

# KIC 006697605

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006697605-01	OBS	2851.01	3.420651	132.306008	374.6	1.764	16.8	19.3	0.97	5370	2.22	384.26
006697605-02	OBS	2851.02	1.239380	131.844319	159.3	1.367	10.2	12.0	0.97	5370	1.30	1487.66

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006697605-01	OBS	PC	0.71	0	0	0	0	CENT_KIC_POS
006697605-02	OBS	PC	1.00	0	0	0	0	CENT_FEW_MEAS

**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.

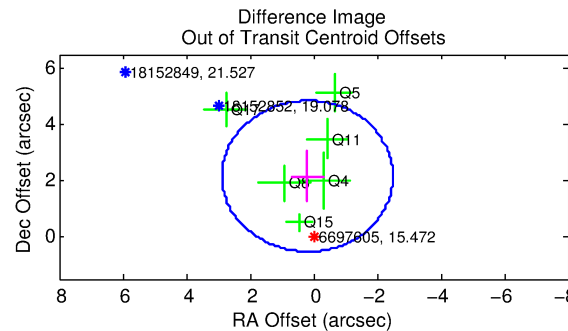
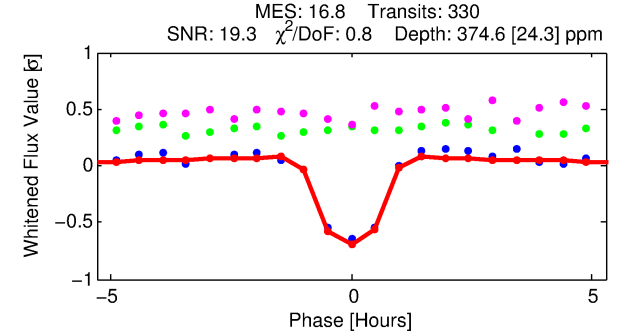
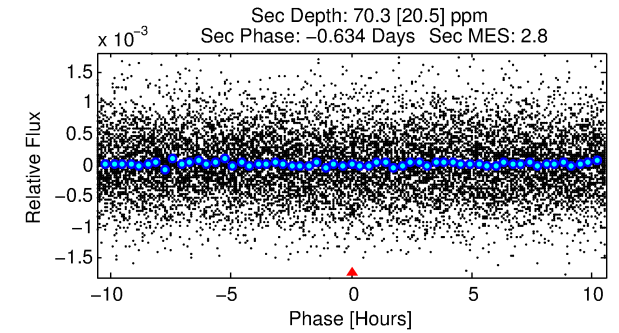
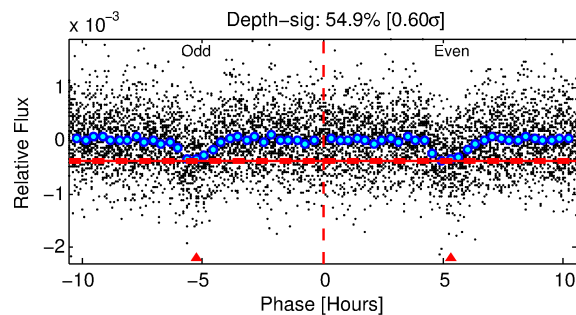
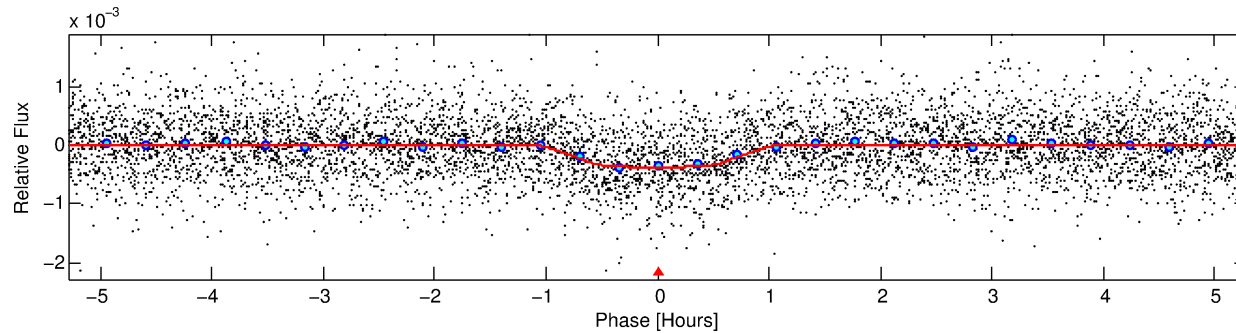
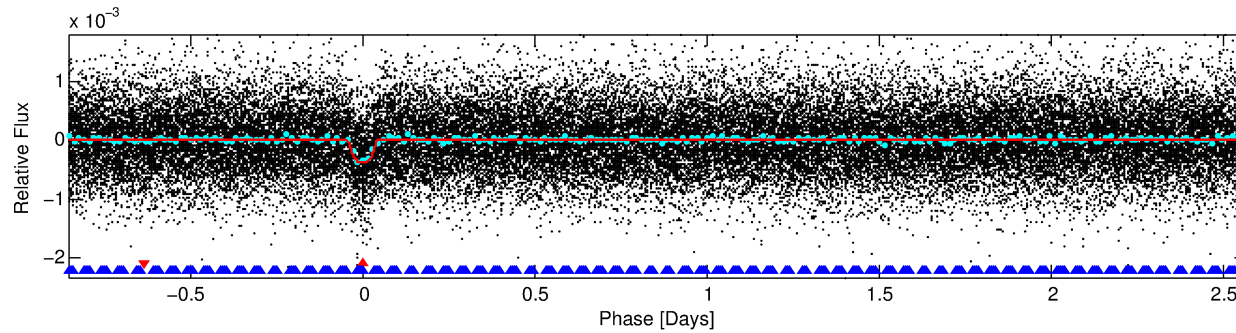
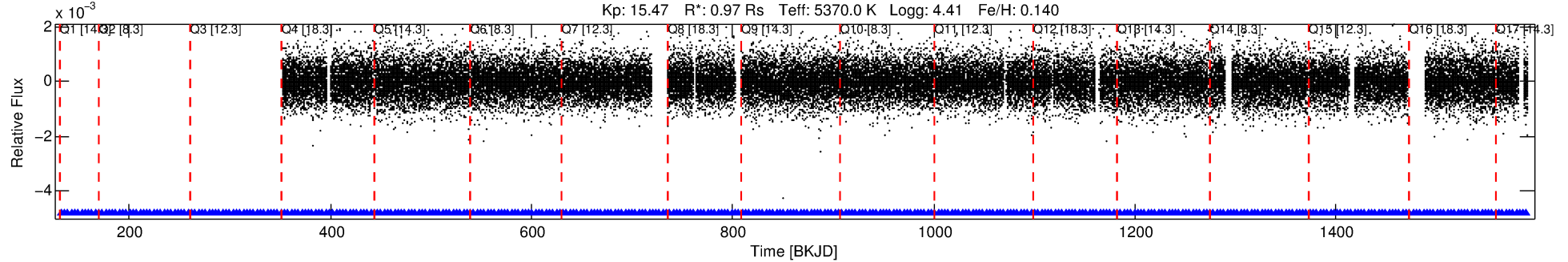
## Ephemeris Match Information For 006697605-01

No Significant Match Found

# DV One-Page Summary

KIC: 6697605 Candidate: 1 of 2 Period: 3.421 d  
KOI: K02851.01 Corr: 0.920

Kp: 15.47 R\*: 0.97 Rs Teff: 5370.0 K Logg: 4.41 Fe/H: 0.140



## DV Fit Results:

Period = 3.42065 [0.00001] d  
Epoch = 132.3060 [0.0016] BKJD  
Rp/R\* = 0.0211 [0.0094]  
a/R\* = 7.67 [13.94]  
b = 0.88 [0.48]  
Seff = 384.27 [71.63]  
Teq = 1129 [53] K  
Rp = 2.22 [1.02] Re  
a = 0.0425 [0.0046] AU  
Ag = 14.18 [13.58] [0.97σ]  
Teffp = 3387 [799] K [2.82σ]

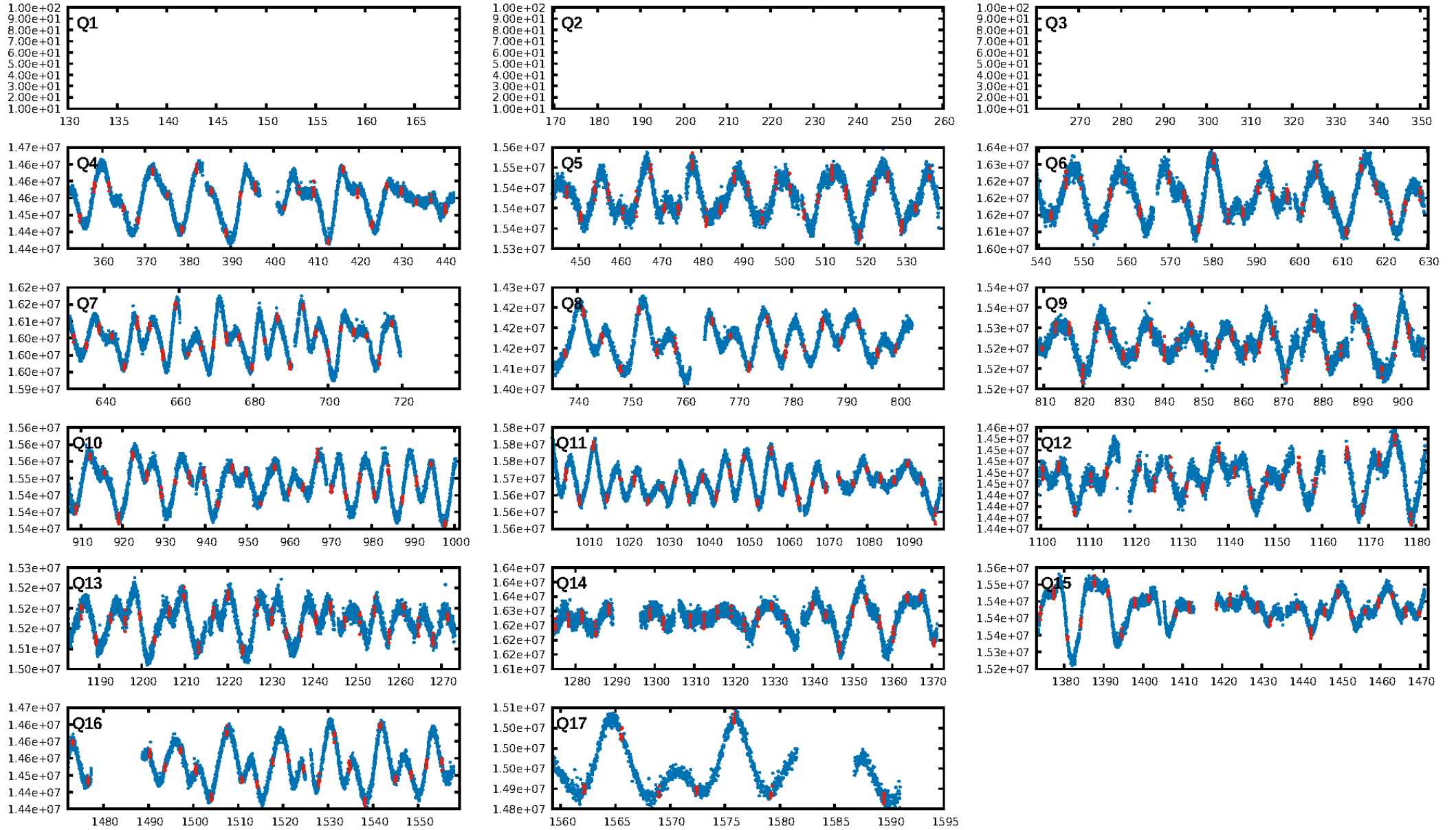
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.45σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.47e-59  
RollingBand-fgt: 1.00 [323/323]  
GhostDiagnostic-chr: 2.502  
Centroid-sig: 0.0%  
Centroid-so: 2.416 arcsec [9.83σ]  
OotOffset-rm: 2.168 arcsec [2.42σ]  
OotOffset-st: 0/2/2/2 [6]  
KicOffset-rm: 3.220 arcsec [3.83σ]  
KicOffset-st: 2/2/2/2 [8]  
DiffImageQuality-fgm: 0.88 [7/8]  
DiffImageOverlap-fno: 1.00 [14/14]

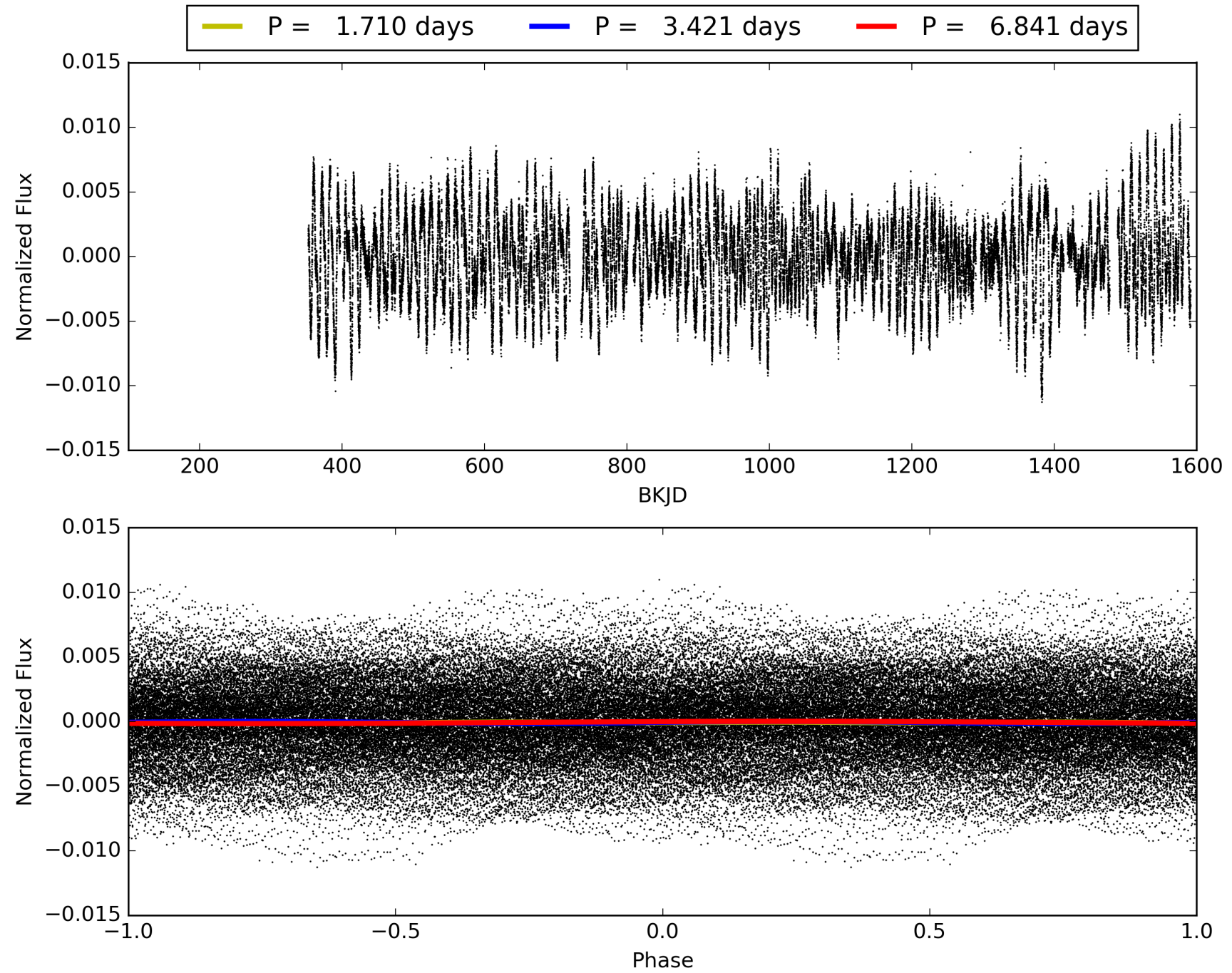
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:28:44 Z

