

# KIC 003239636

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003239636-01	OBS	1093.01	1.057486	132.334876	75.2	2.492	16.7	15.0	1.95	6151	1.99	10754.59
003239636-02	OBS	No	369.139858	222.424685	363.9	13.417	7.5	7.2	1.95	6151	4.12	4.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003239636-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003239636-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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 003239636-01

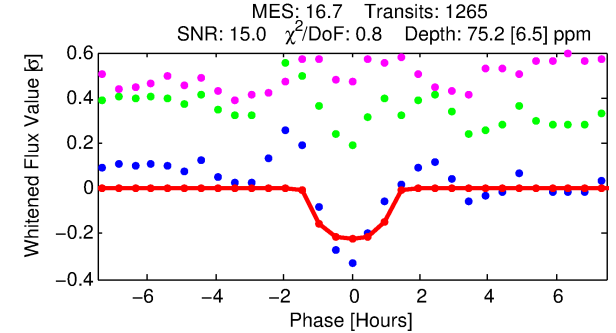
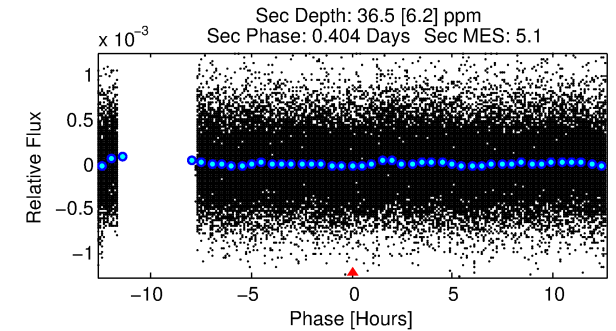
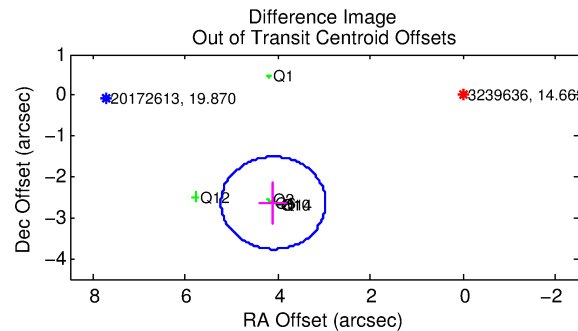
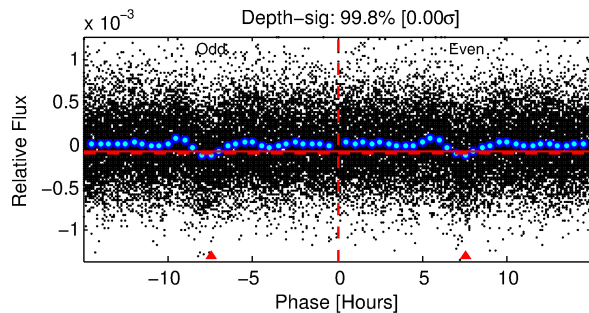
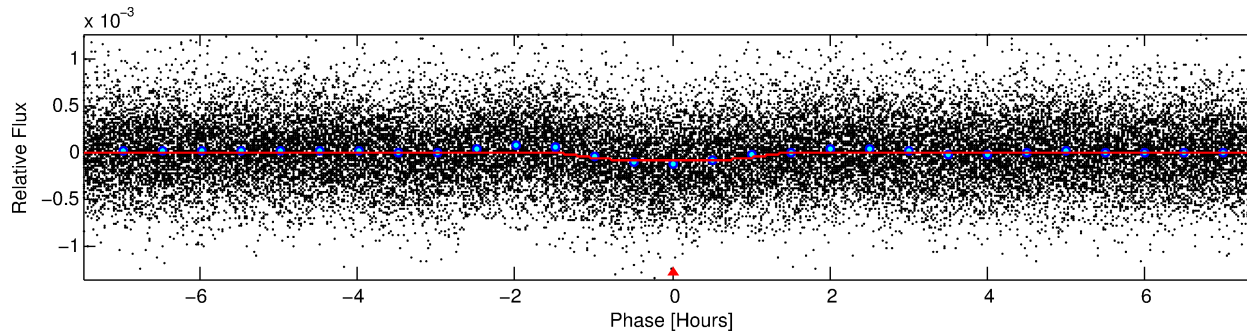
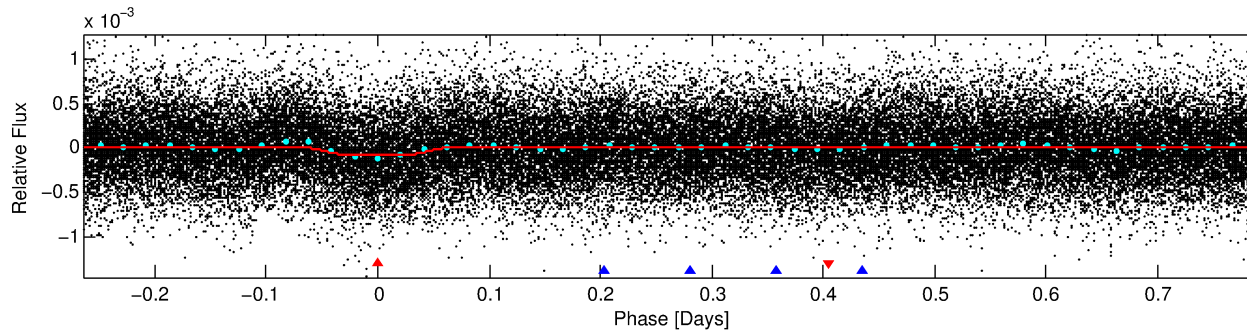
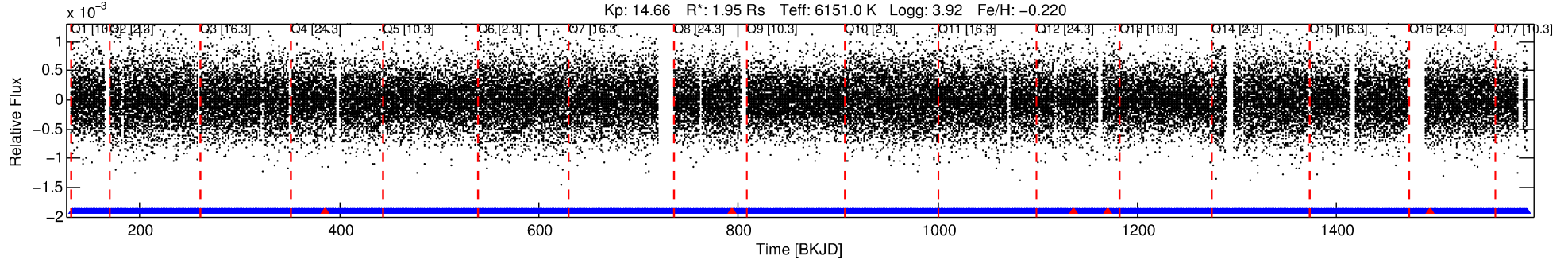
No Significant Match Found

# DV One-Page Summary

KIC: 3239636 Candidate: 1 of 2 Period: 1.057 d

KOI: K01093 Corr: No Ephemeris Match

Kp: 14.66 R\*: 1.95 Rs Teff: 6151.0 K Logg: 3.92 Fe/H: -0.220



## DV Fit Results:

Period = 1.05749 [0.00001] d  
Epoch = 132.3349 [0.0022] BKJD  
Rp/R\* = 0.0093 [0.0040]  
a/R\* = 1.75 [2.72]  
b = 0.90 [0.49]  
Seff = 10754.59 [3698.74]  
Teq = 2597 [223] K  
Rp = 1.99 [0.97] Re  
a = 0.0213 [0.0046] AU  
Ag = 2.31 [2.14] [0.61σ]  
Teffp = 4948 [1070] K [2.15σ]

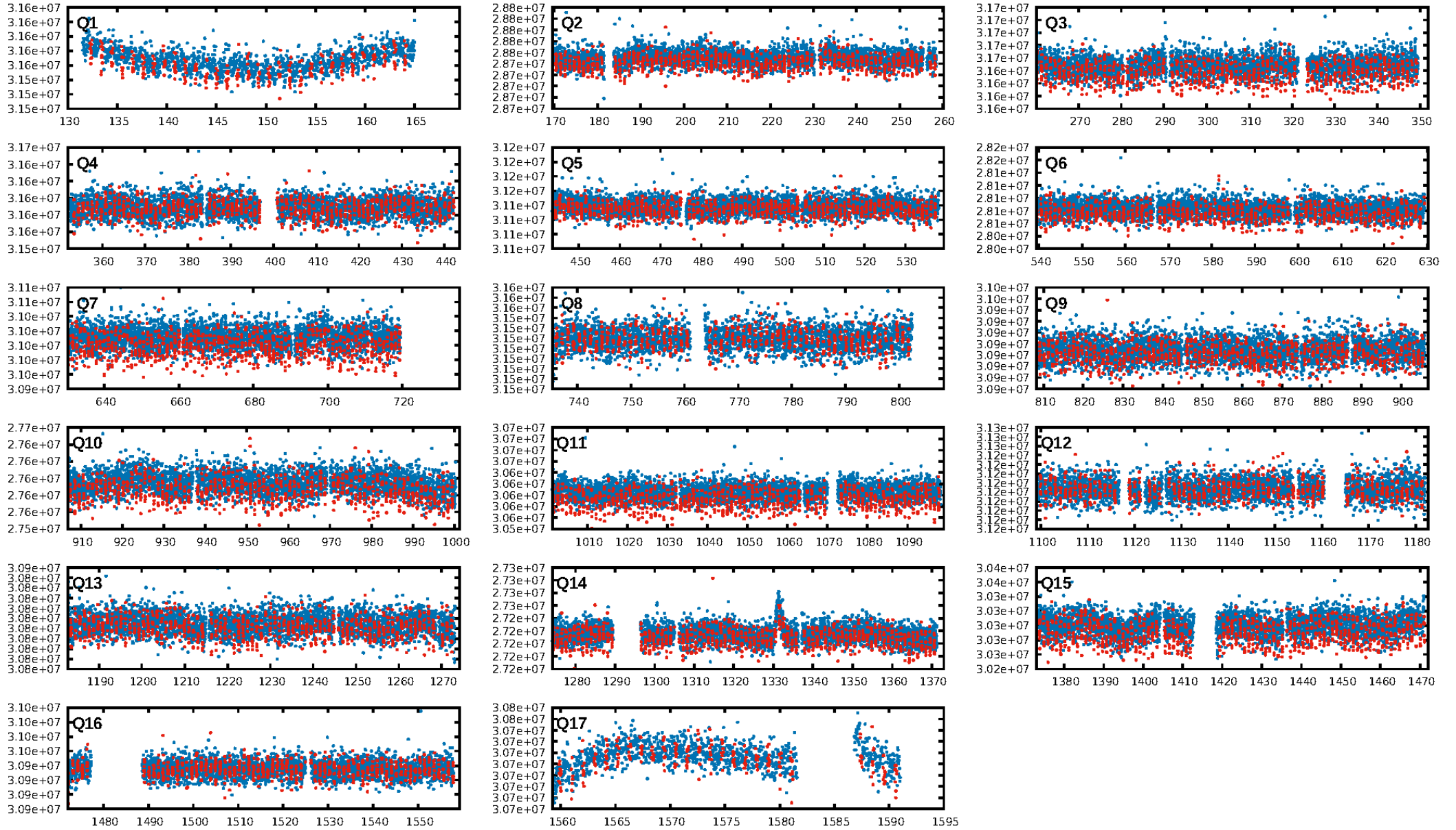
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [647.36σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.70e-57  
RollingBand-fgt: 1.00 [1204/1209]  
GhostDiagnostic-chr: -1.224  
Centroid-sig: 0.0%  
Centroid-so: 6.705 arcsec [6.70σ]  
OotOffset-rm: 4.878 arcsec [12.94σ]  
KicOffset-rm: 5.035 arcsec [14.78σ]  
OotOffset-st: 4/0/1/1 [6]  
KicOffset-st: 4/0/1/1 [6]  
DiffImageQuality-fgm: 1.00 [6/6]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:27:16 Z

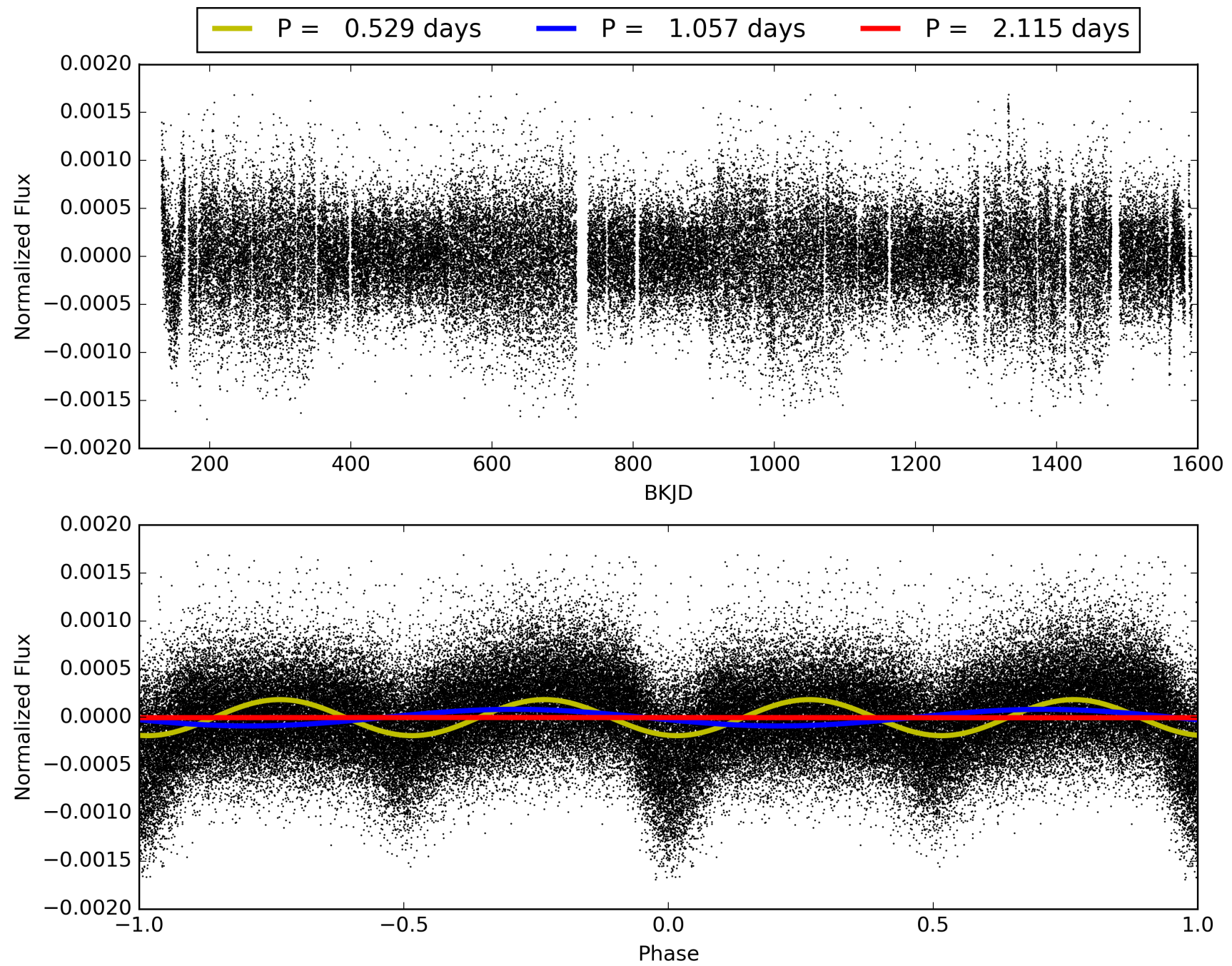
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003239636-01, PDC Light Curves



