

# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
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010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

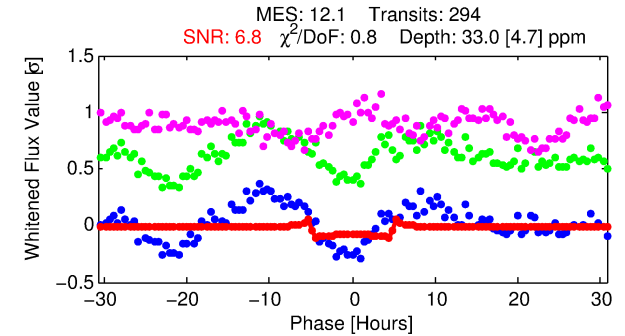
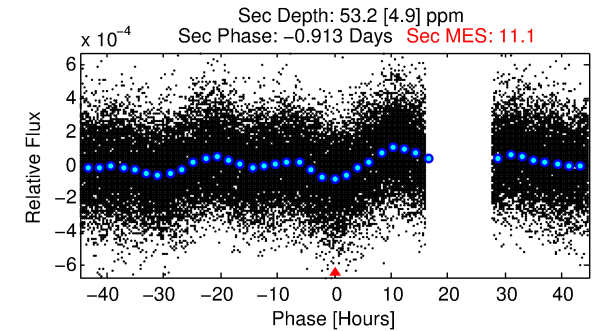
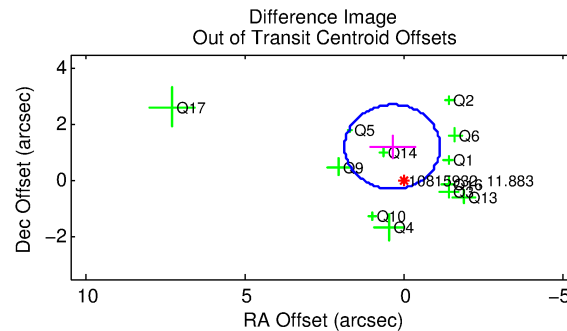
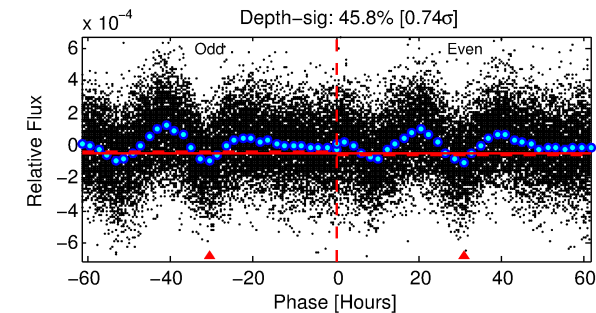
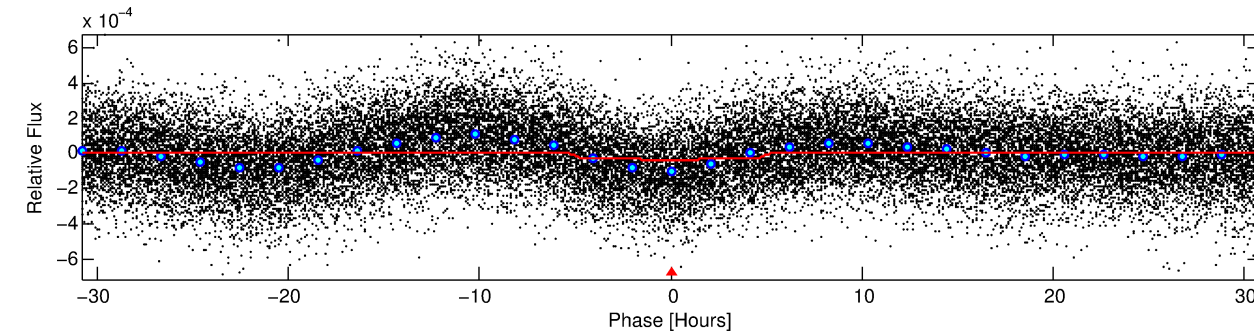
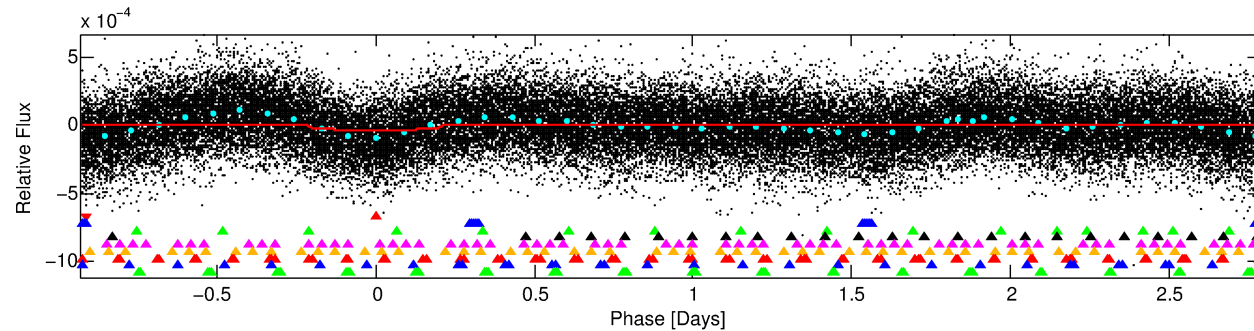
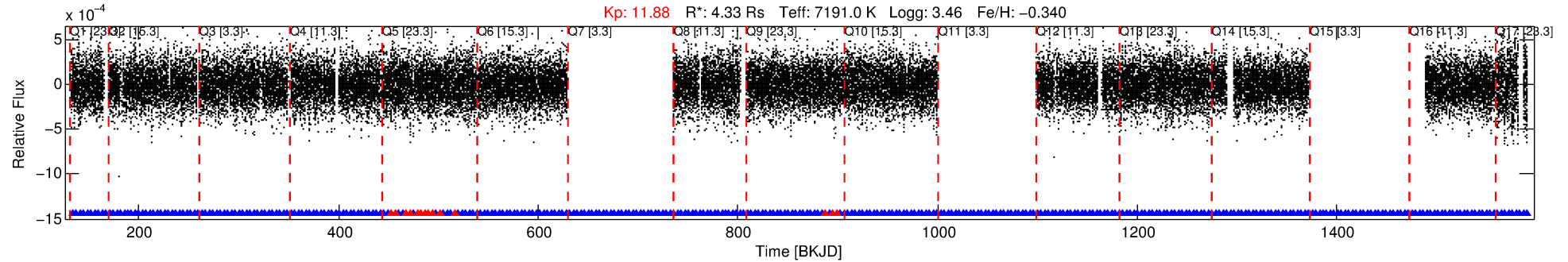
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010815932-01

No Significant Match Found

# DV One-Page Summary

KIC: 10815932 Candidate: 1 of 9 Period: 3.718 d



## DV Fit Results:

Period = 3.71754 [0.00004] d  
Epoch = 133.5116 [0.0064] BKJD  
 $R_p/R^*$  = 0.0062 [0.0010]  
 $a/R^*$  = 1.56 [0.73]  
 $b$  = 0.90 [0.17]  
 $\text{Seff}$  = 12996.76 [14881.03]  
 $T_{\text{eq}}$  = 2723 [779] K  
 $R_p$  = 2.92 [1.92]  $R_e$   
 $a$  = 0.0587 [0.0397] AU  
 $A_g$  = 11.84 [13.98] [0.78 $\sigma$ ]  
 $T_{\text{eff}}$  = 7809 [729] K [4.77 $\sigma$ ]

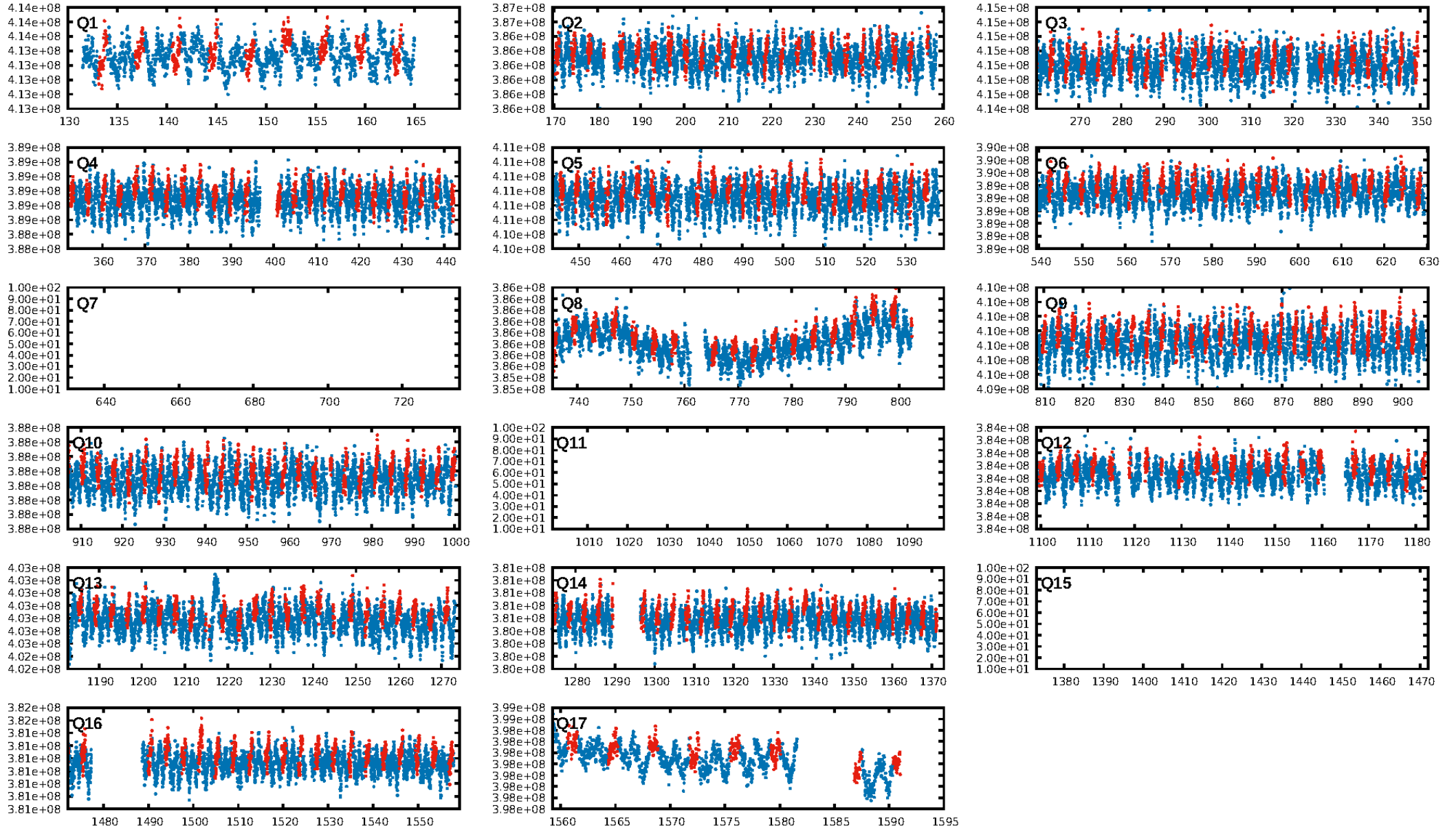
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.49 $\sigma$ ]  
LongPeriod-sig: 100.0% [24.05 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.95 [263/277]  
GhostDiagnostic-chr: 1.299  
Centroid-sig: 20.9%  
Centroid-so: 0.543 arcsec [1.01 $\sigma$ ]  
OotOffset-rm: 1.260 arcsec [2.52 $\sigma$ ]  
OotOffset-st: 4/1/2/5 [12]  
KicOffset-rm: 1.193 arcsec [2.13 $\sigma$ ]  
KicOffset-st: 4/1/2/5 [12]  
DiffImageQuality-fgm: 0.50 [6/12]  
DiffImageOverlap-fno: 0.00 [0/14]

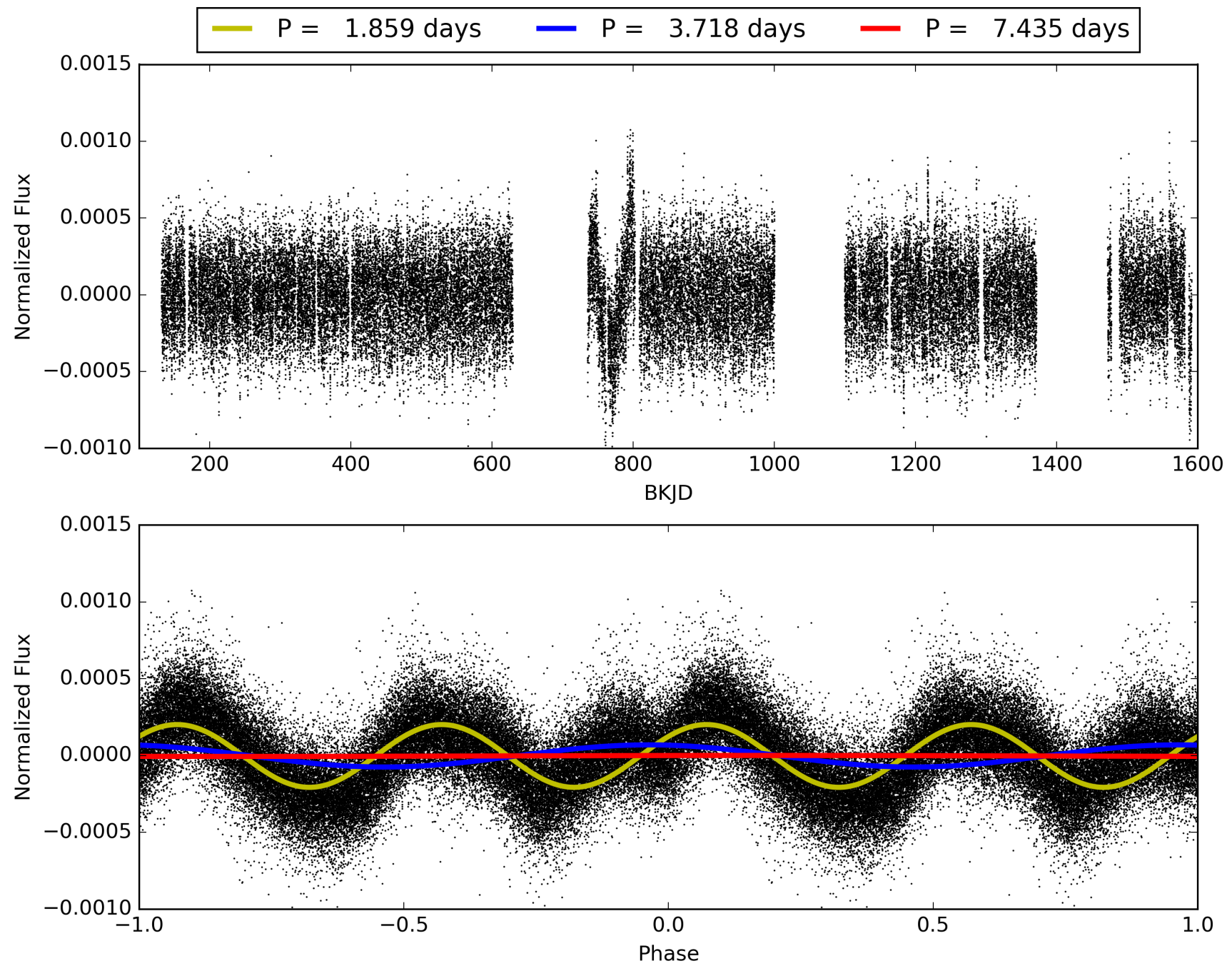
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:37:45 Z

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

# TCE 010815932-01, PDC Light Curves



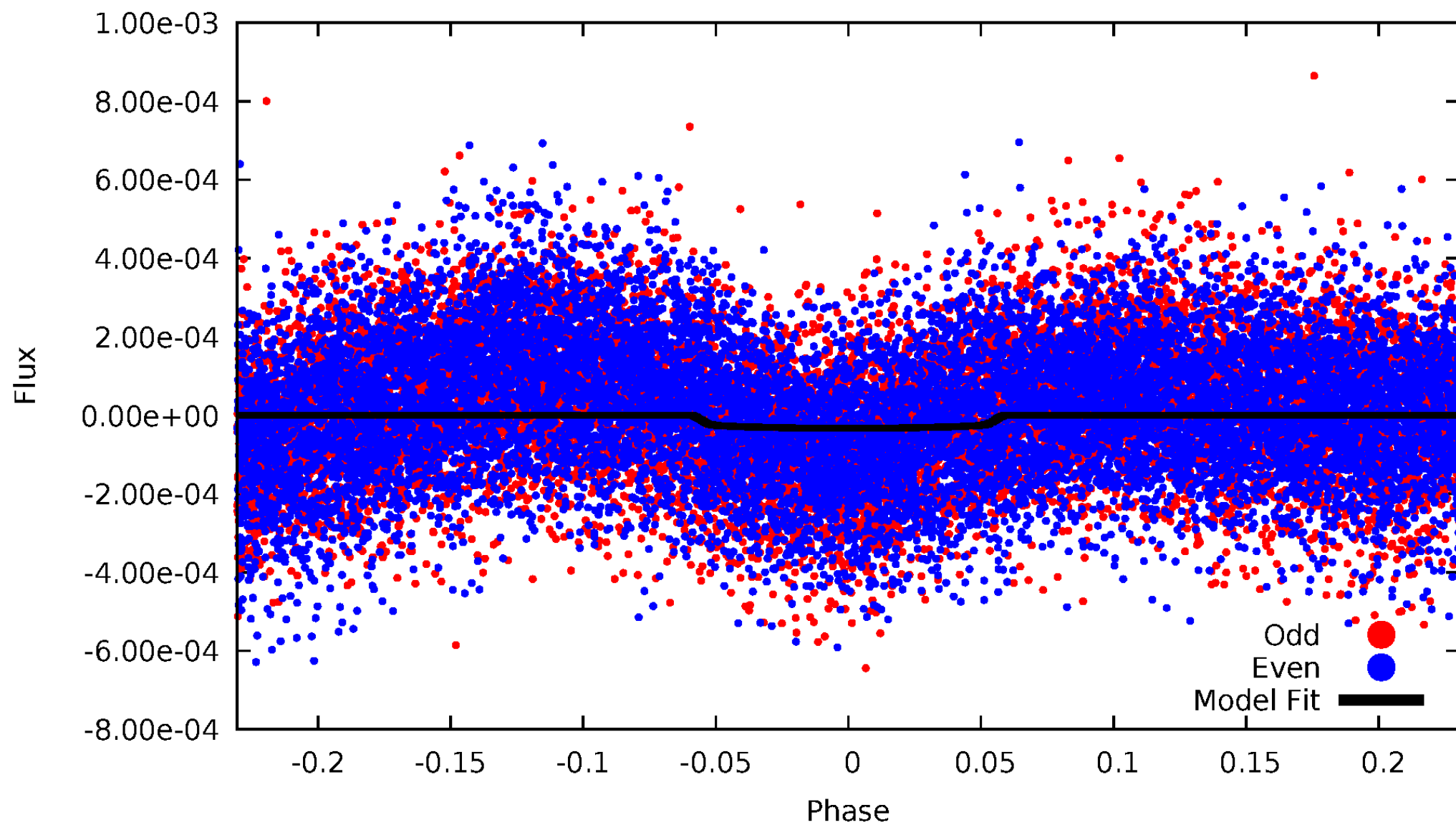
TCE 010815932-01





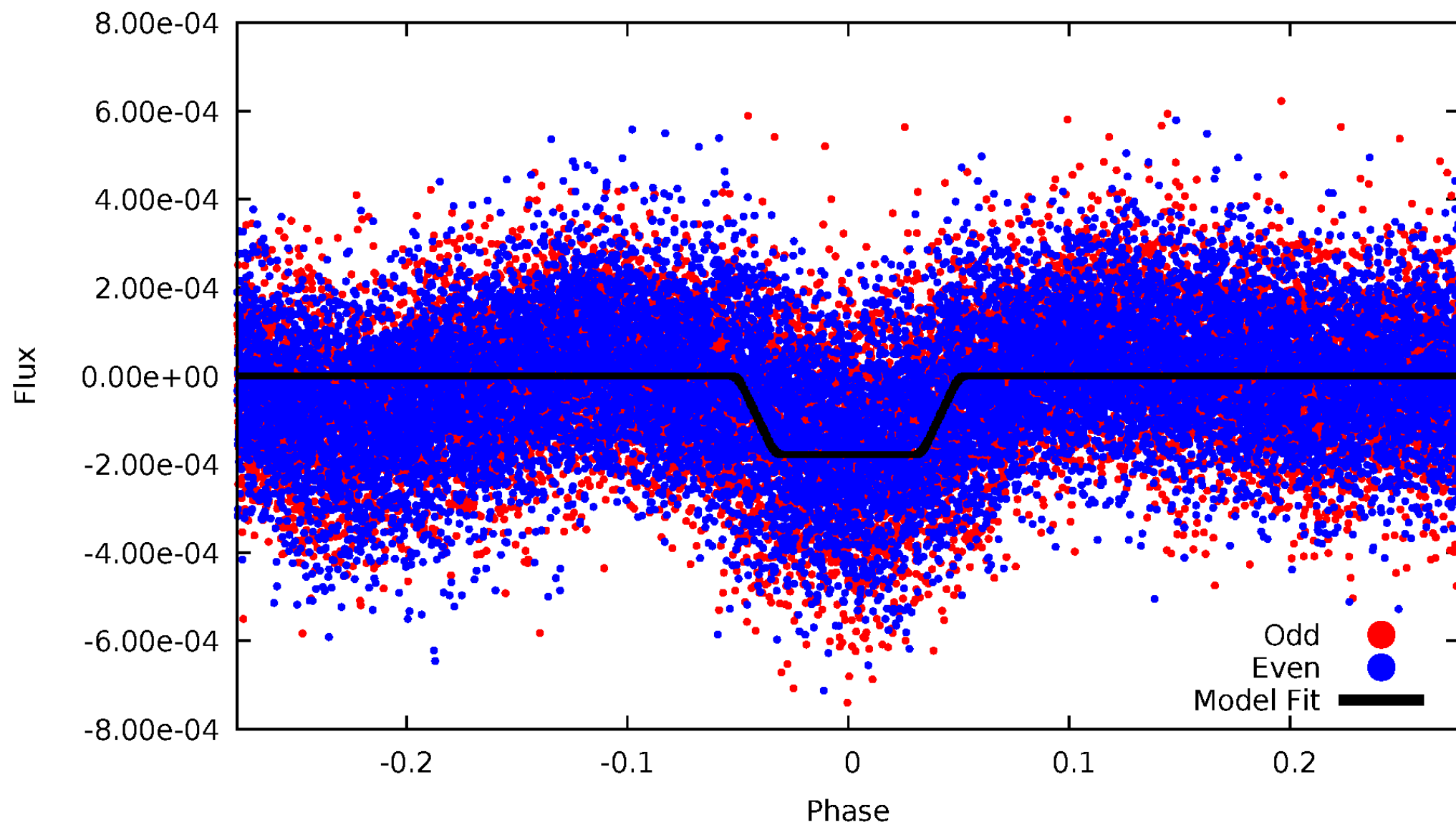
# DV Odd/Even

TCE 010815932-01

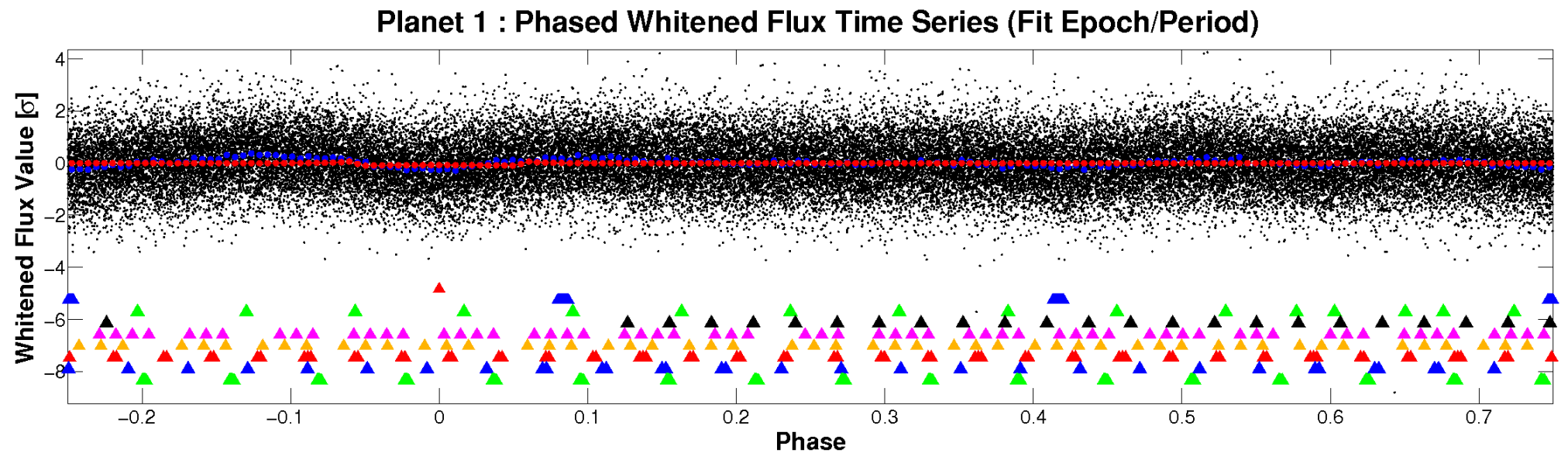
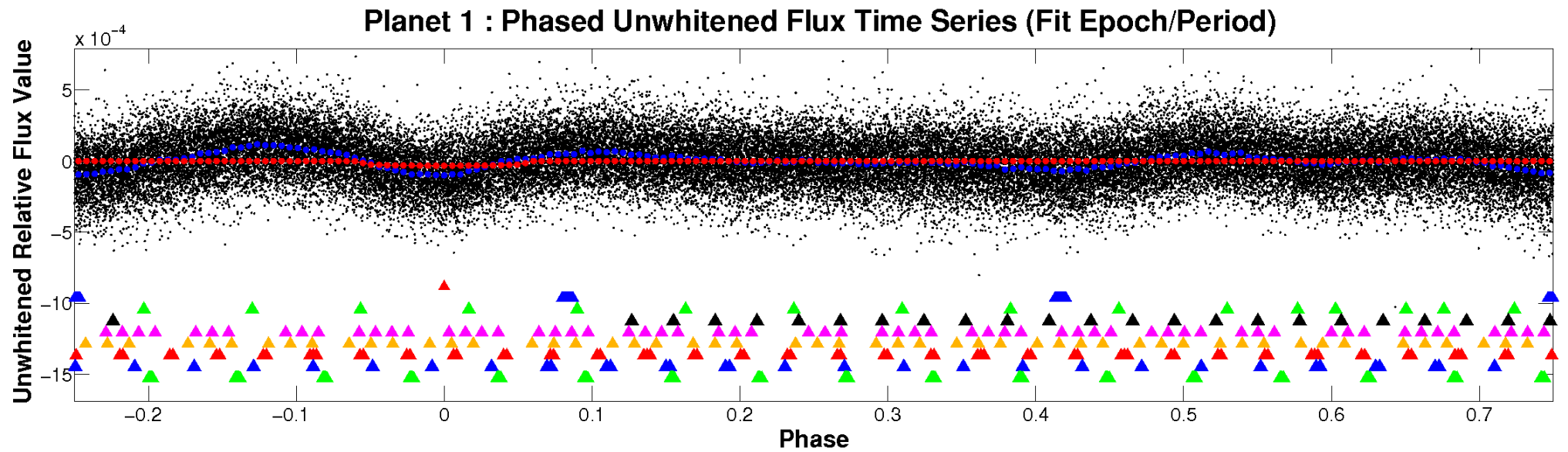


# ALT Odd/Even

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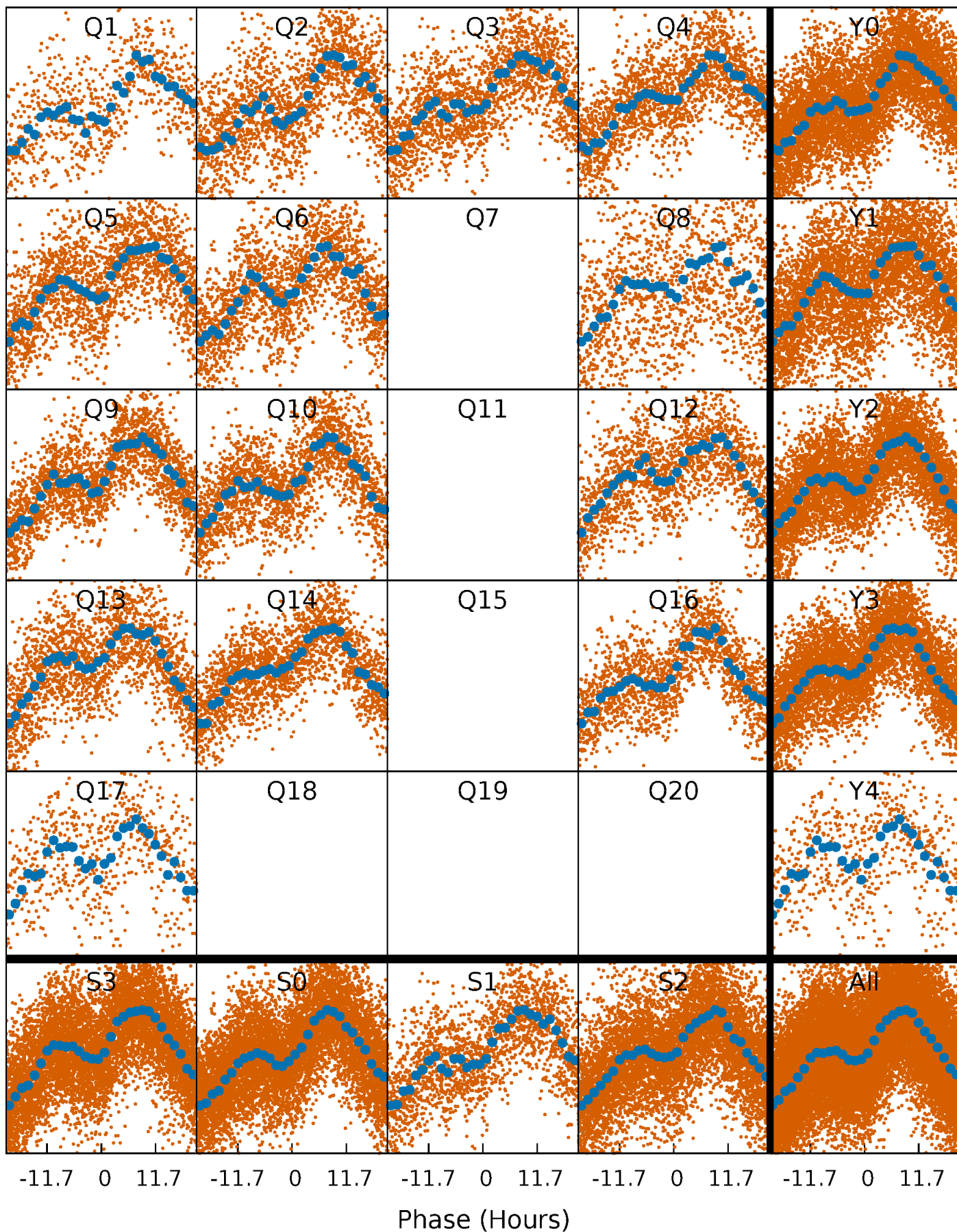


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

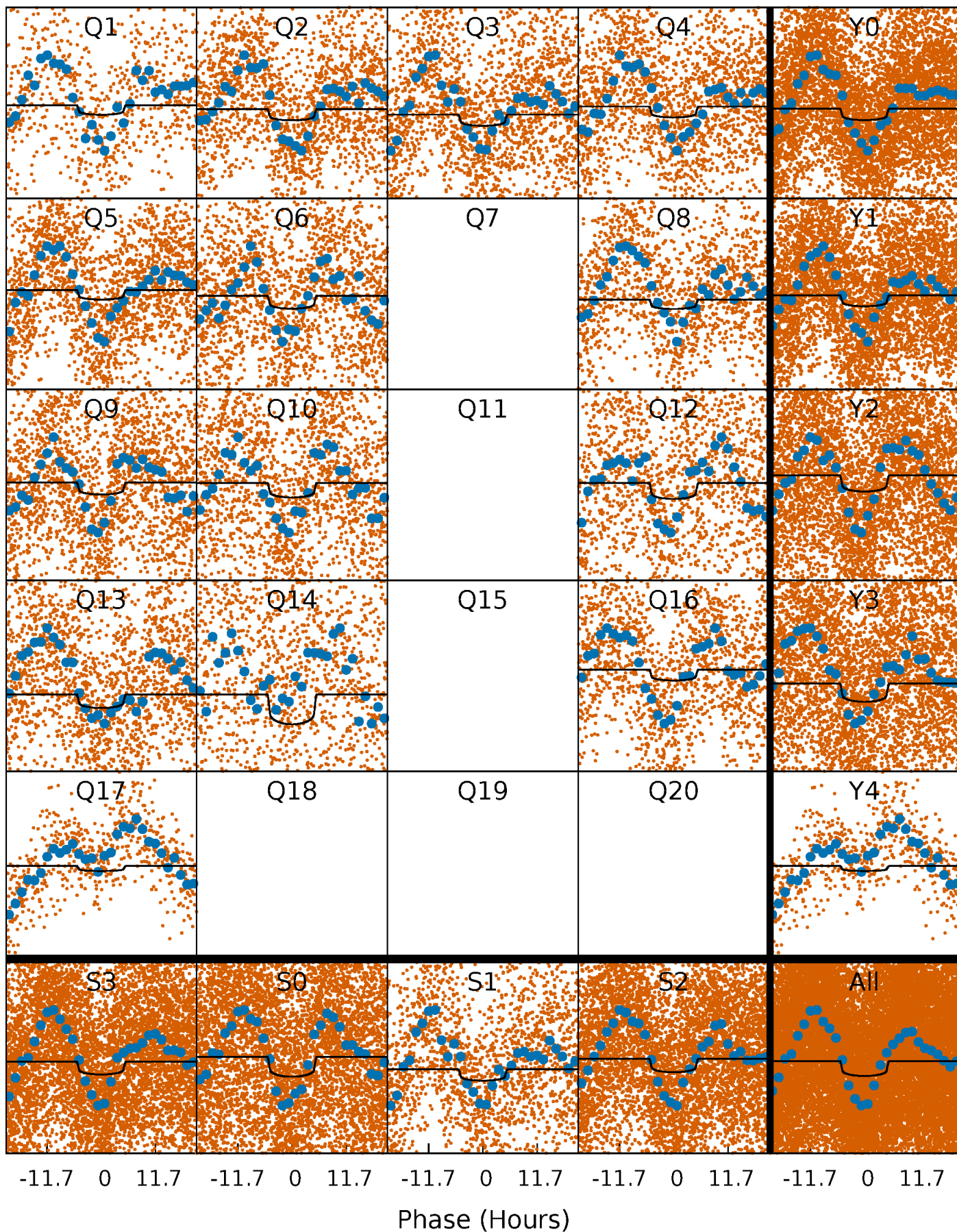
TCE 010815932-01   P= 3.717540 Days    $T_0=133.511554$  (BKJD)





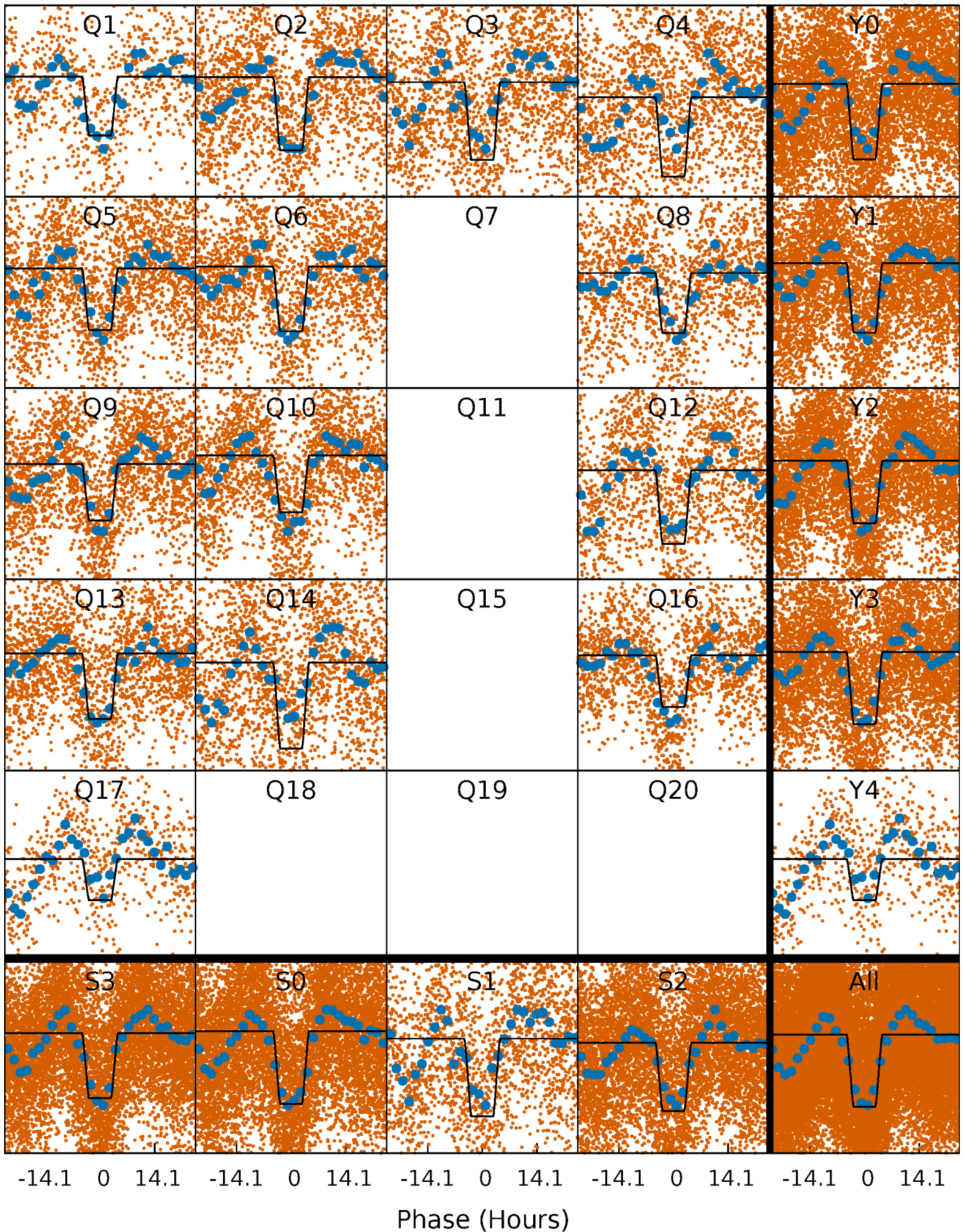
# DV Quarter-Phased Transit Curves

TCE 010815932-01   P= 3.717540 Days    $T_0=133.511554$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010815932-01 P= 3.717446 Days  $T_0=133.487153$  (BKJD)

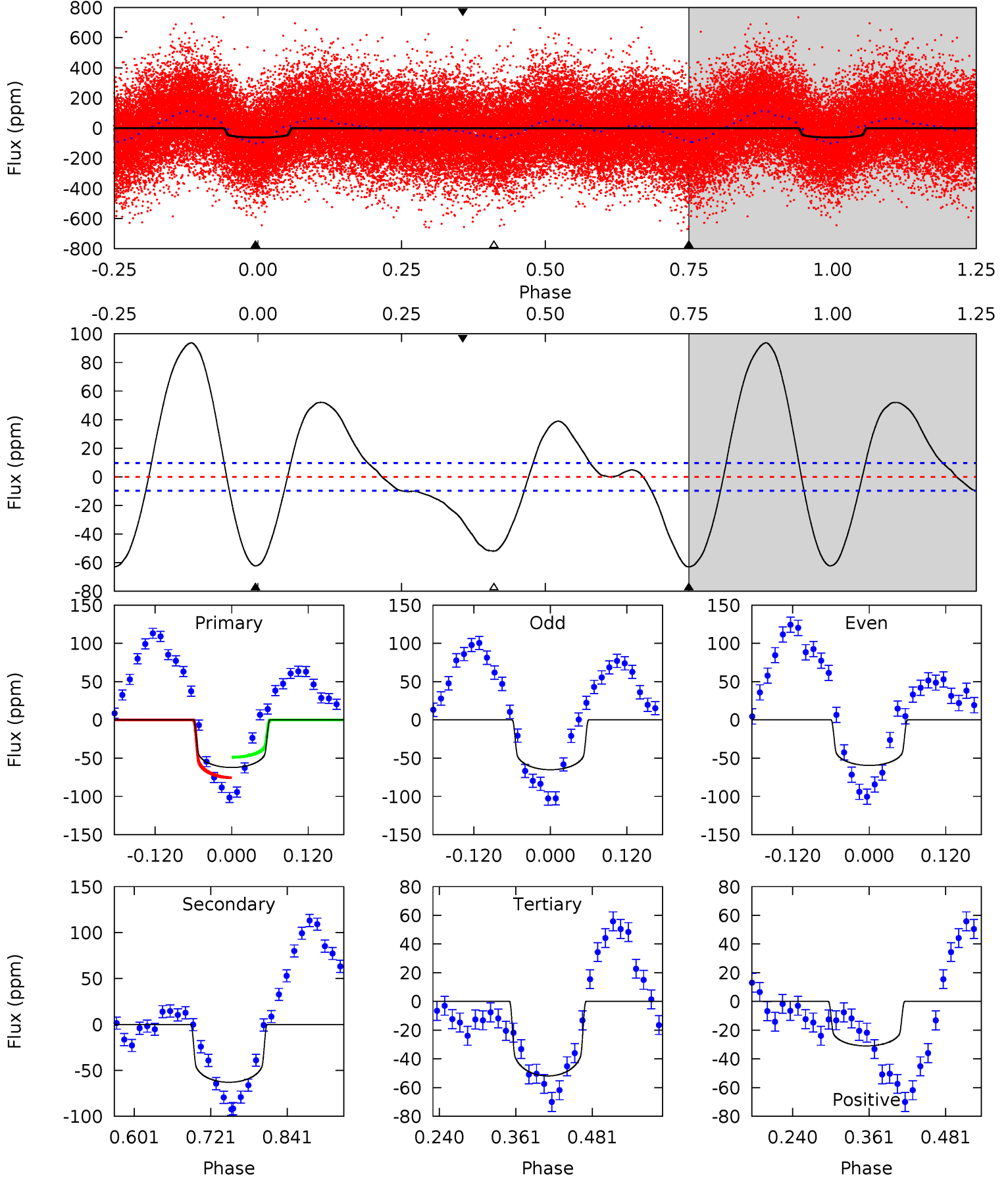




# DV Model-Shift Uniqueness Test

010815932-01, P = 3.717540 Days, E = 129.794014 Days

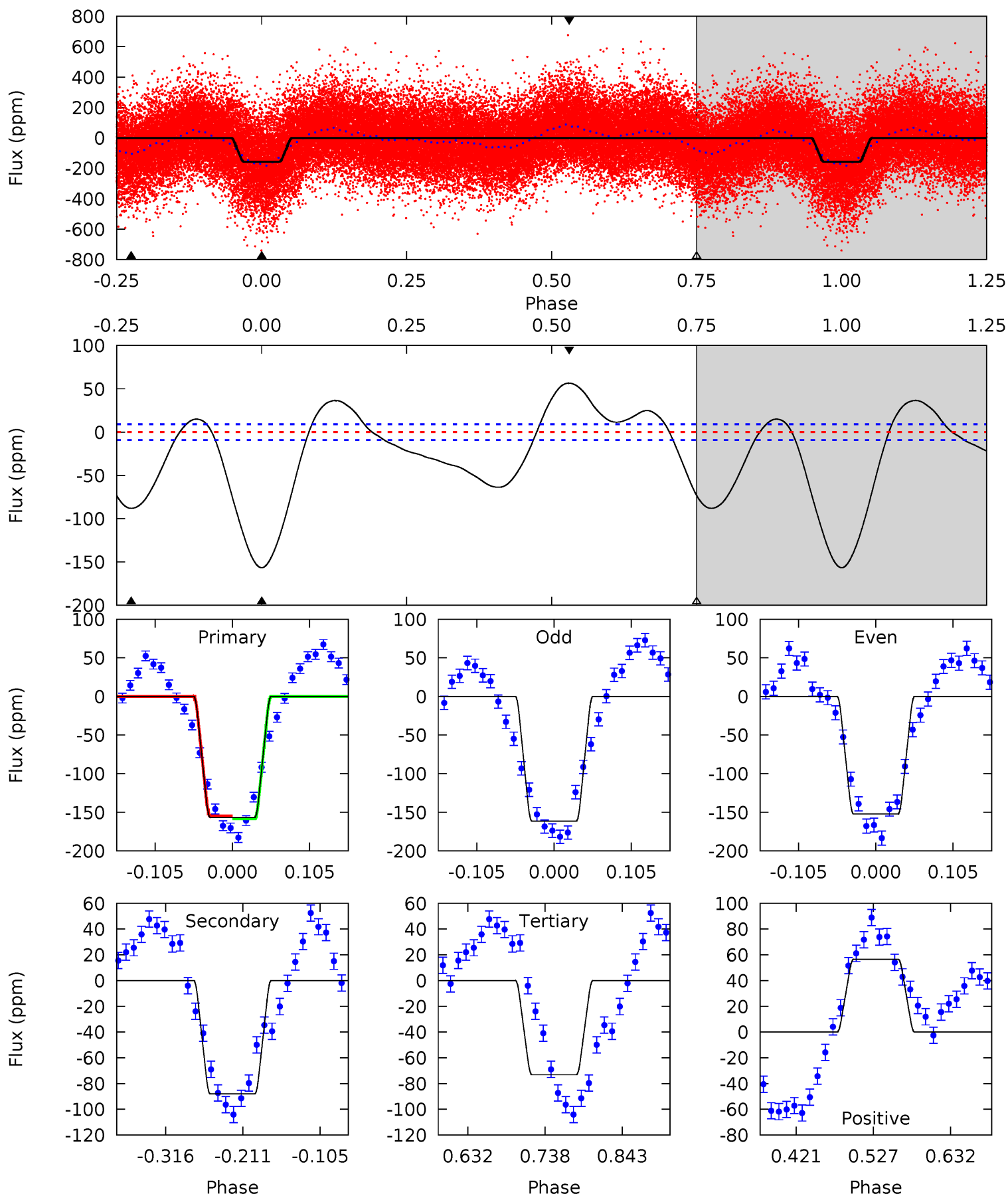
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.1	29.5	24.3	-14.5	4.53	1.55	13.7	4.82	43.6	5.18	44.0	1.32	1.03	0.60	6.33



# Alt Model-Shift Uniqueness Test

010815932-01, P = 3.717446 Days, E = 129.769707 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
78.2	44.0	36.5	28.2	4.55	1.62	17.5	41.7	50.0	7.43	15.7	2.25	1.02	0.27	0.90





### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-63 \pm 2$	$2.67^{+0.61}_{-0.89}$	$3703^{+216}_{-555}$	$8276^{+1058}_{-769}$	$17^{+17}_{-5}$
Alt.	$-88 \pm 2$	$5.97^{+0.88}_{-1.65}$	$3694^{+241}_{-498}$	$5859^{+322}_{-281}$	$4.697^{+3.622}_{-1.070}$

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

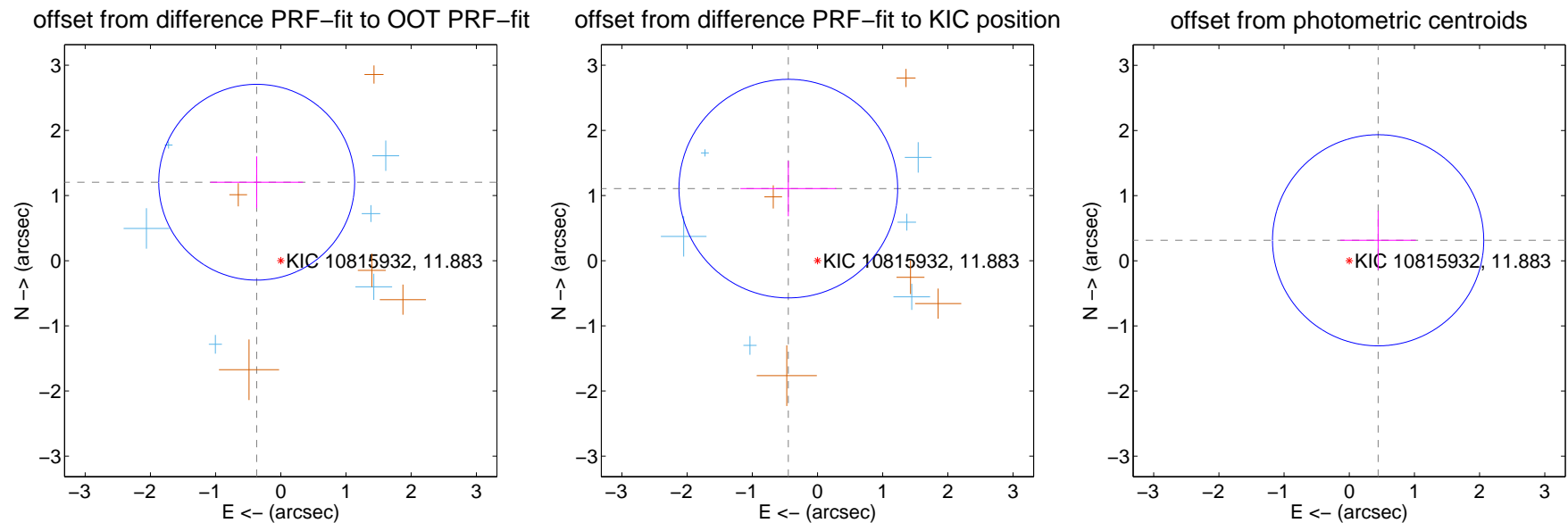
## DV Centroid Data

Supplemental centroid analysis for 010815932-01. **Kepler magnitude: 11.88.** Transit SNR 6.85

There are 6 quarters with good PRF difference image offsets

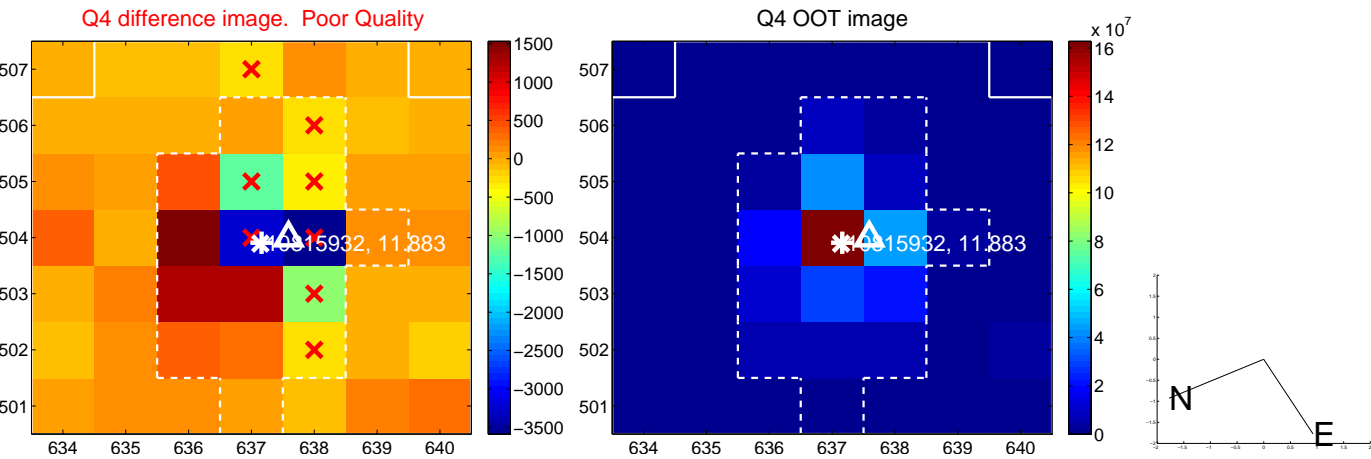
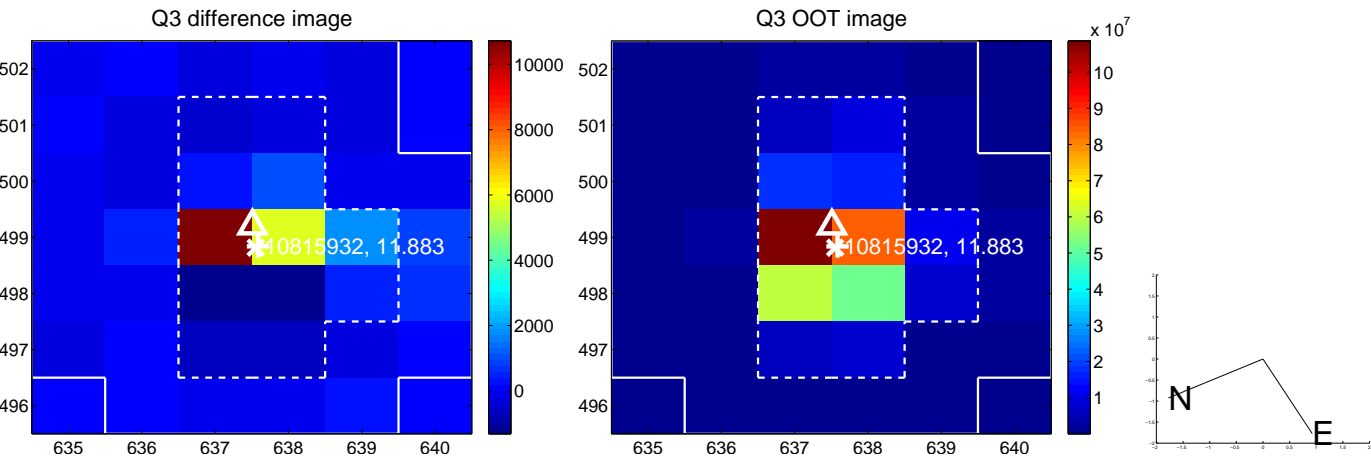
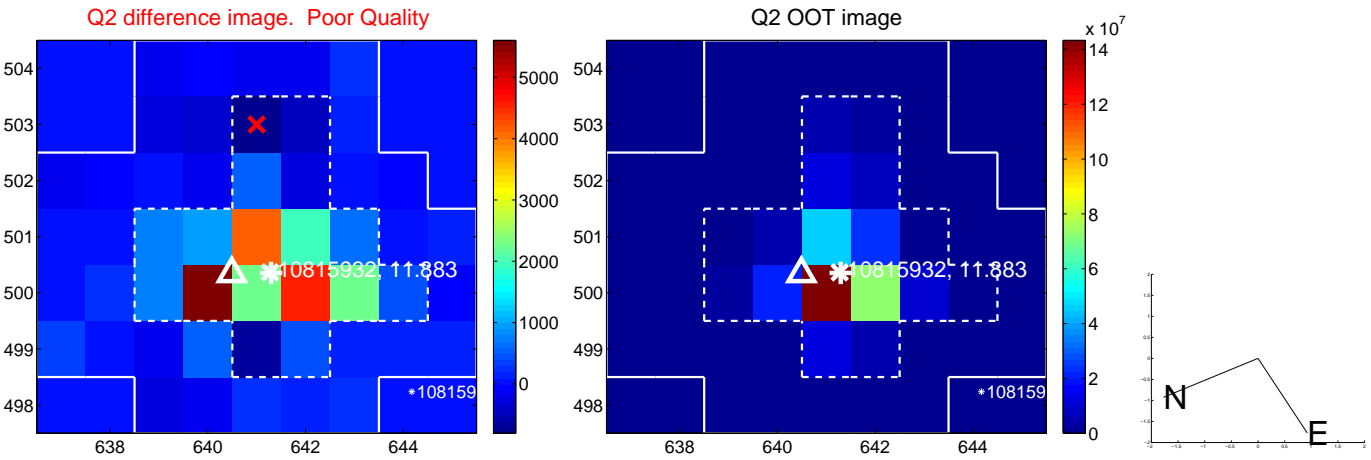
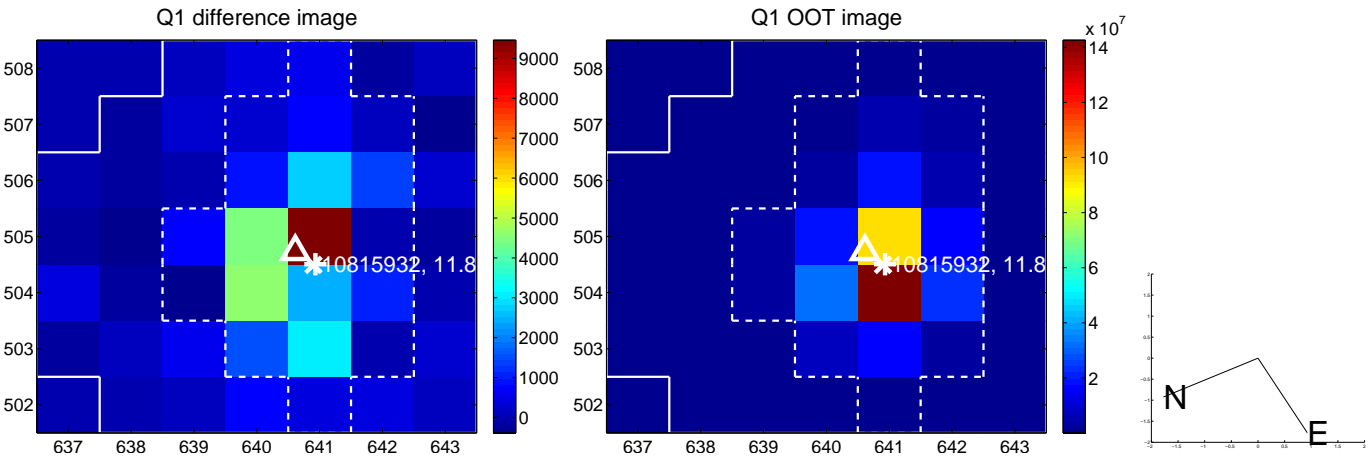
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.260 \pm 0.501$	2.52	$0.369 \pm 0.711$	$1.204 \pm 0.397$
PRF-fit source offset from KIC position	$1.193 \pm 0.559$	2.13	$0.448 \pm 0.736$	$1.106 \pm 0.424$
photometric centroid source offset	$0.54 \pm 0.54$	1.01	$-0.44 \pm 0.58$	$0.31 \pm 0.45$

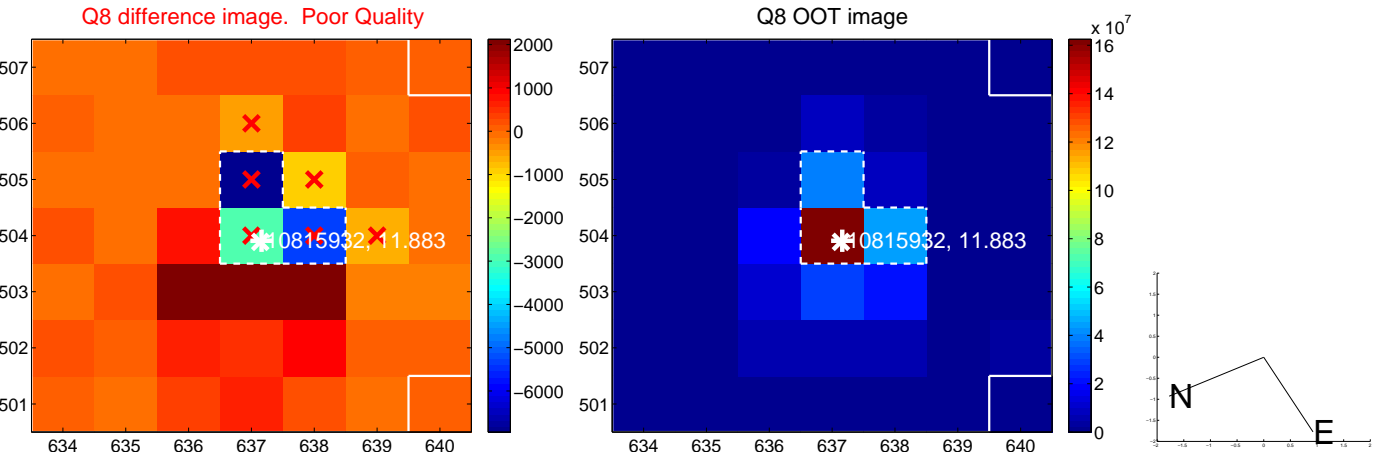
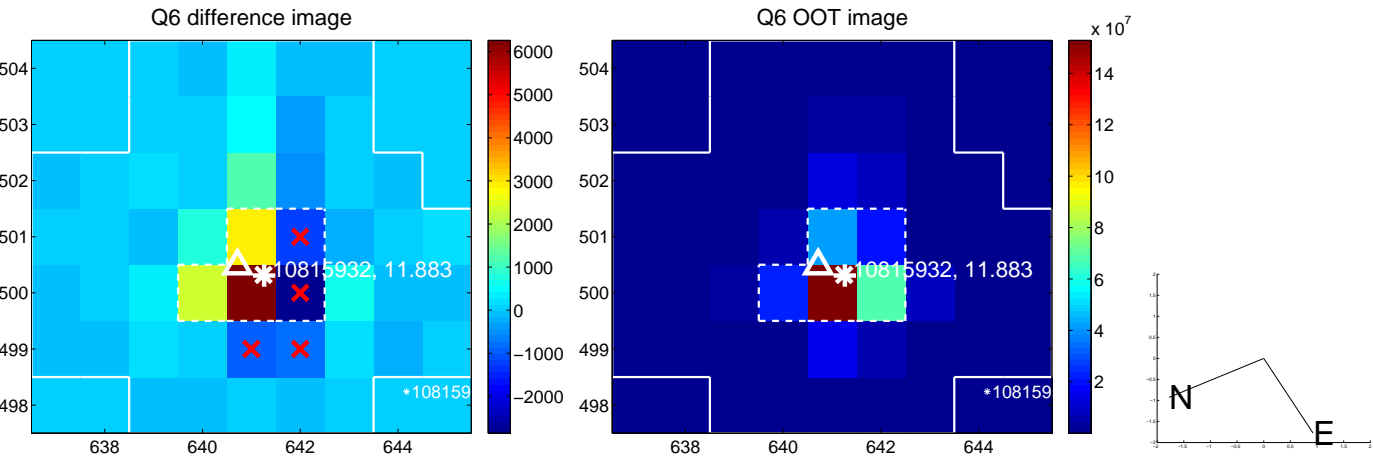
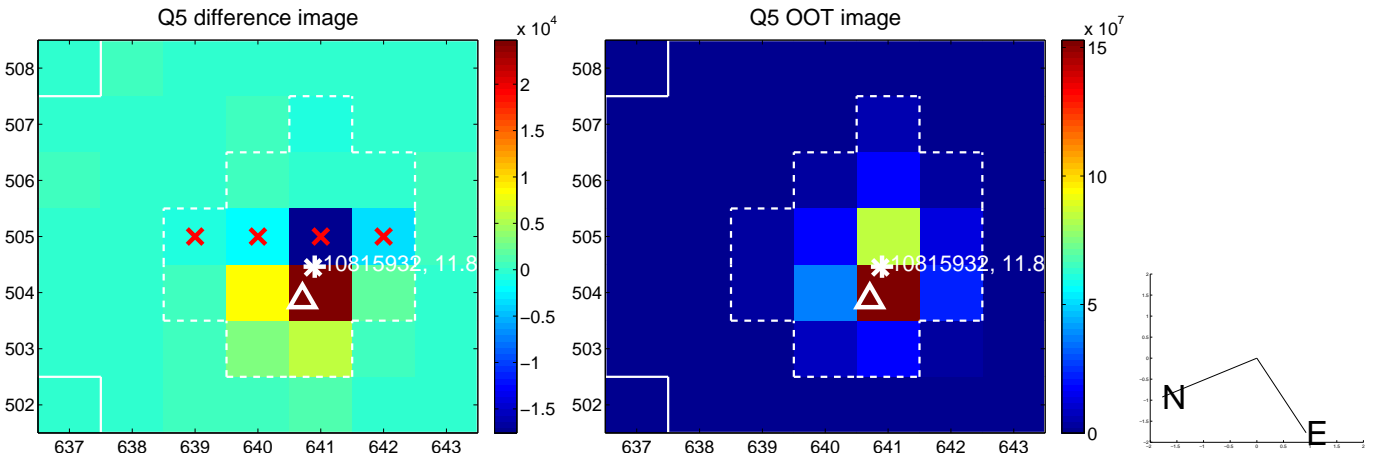


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

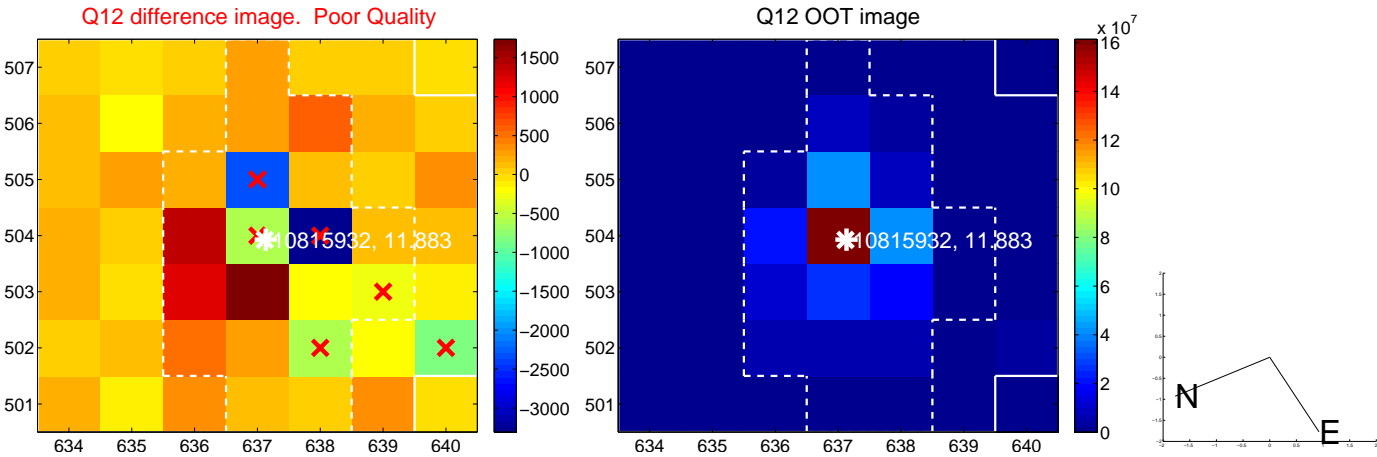
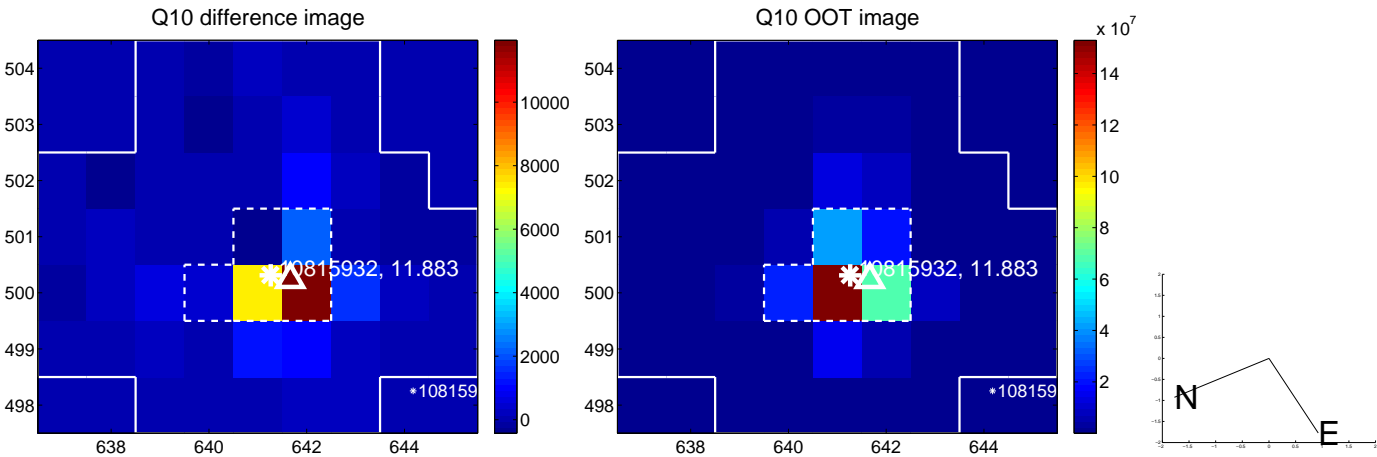
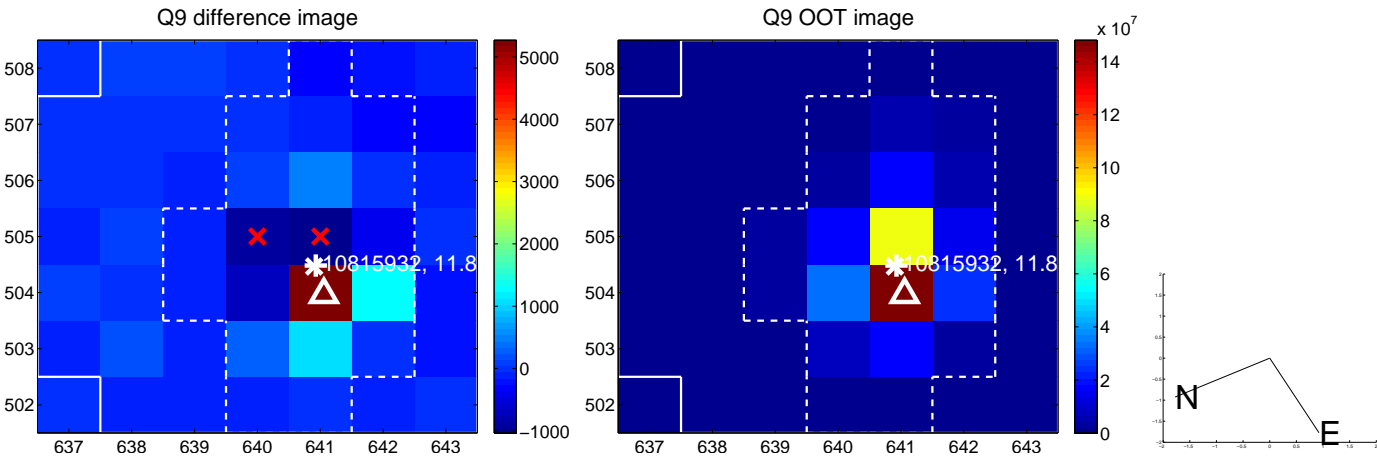


