

# KIC 008890783

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008890783-01	OBS	0464.01	58.362027	138.193468	5366.5	6.405	201.5	190.3	0.95	5592	7.10	9.36
008890783-02	OBS	0464.02	5.350173	131.557202	747.8	2.384	67.4	74.7	0.95	5592	2.87	226.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008890783-01	OBS	PC	0.96	0	0	0	0	NO_COMMENT
008890783-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

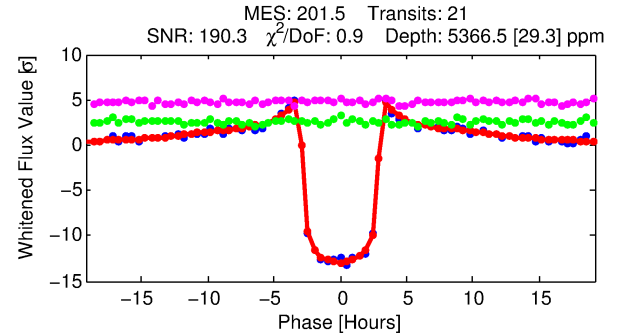
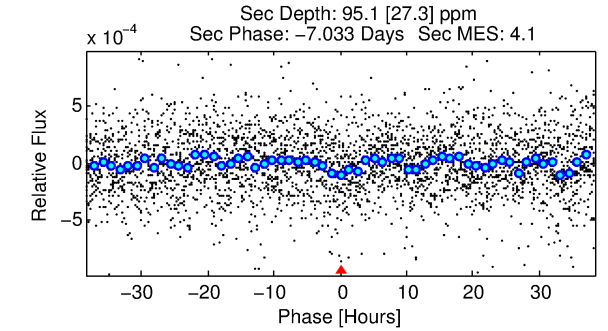
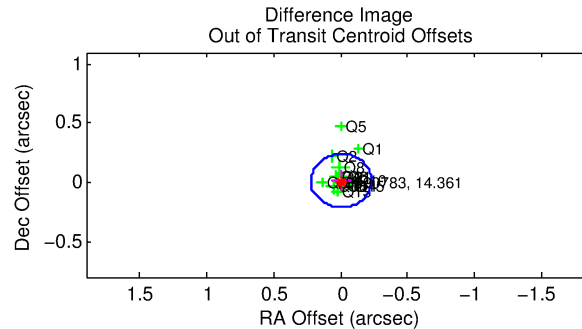
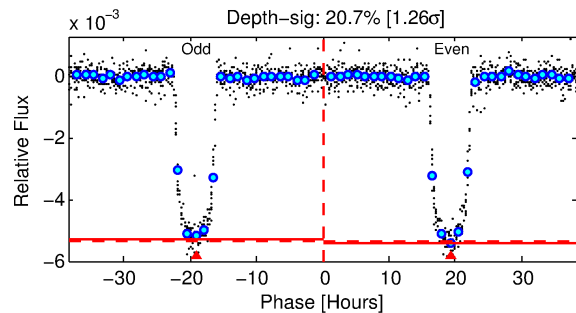
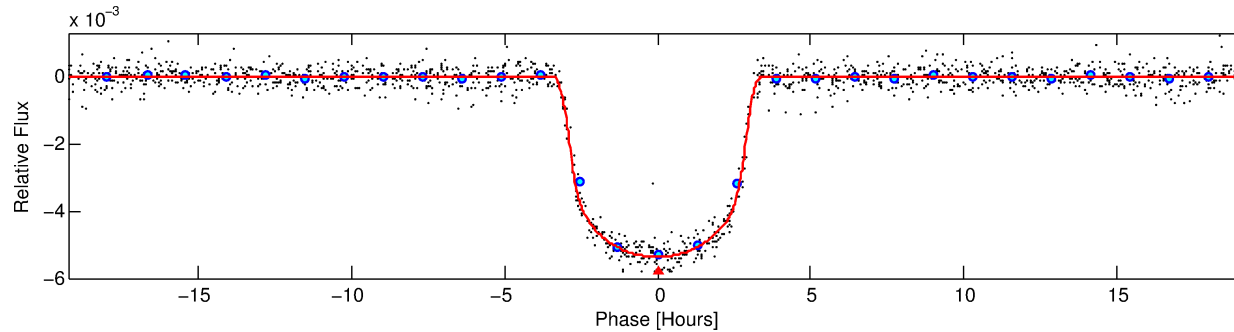
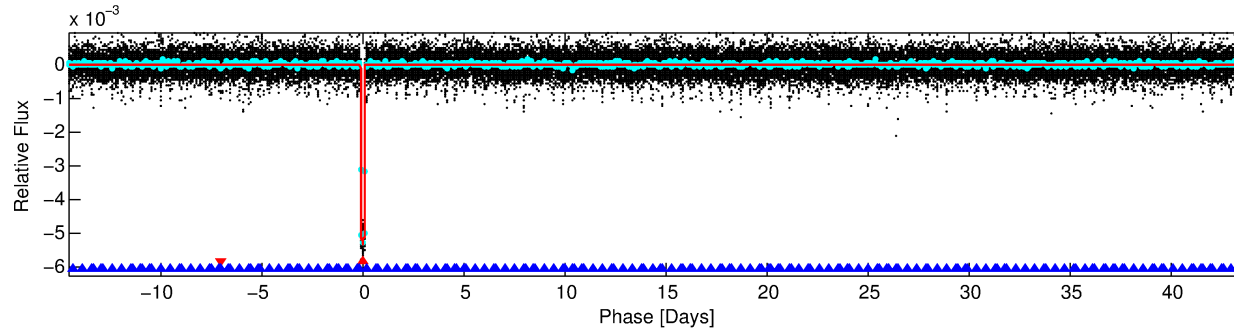
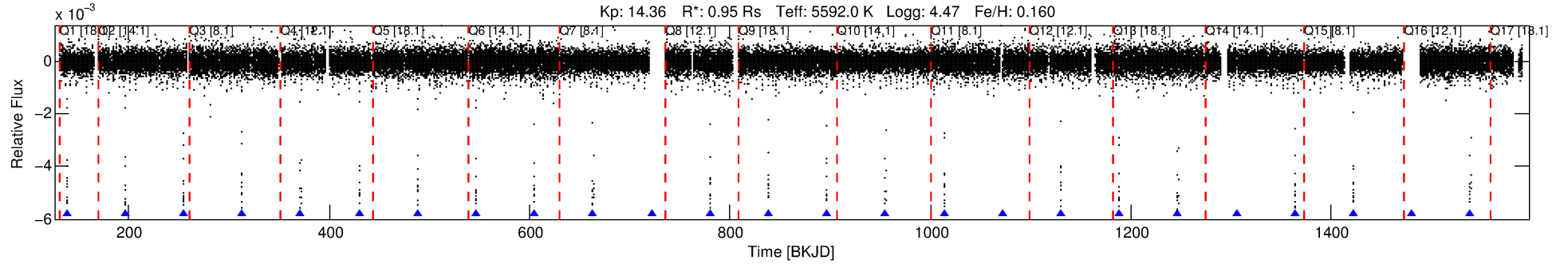
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008890783-01

No Significant Match Found

# DV One-Page Summary

KIC: 8890783 Candidate: 1 of 2 Period: 58.362 d  
KOI: K00464.01 Corr: 0.991



## DV Fit Results:

Period = 58.36203 [0.00004] d  
Epoch = 138.1935 [0.0005] BKJD  
Rp/R\* = 0.0683 [0.0009]  
a/R\* = 65.83 [3.35]  
b = 0.50 [0.08]  
Seff = 9.36 [3.33]  
Teq = 446 [40] K  
Rp = 7.10 [1.98] Re  
a = 0.2916 [0.0679] AU  
Ag = 88.26 [39.05] [2.23 $\sigma$ ]  
Teffp = 2113 [165] K [9.84 $\sigma$ ]

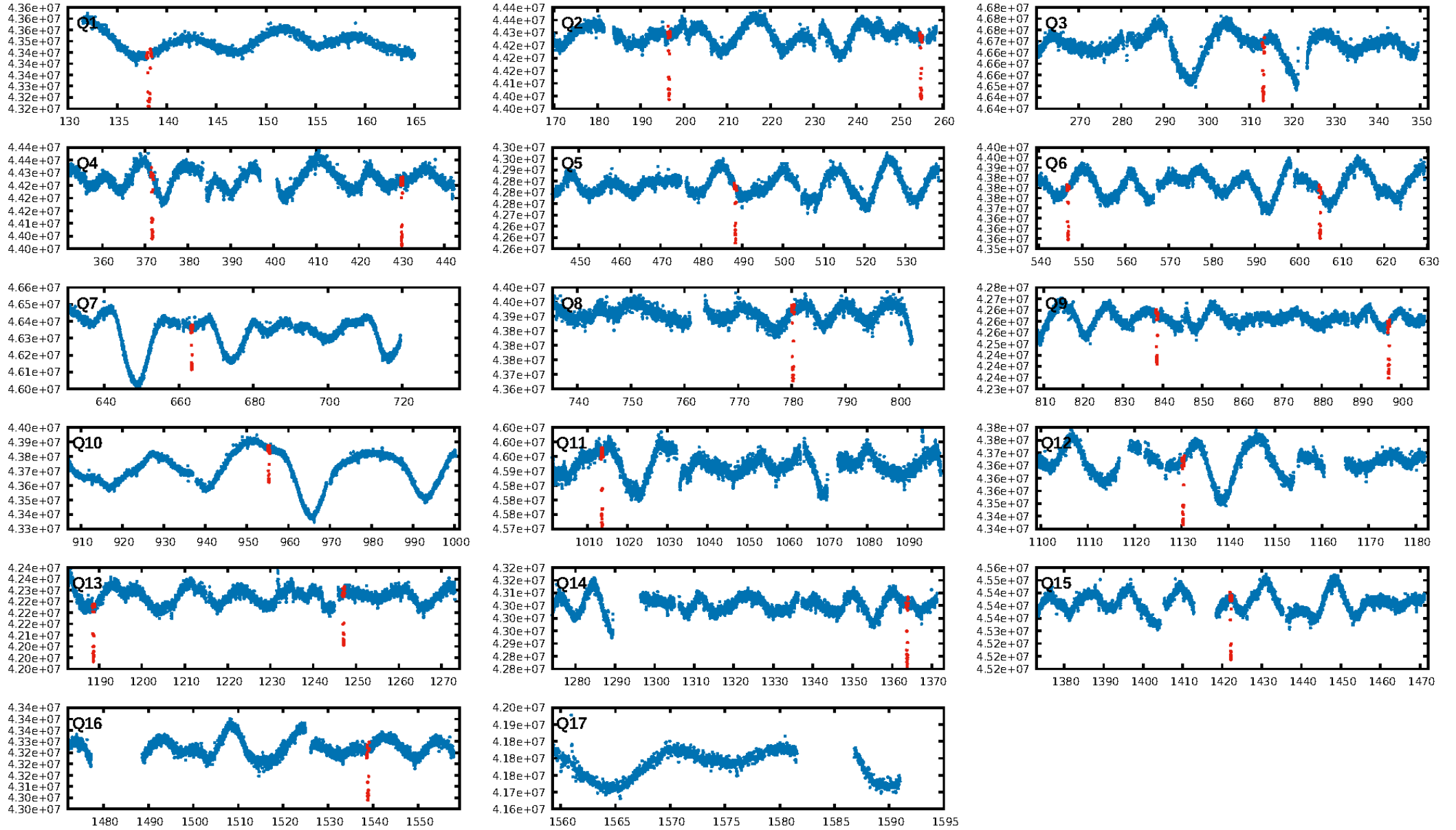
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [186.16 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 86.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [20/20]  
GhostDiagnostic-chr: 4.02  
Centroid-sig: 6.1%  
Centroid-so: 0.027 arcsec [0.65 $\sigma$ ]  
OotOffset-rm: 0.014 arcsec [0.19 $\sigma$ ]  
KicOffset-rm: 0.064 arcsec [0.84 $\sigma$ ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 0.80 [12/15]

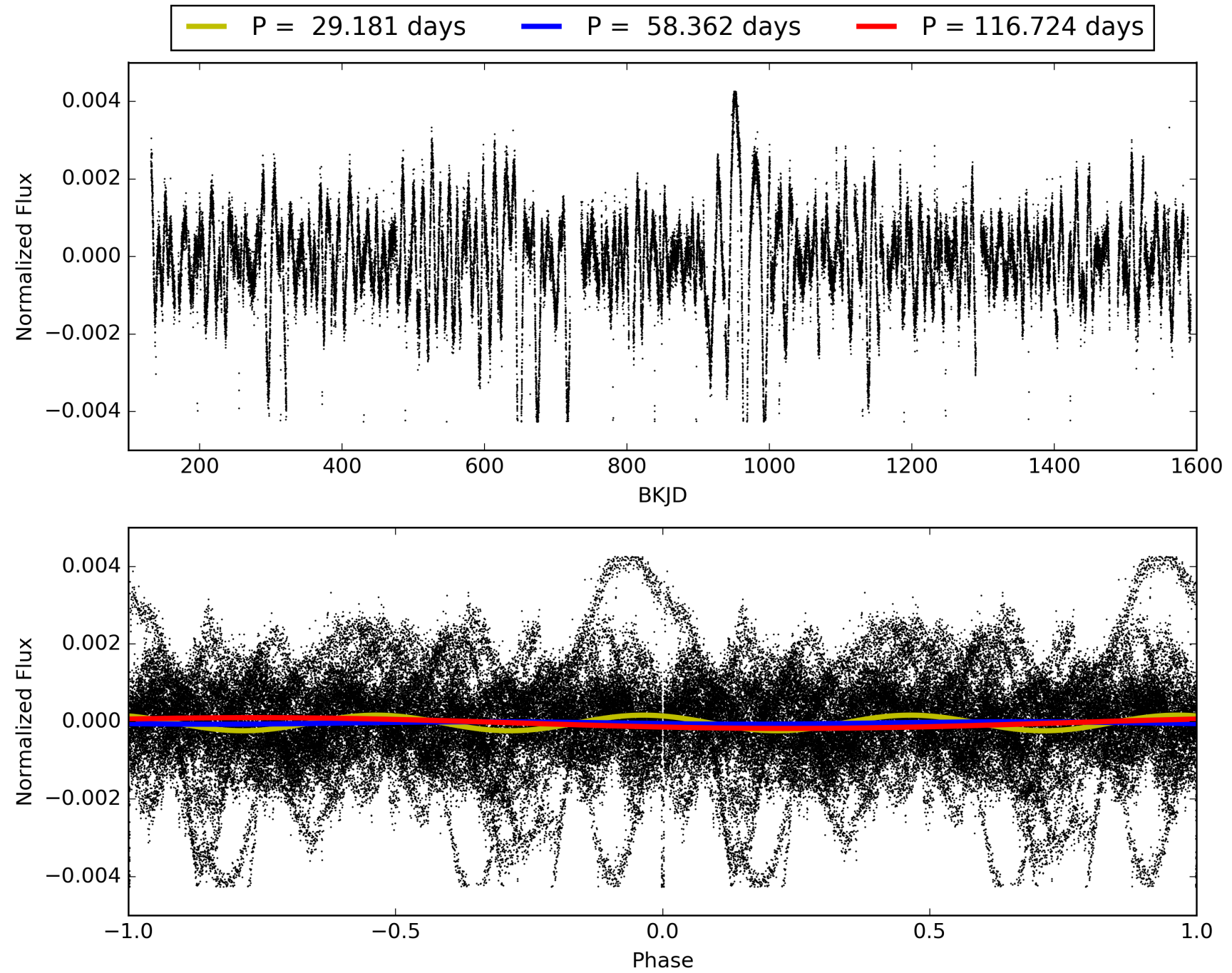
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:59:59 Z