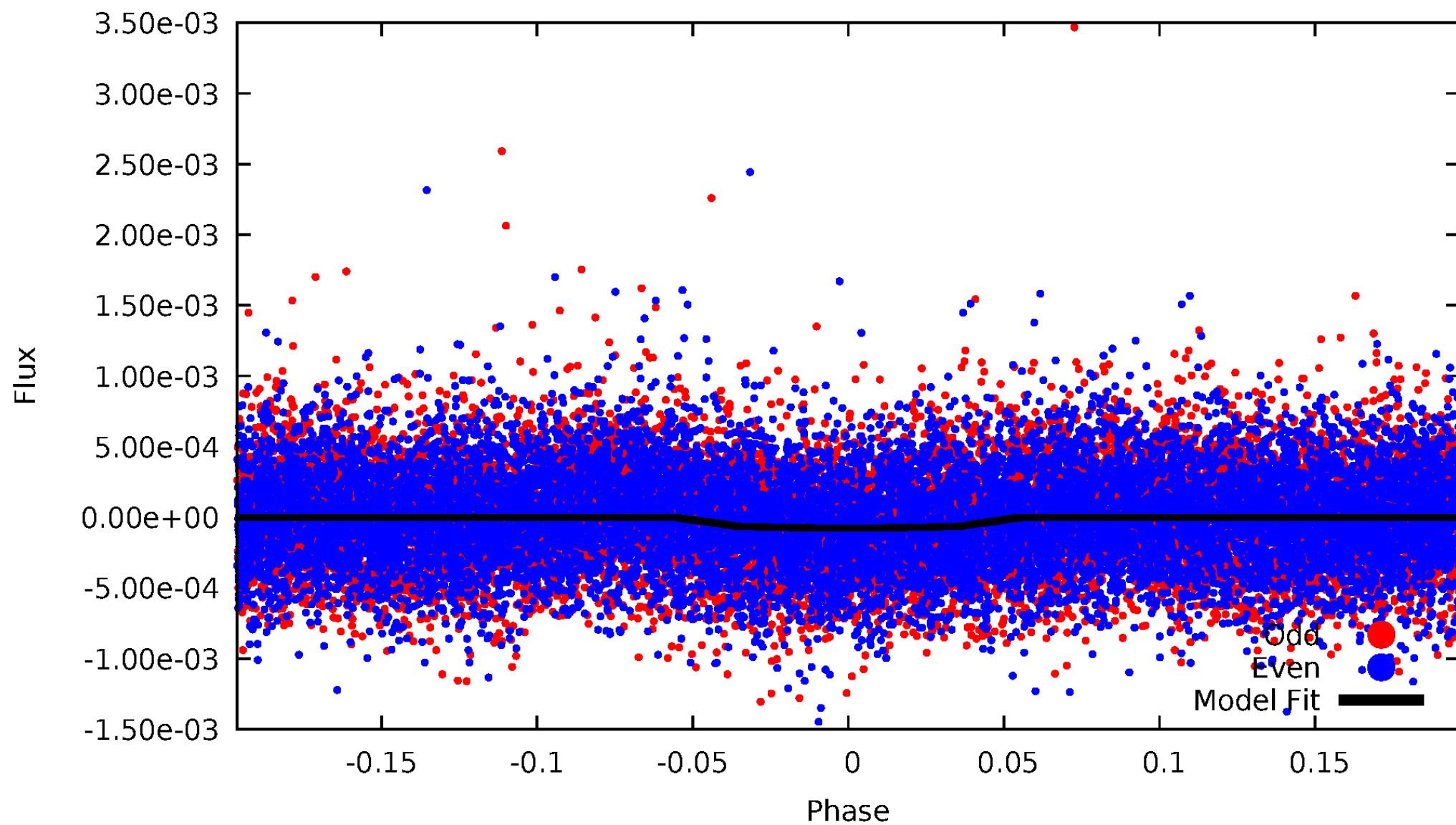


TCE 003239636-01



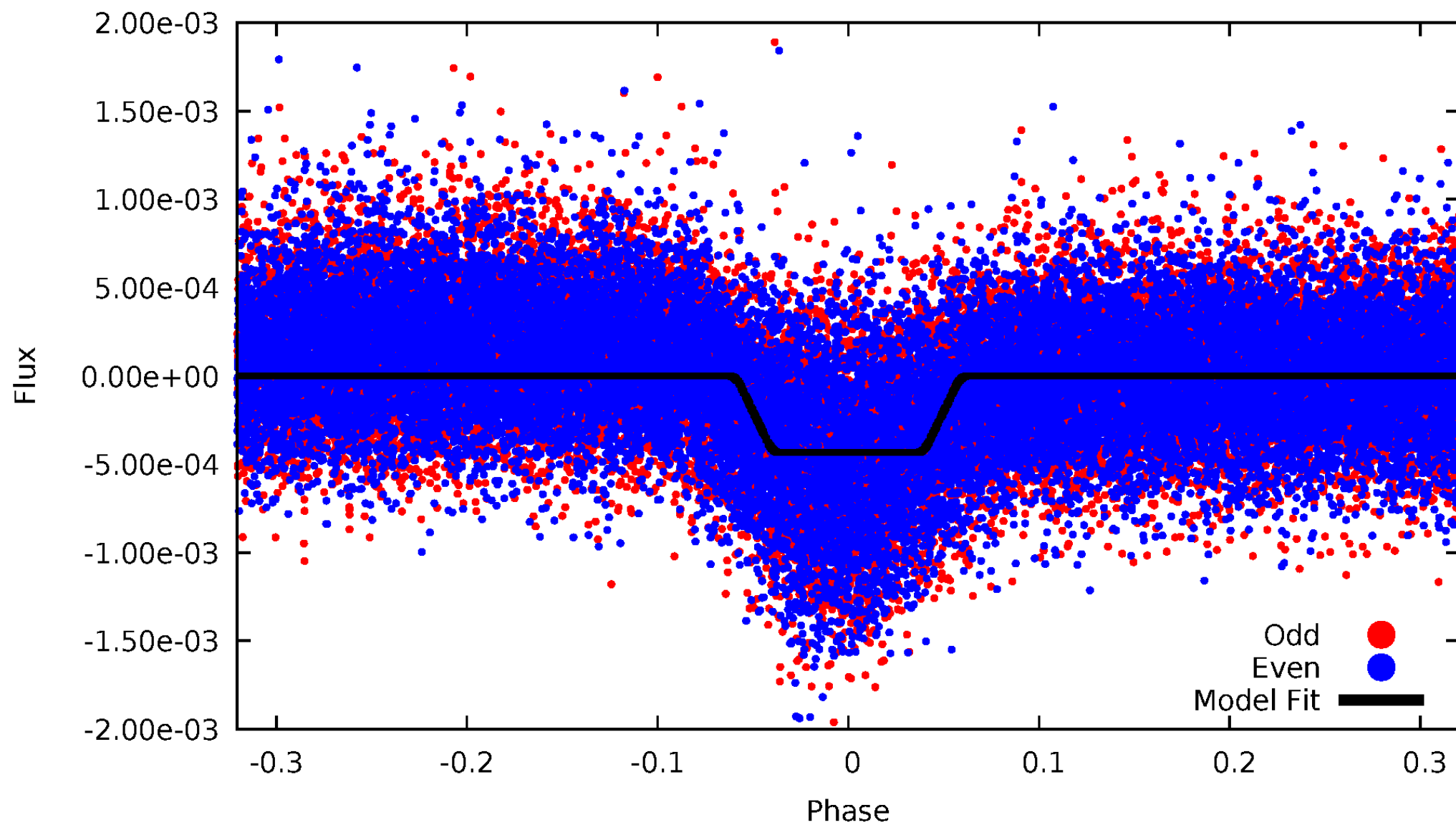
# DV Odd/Even

TCE 003239636-01

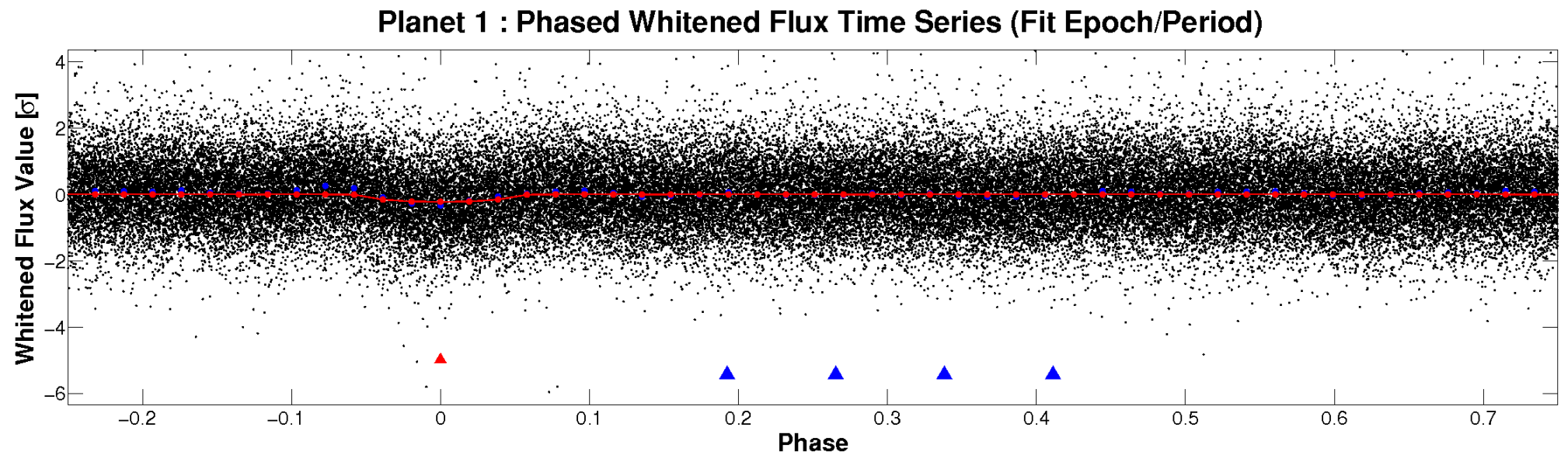
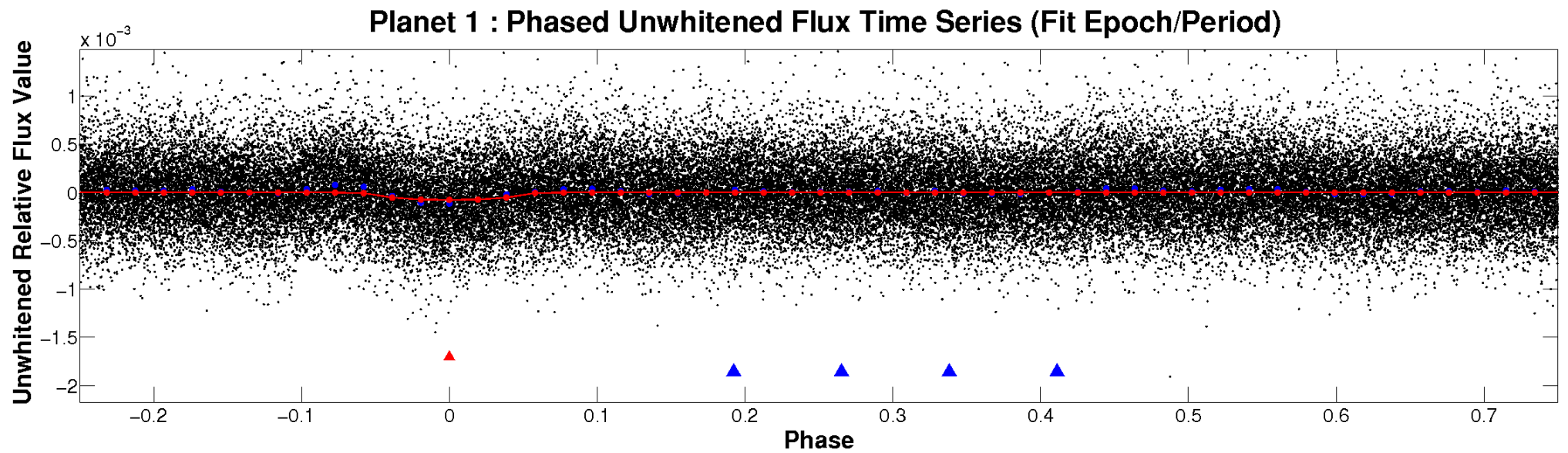


# ALT Odd/Even

TCE 003239636-01



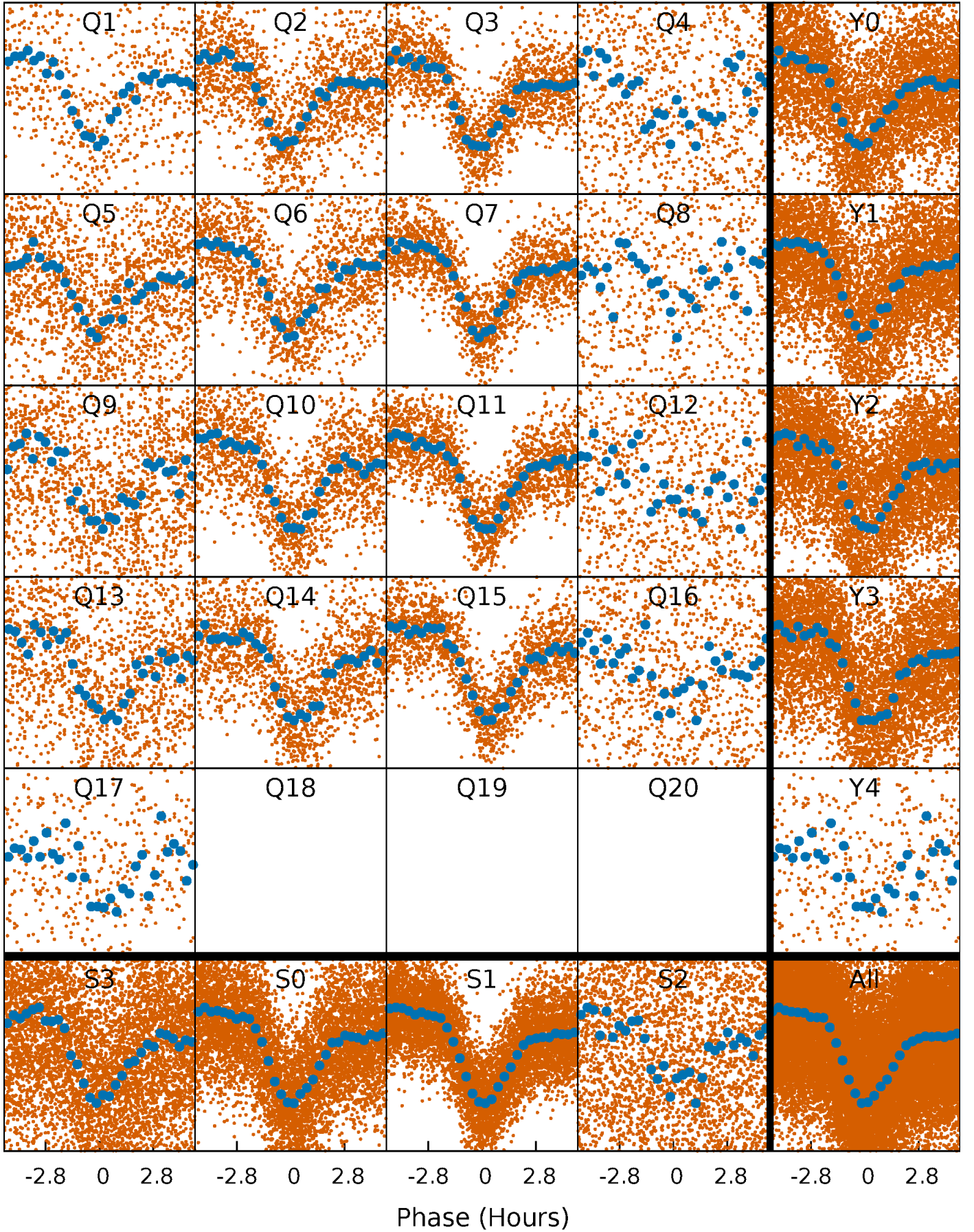
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

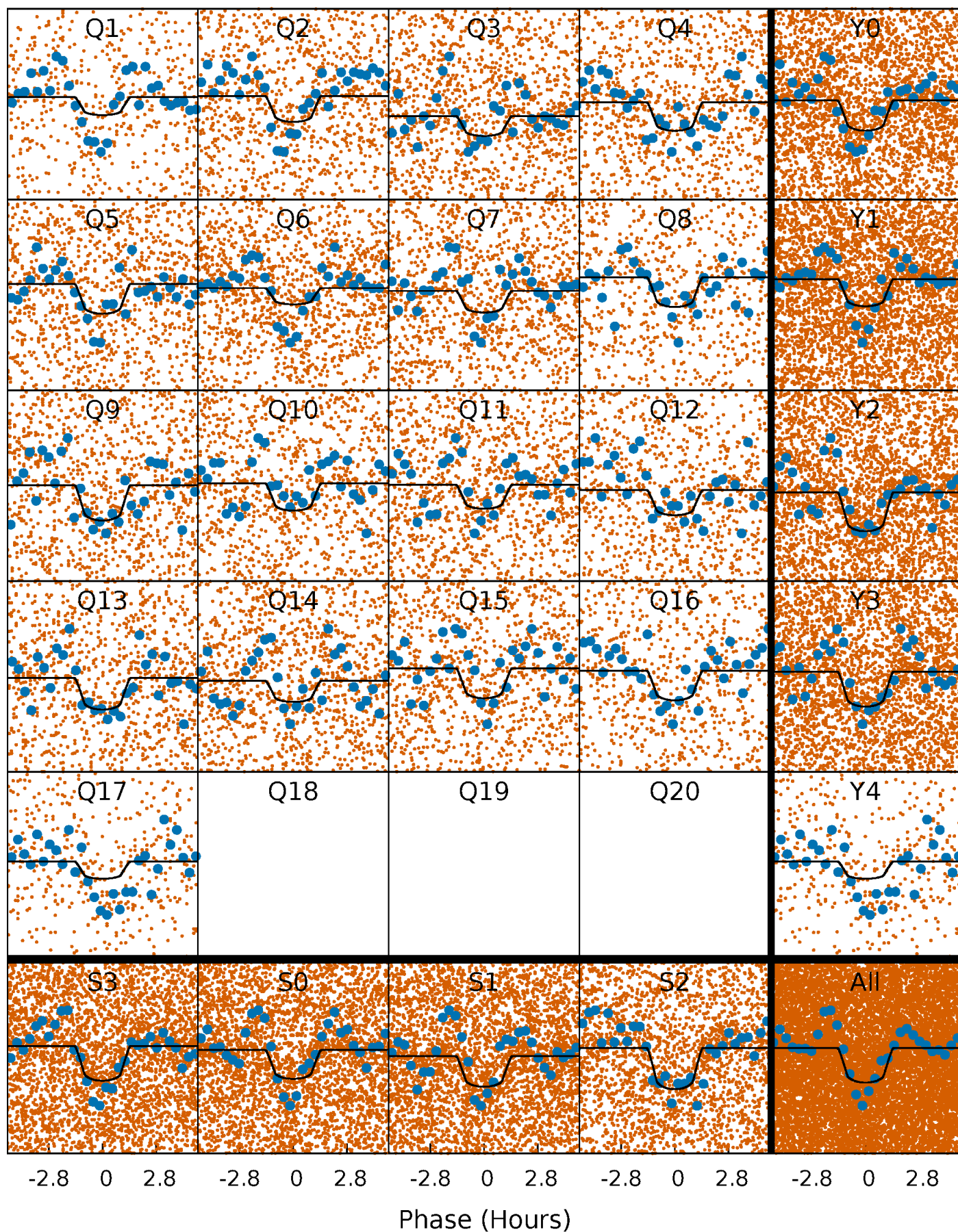
TCE 003239636-01 P= 1.057486 Days  $T_0=132.334876$  (BKJD)





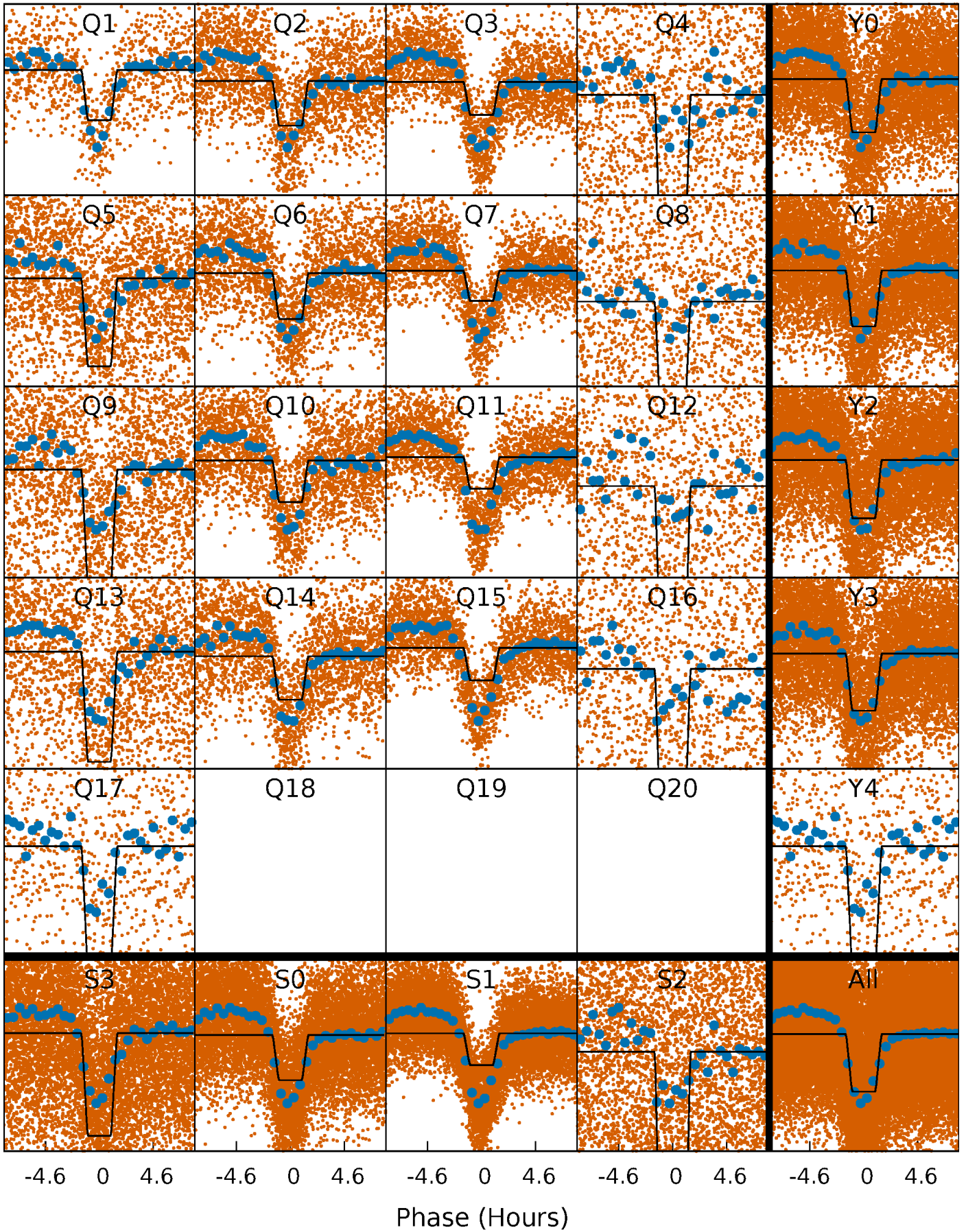
# DV Quarter-Phased Transit Curves

TCE 003239636-01 P= 1.057486 Days  $T_0=132.334876$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003239636-01 P= 1.057511 Days  $T_0=132.327628$  (BKJD)

