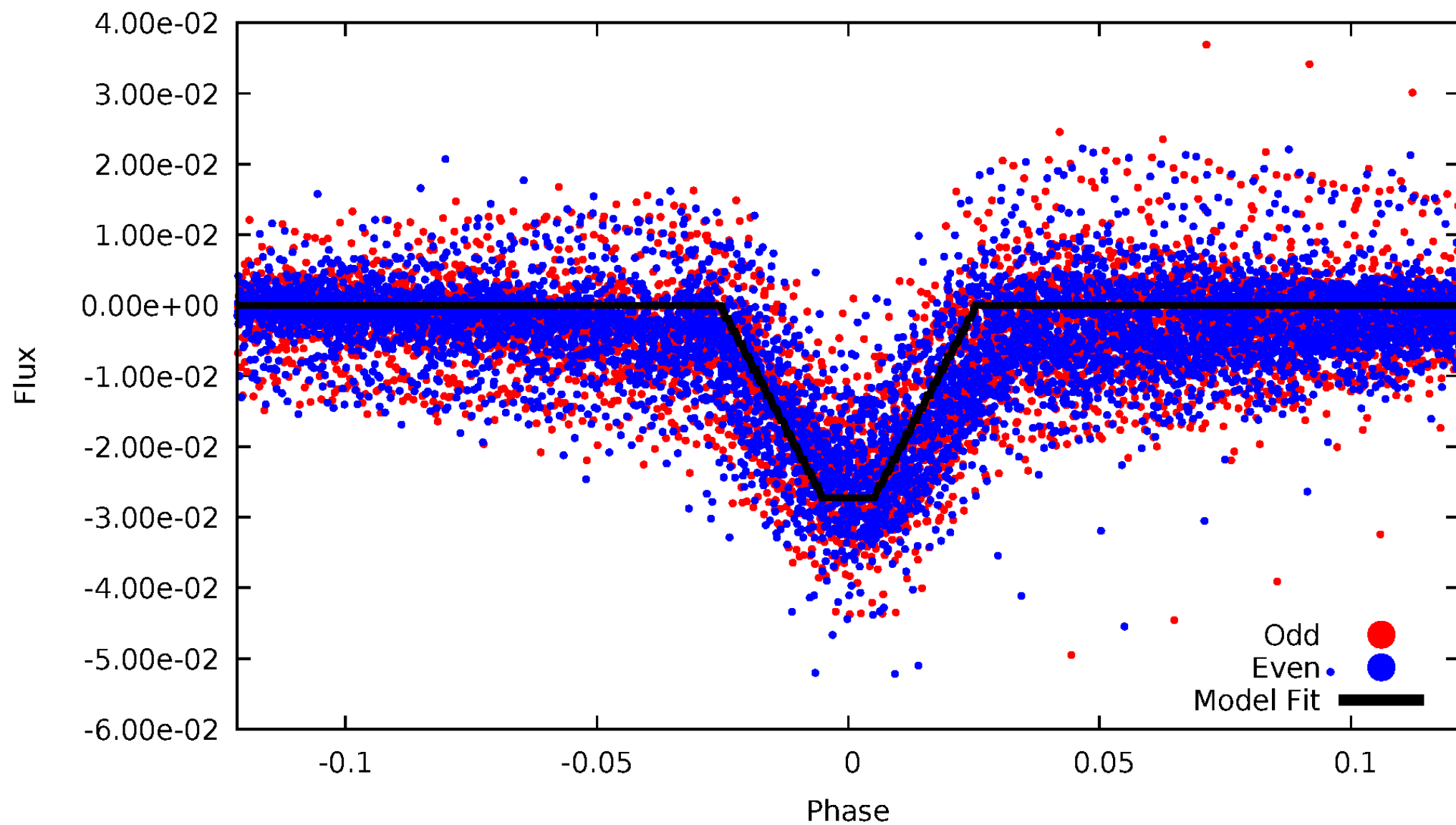
# DV Odd/Even

TCE 003965242-01



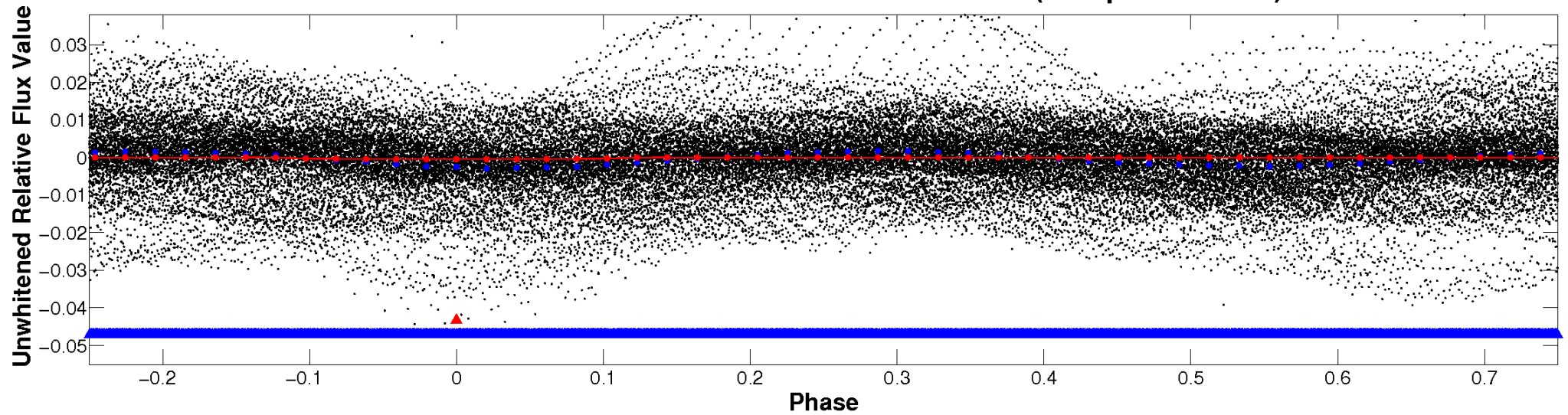
# ALT Odd/Even

TCE 003965242-01

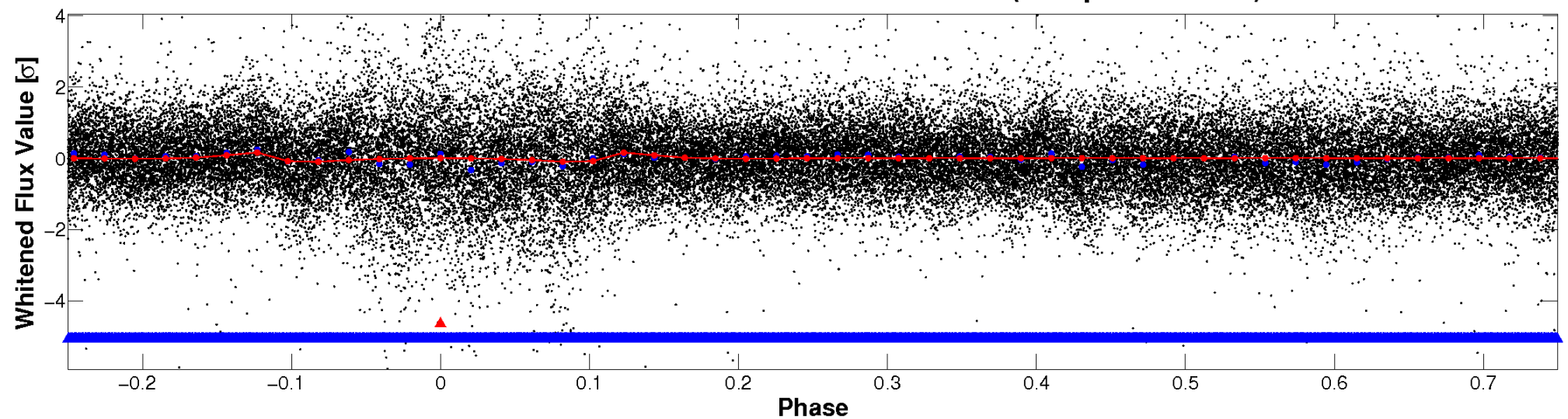


# Non-Whitened Vs. Whitened Light Curve

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



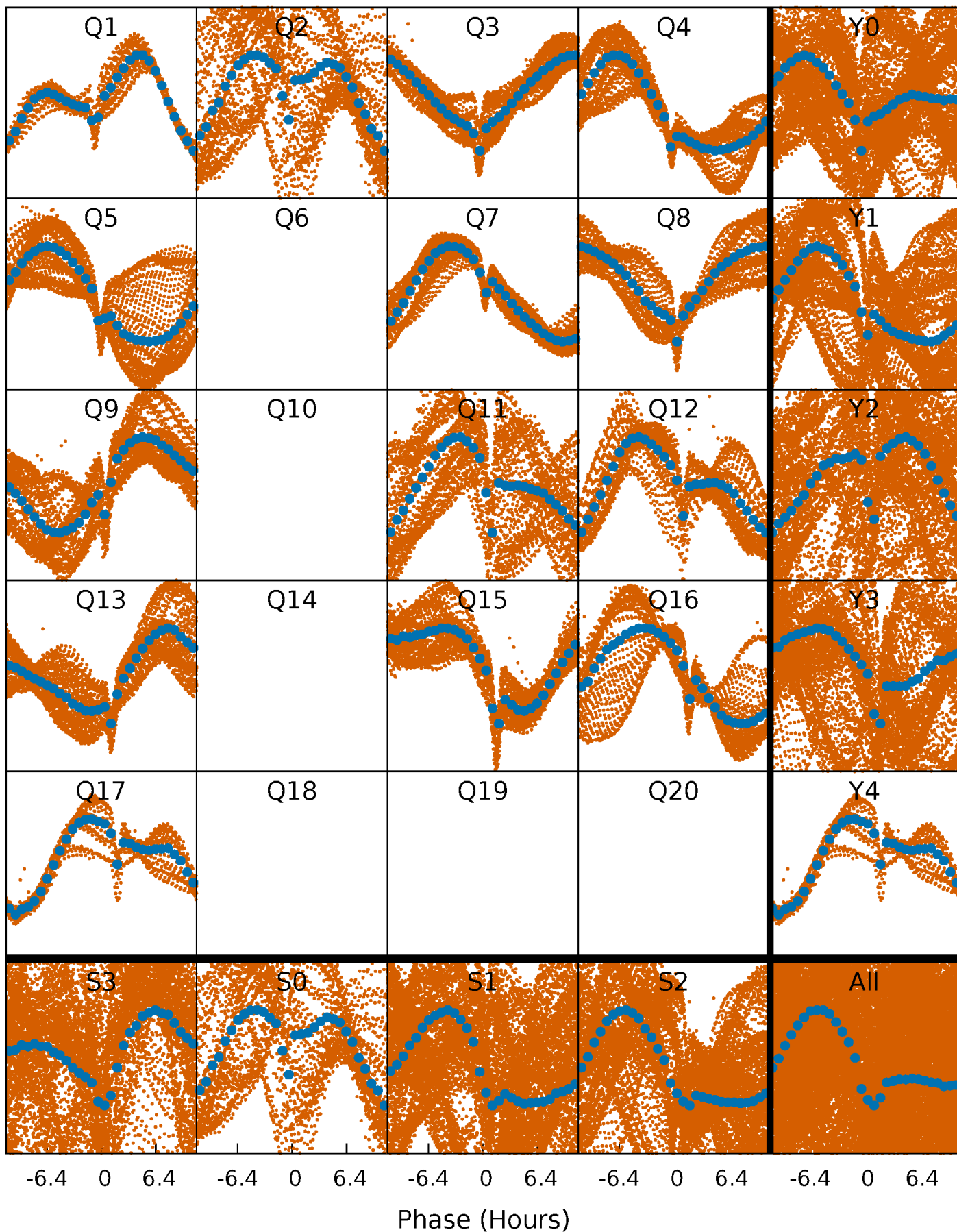
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

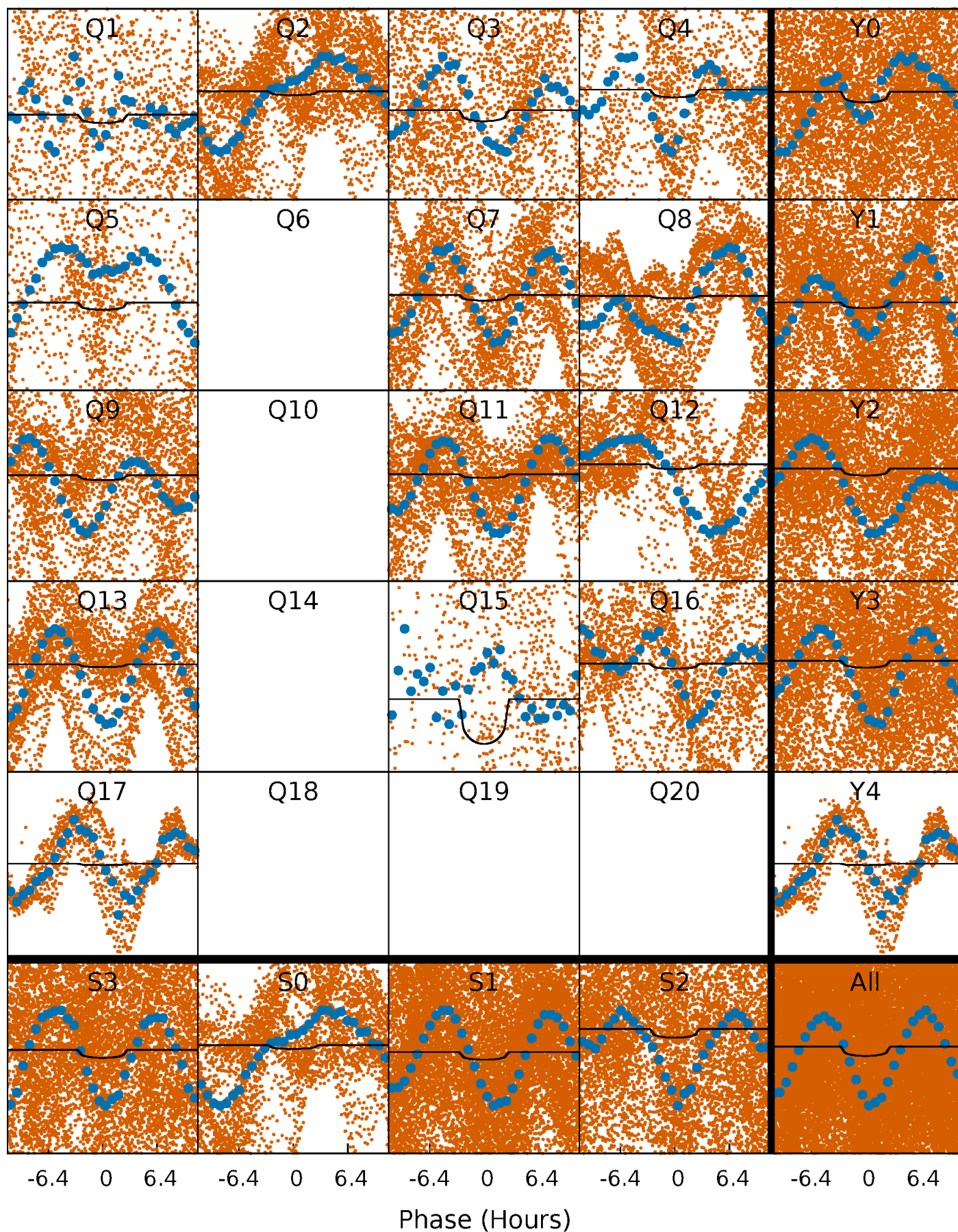
TCE 003965242-01   P= 0.996648 Days    $T_0=131.945235$  (BKJD)





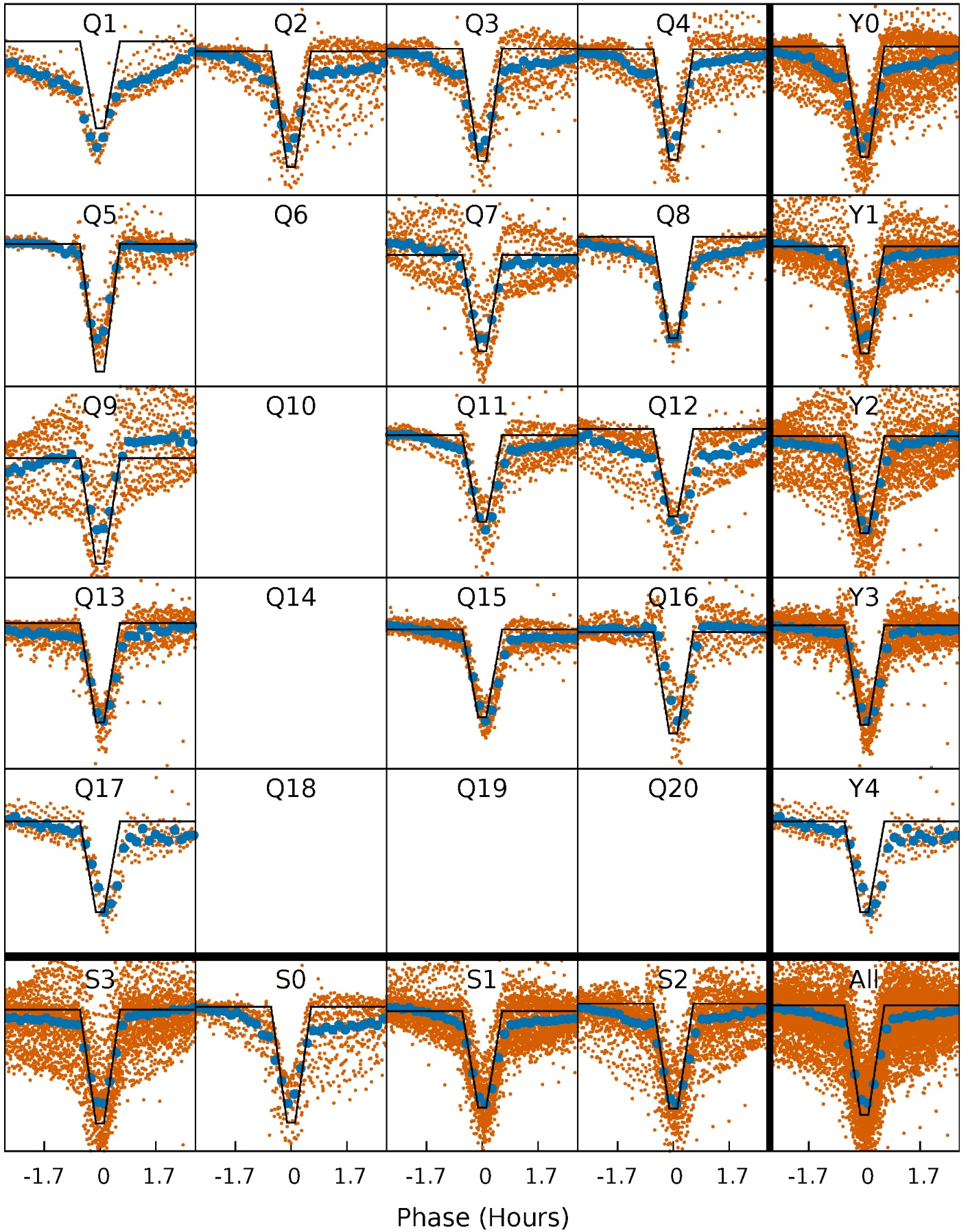
# DV Quarter-Phased Transit Curves

TCE 003965242-01 P= 0.996648 Days  $T_0=131.945235$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