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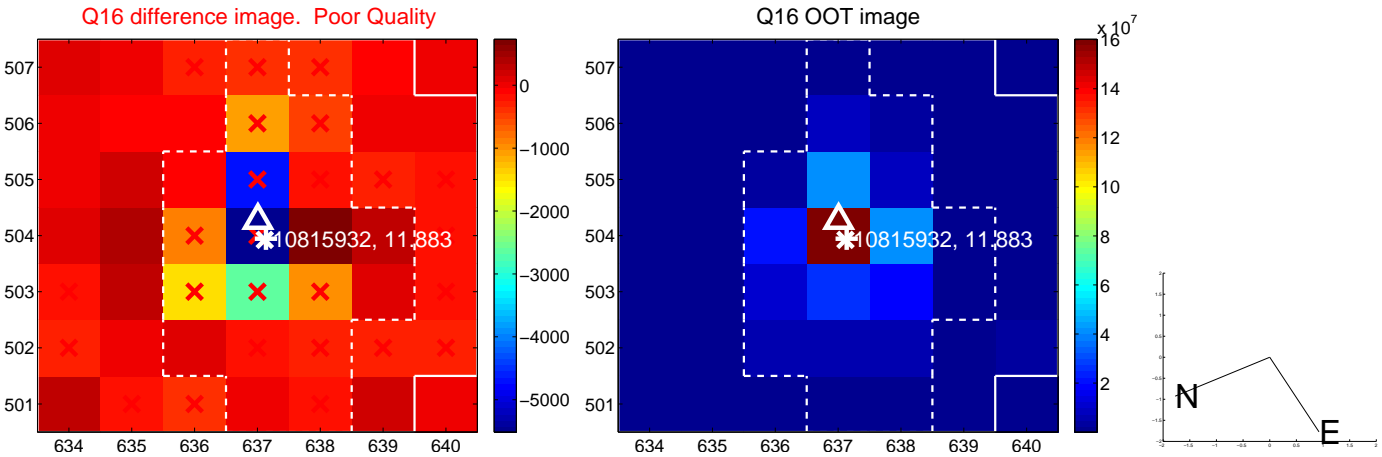
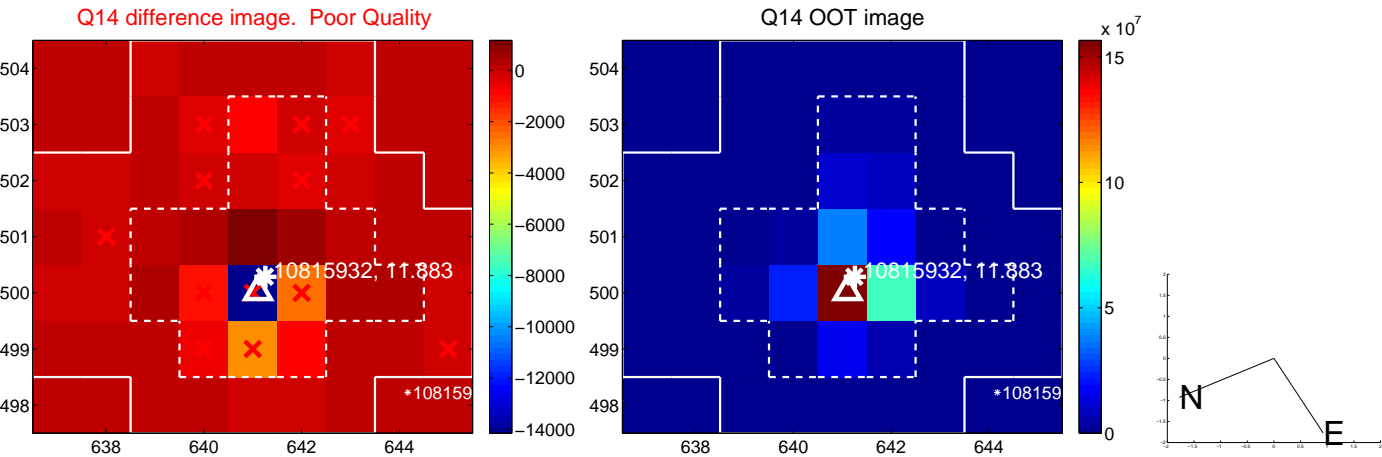
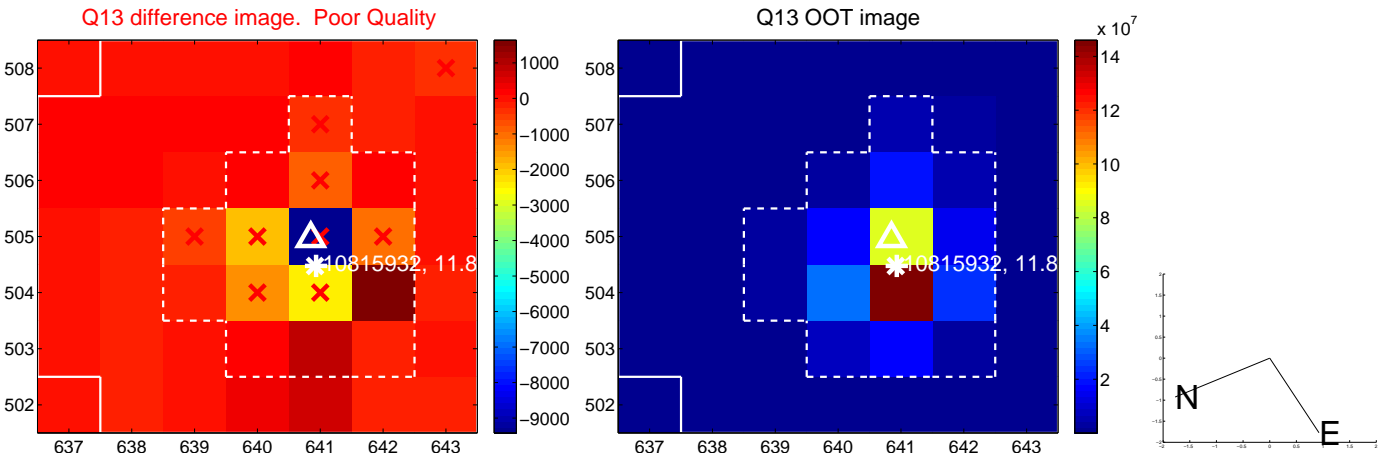




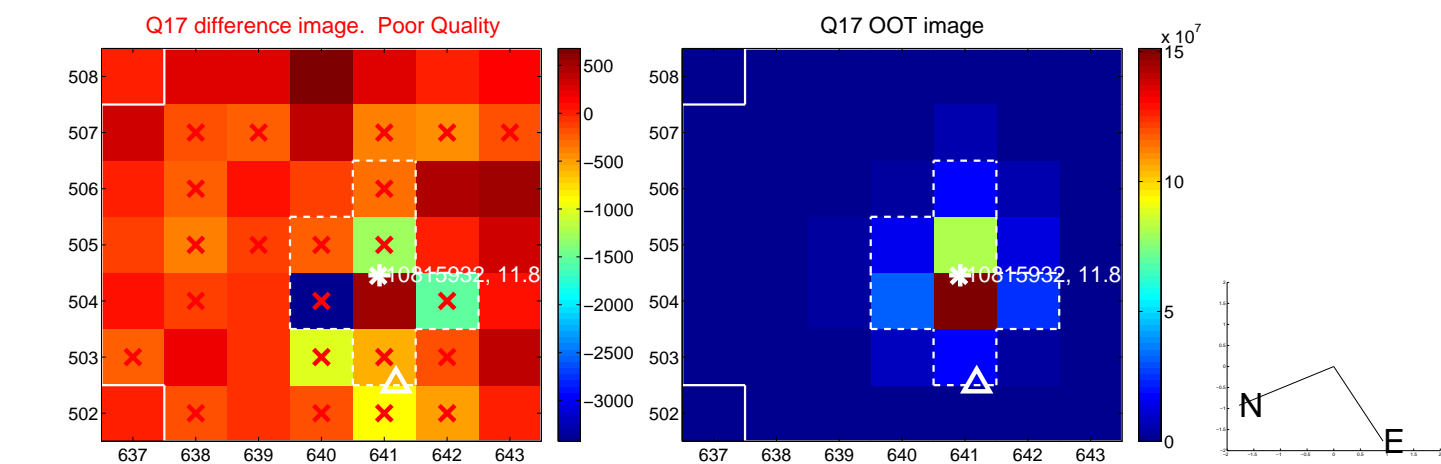
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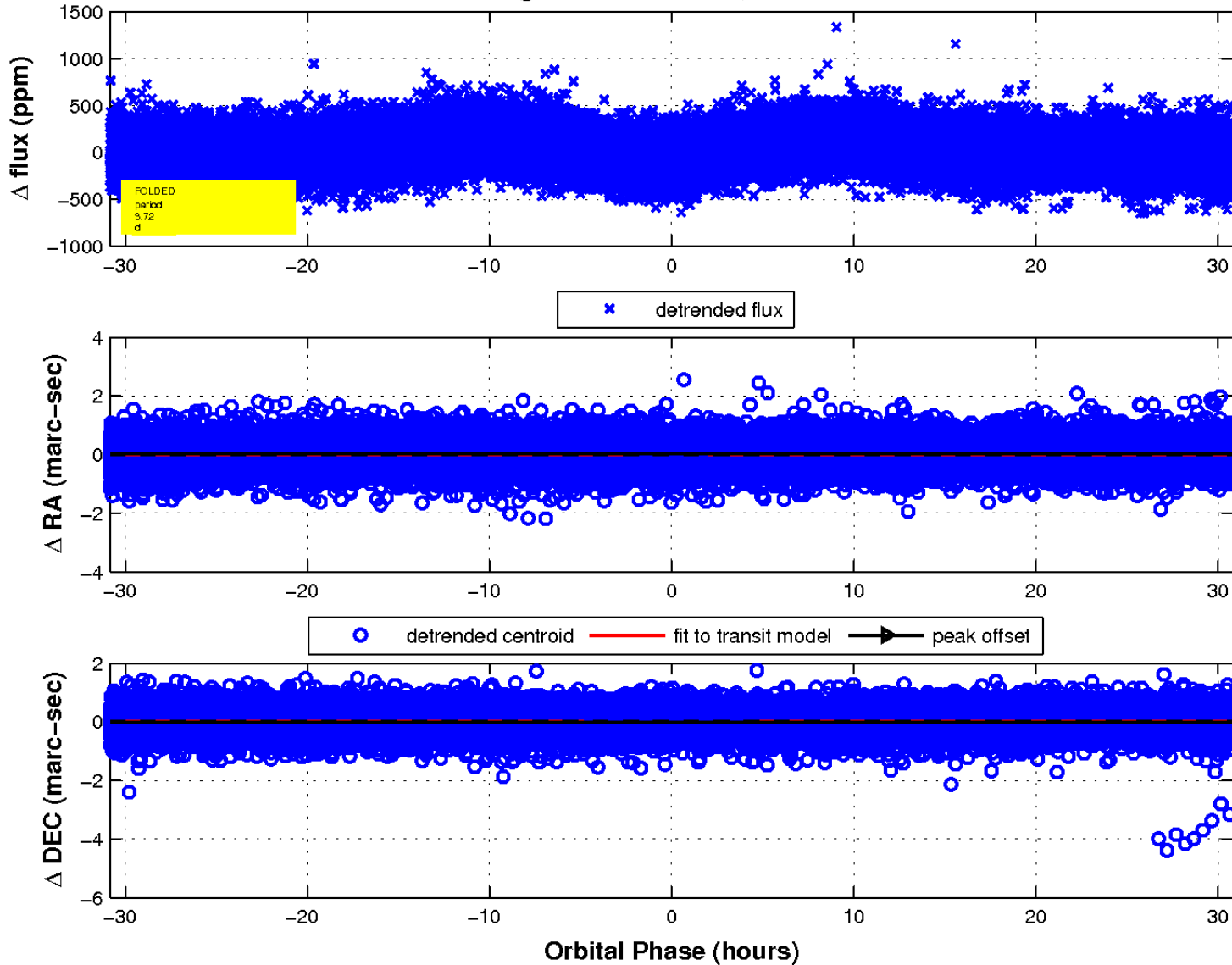
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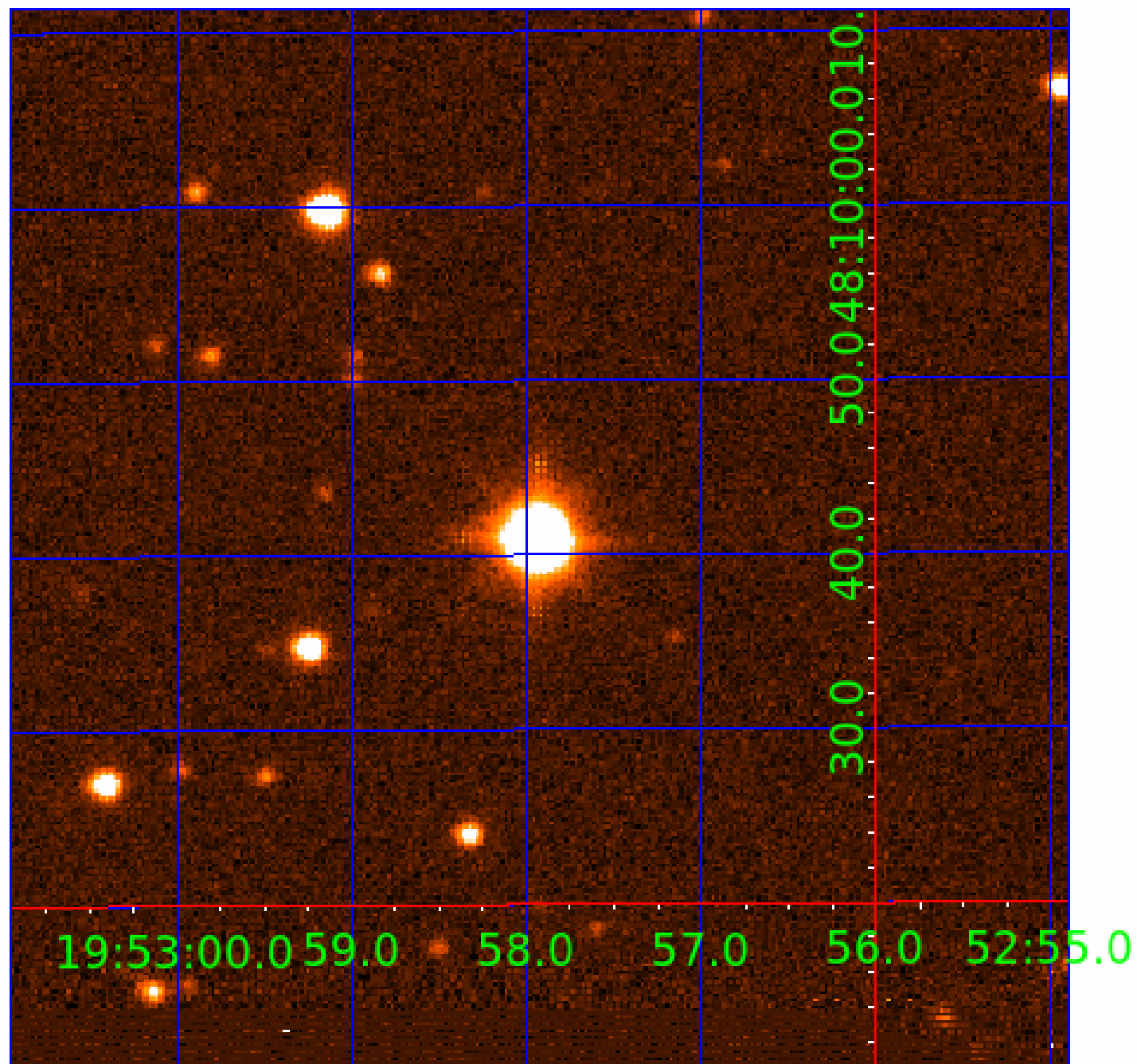


fluxWeightedCentroids, Planet 1 of 9



UKIRT Image

Declination



# KIC 010815932

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010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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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.

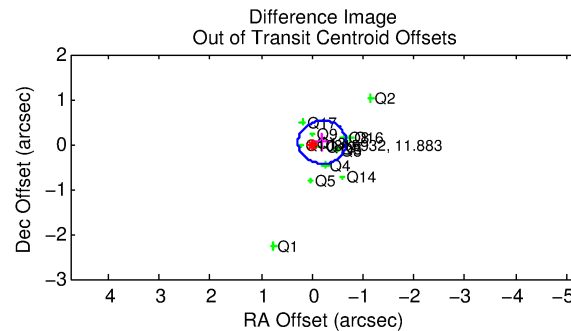
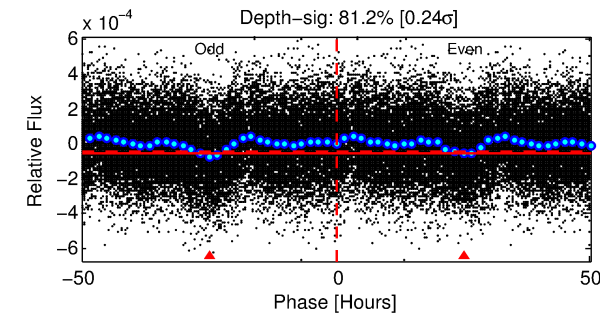
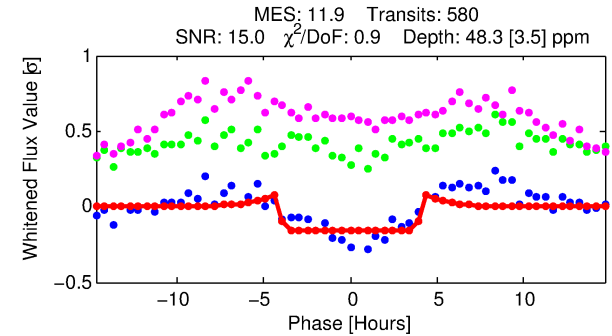
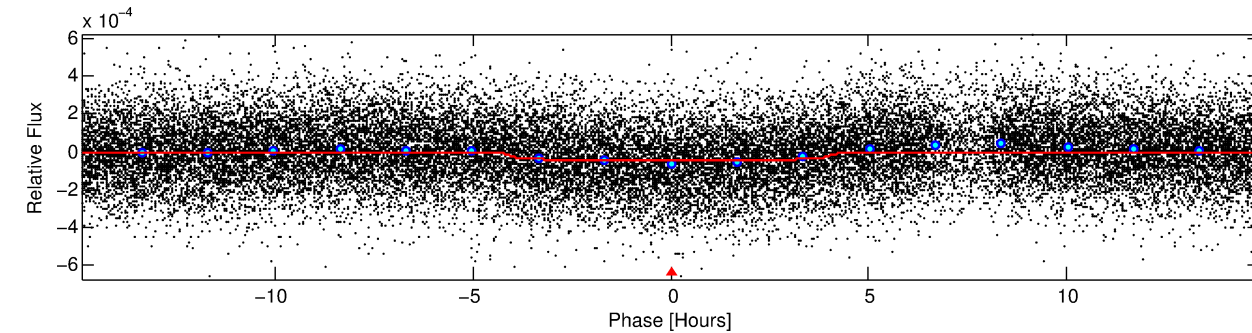
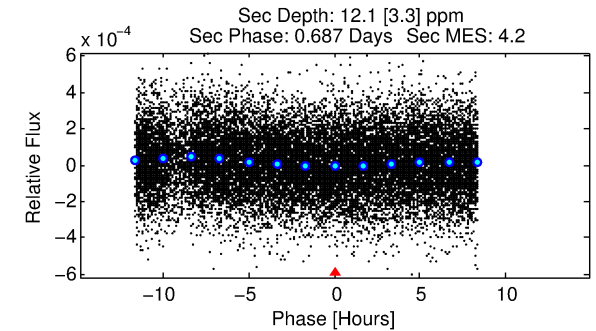
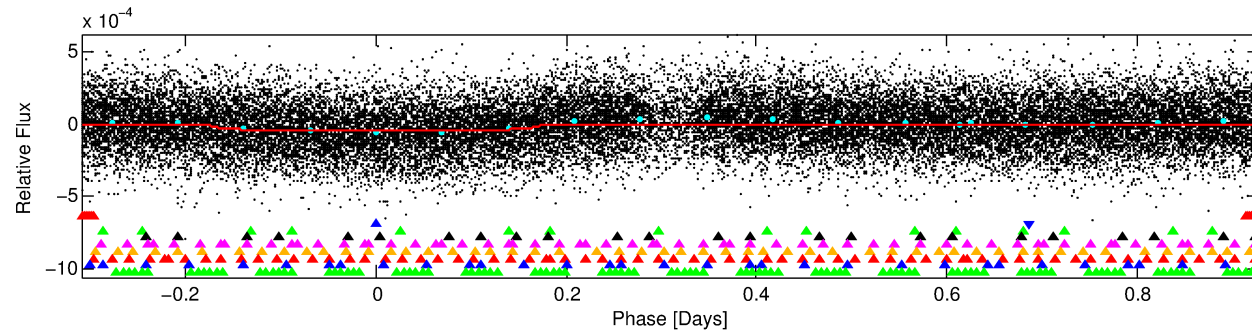
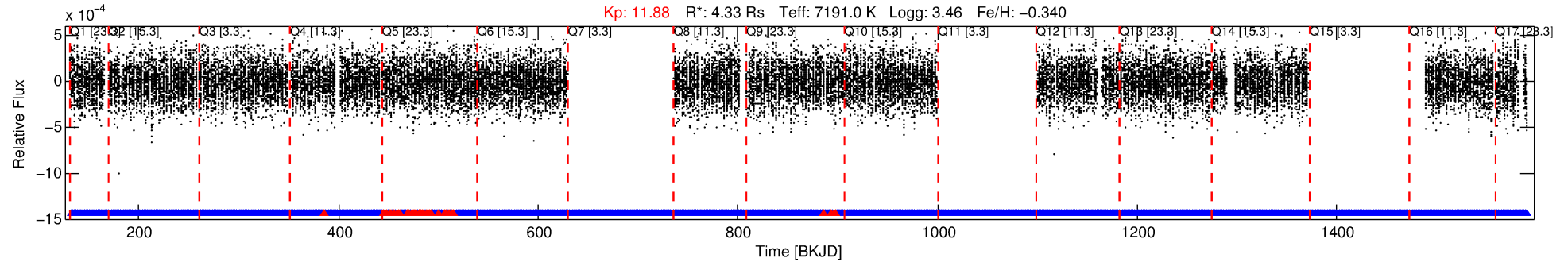
Ephemeris Match Information For 010815932-02

No Significant Match Found



# DV One-Page Summary

KIC: 10815932 Candidate: 2 of 9 Period: 1.239 d



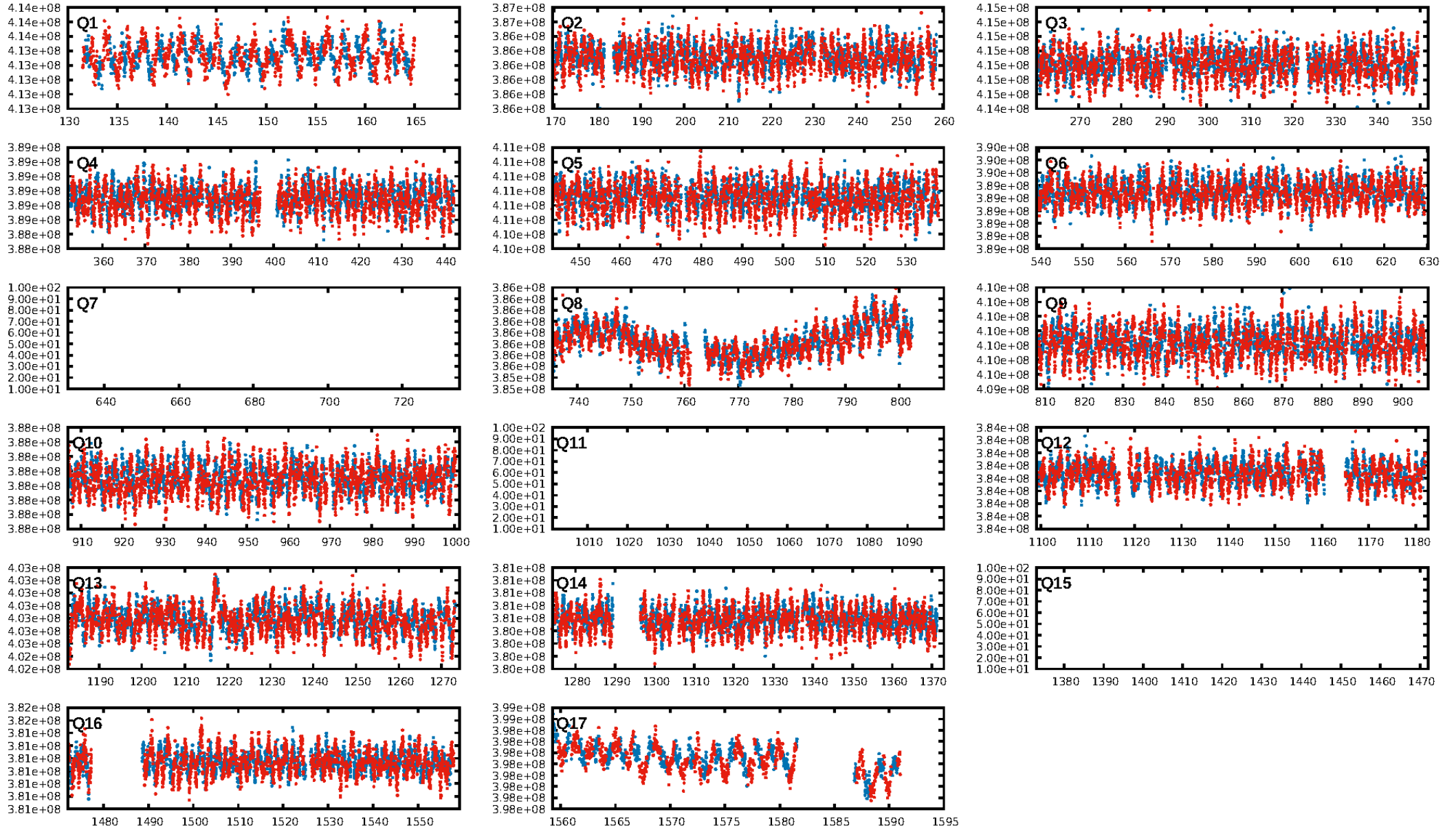
## DV Fit Results:

Period = 1.23916 [0.00001] d  
Epoch = 132.5963 [0.0028] BKJD  
Rp/R\* = 0.0064 [0.0030]  
a/R\* = 1.29 [1.20]  
b = 0.24 [9.28]  
Seff = 56235.15 [64388.10]  
Teff = 3927 [1124] K  
Rp = 3.03 [2.39] Re  
a = 0.0282 [0.0191] AU  
Ag = 0.58 [0.87] [-0.48σ]  
Teffp = 5301 [1307] K [0.80σ]

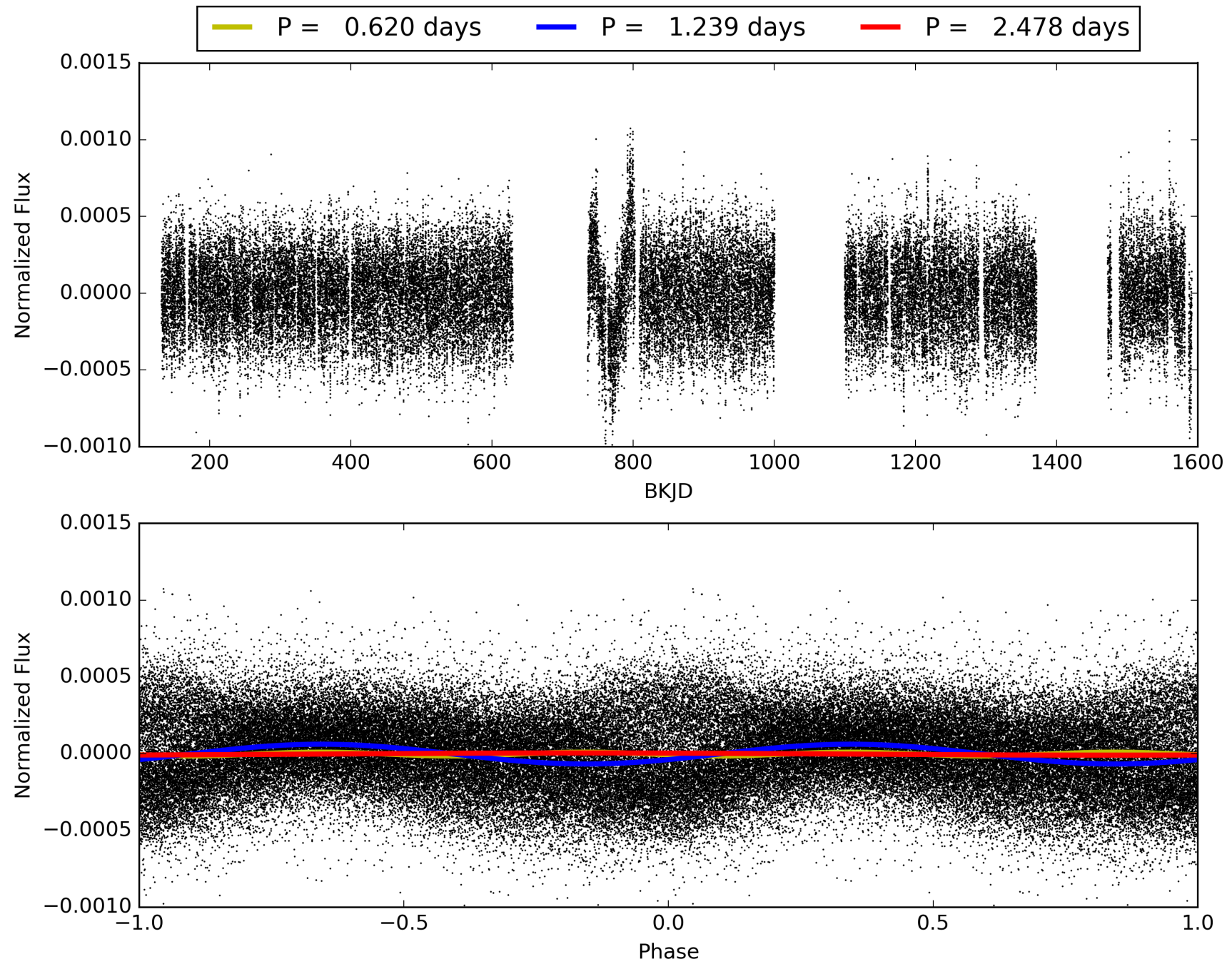
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [4.49σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [513/547]  
GhostDiagnostic-chr: 1.617  
Centroid-sig: 22.5%  
Centroid-so: 0.298 arcsec [1.40σ]  
OotOffset-rm: 0.205 arcsec [1.29σ]  
KicOffset-rm: 0.190 arcsec [1.35σ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 010815932-02, PDC Light Curves

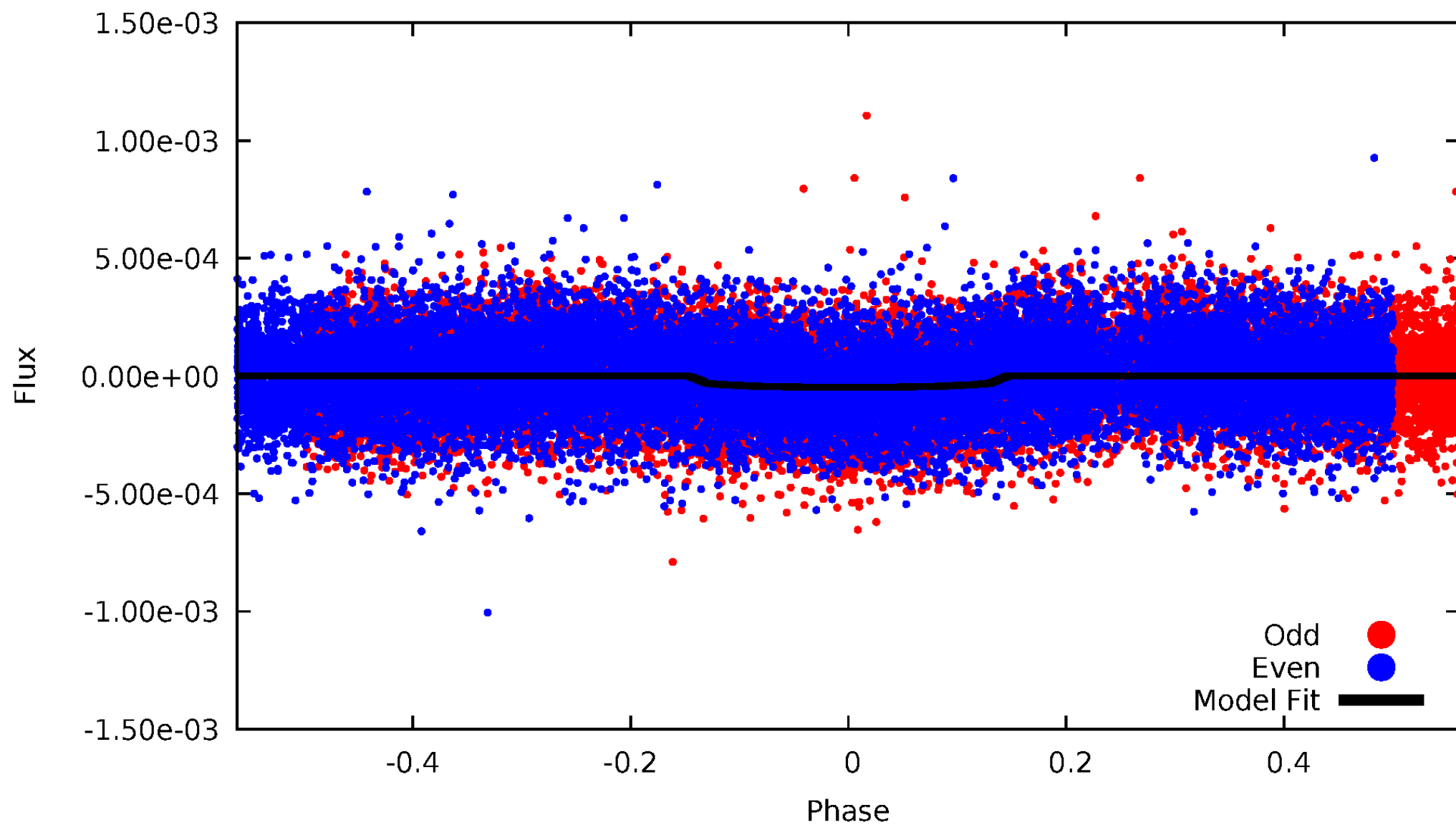


TCE 010815932-02



DV Odd/Even

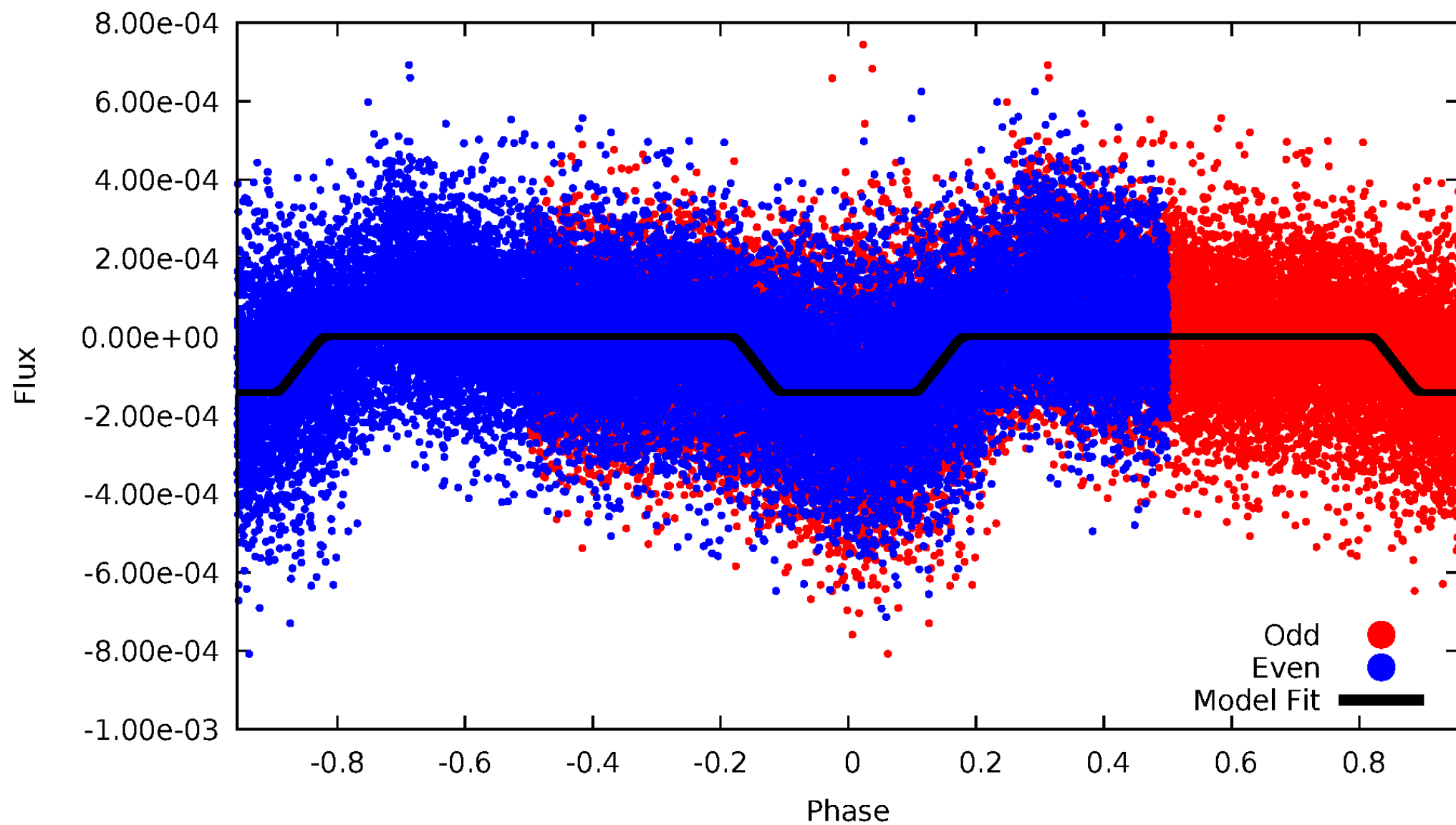
TCE 010815932-02





# ALT Odd/Even

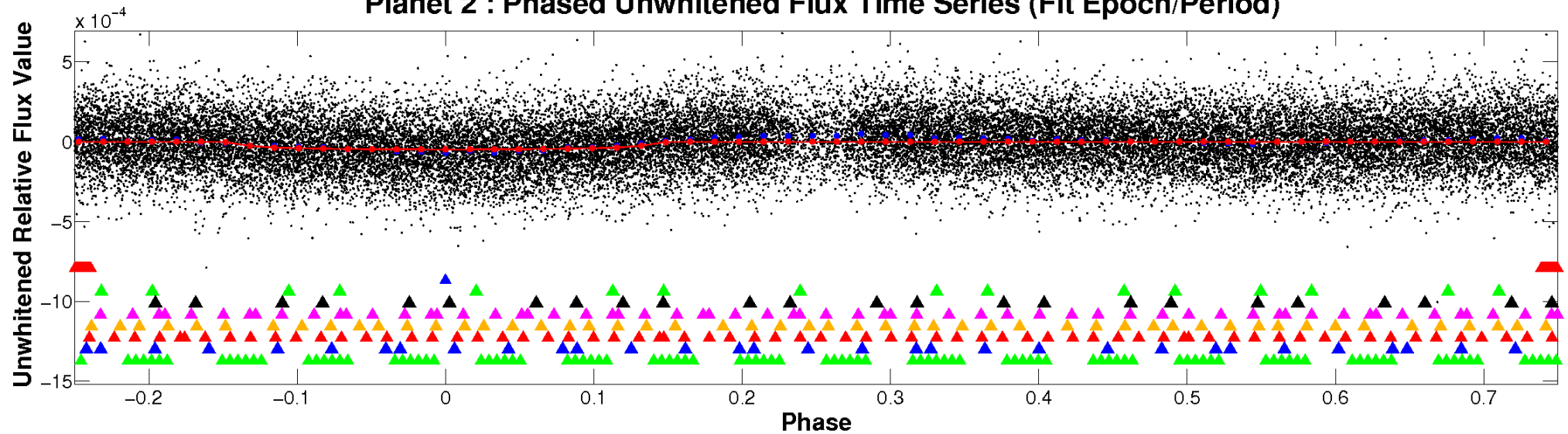
TCE 010815932-02



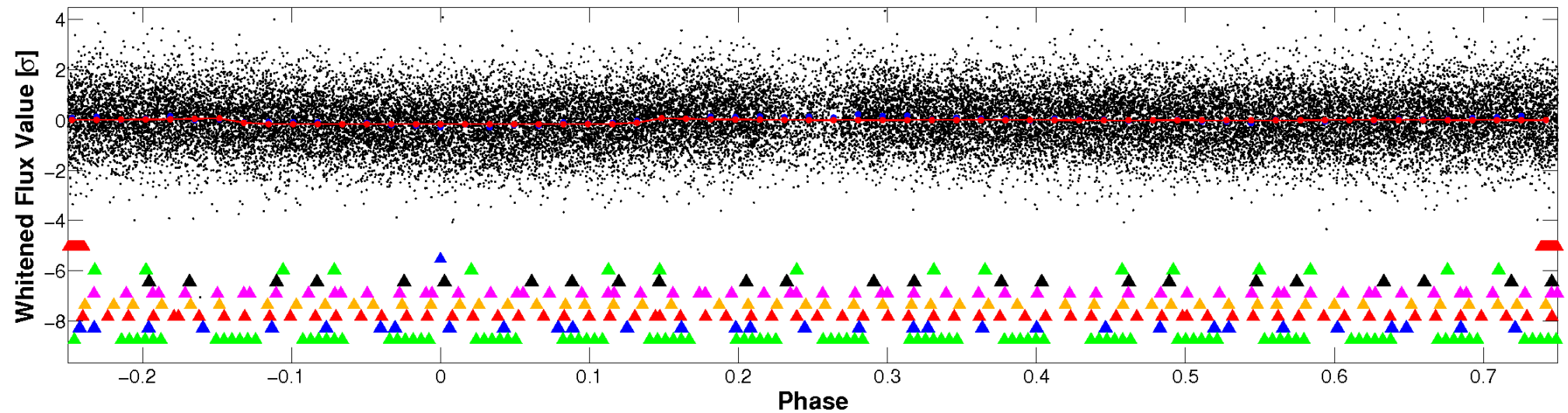


# Non-Whitened Vs. Whitened Light Curve

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

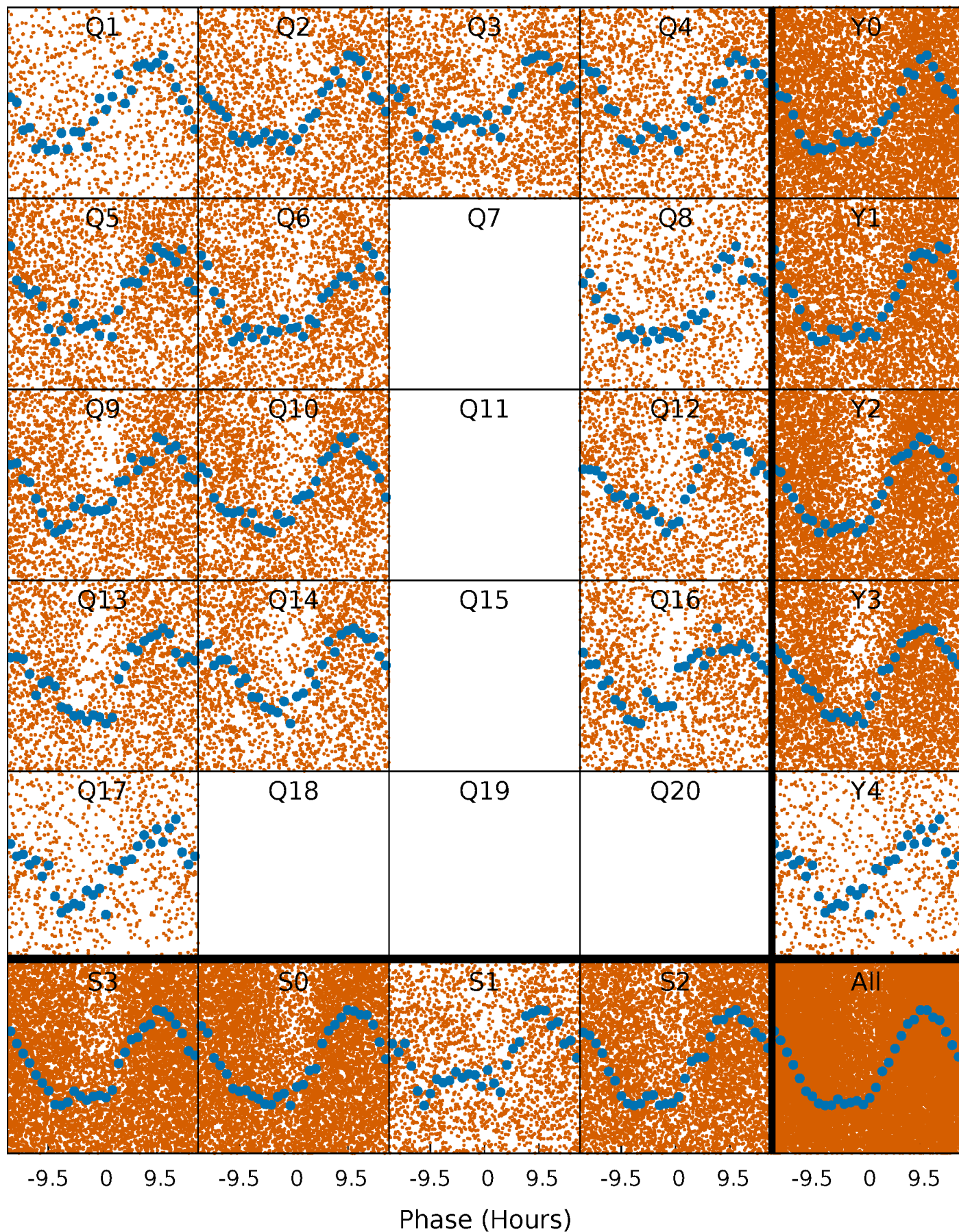


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

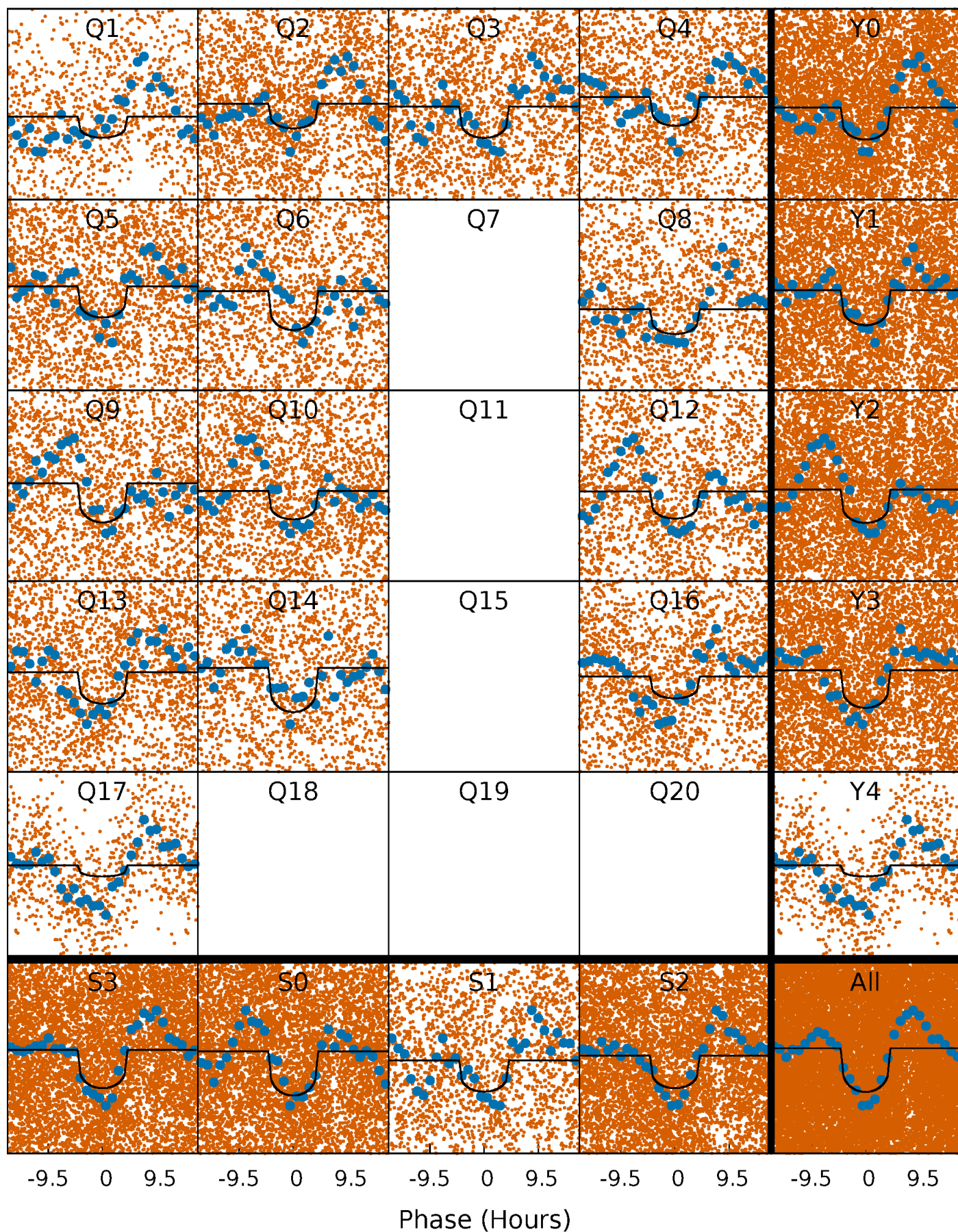
TCE 010815932-02 P= 1.239156 Days  $T_0=132.596322$  (BKJD)





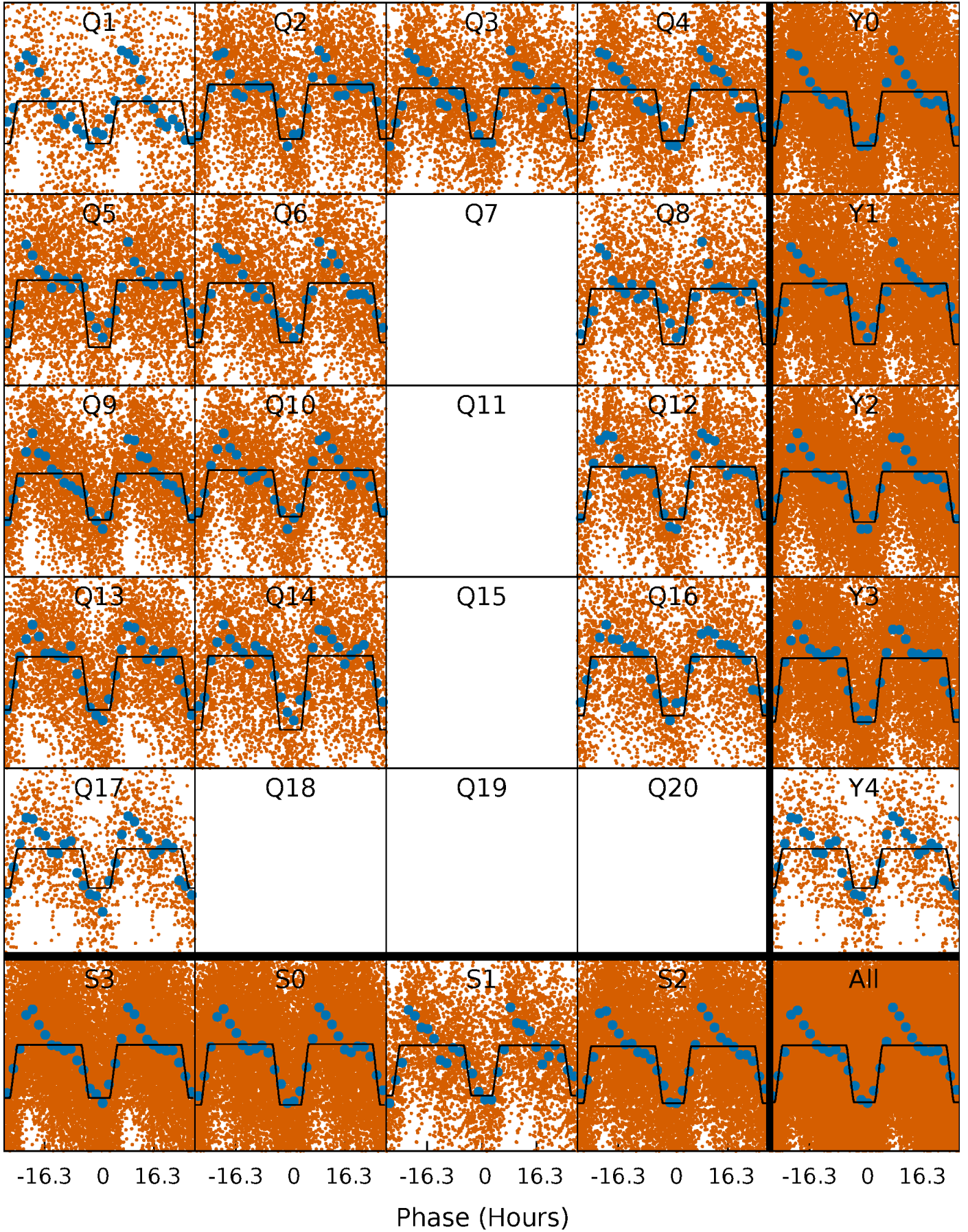
# DV Quarter-Phased Transit Curves

TCE 010815932-02   P= 1.239156 Days    $T_0=132.596322$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010815932-02   P= 1.239103 Days    $T_0=132.619102$  (BKJD)

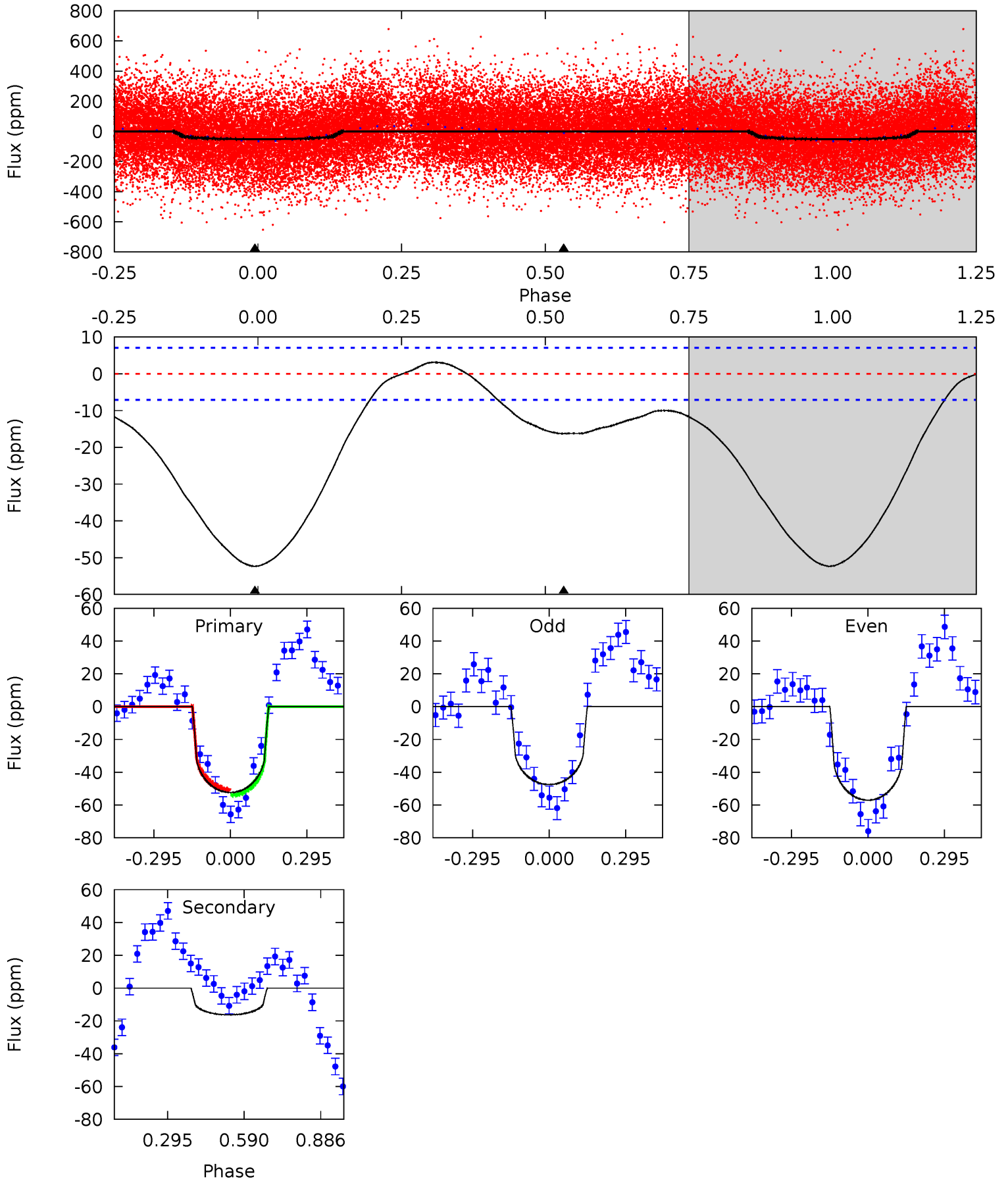




# DV Model-Shift Uniqueness Test

010815932-02, P = 1.239156 Days, E = 131.357166 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
32.0	9.96	0	0	4.33	1.05	3.87	32.0	32.0	9.96	9.96	2.99	1.13	0.06	1.04

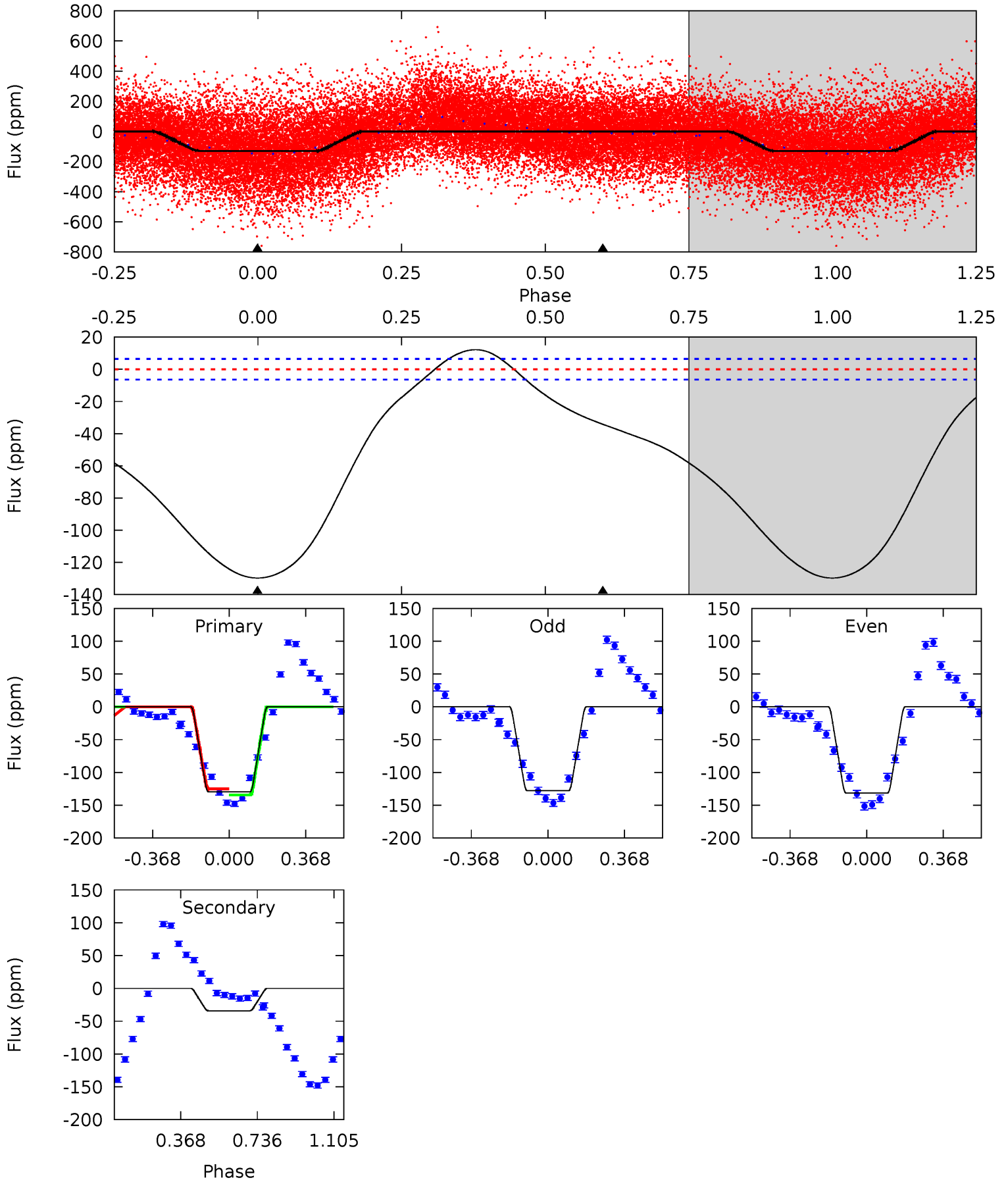




# Alt Model-Shift Uniqueness Test

010815932-02, P = 1.239103 Days, E = 131.379999 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
86.4	22.7	0	0	4.28	0.90	6.00	86.4	86.4	22.7	22.7	1.18	1.05	0.09	3.25



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-16 \pm 2$	$2.67^{+1.52}_{-1.37}$	$5319^{+342}_{-864}$	$5106^{+2315}_{-1350}$	$0.977^{+3.073}_{-0.573}$
Alt.	$-34 \pm 2$	$5.19^{+1.56}_{-1.89}$	$5334^{+329}_{-820}$	$4329^{+984}_{-1229}$	$0.557^{+0.700}_{-0.226}$

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

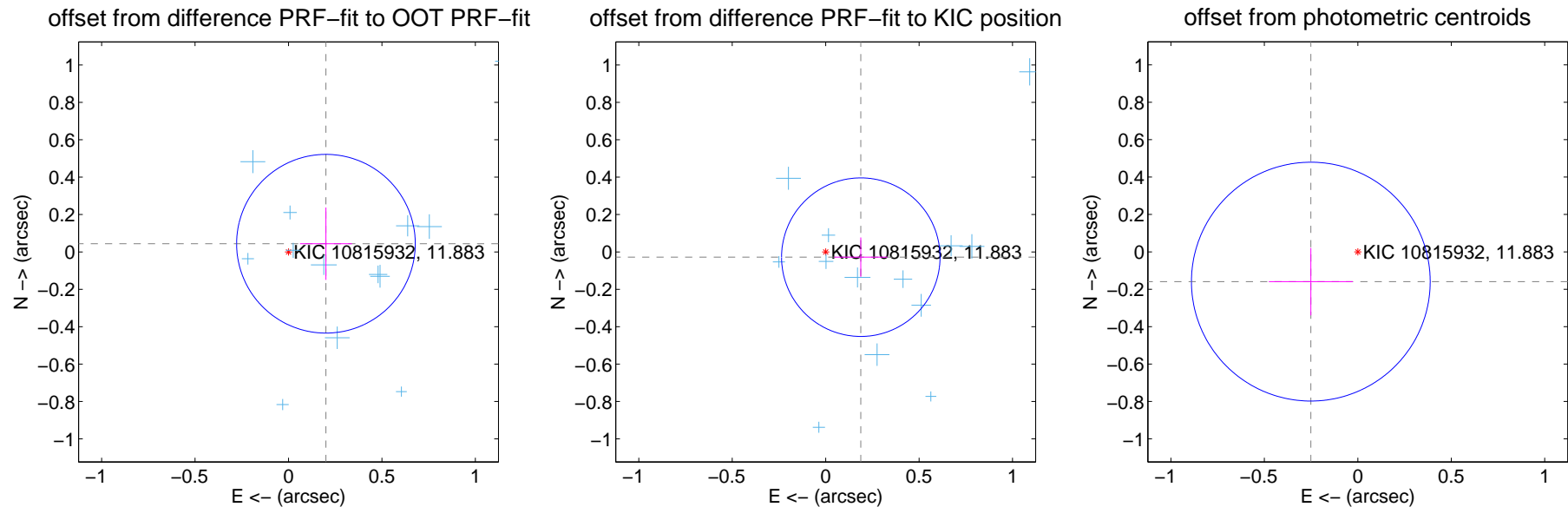
## DV Centroid Data

Supplemental centroid analysis for 010815932-02. **Kepler magnitude: 11.88.** Transit SNR 15.00

There are 14 quarters with good PRF difference image offsets

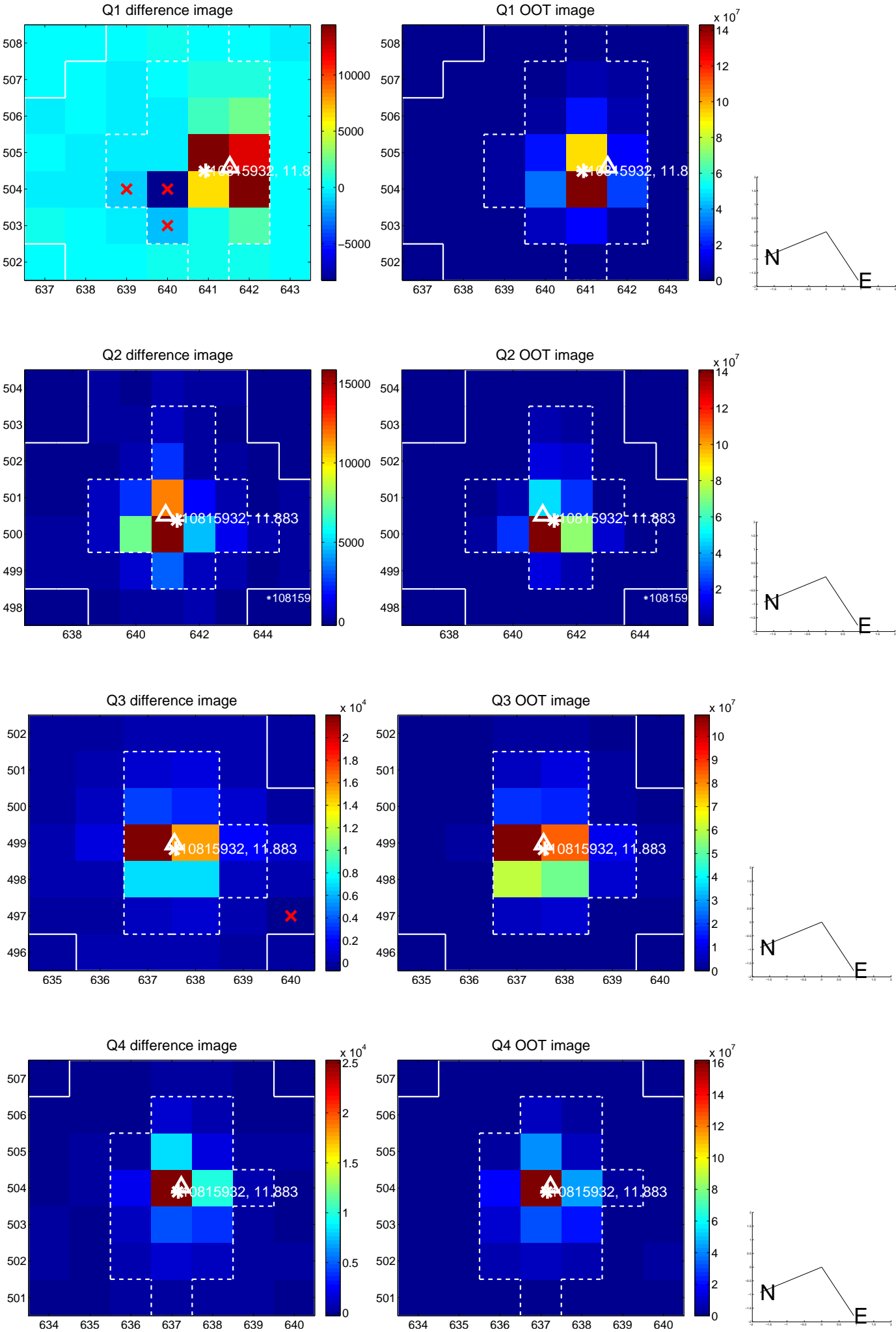
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.205 \pm 0.159$	1.29	$-0.200 \pm 0.139$	$0.044 \pm 0.194$
PRF-fit source offset from KIC position	$0.190 \pm 0.141$	1.35	$-0.188 \pm 0.142$	$-0.028 \pm 0.105$
photometric centroid source offset	$0.30 \pm 0.21$	1.40	$0.25 \pm 0.22$	$-0.16 \pm 0.18$

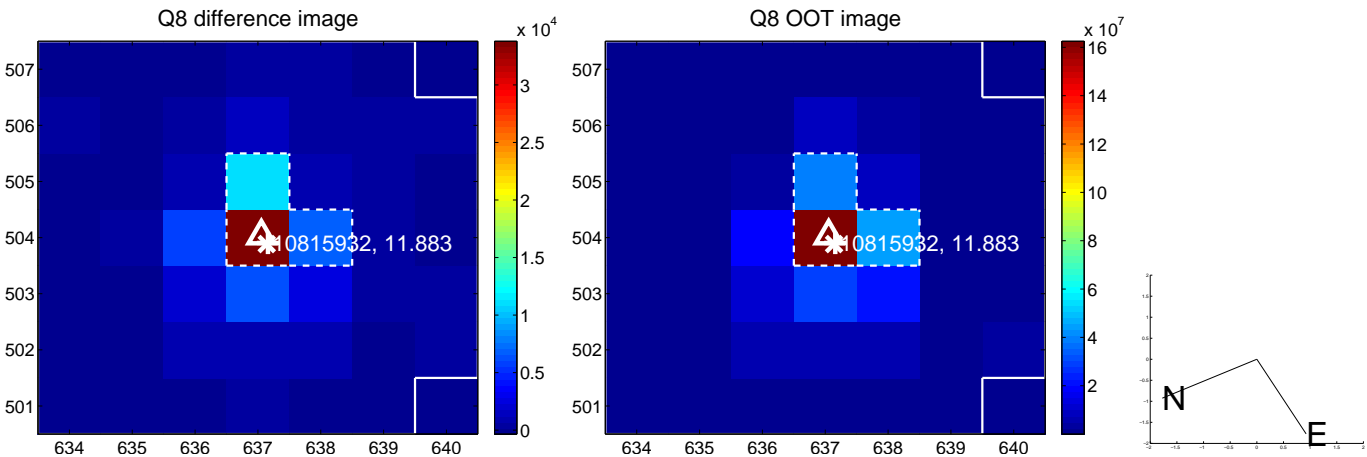
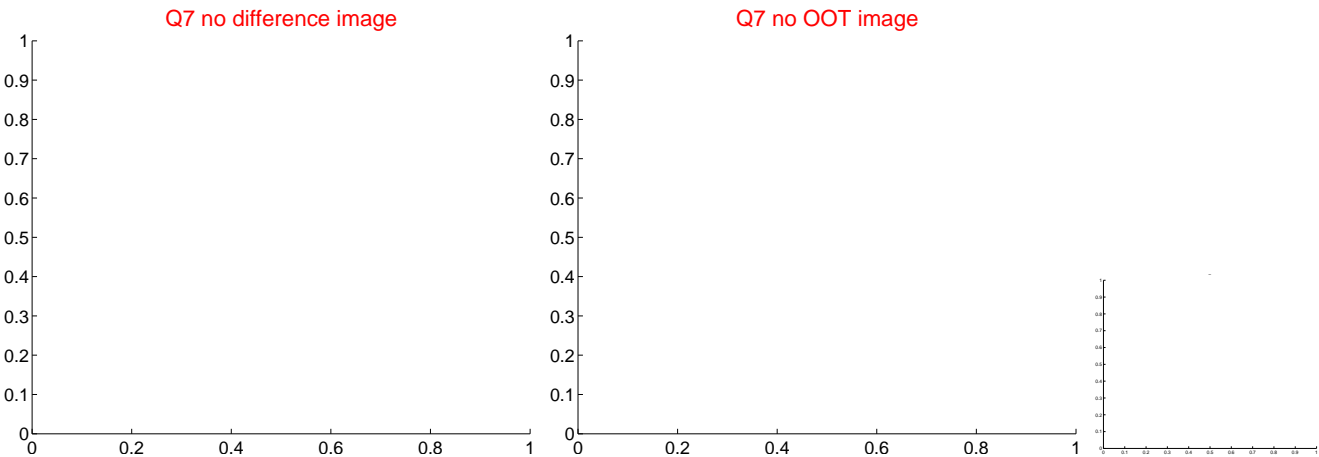
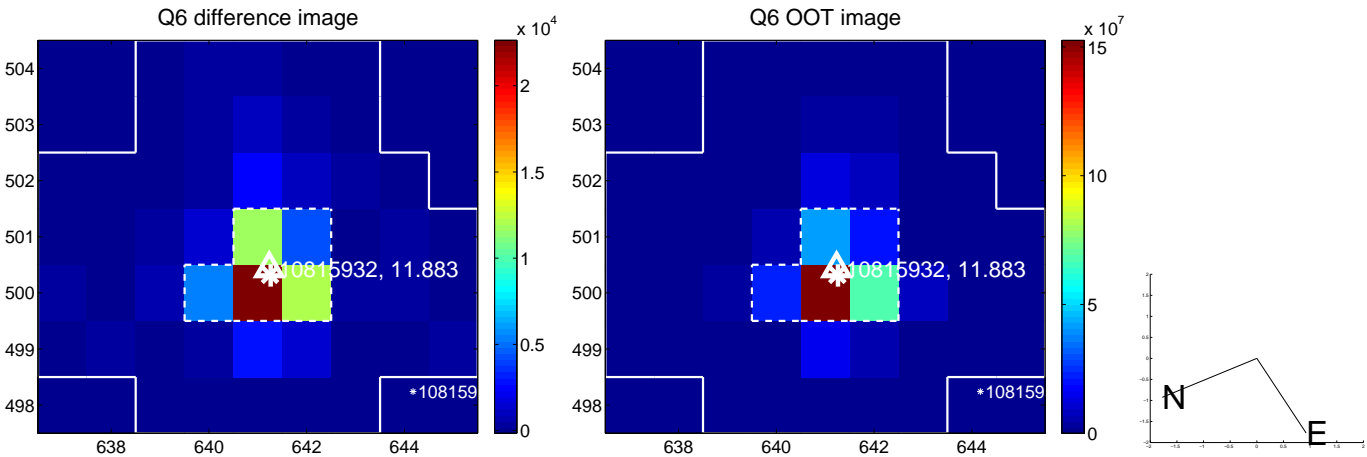
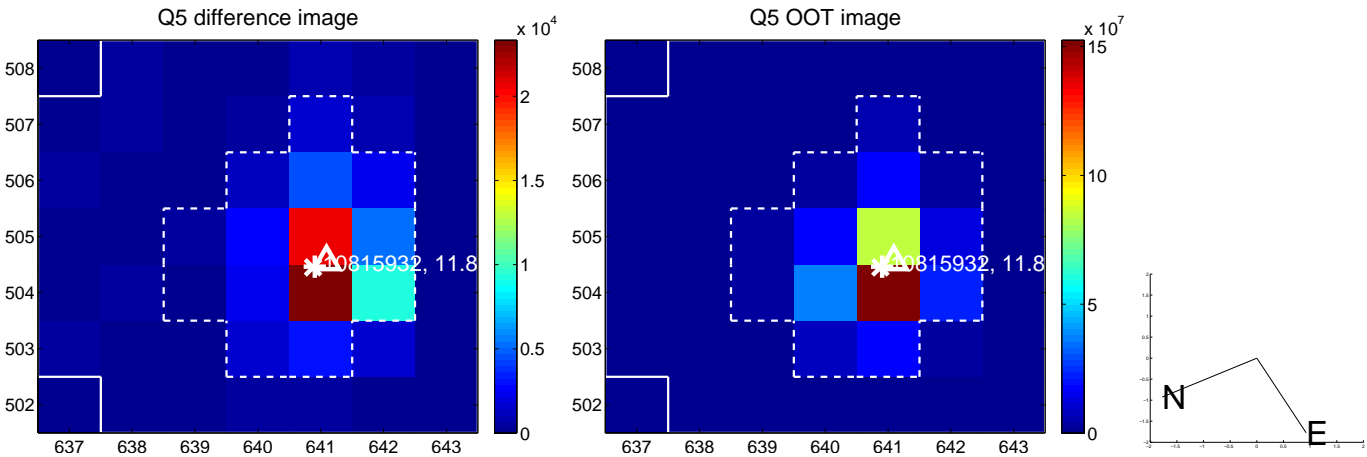


