

# KIC 005823133

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005823133-01	OBS	No	2.750811	132.107949	29.8	10.642	7.4	6.5	0.88	5448	0.53	465.10
005823133-02	OBS	No	365.914642	479.421852	563.5	3.975	8.0	7.1	0.88	5448	2.31	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005823133-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005823133-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—LPP_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.

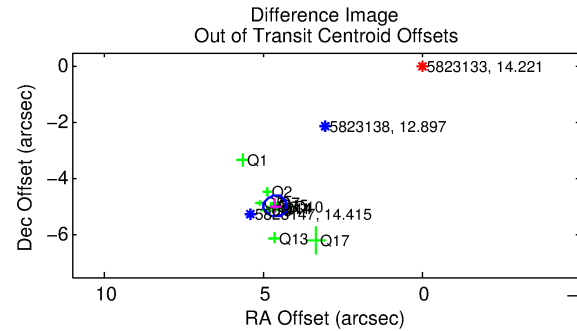
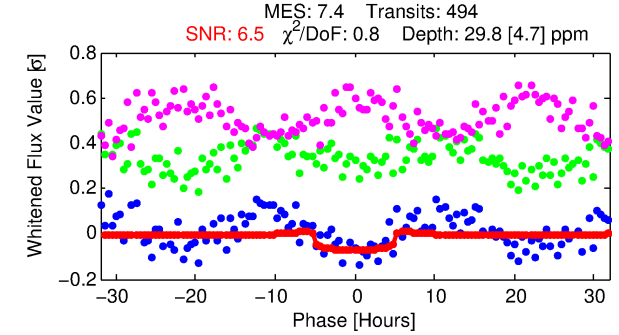
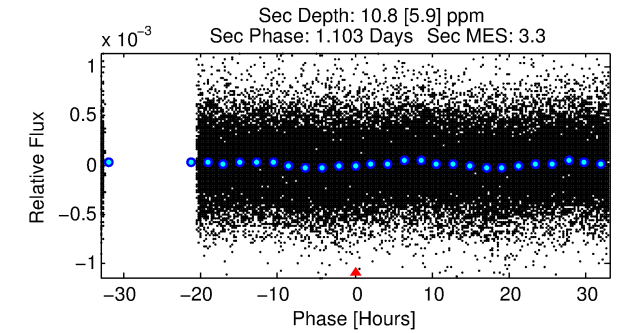
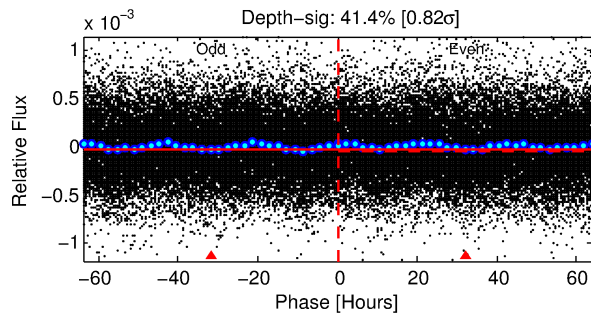
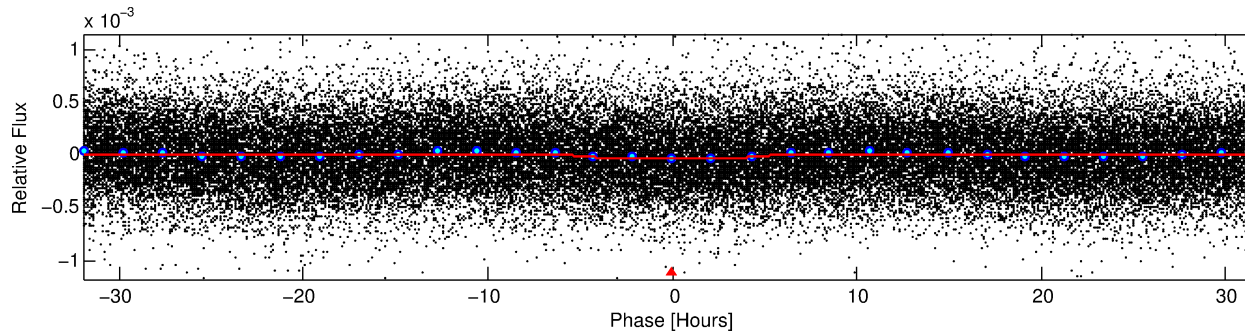
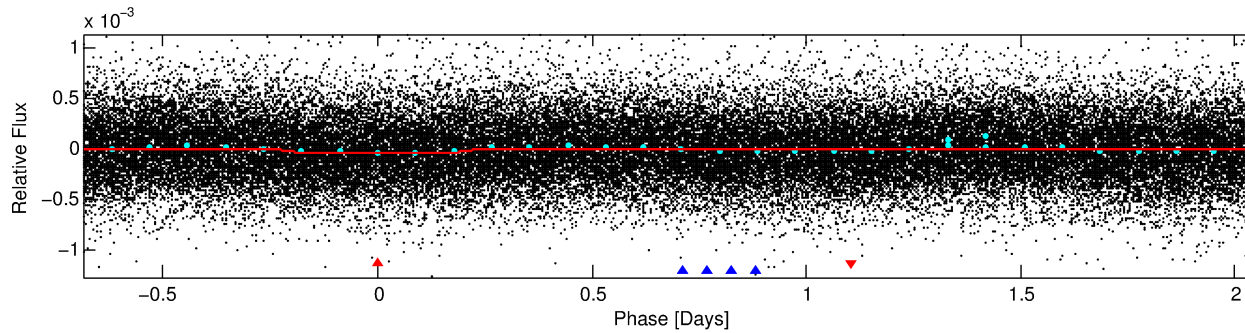
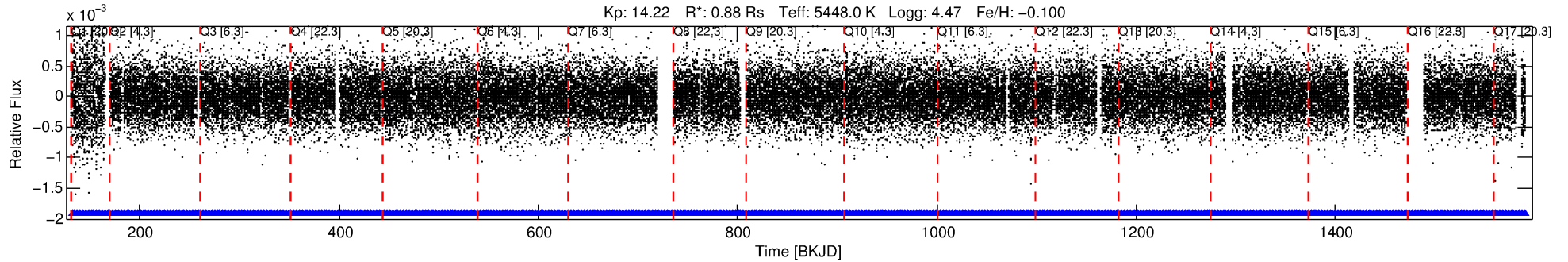
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005823133-01

No Significant Match Found

# DV One-Page Summary

KIC: 5823133 Candidate: 1 of 2 Period: 2.751 d



## DV Fit Results:

Period = 2.75081 [0.00006] d  
Epoch = 132.1079 [0.0135] BKJD  
Rp/R\* = 0.0056 [0.0034]  
a/R\* = 1.50 [2.12]  
b = 0.80 [1.20]  
Seff = 465.10 [130.56]  
Teq = 1184 [83] K  
Rp = 0.53 [0.34] Re  
a = 0.0363 [0.0063] AU  
Ag = 27.51 [37.28] [0.71σ]  
Teffp = 4193 [1401] K [2.14σ]

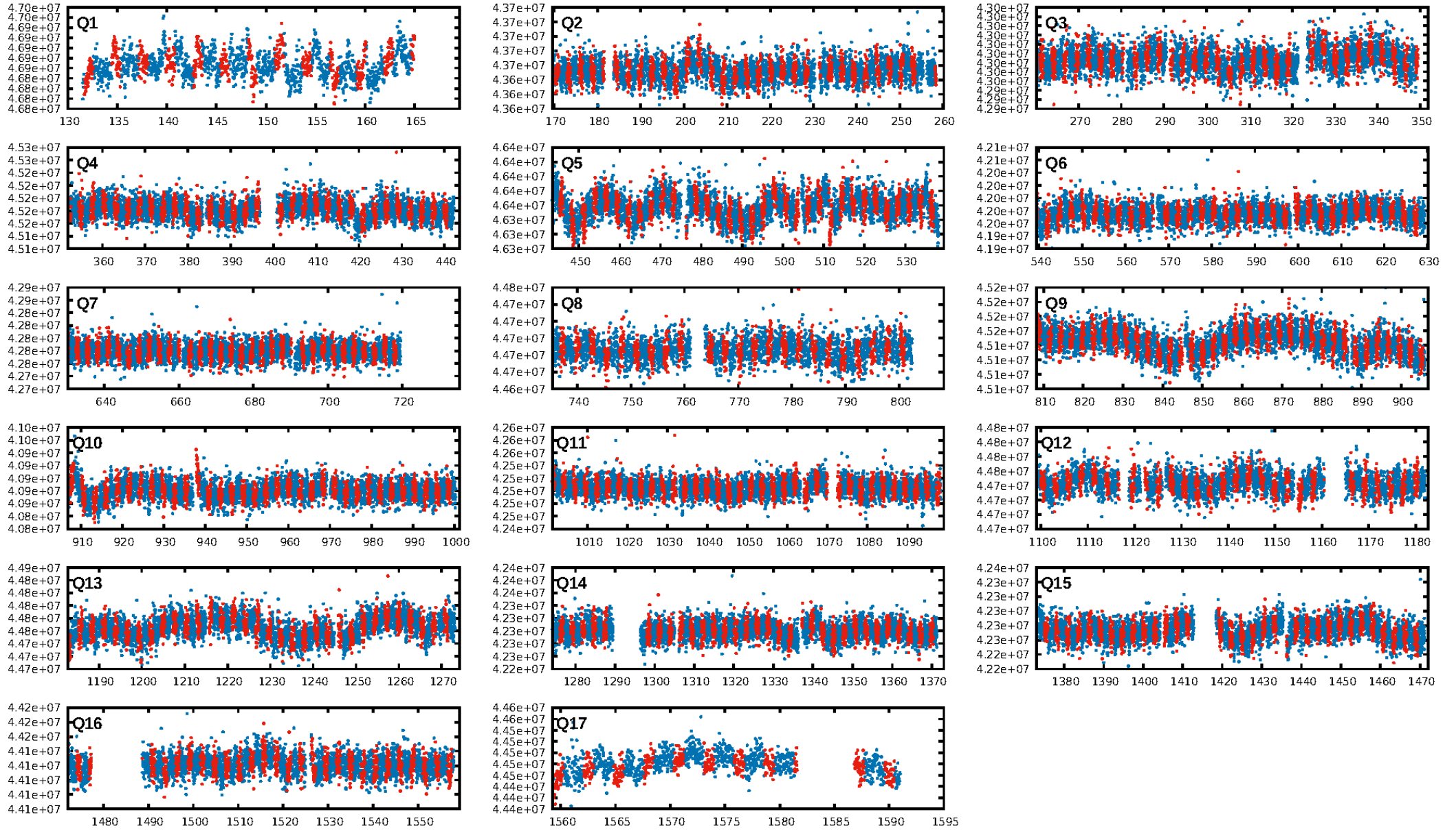
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [767.22σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.38e-11  
RollingBand-fgt: 1.00 [470/470]  
GhostDiagnostic-chr: -0.275  
Centroid-sig: N/A  
Centroid-so: 2.167 arcsec [1.08σ]  
OotOffset-rm: 6.779 arcsec [54.90σ]  
KicOffset-rm: 7.126 arcsec [58.59σ]  
OotOffset-st: 4/3/0/5 [12]  
KicOffset-st: 4/3/0/5 [12]  
DiffImageQuality-fgm: 0.92 [11/12]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:52:46 Z

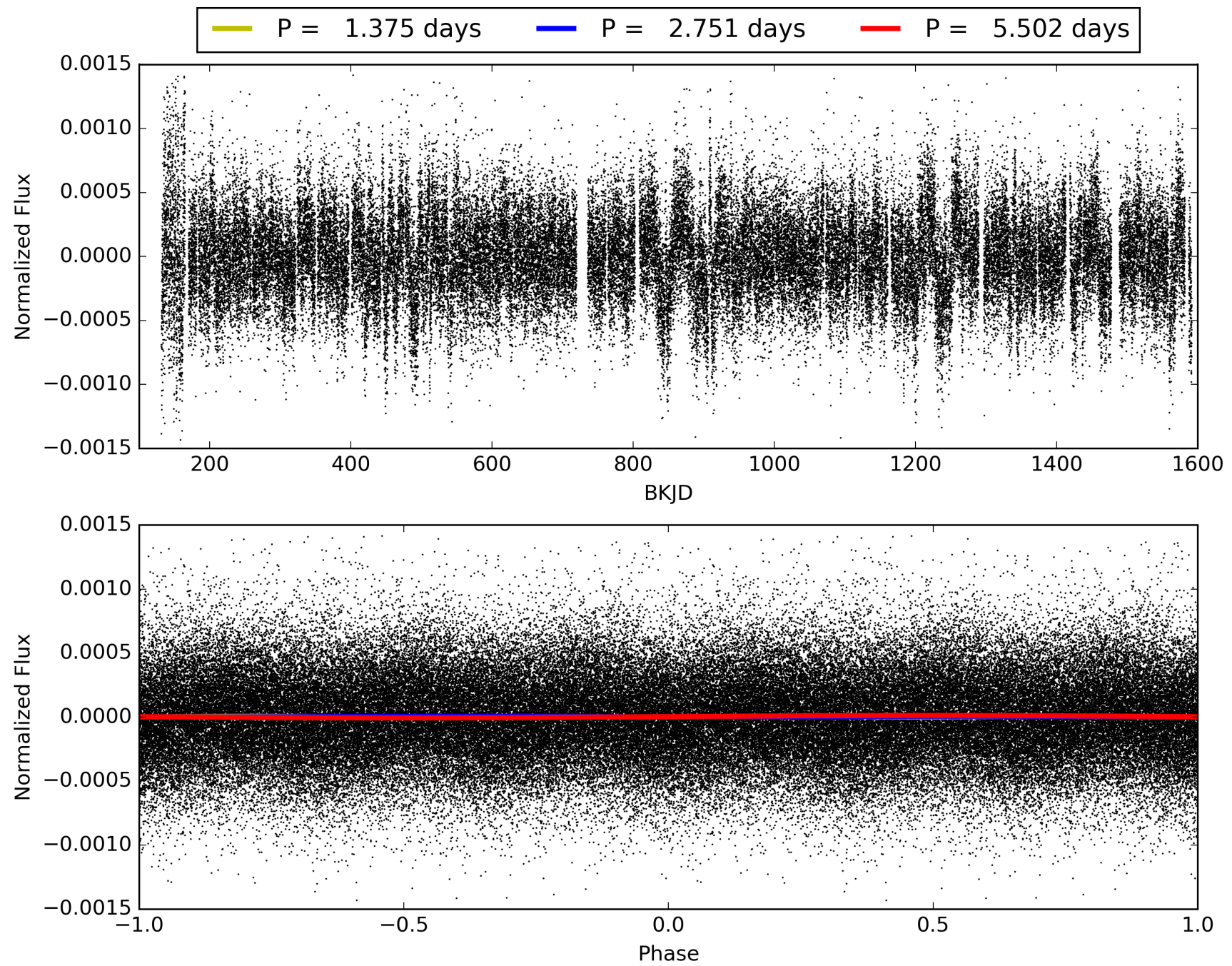
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005823133-01, PDC Light Curves