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

# TCE 008890783-01, PDC Light Curves

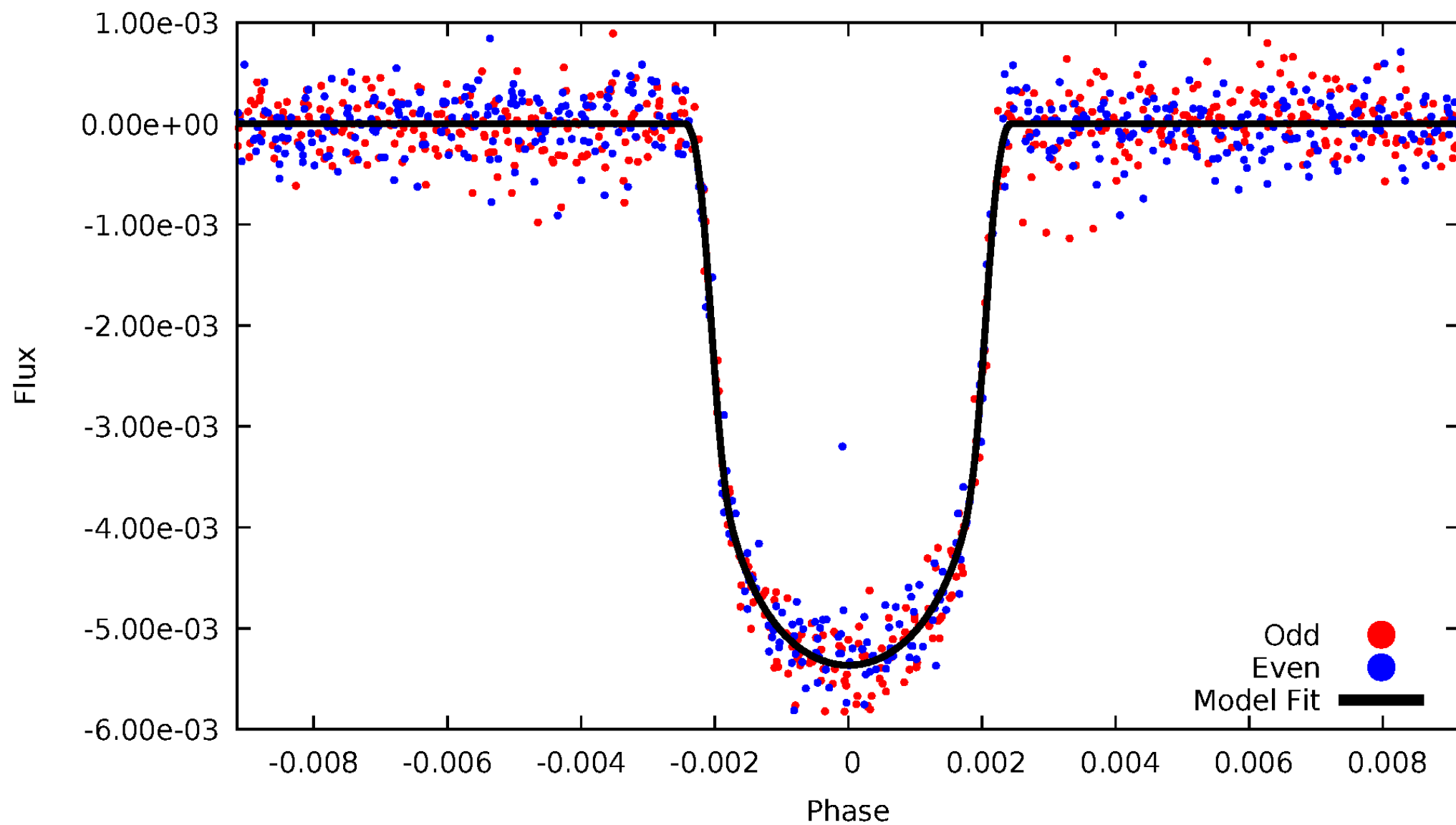


TCE 008890783-01



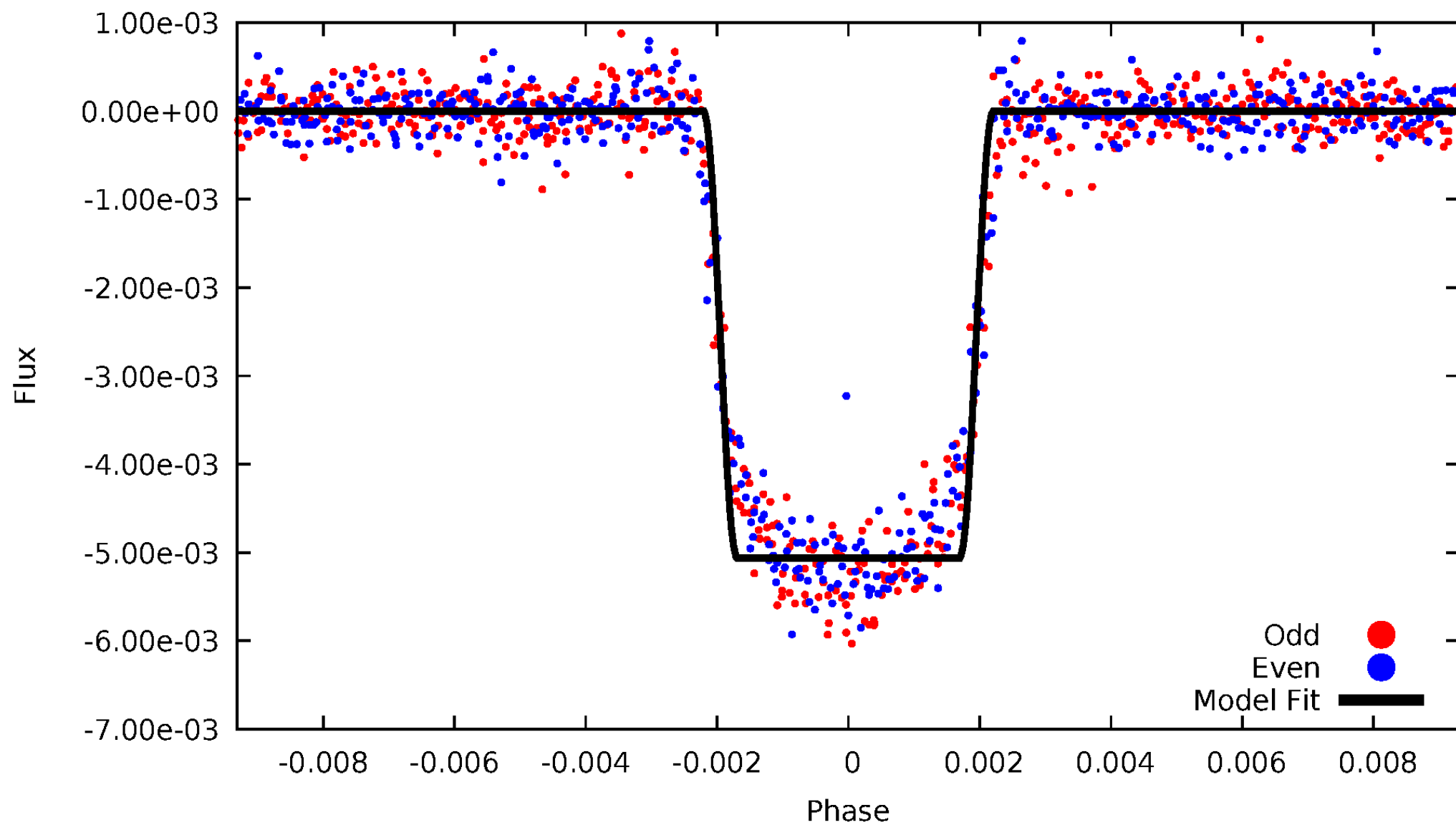
# DV Odd/Even

TCE 008890783-01



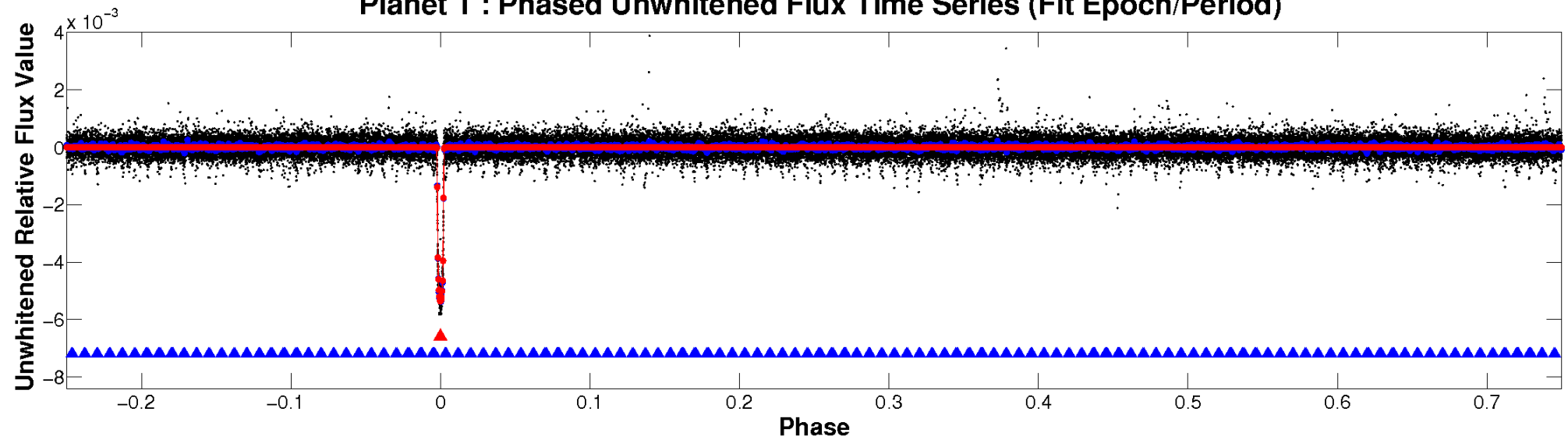
# ALT Odd/Even

TCE 008890783-01

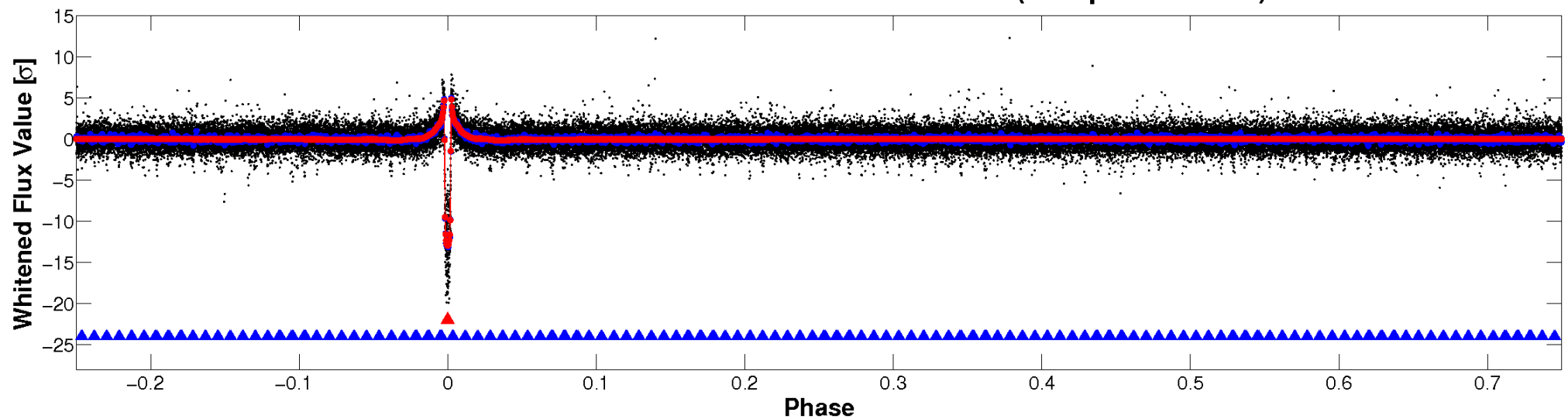


# Non-Whitened Vs. Whitened Light Curve

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

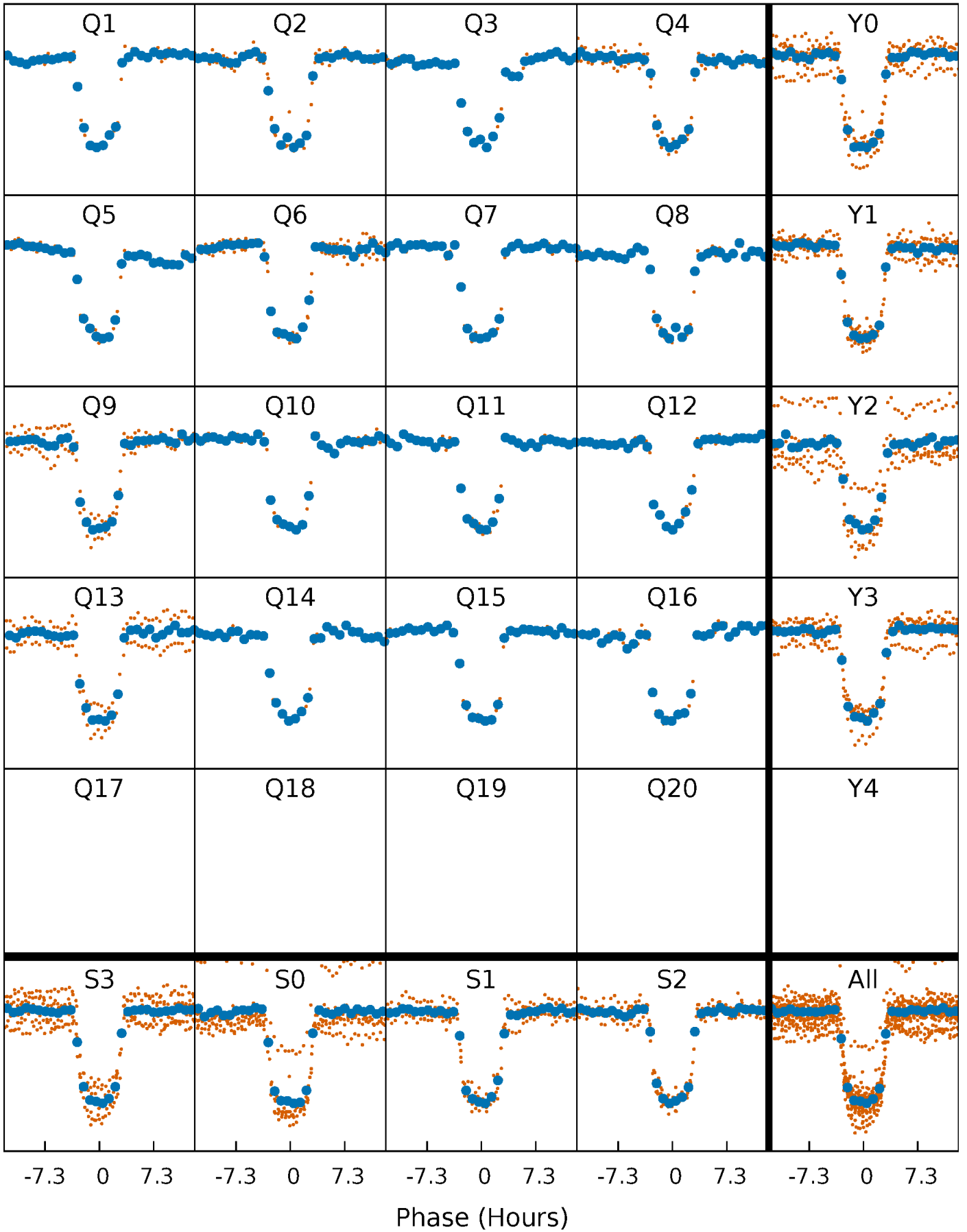


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

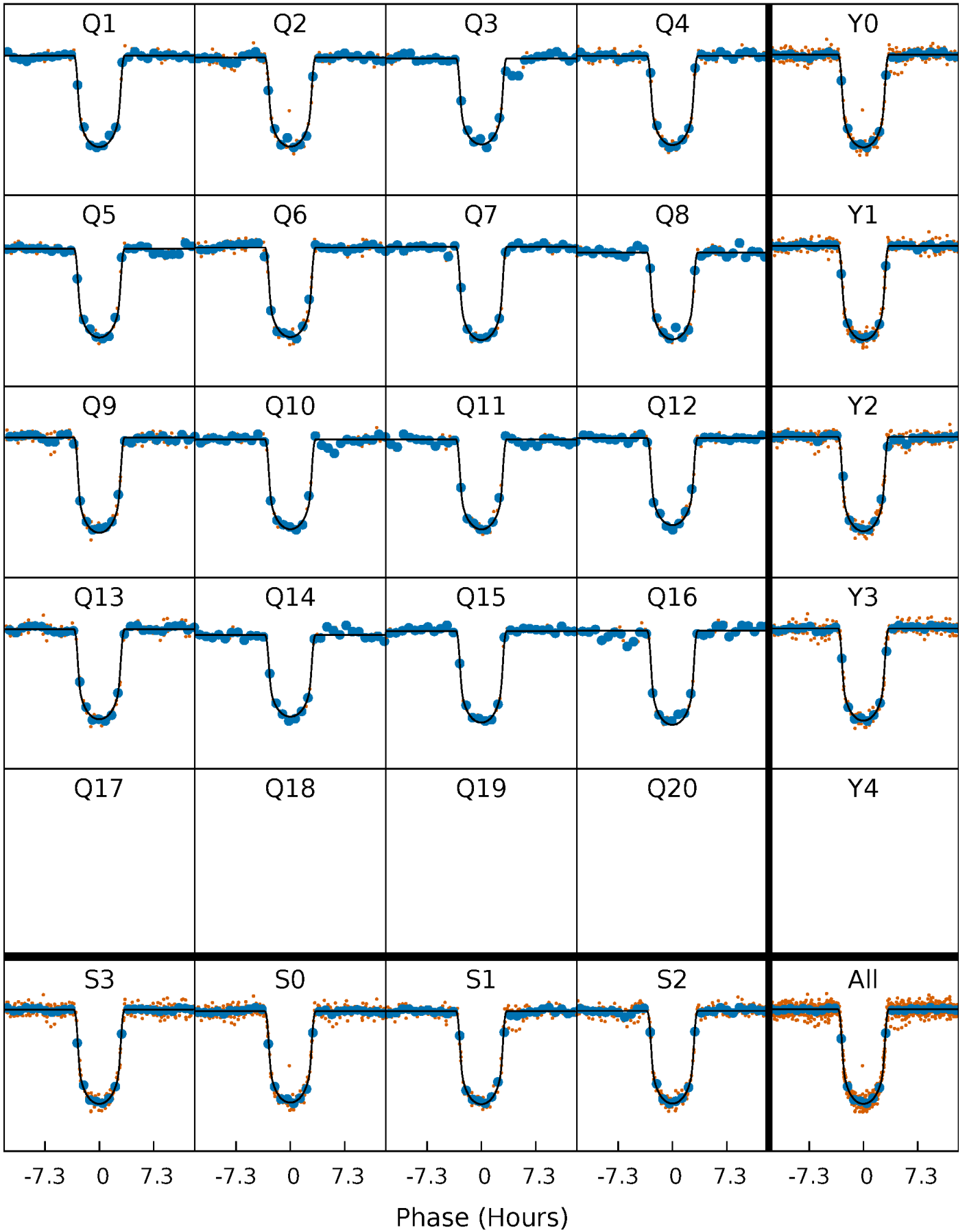
TCE 008890783-01 P= 58.362027 Days  $T_0=138.193468$  (BKJD)





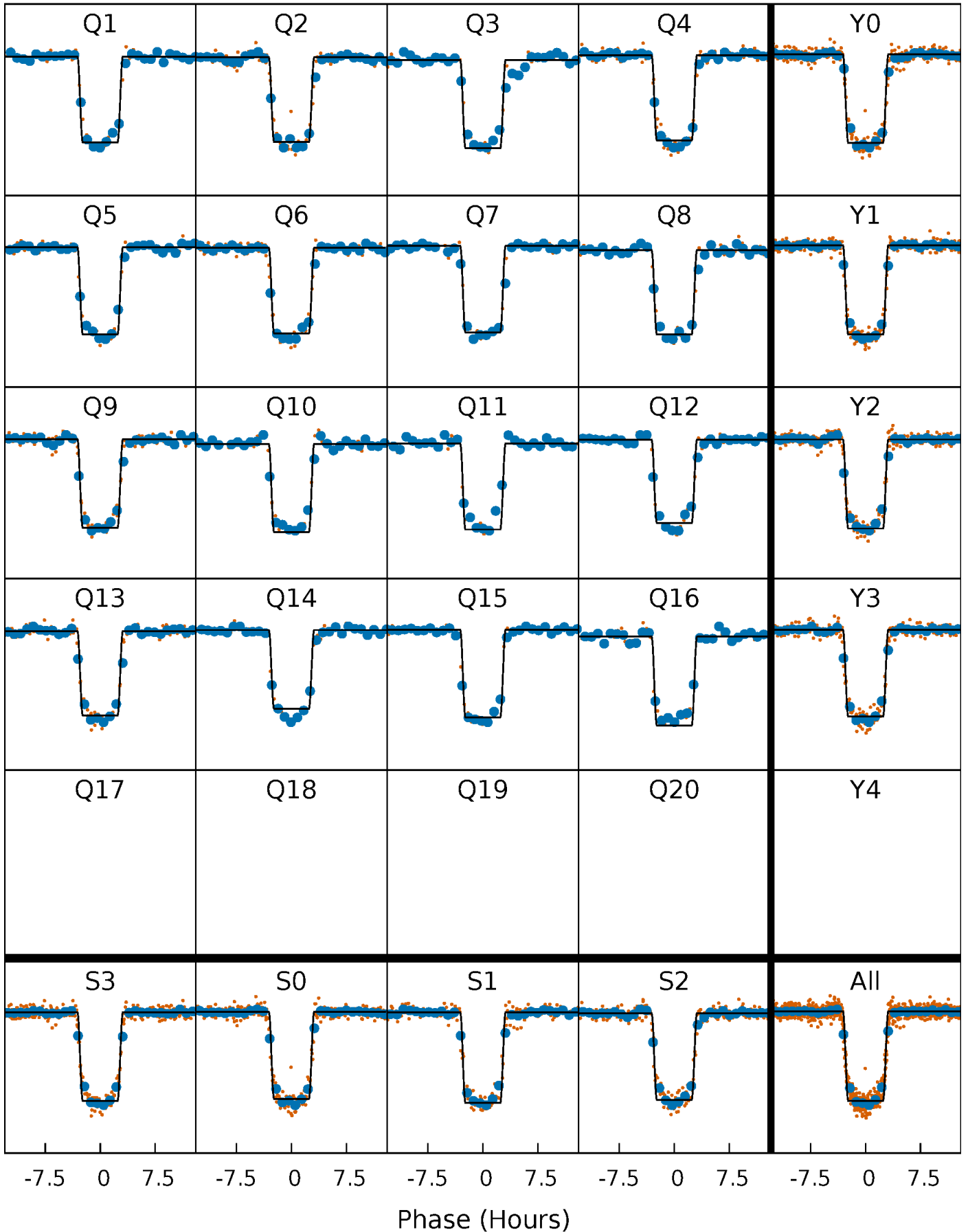
# DV Quarter-Phased Transit Curves

TCE 008890783-01 P= 58.362027 Days  $T_0=138.193468$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

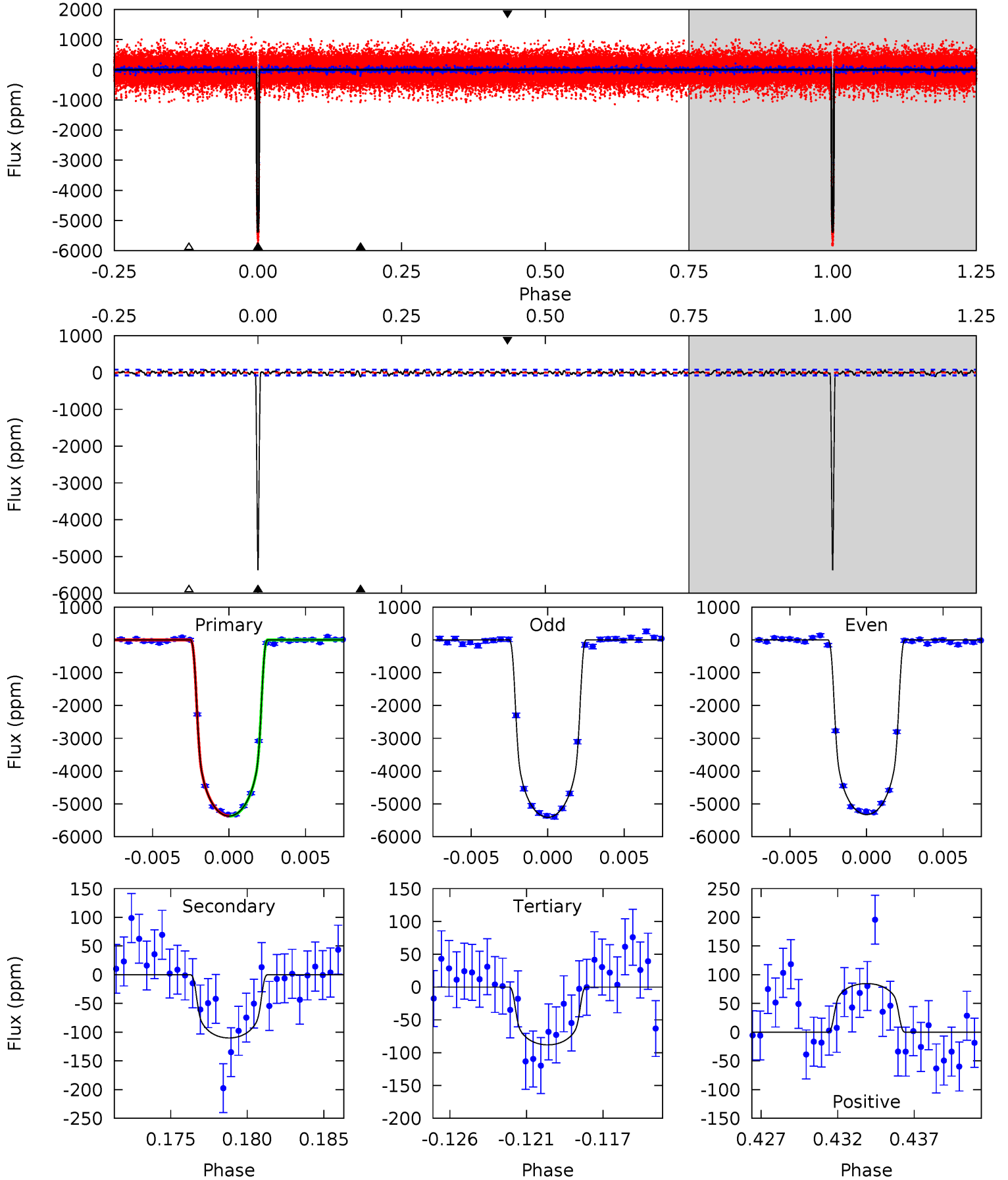
TCE 008890783-01 P= 58.362409 Days  $T_0=138.189420$  (BKJD)