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

# TCE 006697605-01, PDC Light Curves

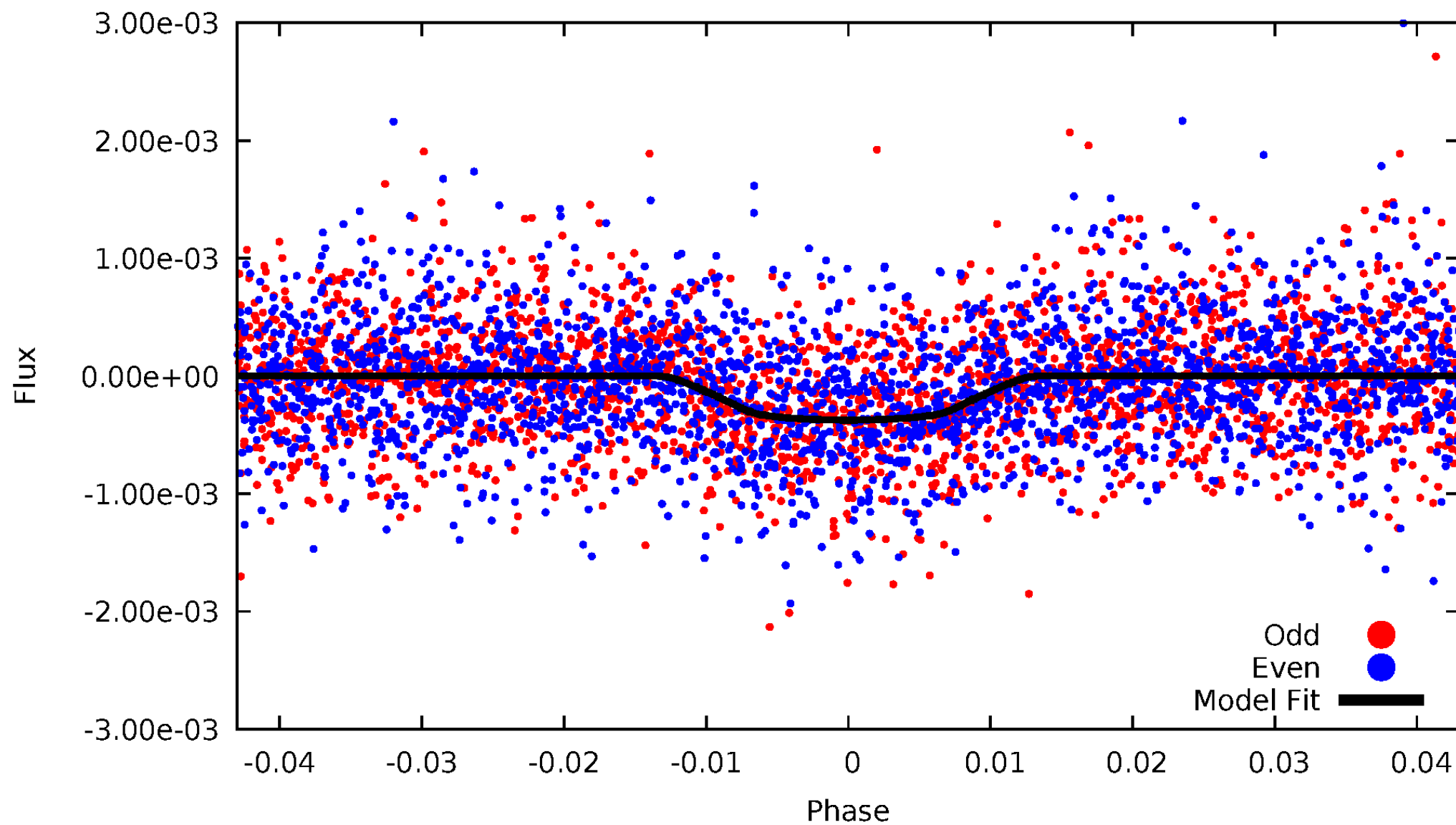


TCE 006697605-01



# DV Odd/Even

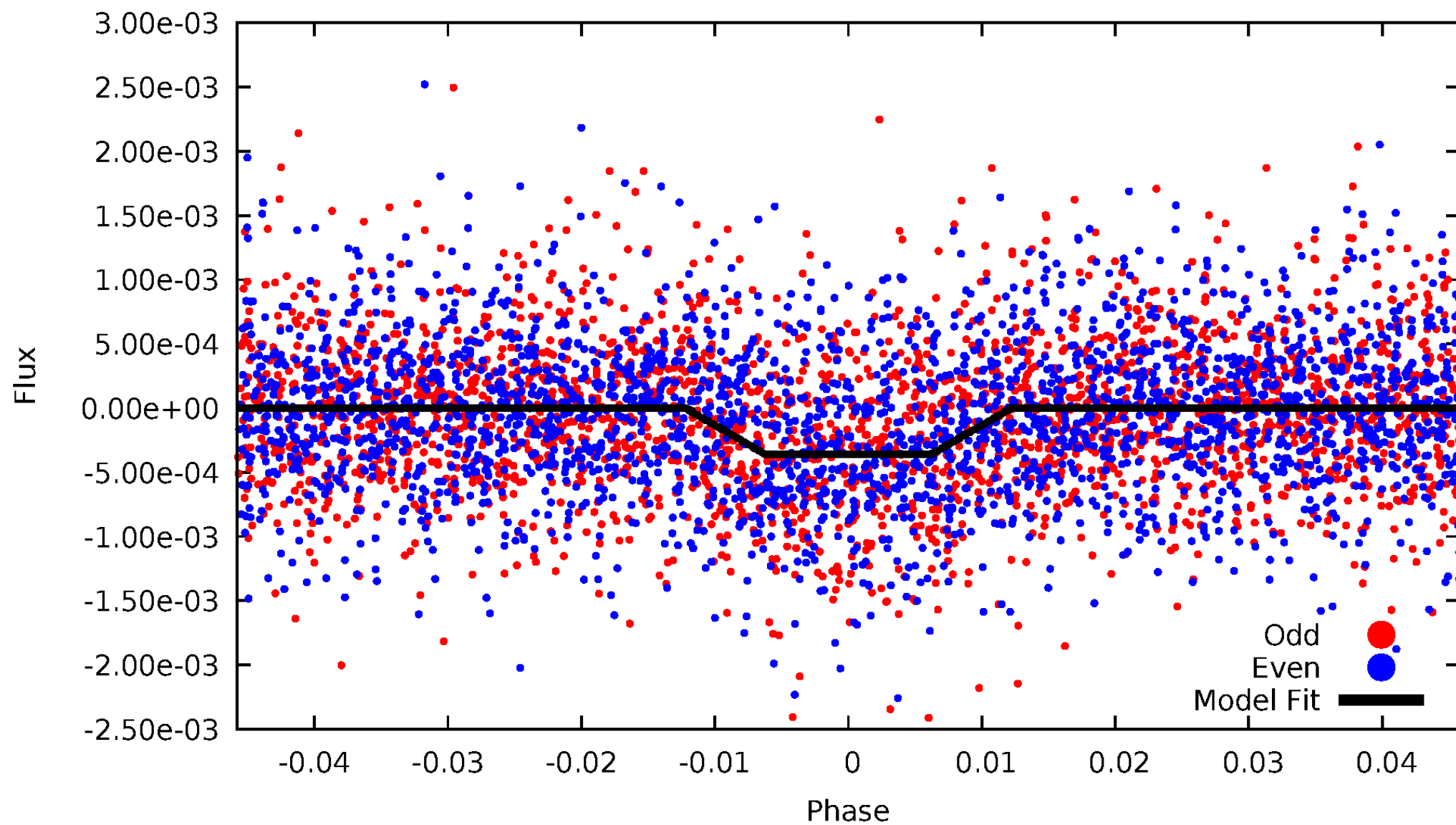
TCE 006697605-01





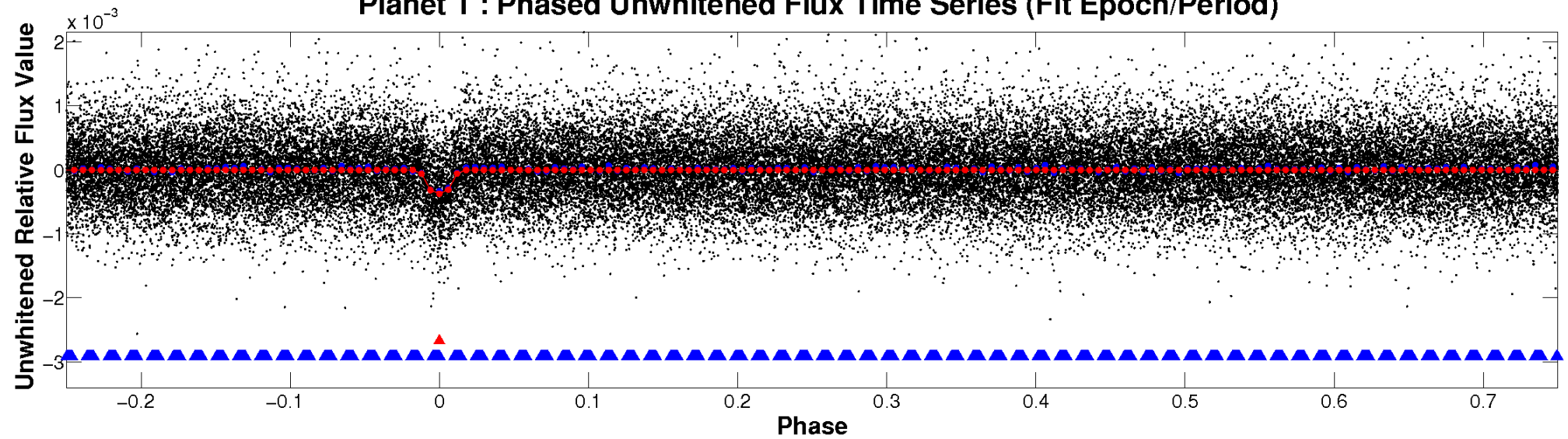
# ALT Odd/Even

TCE 006697605-01

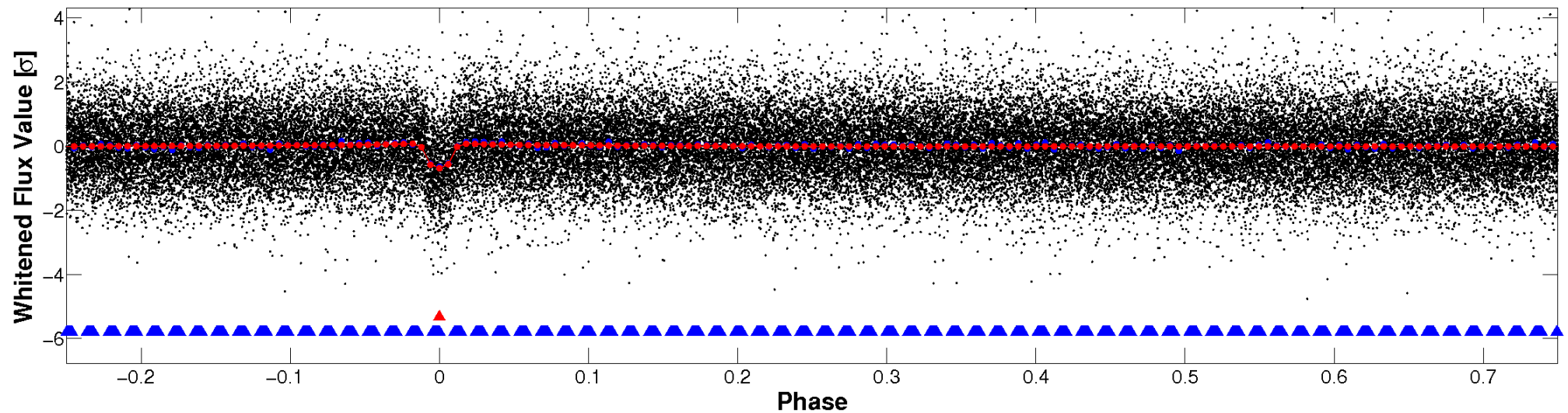


# Non-Whitened Vs. Whitened Light Curve

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

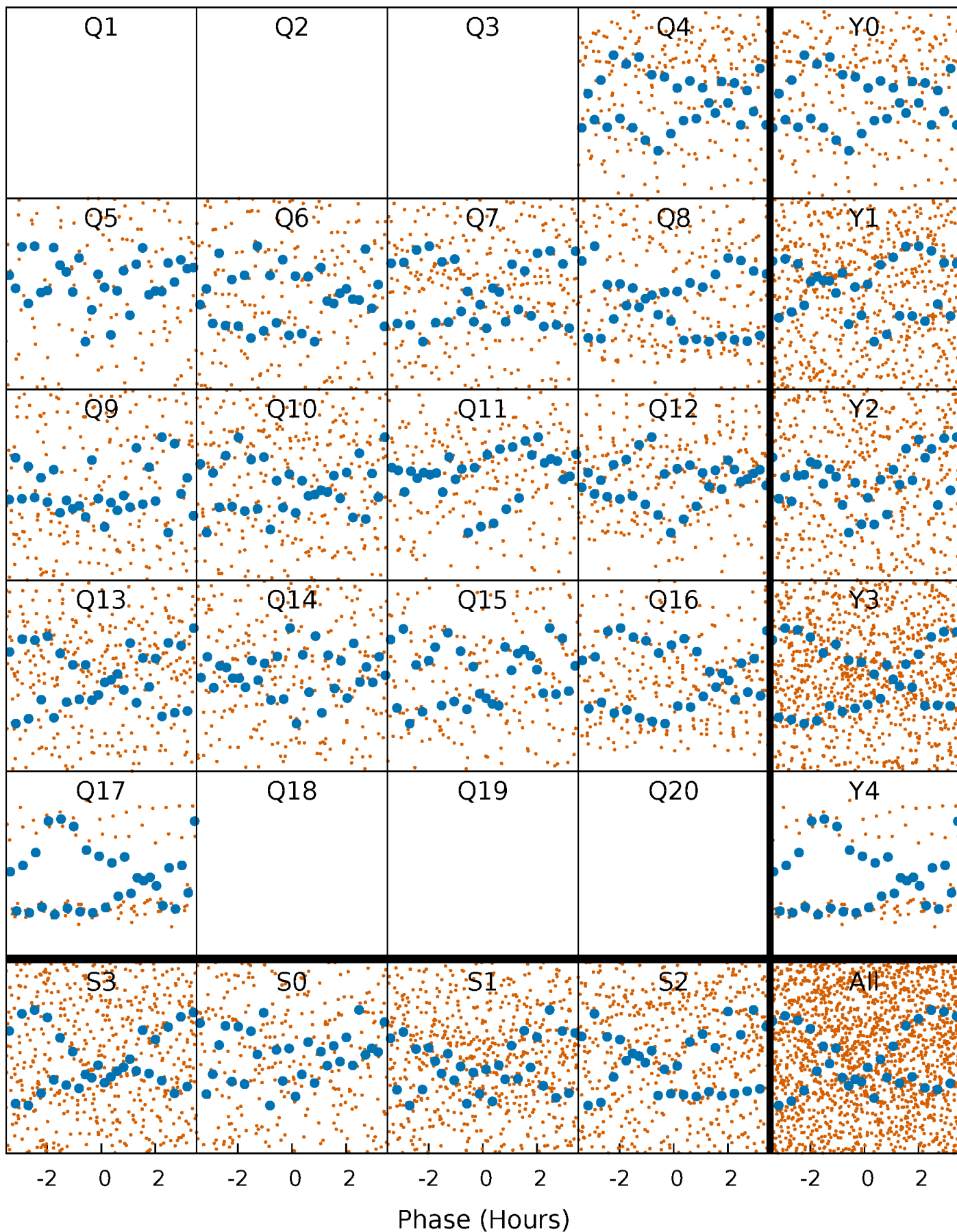


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

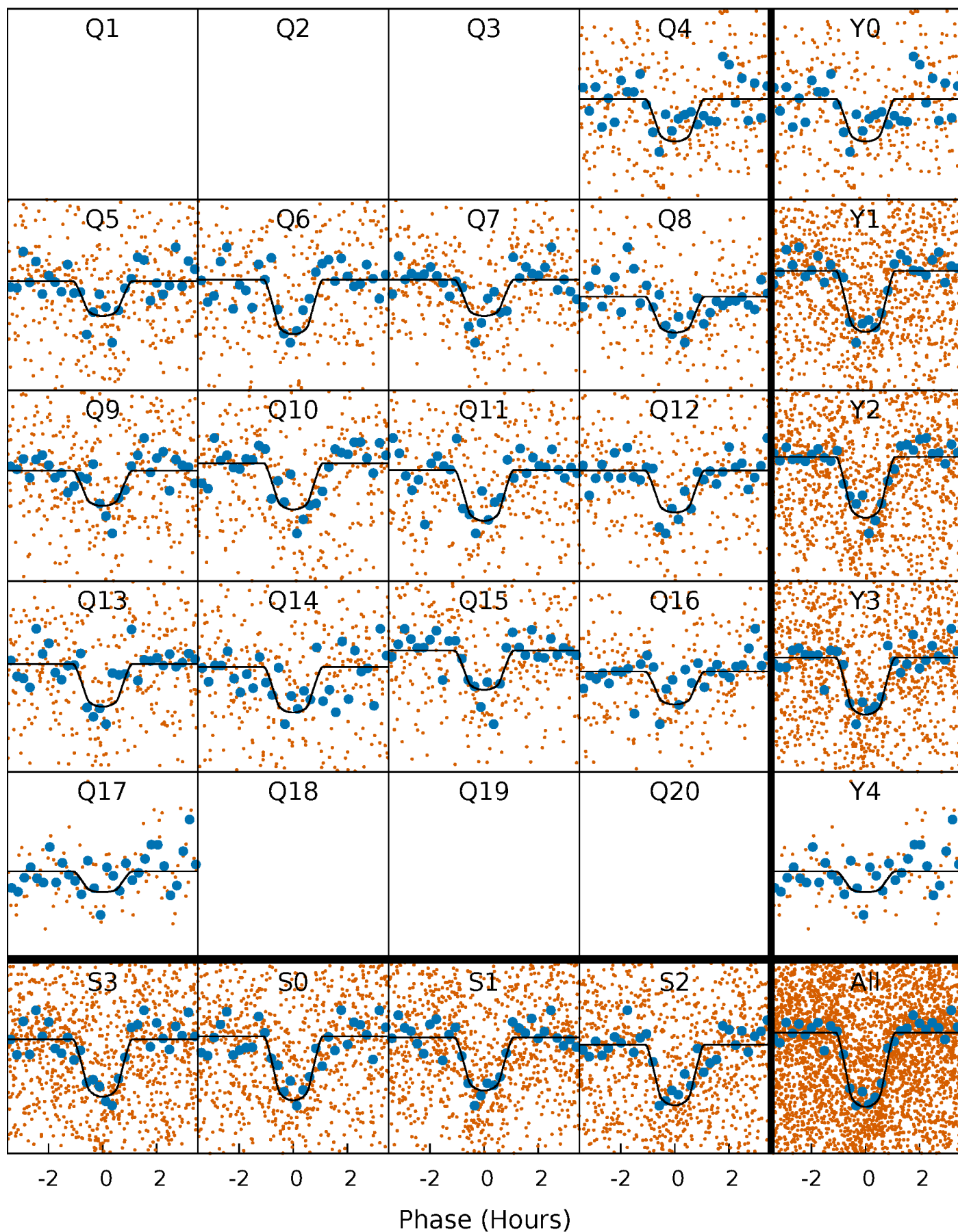
TCE 006697605-01   P= 3.420651 Days    $T_0=132.306008$  (BKJD)





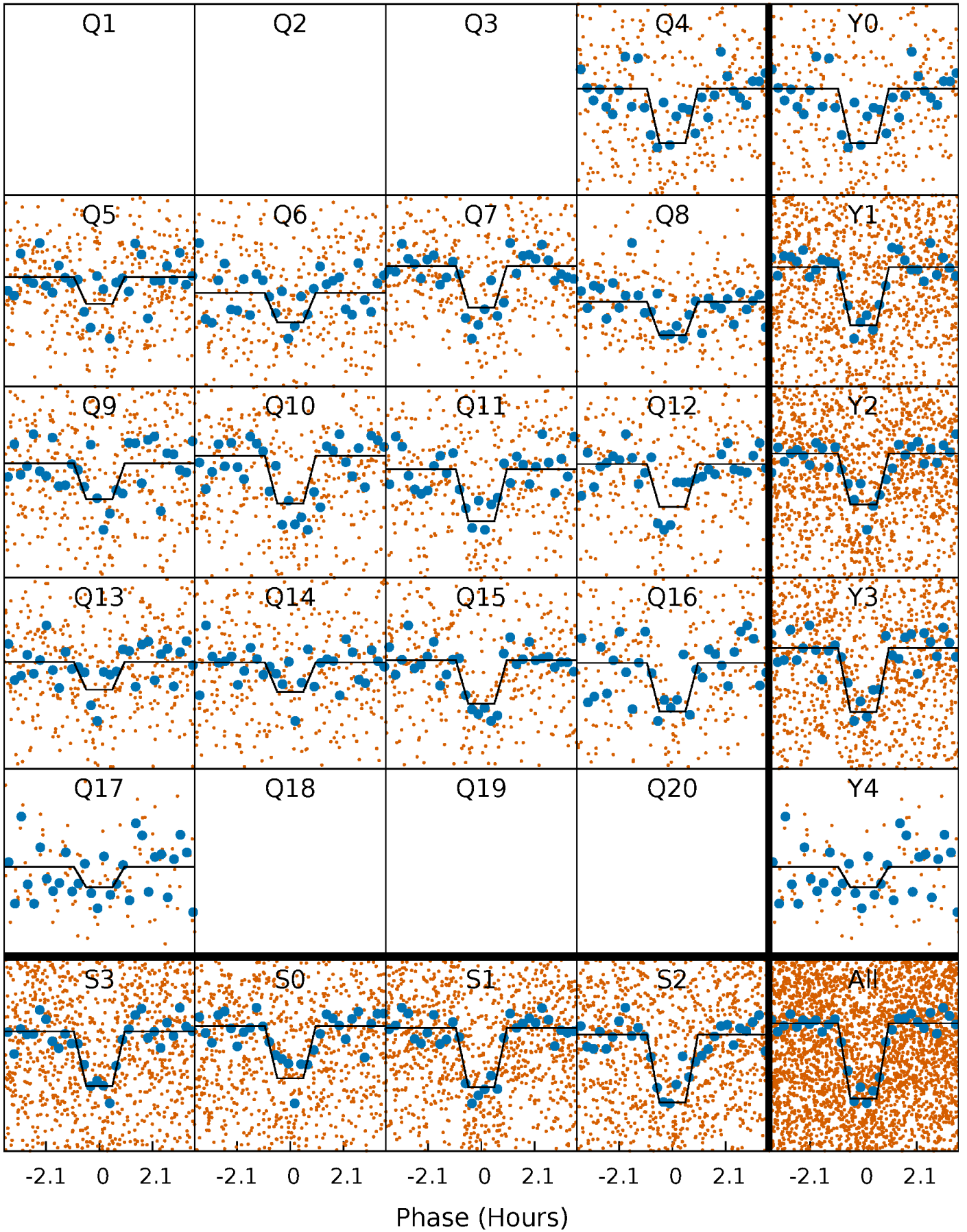
# DV Quarter-Phased Transit Curves

TCE 006697605-01 P= 3.420651 Days  $T_0=132.306008$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

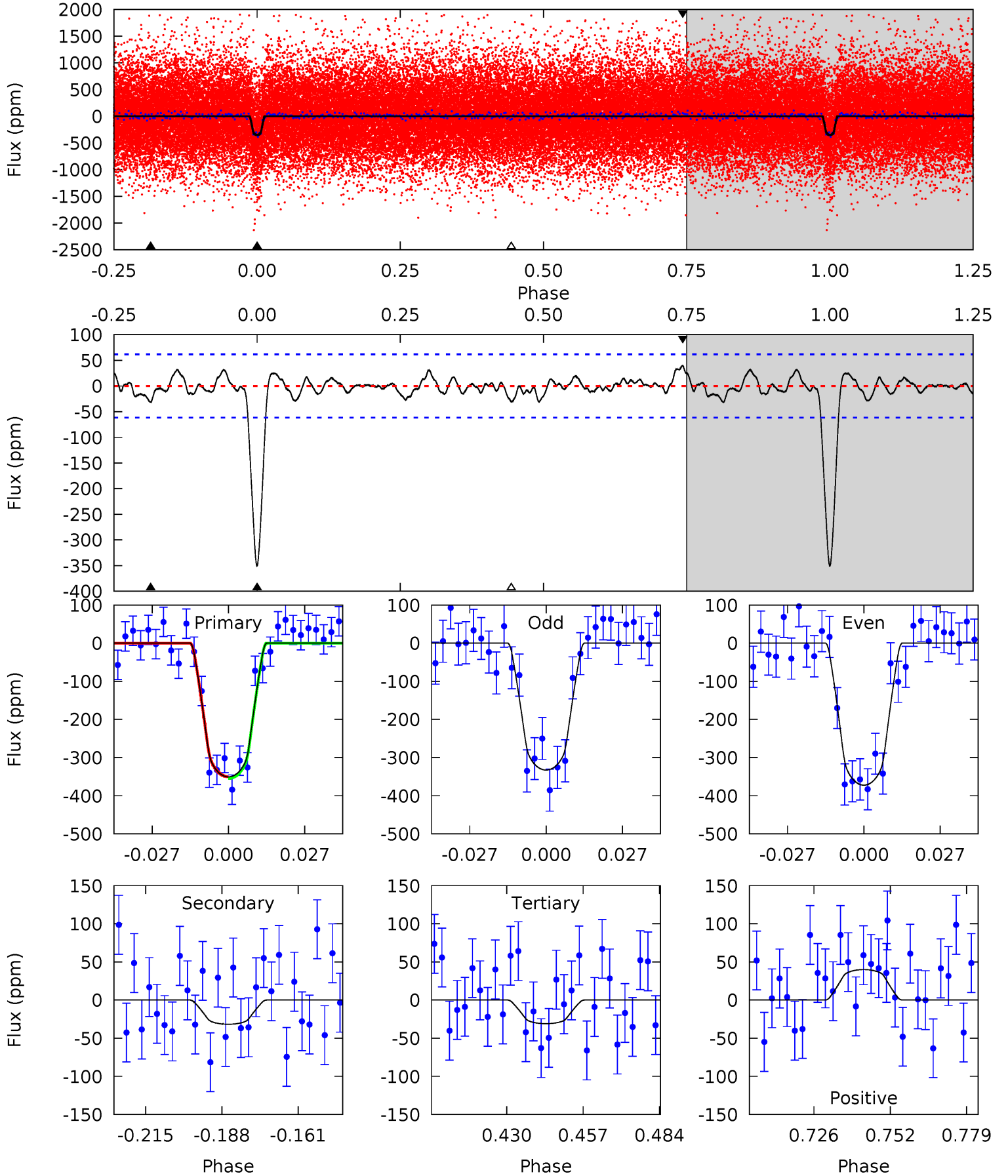
TCE 006697605-01 P= 3.420655 Days  $T_0=132.304587$  (BKJD)



