

# KIC 008823893

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008823893-01	OBS	5575.01	1.506476	132.995468	34.6	3.353	11.4	11.6	1.13	6201	0.78	2534.06
008823893-02	OBS	No	3.698147	135.134690	27.6	17.309	7.8	6.6	1.13	6201	0.60	765.22
008823893-03	OBS	No	88.867708	215.035405	722.5	24.938	37.4	16.4	1.13	6201	5.71	11.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008823893-01	OBS	FP	0.00	0	0	0	1	EPHEM_MATCH
008823893-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV
008823893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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.

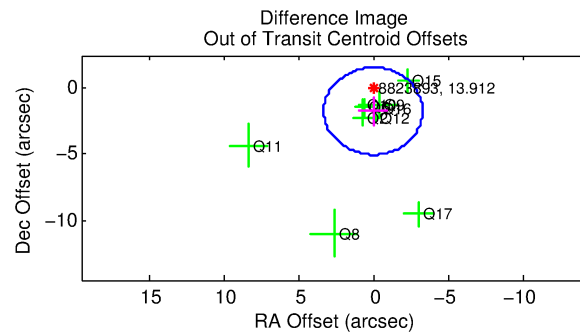
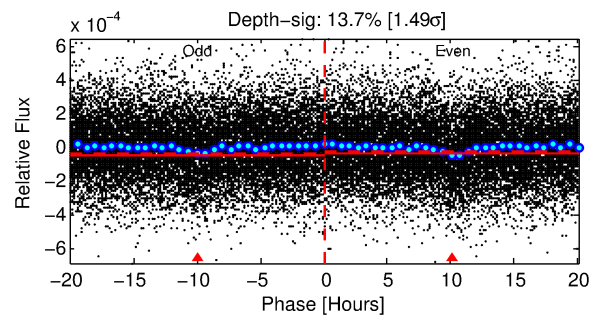
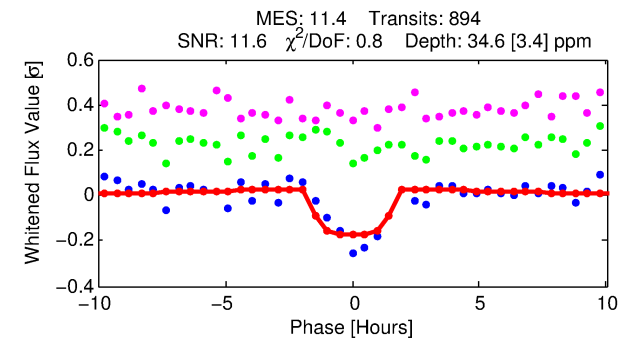
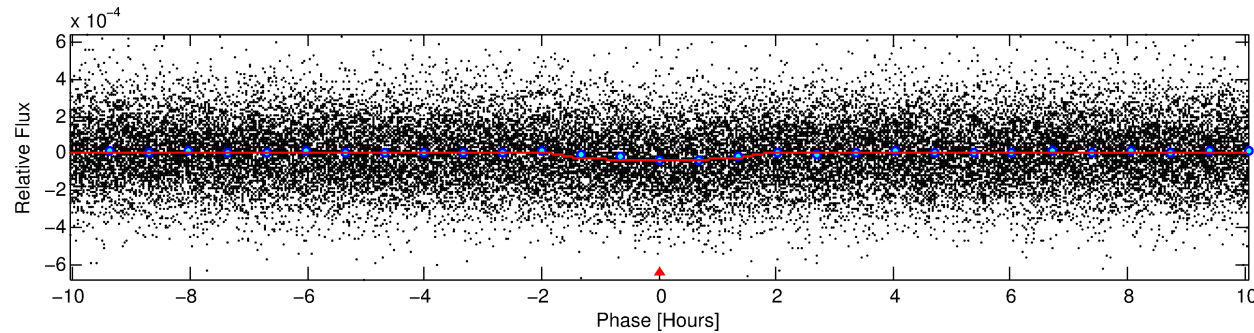
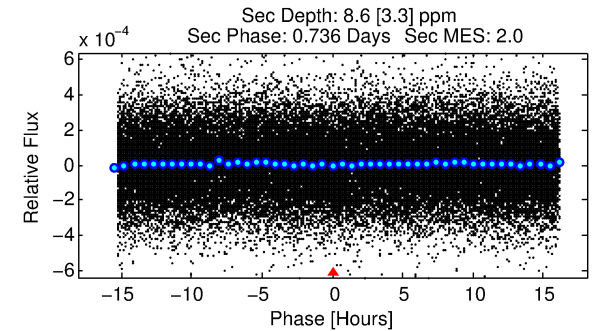
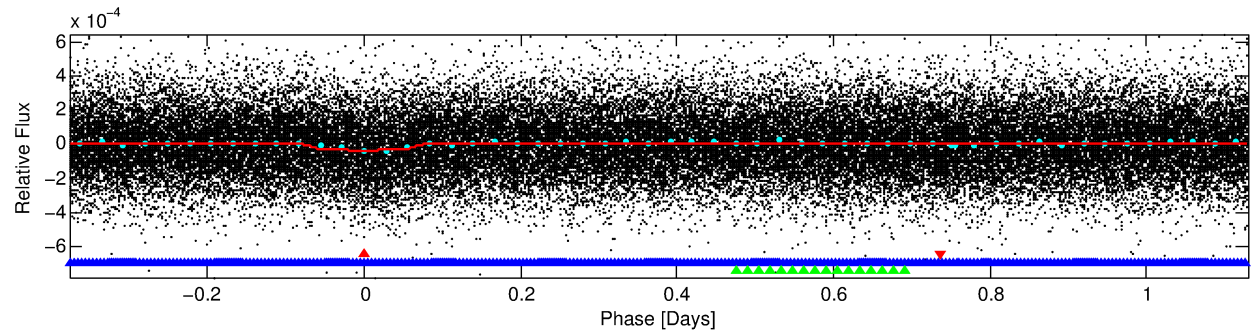
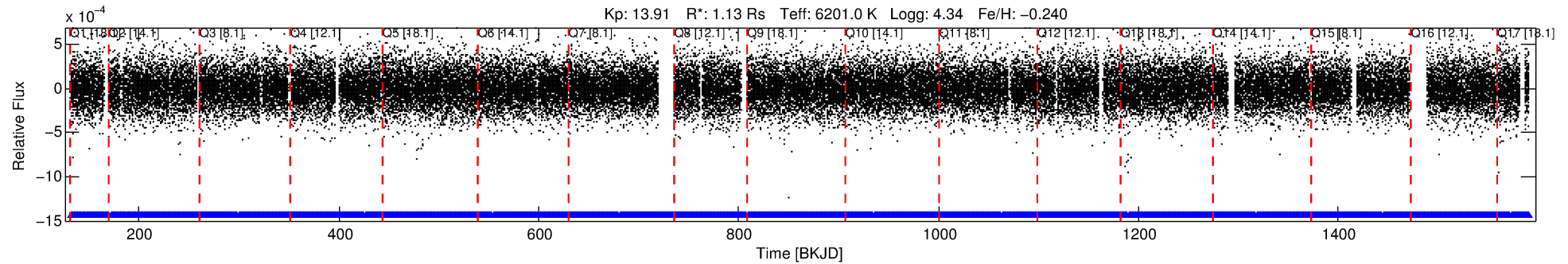
## Ephemeris Match Information For 008823893-01

TCE (1)	KIC	Parent (2)	Parent KIC	P <sub>1</sub> :P <sub>2</sub>	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	m <sub>2</sub>	m <sub>1</sub>	D <sub>2</sub> /D <sub>1</sub>	Mechanism	Flag	$\sigma_P$	$\sigma_T$
008823893-01	8823893	7096.01	8823397	1:1	552.0	139	2	13.25	13.91	13777.00	Col-Anomaly	0	1.46	0.25

**Notes:** P<sub>1</sub>:P<sub>2</sub> is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column. m<sub>2</sub> and m<sub>1</sub> are the magnitudes of the parent and child. D<sub>2</sub>/D<sub>1</sub> is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 8823893 Candidate: 1 of 3 Period: 1.506 d  
KOI: K05575.01 Corr: 0.879



## DV Fit Results:

Period = 1.50648 [0.00001] d  
Epoch = 132.9955 [0.0034] BKJD  
Rp/R\* = 0.0063 [0.0026]  
a/R\* = 1.80 [2.77]  
b = 0.90 [0.47]  
Seff = 2534.06 [988.64]  
Teq = 1809 [176] K  
Rp = 0.78 [0.40] Re  
a = 0.0257 [0.0067] AU  
Ag = 5.18 [5.01] [0.84σ]  
Teffp = 4220 [952] K [2.49σ]

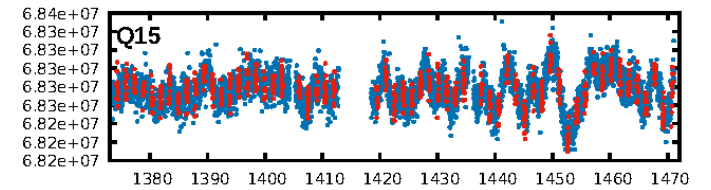
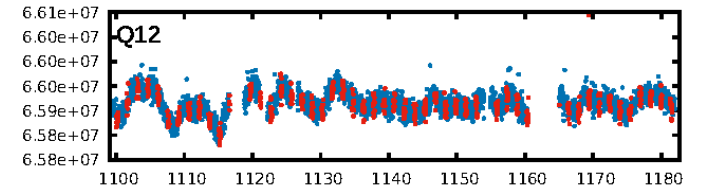
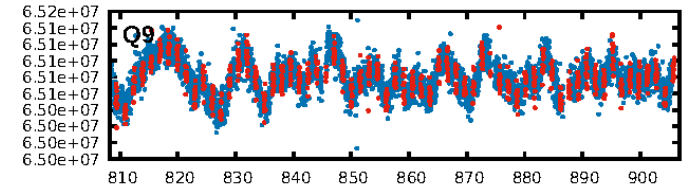
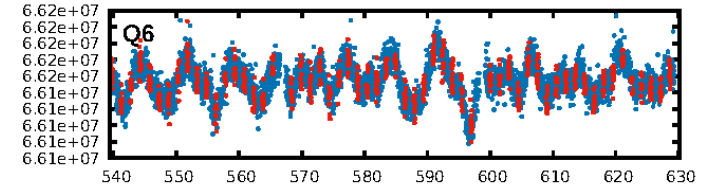
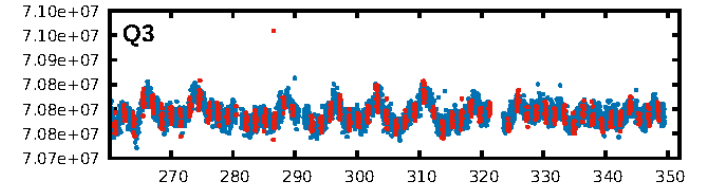
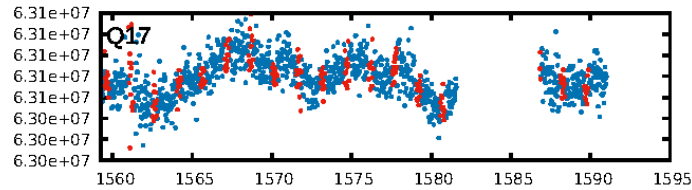
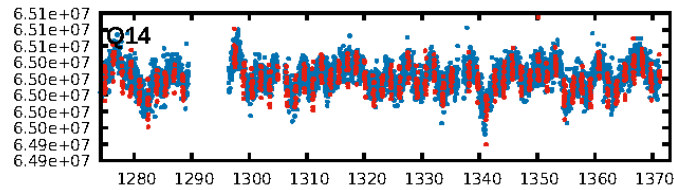
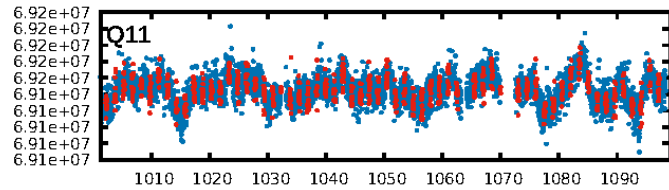
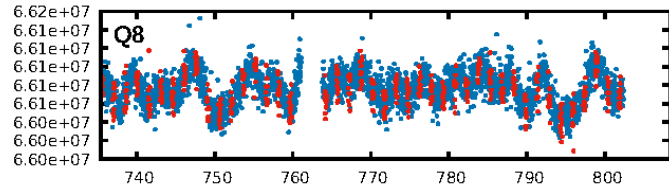
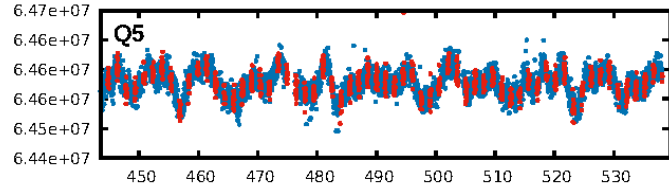
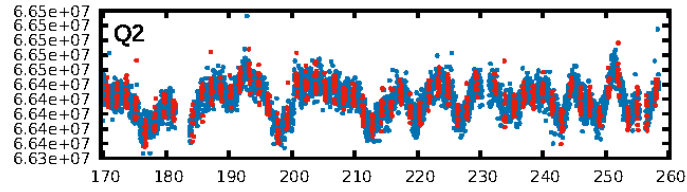
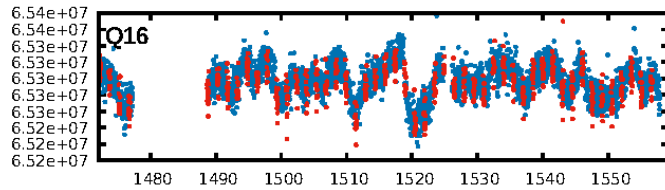
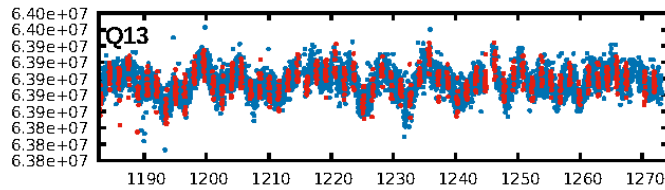
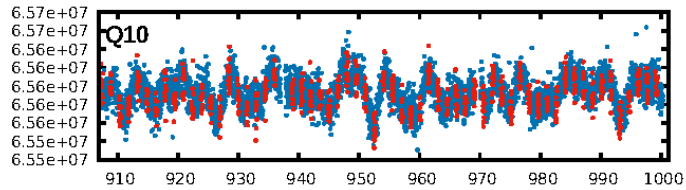
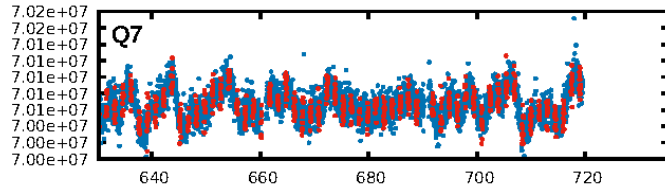
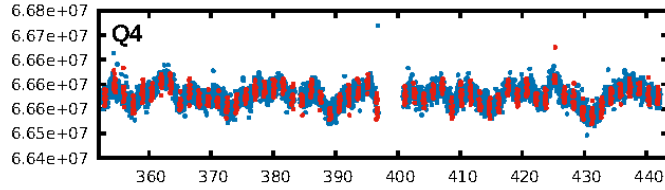
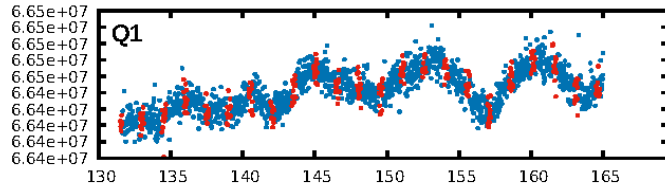
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.7% [2.98σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.58e-23  
RollingBand-fgt: 1.00 [854/854]  
GhostDiagnostic-chr: 6.056  
Centroid-sig: 0.0%  
Centroid-so: 3.104 arcsec [3.31σ]  
OotOffset-rm: 1.723 arcsec [1.57σ]  
KicOffset-rm: 1.704 arcsec [1.39σ]  
OotOffset-st: 3/2/3/2 [10]  
KicOffset-st: 3/2/3/2 [10]  
DiffImageQuality-fgm: 0.40 [4/10]  
DiffImageOverlap-fno: 1.00 [17/17]

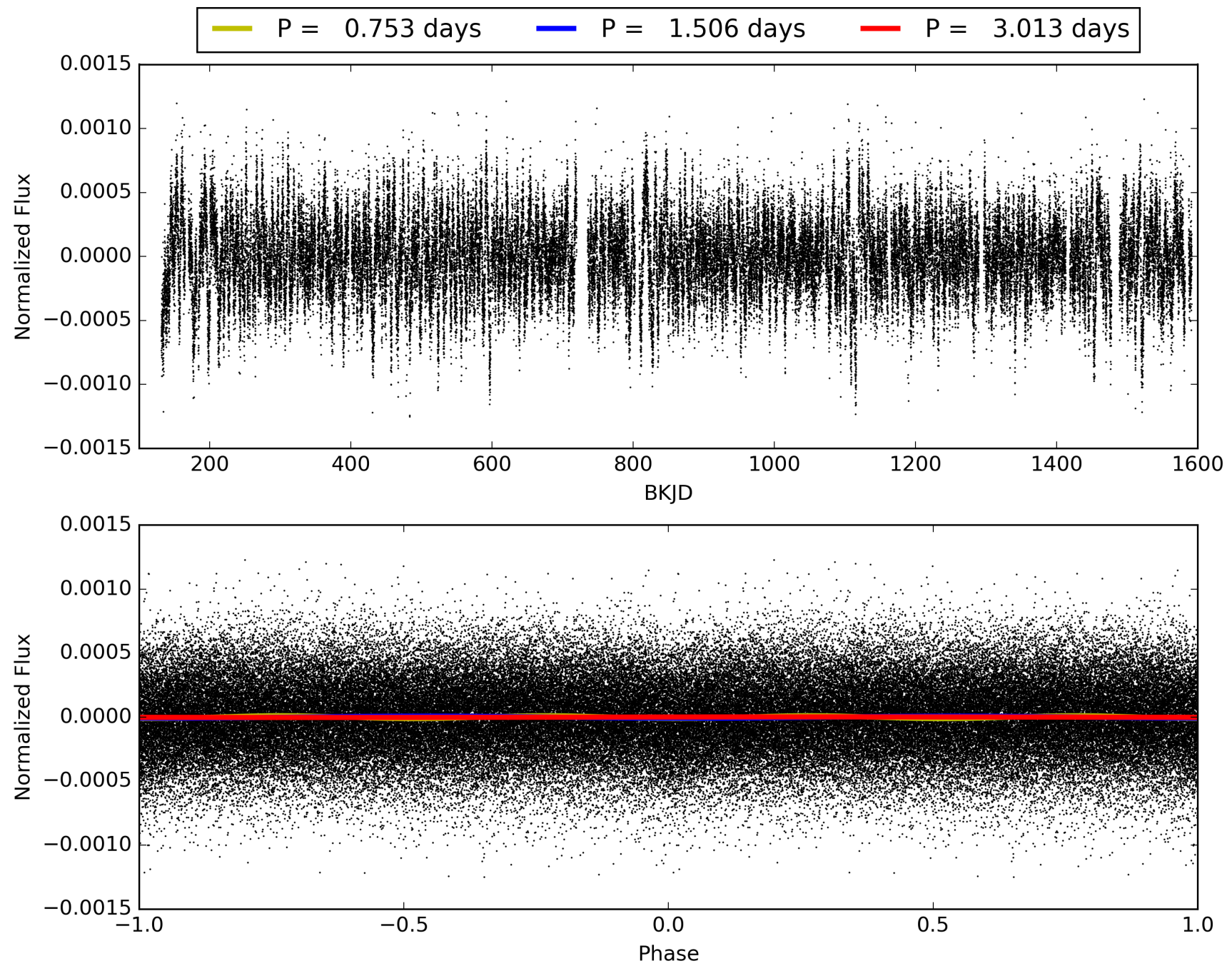
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008823893-01, PDC Light Curves



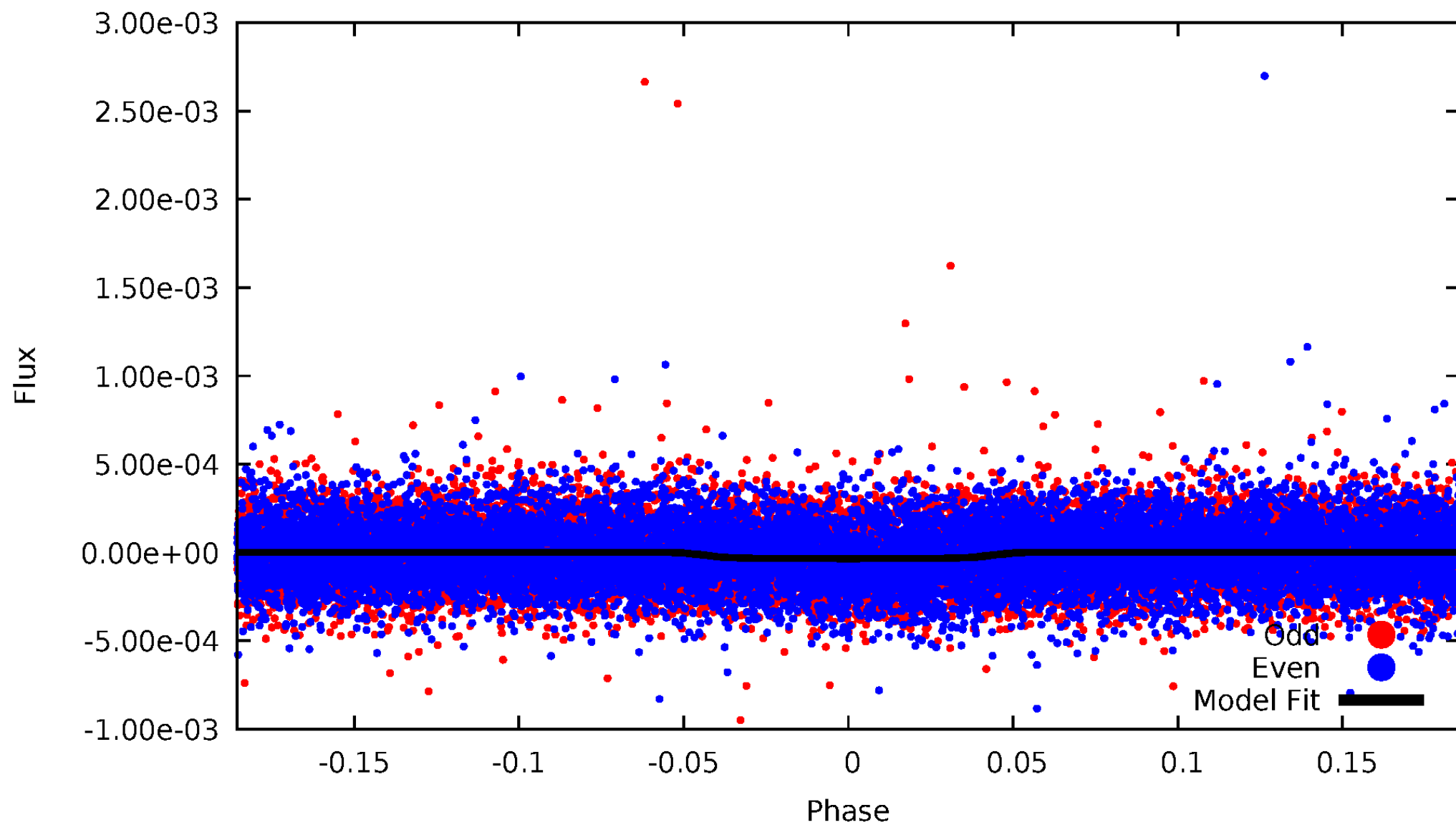
TCE 008823893-01





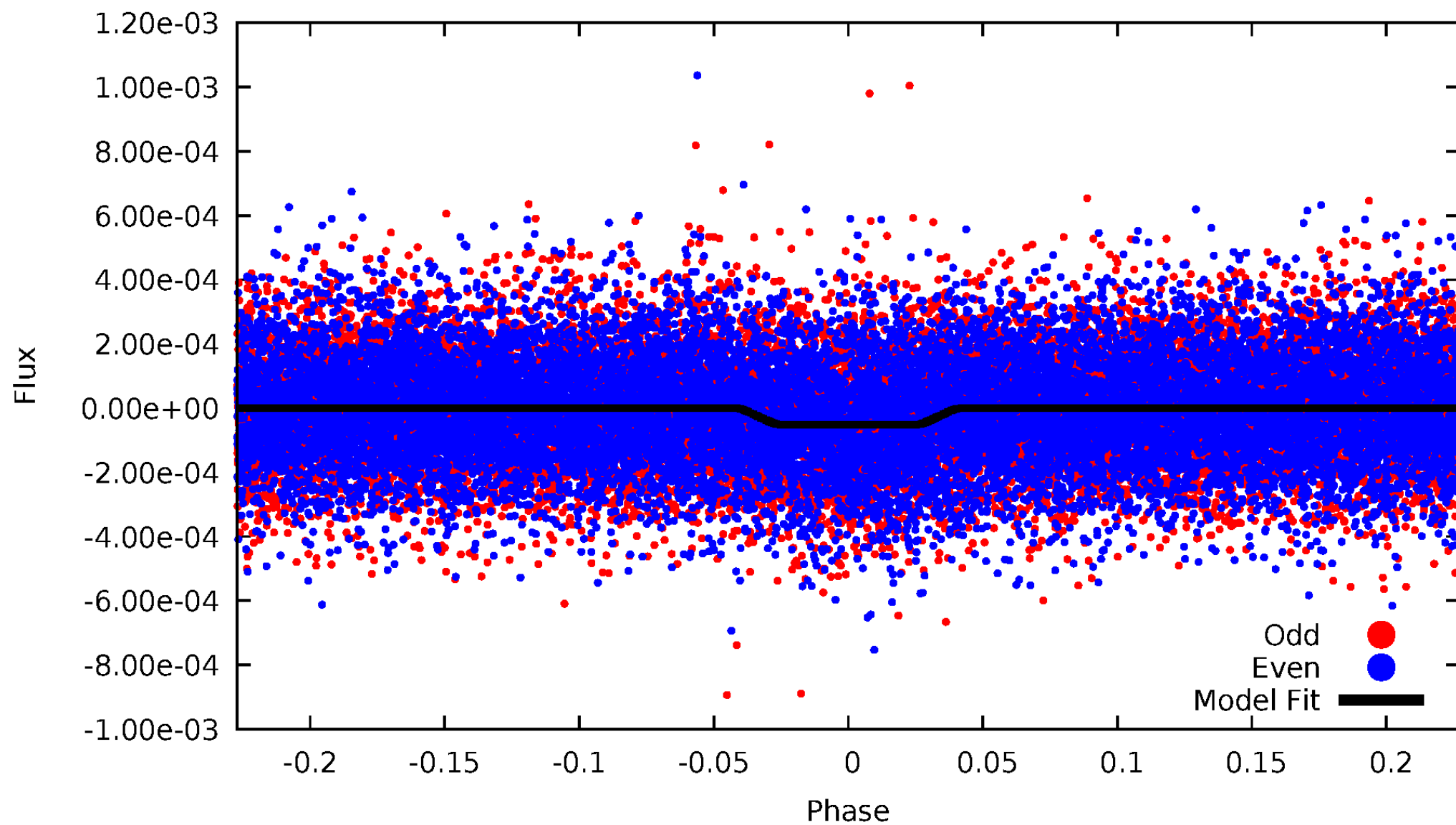
# DV Odd/Even

TCE 008823893-01

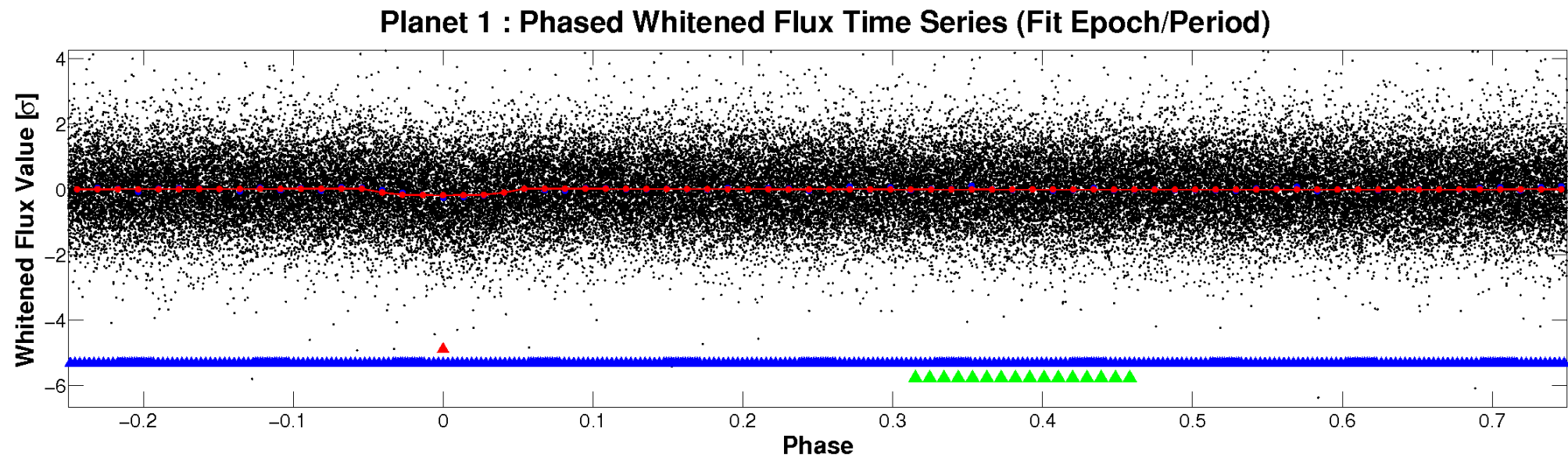
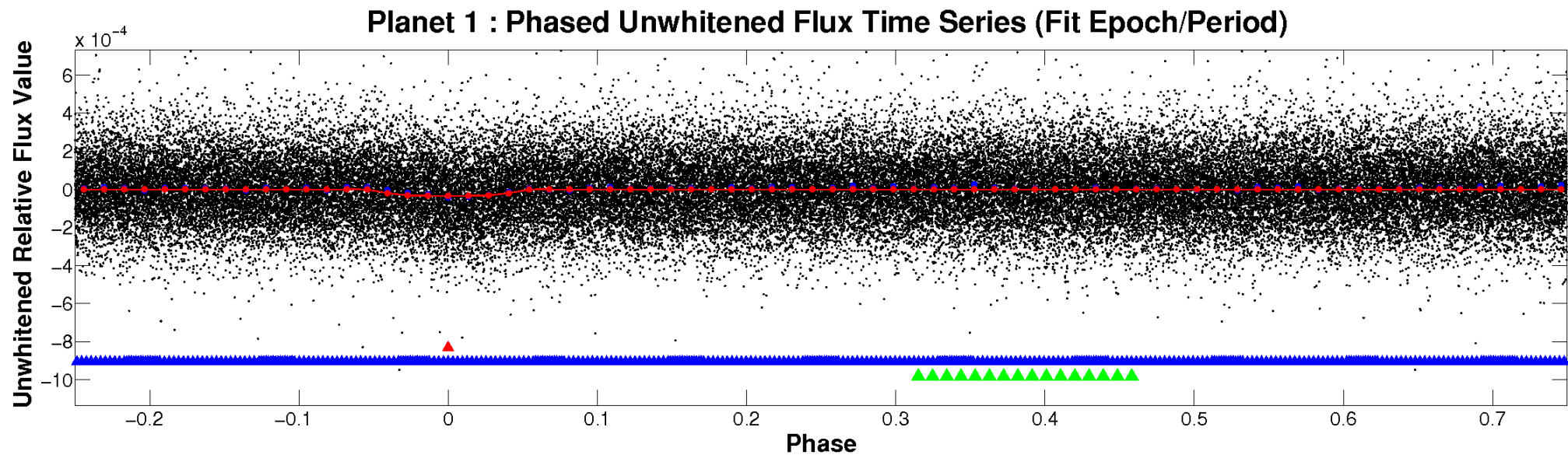