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

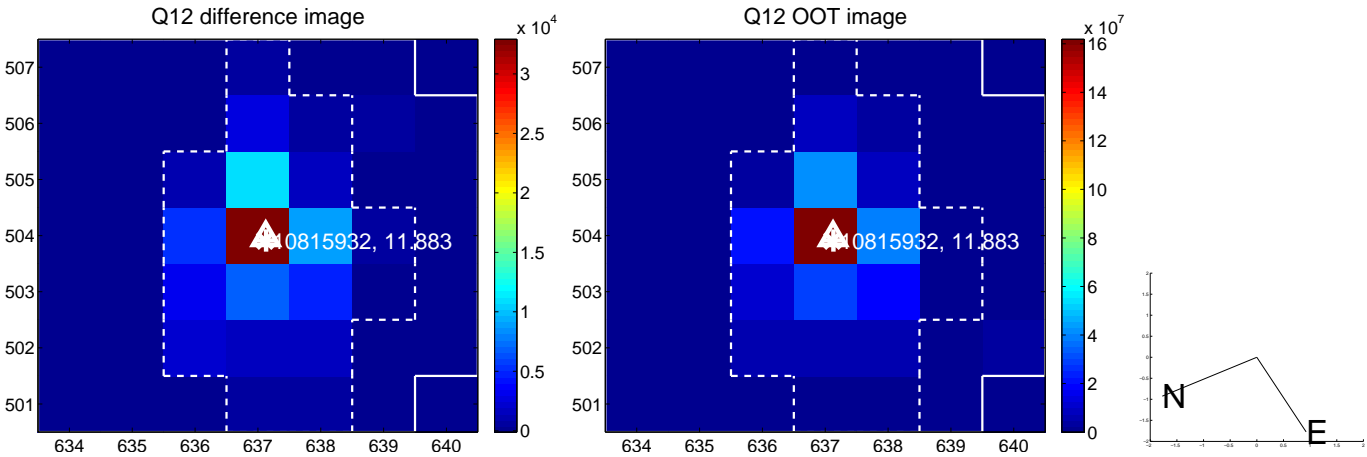
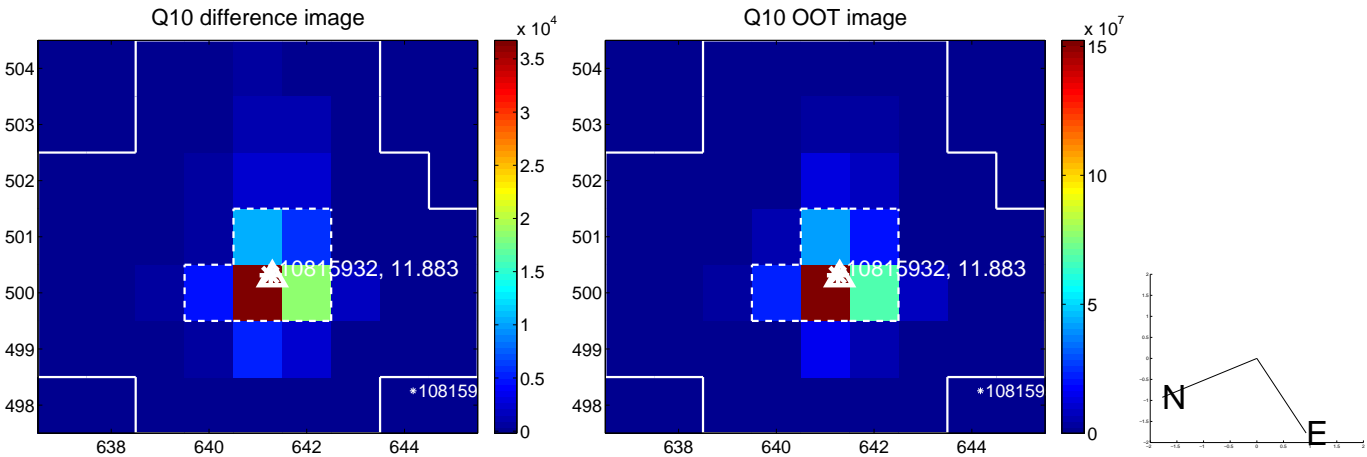
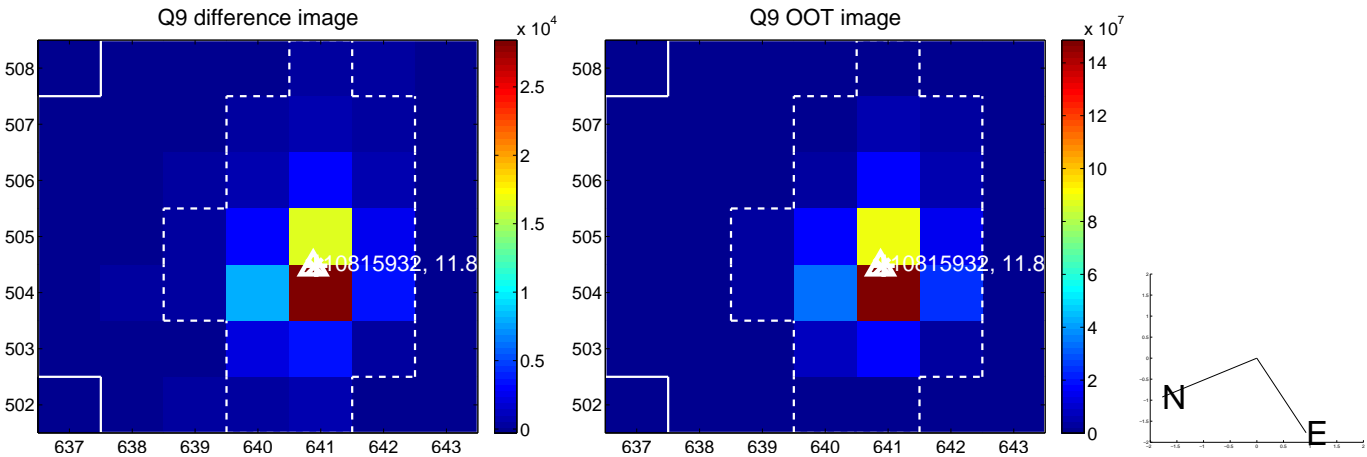


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

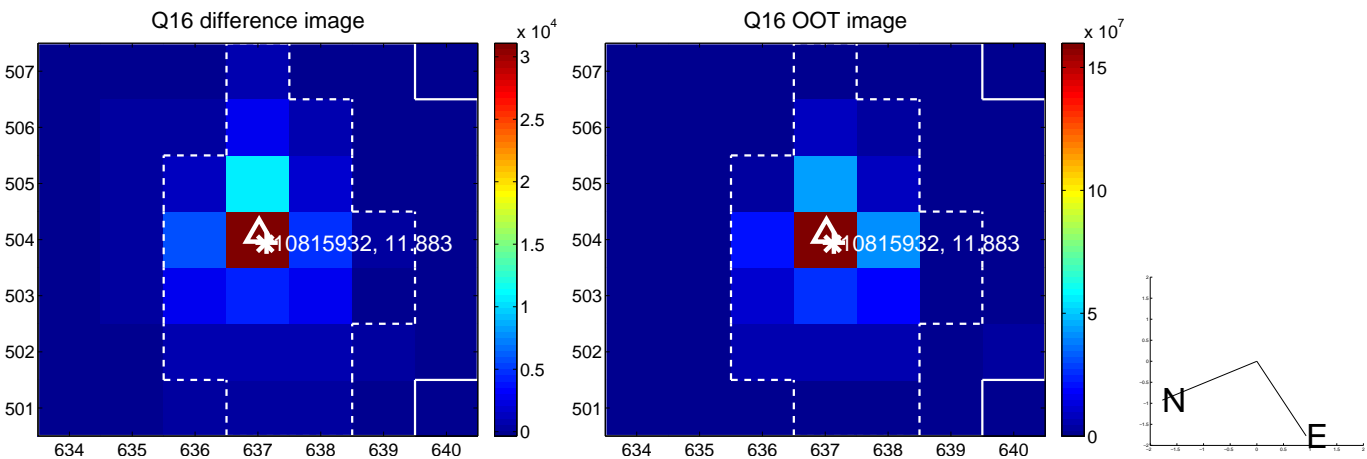
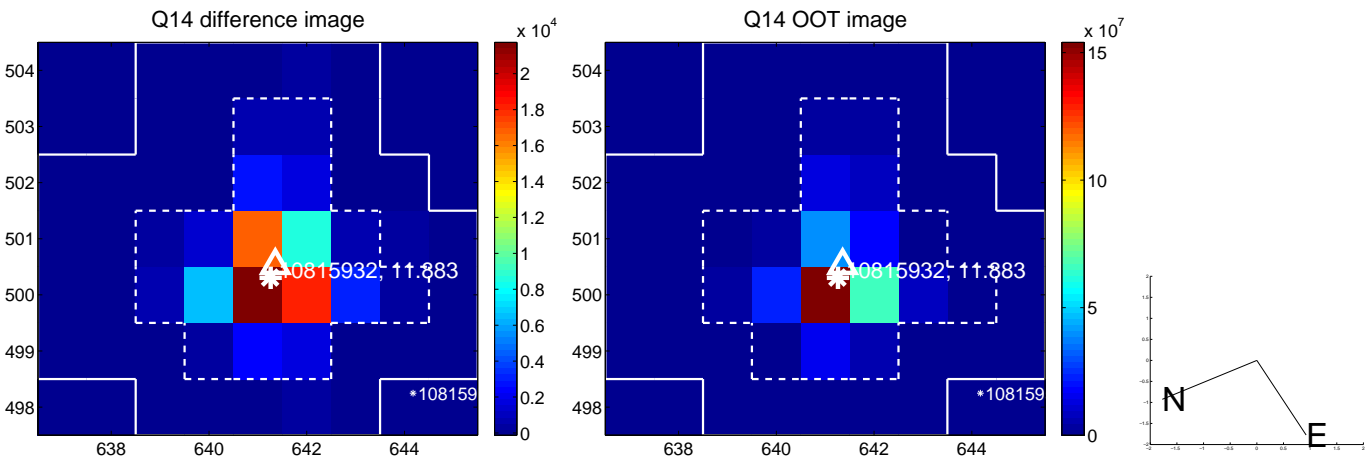
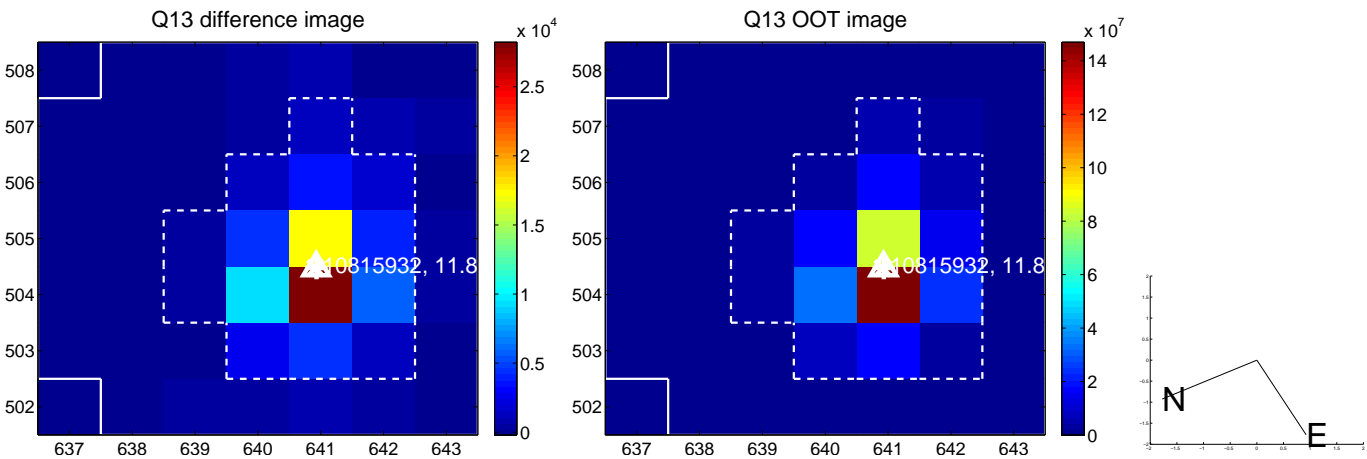




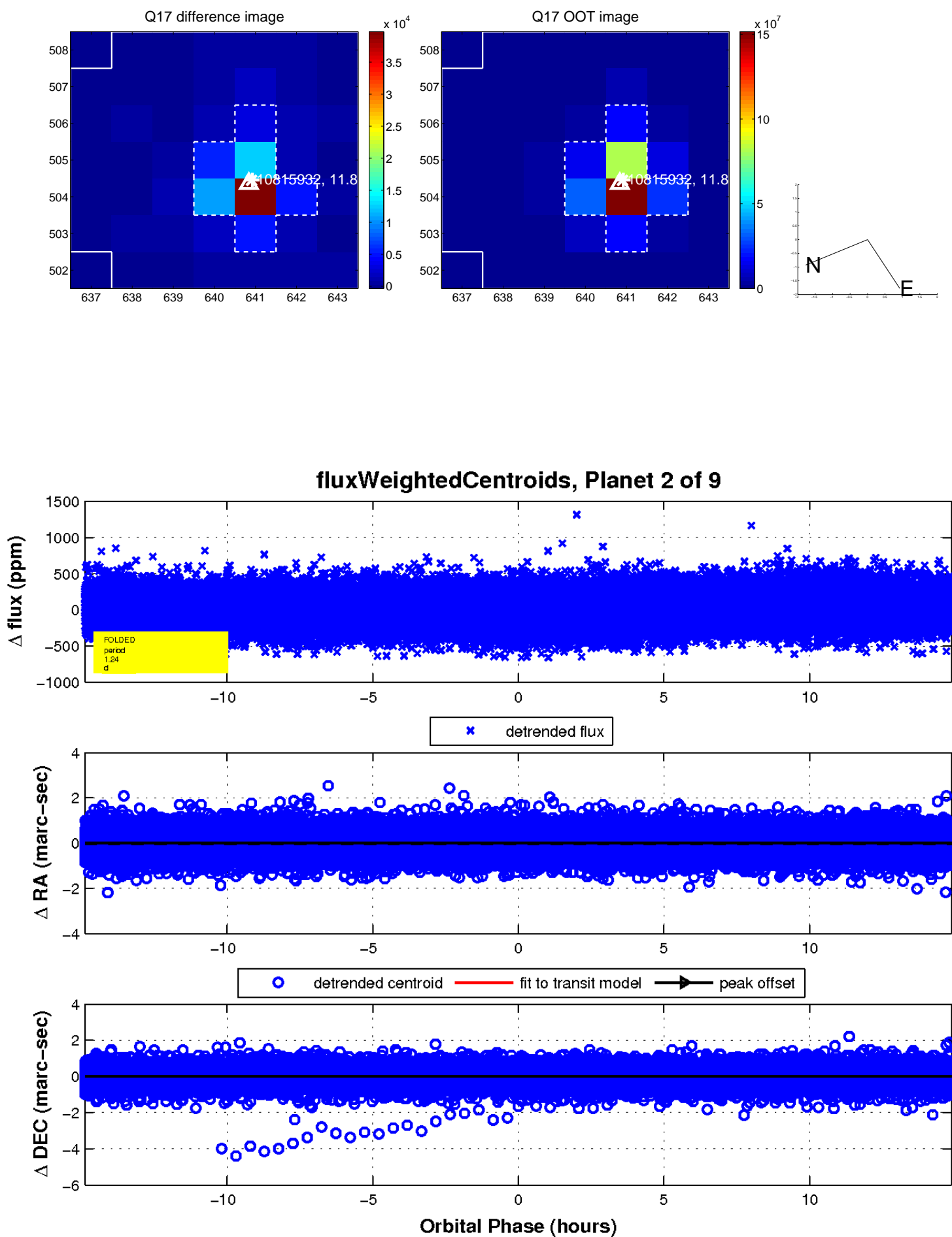
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

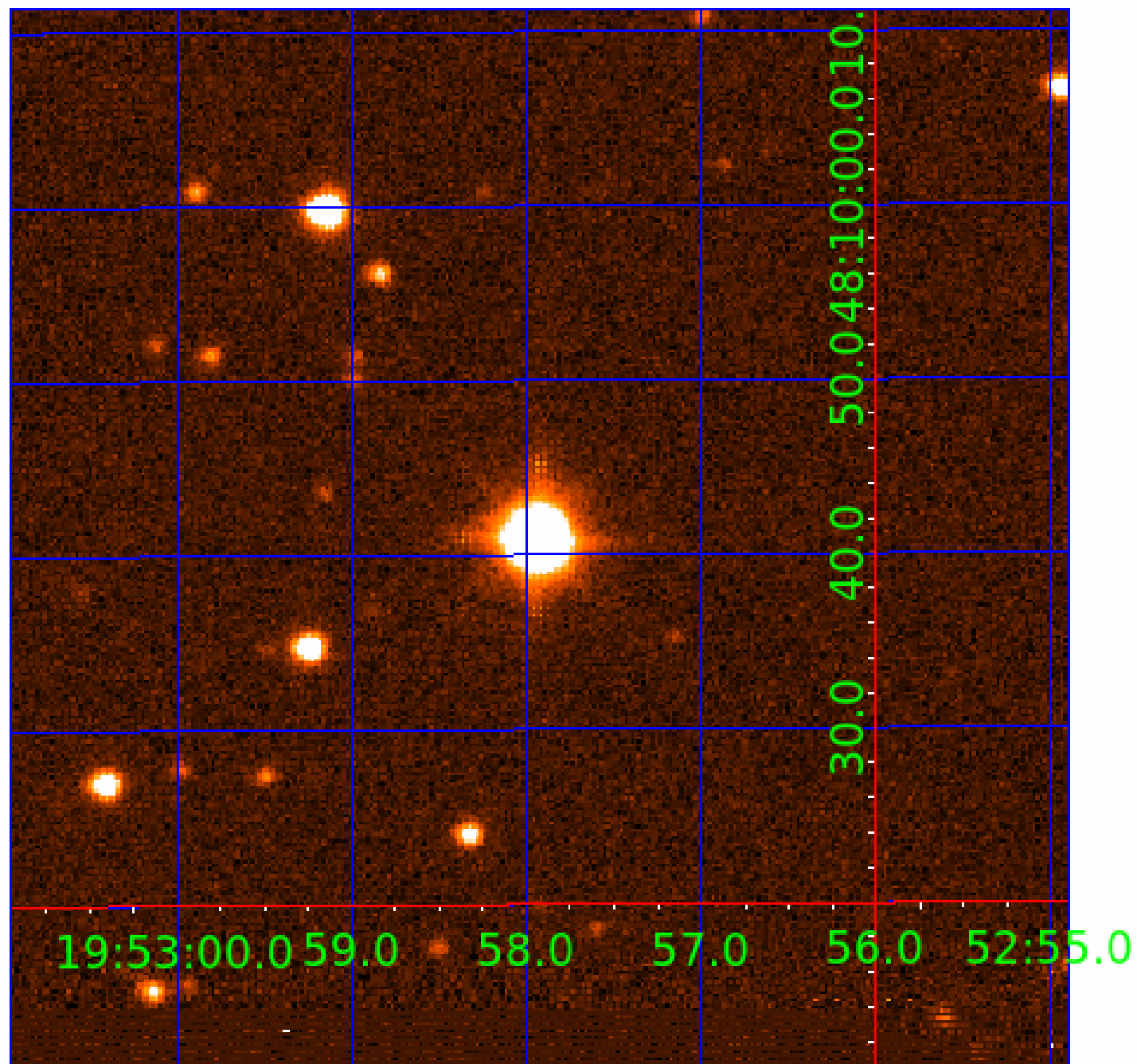


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

**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.

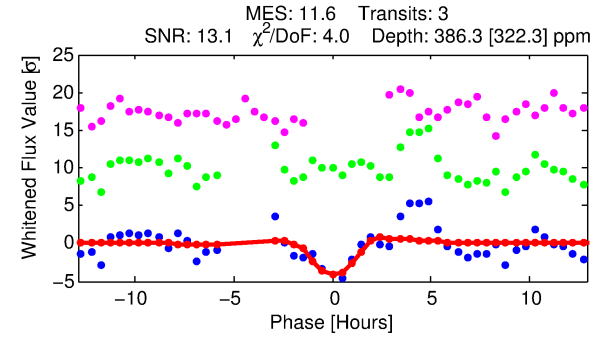
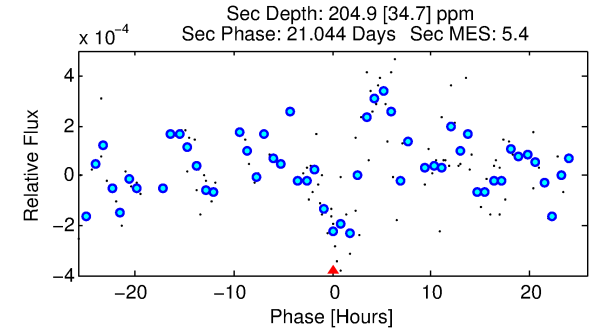
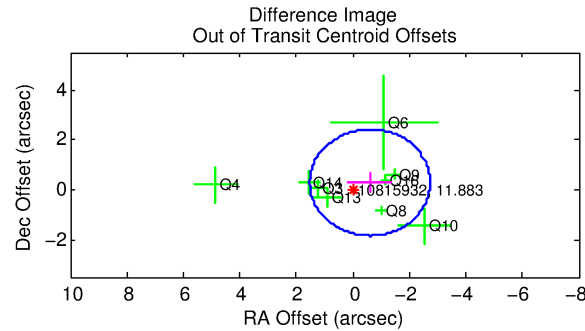
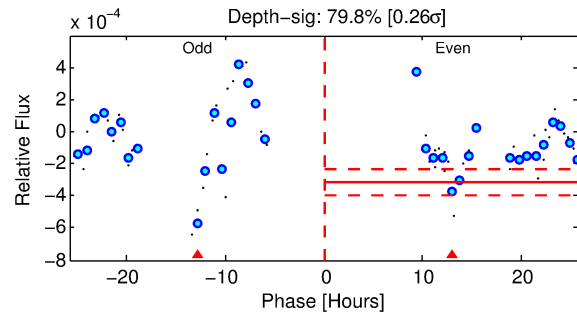
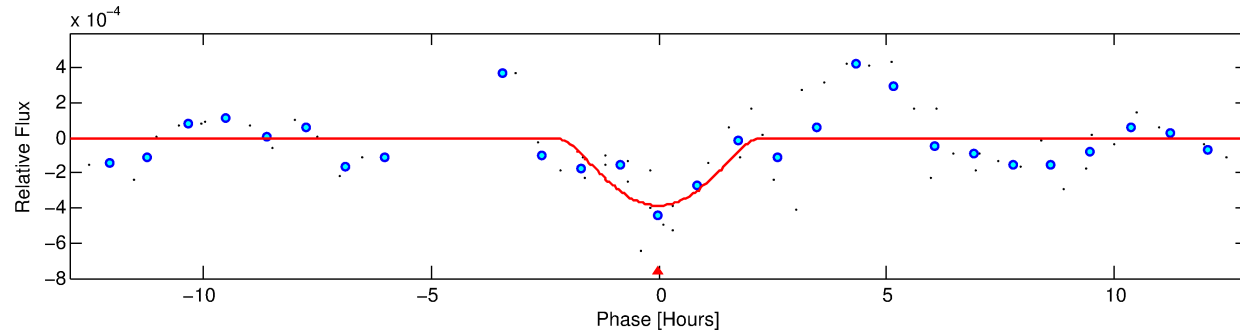
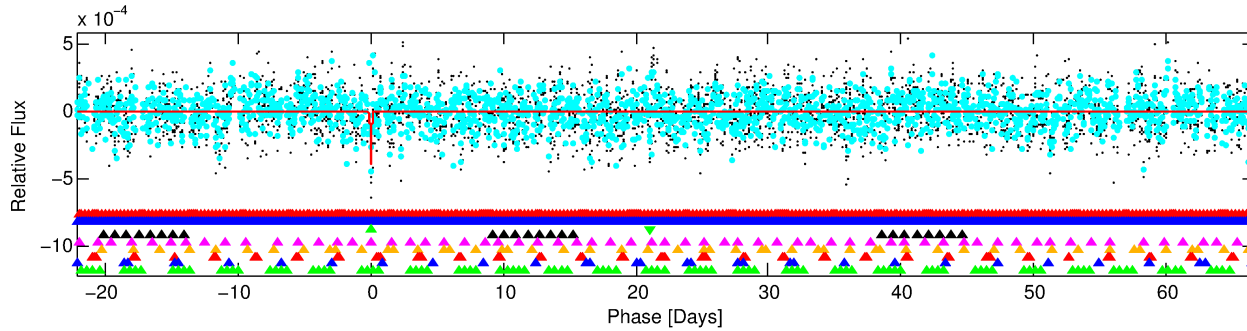
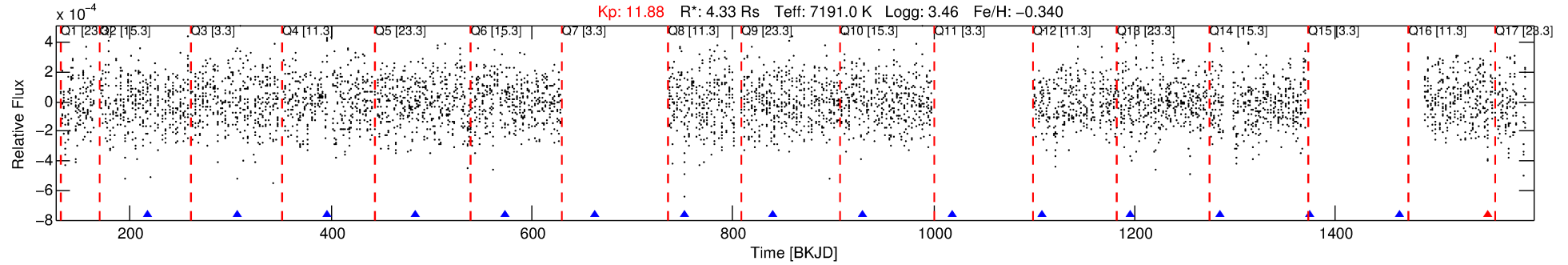
Ephemeris Match Information For 010815932-03

No Significant Match Found



# DV One-Page Summary

KIC: 10815932 Candidate: 3 of 9 Period: 88.949 d



## DV Fit Results:

Period = 88.94863 [0.00151] d  
Epoch = 217.8106 [0.0183] BKJD  
 $R_p/R^*$  = 0.0349 [0.2523]  
 $a/R^*$  = 42.18 [82.16]  
 $b$  = 1.00 [0.39]  
 $S_{\text{eff}}$  = 188.51 [215.83]  
 $T_{\text{eq}}$  = 945 [270] K  
 $R_p$  = 16.50 [119.58]  $R_e$   
 $a$  = 0.4878 [0.3294] AU  
 $A_g$  = 98.50 [1426.51] [0.07 $\sigma$ ]  
 $T_{\text{eff}}$  = 4602 [16612] K [0.22 $\sigma$ ]

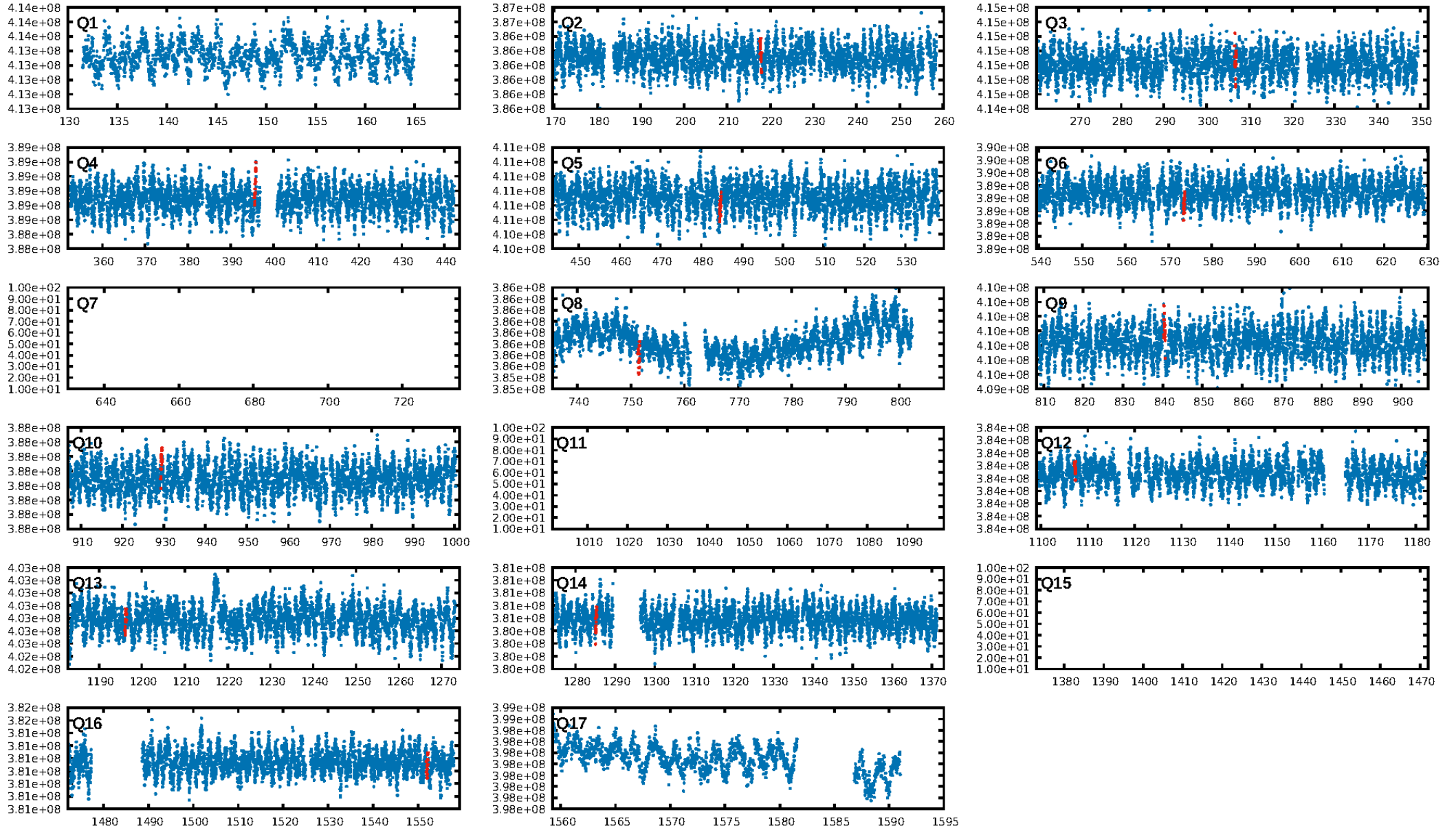
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [125.25 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 25.4%  
ModelChiSquareGof-sig: 30.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: -0.04327  
Centroid-sig: 42.4%  
Centroid-so: 0.324 arcsec [0.85 $\sigma$ ]  
OotOffset-rm: 0.661 arcsec [0.93 $\sigma$ ]  
OotOffset-st: 3/1/3/2 [9]  
KicOffset-rm: 0.643 arcsec [0.90 $\sigma$ ]  
KicOffset-st: 3/1/3/2 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.00 [0/12]

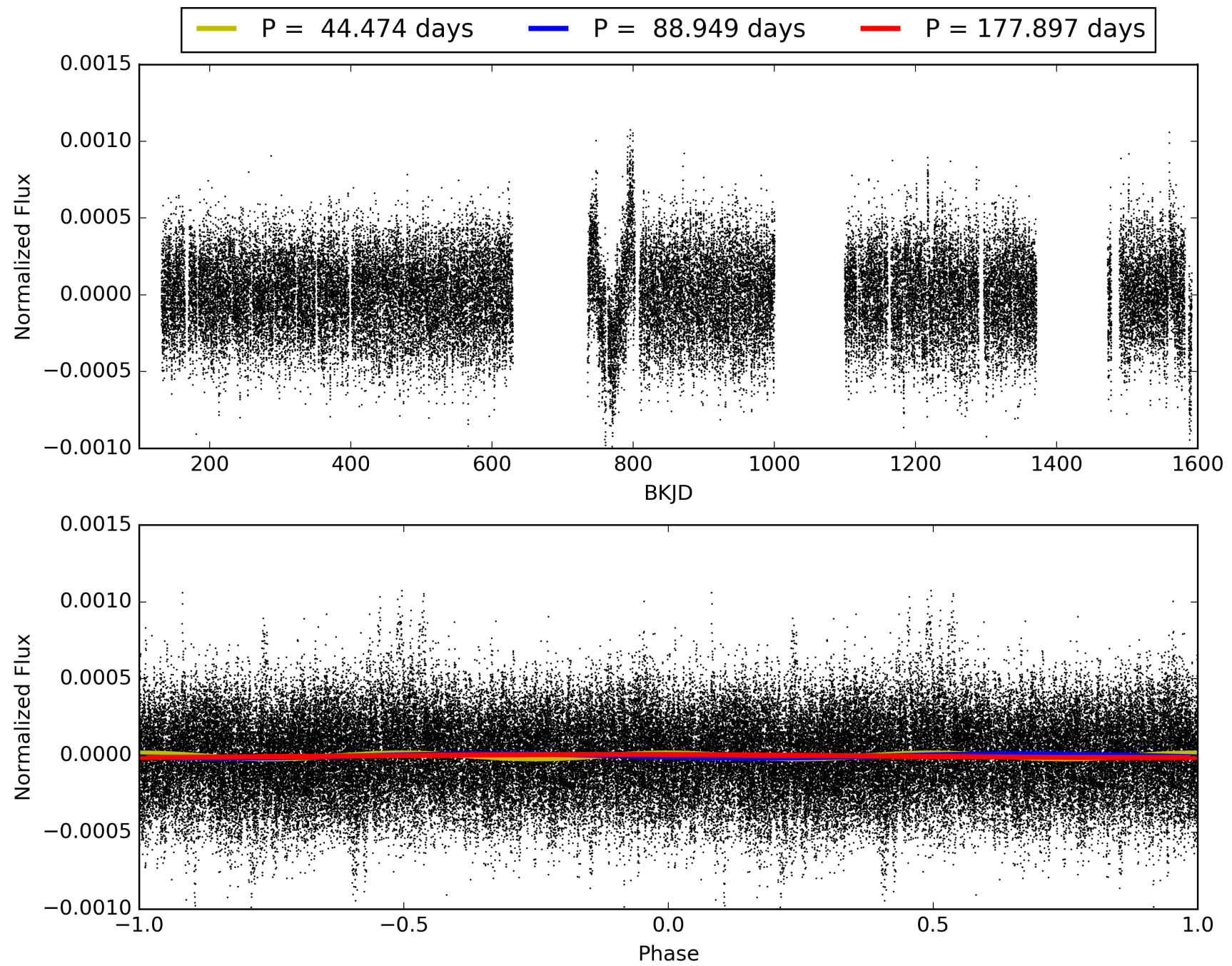
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:06 Z

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

# TCE 010815932-03, PDC Light Curves

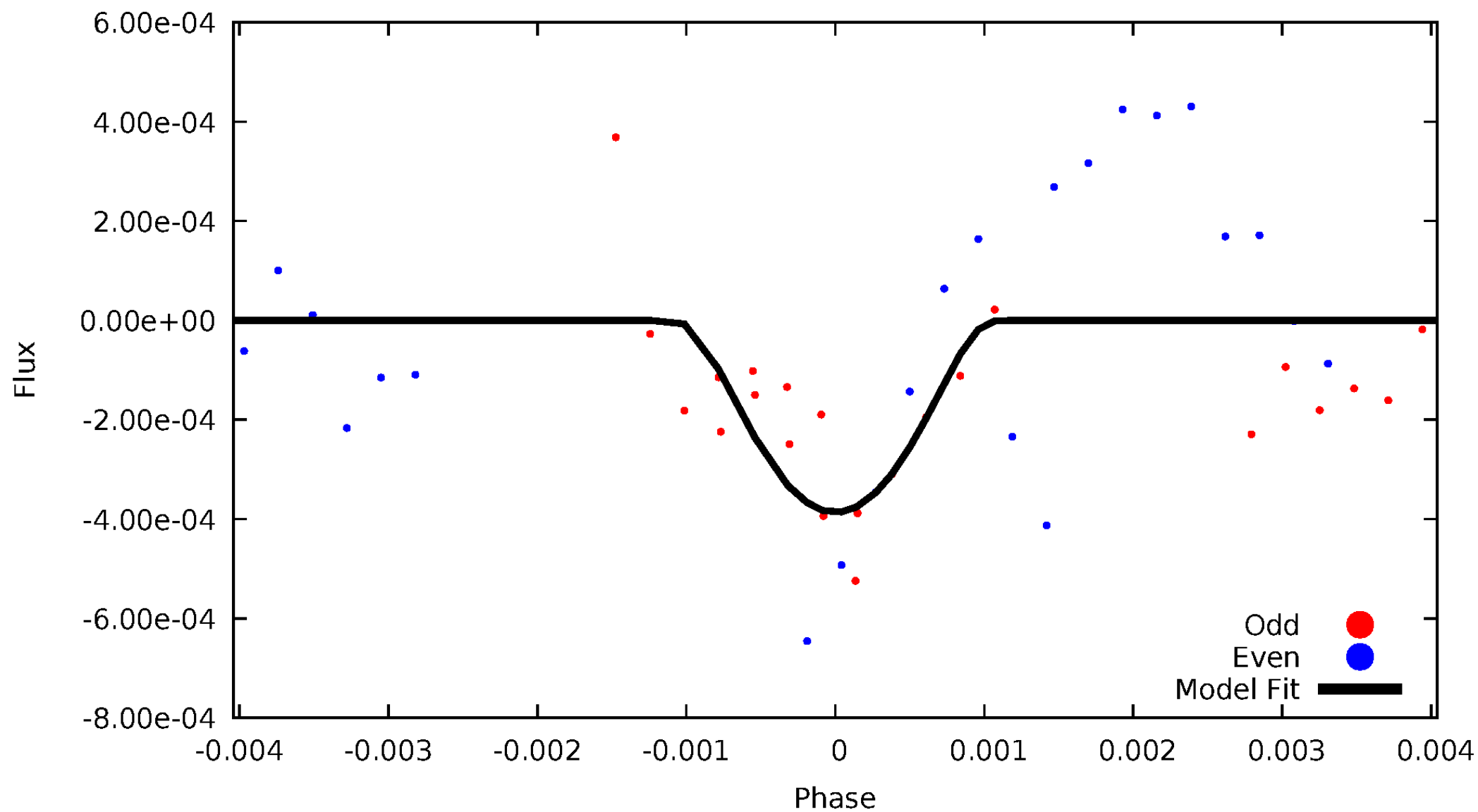


# TCE 010815932-03



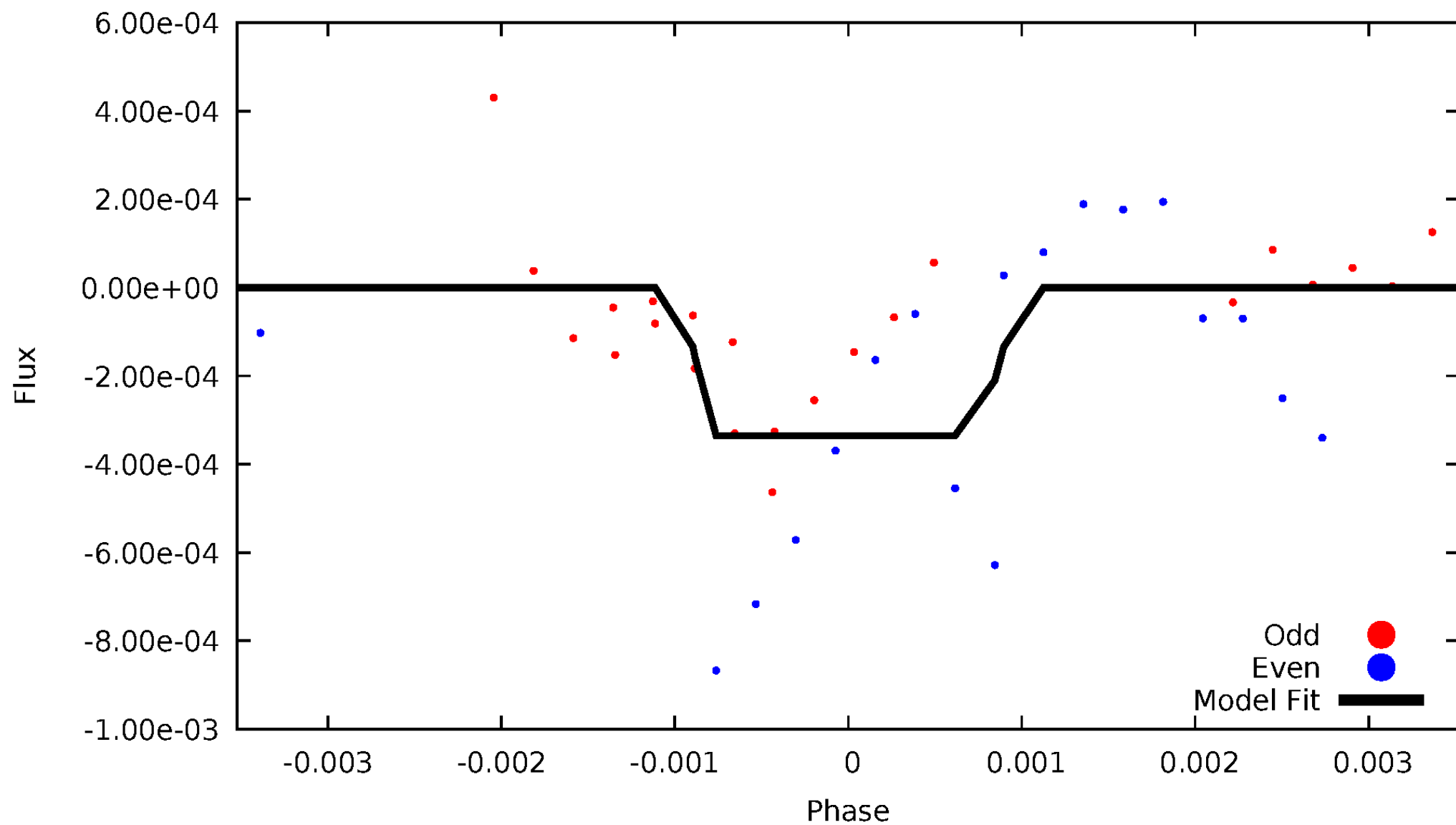
# DV Odd/Even

TCE 010815932-03



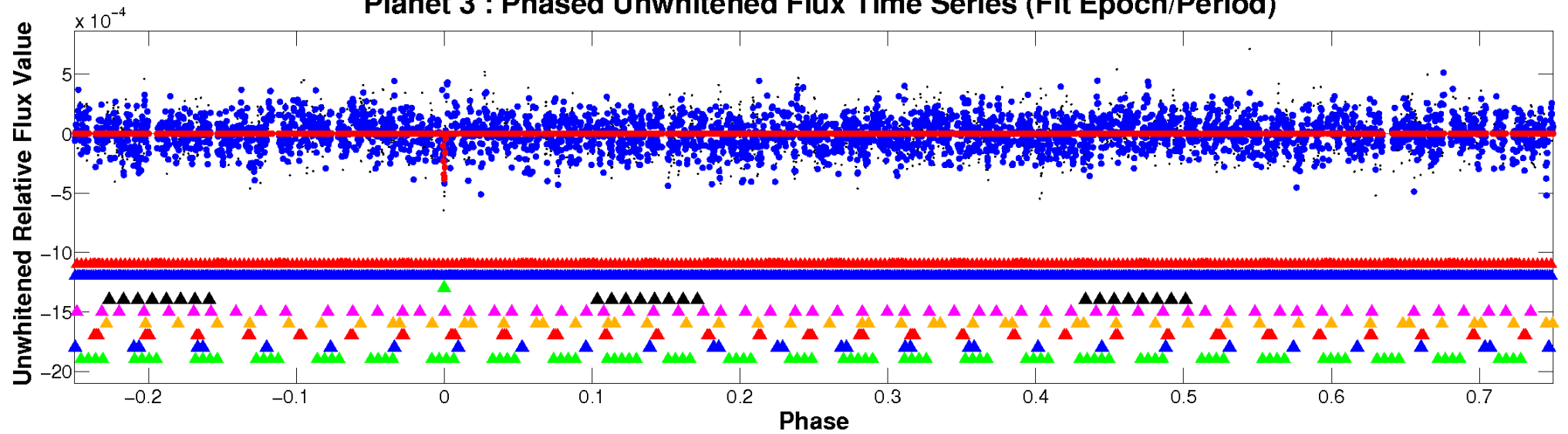
# ALT Odd/Even

TCE 010815932-03

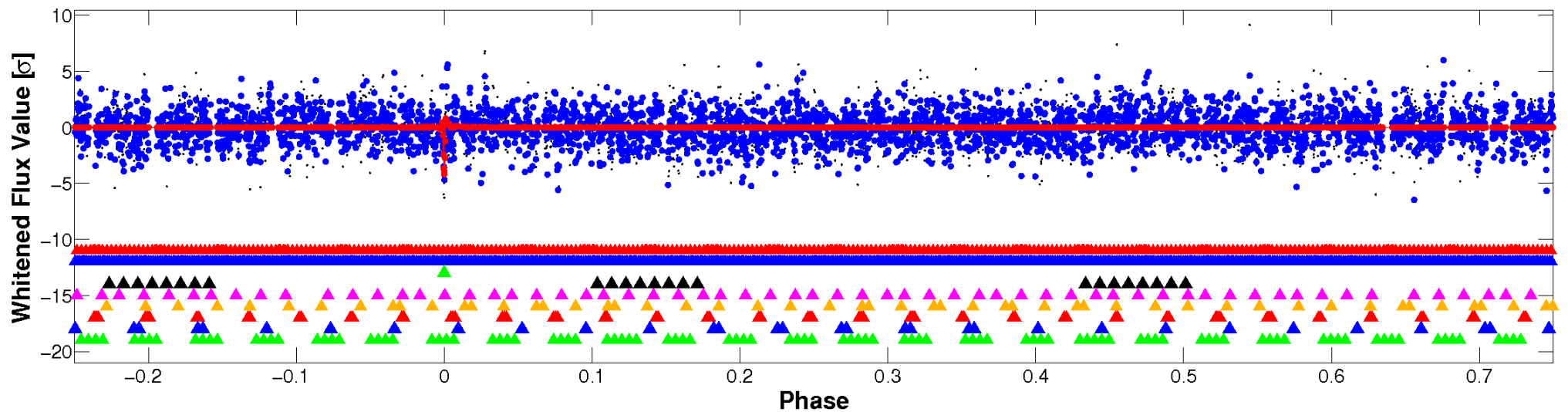


# Non-Whitened Vs. Whitened Light Curve

## Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



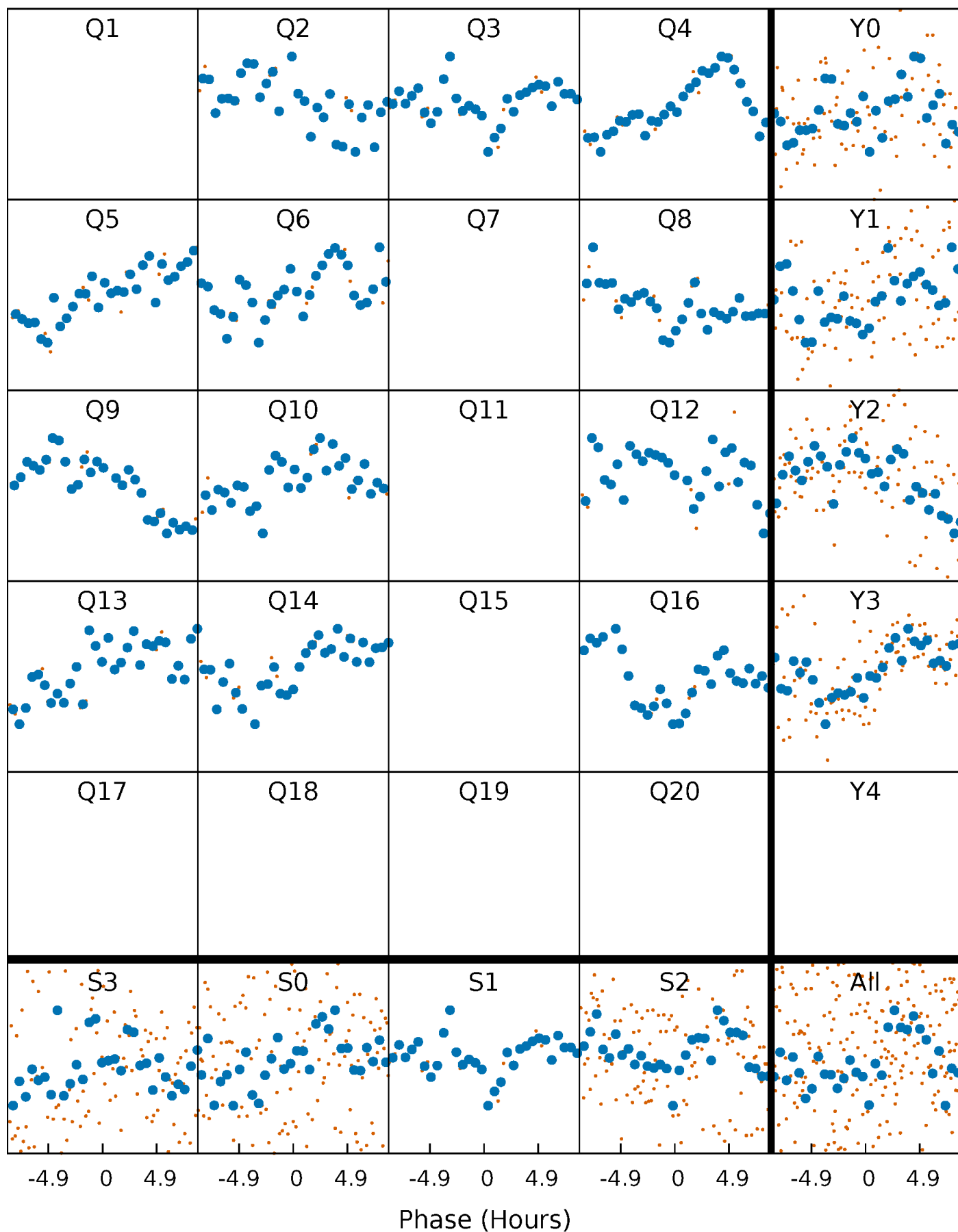
## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





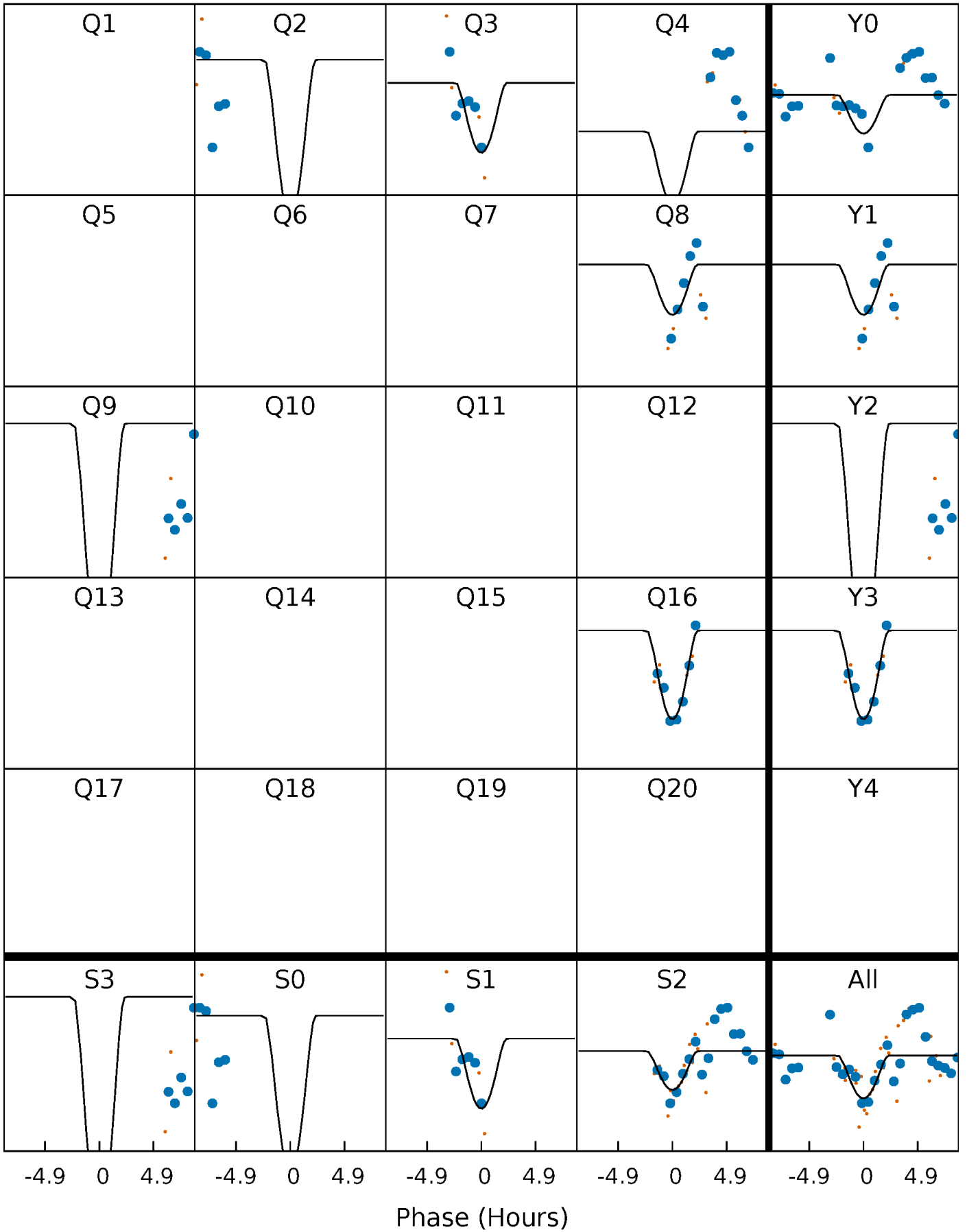
# PDC Quarter-Phased Transit Curves

TCE 010815932-03   P= 88.948627 Days    $T_0=217.810612$  (BKJD)



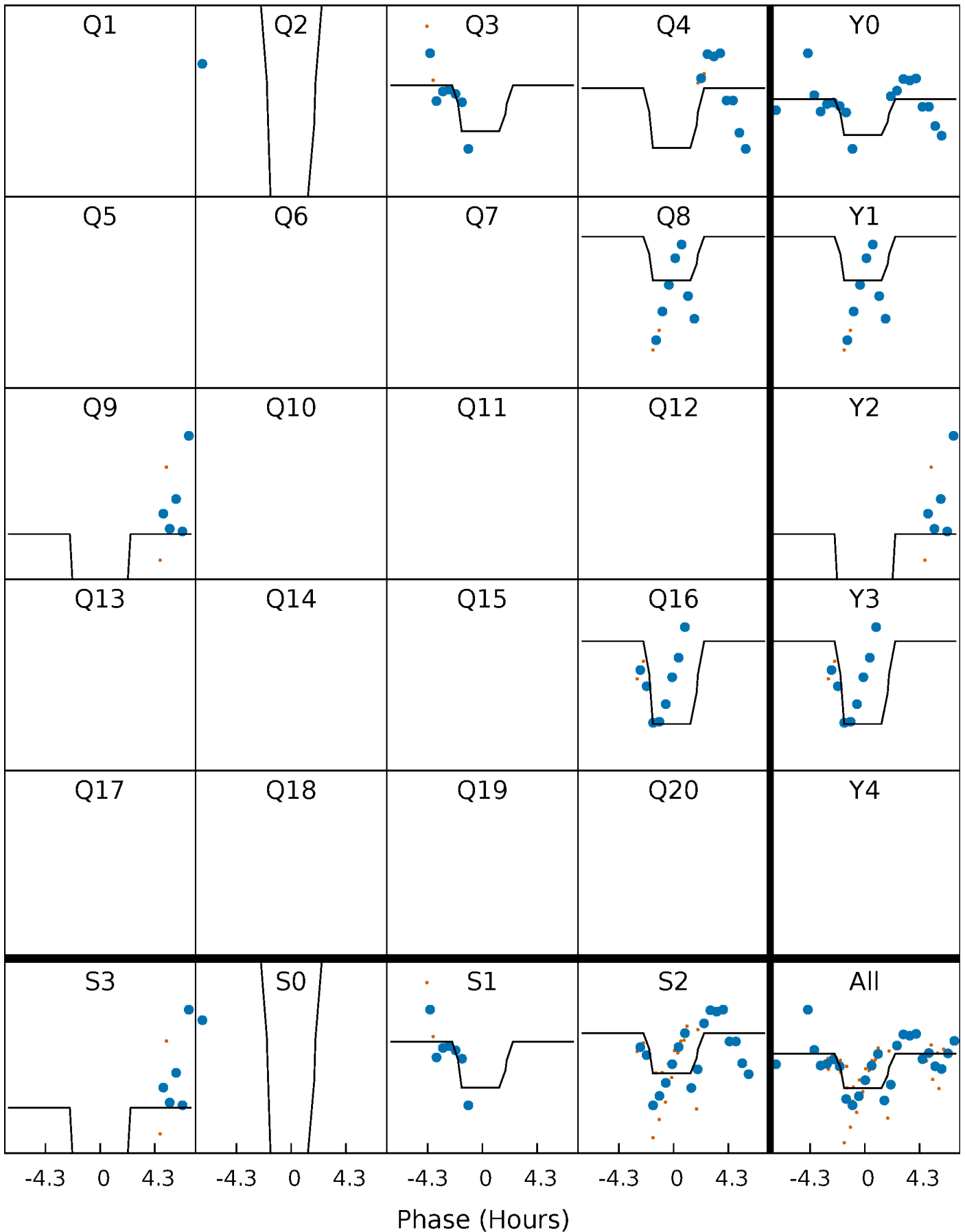
# DV Quarter-Phased Transit Curves

TCE 010815932-03     $P = 88.948627$  Days     $T_0 = 217.810612$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

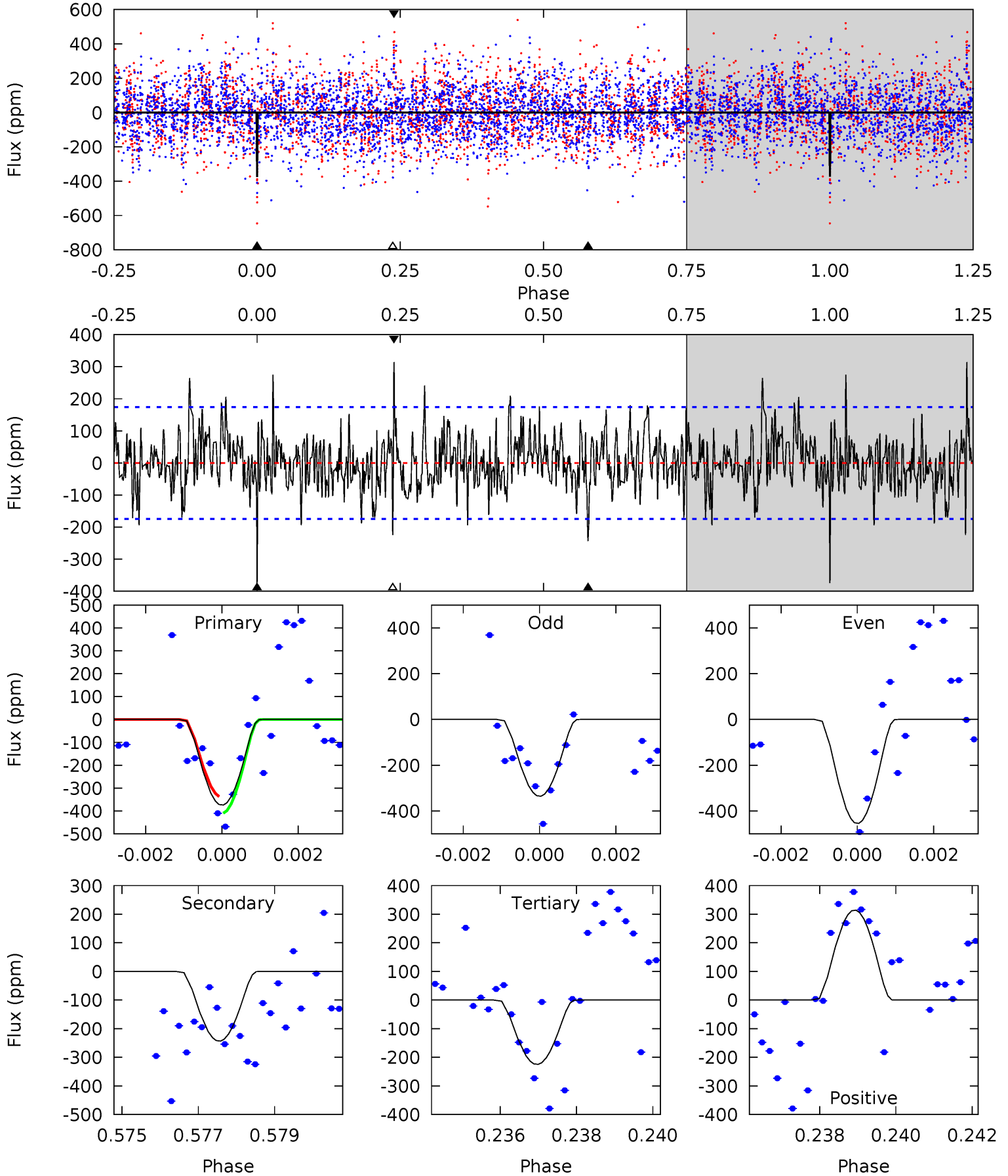
TCE 010815932-03    P= 88.948649 Days     $T_0=217.861547$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-03, P = 88.948627 Days, E = 128.861985 Days

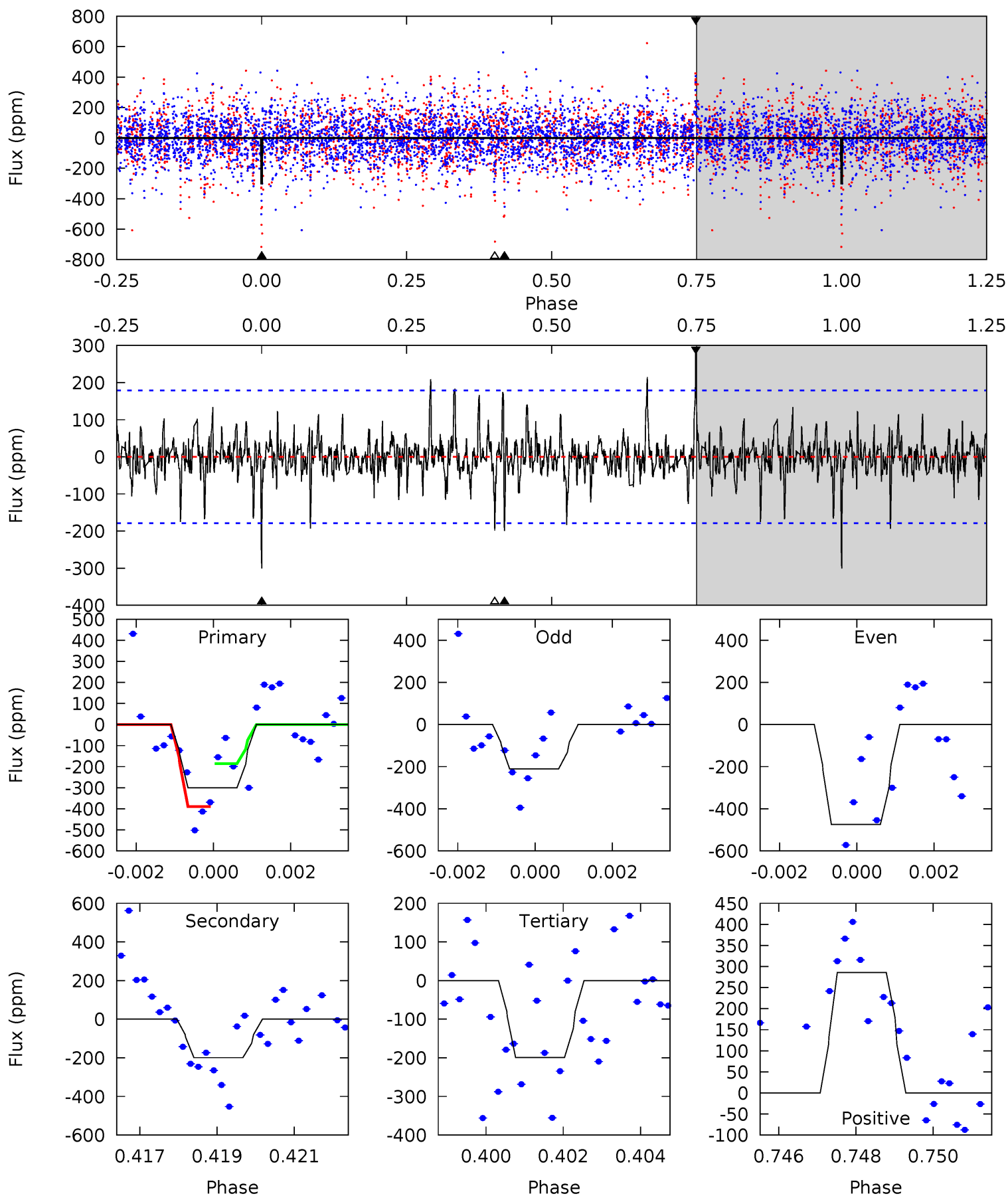
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	7.40	6.83	9.56	5.31	3.06	2.20	4.55	1.82	0.57	-2.16	1.66	1.01	0.46	1.11



# Alt Model-Shift Uniqueness Test

010815932-03, P = 88.948649 Days, E = 128.912898 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
8.94	5.93	5.92	8.51	5.32	3.09	1.49	3.02	0.43	0.01	-2.58	4.05	1.12	0.49	3.04



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-243 \pm 33$	$72.48^{+81.13}_{-49.70}$	$1276^{+86}_{-216}$	$2785^{+1128}_{-506}$	$5.886^{+52.965}_{-4.551}$
Alt.	$-199 \pm 34$	$69.34^{+80.34}_{-51.91}$	$1276^{+86}_{-202}$	$2755^{+1426}_{-509}$	$5.085^{+72.552}_{-3.930}$

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



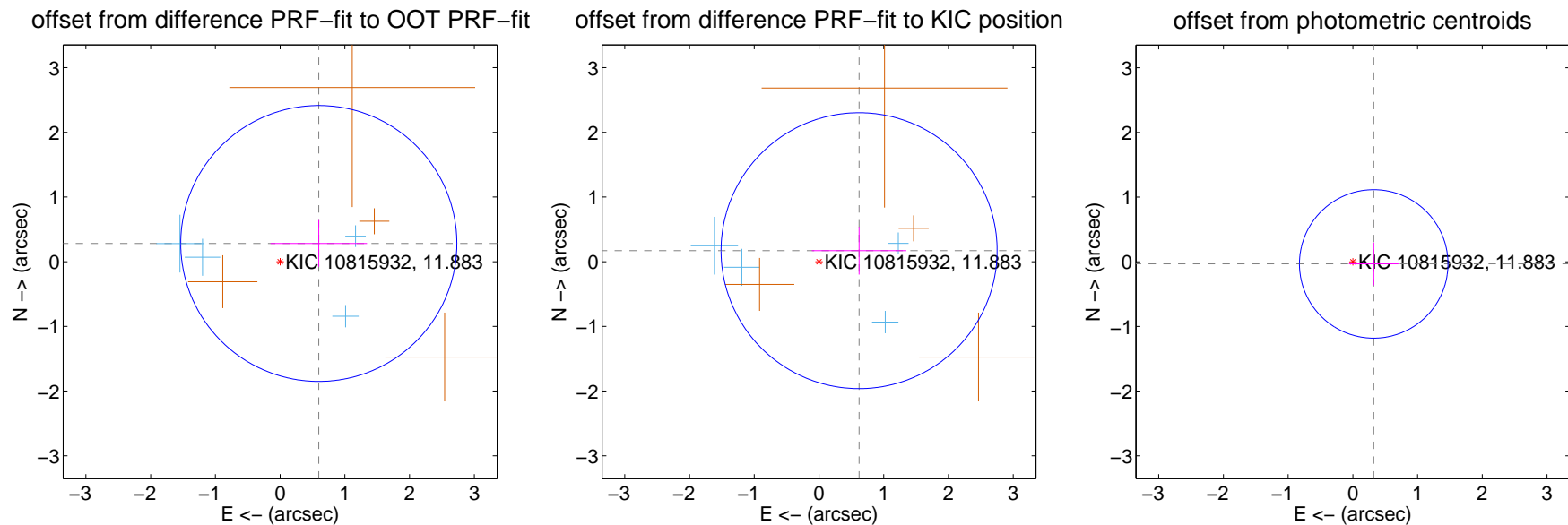
## DV Centroid Data

Supplemental centroid analysis for 010815932-03. **Kepler magnitude: 11.88.** Transit SNR 13.11

There are 4 quarters with good PRF difference image offsets

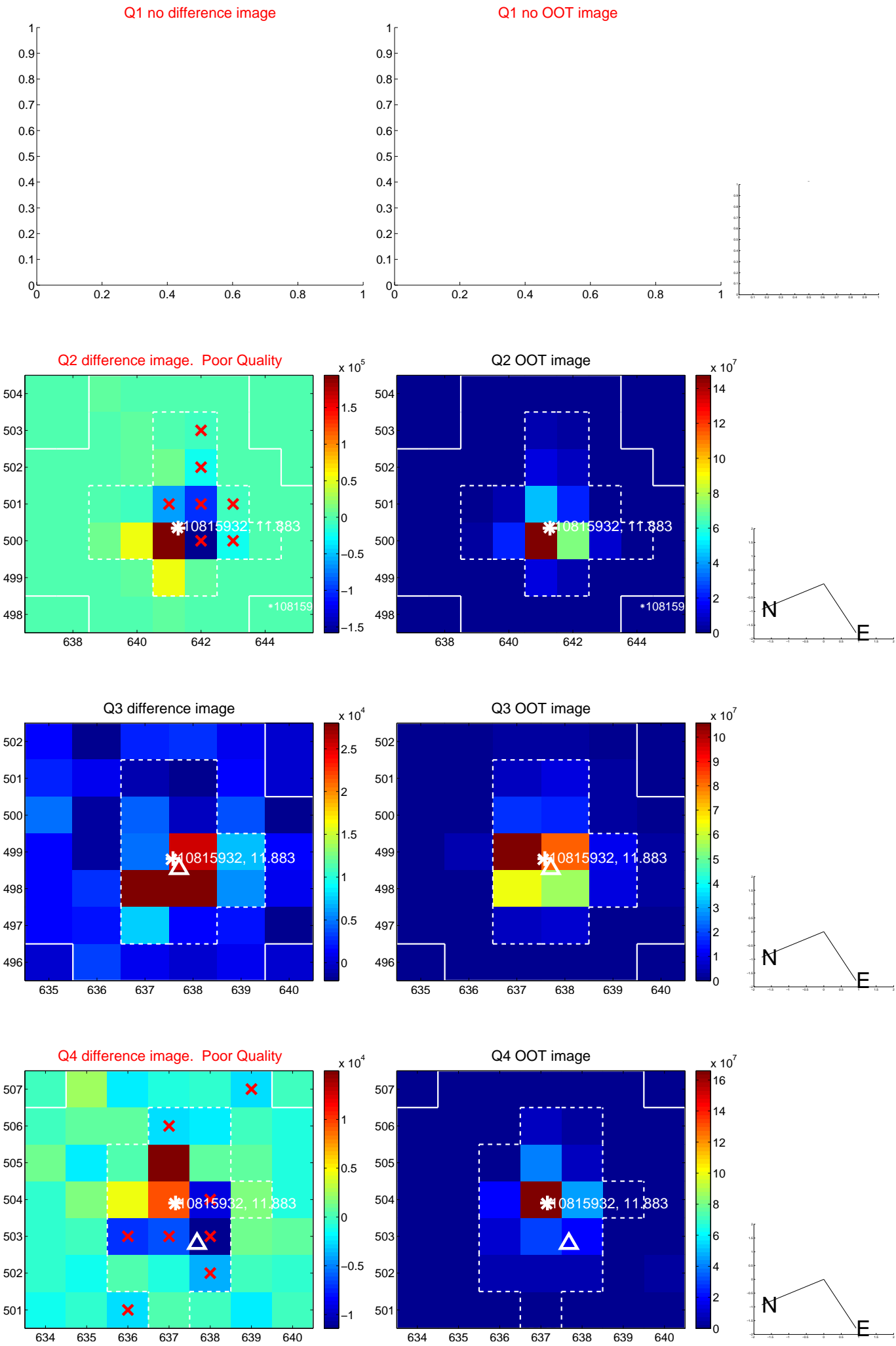
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.661 \pm 0.711$	0.93	$-0.597 \pm 0.746$	$0.282 \pm 0.361$
PRF-fit source offset from KIC position	$0.643 \pm 0.711$	0.90	$-0.620 \pm 0.730$	$0.170 \pm 0.369$
photometric centroid source offset	$0.32 \pm 0.38$	0.85	$-0.32 \pm 0.38$	$-0.03 \pm 0.33$

