

# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

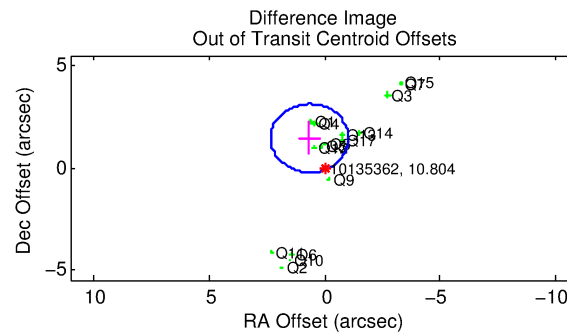
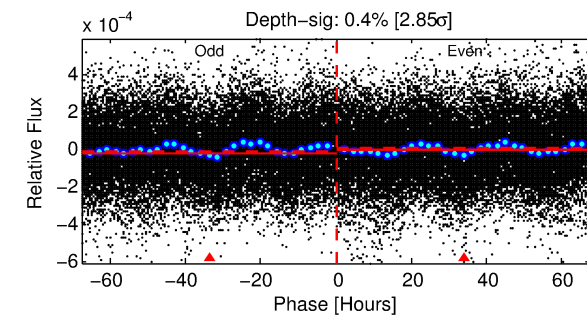
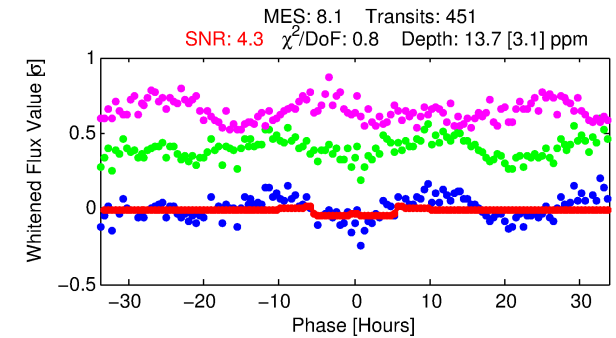
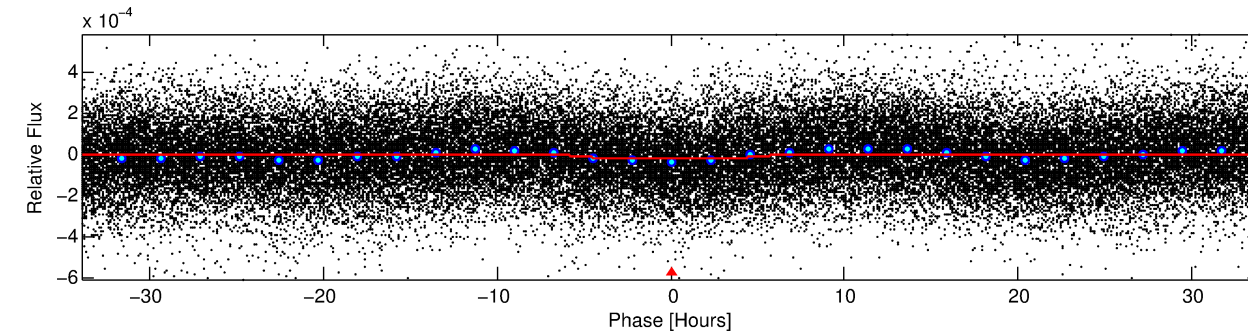
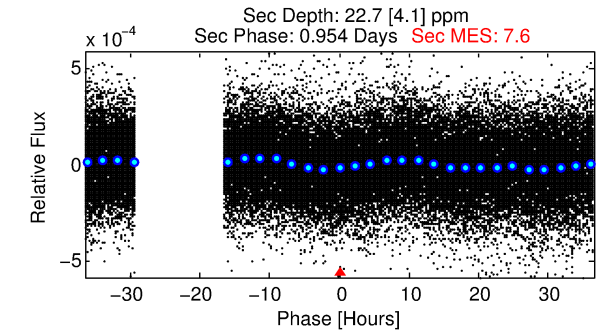
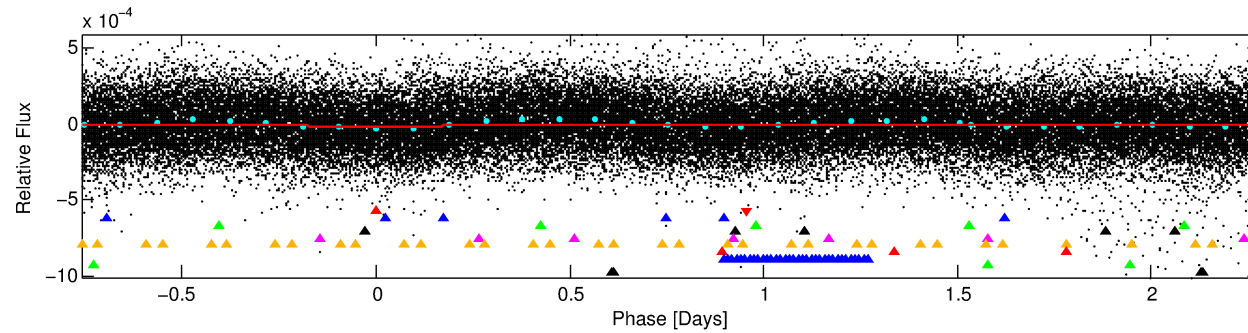
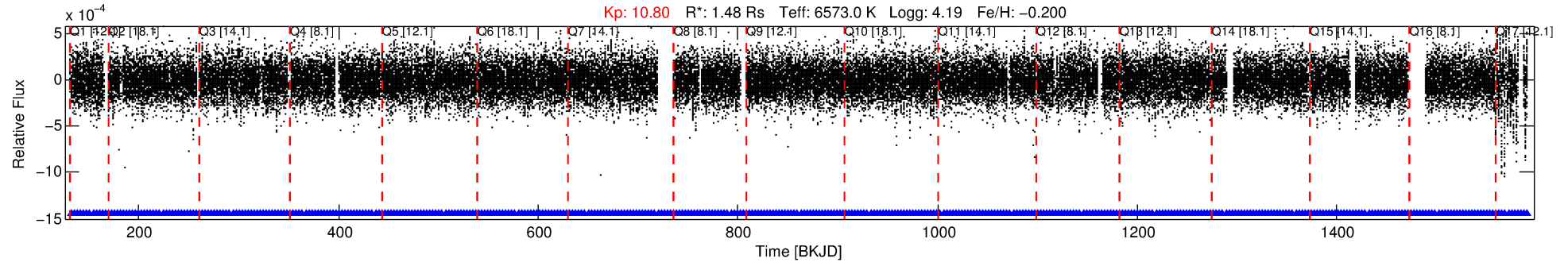
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-01

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 1 of 10 Period: 3.042 d



## DV Fit Results:

Period = 3.04155 [0.00006] d  
Epoch = 133.0552 [0.0106] BKJD  
 $R_p/R^* = 0.0035$  [0.0019]  
 $a/R^* = 2.02$  [4.50]  
 $b = 0.39$  [6.51]  
 $S_{\text{eff}} = 1878.80$  [737.95]  
 $T_{\text{eq}} = 1679$  [165] K  
 $R_p = 0.56$  [0.35]  $R_e$   
 $a = 0.0440$  [0.0113] AU  
 $A_g = 77.73$  [91.41] [0.84σ]  
 $T_{\text{eff}} = 7707$  [2176] K [2.76σ]

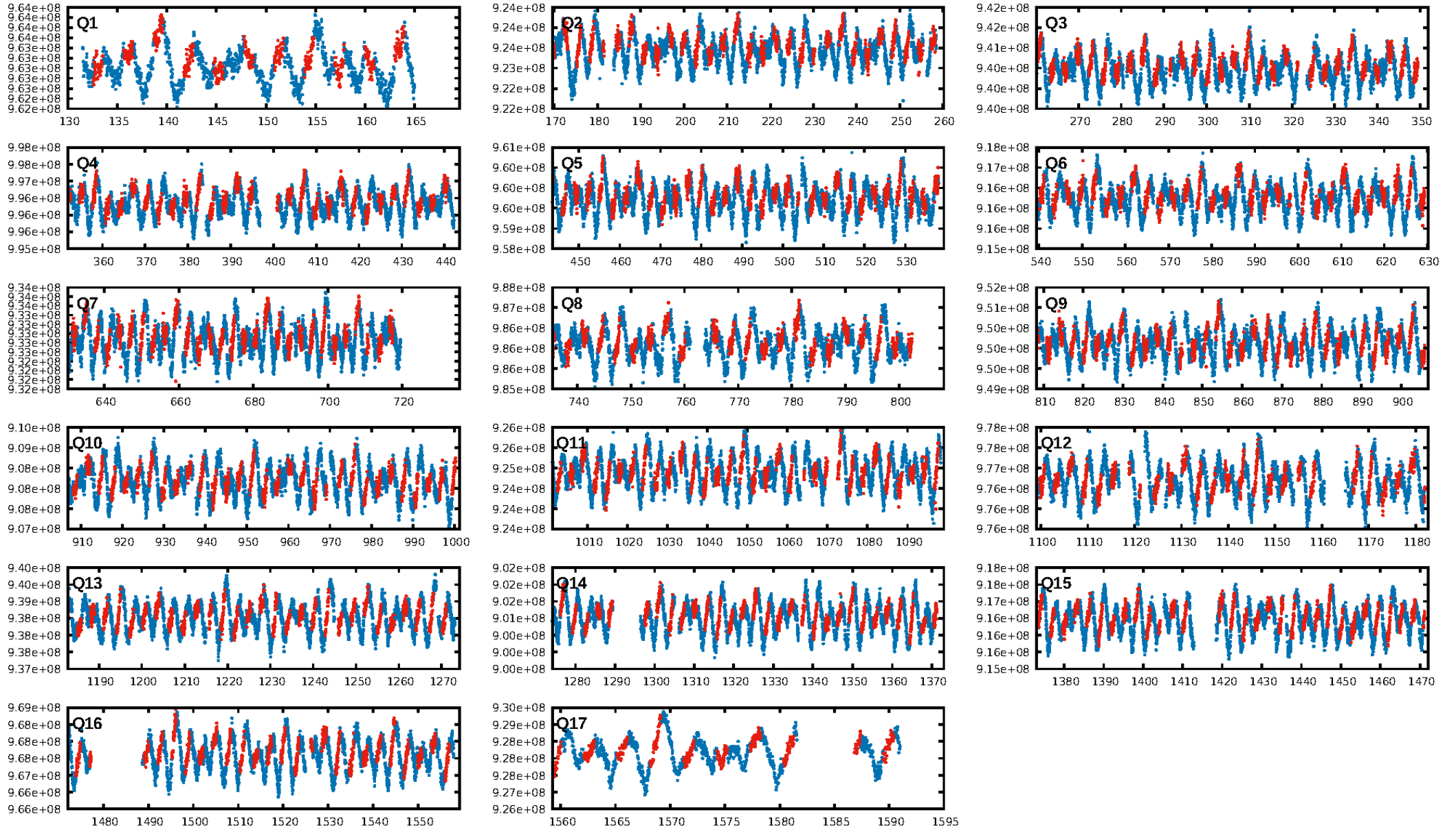
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [63.59σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [430/430]  
GhostDiagnostic-chr: 1.841  
Centroid-sig: 56.0%  
Centroid-so: 0.915 arcsec [0.80σ]  
OotOffset-rm: 1.580 arcsec [2.82σ]  
**KicOffset-rm: 1.766 arcsec [3.27σ]**  
OotOffset-st: 4/4/3/5 [16]  
KicOffset-st: 4/4/3/5 [16]  
DiffImageQuality-fgm: 0.81 [13/16]  
DiffImageOverlap-fno: 1.00 [17/17]

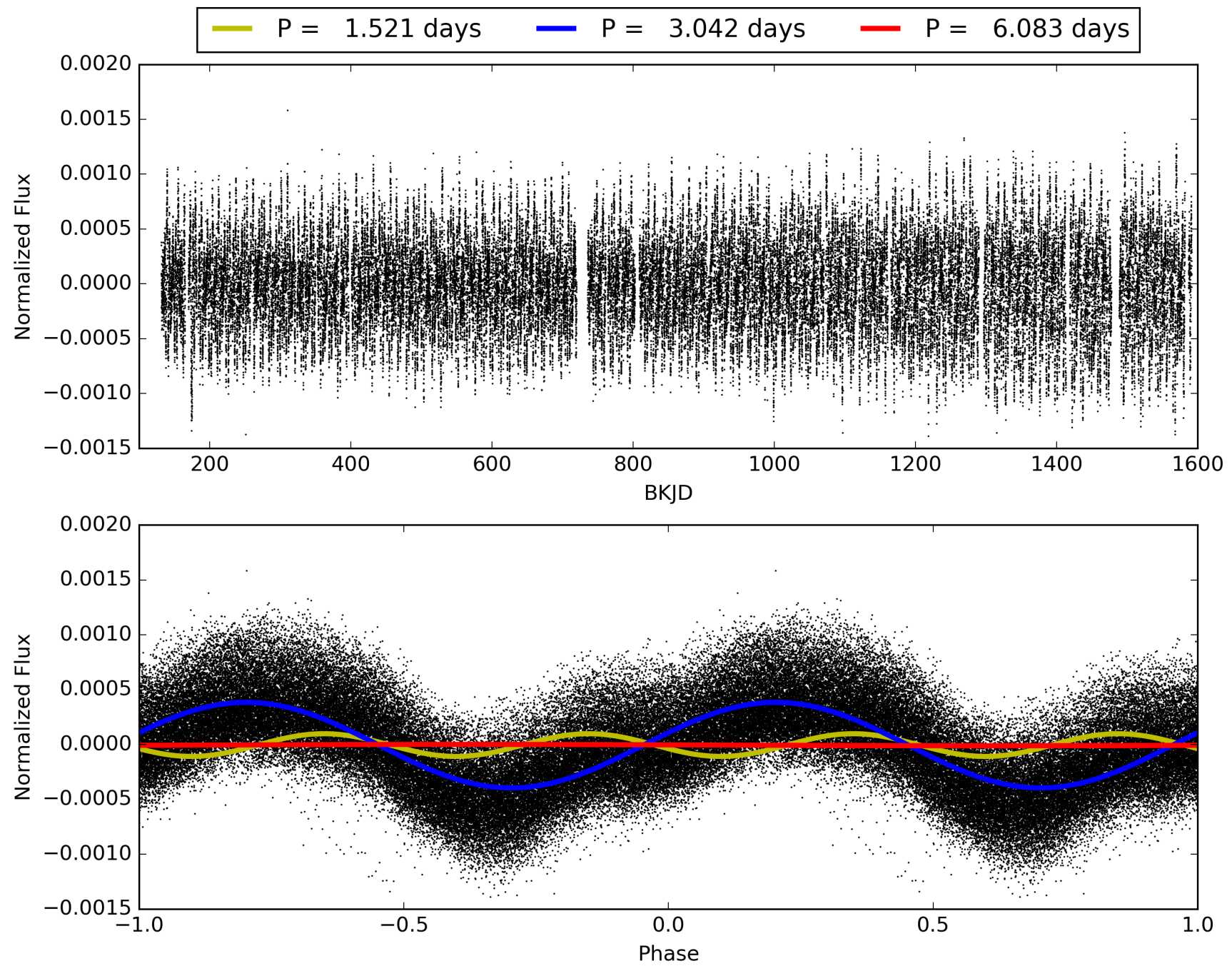
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:45:57 Z

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

# TCE 010135362-01, PDC Light Curves



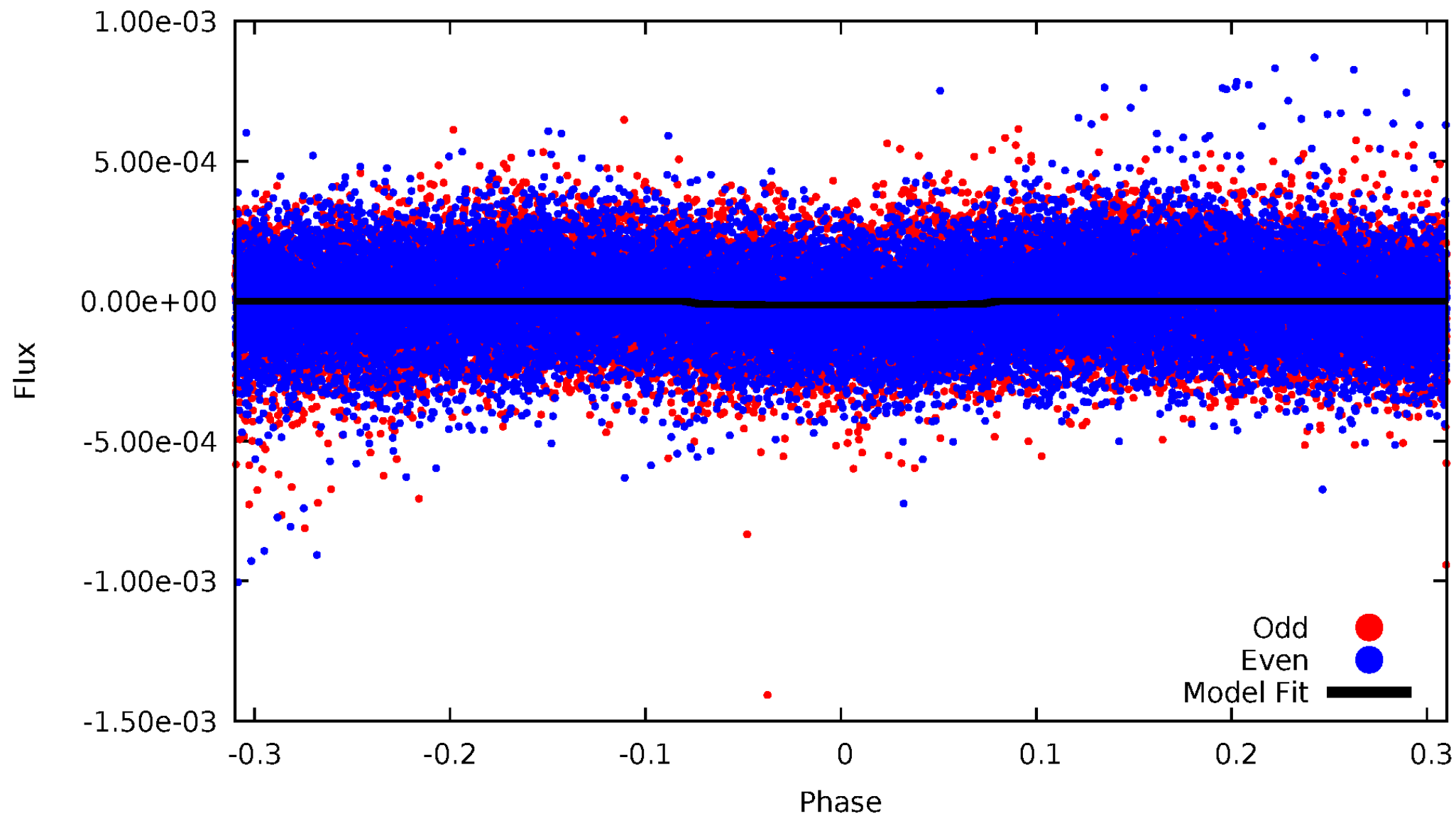
TCE 010135362-01





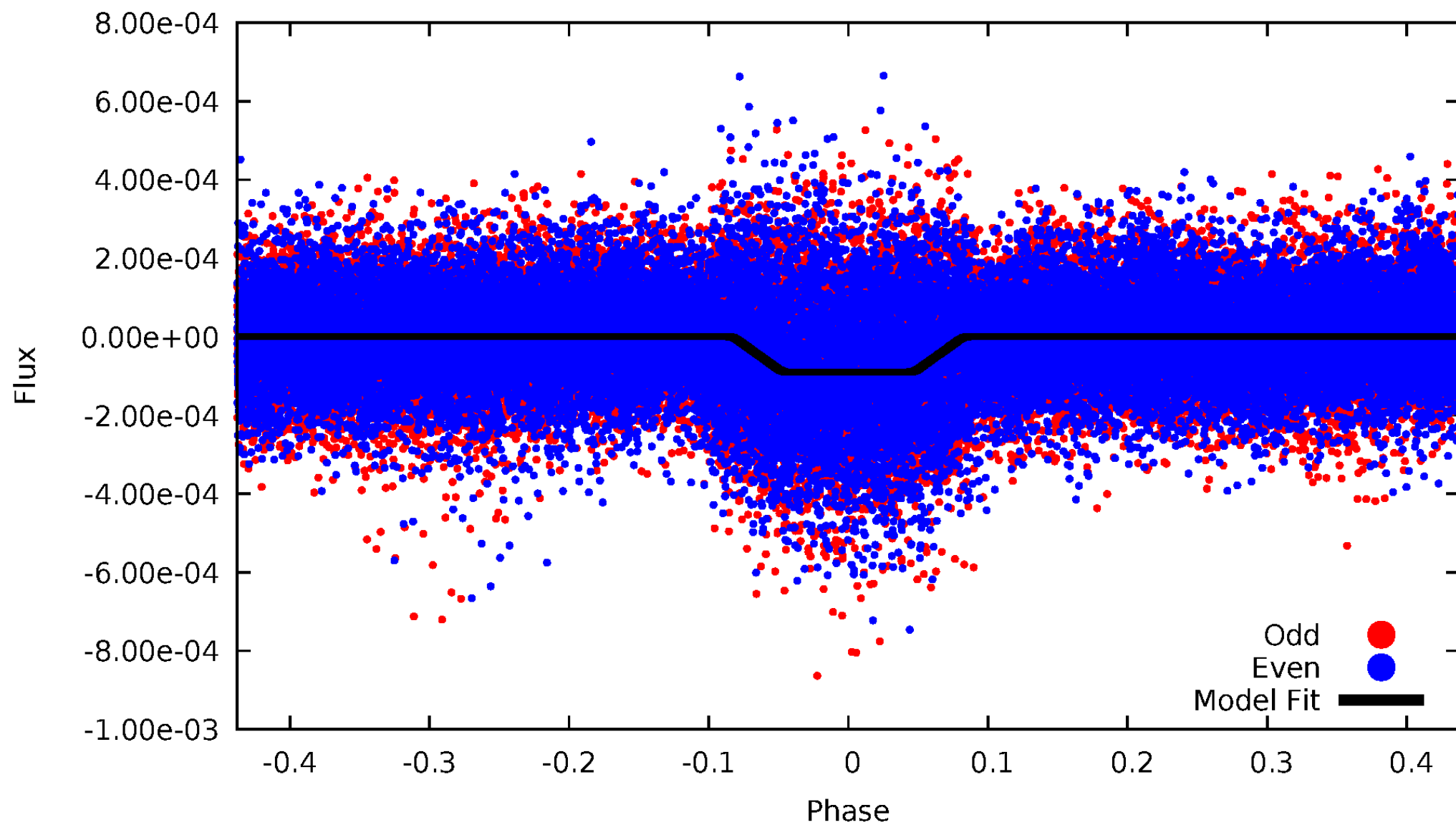
# DV Odd/Even

TCE 010135362-01

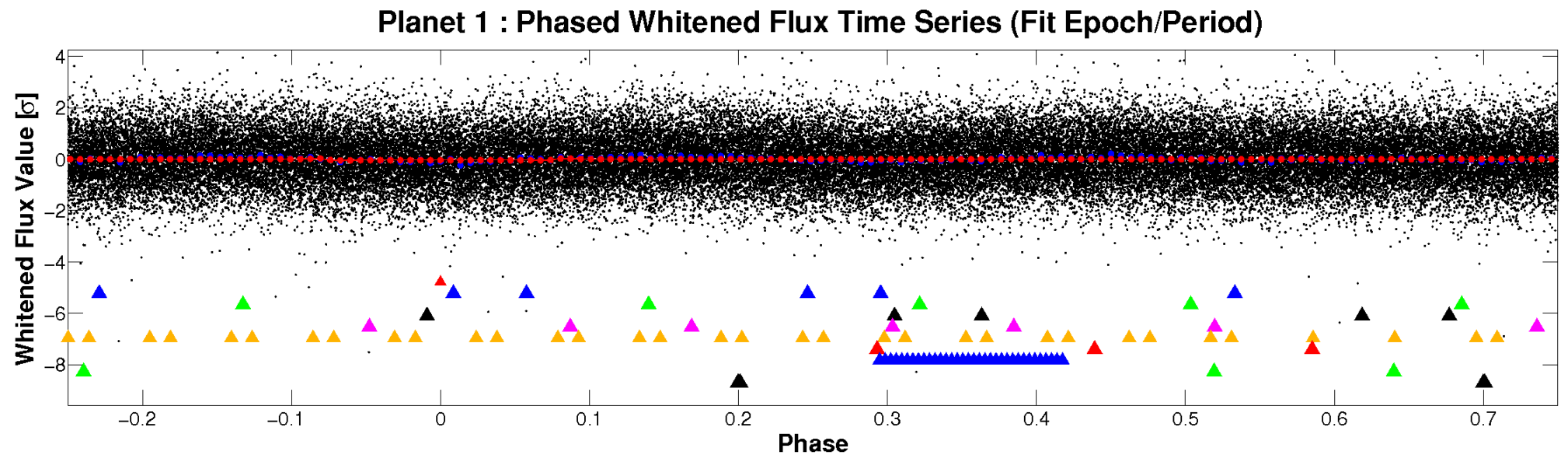
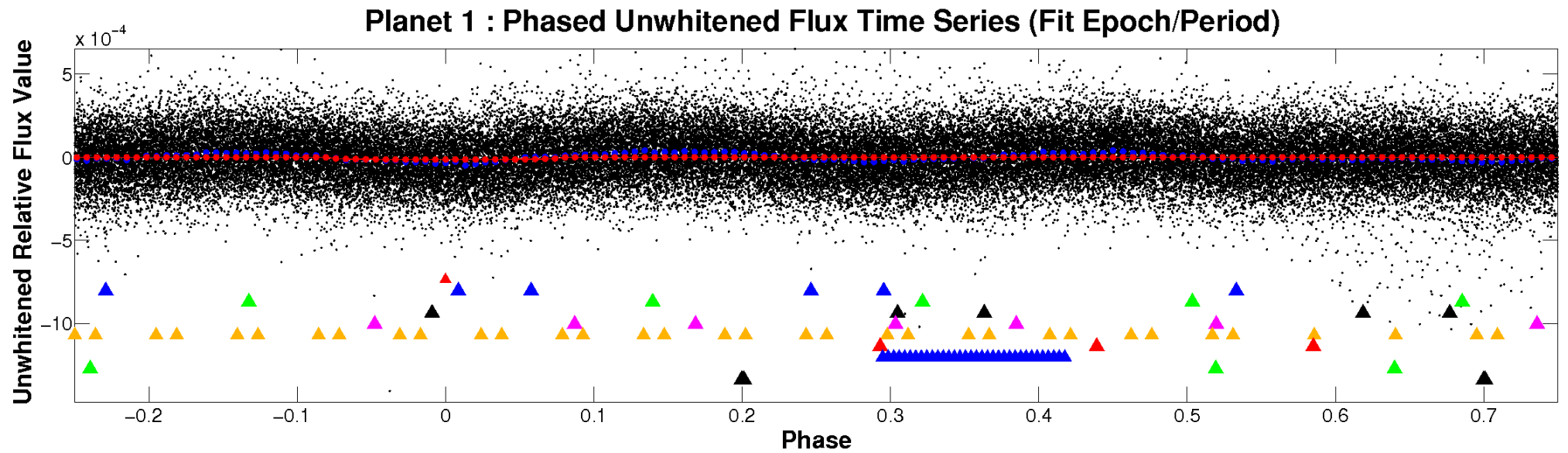


# ALT Odd/Even

TCE 010135362-01

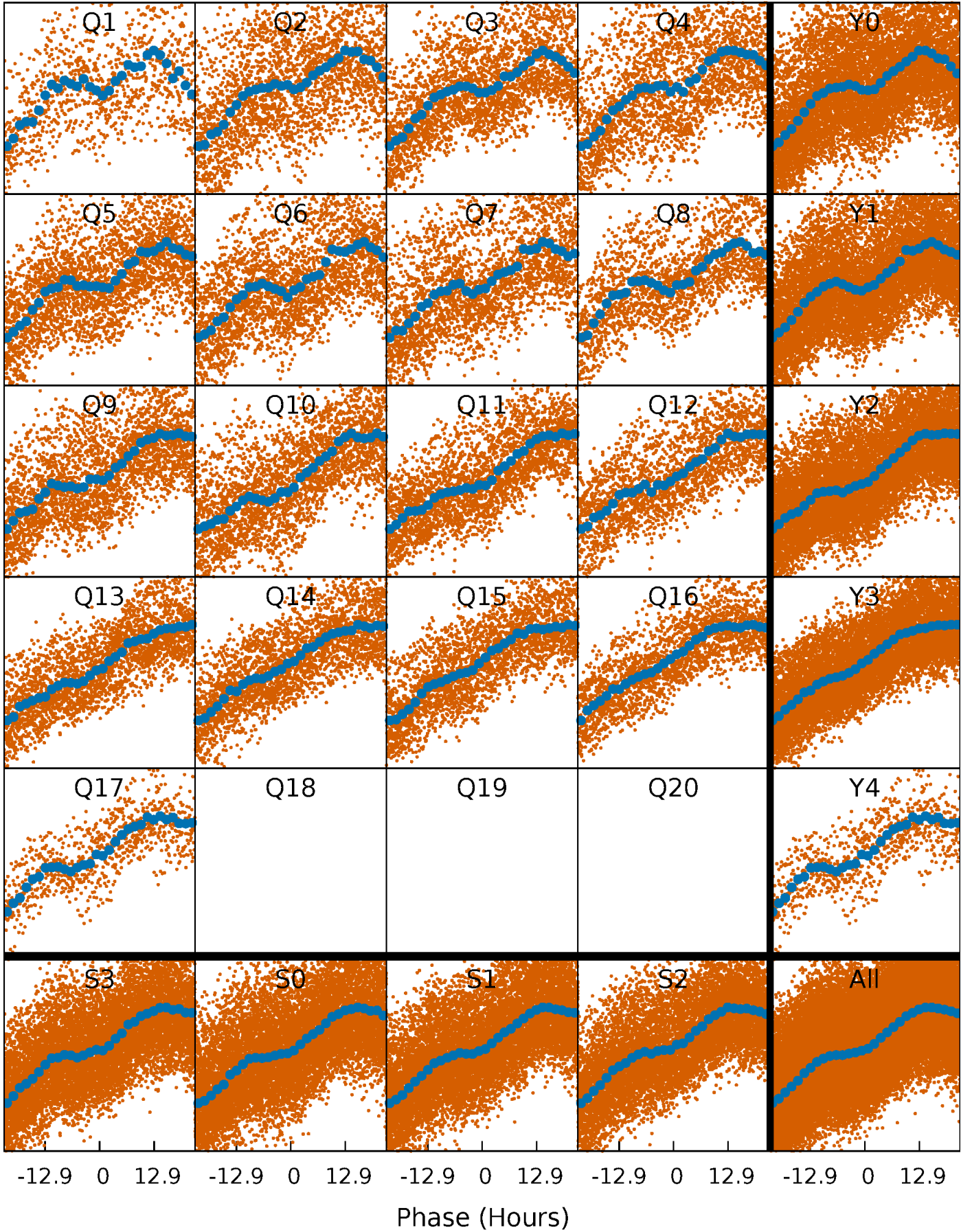


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

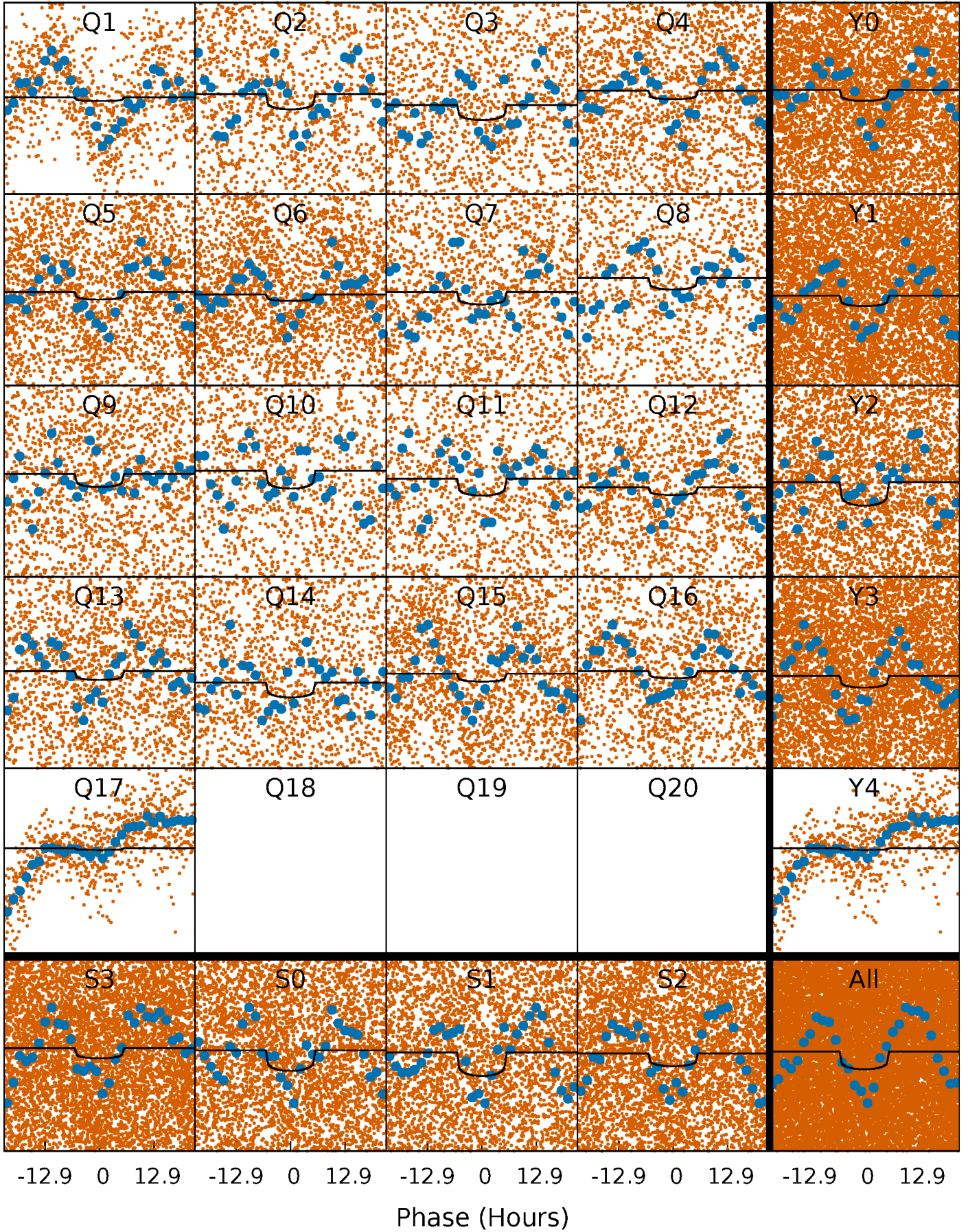
TCE 010135362-01   P= 3.041547 Days    $T_0=133.055158$  (BKJD)





# DV Quarter-Phased Transit Curves

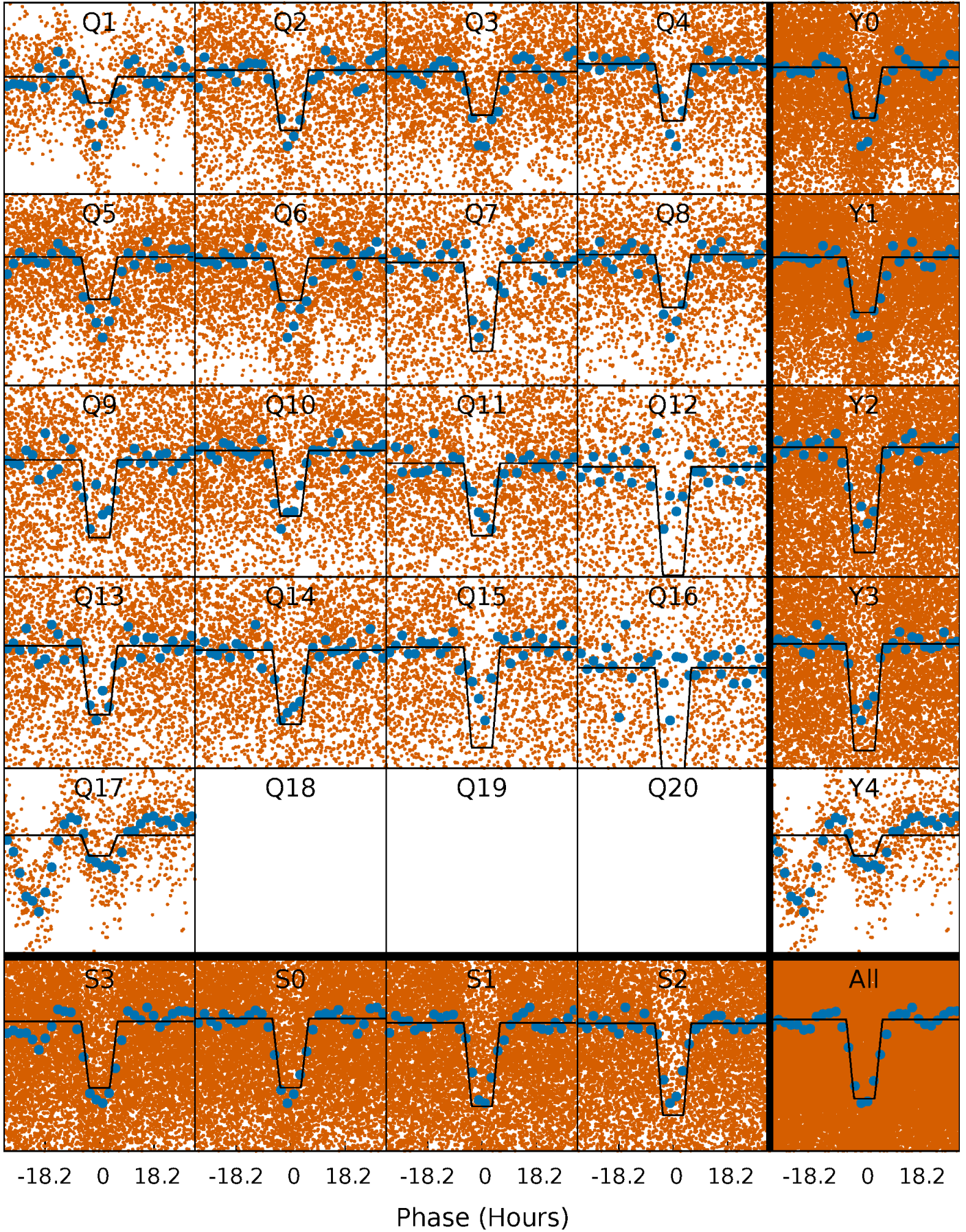
TCE 010135362-01 P= 3.041547 Days  $T_0=133.055158$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

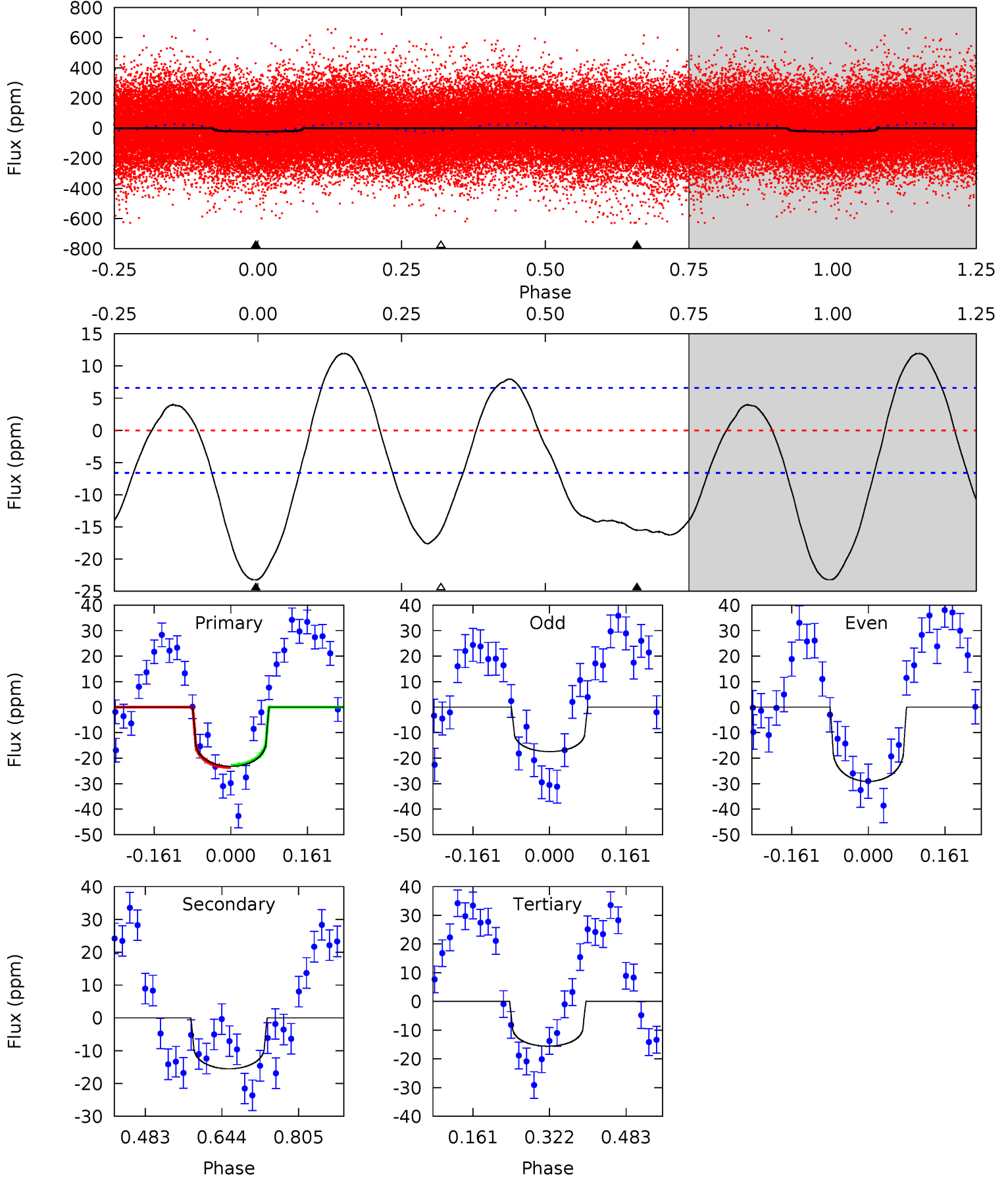
TCE 010135362-01 P= 3.041022 Days  $T_0=133.143289$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-01, P = 3.041547 Days, E = 130.013611 Days

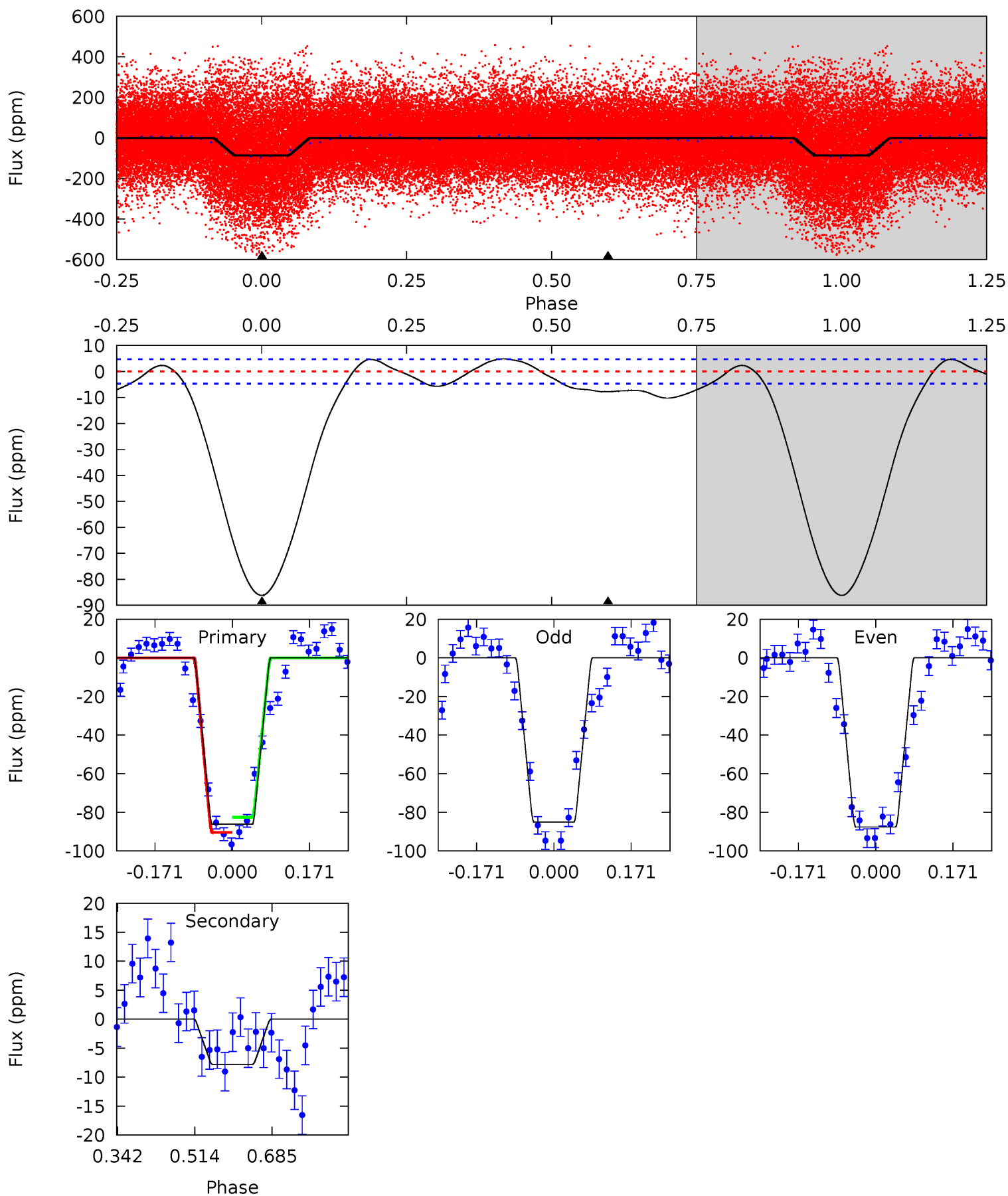
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.7	10.5	10.5	0	4.46	1.40	6.13	5.16	15.7	-0.04	10.5	3.94	1.05	0.34	0.29



# Alt Model-Shift Uniqueness Test

010135362-01, P = 3.041022 Days, E = 130.102267 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
81.4	7.36	0	0	4.45	1.37	3.27	81.4	81.4	7.36	7.36	1.18	0.99	0.05	3.69





### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 1$	$0.57^{+0.32}_{-0.30}$	$2345^{+182}_{-172}$	$6955^{+4100}_{-1371}$	$51^{+171}_{-30}$
Alt.	$-8 \pm 1$	$1.51^{+0.41}_{-0.36}$	$2332^{+184}_{-161}$	$3842^{+349}_{-283}$	$3.659^{+2.485}_{-1.425}$

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

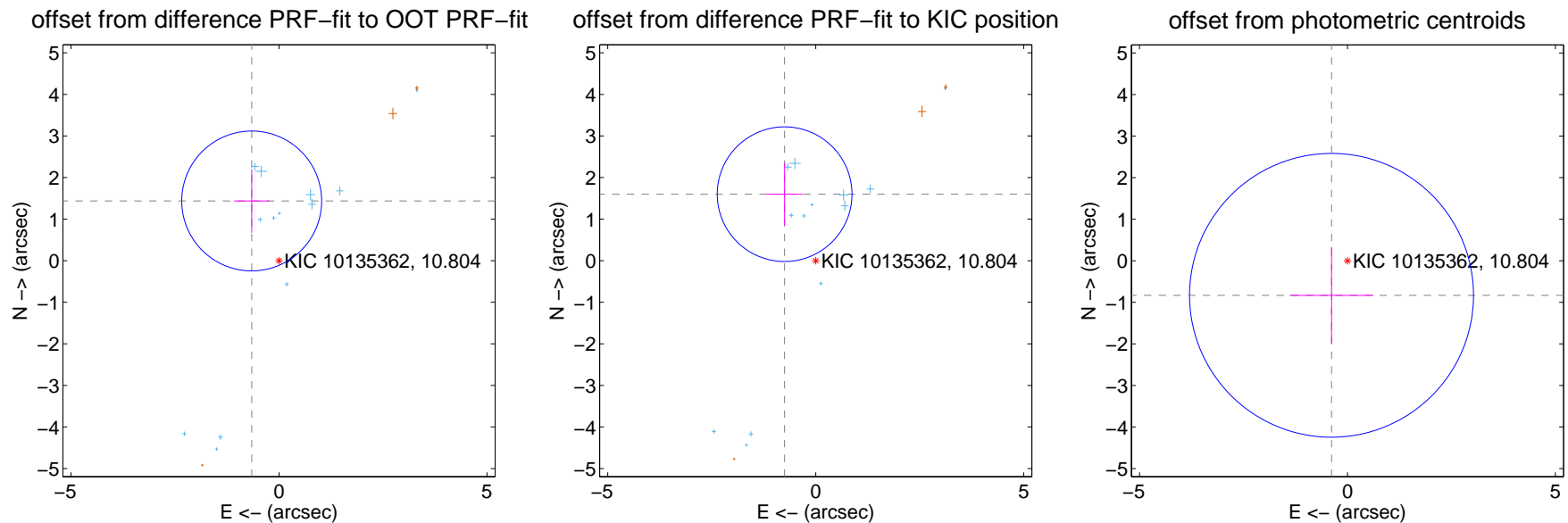
## DV Centroid Data

Supplemental centroid analysis for 010135362-01. **Kepler magnitude: 10.80.** Transit SNR 4.26

There are 13 quarters with good PRF difference image offsets

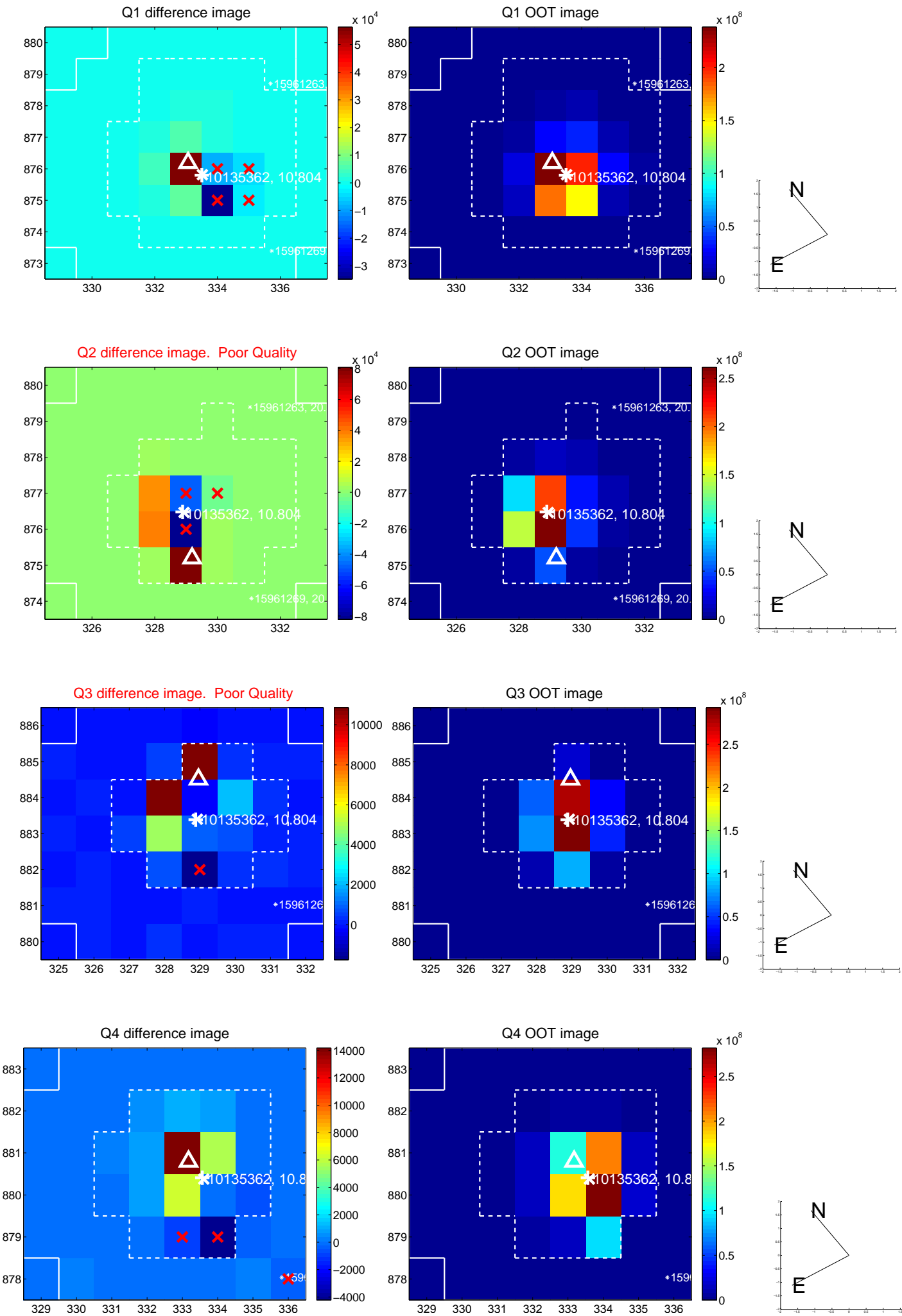
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.580 \pm 0.561$	2.82	$0.656 \pm 0.430$	$1.437 \pm 0.766$
PRF-fit source offset from KIC position	<b><math>1.766 \pm 0.540</math></b>	<b>3.27</b>	$0.748 \pm 0.441$	$1.600 \pm 0.755$
photometric centroid source offset	$0.92 \pm 1.14$	0.80	$0.38 \pm 1.01$	$-0.83 \pm 1.16$

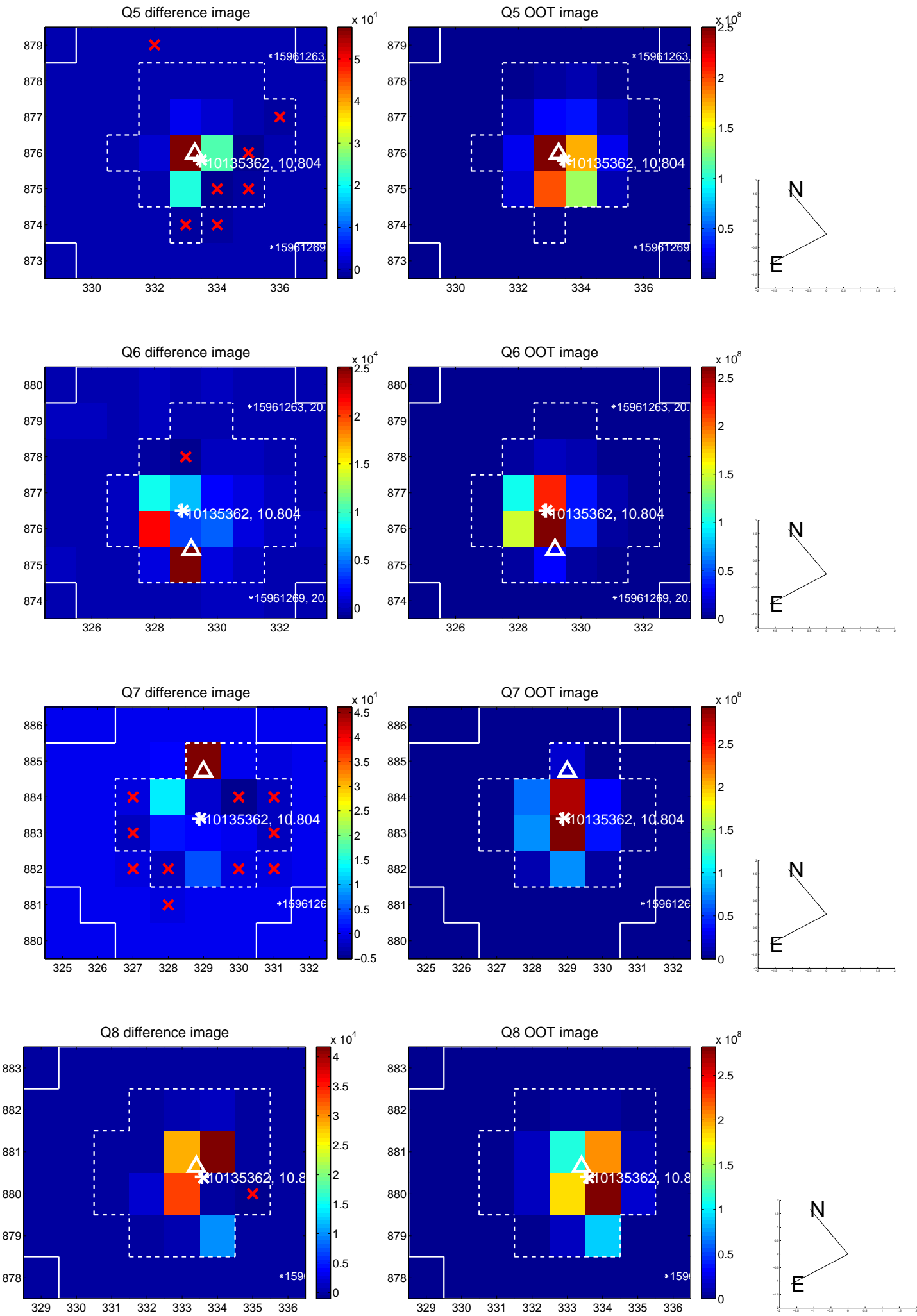


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

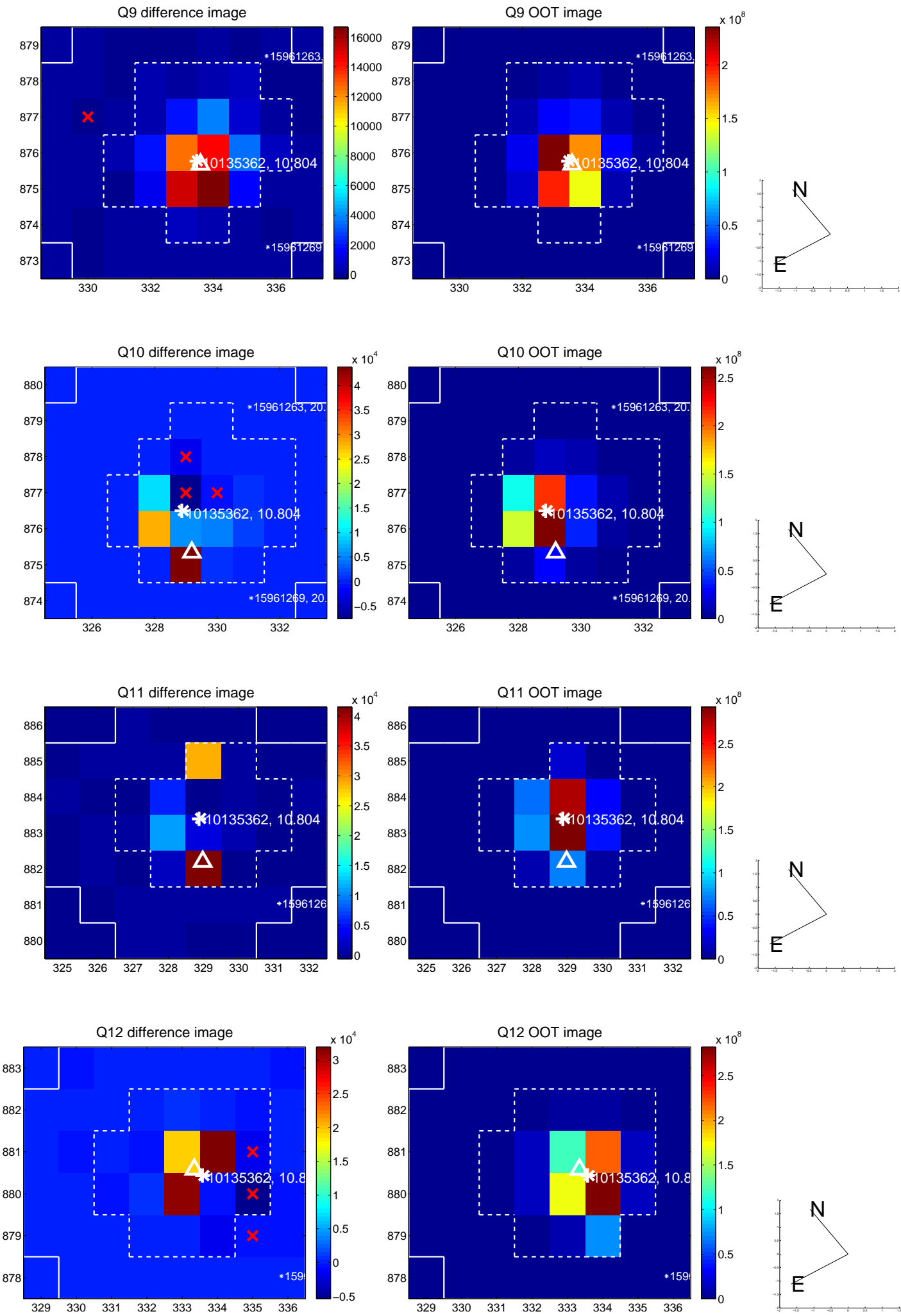


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

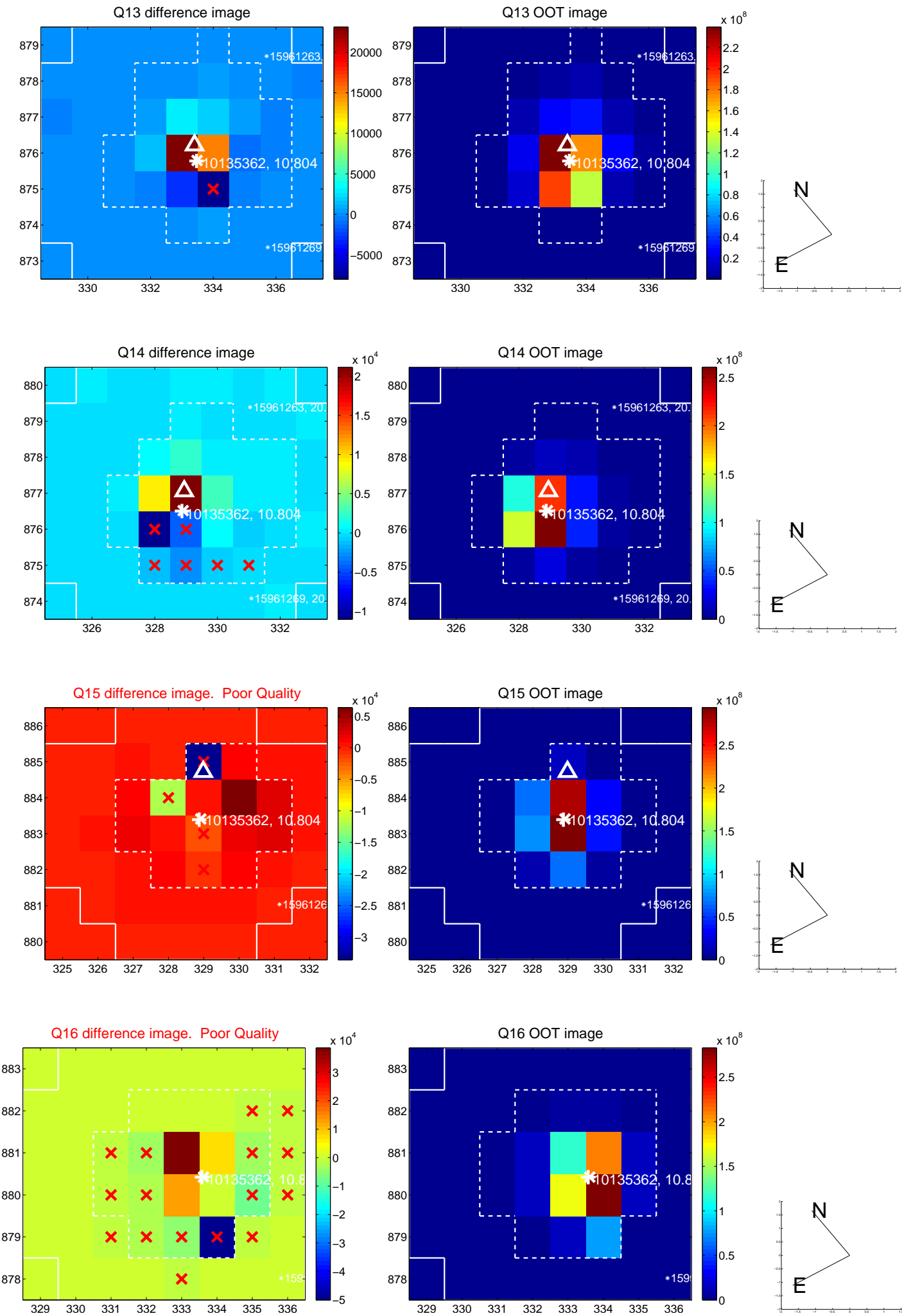




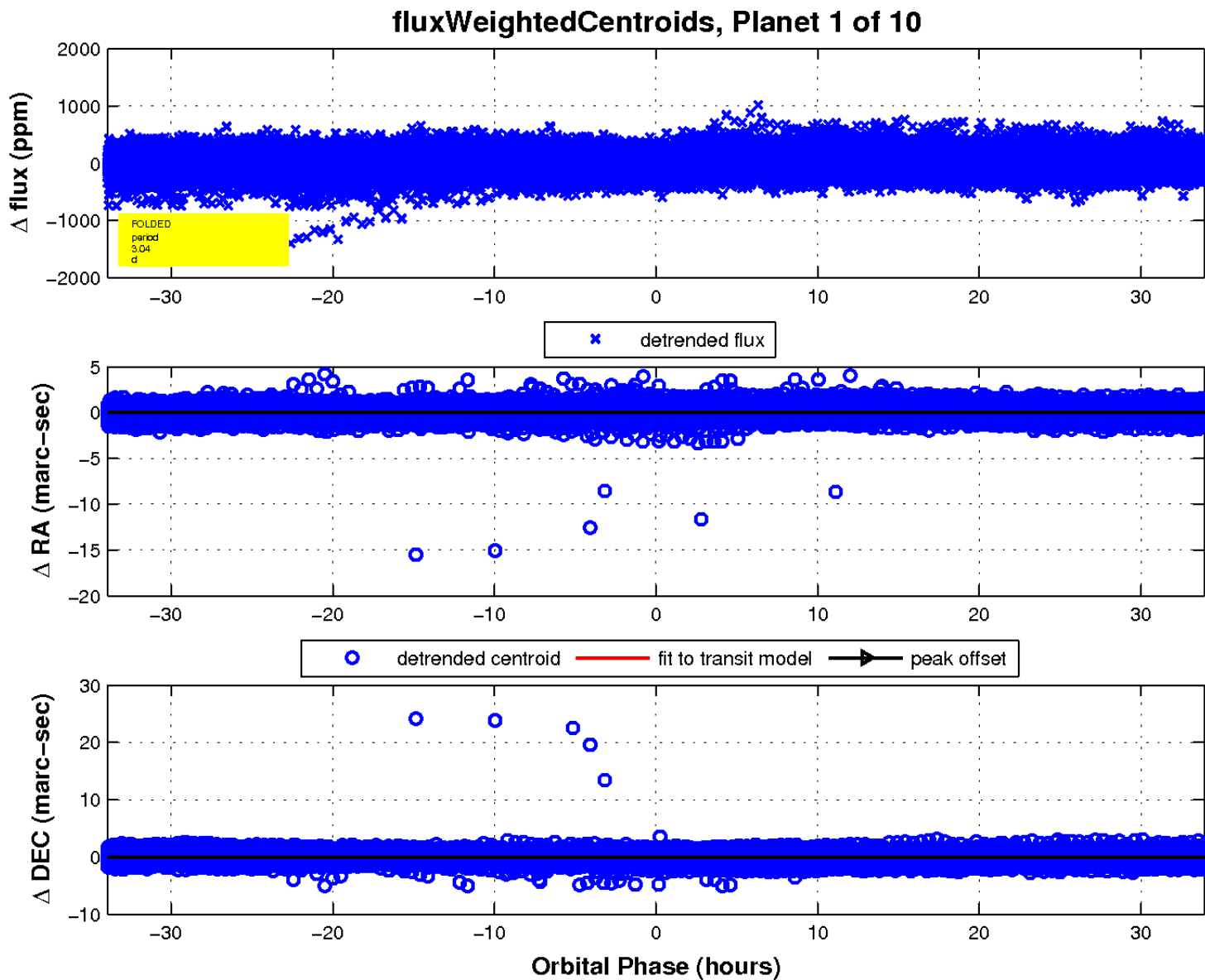
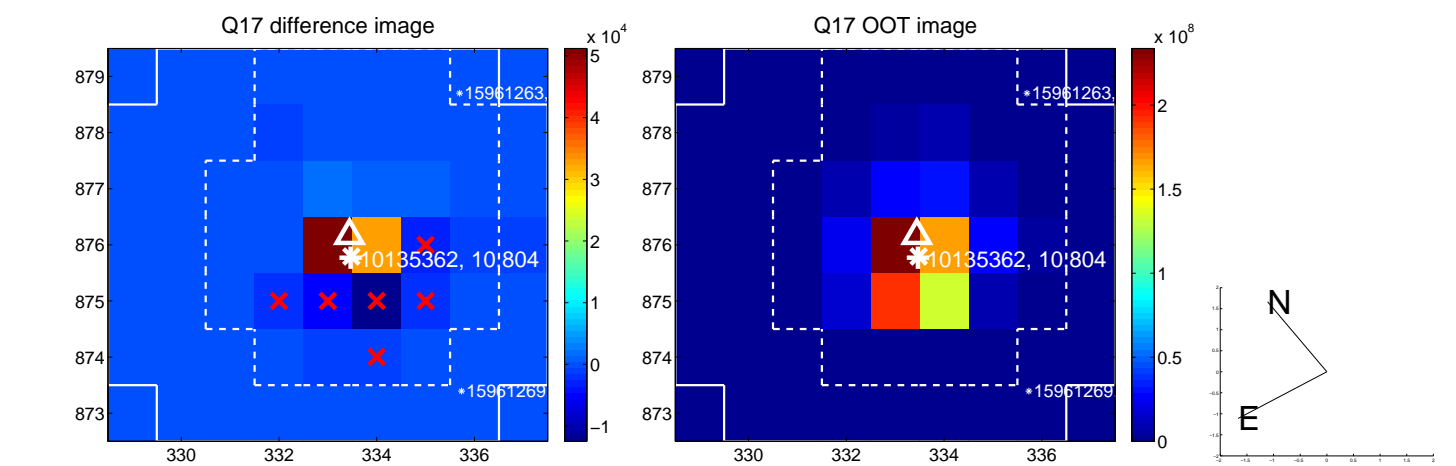
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

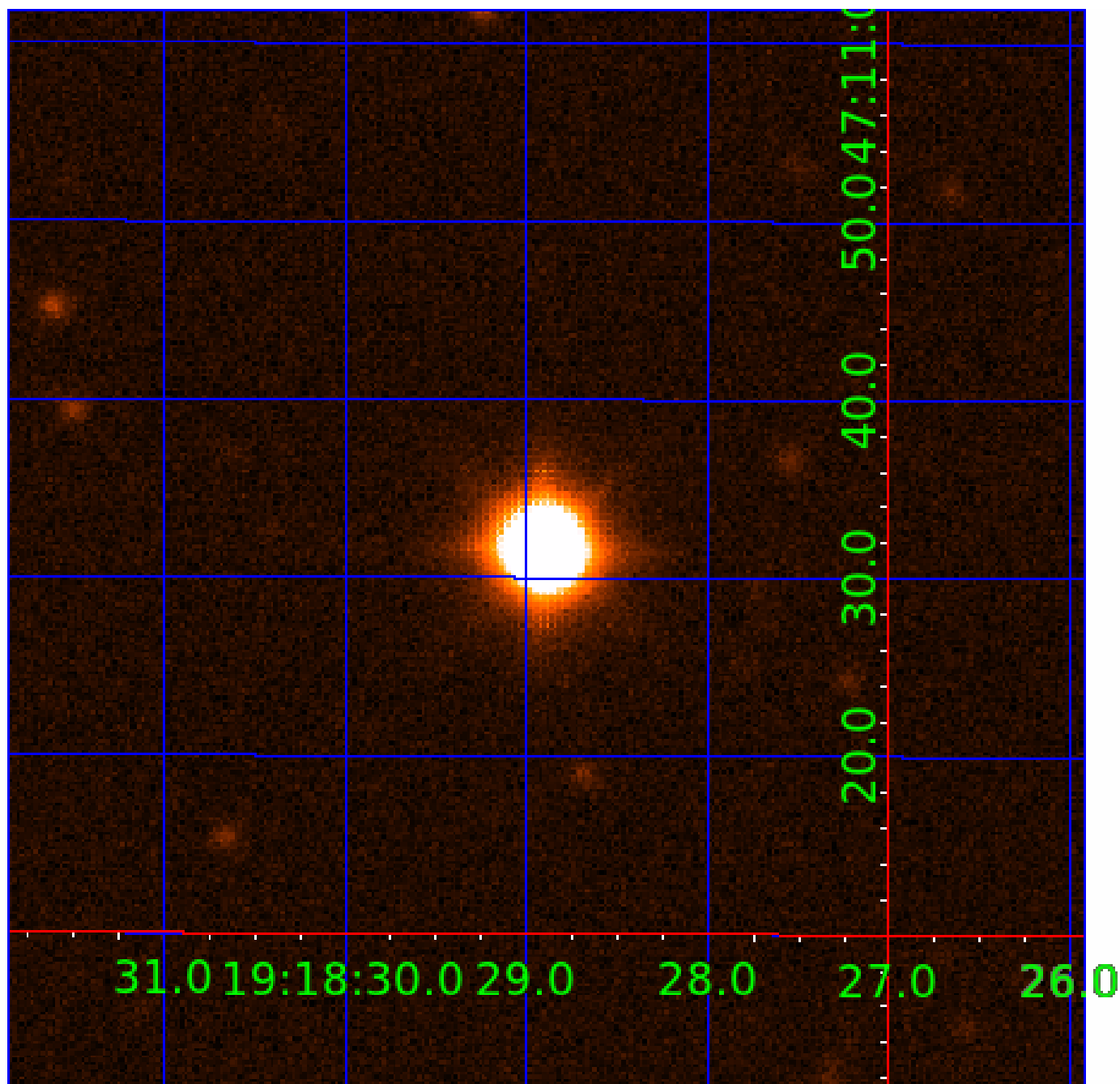


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

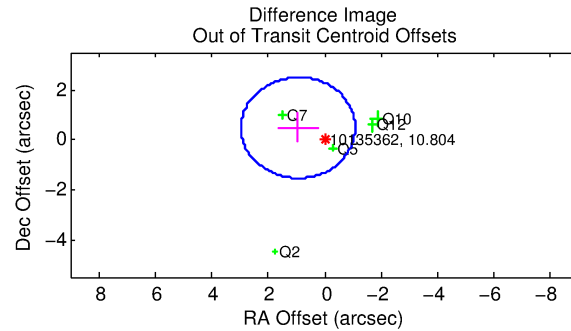
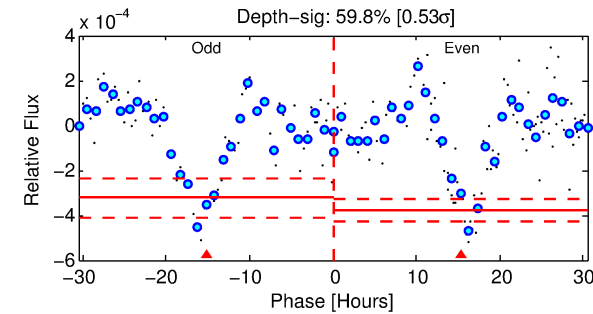
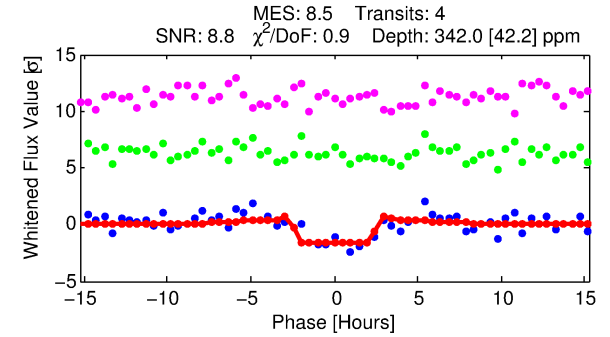
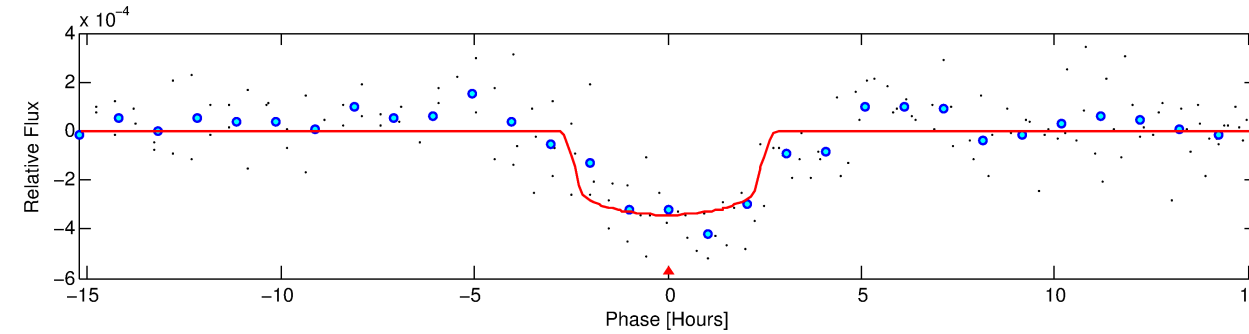
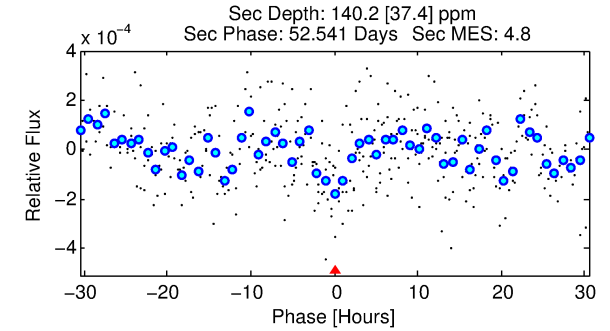
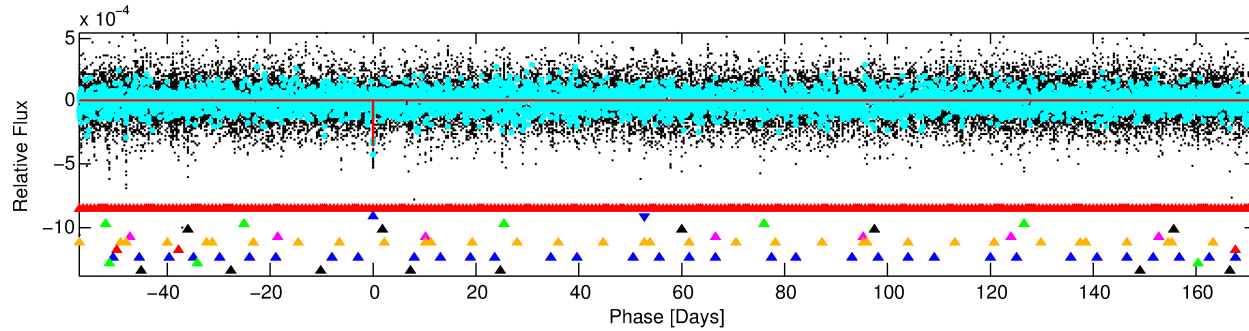
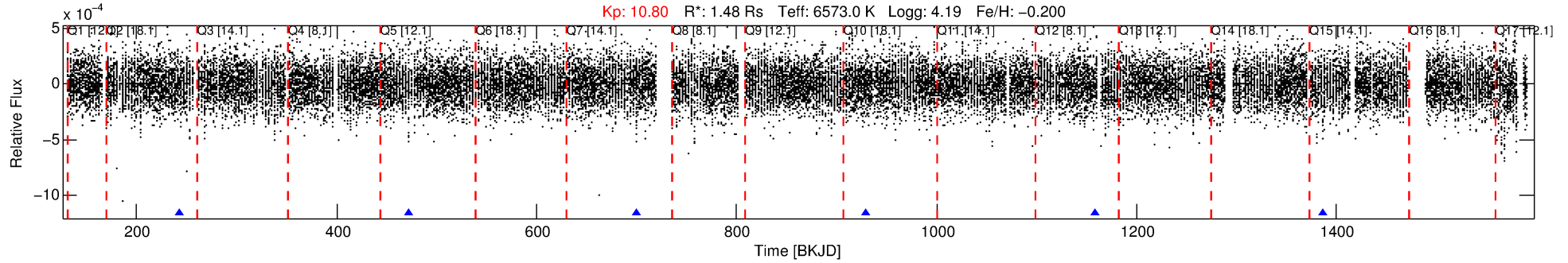
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-02

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 2 of 10 Period: 228.839 d



## DV Fit Results:

Period = 228.83908 [0.00346] d  
Epoch = 242.7264 [0.0083] BKJD  
 $R_p/R^* = 0.0176$  [0.0233]  
 $a/R^* = 298.51$  [2152.50]  
 $b = 0.53$  [9.75]  
 $S_{\text{eff}} = 5.92$  [2.32]  
 $T_{\text{eq}} = 398$  [39] K  
 $R_p = 2.83$  [3.85]  $R_e$   
 $a = 0.7848$  [0.2006] AU  
 $A_g = 5919.07$  [15904.63] [0.37σ]  
 $T_{\text{eff}} = 5393$  [3596] K [1.39σ]

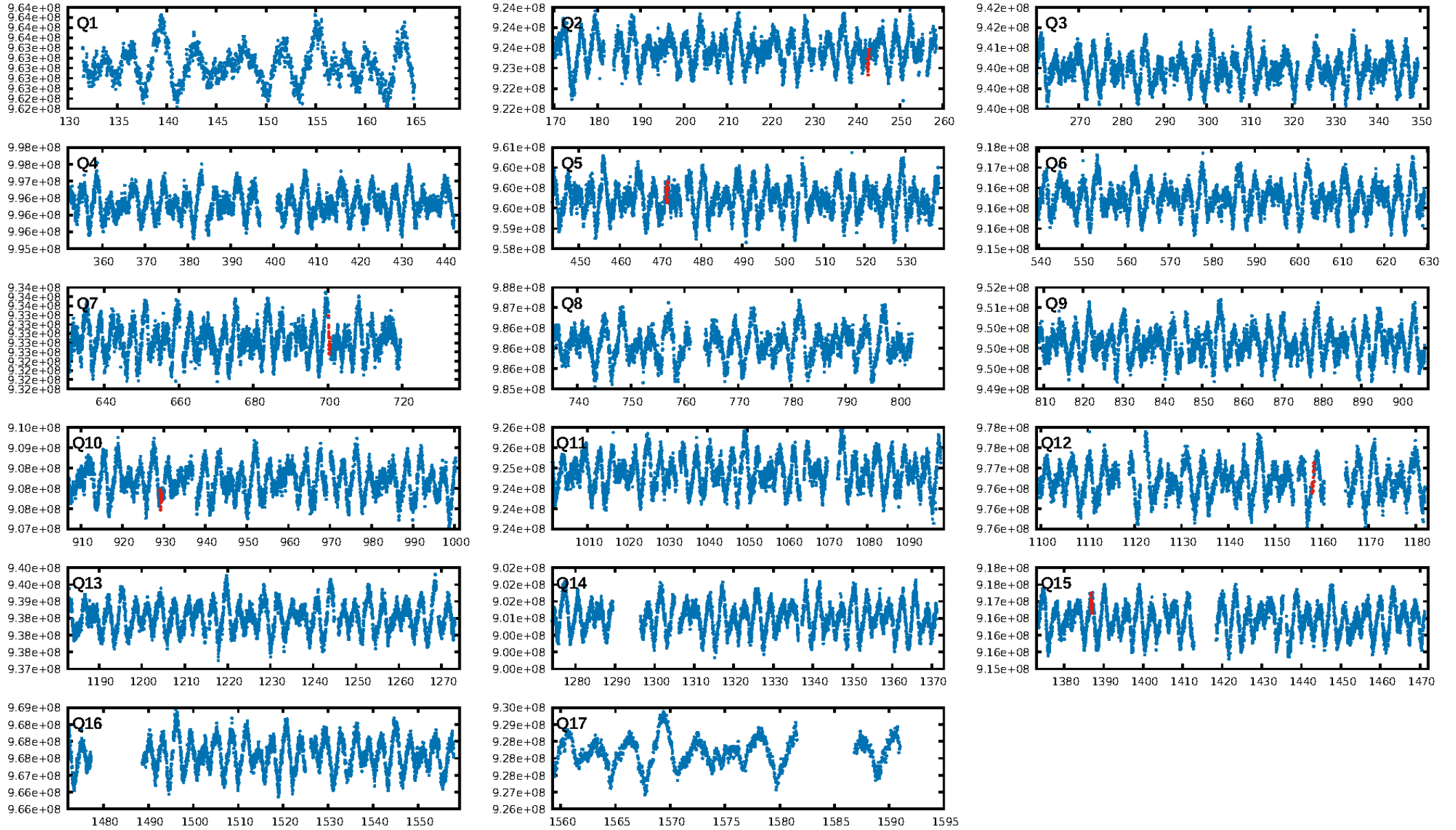
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [50.97σ]  
LongPeriod-sig: 100.0% [90.37σ]  
ModelChiSquare2-sig: 71.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 7.992  
Centroid-sig: 28.9%  
Centroid-so: 0.805 arcsec [1.88σ]  
OotOffset-rm: 1.054 arcsec [1.57σ]  
OotOffset-st: 2/1/1/1 [5]  
KicOffset-rm: 1.214 arcsec [1.81σ]  
KicOffset-st: 2/1/1/1 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 0.60 [3/5]

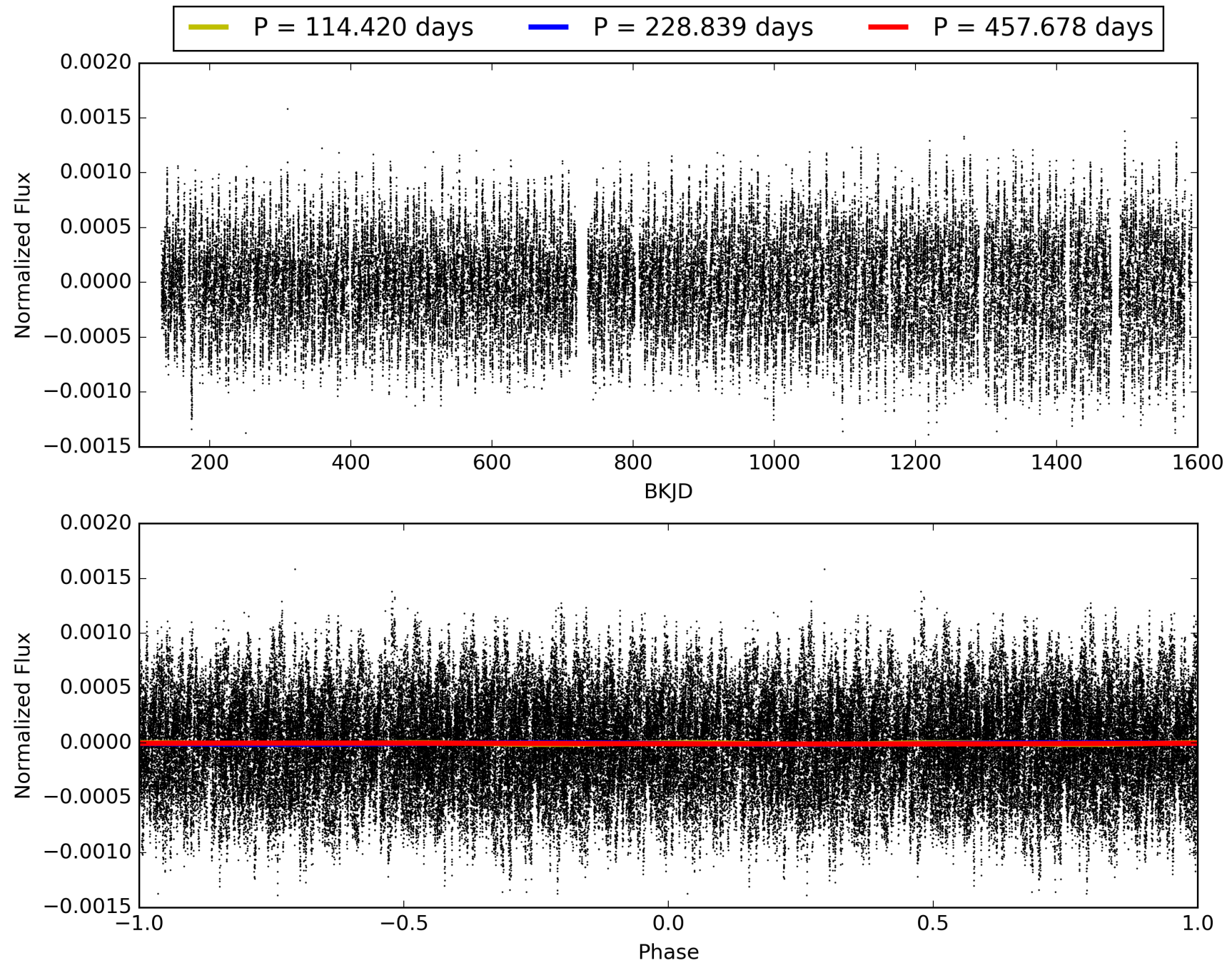
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:09 Z

