

# KIC 006891366

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006891366-01	OBS	1696.01	1.752538	132.730774	108.5	4.665	28.9	30.4	1.18	6221	1.84	2174.54
006891366-02	OBS	No	460.917427	479.099468	402.1	17.780	19.0	9.1	1.18	6221	2.63	1.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006891366-01	OBS	FP	0.00	0	1	1	1	<del>HAS_SEC_TCE</del> <del>CENT_CROWDED</del> <del>HALO_GHOST</del> <del>EPHEM_MATCH</del>
006891366-02	OBS	FP	0.00	1	1	0	0	<del>IS_SEC_TCE</del> <del>CENT_FEW_DIFFS</del>

**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.

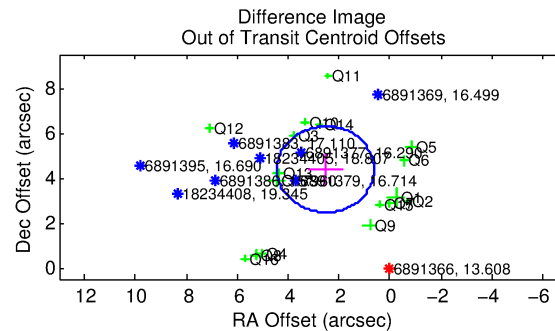
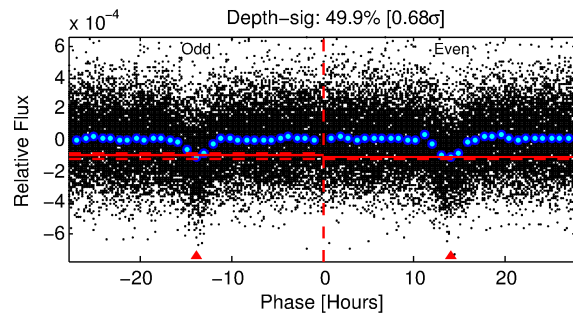
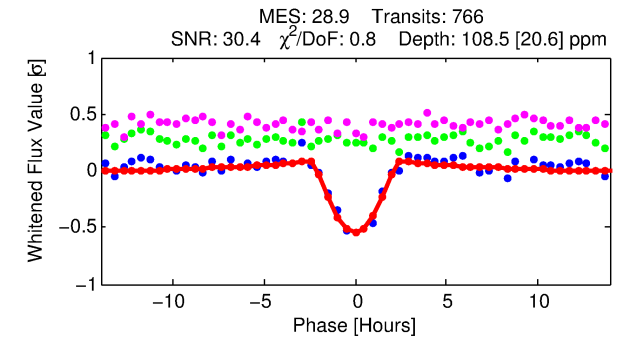
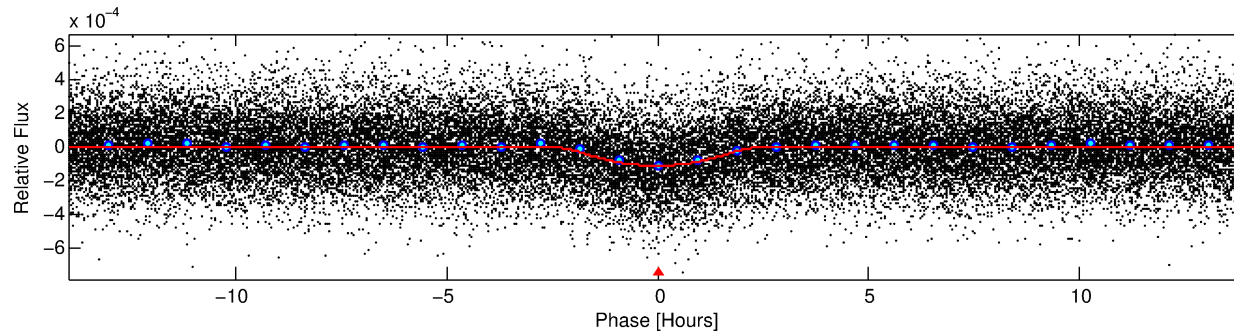
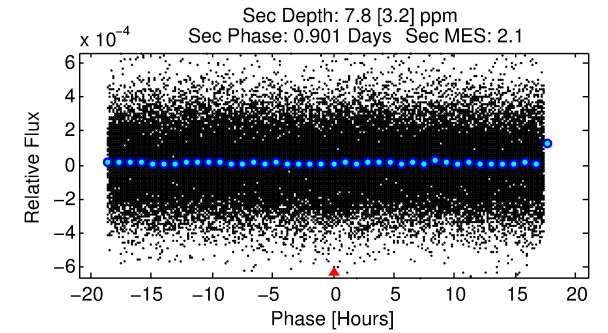
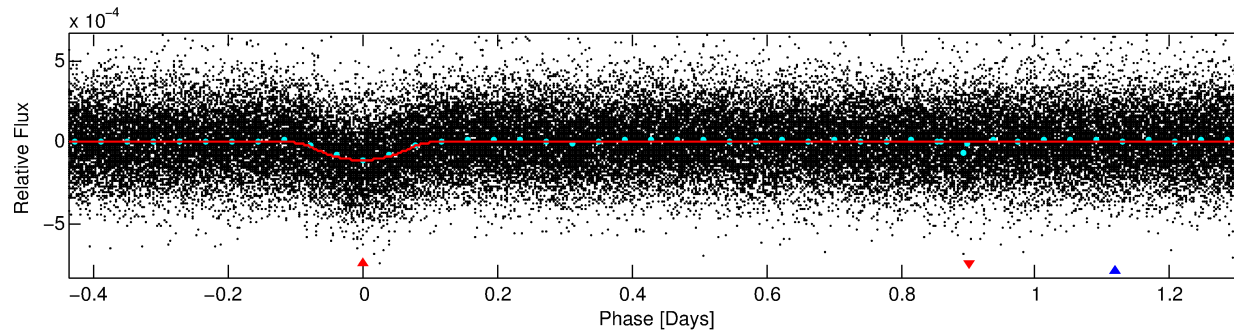
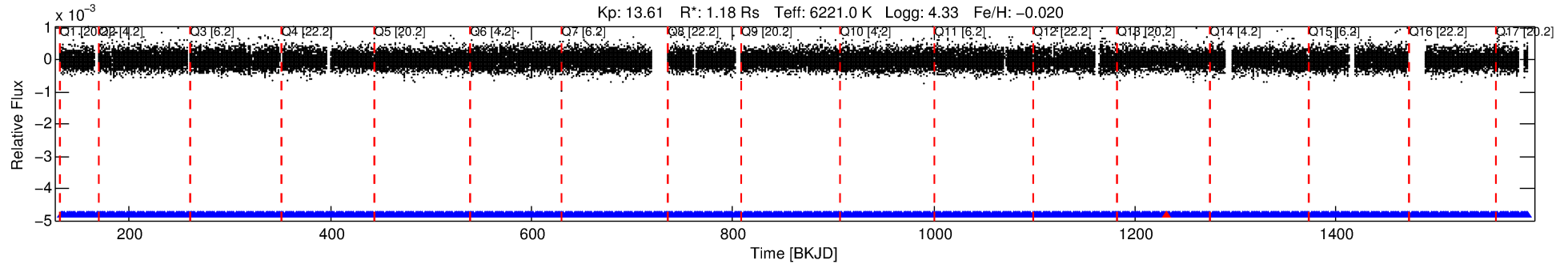
## Ephemeris Match Information For 006891366-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
006891366-01	6891366	5335.01	6891512	1:1	63.9	-9	13	11.39	13.61	3420.00	Direct-PRF	0	1.09	0.51

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 6891366 Candidate: 1 of 2 Period: 1.753 d  
KOI: K01696.01 Corr: 0.854



## DV Fit Results:

Period = 1.75254 [0.00001] d  
Epoch = 132.7308 [0.0024] BKJD  
Rp/R\* = 0.0143 [0.0031]  
a/R\* = 1.18 [0.04]  
b = 0.99 [0.01]  
Seff = 2174.54 [900.68]  
Teq = 1741 [180] K  
Rp = 1.84 [0.73] Re  
a = 0.0293 [0.0080] AU  
Ag = 1.09 [0.77] [0.11σ]  
Teffp = 2748 [420] K [2.20σ]

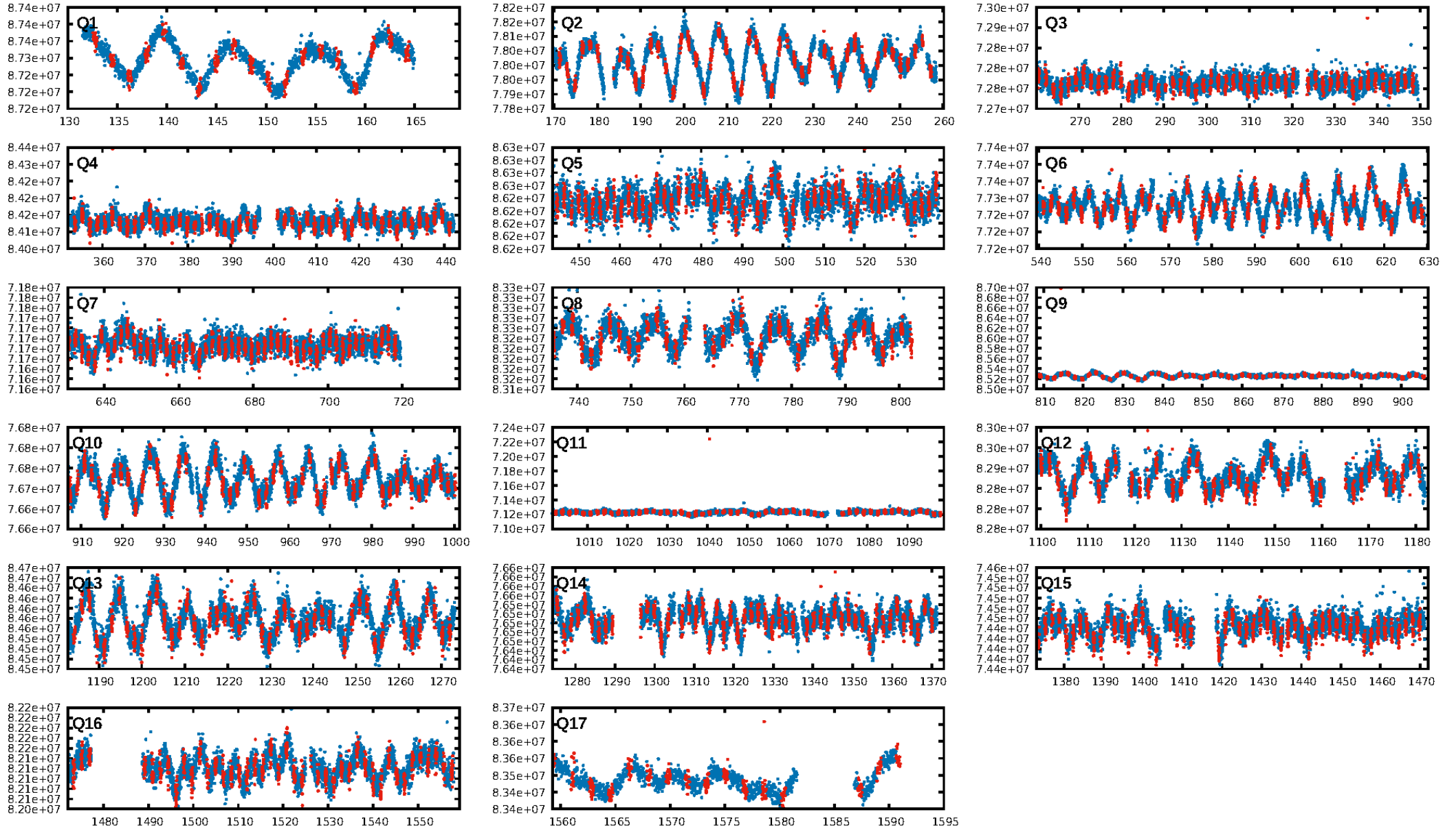
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [599.51σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.17e-165  
RollingBand-fgt: 1.00 [730/731]  
GhostDiagnostic-chr: -0.02999  
Centroid-sig: 0.0%  
Centroid-so: 3.075 arcsec [7.00σ]  
OotOffset-rm: 5.058 arcsec [7.94σ]  
KicOffset-rm: 4.798 arcsec [7.51σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.00 [0/17]  
DiffImageOverlap-fno: 1.00 [17/17]

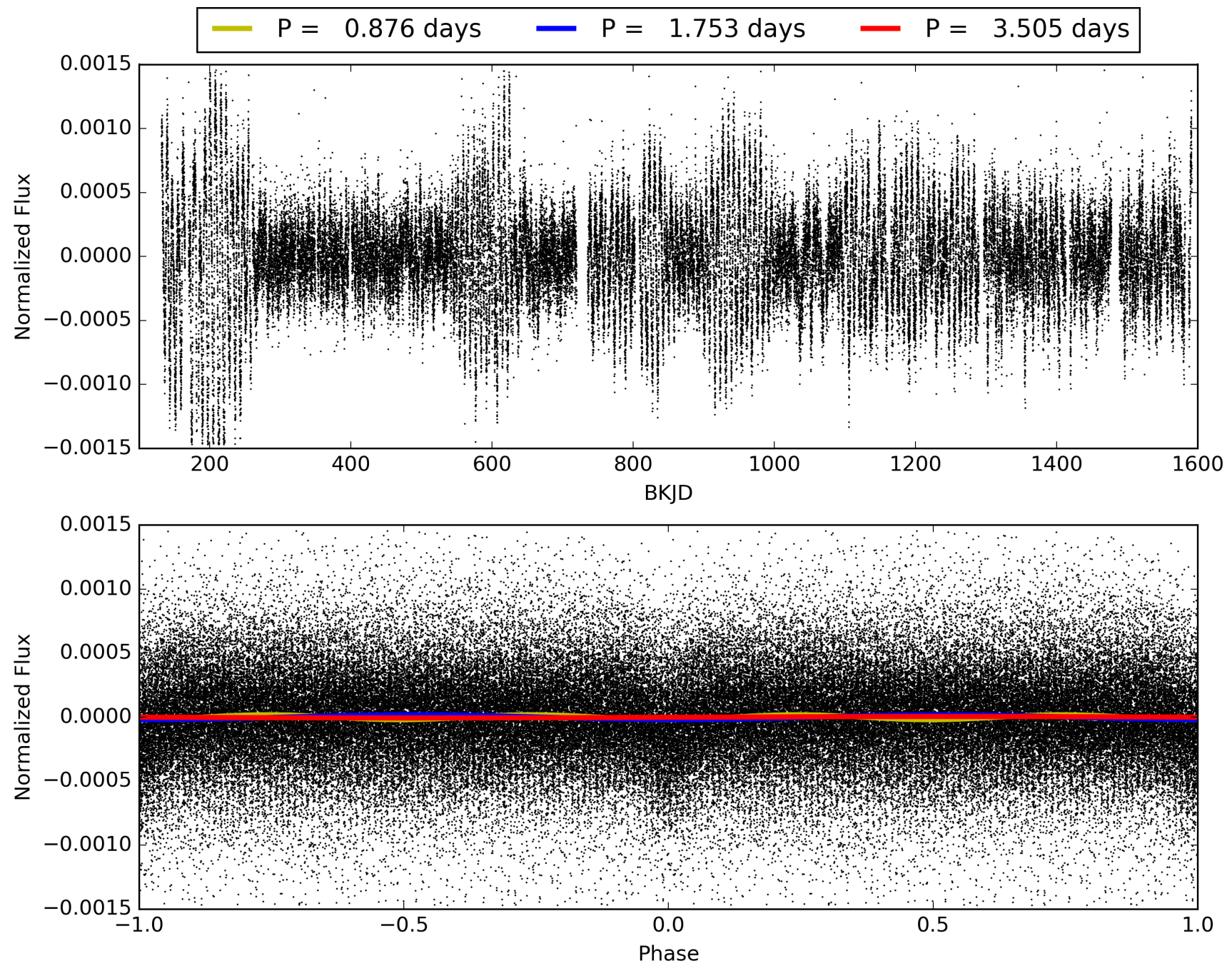
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:15:26 Z