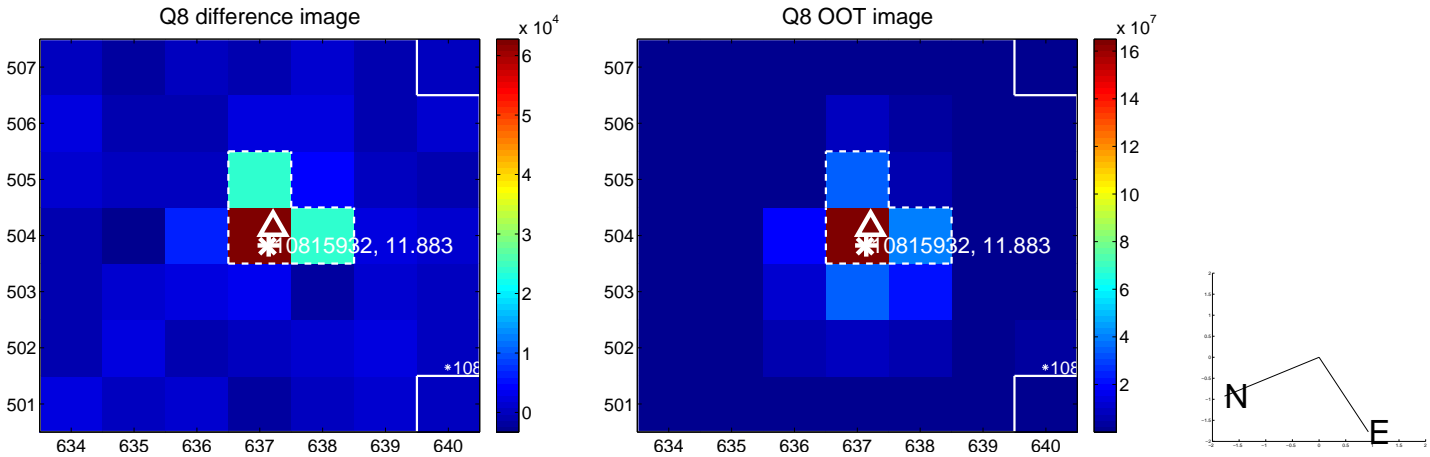
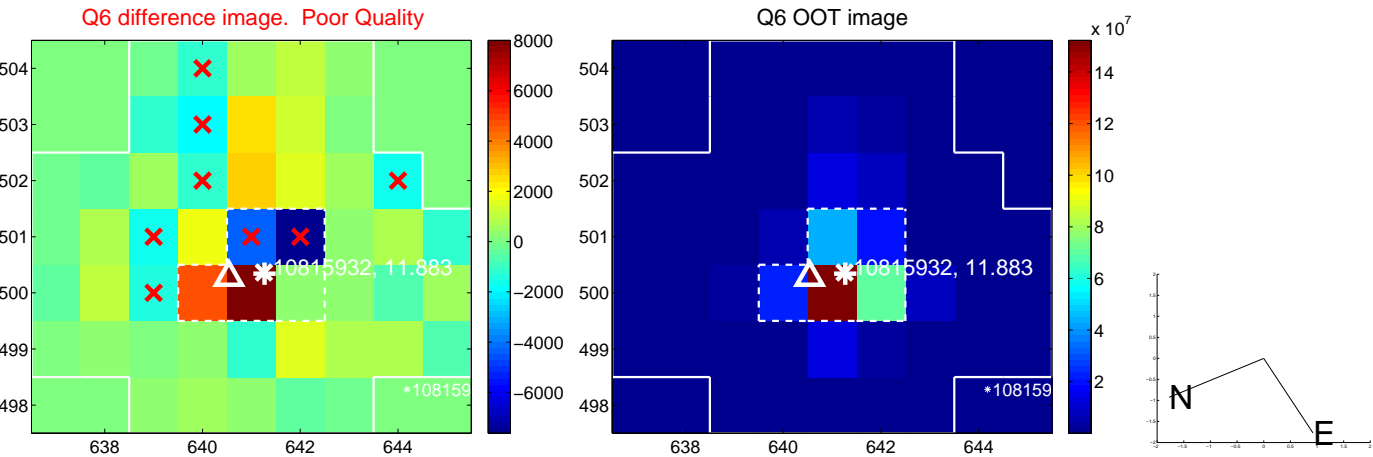
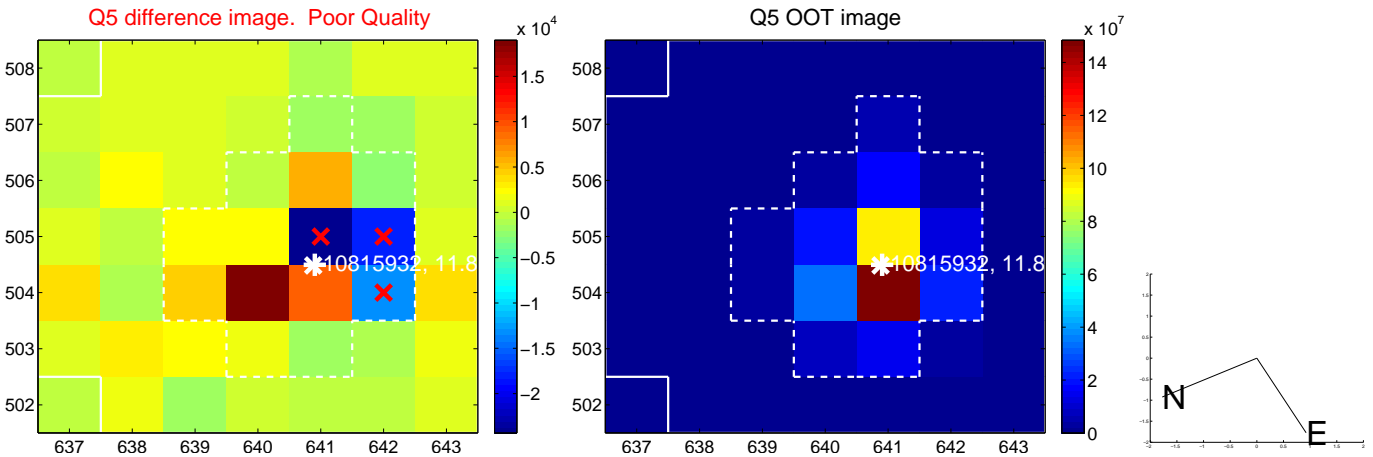


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

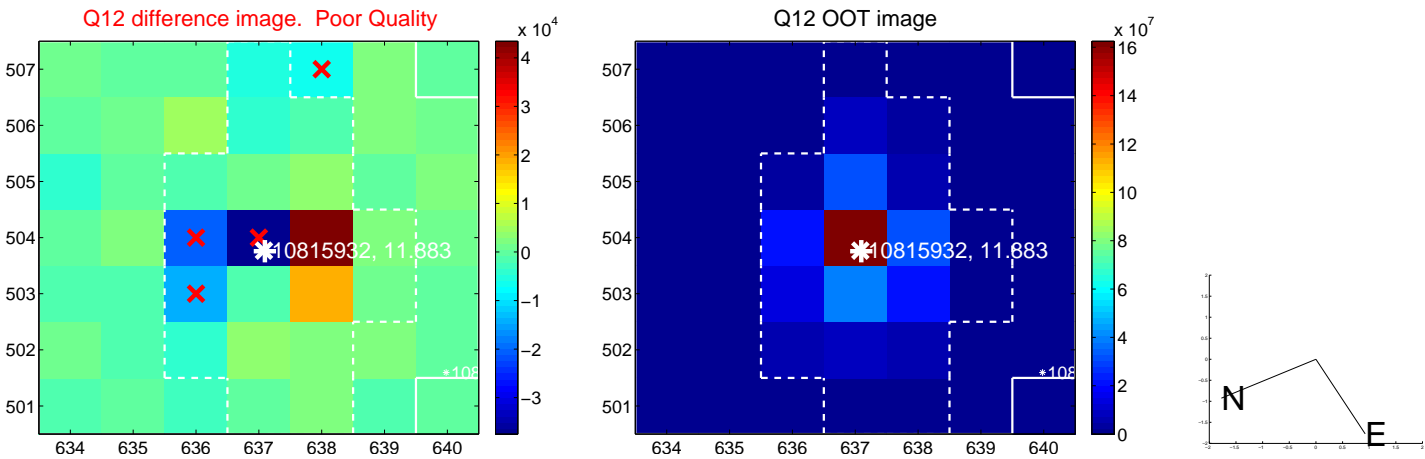
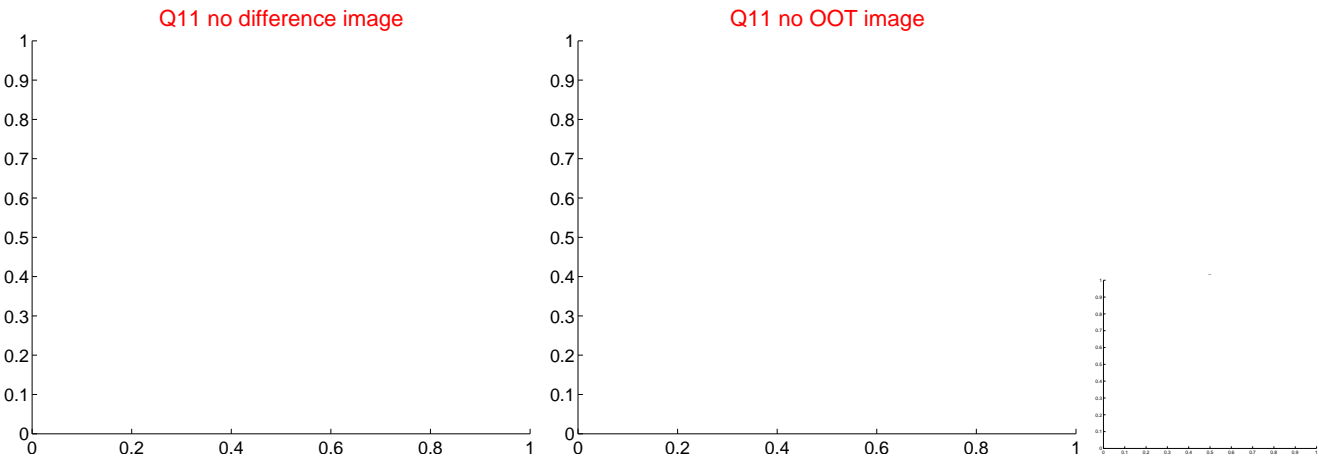
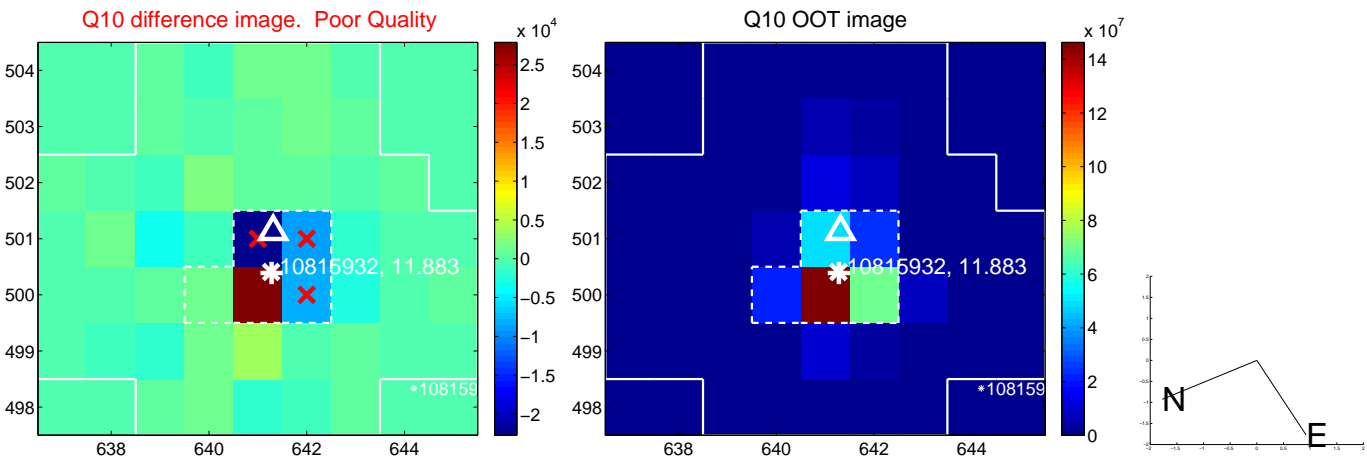
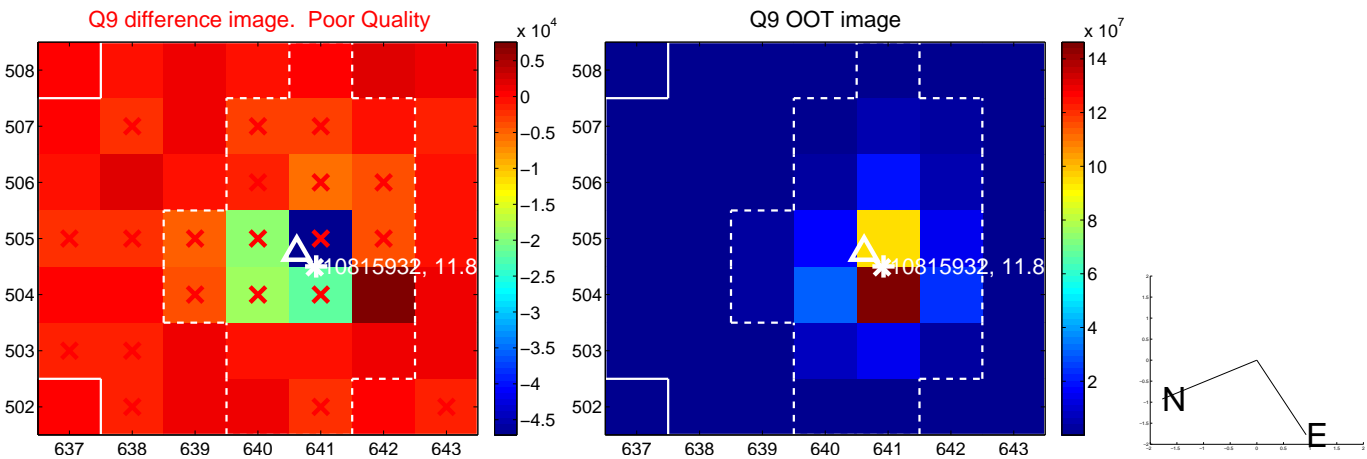
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



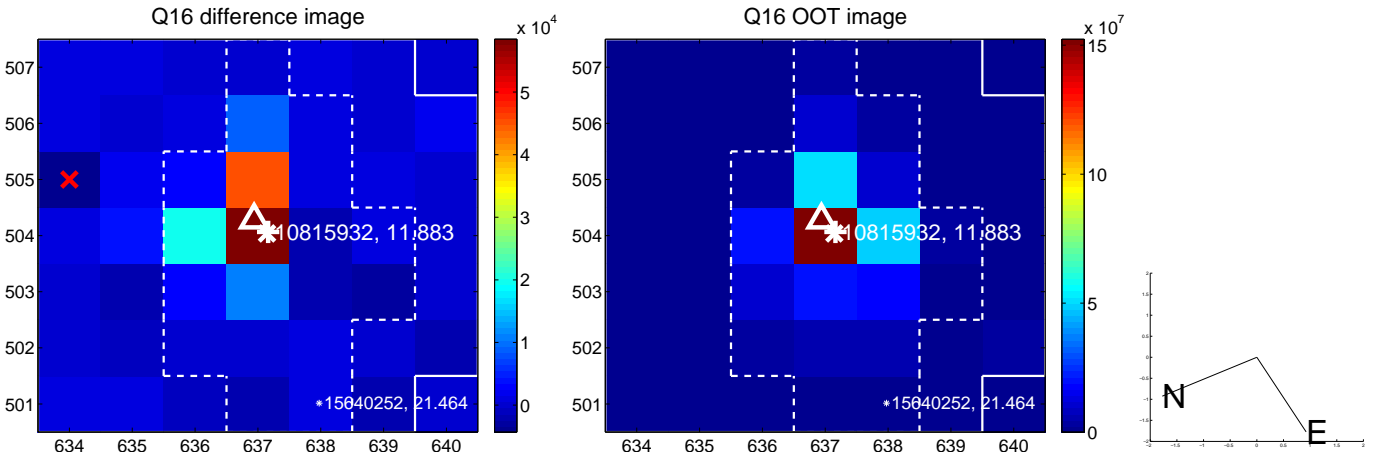
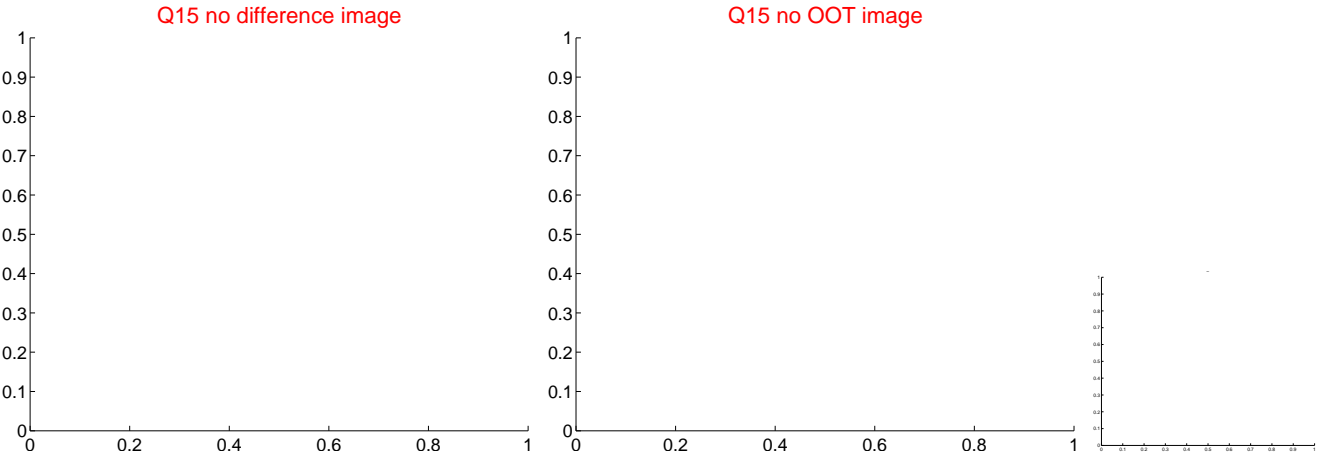
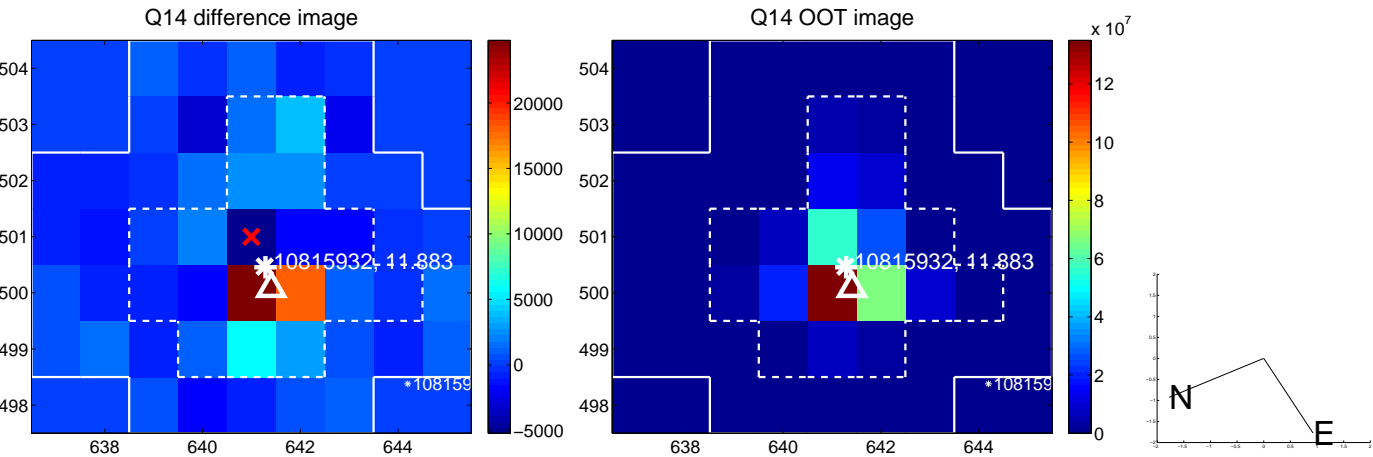
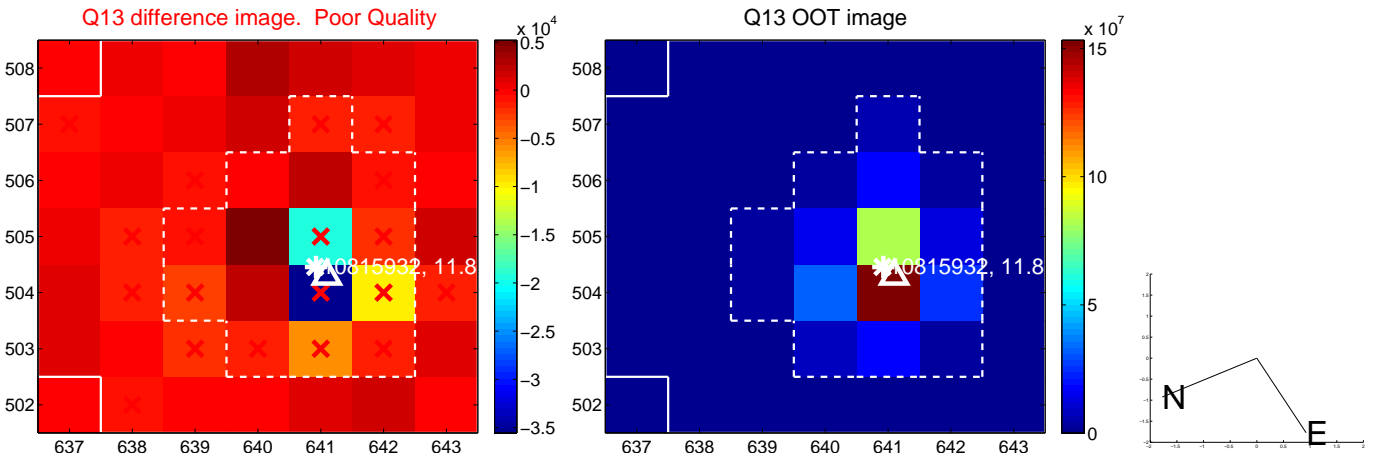
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

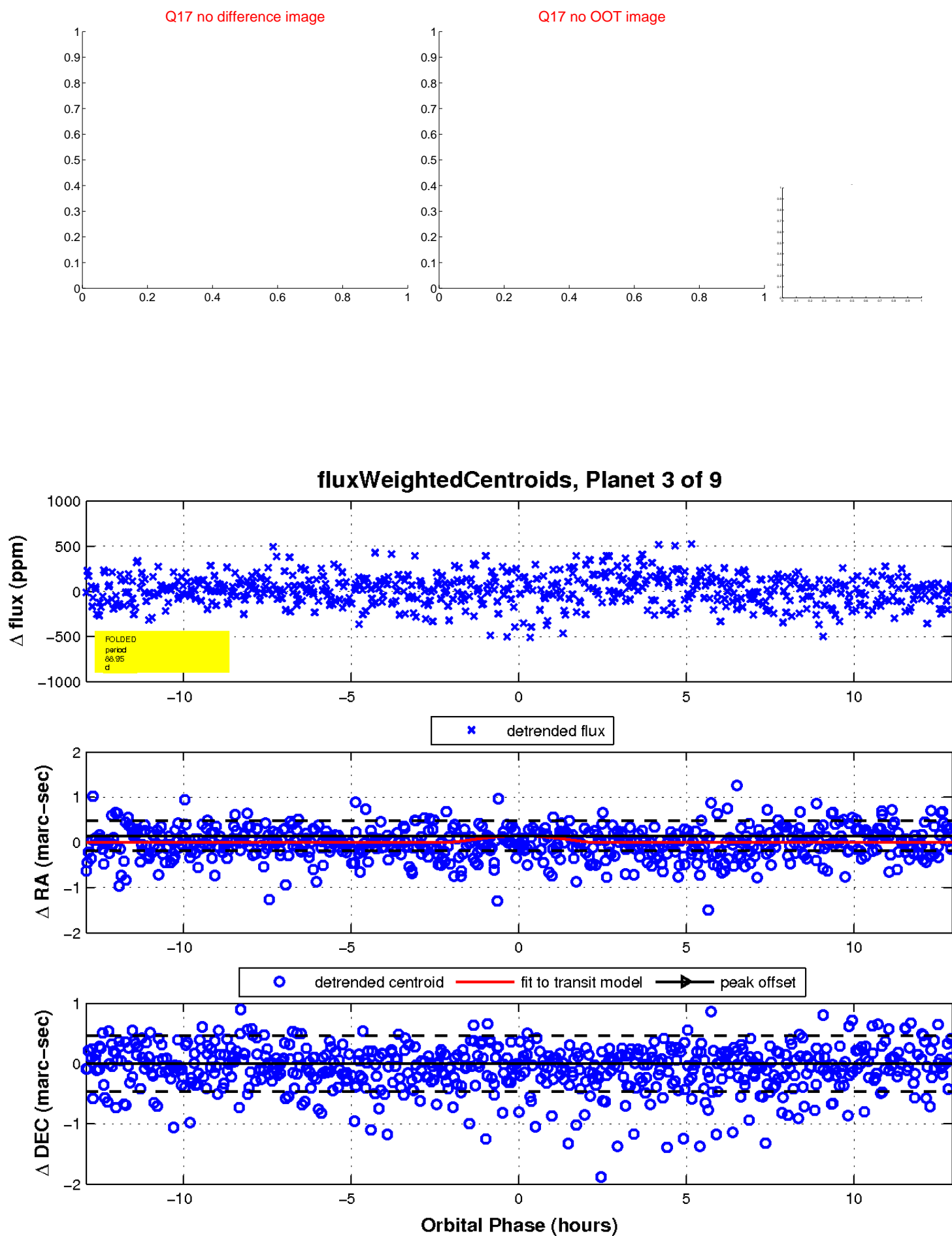


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



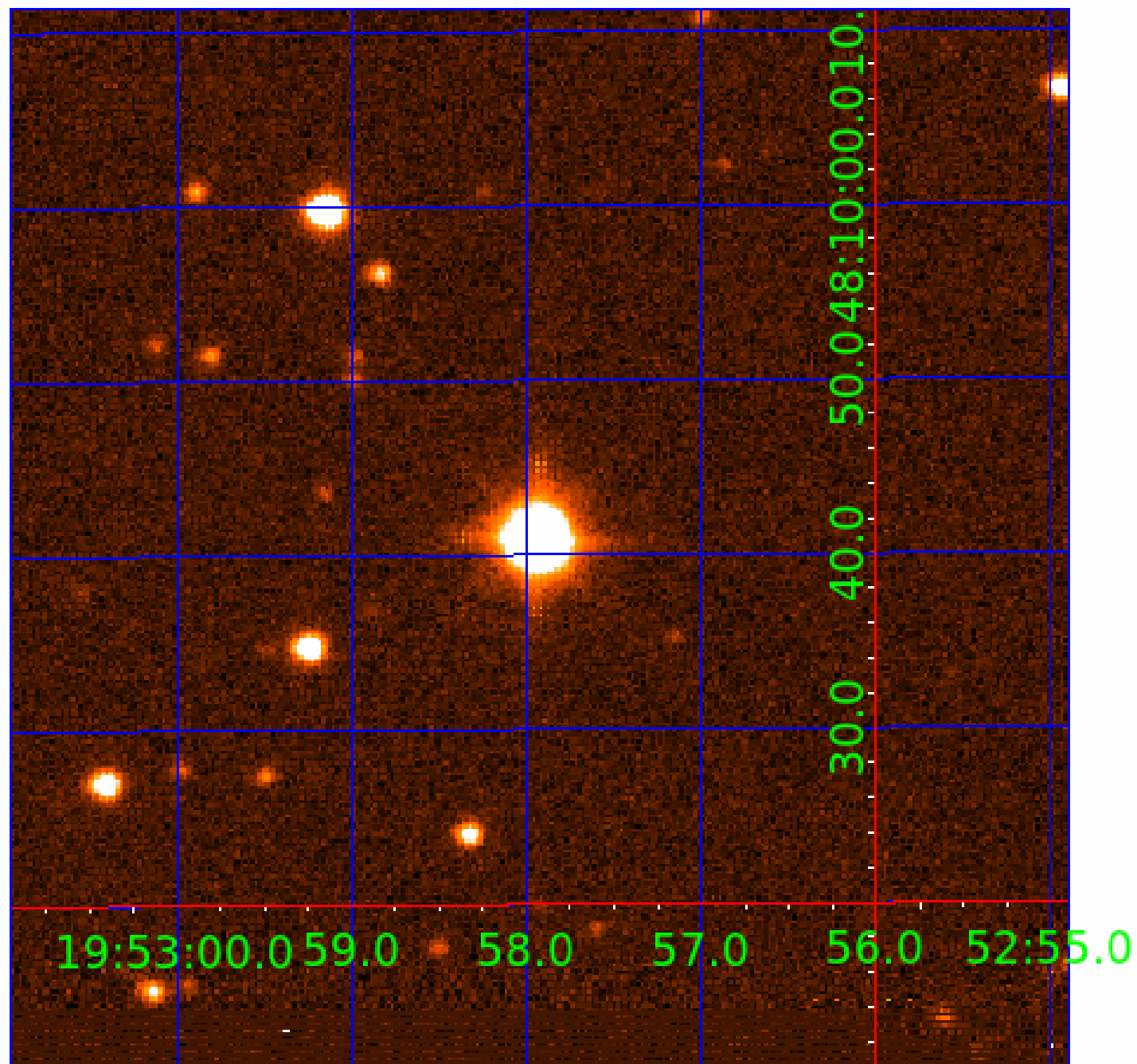


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

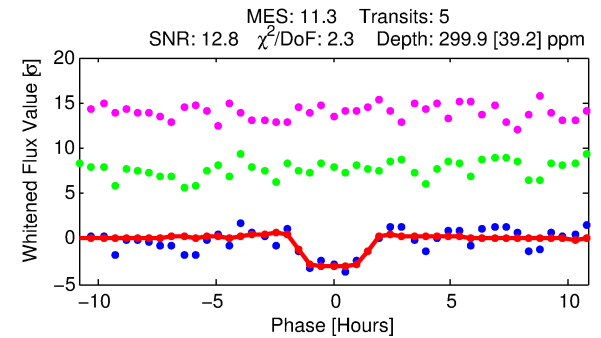
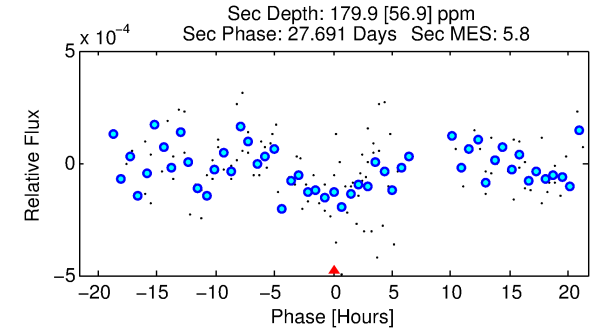
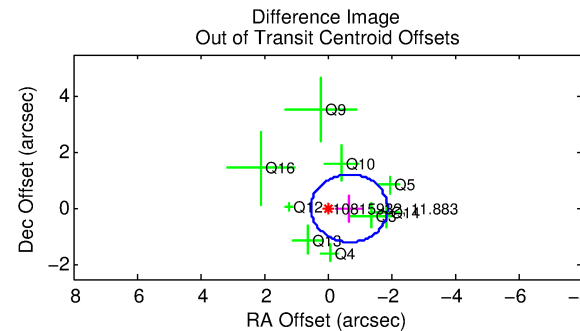
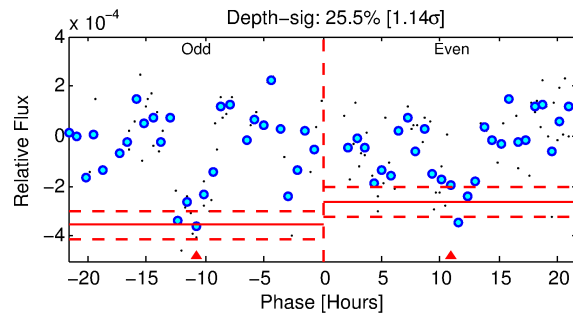
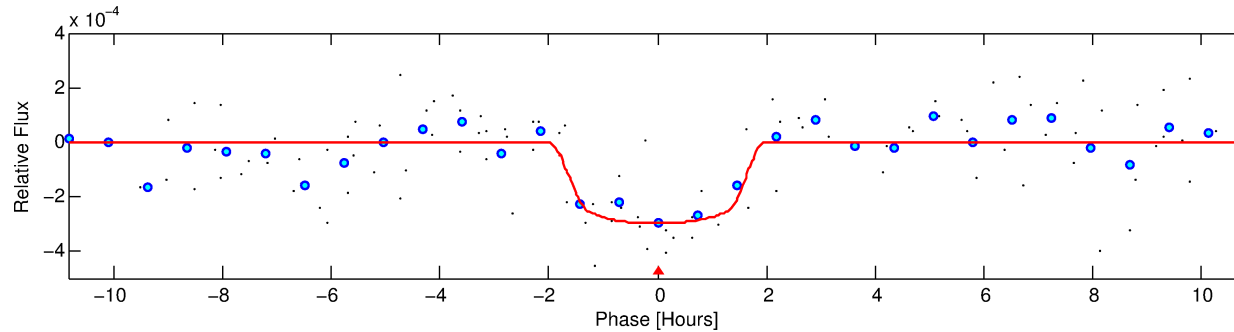
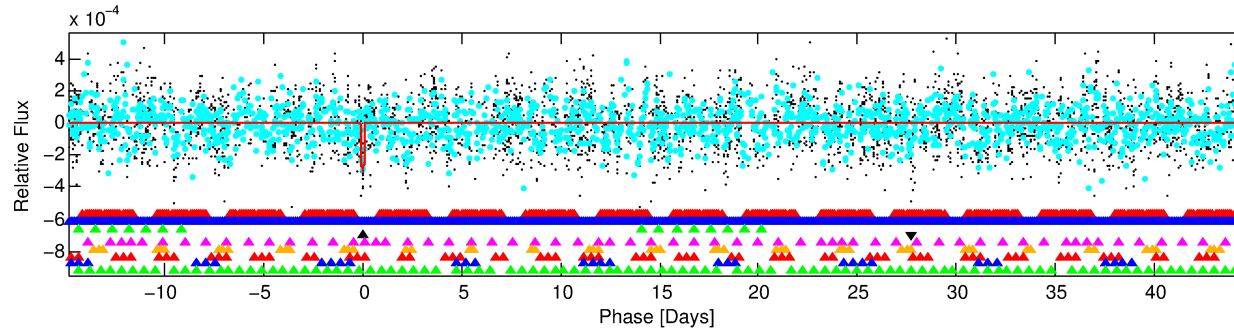
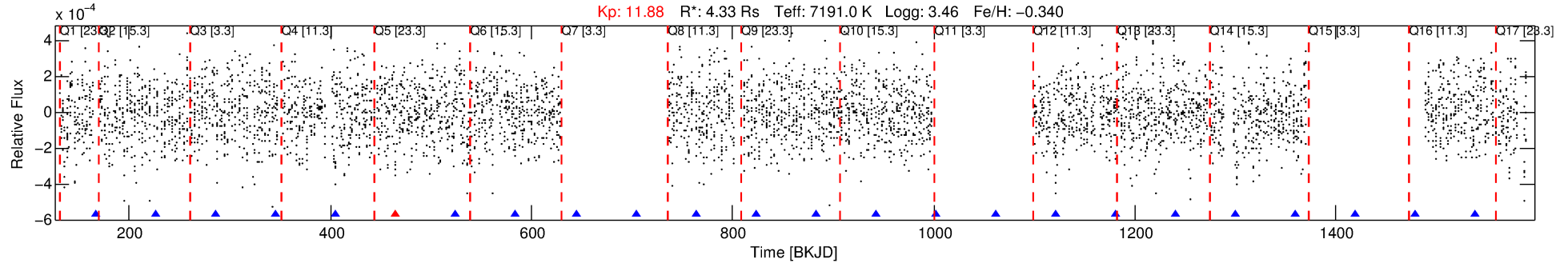
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010815932-04

No Significant Match Found

# DV One-Page Summary

KIC: 10815932 Candidate: 4 of 9 Period: 59.586 d



## DV Fit Results:

Period = 59.5857 [0.00090] d  
Epoch = 167.4410 [0.0109] BKJD  
Rp/R\* = 0.0185 [0.0192]  
a/R\* = 62.12 [349.37]  
b = 0.89 [1.33]  
Seff = 321.60 [368.23]  
Teq = 1080 [309] K  
Rp = 8.75 [10.65] Re  
a = 0.3735 [0.2522] AU  
Ag = 180.29 [429.98] [0.42 $\sigma$ ]  
Teffp = 6118 [3220] K [1.56 $\sigma$ ]

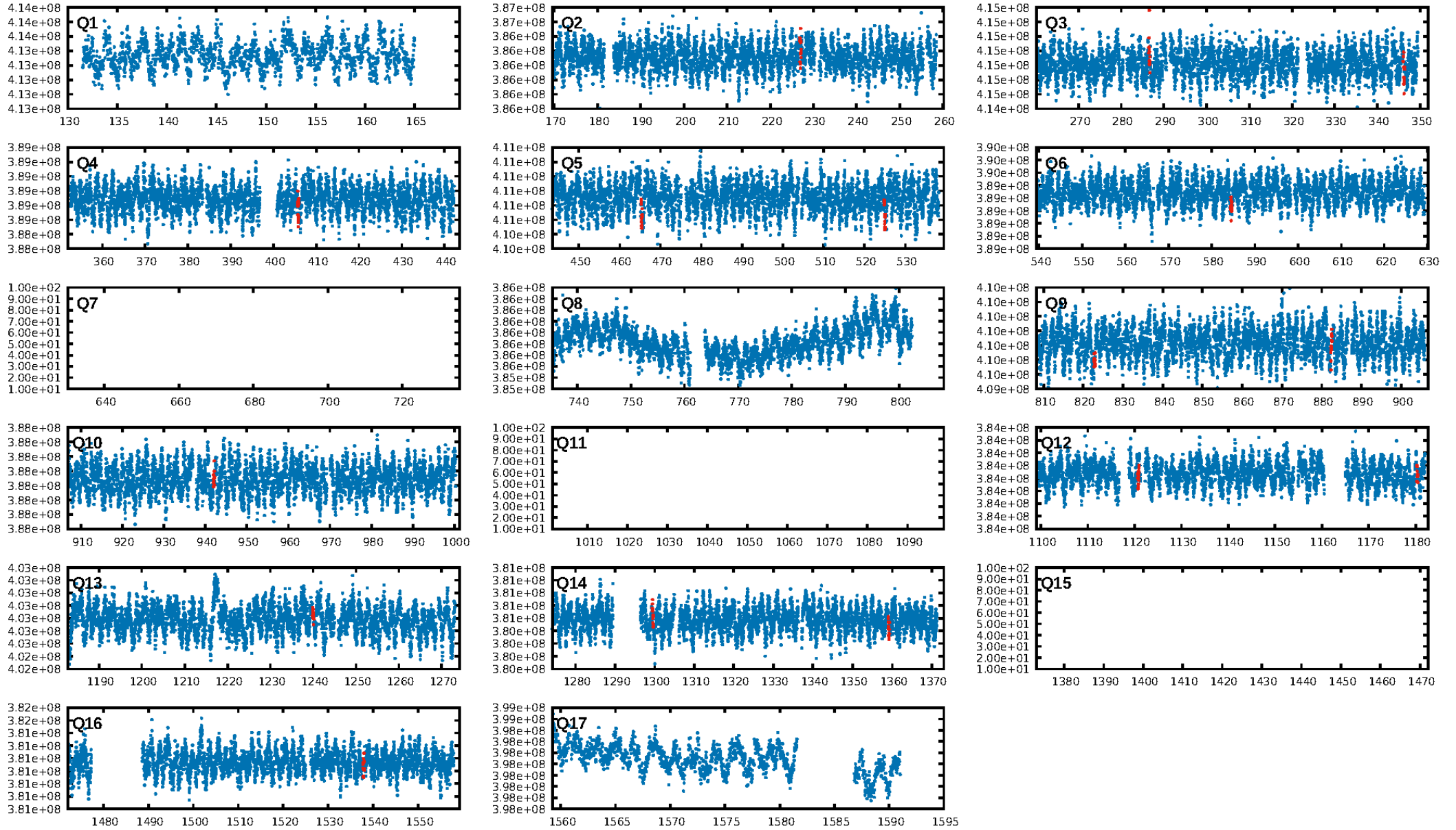
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [55.21 $\sigma$ ]  
LongPeriod-sig: 100.0% [125.25 $\sigma$ ]  
ModelChiSquare2-sig: 3.2%  
ModelChiSquareGof-sig: 88.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.80 [4/5]  
GhostDiagnostic-chr: -86.38  
Centroid-sig: 50.1%  
Centroid-so: 0.440 arcsec [1.08 $\sigma$ ]  
OotOffset-rm: 0.682 arcsec [1.70 $\sigma$ ]  
OotOffset-st: 2/1/3/3 [9]  
KicOffset-rm: 0.682 arcsec [1.60 $\sigma$ ]  
KicOffset-st: 2/1/3/3 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 0.27 [3/11]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:09 Z

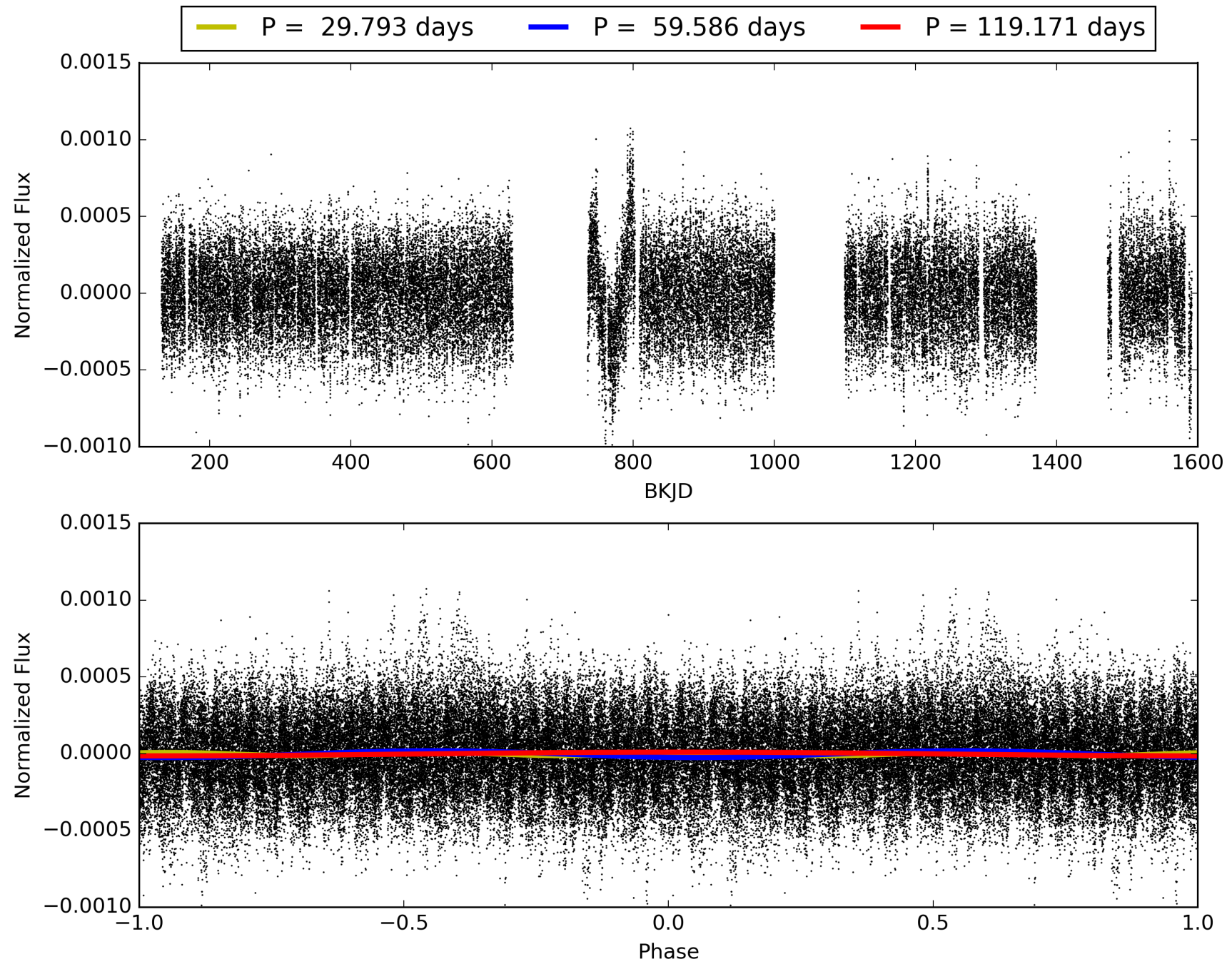
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010815932-04, PDC Light Curves



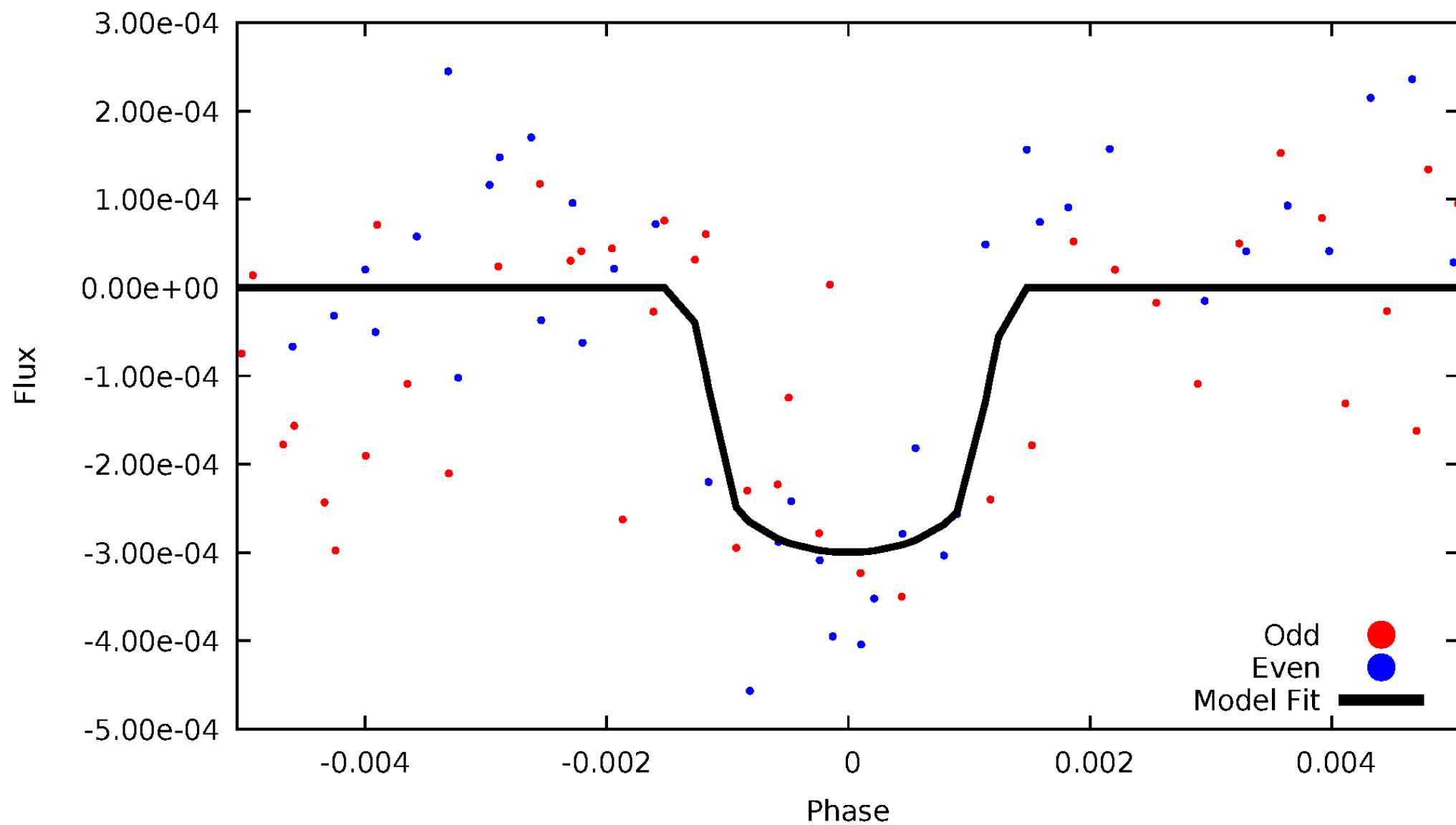


TCE 010815932-04



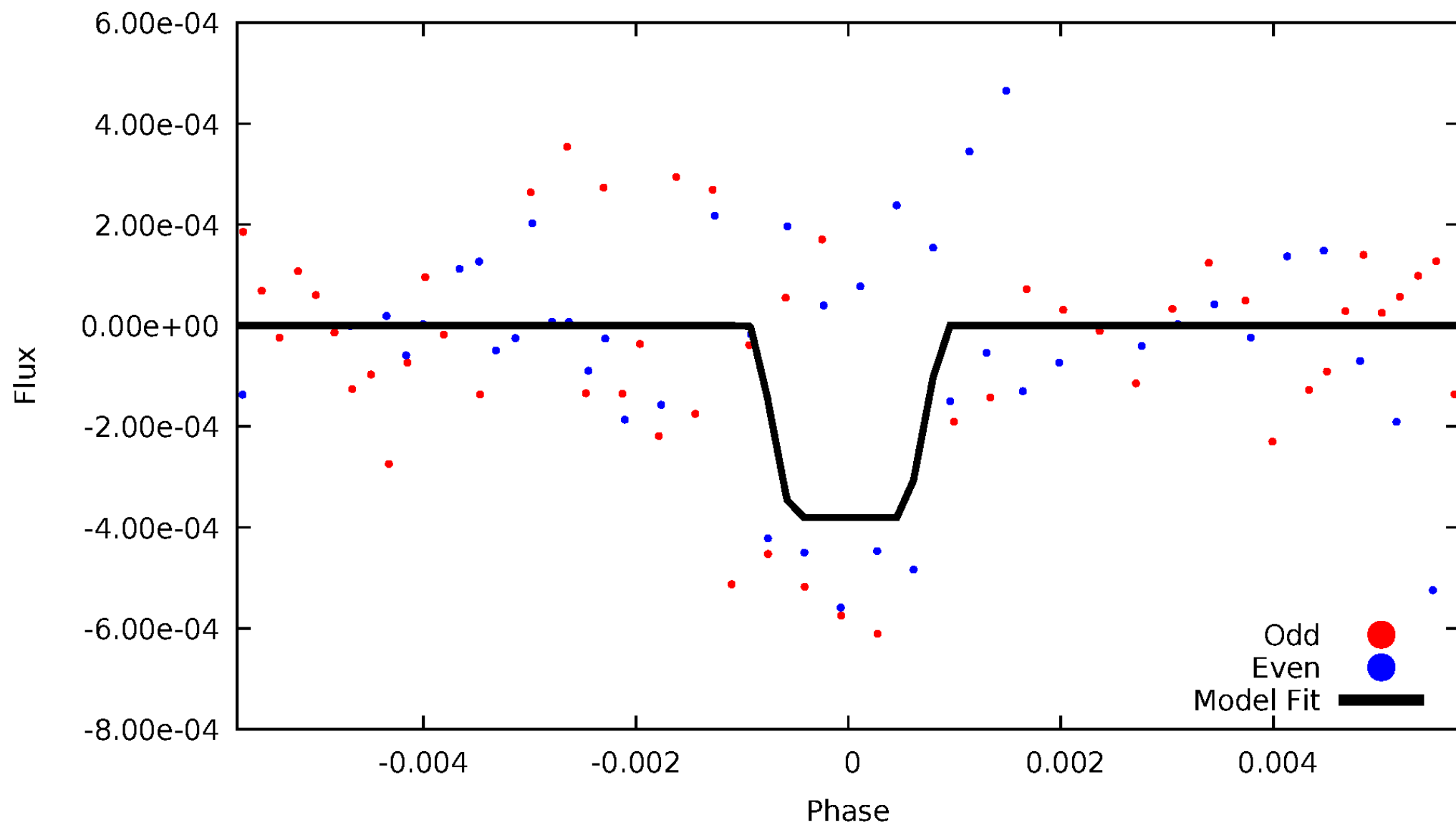
# DV Odd/Even

TCE 010815932-04



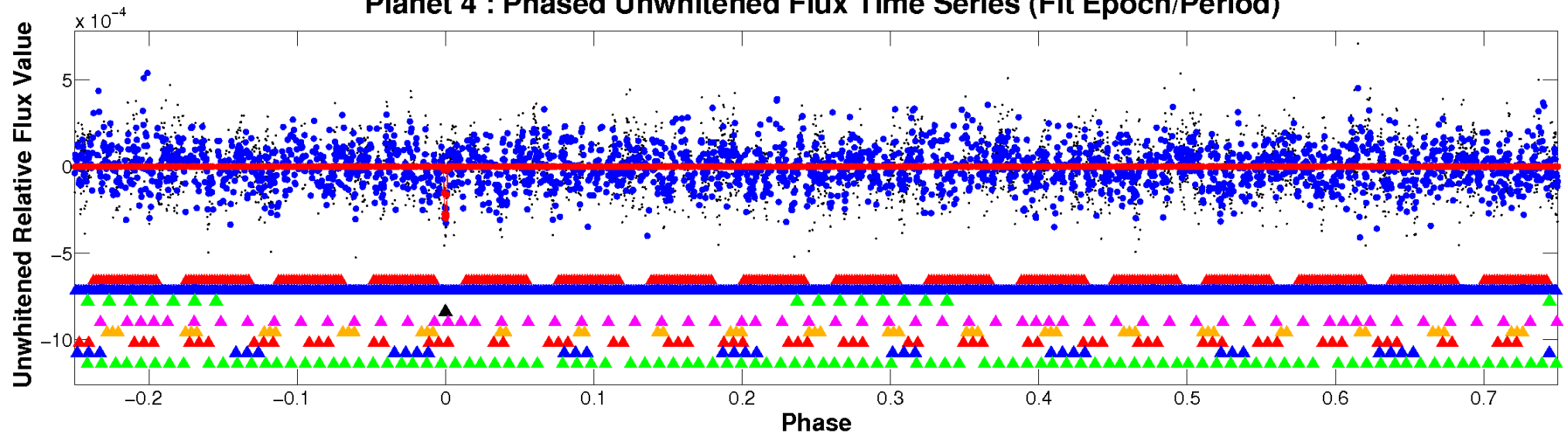
# ALT Odd/Even

TCE 010815932-04

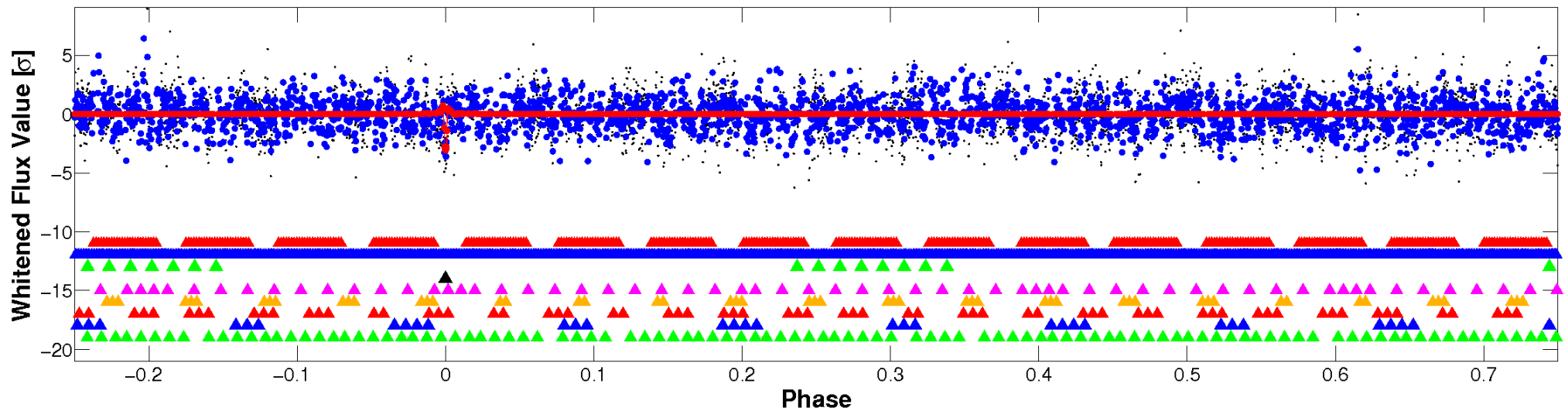


# Non-Whitened Vs. Whitened Light Curve

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

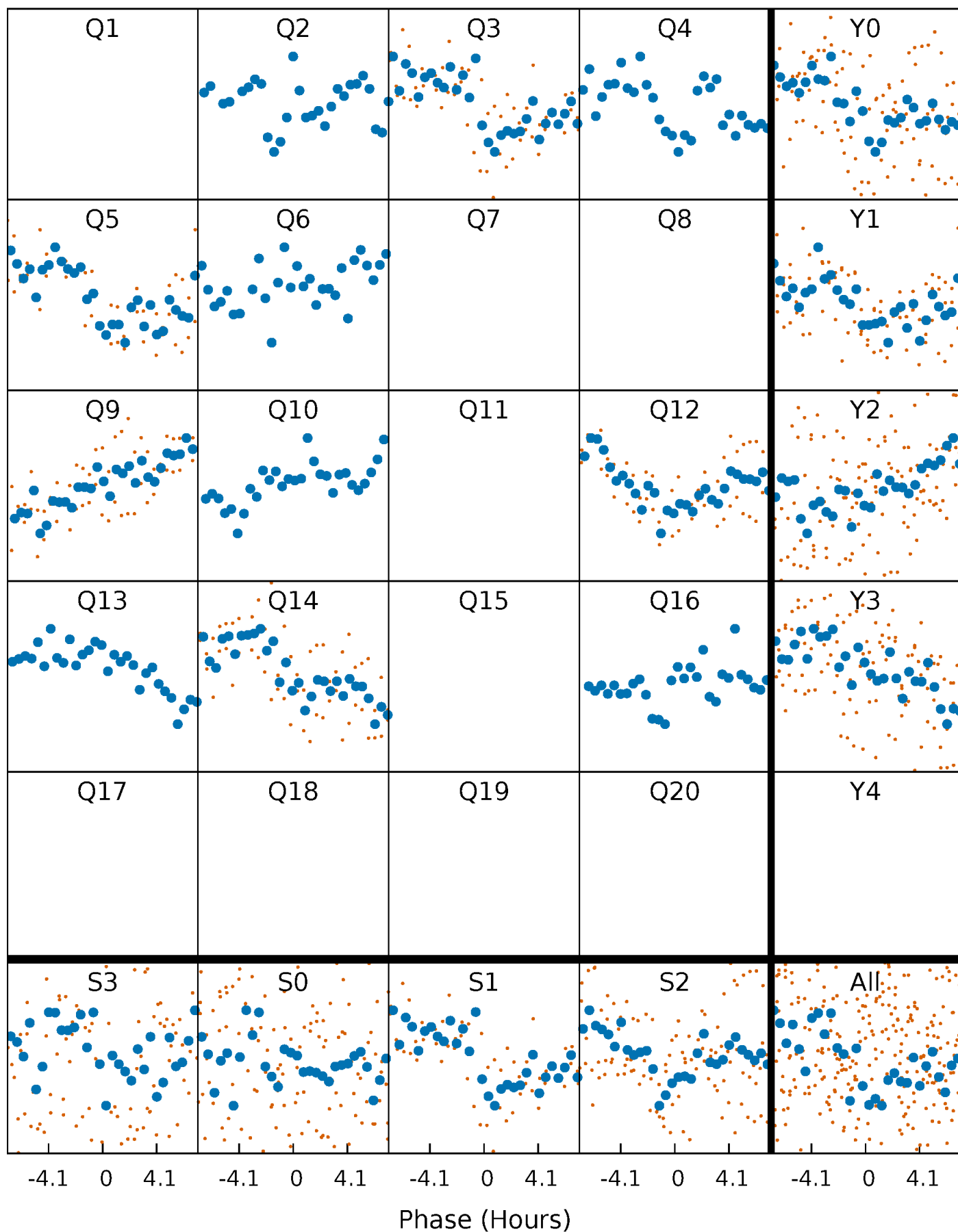


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



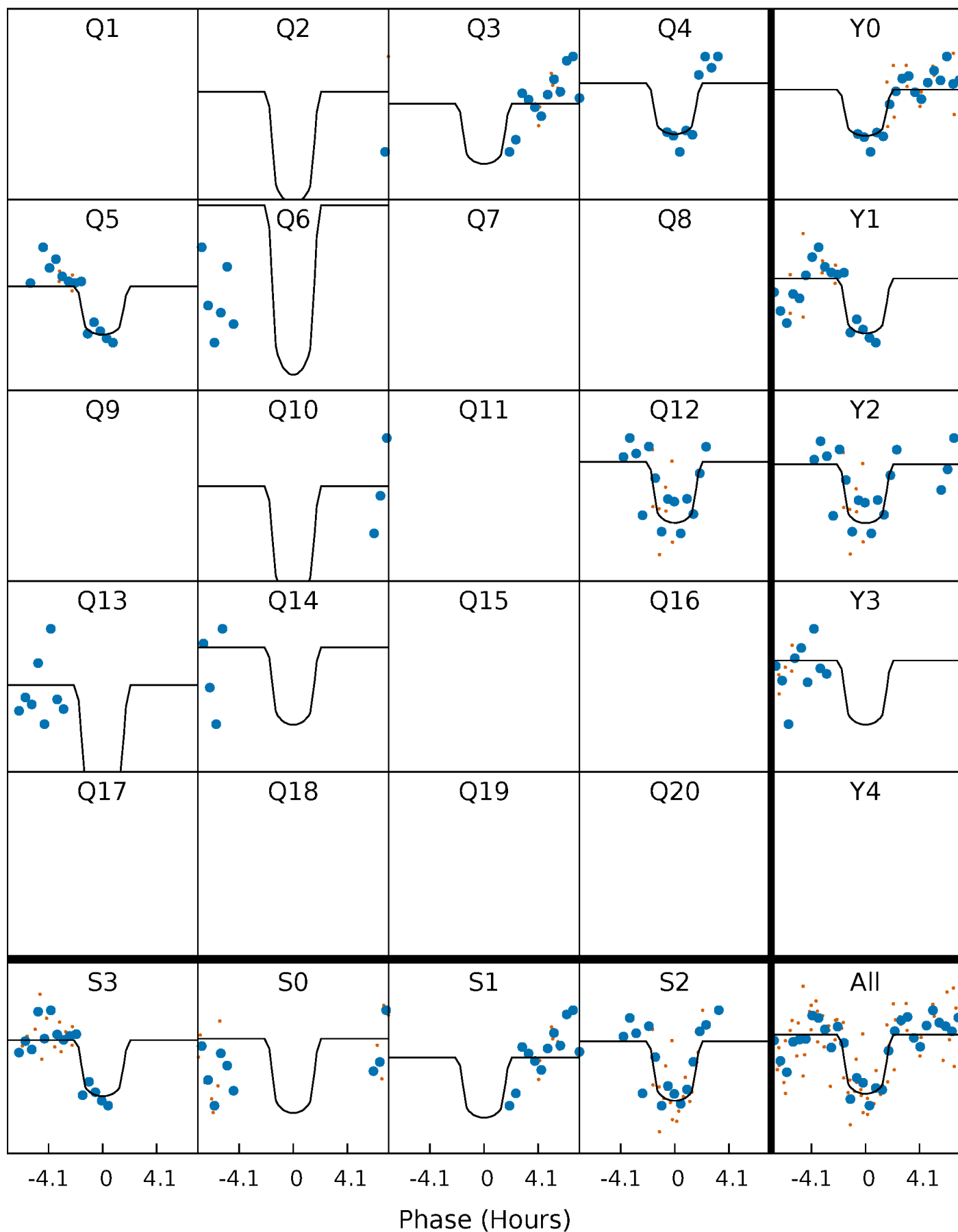
# PDC Quarter-Phased Transit Curves

TCE 010815932-04   P= 59.585575 Days    $T_0=167.441005$  (BKJD)



# DV Quarter-Phased Transit Curves

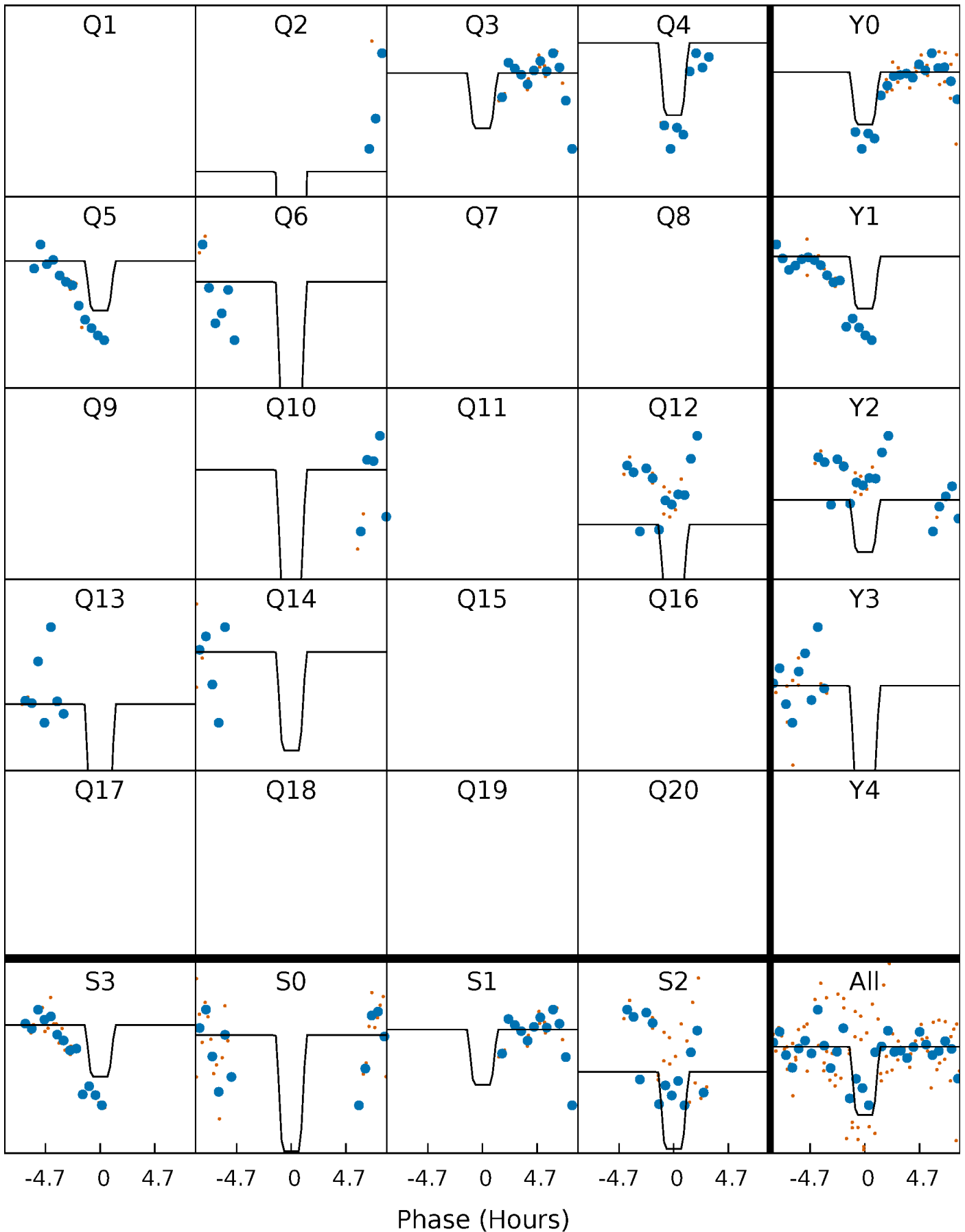
TCE 010815932-04     $P = 59.585575$  Days     $T_0 = 167.441005$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

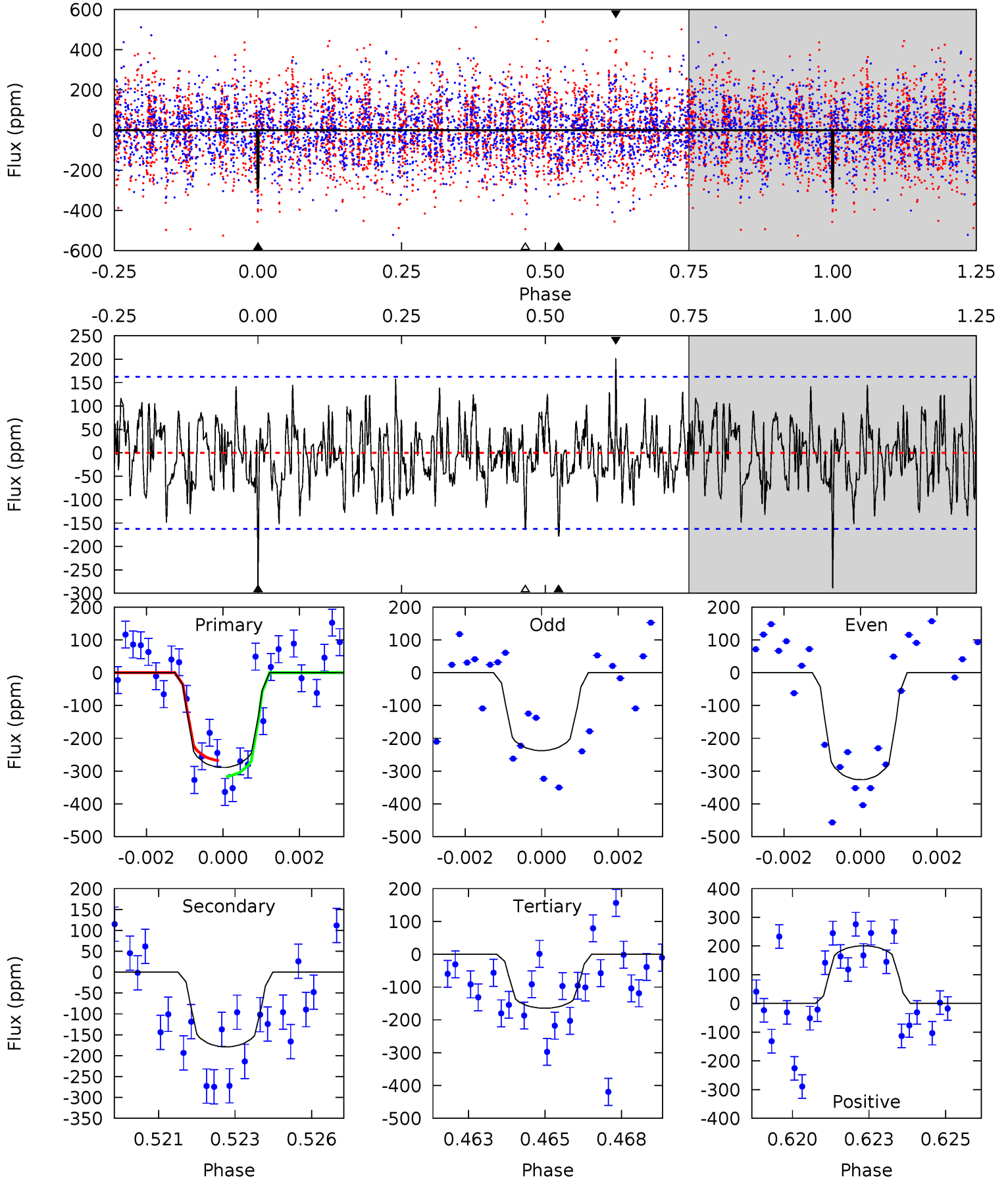
TCE 010815932-04     $P = 59.585198$  Days     $T_0 = 167.453088$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-04,  $P = 59.585575$  Days,  $E = 107.855430$  Days

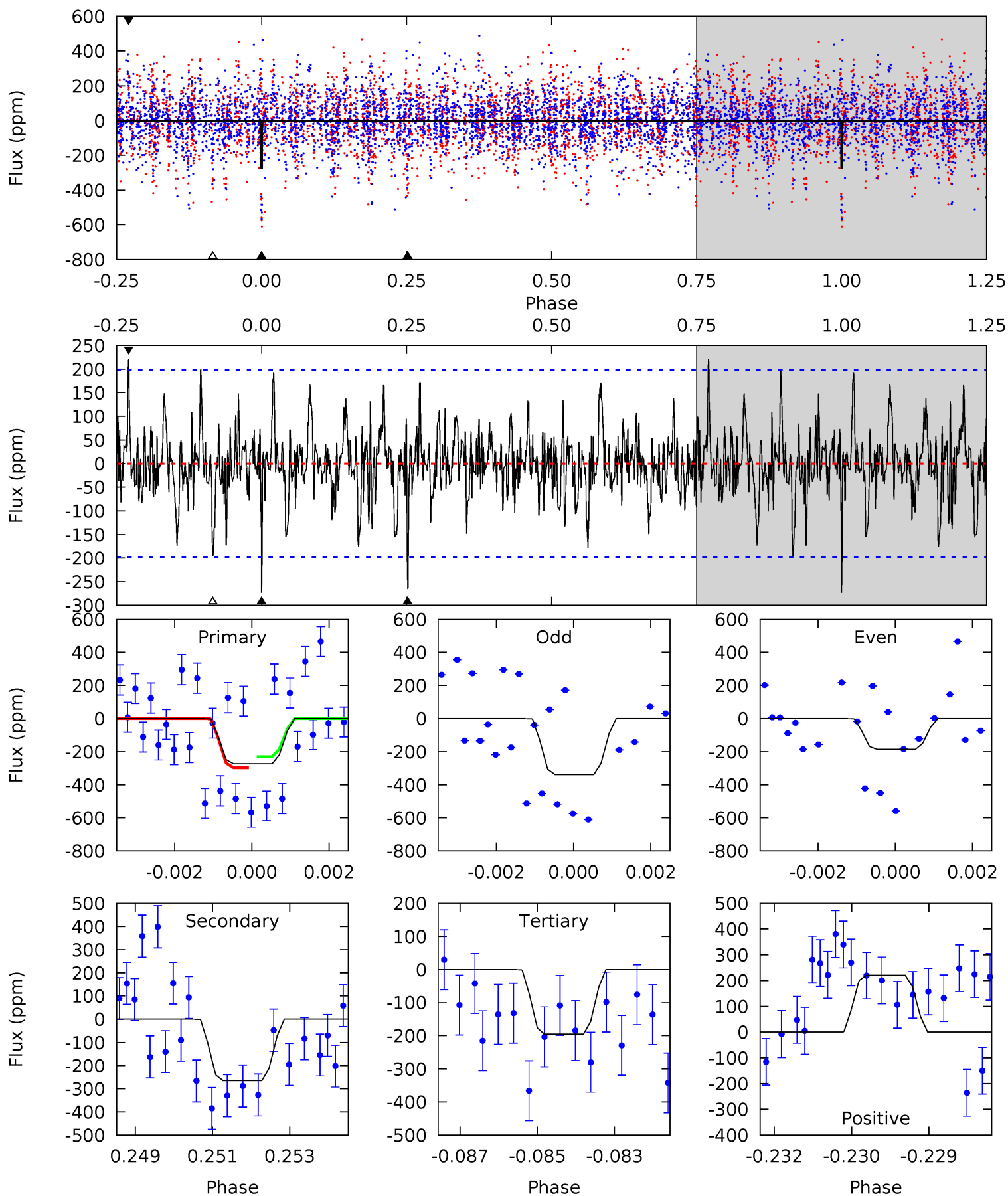
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.41	5.83	5.35	6.53	5.29	3.03	1.81	4.06	2.88	0.47	-0.71	1.42	0.86	0.41	0.79