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

# TCE 010135362-02, PDC Light Curves

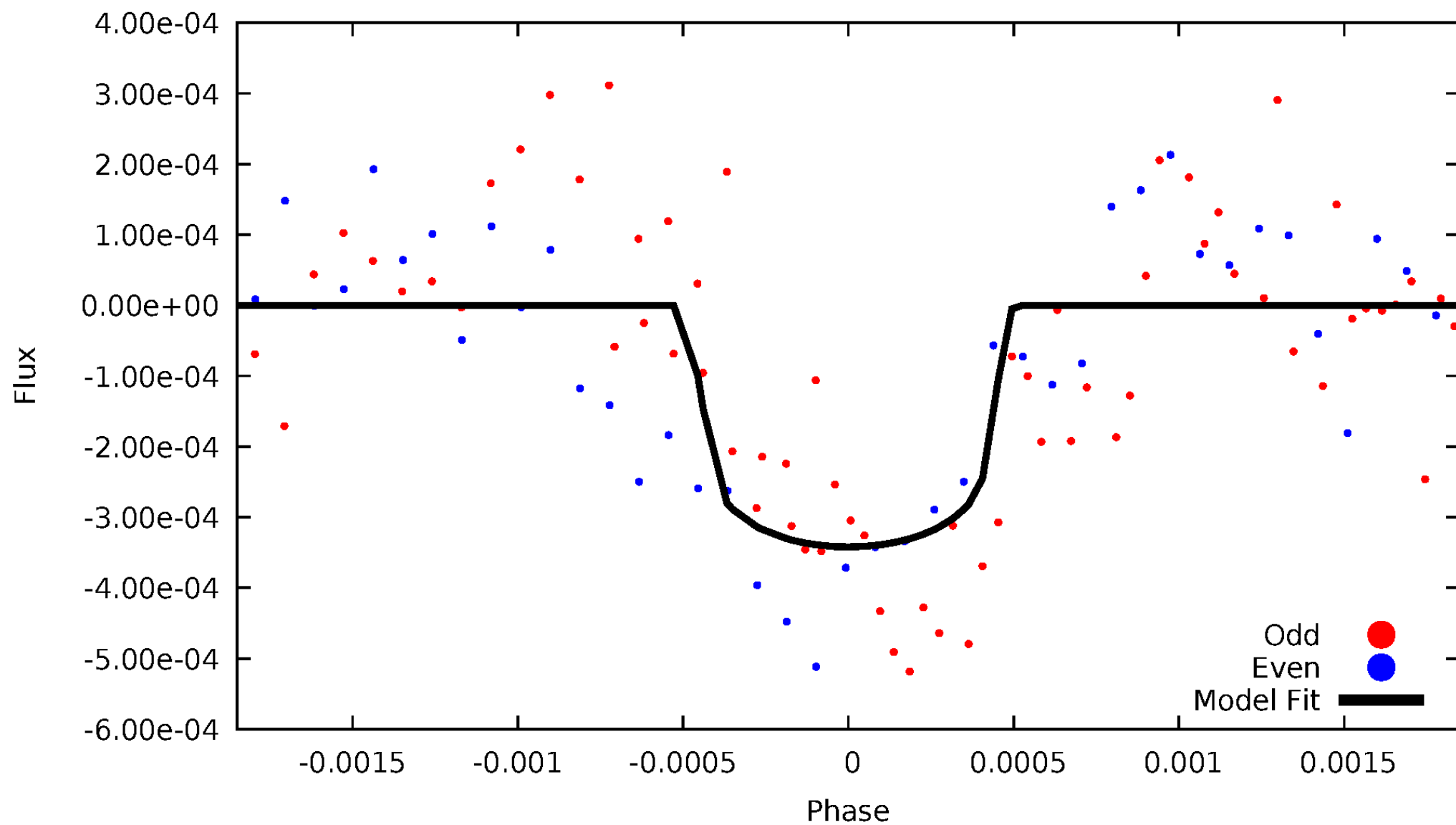


# TCE 010135362-02



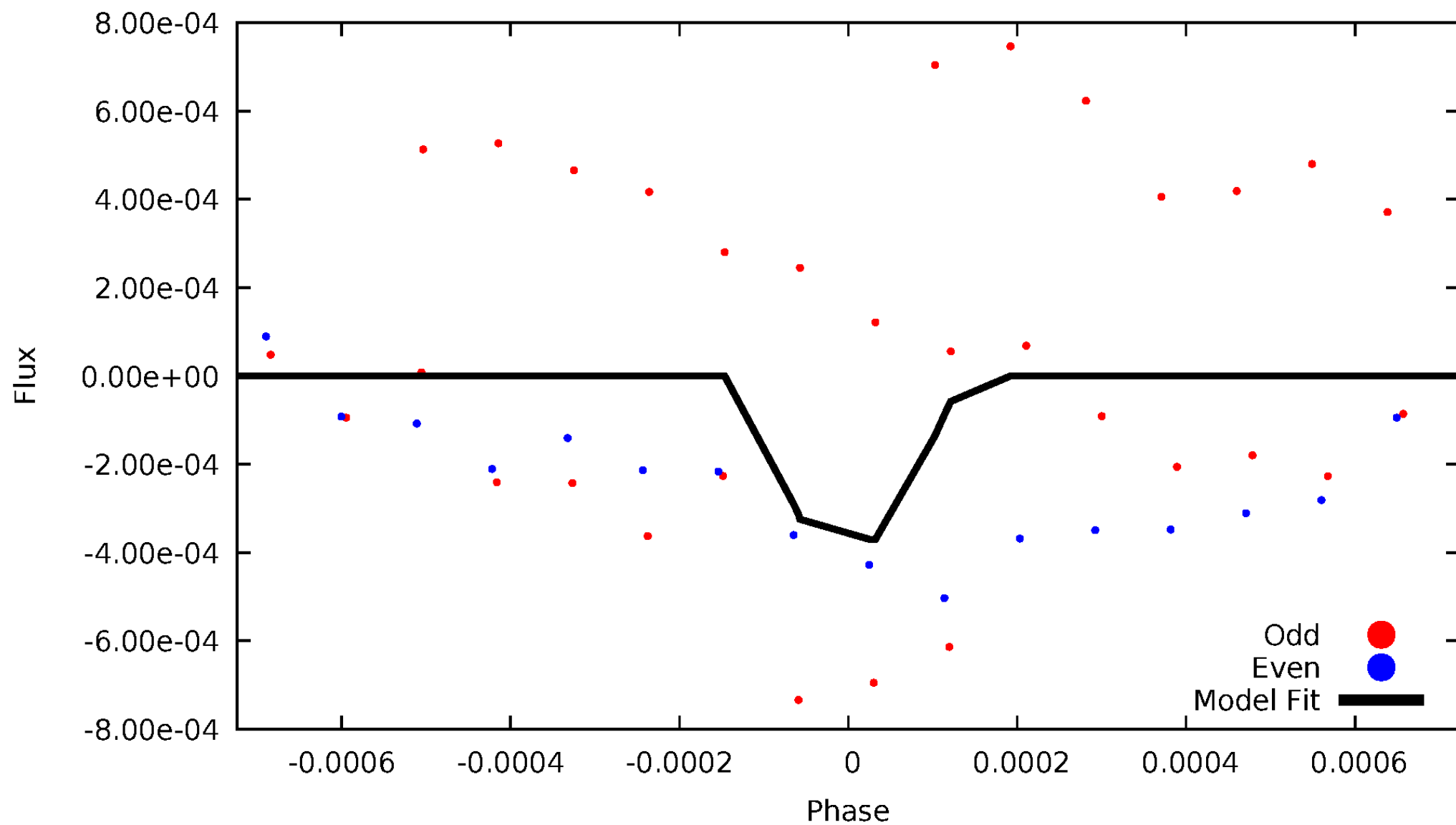
# DV Odd/Even

TCE 010135362-02



# ALT Odd/Even

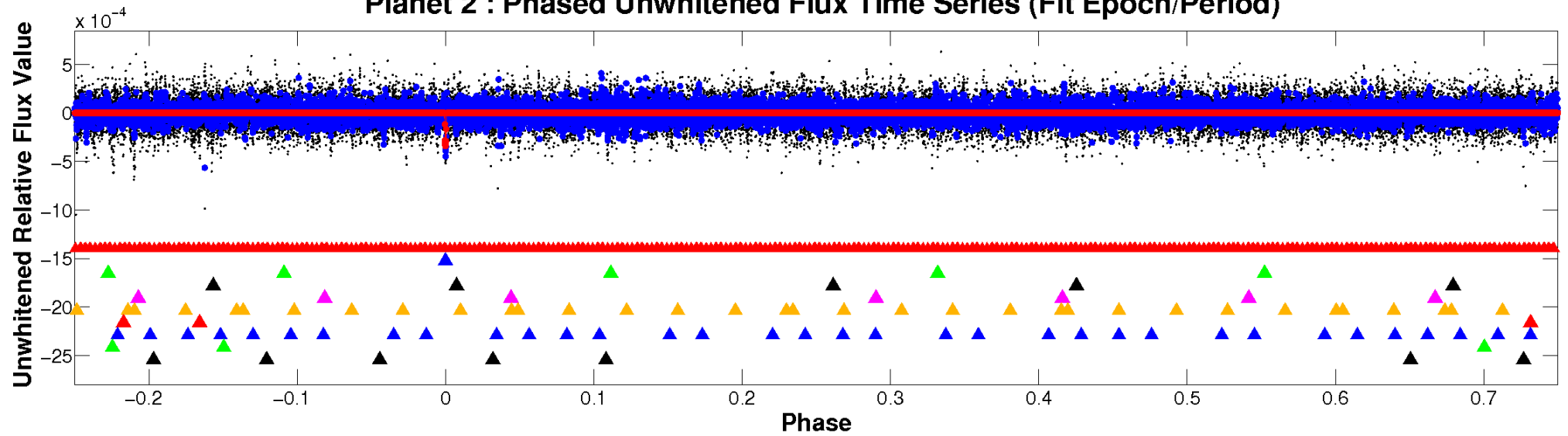
TCE 010135362-02



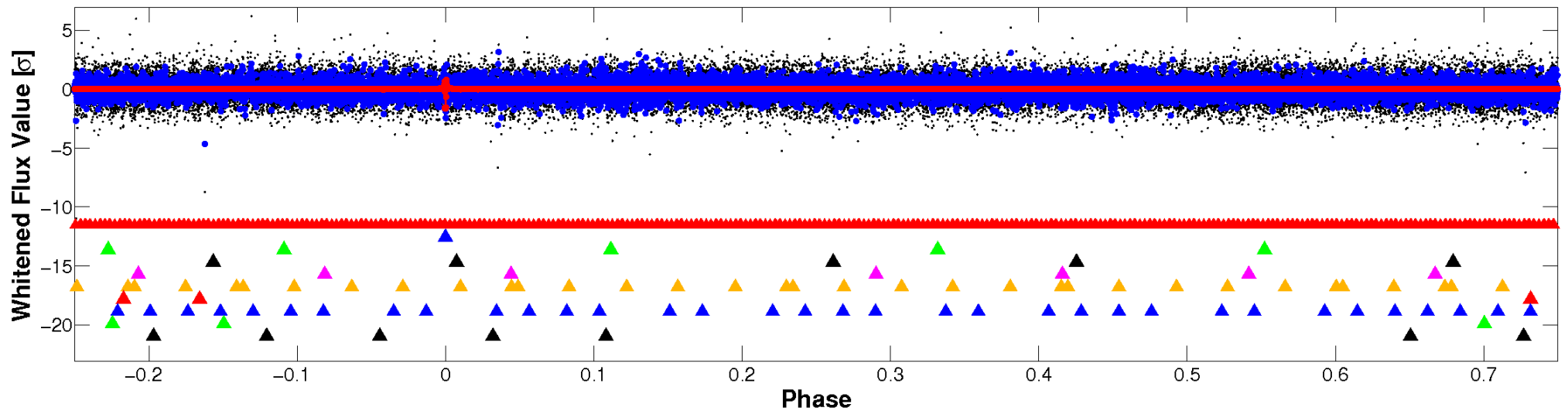


# Non-Whitened Vs. Whitened Light Curve

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



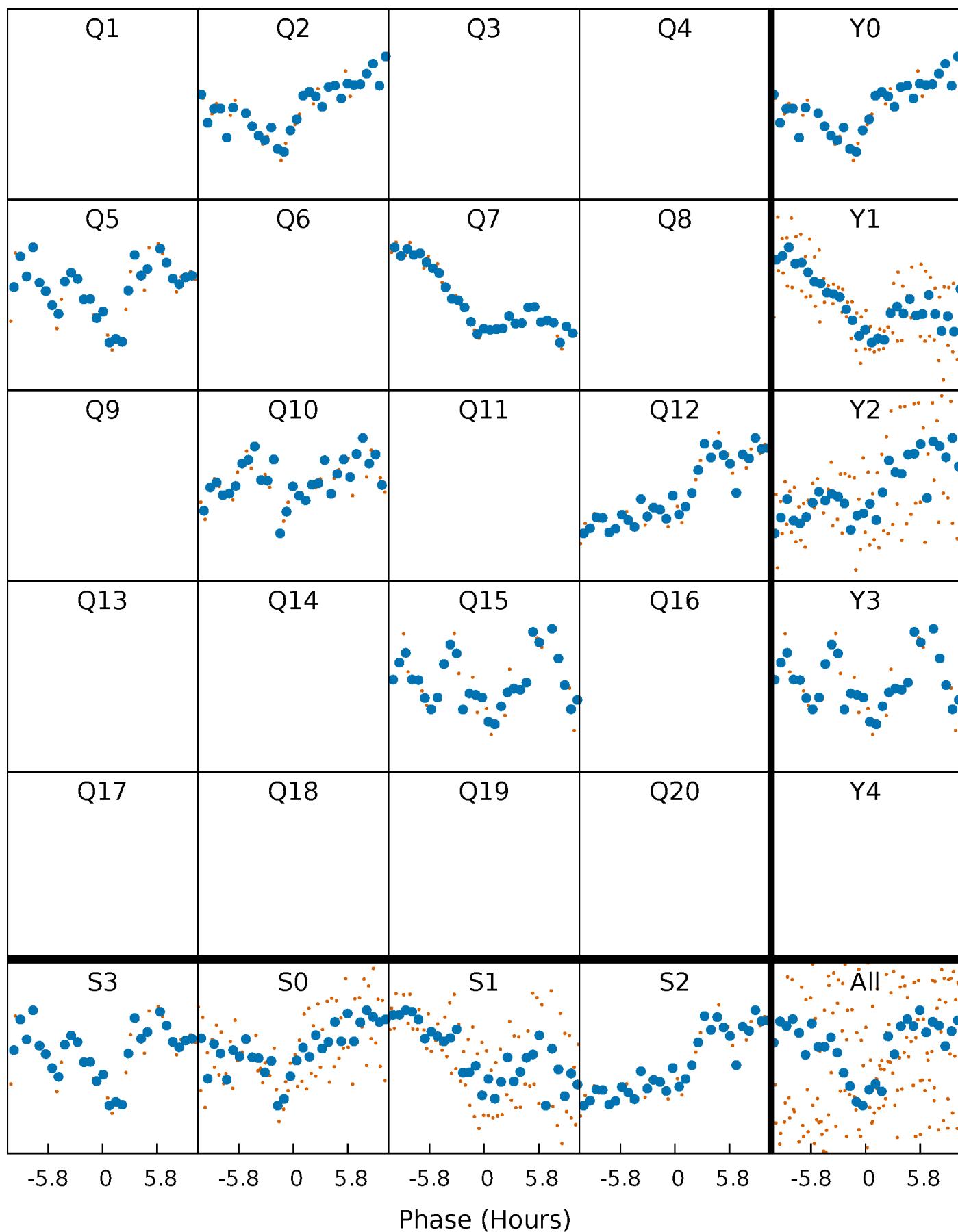
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





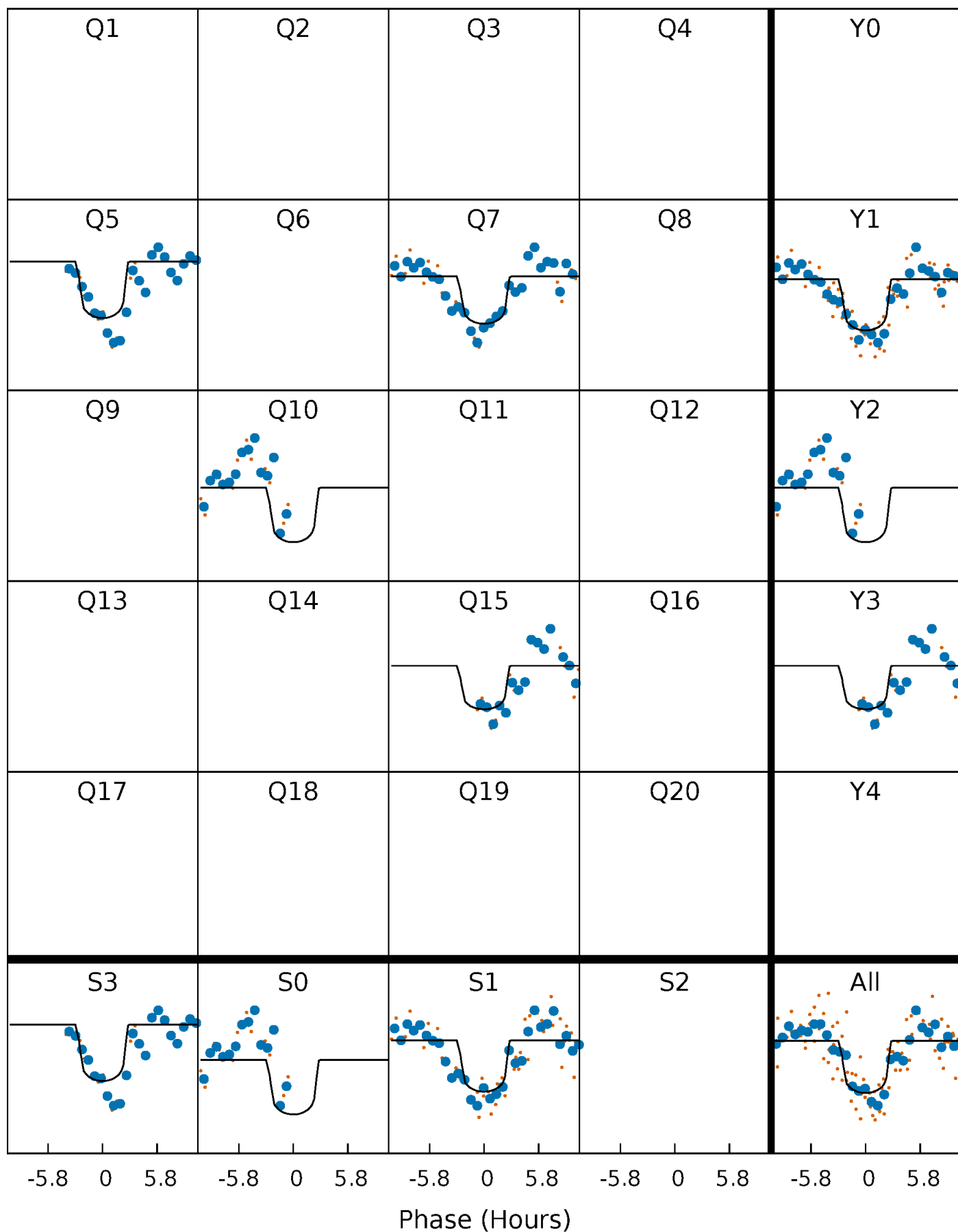
# PDC Quarter-Phased Transit Curves

TCE 010135362-02 P=228.839082 Days  $T_0=242.726412$  (BKJD)



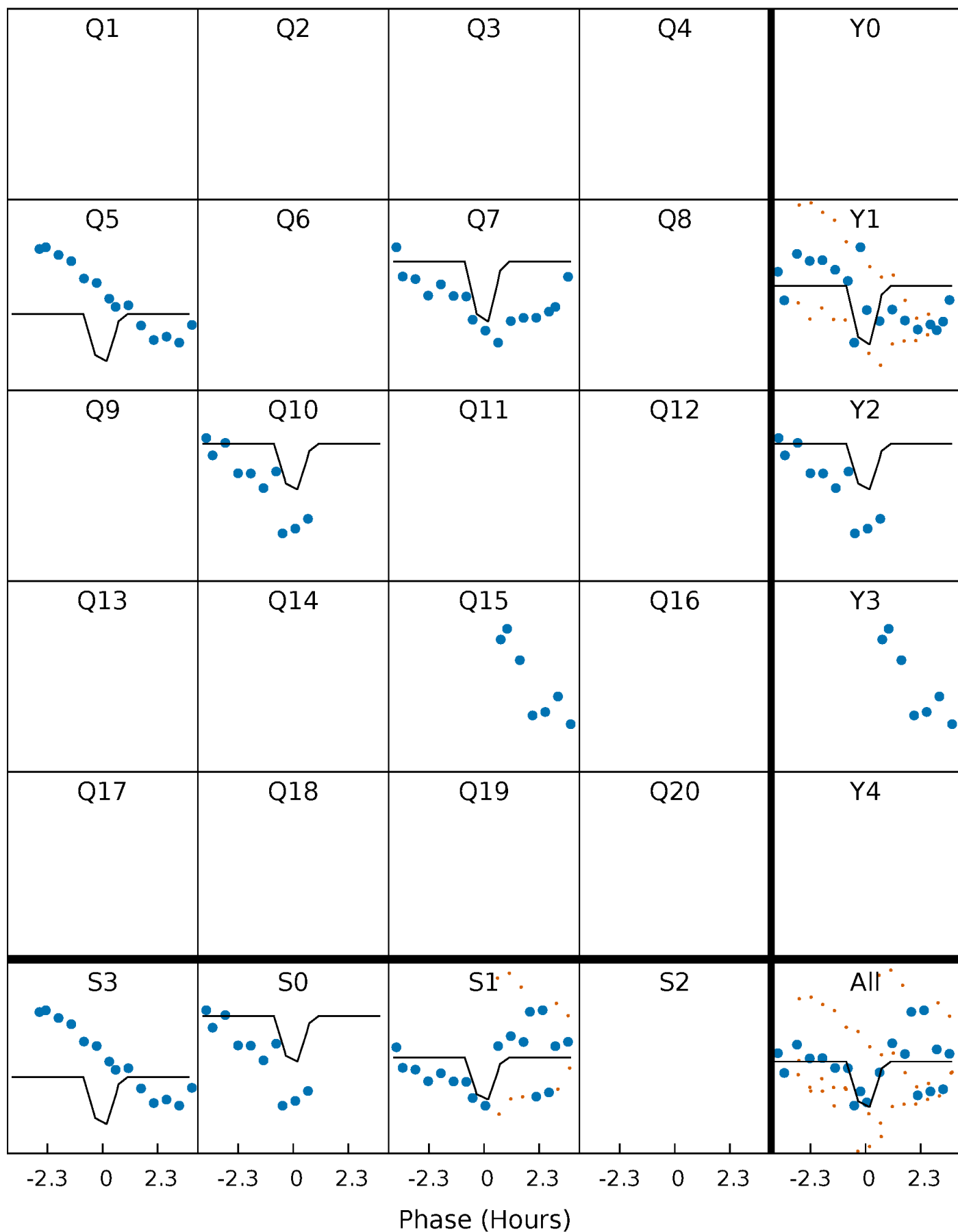
# DV Quarter-Phased Transit Curves

TCE 010135362-02     $P=228.839082$  Days     $T_0=242.726412$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

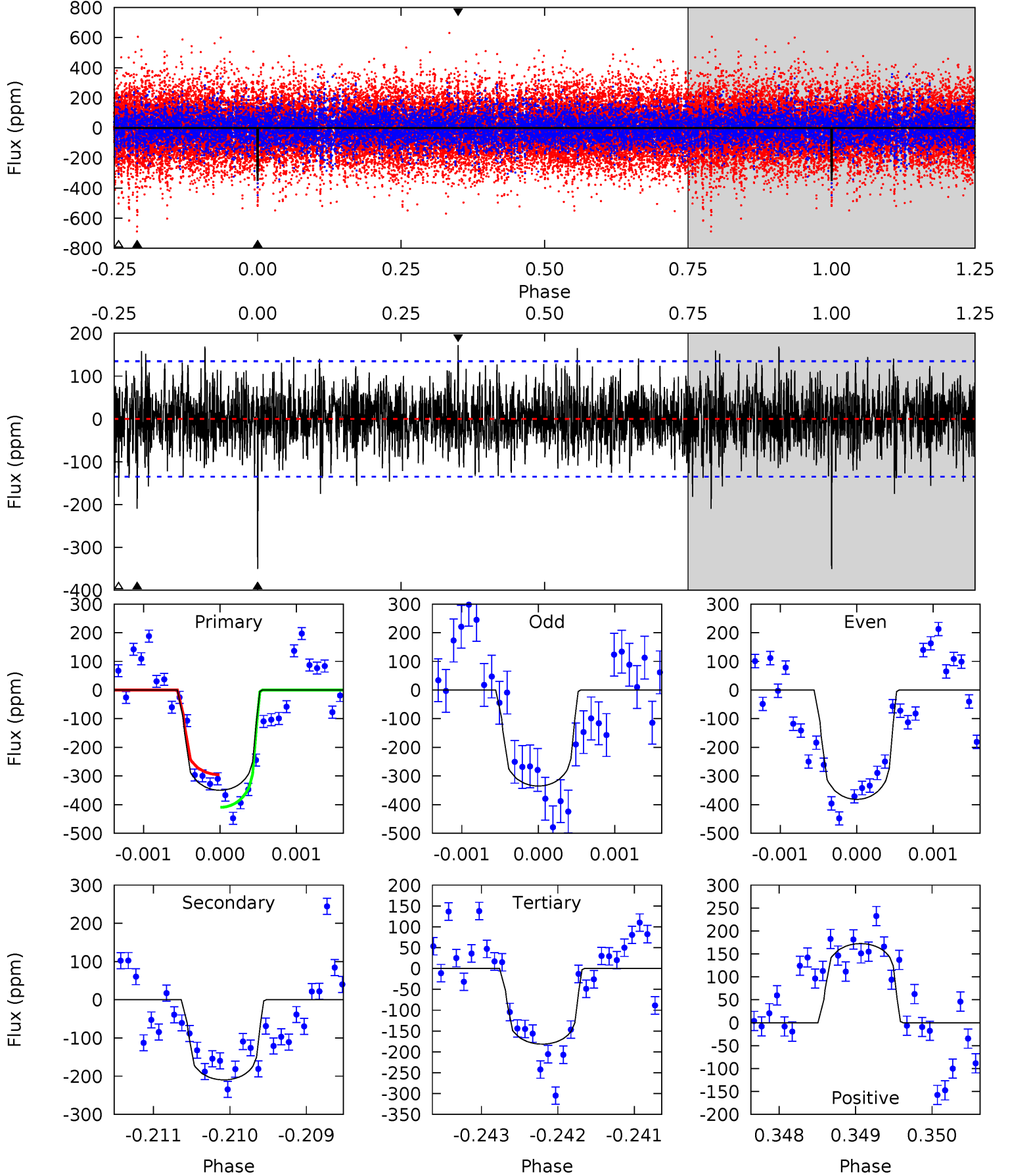
TCE 010135362-02 P=228.837410 Days  $T_0=242.681460$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-02,  $P = 228.839082$  Days,  $E = 13.887330$  Days

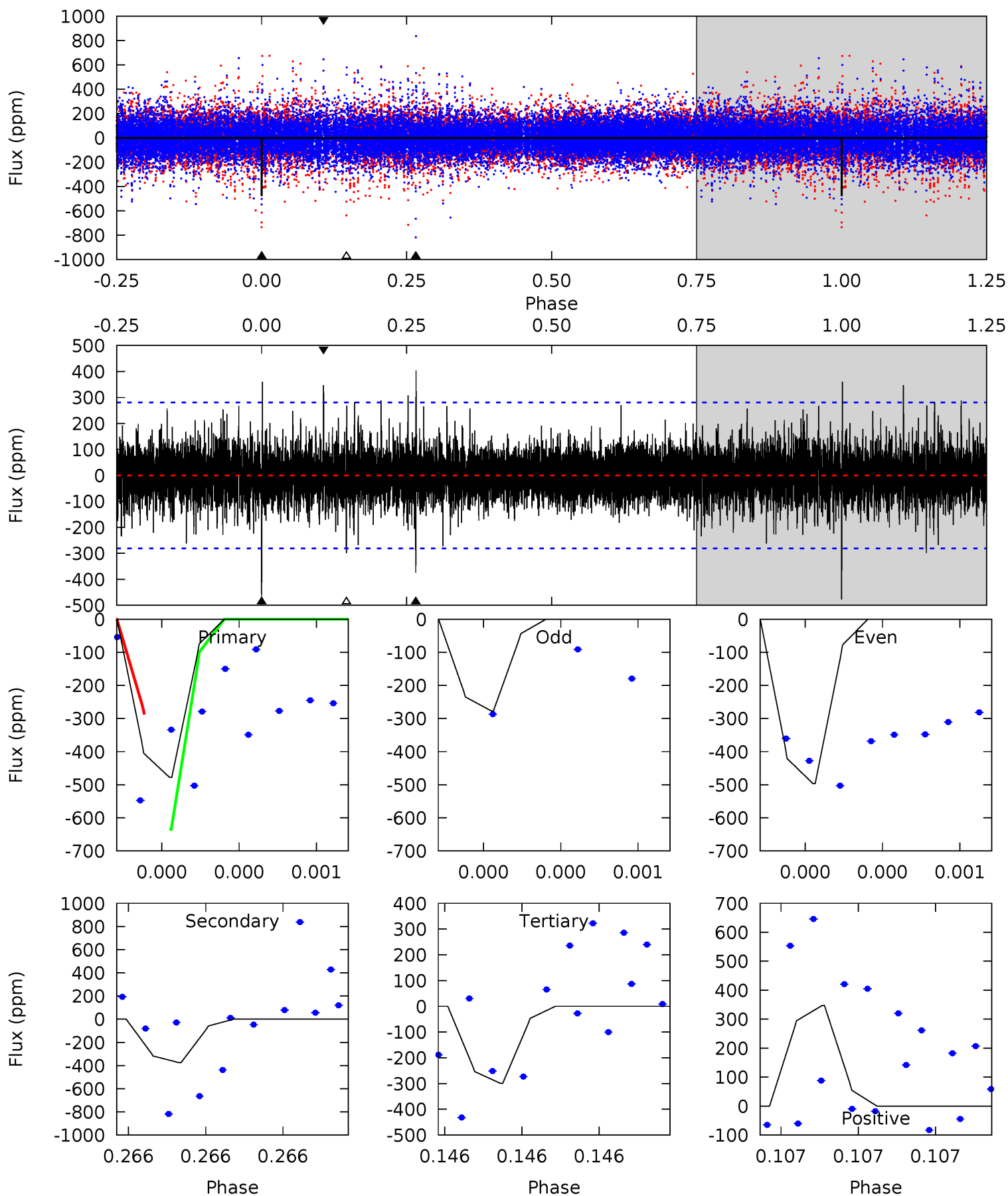
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	8.50	7.36	7.00	5.46	3.31	1.96	6.83	7.19	1.14	1.51	0.87	0.83	0.33	2.31



# Alt Model-Shift Uniqueness Test

010135362-02, P = 228.837410 Days, E = 13.844050 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
9.68	7.59	6.06	7.04	5.69	3.66	1.27	3.62	2.64	1.53	0.55	2.09	0.75	0.46	2.69





### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-210 \pm 25$	$3.90^{+3.59}_{-2.35}$	$557^{+46}_{-39}$	$5156^{+3166}_{-1184}$	$4823^{+24308}_{-3590}$
Alt.	$-375 \pm 49$	$4.13^{+3.62}_{-2.70}$	$555^{+47}_{-41}$	$5749^{+4913}_{-1316}$	$7803^{+51752}_{-5571}$

$T_{max}$  = 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

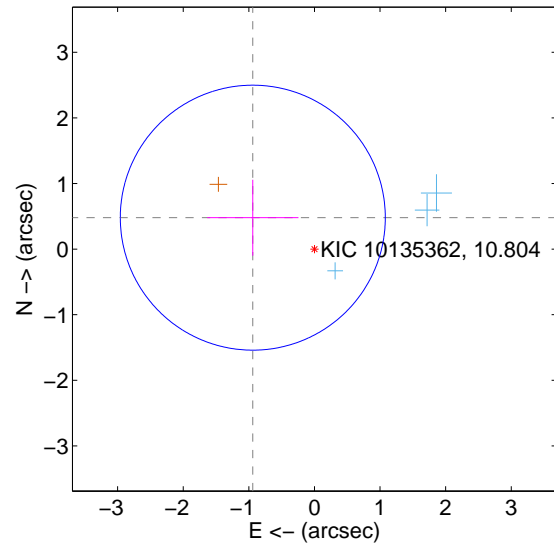
Supplemental centroid analysis for 010135362-02. **Kepler magnitude: 10.80.** Transit SNR 8.84

There are 4 quarters with good PRF difference image offsets

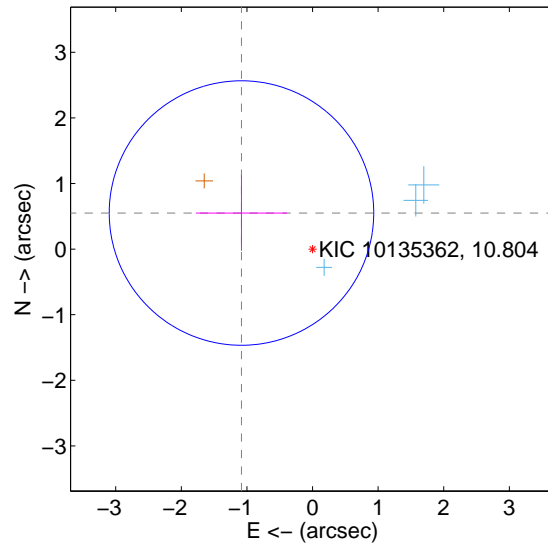
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.054 \pm 0.673$	1.57	$0.939 \pm 0.695$	$0.479 \pm 0.579$
PRF-fit source offset from KIC position	$1.214 \pm 0.672$	1.81	$1.083 \pm 0.694$	$0.550 \pm 0.576$
photometric centroid source offset	$0.81 \pm 0.43$	1.88	$0.73 \pm 0.41$	$-0.33 \pm 0.50$

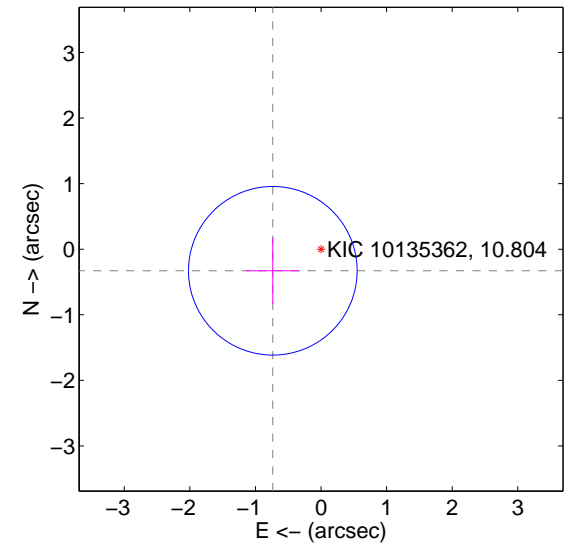
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

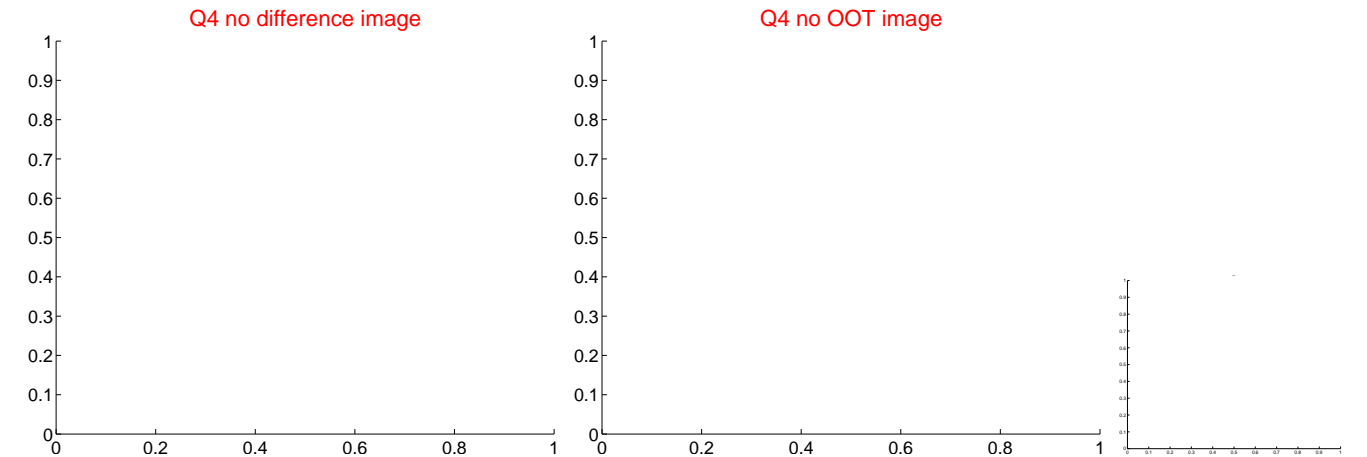
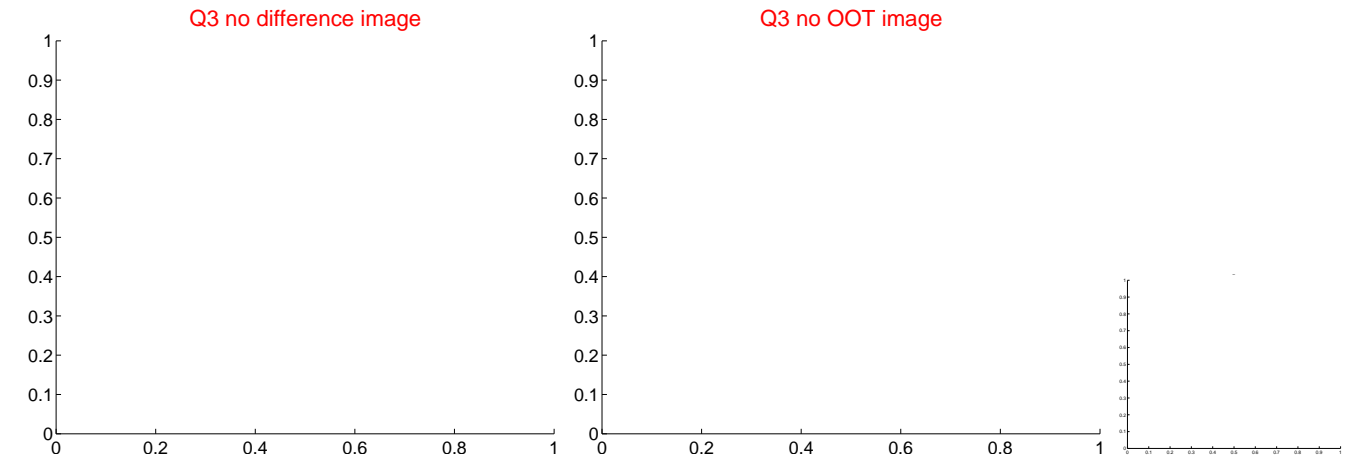
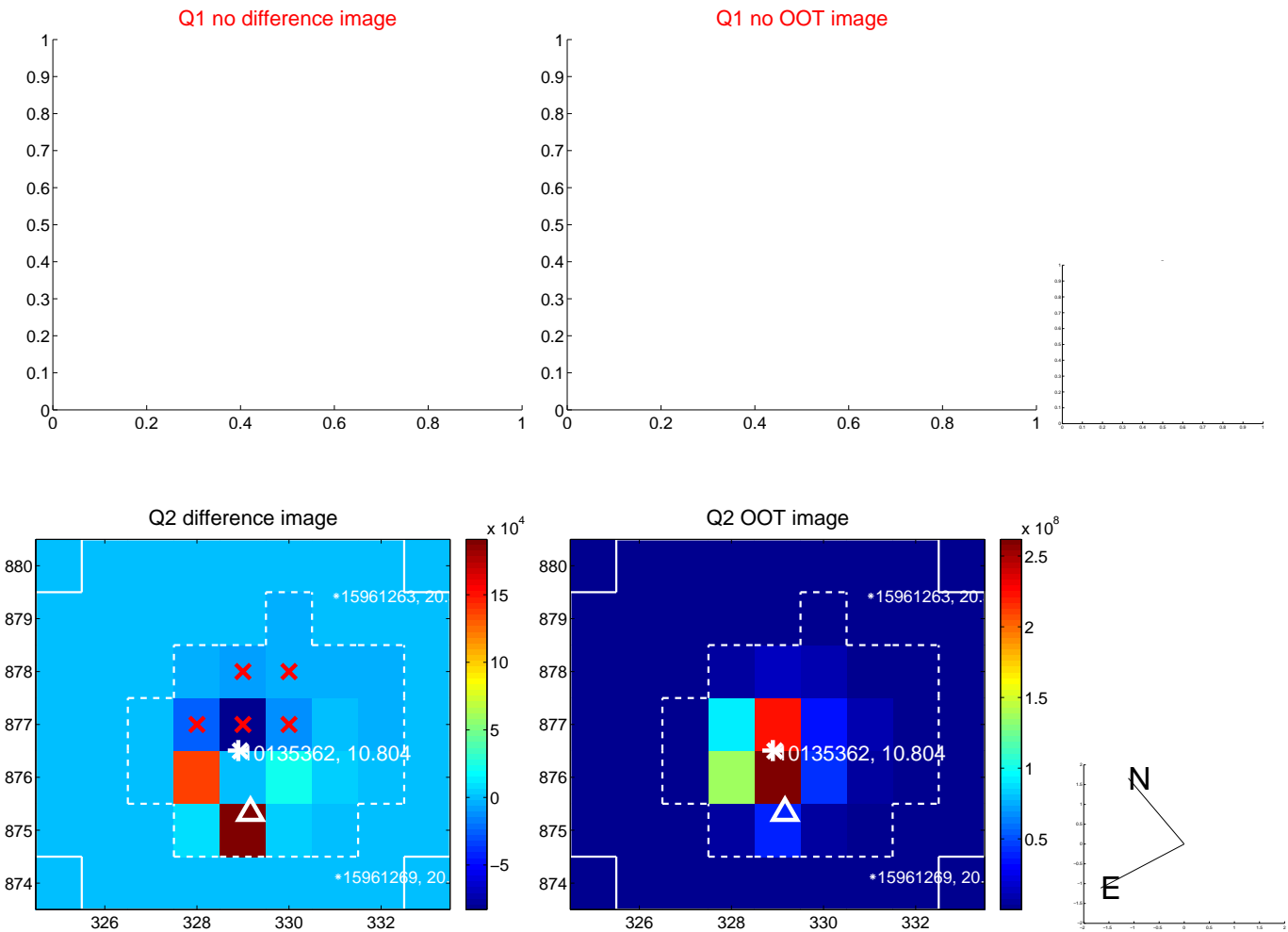


offset from photometric centroids

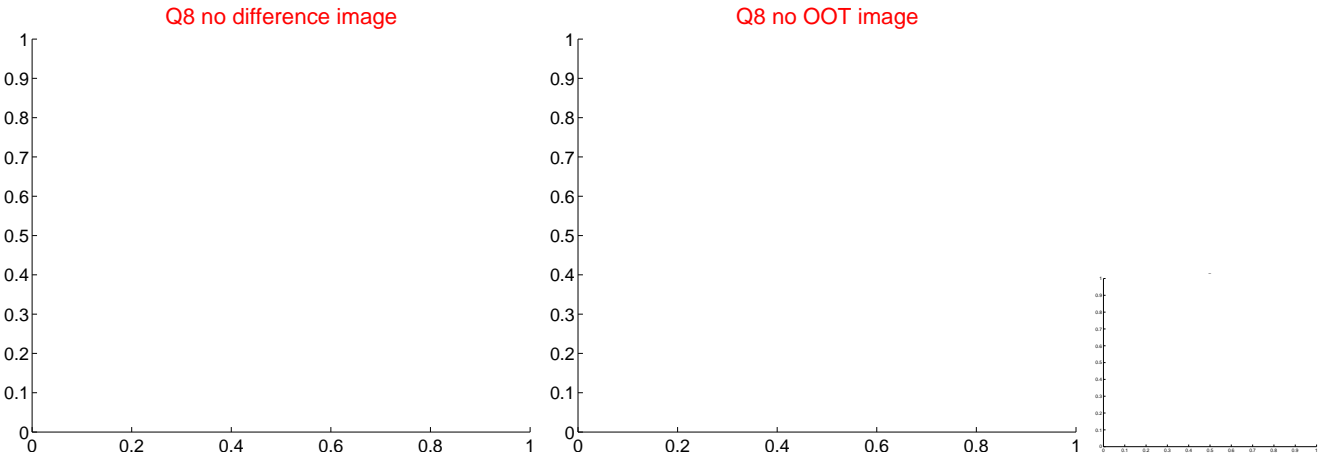
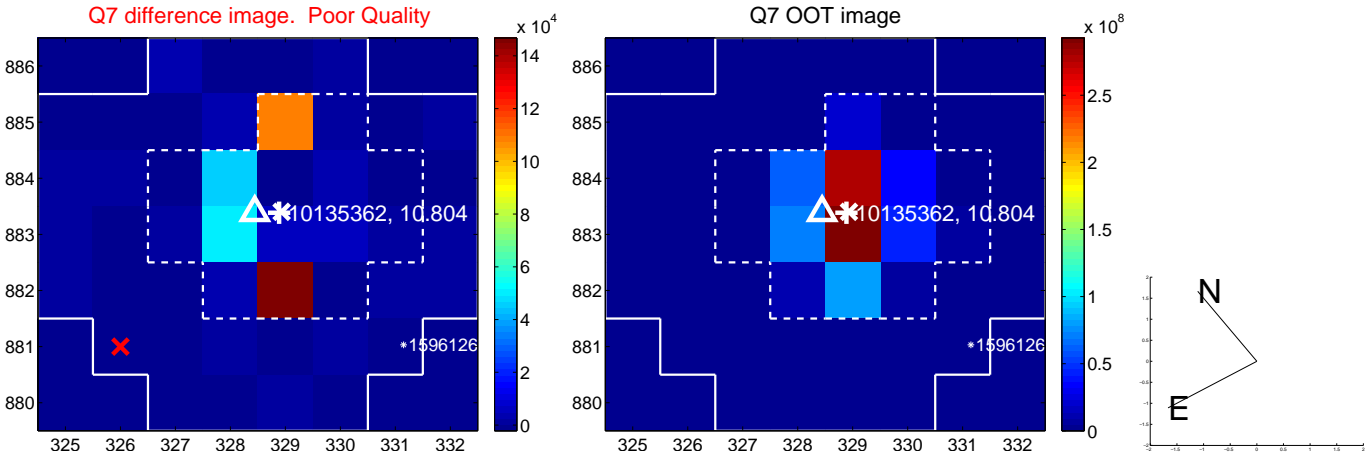
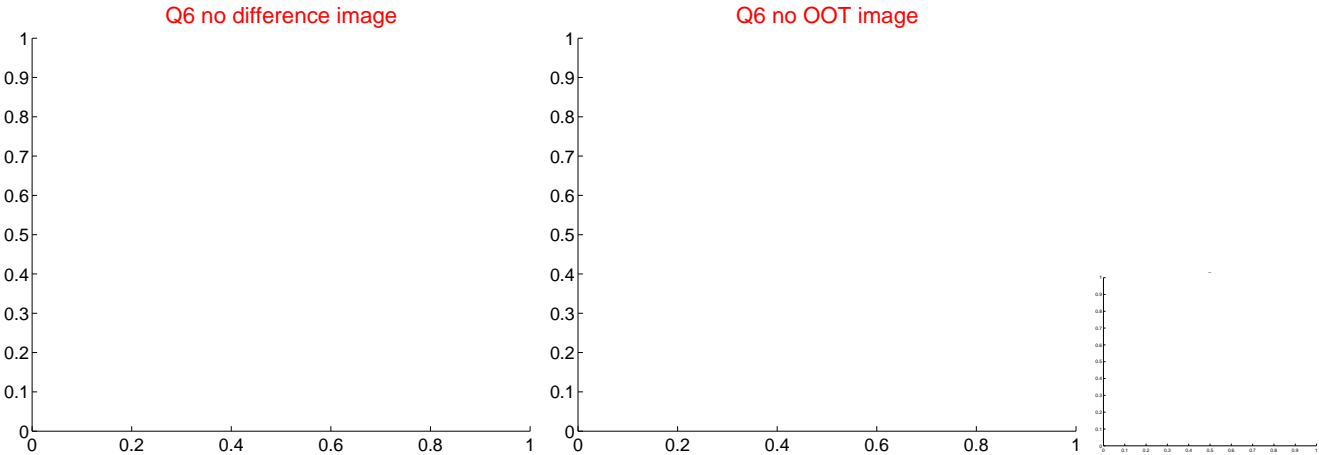
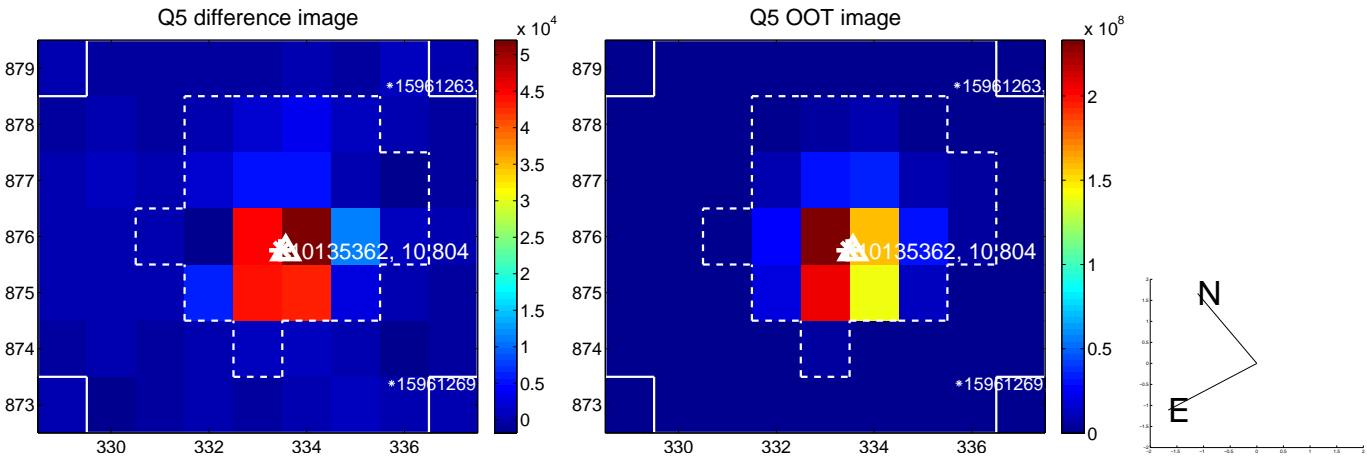


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

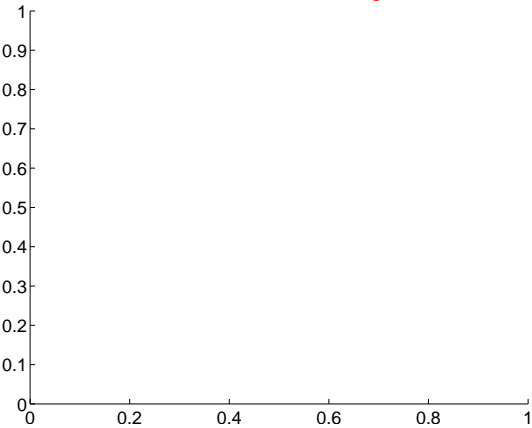


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

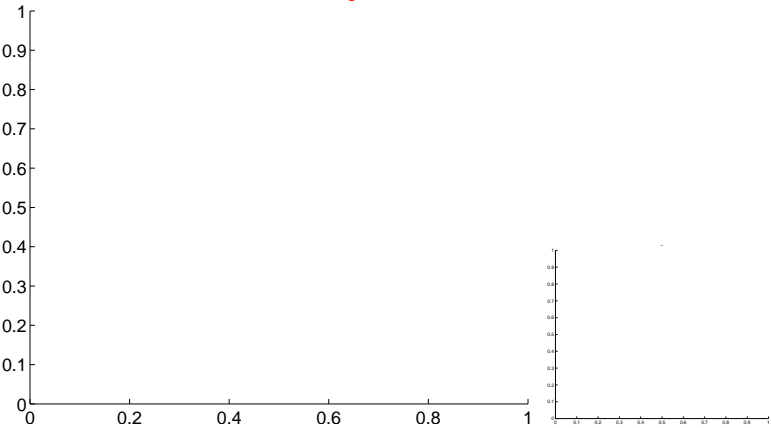


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

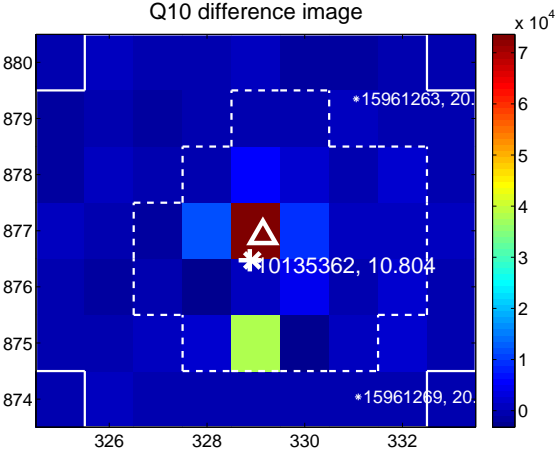
Q9 no difference image



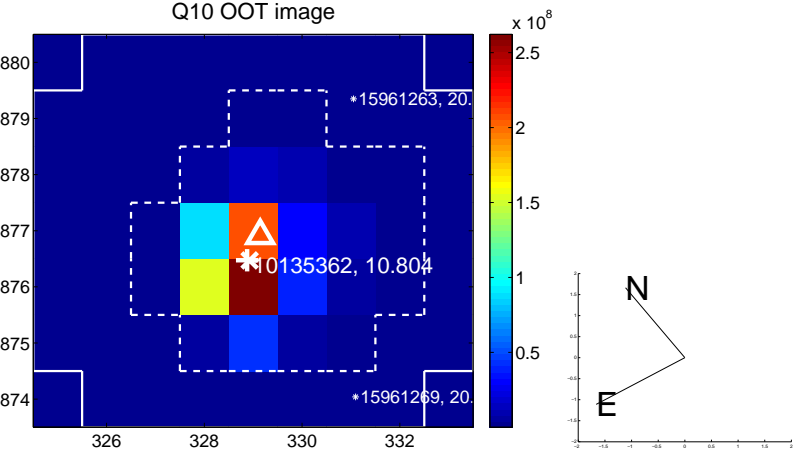
Q9 no OOT image



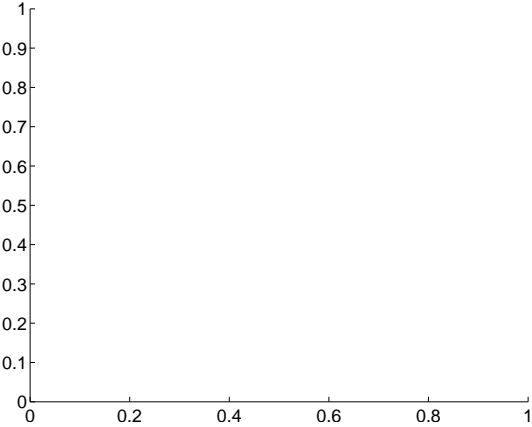
Q10 difference image



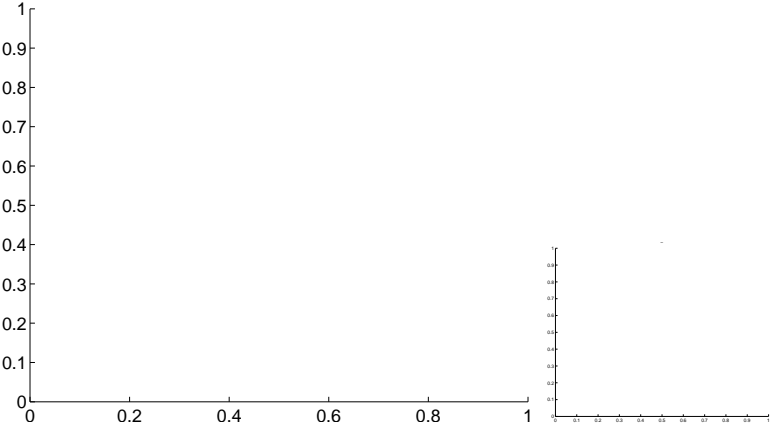
Q10 OOT image



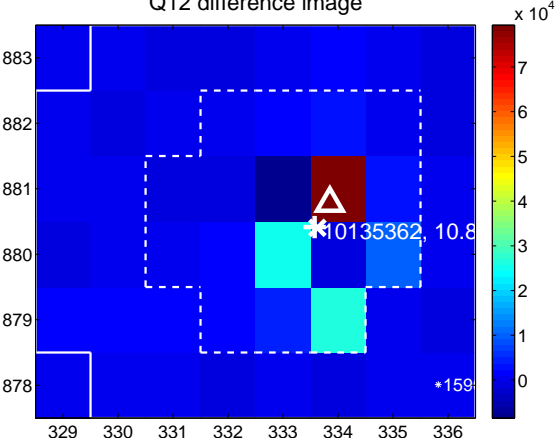
Q11 no difference image



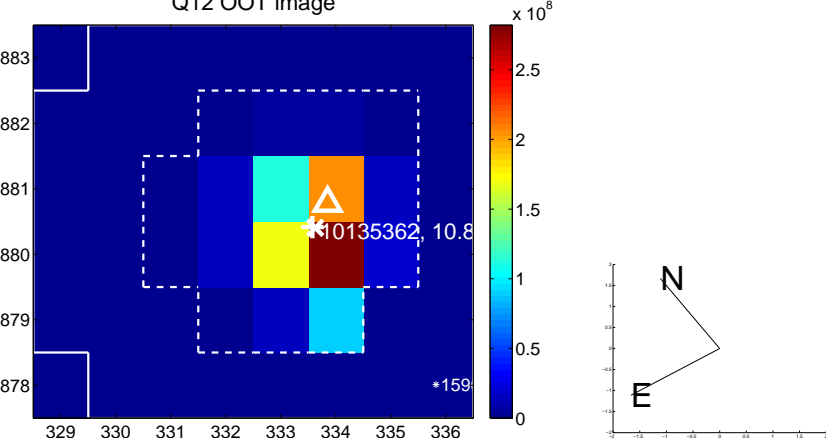
Q11 no OOT image



Q12 difference image

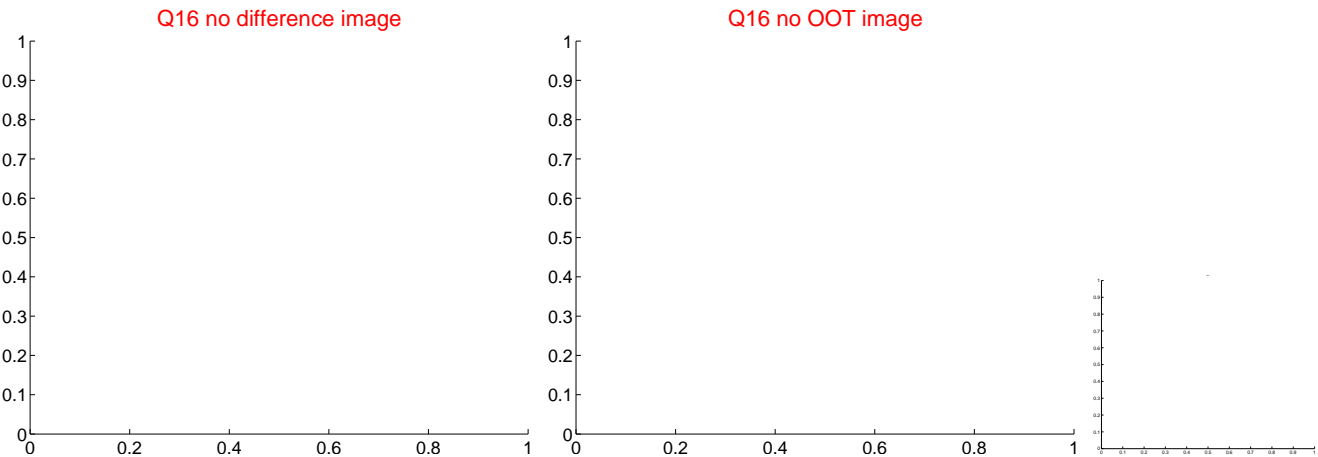
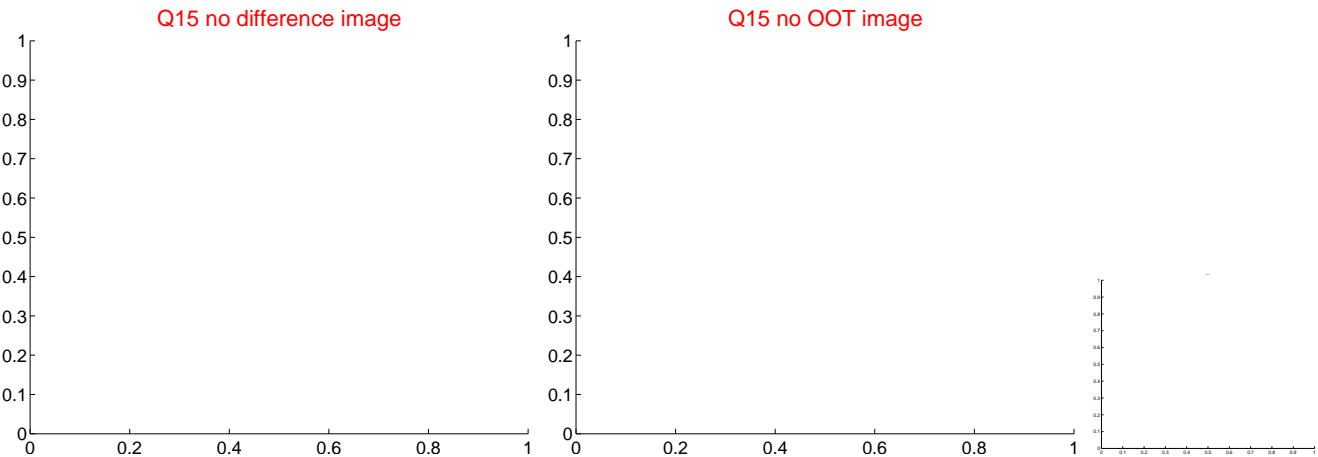
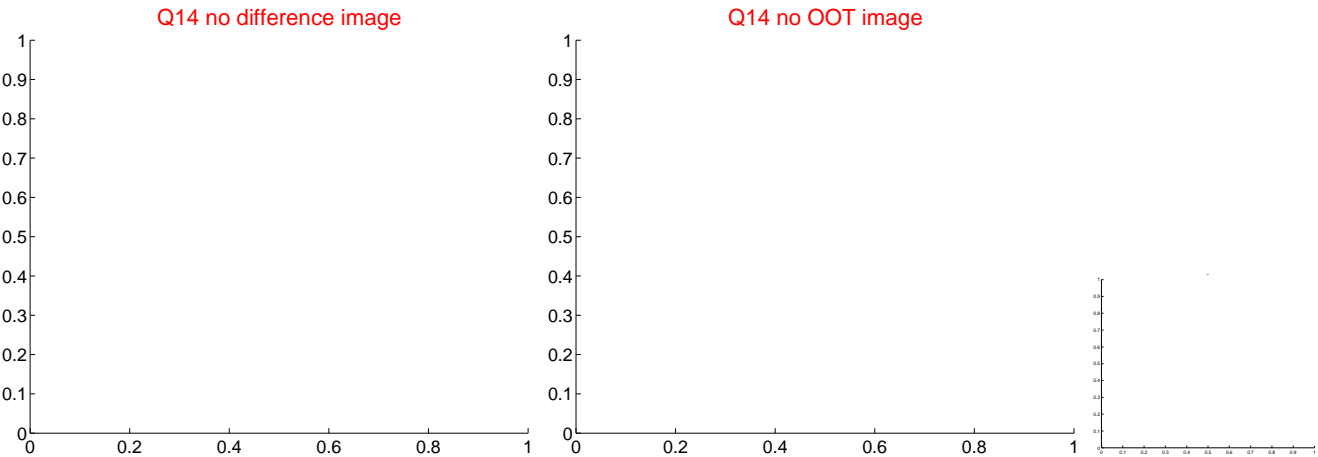
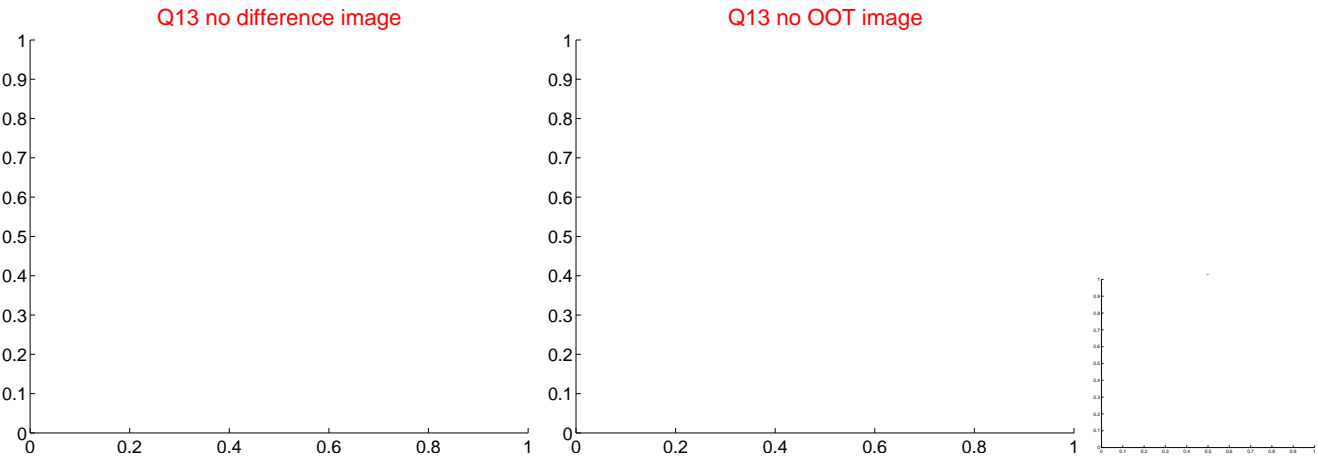


Q12 OOT image

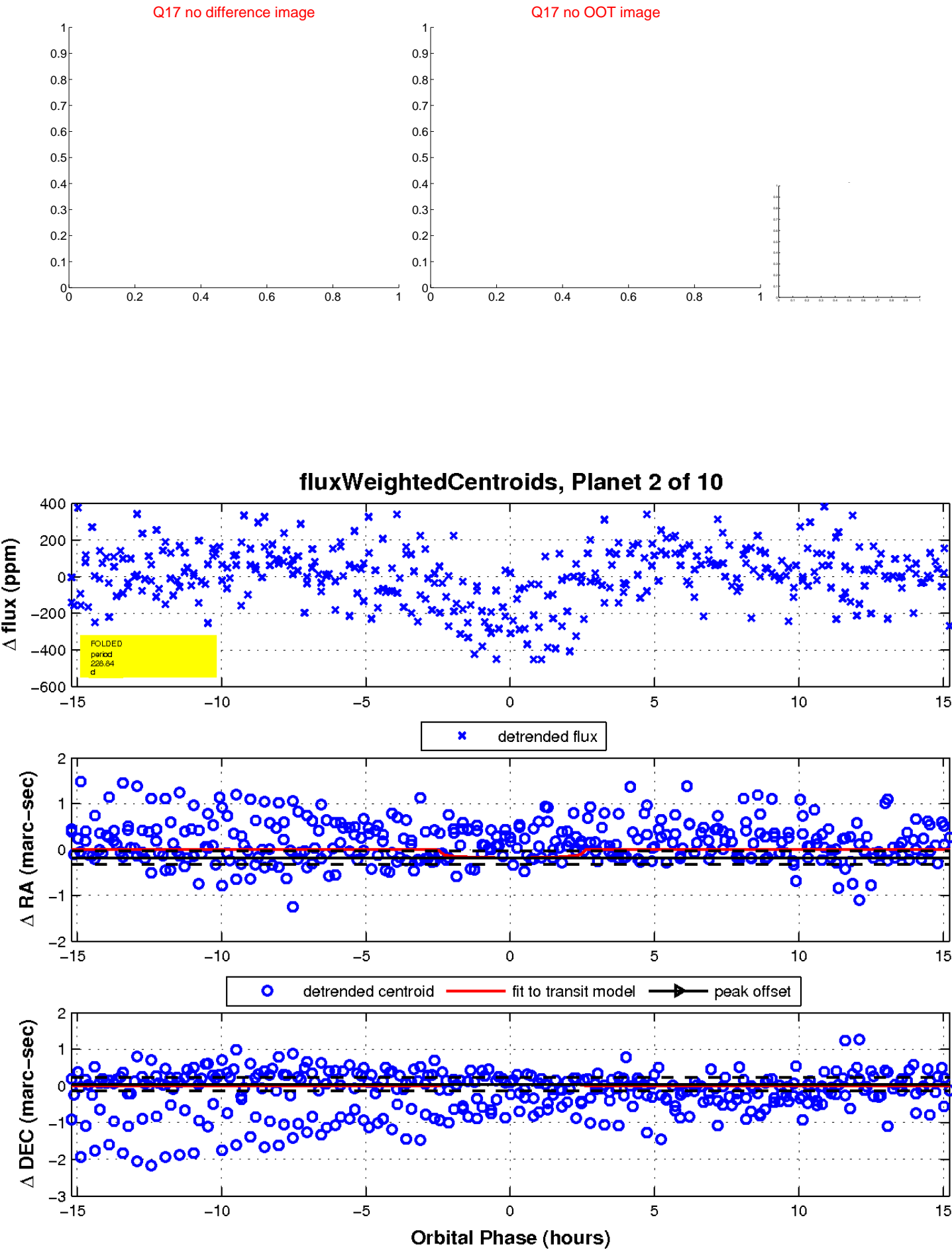




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

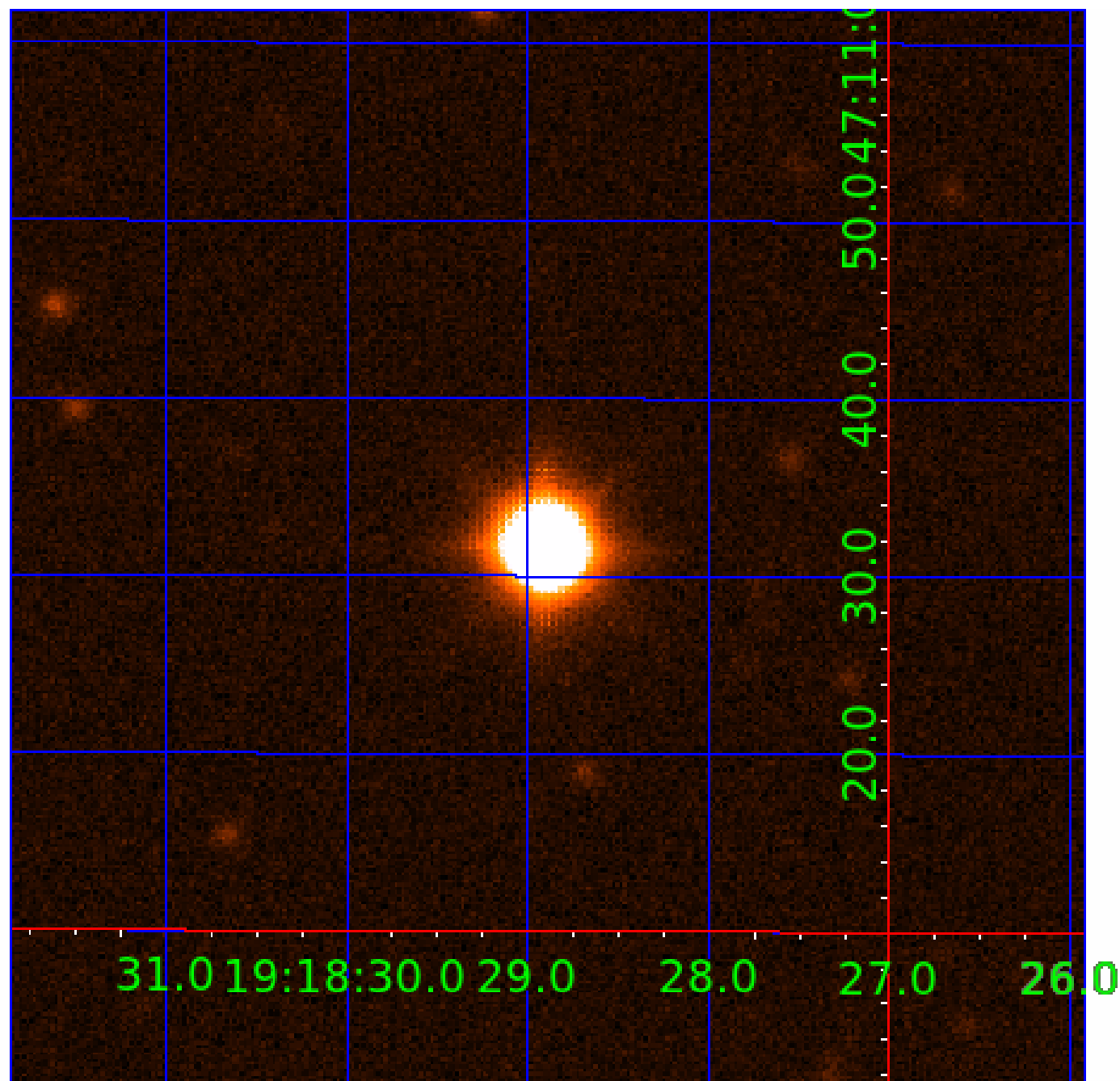


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

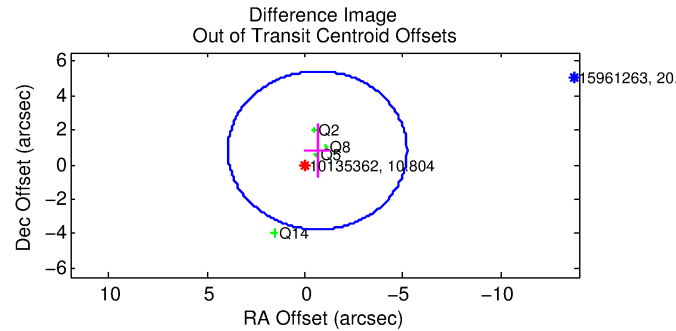
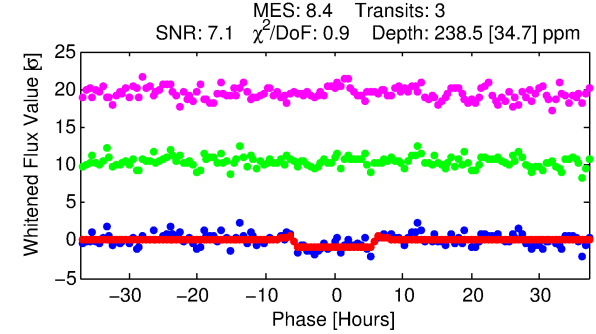
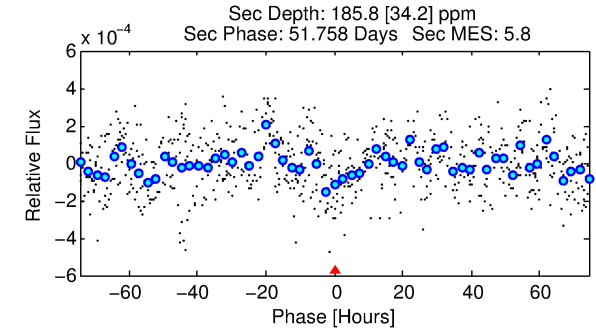
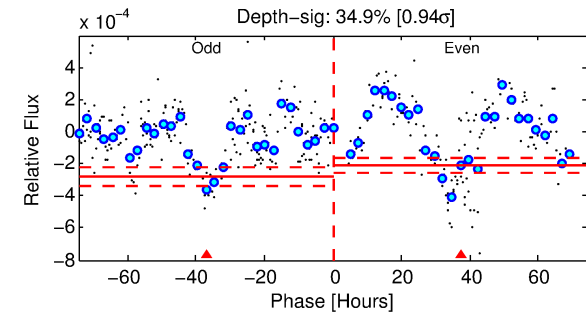
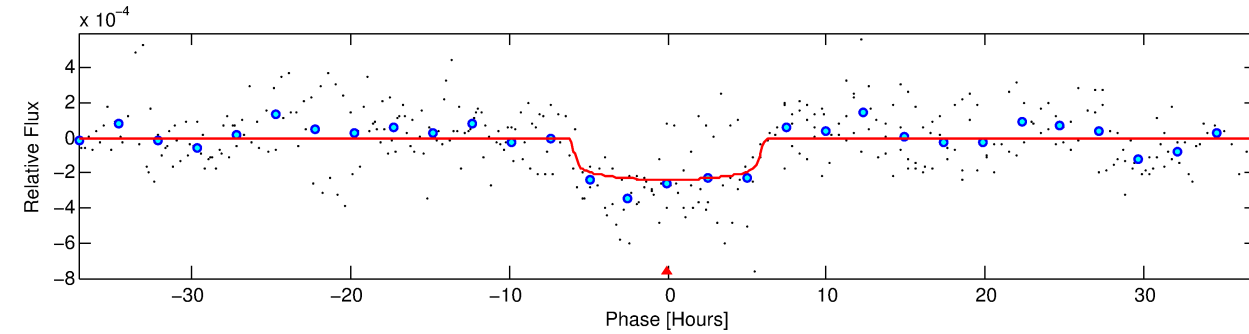
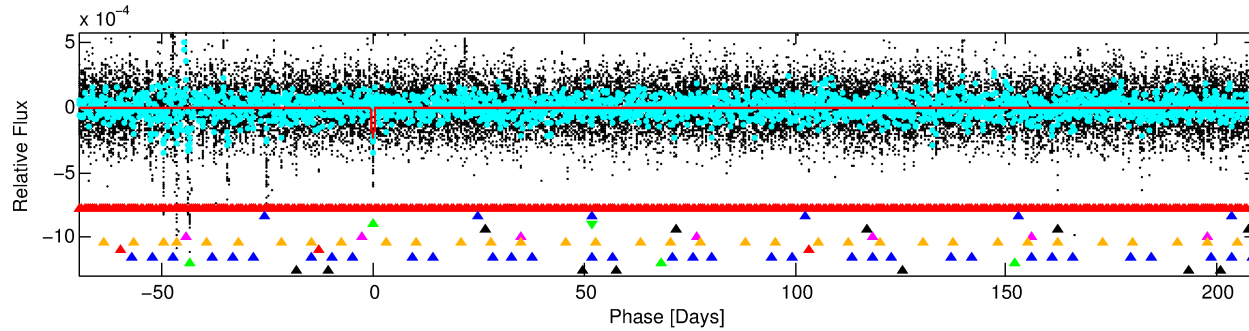
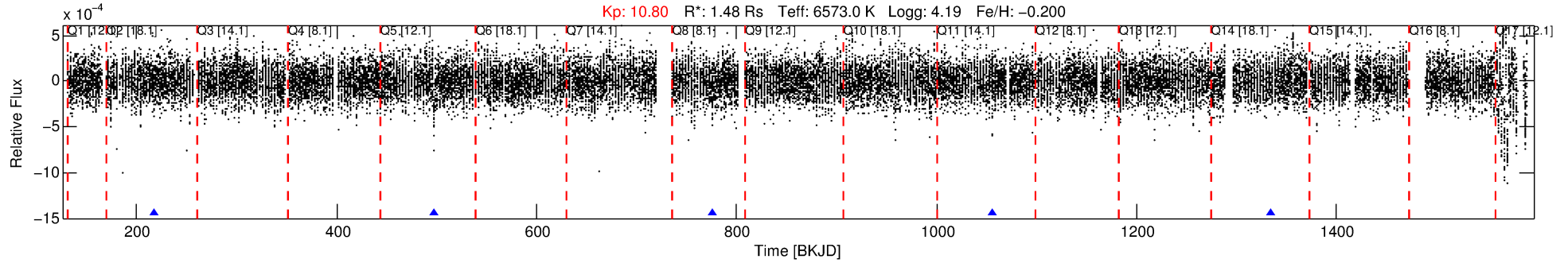
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-03

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 3 of 10 Period: 279.269 d



## DV Fit Results:

Period = 279.26893 [0.01097] d  
Epoch = 217.8153 [0.0262] BKJD  
 $R_p/R^* = 0.0157$  [0.0048]  
 $a/R^* = 104.22$  [172.60]  
 $b = 0.82$  [0.68]  
 $\text{Seff} = 4.54$  [1.78]  
 $T_{\text{eq}} = 372$  [37] K  
 $R_p = 2.53$  [1.10]  $R_e$   
 $a = 0.8963$  [0.2290] AU  
 $A_g = 12802.98$  [9344.66] [1.37 $\sigma$ ]  
 $T_{\text{eff}} = 6120$  [997] K [5.76 $\sigma$ ]

## DV Diagnostic Results:

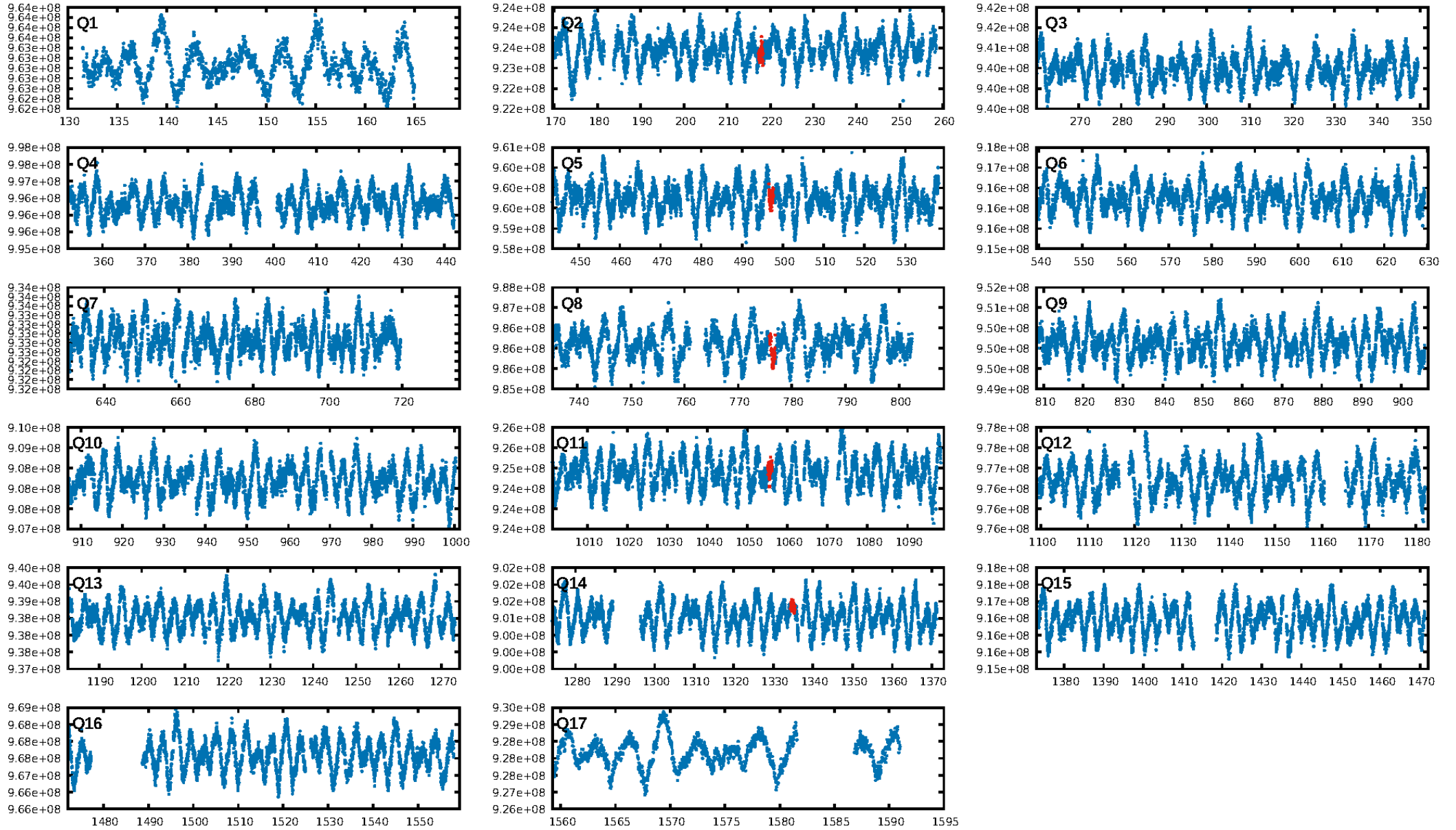
ShortPeriod-sig: 100.0% [90.37 $\sigma$ ]  
LongPeriod-sig: 100.0% [78.71 $\sigma$ ]  
ModelChiSquare2-sig: 36.1%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.32  
Centroid-sig: 67.7%  
Centroid-so: 0.639 arcsec [0.91 $\sigma$ ]  
OotOffset-rm: 1.042 arcsec [0.68 $\sigma$ ]  
OotOffset-st: 2/0/1/1 [4]  
KicOffset-rm: 1.084 arcsec [0.76 $\sigma$ ]  
KicOffset-st: 2/0/1/1 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.20 [1/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:15 Z

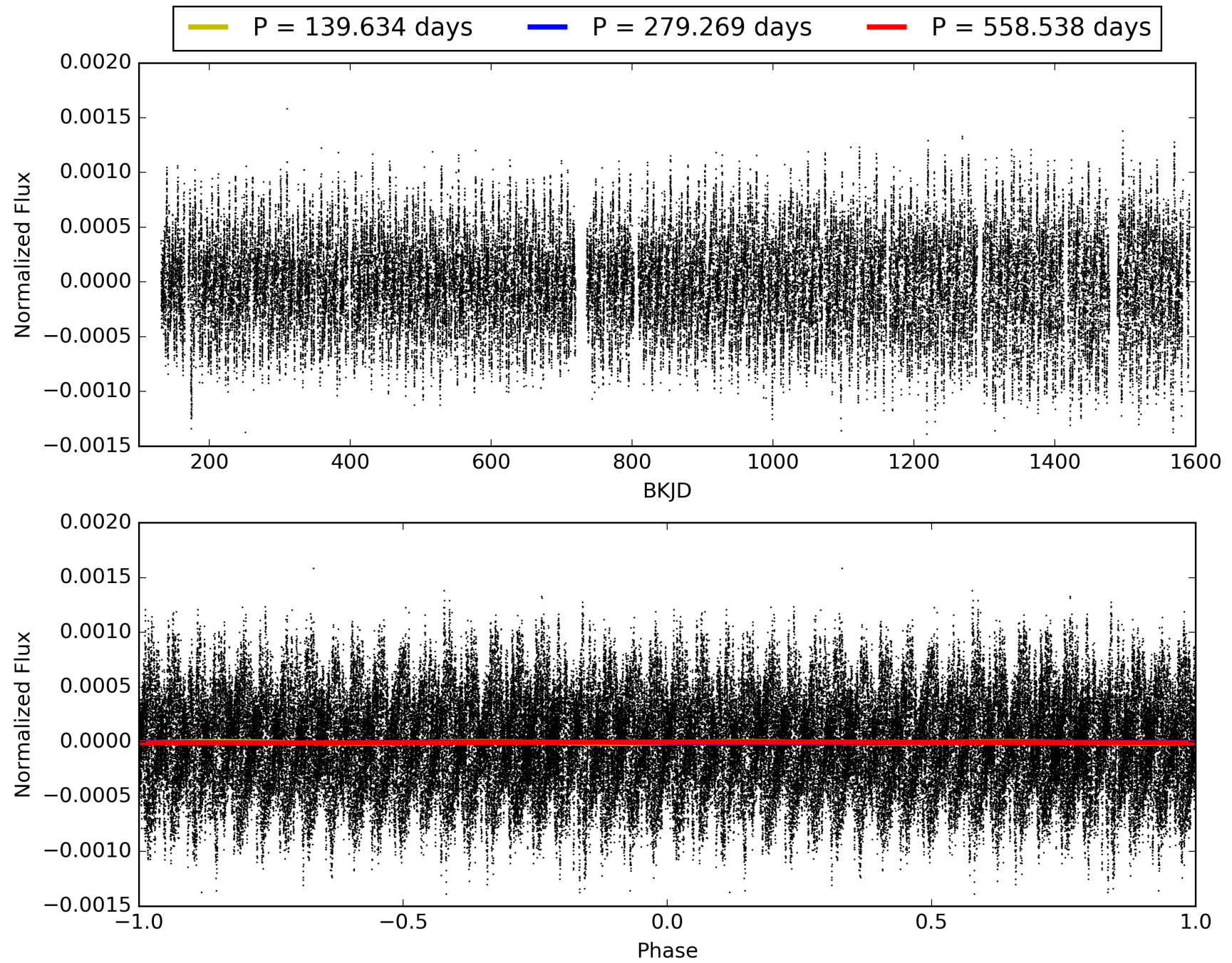
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010135362-03, PDC Light Curves

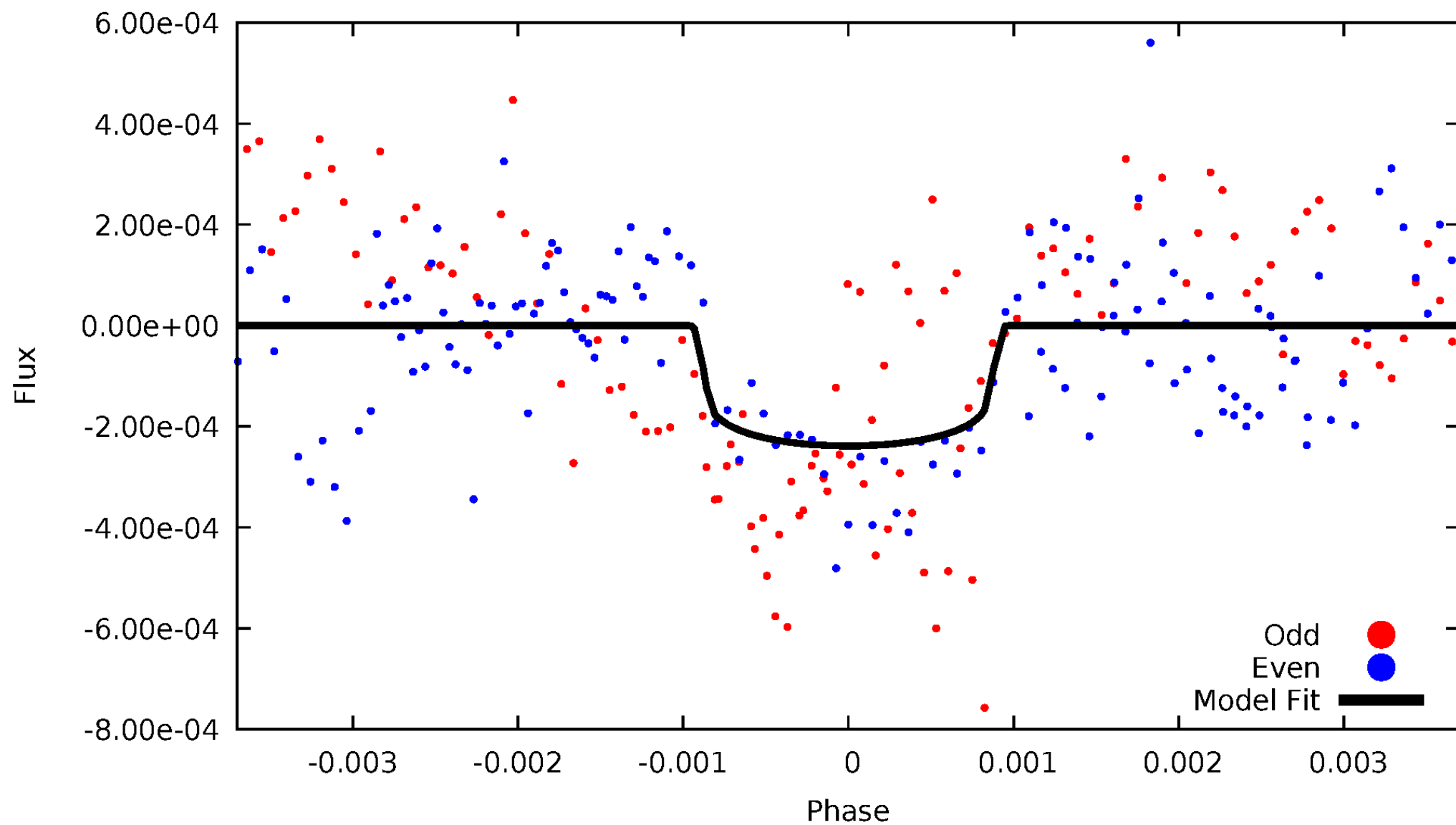


# TCE 010135362-03



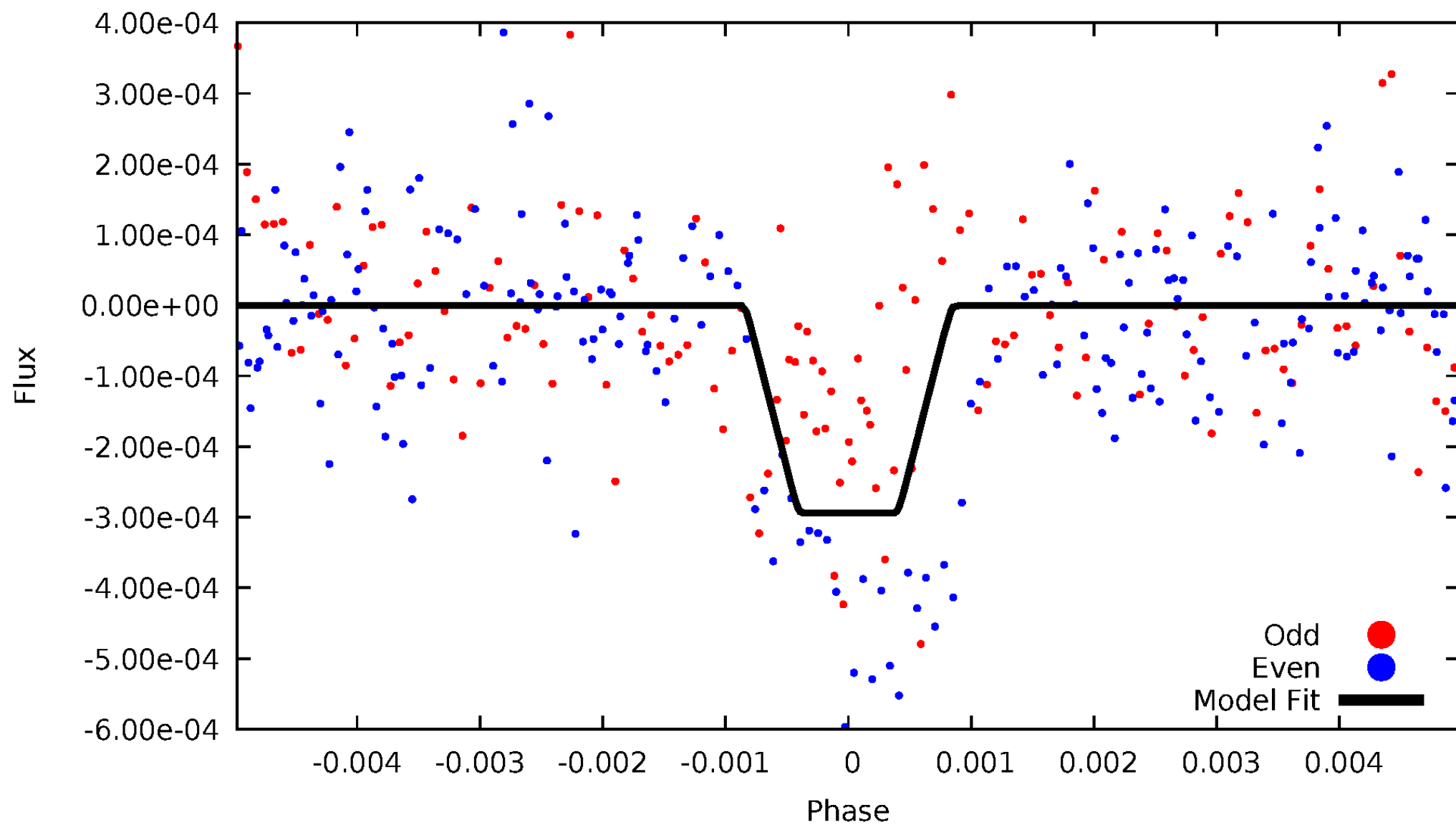
# DV Odd/Even

TCE 010135362-03

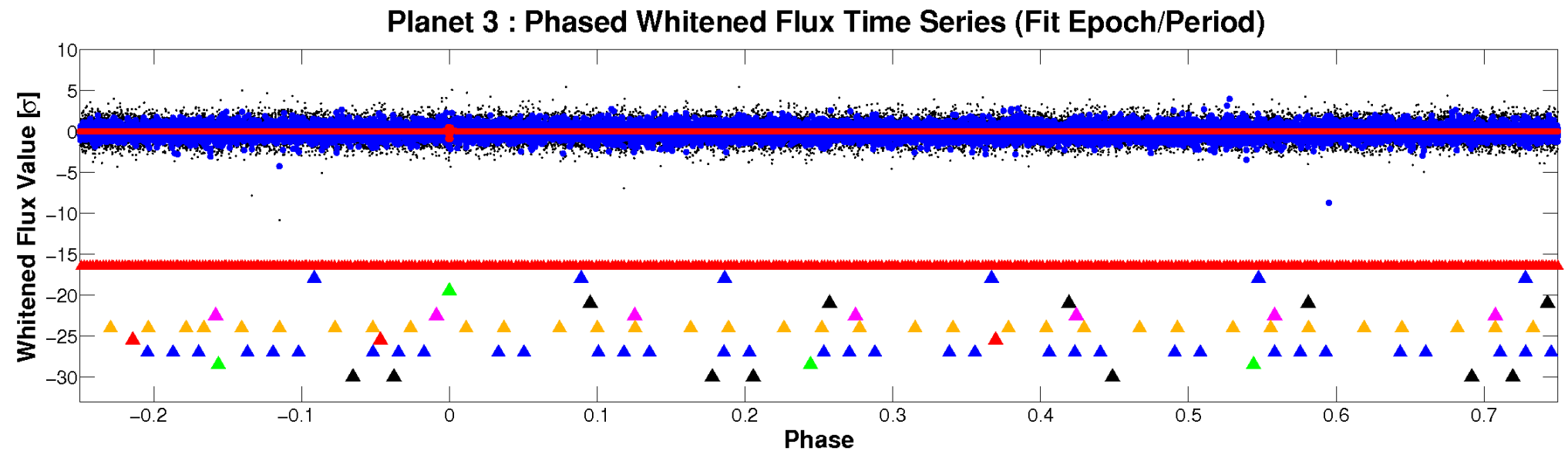
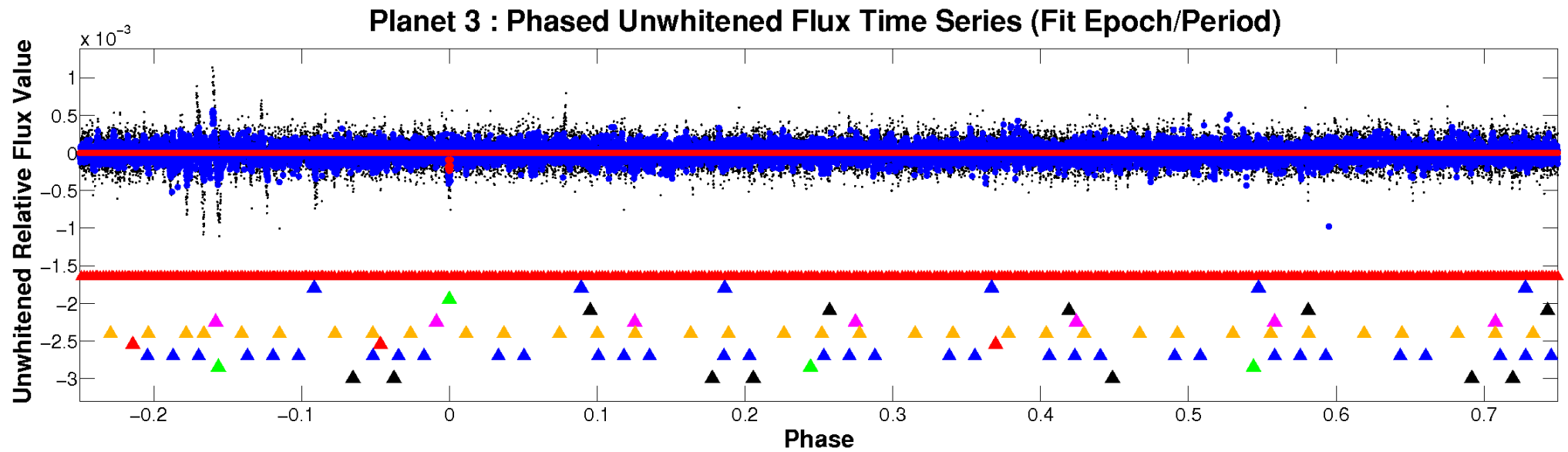


