

# KIC 005389632

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005389632-01	OBS	7726.01	0.949641	132.192866	159.5	1.135	8.1	9.4	0.88	5799	1.34	2224.45
005389632-02	OBS	No	0.949618	131.732577	181.1	0.998	8.2	10.2	0.88	5799	1.18	2224.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005389632-01	OBS	FP	0.01	0	0	1	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
005389632-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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

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

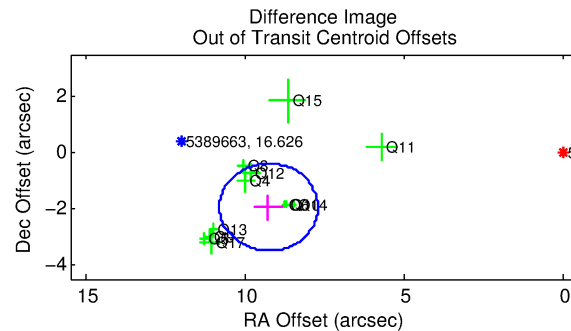
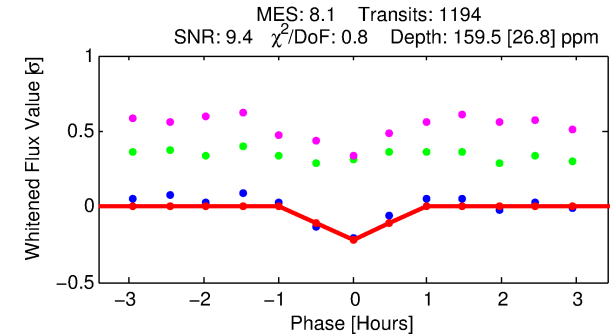
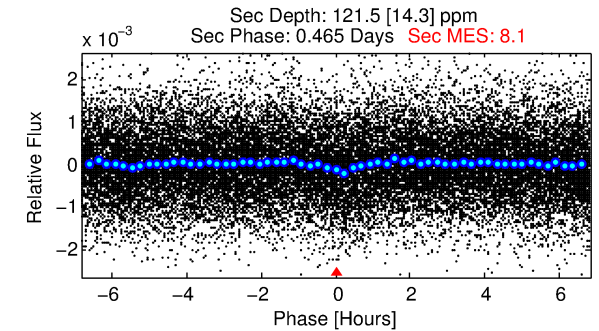
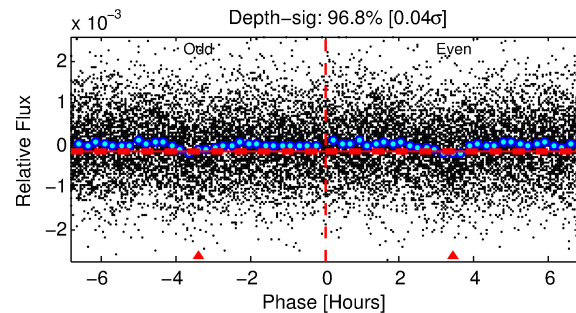
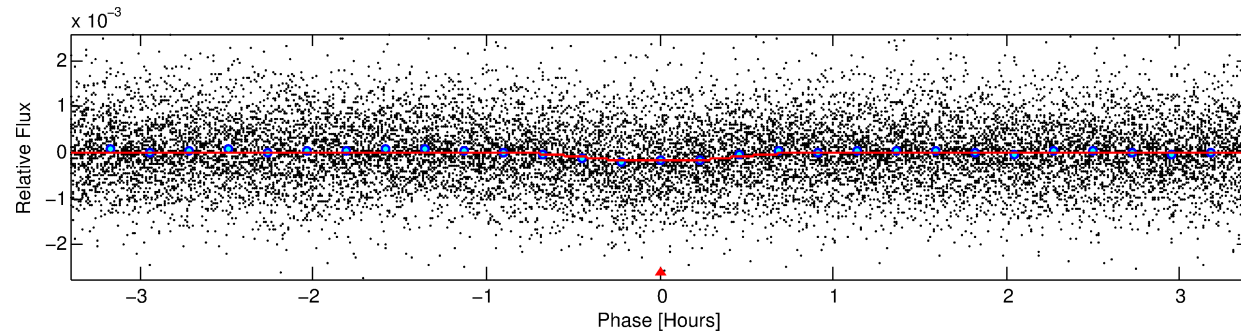
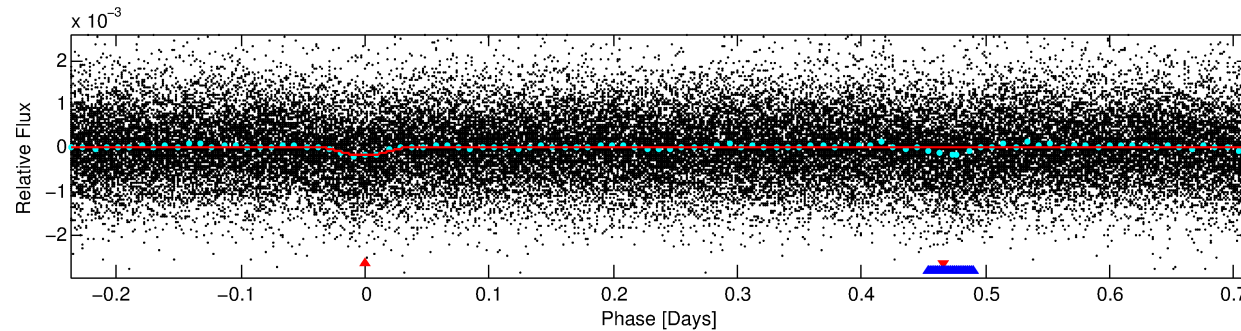
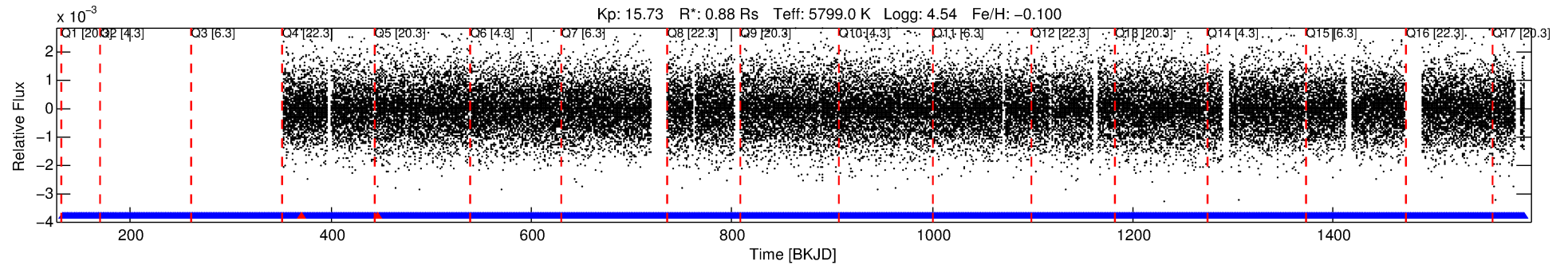
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005389632-01

No Significant Match Found

# DV One-Page Summary

KIC: 5389632 Candidate: 1 of 2 Period: 0.950 d



## DV Fit Results:

Period = 0.94964 [0.00001] d  
Epoch = 132.1929 [0.0020] BKJD  
Rp/R\* = 0.0140 [0.0101]  
a/R\* = 3.01 [9.46]  
b = 0.91 [0.68]  
Seff = 2224.46 [861.24]  
Teq = 1751 [170] K  
Rp = 1.34 [1.05] Re  
a = 0.0187 [0.0047] AU  
Ag = 13.11 [19.64] [0.62 $\sigma$ ]  
Teffp = 5152 [1881] K [1.80 $\sigma$ ]

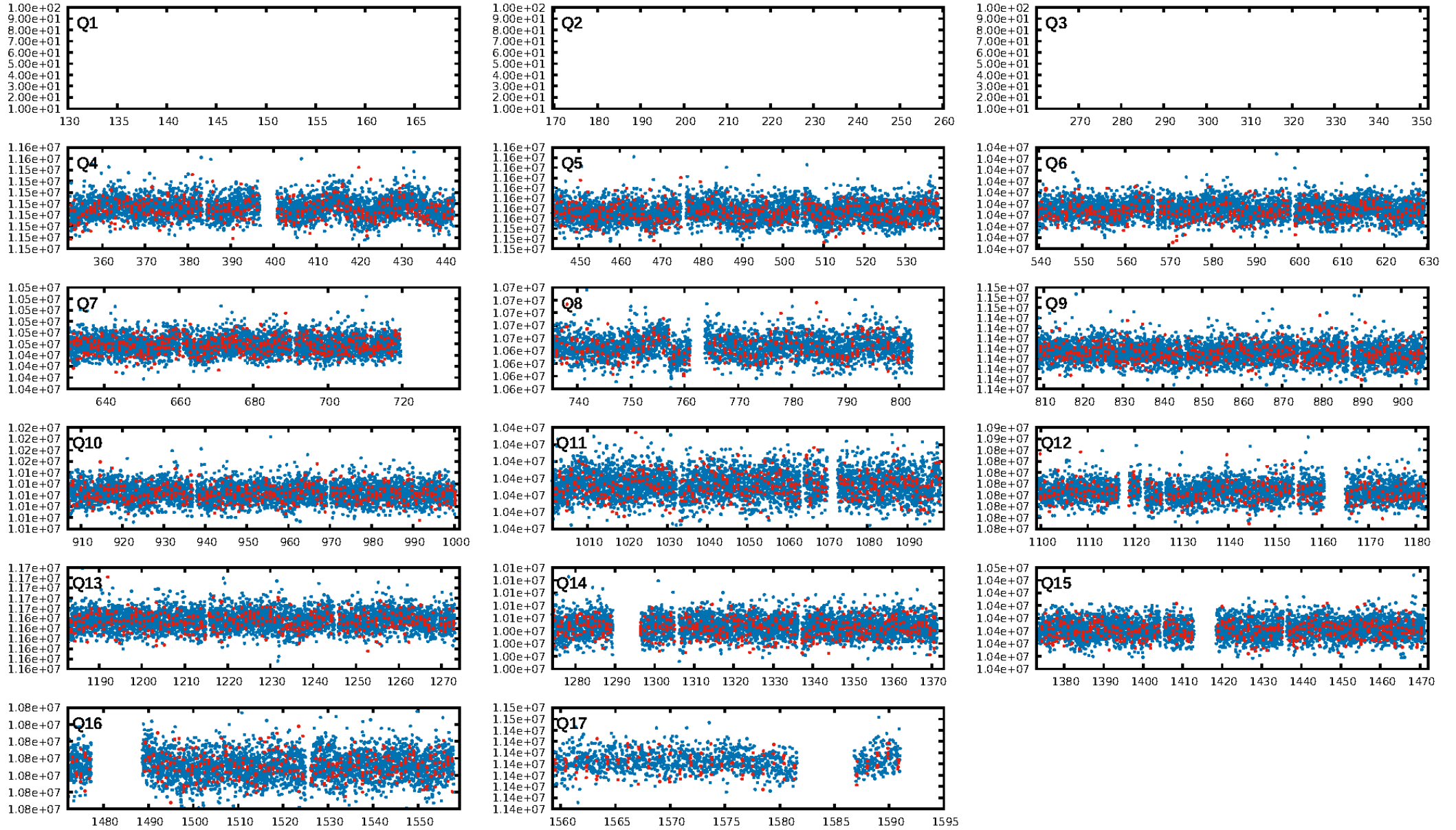
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.67e-17  
RollingBand-fgt: 1.00 [1163/1165]  
GhostDiagnostic-chr: -0.6987  
Centroid-sig: 0.0%  
Centroid-so: 7.447 arcsec [6.83 $\sigma$ ]  
OotOffset-rm: 9.468 arcsec [18.33 $\sigma$ ]  
KicOffset-rm: 9.166 arcsec [17.18 $\sigma$ ]  
OotOffset-st: 3/2/3/4 [12]  
KicOffset-st: 3/2/3/4 [12]  
DiffImageQuality-fgm: 0.83 [10/12]  
DiffImageOverlap-fno: 1.00 [14/14]

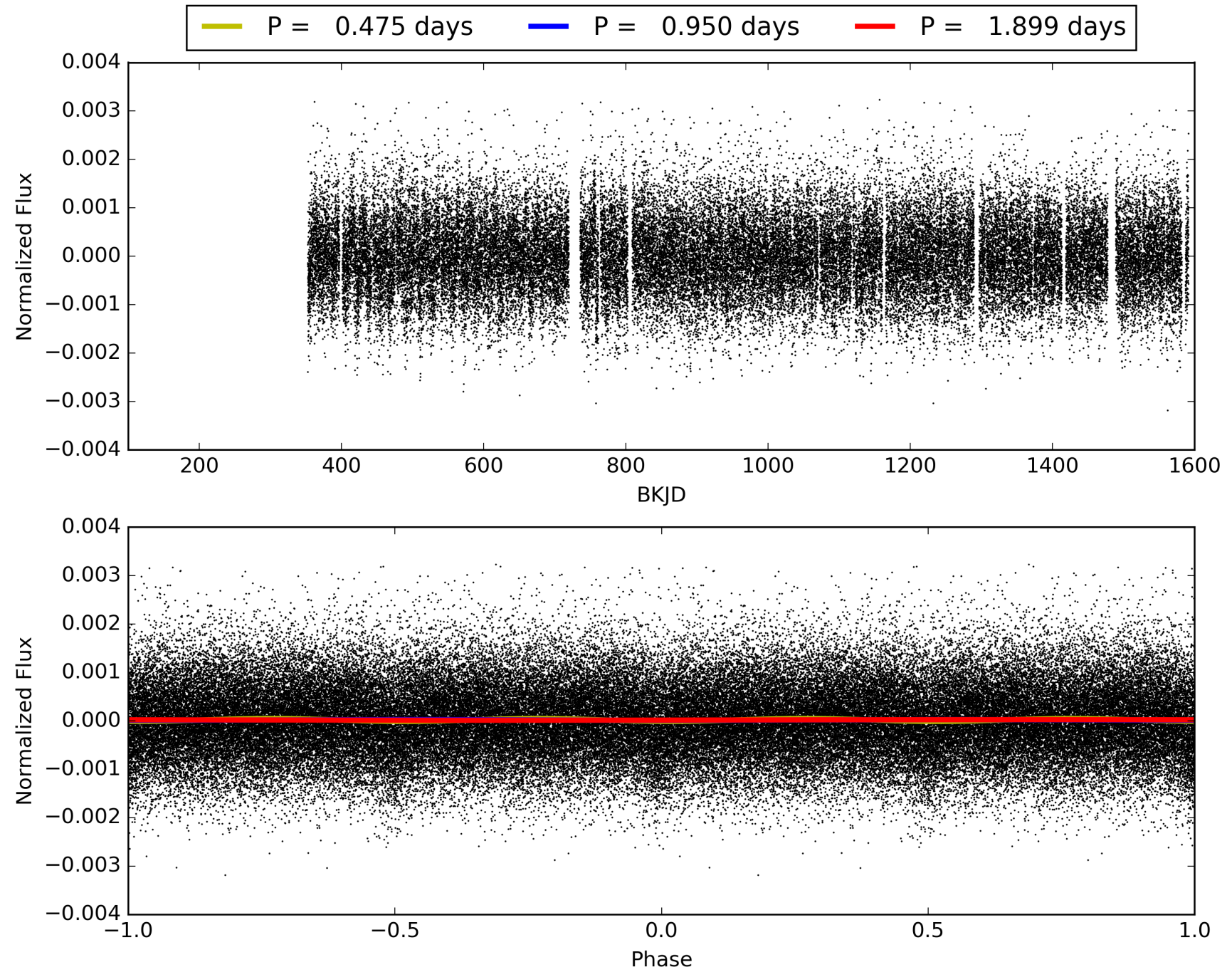
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 20:16:15 Z