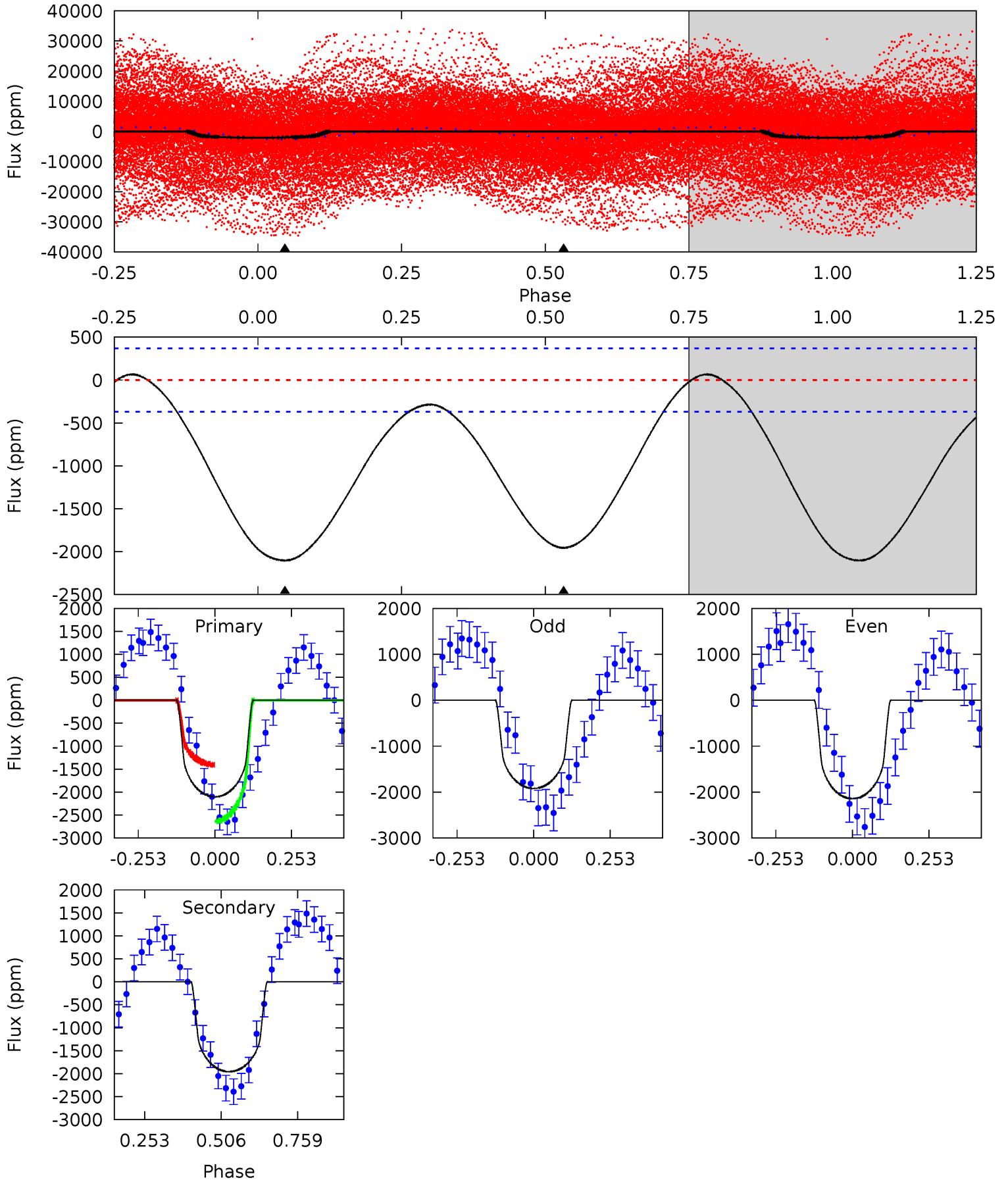
TCE 003965242-01 P= 0.996716 Days  $T_0=131.917654$  (BKJD)



# DV Model-Shift Uniqueness Test

003965242-01, P = 0.996648 Days, E = 130.948587 Days

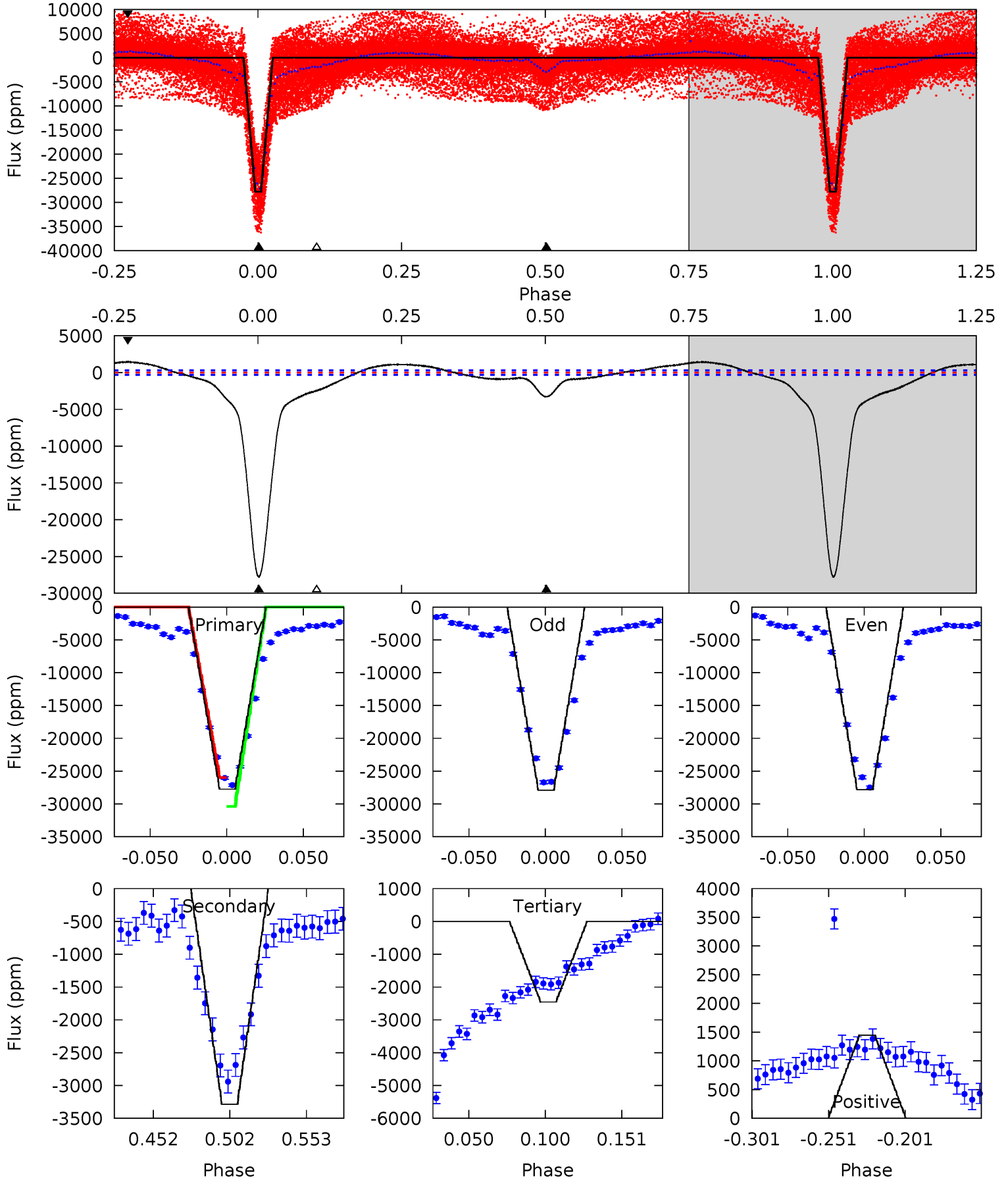
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.9	23.1	0	0	4.37	1.14	1.88	24.9	24.9	23.1	23.1	1.32	2.63	0.03	7.61



# Alt Model-Shift Uniqueness Test

003965242-01, P = 0.996716 Days, E = 130.920938 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
426.9	50.5	37.7	22.3	4.71	1.96	19.1	389.1	404.6	12.8	28.3	0.60	0.99	0.05	33.5





### Stellar Parameters For KIC 003965242

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5332^{+159}_{-159}$	$4.524^{+0.108}_{-0.081}$	$-0.480^{+0.300}_{-0.300}$	$0.762^{+0.100}_{-0.090}$	$0.708^{+0.104}_{-0.045}$	$2.254^{+1.005}_{-0.588}$
	+3%/-3%	+2%/-2%	+62%/-62%	+13%/-12%	+15%/-6%	+45%/-26%
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 003965242-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1956 \pm 85$	$1.67^{+0.43}_{-0.43}$	$2166^{+93}_{-90}$	$8047^{+1693}_{-986}$	$118^{+98}_{-43}$
Alt.	$-3285 \pm 65$	$13.68^{+1.21}_{-1.02}$	$2168^{+100}_{-100}$	$3519^{+85}_{-86}$	$2.963^{+0.481}_{-0.396}$

$T_{\text{max}}$  = 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

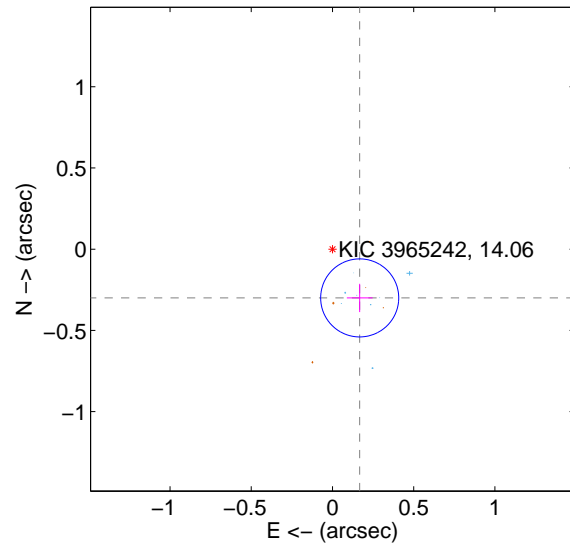
Supplemental centroid analysis for 003965242-01. Kepler magnitude: 14.06. Transit SNR 11.13

There are 8 quarters with good PRF difference image offsets

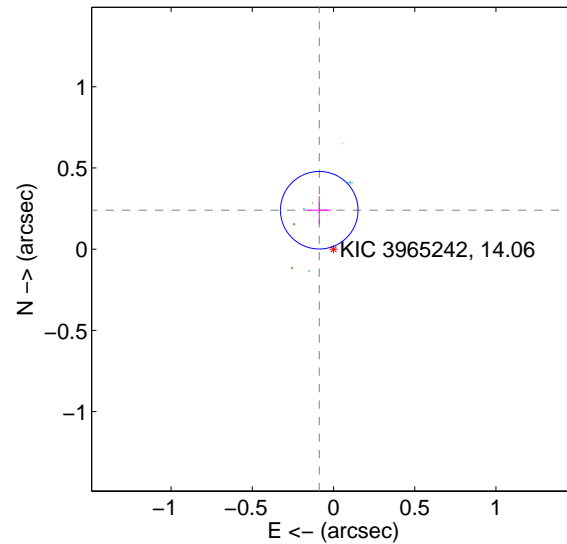
The direct PRF centroid is offset from the target star catalog position by about 0.78 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.344 \pm 0.080$	4.29	$-0.168 \pm 0.079$	$-0.300 \pm 0.087$
PRF-fit source offset from KIC position	$0.255 \pm 0.080$	3.21	$0.088 \pm 0.072$	$0.240 \pm 0.086$
photometric centroid source offset	$0.81 \pm 0.14$	5.67	$0.73 \pm 0.14$	$0.35 \pm 0.15$

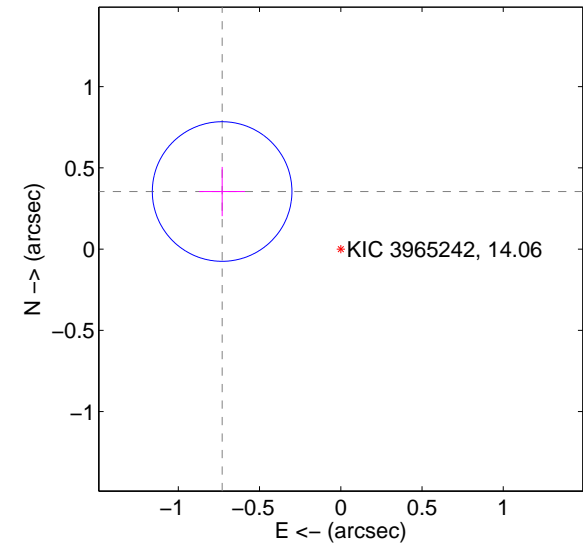
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

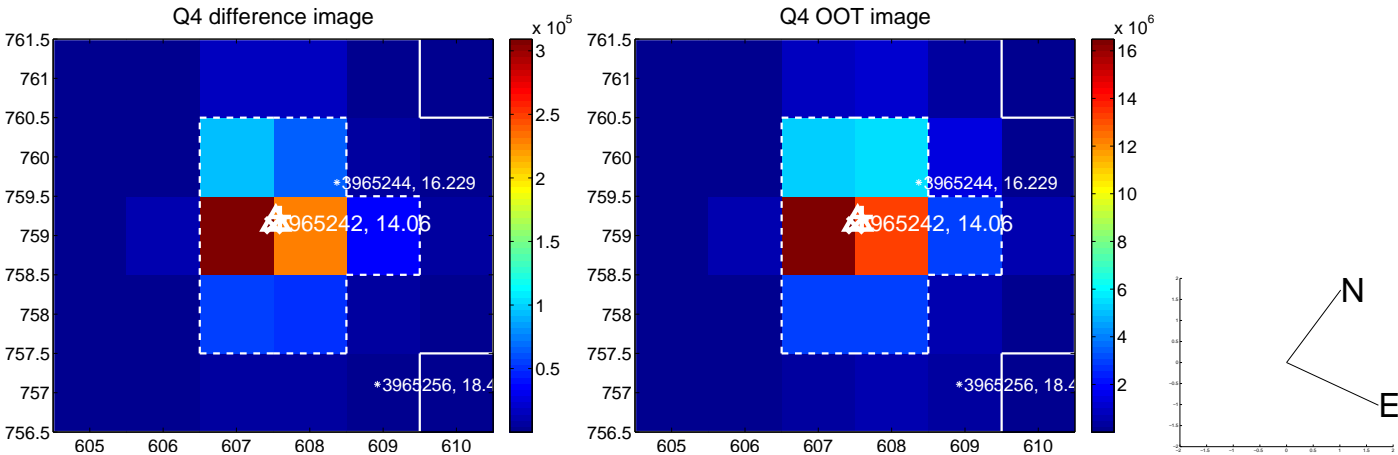
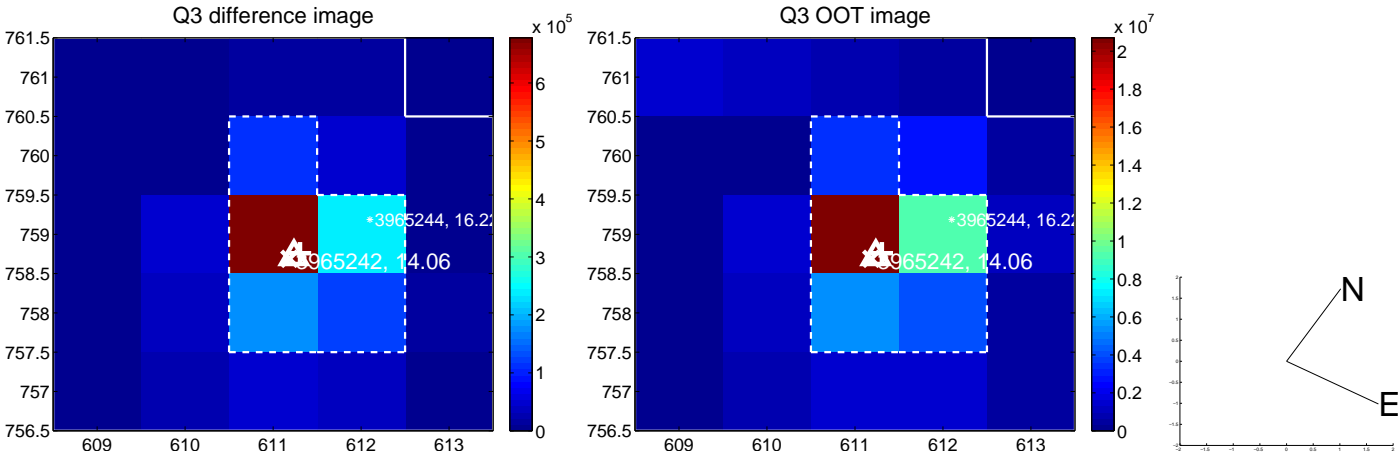
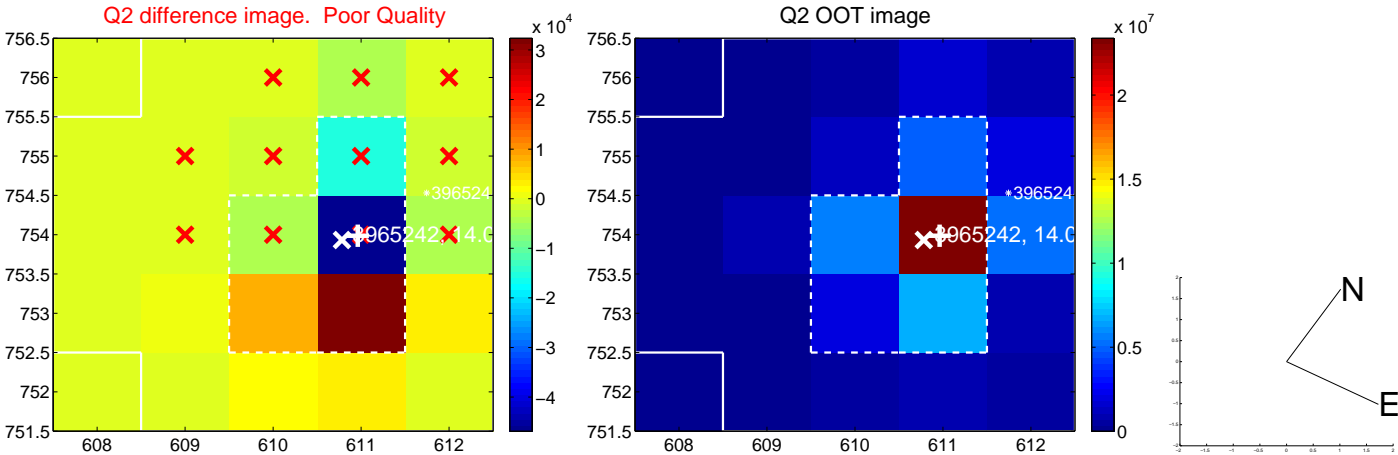
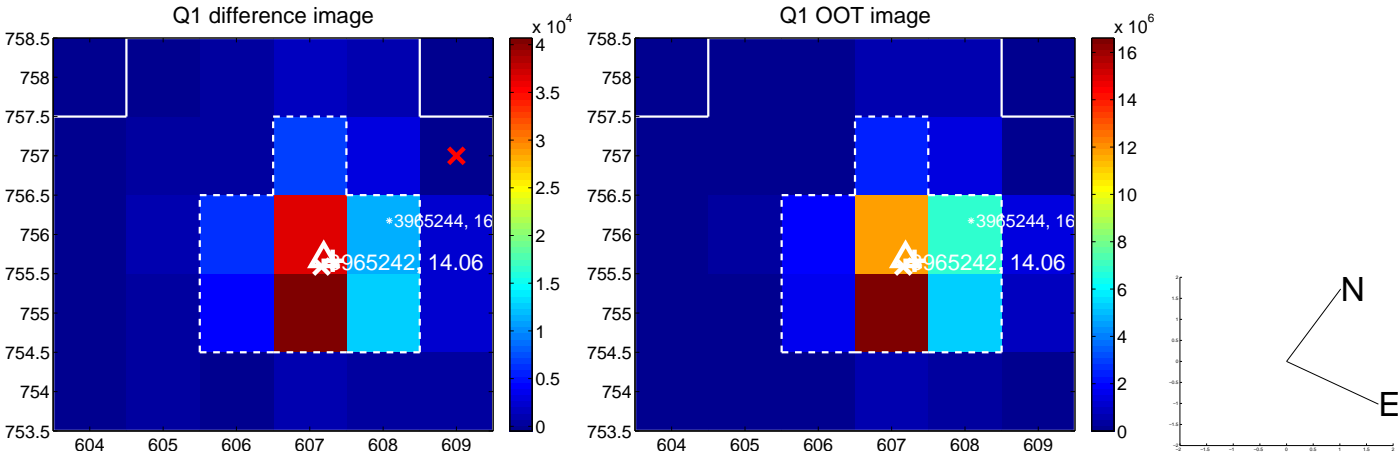


