

# KIC 010206675

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010206675-01	OBS	2283.01	17.402079	141.932643	608.7	3.784	17.6	19.3	0.61	4098	2.68	7.50
010206675-02	OBS	No	17.402940	133.137173	409.2	3.229	12.0	13.3	0.61	4098	1.85	7.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010206675-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
010206675-02	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.

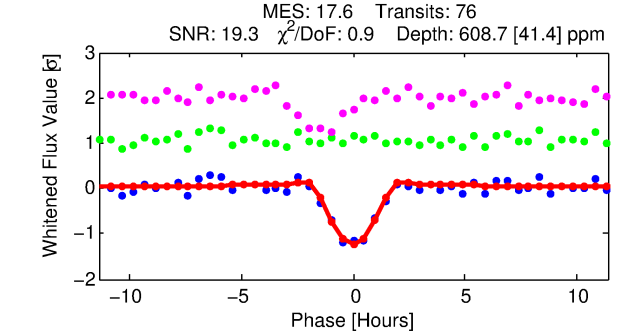
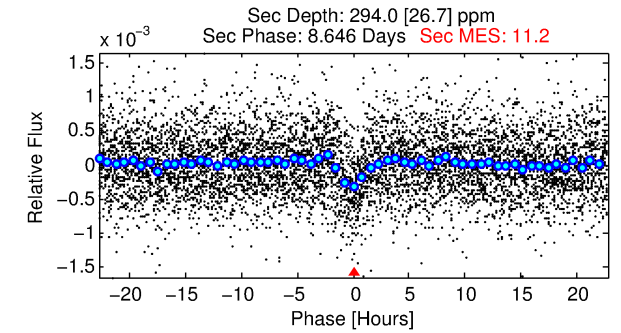
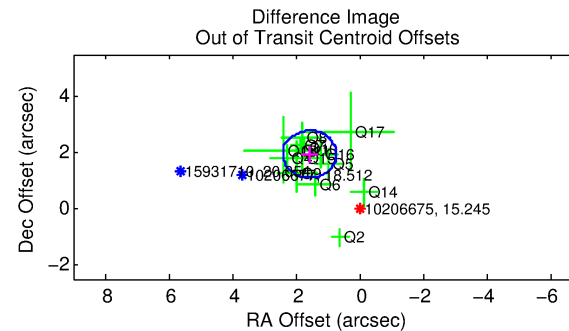
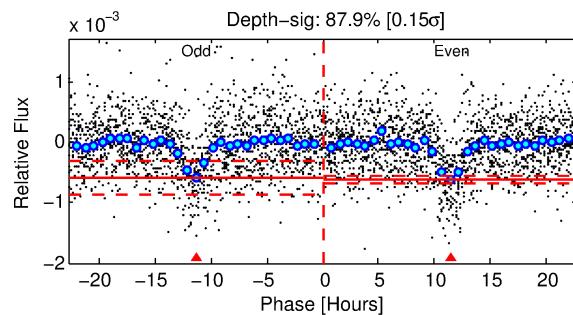
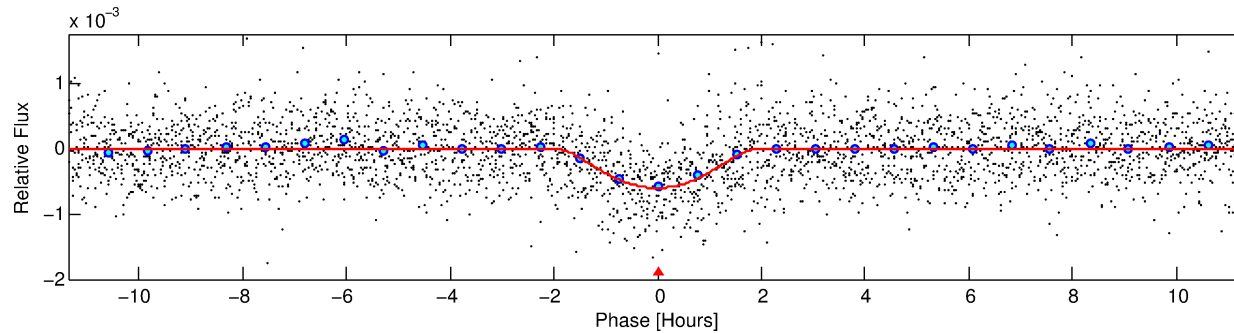
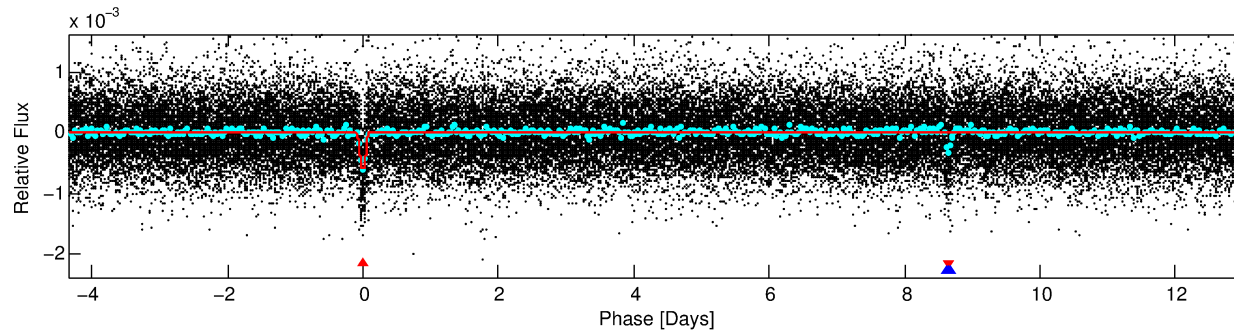
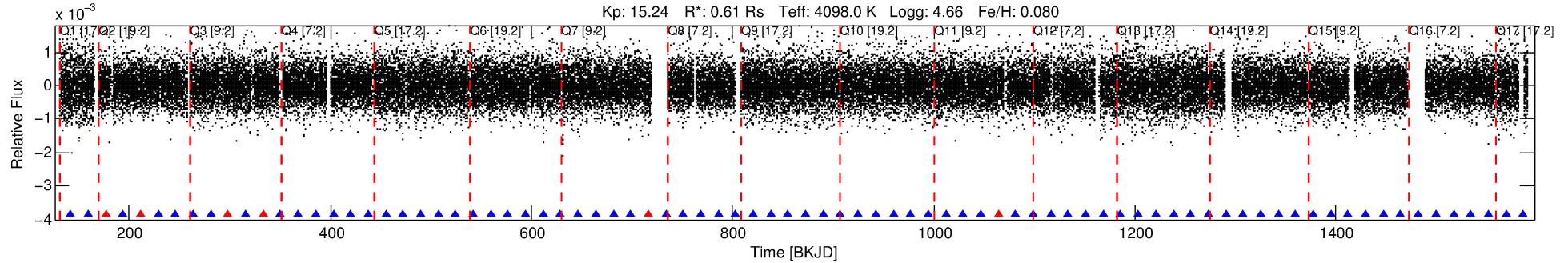
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010206675-01

No Significant Match Found

# DV One-Page Summary

KIC: 10206675 Candidate: 1 of 2 Period: 17.402 d  
KOI: K02283.01 Corr: 0.887



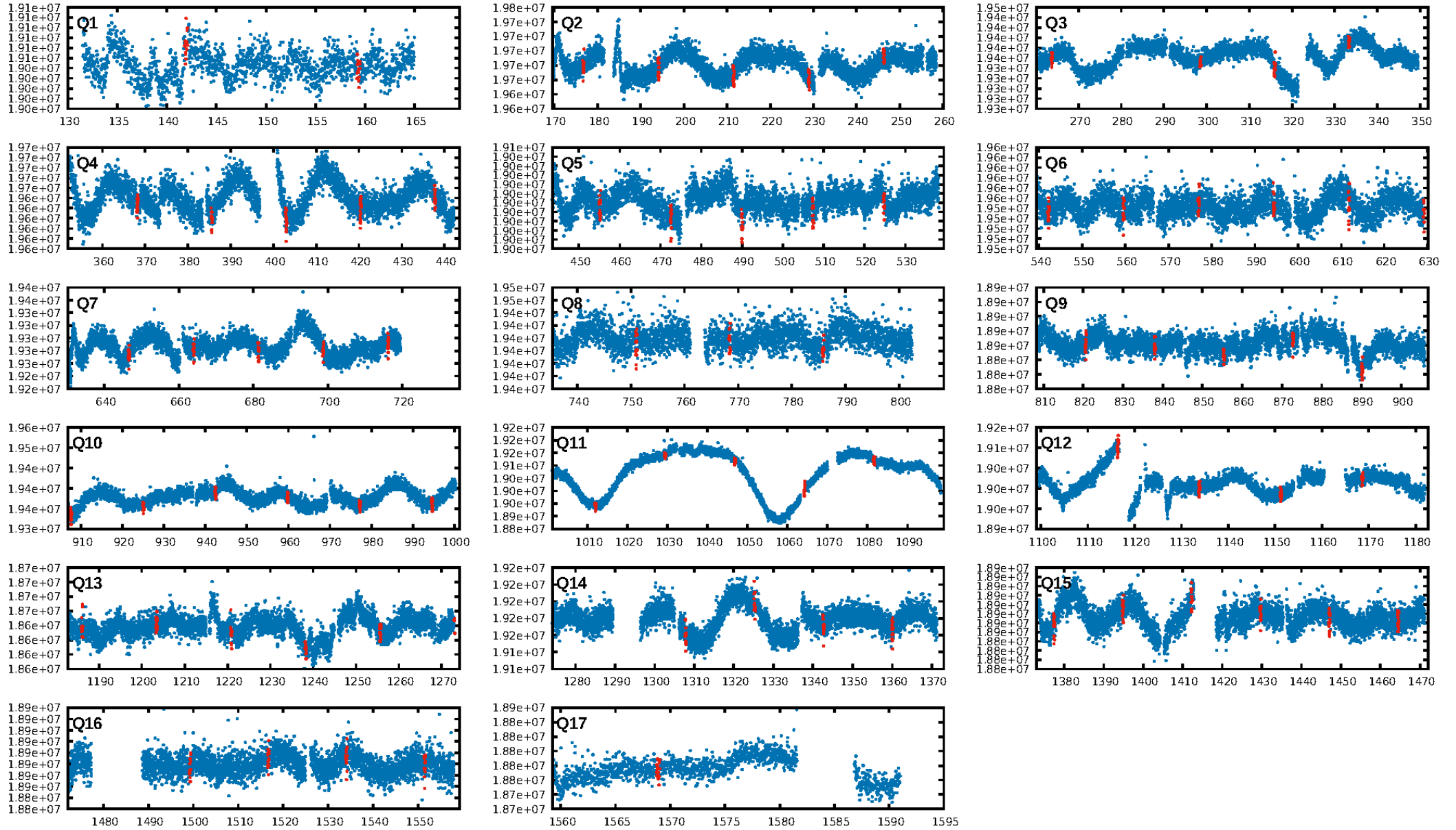
## DV Fit Results:

Period = 17.40208 [0.00009] d  
Epoch = 141.9326 [0.0044] BKJD  
Rp/R\* = 0.0399 [0.0424]  
a/R\* = 11.43 [3.88]  
b = 0.99 [0.07]  
Seff = 7.50 [0.69]  
Teq = 422 [10] K  
Rp = 2.68 [2.85] Re  
a = 0.1129 [0.0040] AU  
Ag = 287.85 [612.30] [0.47 $\sigma$ ]  
Teffp = 2687 [1430] K [1.58 $\sigma$ ]

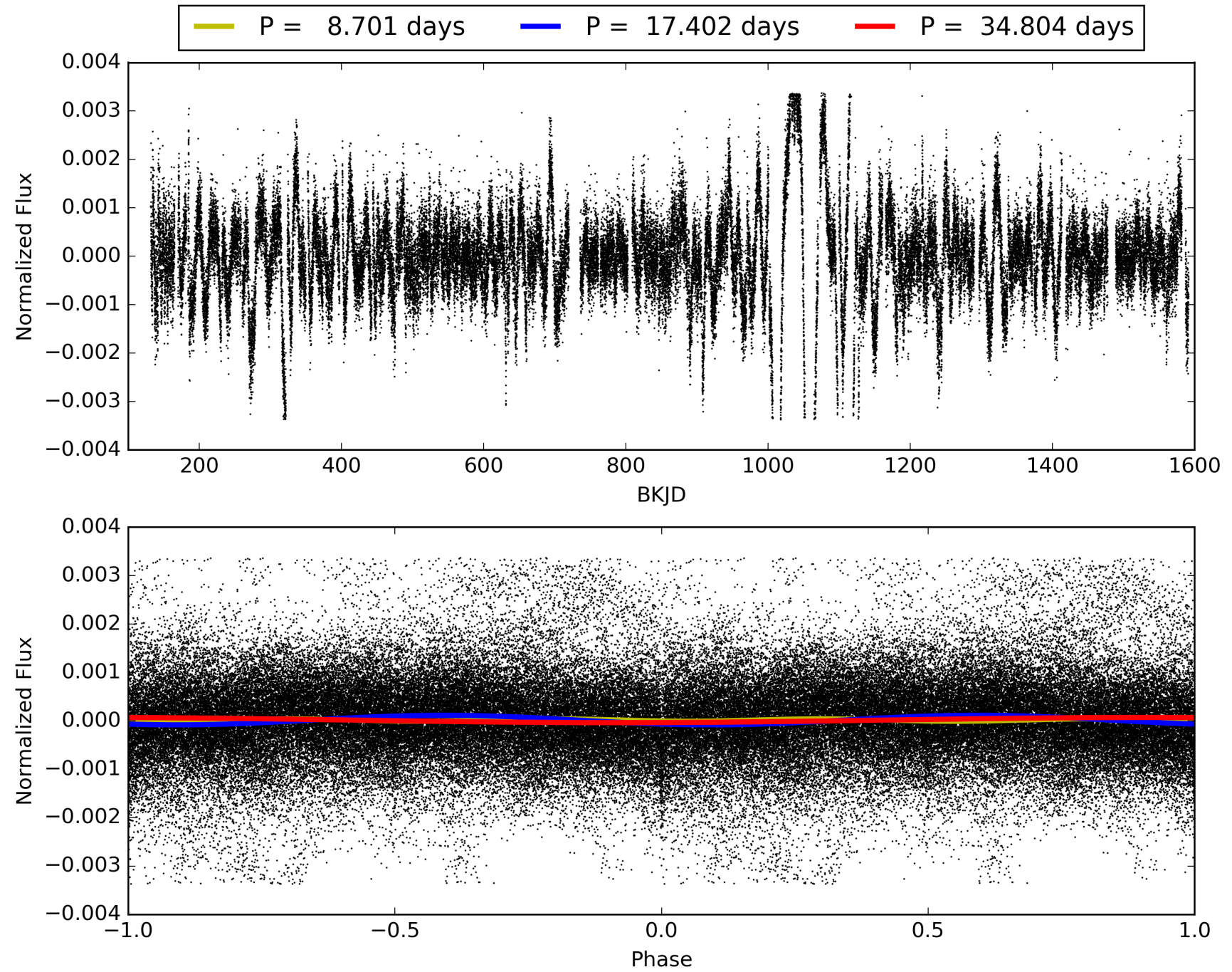
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.3% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: 91.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.07e-65  
RollingBand-fgt: 0.92 [67/73]  
GhostDiagnostic-chr: 4.499  
Centroid-sig: 0.0%  
Centroid-so: 4.215 arcsec [6.40 $\sigma$ ]  
OotOffset-rm: 2.498 arcsec [8.91 $\sigma$ ]  
KicOffset-rm: 2.507 arcsec [9.10 $\sigma$ ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.93 [13/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010206675-01, PDC Light Curves