# ALT Odd/Even

TCE 008823893-01

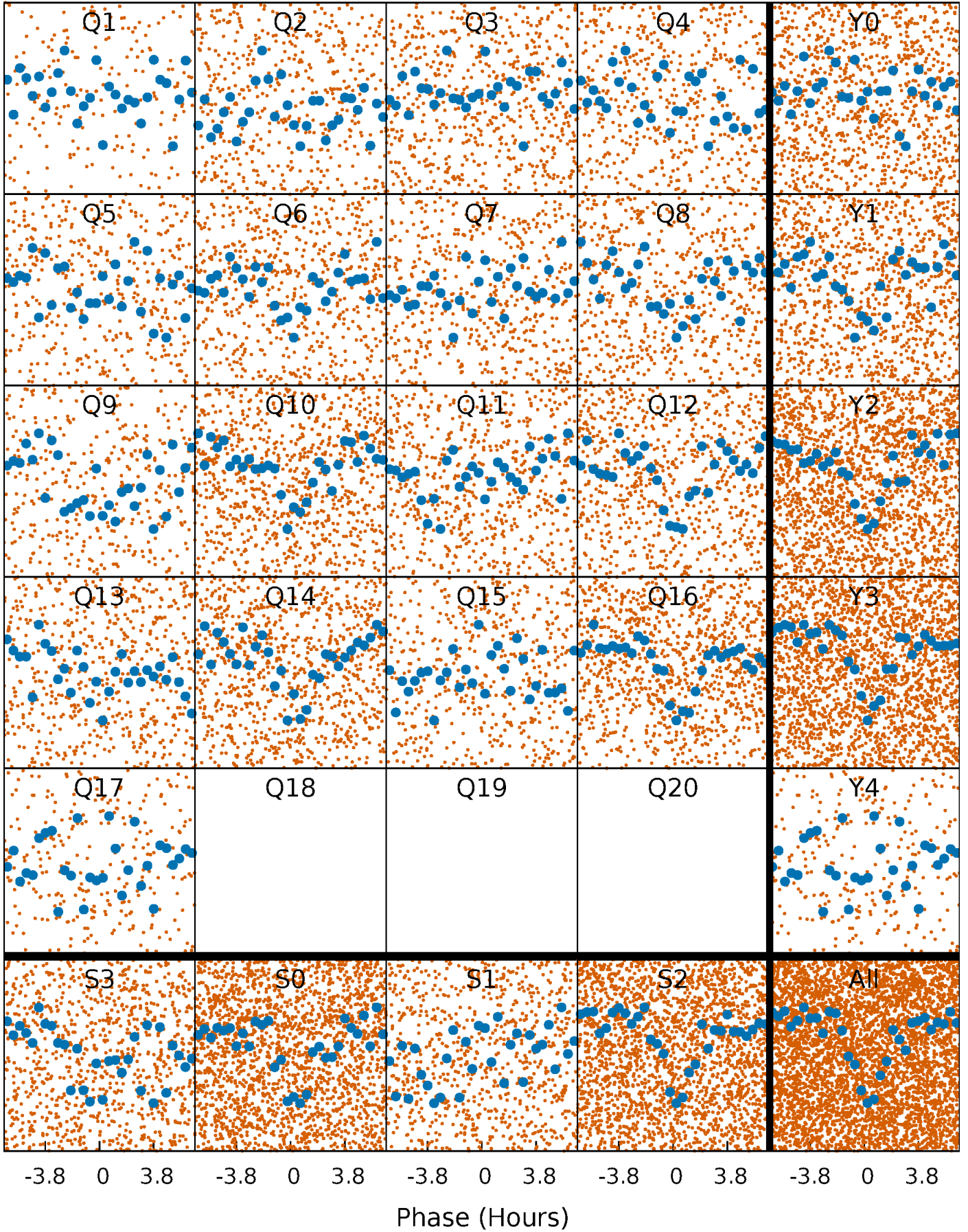


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

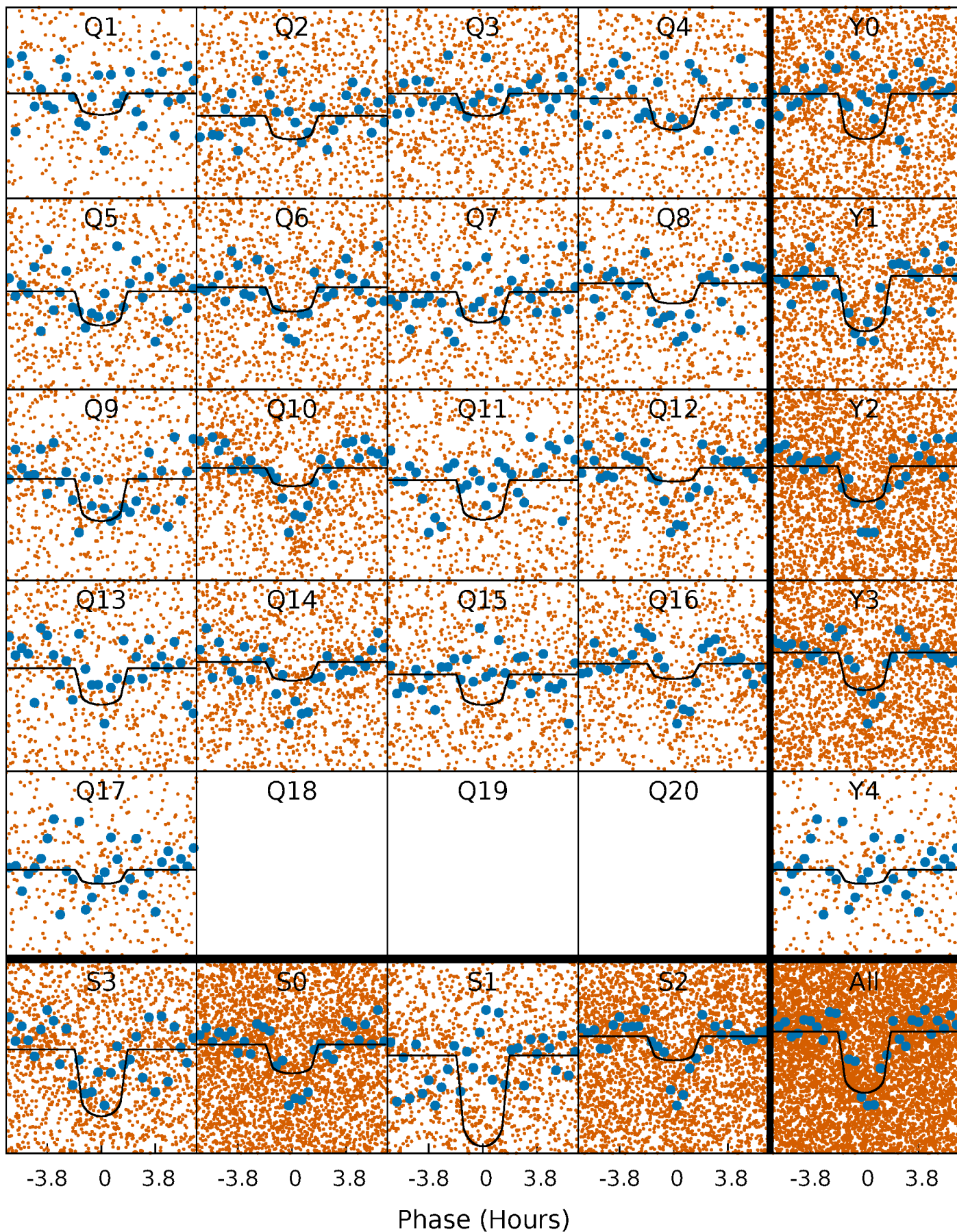
TCE 008823893-01   P= 1.506476 Days    $T_0=132.995468$  (BKJD)





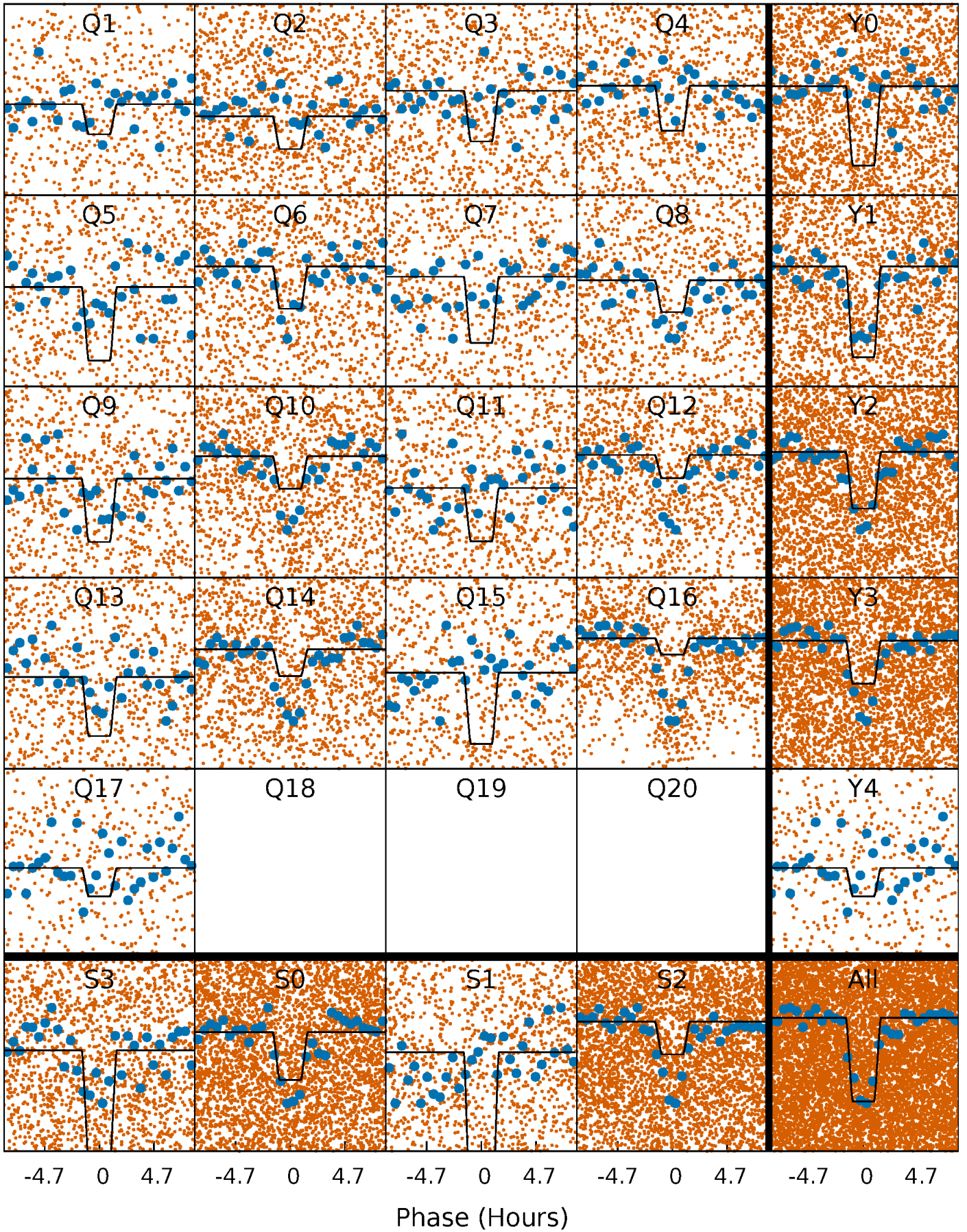
# DV Quarter-Phased Transit Curves

TCE 008823893-01 P= 1.506476 Days  $T_0=132.995468$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008823893-01 P= 1.506496 Days  $T_0=132.994994$  (BKJD)

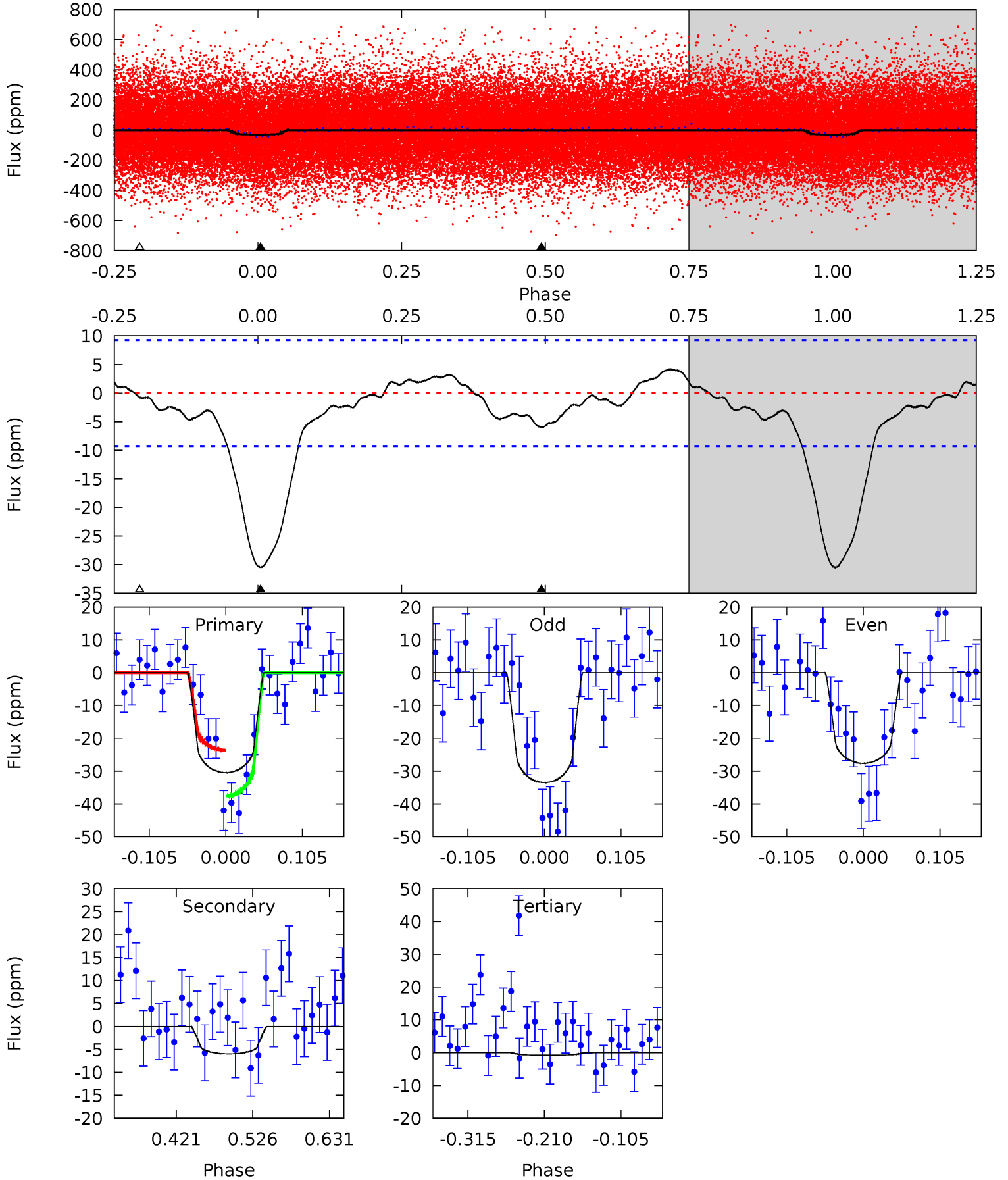




# DV Model-Shift Uniqueness Test

008823893-01, P = 1.506476 Days, E = 131.488992 Days

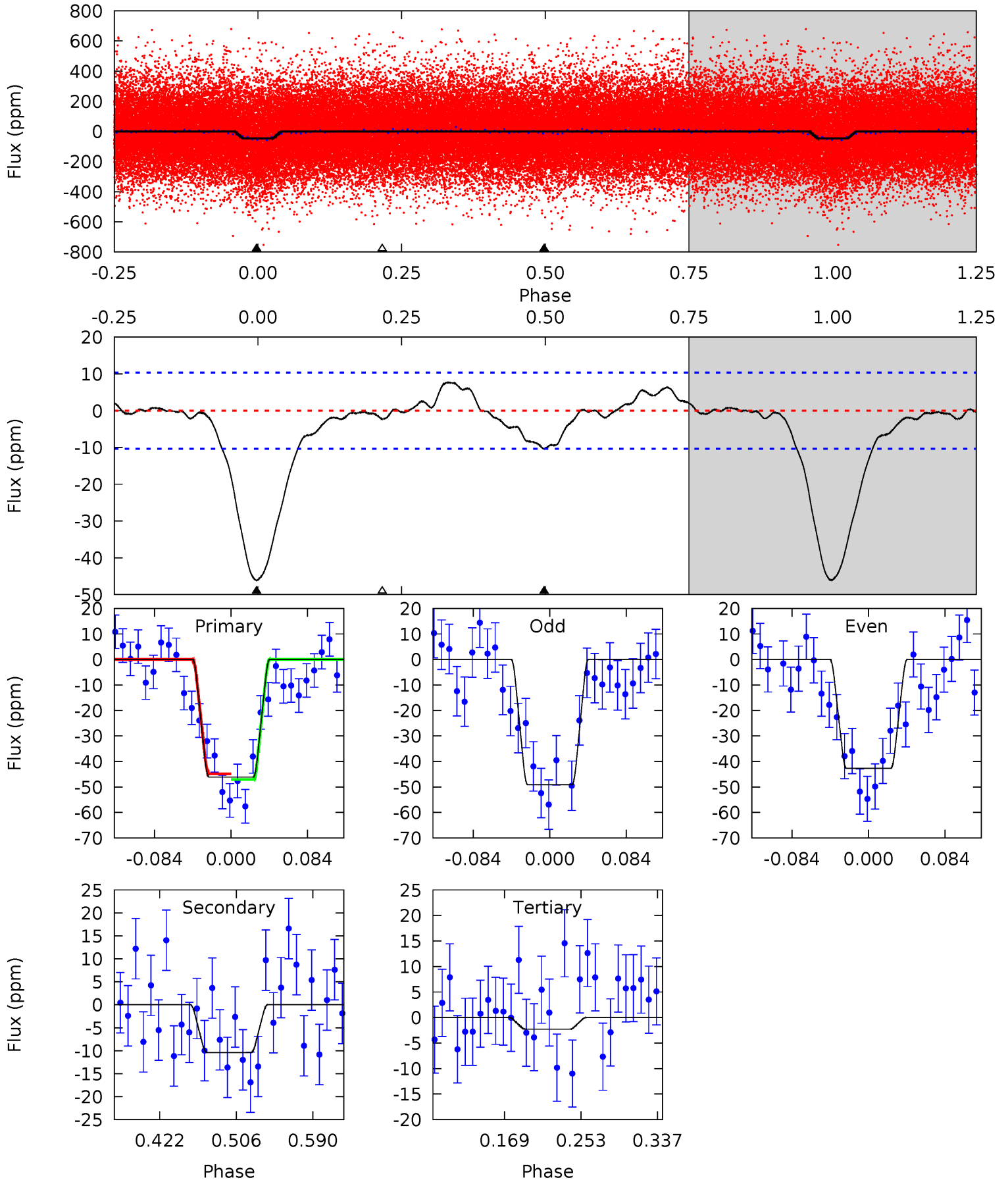
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	2.94	0.37	0	4.55	1.62	1.16	14.6	15.0	2.56	2.94	1.45	1.01	0.12	3.45



# Alt Model-Shift Uniqueness Test

008823893-01, P = 1.506496 Days, E = 131.488498 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
20.5	4.61	1.02	0	4.60	1.73	1.35	19.5	20.5	3.59	4.61	1.43	1.10	0.14	0.49





### Stellar Parameters For KIC 008823893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6201^{+175}_{-197}$	$4.336^{+0.132}_{-0.198}$	$-0.240^{+0.300}_{-0.300}$	$1.126^{+0.353}_{-0.190}$	$0.998^{+0.160}_{-0.107}$	$0.986^{+0.578}_{-0.488}$
	+3%/-3%	+3%/-5%	+125%/-125%	+31%/-17%	+16%/-11%	+59%/-49%
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 008823893-01 / KOI 5575.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-6\pm2$	$0.79^{+0.37}_{-0.32}$	$2542^{+189}_{-143}$	$4023^{+1035}_{-540}$	$3.212^{+7.024}_{-1.745}$
Alt.	$-10\pm2$	$0.90^{+0.37}_{-0.32}$	$2547^{+185}_{-158}$	$4302^{+884}_{-562}$	$4.665^{+6.667}_{-2.372}$

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

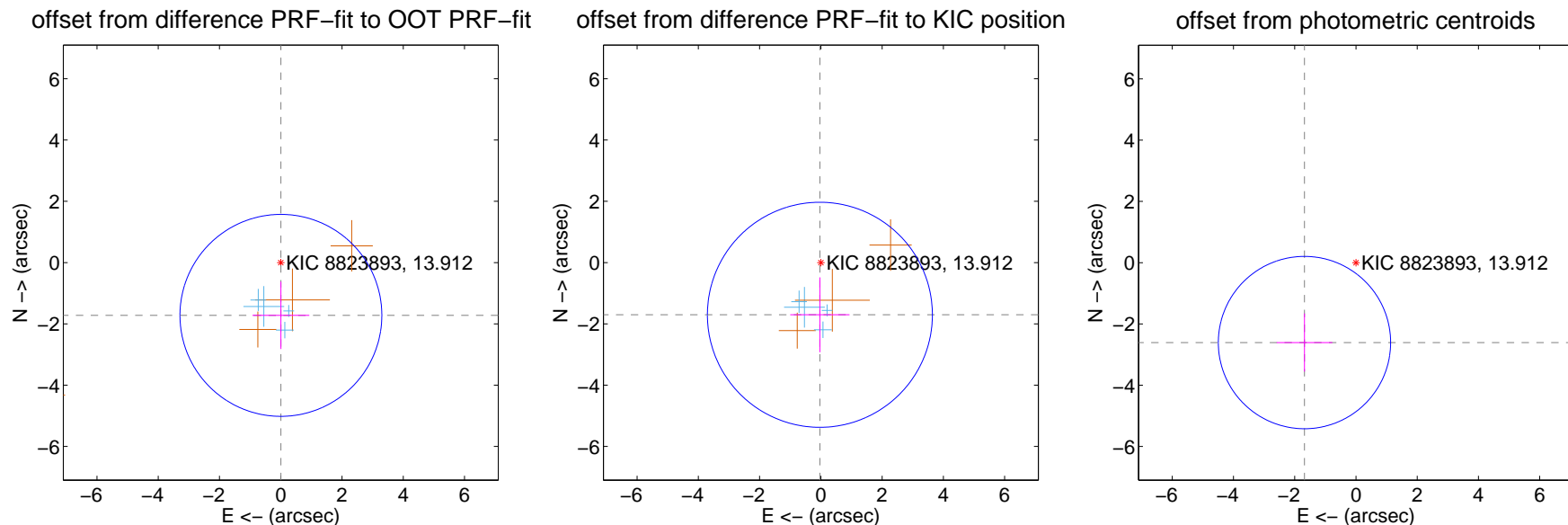
## DV Centroid Data

Supplemental centroid analysis for 008823893-01. Kepler magnitude: 13.91. Transit SNR 11.59

There are 4 quarters with good PRF difference image offsets

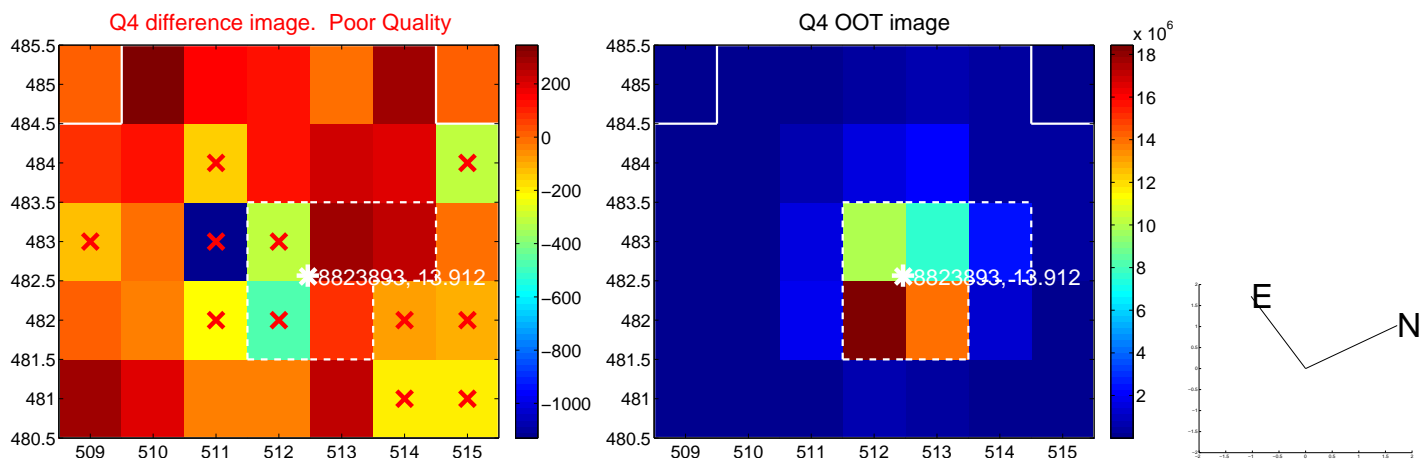
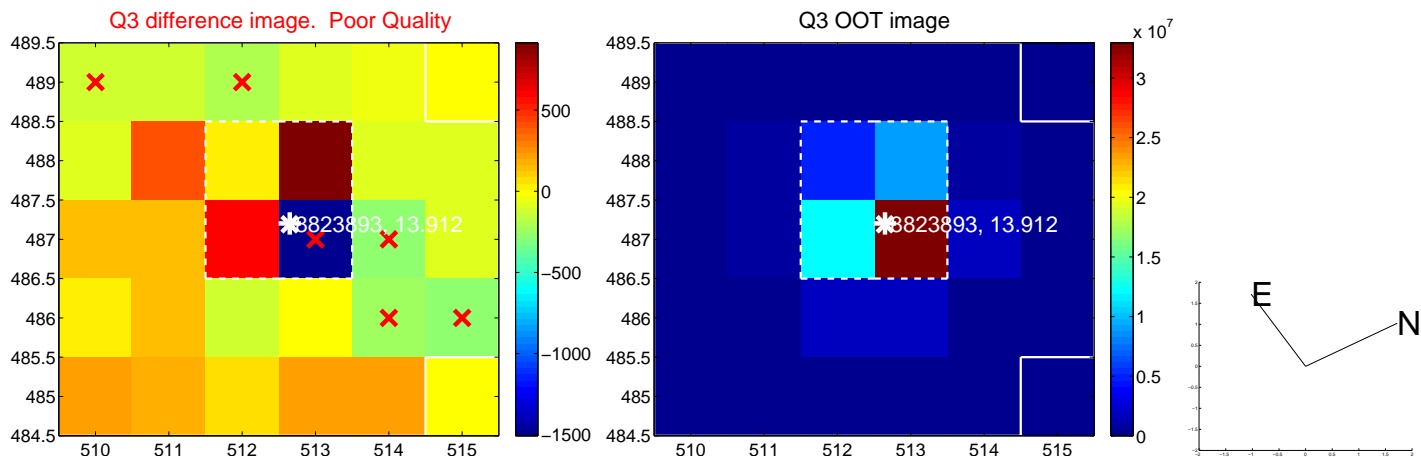
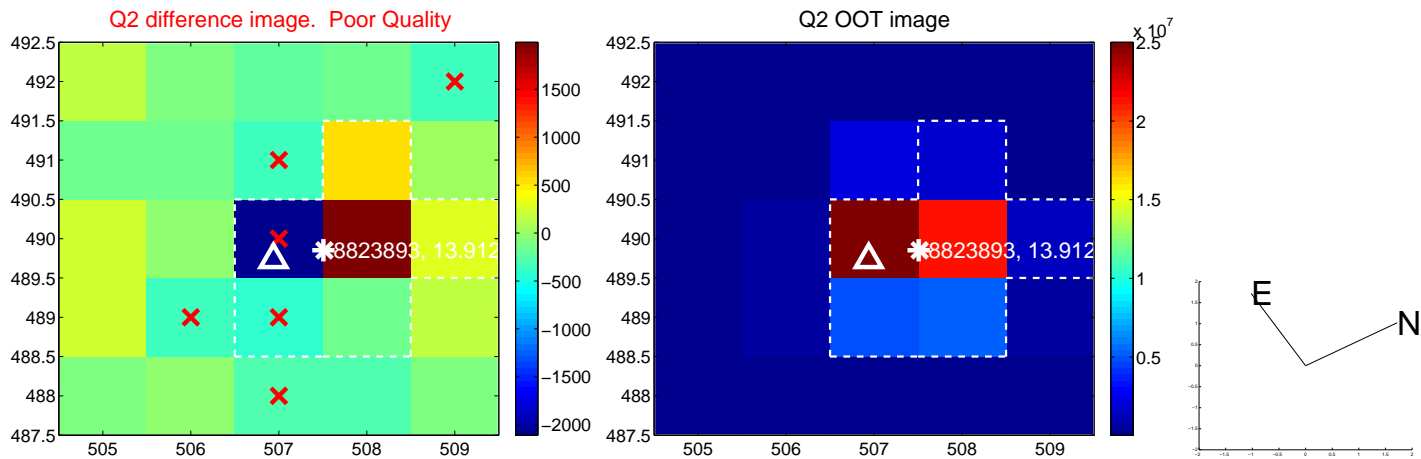
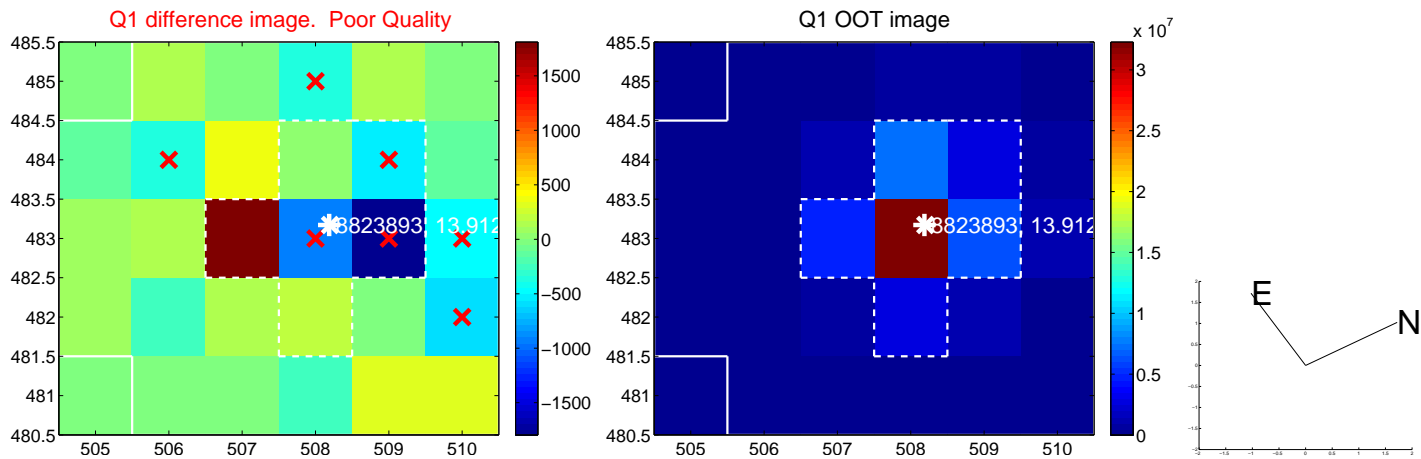
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.723 \pm 1.099$	1.57	$-0.005 \pm 0.929$	$-1.723 \pm 1.099$
PRF-fit source offset from KIC position	$1.704 \pm 1.224$	1.39	$0.032 \pm 0.967$	$-1.704 \pm 1.222$
photometric centroid source offset	$3.10 \pm 0.94$	<b>3.31</b>	$1.68 \pm 0.91$	$-2.61 \pm 0.95$

