

# KIC 008108901

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008108901-01	OBS	No	369.626203	233.018146	548.3	13.817	9.5	9.4	0.91	5896	2.39	0.89
008108901-02	OBS	No	341.478844	260.208366	1978.6	10.500	24.6	-1.0	0.91	5896	4.04	0.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008108901-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—CENT_FEW_MEAS
008108901-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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

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

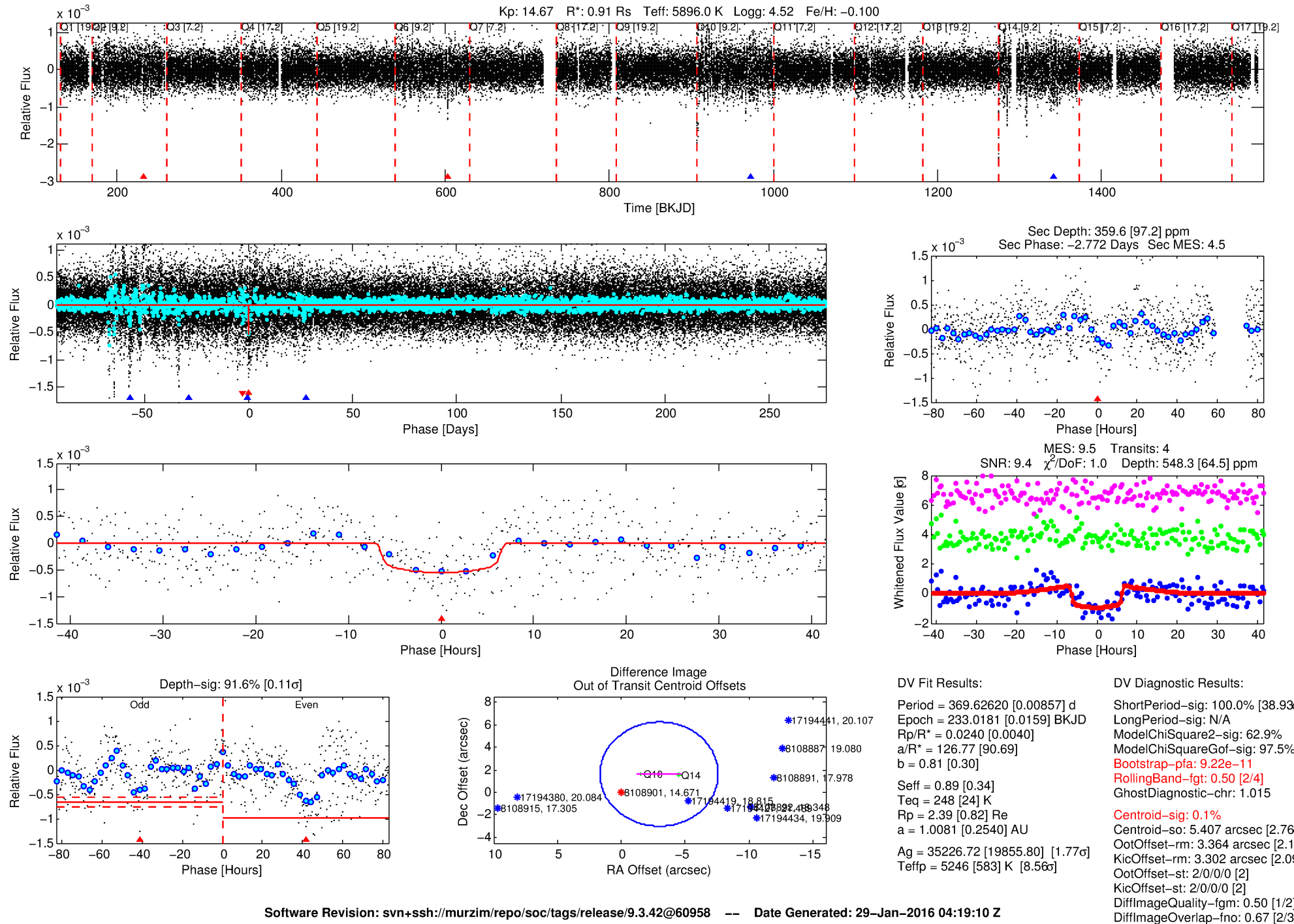
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008108901-01

No Significant Match Found

# DV One-Page Summary

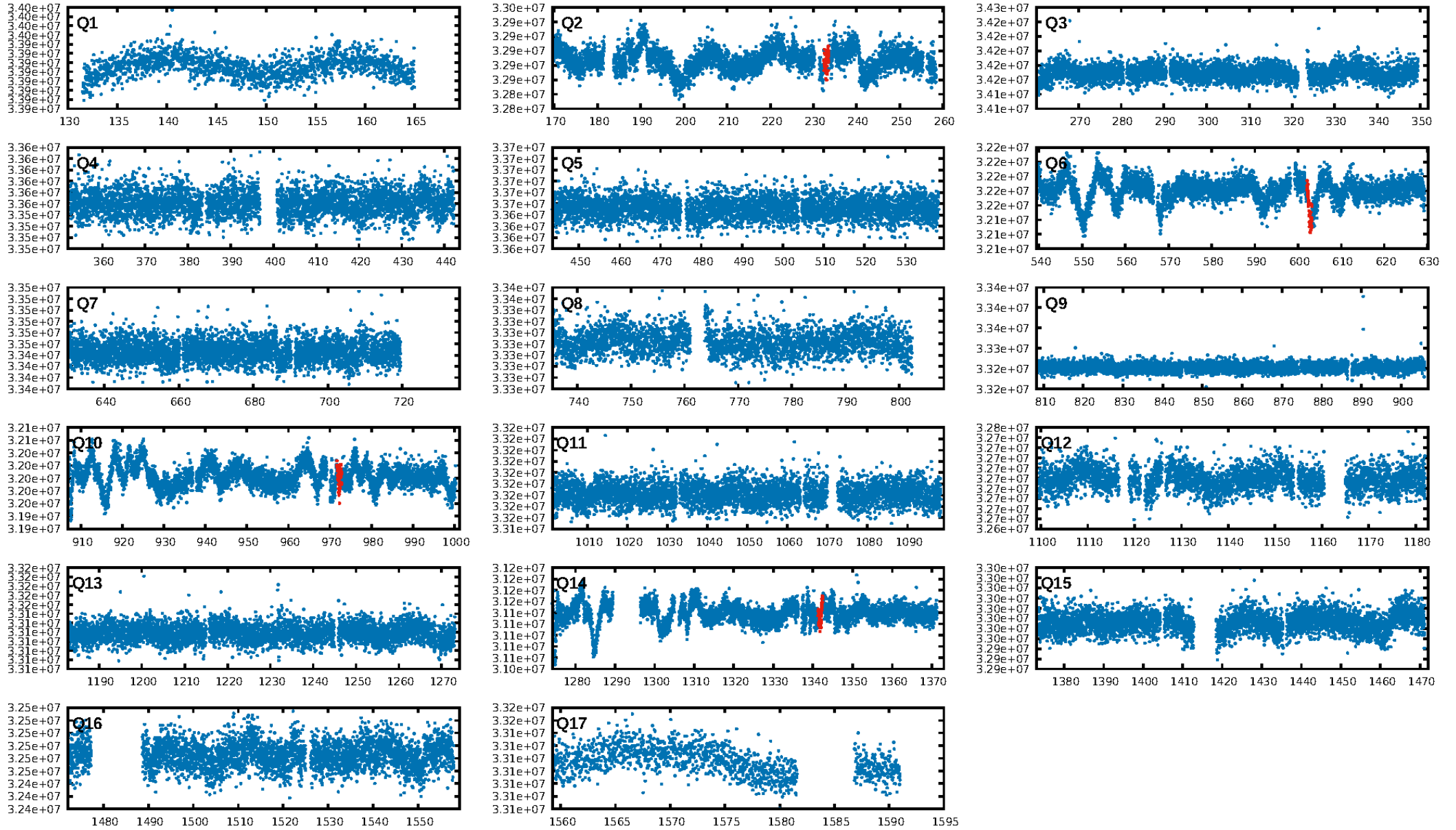
KIC: 8108901 Candidate: 1 of 2 Period: 369.626 d



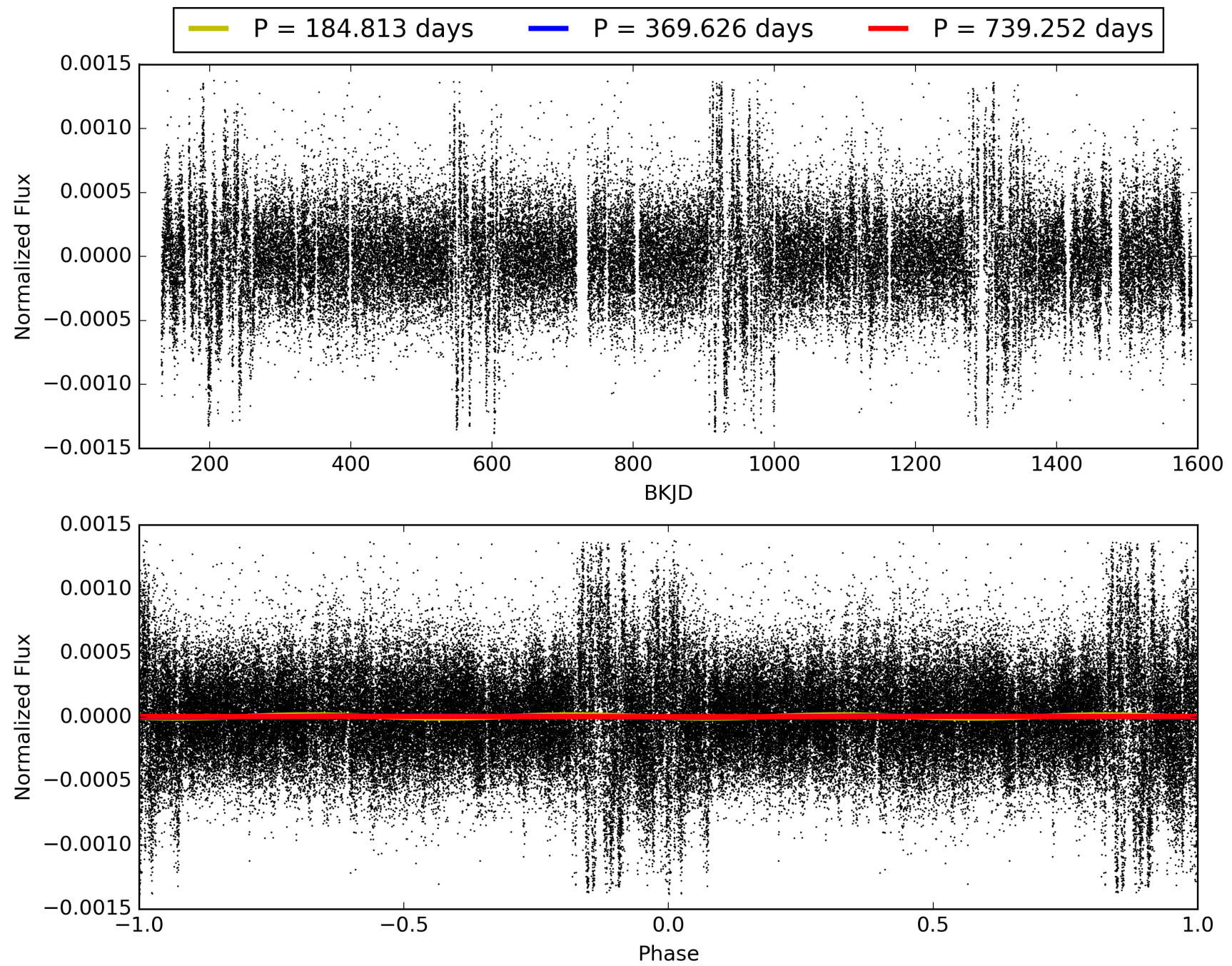
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:19:10 Z