# DV Model-Shift Uniqueness Test

008890783-01, P = 58.362027 Days, E = 79.831441 Days

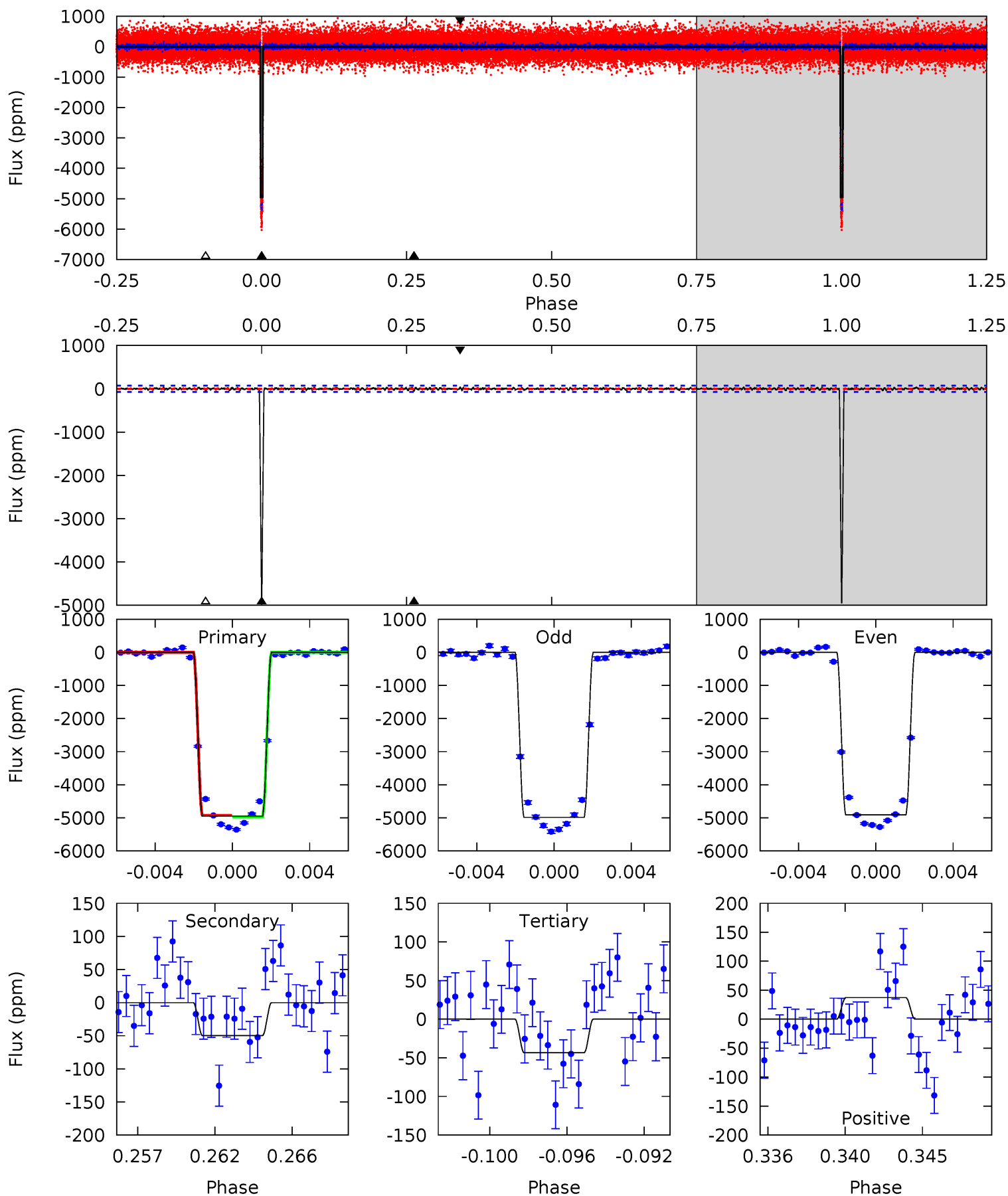
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
354.6	7.27	5.82	5.59	5.16	2.82	1.80	348.8	349.0	1.45	1.68	2.69	1.00	0.02	0.42



# Alt Model-Shift Uniqueness Test

008890783-01, P = 58.362409 Days, E = 79.827011 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
349.7	3.52	3.07	2.63	5.18	2.85	0.86	346.7	347.1	0.45	0.89	2.77	1.00	0.01	1.71



### Stellar Parameters For KIC 008890783

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5592^{+150}_{-166}$	$4.467^{+0.065}_{-0.182}$	$0.160^{+0.200}_{-0.300}$	$0.953^{+0.266}_{-0.106}$	$0.973^{+0.094}_{-0.094}$	$1.580^{+0.496}_{-0.741}$
	+3%/-3%	+1%/-4%	+125%/-188%	+28%/-11%	+10%/-10%	+31%/-47%
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 008890783-01 / KOI 0464.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-110 \pm 15$	$7.27^{+1.05}_{-0.53}$	$634^{+41}_{-31}$	$2885^{+77}_{-66}$	$94^{+22}_{-23}$
Alt.	$-50 \pm 14$	$7.54^{+1.08}_{-0.53}$	$632^{+43}_{-32}$	$2575^{+94}_{-117}$	$38^{+15}_{-12}$

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

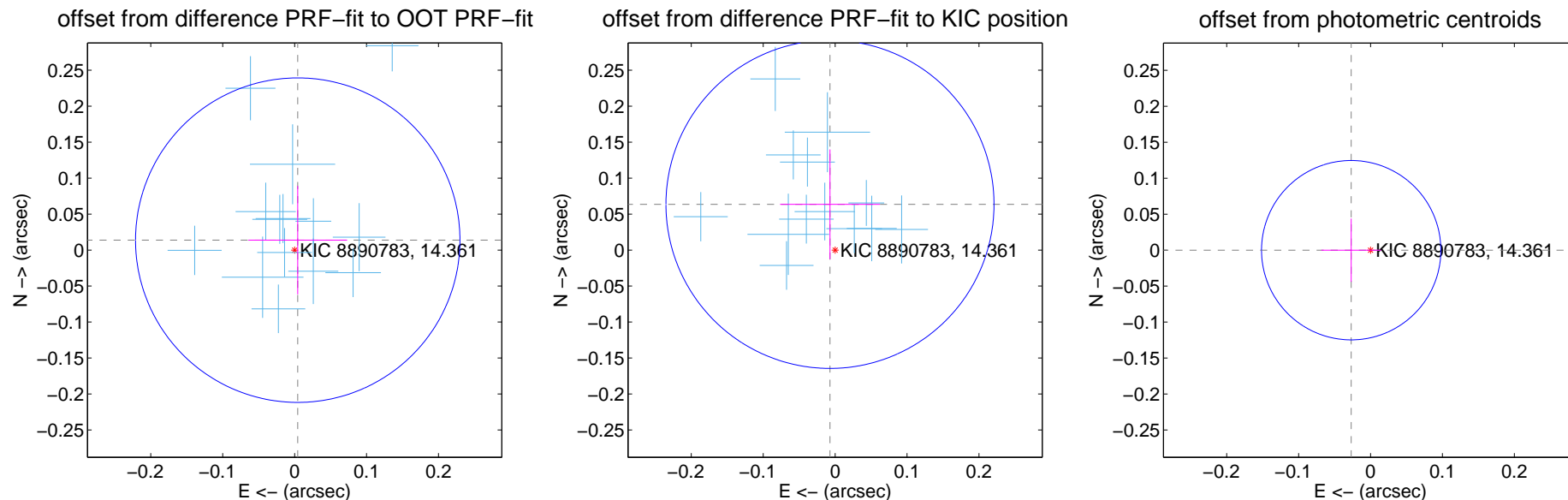
## DV Centroid Data

Supplemental centroid analysis for 008890783-01. Kepler magnitude: 14.36. Transit SNR 190.27

There are 15 quarters with good PRF difference image offsets

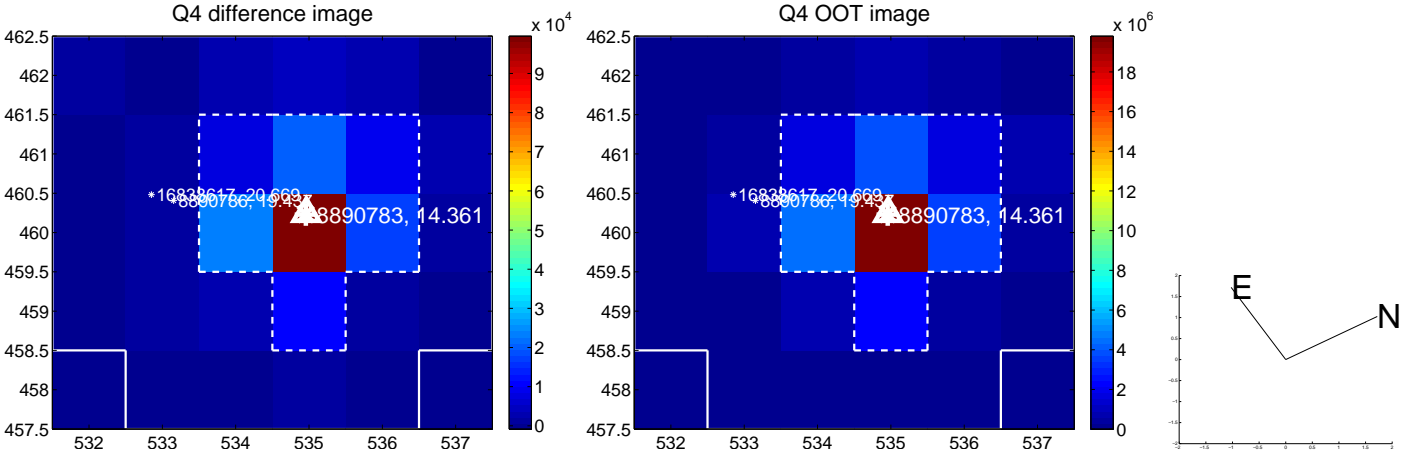
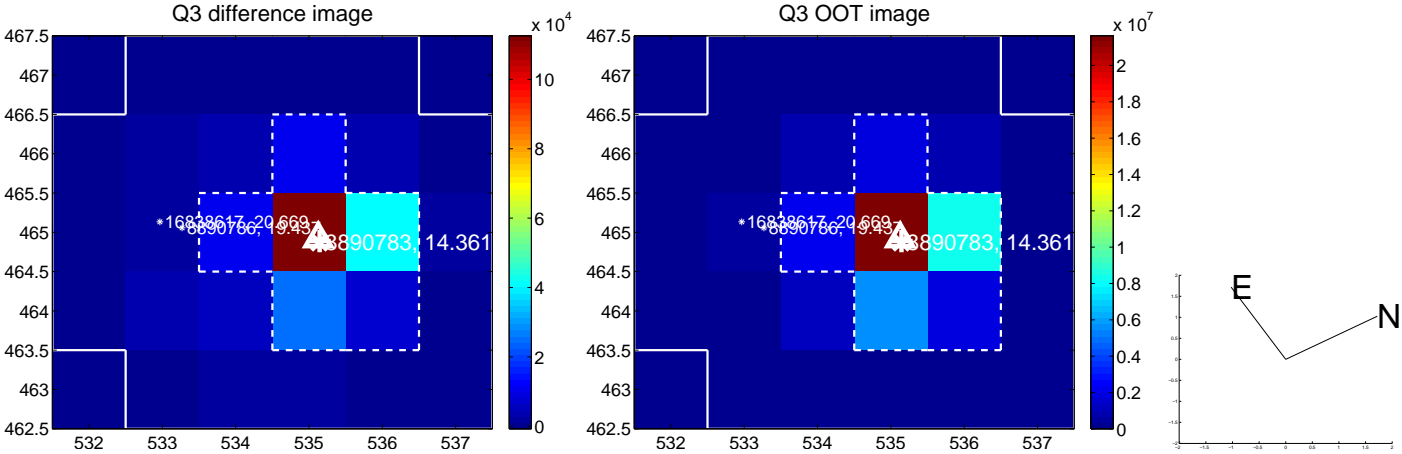
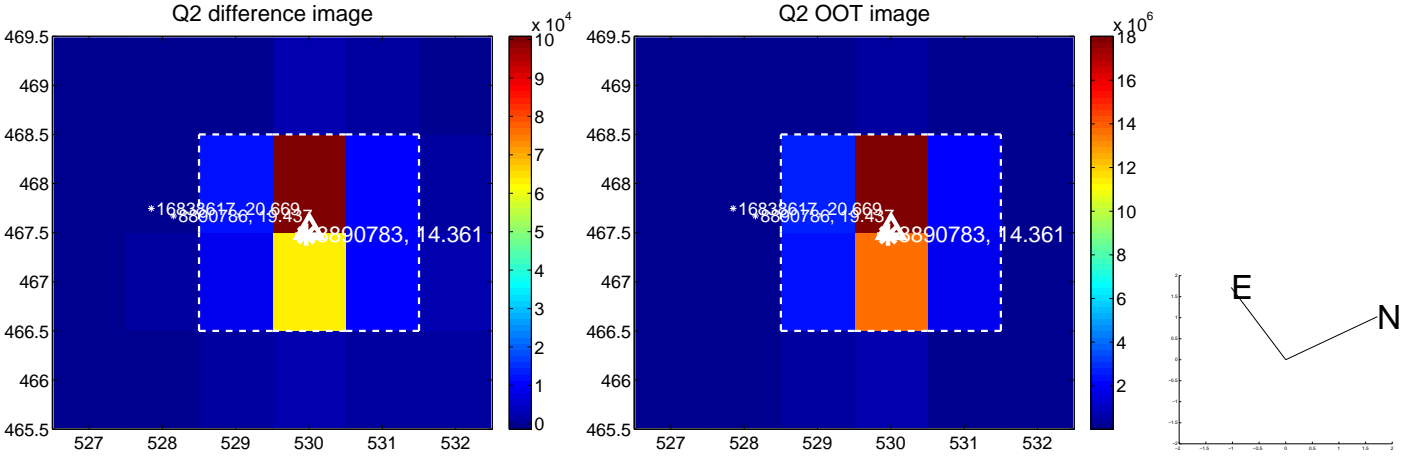
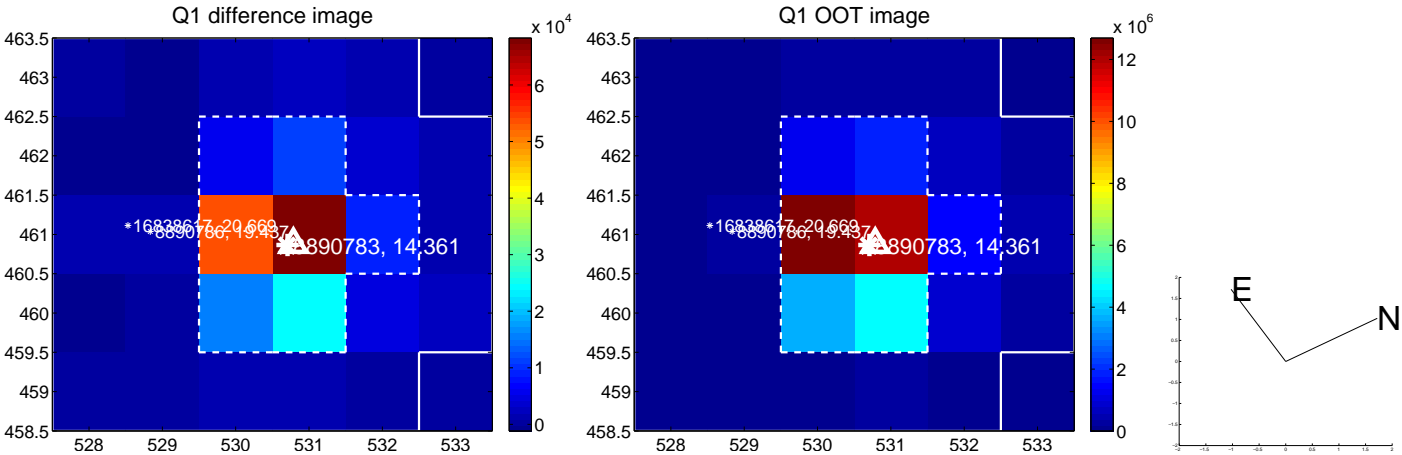
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.014 \pm 0.075$	0.19	$-0.004 \pm 0.069$	$0.014 \pm 0.075$
PRF-fit source offset from KIC position	$0.064 \pm 0.076$	0.84	$0.007 \pm 0.069$	$0.064 \pm 0.076$
photometric centroid source offset	$0.03 \pm 0.04$	0.65	$0.03 \pm 0.04$	$-0.00 \pm 0.04$

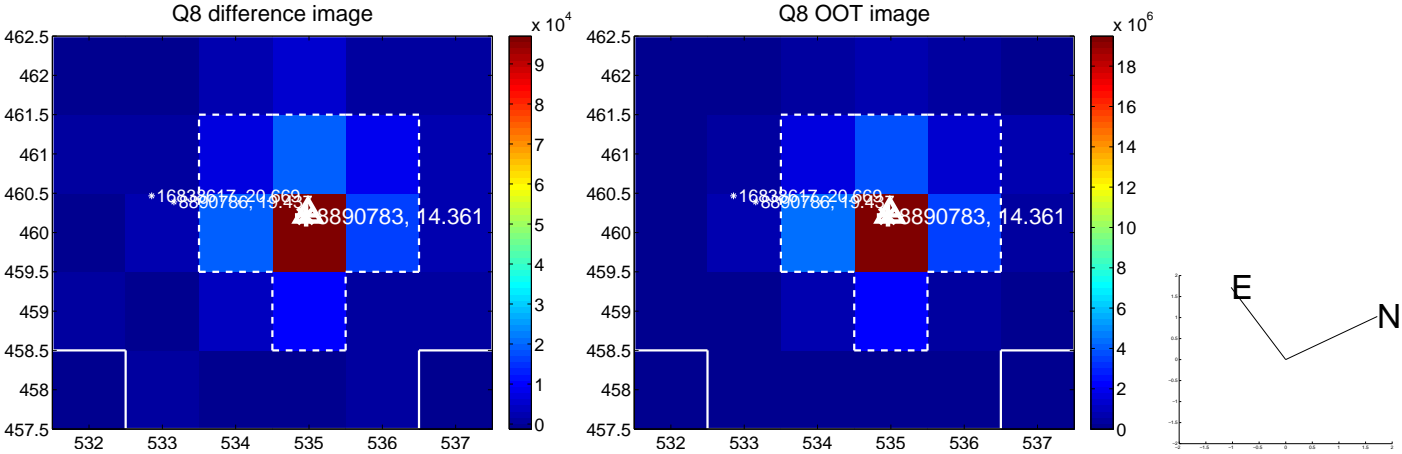
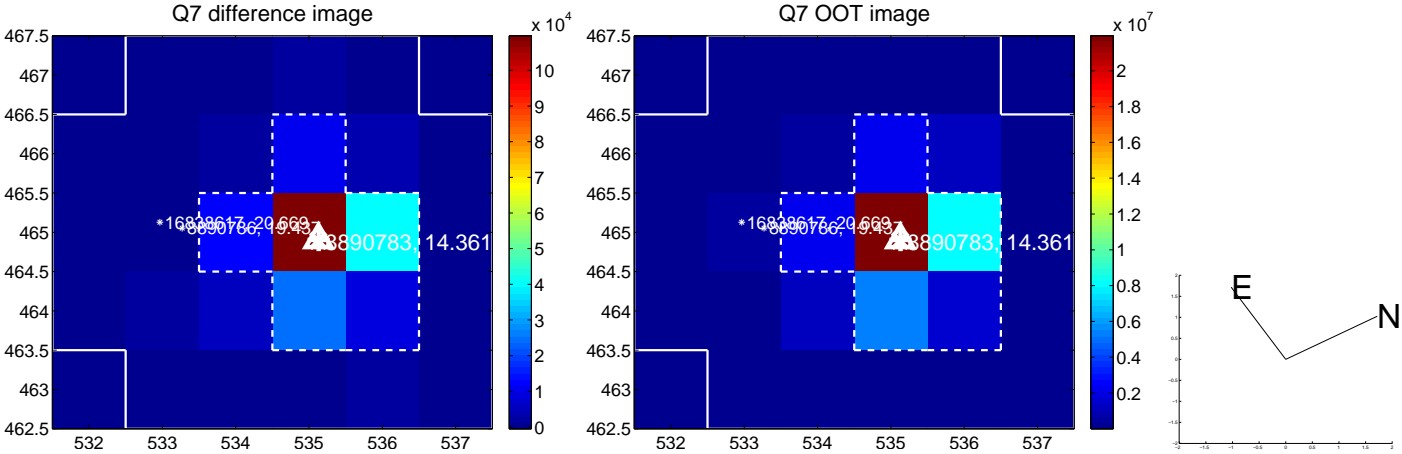
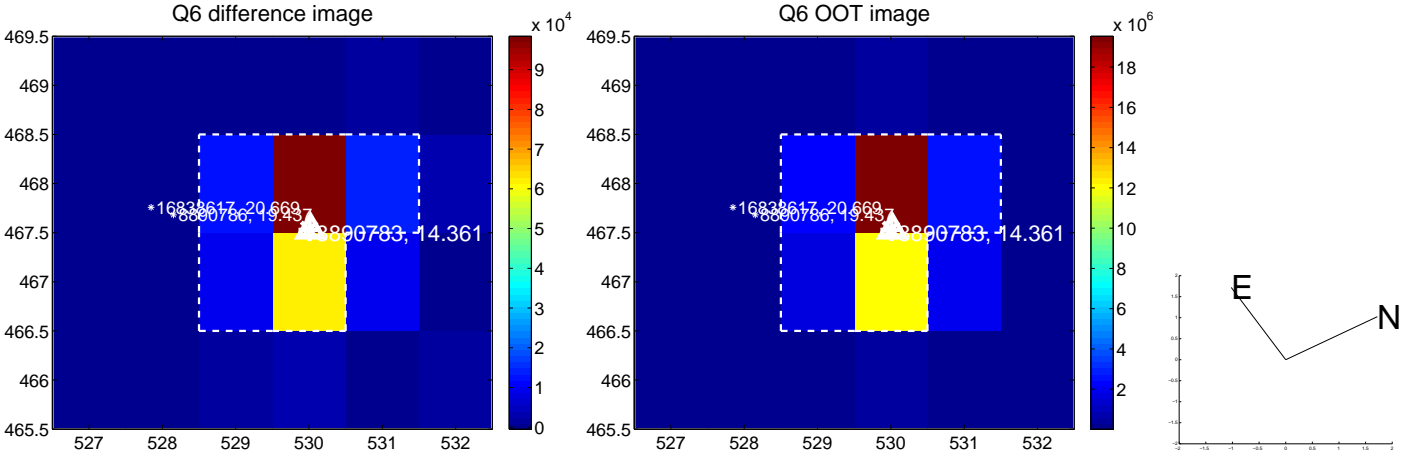
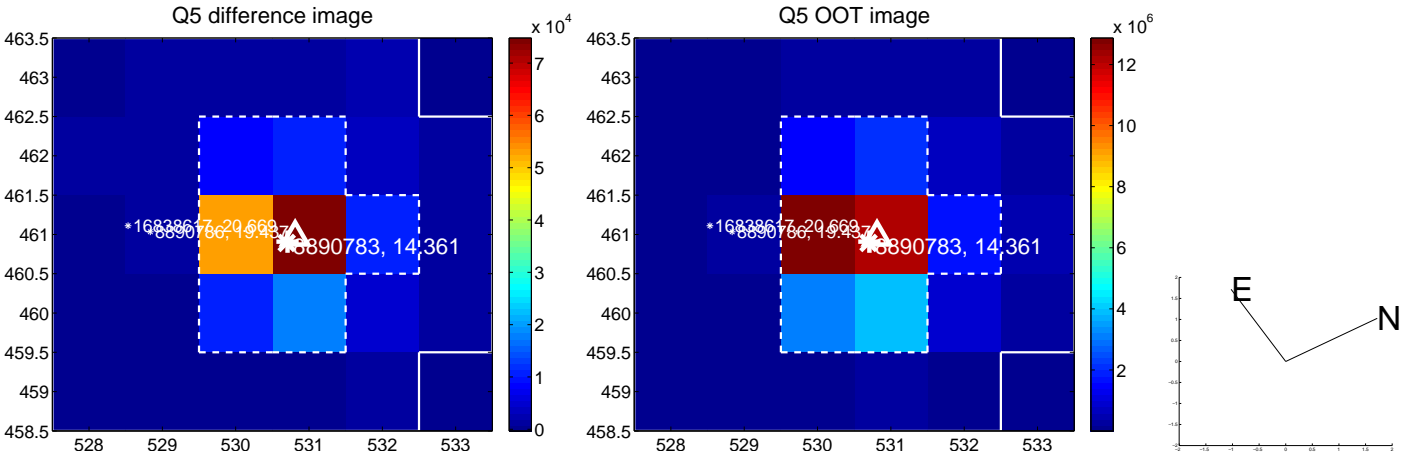