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

# TCE 005389632-01, PDC Light Curves



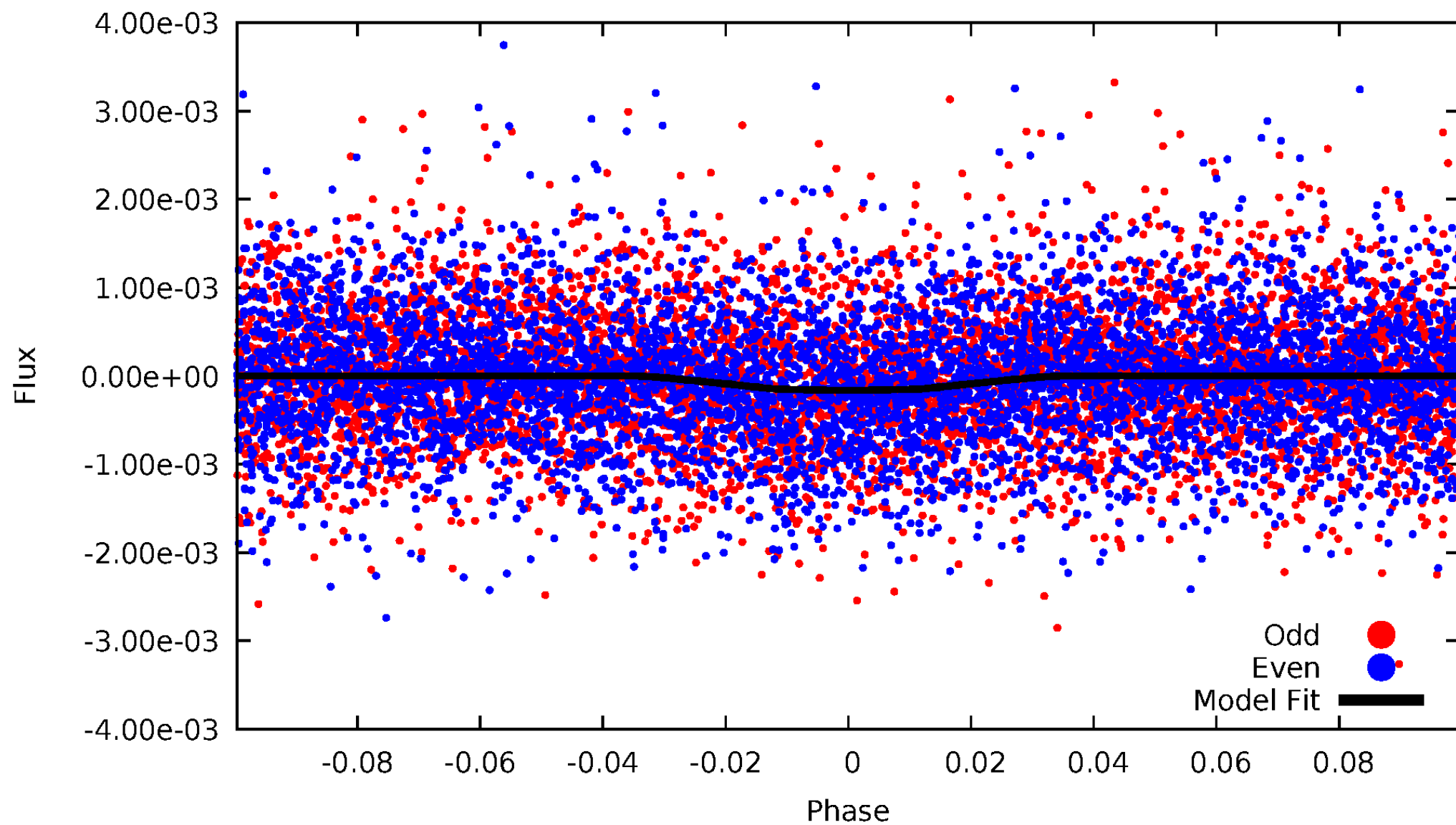
# TCE 005389632-01





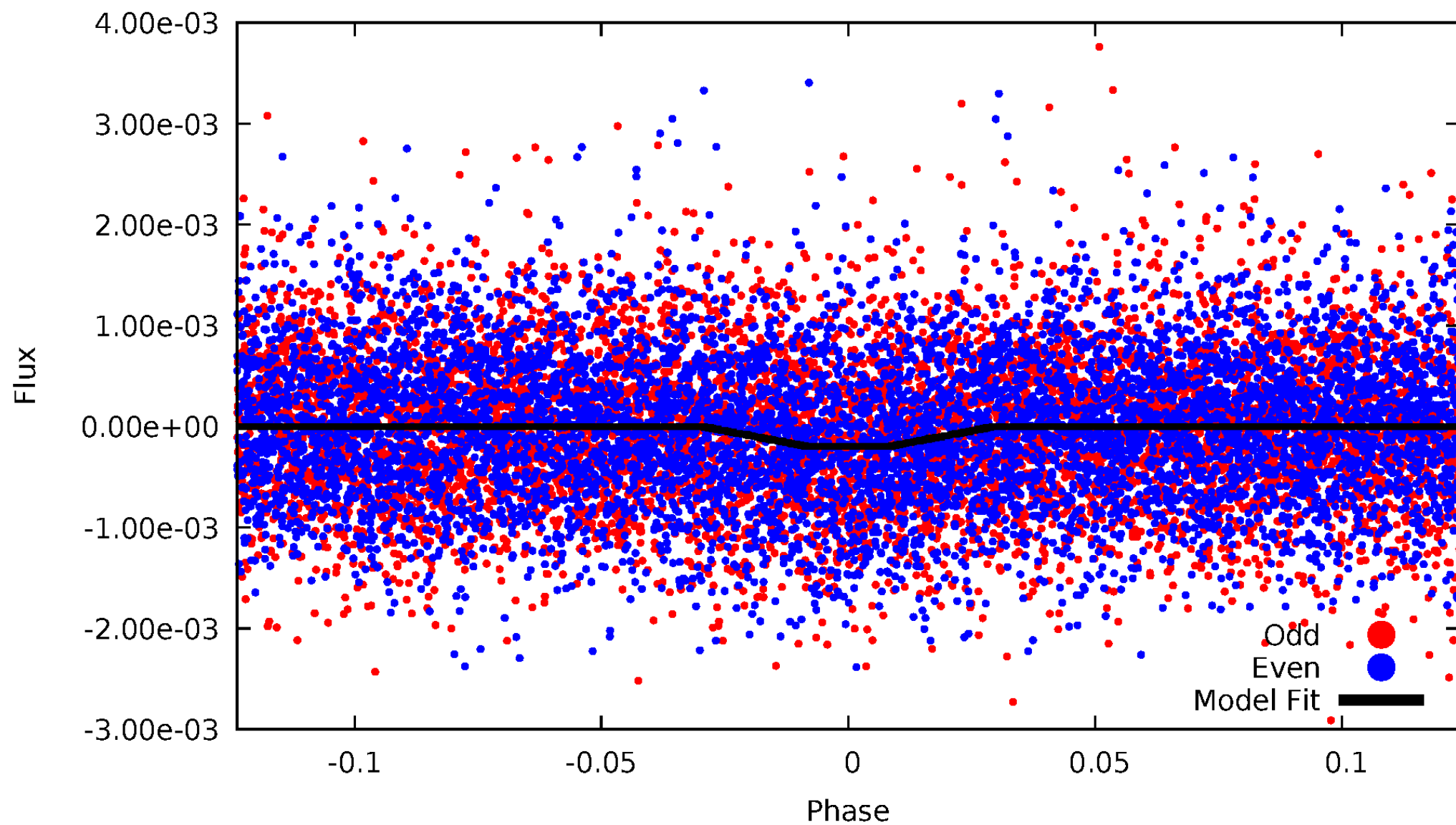
# DV Odd/Even

TCE 005389632-01



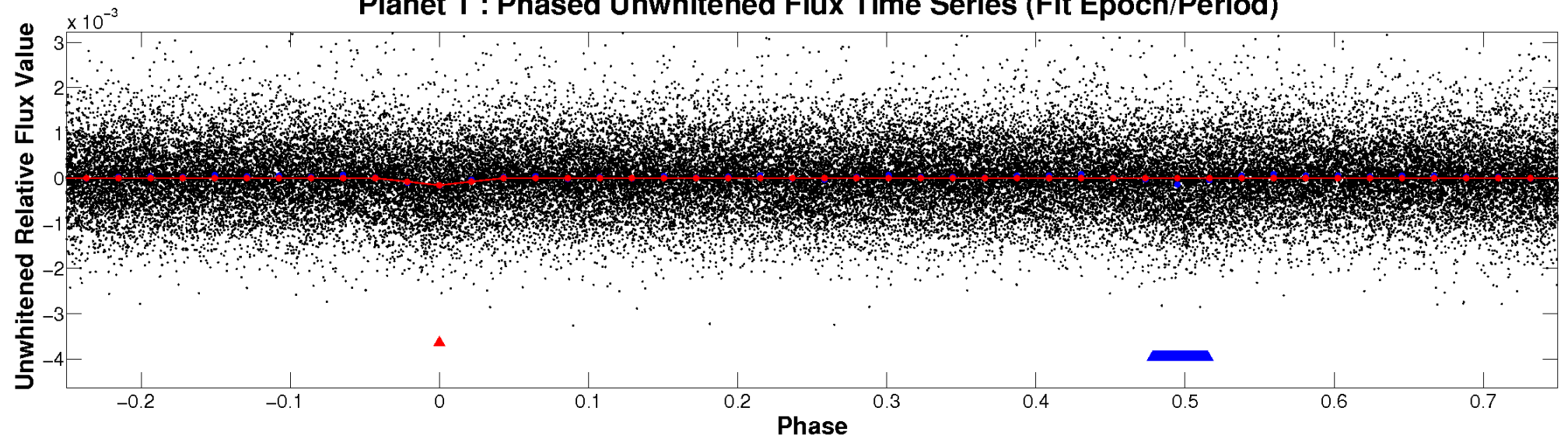
# ALT Odd/Even

TCE 005389632-01

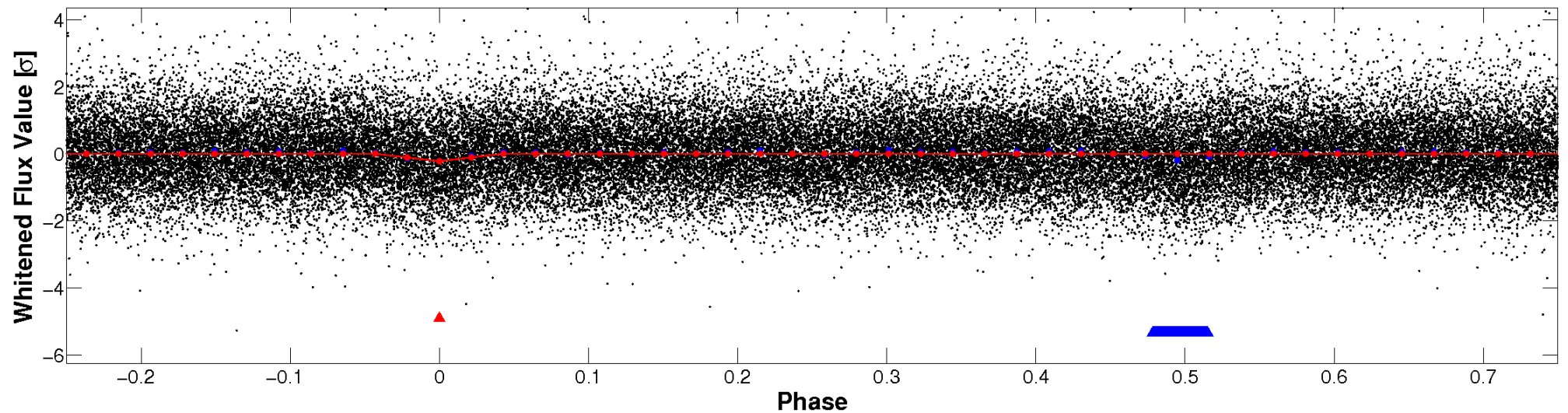


# Non-Whitened Vs. Whitened Light Curve

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

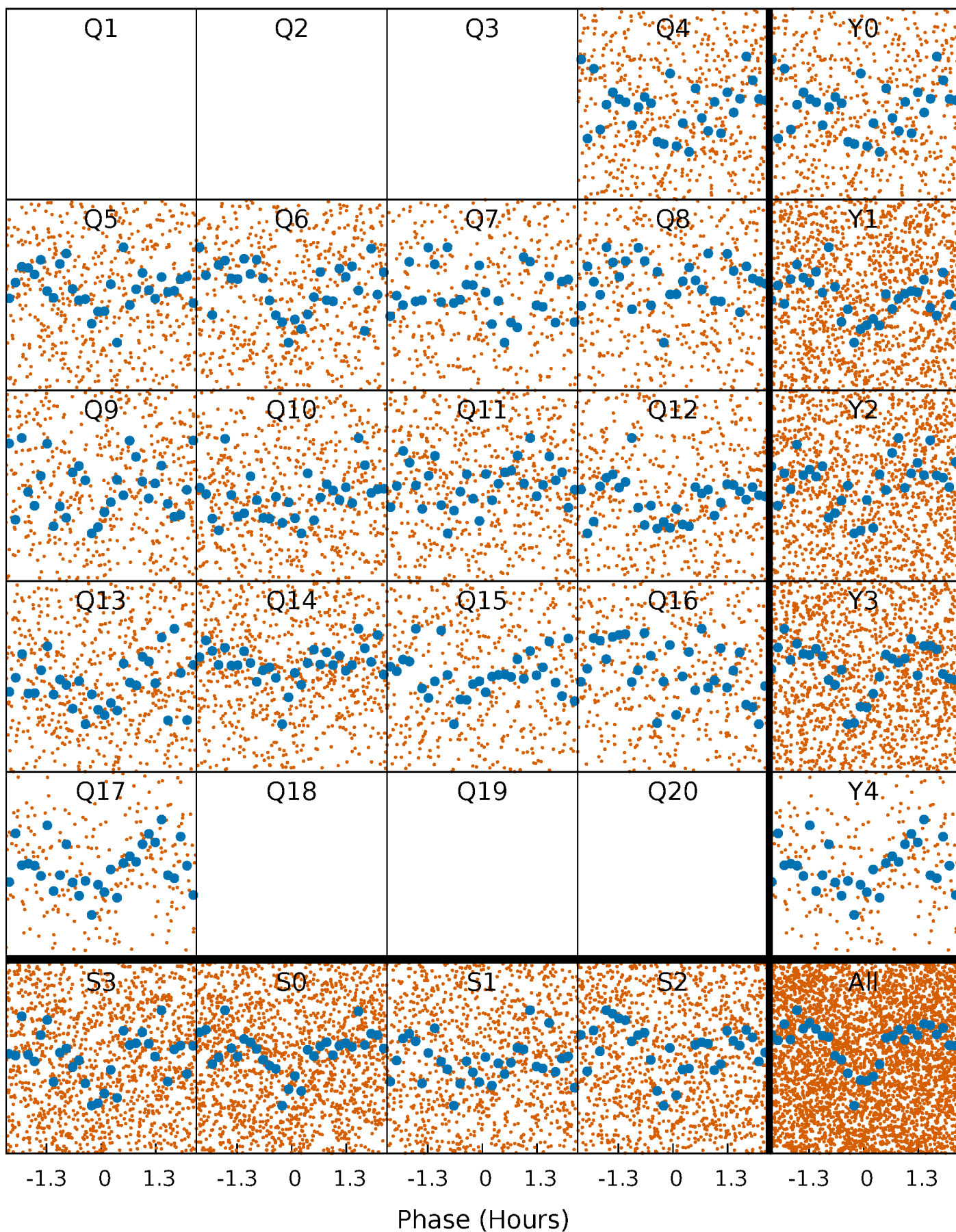


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

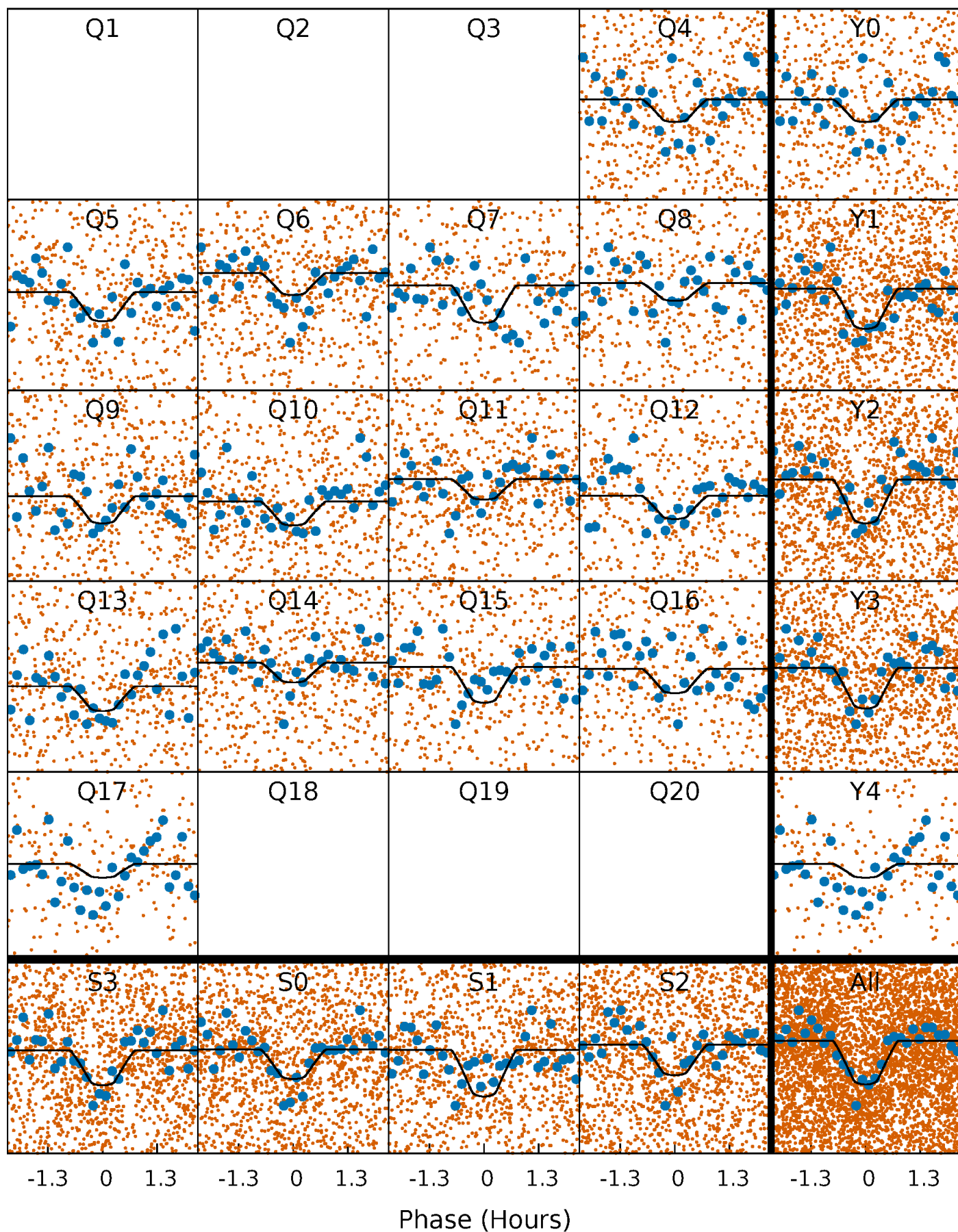
TCE 005389632-01 P= 0.949641 Days  $T_0=132.192866$  (BKJD)





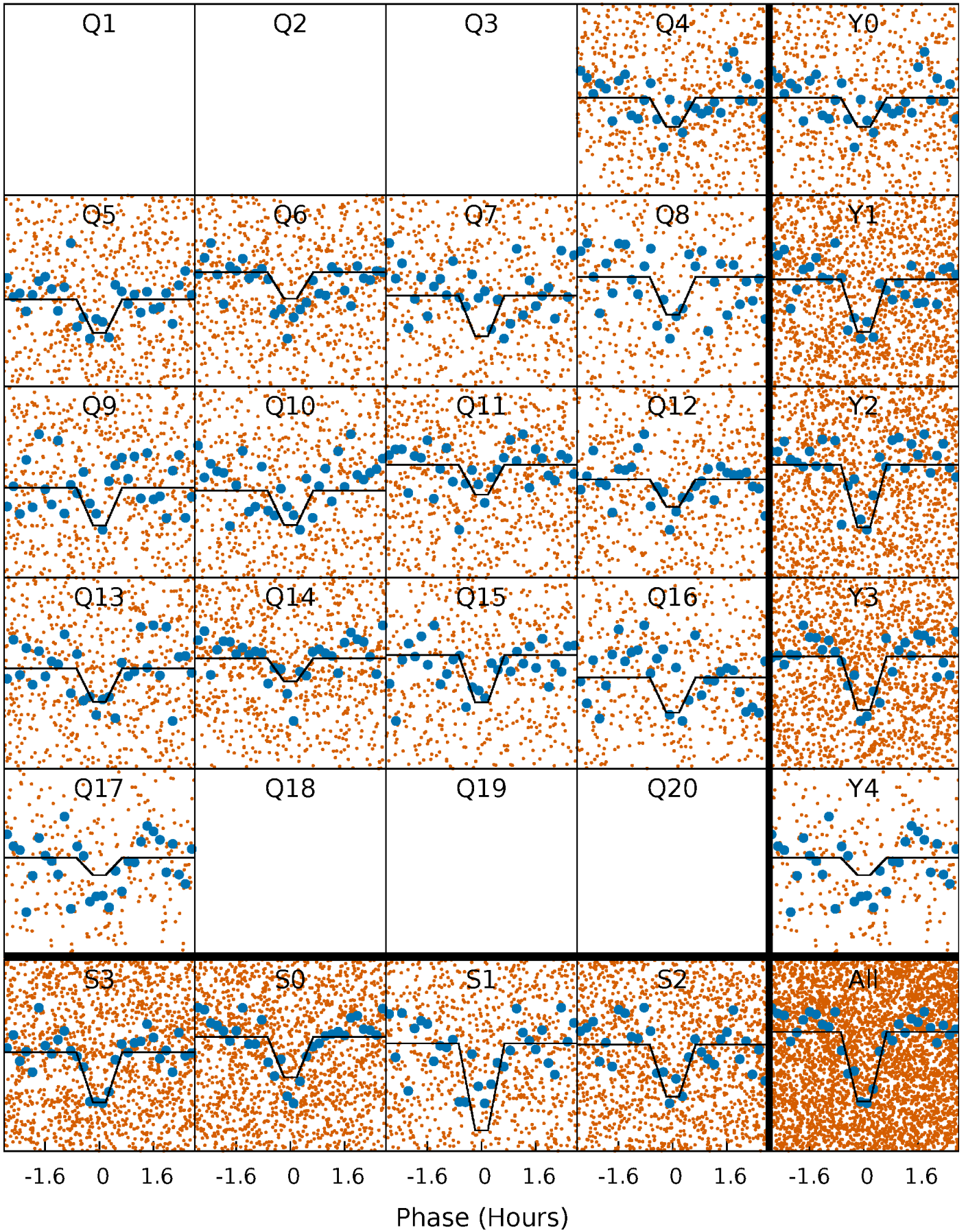
# DV Quarter-Phased Transit Curves

TCE 005389632-01 P= 0.949641 Days  $T_0=132.192866$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

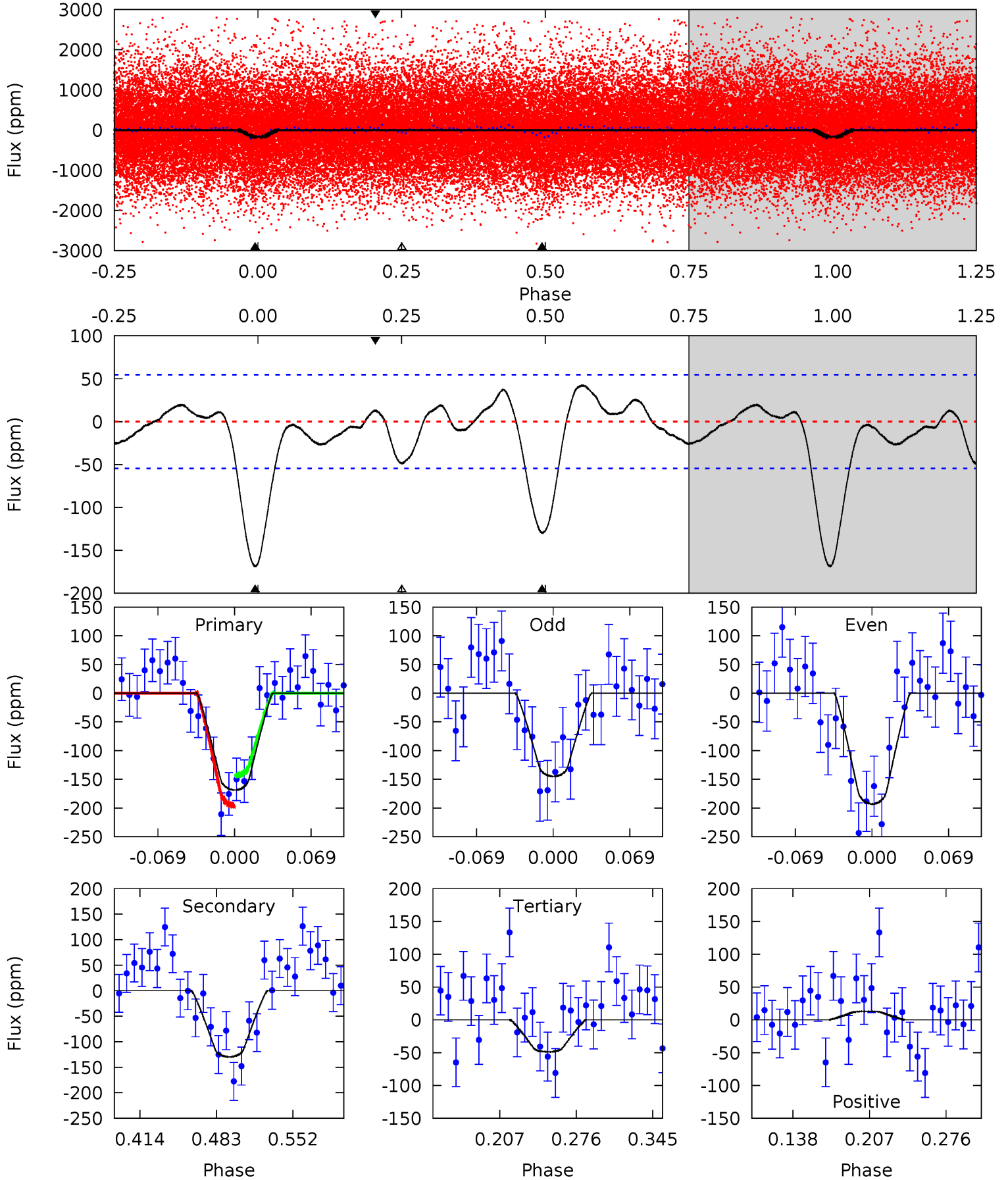
TCE 005389632-01 P= 0.949629 Days  $T_0=132.199021$  (BKJD)