offset from photometric centroids

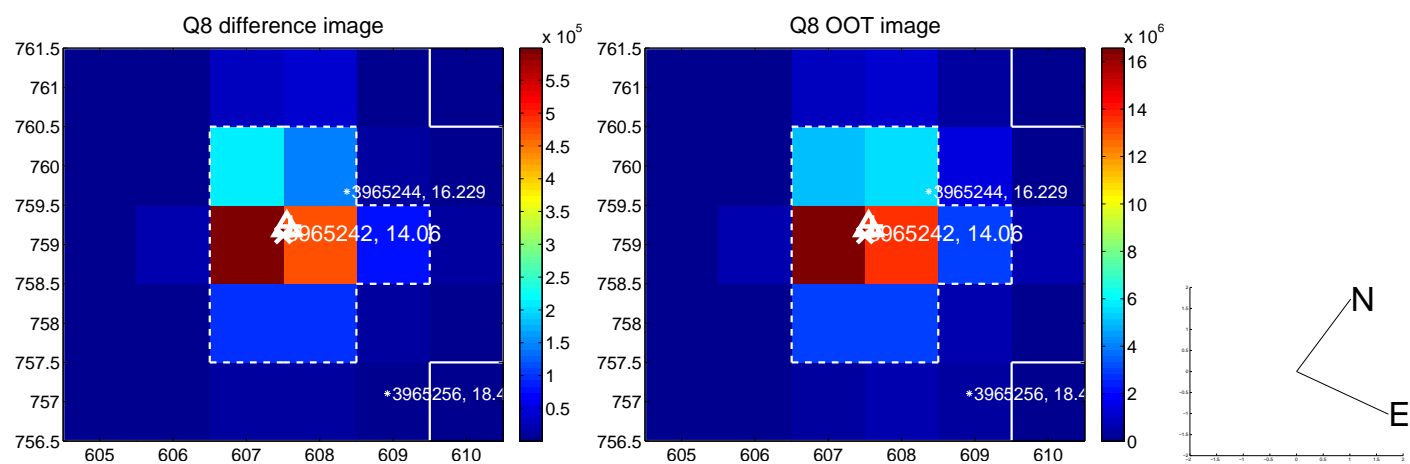
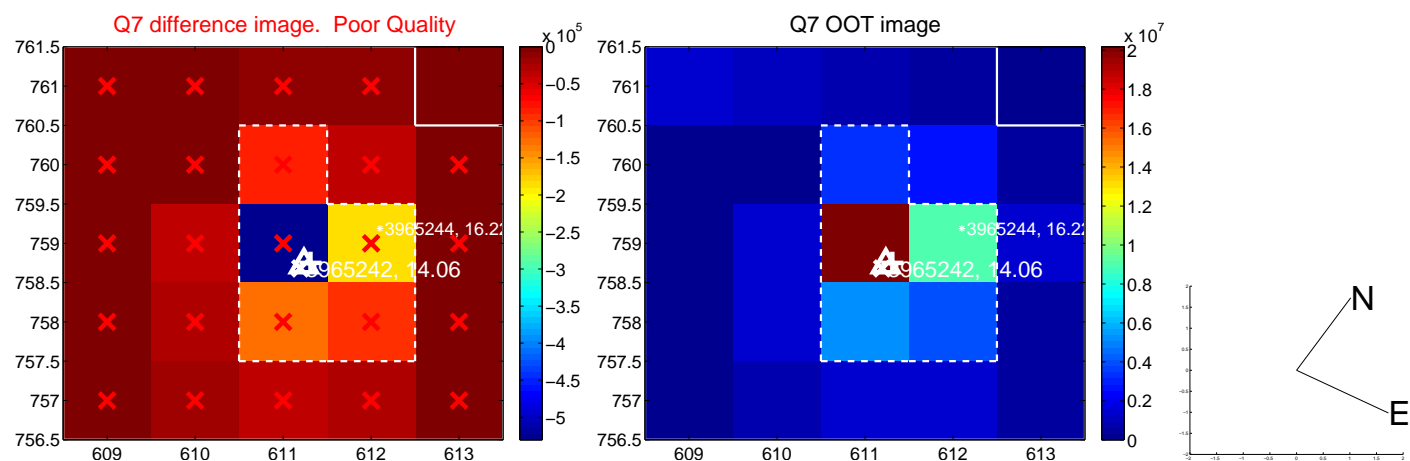
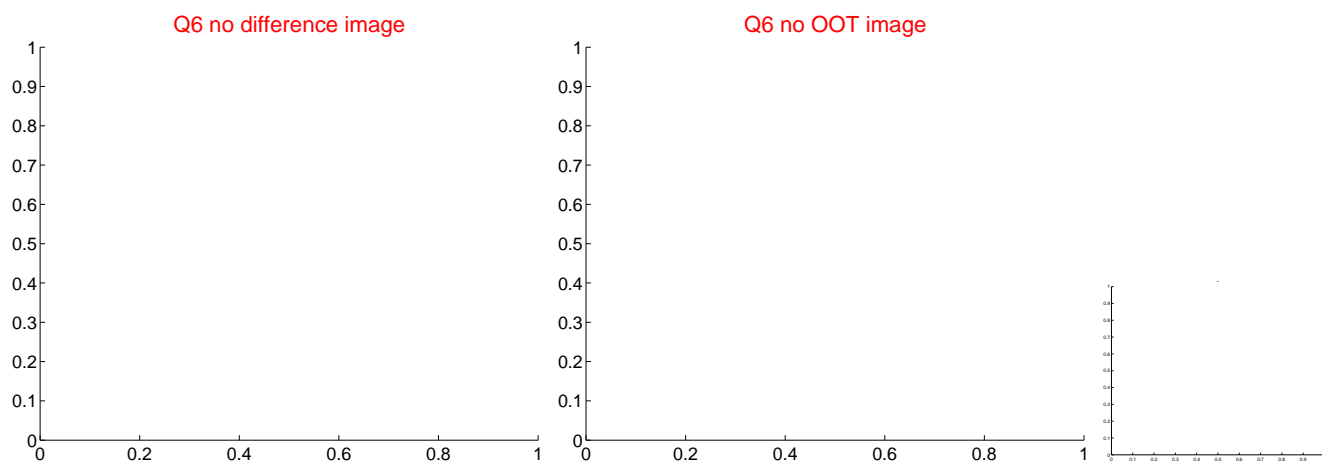
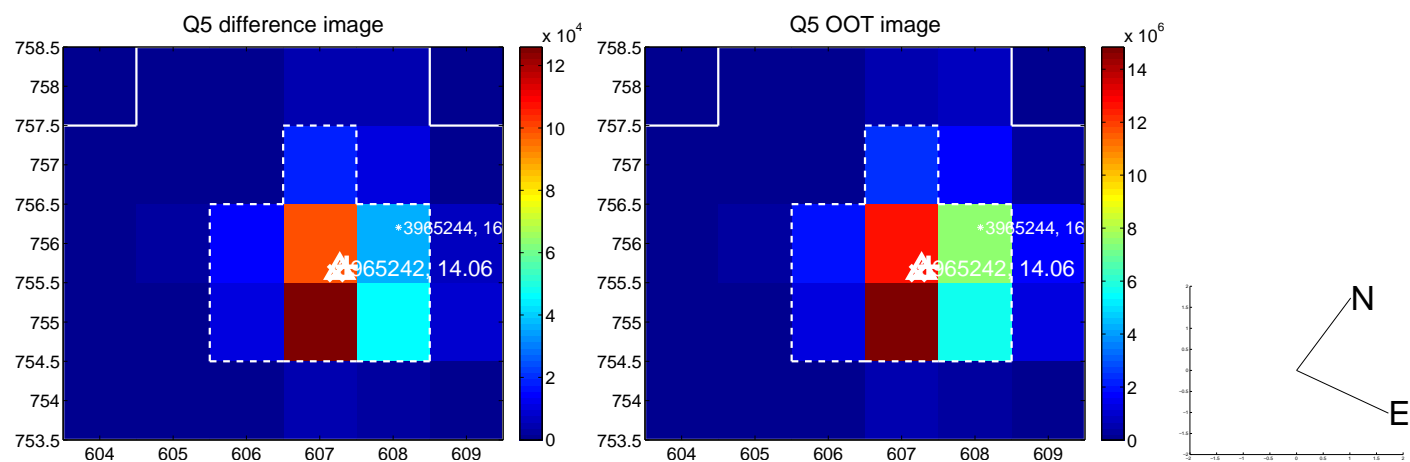


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

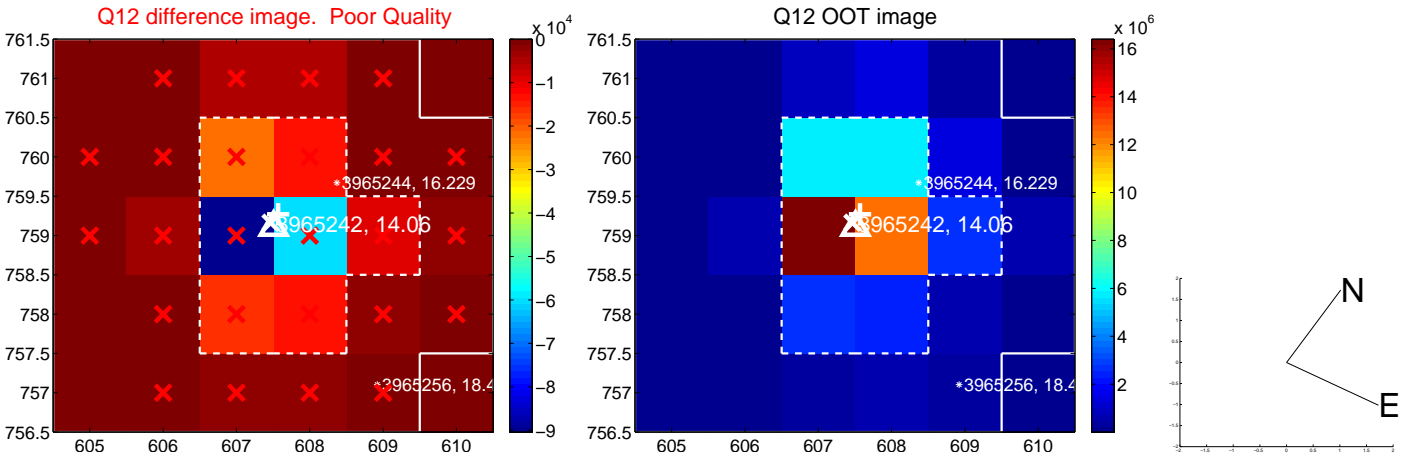
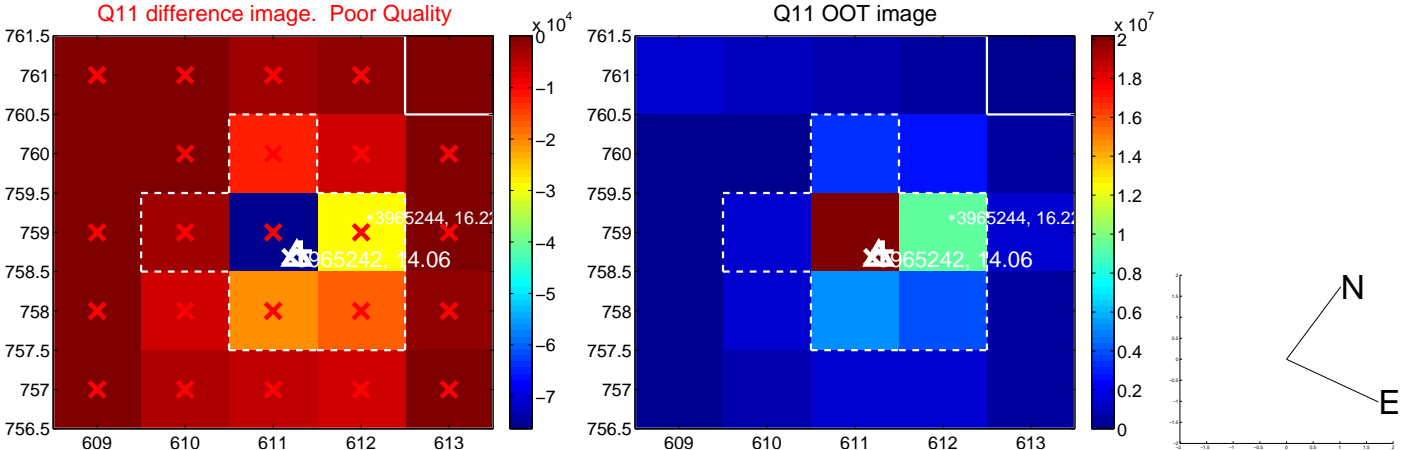
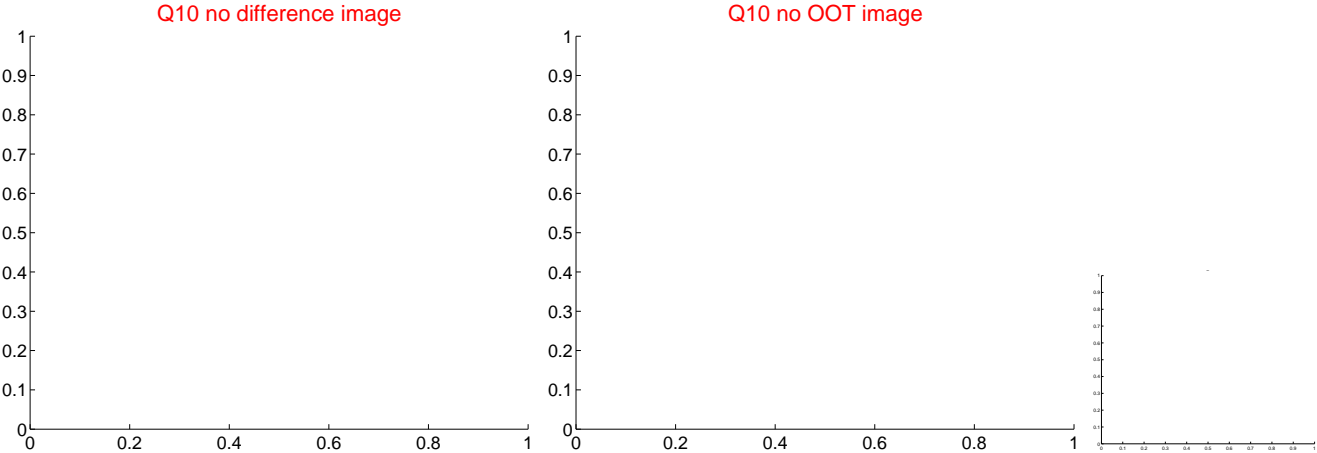
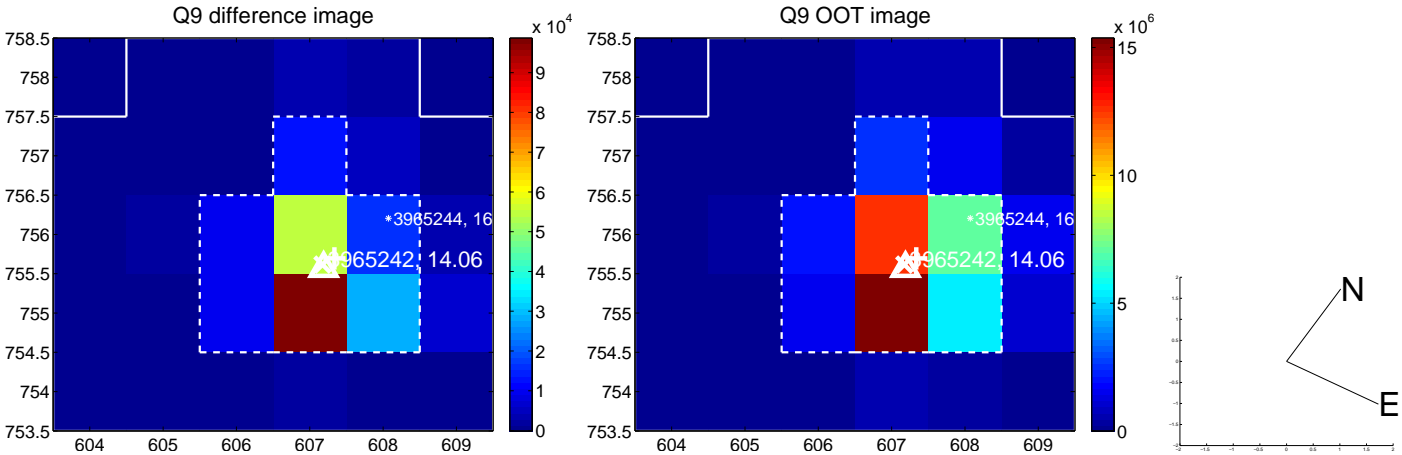