# ALT Odd/Even

TCE 010135362-03

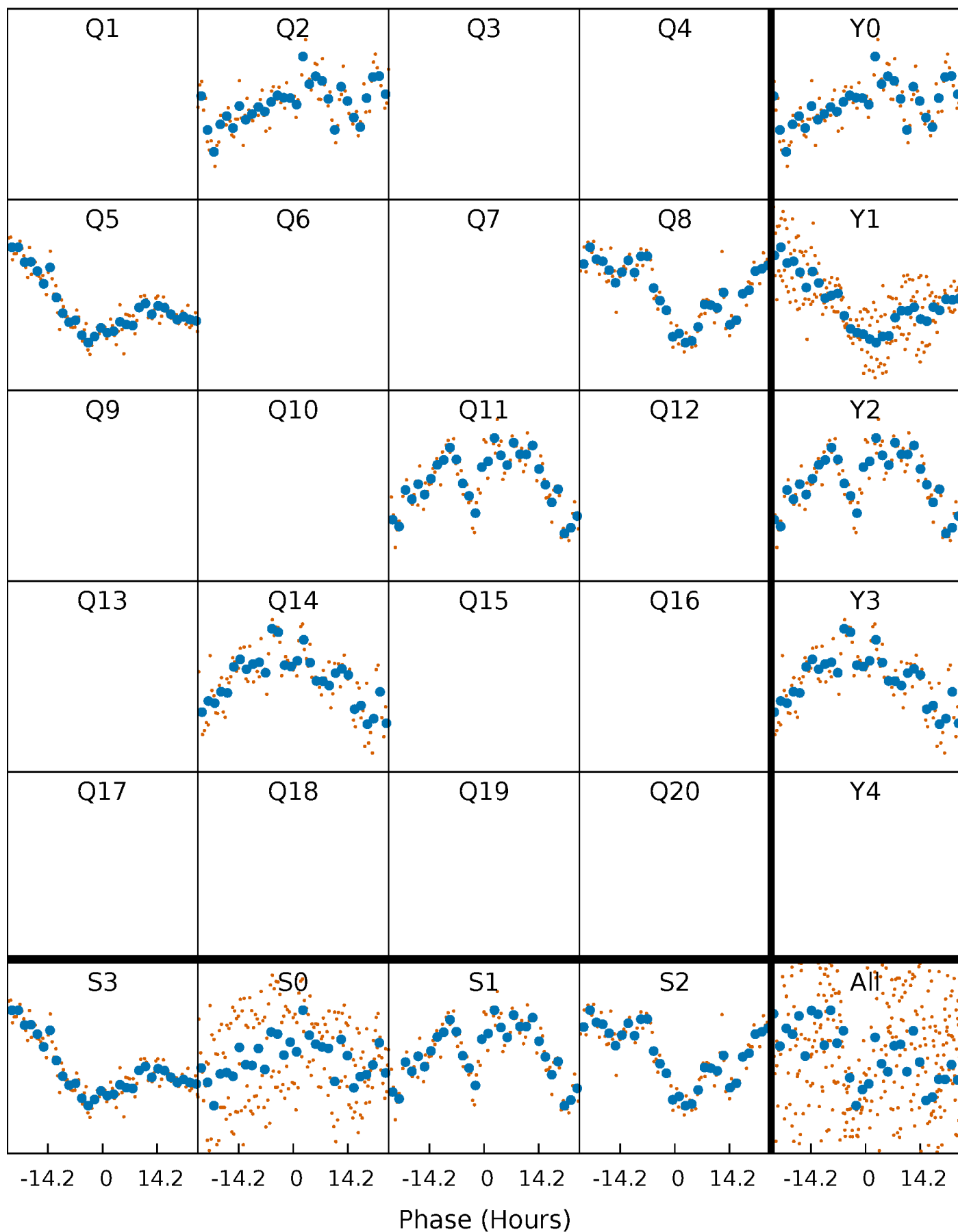


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

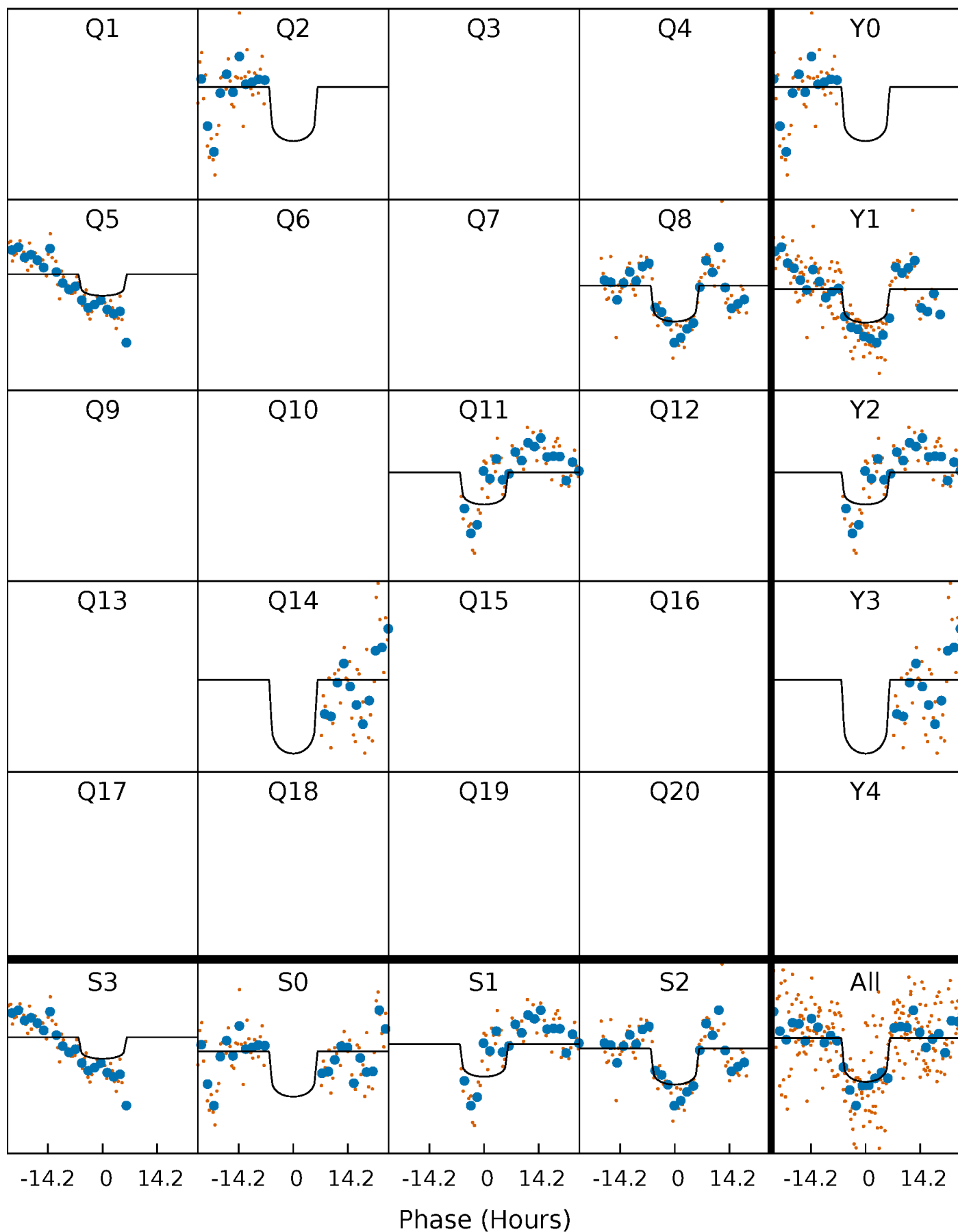
TCE 010135362-03     $P=279.268935$  Days     $T_0=217.815265$  (BKJD)





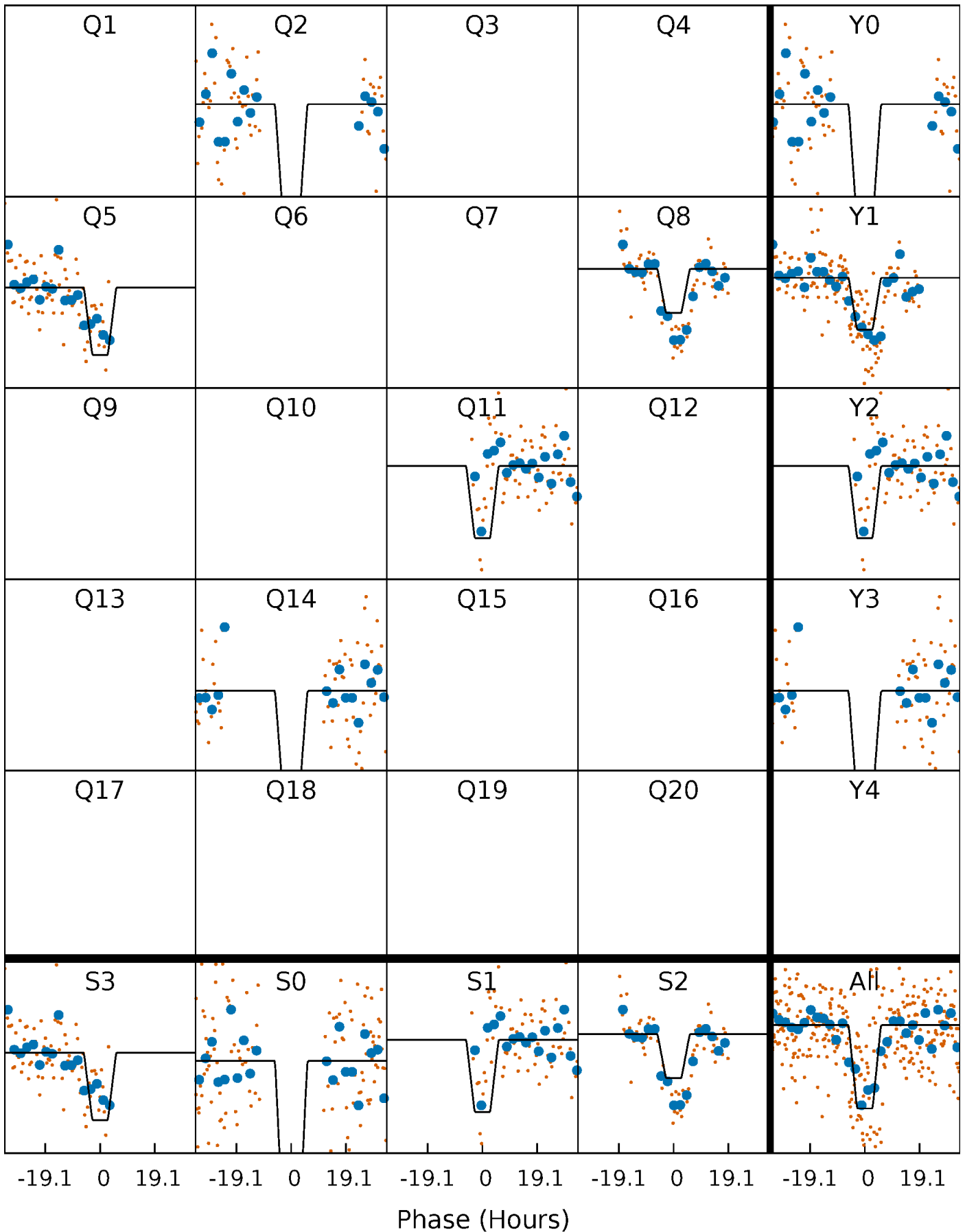
# DV Quarter-Phased Transit Curves

TCE 010135362-03     $P=279.268935$  Days     $T_0=217.815265$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

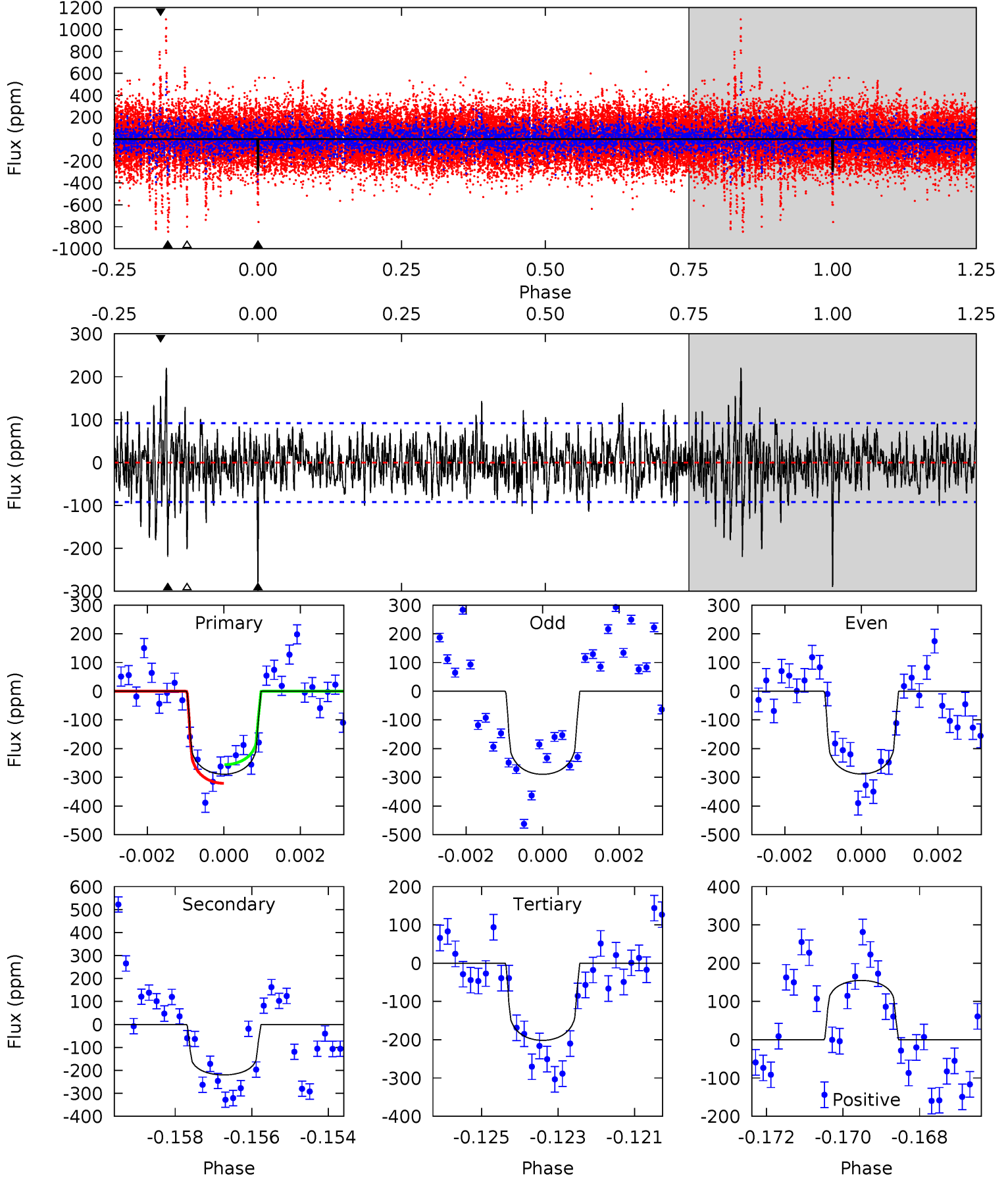
TCE 010135362-03     $P=279.190541$  Days     $T_0=217.958894$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-03, P = 279.268935 Days, E = 217.815265 Days

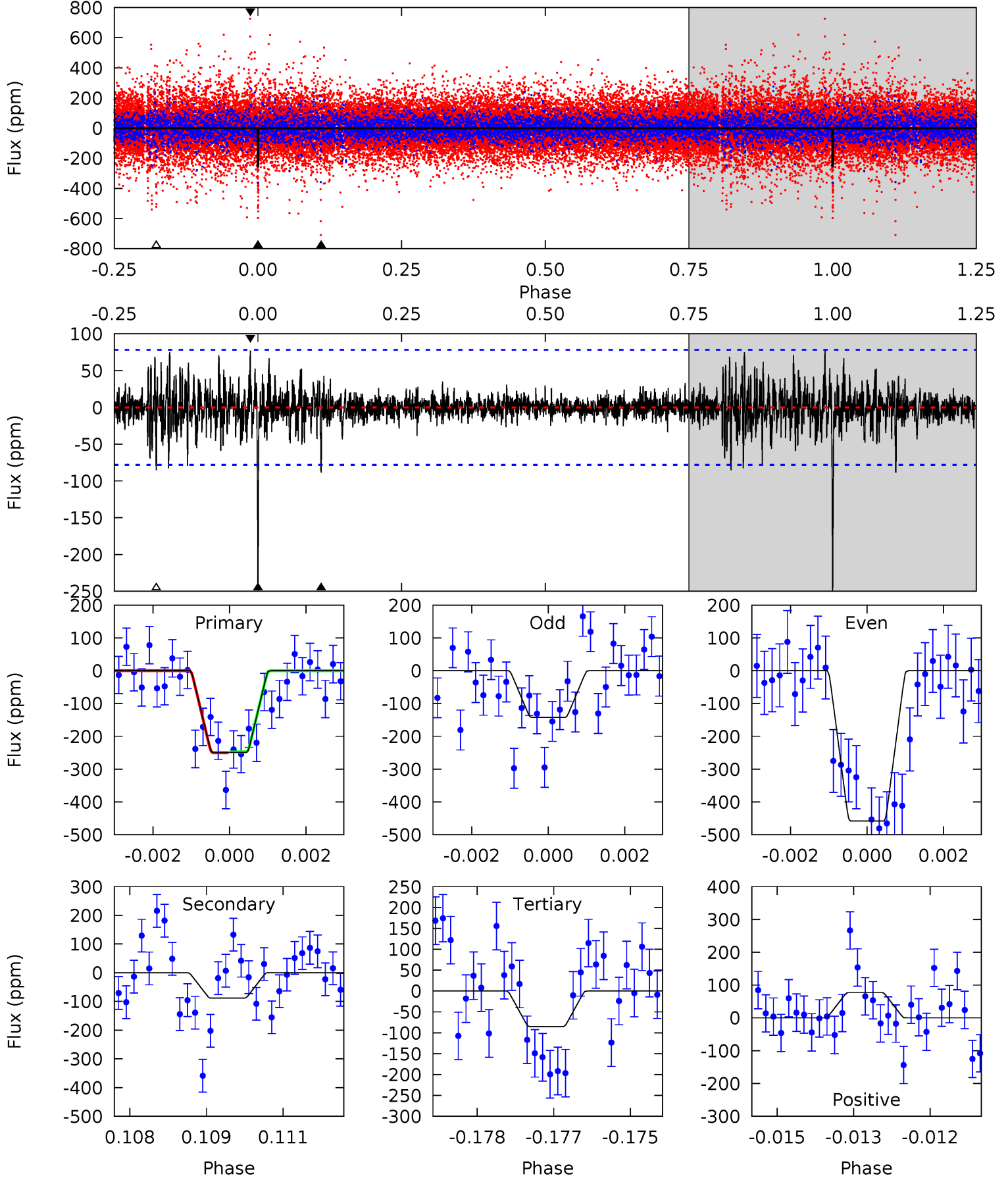
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.8	12.8	11.7	8.99	5.33	3.10	2.55	5.09	7.80	1.06	3.76	0.03	1.00	0.43	1.88



# Alt Model-Shift Uniqueness Test

010135362-03, P = 279.190541 Days, E = 217.958894 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
17.1	6.06	5.84	5.29	5.36	3.14	1.09	11.2	11.8	0.22	0.77	10.4	1.26	0.24	0.09



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-220 \pm 17$	$2.56^{+1.00}_{-0.82}$	$520^{+44}_{-38}$	$6345^{+1317}_{-848}$	$14521^{+16806}_{-6788}$
Alt.	$-88 \pm 15$	$2.74^{+0.93}_{-0.80}$	$519^{+40}_{-38}$	$4929^{+793}_{-501}$	$5165^{+5186}_{-2336}$

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

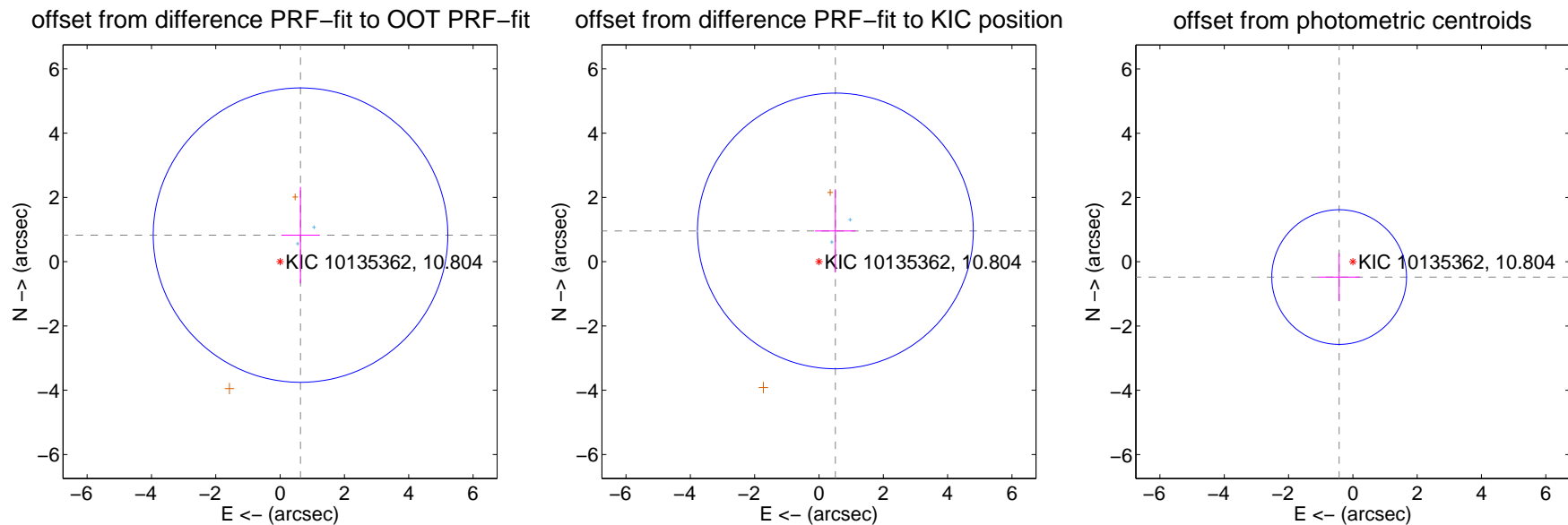
## DV Centroid Data

Supplemental centroid analysis for 010135362-03. **Kepler magnitude: 10.80.** Transit SNR 7.15

**There are 2 quarters with good PRF difference image offsets**

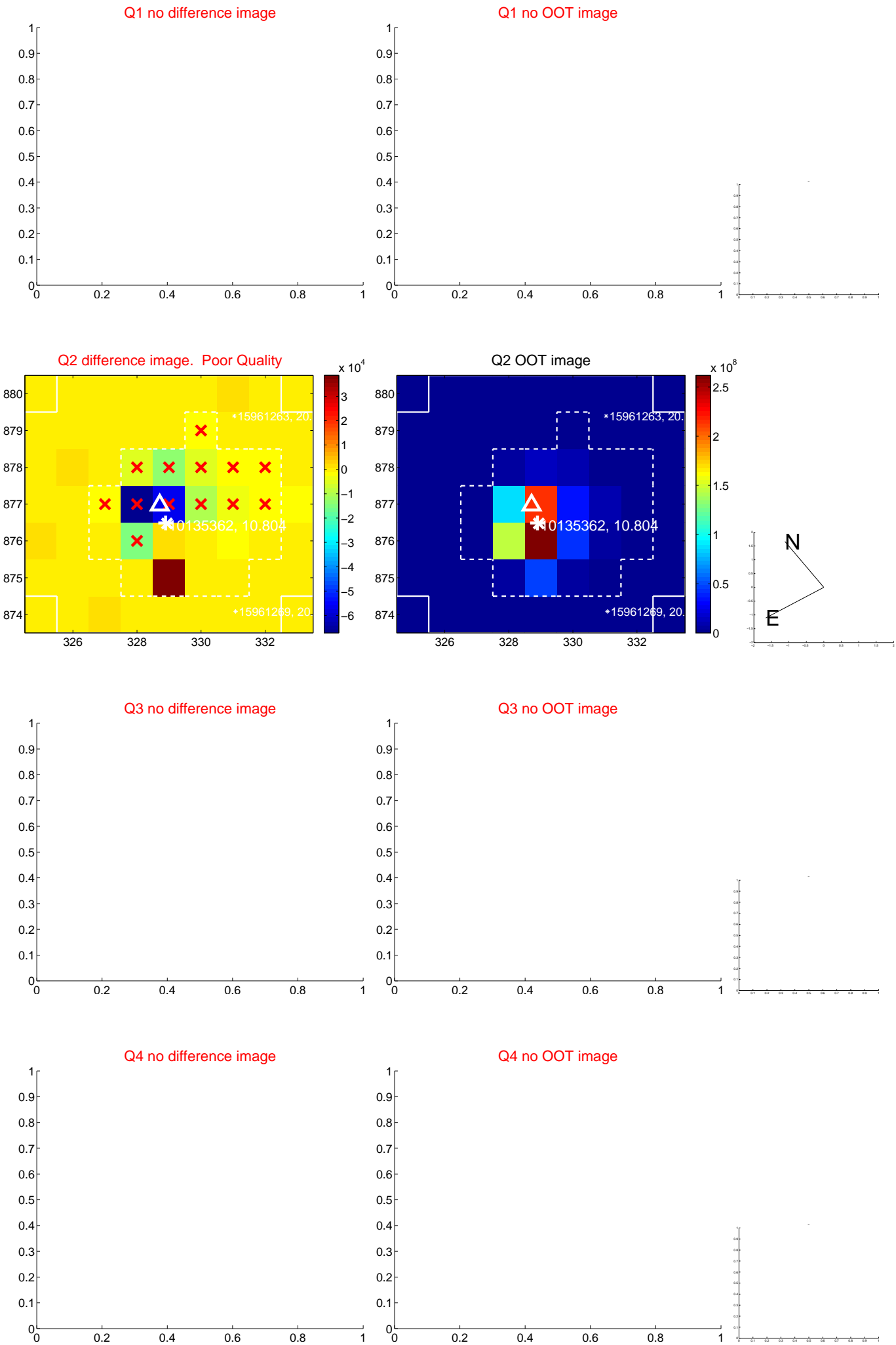
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.042 \pm 1.526$	0.68	$-0.635 \pm 0.595$	$0.827 \pm 1.499$
PRF-fit source offset from KIC position	$1.084 \pm 1.429$	0.76	$-0.510 \pm 0.631$	$0.957 \pm 1.294$
photometric centroid source offset	$0.64 \pm 0.70$	0.91	$0.43 \pm 0.65$	$-0.48 \pm 0.74$



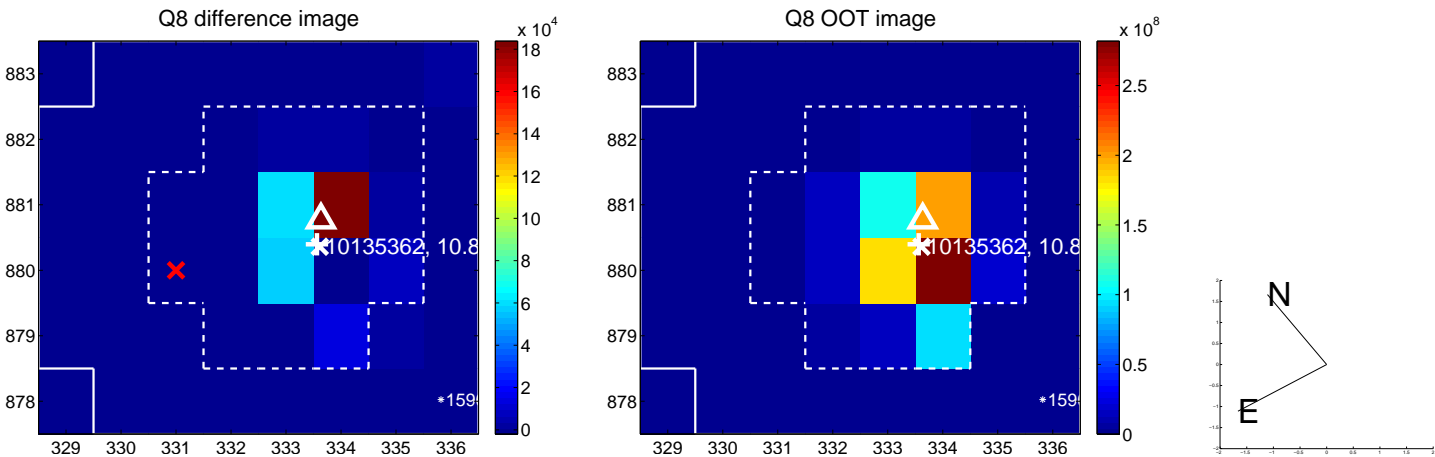
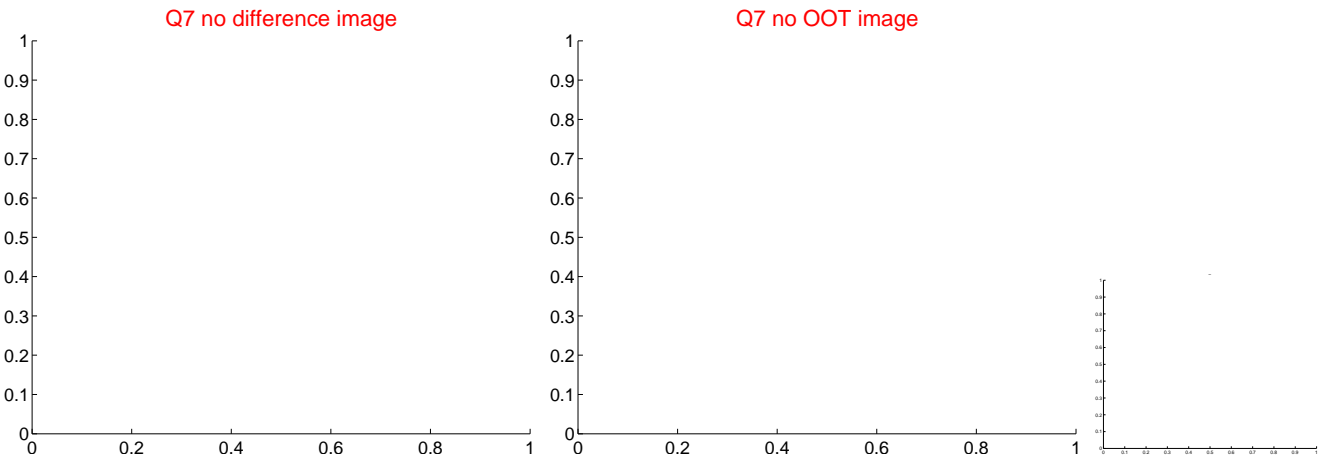
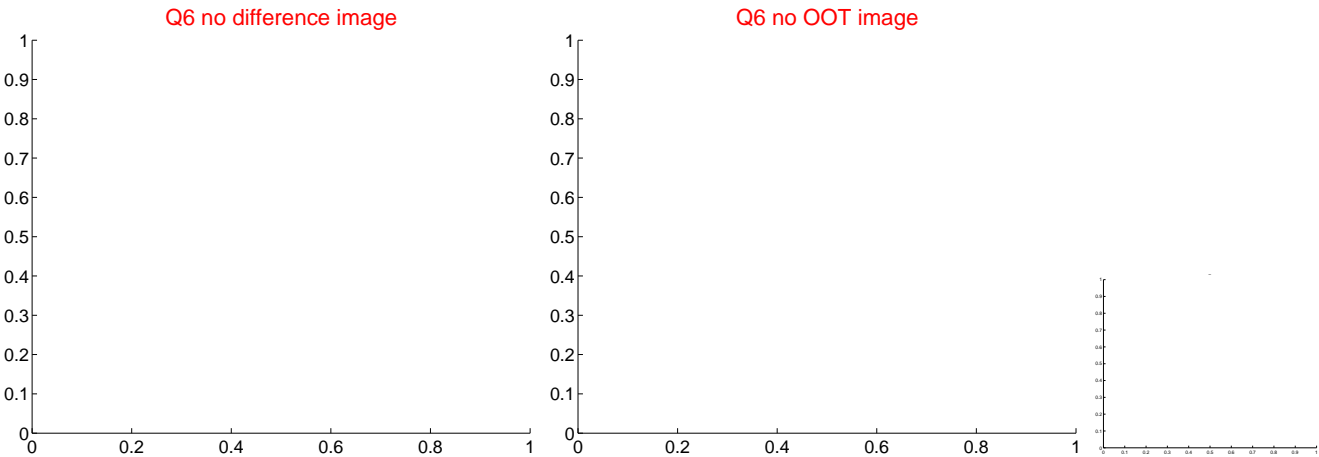
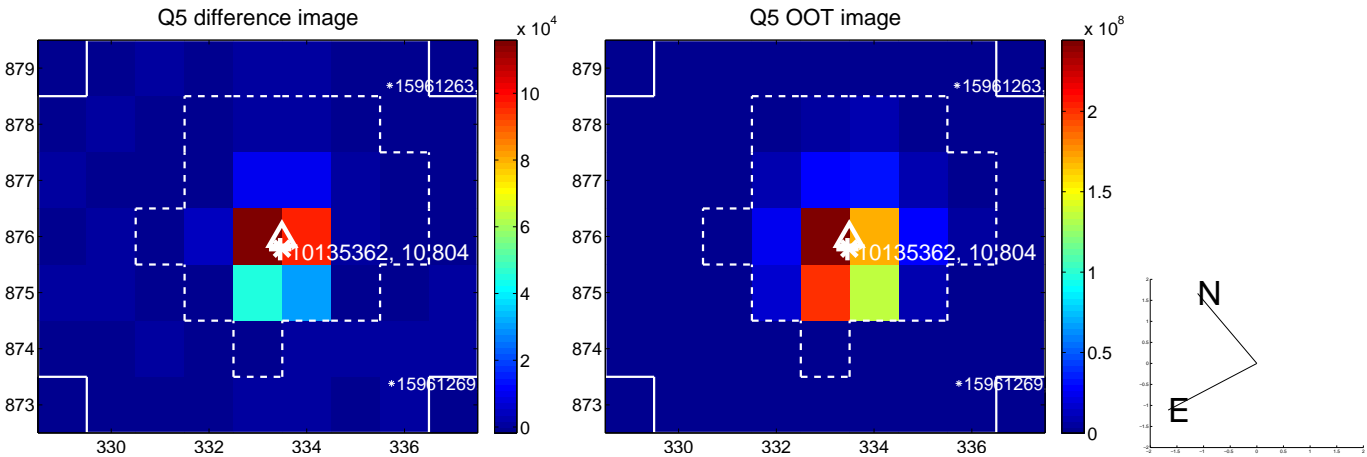
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

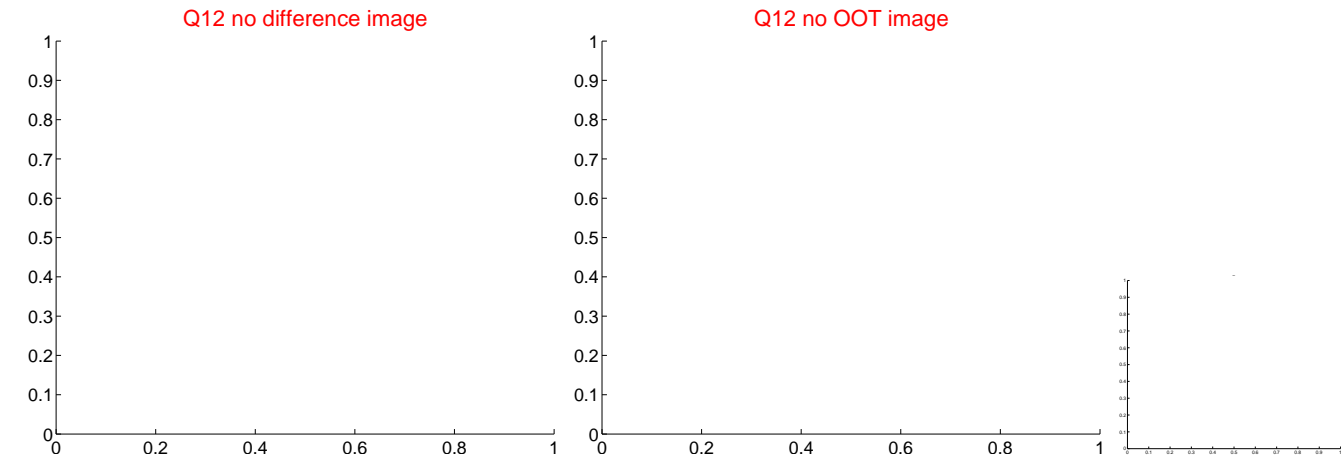
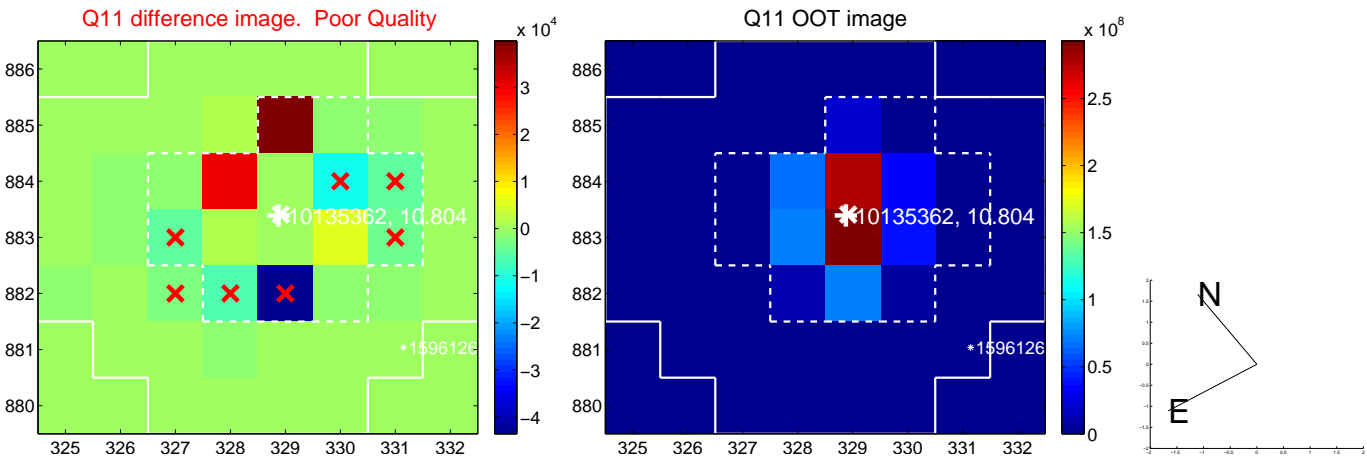
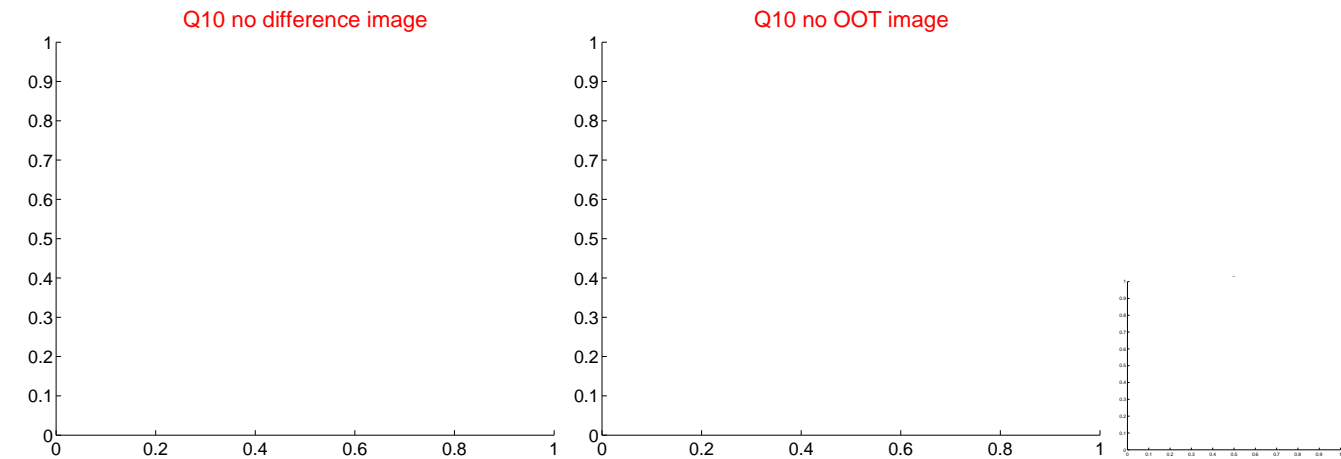
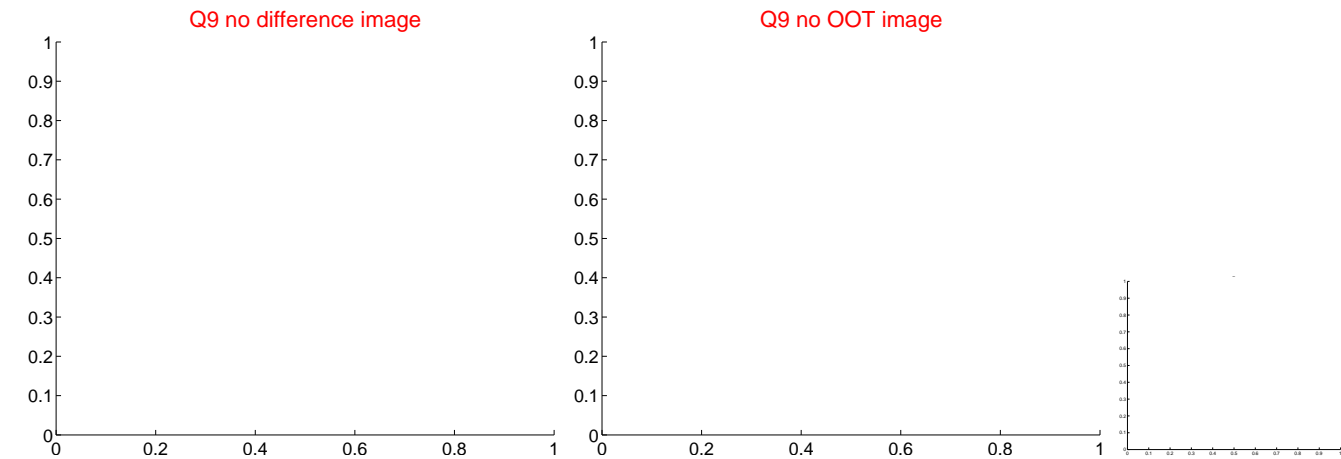




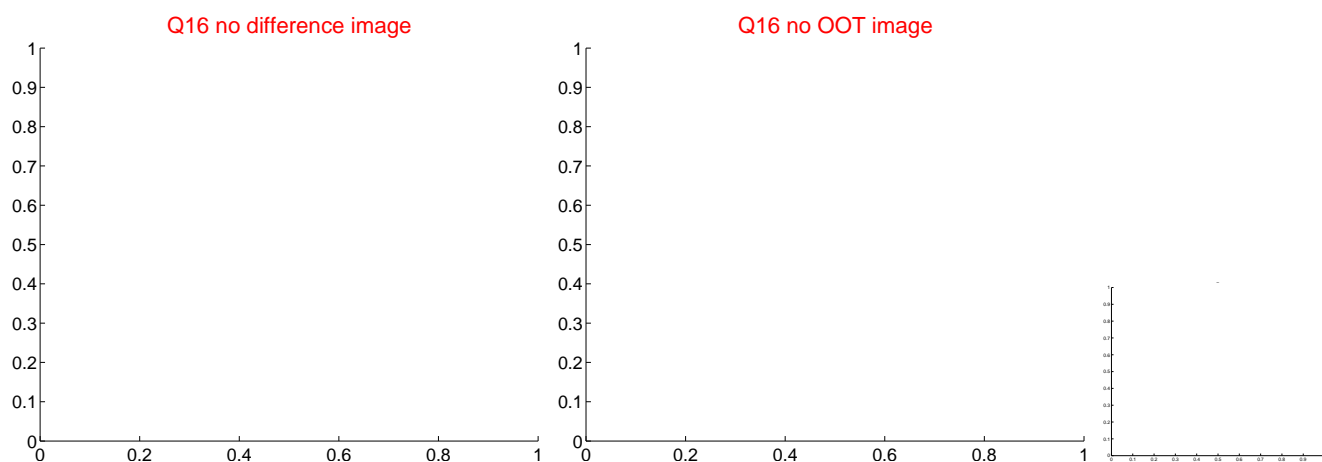
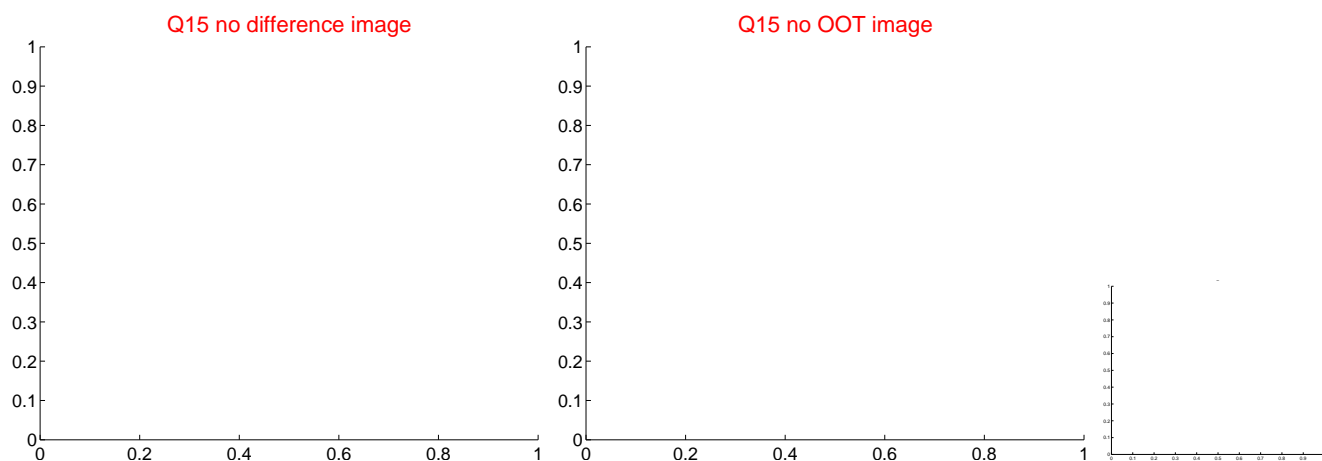
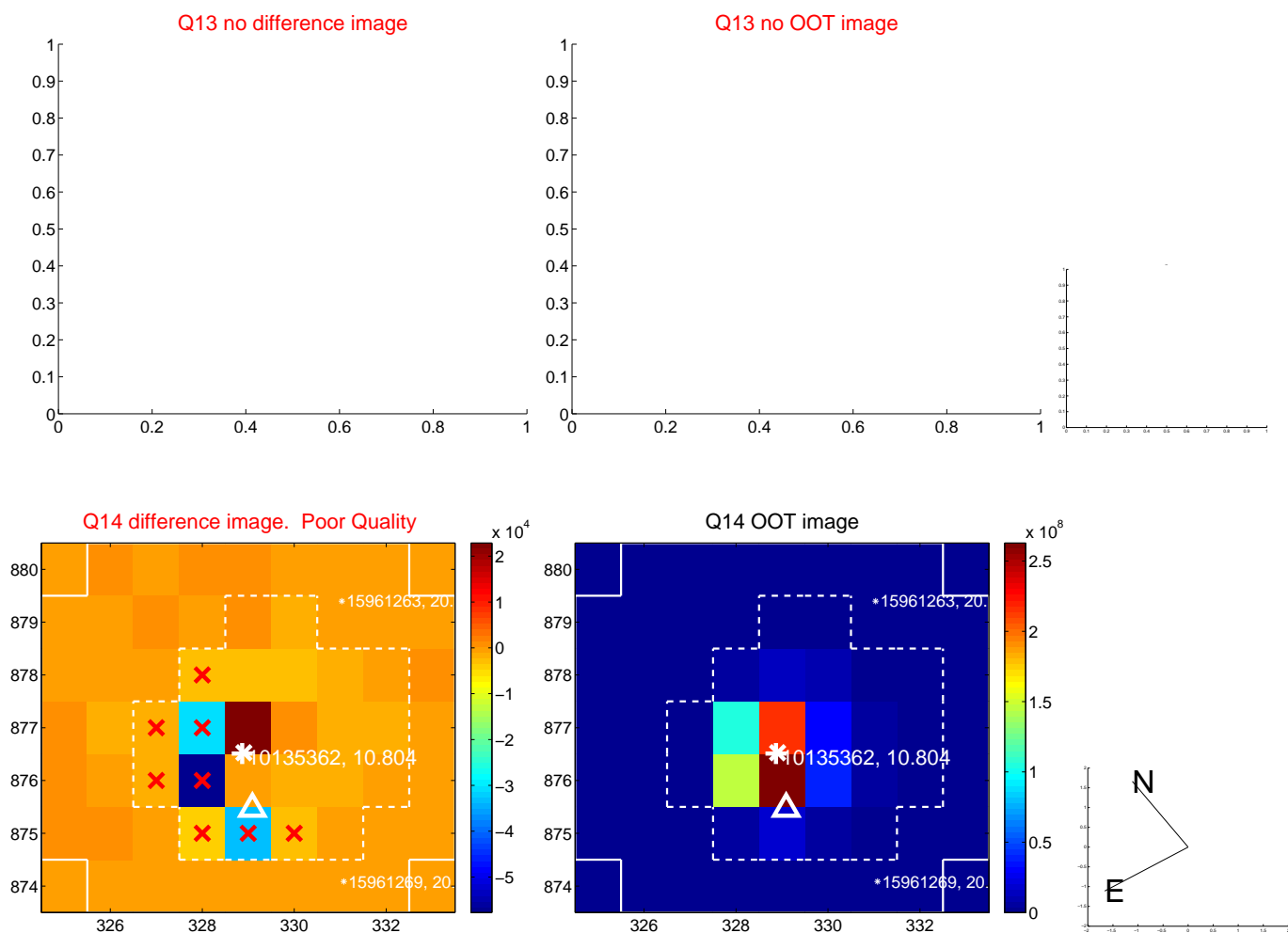
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



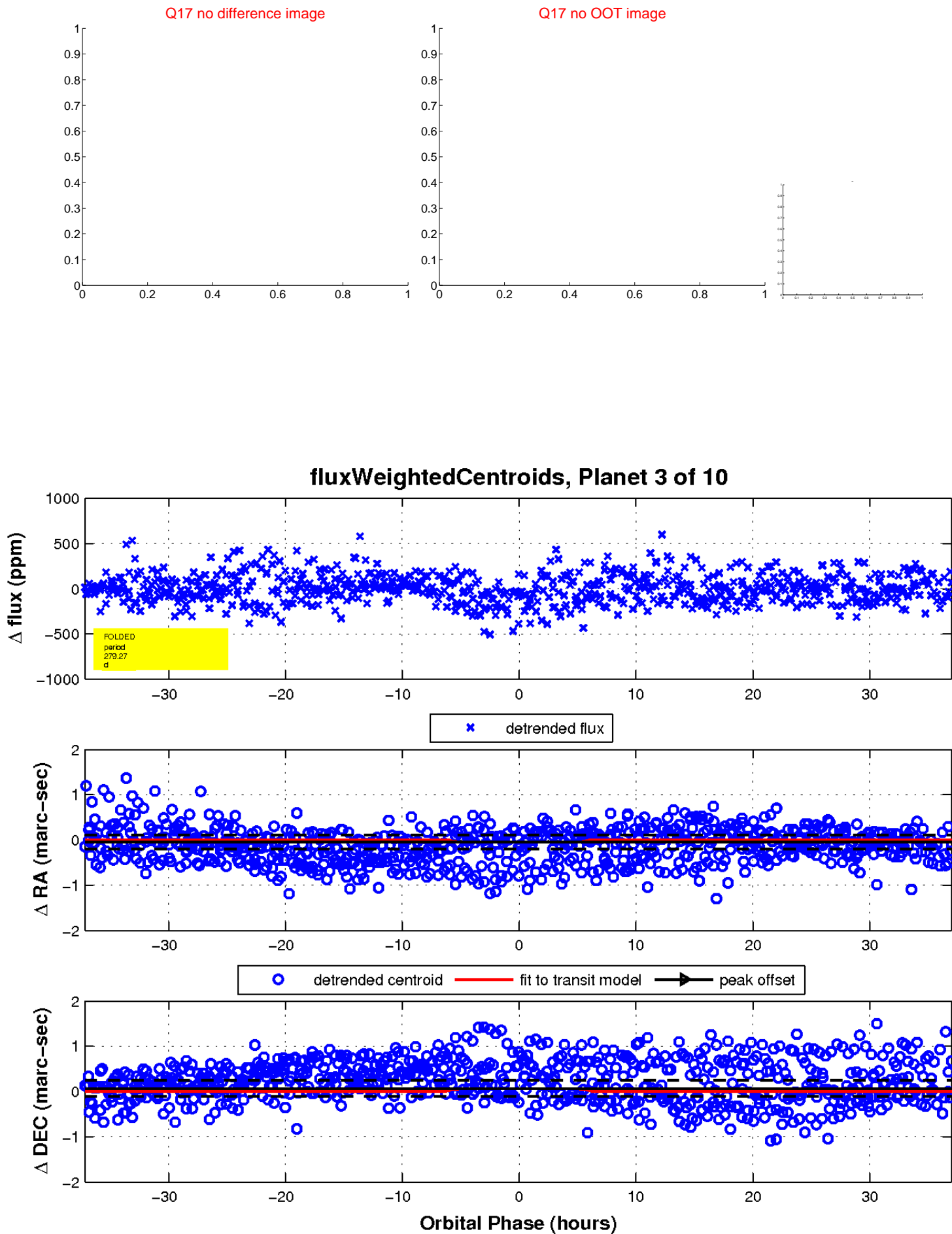
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

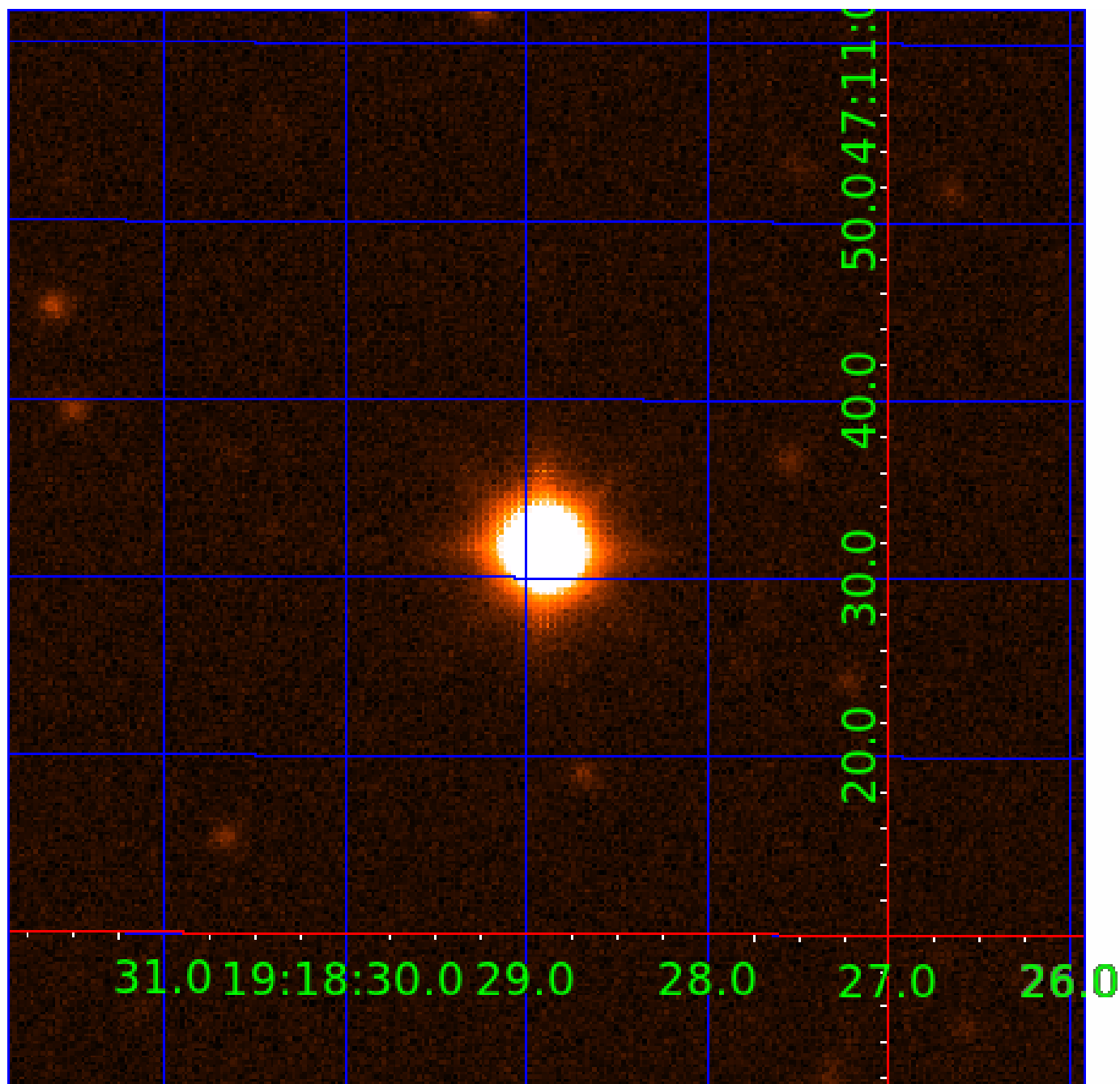


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

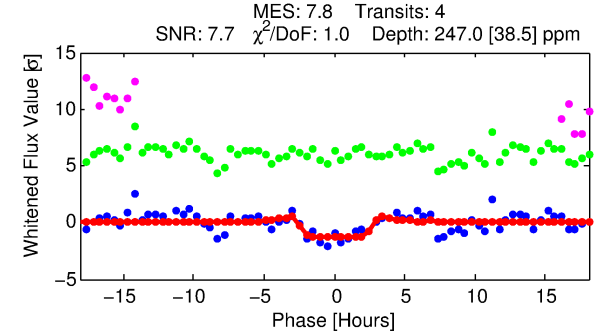
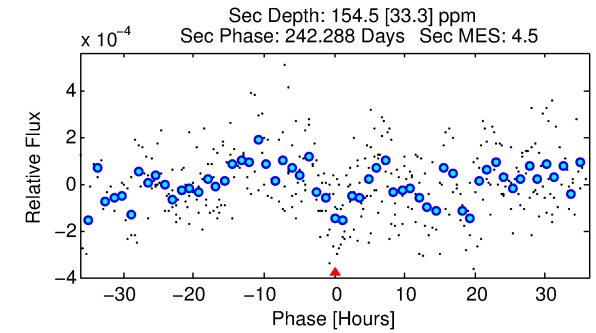
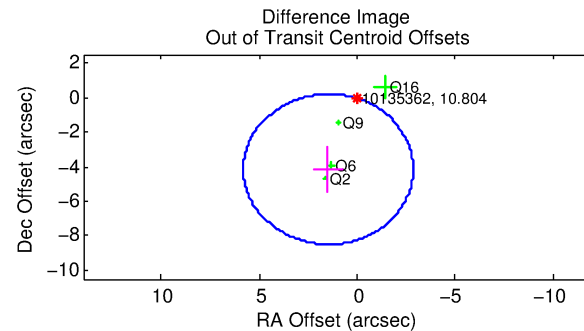
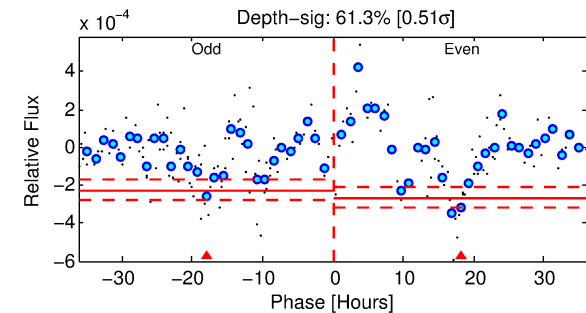
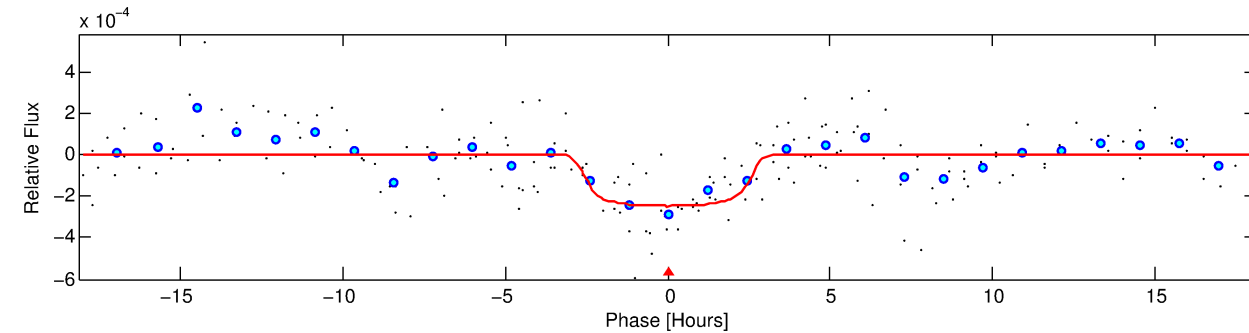
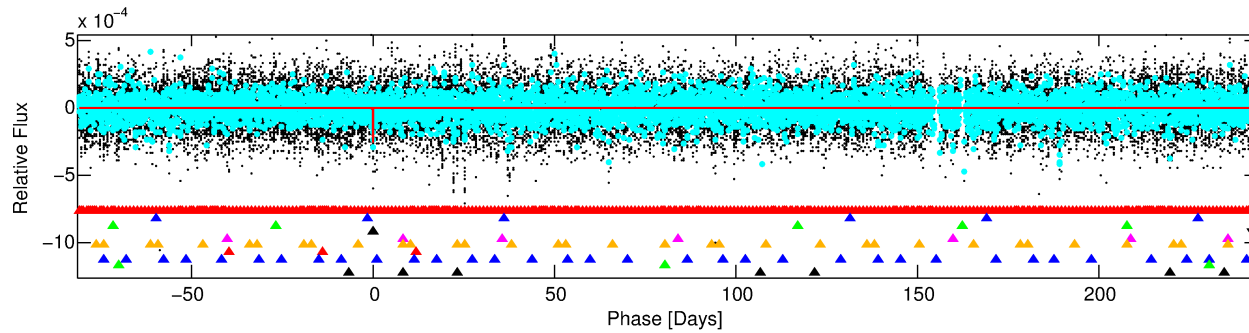
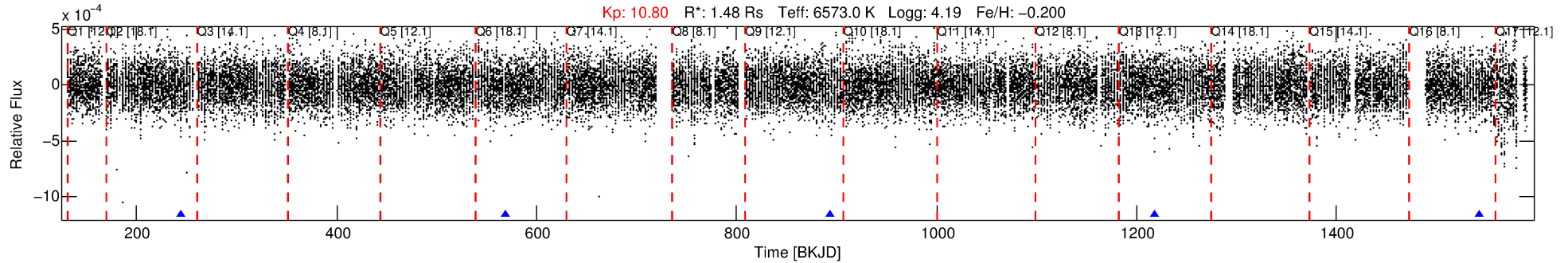
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-04

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 4 of 10 Period: 324.491 d



## DV Fit Results:

Period = 324.49093 [0.00438] d  
 Epoch = 244.4325 [0.0105] BKJD  
 Rp/R\* = 0.0177 [0.0020]  
 a/R\* = 152.92 [63.46]  
 b = 0.95 [0.05]  
 Seff = 3.71 [1.46]  
 Teq = 354 [35] K  
 Rp = 2.85 [0.95] Re  
 a = 0.9906 [0.2531] AU  
 Ag = 10284.96 [4924.50] [2.09 $\sigma$ ]  
 Tefp = 5511 [480] K [10.72 $\sigma$ ]

## DV Diagnostic Results:

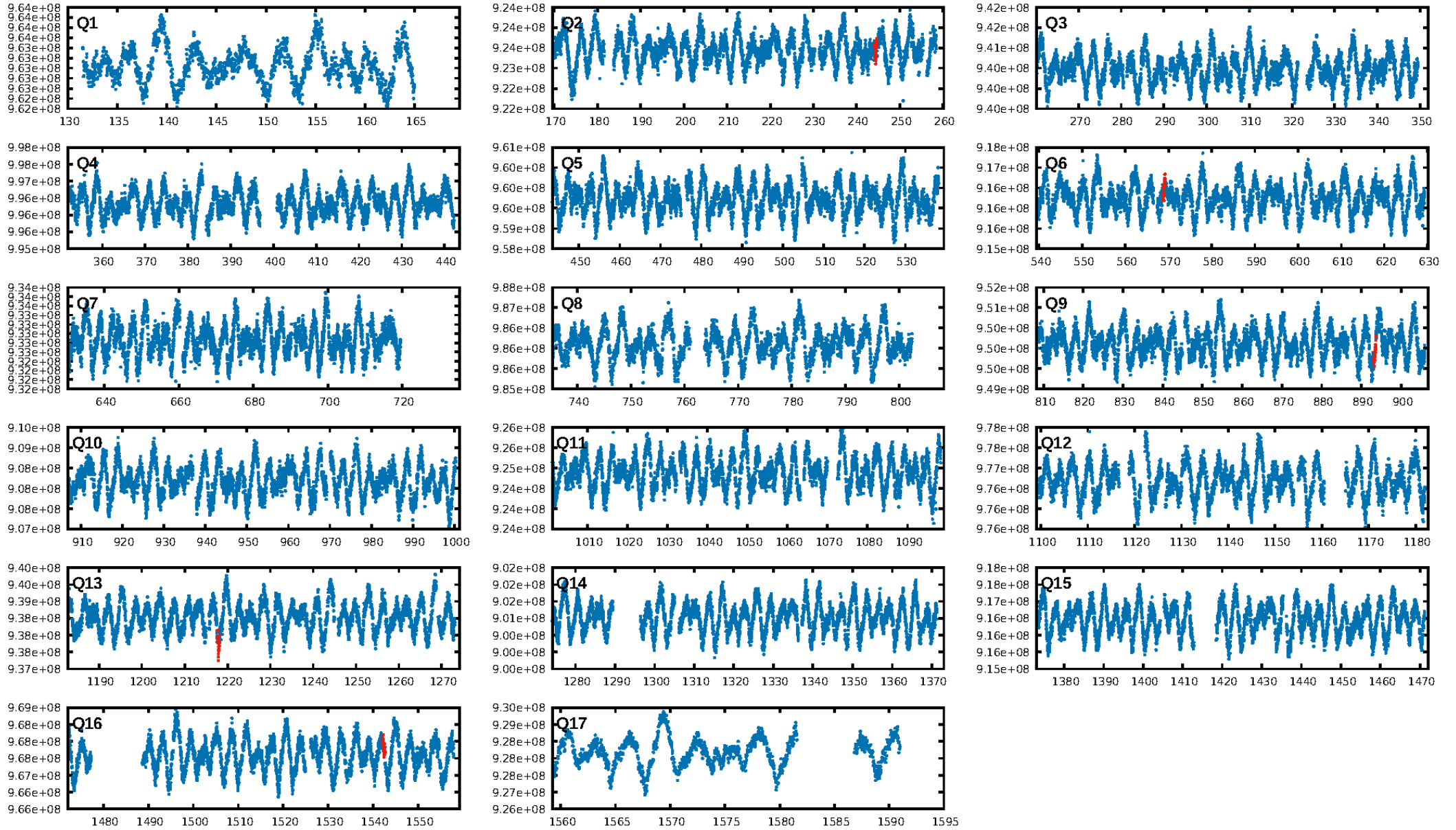
ShortPeriod-sig: 100.0% [78.71 $\sigma$ ]  
 LongPeriod-sig: 100.0% [97.32 $\sigma$ ]  
 ModelChiSquare2-sig: 87.9%  
 ModelChiSquareGof-sig: 98.5%  
 Bootstrap-pfa: N/A  
 RollingBand-fgt: 1.00 [4/4]  
 GhostDiagnostic-chr: -1.782  
 Centroid-sig: 12.4%  
 Centroid-so: 0.766 arcsec [1.25 $\sigma$ ]  
 OotOffset-rm: 4.409 arcsec [3.04 $\sigma$ ]  
 KicOffset-rm: 4.353 arcsec [3.46 $\sigma$ ]  
 OotOffset-st: 2/0/1/1 [4]  
 KicOffset-st: 2/0/1/1 [4]  
 DiffImageQuality-fgm: 0.25 [1/4]  
 DiffImageOverlap-fno: 0.75 [3/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:23 Z

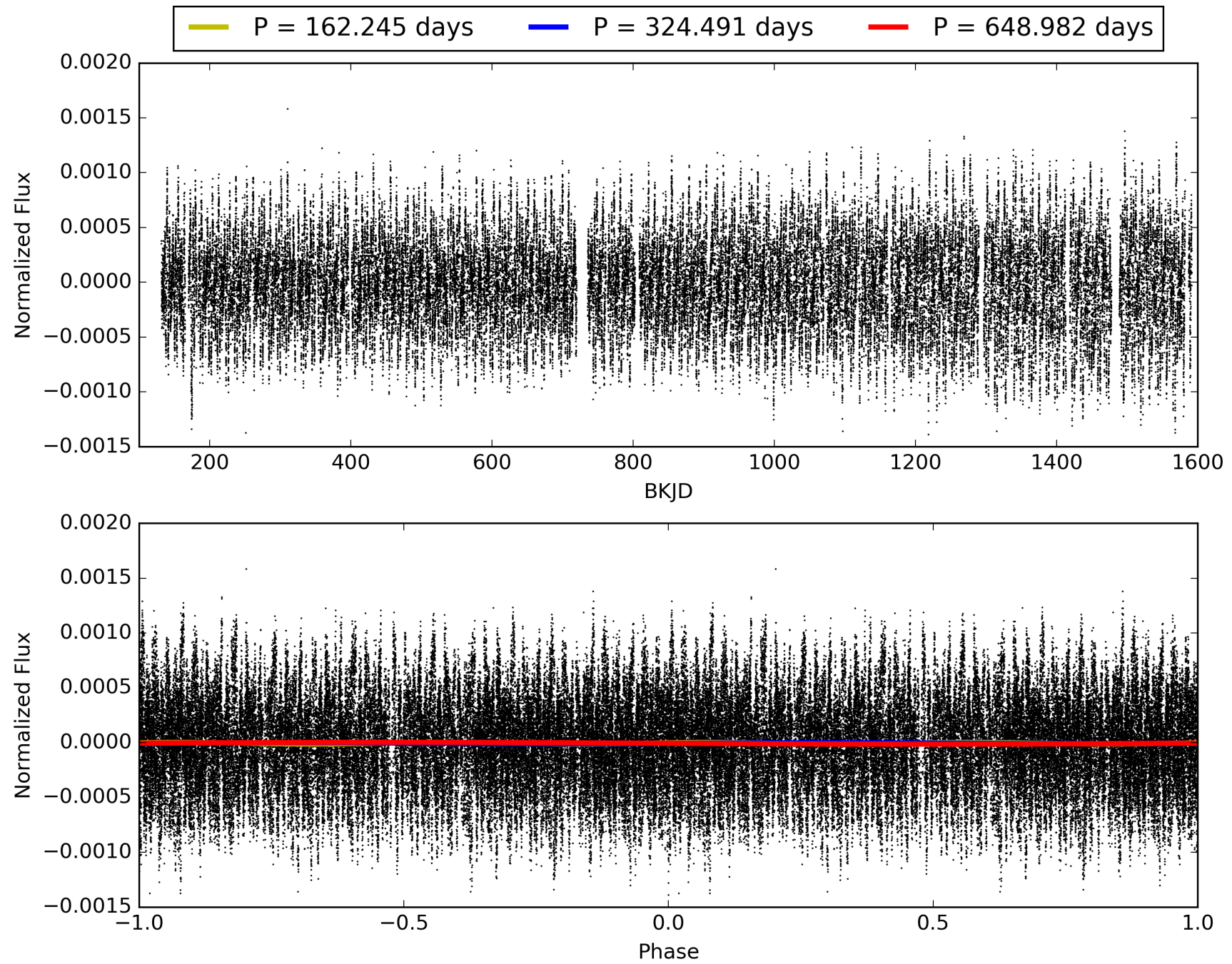
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010135362-04, PDC Light Curves

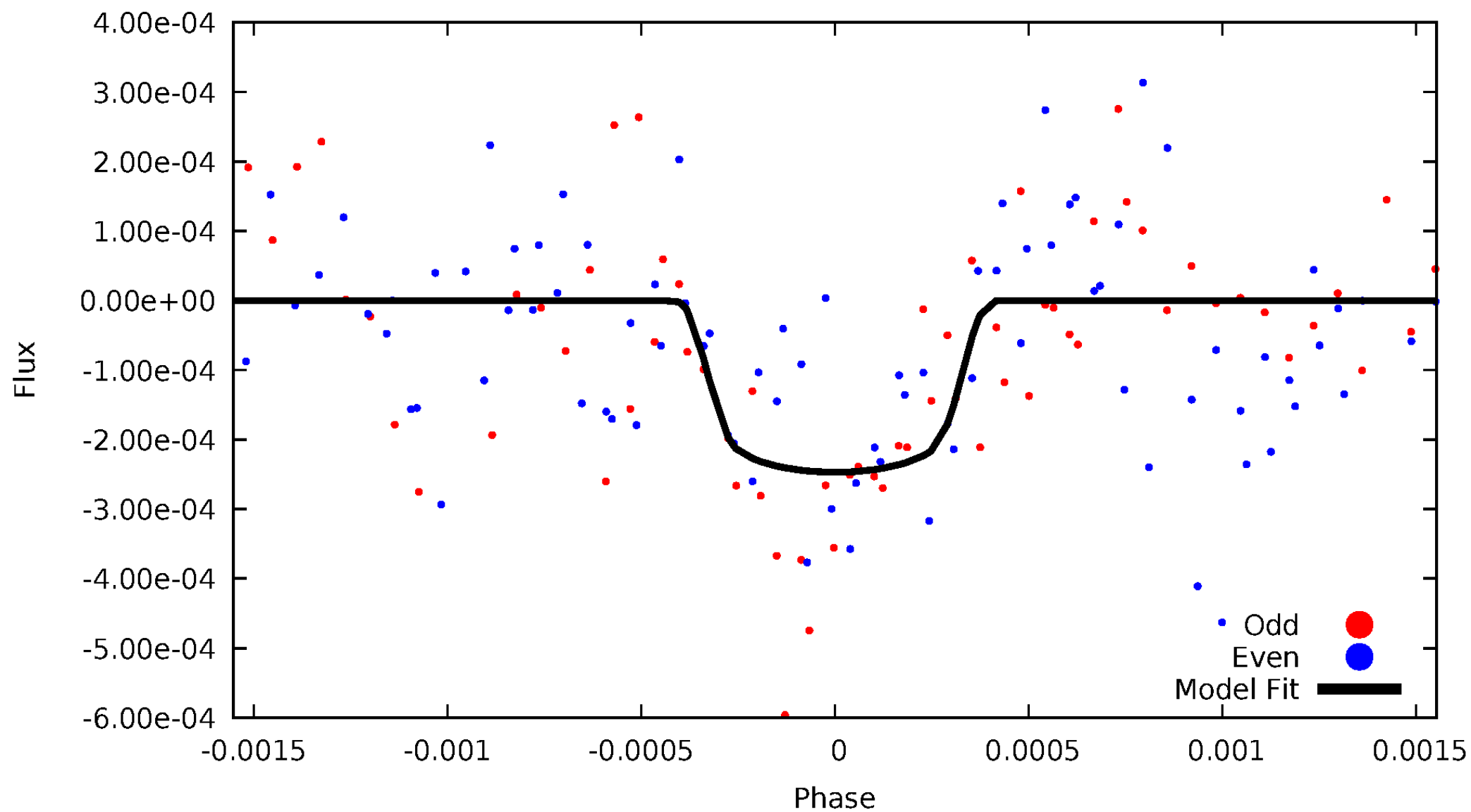


TCE 010135362-04



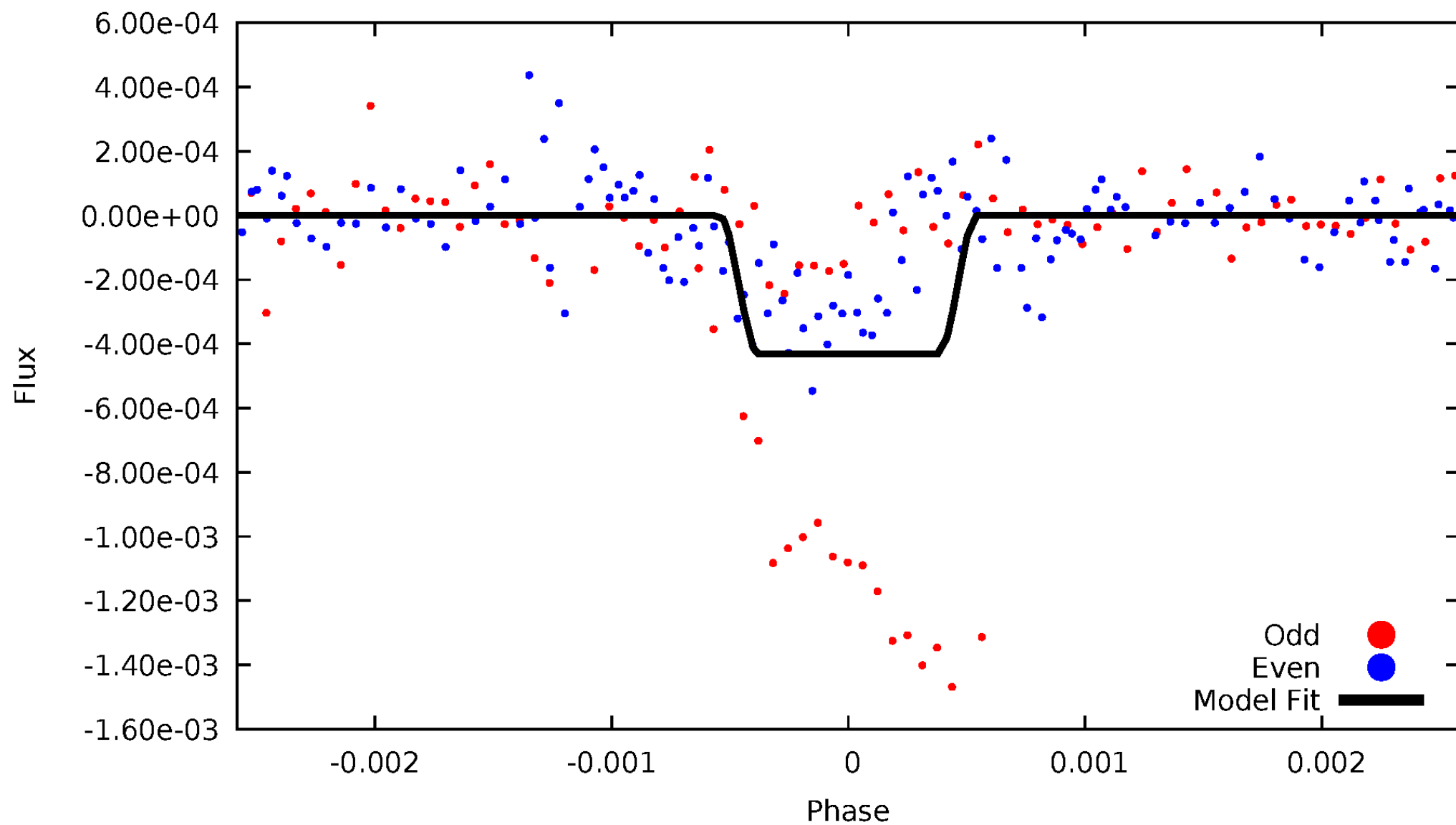
# DV Odd/Even

TCE 010135362-04



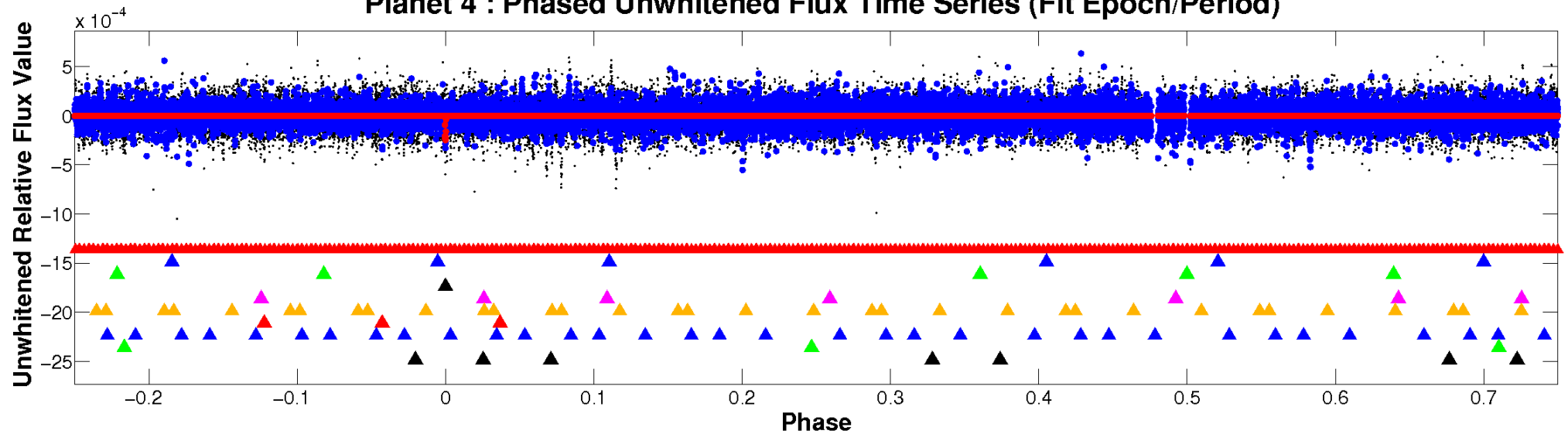
# ALT Odd/Even

TCE 010135362-04

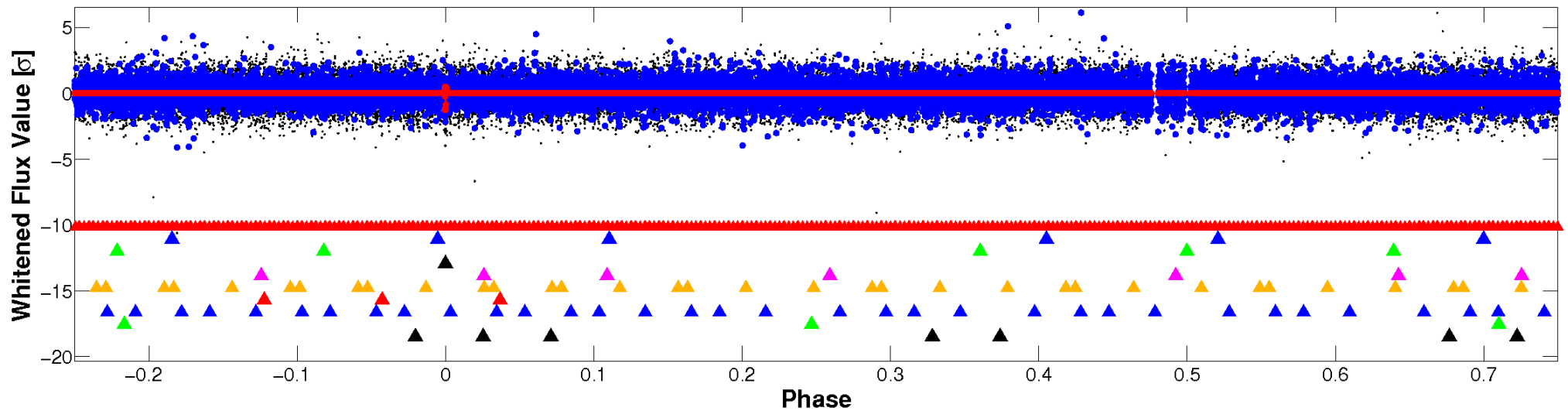


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

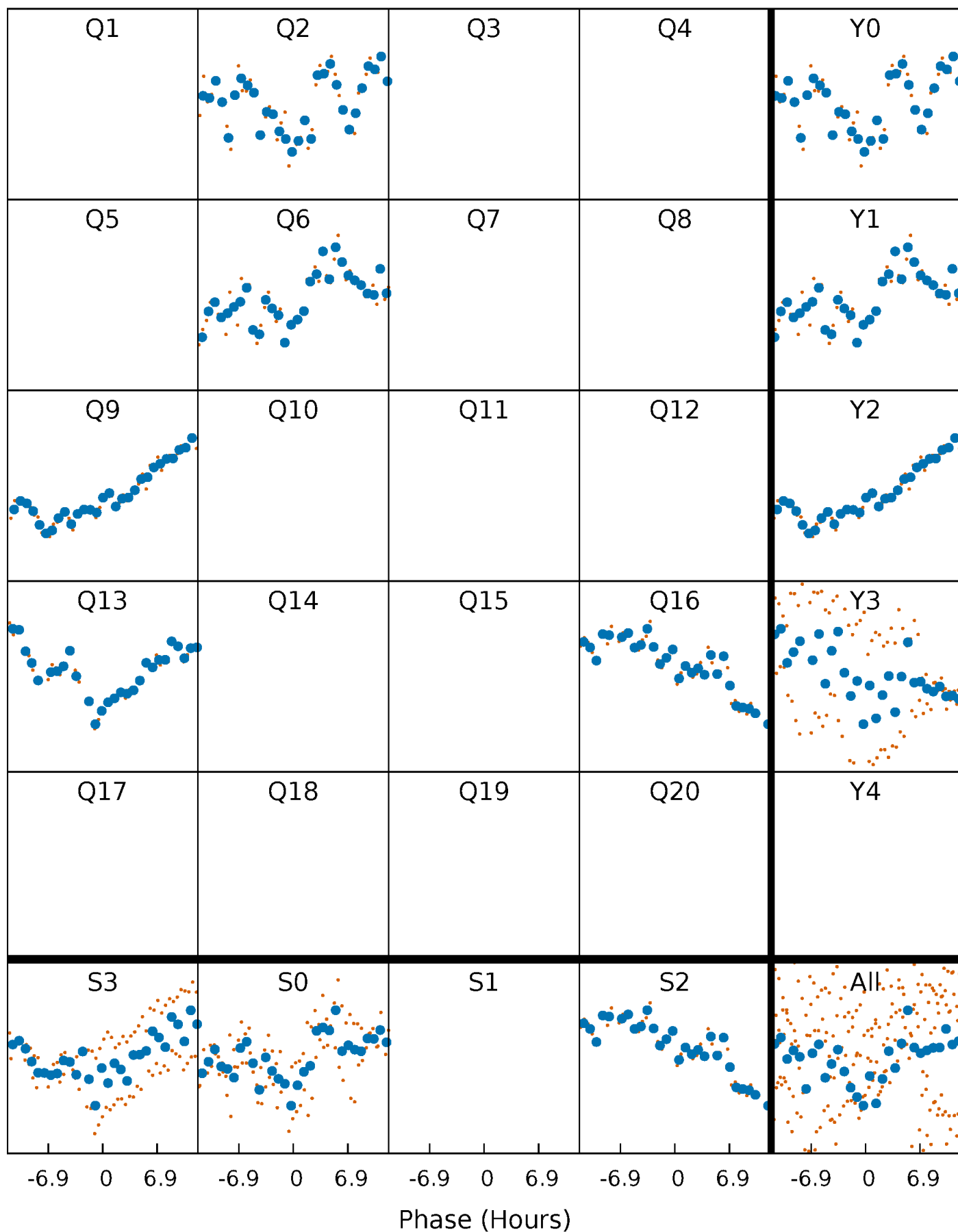


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



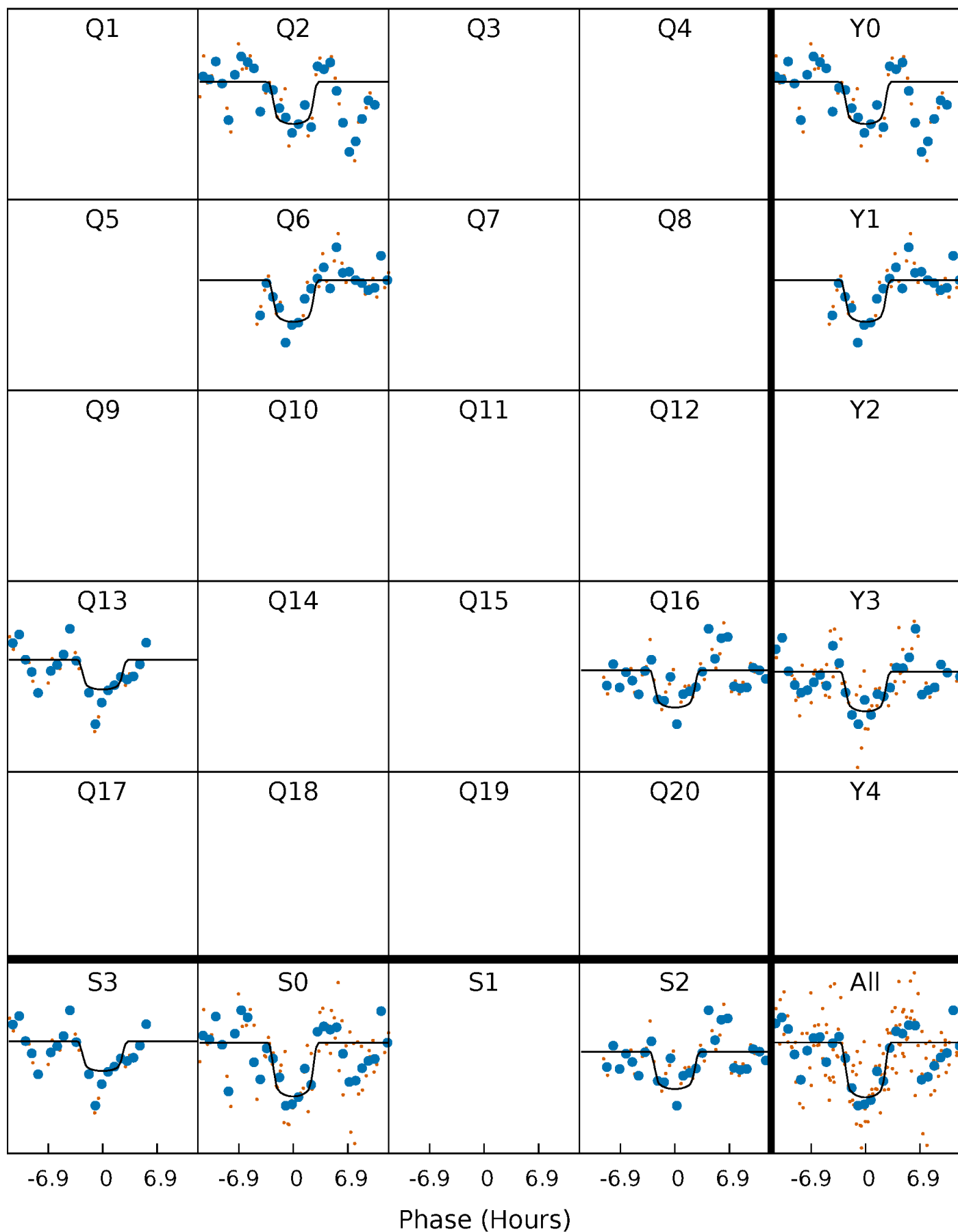
# PDC Quarter-Phased Transit Curves

TCE 010135362-04     $P=324.490927$  Days     $T_0=244.432476$  (BKJD)