# DV Model-Shift Uniqueness Test

005389632-01, P = 0.949641 Days, E = 132.192866 Days

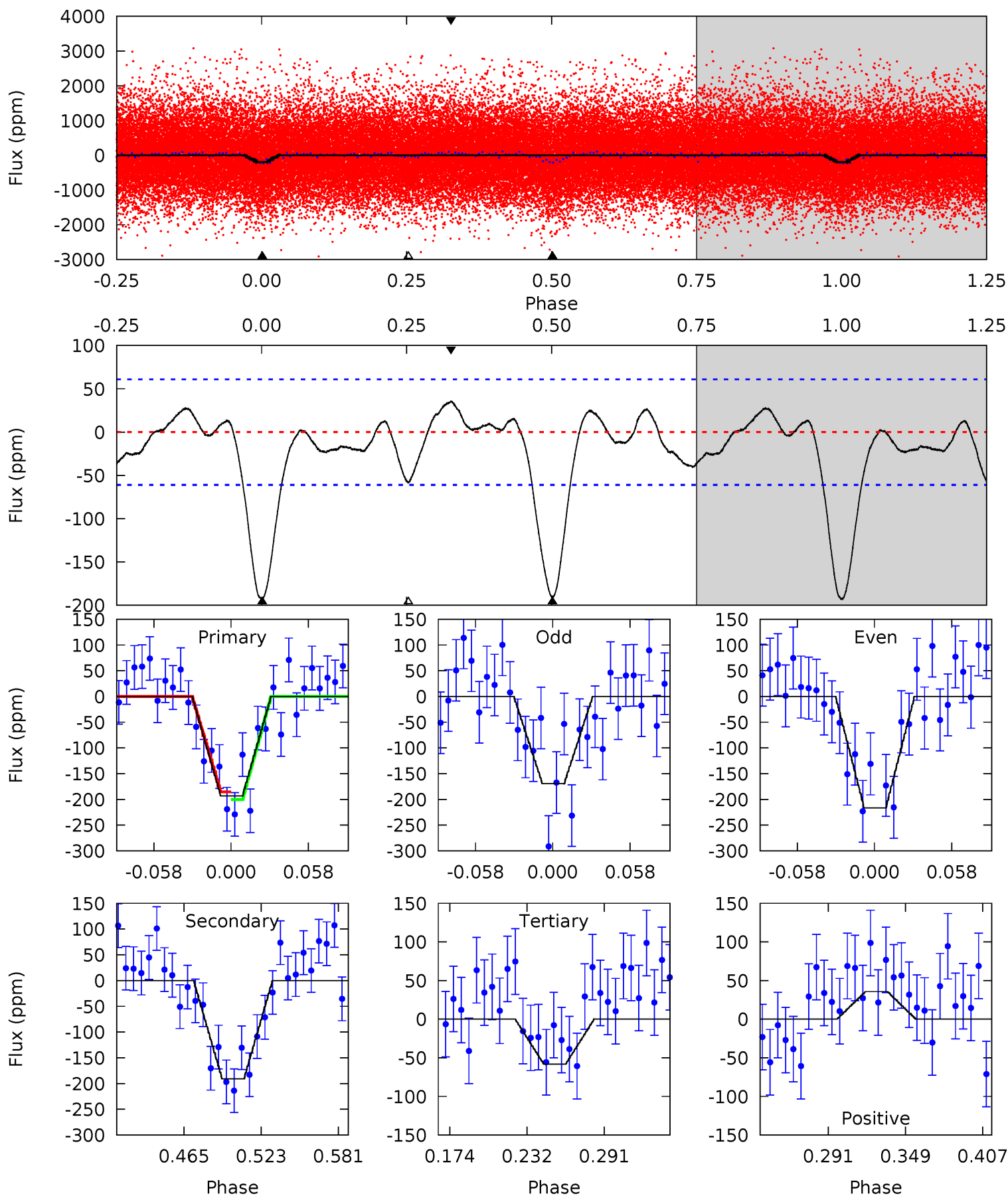
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	11.0	4.15	1.10	4.64	1.82	1.59	10.2	13.2	6.87	9.92	2.04	0.93	0.20	2.25



# Alt Model-Shift Uniqueness Test

005389632-01, P = 0.949629 Days, E = 132.199021 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
14.8	14.6	4.47	2.74	4.68	1.89	1.54	10.3	12.1	10.2	11.9	1.81	0.90	0.16	0.56





### Stellar Parameters For KIC 005389632

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5799^{+184}_{-204}$	$4.539^{+0.046}_{-0.196}$	$-0.100^{+0.300}_{-0.300}$	$0.878^{+0.262}_{-0.082}$	$0.975^{+0.104}_{-0.127}$	$2.026^{+0.389}_{-1.024}$
	+3%/-4%	+1%/-4%	+300%/-300%	+30%/-9%	+11%/-13%	+19%/-51%
Source	KIC0	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 005389632-01 / KOI 7726.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-130 \pm 12$	$1.50^{+1.00}_{-0.89}$	$2510^{+179}_{-127}$	$5099^{+3042}_{-989}$	$11^{+59}_{-7}$
Alt.	$-191 \pm 13$	$1.55^{+0.95}_{-0.94}$	$2495^{+175}_{-124}$	$5457^{+3872}_{-1037}$	$15^{+83}_{-10}$

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

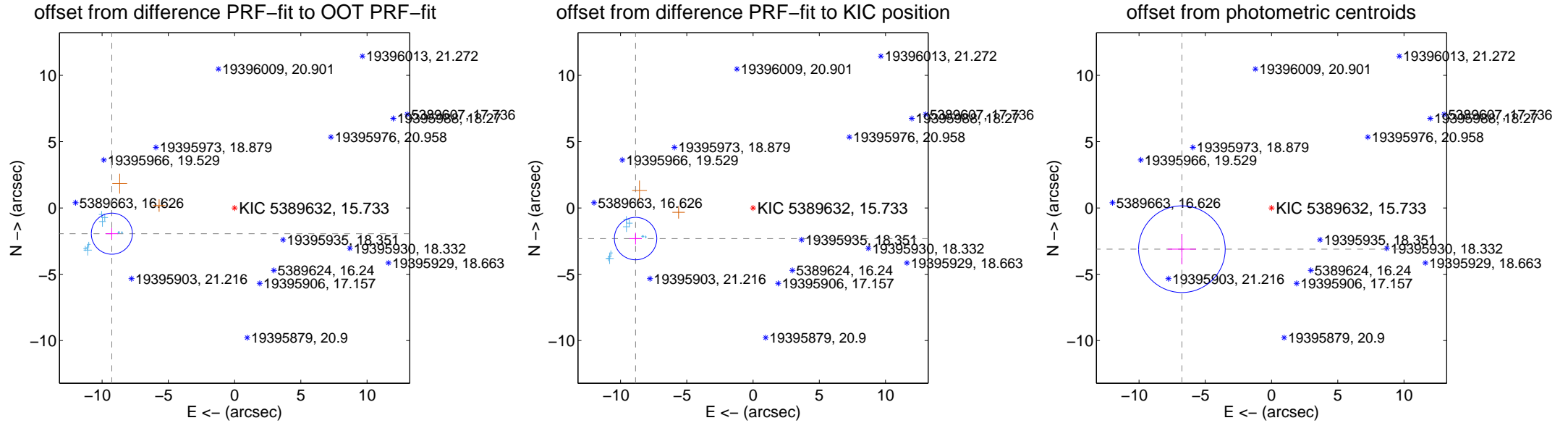
## DV Centroid Data

Supplemental centroid analysis for 005389632-01. Kepler magnitude: 15.73. Transit SNR 9.36

There are 10 quarters with good PRF difference image offsets

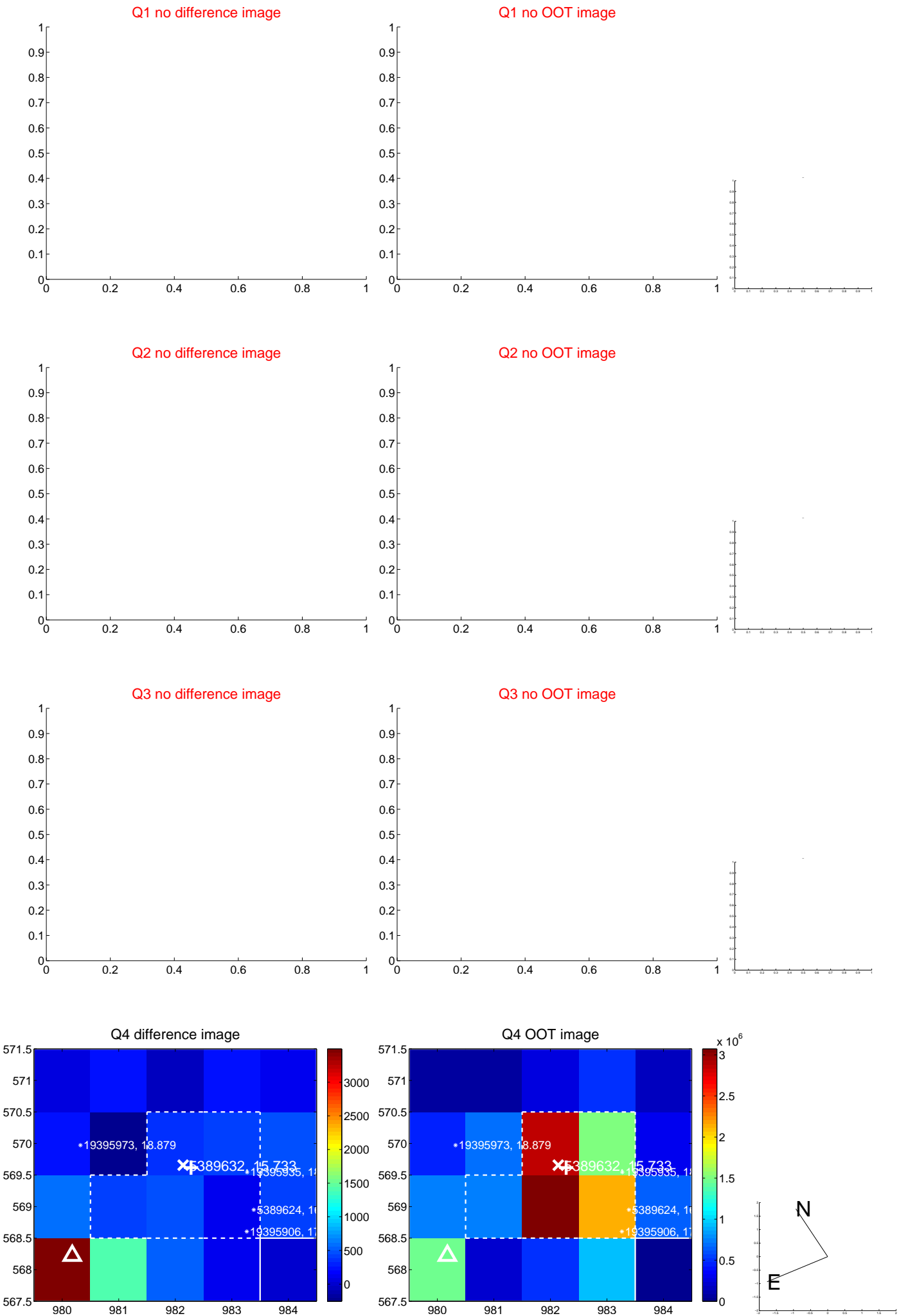
The direct PRF centroid is offset from the target star catalog position by about 0.68 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$9.468 \pm 0.516$	18.33	$9.267 \pm 0.467$	$-1.941 \pm 0.432$
PRF-fit source offset from KIC position	$9.166 \pm 0.533$	17.18	$8.870 \pm 0.464$	$-2.311 \pm 0.446$
photometric centroid source offset	$7.45 \pm 1.09$	6.83	$6.77 \pm 1.08$	$-3.11 \pm 1.14$

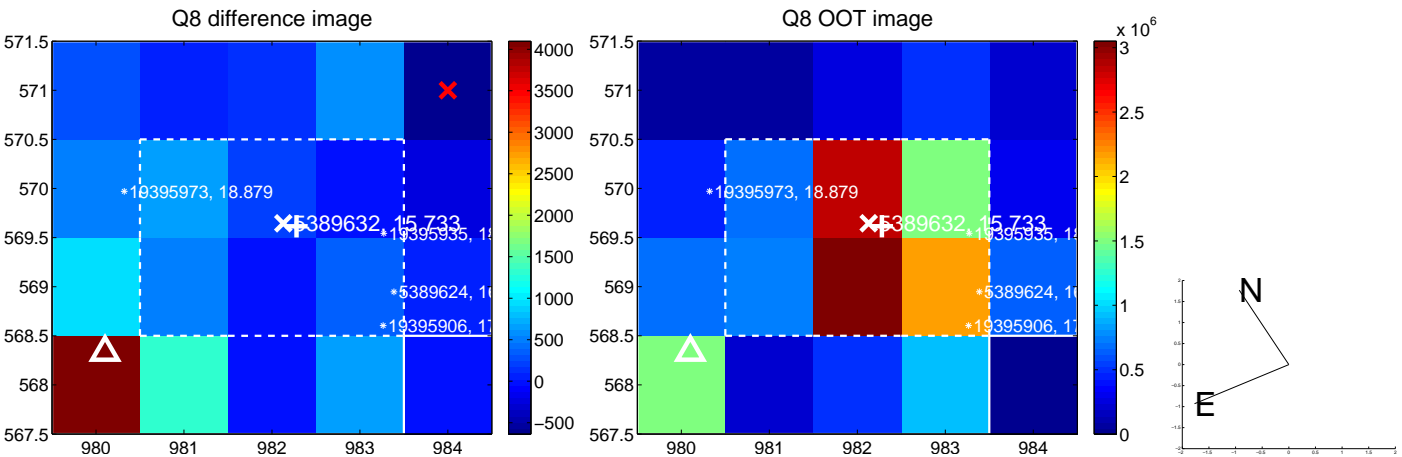
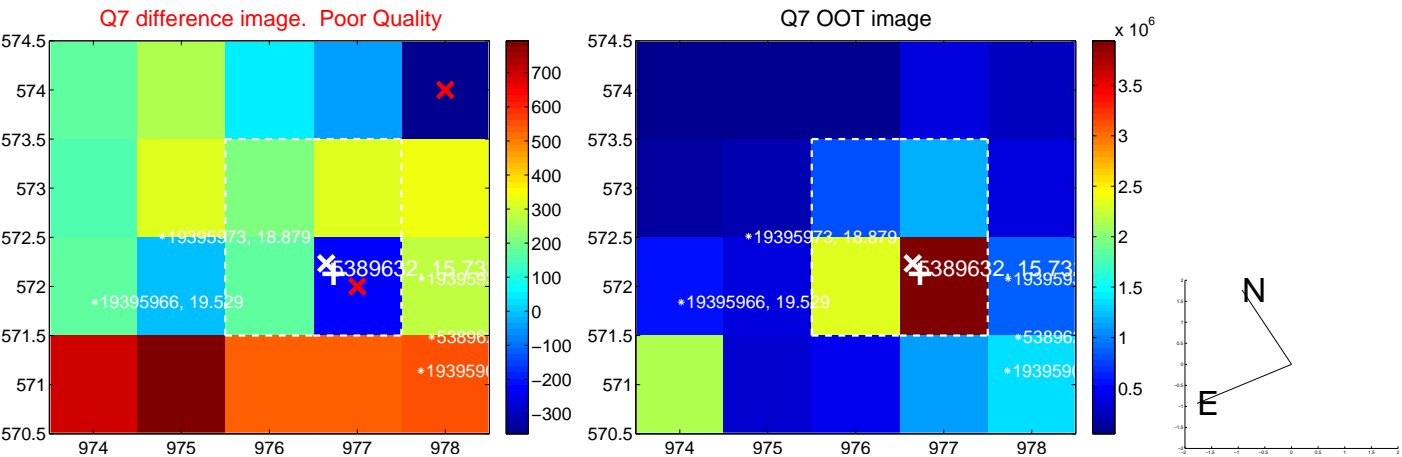
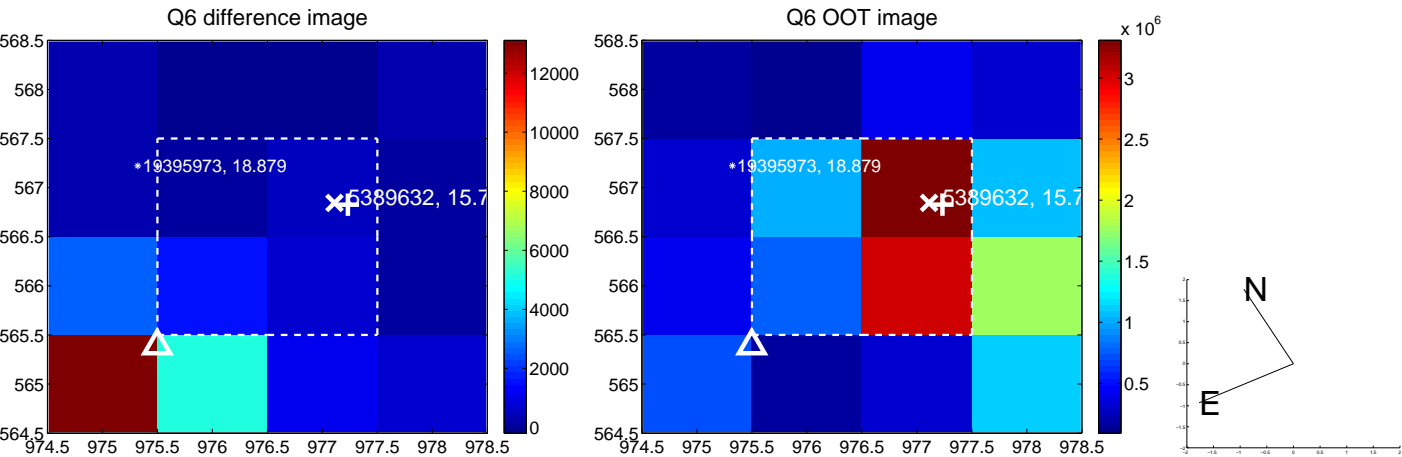
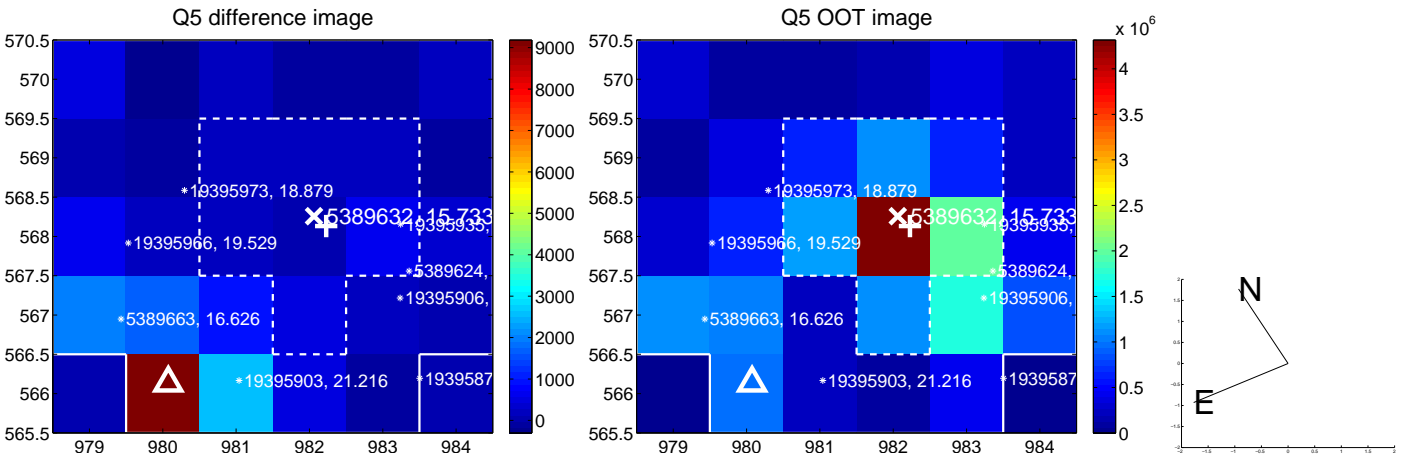