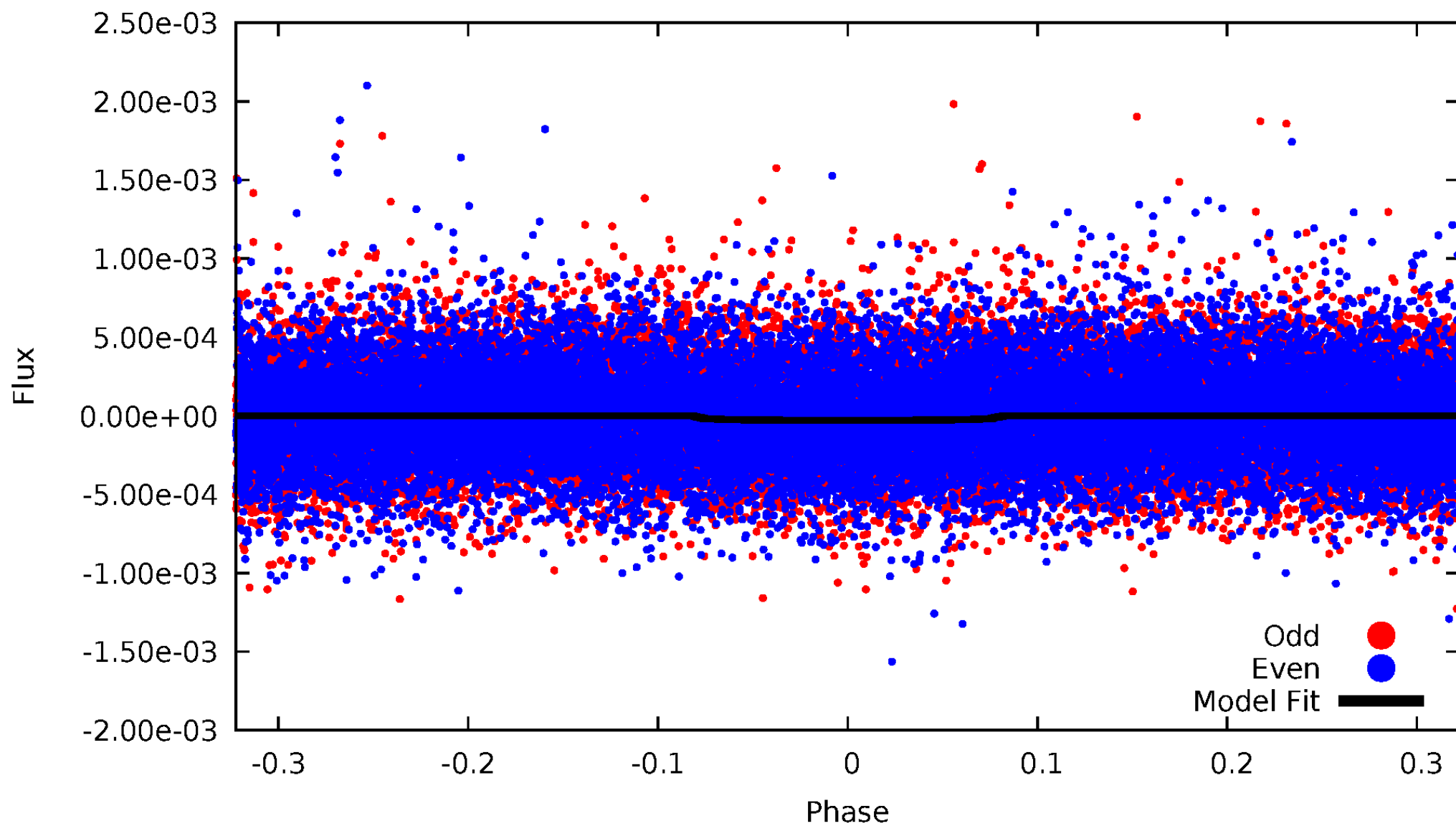


TCE 005823133-01



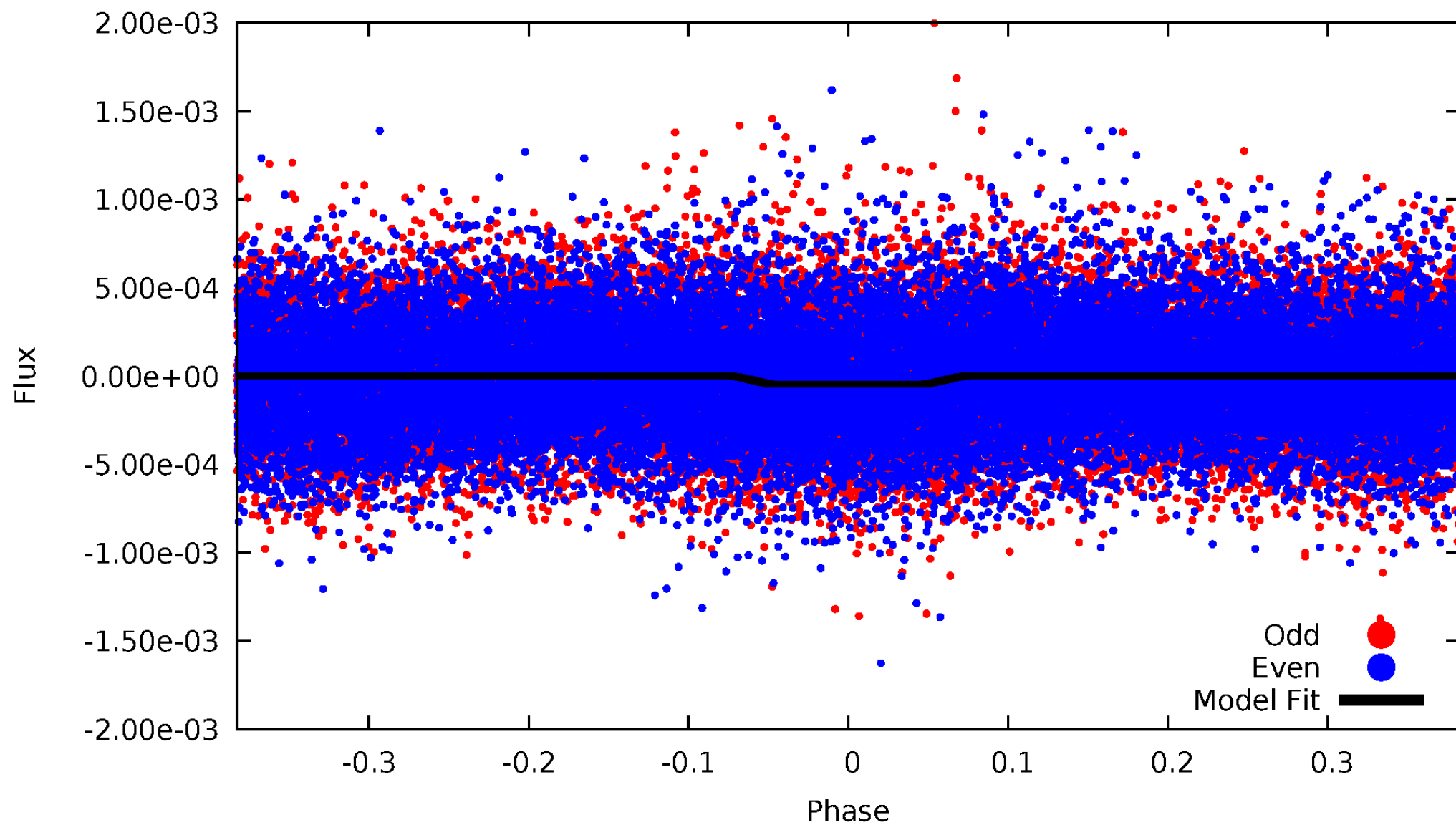
# DV Odd/Even

TCE 005823133-01

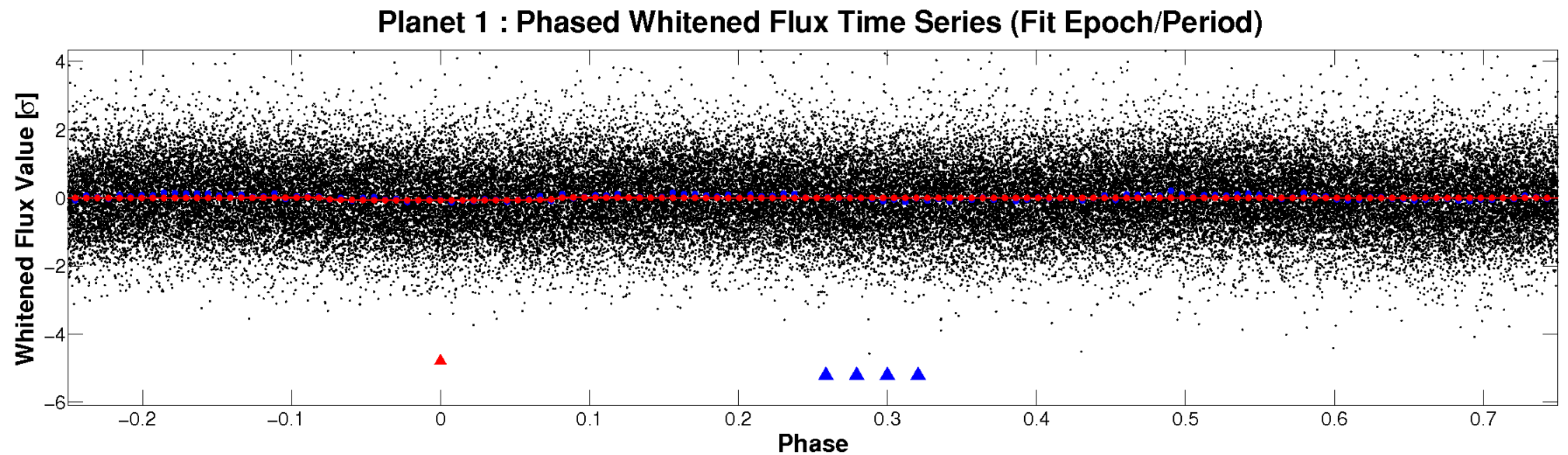
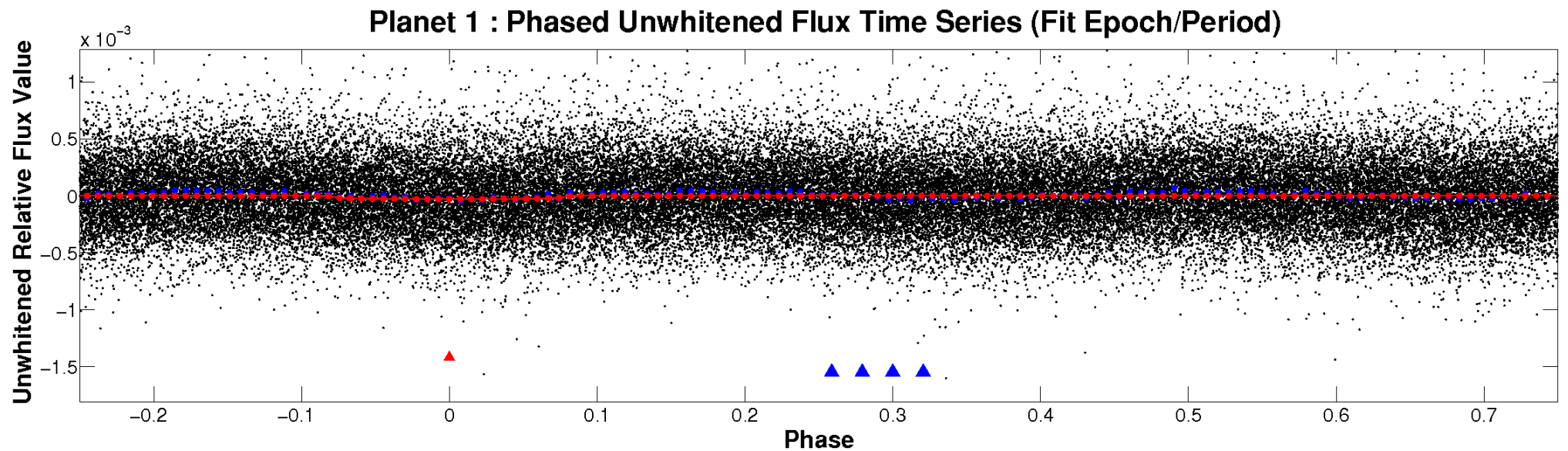


# ALT Odd/Even

TCE 005823133-01



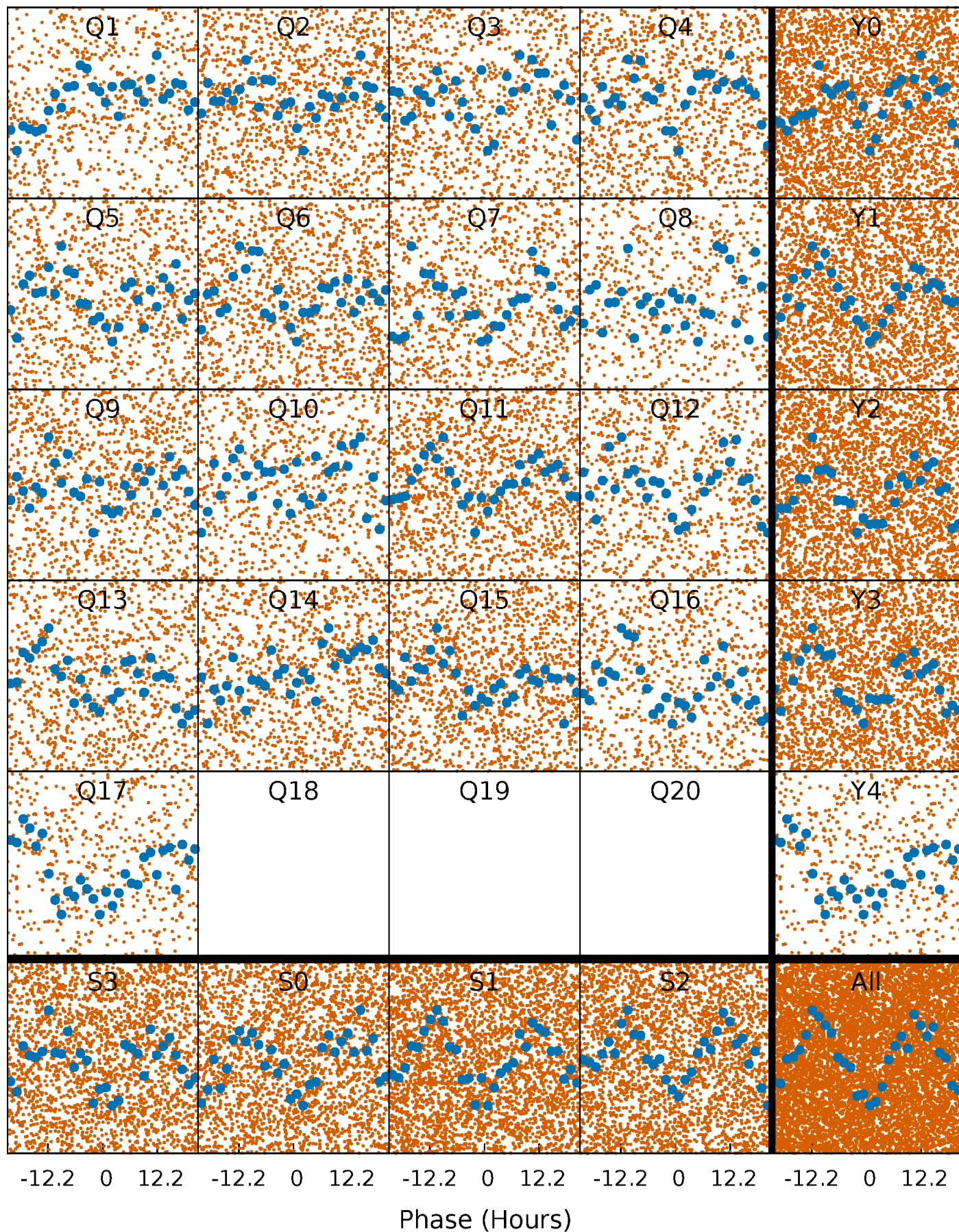
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

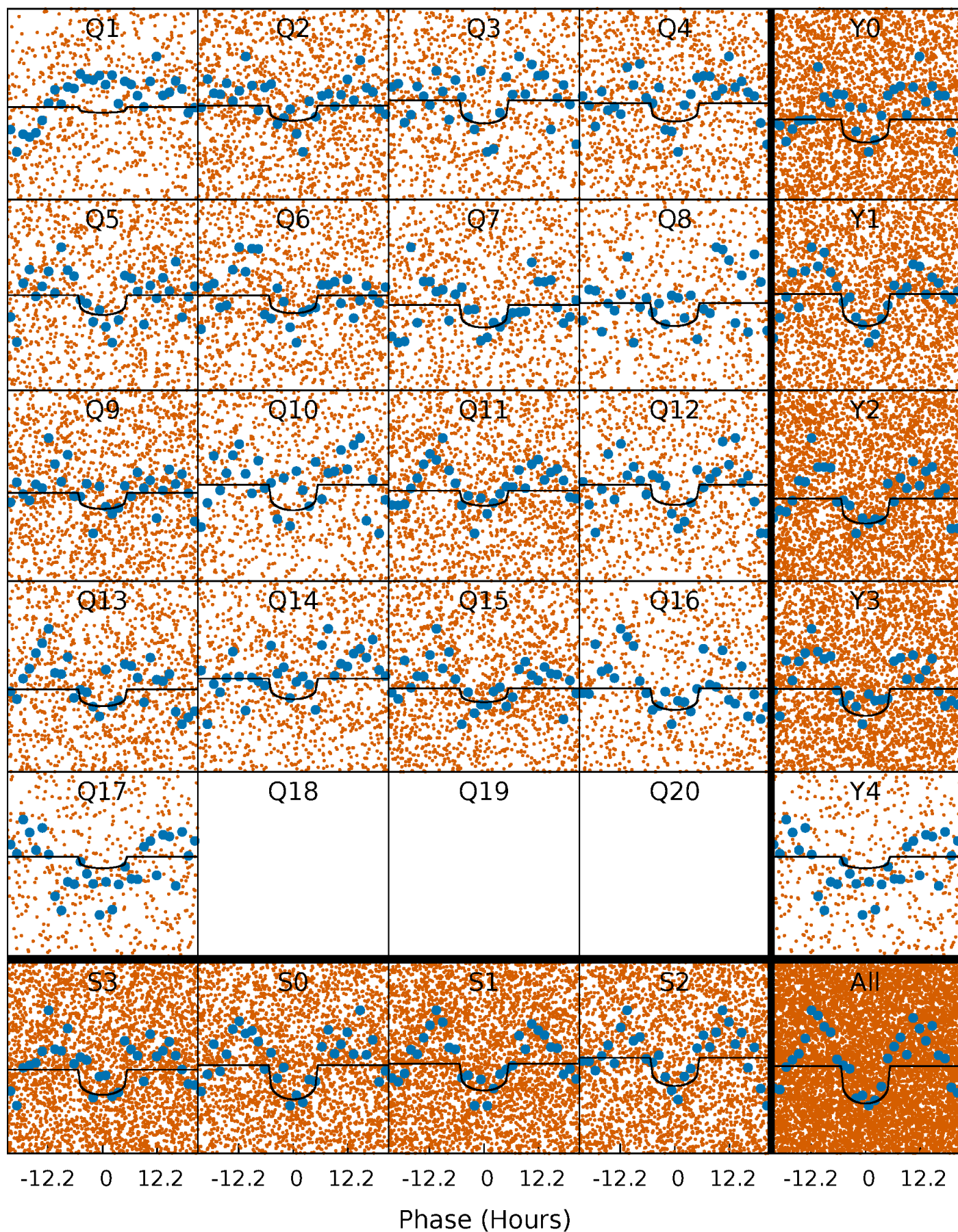
TCE 005823133-01 P= 2.750811 Days  $T_0=132.107949$  (BKJD)