# DV Model-Shift Uniqueness Test

006697605-01, P = 3.420651 Days, E = 132.306008 Days

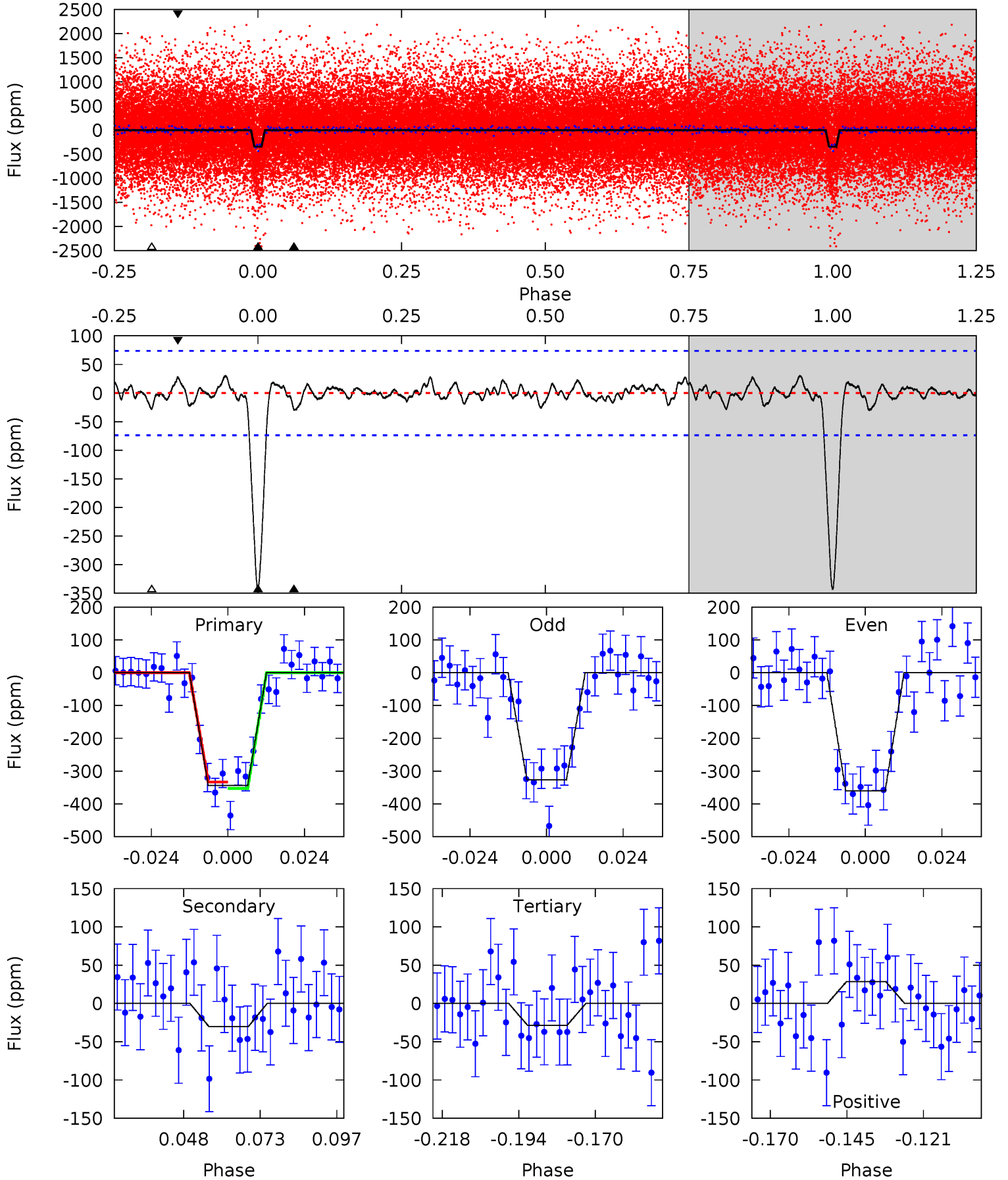
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.5	2.48	2.43	3.13	4.83	2.21	1.03	25.1	24.4	0.06	-0.65	1.55	0.94	0.10	0.17



# Alt Model-Shift Uniqueness Test

006697605-01, P = 3.420655 Days, E = 132.304587 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
22.6	1.99	1.89	1.87	4.85	2.25	0.69	20.8	20.8	0.10	0.12	1.09	0.94	0.08	0.64



### Stellar Parameters For KIC 006697605

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5370^{+85}_{-75}$	$4.411^{+0.104}_{-0.076}$	$0.140^{+0.150}_{-0.150}$	$0.966^{+0.105}_{-0.095}$	$0.877^{+0.064}_{-0.037}$	$1.372^{+0.557}_{-0.333}$
	+2%/-1%	+2%/-2%	+107%/-107%	+11%/-10%	+7%/-4%	+41%/-24%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006697605-01 / KOI 2851.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-32 \pm 13$	$2.24^{+1.01}_{-0.97}$	$1572^{+51}_{-52}$	$3234^{+727}_{-402}$	$5.982^{+14.581}_{-3.476}$
Alt.	$-30 \pm 15$	$1.99^{+0.97}_{-0.92}$	$1576^{+50}_{-50}$	$3346^{+827}_{-513}$	$7.331^{+18.814}_{-4.901}$

$T_{\text{max}}$  = 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

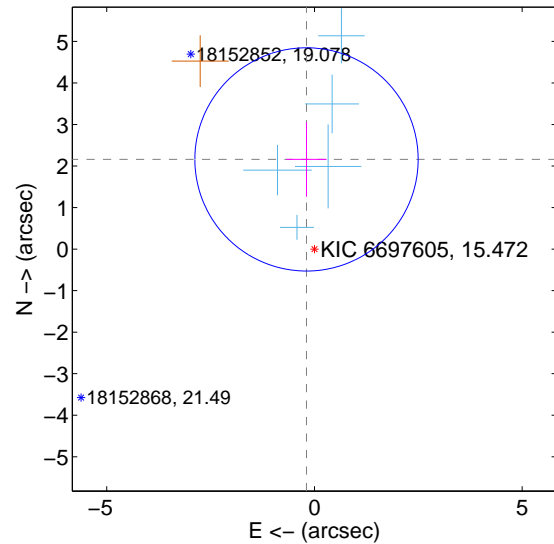
Supplemental centroid analysis for 006697605-01. Kepler magnitude: 15.47. Transit SNR 19.29

There are 7 quarters with good PRF difference image offsets

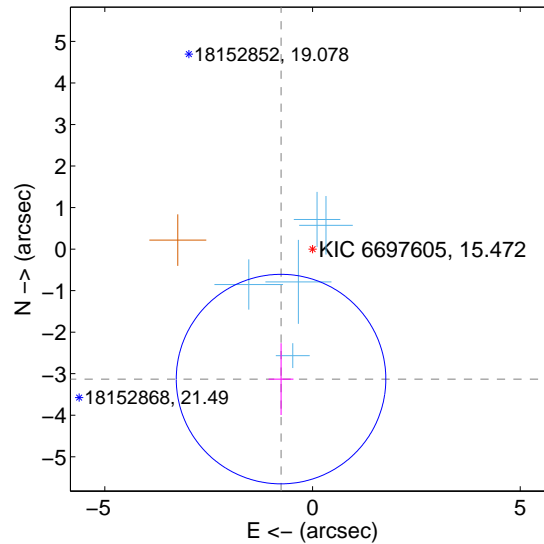
The OOT PRF centroid is offset from the target star catalog position by about 4.34 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.168 \pm 0.896$	2.42	$0.191 \pm 0.486$	$2.159 \pm 0.898$
PRF-fit source offset from KIC position	$3.220 \pm 0.841$	3.83	$0.758 \pm 0.299$	$-3.130 \pm 0.866$
photometric centroid source offset	$2.42 \pm 0.25$	9.83	$0.32 \pm 0.16$	$-2.39 \pm 0.25$

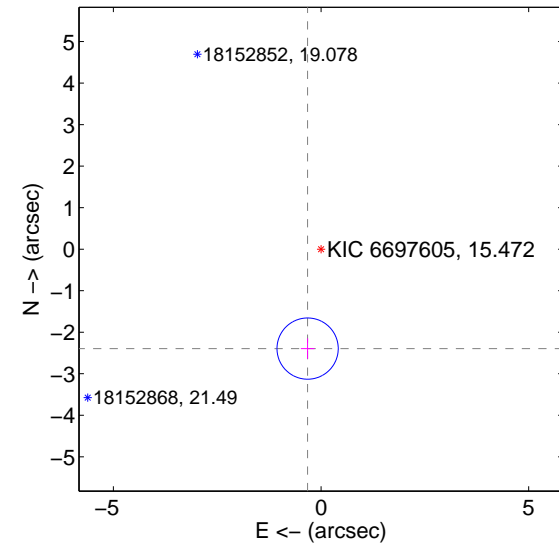
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

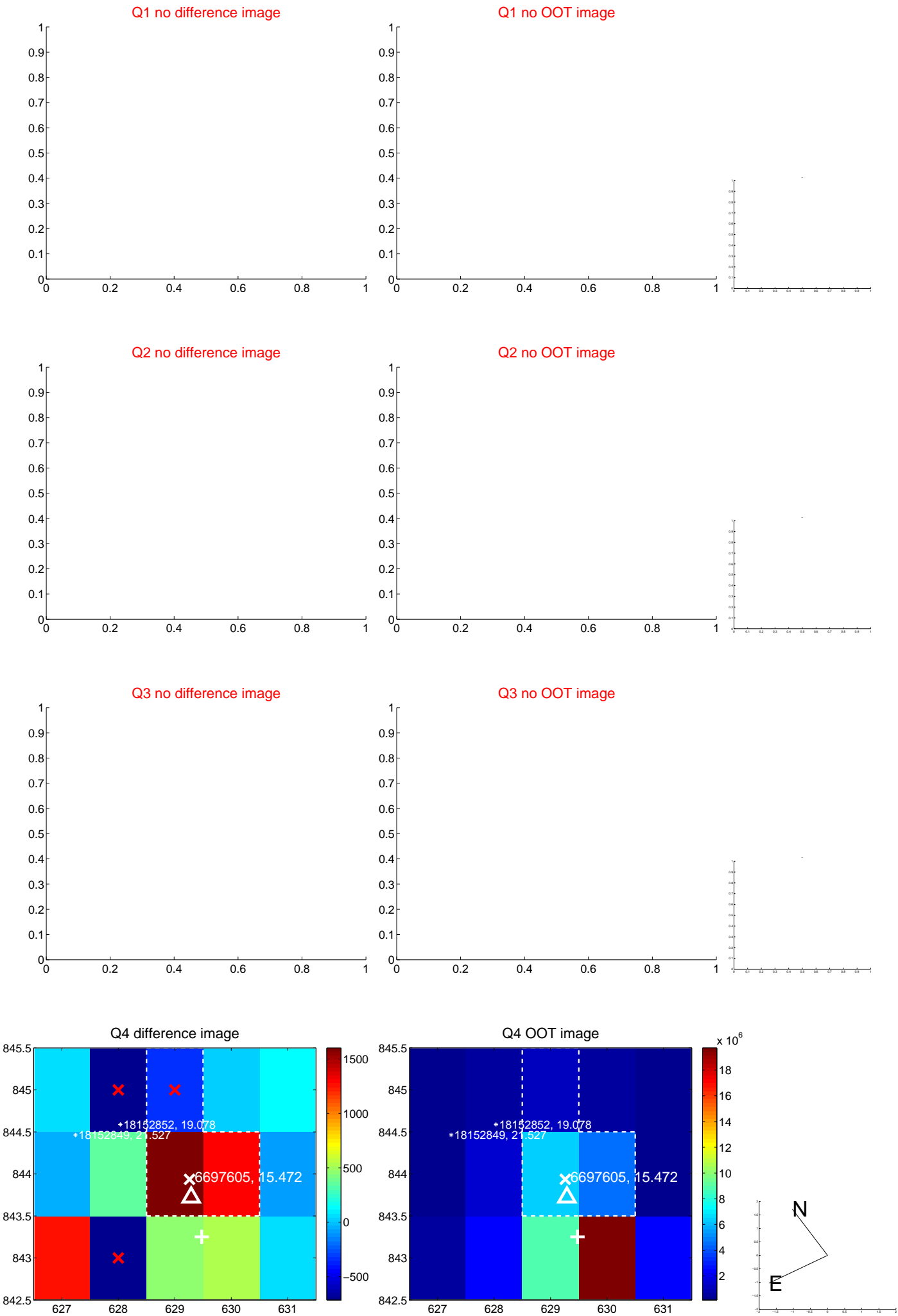


offset from photometric centroids

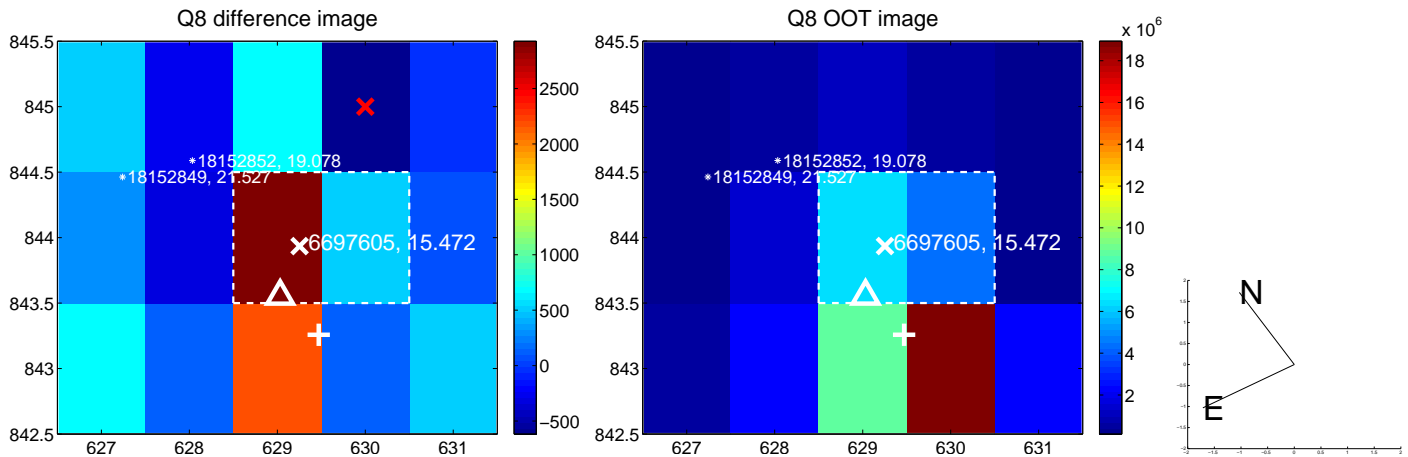
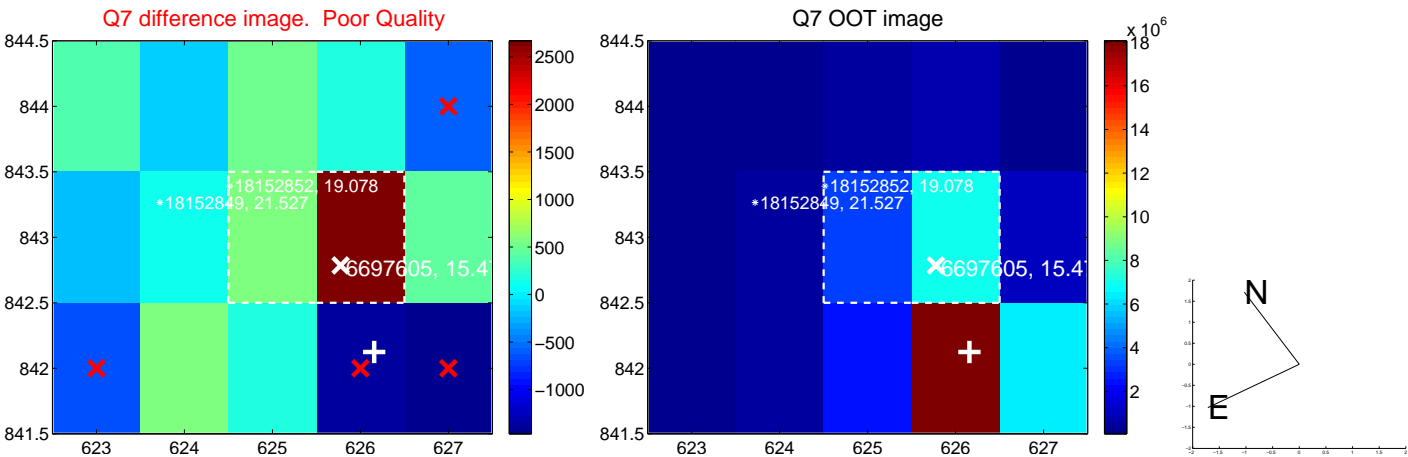
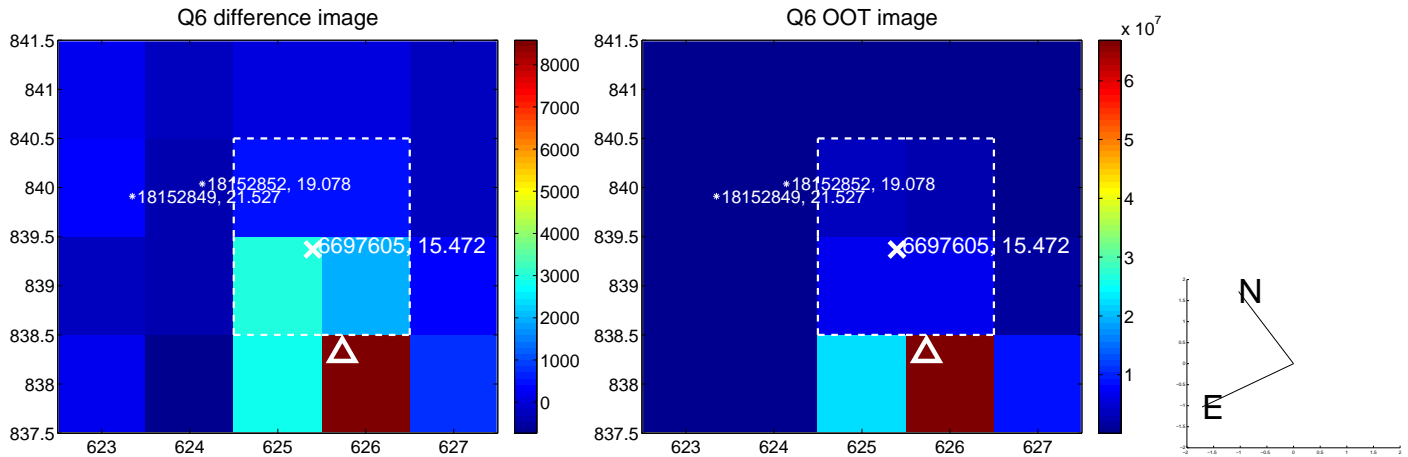
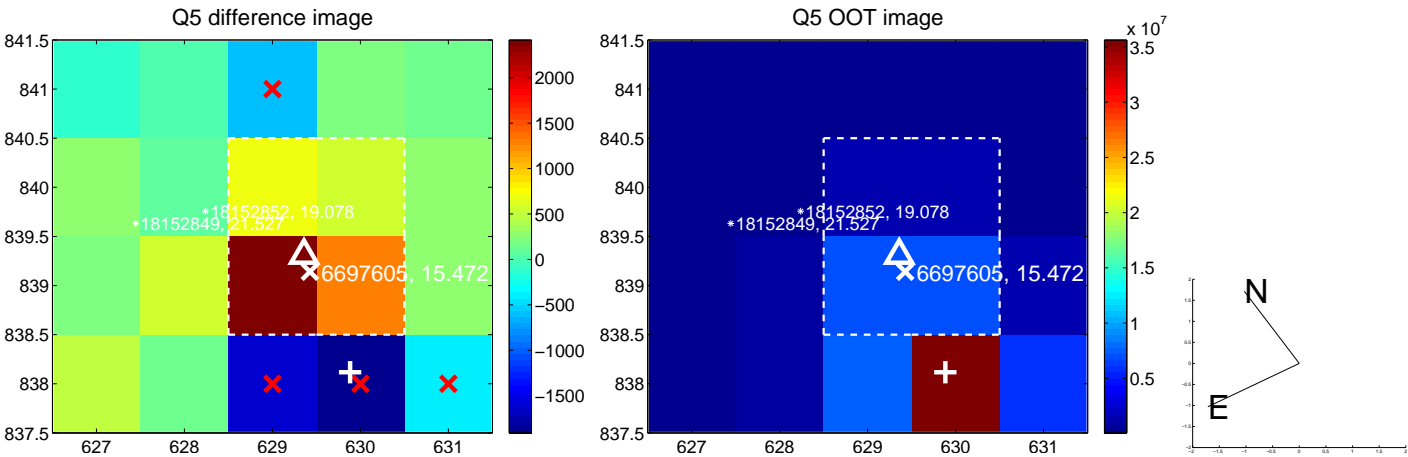