# DV Quarter-Phased Transit Curves

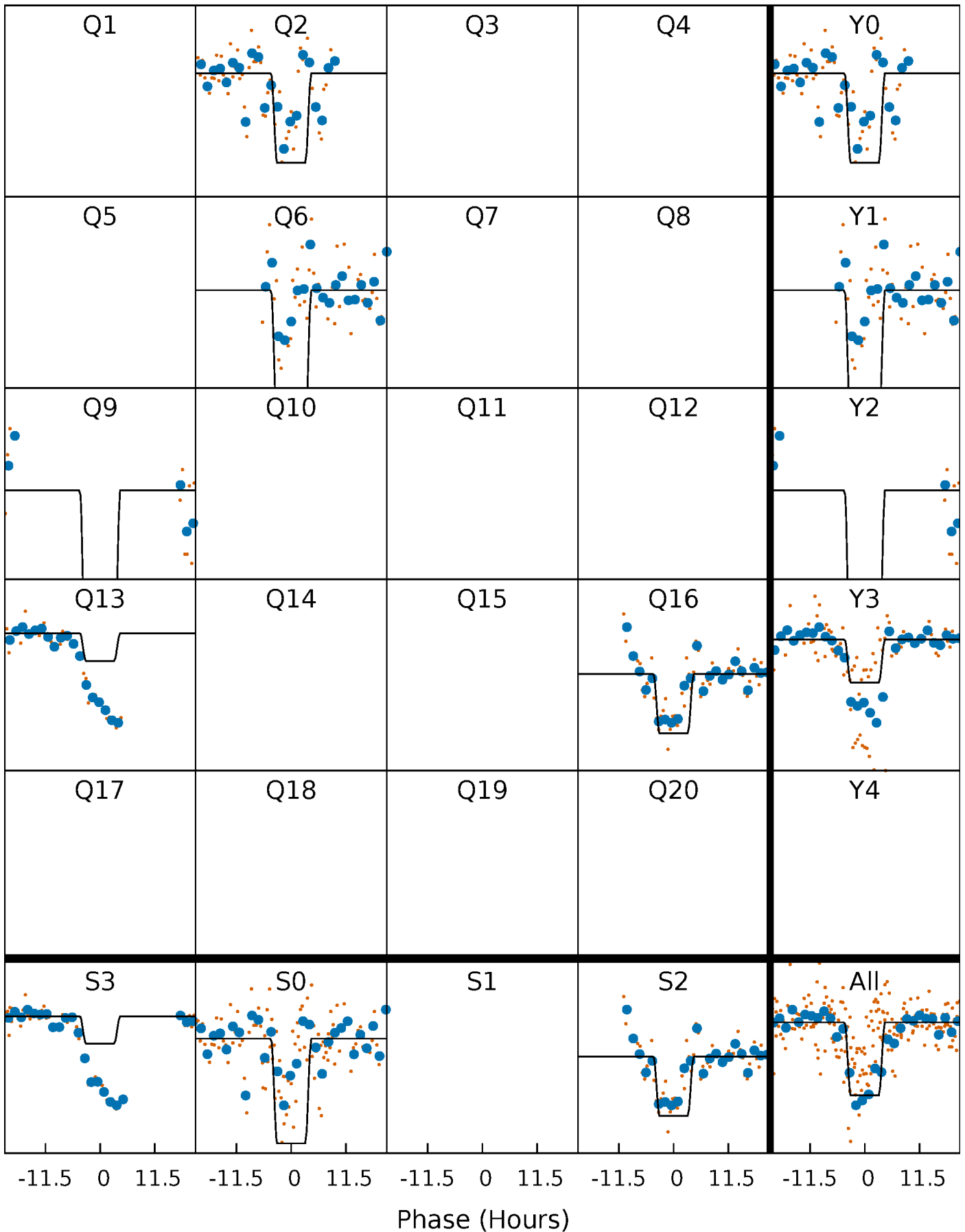
TCE 010135362-04 P=324.490927 Days  $T_0=244.432476$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

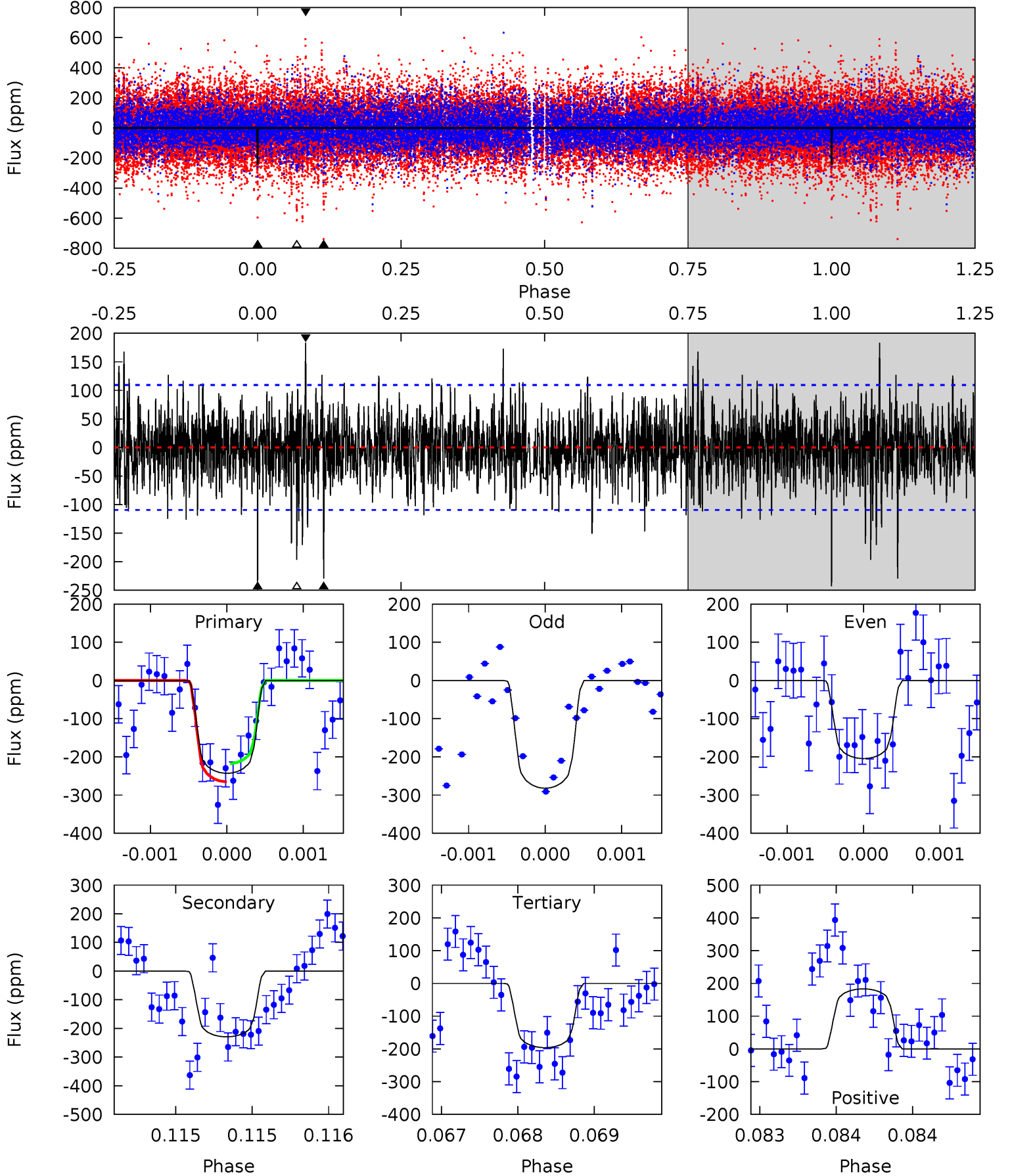
TCE 010135362-04     $P=324.491744$  Days     $T_0=244.491287$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-04, P = 324.490927 Days, E = 244.432476 Days

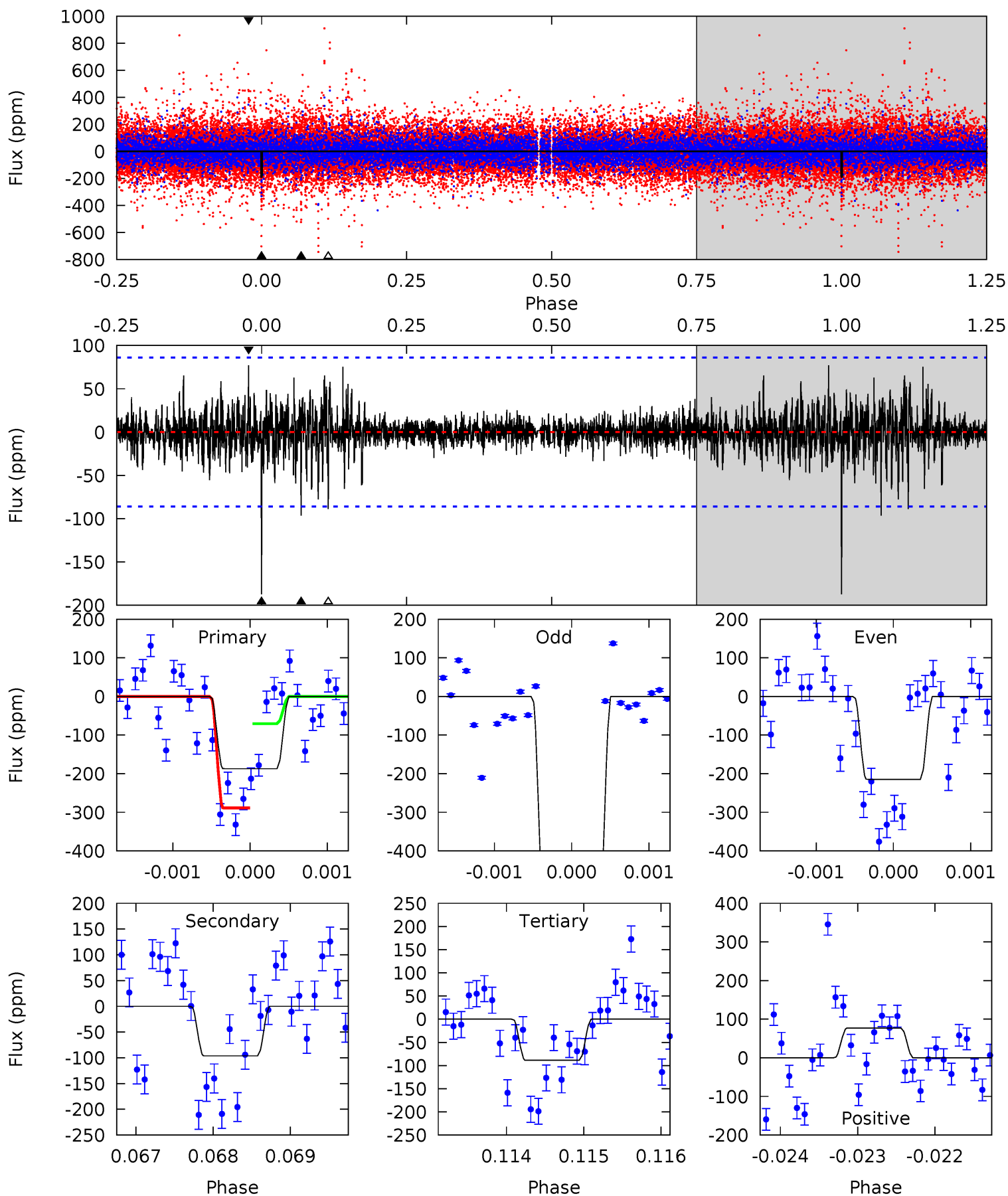
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	11.5	9.84	9.19	5.49	3.35	2.20	2.35	3.00	1.66	2.31	1.95	1.05	0.43	1.18



# Alt Model-Shift Uniqueness Test

010135362-04, P = 324.491744 Days, E = 244.491287 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
11.8	6.08	5.62	4.87	5.44	3.27	0.97	6.22	6.96	0.47	1.21	12.6	1.92	0.29	6.90



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-229 \pm 20$	$2.86^{+0.54}_{-0.50}$	$495^{+41}_{-36}$	$6060^{+450}_{-373}$	$14999^{+6670}_{-4499}$
Alt.	$-96 \pm 16$	$3.34^{+0.66}_{-0.53}$	$492^{+41}_{-36}$	$4644^{+270}_{-253}$	$4631^{+2131}_{-1503}$

$T_{\text{max}}$  = 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

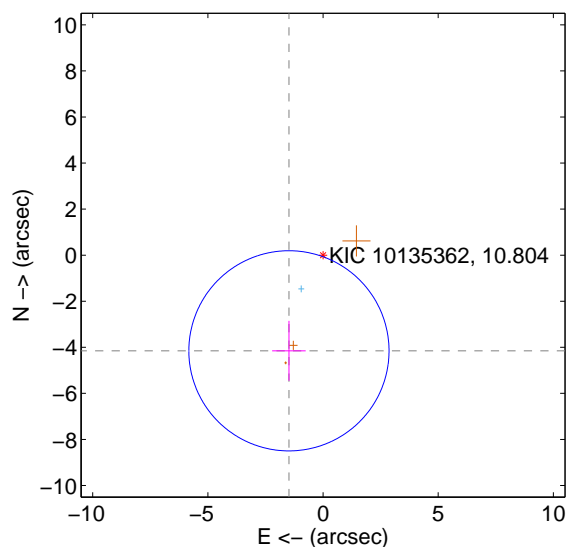
Supplemental centroid analysis for 010135362-04. **Kepler magnitude: 10.80.** Transit SNR 7.66

**There are 1 quarters with good PRF difference image offsets**

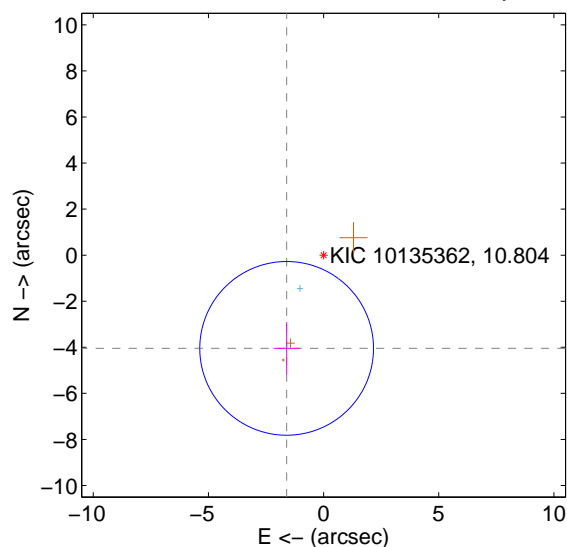
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.409 \pm 1.449</math></b>	<b>3.04</b>	$1.481 \pm 0.728$	$-4.153 \pm 1.299$
PRF-fit source offset from KIC position	<b><math>4.353 \pm 1.257</math></b>	<b>3.46</b>	$1.604 \pm 0.570$	$-4.046 \pm 1.140$
photometric centroid source offset	$0.77 \pm 0.61$	1.25	$-0.55 \pm 0.60$	$-0.54 \pm 0.63$

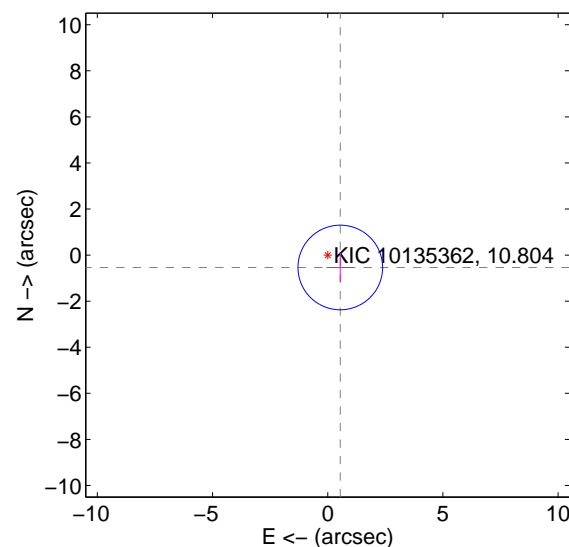
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

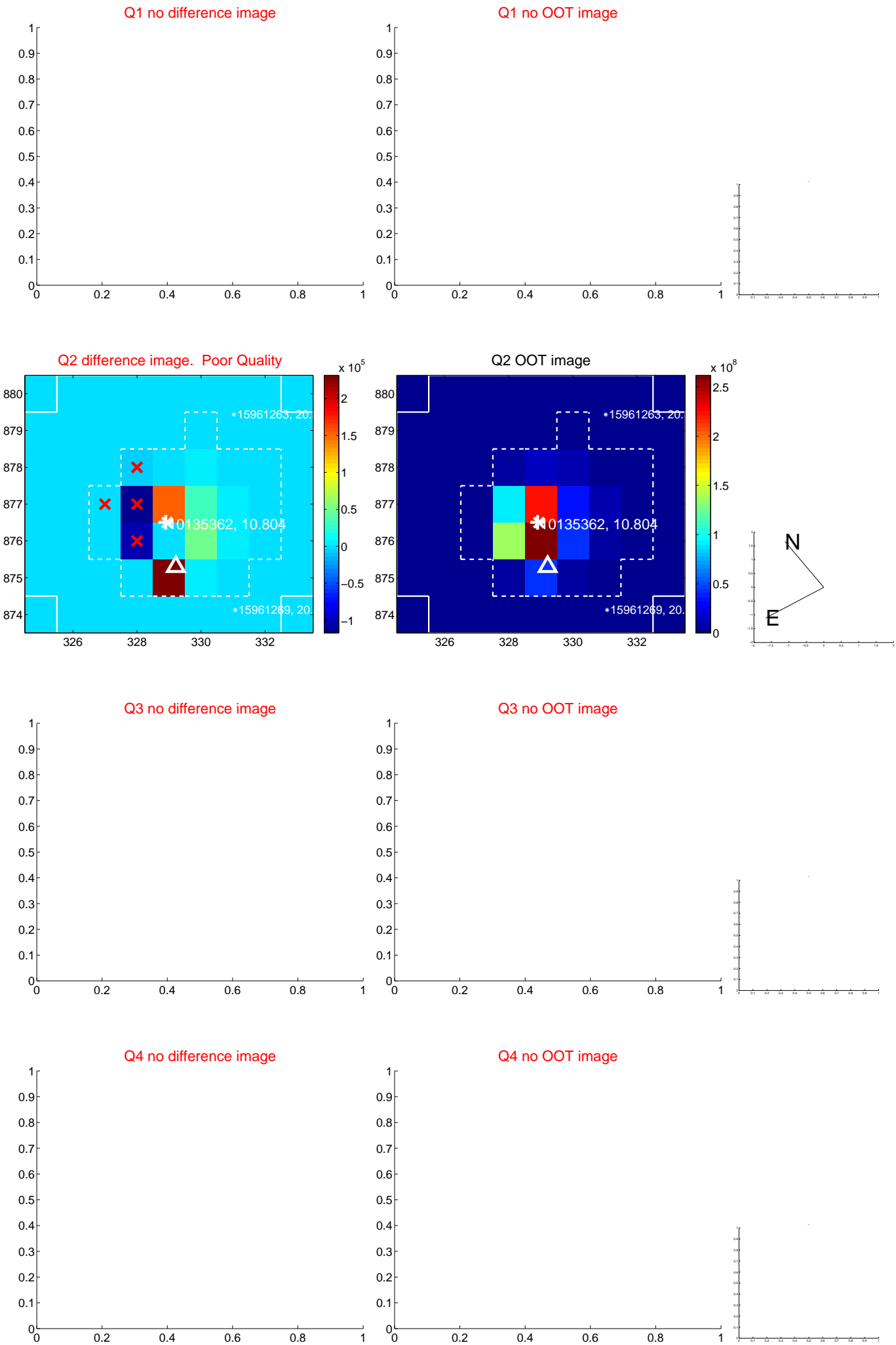


offset from photometric centroids

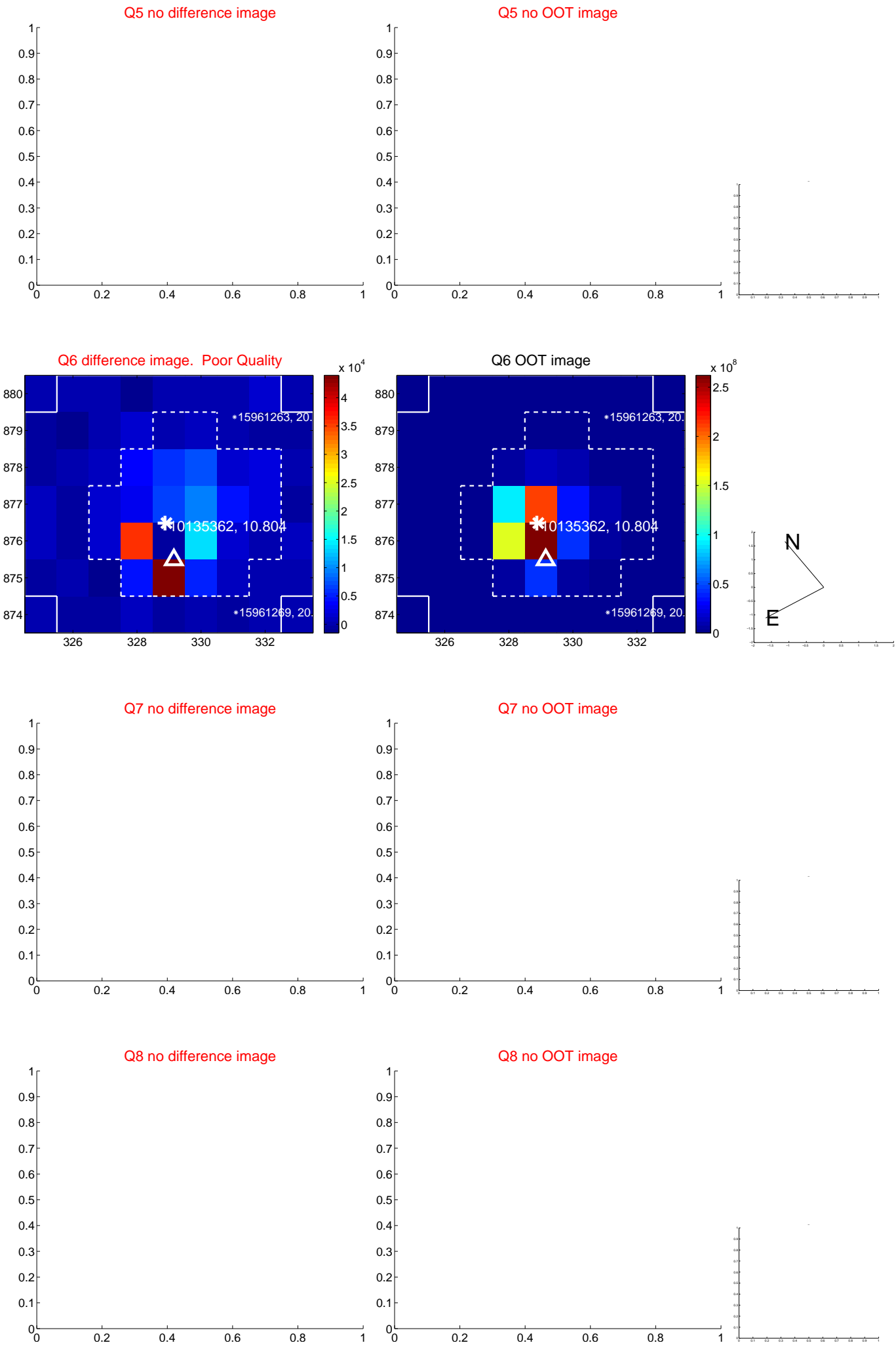


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

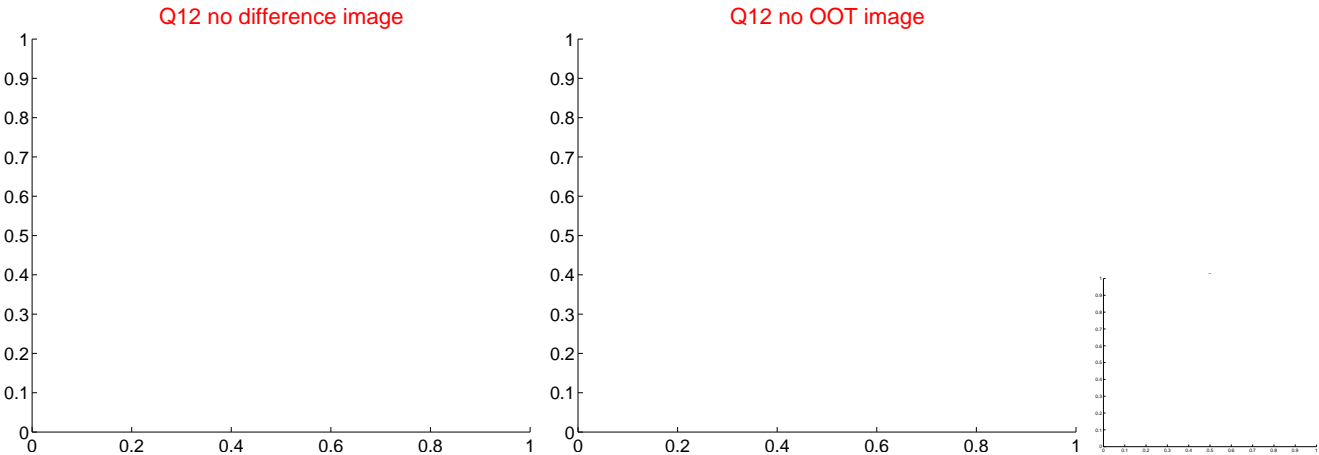
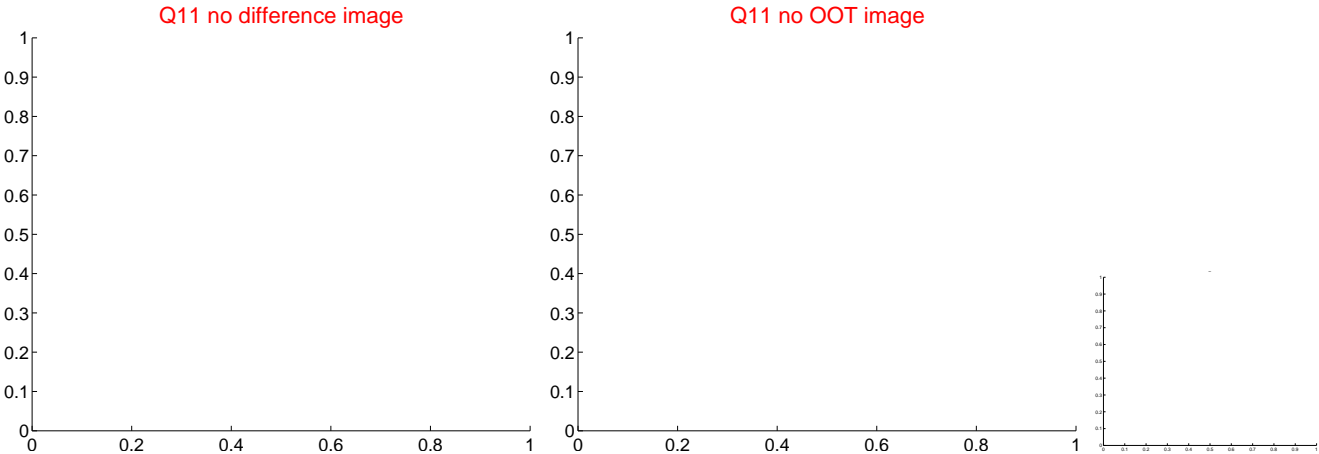
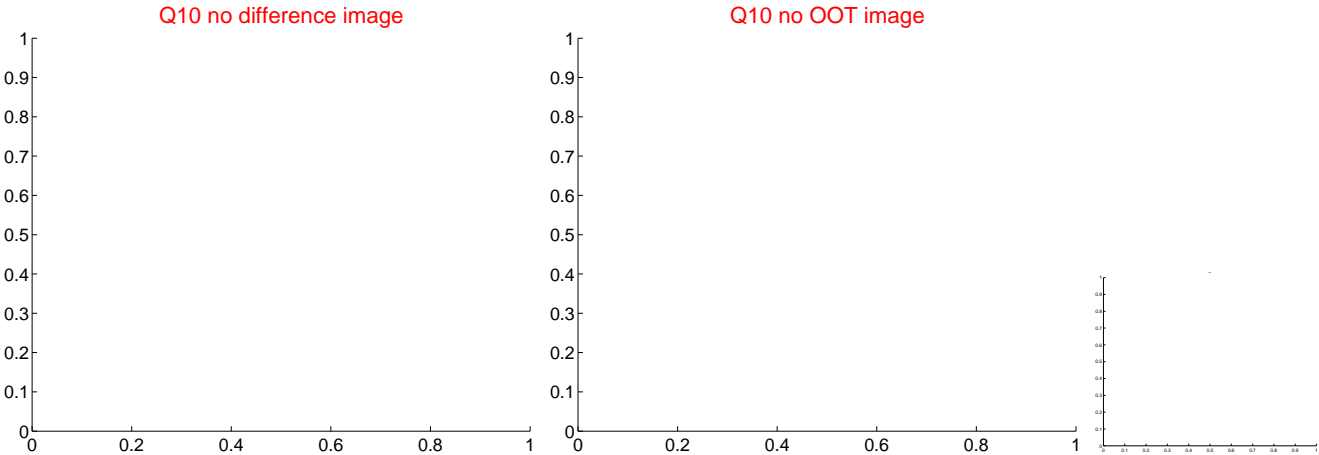
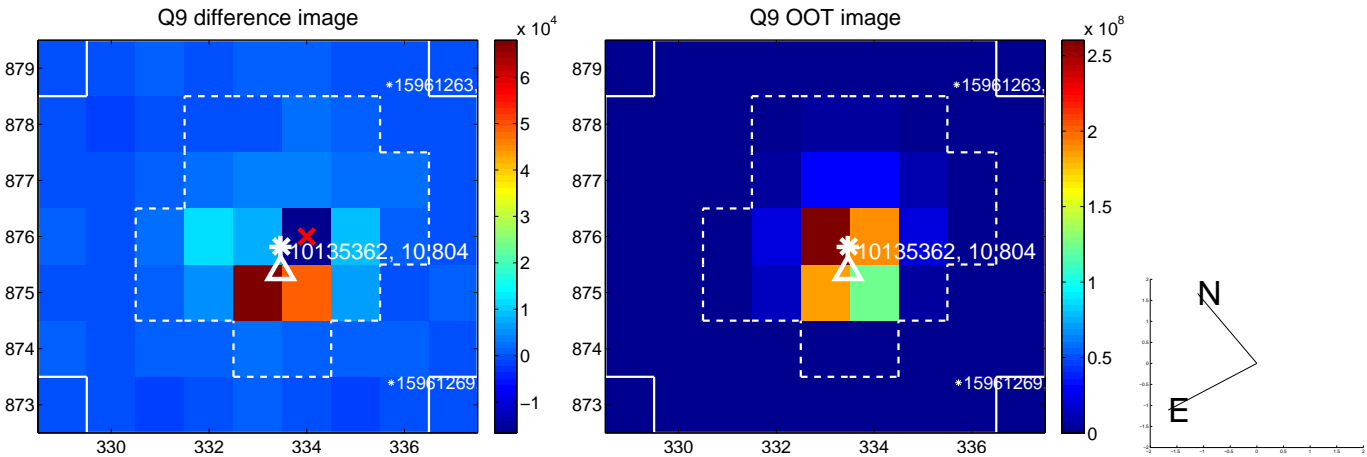


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

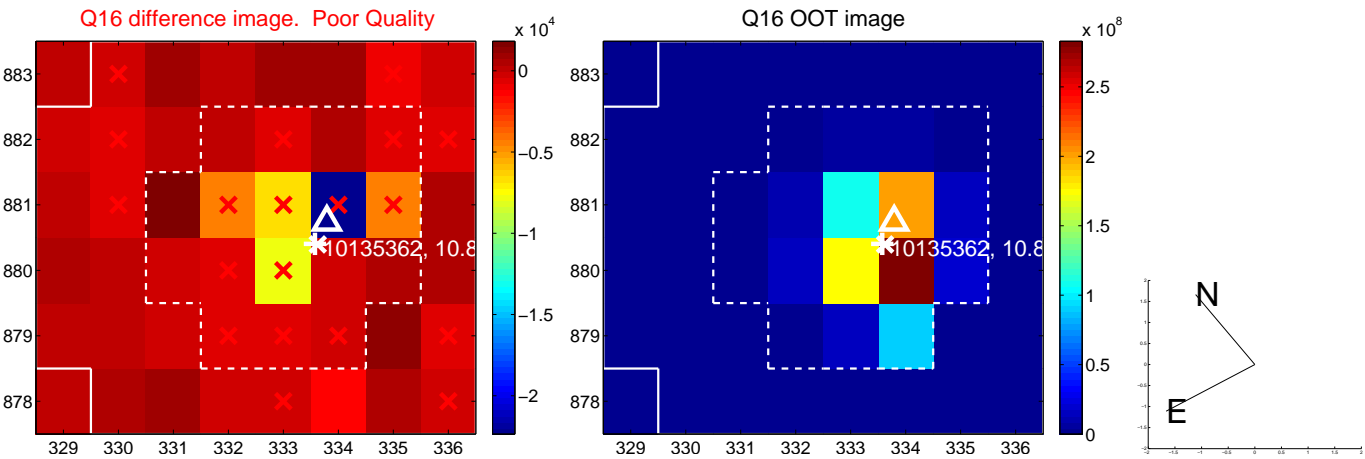
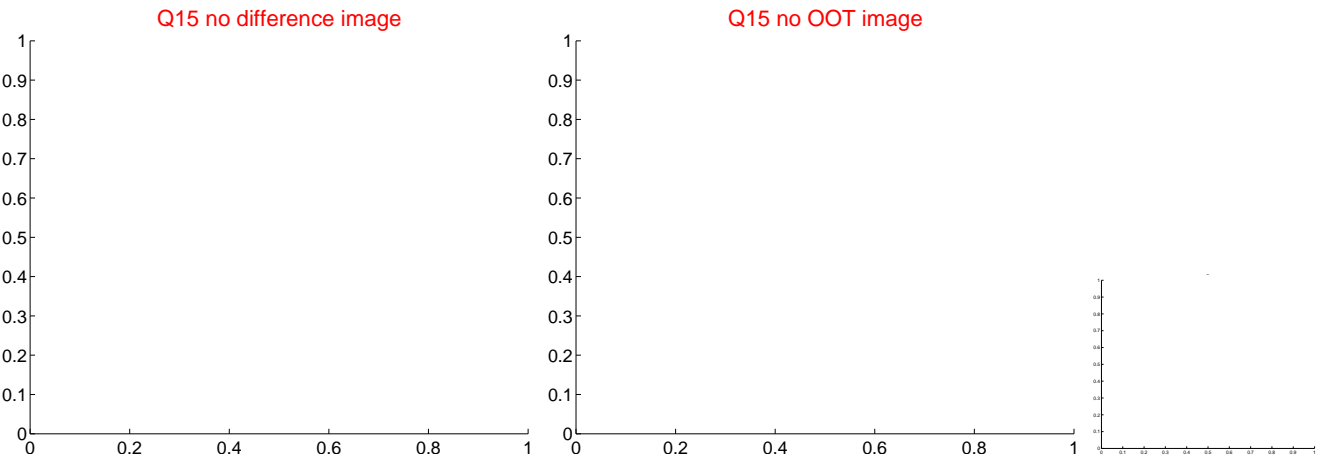
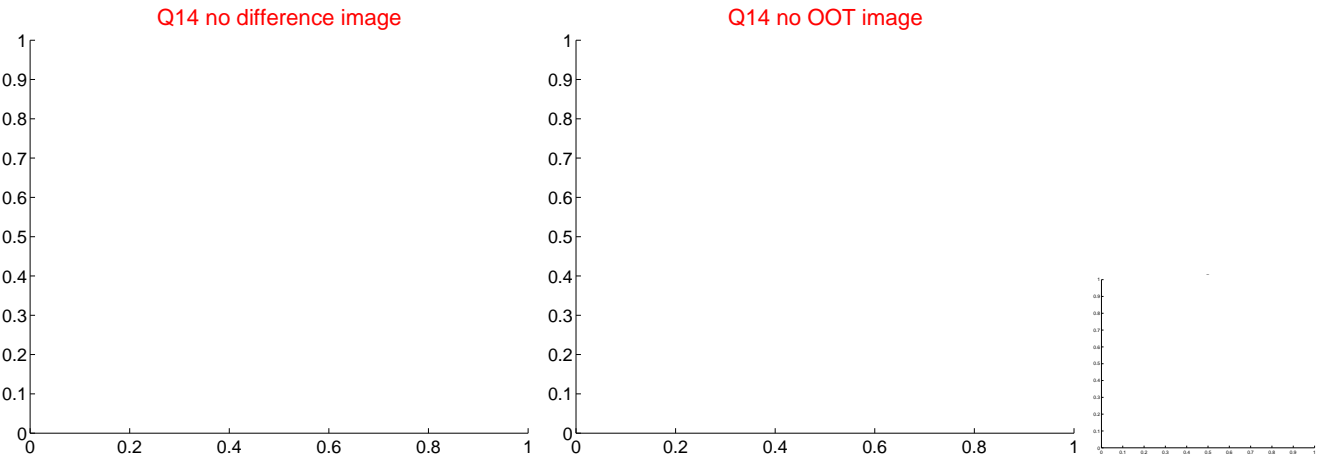
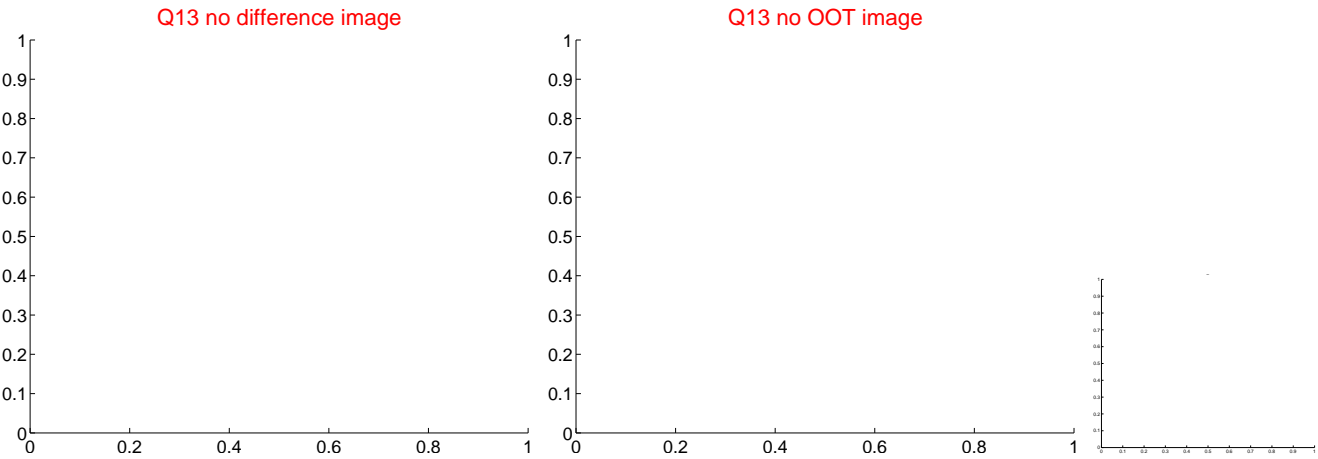




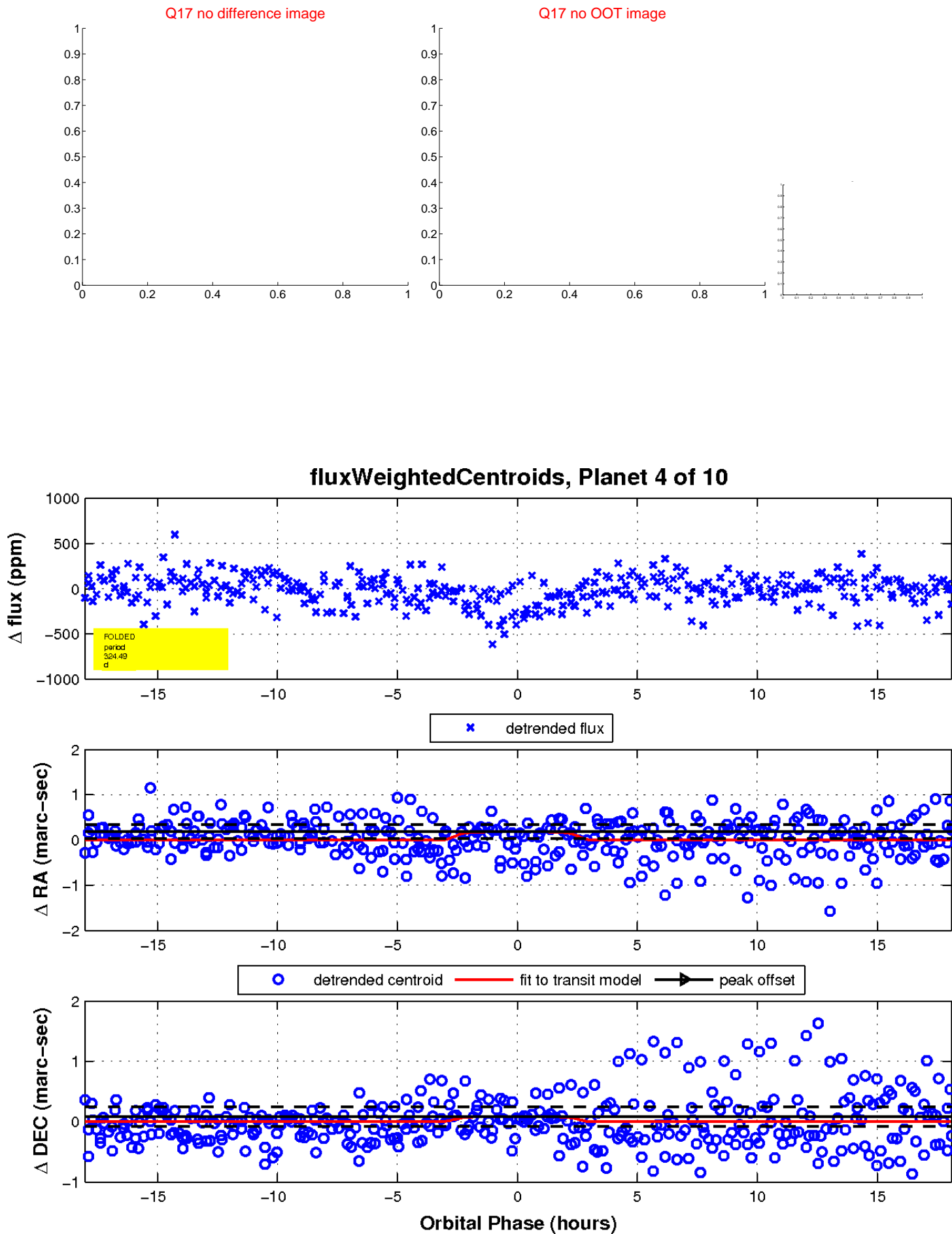
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

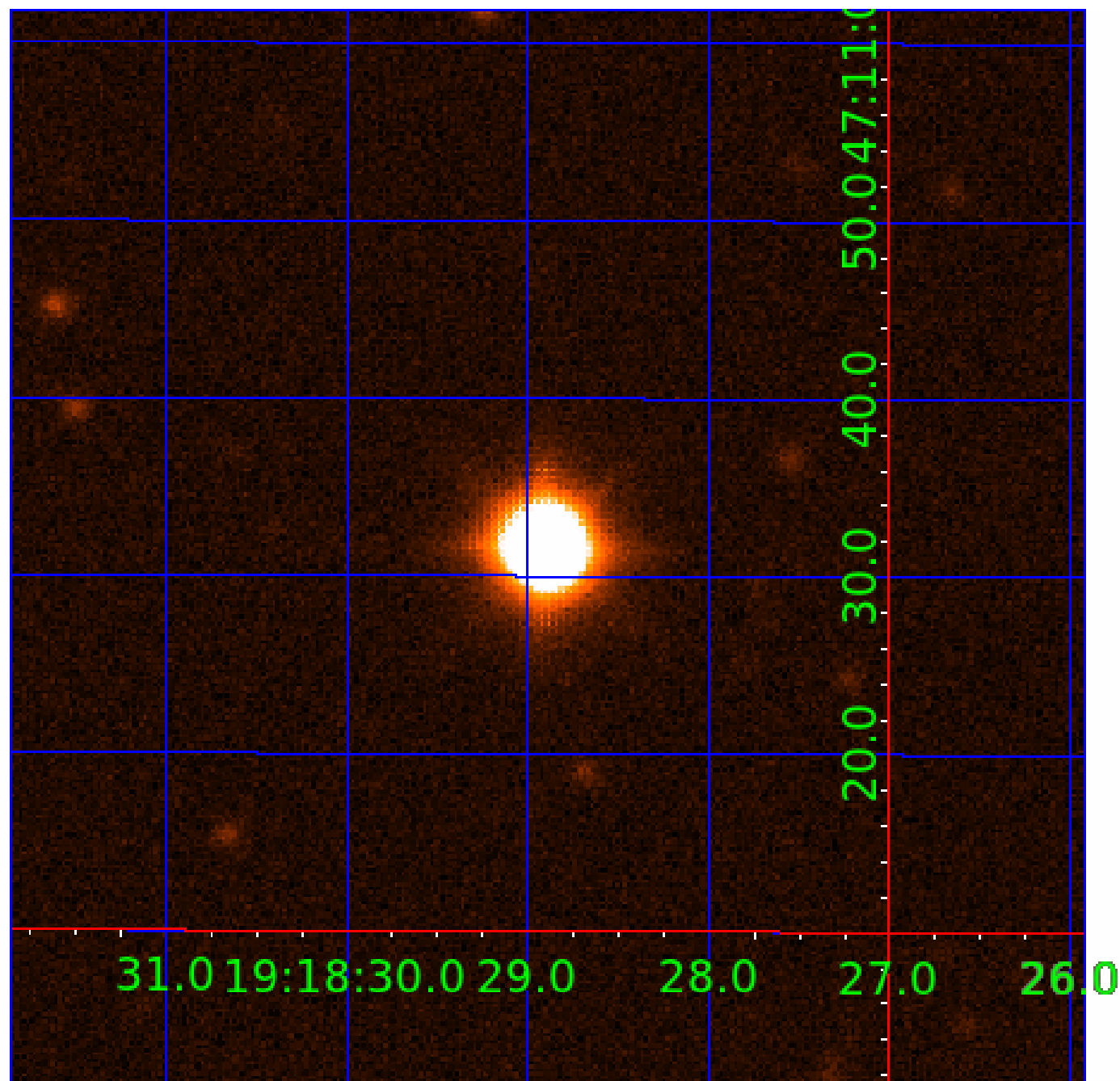


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

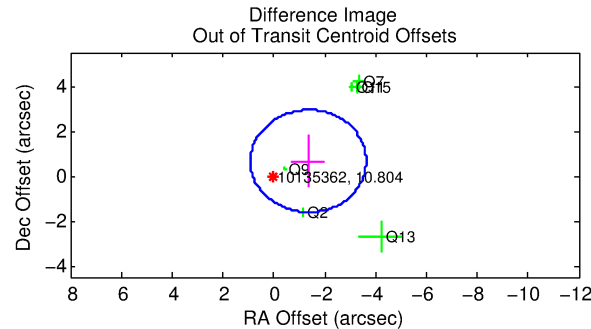
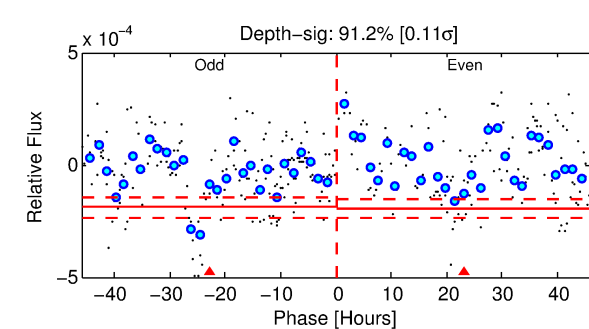
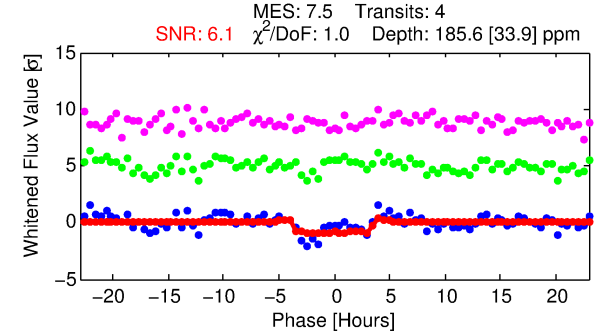
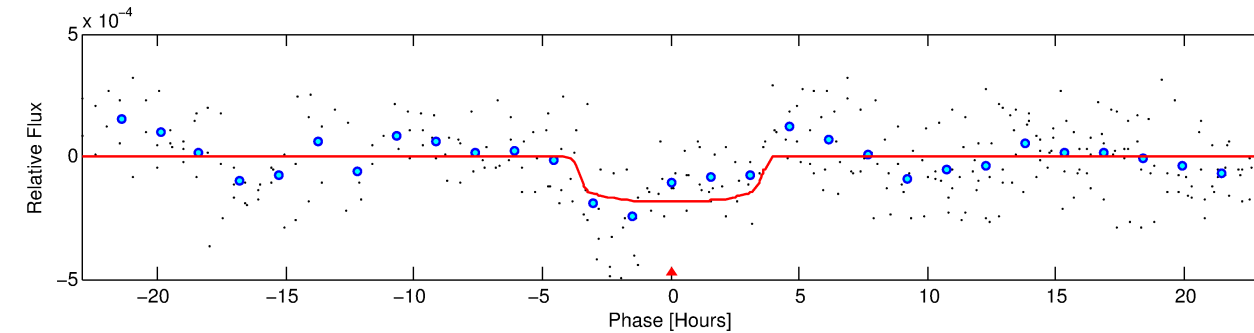
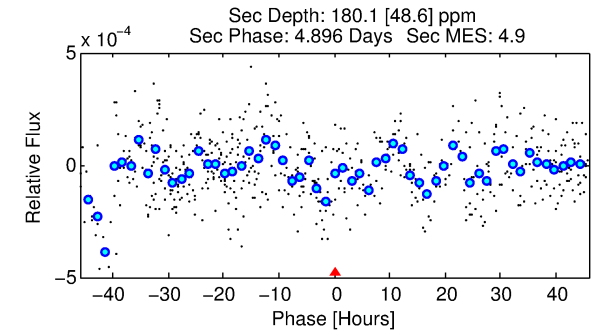
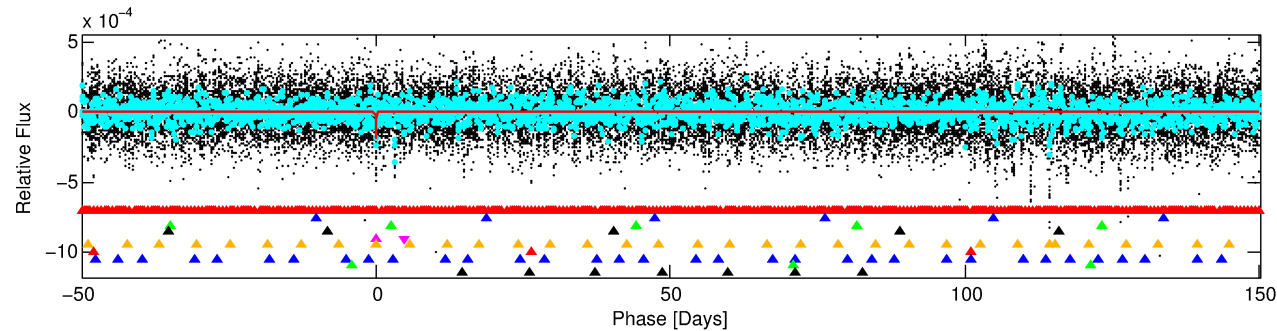
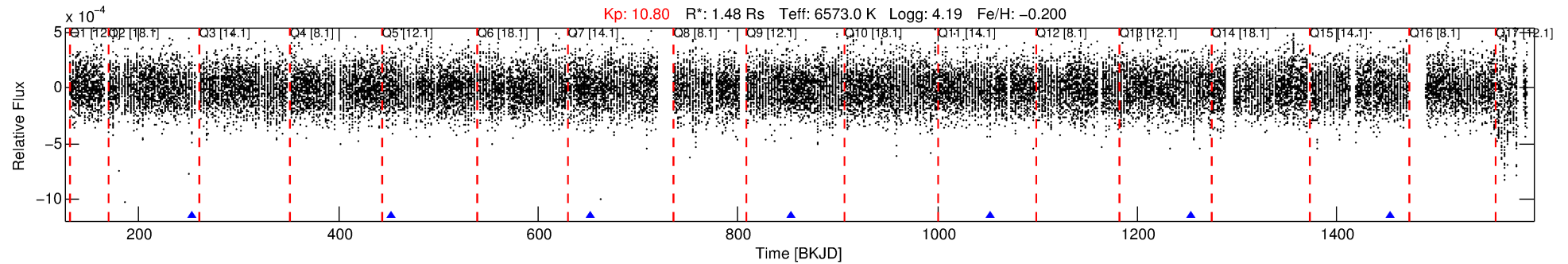
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-05

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 5 of 10 Period: 200.084 d



## DV Fit Results:

Period = 200.08421 [0.00439] d  
Epoch = 252.8461 [0.0167] BKJD  
 $R_p/R^* = 0.0143$  [0.0041]  
 $a/R^* = 102.18$  [153.61]  
 $b = 0.88$  [0.41]  
 $S_{\text{eff}} = 7.07$  [2.78]  
 $T_{\text{eq}} = 416$  [41] K  
 $R_p = 2.31$  [0.98]  $R_e$   
 $a = 0.7176$  [0.1834] AU  
 $A_g = 9595.27$  [7021.53] [1.37σ]  
 $T_{\text{effp}} = 6364$  [1040] K [5.71σ]

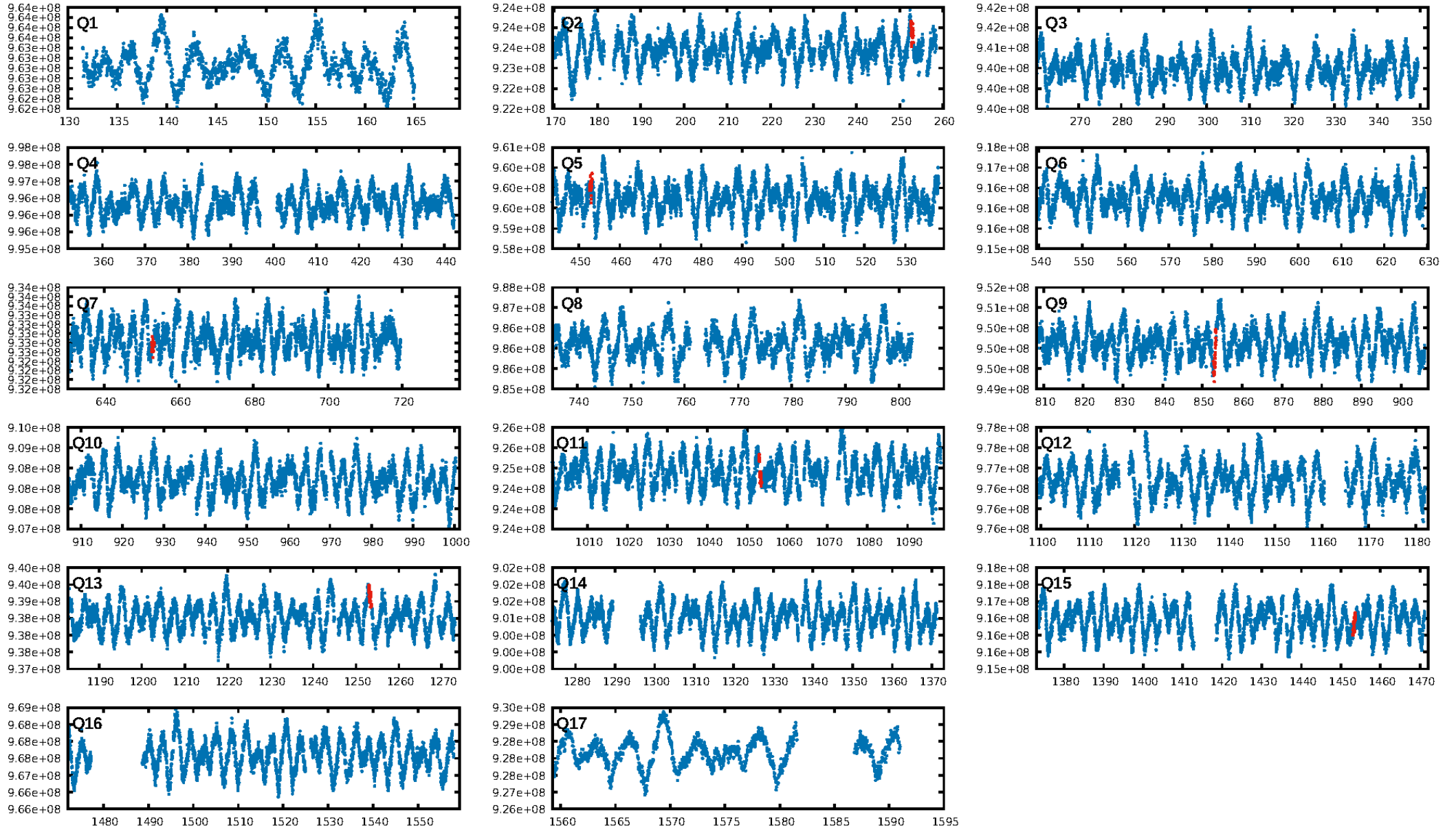
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [282.17σ]  
LongPeriod-sig: 100.0% [27.07σ]  
ModelChiSquare2-sig: 71.4%  
ModelChiSquareGof-sig: 96.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -11.63  
Centroid-sig: 1.4%  
Centroid-so: 1.247 arcsec [1.84σ]  
OotOffset-rm: 1.506 arcsec [1.99σ]  
OotOffset-st: 1/3/0/2 [6]  
KicOffset-rm: 1.419 arcsec [1.55σ]  
KicOffset-st: 1/3/0/2 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.29 [2/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:29 Z

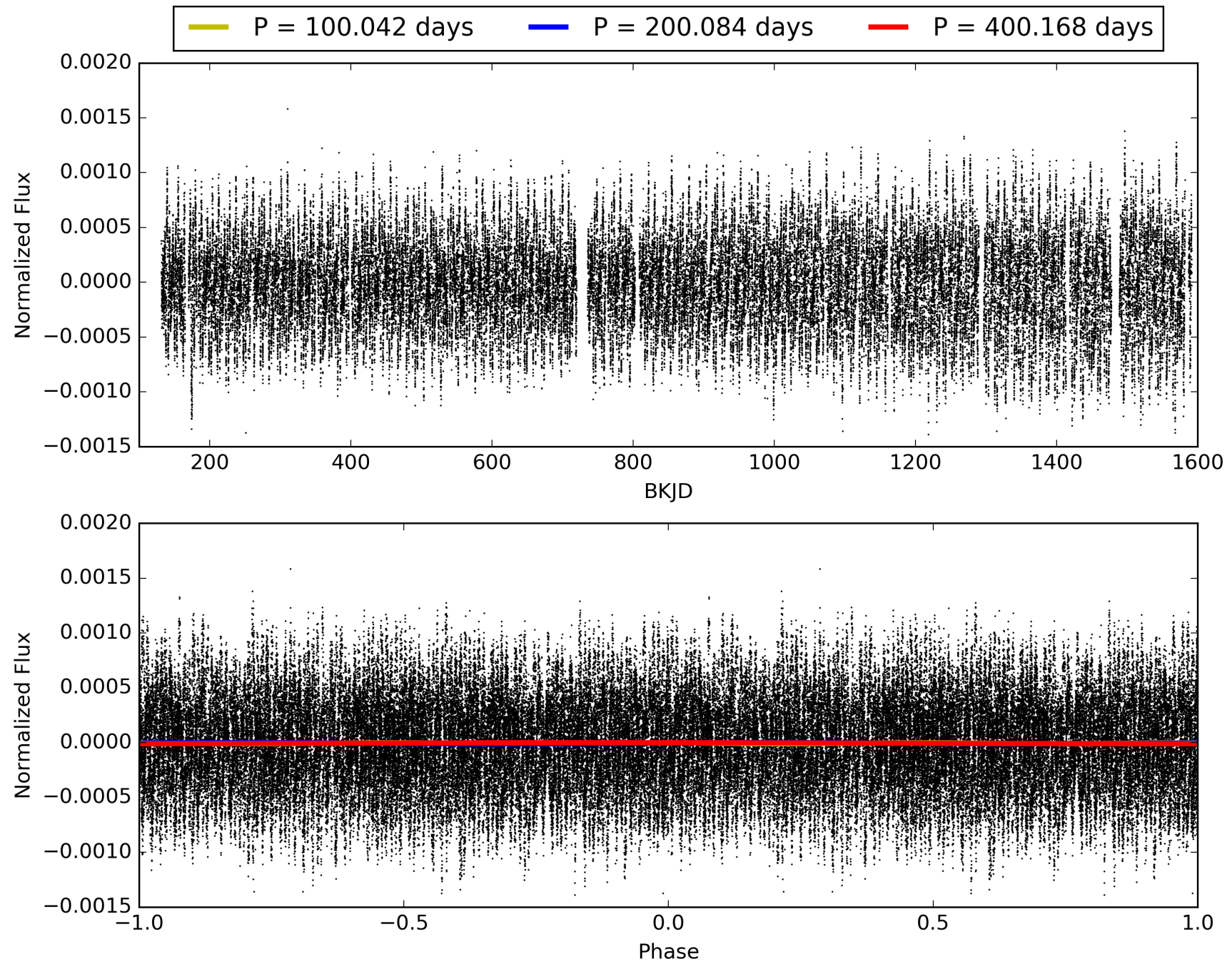
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010135362-05, PDC Light Curves



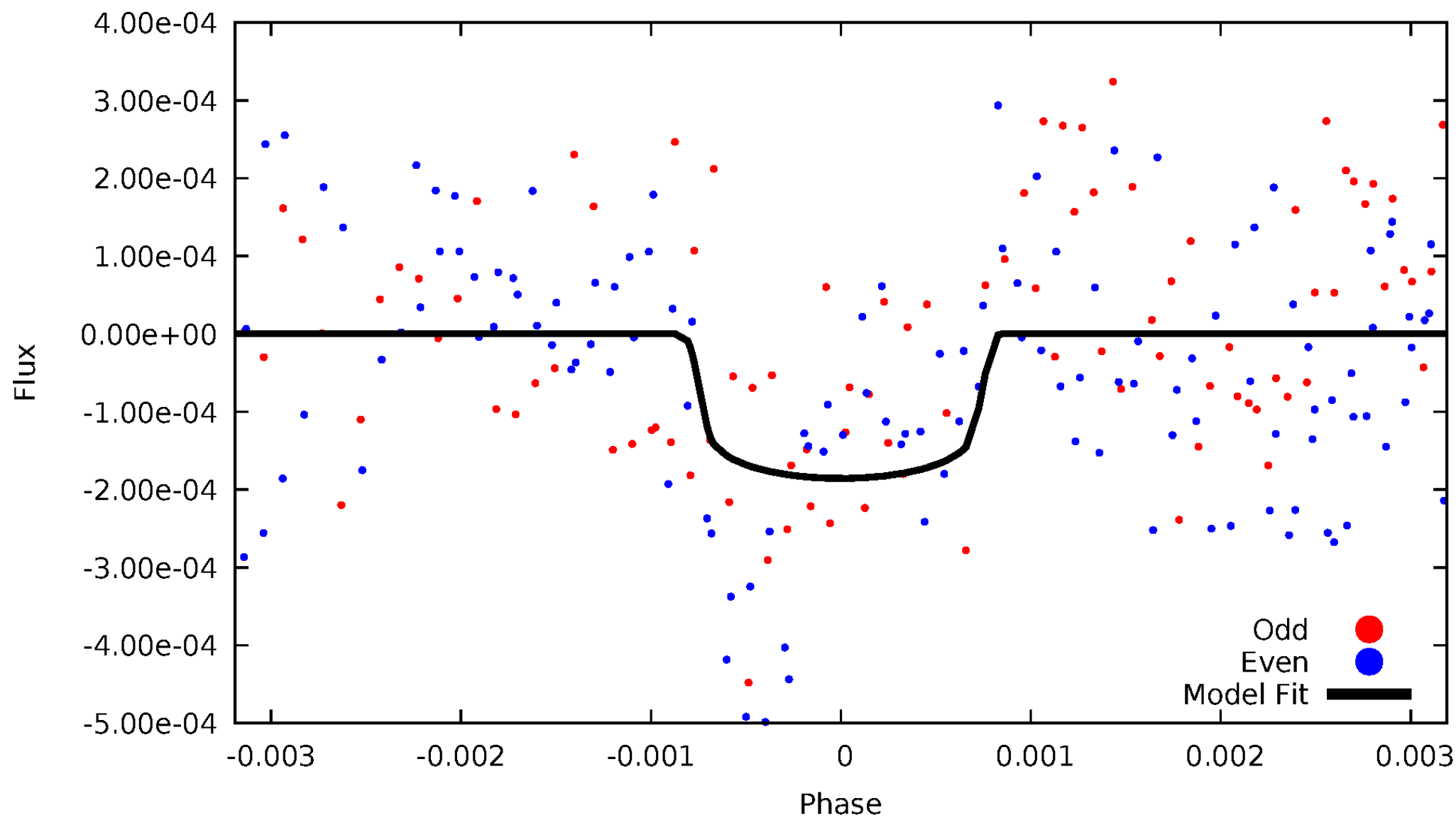


TCE 010135362-05



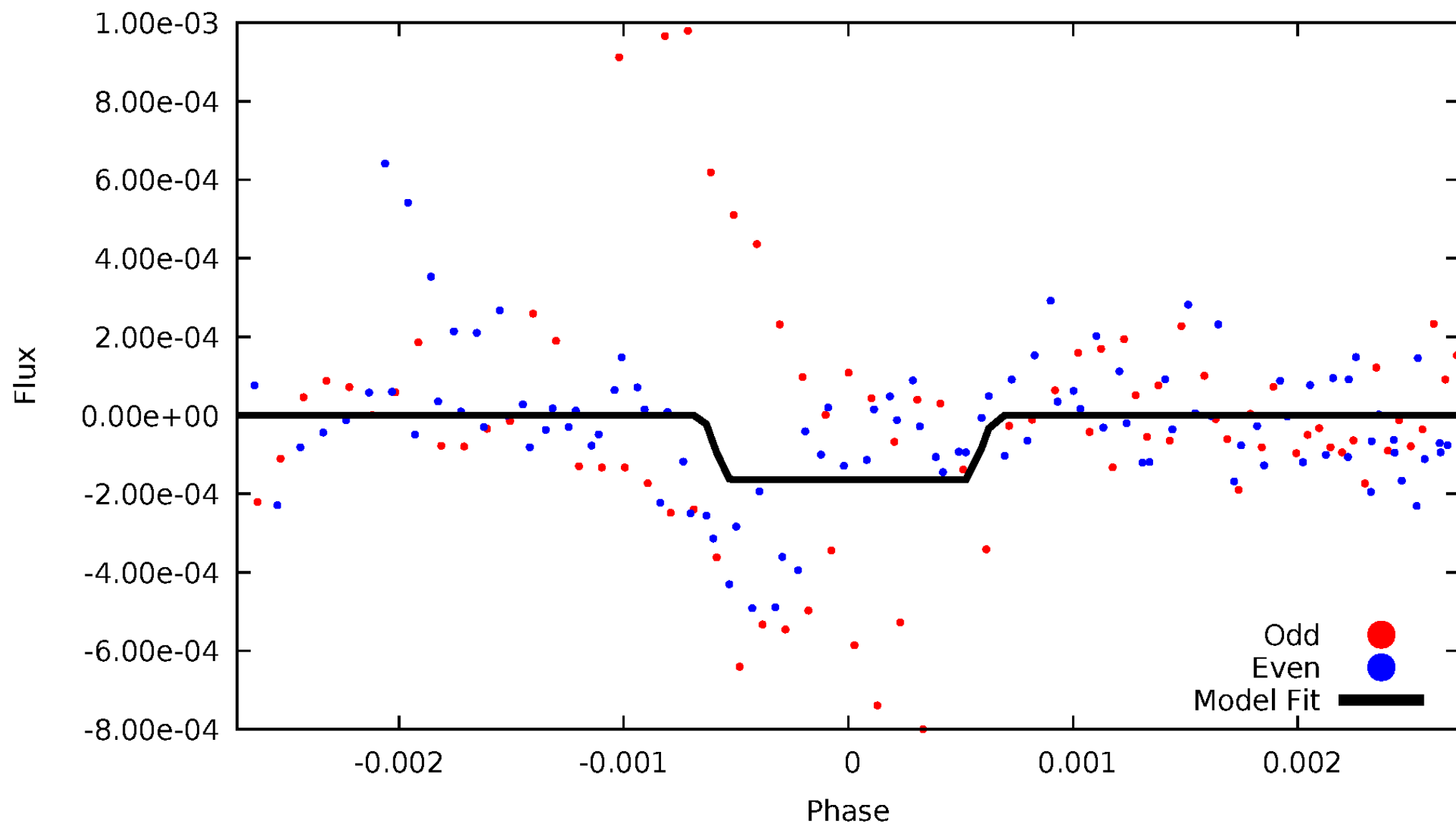
# DV Odd/Even

TCE 010135362-05



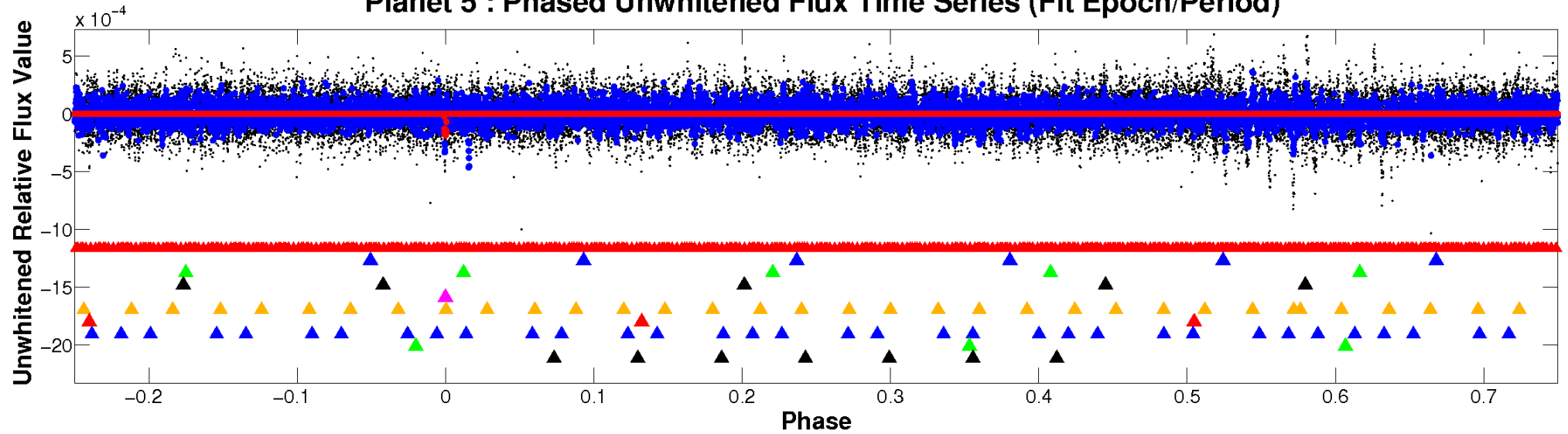
# ALT Odd/Even

TCE 010135362-05

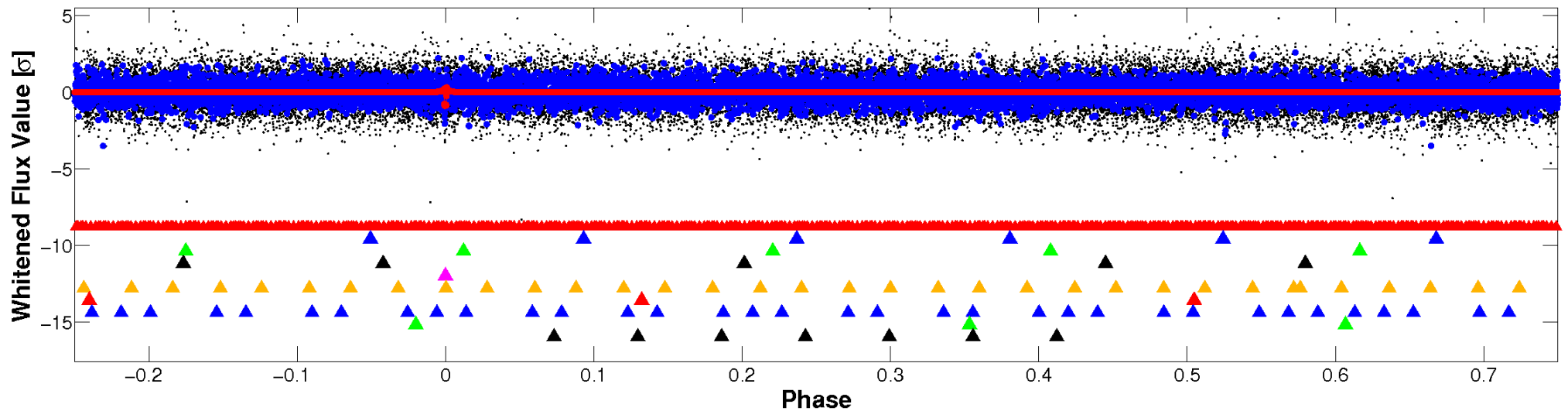


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

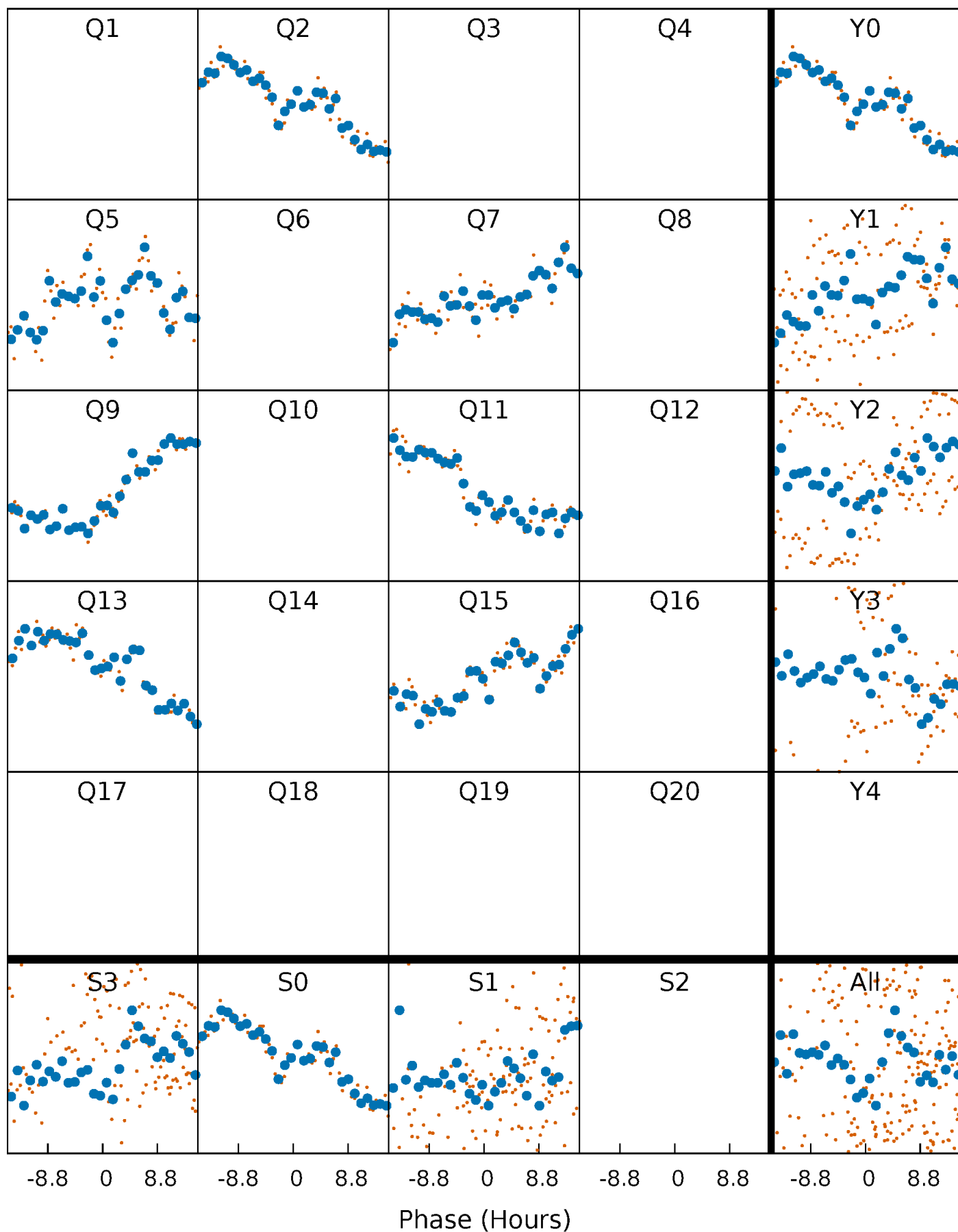


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



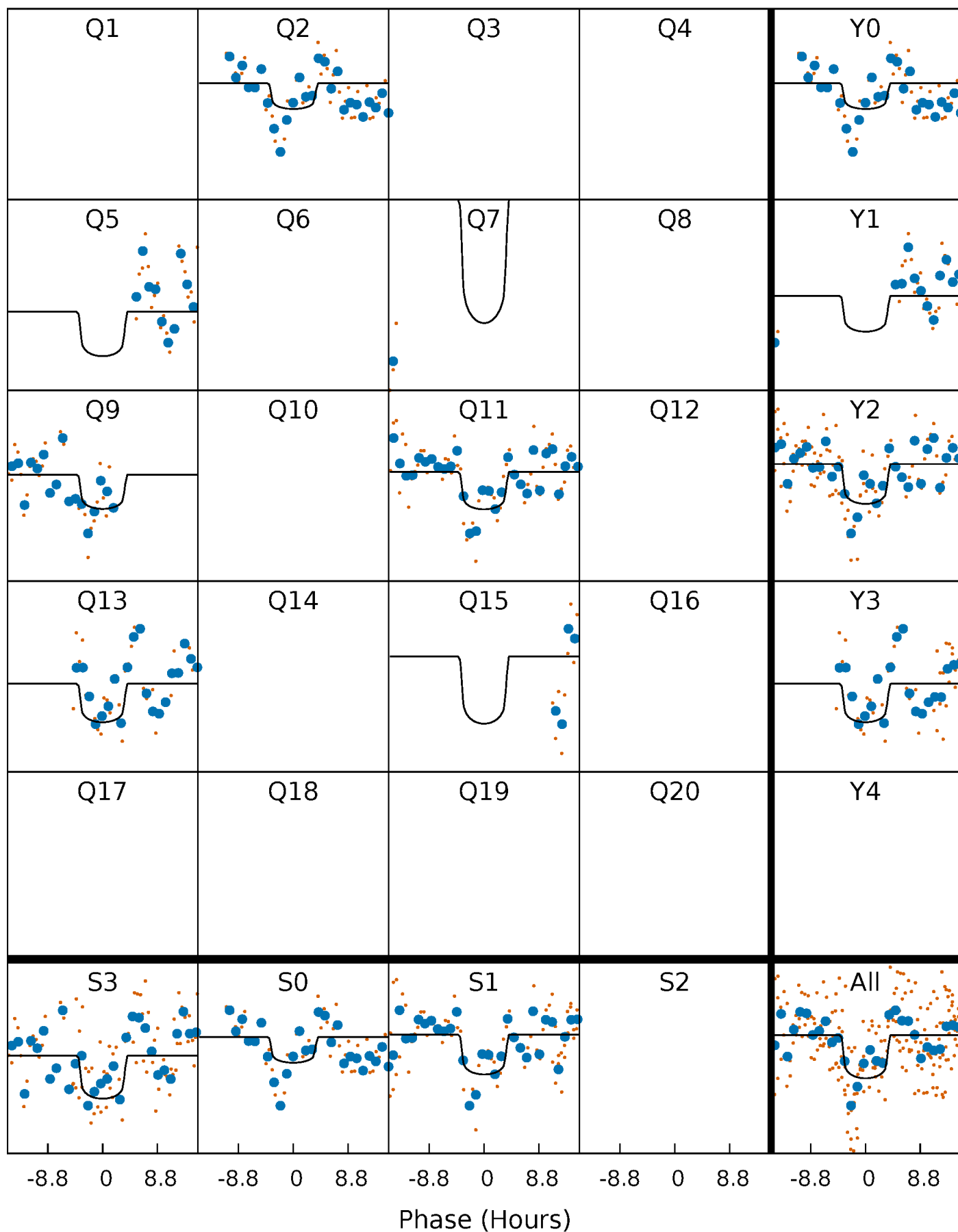
# PDC Quarter-Phased Transit Curves

TCE 010135362-05     $P=200.084209$  Days     $T_0=252.846085$  (BKJD)



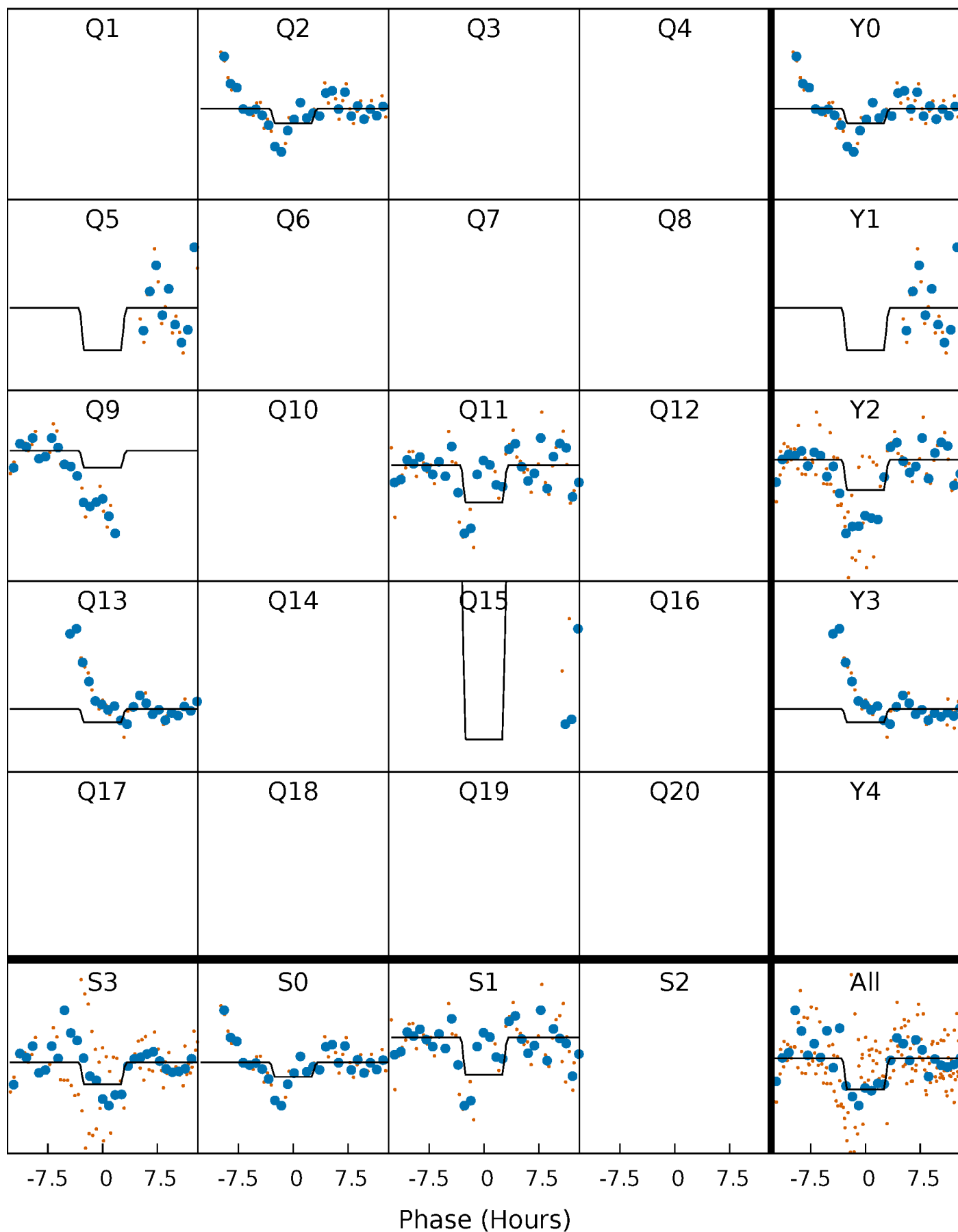
# DV Quarter-Phased Transit Curves

TCE 010135362-05     $P=200.084209$  Days     $T_0=252.846085$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

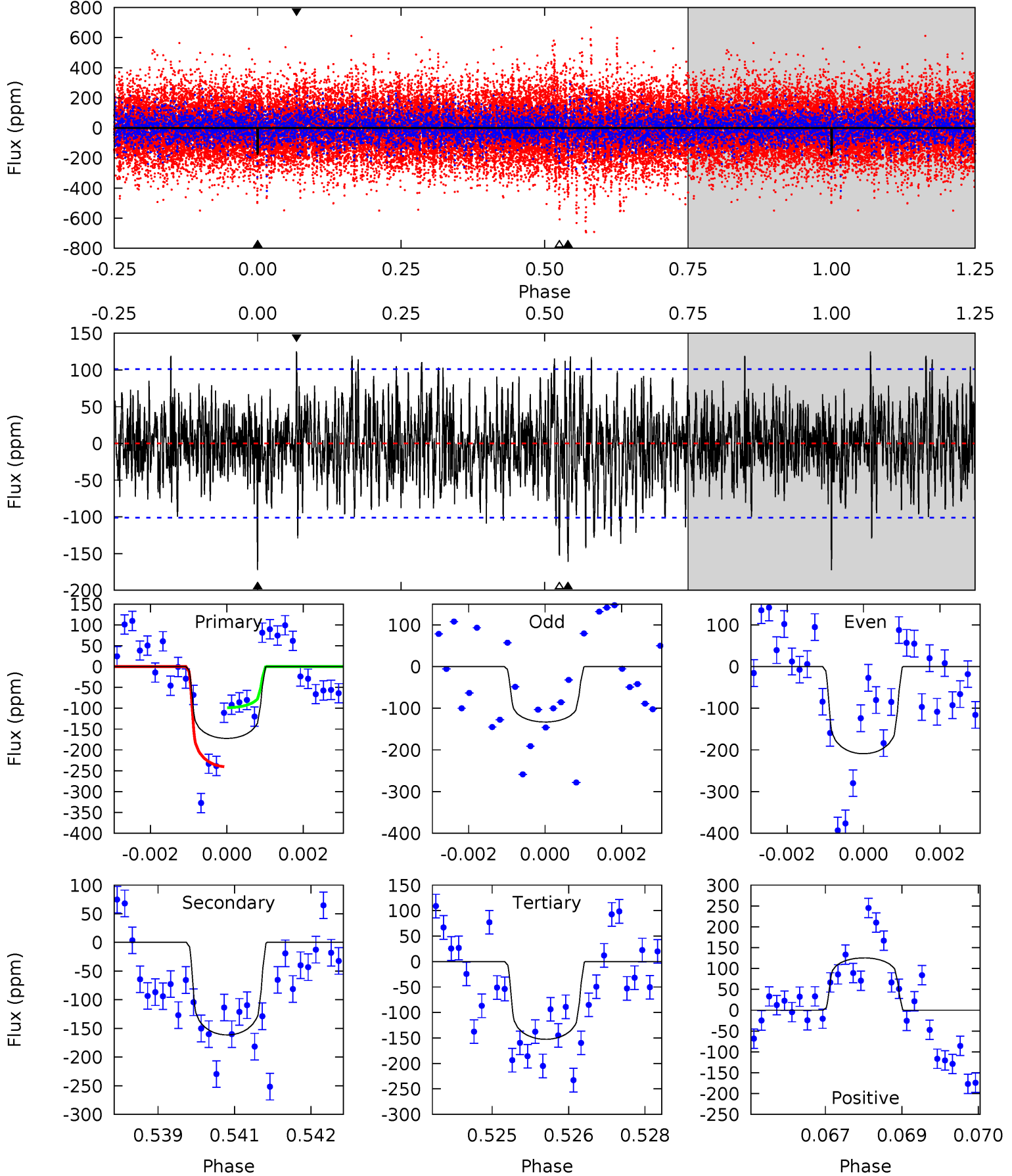
TCE 010135362-05     $P=200.088866$  Days     $T_0=252.831666$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-05,  $P = 200.084209$  Days,  $E = 52.761876$  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	8.55	8.09	6.64	5.36	3.15	2.21	1.05	2.49	0.46	1.91	2.03	0.89	0.42	3.75