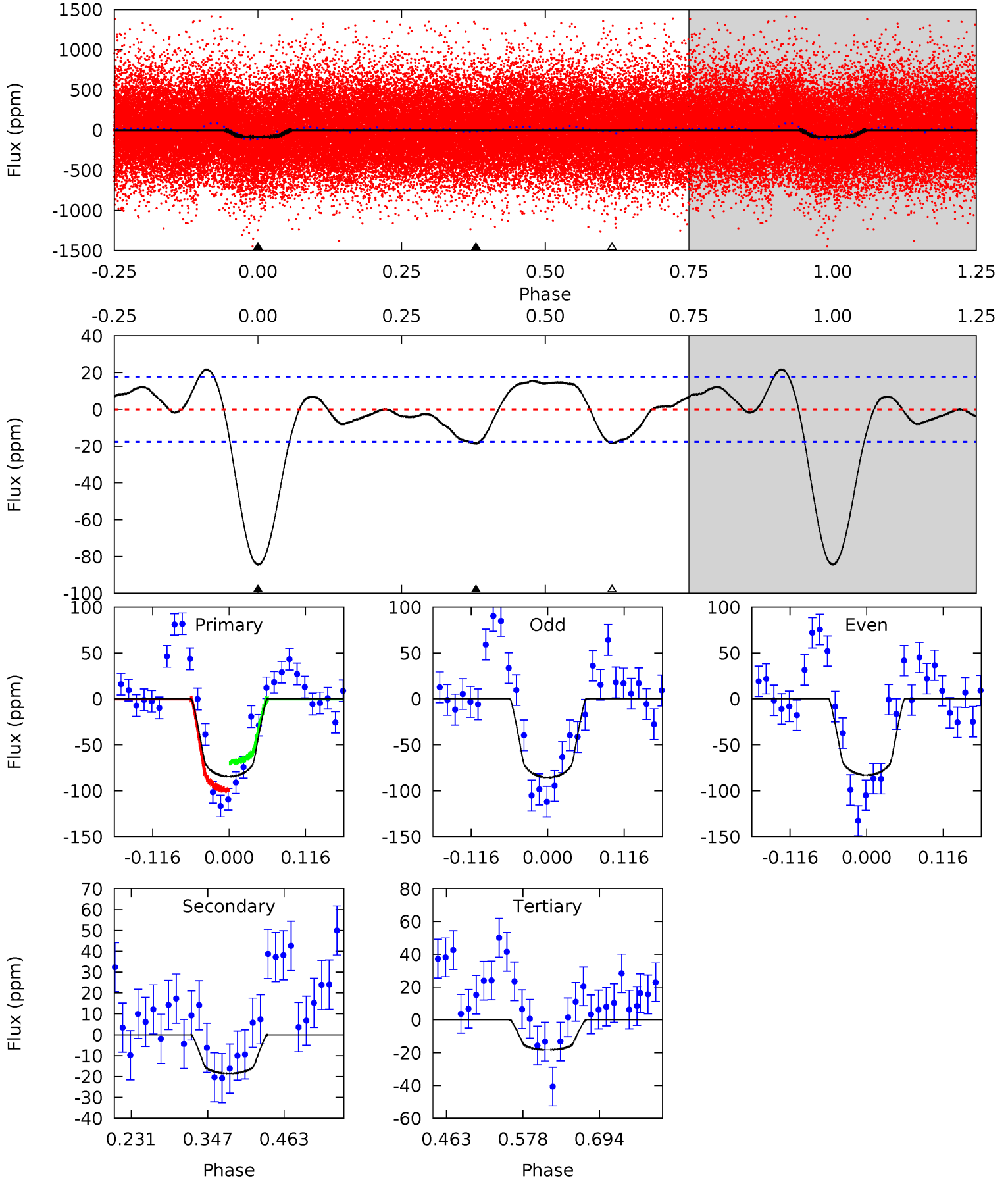




# DV Model-Shift Uniqueness Test

003239636-01, P = 1.057486 Days, E = 131.277390 Days

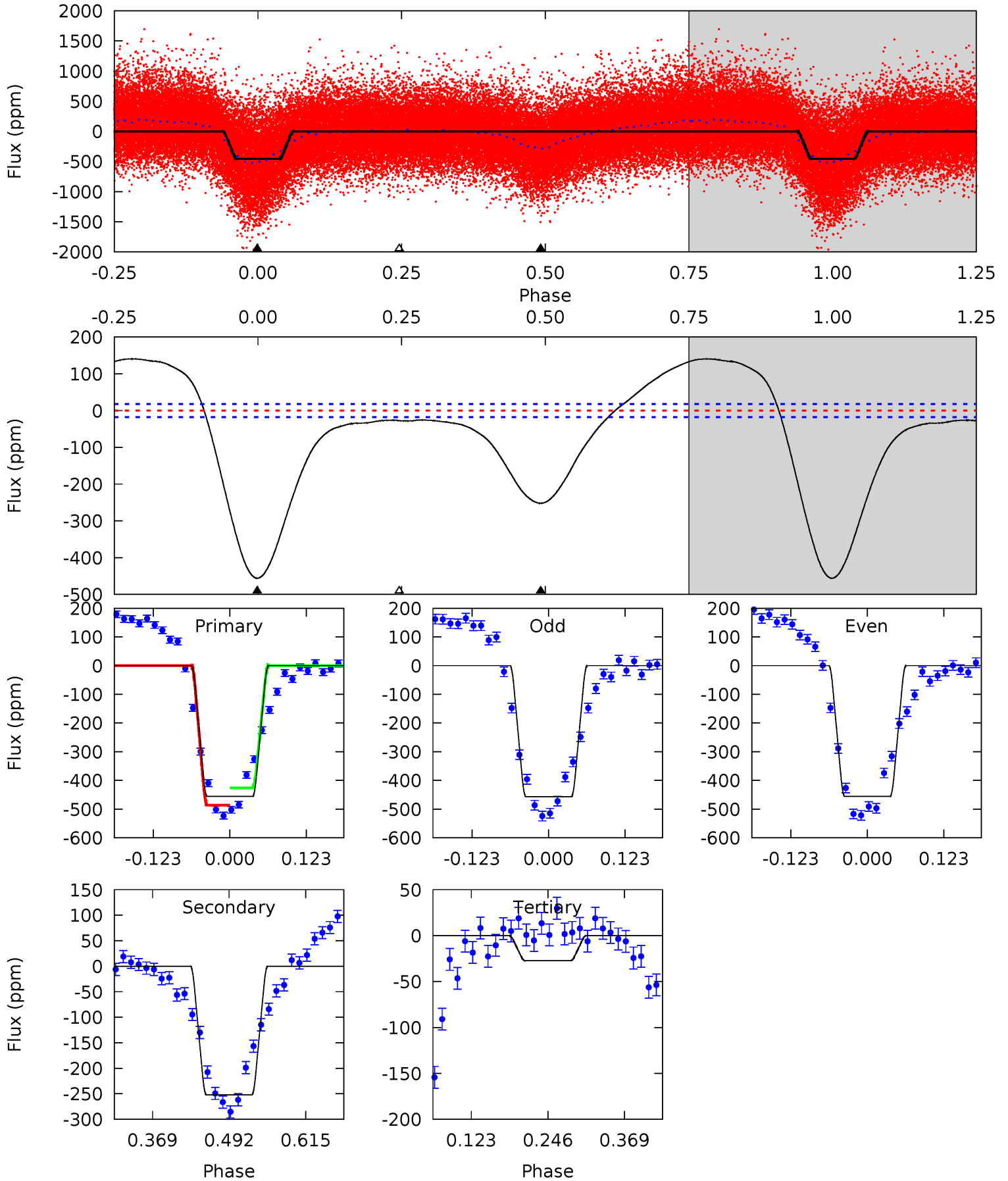
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.7	4.76	4.70	0	4.53	1.57	2.29	17.0	21.7	0.06	4.76	0.33	0.95	0.20	3.90



# Alt Model-Shift Uniqueness Test

003239636-01, P = 1.057511 Days, E = 131.270117 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
114.5	63.3	6.85	0	4.52	1.54	18.4	107.6	114.5	56.4	63.3	0.08	1.01	0.24	7.61





### Stellar Parameters For KIC 003239636

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6151^{+83}_{-73}$	$3.920^{+0.196}_{-0.098}$	$-0.220^{+0.200}_{-0.150}$	$1.954^{+0.308}_{-0.462}$	$1.158^{+0.135}_{-0.122}$	$0.219^{+0.237}_{-0.067}$
	+1%/-1%	+5%/-2%	+91%/-68%	+16%/-24%	+12%/-11%	+108%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003239636-01 / KOI 1093.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-19 \pm 4$	$1.93^{+0.86}_{-0.79}$	$3606^{+169}_{-228}$	$4170^{+1150}_{-720}$	$1.246^{+2.445}_{-0.664}$
Alt.	$-252 \pm 4$	$4.30^{+1.03}_{-0.95}$	$3600^{+162}_{-213}$	$5320^{+601}_{-445}$	$3.472^{+2.215}_{-1.210}$

$T_{max}$  = 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

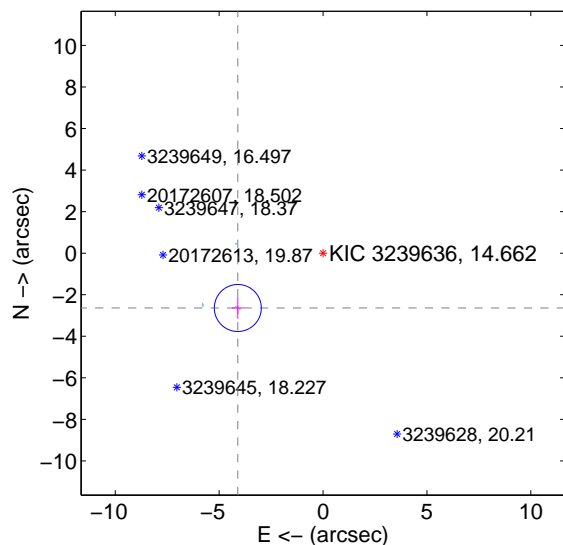
Supplemental centroid analysis for 003239636-01. Kepler magnitude: 14.66. Transit SNR 14.95

There are 6 quarters with good PRF difference image offsets

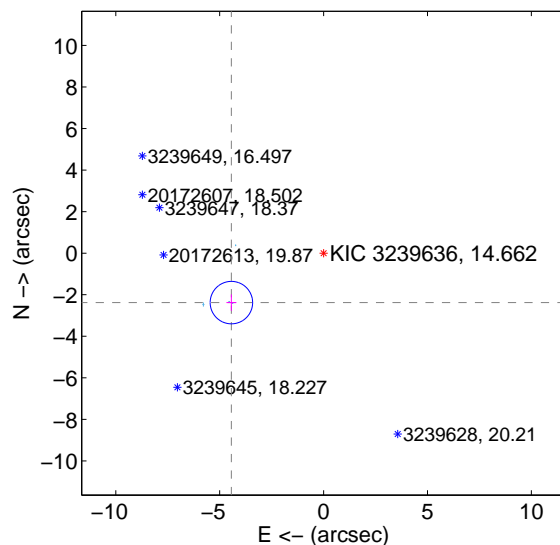
The direct PRF centroid is offset from the target star catalog position by about 0.47 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.878 \pm 0.377$	12.94	$4.102 \pm 0.277$	$-2.639 \pm 0.517$
PRF-fit source offset from KIC position	$5.035 \pm 0.341$	14.78	$4.437 \pm 0.239$	$-2.380 \pm 0.393$
photometric centroid source offset	$6.70 \pm 1.00$	6.70	$4.51 \pm 0.97$	$-4.96 \pm 1.03$

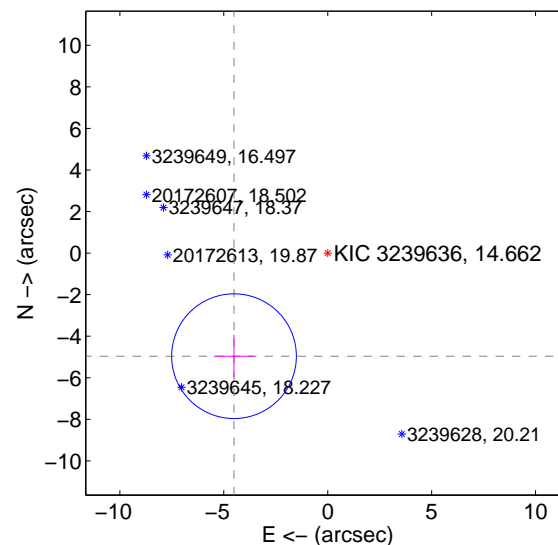
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

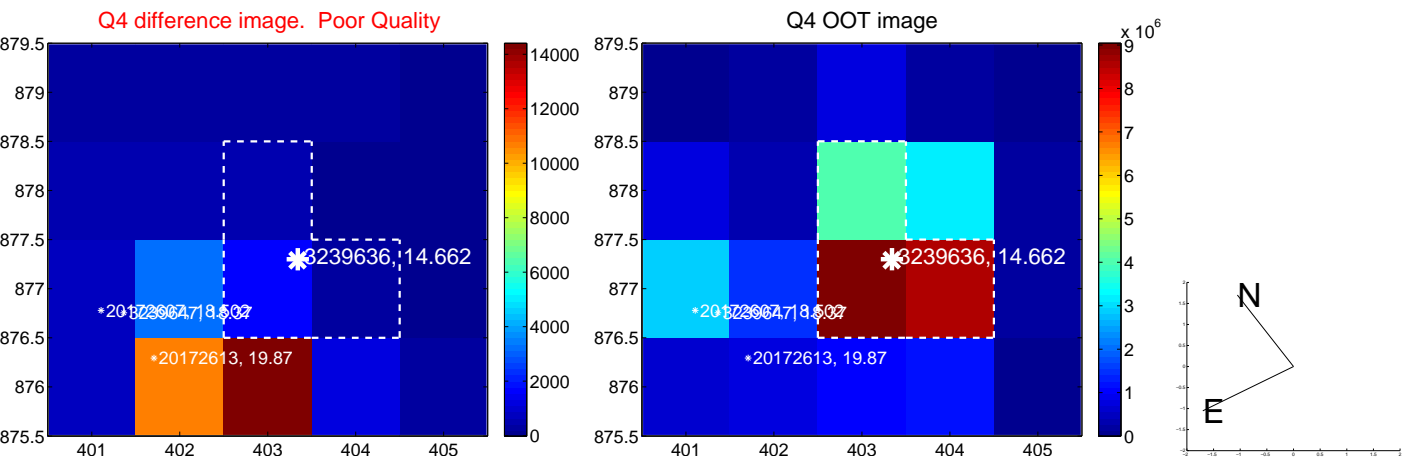
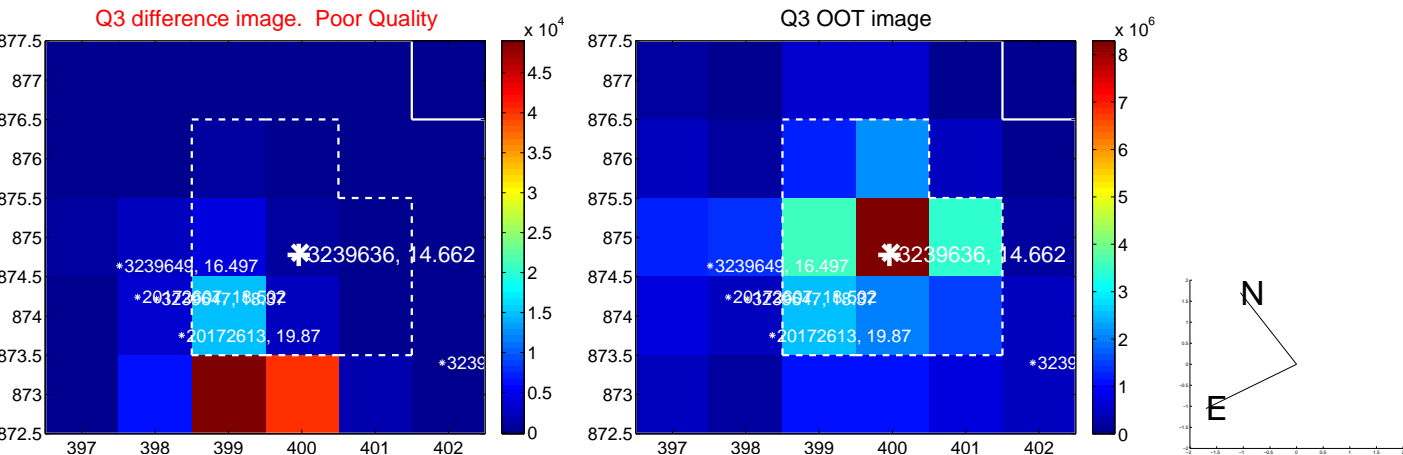
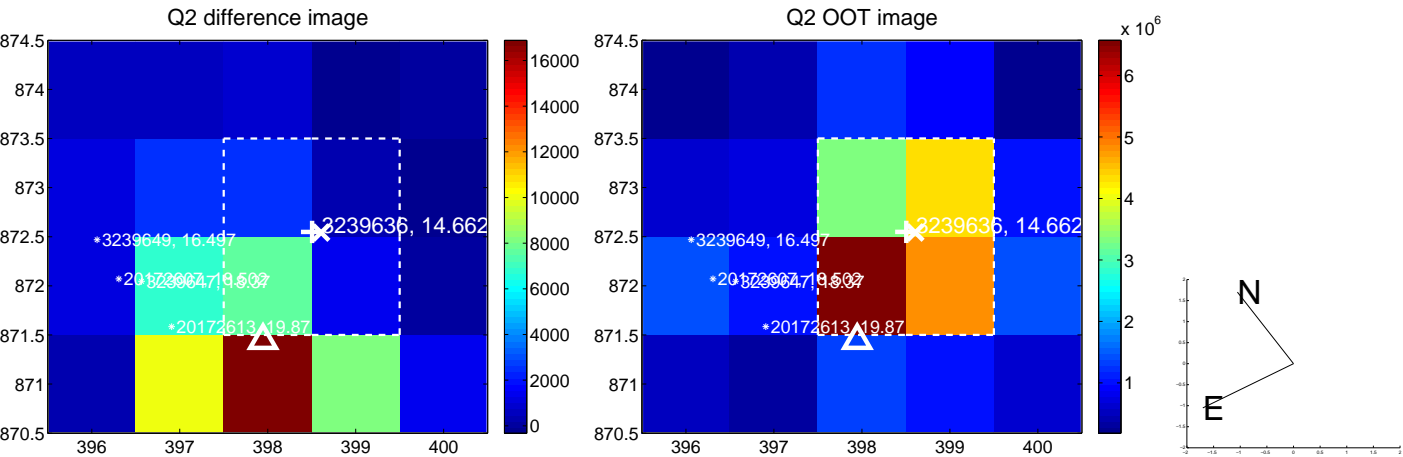
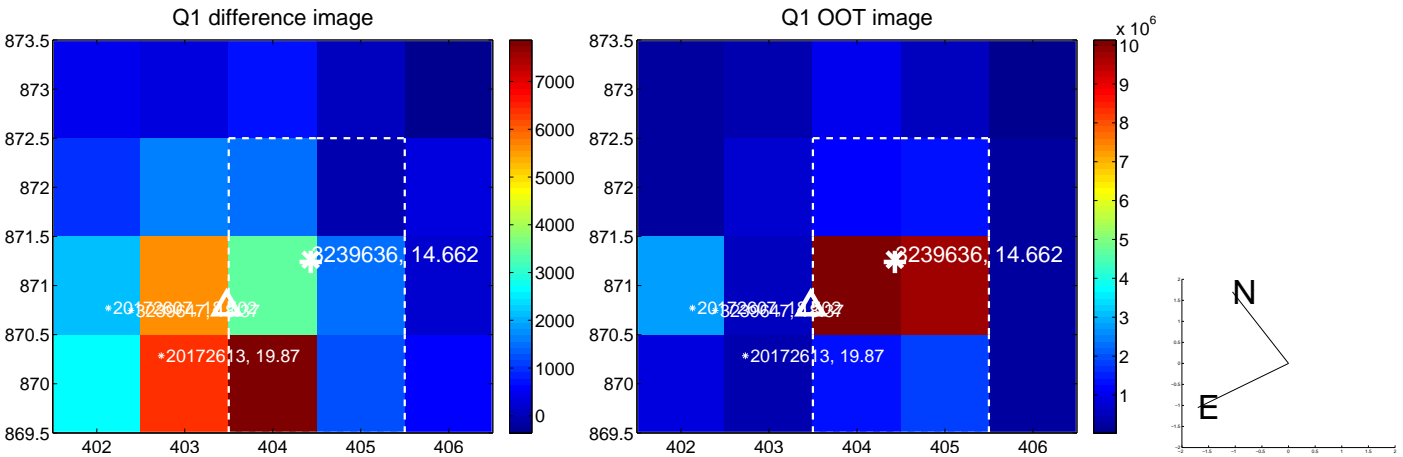