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

# TCE 006891366-01, PDC Light Curves



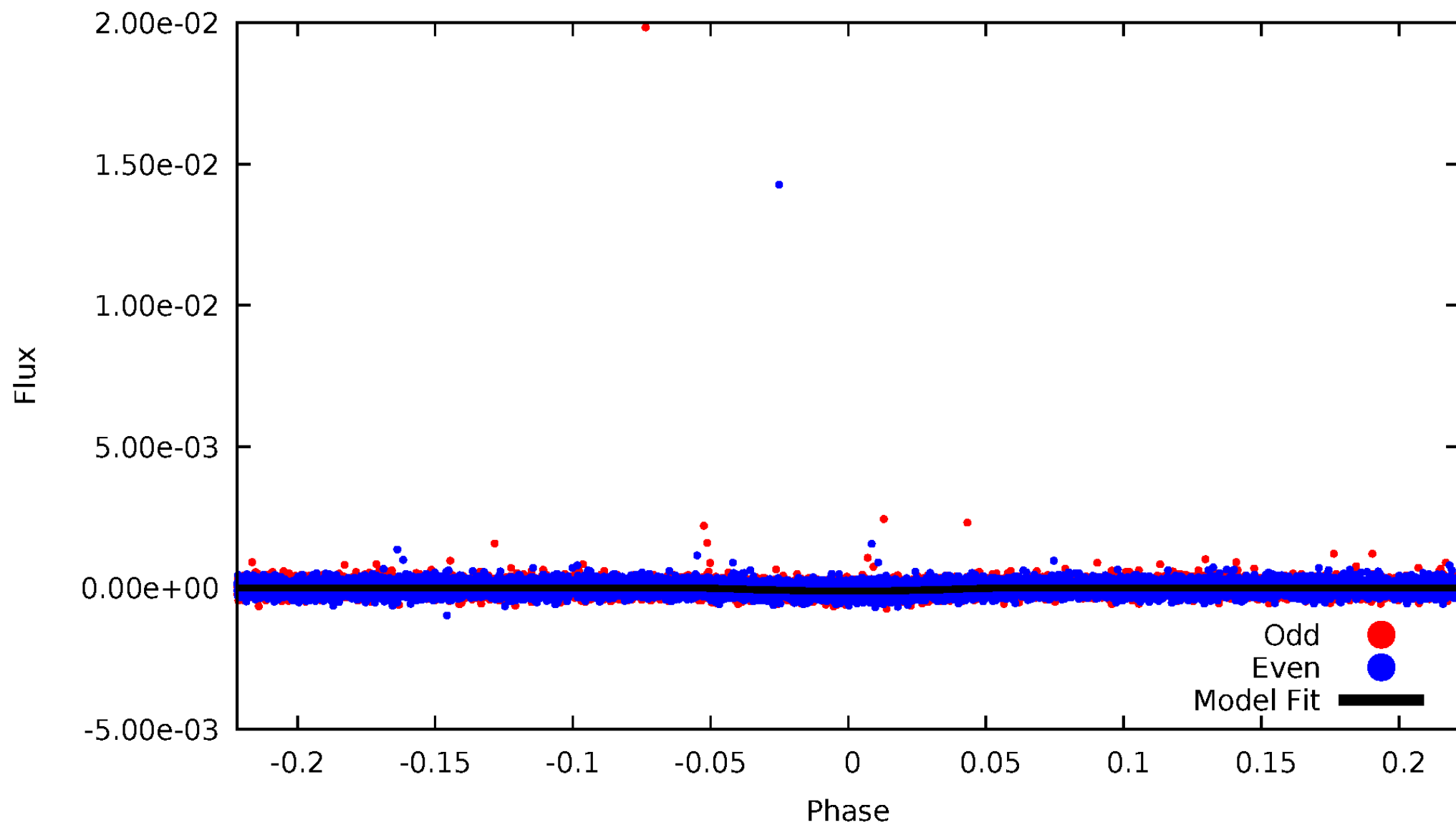
TCE 006891366-01





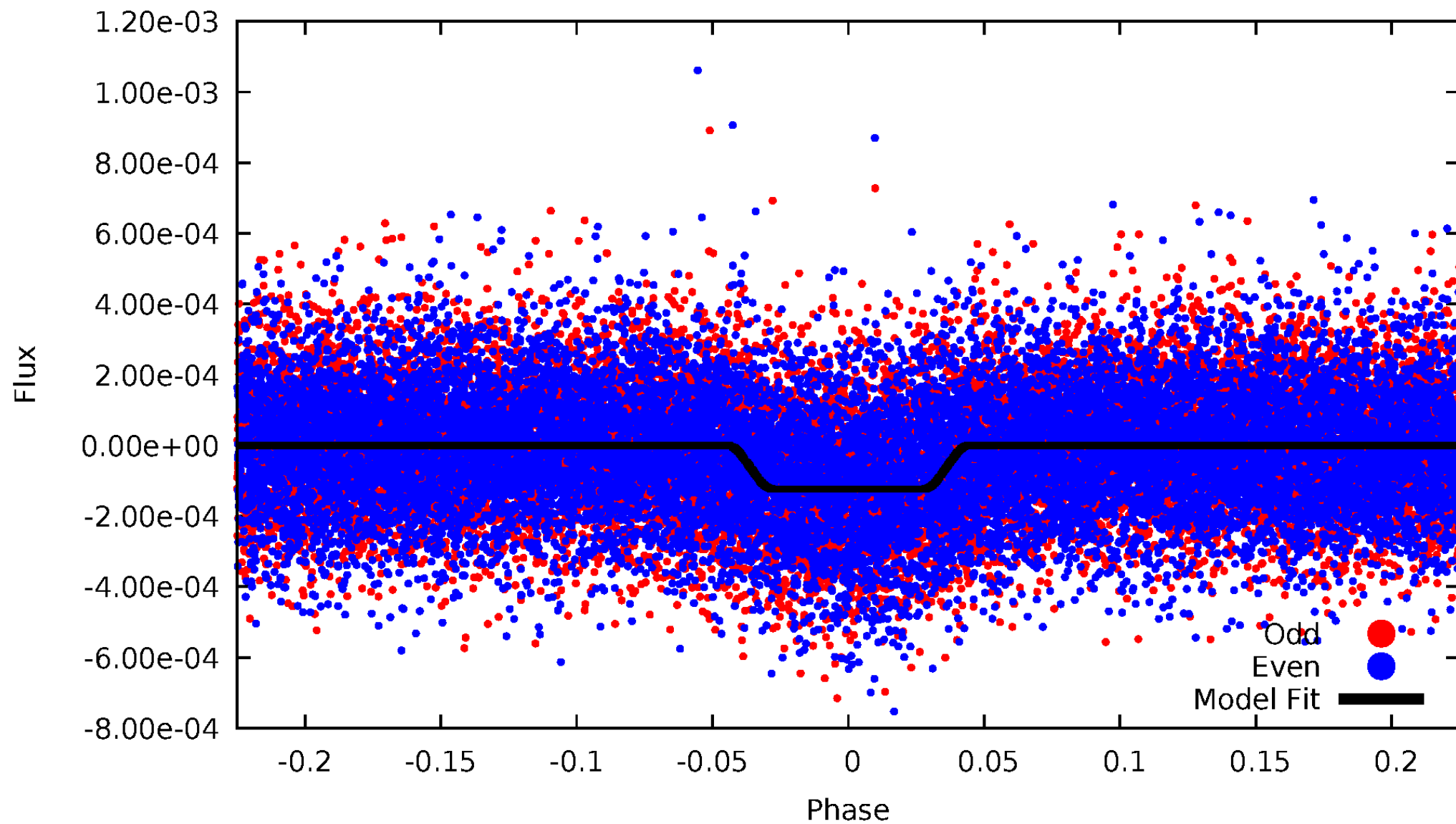
# DV Odd/Even

TCE 006891366-01



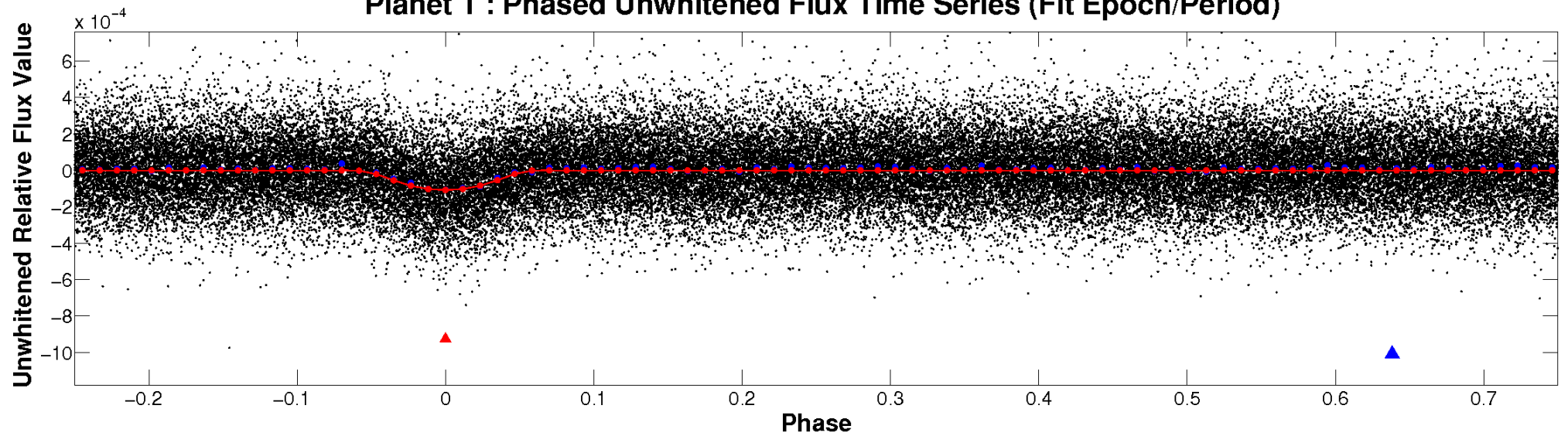
# ALT Odd/Even

TCE 006891366-01

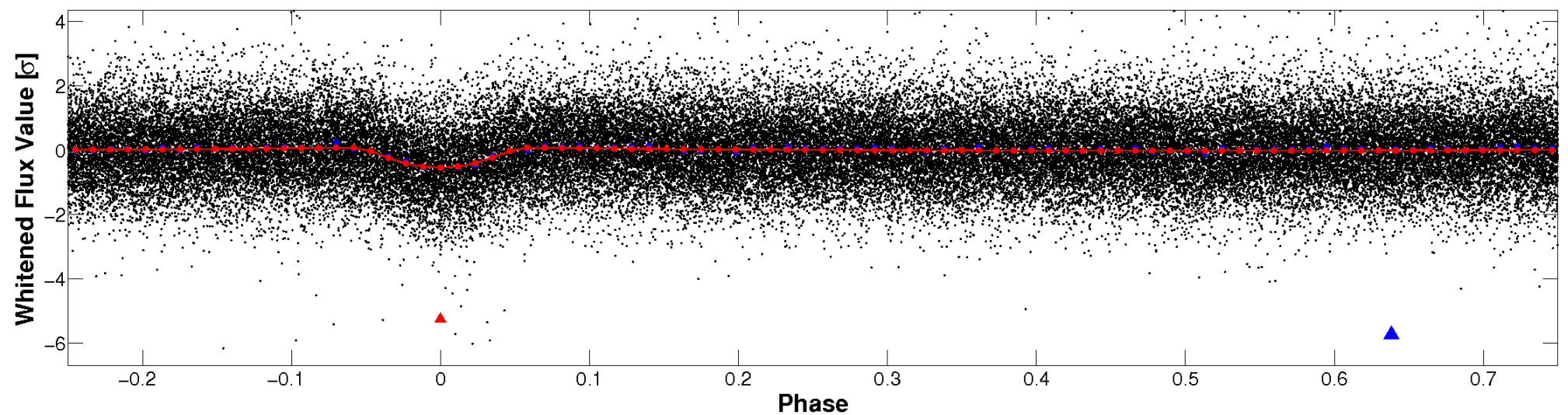


# Non-Whitened Vs. Whitened Light Curve

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

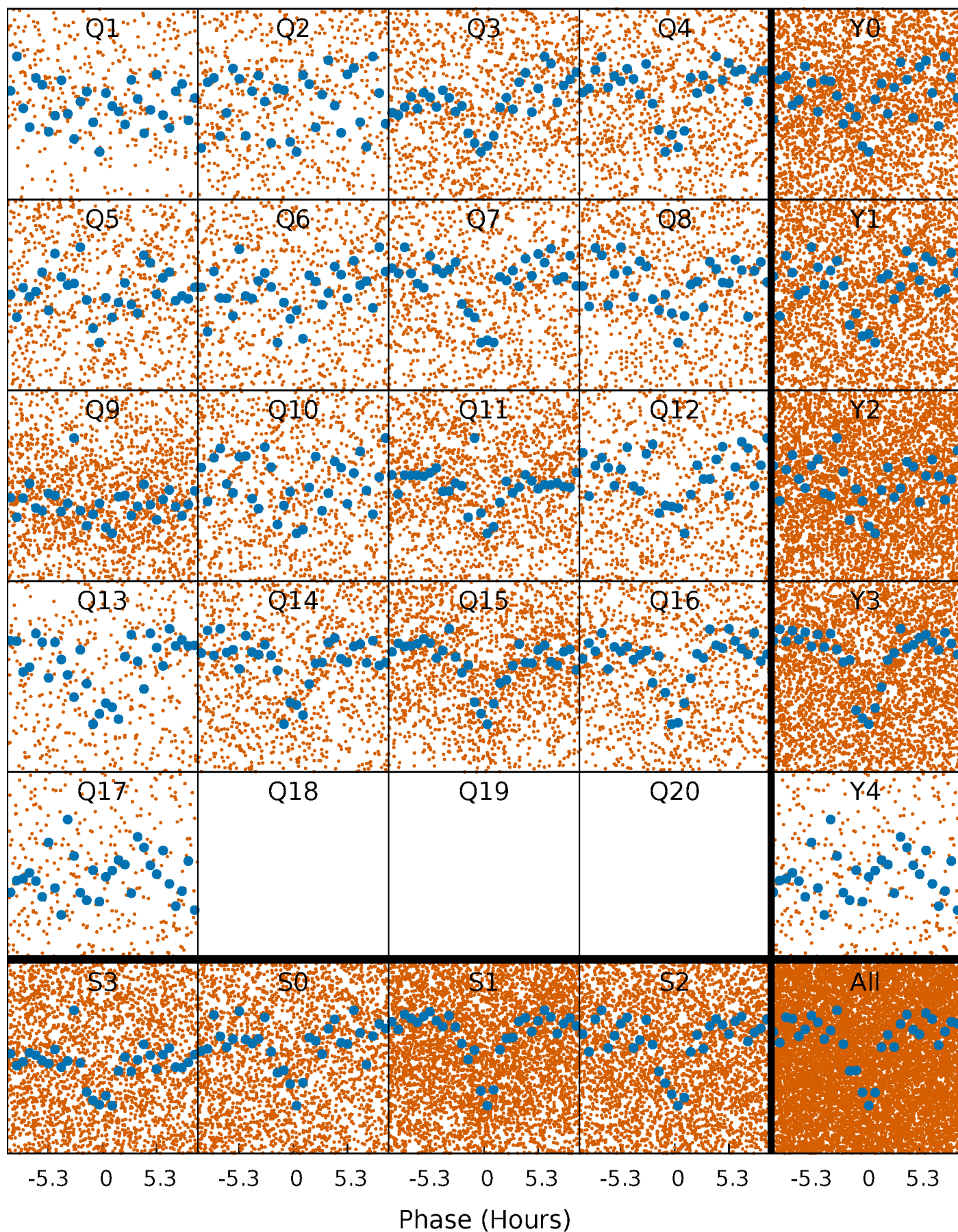


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

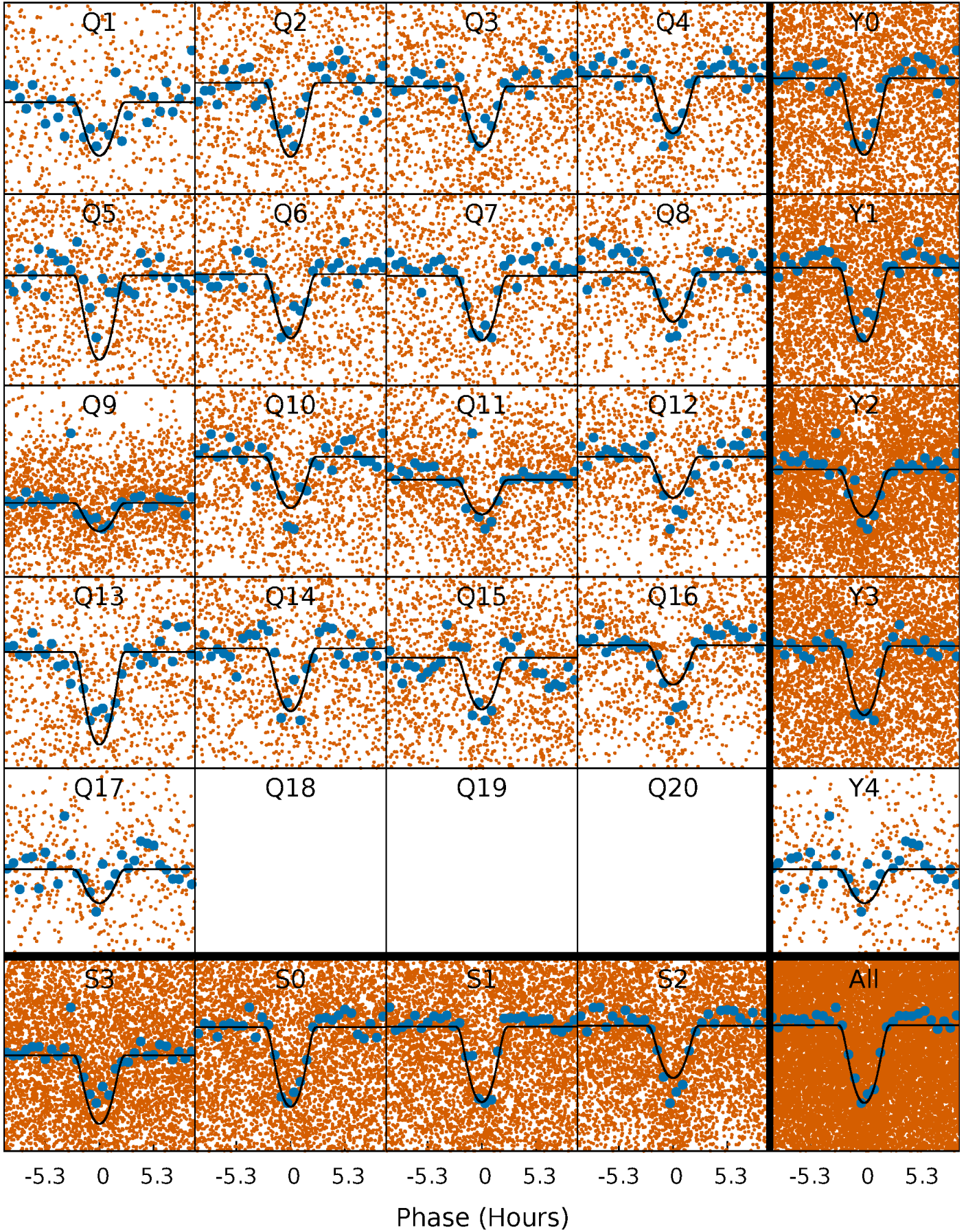
TCE 006891366-01 P= 1.752538 Days  $T_0=132.730774$  (BKJD)