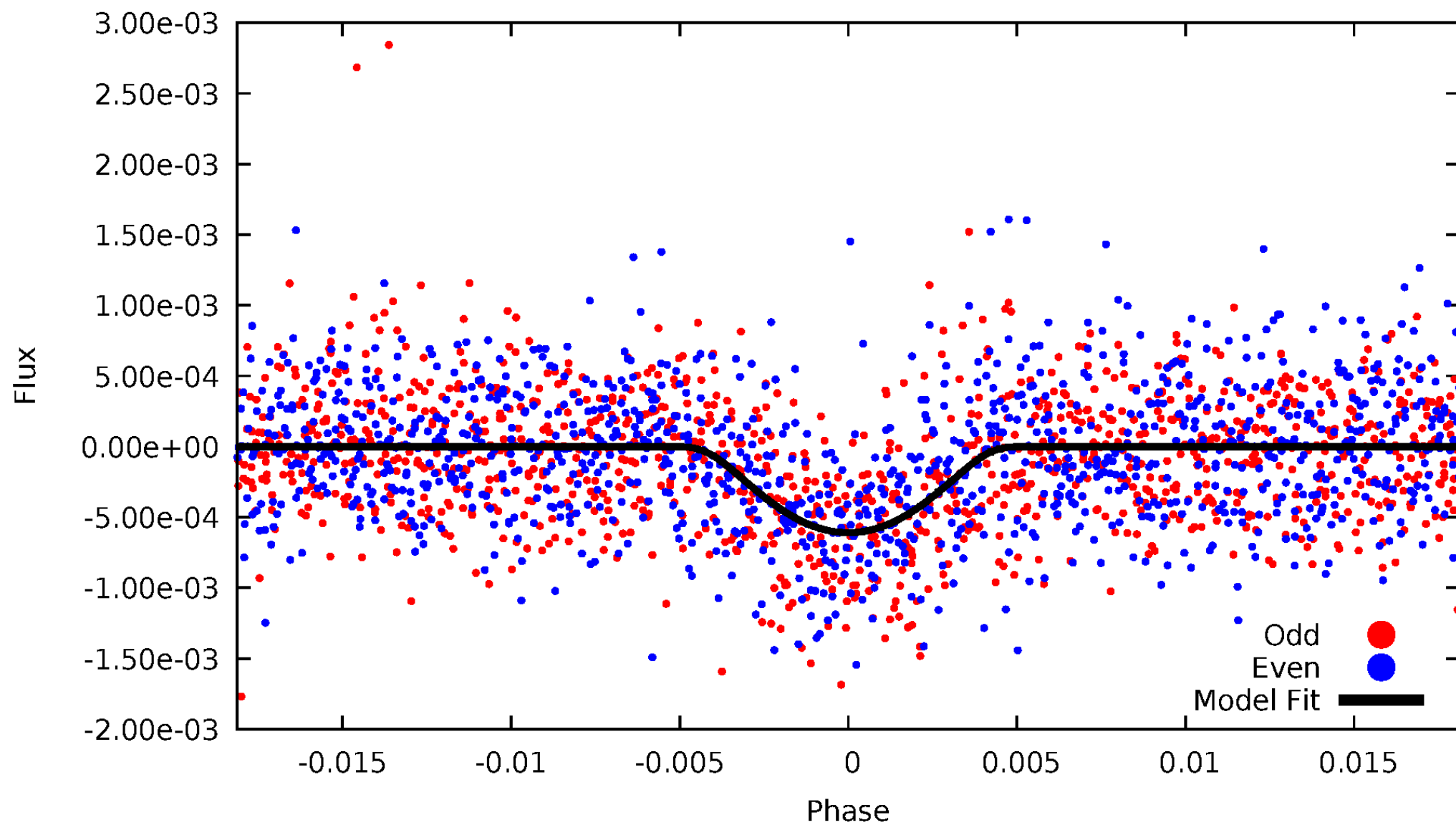


# TCE 010206675-01



# DV Odd/Even

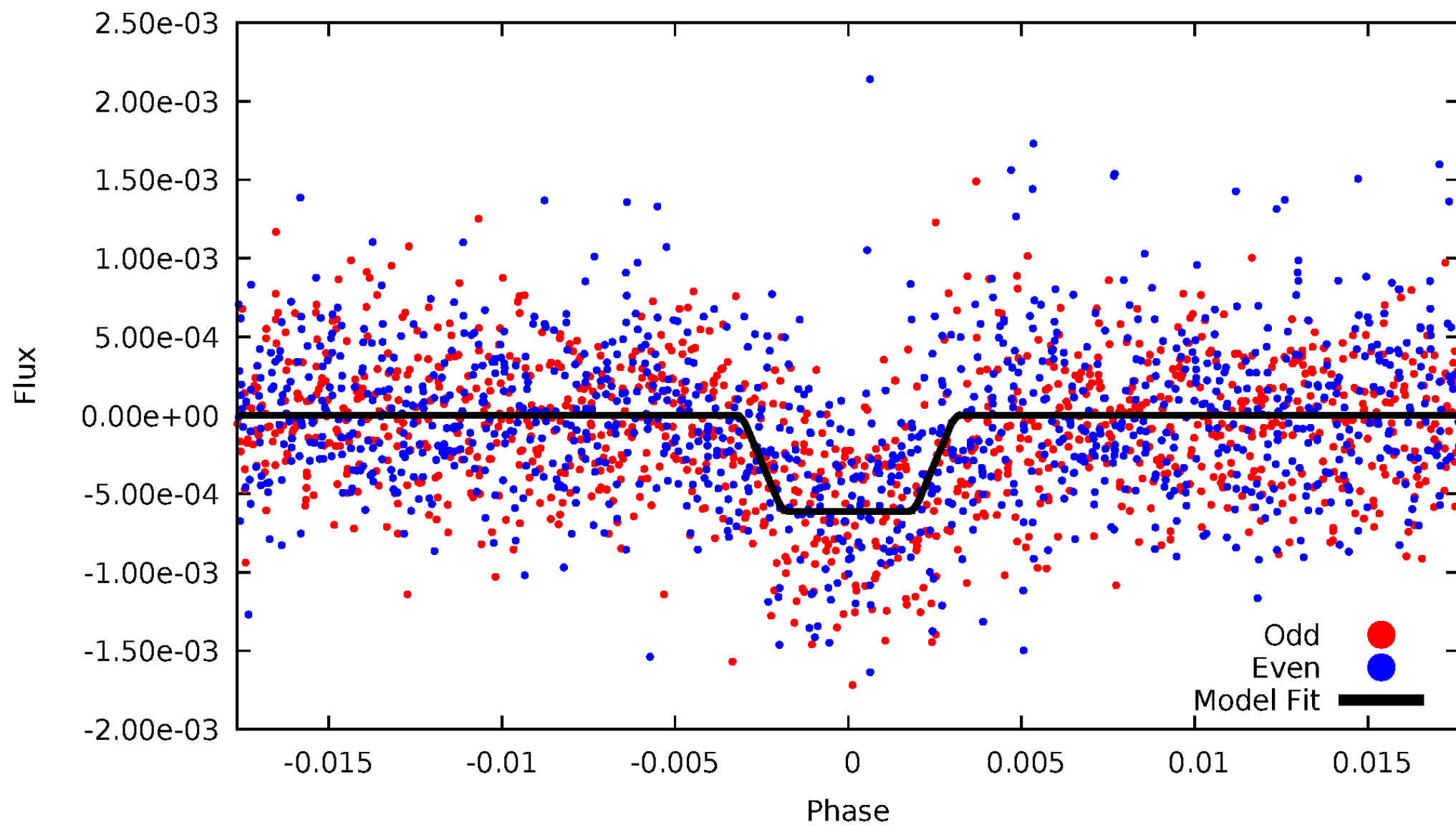
TCE 010206675-01



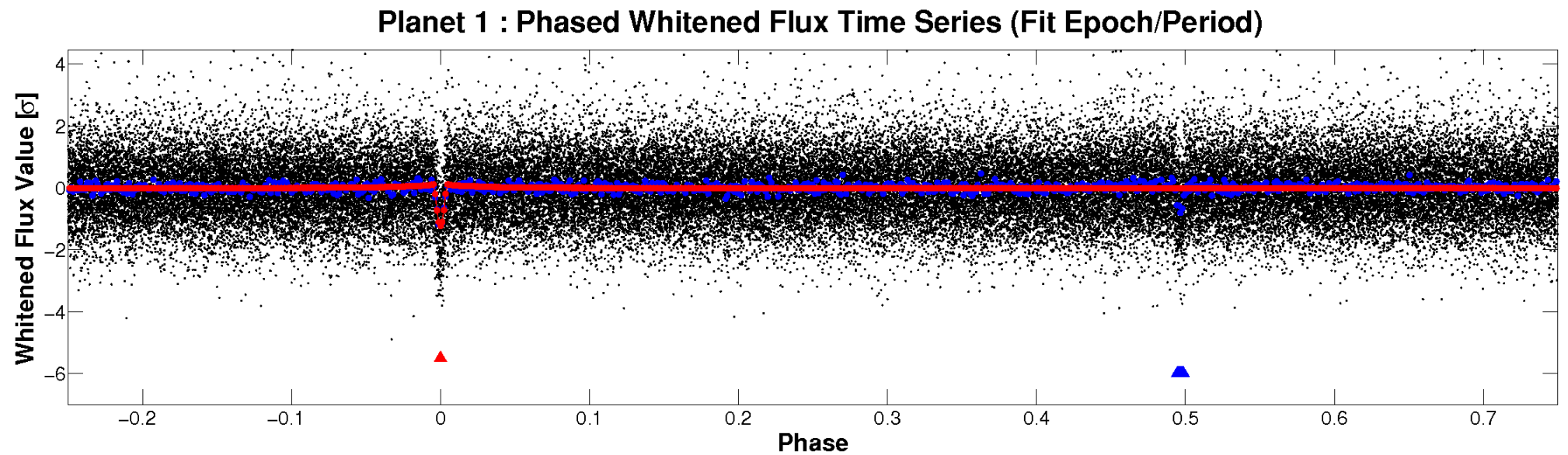
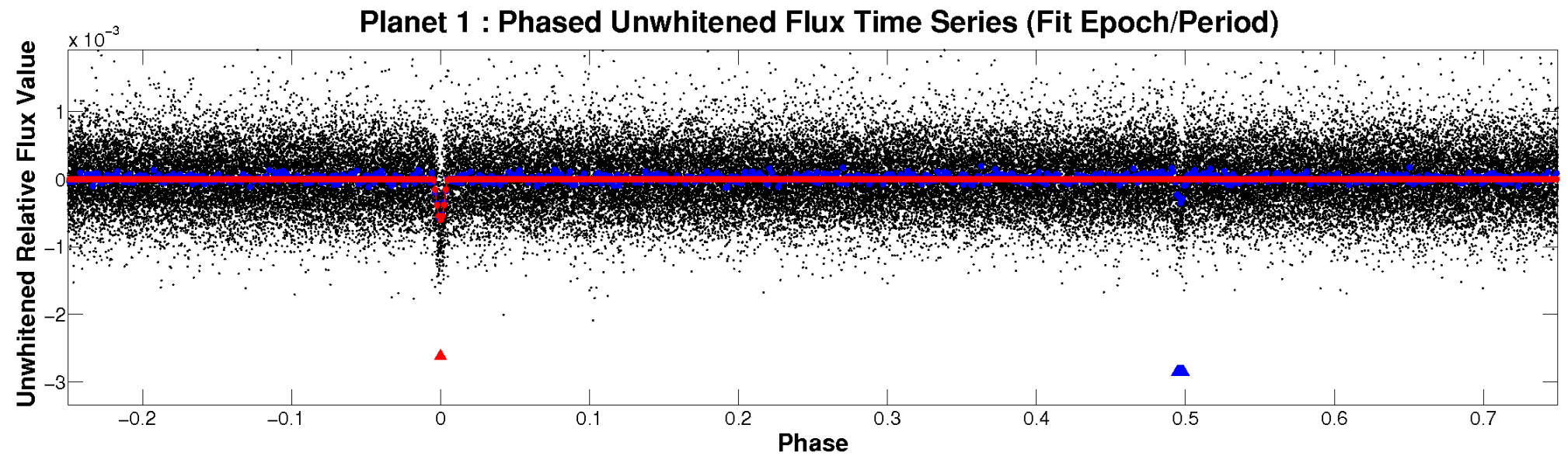


# ALT Odd/Even

TCE 010206675-01

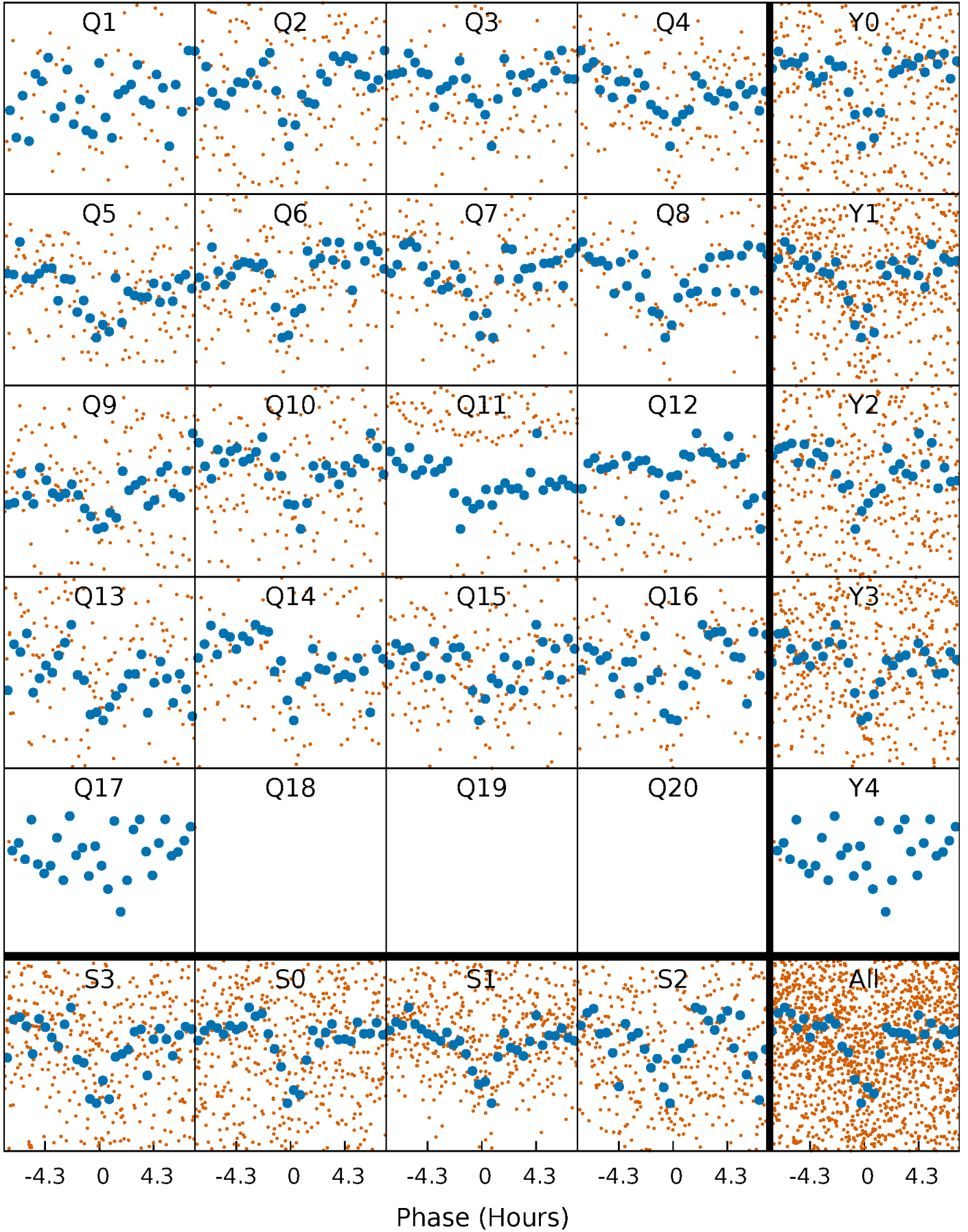


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

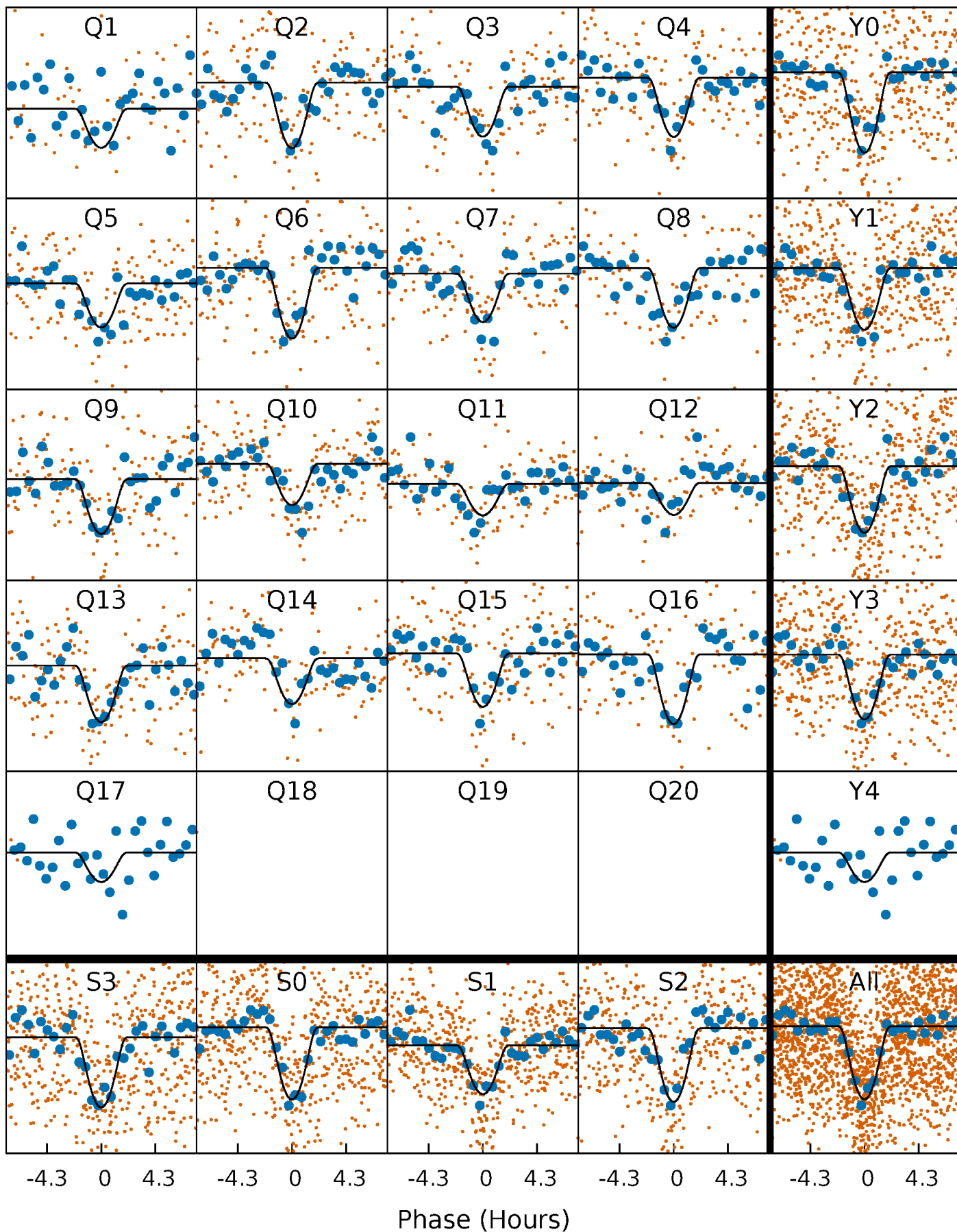
TCE 010206675-01 P= 17.402079 Days  $T_0=141.932643$  (BKJD)