offset from photometric centroids

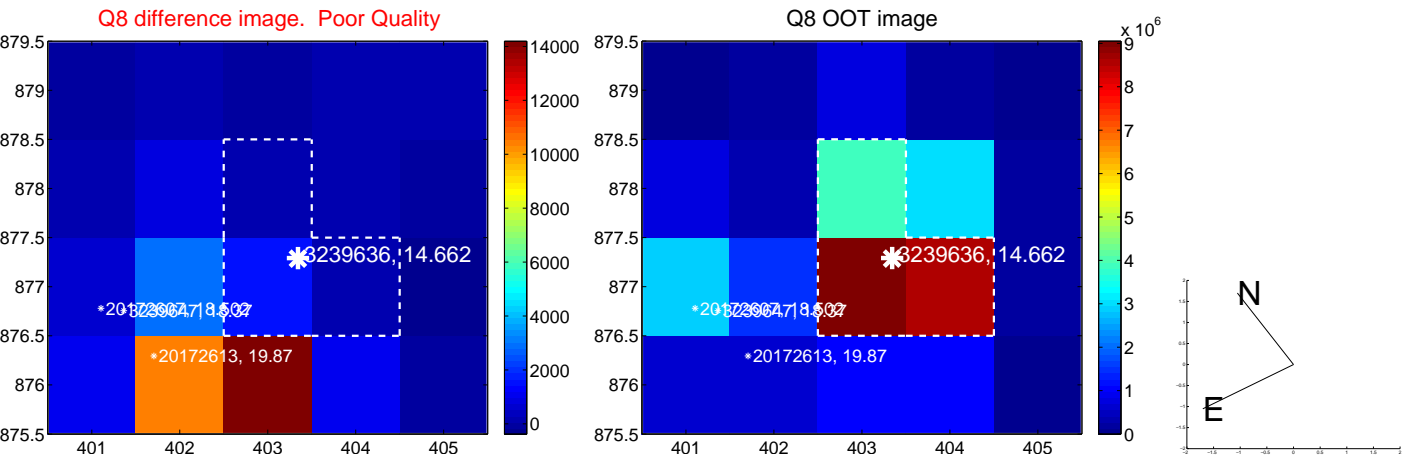
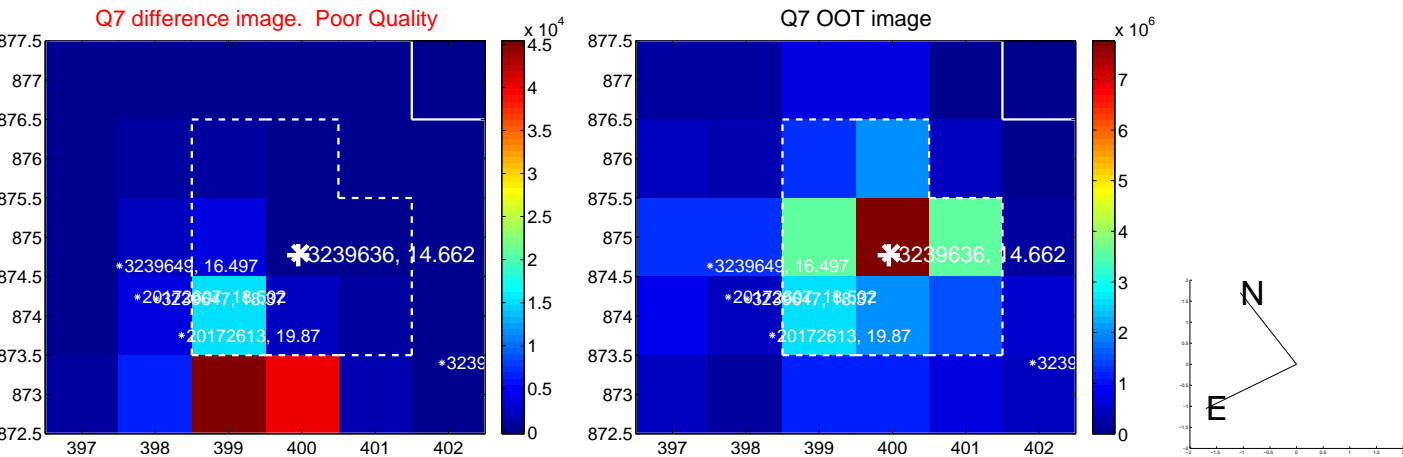
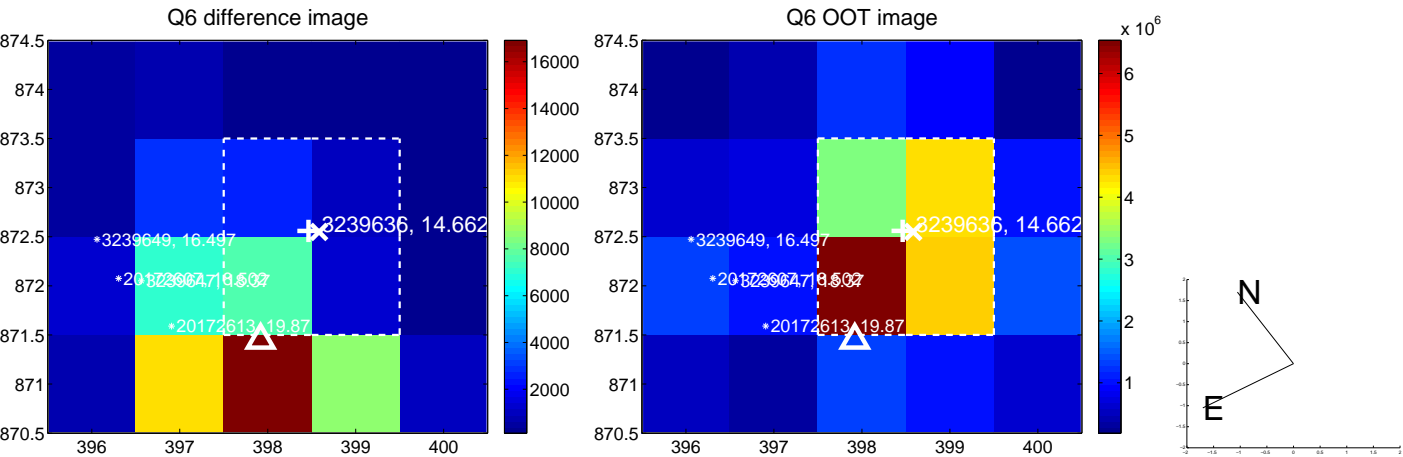
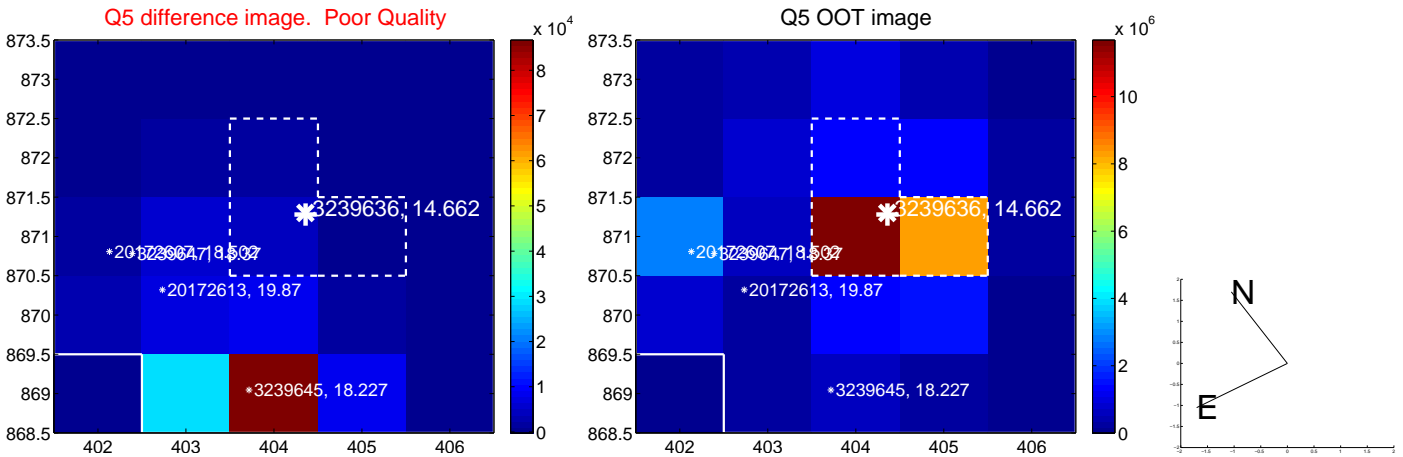


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

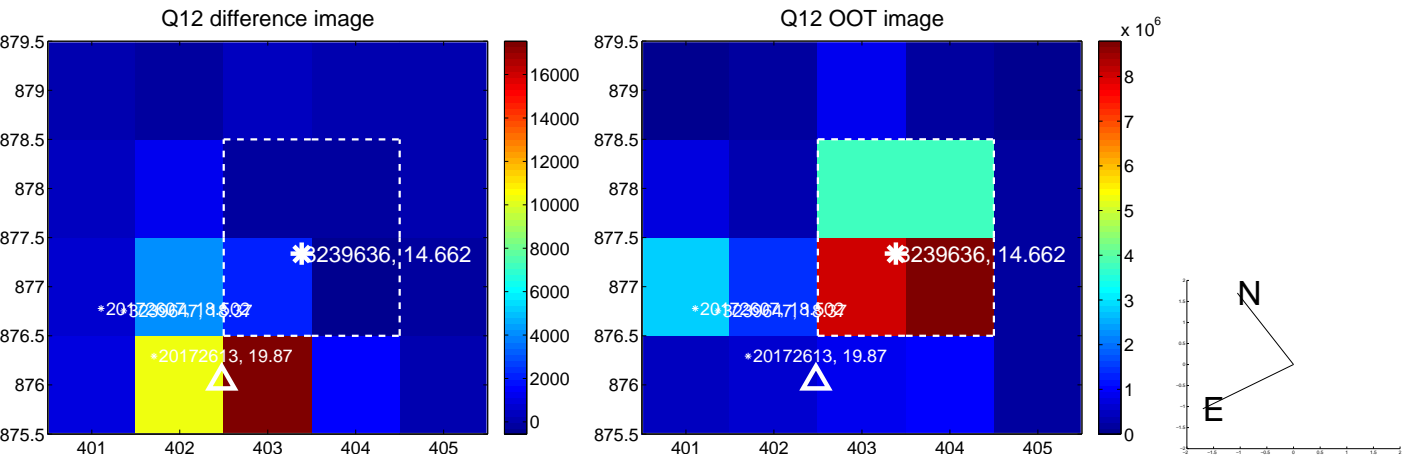
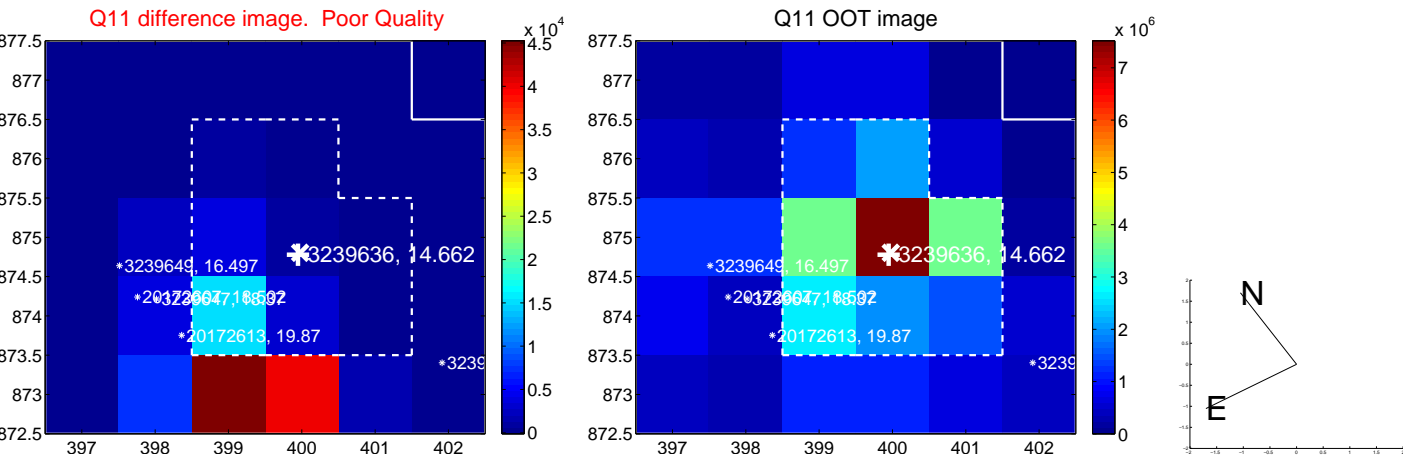
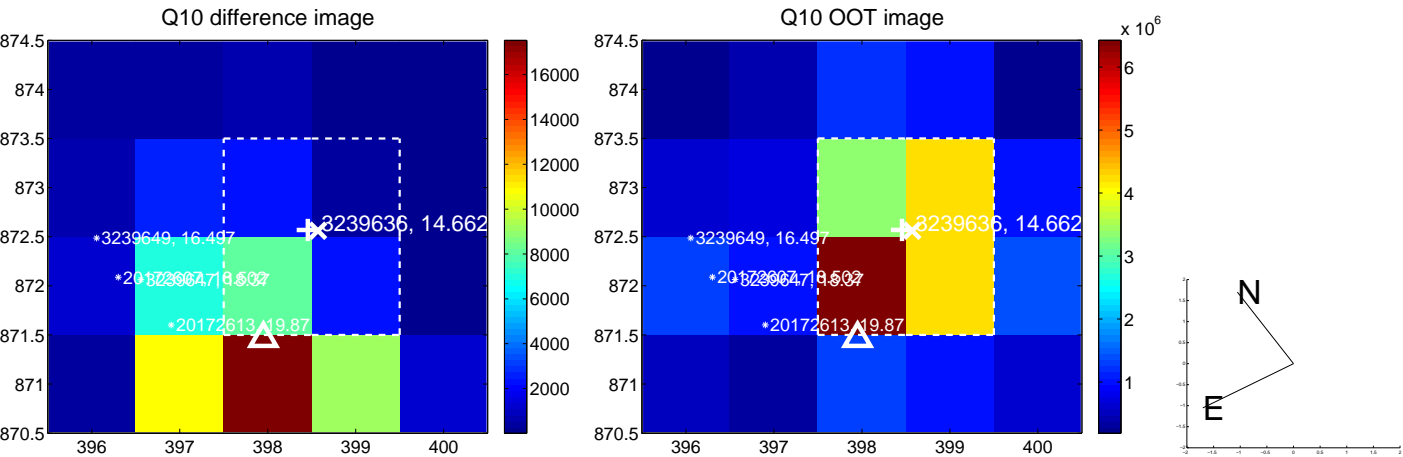
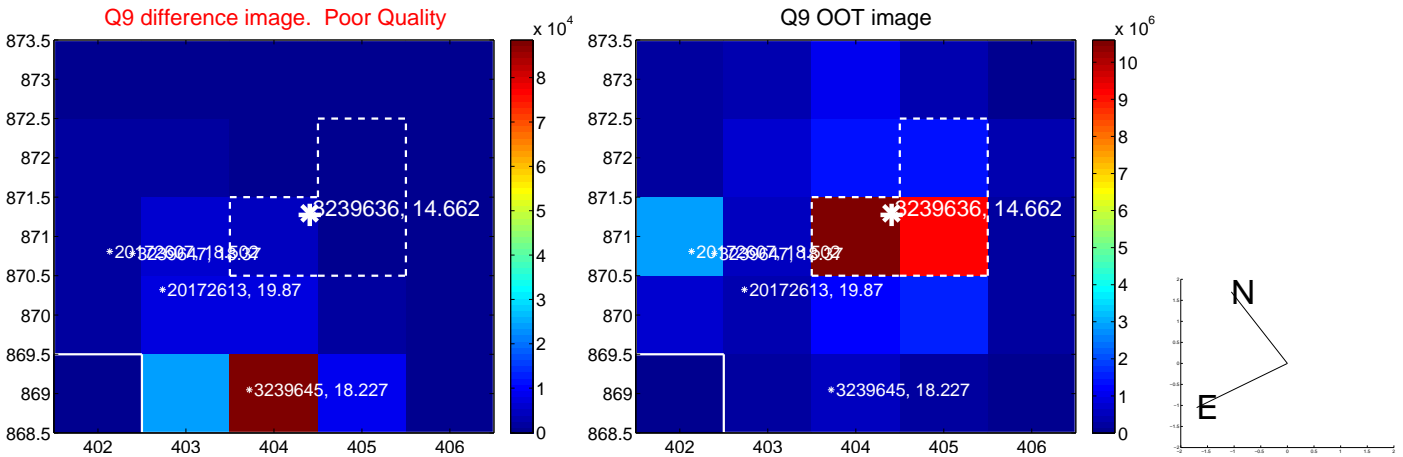


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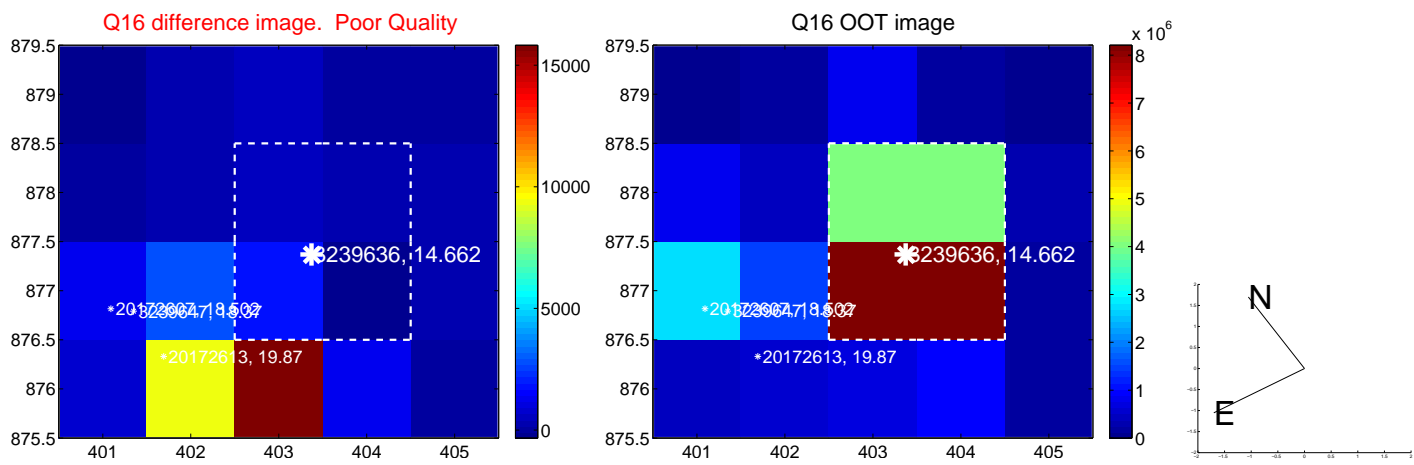
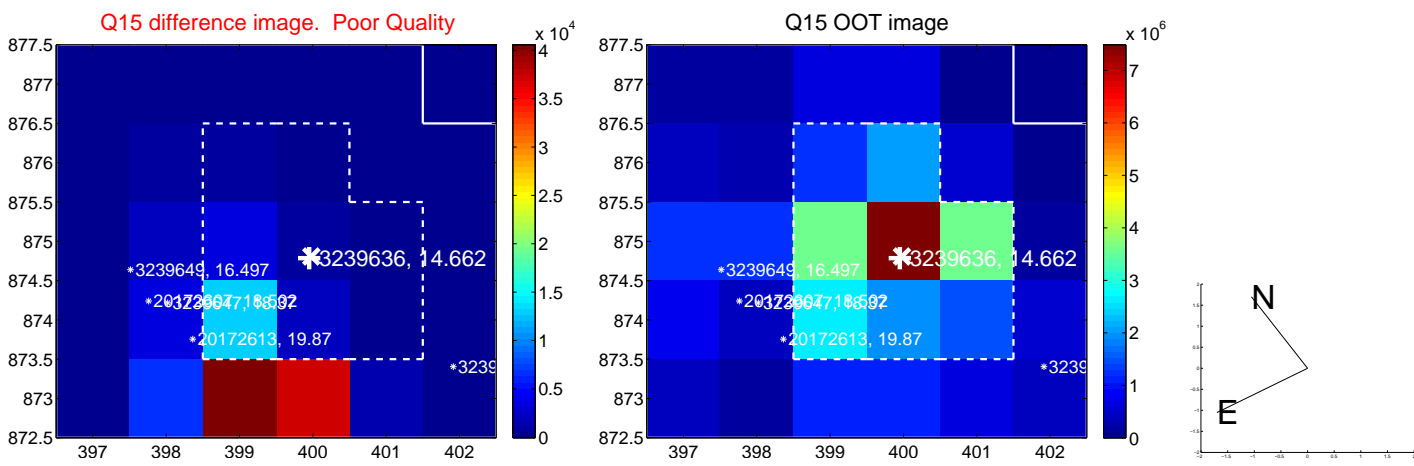
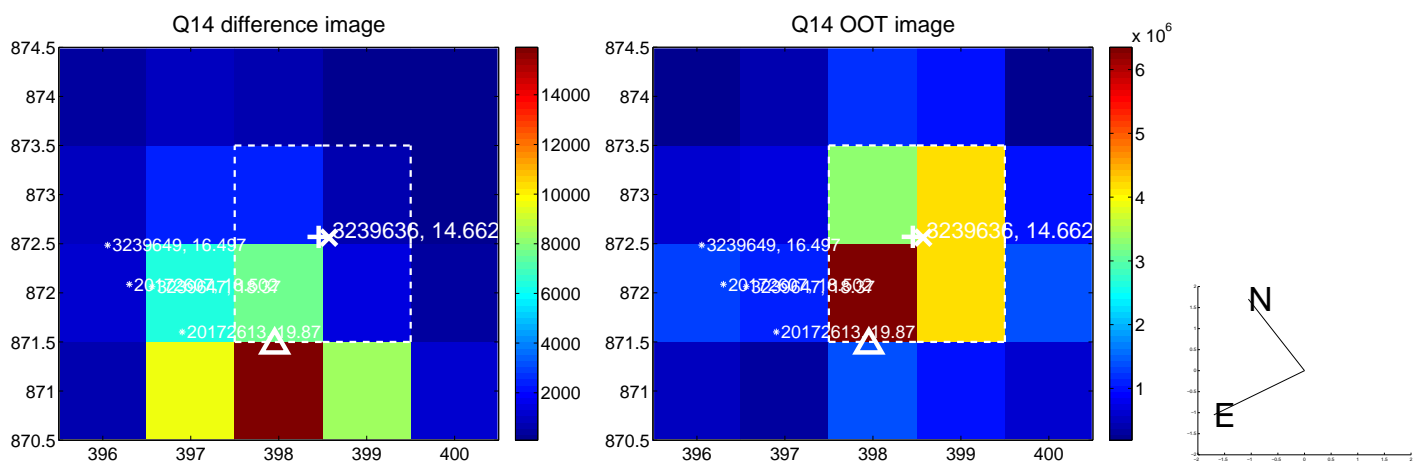
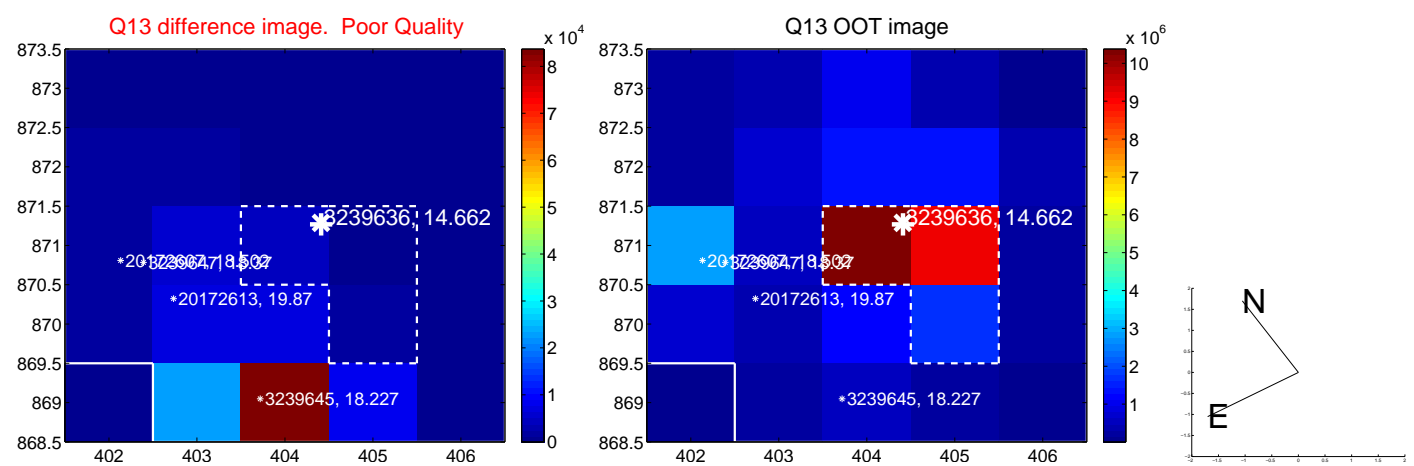