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

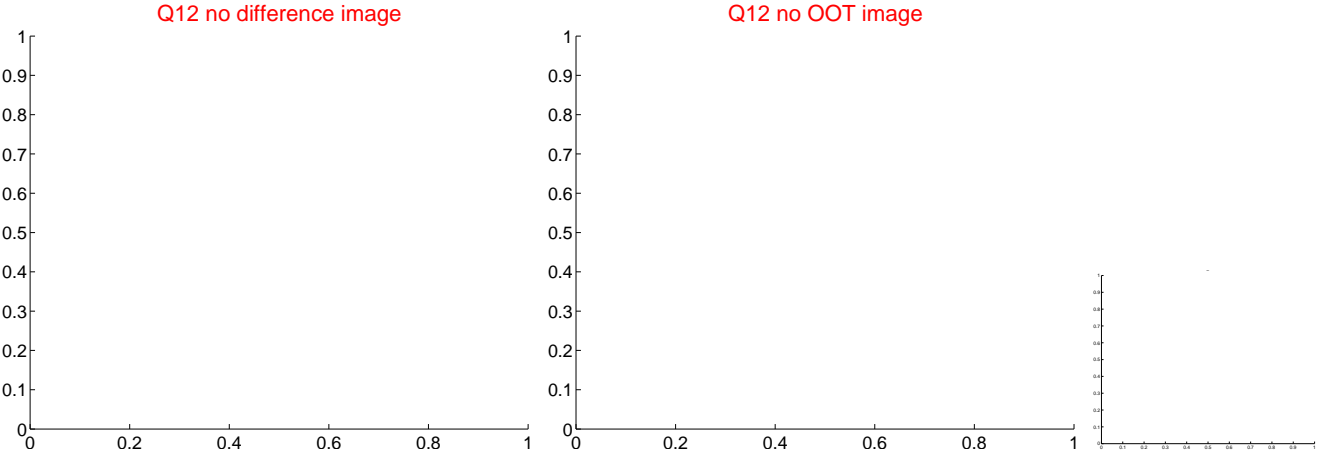
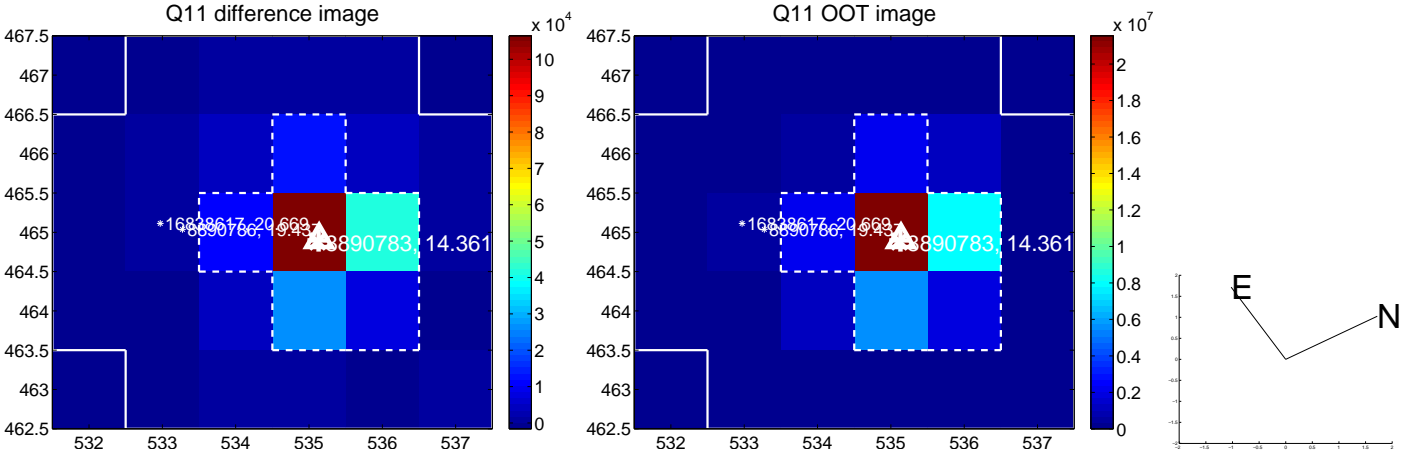
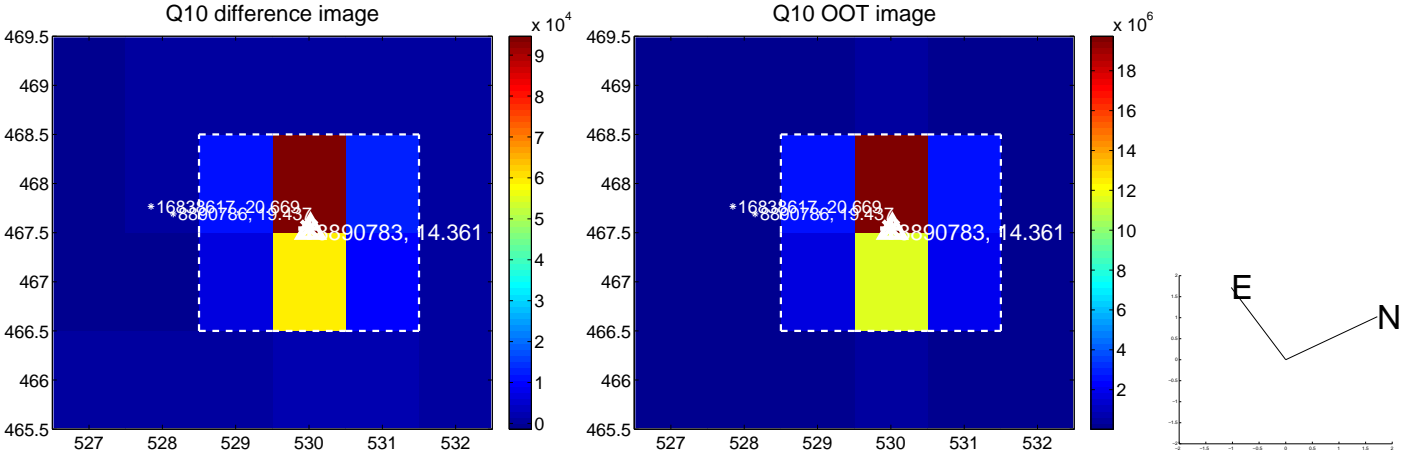
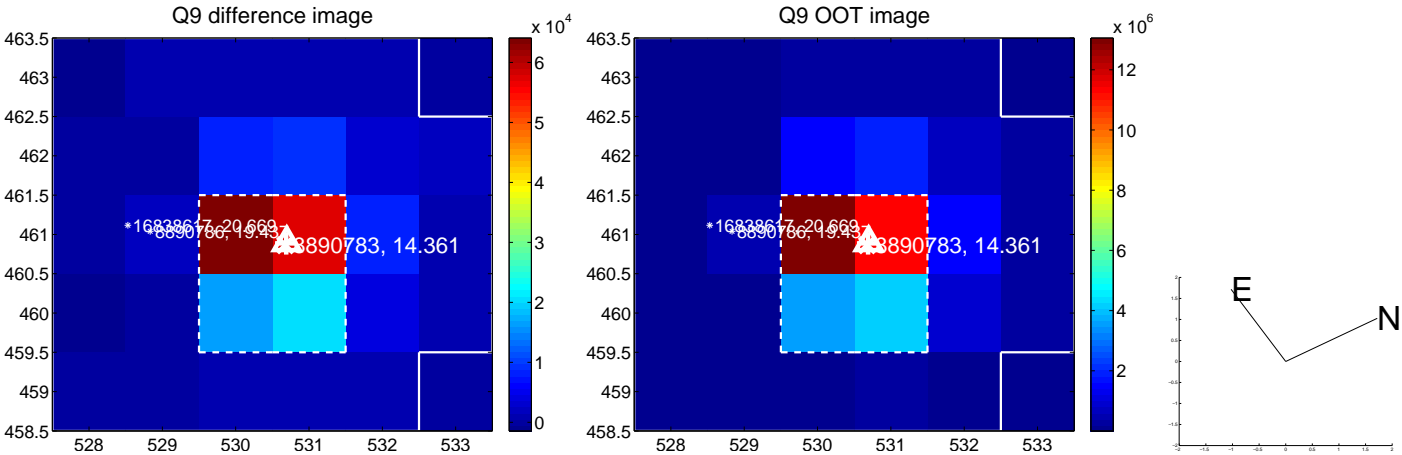


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

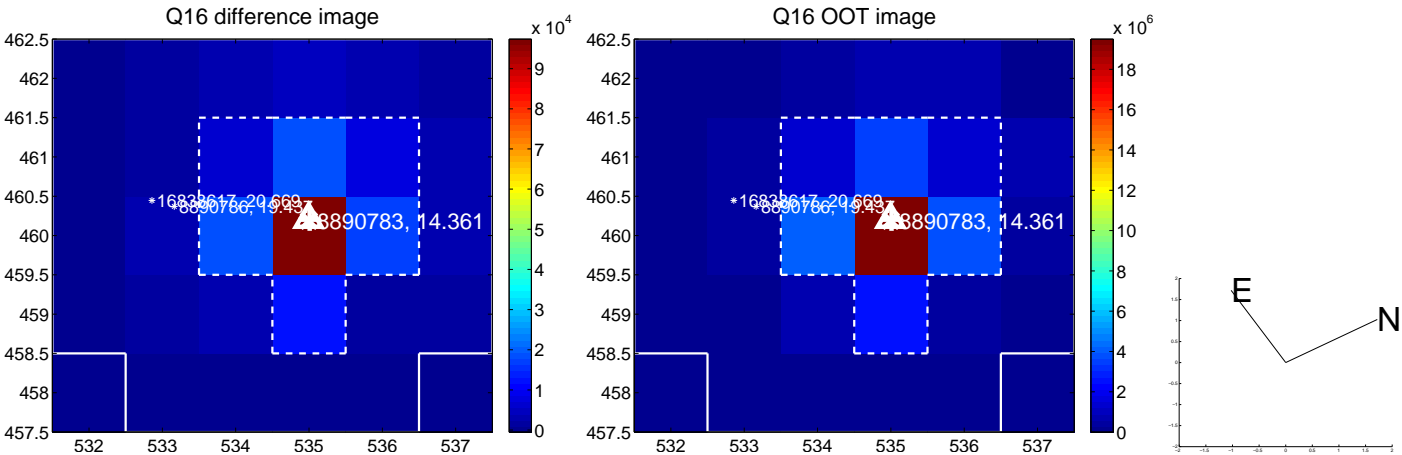
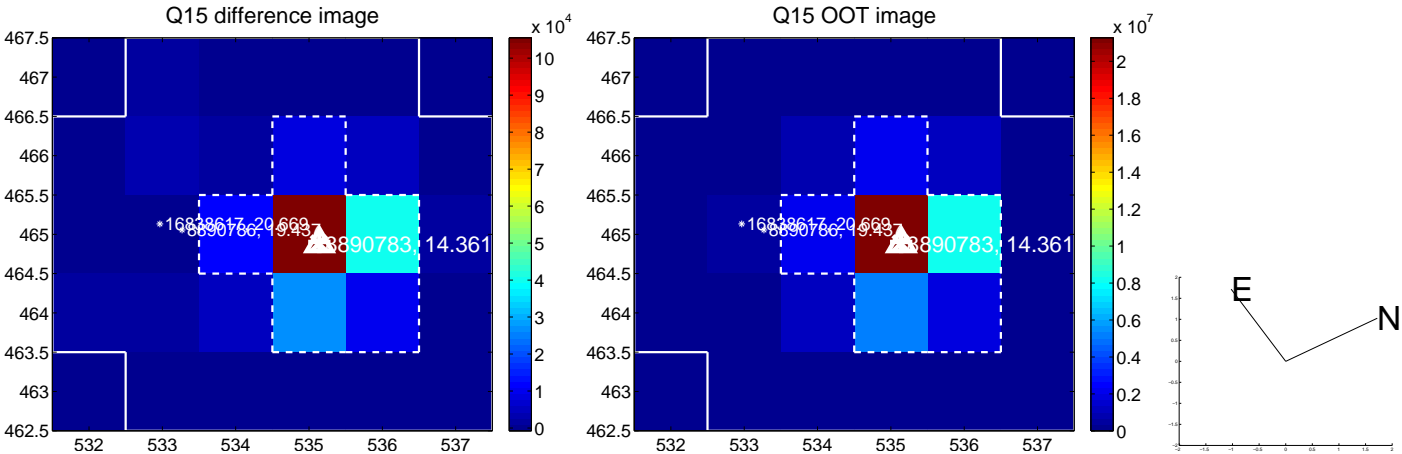
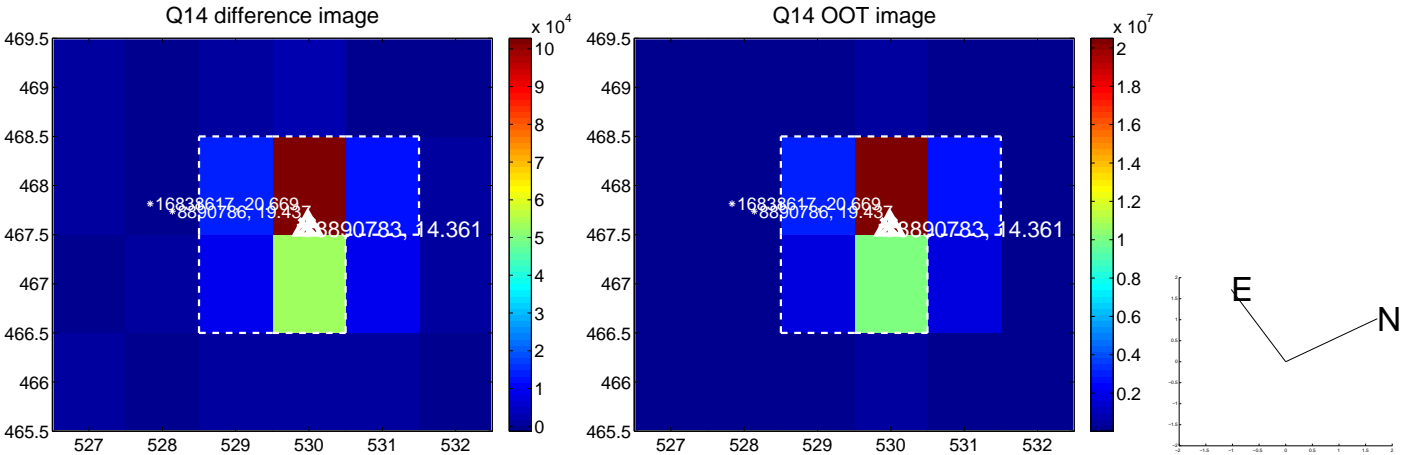
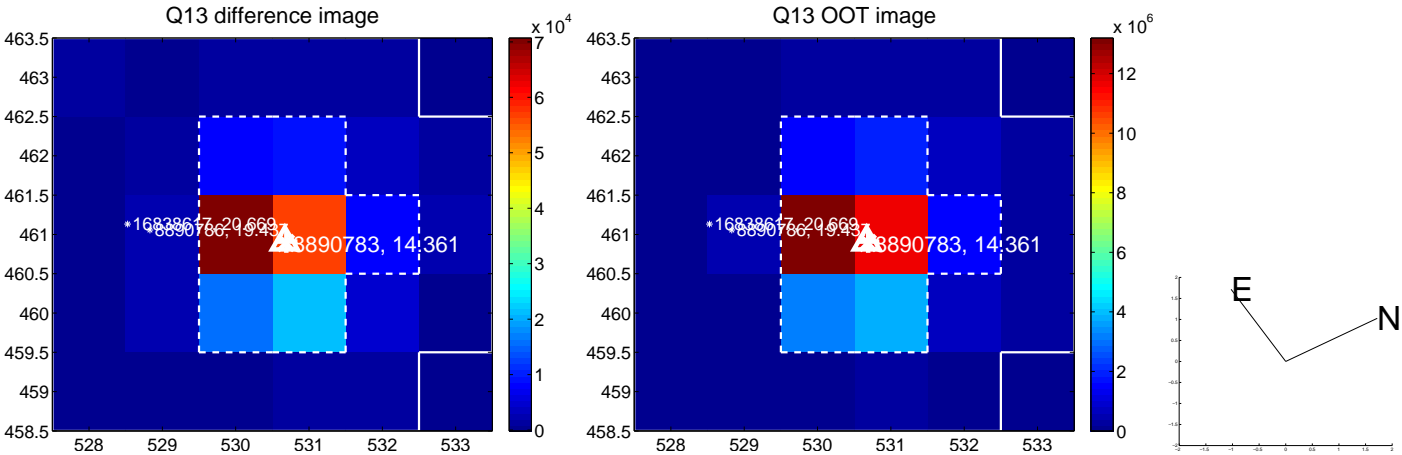




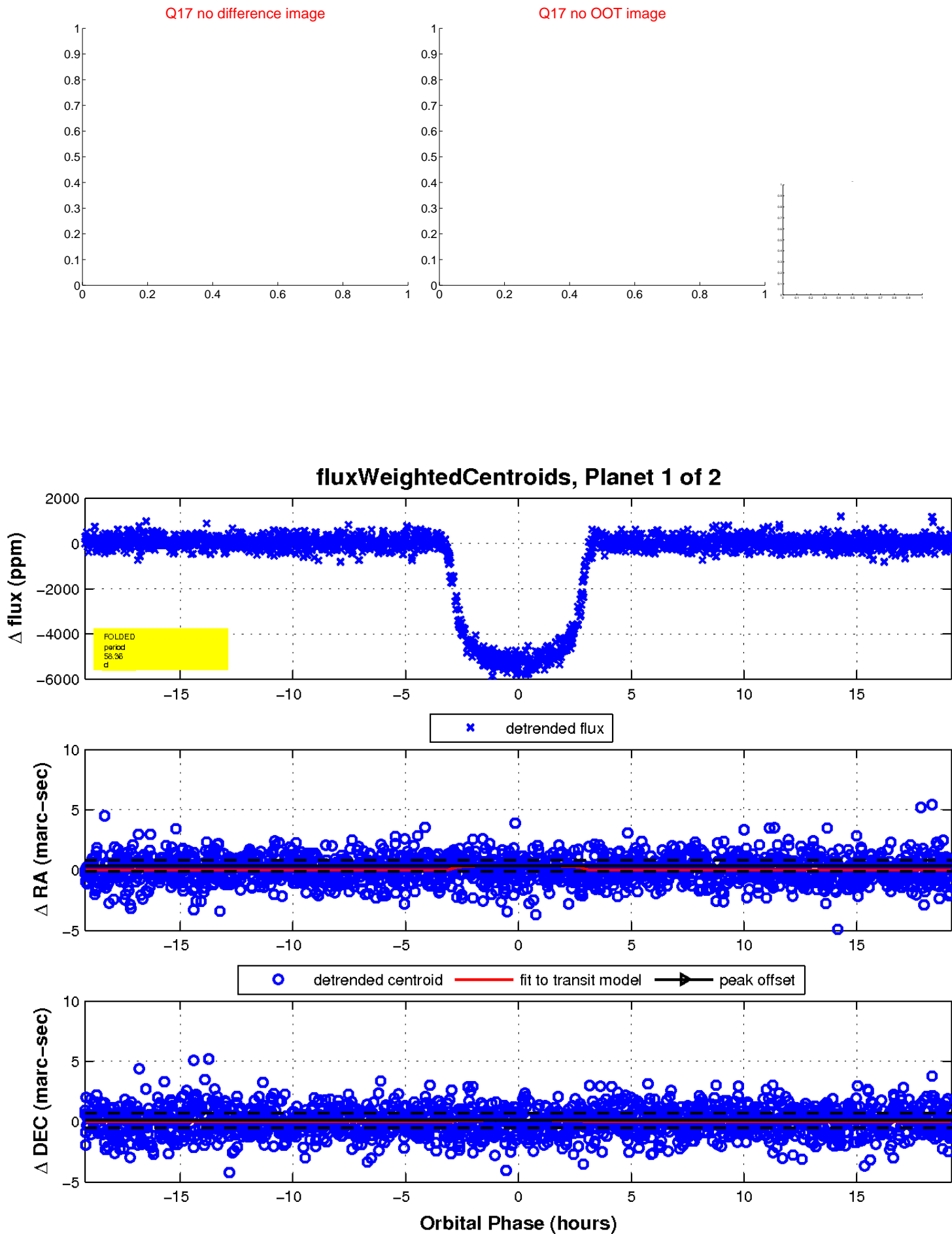
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

