

# KIC 007202957

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007202957-01	OBS	2687.01	1.716836	132.029823	59.8	2.094	50.0	54.7	0.90	5808	0.83	1062.10
007202957-02	OBS	2687.02	8.167365	136.202327	100.1	3.371	36.3	39.4	0.90	5808	1.07	132.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007202957-01	OBS	PC	1.00	0	0	0	0	CENT_SATURATED
007202957-02	OBS	PC	1.00	0	0	0	0	CENT_SATURATED

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

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

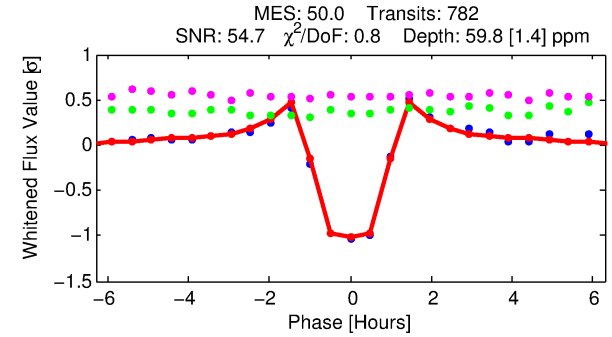
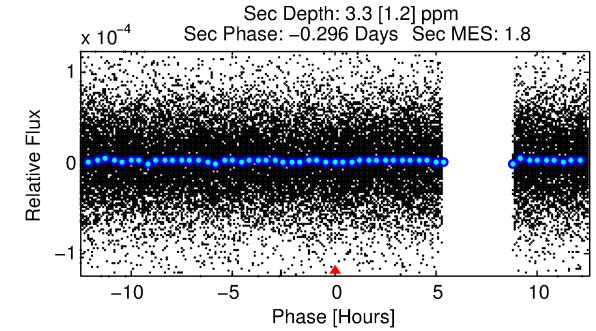
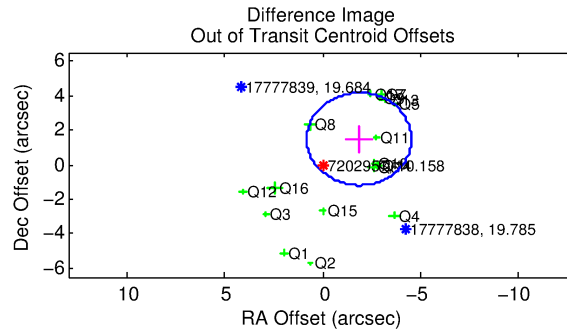
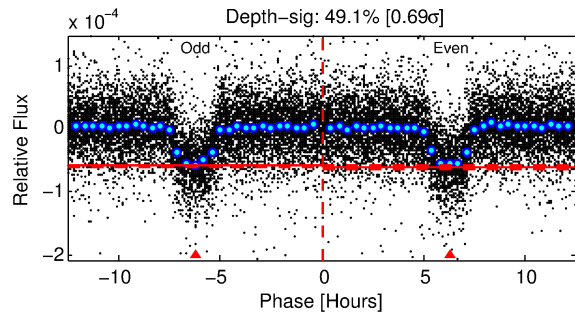
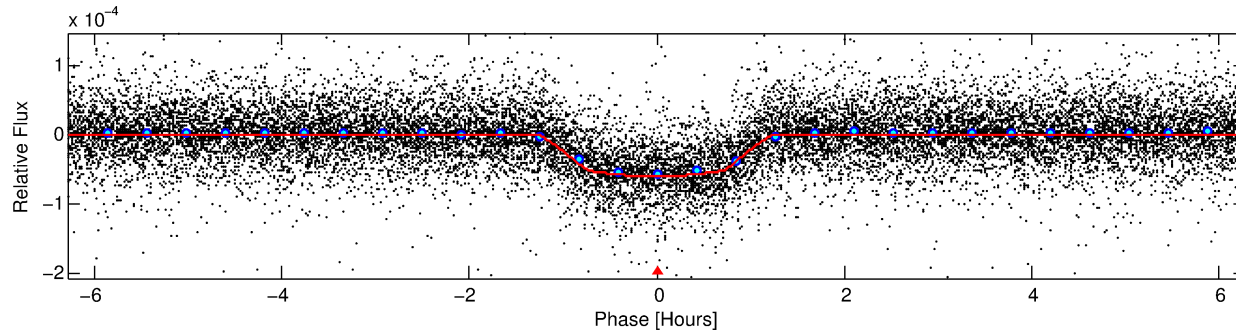
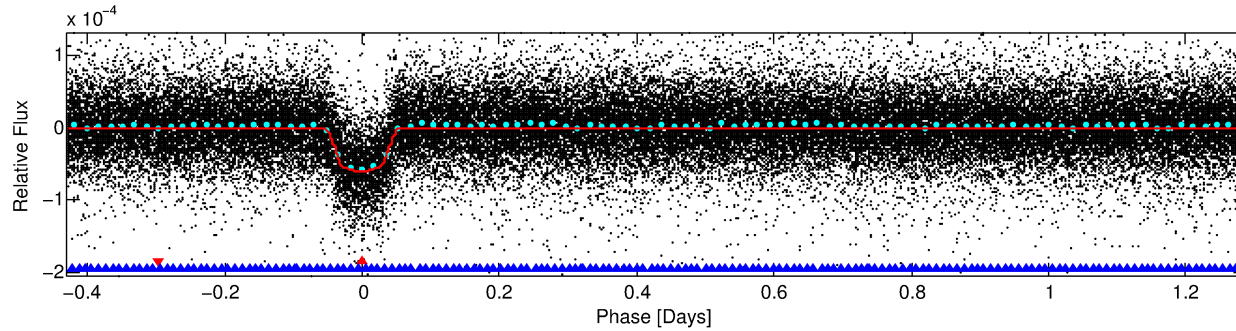
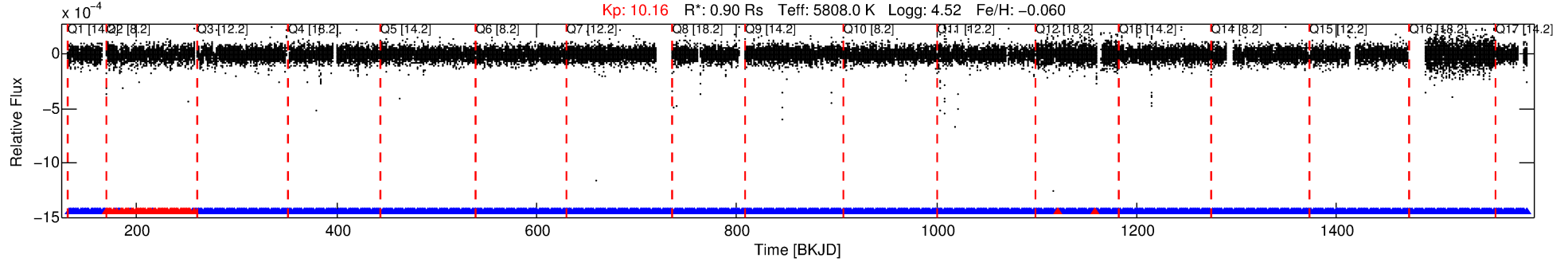
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007202957-01

No Significant Match Found

# DV One-Page Summary

KIC: 7202957 Candidate: 1 of 2 Period: 1.717 d  
KOI: K02687.01 Corr: 0.987



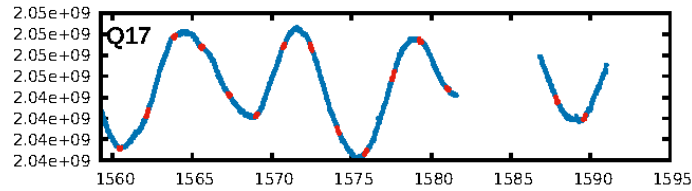
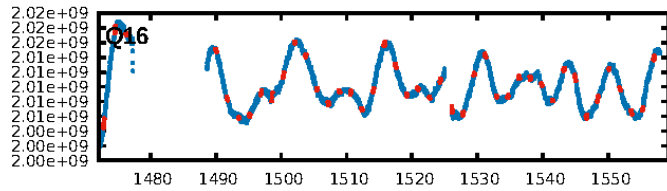
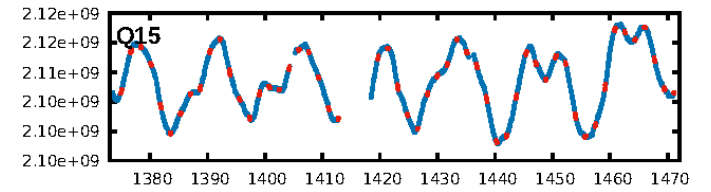
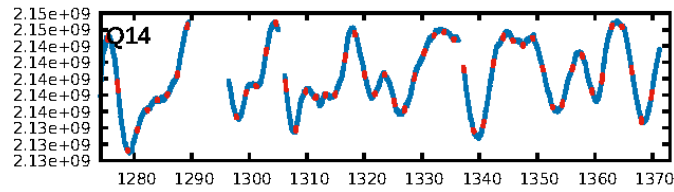
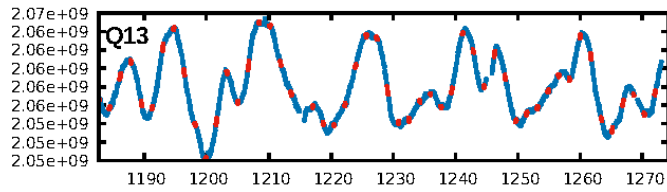
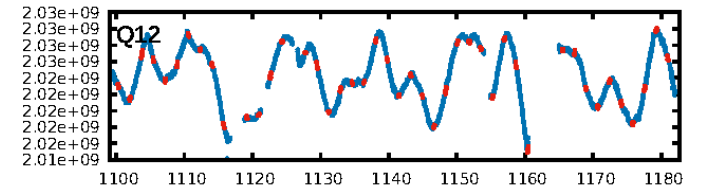
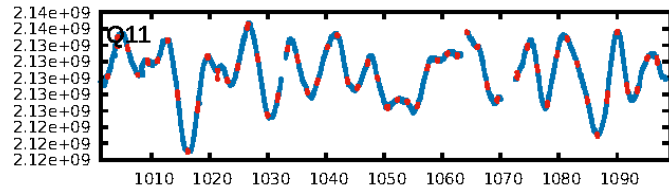
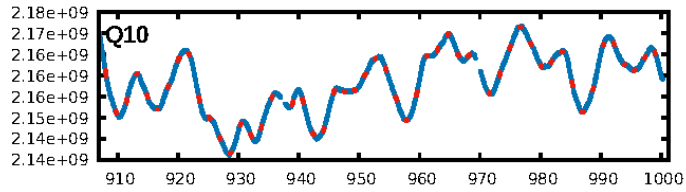
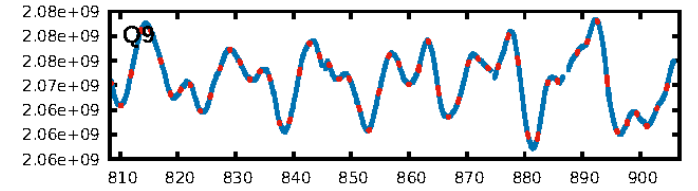
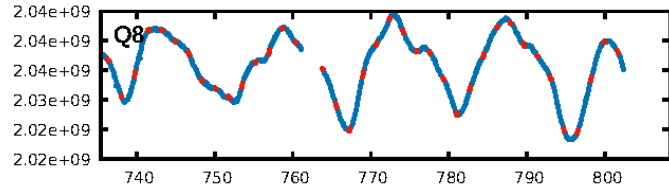
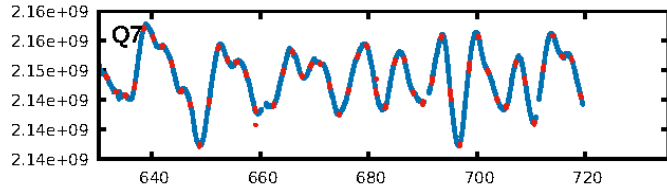
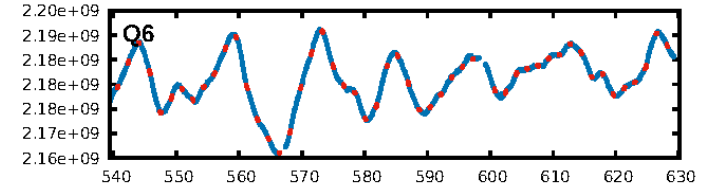
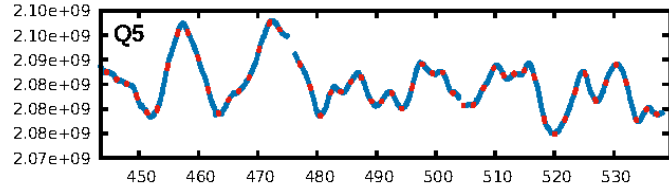
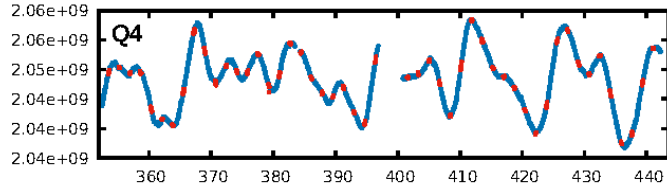
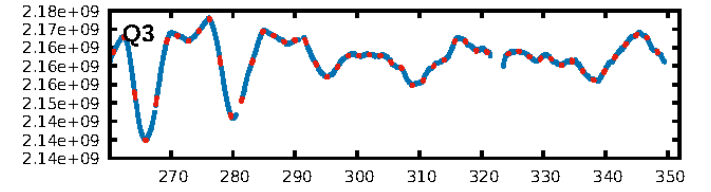
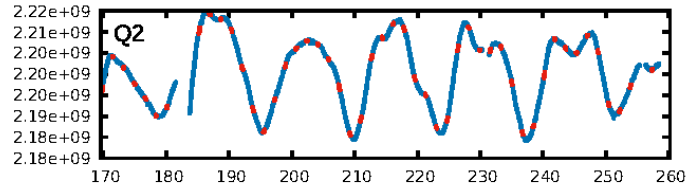
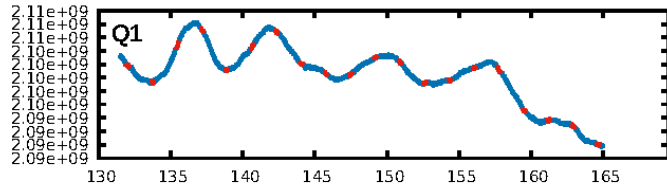
## DV Fit Results:

Period = 1.71684 [0.00000] d  
Epoch = 132.0298 [0.0004] BKJD  
Rp/R\* = 0.0084 [0.0006]  
a/R\* = 2.99 [0.88]  
b = 0.90 [0.07]  
Seff = 1062.10 [242.44]  
Teq = 1456 [83] K  
Rp = 0.83 [0.14] Re  
a = 0.0279 [0.0038] AU  
Ag = 2.06 [0.91] [1.16 $\sigma$ ]  
Teffp = 2695 [269] K [4.40 $\sigma$ ]

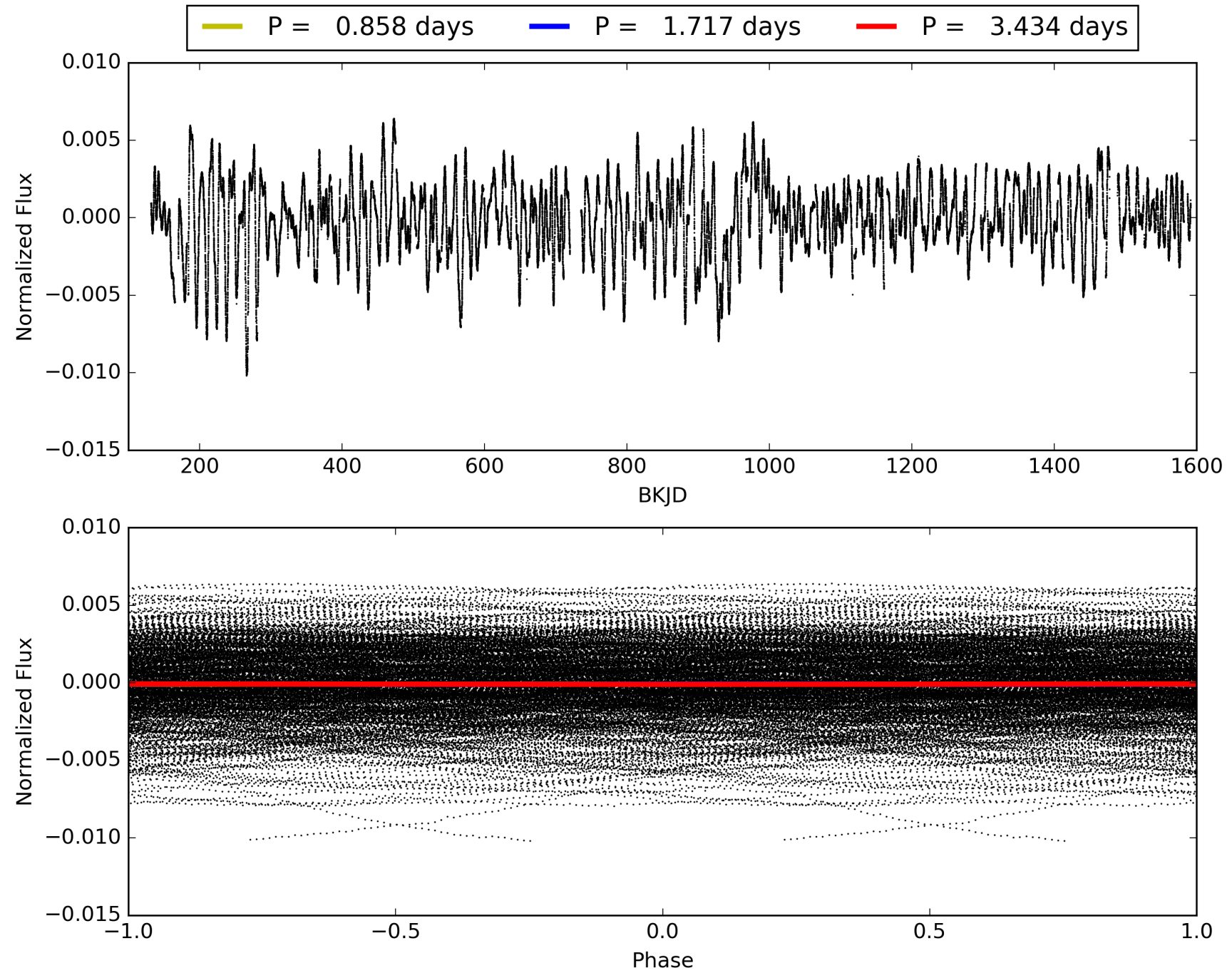
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [39.01 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.94 [699/747]  
GhostDiagnostic-chr: 14.08  
Centroid-sig: N/A  
Centroid-so: 1.970 arcsec [7.79 $\sigma$ ]  
OotOffset-rm: 2.375 arcsec [2.66 $\sigma$ ]  
KicOffset-rm: 3.483 arcsec [3.73 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.35 [6/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 007202957-01, PDC Light Curves