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

# TCE 008108901-01, PDC Light Curves

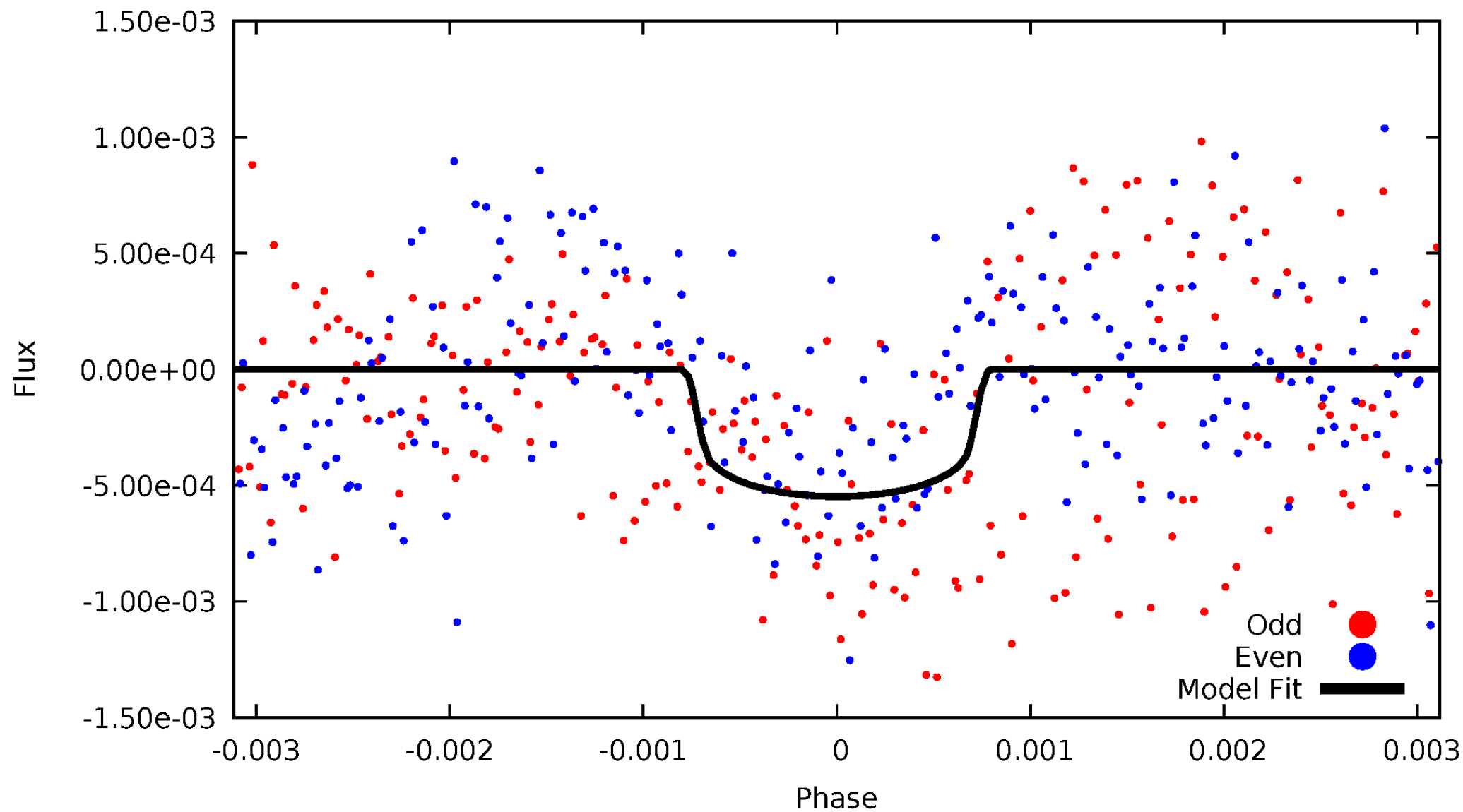


# TCE 008108901-01



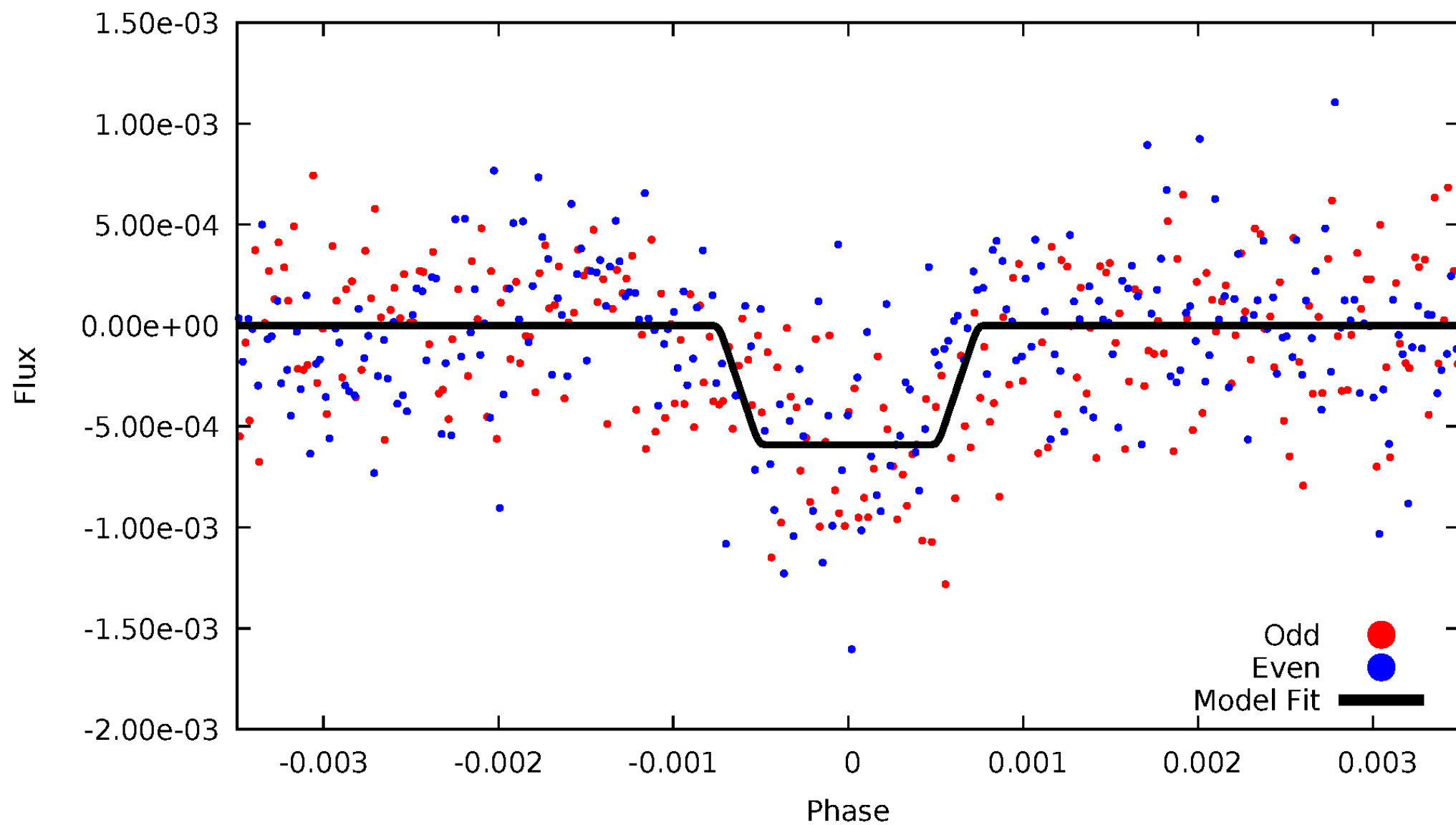
# DV Odd/Even

TCE 008108901-01



# ALT Odd/Even

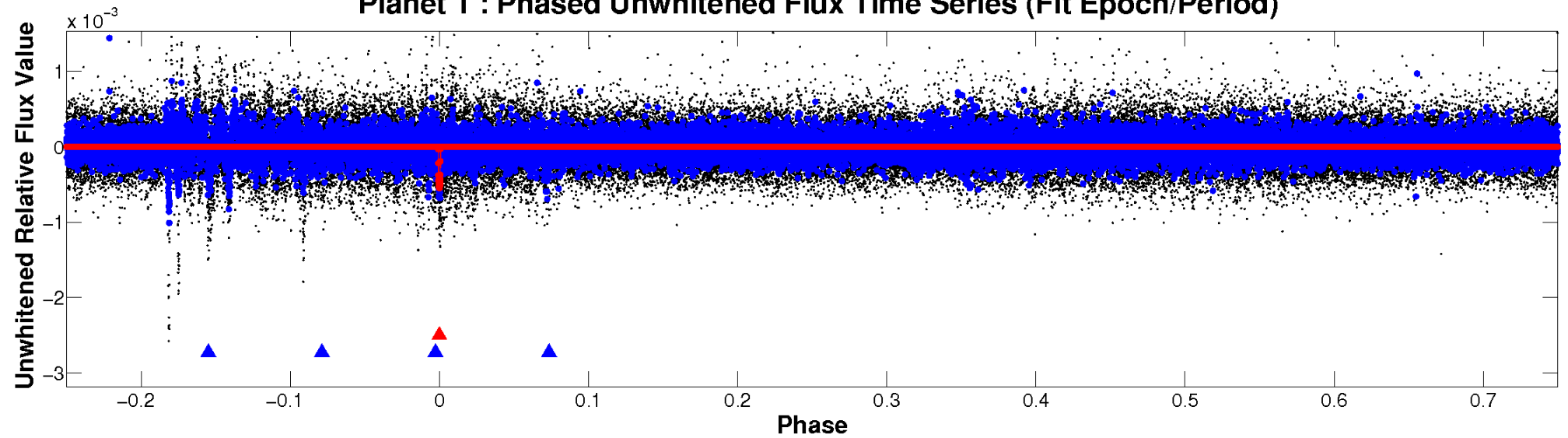
TCE 008108901-01



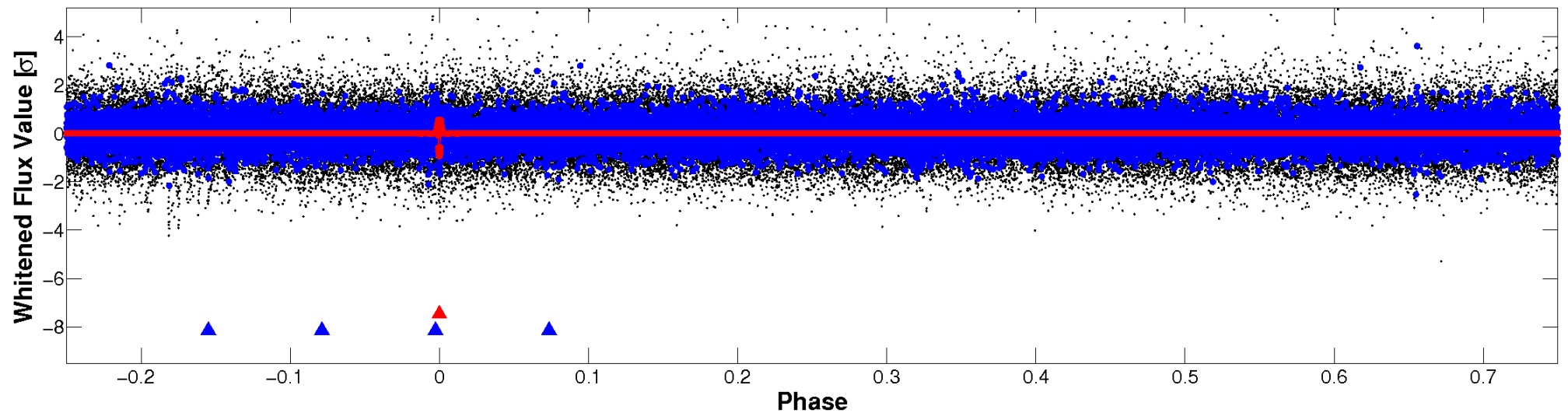


# Non-Whitened Vs. Whitened Light Curve

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

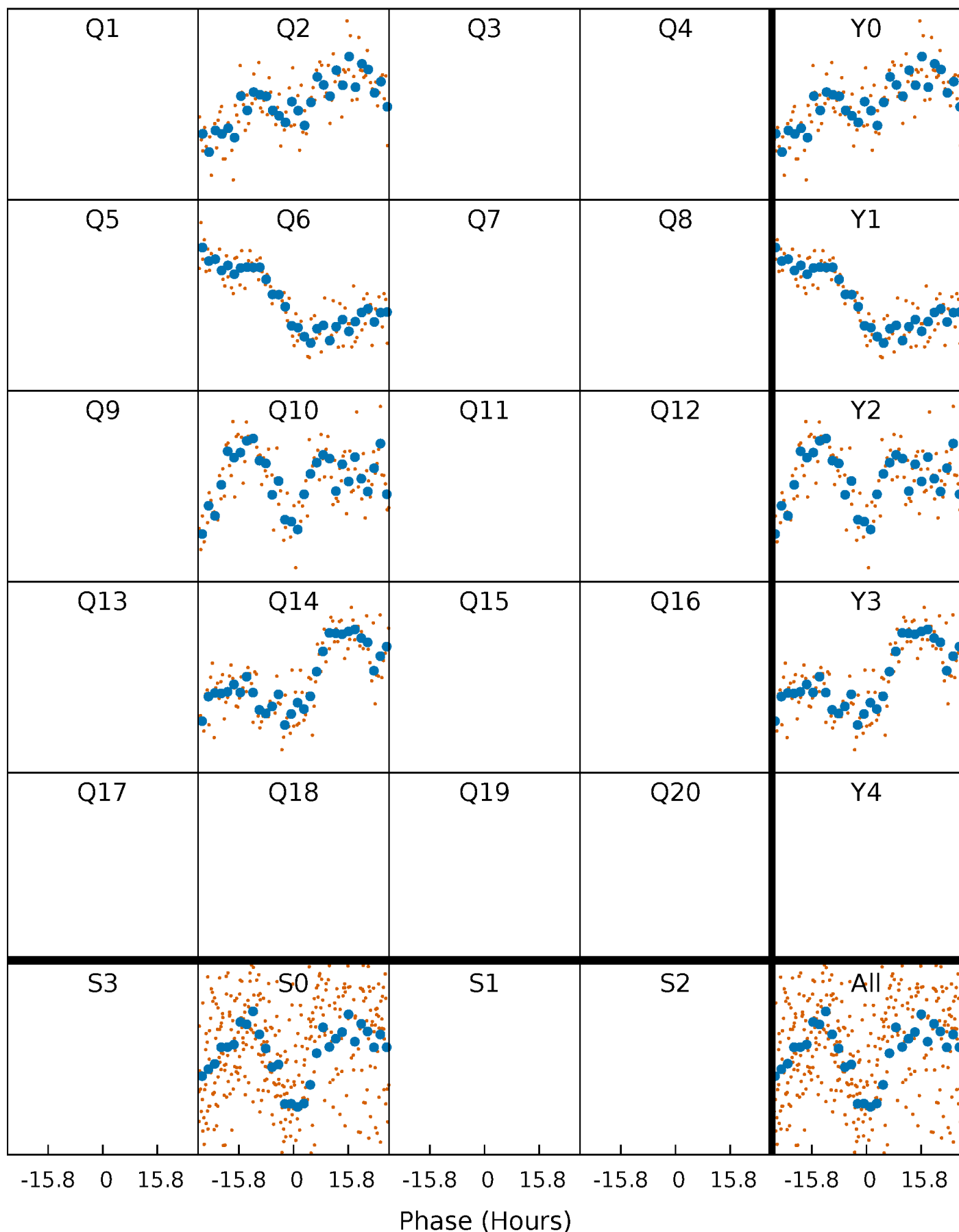


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

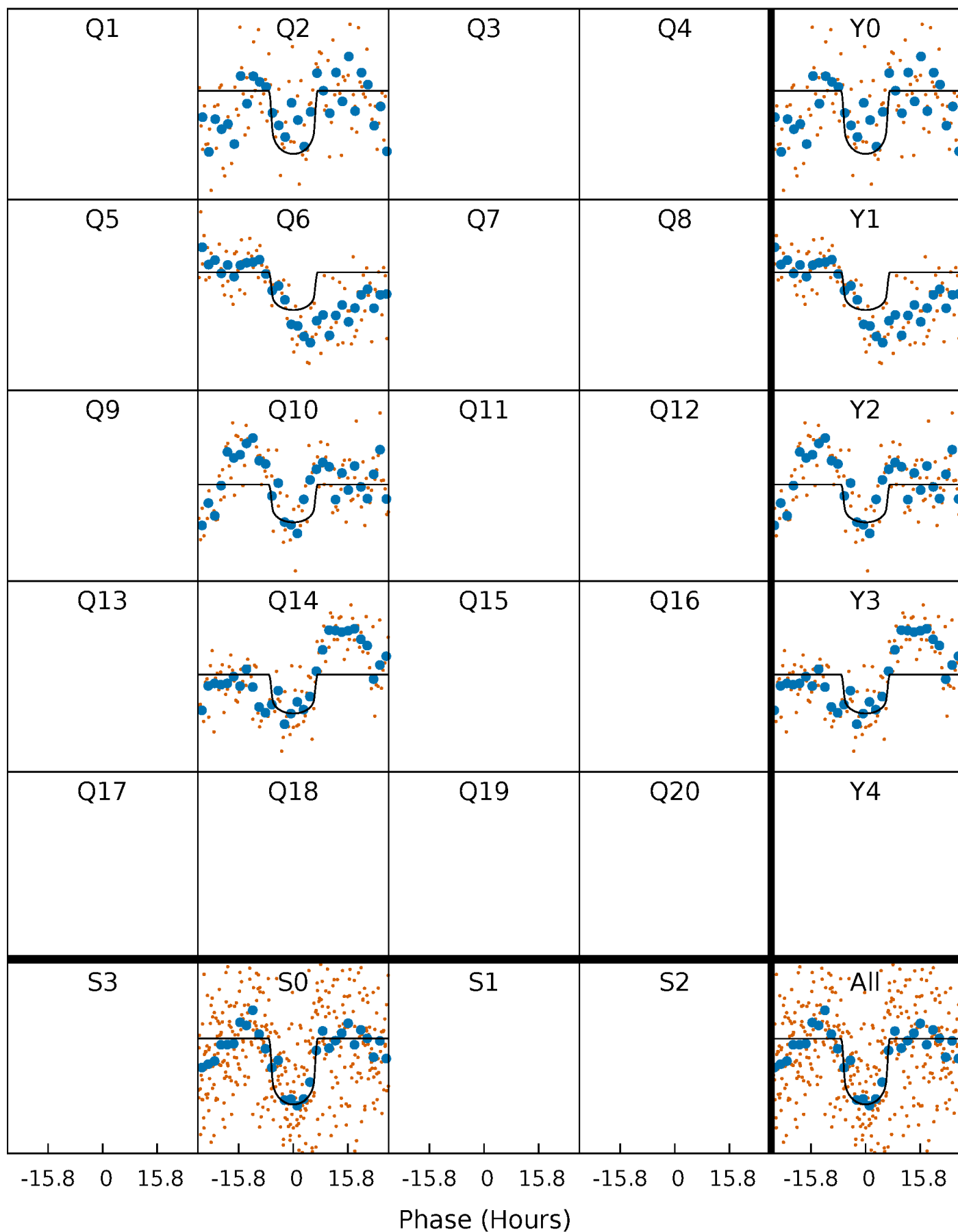
TCE 008108901-01 P=369.626203 Days  $T_0=233.018146$  (BKJD)





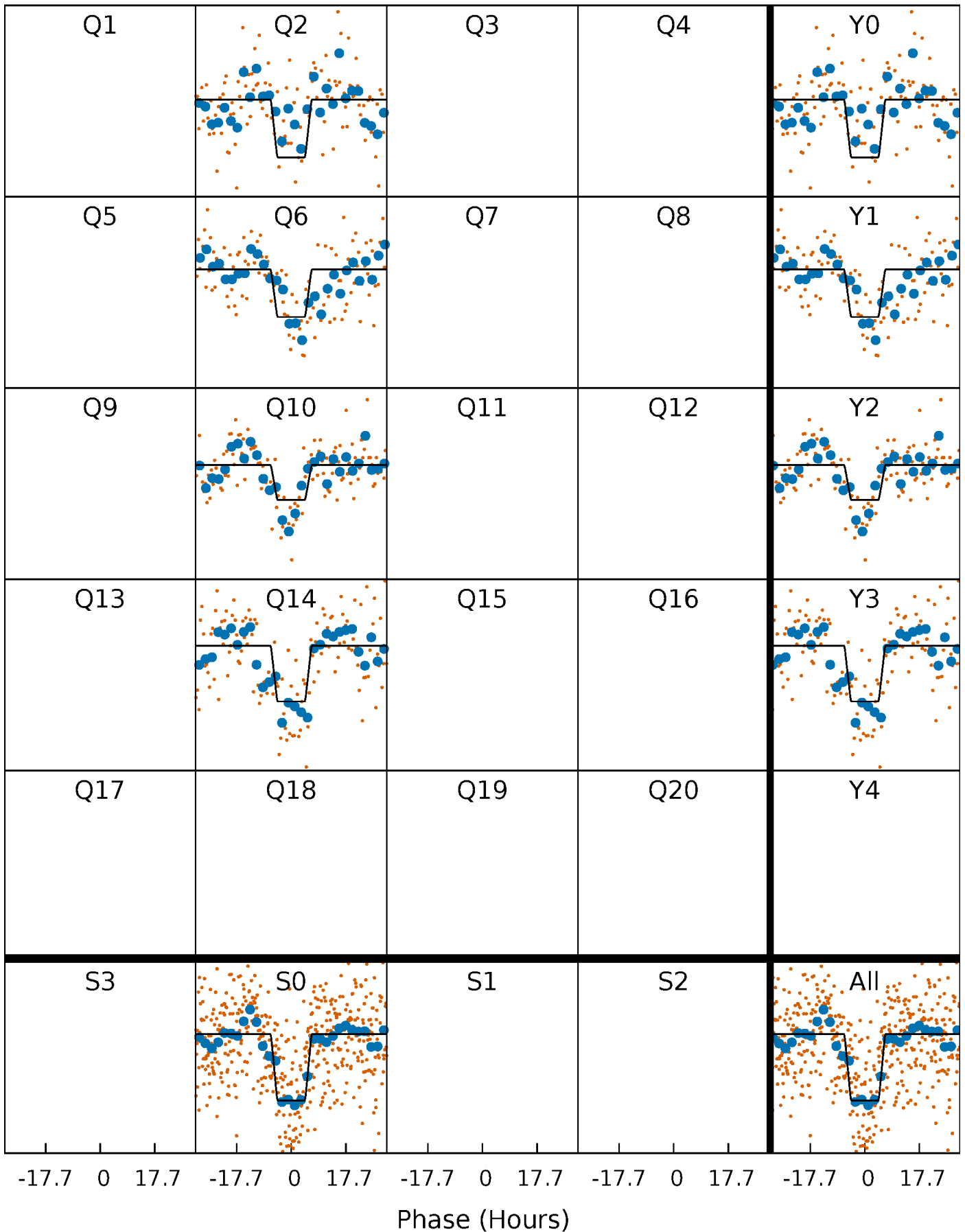
# DV Quarter-Phased Transit Curves

TCE 008108901-01 P=369.626203 Days  $T_0=233.018146$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

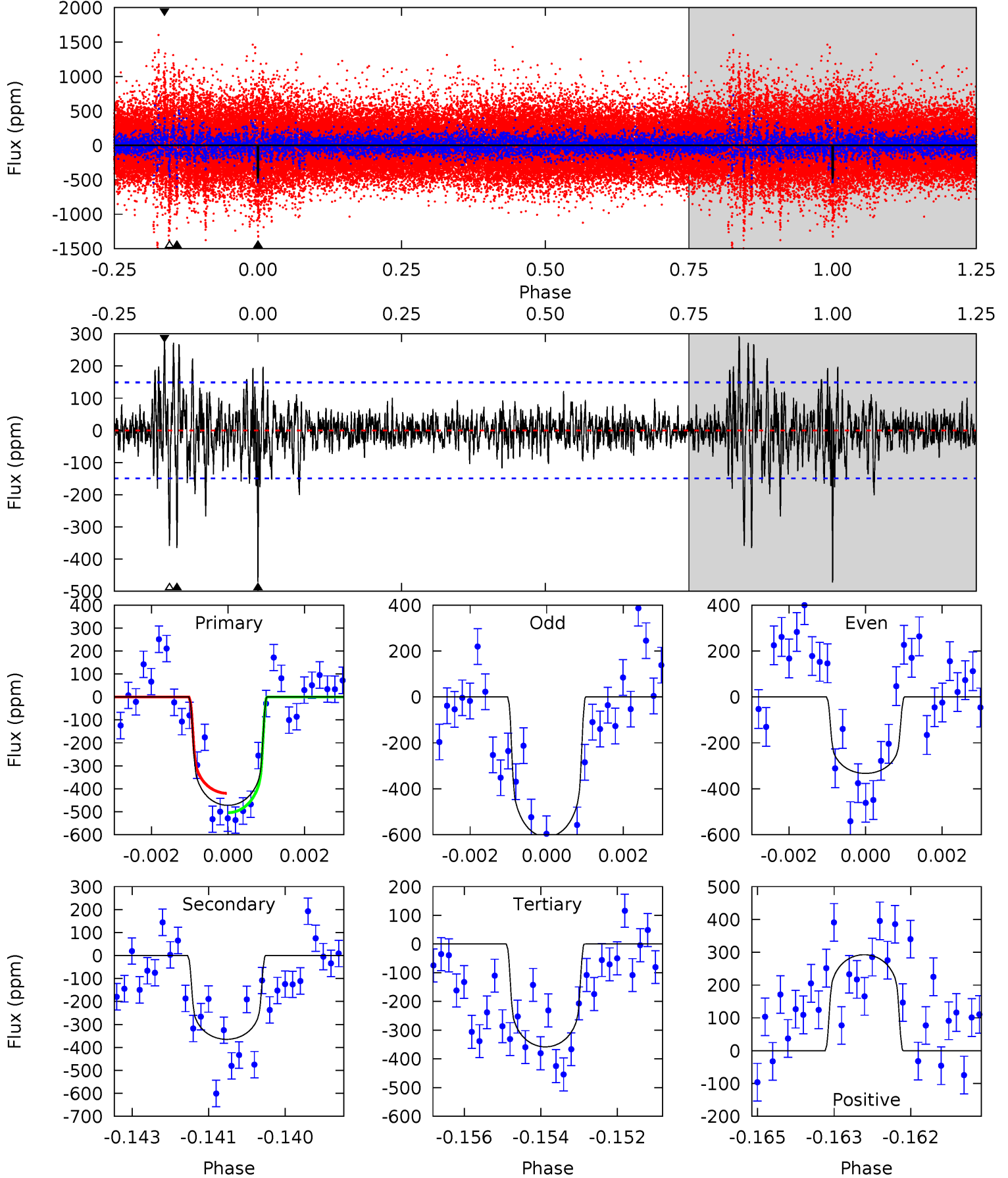
TCE 008108901-01     $P=369.629478$  Days     $T_0=233.029755$  (BKJD)



# DV Model-Shift Uniqueness Test

008108901-01, P = 369.626203 Days, E = 233.018146 Days

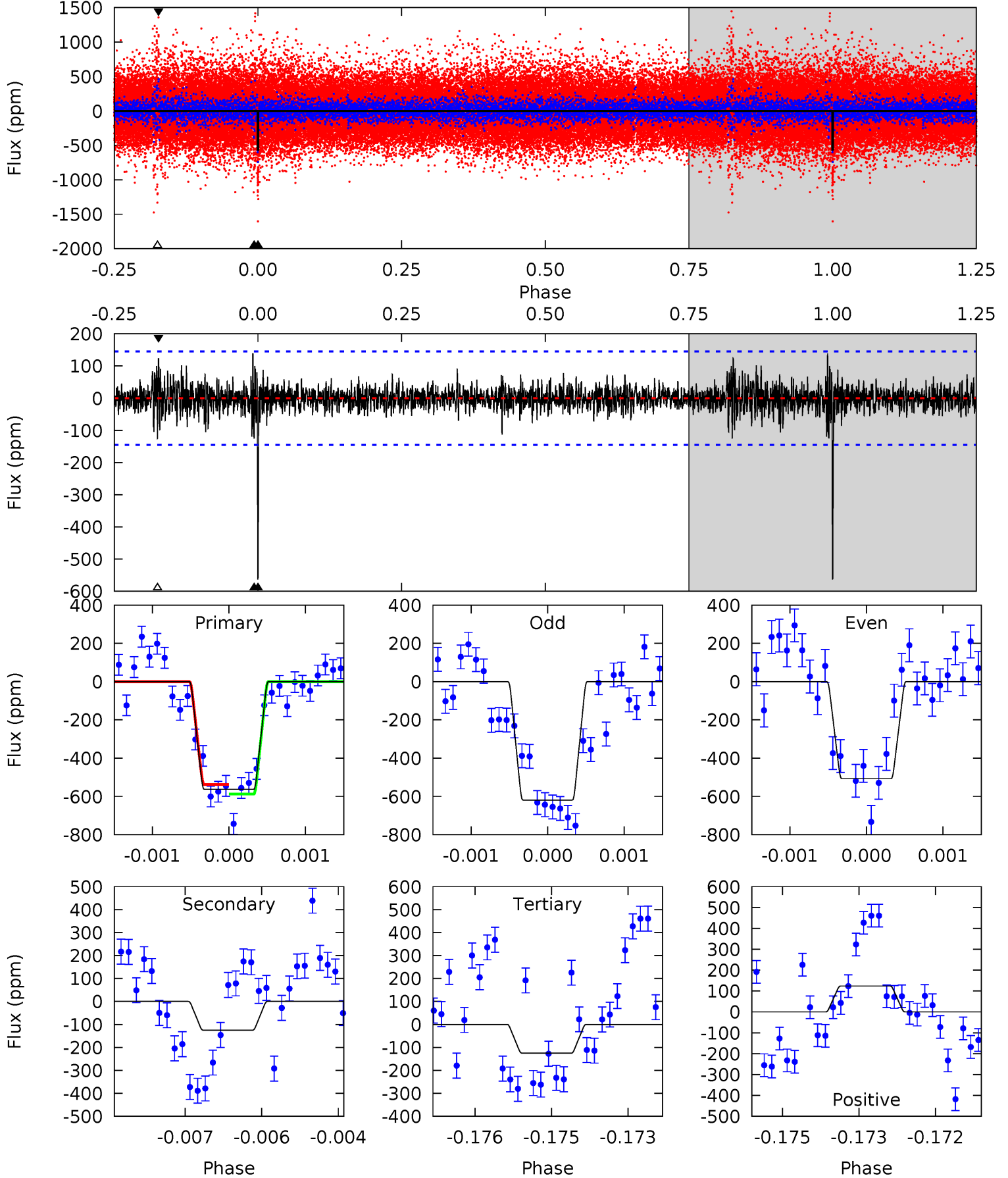
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	13.2	12.9	10.5	5.37	3.16	1.92	4.11	6.48	0.24	2.61	4.98	1.10	0.38	1.51