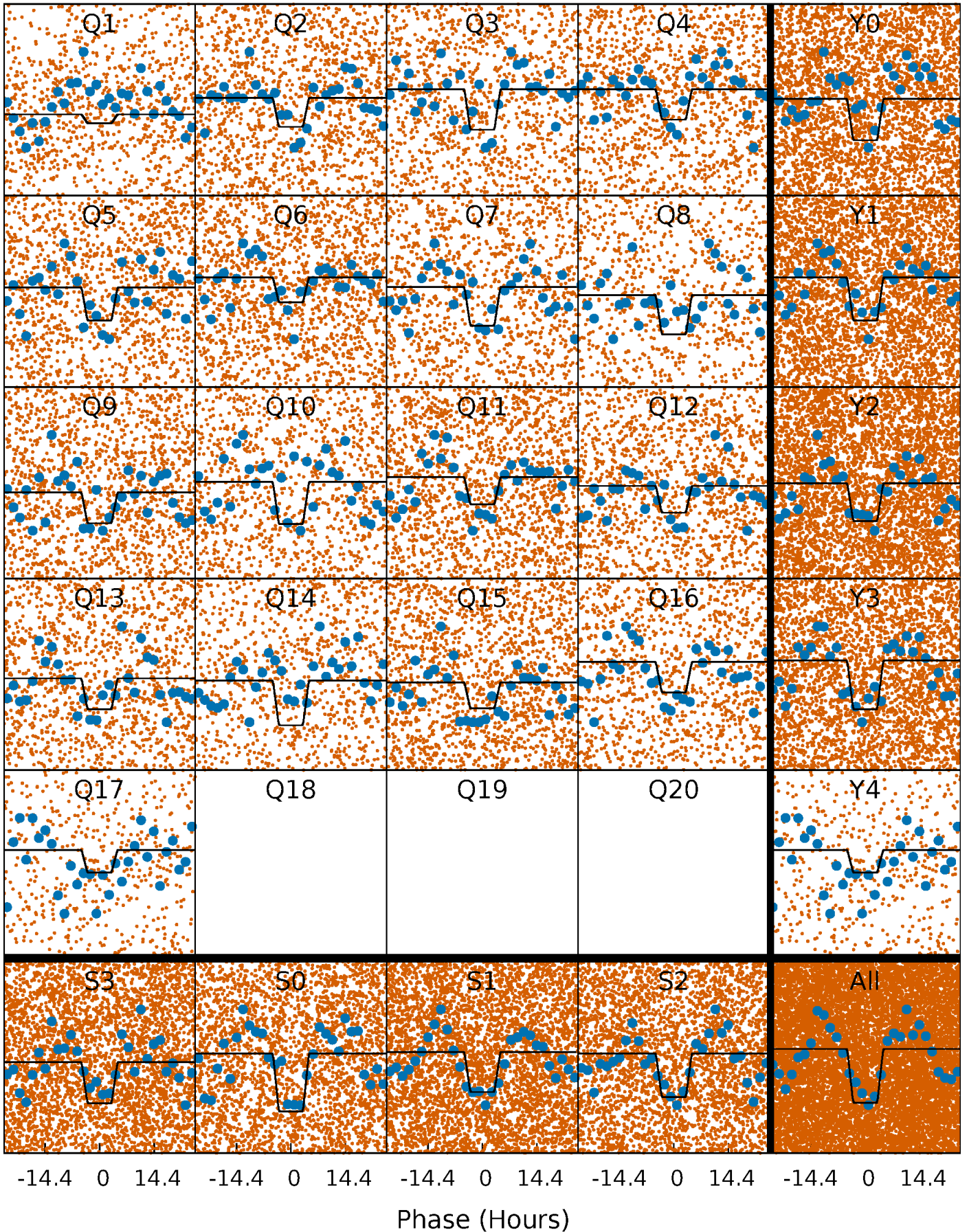
# DV Quarter-Phased Transit Curves

TCE 005823133-01 P= 2.750811 Days  $T_0=132.107949$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005823133-01 P= 2.750802 Days  $T_0=132.116101$  (BKJD)

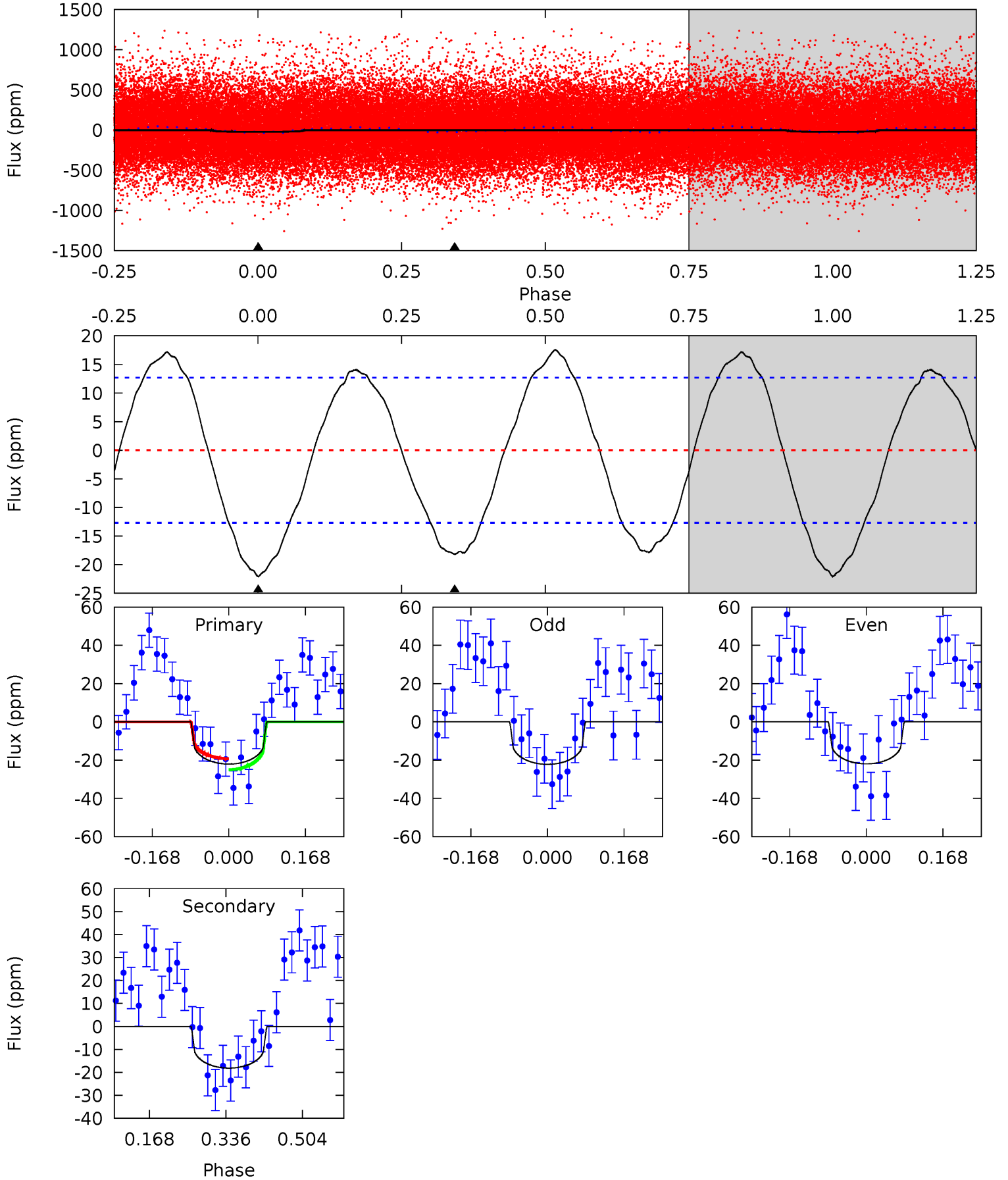




# DV Model-Shift Uniqueness Test

005823133-01, P = 2.750811 Days, E = 129.357138 Days

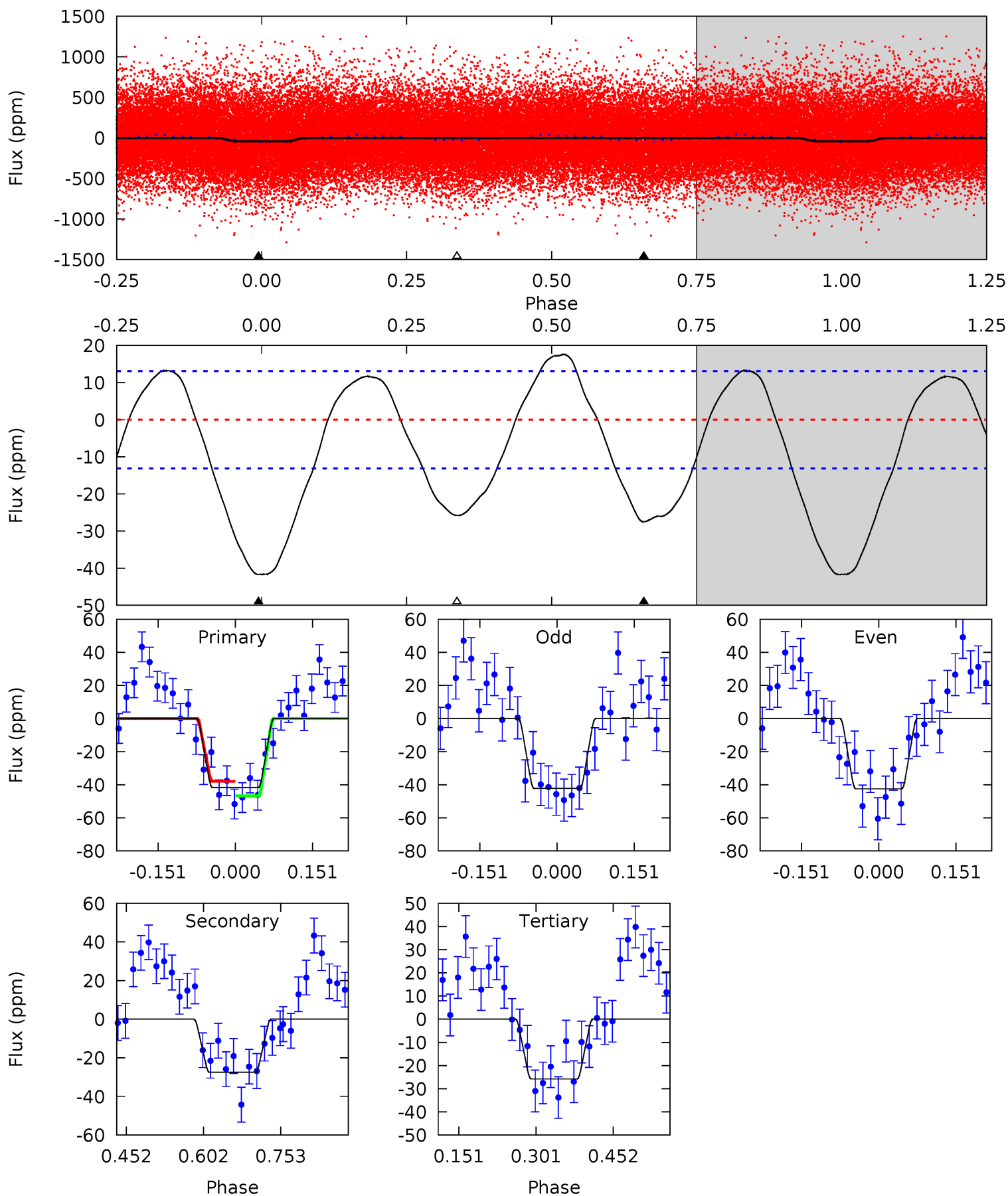
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.75	6.38	0	0	4.45	1.38	4.34	7.75	7.75	6.38	6.38	0.04	0.94	0.44	1.03



# Alt Model-Shift Uniqueness Test

005823133-01, P = 2.750802 Days, E = 129.365299 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
14.2	9.40	8.82	0	4.48	1.44	4.98	5.43	14.2	0.59	9.40	0.06	1.05	0.30	1.51





### Stellar Parameters For KIC 005823133

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5448^{+164}_{-147}$	$4.473^{+0.092}_{-0.138}$	$-0.100^{+0.300}_{-0.300}$	$0.880^{+0.184}_{-0.113}$	$0.839^{+0.110}_{-0.073}$	$1.734^{+0.691}_{-0.689}$
	+3%/-3%	+2%/-3%	+300%/-300%	+21%/-13%	+13%/-9%	+40%/-40%
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 005823133-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-18 \pm 3$	$0.57^{+0.35}_{-0.30}$	$1660^{+102}_{-79}$	$4740^{+1981}_{-746}$	$40^{+142}_{-24}$
Alt.	$-28 \pm 3$	$0.66^{+0.34}_{-0.29}$	$1661^{+87}_{-76}$	$4850^{+1466}_{-718}$	$45^{+94}_{-26}$

$T_{max}$  = 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

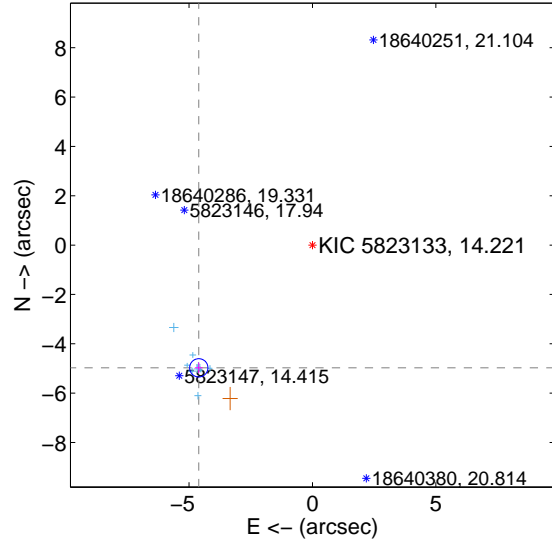
Supplemental centroid analysis for 005823133-01. Kepler magnitude: 14.22. Transit SNR 6.47

There are 11 quarters with good PRF difference image offsets

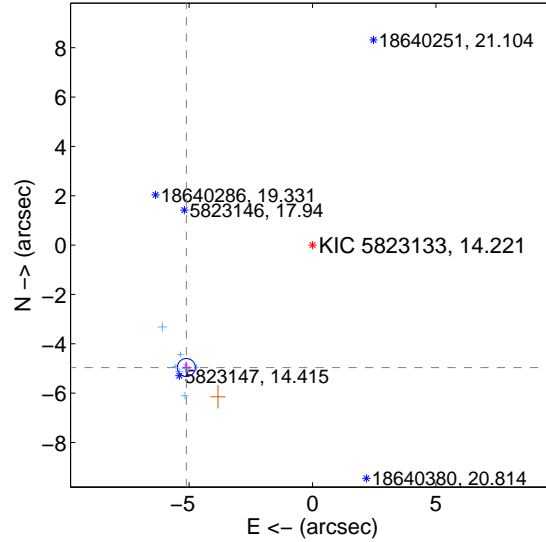
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>6.779 <math>\pm</math> 0.123</b>	<b>54.90</b>	4.607 $\pm$ 0.156	-4.974 $\pm$ 0.219
PRF-fit source offset from KIC position	<b>7.126 <math>\pm</math> 0.122</b>	<b>58.59</b>	5.114 $\pm$ 0.162	-4.963 $\pm$ 0.219
photometric centroid source offset	2.17 $\pm$ 2.00	1.08	2.02 $\pm$ 1.92	0.77 $\pm$ 2.52

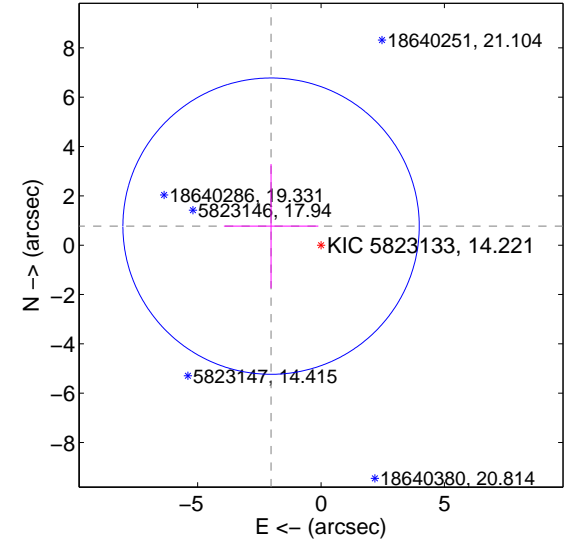
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