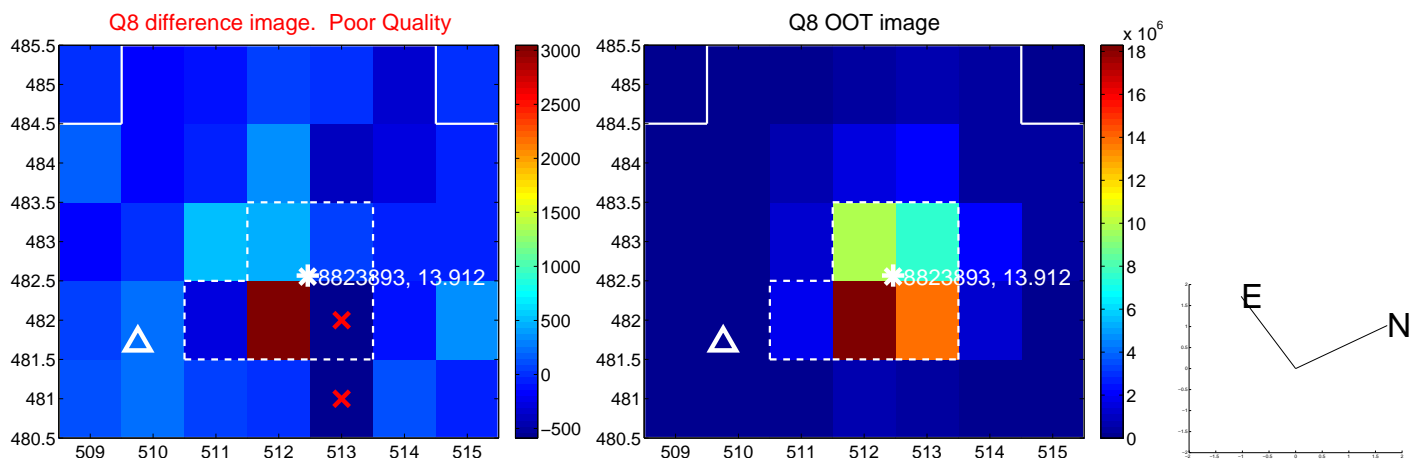
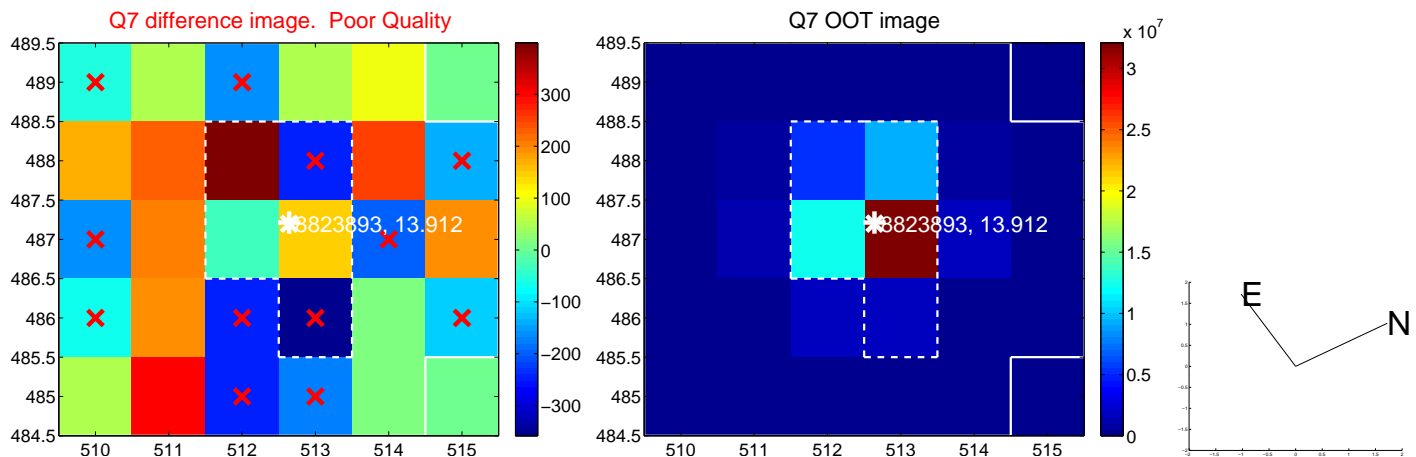
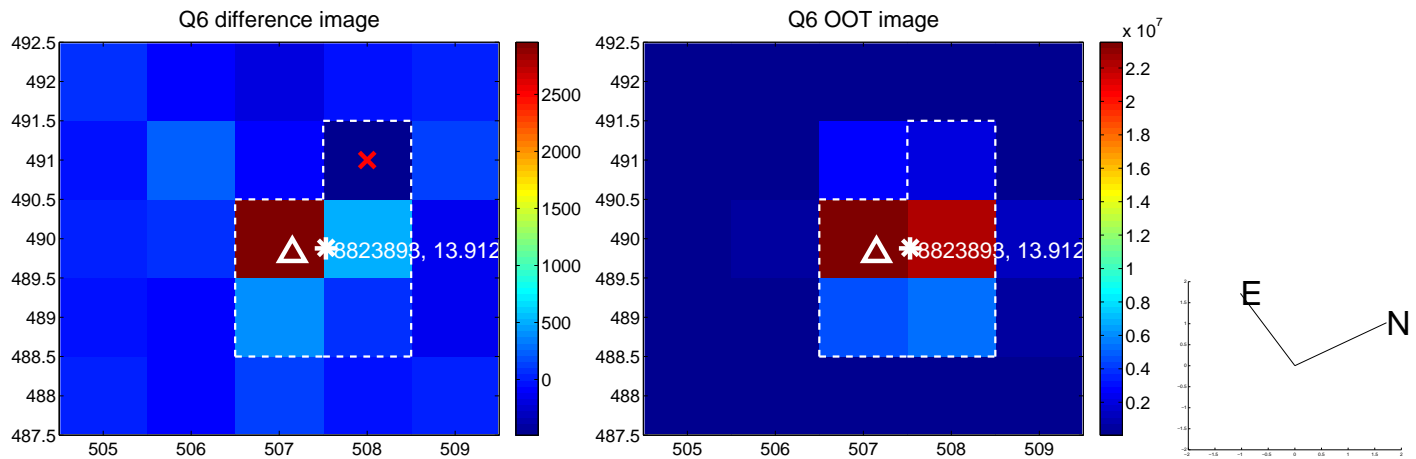
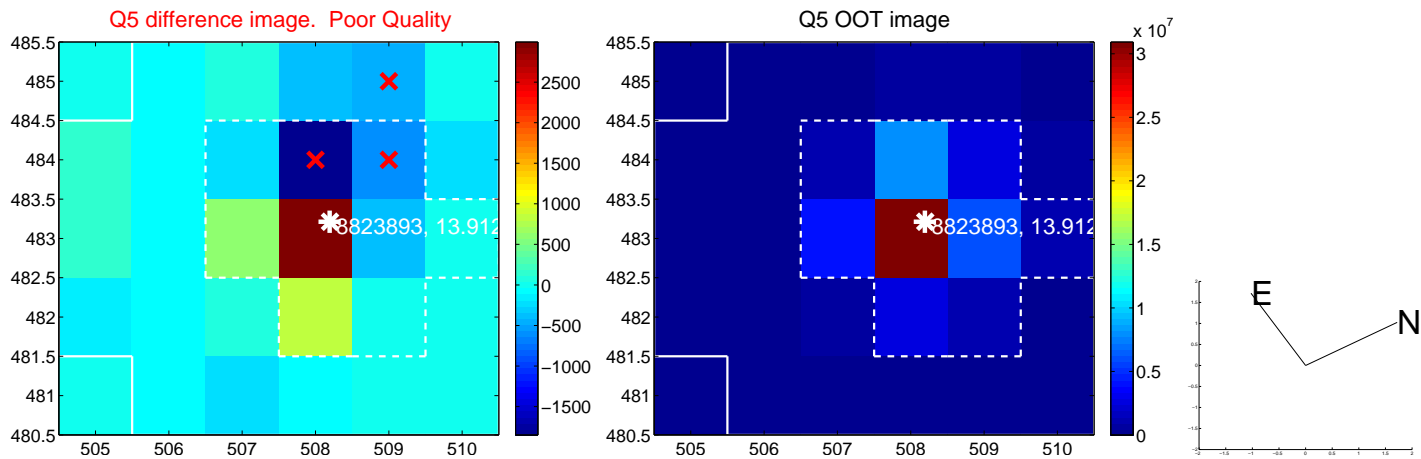


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

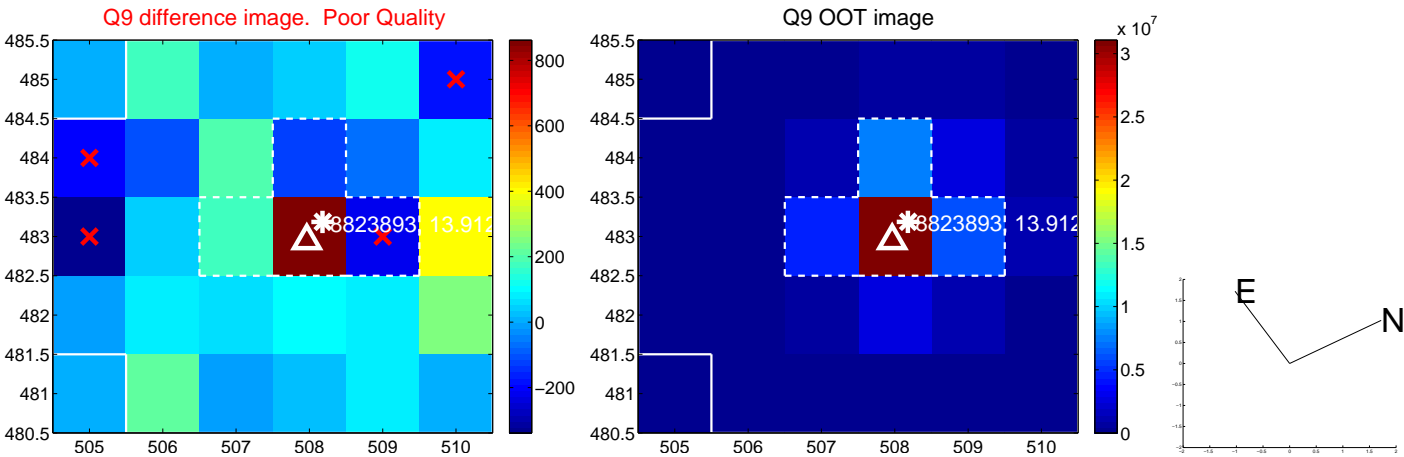


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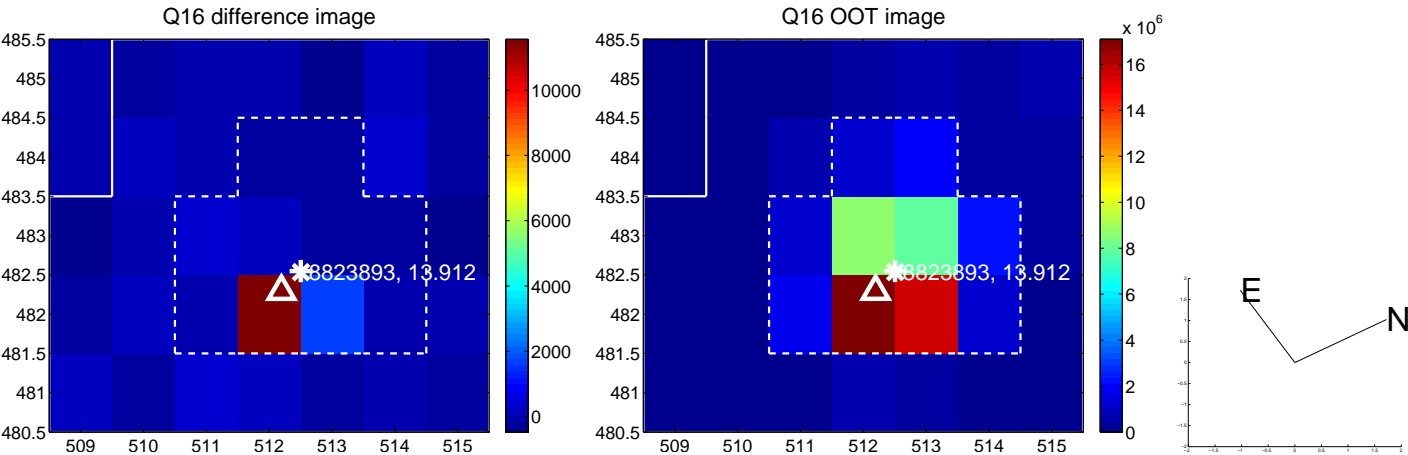
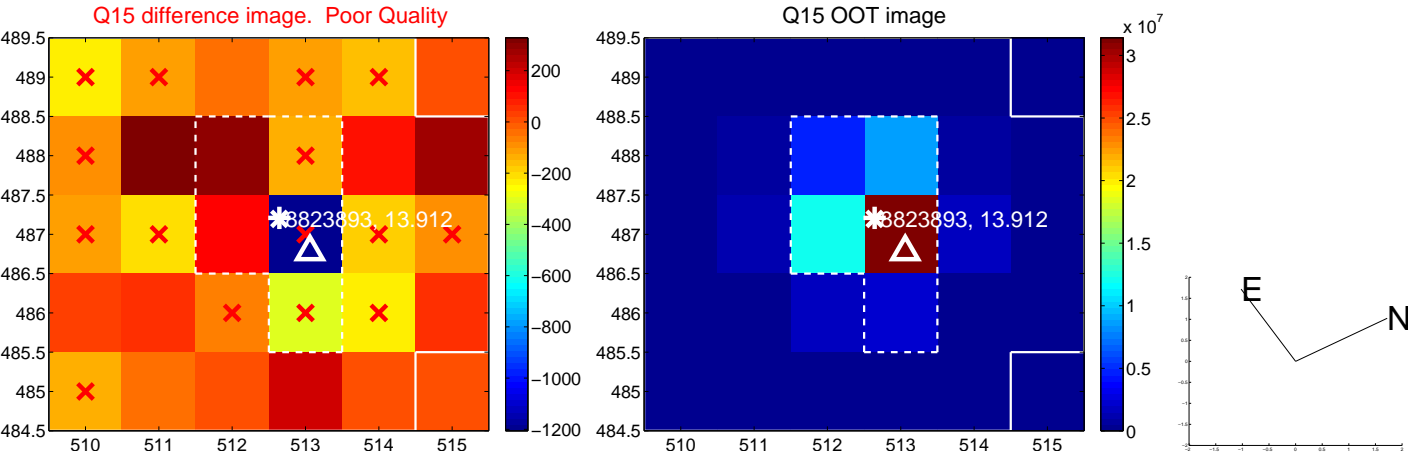
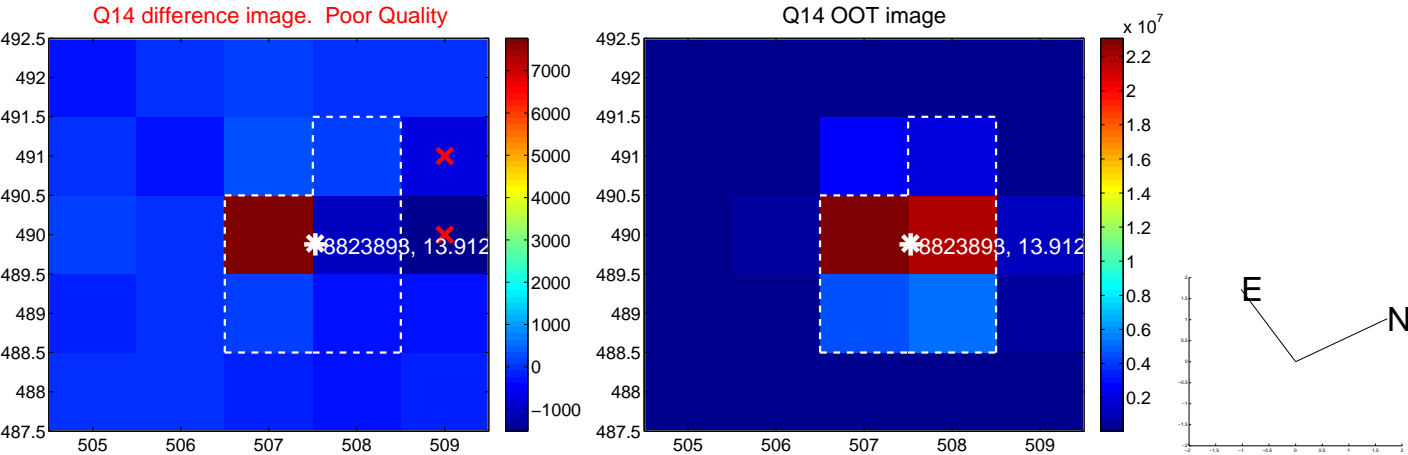
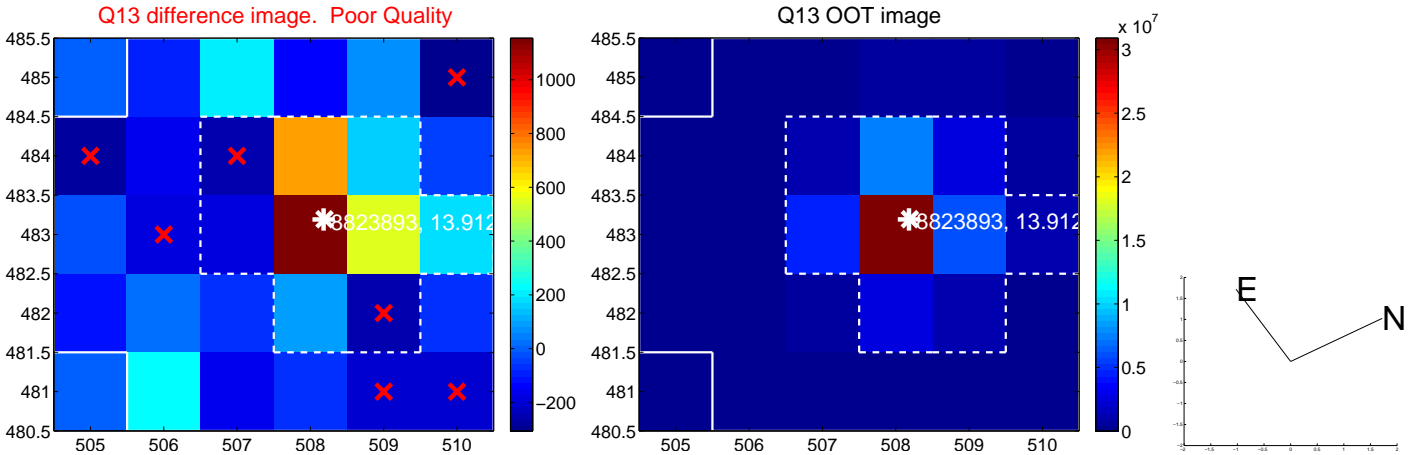




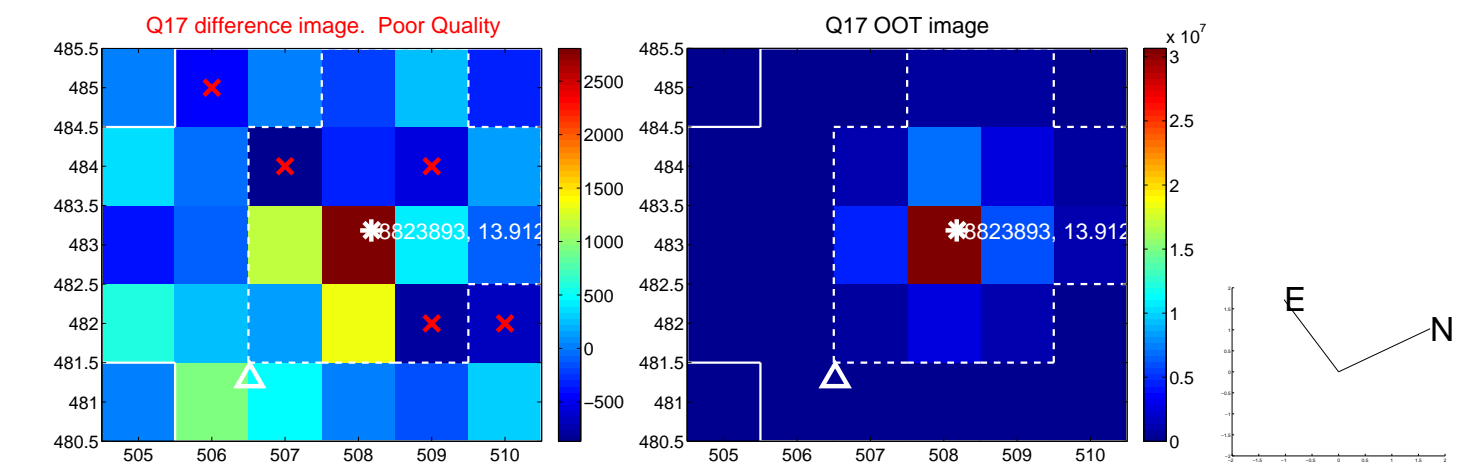
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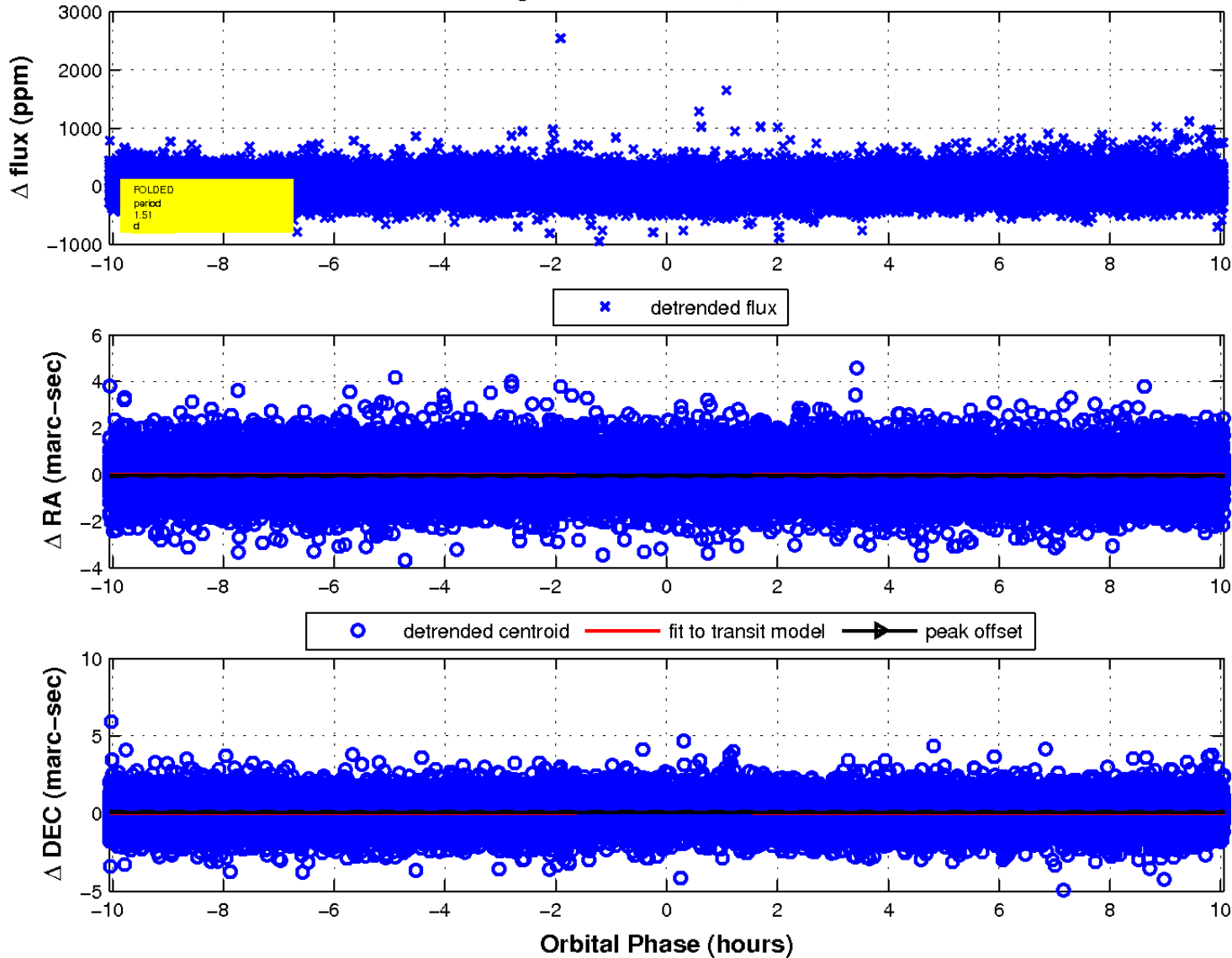
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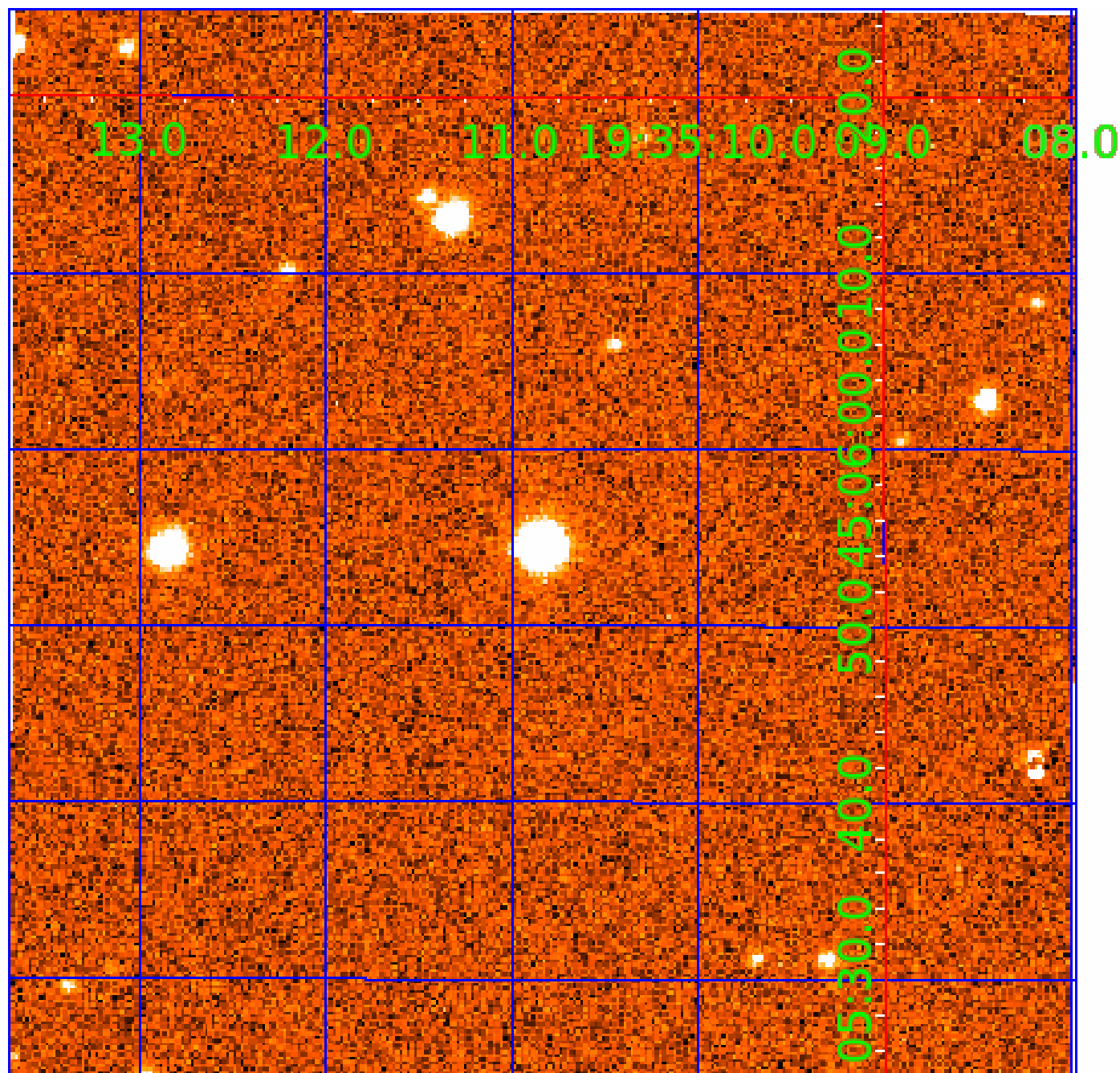


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 008823893

## Q1-17 DR25 TCE Parameters

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008823893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

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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.

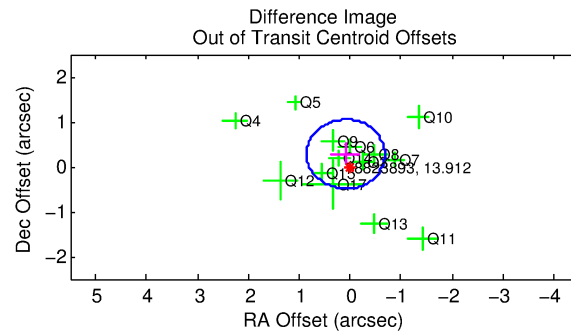
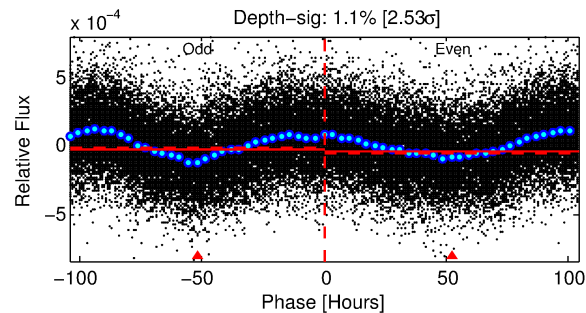
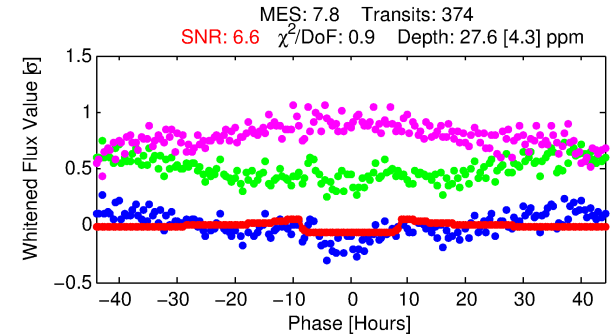
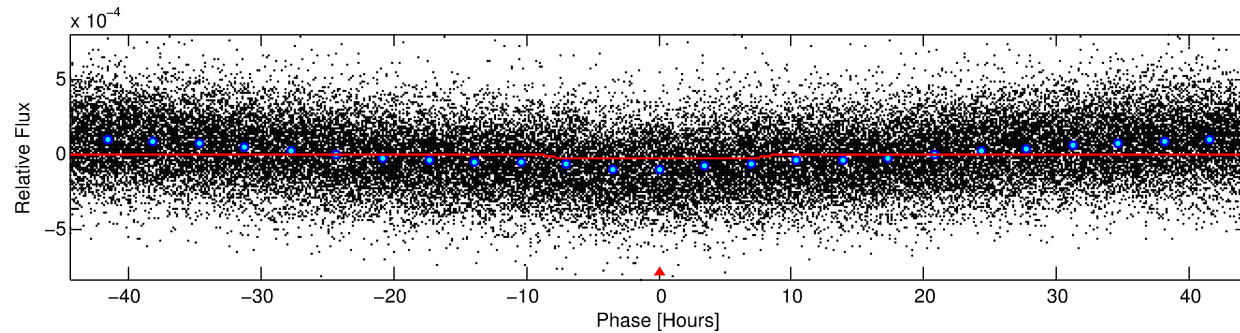
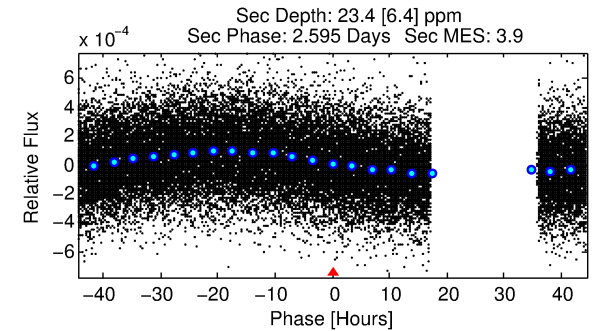
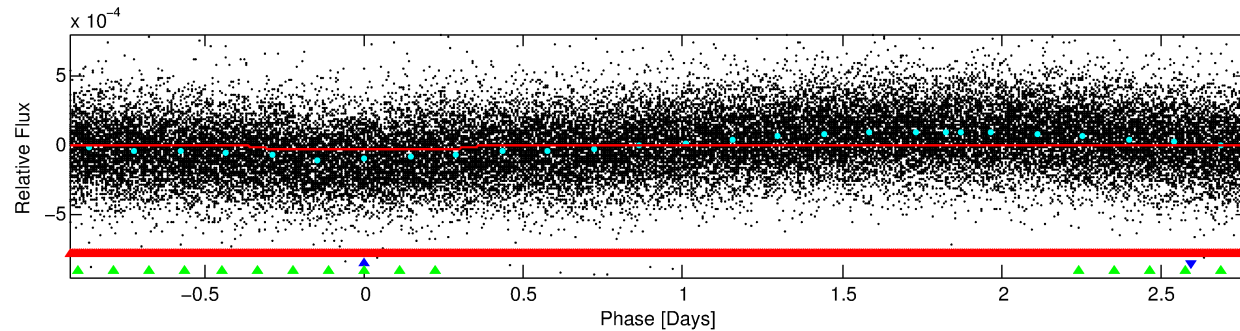
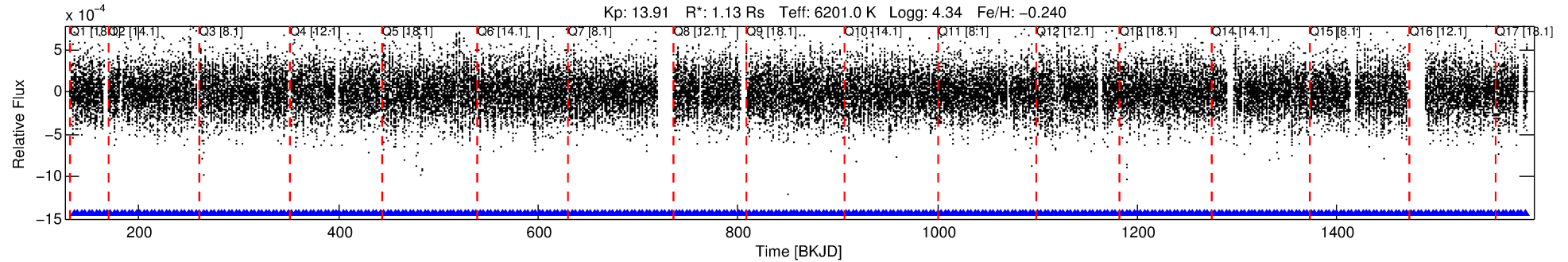
## Ephemeris Match Information For 008823893-02