# Alt Model-Shift Uniqueness Test

008108901-01,  $P = 369.629478$  Days,  $E = 233.029755$  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
20.9	4.64	4.63	4.60	5.38	3.18	0.99	16.2	16.3	0.01	0.04	2.09	0.91	0.20	0.92



### Stellar Parameters For KIC 008108901

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5896^{+159}_{-176}$	$4.516^{+0.050}_{-0.200}$	$-0.100^{+0.300}_{-0.300}$	$0.914^{+0.274}_{-0.091}$	$1.000^{+0.117}_{-0.130}$	$1.846^{+0.471}_{-0.908}$
	+3%/-3%	+1%/-4%	+300%/-300%	+30%/-10%	+12%/-13%	+26%/-49%
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 008108901-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-365 \pm 28$	$2.46^{+0.56}_{-0.45}$	$353^{+22}_{-17}$	$5329^{+500}_{-400}$	$33267^{+15788}_{-11143}$
Alt.	$-125 \pm 27$	$2.53^{+0.53}_{-0.44}$	$353^{+26}_{-17}$	$4261^{+363}_{-325}$	$10649^{+5775}_{-3843}$

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

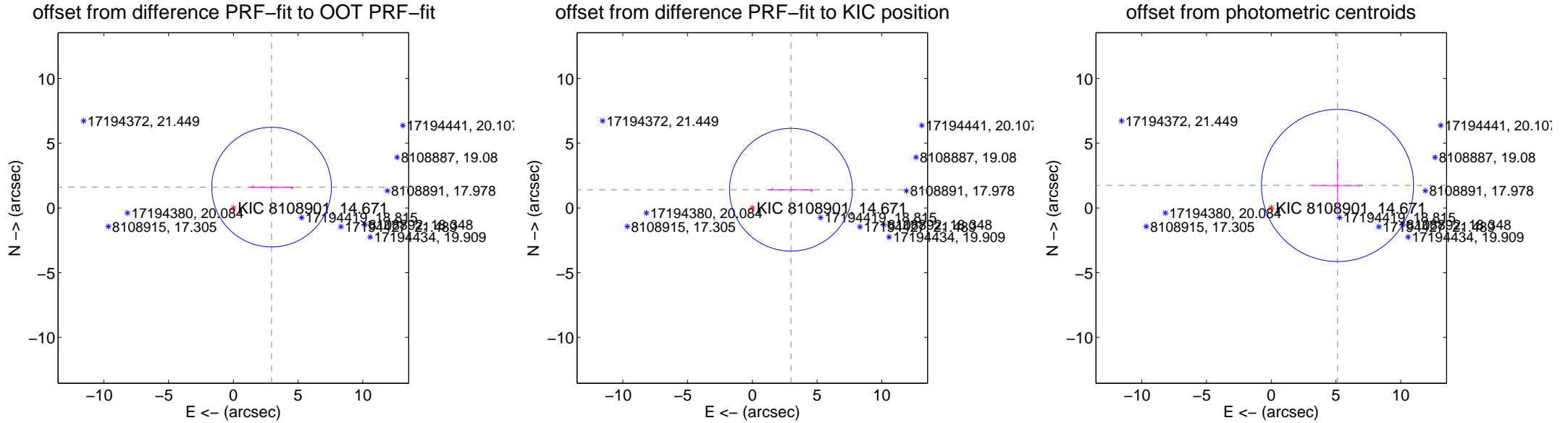
## DV Centroid Data

Supplemental centroid analysis for 008108901-01. Kepler magnitude: 14.67. Transit SNR 9.37

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

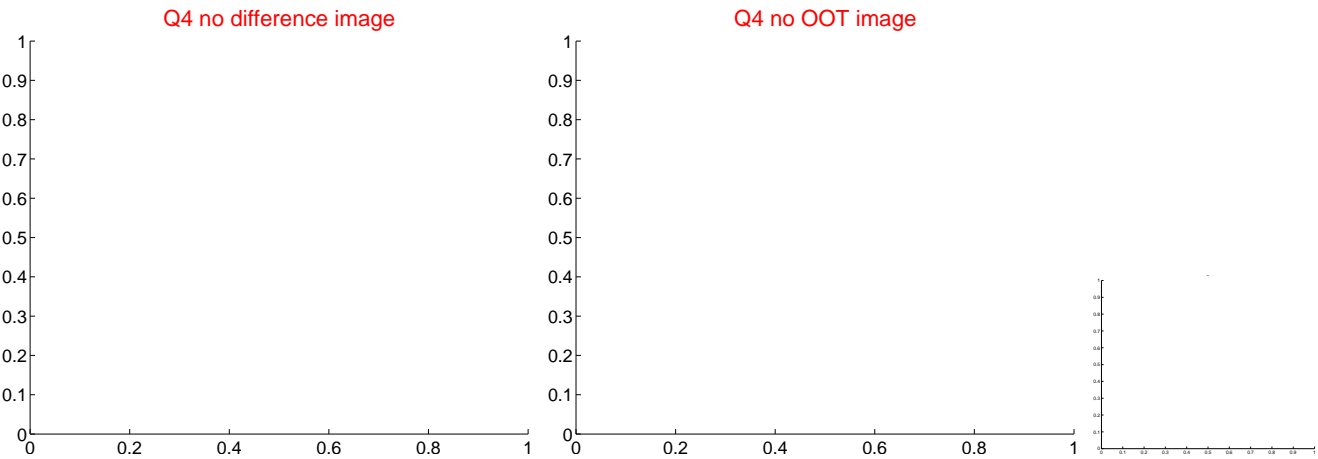
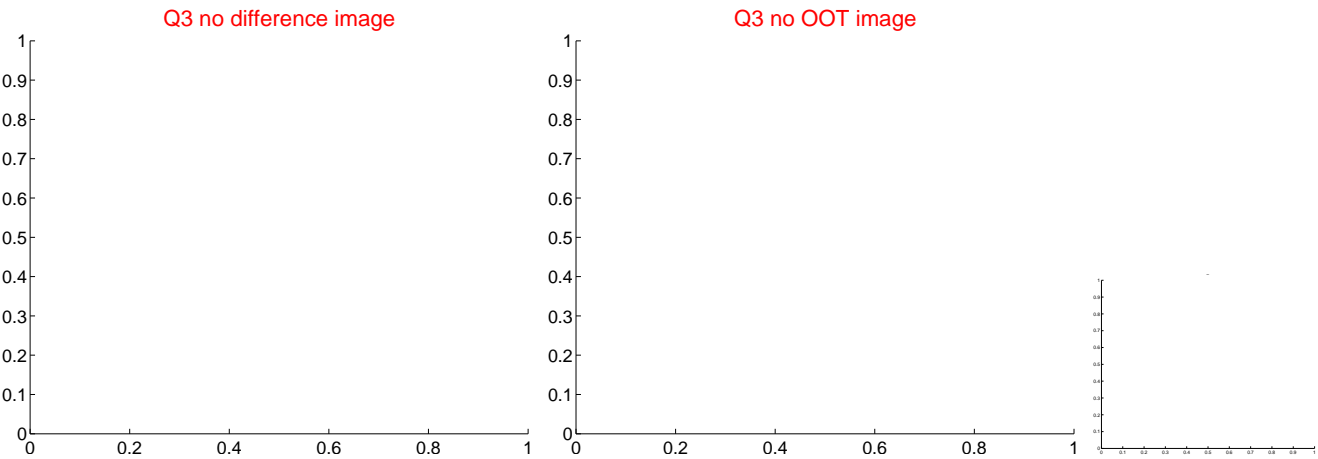
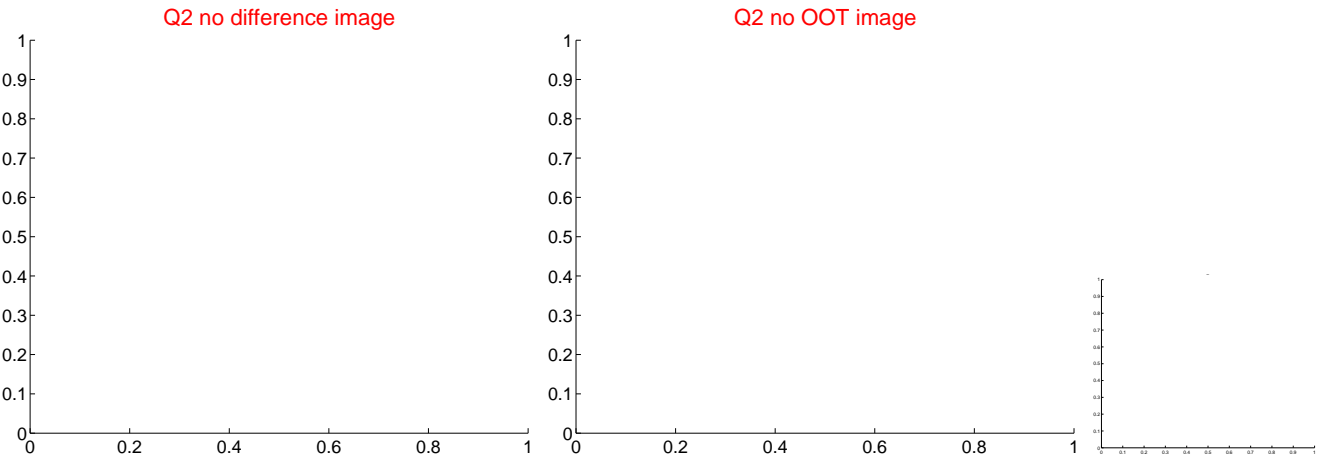
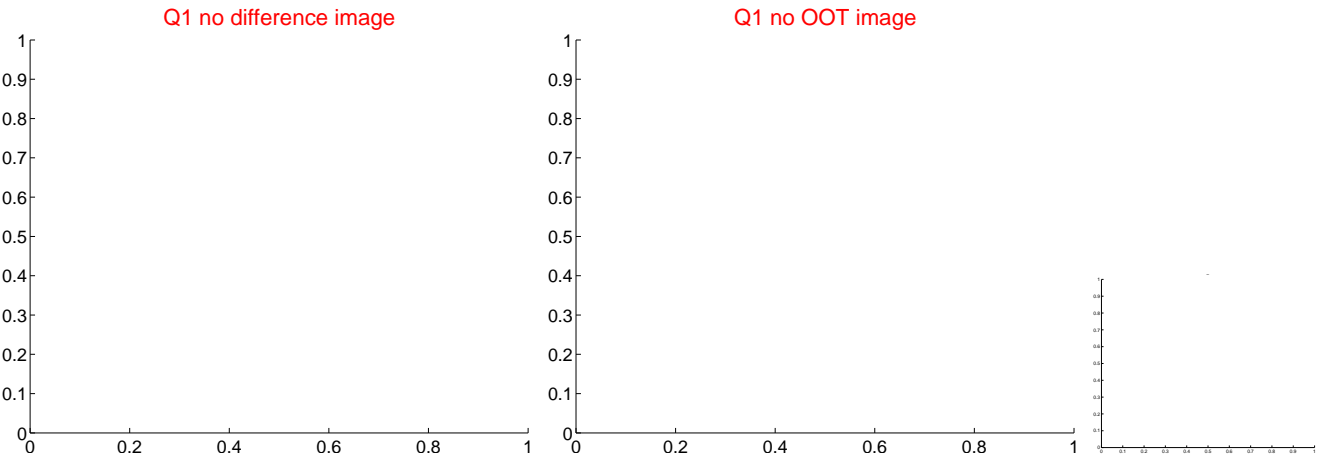
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.364 \pm 1.541$	2.18	$-2.953 \pm 1.754$	$1.611 \pm 0.091$
PRF-fit source offset from KIC position	$3.302 \pm 1.580$	2.09	$-2.986 \pm 1.746$	$1.408 \pm 0.098$
photometric centroid source offset	$5.41 \pm 1.96$	2.76	$-5.12 \pm 1.94$	$1.74 \pm 2.10$



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.

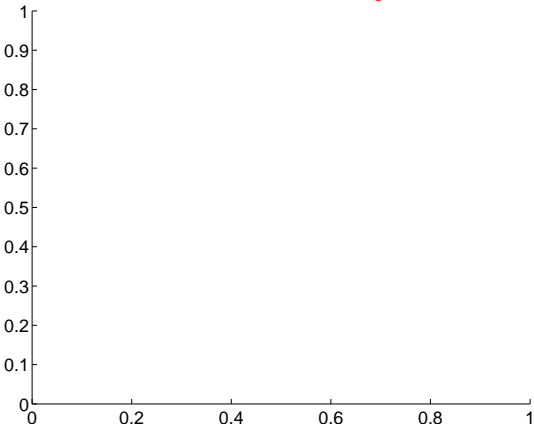


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

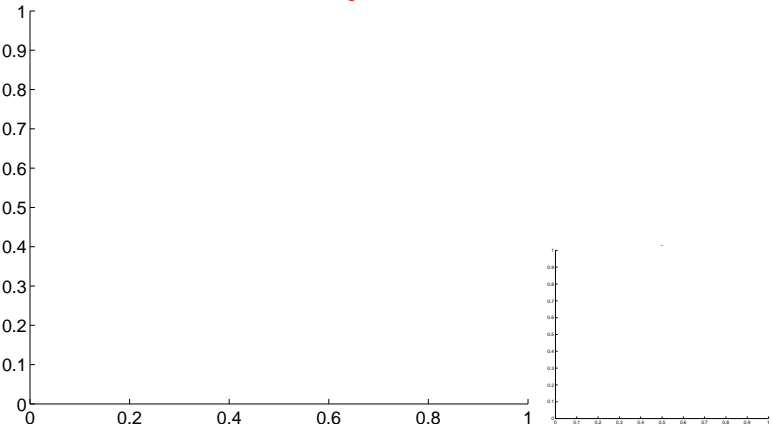


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

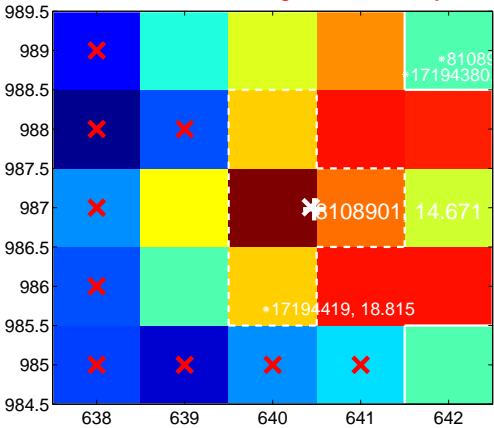
Q5 no difference image



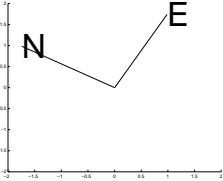
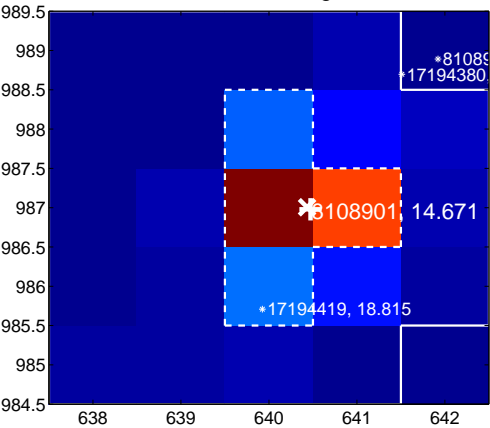
Q5 no OOT image



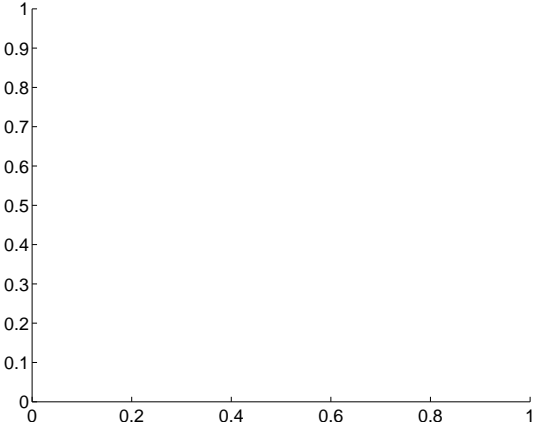
Q6 difference image. Poor Quality



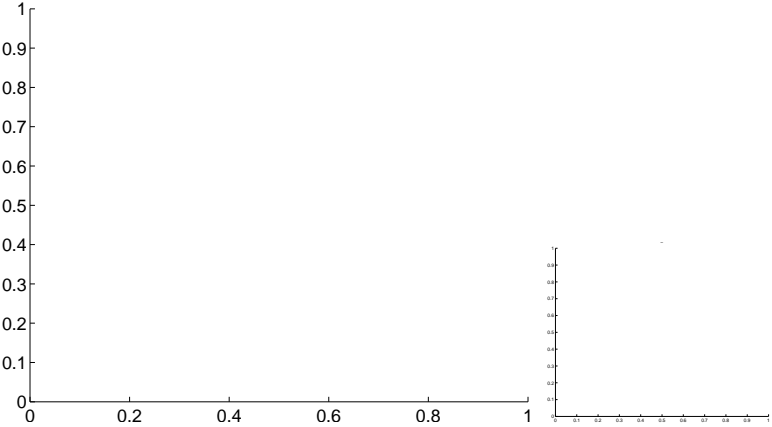
Q6 OOT image



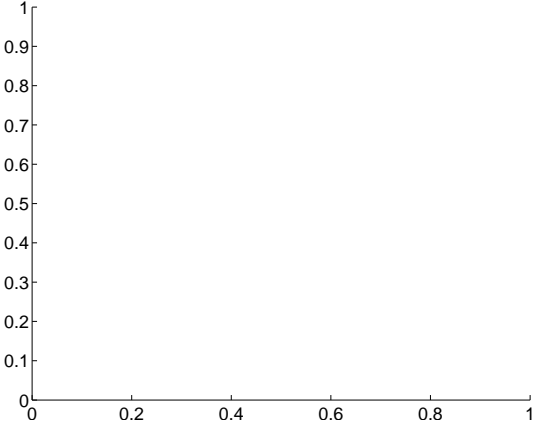
Q7 no difference image



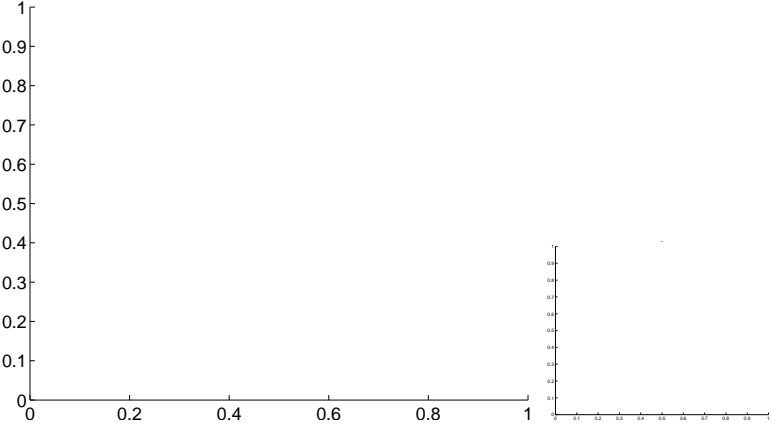
Q7 no OOT image



Q8 no difference image

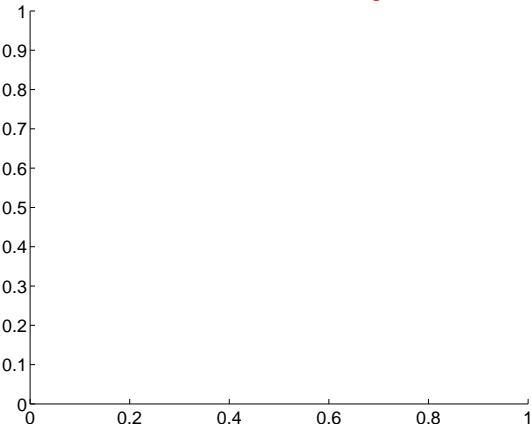


Q8 no OOT image

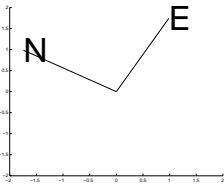
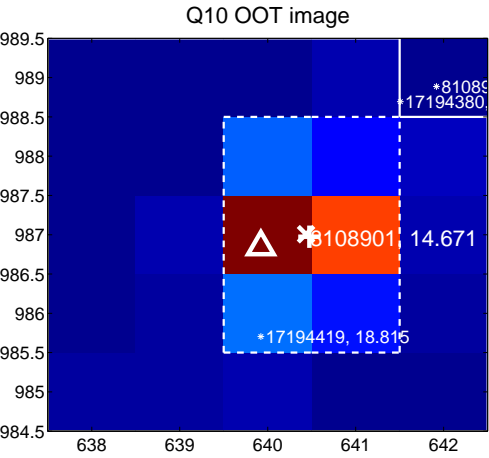
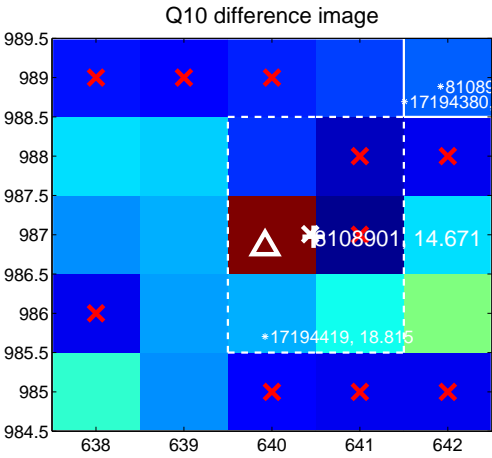
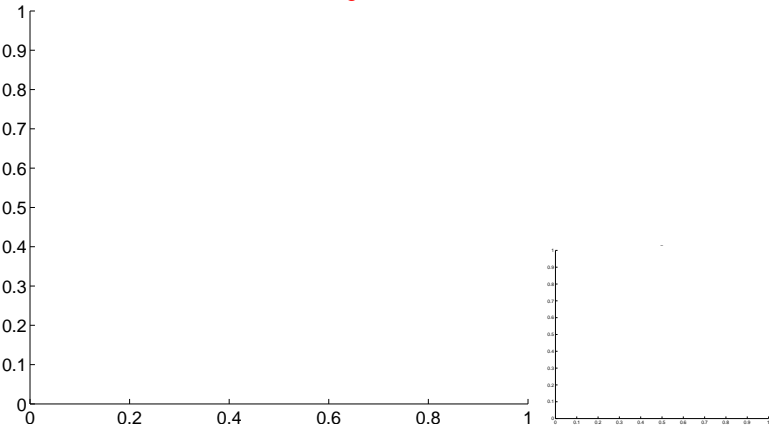