# Alt Model-Shift Uniqueness Test

010815932-04, P = 59.585198 Days, E = 107.867890 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
7.39	7.18	5.28	5.97	5.35	3.13	1.50	2.11	1.42	1.90	1.21	2.06	1.05	0.45	0.85



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-179 \pm 31$	$8.78^{+8.54}_{-5.79}$	$1461^{+91}_{-234}$	$5503^{+3956}_{-1194}$	$172^{+1197}_{-128}$
Alt.	$-265 \pm 37$	$9.13^{+8.73}_{-5.69}$	$1469^{+90}_{-227}$	$6052^{+4798}_{-1398}$	$233^{+1422}_{-170}$

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

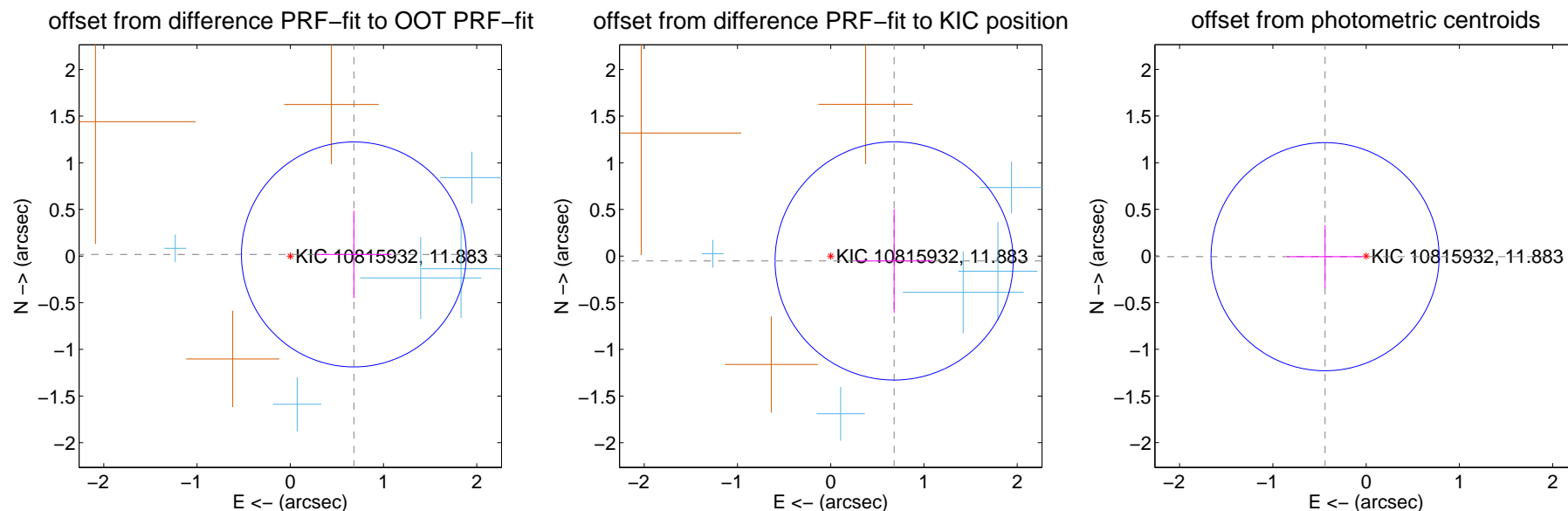
## DV Centroid Data

Supplemental centroid analysis for 010815932-04. **Kepler magnitude: 11.88.** Transit SNR 12.80

There are 5 quarters with good PRF difference image offsets

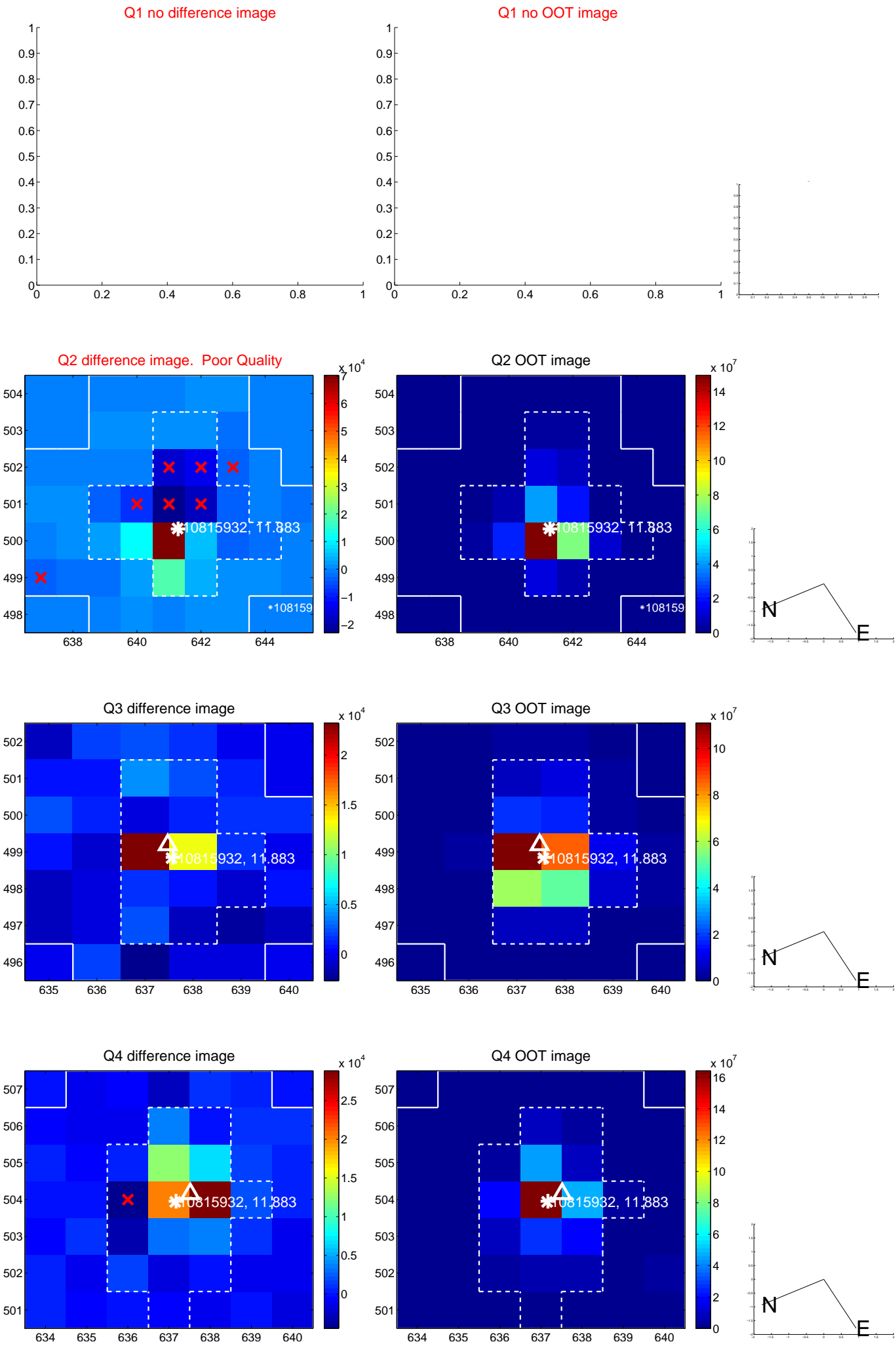
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.682 \pm 0.402$	1.70	$-0.682 \pm 0.404$	$0.018 \pm 0.468$
PRF-fit source offset from KIC position	$0.682 \pm 0.426$	1.60	$-0.680 \pm 0.417$	$-0.052 \pm 0.556$
photometric centroid source offset	$0.44 \pm 0.41$	1.08	$0.44 \pm 0.41$	$-0.01 \pm 0.34$



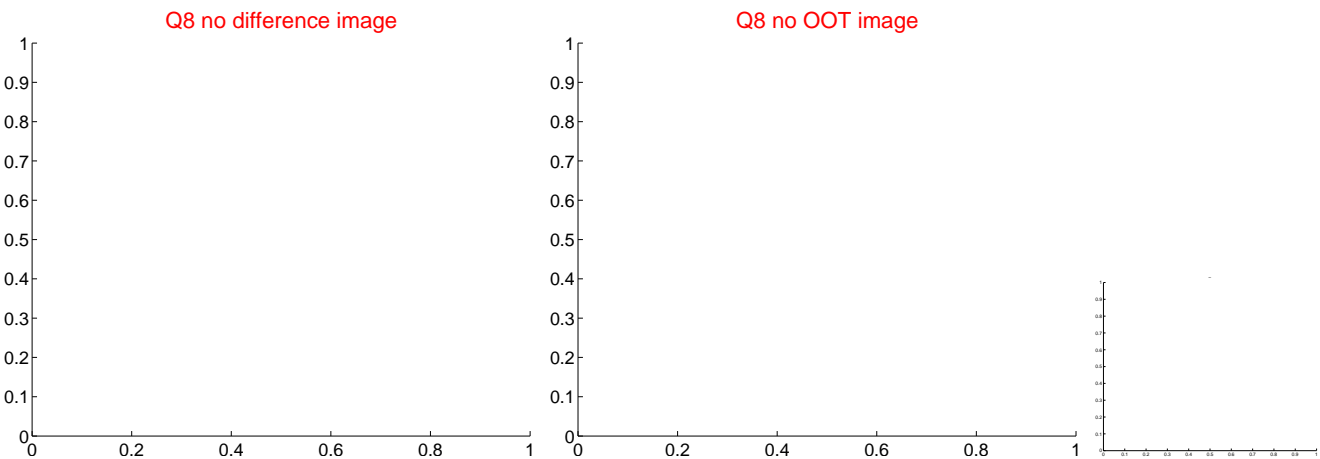
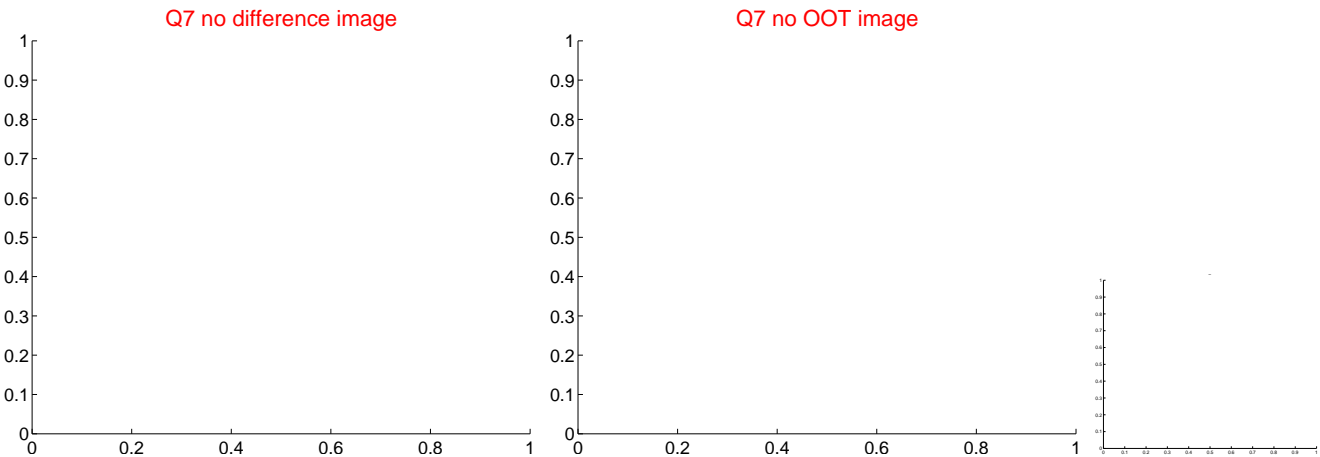
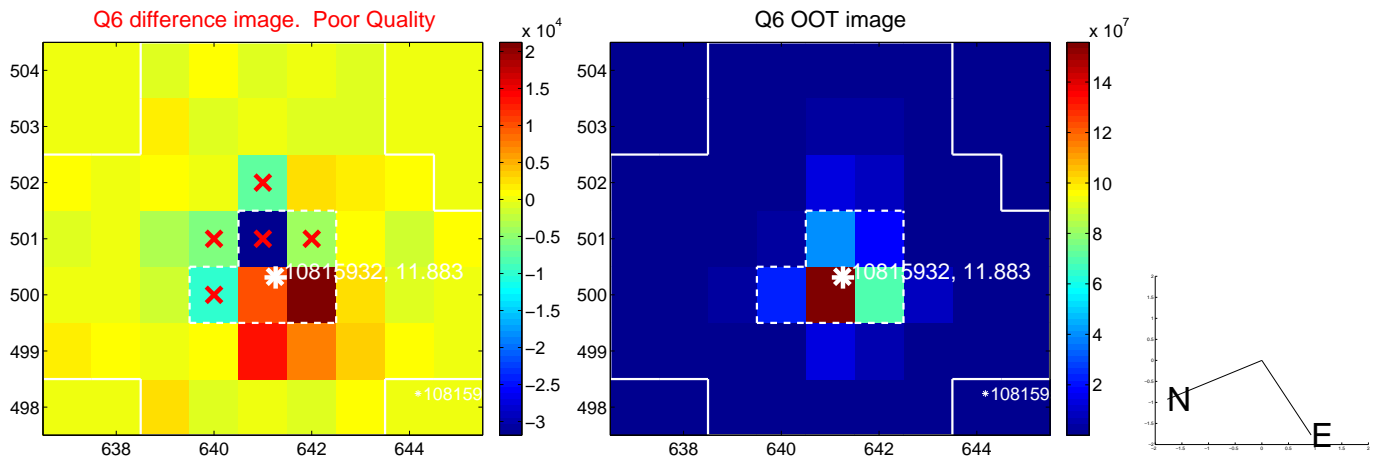
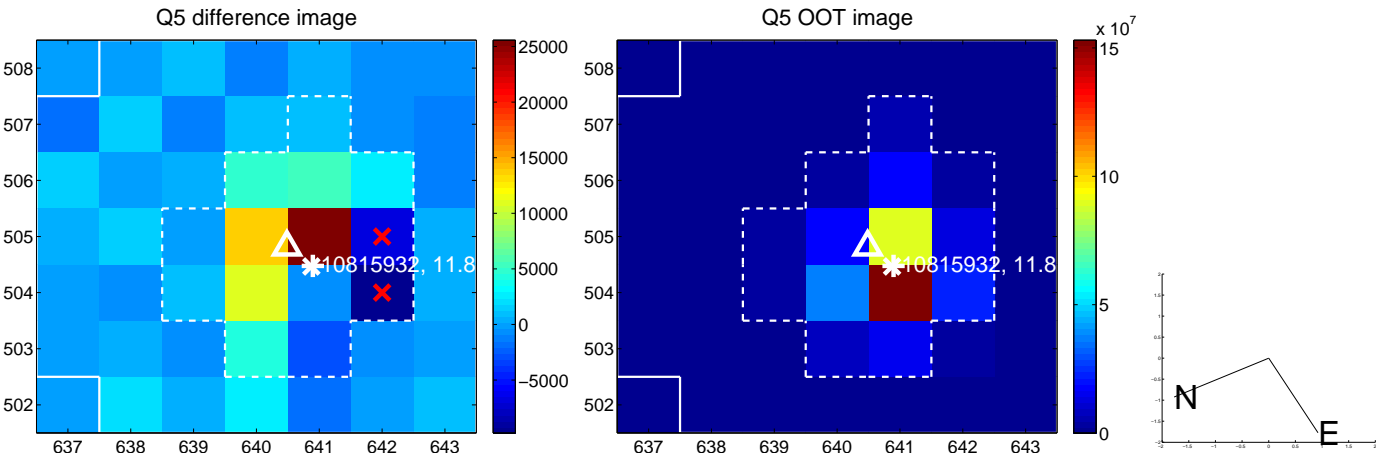
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

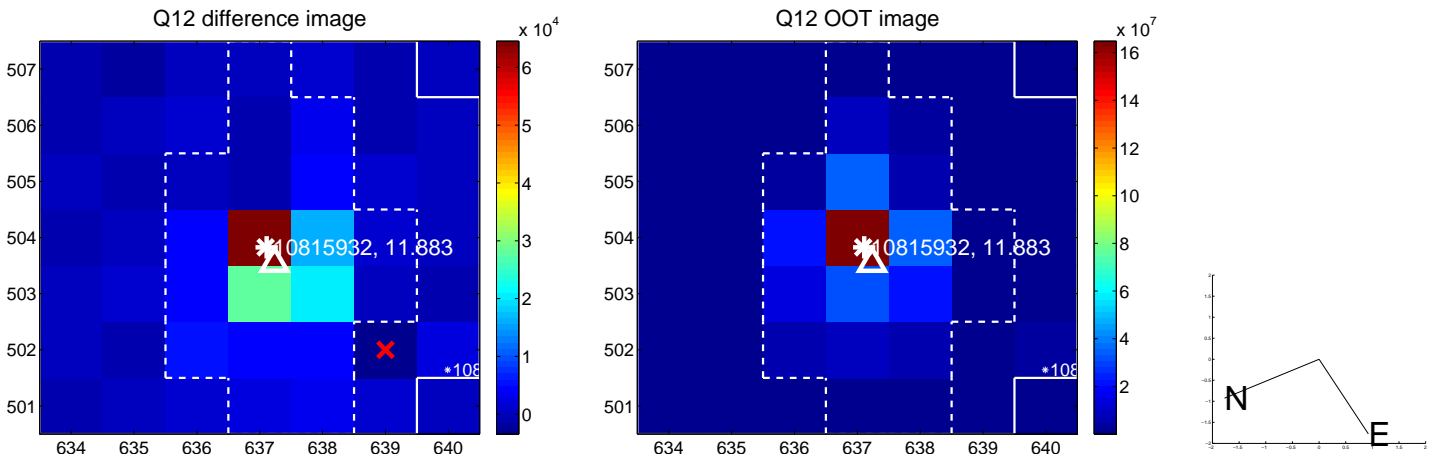
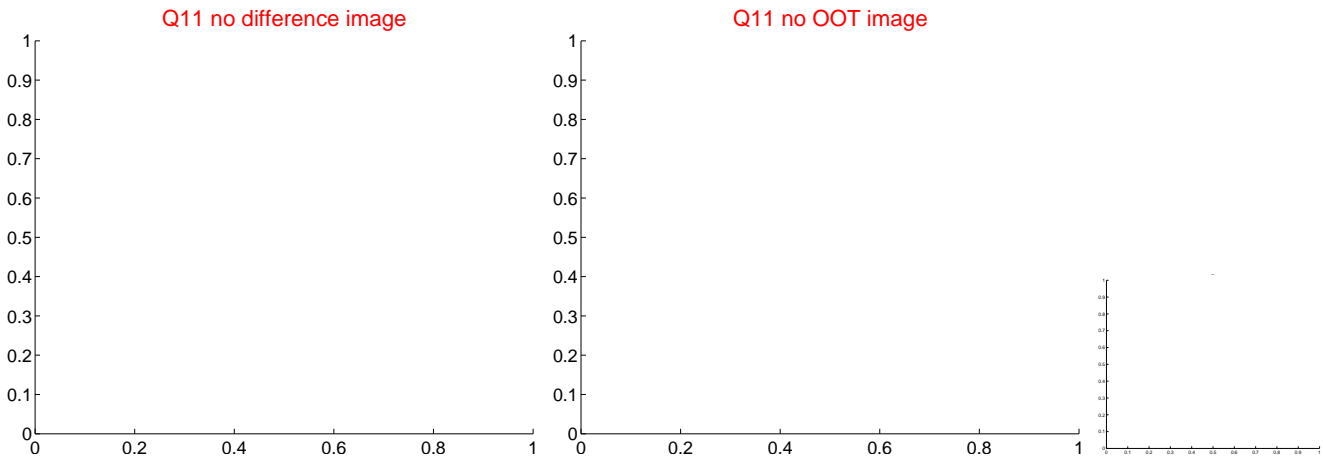
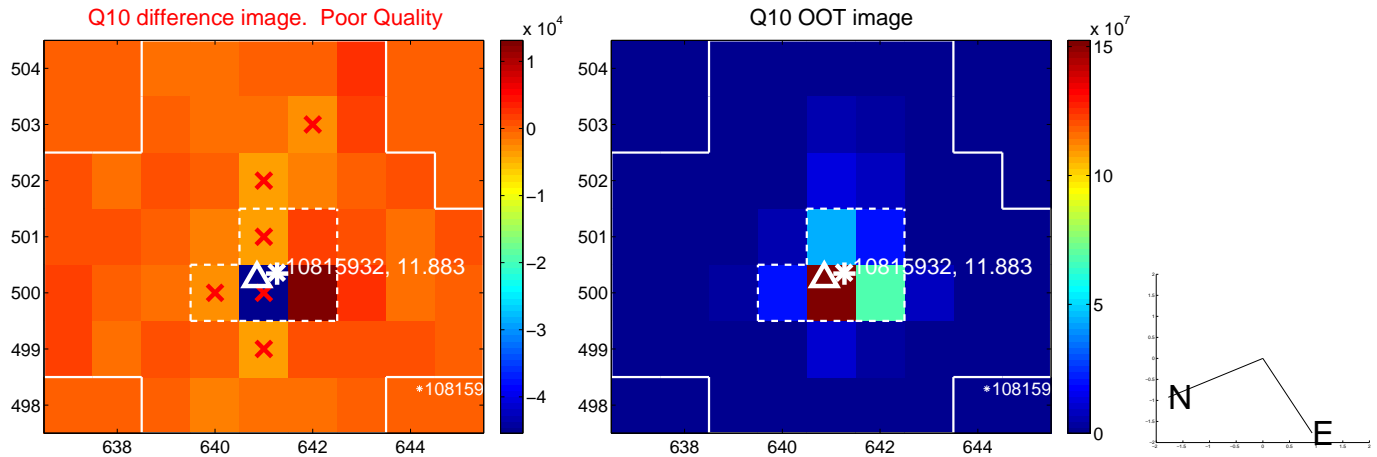
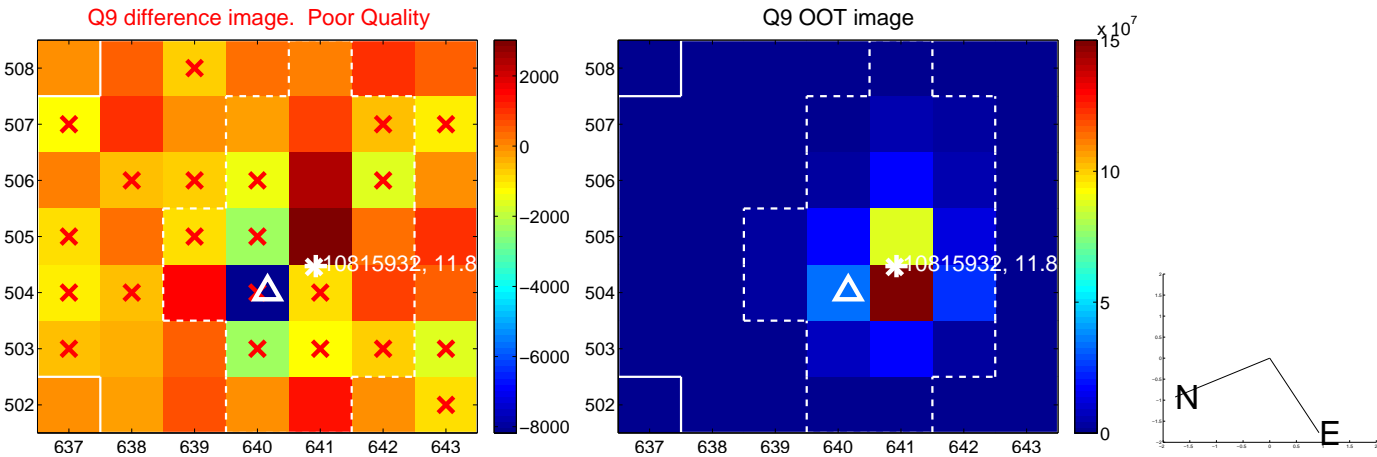




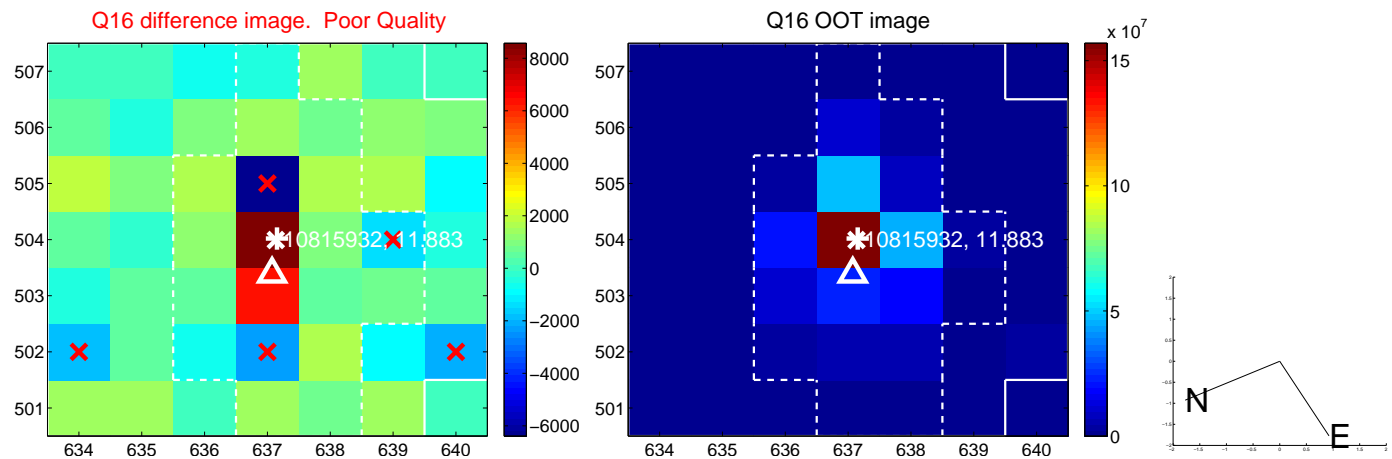
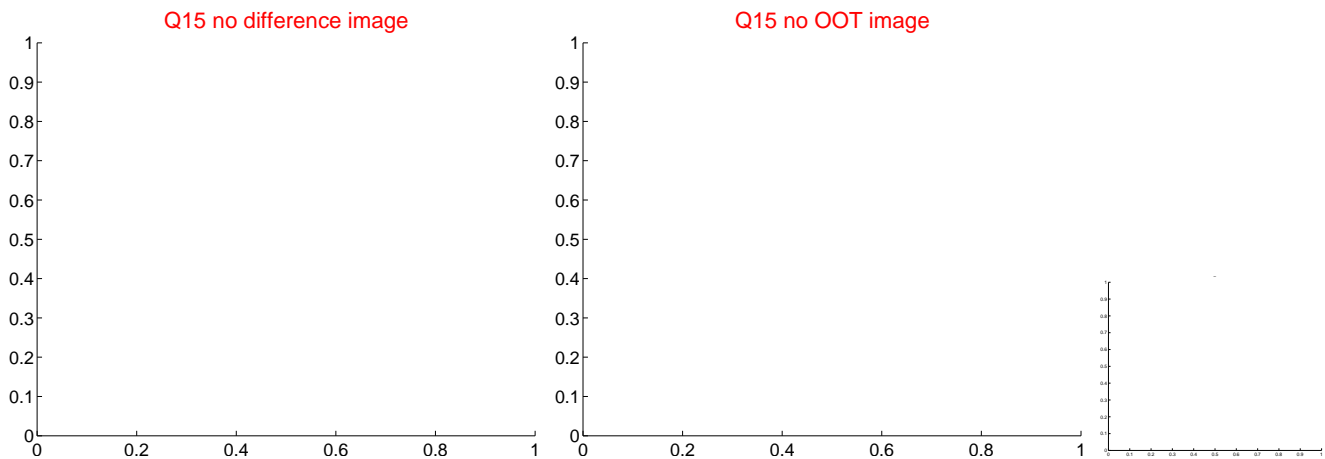
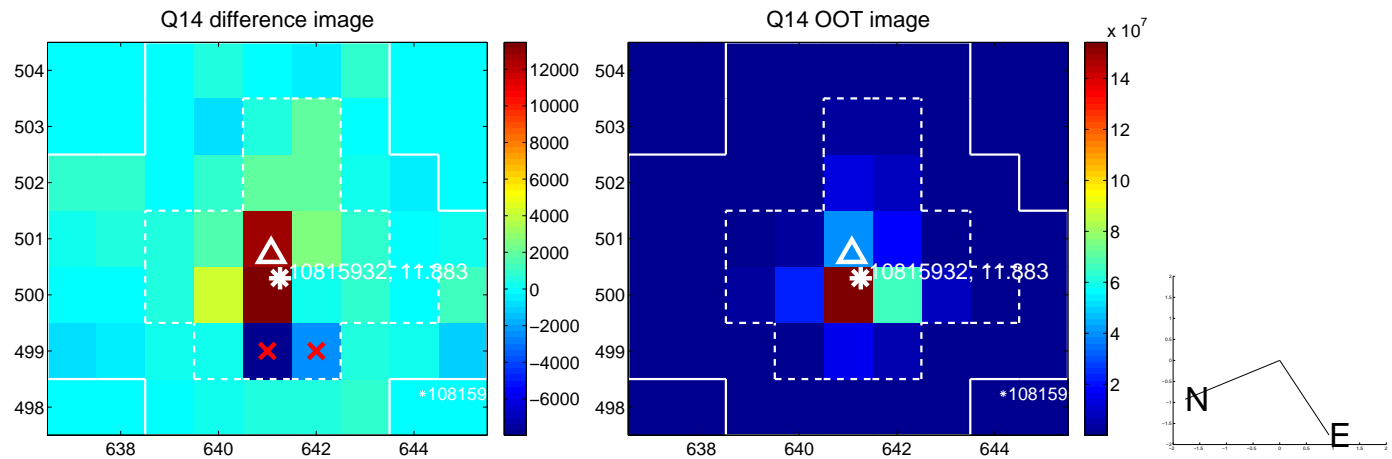
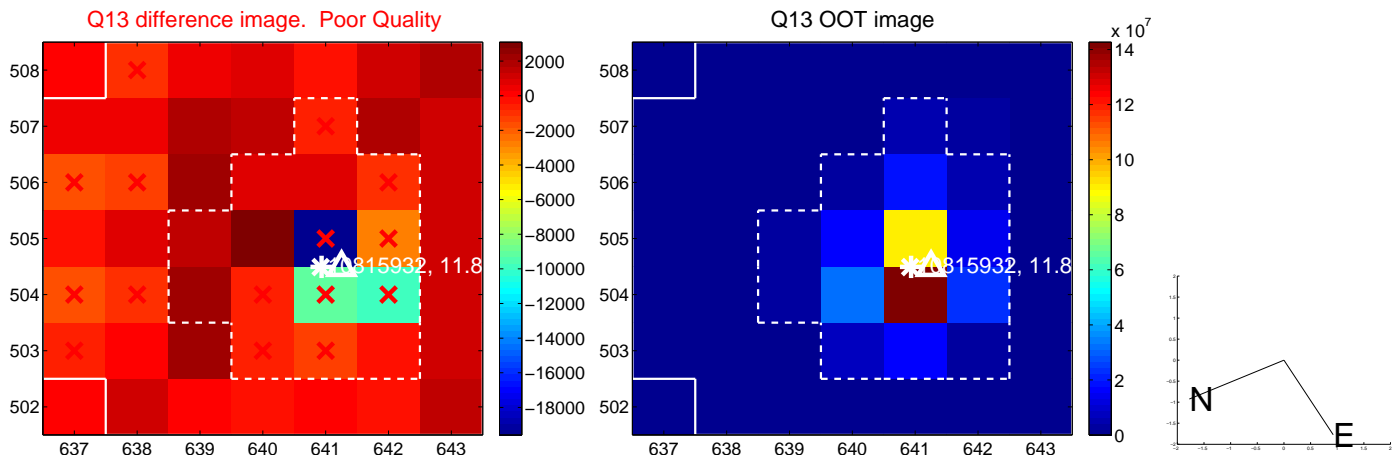
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



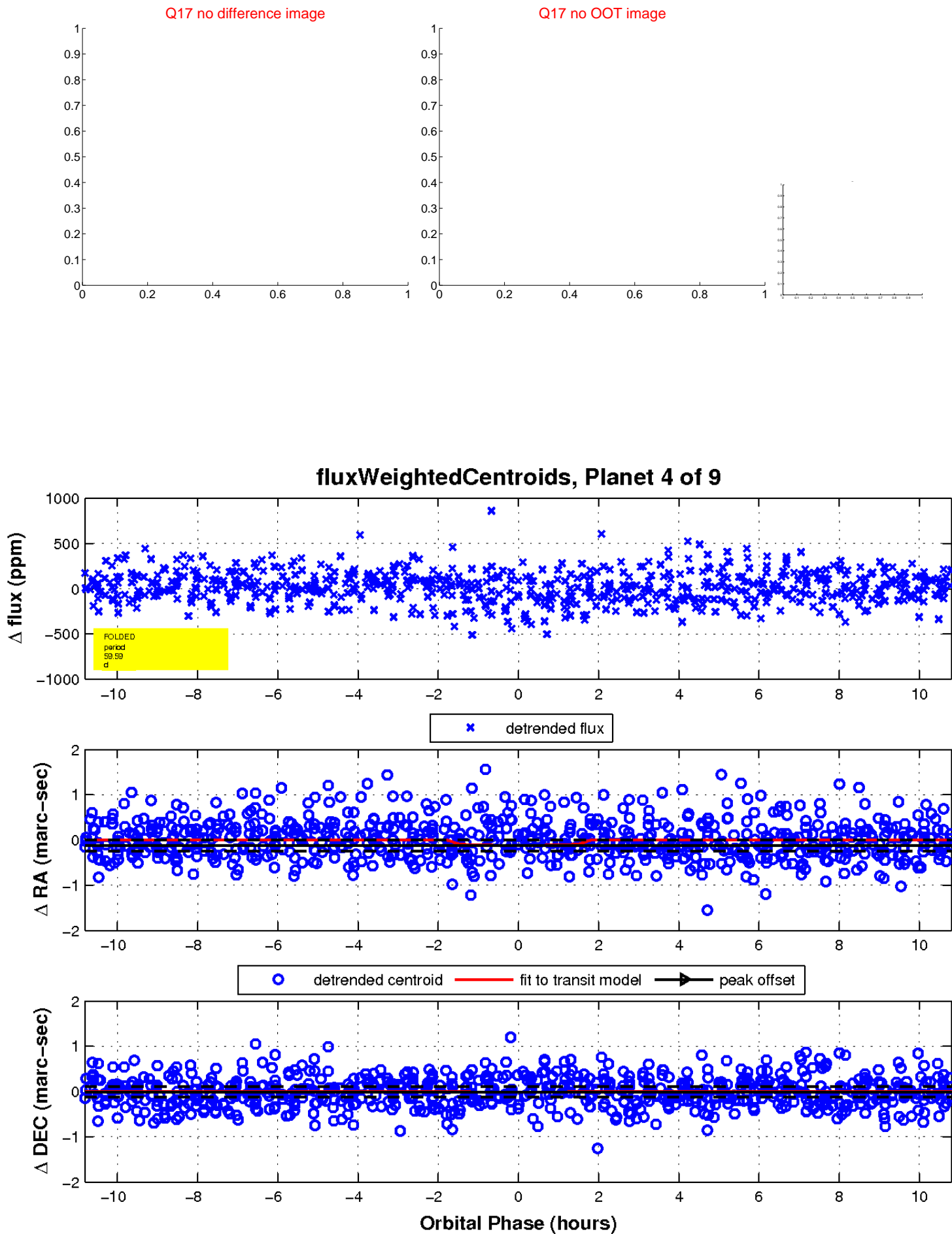
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

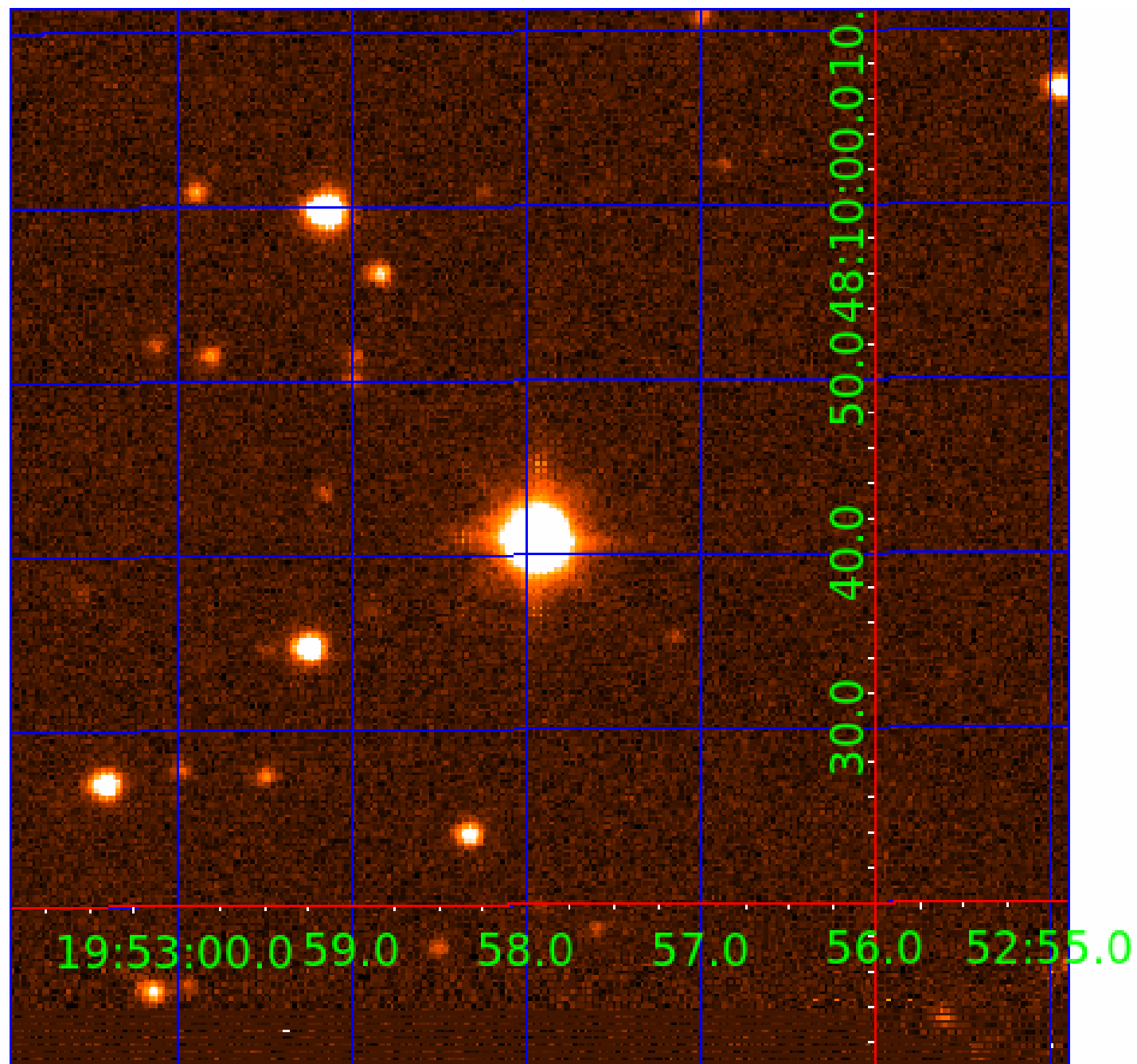


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

**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.

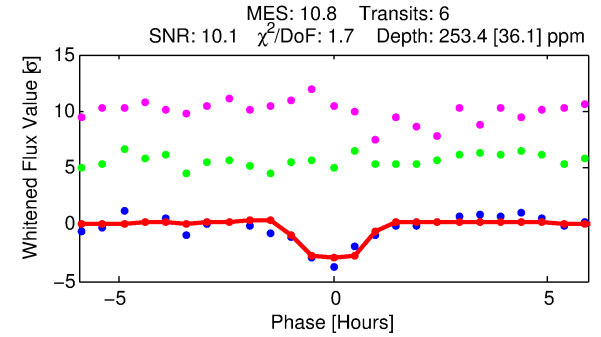
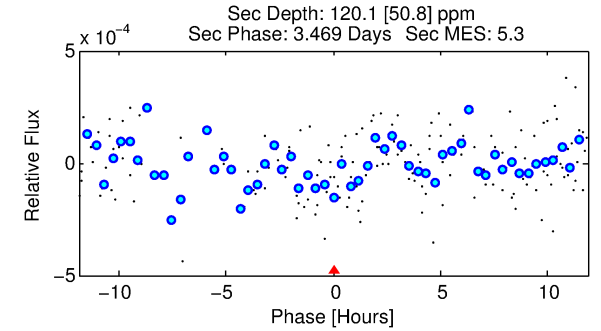
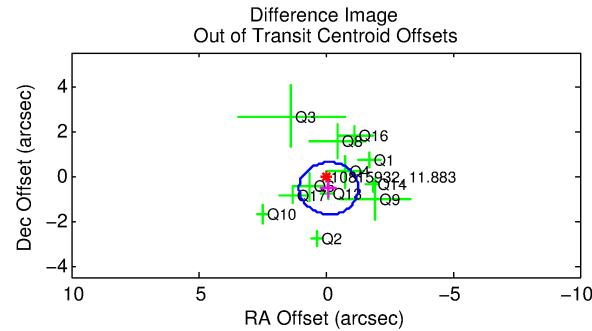
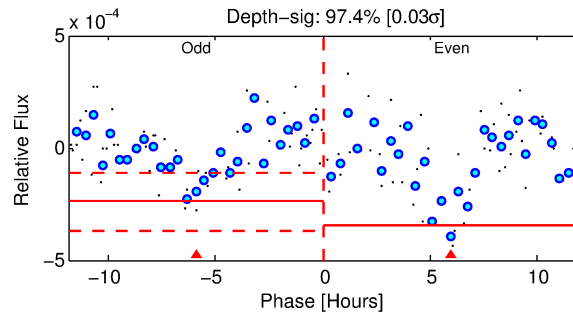
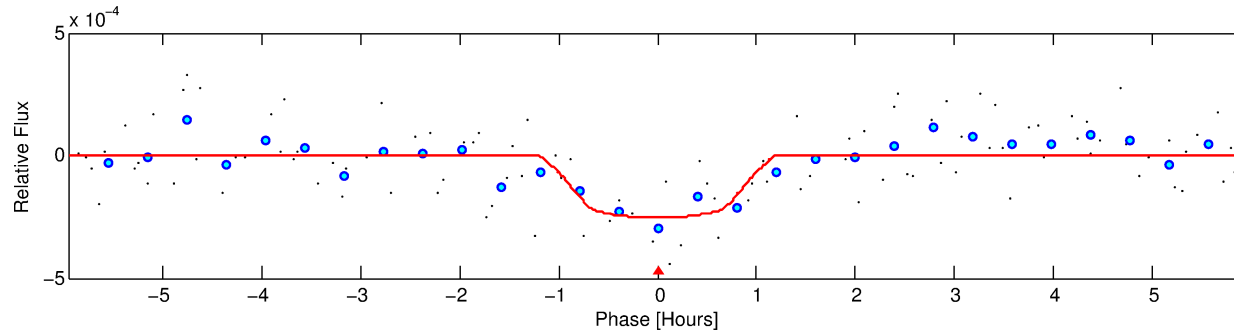
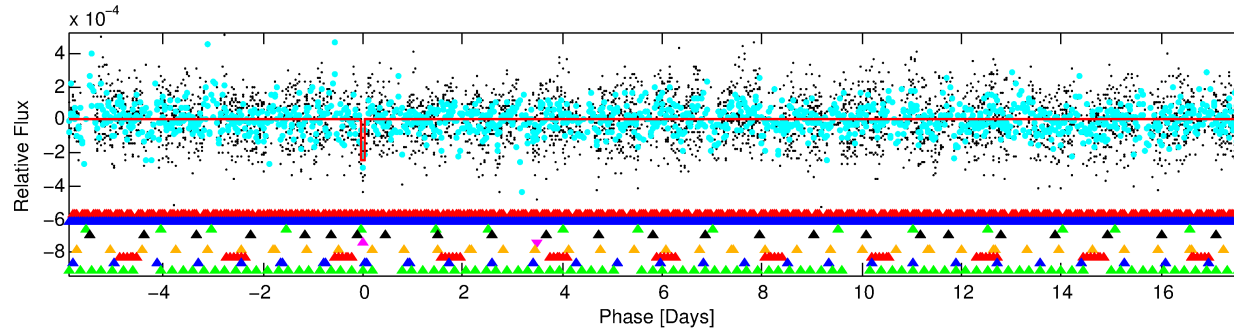
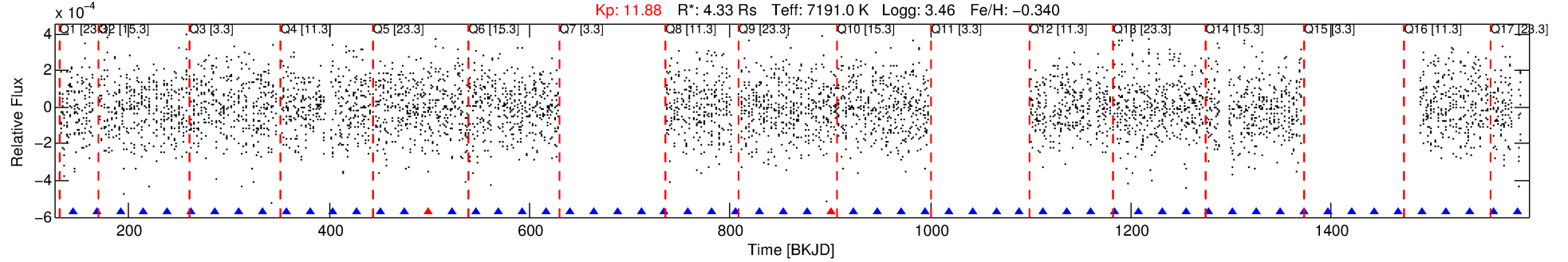
Ephemeris Match Information For 010815932-05

No Significant Match Found



# DV One-Page Summary

KIC: 10815932 Candidate: 5 of 9 Period: 23.620 d



## DV Fit Results:

Period = 23.61974 [0.00036] d  
Epoch = 144.4504 [0.0107] BKJD  
 $R_p/R^* = 0.0166$  [0.0335]  
 $a/R^* = 50.94$  [541.47]  
 $b = 0.85$  [3.61]  
 $\text{Seff} = 1104.44$  [1264.56]  
 $T_{\text{eq}} = 1470$  [421] K  
 $R_p = 7.82$  [16.57]  $R_e$   
 $a = 0.2015$  [0.1361] AU  
 $A_g = 43.83$  [184.83] [0.23 $\sigma$ ]  
 $T_{\text{eff}} = 5848$  [5944] K [0.73 $\sigma$ ]

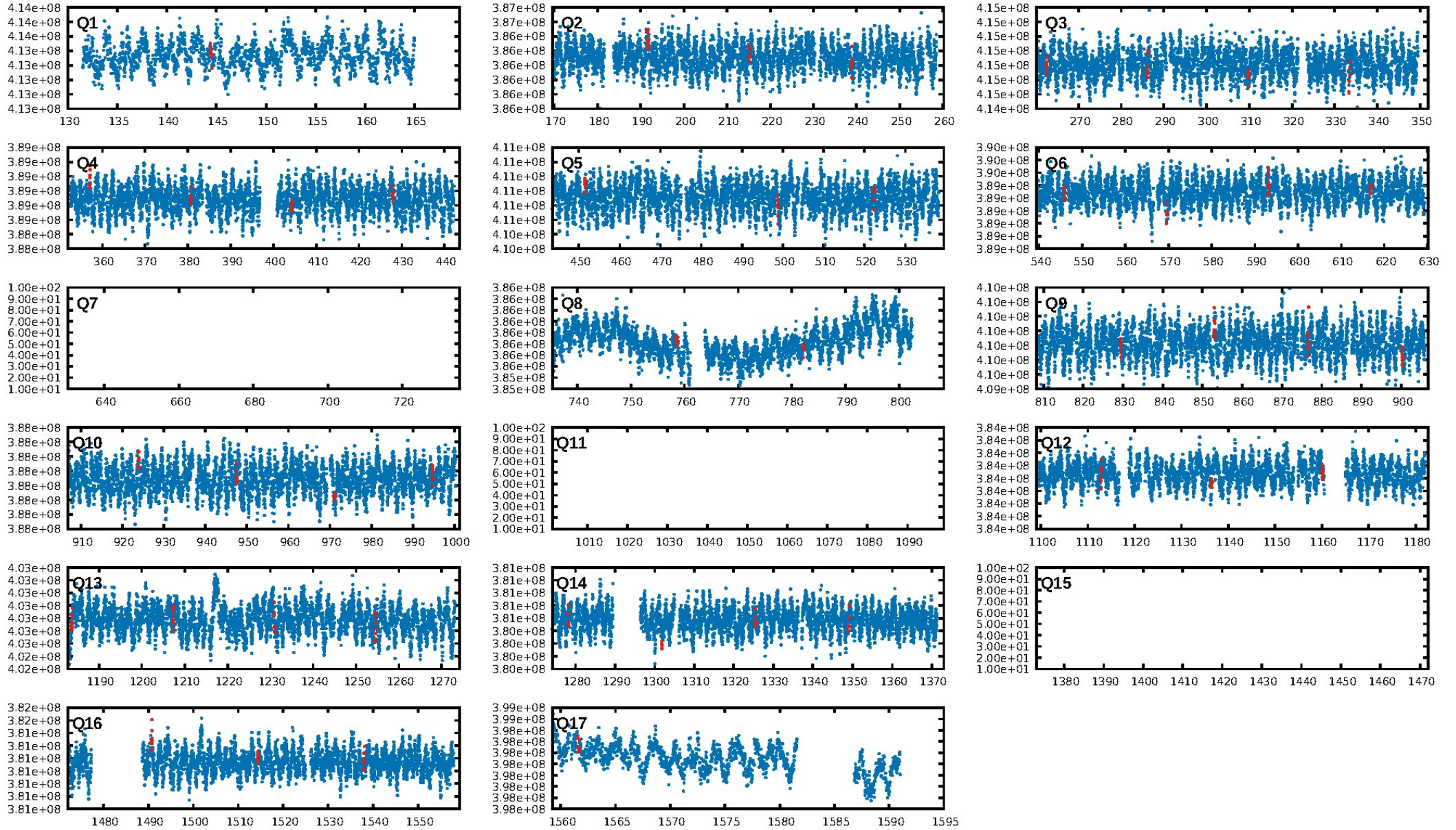
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.49 $\sigma$ ]  
LongPeriod-sig: 100.0% [30.00 $\sigma$ ]  
ModelChiSquare2-sig: 3.9%  
ModelChiSquareGof-sig: 86.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.67 [4/6]  
GhostDiagnostic-chr: -0.9056  
Centroid-sig: 1.8%  
Centroid-so: 0.549 arcsec [1.71 $\sigma$ ]  
OotOffset-rm: 0.569 arcsec [1.47 $\sigma$ ]  
OotOffset-st: 4/1/3/4 [12]  
KicOffset-rm: 0.626 arcsec [1.63 $\sigma$ ]  
KicOffset-st: 4/1/3/4 [12]  
DiffImageQuality-fgm: 0.50 [6/12]  
DiffImageOverlap-fno: 0.36 [5/14]

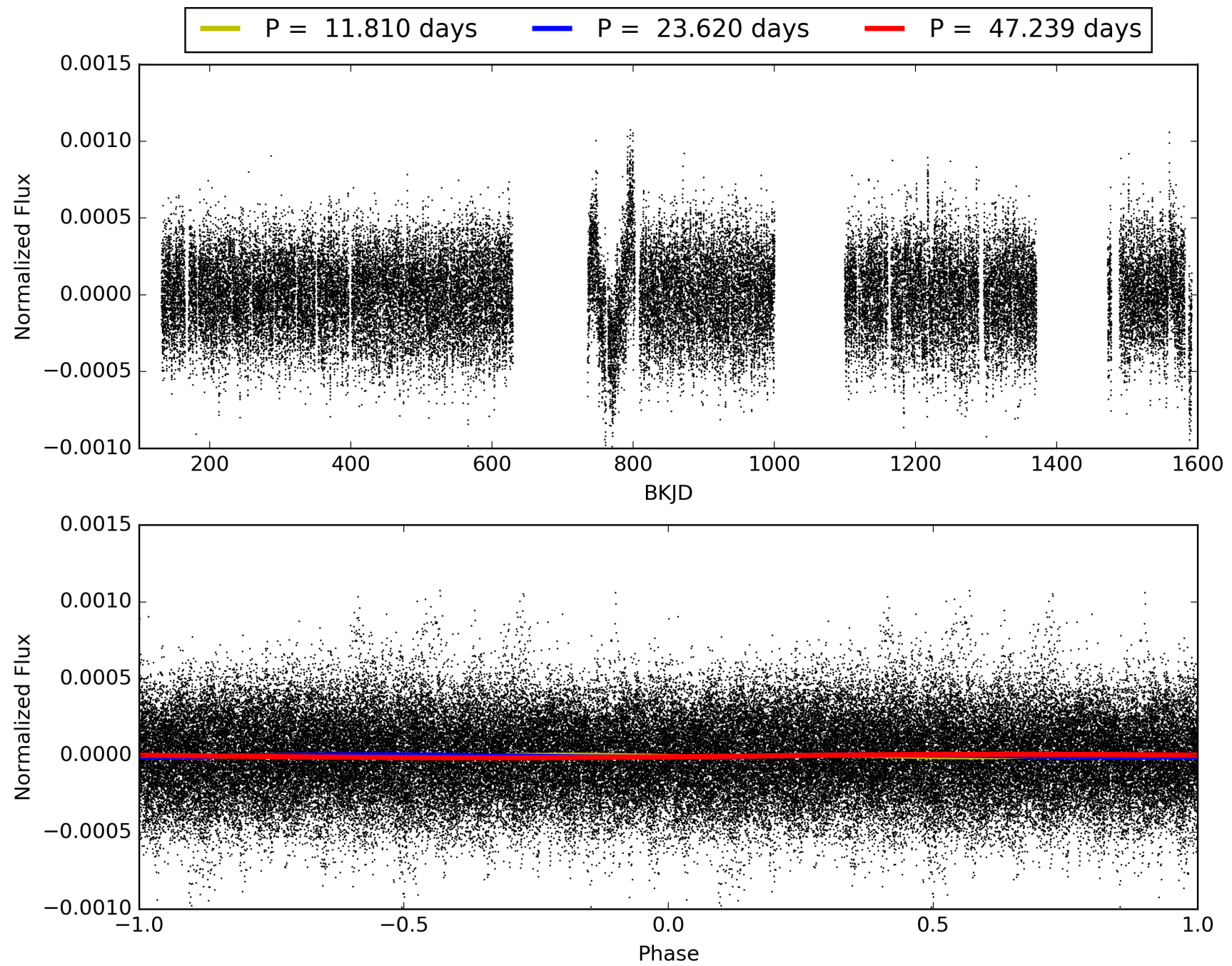
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:12 Z

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

# TCE 010815932-05, PDC Light Curves

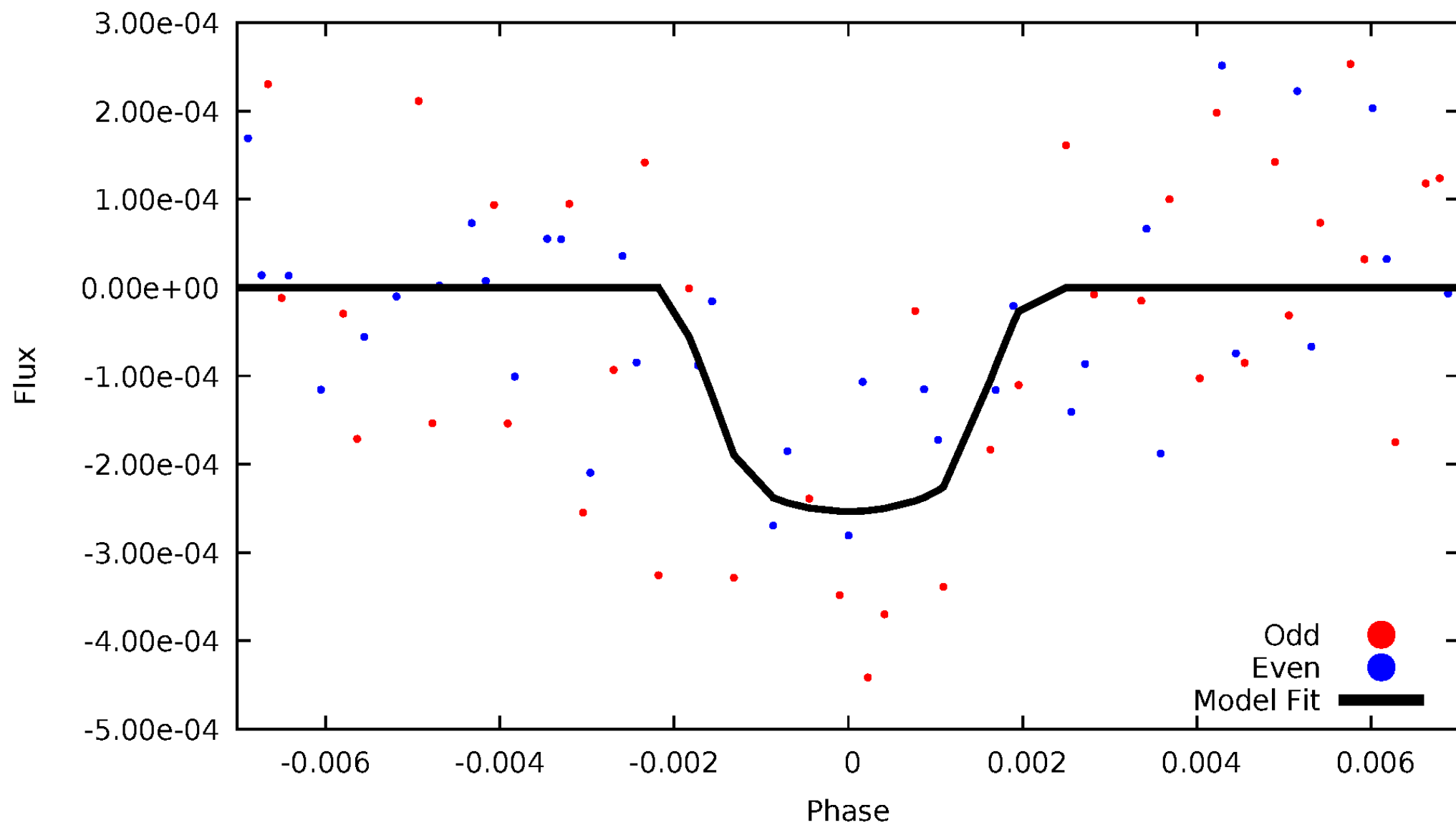


TCE 010815932-05



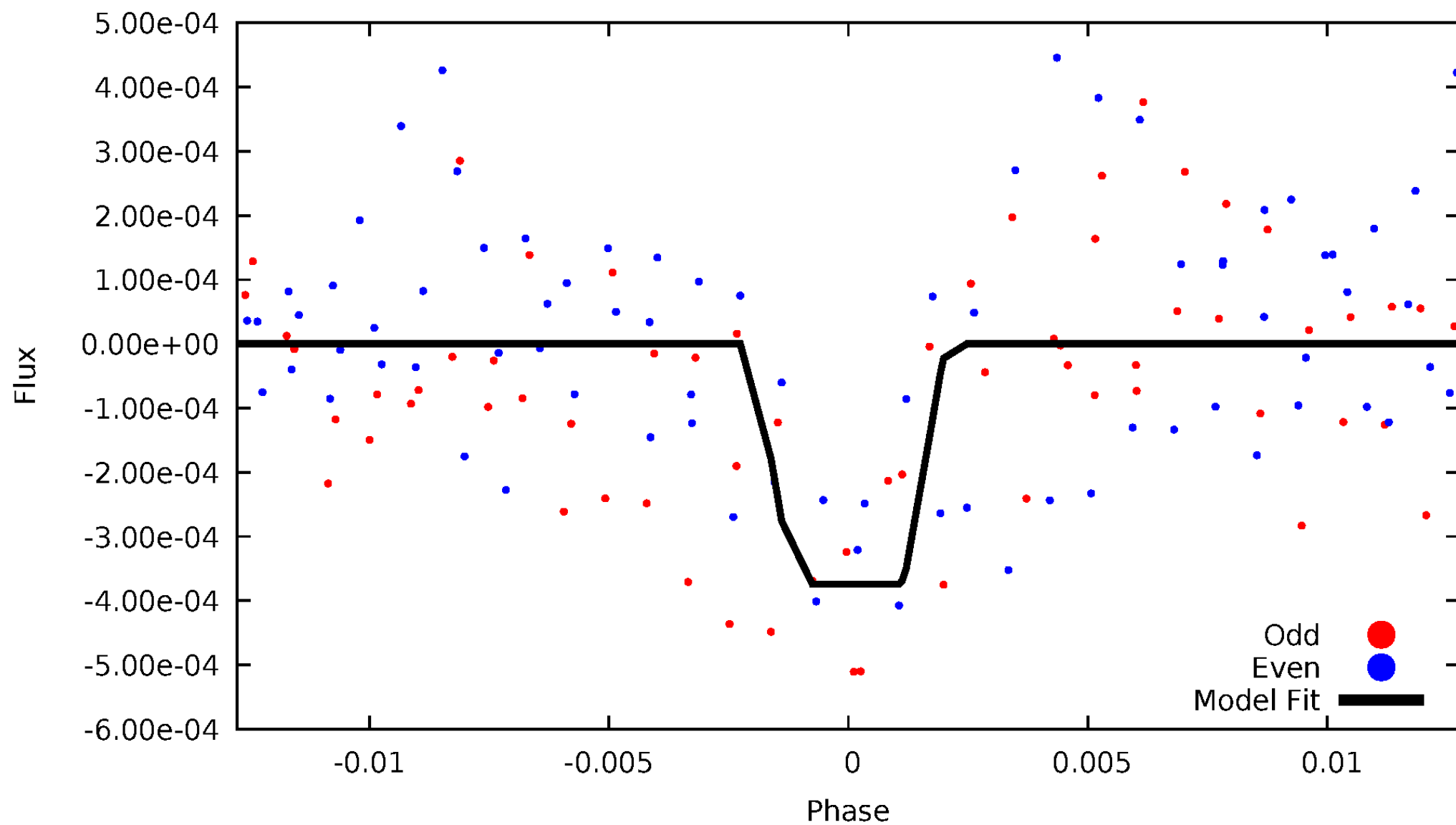
# DV Odd/Even

TCE 010815932-05



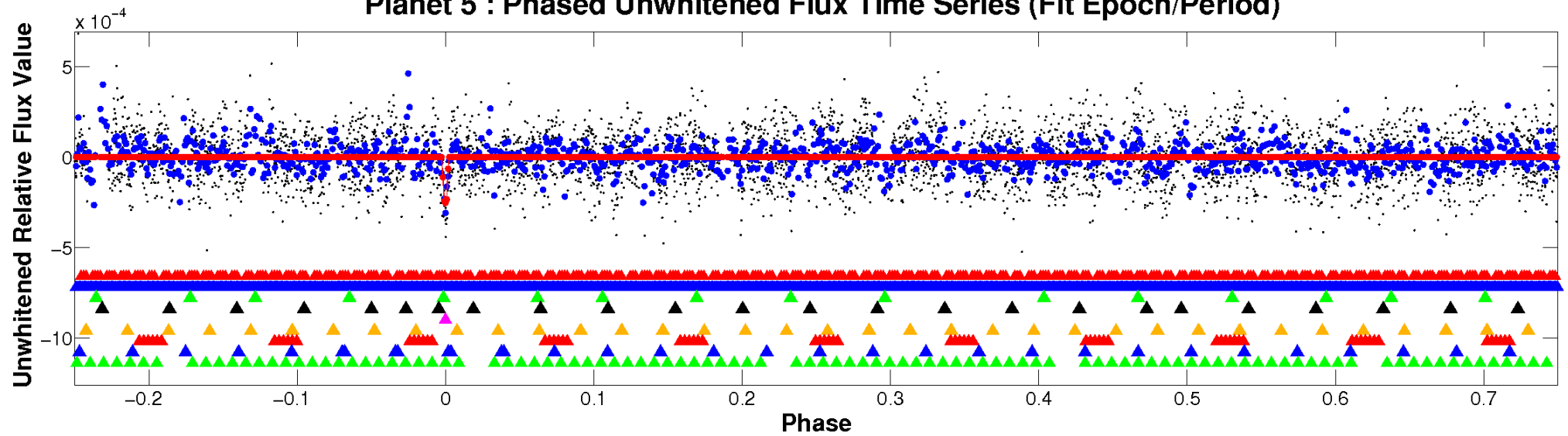
# ALT Odd/Even

TCE 010815932-05

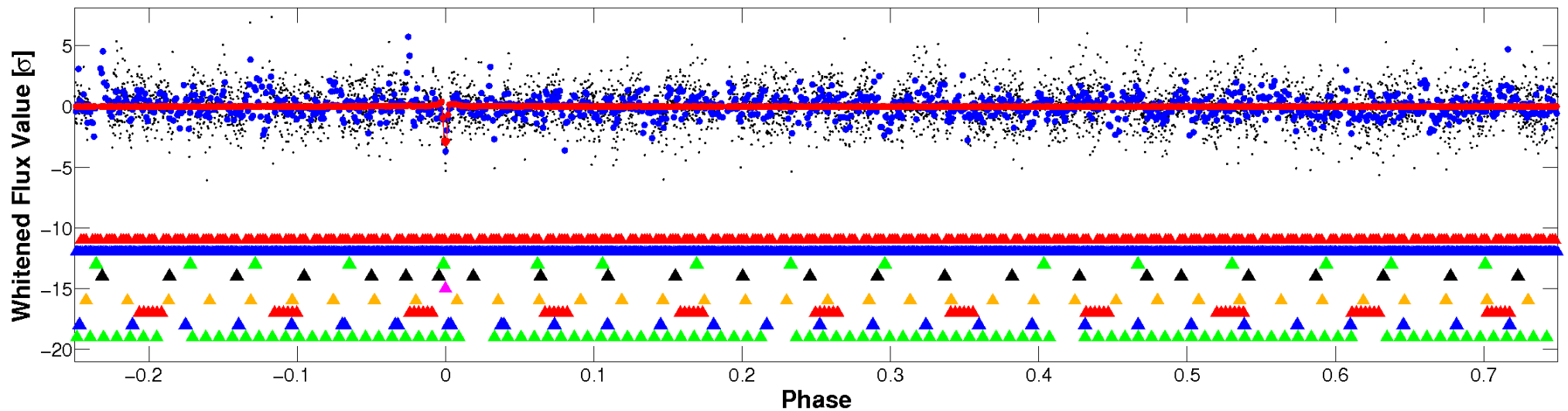


# Non-Whitened Vs. Whitened Light Curve

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



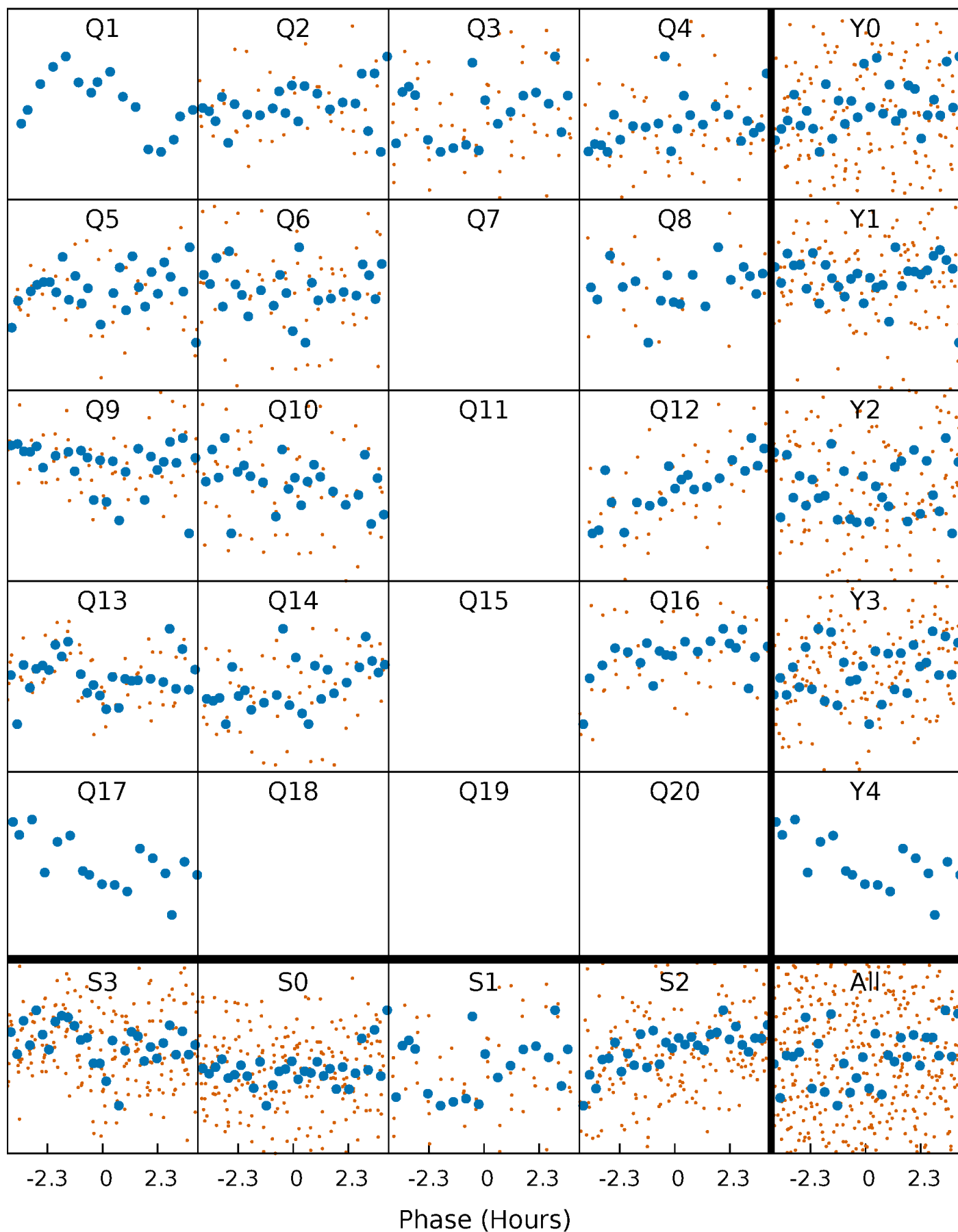
## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