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

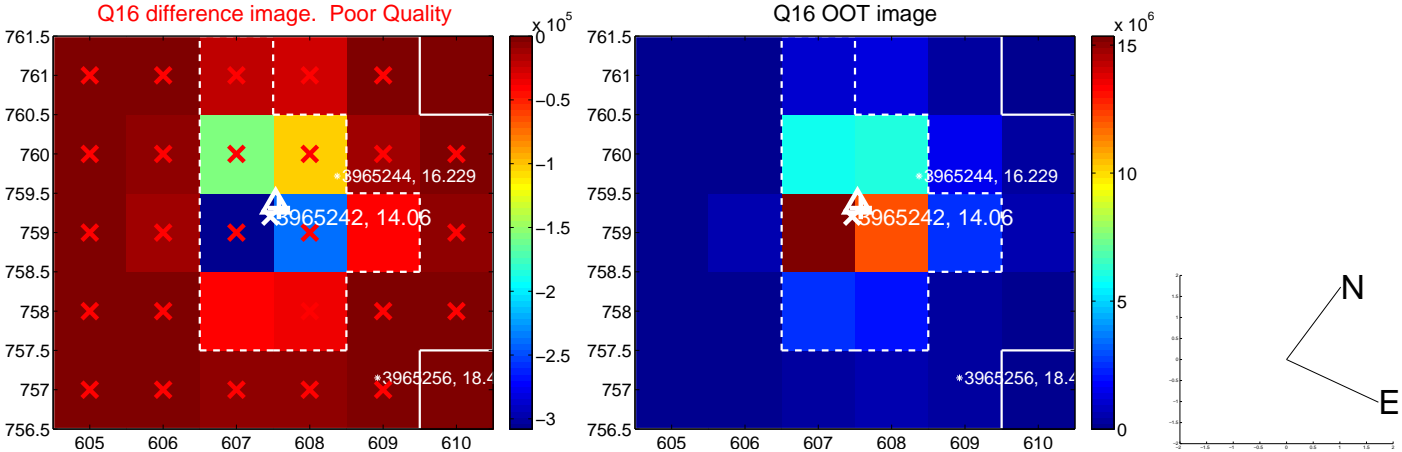
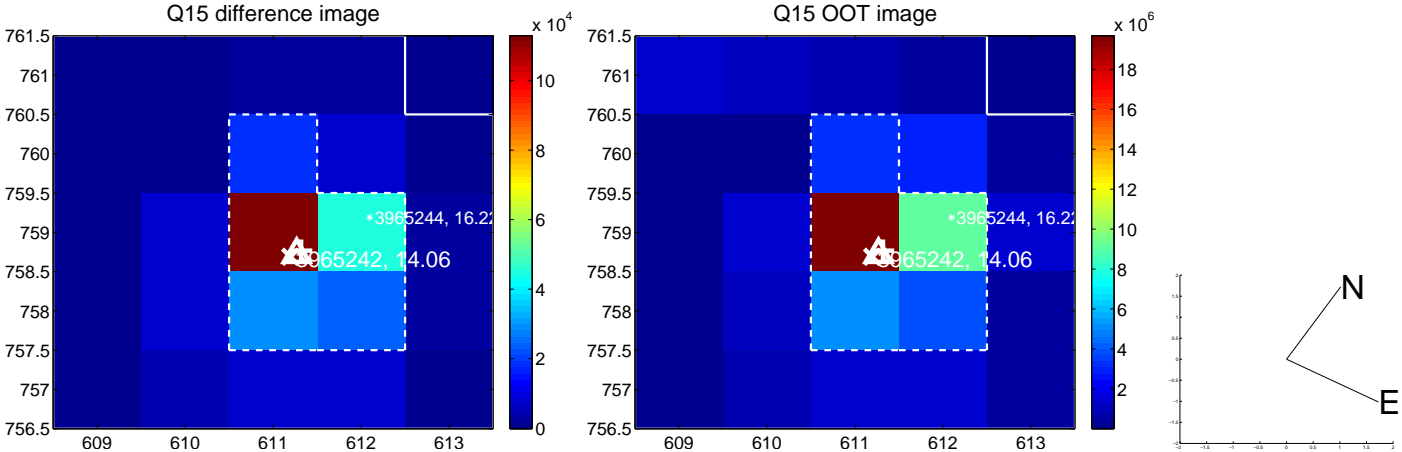
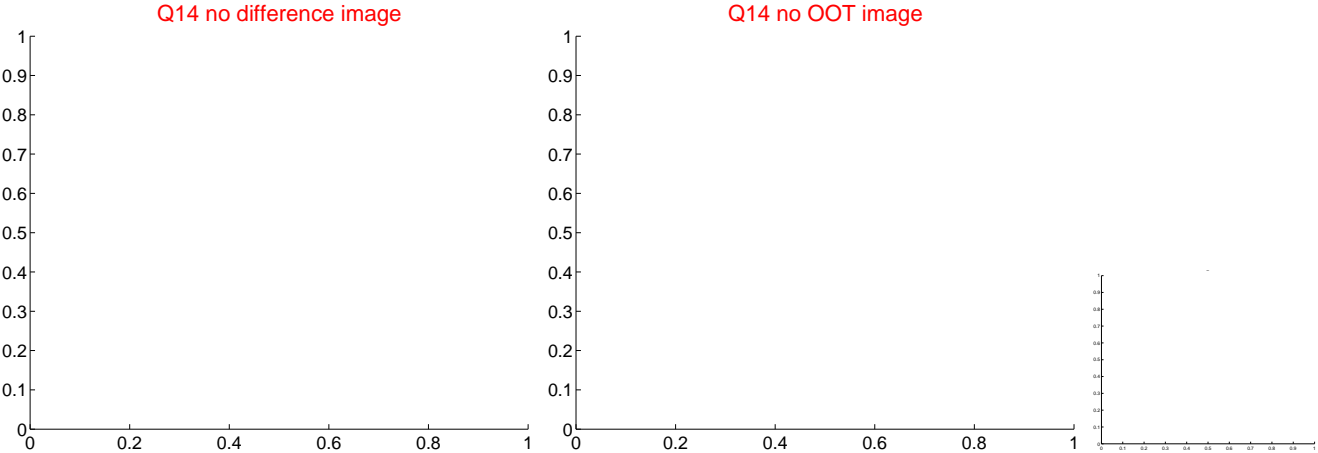
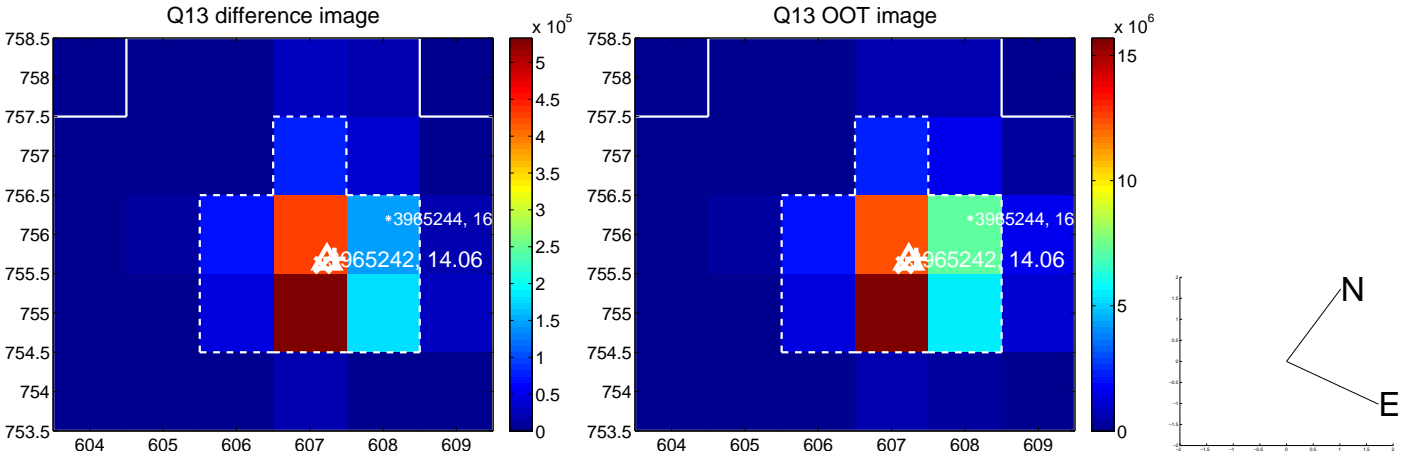




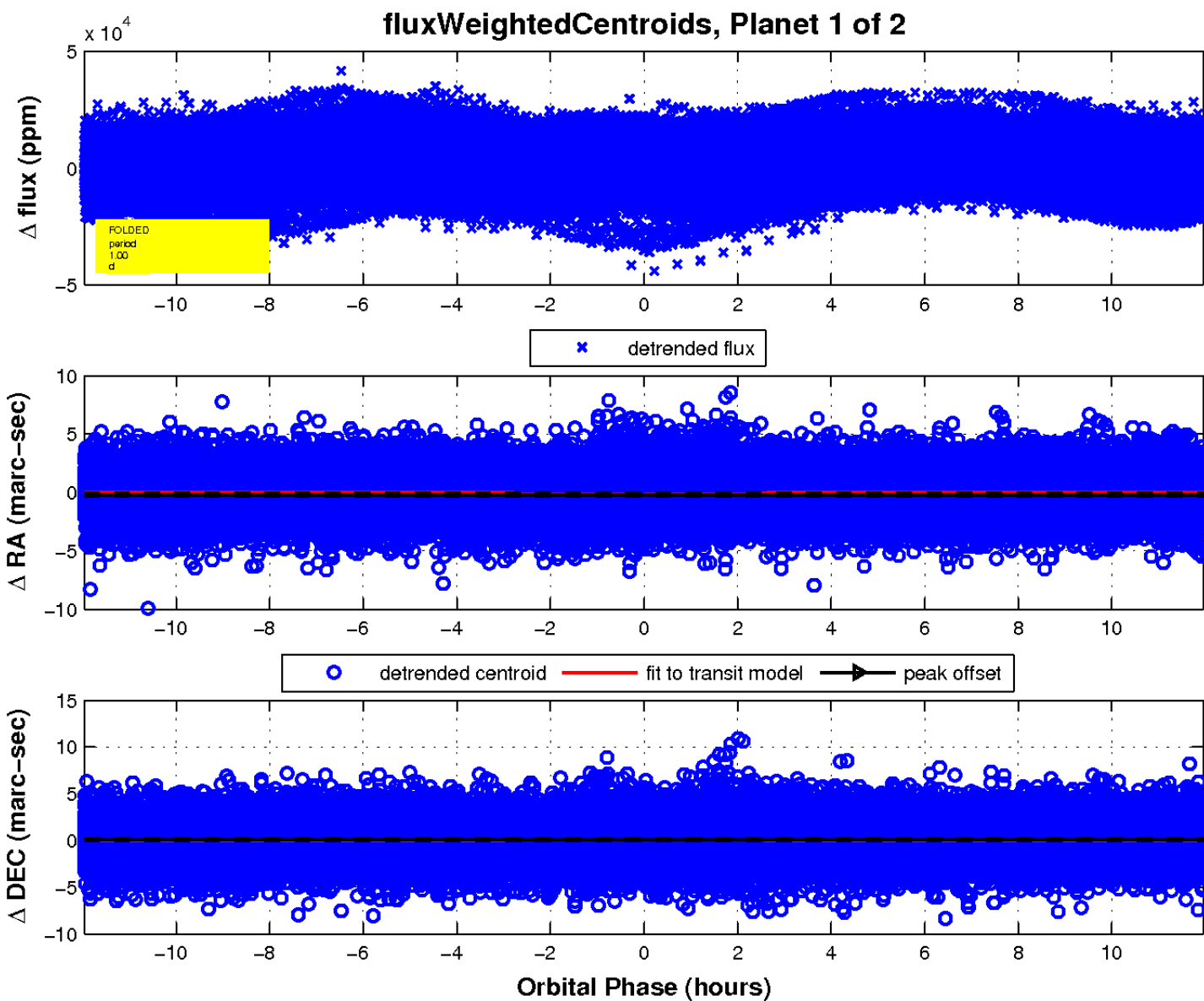
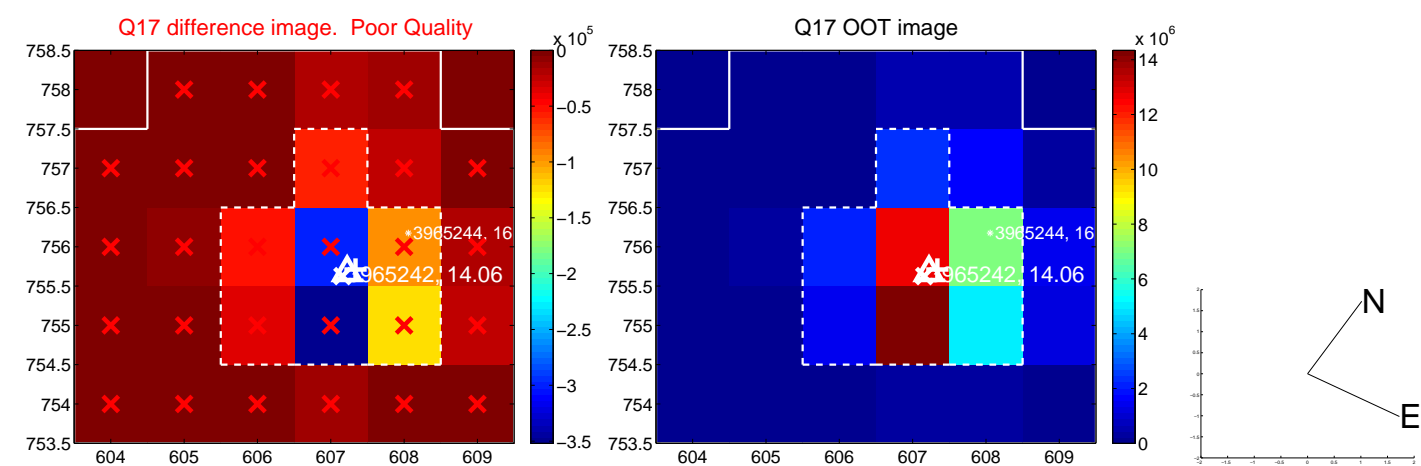
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

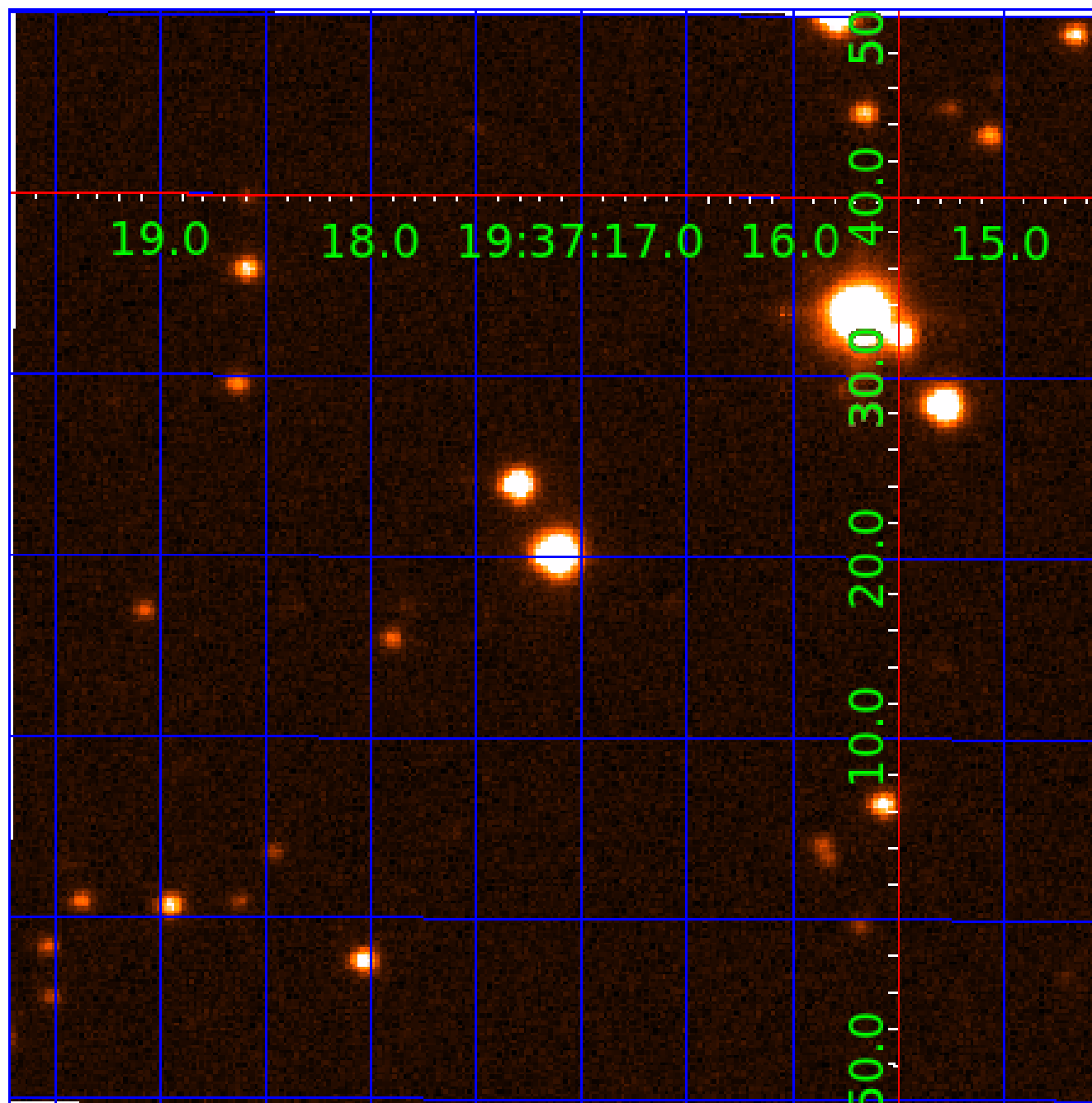


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003965242

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003965242-01	OBS	No	0.996648	131.945235	464.5	5.611	14.8	11.1	0.76	5332	1.69	1387.93
003965242-02	OBS	No	0.992167	131.569527	359.4	3.000	9.9	-1.0	0.76	5332	1.42	1396.30

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003965242-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_KIC_POS—HALO_GHOST
003965242-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—CENT_NOFITS

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

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

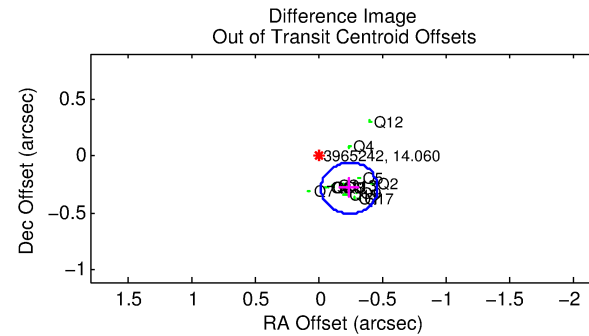
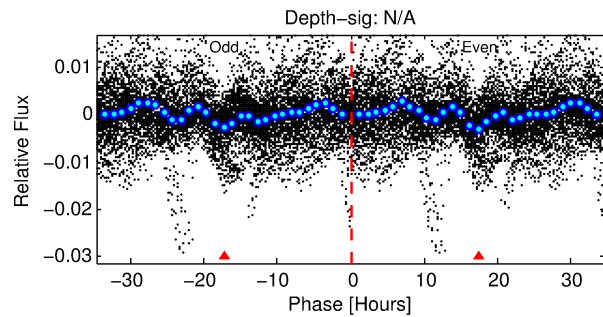
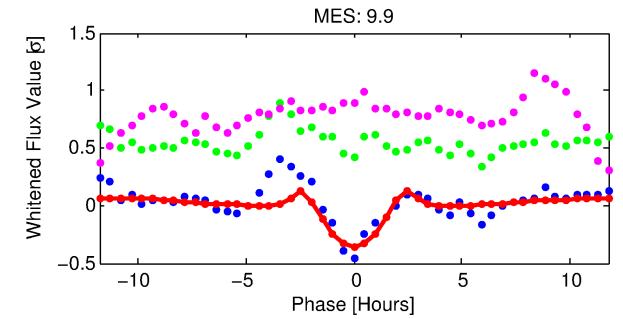
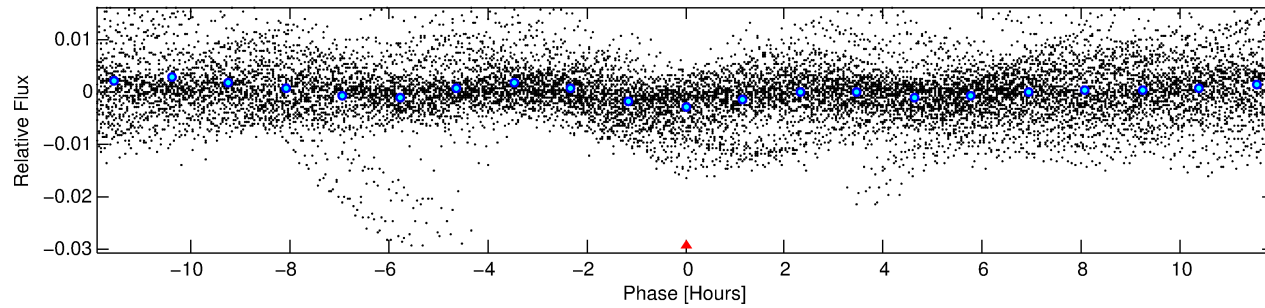
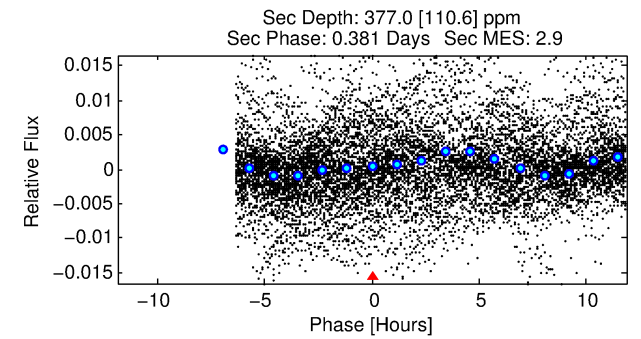
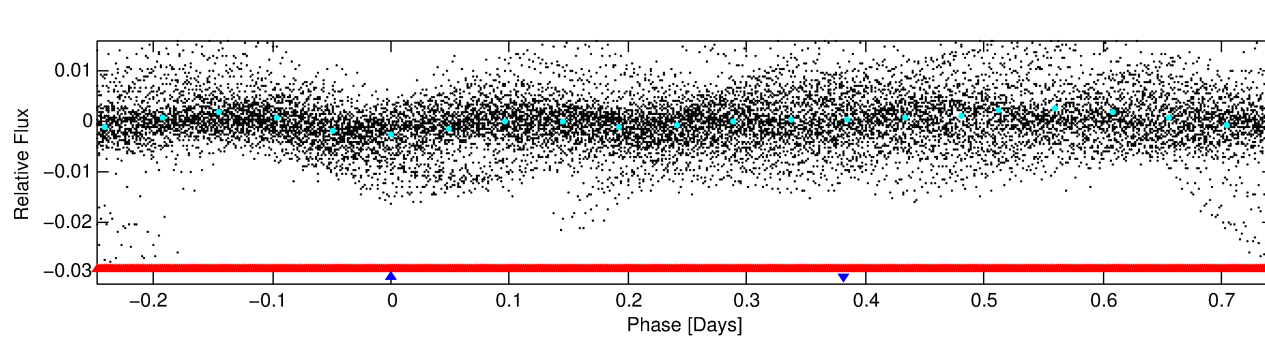
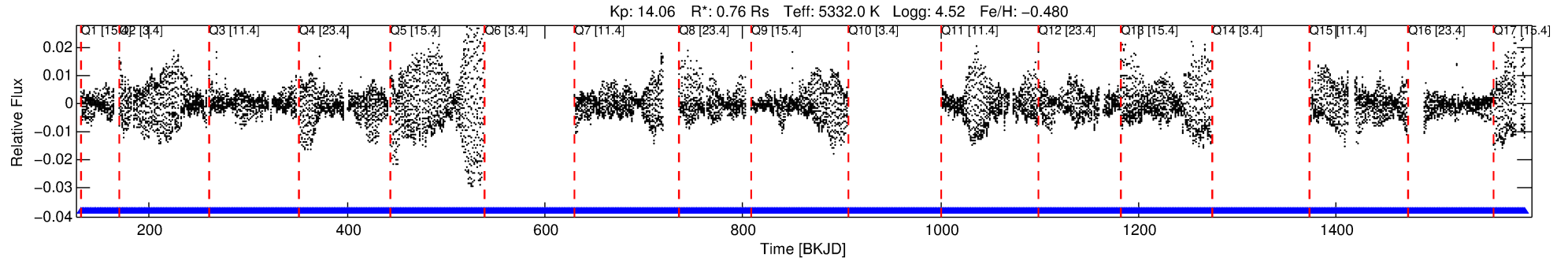
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003965242-02