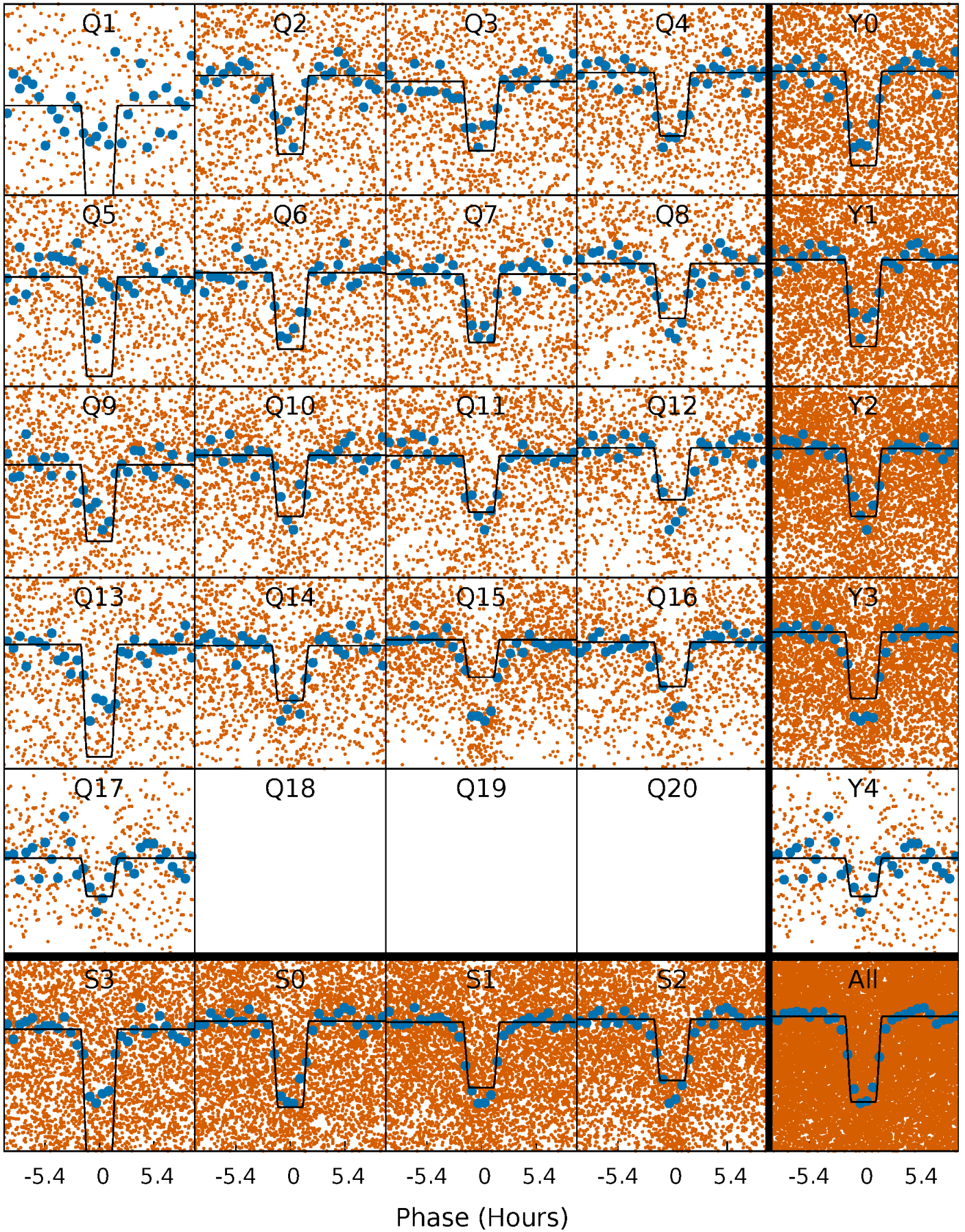
# DV Quarter-Phased Transit Curves

TCE 006891366-01 P= 1.752538 Days  $T_0=132.730774$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006891366-01 P= 1.752545 Days  $T_0=132.727720$  (BKJD)

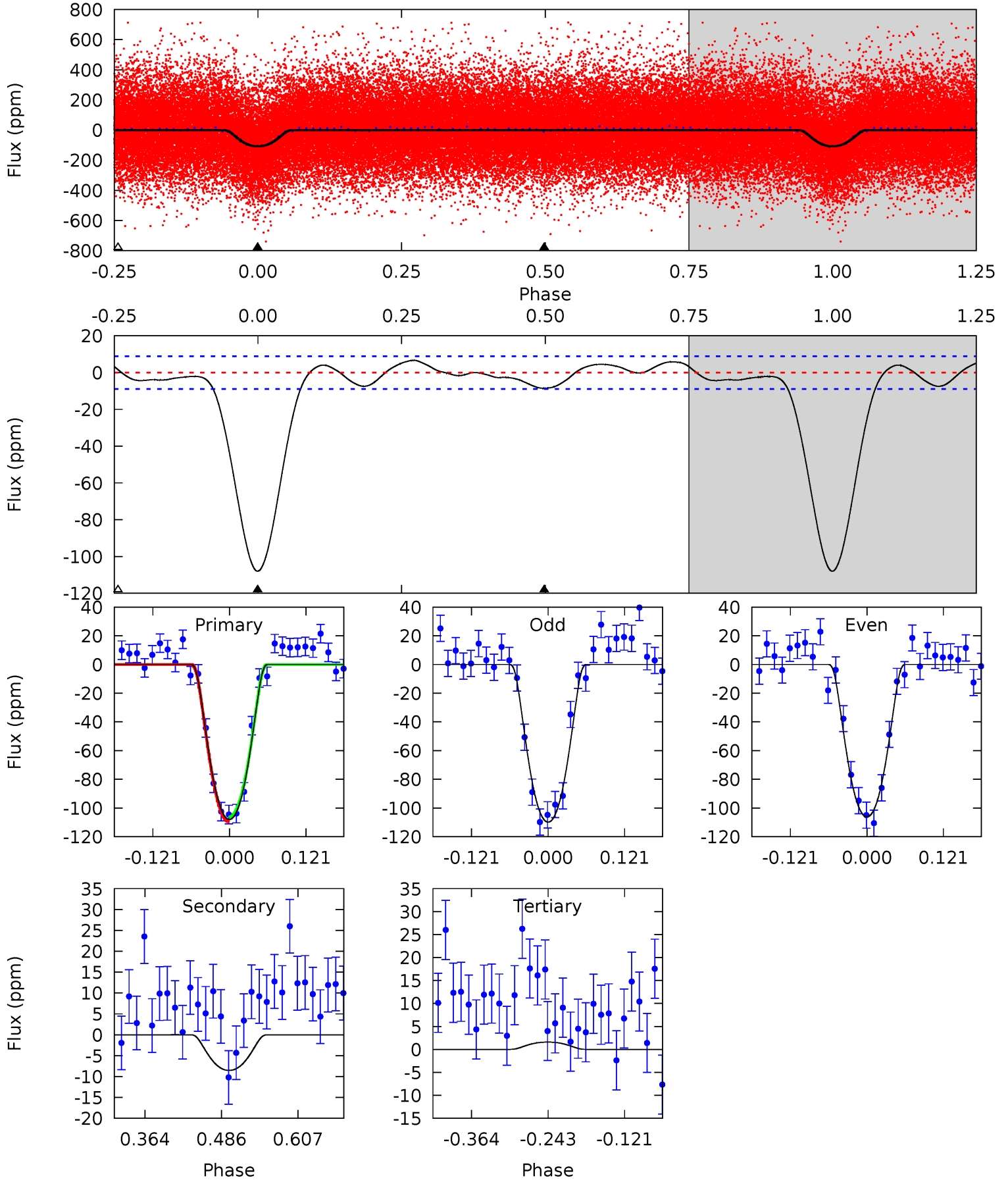




# DV Model-Shift Uniqueness Test

006891366-01, P = 1.752538 Days, E = 130.978236 Days

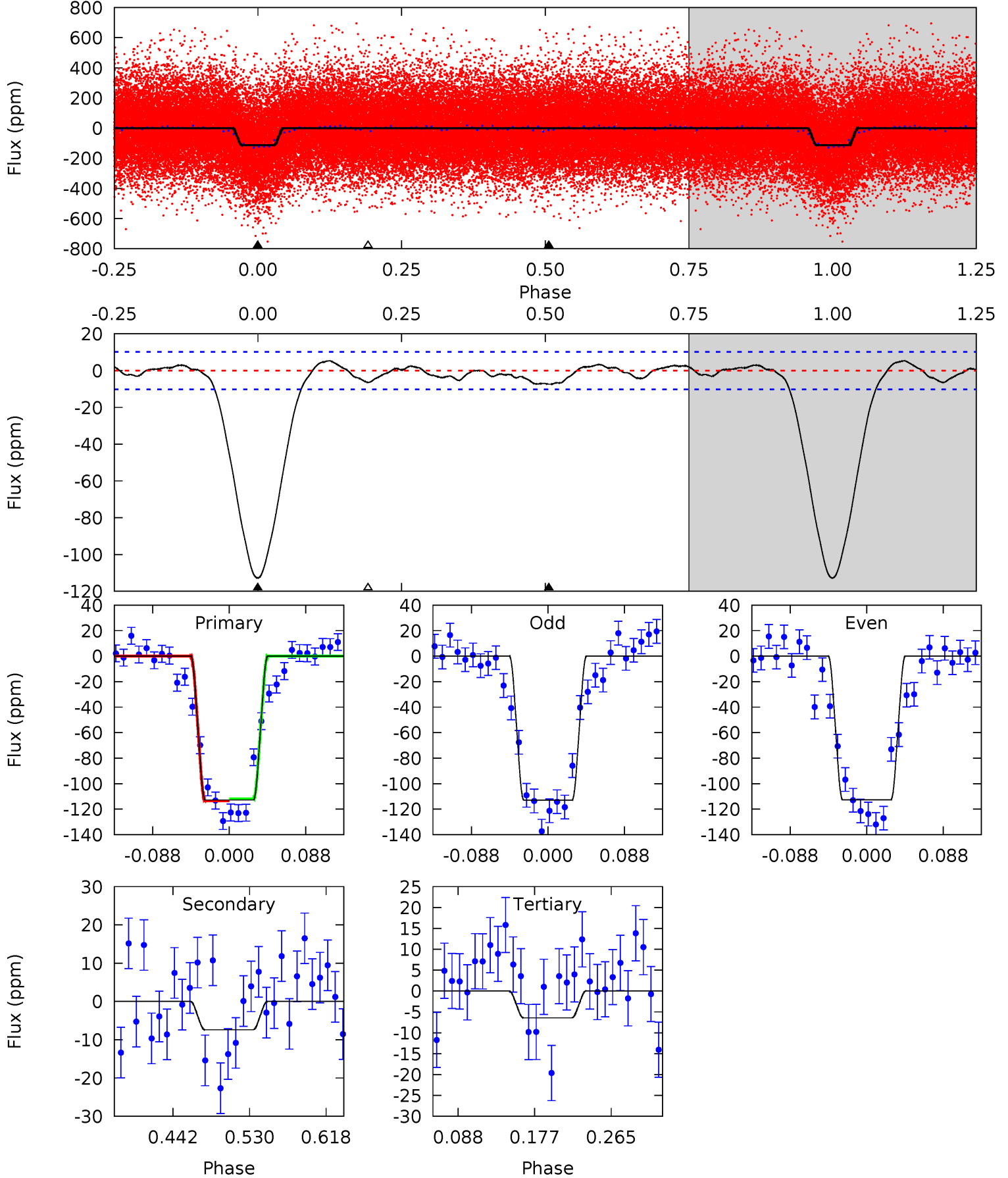
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.0	4.35	-0.81	0	4.52	1.55	1.94	55.8	55.0	5.16	4.35	0.95	0.98	0.06	0.83



# Alt Model-Shift Uniqueness Test

006891366-01, P = 1.752545 Days, E = 130.975175 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
50.7	3.32	2.89	0	4.59	1.70	1.18	47.8	50.7	0.44	3.32	0.04	1.04	0.05	0.34





### Stellar Parameters For KIC 006891366

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6221^{+167}_{-223}$	$4.333^{+0.112}_{-0.208}$	$-0.020^{+0.250}_{-0.300}$	$1.180^{+0.392}_{-0.168}$	$1.090^{+0.189}_{-0.131}$	$0.935^{+0.454}_{-0.482}$
	+3%/-4%	+3%/-5%	+1250%/-1500%	+33%/-14%	+17%/-12%	+49%/-52%
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 006891366-01 / KOI 1696.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-9 \pm 2$	$1.89^{+0.51}_{-0.44}$	$2456^{+180}_{-146}$	$3183^{+349}_{-317}$	$1.123^{+0.890}_{-0.460}$
Alt.	$-7 \pm 2$	$1.46^{+0.44}_{-0.42}$	$2458^{+185}_{-153}$	$3441^{+504}_{-432}$	$1.667^{+1.751}_{-0.850}$

$T_{max}$  = 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

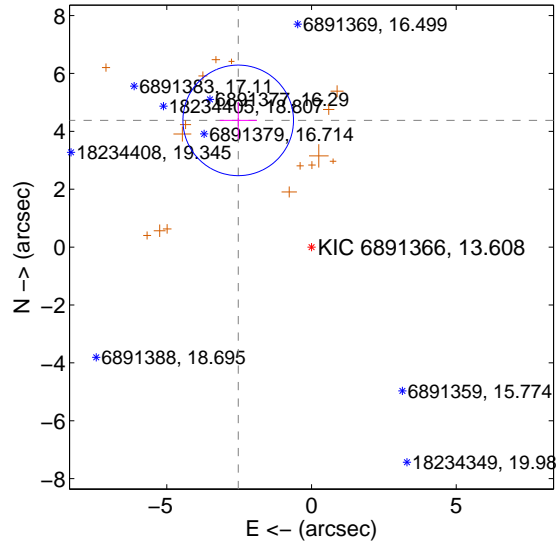
Supplemental centroid analysis for 006891366-01. Kepler magnitude: 13.61. Transit SNR 30.41

There are 0 quarters with good PRF difference image offsets

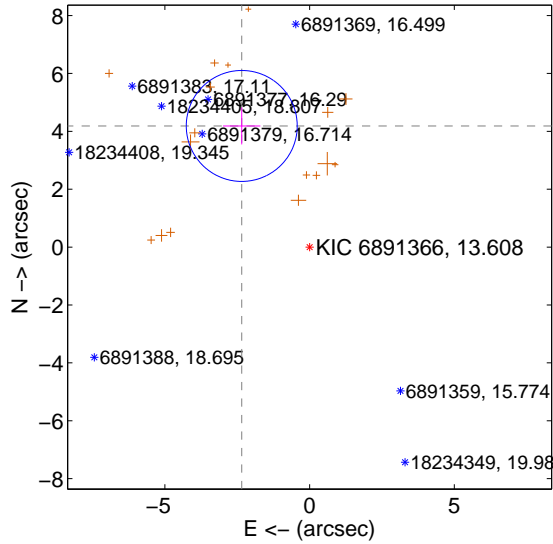
The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.058 \pm 0.637$	7.94	$2.532 \pm 0.641$	$4.379 \pm 0.635$
PRF-fit source offset from KIC position	$4.798 \pm 0.639$	7.51	$2.344 \pm 0.644$	$4.186 \pm 0.637$
photometric centroid source offset	$3.07 \pm 0.44$	7.00	$2.27 \pm 0.41$	$2.08 \pm 0.47$

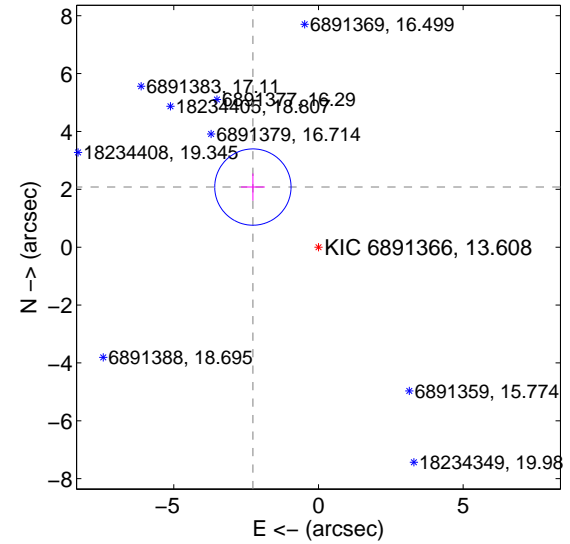
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

