

# KIC 005894972

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005894972-01	OBS	No	3.340924	133.661321	24.3	12.901	7.3	6.9	2.65	6541	1.47	4557.20
005894972-02	OBS	6634.01	3.343145	131.619237	31.6	21.693	11.3	10.6	2.65	6541	1.53	4553.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005894972-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005894972-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT

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

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

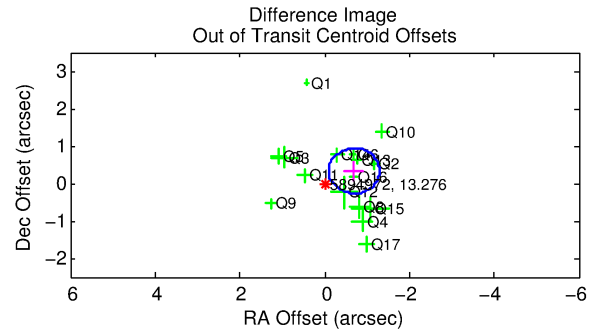
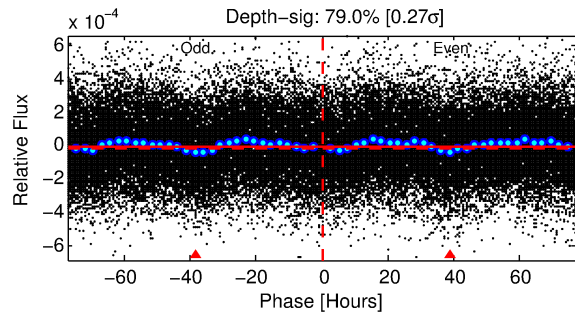
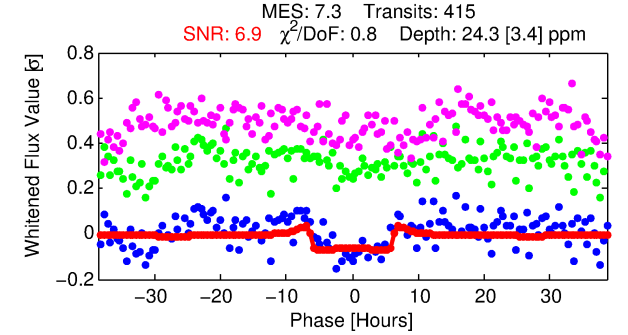
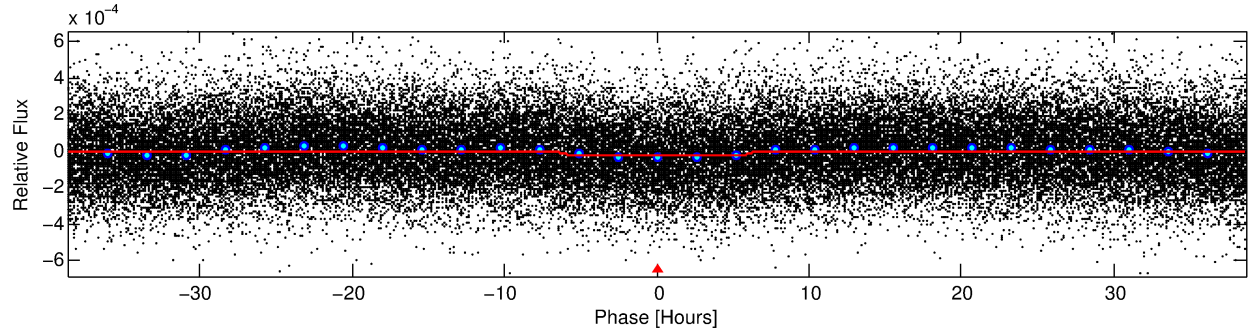
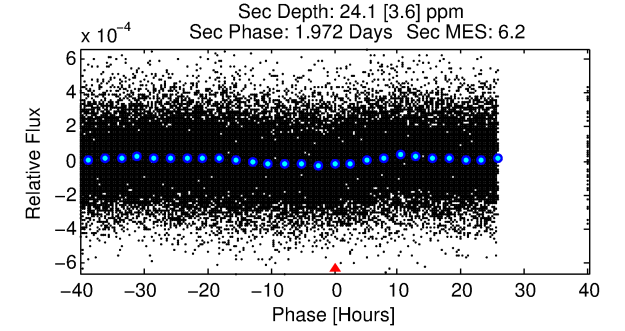
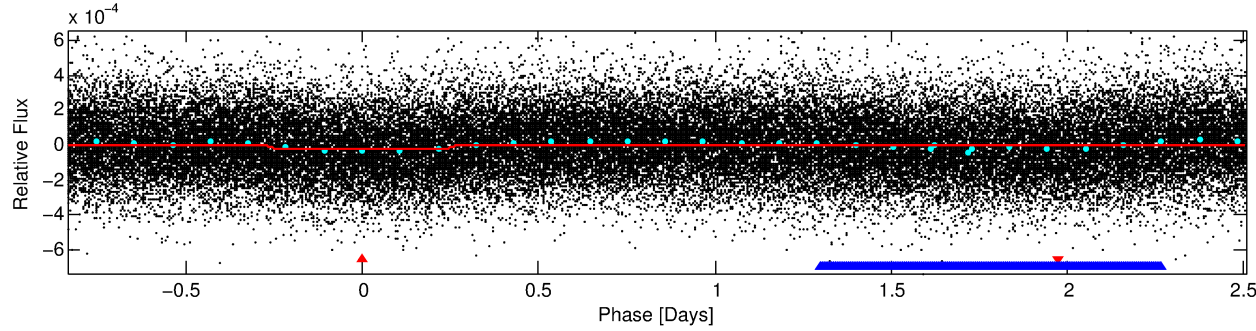
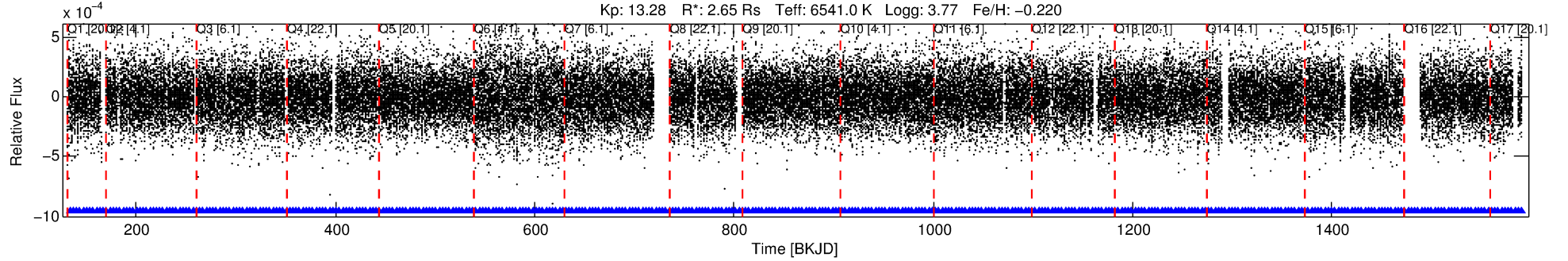
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005894972-01

No Significant Match Found

# DV One-Page Summary

KIC: 5894972 Candidate: 1 of 2 Period: 3.341 d  
KOI: K06634 Corr: No Ephemeris Match



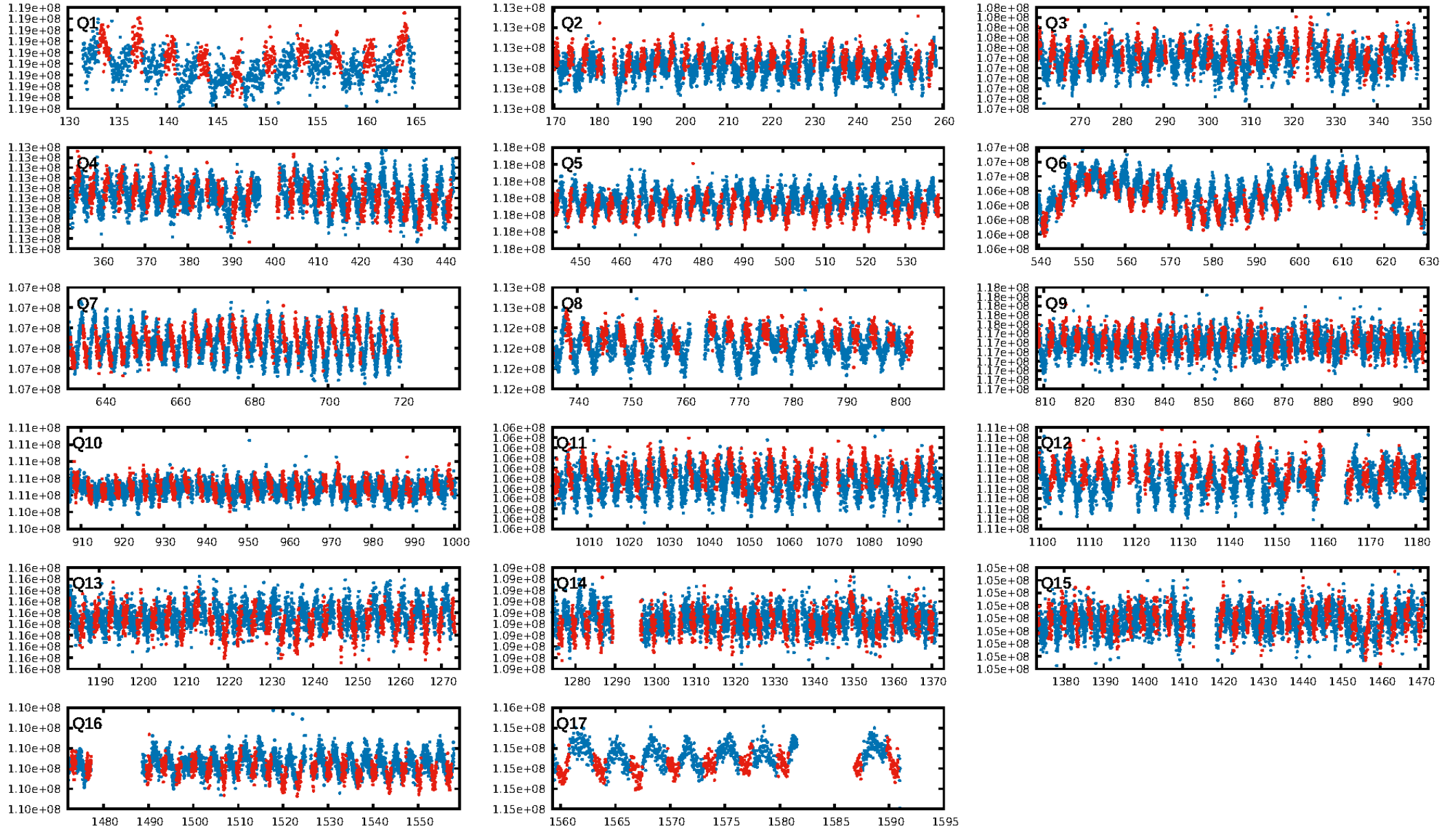
## DV Fit Results:

Period = 3.34092 [0.00005] d  
Epoch = 133.6613 [0.0090] BKJD  
Rp/R\* = 0.0051 [0.0012]  
a/R\* = 1.40 [0.86]  
b = 0.85 [0.42]  
Seff = 4557.20 [2379.04]  
Teff = 2095 [273] K  
Rp = 1.47 [0.62] Re  
a = 0.0503 [0.0164] AU  
Ag = 15.46 [10.82] [1.34σ]  
Teffp = 6423 [798] K [5.13σ]

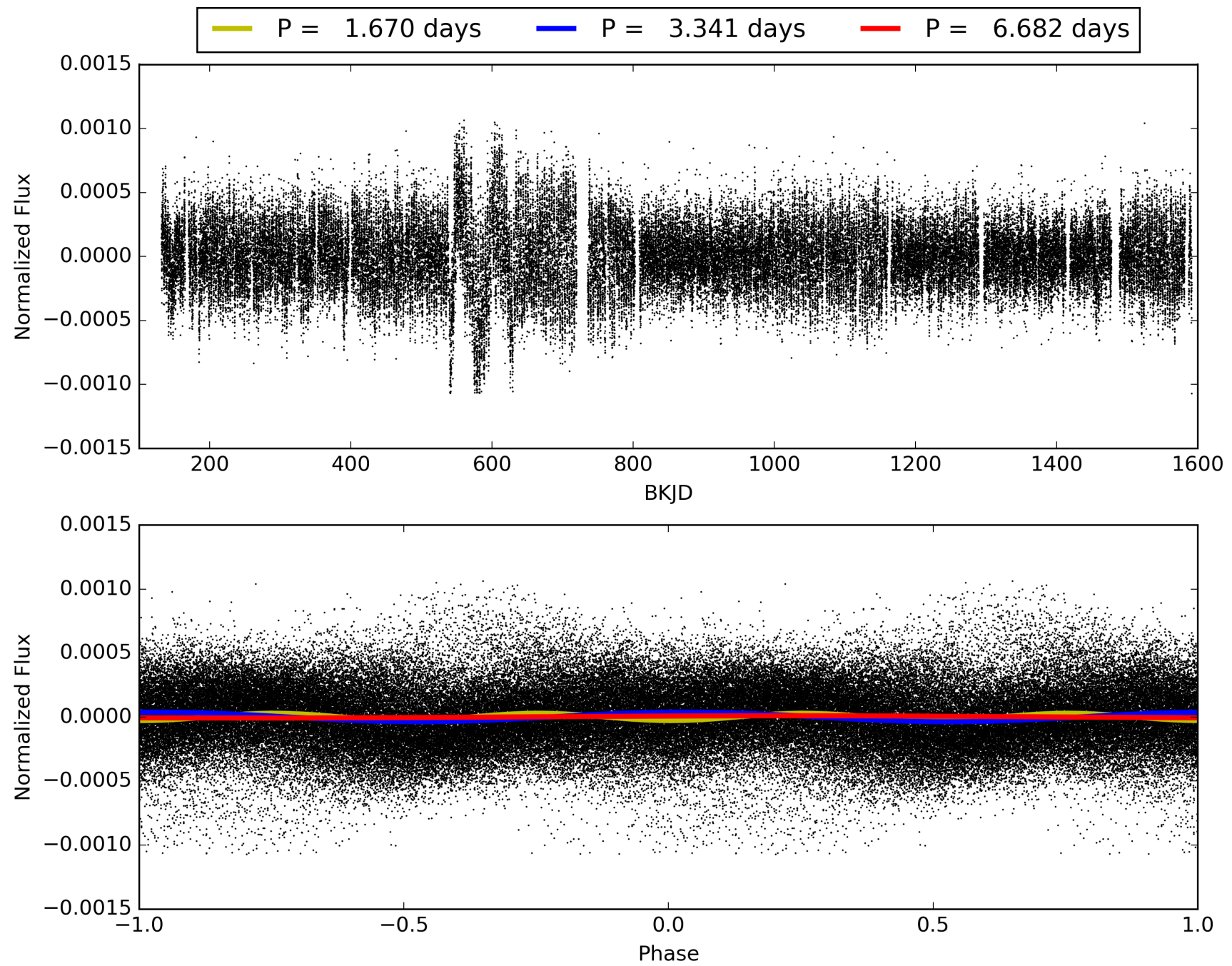
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.2% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [396/396]  
GhostDiagnostic-chr: 1.924  
Centroid-sig: 58.0%  
Centroid-so: 0.636 arcsec [0.70σ]  
OotOffset-rm: 0.767 arcsec [3.83σ]  
KicOffset-rm: 0.738 arcsec [3.52σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.62 [10/16]  
DiffImageOverlap-fno: 0.59 [10/17]