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

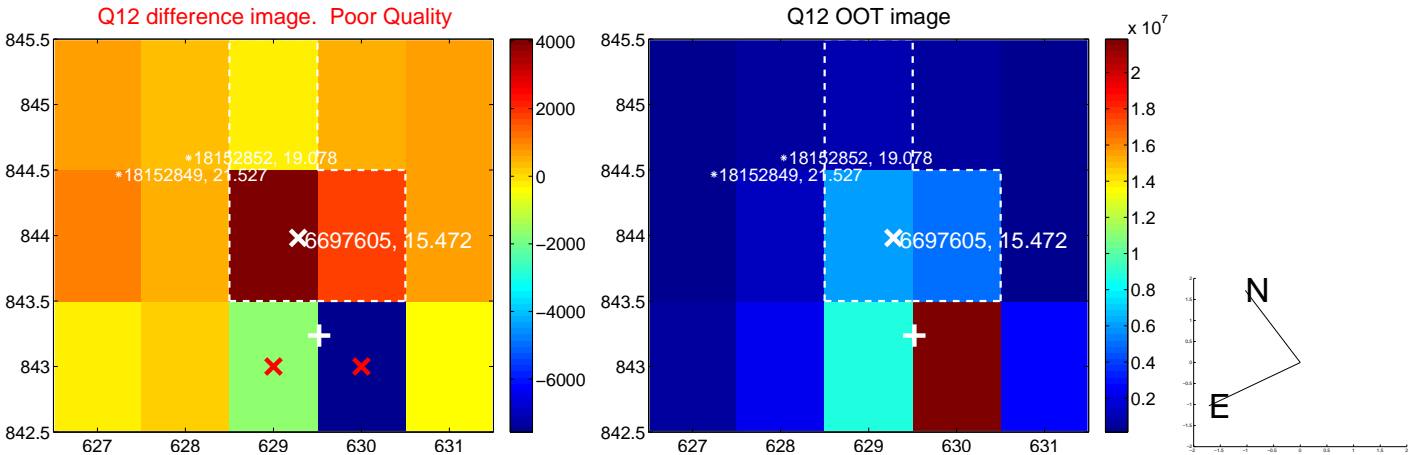
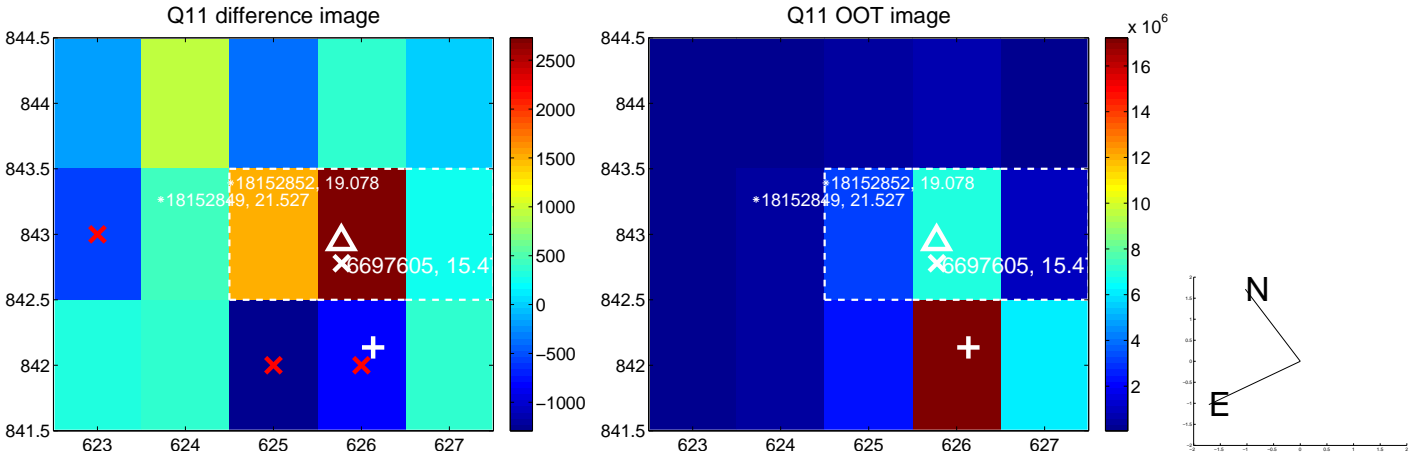
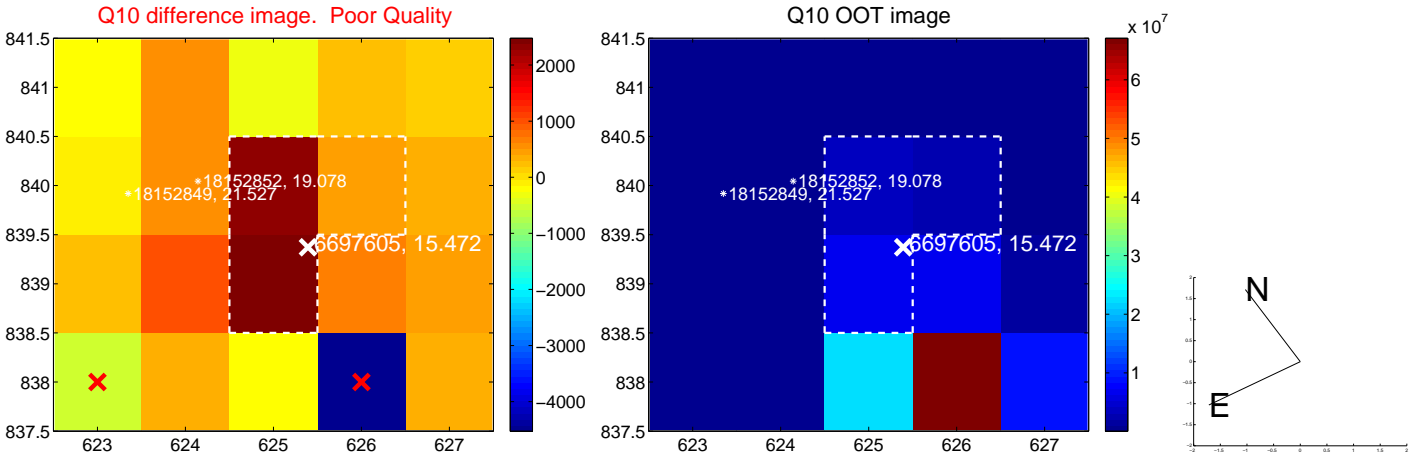
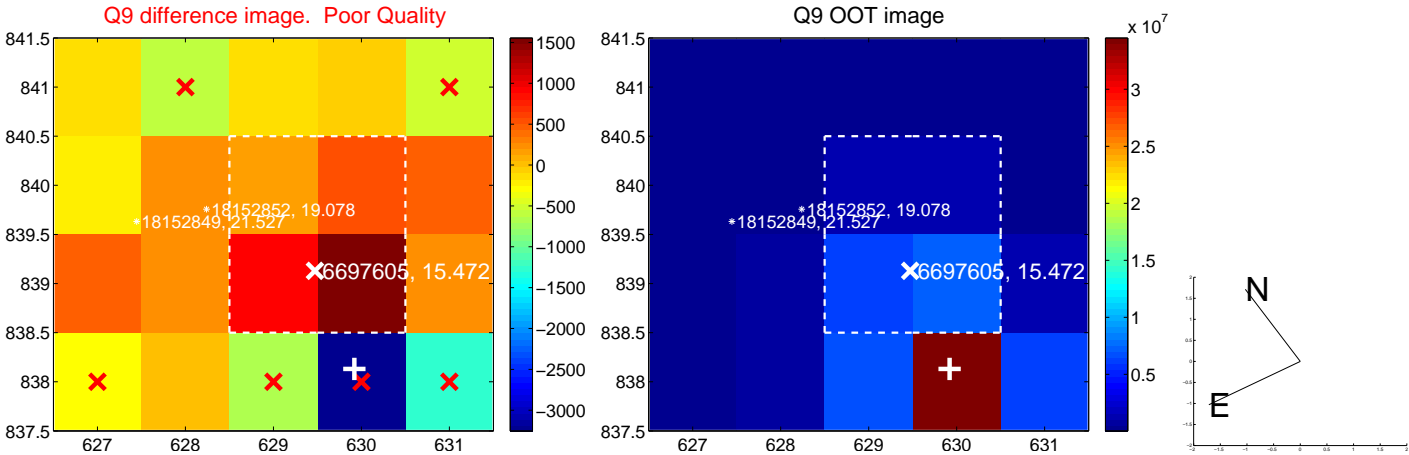
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



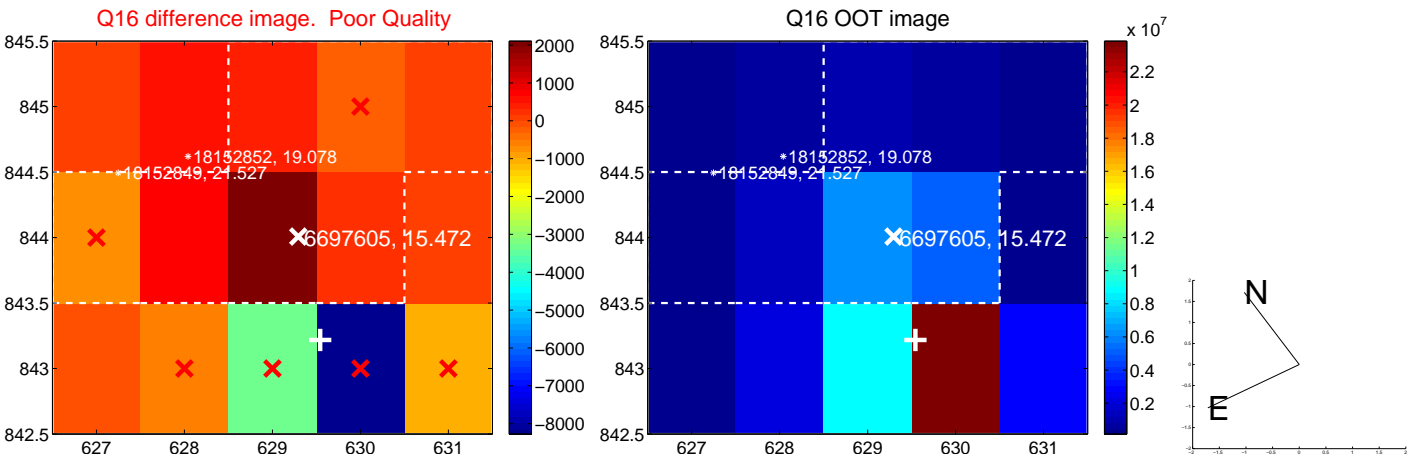
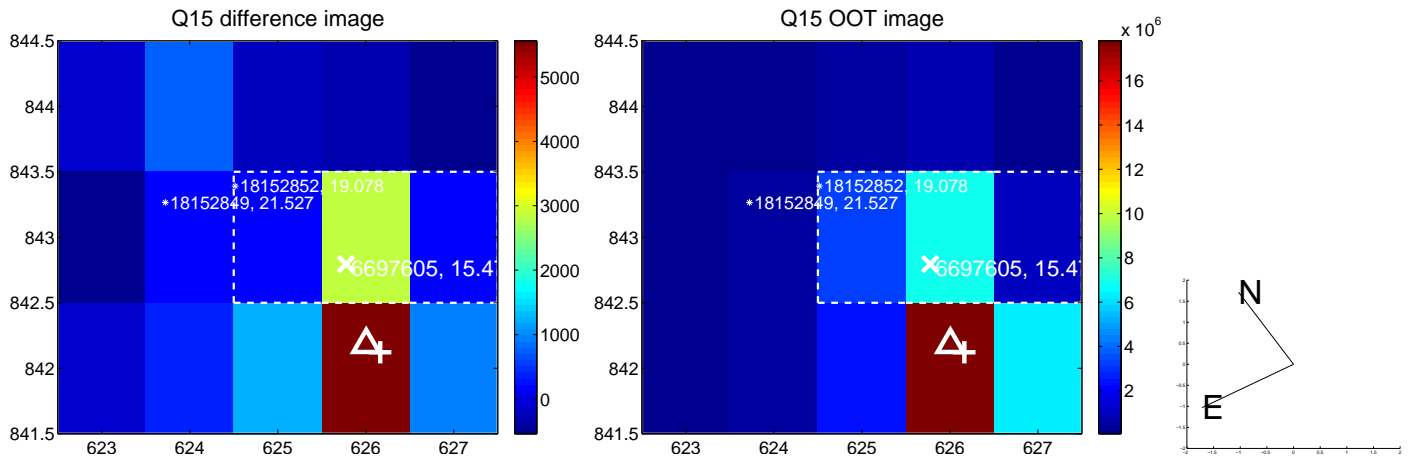
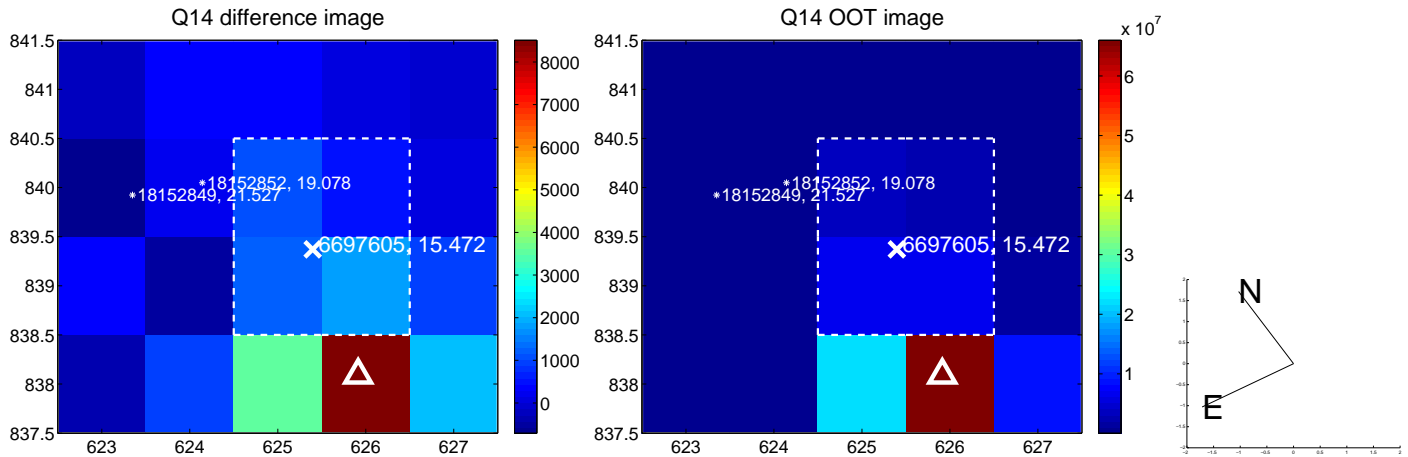
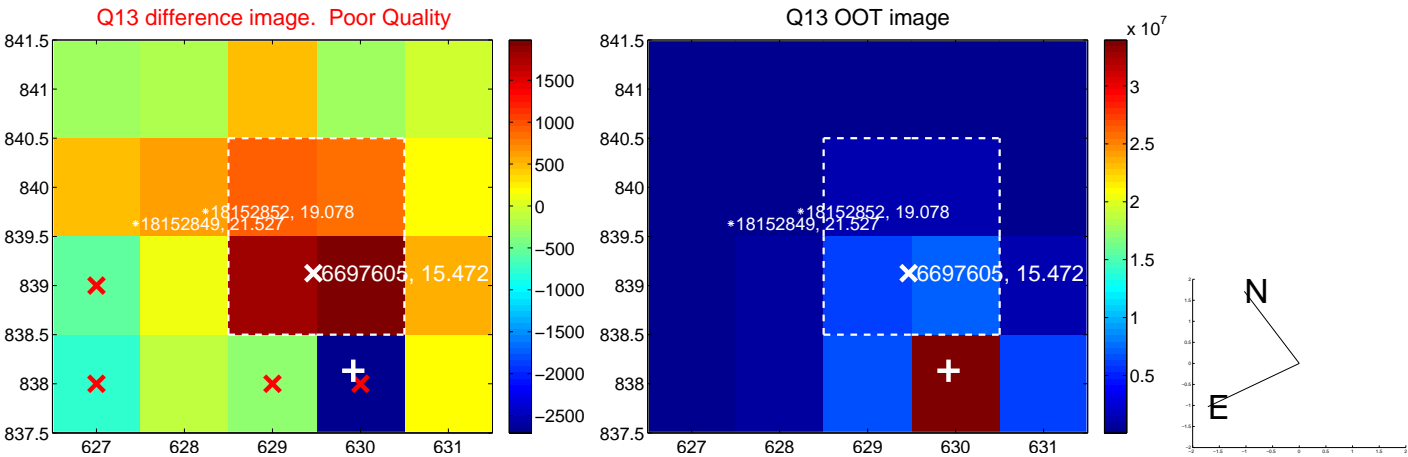
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

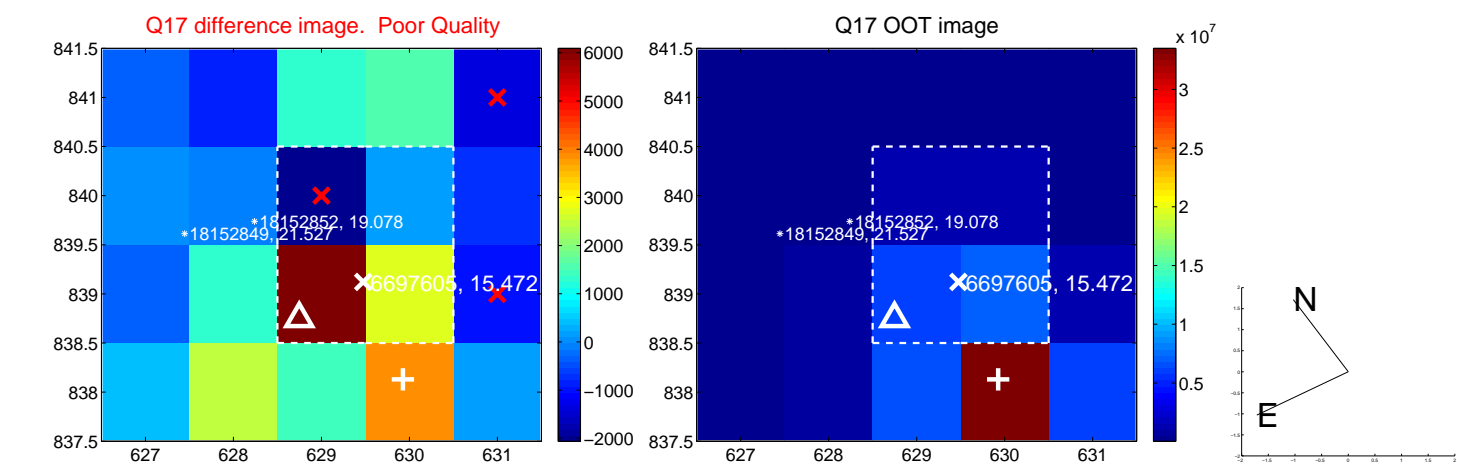


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

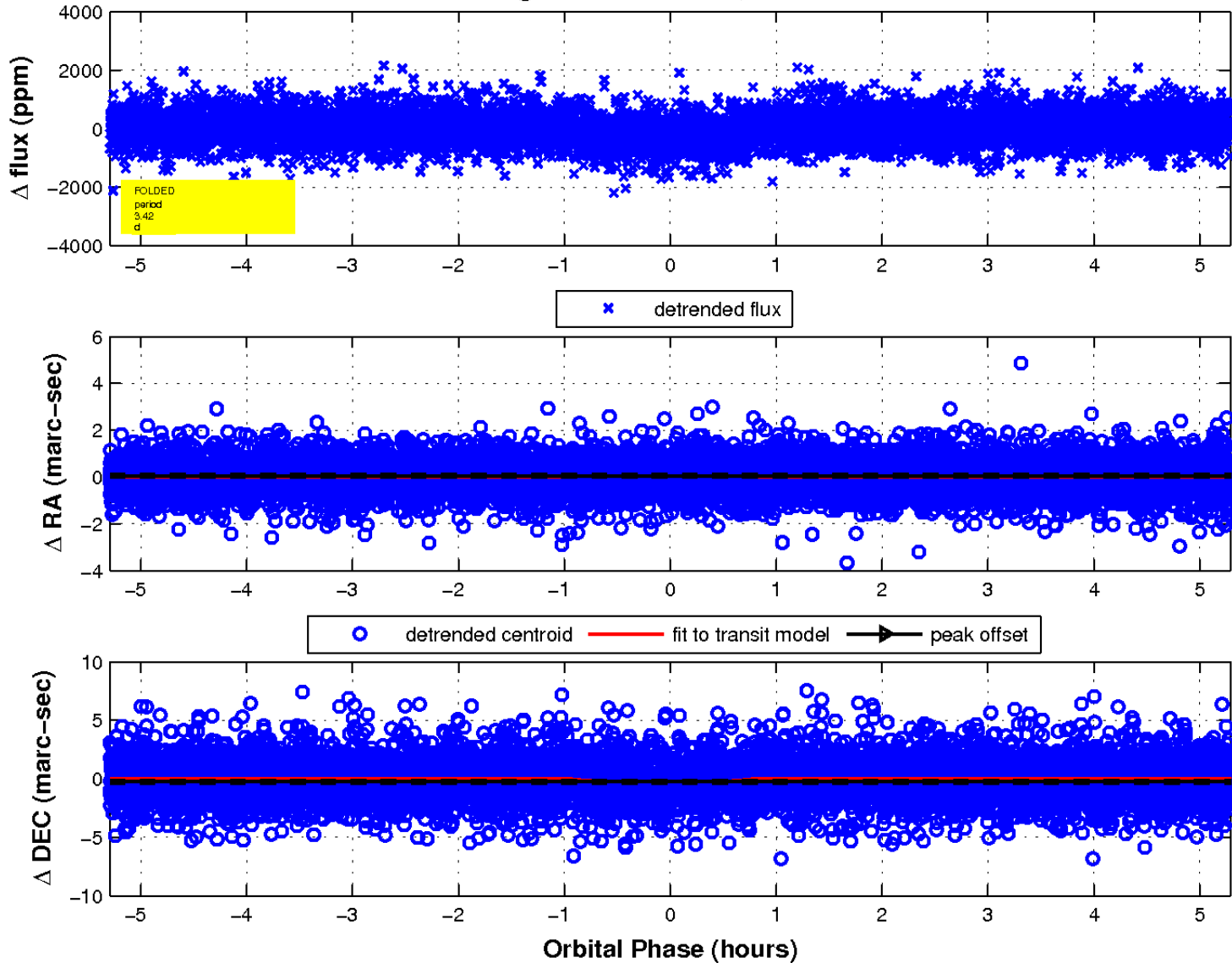




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

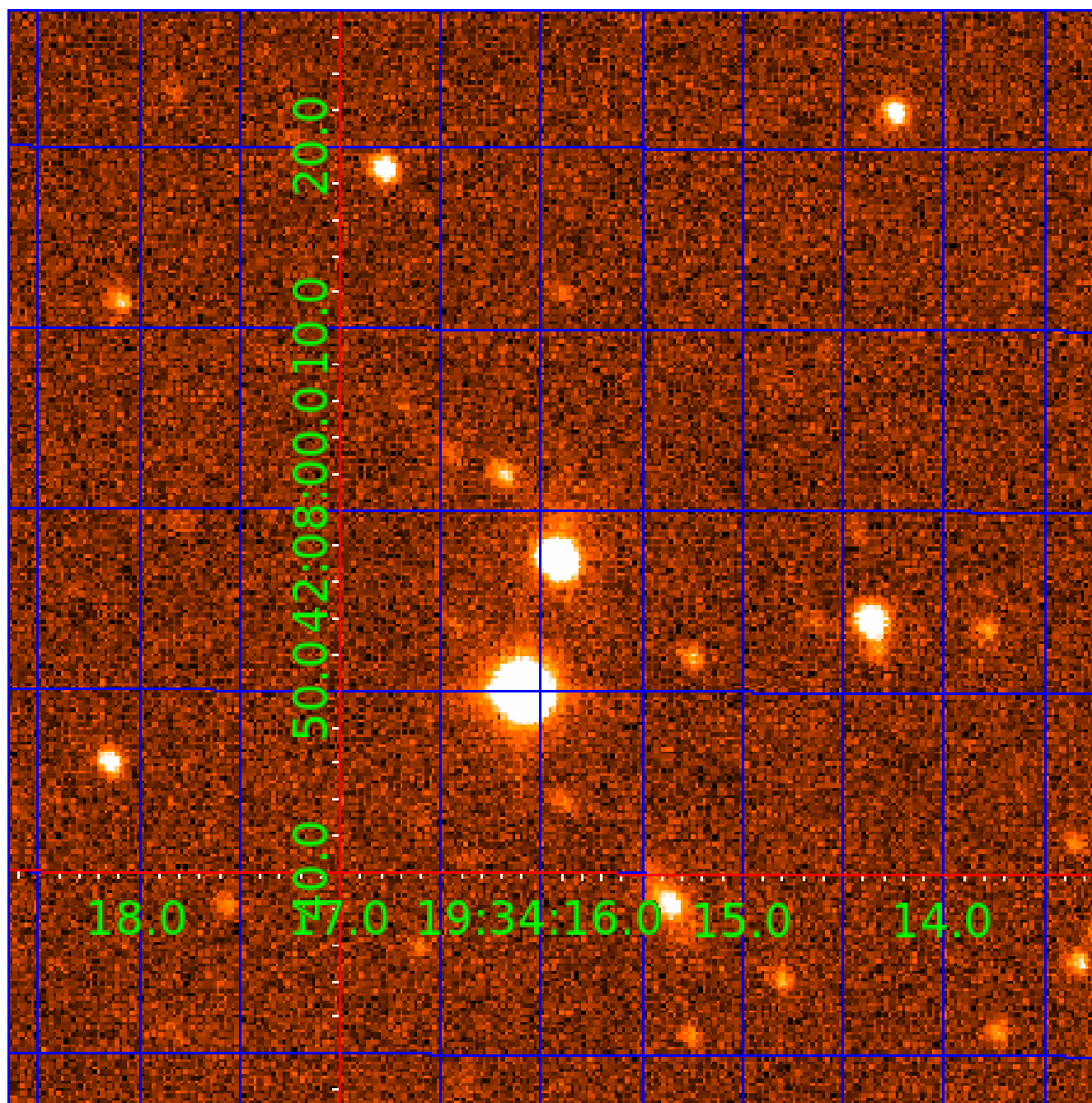


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 006697605

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006697605-01	OBS	2851.01	3.420651	132.306008	374.6	1.764	16.8	19.3	0.97	5370	2.22	384.26
006697605-02	OBS	2851.02	1.239380	131.844319	159.3	1.367	10.2	12.0	0.97	5370	1.30	1487.66