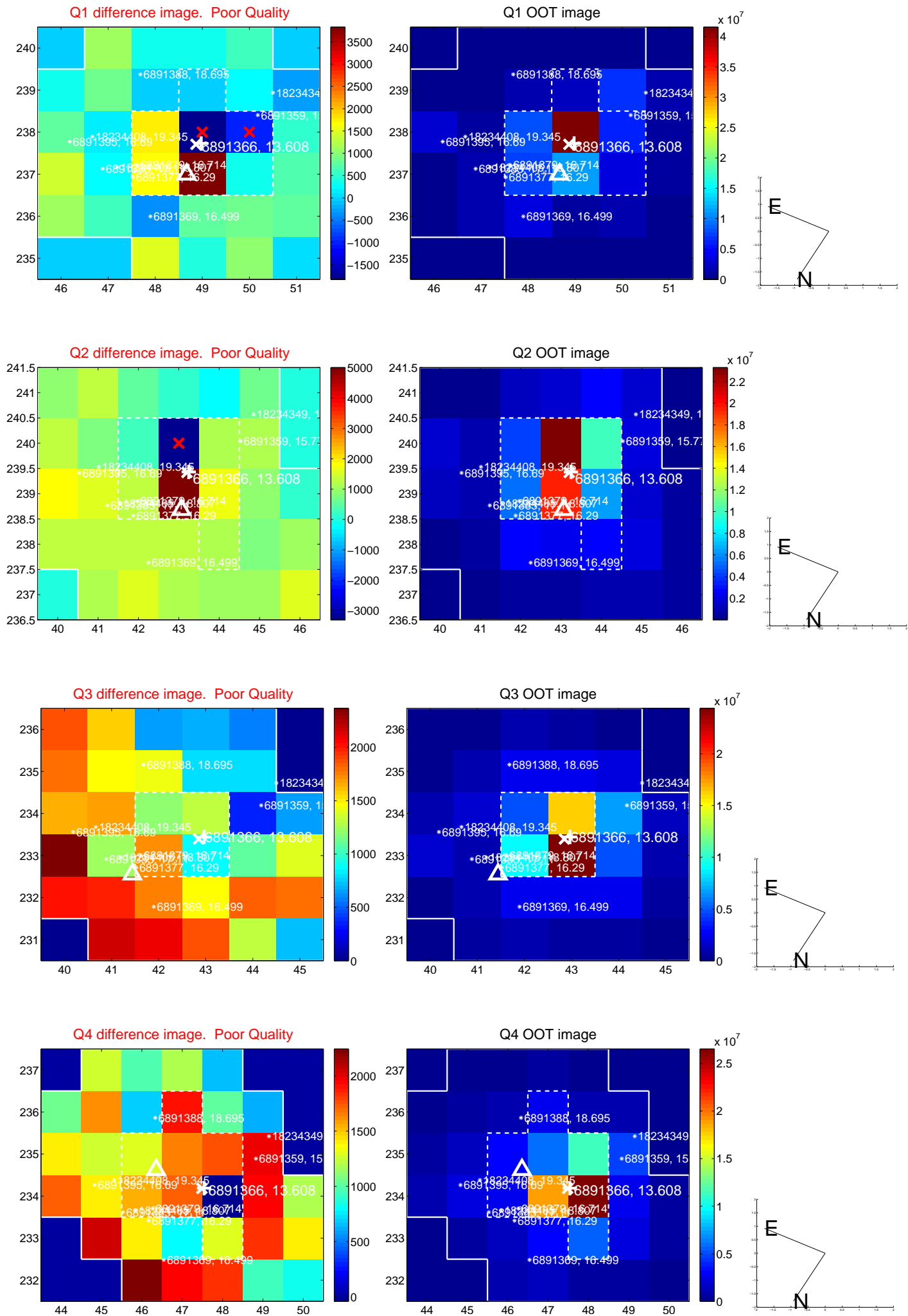


offset from photometric centroids

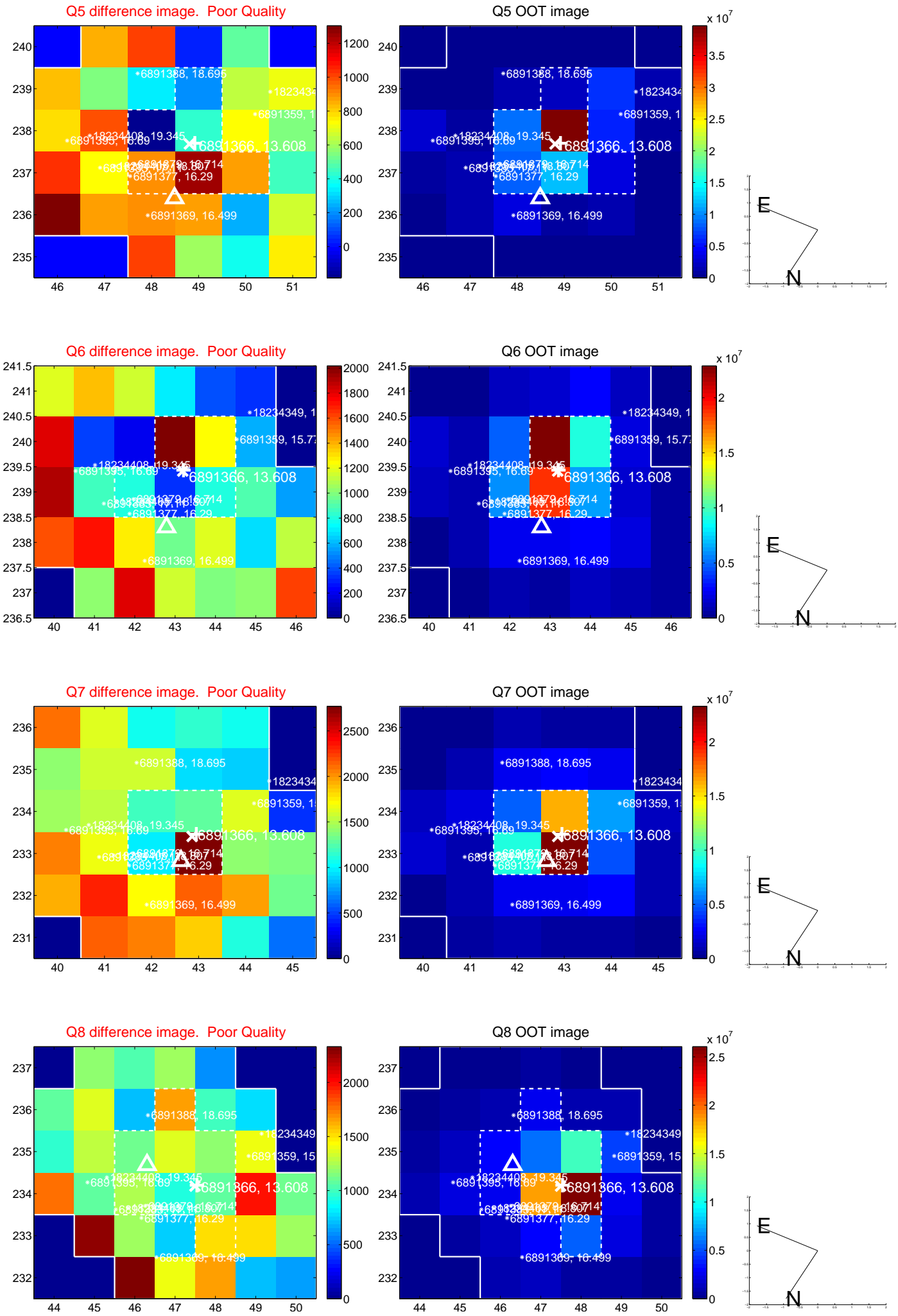


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

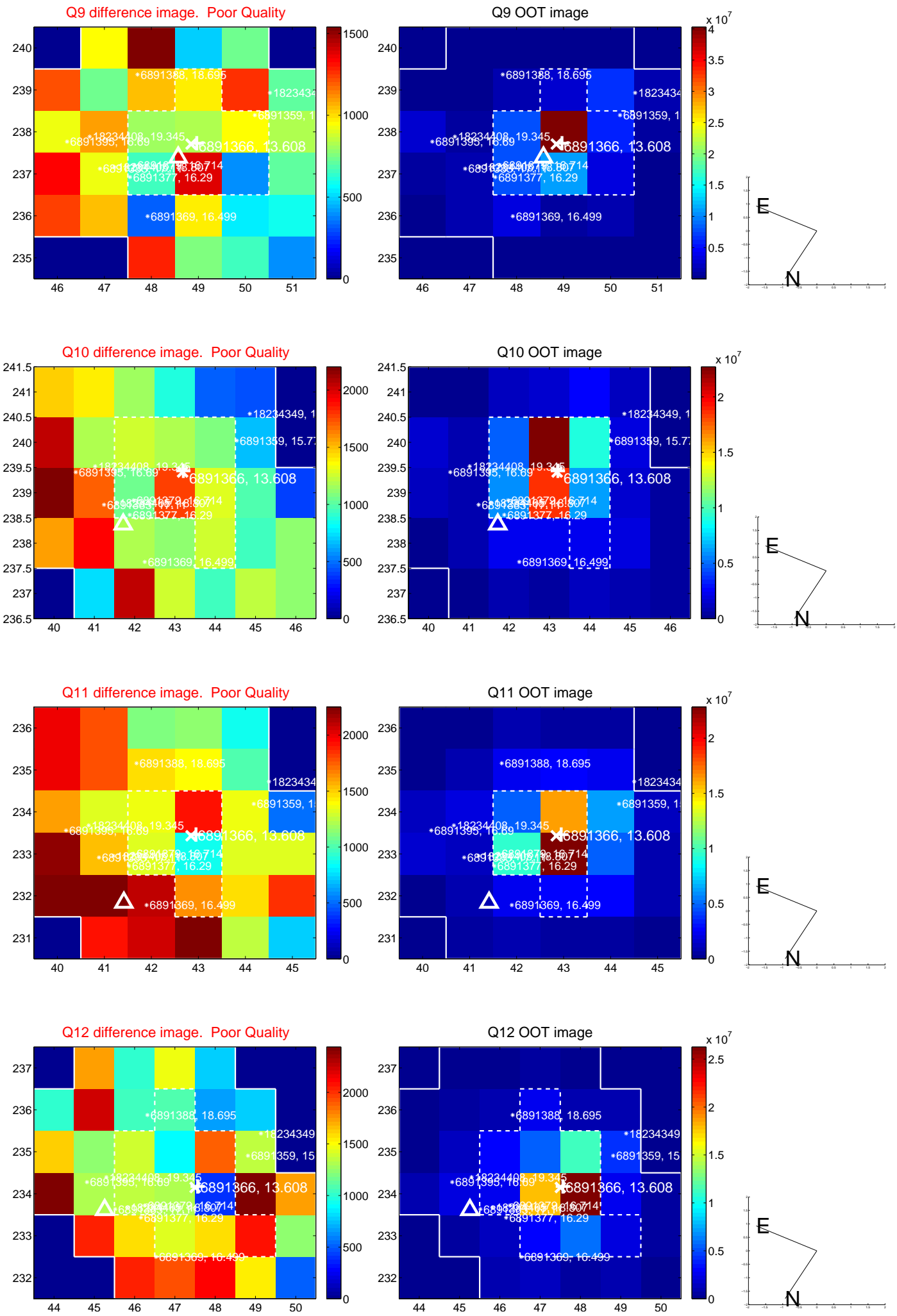


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

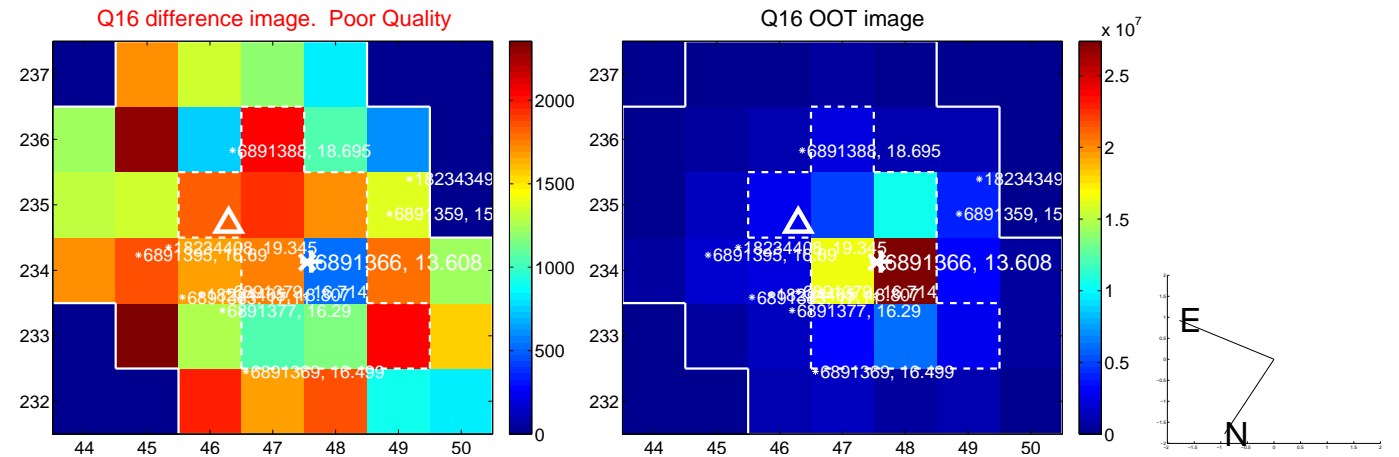
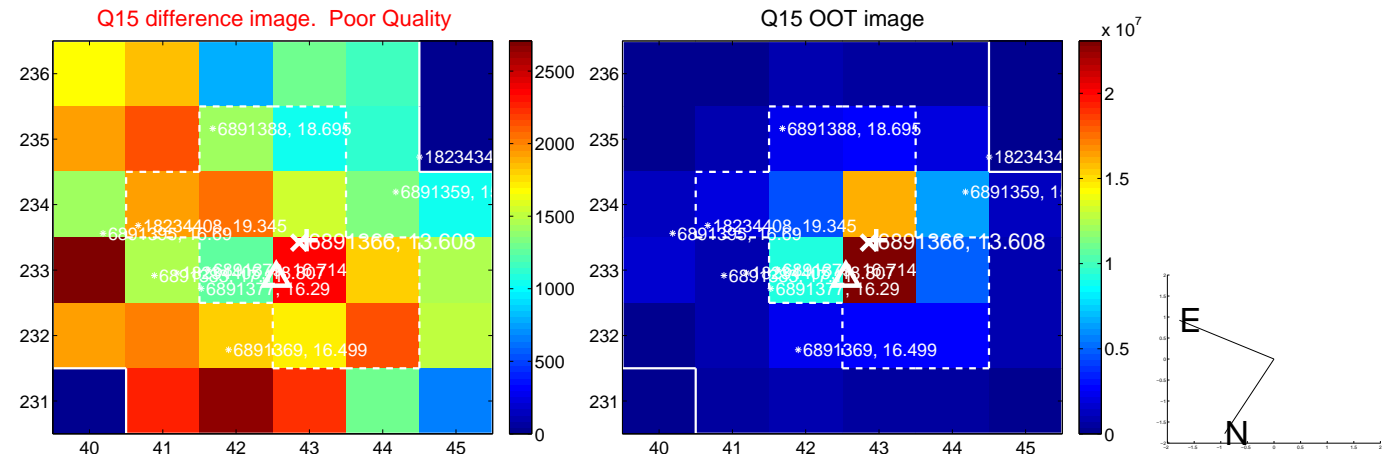
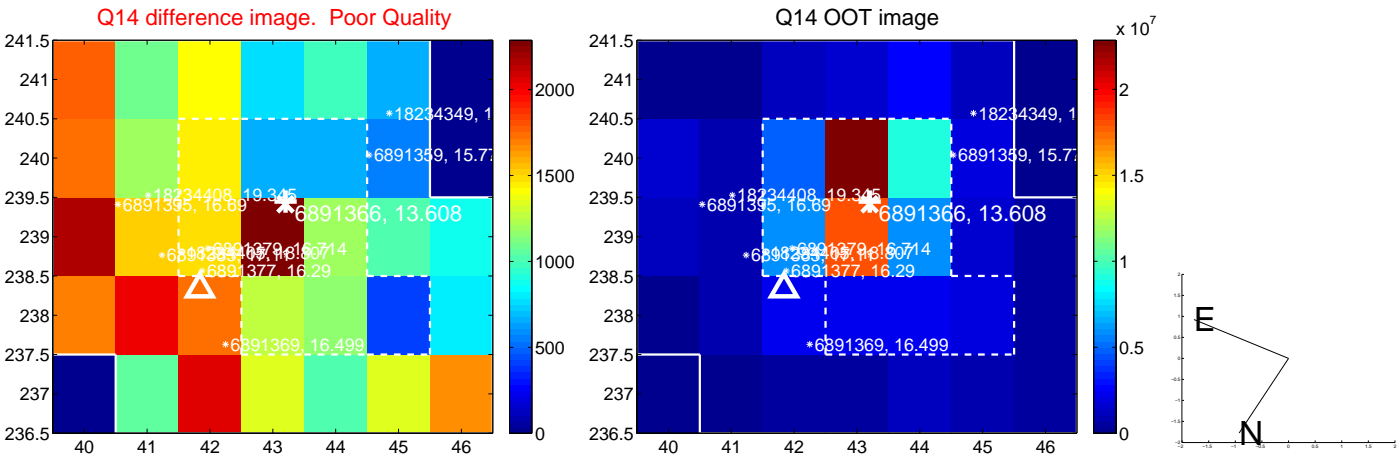
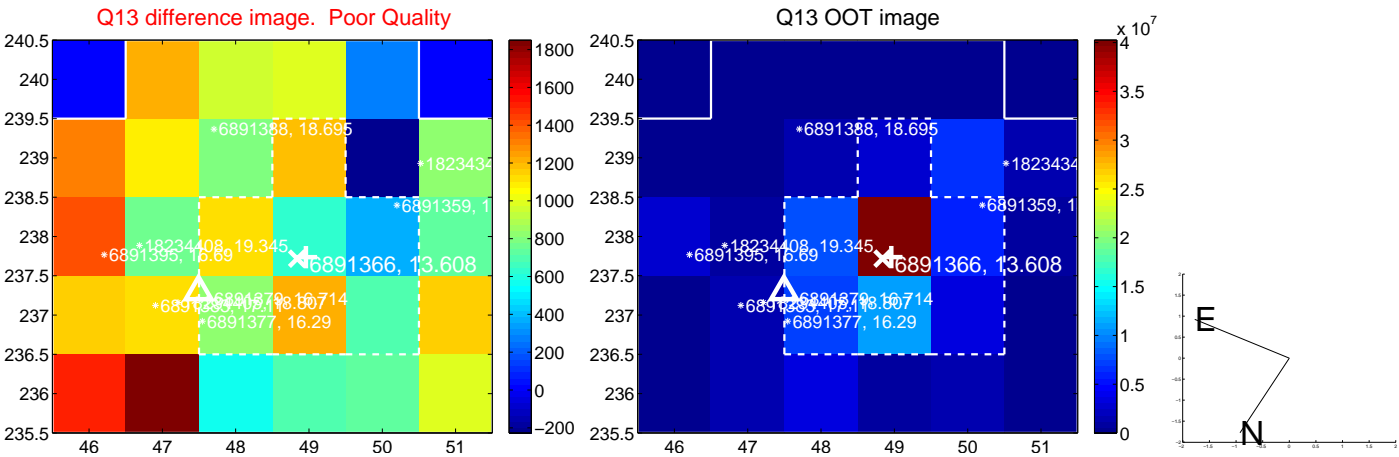