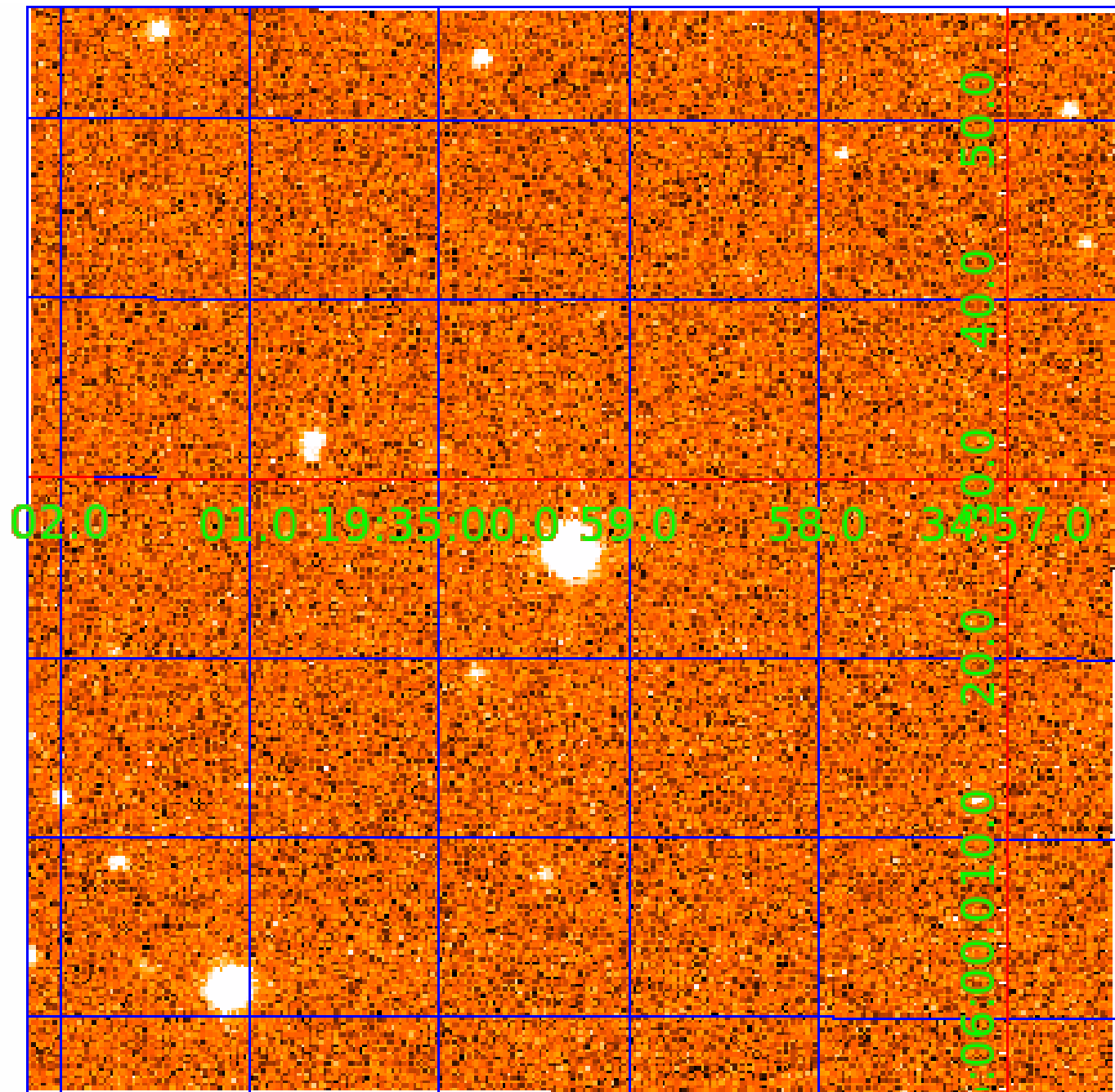


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008890783

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008890783-01	OBS	0464.01	58.362027	138.193468	5366.5	6.405	201.5	190.3	0.95	5592	7.10	9.36
008890783-02	OBS	0464.02	5.350173	131.557202	747.8	2.384	67.4	74.7	0.95	5592	2.87	226.33

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008890783-01	OBS	PC	0.96	0	0	0	0	NO_COMMENT
008890783-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

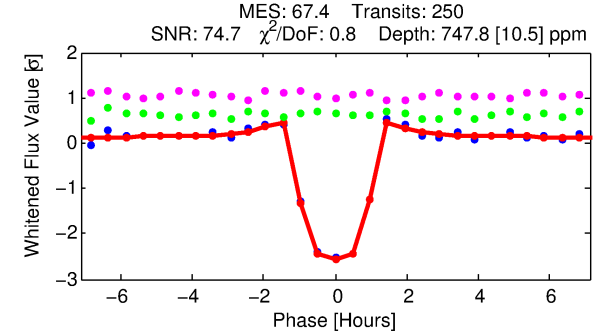
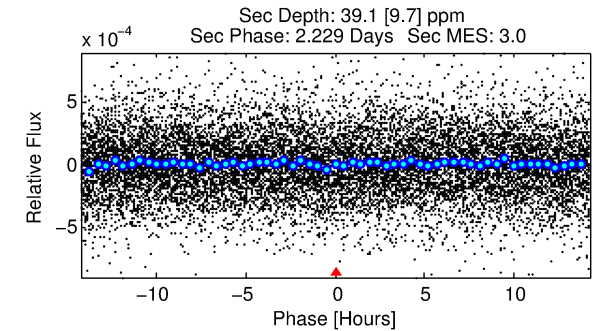
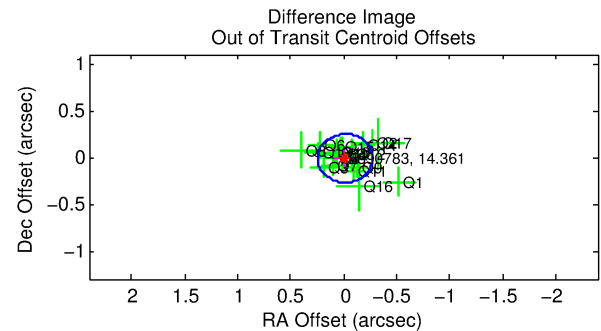
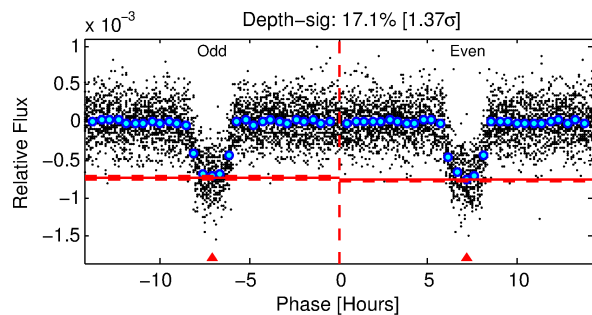
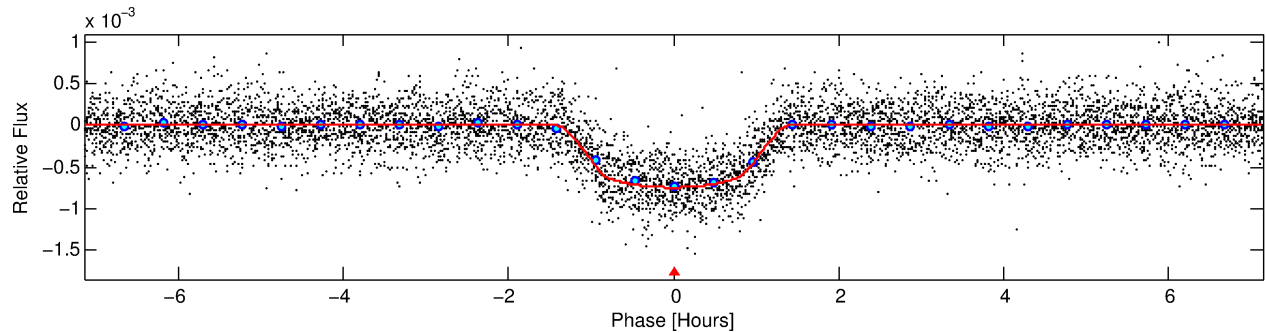
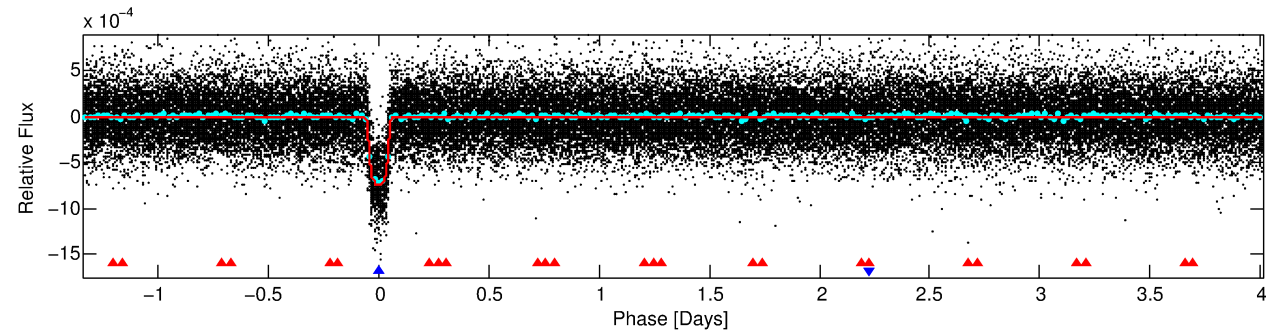
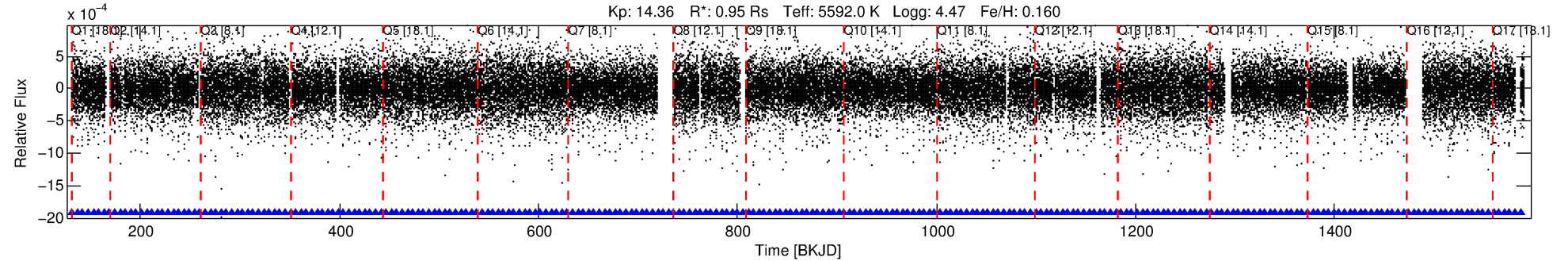
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008890783-02

No Significant Match Found

# DV One-Page Summary

KIC: 8890783 Candidate: 2 of 2 Period: 5.350 d  
KOI: K00464.02 Corr: 0.970



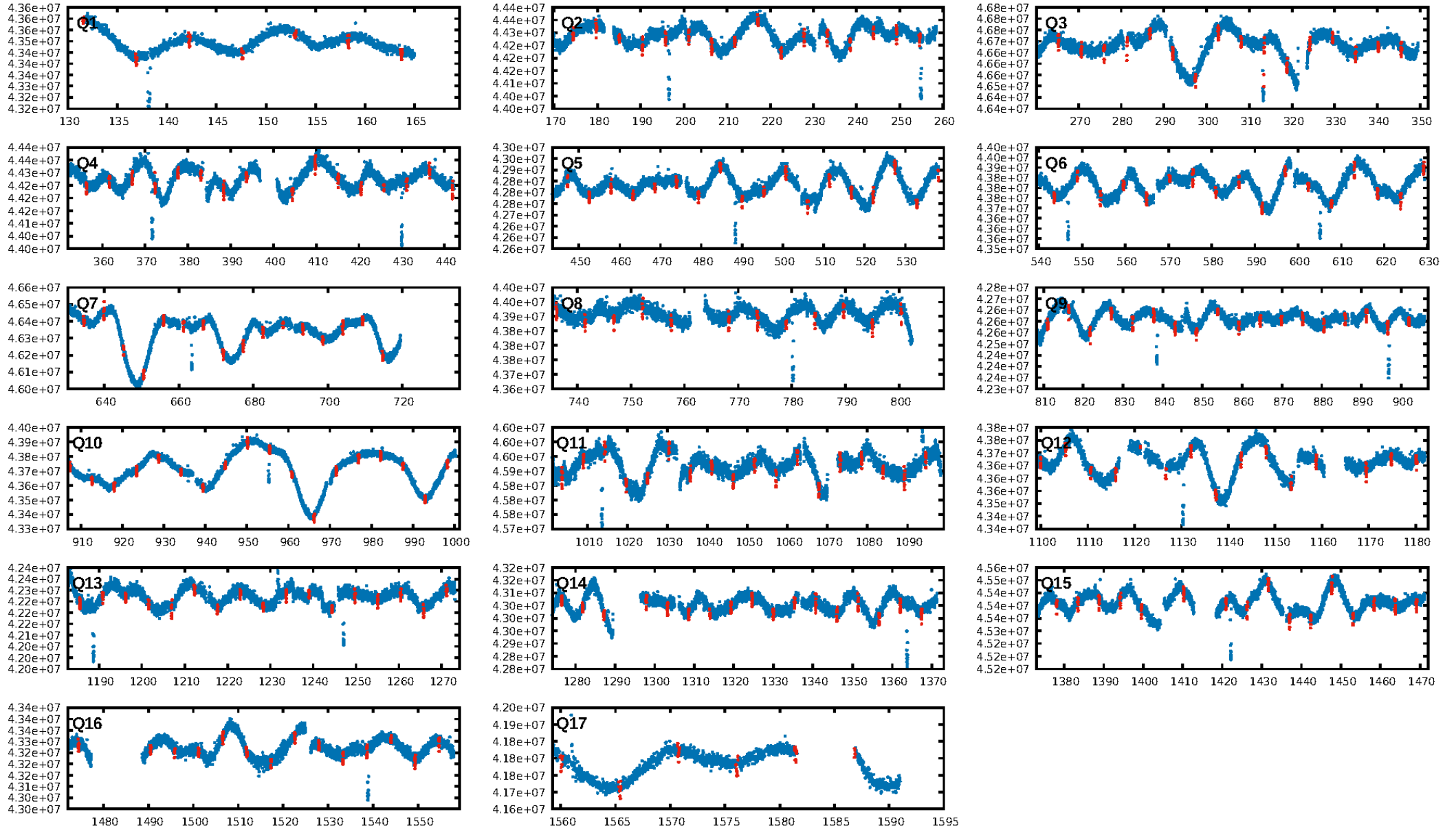
## DV Fit Results:

Period = 5.35017 [0.00000] d  
Epoch = 131.5572 [0.0005] BKJD  
Rp/R\* = 0.0276 [0.0035]  
a/R\* = 11.61 [5.96]  
b = 0.77 [0.27]  
Seff = 226.33 [80.59]  
Teff = 989 [88] K  
Rp = 2.87 [0.88] Re  
a = 0.0593 [0.0138] AU  
Ag = 9.18 [4.49] [1.82 $\sigma$ ]  
Teffp = 2662 [249] K [6.32 $\sigma$ ]

## DV Diagnostic Results:

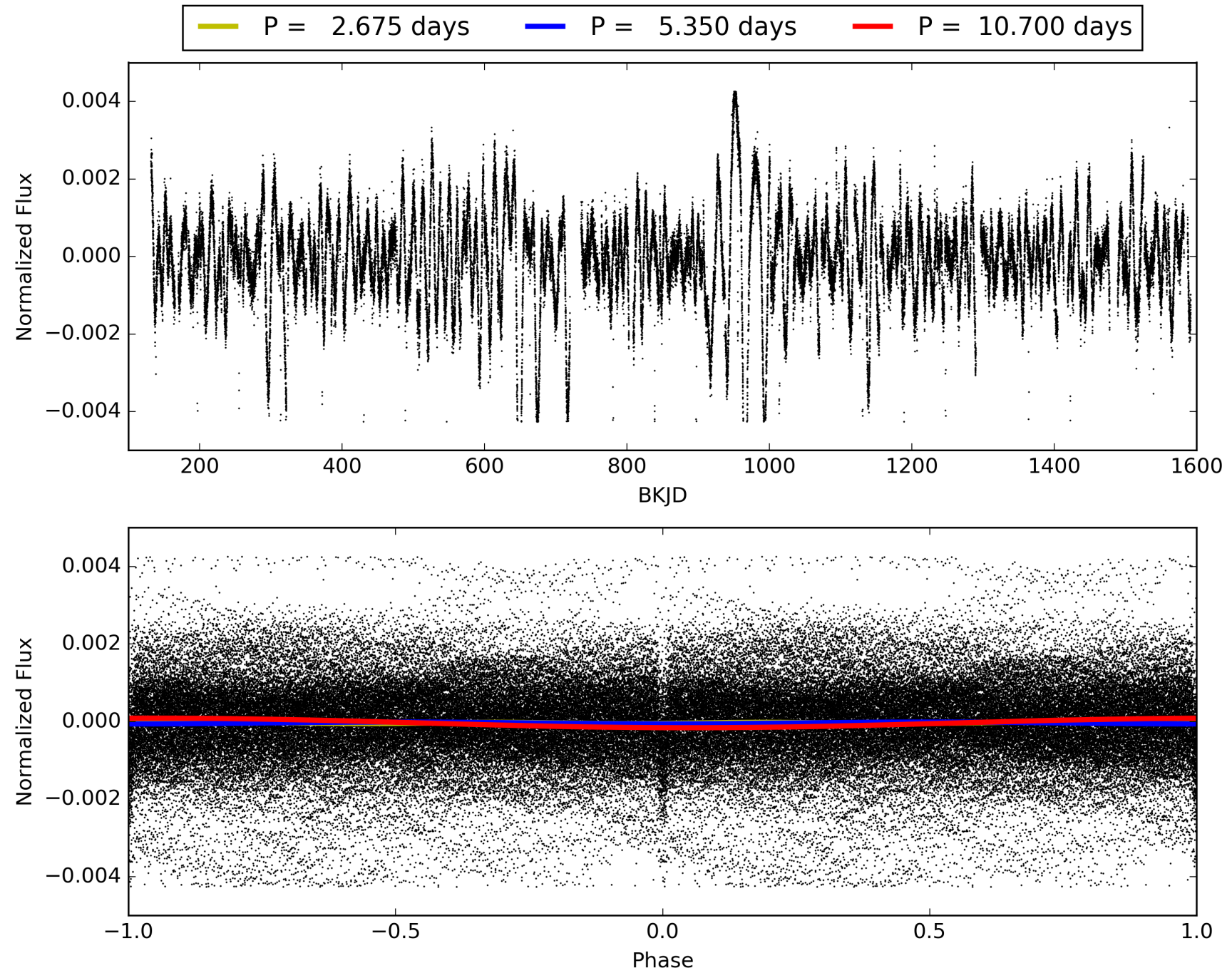
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [186.16 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [237/237]  
GhostDiagnostic-chr: 5.667  
Centroid-sig: 0.2%  
Centroid-so: 0.264 arcsec [1.89 $\sigma$ ]  
OotOffset-rm: 0.017 arcsec [0.20 $\sigma$ ]  
KicOffset-rm: 0.044 arcsec [0.57 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 008890783-02, PDC Light Curves