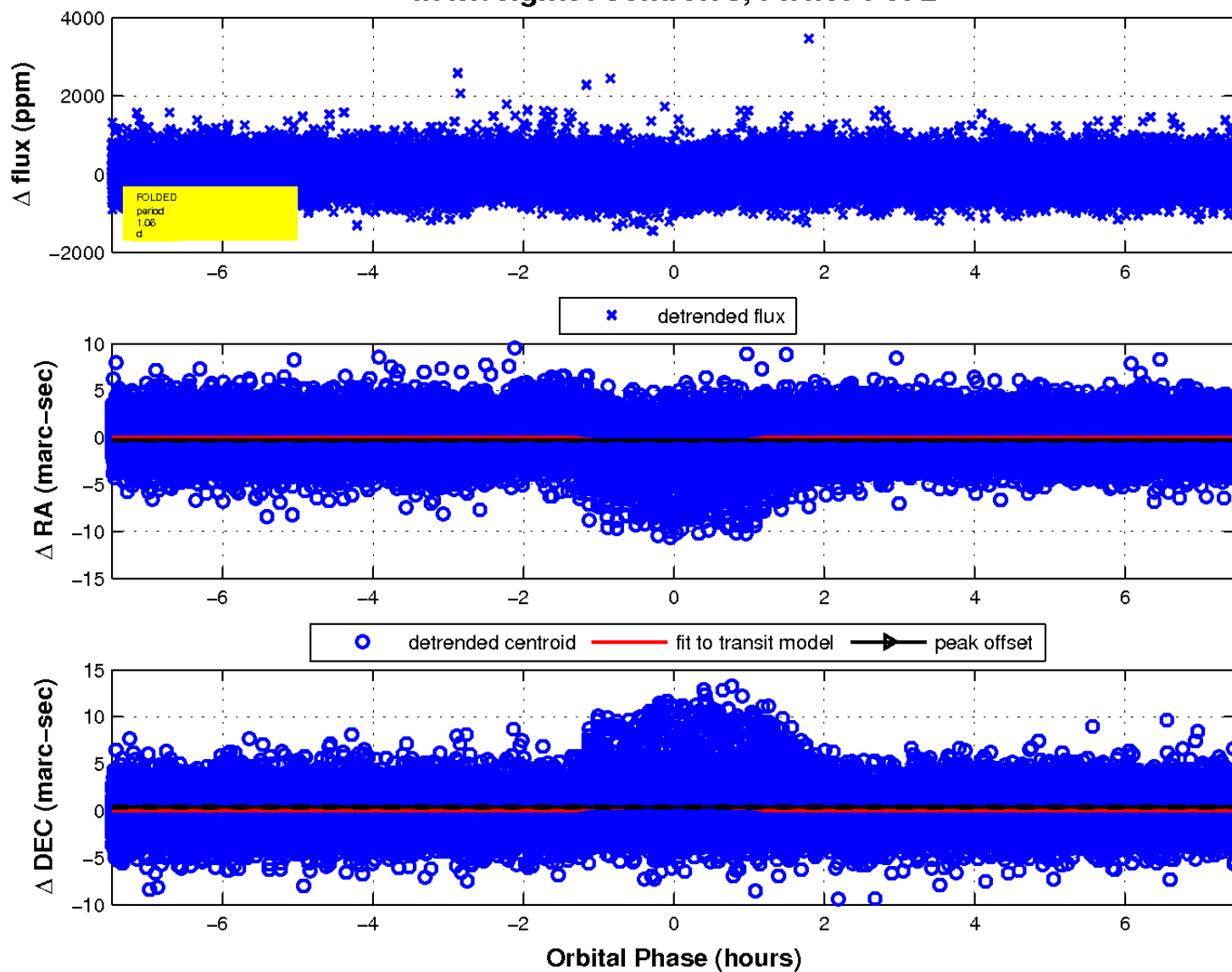
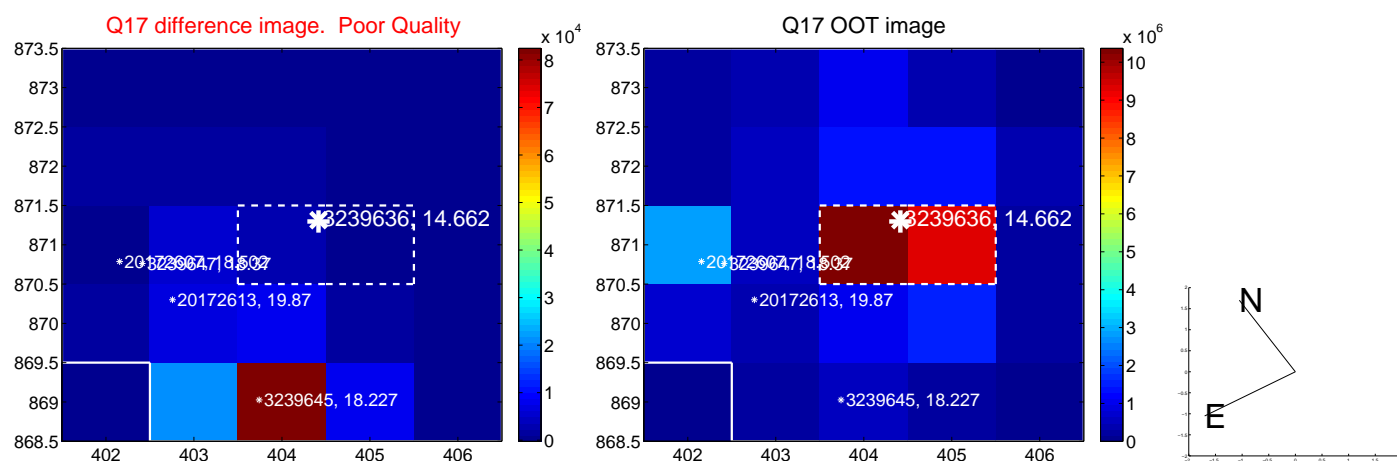
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

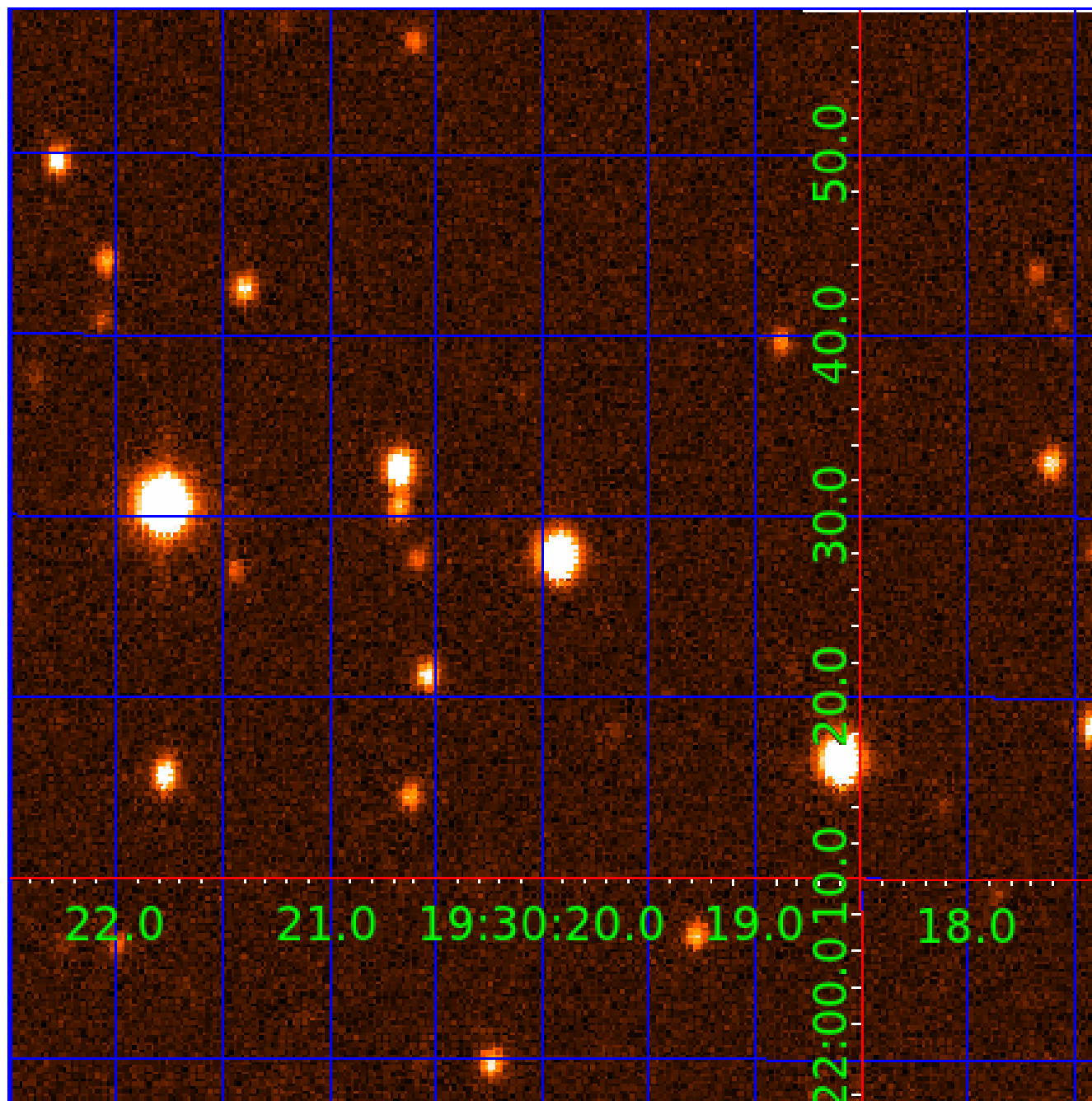


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003239636

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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003239636-02	OBS	No	369.139858	222.424685	363.9	13.417	7.5	7.2	1.95	6151	4.12	4.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003239636-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
003239636-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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.

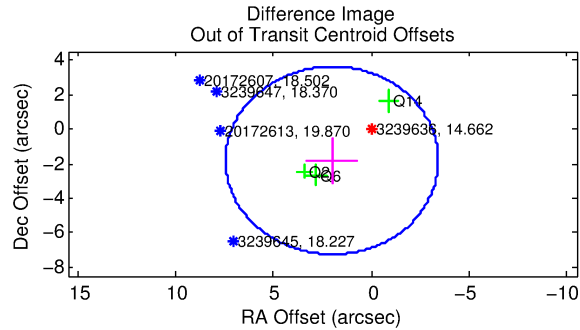
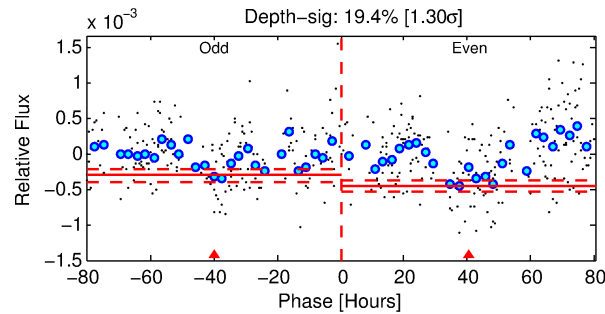
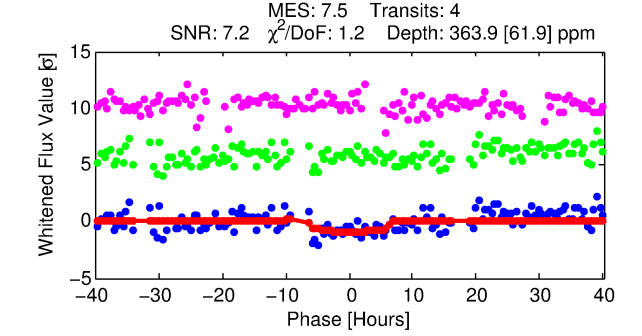
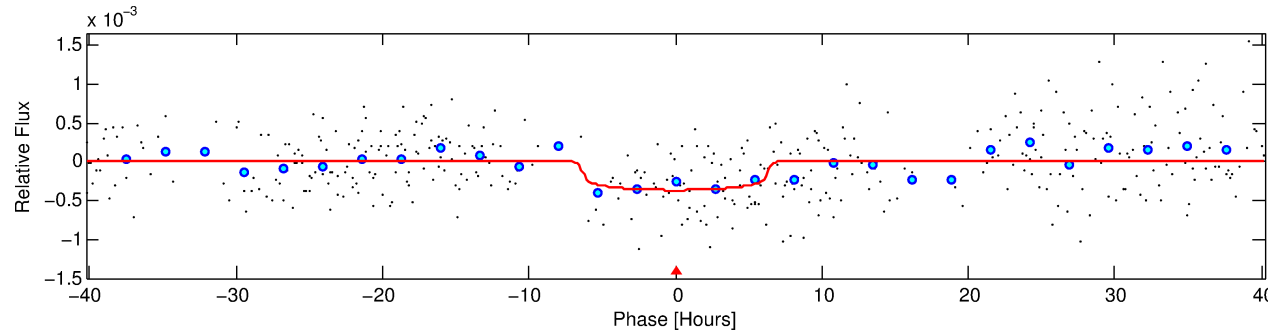
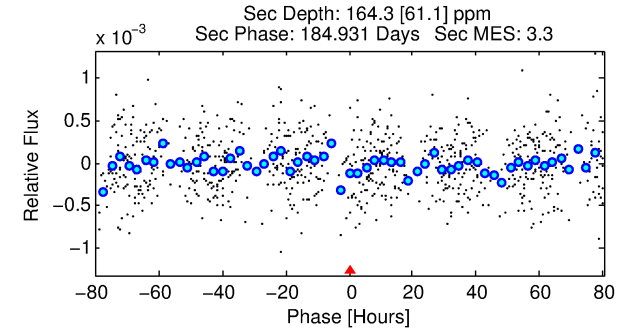
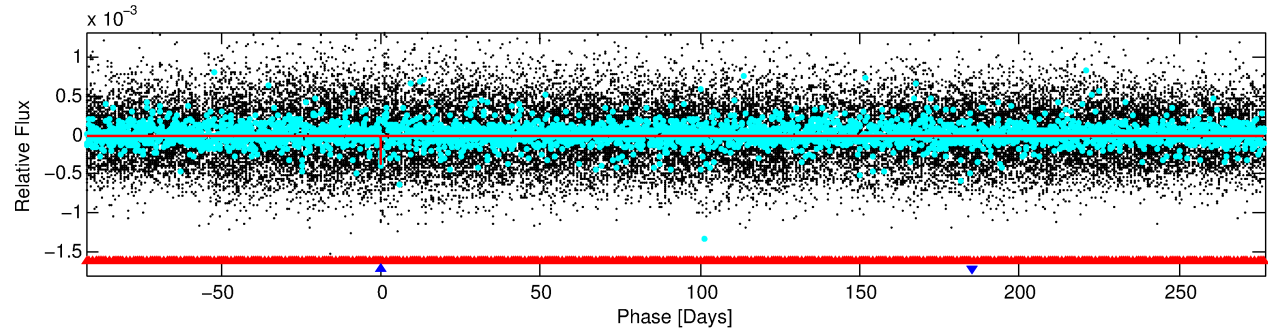
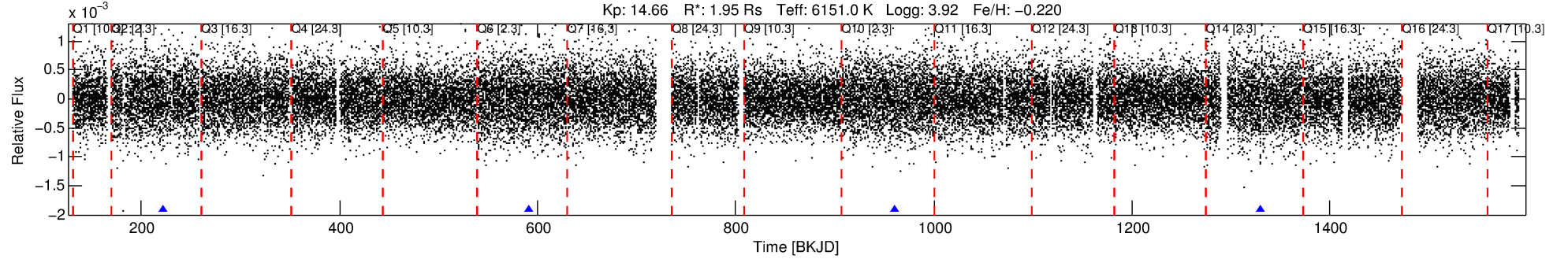
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003239636-02

No Significant Match Found

# DV One-Page Summary

KIC: 3239636 Candidate: 2 of 2 Period: 369.140 d  
KOI: K01093 Corr: No Ephemeris Match



## DV Fit Results:

Period = 369.13986 [0.02079] d  
Epoch = 222.4247 [0.0540] BKJD  
Rp/R\* = 0.0193 [0.0092]  
a/R\* = 133.66 [323.87]  
b = 0.80 [1.12]  
Seff = 4.38 [1.50]  
Teq = 369 [32] K  
Rp = 4.12 [2.19] Re  
a = 1.0579 [0.2305] AU  
Ag = 5971.16 [6436.66] [0.93 $\sigma$ ]  
Teff = 5012 [1284] K [3.62 $\sigma$ ]

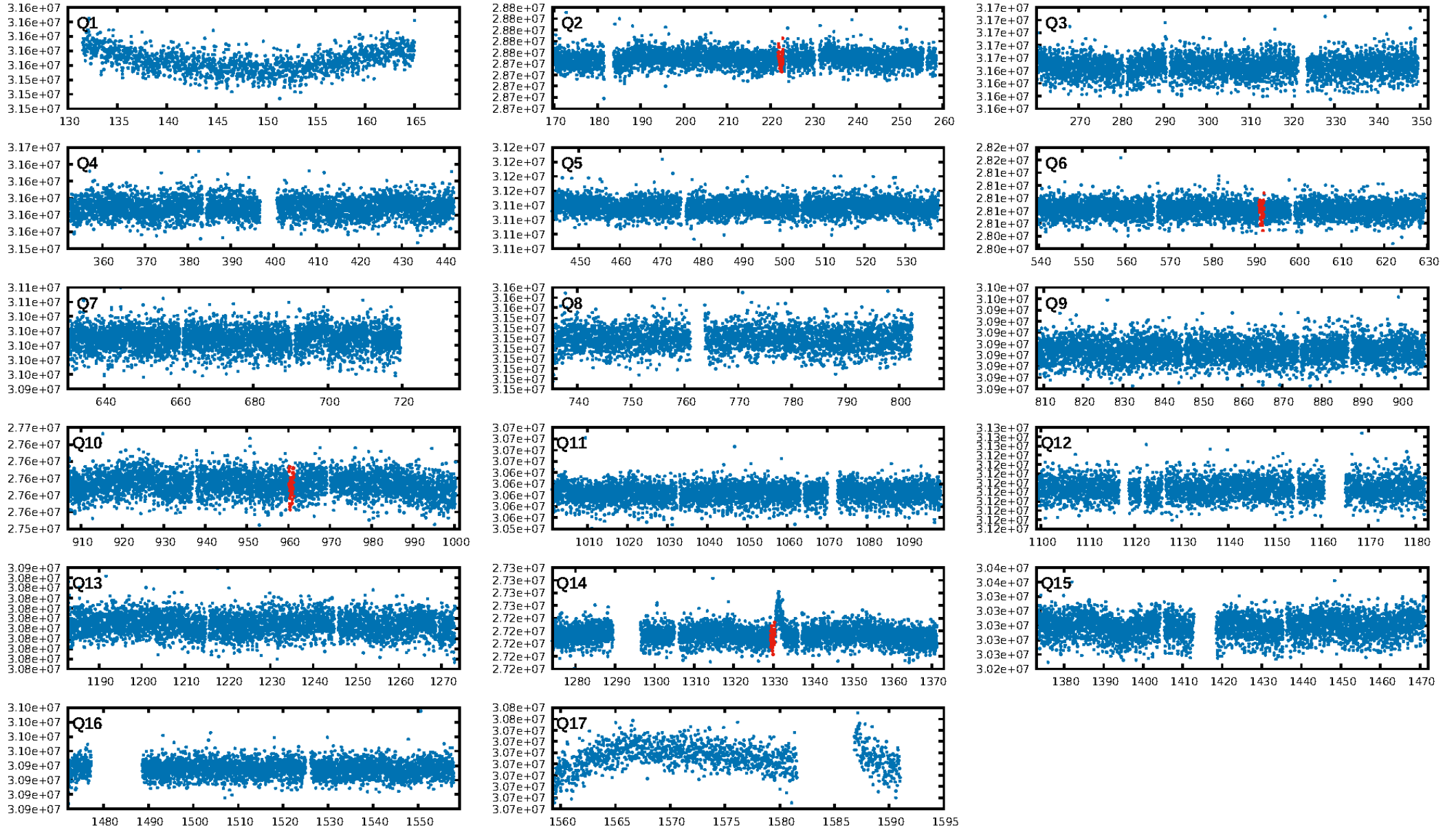
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [647.36 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 12.6%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.37e-12**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -5.656  
Centroid-sig: 38.3%  
Centroid-so: 1.621 arcsec [0.81 $\sigma$ ]  
OotOffset-rm: 2.714 arcsec [1.50 $\sigma$ ]  
OotOffset-st: 3/0/0/0 [3]  
KicOffset-rm: 2.851 arcsec [1.54 $\sigma$ ]  
KicOffset-st: 3/0/0/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/4]