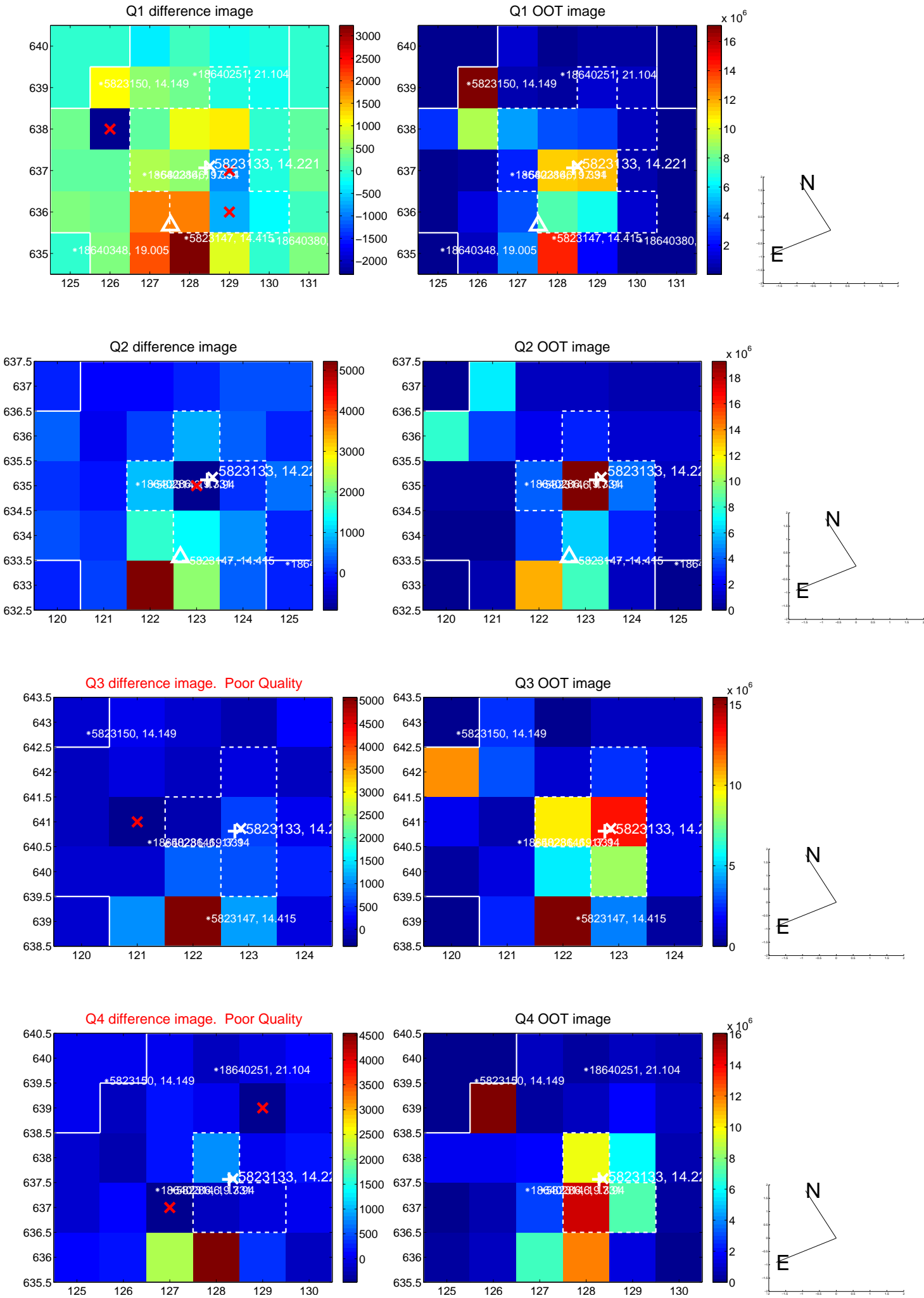


offset from photometric centroids

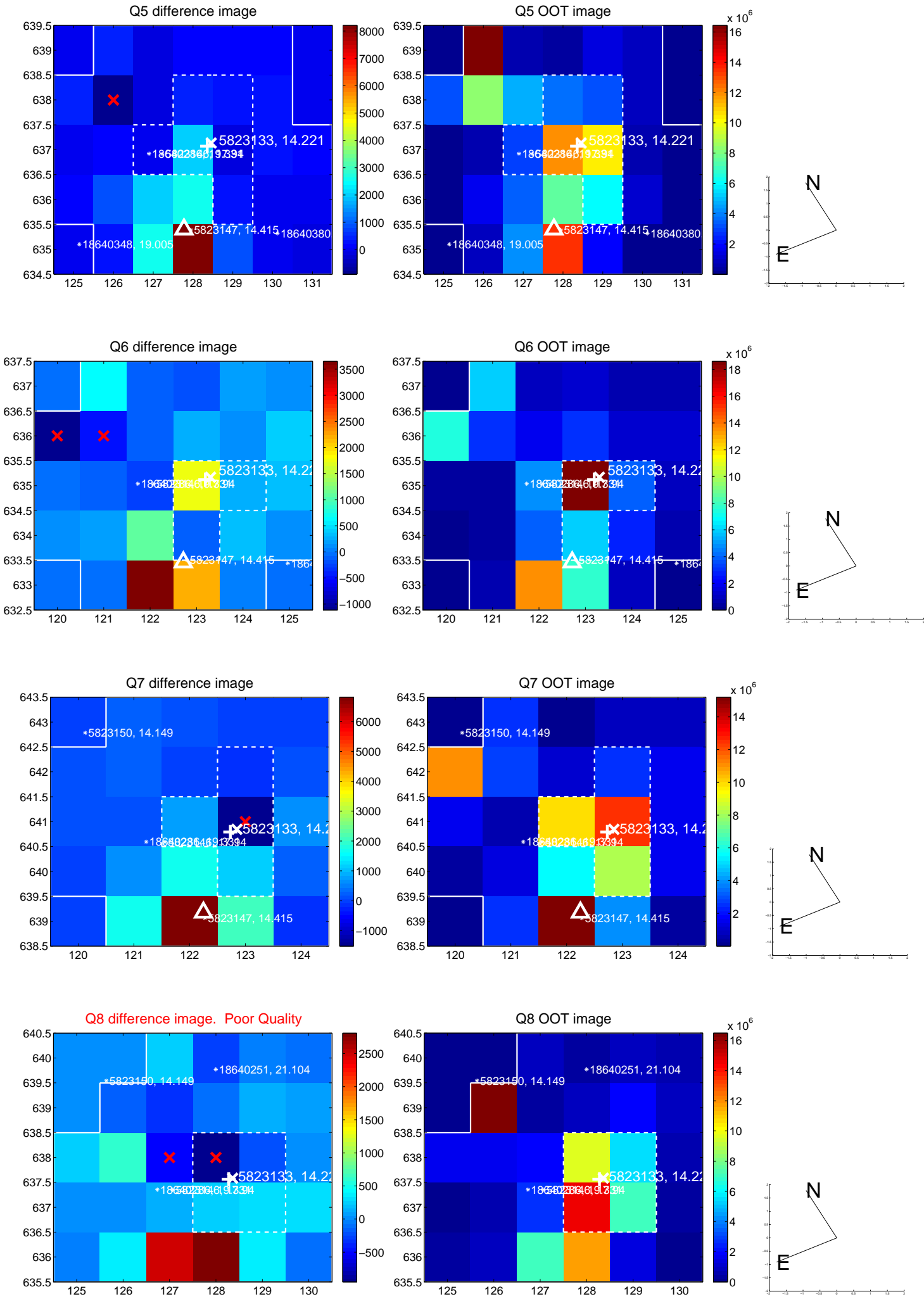


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

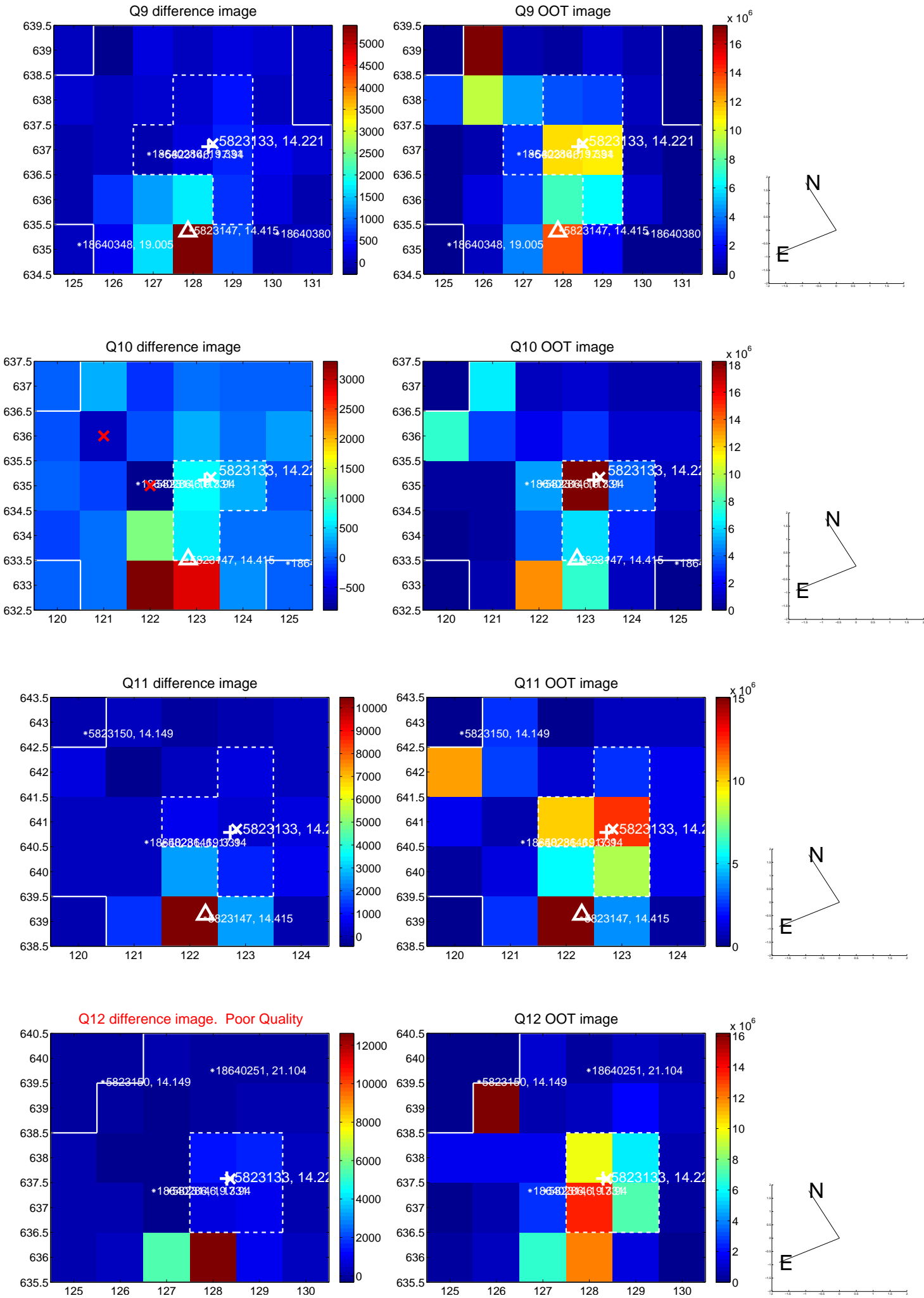


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

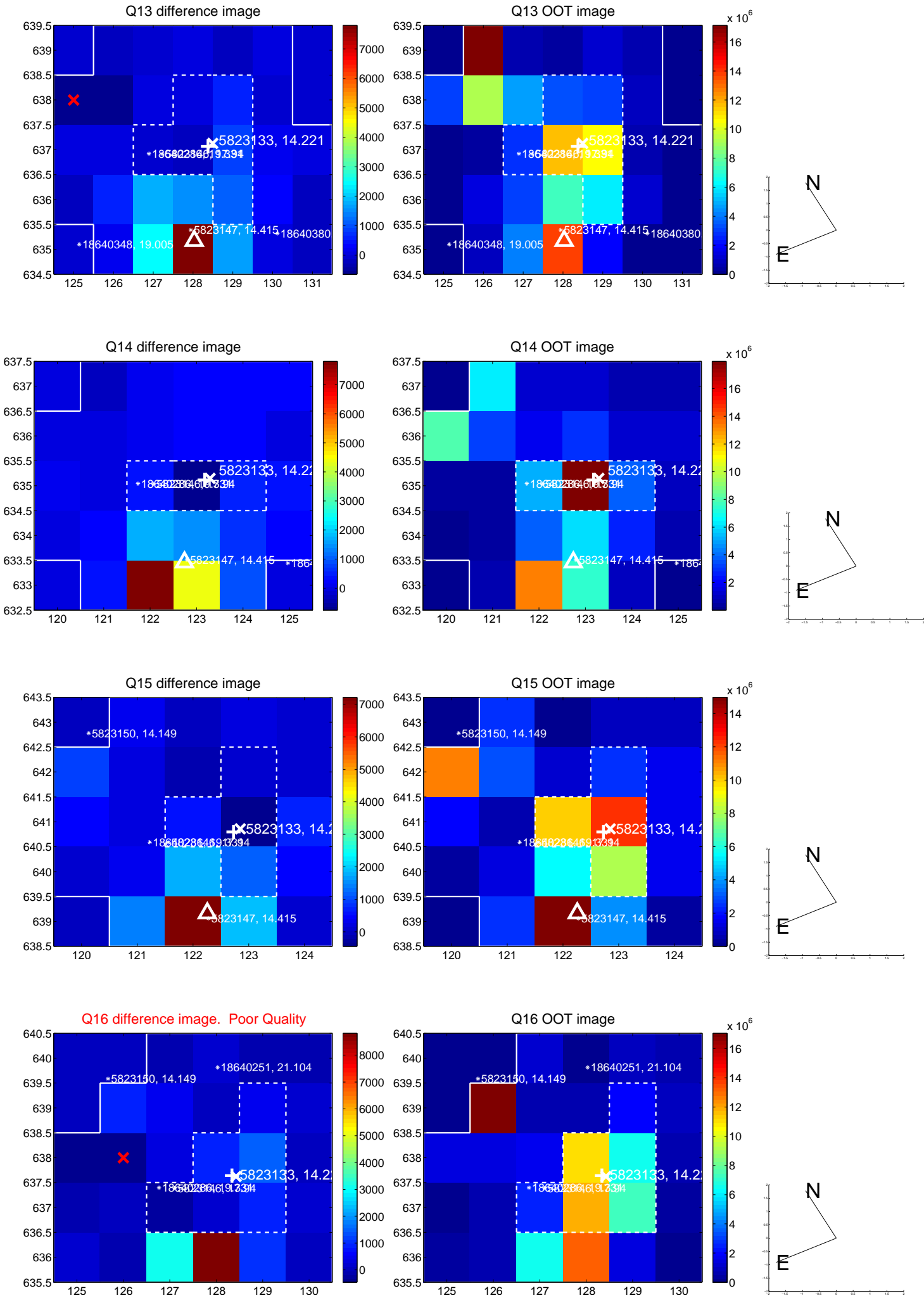




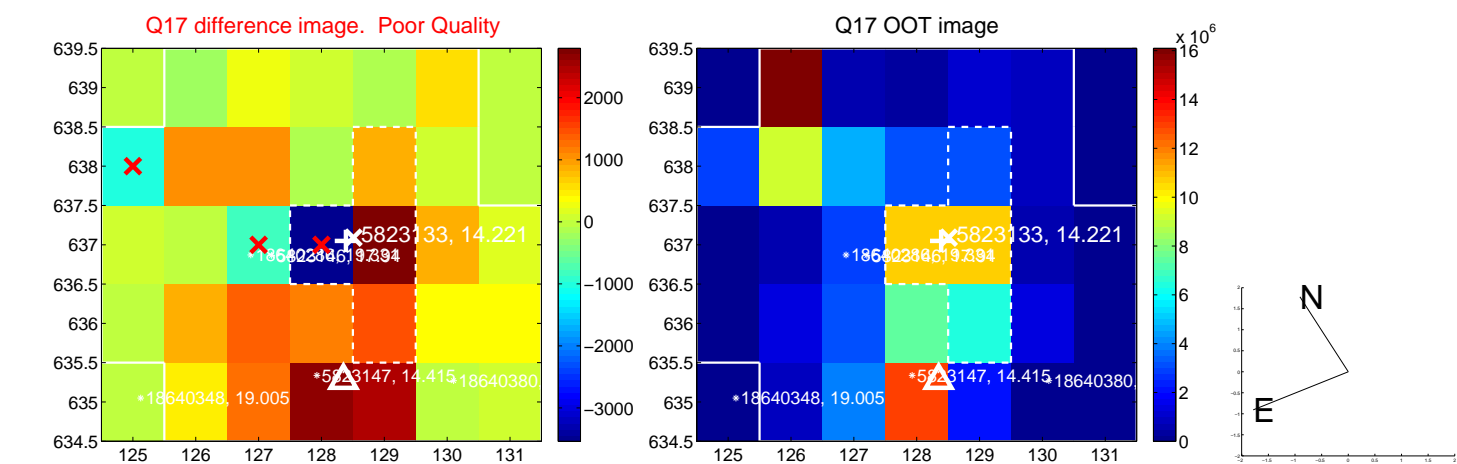
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



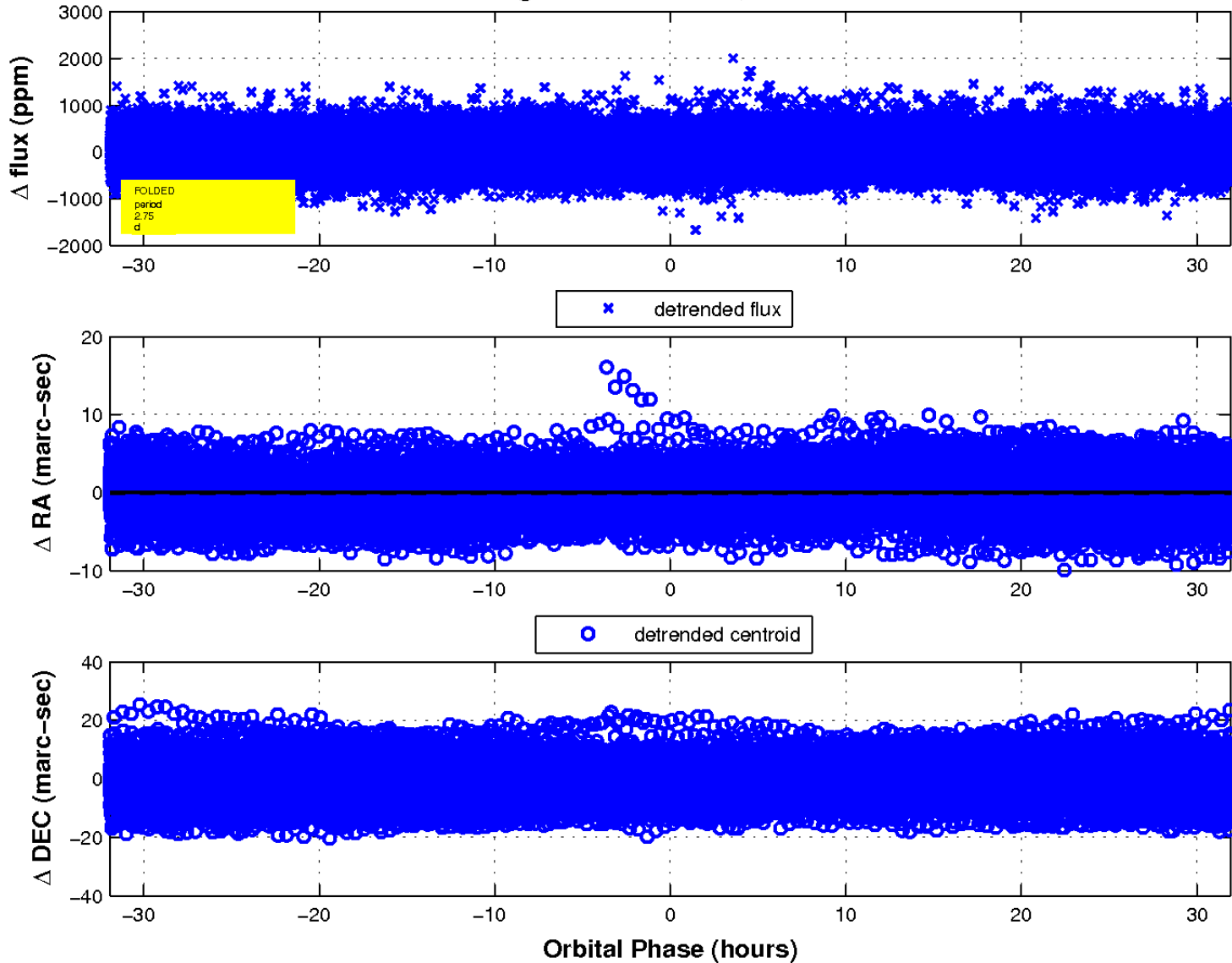
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