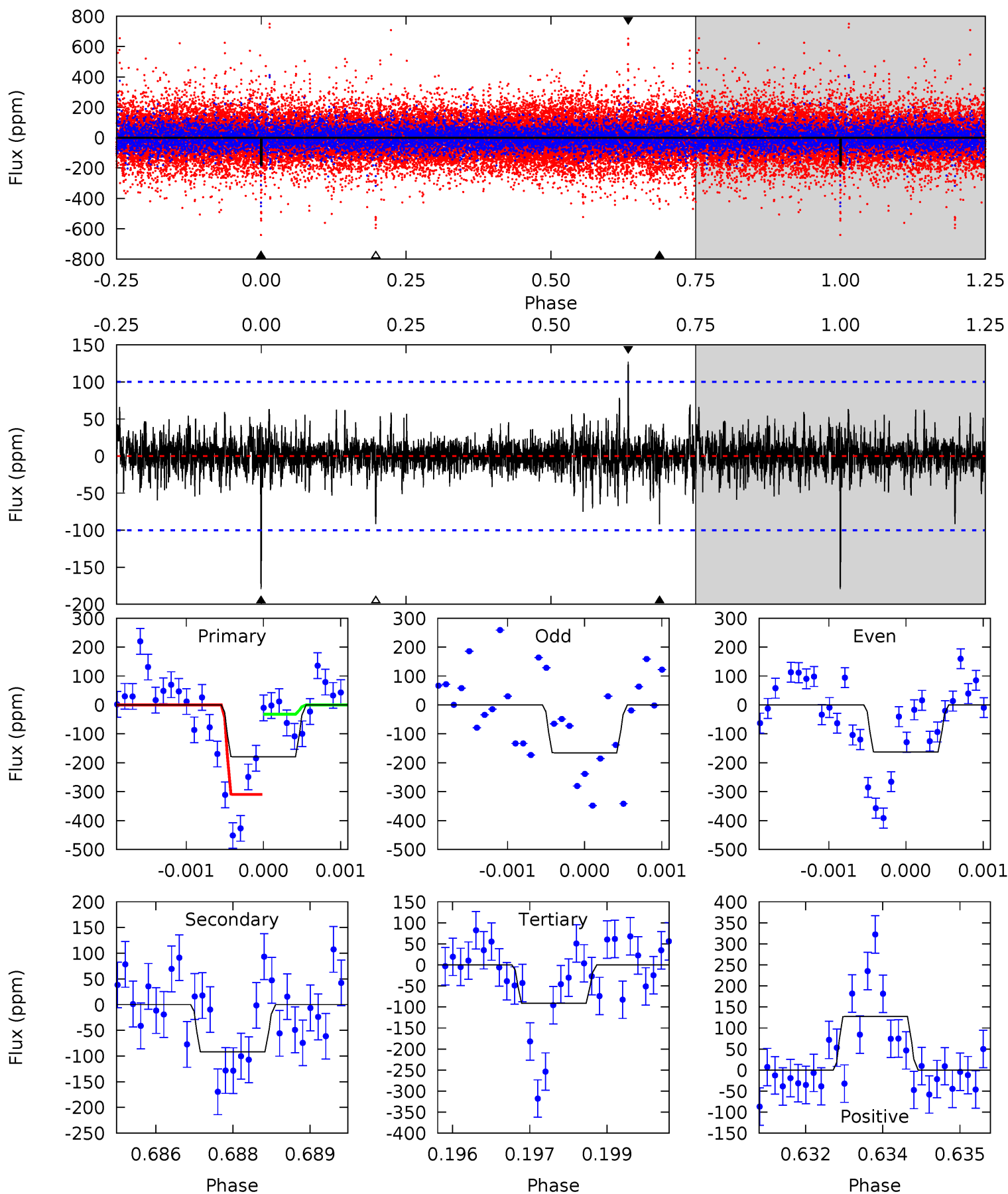




# Alt Model-Shift Uniqueness Test

010135362-05, P = 200.088866 Days, E = 52.742800 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
9.71	4.98	4.94	6.89	5.41	3.23	0.96	4.76	2.82	0.04	-1.91	0.08	1.21	0.42	7.54



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-161 \pm 19$	$2.31^{+0.77}_{-0.67}$	$580^{+47}_{-40}$	$6183^{+1140}_{-751}$	$8624^{+8716}_{-3711}$
Alt.	$-92 \pm 18$	$2.03^{+0.80}_{-0.69}$	$581^{+48}_{-42}$	$5703^{+1326}_{-732}$	$6224^{+7888}_{-2982}$

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

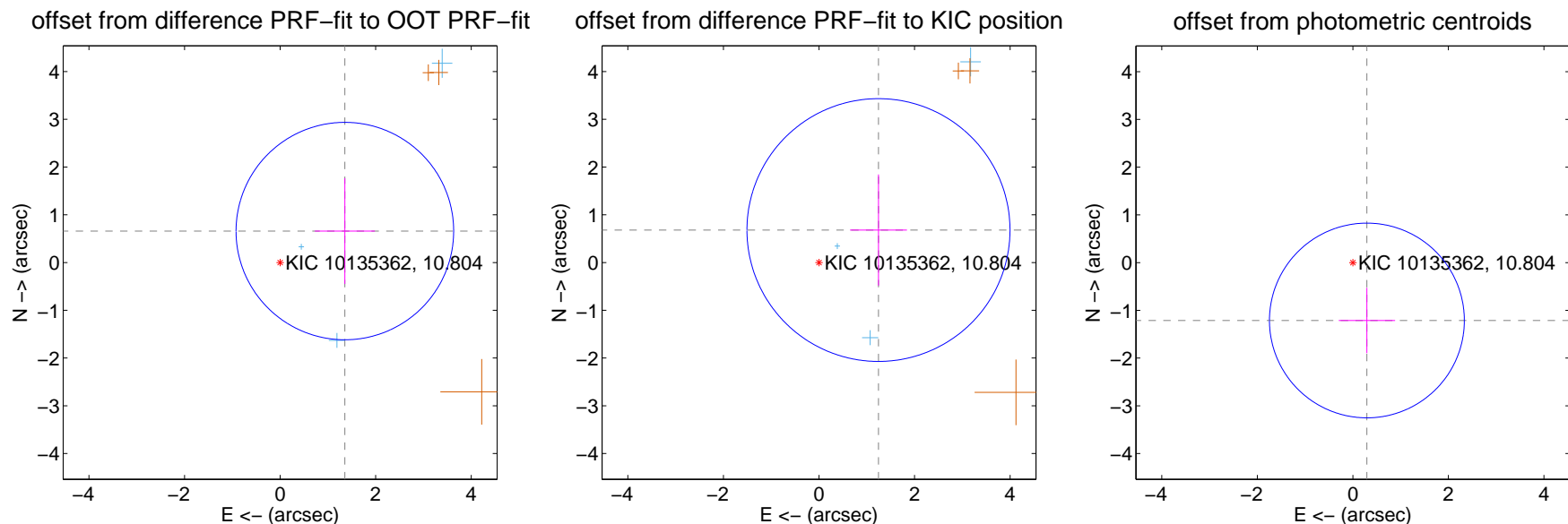
## DV Centroid Data

Supplemental centroid analysis for 010135362-05. **Kepler magnitude: 10.80.** Transit SNR 6.13

**There are 3 quarters with good PRF difference image offsets**

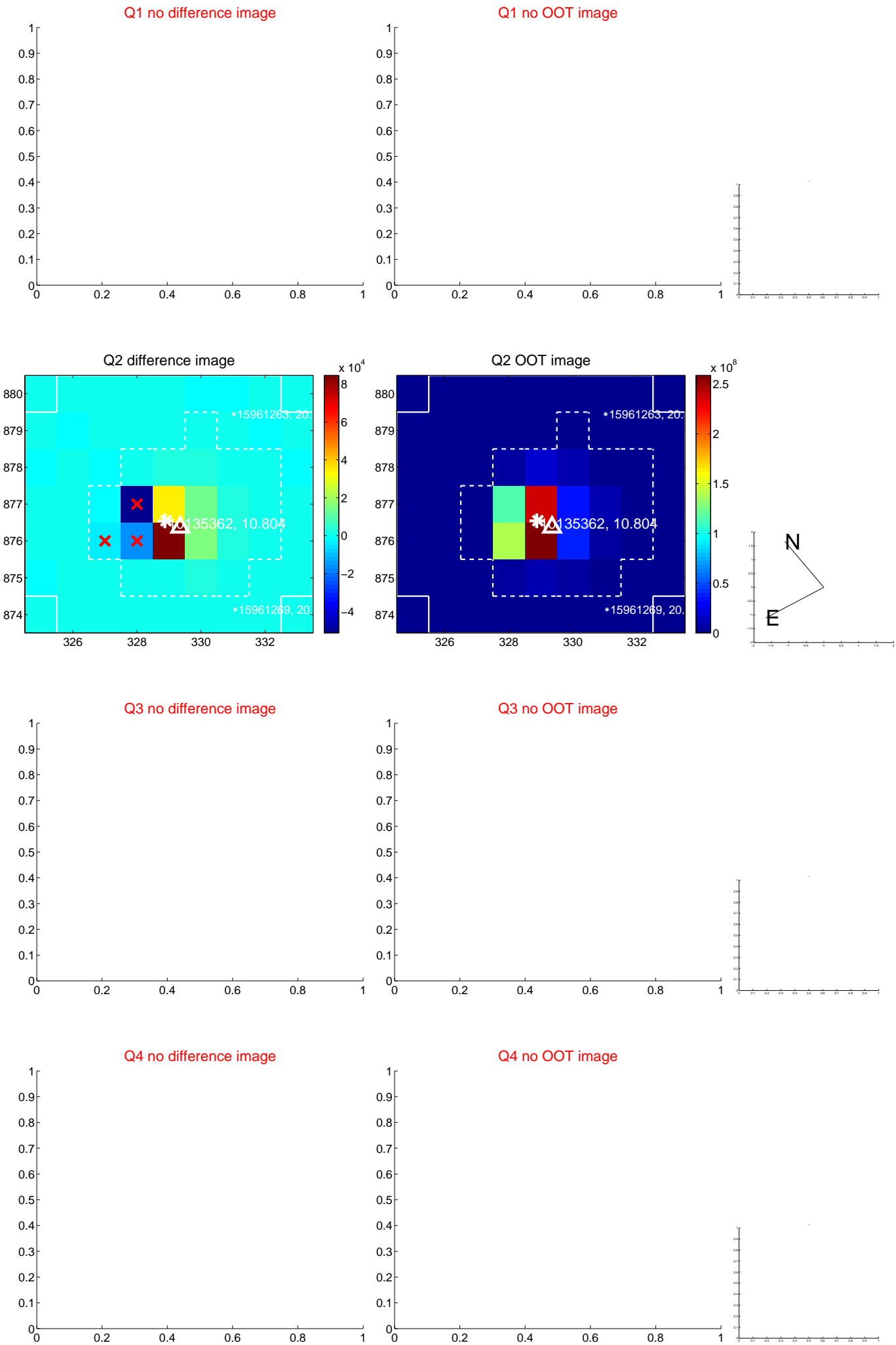
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.506 \pm 0.759$	1.99	$-1.355 \pm 0.628$	$0.659 \pm 1.106$
PRF-fit source offset from KIC position	$1.419 \pm 0.917$	1.55	$-1.245 \pm 0.596$	$0.680 \pm 1.164$
photometric centroid source offset	$1.25 \pm 0.68$	1.84	$-0.29 \pm 0.59$	$-1.21 \pm 0.68$

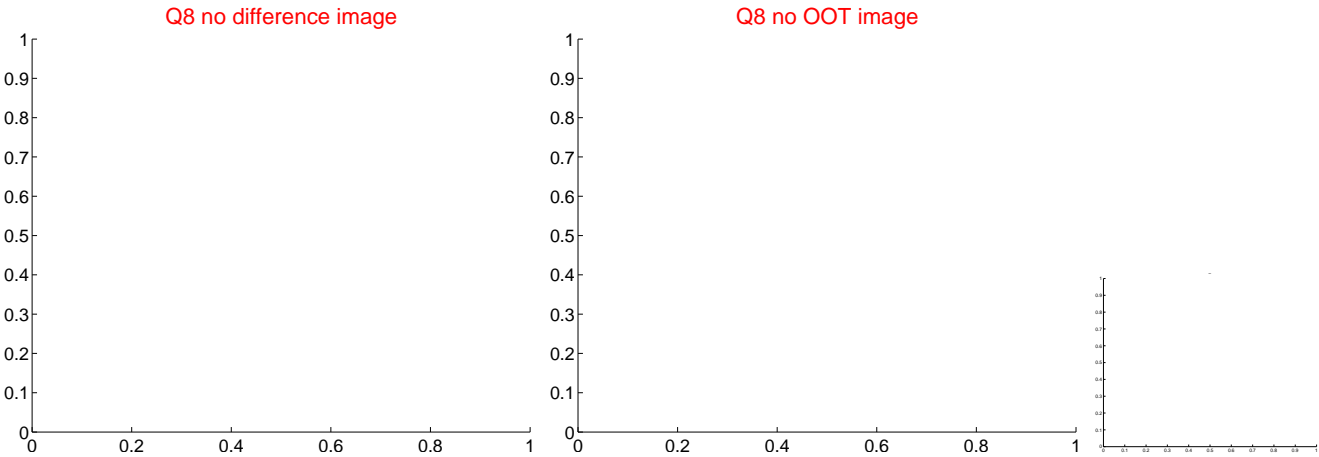
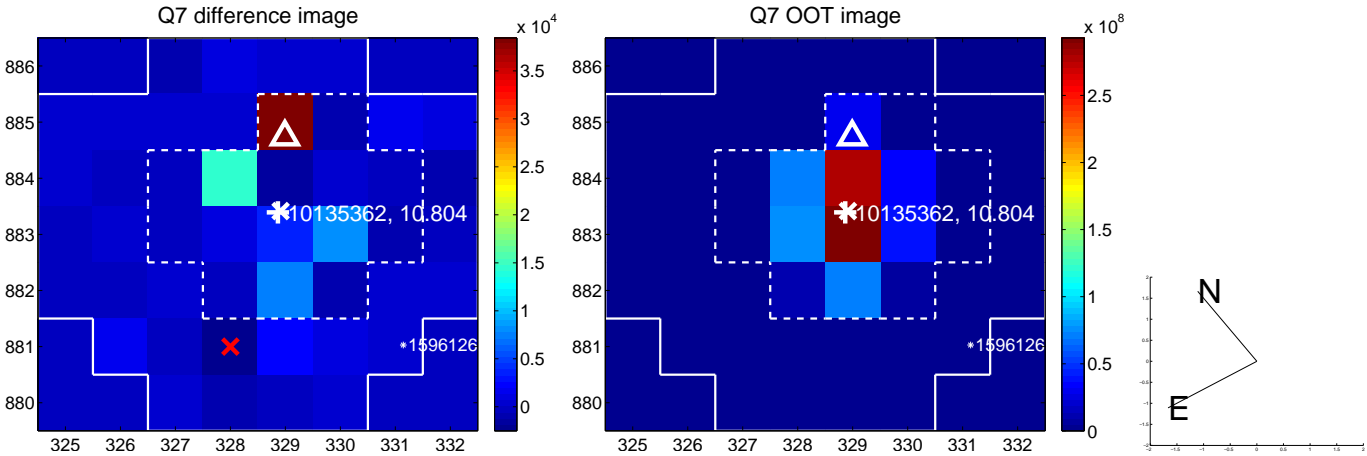
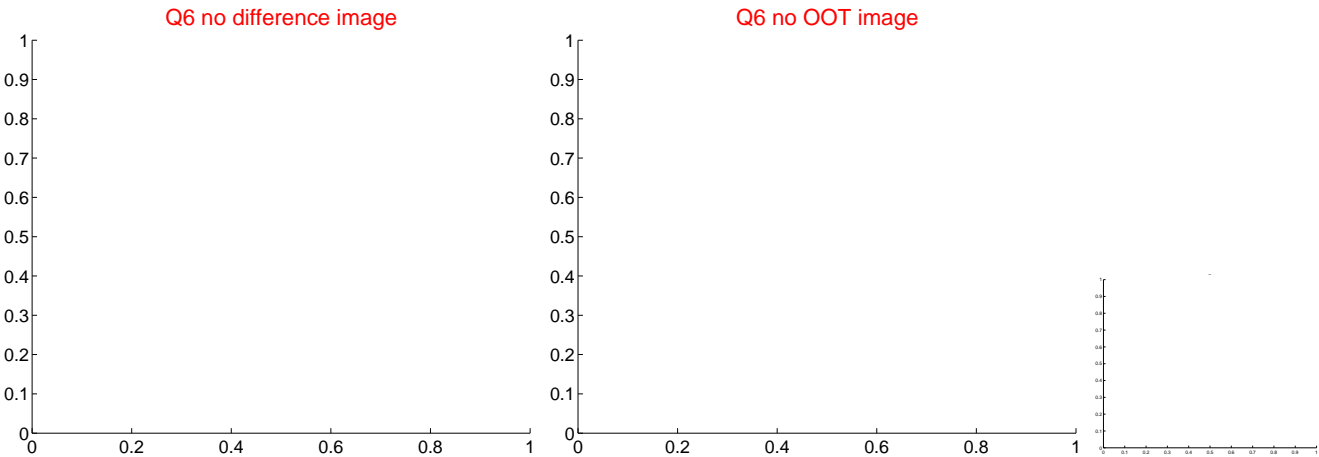
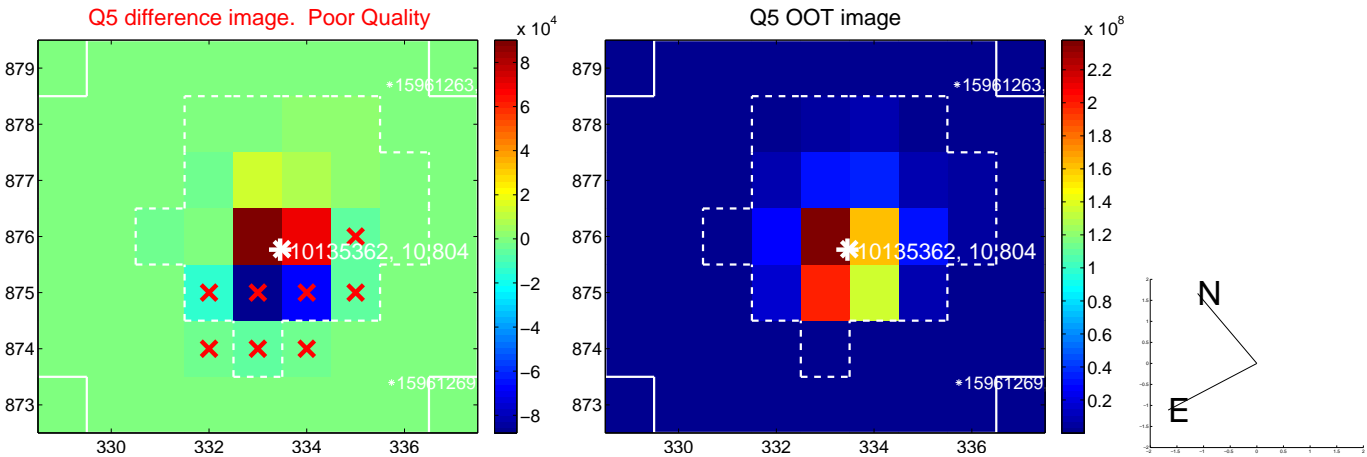


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

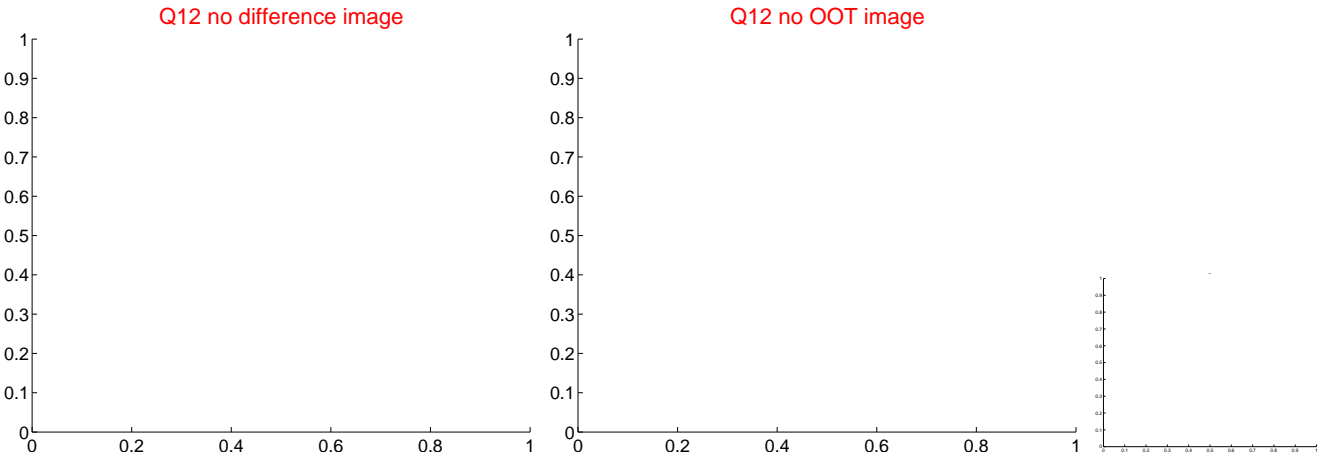
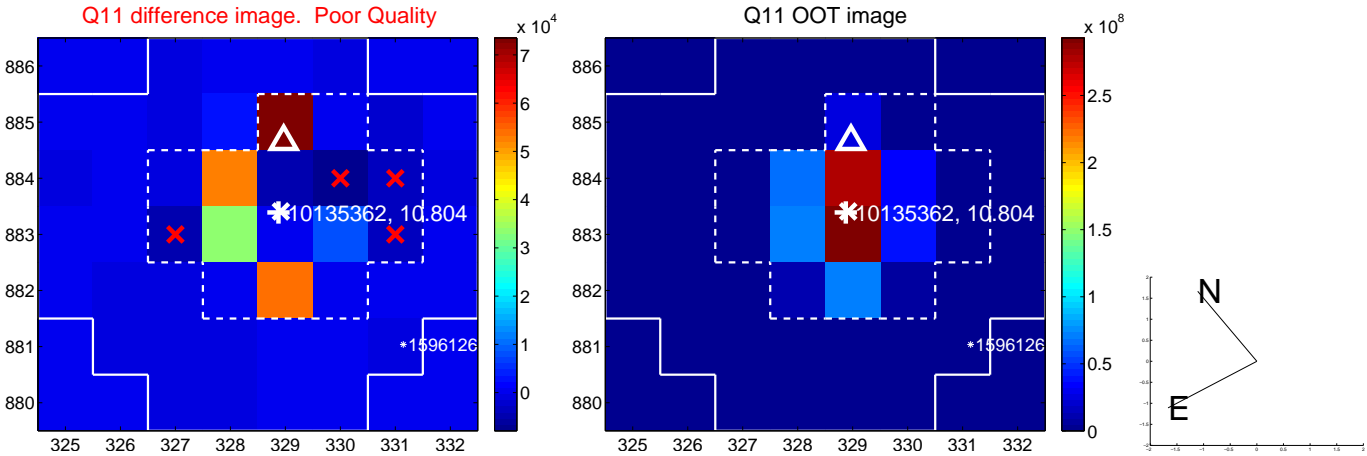
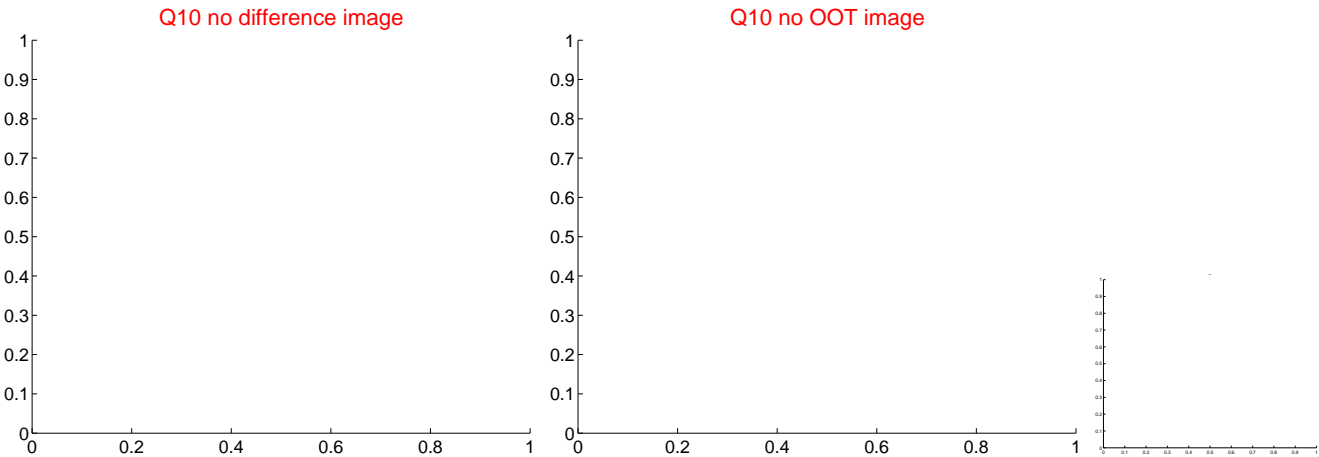
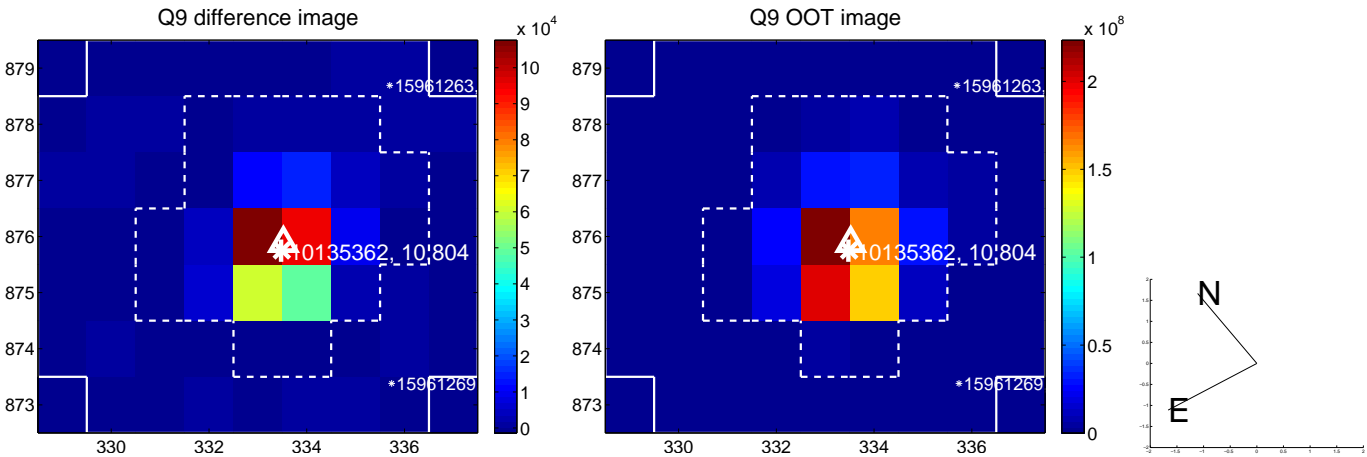
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



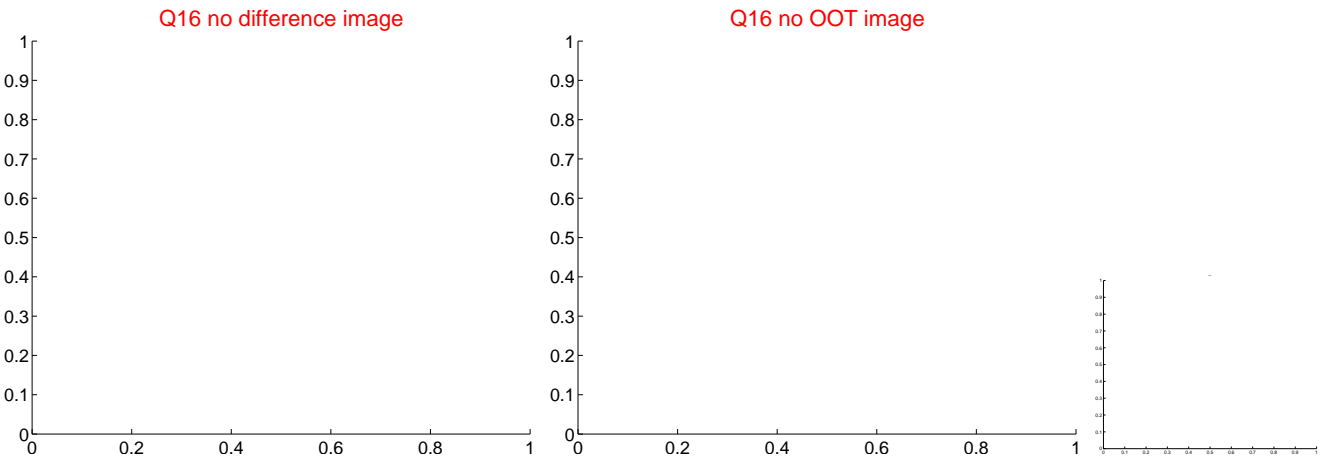
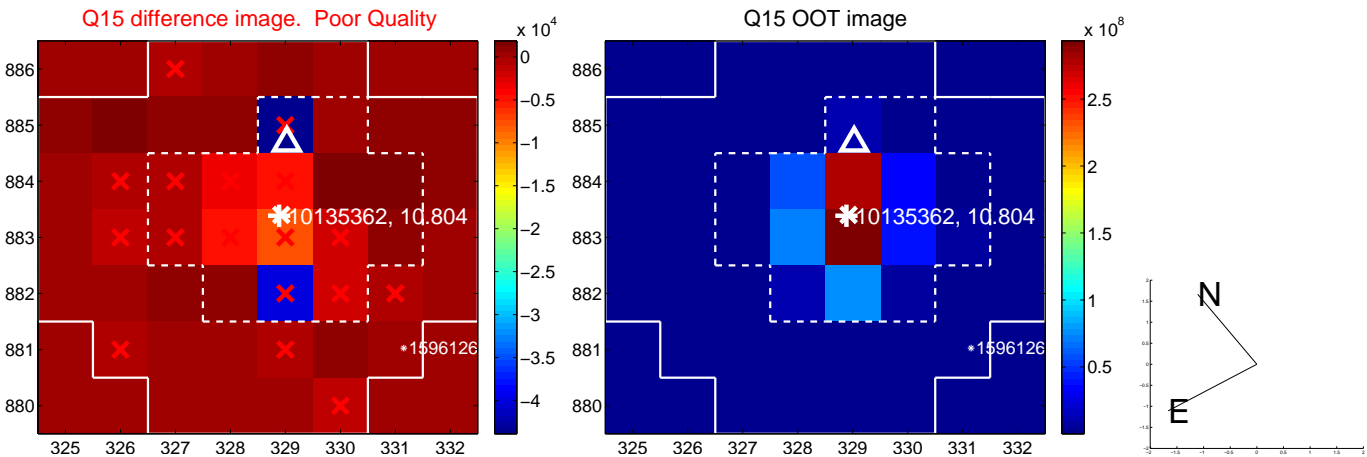
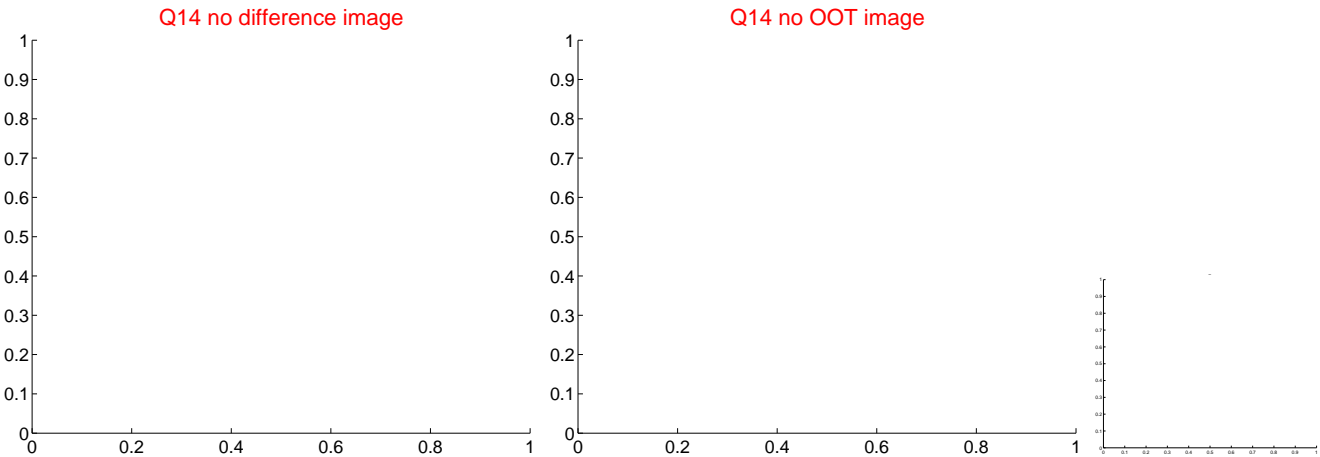
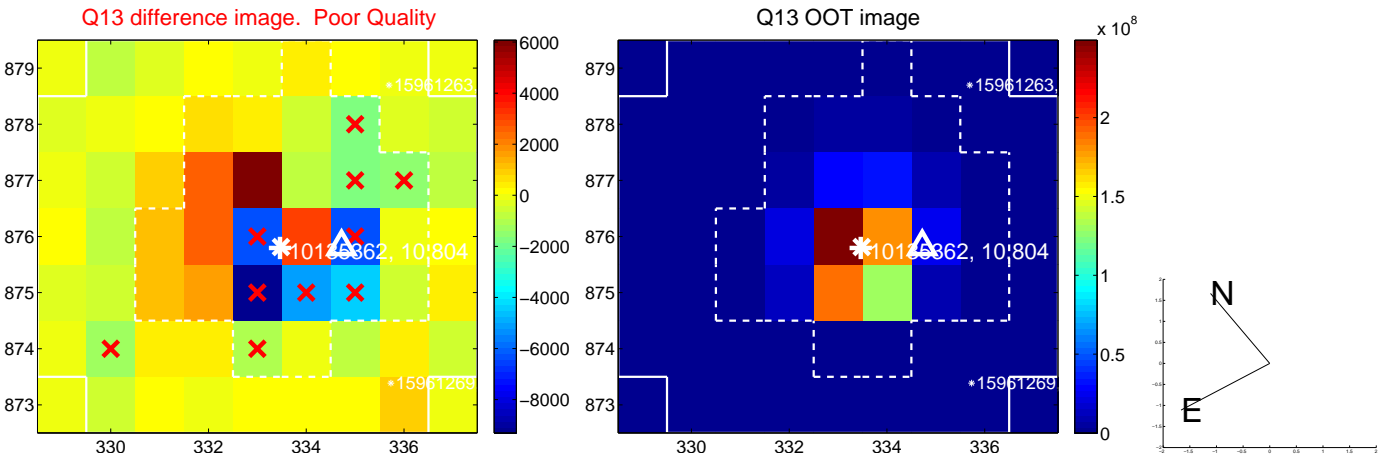
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



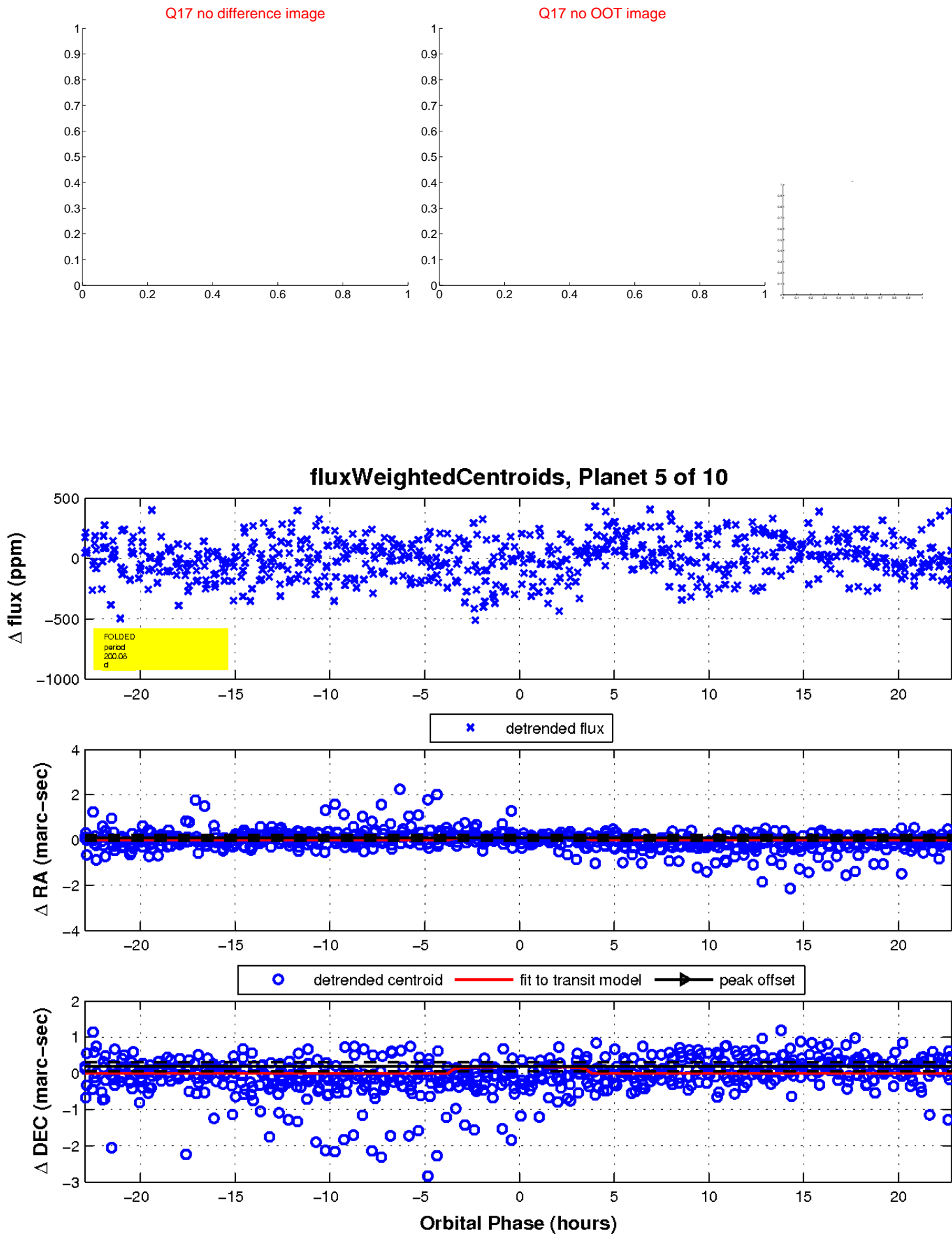
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



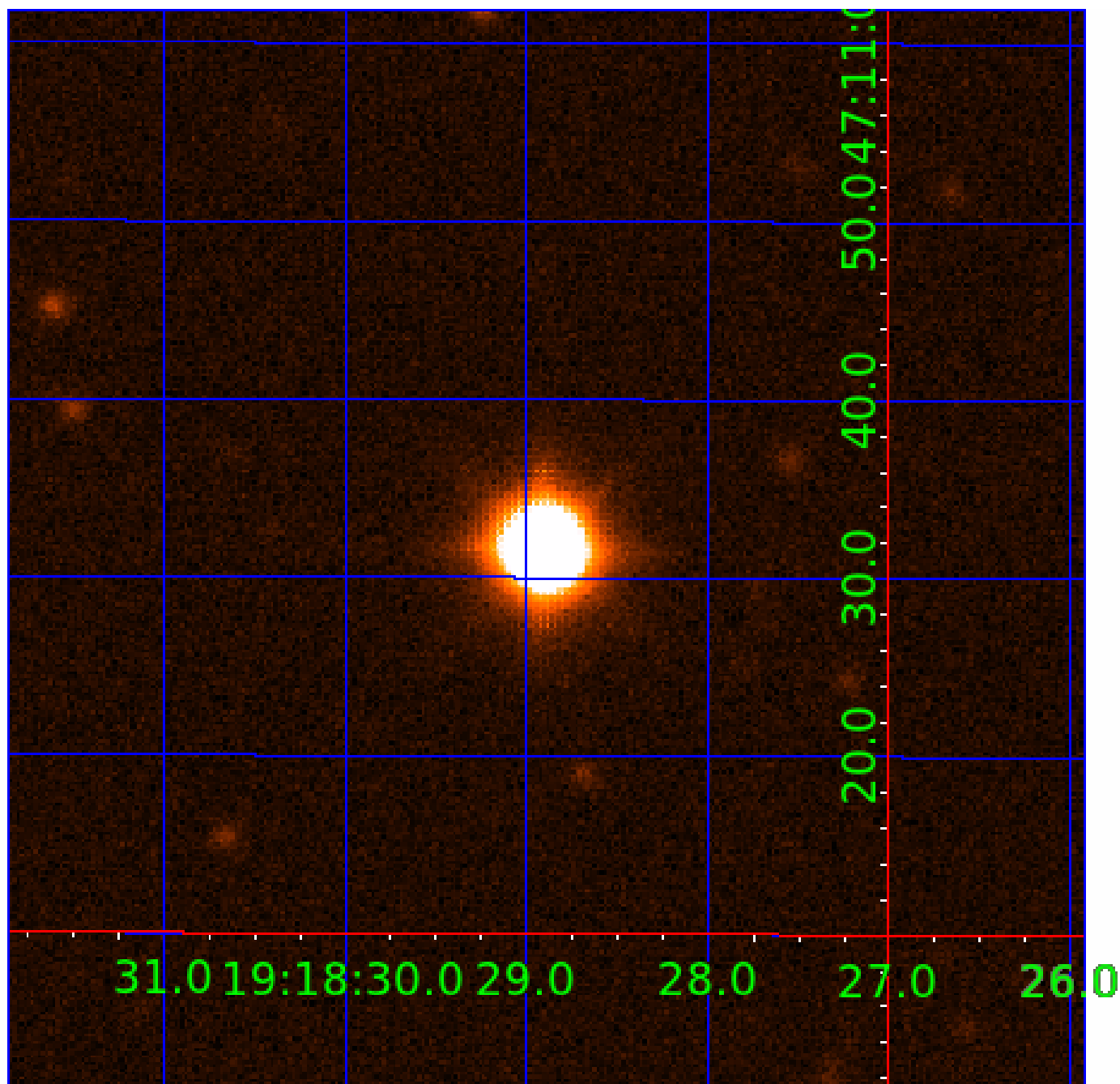
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

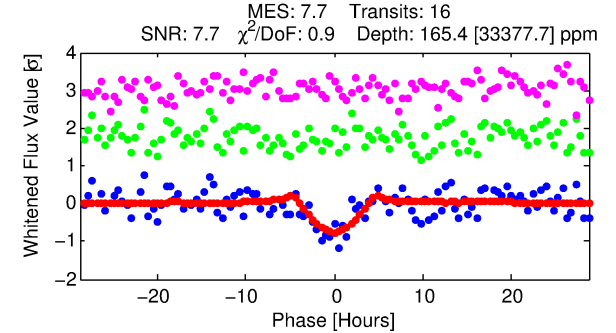
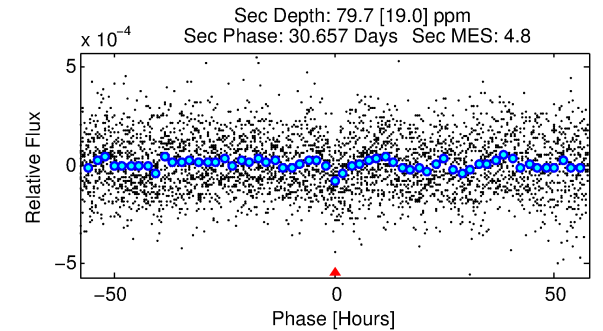
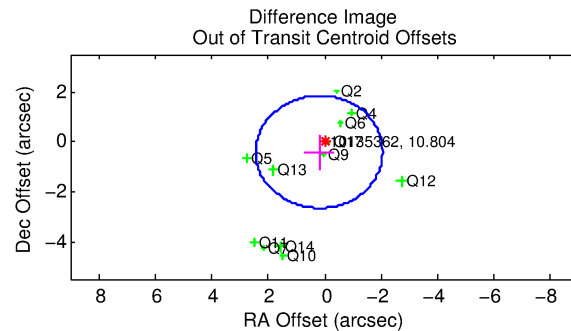
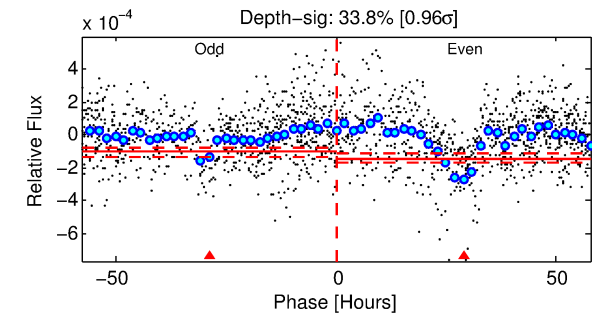
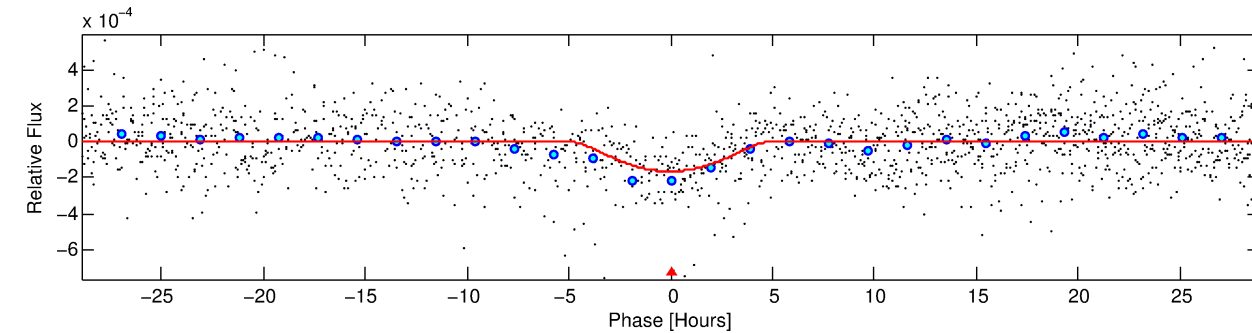
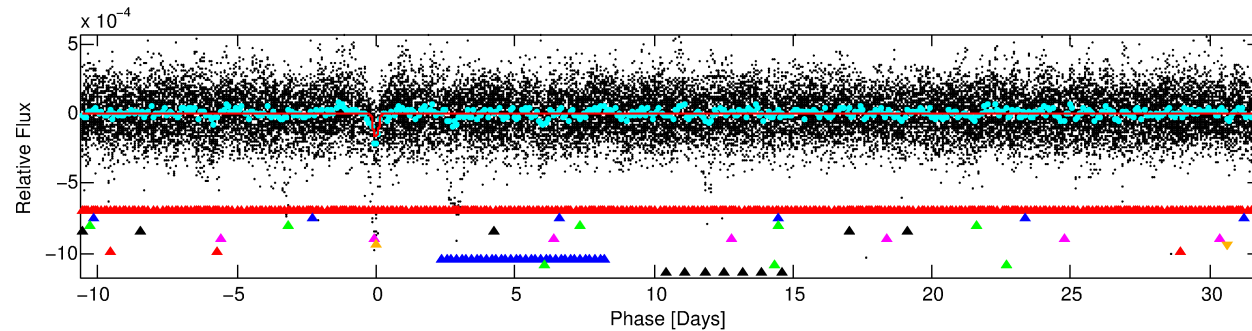
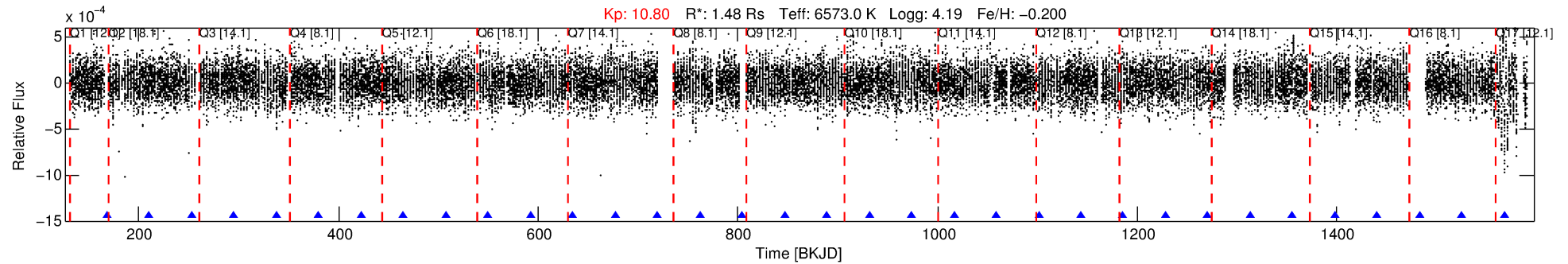
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-06

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 6 of 10 Period: 42.415 d



## DV Fit Results:

Period = 42.41504 [0.00153] d  
Epoch = 168.0847 [0.0263] BKJD  
Rp/R\* = 0.0234 [0.0651]  
a/R\* = 7.38 [5.46]  
b = 1.00 [3.39]  
Seff = 55.97 [21.99]  
Teq = 697 [68] K  
Rp = 3.76 [10.55] Re  
a = 0.2551 [0.0652] AU  
Ag = 201.71 [1127.47] [0.18 $\sigma$ ]  
Teffp = 4064 [5669] K [0.59 $\sigma$ ]

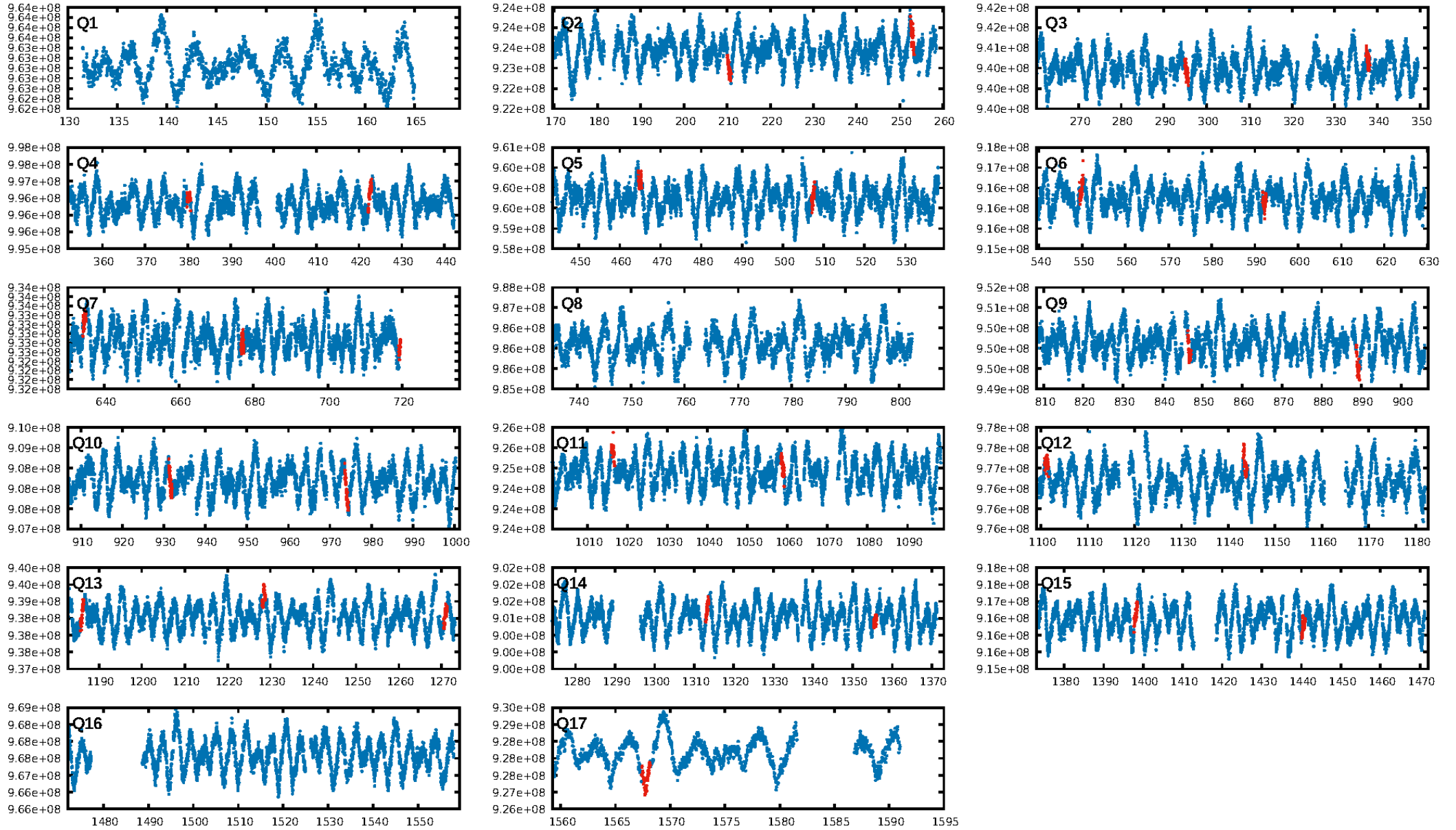
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [63.59 $\sigma$ ]  
LongPeriod-sig: 23.0% [0.29 $\sigma$ ]  
ModelChiSquare2-sig: 90.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [15/15]  
**GhostDiagnostic-chr: 8.873**  
Centroid-sig: 70.8%  
Centroid-so: 0.540 arcsec [1.25 $\sigma$ ]  
OotOffset-rm: 0.453 arcsec [0.60 $\sigma$ ]  
KicOffset-rm: 0.543 arcsec [0.72 $\sigma$ ]  
OotOffset-st: 4/2/2/4 [12]  
KicOffset-st: 4/2/2/4 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 0.36 [5/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:34 Z

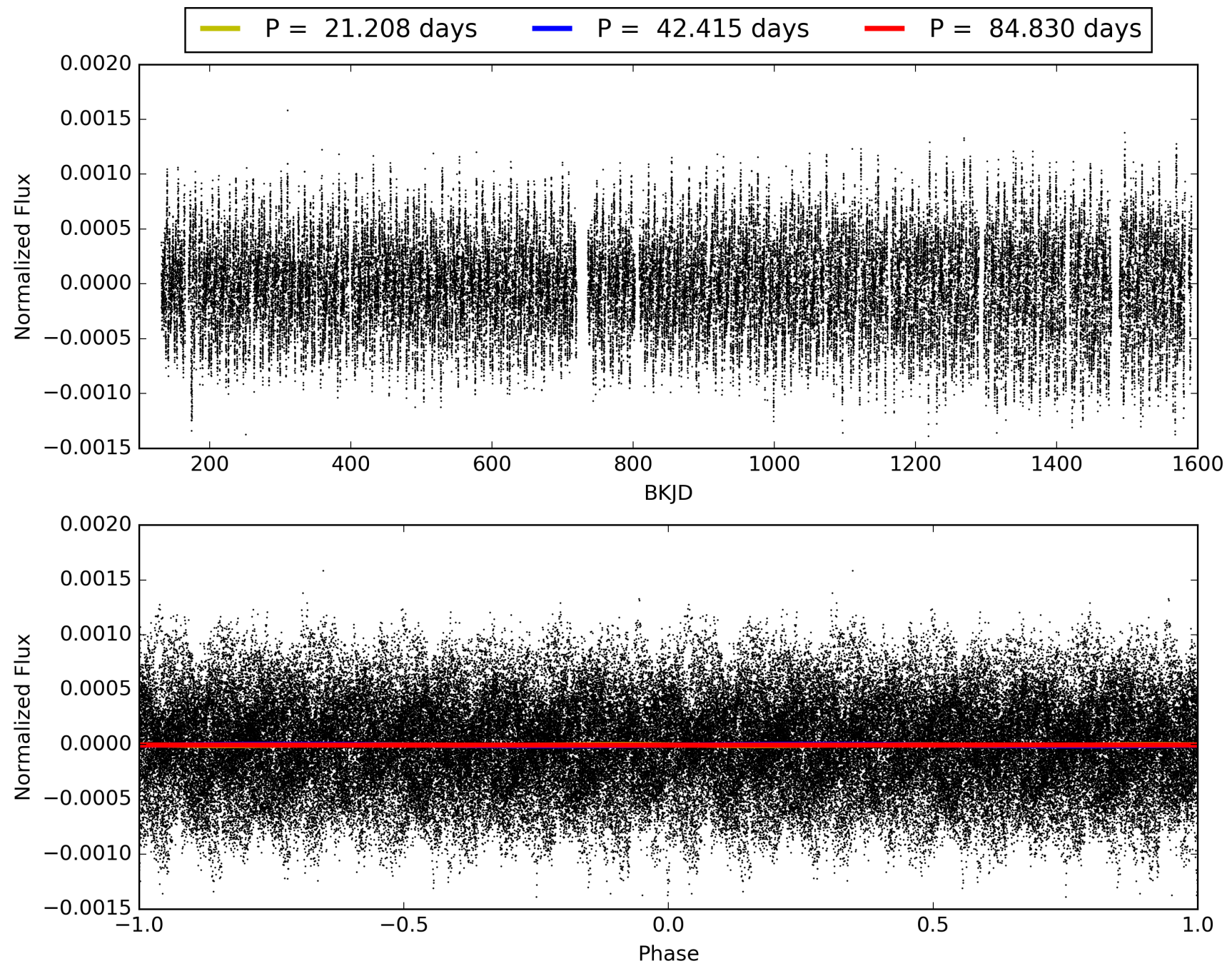
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010135362-06, PDC Light Curves



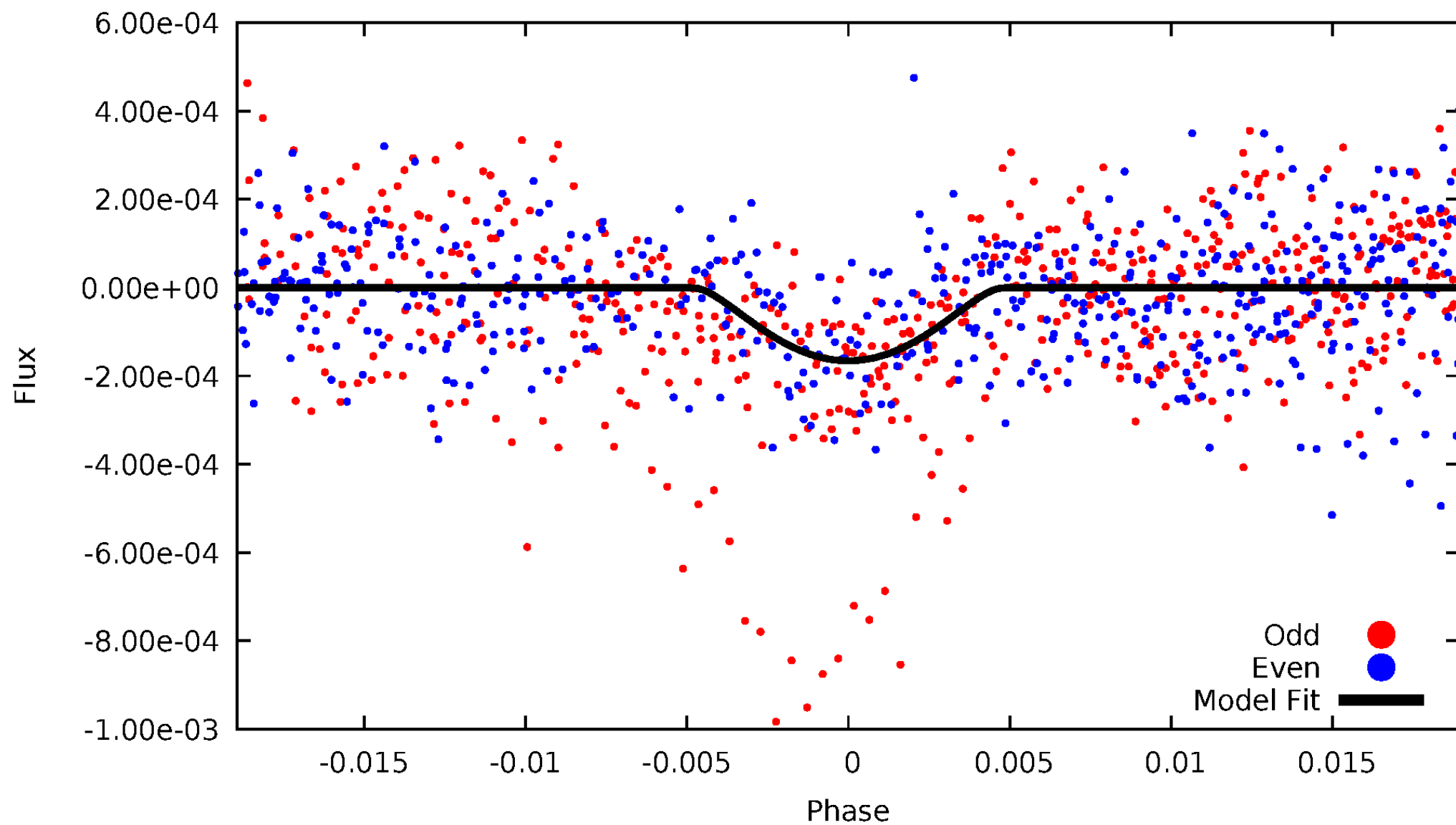


TCE 010135362-06



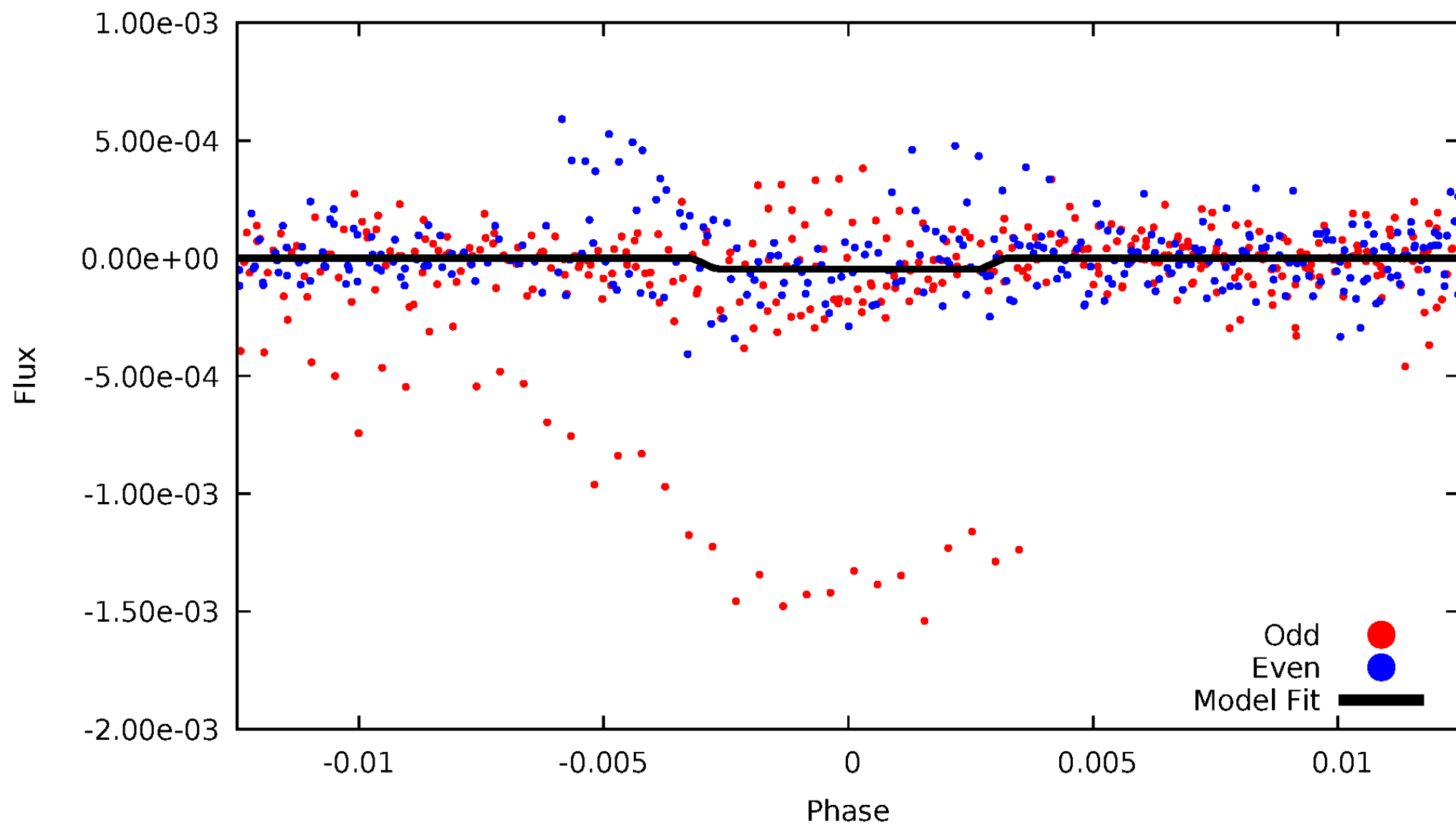
# DV Odd/Even

TCE 010135362-06



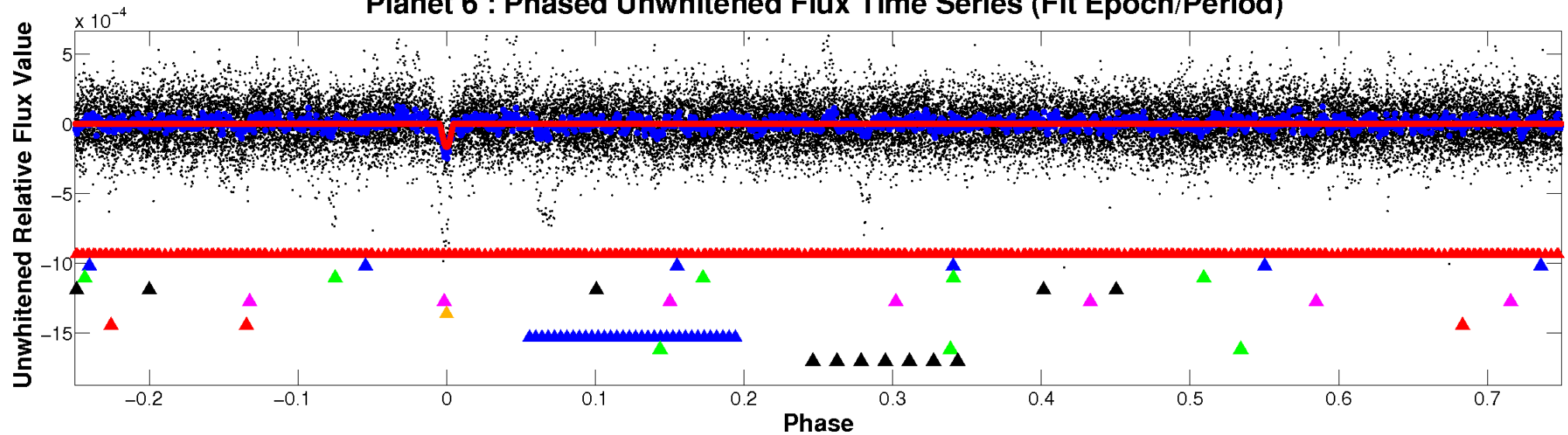
# ALT Odd/Even

TCE 010135362-06

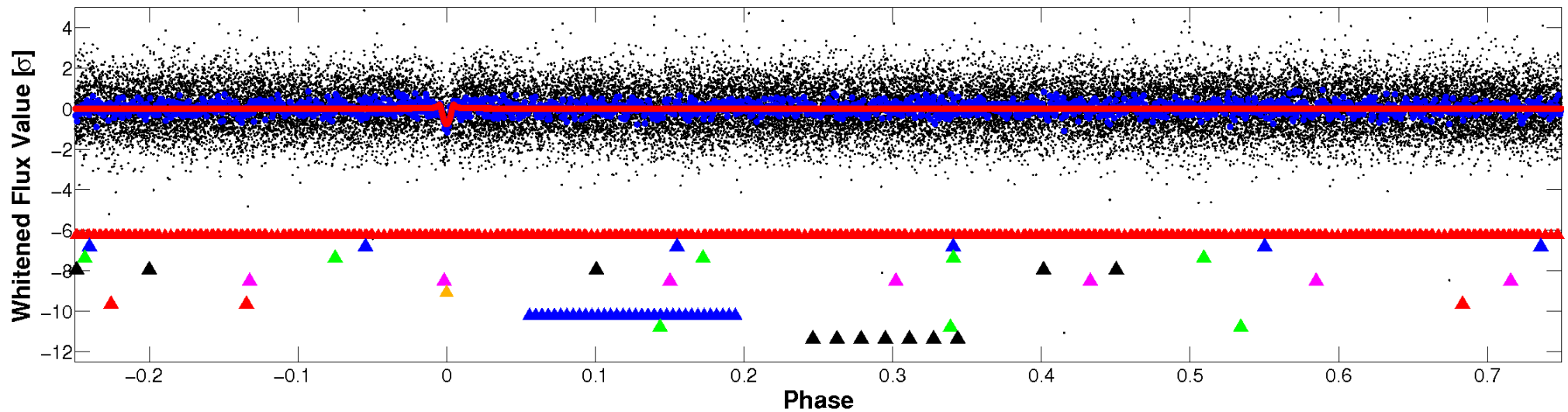


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



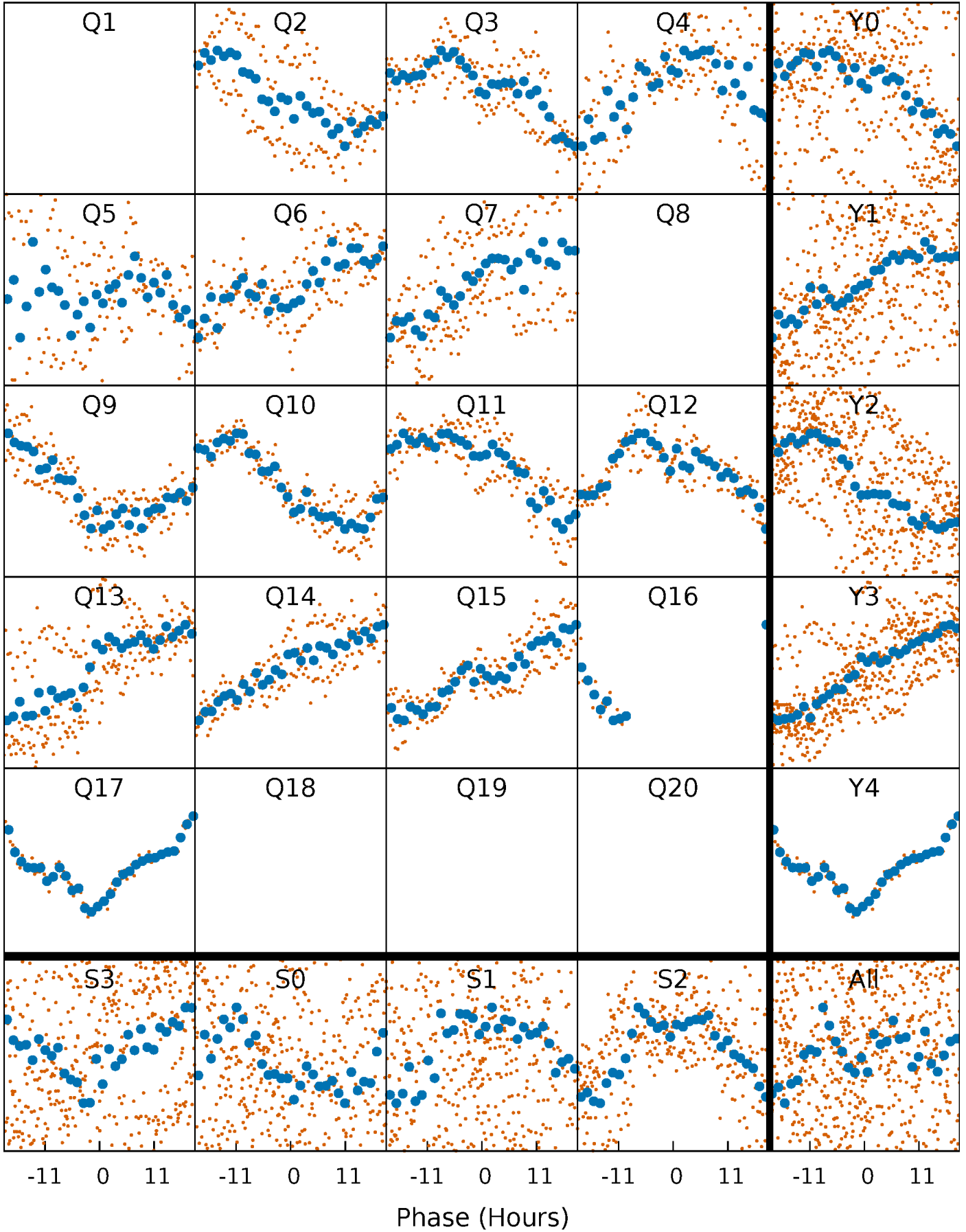
## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)





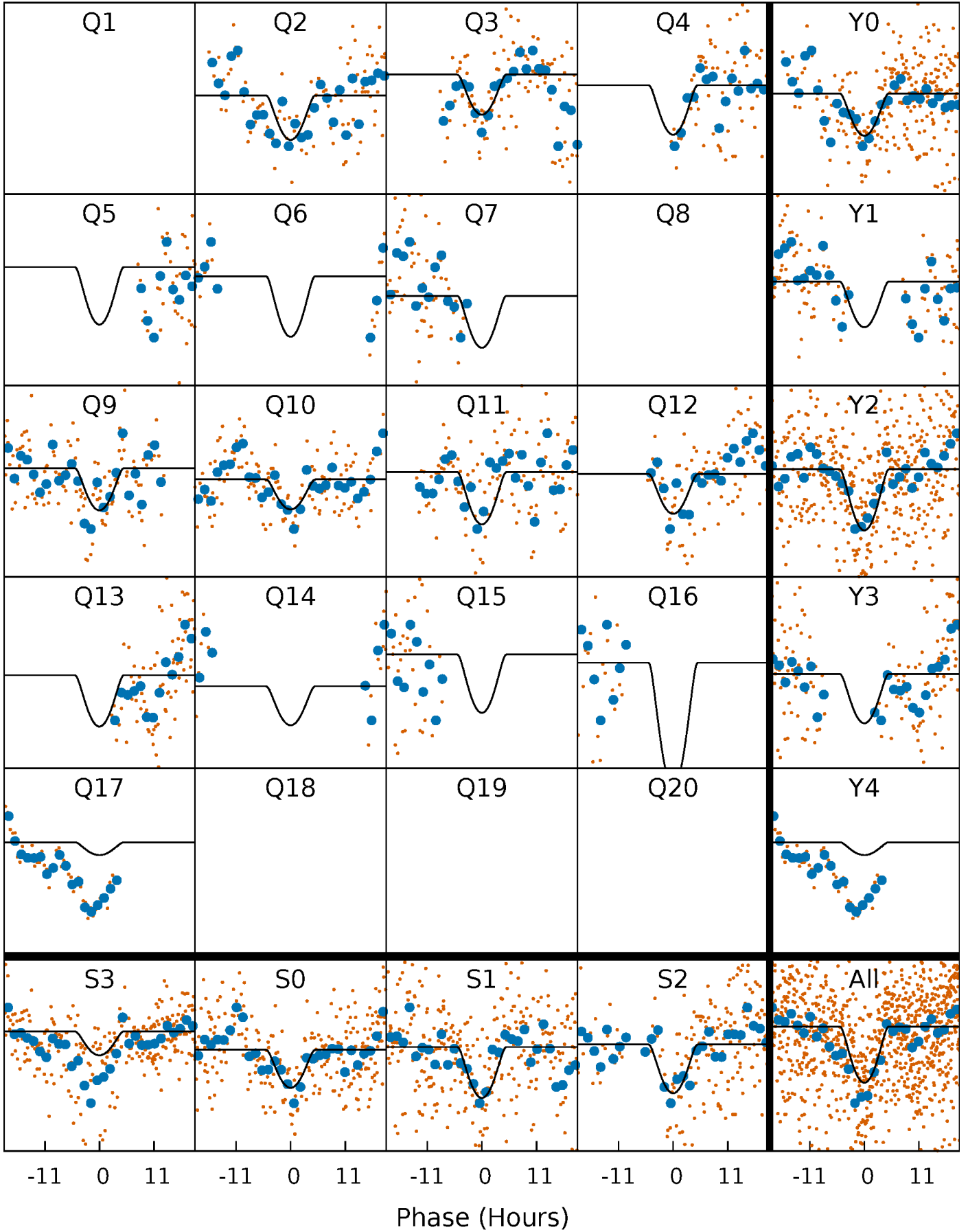
# PDC Quarter-Phased Transit Curves

TCE 010135362-06 P= 42.415035 Days  $T_0=168.084712$  (BKJD)



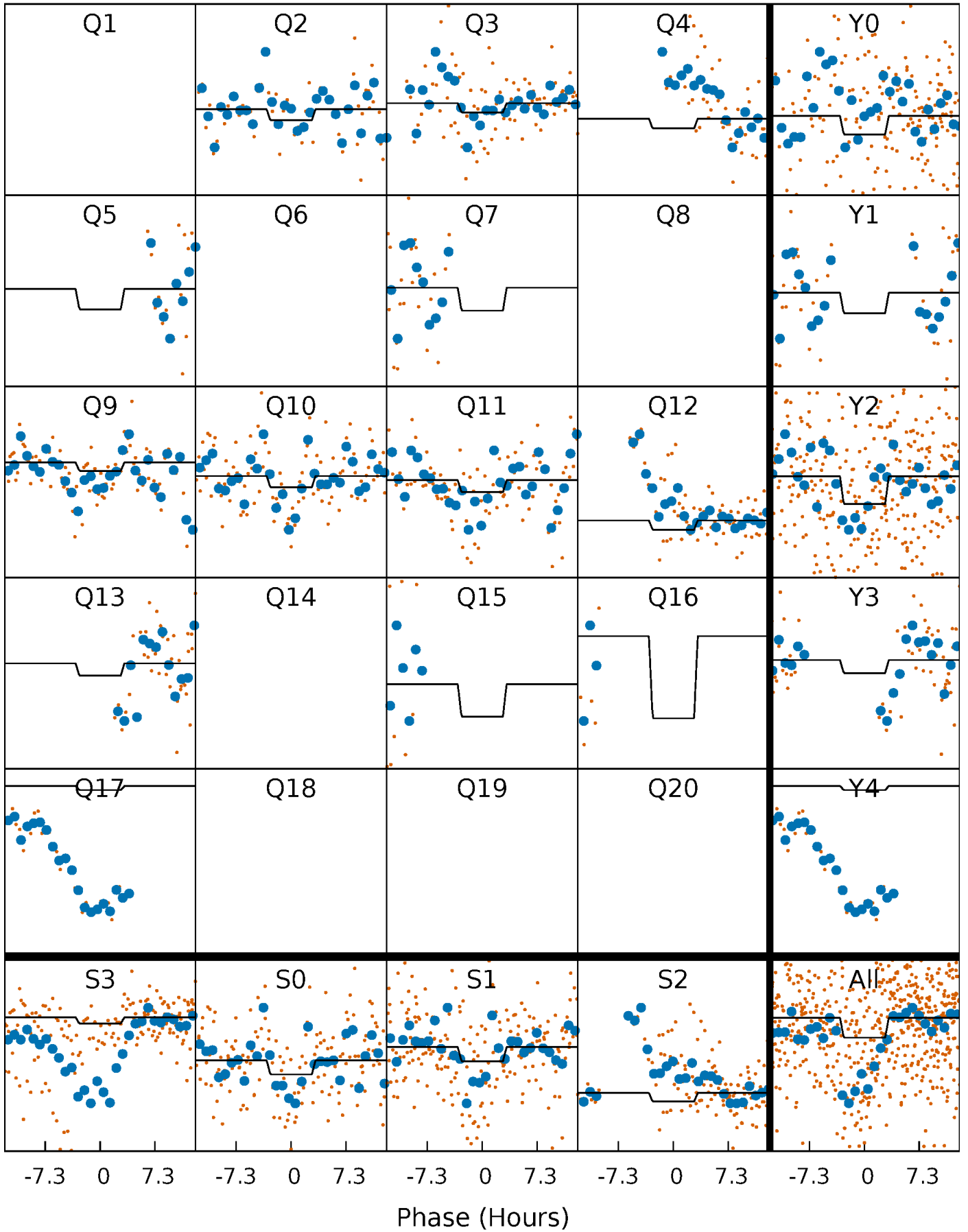
# DV Quarter-Phased Transit Curves

TCE 010135362-06 P= 42.415035 Days  $T_0=168.084712$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

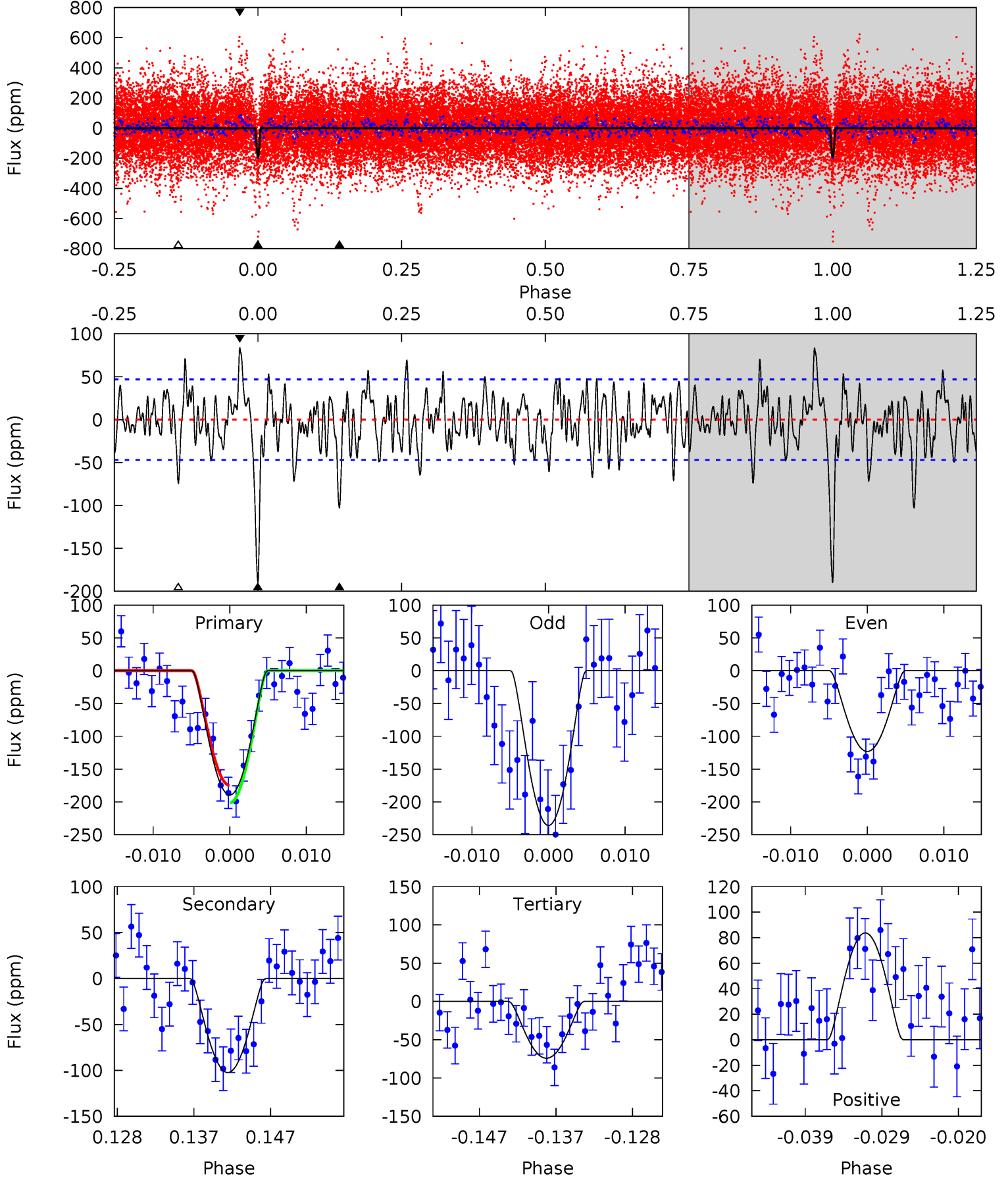
TCE 010135362-06     $P = 42.412829$  Days     $T_0 = 168.159889$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-06, P = 42.415035 Days, E = 125.669677 Days

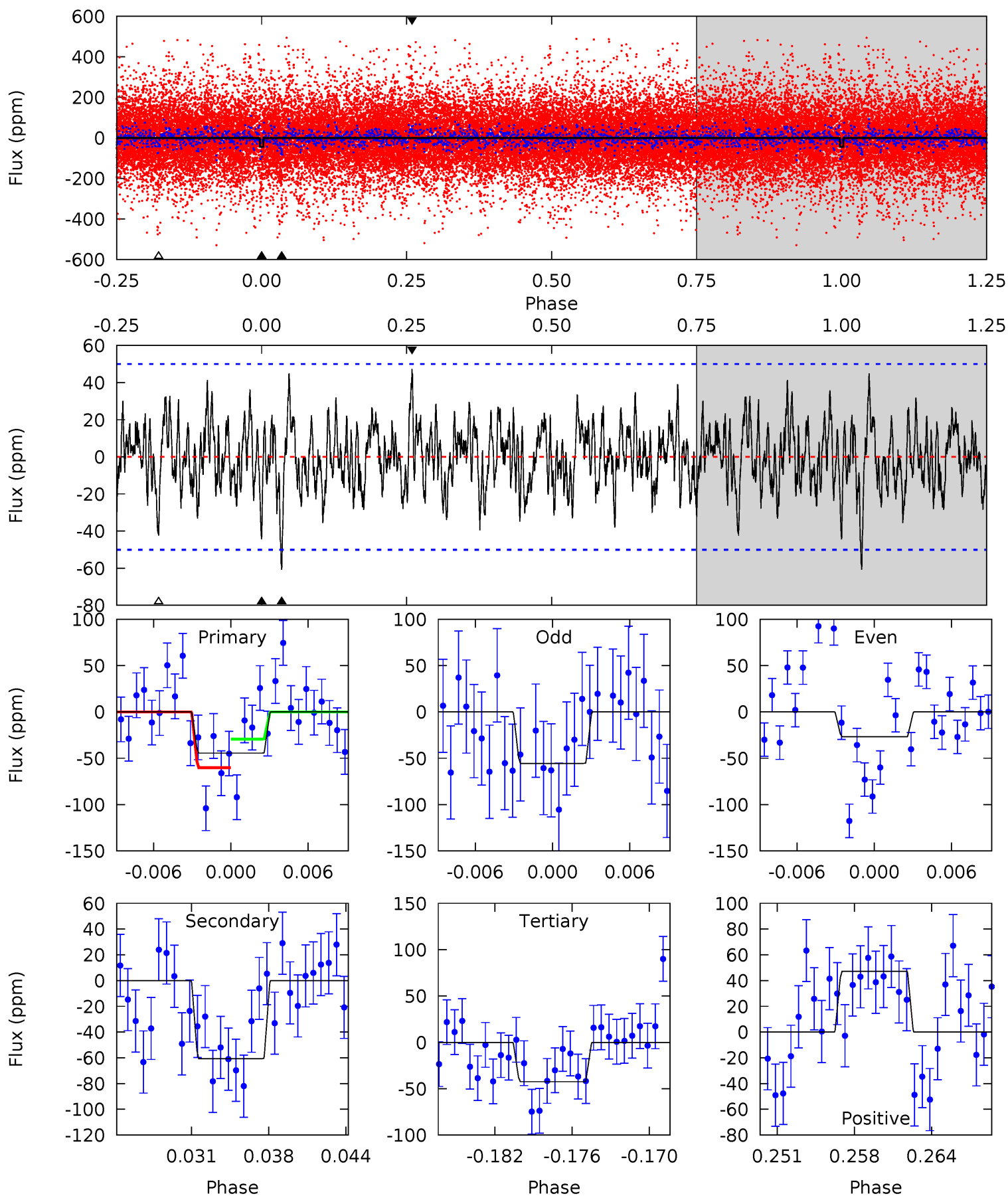
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.3	11.0	7.95	8.98	5.03	2.58	2.76	12.4	11.4	3.03	2.00	6.07	1.13	0.31	1.42



# Alt Model-Shift Uniqueness Test

010135362-06, P = 42.412829 Days, E = 125.747060 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
4.55	6.20	4.33	4.83	5.11	2.73	1.51	0.21	-0.28	1.87	1.37	1.46	1.78	0.44	1.57



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-102 \pm 9$	$8.72^{+9.25}_{-5.90}$	$978^{+85}_{-73}$	$3352^{+1733}_{-613}$	$48^{+413}_{-37}$
Alt.	$-61 \pm 10$	$7.91^{+7.99}_{-5.31}$	$970^{+80}_{-68}$	$3212^{+1508}_{-598}$	$35^{+291}_{-27}$

$T_{\text{max}}$  = 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

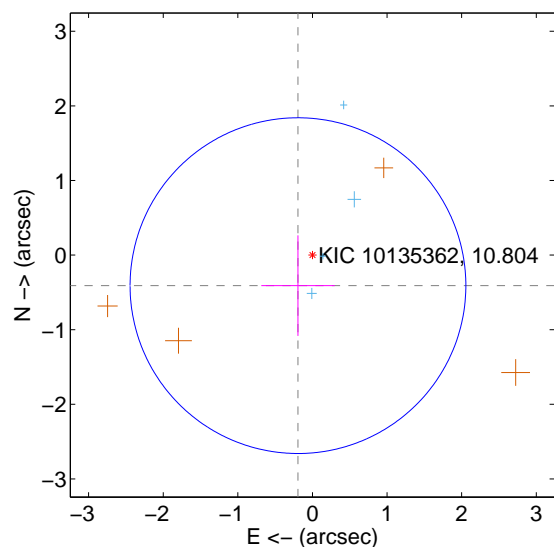
Supplemental centroid analysis for 010135362-06. **Kepler magnitude: 10.80.** Transit SNR 7.74

There are 5 quarters with good PRF difference image offsets

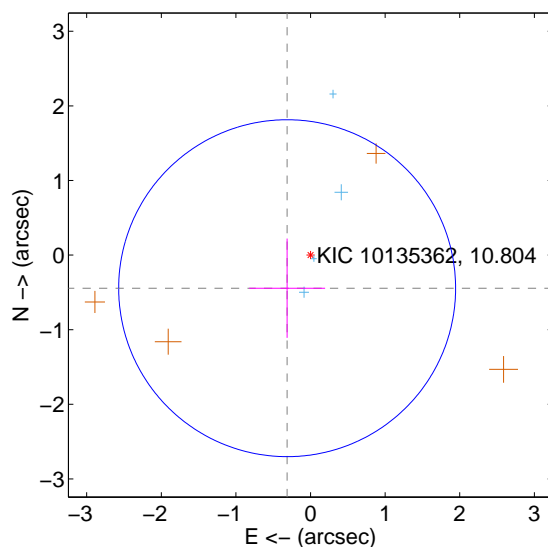
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.453 \pm 0.750$	0.60	$0.194 \pm 0.492$	$-0.409 \pm 0.674$
PRF-fit source offset from KIC position	$0.543 \pm 0.753$	0.72	$0.313 \pm 0.509$	$-0.444 \pm 0.665$
photometric centroid source offset	$0.54 \pm 0.43$	1.25	$0.46 \pm 0.41$	$-0.27 \pm 0.48$