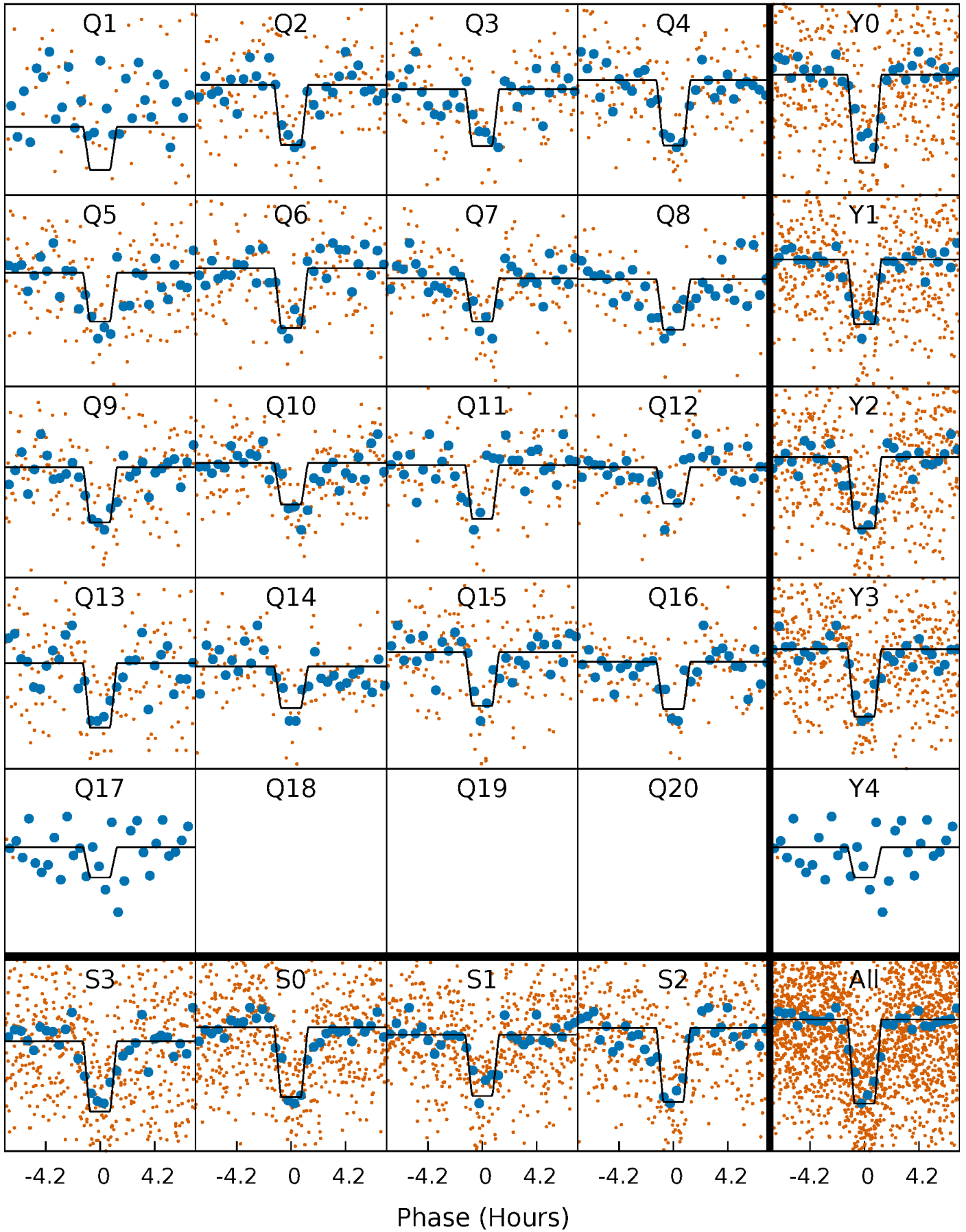
# DV Quarter-Phased Transit Curves

TCE 010206675-01 P= 17.402079 Days  $T_0=141.932643$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

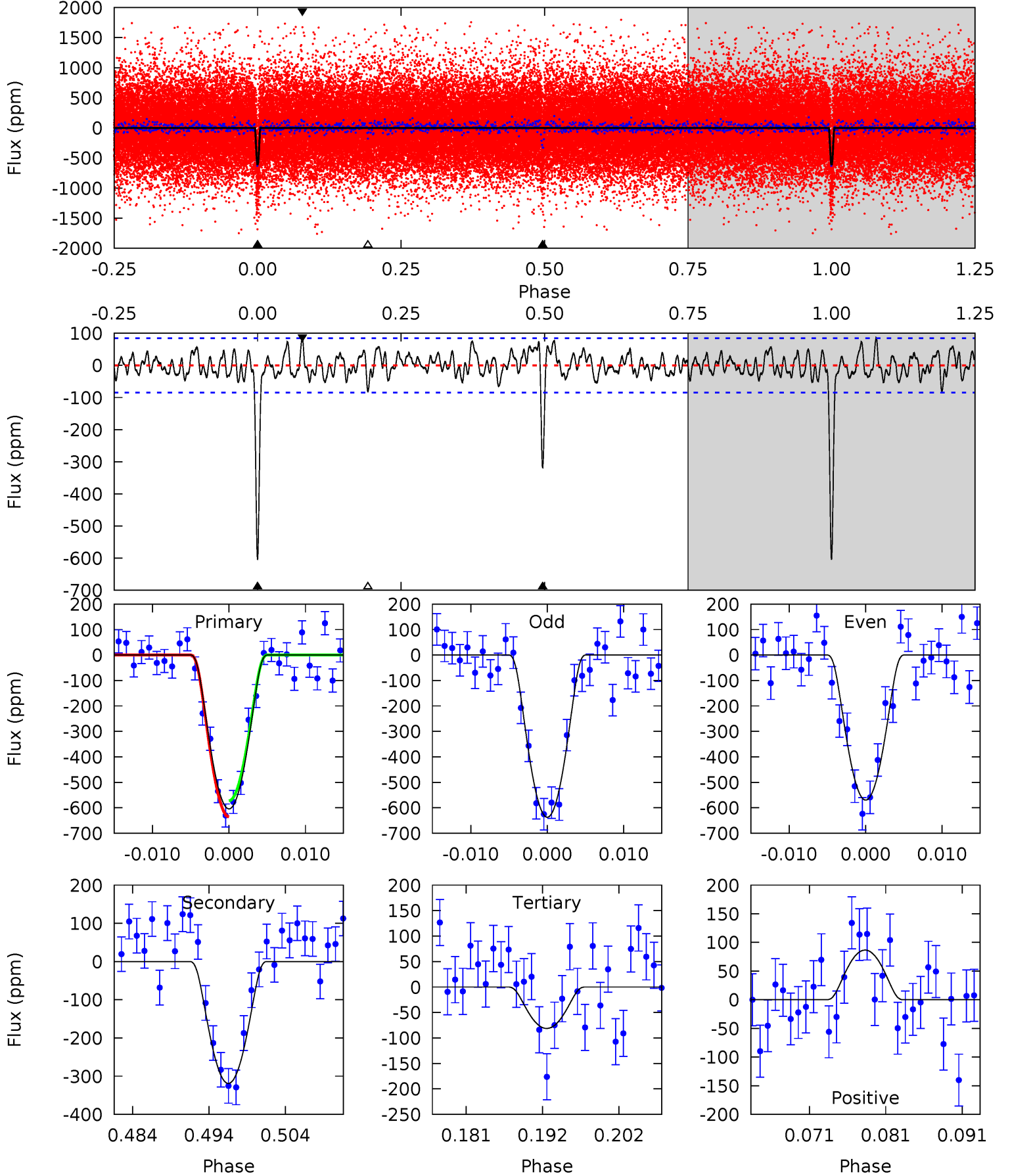
TCE 010206675-01 P= 17.402228 Days  $T_0=141.922822$  (BKJD)



# DV Model-Shift Uniqueness Test

010206675-01, P = 17.402079 Days, E = 124.530564 Days

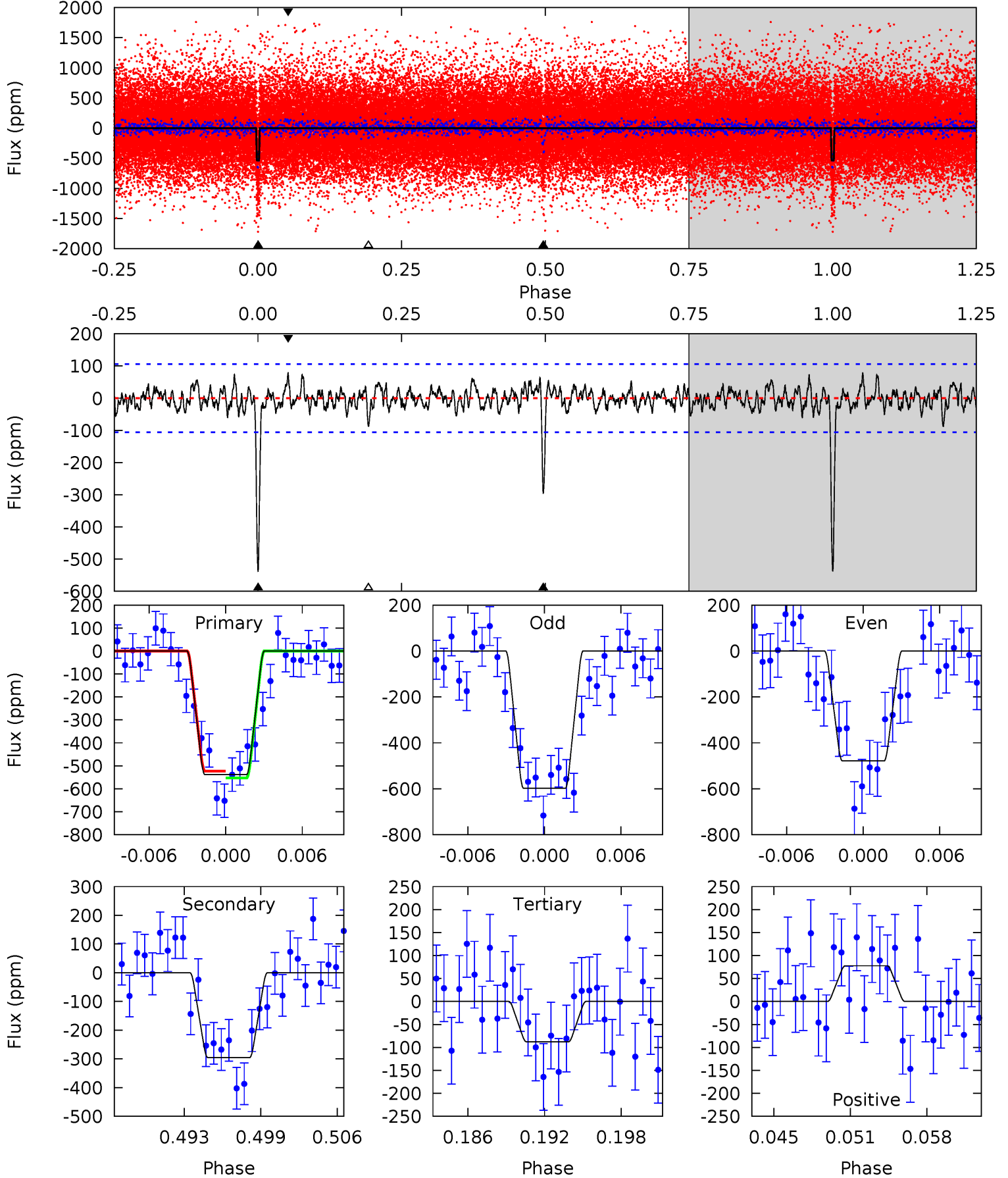
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.9	18.9	4.83	5.15	5.02	2.57	1.69	31.0	30.7	14.1	13.8	2.00	0.94	0.13	1.87



# Alt Model-Shift Uniqueness Test

010206675-01, P = 17.402228 Days, E = 124.520594 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
25.9	14.3	4.24	3.75	5.11	2.73	1.18	21.7	22.2	10.0	10.5	2.87	1.00	0.13	0.73



### Stellar Parameters For KIC 010206675

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4098^{+82}_{-82}$	$4.662^{+0.022}_{-0.022}$	$0.080^{+0.150}_{-0.150}$	$0.615^{+0.027}_{-0.029}$	$0.634^{+0.029}_{-0.032}$	$3.839^{+0.370}_{-0.337}$
	+2%/-2%	+0%/-0%	+188%/-188%	+4%/-5%	+5%/-5%	+10%/-9%
Source	SPE60	SPE60	SPE60	DSEP		

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

### Secondary Eclipse Parameters for KIC 010206675-01 / KOI 2283.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-319±17	$3.32^{+2.42}_{-2.08}$	$591^{+13}_{-14}$	$2964^{+1080}_{-389}$	$201^{+1243}_{-133}$
Alt.	-296±21	$2.83^{+2.37}_{-1.88}$	$590^{+12}_{-14}$	$3088^{+1319}_{-477}$	$262^{+1967}_{-185}$

$T_{max}$  = 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

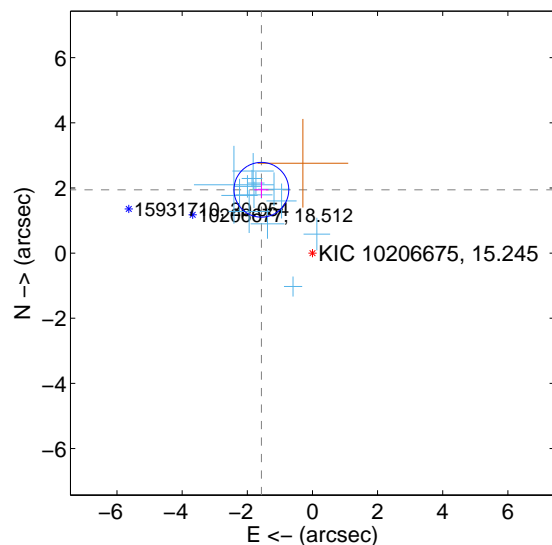
Supplemental centroid analysis for 010206675-01. Kepler magnitude: 15.24. Transit SNR 19.28

There are 13 quarters with good PRF difference image offsets

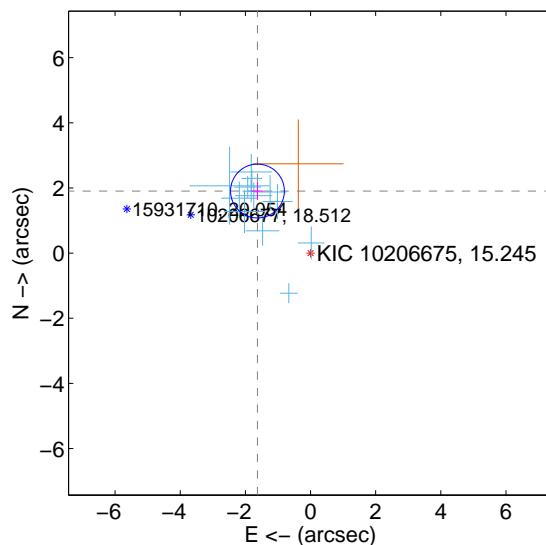
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.498 \pm 0.280$	8.91	$1.568 \pm 0.218$	$1.944 \pm 0.253$
PRF-fit source offset from KIC position	$2.507 \pm 0.275$	9.10	$1.629 \pm 0.190$	$1.905 \pm 0.277$
photometric centroid source offset	$4.21 \pm 0.66$	6.40	$2.05 \pm 0.74$	$3.68 \pm 0.63$

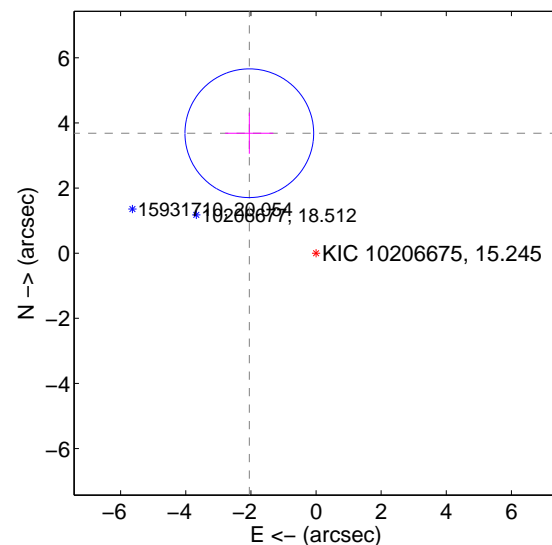
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