# TCE 005894972-01, PDC Light Curves



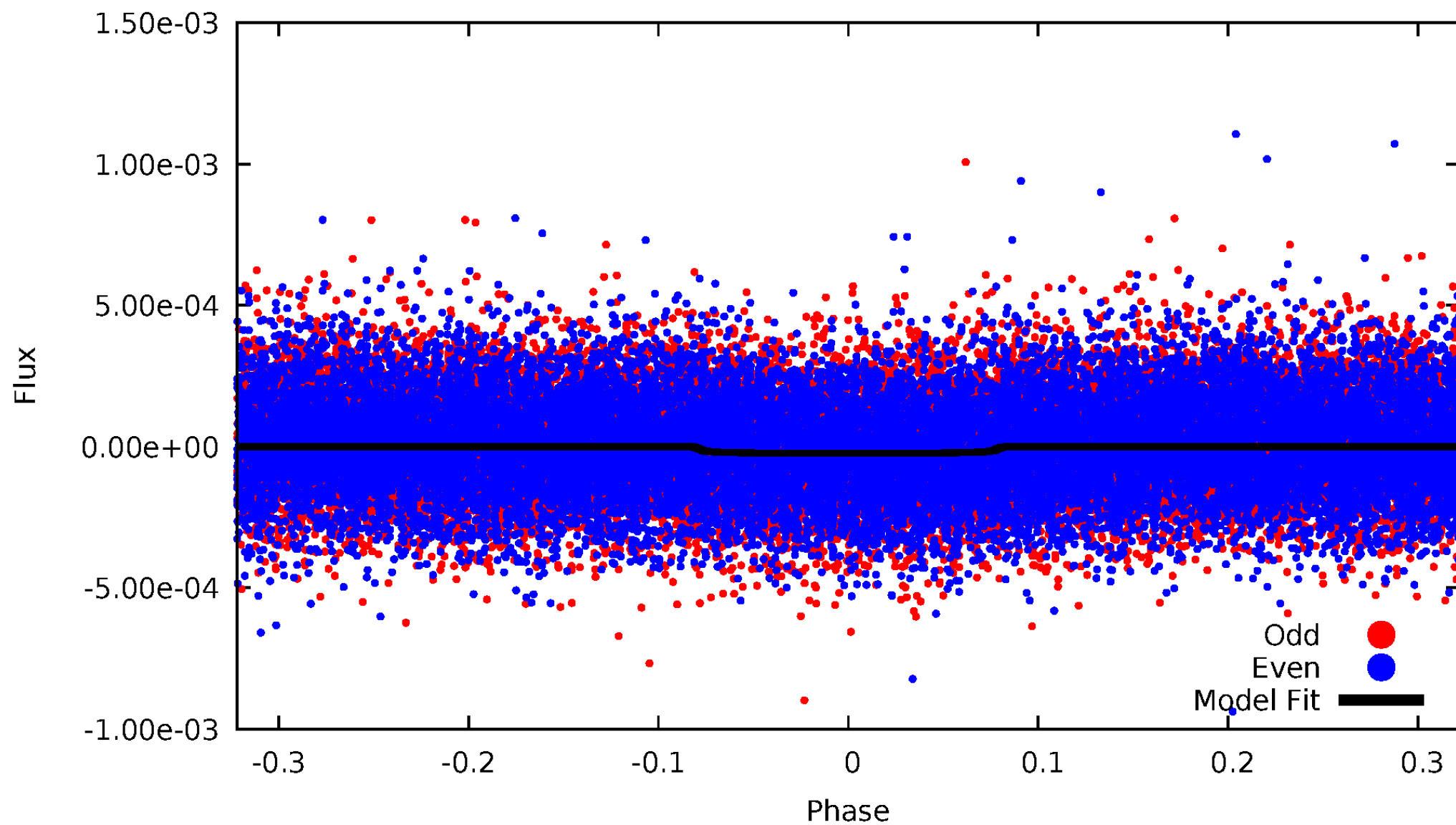
TCE 005894972-01





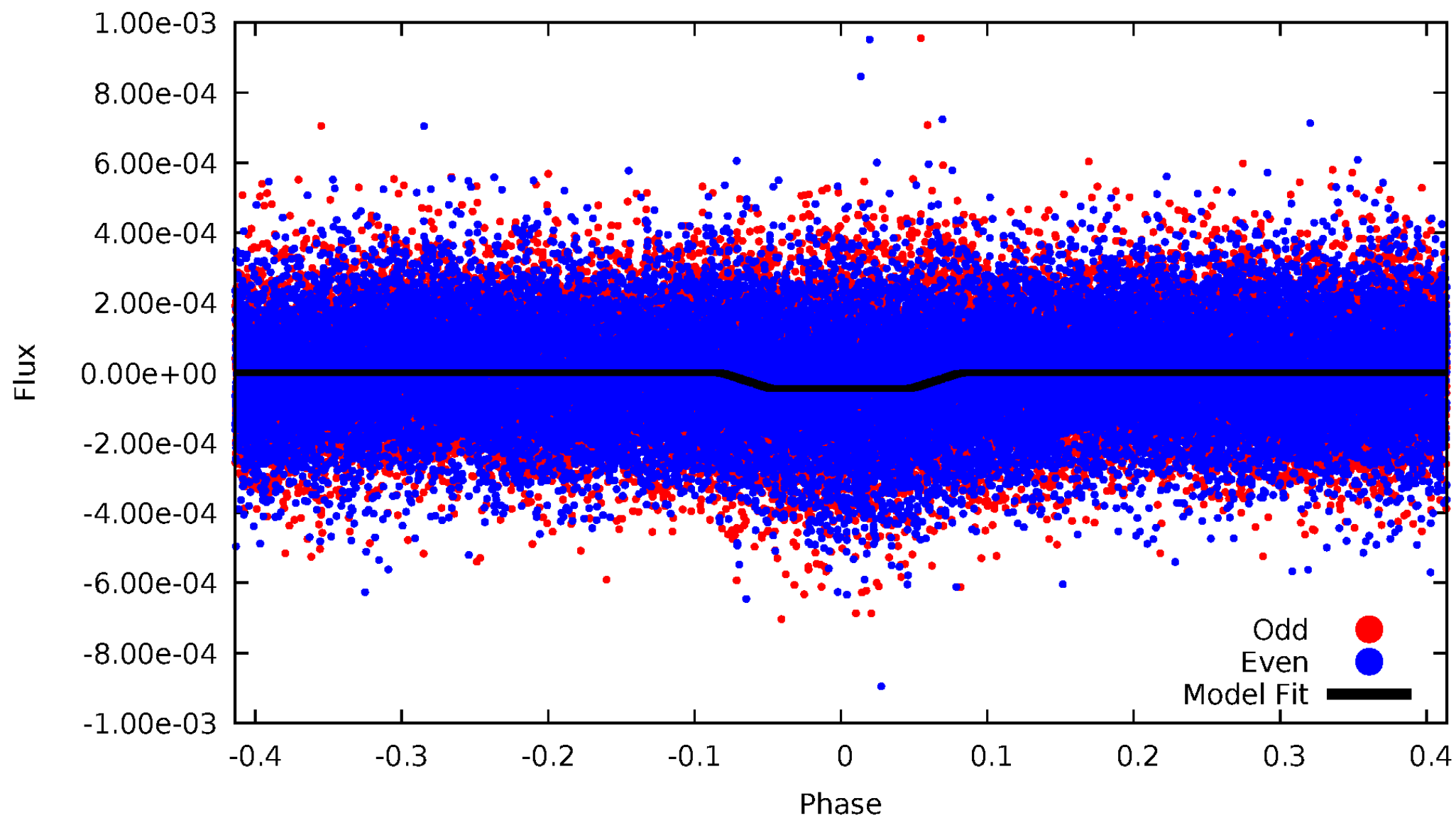
# DV Odd/Even

TCE 005894972-01



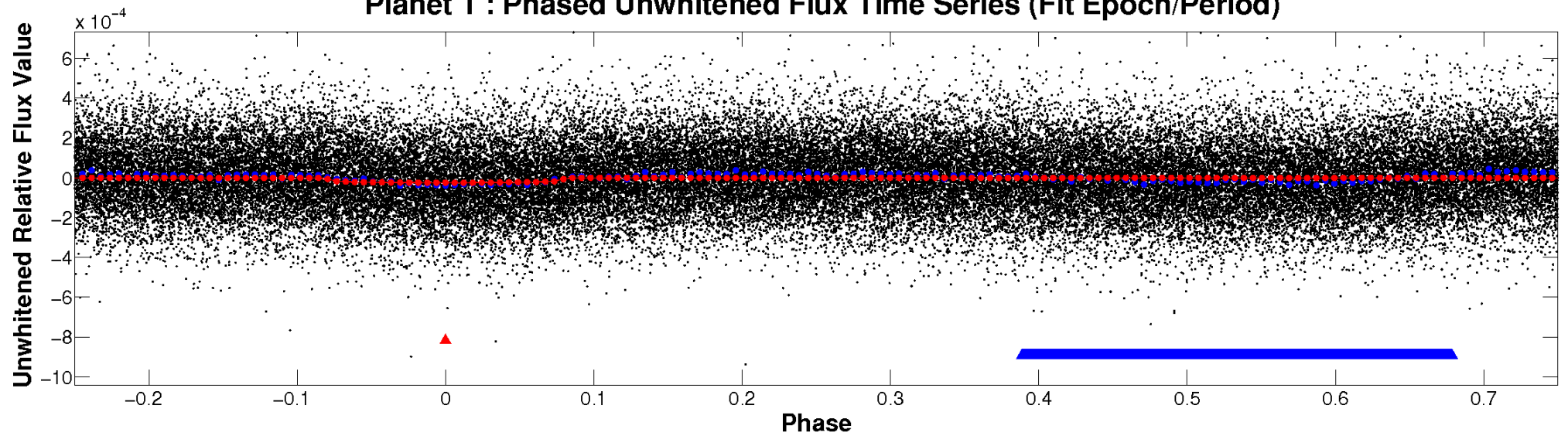
# ALT Odd/Even

TCE 005894972-01

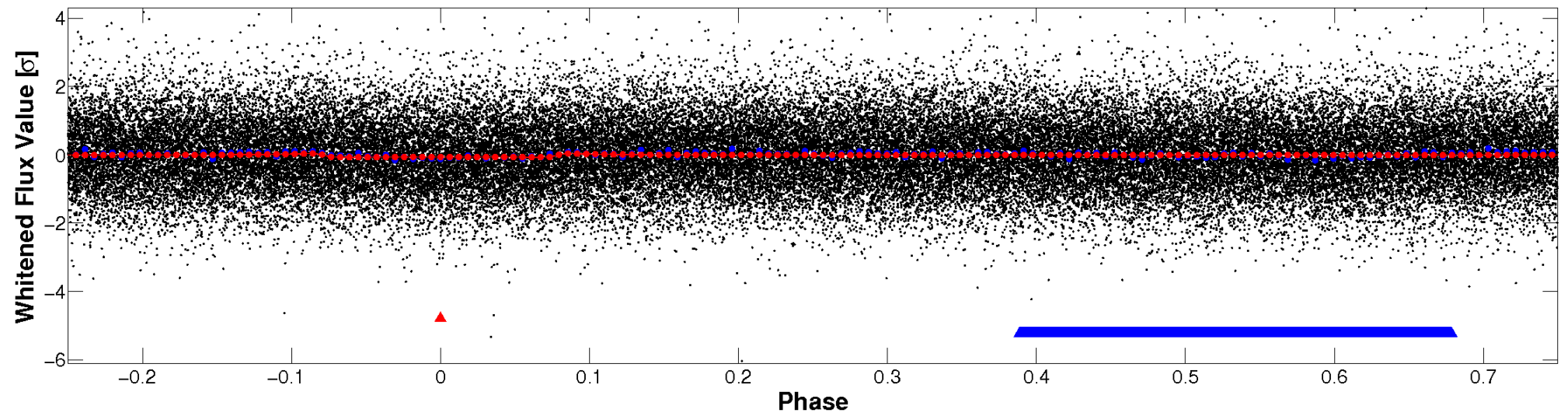


# Non-Whitened Vs. Whitened Light Curve

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

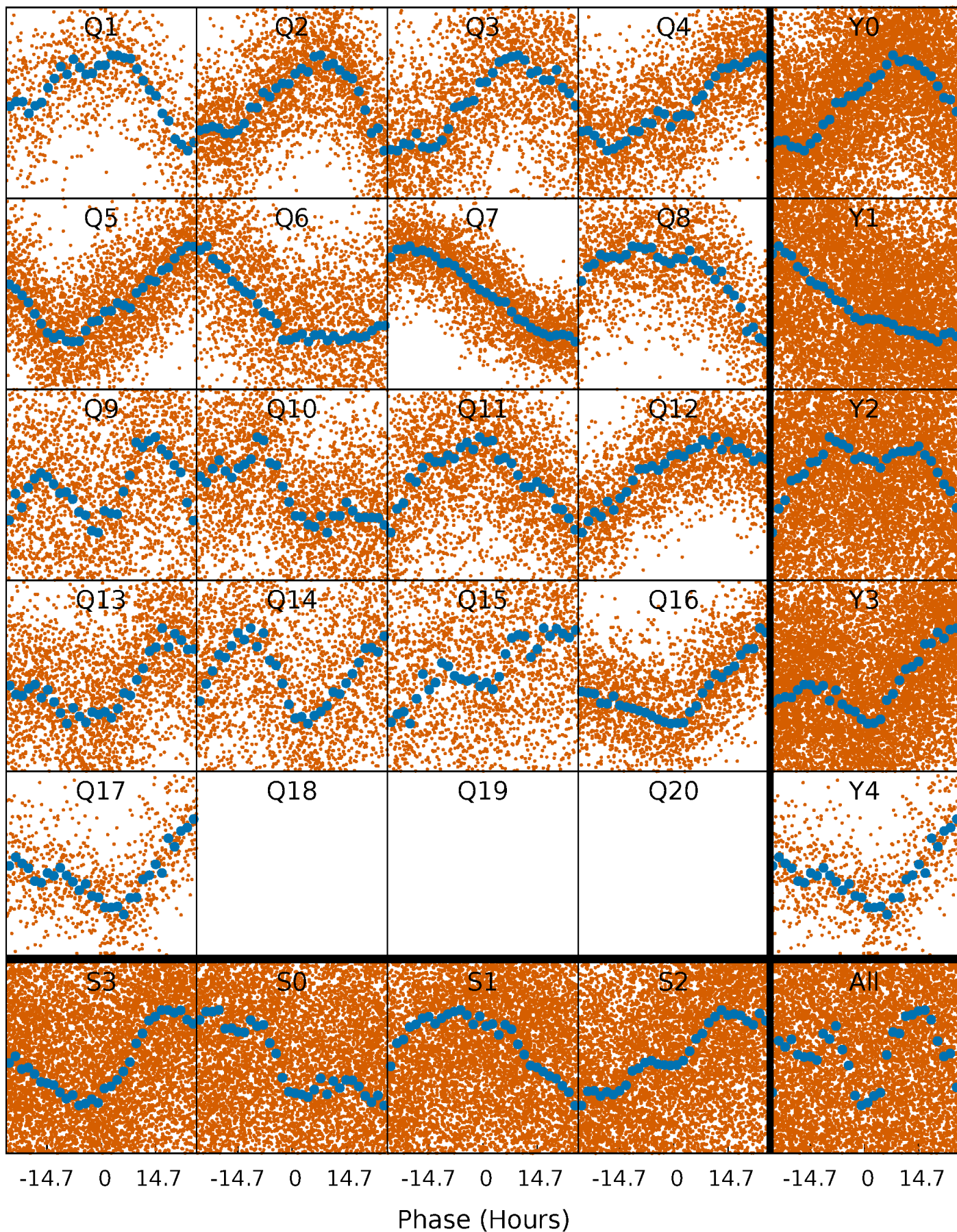


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

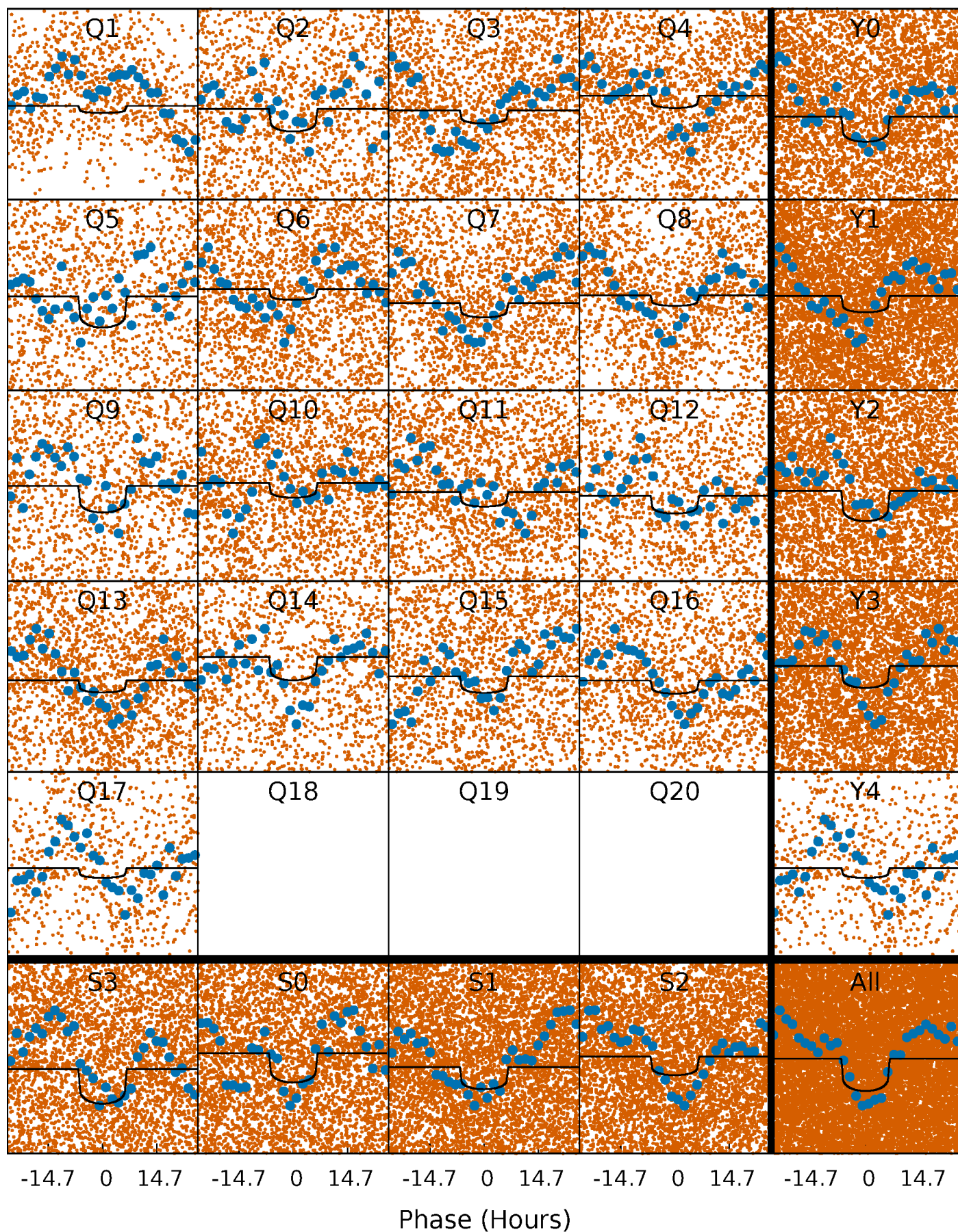
TCE 005894972-01   P= 3.340924 Days    $T_0=133.661321$  (BKJD)





# DV Quarter-Phased Transit Curves

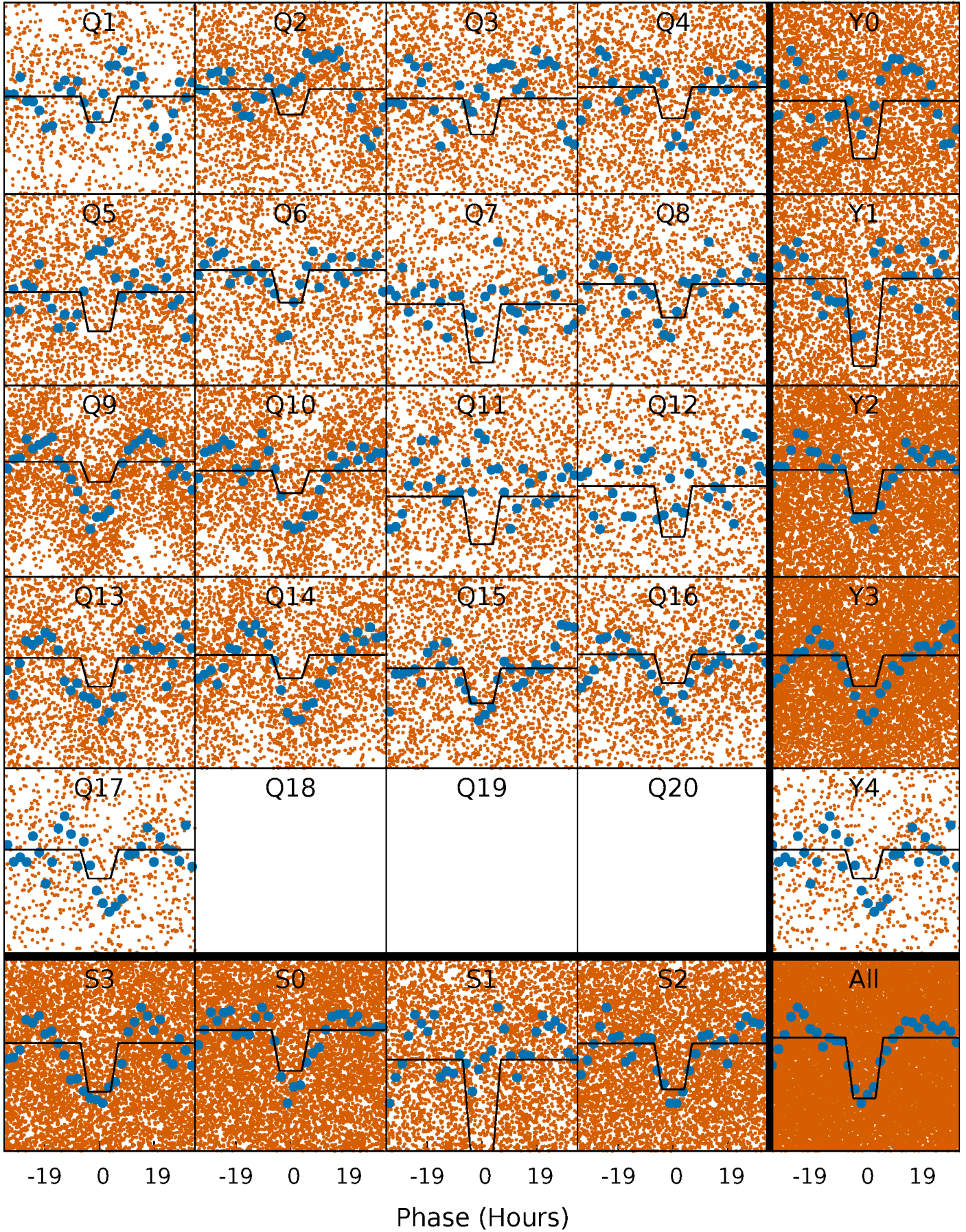
TCE 005894972-01 P= 3.340924 Days  $T_0=133.661321$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

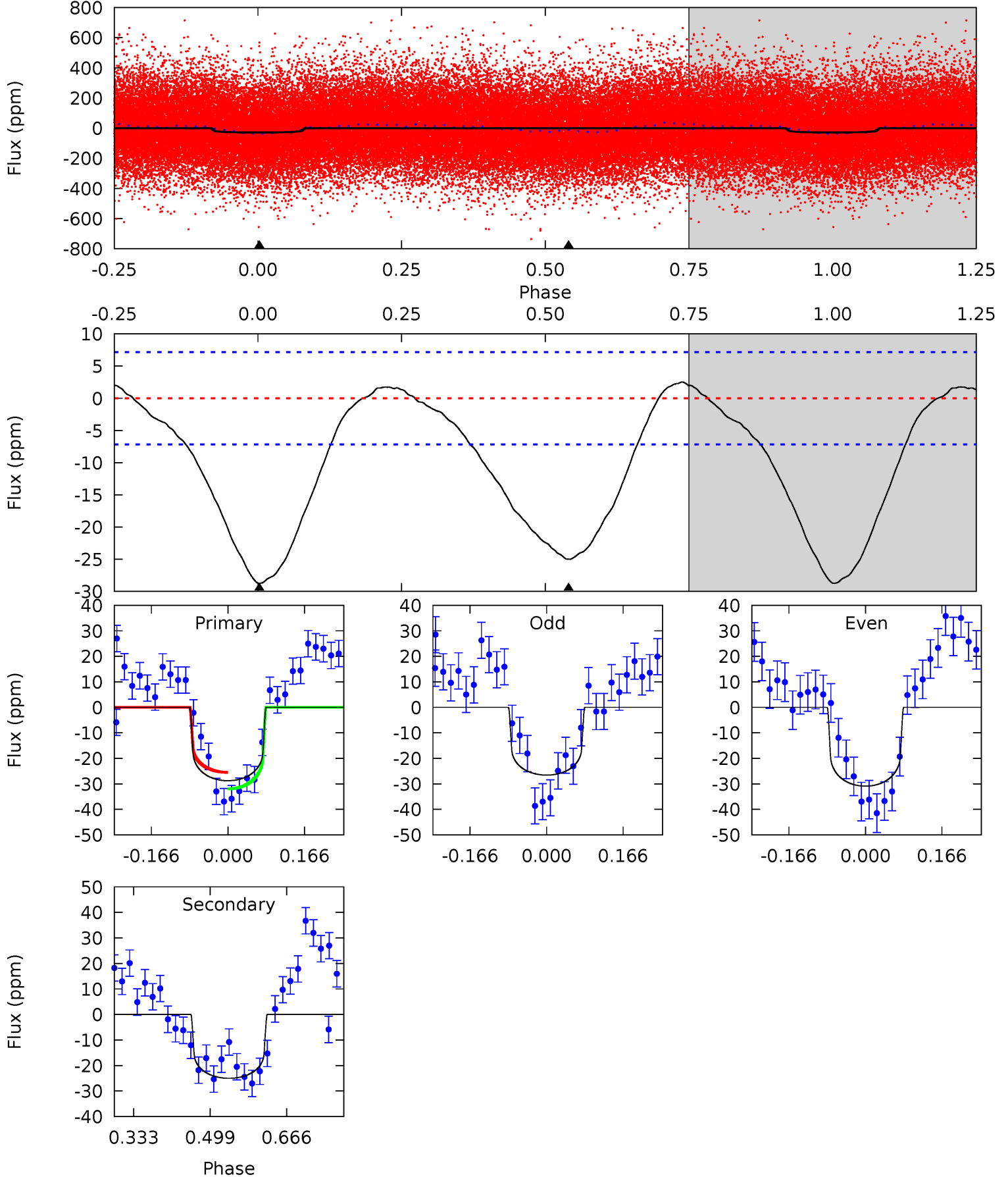
TCE 005894972-01 P= 3.341037 Days  $T_0=133.673536$  (BKJD)



# DV Model-Shift Uniqueness Test

005894972-01, P = 3.340924 Days, E = 130.320397 Days

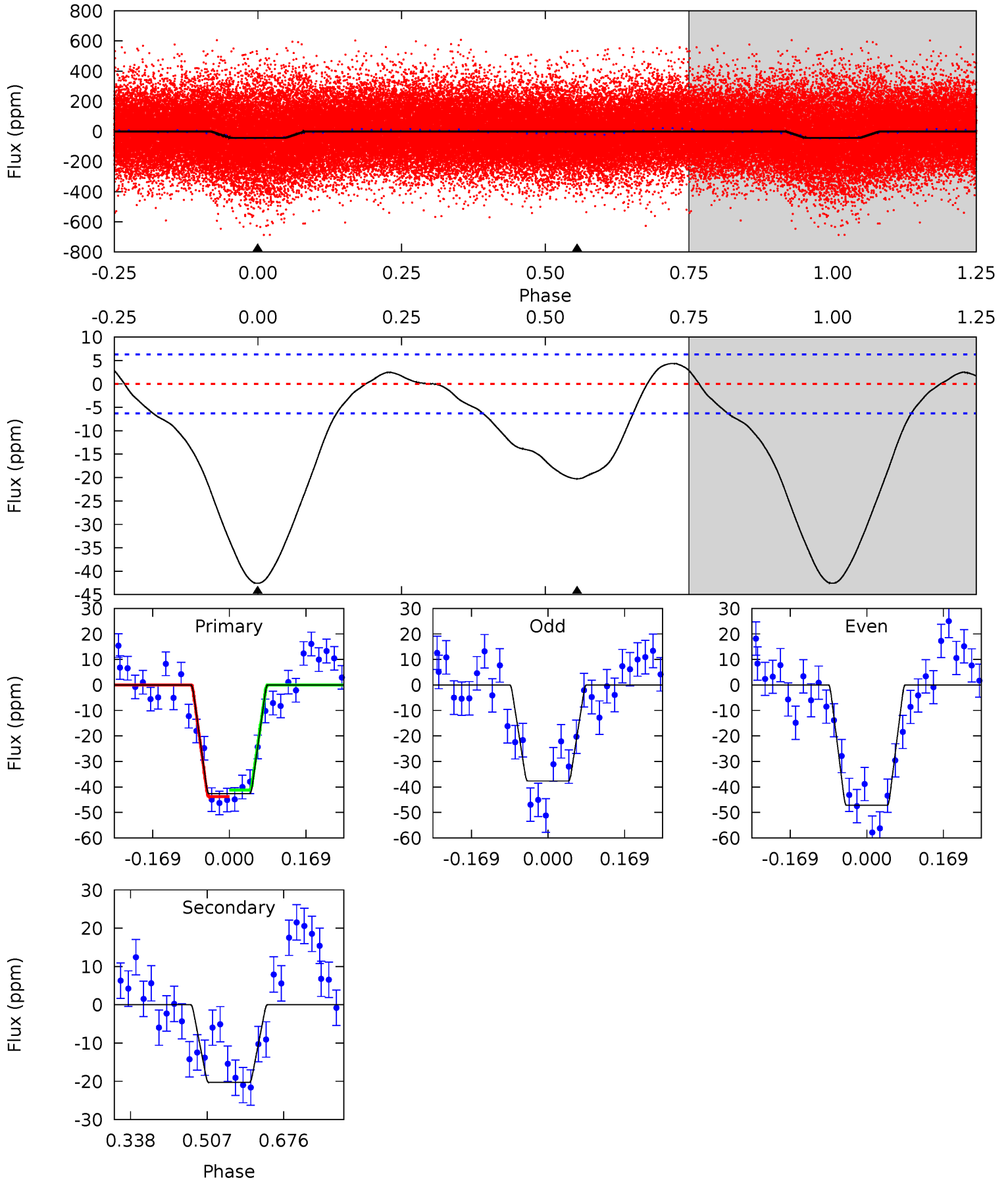
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.9	15.5	0	0	4.46	1.38	1.52	17.9	17.9	15.5	15.5	1.35	1.19	0.08	2.02