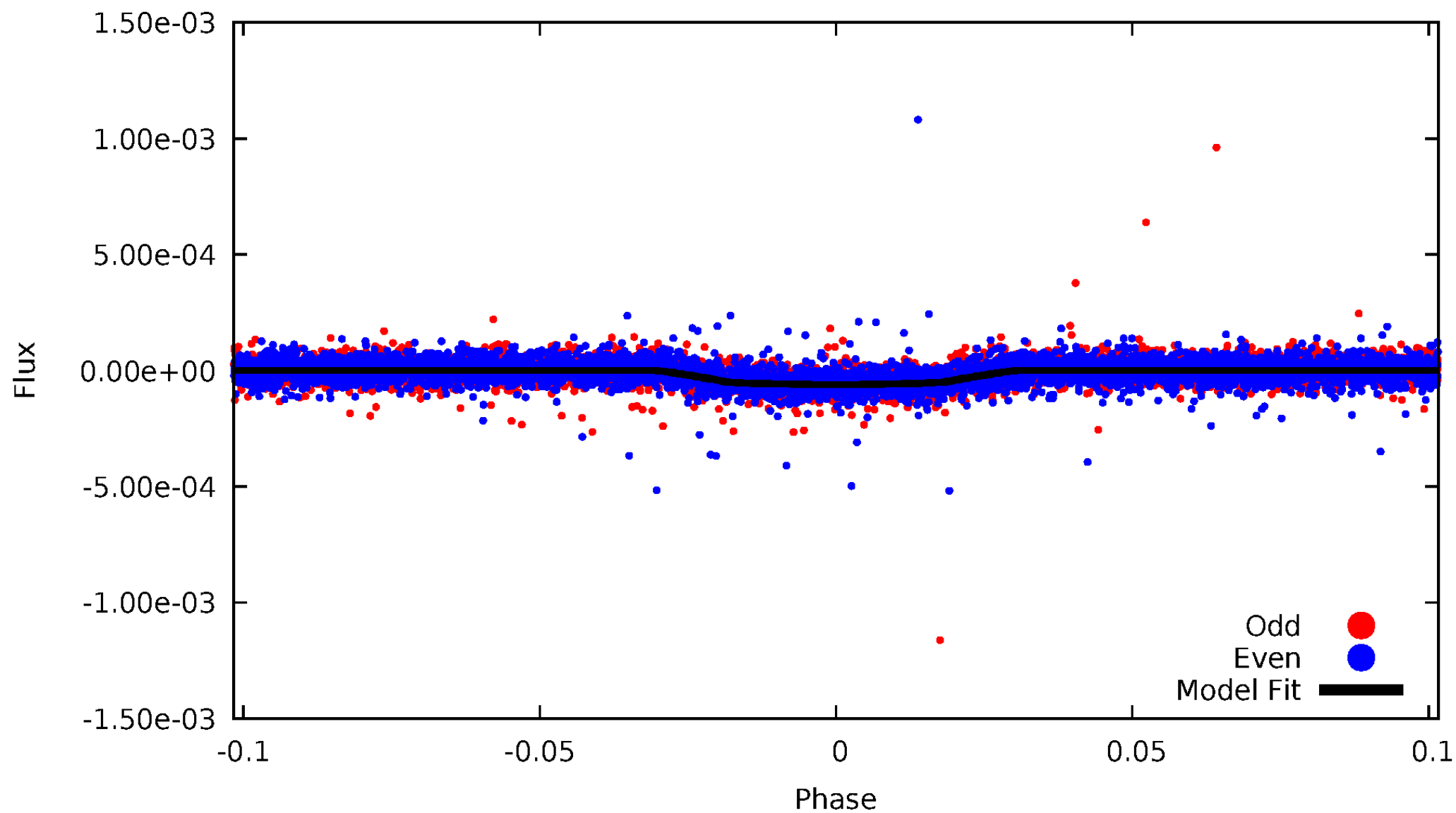


TCE 007202957-01



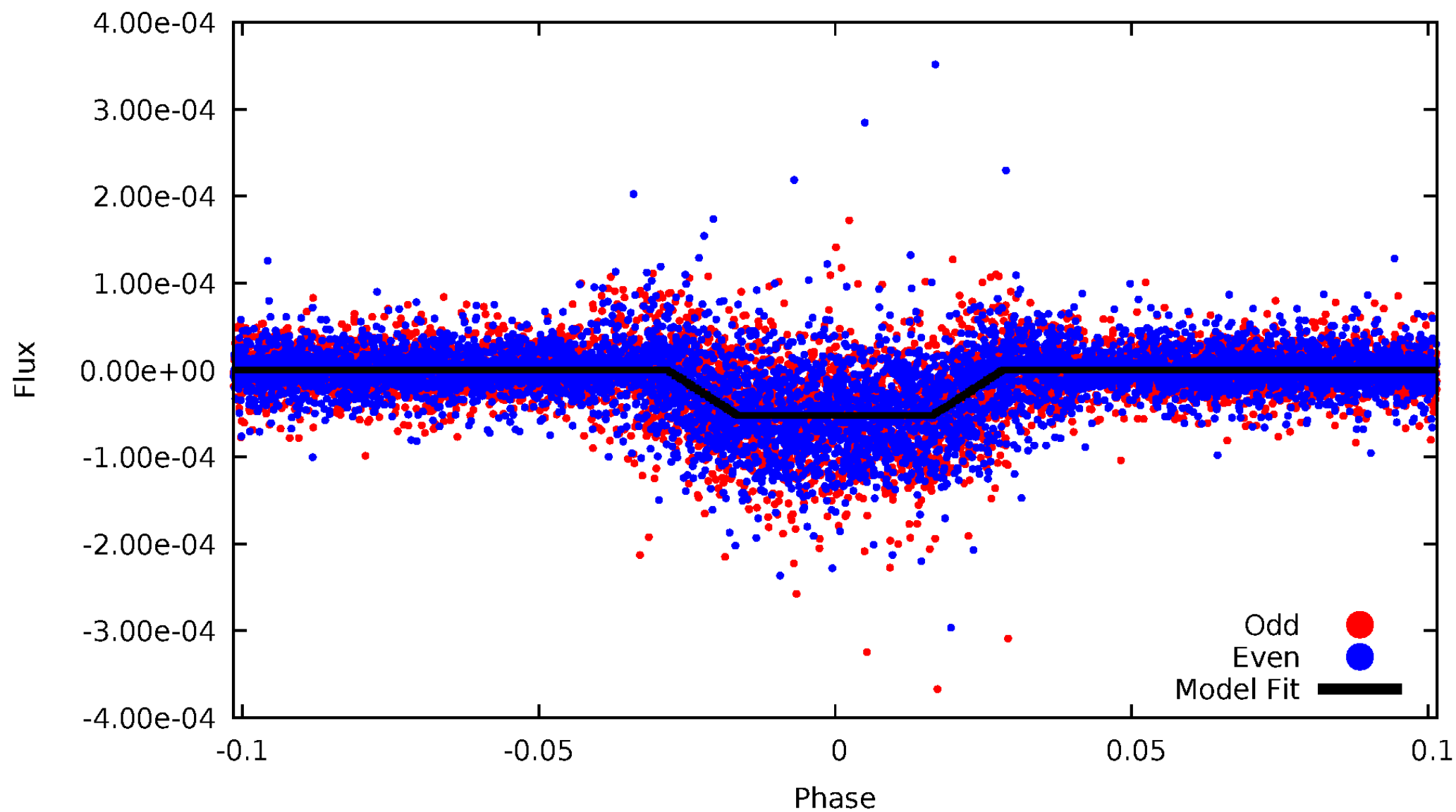
# DV Odd/Even

TCE 007202957-01



# ALT Odd/Even

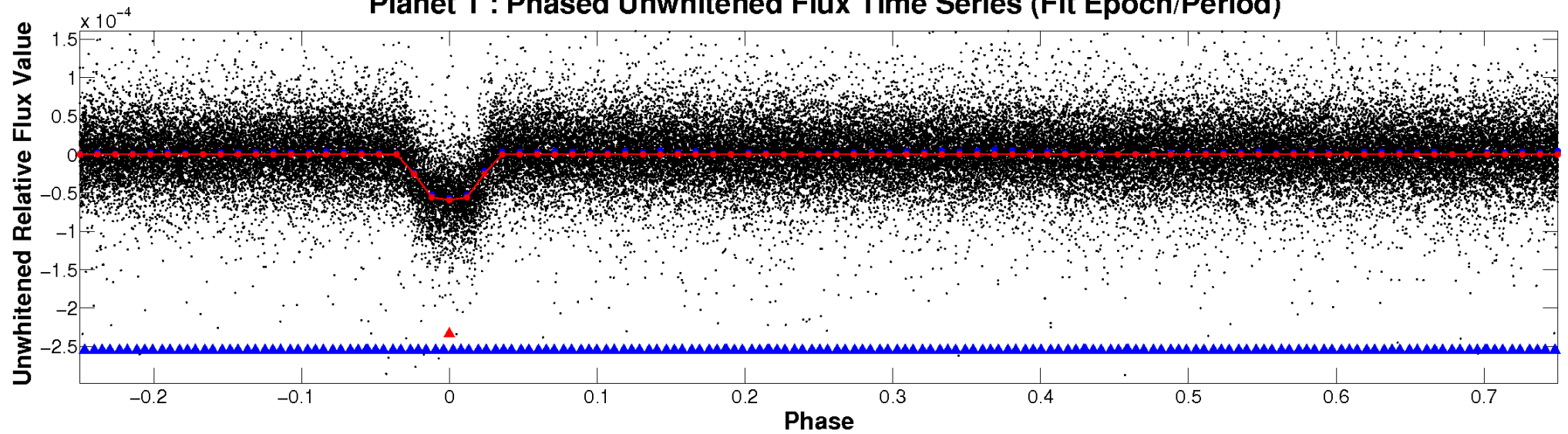
TCE 007202957-01



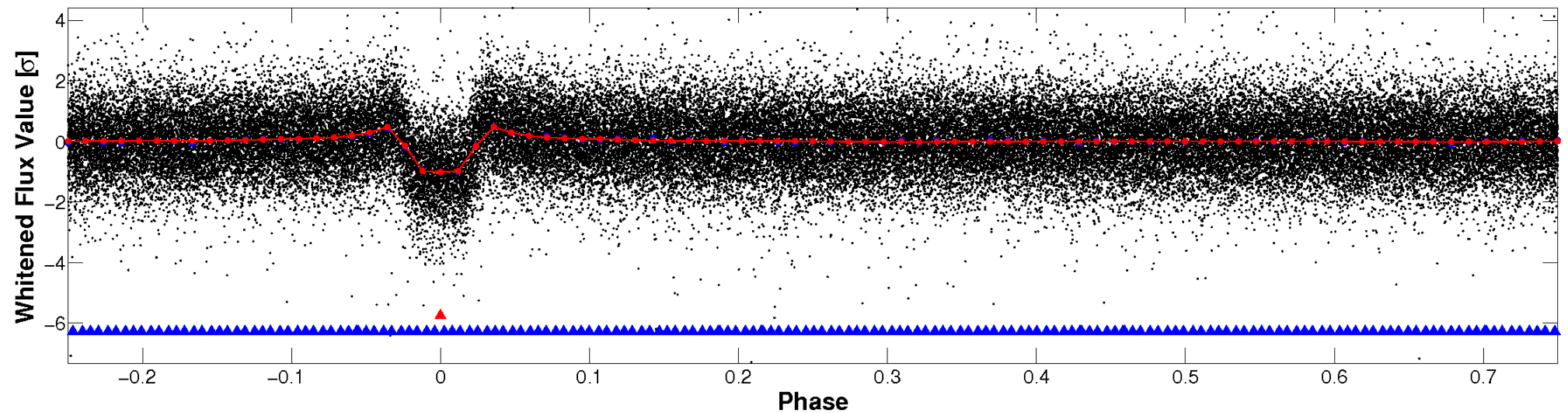


# Non-Whitened Vs. Whitened Light Curve

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

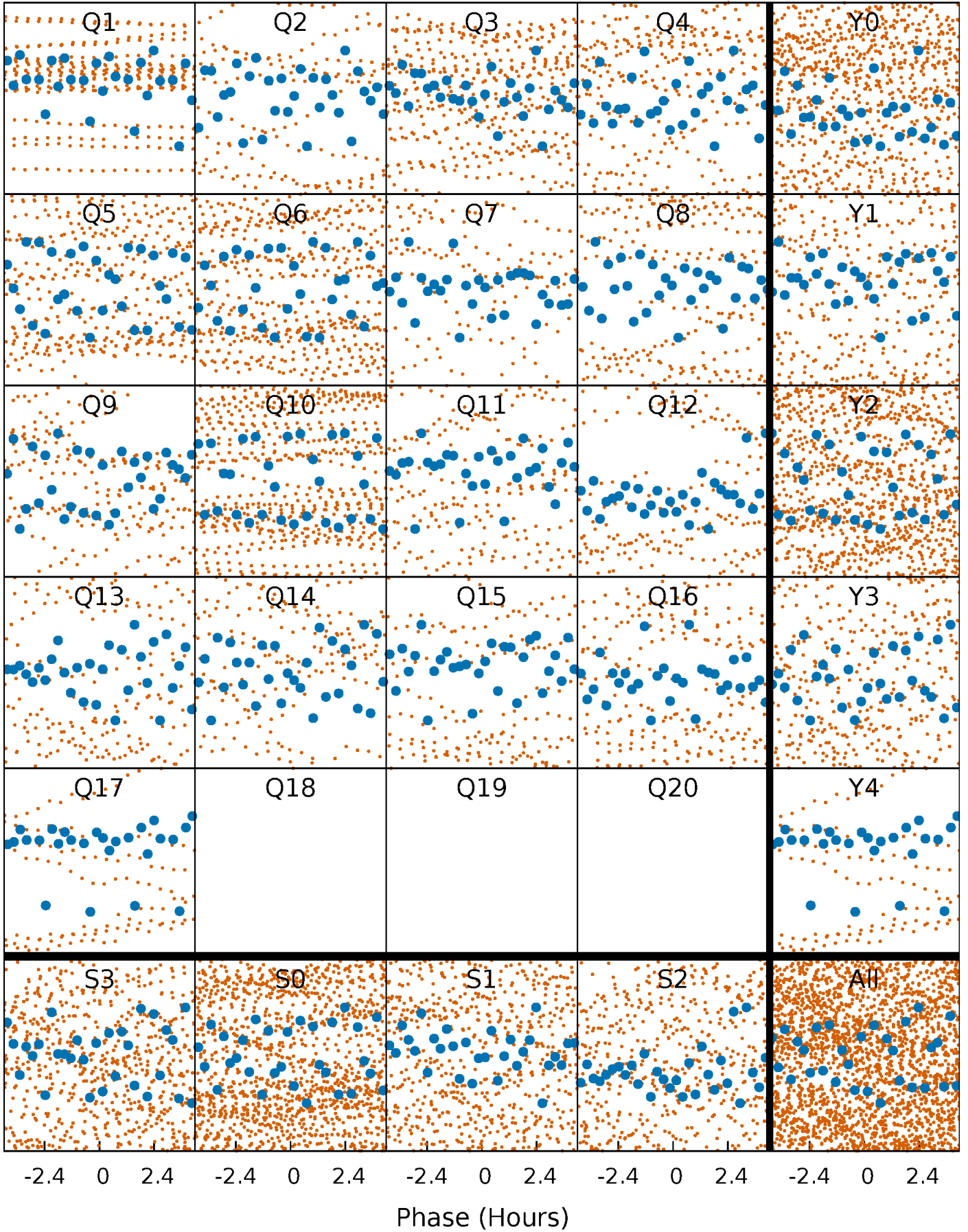


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

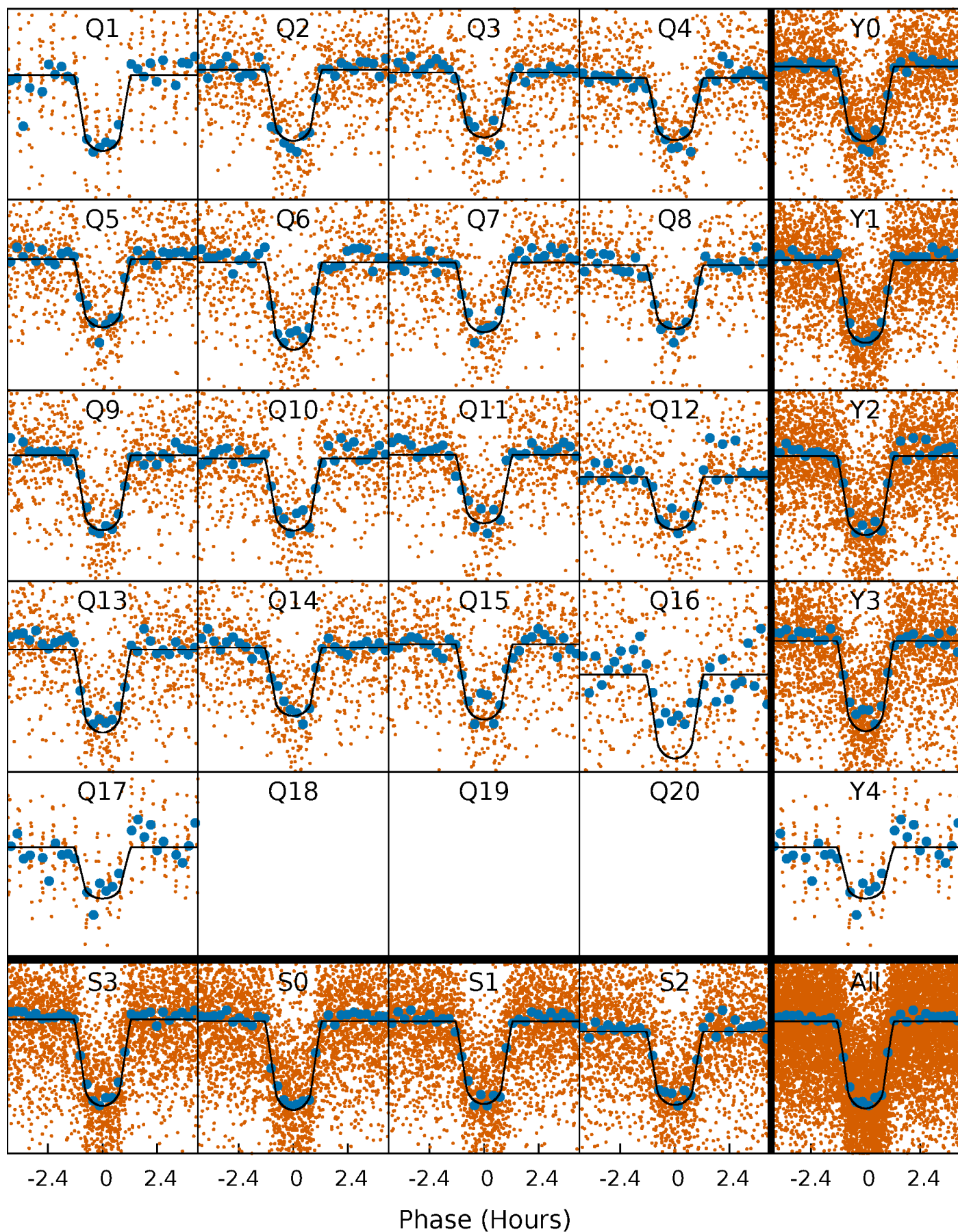
TCE 007202957-01   P= 1.716836 Days    $T_0=132.029823$  (BKJD)