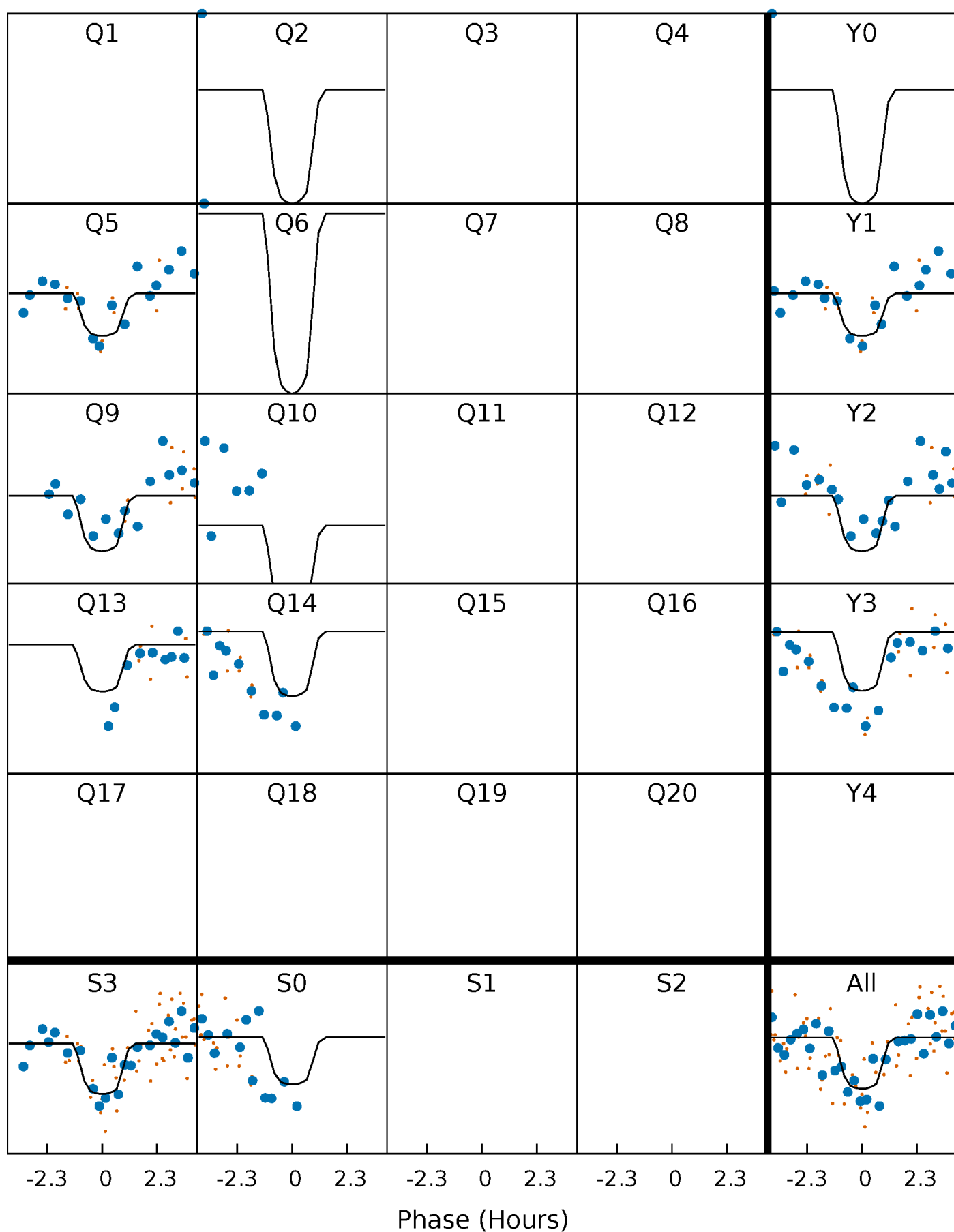
# PDC Quarter-Phased Transit Curves

TCE 010815932-05     $P = 23.619739$  Days     $T_0 = 144.450437$  (BKJD)



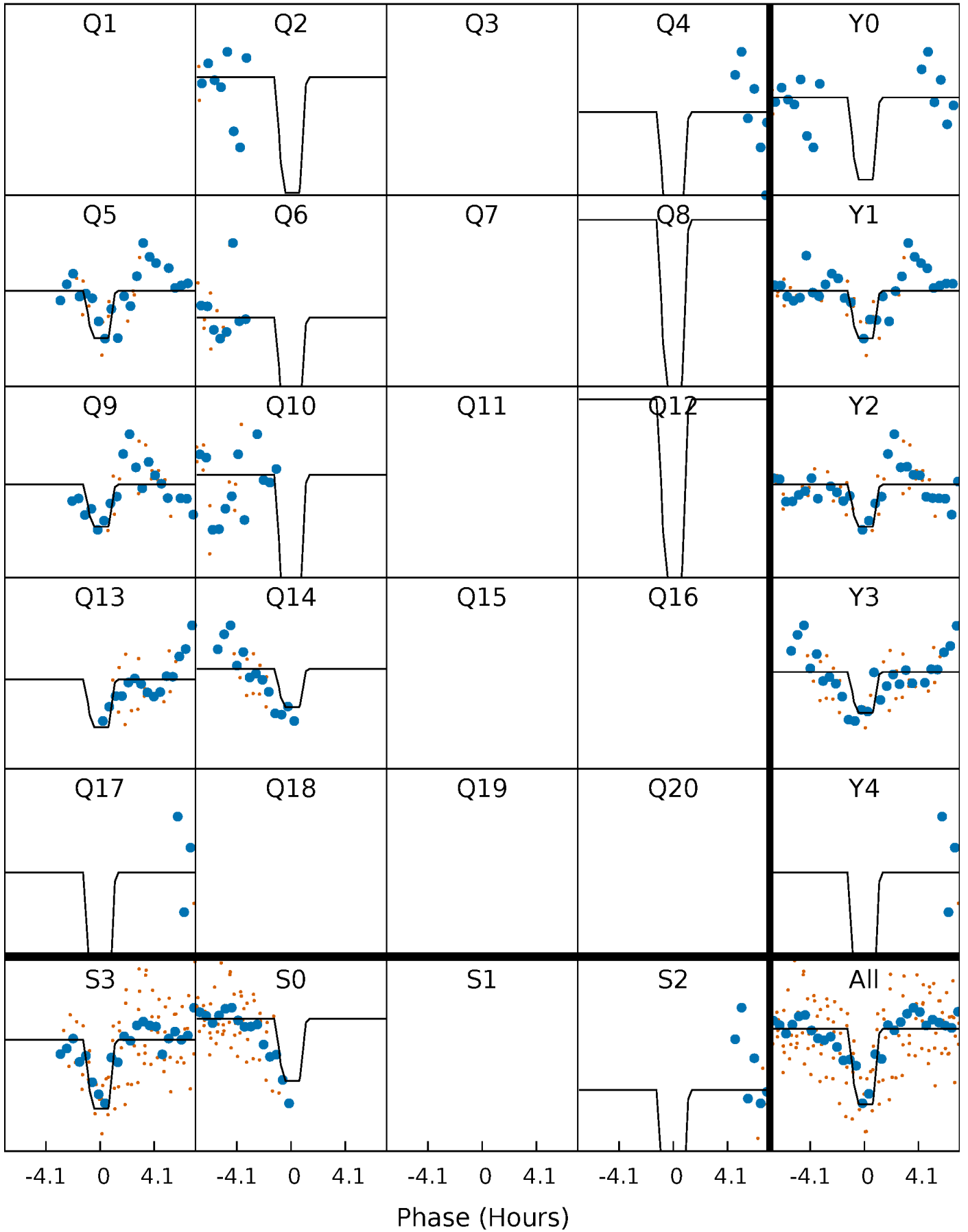
# DV Quarter-Phased Transit Curves

TCE 010815932-05     $P = 23.619739$  Days     $T_0 = 144.450437$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

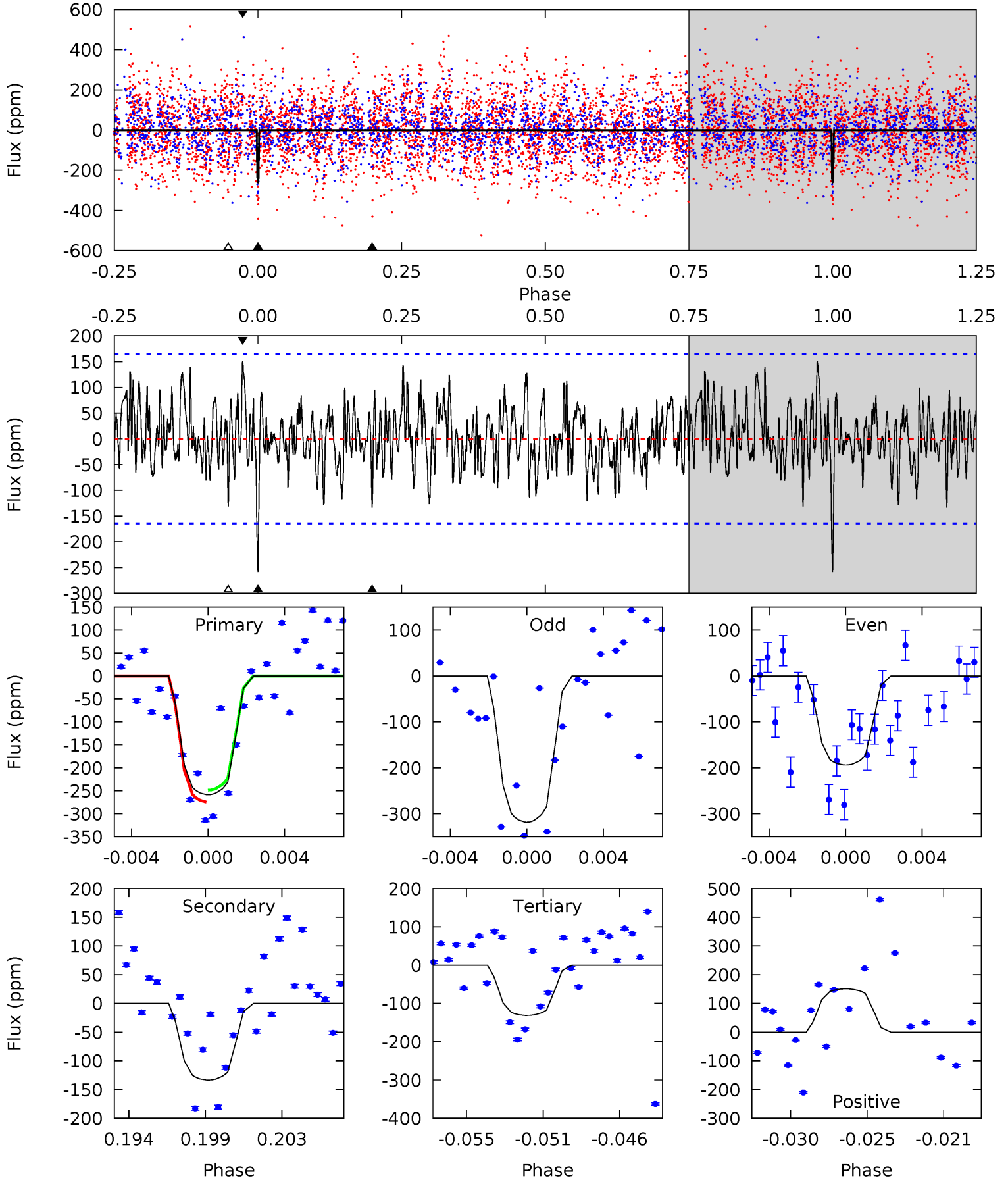
TCE 010815932-05     $P = 23.620196$  Days     $T_0 = 144.435166$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-05, P = 23.619739 Days, E = 120.830698 Days

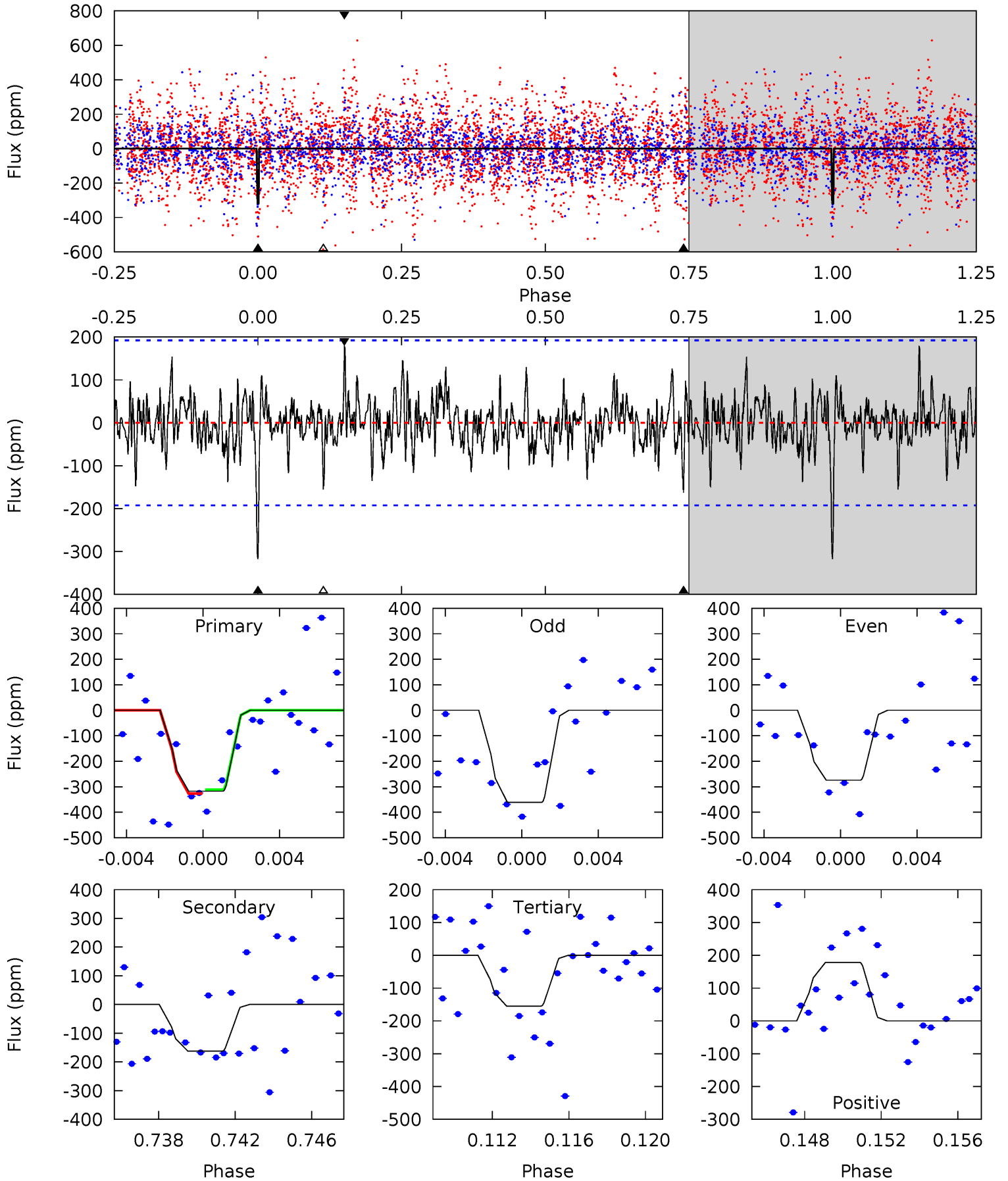
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.18	4.22	4.15	4.77	5.19	2.86	1.55	4.02	3.40	0.07	-0.55	1.97	1.16	0.37	0.39



# Alt Model-Shift Uniqueness Test

010815932-05,  $P = 23.620196$  Days,  $E = 120.814970$  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
8.58	4.40	4.19	4.82	5.20	2.88	1.29	4.38	3.76	0.21	-0.42	1.19	0.97	0.36	0.19



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-133 \pm 32$	$10.97^{+13.89}_{-7.49}$	$1977^{+140}_{-272}$	$4619^{+3688}_{-1040}$	$22^{+222}_{-18}$
Alt.	$-163 \pm 37$	$12.53^{+13.34}_{-8.82}$	$1983^{+133}_{-318}$	$4601^{+3355}_{-991}$	$23^{+227}_{-18}$

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

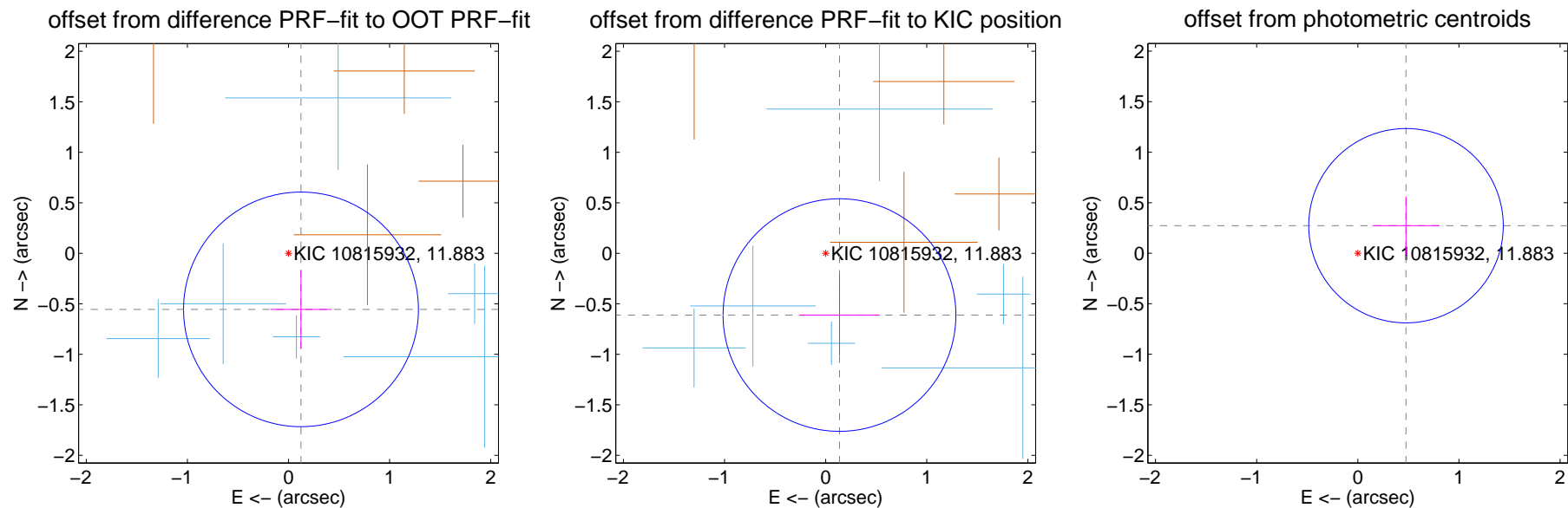
## DV Centroid Data

Supplemental centroid analysis for 010815932-05. **Kepler magnitude: 11.88.** Transit SNR 10.05

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

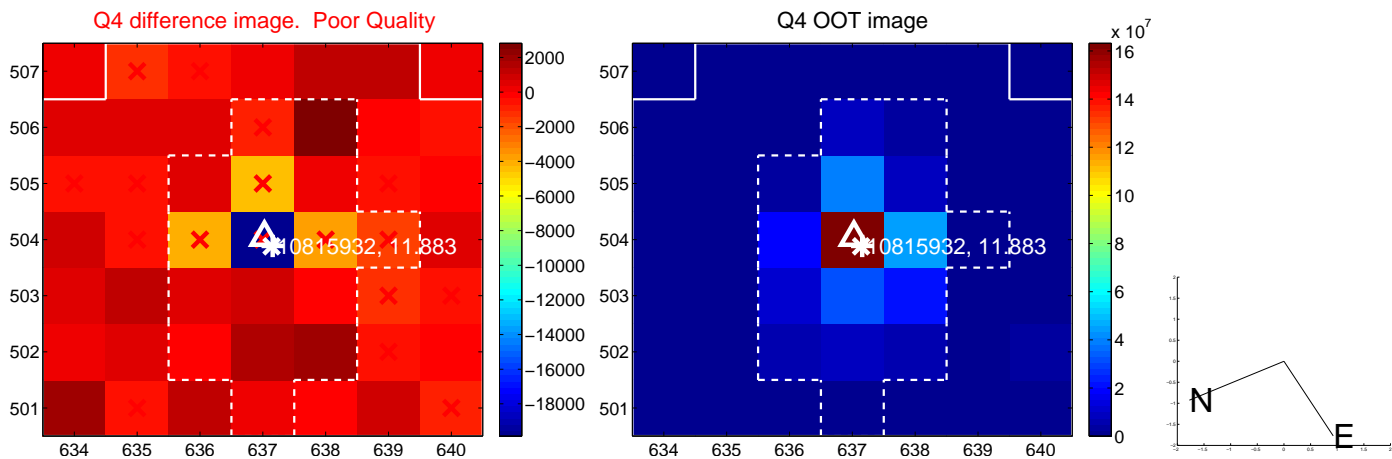
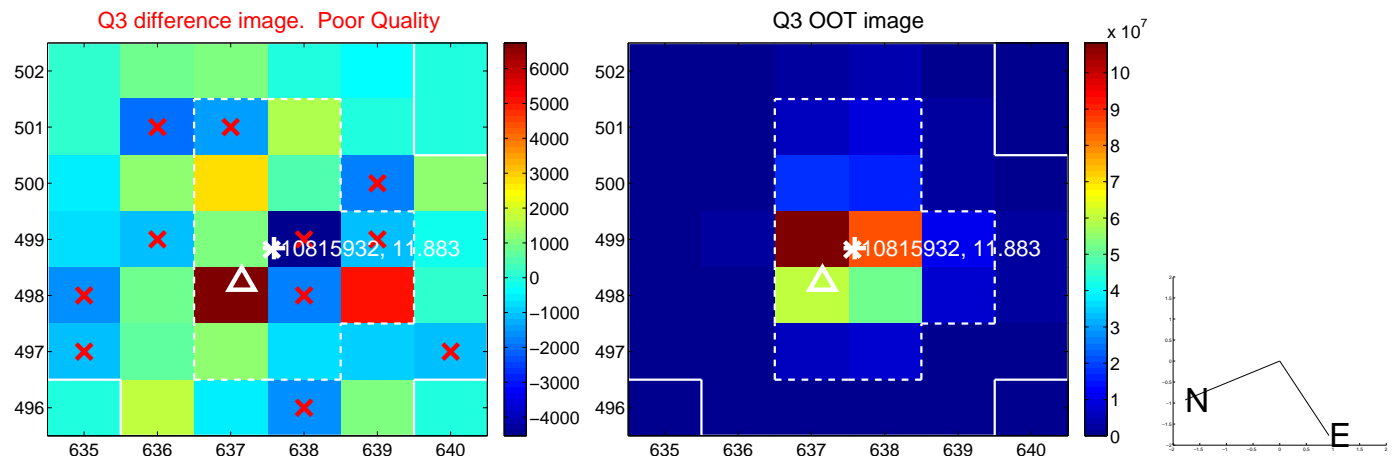
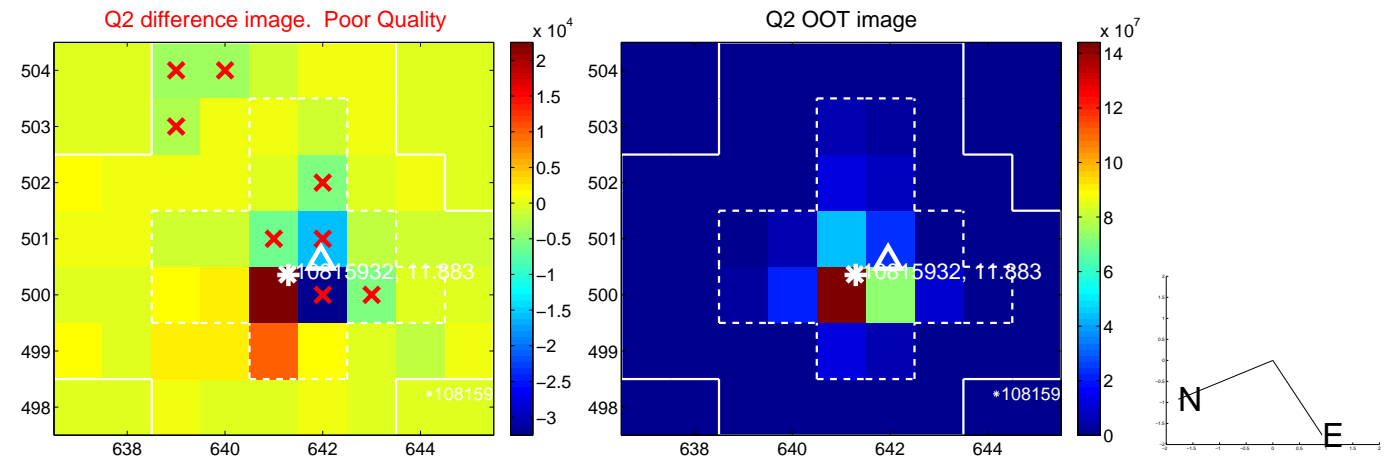
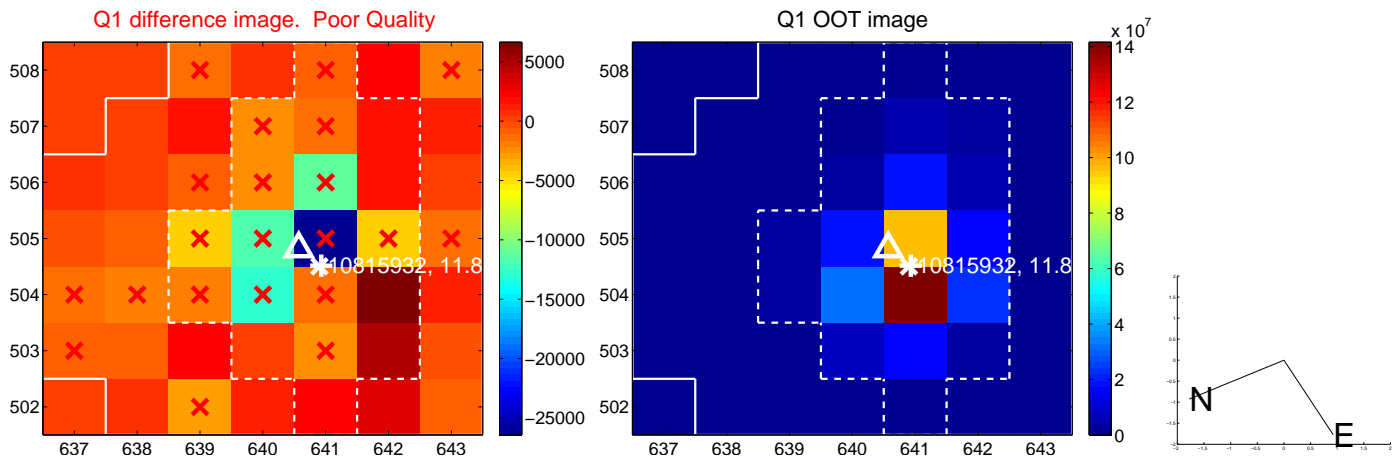
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.569 \pm 0.387$	1.47	$-0.124 \pm 0.302$	$-0.555 \pm 0.391$
PRF-fit source offset from KIC position	$0.626 \pm 0.384$	1.63	$-0.137 \pm 0.400$	$-0.611 \pm 0.401$
photometric centroid source offset	$0.55 \pm 0.32$	1.71	$-0.48 \pm 0.33$	$0.27 \pm 0.29$



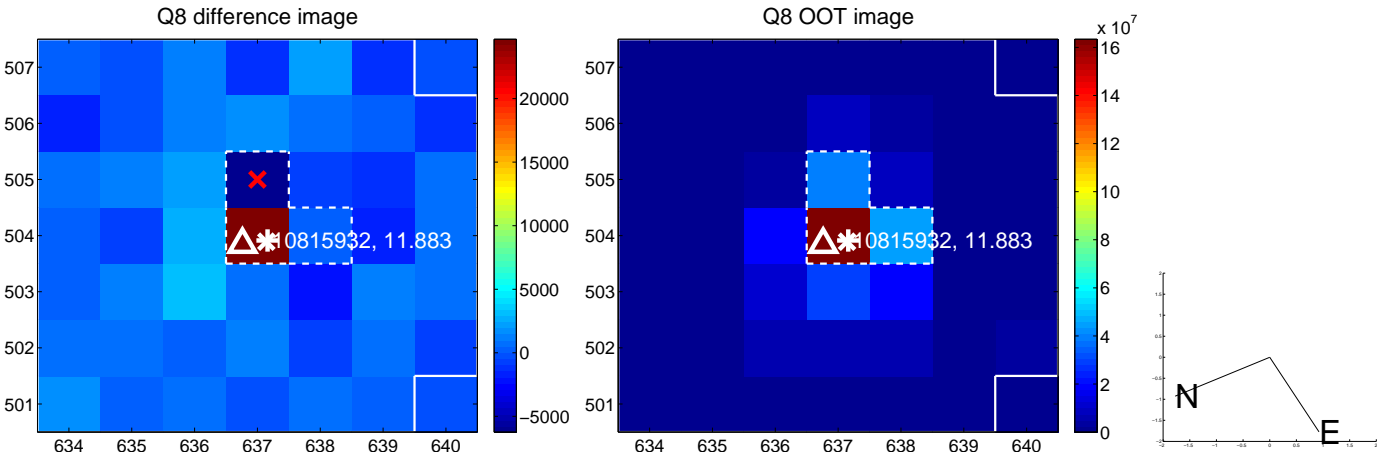
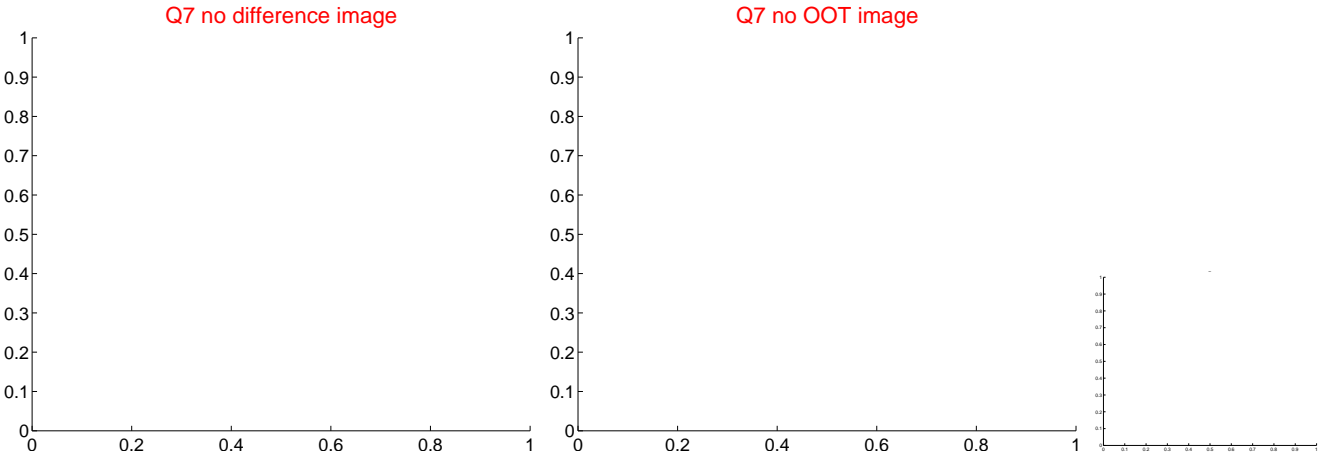
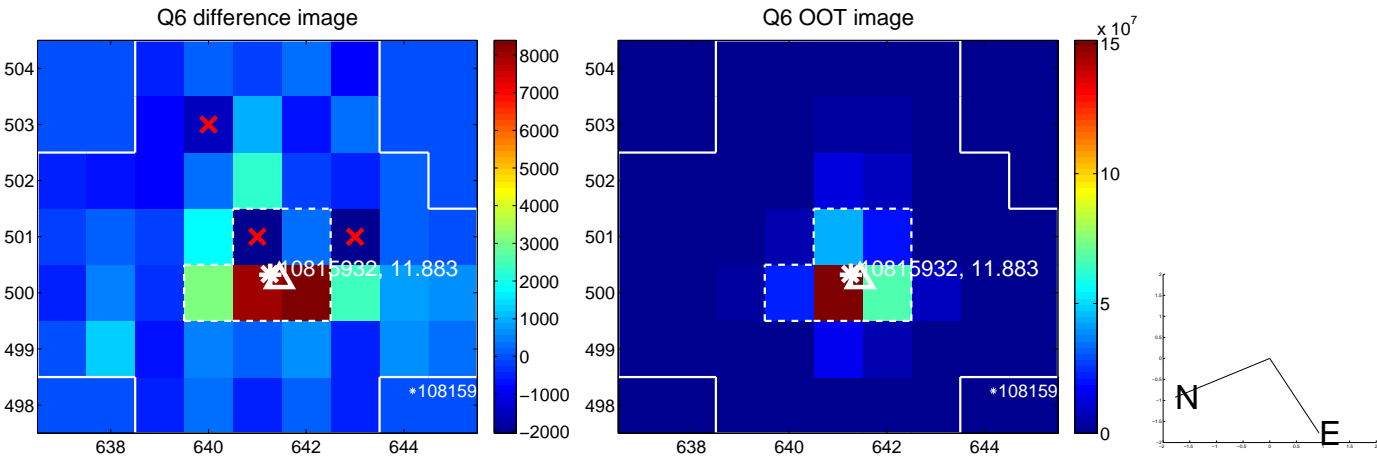
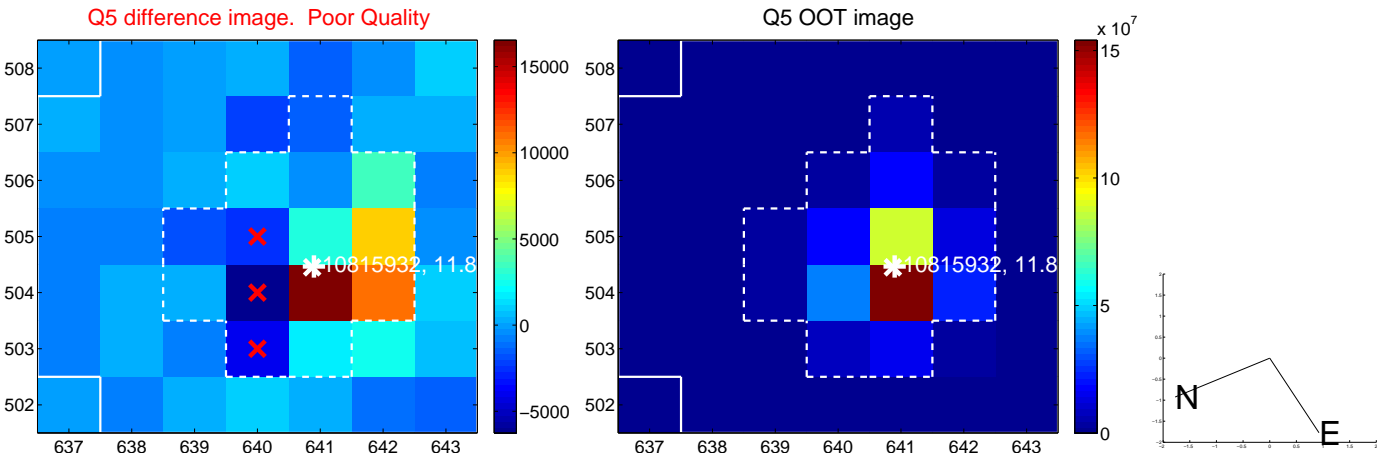
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



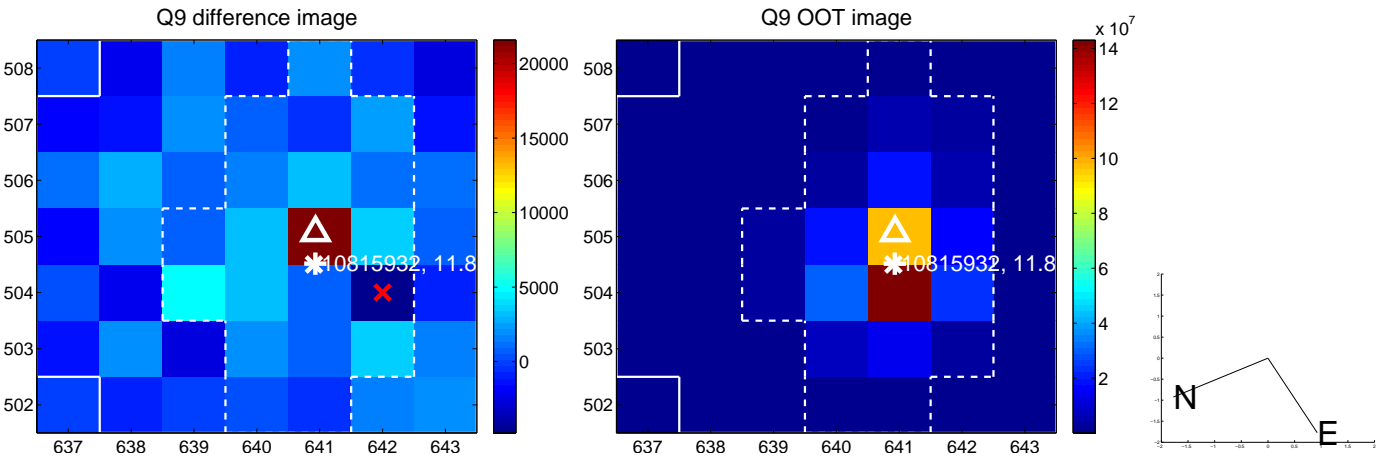
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



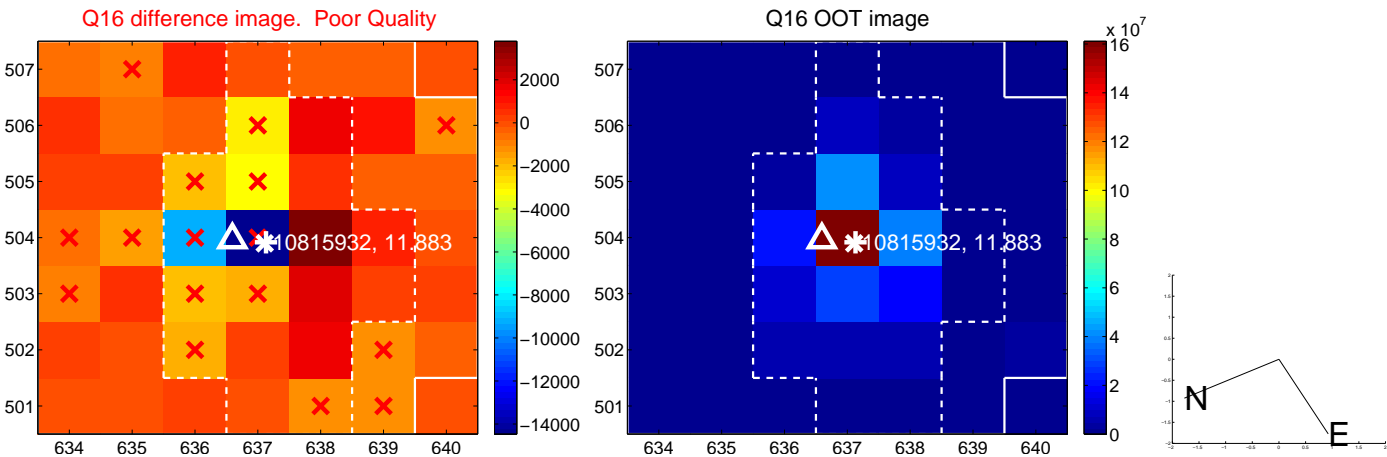
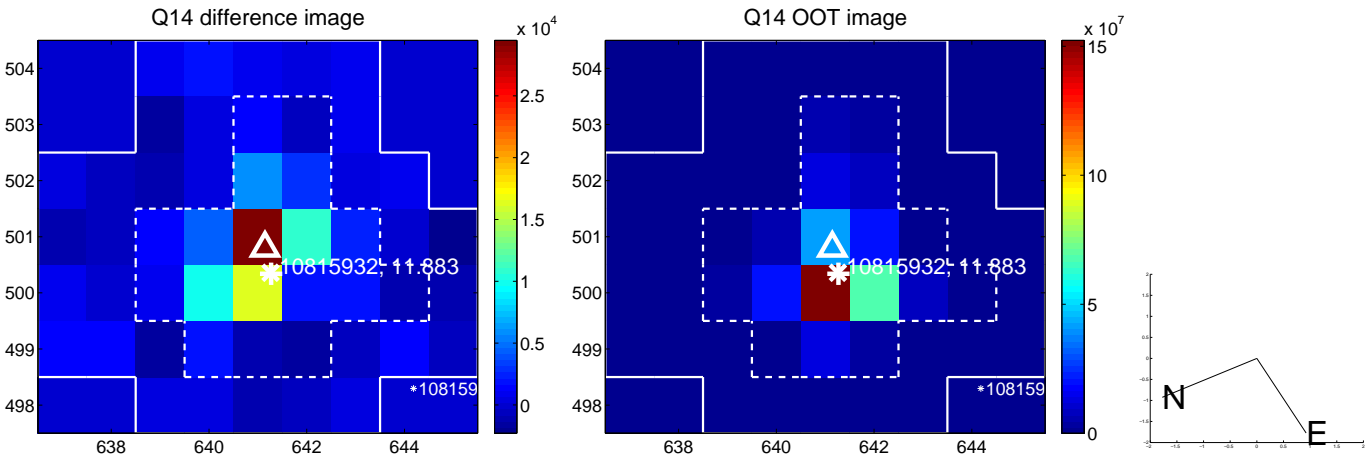
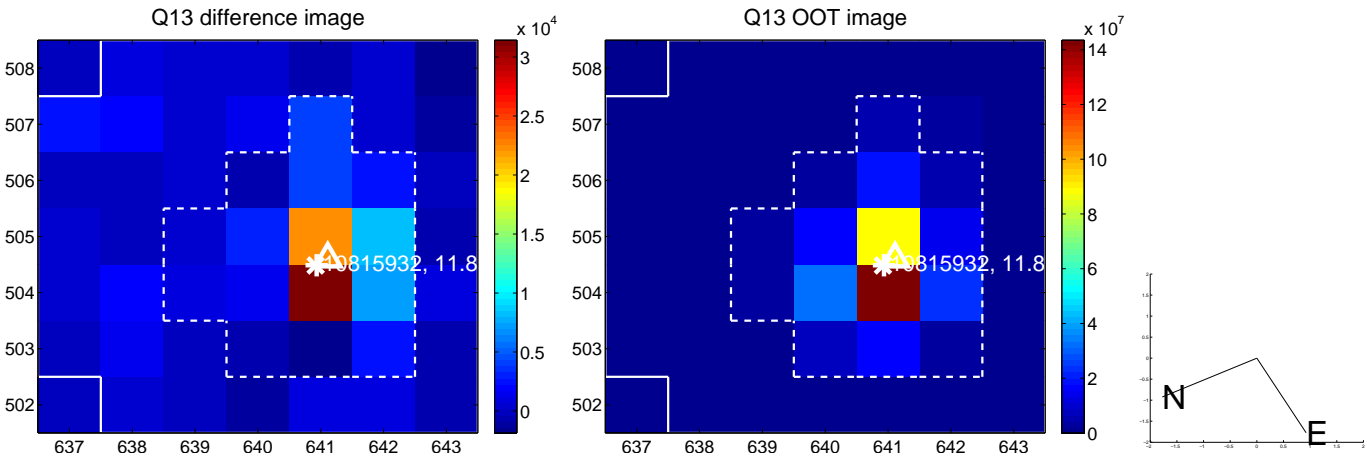
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



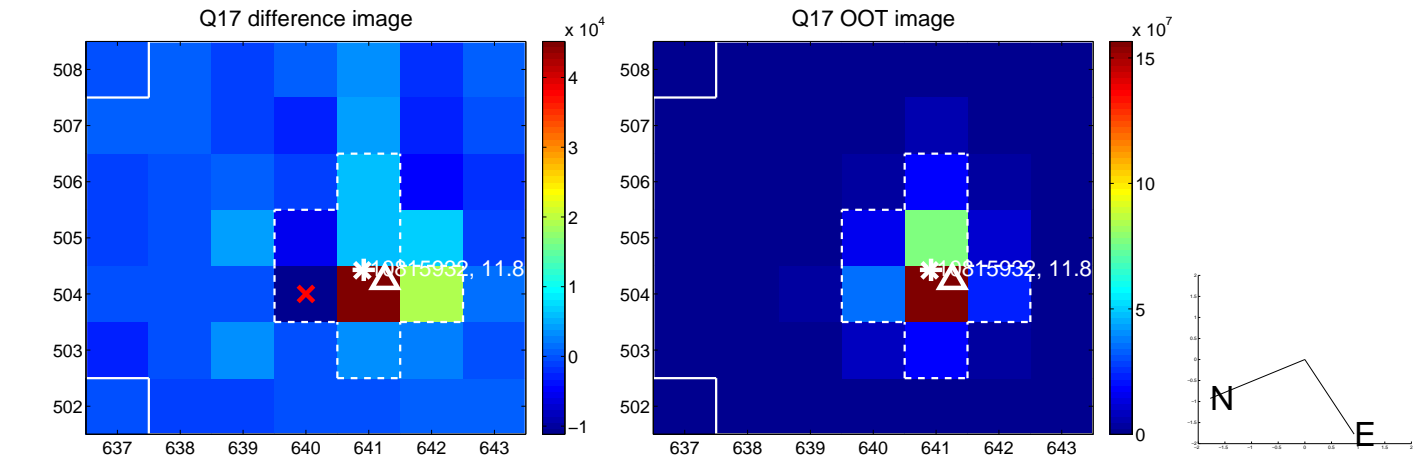
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



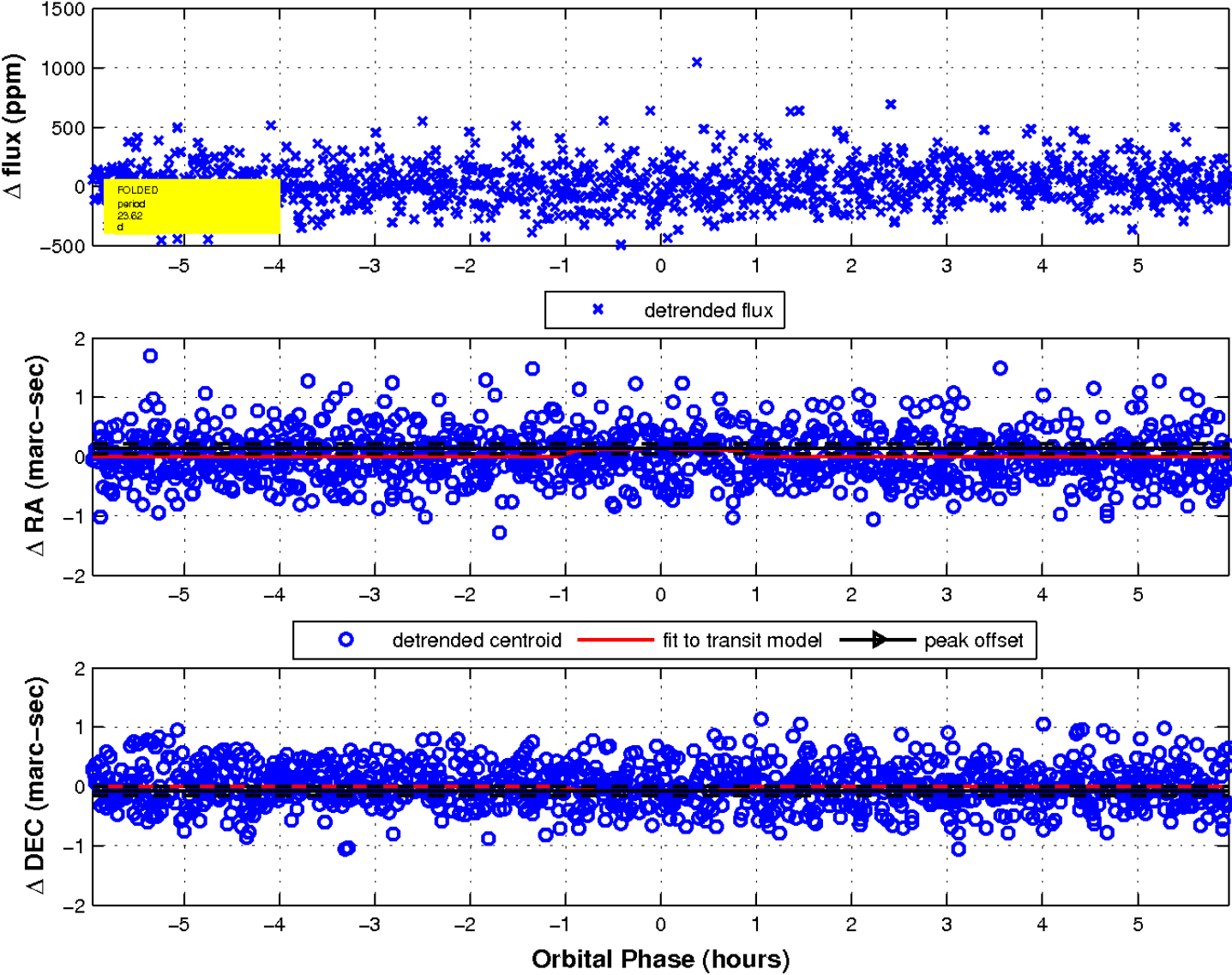
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

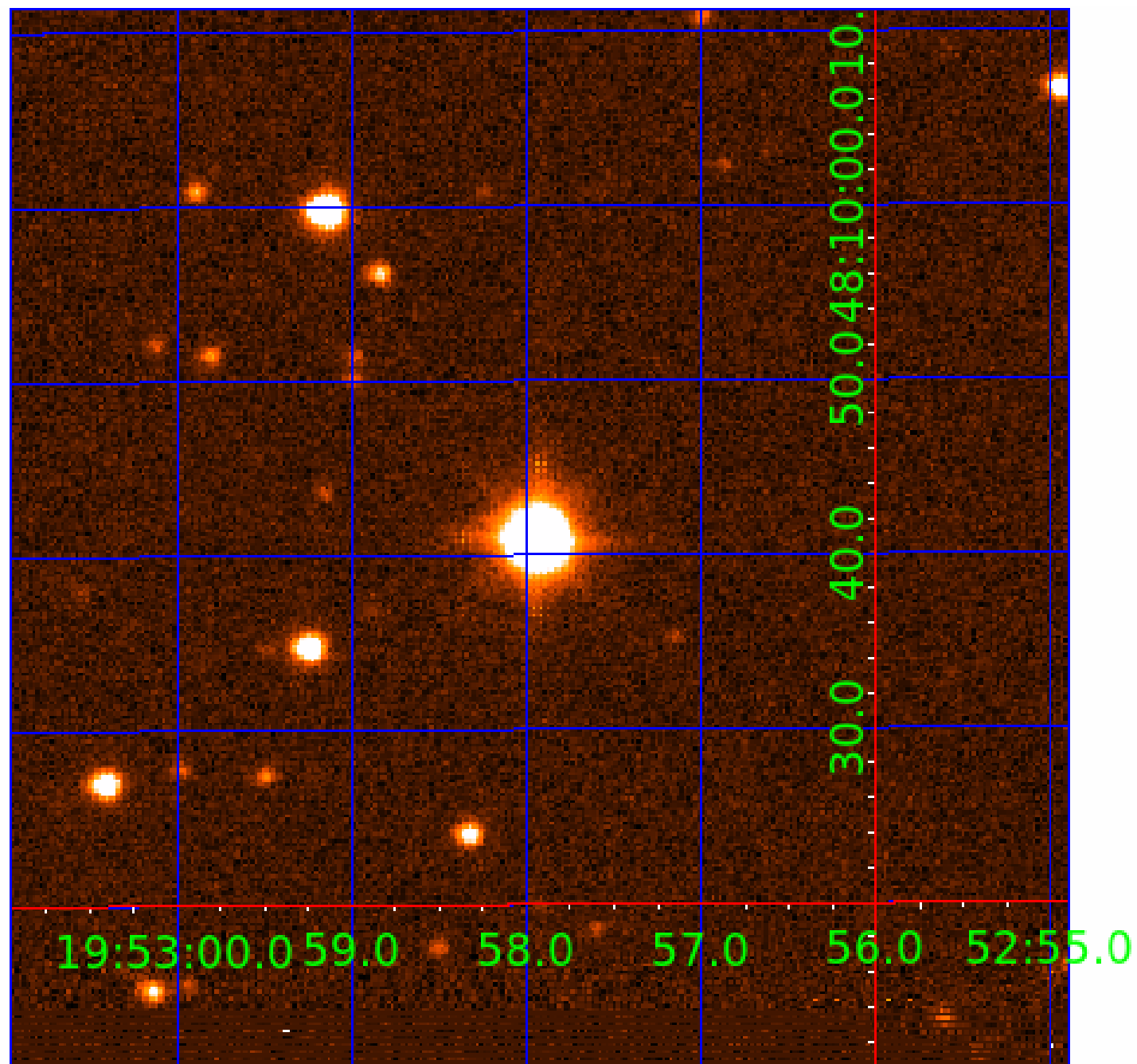


fluxWeightedCentroids, Planet 5 of 9



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

**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.

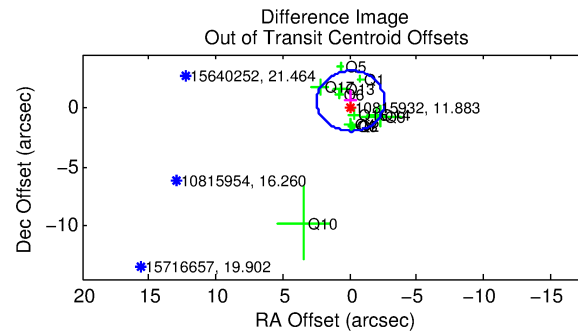
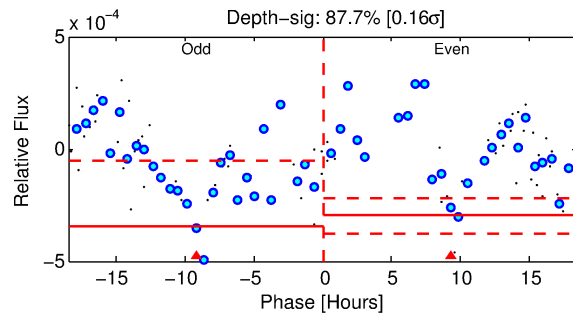
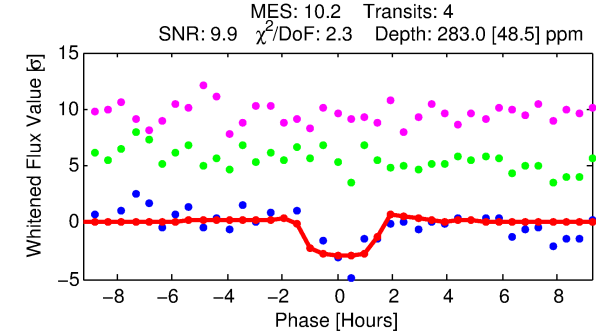
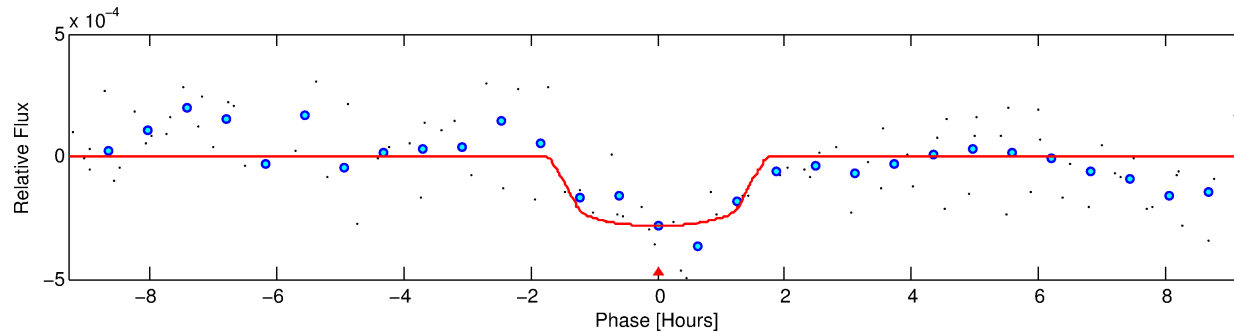
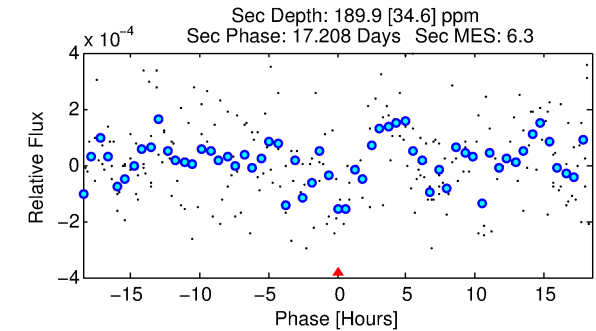
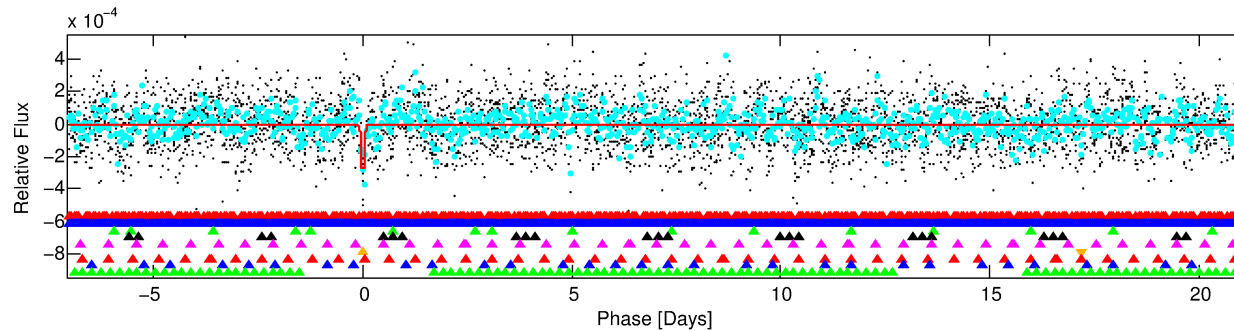
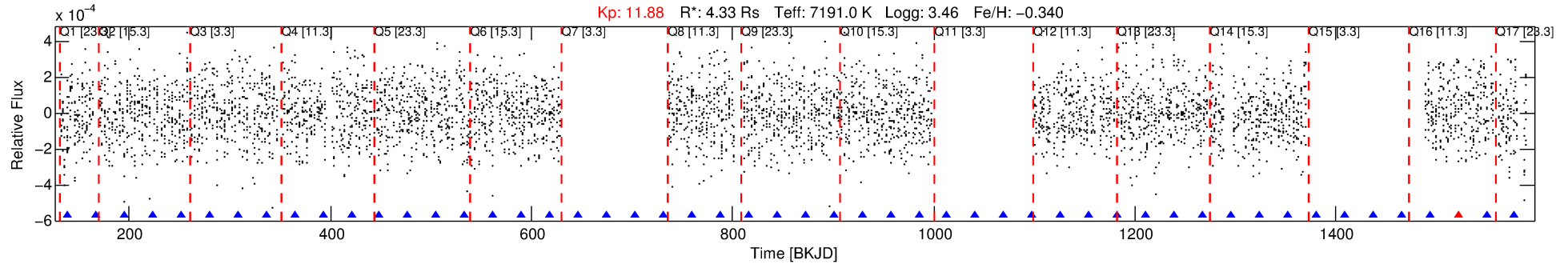
Ephemeris Match Information For 010815932-06

No Significant Match Found



# DV One-Page Summary

KIC: 10815932 Candidate: 6 of 9 Period: 28.213 d



## DV Fit Results:

Period = 28.21279 [0.00043] d  
Epoch = 138.7202 [0.0107] BKJD  
Rp/R\* = 0.0169 [0.0265]  
a/R\* = 45.67 [359.60]  
b = 0.78 [4.08]  
Seff = 871.46 [997.80]  
Teq = 1385 [397] K  
Rp = 7.99 [13.53] Re  
a = 0.2269 [0.1532] AU  
Ag = 84.14 [280.91] [0.30σ]  
Teffp = 6487 [5101] K [1.00σ]

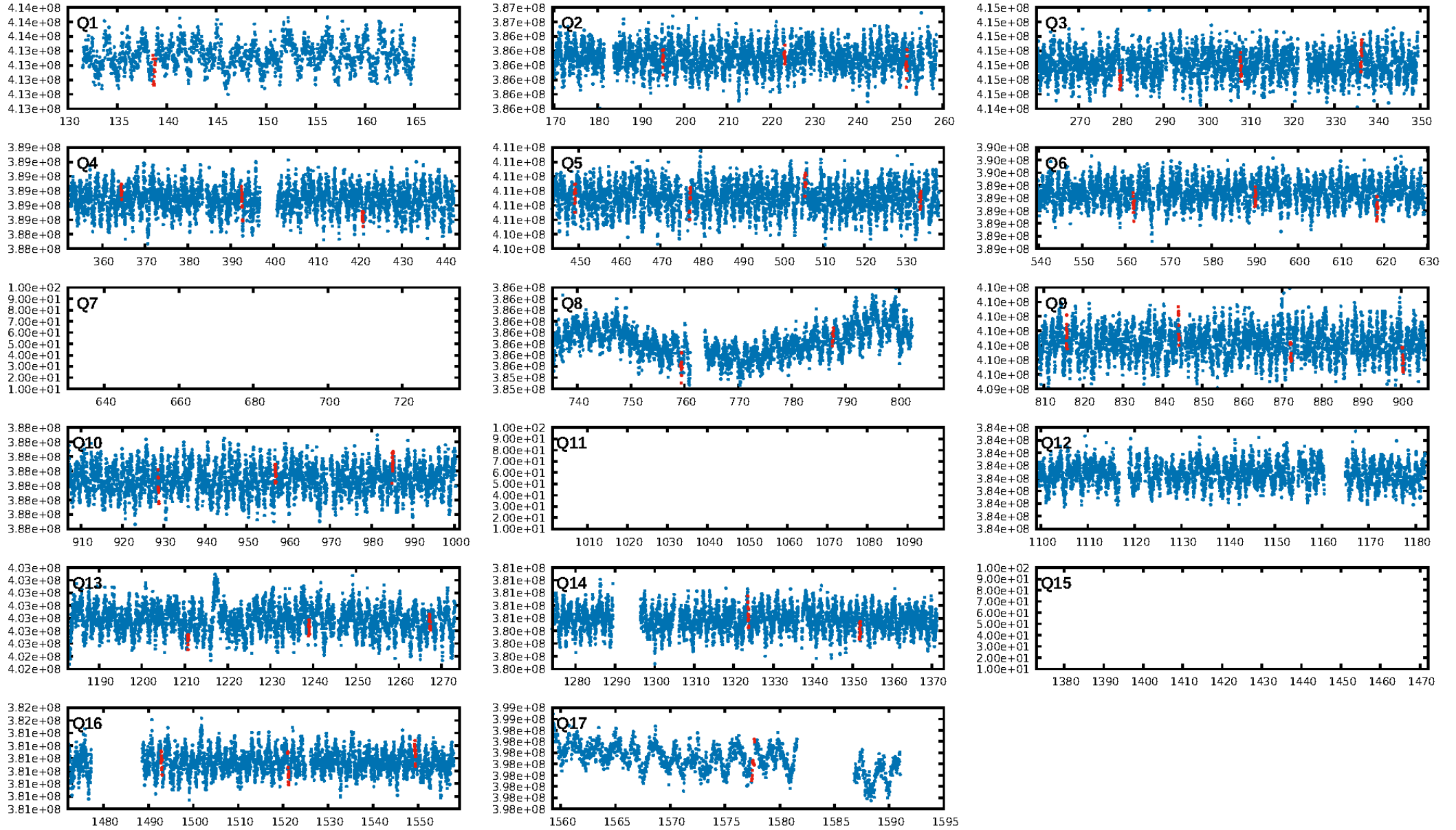
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [30.00σ]  
LongPeriod-sig: 100.0% [80.54σ]  
ModelChiSquare2-sig: 35.5%  
ModelChiSquareGof-sig: 92.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: -1.66  
Centroid-sig: 0.0%  
Centroid-so: 0.691 arcsec [2.70σ]  
OotOffset-rm: 0.558 arcsec [0.66σ]  
KicOffset-rm: 0.495 arcsec [0.50σ]  
OotOffset-st: 4/0/3/5 [12]  
KicOffset-st: 4/0/3/5 [12]  
DiffImageQuality-fgm: 0.58 [7/12]  
DiffImageOverlap-fno: 0.23 [3/13]

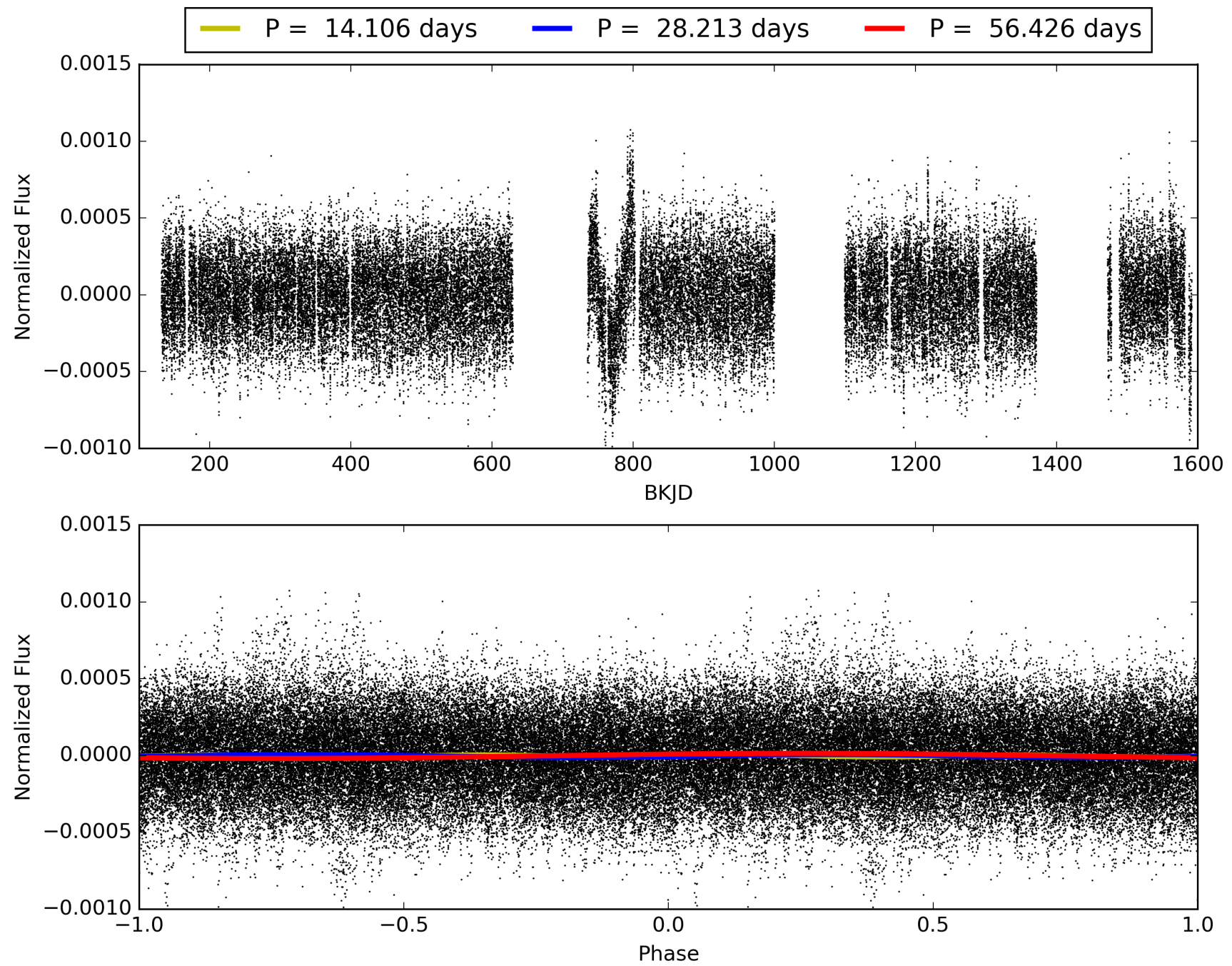
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:15 Z