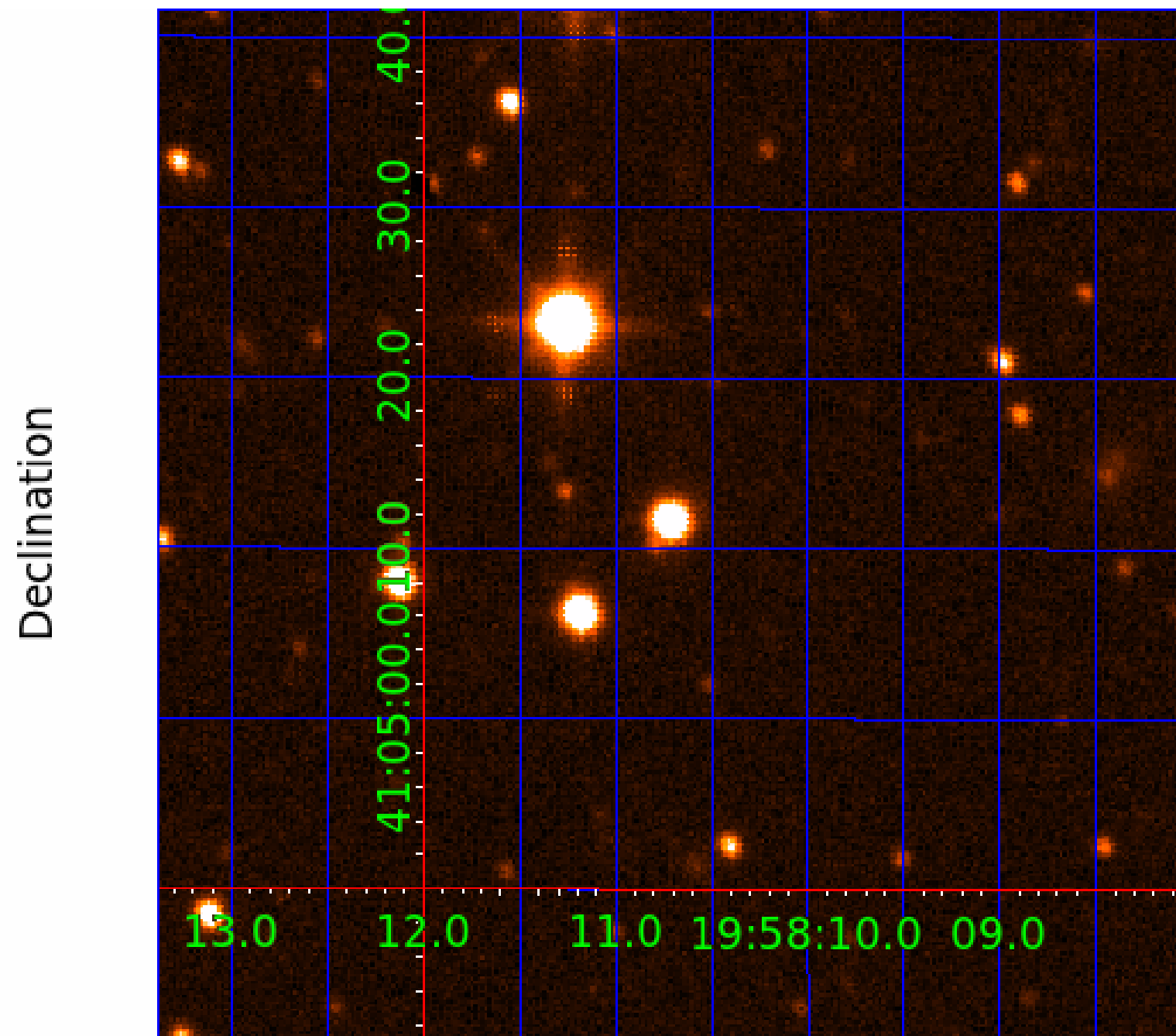
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 005823133

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005823133-01	OBS	No	2.750811	132.107949	29.8	10.642	7.4	6.5	0.88	5448	0.53	465.10
005823133-02	OBS	No	365.914642	479.421852	563.5	3.975	8.0	7.1	0.88	5448	2.31	0.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005823133-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
005823133-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—LPP_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.

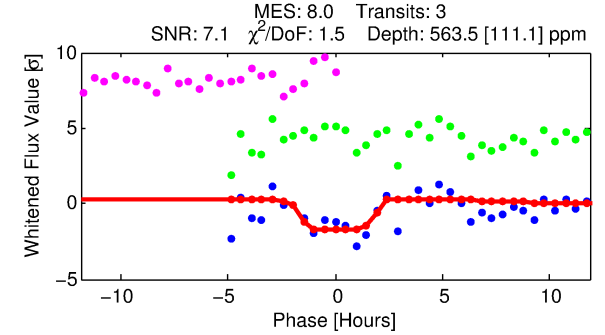
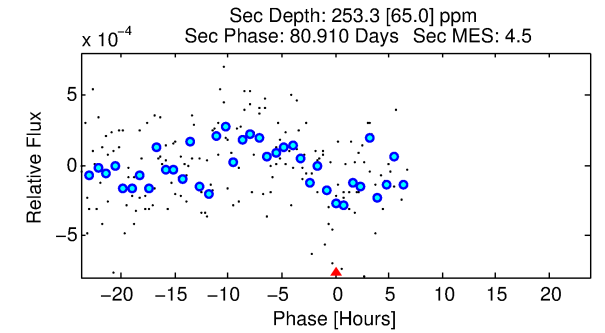
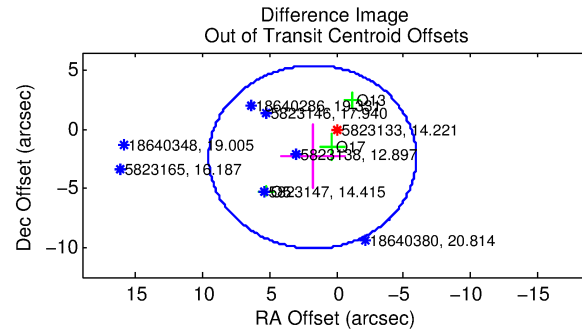
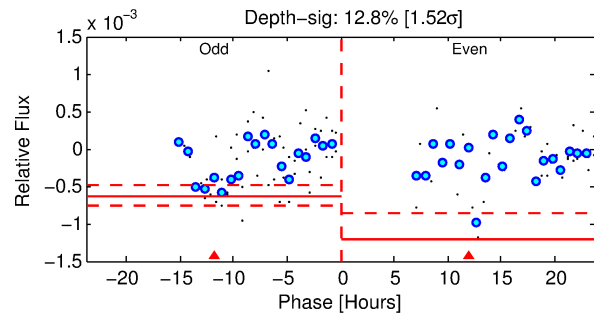
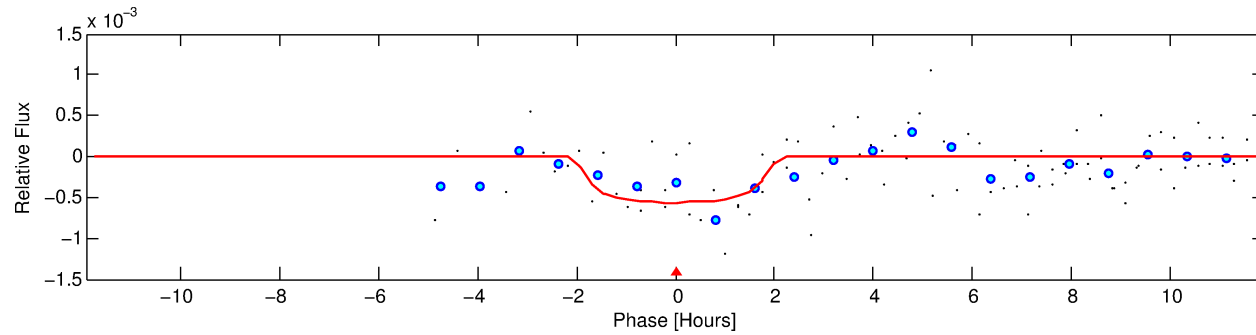
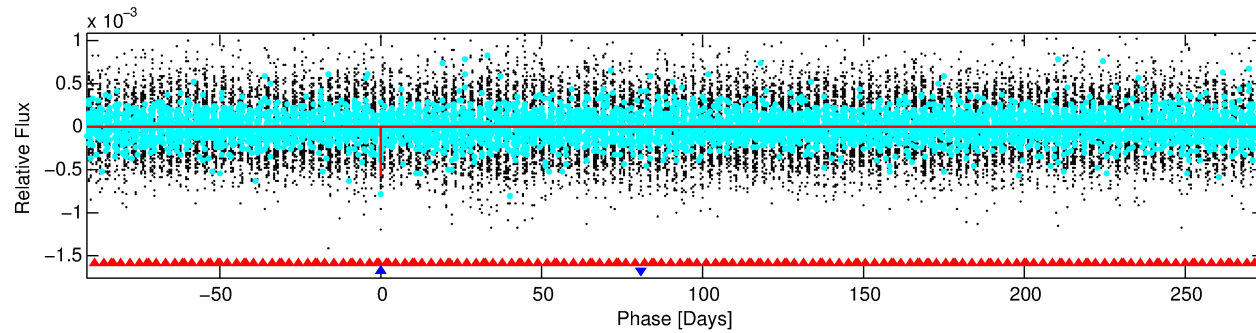
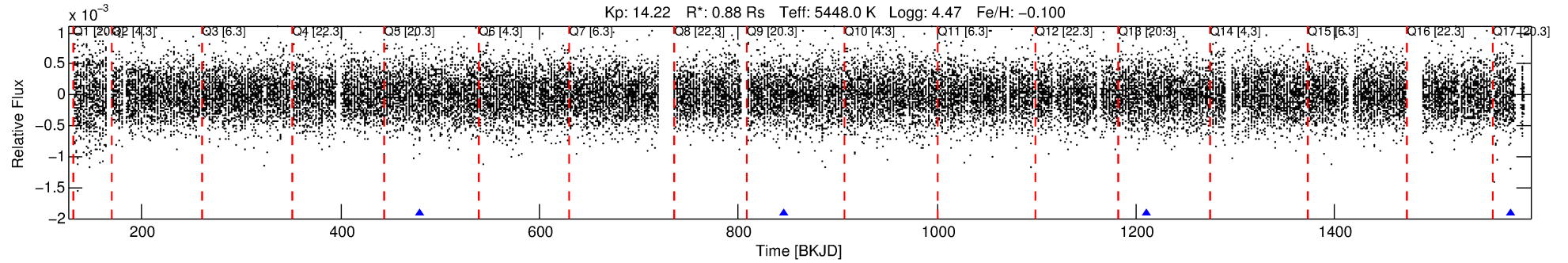
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005823133-02

No Significant Match Found

# DV One-Page Summary

KIC: 5823133 Candidate: 2 of 2 Period: 365.915 d



## DV Fit Results:

Period = 365.91464 [0.00831] d  
Epoch = 479.4219 [0.0191] BKJD  
Rp/R\* = 0.0241 [0.0710]  
a/R\* = 459.78 [5603.58]  
b = 0.79 [5.98]  
Seff = 0.68 [0.19]  
Teff = 232 [16] K  
Rp = 2.31 [6.84] Re  
a = 0.9447 [0.1654] AU  
Ag = 23267.50 [137525.06] [0.17 $\sigma$ ]  
Teffp = 4430 [6541] K [0.64 $\sigma$ ]

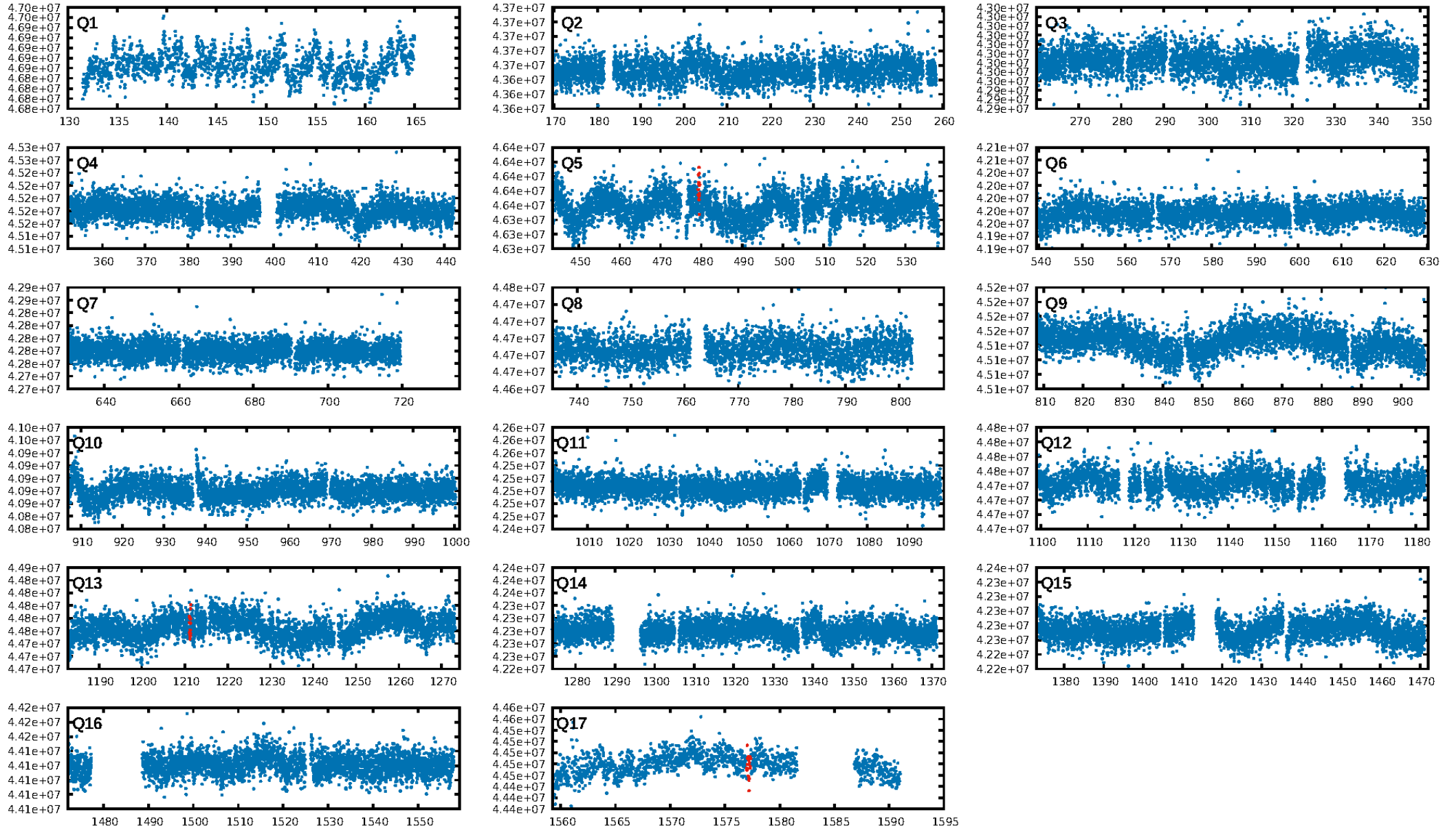
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [767.22 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 86.2%  
ModelChiSquareGof-sig: 78.5%  
**Bootstrap-pfa: 7.59e-12**  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -1.587  
Centroid-sig: N/A  
Centroid-so: 4.312 arcsec [2.33 $\sigma$ ]  
OotOffset-rm: 2.951 arcsec [1.14 $\sigma$ ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-rm: 3.333 arcsec [1.31 $\sigma$ ]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 1.00 [3/3]