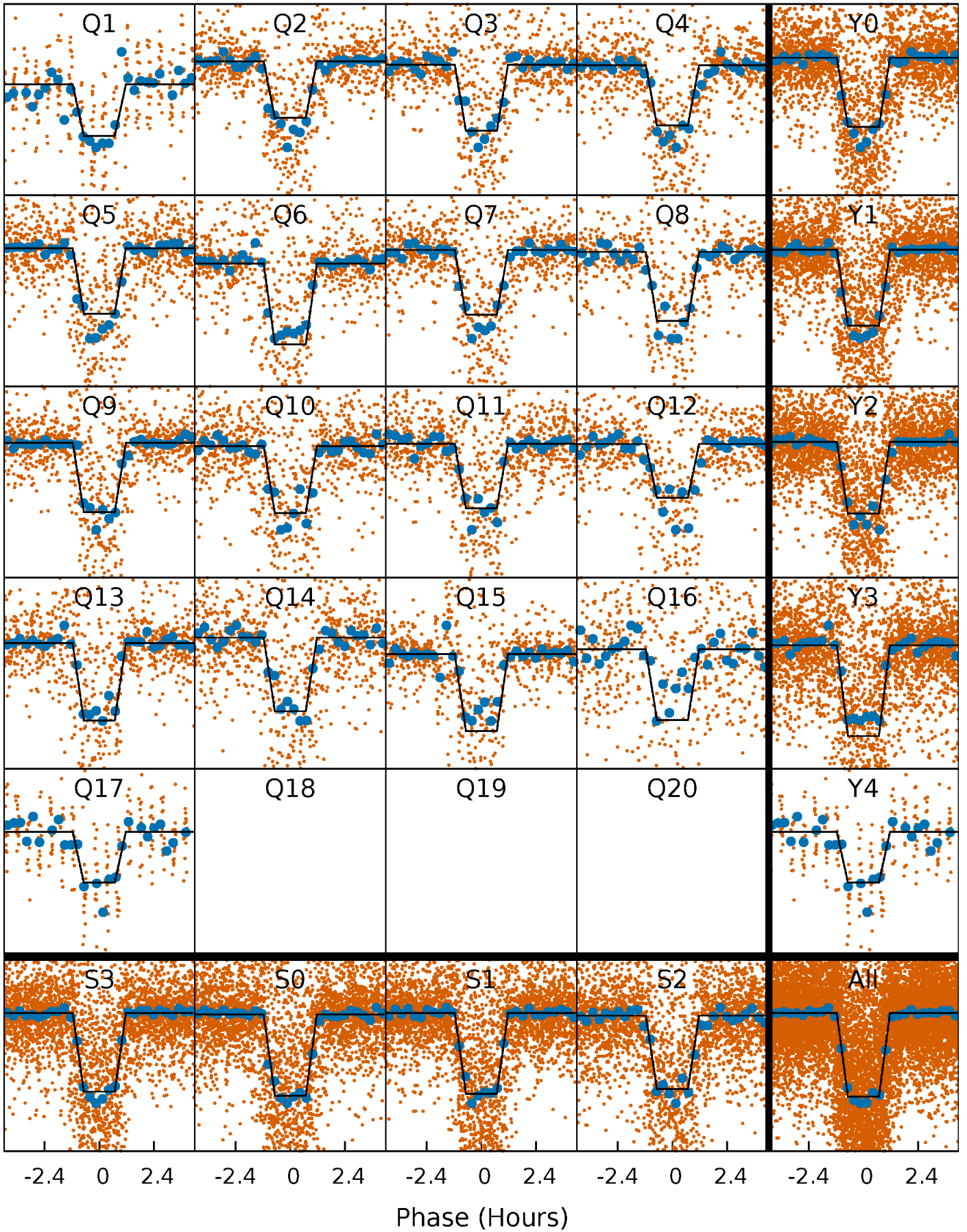
# DV Quarter-Phased Transit Curves

TCE 007202957-01 P= 1.716836 Days  $T_0=132.029823$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

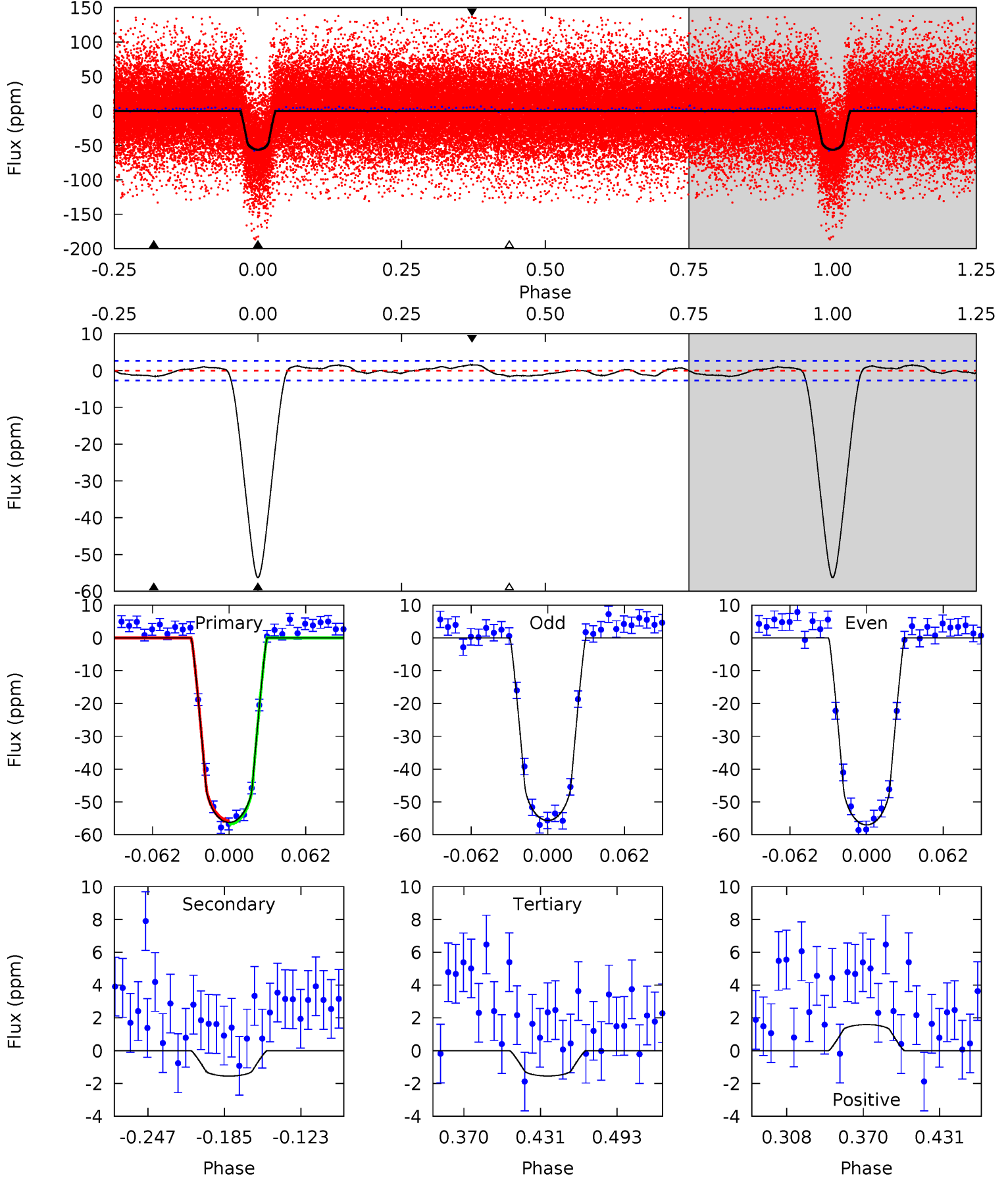
TCE 007202957-01 P= 1.716831 Days  $T_0=132.031490$  (BKJD)



# DV Model-Shift Uniqueness Test

007202957-01, P = 1.716836 Days, E = 130.312987 Days

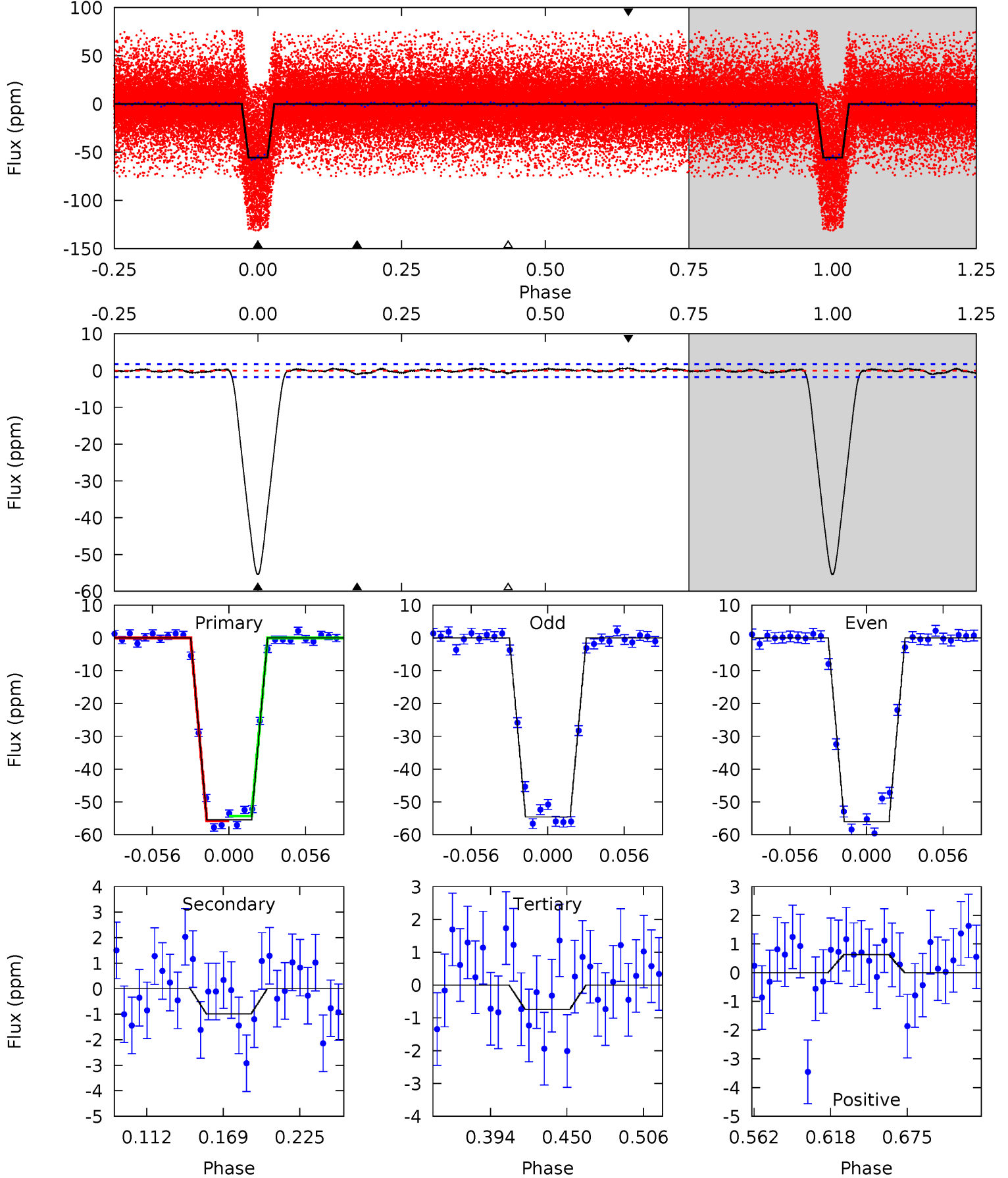
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
98.2	2.70	2.69	2.78	4.67	1.87	1.53	95.5	95.4	0.01	-0.07	1.18	1.00	0.03	0.74



# Alt Model-Shift Uniqueness Test

007202957-01, P = 1.716831 Days, E = 130.314659 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
150.1	2.67	2.00	1.71	4.68	1.91	0.79	148.1	148.4	0.67	0.96	2.00	1.01	0.01	1.97





### Stellar Parameters For KIC 007202957

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5808^{+105}_{-128}$	$4.522^{+0.030}_{-0.120}$	$-0.060^{+0.150}_{-0.150}$	$0.902^{+0.138}_{-0.046}$	$0.987^{+0.049}_{-0.078}$	$1.893^{+0.222}_{-0.645}$
	+2%/-2%	+1%/-3%	+250%/-250%	+15%/-5%	+5%/-8%	+12%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 007202957-01 / KOI 2687.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-2\pm 1$	$0.85^{+0.09}_{-0.08}$	$2060^{+77}_{-59}$	$2762^{+194}_{-297}$	$0.893^{+0.388}_{-0.340}$
Alt.	$-1\pm 0$	$0.73^{+0.07}_{-0.07}$	$2055^{+85}_{-60}$	$2690^{+197}_{-327}$	$0.791^{+0.352}_{-0.318}$

$T_{\text{max}}$  = 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

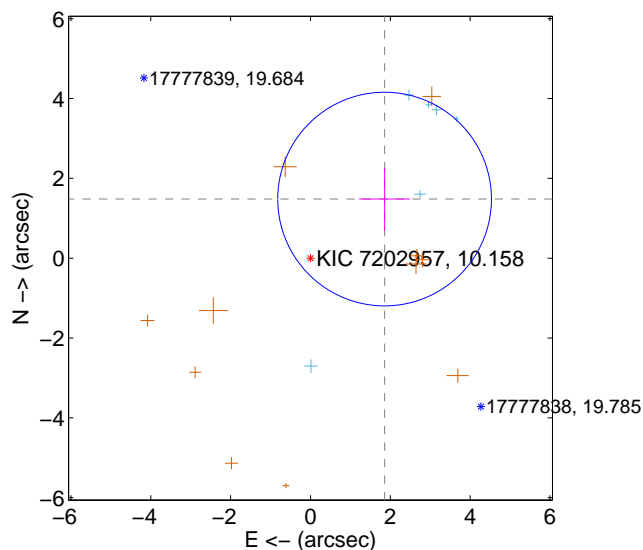
Supplemental centroid analysis for 007202957-01. **Kepler magnitude: 10.16.** Transit SNR 54.74

There are 6 quarters with good PRF difference image offsets

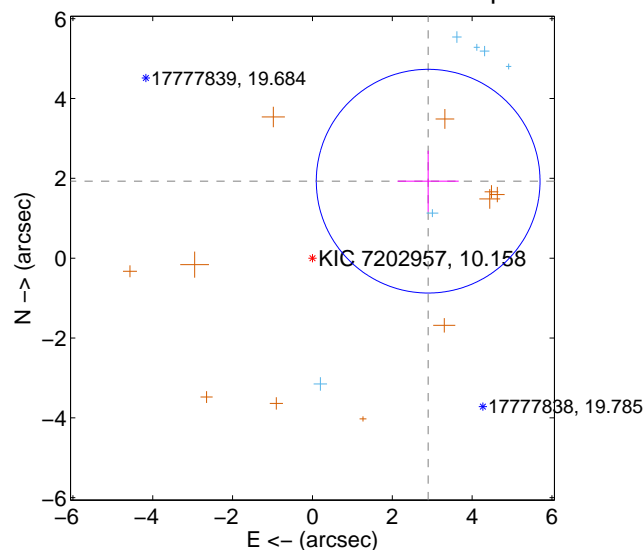
The direct PRF centroid is offset from the target star catalog position by about 1.85 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.375 \pm 0.892$	2.66	$-1.857 \pm 0.638$	$1.481 \pm 0.784$
PRF-fit source offset from KIC position	$3.483 \pm 0.934$	3.73	$-2.900 \pm 0.767$	$1.929 \pm 0.765$
photometric centroid source offset	$1.97 \pm 0.25$	7.79	$-1.27 \pm 0.23$	$1.51 \pm 0.27$

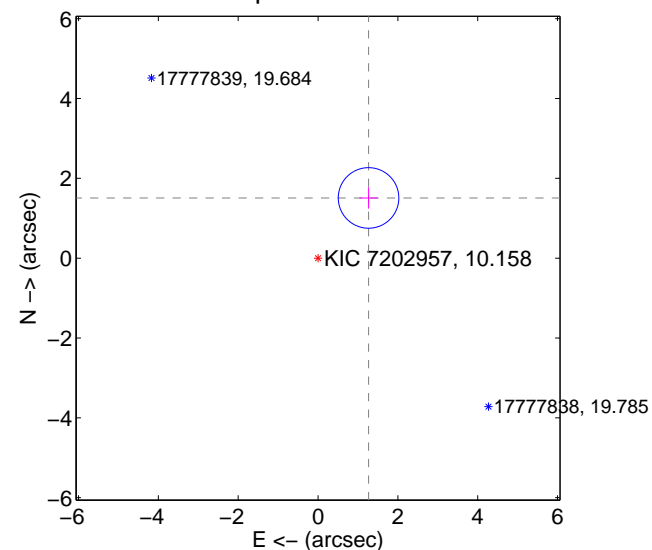
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