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006697605-01	OBS	PC	0.71	0	0	0	0	CENT_KIC_POS
006697605-02	OBS	PC	1.00	0	0	0	0	CENT_FEW_MEAS

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

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

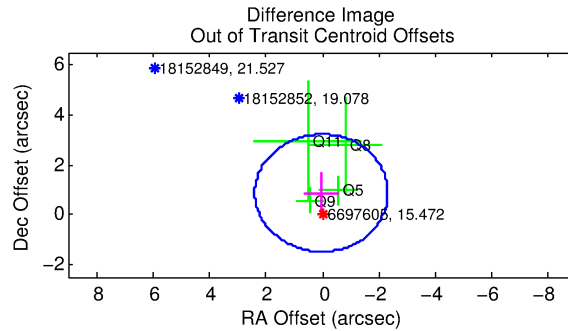
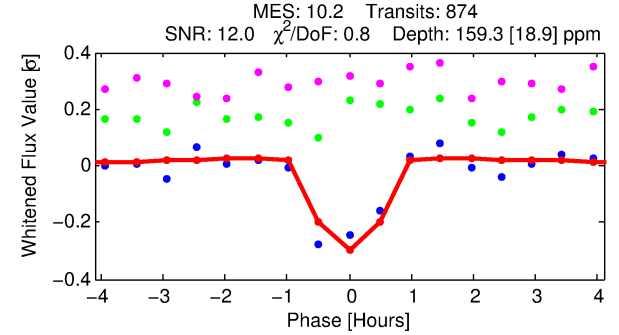
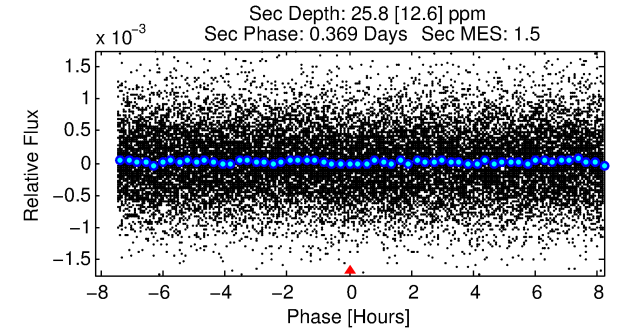
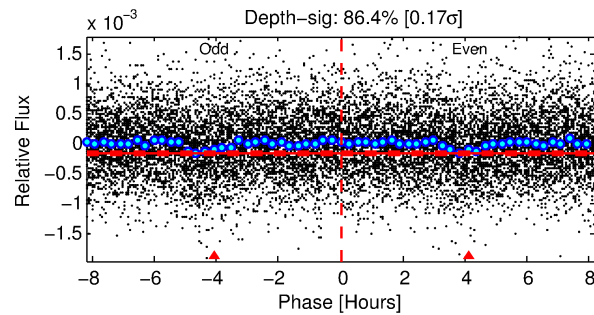
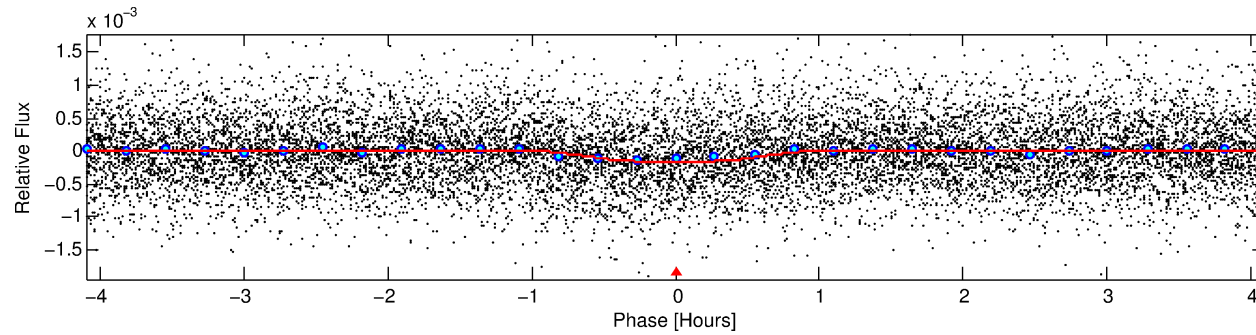
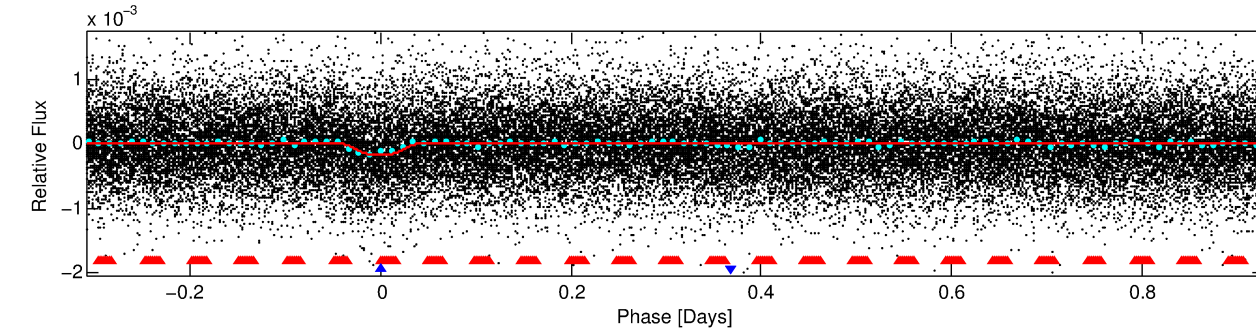
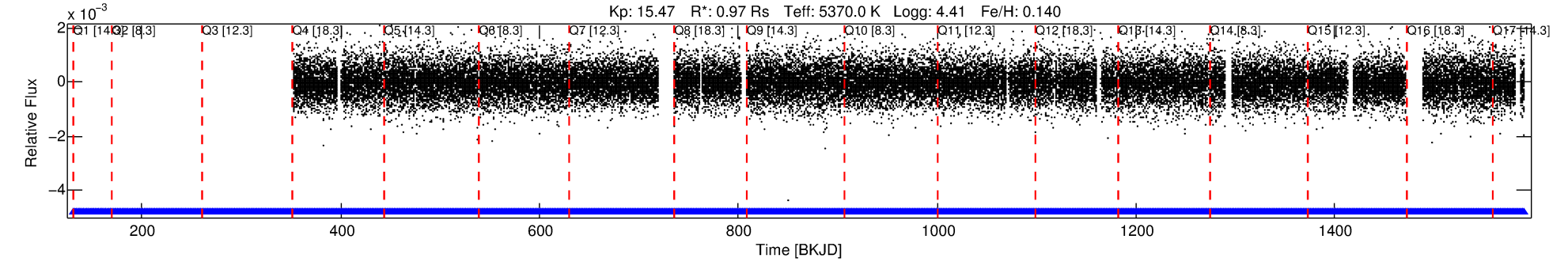
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006697605-02

No Significant Match Found

# DV One-Page Summary

KIC: 6697605 Candidate: 2 of 2 Period: 1.239 d  
KOI: K02851.02 Corr: 0.849



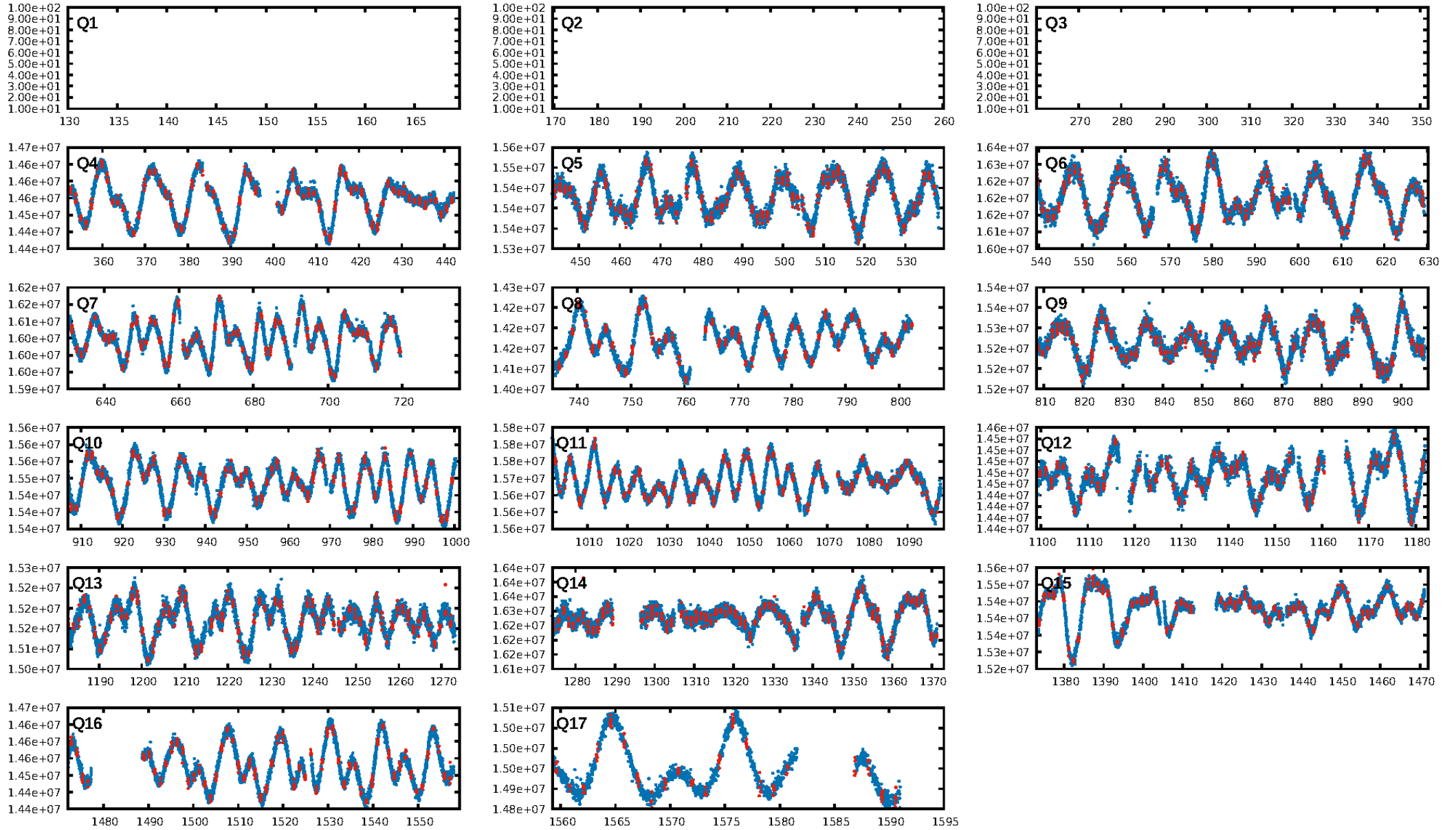
## DV Fit Results:

Period = 1.23938 [0.00001] d  
Epoch = 131.8443 [0.0017] BKJD  
Rp/R\* = 0.0123 [0.0067]  
a/R\* = 5.23 [10.38]  
b = 0.68 [1.63]  
Seff = 1487.66 [277.31]  
Teq = 1584 [74] K  
Rp = 1.30 [0.72] Re  
a = 0.0216 [0.0023] AU  
Ag = 3.93 [4.72] [0.62 $\sigma$ ]  
Teffp = 3446 [1027] K [1.81 $\sigma$ ]

## DV Diagnostic Results:

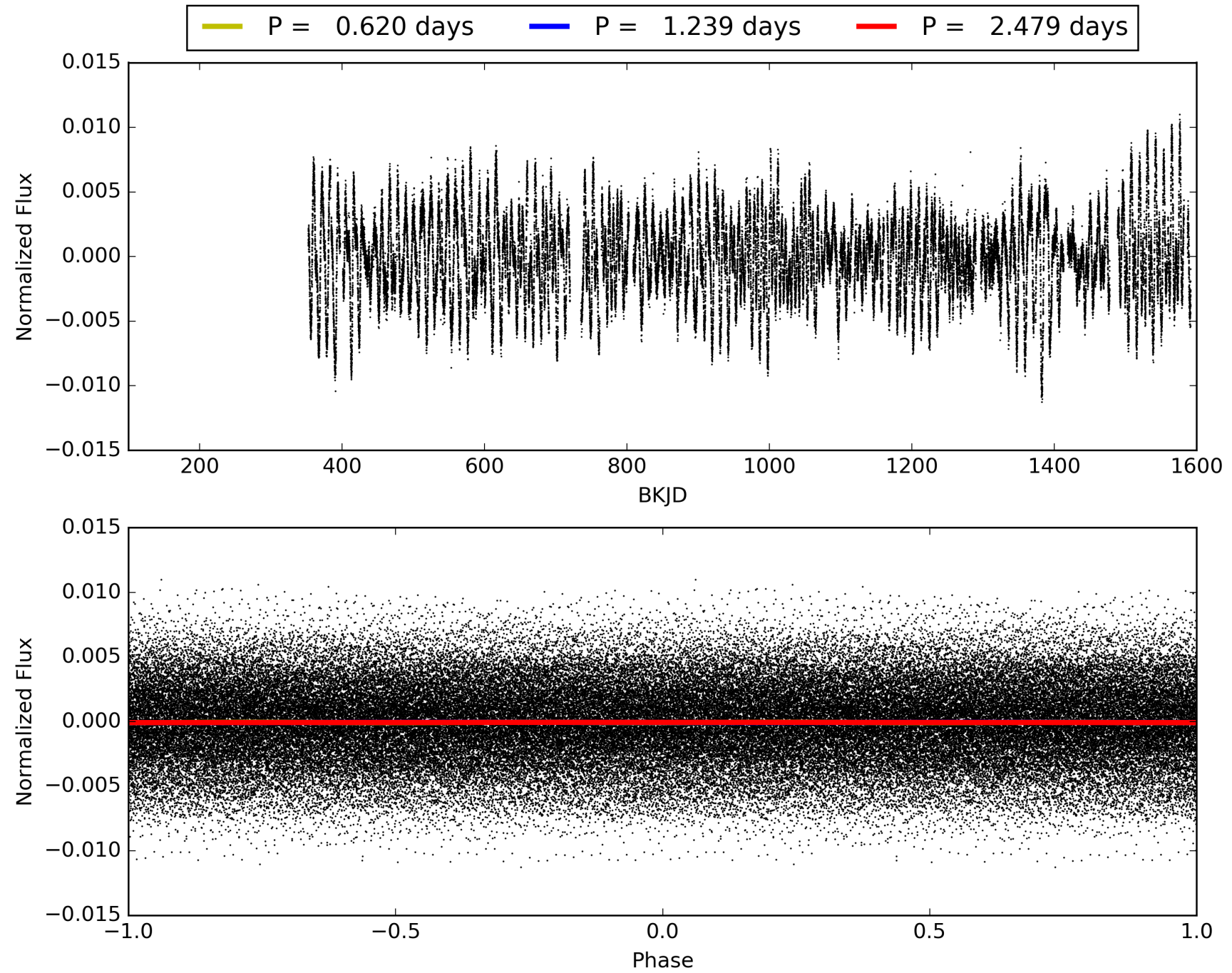
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [23.45 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.63e-23  
RollingBand-fgt: 1.00 [853/853]  
GhostDiagnostic-chr: 0.8552  
Centroid-sig: 0.0%  
Centroid-so: 2.303 arcsec [6.12 $\sigma$ ]  
OotOffset-rm: 0.865 arcsec [1.10 $\sigma$ ]  
KicOffset-rm: 3.479 arcsec [4.18 $\sigma$ ]  
OotOffset-st: 0/1/1/2 [4]  
KicOffset-st: 0/1/1/2 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 006697605-02, PDC Light Curves