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

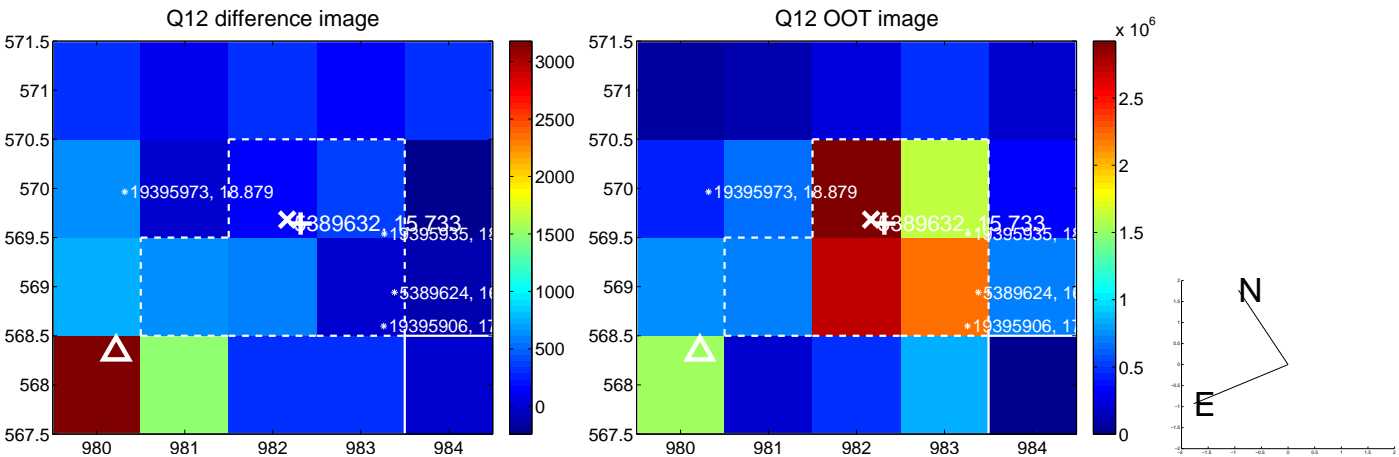
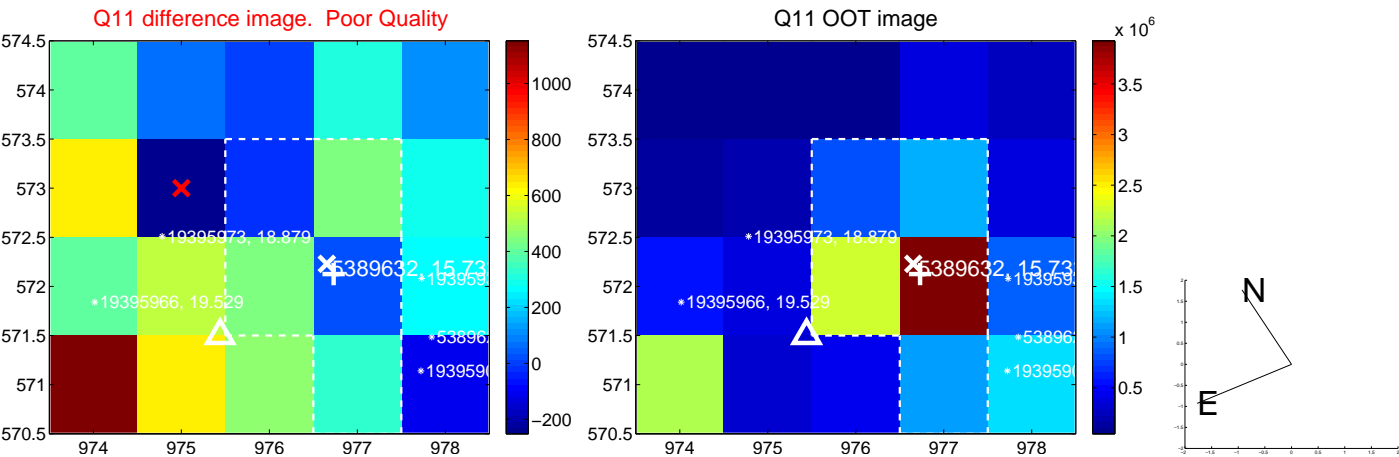
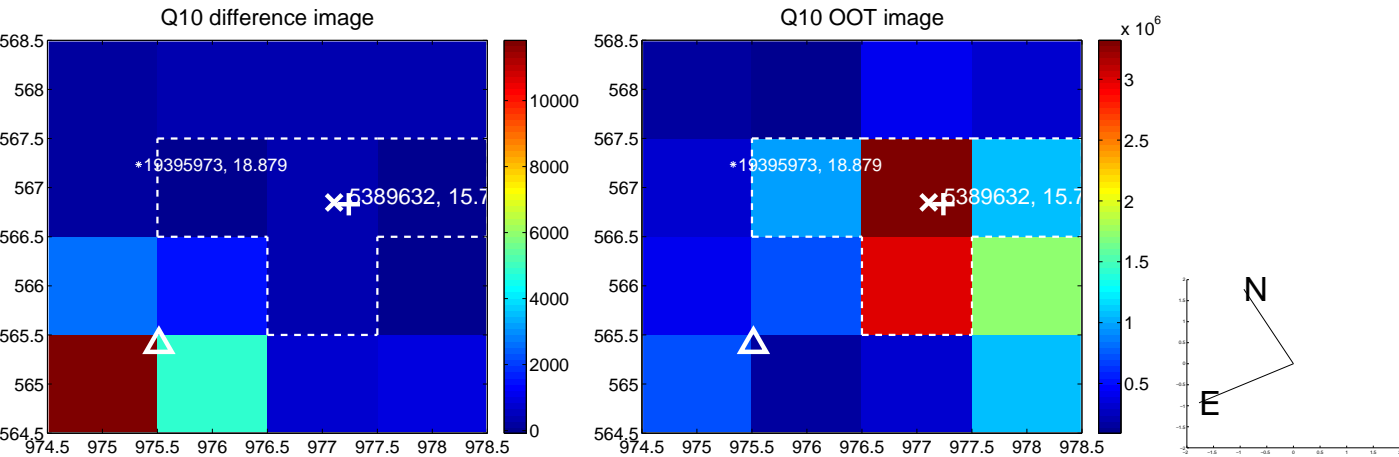
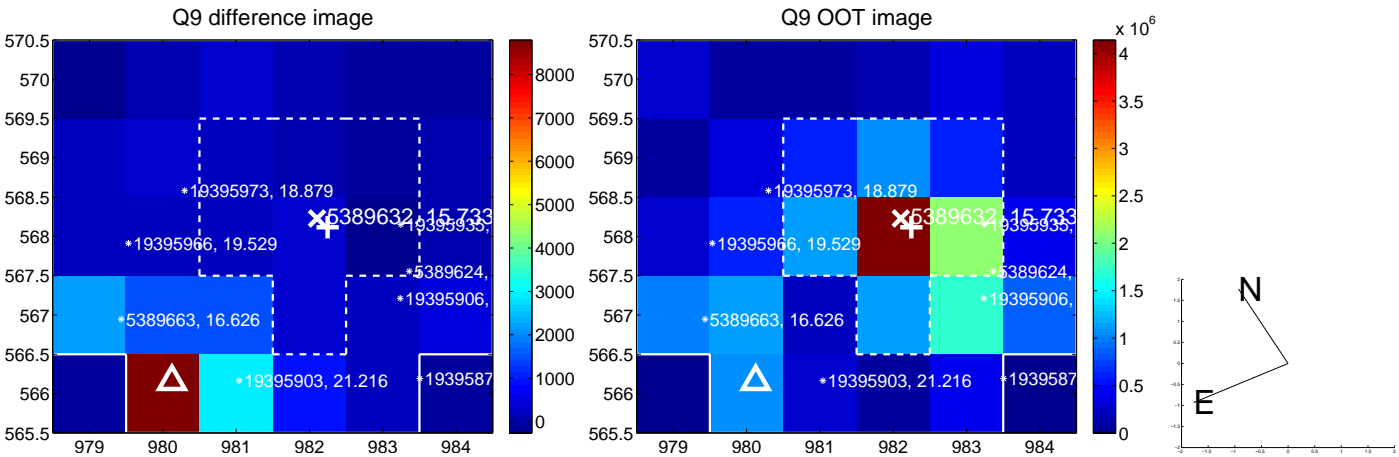


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

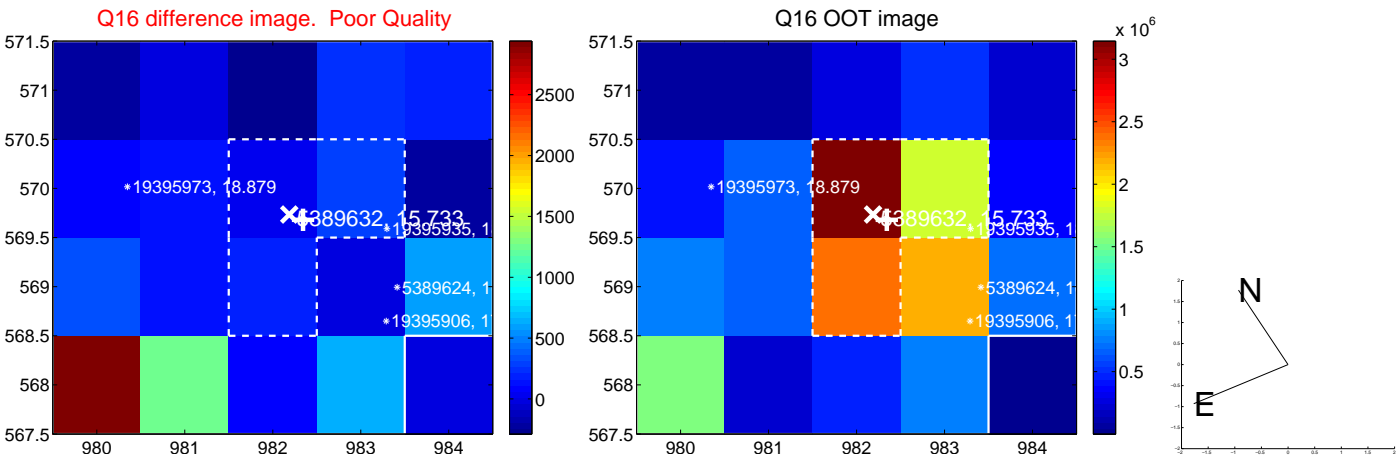
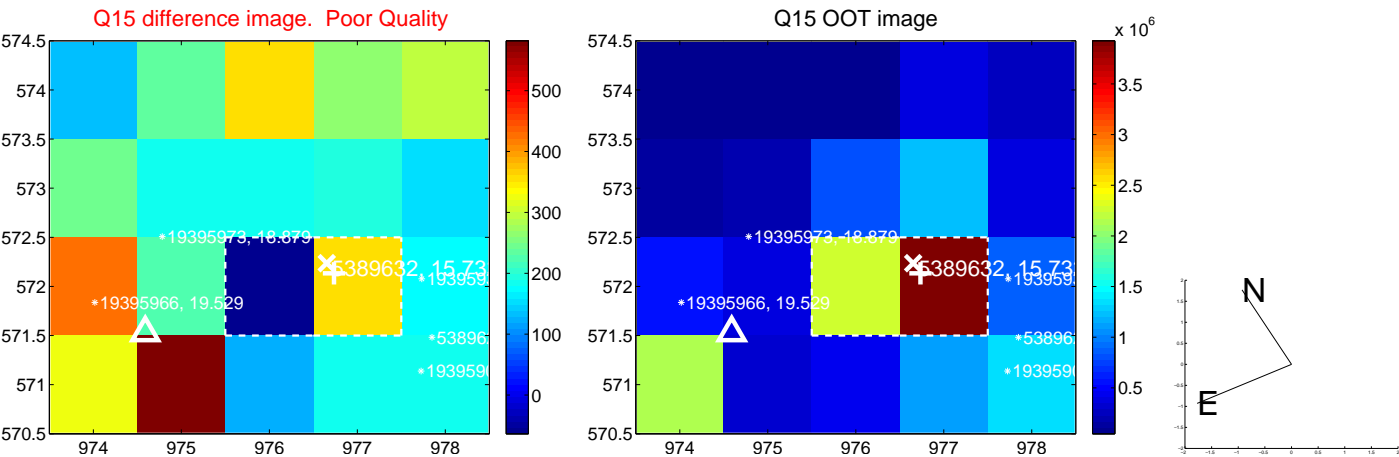
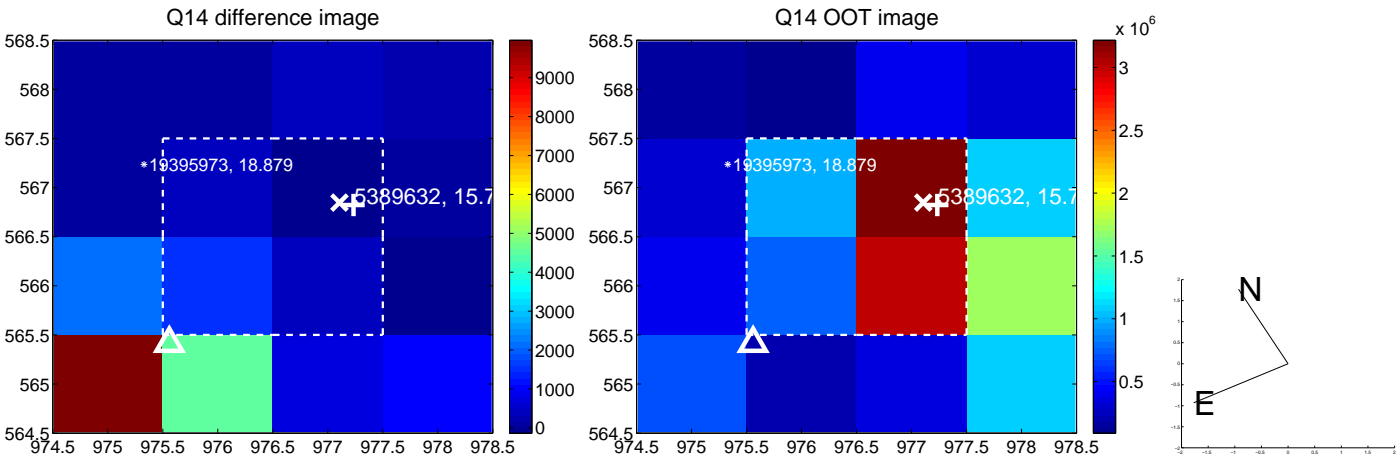
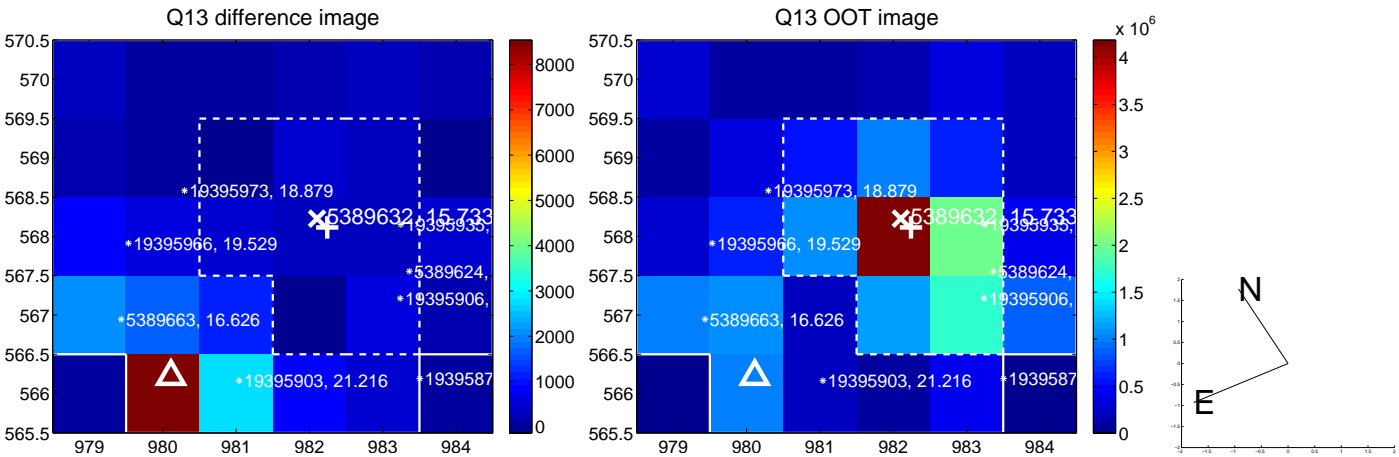




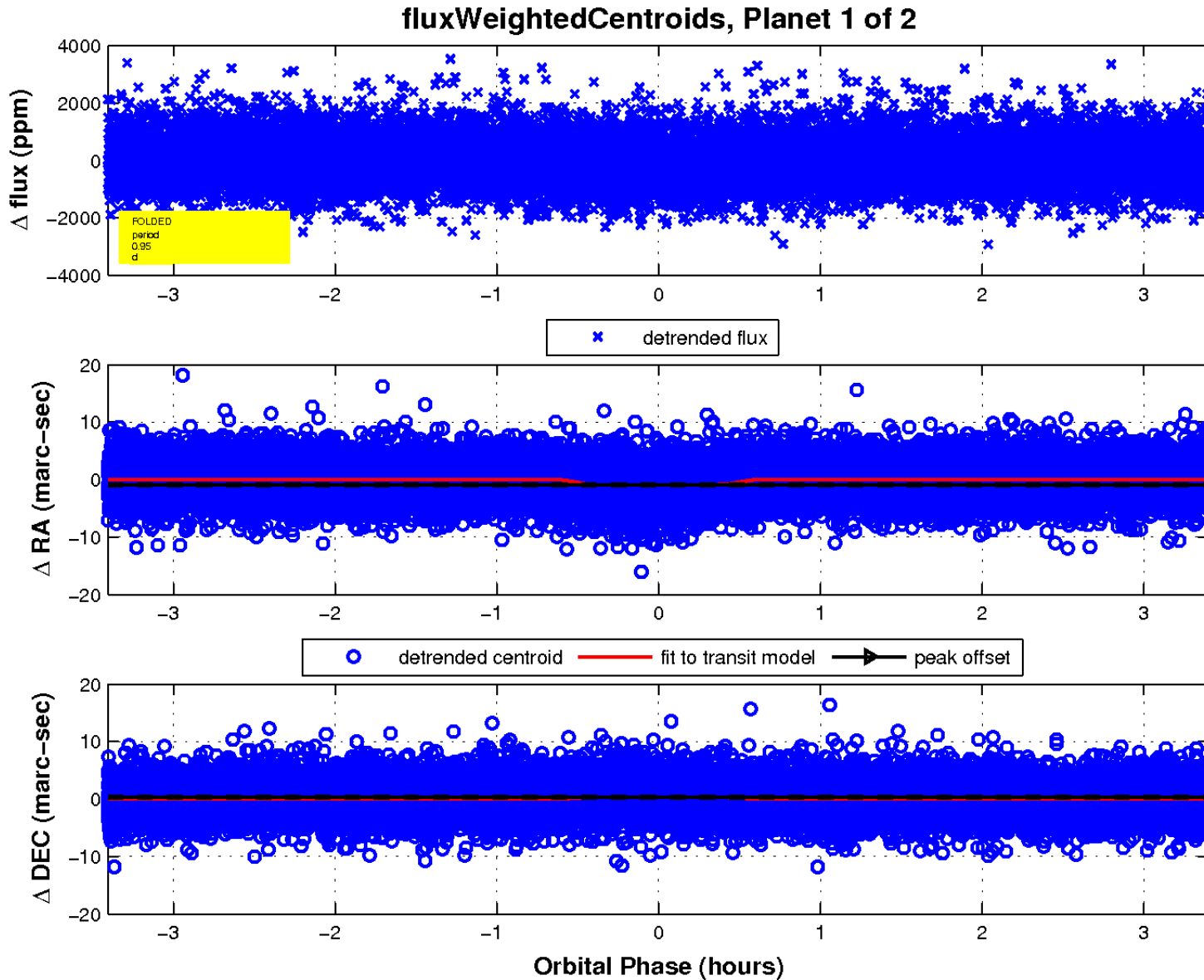
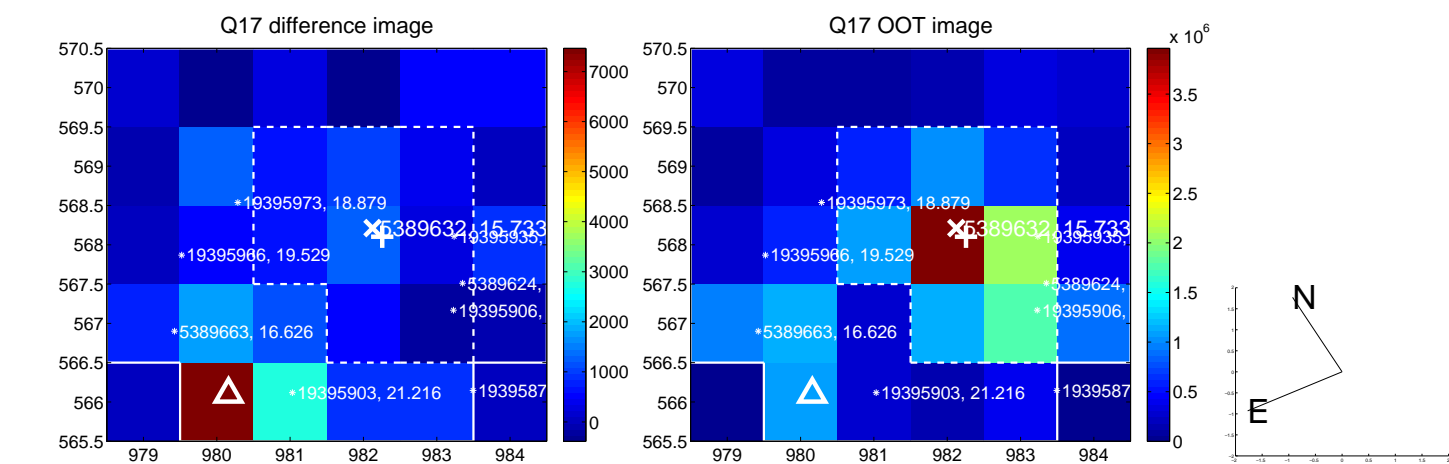
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