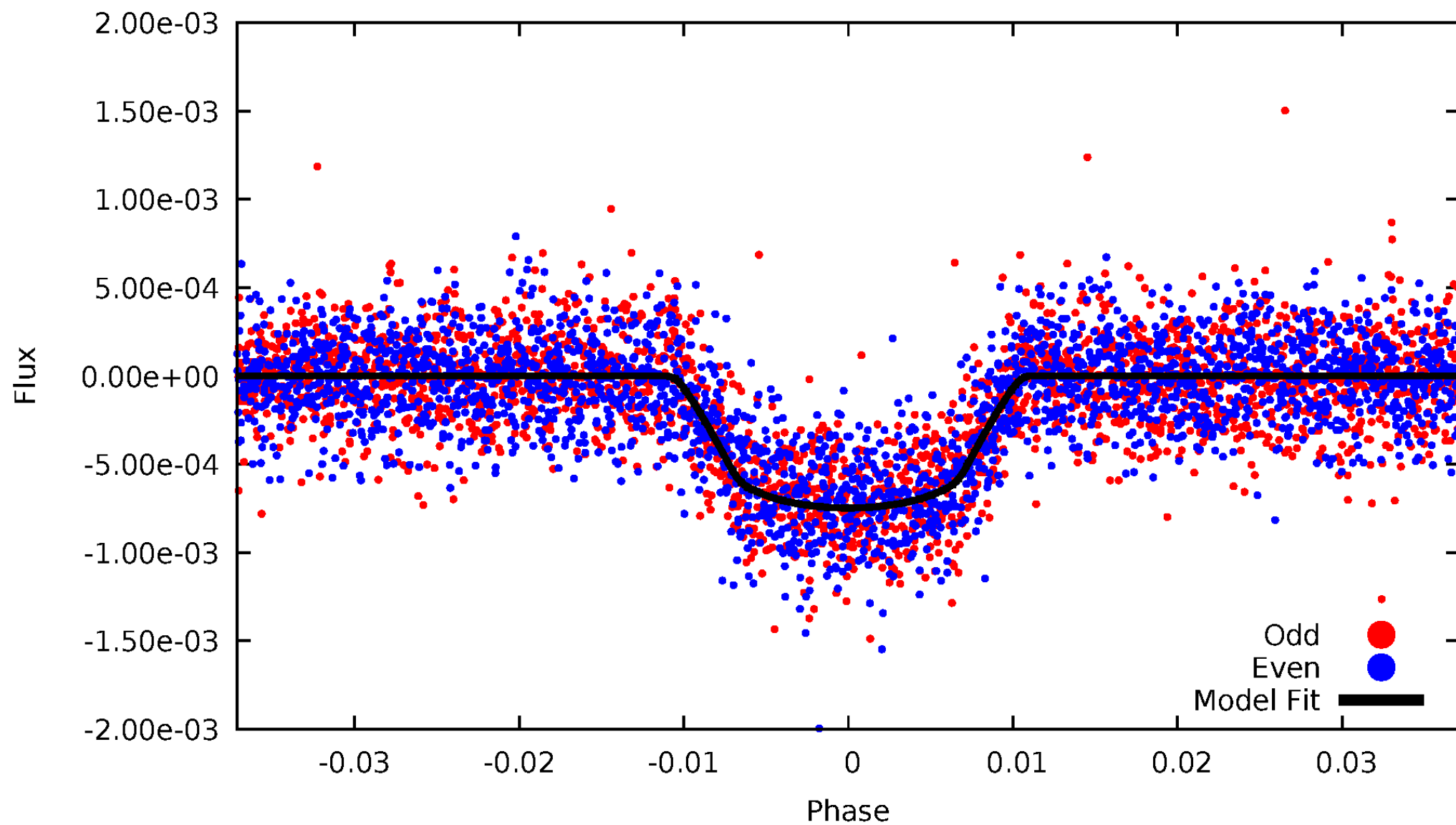
TCE 008890783-02





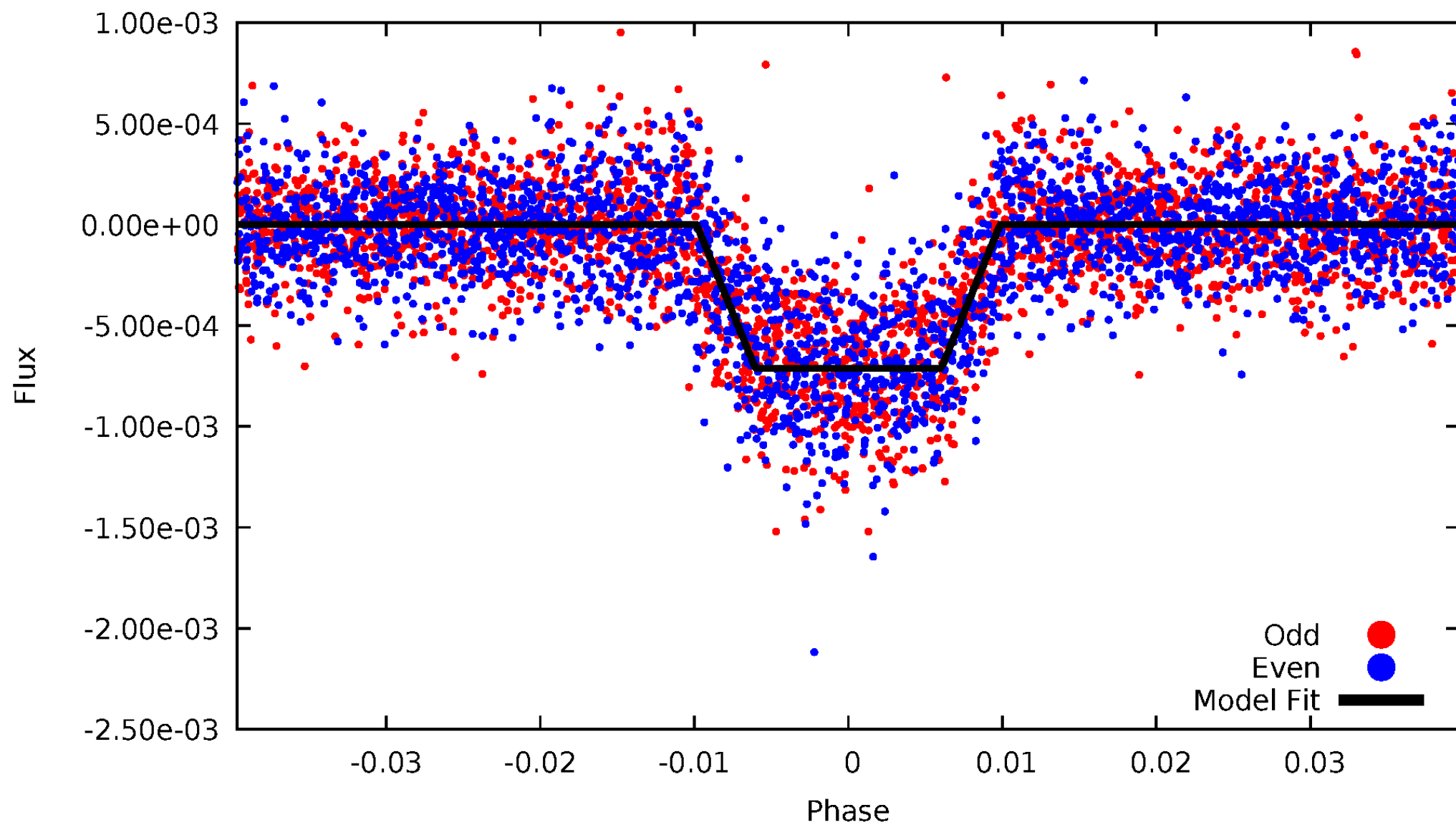
# DV Odd/Even

TCE 008890783-02



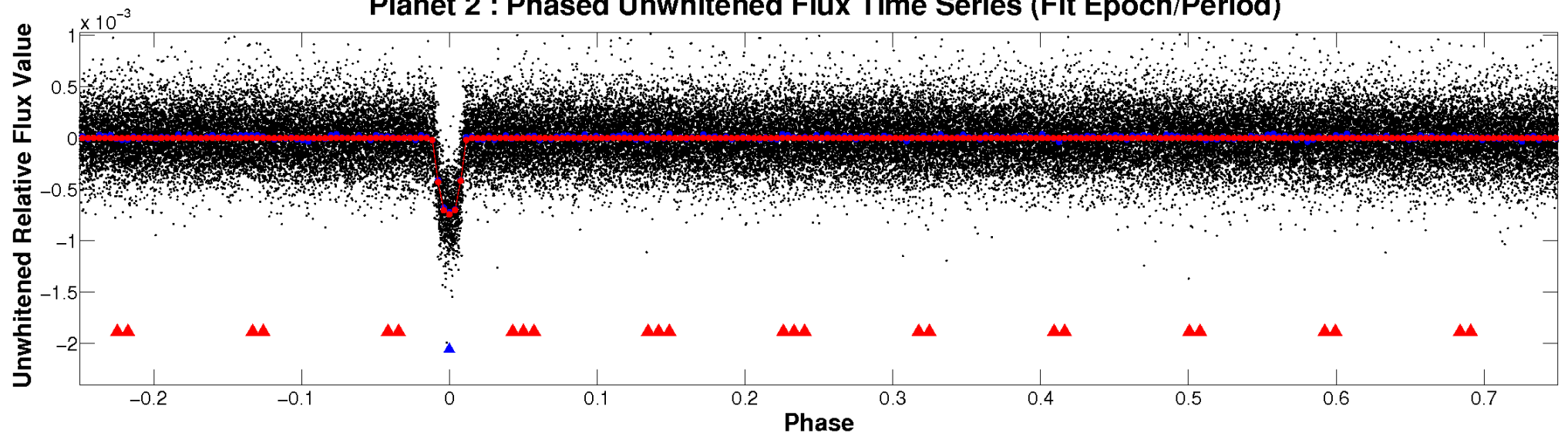
# ALT Odd/Even

TCE 008890783-02

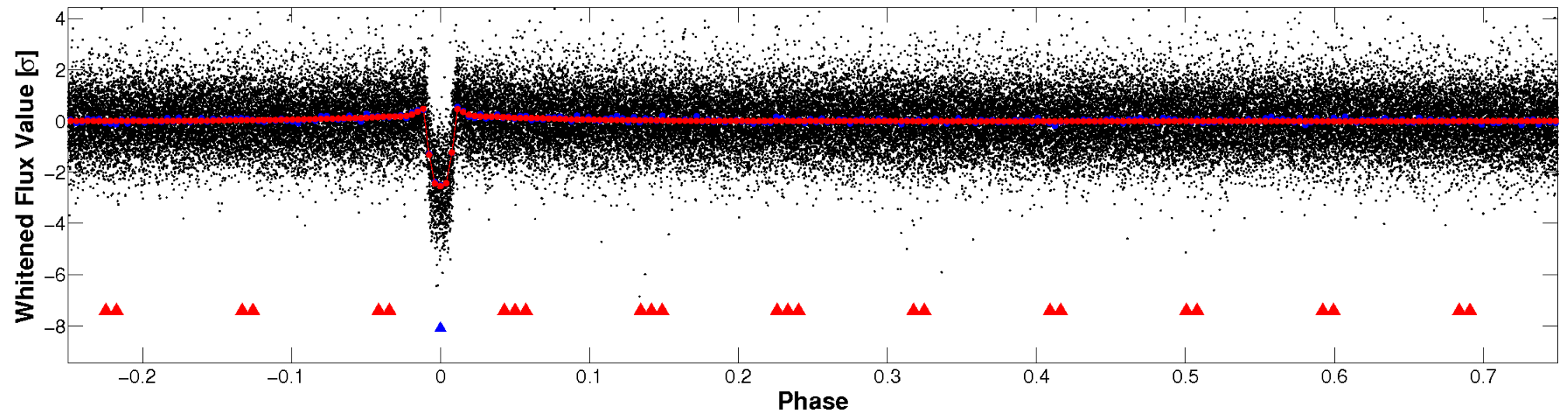


# Non-Whitened Vs. Whitened Light Curve

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

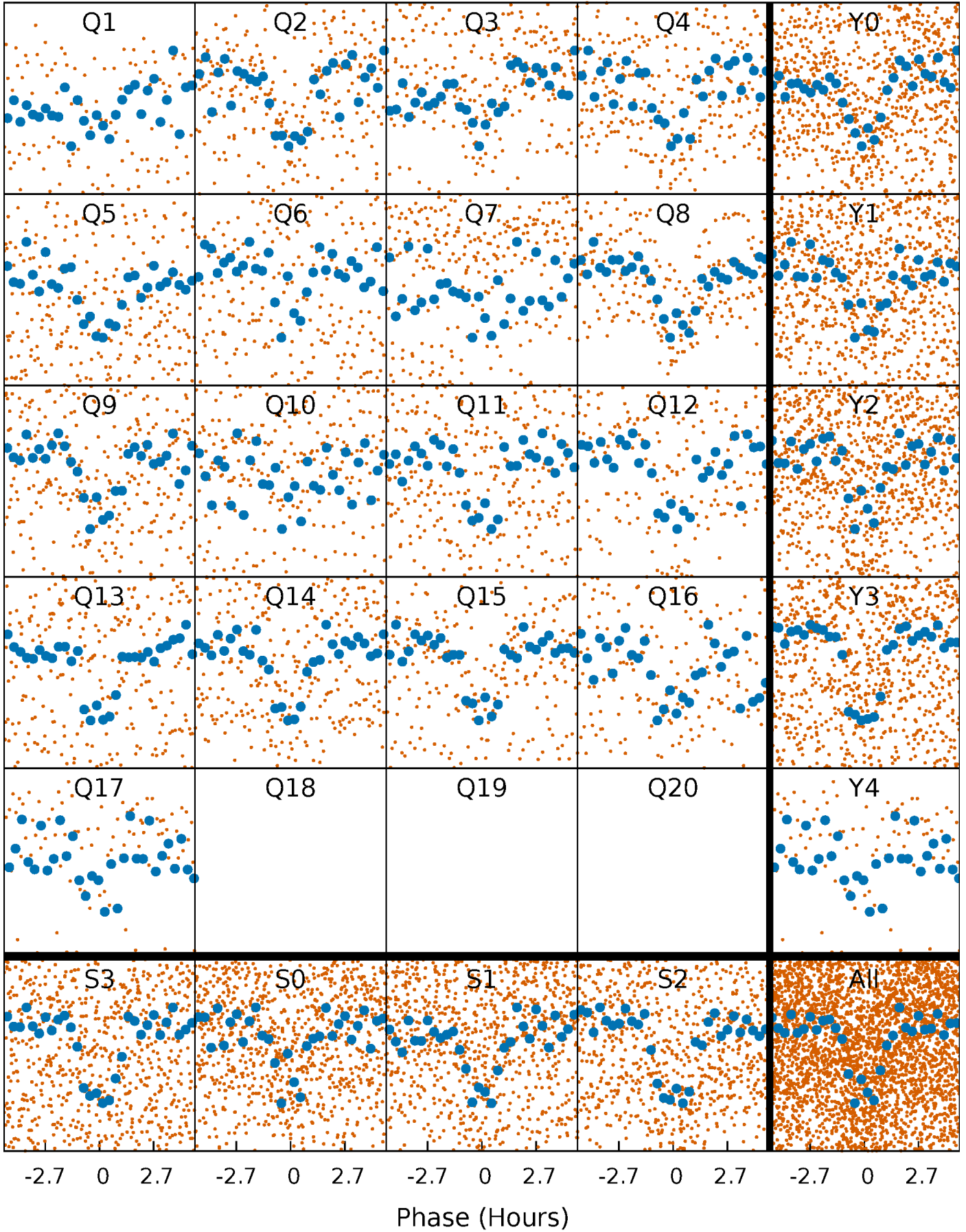


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



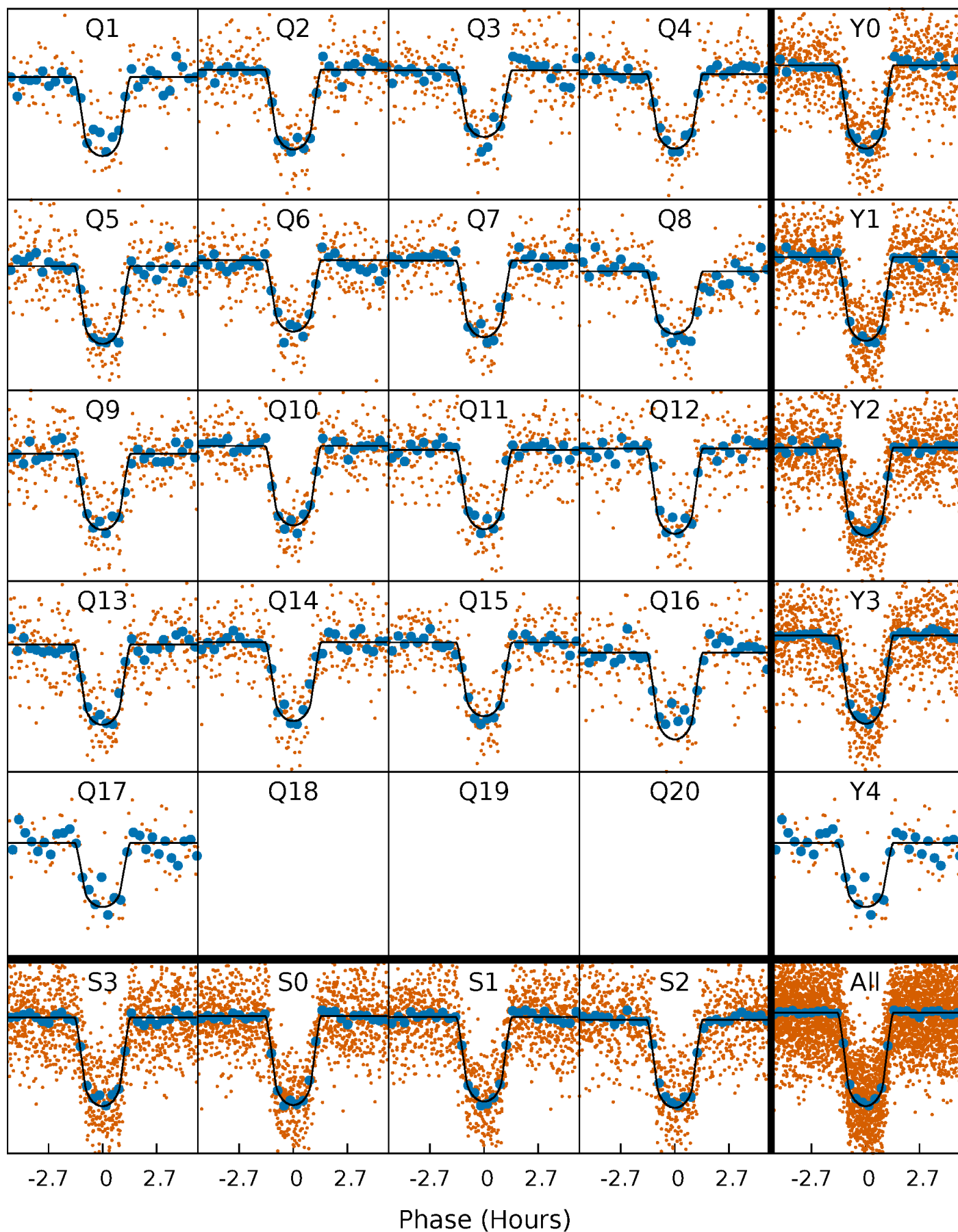
# PDC Quarter-Phased Transit Curves

TCE 008890783-02   P= 5.350173 Days    $T_0=131.557202$  (BKJD)



# DV Quarter-Phased Transit Curves

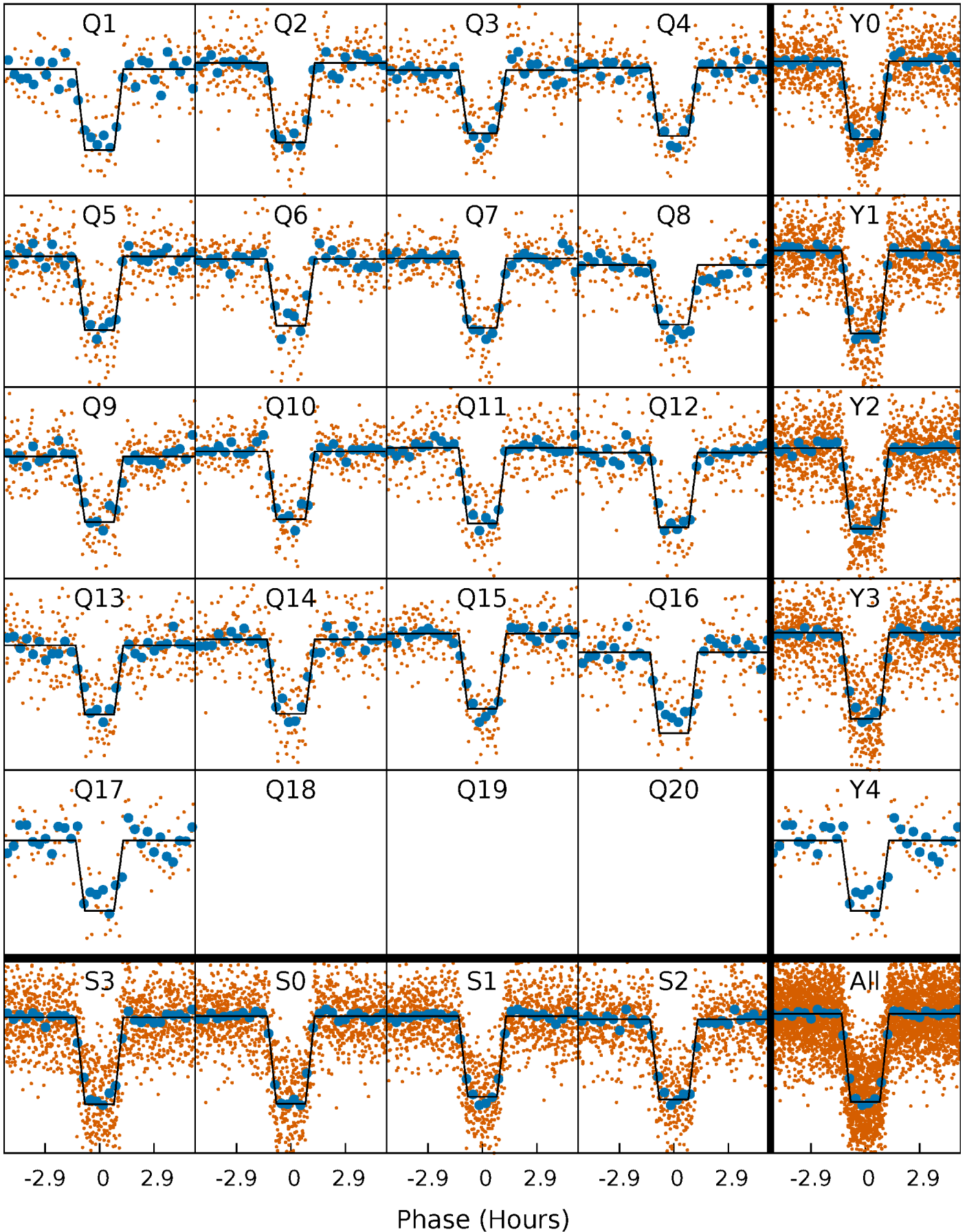
TCE 008890783-02   P= 5.350173 Days    $T_0=131.557202$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

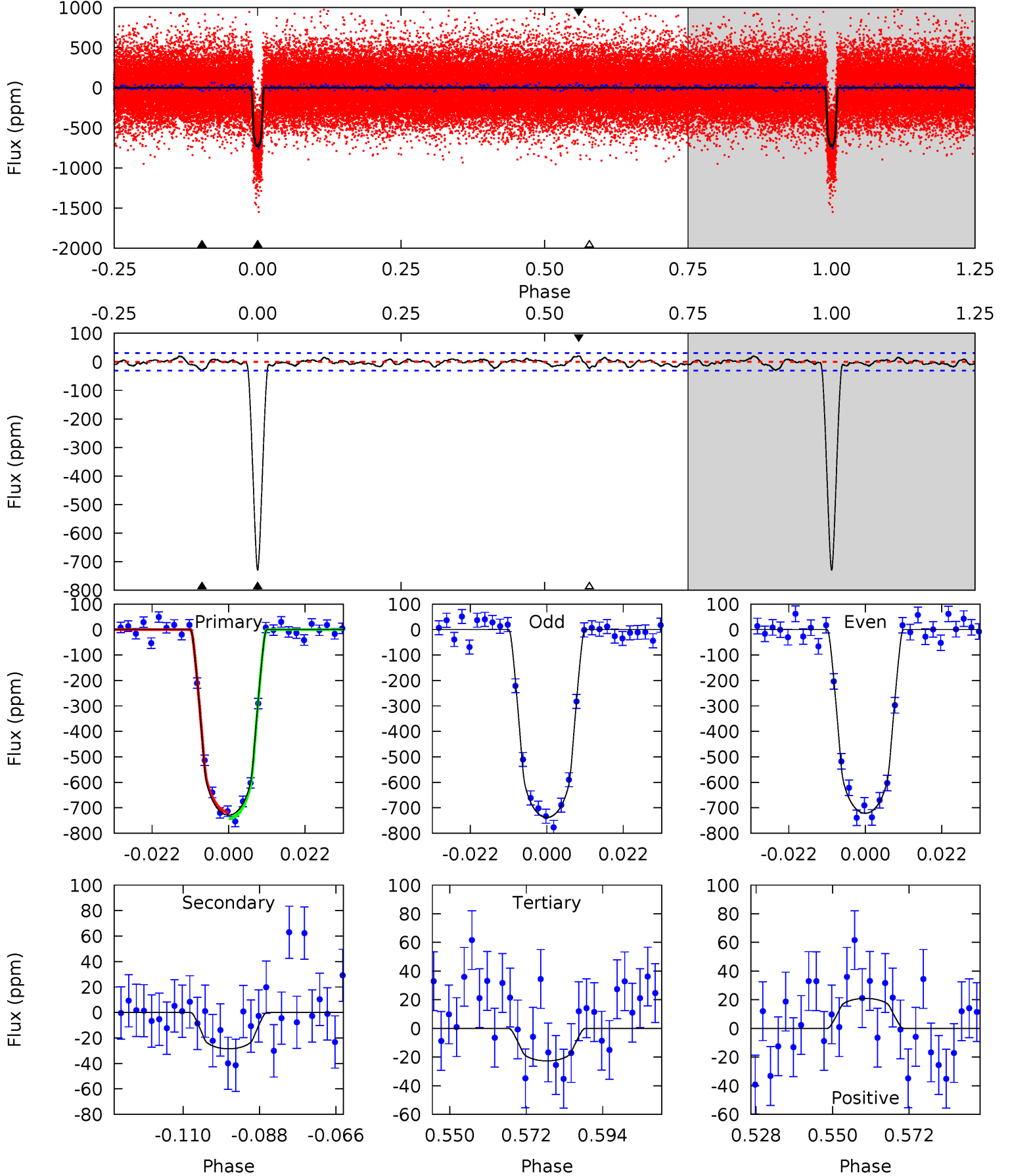
TCE 008890783-02 P= 5.350151 Days  $T_0=131.560140$  (BKJD)