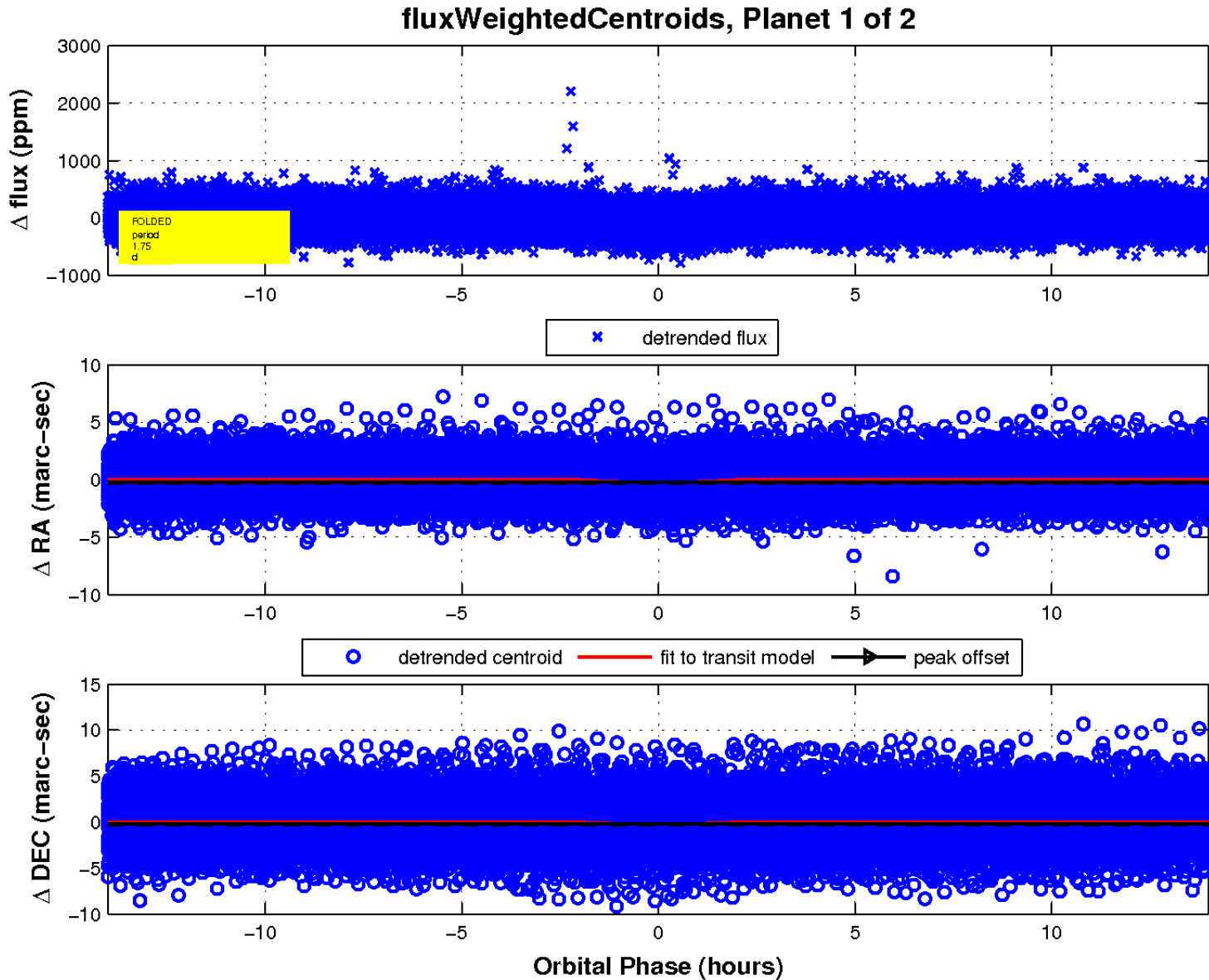
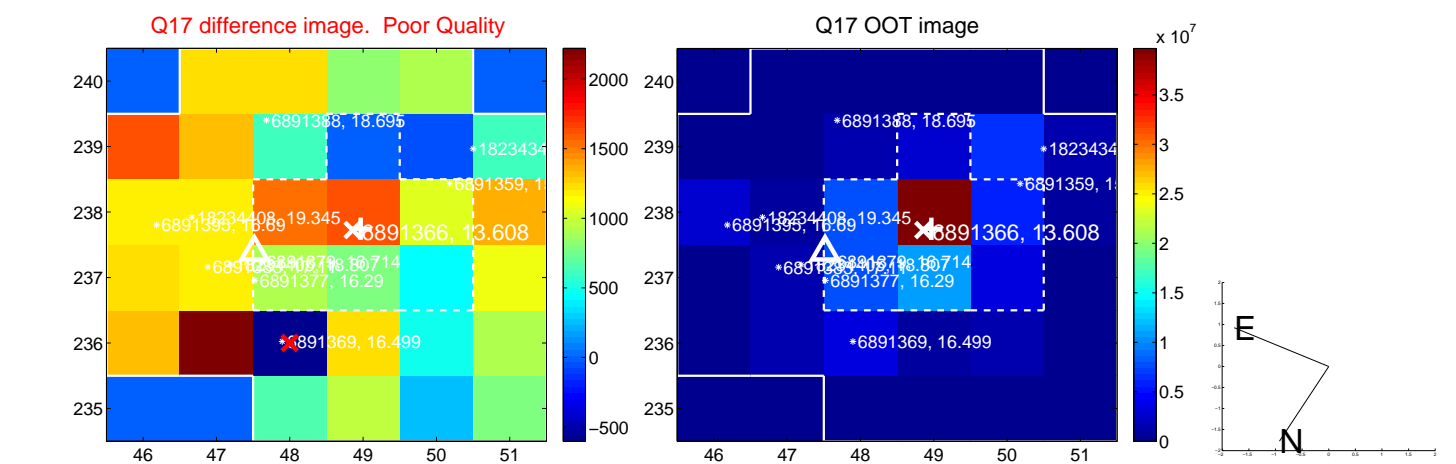
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

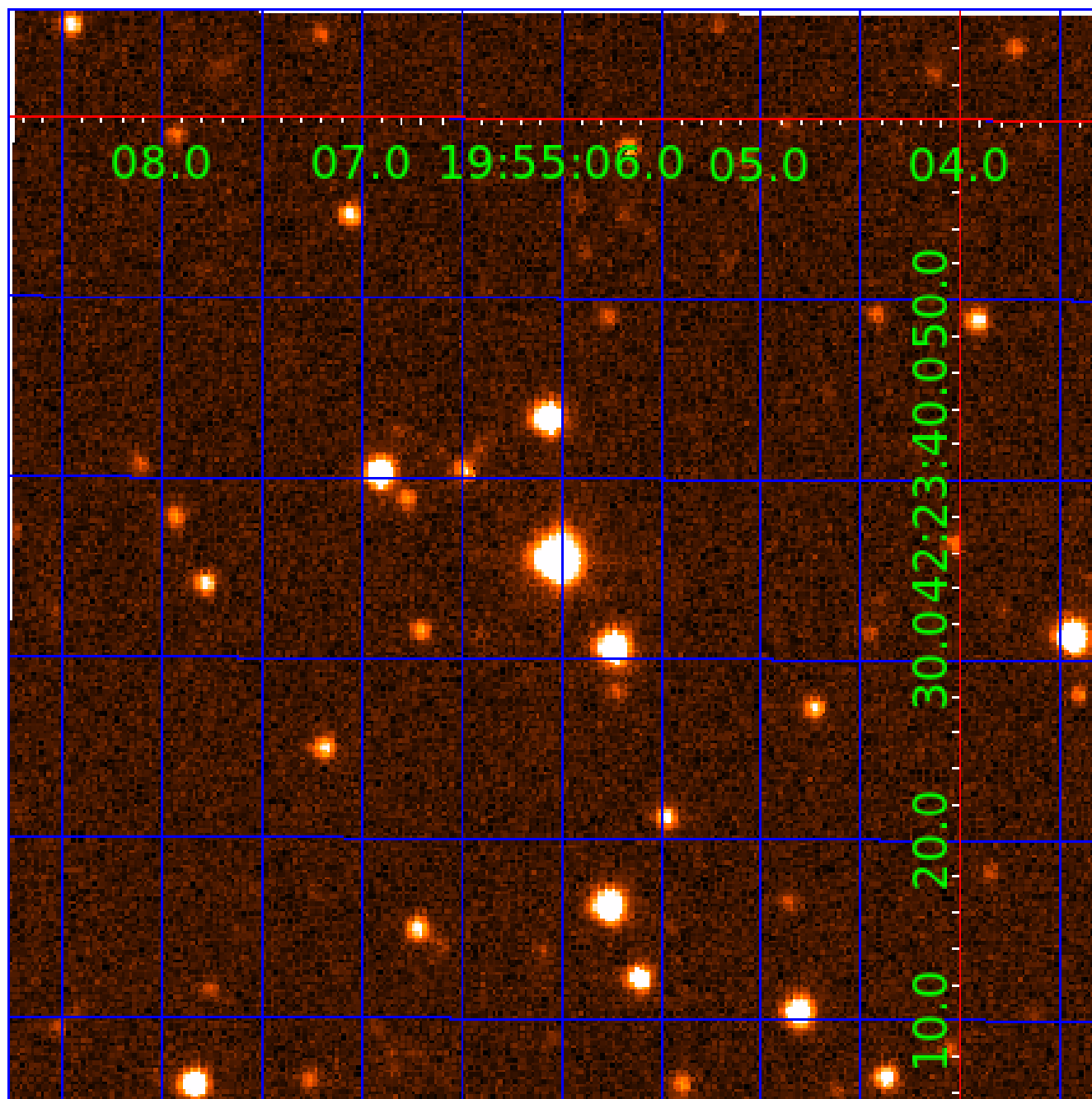


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 006891366

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006891366-01	OBS	1696.01	1.752538	132.730774	108.5	4.665	28.9	30.4	1.18	6221	1.84	2174.54
006891366-02	OBS	No	460.917427	479.099468	402.1	17.780	19.0	9.1	1.18	6221	2.63	1.29

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006891366-01	OBS	FP	0.00	0	1	1	1	HAS_SEC_TCE—CENT_CROWDED—HALO_GHOST—EPHEM_MATCH
006891366-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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 006891366-02

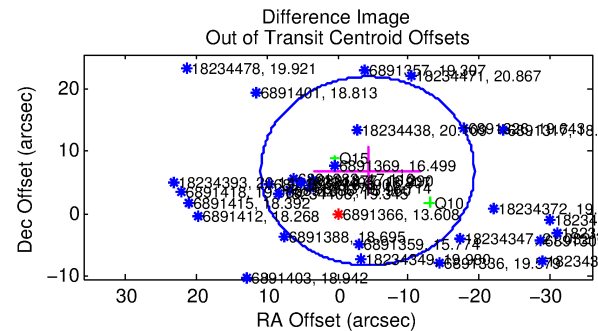
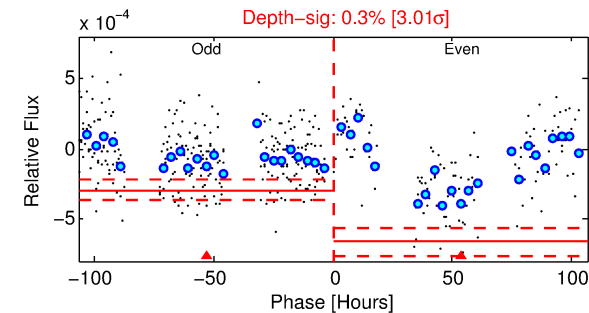
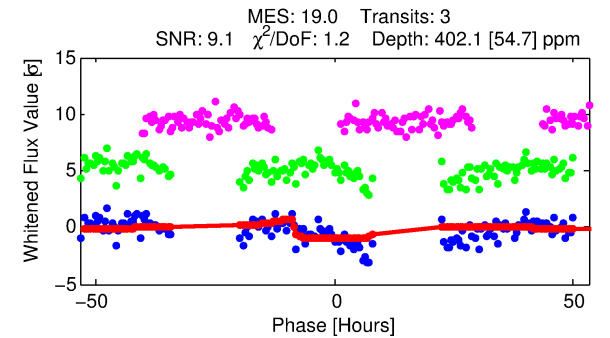
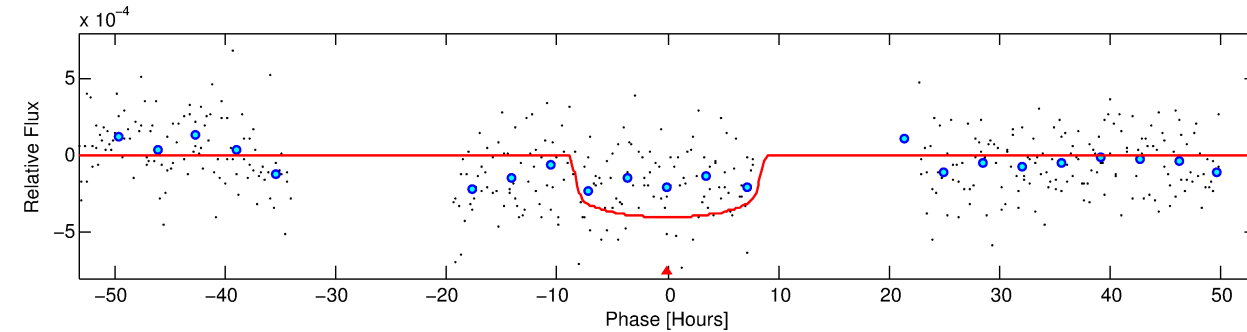
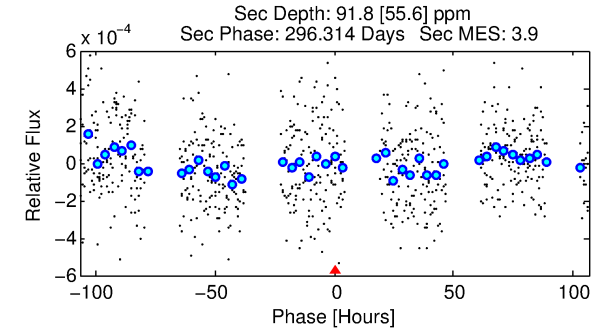
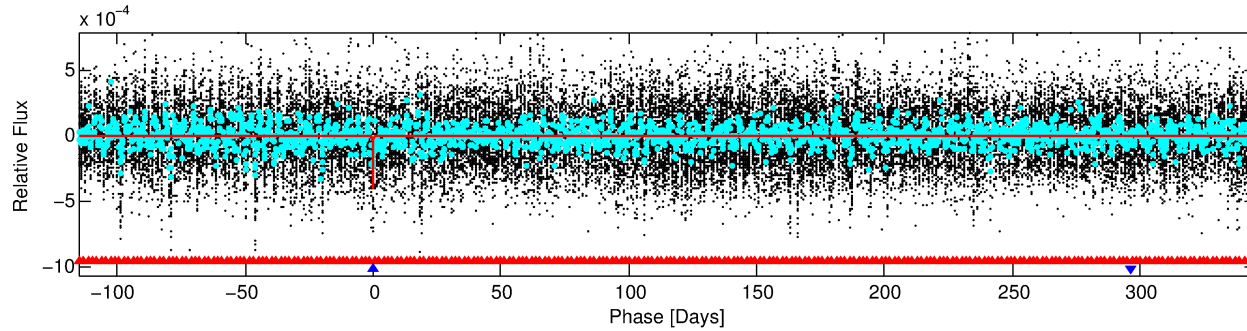
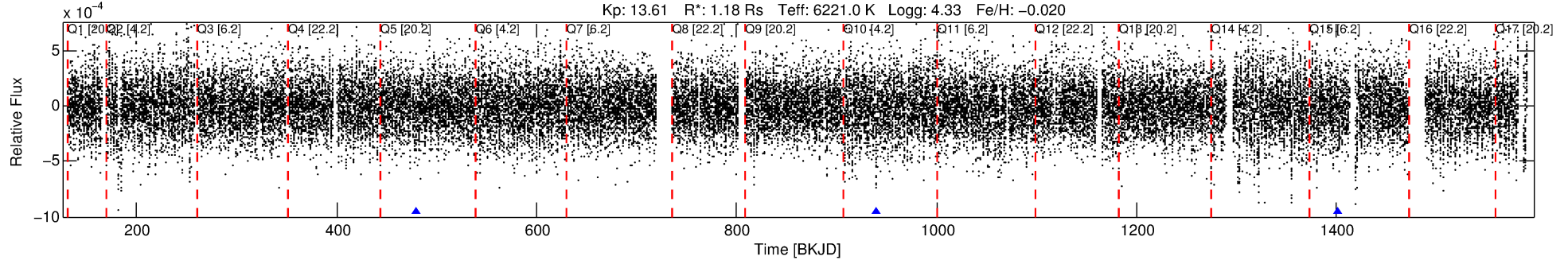
No Significant Match Found

# DV One-Page Summary

KIC: 6891366 Candidate: 2 of 2 Period: 460.917 d

KOI: K01696 Corr: No Ephemeris Match

Kp: 13.61 R\*: 1.18 Rs Teff: 6221.0 K Logg: 4.33 Fe/H: -0.020



## DV Fit Results:

Period = 460.91743 [0.01719] d  
Epoch = 479.0995 [0.0454] BKJD  
Rp/R\* = 0.0204 [0.0034]  
a/R\* = 123.27 [95.59]  
b = 0.81 [0.34]  
Seff = 1.29 [0.53]  
Teq = 272 [28] K  
Rp = 2.63 [0.98] Re  
a = 1.2033 [0.3285] AU  
Ag = 10595.11 [8412.55] [1.26σ]  
Teff = 4263 [754] K [5.29σ]

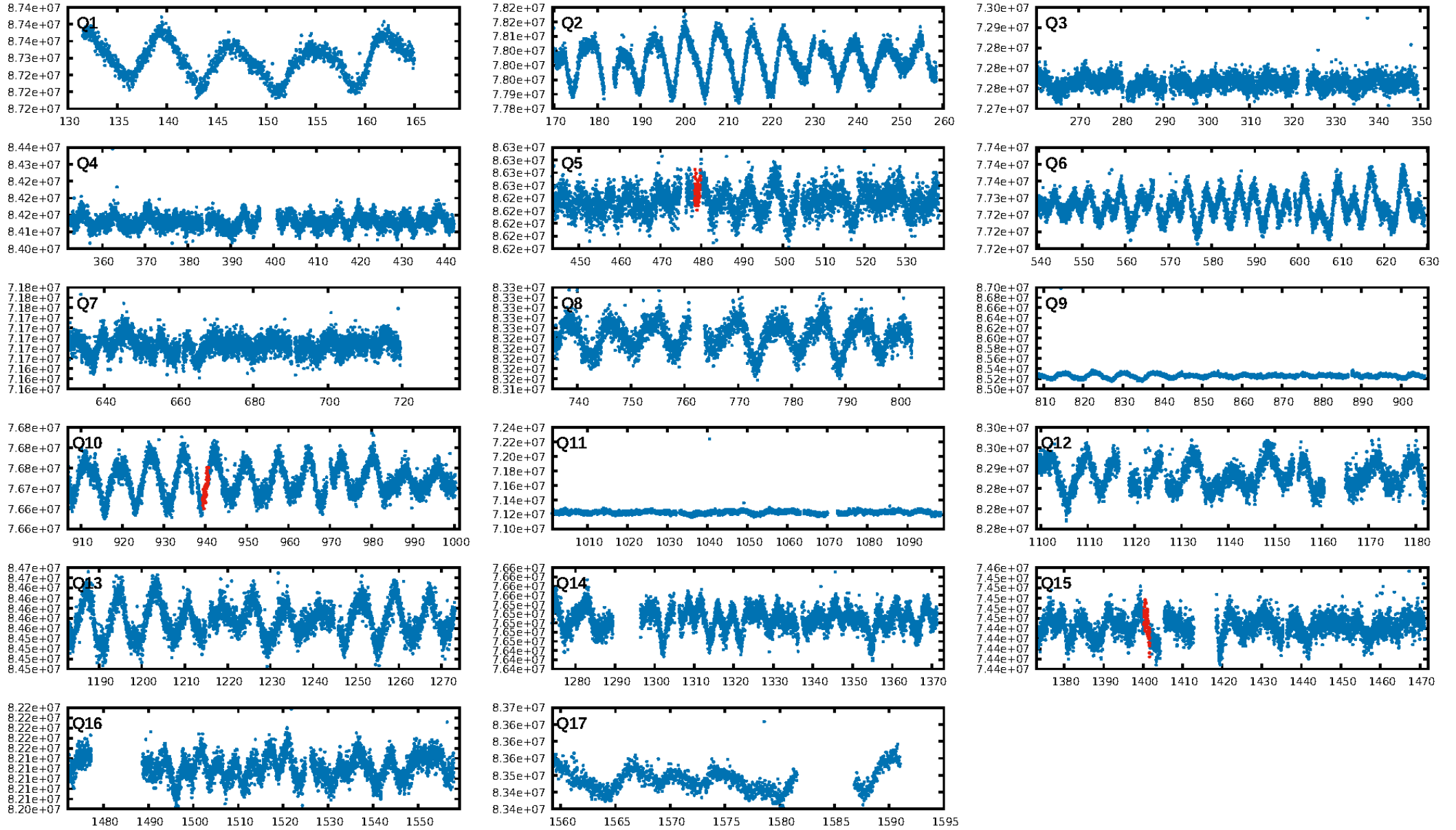
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [599.51σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 45.3%  
Bootstrap-pfa: 1.14e-47  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.385  
Centroid-sig: 18.0%  
Centroid-so: 2.013 arcsec [1.16σ]  
OotOffset-rm: 8.023 arcsec [1.59σ]  
KicOffset-rm: 7.877 arcsec [1.56σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/3]