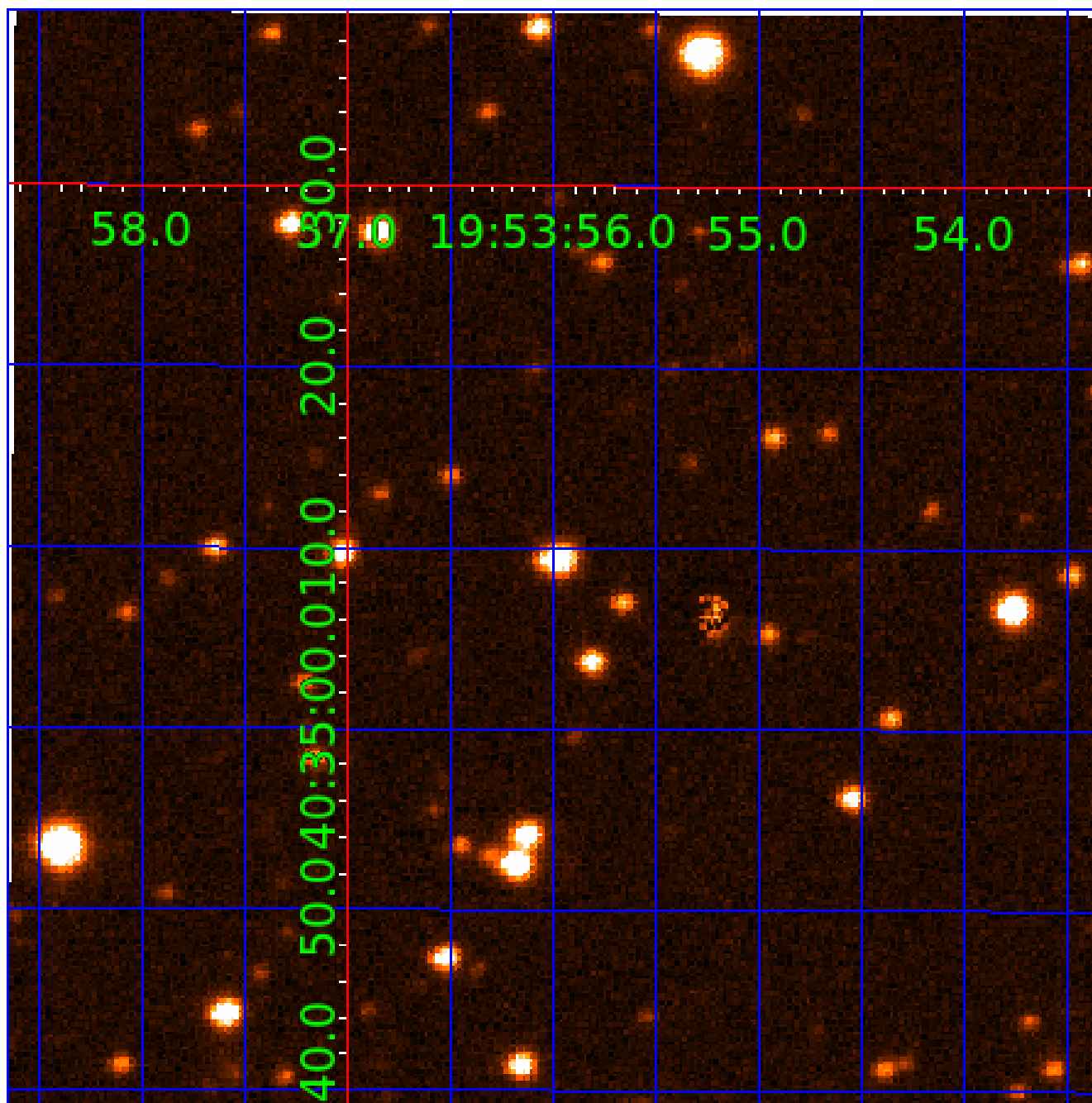


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005389632

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005389632-01	OBS	7726.01	0.949641	132.192866	159.5	1.135	8.1	9.4	0.88	5799	1.34	2224.45
005389632-02	OBS	No	0.949618	131.732577	181.1	0.998	8.2	10.2	0.88	5799	1.18	2224.53

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005389632-01	OBS	FP	0.01	0	0	1	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
005389632-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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

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

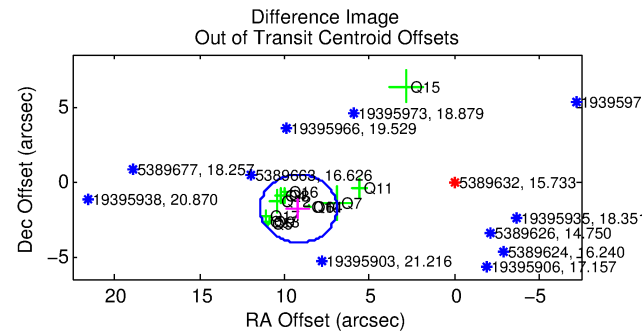
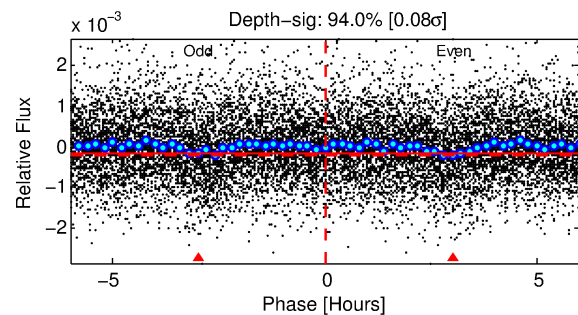
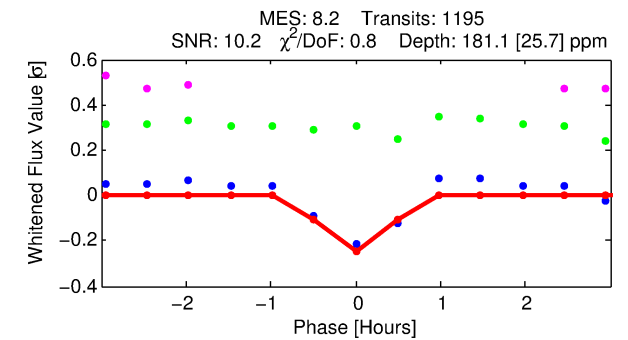
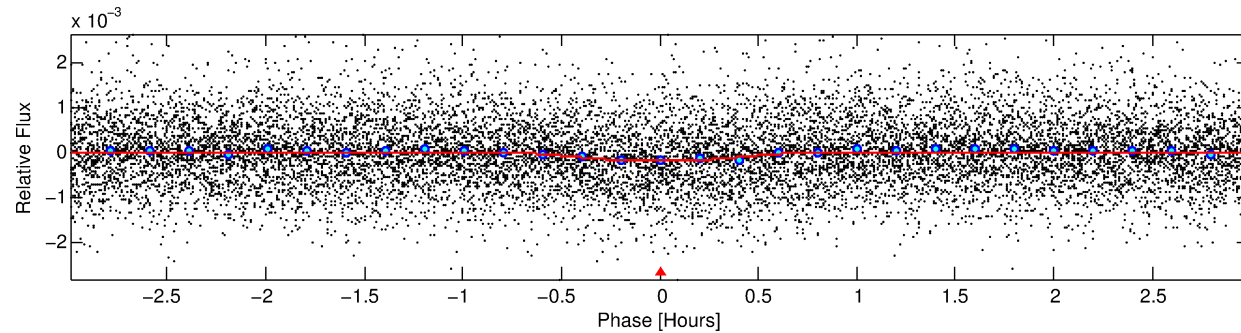
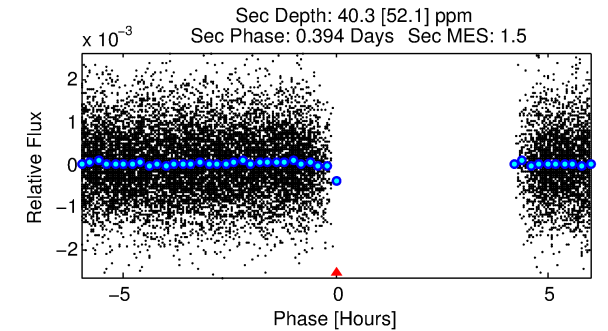
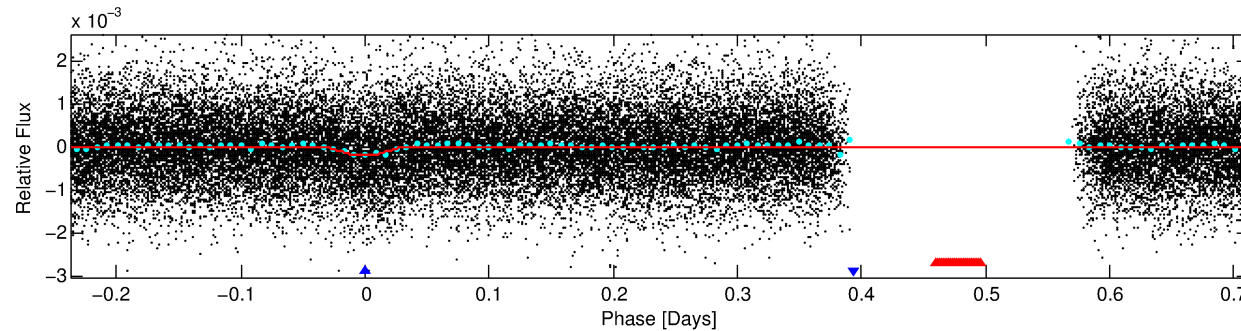
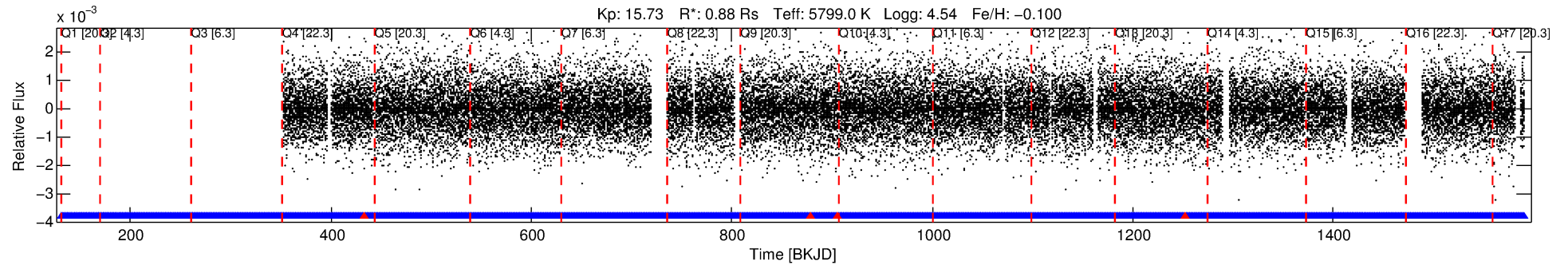
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005389632-02

No Significant Match Found

# DV One-Page Summary

KIC: 5389632 Candidate: 2 of 2 Period: 0.950 d



## DV Fit Results:

Period = 0.94962 [0.00001] d  
Epoch = 131.7326 [0.0018] BKJD  
Rp/R\* = 0.0124 [0.0216]  
a/R\* = 7.35 [57.12]  
b = 0.10 [76.56]  
Seff = 2224.53 [861.27]  
Teff = 1751 [170] K  
Rp = 1.18 [2.10] Re  
a = 0.0187 [0.0047] AU  
Ag = 5.56 [20.86] [0.22 $\sigma$ ]  
Teffp = 4157 [3886] K [0.62 $\sigma$ ]

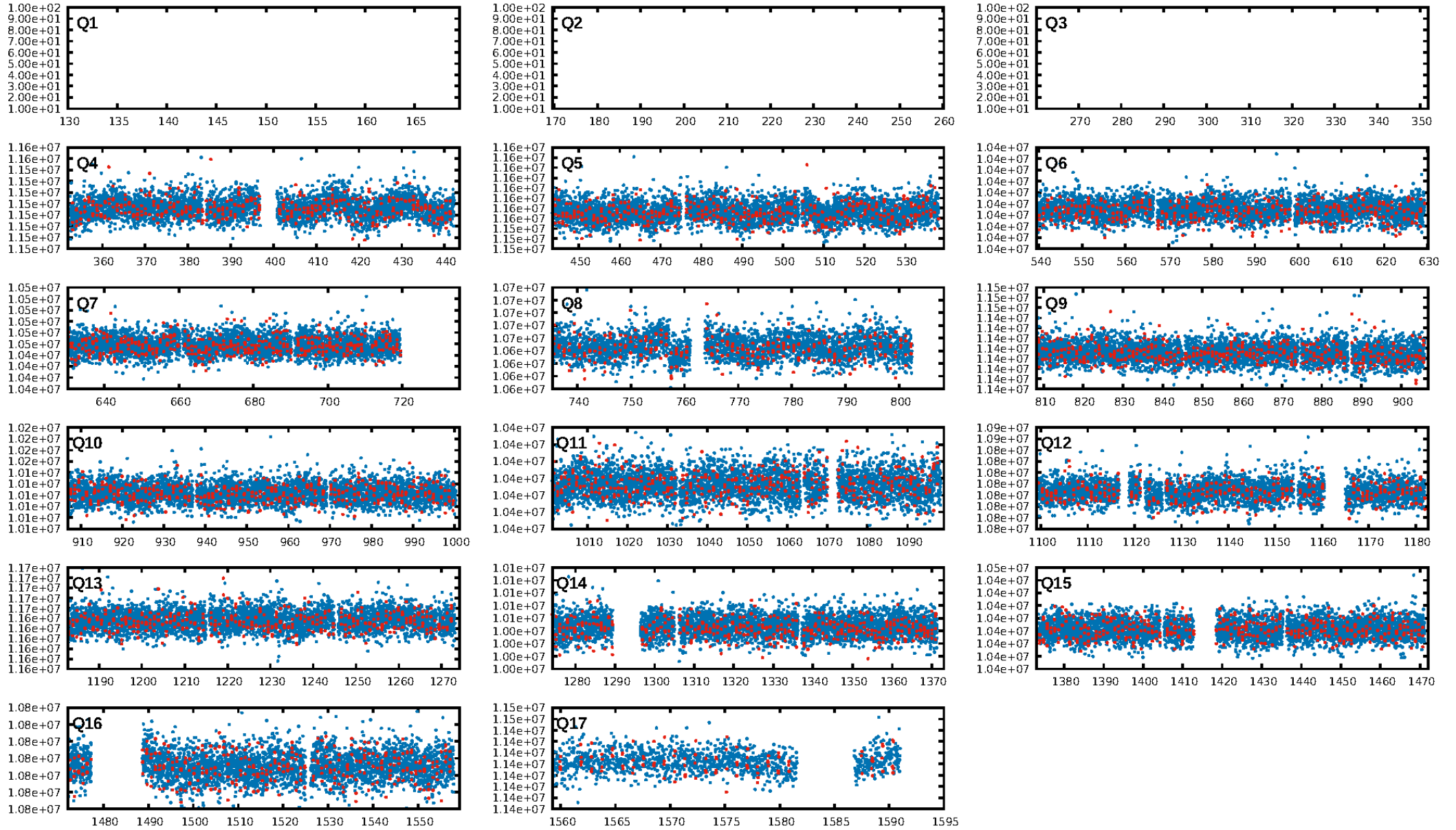
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.51e-18  
RollingBand-fgt: 1.00 [1165/1169]  
GhostDiagnostic-chr: -0.6075  
Centroid-sig: 0.0%  
Centroid-so: 11.158 arcsec [11.08 $\sigma$ ]  
OotOffset-rm: 9.346 arcsec [12.36 $\sigma$ ]  
KicOffset-rm: 9.024 arcsec [12.52 $\sigma$ ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.79 [11/14]  
DiffImageOverlap-fno: 1.00 [14/14]

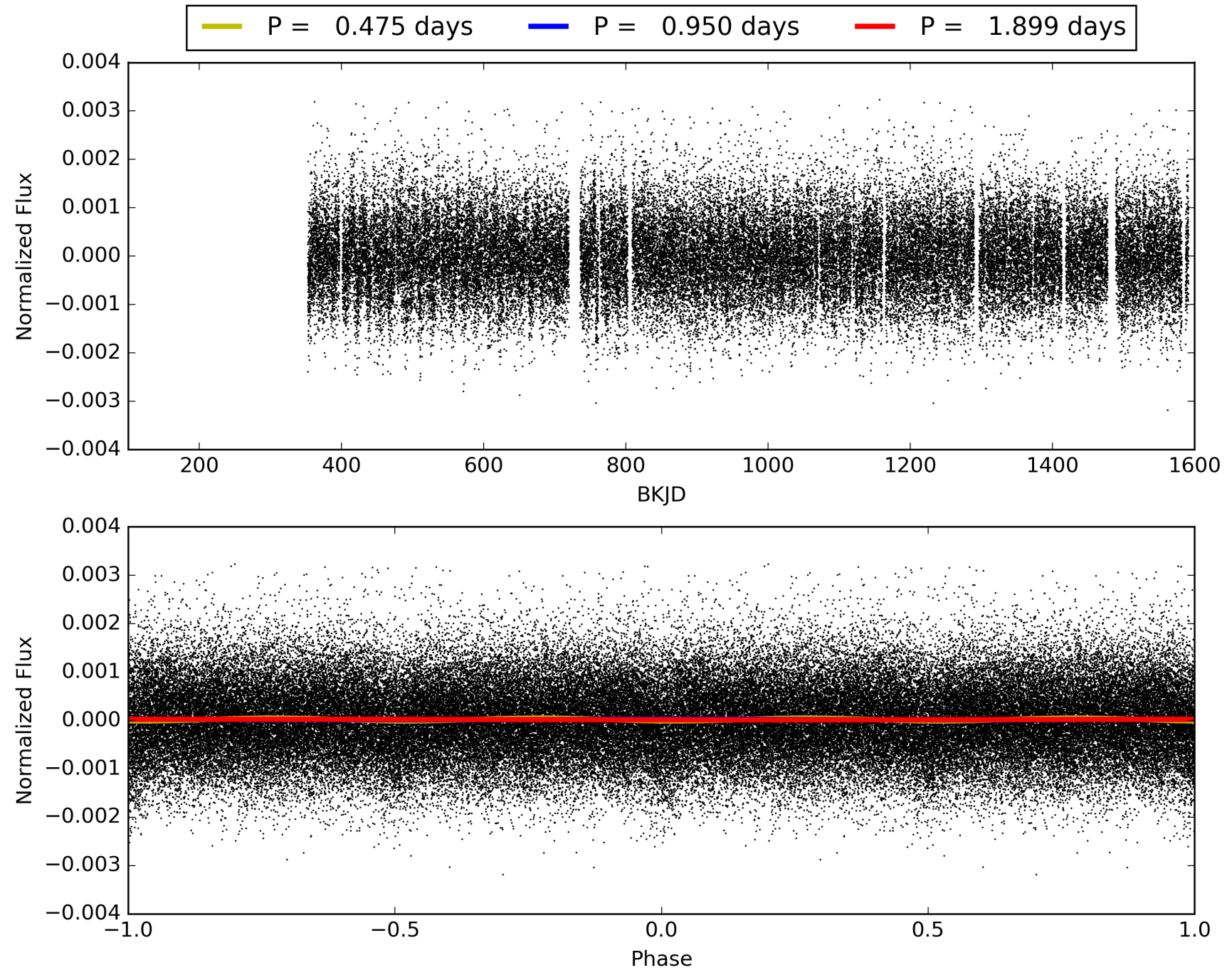
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 20:16:23 Z