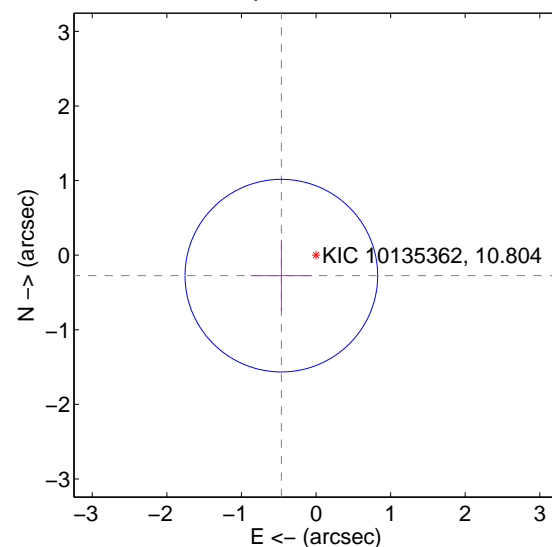
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

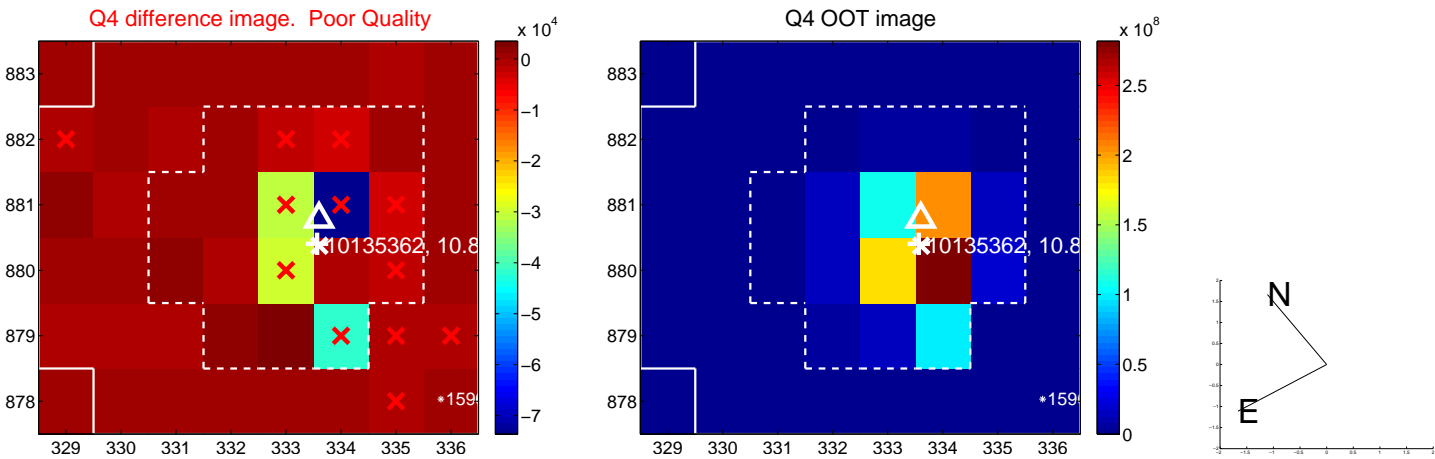
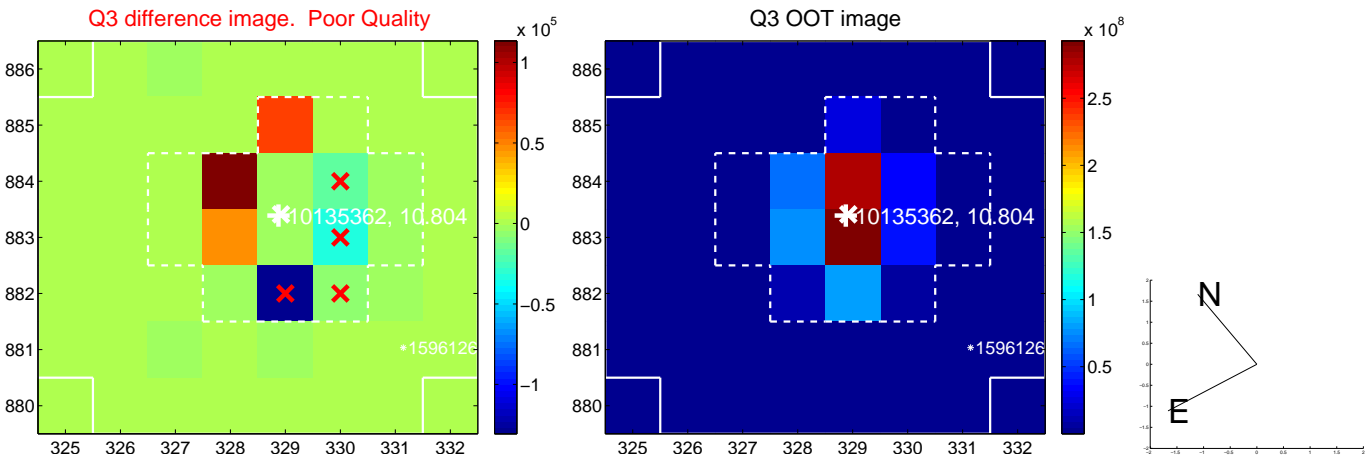
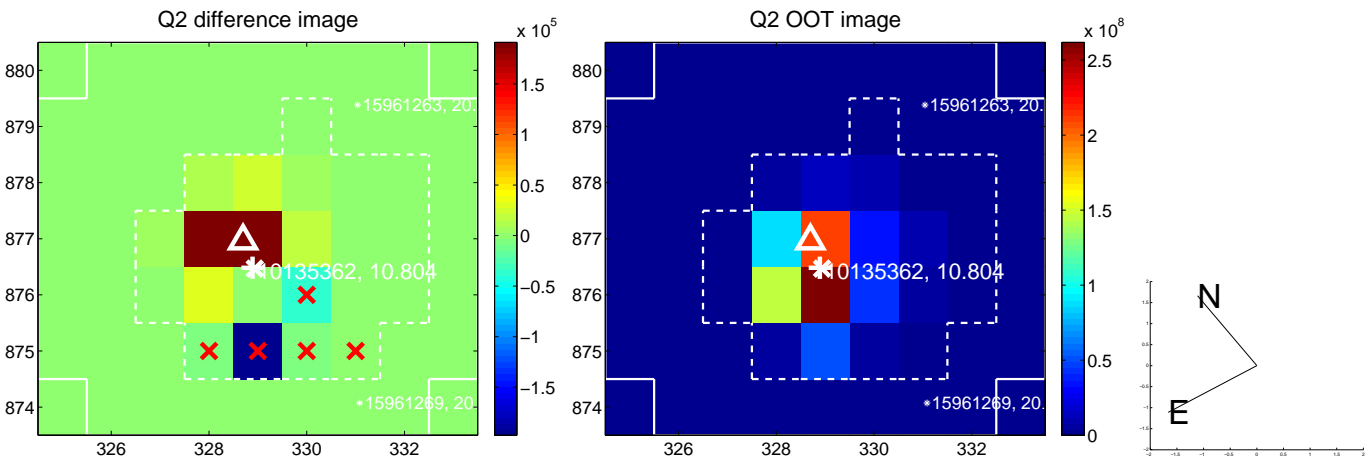
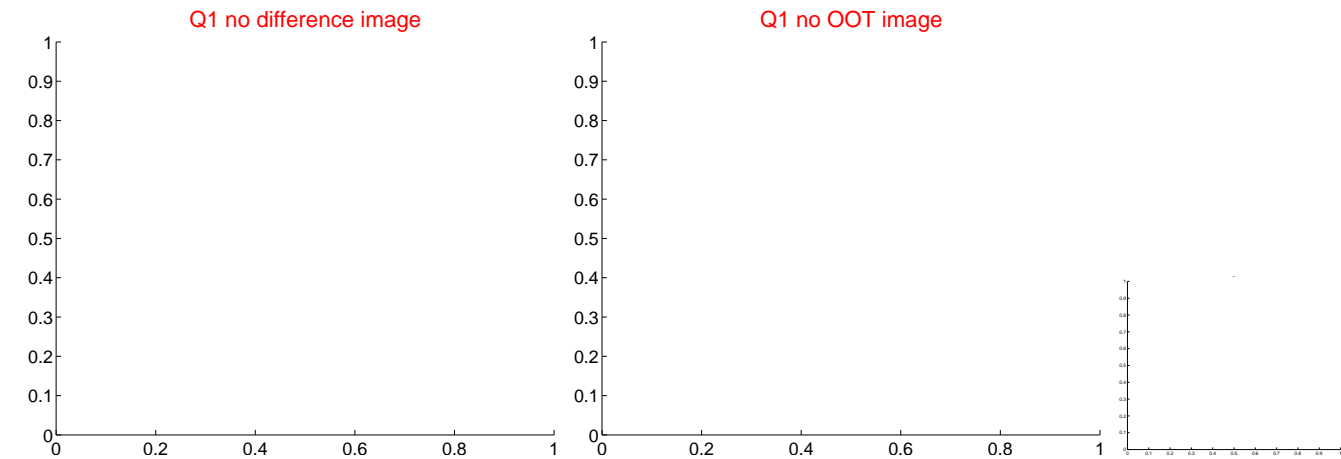


offset from photometric centroids



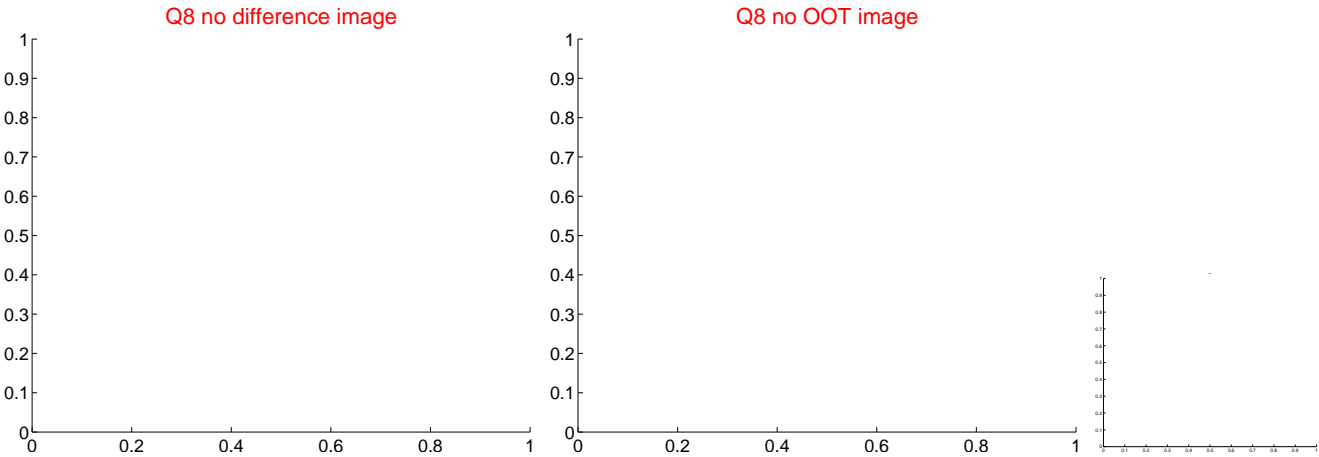
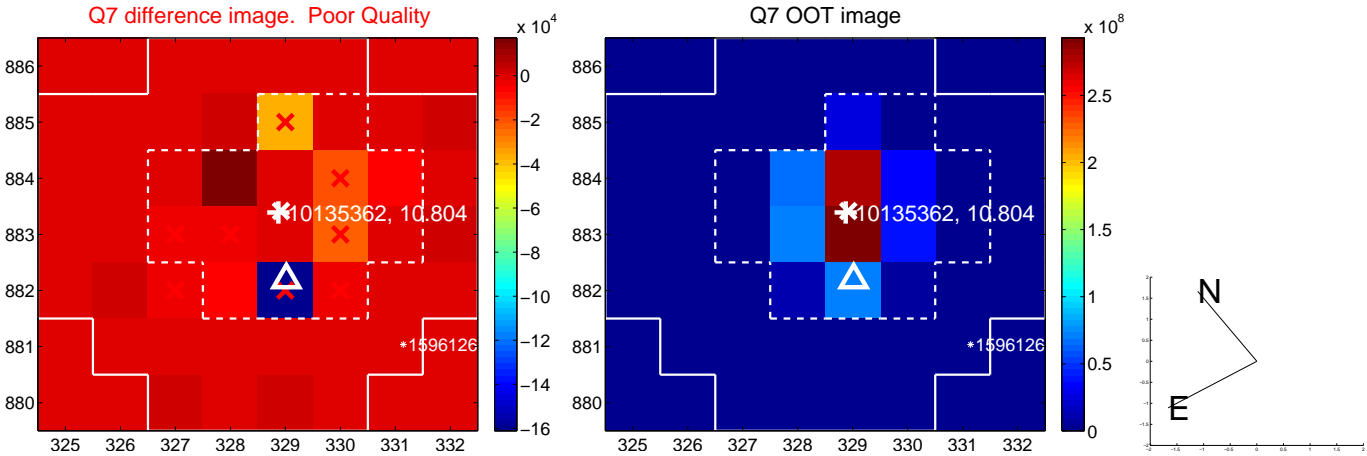
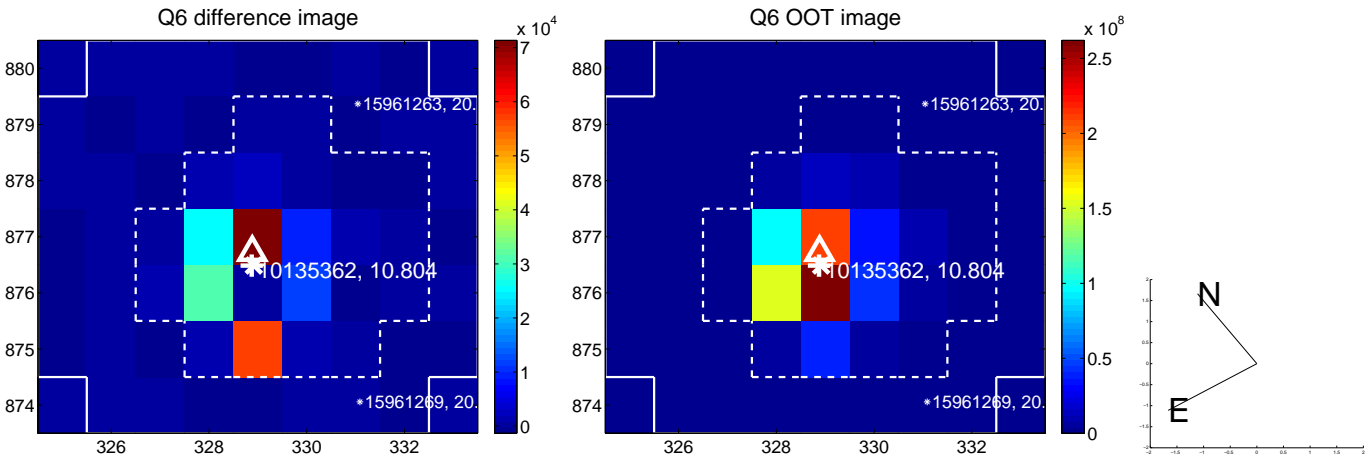
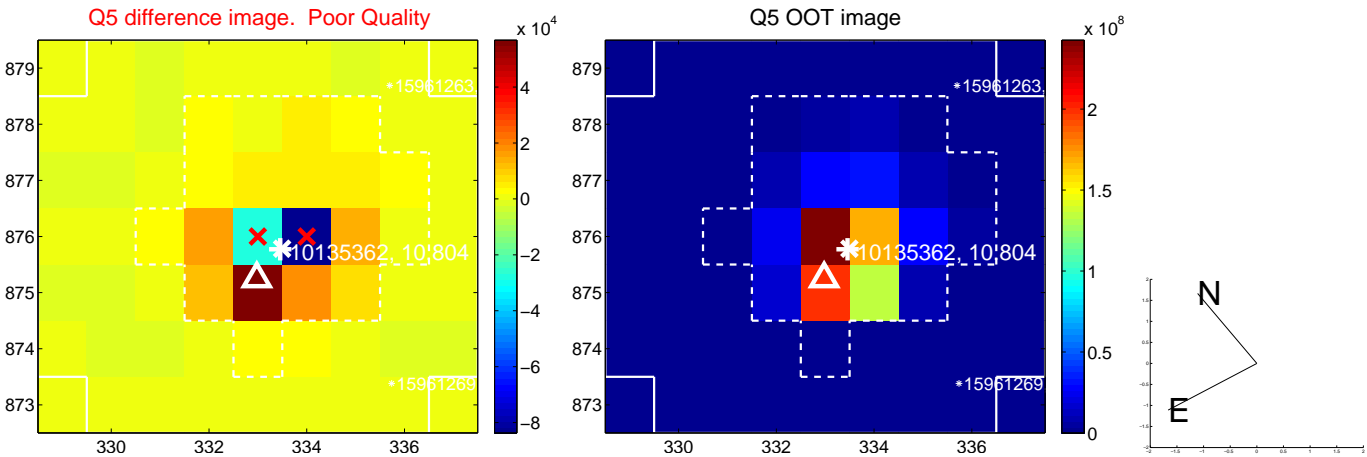
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

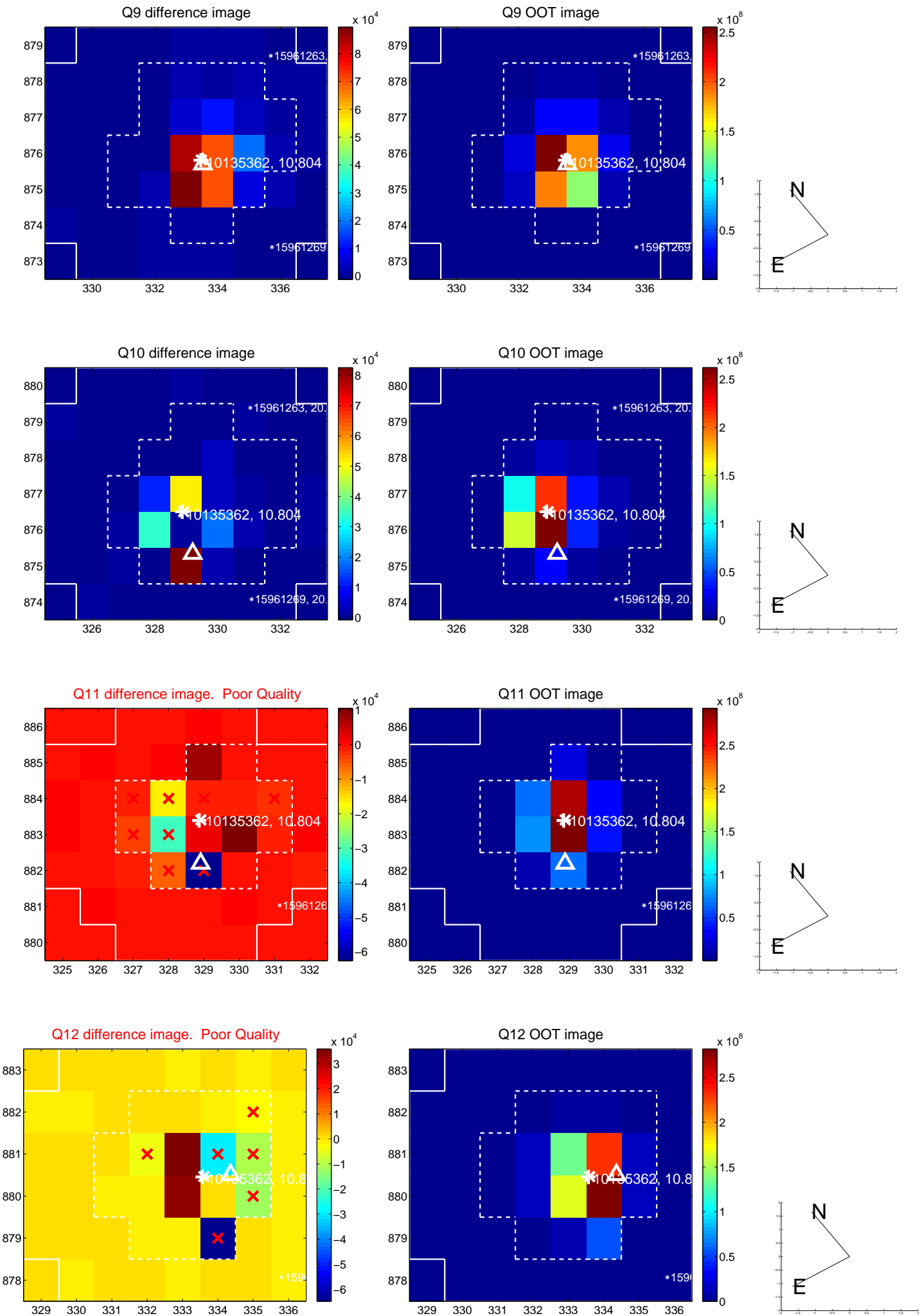




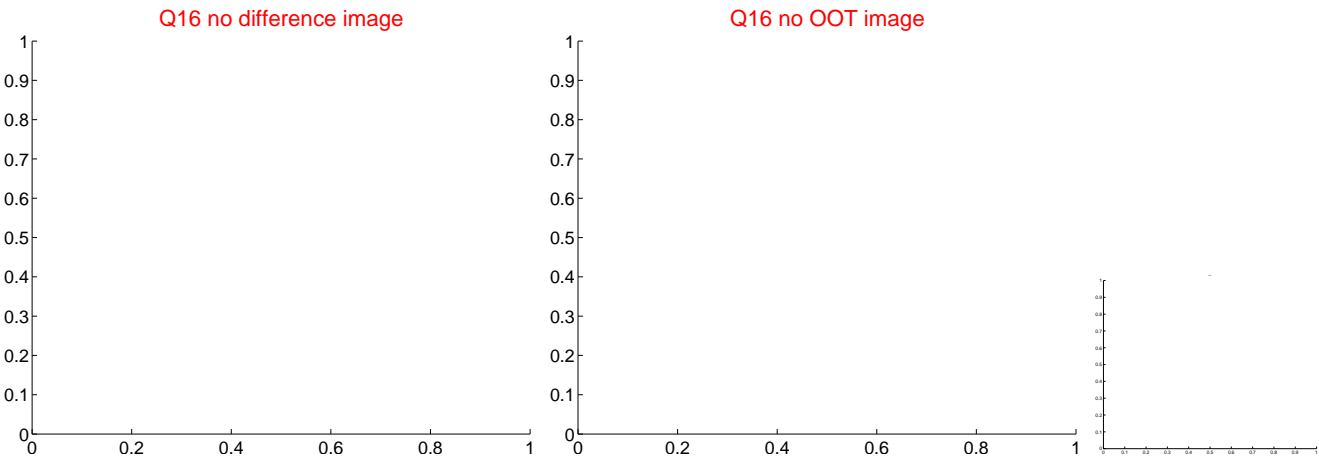
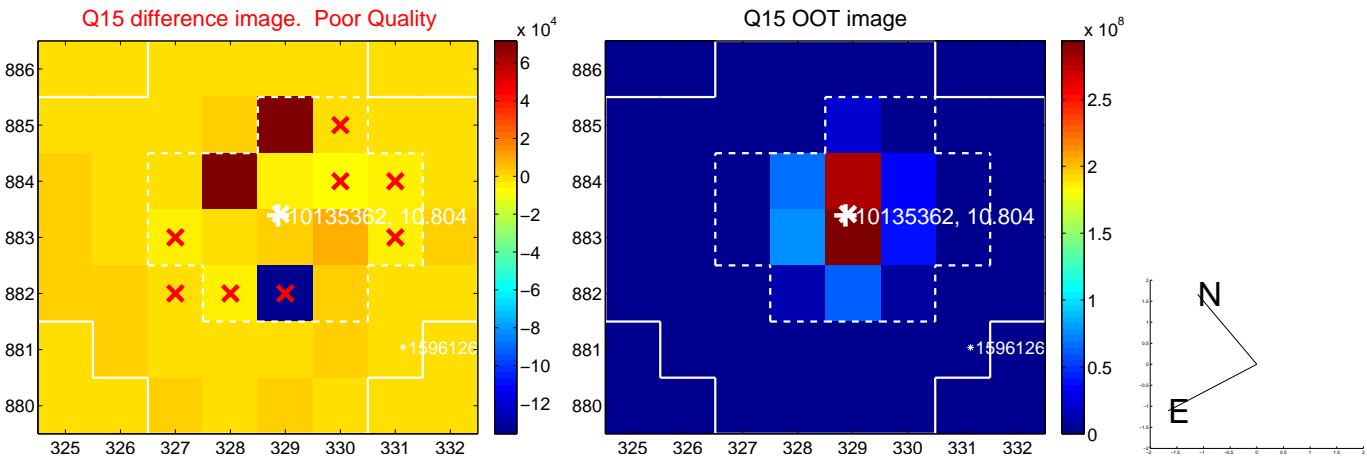
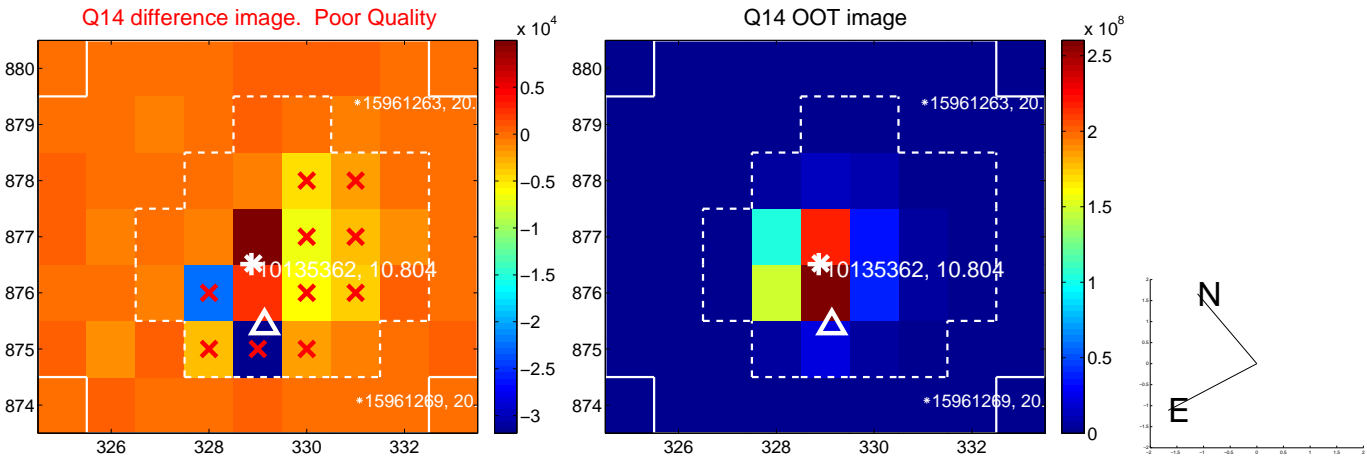
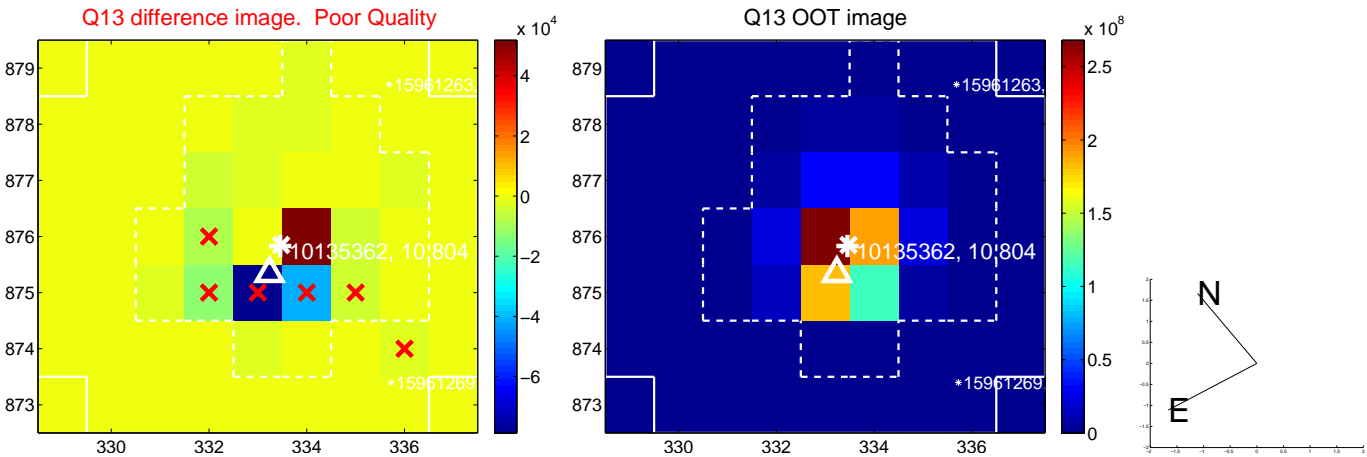
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



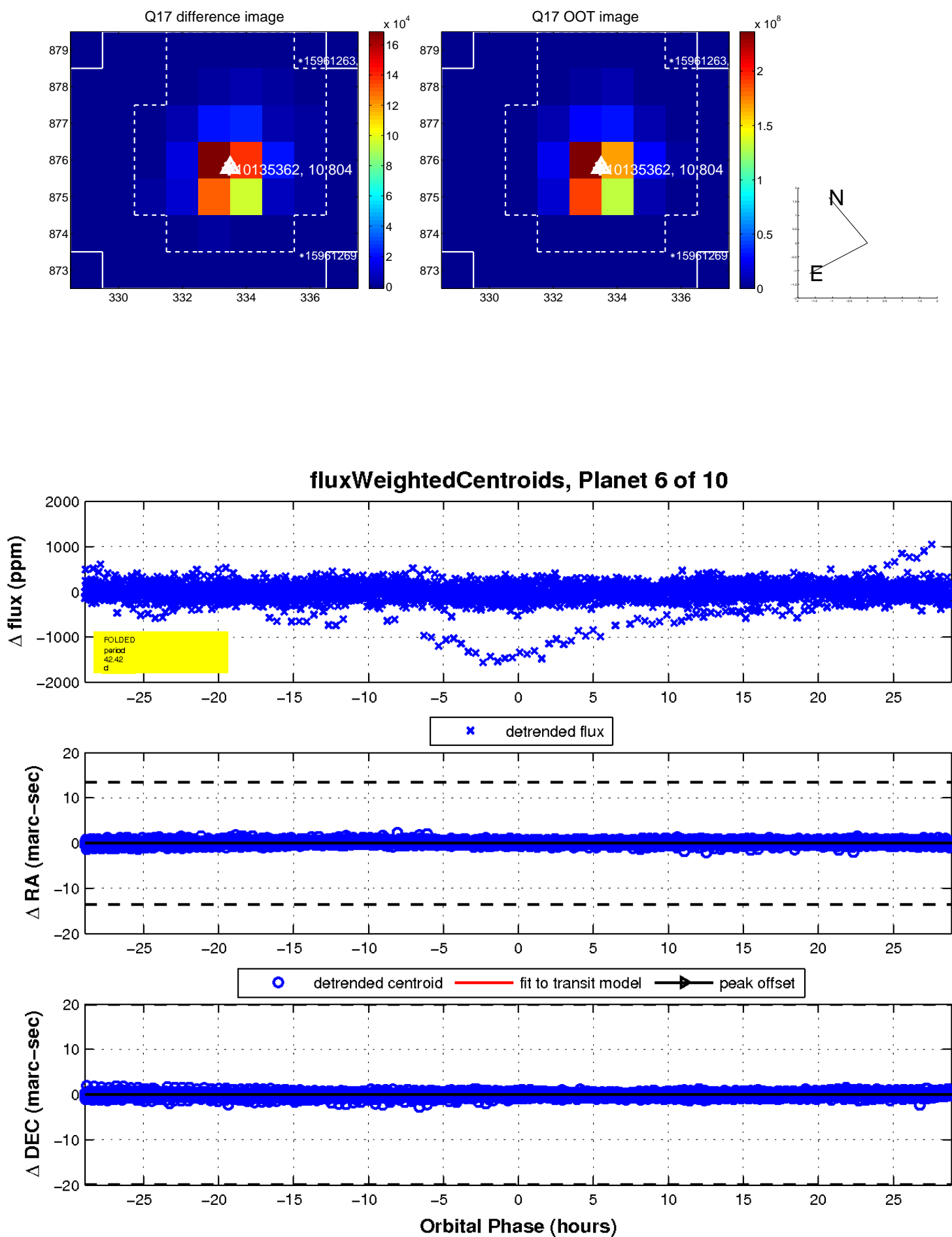
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

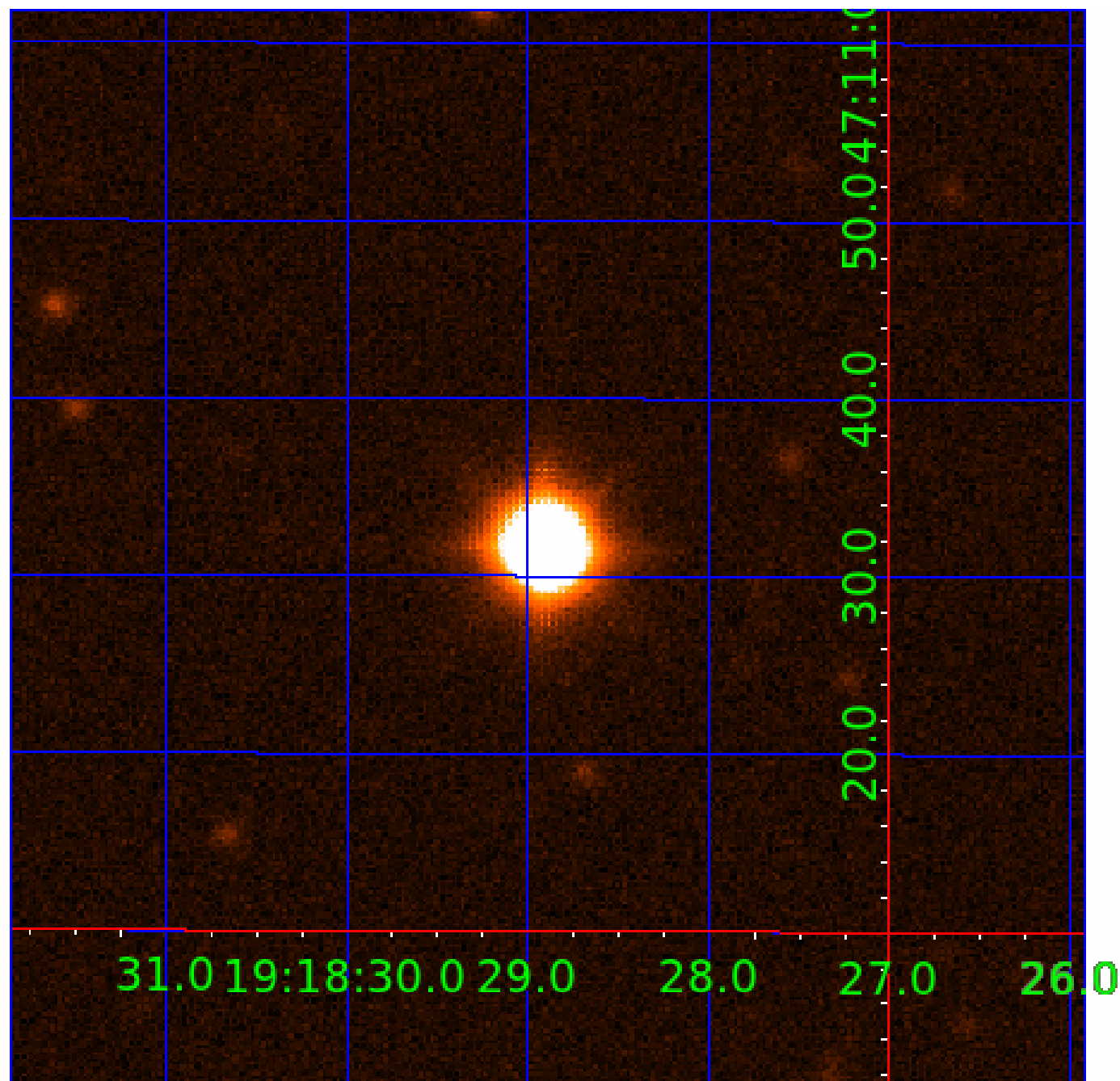


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

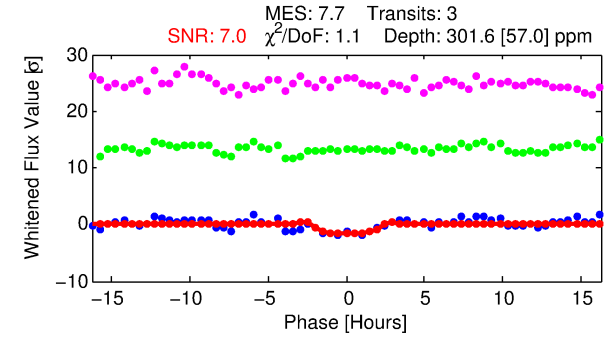
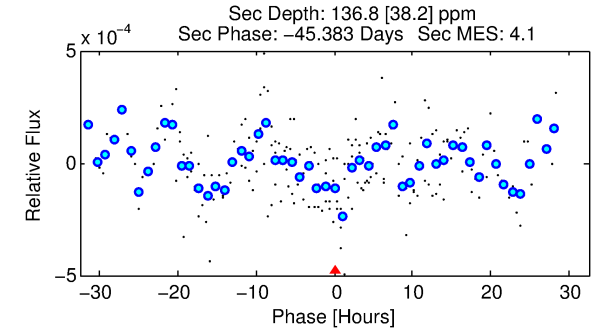
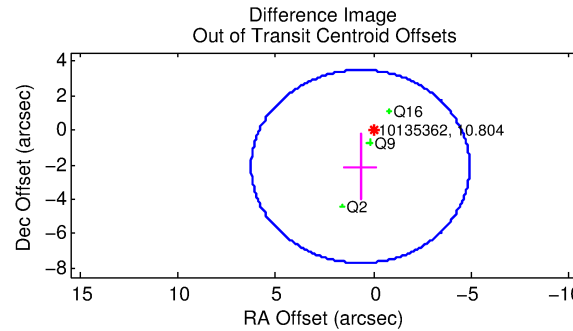
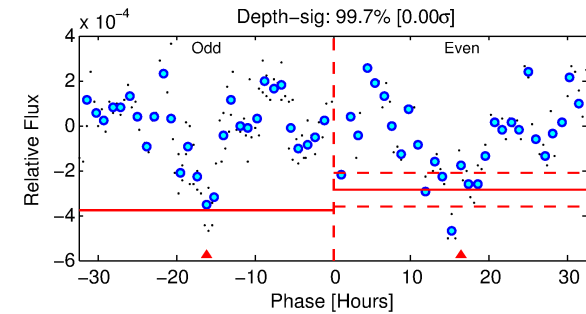
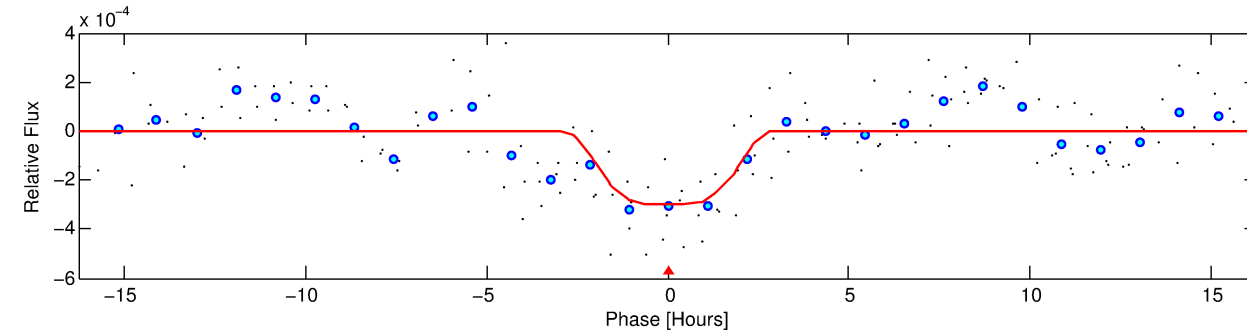
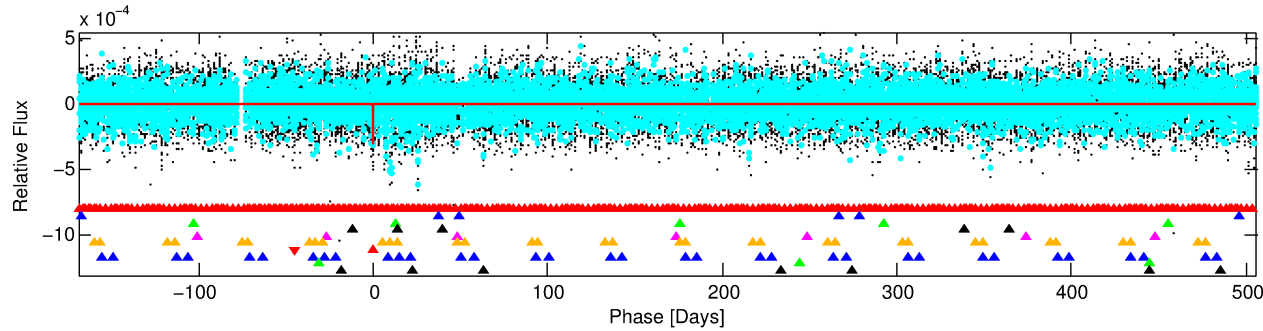
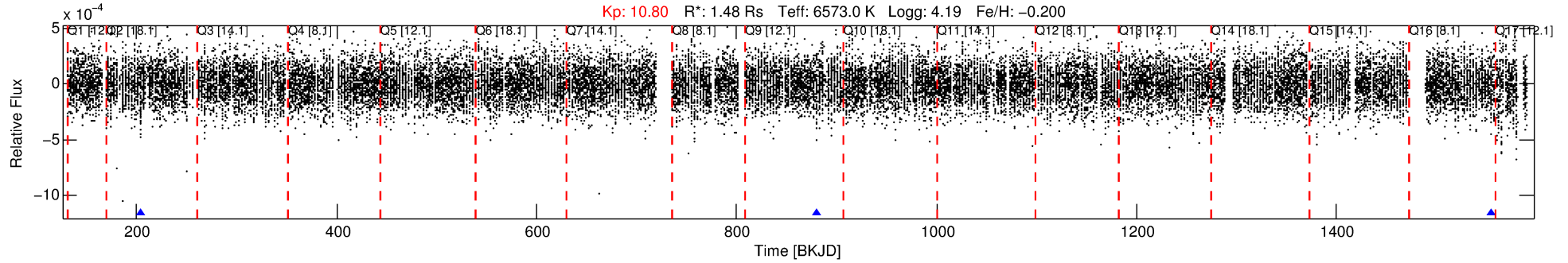
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-07

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 7 of 10 Period: 674.779 d



## DV Fit Results:

Period = 674.77920 [0.01062] d  
Epoch = 204.7905 [0.0140] BKJD  
 $R_p/R^* = 0.0207$  [0.0025]  
 $a/R^* = 291.68$  [71.82]  
 $b = 0.97$  [0.01]  
 $\text{Seff} = 1.40$  [0.55]  
 $T_{\text{eq}} = 277$  [27] K  
 $R_p = 3.33$  [1.11]  $R_e$   
 $a = 1.6138$  [0.4124] AU  
 $A_g = 17701.39$  [9119.28] [1.94 $\sigma$ ]  
 $T_{\text{eff}} = 4946$  [491] K [9.50 $\sigma$ ]

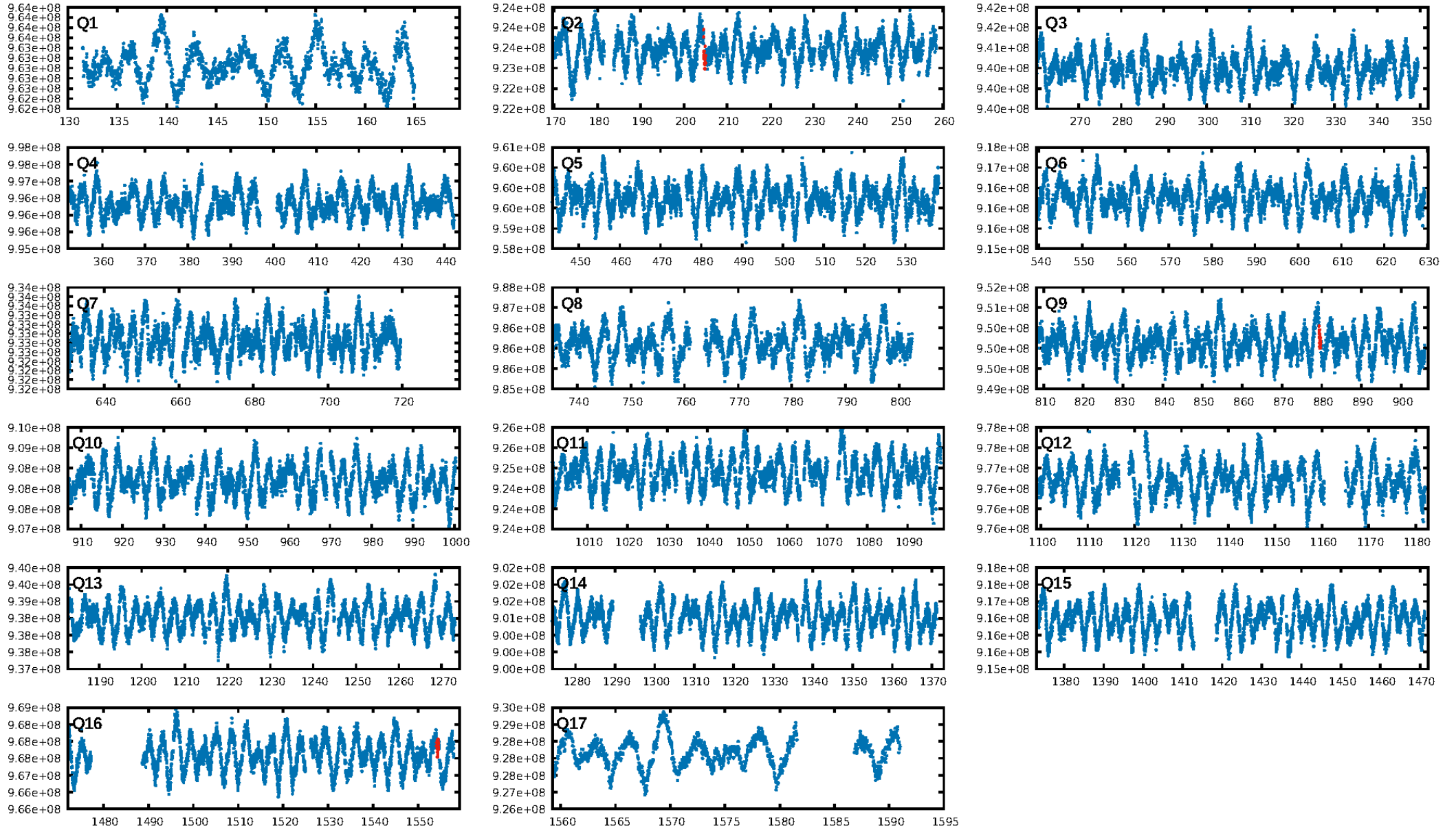
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [129.74 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 77.3%  
ModelChiSquareGof-sig: 90.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.282  
Centroid-sig: 92.3%  
Centroid-so: 0.284 arcsec [0.40 $\sigma$ ]  
OotOffset-rm: 2.214 arcsec [1.19 $\sigma$ ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-rm: 2.125 arcsec [1.17 $\sigma$ ]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:45 Z

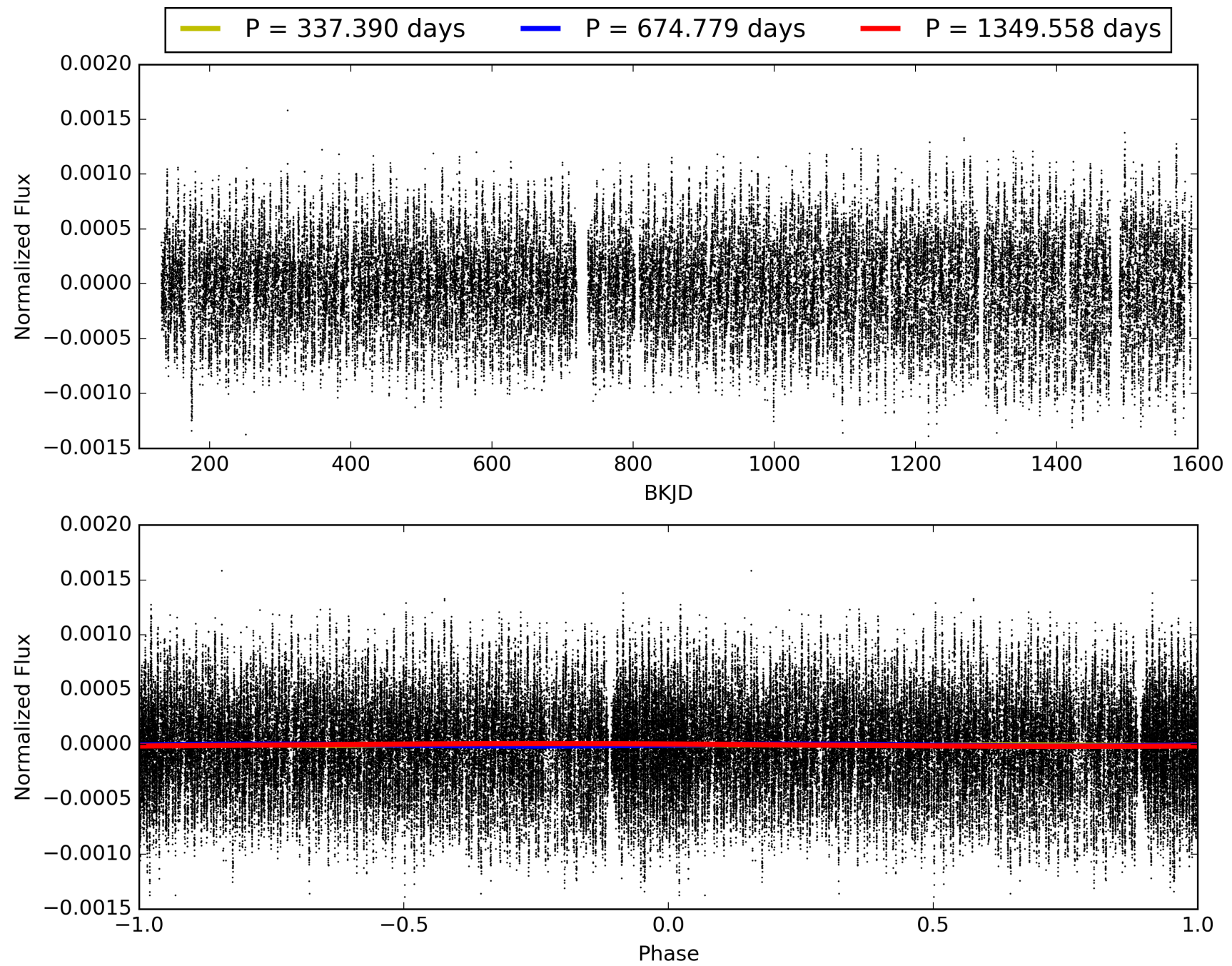
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010135362-07, PDC Light Curves



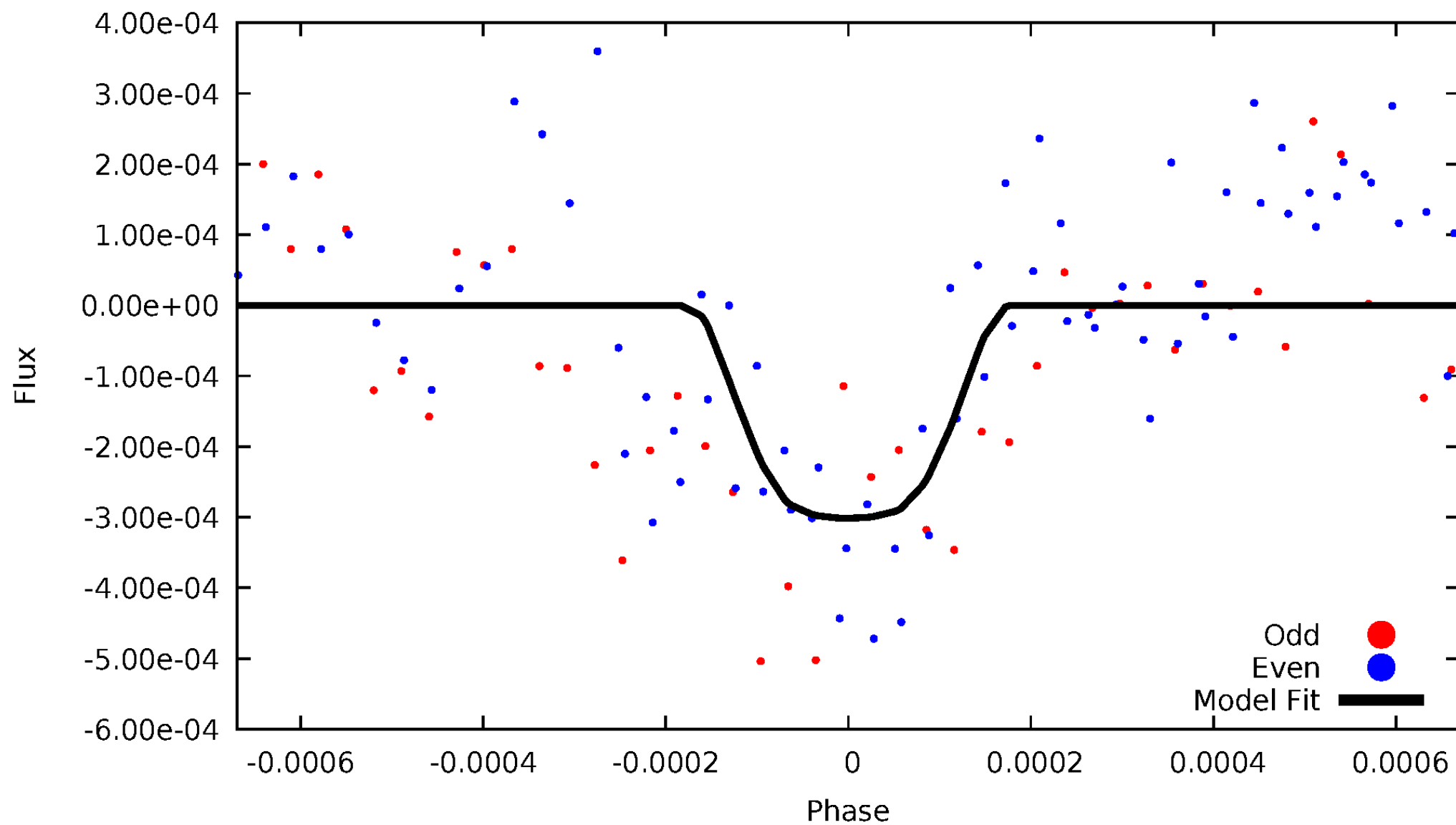


# TCE 010135362-07



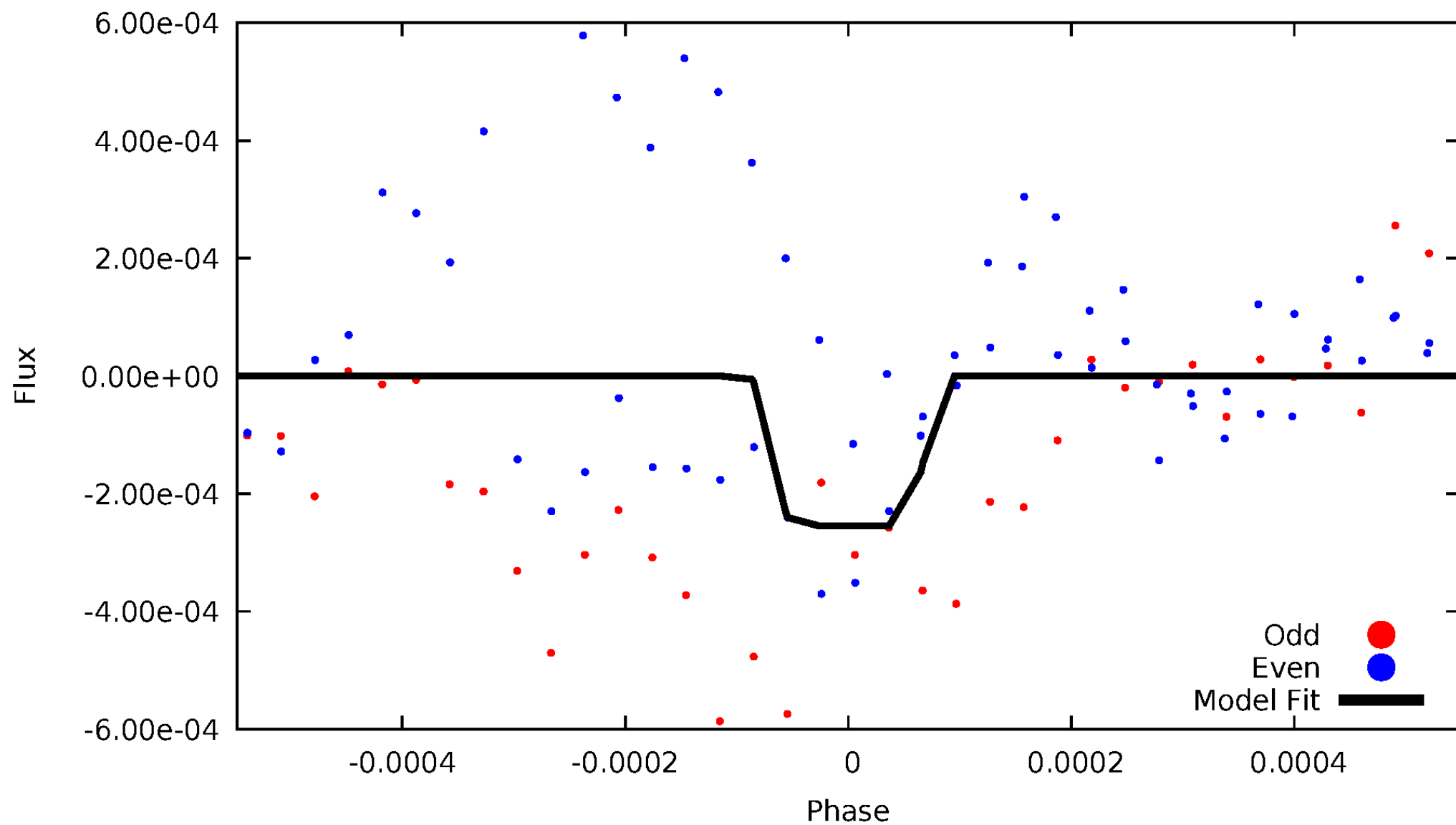
# DV Odd/Even

TCE 010135362-07



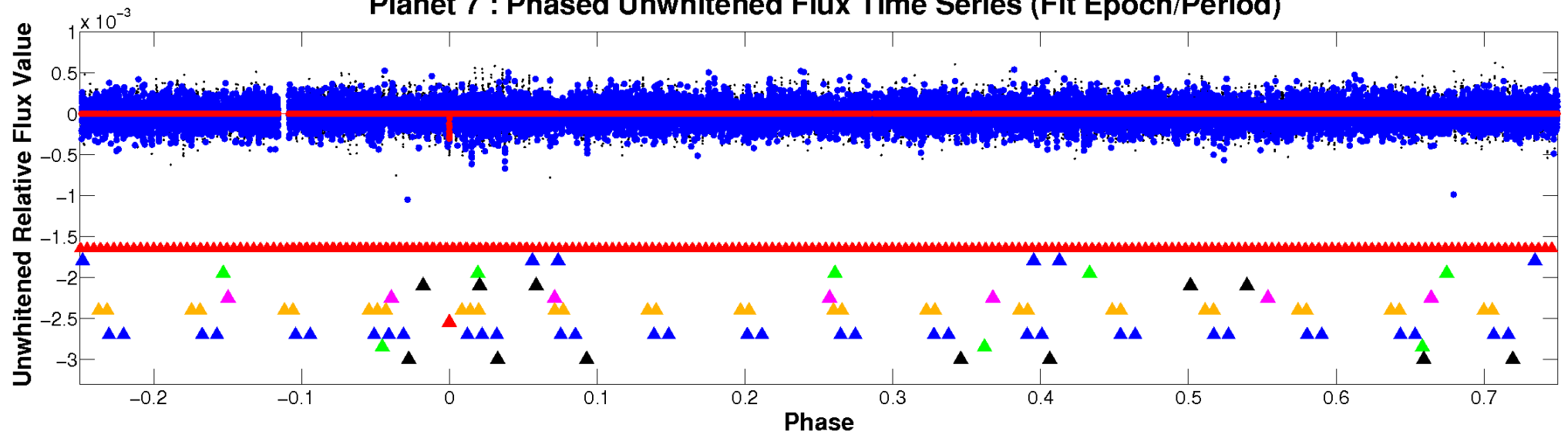
# ALT Odd/Even

TCE 010135362-07

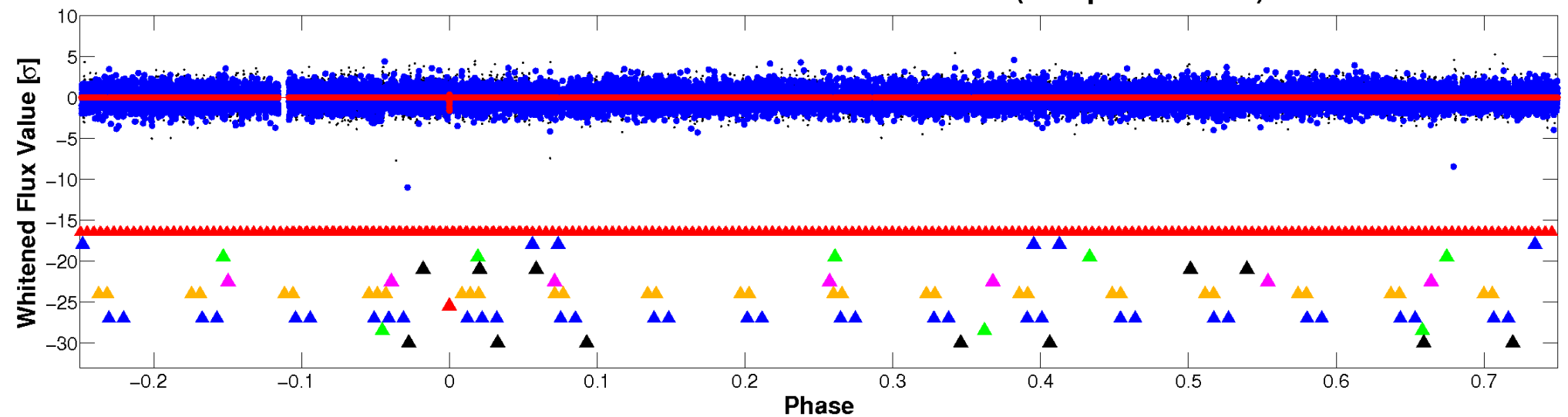


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

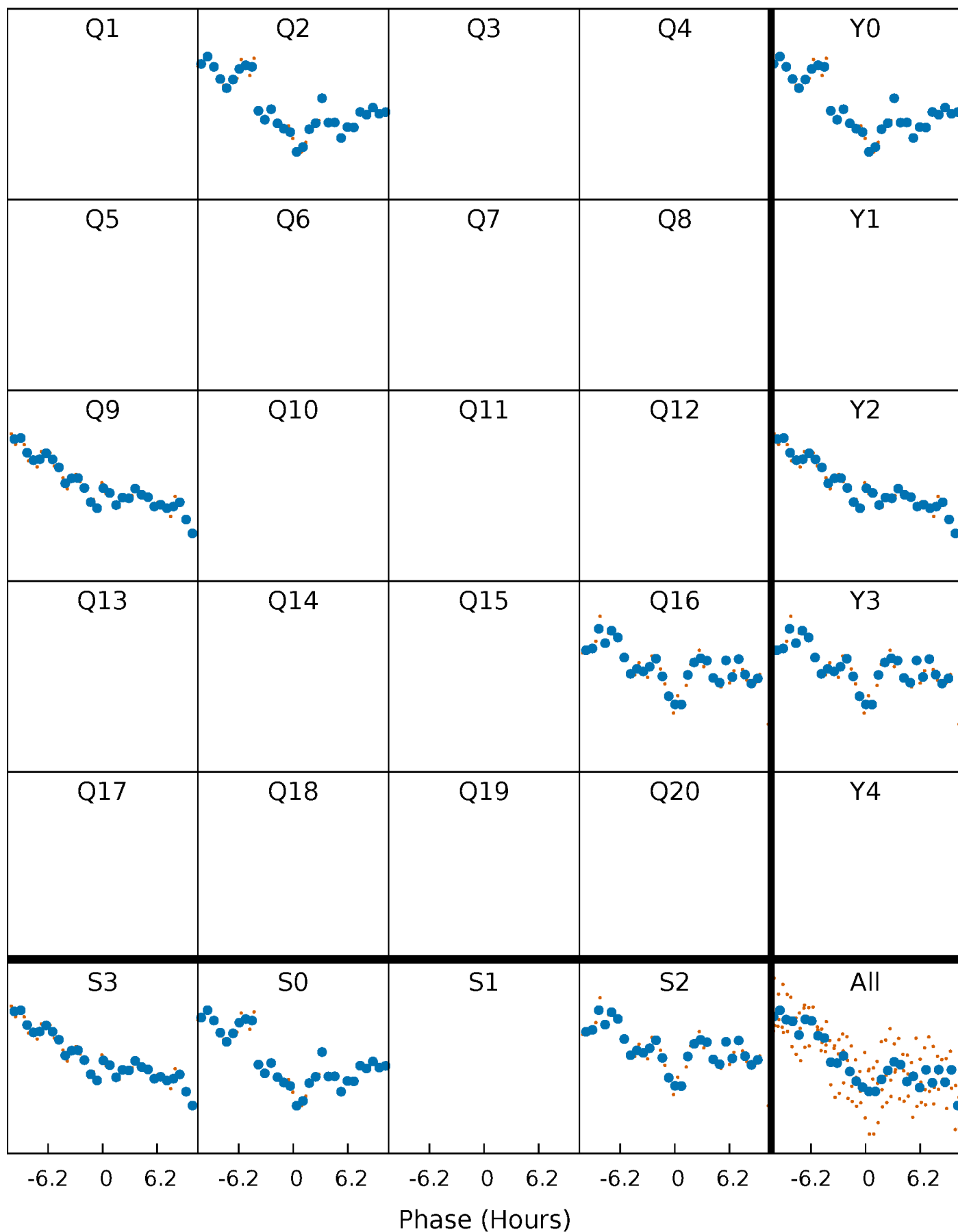


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



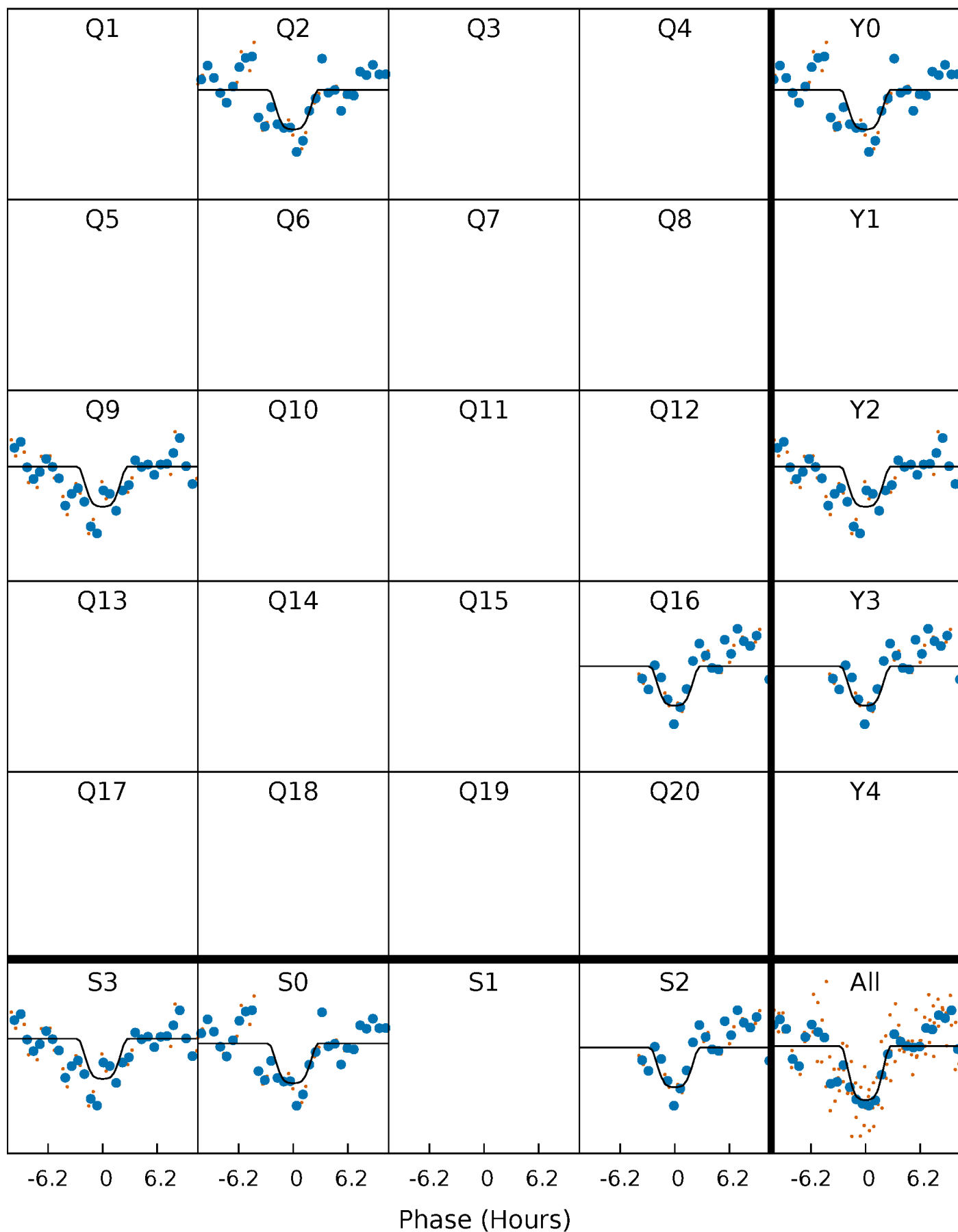
# PDC Quarter-Phased Transit Curves

TCE 010135362-07     $P=674.779196$  Days     $T_0=204.790468$  (BKJD)



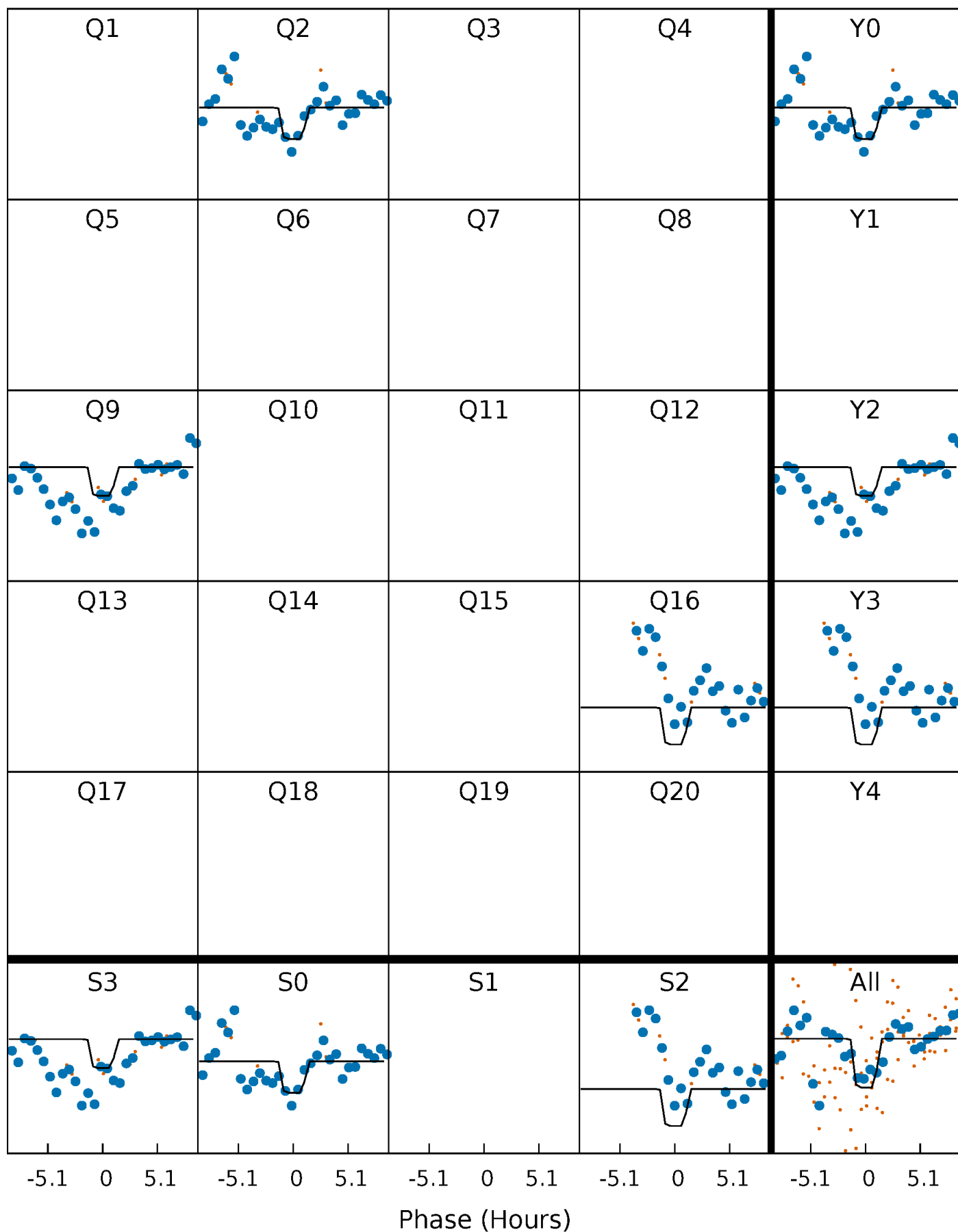
# DV Quarter-Phased Transit Curves

TCE 010135362-07     $P=674.779196$  Days     $T_0=204.790468$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

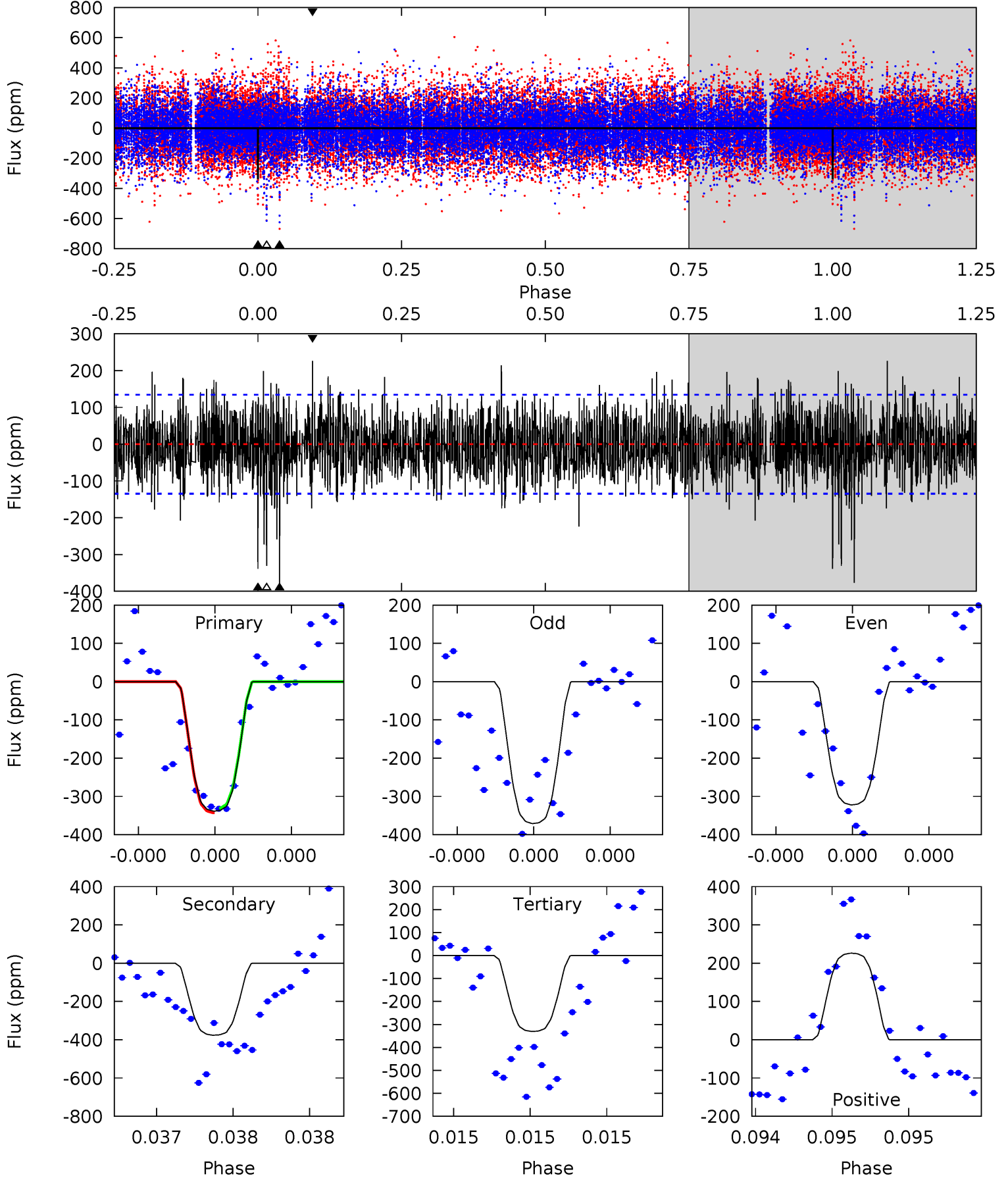
TCE 010135362-07     $P=674.757018$  Days     $T_0=204.825503$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-07, P = 674.779196 Days, E = 204.790468 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
14.2	15.8	13.9	9.47	5.63	3.57	2.47	0.32	4.71	1.92	6.30	0.97	0.91	0.38	0.24

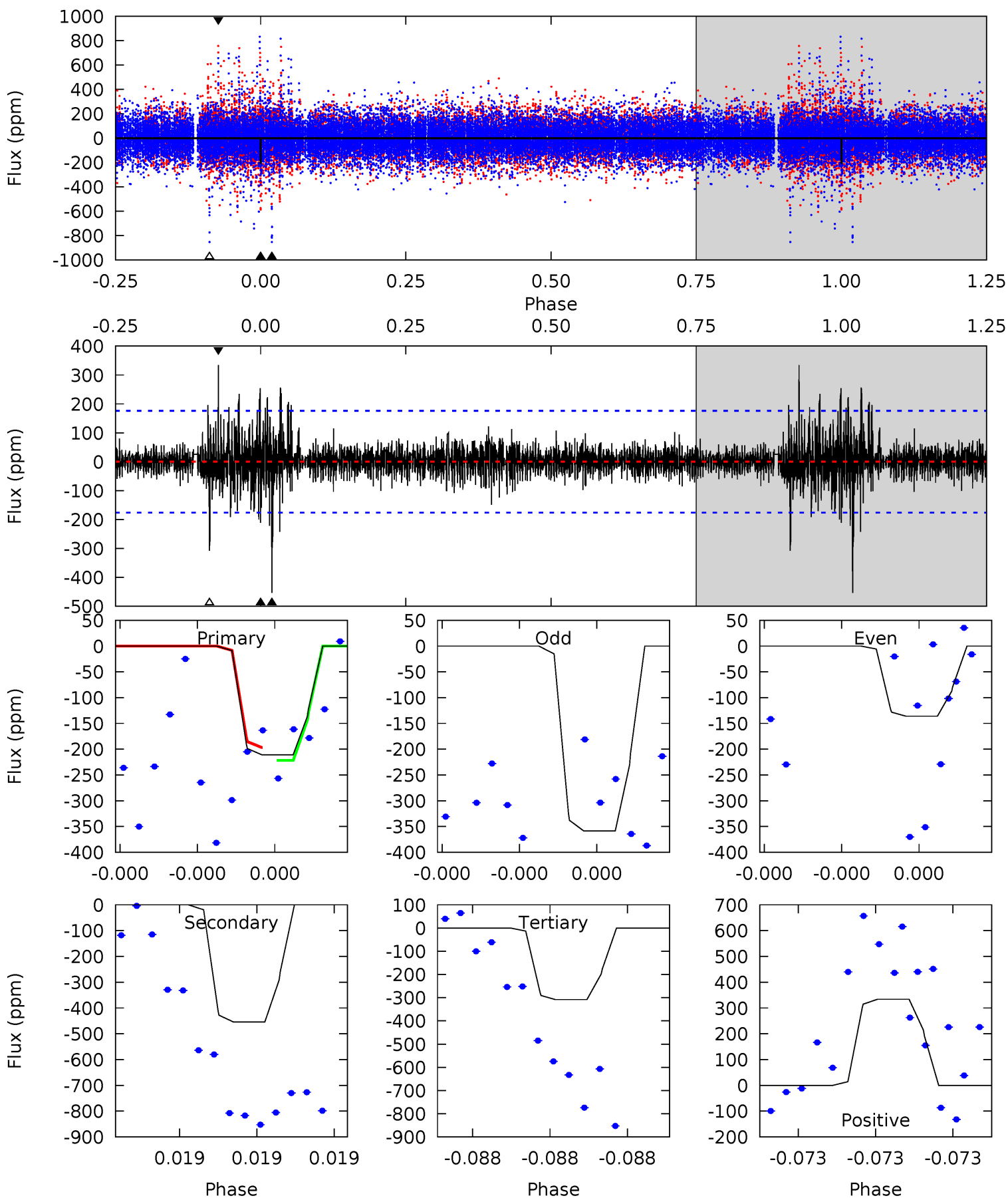




# Alt Model-Shift Uniqueness Test

010135362-07, P = 674.757018 Days, E = 204.825503 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
6.92	14.9	10.1	11.0	5.78	3.79	1.23	-3.20	-4.04	4.78	3.94	3.50	0.73	0.42	0.41



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-376 \pm 24$	$3.38^{+0.70}_{-0.64}$	$387^{+34}_{-28}$	$6317^{+513}_{-405}$	$47094^{+23355}_{-13984}$
Alt.	$-454 \pm 30$	$2.54^{+0.61}_{-0.50}$	$387^{+30}_{-26}$	$7705^{+910}_{-679}$	$98270^{+53974}_{-33200}$

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

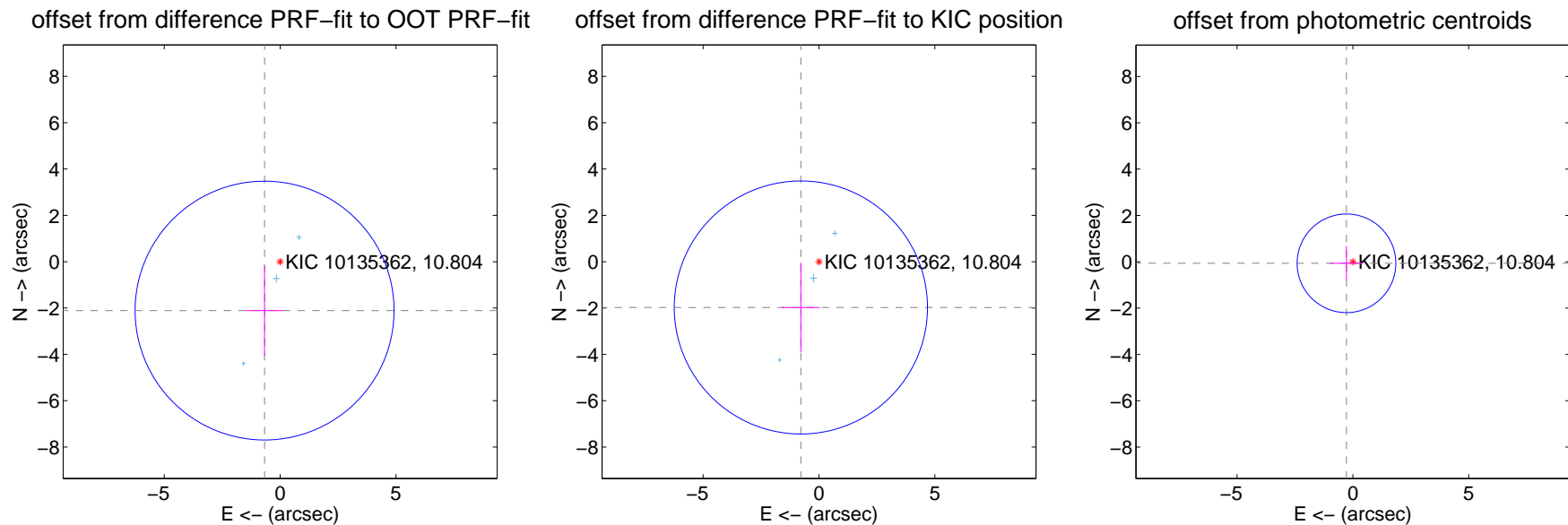
## DV Centroid Data

Supplemental centroid analysis for 010135362-07. **Kepler magnitude: 10.80.** Transit SNR 6.96

**There are 3 quarters with good PRF difference image offsets**

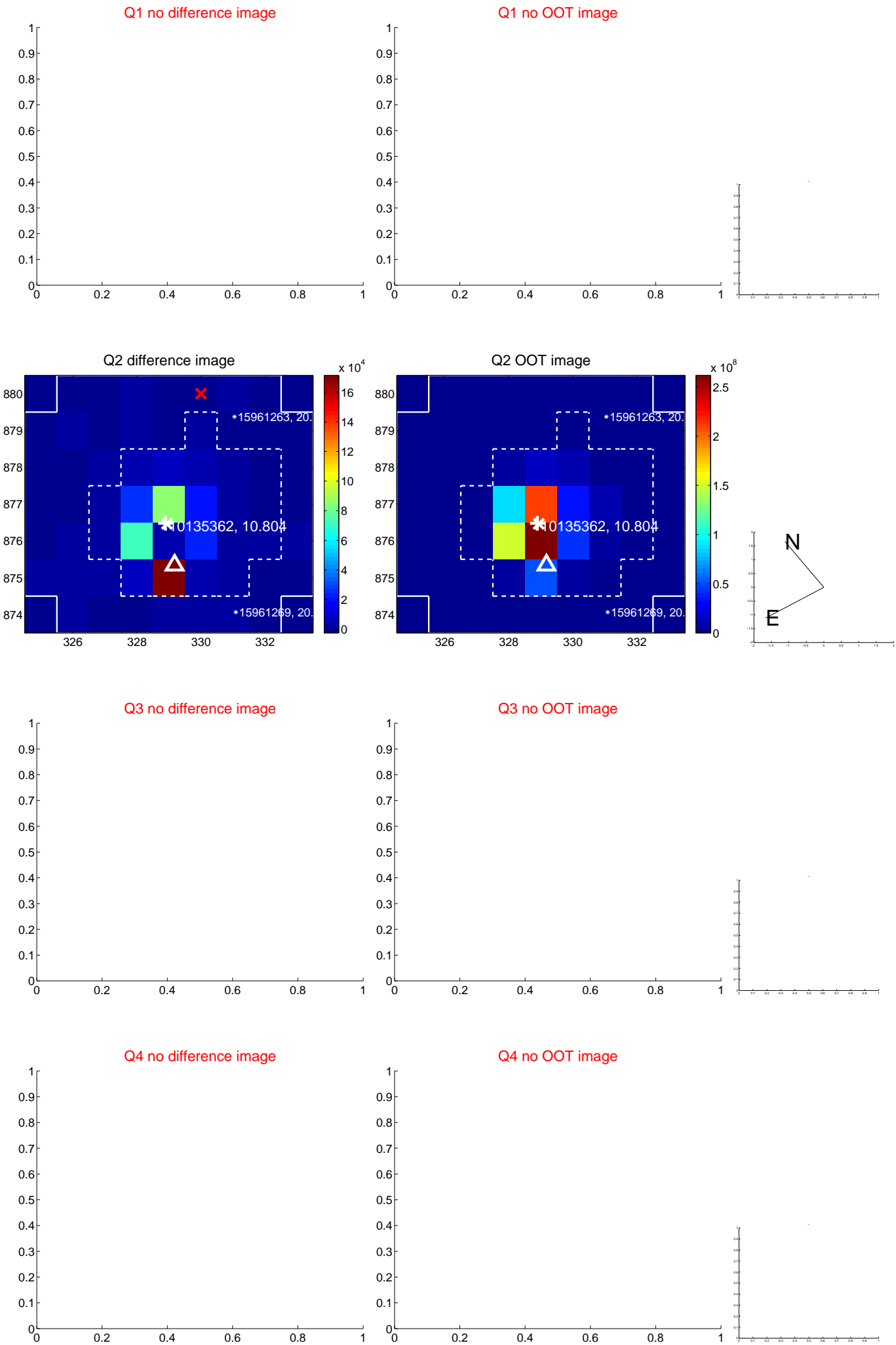
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.214 \pm 1.862$	1.19	$0.670 \pm 0.818$	$-2.110 \pm 1.936$
PRF-fit source offset from KIC position	$2.125 \pm 1.821$	1.17	$0.781 \pm 0.819$	$-1.977 \pm 1.931$
photometric centroid source offset	$0.28 \pm 0.71$	0.40	$0.28 \pm 0.71$	$-0.07 \pm 0.73$