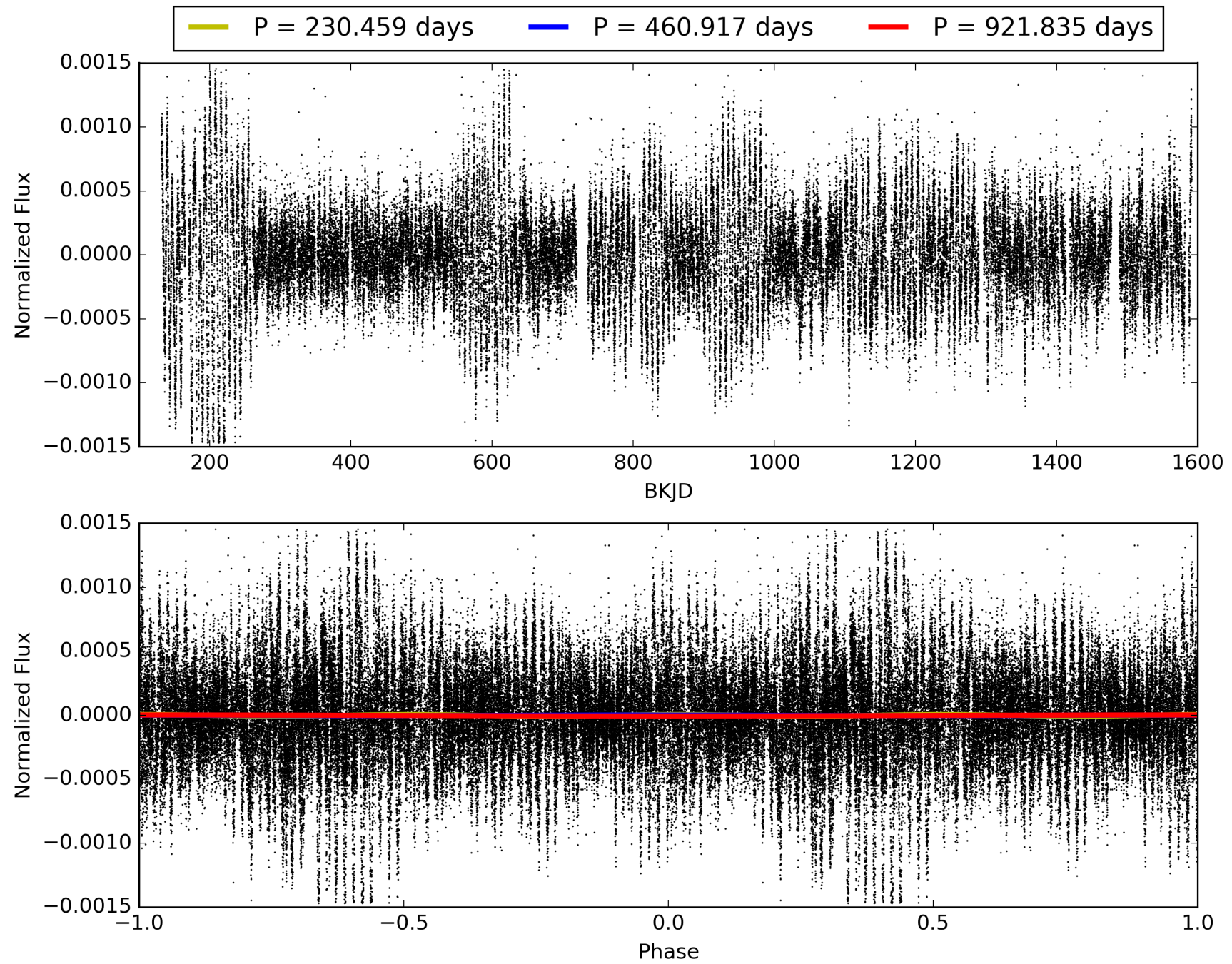
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 13:15:37 Z