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

# TCE 005389632-02, PDC Light Curves



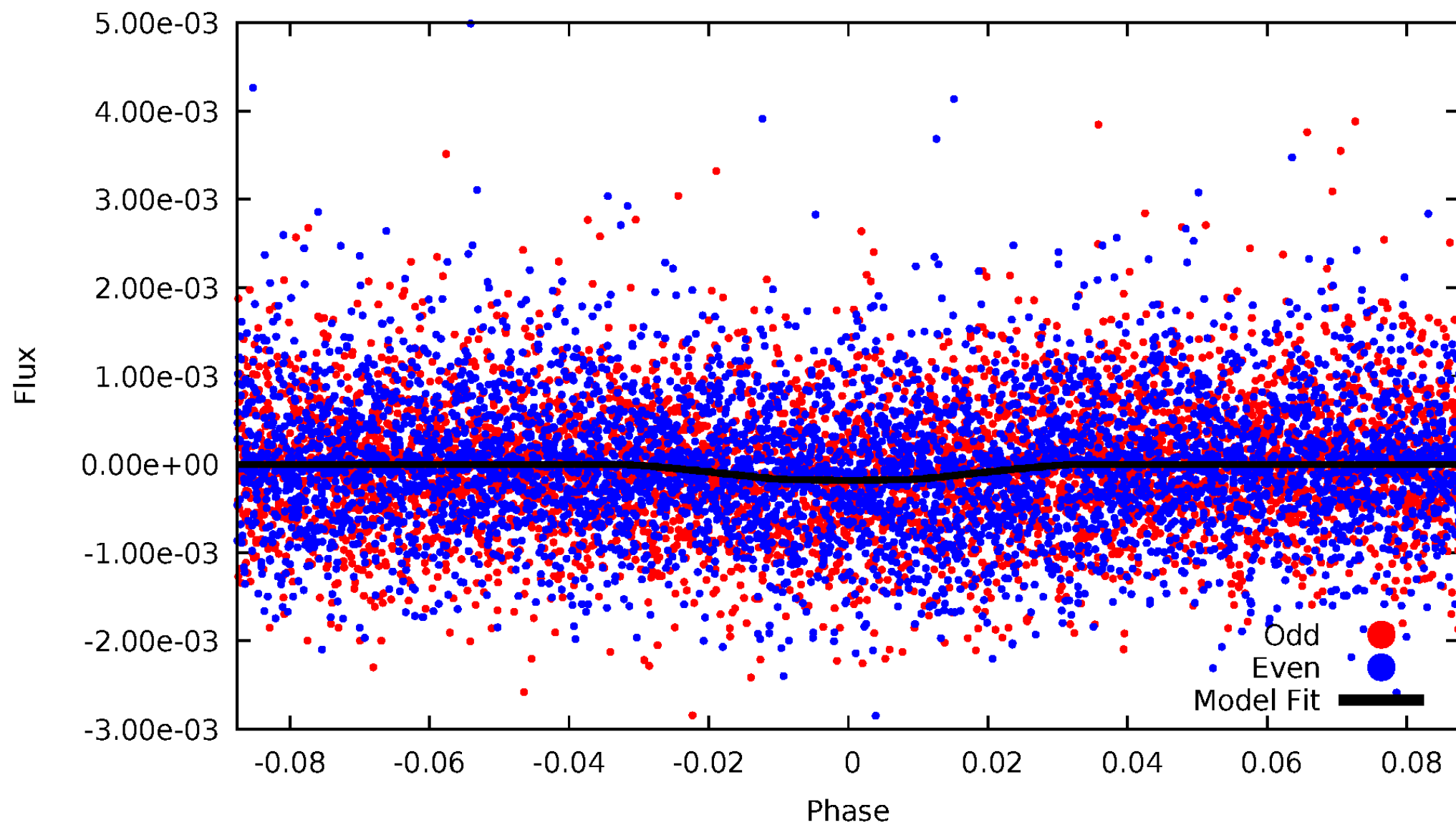
# TCE 005389632-02





# DV Odd/Even

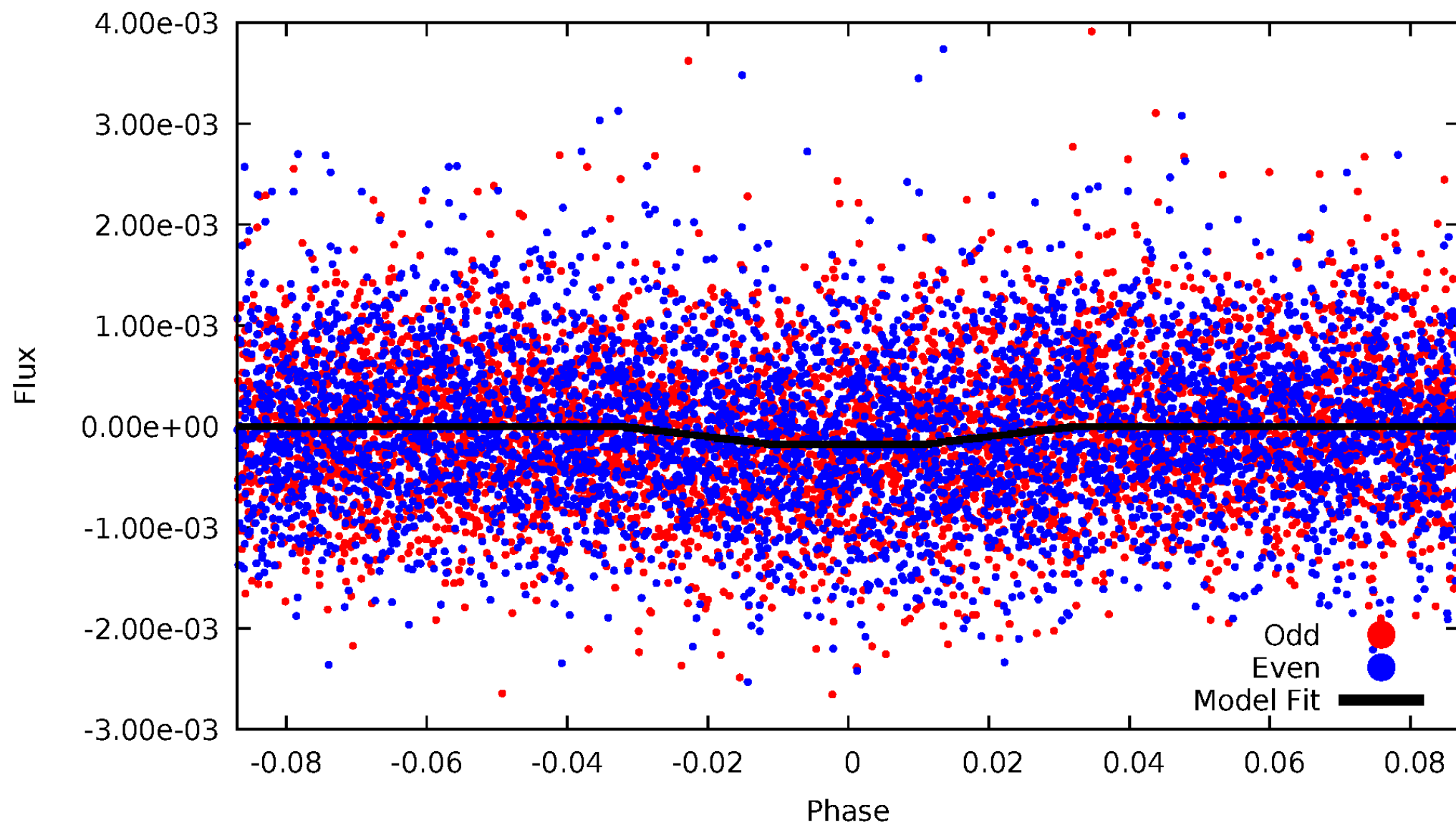
TCE 005389632-02





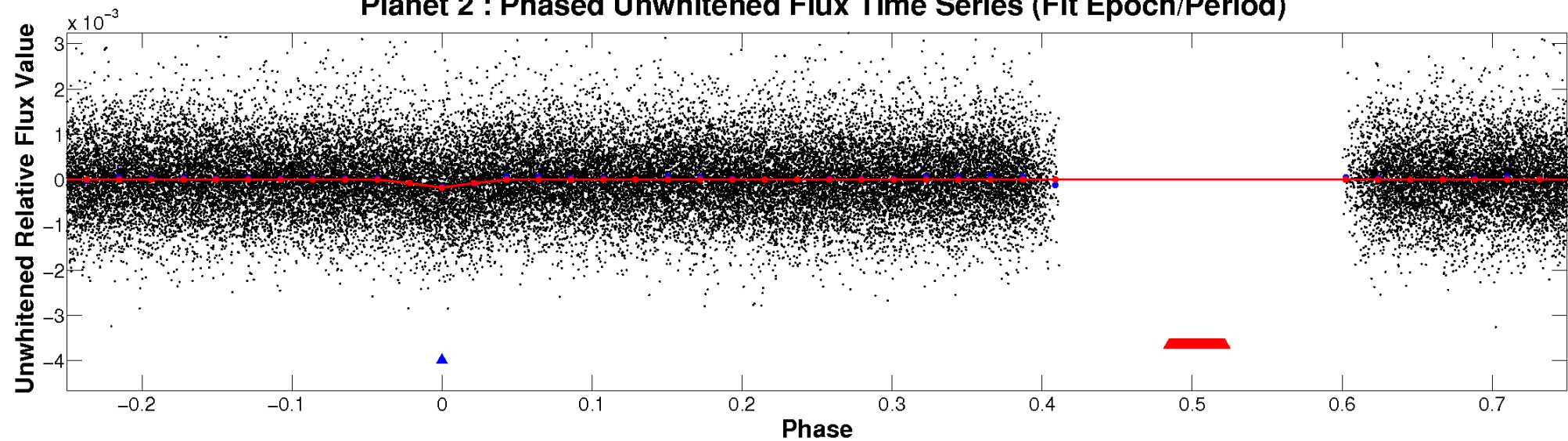
# ALT Odd/Even

TCE 005389632-02

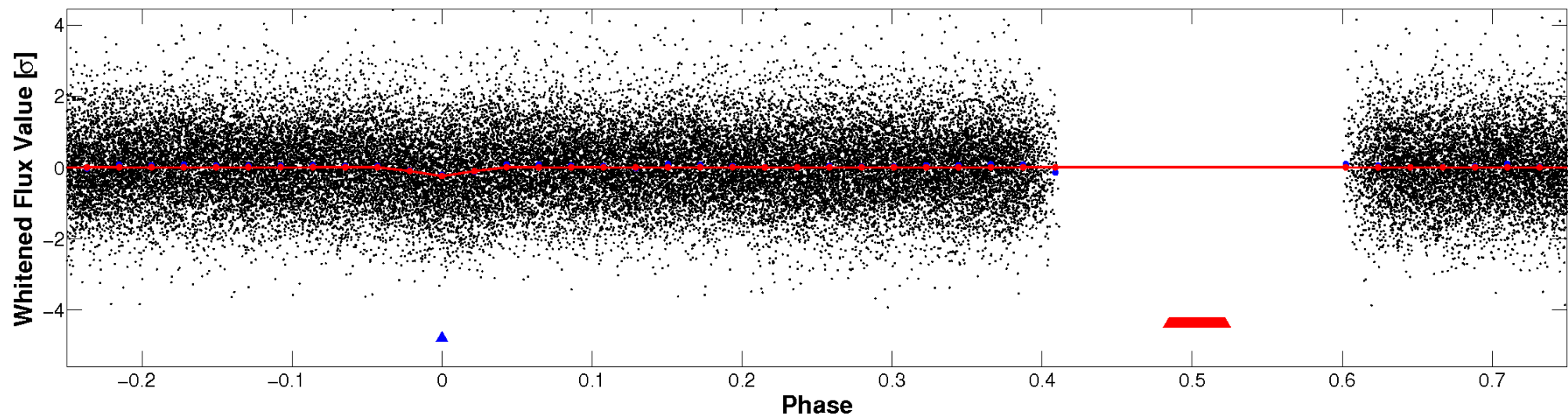


# Non-Whitened Vs. Whitened Light Curve

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

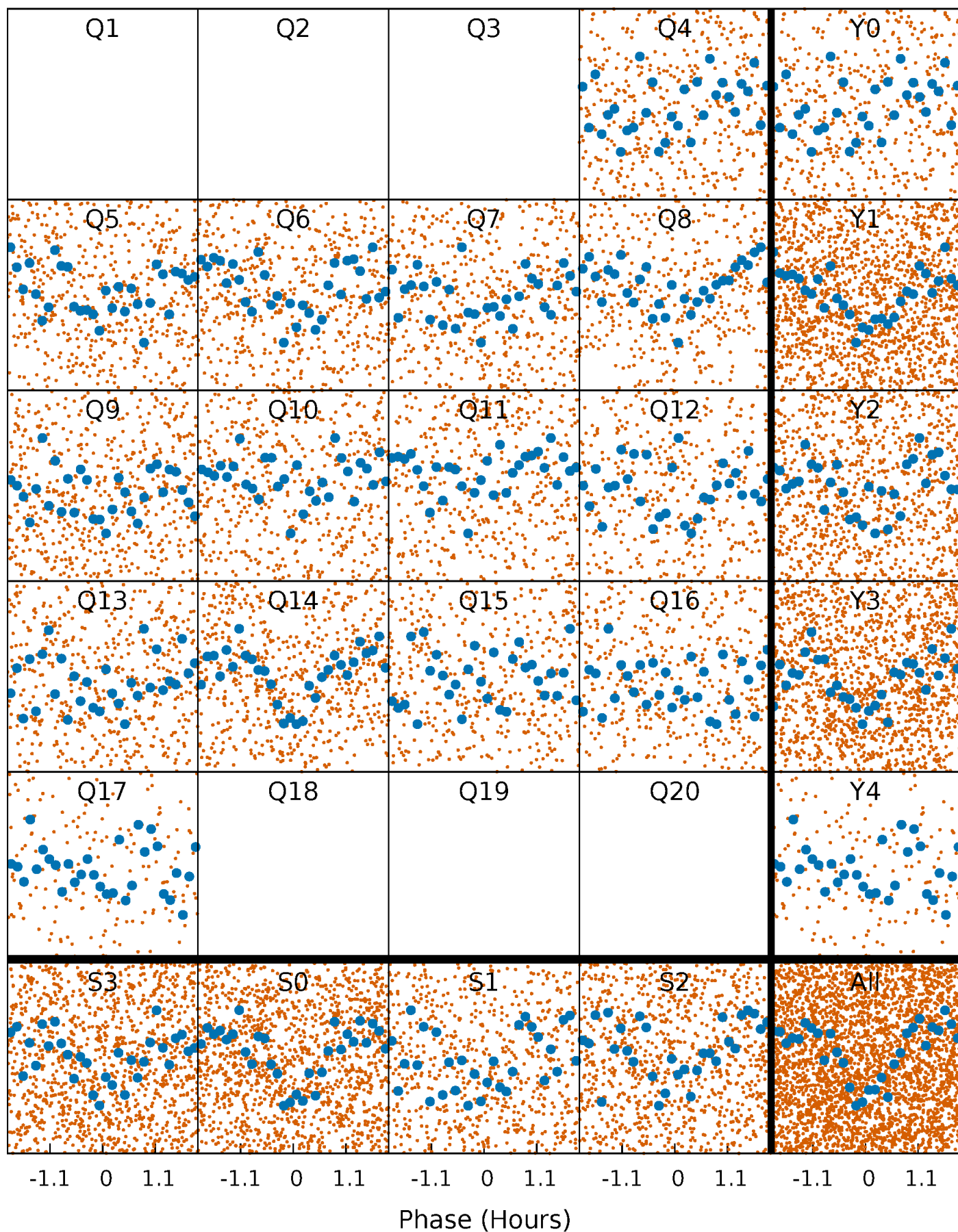


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



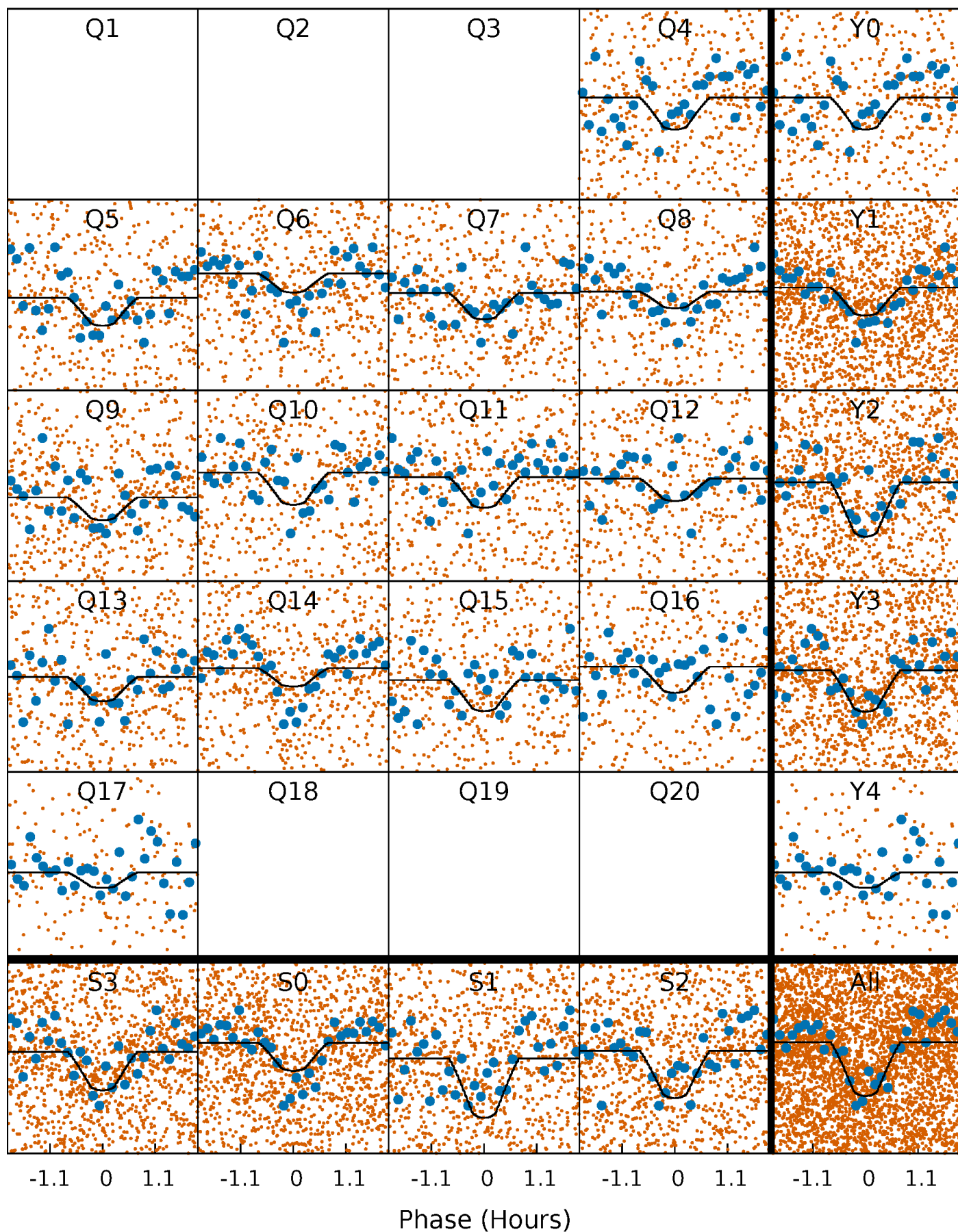
# PDC Quarter-Phased Transit Curves

TCE 005389632-02   P= 0.949618 Days    $T_0=131.732577$  (BKJD)



# DV Quarter-Phased Transit Curves

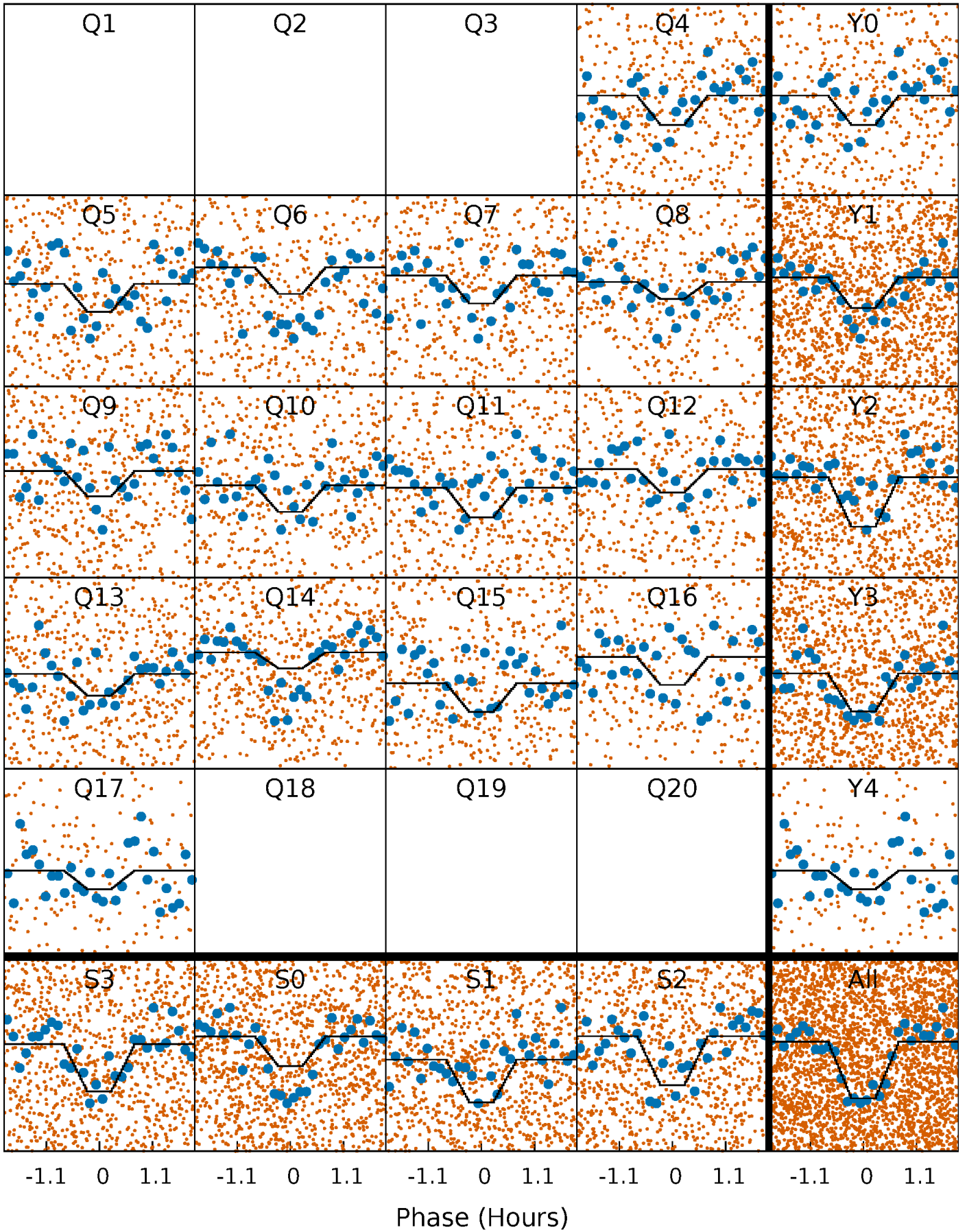
TCE 005389632-02     $P = 0.949618$  Days     $T_0 = 131.732577$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005389632-02 P= 0.949621 Days  $T_0=131.732918$  (BKJD)