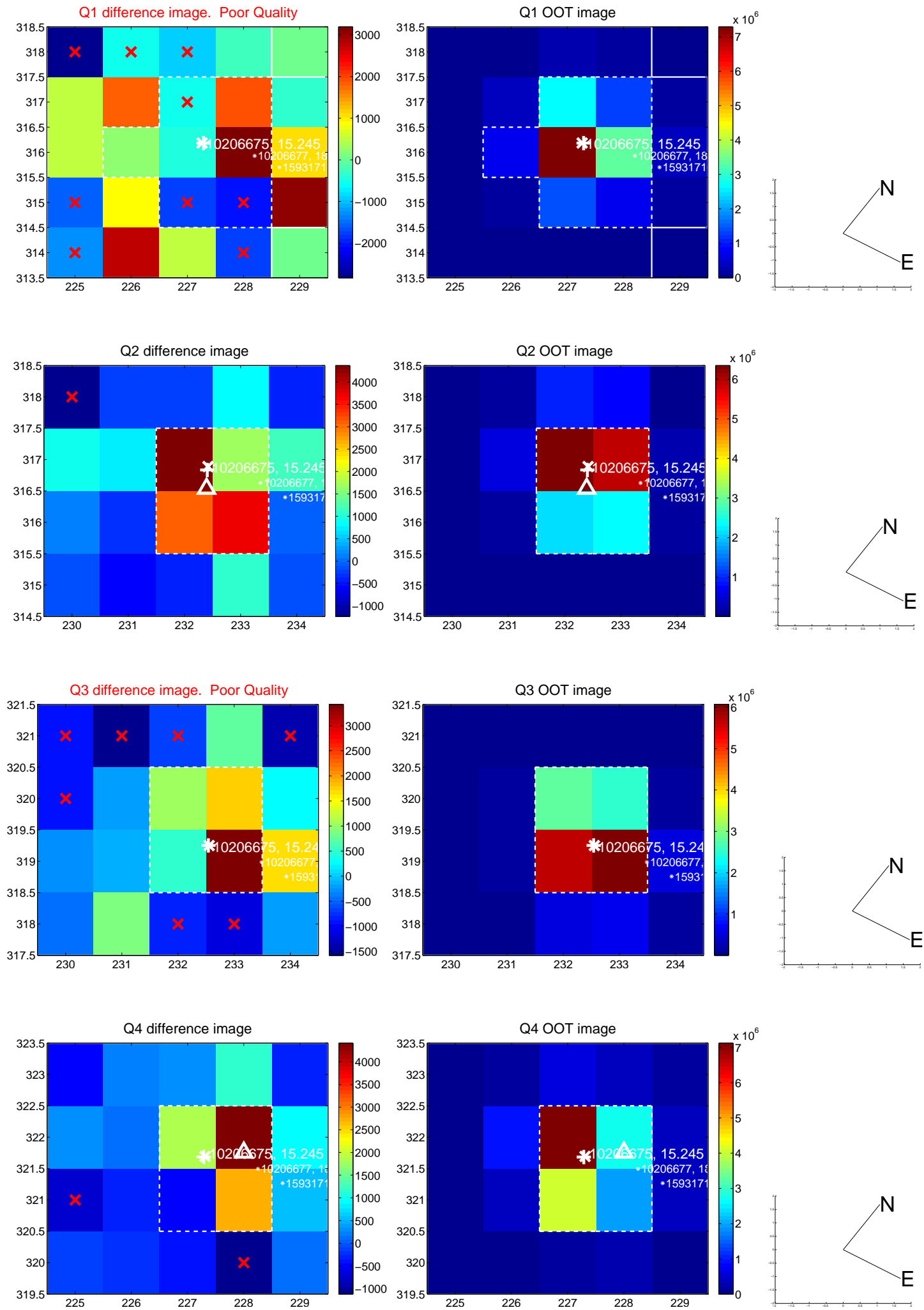


offset from photometric centroids

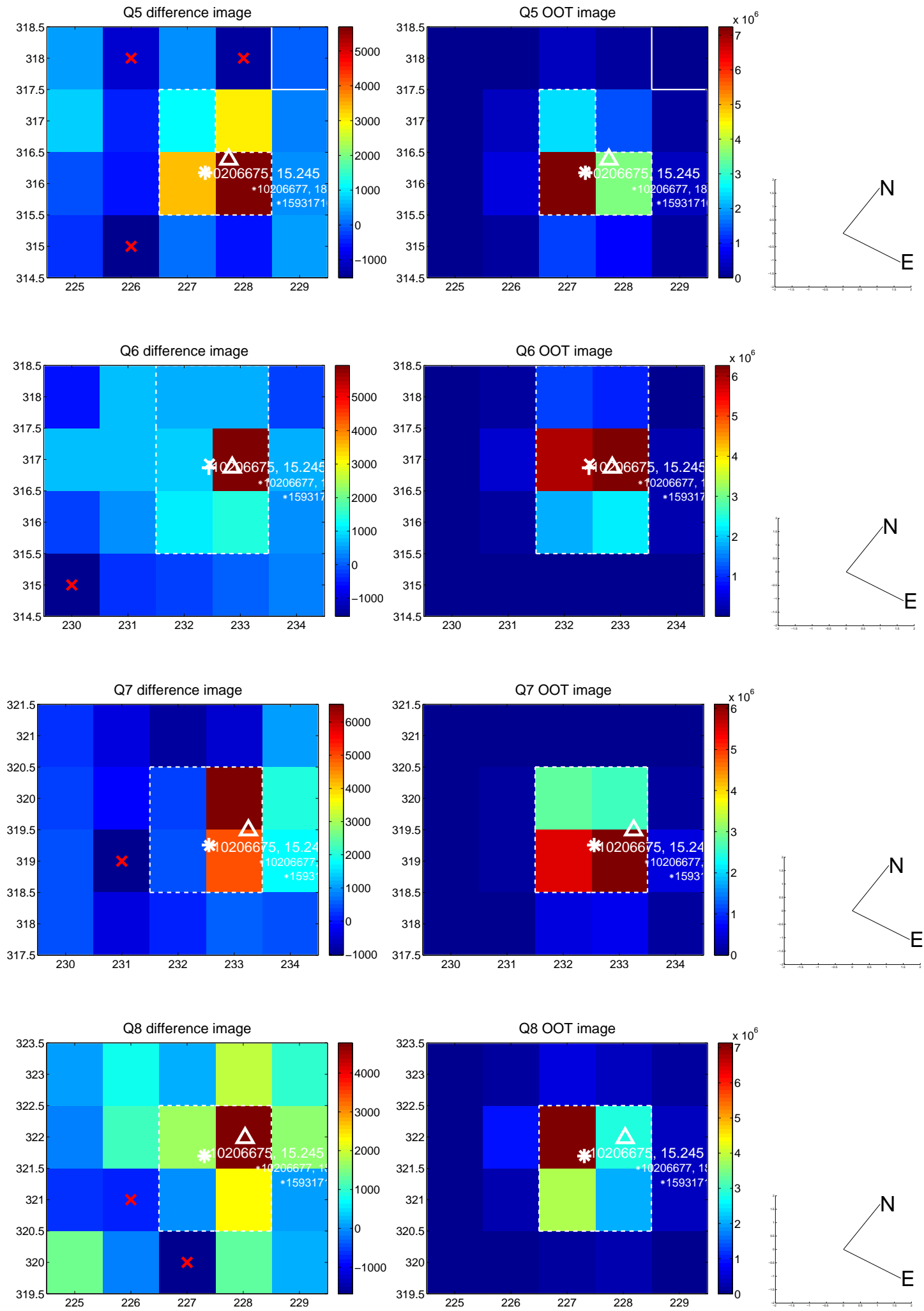


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

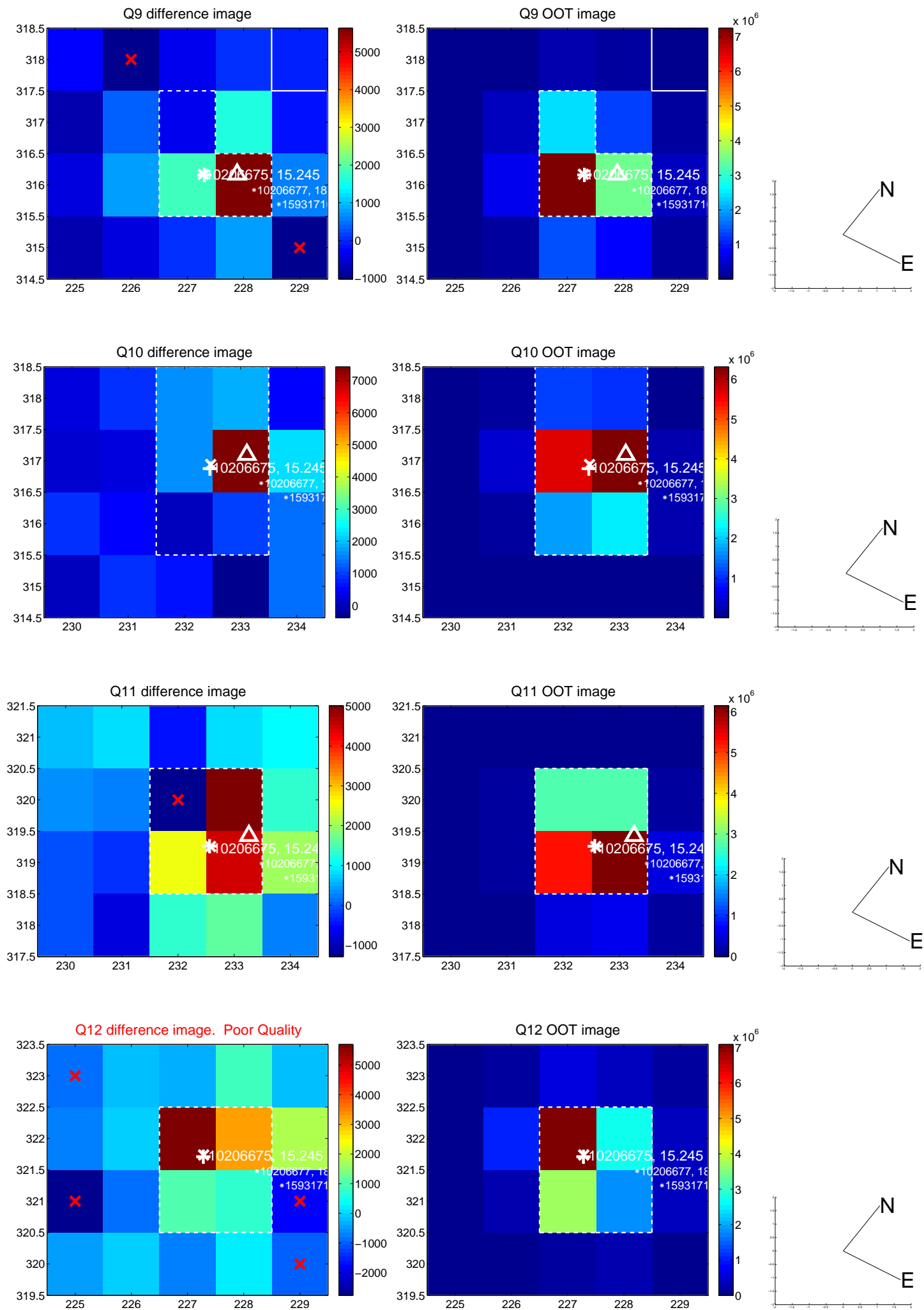
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



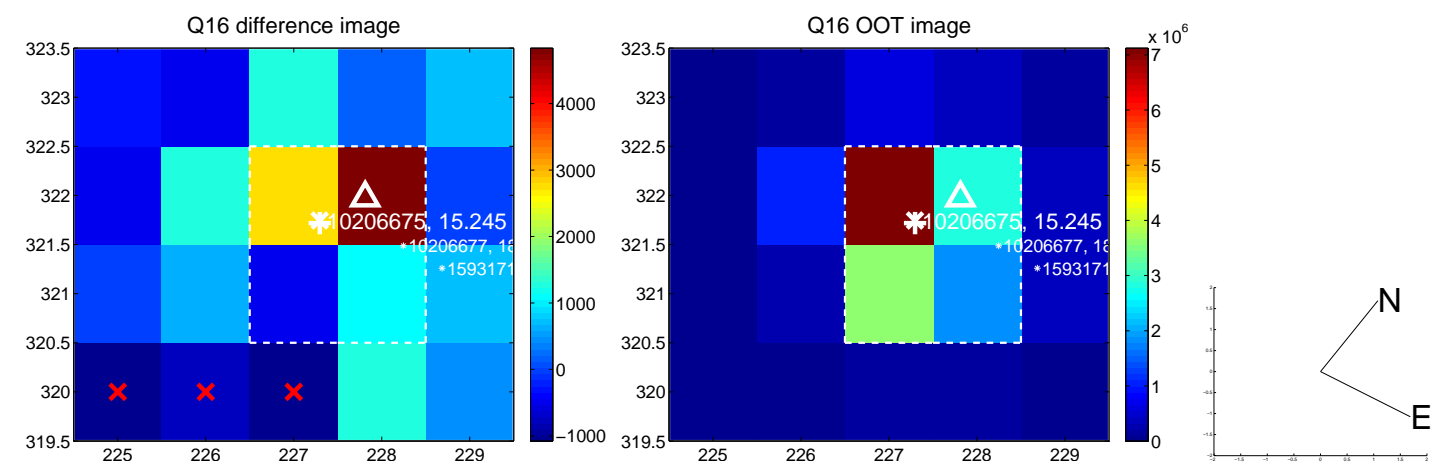
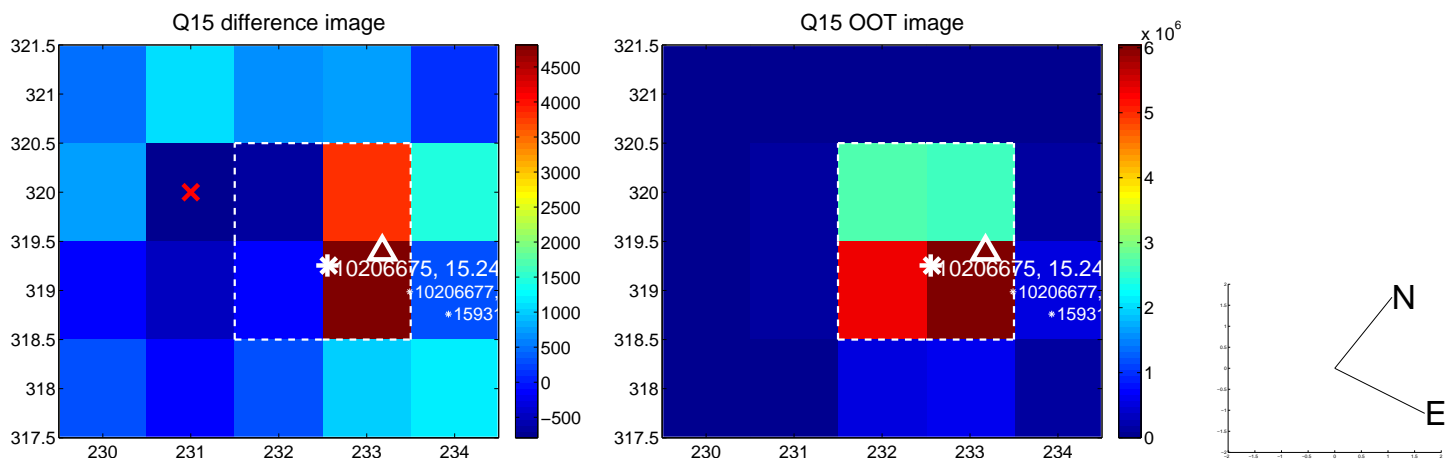
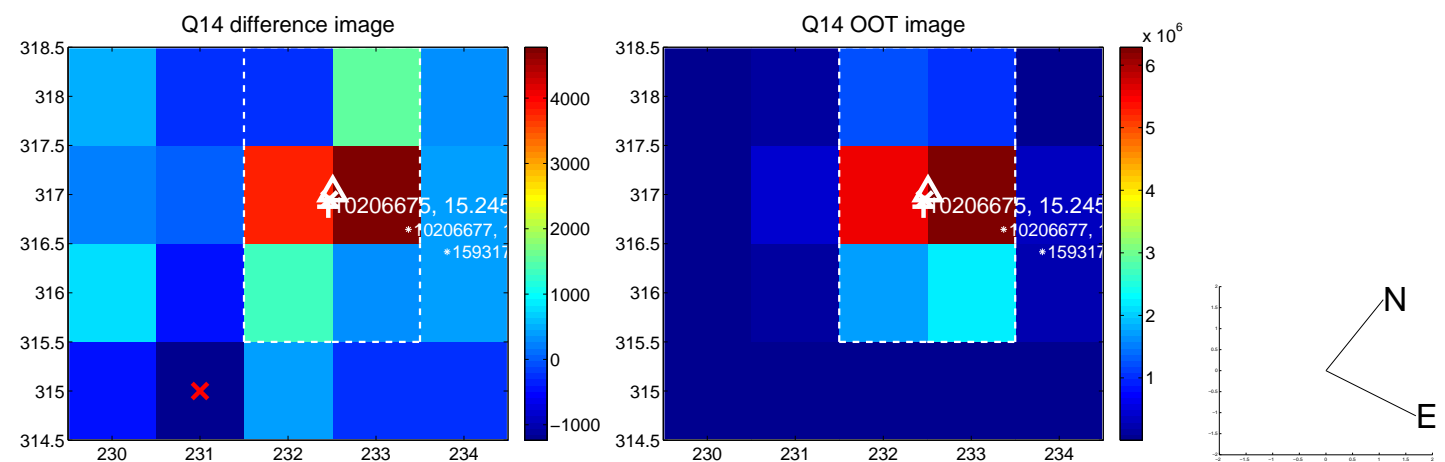
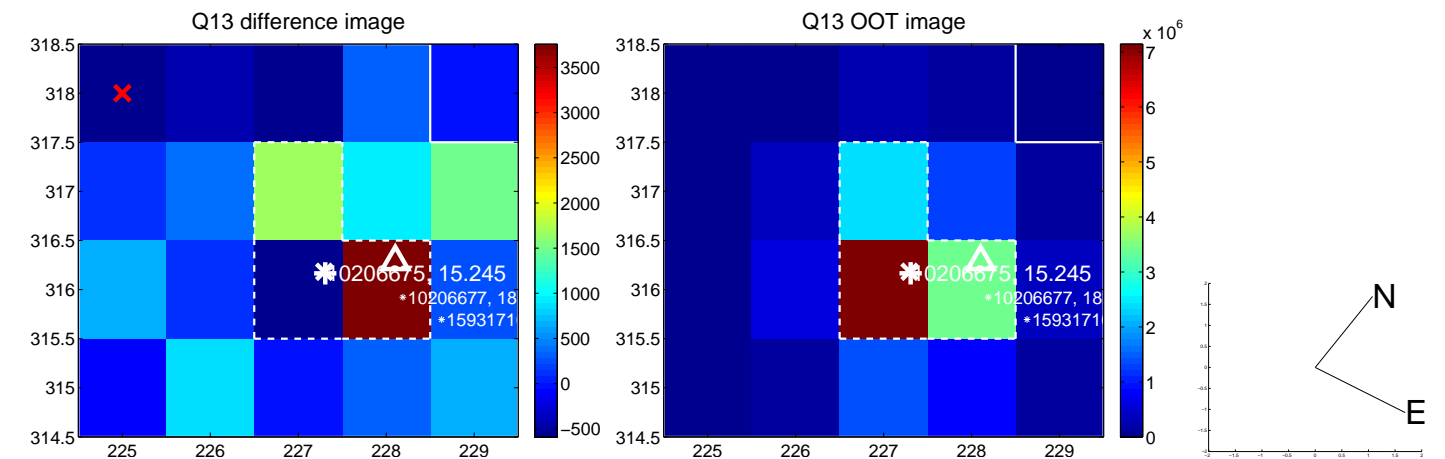
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

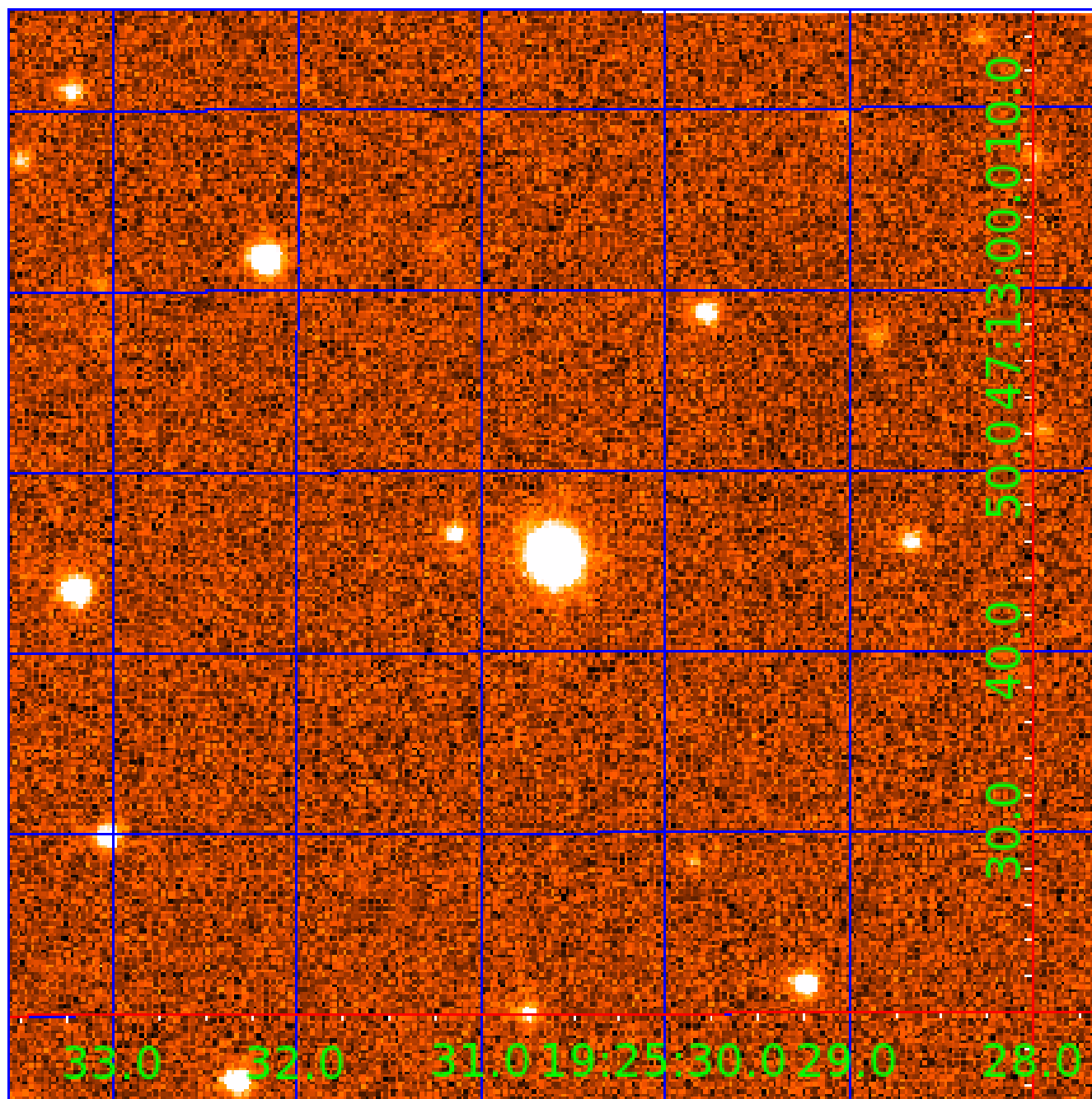






UKIRT Image

Declination



# KIC 010206675

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010206675-01	OBS	2283.01	17.402079	141.932643	608.7	3.784	17.6	19.3	0.61	4098	2.68	7.50
010206675-02	OBS	No	17.402940	133.137173	409.2	3.229	12.0	13.3	0.61	4098	1.85	7.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010206675-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET
010206675-02	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.