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

# TCE 006891366-02, PDC Light Curves



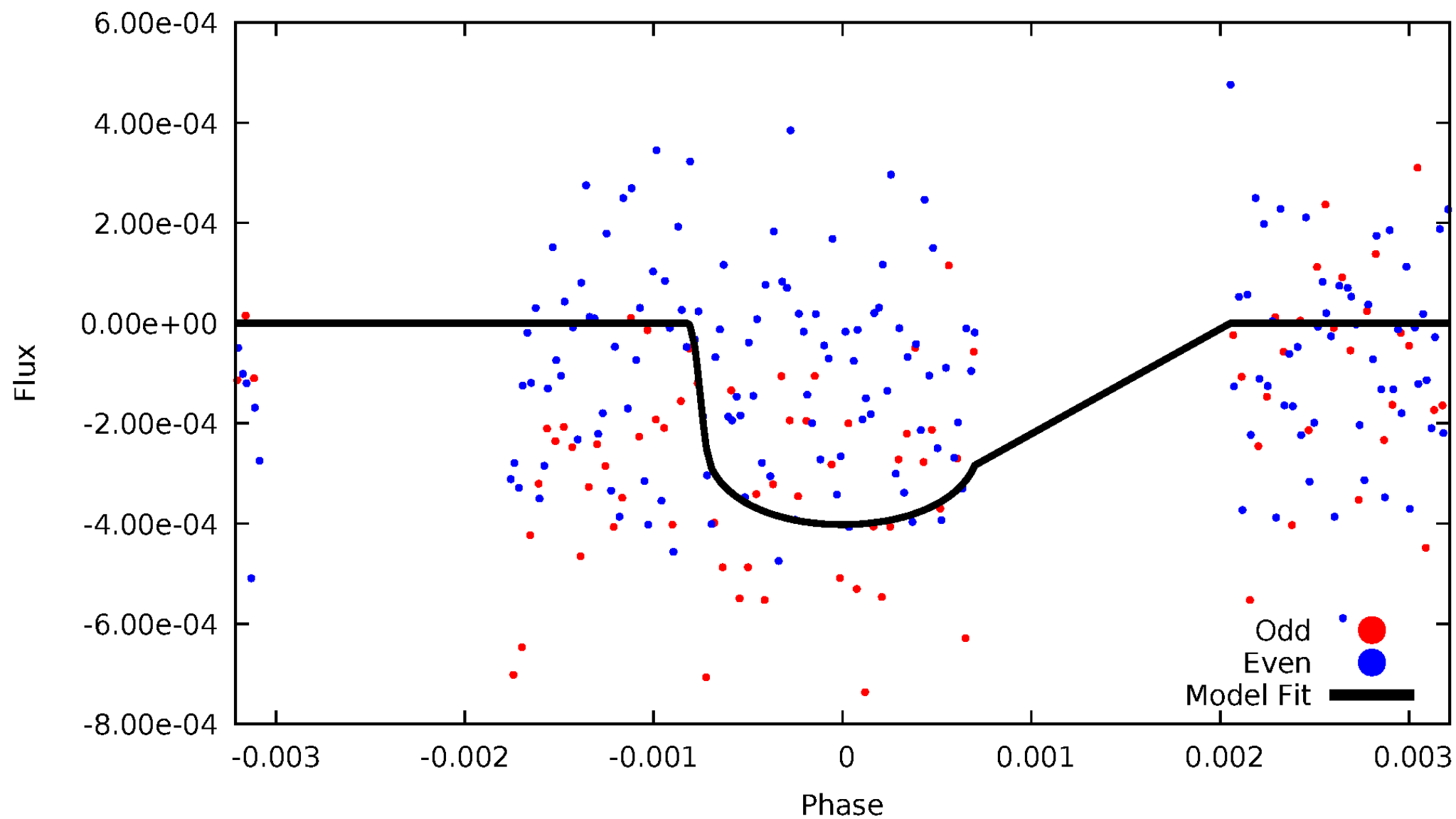
TCE 006891366-02





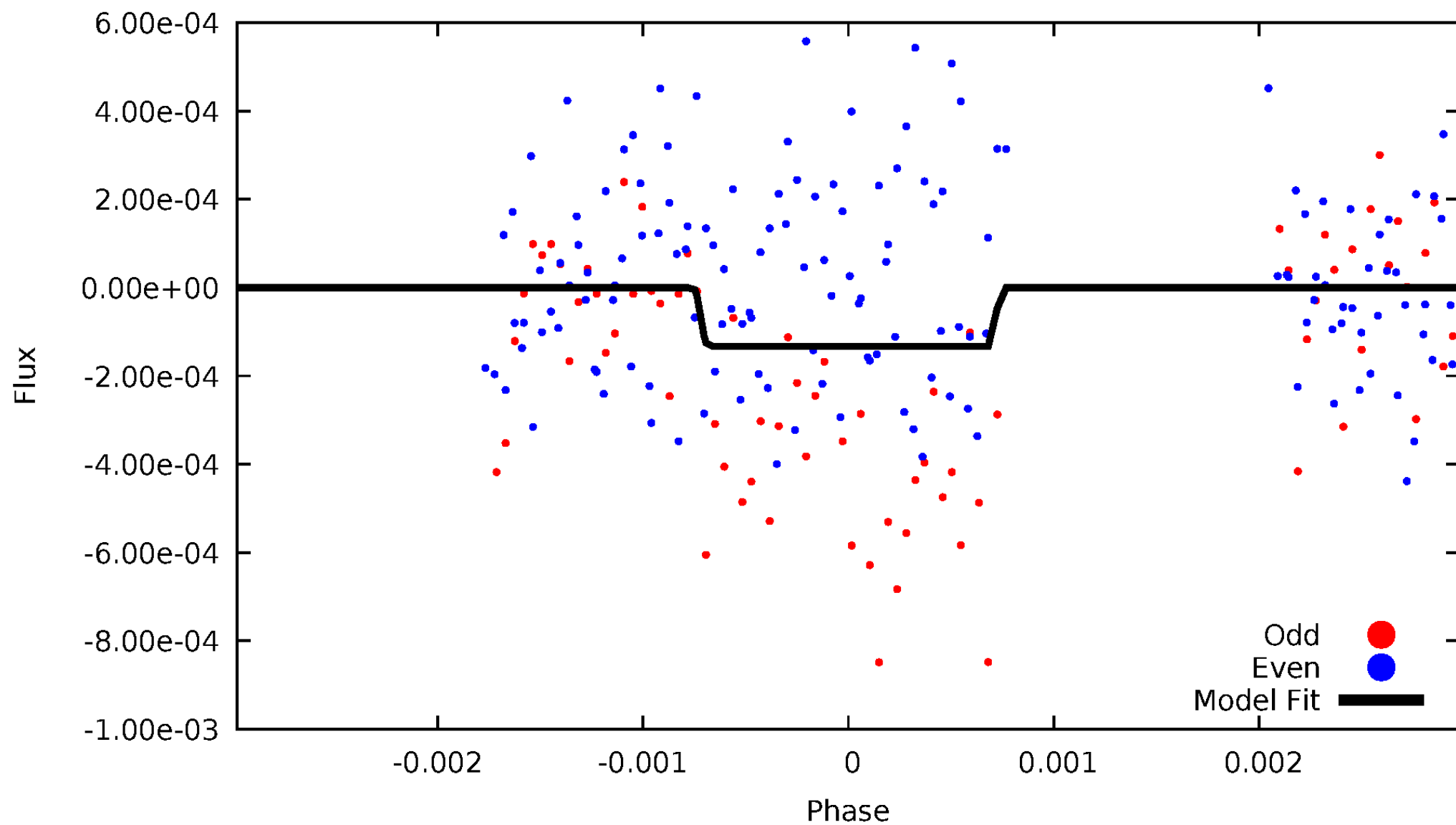
# DV Odd/Even

TCE 006891366-02



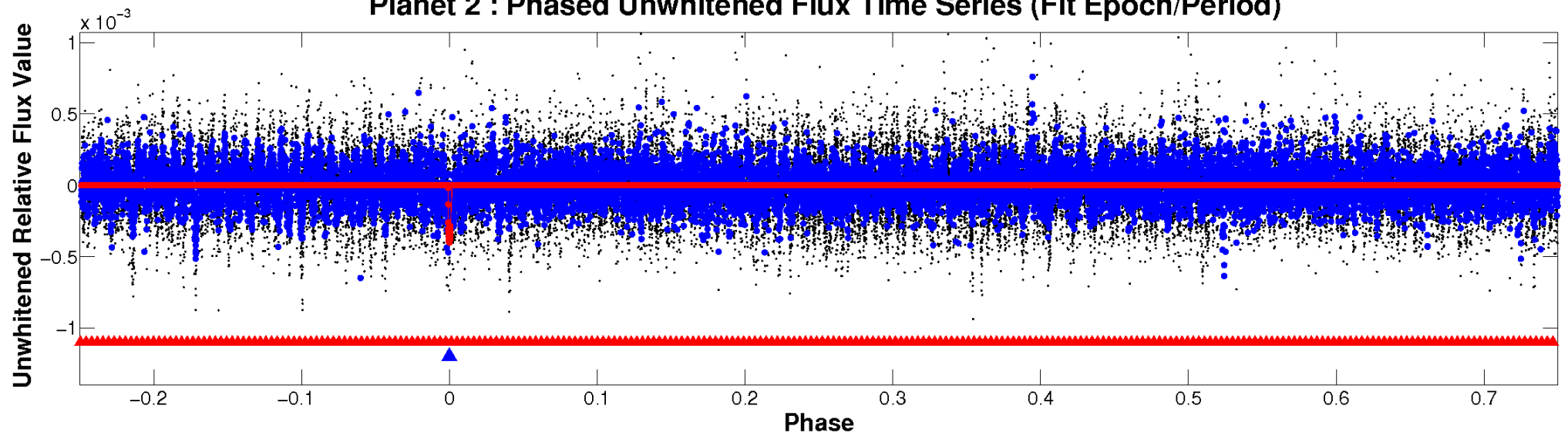
# ALT Odd/Even

TCE 006891366-02

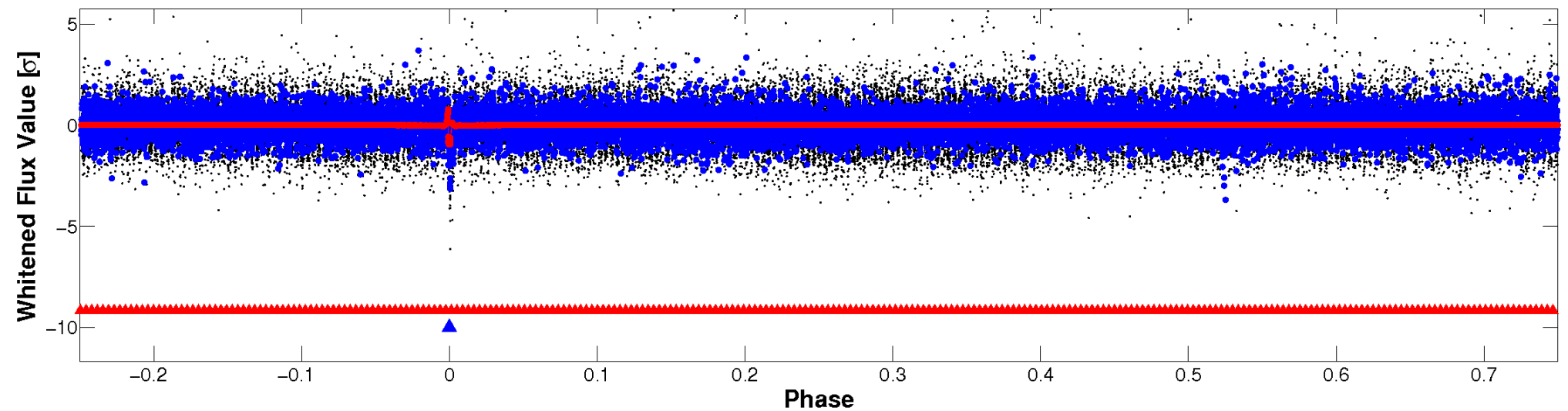


# Non-Whitened Vs. Whitened Light Curve

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



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



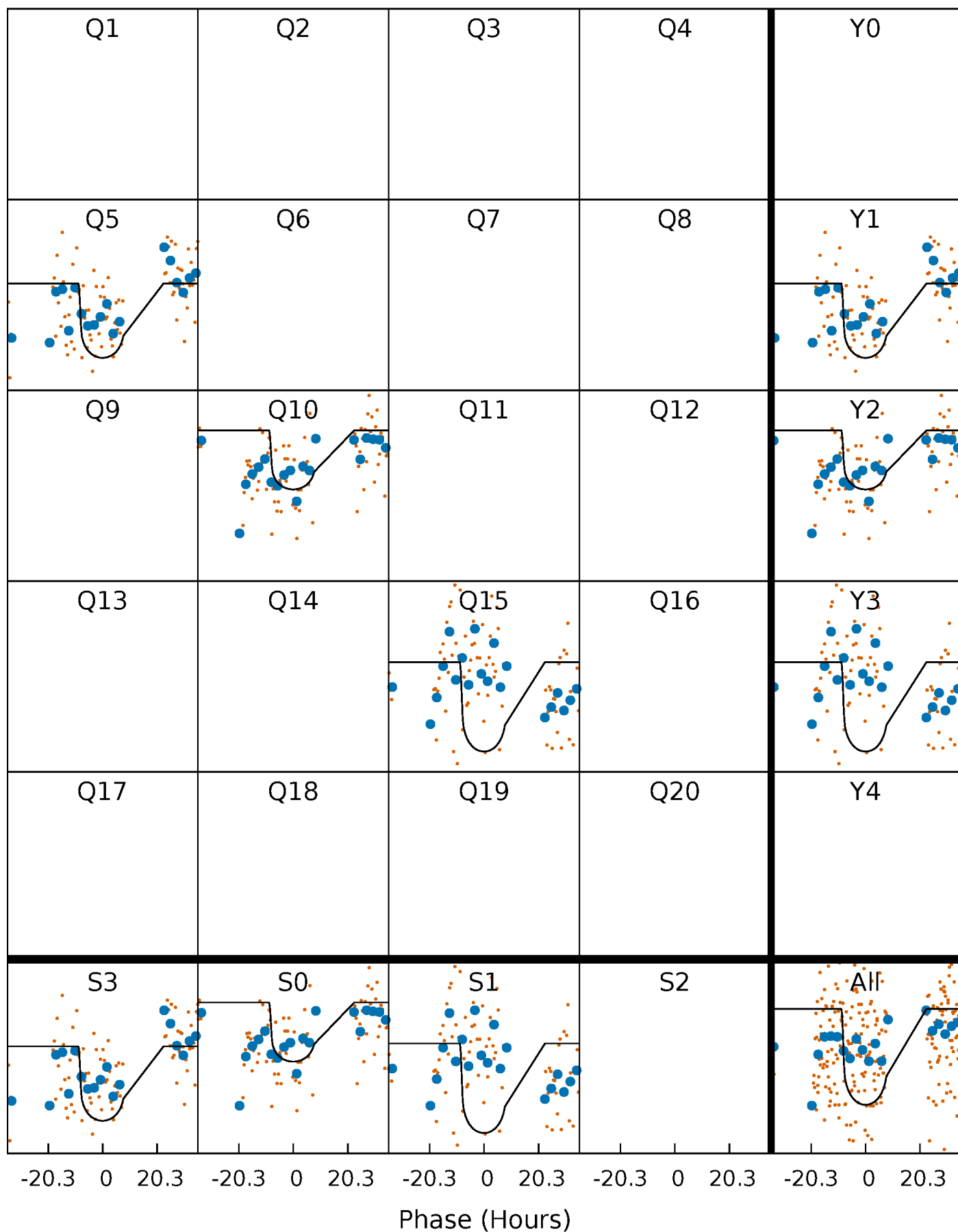
# PDC Quarter-Phased Transit Curves

TCE 006891366-02     $P=460.917426$  Days     $T_0=479.099468$  (BKJD)



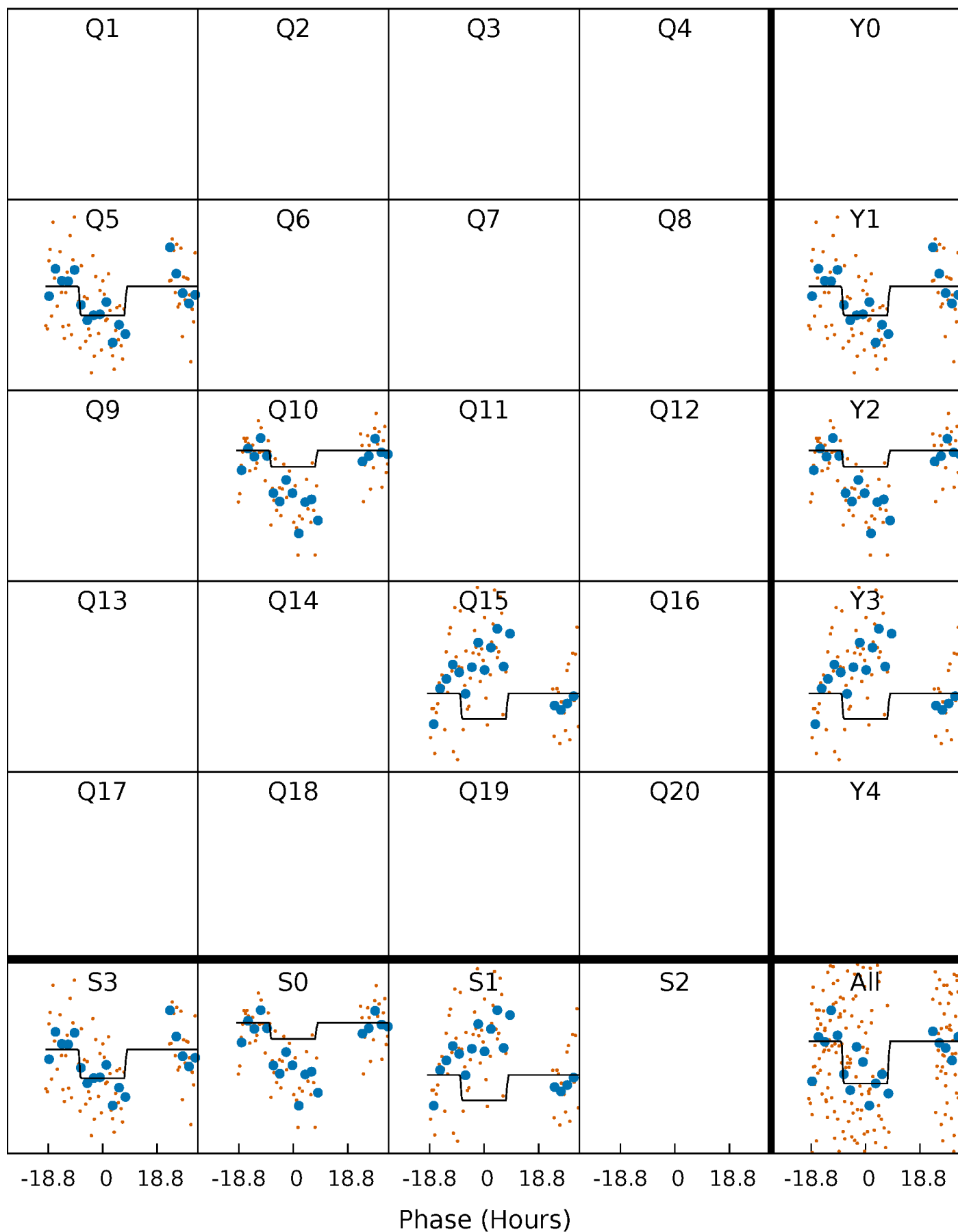
# DV Quarter-Phased Transit Curves

TCE 006891366-02     $P=460.917426$  Days     $T_0=479.099468$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006891366-02 P=460.899379 Days  $T_0=479.103697$  (BKJD)

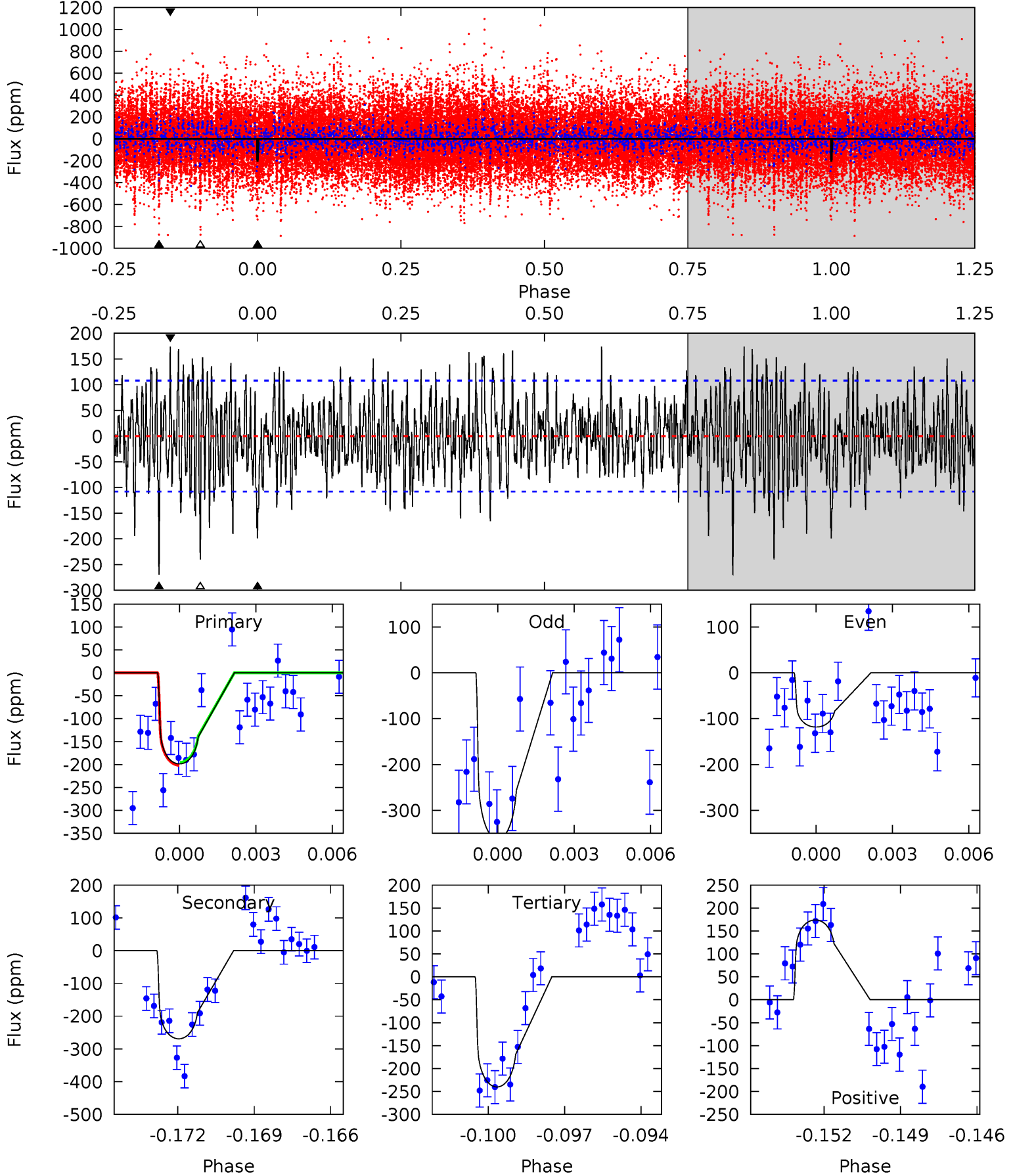




# DV Model-Shift Uniqueness Test

006891366-02, P = 460.917426 Days, E = 18.182042 Days

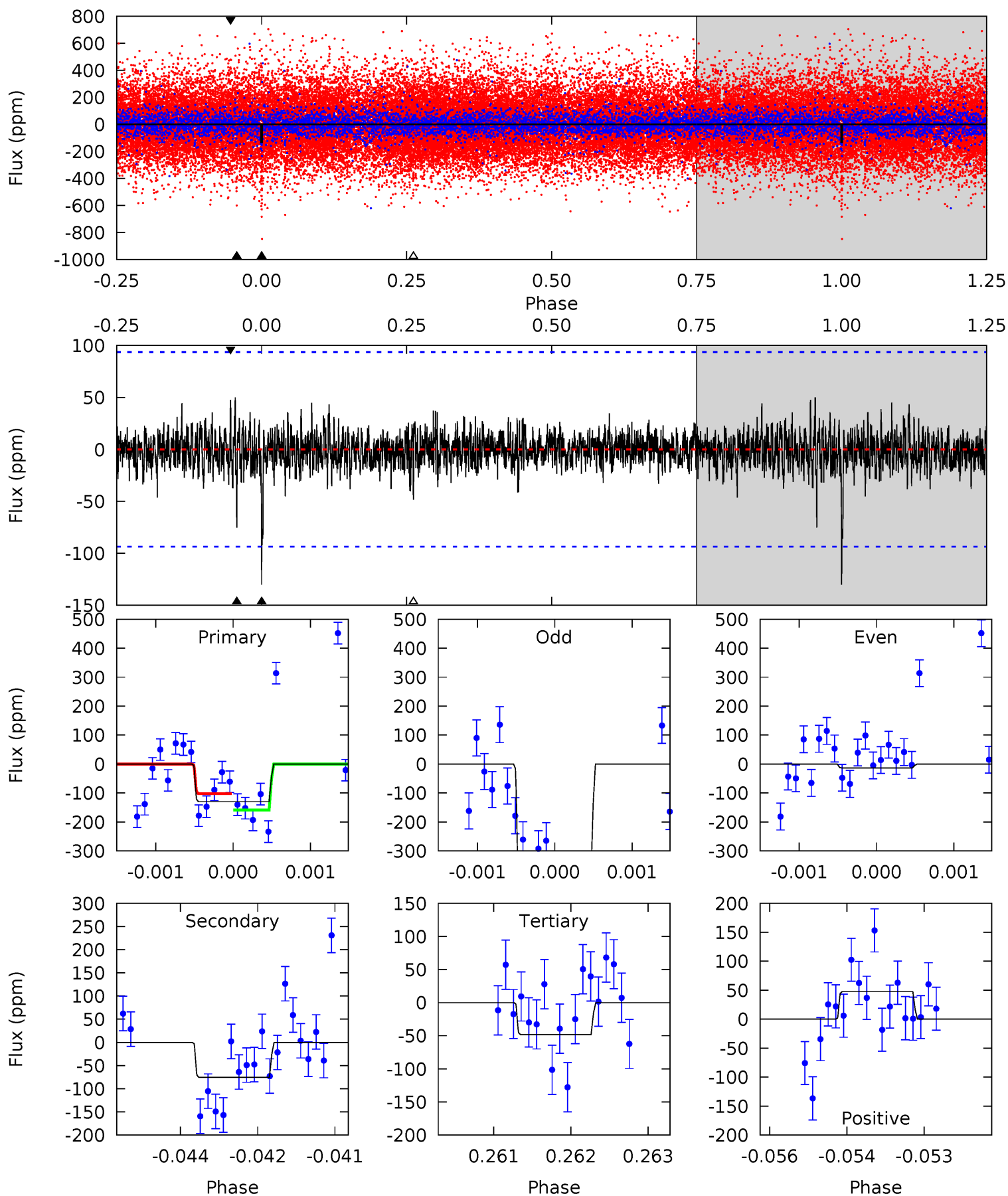
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.70	13.1	11.7	8.50	5.26	2.98	2.96	-2.03	1.20	1.42	4.64	5.67	0.92	0.39	0.15



# Alt Model-Shift Uniqueness Test

006891366-02, P = 460.899379 Days, E = 18.204318 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
7.49	4.33	2.78	2.74	5.38	3.18	0.69	4.71	4.75	1.56	1.59	11.3	0.84	0.28	1.63



### Stellar Parameters For KIC 006891366

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6221^{+167}_{-223}$	$4.333^{+0.112}_{-0.208}$	$-0.020^{+0.250}_{-0.300}$	$1.180^{+0.392}_{-0.168}$	$1.090^{+0.189}_{-0.131}$	$0.935^{+0.454}_{-0.482}$
	+3%/-4%	+3%/-5%	+1250%/-1500%	+33%/-14%	+17%/-12%	+49%/-52%
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 006891366-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-269 \pm 20$	$2.73^{+0.50}_{-0.55}$	$383^{+29}_{-24}$	$5577^{+529}_{-415}$	$28757^{+16258}_{-8507}$
Alt.	$-75 \pm 17$	$1.50^{+0.56}_{-0.46}$	$382^{+29}_{-22}$	$5418^{+1090}_{-686}$	$26463^{+29745}_{-13275}$

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

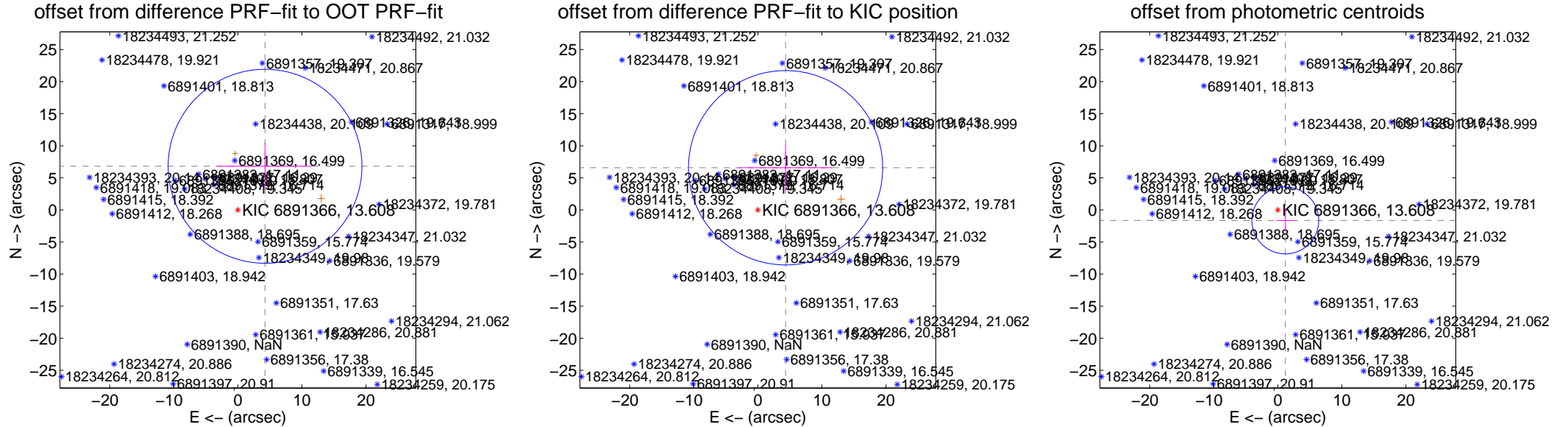
## DV Centroid Data

Supplemental centroid analysis for 006891366-02. Kepler magnitude: 13.61. Transit SNR 9.08