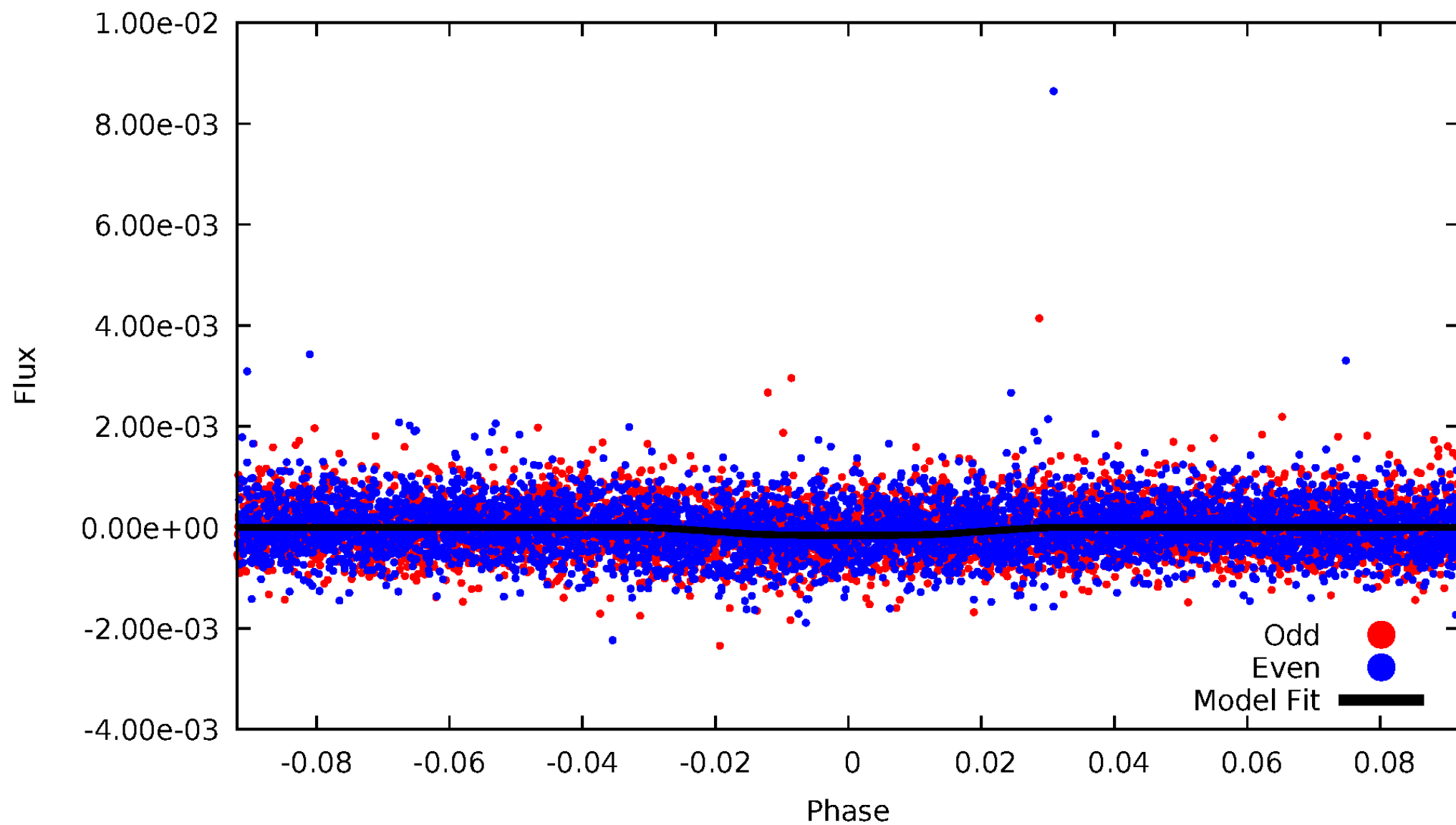


TCE 006697605-02



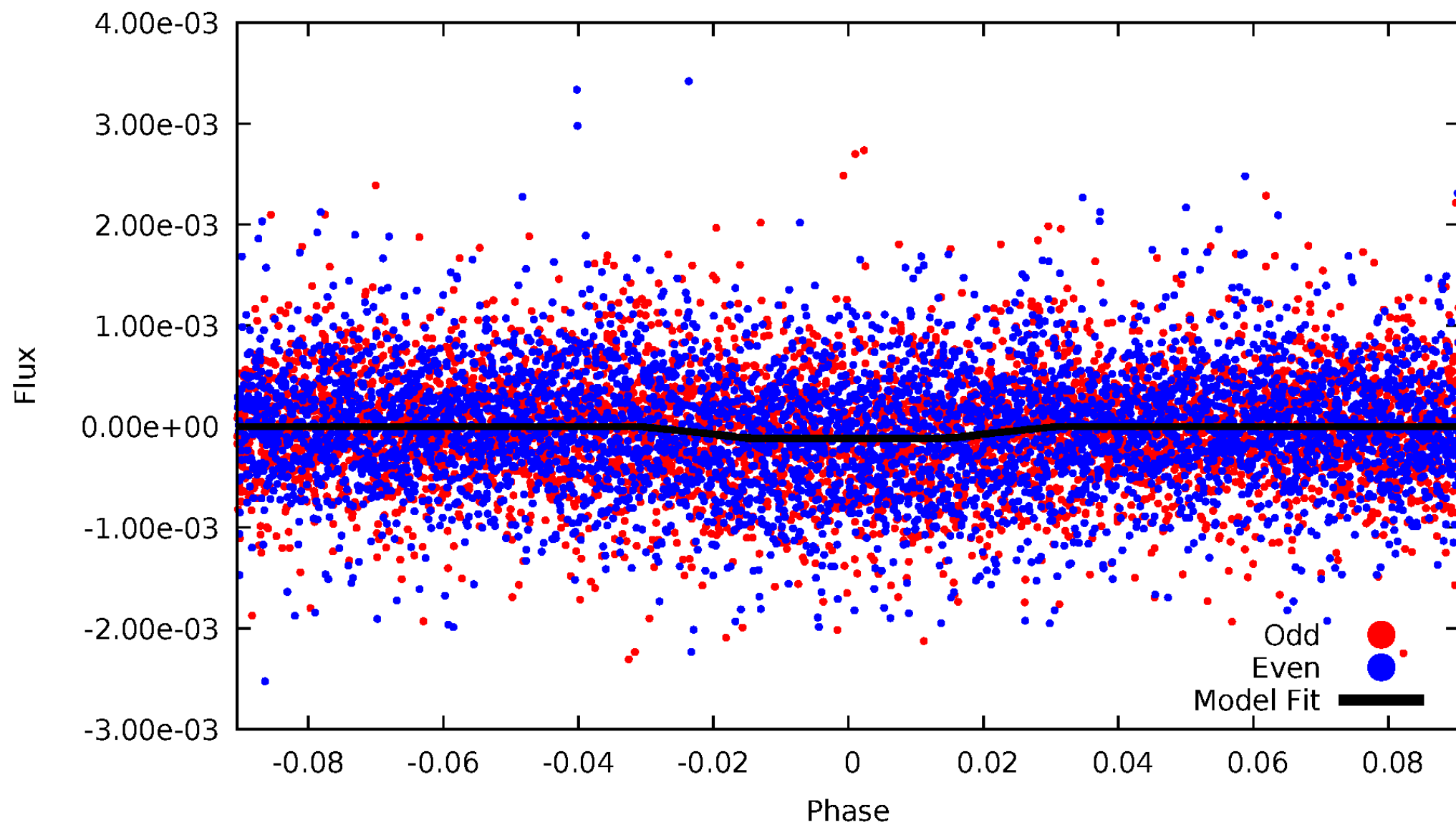
# DV Odd/Even

TCE 006697605-02



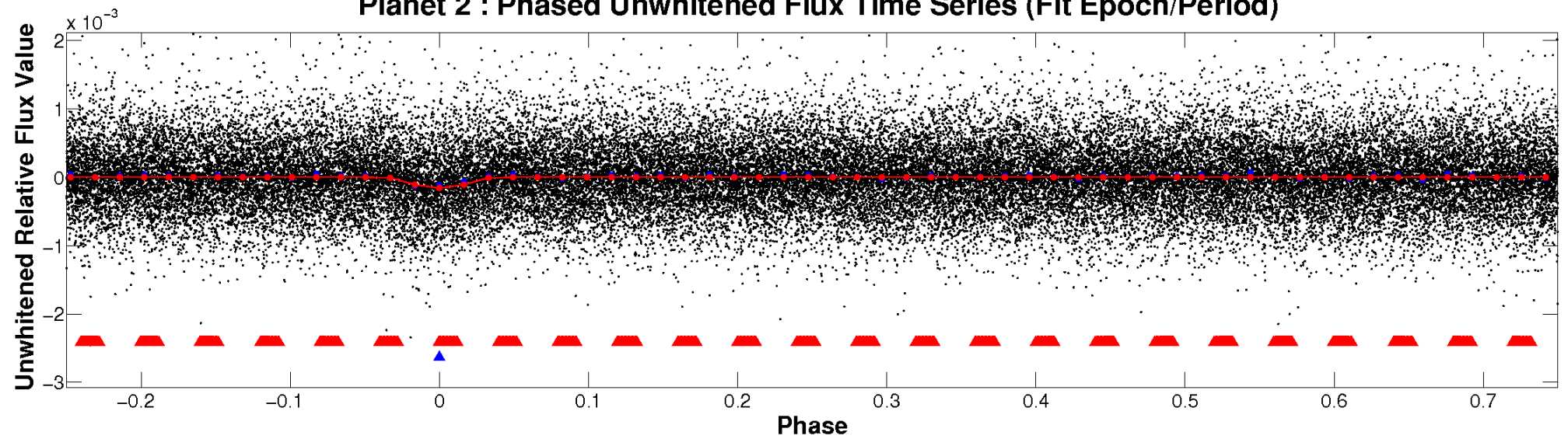
# ALT Odd/Even

TCE 006697605-02

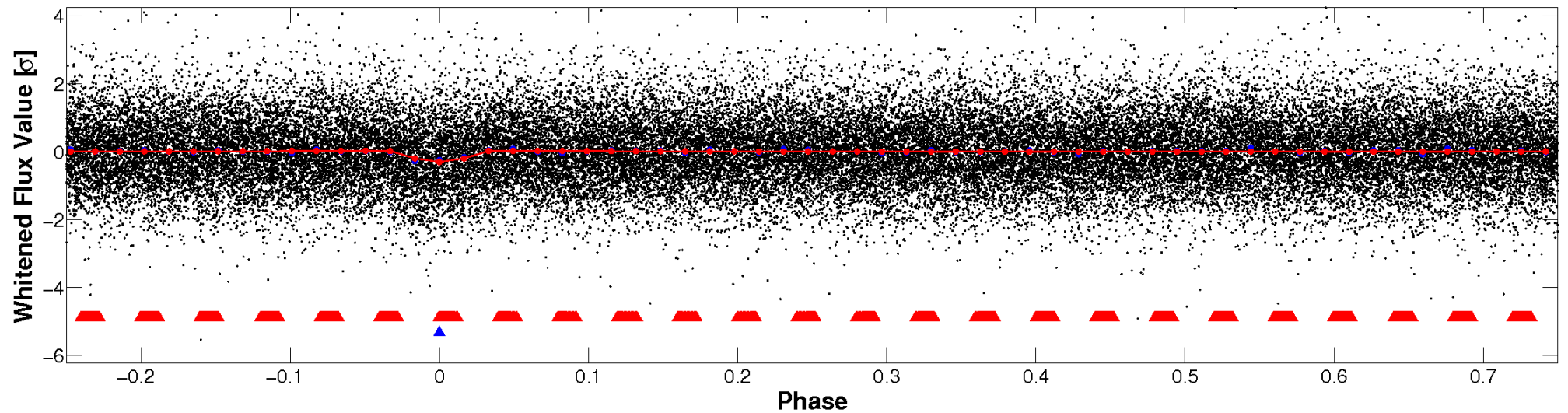


# Non-Whitened Vs. Whitened Light Curve

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

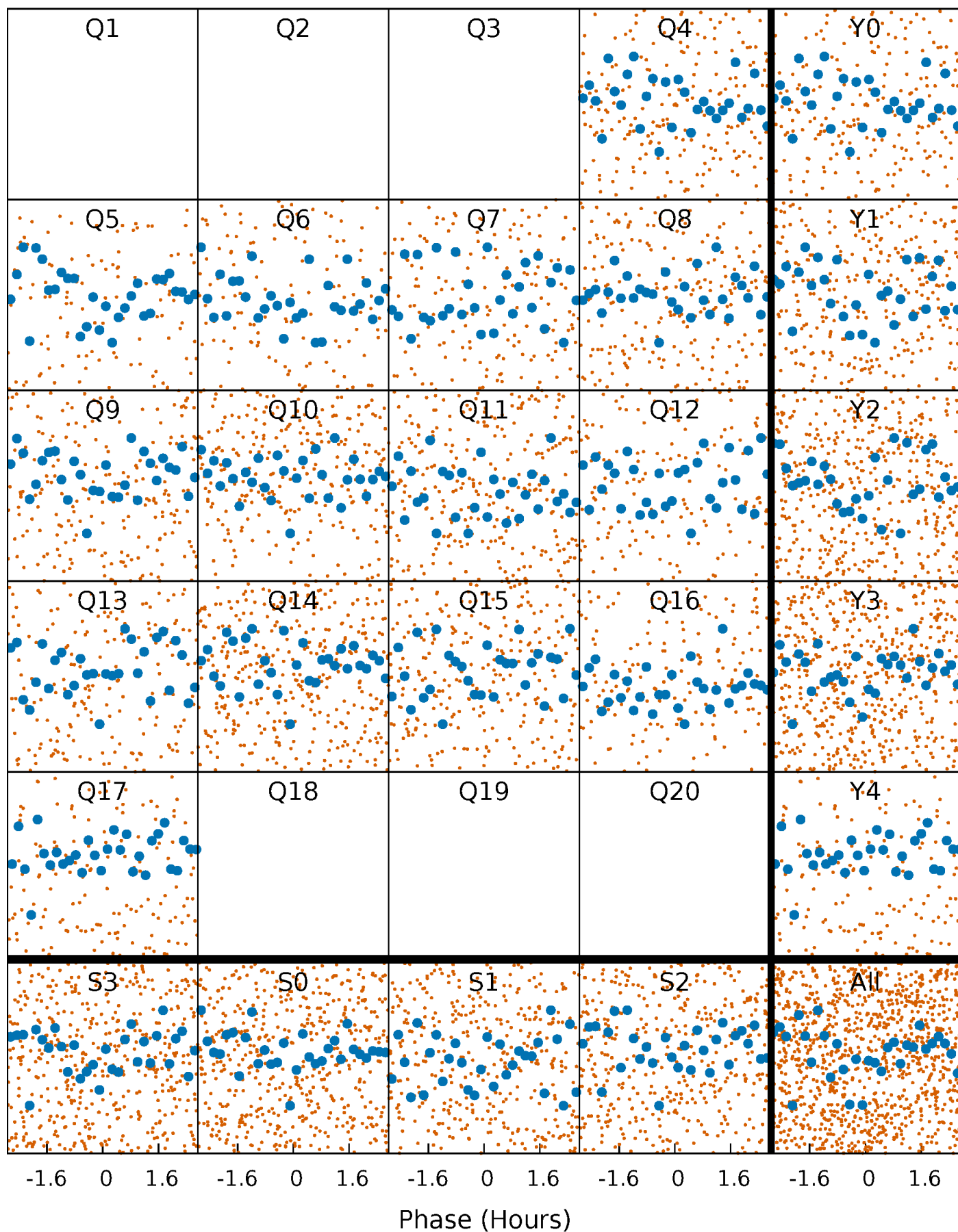


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

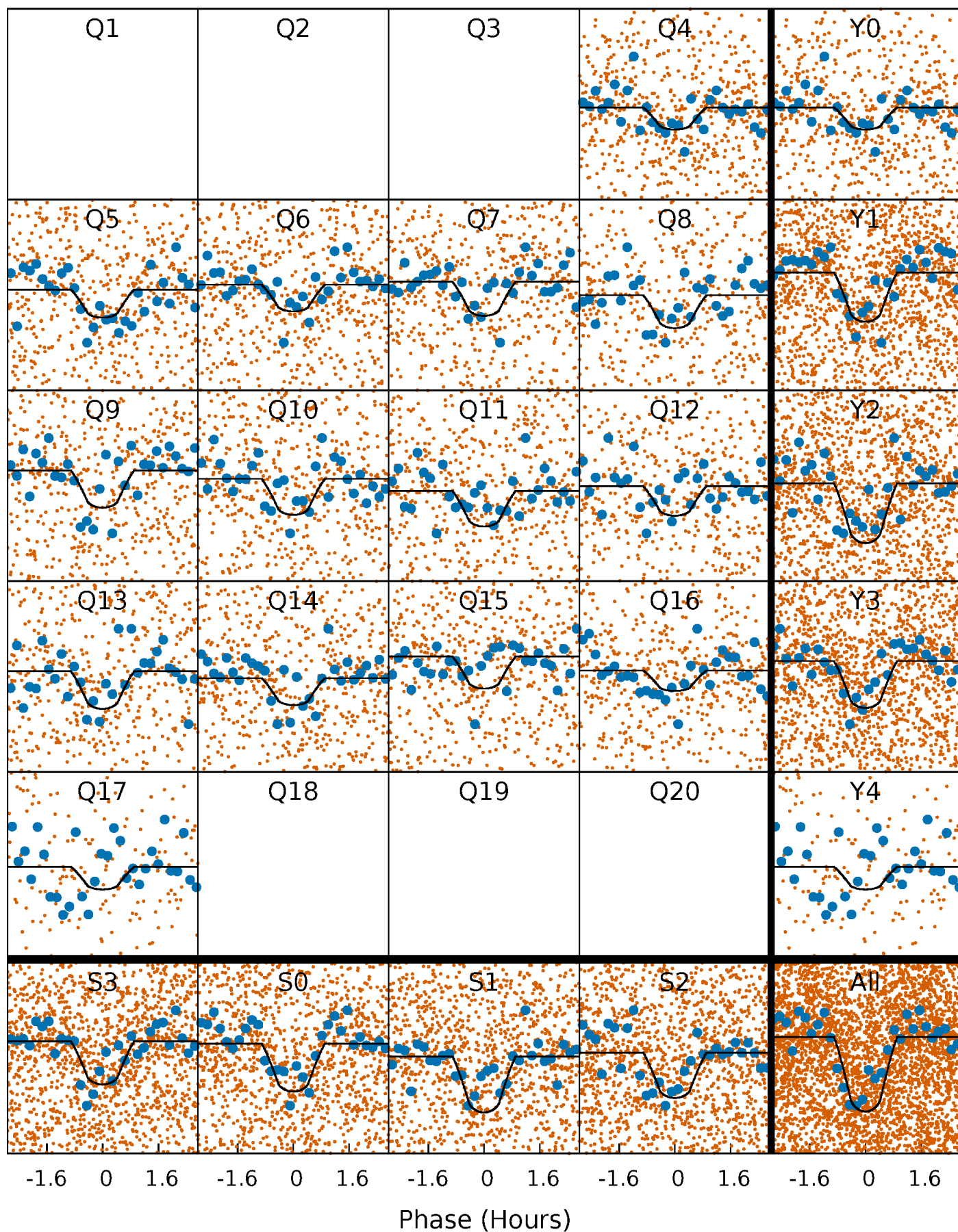
TCE 006697605-02 P= 1.239380 Days  $T_0=131.844319$  (BKJD)





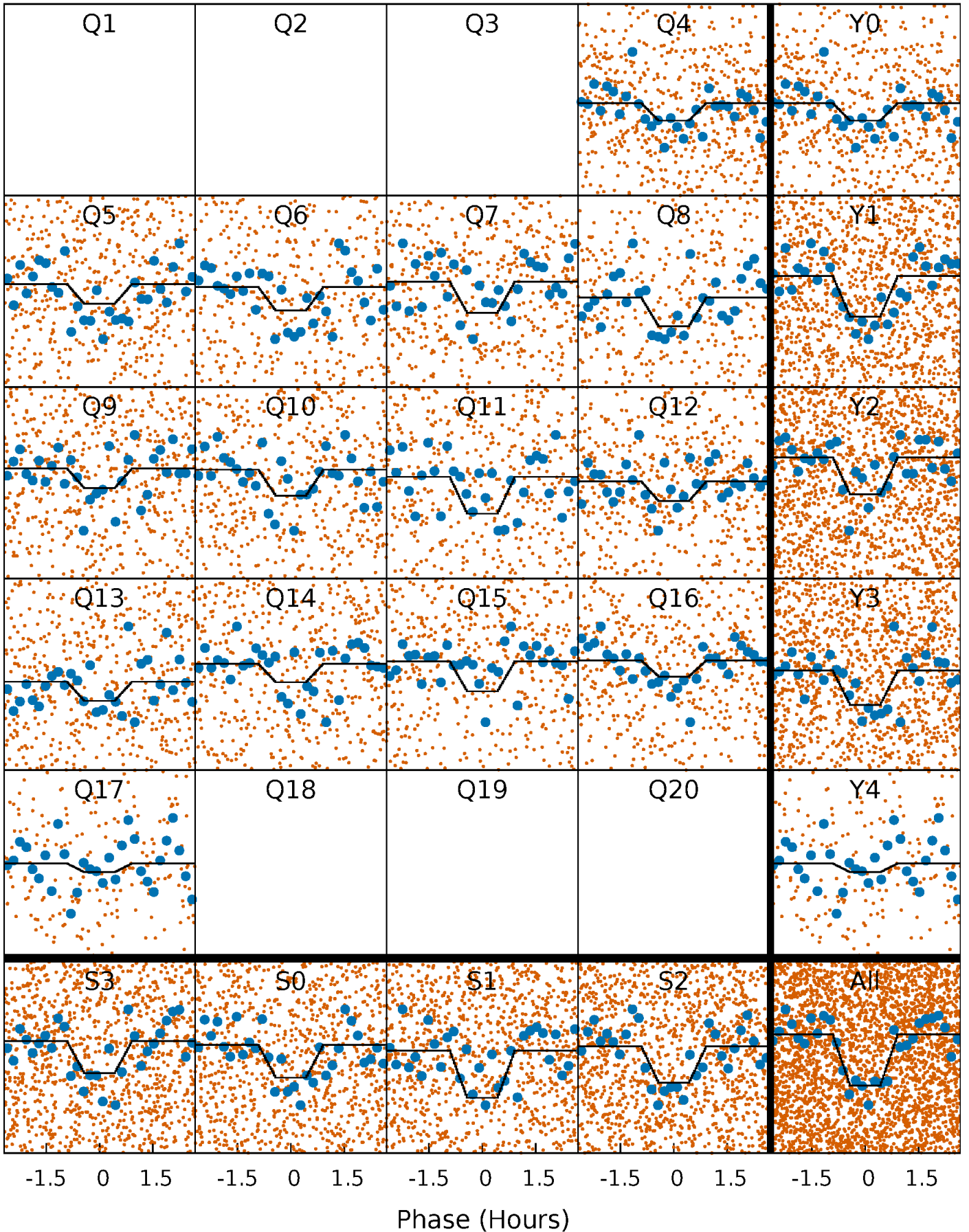
# DV Quarter-Phased Transit Curves

TCE 006697605-02     $P = 1.239380$  Days     $T_0 = 131.844319$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

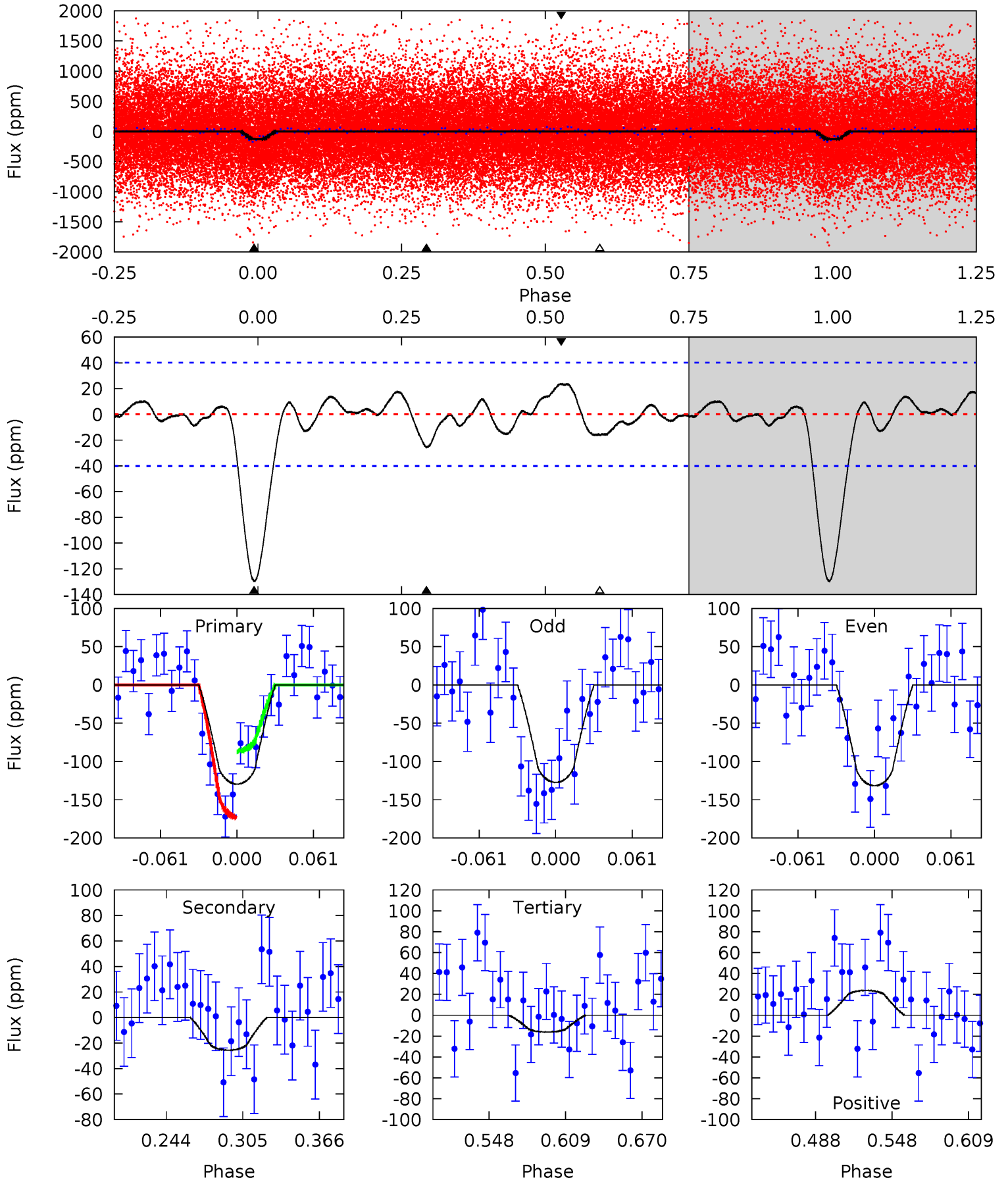
TCE 006697605-02    P= 1.239365 Days     $T_0=131.846024$  (BKJD)