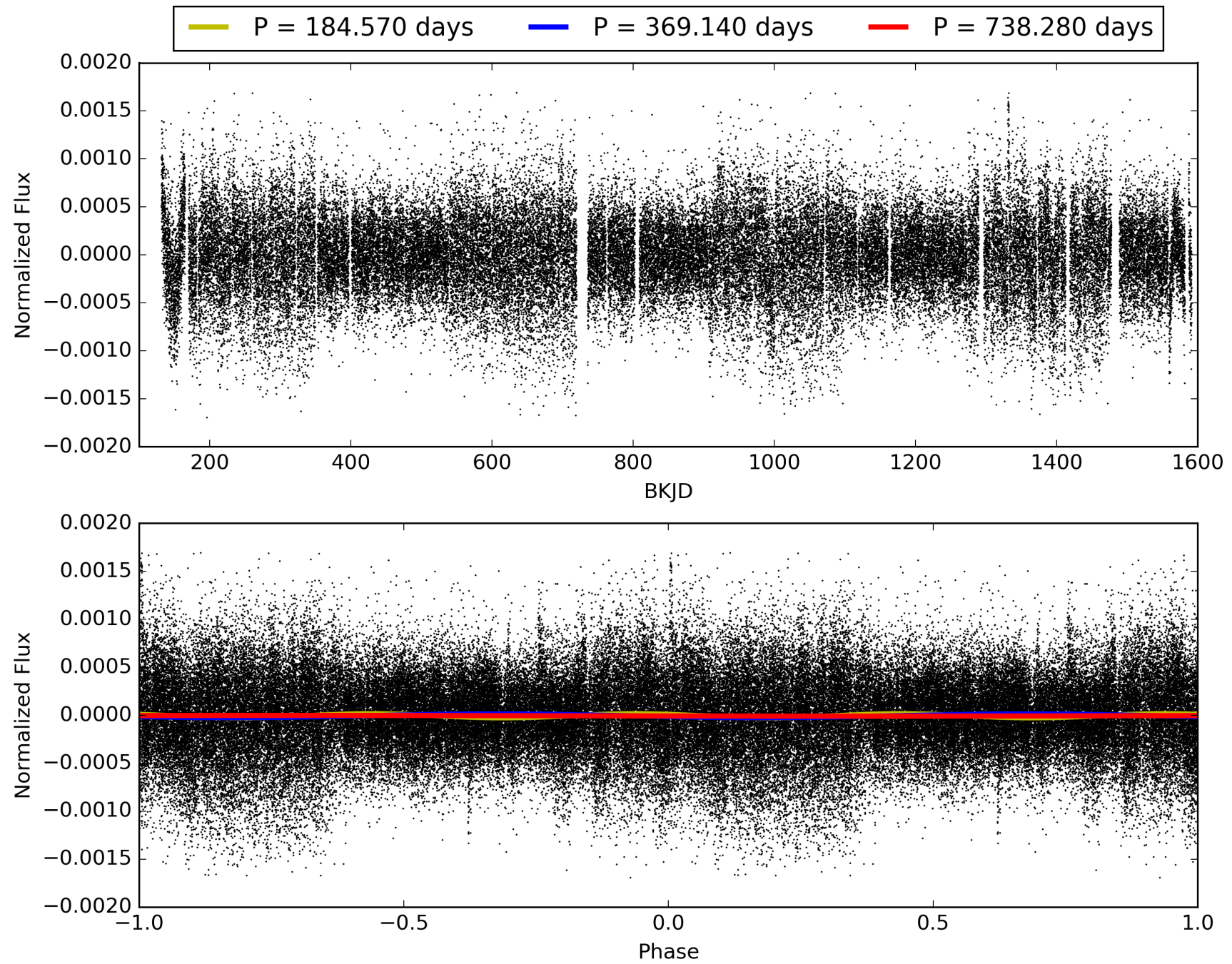
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:27:28 Z

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

# TCE 003239636-02, PDC Light Curves



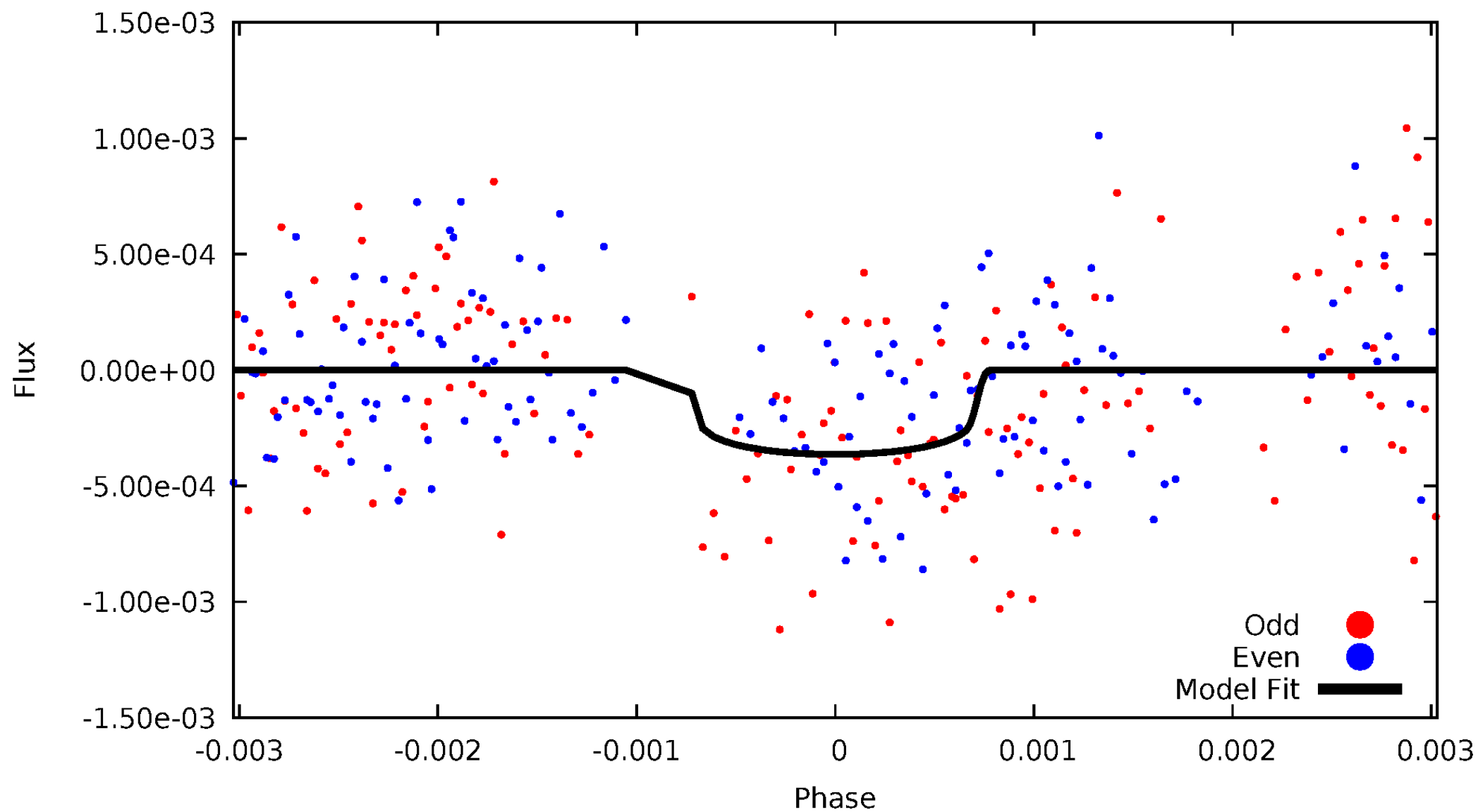
TCE 003239636-02





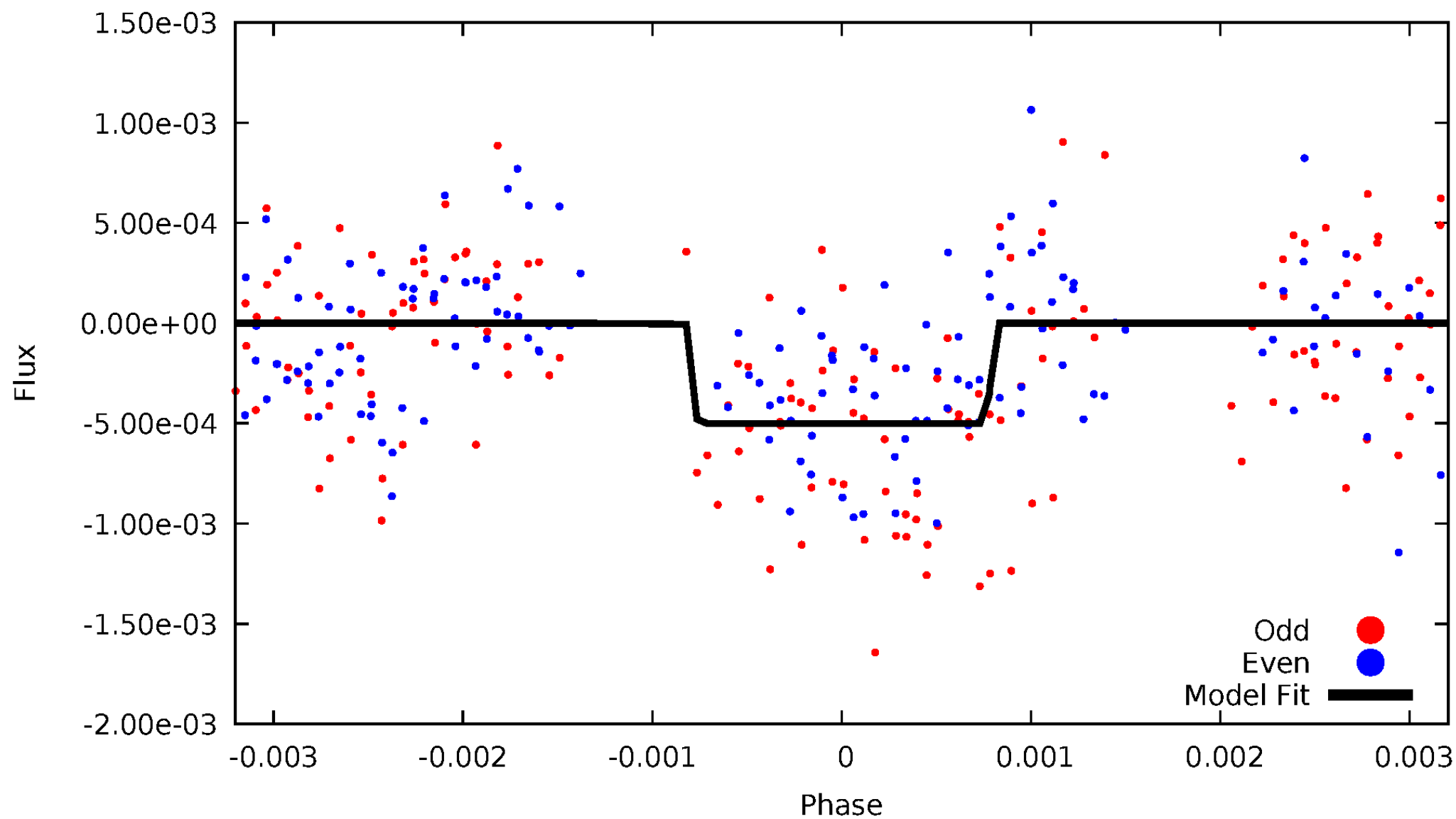
# DV Odd/Even

TCE 003239636-02



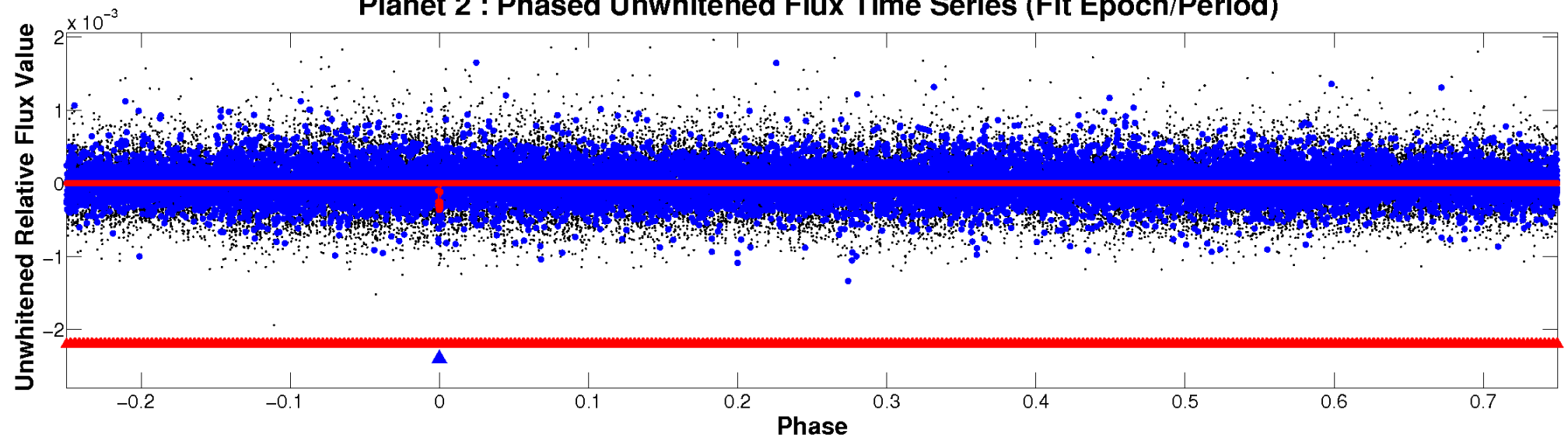
# ALT Odd/Even

TCE 003239636-02

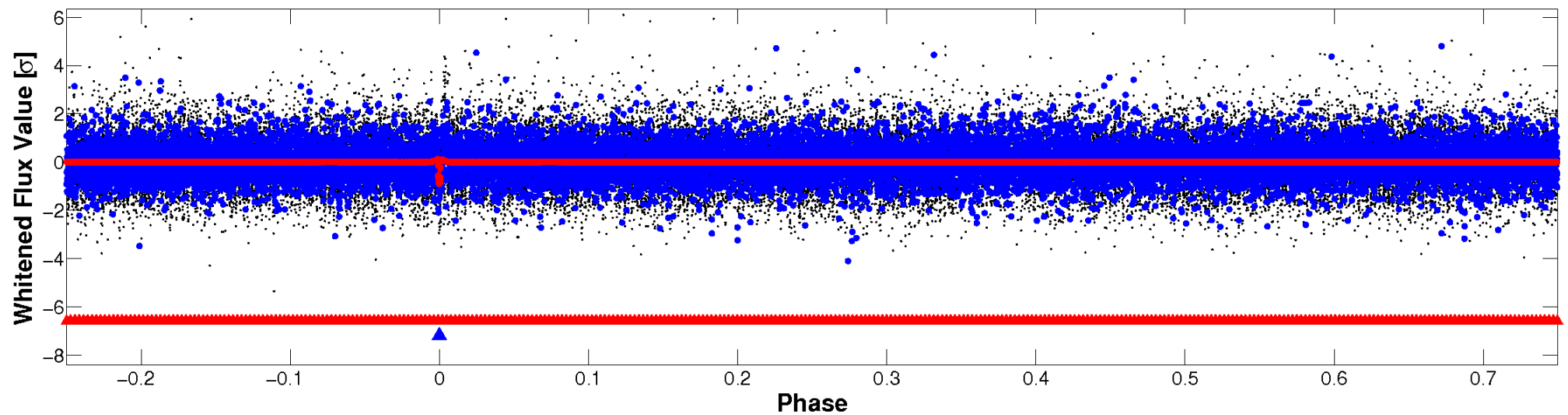


# Non-Whitened Vs. Whitened Light Curve

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

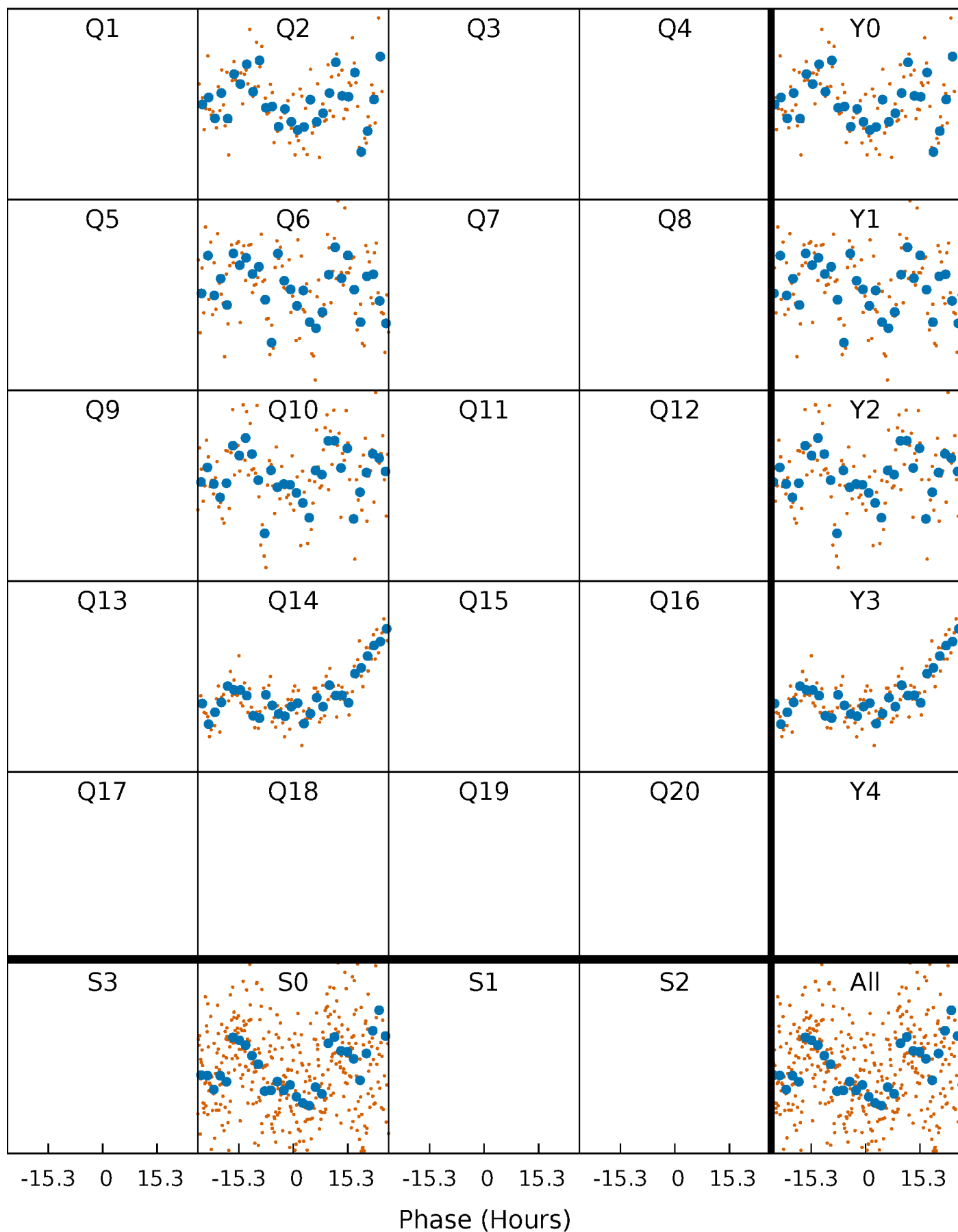


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

TCE 003239636-02 P=369.139858 Days  $T_0=222.424685$  (BKJD)