No Significant Match Found

# DV One-Page Summary

KIC: 8823893 Candidate: 2 of 3 Period: 3.698 d

KOI: K05575 Corr: No Ephemeris Match



## DV Fit Results:

Period = 3.69815 [0.00007] d  
Epoch = 135.1347 [0.0134] BKJD  
Rp/R\* = 0.0049 [0.0041]  
a/R\* = 1.67 [4.59]  
b = 0.37 [10.14]  
Seff = 765.22 [298.54]  
Teq = 1341 [131] K  
Rp = 0.60 [0.54] Re  
a = 0.0469 [0.0121] AU  
Ag = 78.44 [137.21] [0.56σ]  
Teffp = 6171 [2645] K [1.82σ]

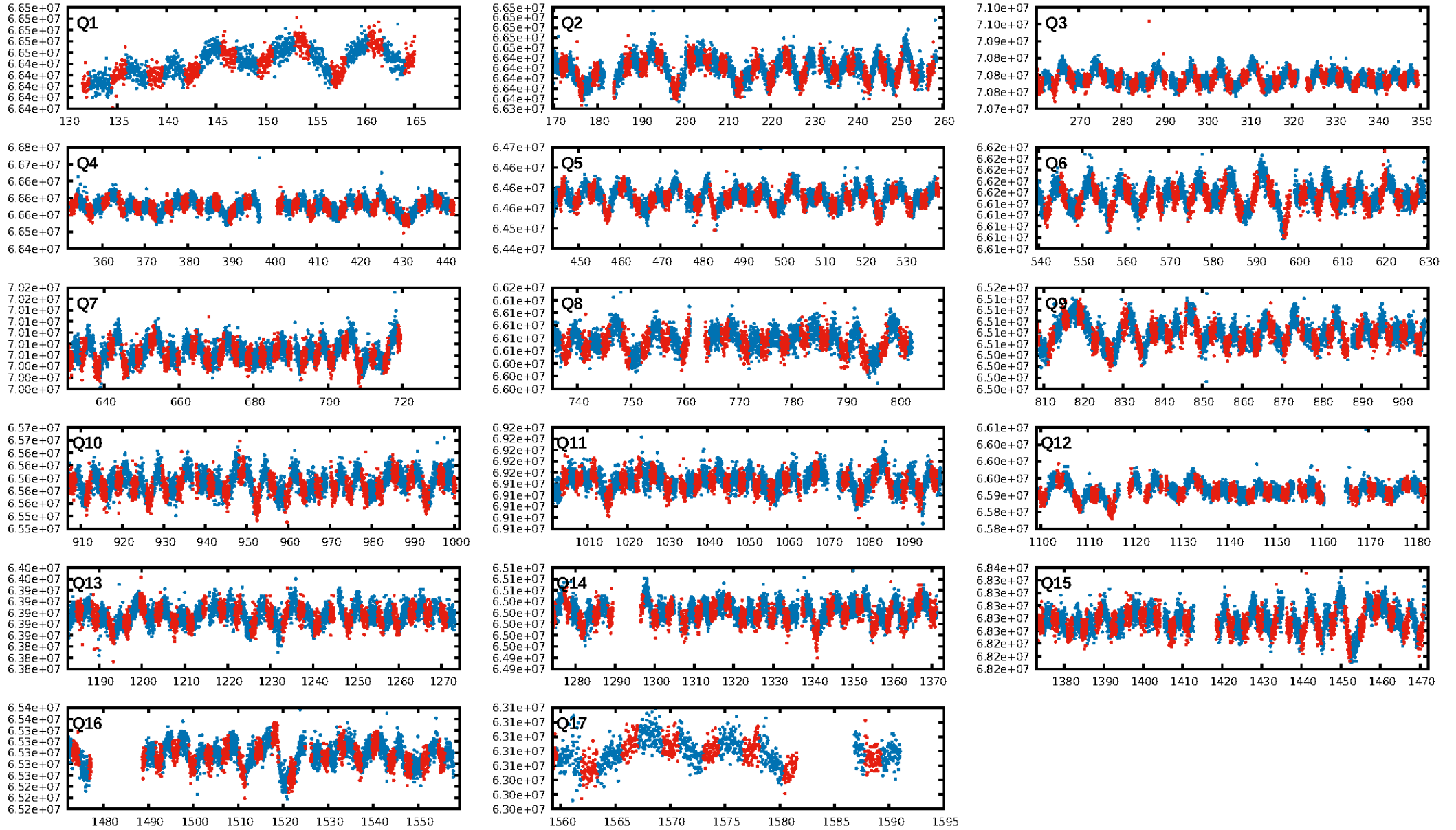
## DV Diagnostic Results:

ShortPeriod-sig: 99.7% [2.98σ]  
LongPeriod-sig: 100.0% [67.34σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.81e-18  
RollingBand-fgt: 1.00 [356/356]  
GhostDiagnostic-chr: 2.492  
Centroid-sig: 71.9%  
Centroid-so: 0.513 arcsec [0.63σ]  
OotOffset-rm: 0.292 arcsec [1.14σ]  
KicOffset-rm: 0.308 arcsec [1.19σ]  
OotOffset-st: 3/4/3/4 [14]  
KicOffset-st: 3/4/3/4 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/17]

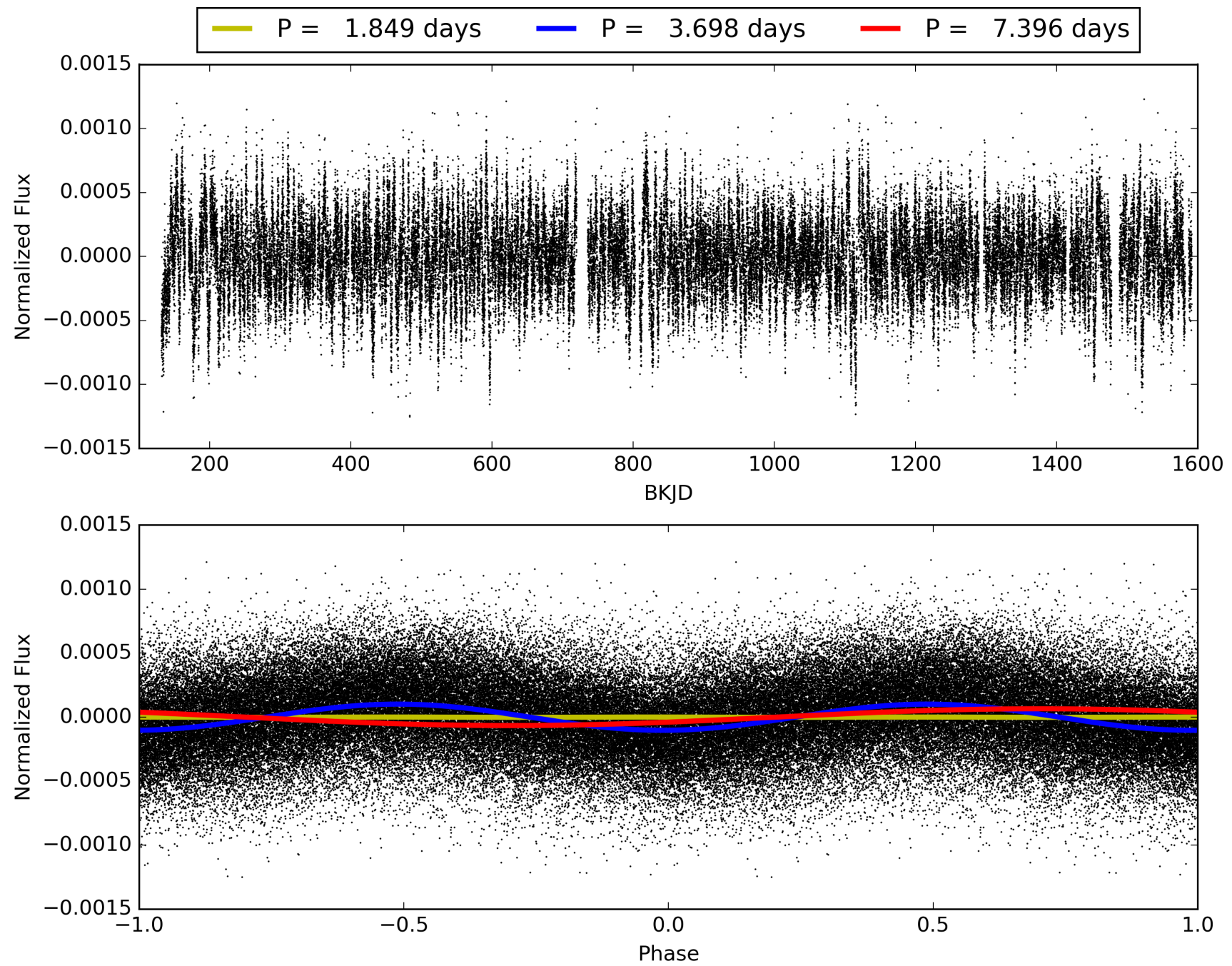
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:48:28 Z

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

# TCE 008823893-02, PDC Light Curves



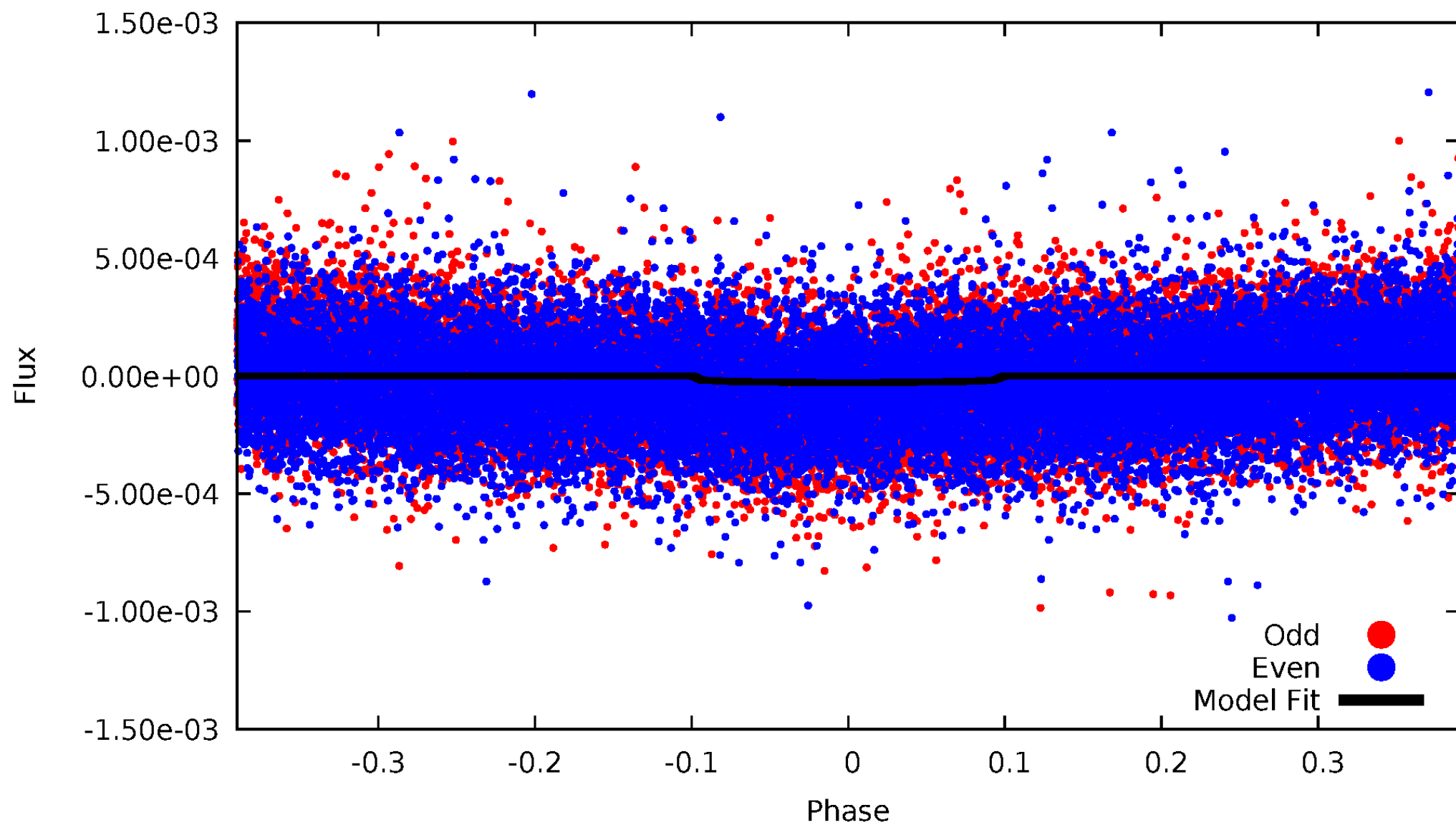
TCE 008823893-02





# DV Odd/Even

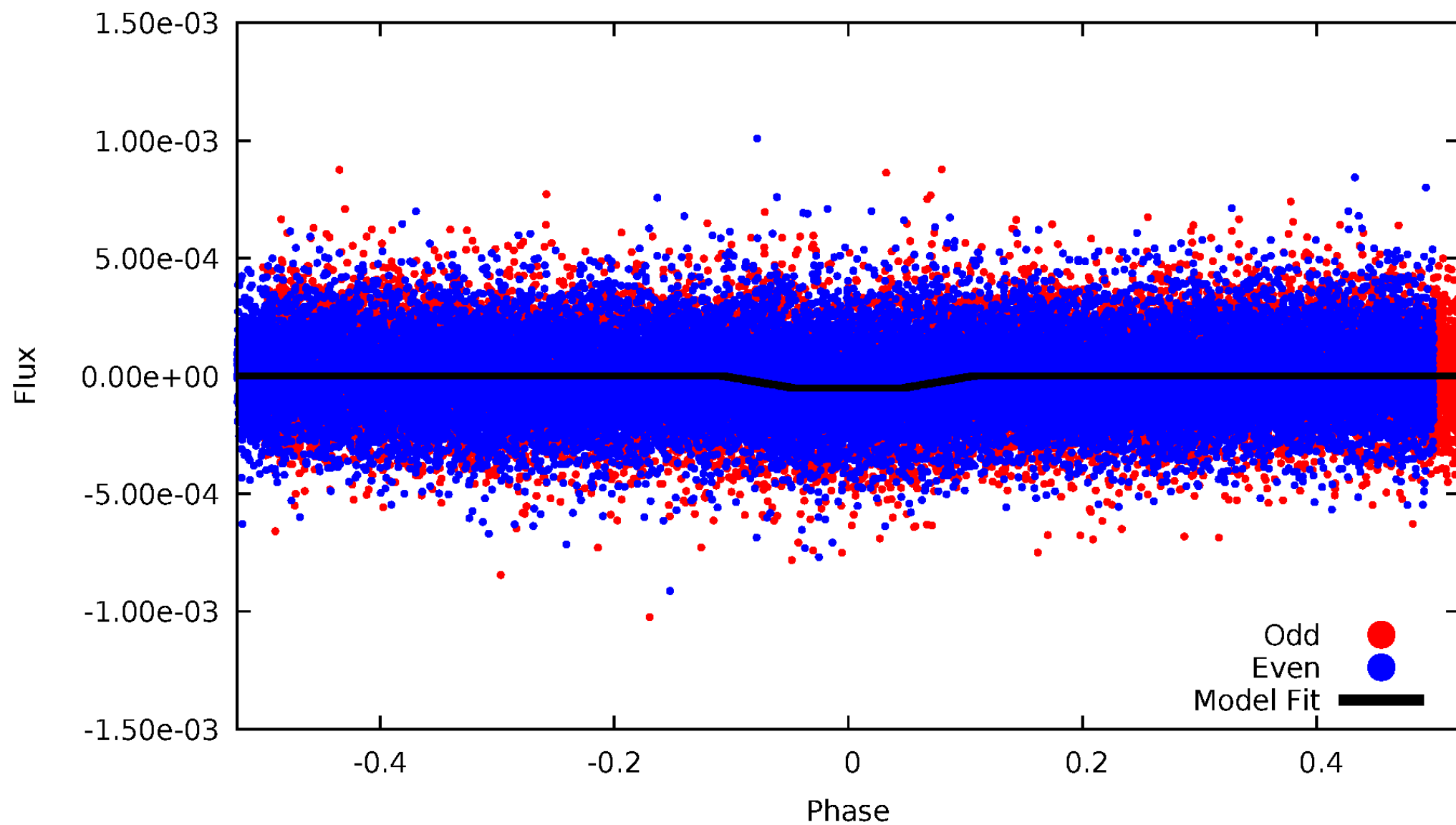
TCE 008823893-02





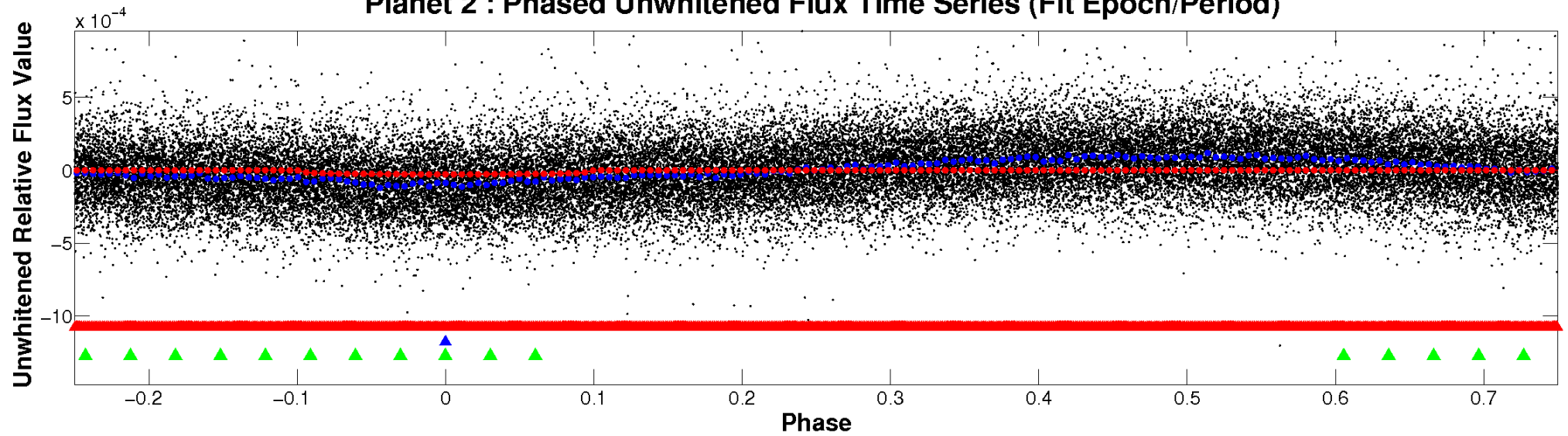
# ALT Odd/Even

TCE 008823893-02

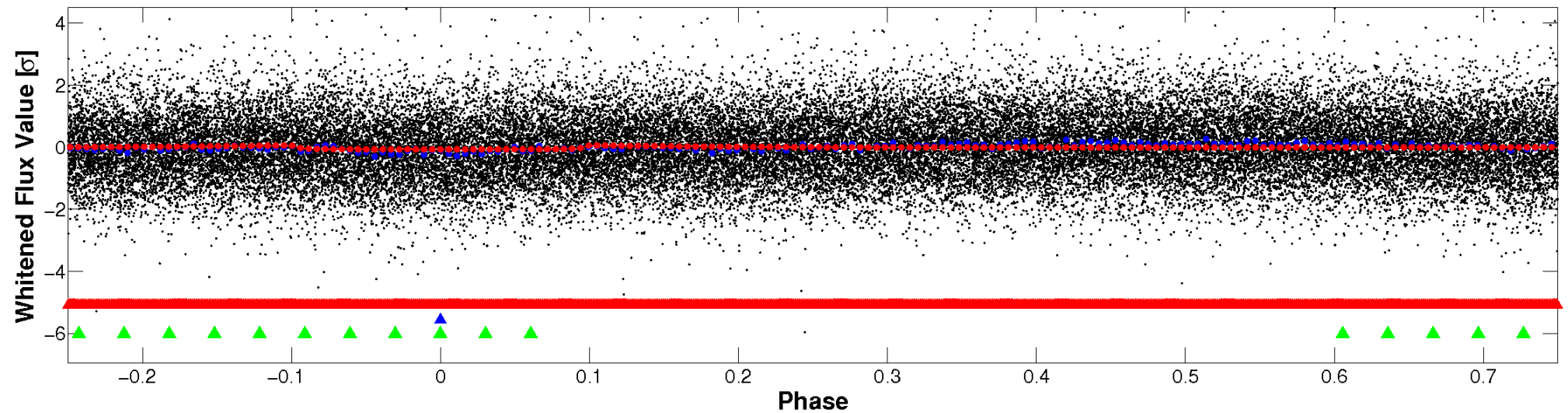


# Non-Whitened Vs. Whitened Light Curve

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

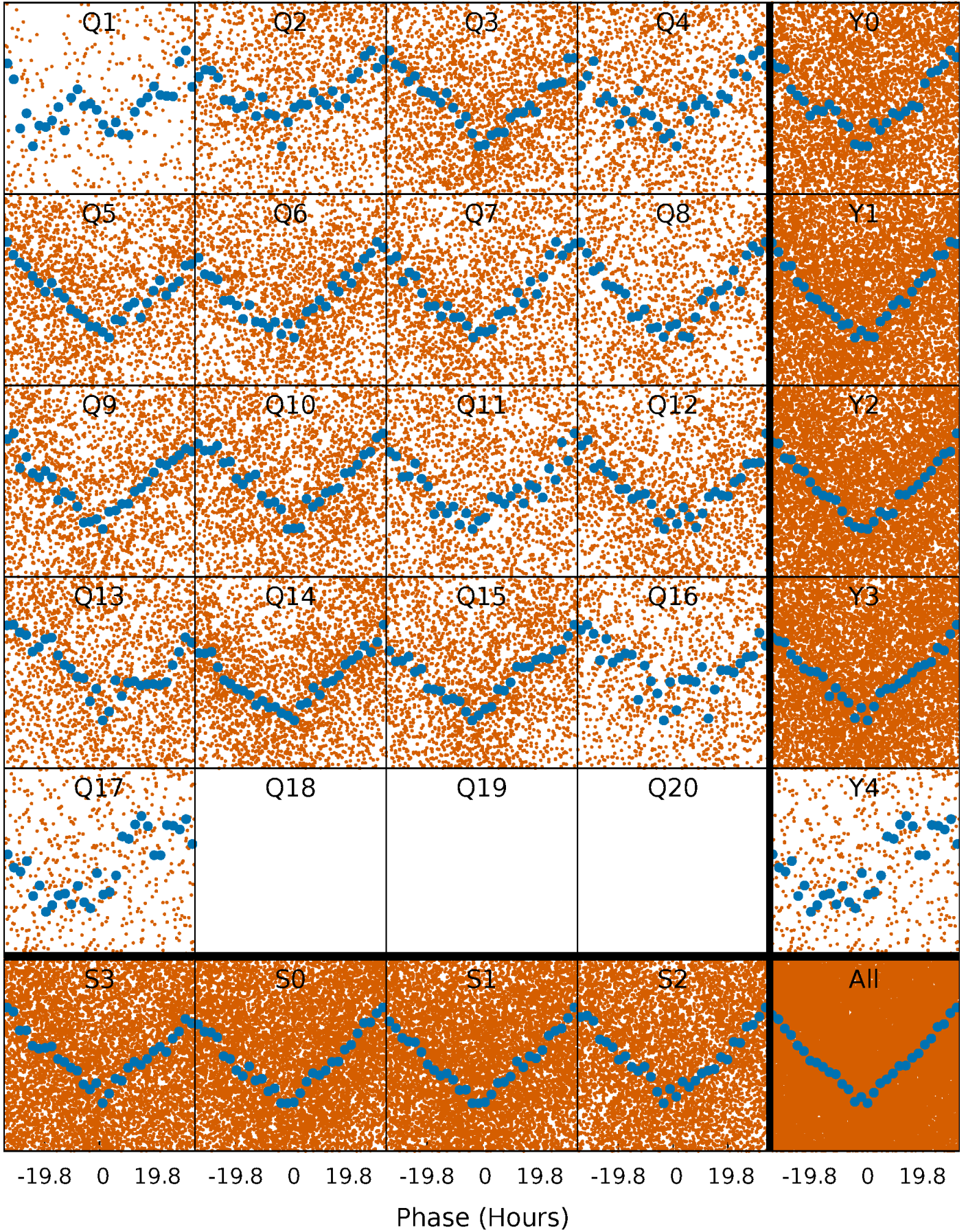


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

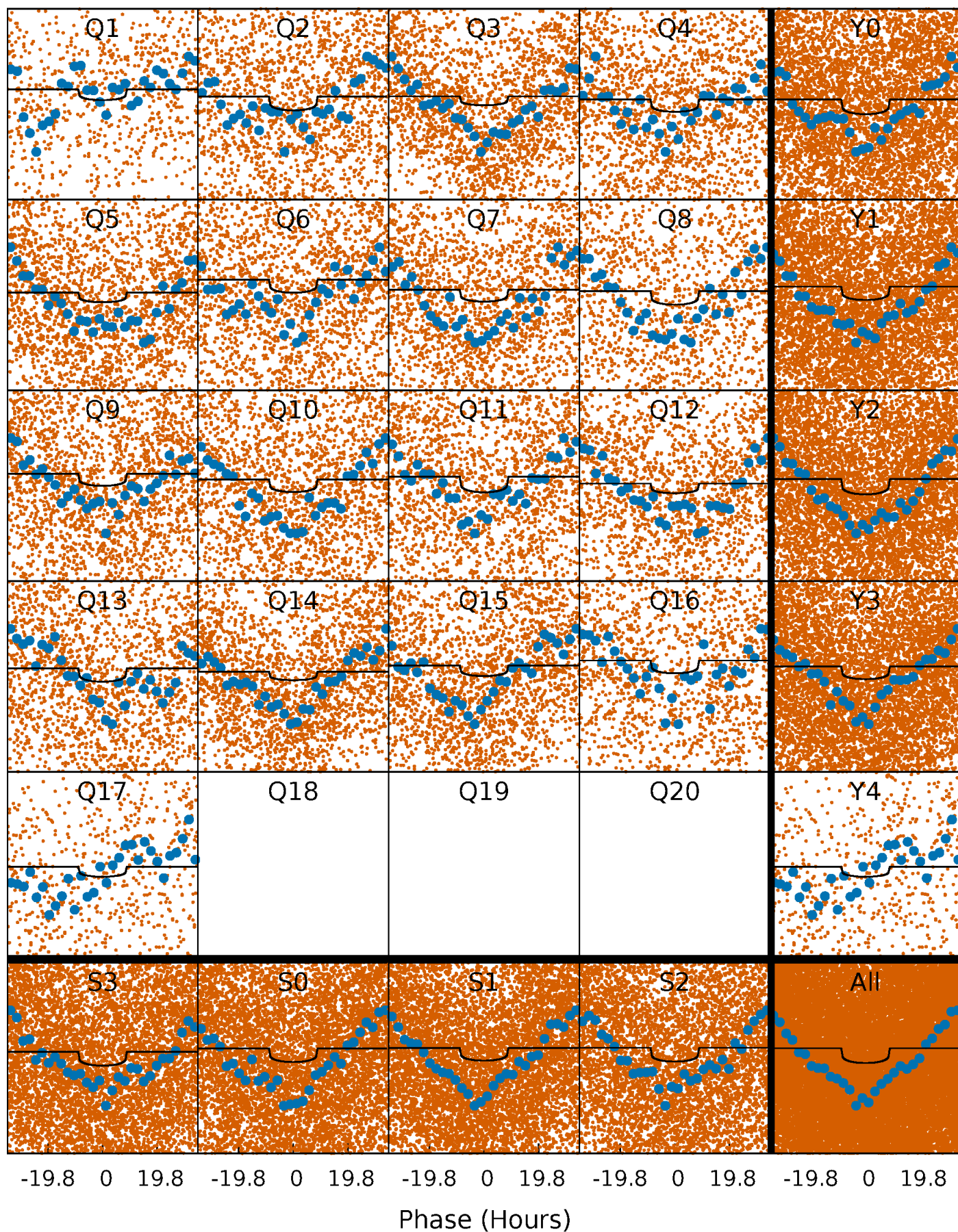
TCE 008823893-02   P= 3.698147 Days    $T_0=135.134691$  (BKJD)





# DV Quarter-Phased Transit Curves

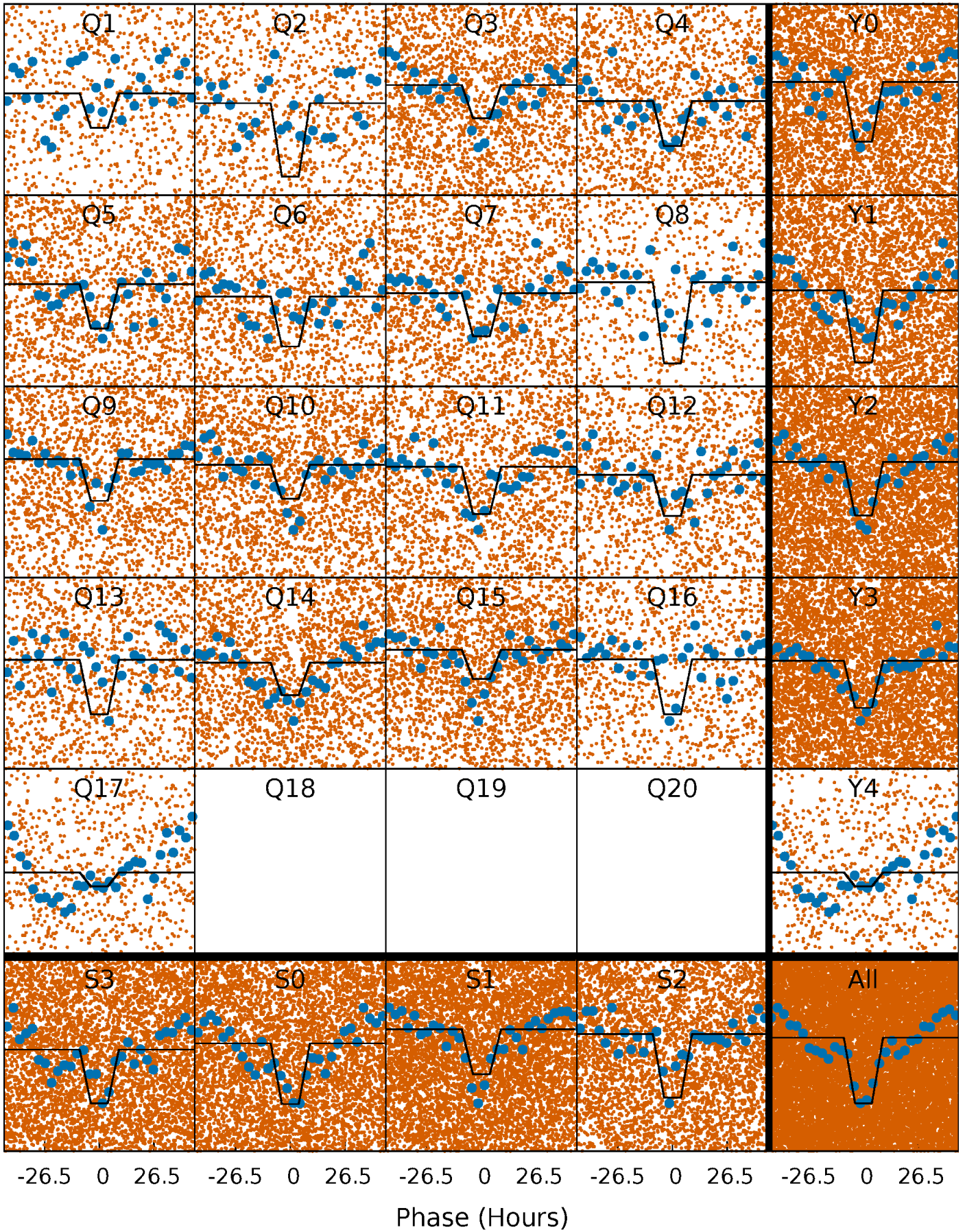
TCE 008823893-02 P= 3.698147 Days  $T_0=135.134691$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 008823893-02 P= 3.697957 Days  $T_0=135.139588$  (BKJD)