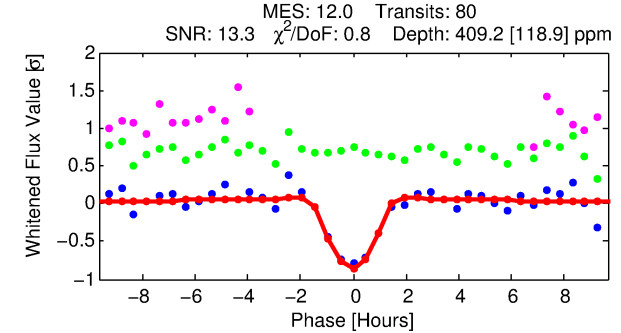
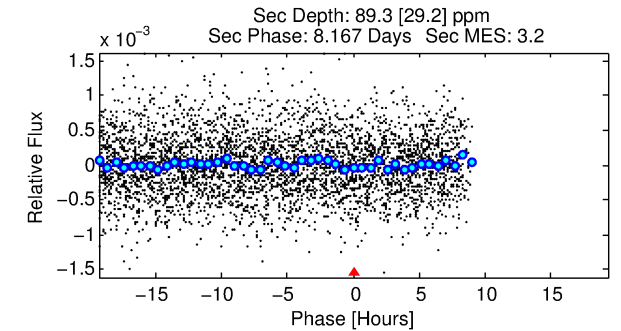
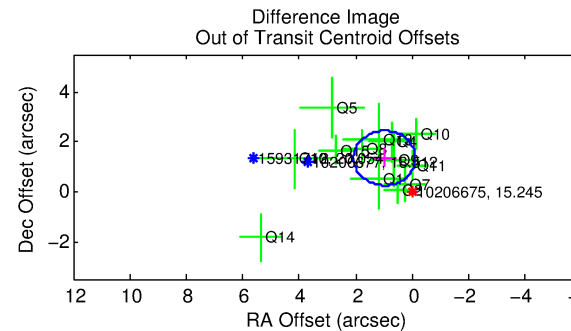
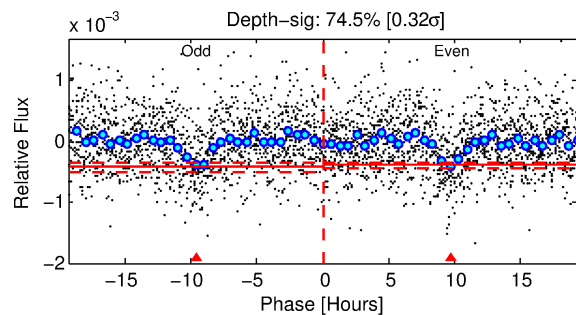
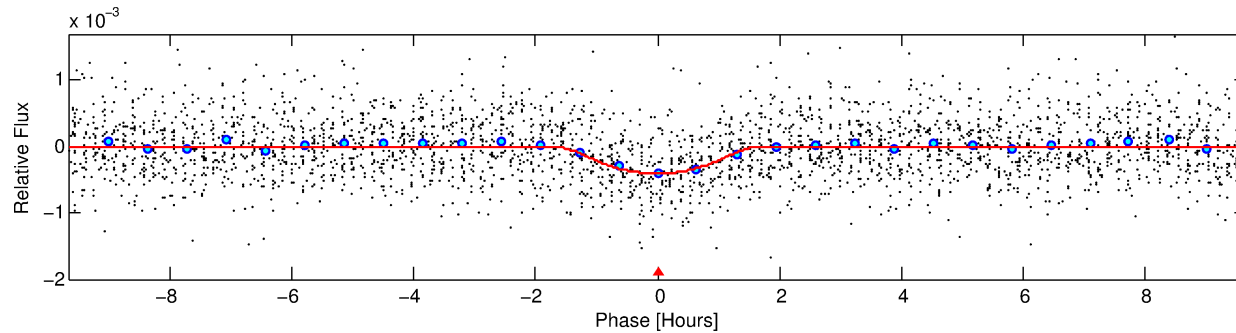
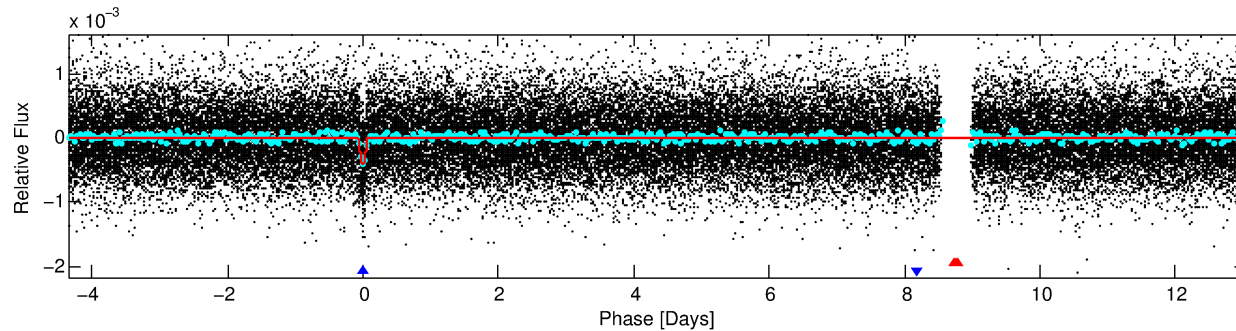
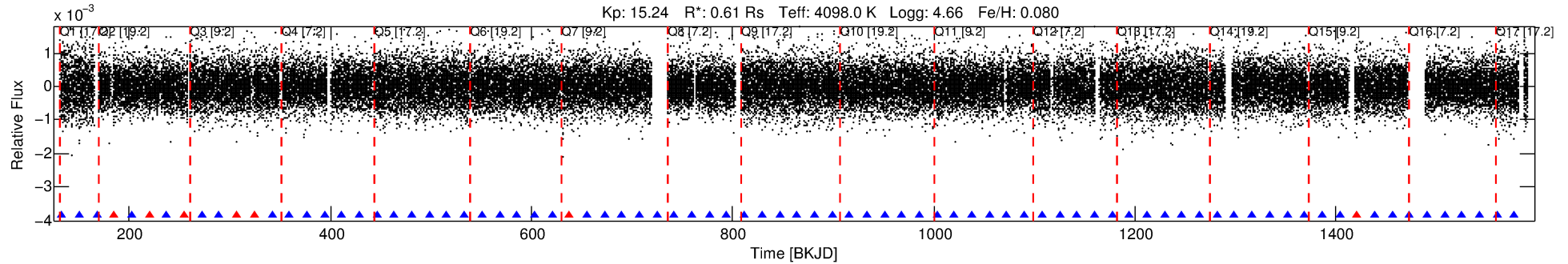
## Ephemeris Match Information For 010206675-02

No Significant Match Found

# DV One-Page Summary

KIC: 10206675 Candidate: 2 of 2 Period: 17.403 d

KOI: K02283 Corr: No Ephemeris Match



## DV Fit Results:

Period = 17.40294 [0.00012] d  
Epoch = 133.1372 [0.0057] BKJD  
Rp/R\* = 0.0275 [0.0115]  
a/R\* = 13.05 [3.77]  
b = 0.98 [0.03]  
Seff = 7.50 [0.69]  
Teq = 422 [10] K  
Rp = 1.85 [0.77] Re  
a = 0.1129 [0.0040] AU  
Ag = 183.33 [164.16] [1.11 $\sigma$ ]  
Teffp = 2401 [539] K [3.67 $\sigma$ ]

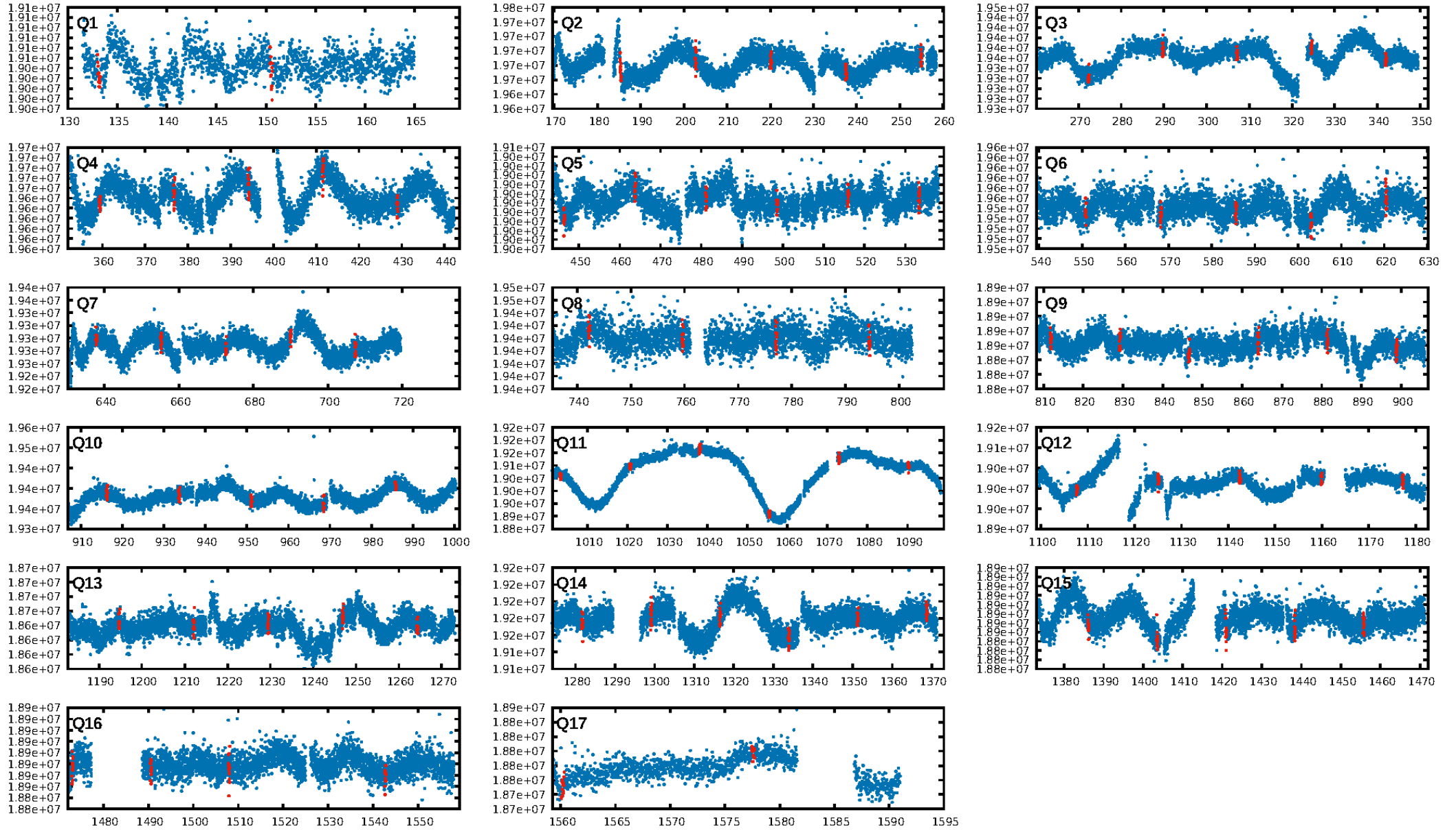
## DV Diagnostic Results:

ShortPeriod-sig: 0.3% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 95.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.18e-31  
RollingBand-fgt: 0.91 [69/76]  
GhostDiagnostic-chr: 2.18  
Centroid-sig: 1.2%  
Centroid-so: 1.698 arcsec [1.71 $\sigma$ ]  
OotOffset-rm: 1.665 arcsec [4.55 $\sigma$ ]  
KicOffset-rm: 1.703 arcsec [4.92 $\sigma$ ]  
OotOffset-st: 3/3/3/4 [13]  
KicOffset-st: 3/3/3/4 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:43:50 Z

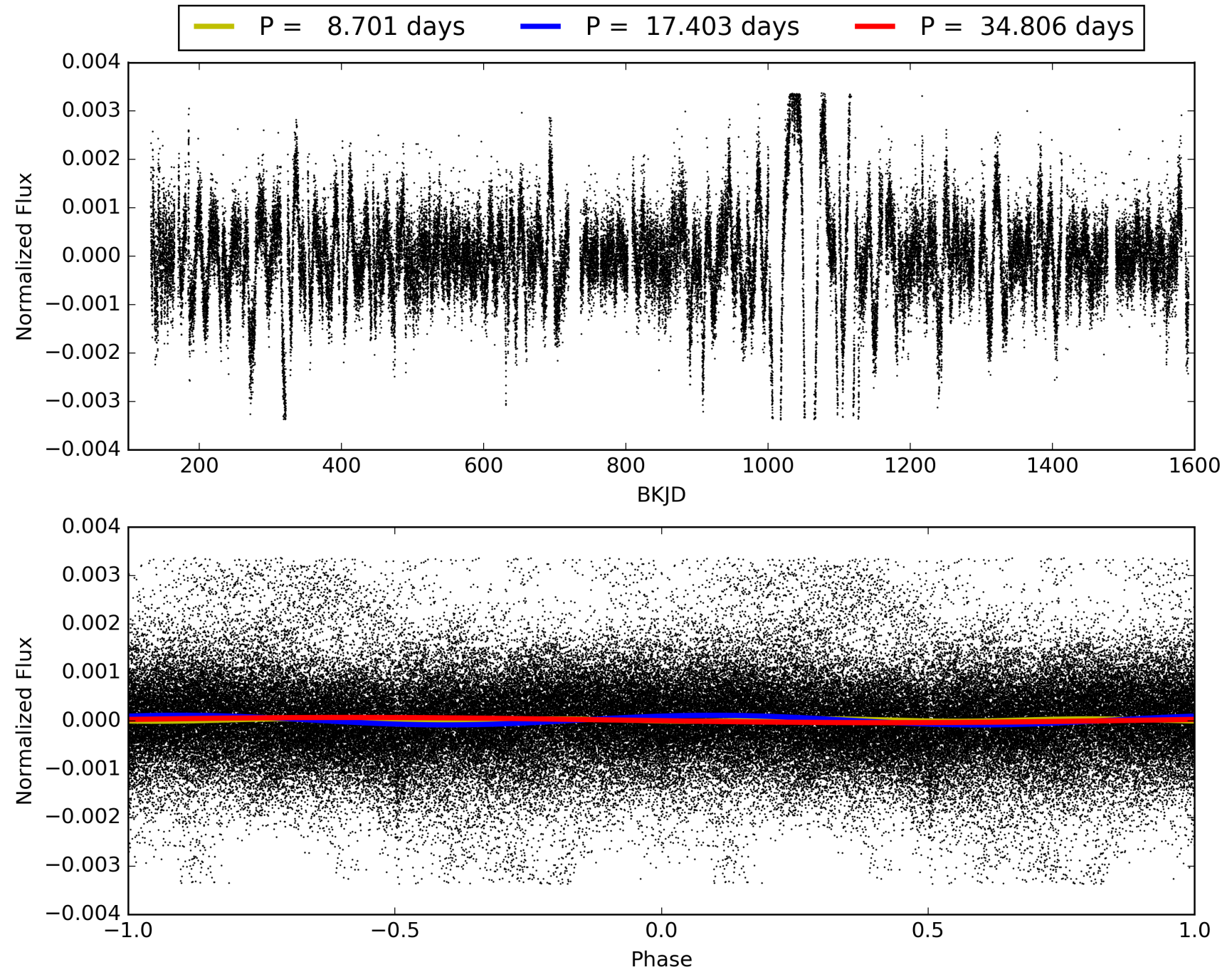
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010206675-02, PDC Light Curves