# DV Quarter-Phased Transit Curves

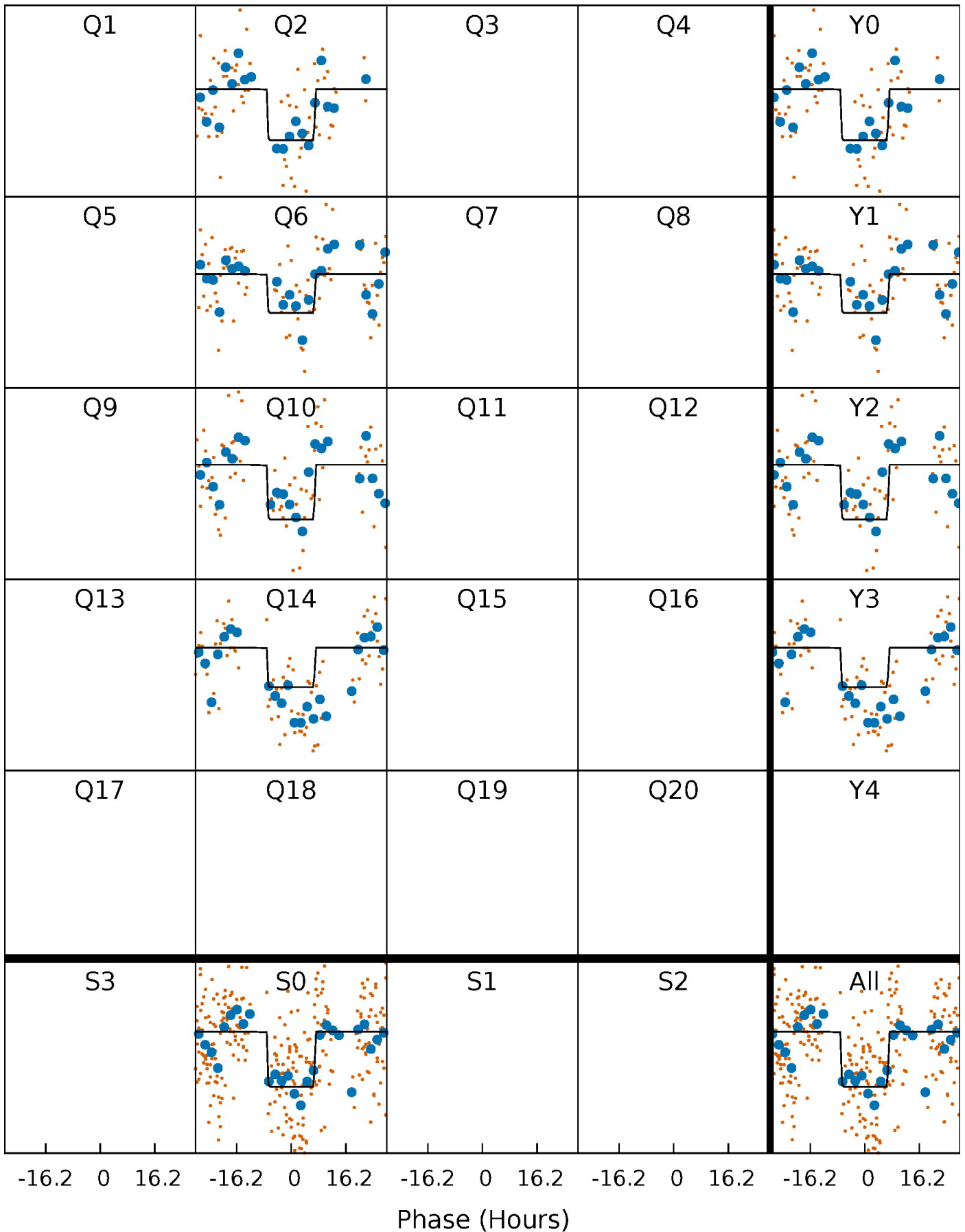
TCE 003239636-02 P=369.139858 Days  $T_0=222.424685$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

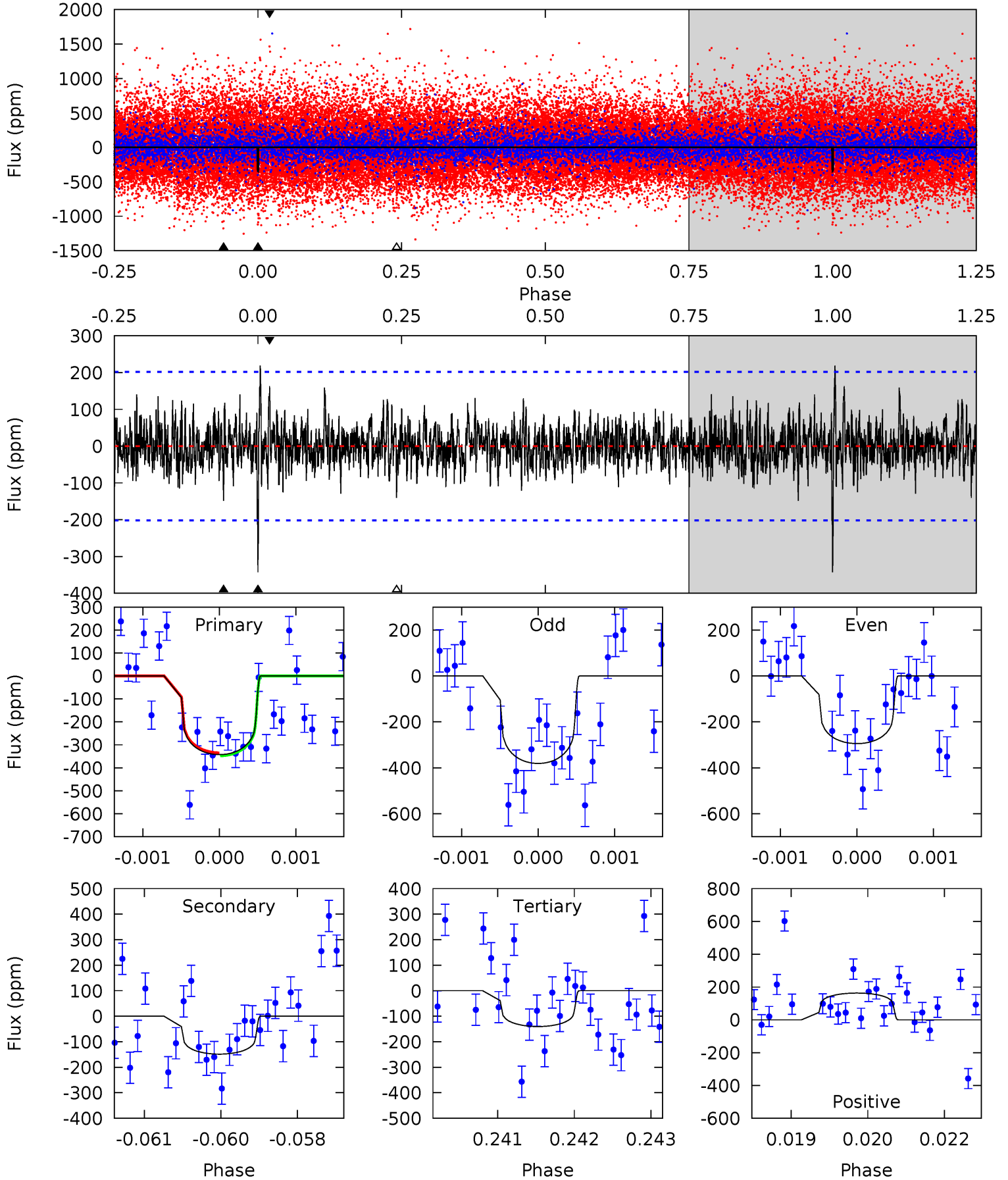
TCE 003239636-02 P=369.111828 Days  $T_0=222.544979$  (BKJD)



# DV Model-Shift Uniqueness Test

003239636-02, P = 369.139858 Days, E = 222.424685 Days

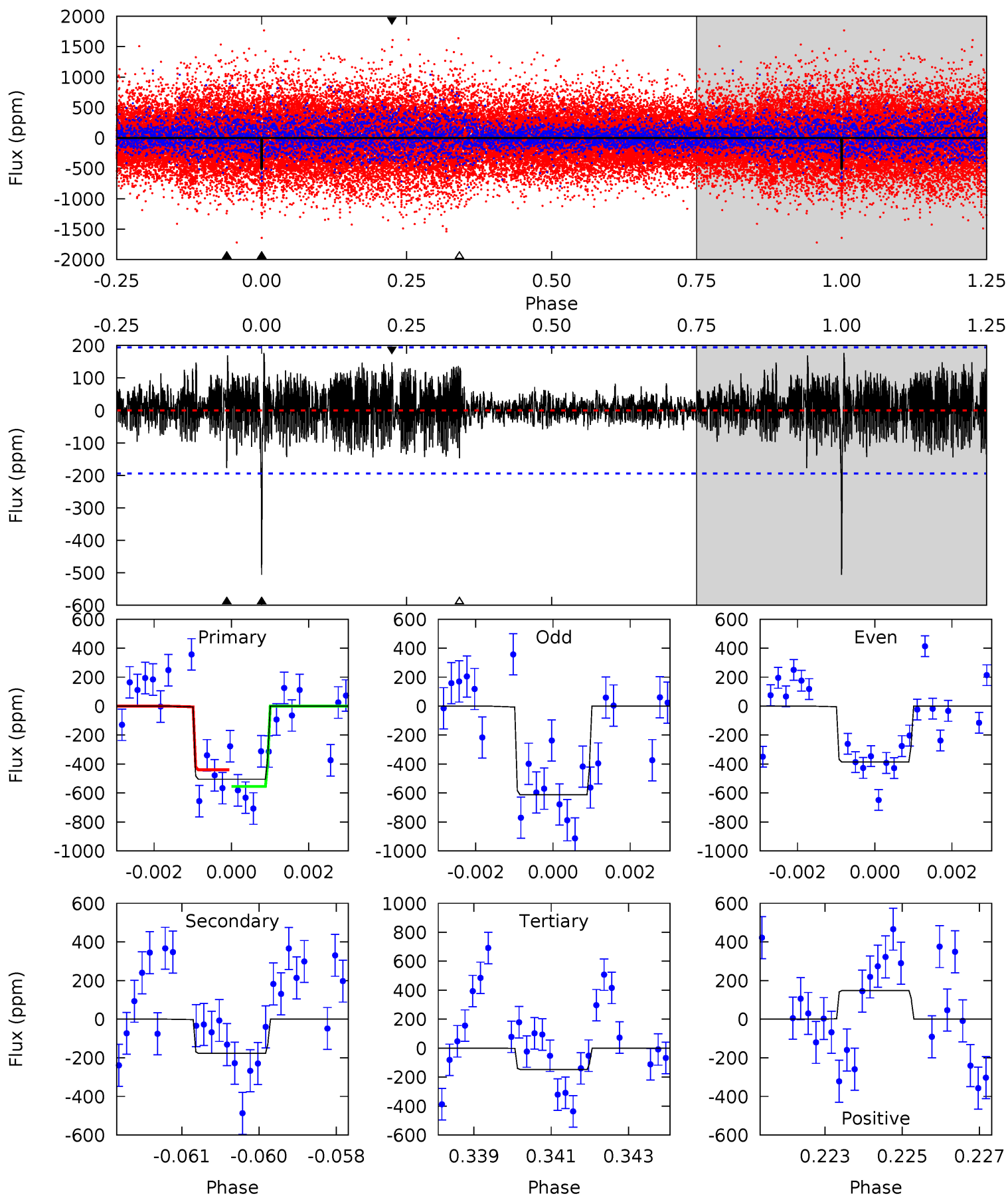
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.13	3.96	3.74	4.35	5.38	3.18	1.15	5.39	4.78	0.22	-0.39	1.15	1.08	0.39	0.17



# Alt Model-Shift Uniqueness Test

003239636-02, P = 369.111828 Days, E = 222.544979 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
13.9	4.89	4.04	4.09	5.36	3.15	1.24	9.91	9.86	0.85	0.80	3.10	1.14	0.26	1.58



### Stellar Parameters For KIC 003239636

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6151^{+83}_{-73}$	$3.920^{+0.196}_{-0.098}$	$-0.220^{+0.200}_{-0.150}$	$1.954^{+0.308}_{-0.462}$	$1.158^{+0.135}_{-0.122}$	$0.219^{+0.237}_{-0.067}$
	+1%/-1%	+5%/-2%	+91%/-68%	+16%/-24%	+12%/-11%	+108%/-30%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003239636-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-149 \pm 38$	$4.08^{+2.04}_{-1.86}$	$512^{+24}_{-31}$	$4898^{+1688}_{-733}$	$5521^{+13732}_{-3238}$
Alt.	$-177 \pm 36$	$4.64^{+2.11}_{-1.90}$	$513^{+22}_{-33}$	$4844^{+1378}_{-653}$	$5013^{+10447}_{-2681}$

$T_{max}$  = 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

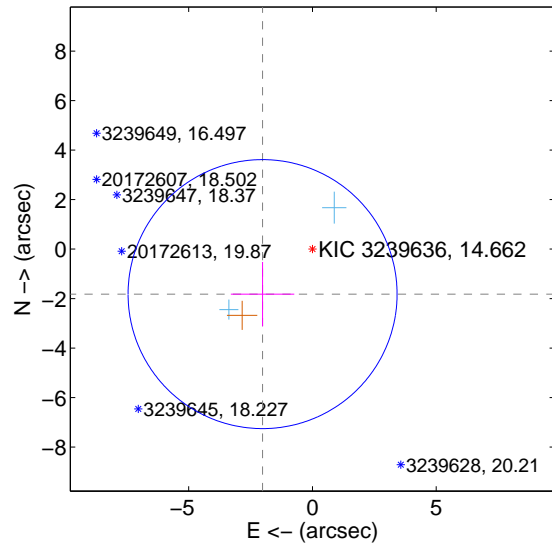
Supplemental centroid analysis for 003239636-02. Kepler magnitude: 14.66. Transit SNR 7.15

There are 2 quarters with good PRF difference image offsets

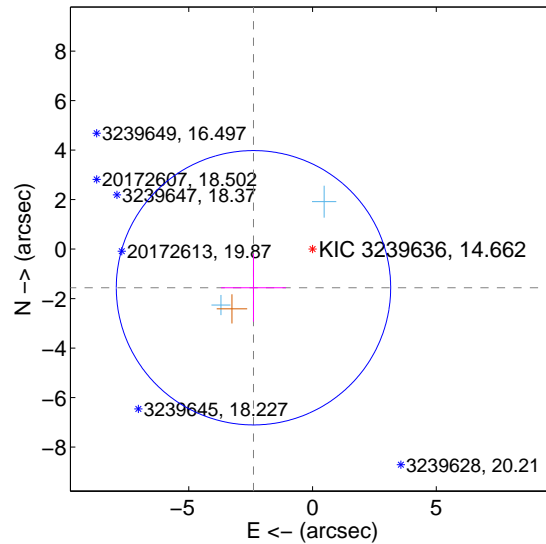
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.714 \pm 1.811$	1.50	$2.014 \pm 1.281$	$-1.819 \pm 1.300$
PRF-fit source offset from KIC position	$2.851 \pm 1.847$	1.54	$2.386 \pm 1.316$	$-1.562 \pm 1.369$
photometric centroid source offset	$1.62 \pm 2.01$	0.81	$-0.45 \pm 1.82$	$-1.56 \pm 2.02$

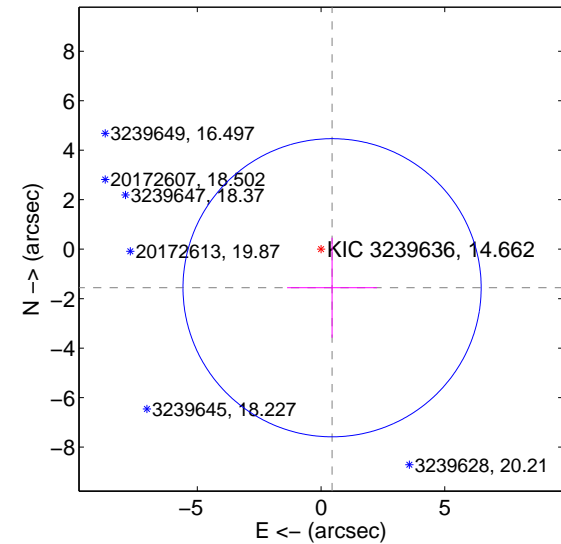
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

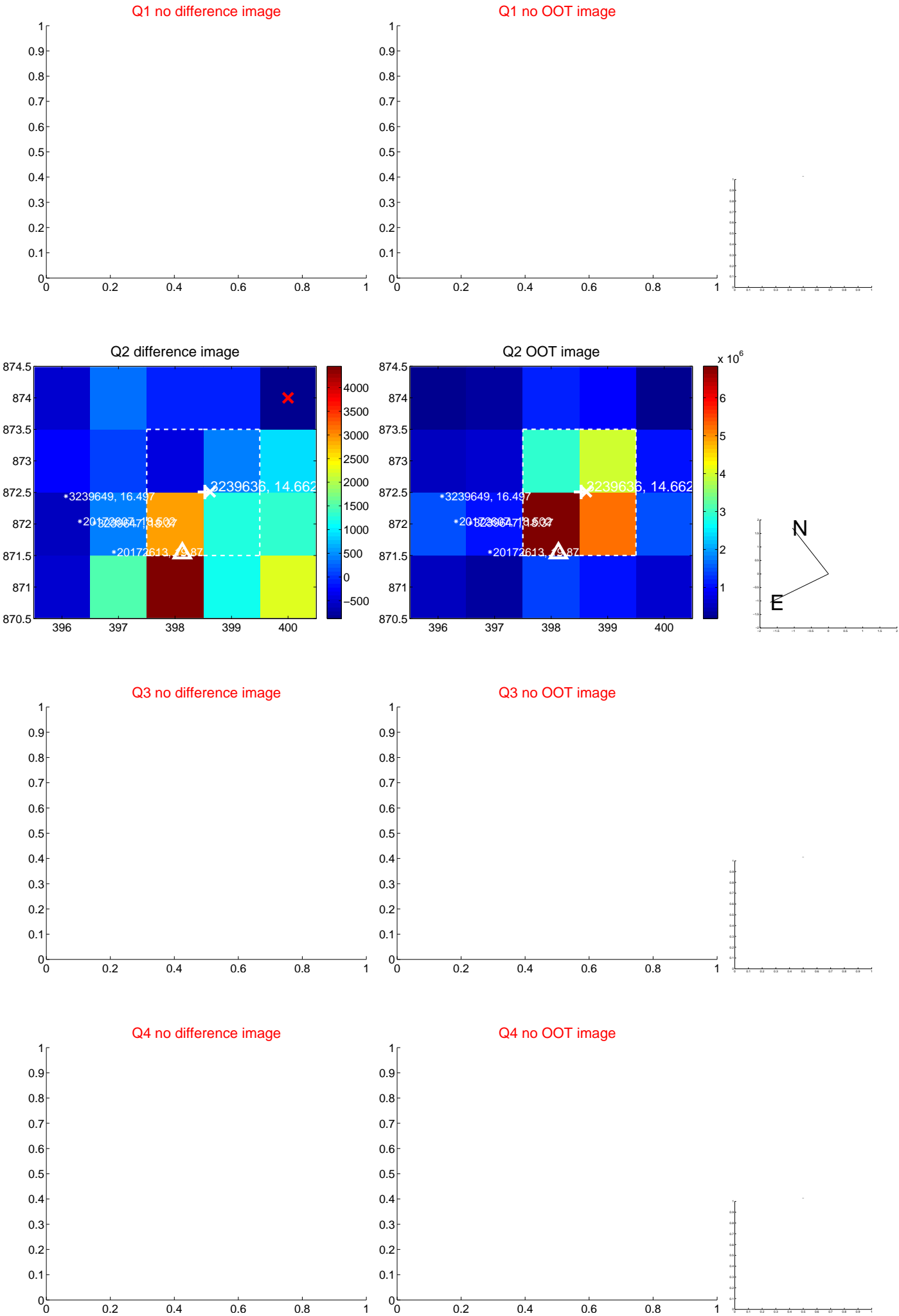


offset from photometric centroids



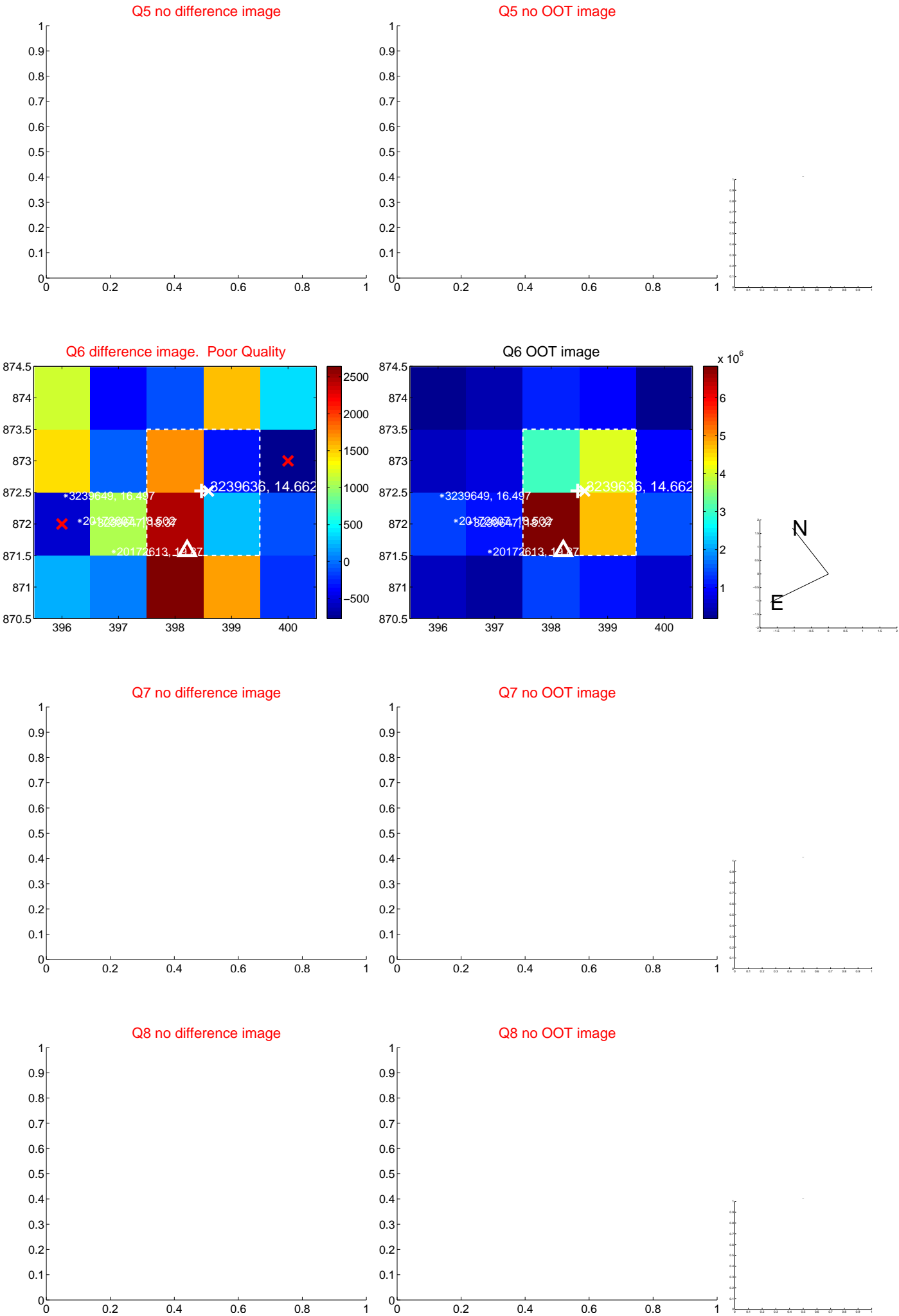
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