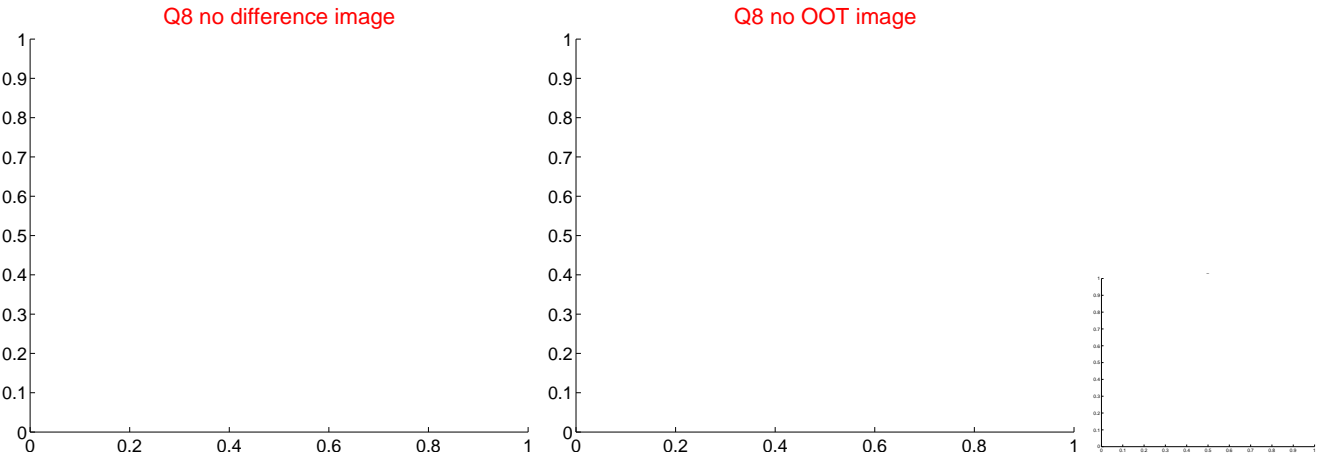
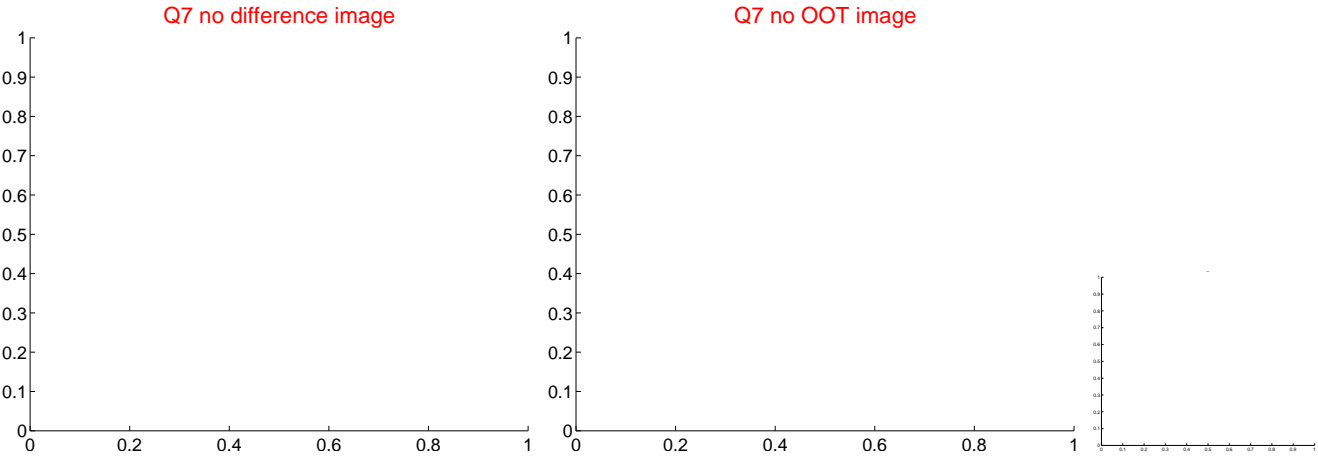
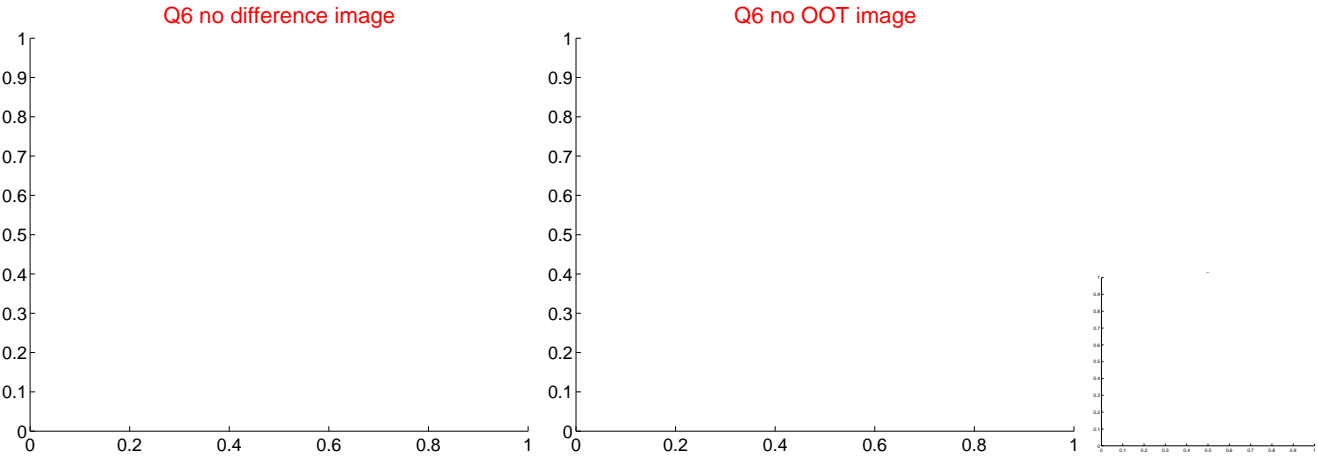
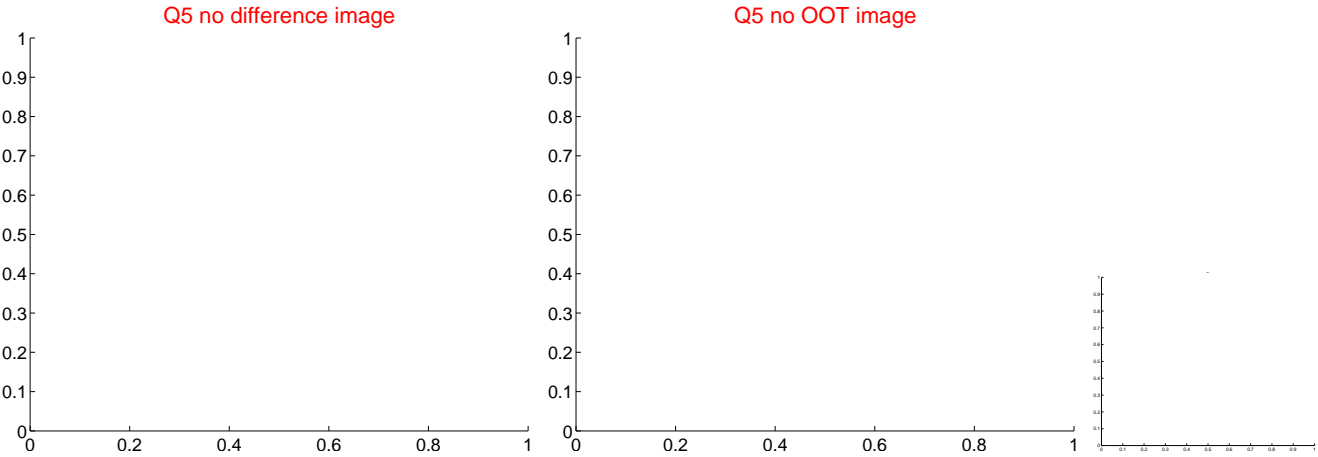


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

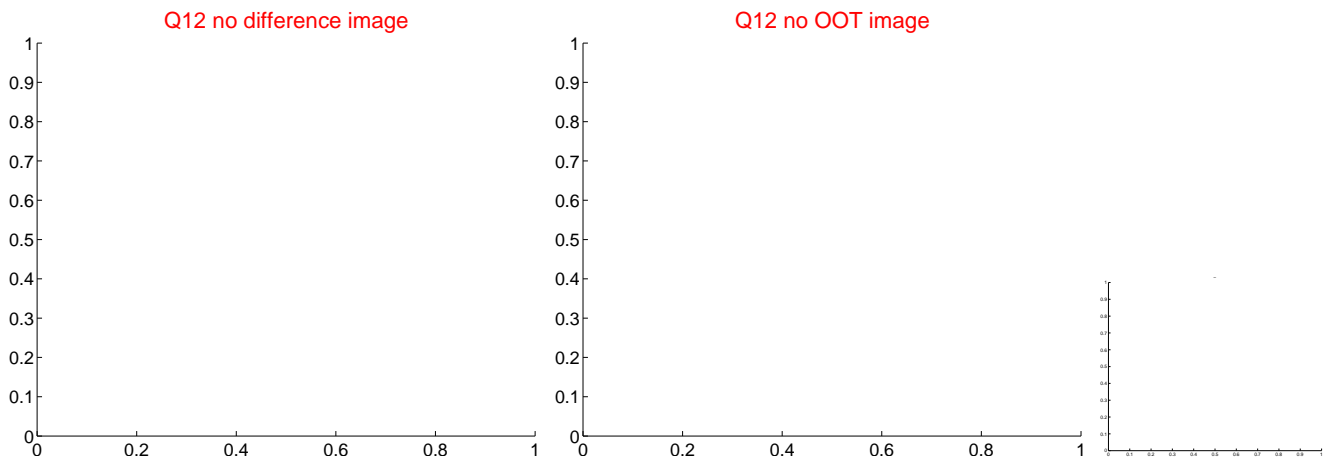
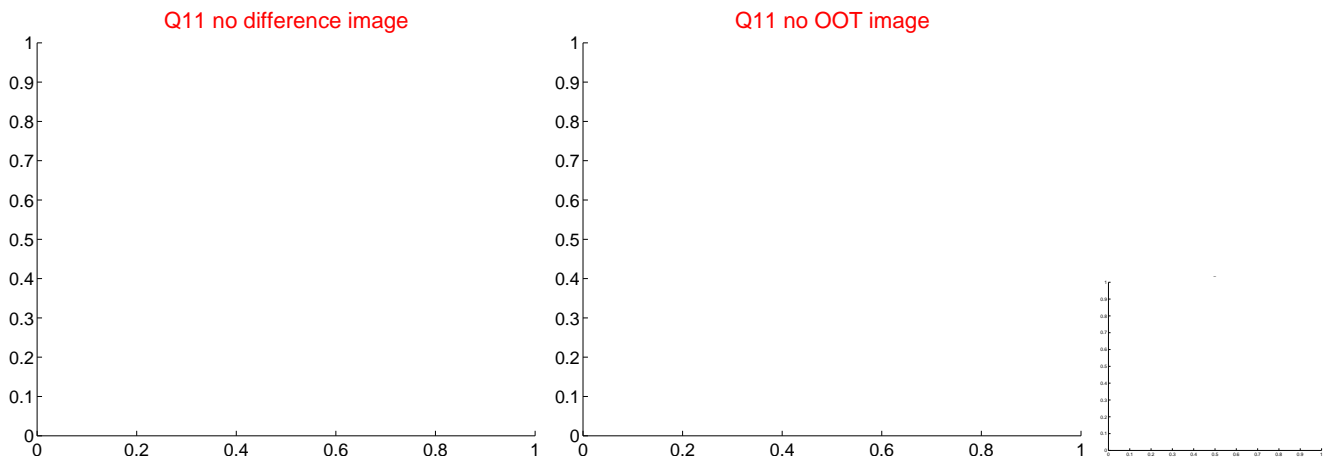
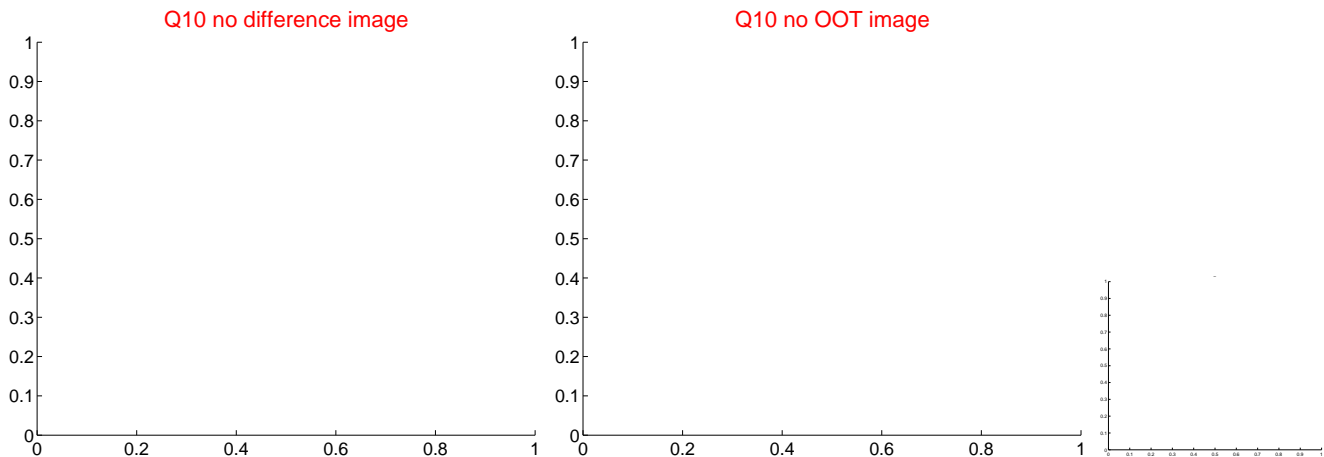
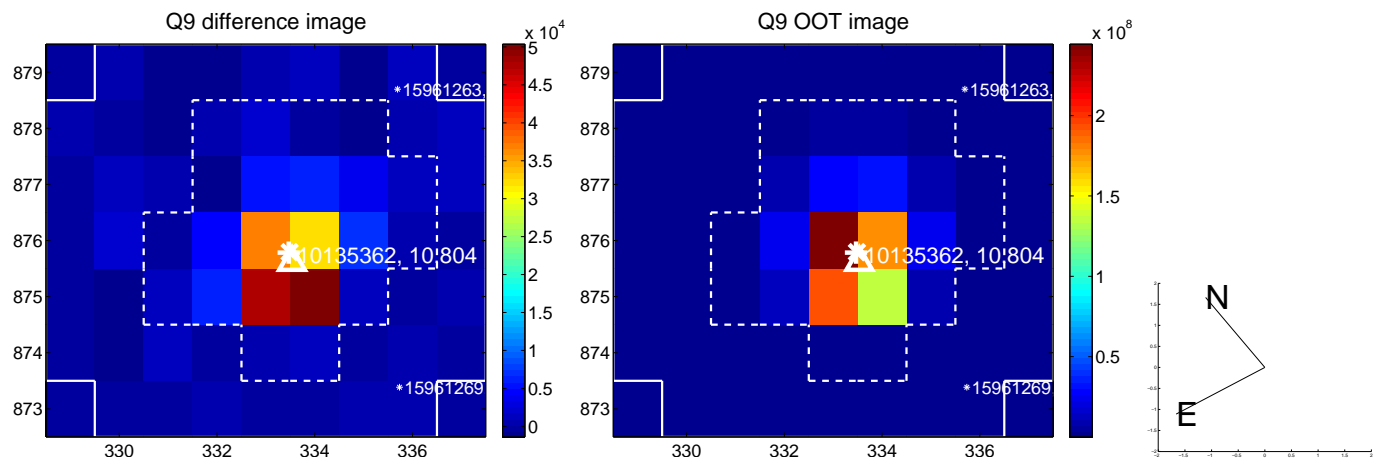
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



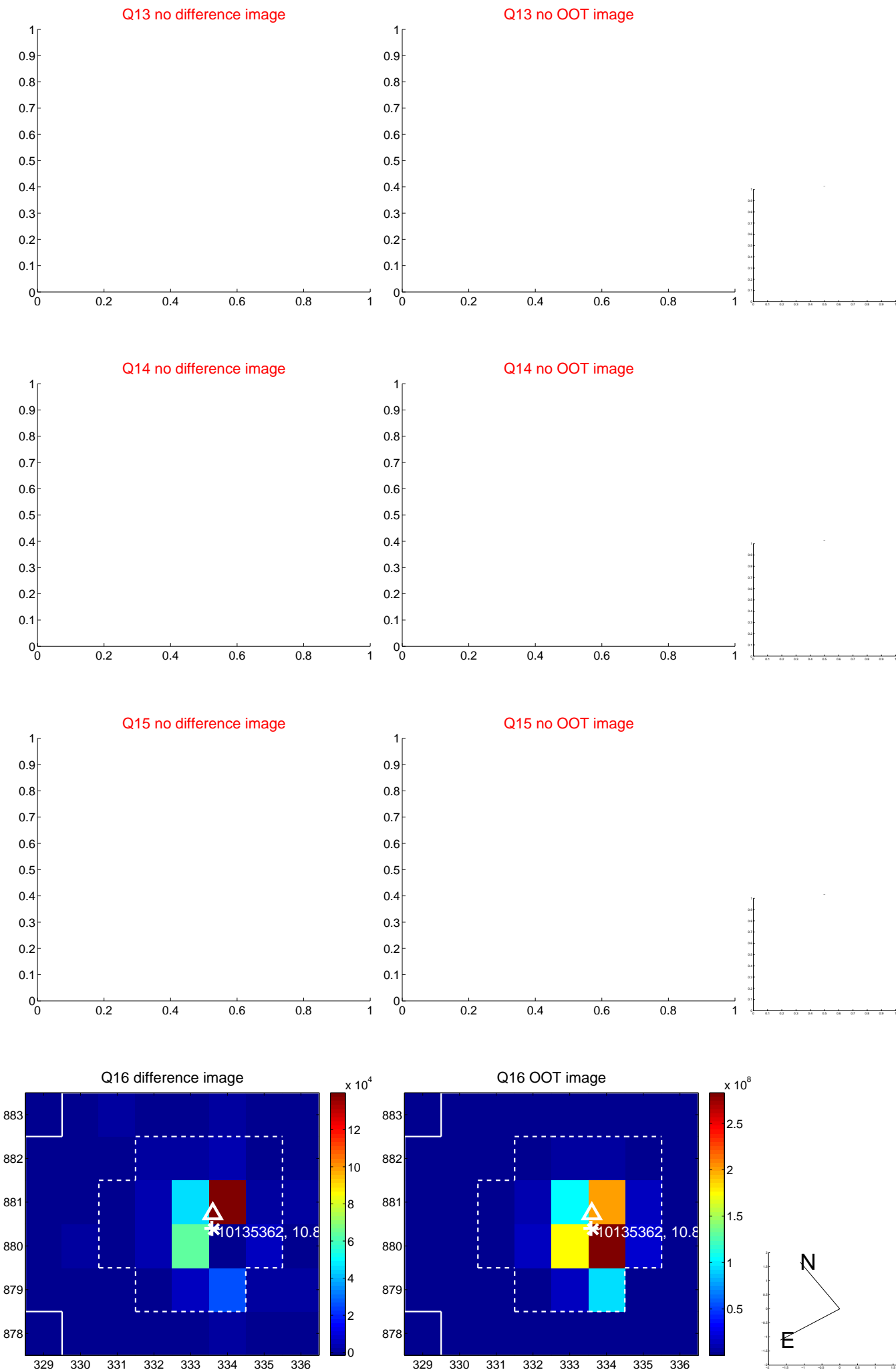
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



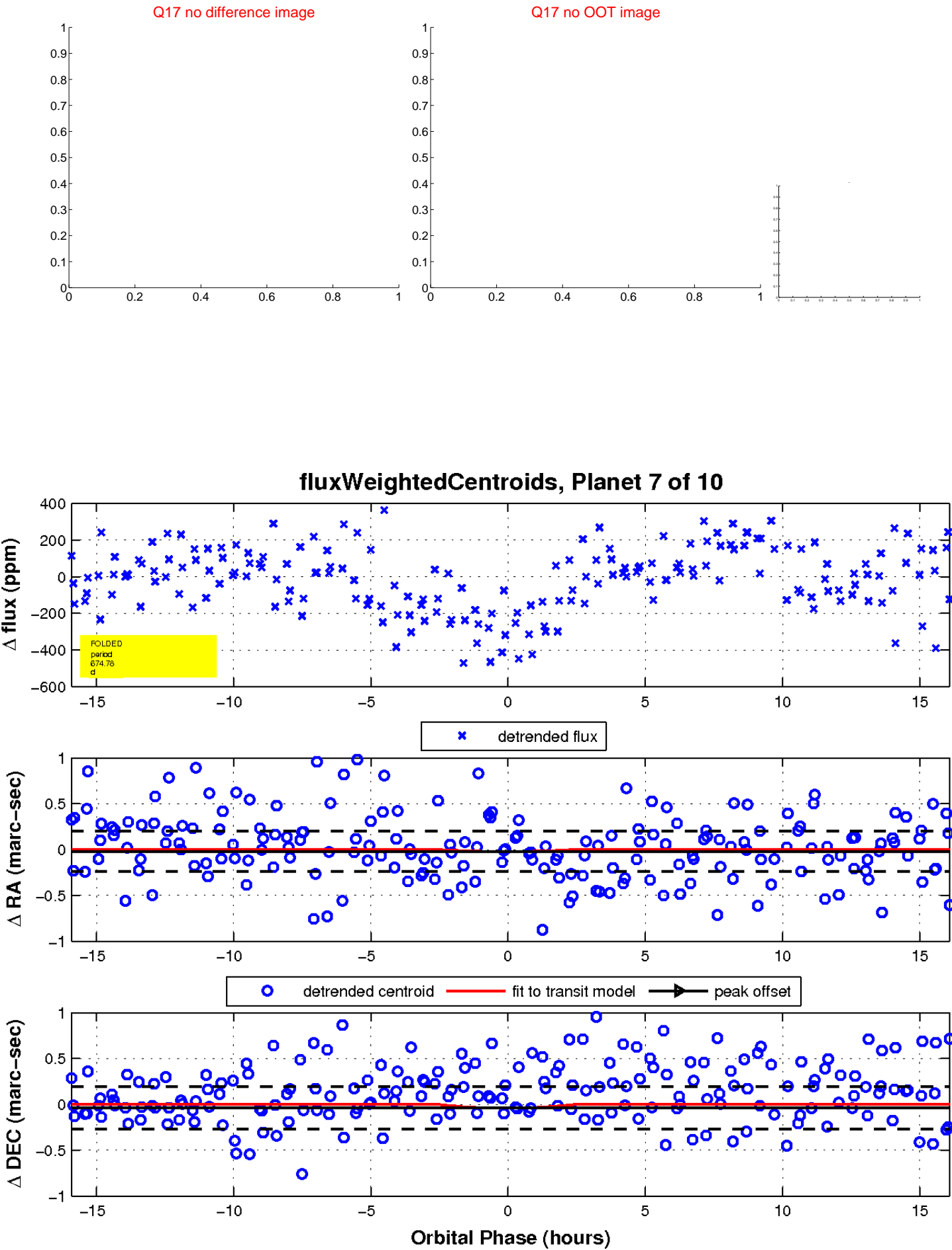
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



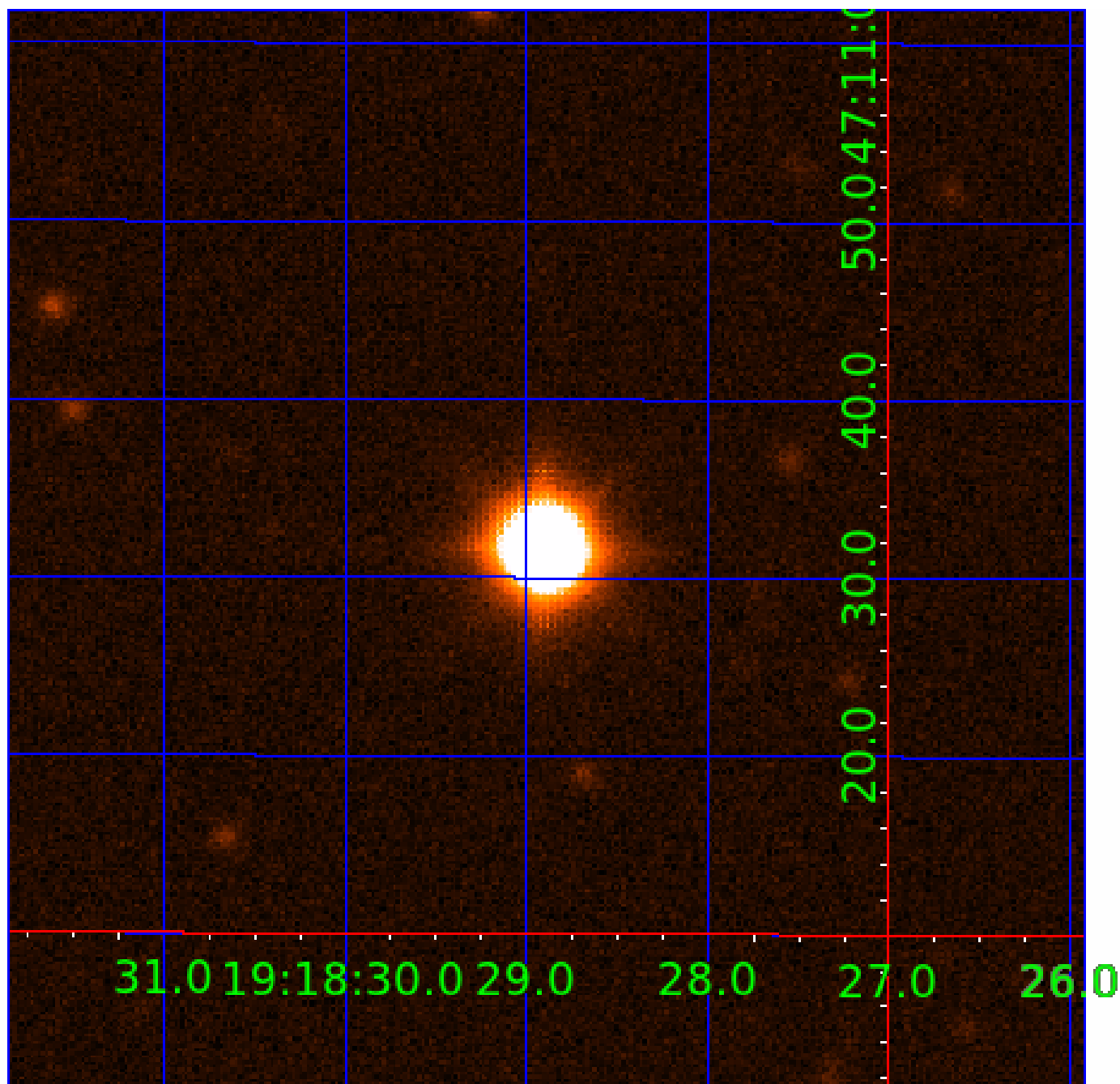
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

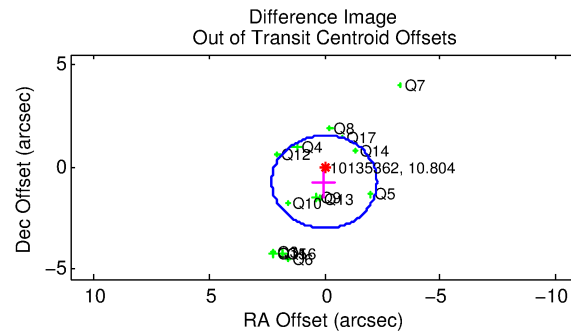
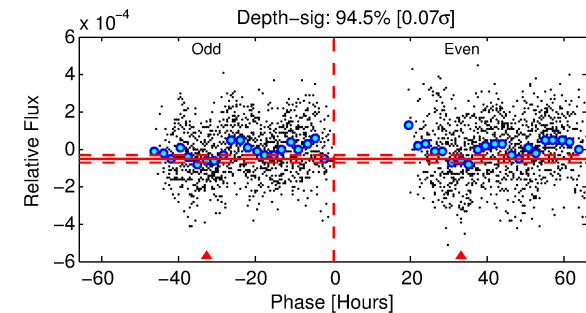
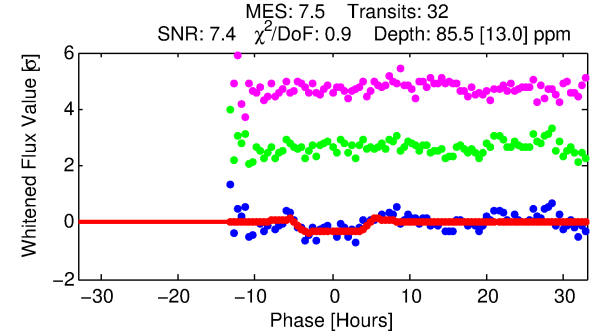
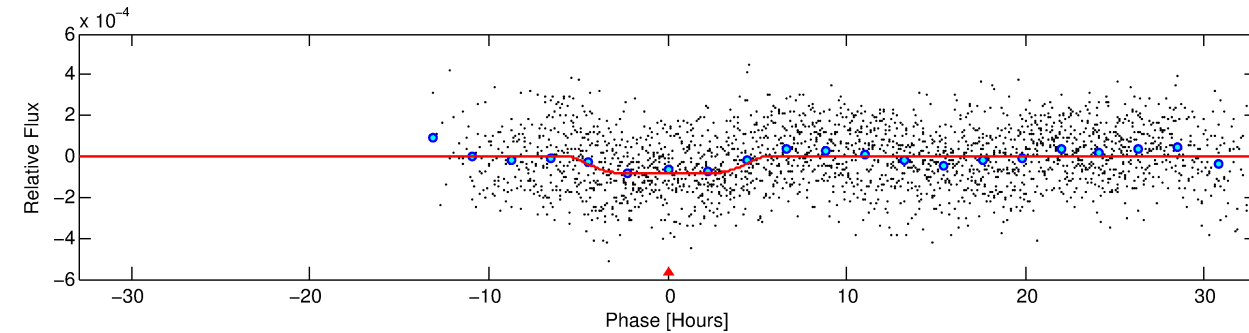
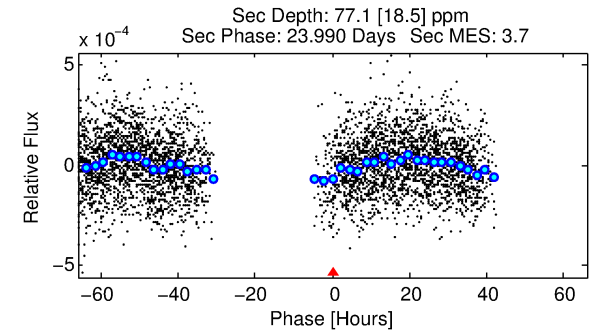
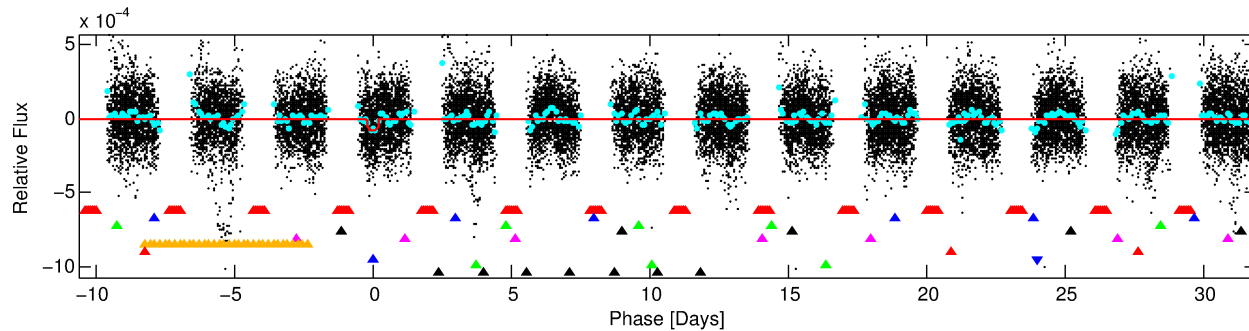
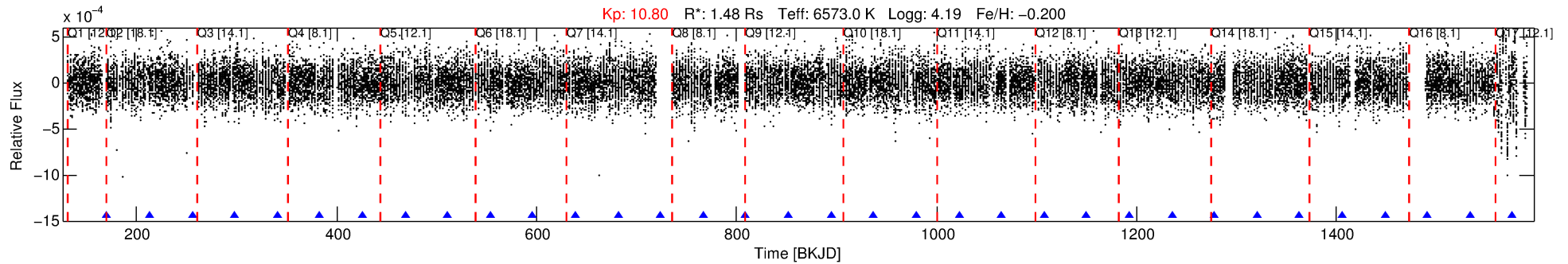
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-08

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 8 of 10 Period: 42.593 d



## DV Fit Results:

Period = 42.59297 [0.00125] d  
Epoch = 170.4502 [0.0248] BKJD  
Rp/R\* = 0.0111 [0.0010]  
a/R\* = 7.68 [1.75]  
b = 0.98 [0.01]  
Seff = 55.66 [21.86]  
Teq = 696 [68] K  
Rp = 1.79 [0.58] Re  
a = 0.2558 [0.0654] AU  
Ag = 867.36 [407.56] [2.13σ]  
Teffp = 5844 [491] K [10.39σ]

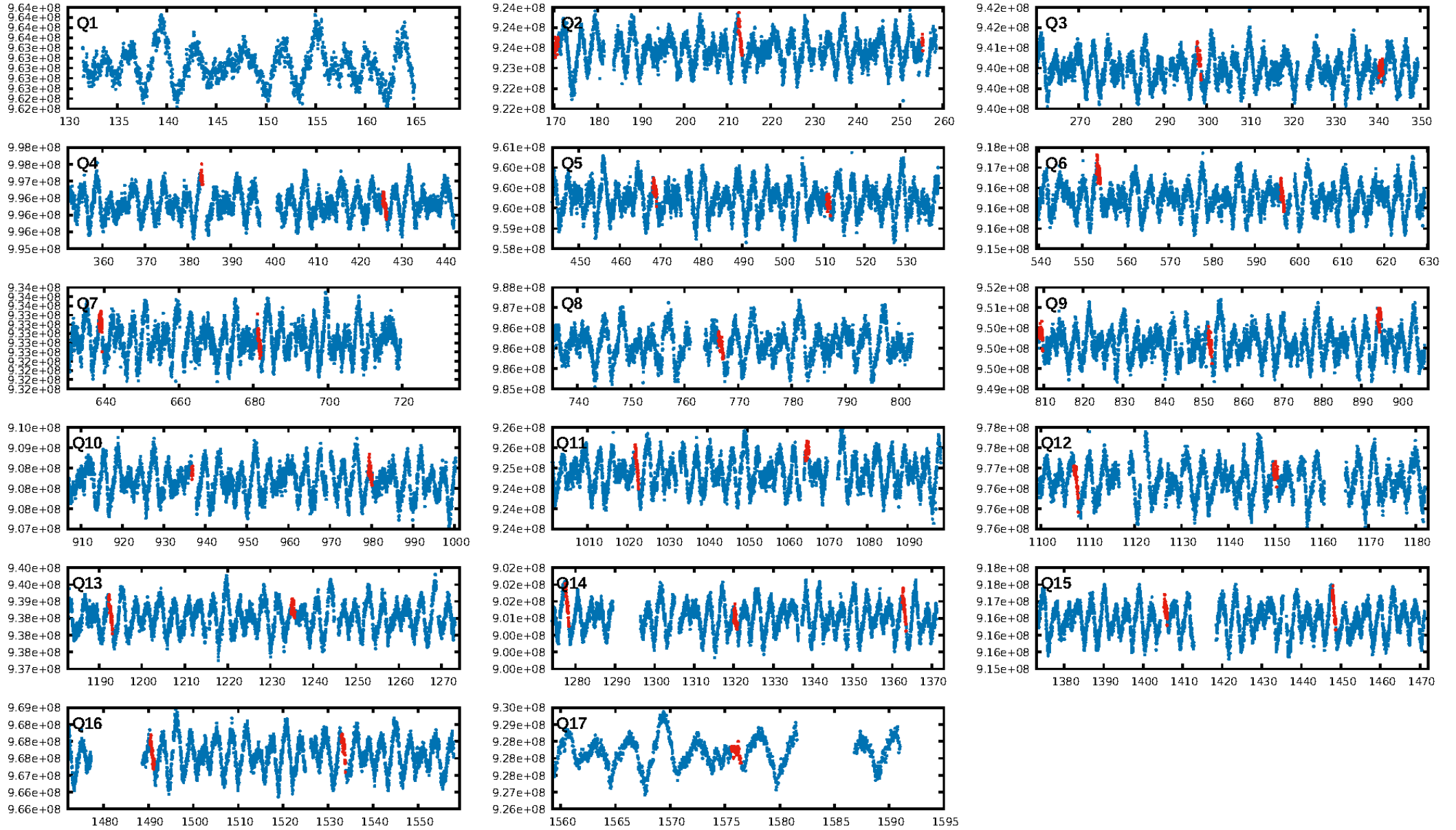
## DV Diagnostic Results:

ShortPeriod-sig: 23.0% [0.29σ]  
LongPeriod-sig: 100.0% [282.17σ]  
ModelChiSquare2-sig: 60.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [31/31]  
GhostDiagnostic-chr: 2.513  
Centroid-sig: 40.5%  
Centroid-so: 0.957 arcsec [1.35σ]  
OotOffset-rm: 0.746 arcsec [0.98σ]  
KicOffset-rm: 0.710 arcsec [0.94σ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.00 [0/15]  
DiffImageOverlap-fno: 0.62 [10/16]

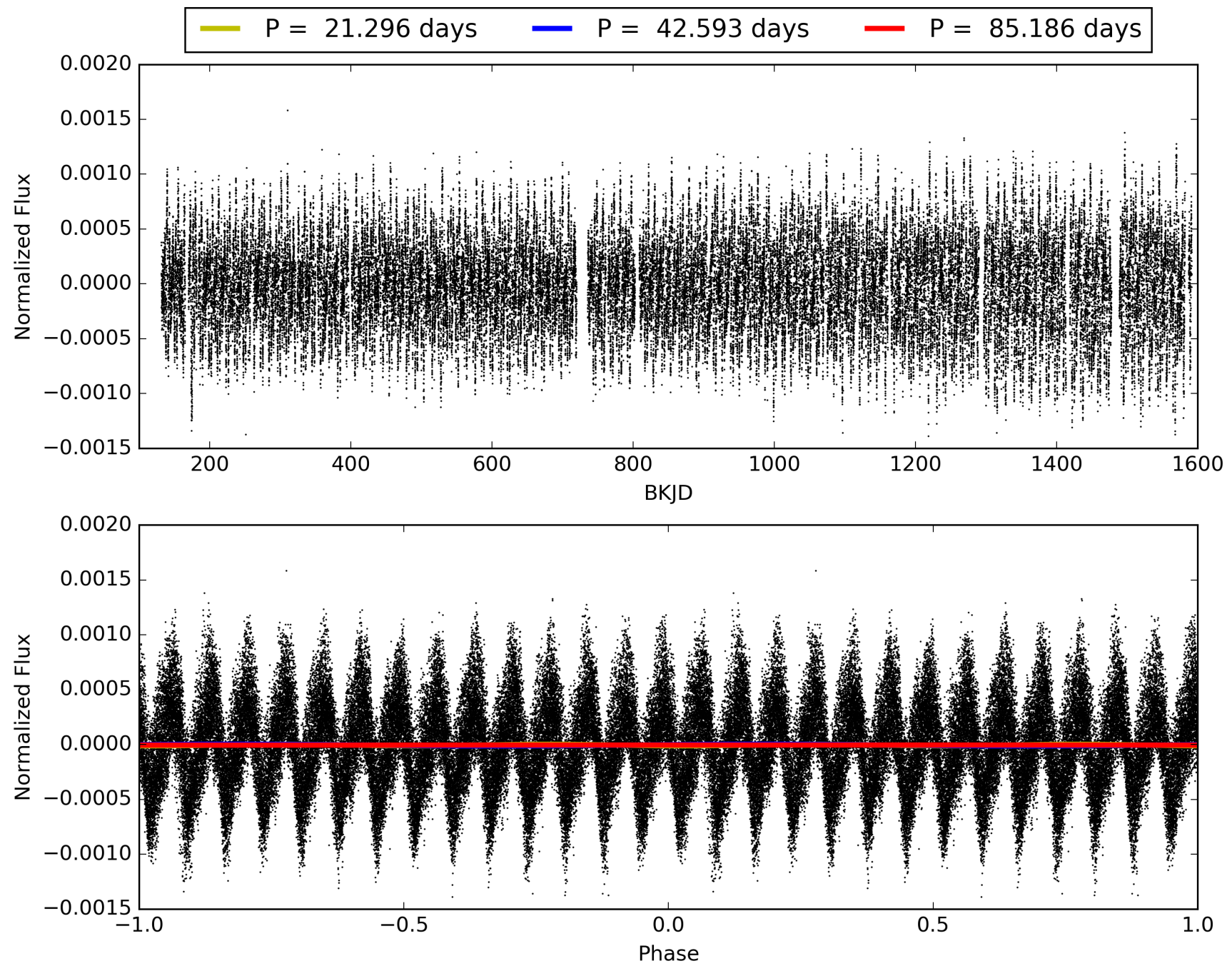
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:50 Z

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

# TCE 010135362-08, PDC Light Curves



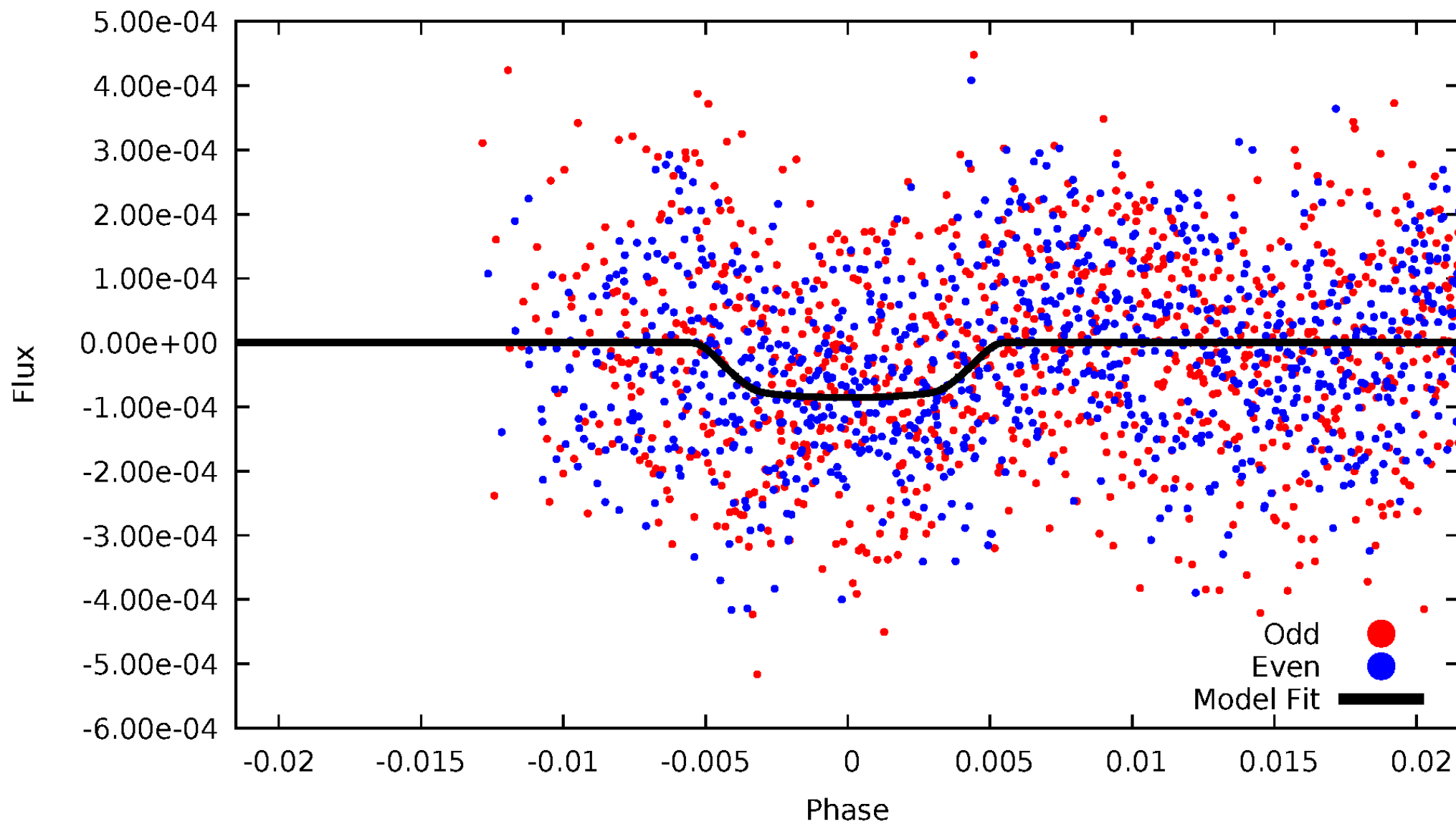
# TCE 010135362-08





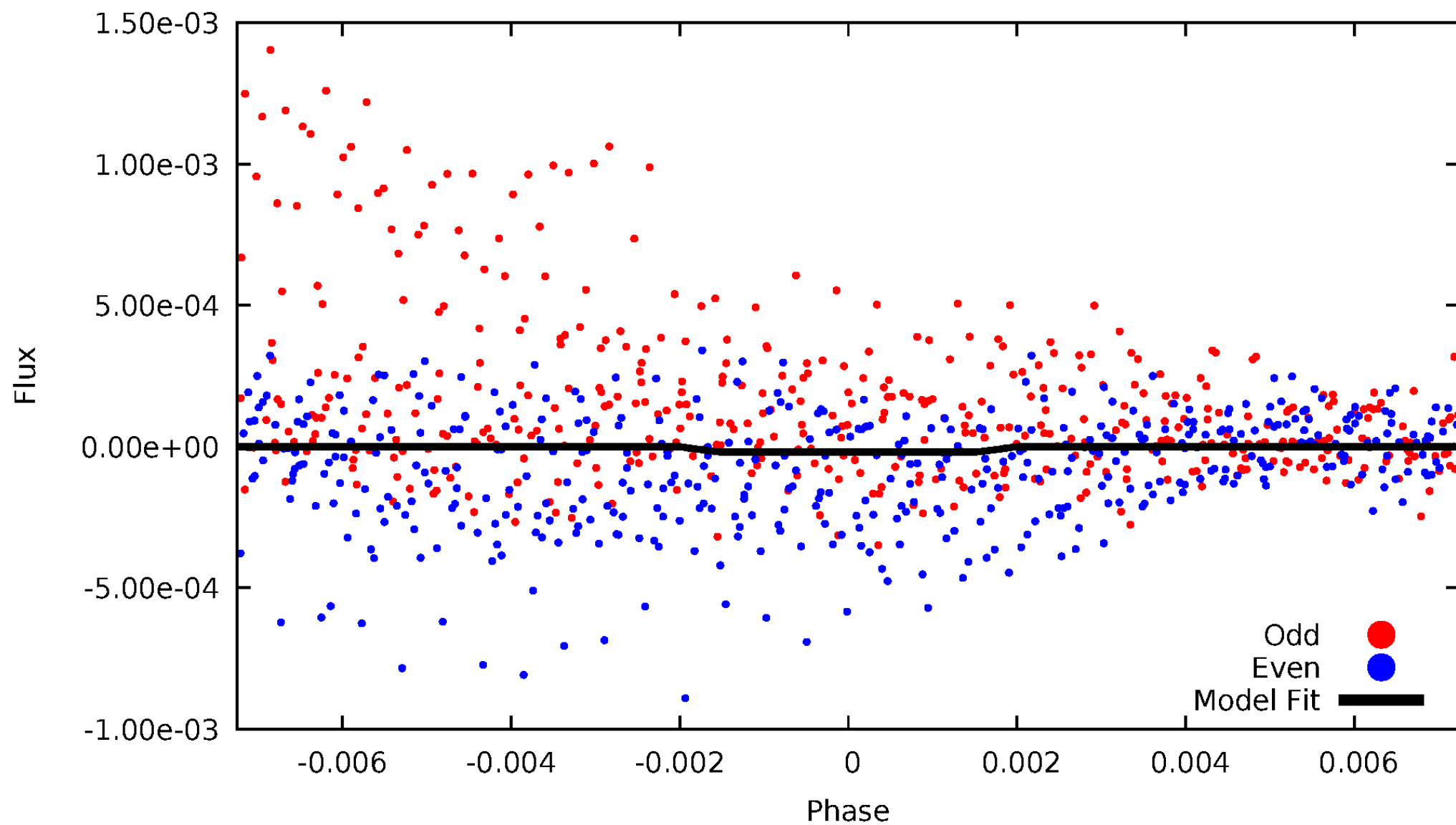
DV Odd/Even

TCE 010135362-08



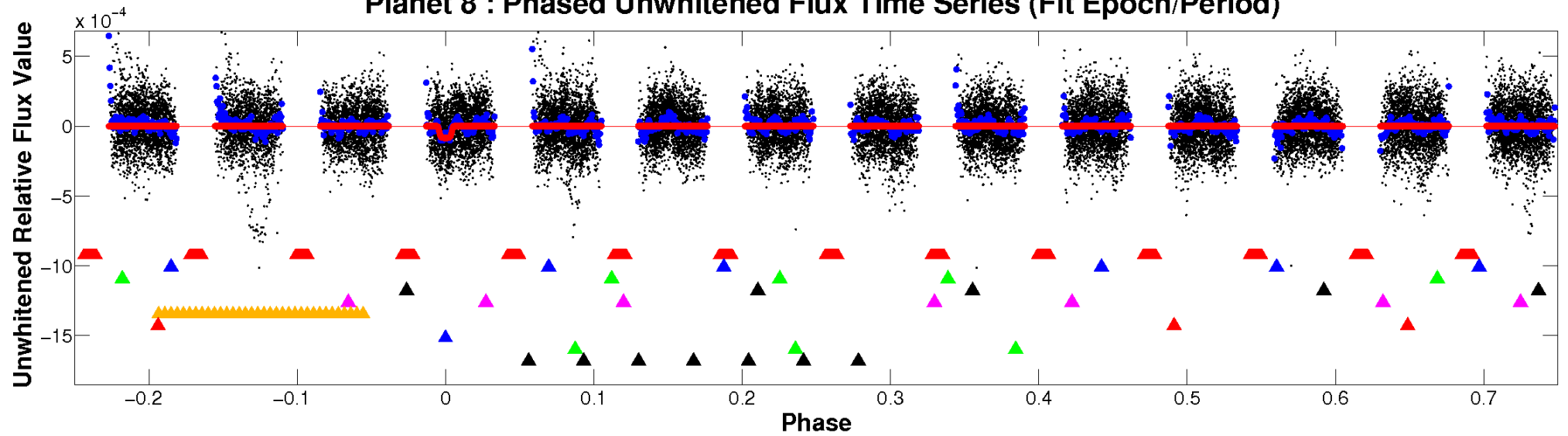
# ALT Odd/Even

TCE 010135362-08

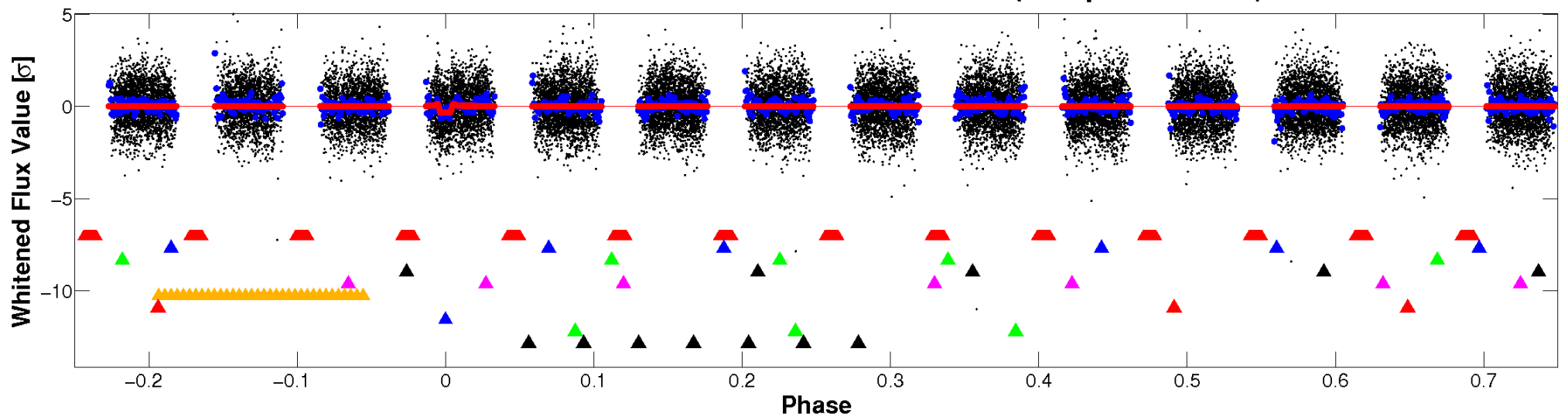


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



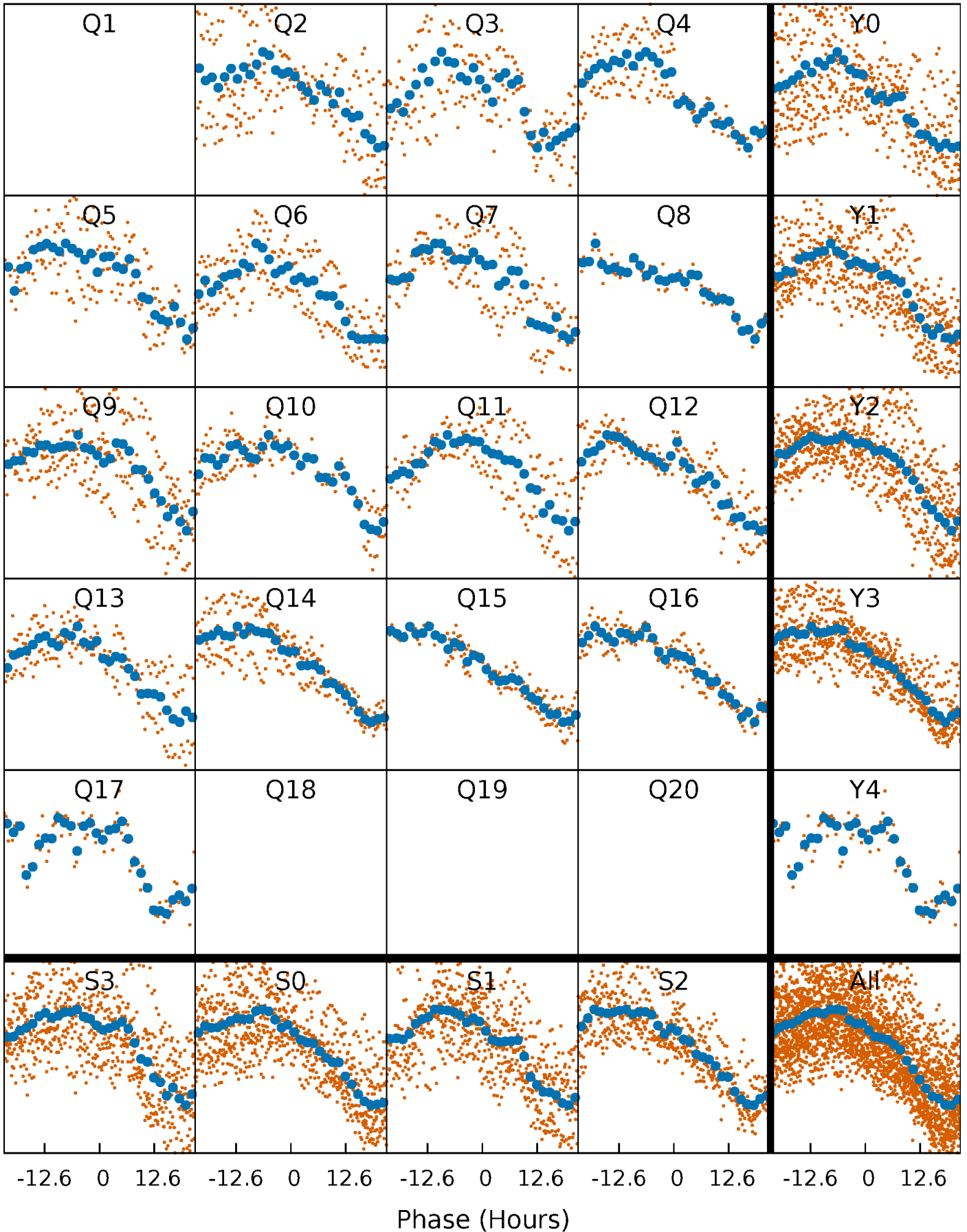
## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)





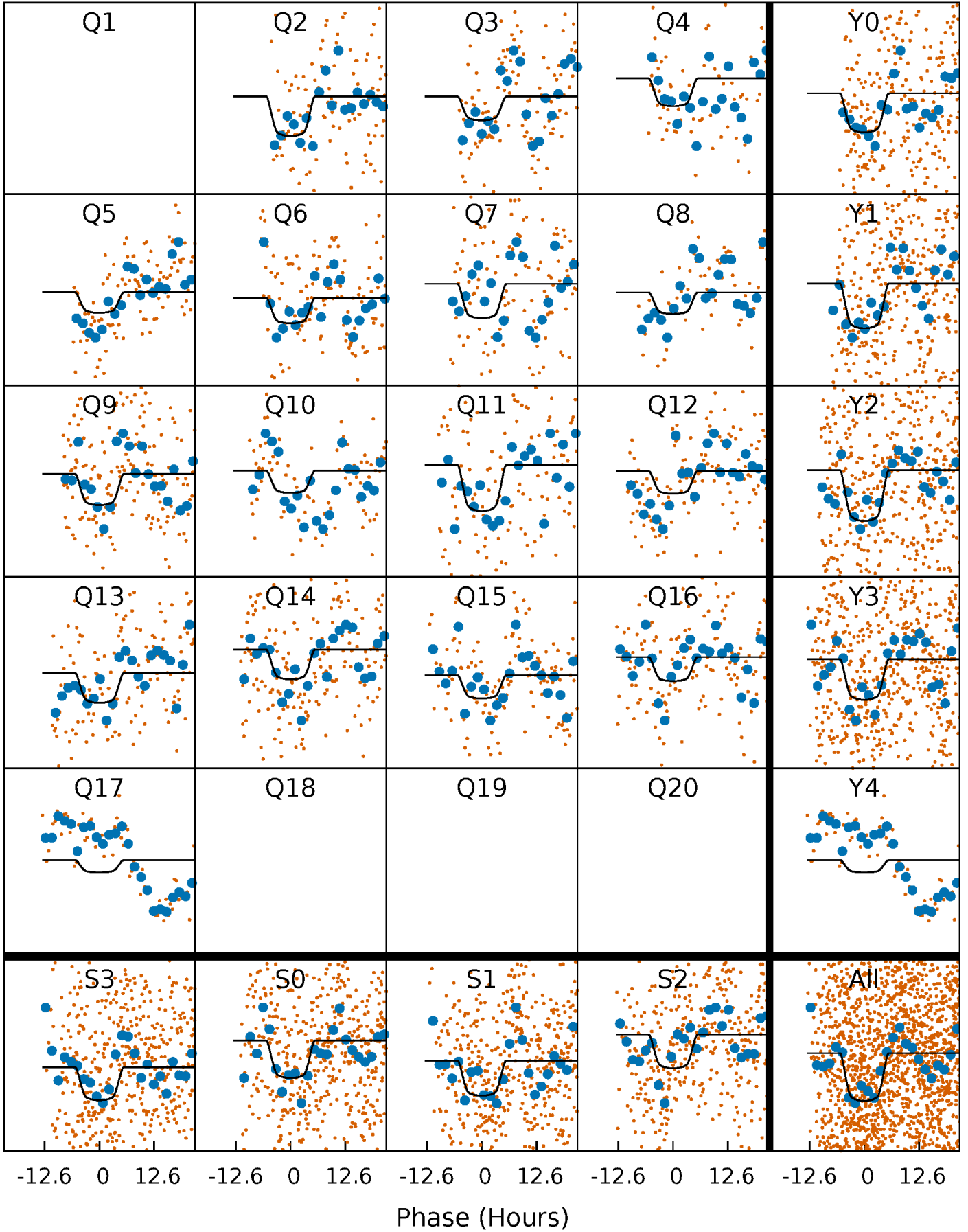
# PDC Quarter-Phased Transit Curves

TCE 010135362-08     $P = 42.592973$  Days     $T_0 = 170.450186$  (BKJD)



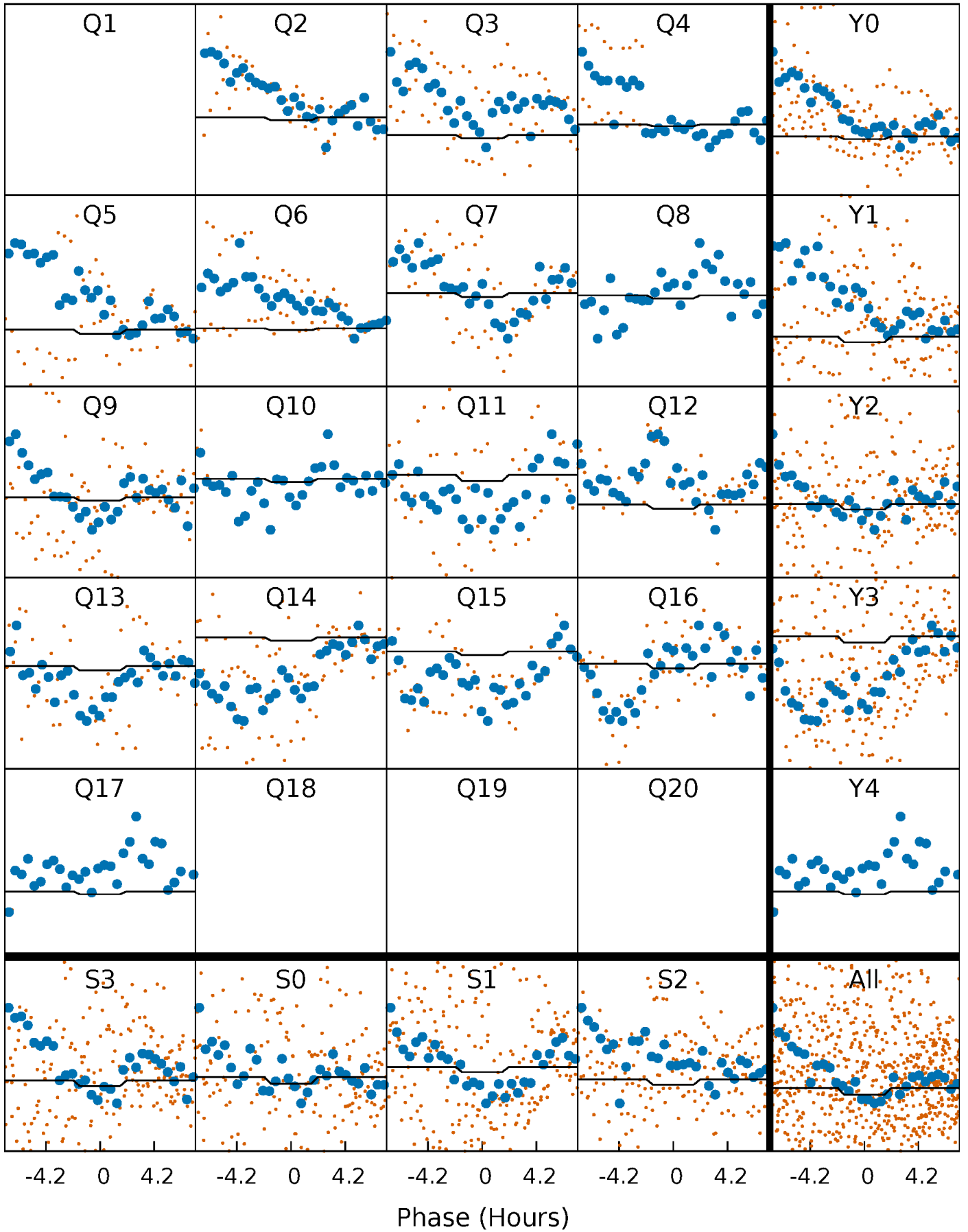
# DV Quarter-Phased Transit Curves

TCE 010135362-08     $P = 42.592973$  Days     $T_0 = 170.450186$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

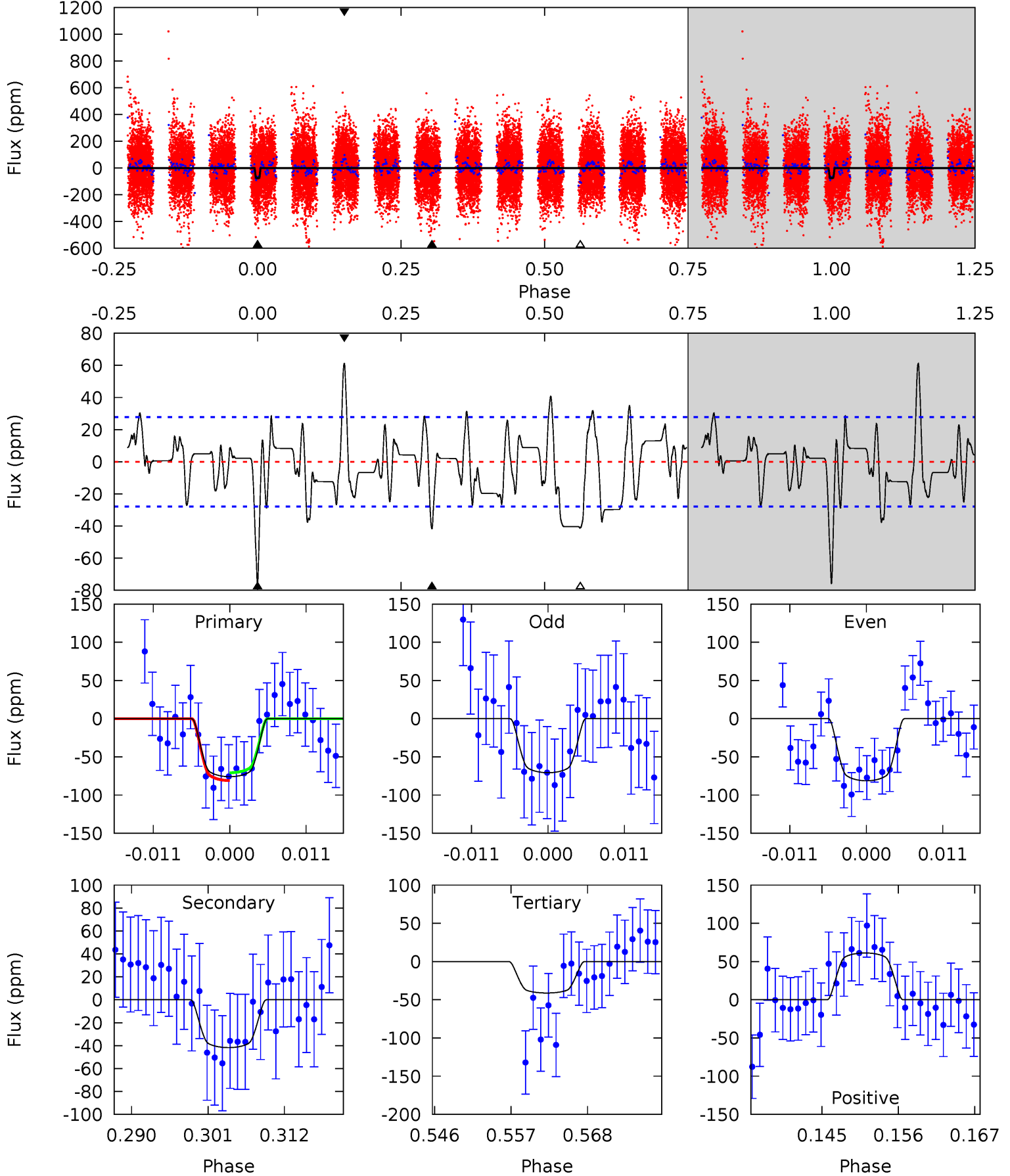
TCE 010135362-08 P= 42.591690 Days  $T_0=170.556957$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-08, P = 42.592973 Days, E = 127.857213 Days

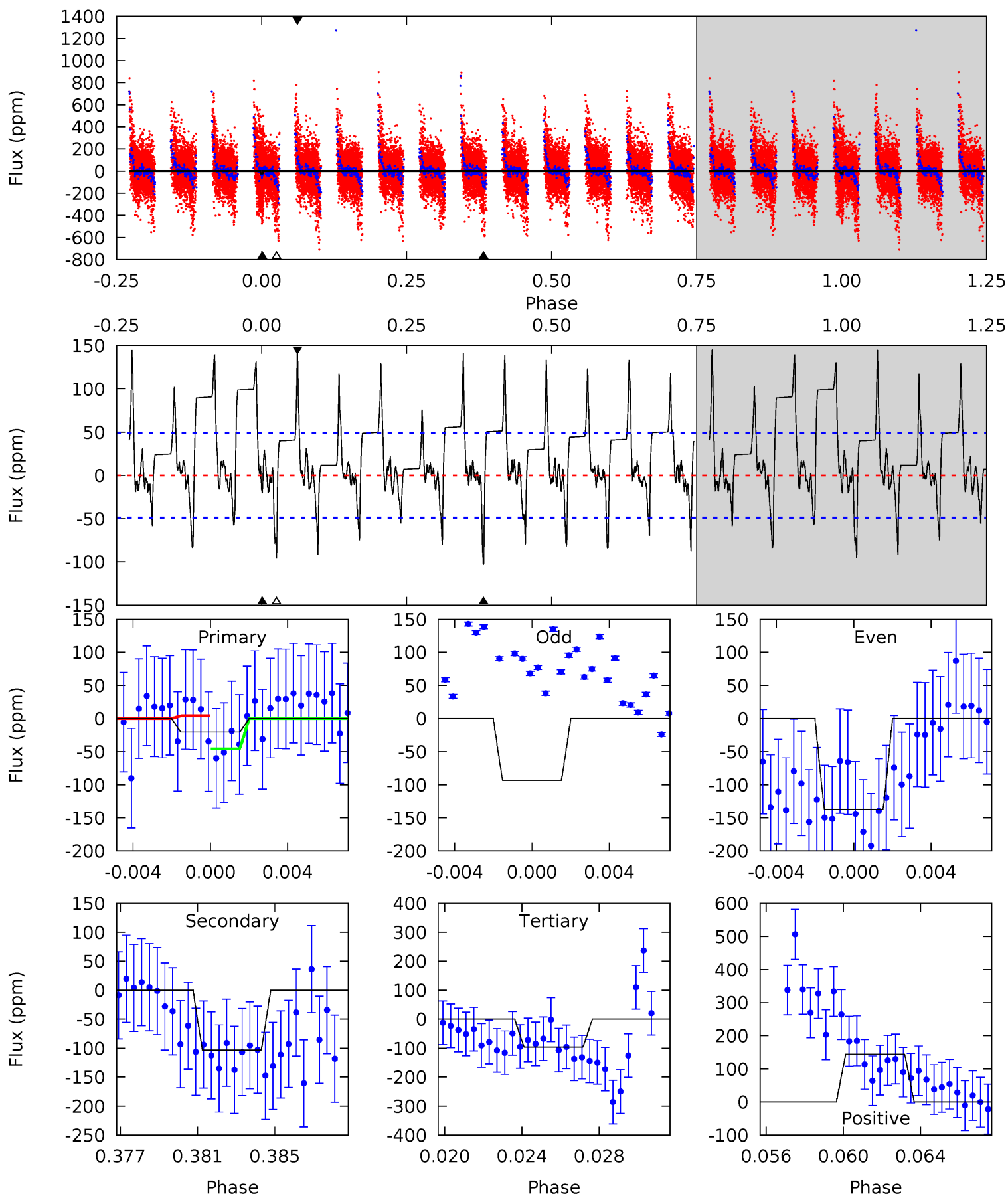
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.7	7.50	7.40	11.0	5.01	2.54	3.30	6.25	2.64	0.10	-3.51	0.95	0.90	0.45	0.93



# Alt Model-Shift Uniqueness Test

010135362-08, P = 42.591690 Days, E = 127.965267 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
2.19	11.0	10.2	15.4	5.20	2.88	4.01	-8.00	-13.2	0.80	-4.44	2.37	0.82	0.58	2.26



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-42 \pm 6$	$1.80^{+0.36}_{-0.27}$	$978^{+80}_{-71}$	$5070^{+278}_{-299}$	$453^{+197}_{-137}$
Alt.	$-103 \pm 9$	$0.70^{+0.20}_{-0.18}$	$974^{+78}_{-71}$	$11368^{+2906}_{-1814}$	$7655^{+5844}_{-3091}$

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

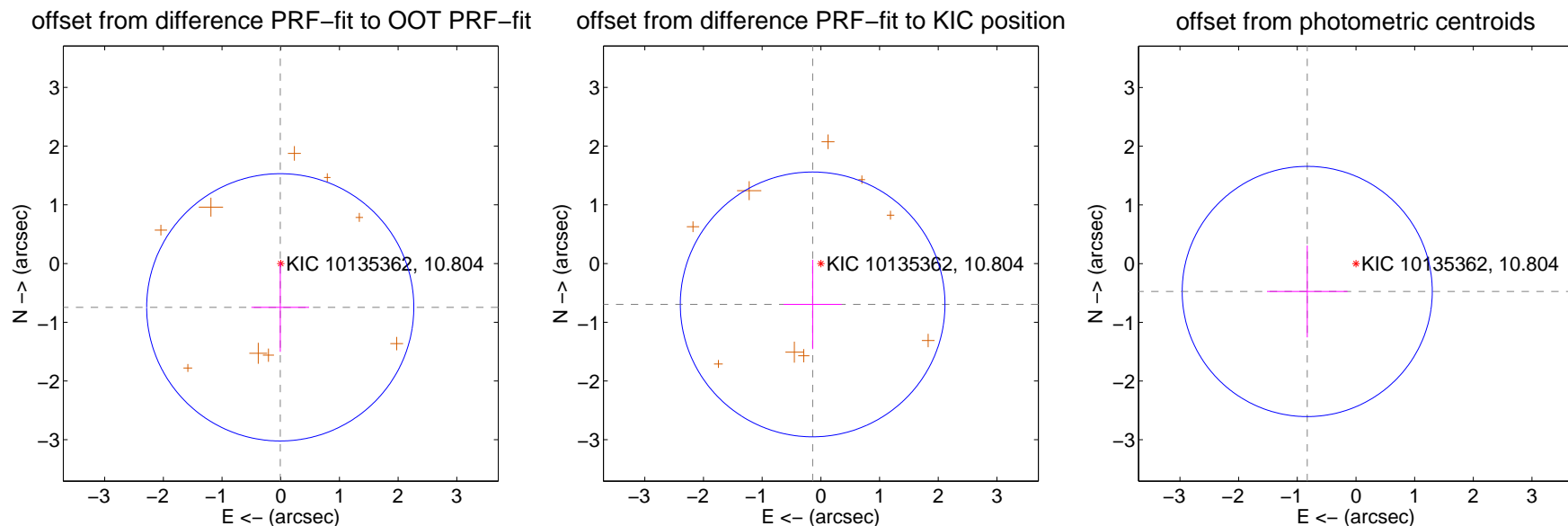
## DV Centroid Data

Supplemental centroid analysis for 010135362-08. **Kepler magnitude: 10.80.** Transit SNR 7.42

**There are 0 quarters with good PRF difference image offsets**

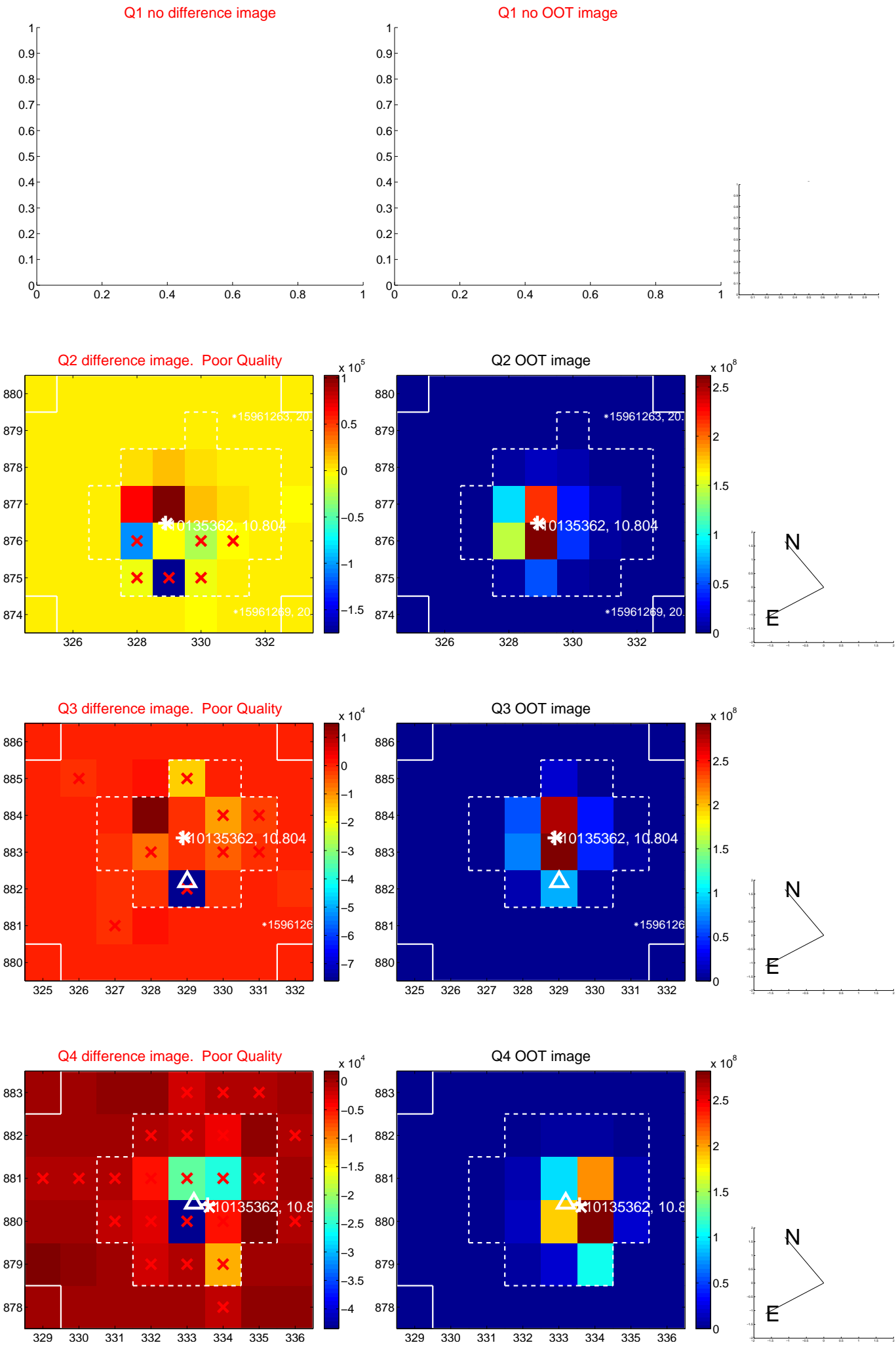
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.746 \pm 0.759$	0.98	$0.008 \pm 0.492$	$-0.746 \pm 0.759$
PRF-fit source offset from KIC position	$0.710 \pm 0.752$	0.94	$0.140 \pm 0.496$	$-0.696 \pm 0.760$
photometric centroid source offset	$0.96 \pm 0.71$	1.35	$0.83 \pm 0.69$	$-0.47 \pm 0.78$



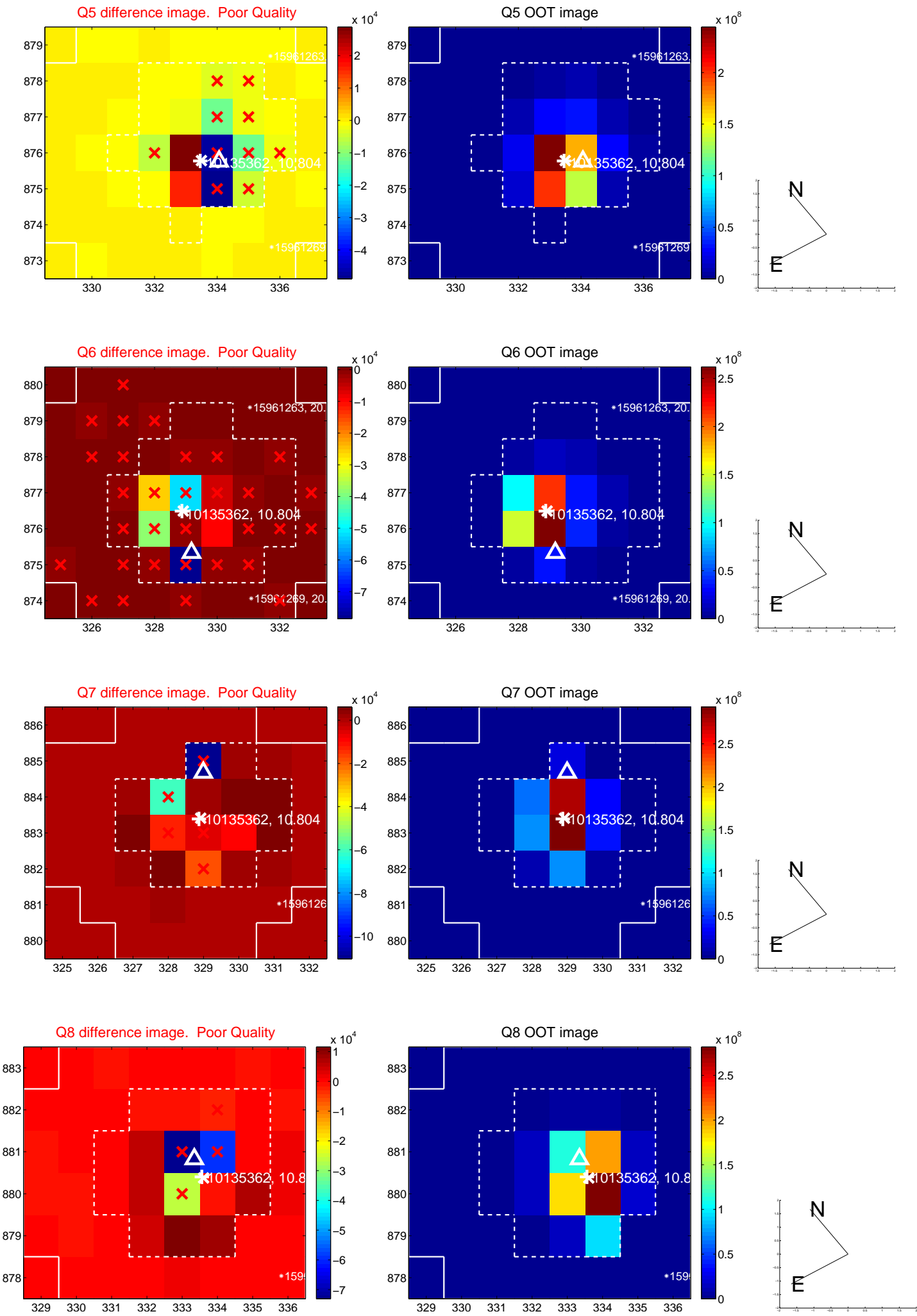
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

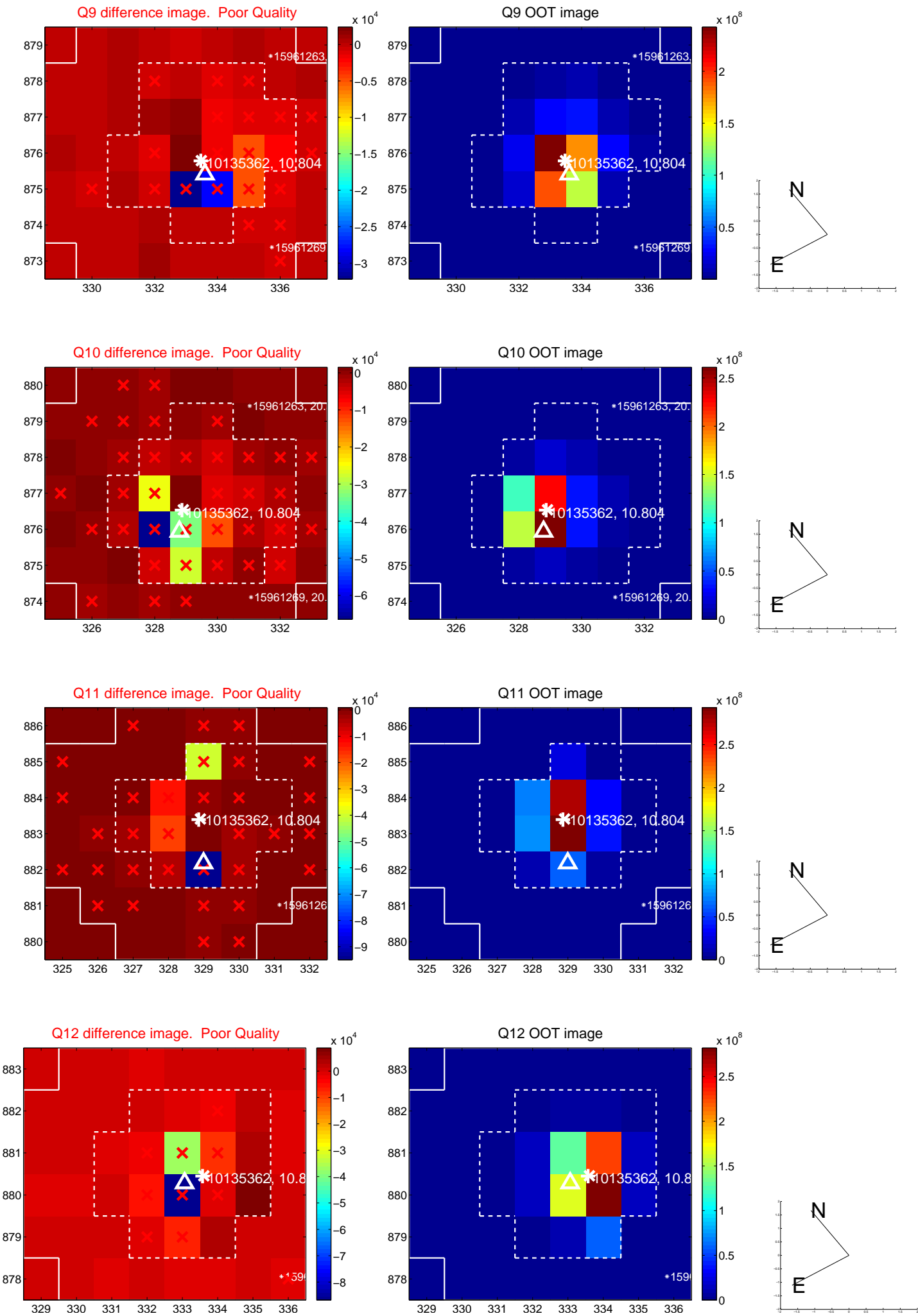




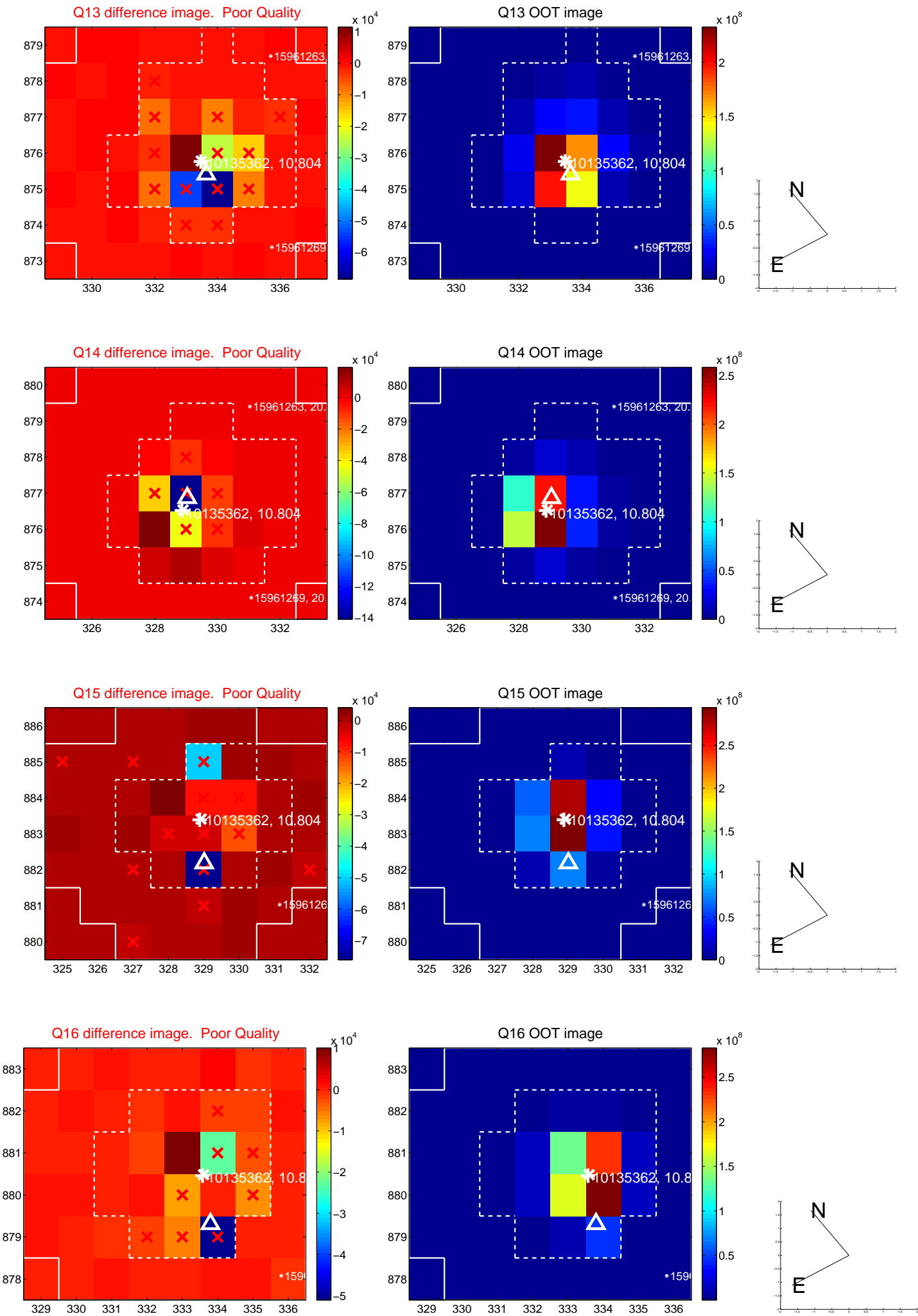
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



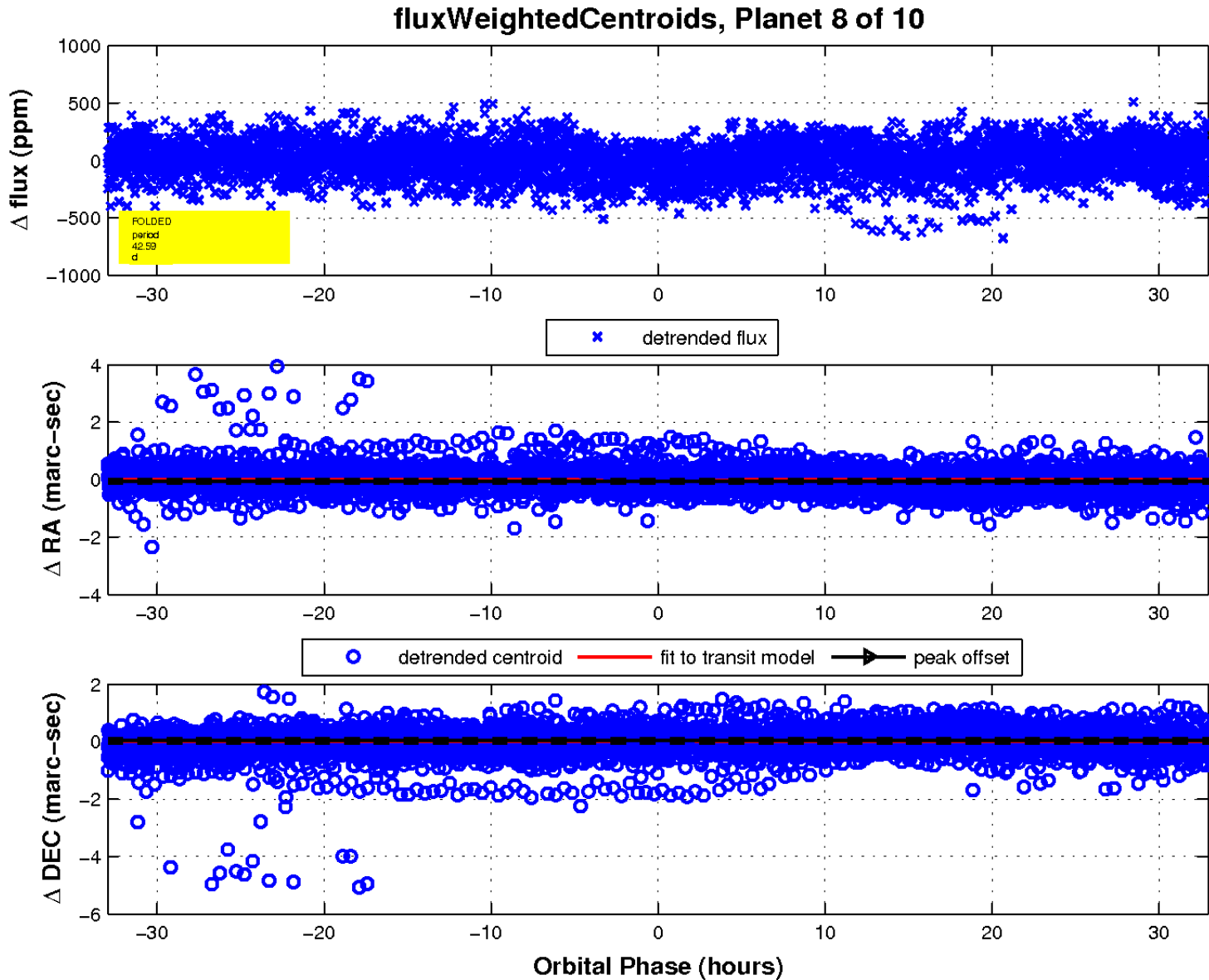
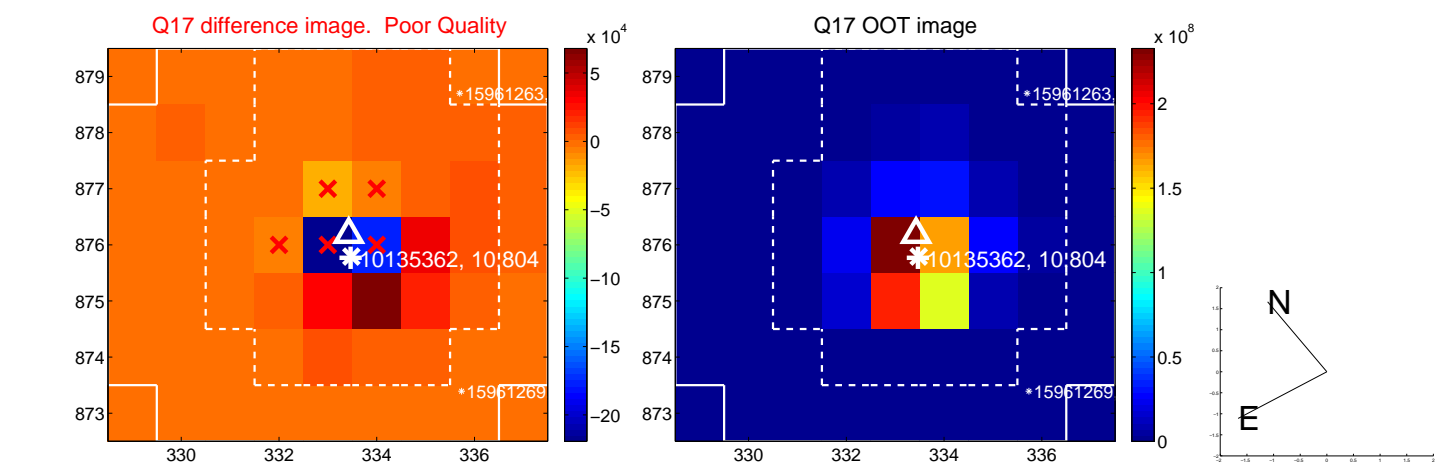
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