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.023 \pm 5.040$	1.59	$-4.242 \pm 7.467$	$6.810 \pm 3.691$
PRF-fit source offset from KIC position	$7.877 \pm 5.050$	1.56	$-4.333 \pm 7.376$	$6.578 \pm 3.602$
photometric centroid source offset	$2.01 \pm 1.74$	1.16	$-1.17 \pm 1.41$	$-1.64 \pm 1.89$

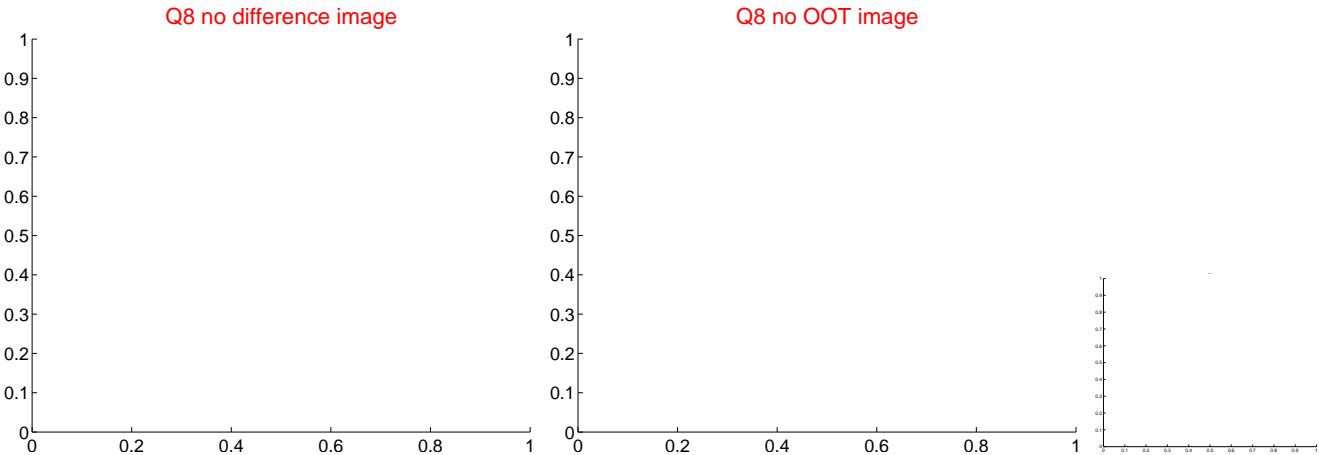
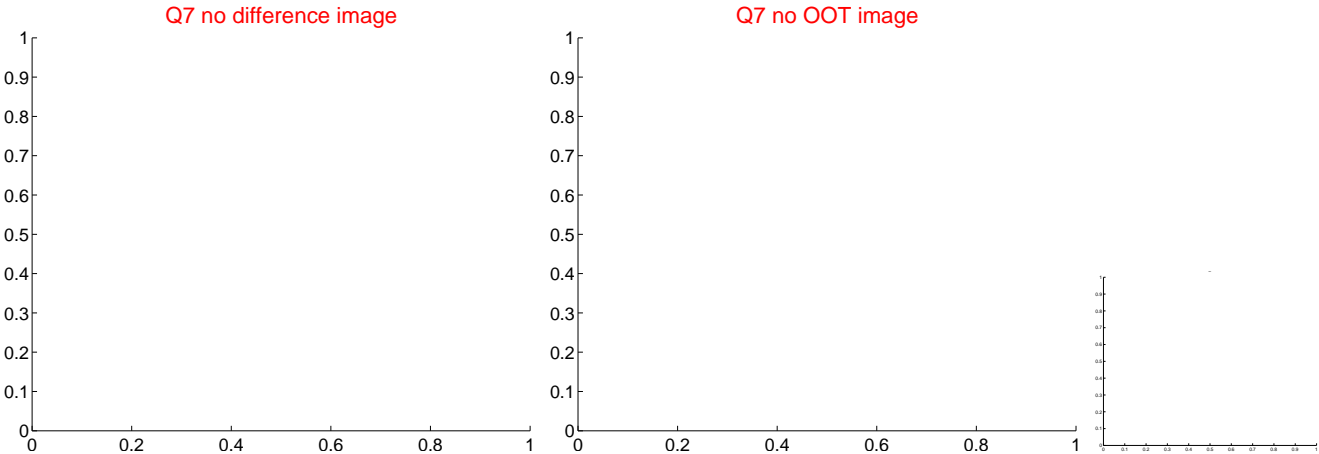
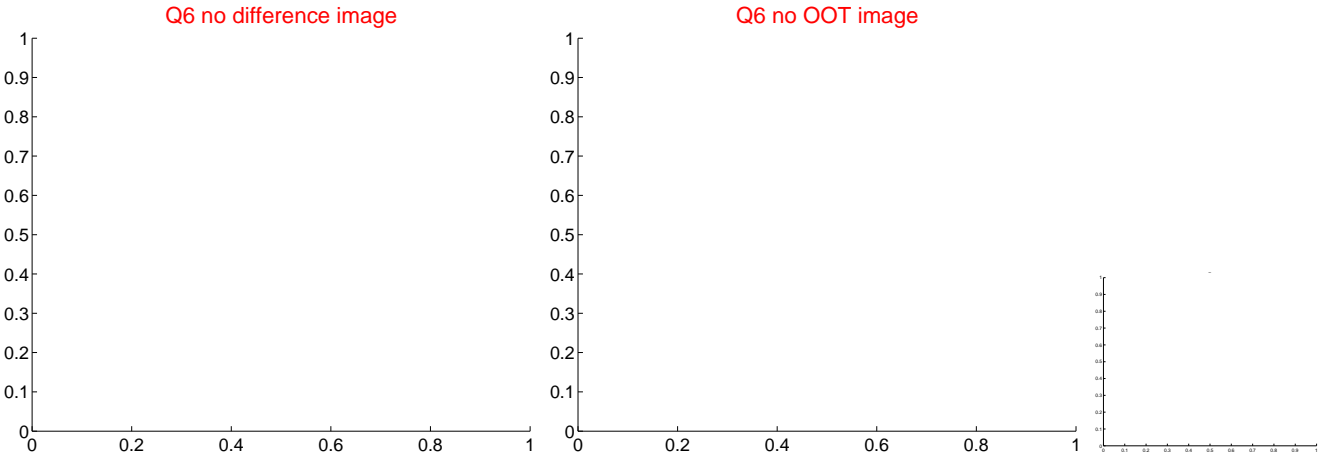
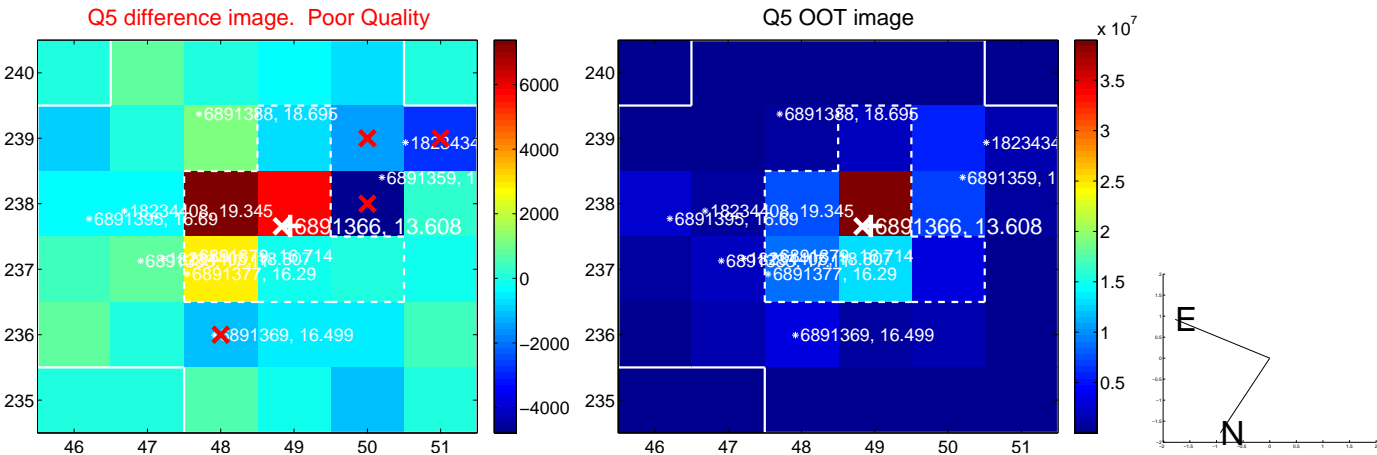


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

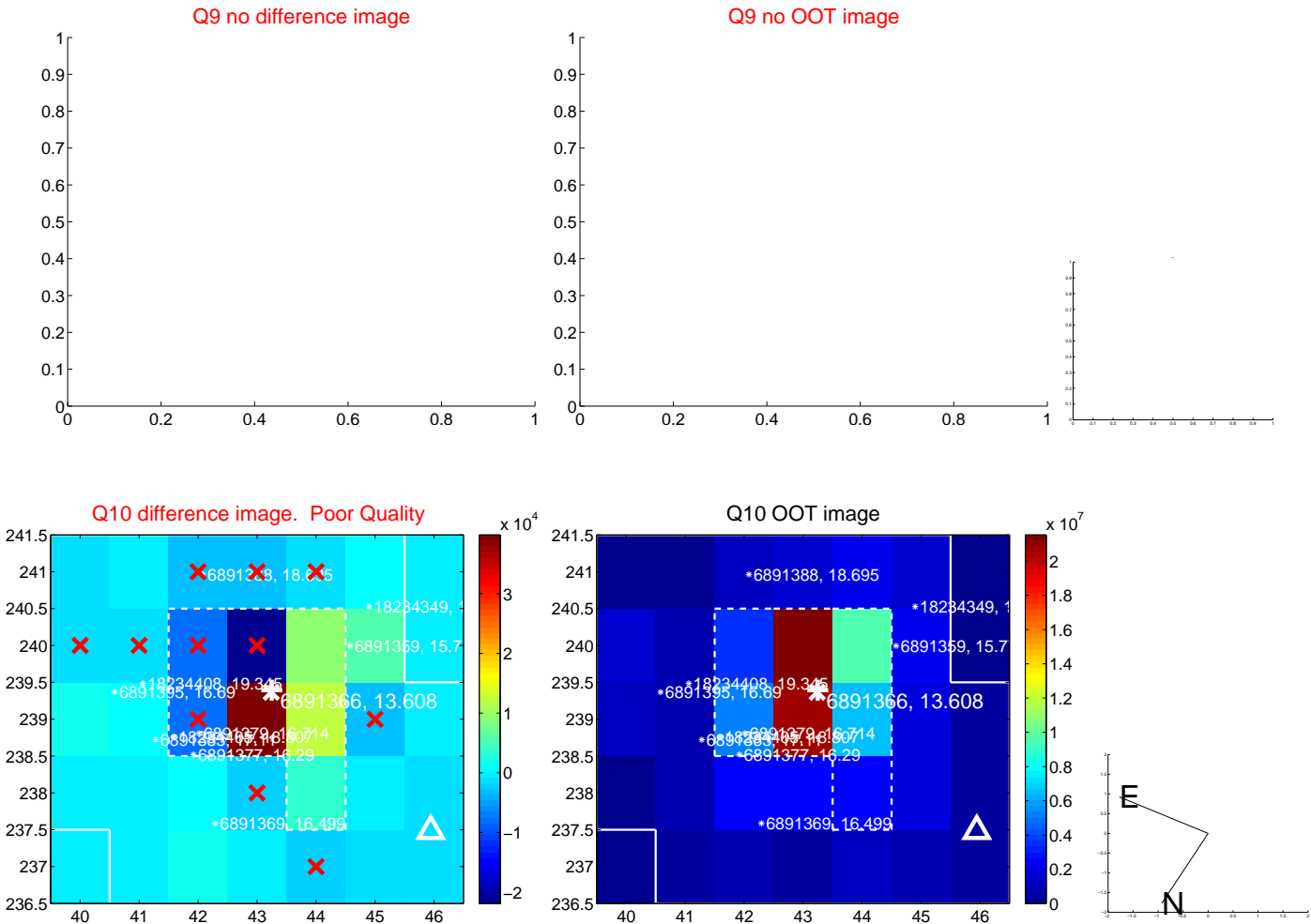


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

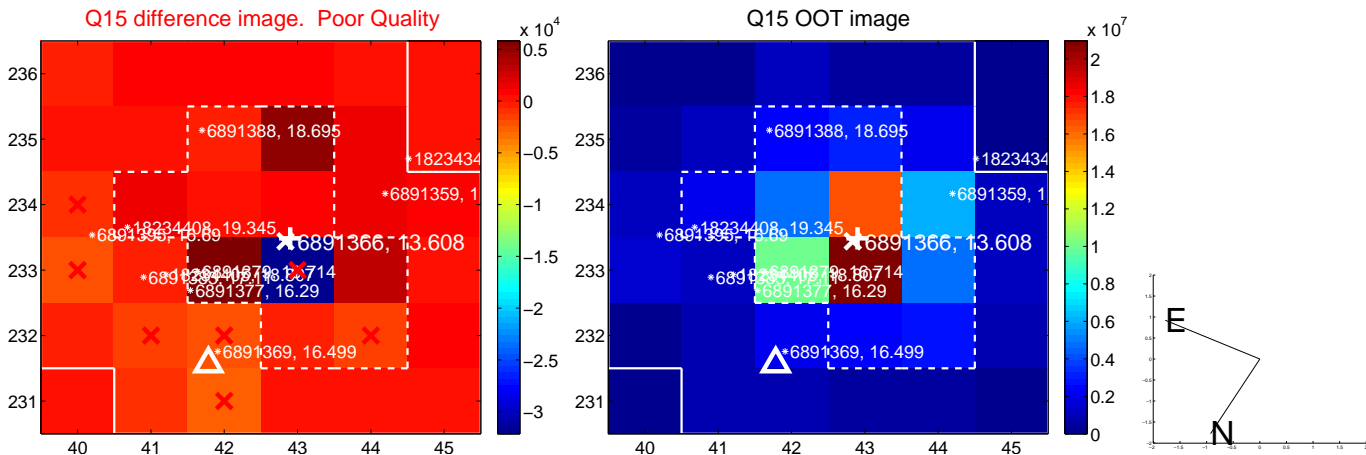




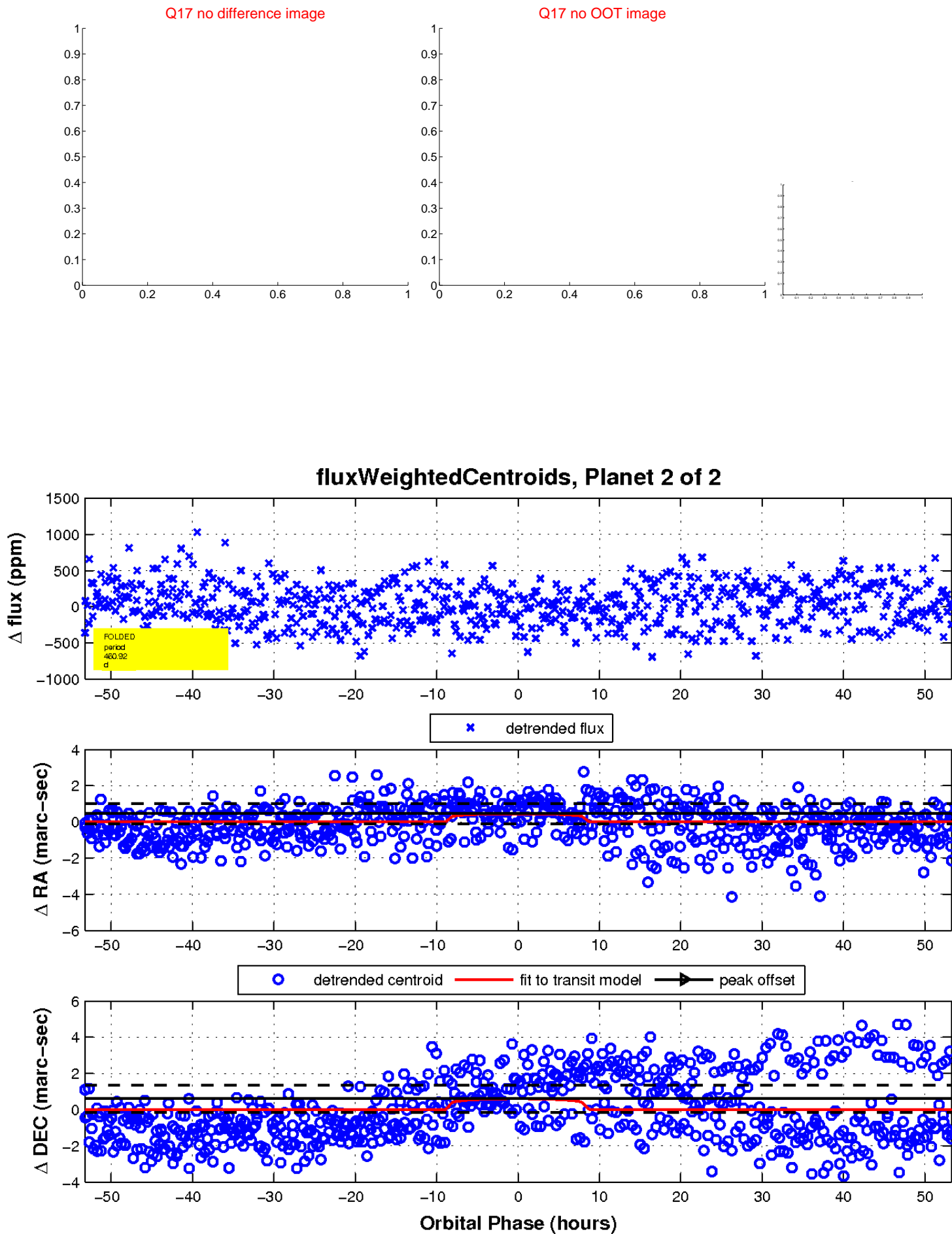
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