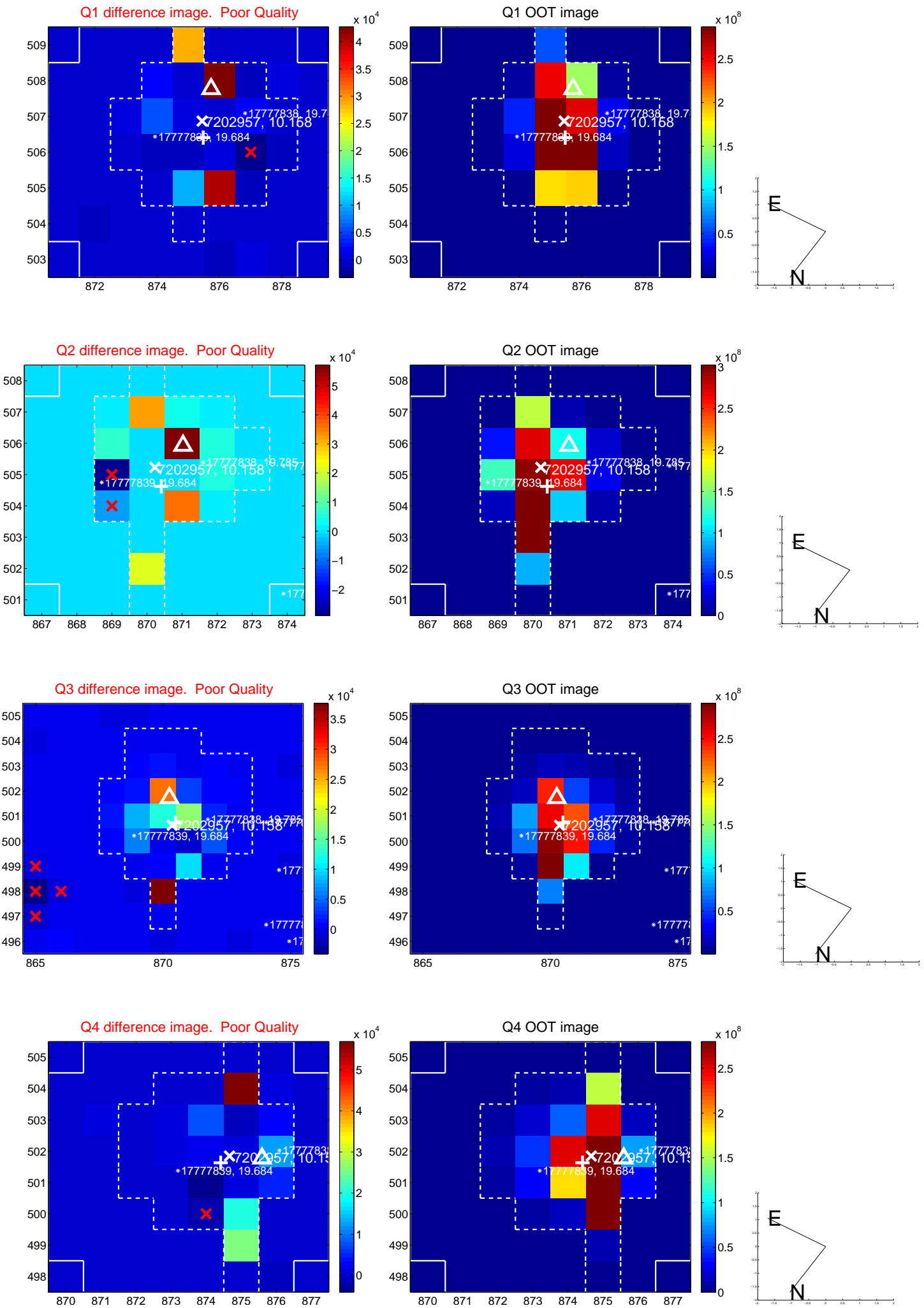
offset from photometric centroids



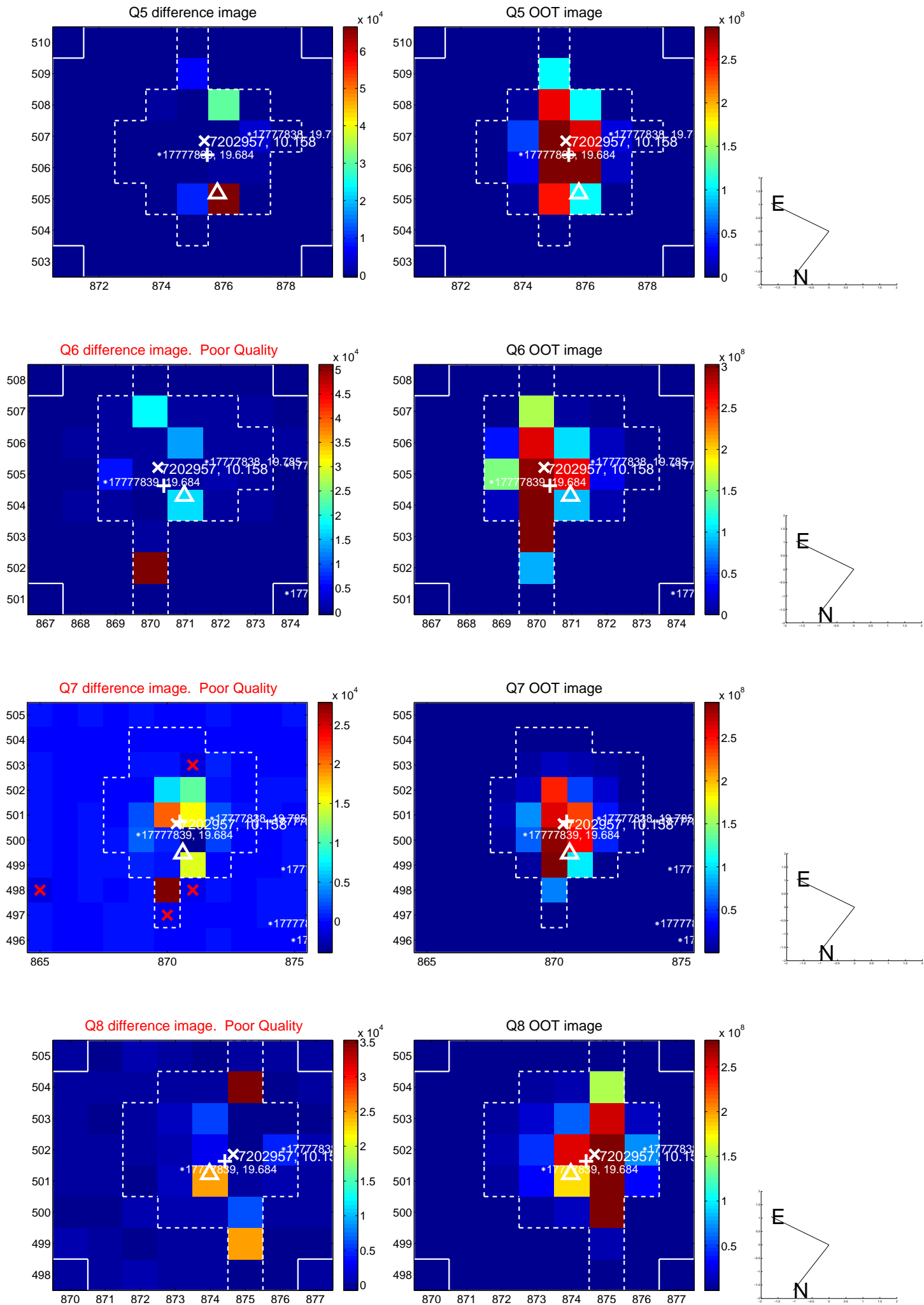
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



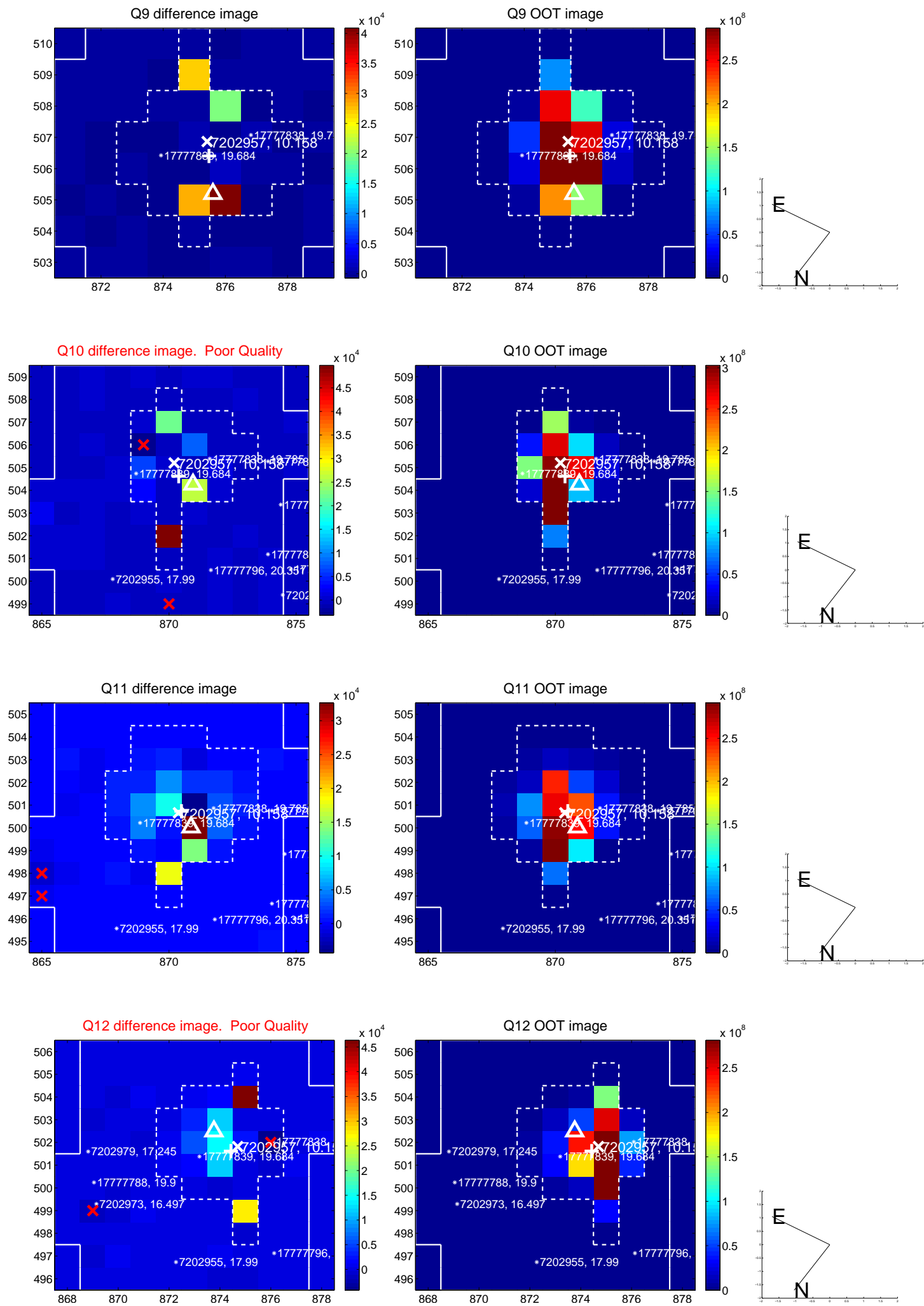
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



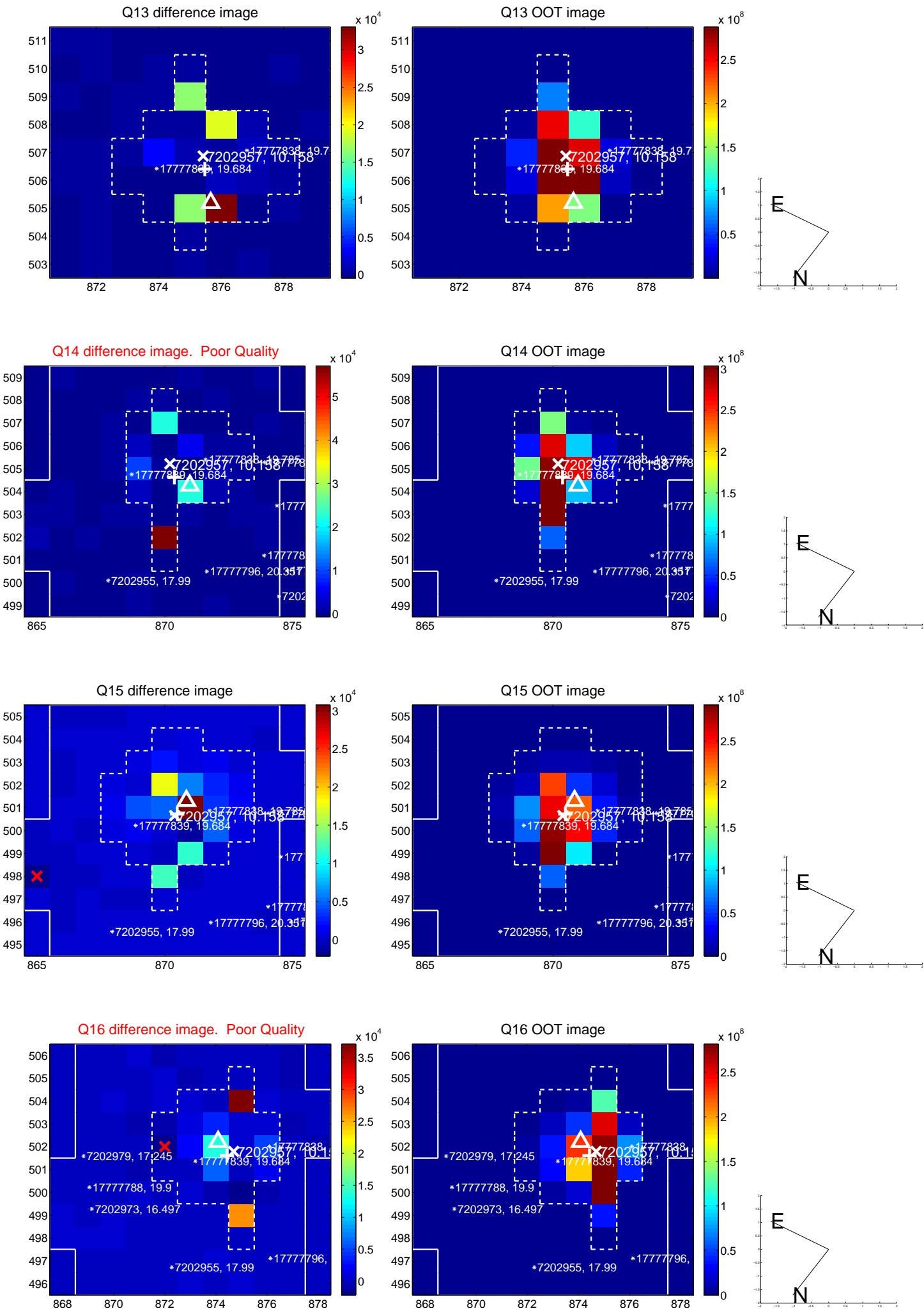
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



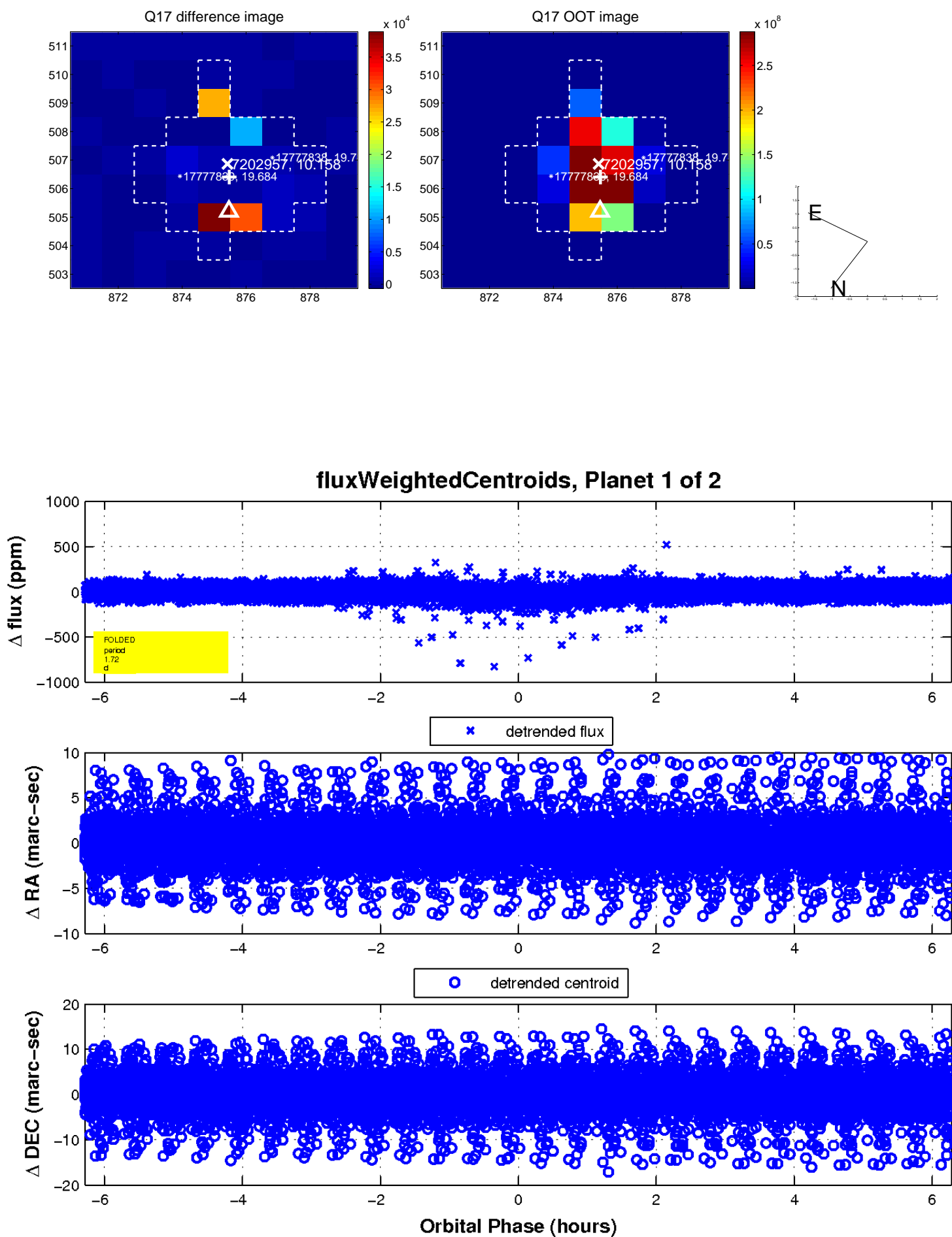
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