# DV Model-Shift Uniqueness Test

006697605-02, P = 1.239380 Days, E = 131.844319 Days

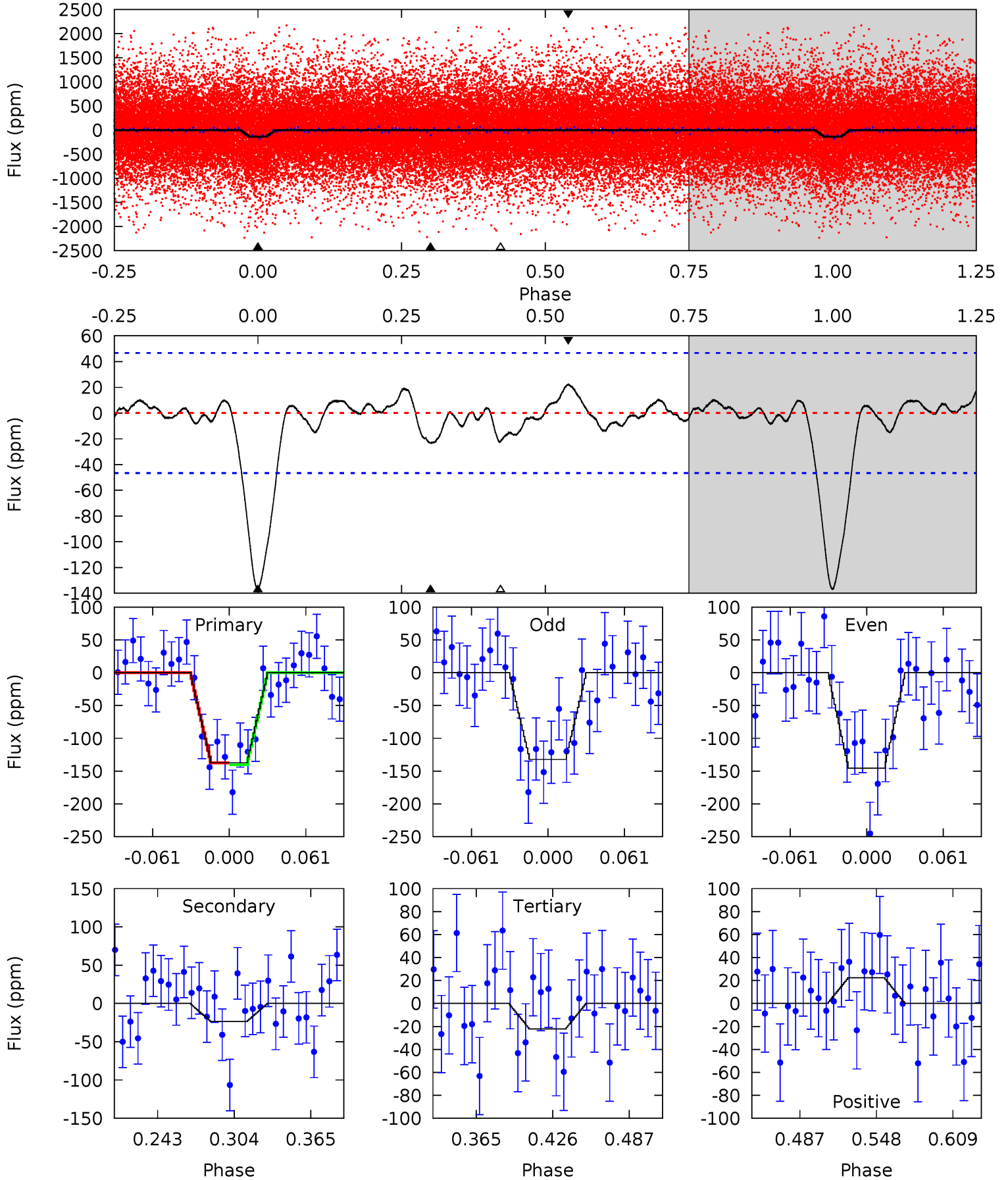
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	2.97	1.87	2.76	4.67	1.87	1.03	13.2	12.3	1.10	0.22	0.26	1.04	0.15	5.05



# Alt Model-Shift Uniqueness Test

006697605-02, P = 1.239365 Days, E = 131.846024 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
13.7	2.36	2.22	2.24	4.67	1.87	0.81	11.5	11.5	0.14	0.13	0.68	0.94	0.14	0.14



### Stellar Parameters For KIC 006697605

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5370^{+85}_{-75}$	$4.411^{+0.104}_{-0.076}$	$0.140^{+0.150}_{-0.150}$	$0.966^{+0.105}_{-0.095}$	$0.877^{+0.064}_{-0.037}$	$1.372^{+0.557}_{-0.333}$
	+2%/-1%	+2%/-2%	+107%/-107%	+11%/-10%	+7%/-4%	+41%/-24%
Source	SPE90	SPE90	SPE90	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 006697605-02 / KOI 2851.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-26 \pm 9$	$1.34^{+0.65}_{-0.67}$	$2207^{+70}_{-74}$	$3699^{+1166}_{-549}$	$3.634^{+11.473}_{-2.140}$
Alt.	$-24 \pm 10$	$1.17^{+0.70}_{-0.64}$	$2208^{+68}_{-76}$	$3782^{+1464}_{-671}$	$4.069^{+17.346}_{-2.651}$

$T_{\text{max}}$  = 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

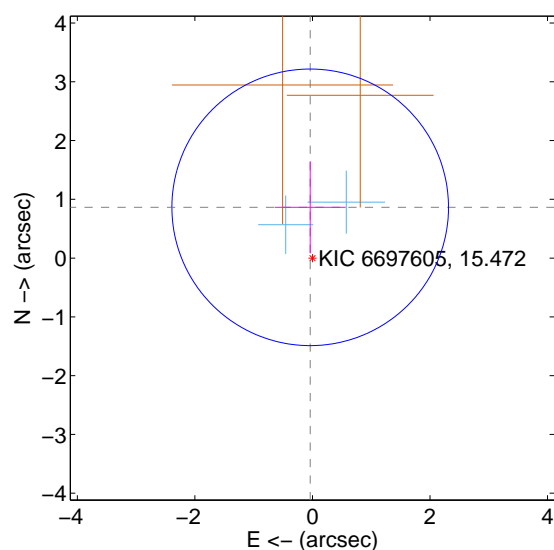
Supplemental centroid analysis for 006697605-02. Kepler magnitude: 15.47. Transit SNR 12.05

There are 2 quarters with good PRF difference image offsets

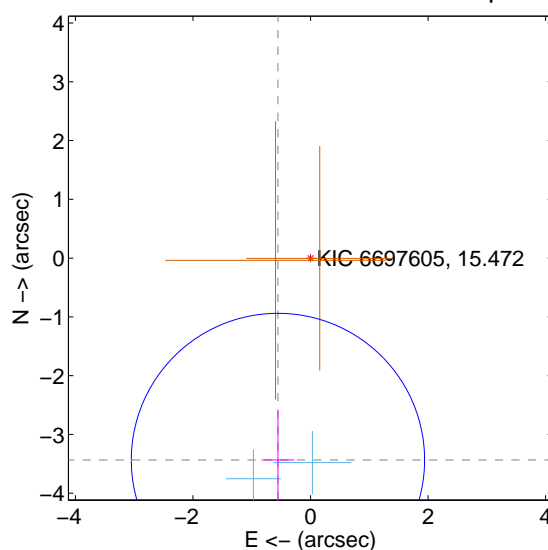
The OOT PRF centroid is offset from the target star catalog position by about 2.98 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.865 \pm 0.784$	1.10	$0.038 \pm 0.603$	$0.864 \pm 0.785$
PRF-fit source offset from KIC position	$3.479 \pm 0.832$	4.18	$0.554 \pm 0.281$	$-3.434 \pm 0.837$
photometric centroid source offset	$2.30 \pm 0.38$	6.12	$0.25 \pm 0.25$	$-2.29 \pm 0.38$

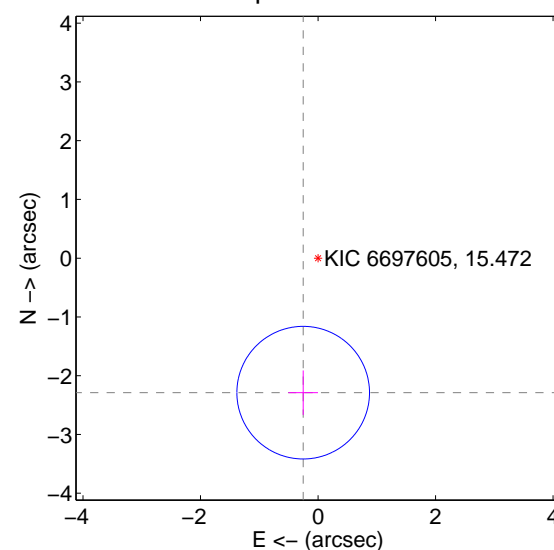
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

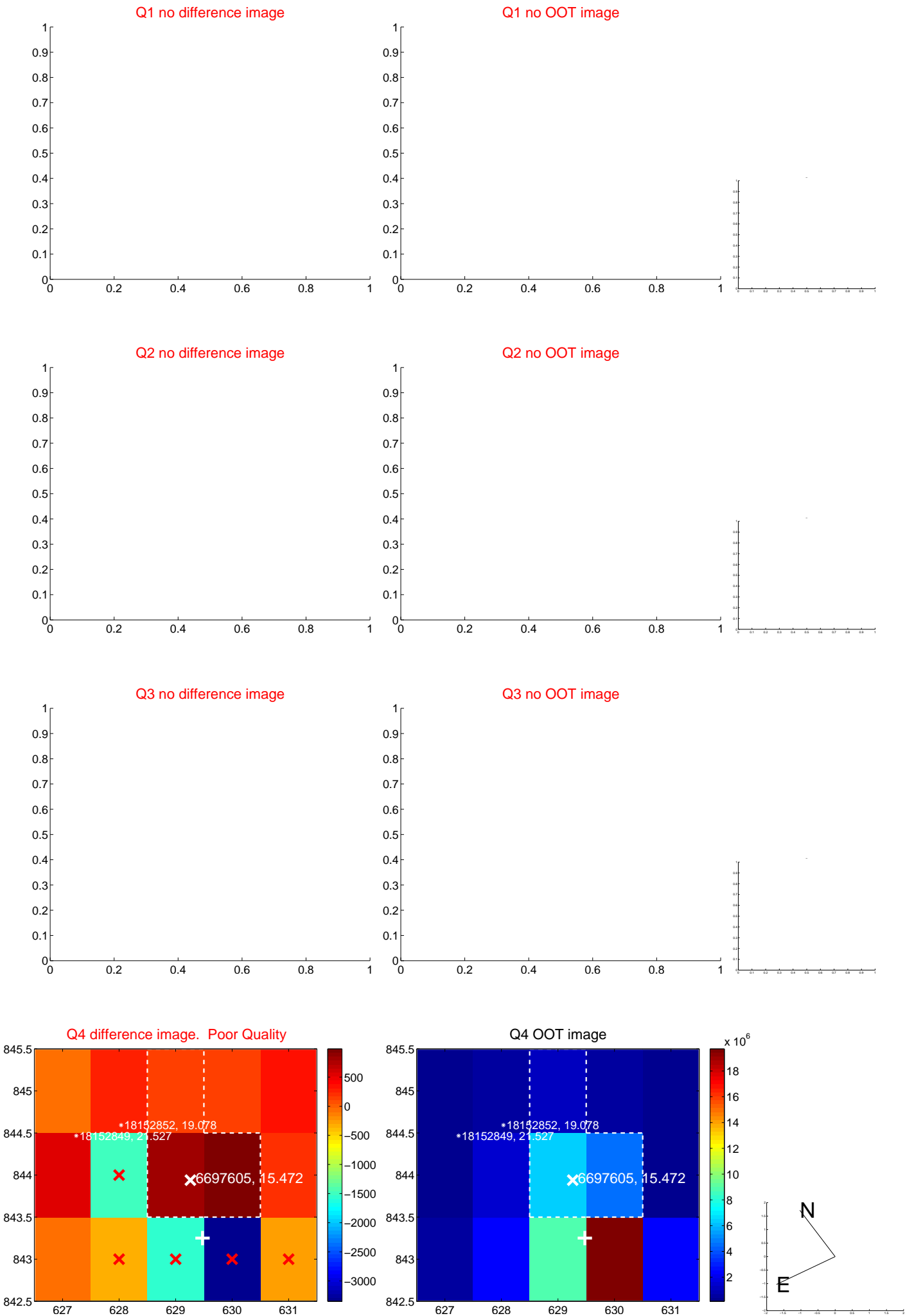


offset from photometric centroids



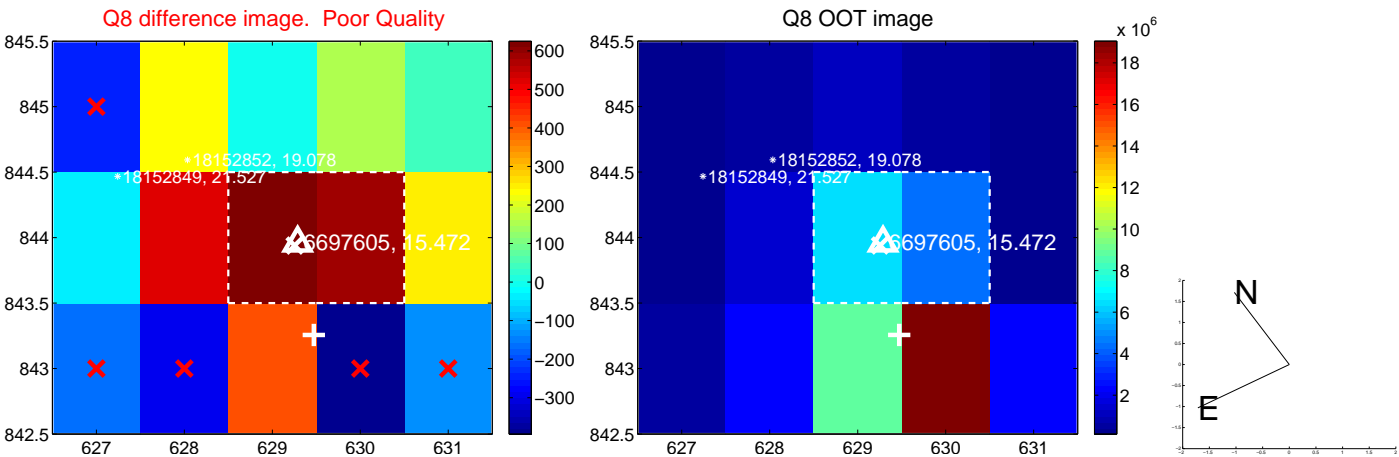
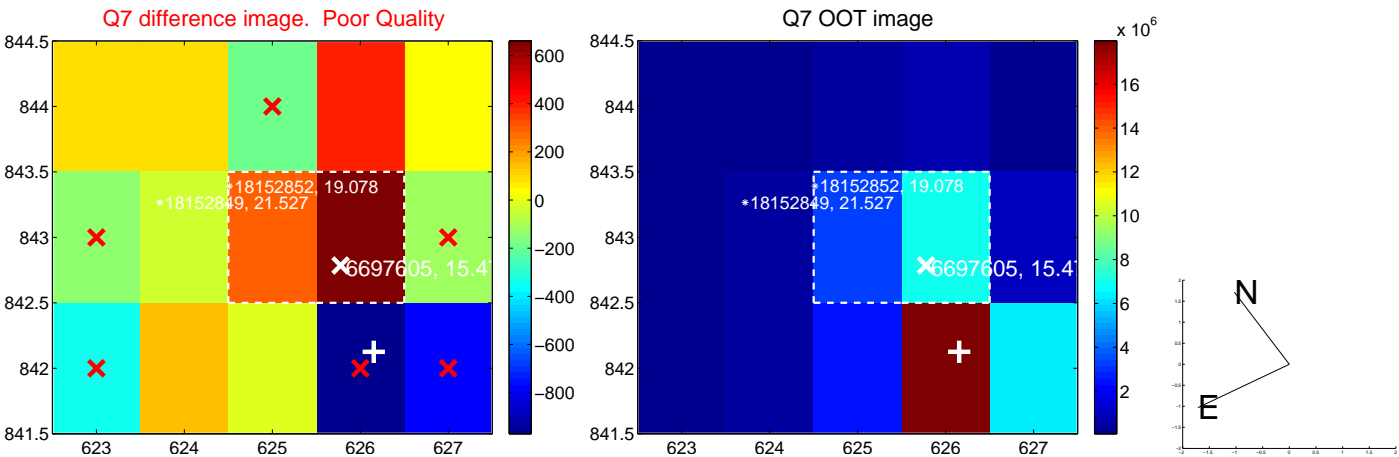
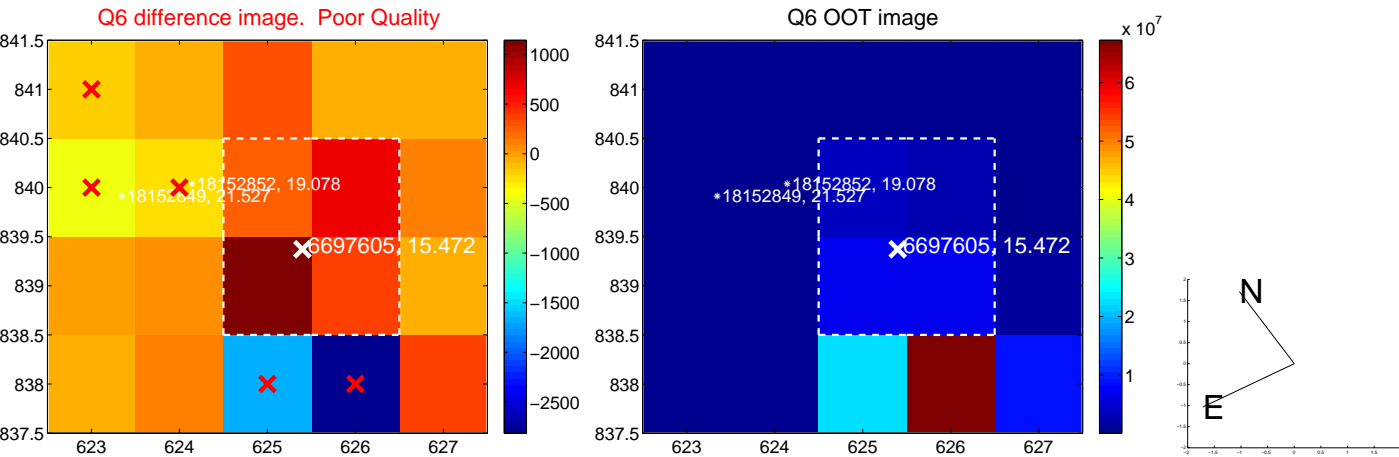
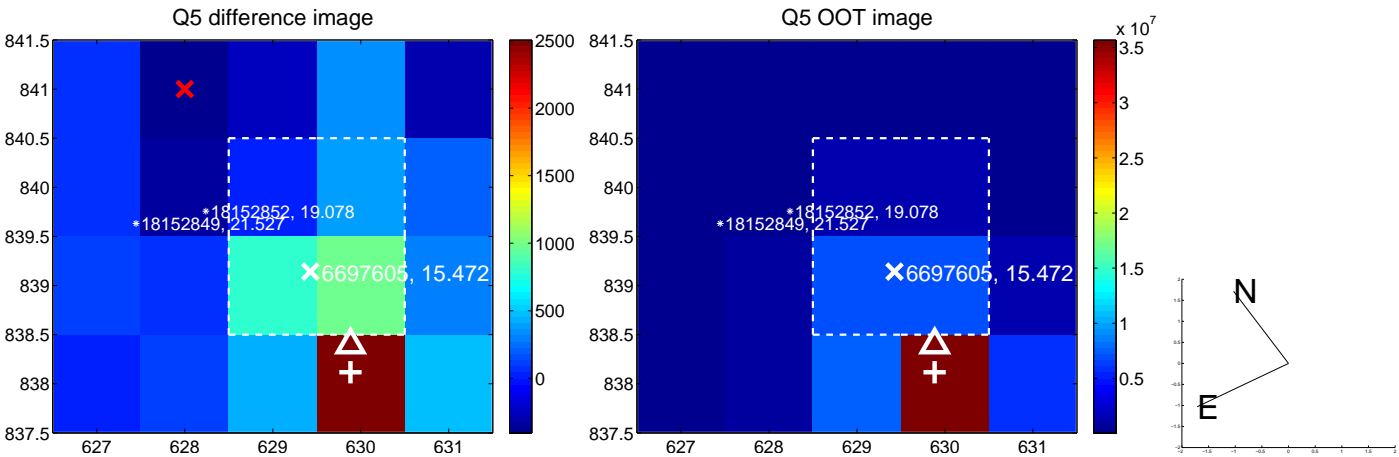
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