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

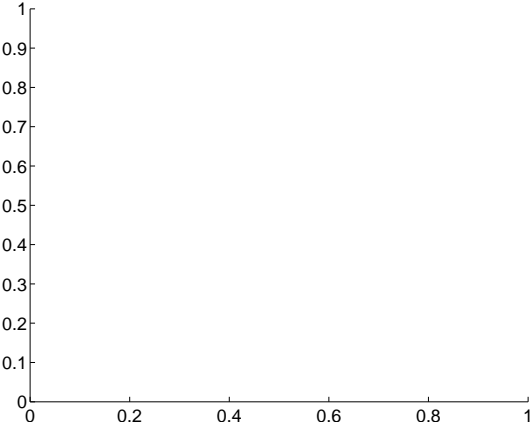
Q9 no difference image



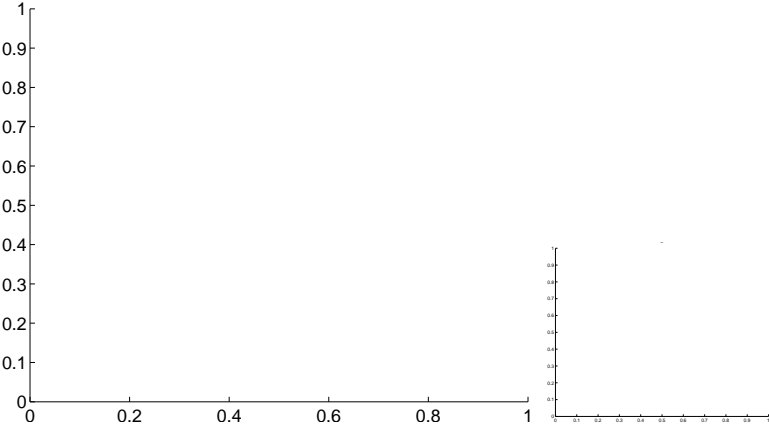
Q9 no OOT image



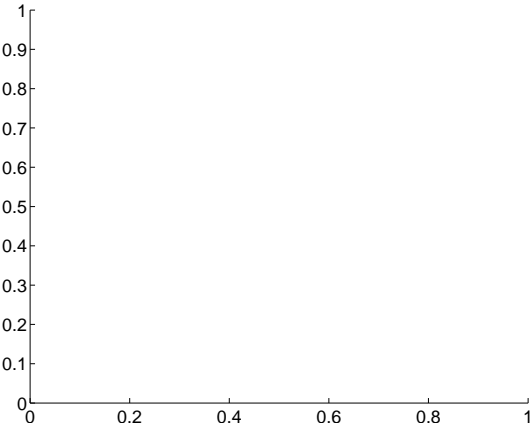
Q11 no difference image



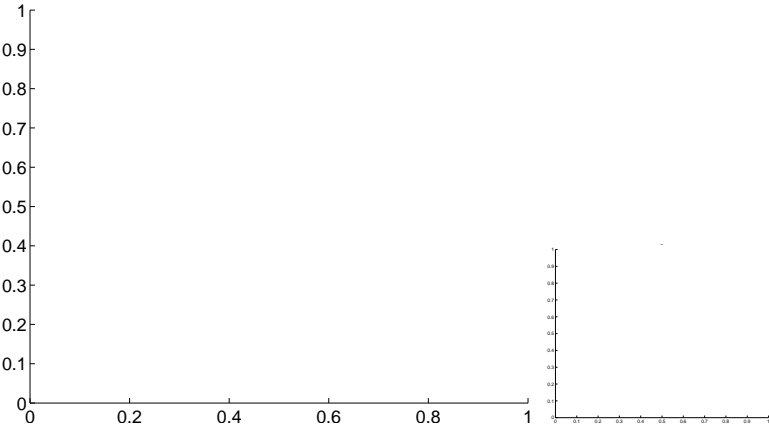
Q11 no OOT image



Q12 no difference image

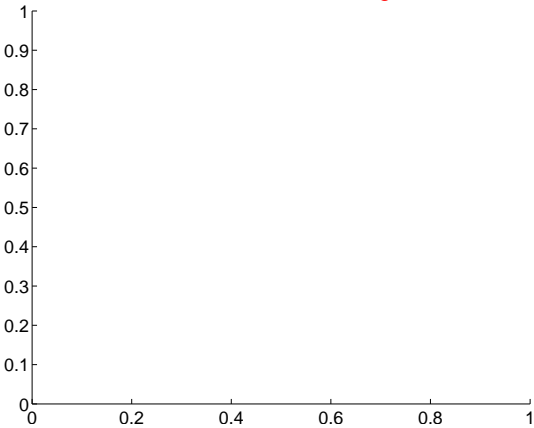


Q12 no OOT image

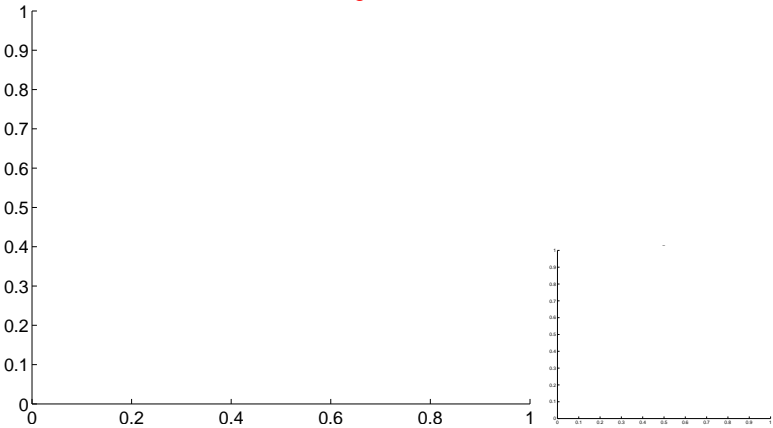


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

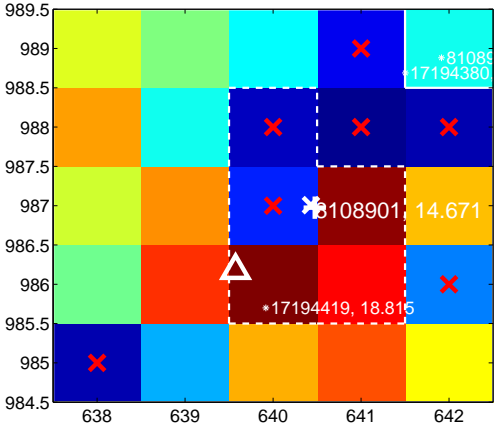
Q13 no difference image



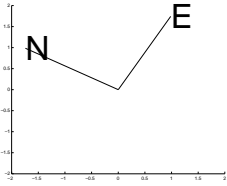
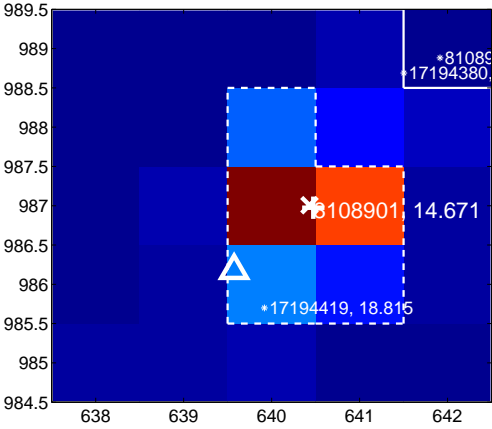
Q13 no OOT image



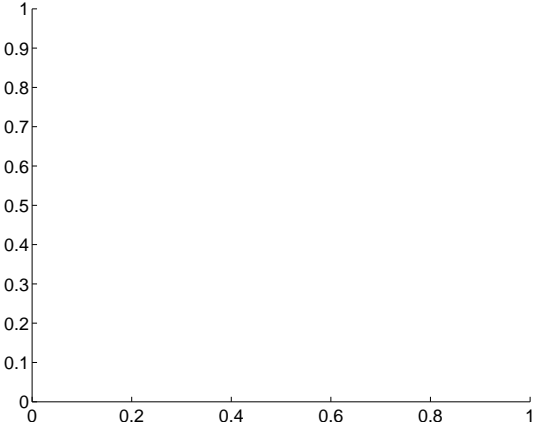
Q14 difference image. Poor Quality



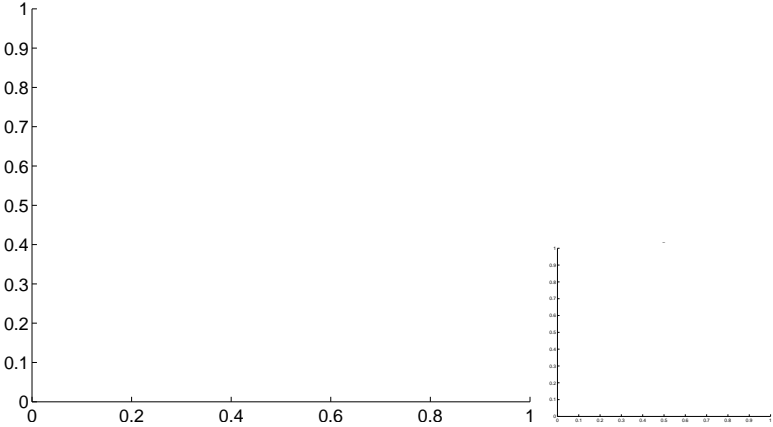
Q14 OOT image



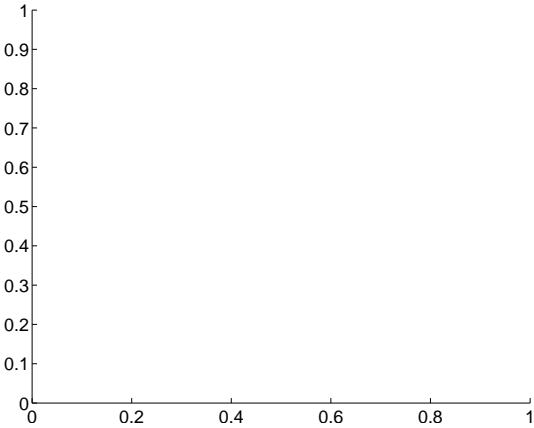
Q15 no difference image



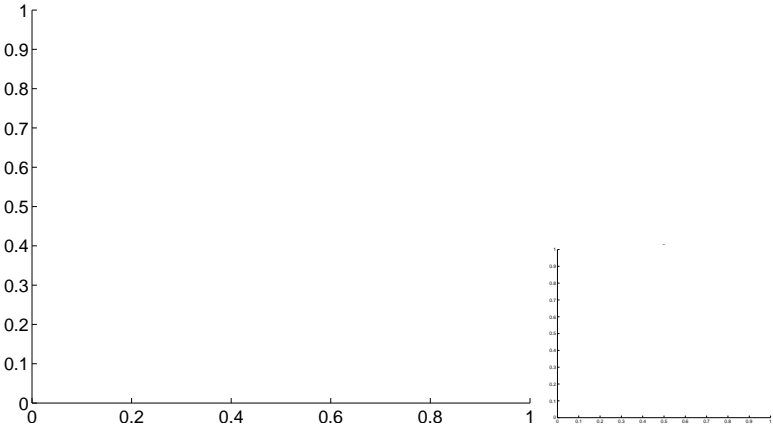
Q15 no OOT image



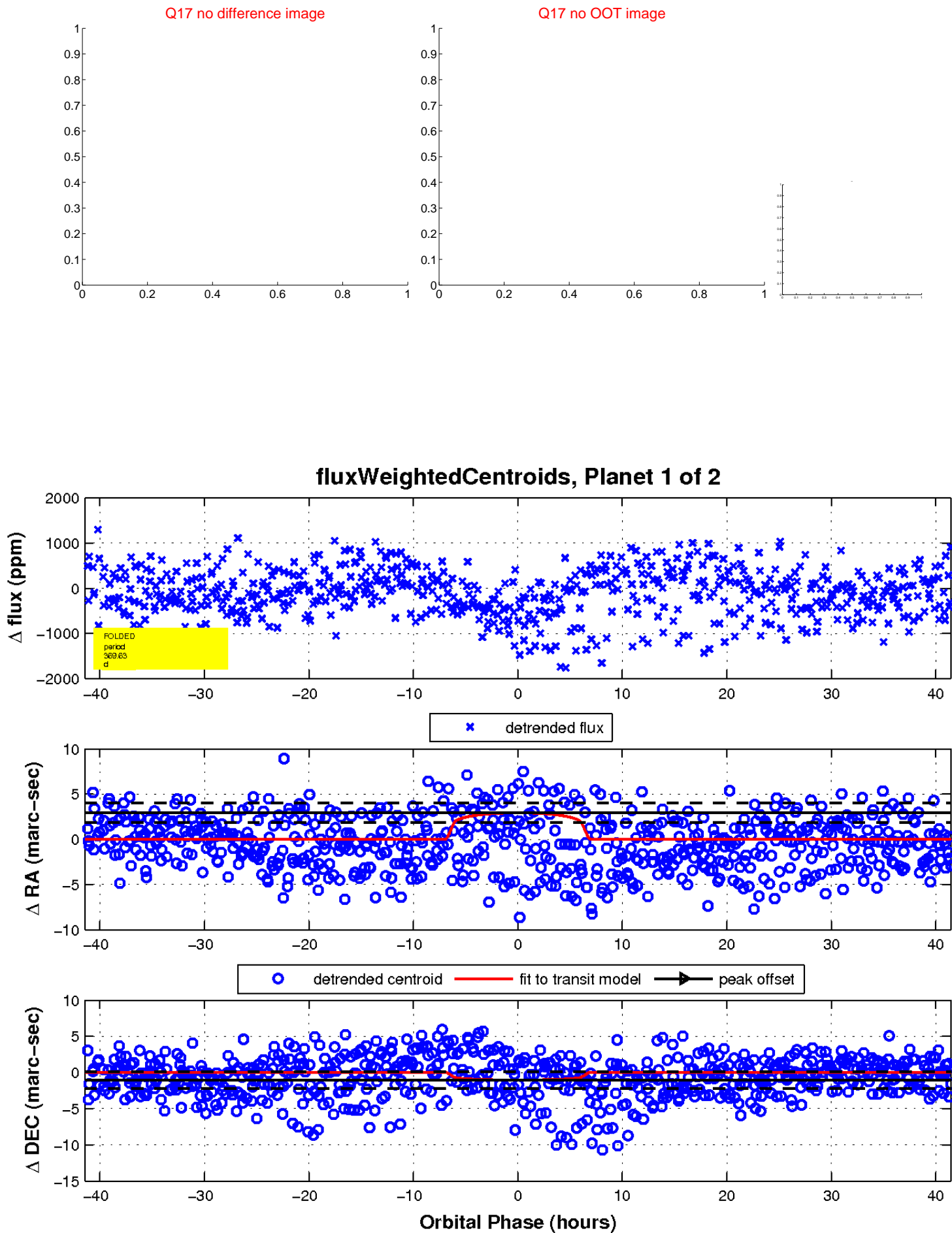
Q16 no difference image



Q16 no OOT image

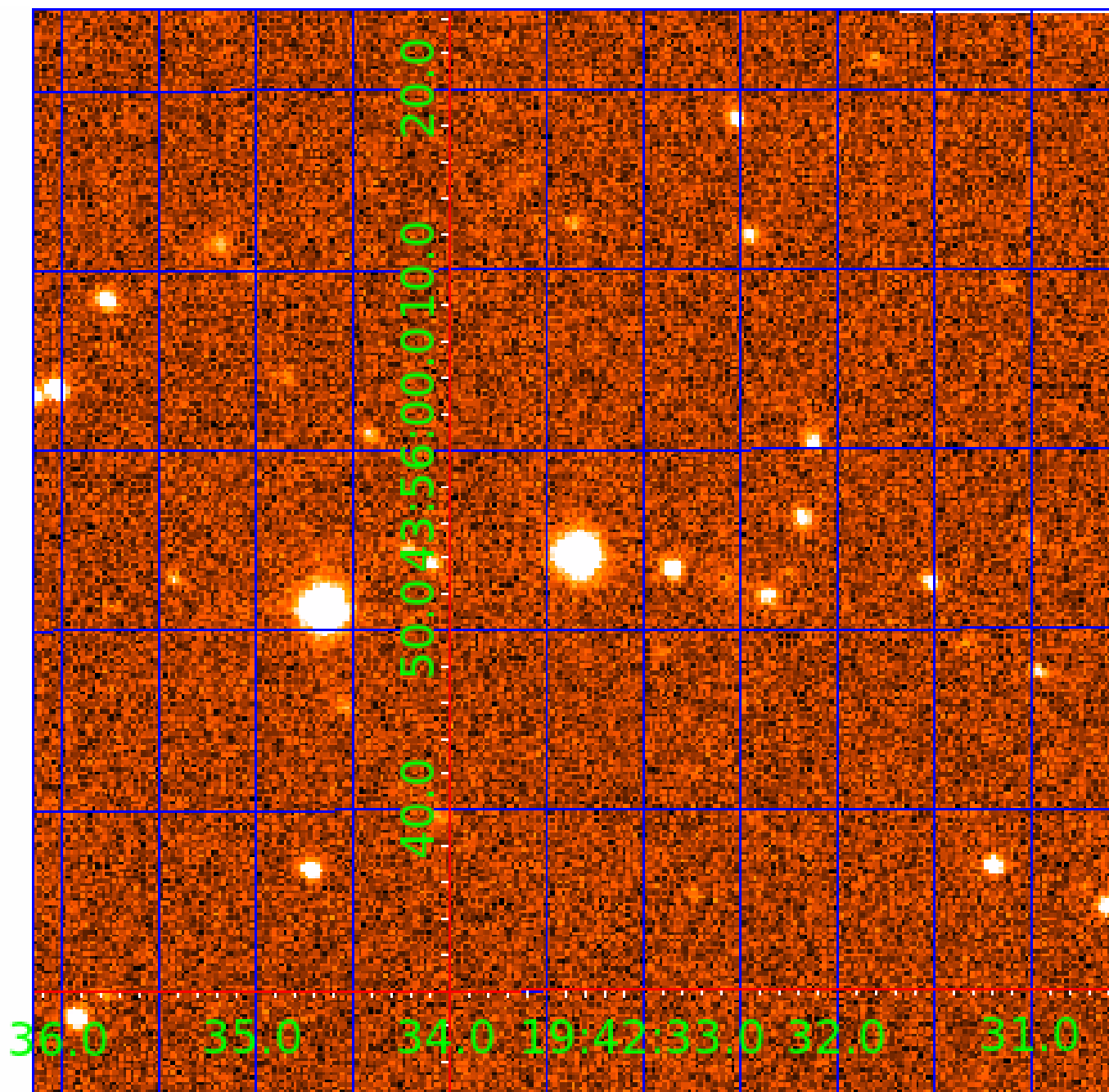


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008108901

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008108901-01	OBS	No	369.626203	233.018146	548.3	13.817	9.5	9.4	0.91	5896	2.39	0.89
008108901-02	OBS	No	341.478844	260.208366	1978.6	10.500	24.6	-1.0	0.91	5896	4.04	0.99