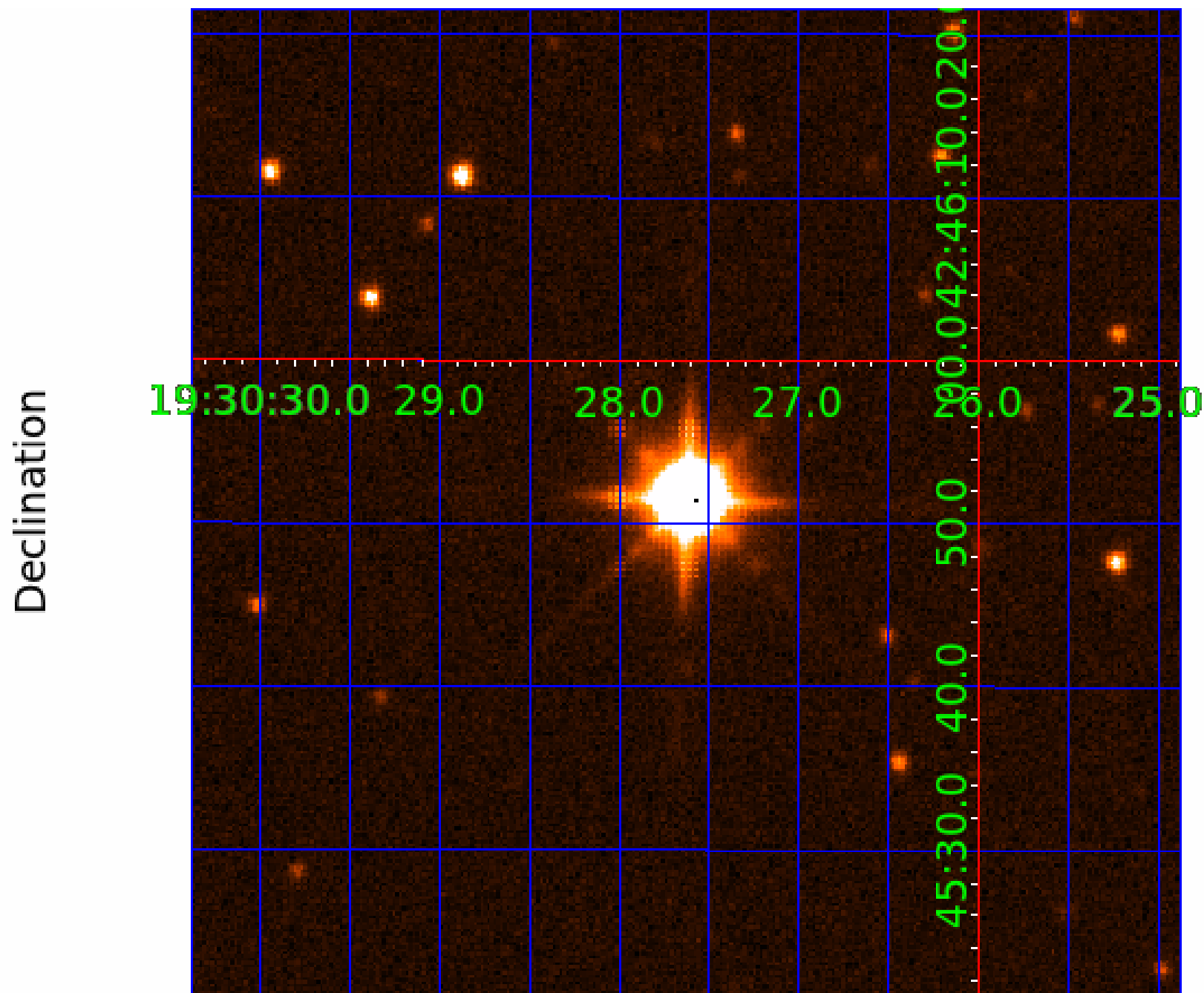
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 007202957

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007202957-01	OBS	2687.01	1.716836	132.029823	59.8	2.094	50.0	54.7	0.90	5808	0.83	1062.10
007202957-02	OBS	2687.02	8.167365	136.202327	100.1	3.371	36.3	39.4	0.90	5808	1.07	132.75

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007202957-01	OBS	PC	1.00	0	0	0	0	CENT_SATURATED
007202957-02	OBS	PC	1.00	0	0	0	0	CENT_SATURATED

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

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

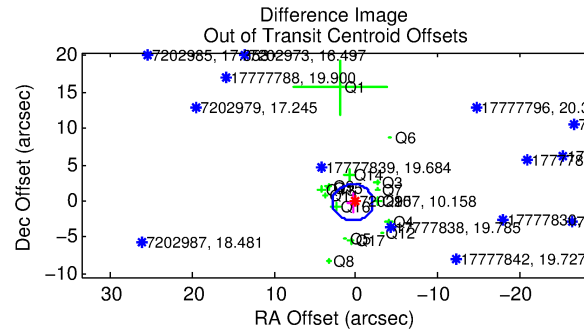
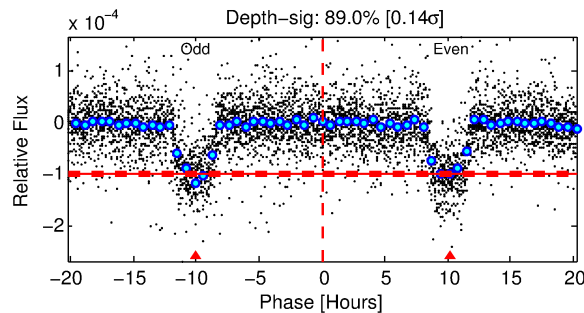
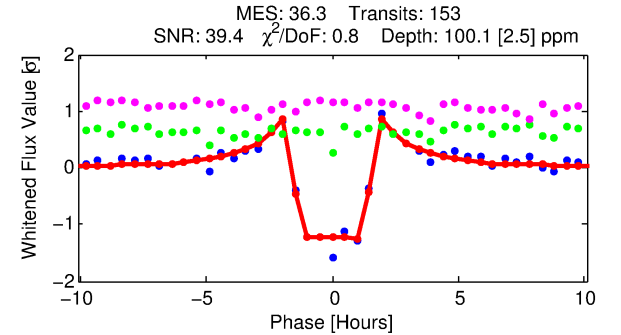
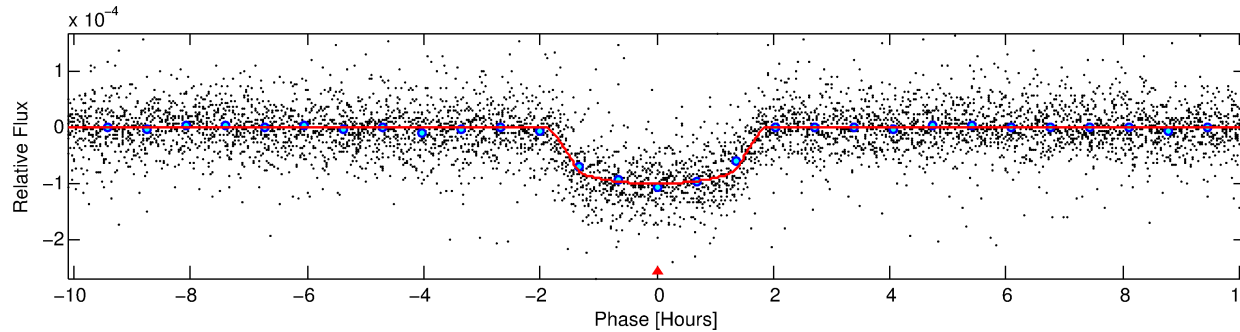
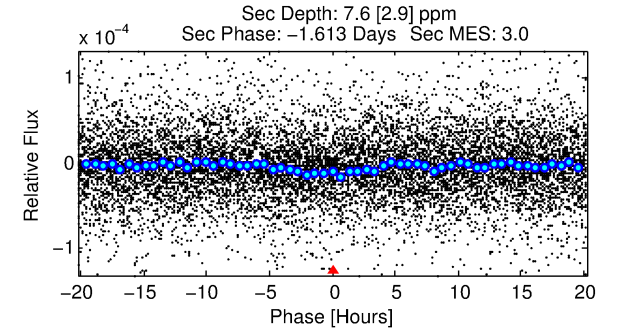
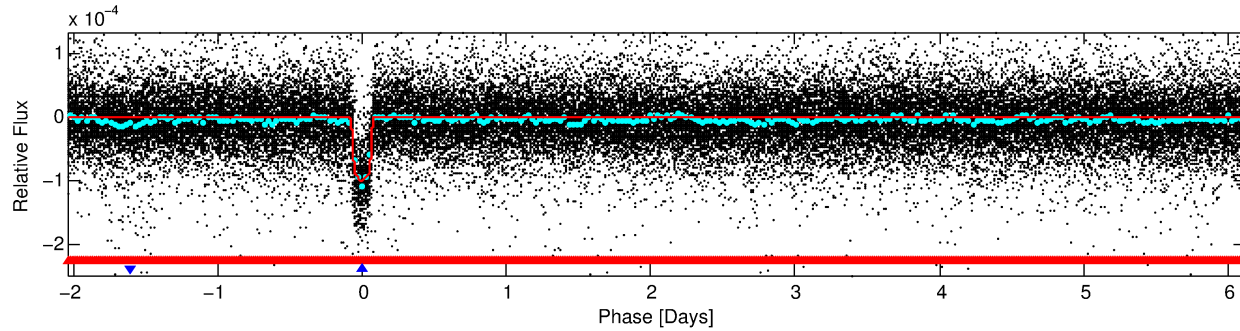
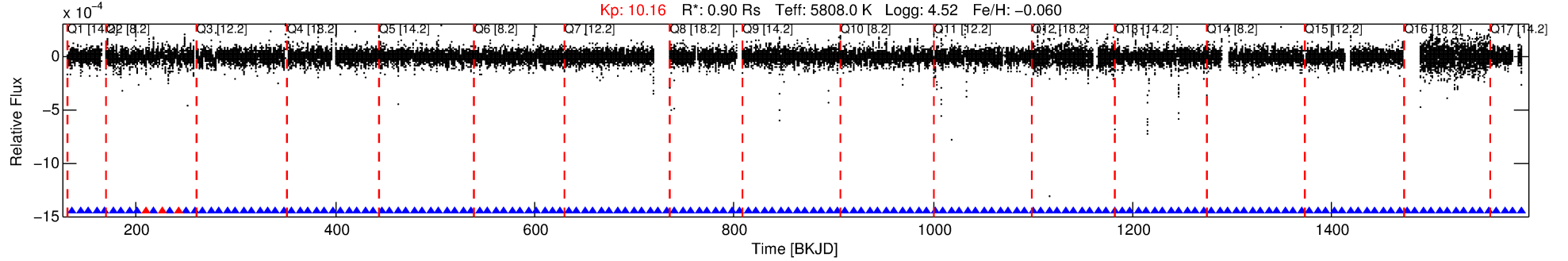
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007202957-02

No Significant Match Found

# DV One-Page Summary

KIC: 7202957 Candidate: 2 of 2 Period: 8.167 d  
KOI: K02687.02 Corr: 0.987



## DV Fit Results:

Period = 8.16736 [0.00001] d  
Epoch = 136.2023 [0.0010] BKJD  
Rp/R\* = 0.0109 [0.0009]  
a/R\* = 8.68 [3.43]  
b = 0.90 [0.09]  
Seff = 132.75 [30.30]  
Teq = 866 [49] K  
Rp = 1.07 [0.19] Re  
a = 0.0790 [0.0109] AU  
Ag = 22.91 [10.60] [2.07σ]  
Teffp = 2928 [308] K [6.60σ]

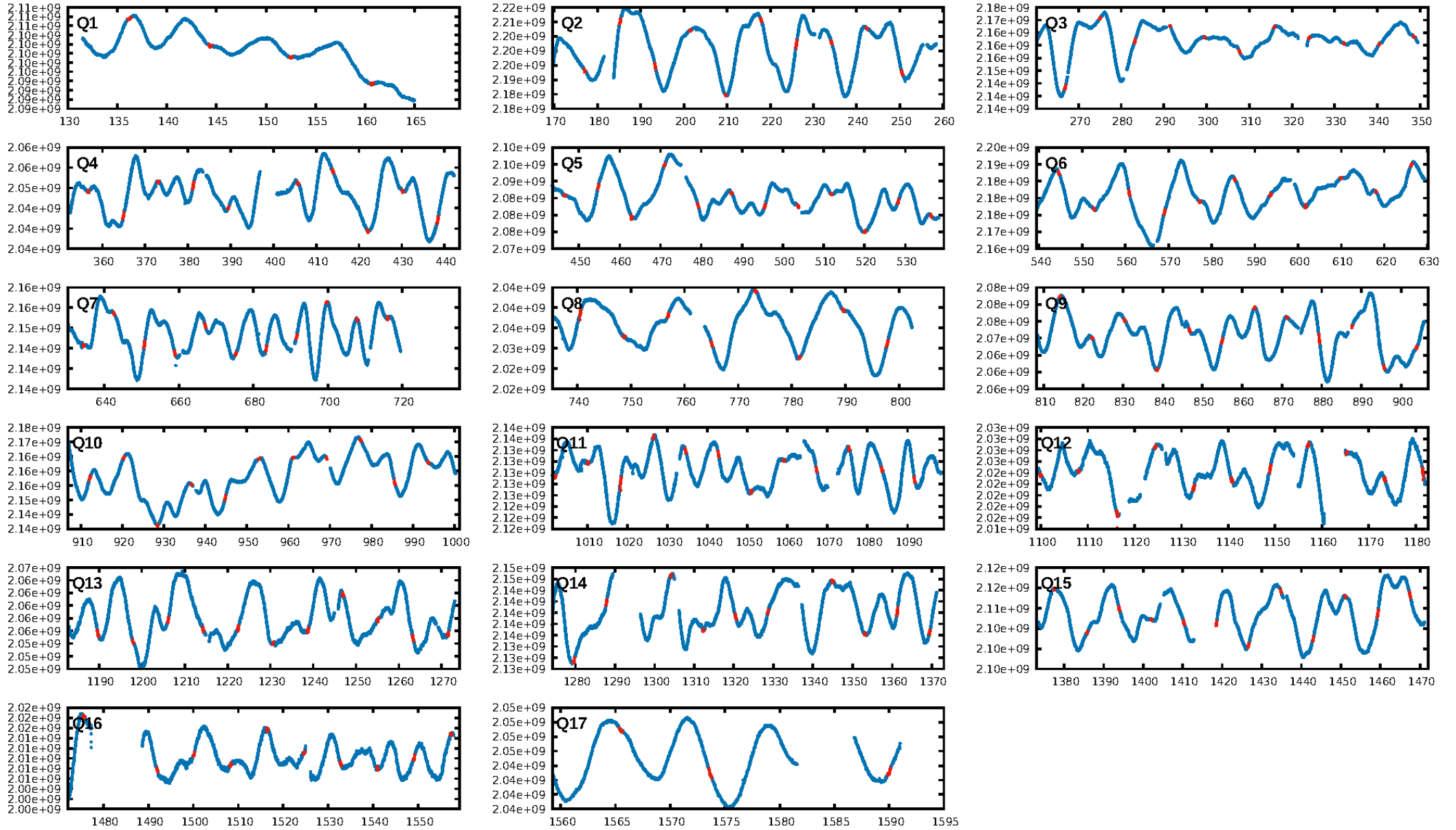
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.01σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 97.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.02e-223  
RollingBand-fgt: 0.98 [143/146]  
GhostDiagnostic-chr: 4.18  
Centroid-sig: N/A  
Centroid-so: 1.163 arcsec [3.99σ]  
OotOffset-rm: 0.500 arcsec [0.60σ]  
KicOffset-rm: 1.237 arcsec [0.92σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.06 [1/17]  
DiffImageOverlap-fno: 1.00 [17/17]

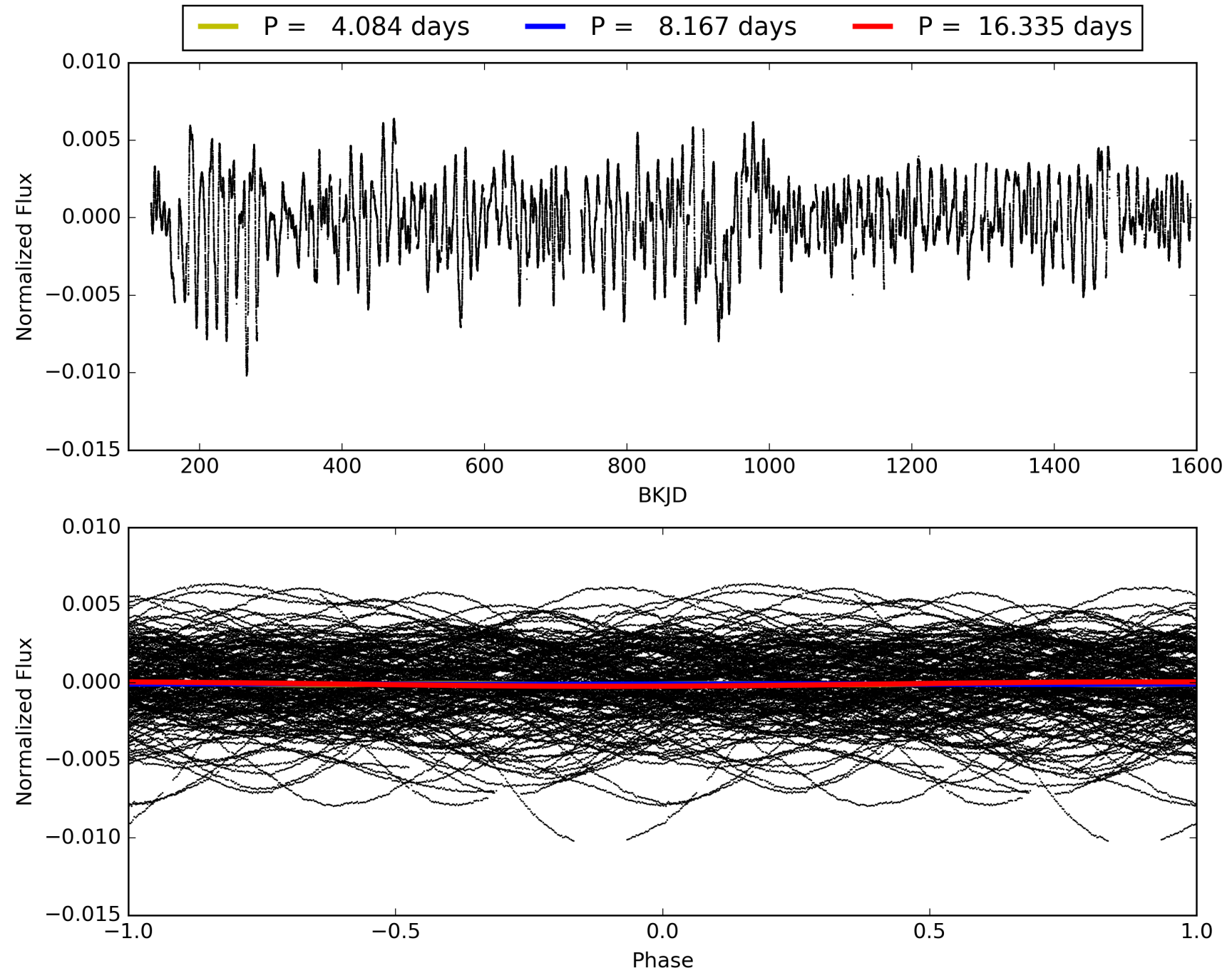
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 18:30:01 Z