# Alt Model-Shift Uniqueness Test

005894972-01, P = 3.341037 Days, E = 130.332499 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
30.1	14.4	0	0	4.45	1.38	2.06	30.1	30.1	14.4	14.4	3.36	1.26	0.09	0.91





### Stellar Parameters For KIC 005894972

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6541^{+177}_{-197}$	$3.773^{+0.293}_{-0.098}$	$-0.220^{+0.300}_{-0.250}$	$2.652^{+0.433}_{-0.939}$	$1.519^{+0.227}_{-0.340}$	$0.115^{+0.256}_{-0.035}$
	+3%/-3%	+8%/-3%	+136%/-114%	+16%/-35%	+15%/-22%	+223%/-30%
Source	PHO1	FLK73	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 005894972-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-25 \pm 2$	$1.39^{+0.45}_{-0.40}$	$2879^{+181}_{-223}$	$6474^{+1139}_{-703}$	$18^{+17}_{-7}$
Alt.	$-20 \pm 1$	$1.83^{+0.42}_{-0.39}$	$2883^{+160}_{-228}$	$5372^{+460}_{-429}$	$8.364^{+4.945}_{-2.779}$

$T_{max}$  = 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

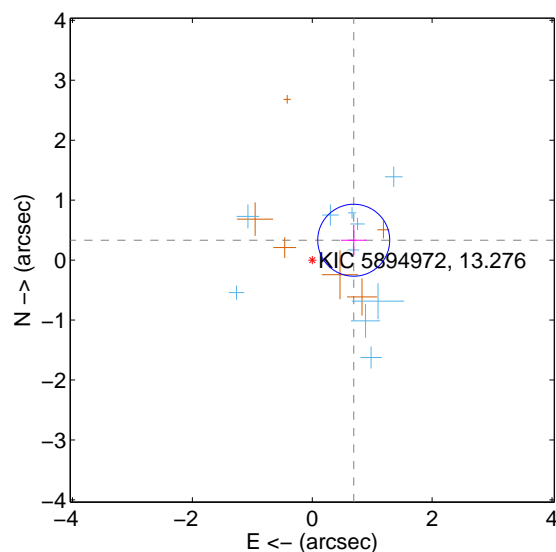
Supplemental centroid analysis for 005894972-01. Kepler magnitude: 13.28. Transit SNR 6.92

There are 10 quarters with good PRF difference image offsets

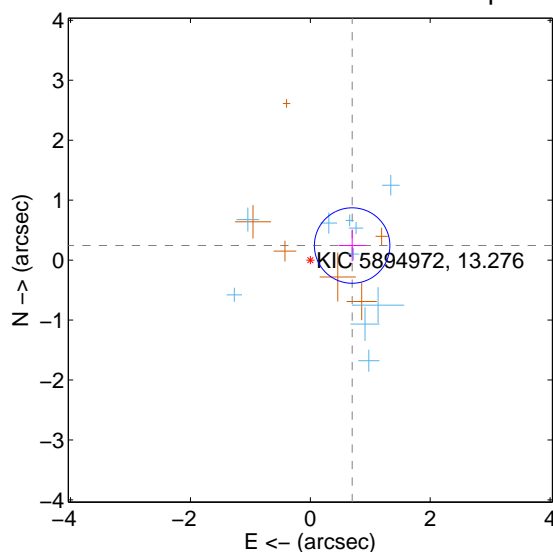
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>0.767 \pm 0.200</math></b>	<b>3.83</b>	$-0.692 \pm 0.211$	$0.331 \pm 0.257$
PRF-fit source offset from KIC position	<b><math>0.738 \pm 0.210</math></b>	<b>3.52</b>	$-0.697 \pm 0.226$	$0.243 \pm 0.265$
photometric centroid source offset	$0.64 \pm 0.91$	0.70	$-0.63 \pm 0.91$	$-0.09 \pm 0.84$

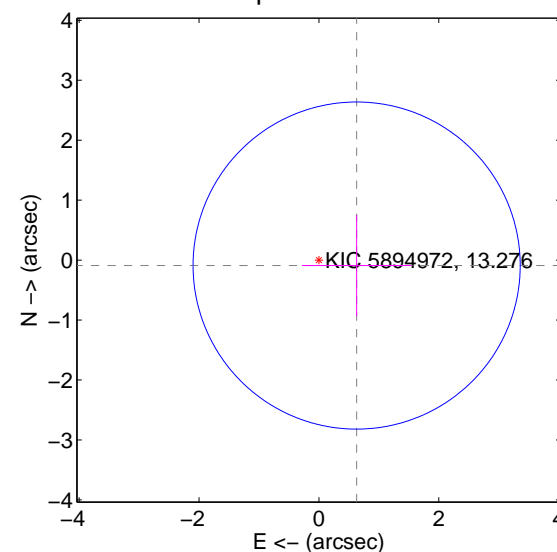
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

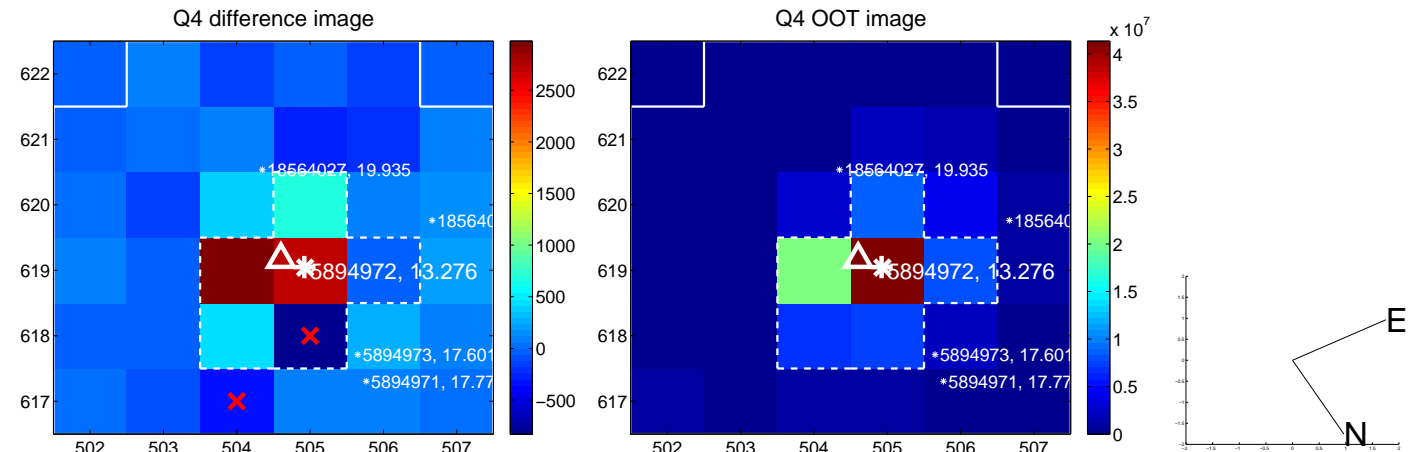
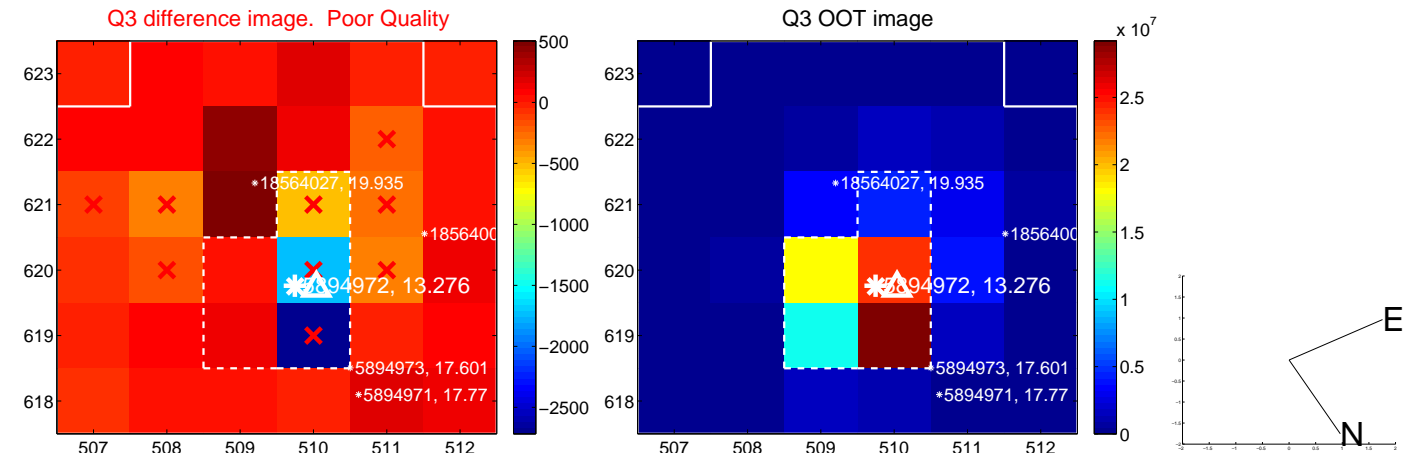
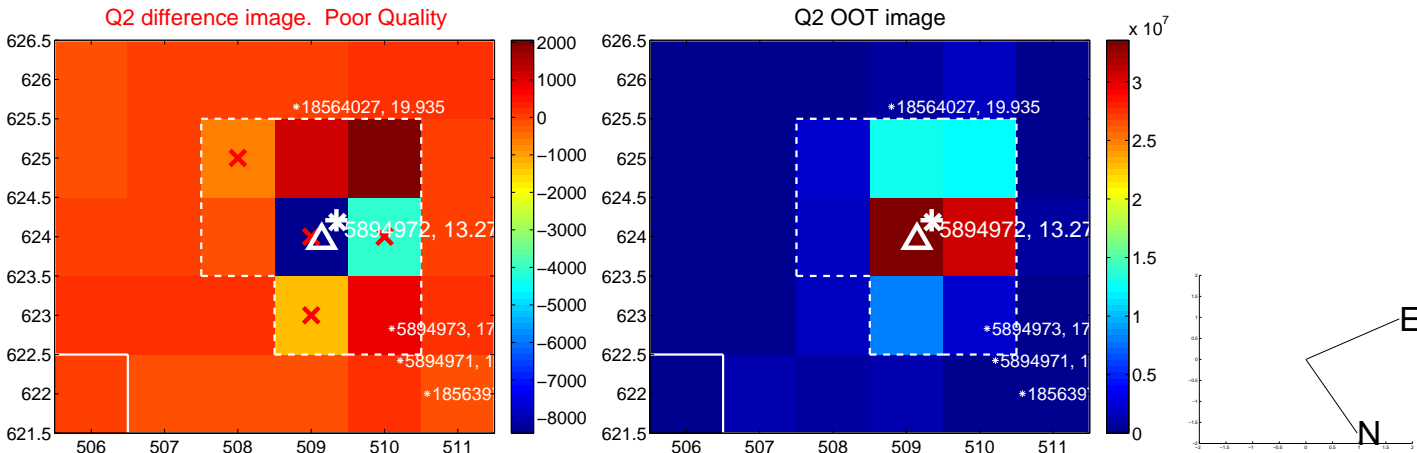
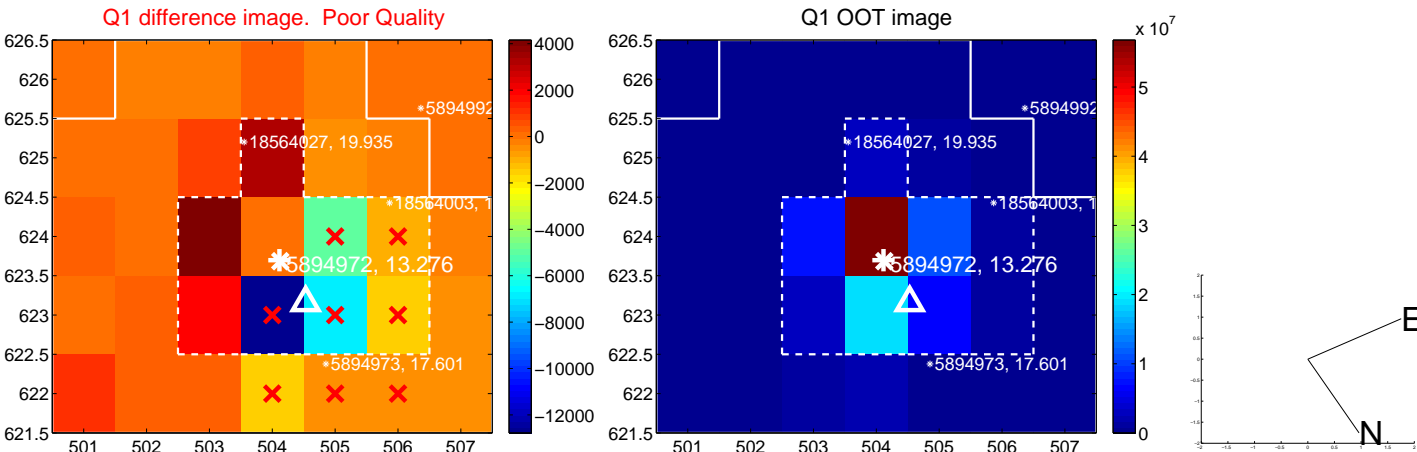


offset from photometric centroids

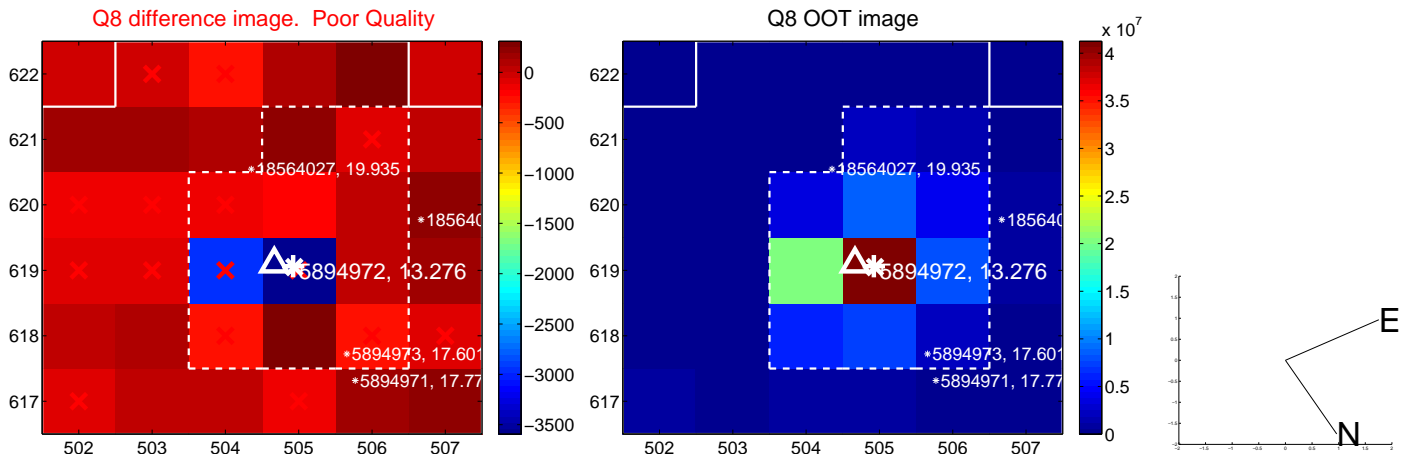
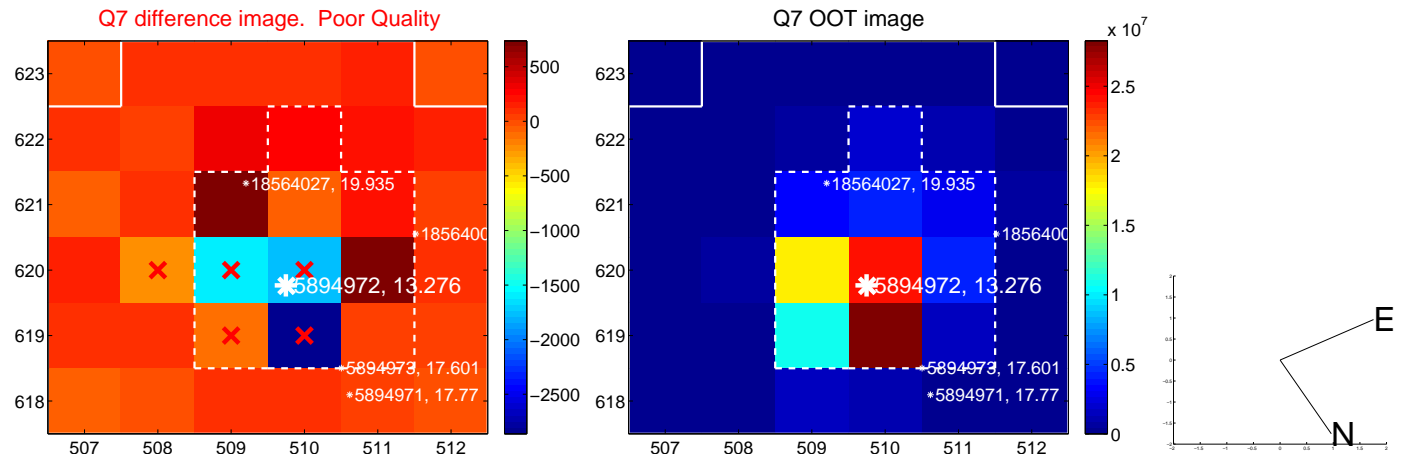
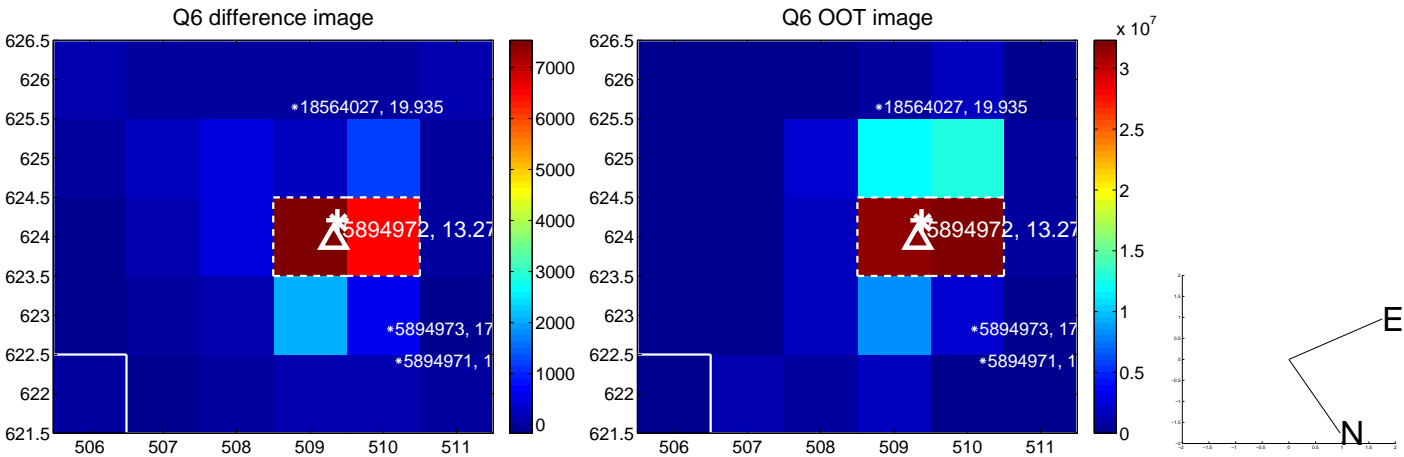
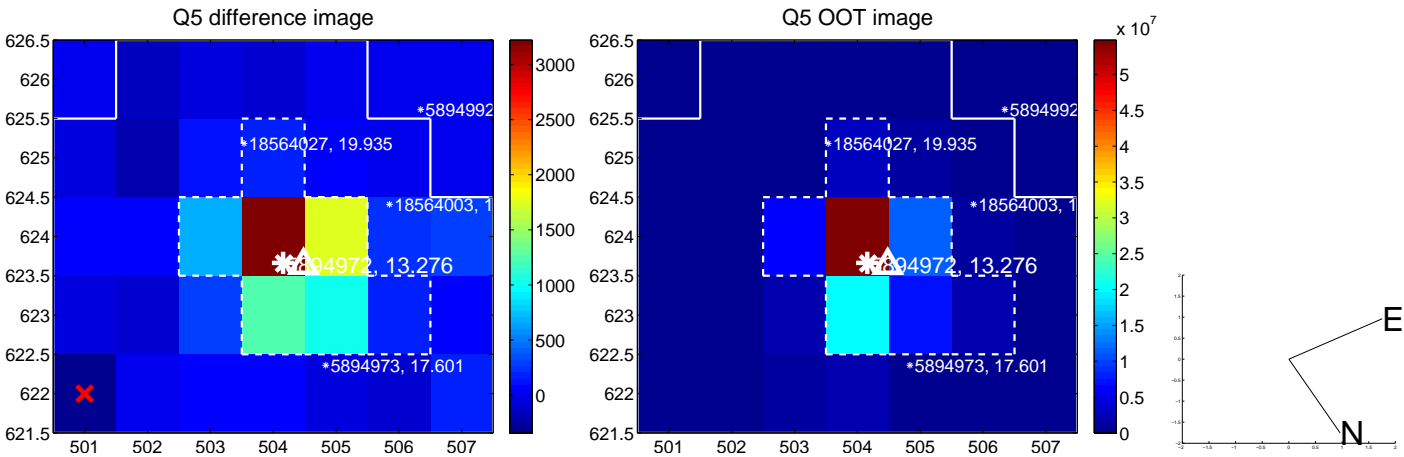