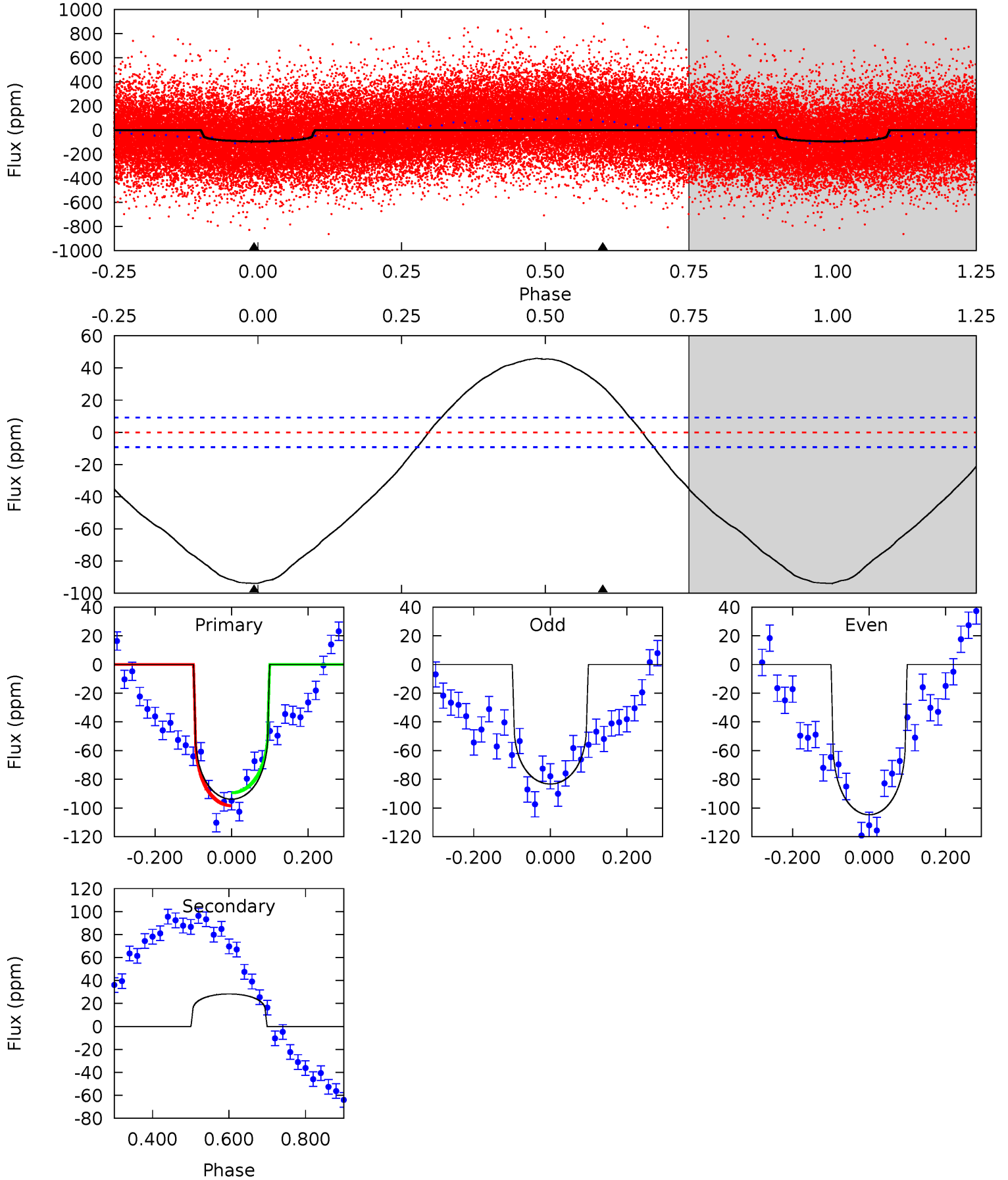




# DV Model-Shift Uniqueness Test

008823893-02, P = 3.698147 Days, E = 131.436544 Days

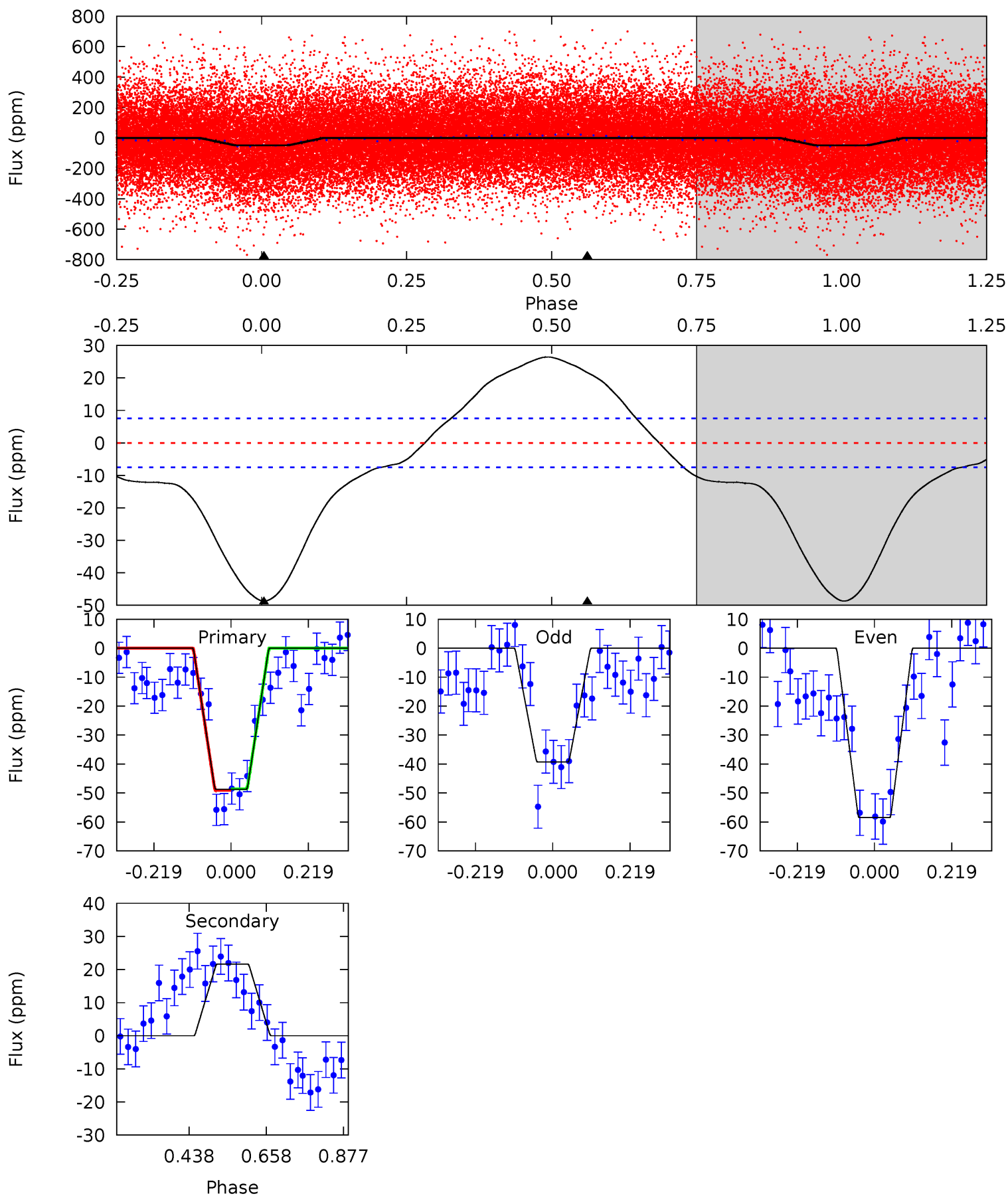
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.1	-13.6	0	0	4.42	1.28	11.4	45.1	45.1	-13.6	-13.6	5.03	1.07	0.33	2.18



# Alt Model-Shift Uniqueness Test

008823893-02, P = 3.697957 Days, E = 131.441631 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
28.4	-12.6	0	0	4.40	1.23	3.36	28.4	28.4	-12.6	-12.6	5.64	0.81	0.35	0.16



### Stellar Parameters For KIC 008823893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6201^{+175}_{-197}$	$4.336^{+0.132}_{-0.198}$	$-0.240^{+0.300}_{-0.300}$	$1.126^{+0.353}_{-0.190}$	$0.998^{+0.160}_{-0.107}$	$0.986^{+0.578}_{-0.488}$
	+3%/-3%	+3%/-5%	+125%/-125%	+31%/-17%	+16%/-11%	+59%/-49%
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 008823893-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$28 \pm 2$	$0.69^{+0.50}_{-0.41}$	$1876^{+154}_{-110}$	$-6049^{+1325}_{-4526}$	$-70.328^{+46.170}_{-359.259}$
Alt.	$22 \pm 2$	$0.95^{+0.53}_{-0.49}$	$1892^{+146}_{-114}$	$-4974^{+764}_{-2181}$	$-28.810^{+16.932}_{-98.772}$

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

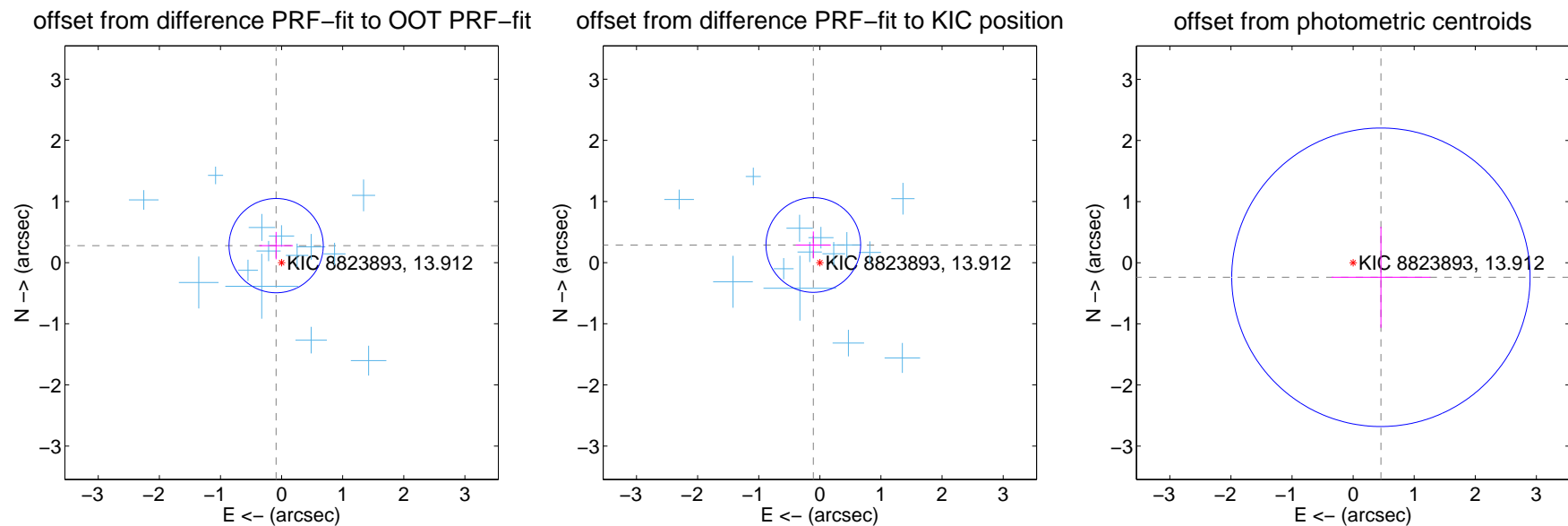
## DV Centroid Data

Supplemental centroid analysis for 008823893-02. Kepler magnitude: 13.91. Transit SNR 6.55

There are 14 quarters with good PRF difference image offsets

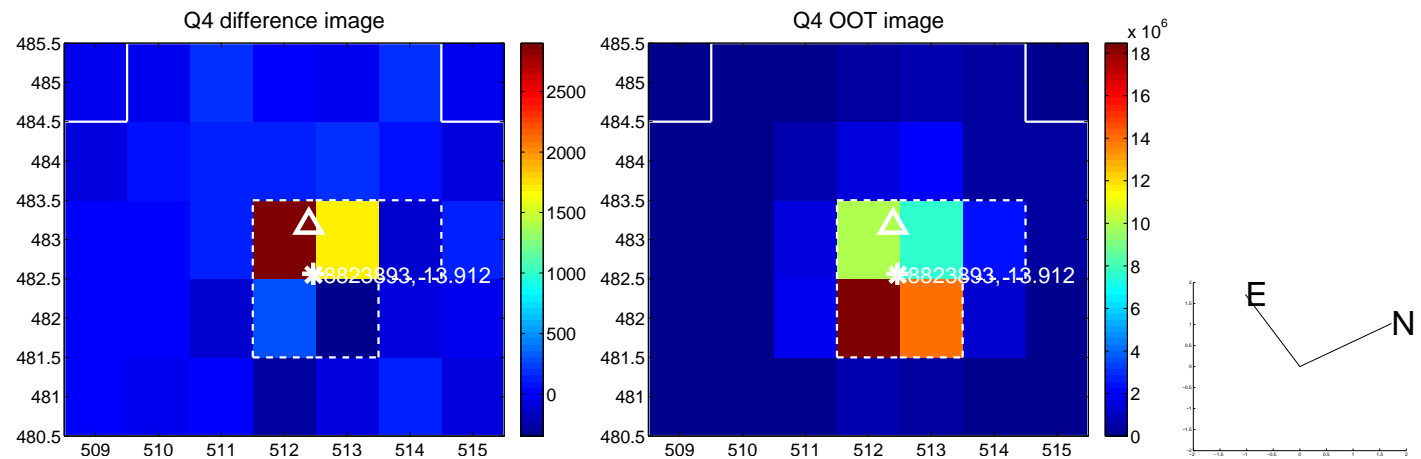
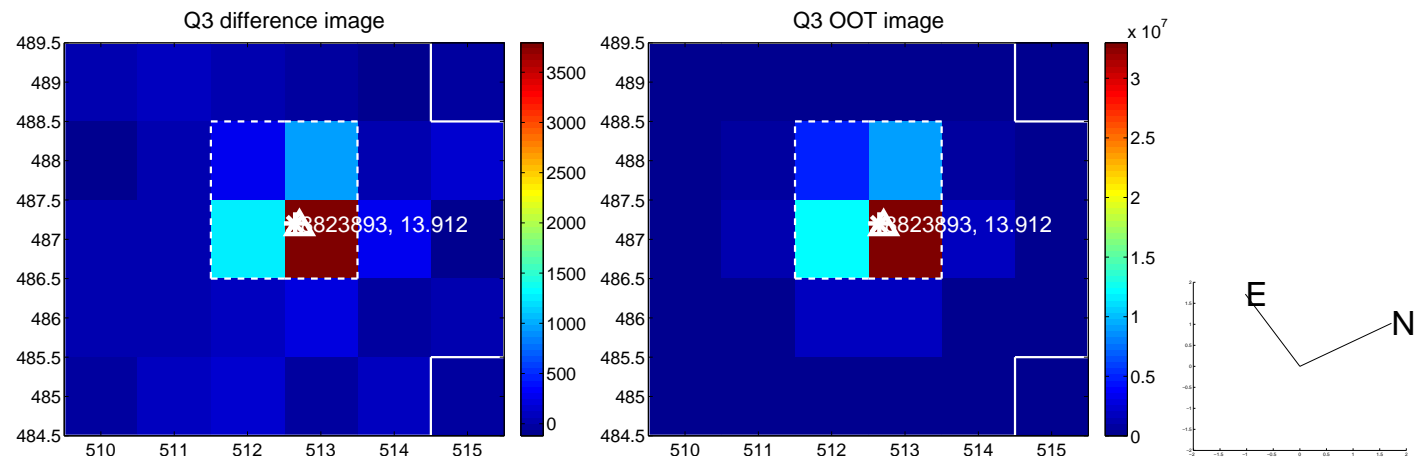
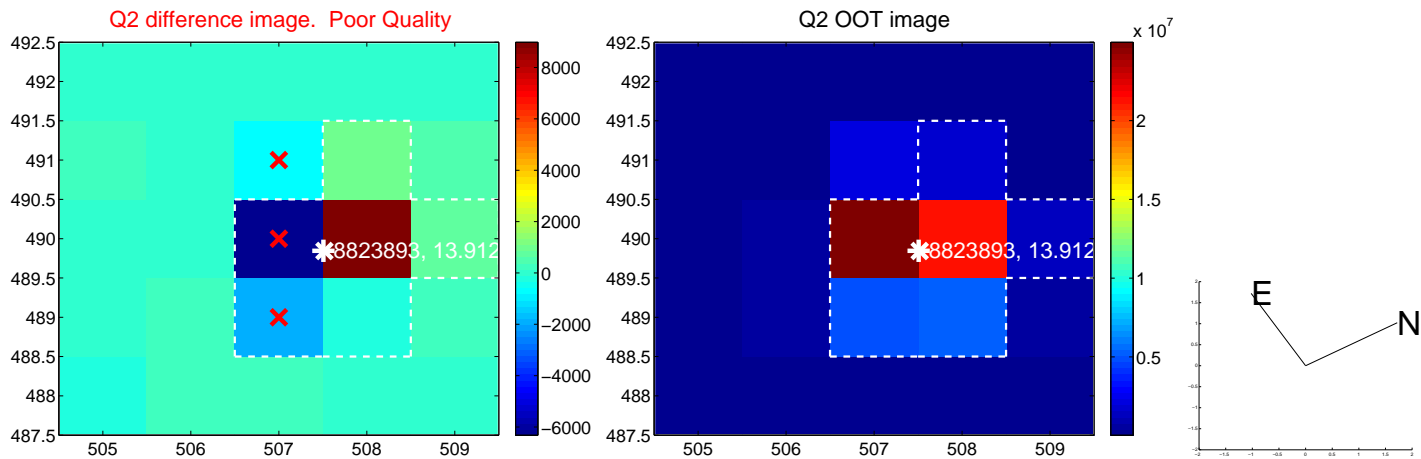
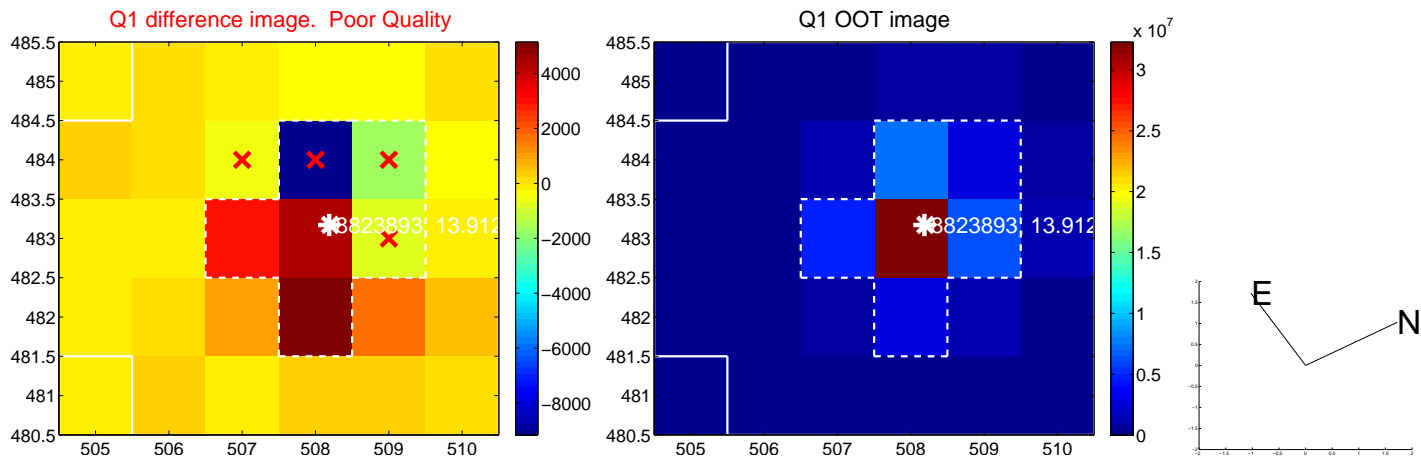
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.292 \pm 0.257$	1.14	$0.089 \pm 0.275$	$0.278 \pm 0.224$
PRF-fit source offset from KIC position	$0.308 \pm 0.258$	1.19	$0.107 \pm 0.286$	$0.289 \pm 0.220$
photometric centroid source offset	$0.51 \pm 0.81$	0.63	$-0.45 \pm 0.81$	$-0.24 \pm 0.83$



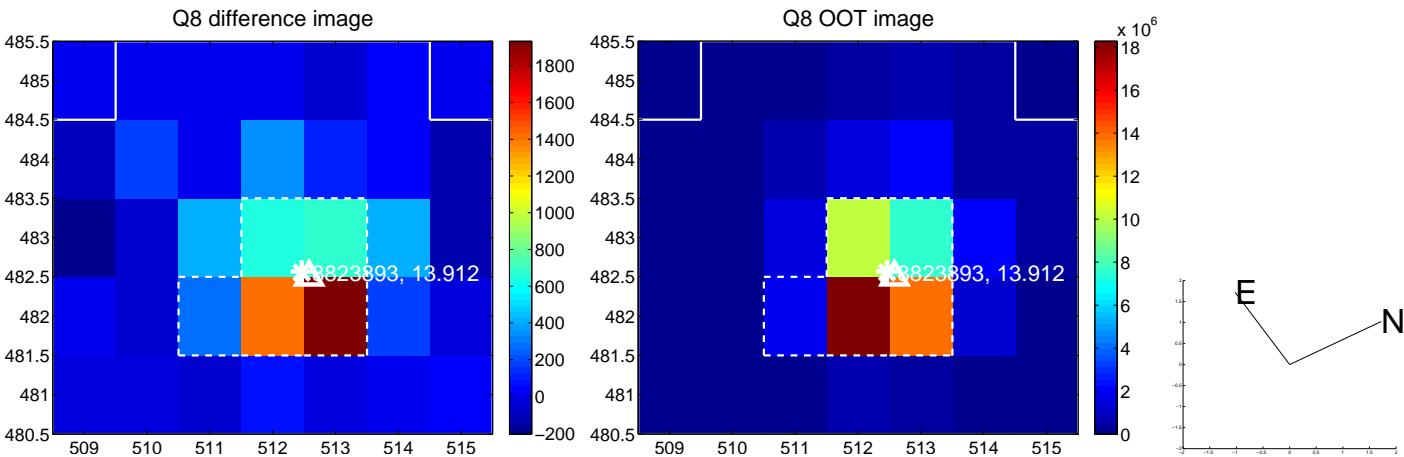
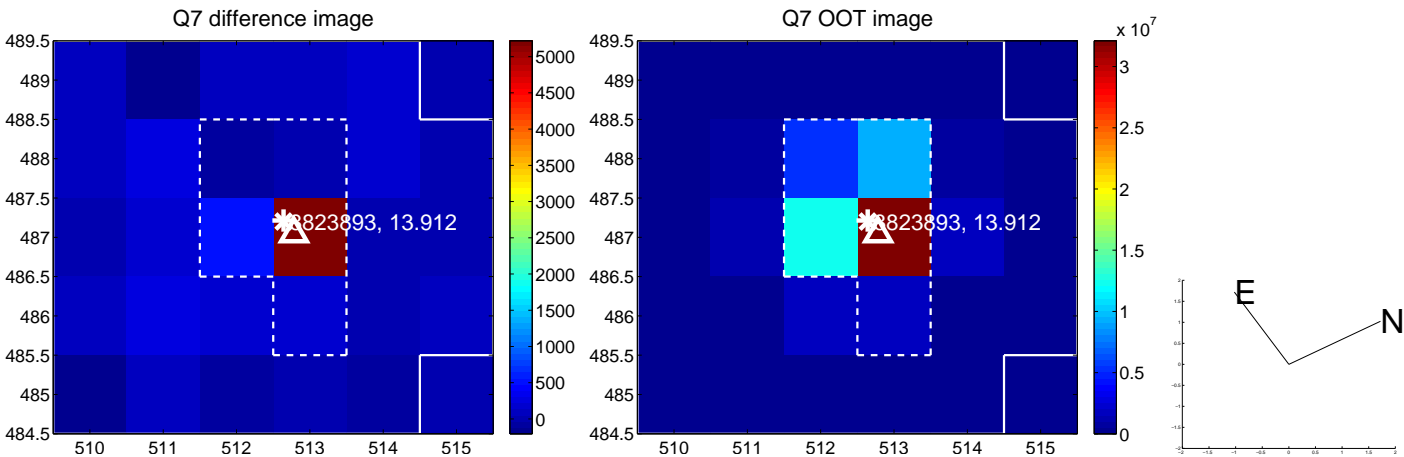
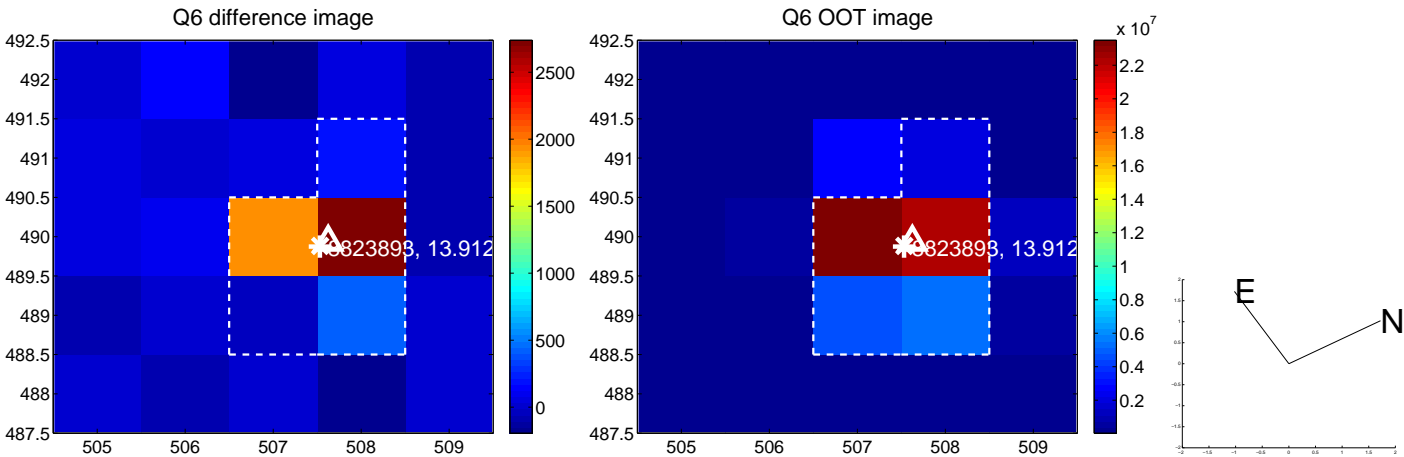
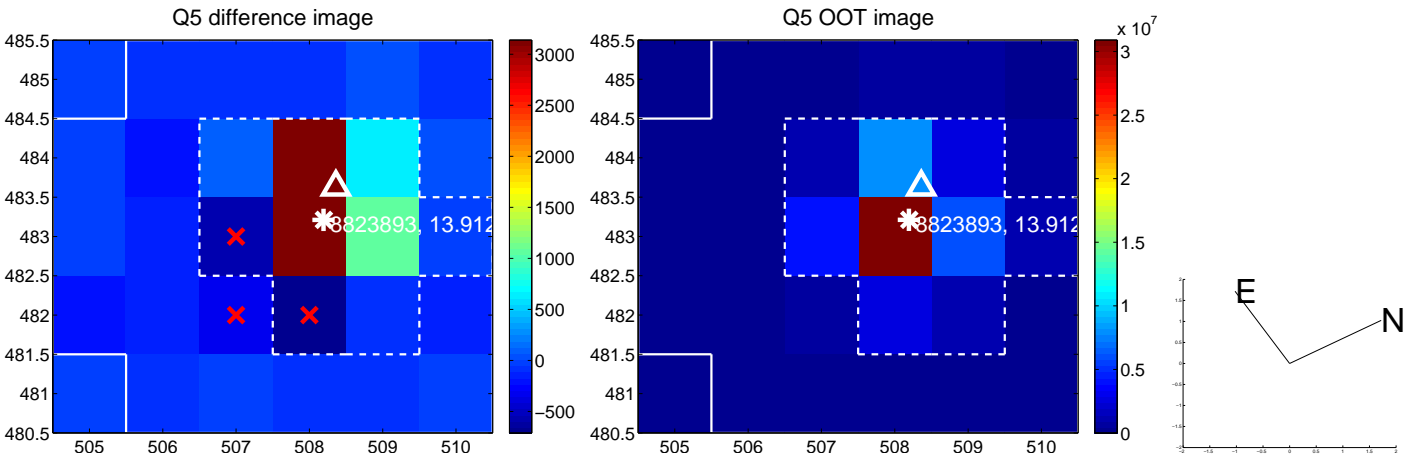
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

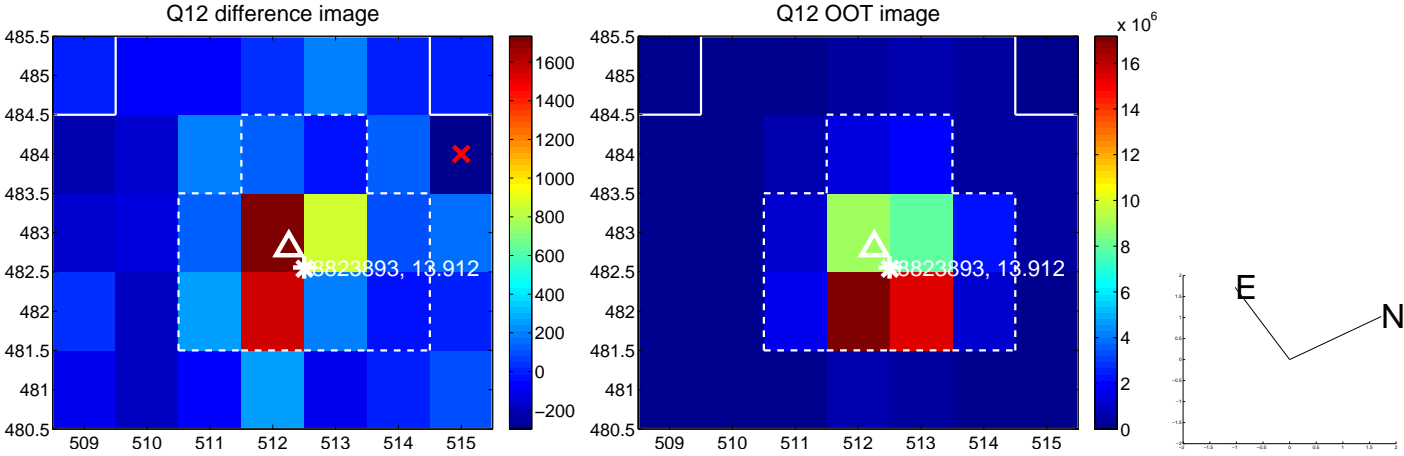
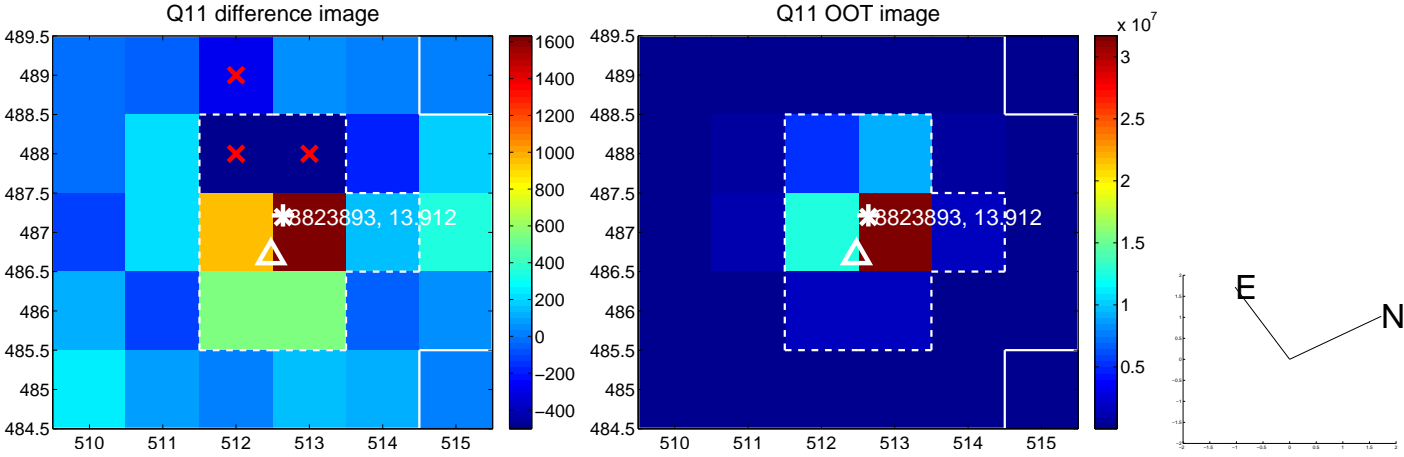
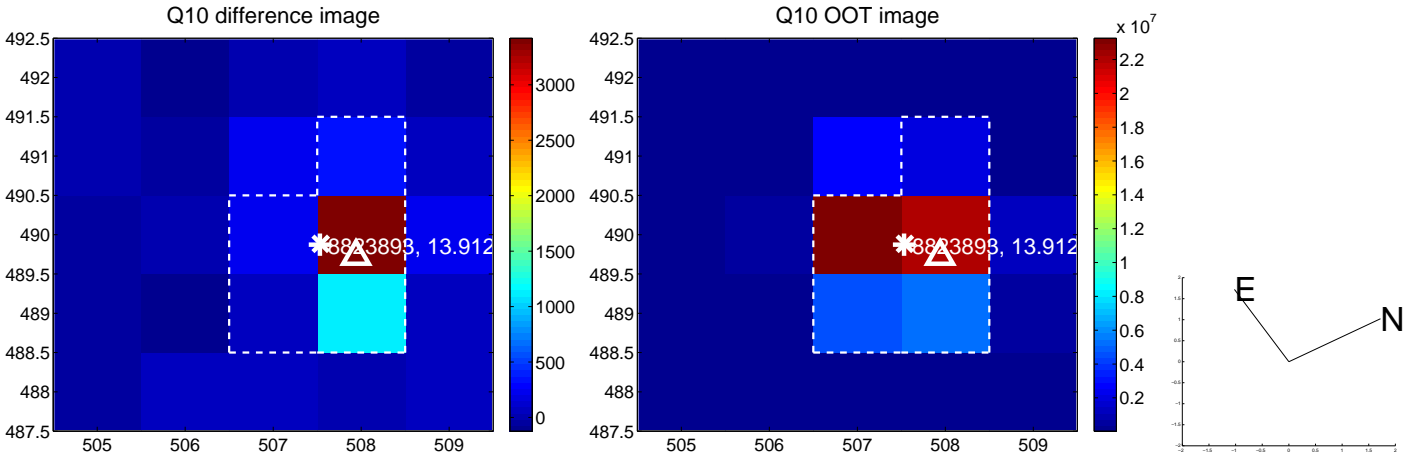
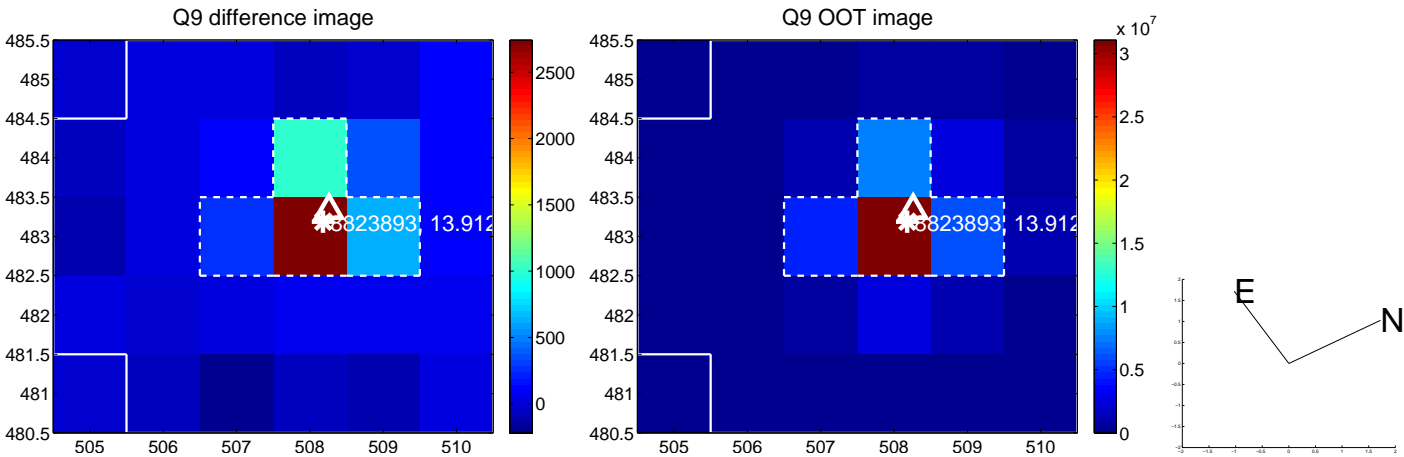