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008108901-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—CENT_FEW_MEAS
008108901-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS

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

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

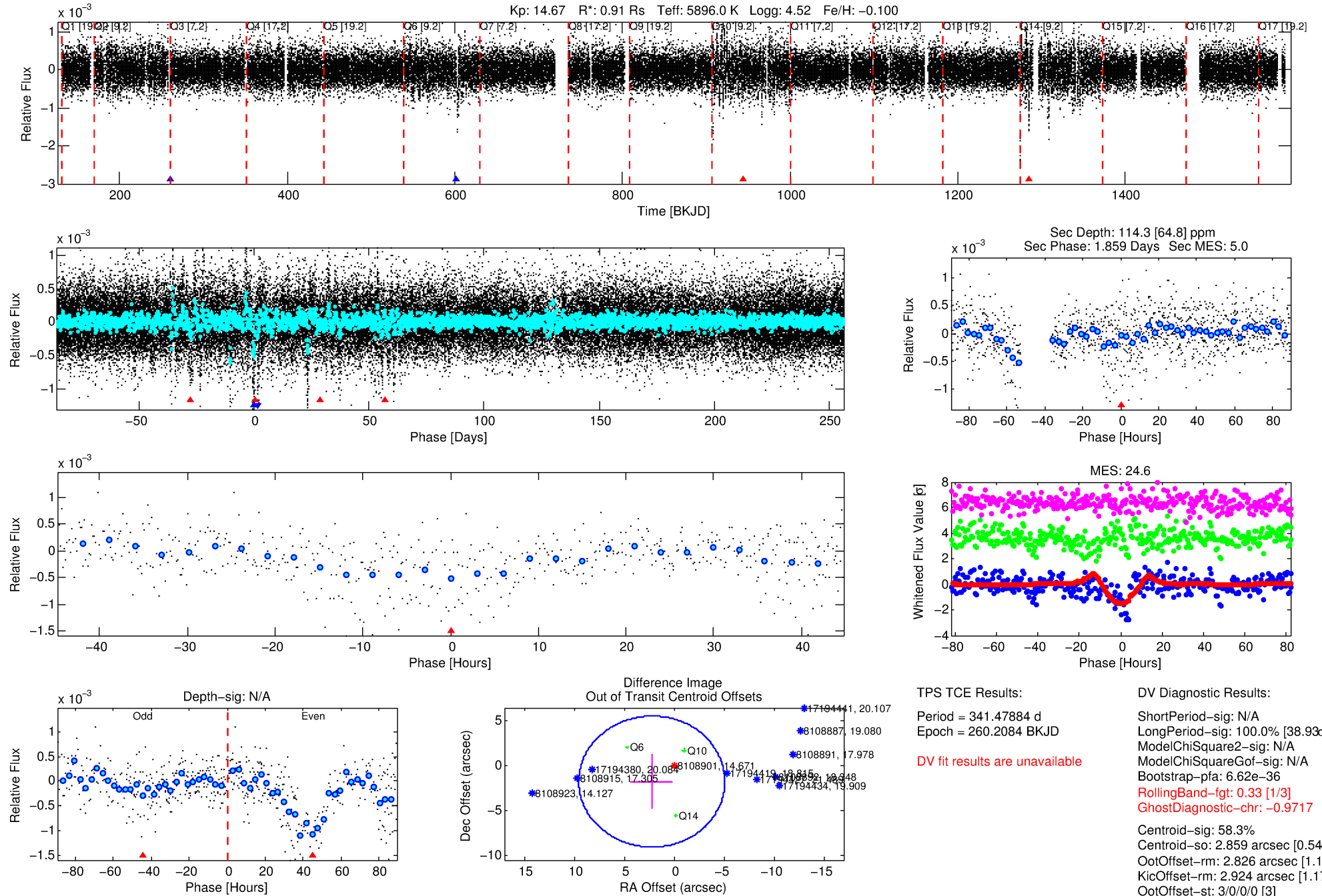
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008108901-02

No Significant Match Found

# DV One-Page Summary

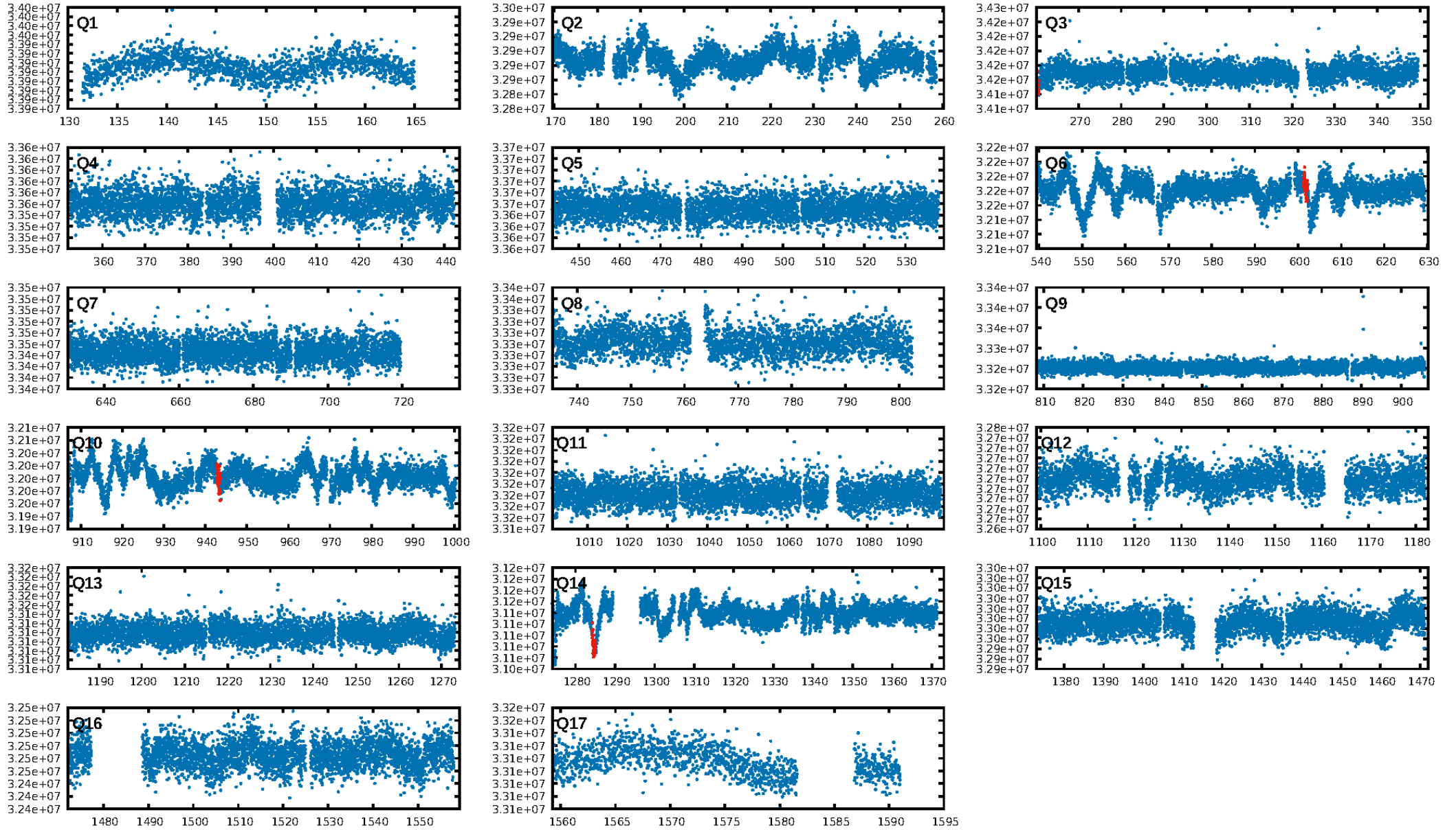
KIC: 8108901 Candidate: 2 of 2 Period: 341.479 d



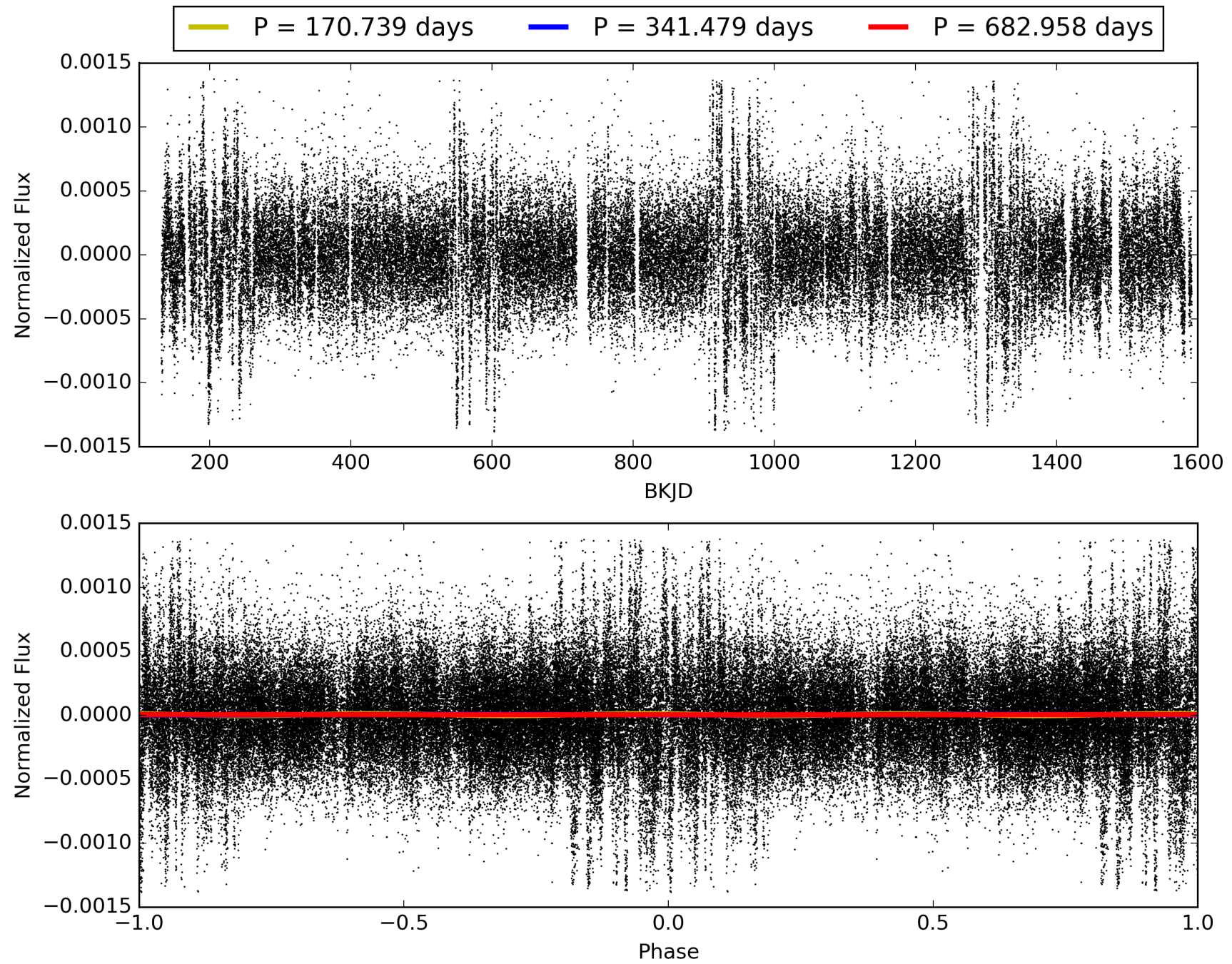
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:19:18 Z