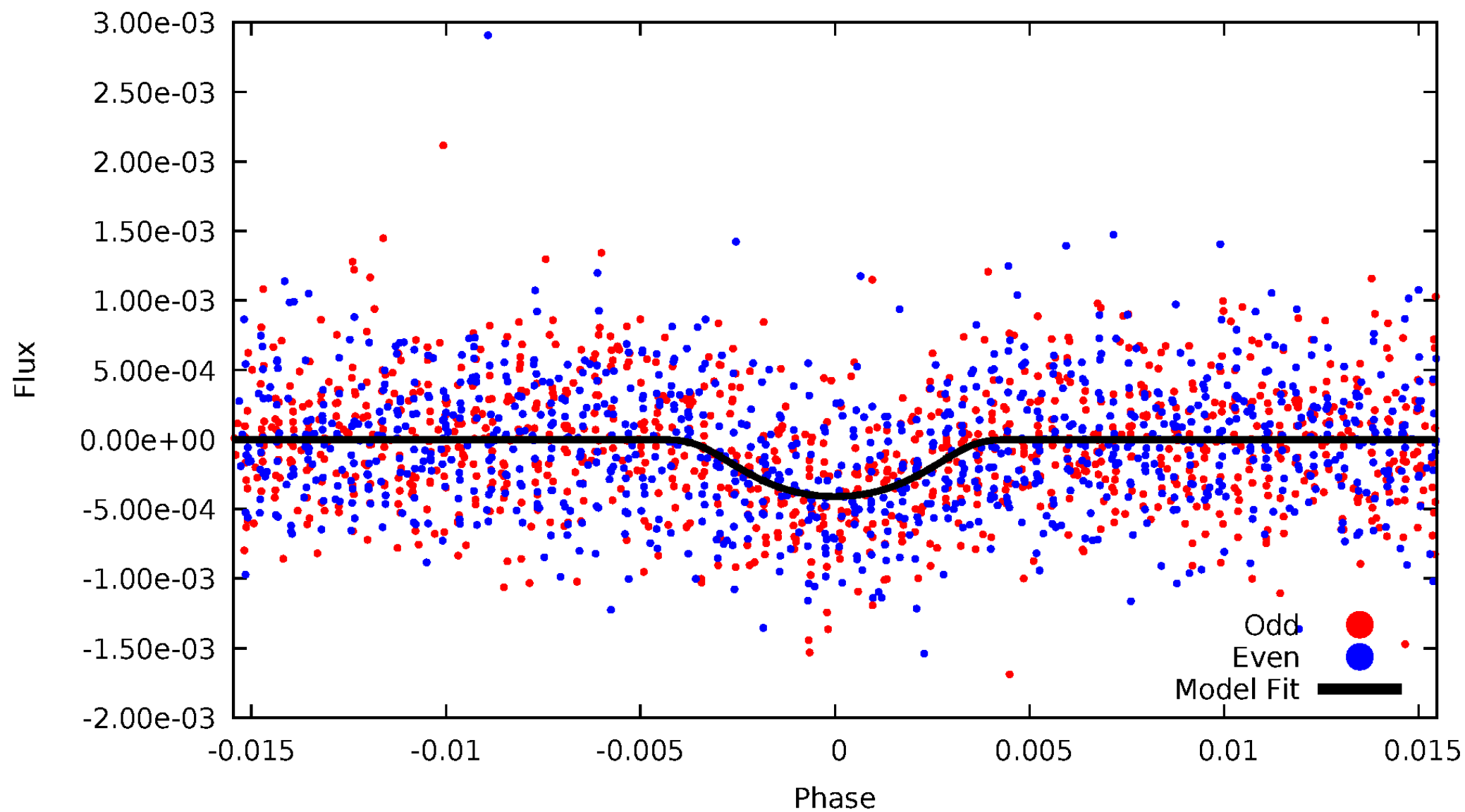


# TCE 010206675-02



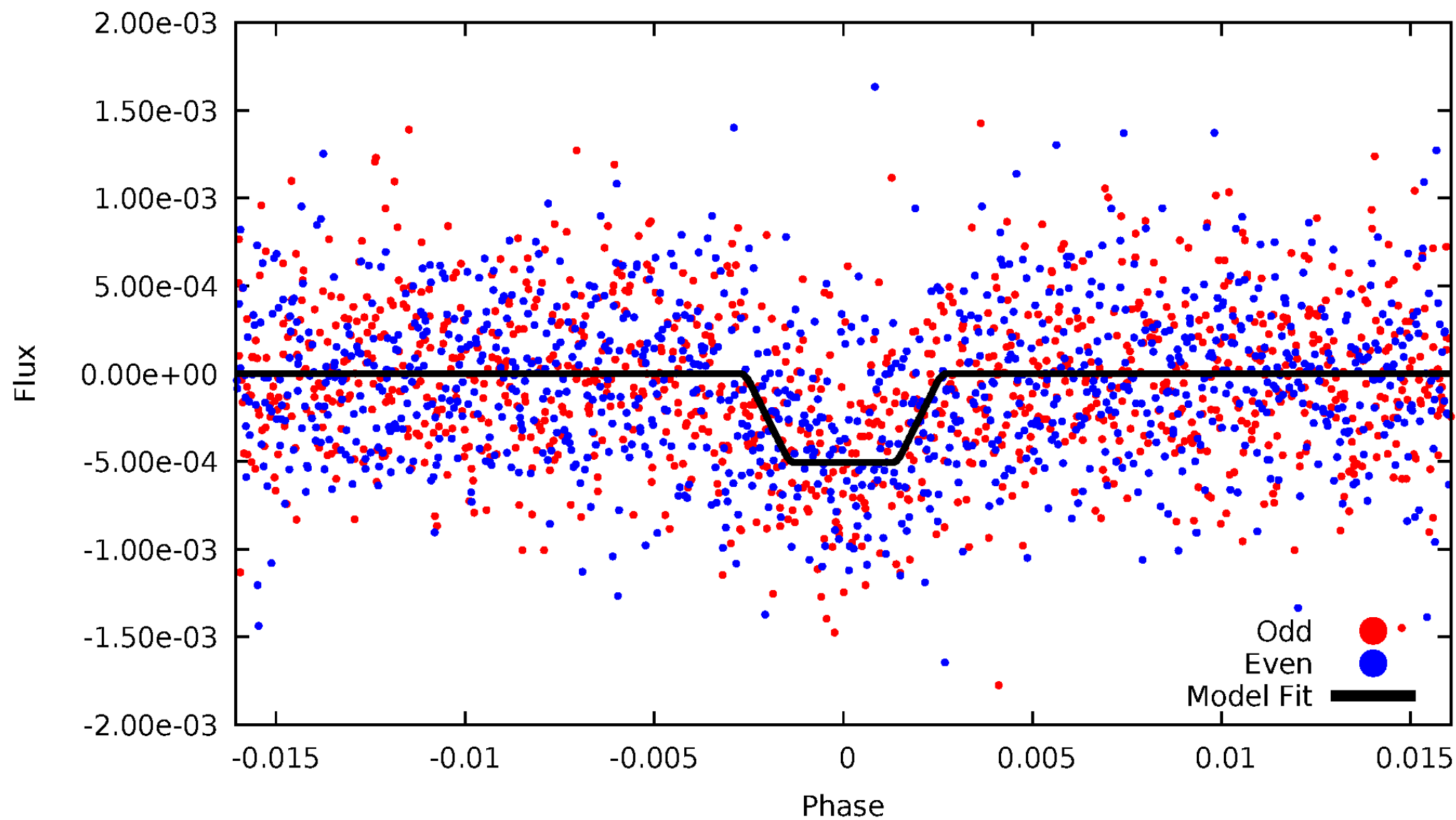
# DV Odd/Even

TCE 010206675-02



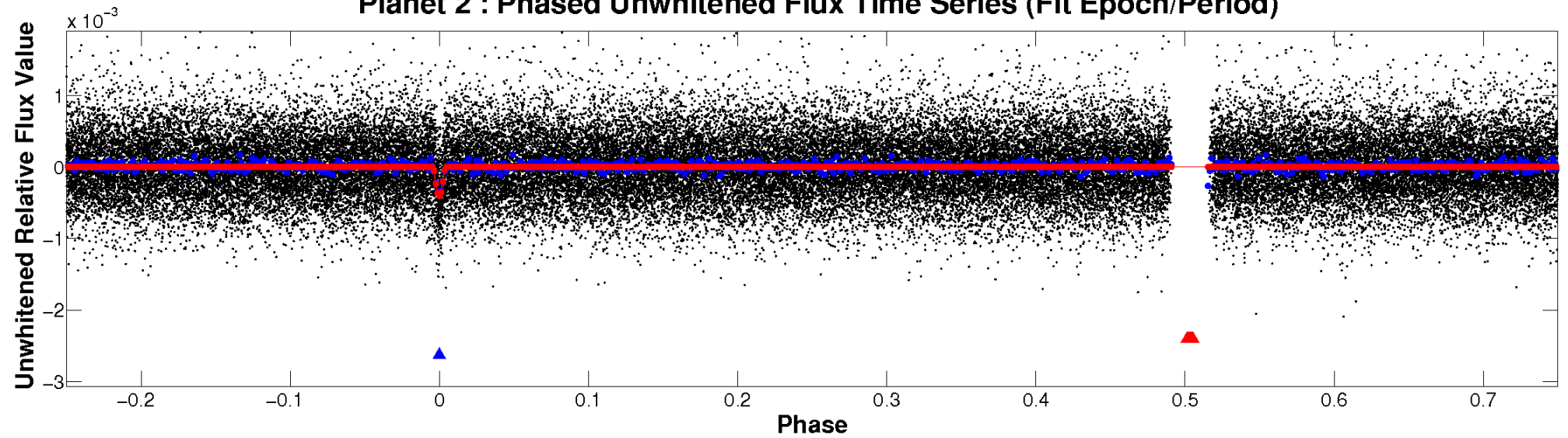
# ALT Odd/Even

TCE 010206675-02

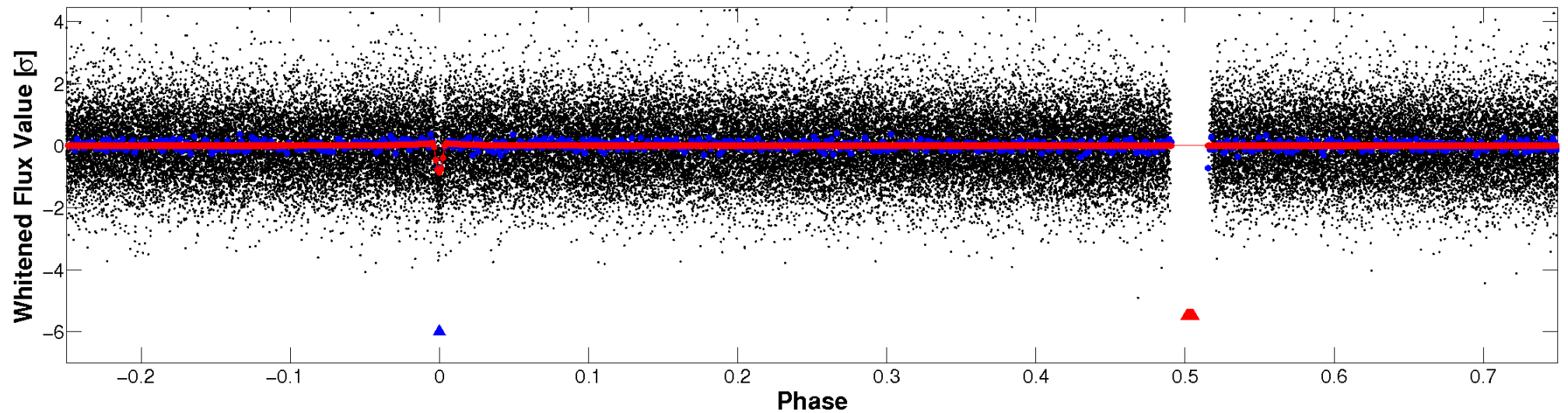


# Non-Whitened Vs. Whitened Light Curve

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

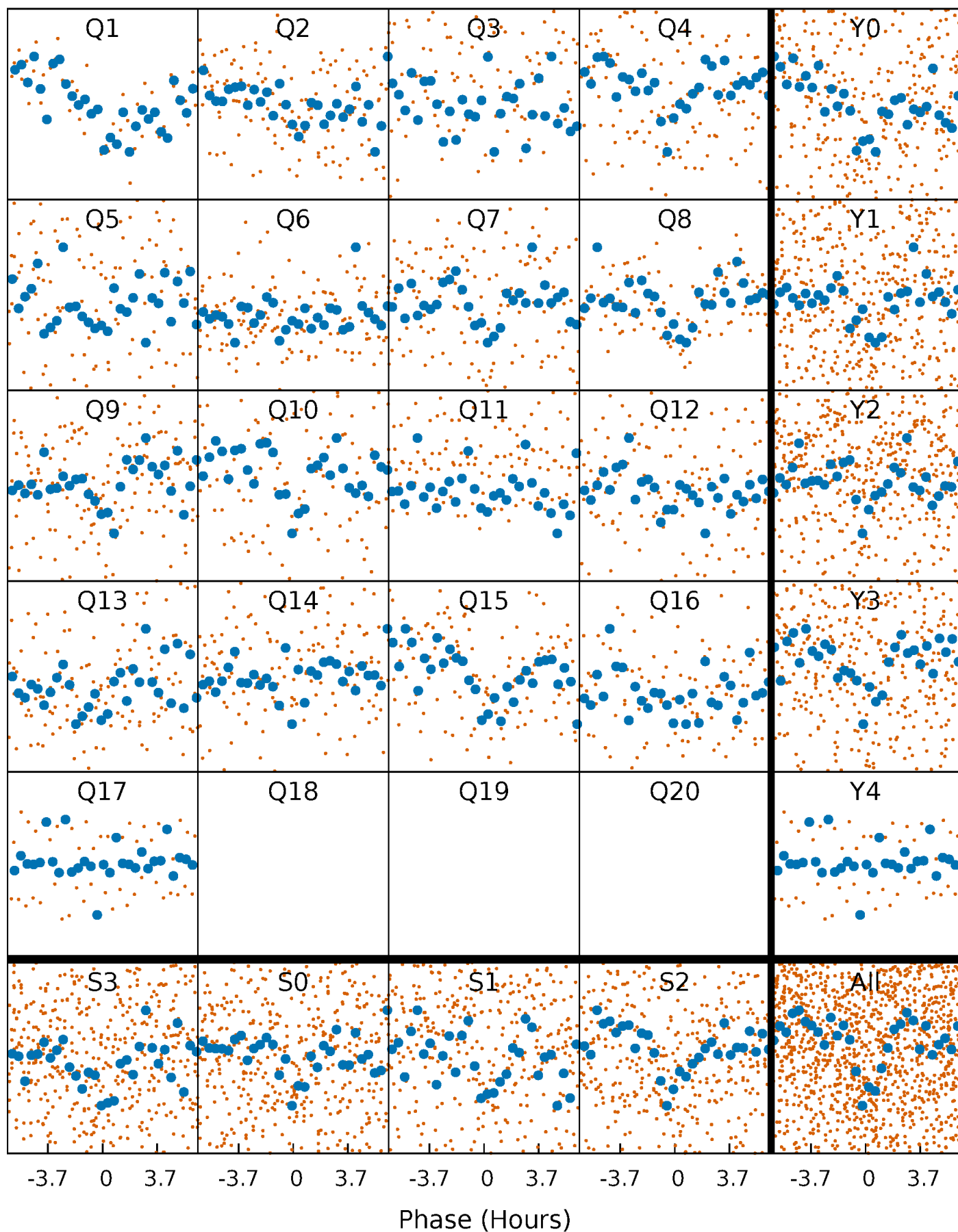


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

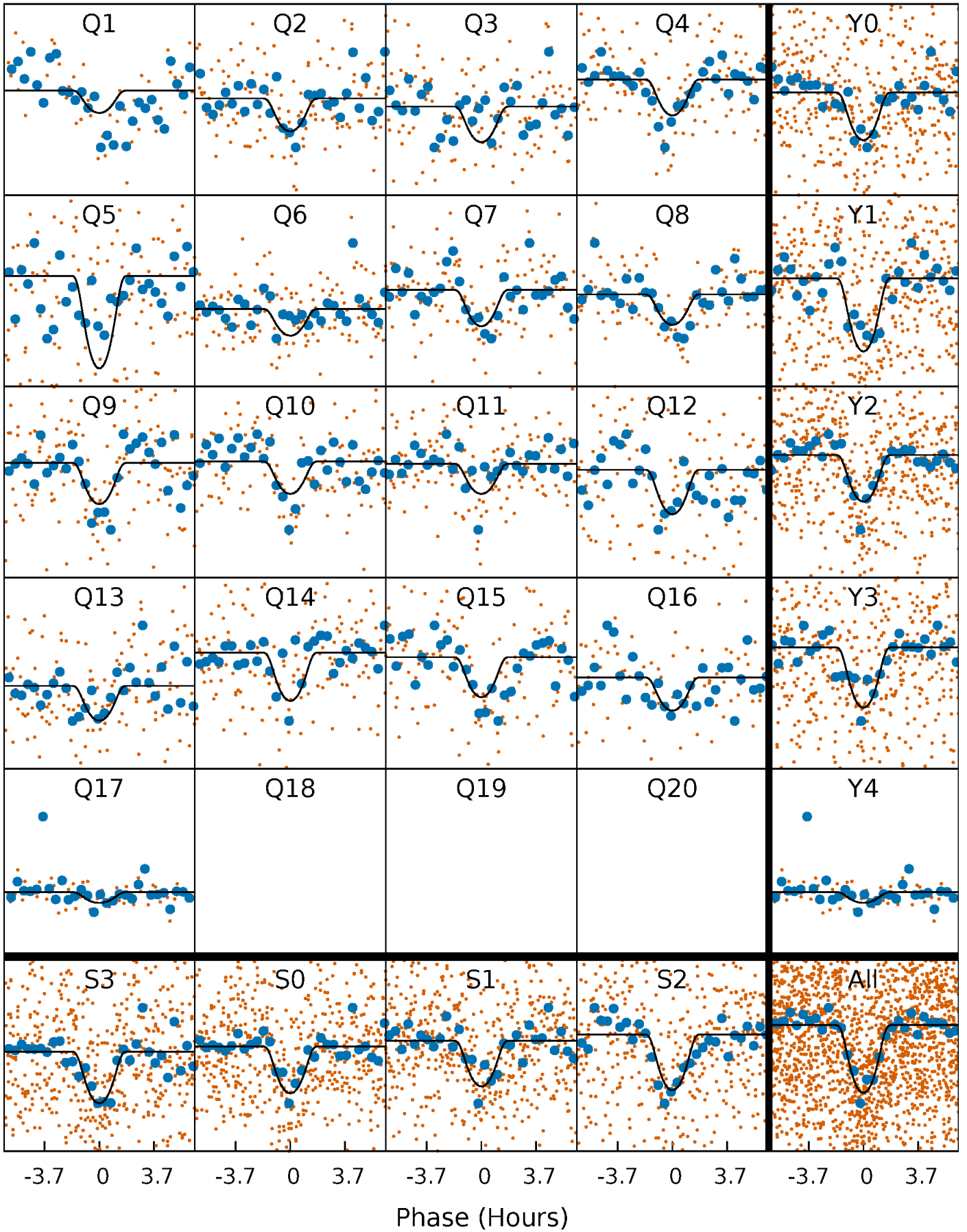
TCE 010206675-02 P= 17.402940 Days  $T_0=133.137173$  (BKJD)