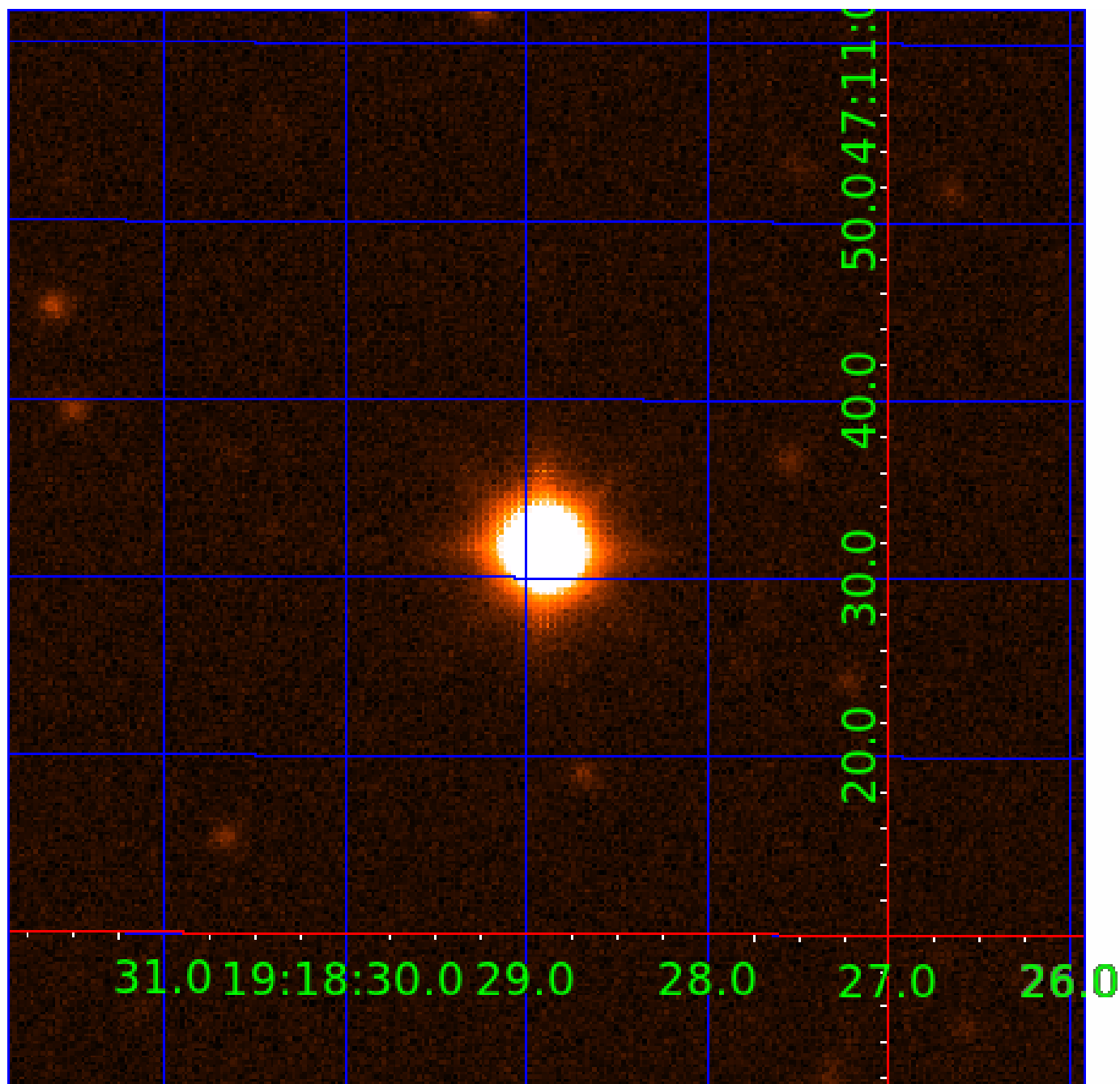


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010135362

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010135362-01	OBS	No	3.041547	133.055158	13.7	11.314	8.1	4.3	1.48	6573	0.56	1878.80
010135362-02	OBS	No	228.839082	242.726412	342.0	5.076	8.5	8.8	1.48	6573	2.83	5.92
010135362-03	OBS	No	279.268935	217.815265	238.5	12.394	8.4	7.1	1.48	6573	2.53	4.54
010135362-04	OBS	No	324.490928	244.432476	247.0	6.044	7.8	7.7	1.48	6573	2.85	3.71
010135362-05	OBS	No	200.084209	252.846085	185.6	7.658	7.5	6.1	1.48	6573	2.31	7.08
010135362-06	OBS	No	42.415035	168.084712	165.4	9.634	7.7	7.7	1.48	6573	3.76	55.97
010135362-07	OBS	No	674.779196	204.790468	301.6	5.422	7.7	7.0	1.48	6573	3.33	1.40
010135362-08	OBS	No	42.592973	170.450185	85.5	10.990	7.5	7.4	1.48	6573	1.79	55.66
010135362-09	OBS	No	474.848028	174.174808	253.0	36.585	8.2	7.1	1.48	6573	2.56	2.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010135362-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—CENT_SATURATED
010135362-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_SATURATED
010135362-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
010135362-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-08	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
010135362-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

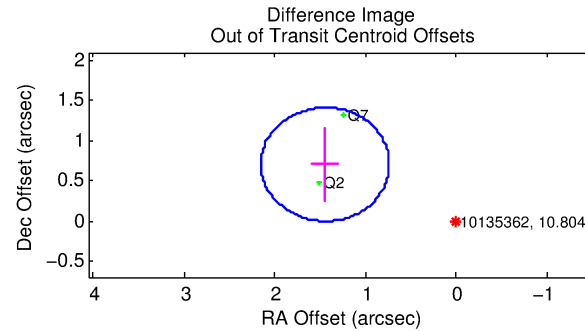
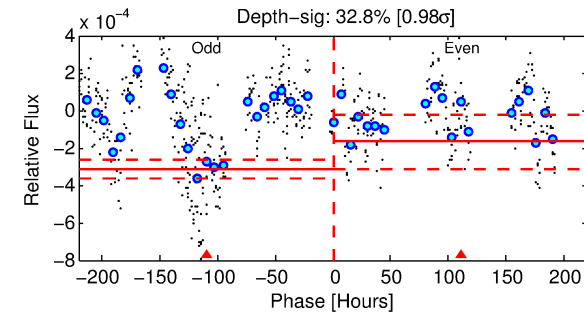
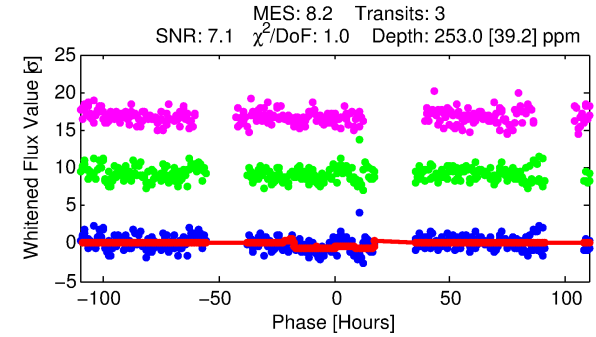
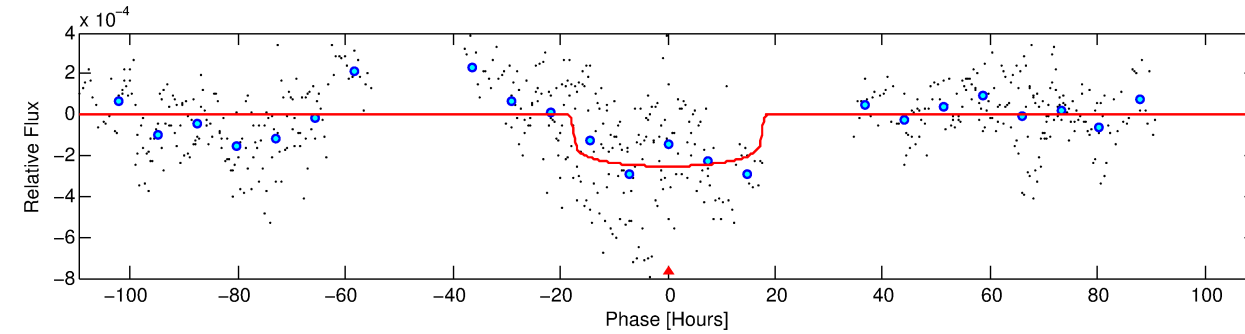
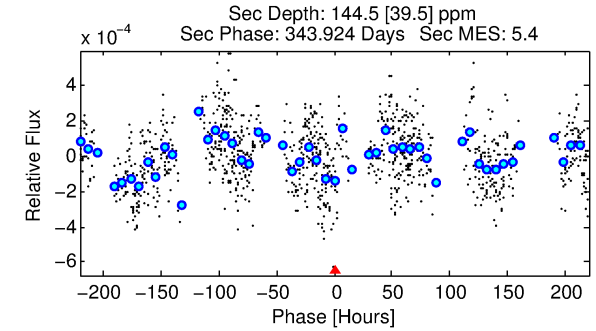
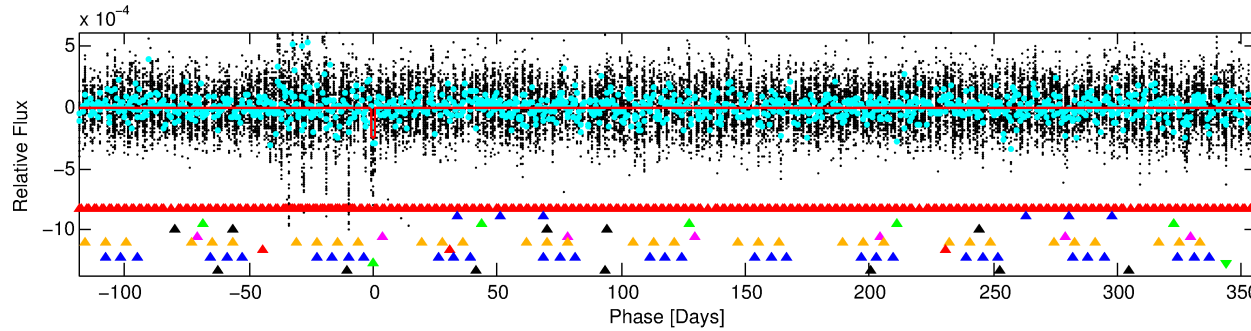
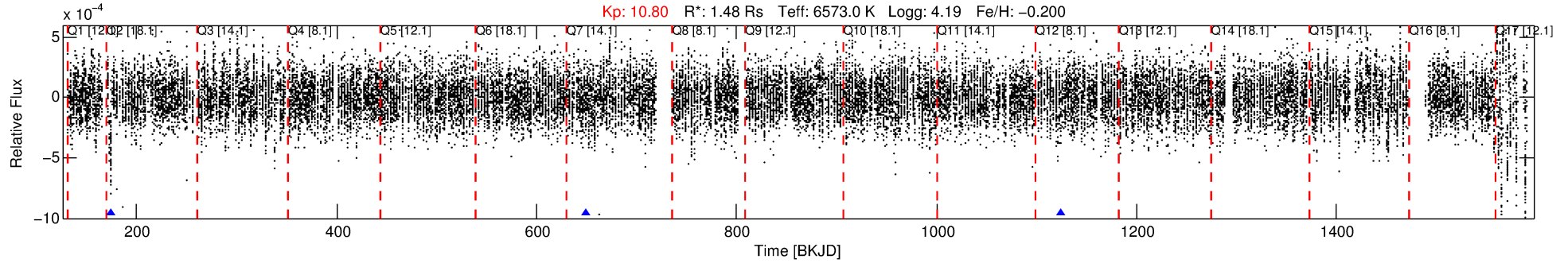
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010135362-09

No Significant Match Found

# DV One-Page Summary

KIC: 10135362 Candidate: 9 of 10 Period: 474.848 d



## DV Fit Results:

Period = 474.84803 [0.02218] d  
Epoch = 174.1748 [0.0213] BKJD  
 $R_p/R^* = 0.0159$  [0.0019]  
 $a/R^* = 66.91$  [31.27]  
 $b = 0.76$  [0.26]  
 $S_{\text{eff}} = 2.23$  [0.88]  
 $T_{\text{eq}} = 312$  [31] K  
 $R_p = 2.56$  [0.85]  $R_e$   
 $a = 1.2768$  [0.3263] AU  
 $A_g = 19856.01$  [10170.14] [1.95σ]  
 $T_{\text{eff}} = 5722$  [562] K [9.61σ]

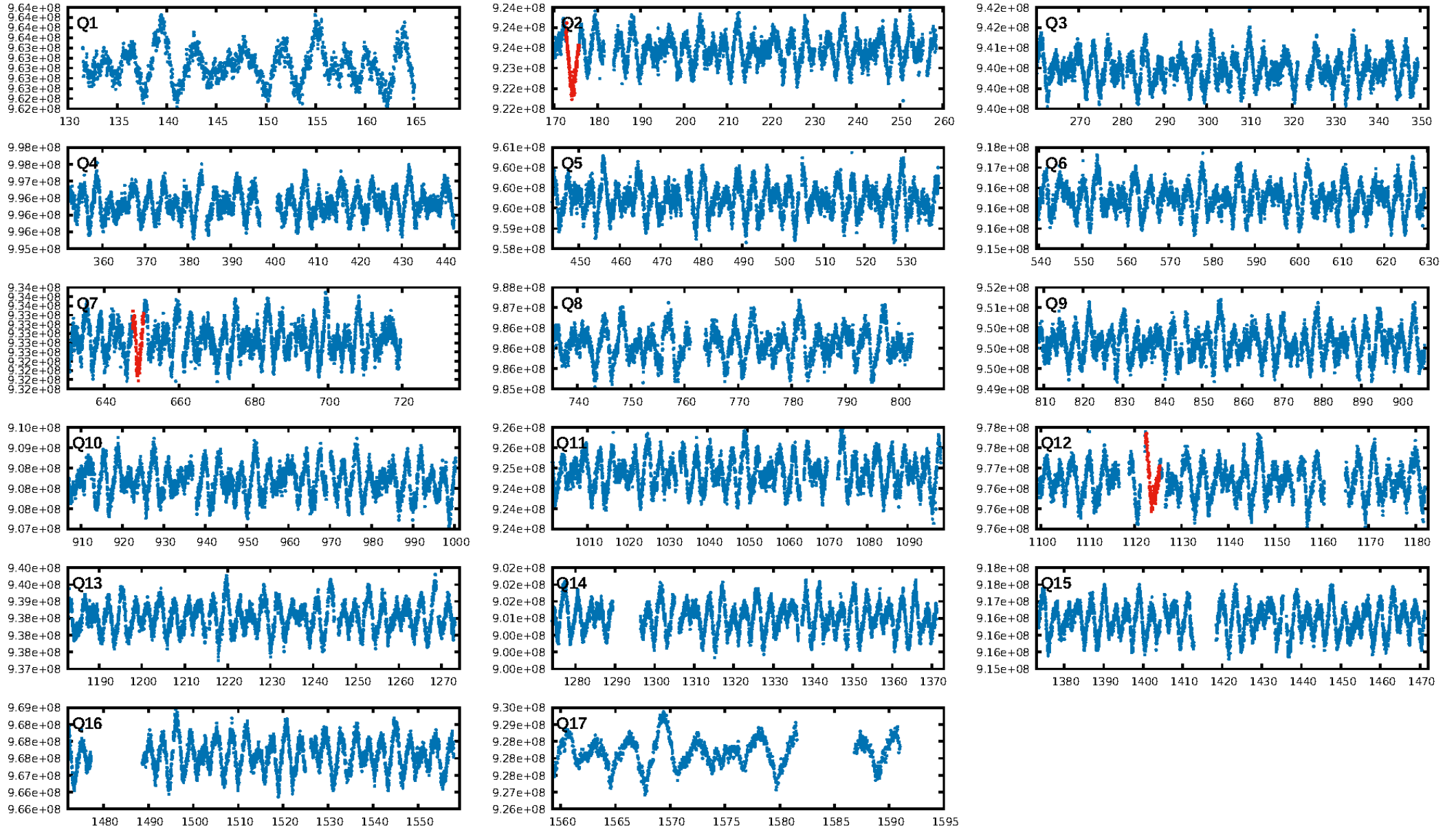
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.32σ]  
LongPeriod-sig: 100.0% [129.74σ]  
ModelChiSquare2-sig: 1.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 6.237  
Centroid-sig: 70.7%  
Centroid-so: 0.422 arcsec [0.39σ]  
OotOffset-rm: 1.605 arcsec [6.81σ]  
KicOffset-rm: 1.796 arcsec [9.23σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:46:57 Z

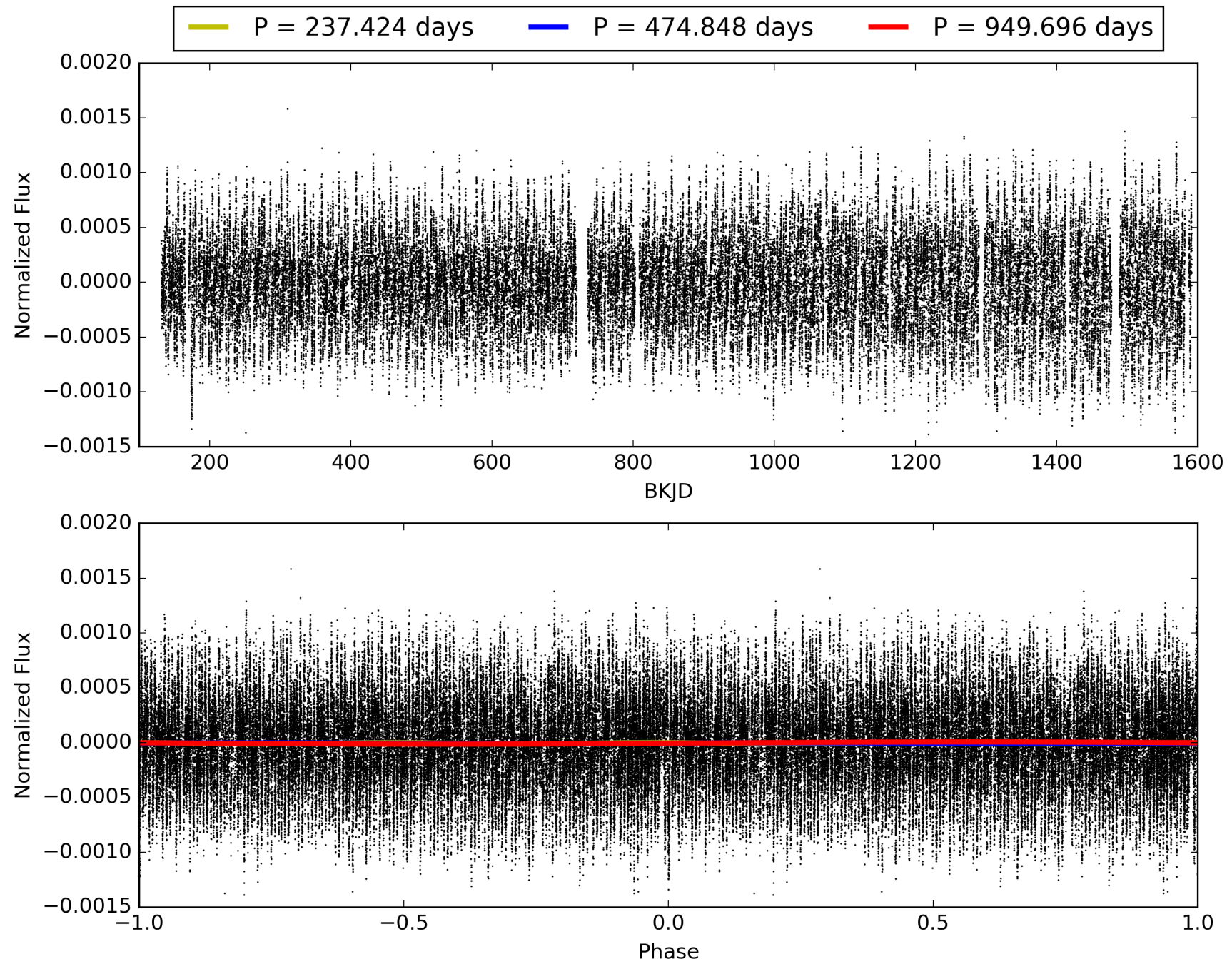
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010135362-09, PDC Light Curves



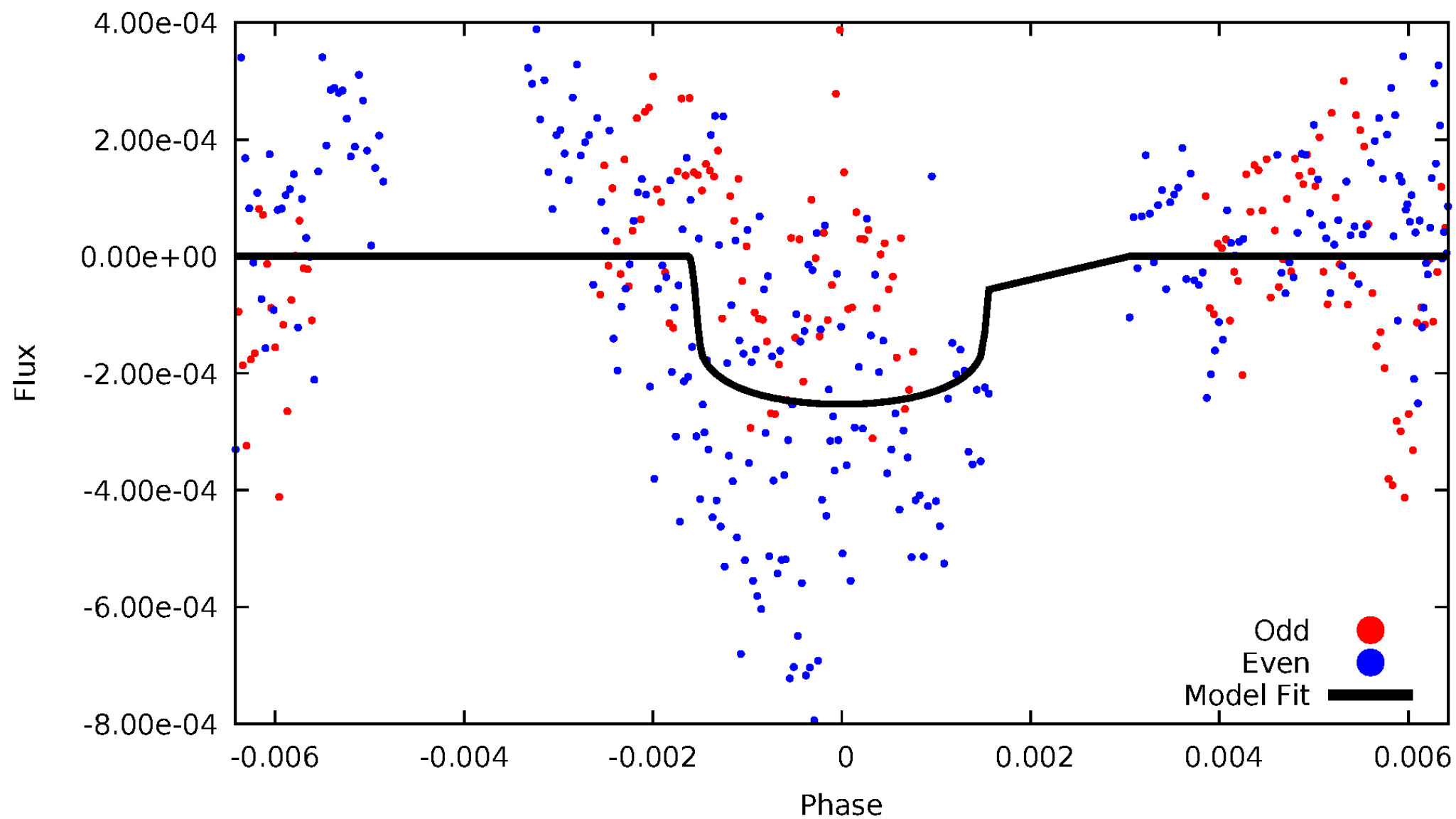


# TCE 010135362-09



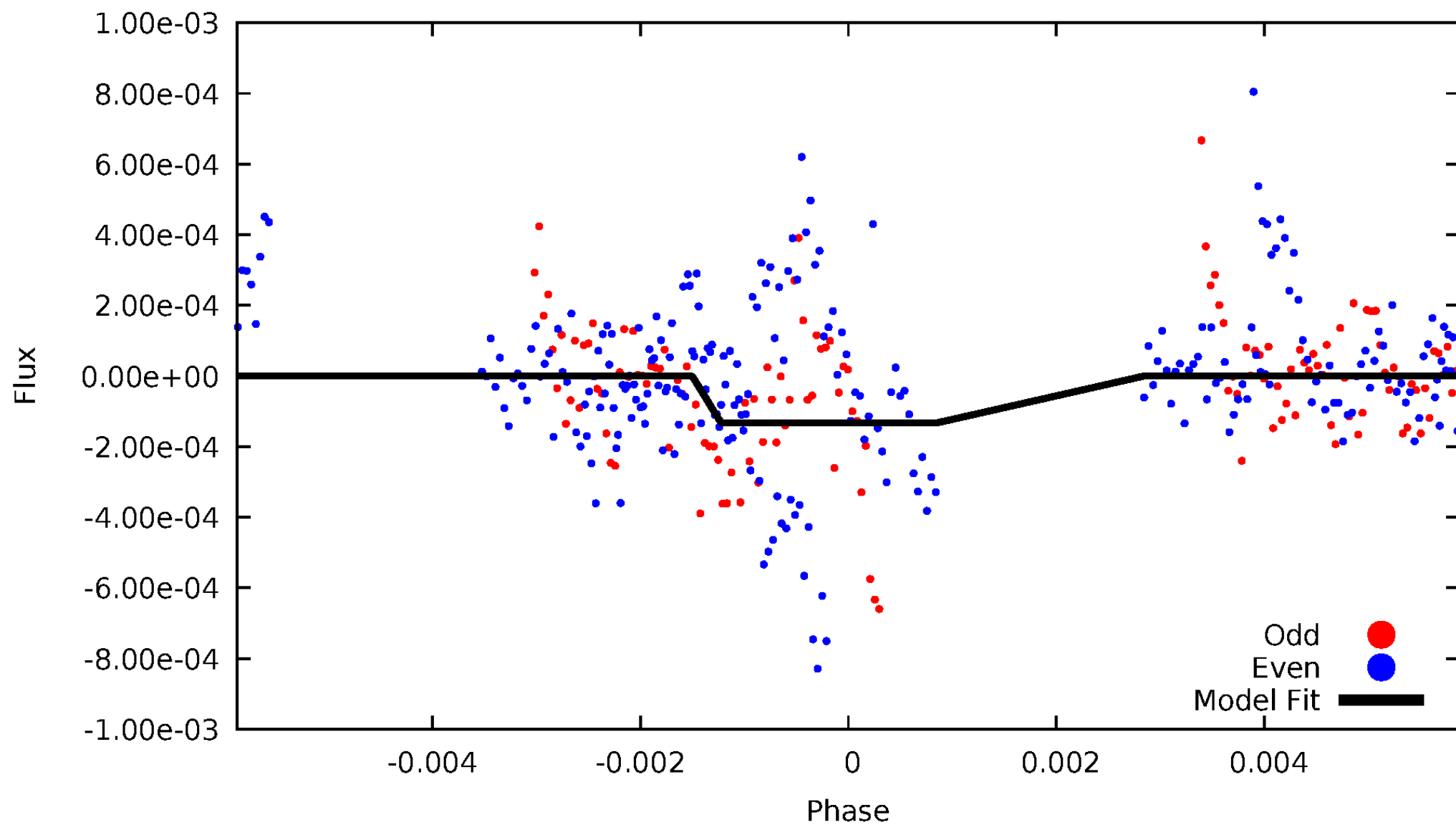
# DV Odd/Even

TCE 010135362-09

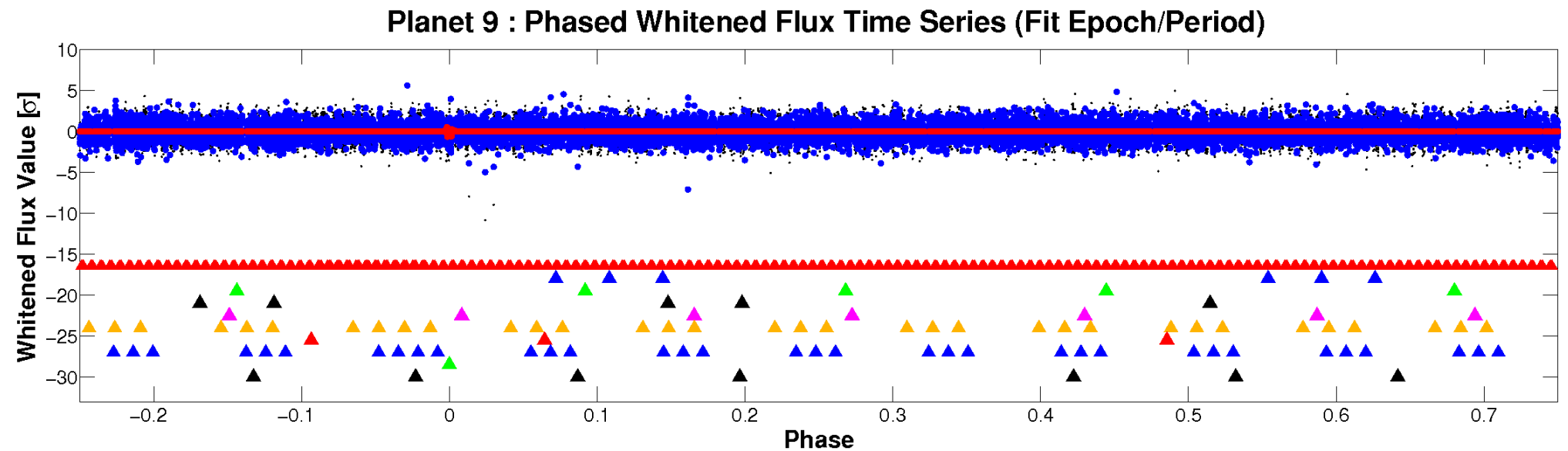
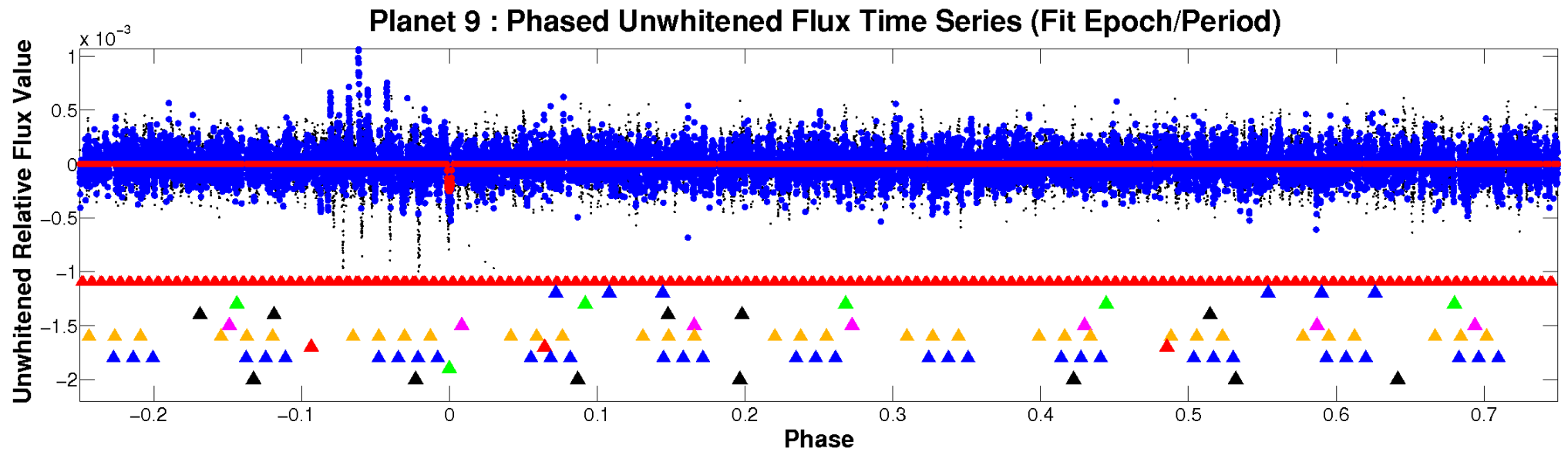


# ALT Odd/Even

TCE 010135362-09

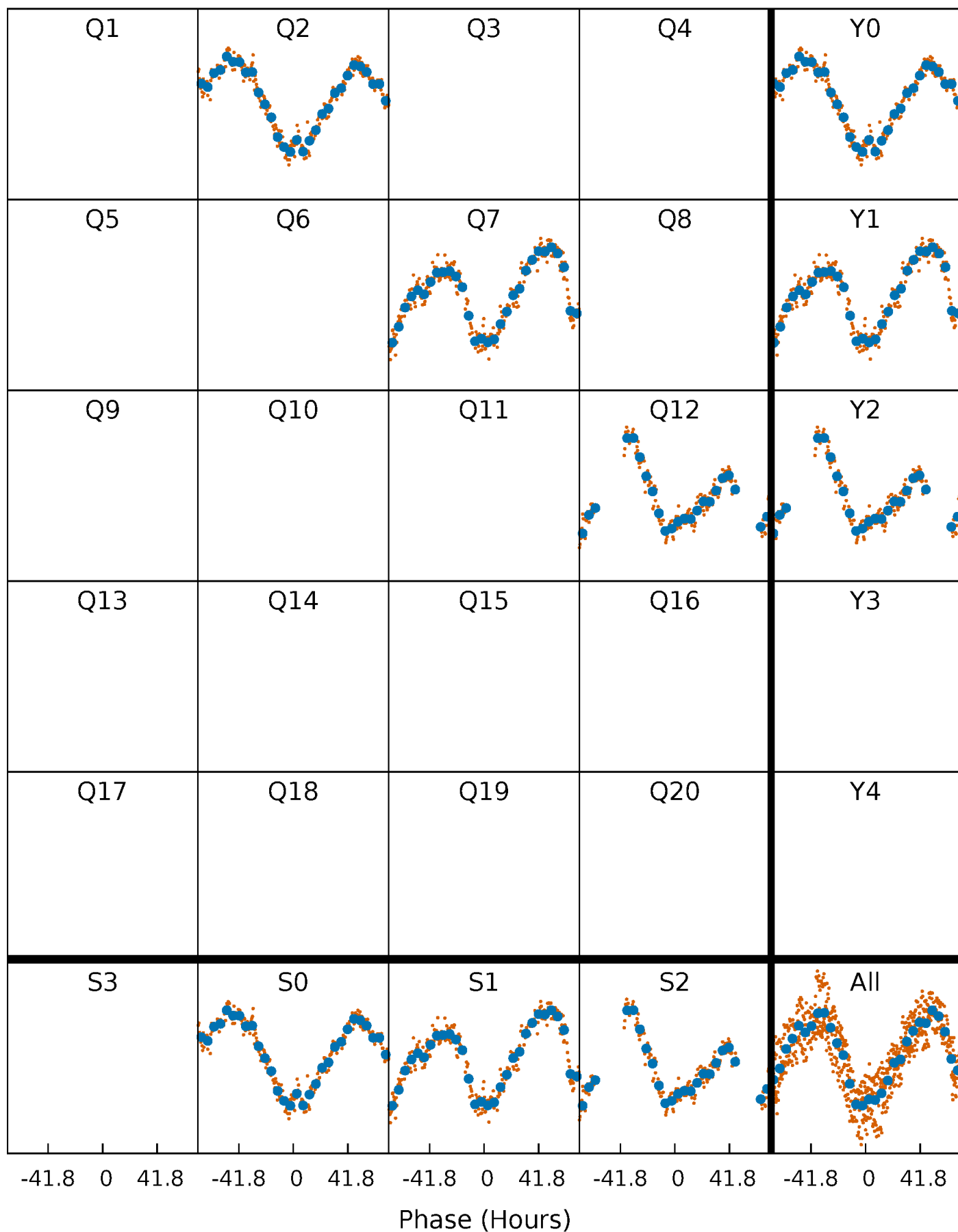


# Non-Whitened Vs. Whitened Light Curve



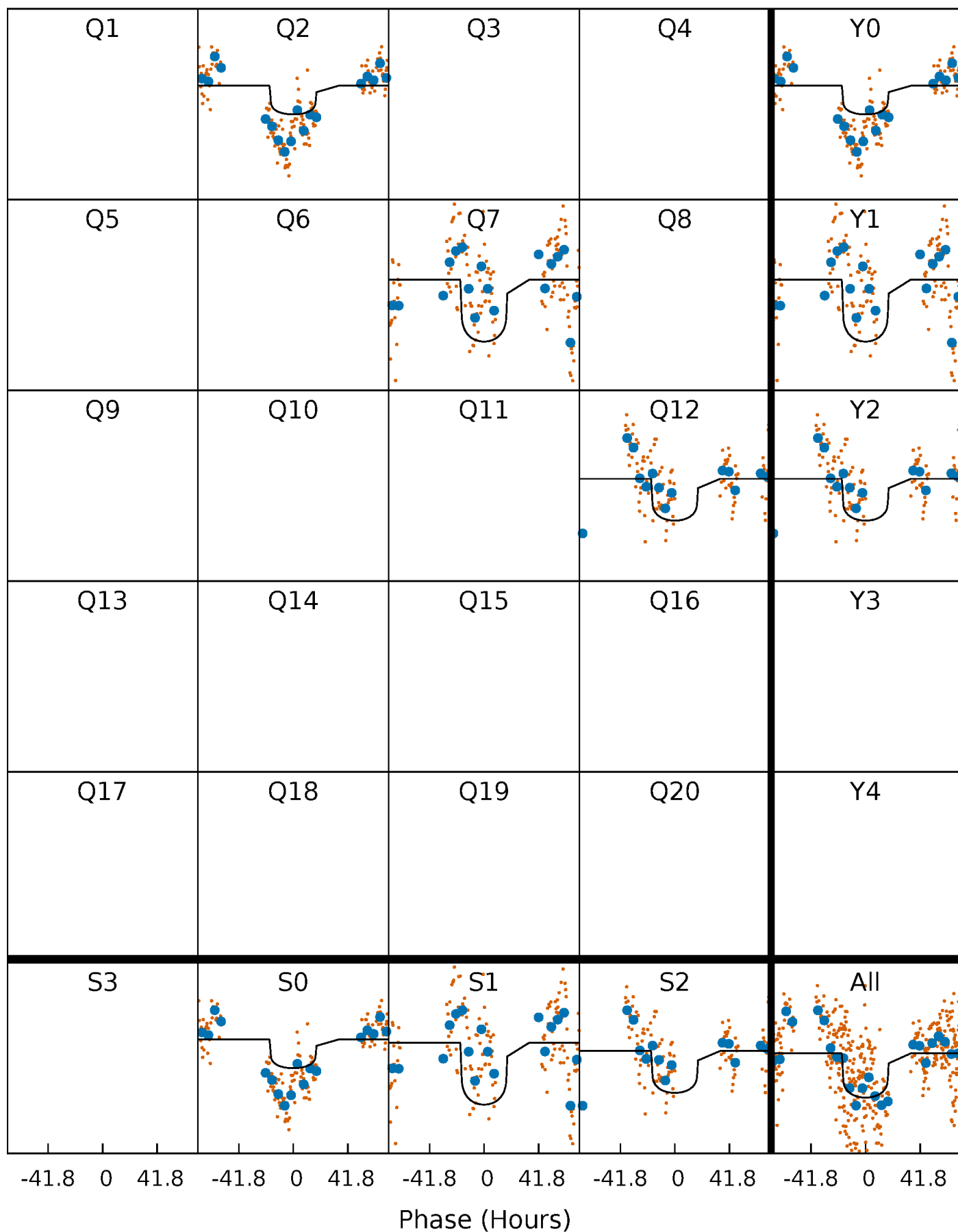
# PDC Quarter-Phased Transit Curves

TCE 010135362-09     $P=474.848028$  Days     $T_0=174.174808$  (BKJD)



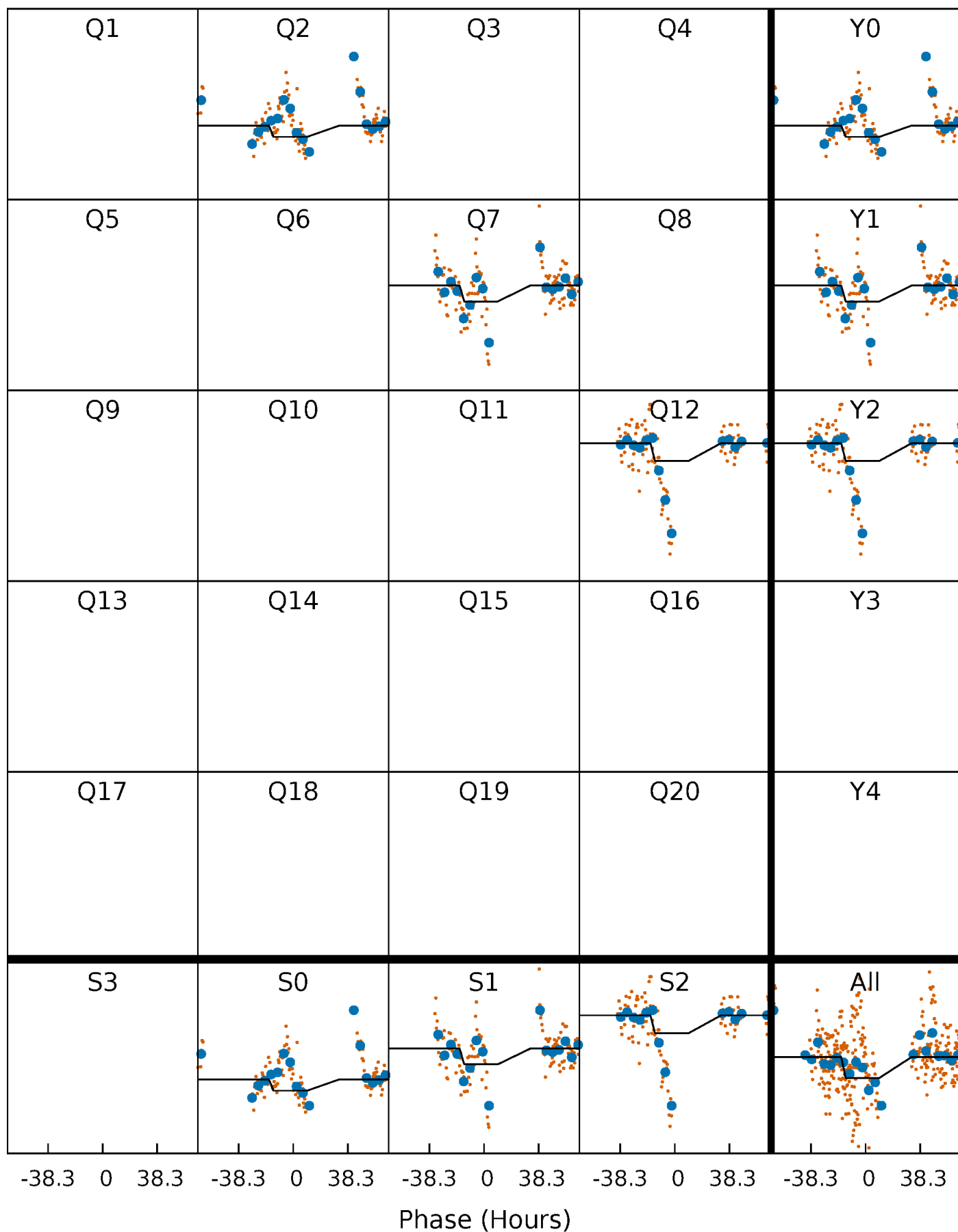
# DV Quarter-Phased Transit Curves

TCE 010135362-09     $P=474.848028$  Days     $T_0=174.174808$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

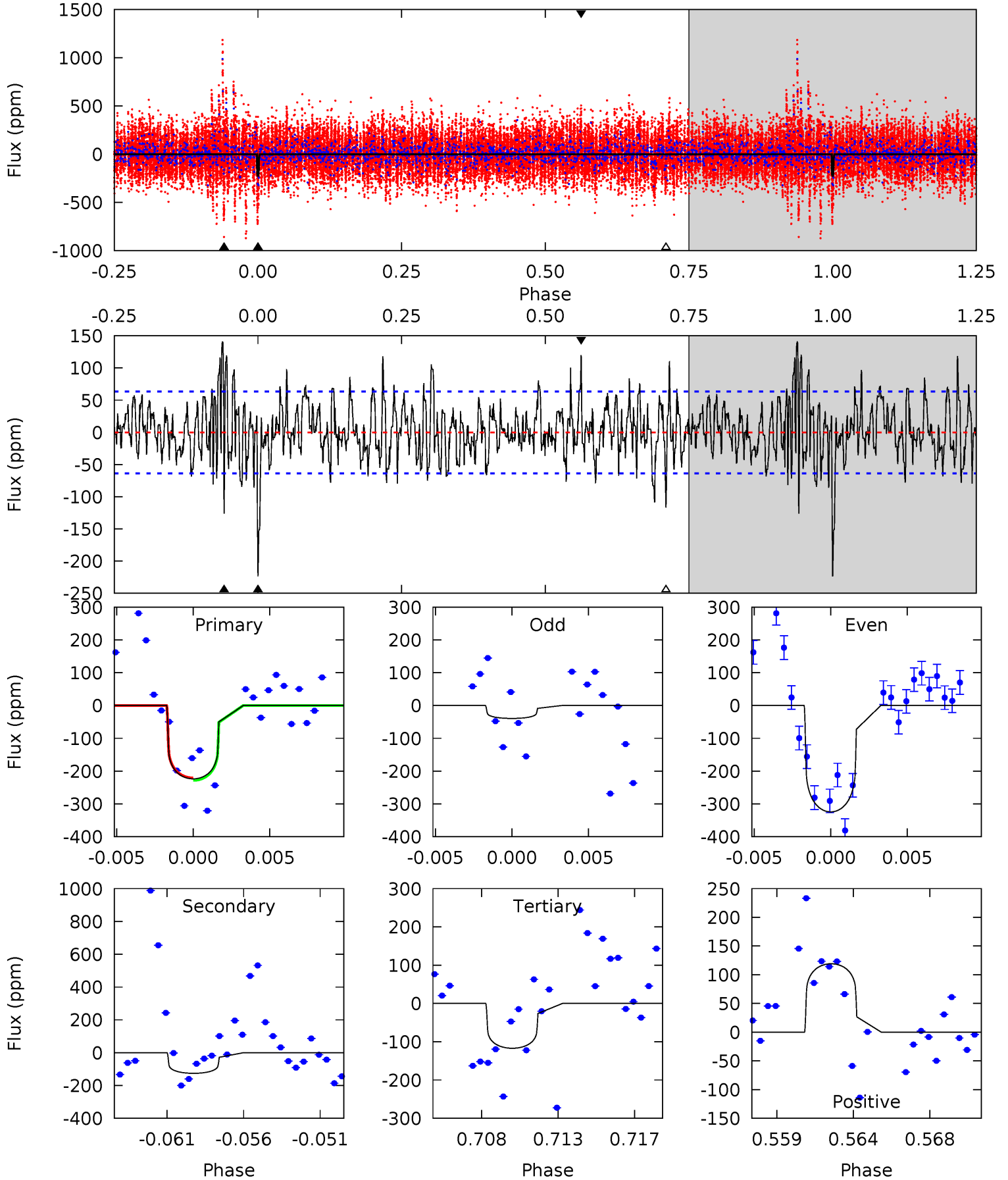
TCE 010135362-09     $P=474.726088$  Days     $T_0=174.514772$  (BKJD)



# DV Model-Shift Uniqueness Test

010135362-09, P = 474.848028 Days, E = 174.174808 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
18.2	10.2	9.52	9.68	5.17	2.83	2.96	8.66	8.49	0.72	0.55	10.4	1.98	0.39	0.27

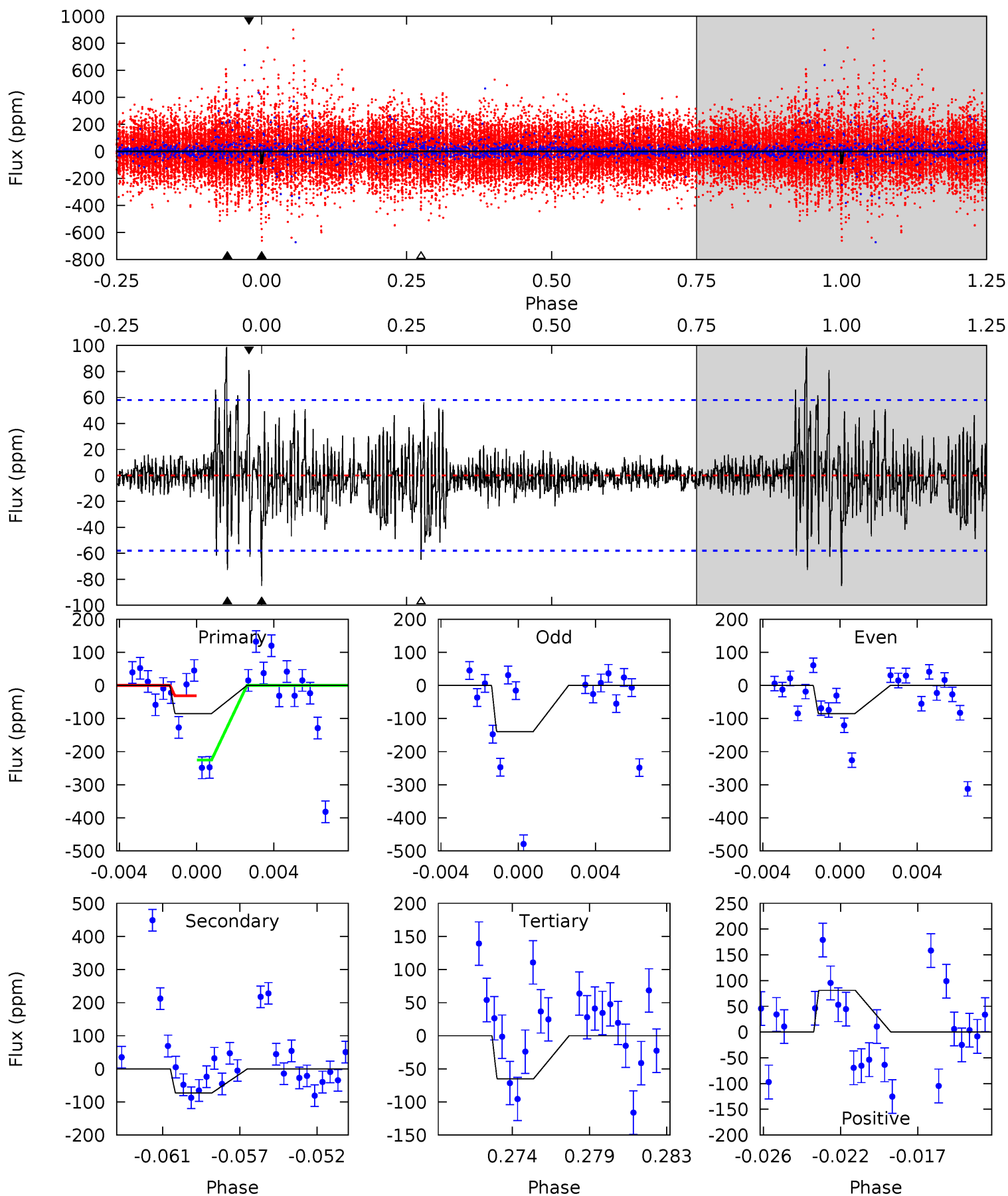




# Alt Model-Shift Uniqueness Test

010135362-09, P = 474.726088 Days, E = 174.514772 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
7.60	6.50	5.81	7.23	5.18	2.85	1.30	1.79	0.37	0.69	-0.73	2.30	1.07	0.54	7.00



### Stellar Parameters For KIC 010135362

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-250}$	$4.190^{+0.175}_{-0.193}$	$-0.200^{+0.250}_{-0.300}$	$1.476^{+0.461}_{-0.346}$	$1.236^{+0.181}_{-0.201}$	$0.541^{+0.498}_{-0.255}$
	+3%/-4%	+4%/-5%	+125%/-150%	+31%/-23%	+15%/-16%	+92%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010135362-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-126 \pm 12$	$2.57^{+0.51}_{-0.46}$	$436^{+34}_{-33}$	$5525^{+396}_{-353}$	$17106^{+7724}_{-5332}$
Alt.	$-73 \pm 11$	$1.87^{+0.43}_{-0.40}$	$437^{+32}_{-31}$	$5616^{+597}_{-460}$	$18507^{+11621}_{-6821}$

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

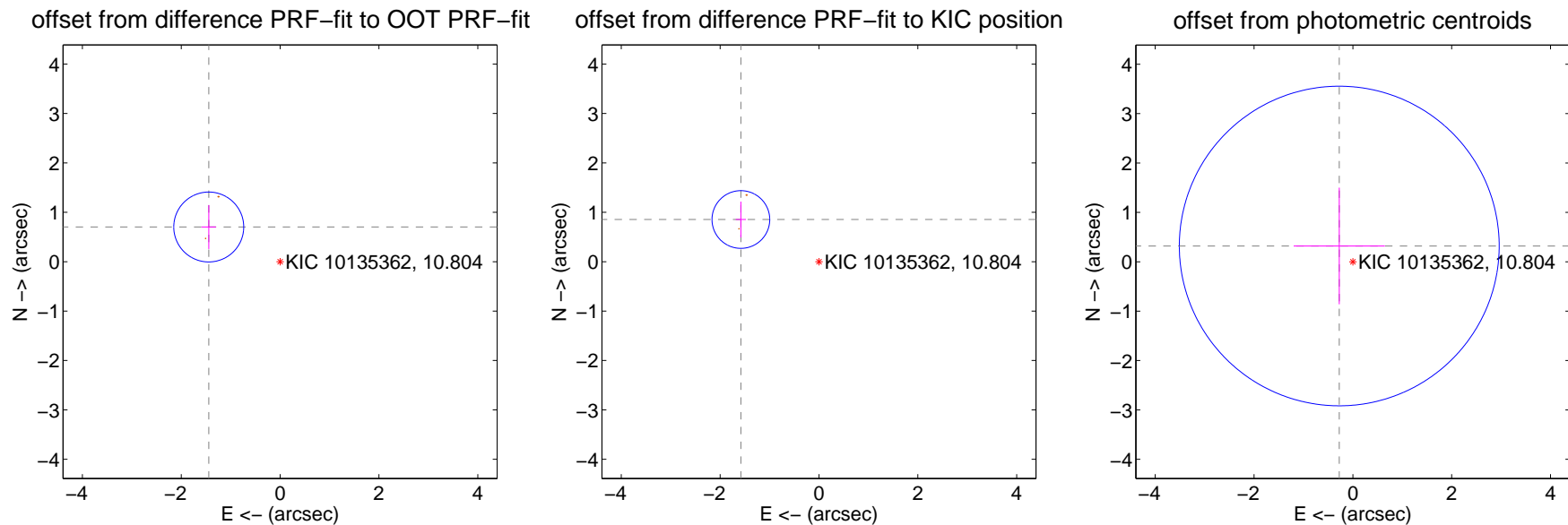
## DV Centroid Data

Supplemental centroid analysis for 010135362-09. **Kepler magnitude: 10.80.** Transit SNR 7.12

**There are 0 quarters with good PRF difference image offsets**

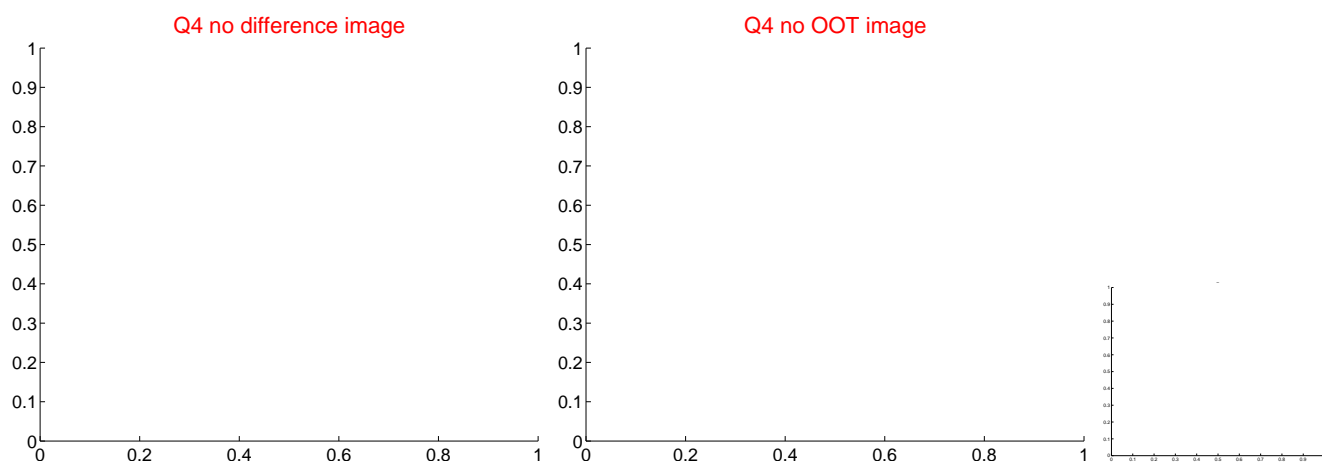
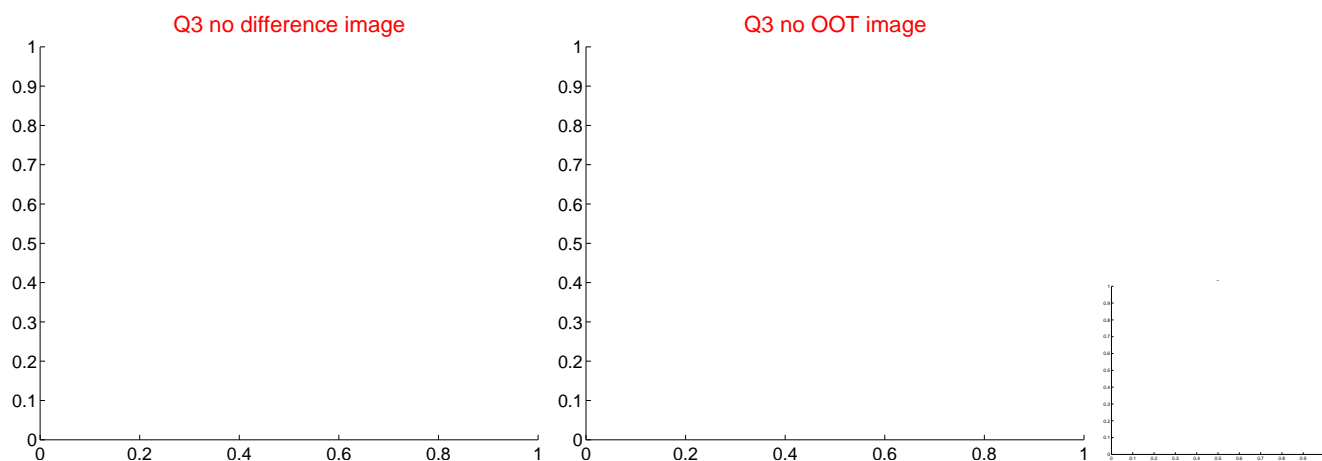
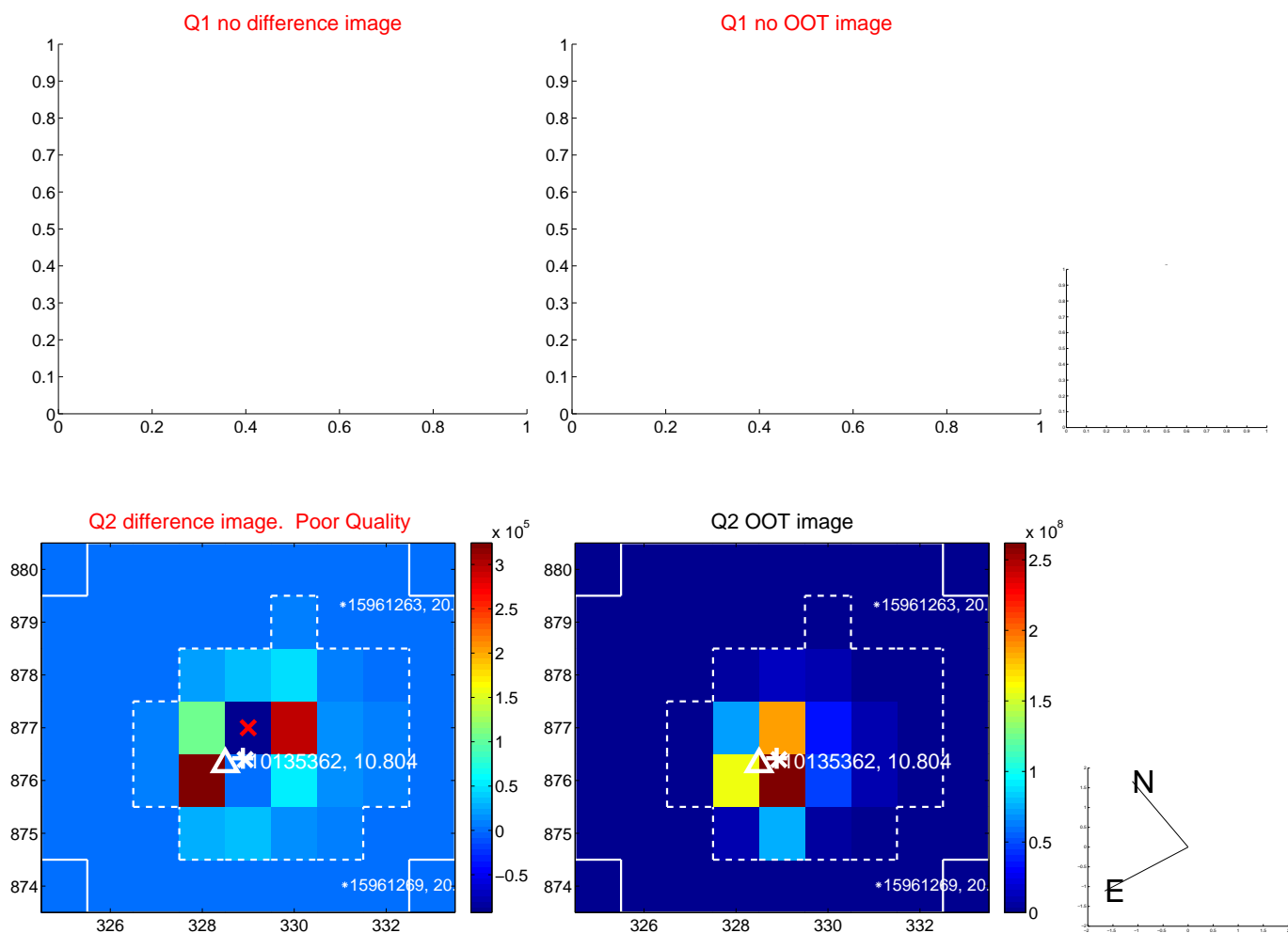
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>1.605 \pm 0.236</math></b>	<b>6.81</b>	$1.444 \pm 0.147$	$0.703 \pm 0.446$
PRF-fit source offset from KIC position	<b><math>1.796 \pm 0.195</math></b>	<b>9.23</b>	$1.580 \pm 0.102$	$0.854 \pm 0.363$
photometric centroid source offset	$0.42 \pm 1.08$	0.39	$0.28 \pm 0.92$	$0.32 \pm 1.18$

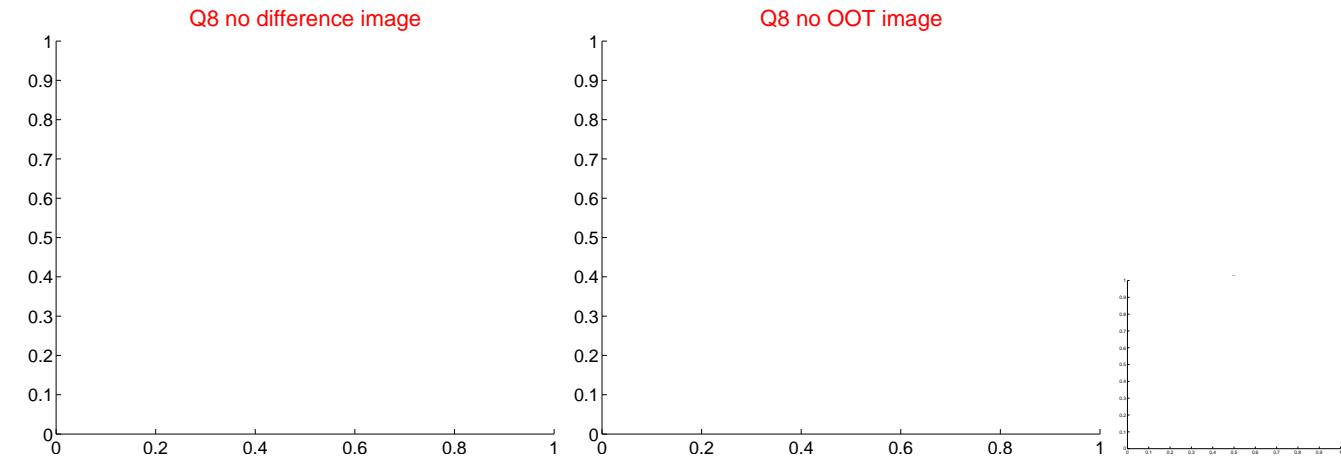
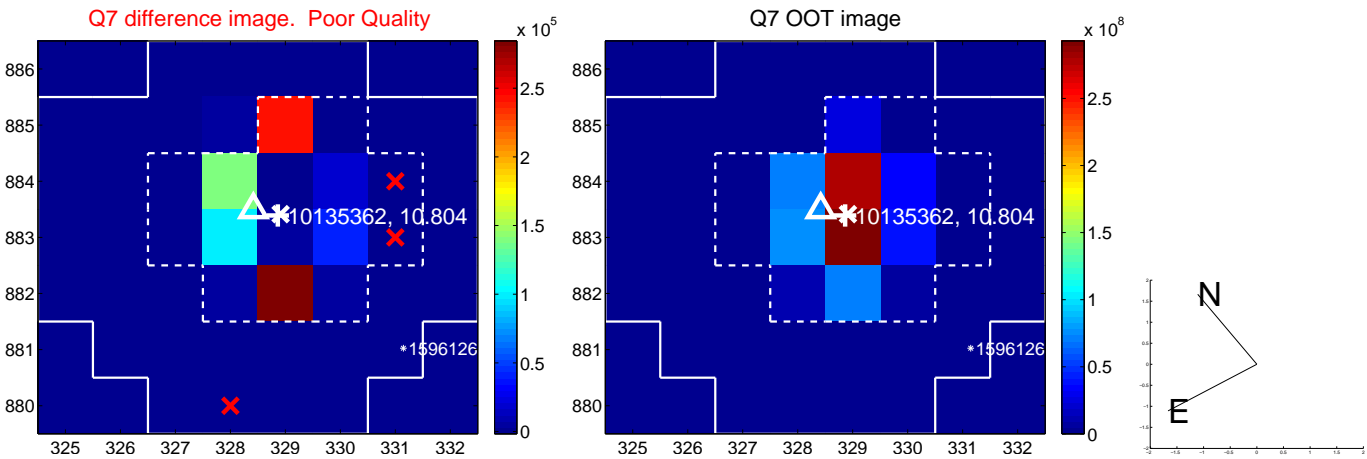
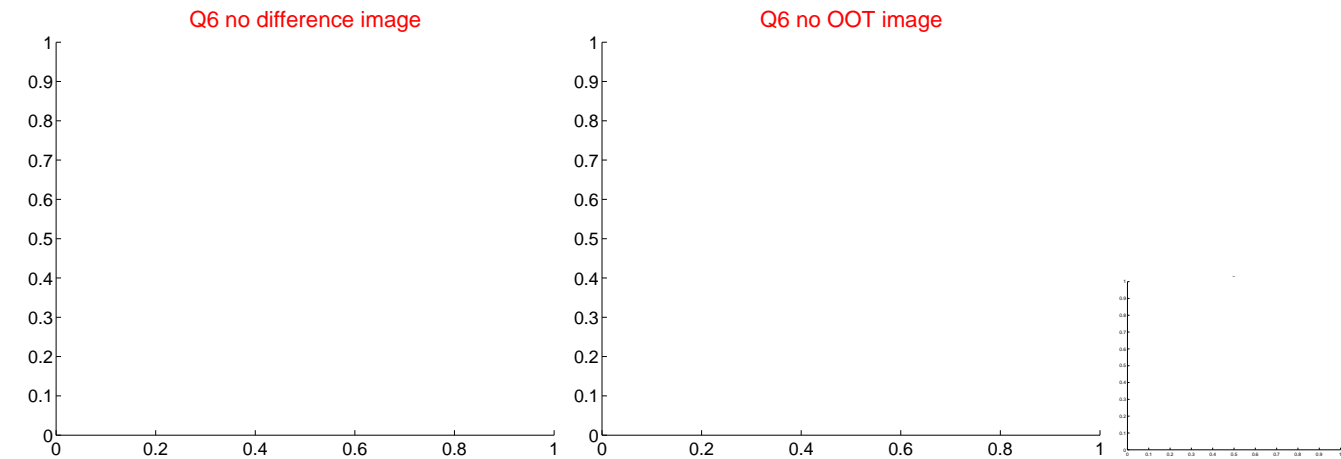
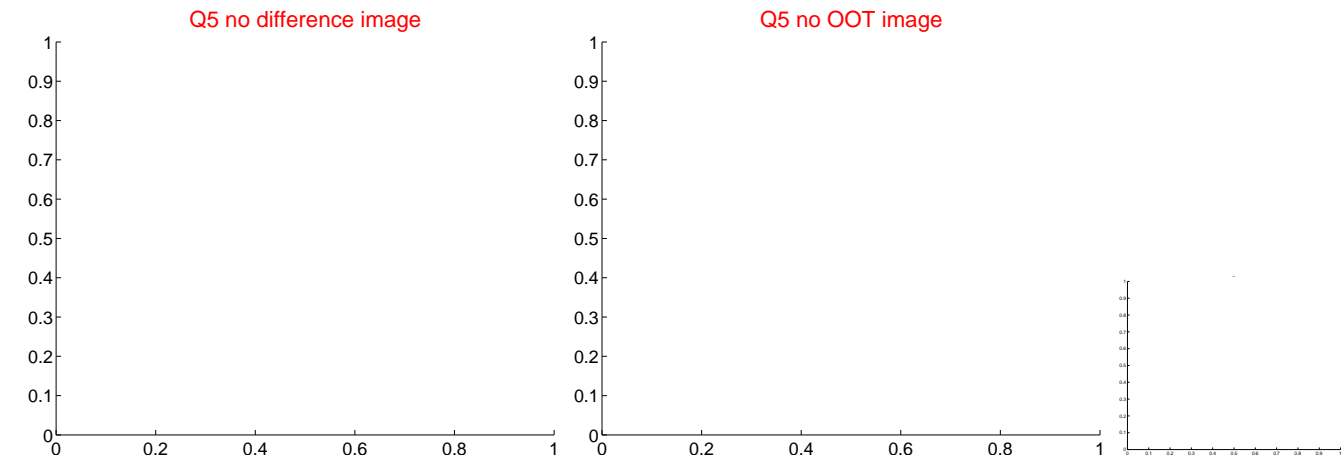


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

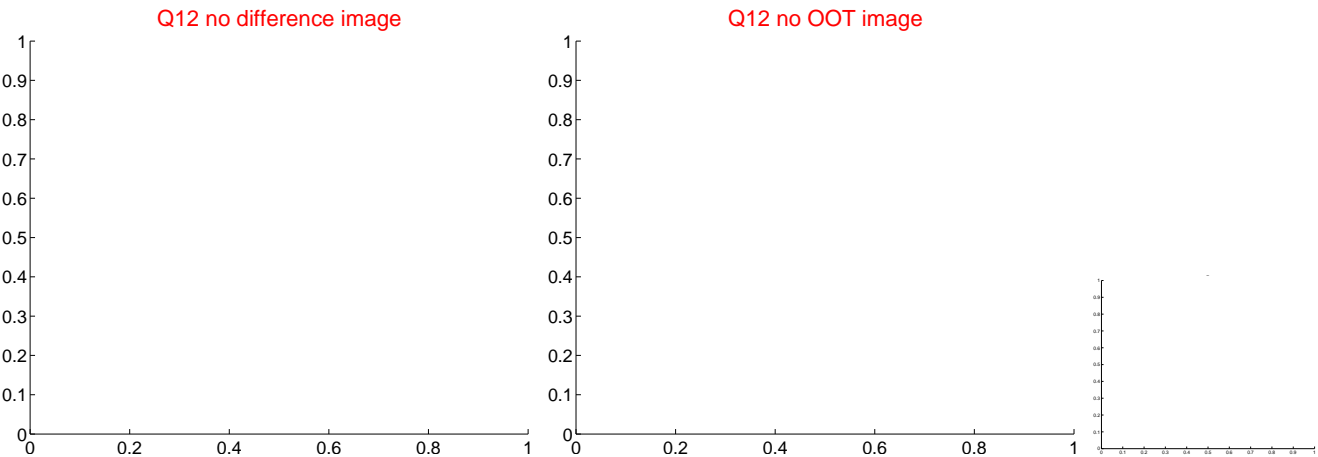
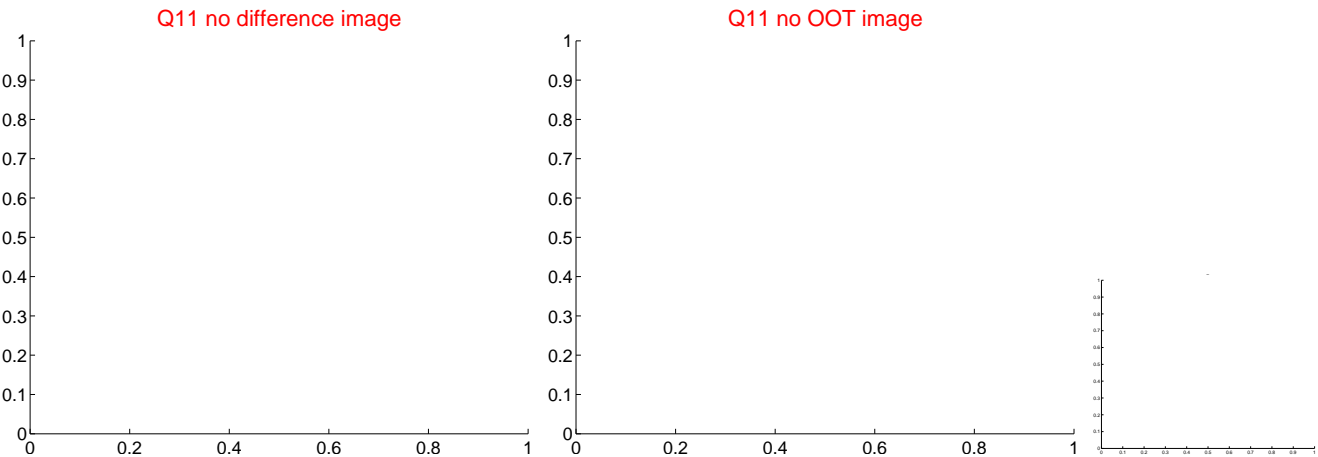
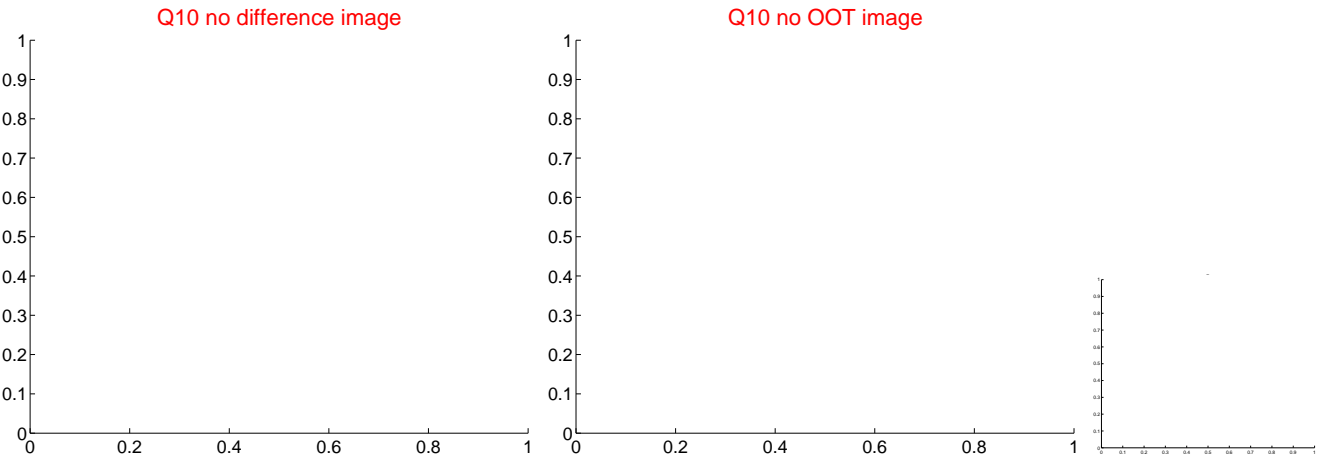
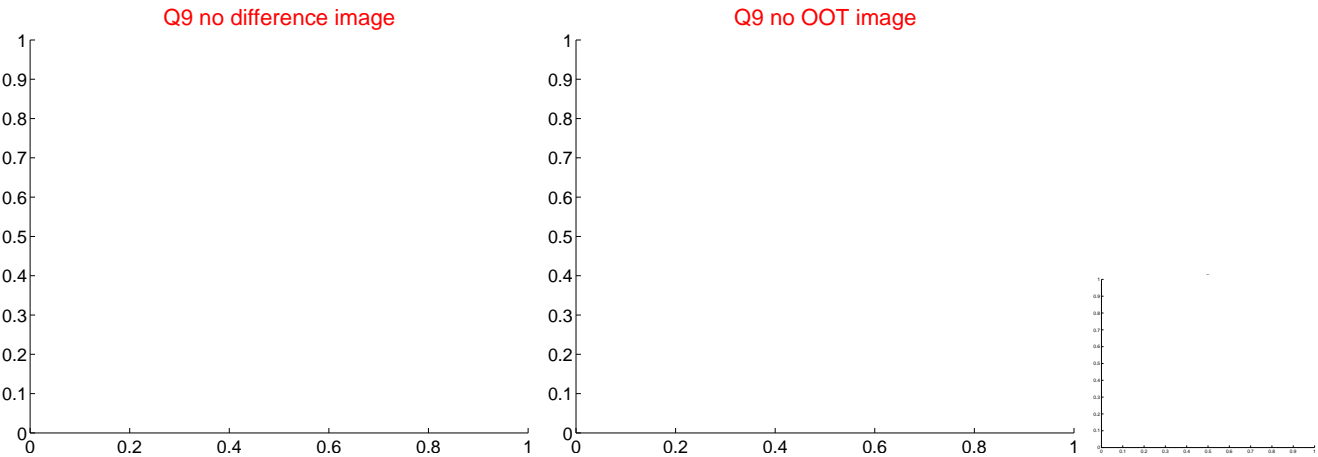
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



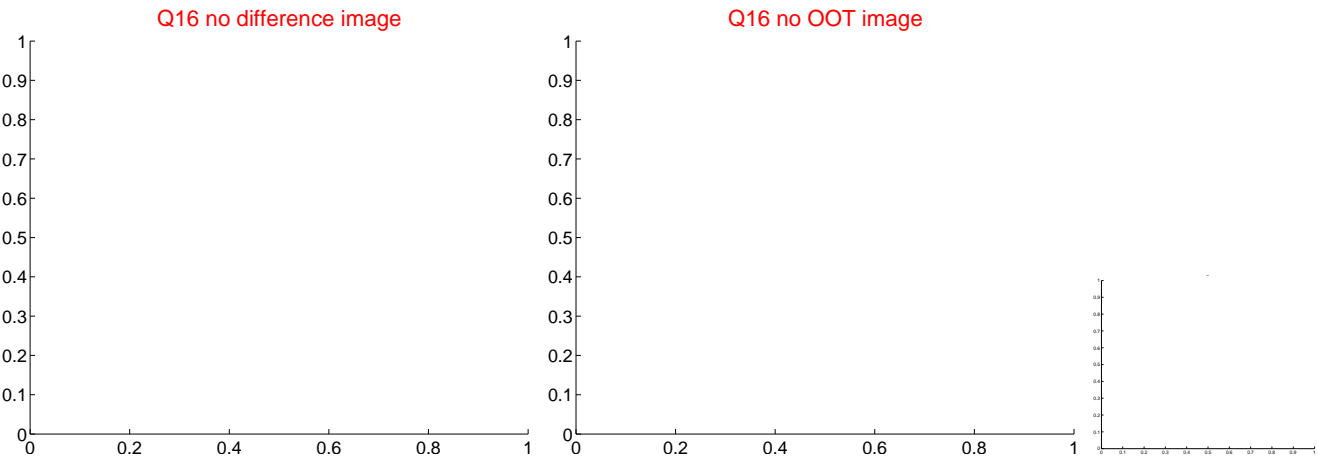
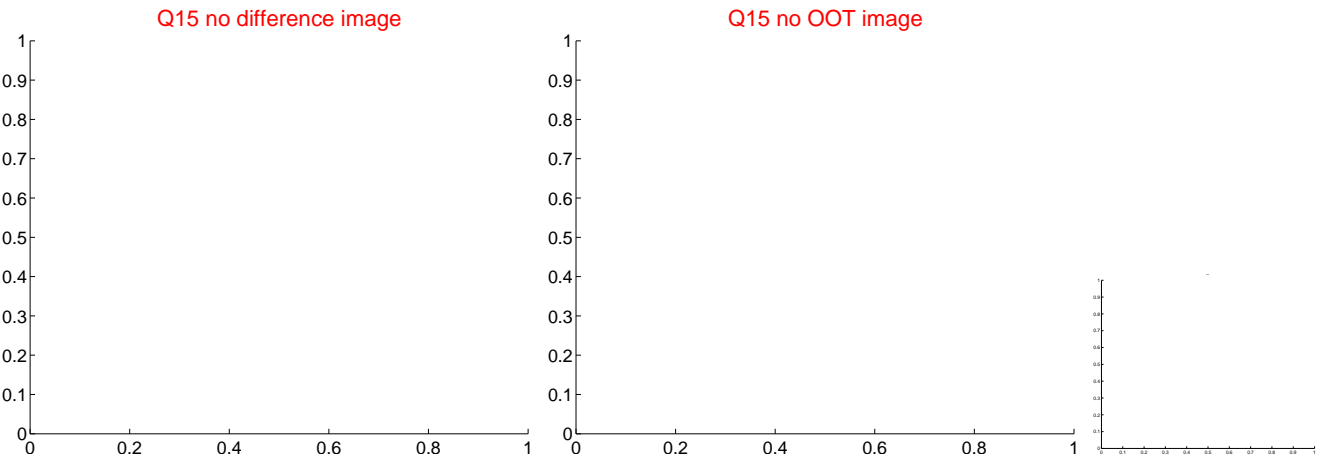
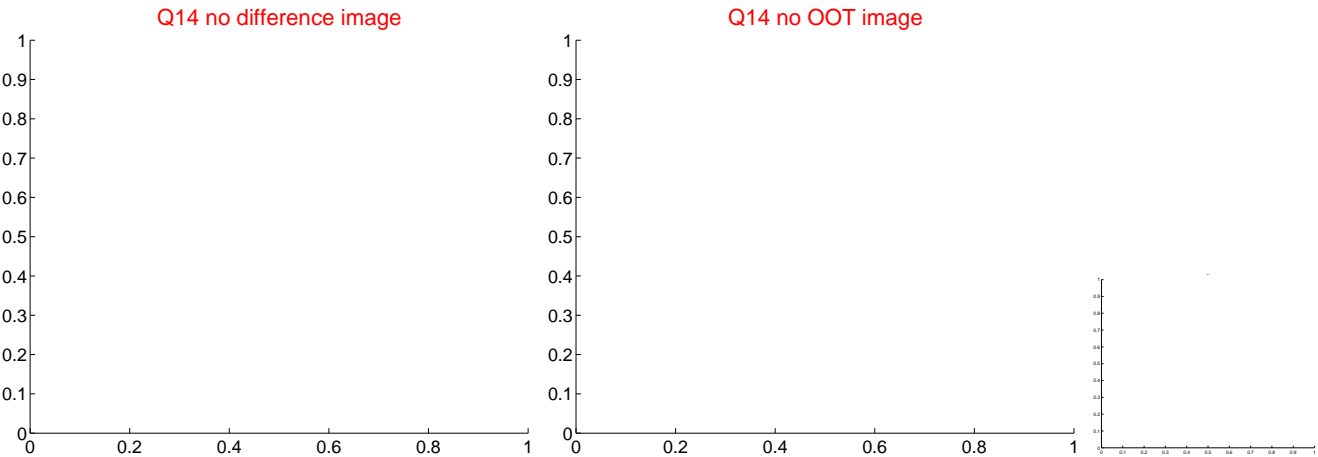
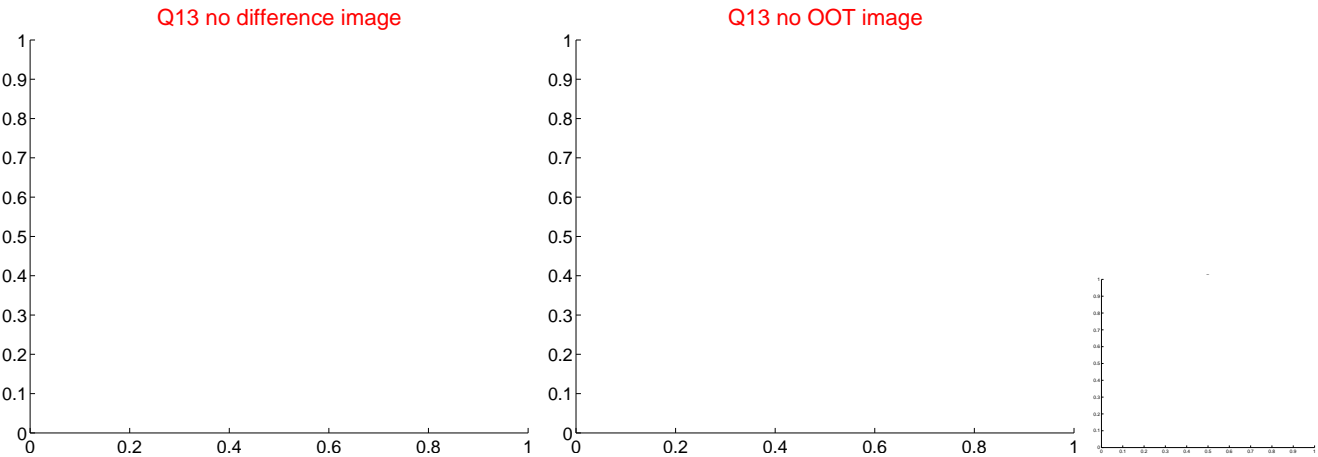
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



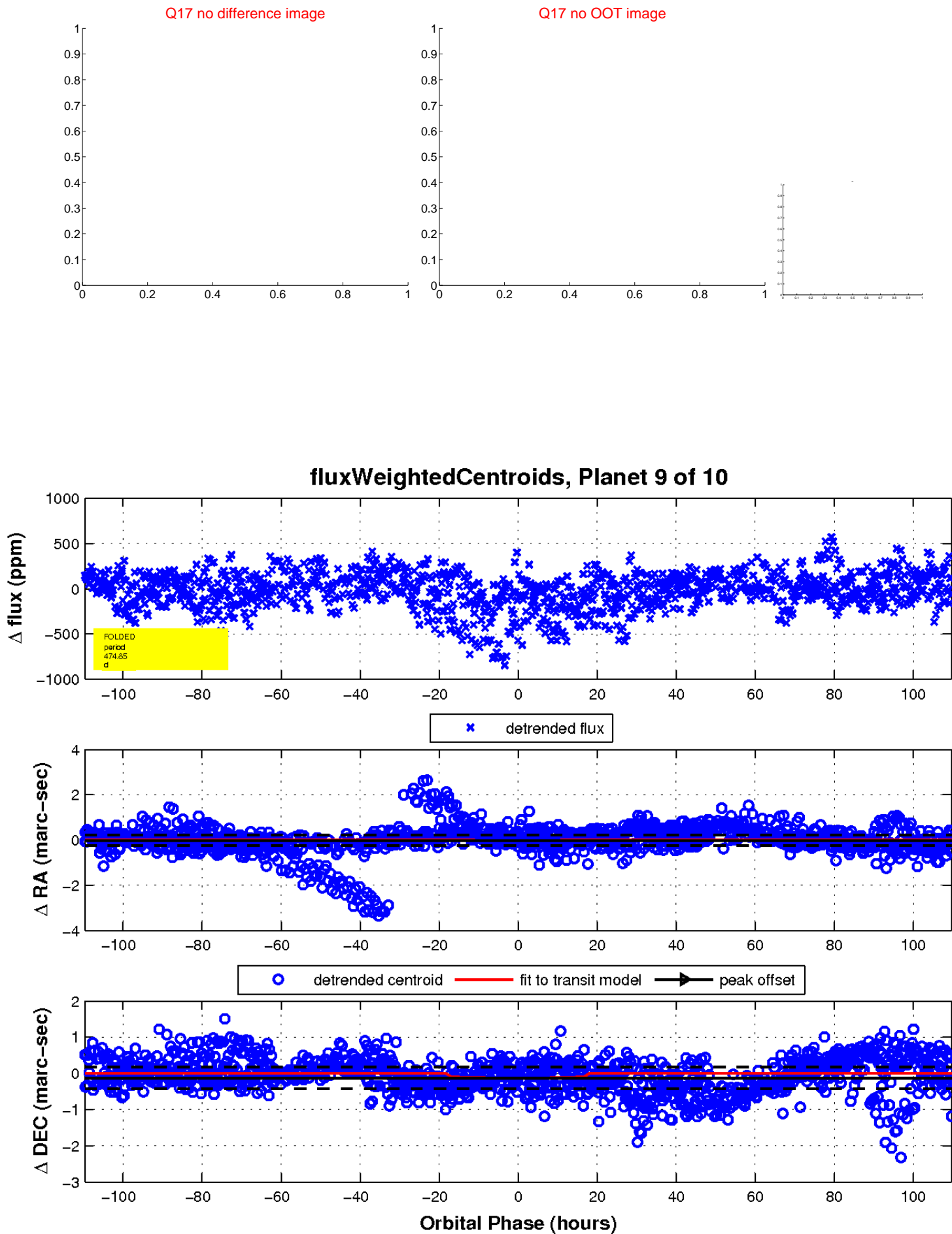
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