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

# TCE 007202957-02, PDC Light Curves

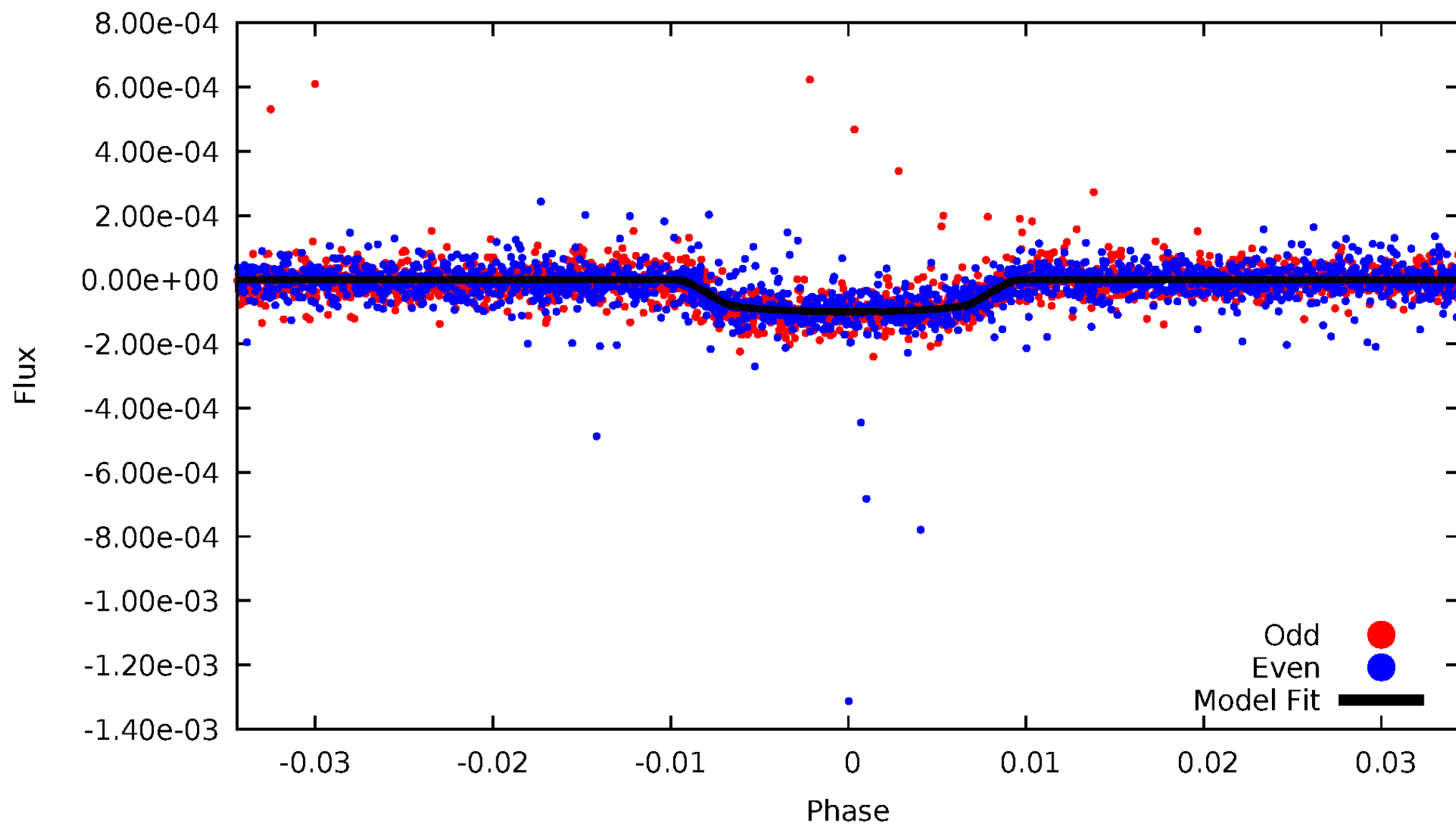


TCE 007202957-02



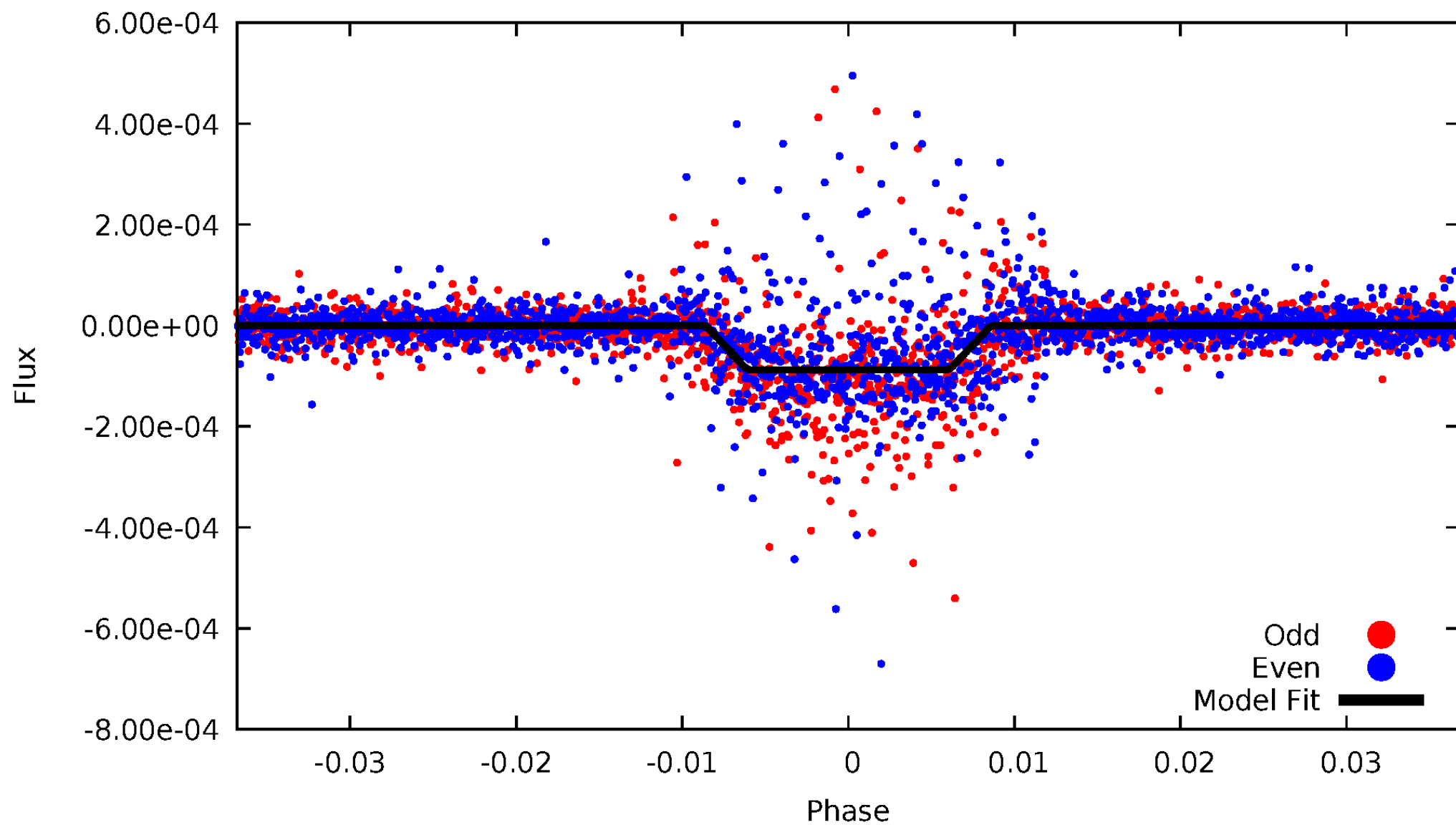
# DV Odd/Even

TCE 007202957-02



# ALT Odd/Even

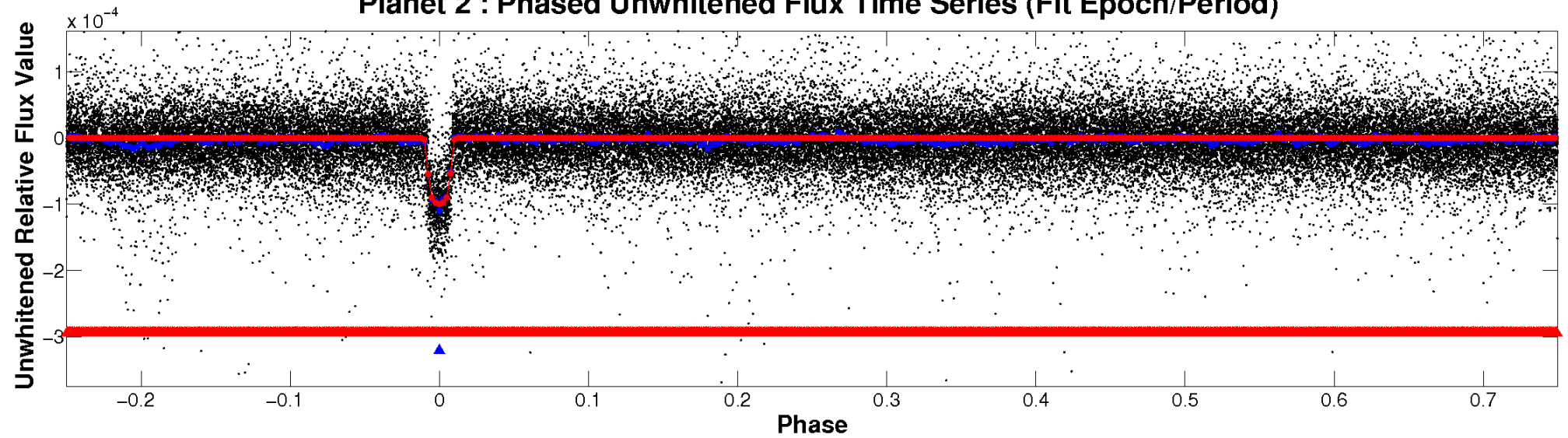
TCE 007202957-02



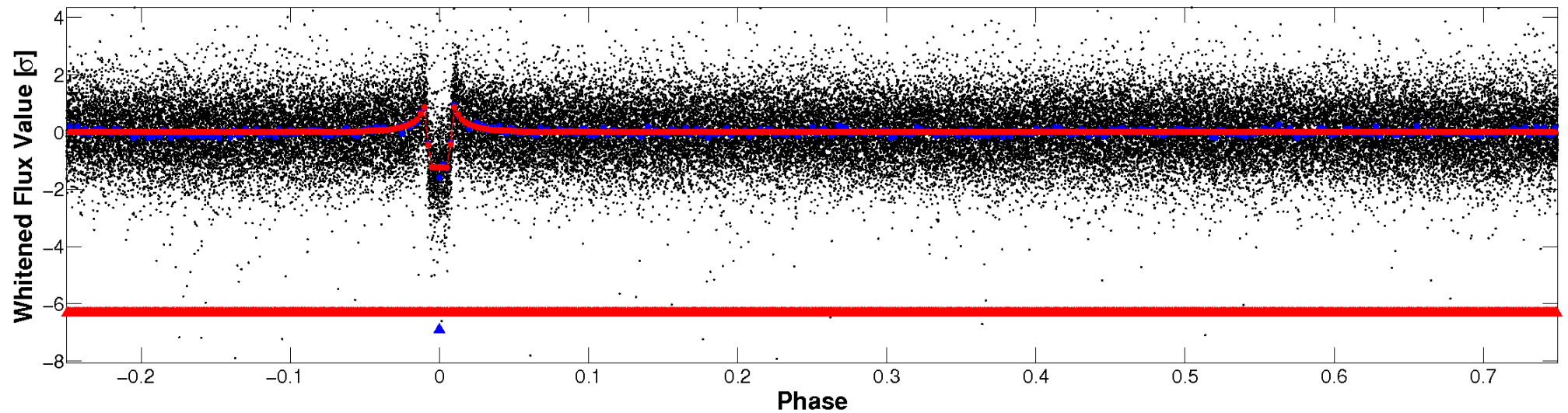


# Non-Whitened Vs. Whitened Light Curve

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

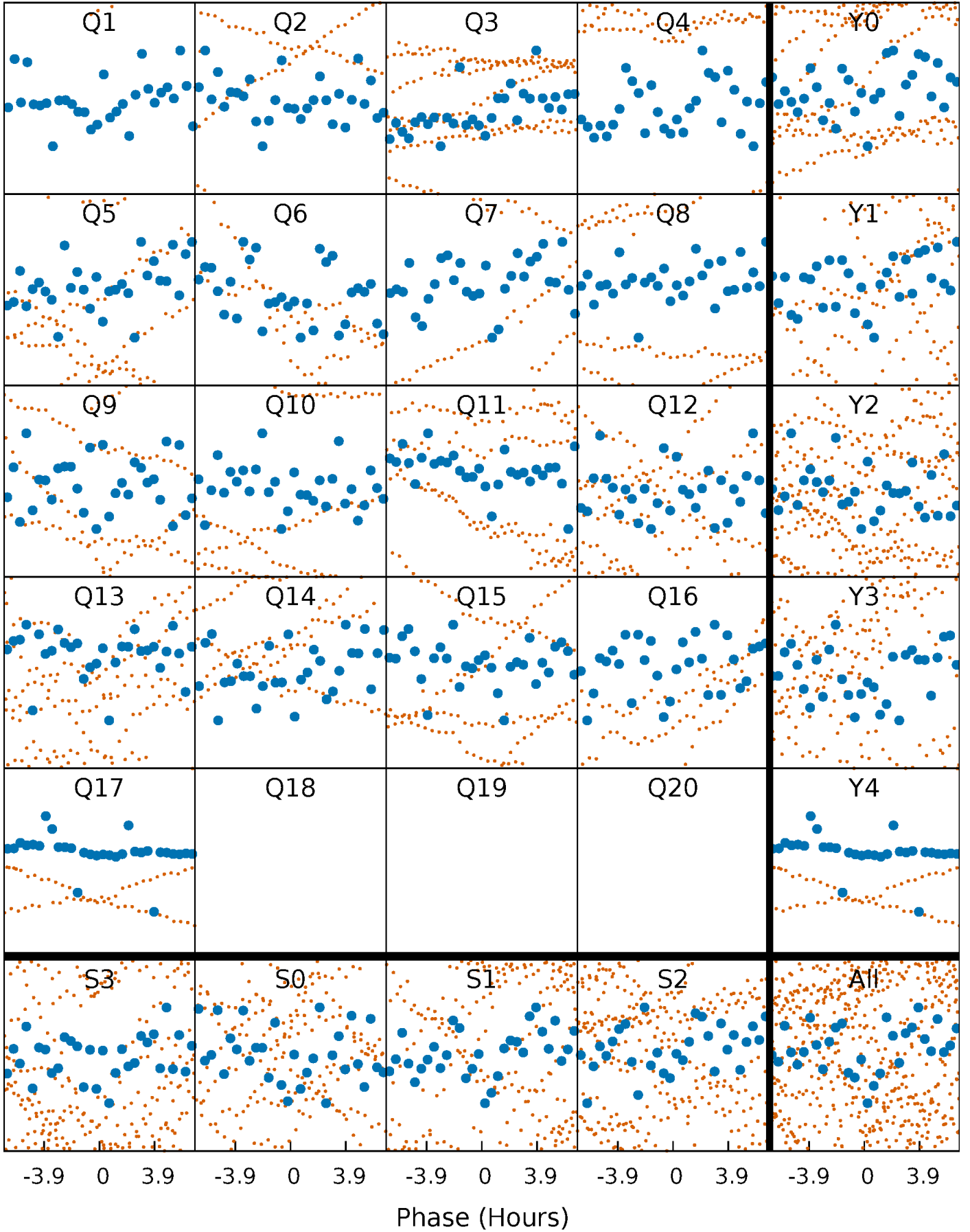


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



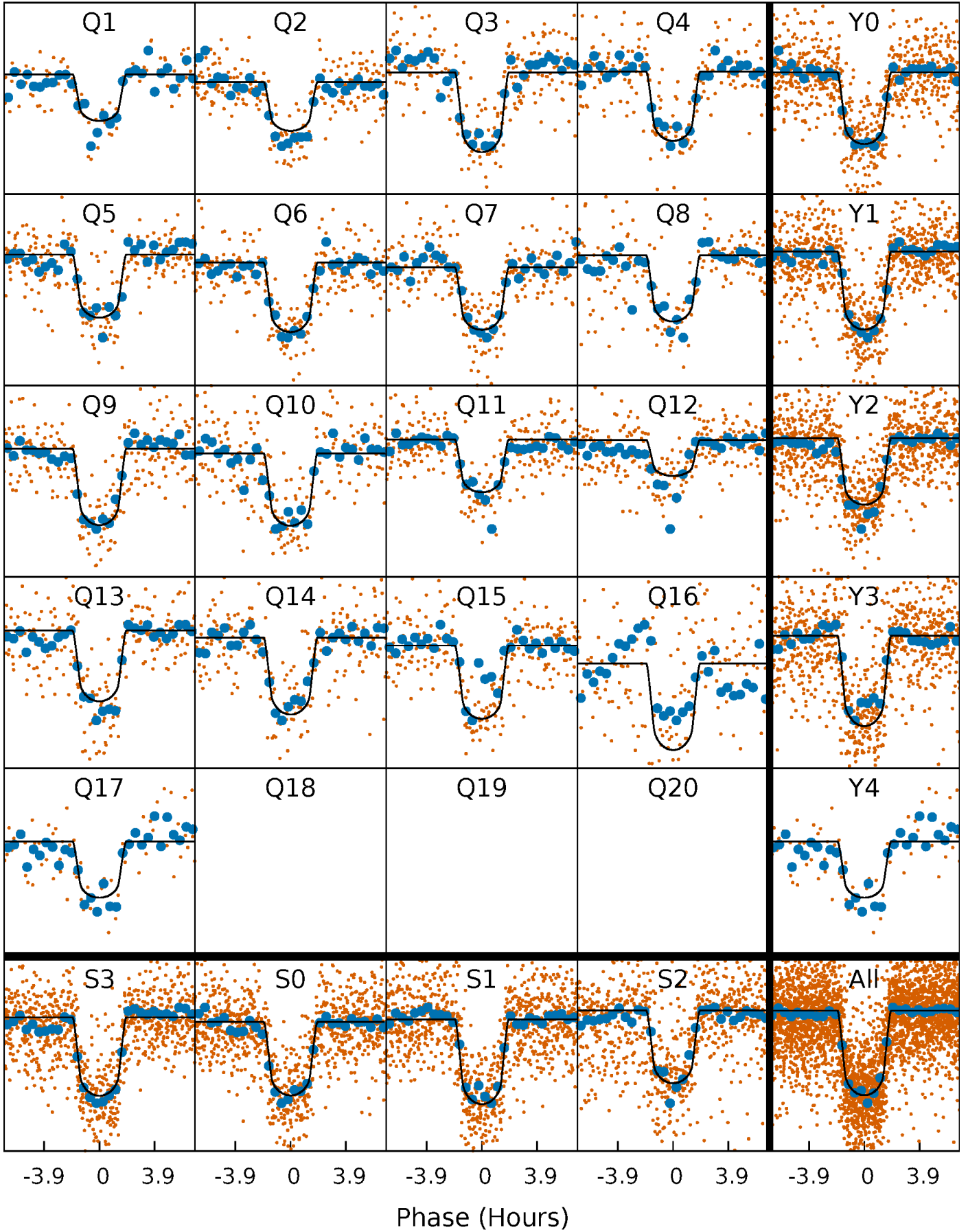
# PDC Quarter-Phased Transit Curves

TCE 007202957-02   P= 8.167365 Days    $T_0=136.202327$  (BKJD)