No Significant Match Found

# DV One-Page Summary

KIC: 3965242 Candidate: 2 of 2 Period: 0.992 d



## TPS TCE Results:

Period = 0.99217 d  
Epoch = 131.5695 BKJD

DV fit results are unavailable

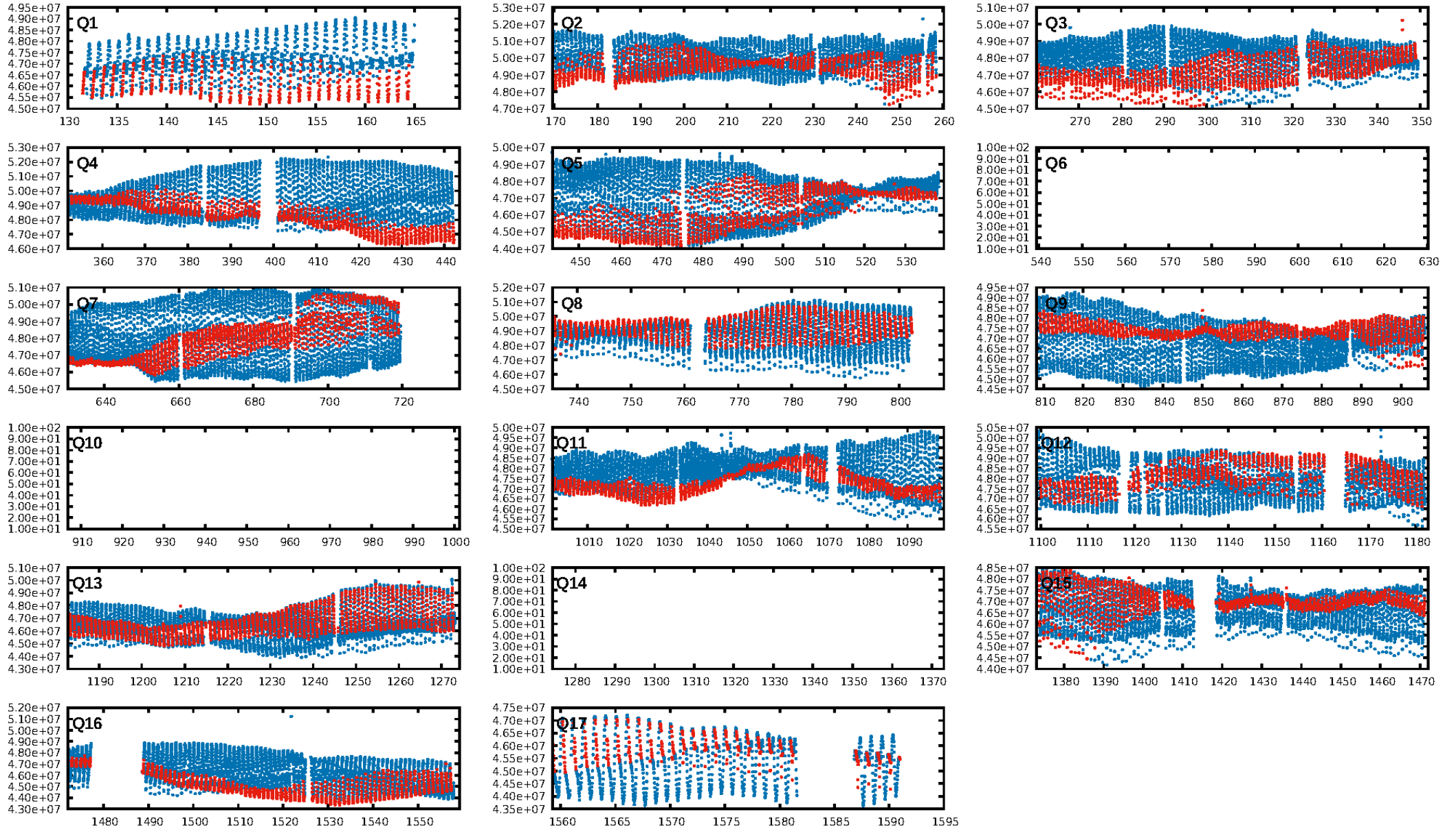
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 1.3% [0.02σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [554/554]  
GhostDiagnostic-chr: 1.532  
Centroid-sig: 0.2%  
Centroid-so: 0.638 arcsec [128.38σ]  
OotOffset-rm: 0.368 arcsec [4.95σ]  
KicOffset-rm: 0.280 arcsec [3.73σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:17:12 Z

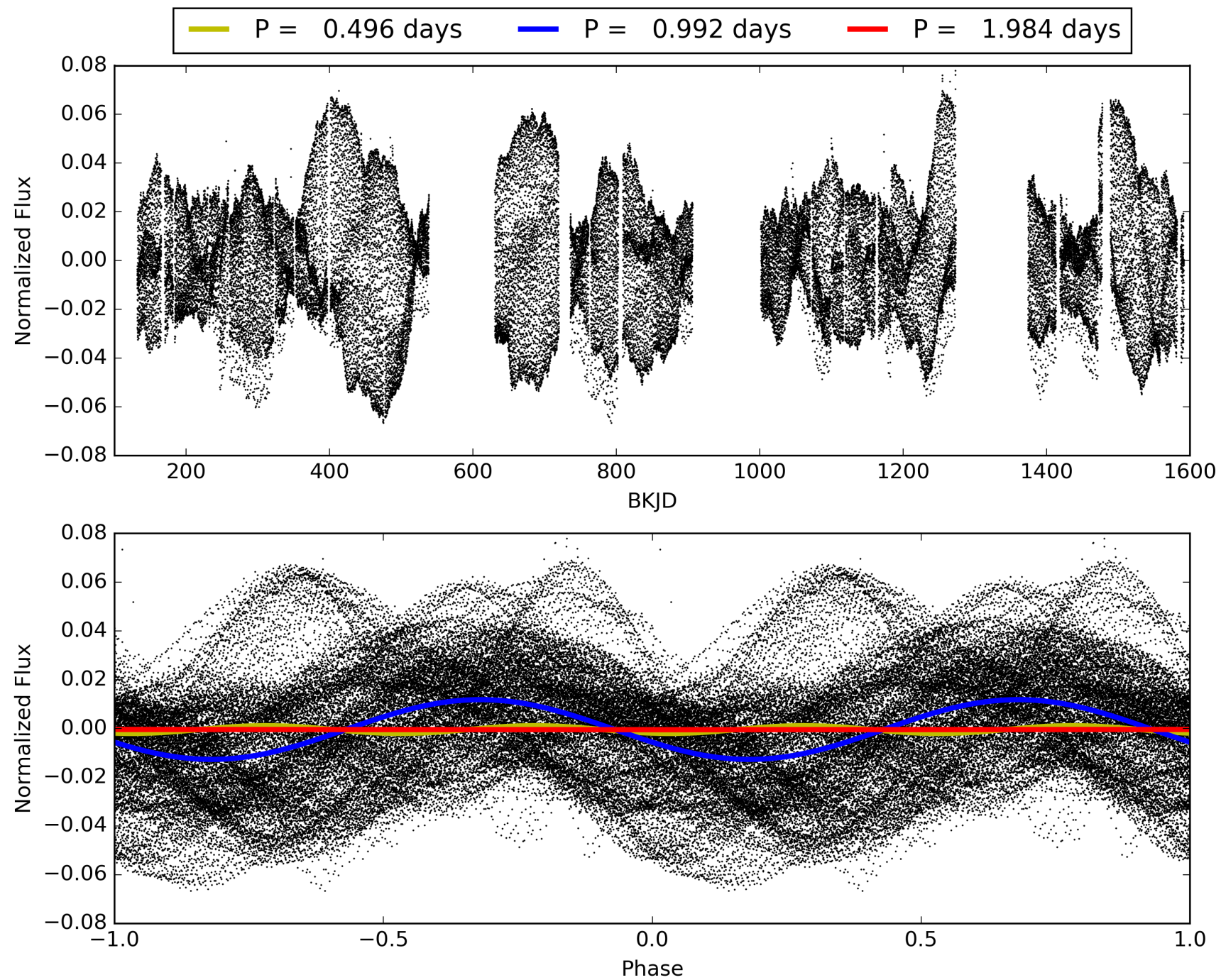
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003965242-02, PDC Light Curves