# DV Model-Shift Uniqueness Test

008890783-02, P = 5.350173 Days, E = 126.207029 Days

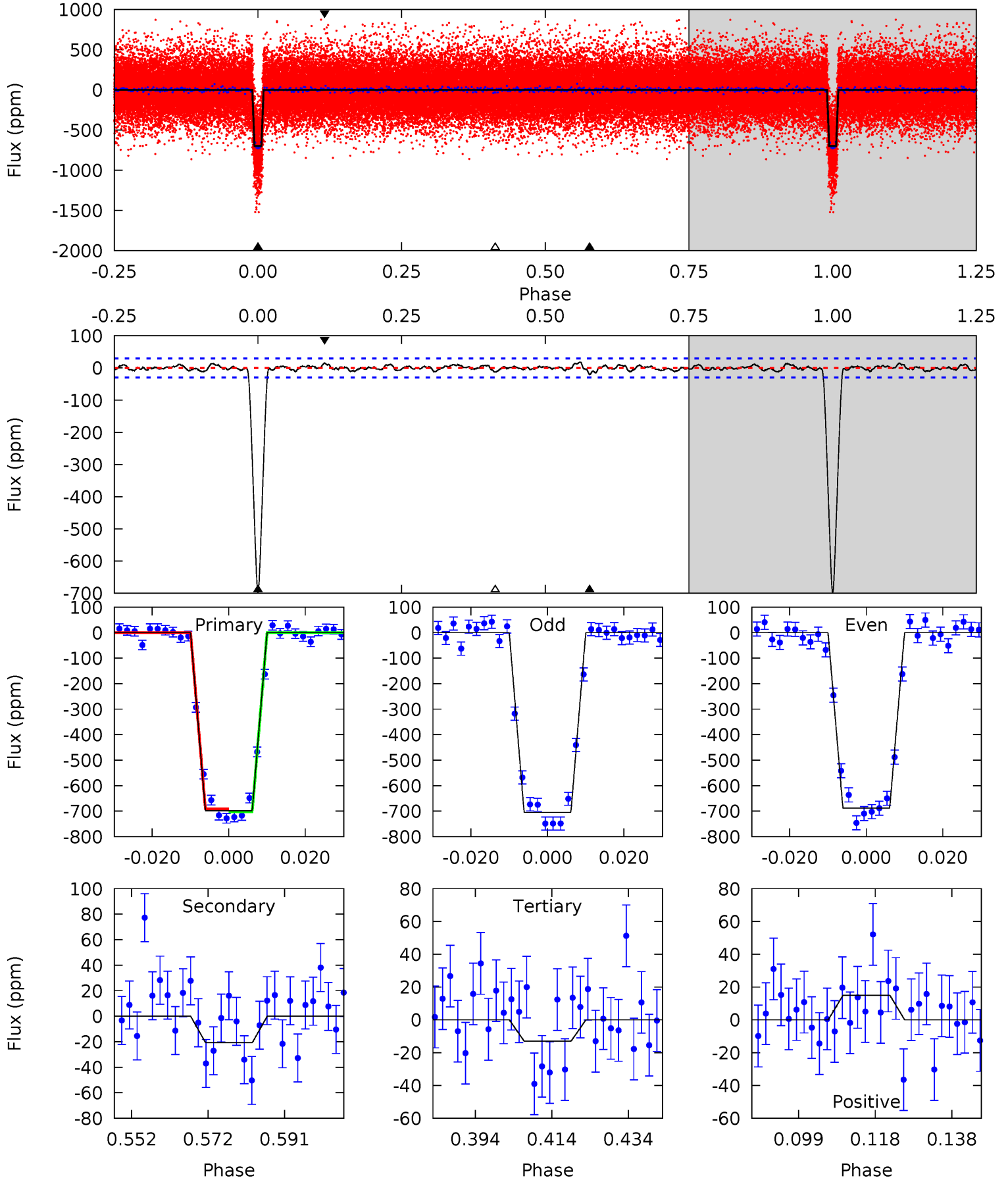
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
116.1	4.54	3.61	3.33	4.87	2.29	1.34	112.5	112.8	0.93	1.21	1.32	1.00	0.03	2.09



# Alt Model-Shift Uniqueness Test

008890783-02, P = 5.350151 Days, E = 126.209989 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
115.9	3.44	2.16	2.49	4.89	2.33	0.91	113.8	113.4	1.28	0.95	1.37	1.00	0.03	0.89





### Stellar Parameters For KIC 008890783

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5592^{+150}_{-166}$	$4.467^{+0.065}_{-0.182}$	$0.160^{+0.200}_{-0.300}$	$0.953^{+0.266}_{-0.106}$	$0.973^{+0.094}_{-0.094}$	$1.580^{+0.496}_{-0.741}$
	+3%/-3%	+1%/-4%	+125%/-188%	+28%/-11%	+10%/-10%	+31%/-47%
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 008890783-02 / KOI 0464.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-28 \pm 6$	$2.99^{+0.53}_{-0.45}$	$1402^{+96}_{-61}$	$3055^{+180}_{-157}$	$6.078^{+2.803}_{-2.115}$
Alt.	$-21 \pm 6$	$2.85^{+0.52}_{-0.44}$	$1398^{+92}_{-61}$	$2942^{+184}_{-176}$	$4.750^{+2.554}_{-1.843}$

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

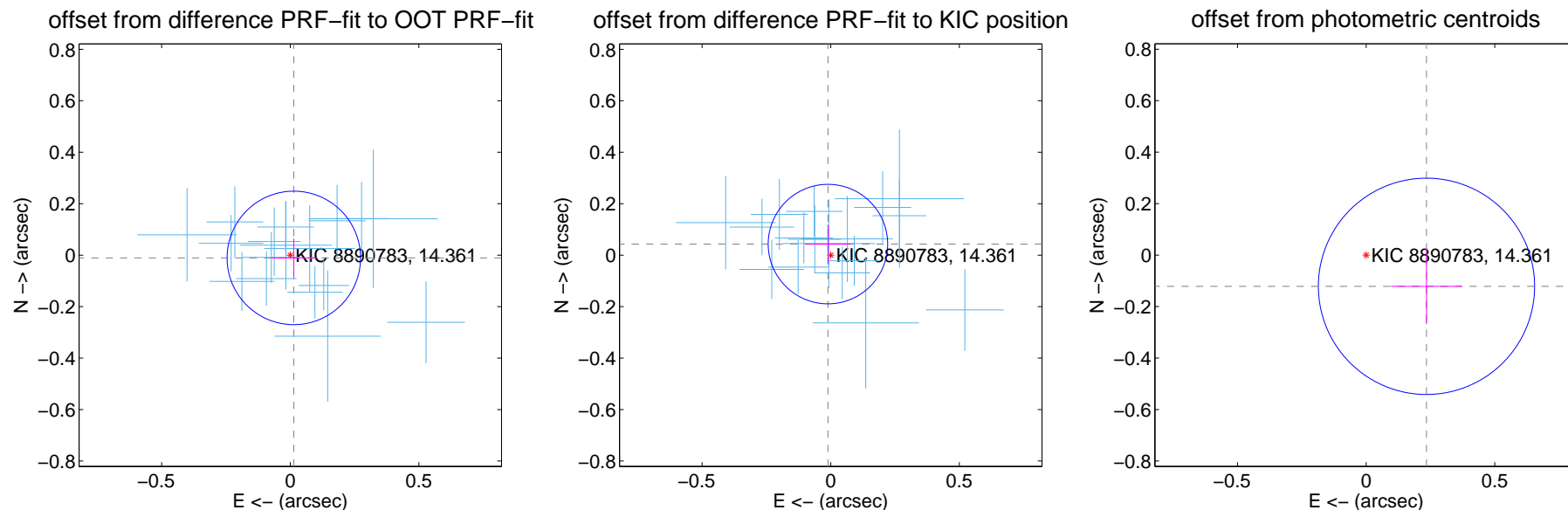
## DV Centroid Data

Supplemental centroid analysis for 008890783-02. Kepler magnitude: 14.36. Transit SNR 74.75

There are 17 quarters with good PRF difference image offsets

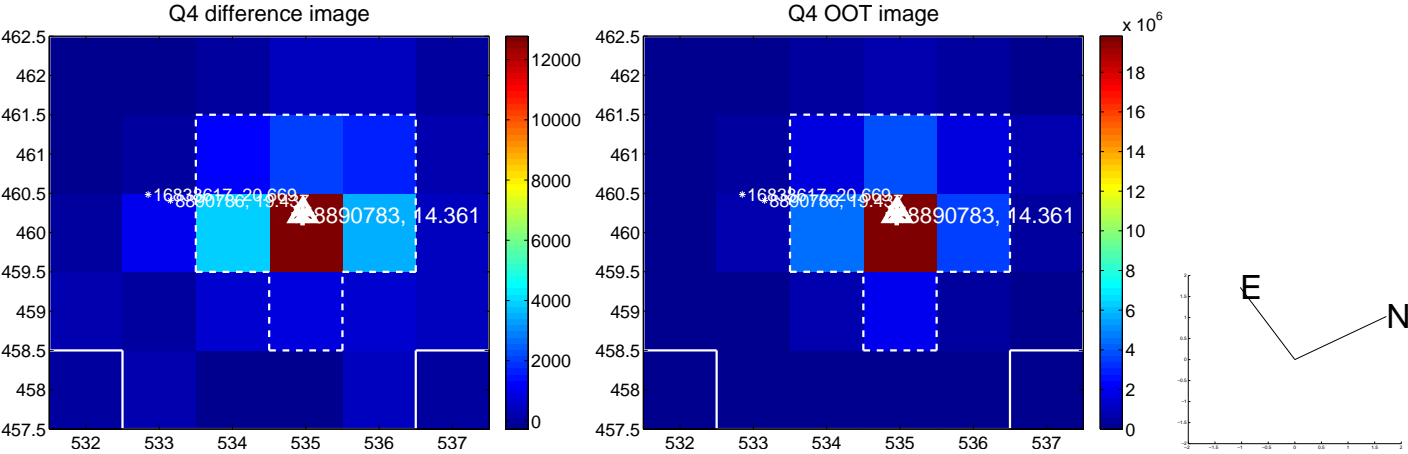
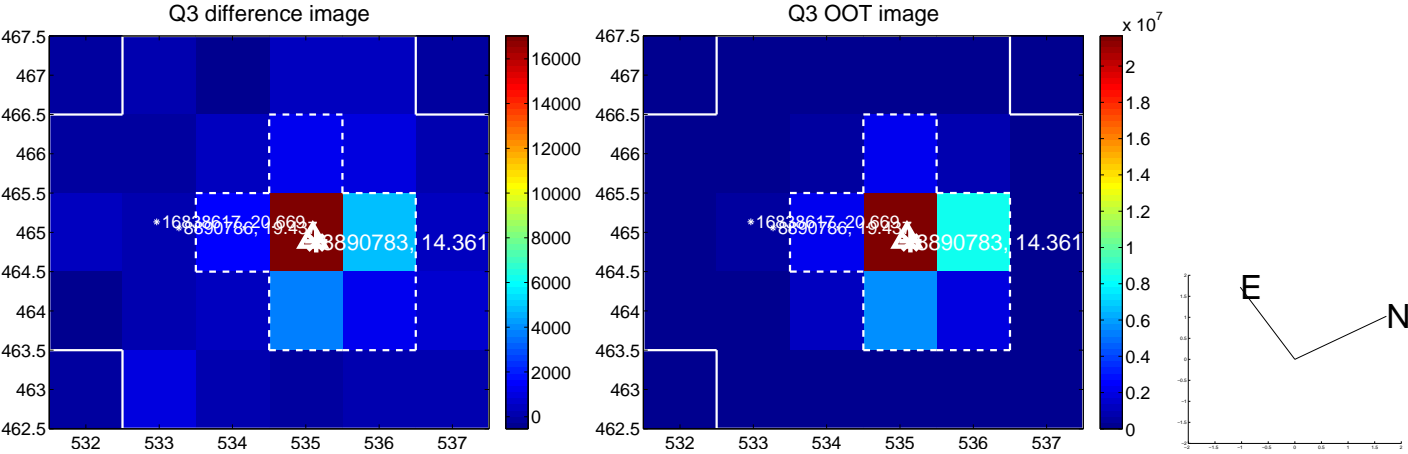
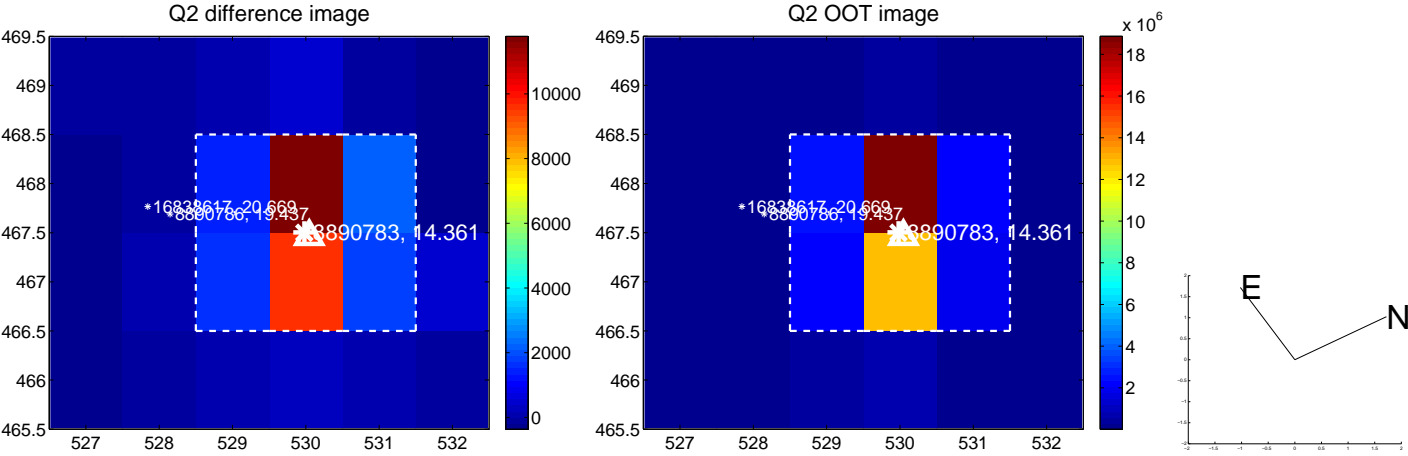
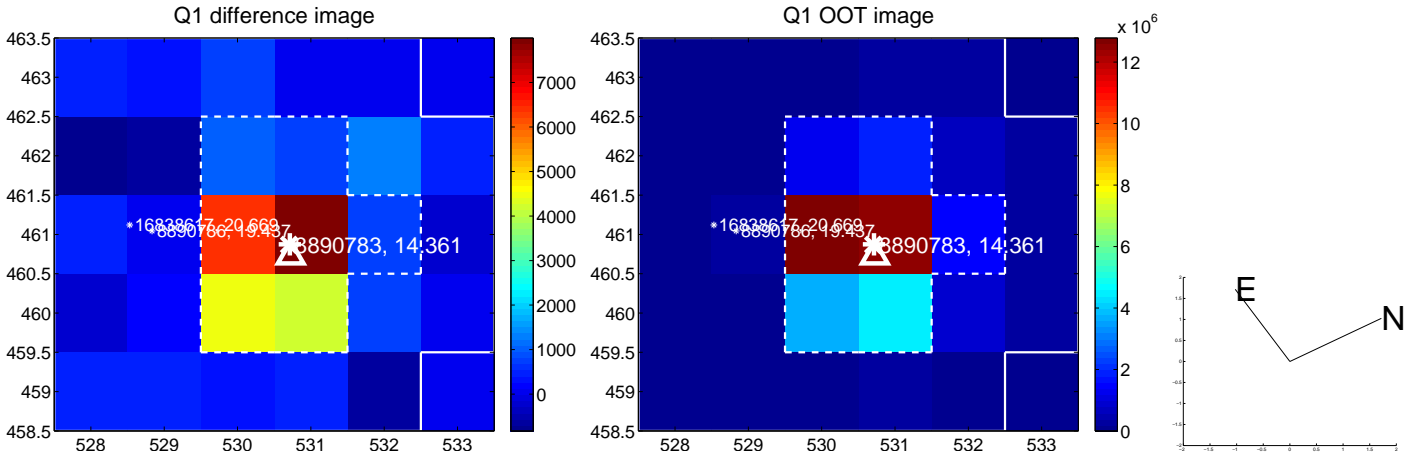
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.017 \pm 0.086$	0.20	$-0.014 \pm 0.087$	$-0.011 \pm 0.075$
PRF-fit source offset from KIC position	$0.044 \pm 0.077$	0.57	$0.011 \pm 0.088$	$0.043 \pm 0.075$
photometric centroid source offset	$0.26 \pm 0.14$	1.89	$-0.23 \pm 0.14$	$-0.12 \pm 0.15$

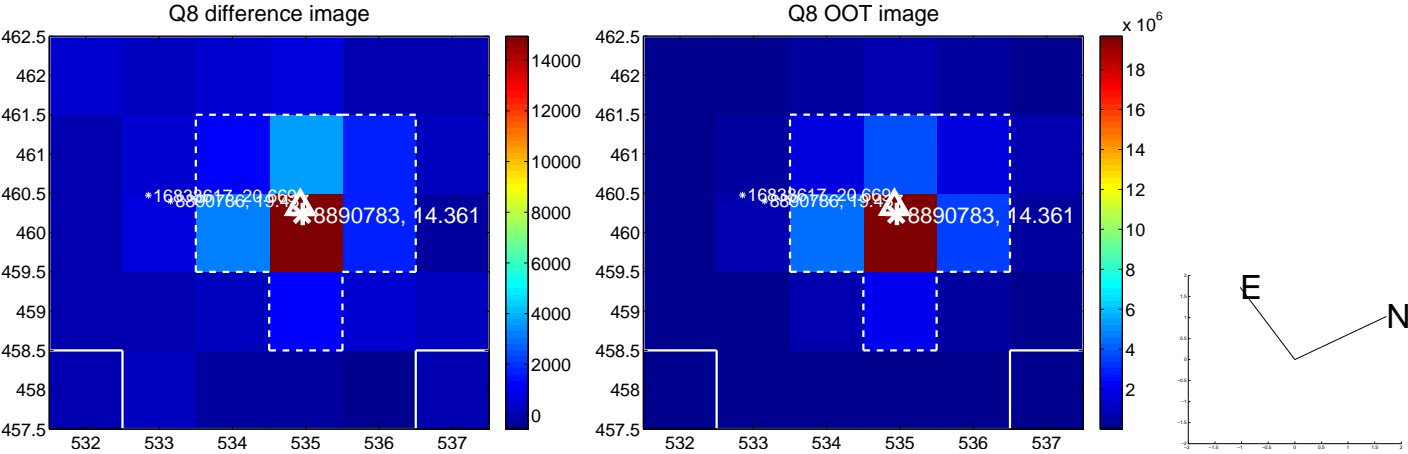
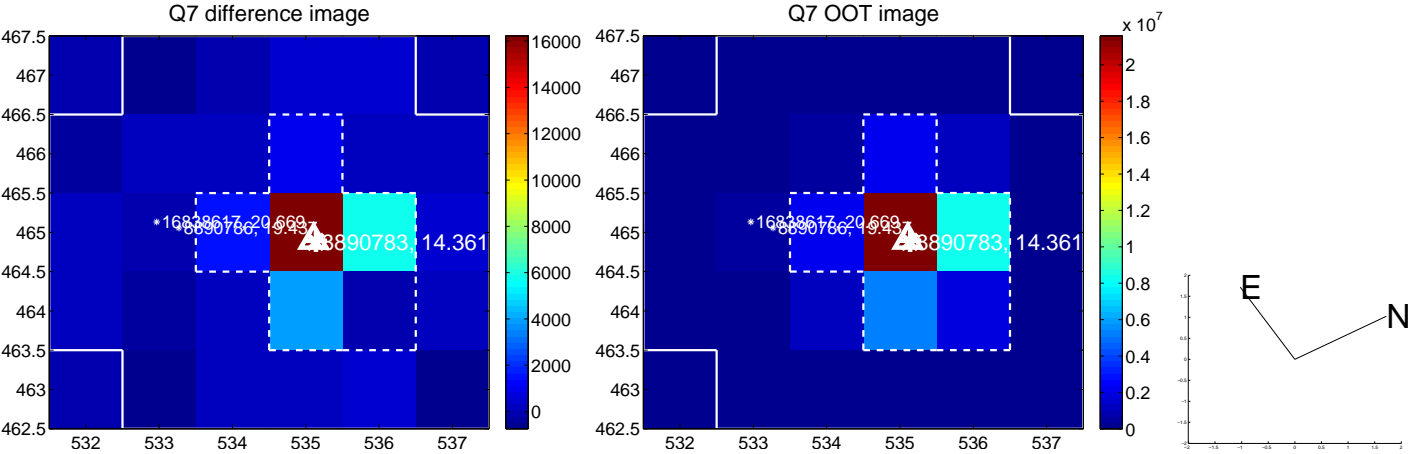
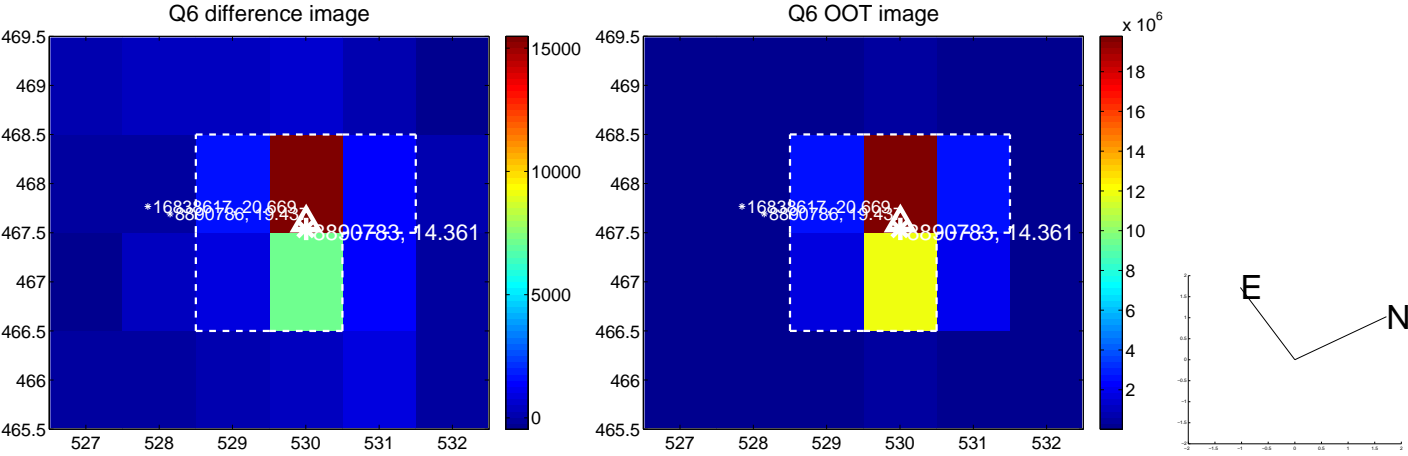
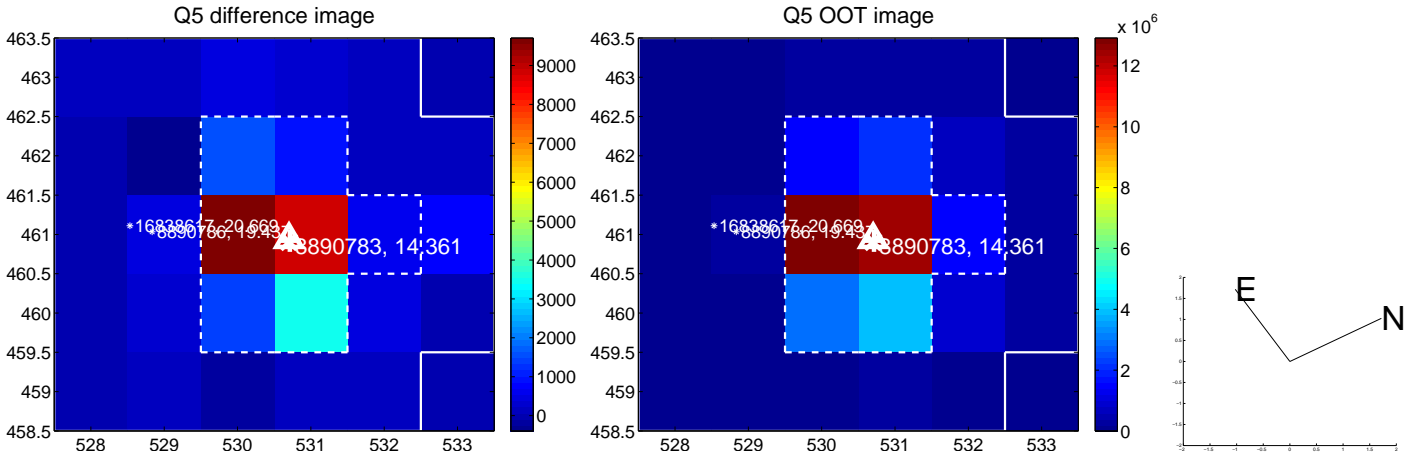