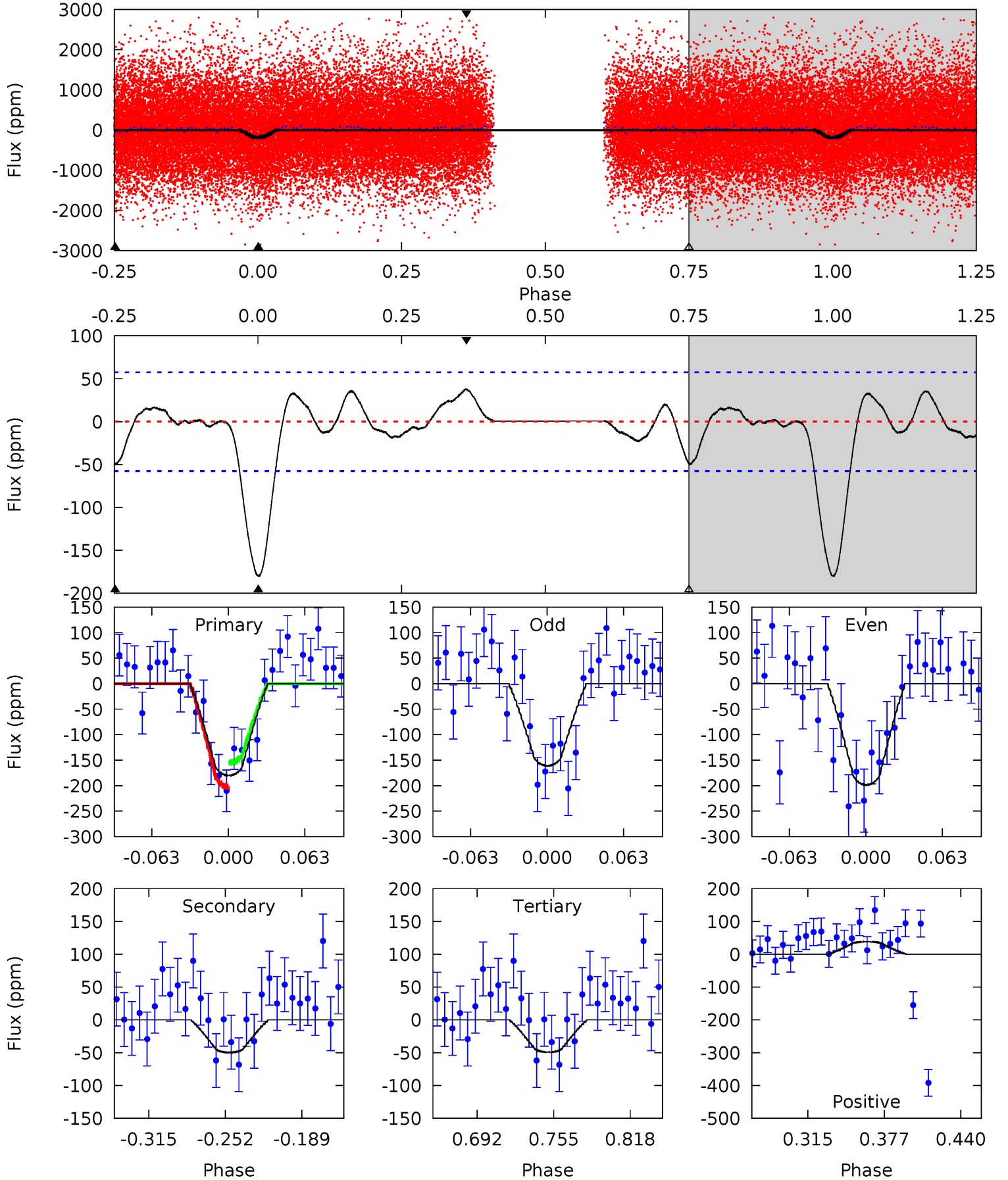




# DV Model-Shift Uniqueness Test

005389632-02, P = 0.949618 Days, E = 131.732577 Days

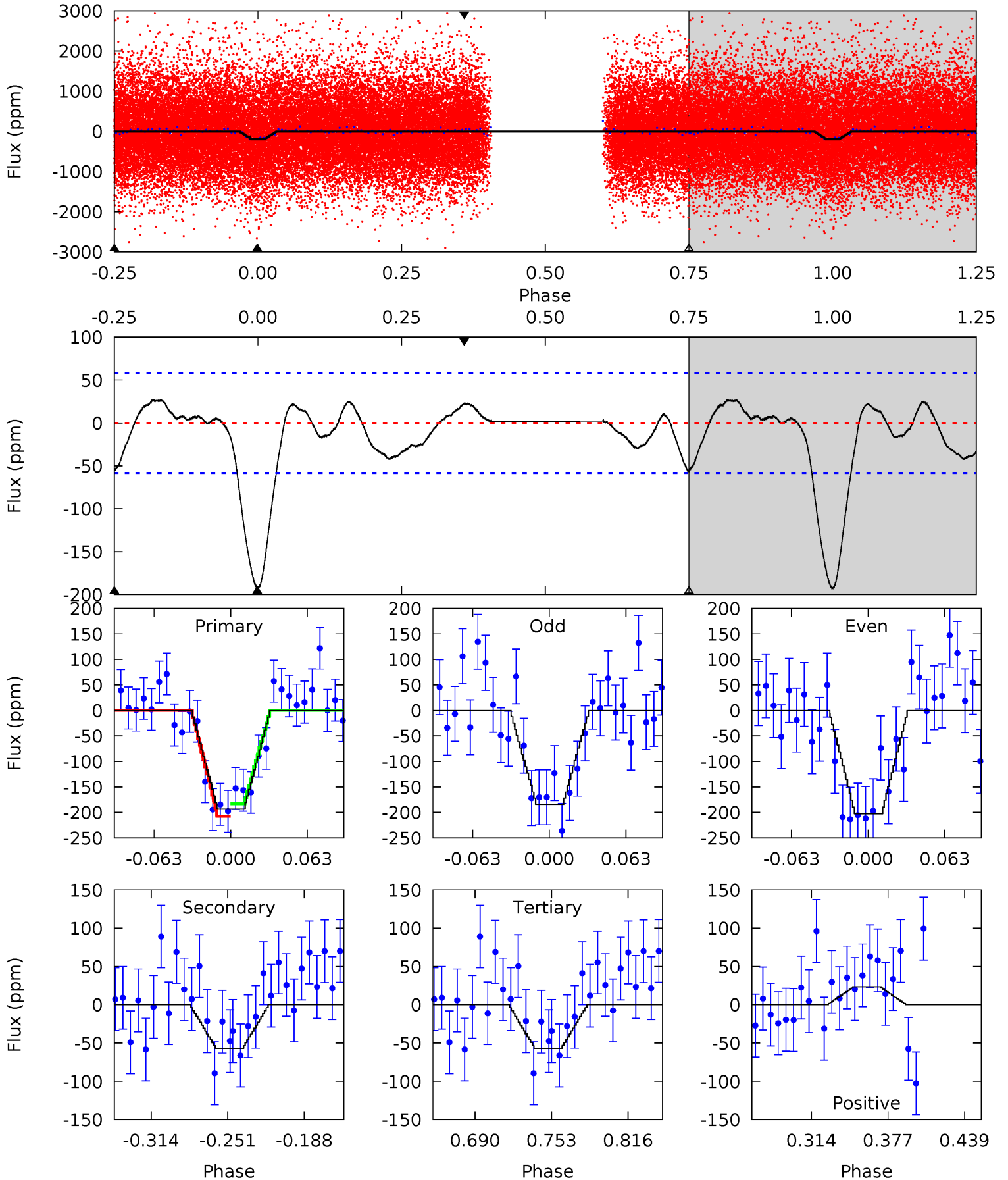
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	4.04	3.99	3.08	4.66	1.86	1.38	10.6	11.5	0.05	0.95	1.53	0.99	0.17	1.91



# Alt Model-Shift Uniqueness Test

005389632-02, P = 0.949621 Days, E = 131.732918 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
15.5	4.57	4.55	1.88	4.66	1.86	1.58	10.9	13.6	0.02	2.69	0.75	1.06	0.12	0.97



### Stellar Parameters For KIC 005389632

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5799^{+184}_{-204}$	$4.539^{+0.046}_{-0.196}$	$-0.100^{+0.300}_{-0.300}$	$0.878^{+0.262}_{-0.082}$	$0.975^{+0.104}_{-0.127}$	$2.026^{+0.389}_{-1.024}$
	+3%/-4%	+1%/-4%	+300%/-300%	+30%/-9%	+11%/-13%	+19%/-51%
Source	KIC0	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 005389632-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-50 \pm 12$	$1.93^{+1.94}_{-1.27}$	$2496^{+173}_{-133}$	$3758^{+2157}_{-959}$	$2.405^{+20.336}_{-1.808}$
Alt.	$-57 \pm 13$	$1.92^{+2.04}_{-1.26}$	$2500^{+161}_{-127}$	$3832^{+2278}_{-922}$	$2.800^{+21.006}_{-2.125}$

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

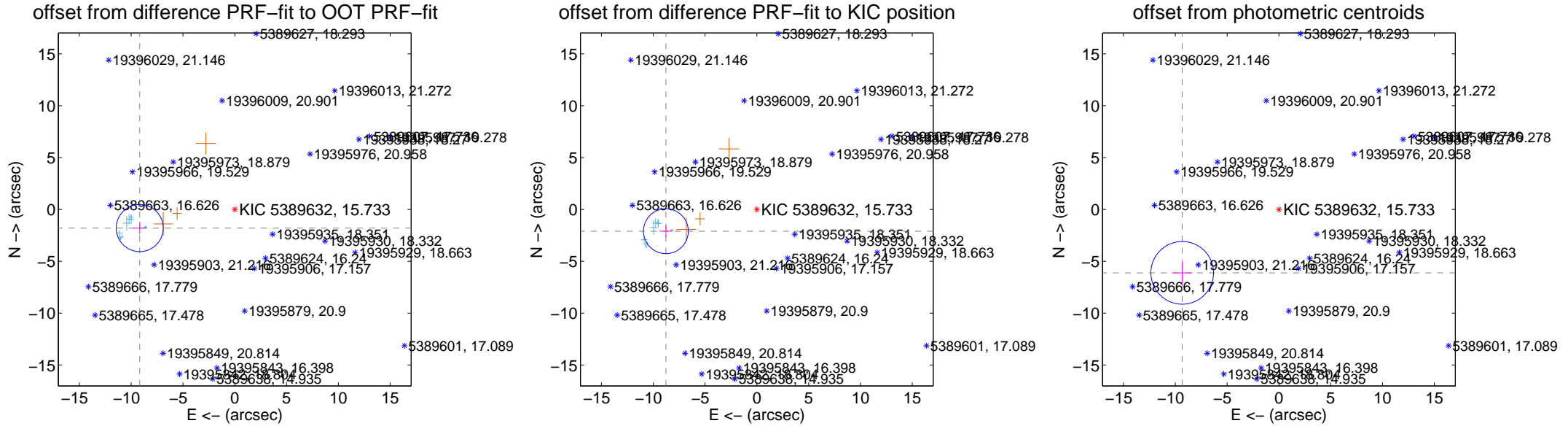
## DV Centroid Data

Supplemental centroid analysis for 005389632-02. Kepler magnitude: 15.73. Transit SNR 10.21

There are 11 quarters with good PRF difference image offsets

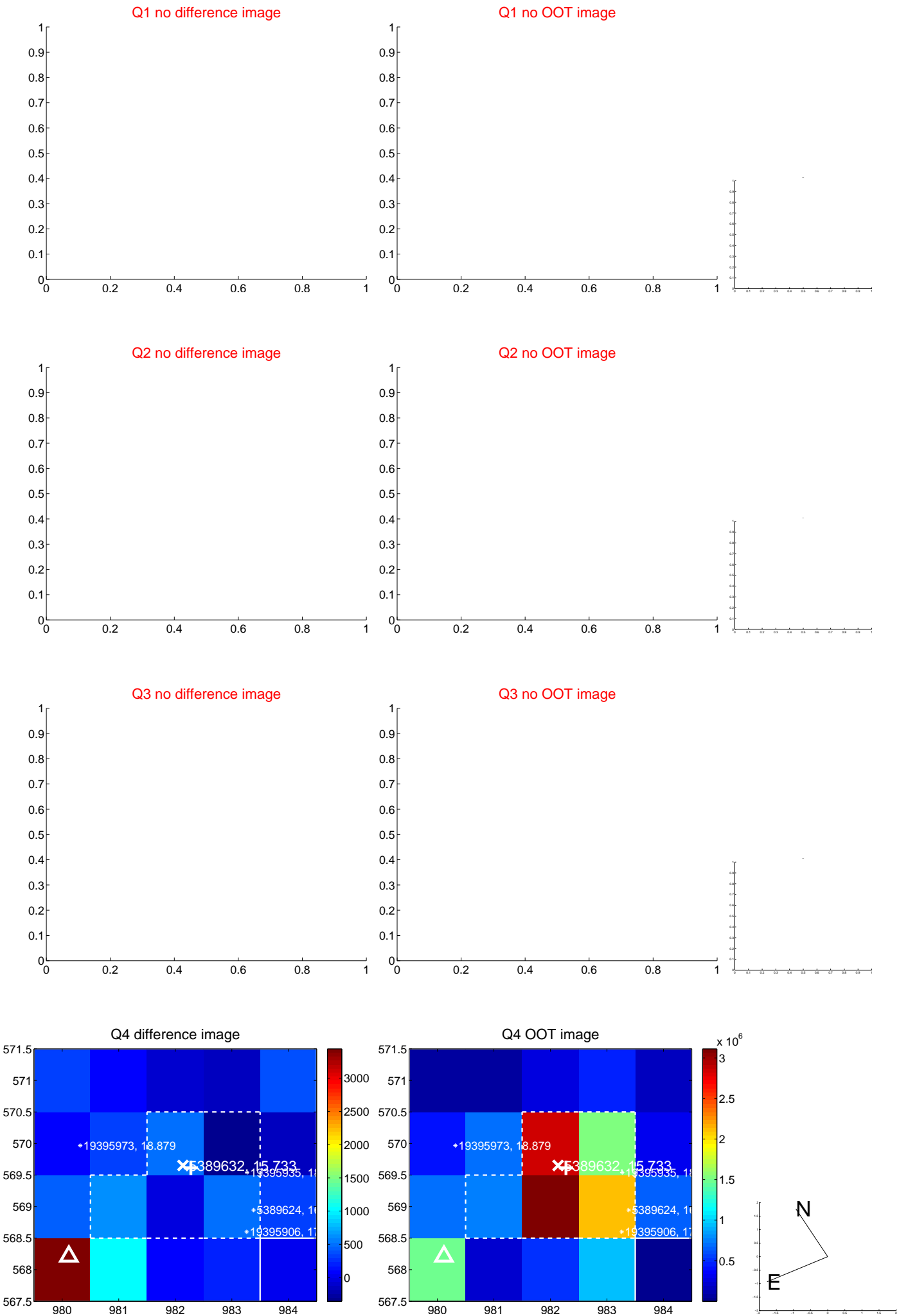
The direct PRF centroid is offset from the target star catalog position by about 0.69 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	9.346 $\pm$ 0.756	12.36	9.172 $\pm$ 0.665	-1.796 $\pm$ 0.620
PRF-fit source offset from KIC position	9.024 $\pm$ 0.721	12.52	8.777 $\pm$ 0.617	-2.098 $\pm$ 0.597
photometric centroid source offset	11.16 $\pm$ 1.01	11.08	9.33 $\pm$ 0.99	-6.11 $\pm$ 1.05



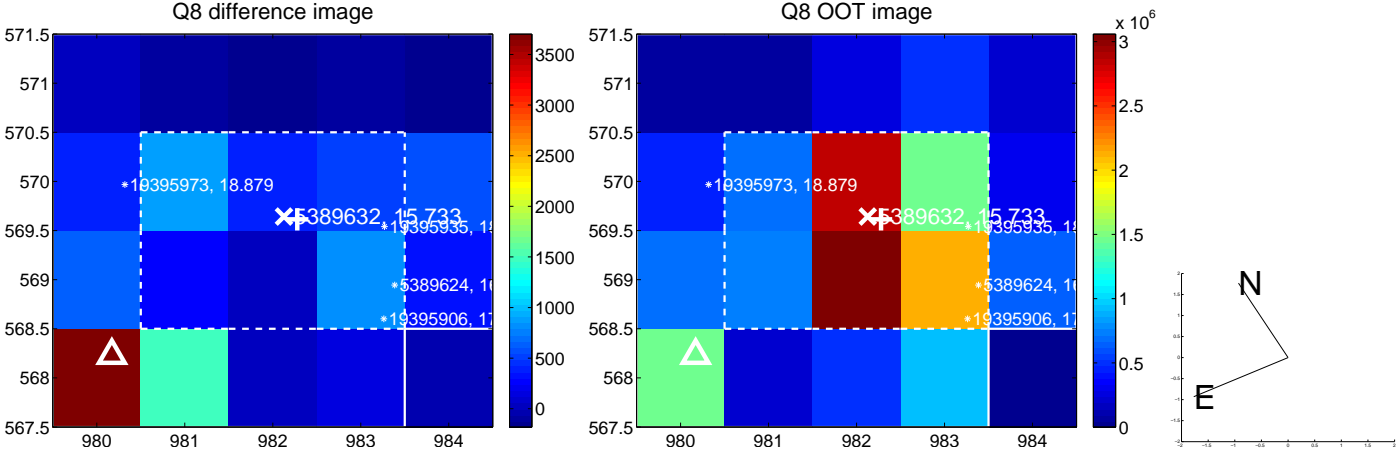
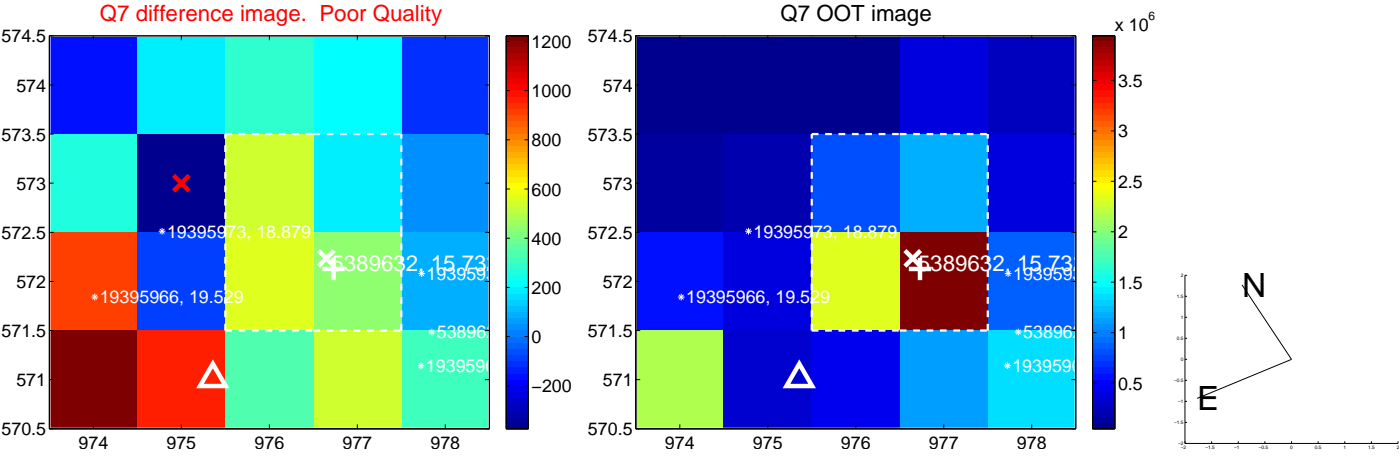
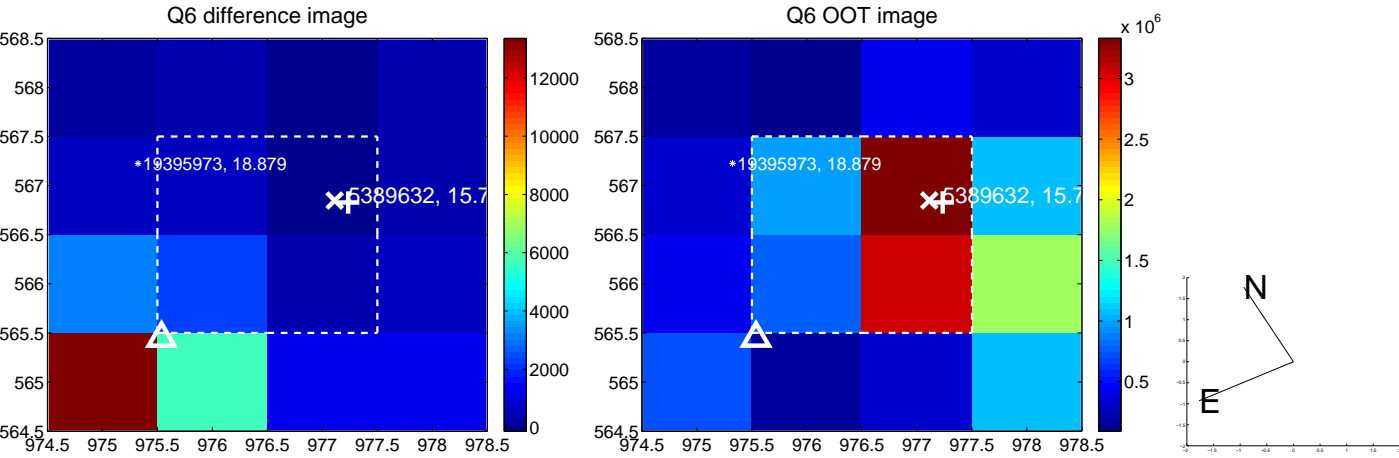
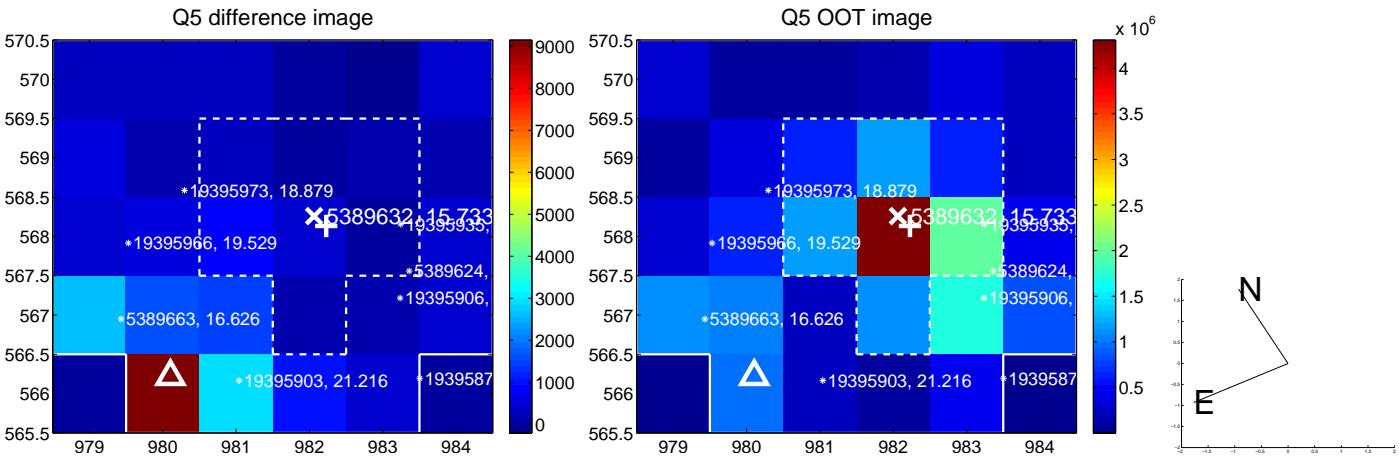
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