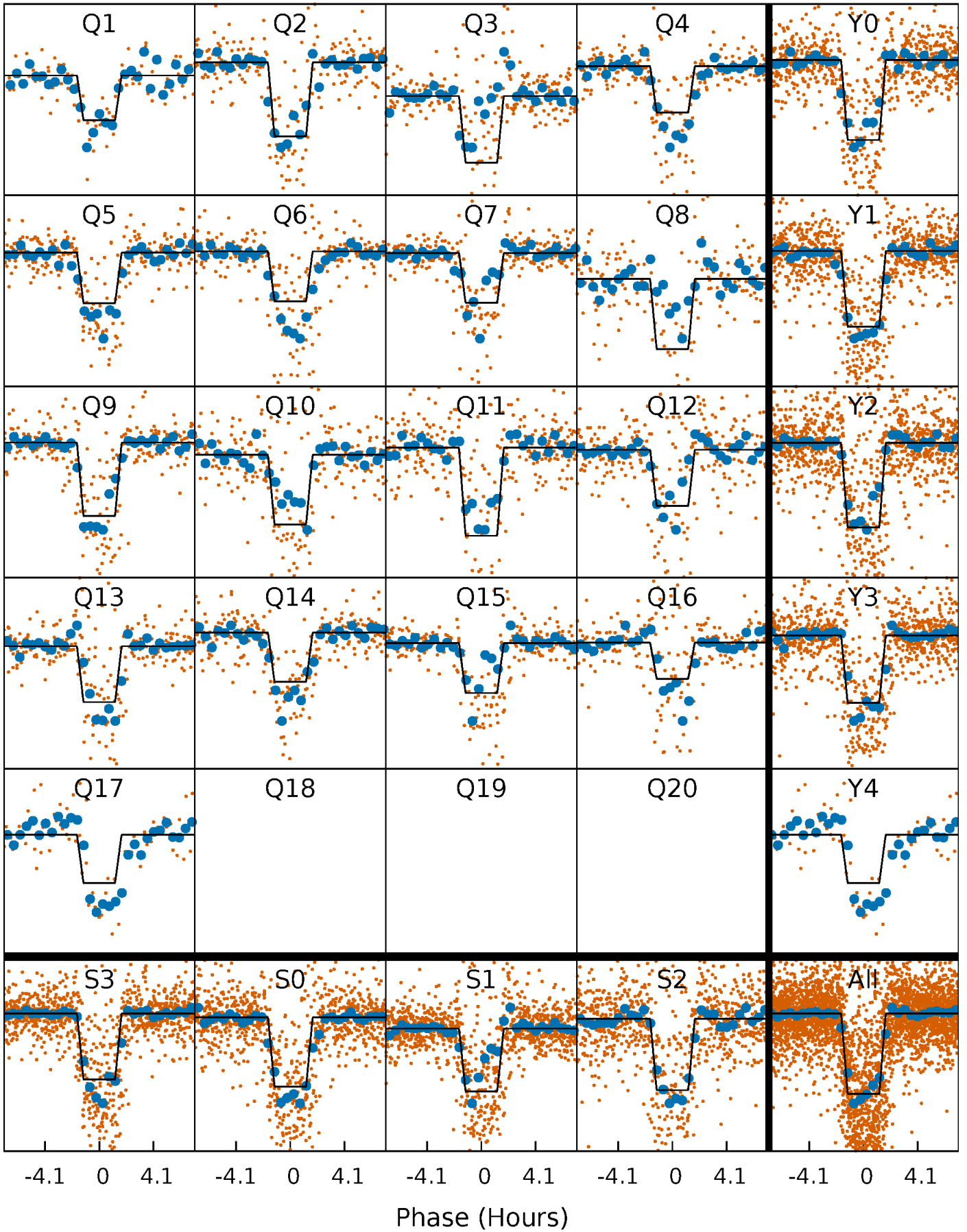
# DV Quarter-Phased Transit Curves

TCE 007202957-02   P= 8.167365 Days    $T_0=136.202327$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

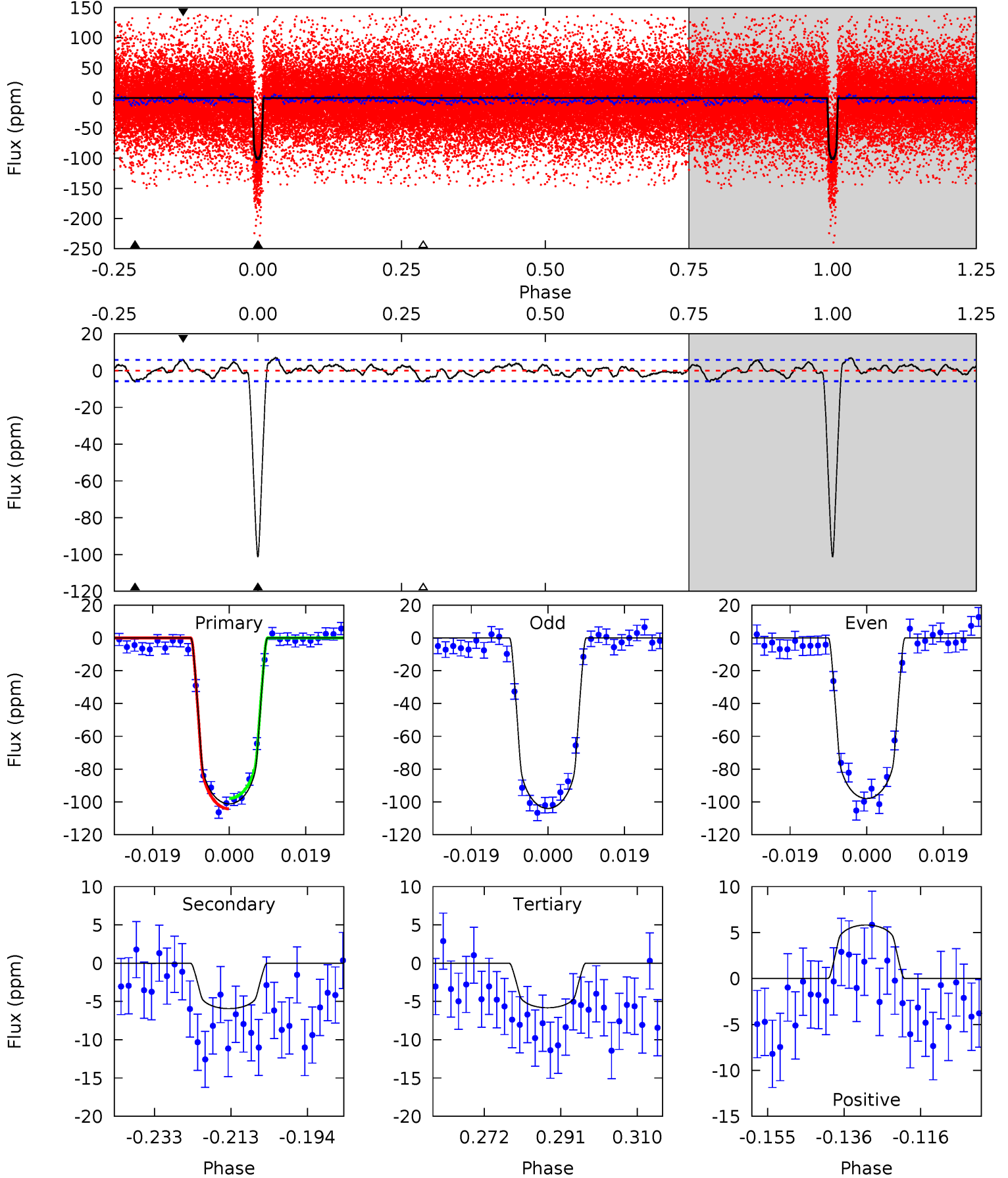
TCE 007202957-02   P= 8.167255 Days    $T_0=136.208443$  (BKJD)



# DV Model-Shift Uniqueness Test

007202957-02, P = 8.167365 Days, E = 128.034962 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
85.1	4.99	4.90	4.90	4.90	2.34	1.92	80.2	80.2	0.09	0.09	2.56	0.99	0.06	2.68

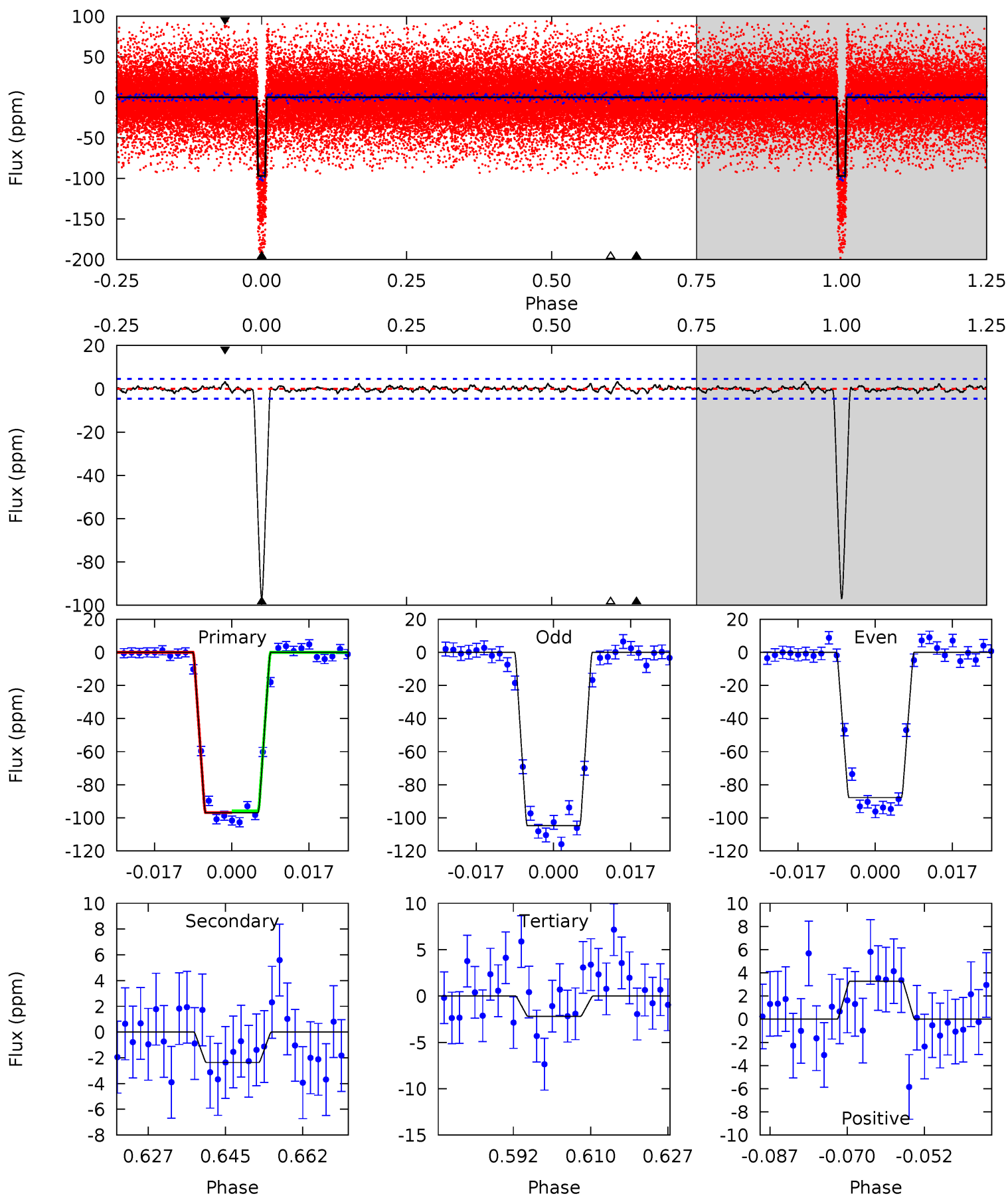




# Alt Model-Shift Uniqueness Test

007202957-02, P = 8.167255 Days, E = 128.041188 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
104.2	2.54	2.35	3.51	4.92	2.38	0.93	101.8	100.6	0.19	-0.97	9.04	0.79	0.03	0.53





### Stellar Parameters For KIC 007202957

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5808^{+105}_{-128}$	$4.522^{+0.030}_{-0.120}$	$-0.060^{+0.150}_{-0.150}$	$0.902^{+0.138}_{-0.046}$	$0.987^{+0.049}_{-0.078}$	$1.893^{+0.222}_{-0.645}$
	+2%/-2%	+1%/-3%	+250%/-250%	+15%/-5%	+5%/-8%	+12%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

### Secondary Eclipse Parameters for KIC 007202957-02 / KOI 2687.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-6 \pm 1$	$1.09^{+0.13}_{-0.10}$	$1222^{+44}_{-37}$	$3291^{+144}_{-135}$	$17^{+5}_{-4}$
Alt.	$-2 \pm 1$	$0.94^{+0.11}_{-0.11}$	$1222^{+50}_{-35}$	$3005^{+186}_{-213}$	$8.980^{+4.935}_{-3.488}$

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

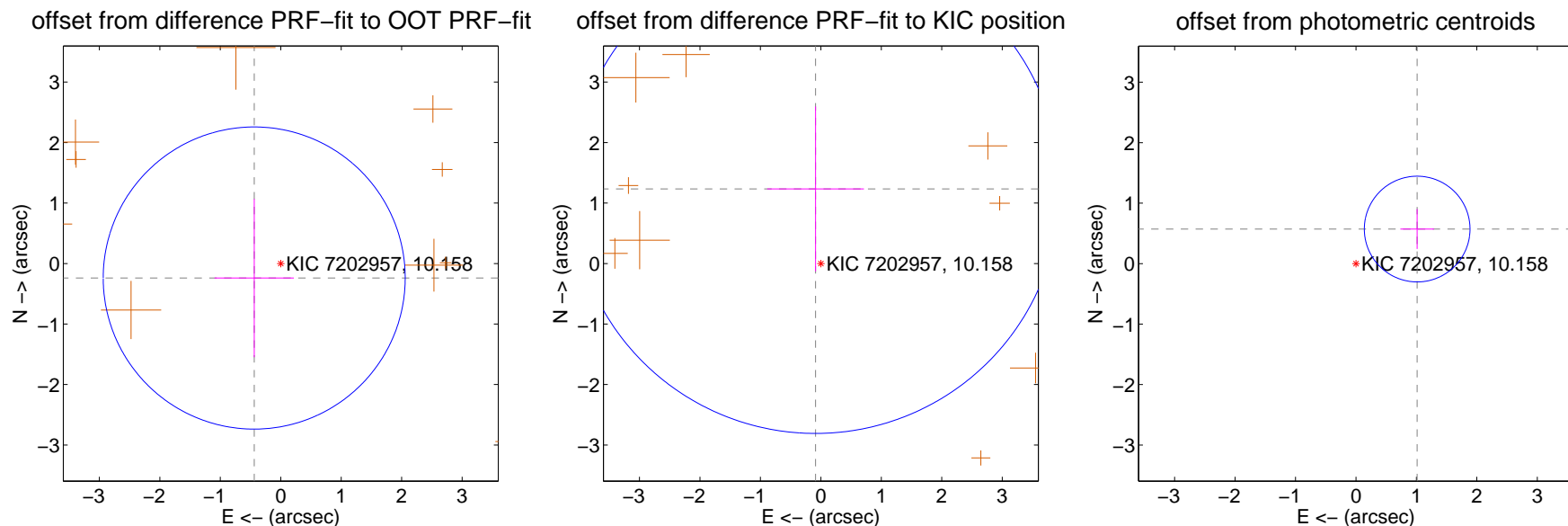
## DV Centroid Data

Supplemental centroid analysis for 007202957-02. **Kepler magnitude: 10.16.** Transit SNR 39.44

**There are 1 quarters with good PRF difference image offsets**

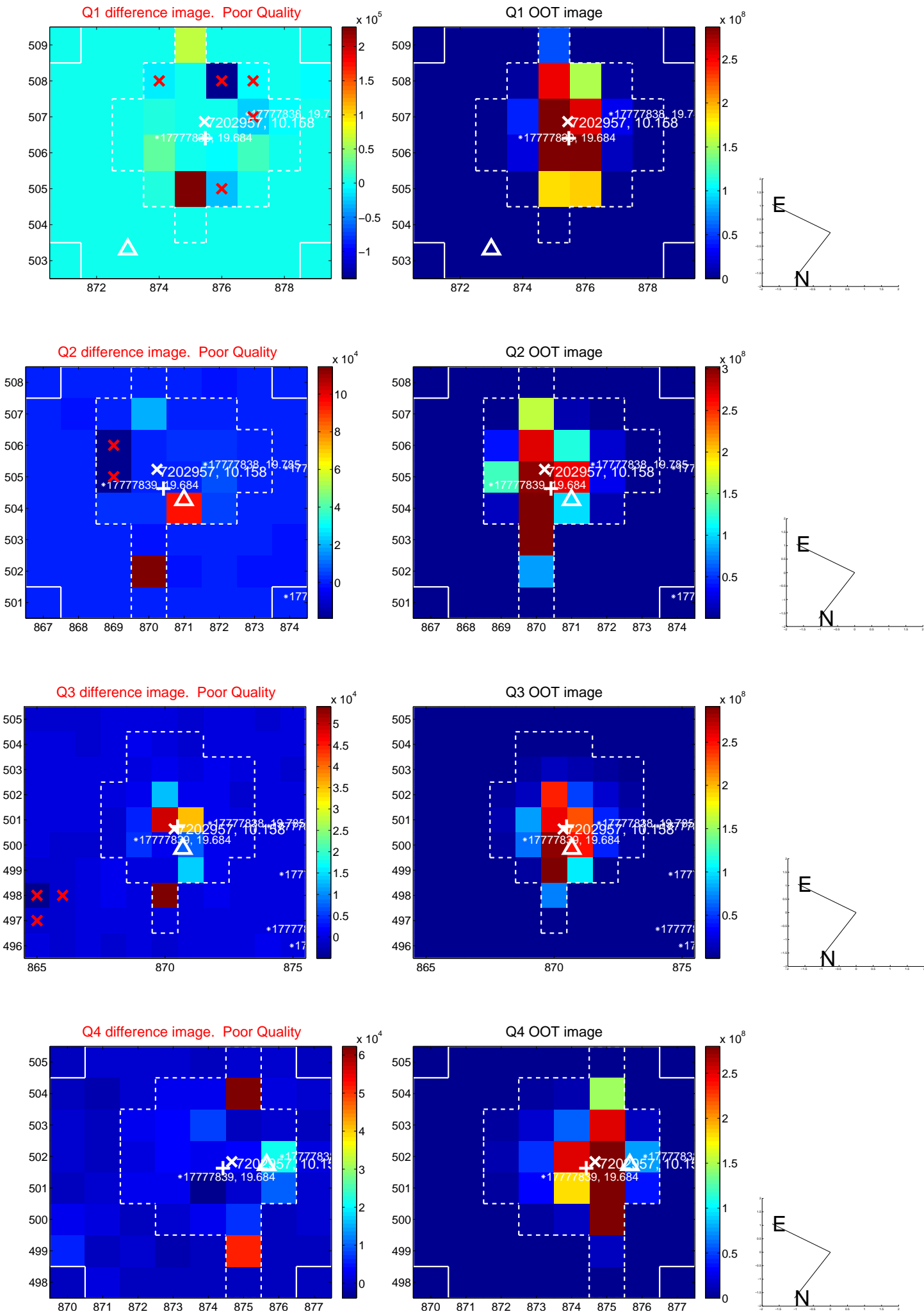
The direct PRF centroid is offset from the target star catalog position by about 1.85 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.500 \pm 0.833$	0.60	$0.439 \pm 0.657$	$-0.240 \pm 1.308$
PRF-fit source offset from KIC position	$1.237 \pm 1.348$	0.92	$0.088 \pm 0.800$	$1.234 \pm 1.363$
photometric centroid source offset	<b><math>1.16 \pm 0.29</math></b>	<b>3.99</b>	$-1.01 \pm 0.28$	$0.57 \pm 0.33$