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

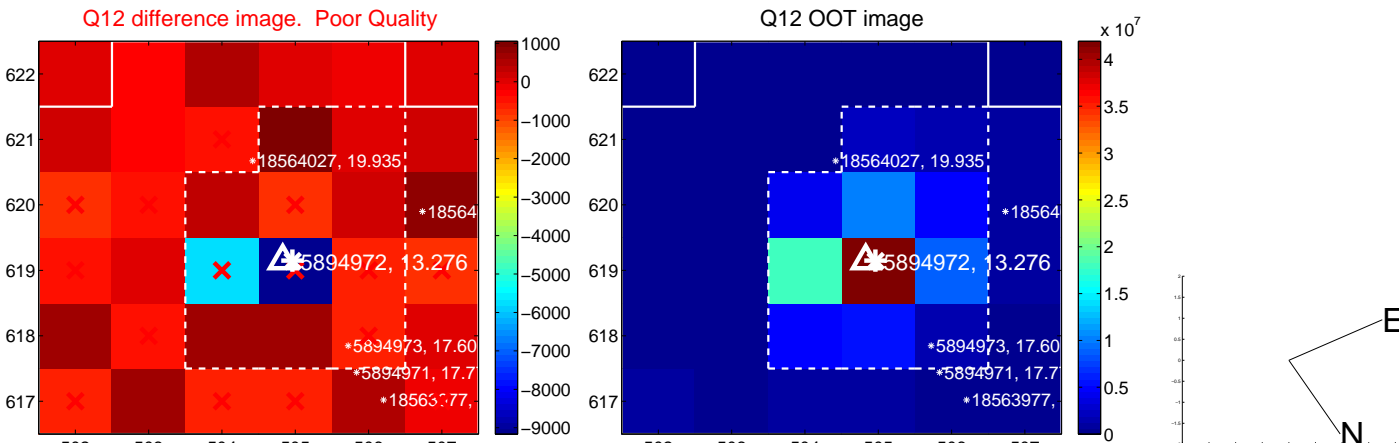
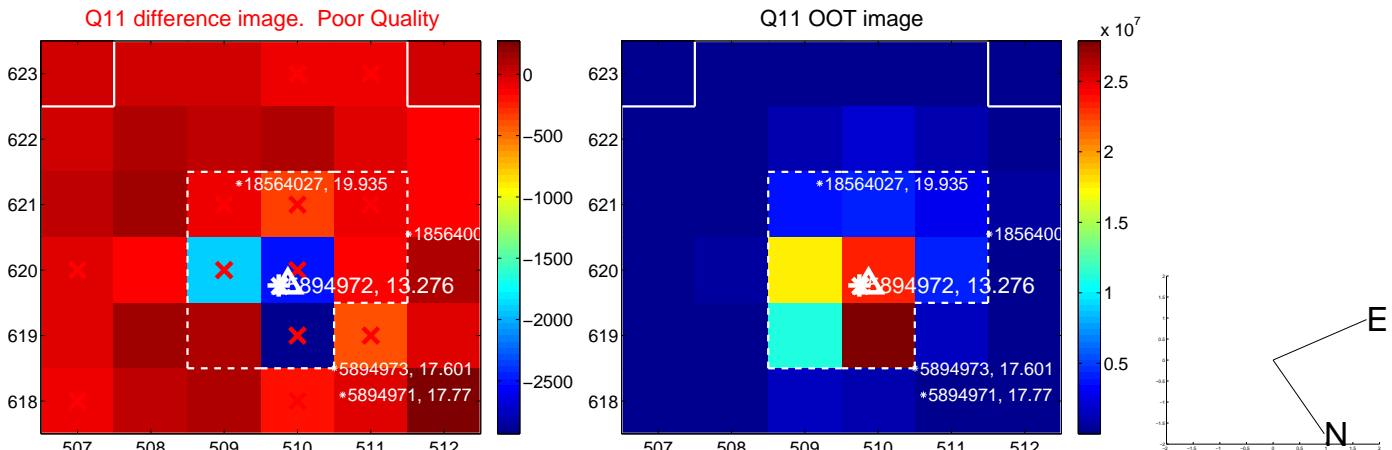
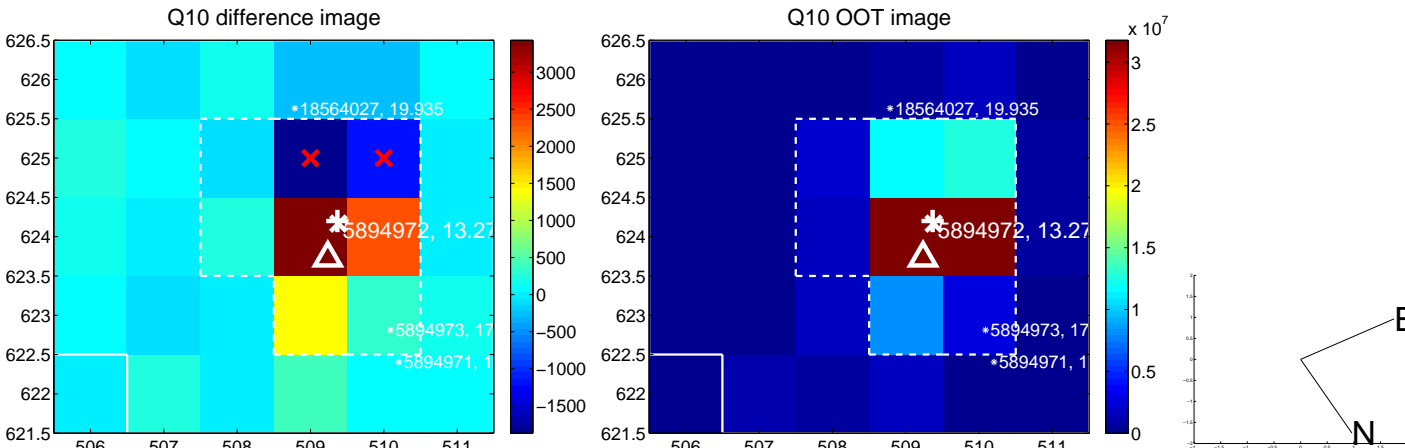
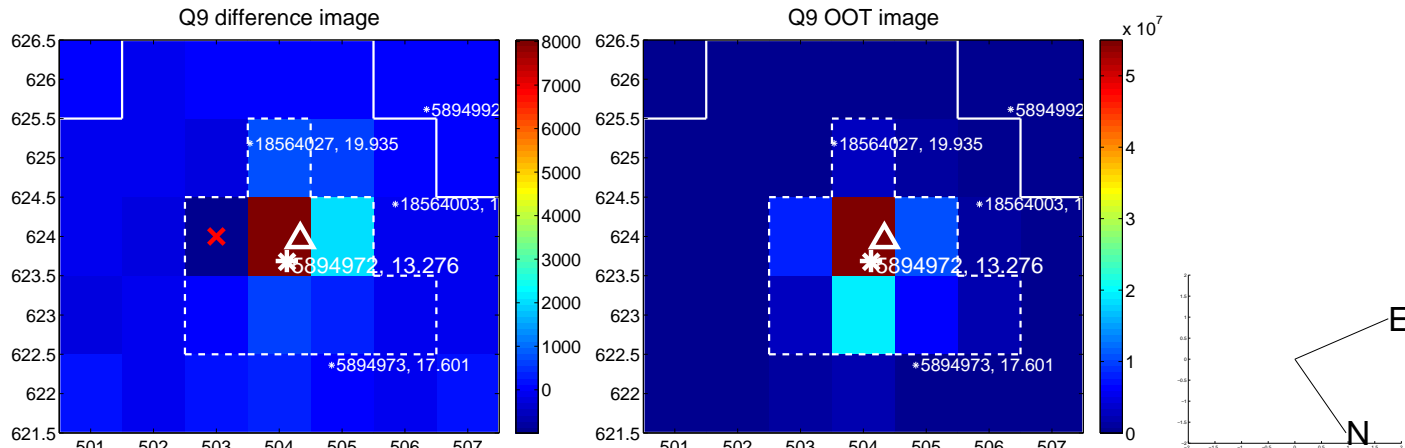


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

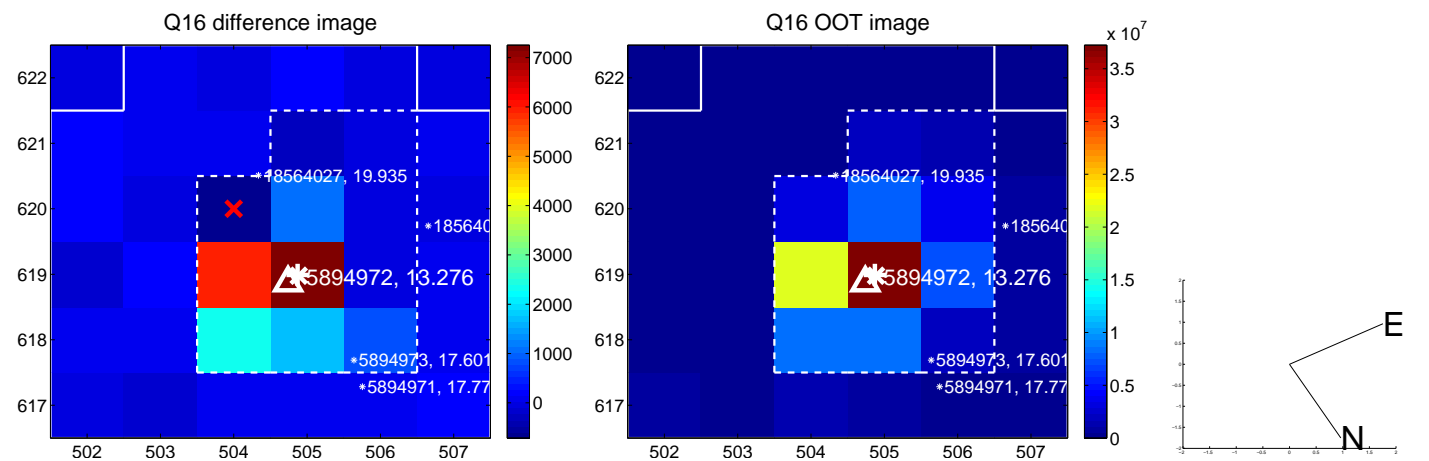
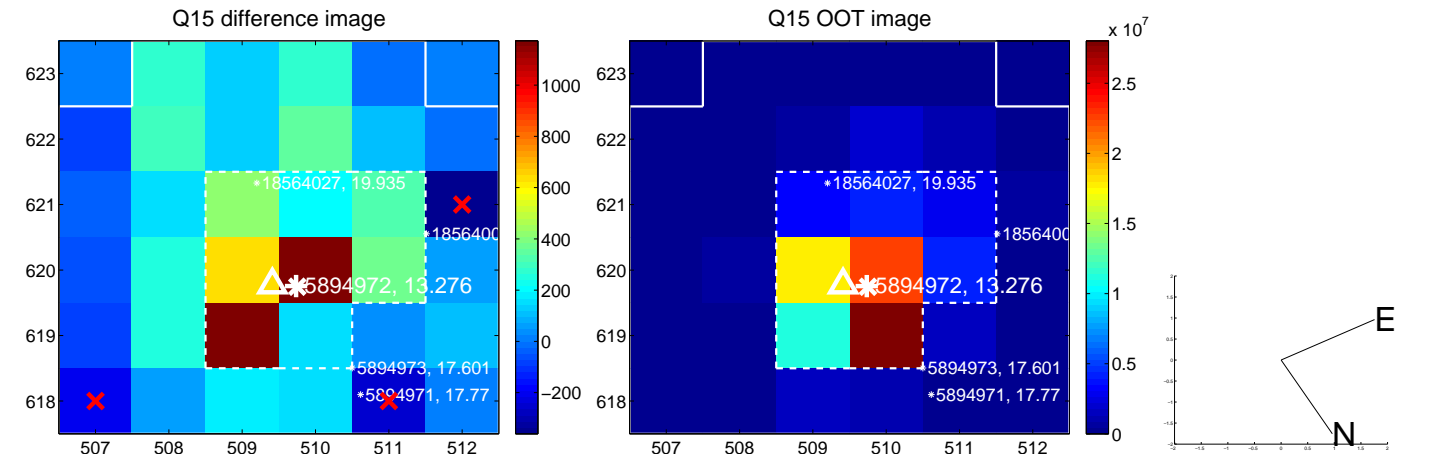
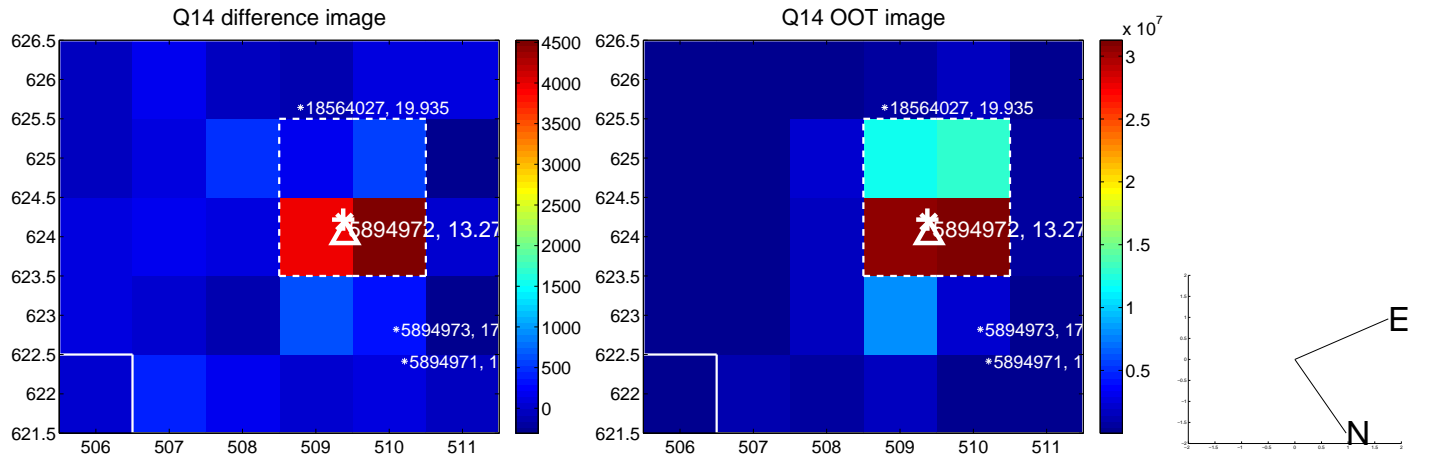
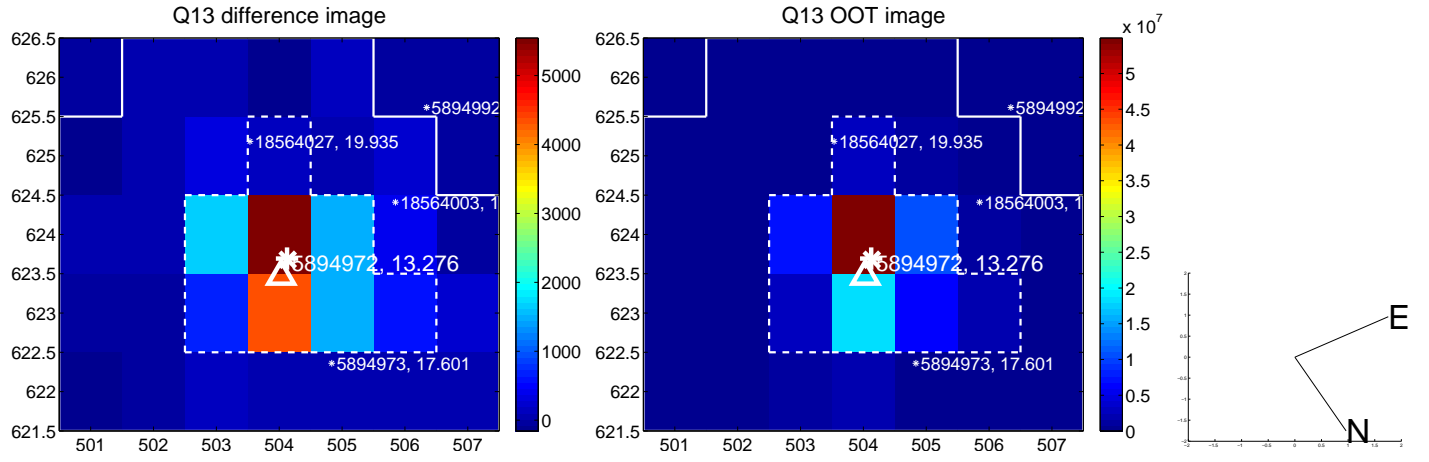




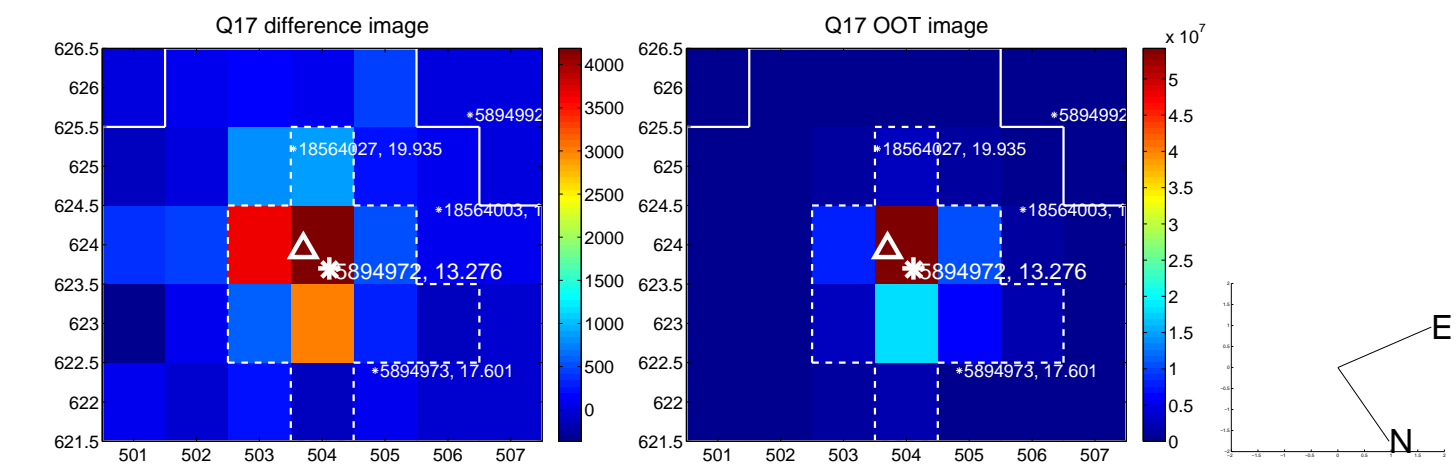
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



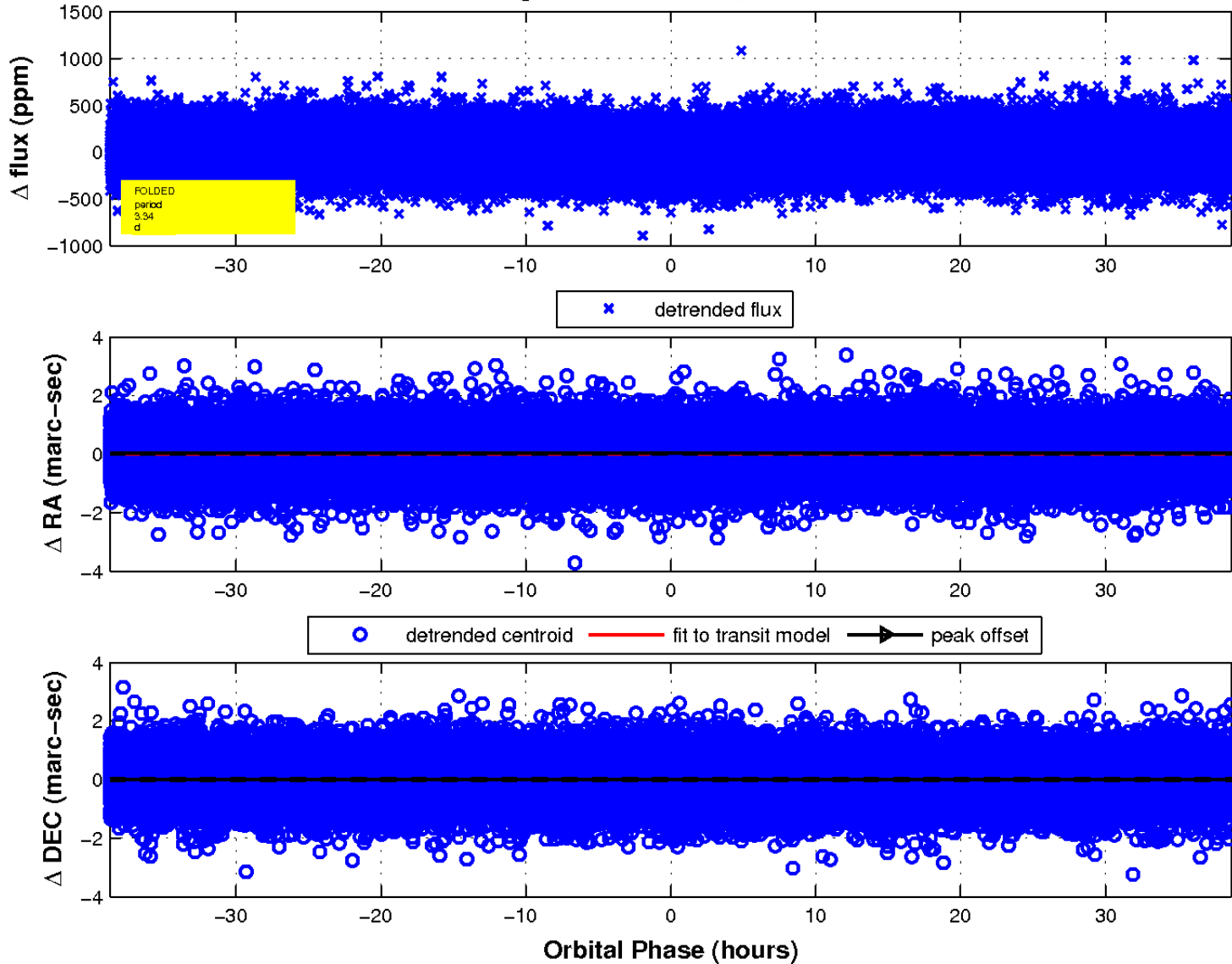
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