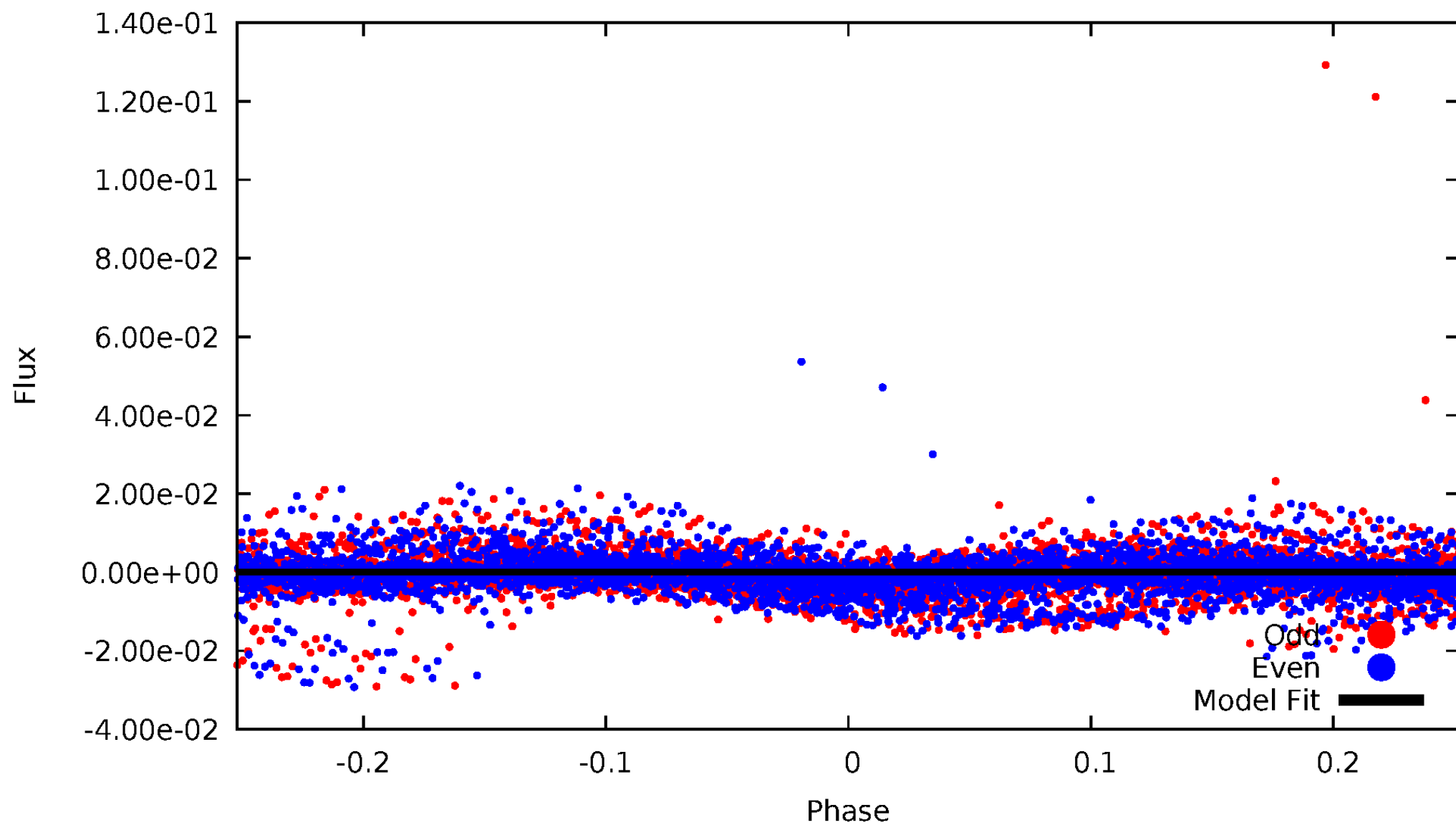


TCE 003965242-02



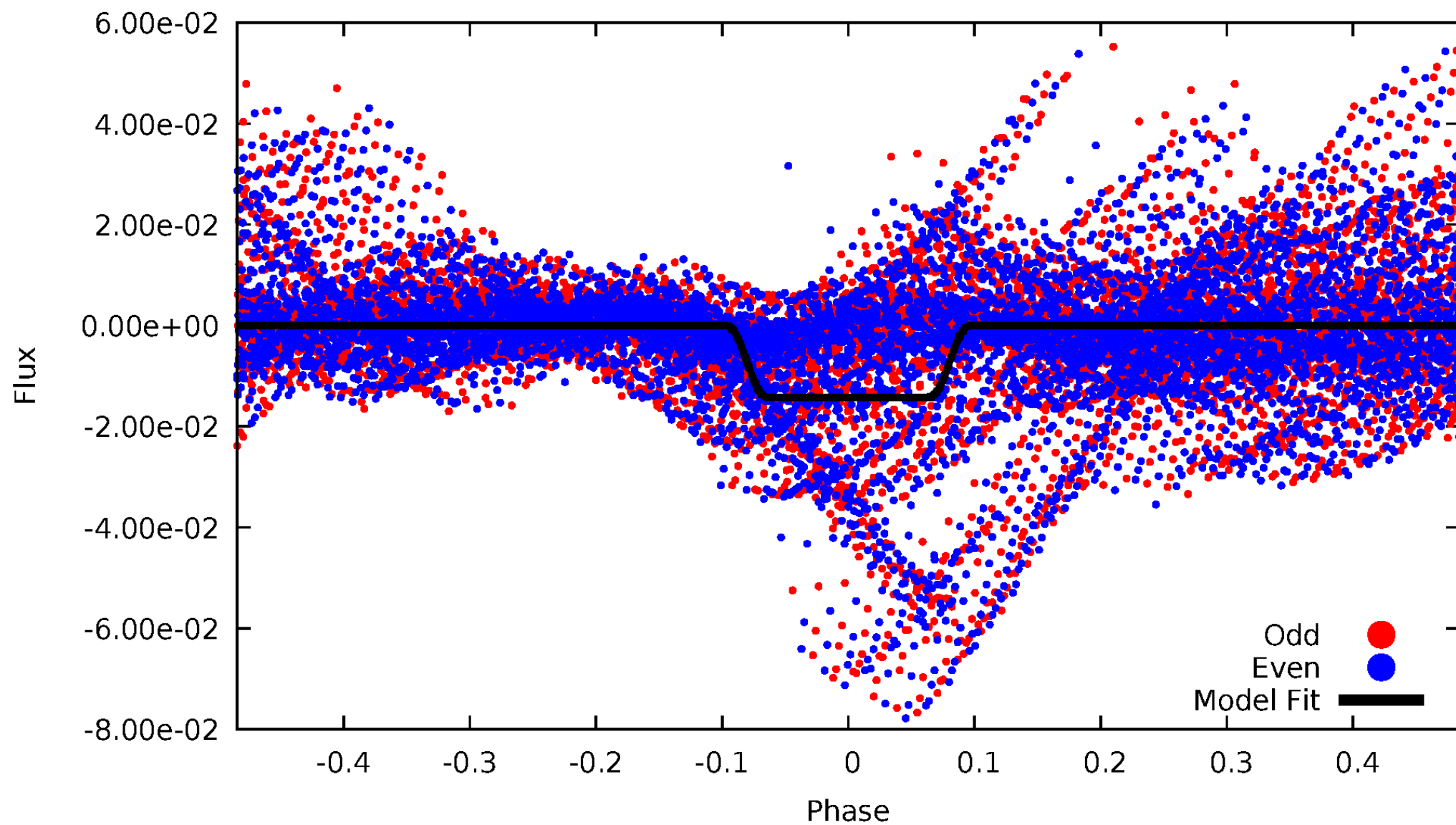
# DV Odd/Even

TCE 003965242-02



# ALT Odd/Even

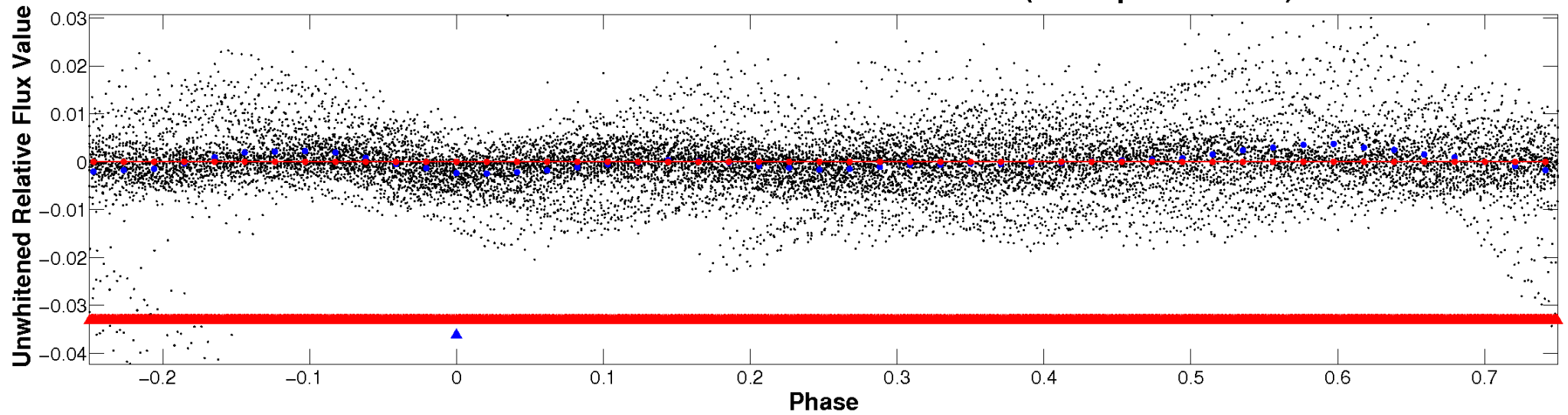
TCE 003965242-02





# Non-Whitened Vs. Whitened Light Curve

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

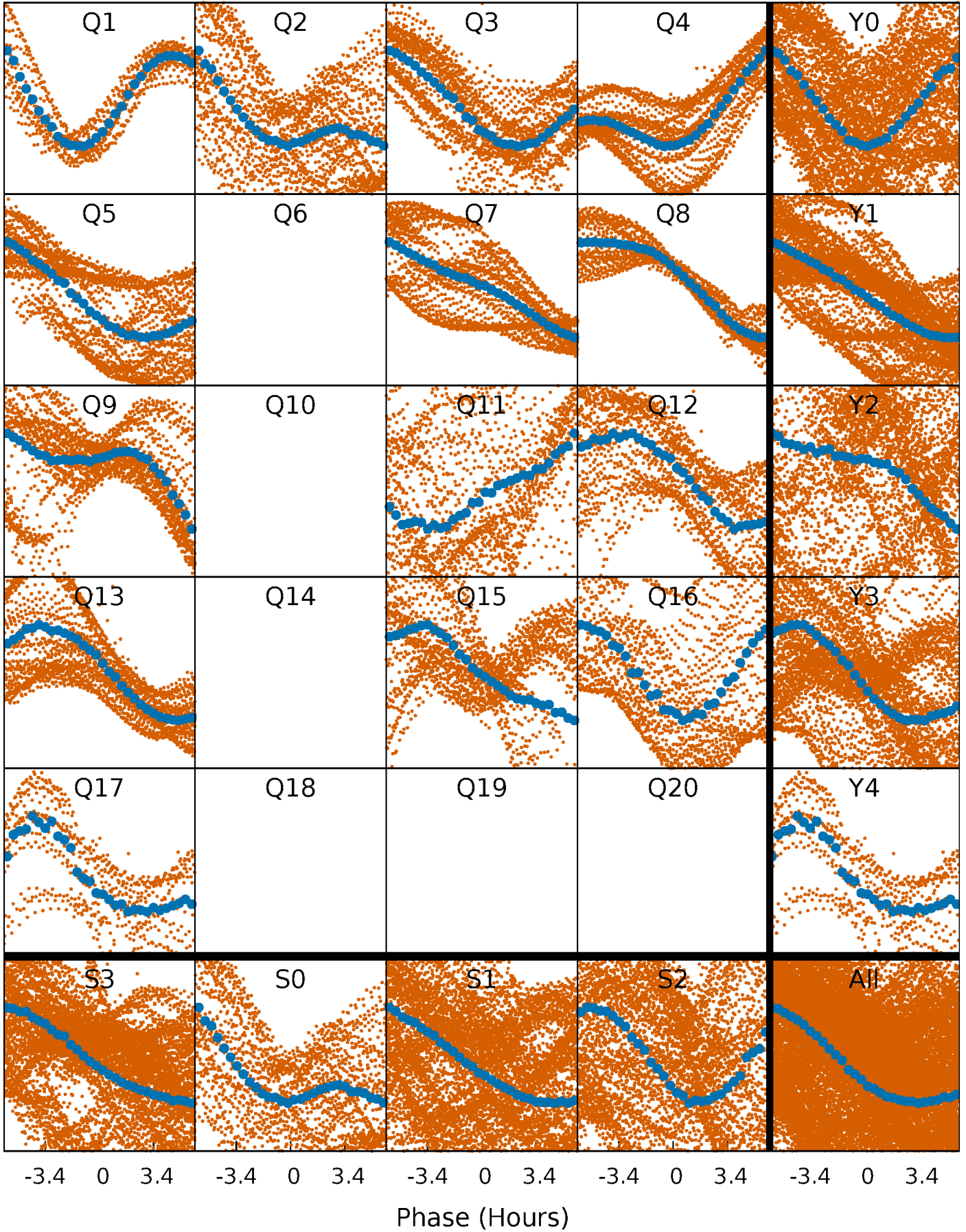


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



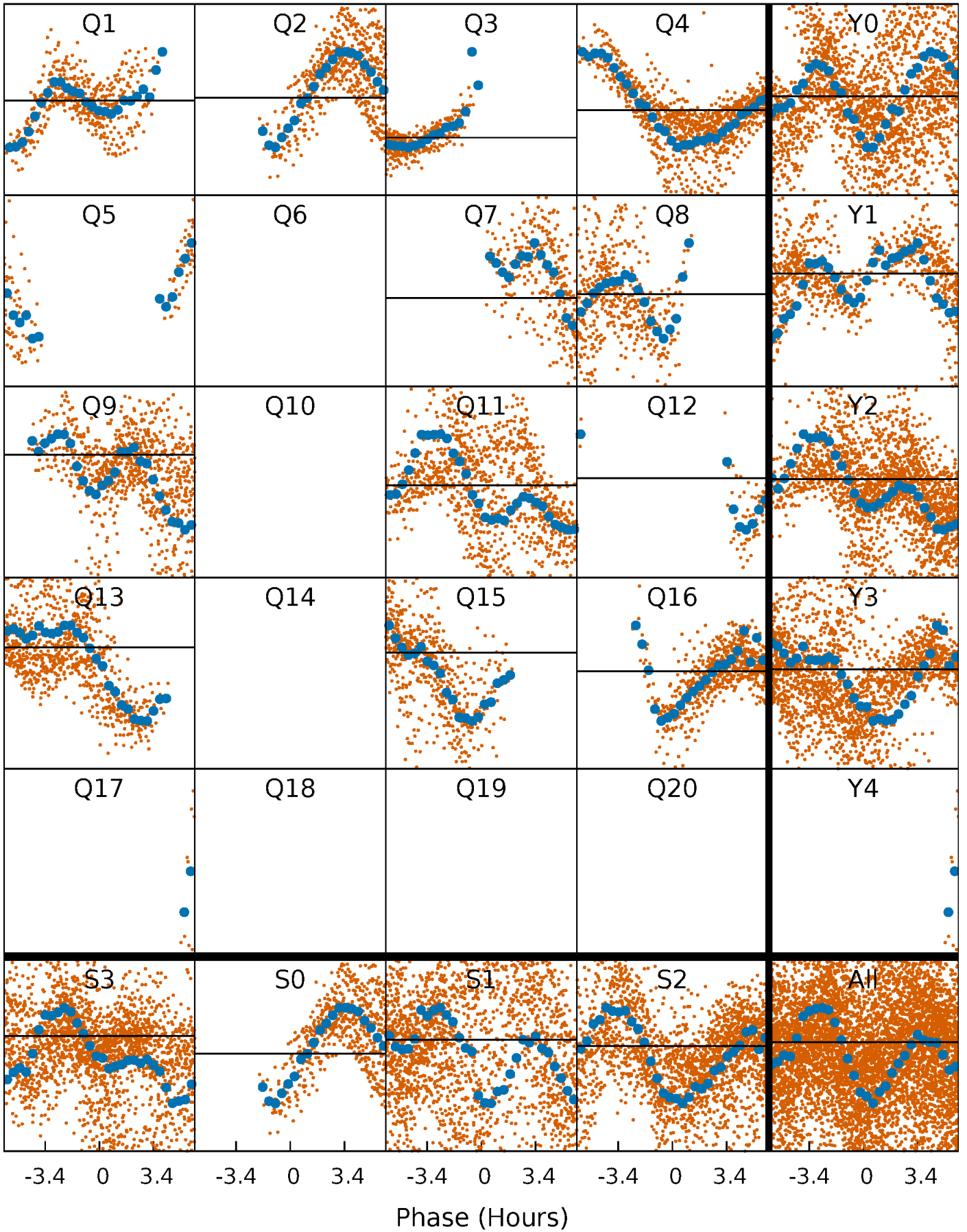
# PDC Quarter-Phased Transit Curves

TCE 003965242-02   P= 0.992167 Days    $T_0=131.569527$  (BKJD)



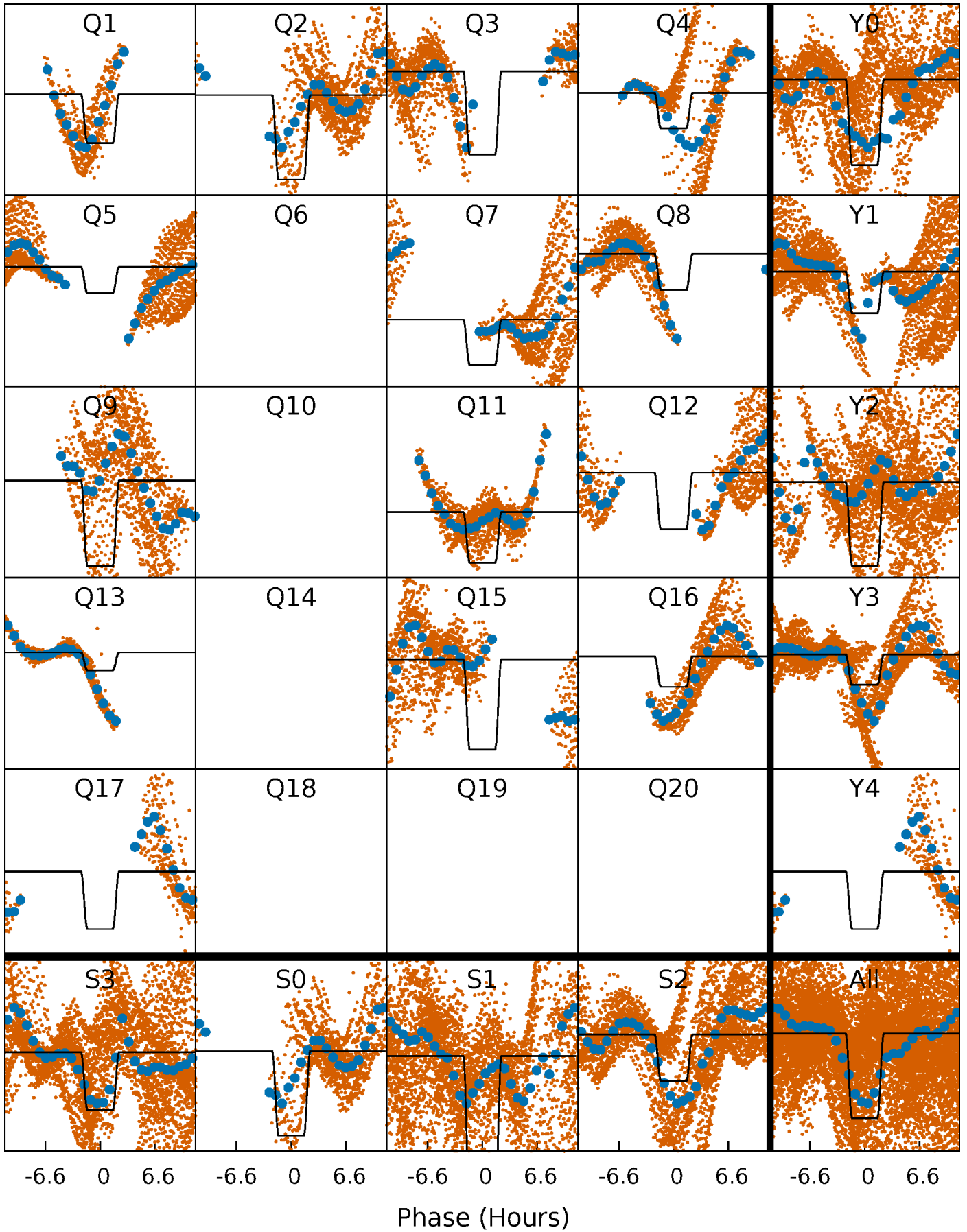
# DV Quarter-Phased Transit Curves

TCE 003965242-02   P= 0.992167 Days    $T_0=131.569527$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

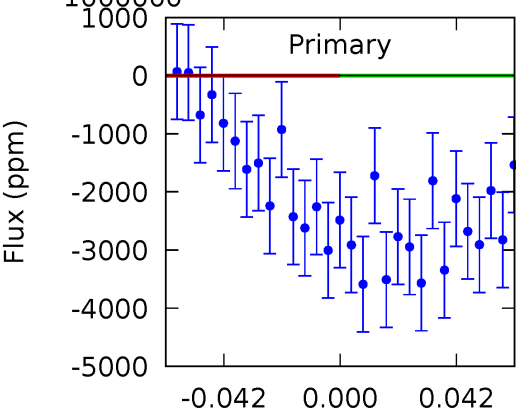
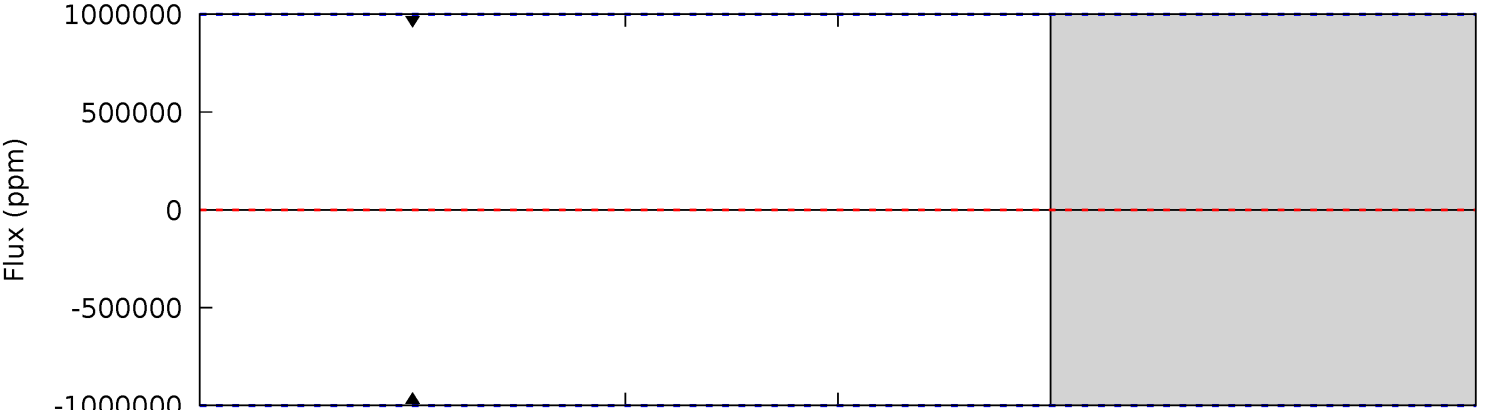
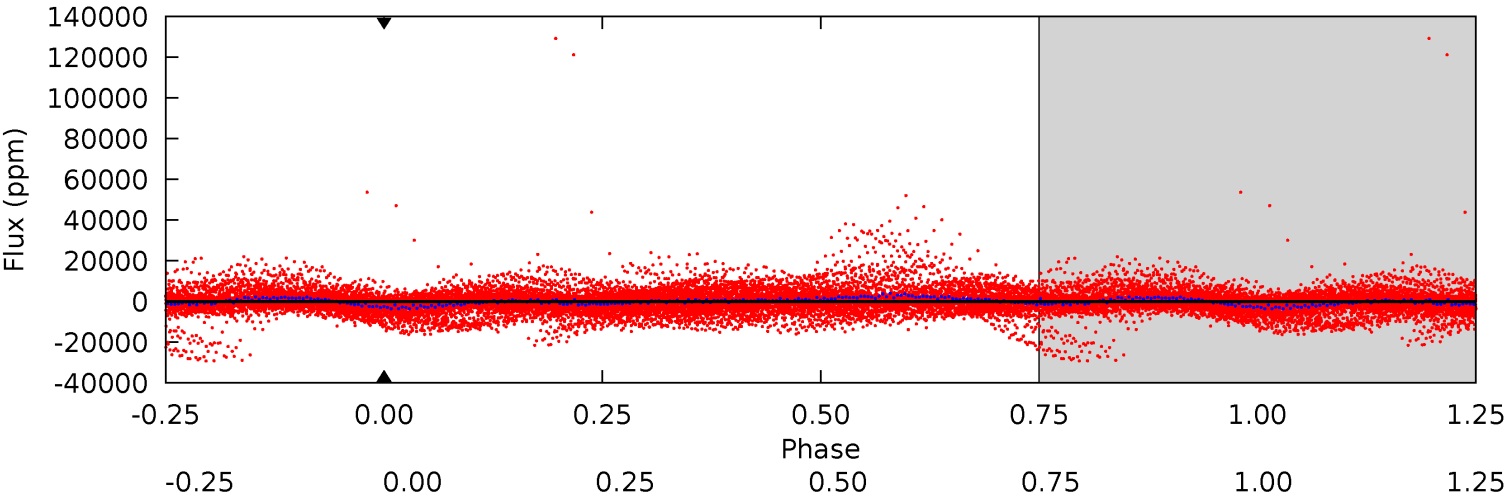
TCE 003965242-02     $P = 0.992167$  Days     $T_0 = 131.597430$  (BKJD)



# DV Model-Shift Uniqueness Test

003965242-02, P = 0.992167 Days, E = 130.577360 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

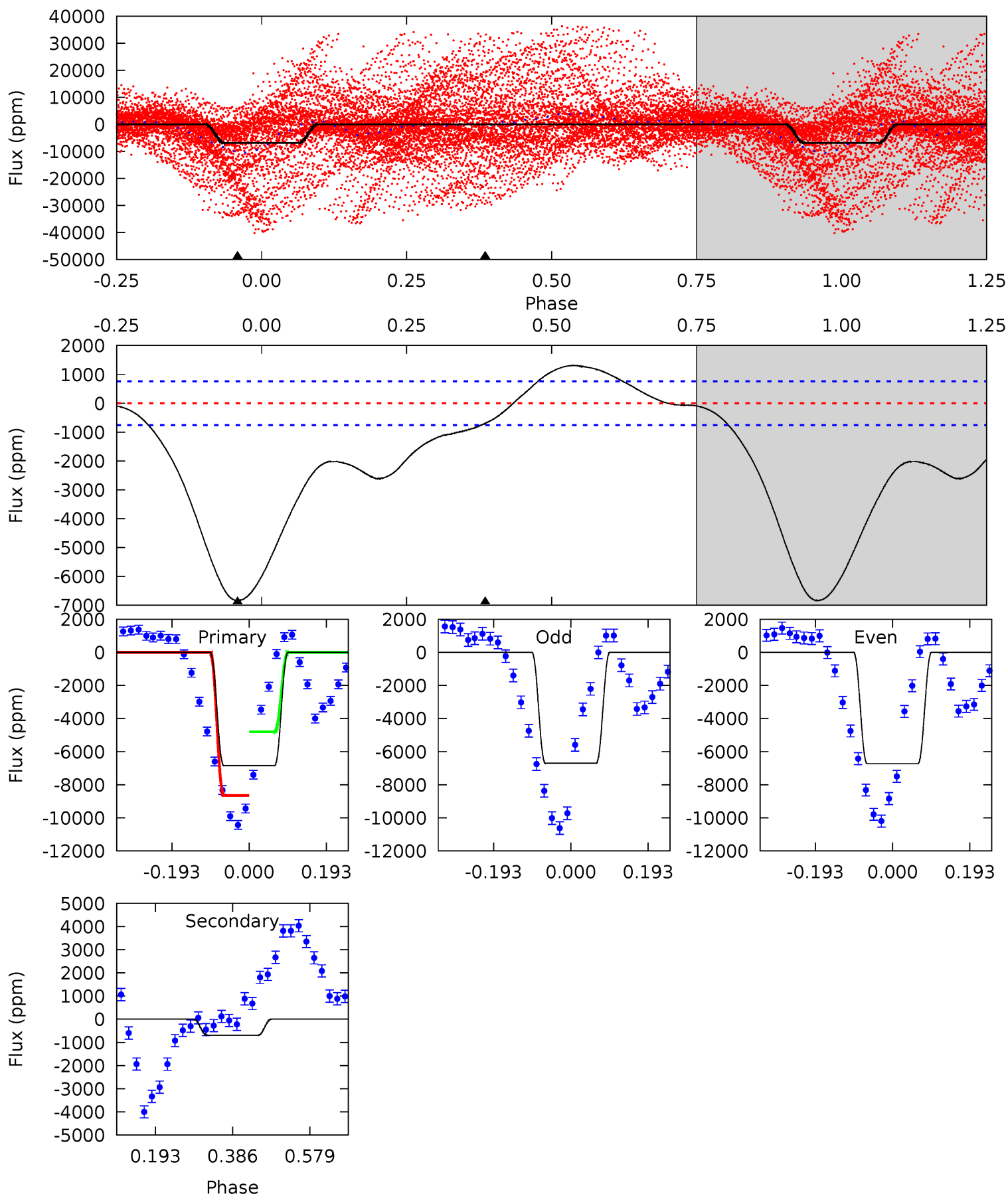




# Alt Model-Shift Uniqueness Test

003965242-02, P = 0.992167 Days, E = 130.605263 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
40.0	4.06	0	0	4.43	1.30	6.83	40.0	40.0	4.06	4.06	0.07	2.33	0.16	11.2





### Stellar Parameters For KIC 003965242

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5332^{+159}_{-159}$	$4.524^{+0.108}_{-0.081}$	$-0.480^{+0.300}_{-0.300}$	$0.762^{+0.100}_{-0.090}$	$0.708^{+0.104}_{-0.045}$	$2.254^{+1.005}_{-0.588}$
	+3%/-3%	+2%/-2%	+62%/-62%	+13%/-12%	+15%/-6%	+45%/-26%
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 003965242-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$6.20^{+6.81}_{-4.38}$	$2163^{+100}_{-88}$	$-3562^{+21089}_{-13743}$	$-2.114^{+839.527}_{-798.357}$
Alt.	$-693 \pm 171$	$10.99^{+8.04}_{-6.45}$	$2166^{+96}_{-96}$	$2819^{+1131}_{-1011}$	$0.908^{+4.598}_{-0.597}$