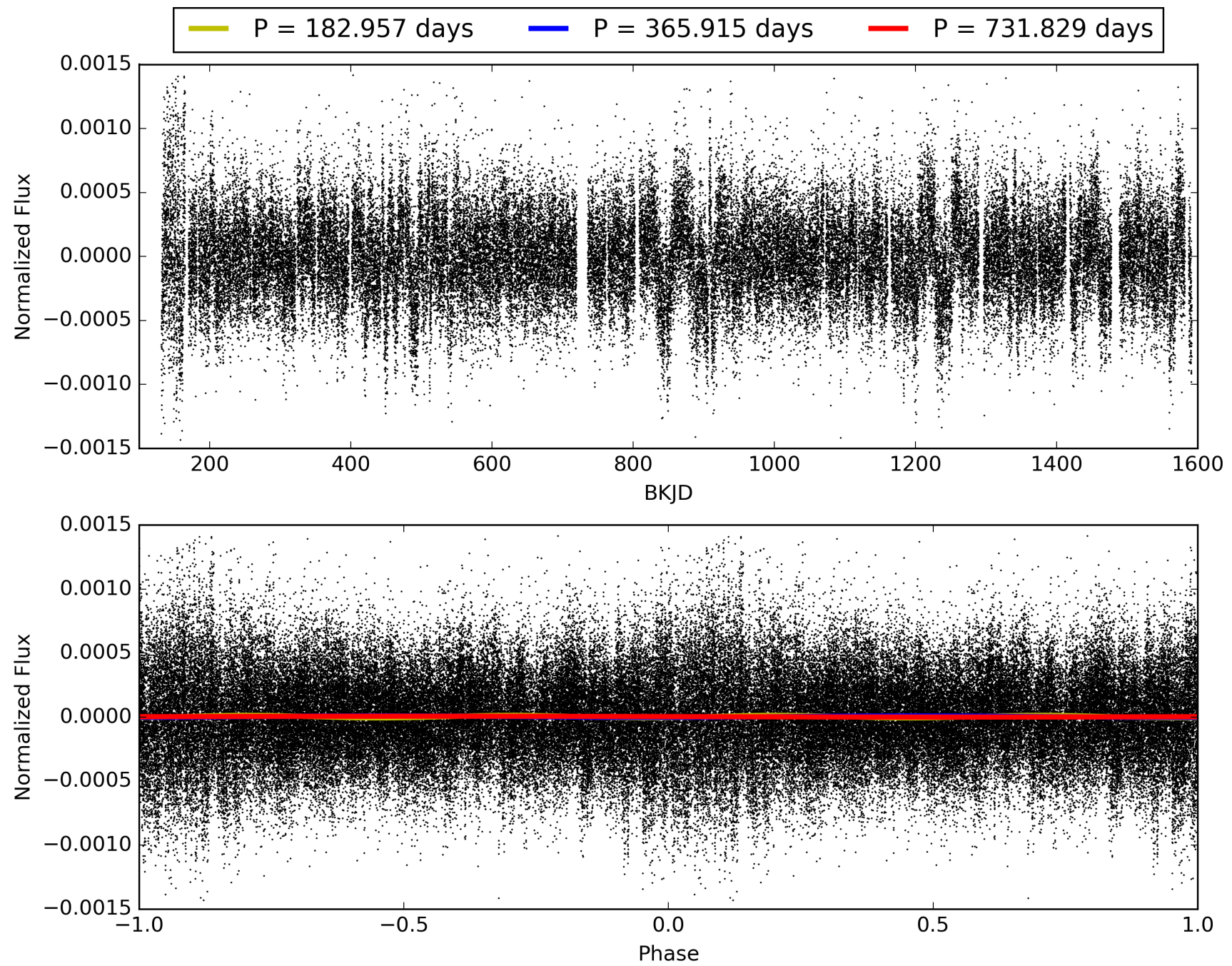
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:53:01 Z