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

# TCE 010815932-06, PDC Light Curves

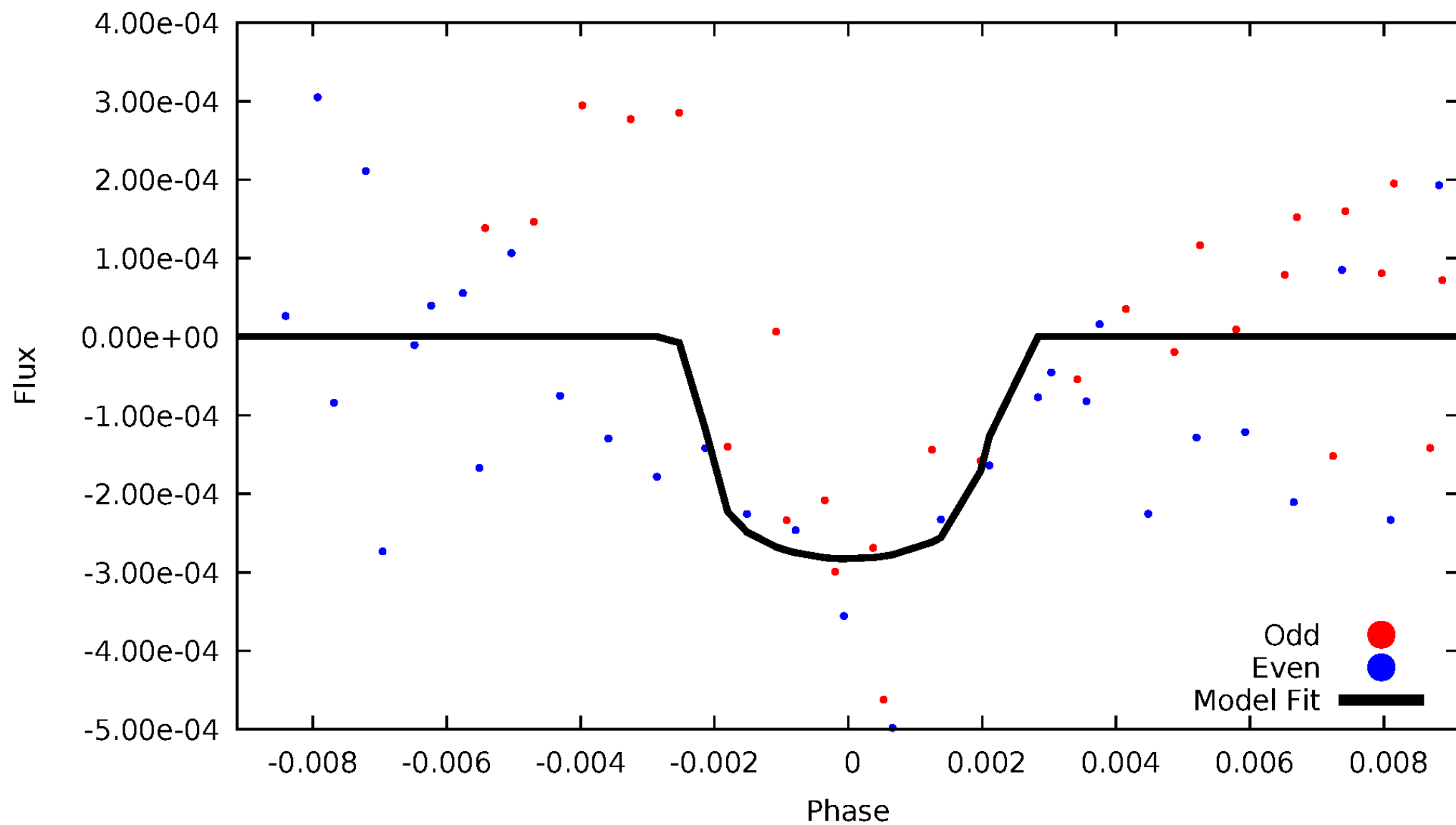


TCE 010815932-06



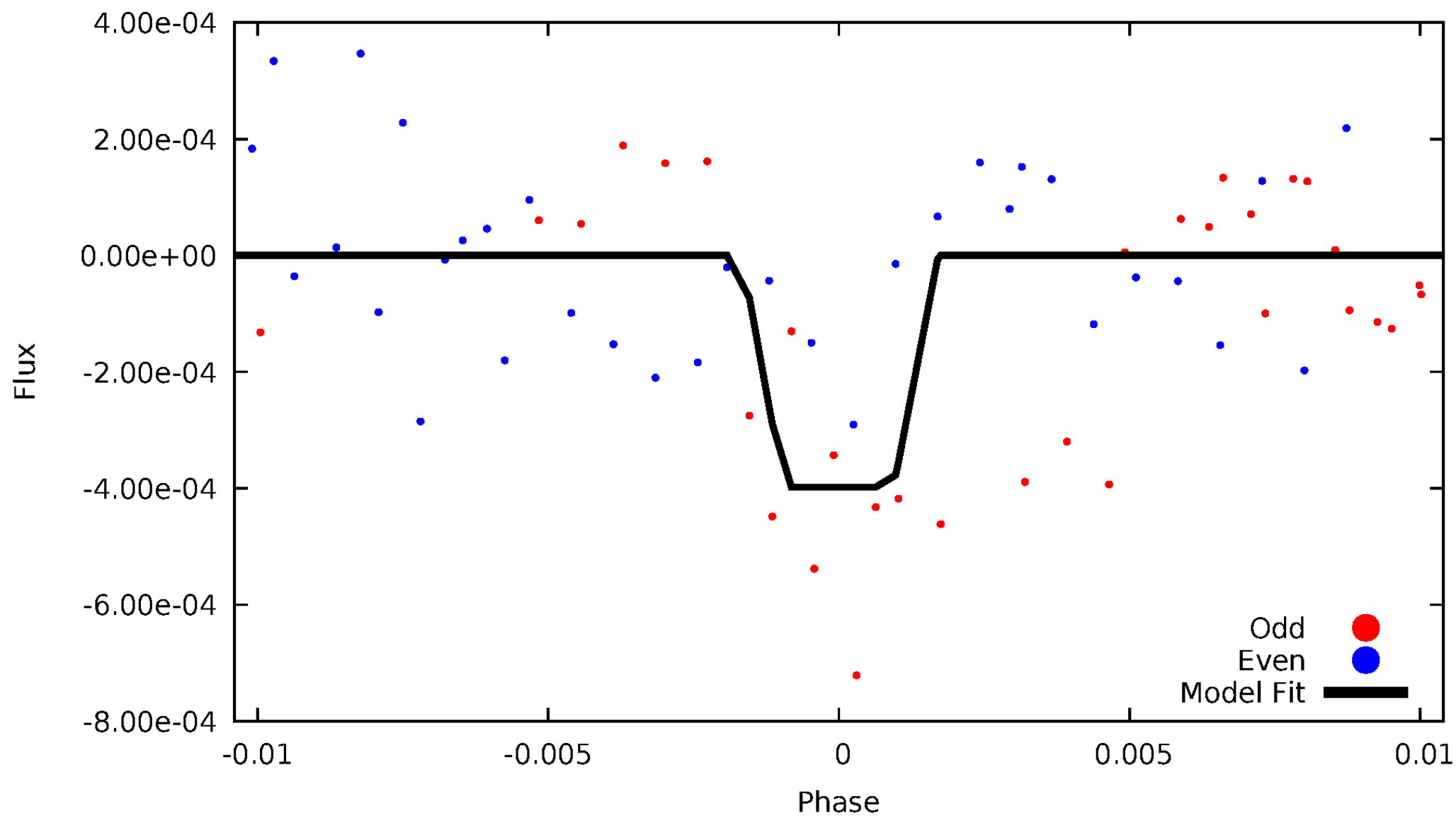
# DV Odd/Even

TCE 010815932-06



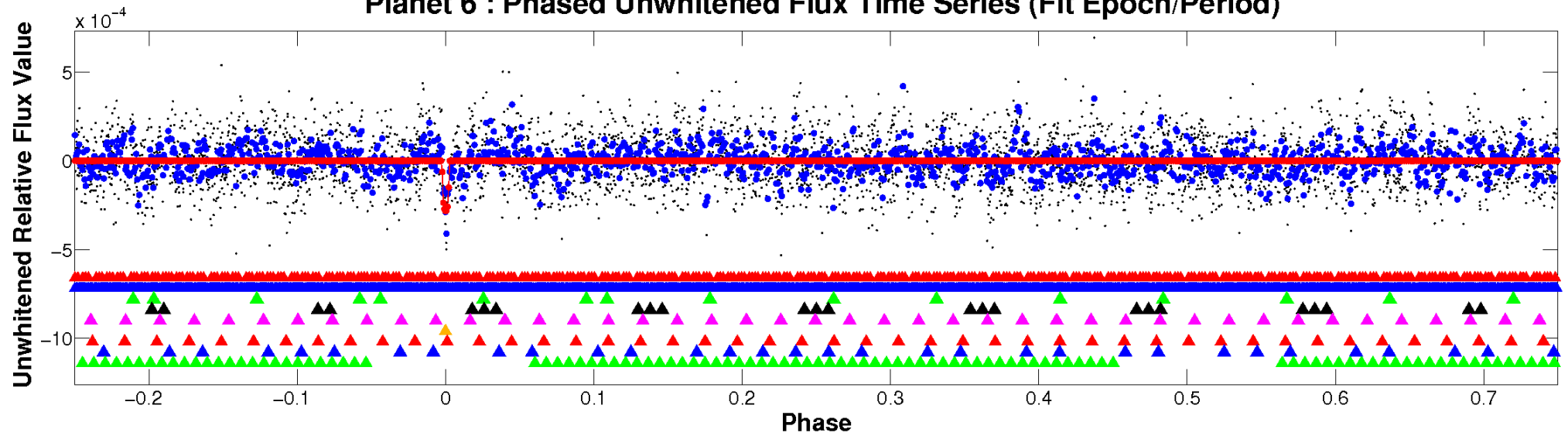
# ALT Odd/Even

TCE 010815932-06

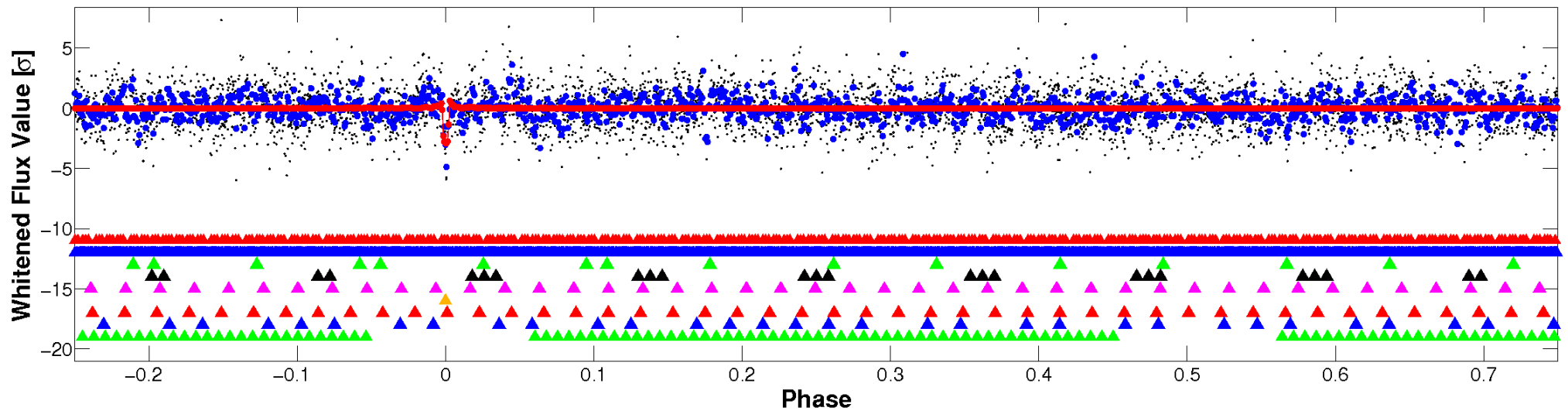


# Non-Whitened Vs. Whitened Light Curve

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



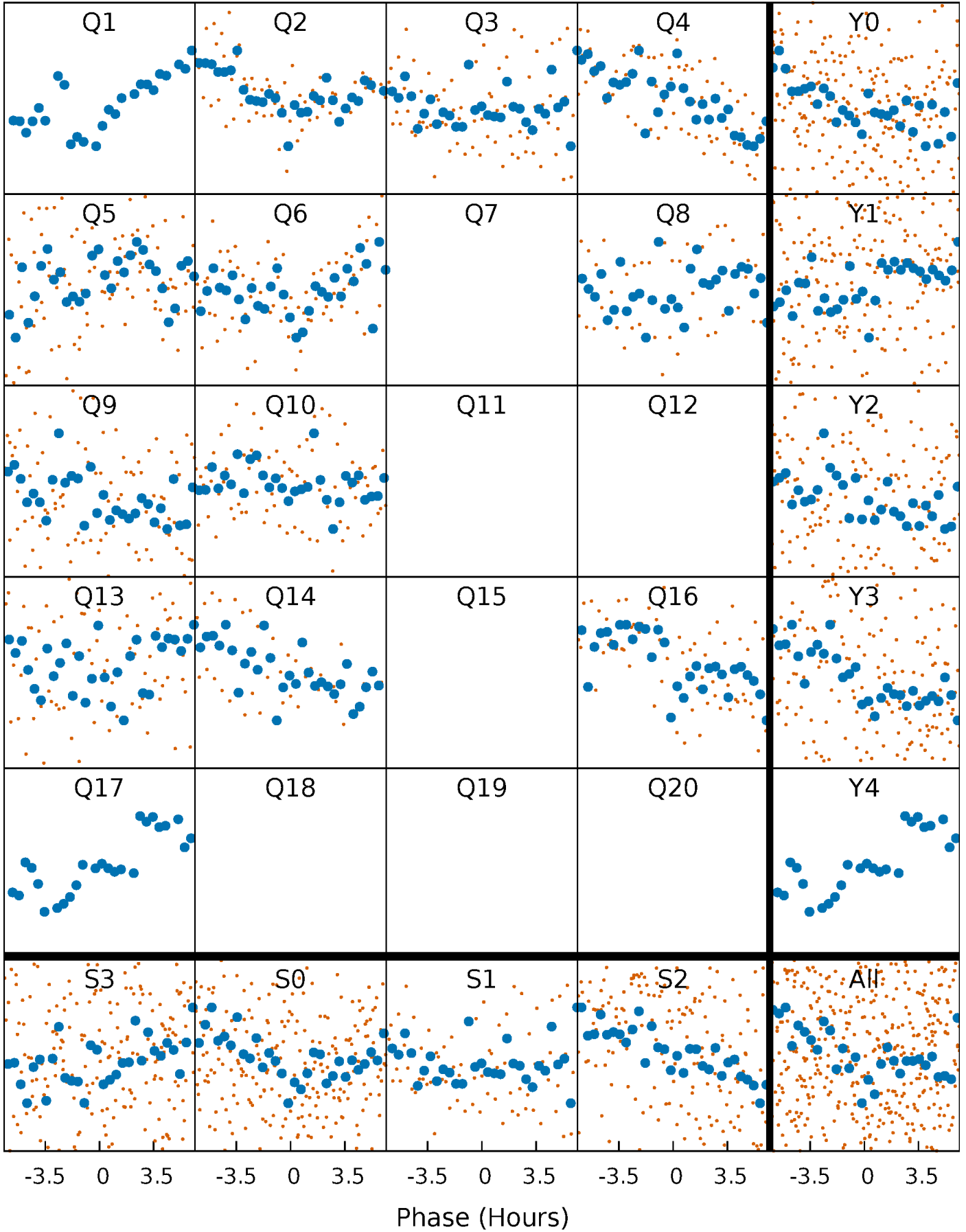
## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

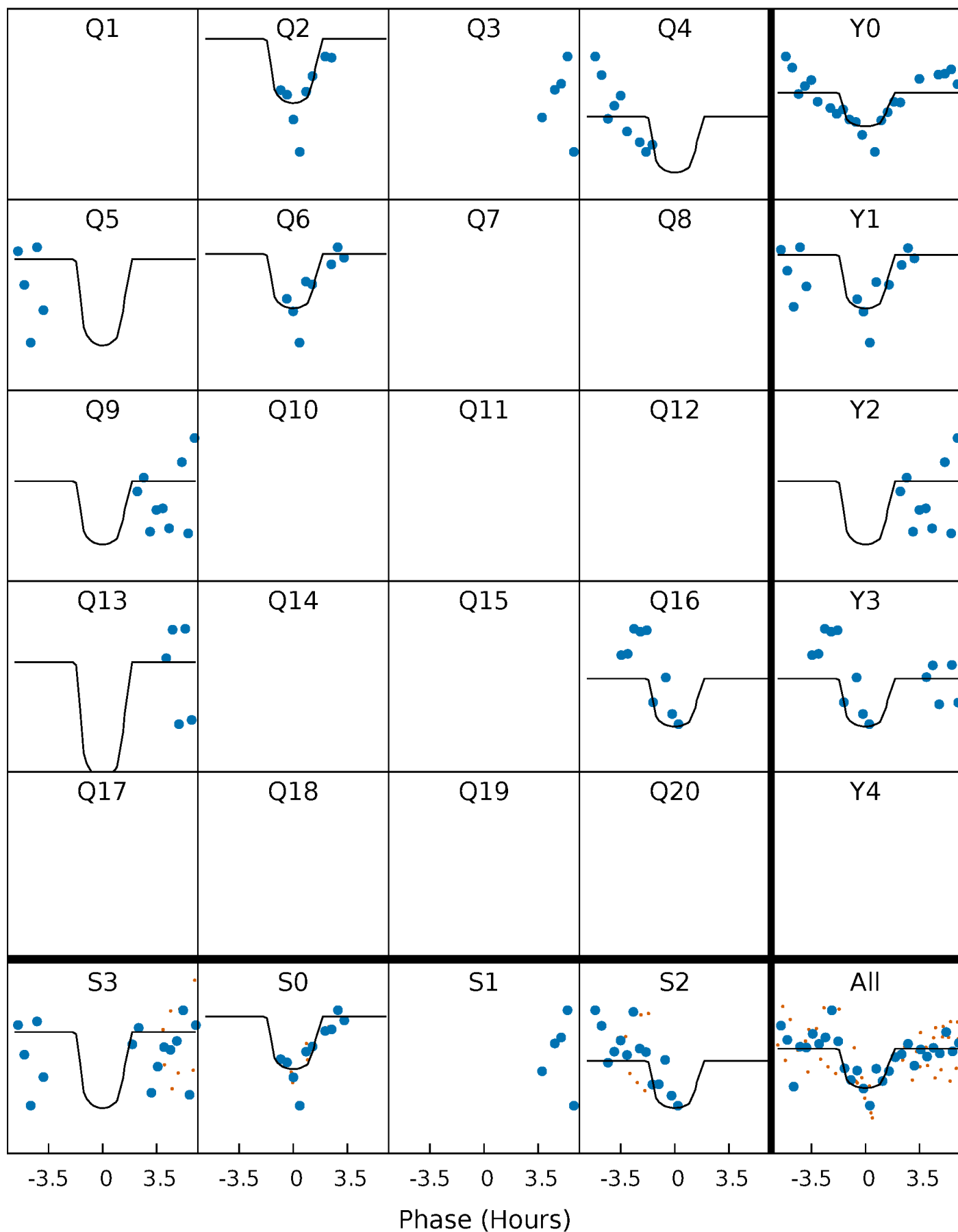
TCE 010815932-06     $P = 28.212795$  Days     $T_0 = 138.720198$  (BKJD)





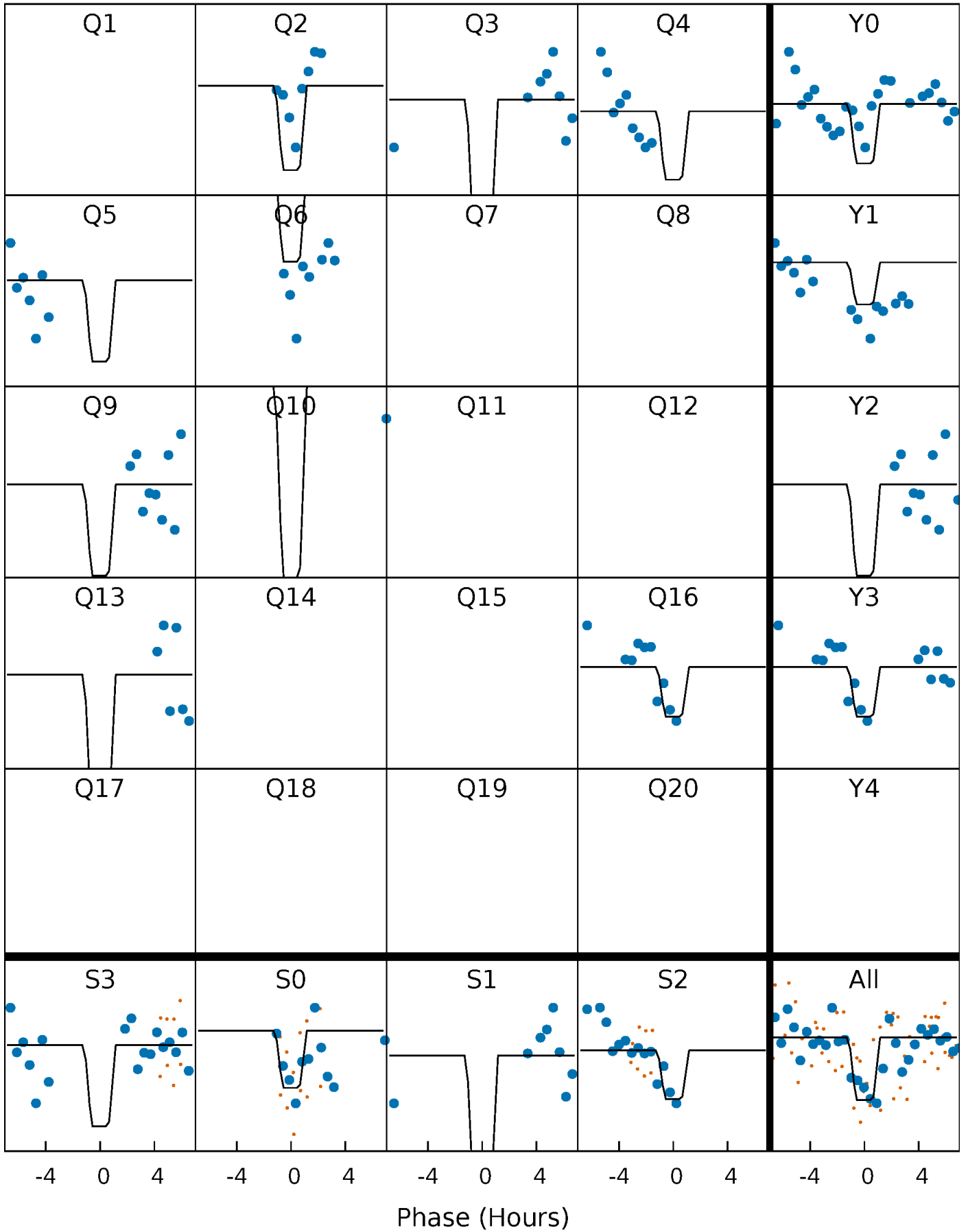
# DV Quarter-Phased Transit Curves

TCE 010815932-06 P= 28.212795 Days  $T_0=138.720198$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

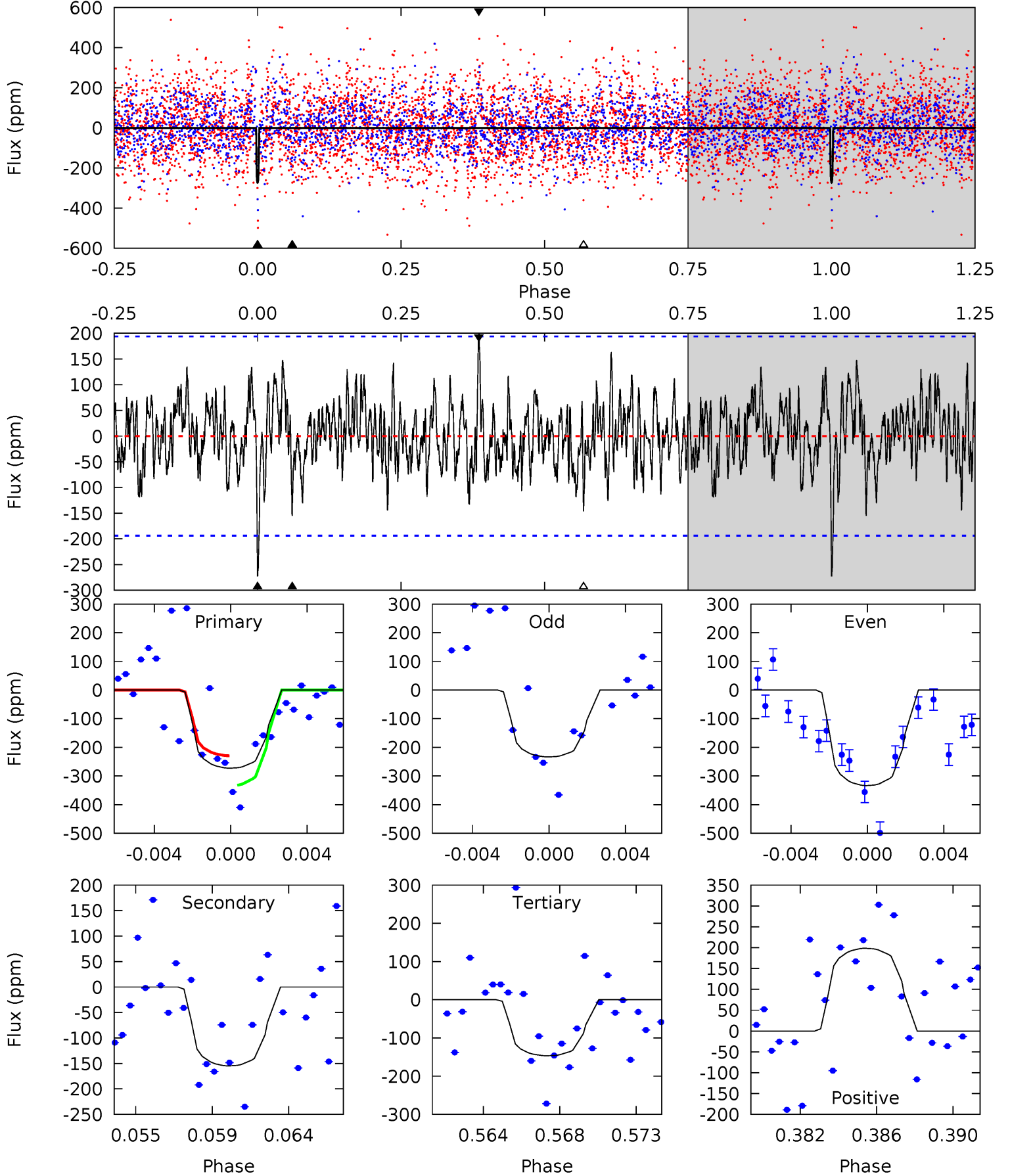
TCE 010815932-06 P= 28.212392 Days  $T_0=138.732527$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-06,  $P = 28.212795$  Days,  $E = 110.507403$  Days

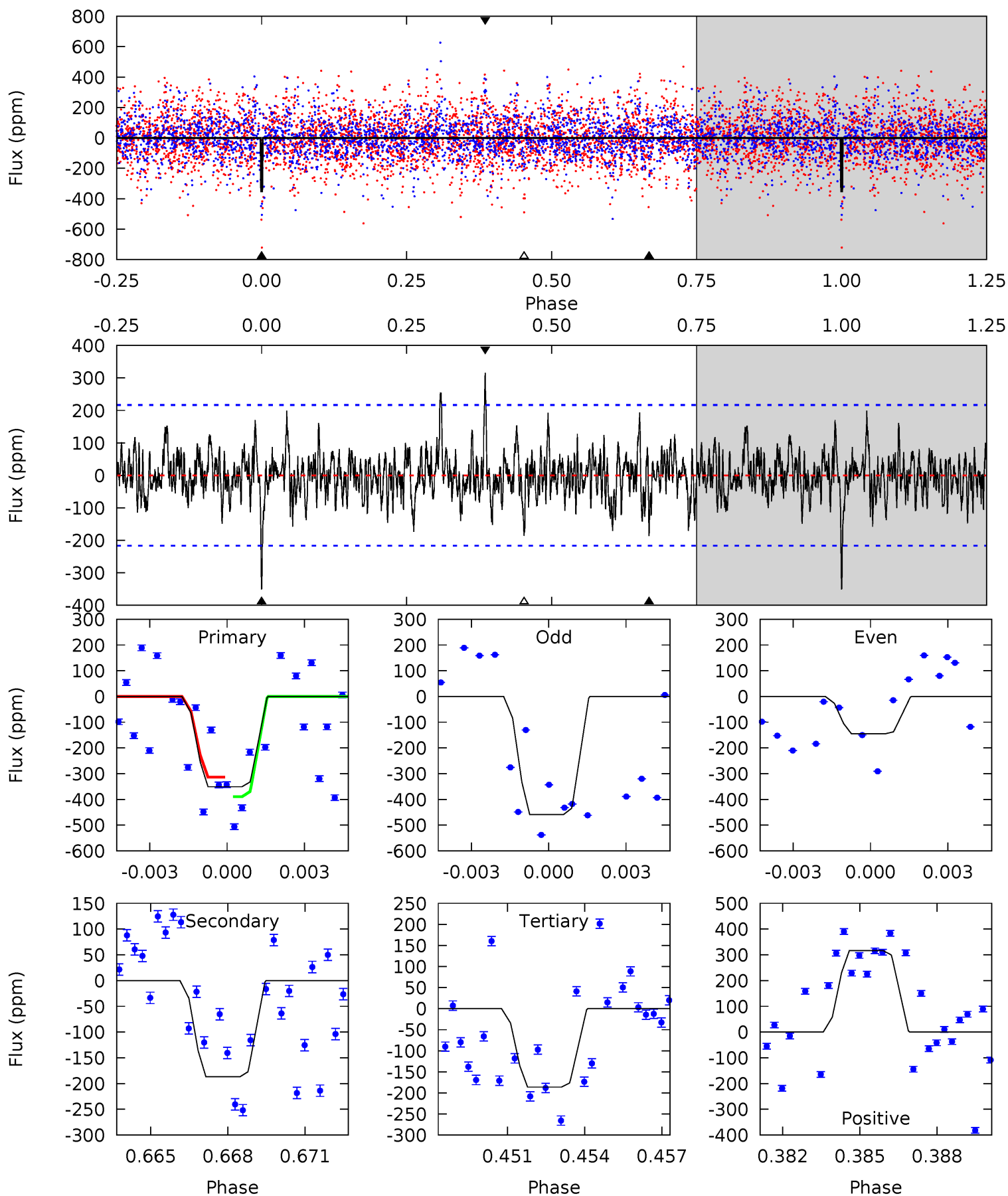
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.30	4.14	3.92	5.31	5.19	2.86	1.43	3.38	1.99	0.22	-1.17	1.35	0.90	0.42	1.36



# Alt Model-Shift Uniqueness Test

010815932-06, P = 28.212392 Days, E = 110.520135 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
8.47	4.52	4.50	7.63	5.24	2.94	1.42	3.98	0.84	0.02	-3.12	3.74	1.11	0.47	0.92



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-155 \pm 37$	$10.27^{+10.66}_{-7.17}$	$1880^{+119}_{-305}$	$4985^{+3453}_{-1101}$	$41^{+357}_{-32}$
Alt.	$-187 \pm 41$	$11.58^{+11.32}_{-7.99}$	$1877^{+112}_{-275}$	$4947^{+4760}_{-997}$	$39^{+379}_{-30}$

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

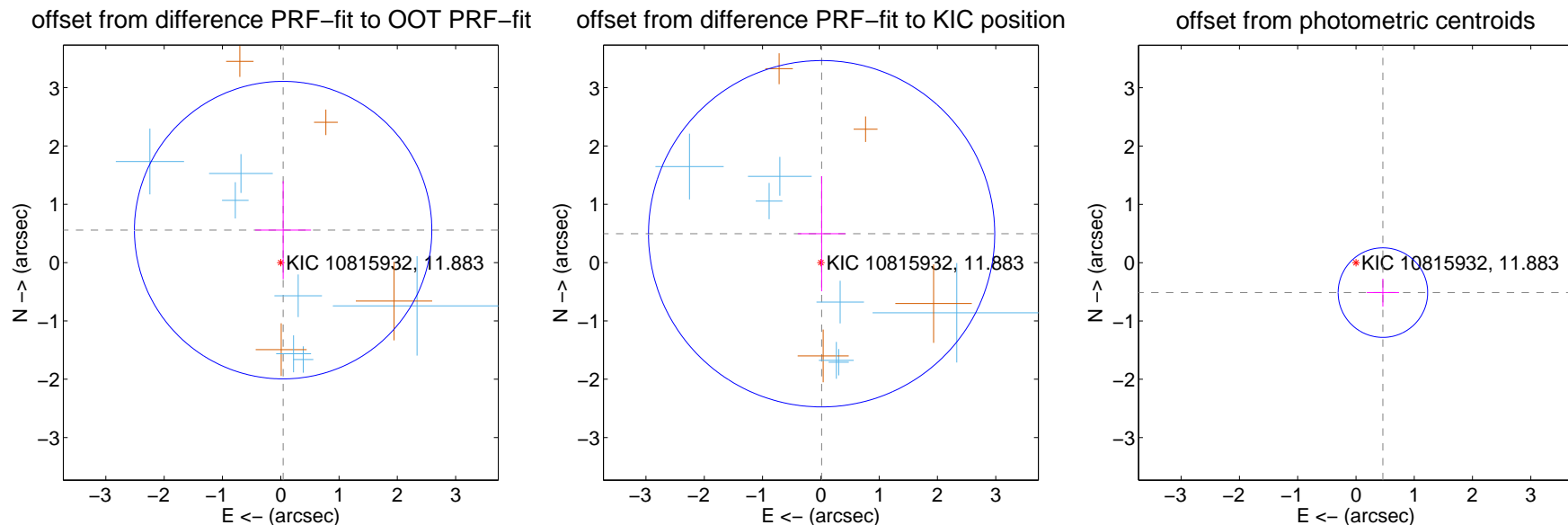
## DV Centroid Data

Supplemental centroid analysis for 010815932-06. **Kepler magnitude: 11.88.** Transit SNR 9.94

There are 7 quarters with good PRF difference image offsets

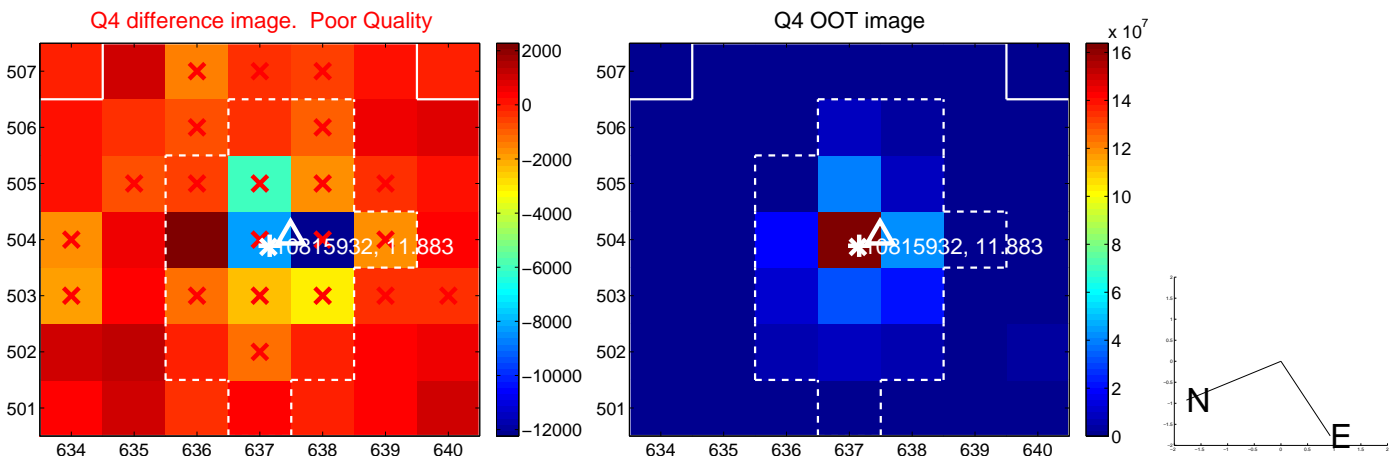
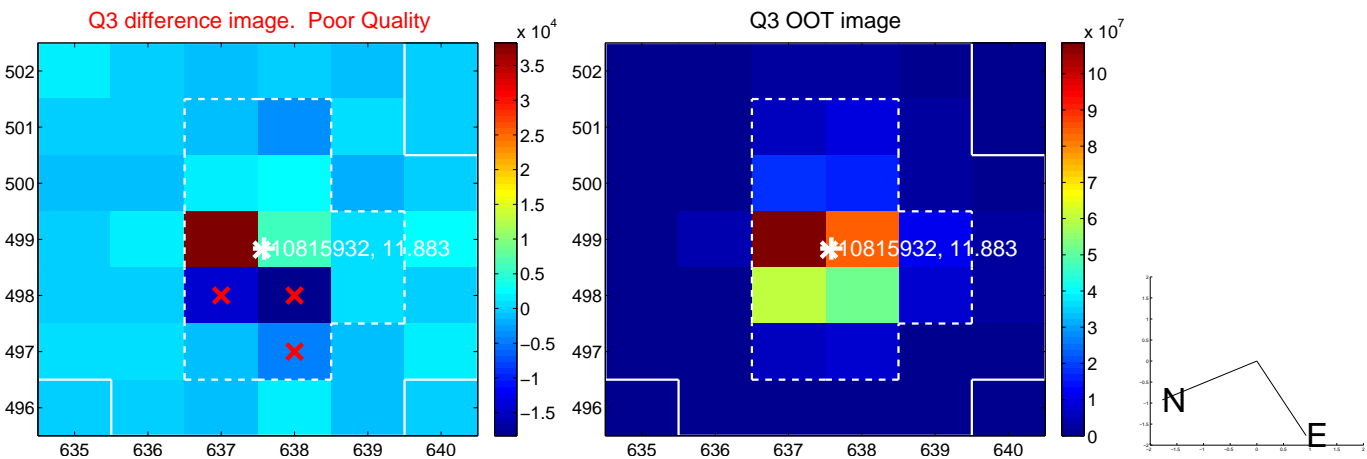
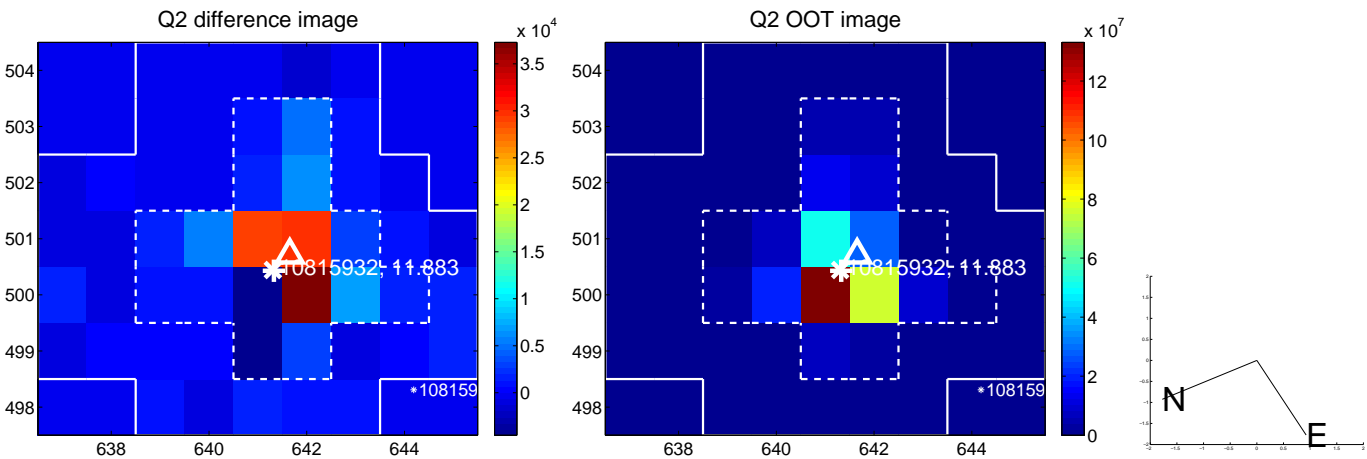
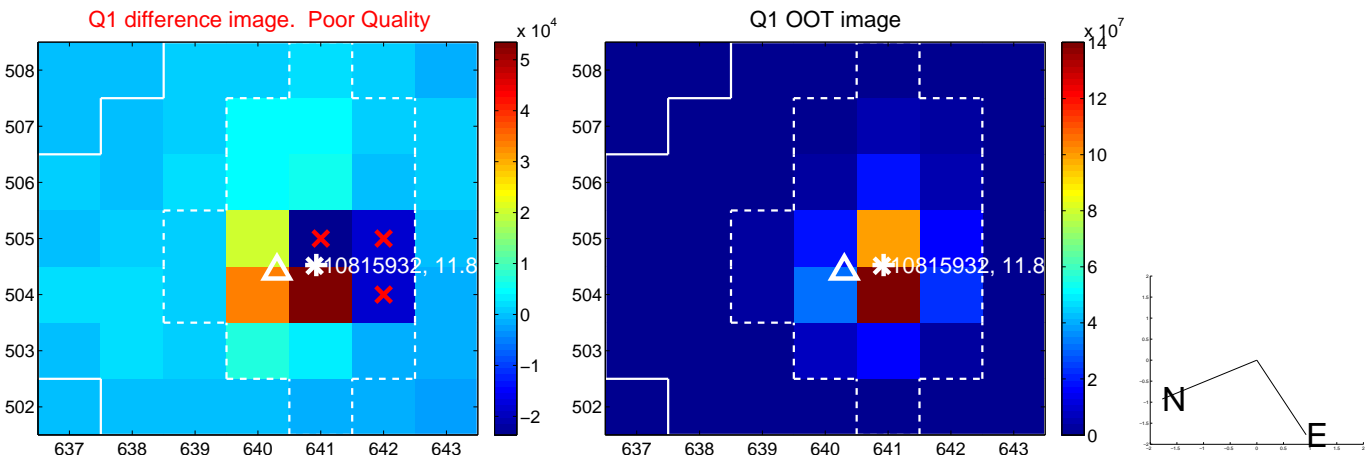
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.558 \pm 0.850$	0.66	$-0.041 \pm 0.480$	$0.557 \pm 0.841$
PRF-fit source offset from KIC position	$0.495 \pm 0.990$	0.50	$-0.013 \pm 0.408$	$0.495 \pm 0.987$
photometric centroid source offset	$0.69 \pm 0.26$	2.70	$-0.46 \pm 0.28$	$-0.51 \pm 0.24$



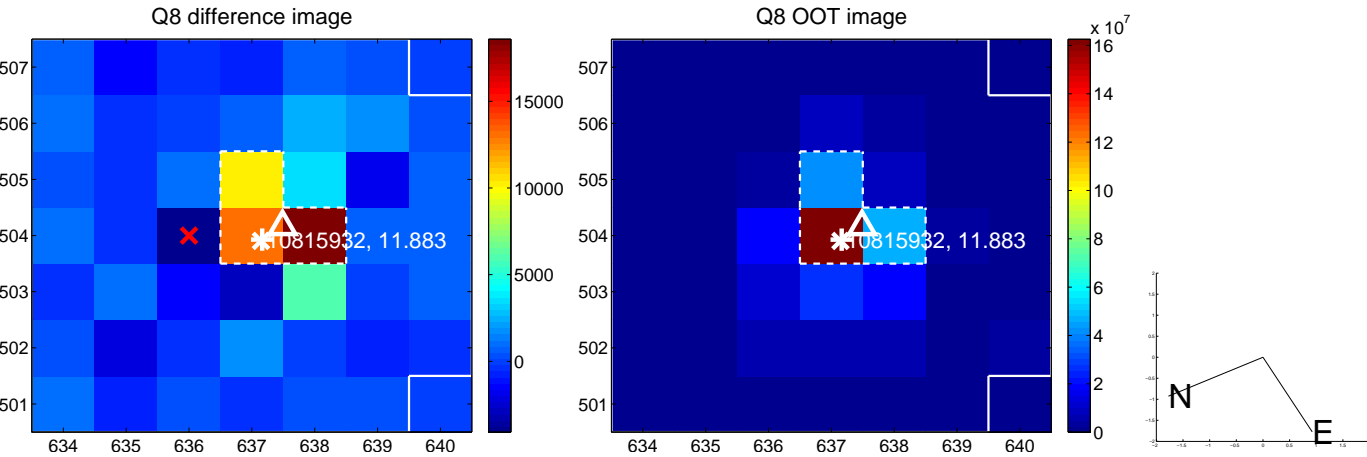
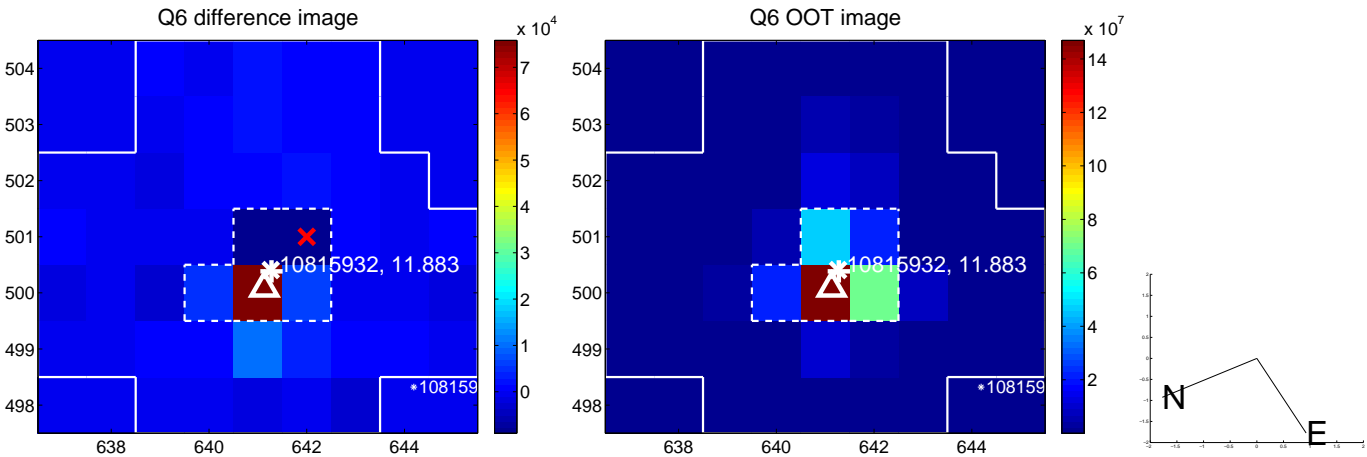
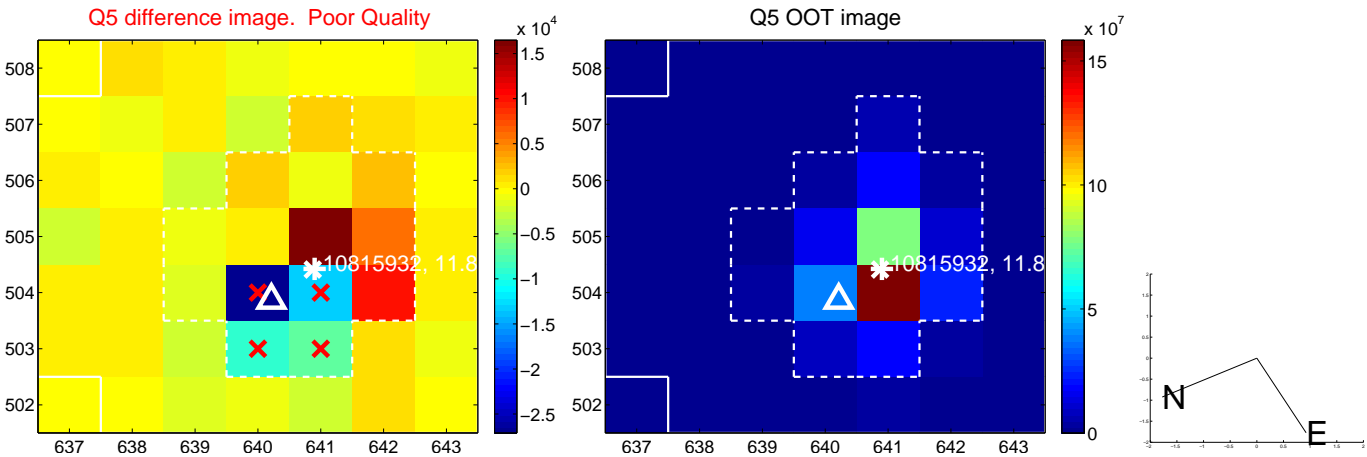
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

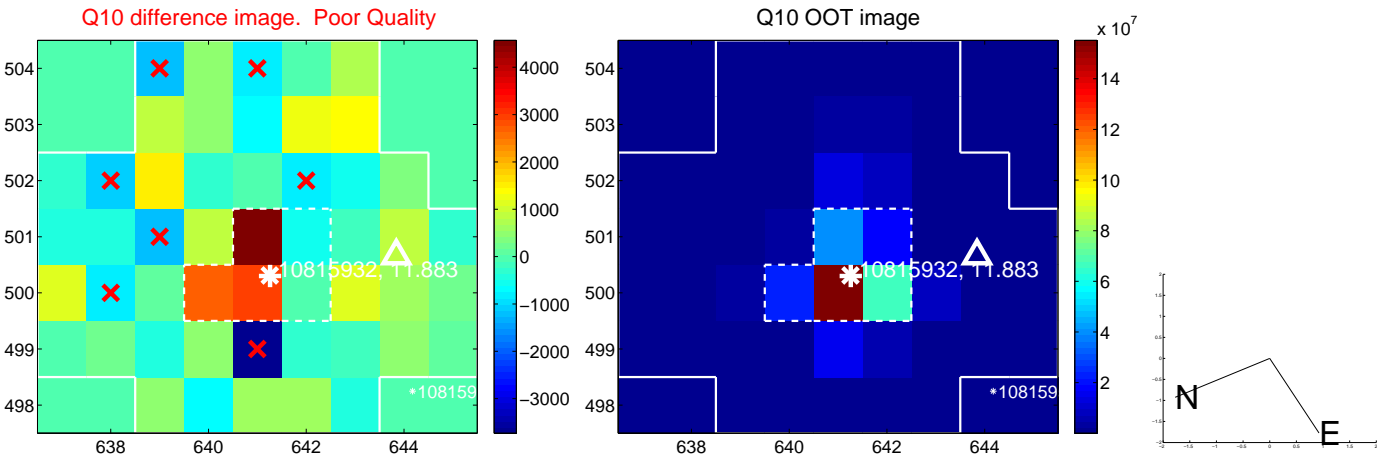
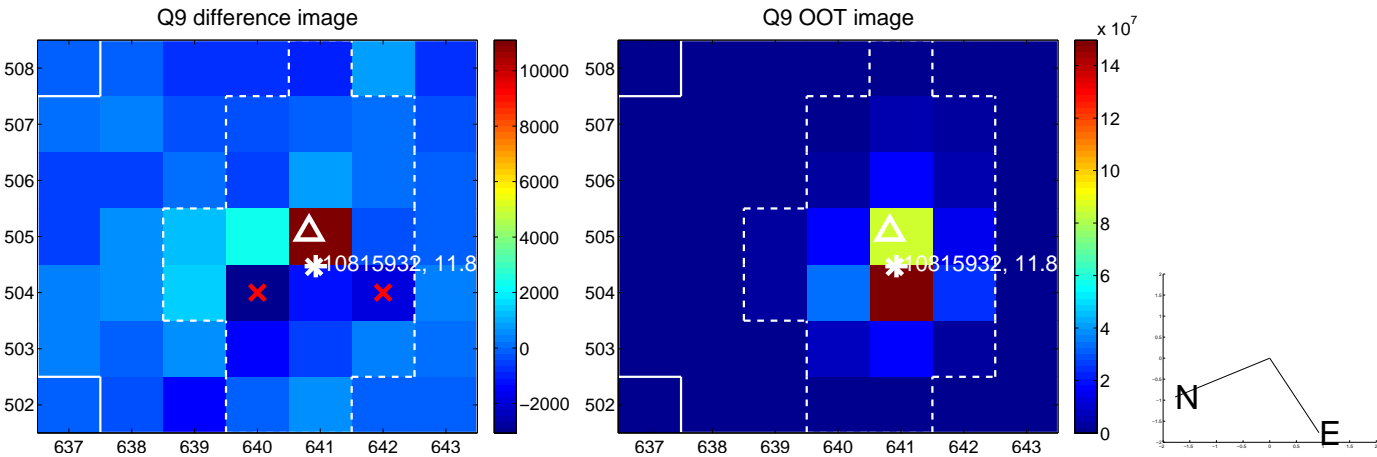




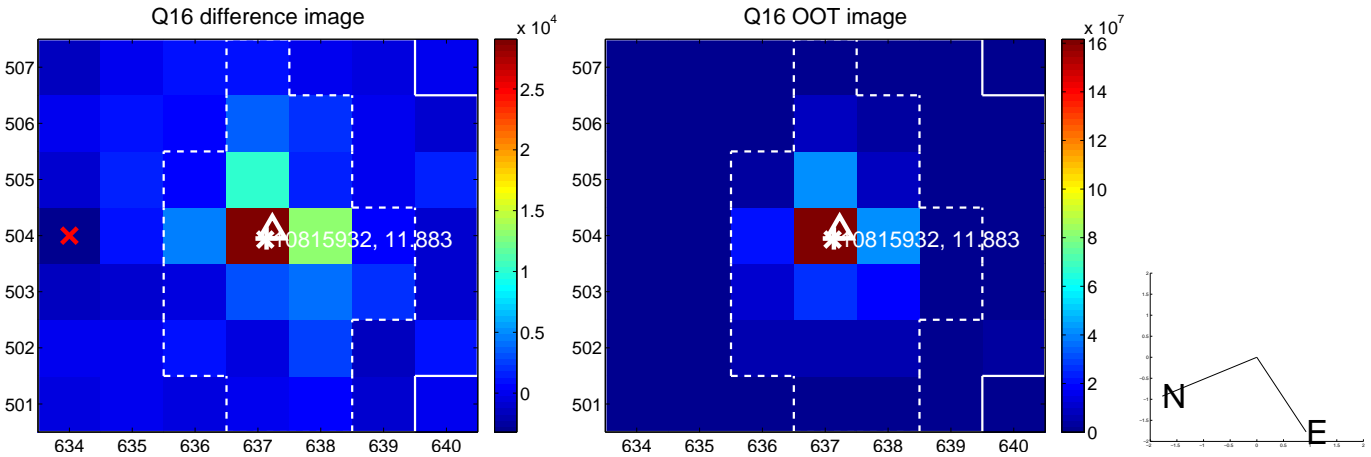
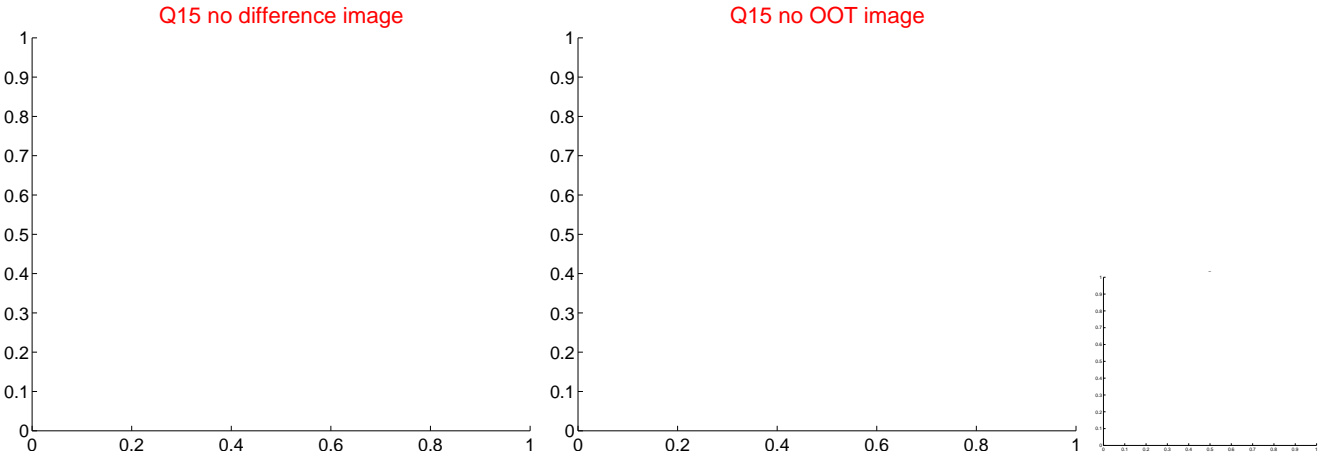
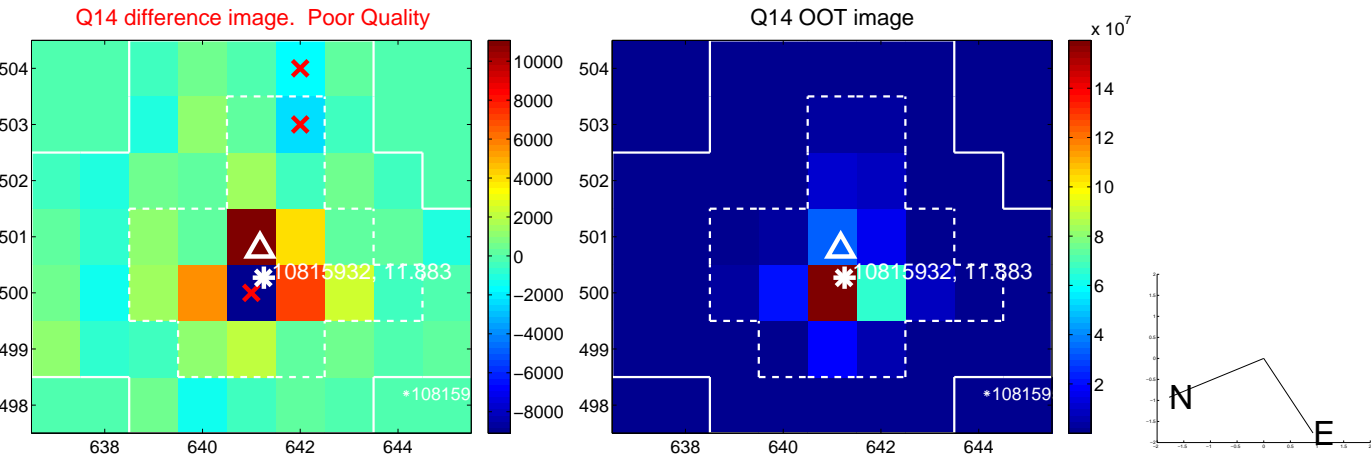
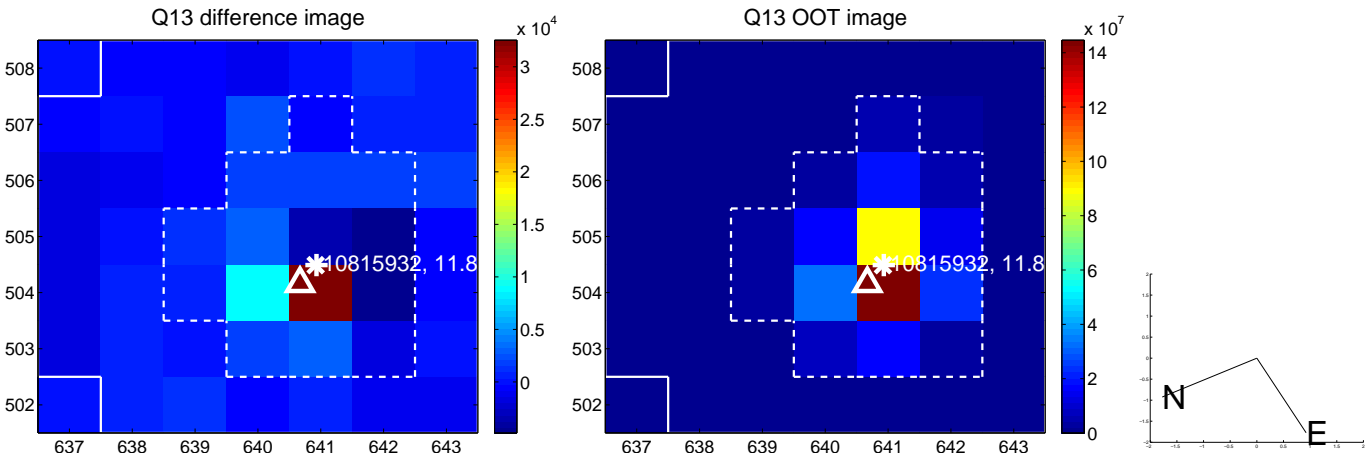
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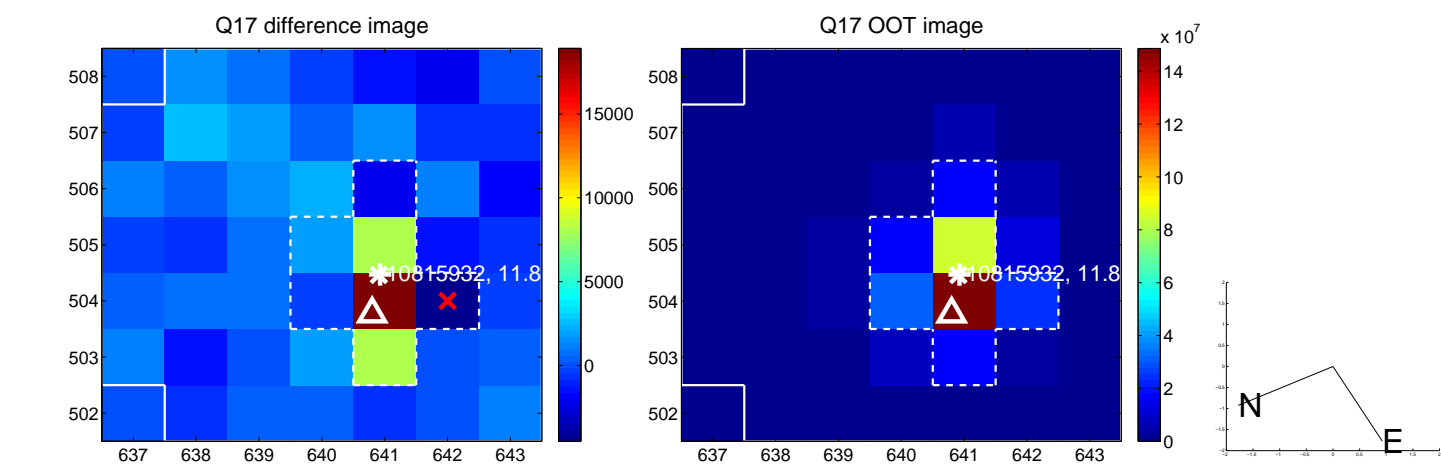
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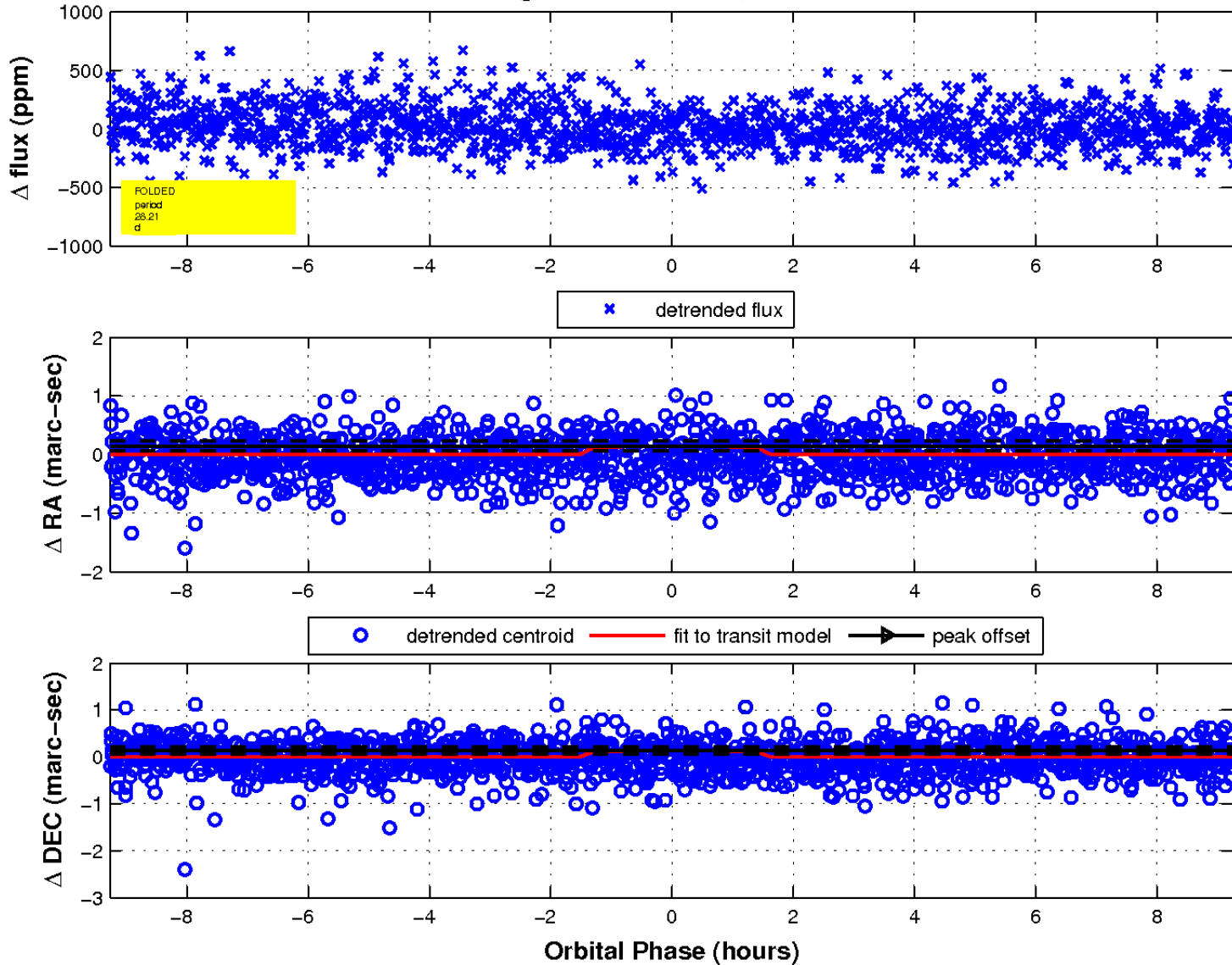
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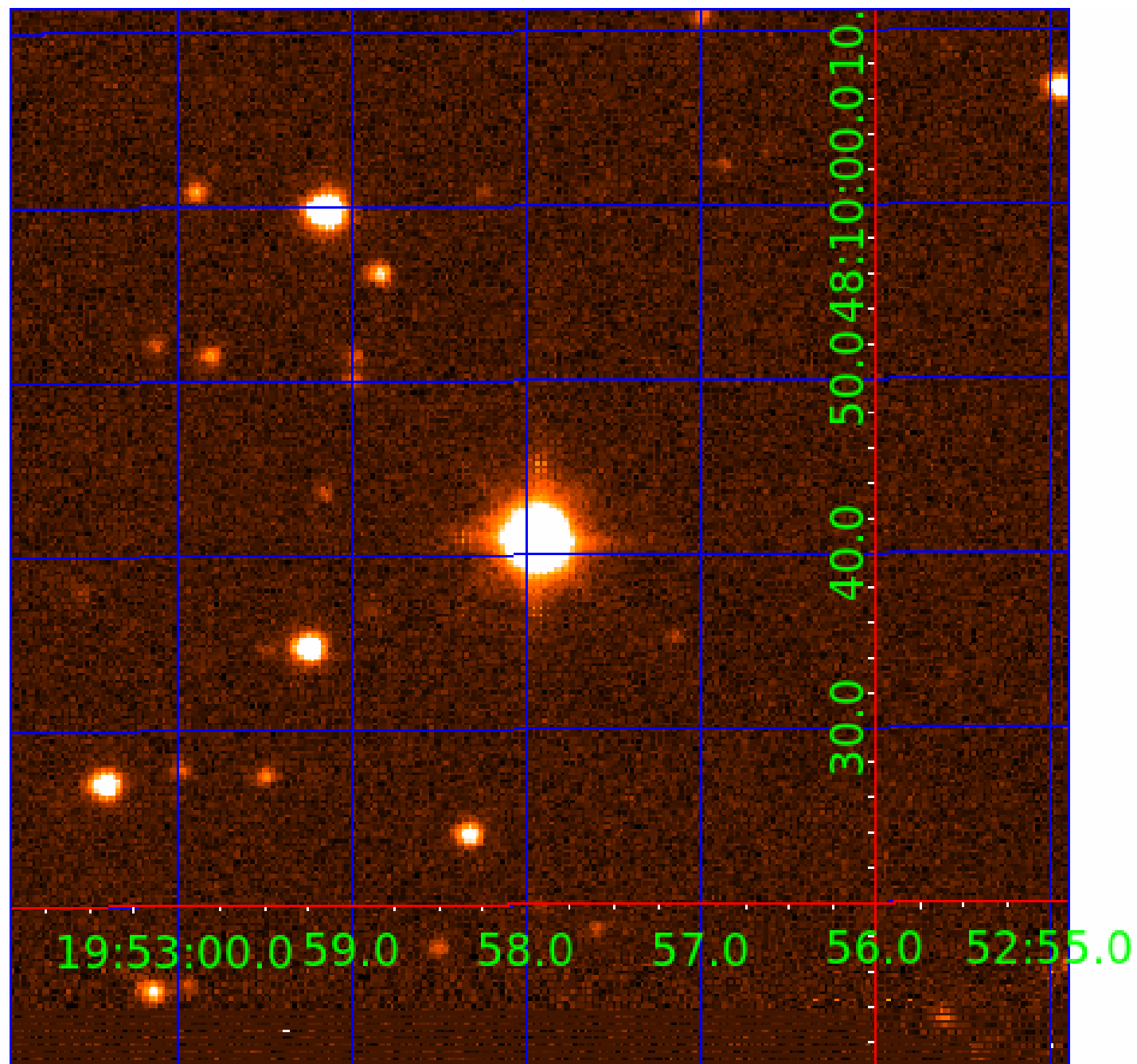


fluxWeightedCentroids, Planet 6 of 9



UKIRT Image

Declination



# KIC 010815932

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

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010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

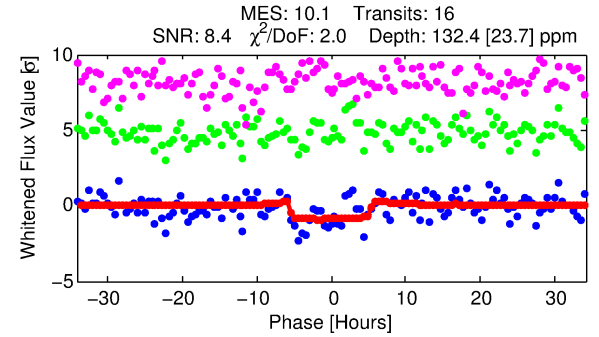
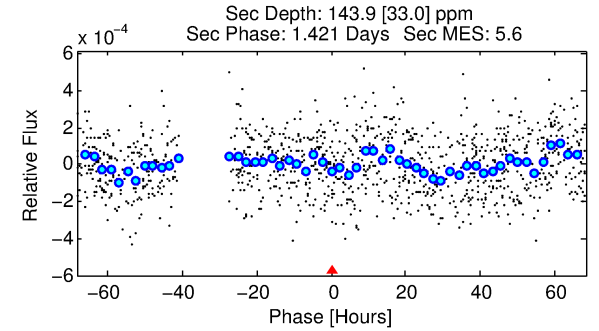
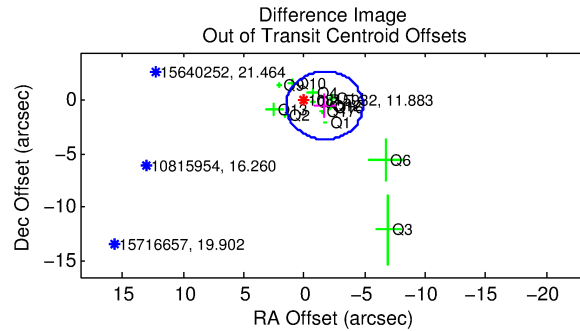
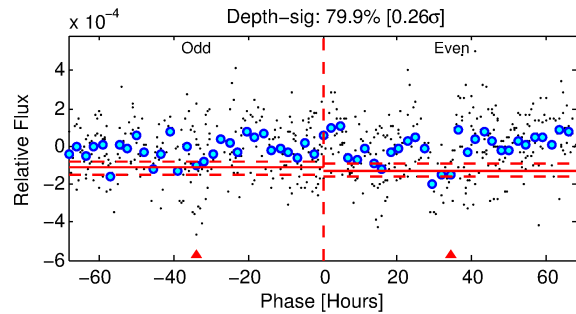
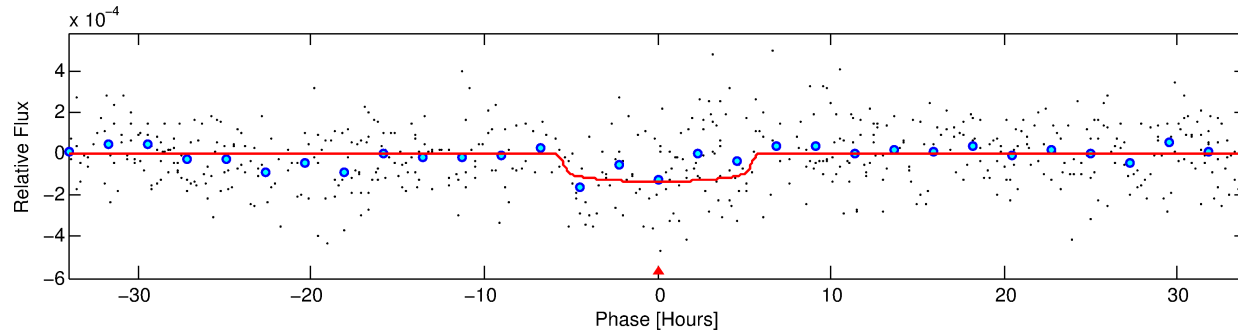
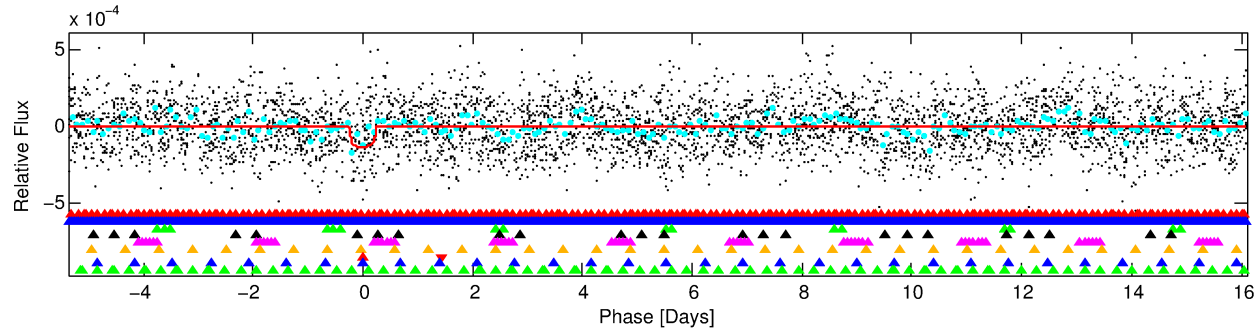
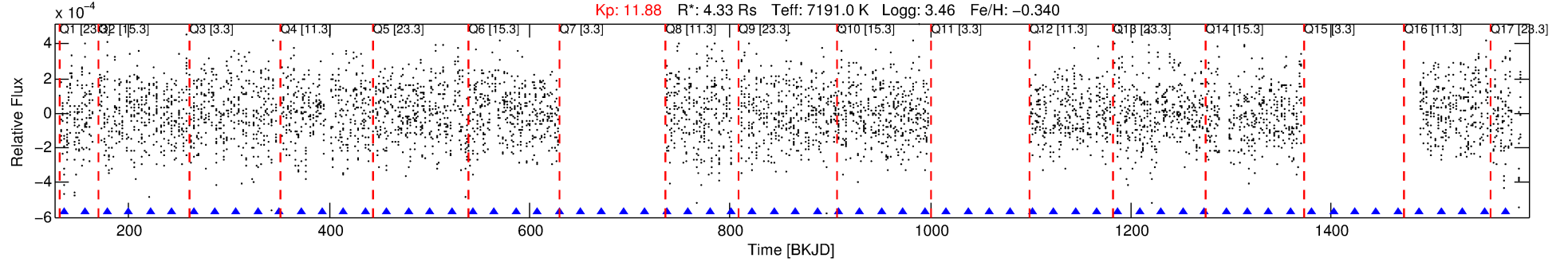
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010815932-07

No Significant Match Found

# DV One-Page Summary

KIC: 10815932 Candidate: 7 of 9 Period: 21.466 d



## DV Fit Results:

Period = 21.46606 [0.00083] d  
Epoch = 135.6918 [0.0353] BKJD  
Rp/R\* = 0.0120 [0.0042]  
a/R\* = 8.02 [14.08]  
b = 0.85 [0.59]  
Seff = 1254.60 [1436.49]  
Teq = 1518 [434] K  
Rp = 5.65 [4.10] Re  
a = 0.1891 [0.1277] AU  
Ag = 88.74 [119.74] [0.73 $\sigma$ ]  
Teffp = 7202 [1355] K [4.00 $\sigma$ ]

## DV Diagnostic Results:

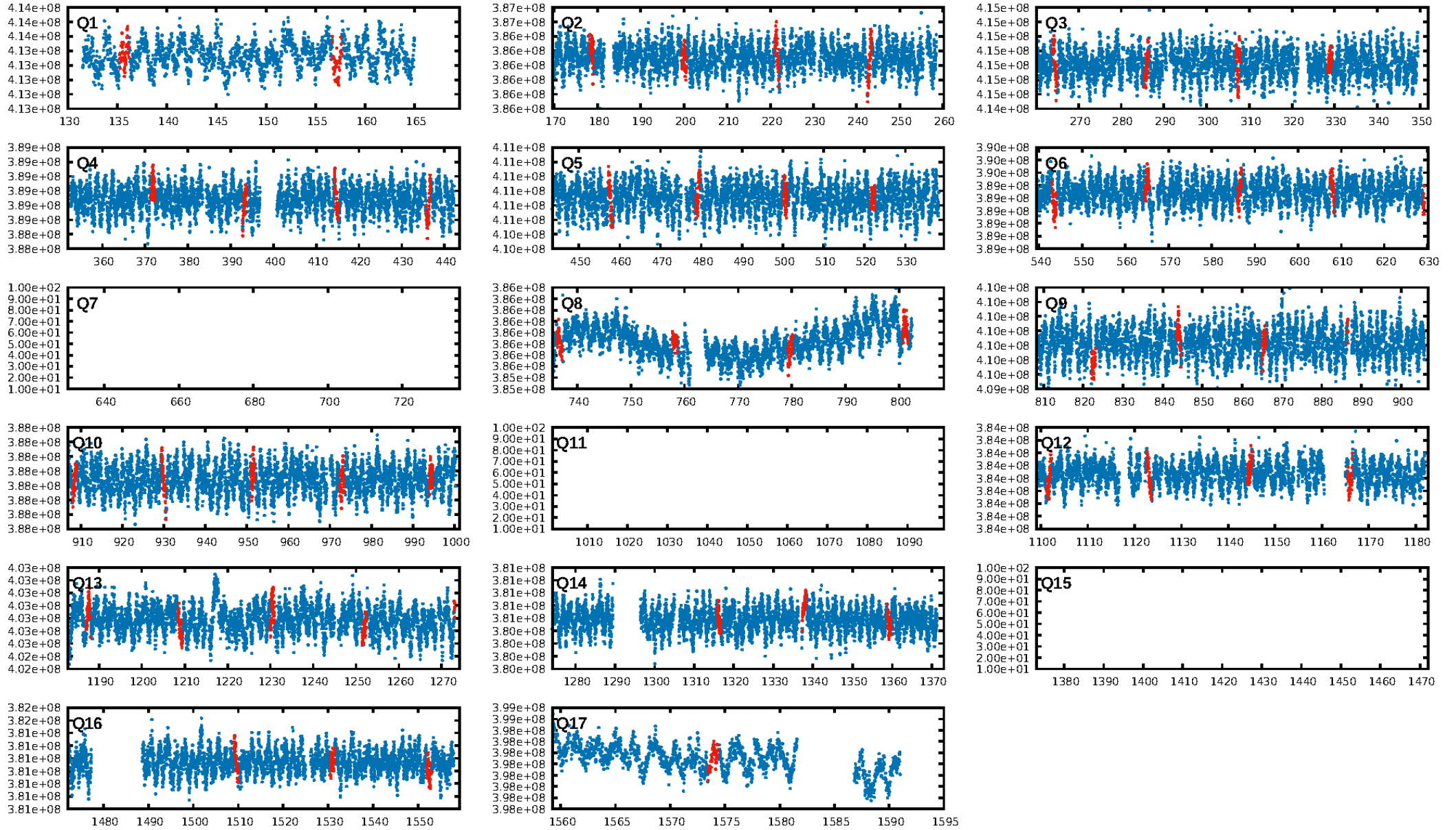
ShortPeriod-sig: 100.0% [15.10 $\sigma$ ]  
LongPeriod-sig: 100.0% [4.49 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: -5.54  
Centroid-sig: 55.1%  
Centroid-so: 0.192 arcsec [0.70 $\sigma$ ]  
OotOffset-rm: 1.737 arcsec [1.64 $\sigma$ ]  
OotOffset-st: 4/1/4/4 [13]  
KicOffset-rm: 1.752 arcsec [1.82 $\sigma$ ]  
KicOffset-st: 4/1/4/4 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:19 Z