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

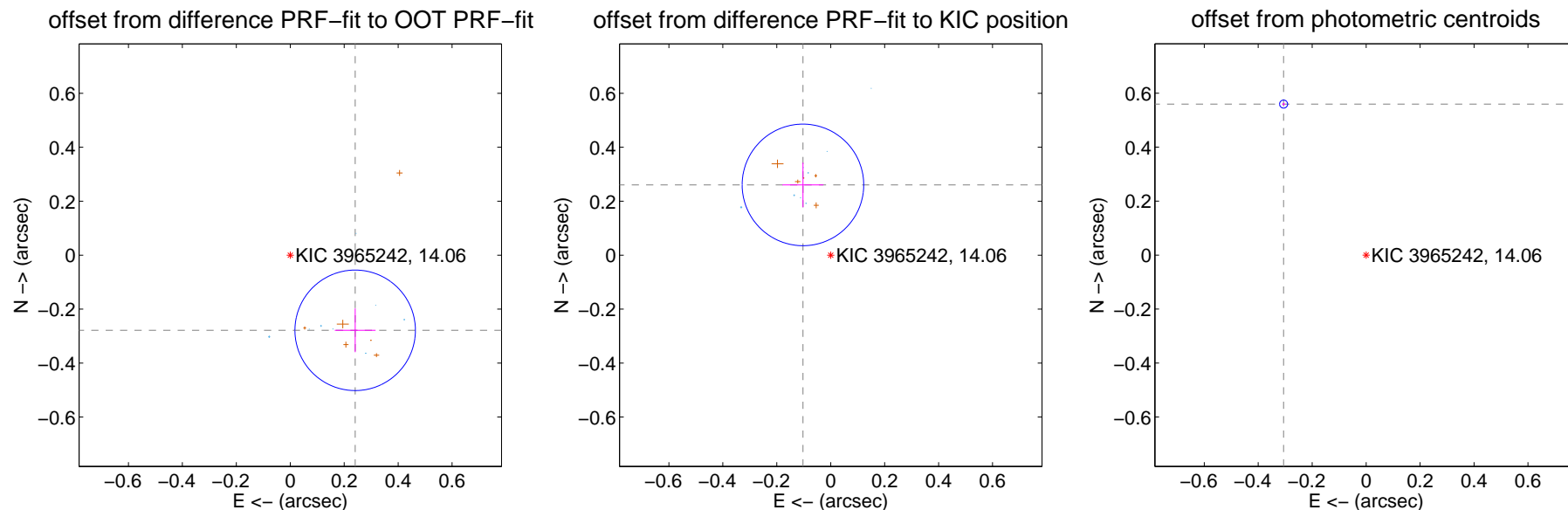
## DV Centroid Data

Supplemental centroid analysis for 003965242-02. Kepler magnitude: 14.06. Transit SNR -1.00

There are 8 quarters with good PRF difference image offsets

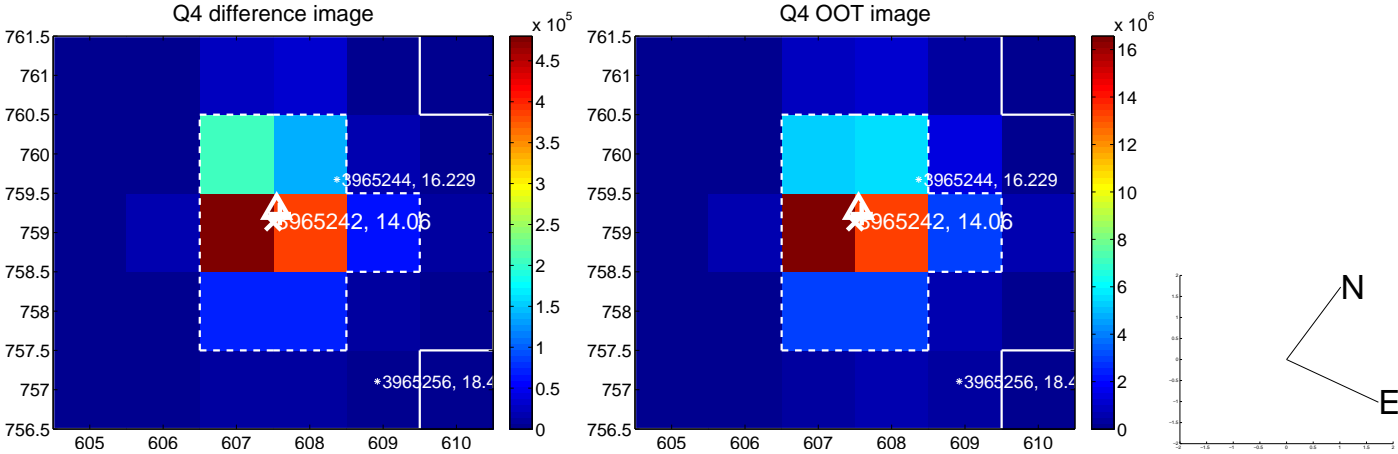
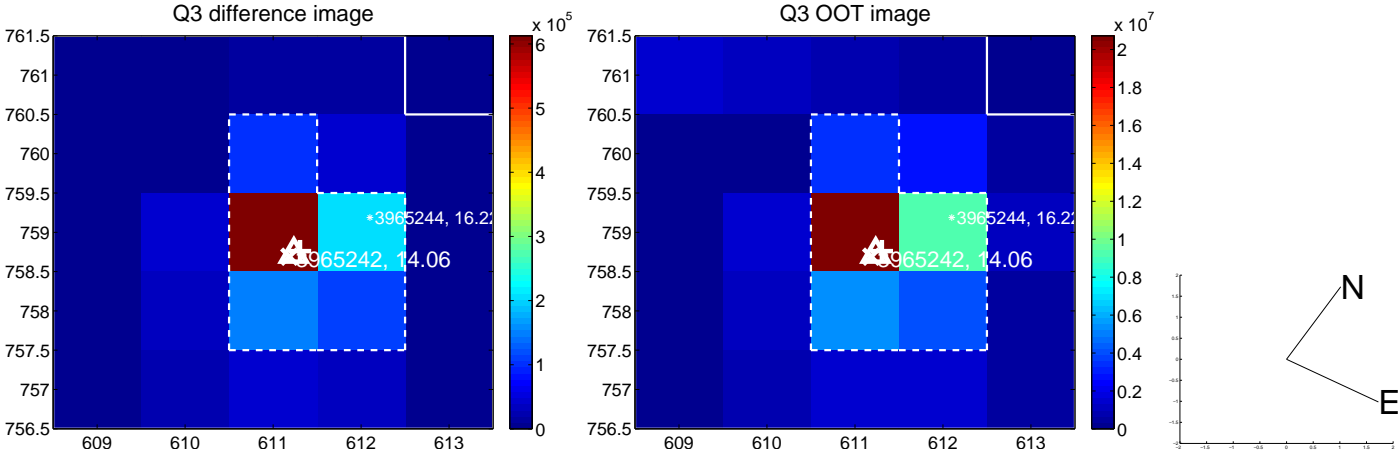
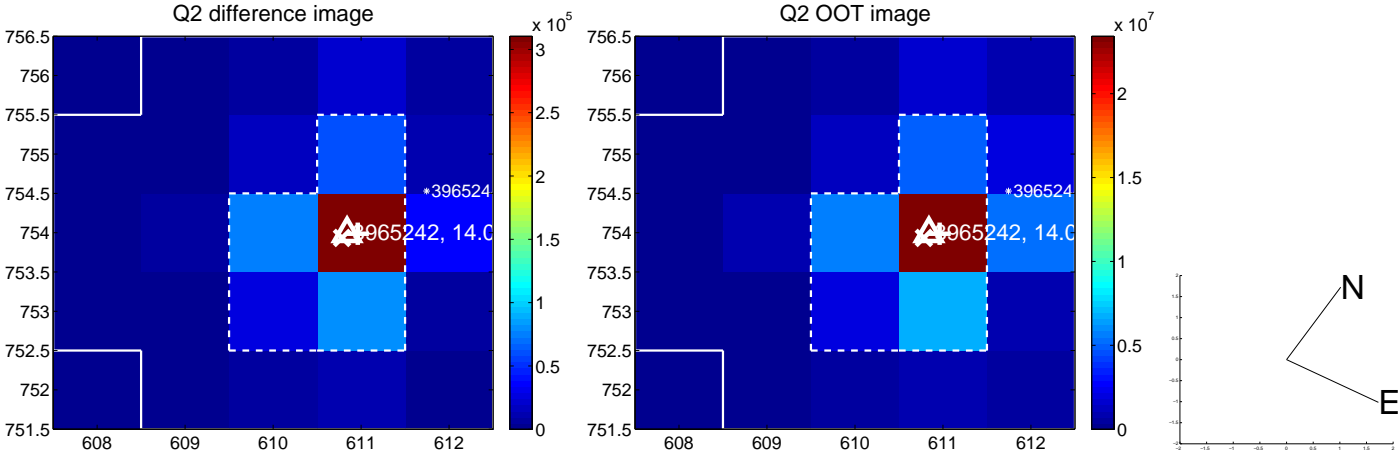
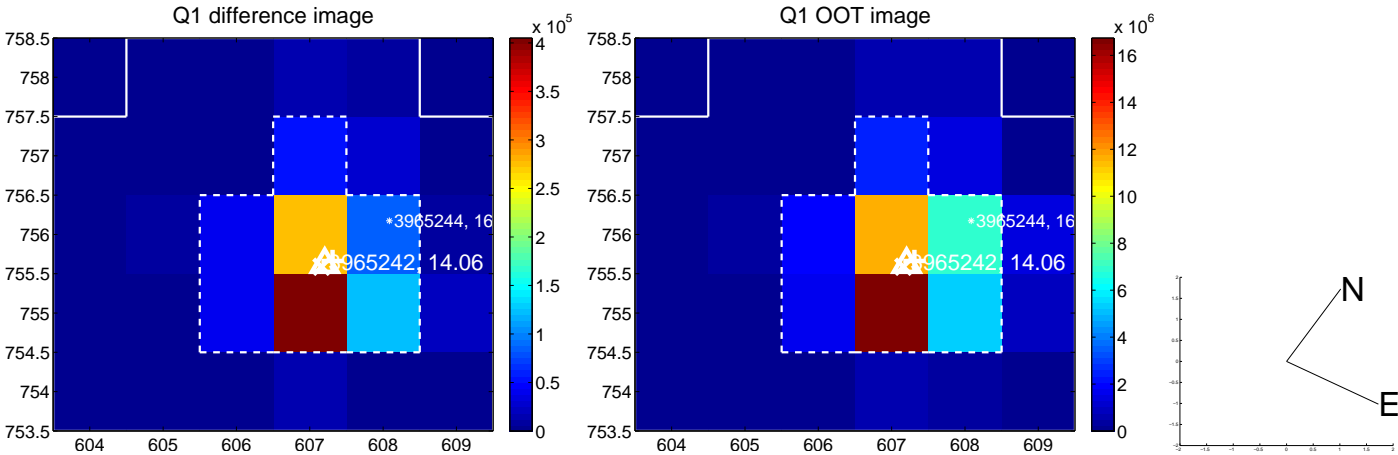
The direct PRF centroid is offset from the target star catalog position by about 0.78 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.368 \pm 0.074$	4.95	$-0.241 \pm 0.076$	$-0.279 \pm 0.081$
PRF-fit source offset from KIC position	$0.280 \pm 0.075$	3.73	$0.103 \pm 0.076$	$0.260 \pm 0.082$
photometric centroid source offset	$0.64 \pm 0.00$	128.38	$0.31 \pm 0.00$	$0.56 \pm 0.01$

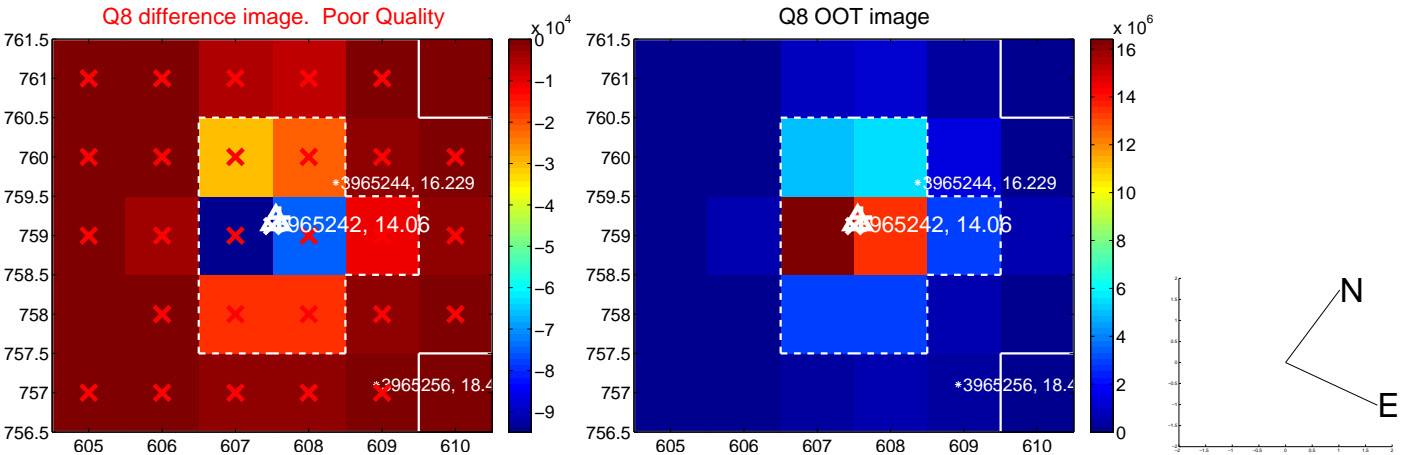
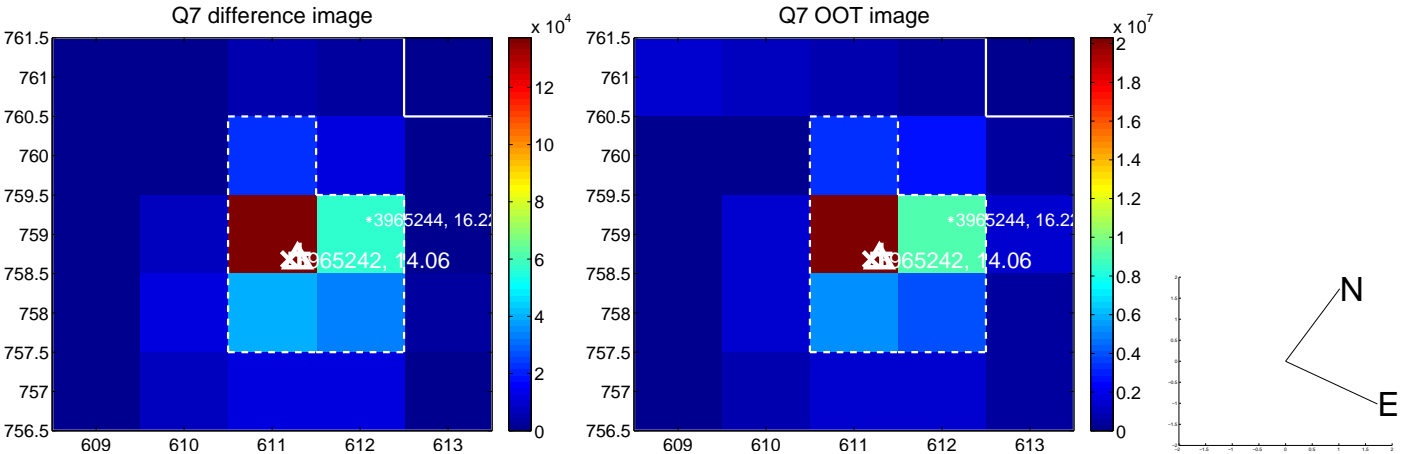
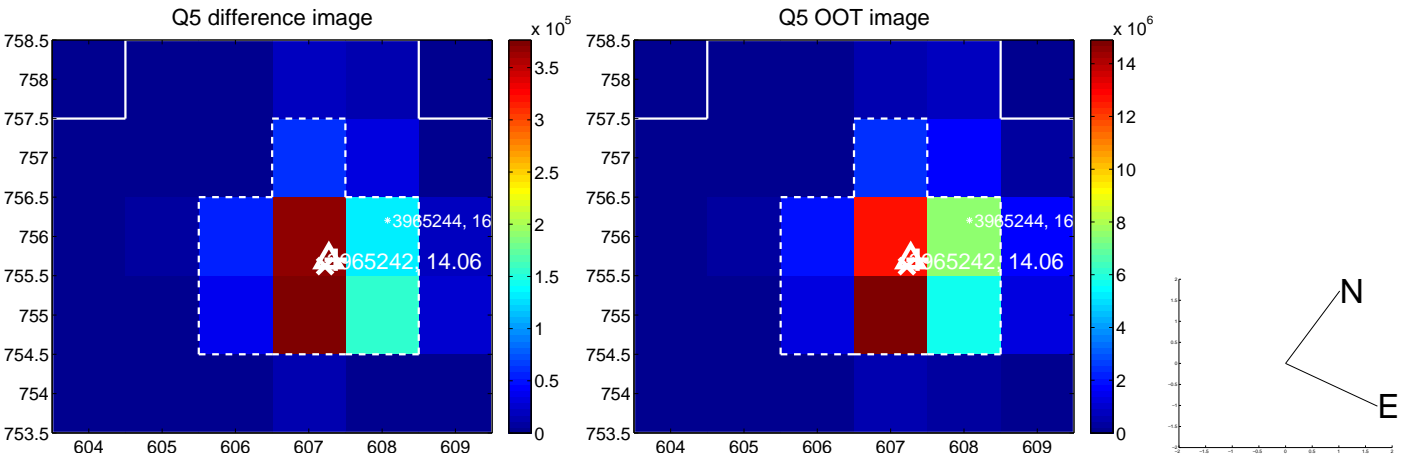