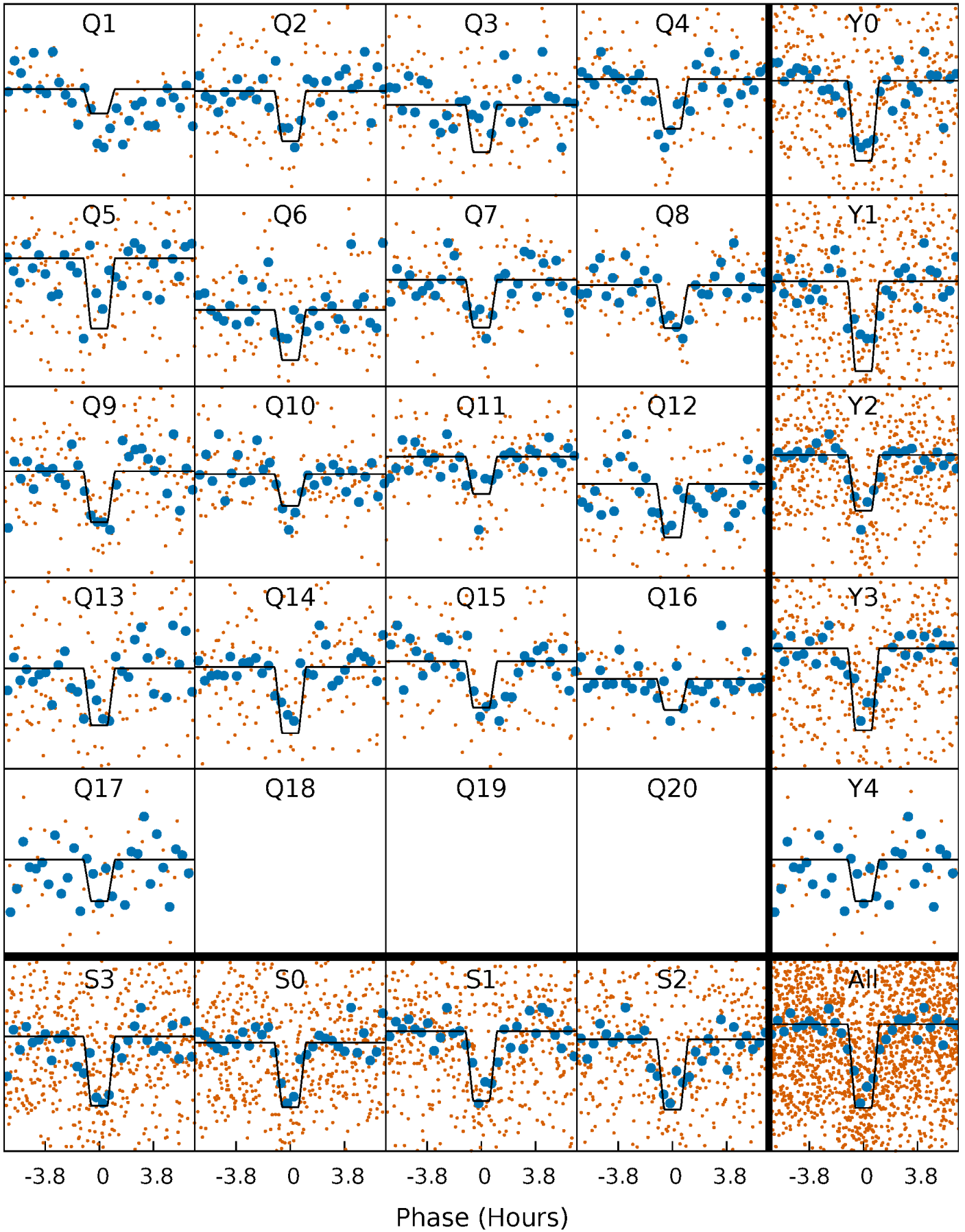
# DV Quarter-Phased Transit Curves

TCE 010206675-02 P= 17.402940 Days  $T_0=133.137173$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

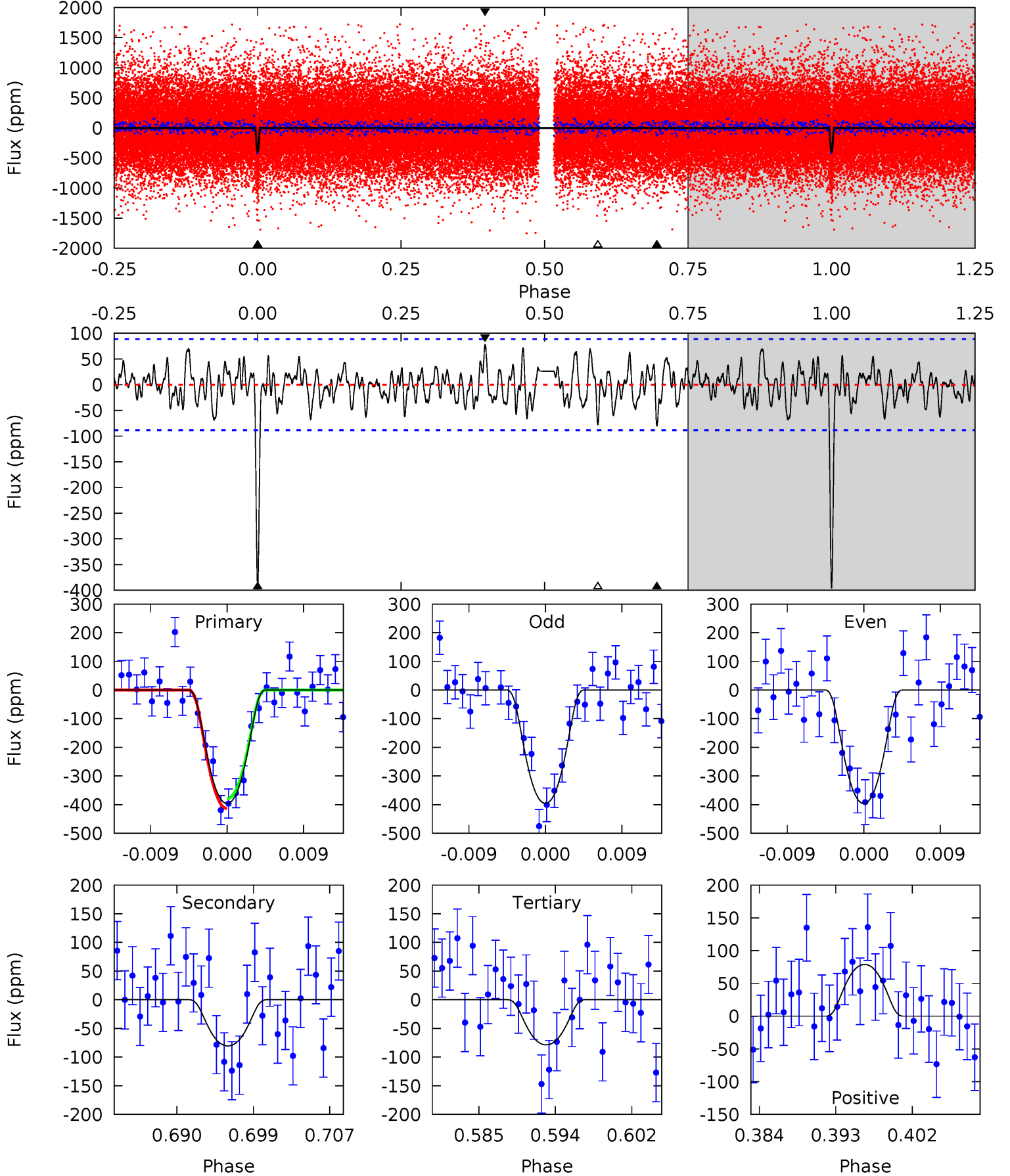
TCE 010206675-02 P= 17.402756 Days  $T_0=133.143967$  (BKJD)



# DV Model-Shift Uniqueness Test

010206675-02, P = 17.402940 Days, E = 115.734233 Days

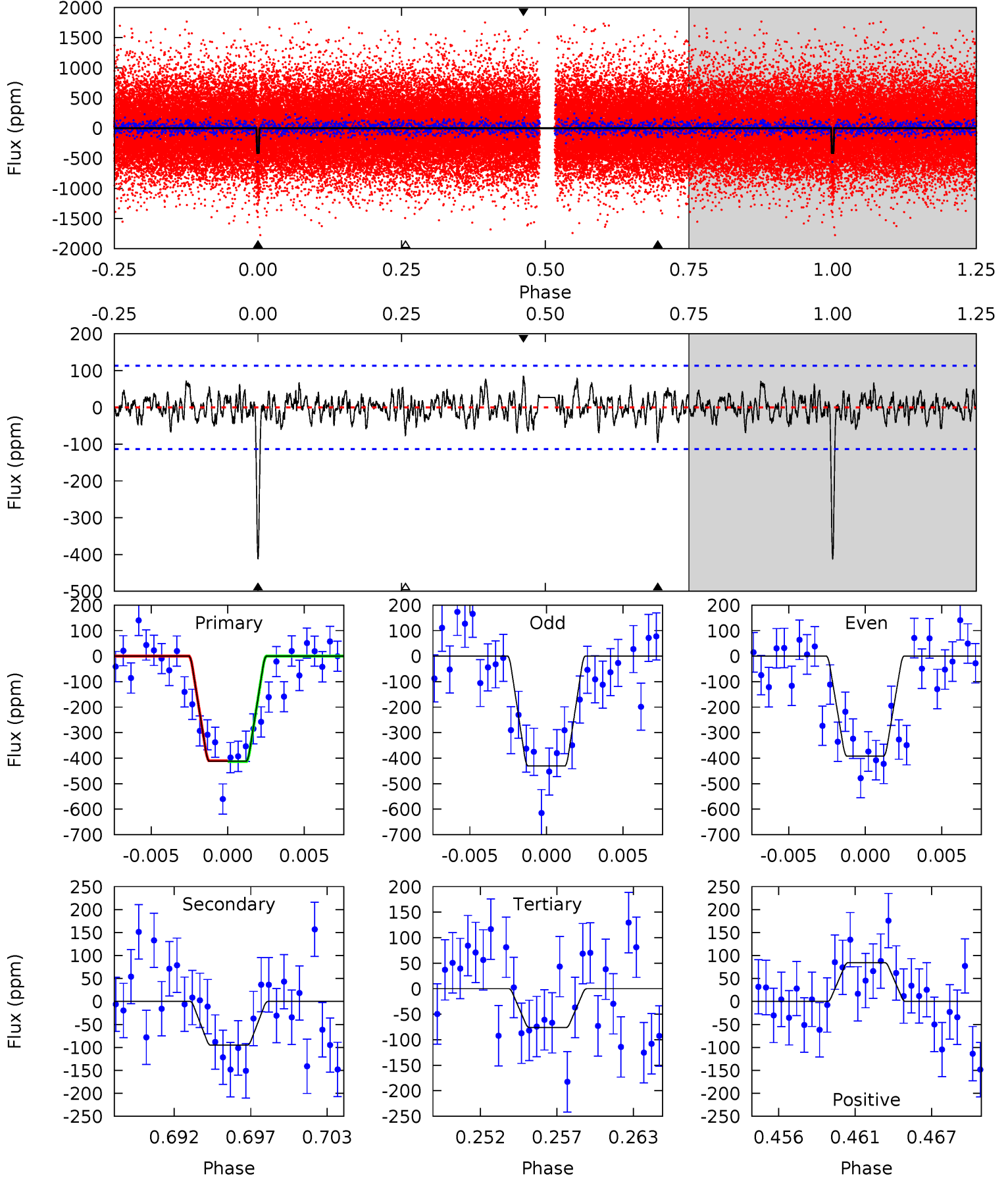
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.6	4.59	4.49	4.50	5.05	2.62	1.57	18.1	18.1	0.11	0.10	0.01	1.05	0.17	1.00



# Alt Model-Shift Uniqueness Test

010206675-02, P = 17.402756 Days, E = 115.741211 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
18.7	4.32	3.45	3.83	5.14	2.78	1.21	15.2	14.8	0.86	0.49	0.88	1.01	0.17	0.07



### Stellar Parameters For KIC 010206675

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4098^{+82}_{-82}$	$4.662^{+0.022}_{-0.022}$	$0.080^{+0.150}_{-0.150}$	$0.615^{+0.027}_{-0.029}$	$0.634^{+0.029}_{-0.032}$	$3.839^{+0.370}_{-0.337}$
	+2%/-2%	+0%/-0%	+188%/-188%	+4%/-5%	+5%/-5%	+10%/-9%
Source	SPE60	SPE60	SPE60	DSEP		

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

### Secondary Eclipse Parameters for KIC 010206675-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-81 \pm 18$	$1.86^{+0.83}_{-0.79}$	$590^{+15}_{-12}$	$2894^{+488}_{-288}$	$165^{+297}_{-90}$
Alt.	$-95 \pm 22$	$1.53^{+0.77}_{-0.78}$	$590^{+12}_{-13}$	$3129^{+771}_{-353}$	$292^{+861}_{-166}$

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

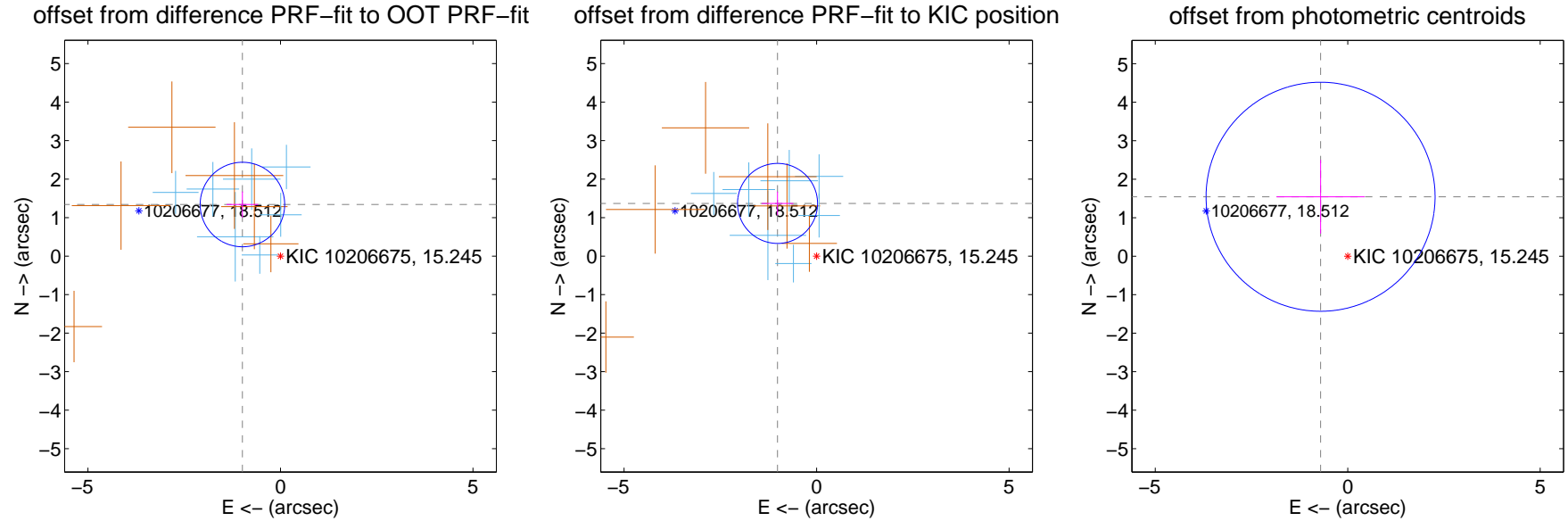
## DV Centroid Data

Supplemental centroid analysis for 010206675-02. Kepler magnitude: 15.24. Transit SNR 13.31

There are 7 quarters with good PRF difference image offsets

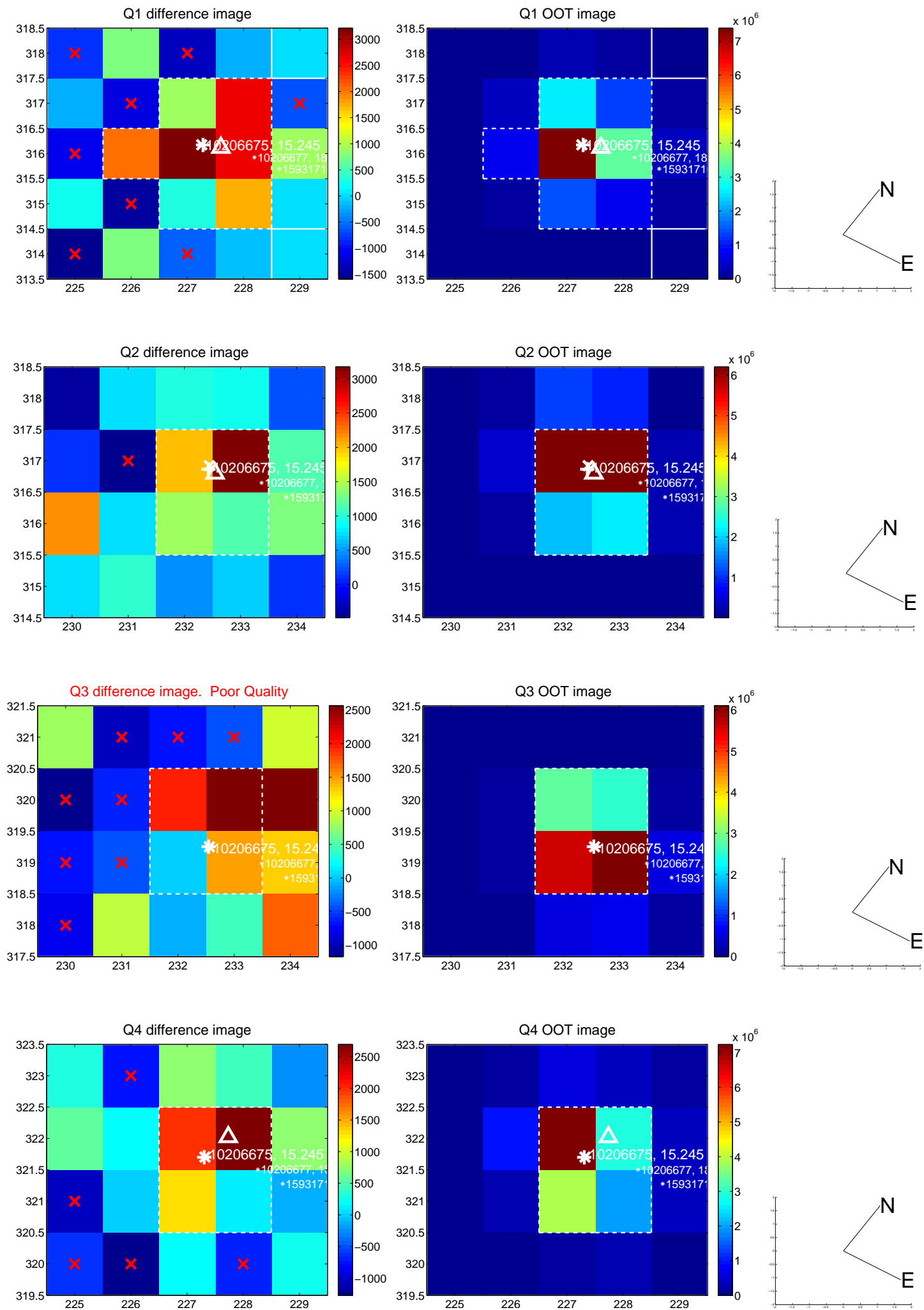
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.665 \pm 0.366$	4.55	$0.988 \pm 0.412$	$1.340 \pm 0.338$
PRF-fit source offset from KIC position	$1.703 \pm 0.346$	4.92	$1.014 \pm 0.411$	$1.369 \pm 0.305$
photometric centroid source offset	$1.70 \pm 0.99$	1.71	$0.71 \pm 1.15$	$1.54 \pm 0.96$