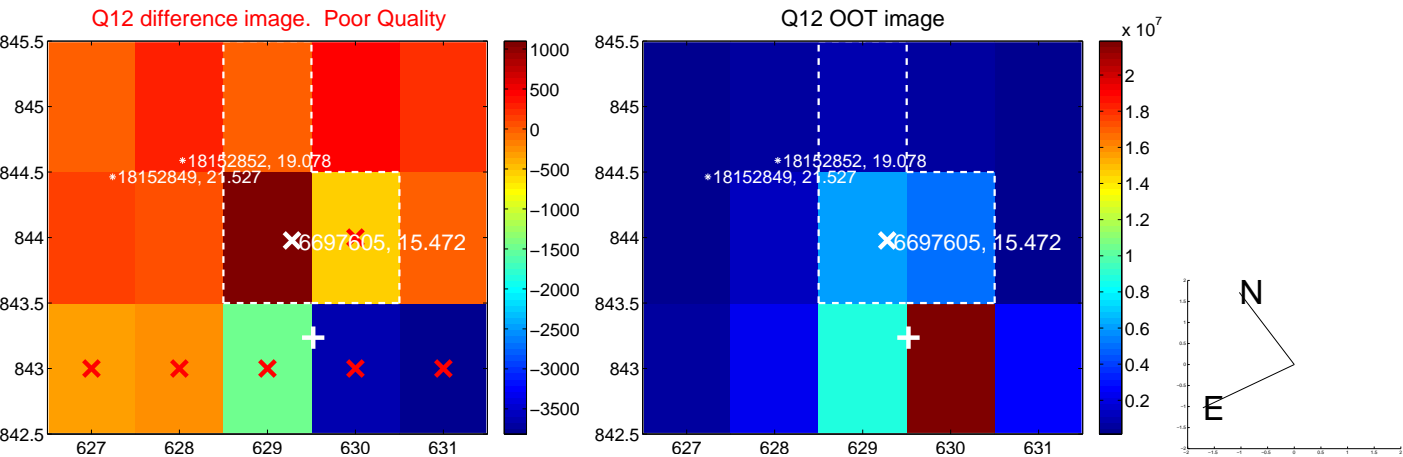
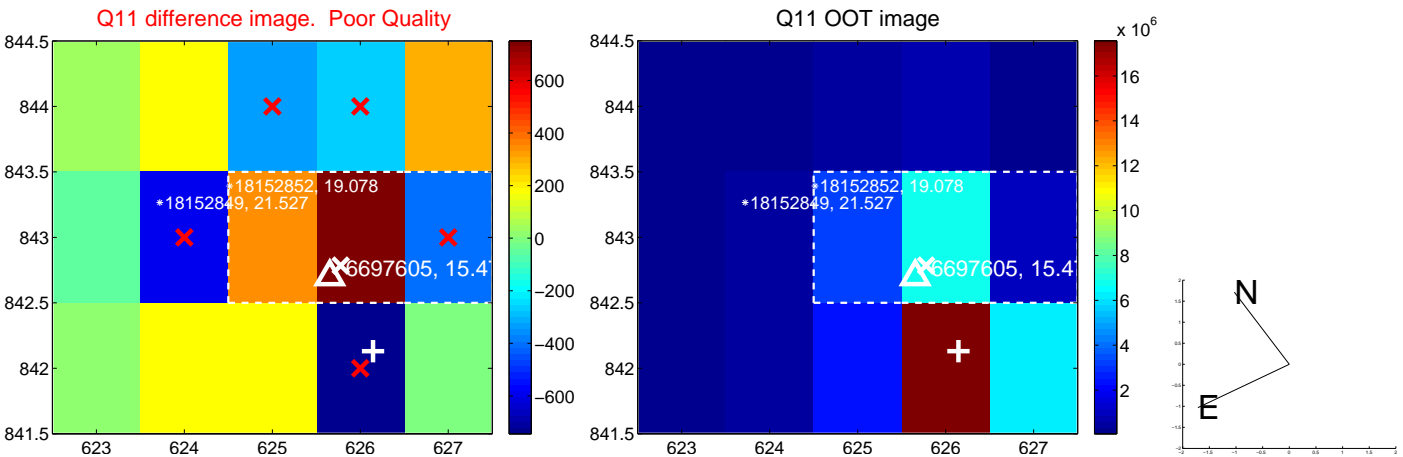
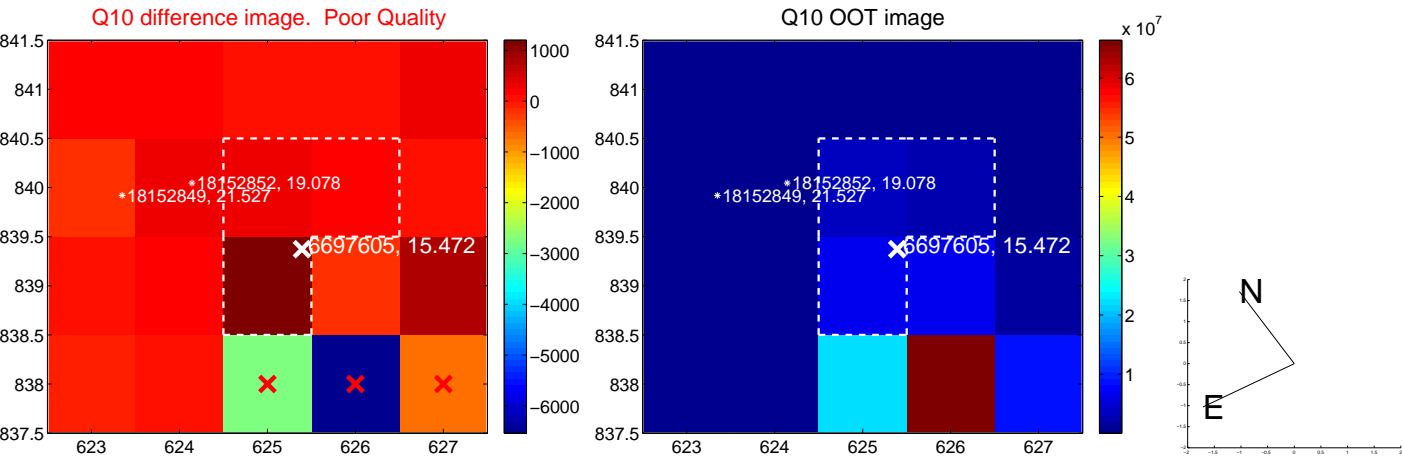
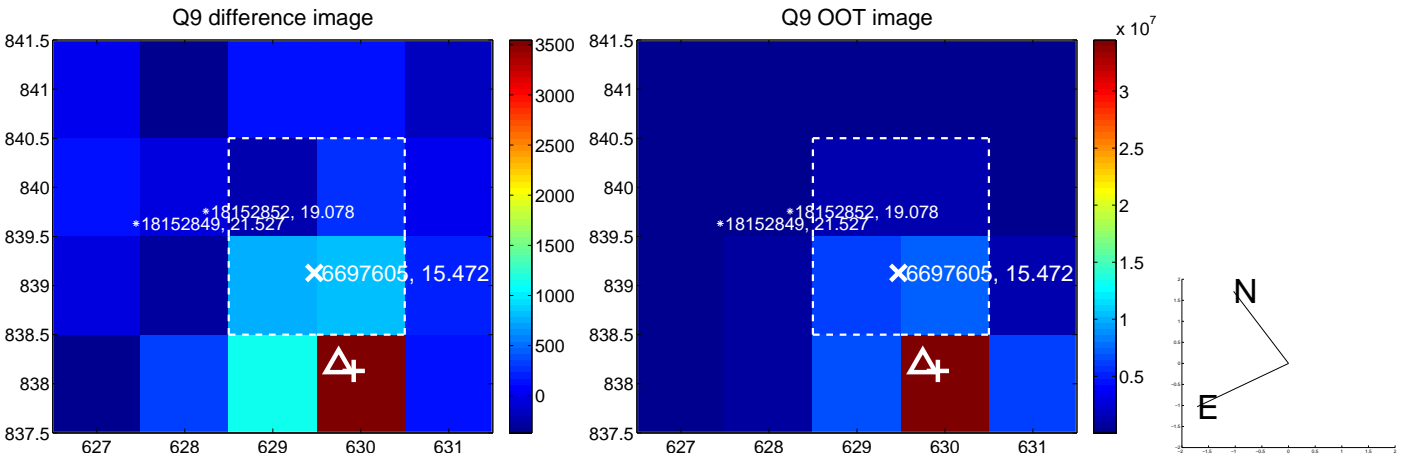




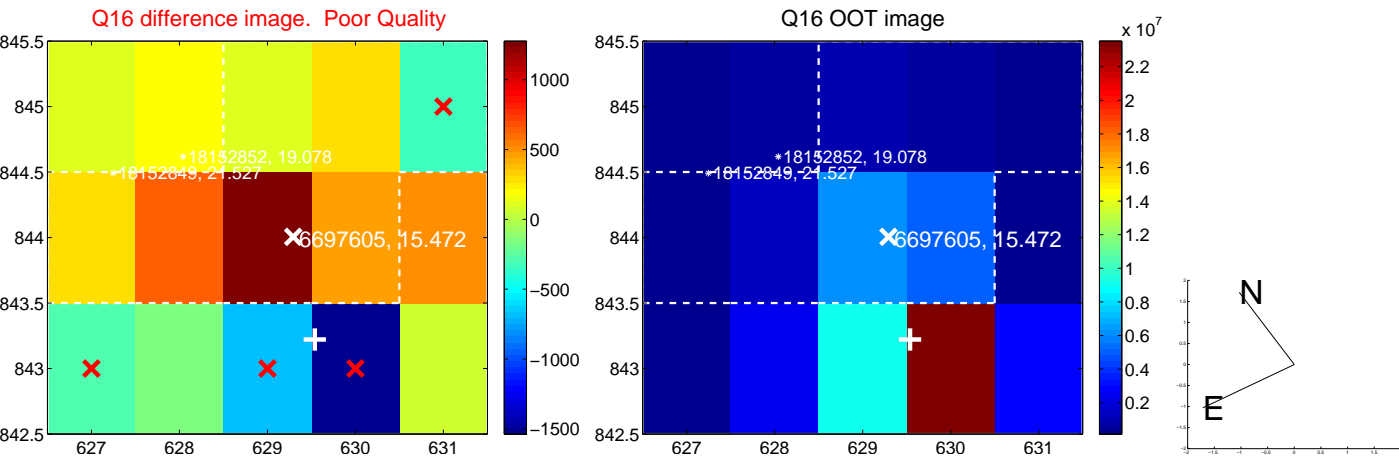
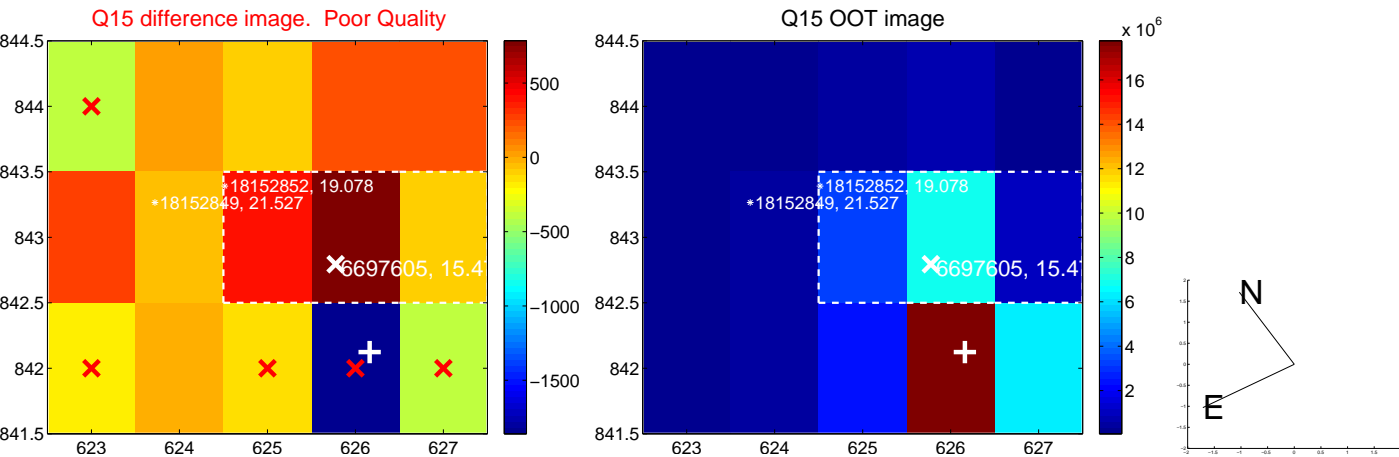
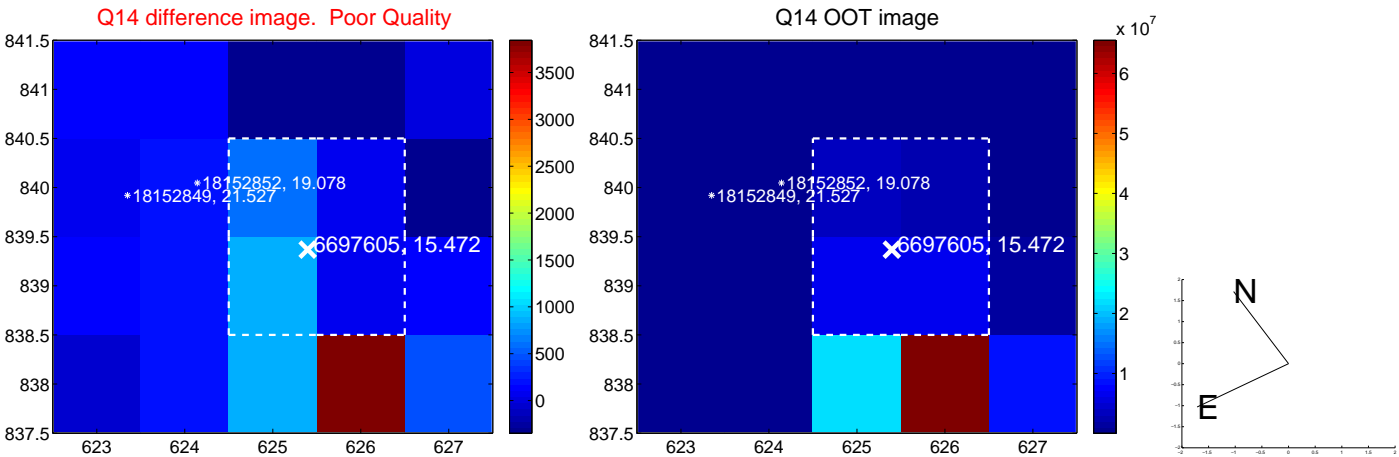
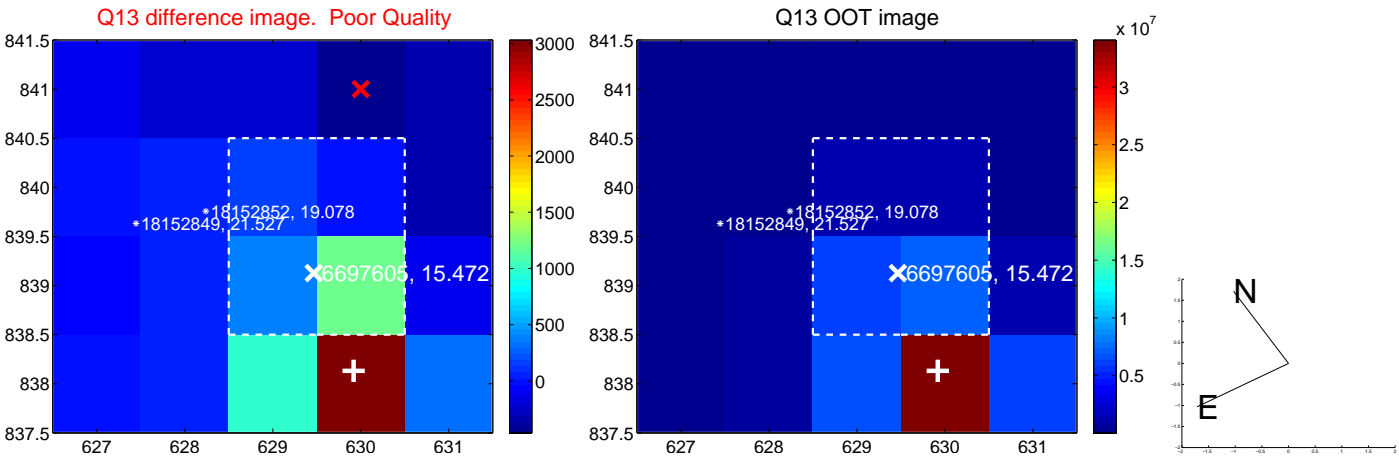
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



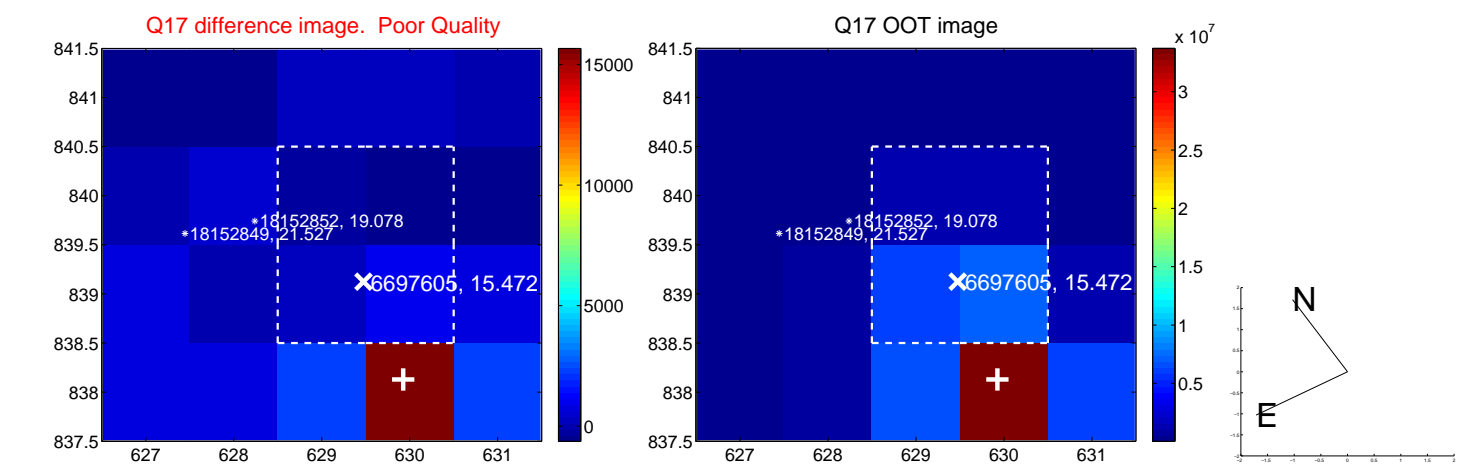
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



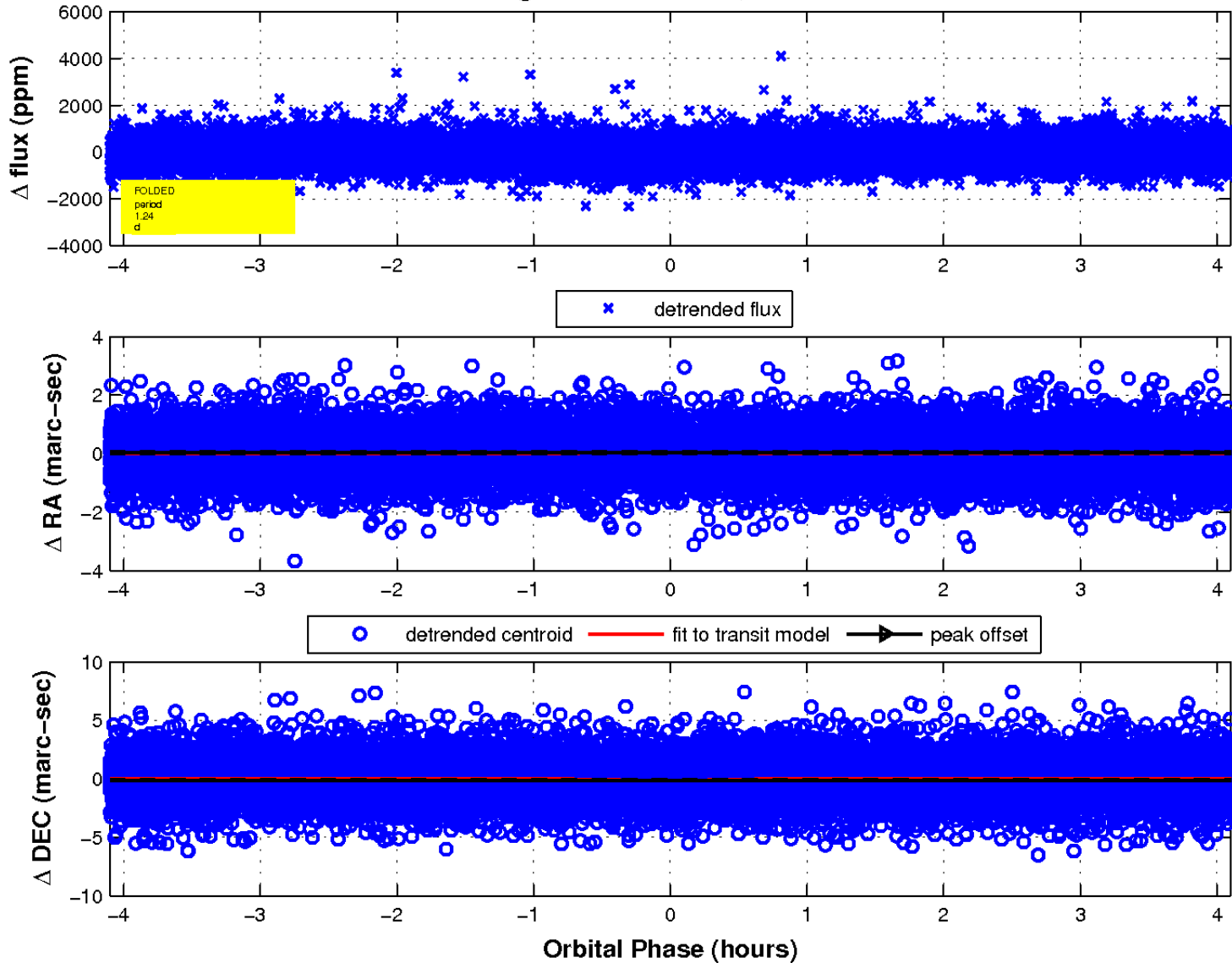
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



### fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