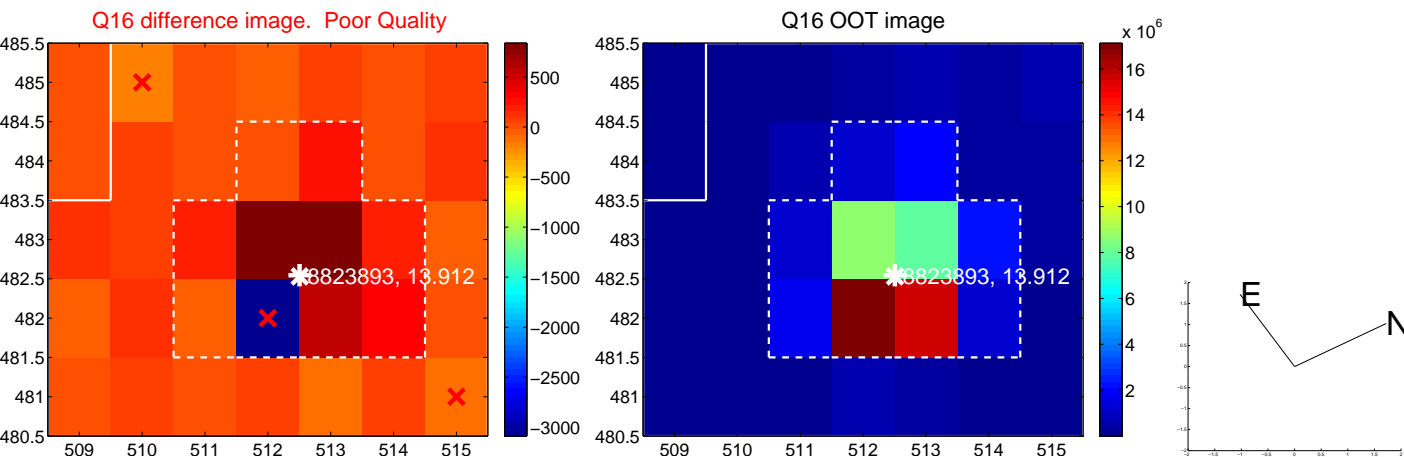
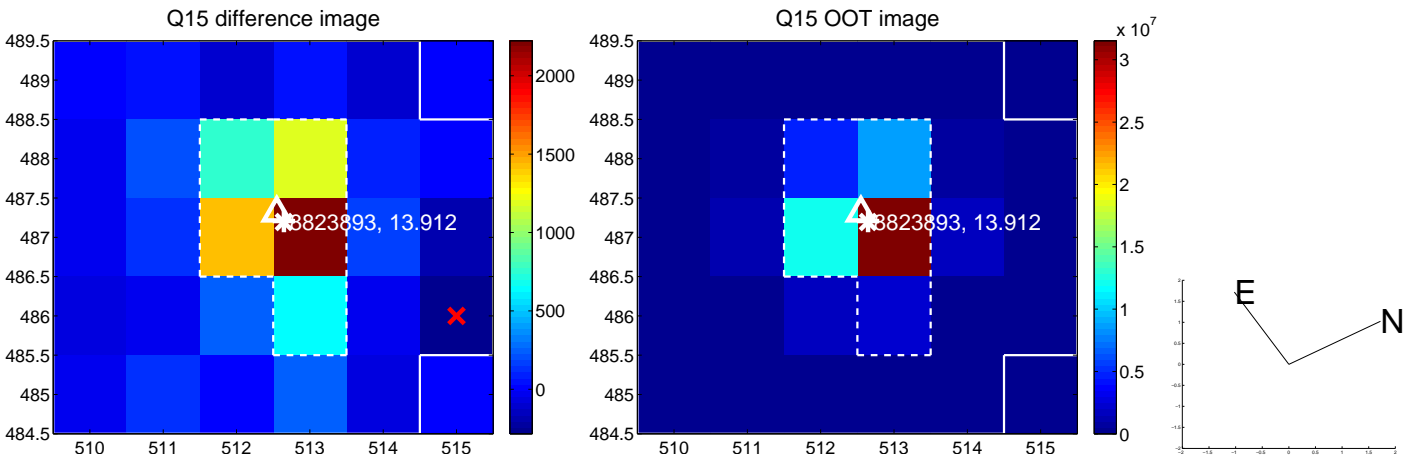
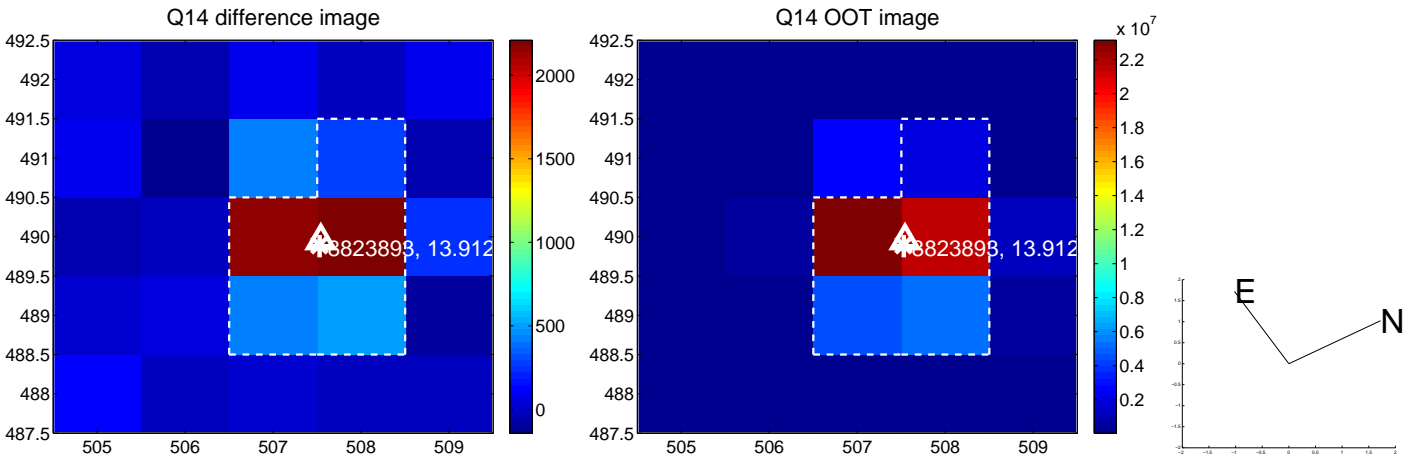
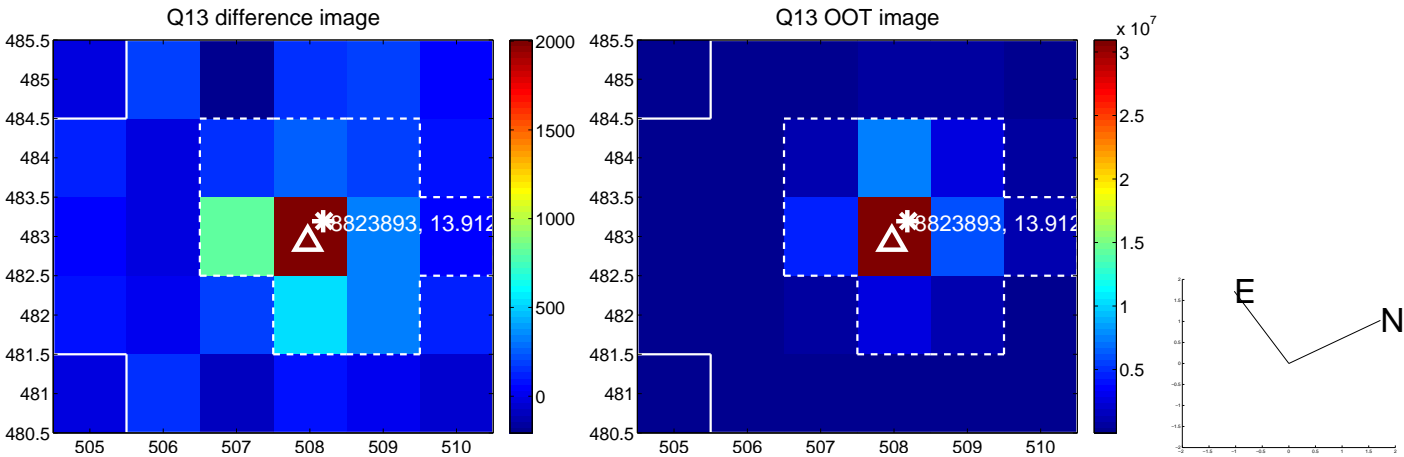
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



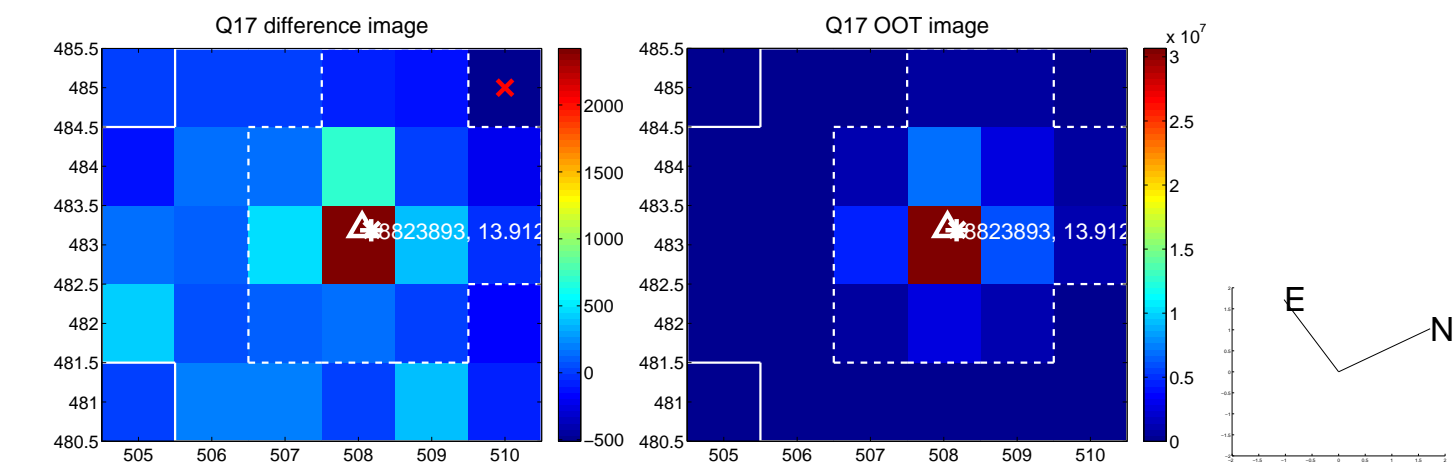
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



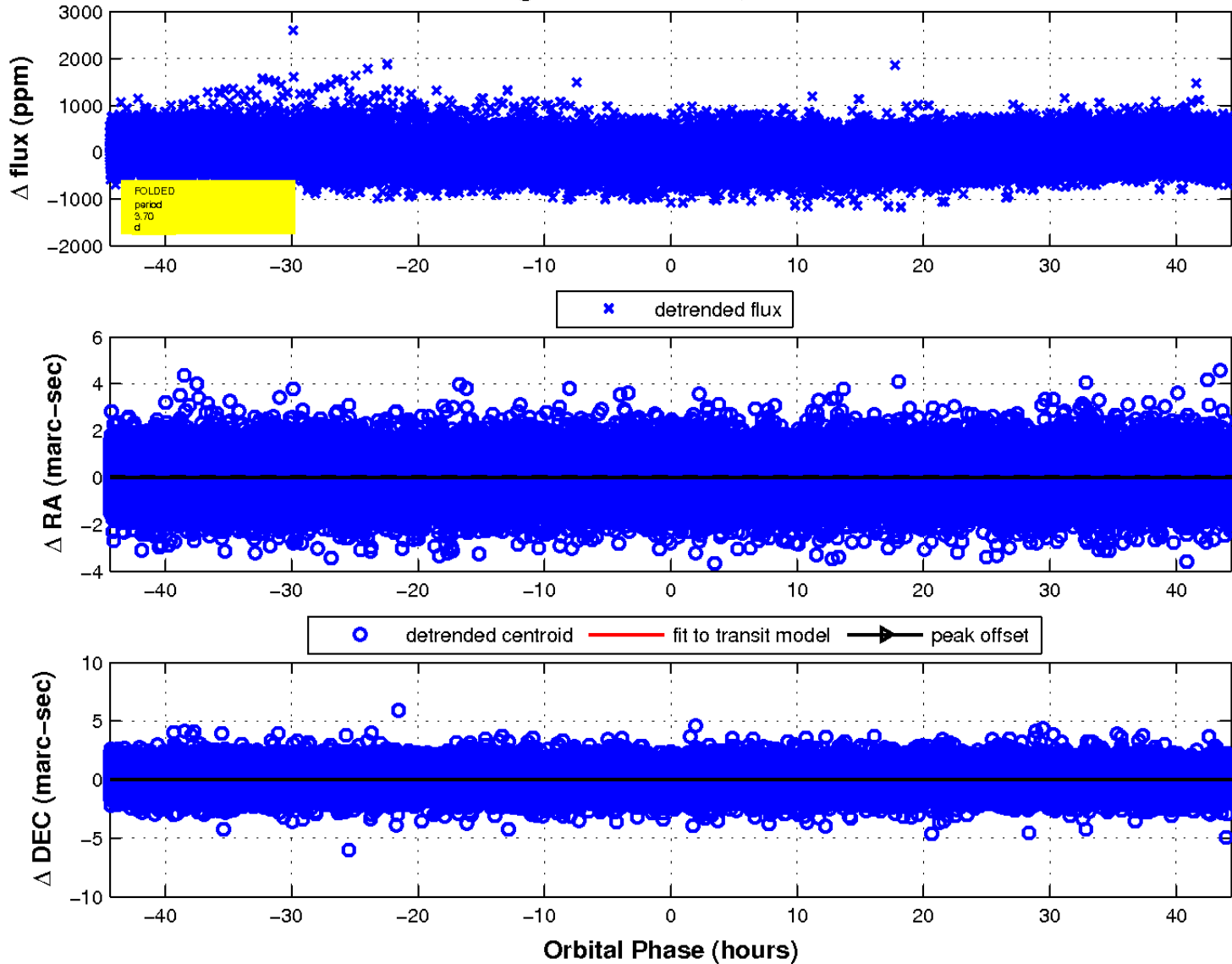
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

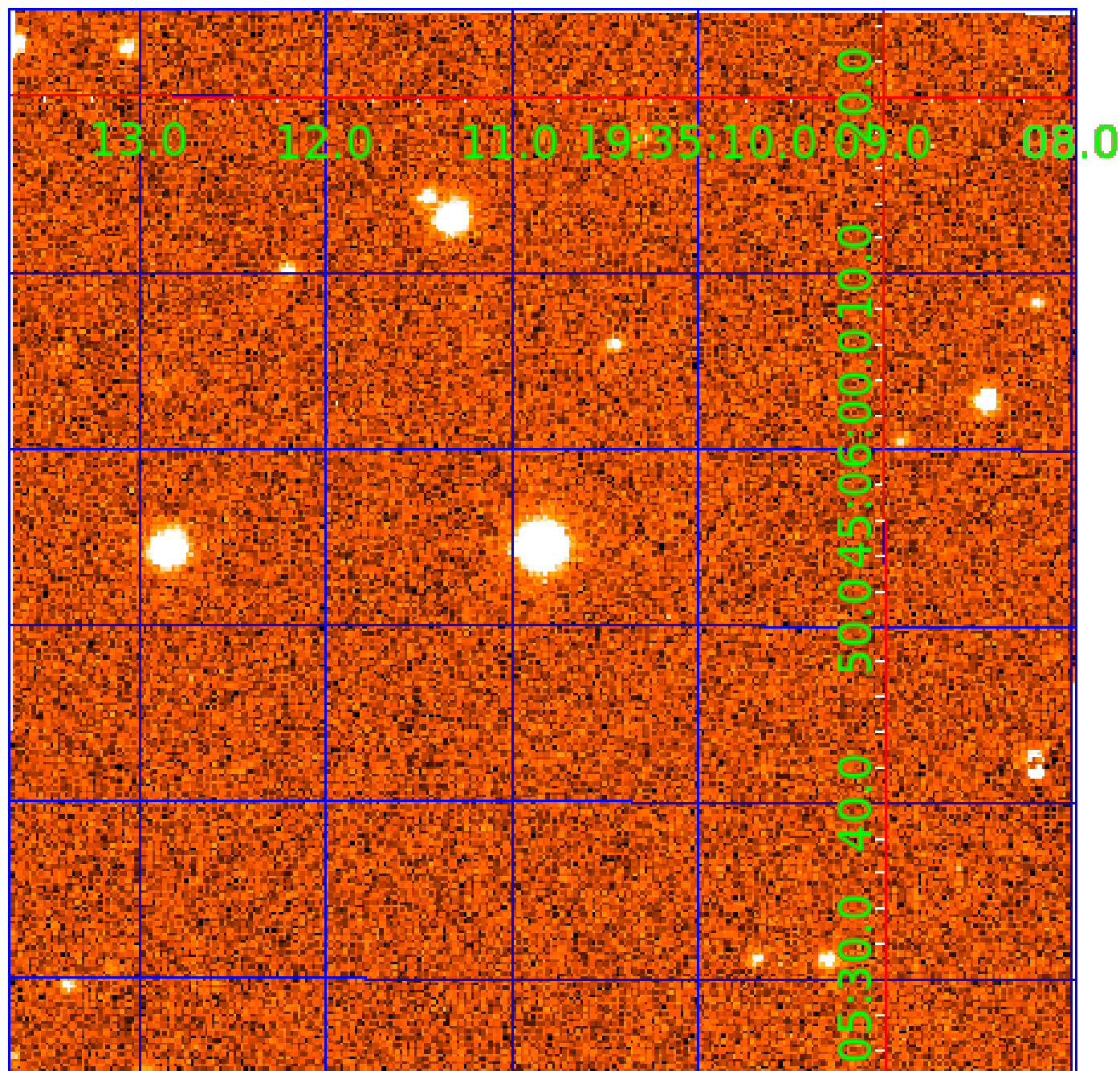


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination





# KIC 008823893

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008823893-01	OBS	5575.01	1.506476	132.995468	34.6	3.353	11.4	11.6	1.13	6201	0.78	2534.06
008823893-02	OBS	No	3.698147	135.134690	27.6	17.309	7.8	6.6	1.13	6201	0.60	765.22
008823893-03	OBS	No	88.867708	215.035405	722.5	24.938	37.4	16.4	1.13	6201	5.71	11.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008823893-01	OBS	FP	0.00	0	0	0	1	EPHEM_MATCH
008823893-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV
008823893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS

**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 008823893-03

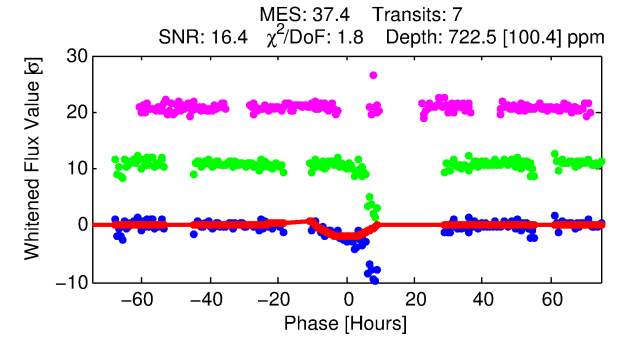
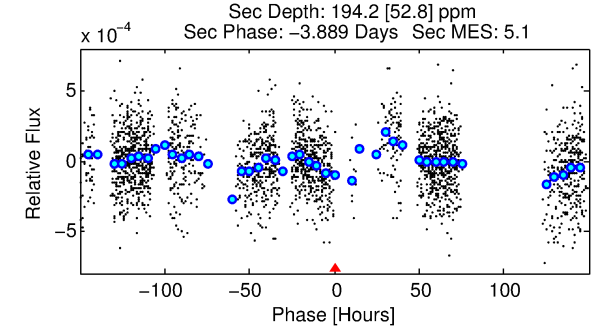
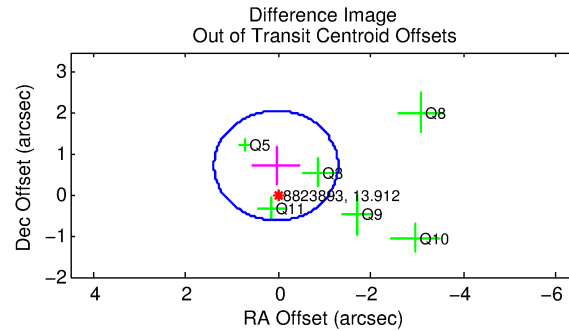
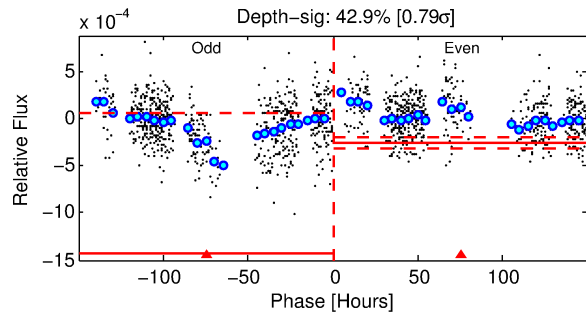
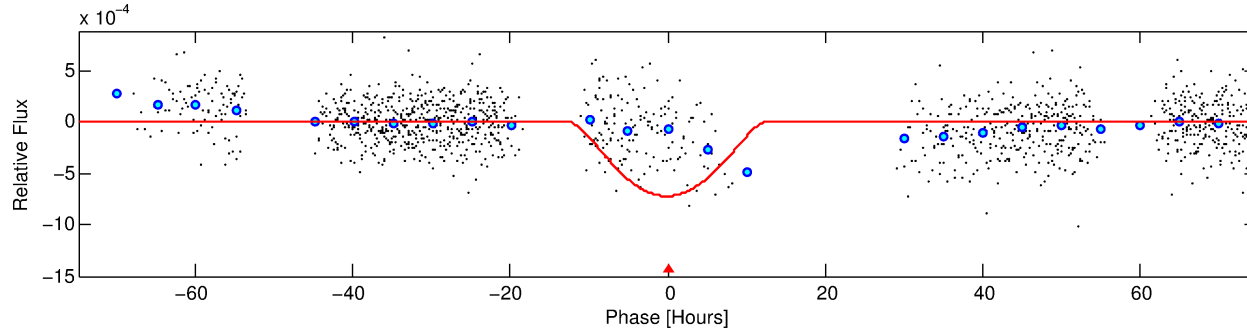
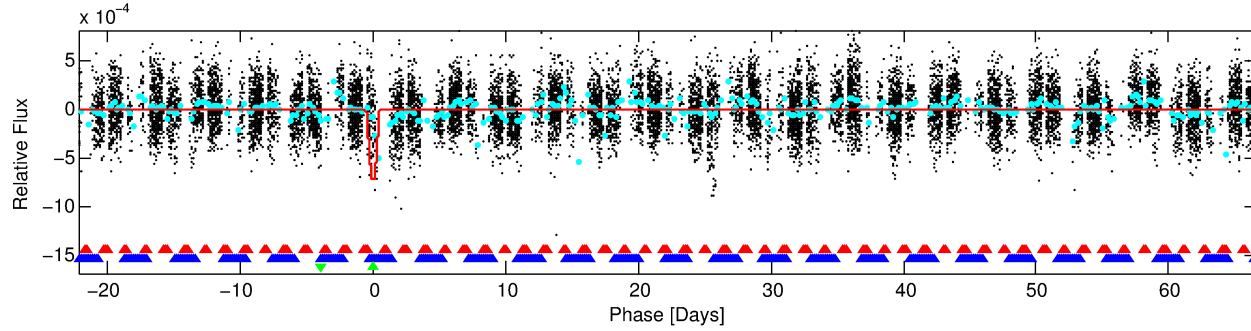
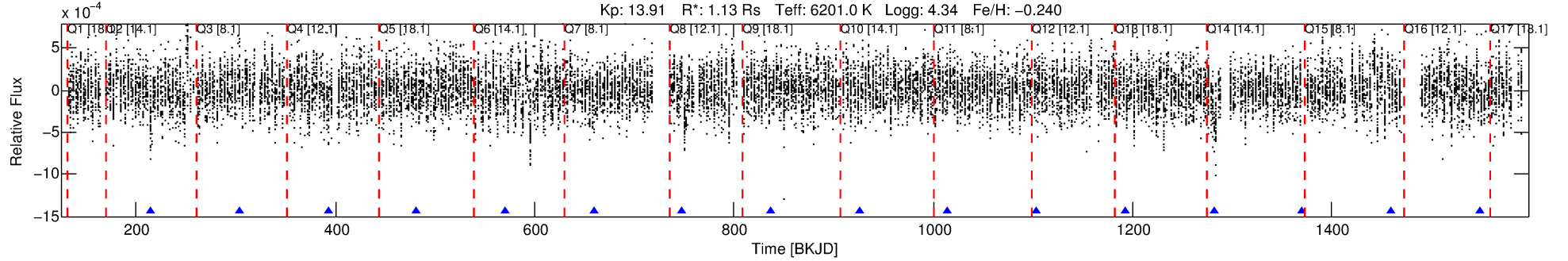
No Significant Match Found

# DV One-Page Summary

KIC: 8823893 Candidate: 3 of 3 Period: 88.868 d

KOI: K05575 Corr: No Ephemeris Match

Kp: 13.91 R\*: 1.13 Rs Teff: 6201.0 K Logg: 4.34 Fe/H: -0.240



## DV Fit Results:

Period = 88.86771 [0.00907] d  
Epoch = 215.0354 [0.0273] BKJD  
Rp/R\* = 0.0465 [0.0818]  
a/R\* = 8.57 [3.97]  
b = 1.00 [0.12]  
Seff = 11.04 [4.31]  
Teq = 465 [45] K  
Rp = 5.71 [10.21] Re  
a = 0.3901 [0.1008] AU  
Ag = 498.24 [1768.60] [0.28σ]  
Teffp = 3395 [2998] K [0.98σ]

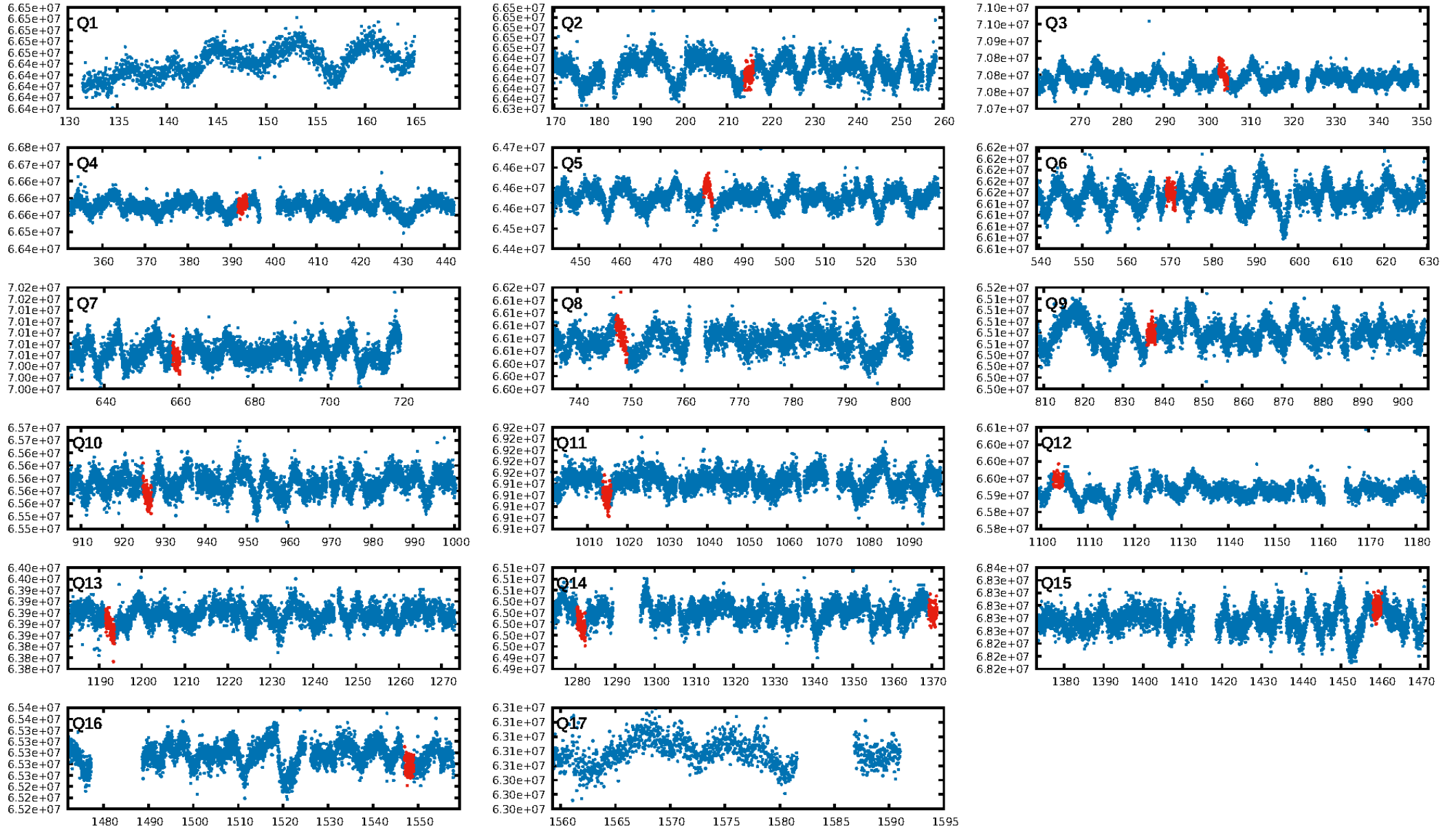
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.34σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.59e-108  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -6.948  
Centroid-sig: 54.6%  
Centroid-so: 0.126 arcsec [0.77σ]  
OotOffset-rm: 0.731 arcsec [1.63σ]  
KicOffset-rm: 0.733 arcsec [1.66σ]  
OotOffset-st: 1/2/1/2 [6]  
KicOffset-st: 1/2/1/2 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 0.00 [0/10]