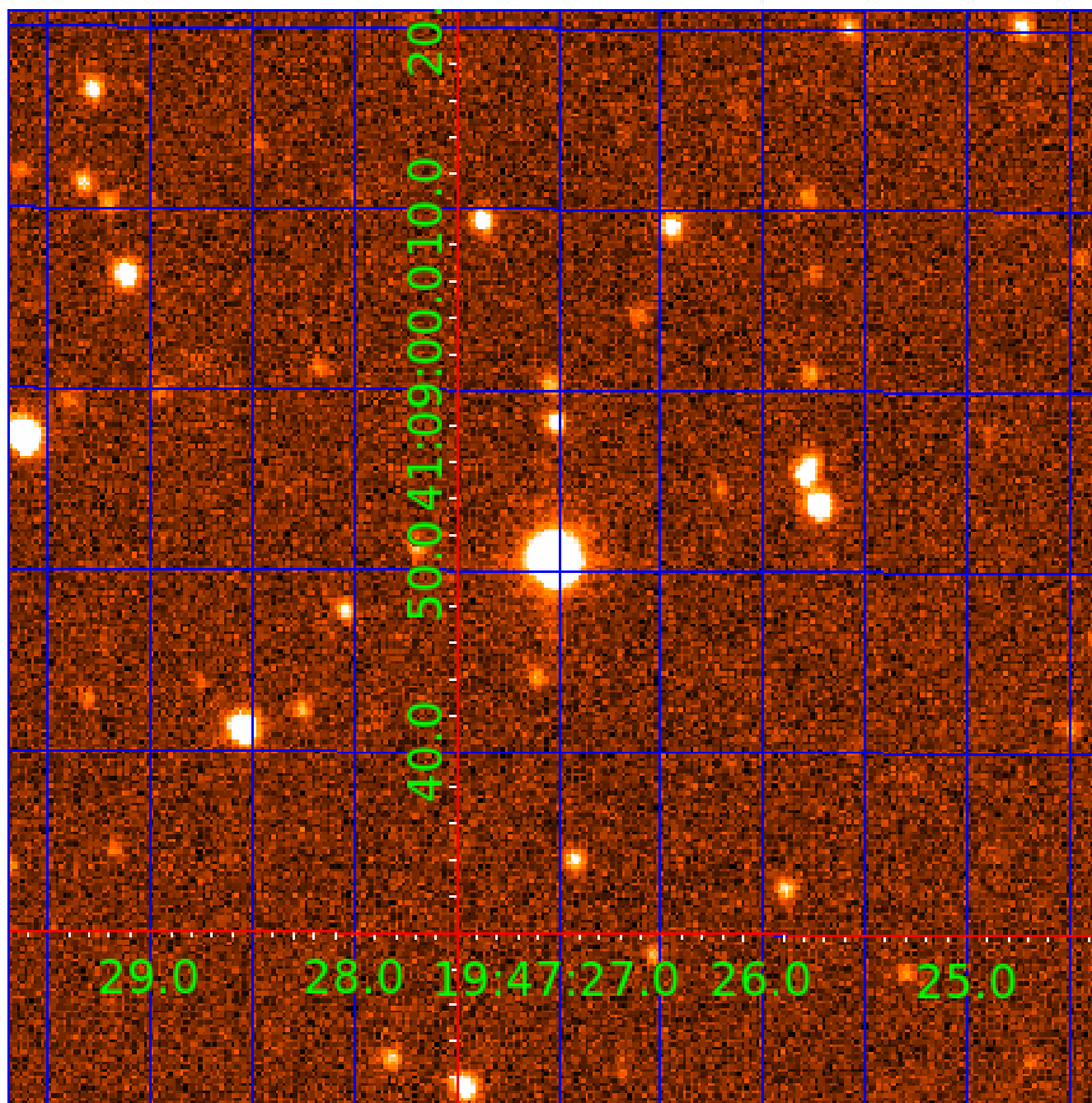


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005894972

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005894972-01	OBS	No	3.340924	133.661321	24.3	12.901	7.3	6.9	2.65	6541	1.47	4557.20
005894972-02	OBS	6634.01	3.343145	131.619237	31.6	21.693	11.3	10.6	2.65	6541	1.53	4553.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005894972-01	OBS	FP	0.00	1	0	0	0	LPP_DV
005894972-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT

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

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

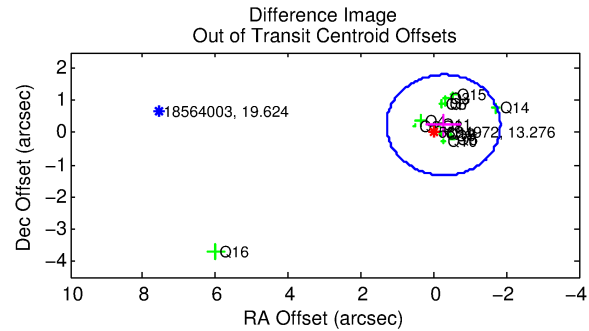
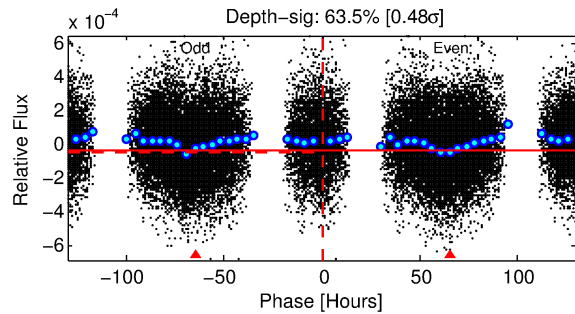
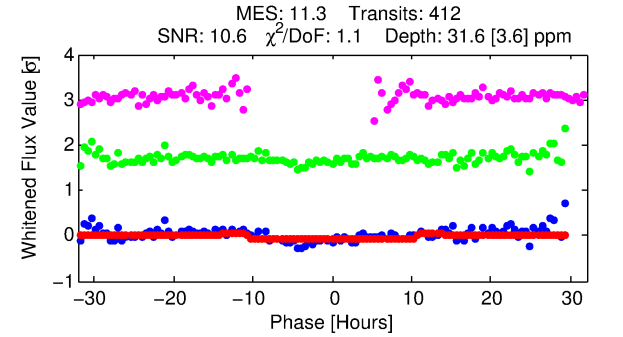
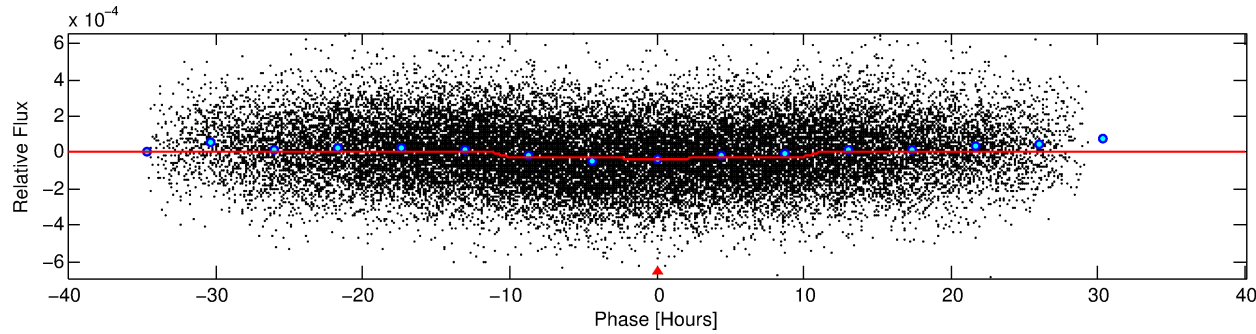
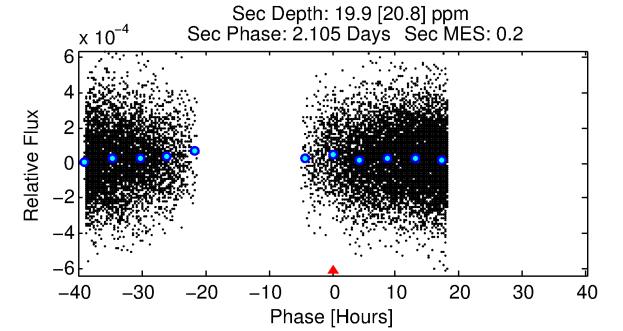
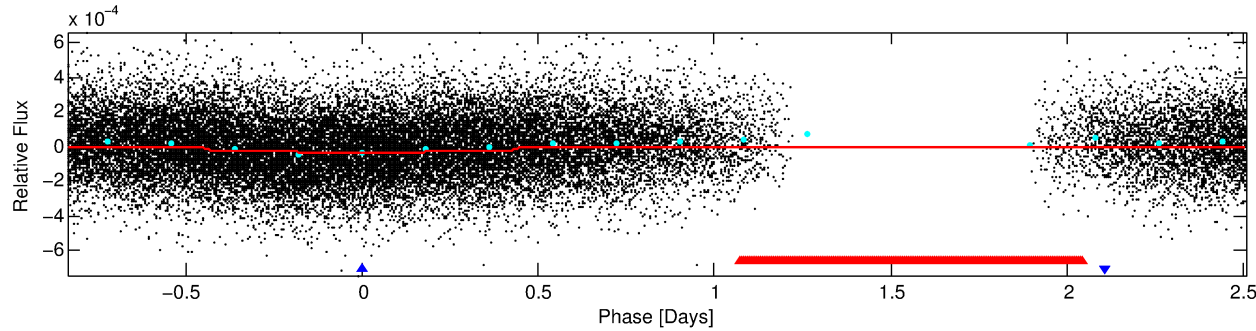
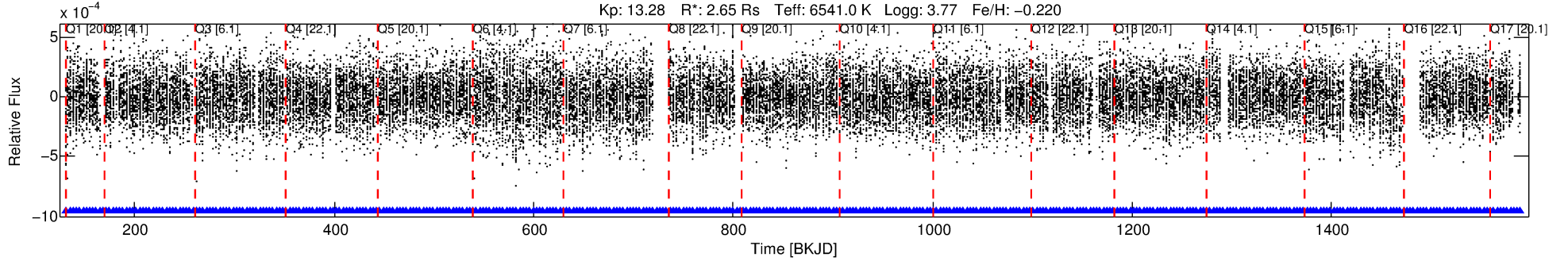
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005894972-02

No Significant Match Found

# DV One-Page Summary

KIC: 5894972 Candidate: 2 of 2 Period: 3.343 d  
KOI: K06634.01 Corr: 0.873



## DV Fit Results:

Period = 3.34314 [0.00005] d  
Epoch = 131.6192 [0.0088] BKJD  
Rp/R\* = 0.0053 [0.0027]  
a/R\* = 1.28 [1.39]  
b = 0.43 [5.20]  
Seff = 4553.16 [2376.94]  
Teq = 2095 [273] K  
Rp = 1.53 [0.94] Re  
a = 0.0503 [0.0164] AU  
Ag = 11.90 [18.29] [0.60σ]  
Teffp = 6014 [2189] K [1.78σ]

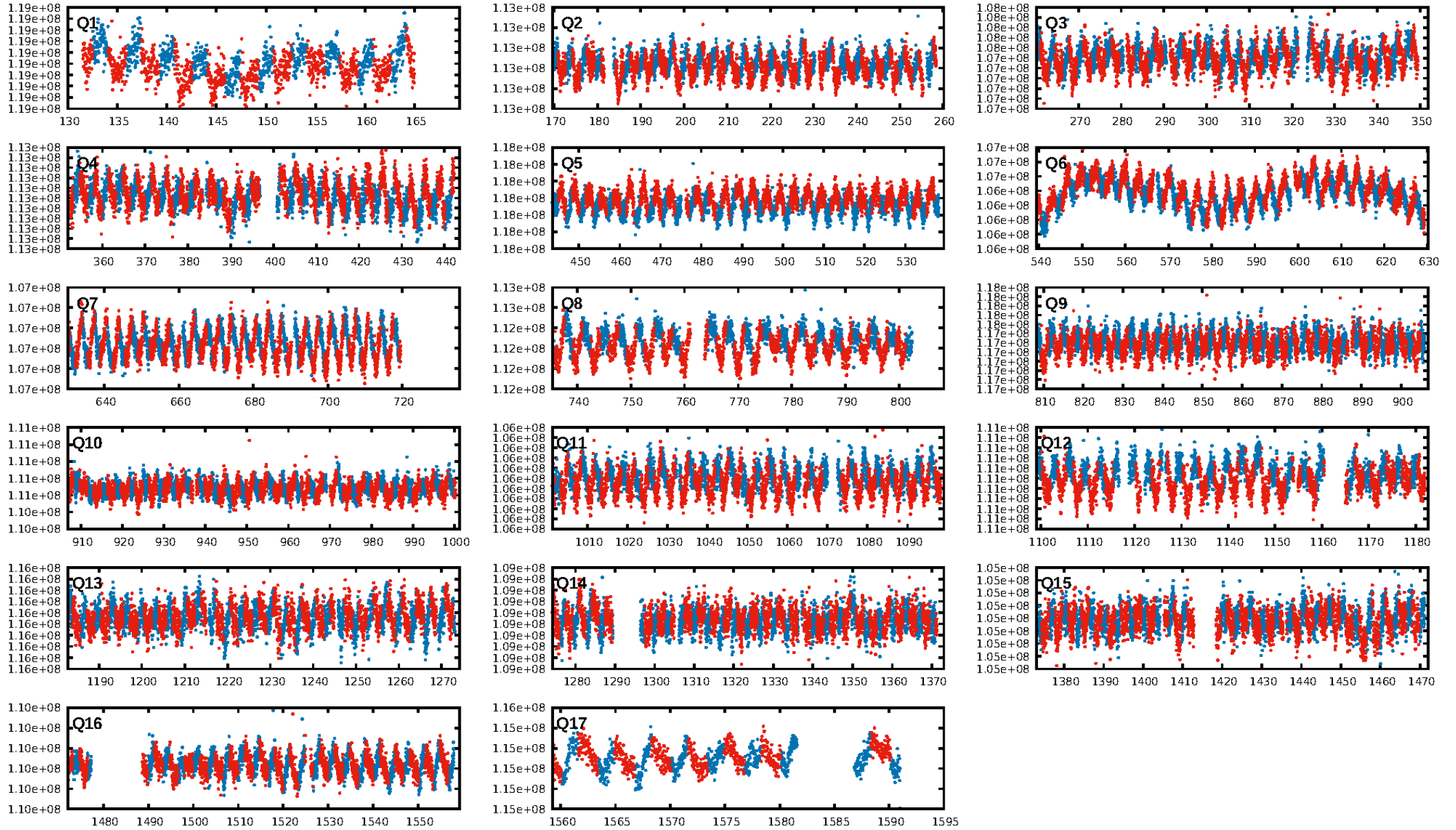
## DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [393/393]  
GhostDiagnostic-chr: 1.26  
Centroid-sig: 11.1%  
Centroid-so: 0.844 arcsec [1.45σ]  
OotOffset-rm: 0.355 arcsec [0.68σ]  
OotOffset-st: 4/4/4/2 [14]  
KicOffset-rm: 0.326 arcsec [0.66σ]  
KicOffset-st: 4/4/4/2 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 0.00 [0/17]

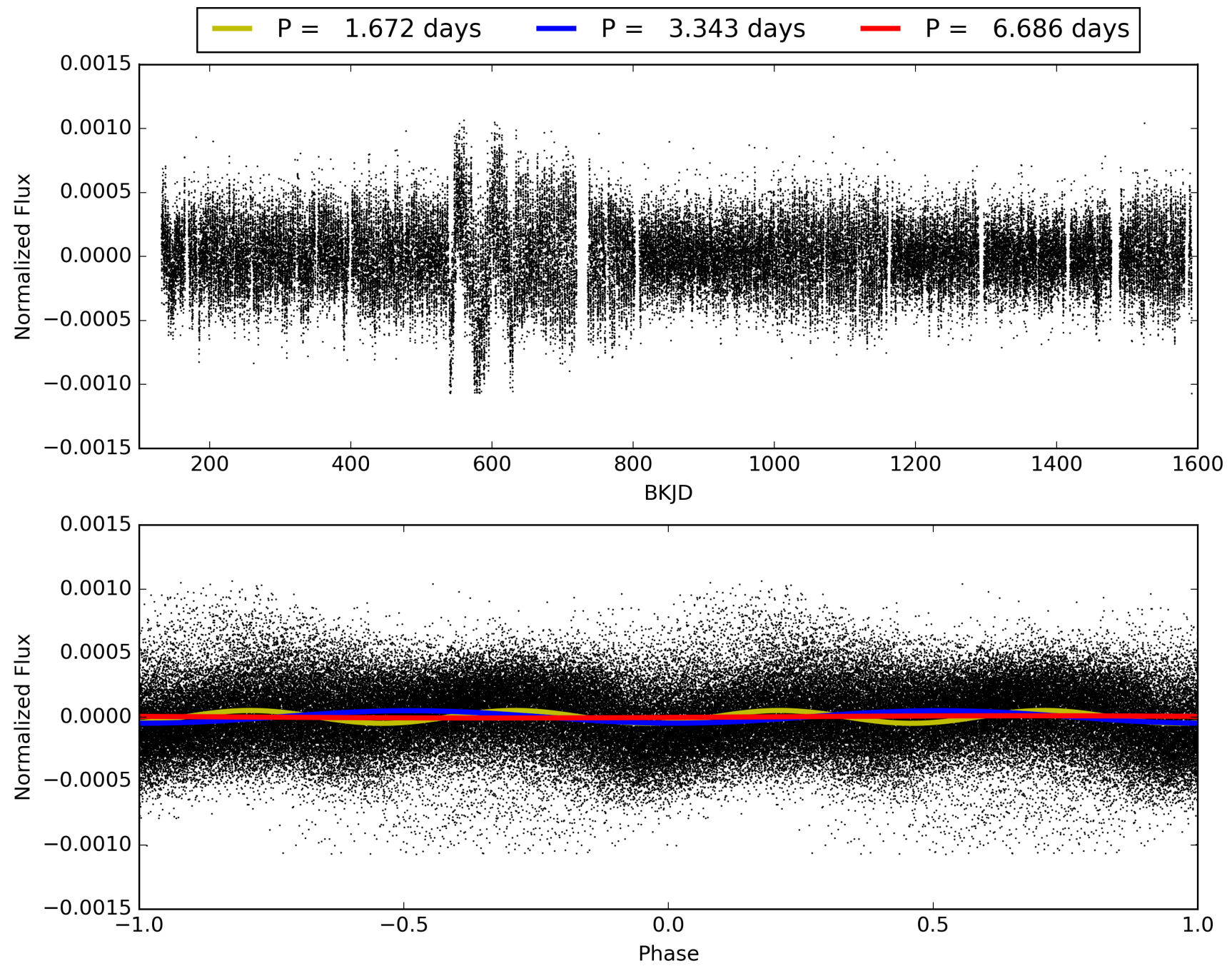
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:38:20 Z