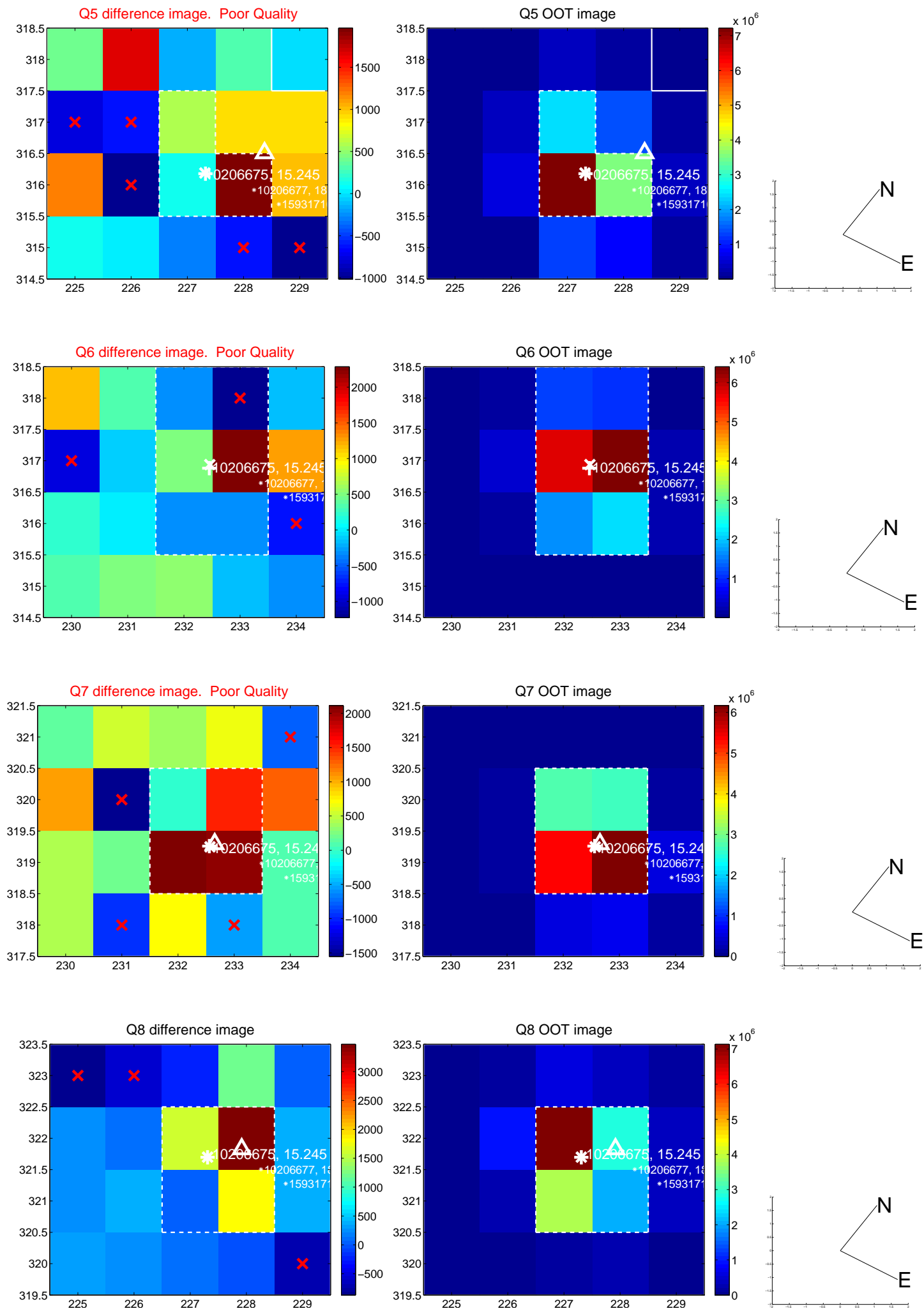
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

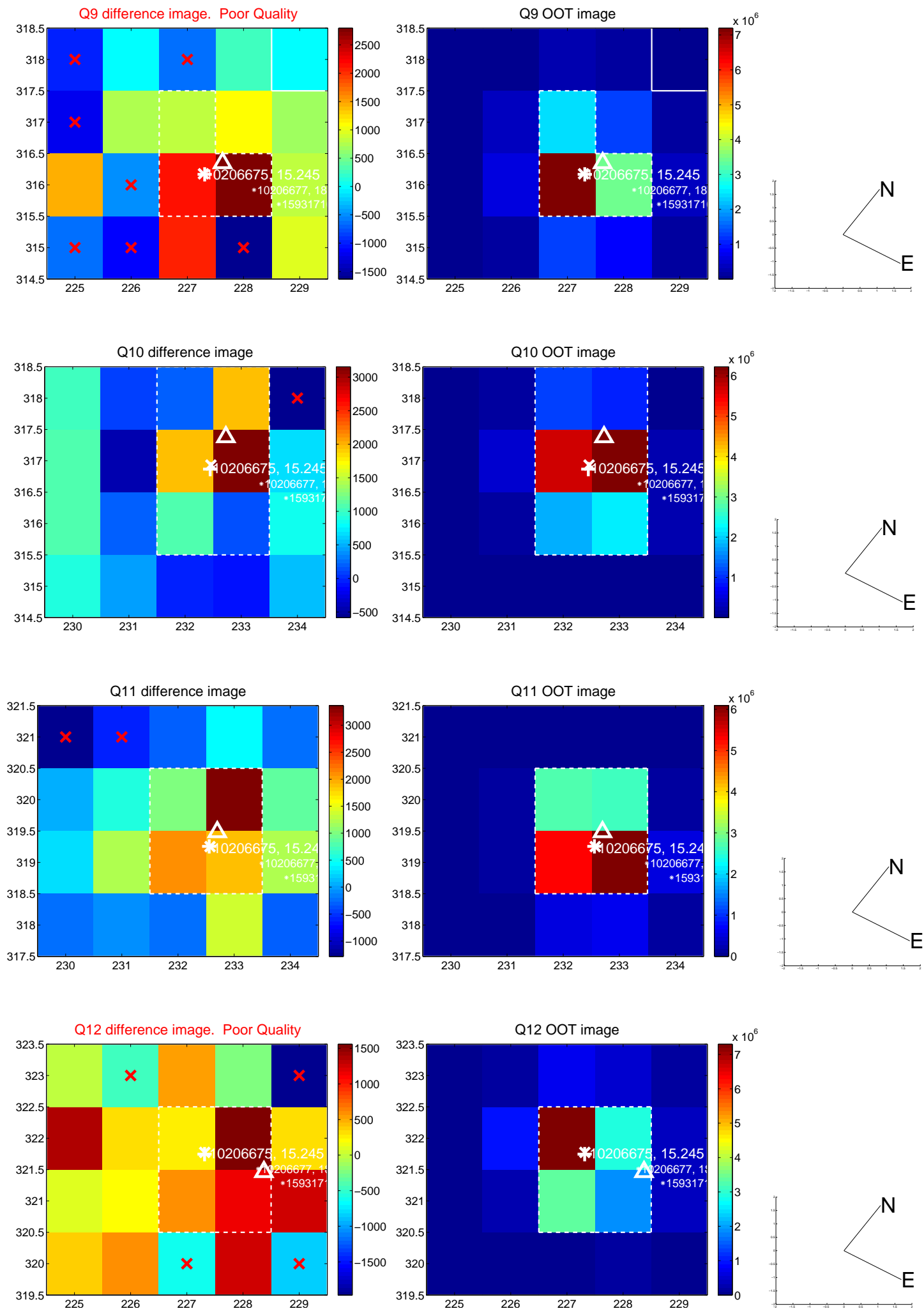




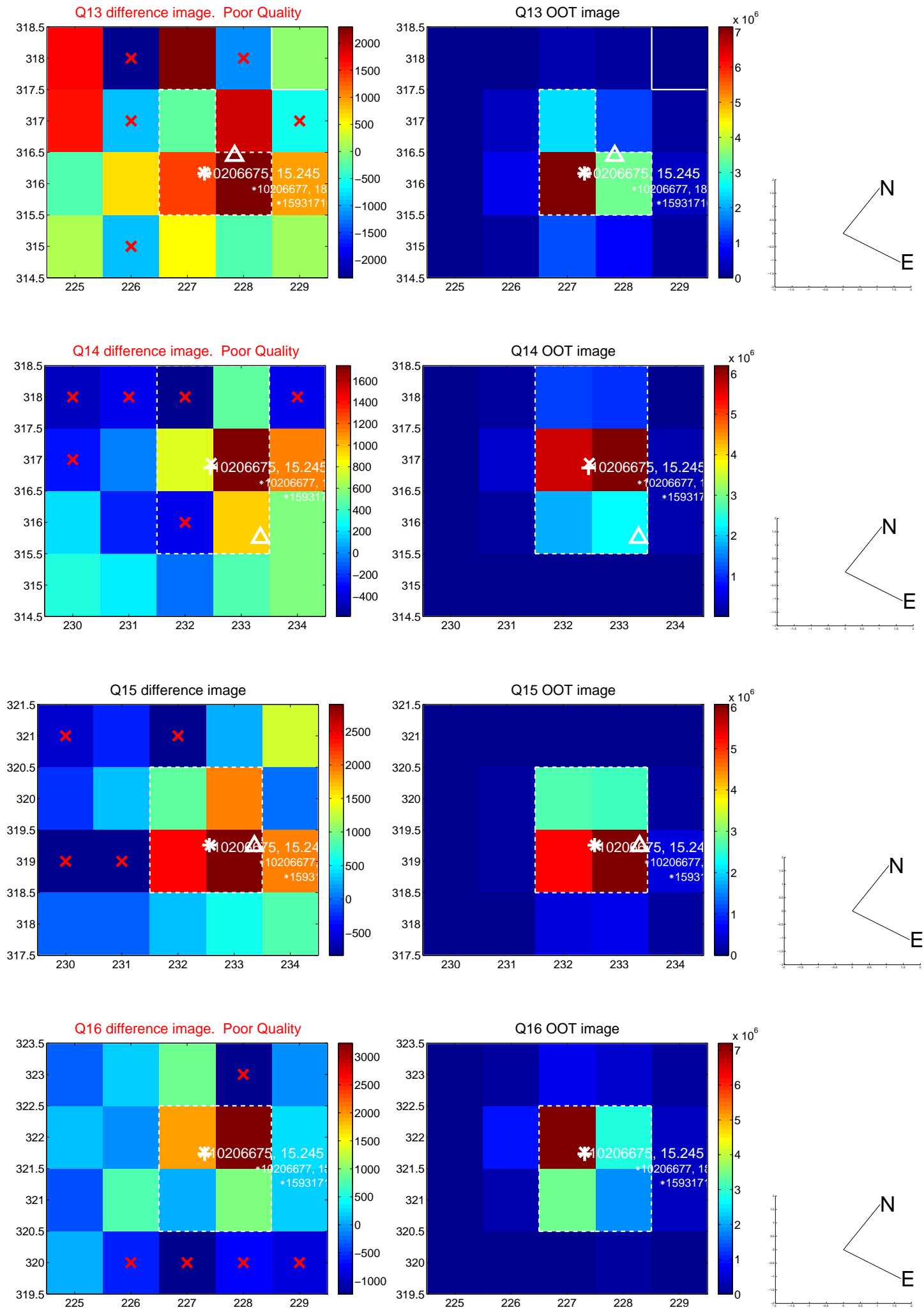
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



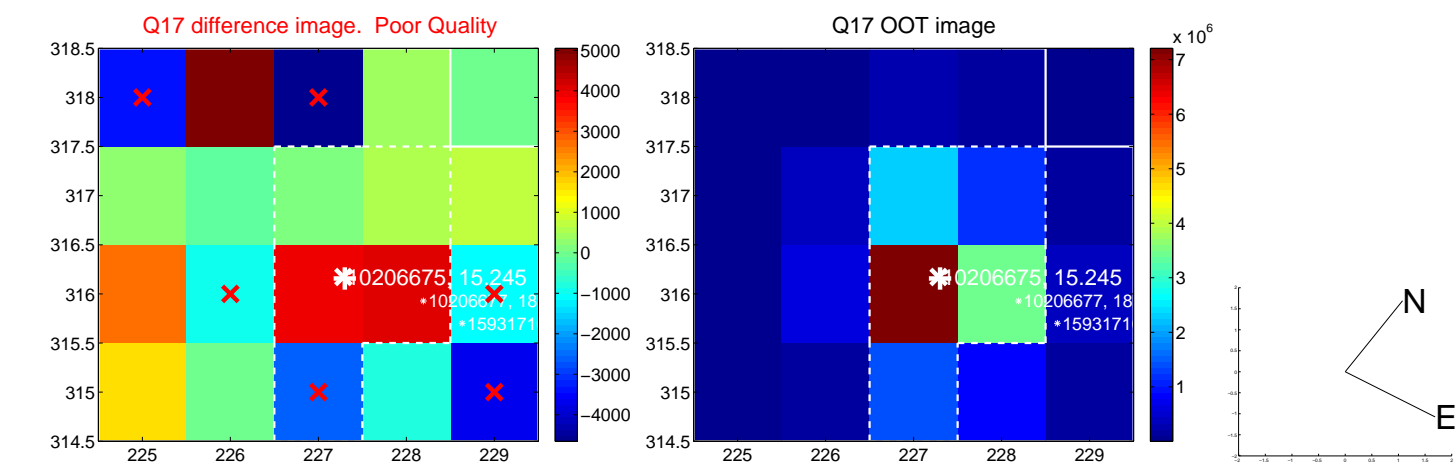
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



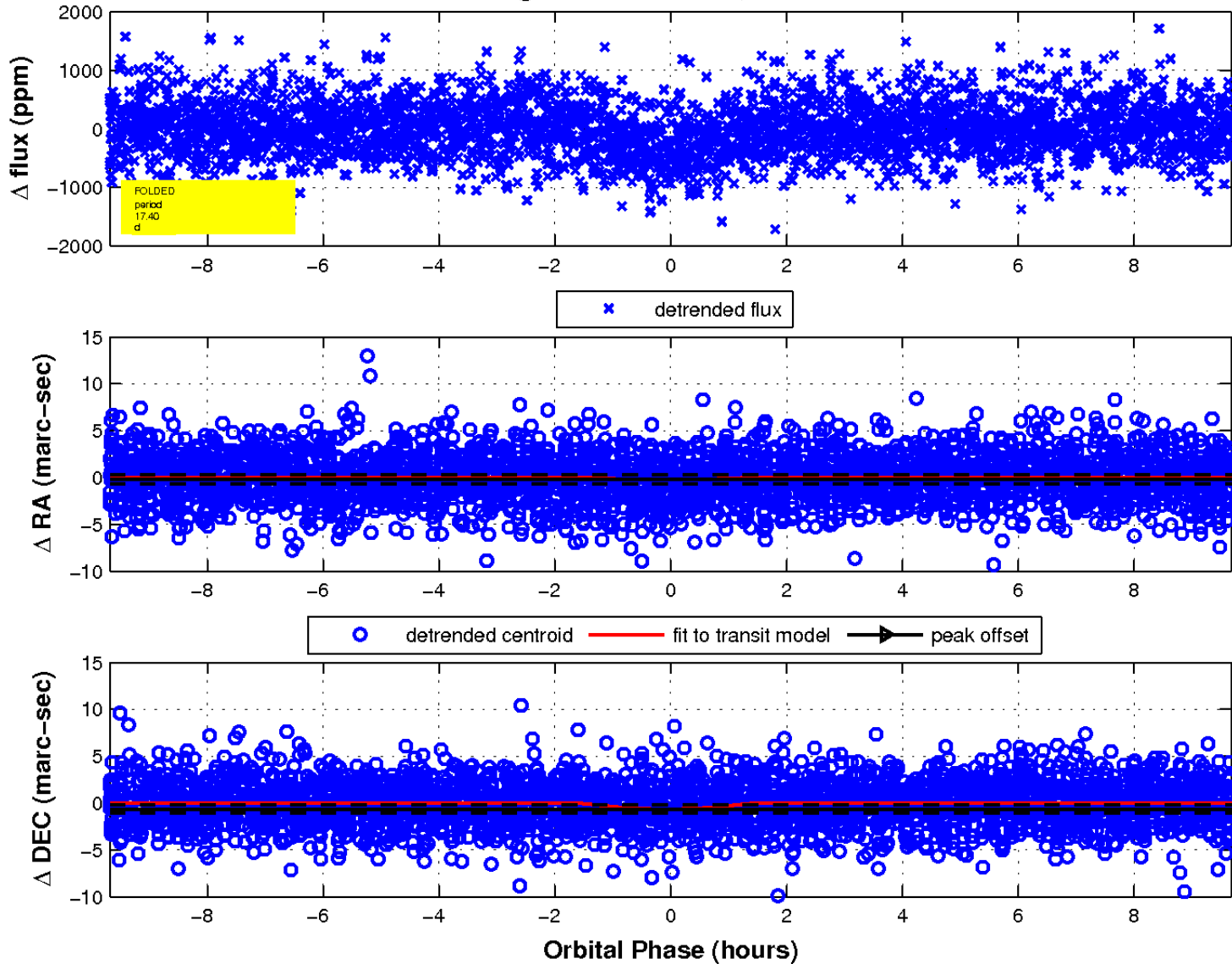
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