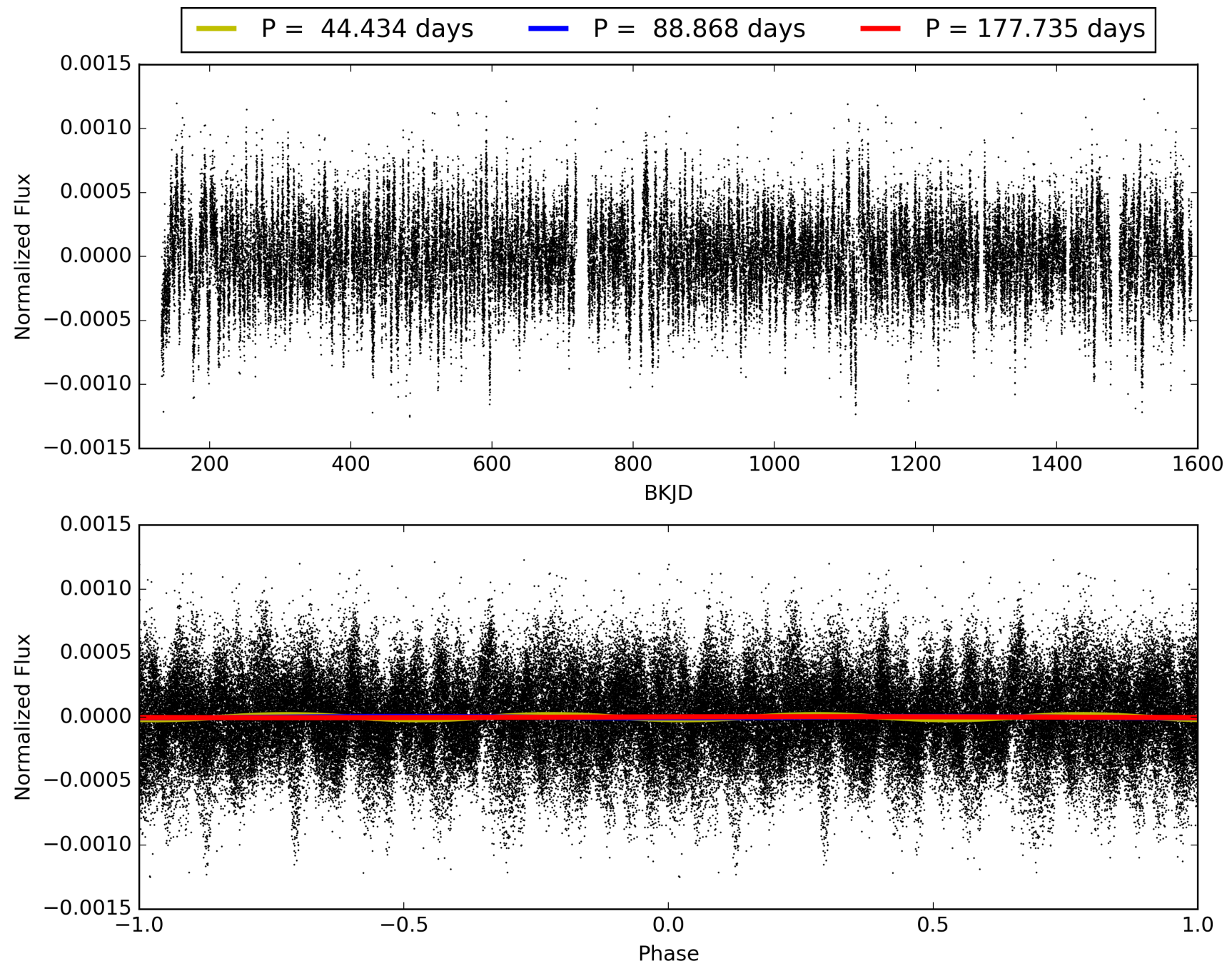
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:48:38 Z

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

# TCE 008823893-03, PDC Light Curves

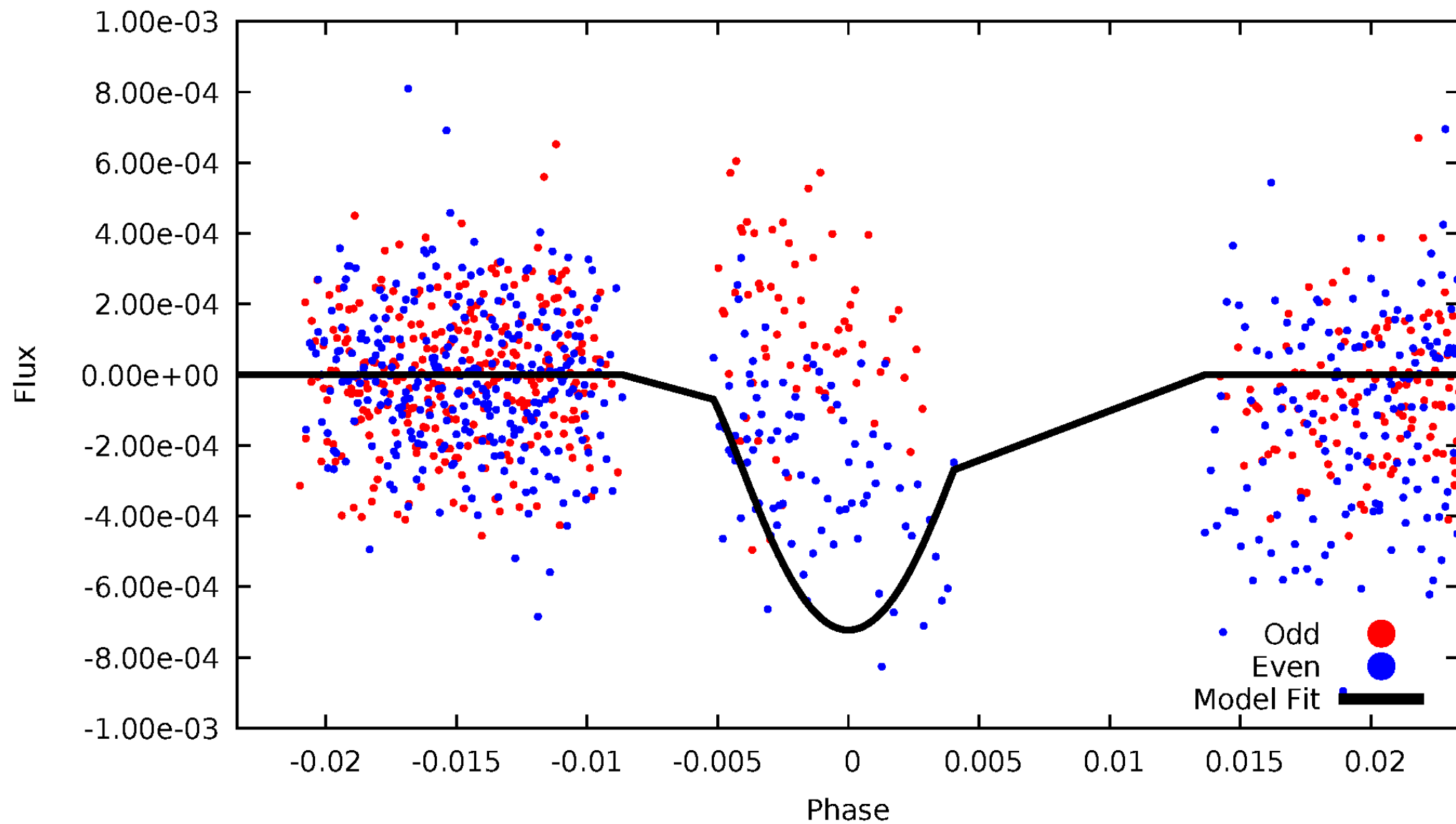


TCE 008823893-03



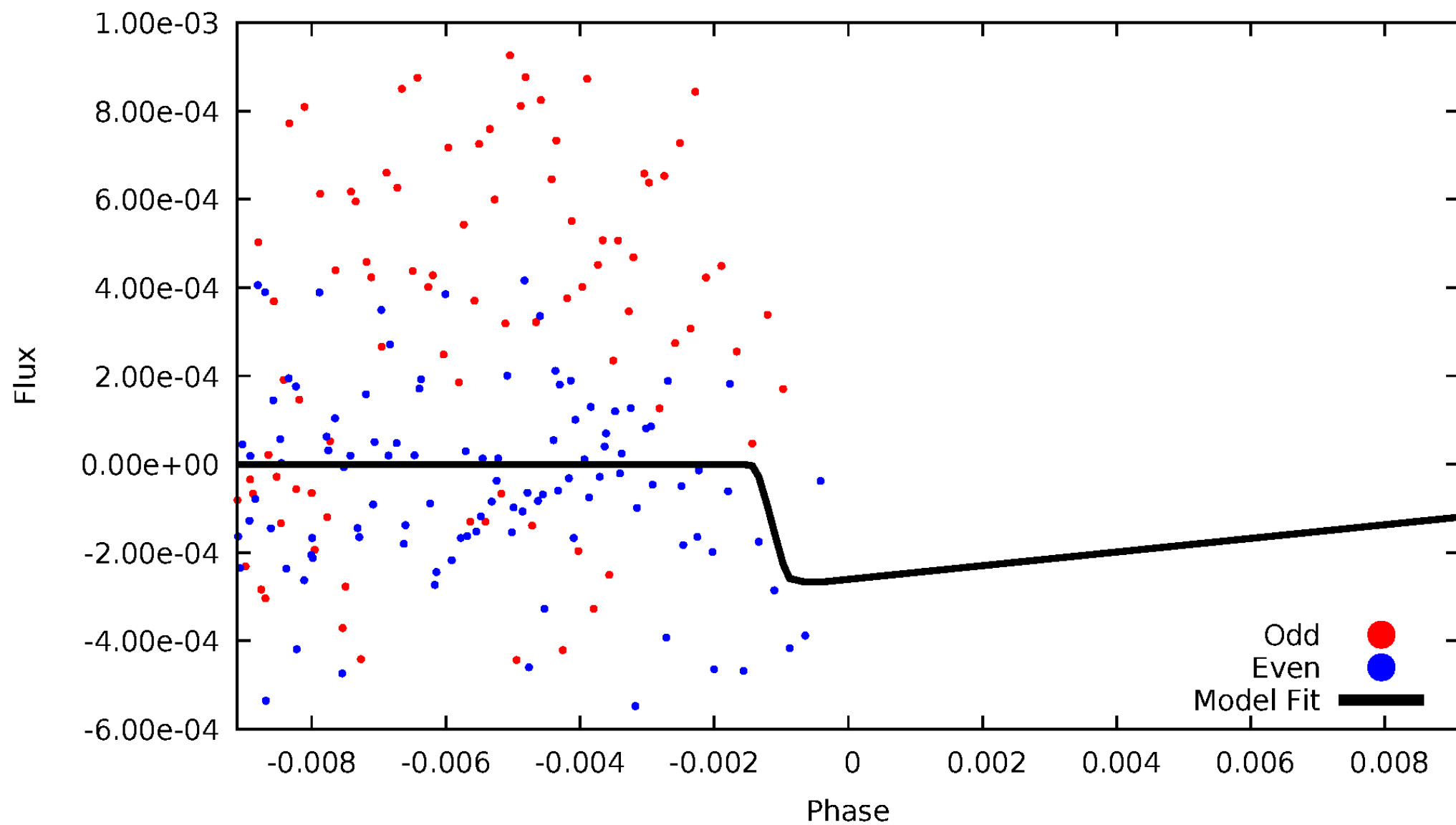
# DV Odd/Even

TCE 008823893-03



# ALT Odd/Even

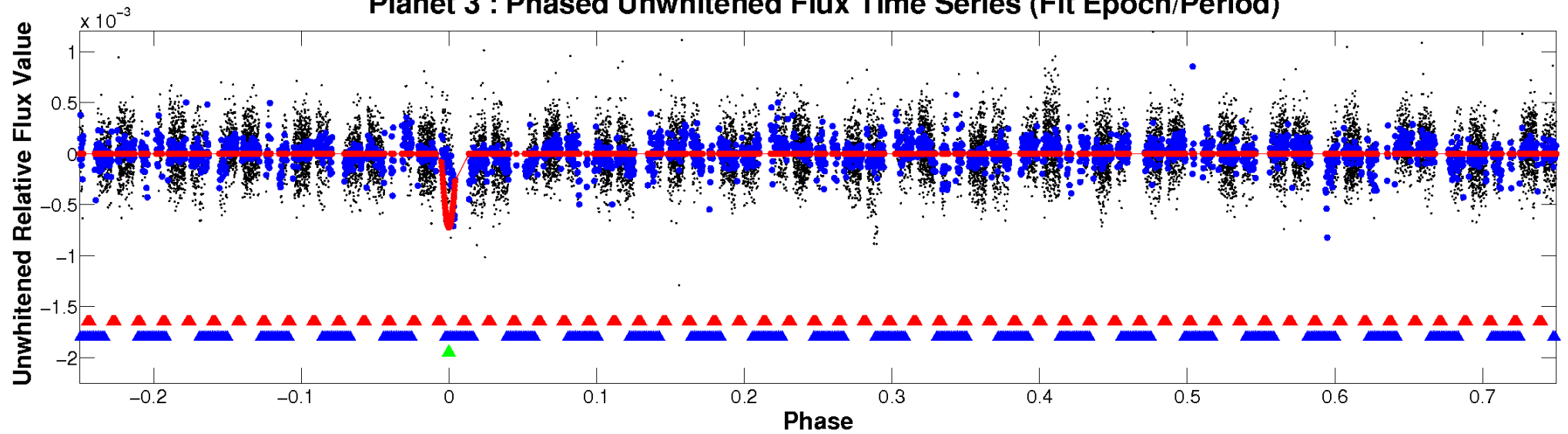
TCE 008823893-03



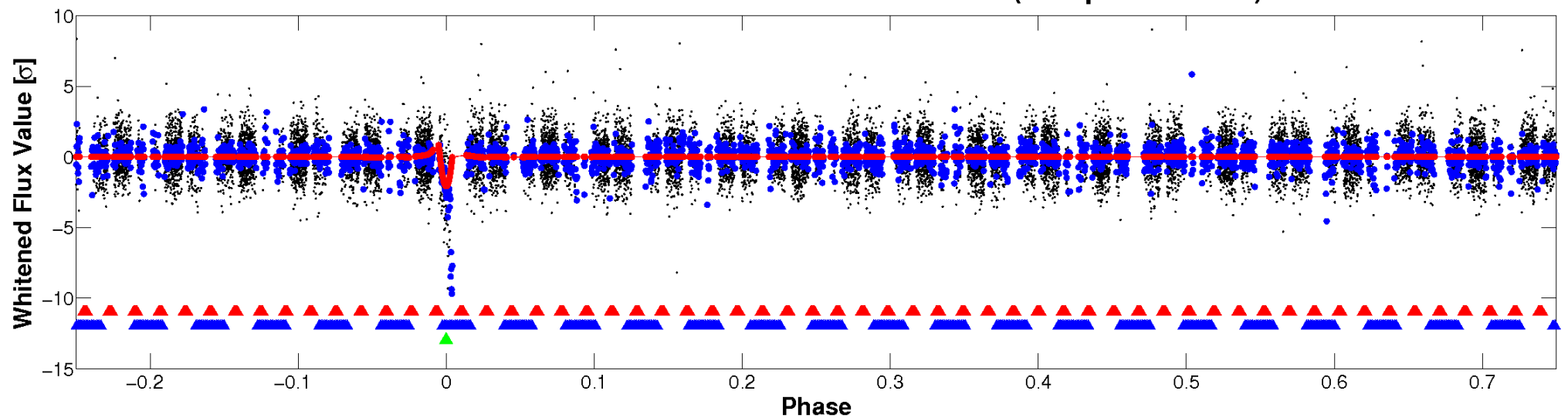


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

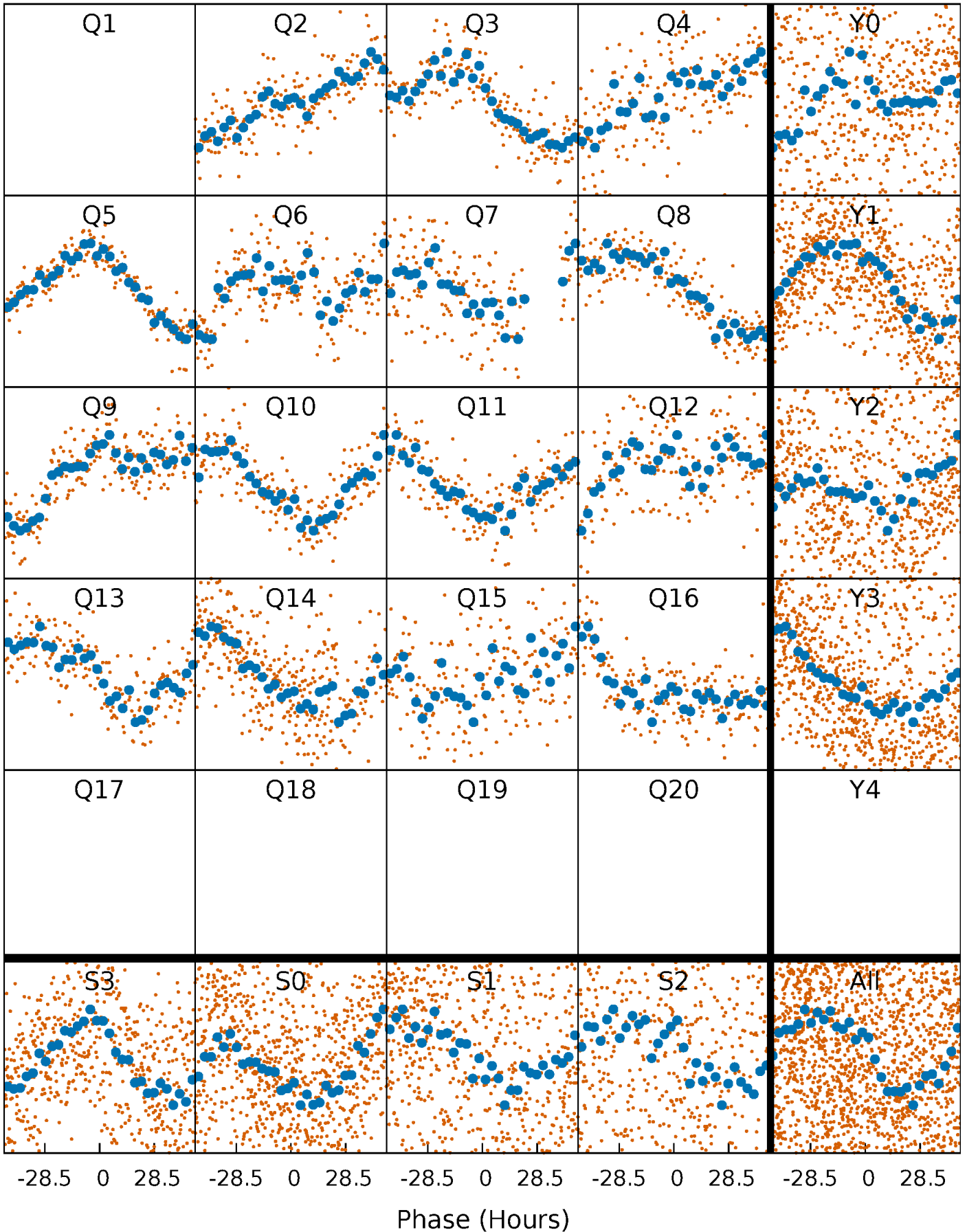


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



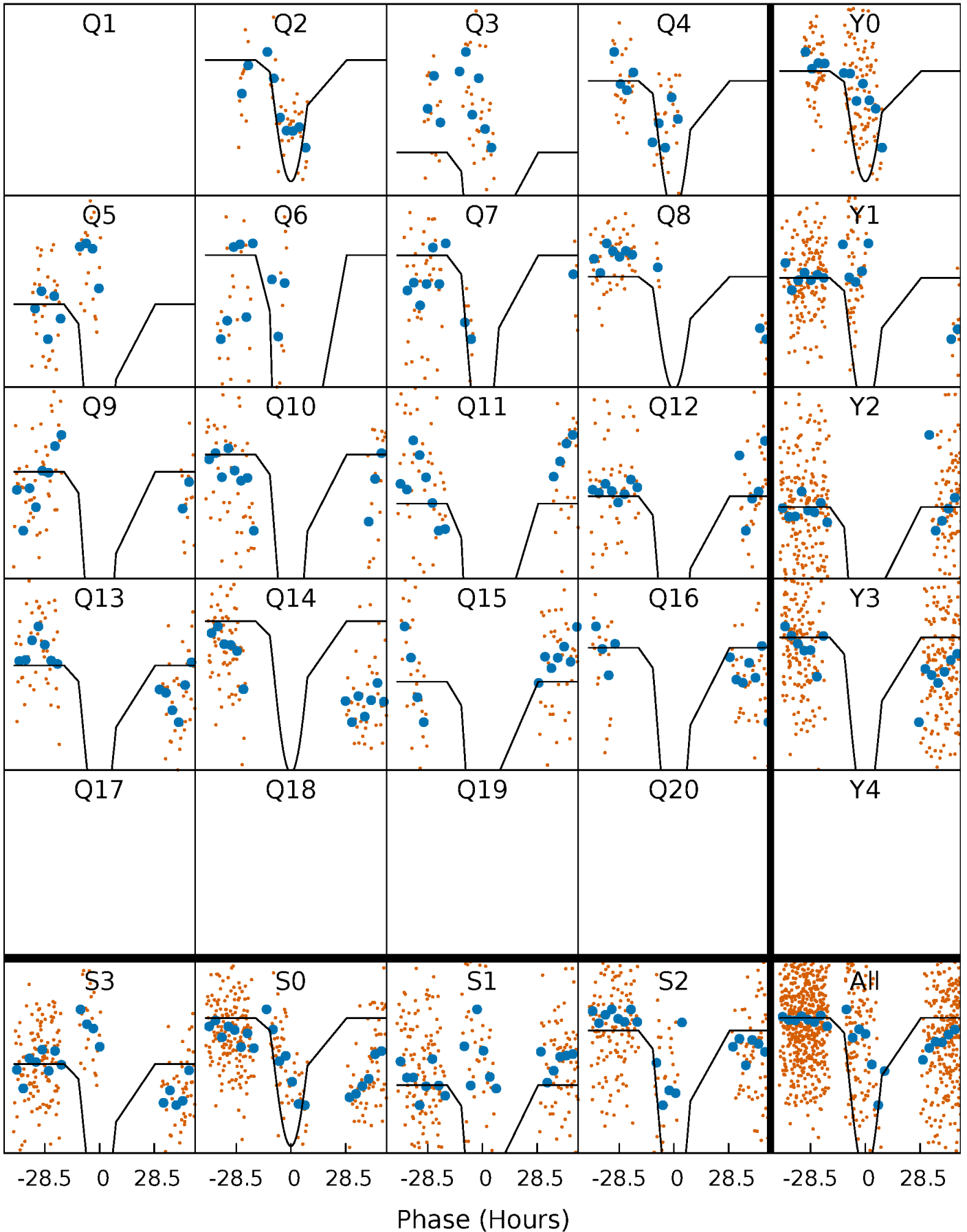
# PDC Quarter-Phased Transit Curves

TCE 008823893-03     $P = 88.867708$  Days     $T_0 = 215.035405$  (BKJD)



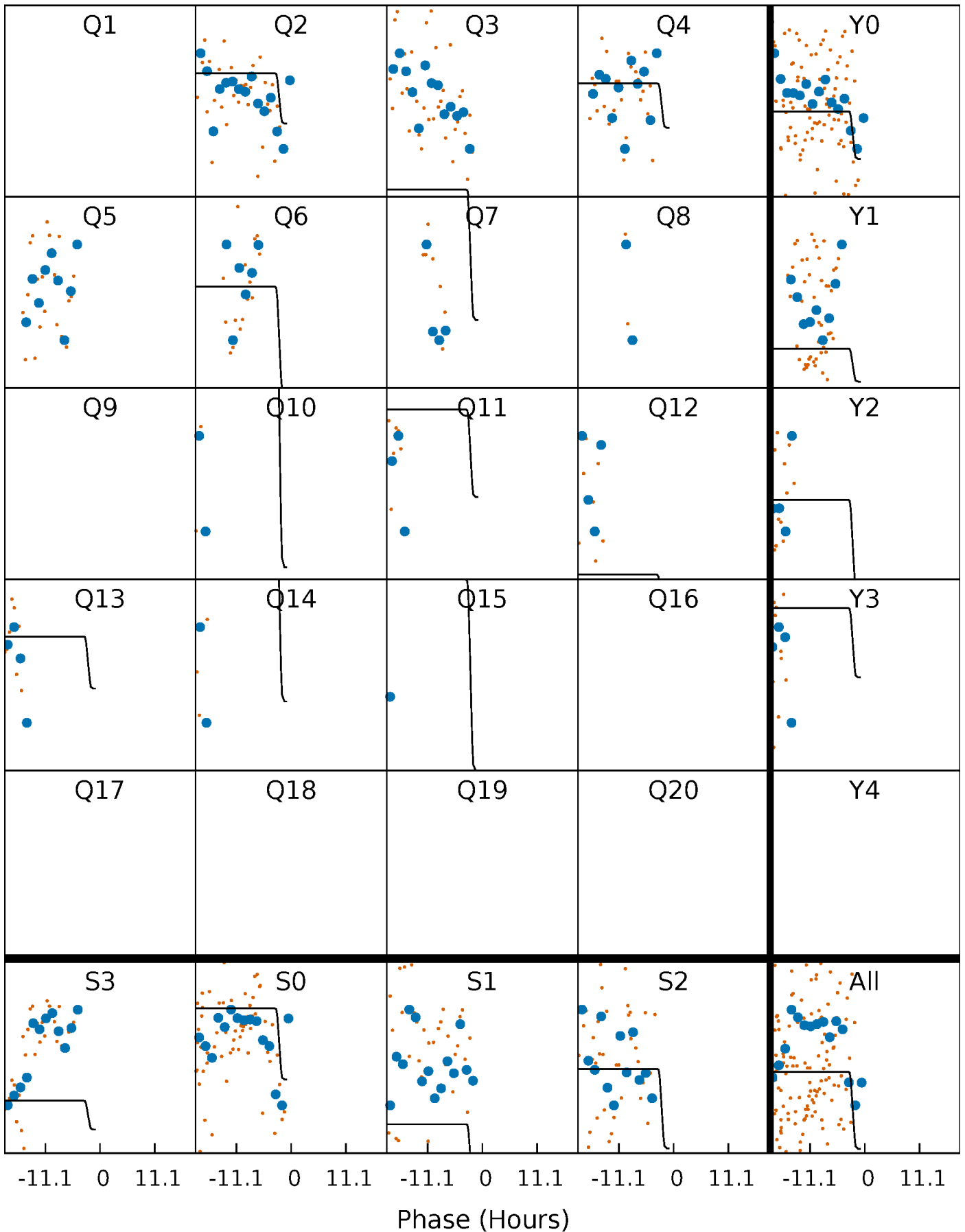
# DV Quarter-Phased Transit Curves

TCE 008823893-03 P= 88.867708 Days  $T_0=215.035405$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

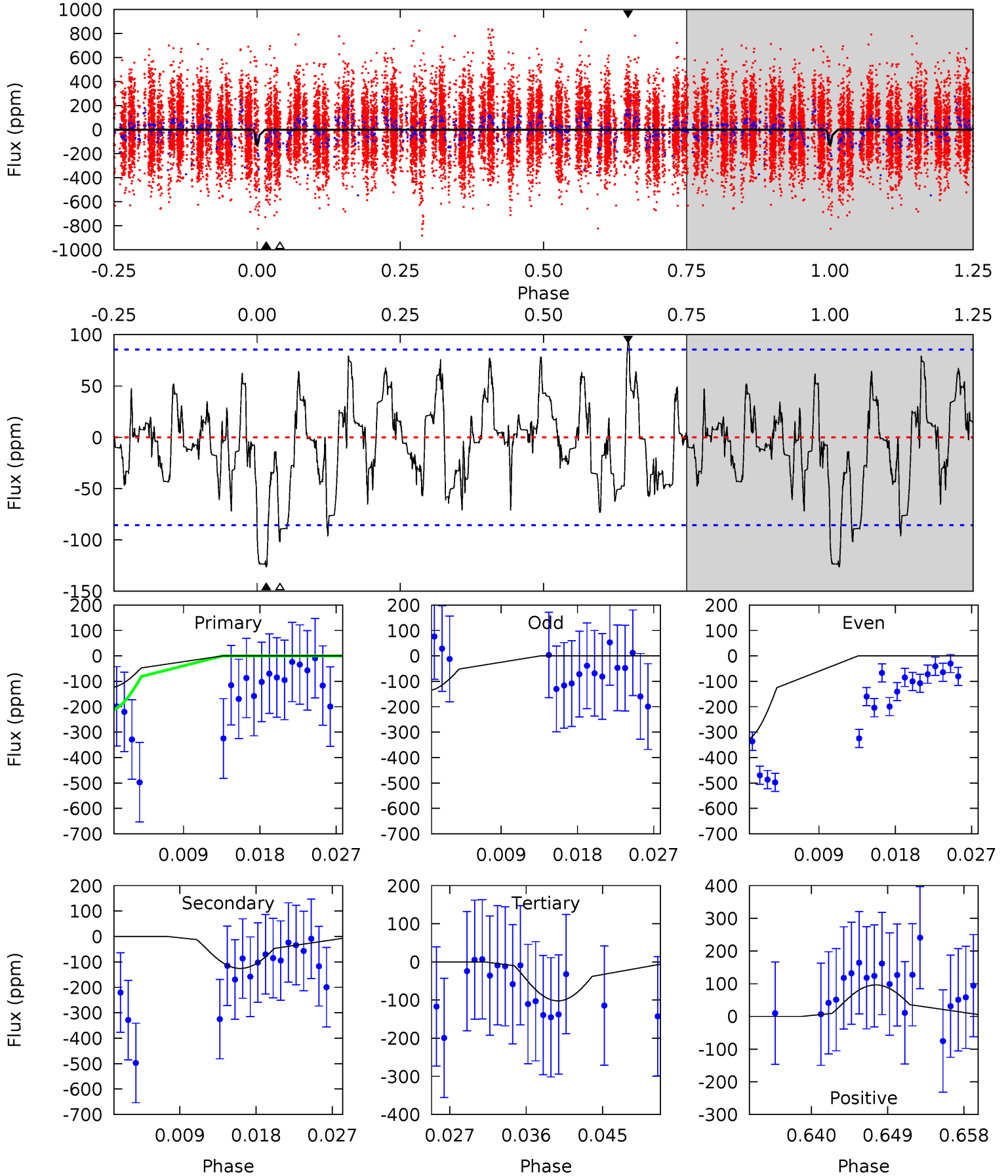
TCE 008823893-03     $P = 88.811063$  Days     $T_0 = 215.430912$  (BKJD)