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

# TCE 005894972-02, PDC Light Curves



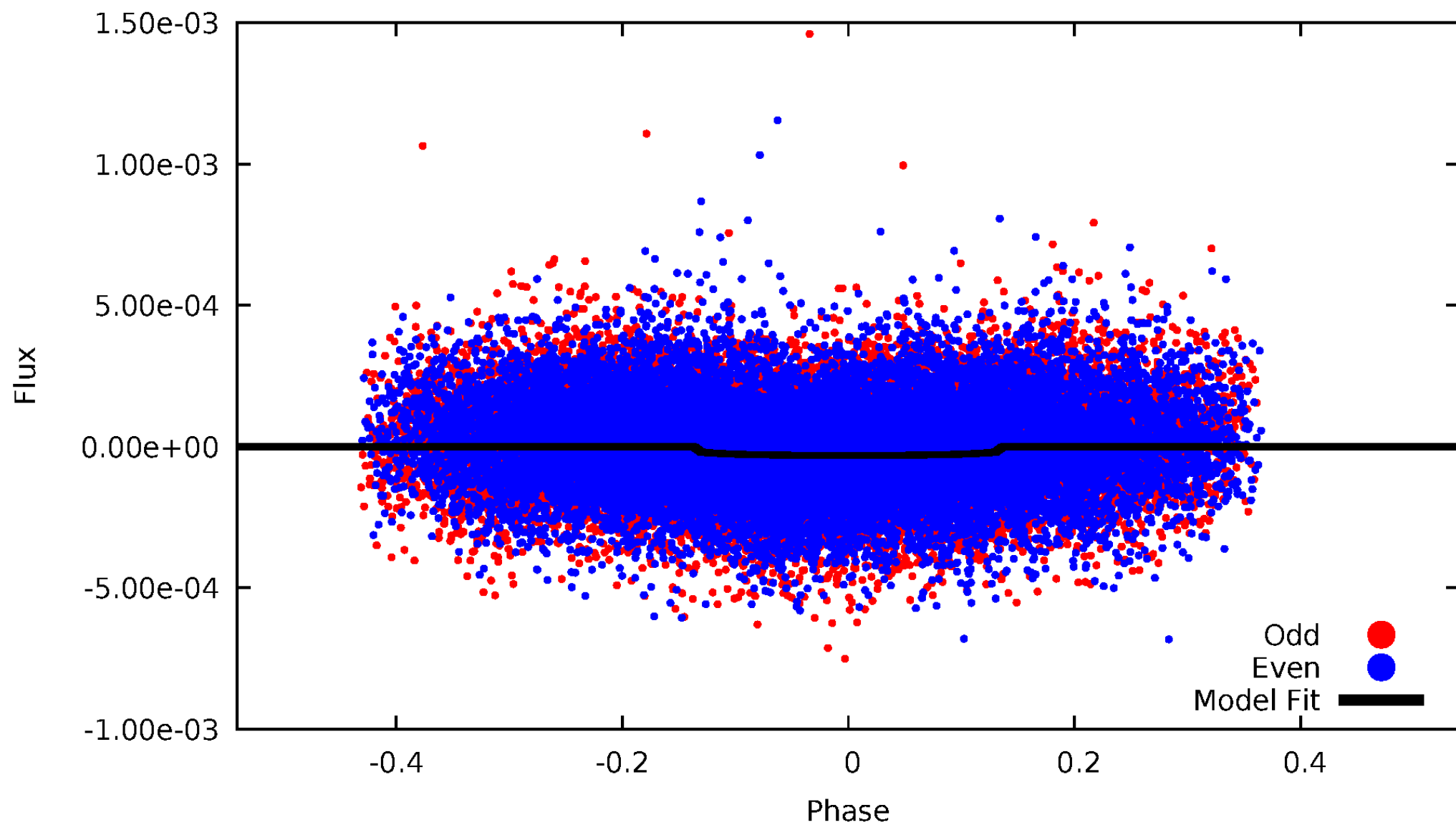
TCE 005894972-02





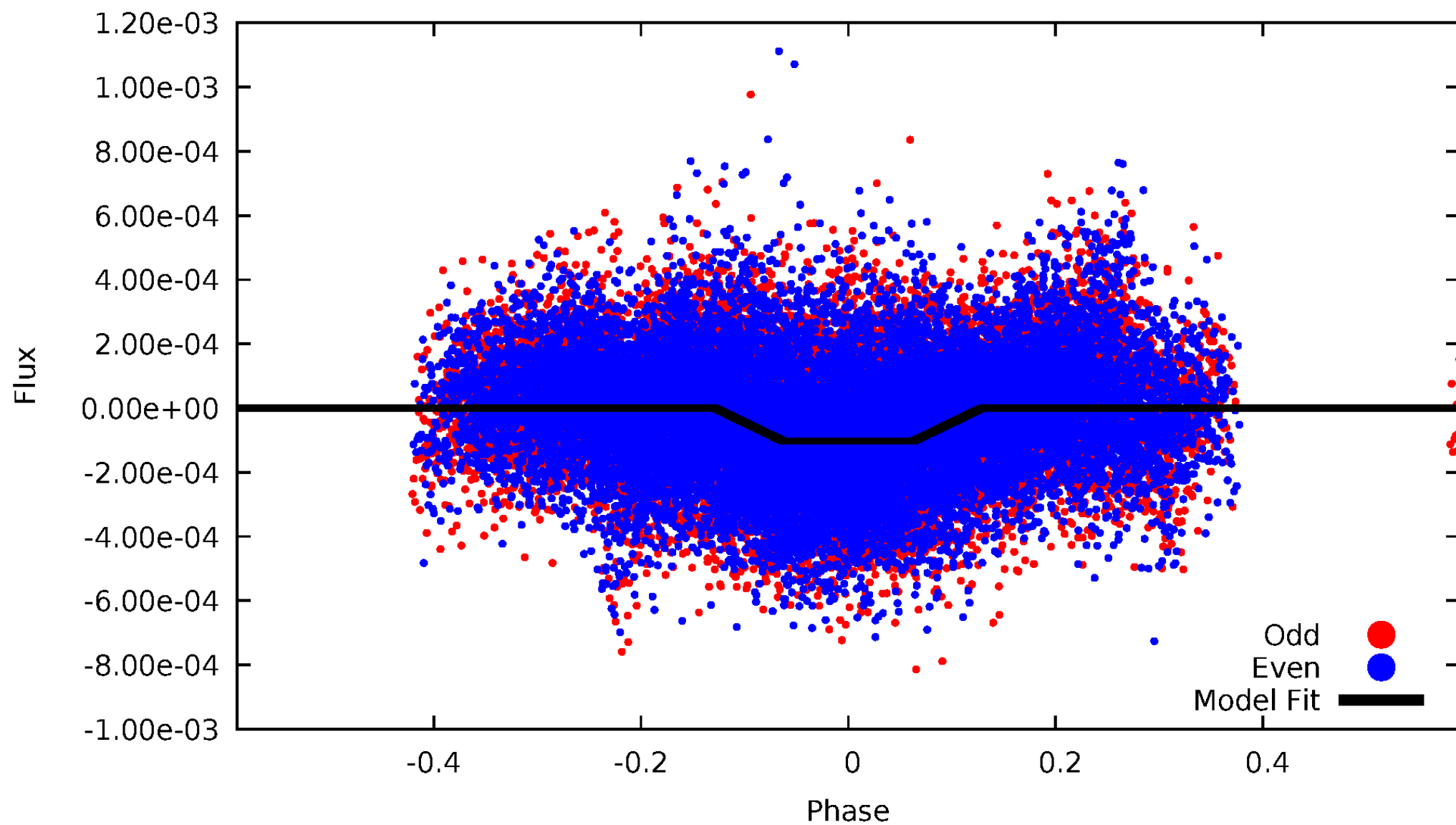
# DV Odd/Even

TCE 005894972-02



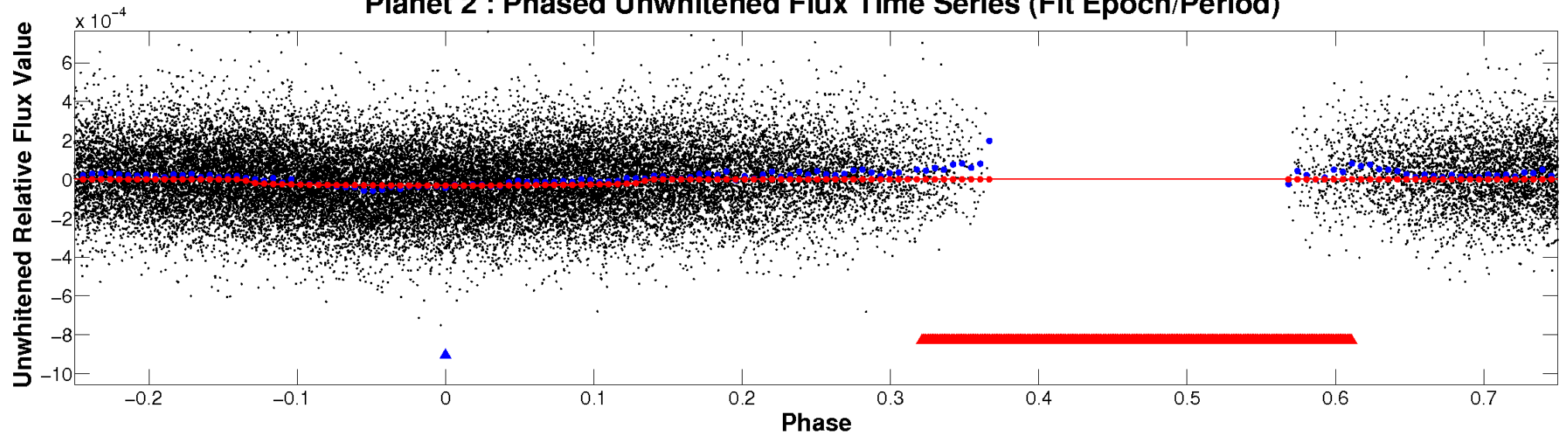
# ALT Odd/Even

TCE 005894972-02

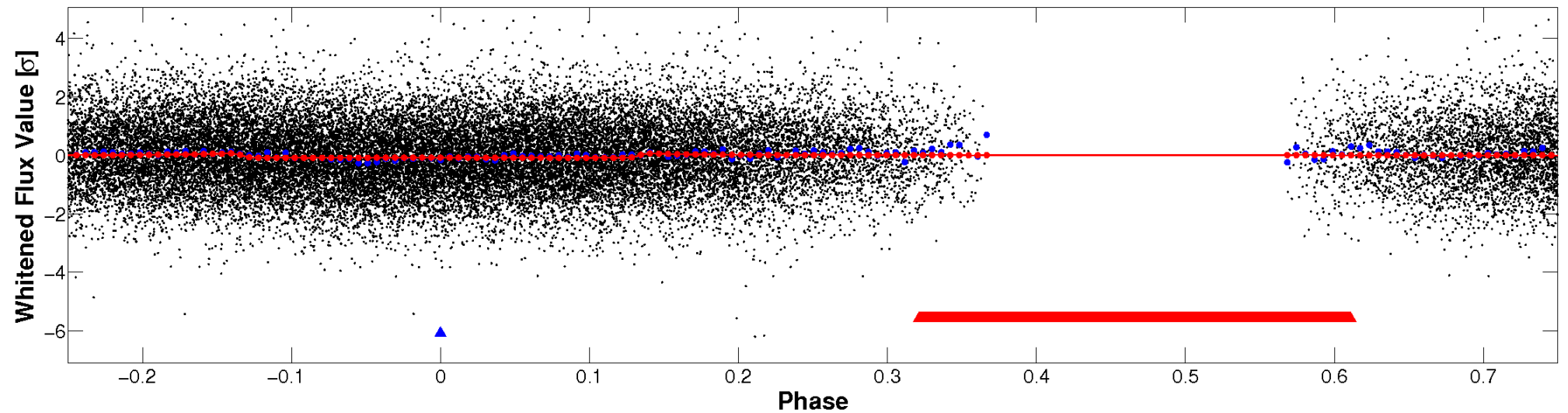


# Non-Whitened Vs. Whitened Light Curve

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

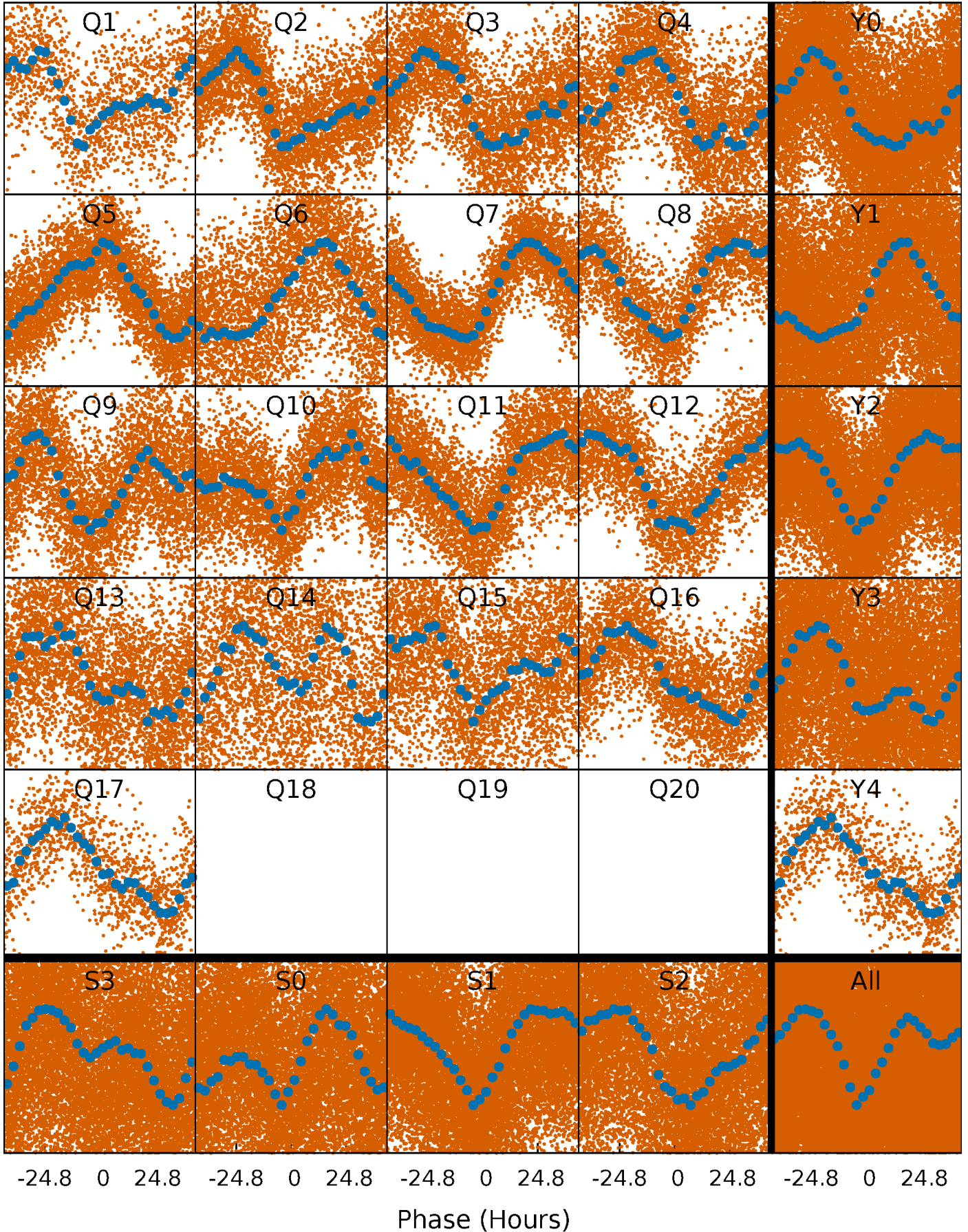


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

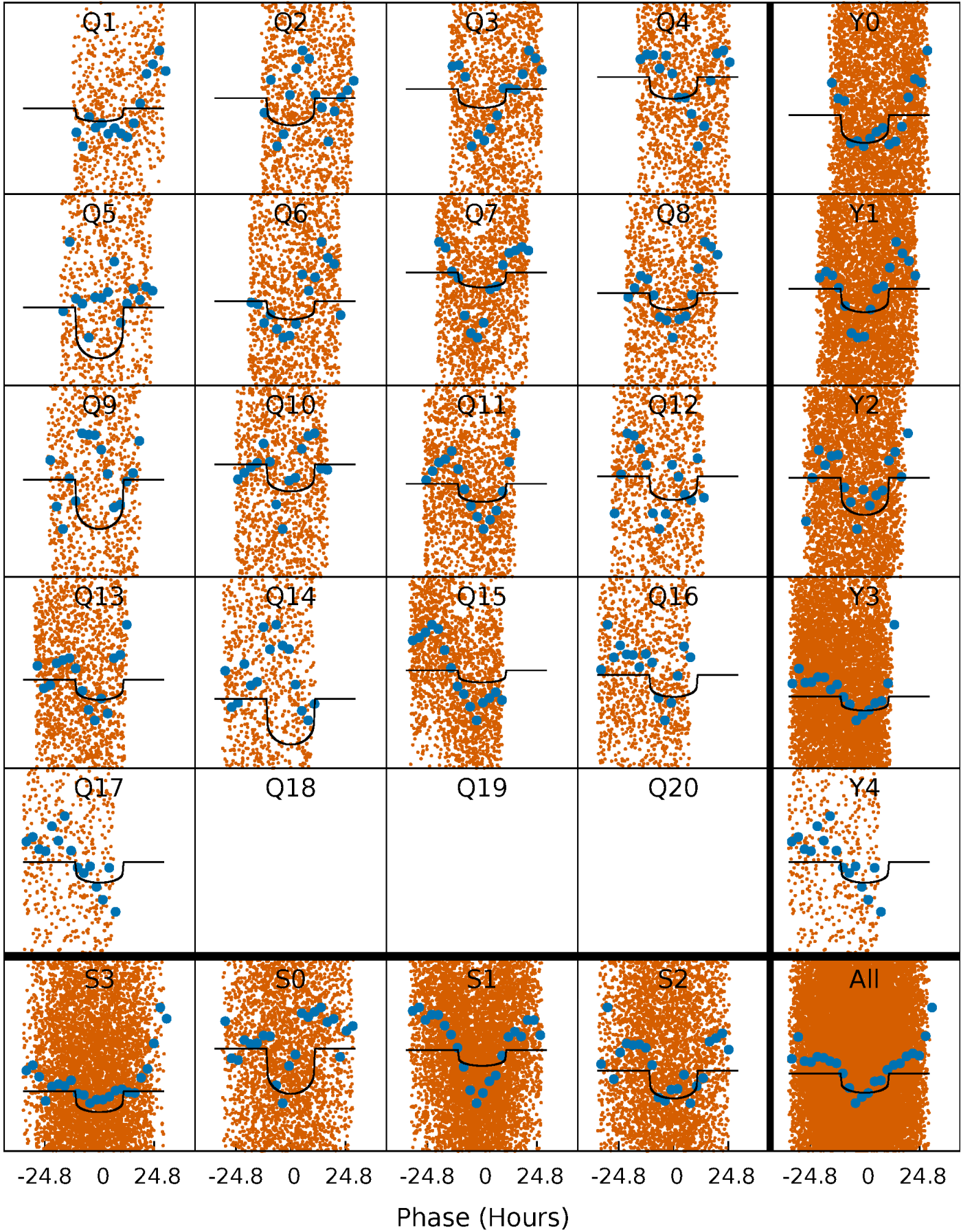
TCE 005894972-02   P= 3.343145 Days    $T_0=131.619237$  (BKJD)





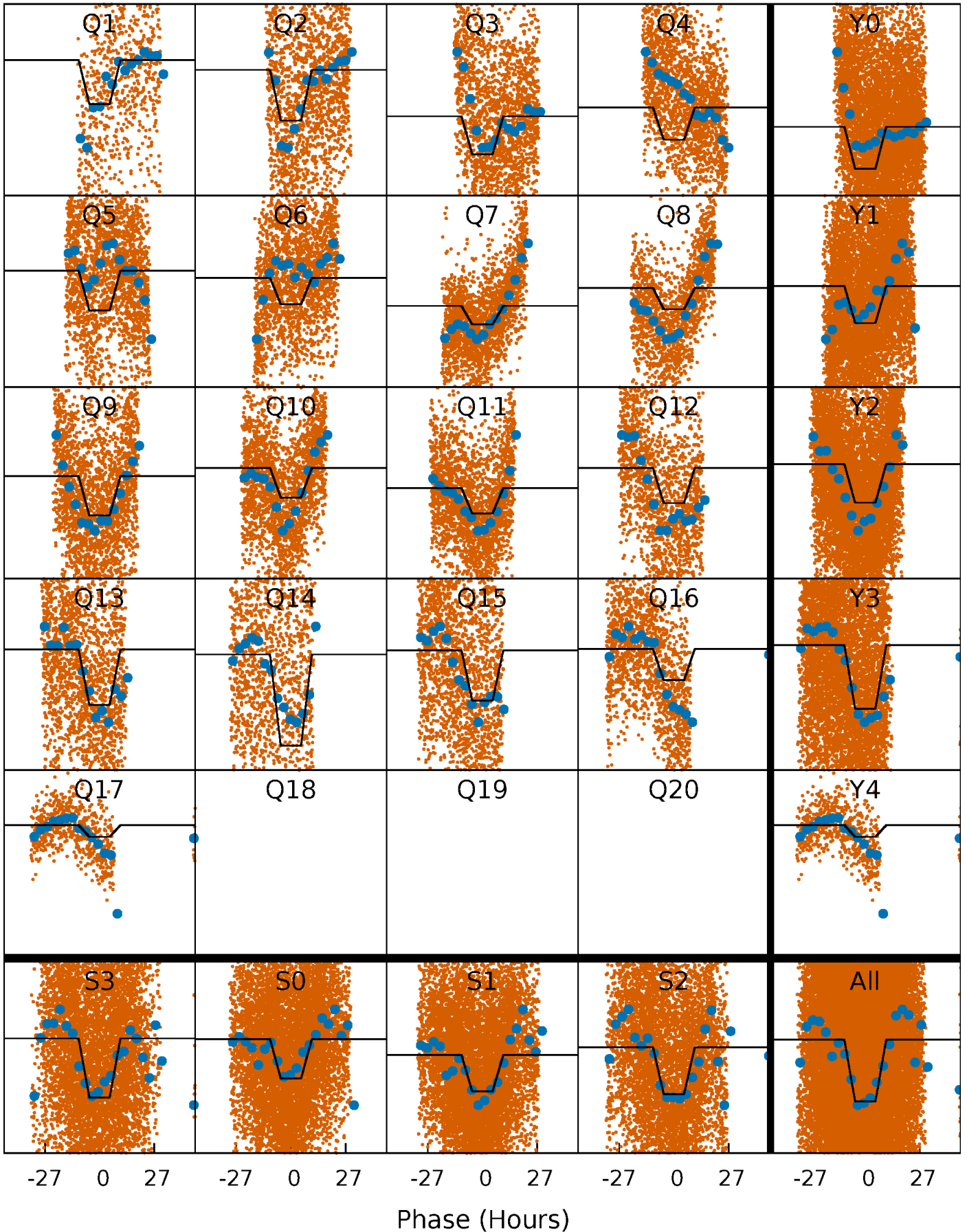
# DV Quarter-Phased Transit Curves

TCE 005894972-02    P= 3.343145 Days     $T_0=131.619237$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005894972-02     $P = 3.343153$  Days     $T_0 = 131.579892$  (BKJD)