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

# TCE 008108901-02, PDC Light Curves

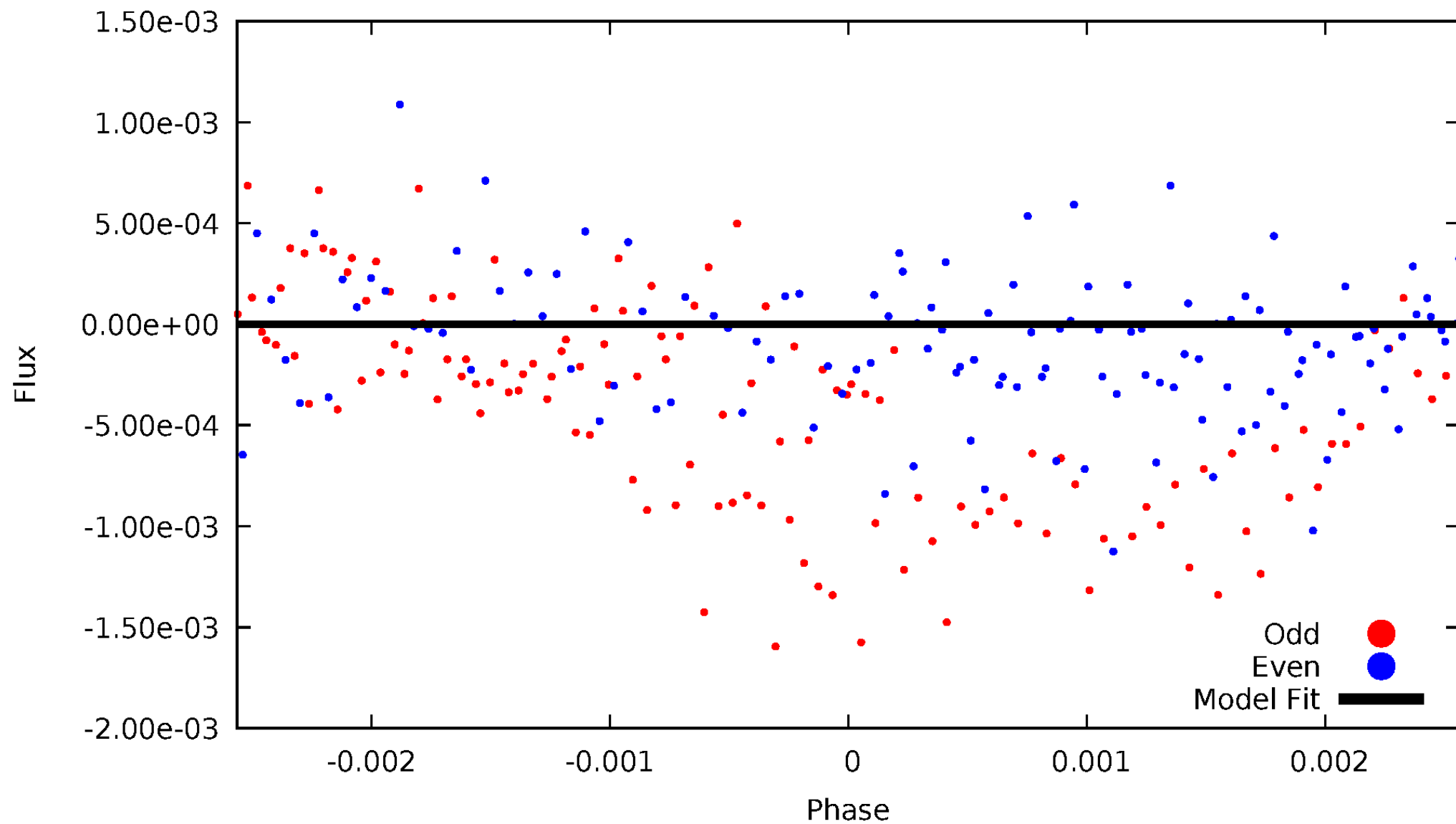


# TCE 008108901-02



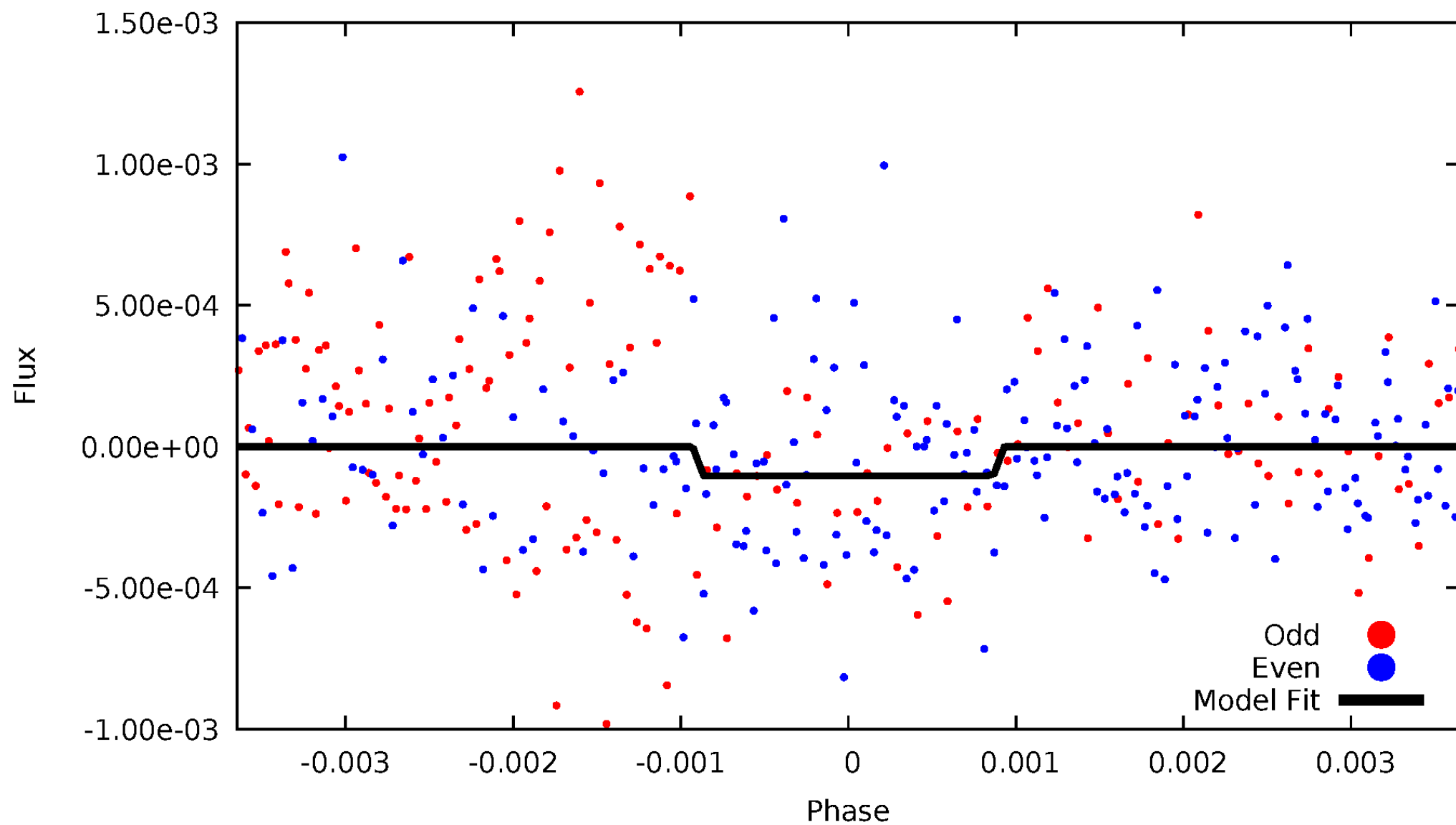
# DV Odd/Even

TCE 008108901-02



# ALT Odd/Even

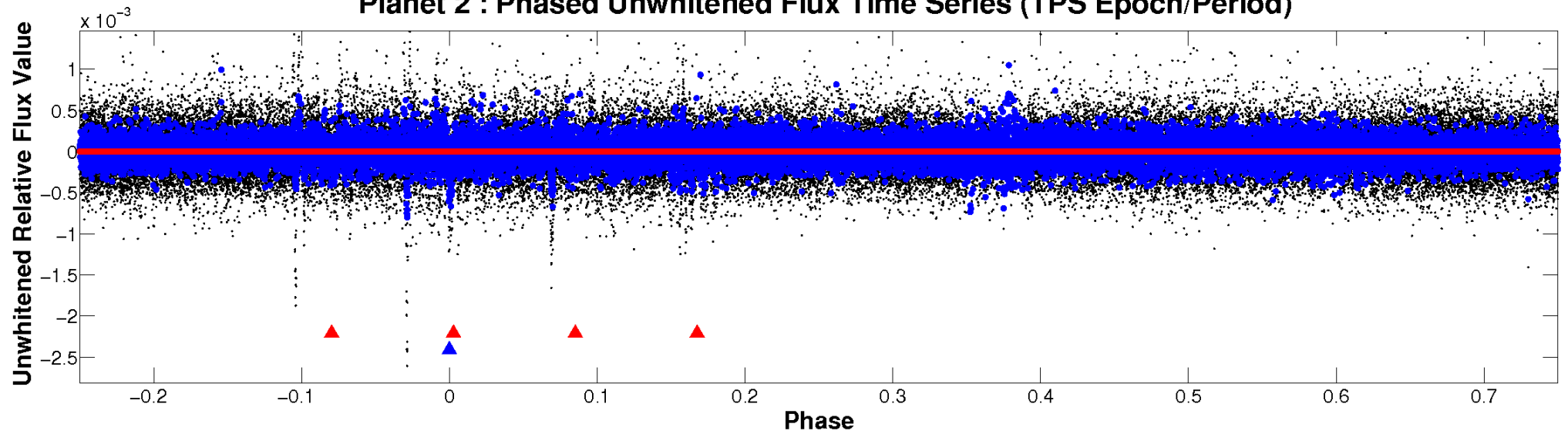
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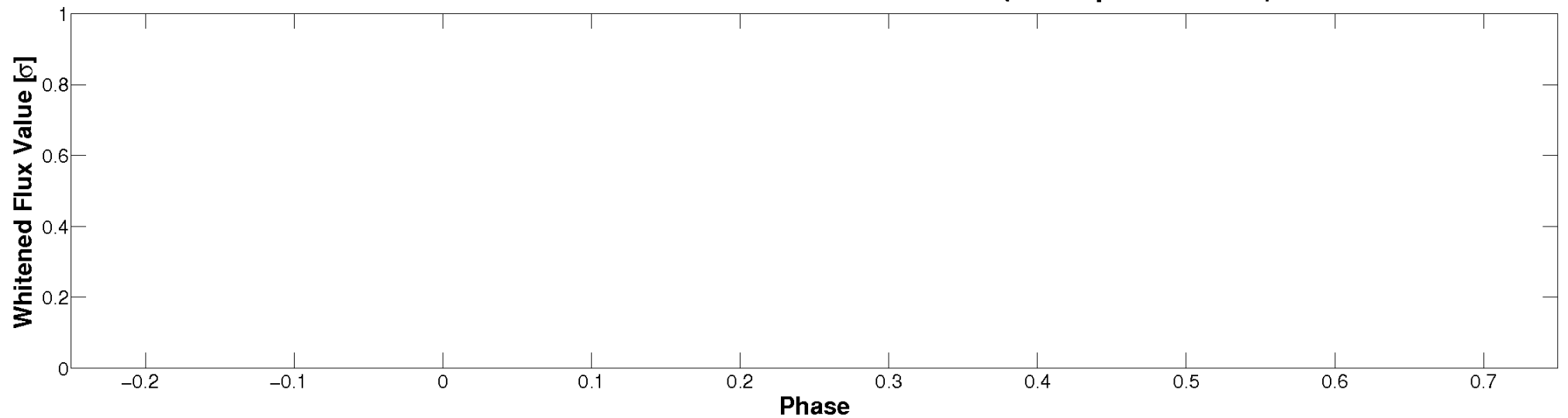


# Non-Whitened Vs. Whitened Light Curve

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

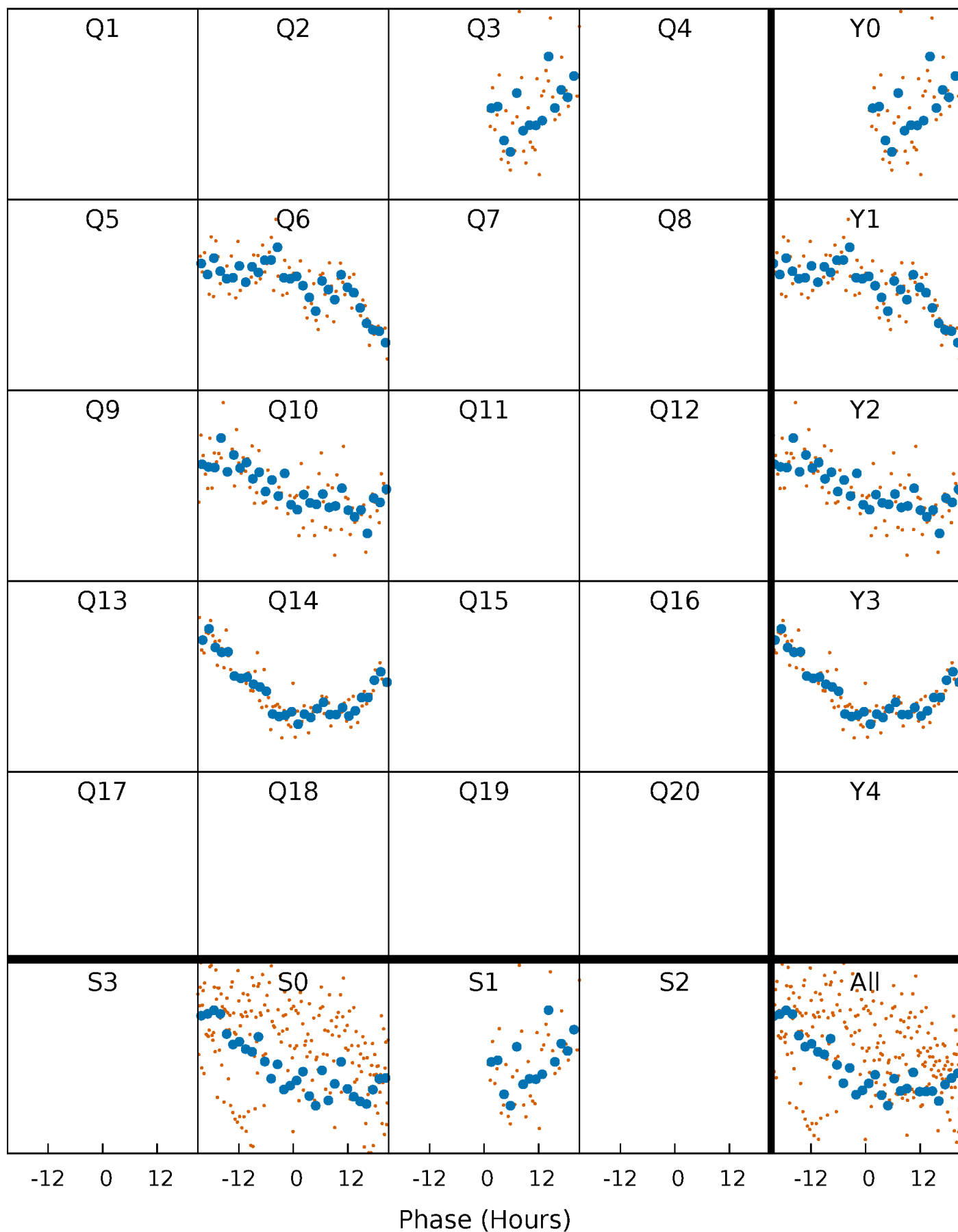


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



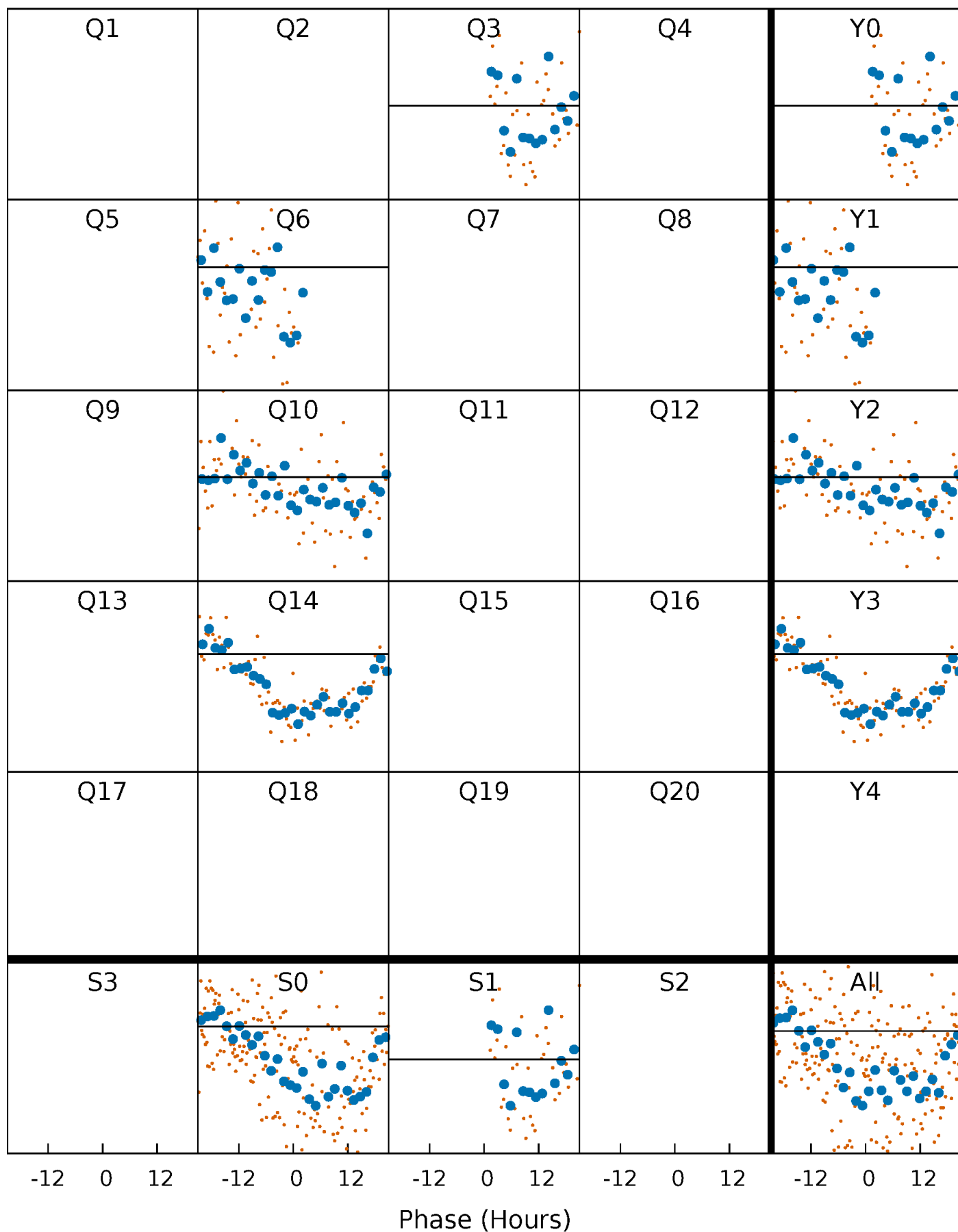
# PDC Quarter-Phased Transit Curves

TCE 008108901-02     $P=341.478843$  Days     $T_0=260.208366$  (BKJD)



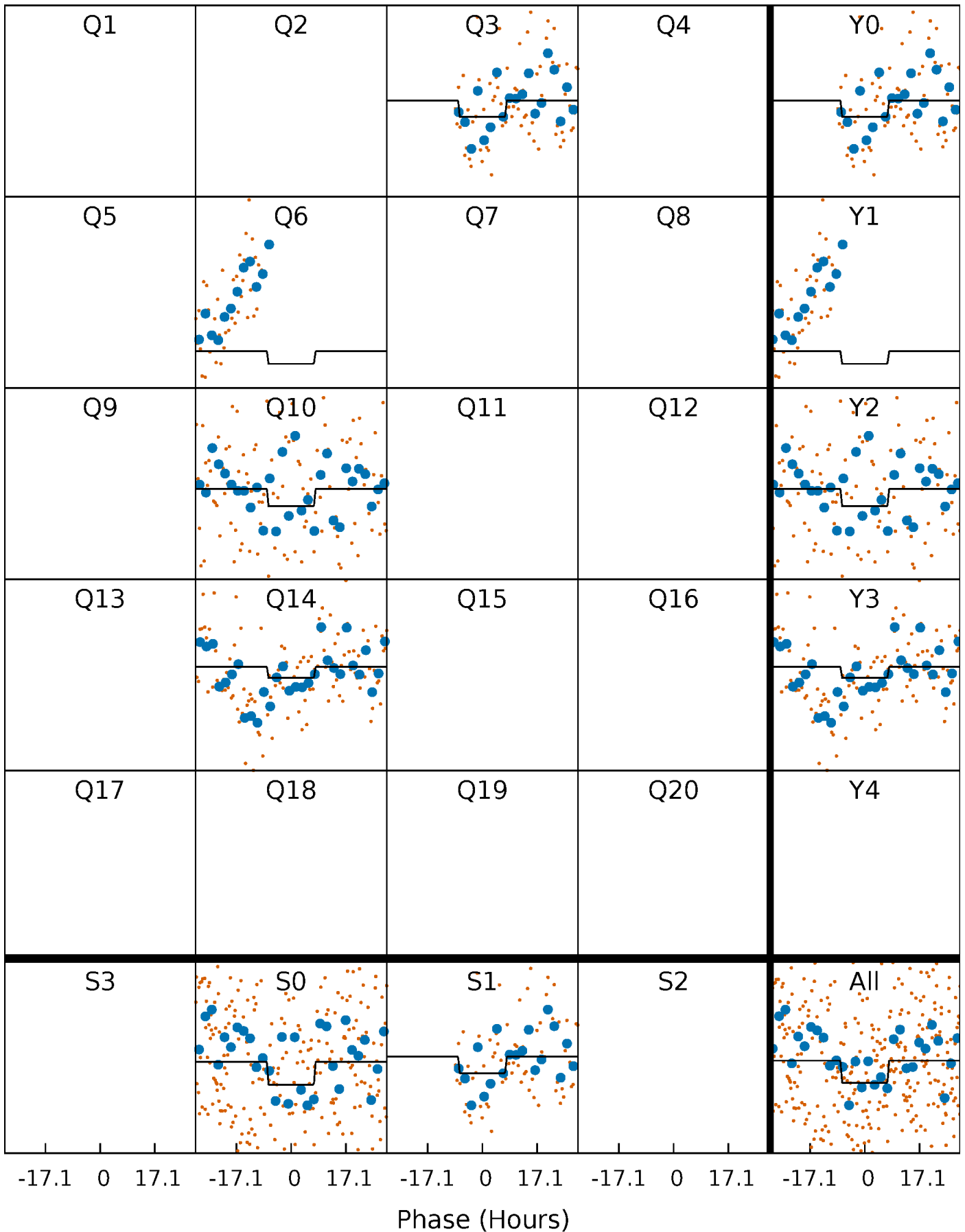
# DV Quarter-Phased Transit Curves

TCE 008108901-02     $P=341.478843$  Days     $T_0=260.208366$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

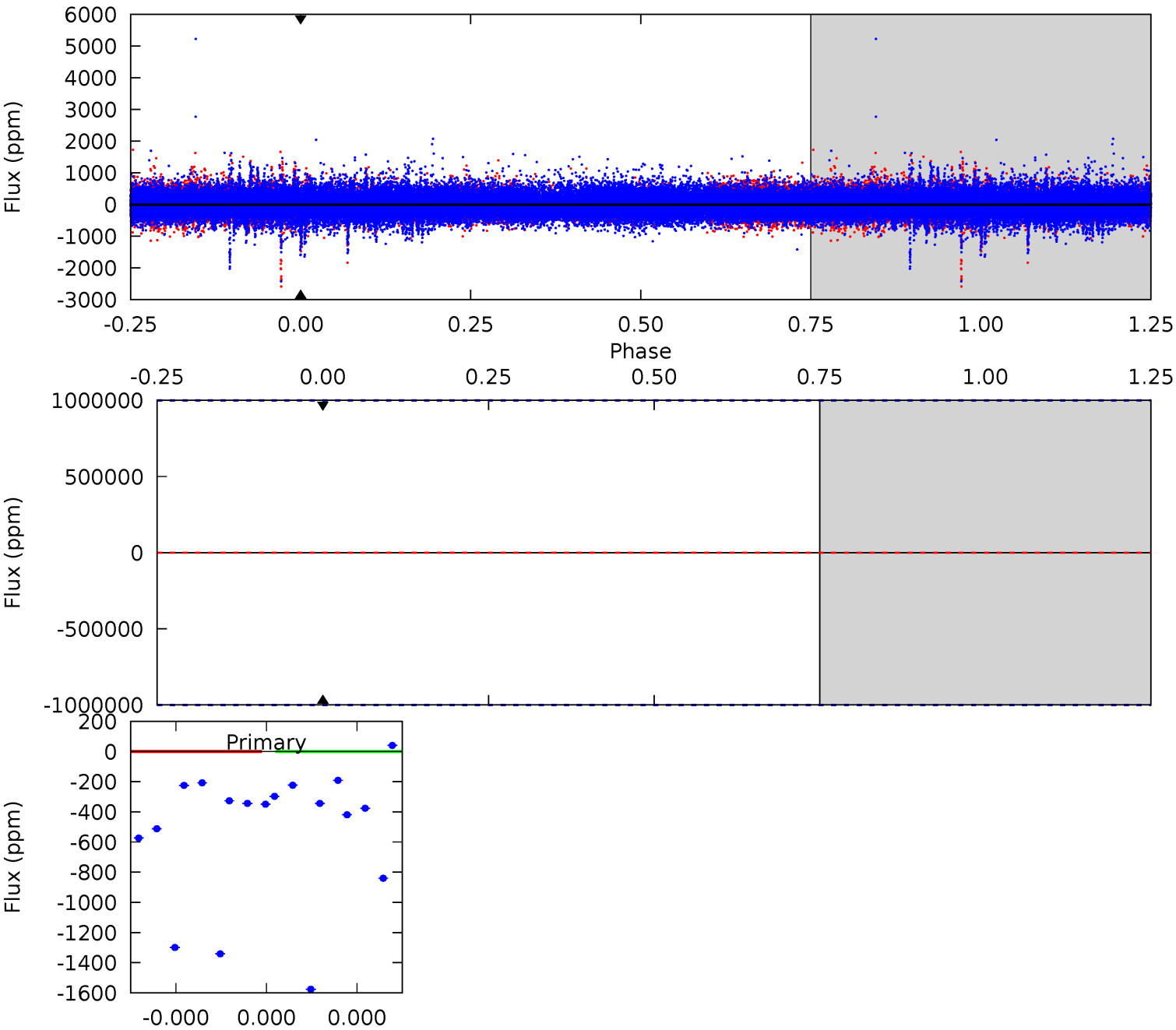
TCE 008108901-02 P=341.478843 Days  $T_0=260.596702$  (BKJD)



# DV Model-Shift Uniqueness Test

008108901-02, P = 341.478843 Days, E = 260.208366 Days

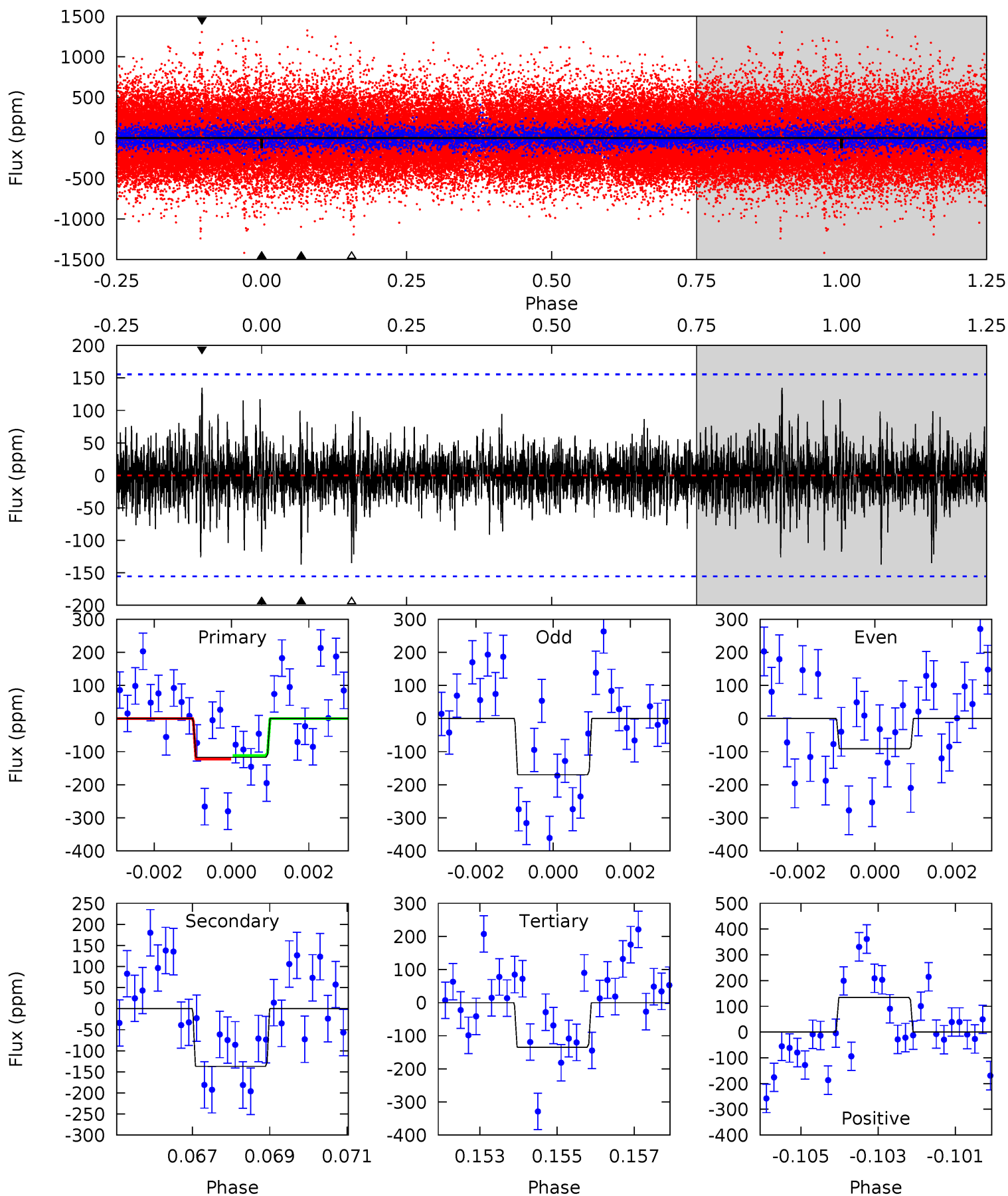
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008108901-02, P = 341.478843 Days, E = 260.596702 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
4.03	4.71	4.63	4.63	5.34	3.11	0.94	-0.61	-0.60	0.07	0.08	1.28	1.01	0.50	0.18