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

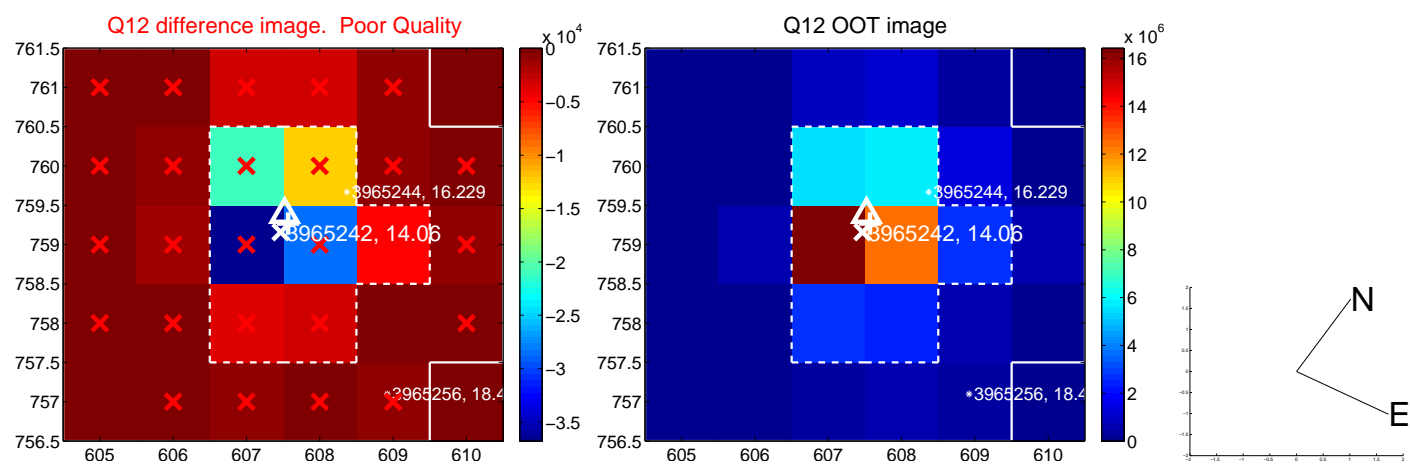
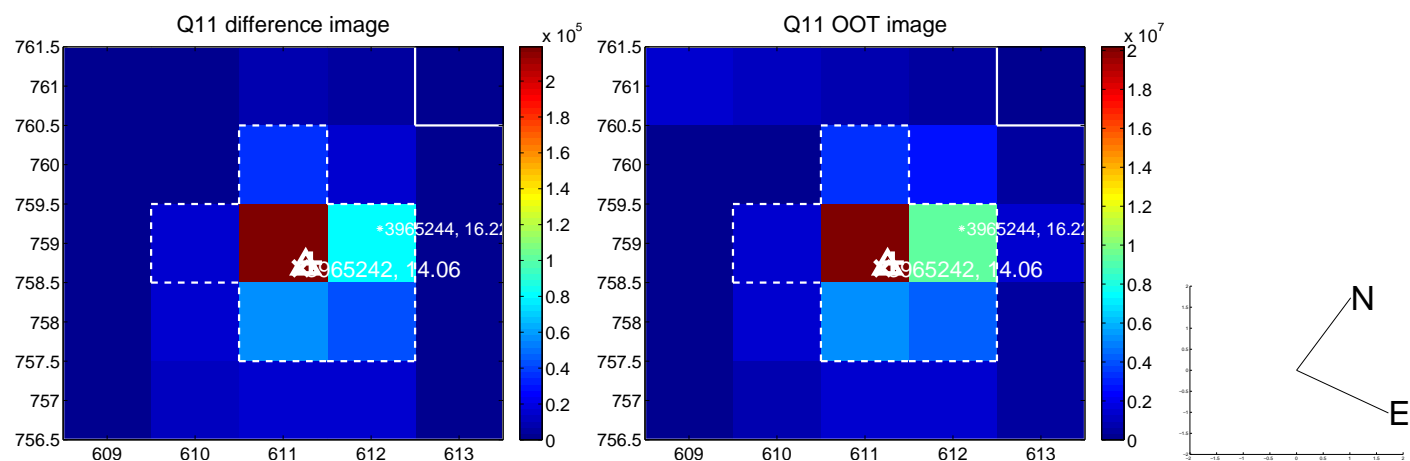
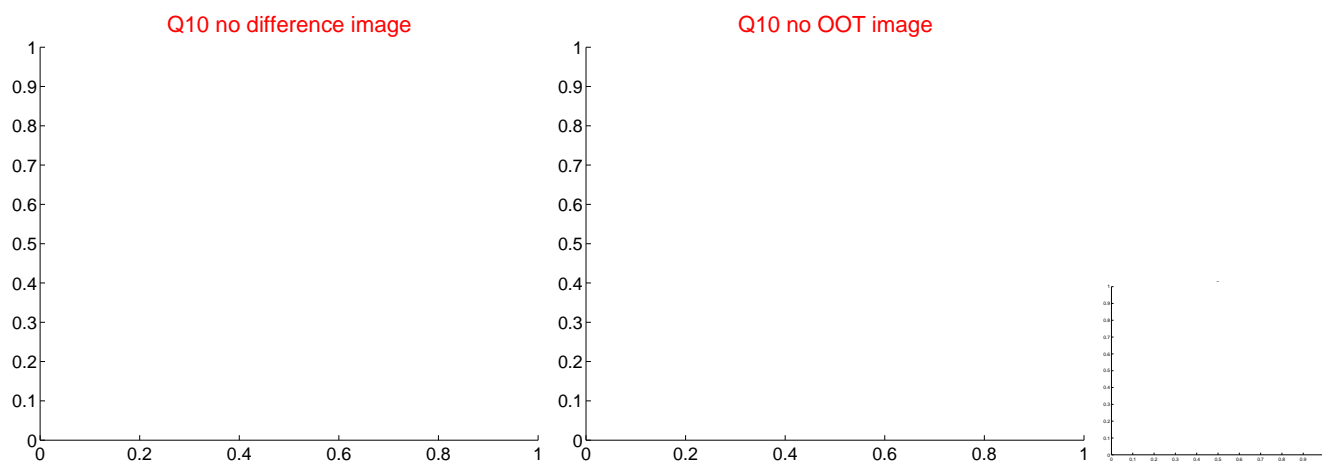
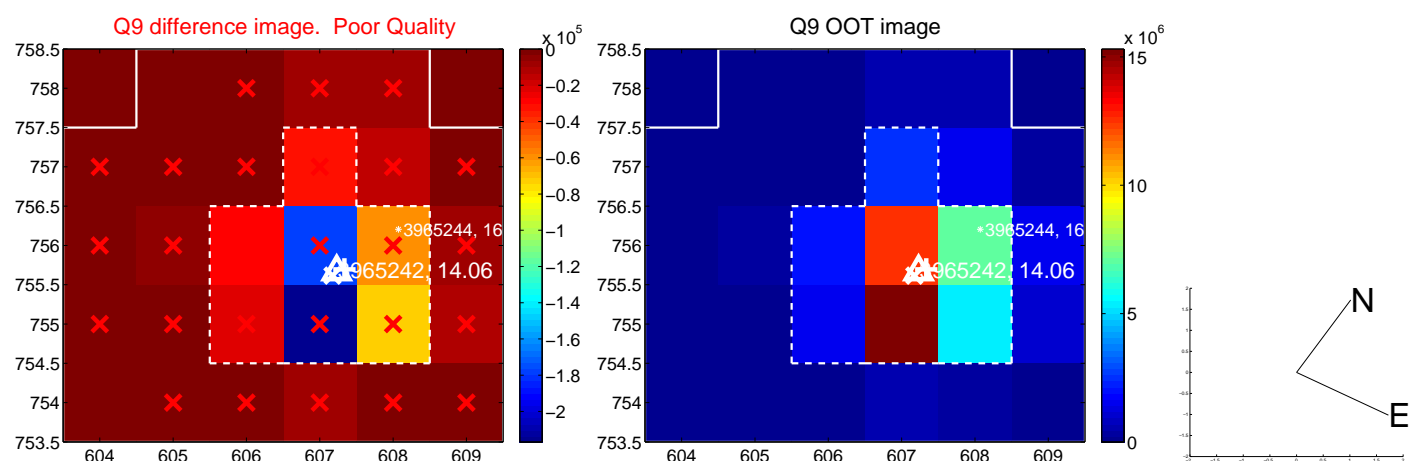
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



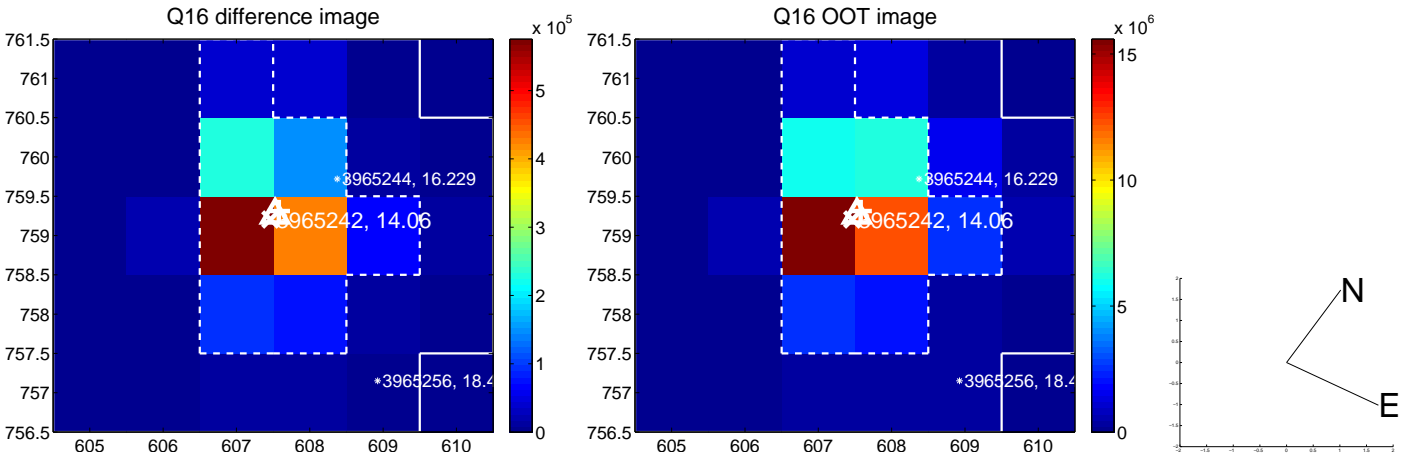
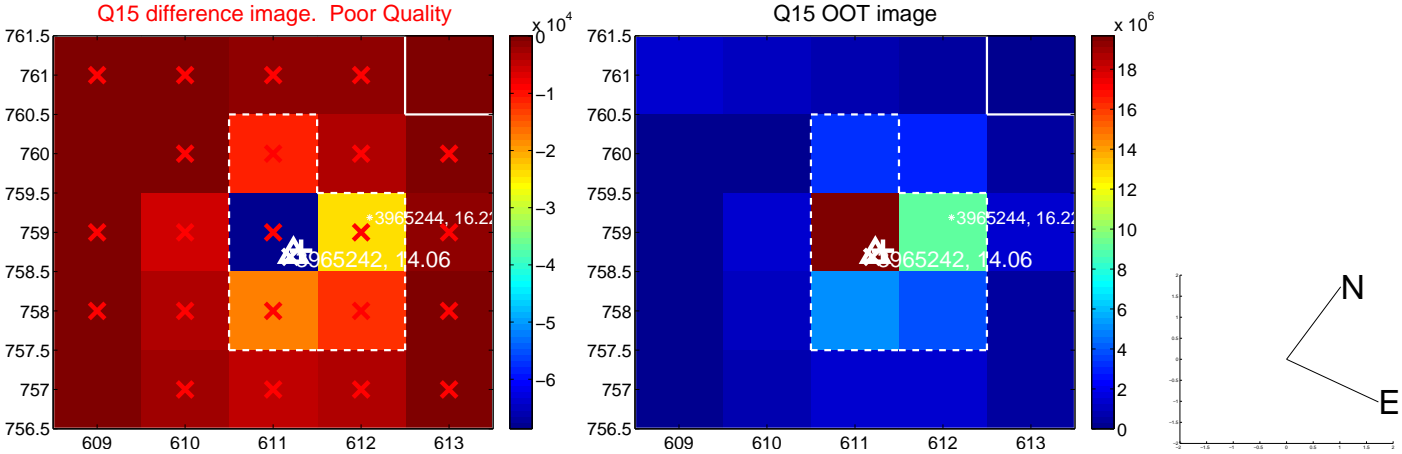
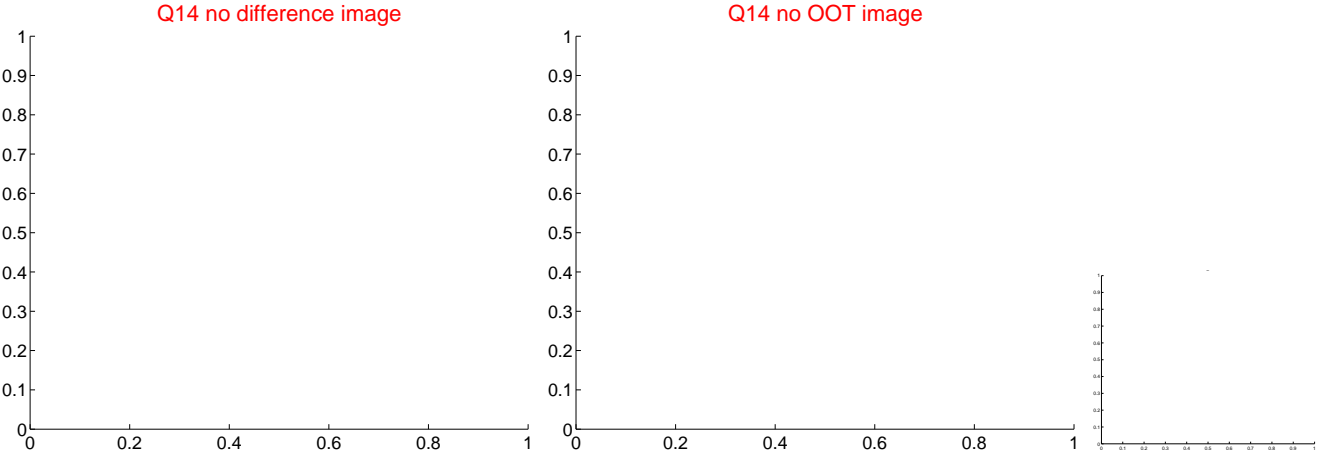
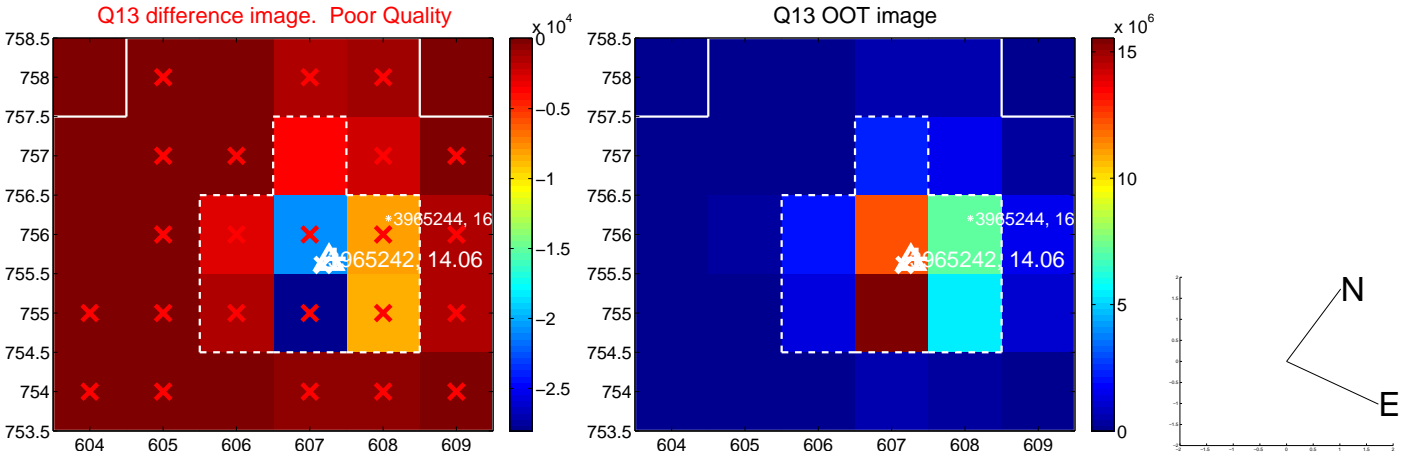
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

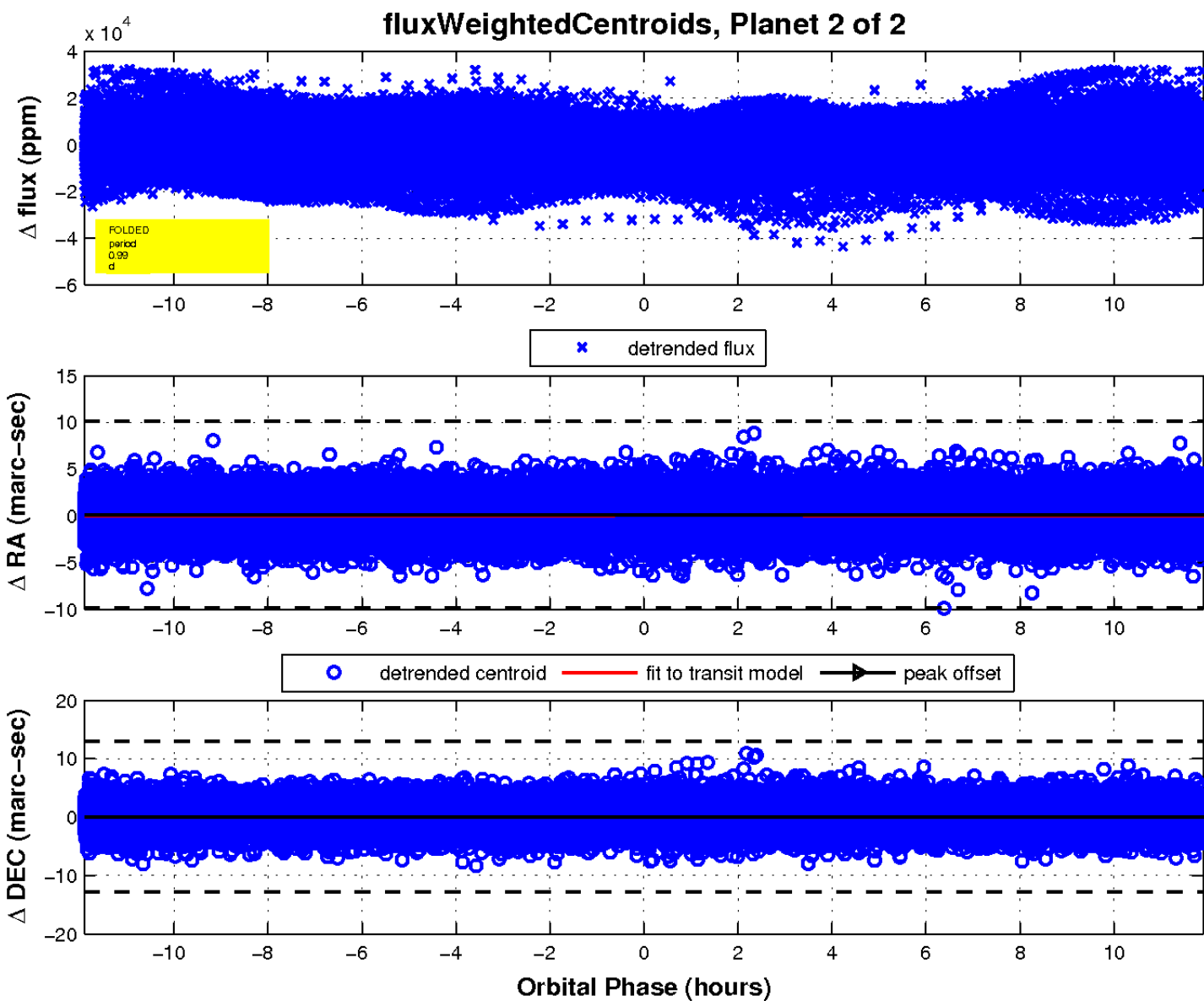
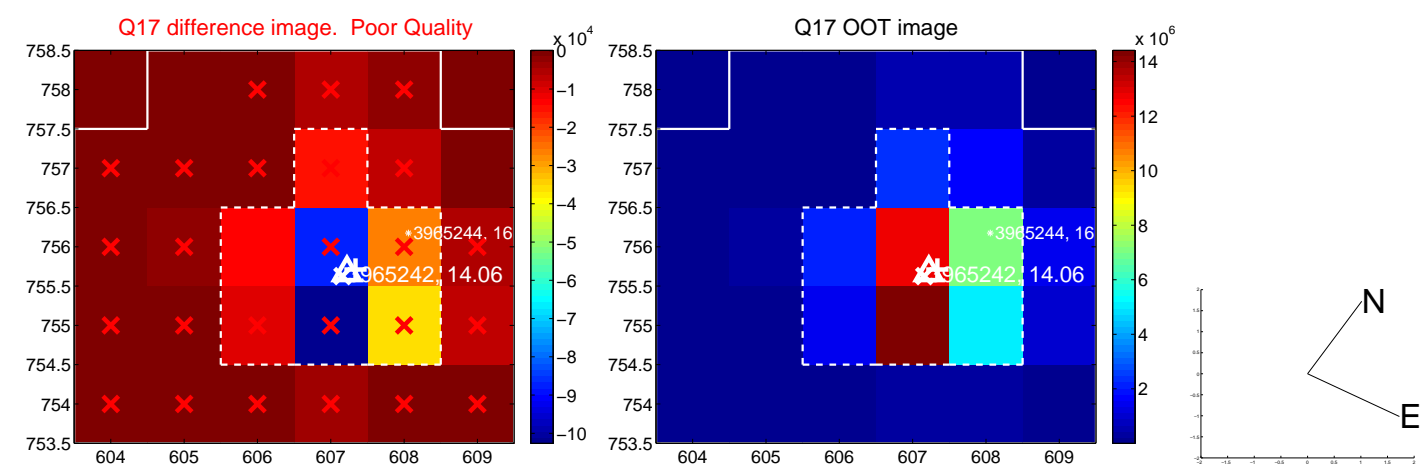


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