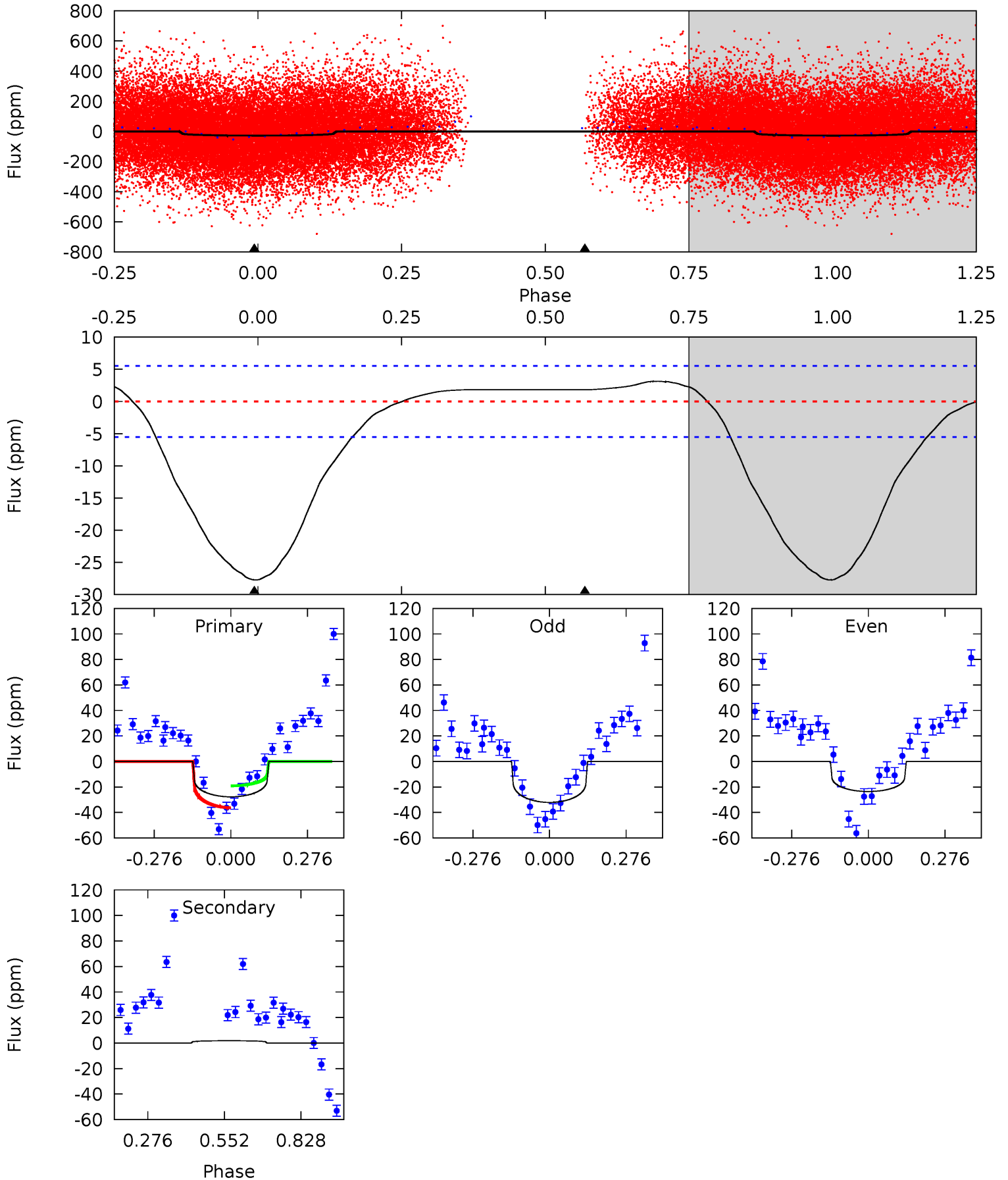




# DV Model-Shift Uniqueness Test

005894972-02, P = 3.343145 Days, E = 128.276092 Days

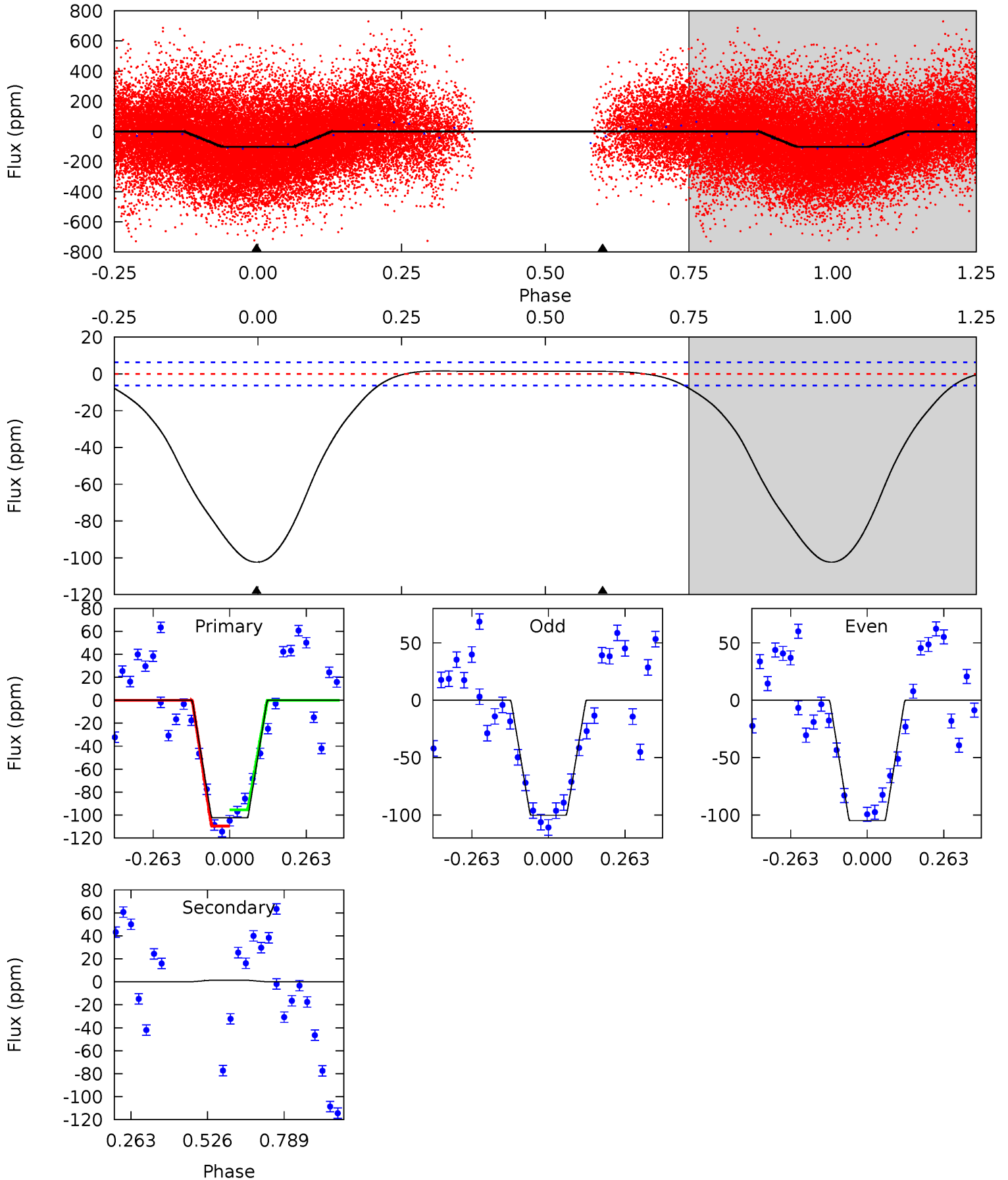
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	-1.43	0	0	4.35	1.09	0.83	21.8	21.8	-1.43	-1.43	3.36	0.99	0.10	6.90



# Alt Model-Shift Uniqueness Test

005894972-02, P = 3.343153 Days, E = 128.236739 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
70.7	-0.96	0	0	4.36	1.12	1.84	70.7	70.7	-0.96	-0.96	1.62	0.89	0.02	4.92



### Stellar Parameters For KIC 005894972

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6541^{+177}_{-197}$	$3.773^{+0.293}_{-0.098}$	$-0.220^{+0.300}_{-0.250}$	$2.652^{+0.433}_{-0.939}$	$1.519^{+0.227}_{-0.340}$	$0.115^{+0.256}_{-0.035}$
	+3%/-3%	+8%/-3%	+136%/-114%	+16%/-35%	+15%/-22%	+223%/-30%
Source	PHO1	FLK73	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 005894972-02 / KOI 6634.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$2 \pm 1$	$1.40^{+0.80}_{-0.68}$	$2871^{+180}_{-249}$	$-3795^{+522}_{-1028}$	$-1.089^{+0.863}_{-3.943}$
Alt.	$1 \pm 1$	$2.76^{+0.94}_{-0.83}$	$2877^{+161}_{-241}$	$-3273^{+286}_{-288}$	$-0.220^{+0.222}_{-0.417}$

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

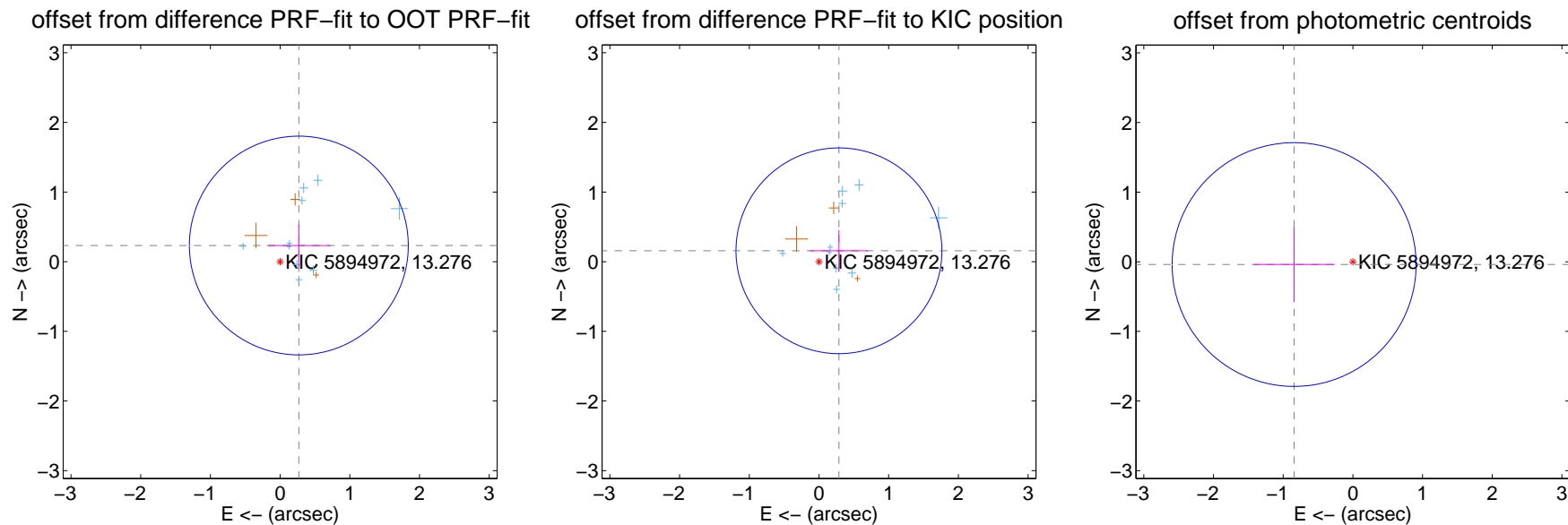
## DV Centroid Data

Supplemental centroid analysis for 005894972-02. Kepler magnitude: 13.28. Transit SNR 10.58

There are 10 quarters with good PRF difference image offsets

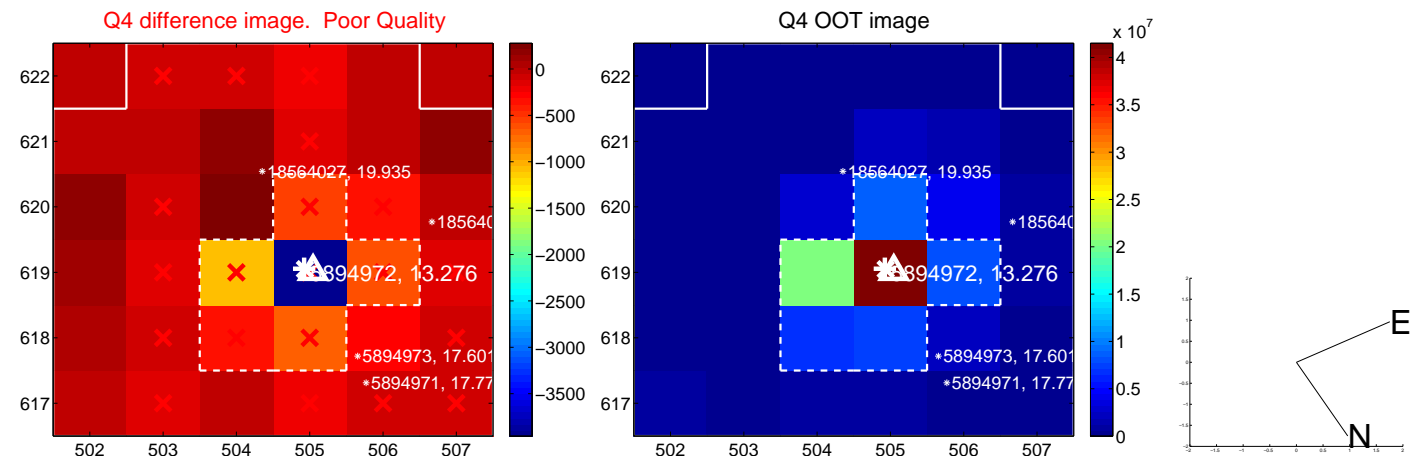
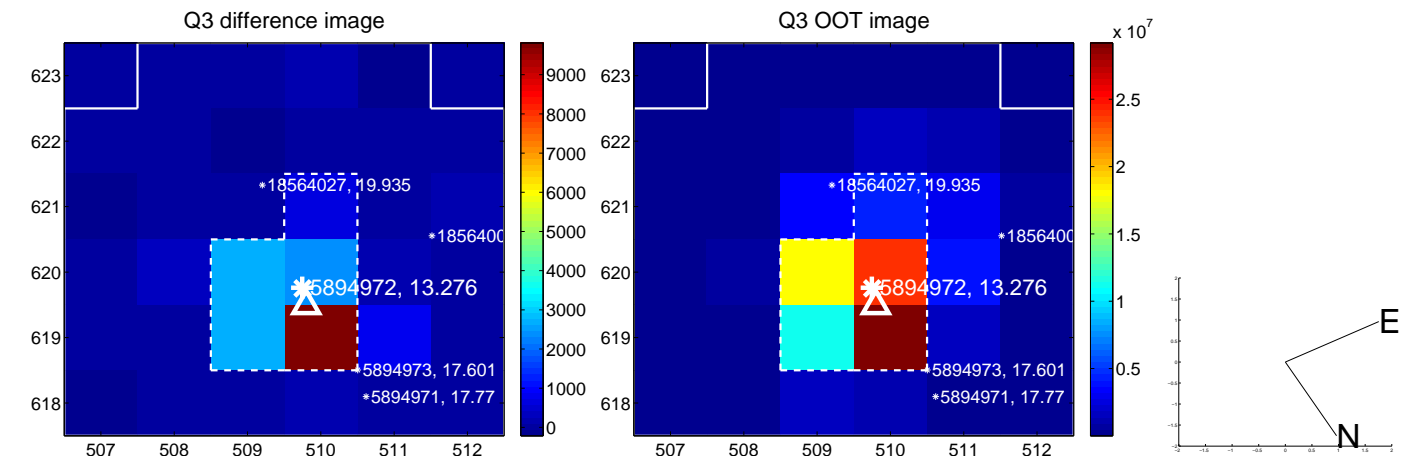
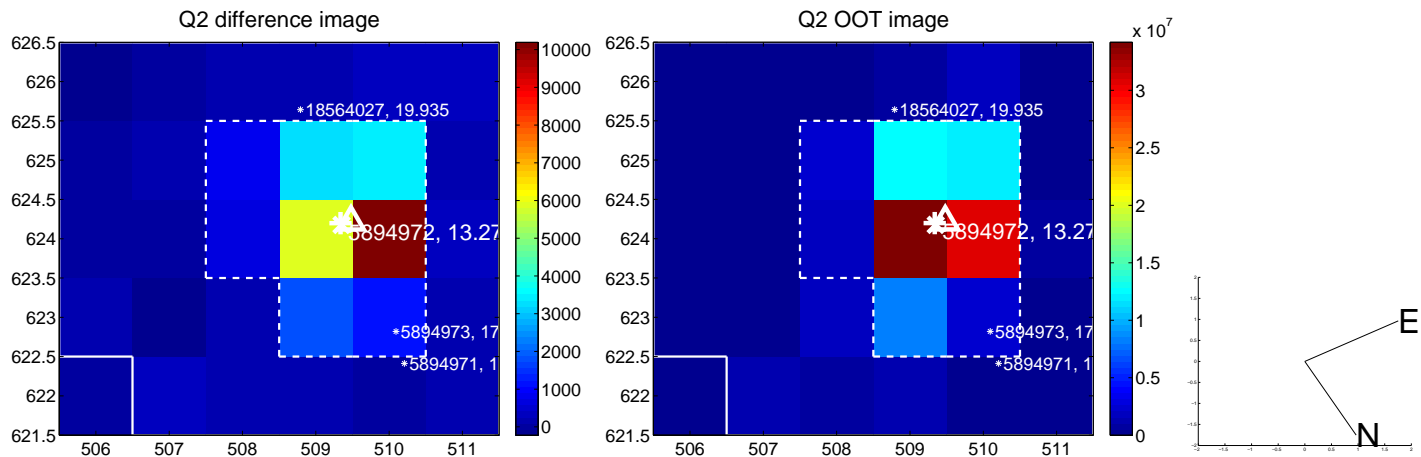
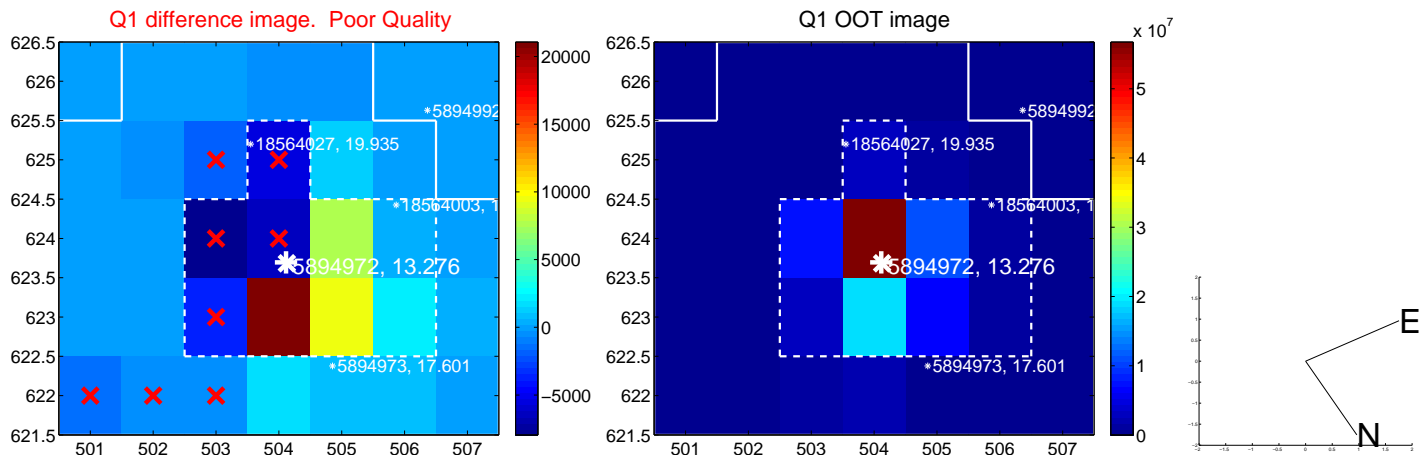
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.355 \pm 0.523$	0.68	$-0.269 \pm 0.451$	$0.232 \pm 0.306$
PRF-fit source offset from KIC position	$0.326 \pm 0.492$	0.66	$-0.286 \pm 0.414$	$0.157 \pm 0.300$
photometric centroid source offset	$0.84 \pm 0.58$	1.45	$0.84 \pm 0.58$	$-0.04 \pm 0.54$