### Stellar Parameters For KIC 008108901

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5896^{+159}_{-176}$	$4.516^{+0.050}_{-0.200}$	$-0.100^{+0.300}_{-0.300}$	$0.914^{+0.274}_{-0.091}$	$1.000^{+0.117}_{-0.130}$	$1.846^{+0.471}_{-0.908}$
	+3%/-3%	+1%/-4%	+300%/-300%	+30%/-10%	+12%/-13%	+26%/-49%
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 008108901-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$8.73^{+8.77}_{-5.55}$	$364^{+24}_{-17}$	$4065^{+15270}_{-21836}$	$8254^{+1116462}_{-944580}$
Alt.	$-137 \pm 29$	$6.97^{+8.06}_{-5.01}$	$364^{+24}_{-18}$	$3104^{+1703}_{-570}$	$1387^{+16645}_{-1102}$

$T_{max}$  = 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

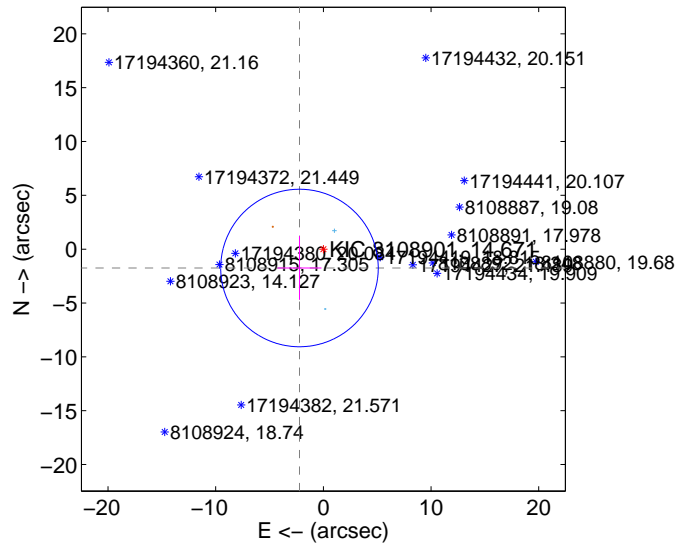
Supplemental centroid analysis for 008108901-02. Kepler magnitude: 14.67. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

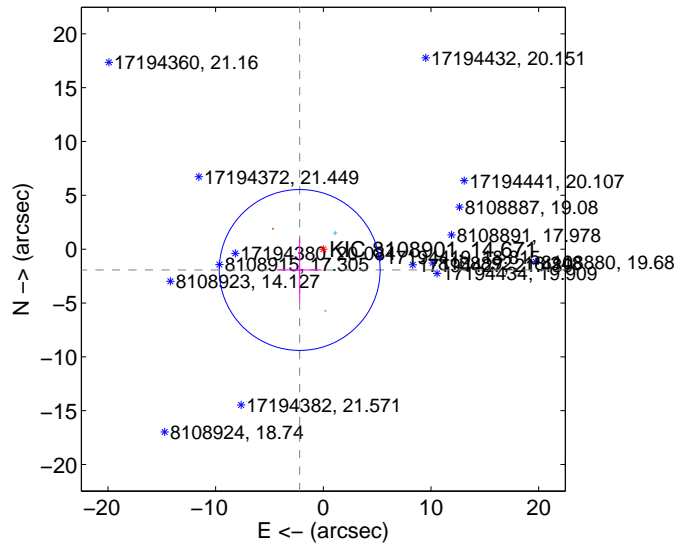
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.826 \pm 2.439$	1.16	$2.219 \pm 2.047$	$-1.750 \pm 2.962$
PRF-fit source offset from KIC position	$2.924 \pm 2.491$	1.17	$2.194 \pm 2.060$	$-1.933 \pm 2.954$
photometric centroid source offset	$2.86 \pm 5.29$	0.54	$-0.77 \pm 4.90$	$2.75 \pm 5.32$

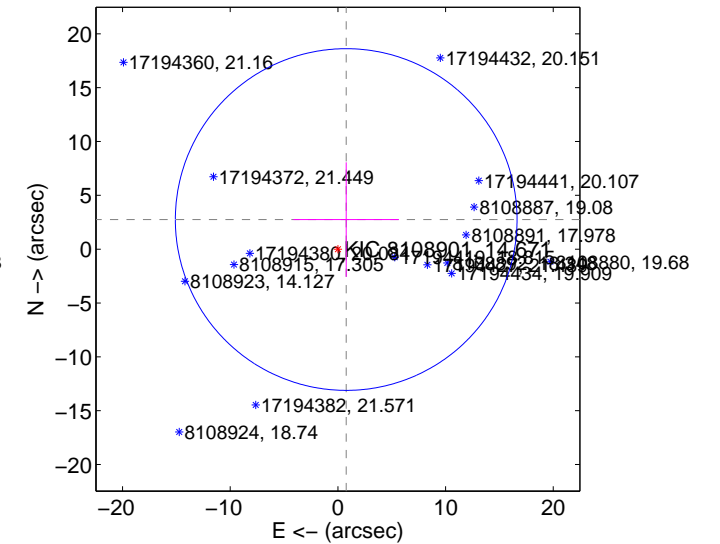
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

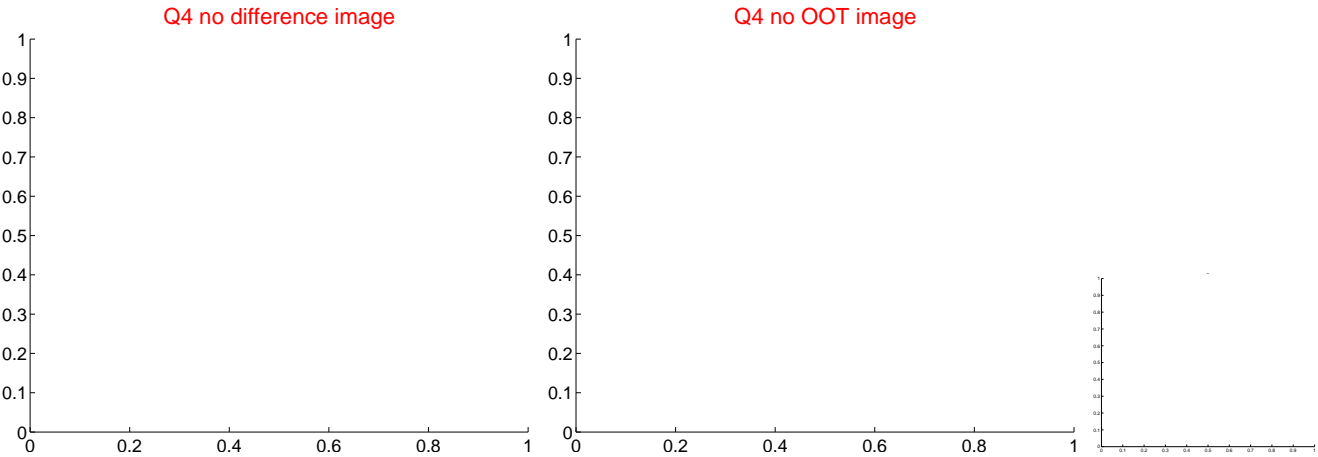
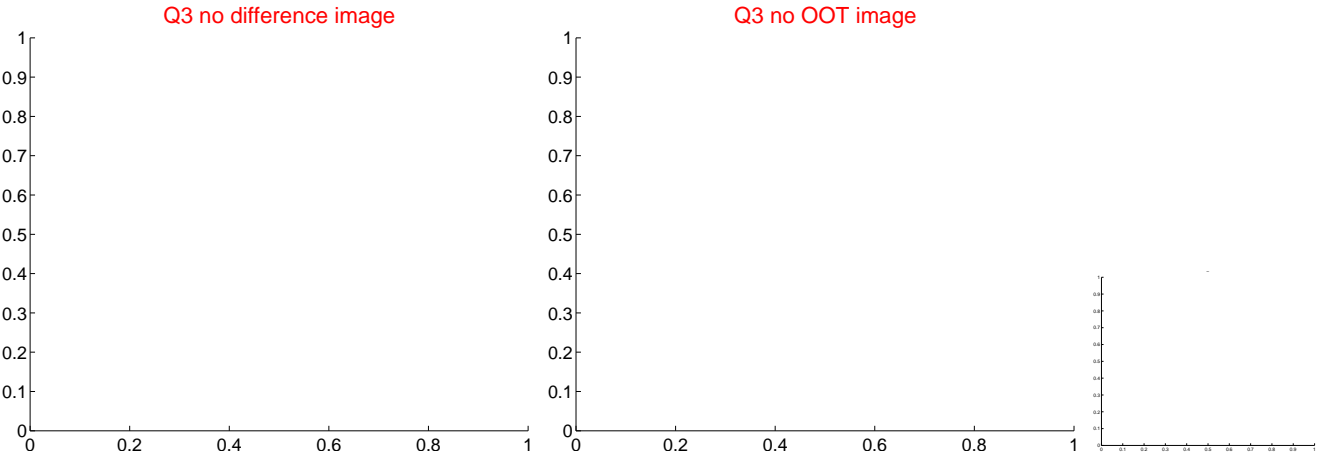
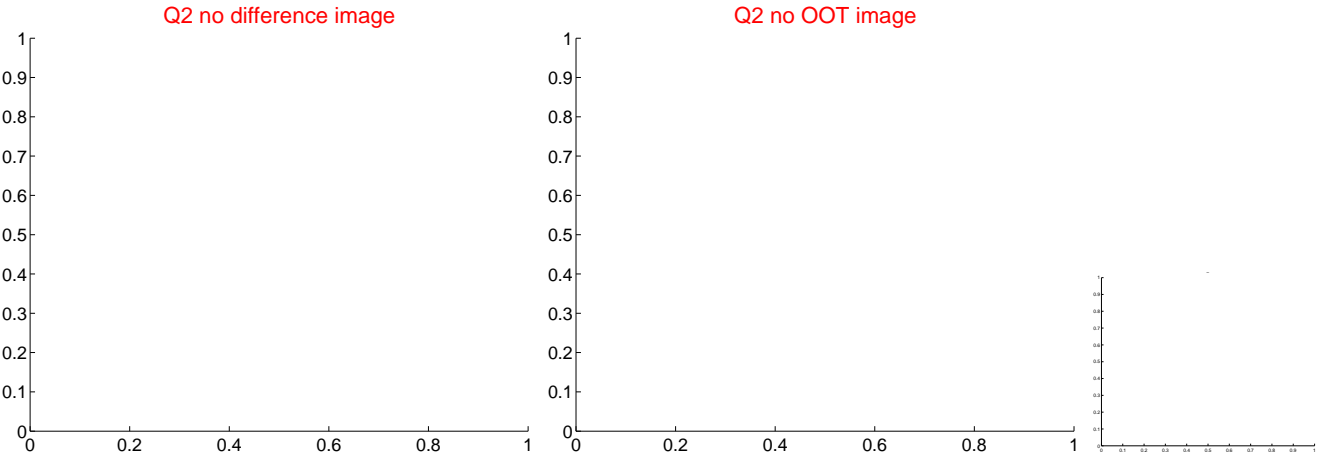
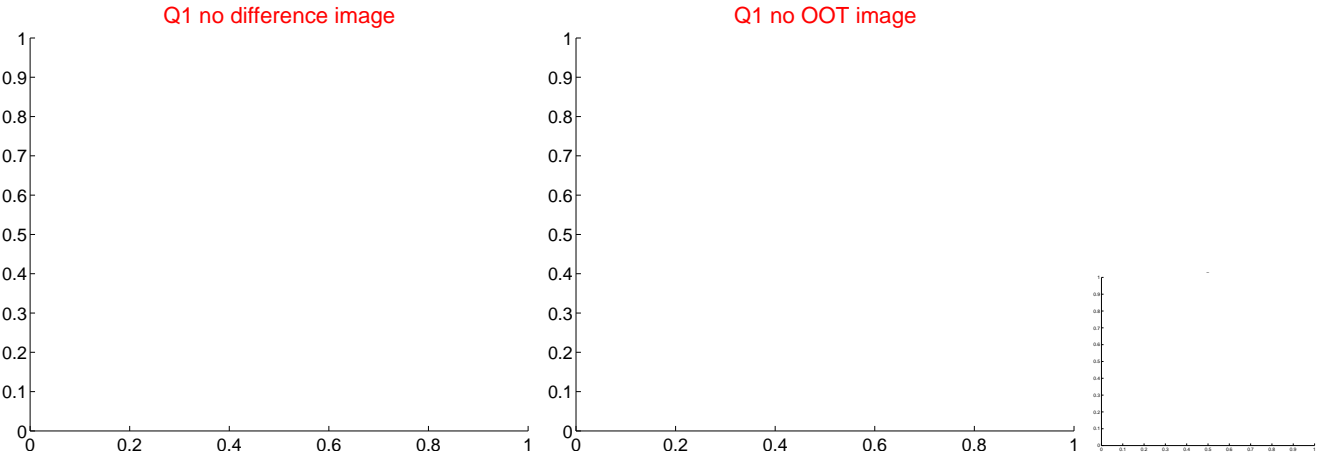


offset from photometric centroids



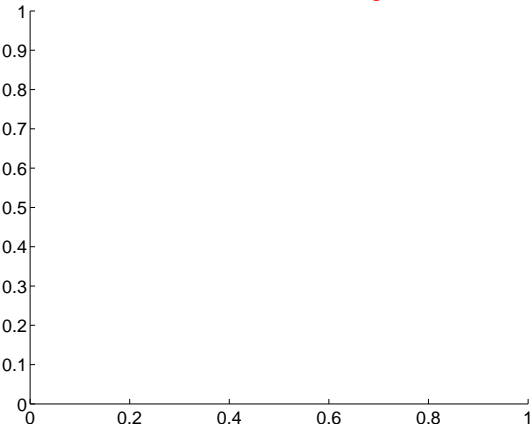
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

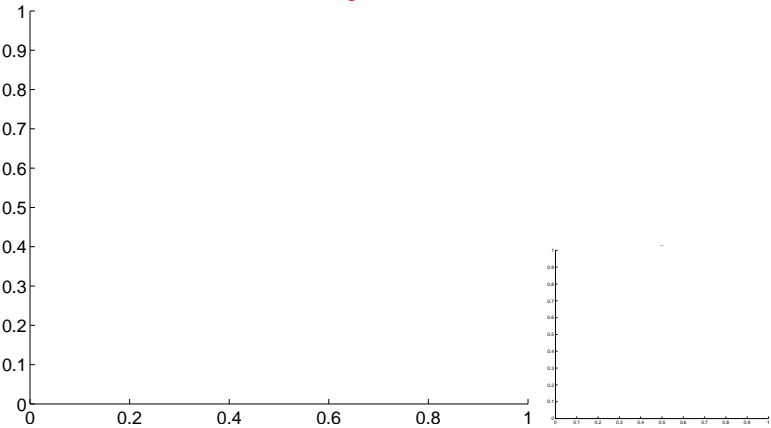


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

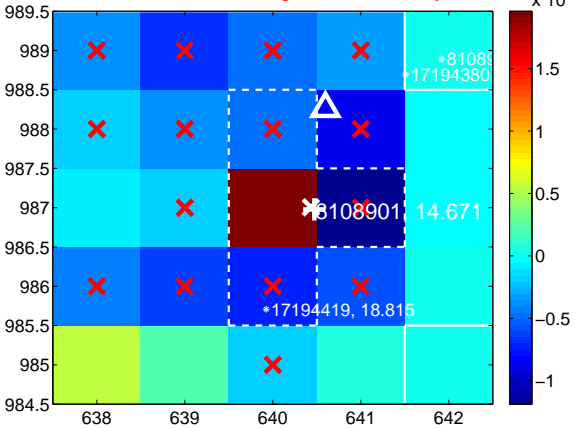
Q5 no difference image



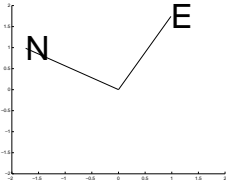
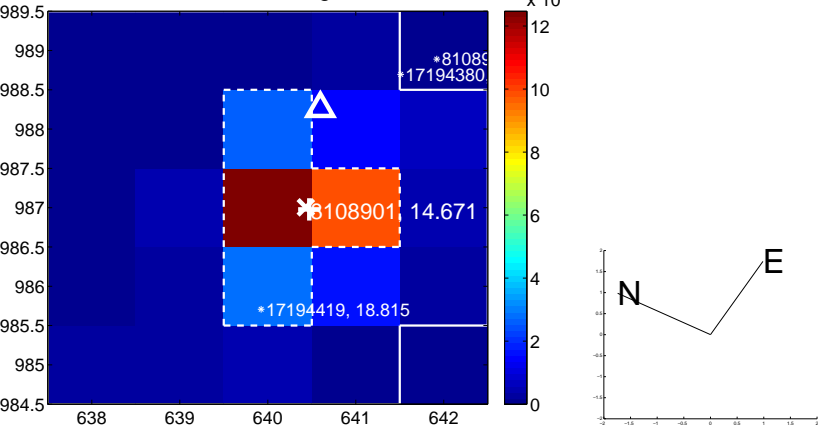
Q5 no OOT image