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

# TCE 005823133-02, PDC Light Curves



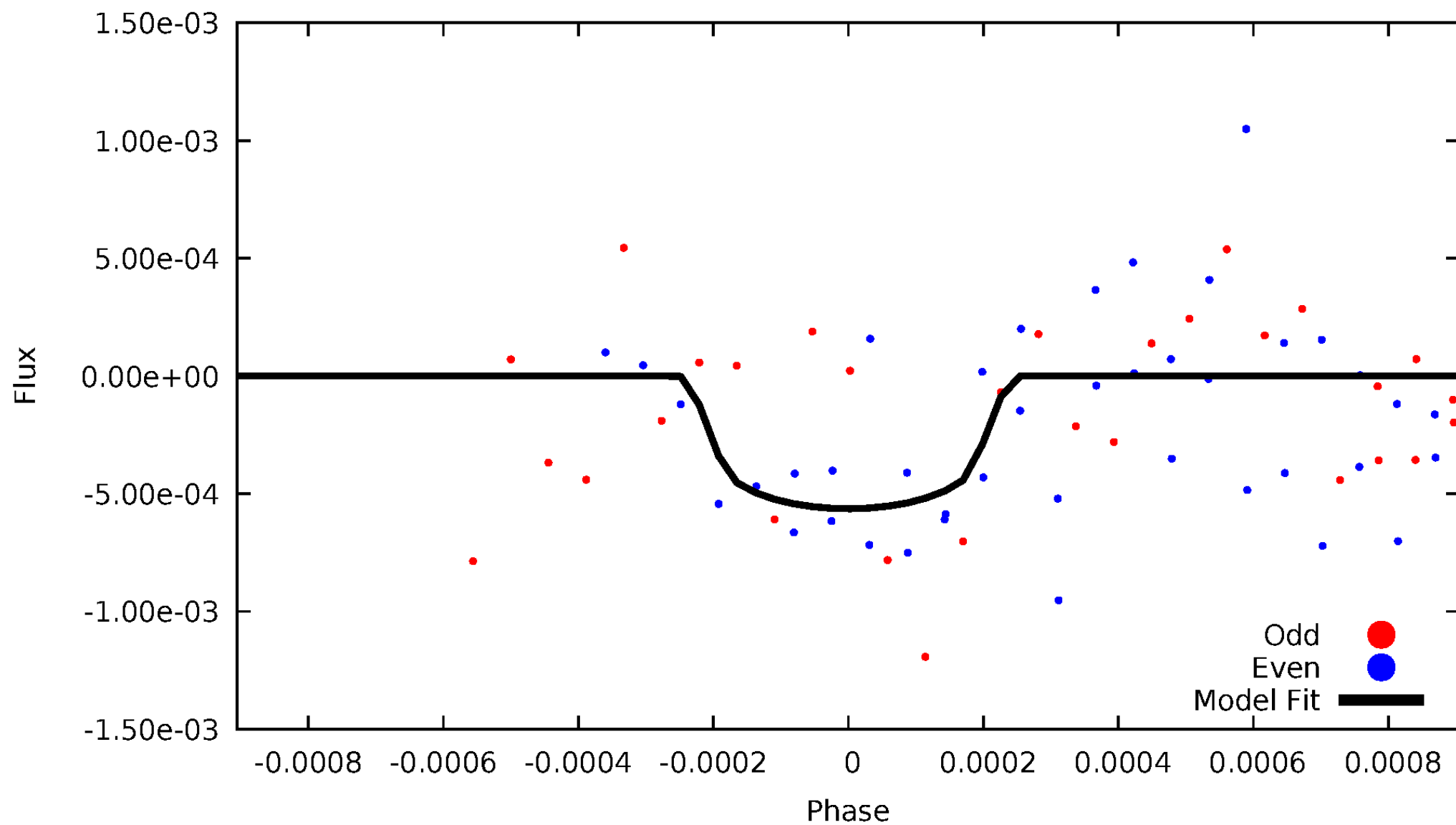
TCE 005823133-02





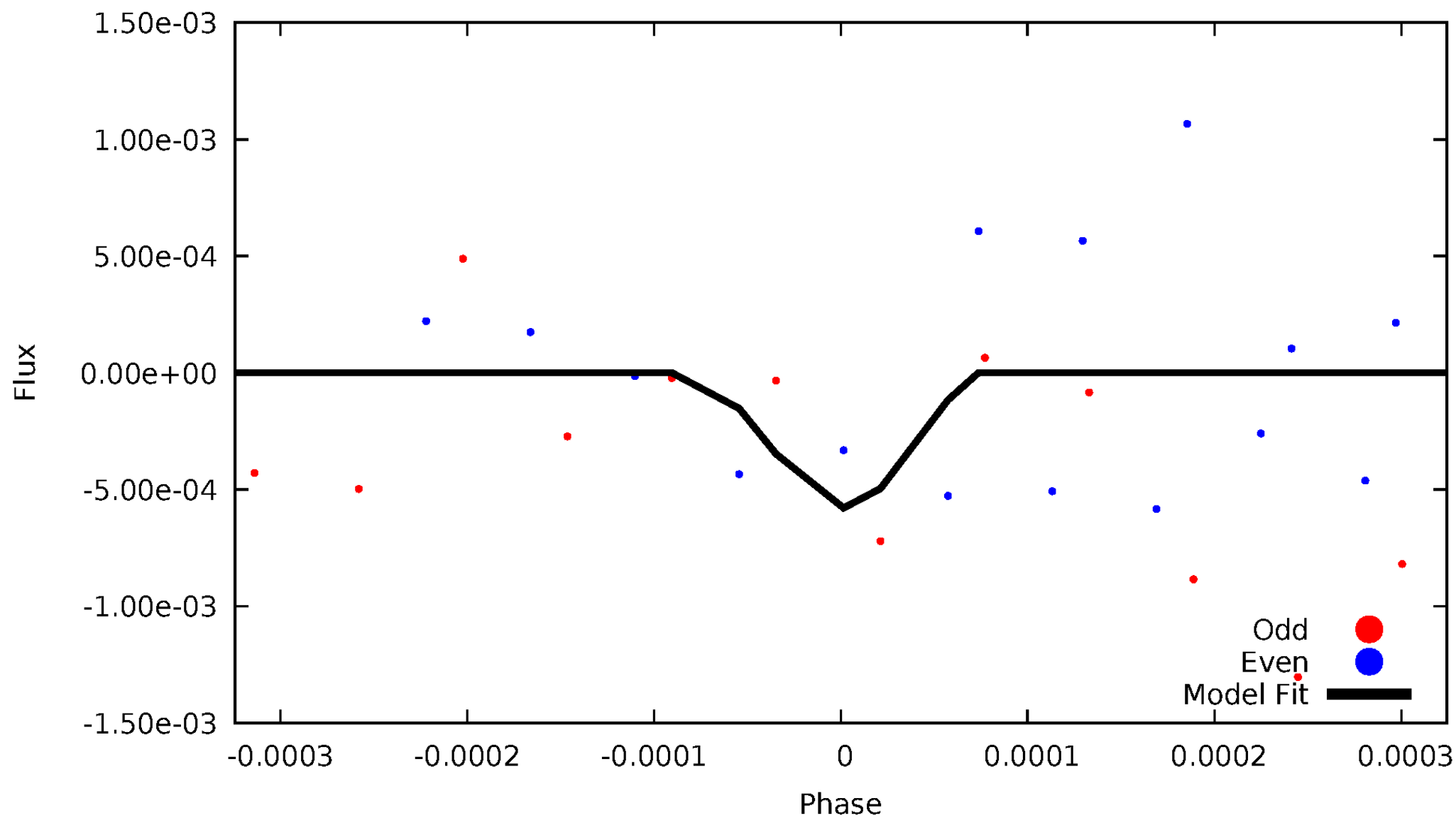
# DV Odd/Even

TCE 005823133-02



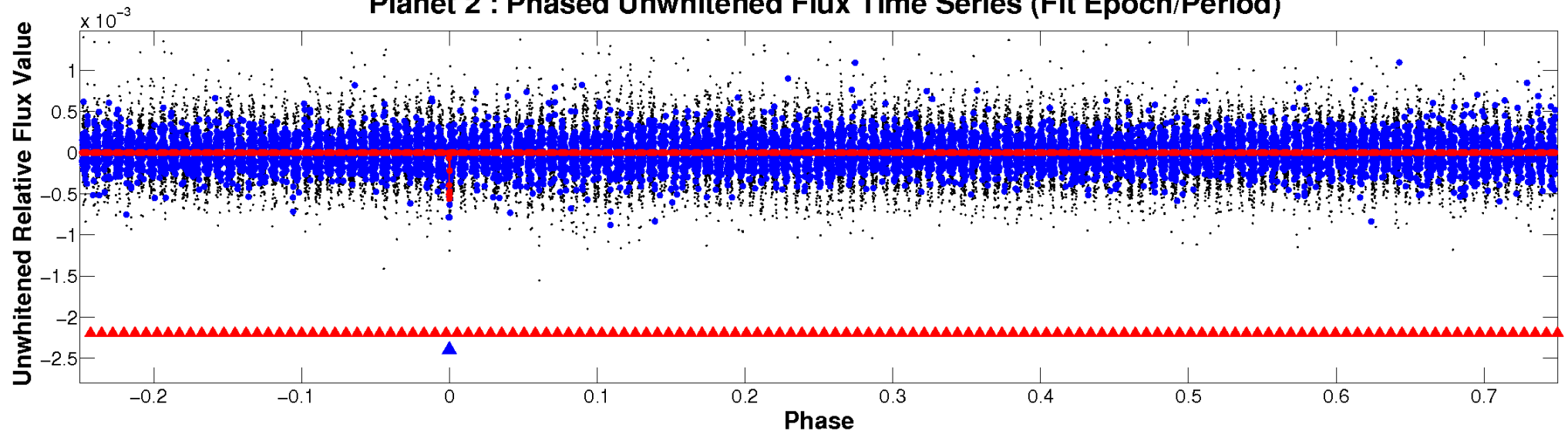
# ALT Odd/Even

TCE 005823133-02

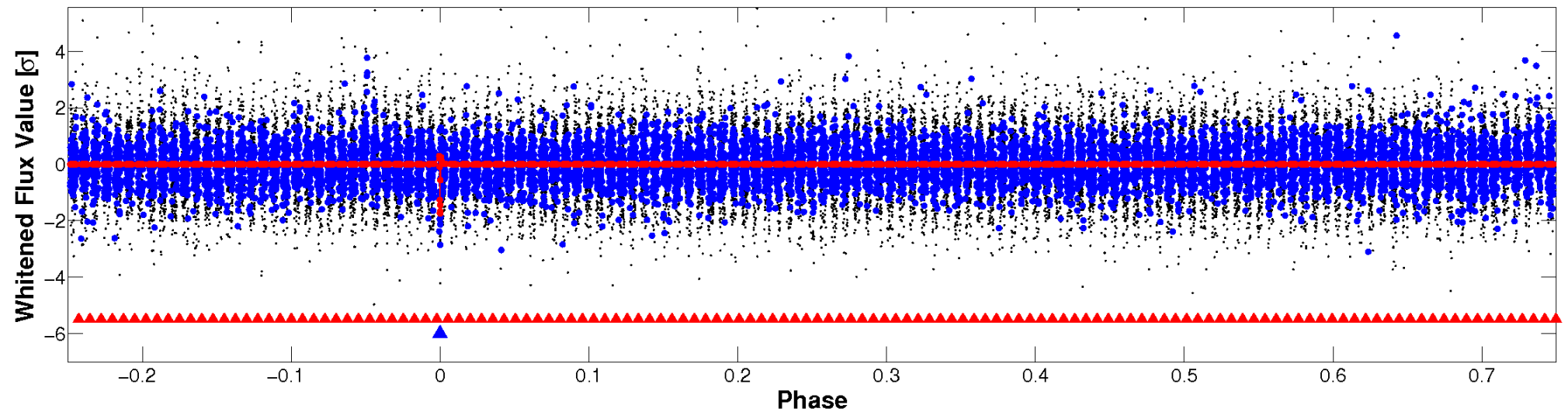


# Non-Whitened Vs. Whitened Light Curve

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

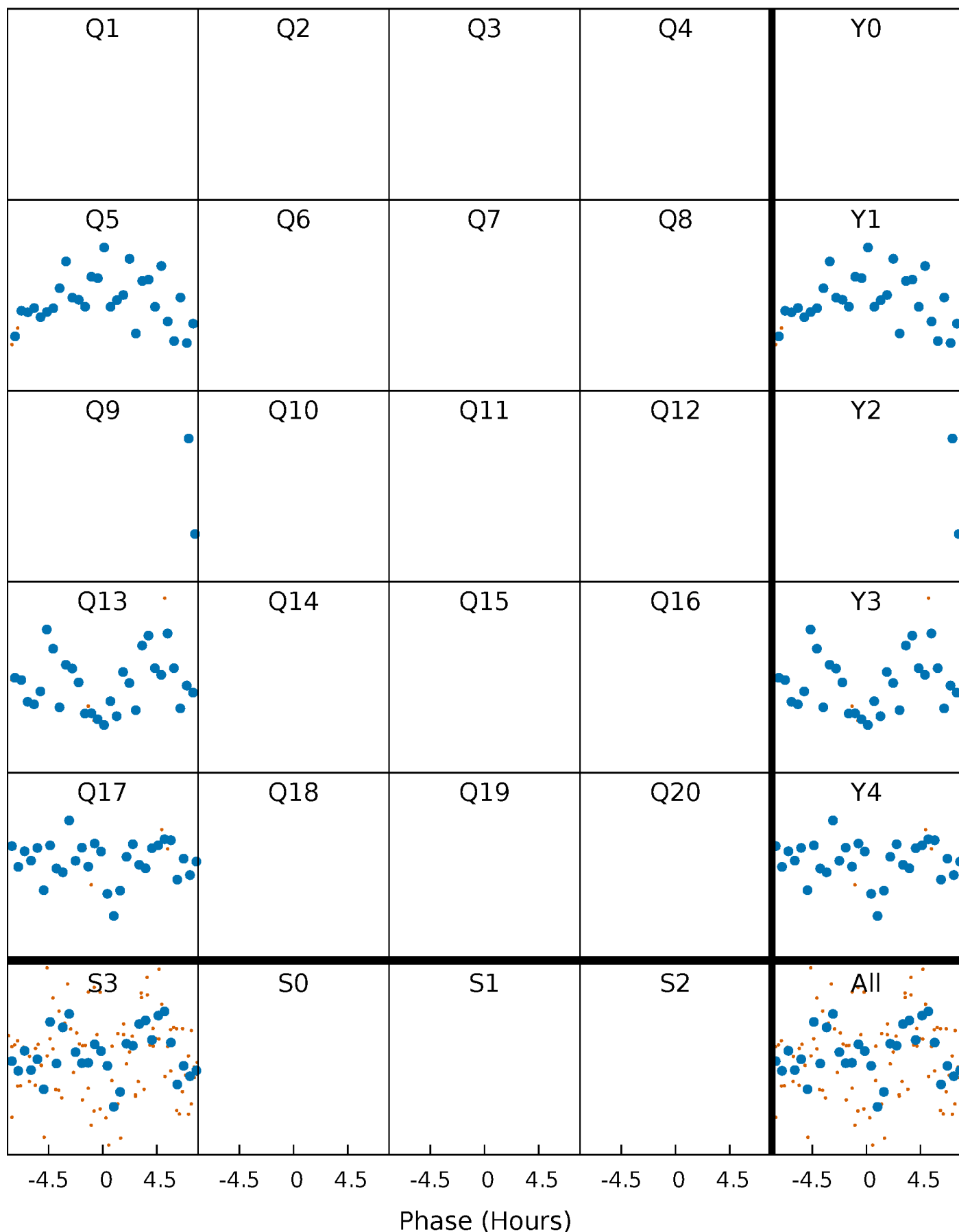


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



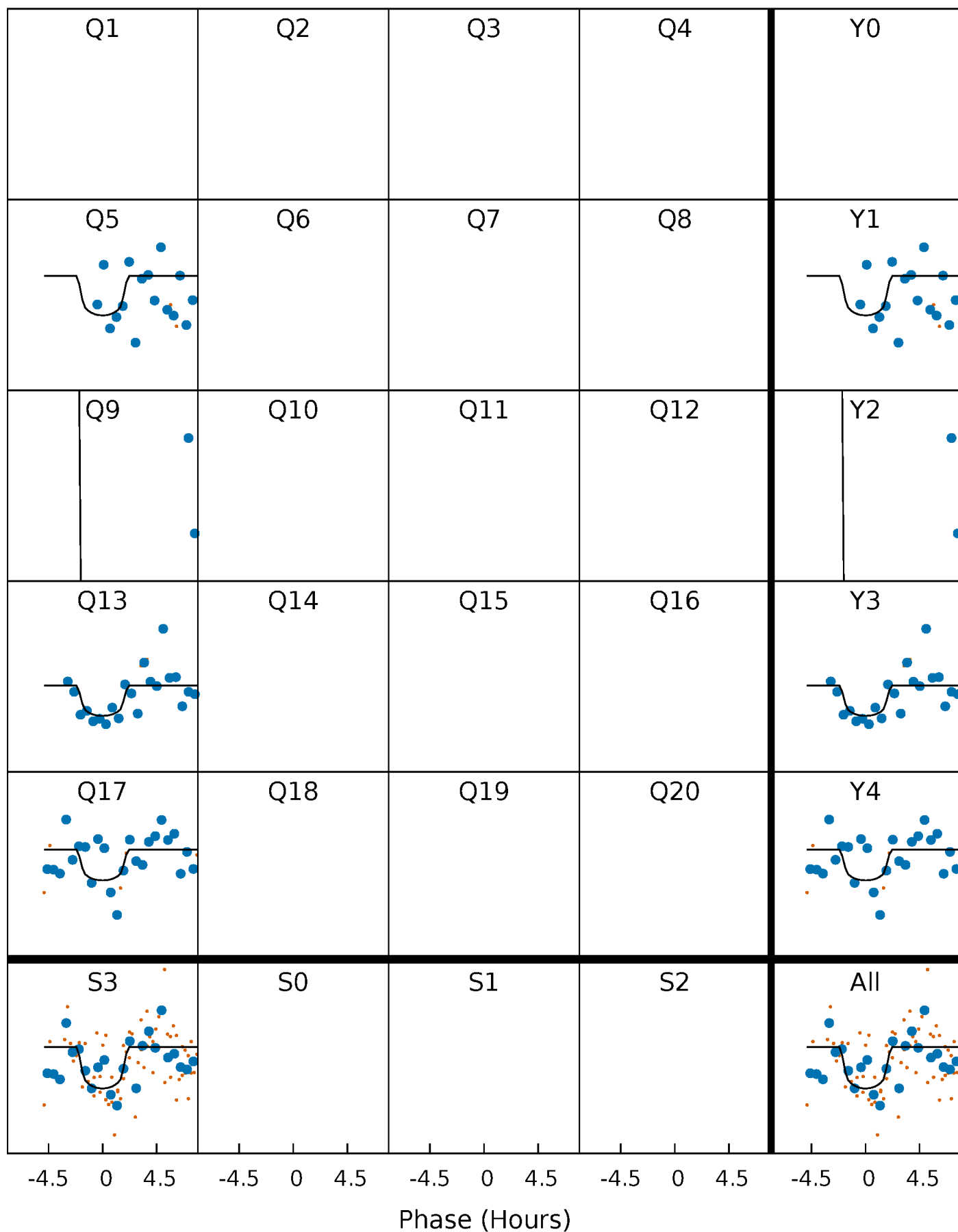
# PDC Quarter-Phased Transit Curves

TCE 005823133-02     $P=365.914642$  Days     $T_0=479.421852$  (BKJD)



# DV Quarter-Phased Transit Curves

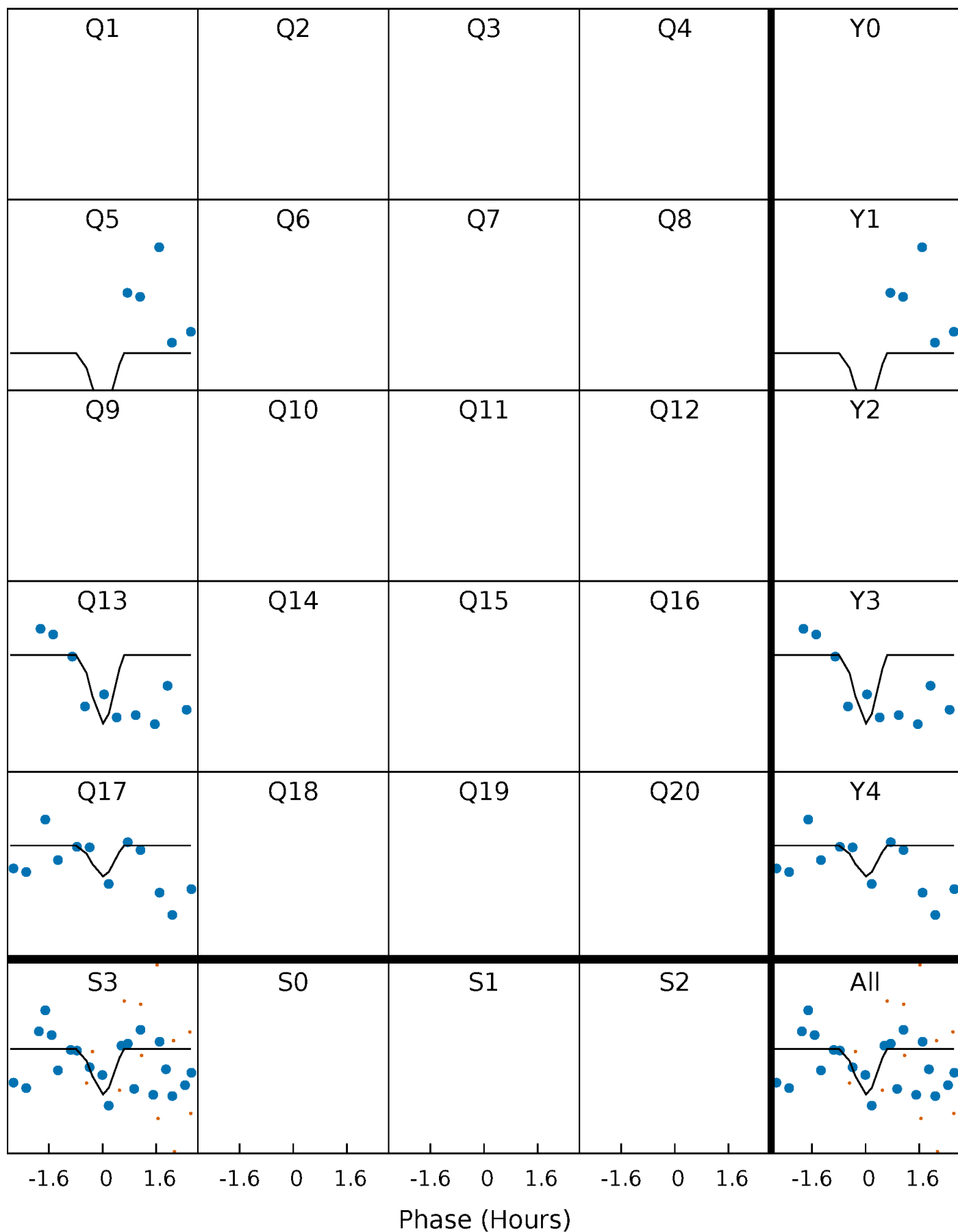
TCE 005823133-02     $P=365.914642$  Days     $T_0=479.421852$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

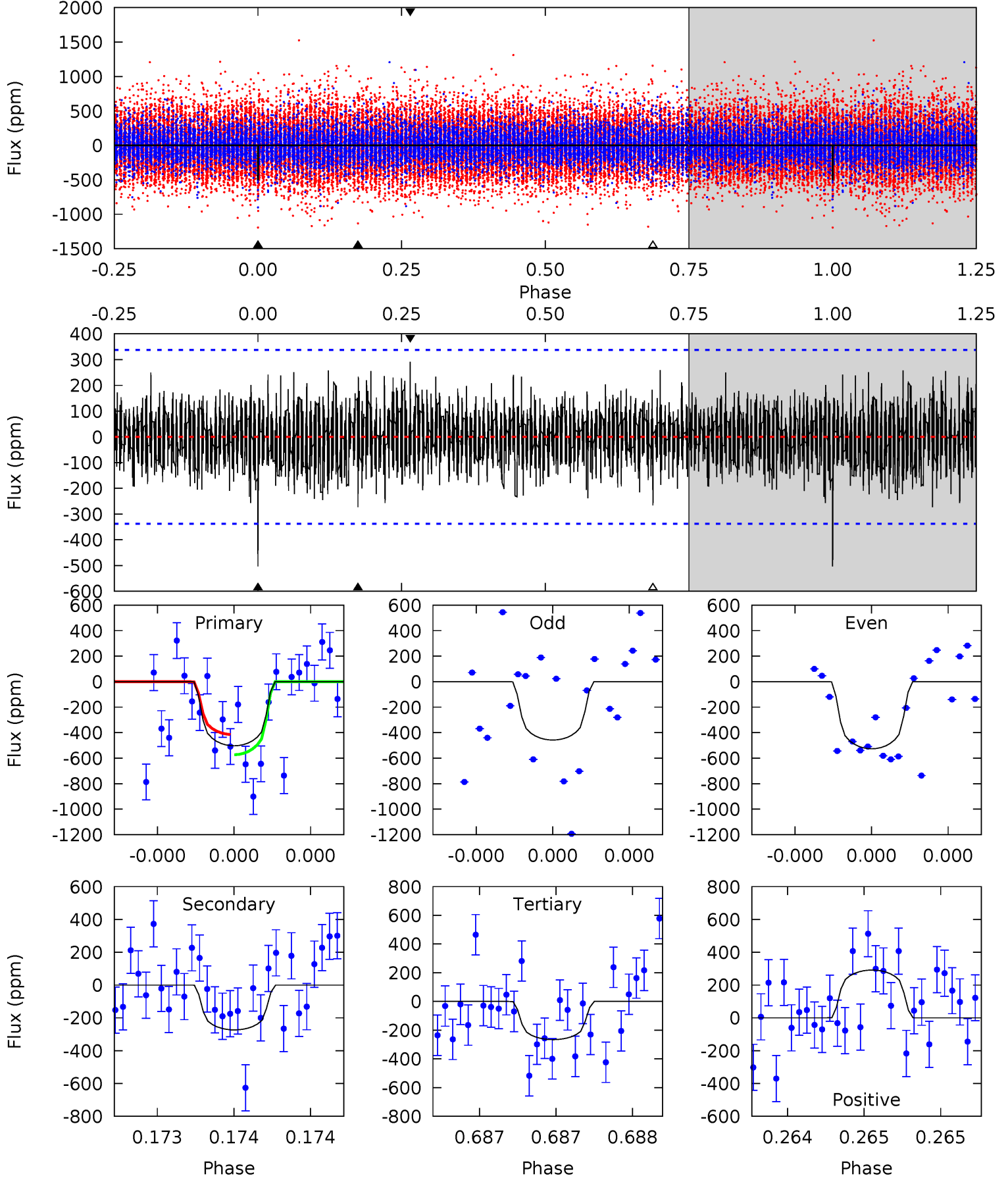
TCE 005823133-02 P=365.917381 Days  $T_0=479.365903$  (BKJD)



# DV Model-Shift Uniqueness Test

005823133-02, P = 365.914642 Days, E = 113.507210 Days

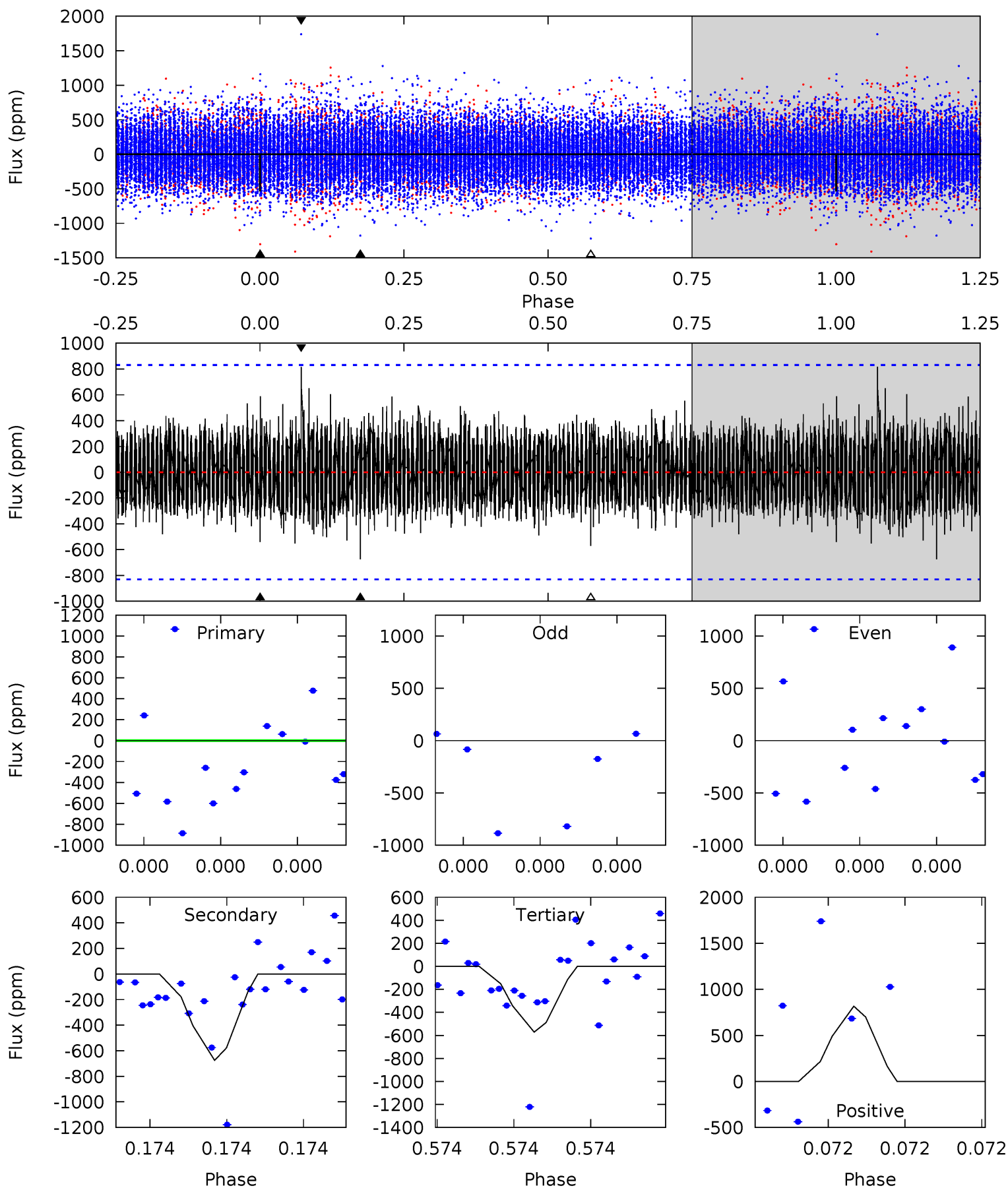
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.32	4.52	4.40	4.82	5.58	3.50	1.25	3.92	3.50	0.12	-0.30	0.54	1.09	0.37	1.30



# Alt Model-Shift Uniqueness Test

005823133-02, P = 365.917381 Days, E = 113.448522 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
3.77	4.72	3.99	5.71	5.81	3.83	0.96	-0.22	-1.94	0.73	-0.99	0.01	1.00	0.55	1.25



### Stellar Parameters For KIC 005823133

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5448^{+164}_{-147}$	$4.473^{+0.092}_{-0.138}$	$-0.100^{+0.300}_{-0.300}$	$0.880^{+0.184}_{-0.113}$	$0.839^{+0.110}_{-0.073}$	$1.734^{+0.691}_{-0.689}$
	+3%/-3%	+2%/-3%	+300%/-300%	+21%/-13%	+13%/-9%	+40%/-40%
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 005823133-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-273 \pm 60$	$5.78^{+5.74}_{-3.94}$	$326^{+19}_{-15}$	$3381^{+1750}_{-591}$	$3961^{+36181}_{-2977}$
Alt.	$-675 \pm 143$	$5.82^{+5.78}_{-4.13}$	$328^{+17}_{-17}$	$3931^{+2632}_{-791}$	$9943^{+98831}_{-7541}$

$T_{max}$  = 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

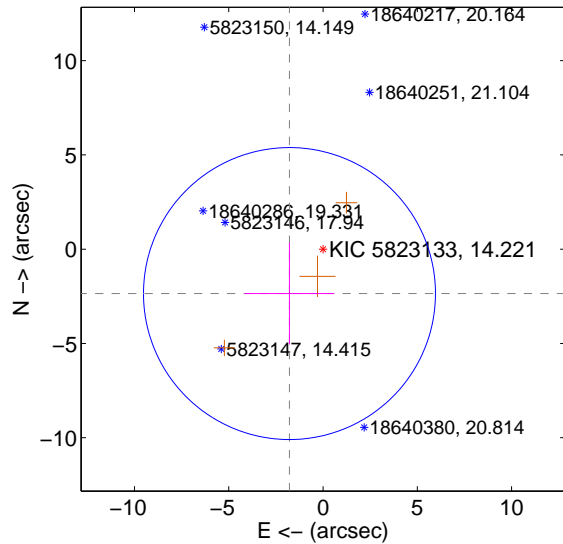
Supplemental centroid analysis for 005823133-02. Kepler magnitude: 14.22. Transit SNR 7.15