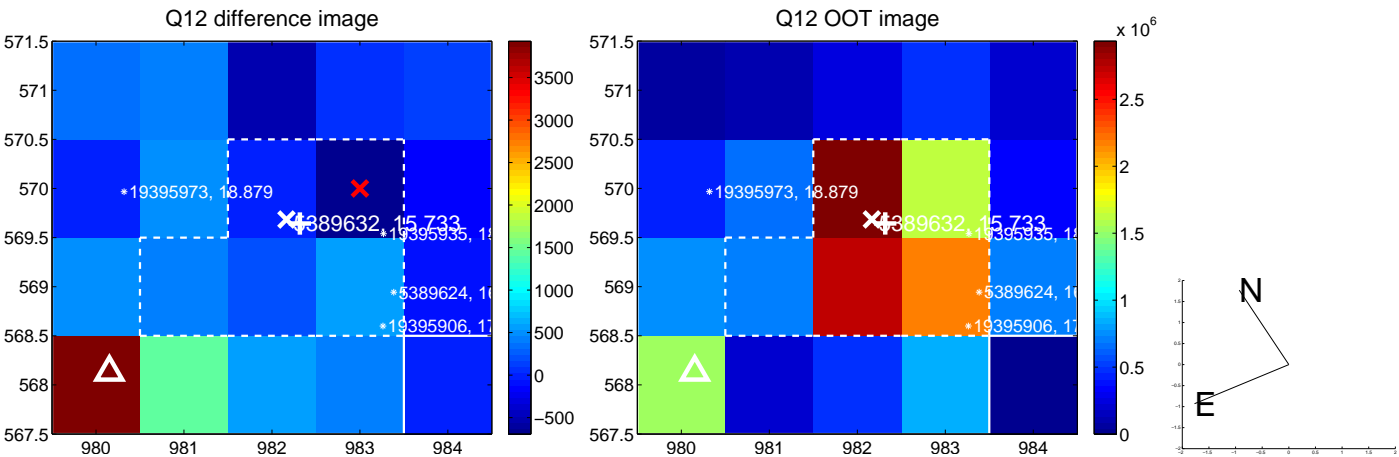
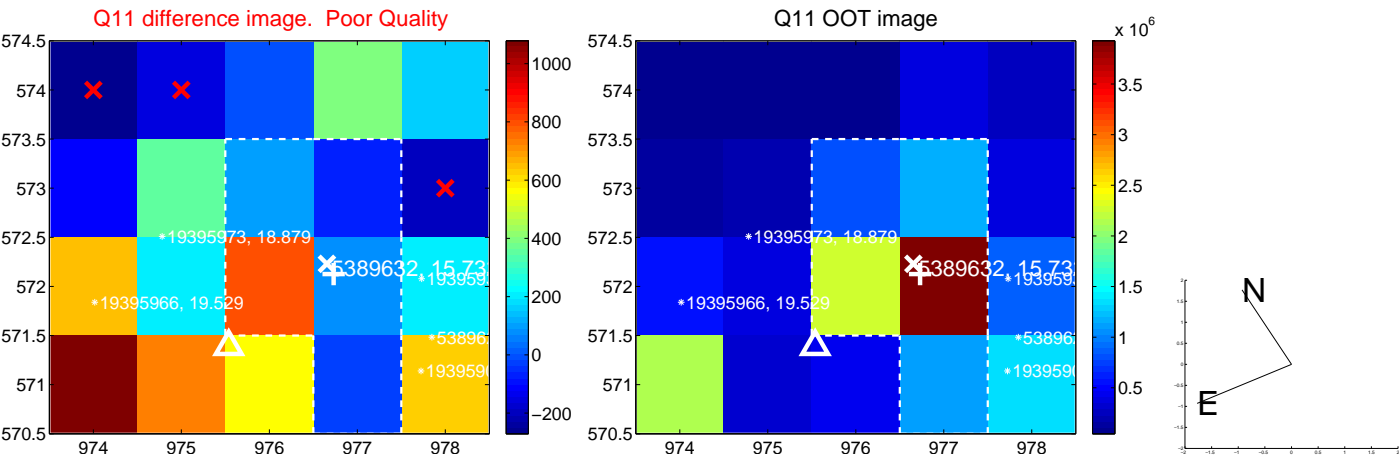
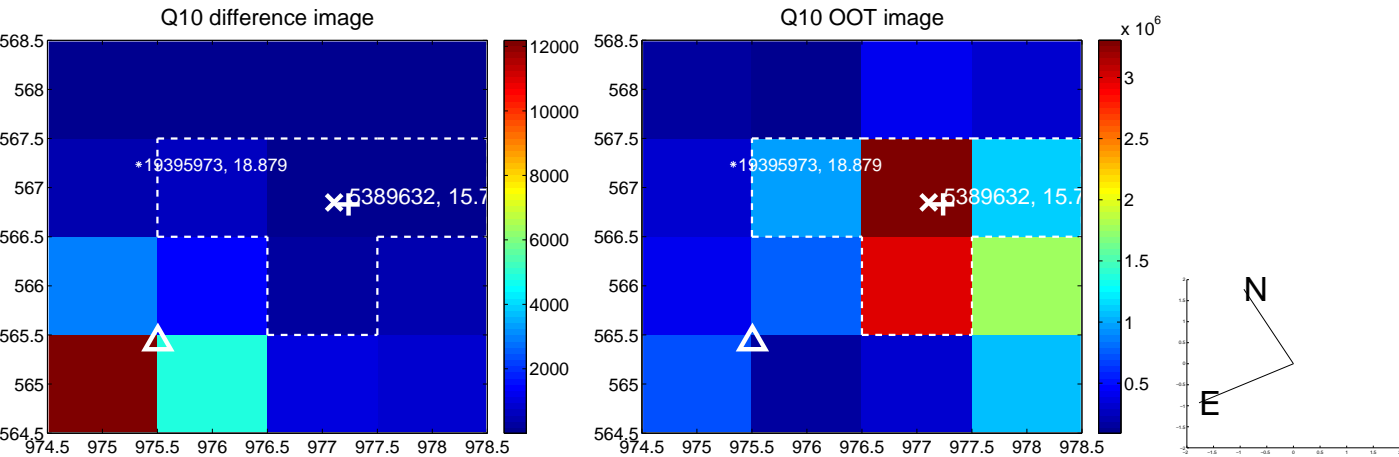
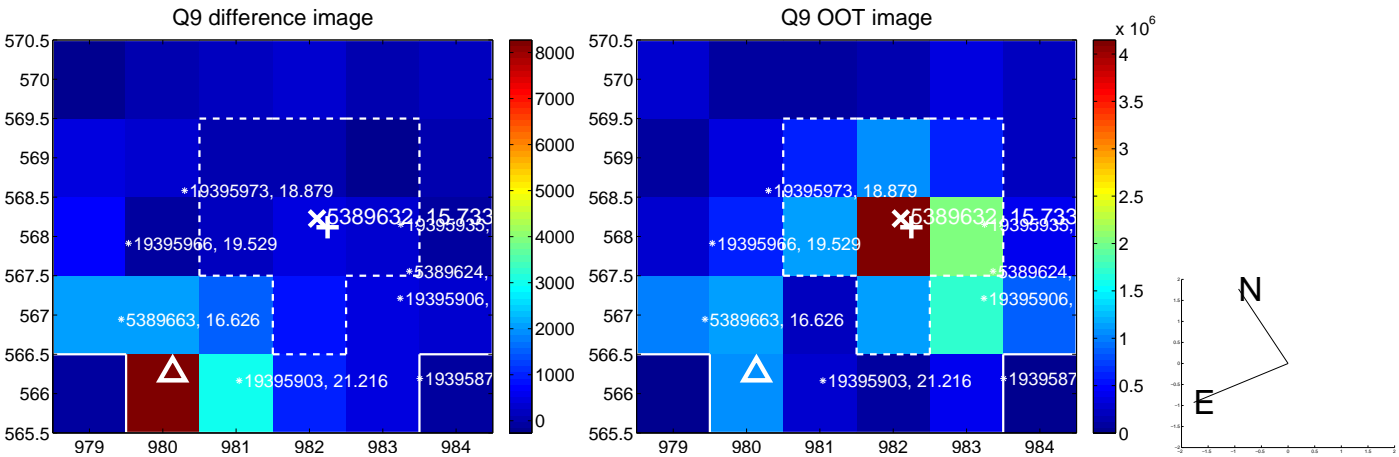




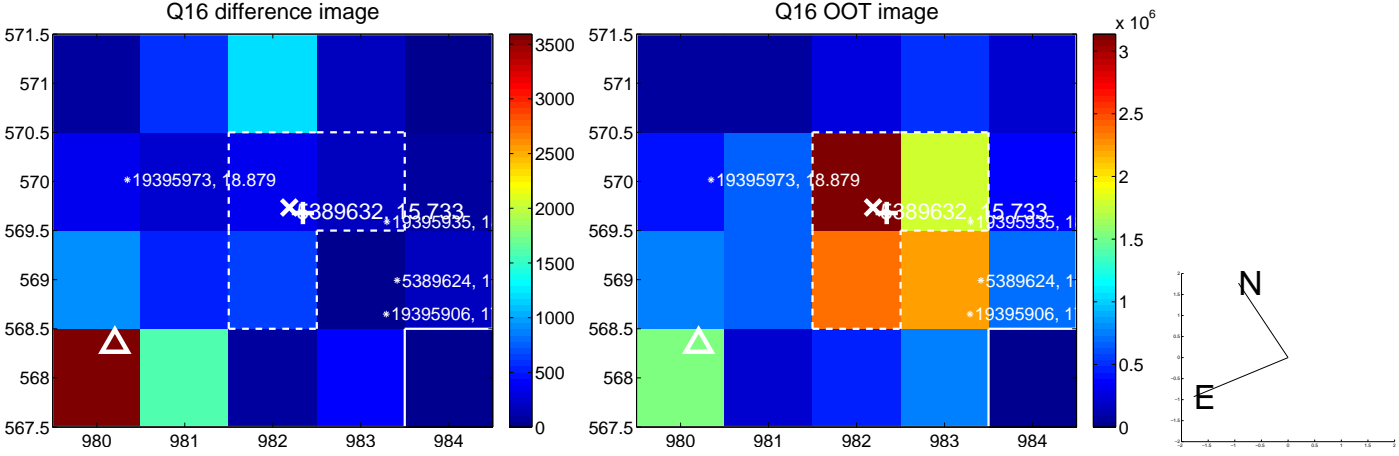
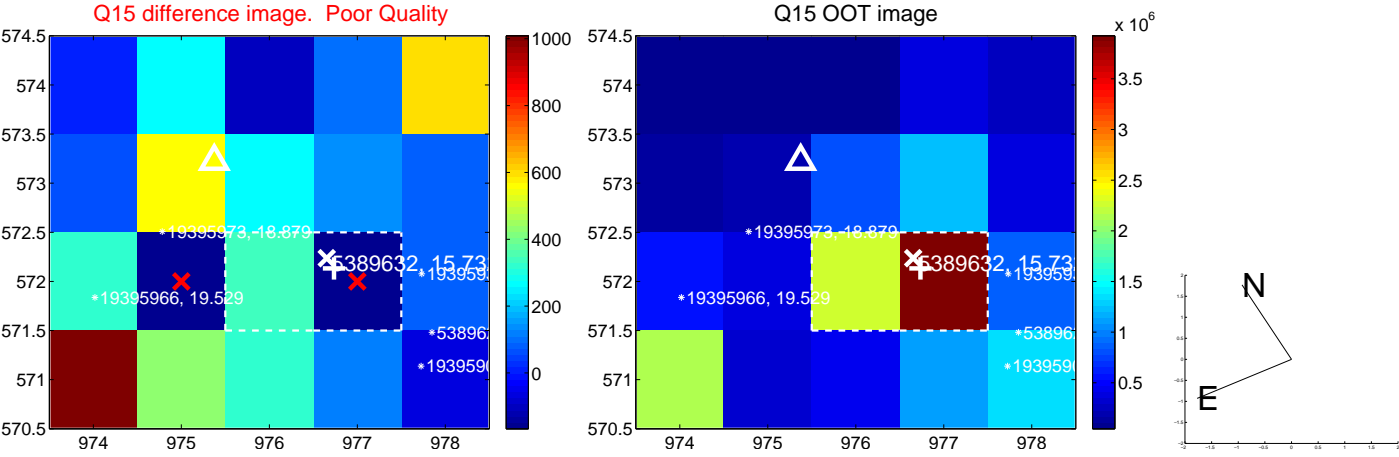
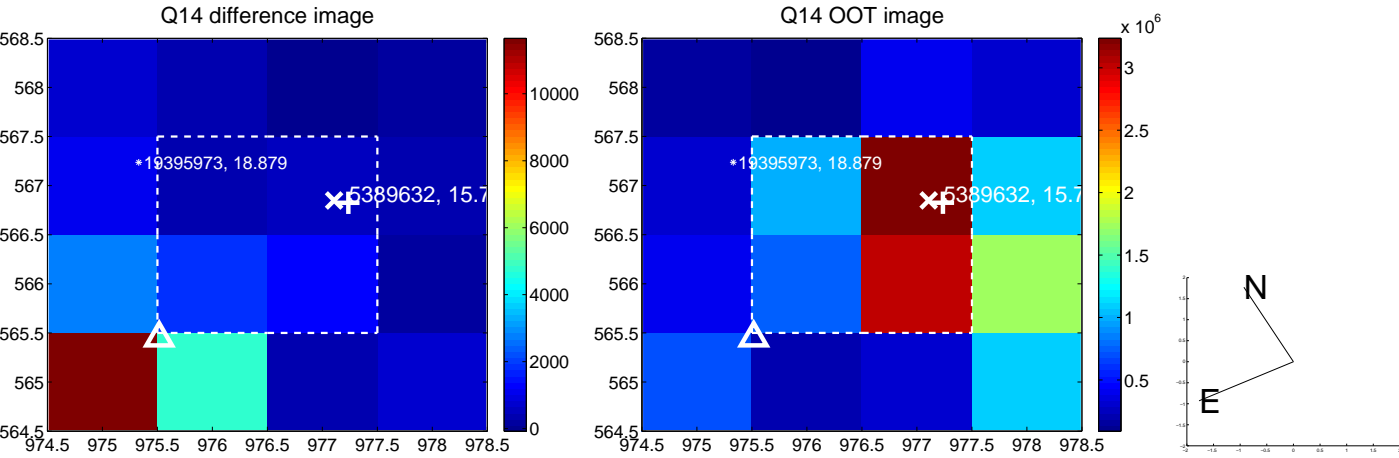
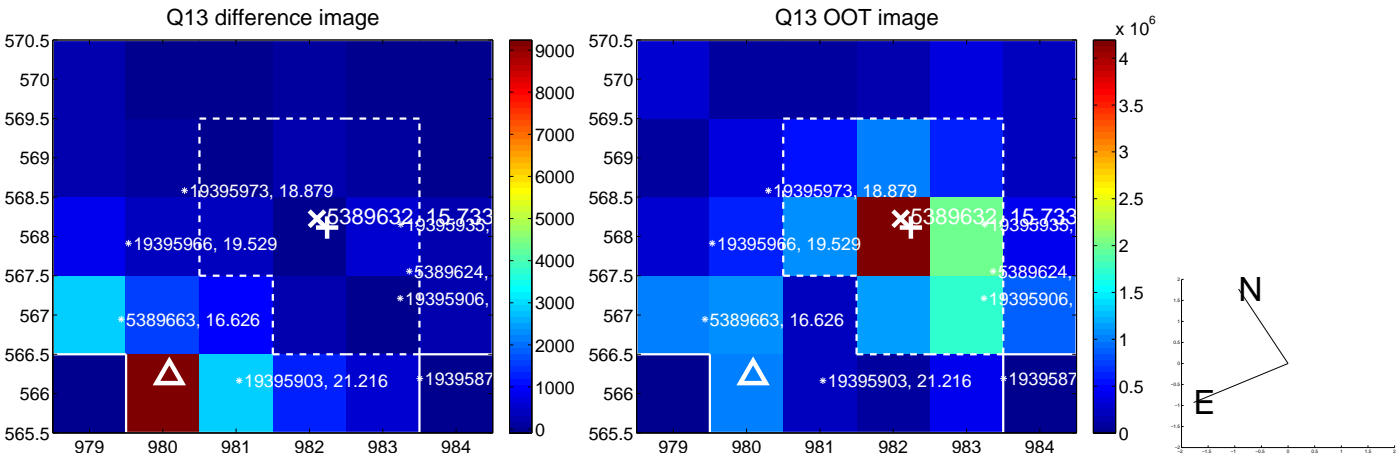
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



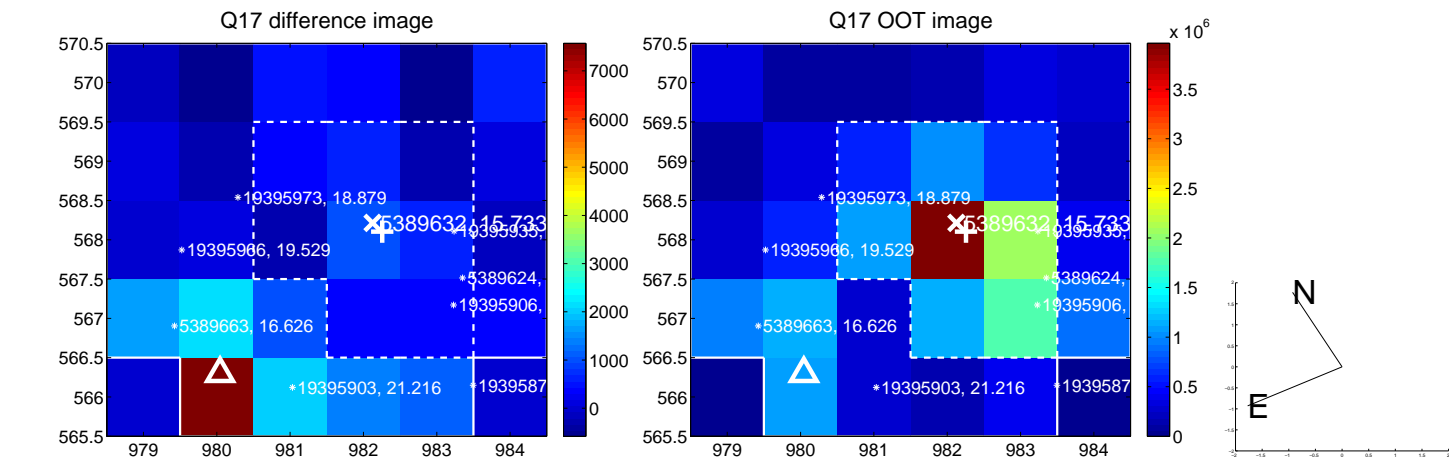
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



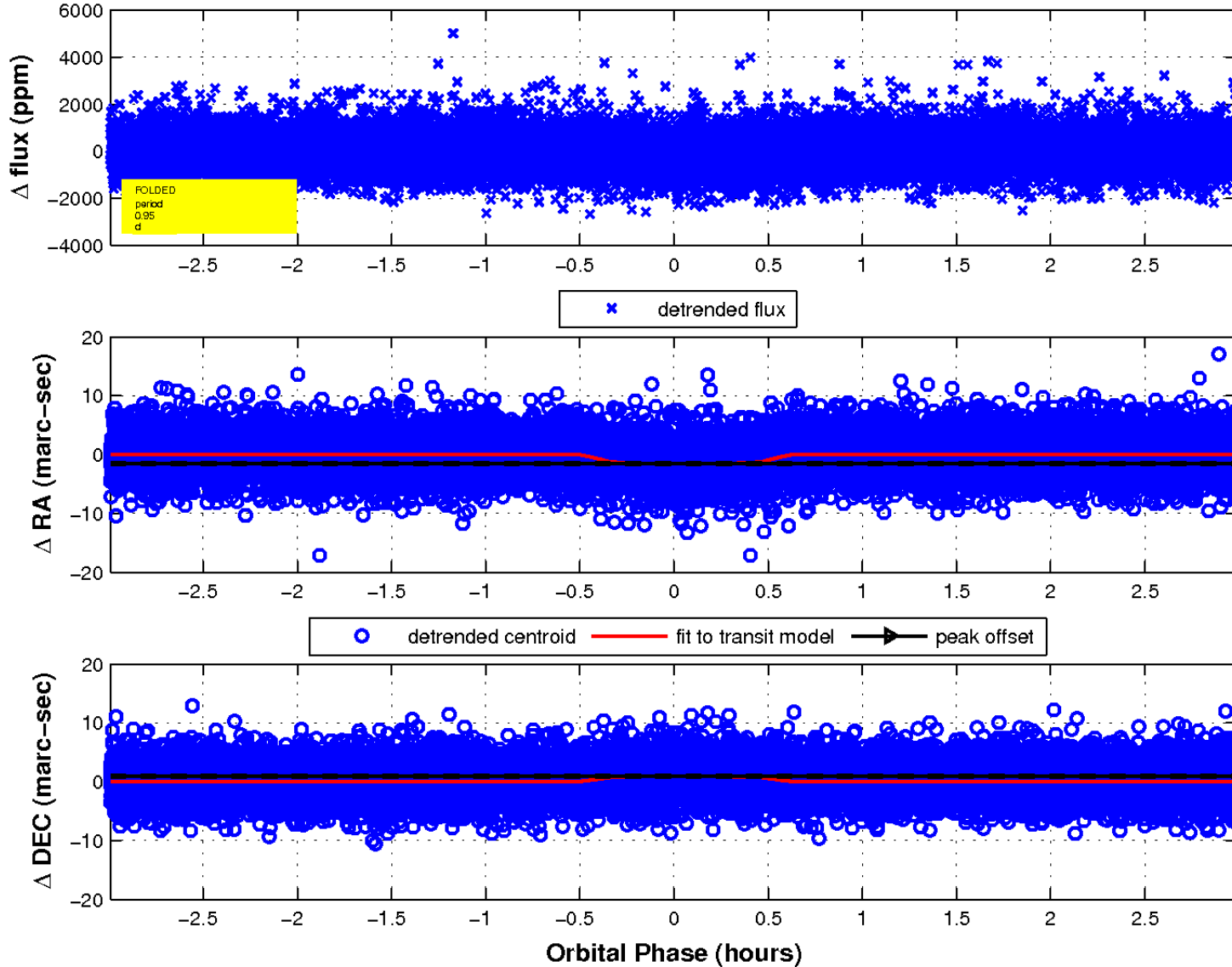
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