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

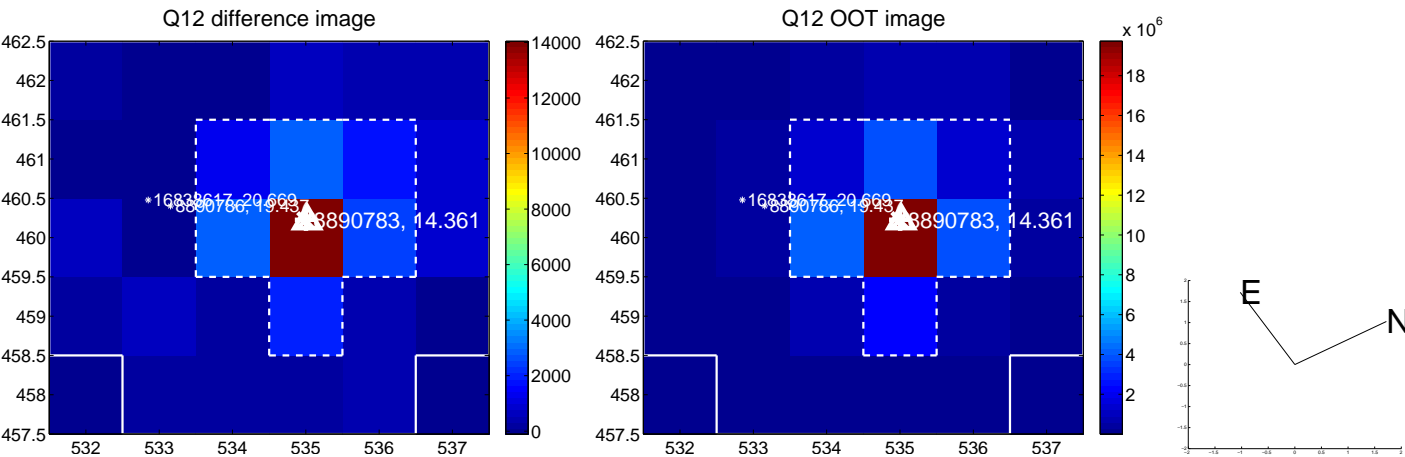
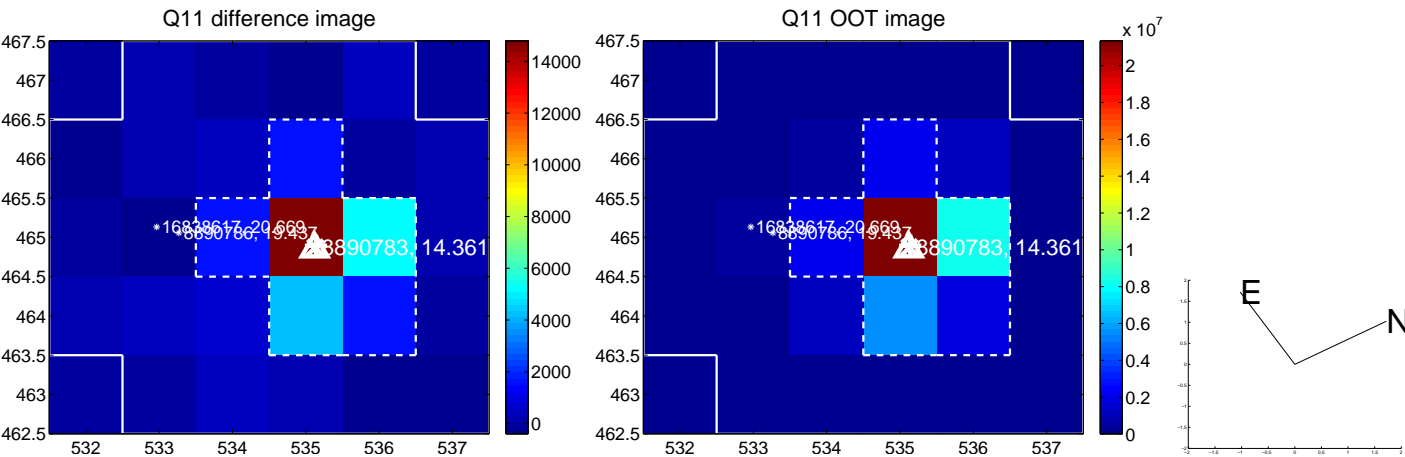
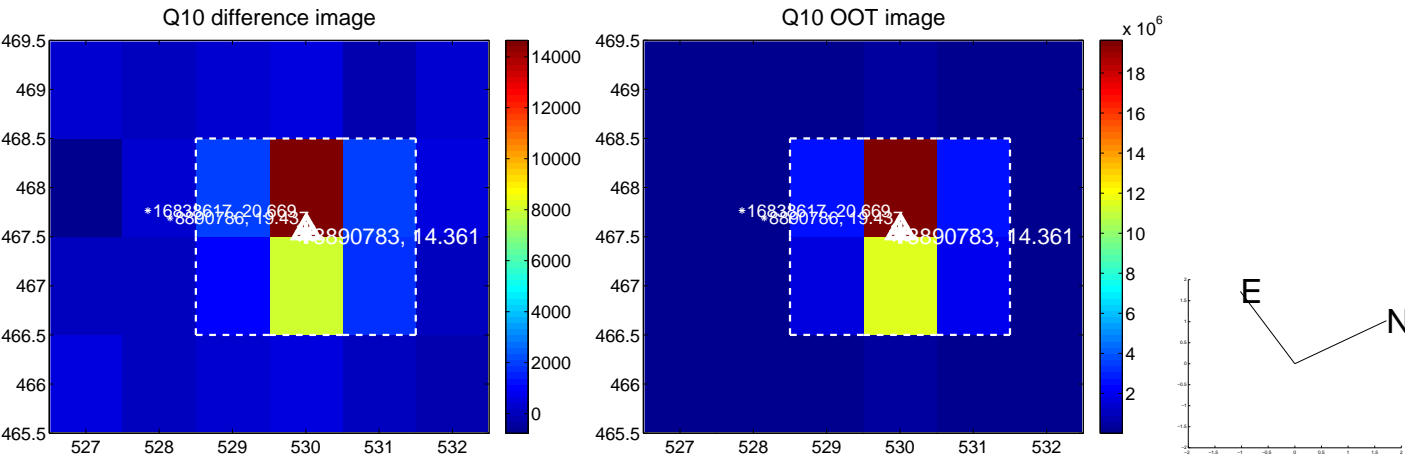
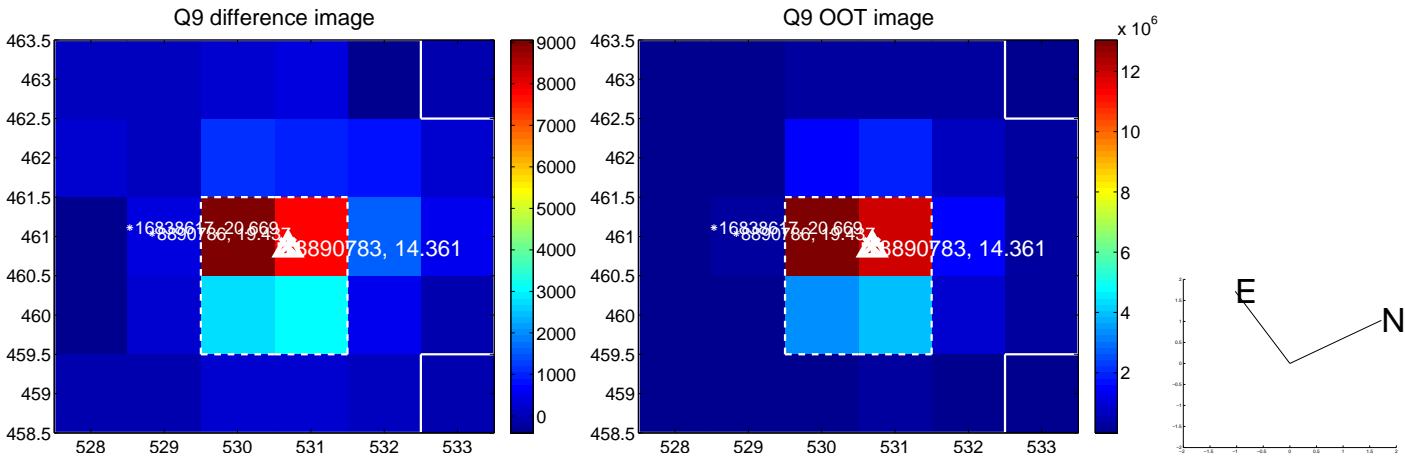
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



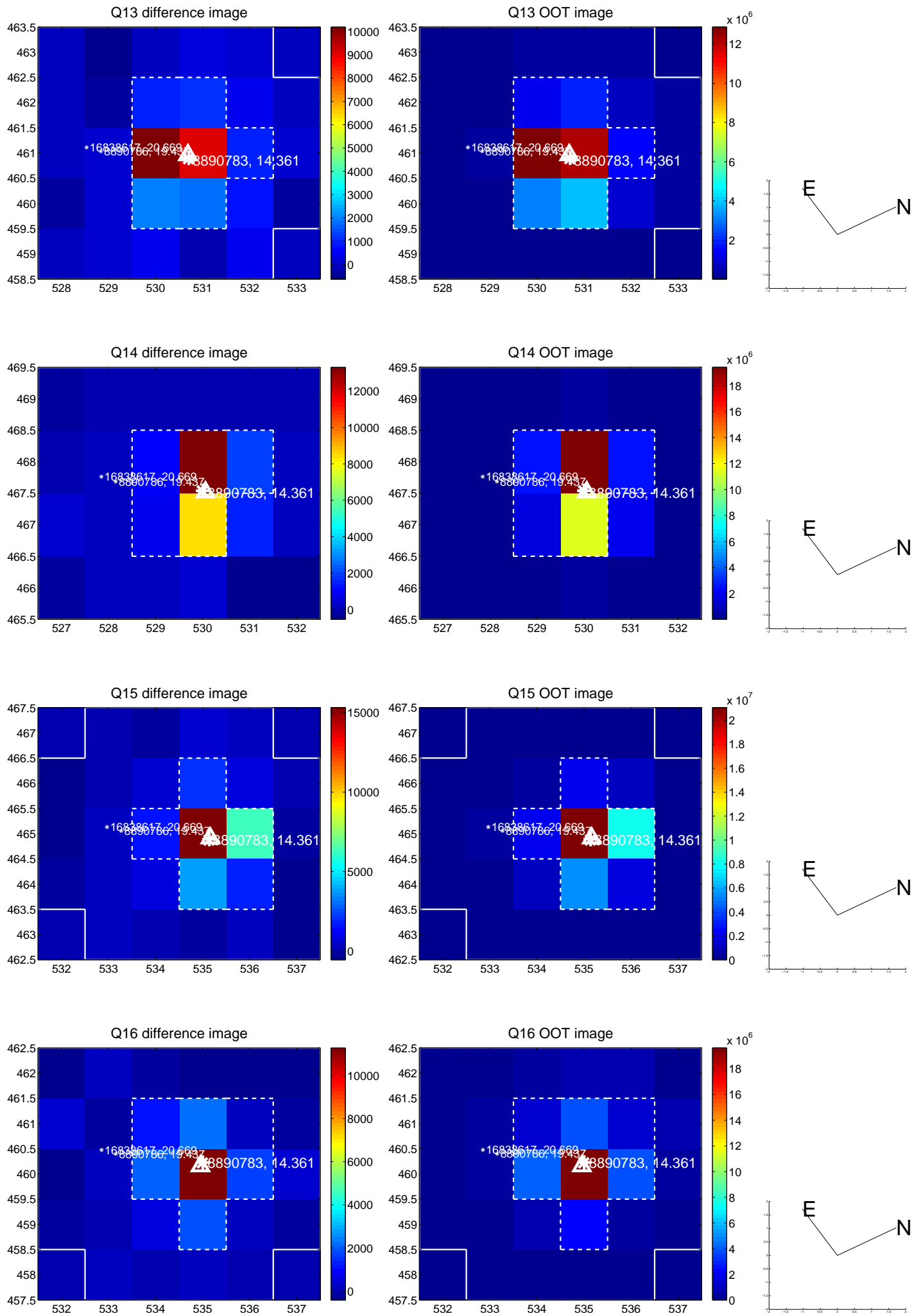
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



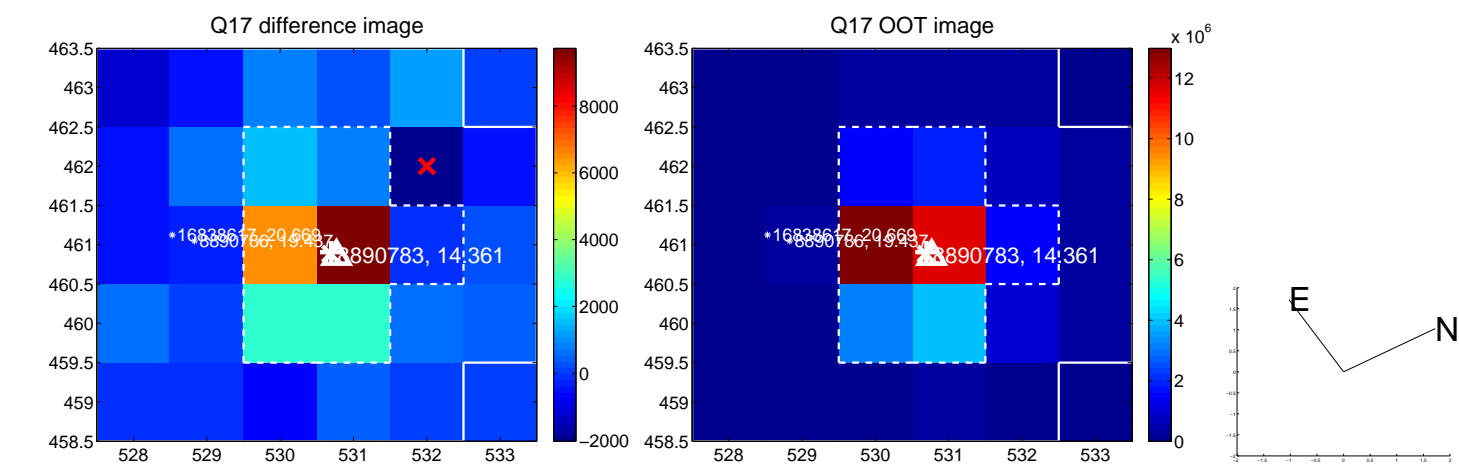
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



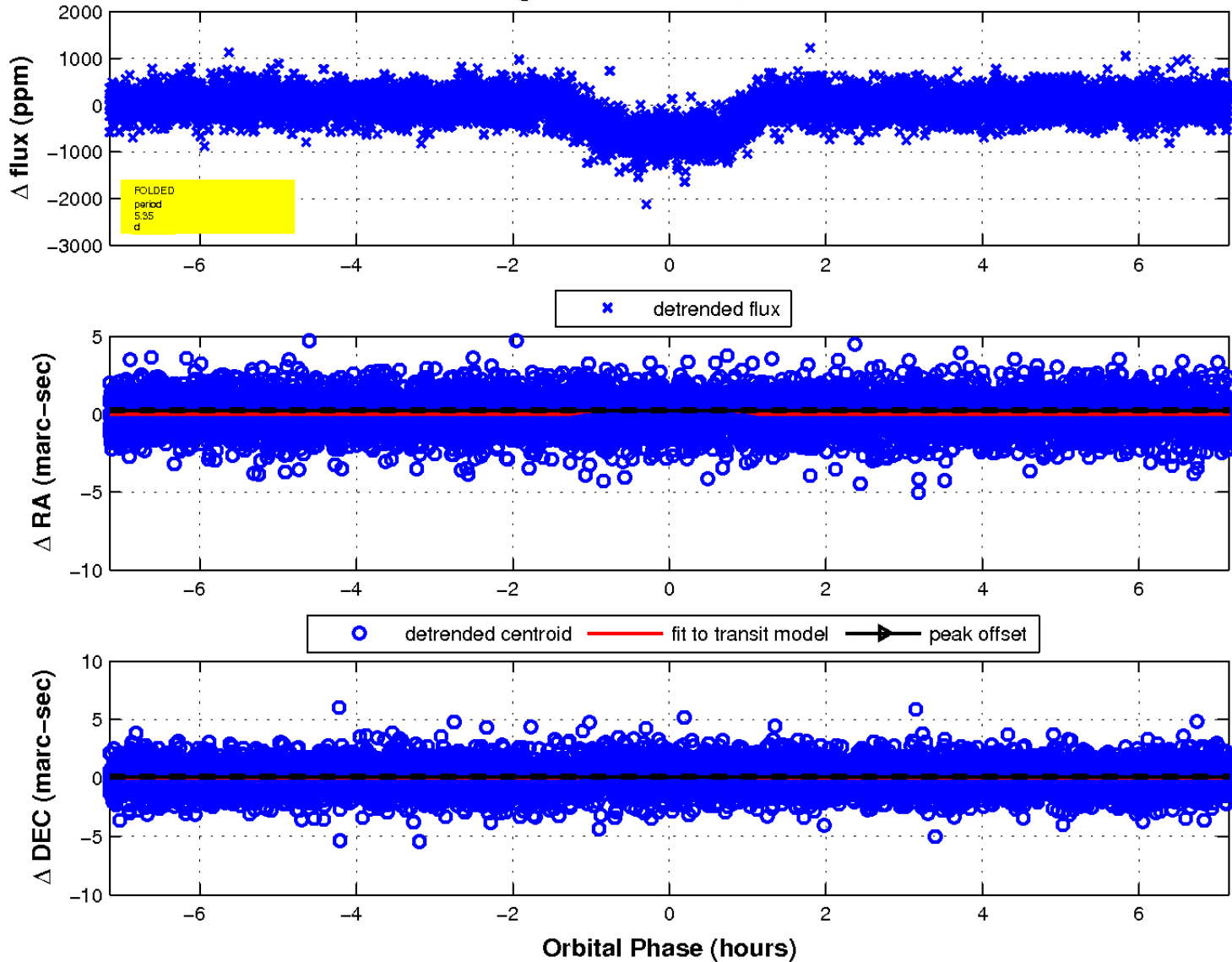
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