# DV Model-Shift Uniqueness Test

008823893-03, P = 88.867708 Days, E = 126.167697 Days

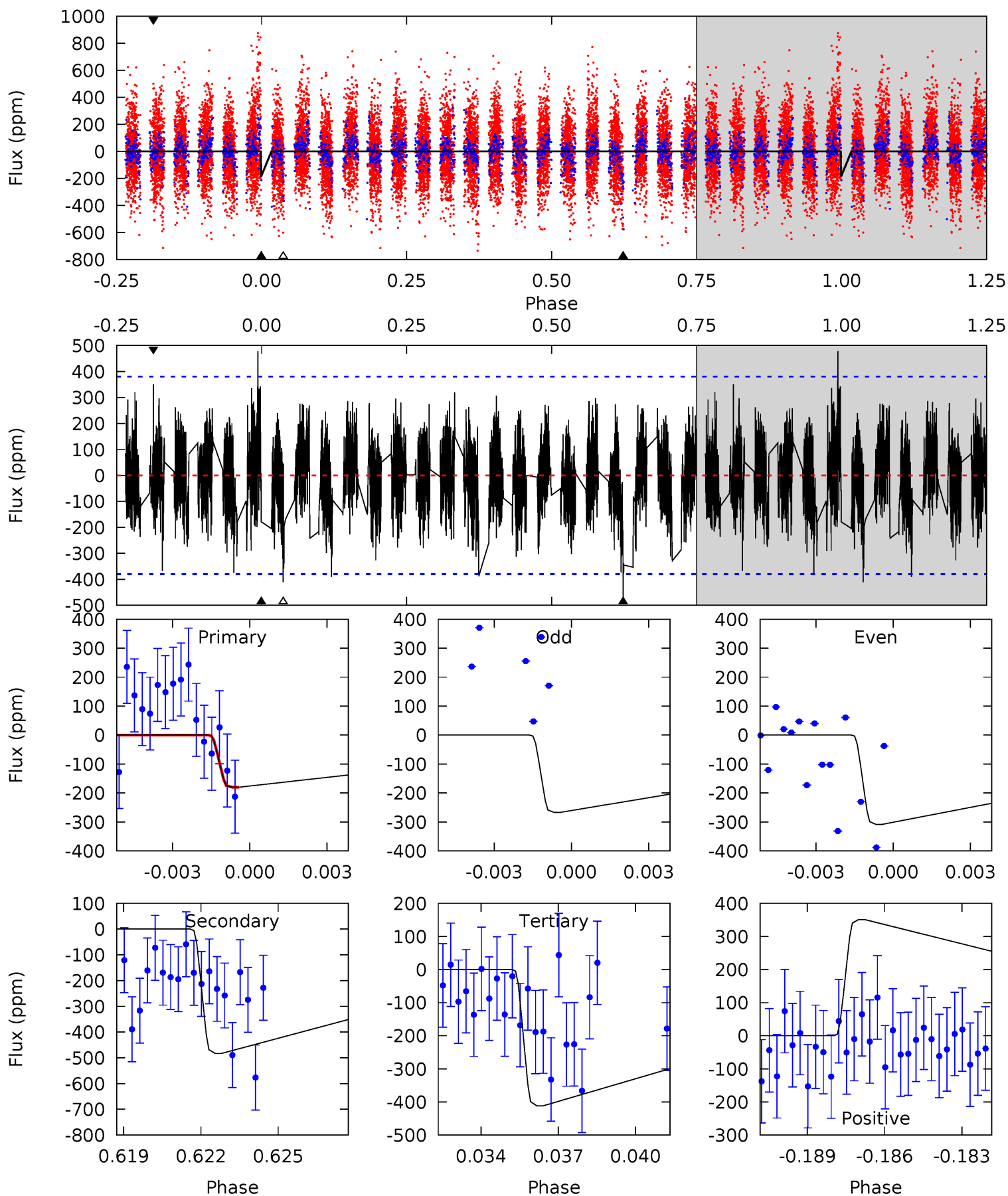
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.46	7.41	6.02	5.68	5.05	2.61	2.10	1.44	1.79	1.39	1.74	5.78	1.59	0.43	3.55



# Alt Model-Shift Uniqueness Test

008823893-03, P = 88.811063 Days, E = 126.619849 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
2.50	6.69	5.70	4.85	5.26	2.98	1.36	-3.20	-2.36	0.99	1.83	0.26	0	0.50	0





### Stellar Parameters For KIC 008823893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6201^{+175}_{-197}$	$4.336^{+0.132}_{-0.198}$	$-0.240^{+0.300}_{-0.300}$	$1.126^{+0.353}_{-0.190}$	$0.998^{+0.160}_{-0.107}$	$0.986^{+0.578}_{-0.488}$
	+3%/-3%	+3%/-5%	+125%/-125%	+31%/-17%	+16%/-11%	+59%/-49%
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 008823893-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-126 \pm 17$	$9.66^{+9.06}_{-6.67}$	$654^{+47}_{-37}$	$3027^{+1412}_{-500}$	$112^{+1114}_{-83}$
Alt.	$-483 \pm 72$	$7.50^{+7.88}_{-5.11}$	$655^{+49}_{-43}$	$4035^{+2481}_{-803}$	$710^{+5859}_{-532}$

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

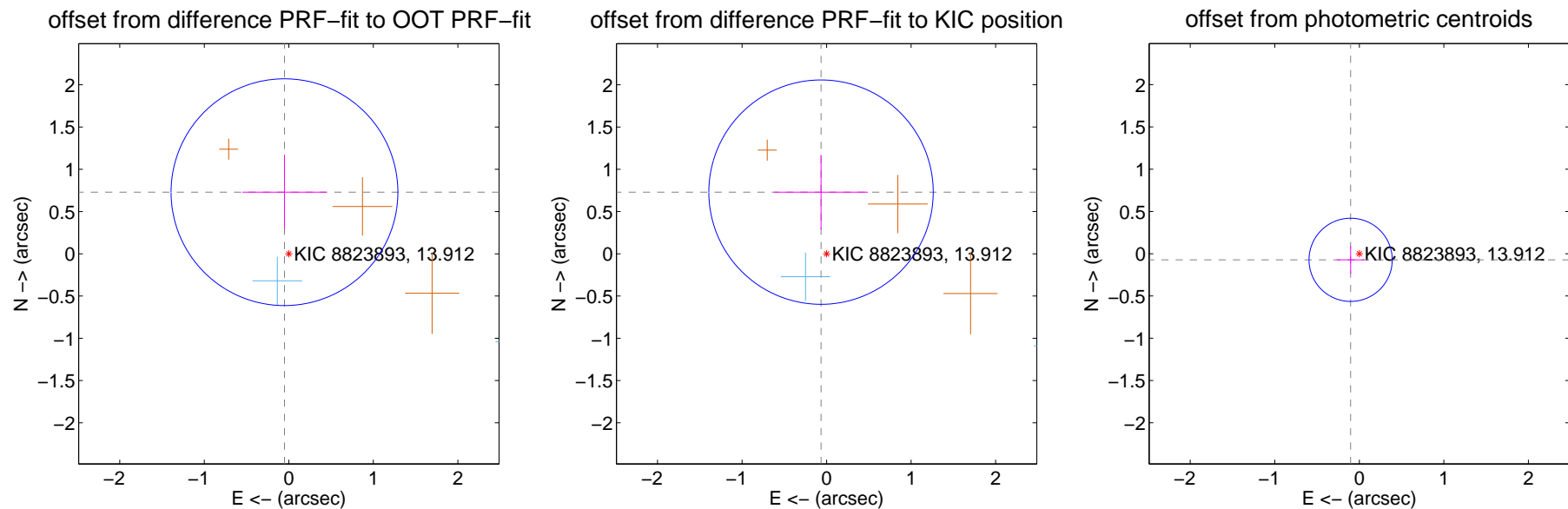
## DV Centroid Data

Supplemental centroid analysis for 008823893-03. Kepler magnitude: 13.91. Transit SNR 16.38

There are 2 quarters with good PRF difference image offsets

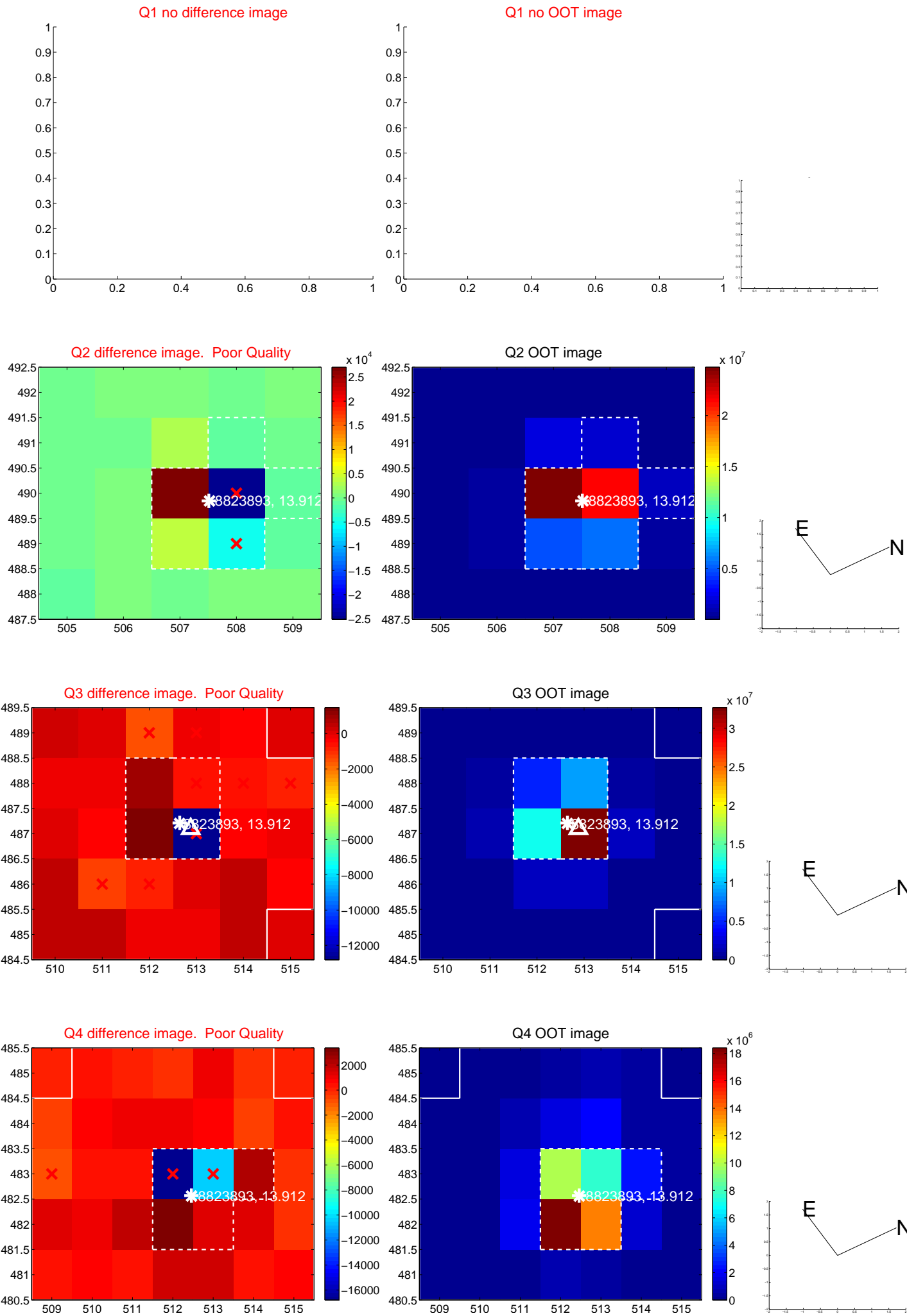
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.731 \pm 0.447$	1.63	$0.051 \pm 0.497$	$0.729 \pm 0.442$
PRF-fit source offset from KIC position	$0.733 \pm 0.443$	1.66	$0.066 \pm 0.554$	$0.730 \pm 0.442$
photometric centroid source offset	$0.13 \pm 0.16$	0.77	$0.10 \pm 0.16$	$-0.07 \pm 0.16$

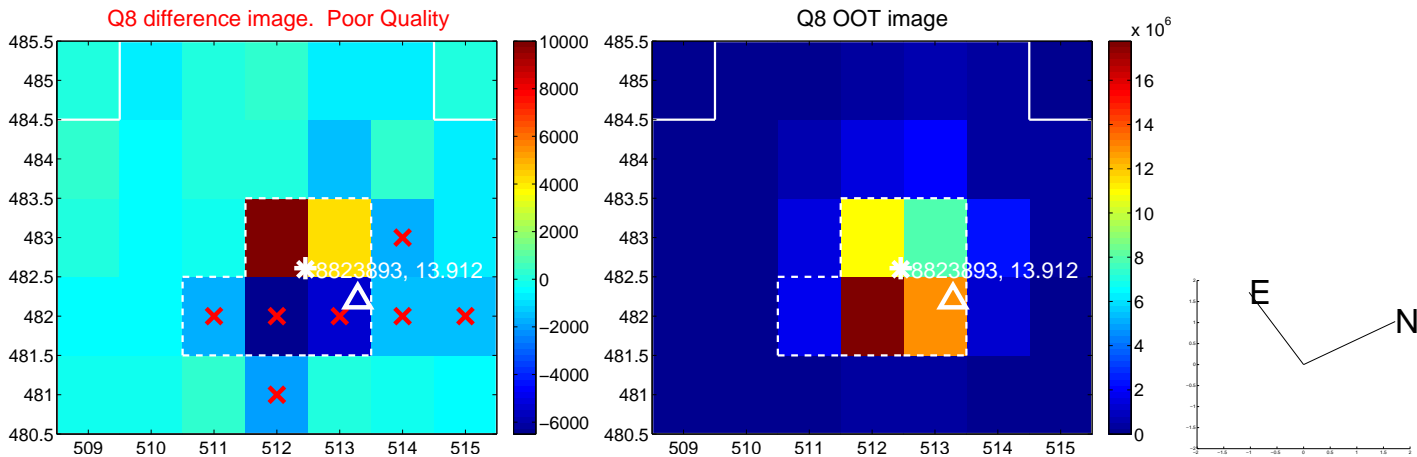
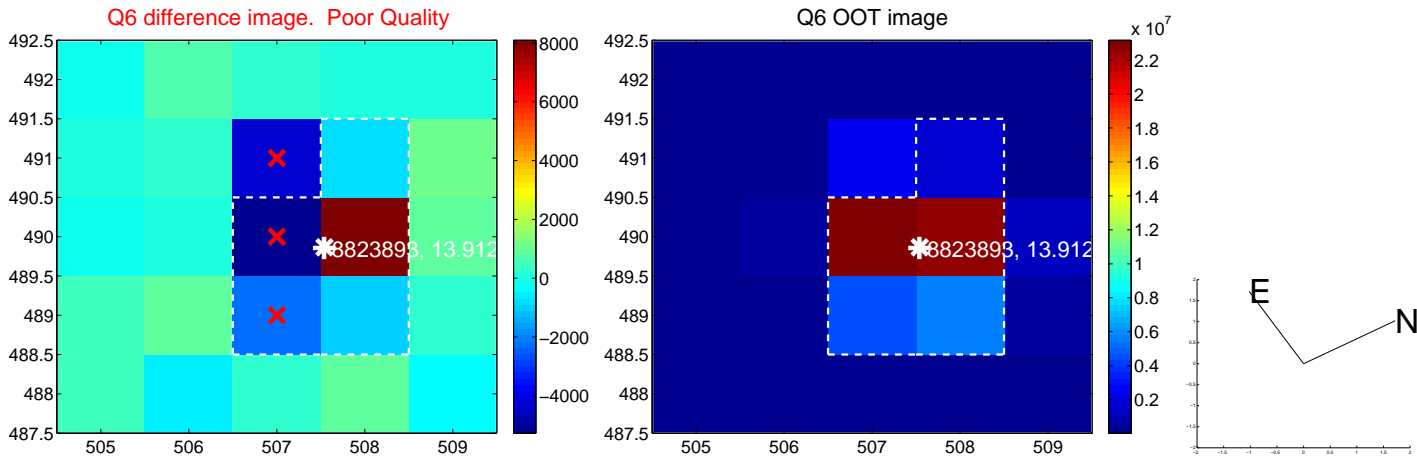
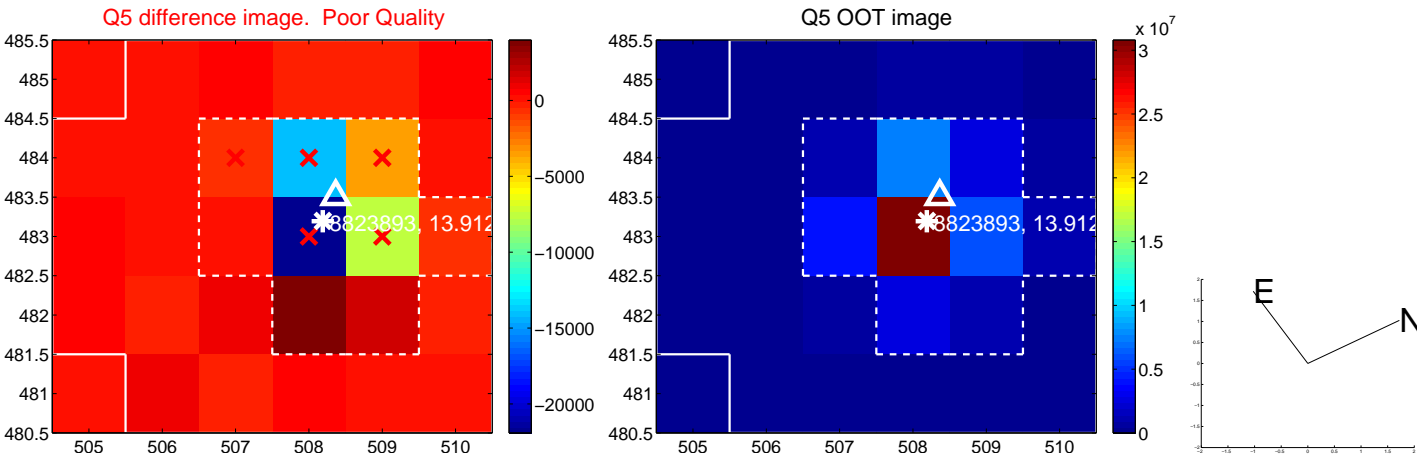


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

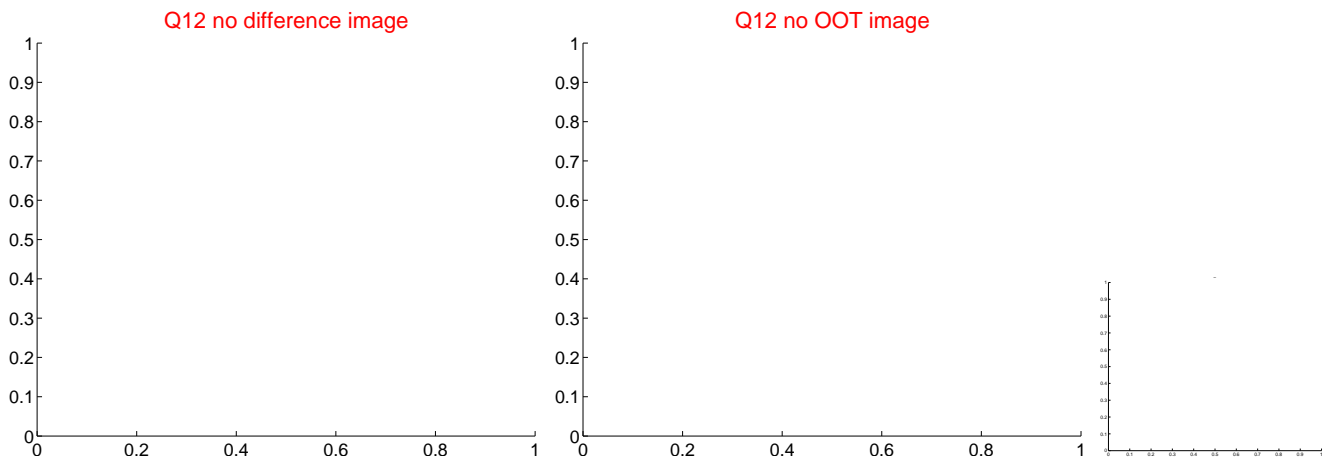
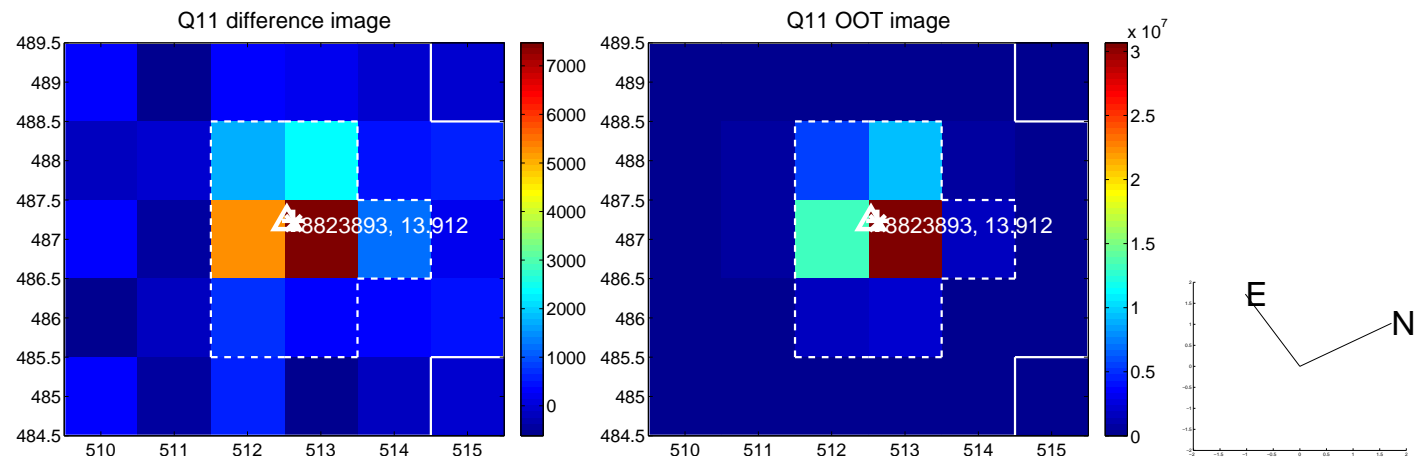
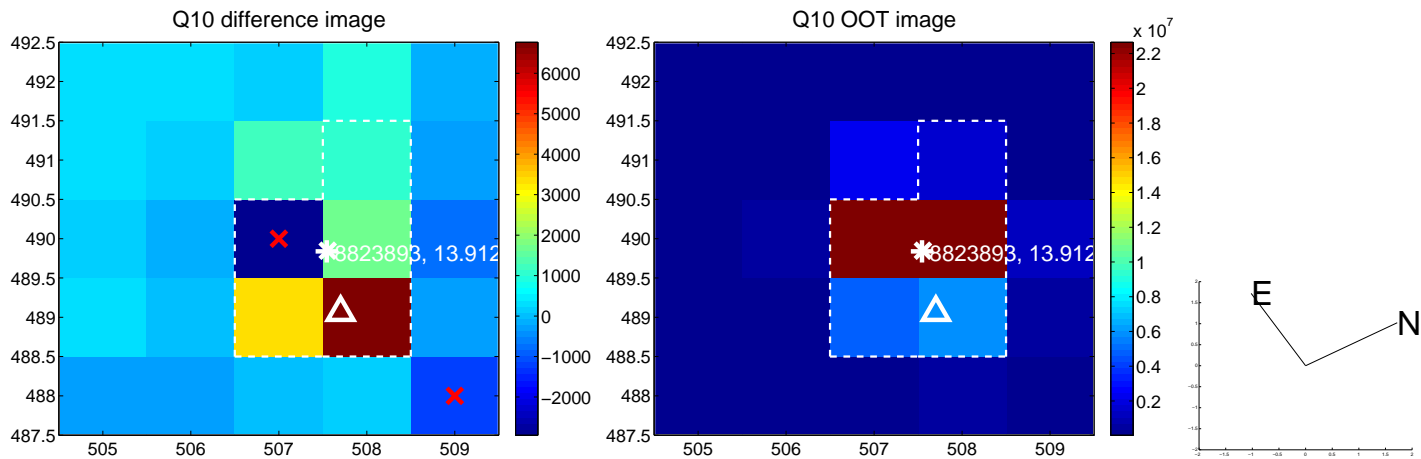
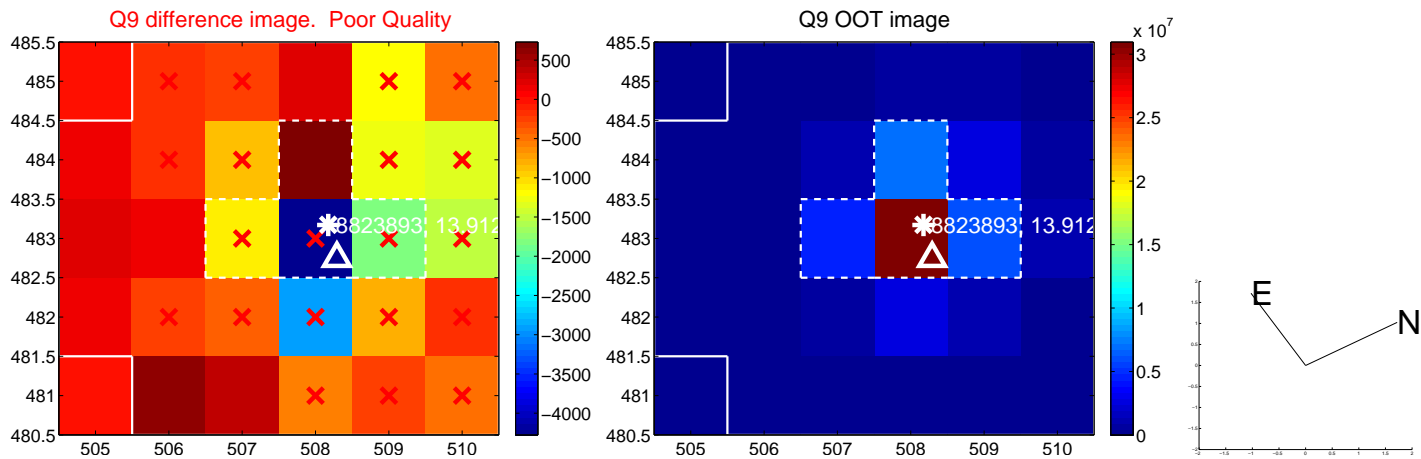
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



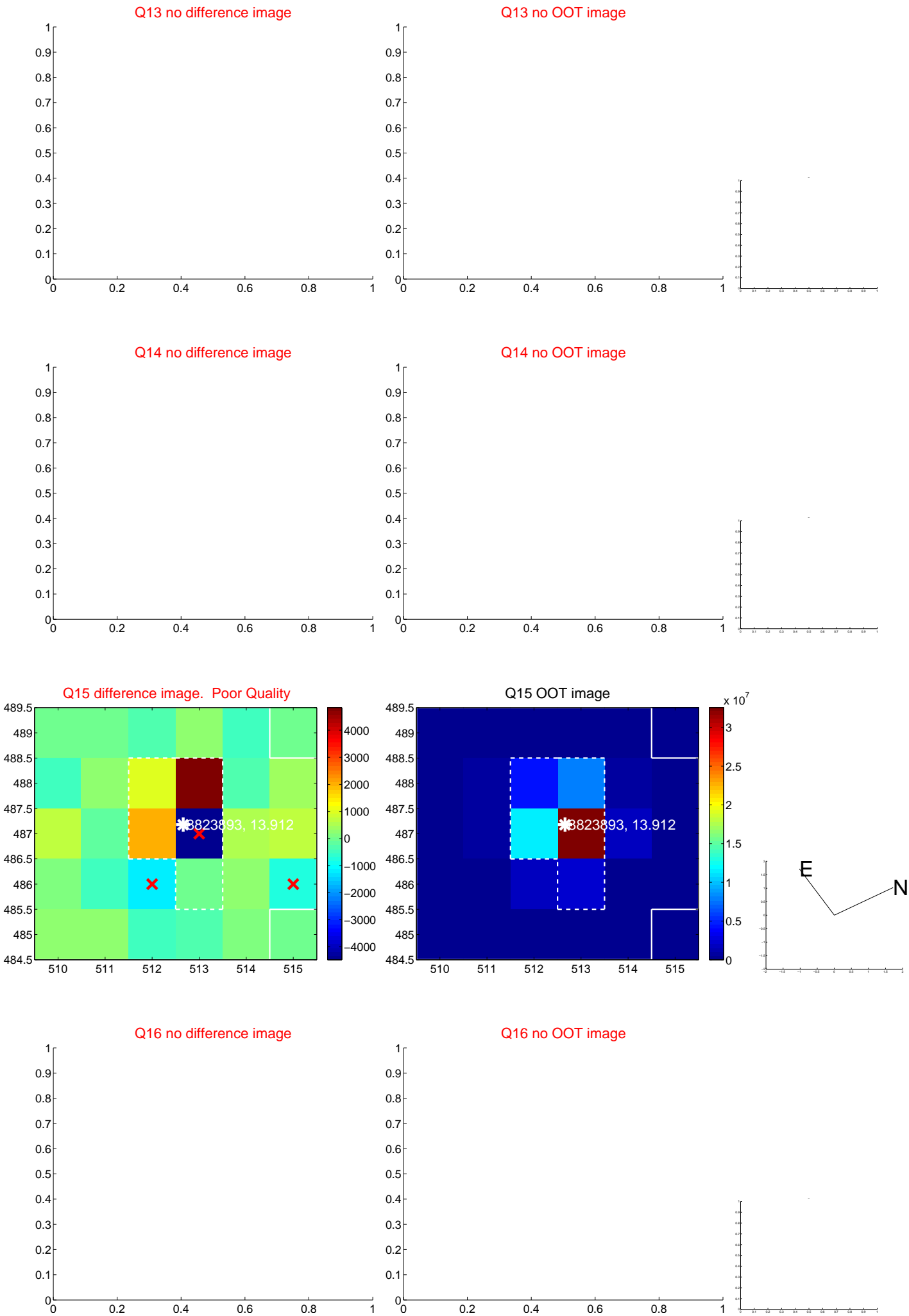
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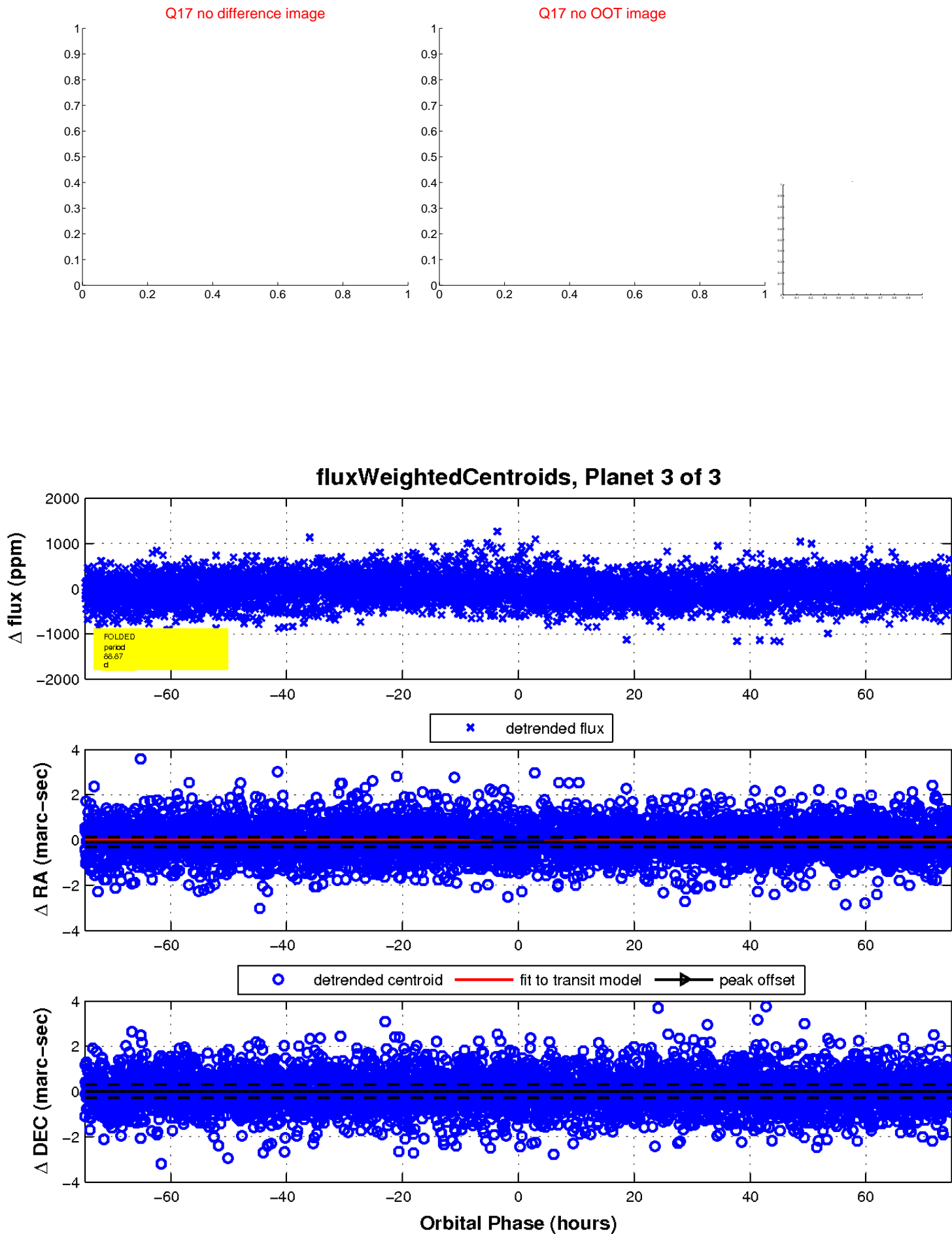


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.





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



UKIRT Image

Declination