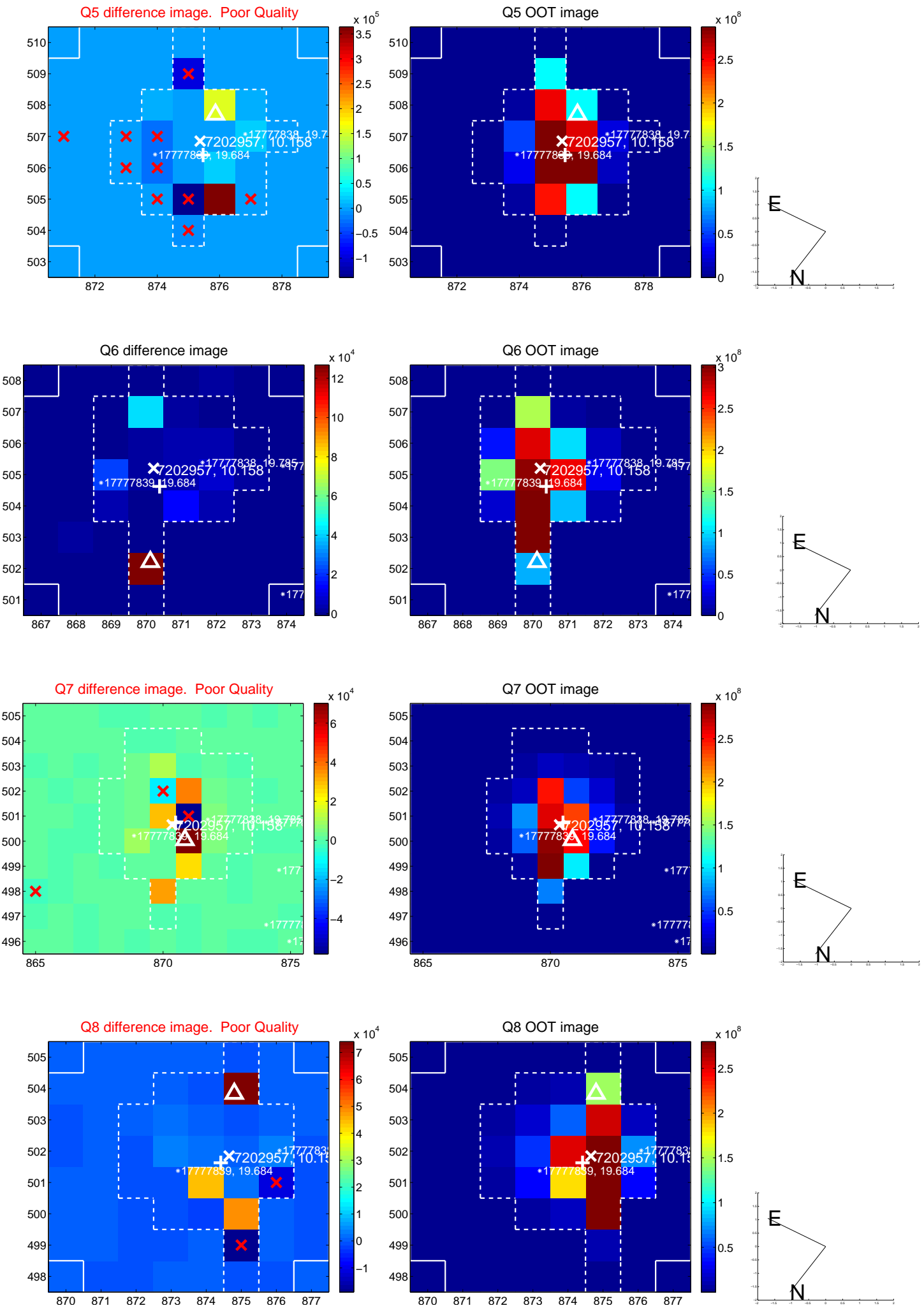


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

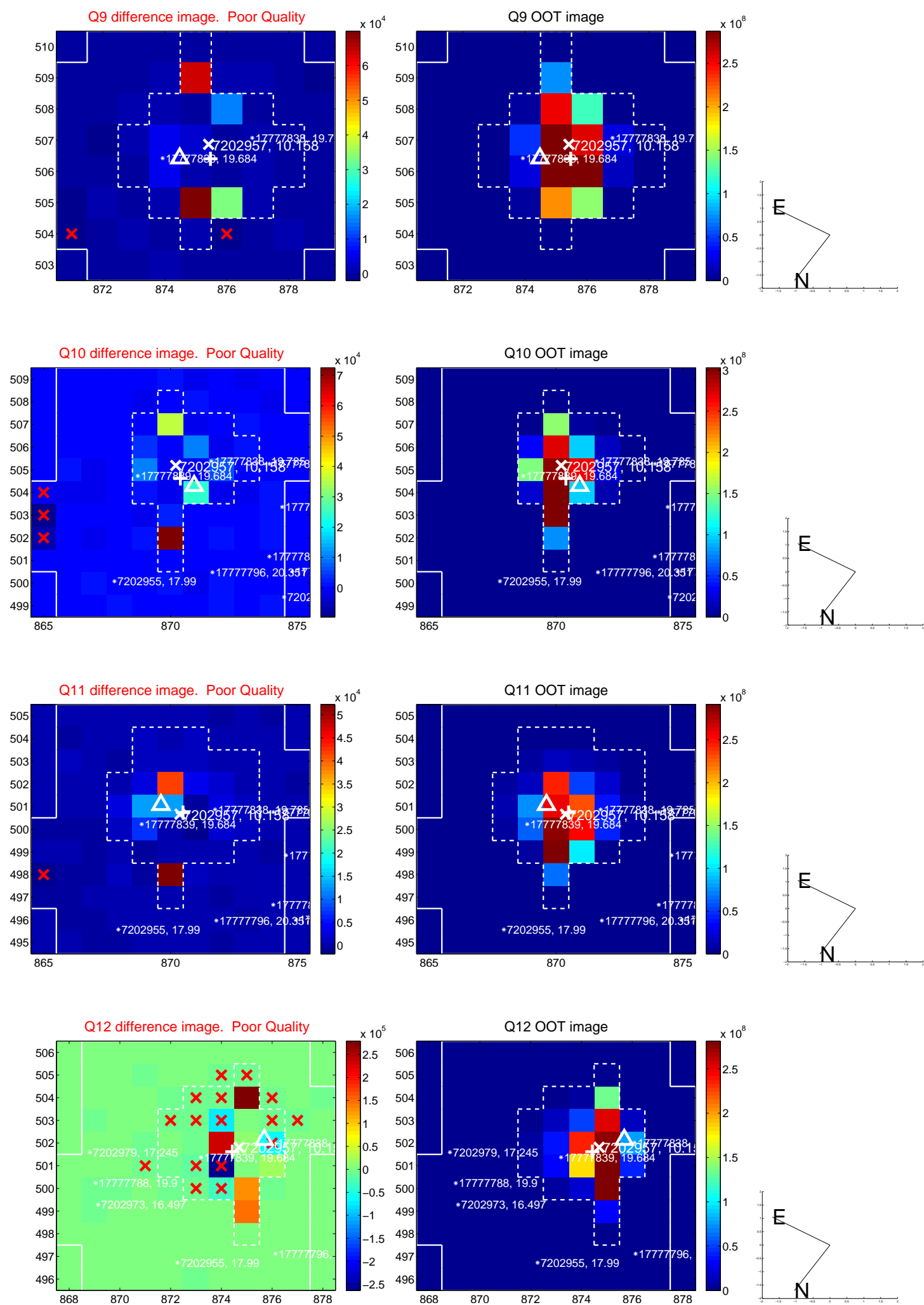
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



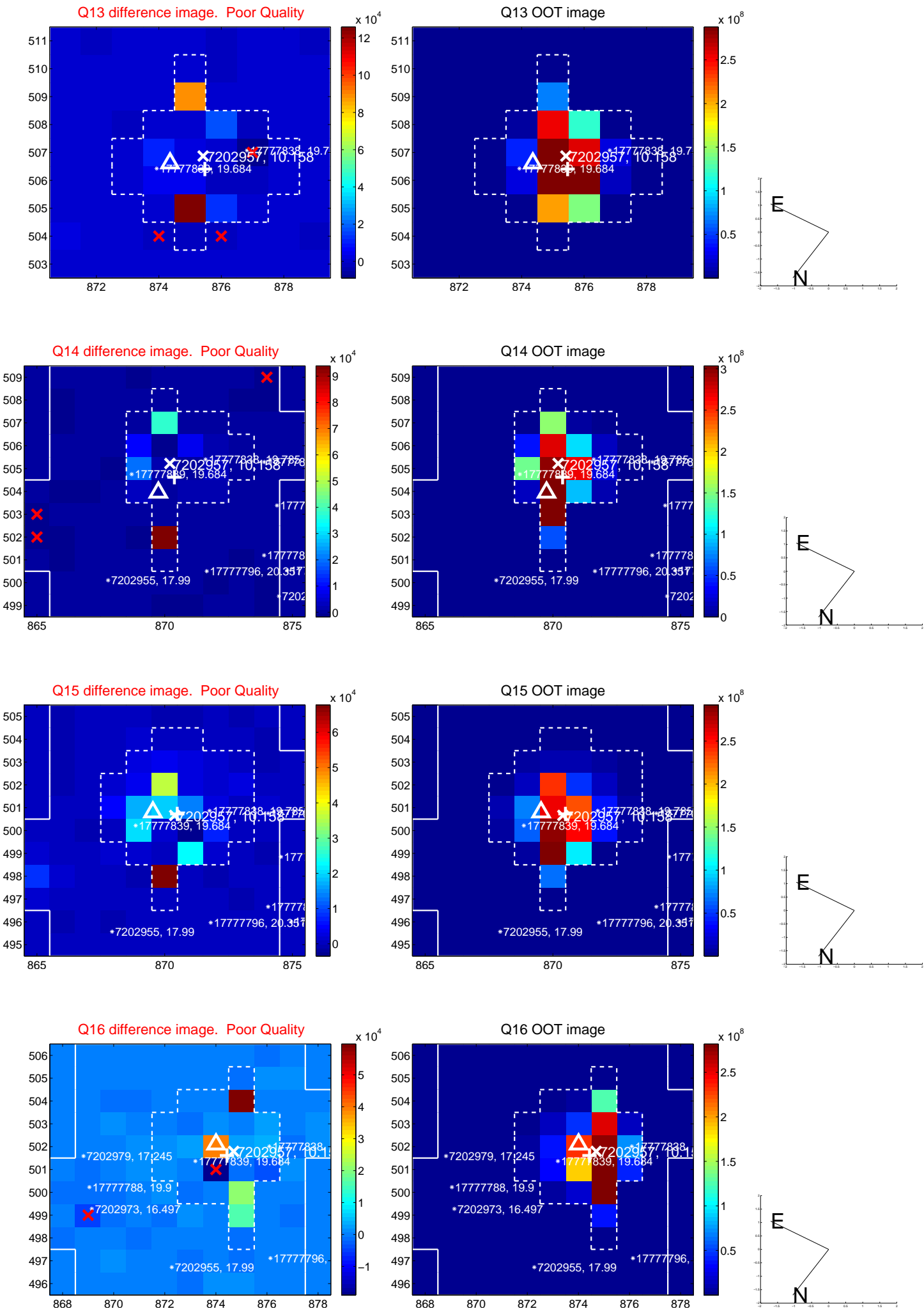
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

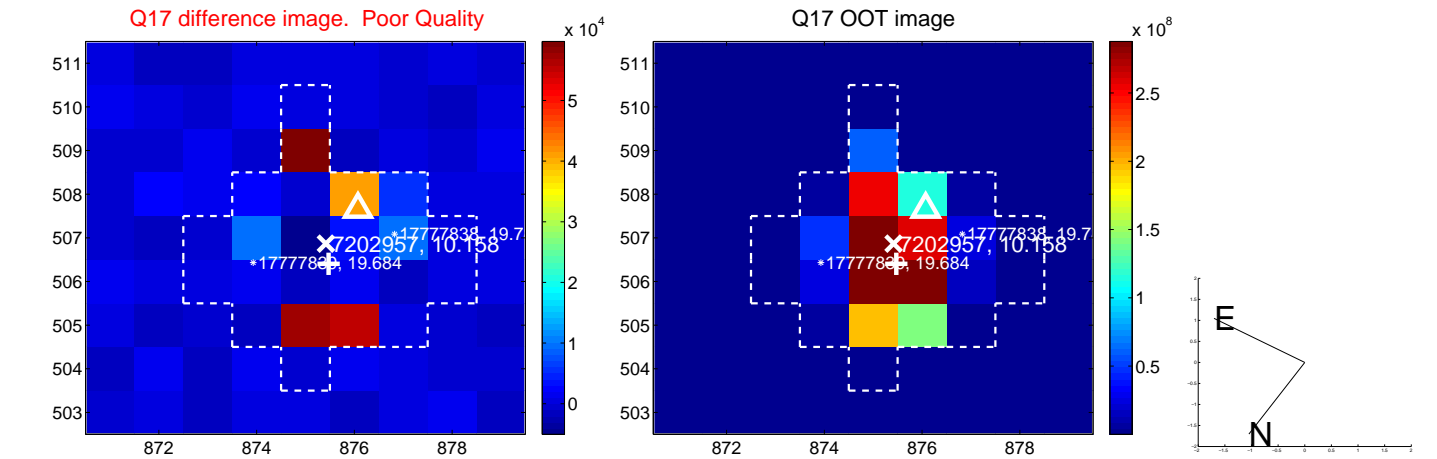


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

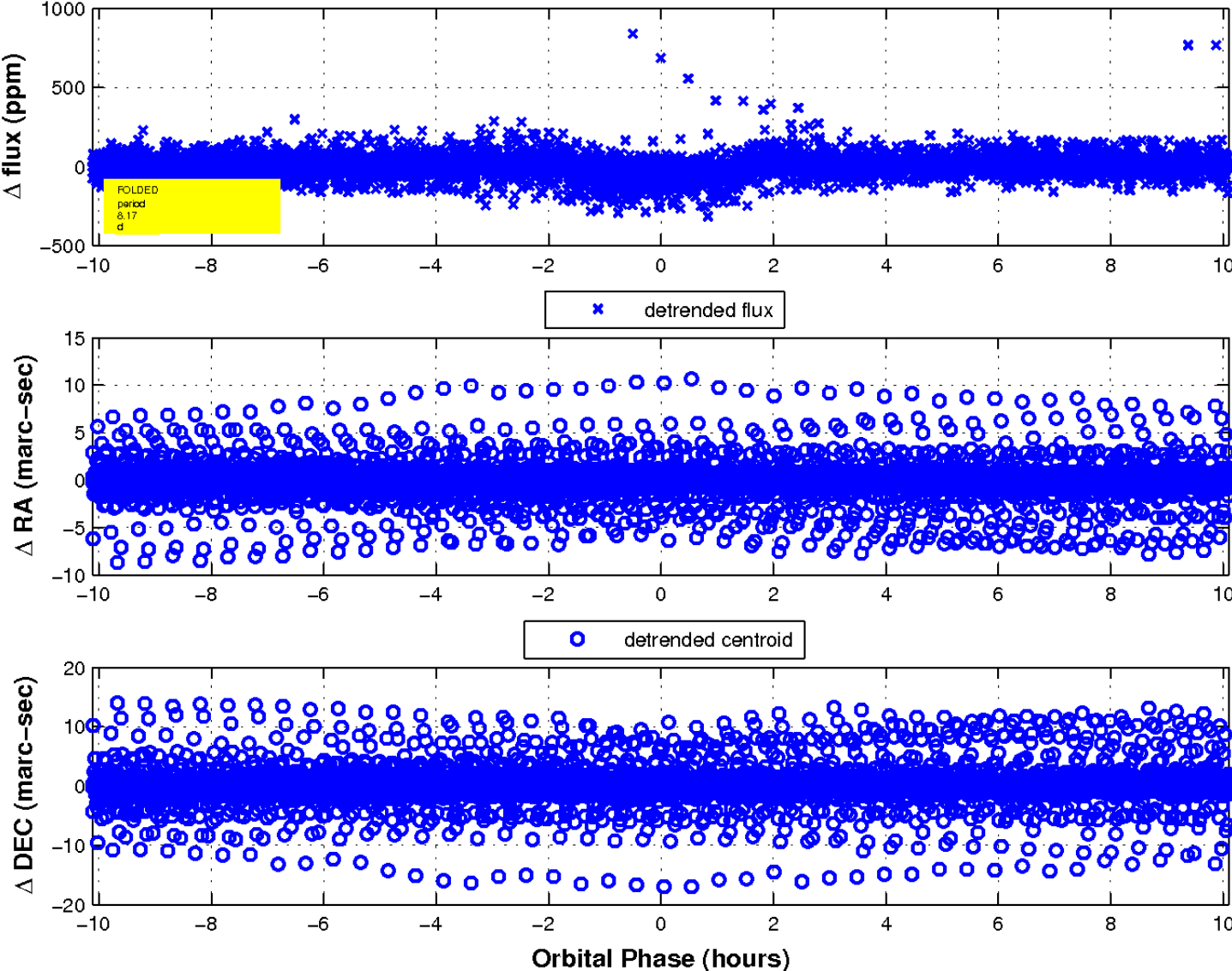




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