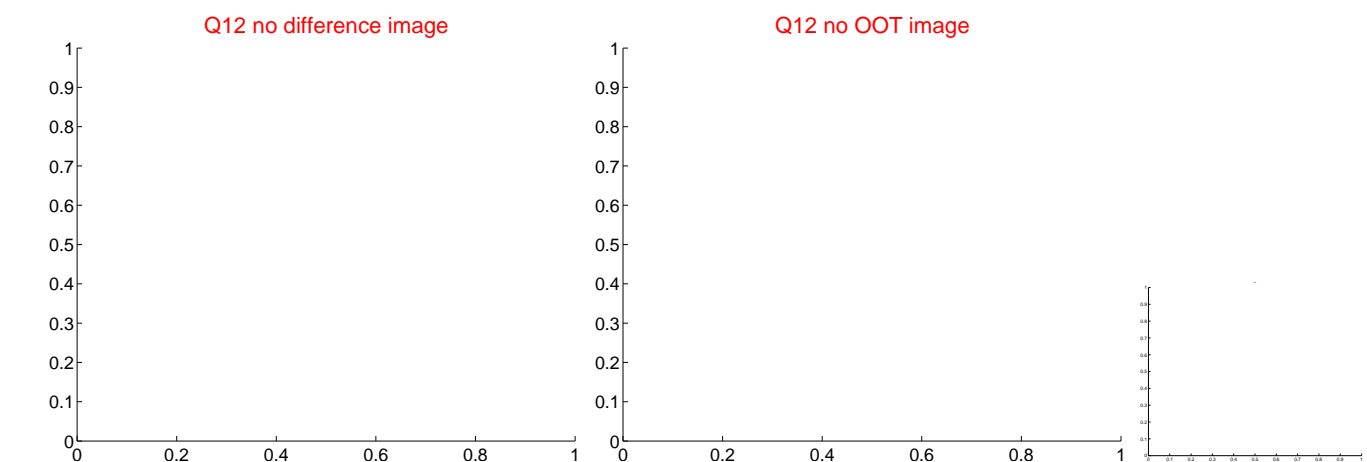
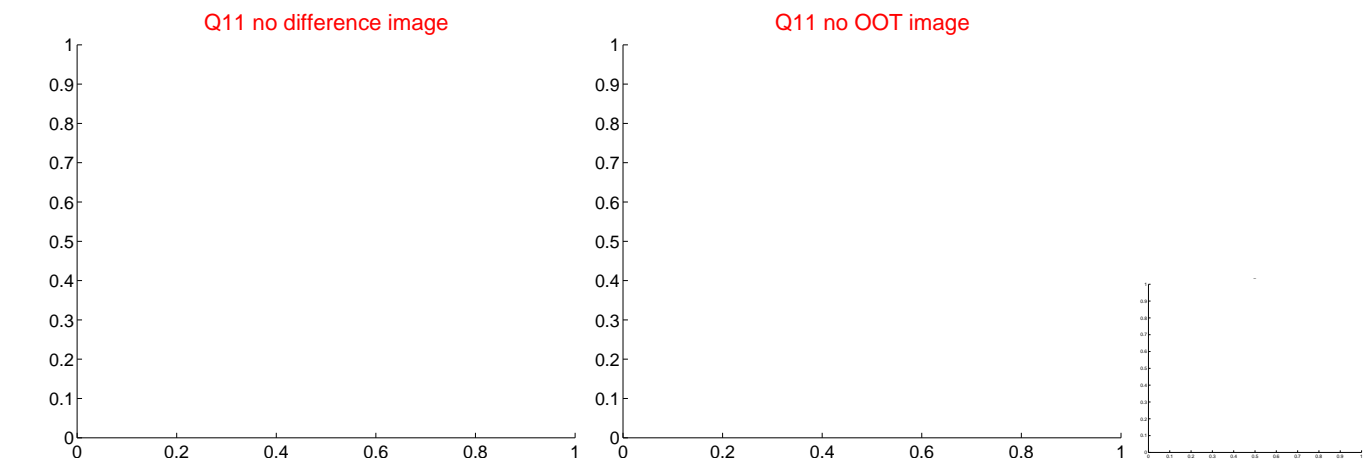
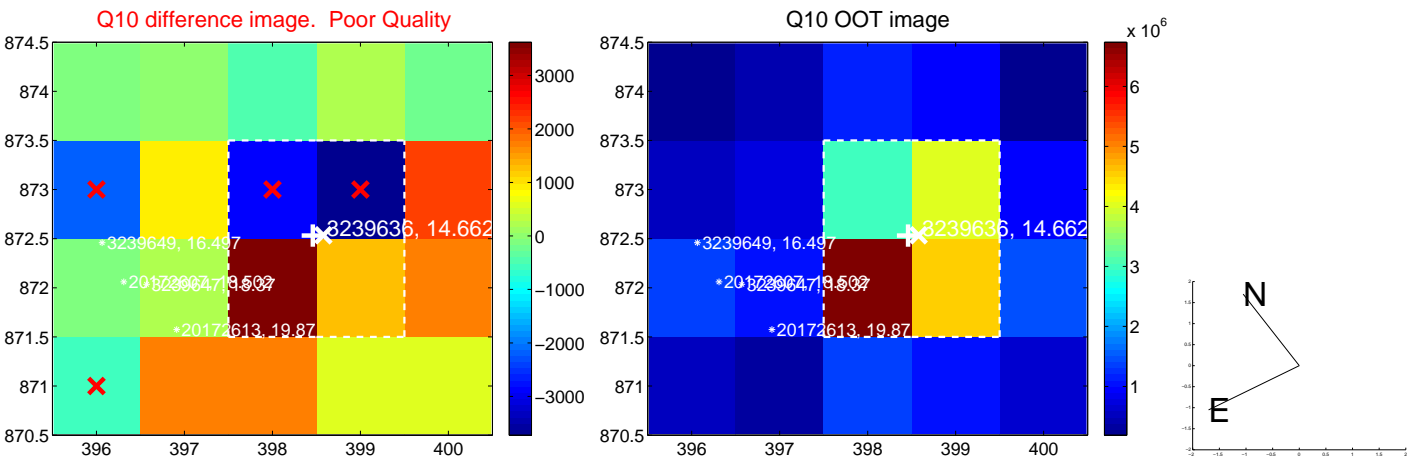
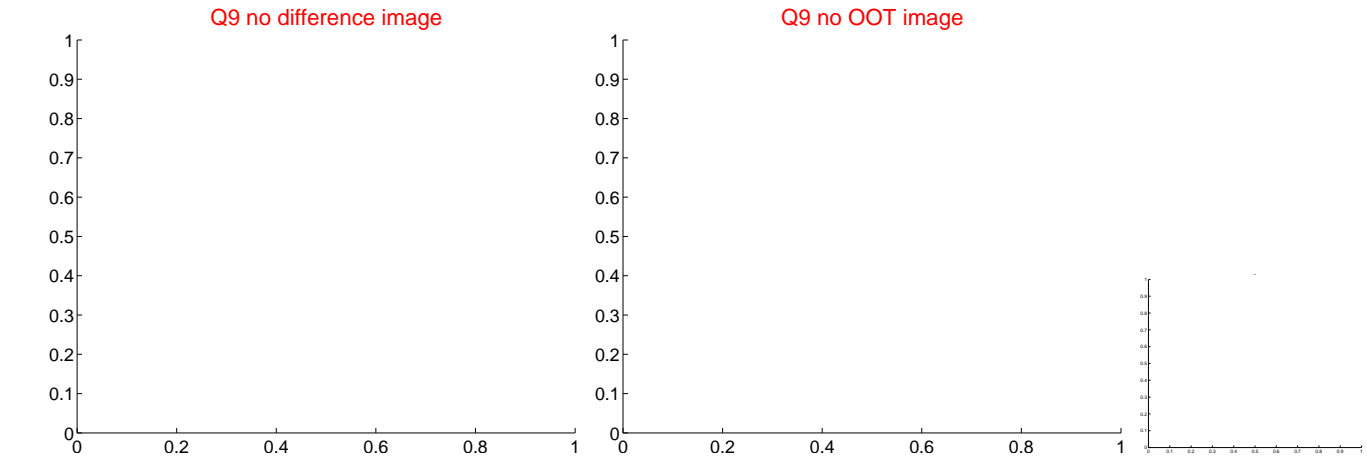




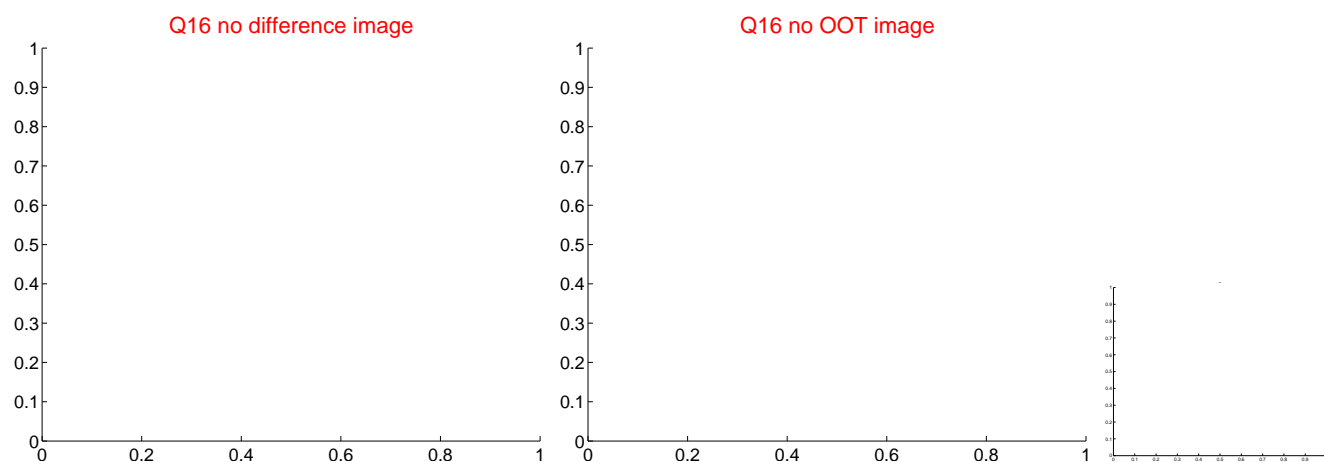
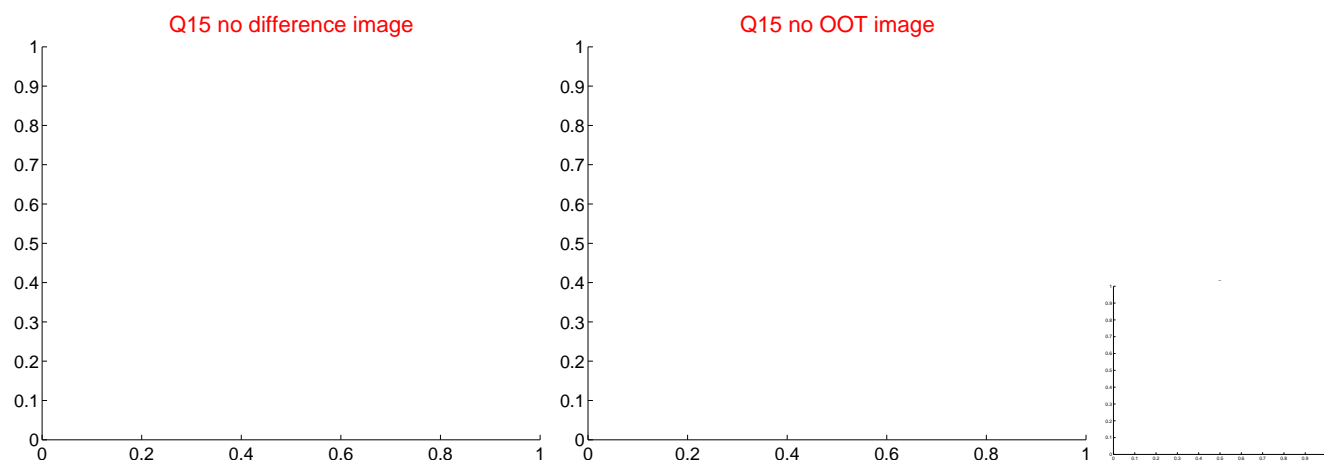
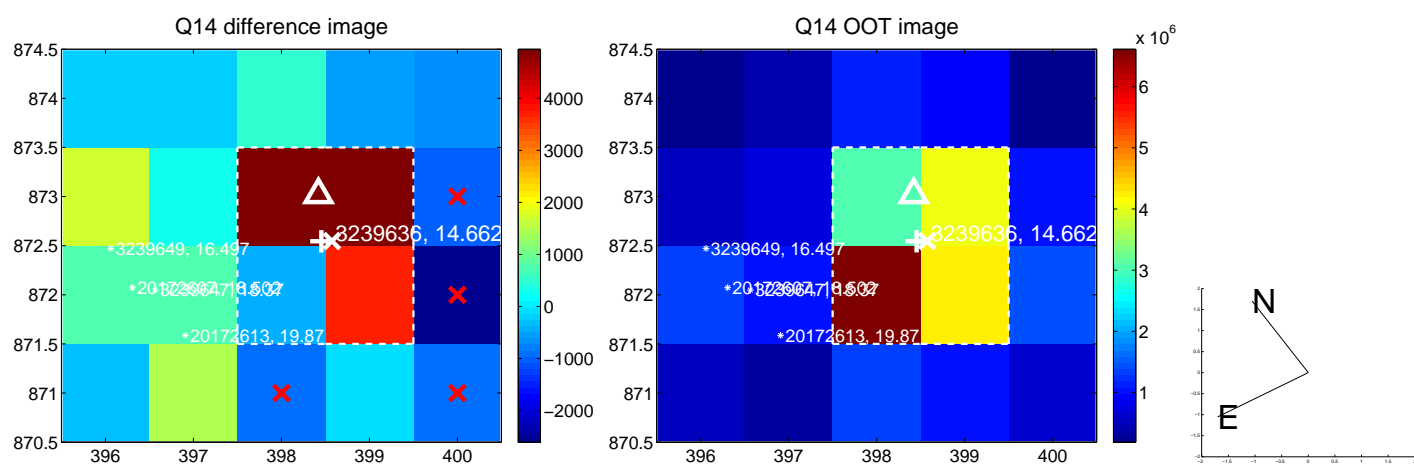
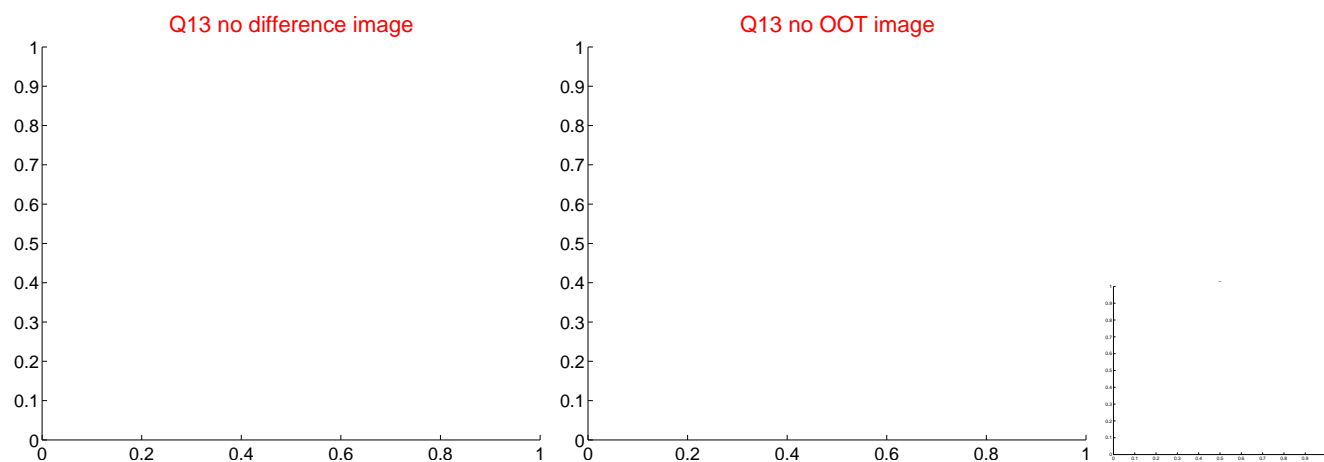
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



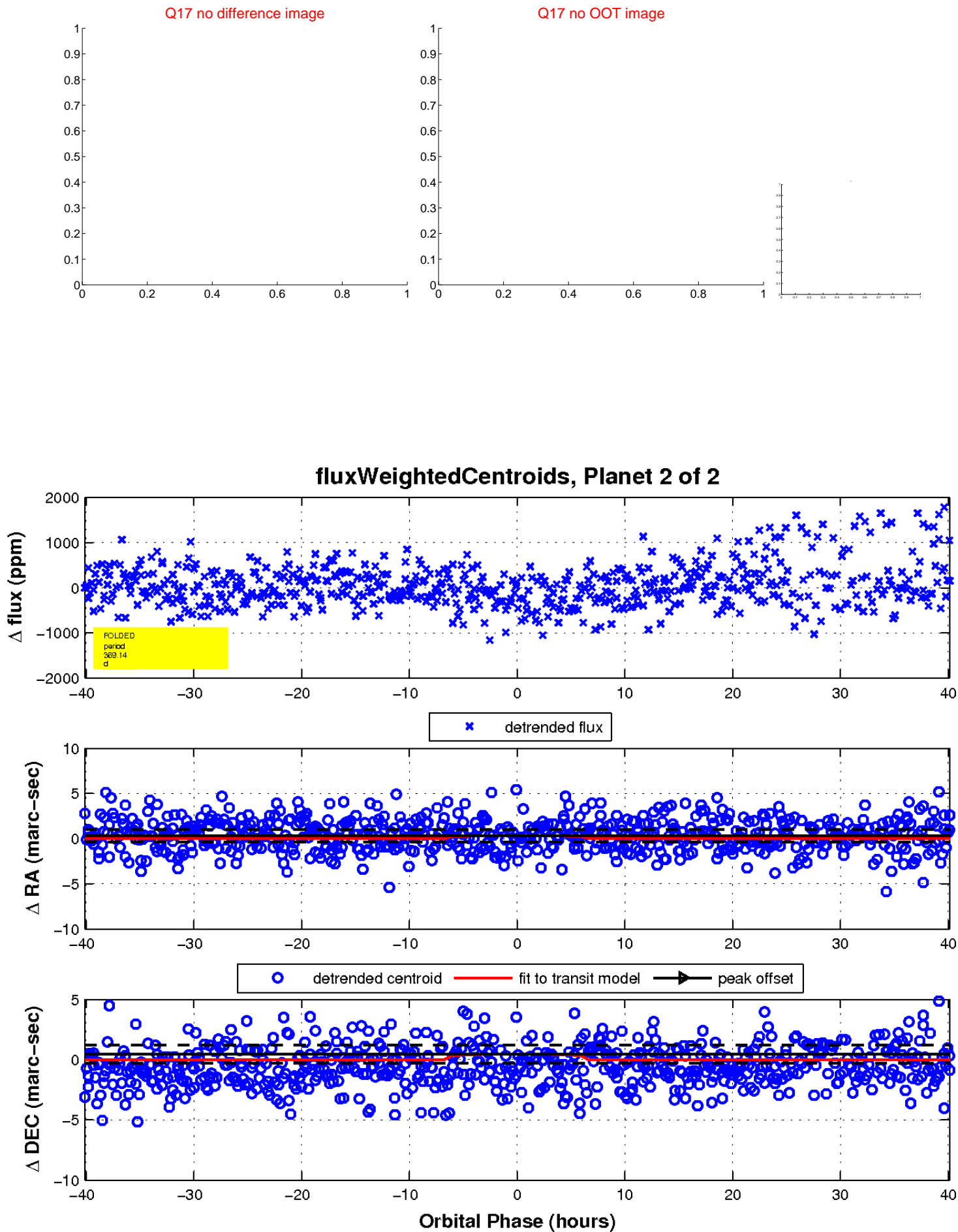
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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.



UKIRT Image

Declination