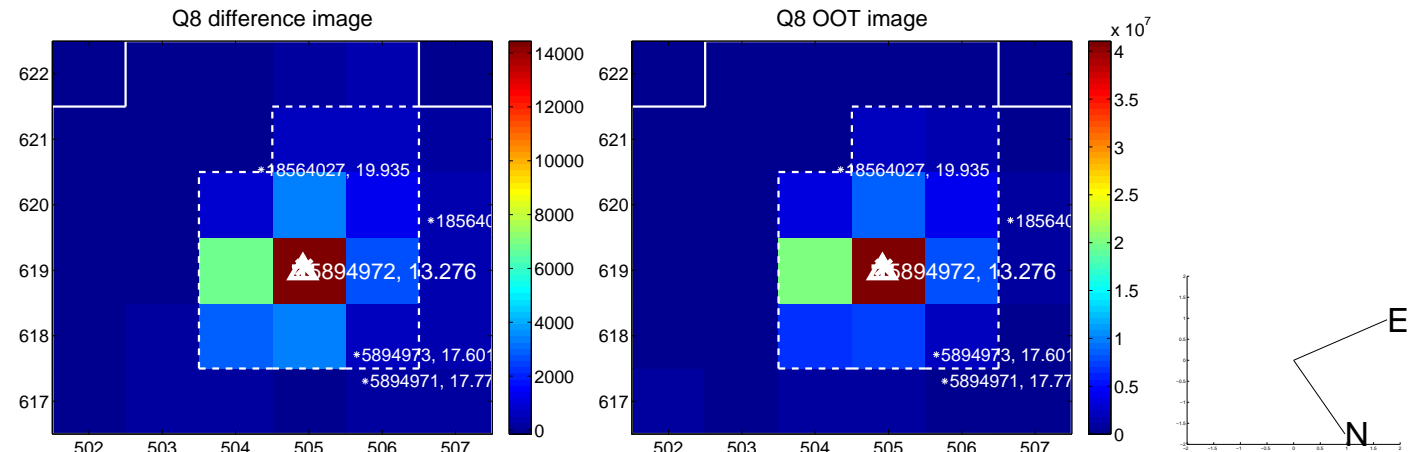
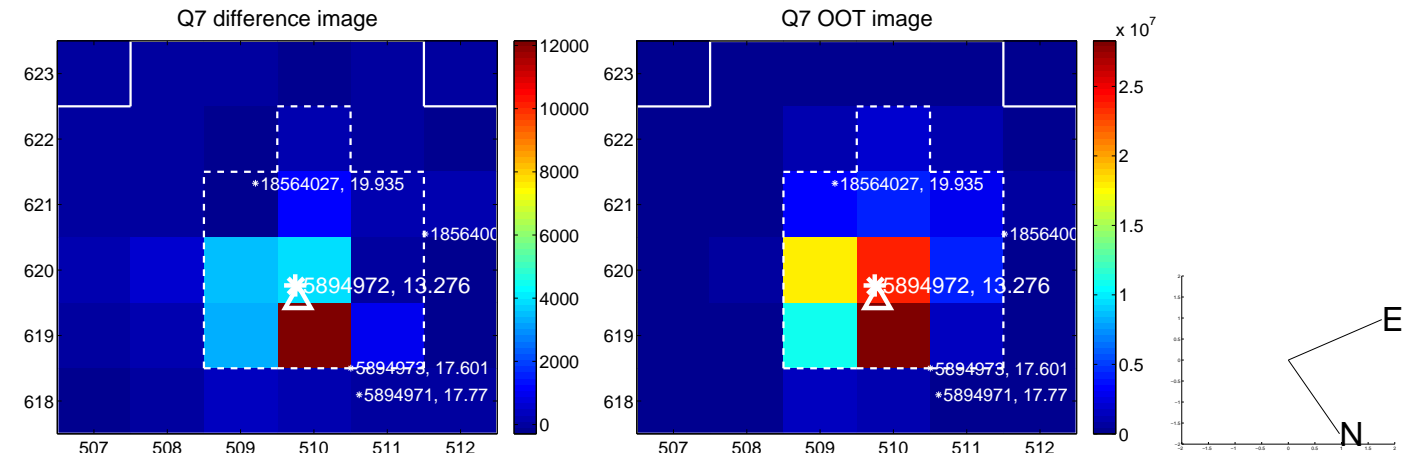
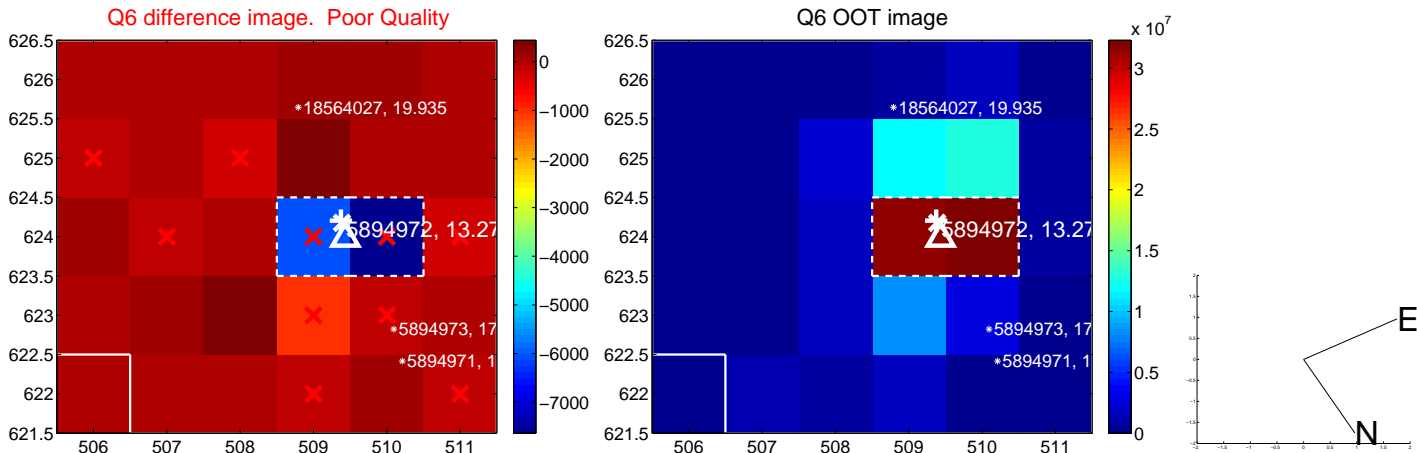
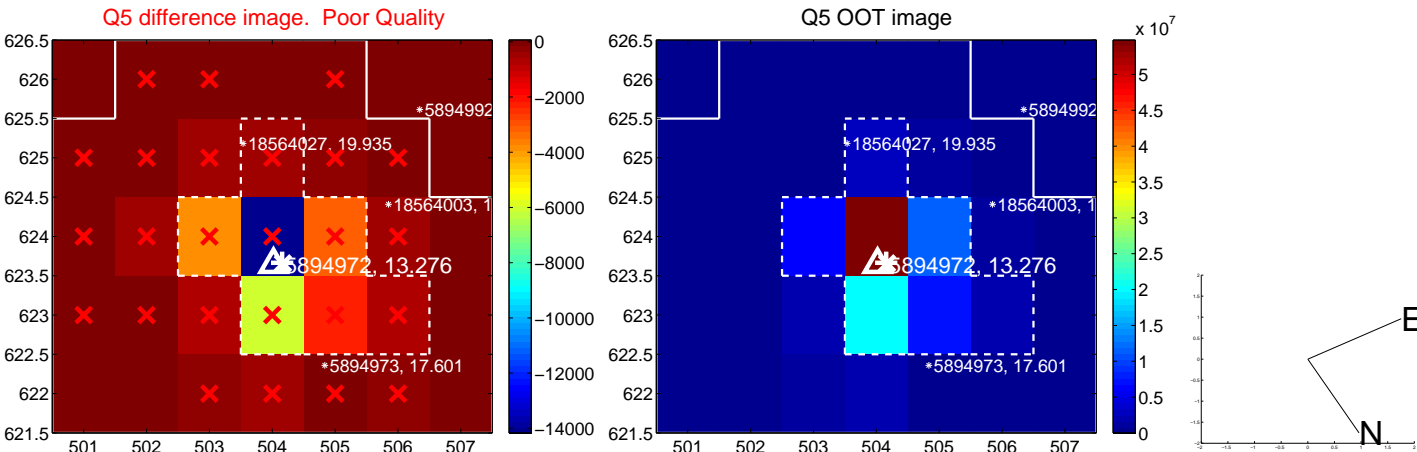


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

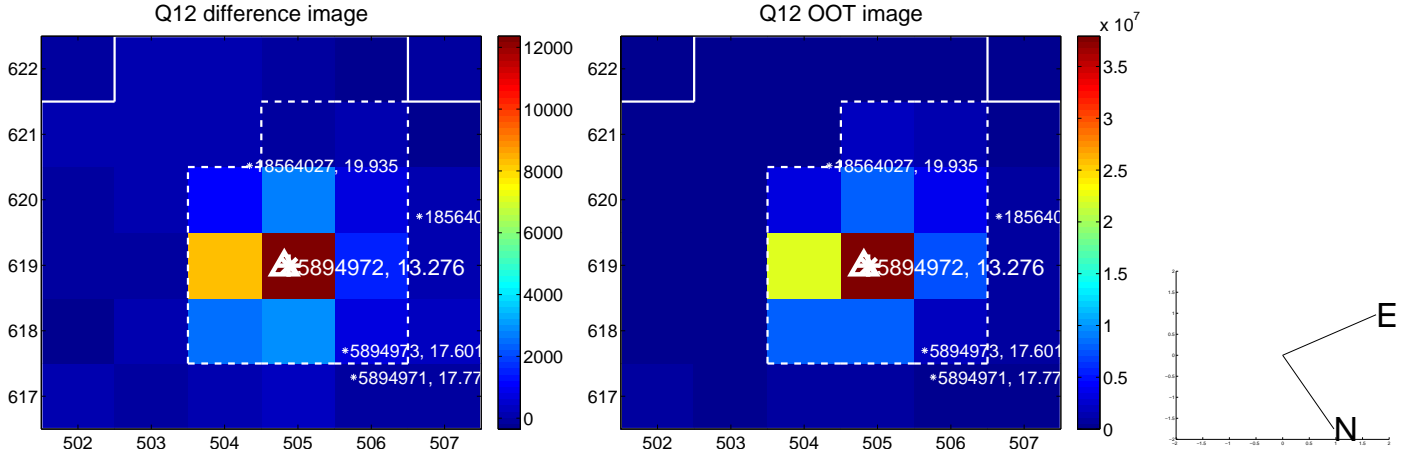
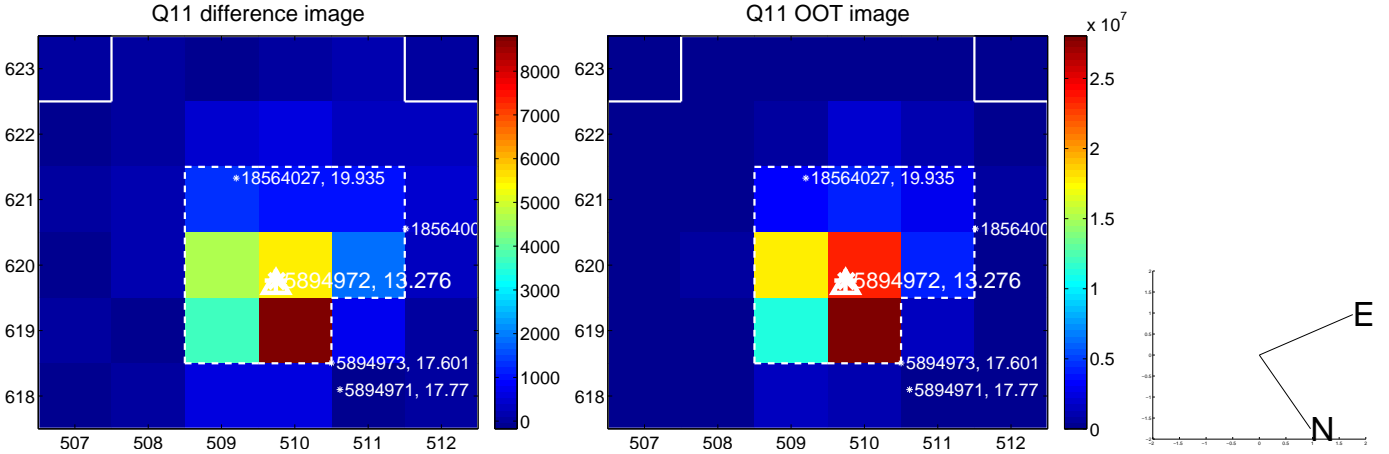
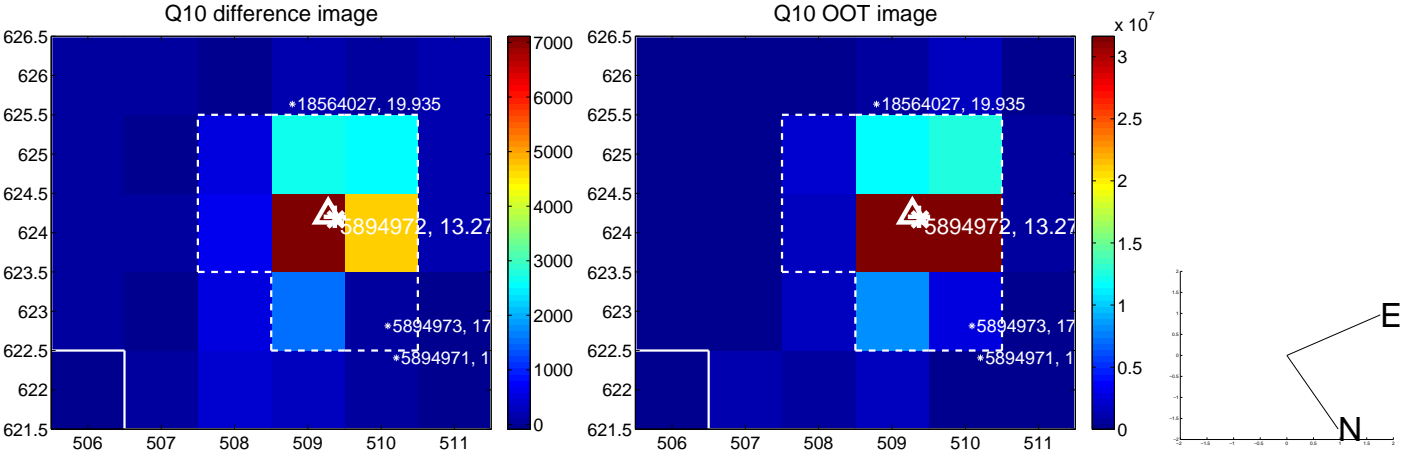
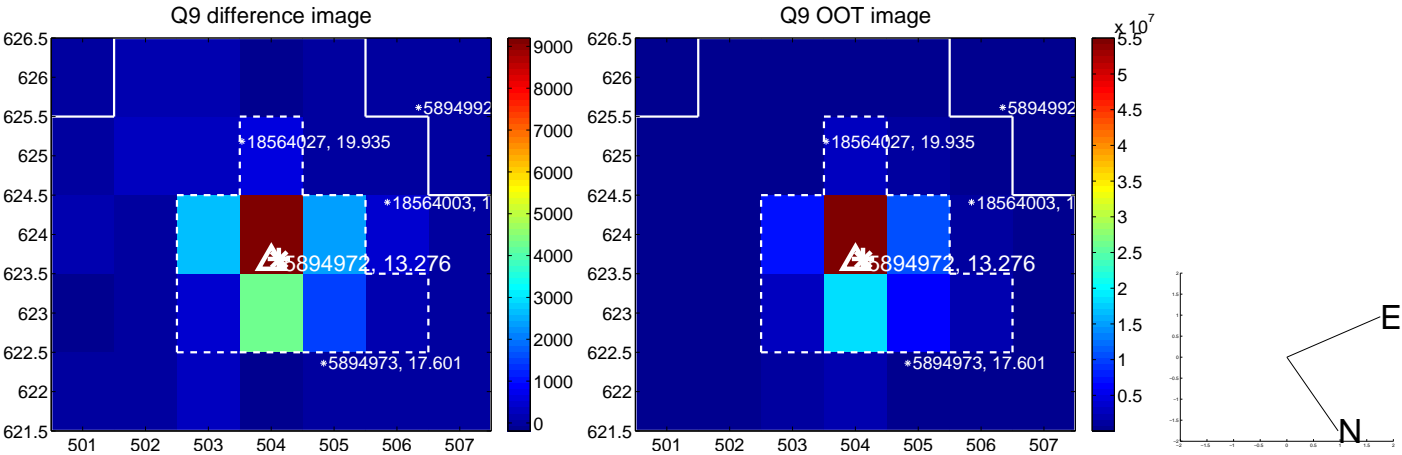


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

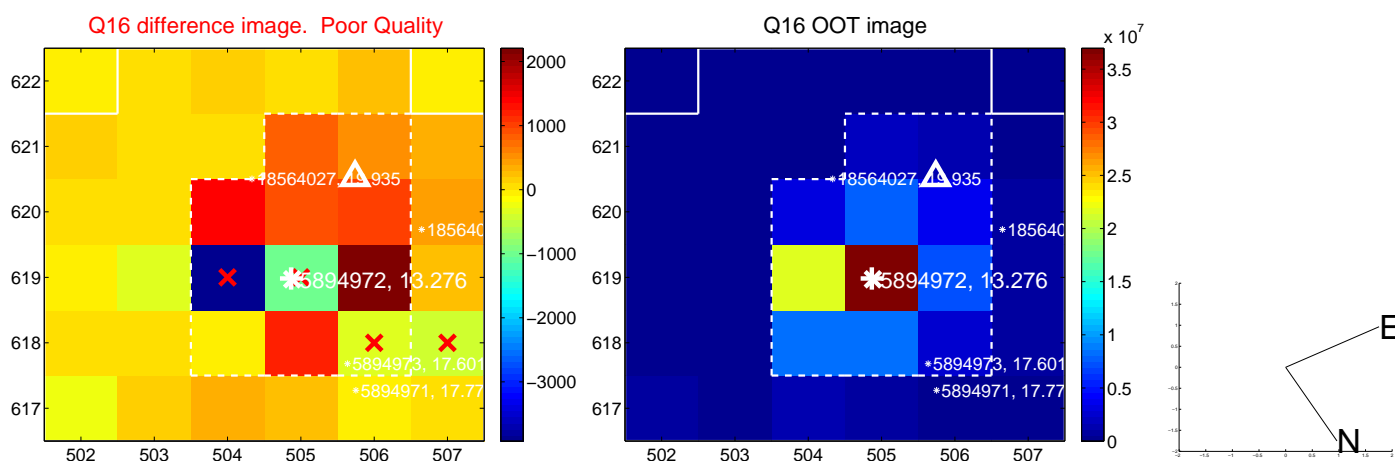
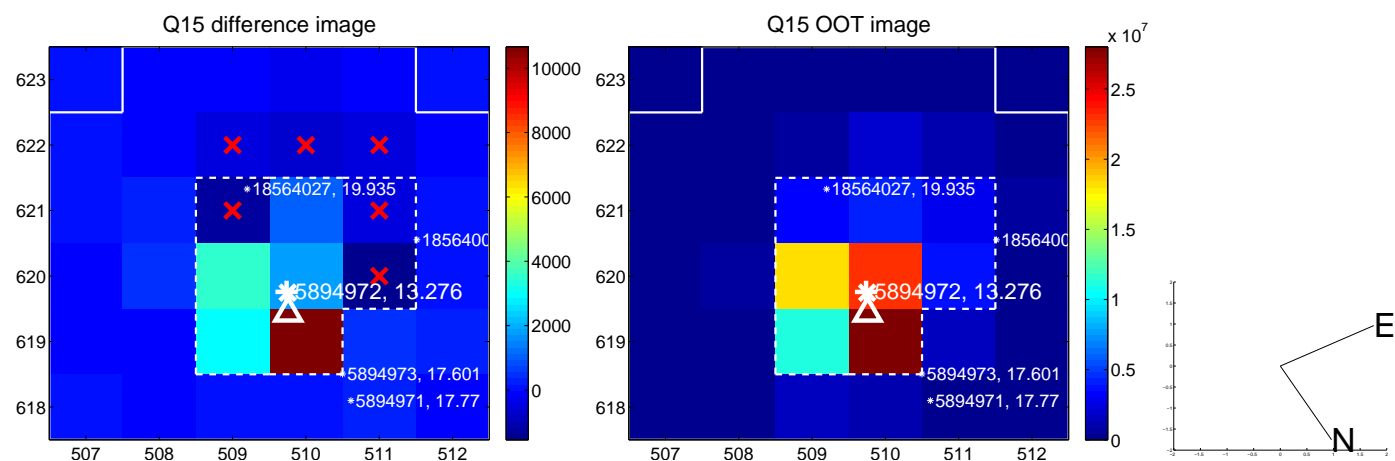
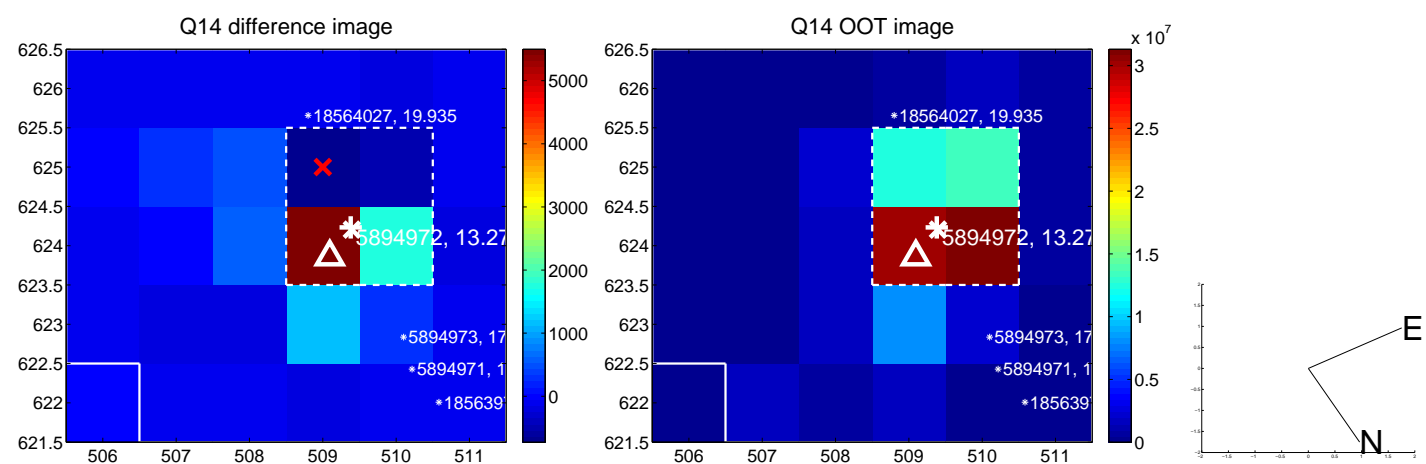
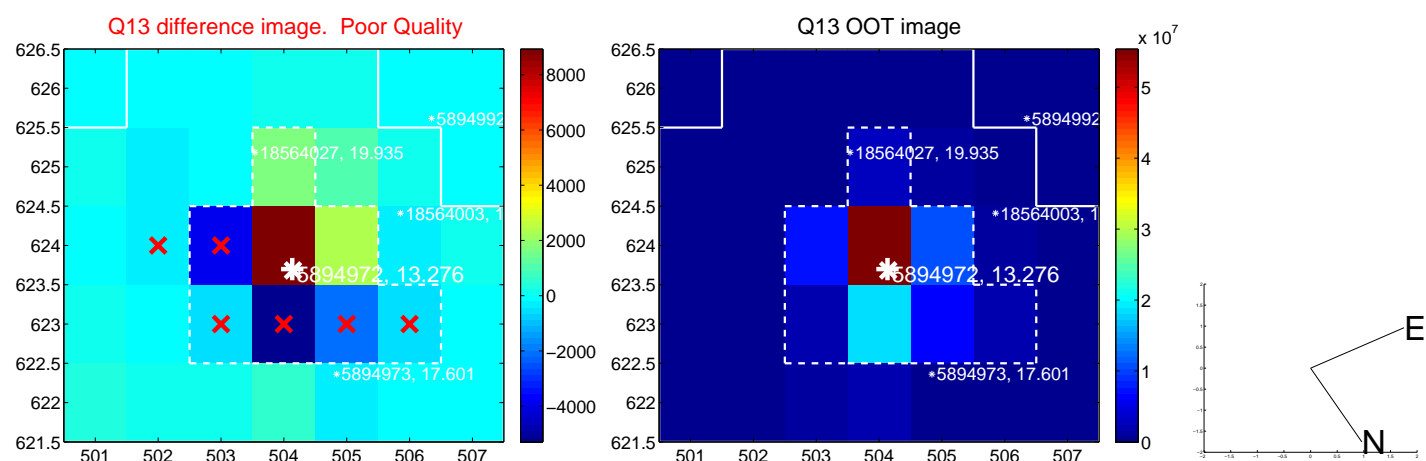




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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





UKIRT Image

Declination