There are 0 quarters with good PRF difference image offsets

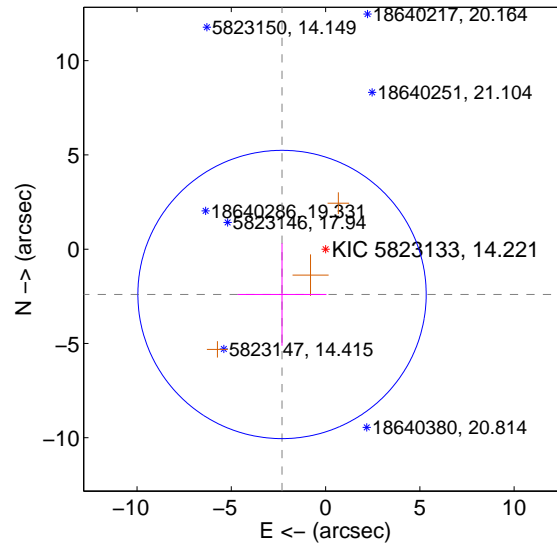
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.951 \pm 2.581$	1.14	$1.780 \pm 2.371$	$-2.354 \pm 2.694$
PRF-fit source offset from KIC position	$3.333 \pm 2.549$	1.31	$2.310 \pm 2.353$	$-2.403 \pm 2.717$
photometric centroid source offset	$4.31 \pm 1.85$	2.33	$3.51 \pm 1.59$	$-2.50 \pm 2.29$

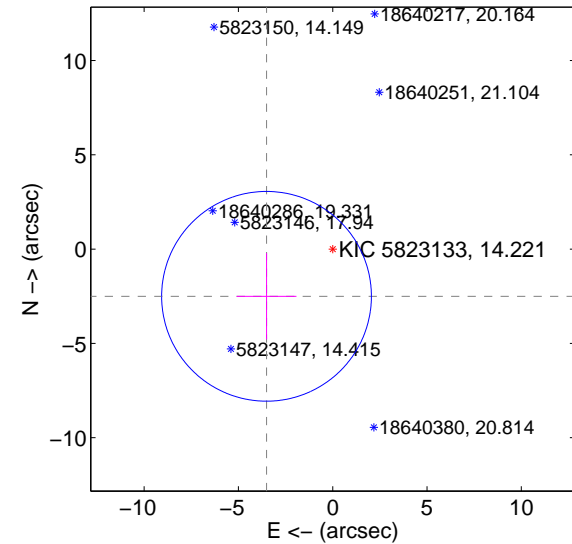
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



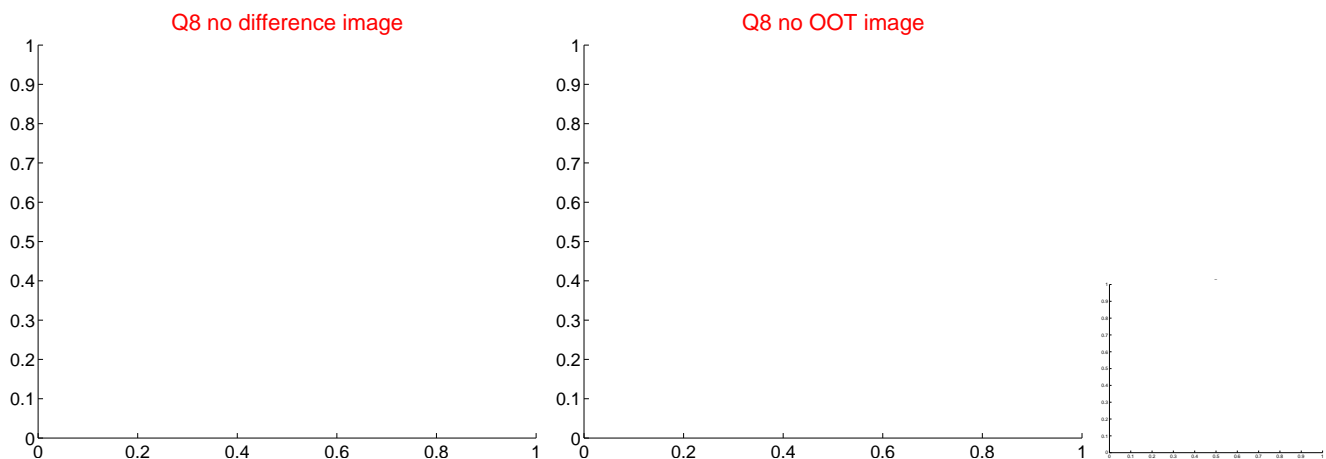
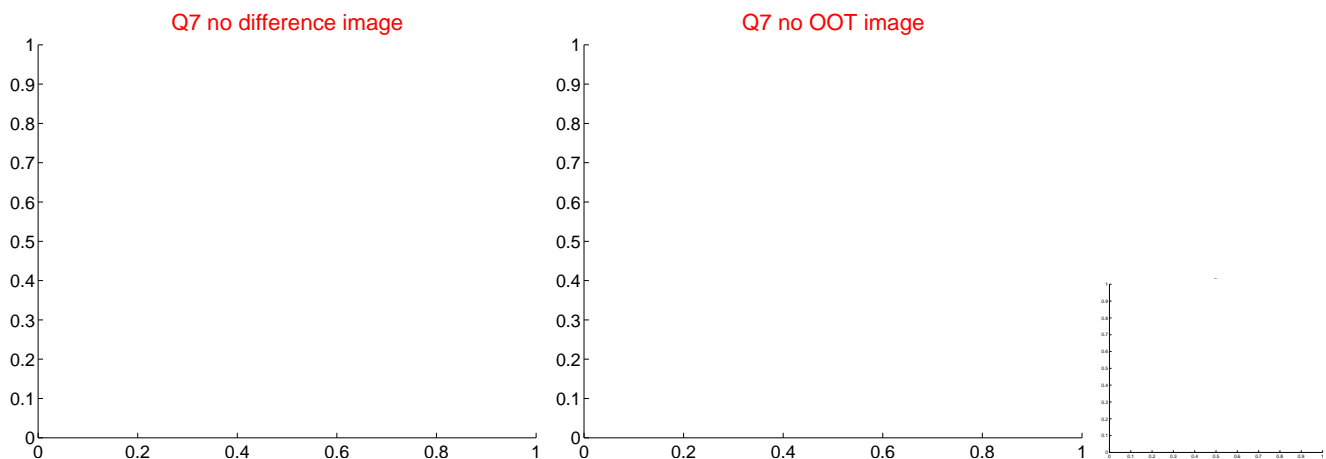
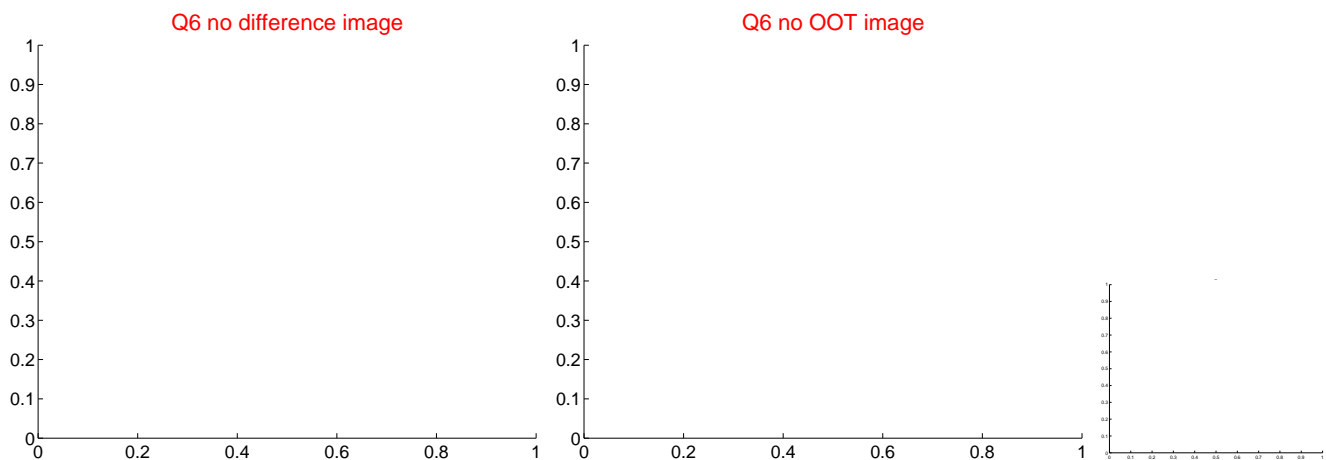
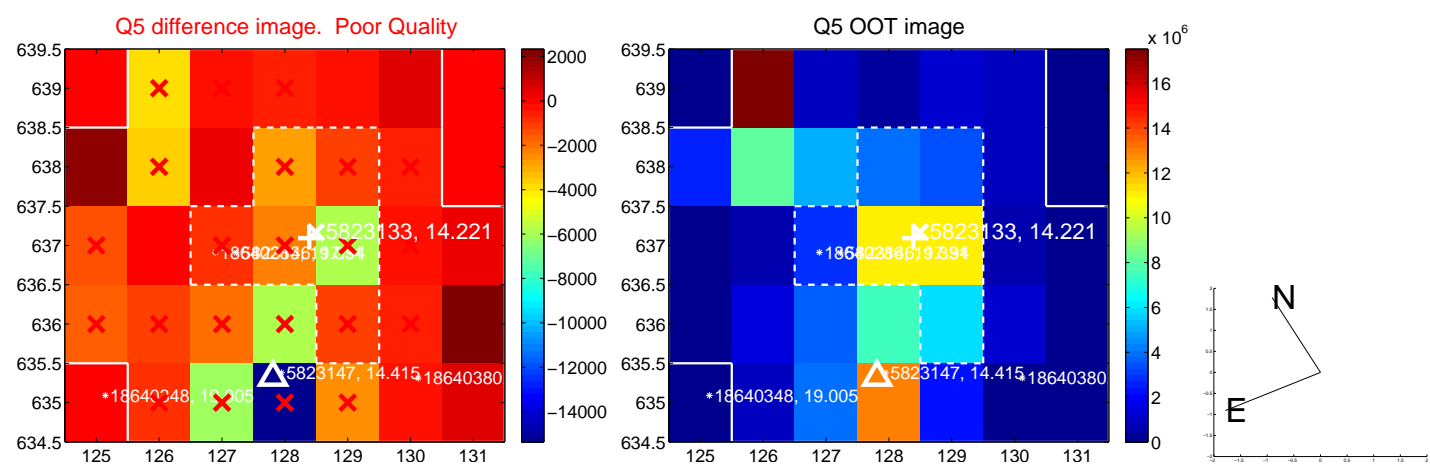
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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





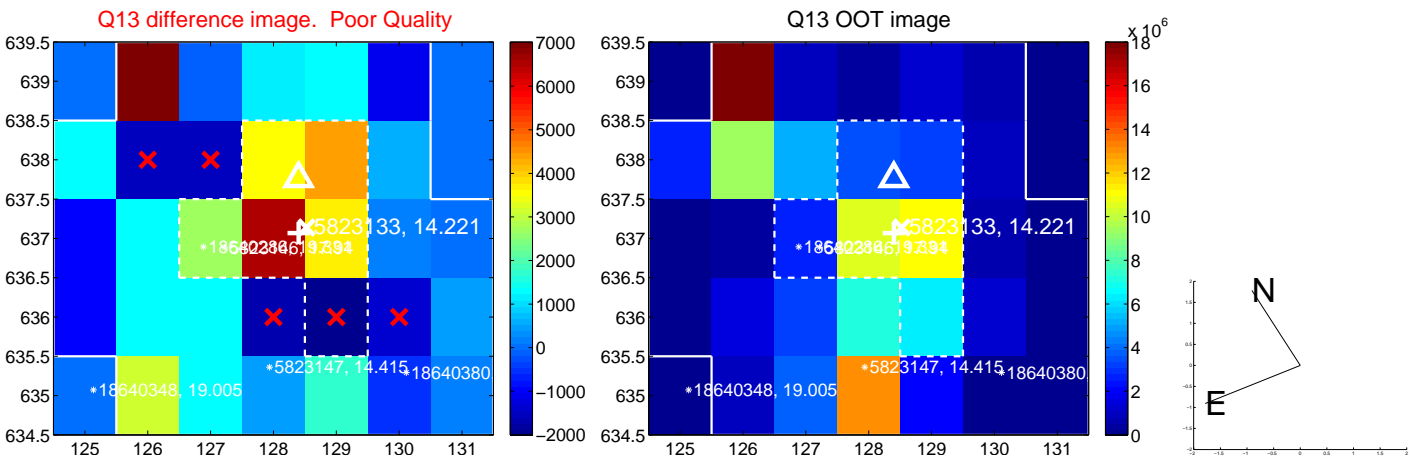
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



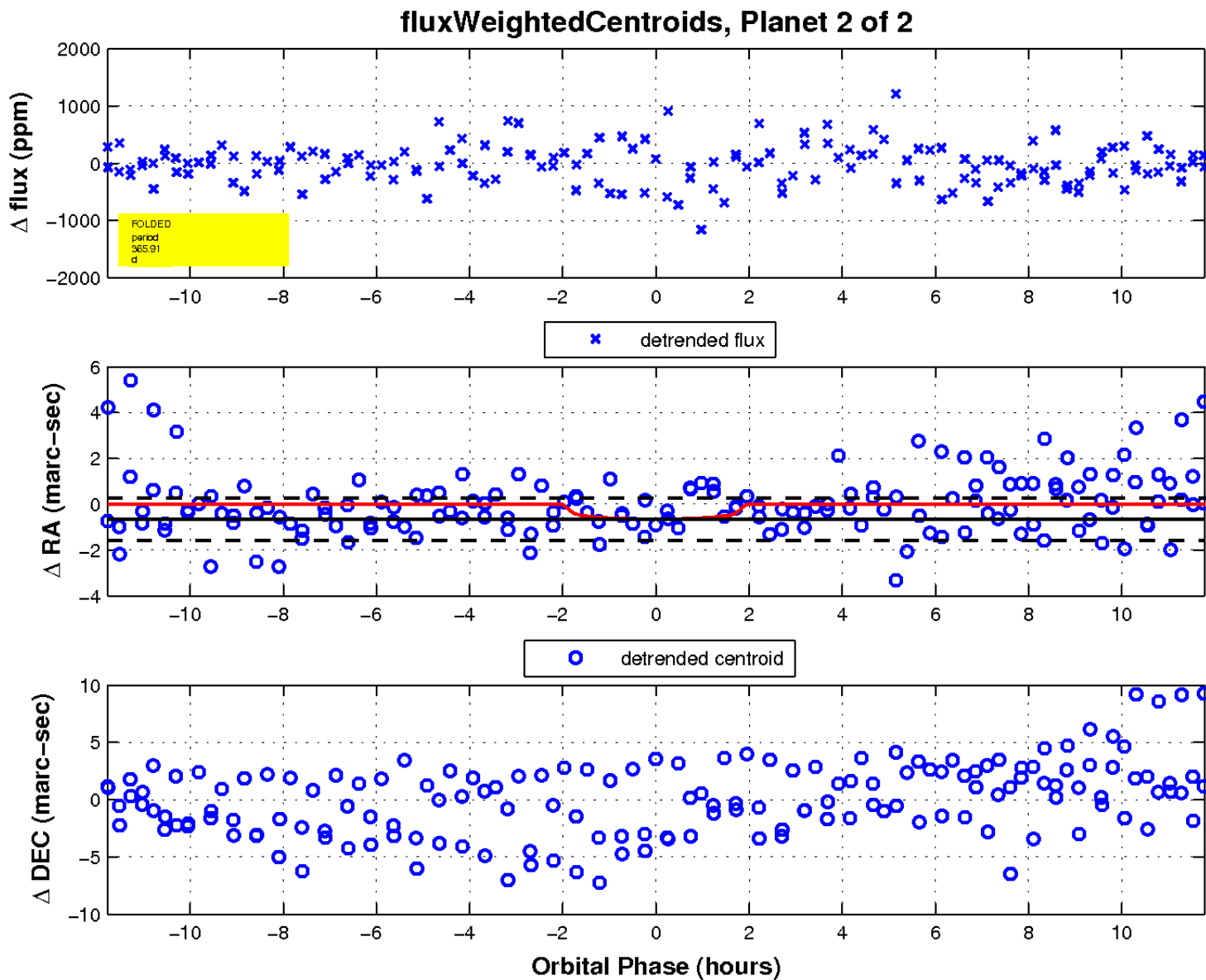
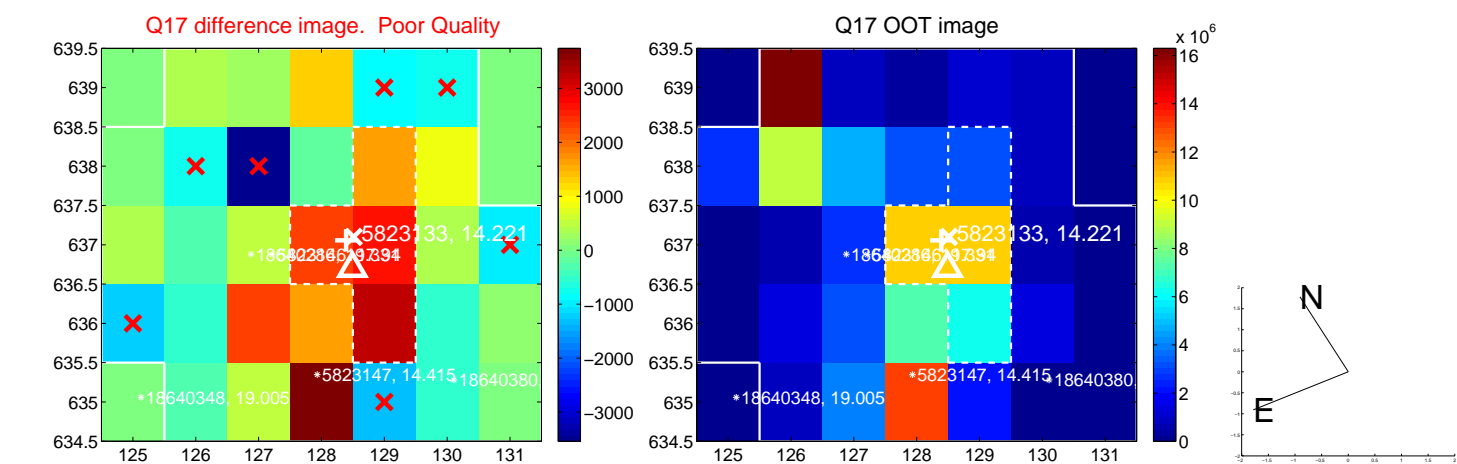
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UKIRT Image