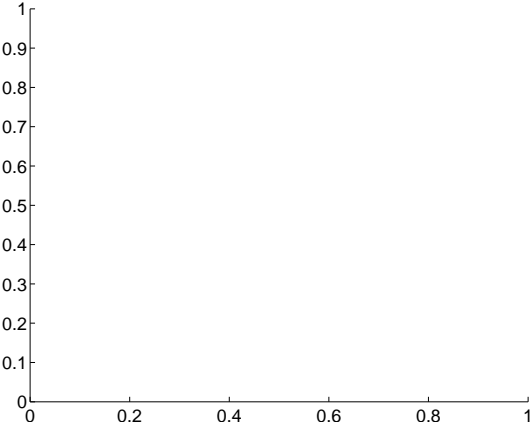
Q6 difference image. Poor Quality



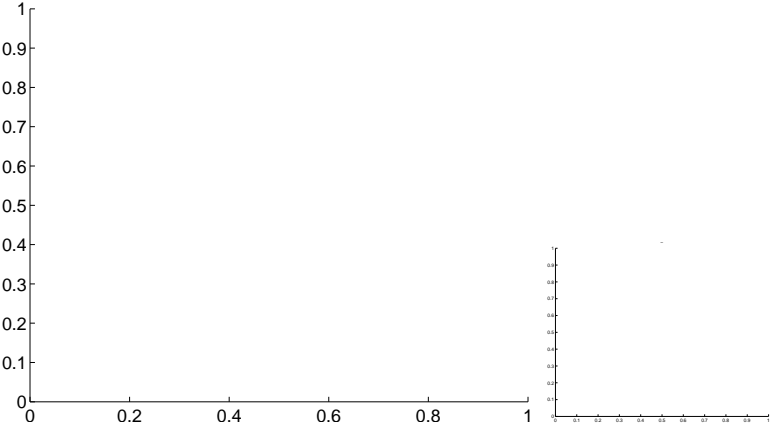
Q6 OOT image



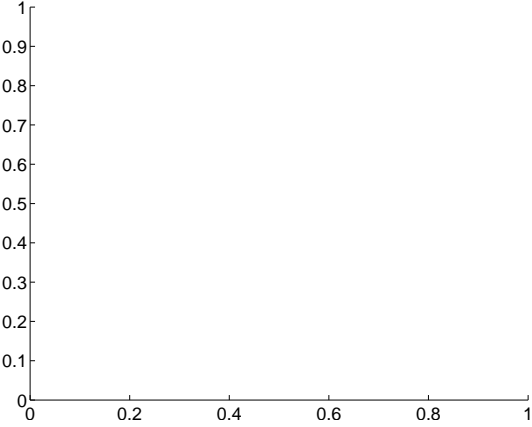
Q7 no difference image



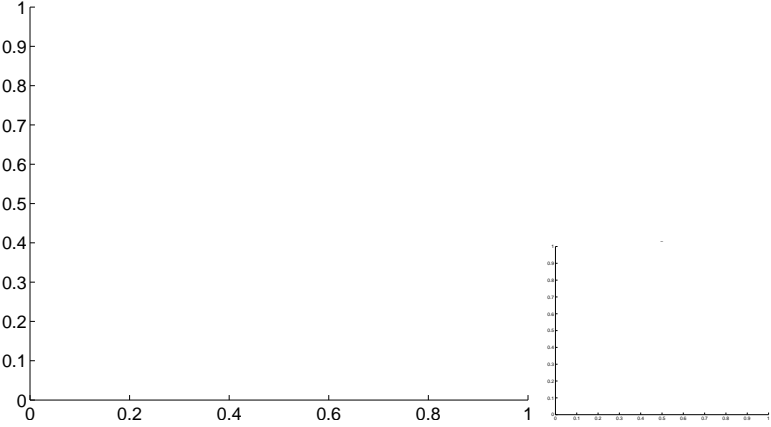
Q7 no OOT image



Q8 no difference image

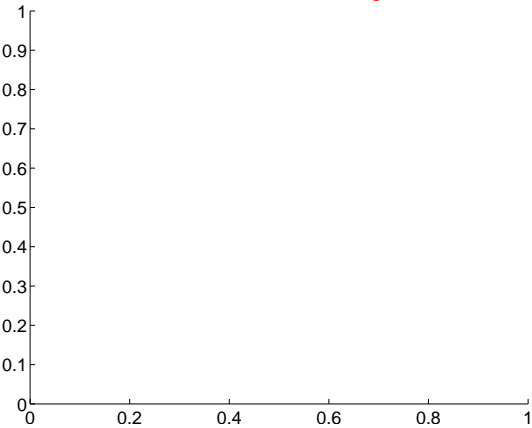


Q8 no OOT image

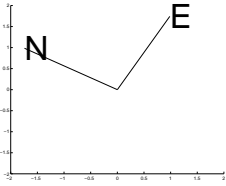
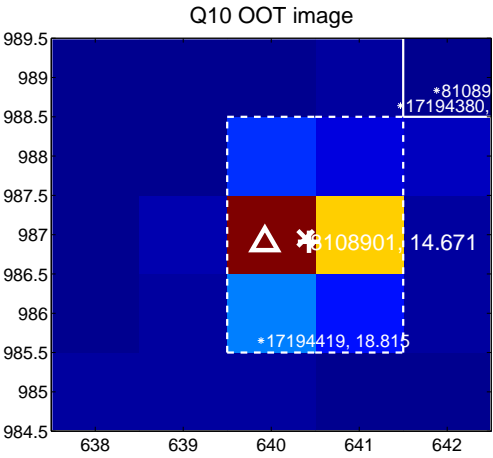
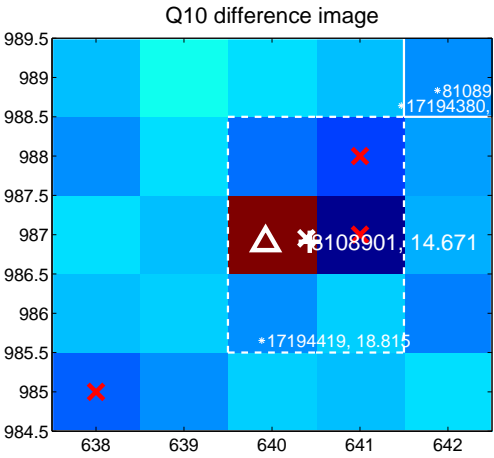
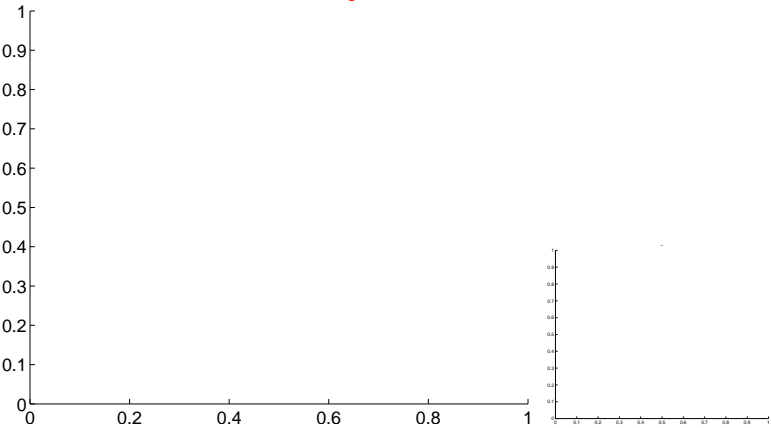


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

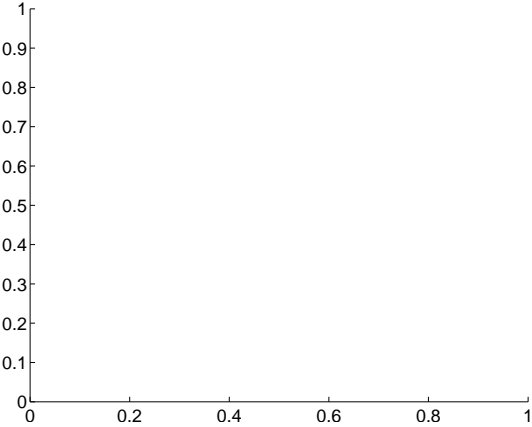
Q9 no difference image



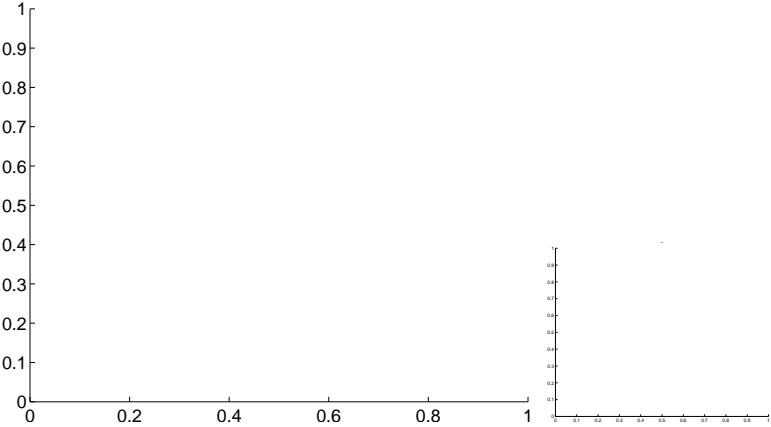
Q9 no OOT image



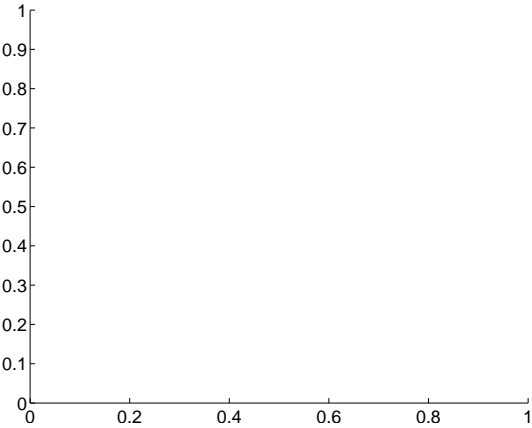
Q11 no difference image



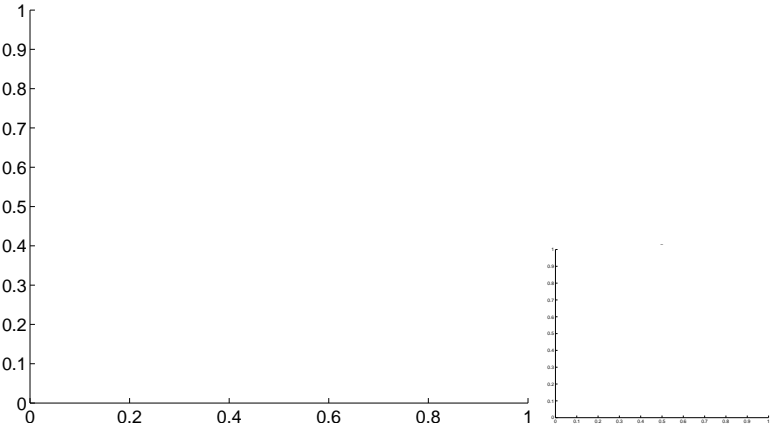
Q11 no OOT image



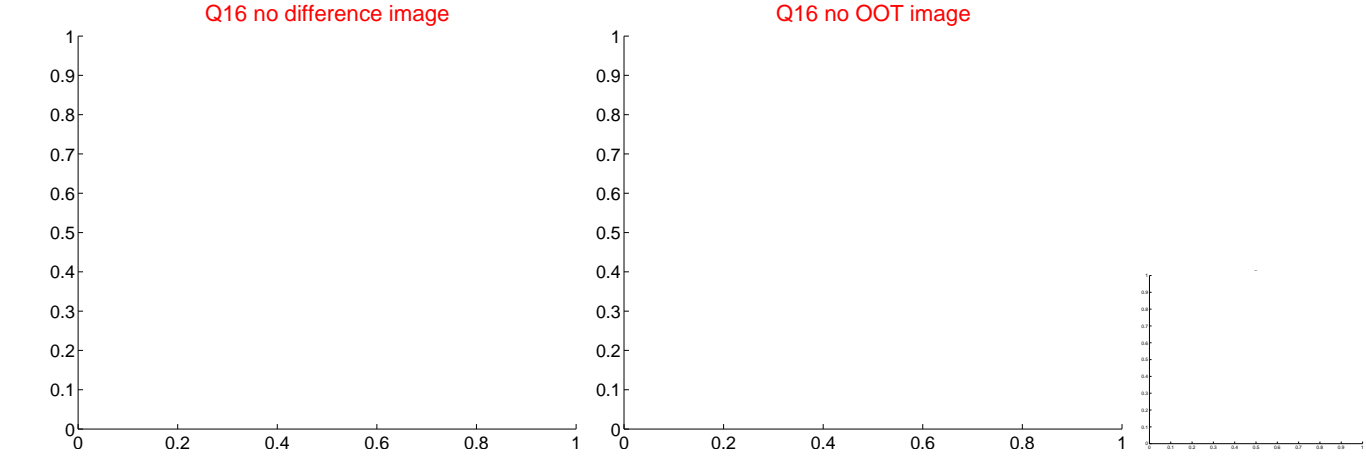
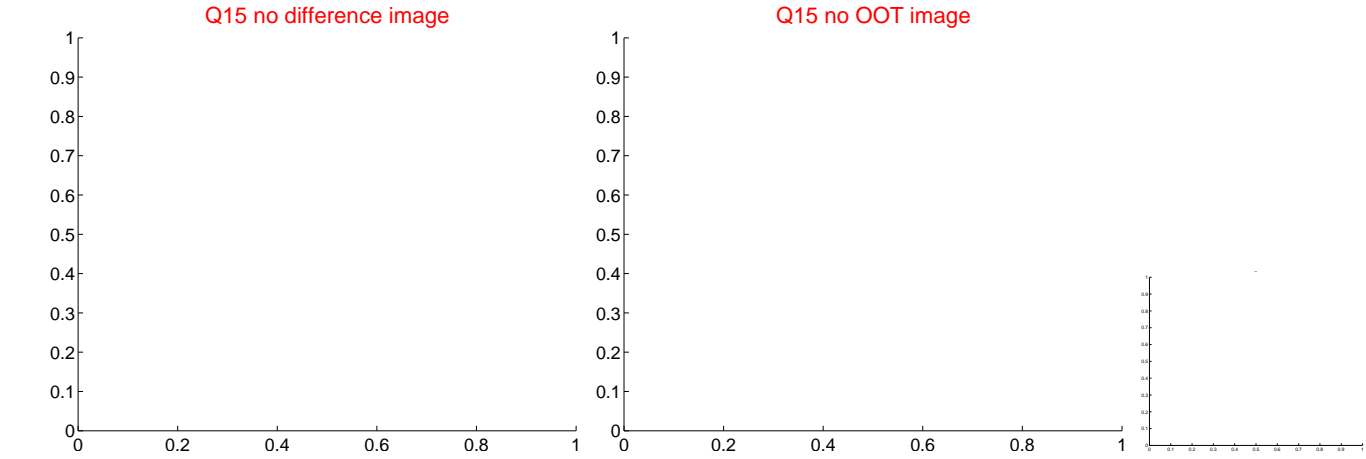
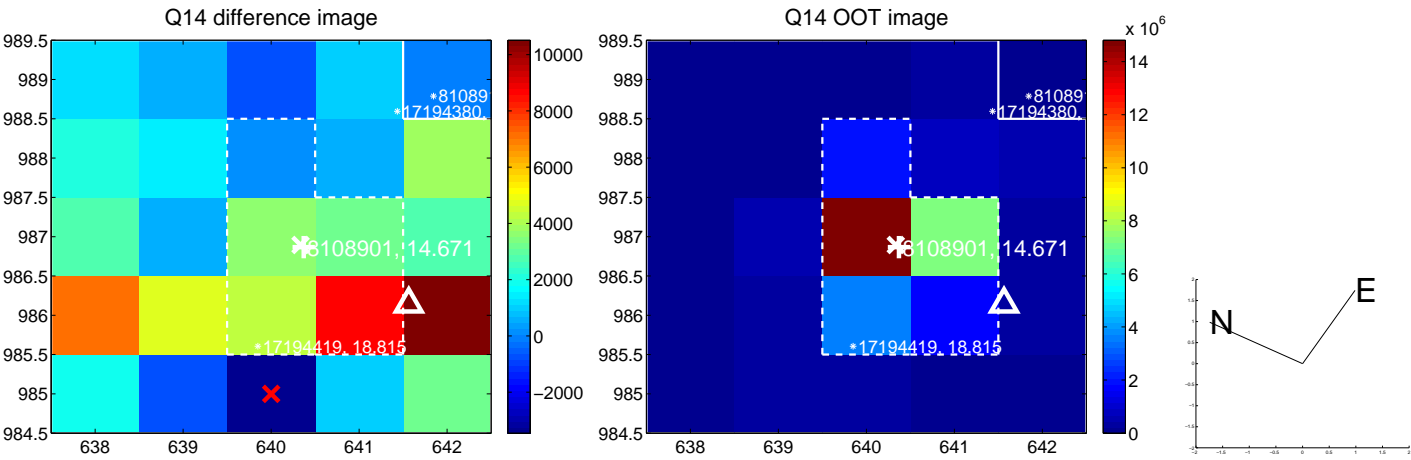
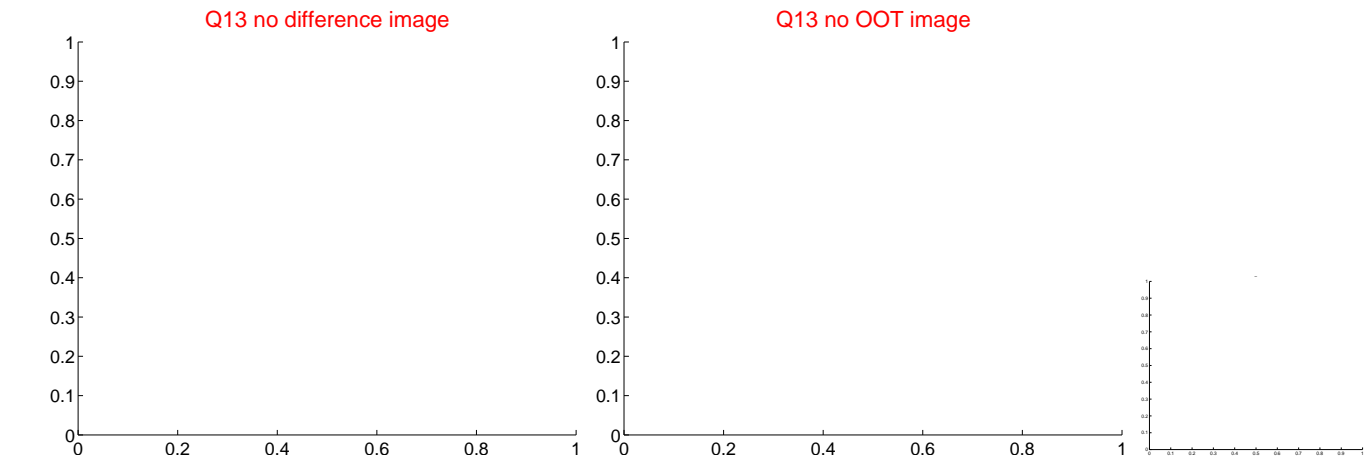
Q12 no difference image



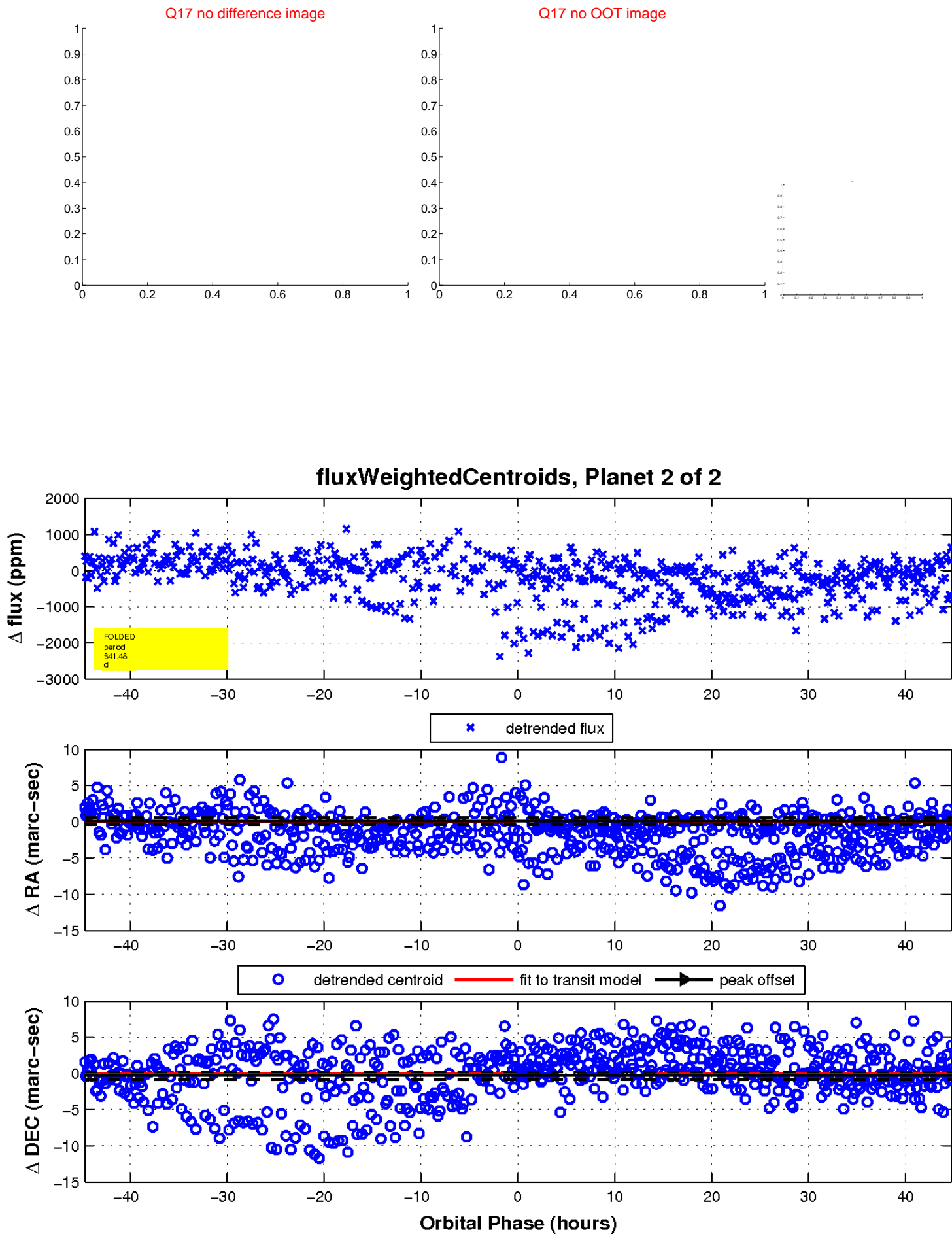
Q12 no OOT image



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.



# UKIRT Image

Declination