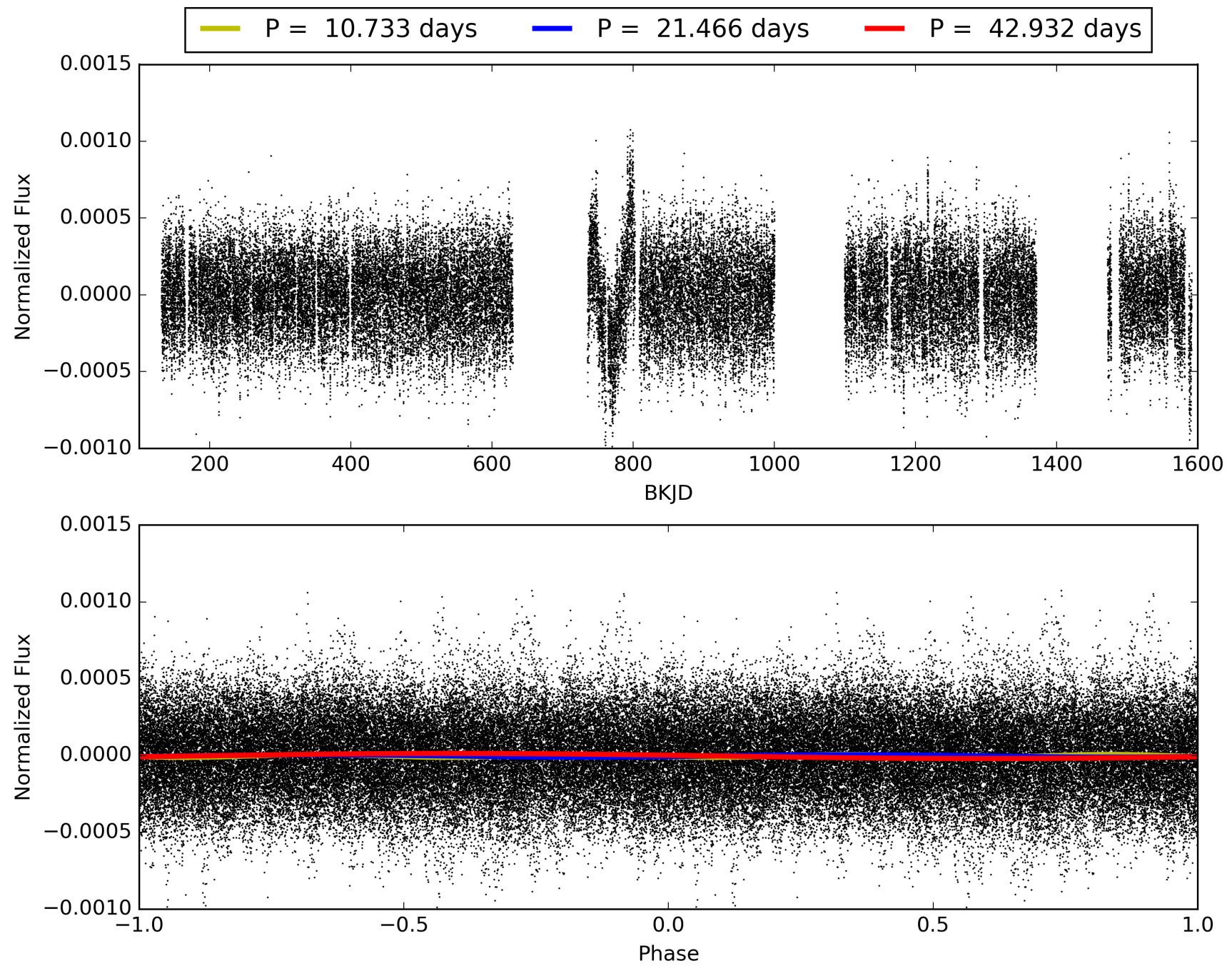
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010815932-07, PDC Light Curves

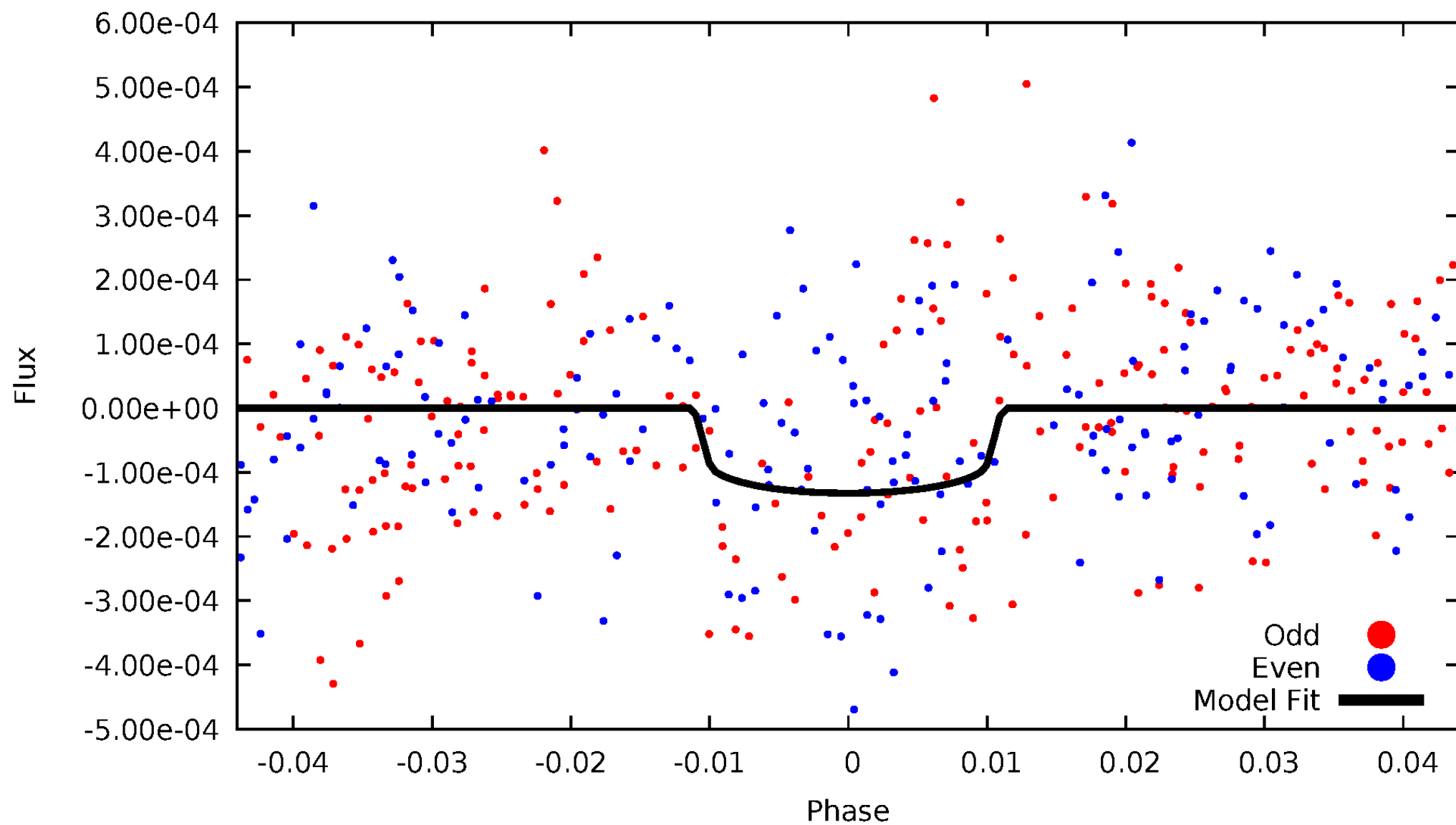


TCE 010815932-07



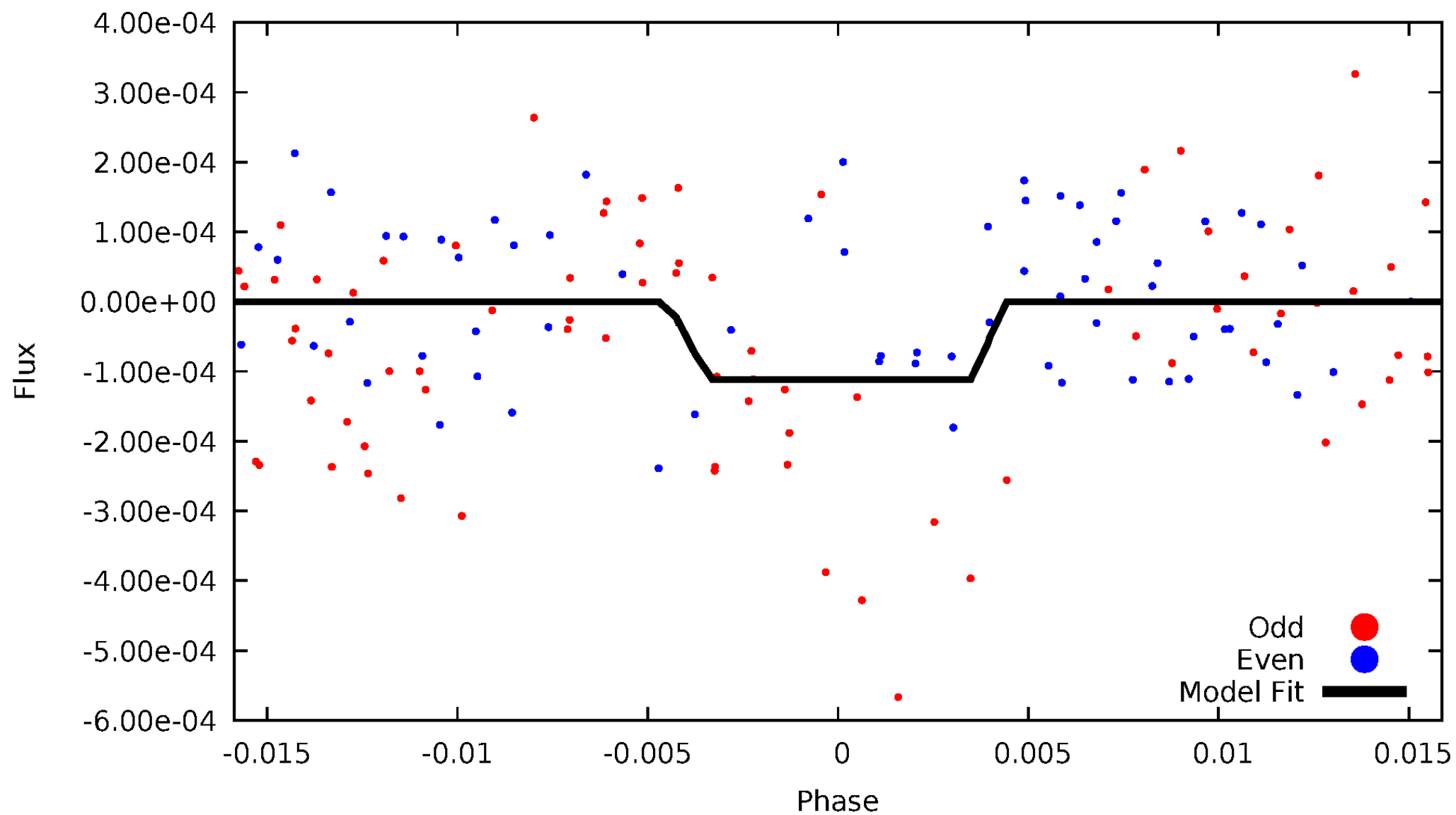
# DV Odd/Even

TCE 010815932-07



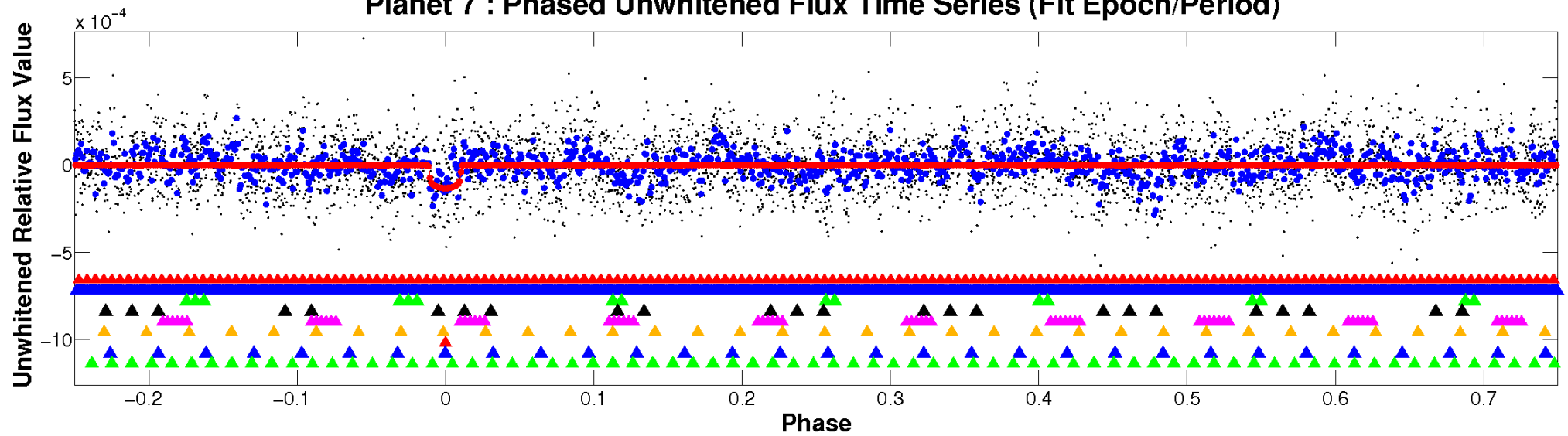
# ALT Odd/Even

TCE 010815932-07

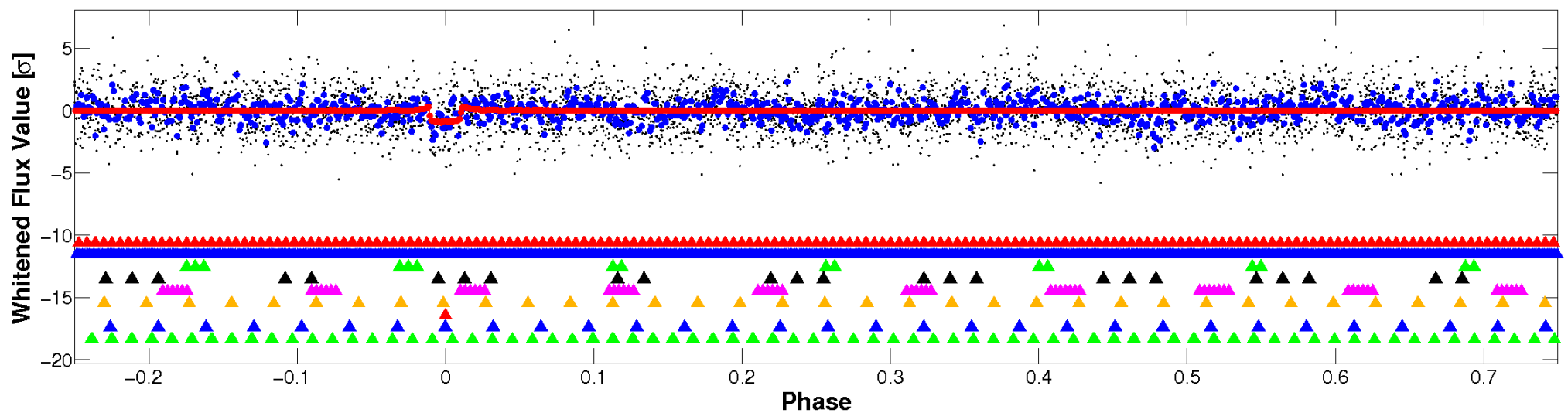


# Non-Whitened Vs. Whitened Light Curve

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

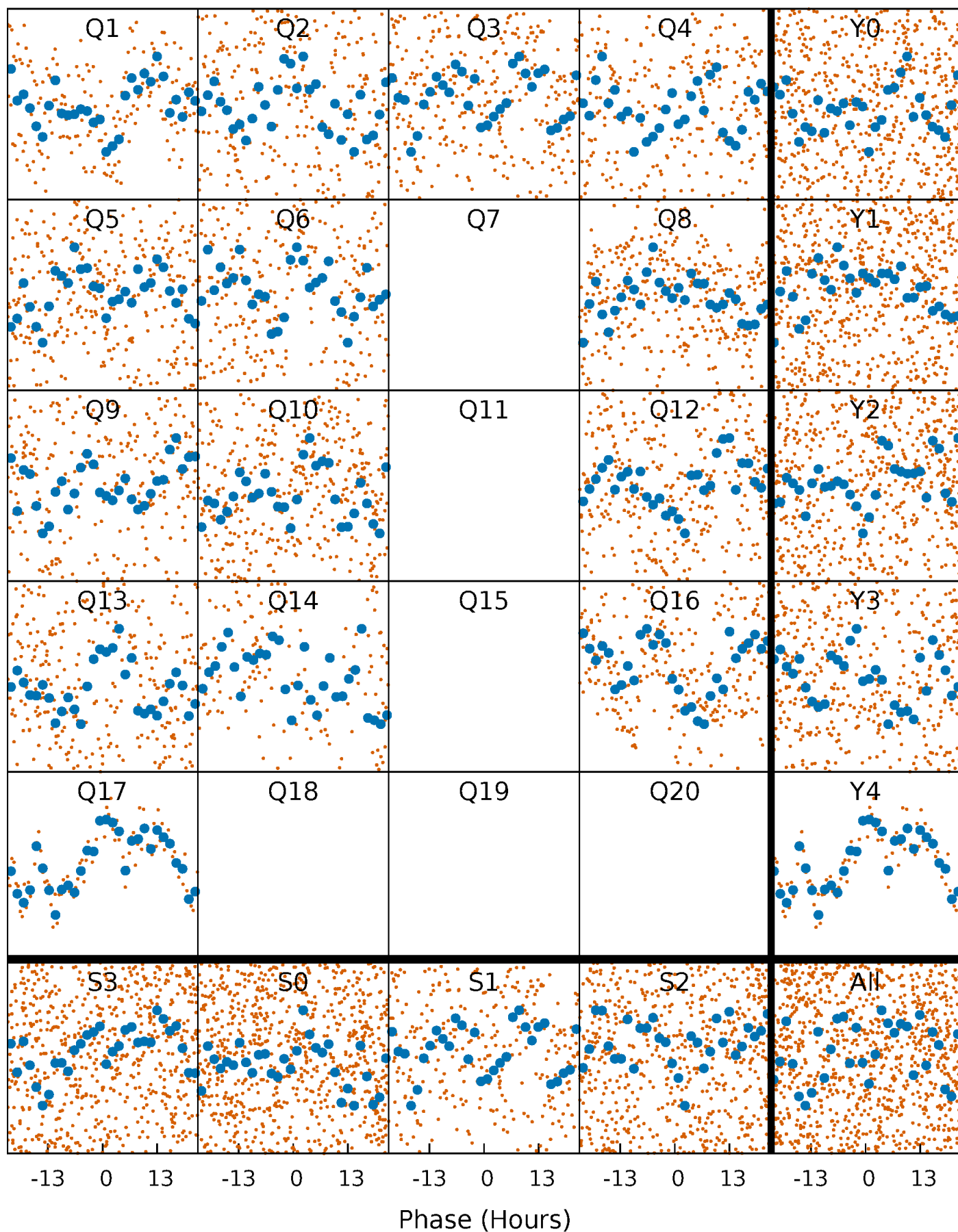


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

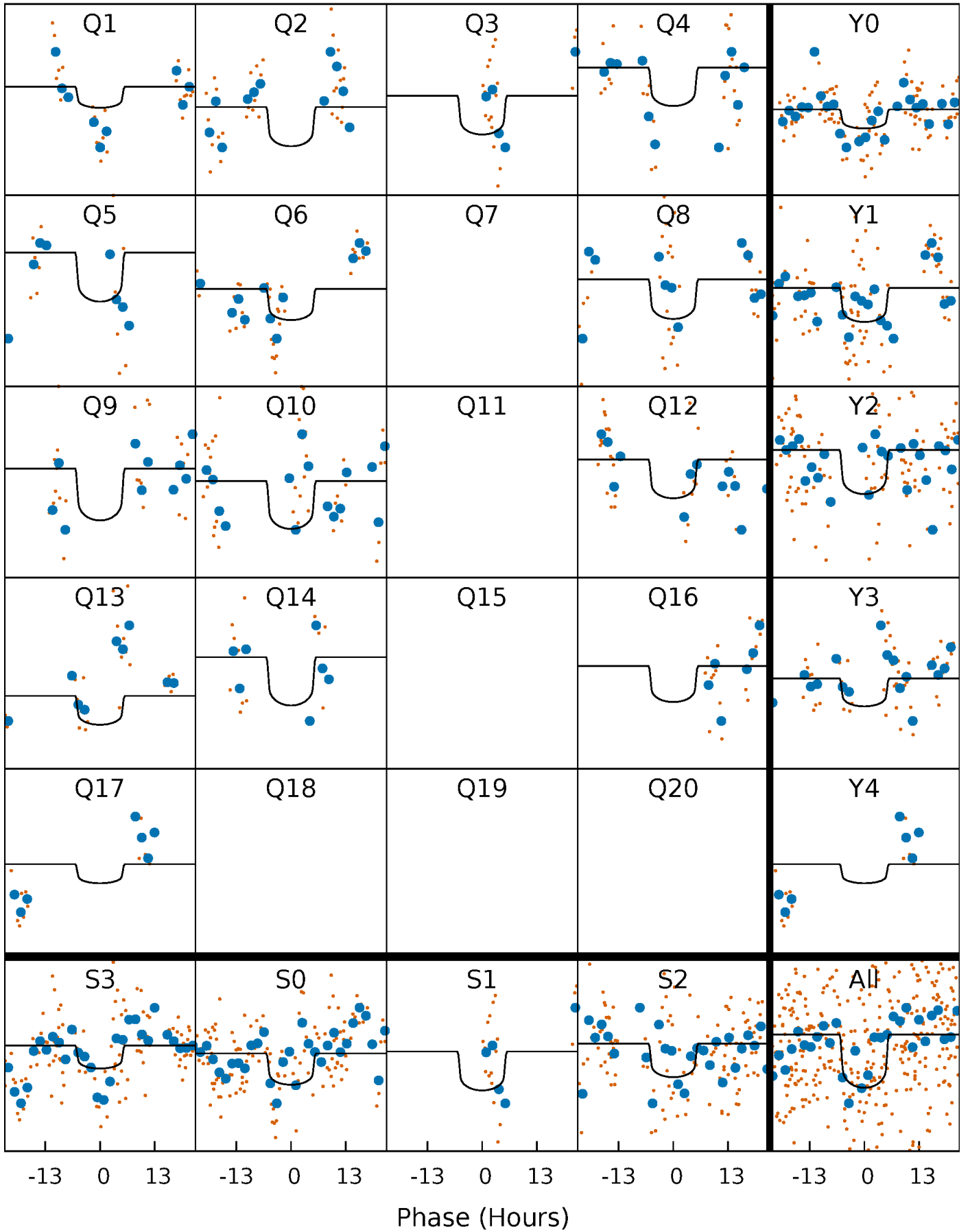
TCE 010815932-07     $P = 21.466060$  Days     $T_0 = 135.691781$  (BKJD)





# DV Quarter-Phased Transit Curves

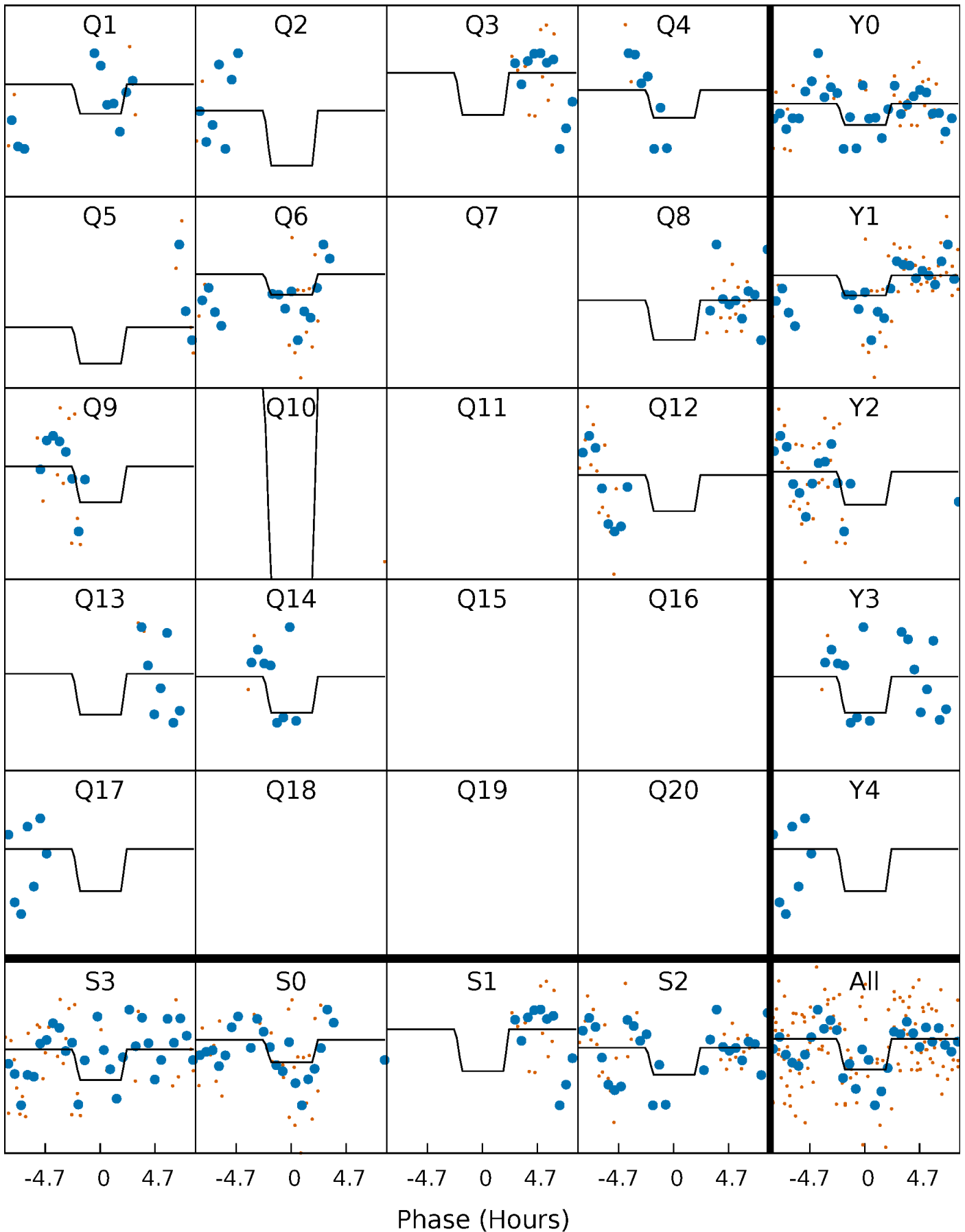
TCE 010815932-07   P= 21.466060 Days    $T_0=135.691781$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

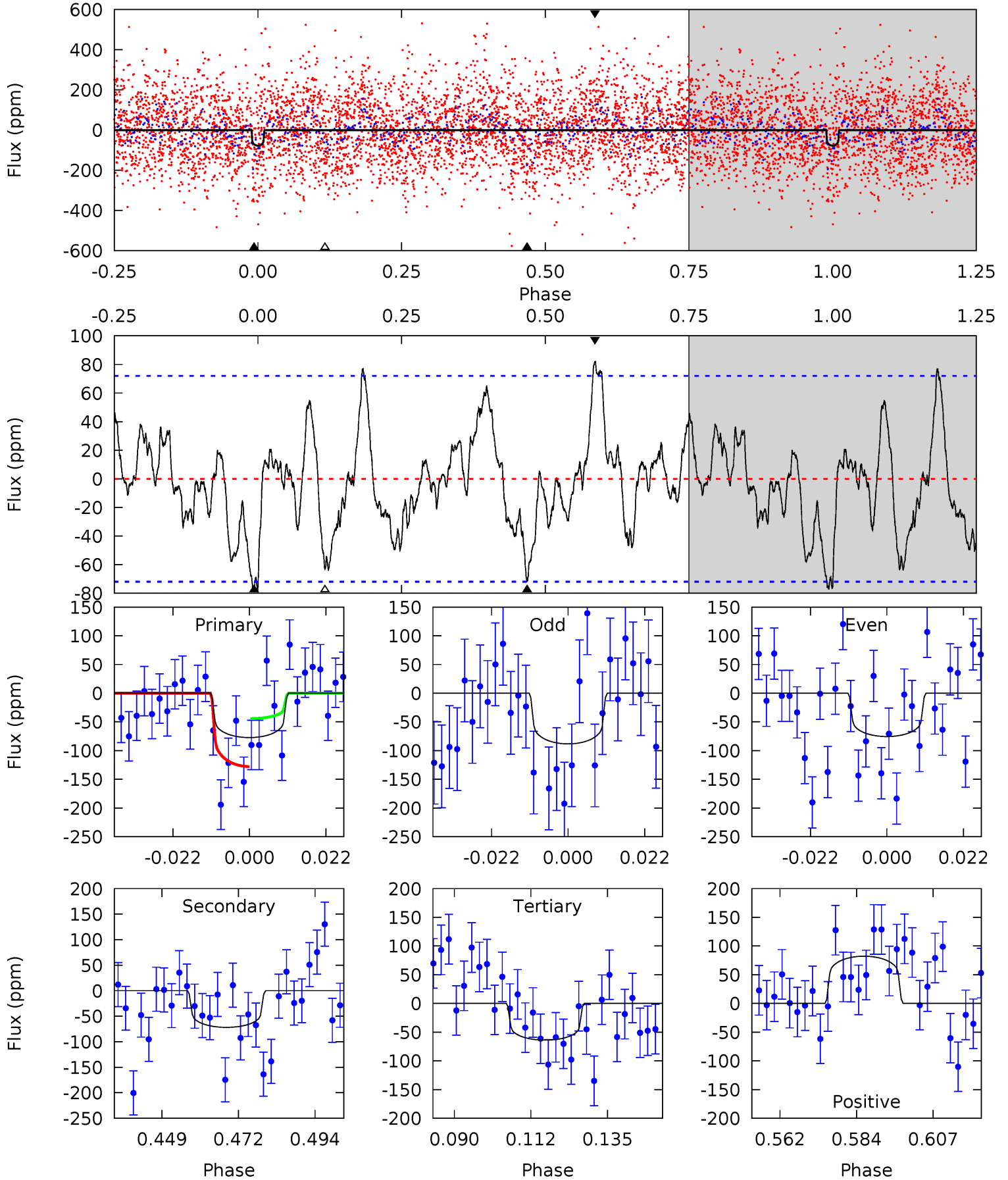
TCE 010815932-07     $P = 21.459133$  Days     $T_0 = 135.635793$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-07, P = 21.466060 Days, E = 114.225721 Days

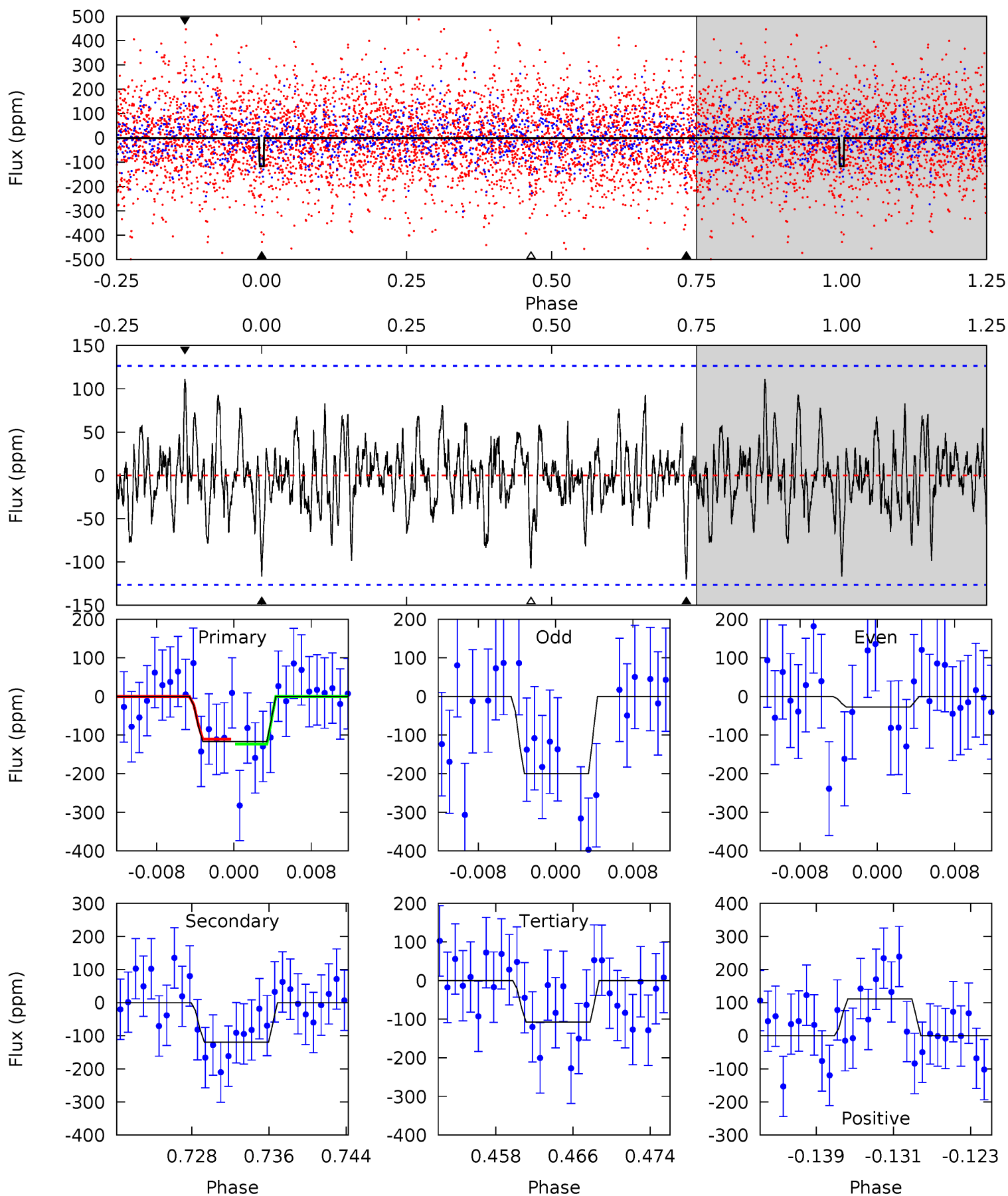
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.23	4.86	4.32	5.56	4.87	2.28	1.90	0.91	-0.33	0.54	-0.70	0.44	0.79	0.52	2.79



# Alt Model-Shift Uniqueness Test

010815932-07, P = 21.459133 Days, E = 114.176660 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
4.68	4.81	4.31	4.45	5.06	2.64	1.27	0.37	0.23	0.50	0.36	3.45	1.17	0.48	0.26



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-72 \pm 15$	$5.05^{+2.22}_{-2.18}$	$2054^{+133}_{-282}$	$5913^{+1490}_{-814}$	$54^{+113}_{-28}$
Alt.	$-120 \pm 25$	$4.23^{+2.18}_{-1.97}$	$2050^{+132}_{-315}$	$7367^{+2869}_{-1252}$	$128^{+315}_{-72}$

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

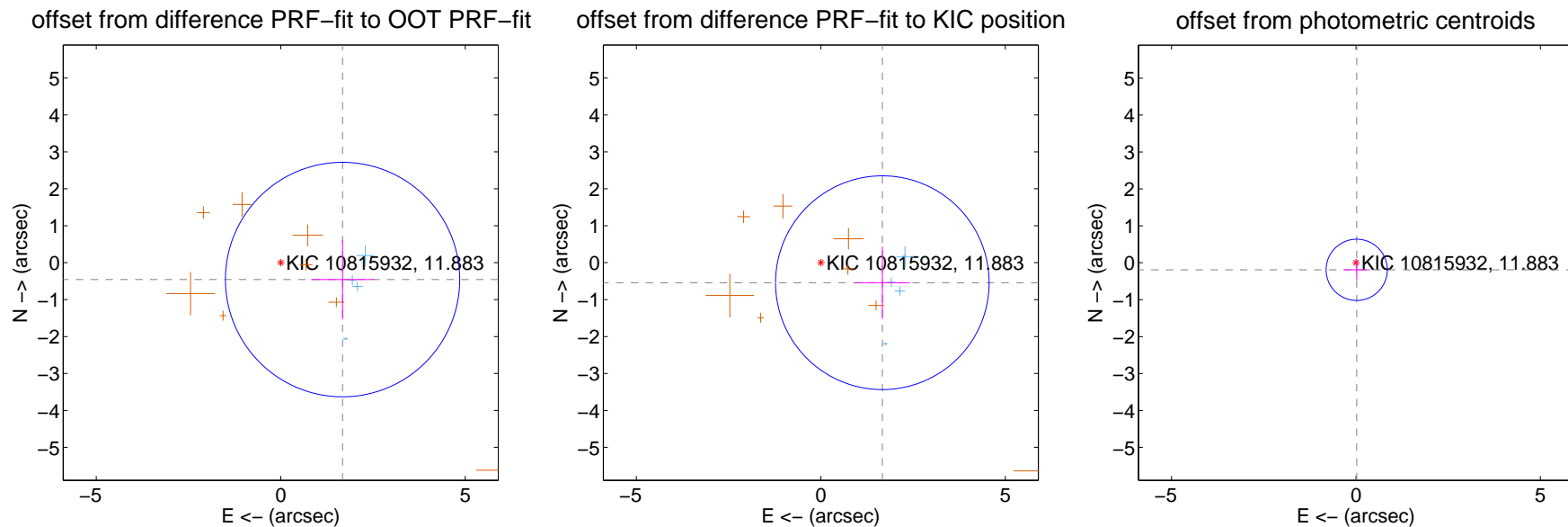
## DV Centroid Data

Supplemental centroid analysis for 010815932-07. **Kepler magnitude: 11.88.** Transit SNR 8.37

There are 4 quarters with good PRF difference image offsets

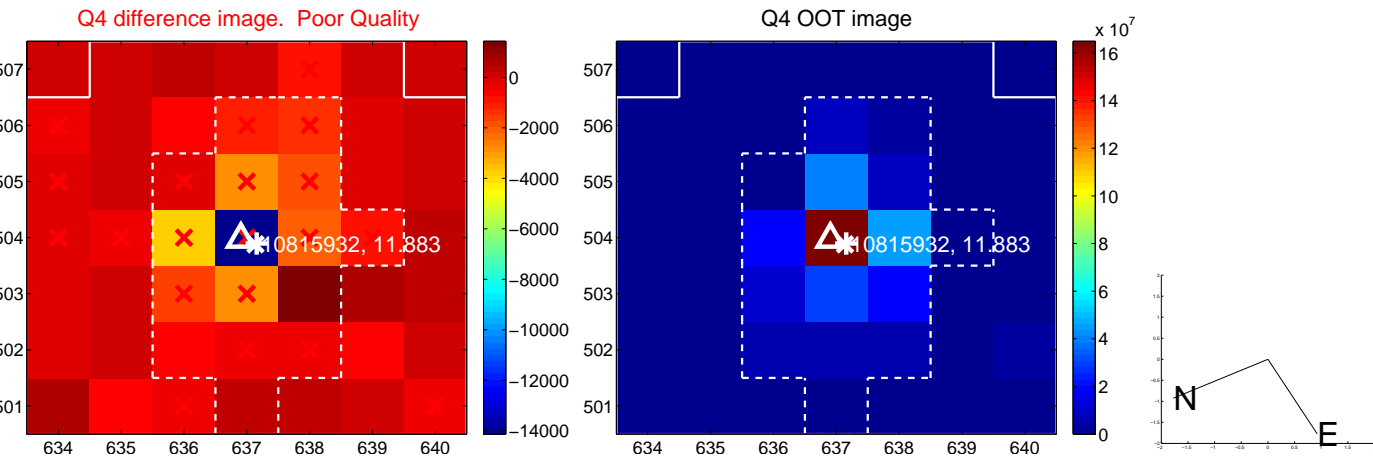
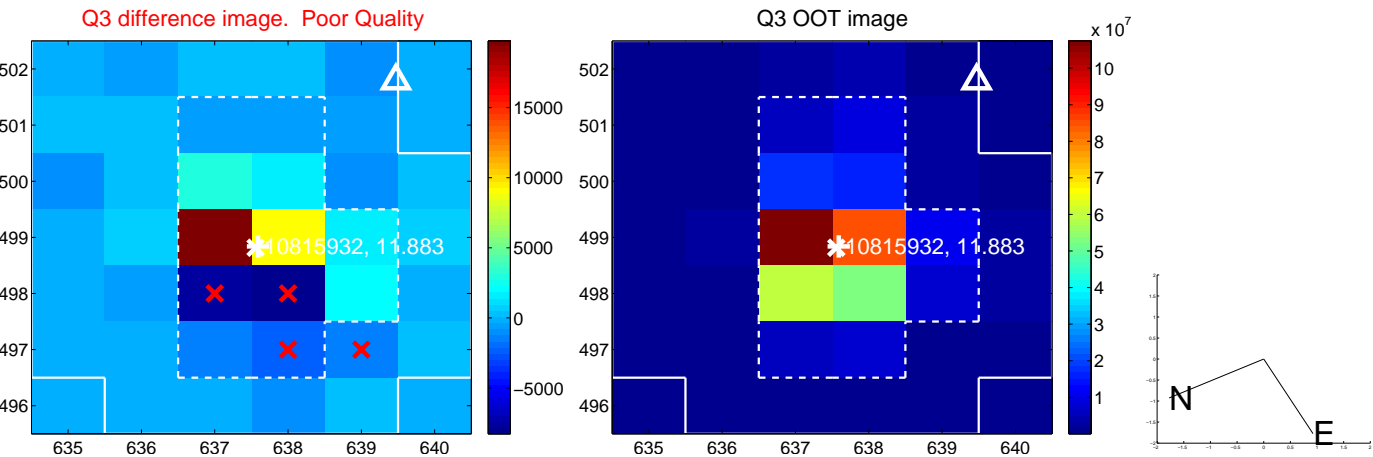
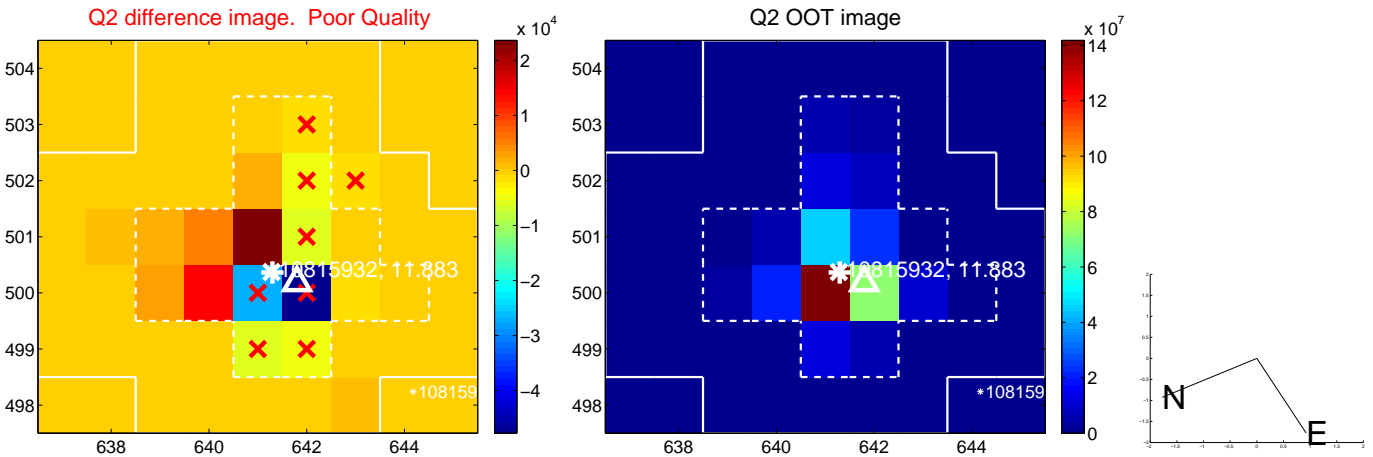
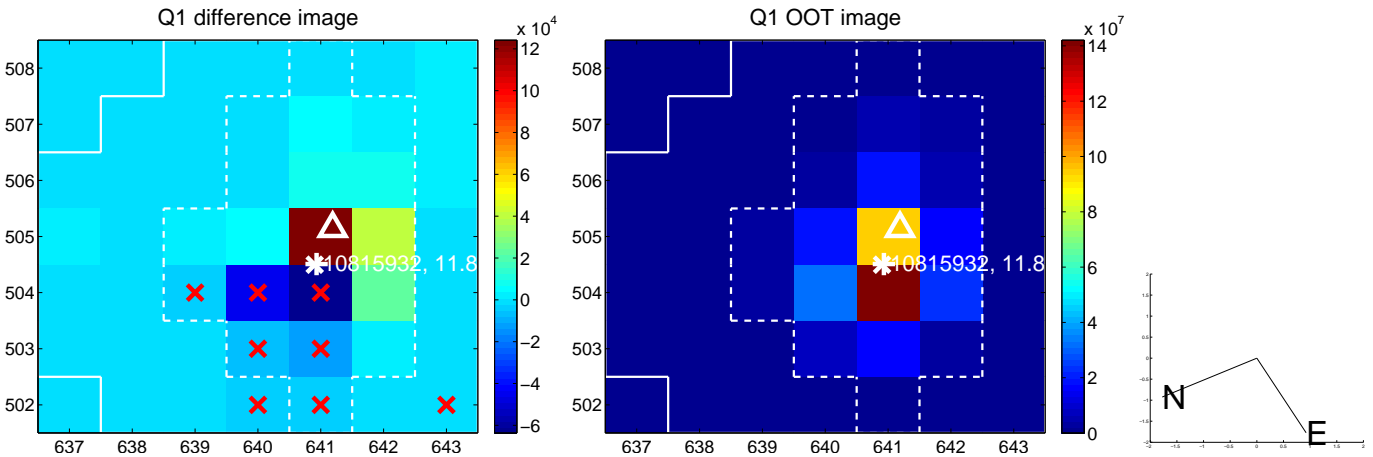
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.737 \pm 1.058$	1.64	$-1.676 \pm 0.851$	$-0.457 \pm 1.077$
PRF-fit source offset from KIC position	$1.752 \pm 0.965$	1.82	$-1.666 \pm 0.748$	$-0.542 \pm 0.980$
photometric centroid source offset	$0.19 \pm 0.28$	0.70	$-0.02 \pm 0.36$	$-0.19 \pm 0.28$

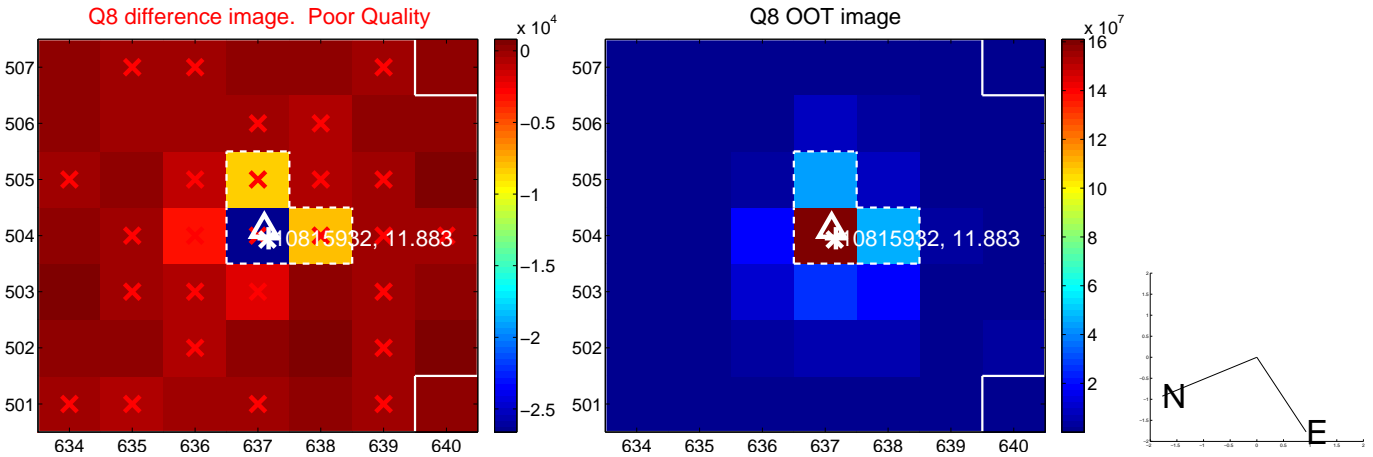
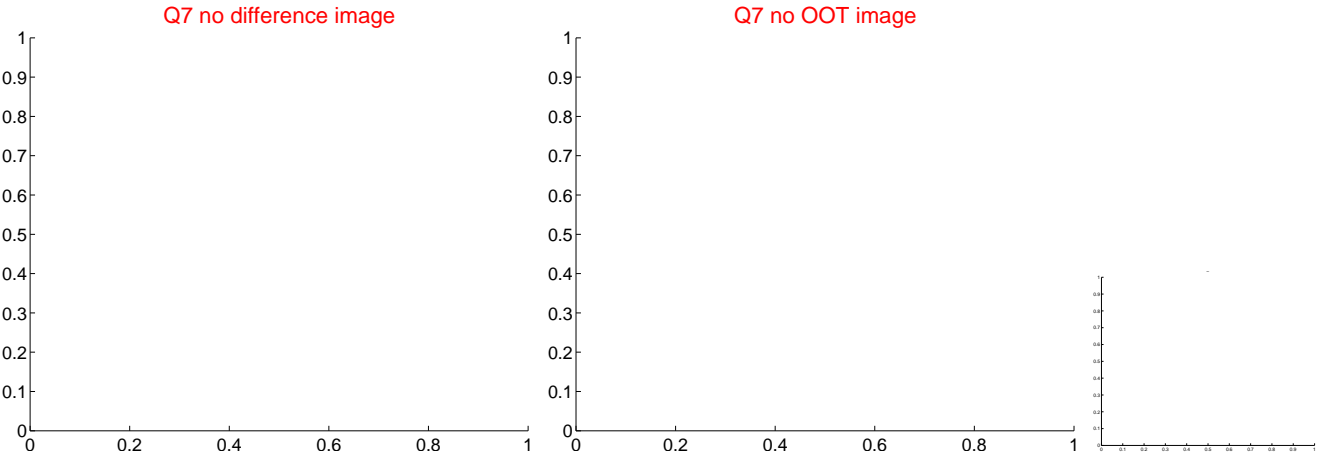
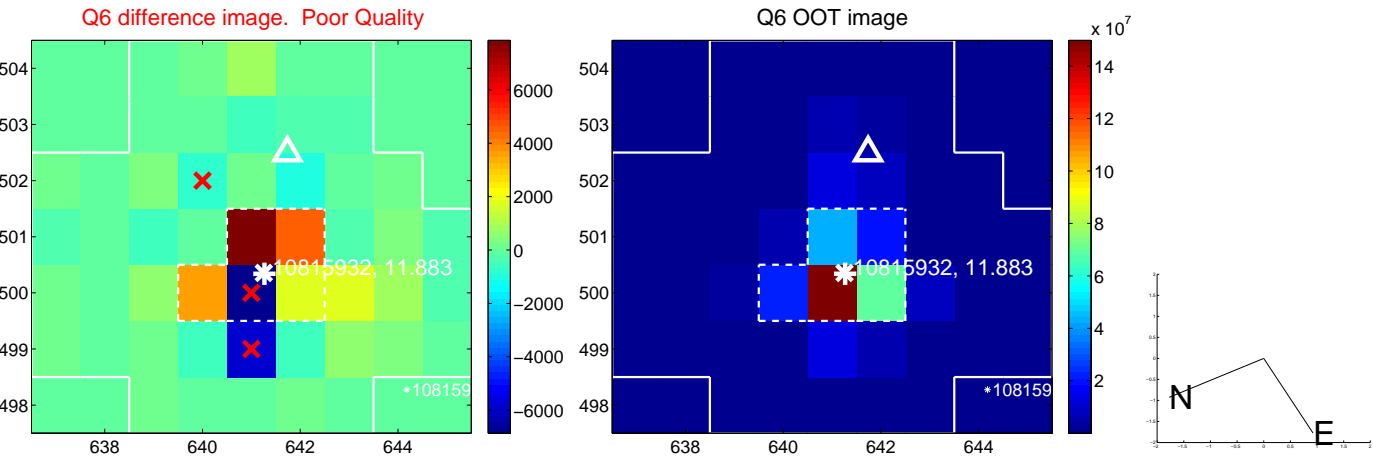
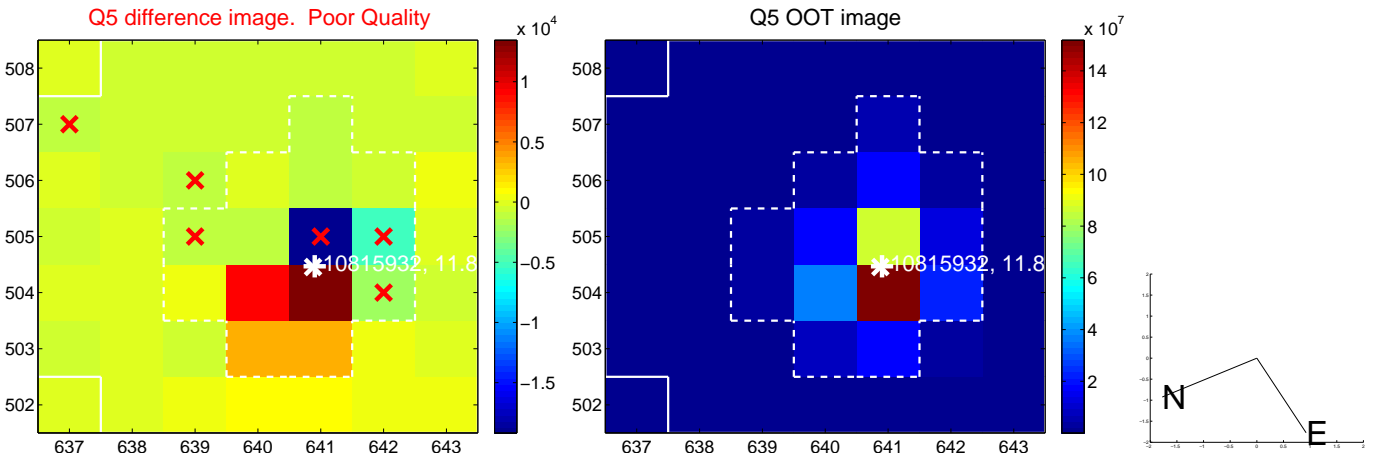


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

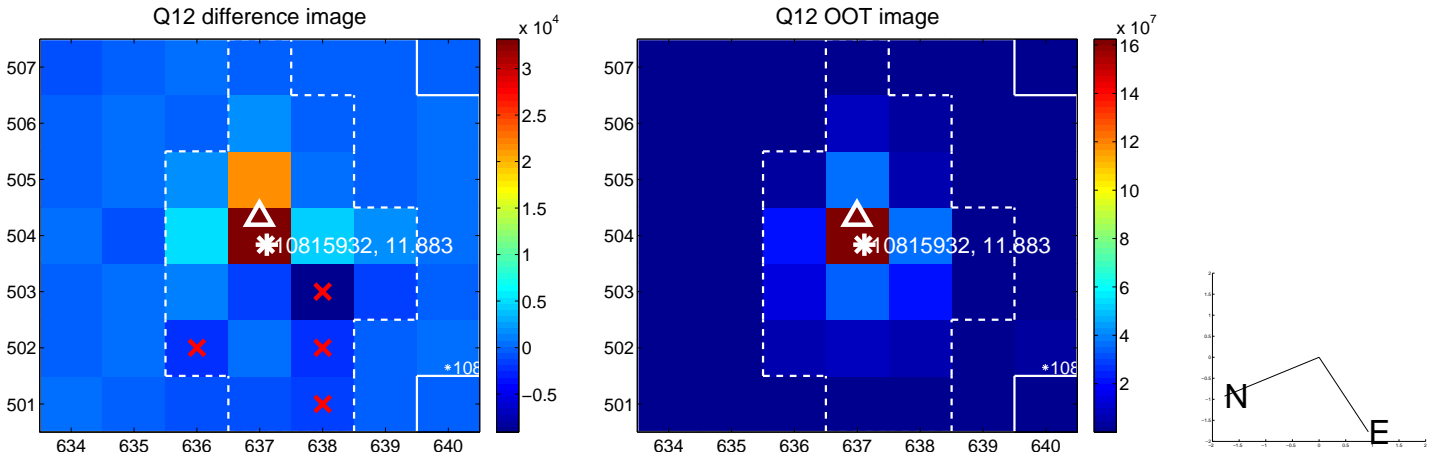
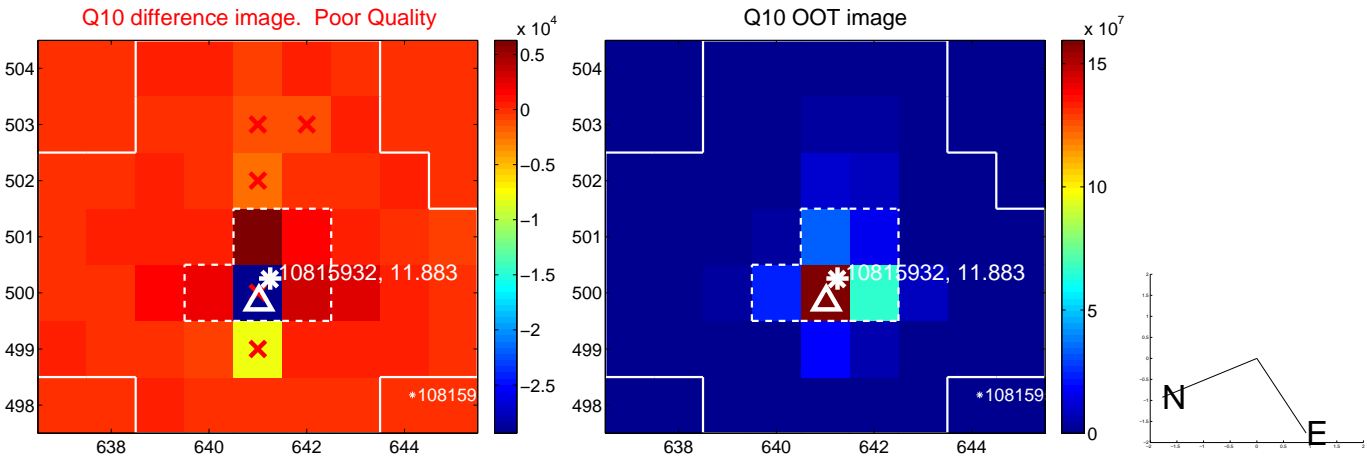
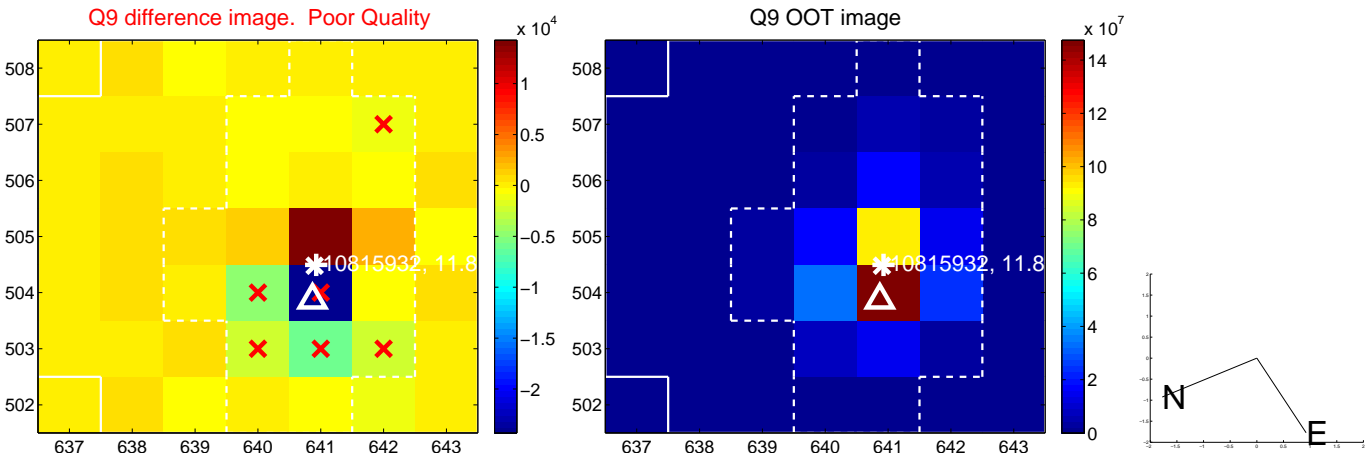


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

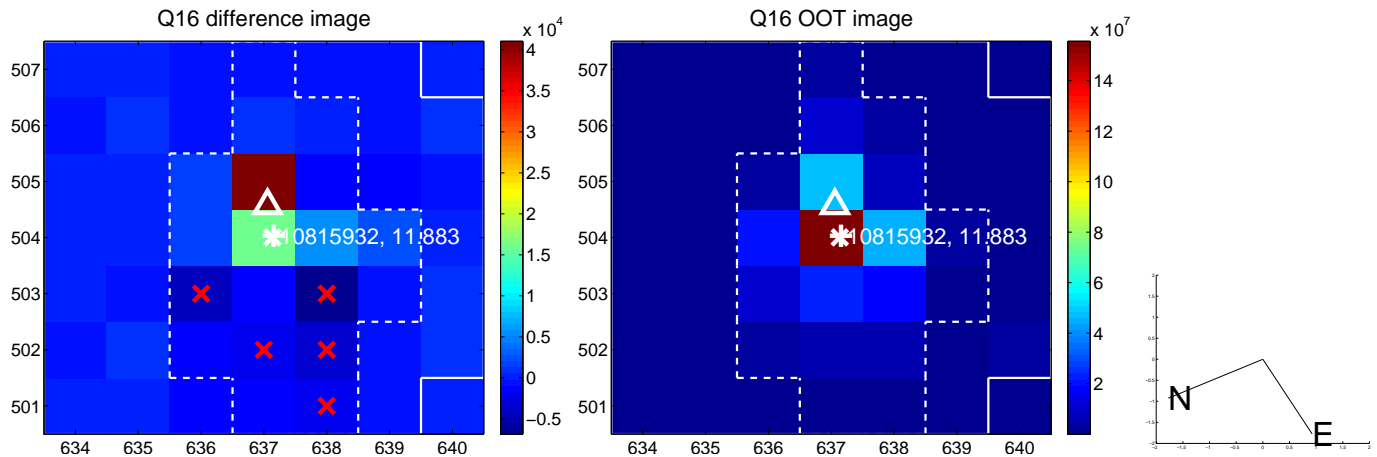
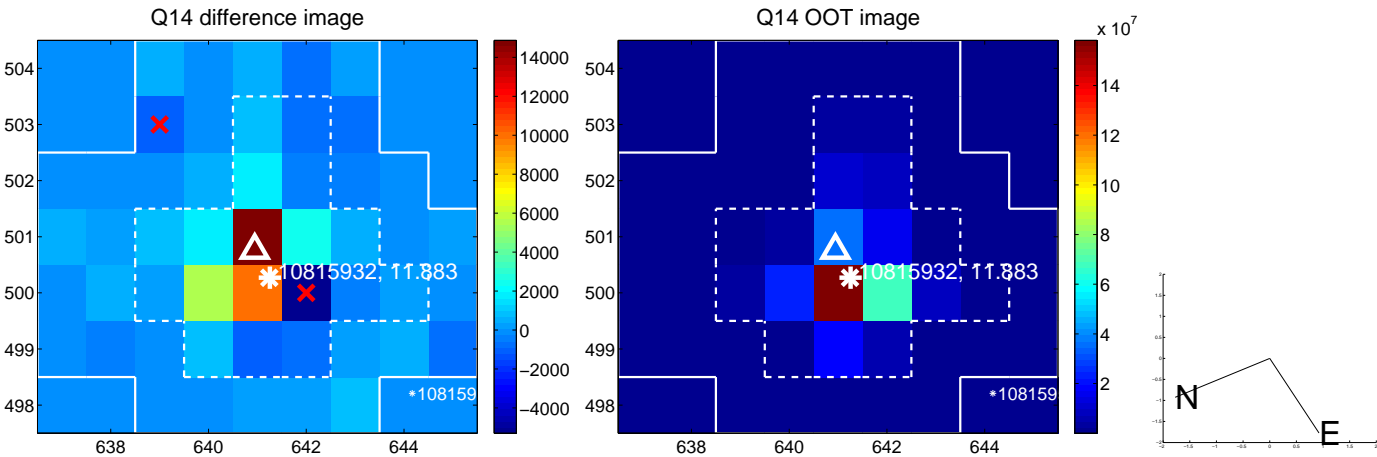
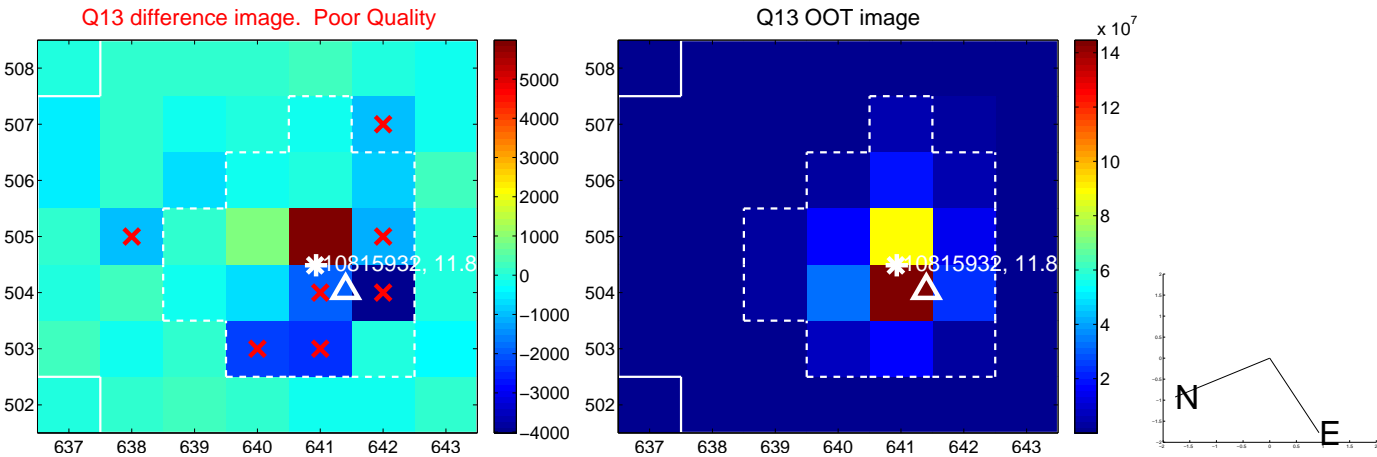




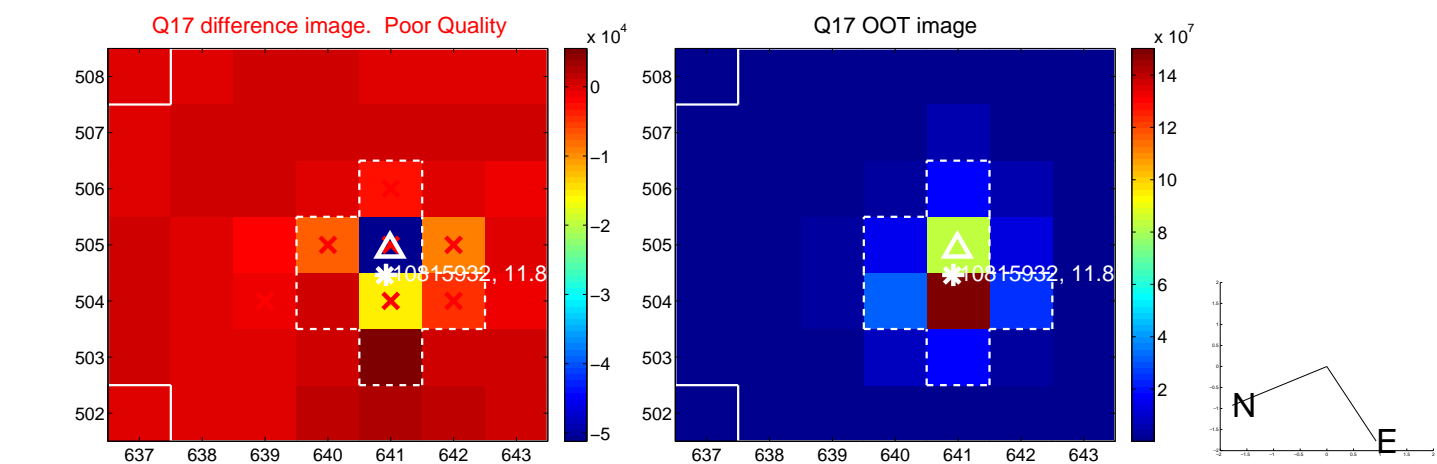
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



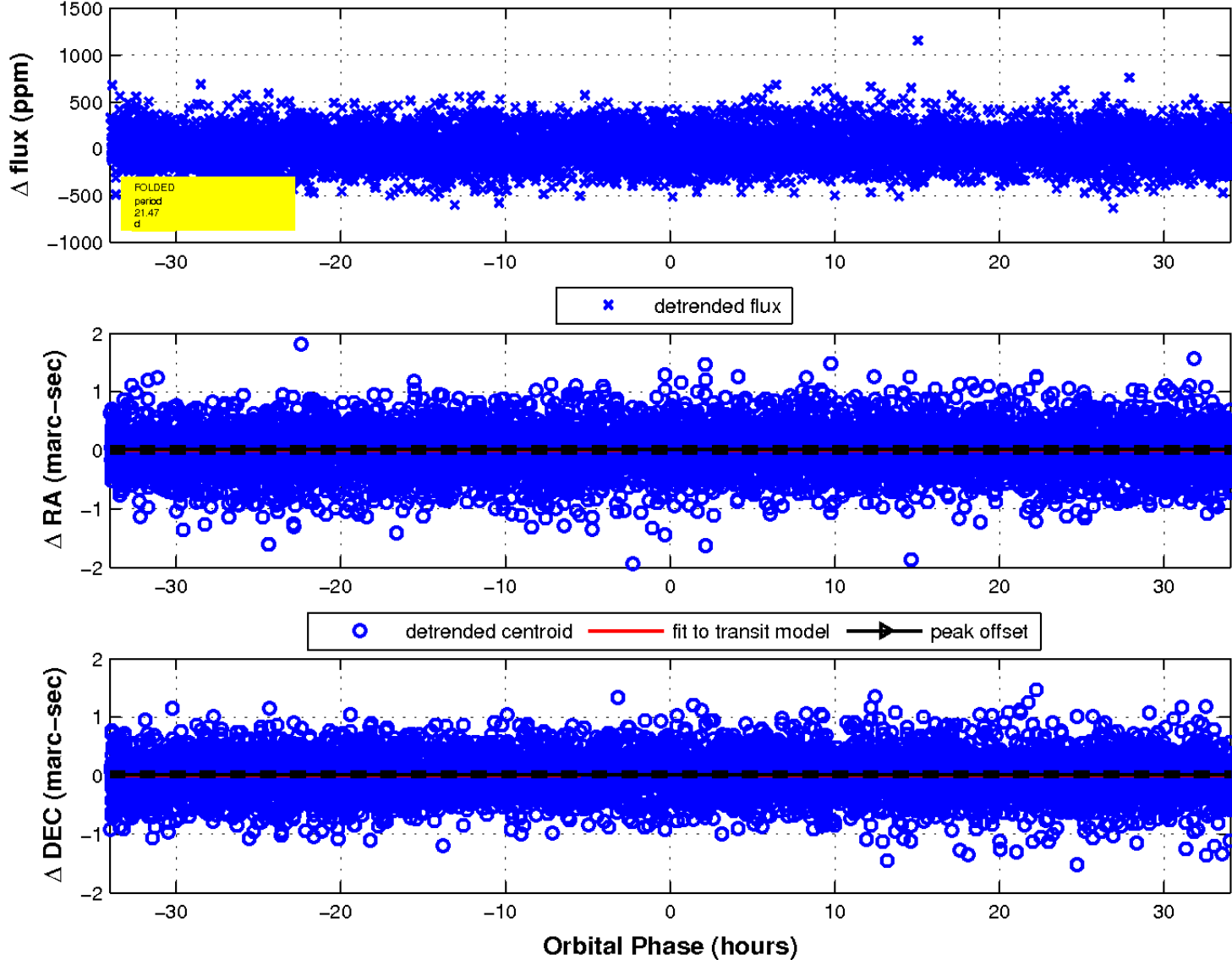
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

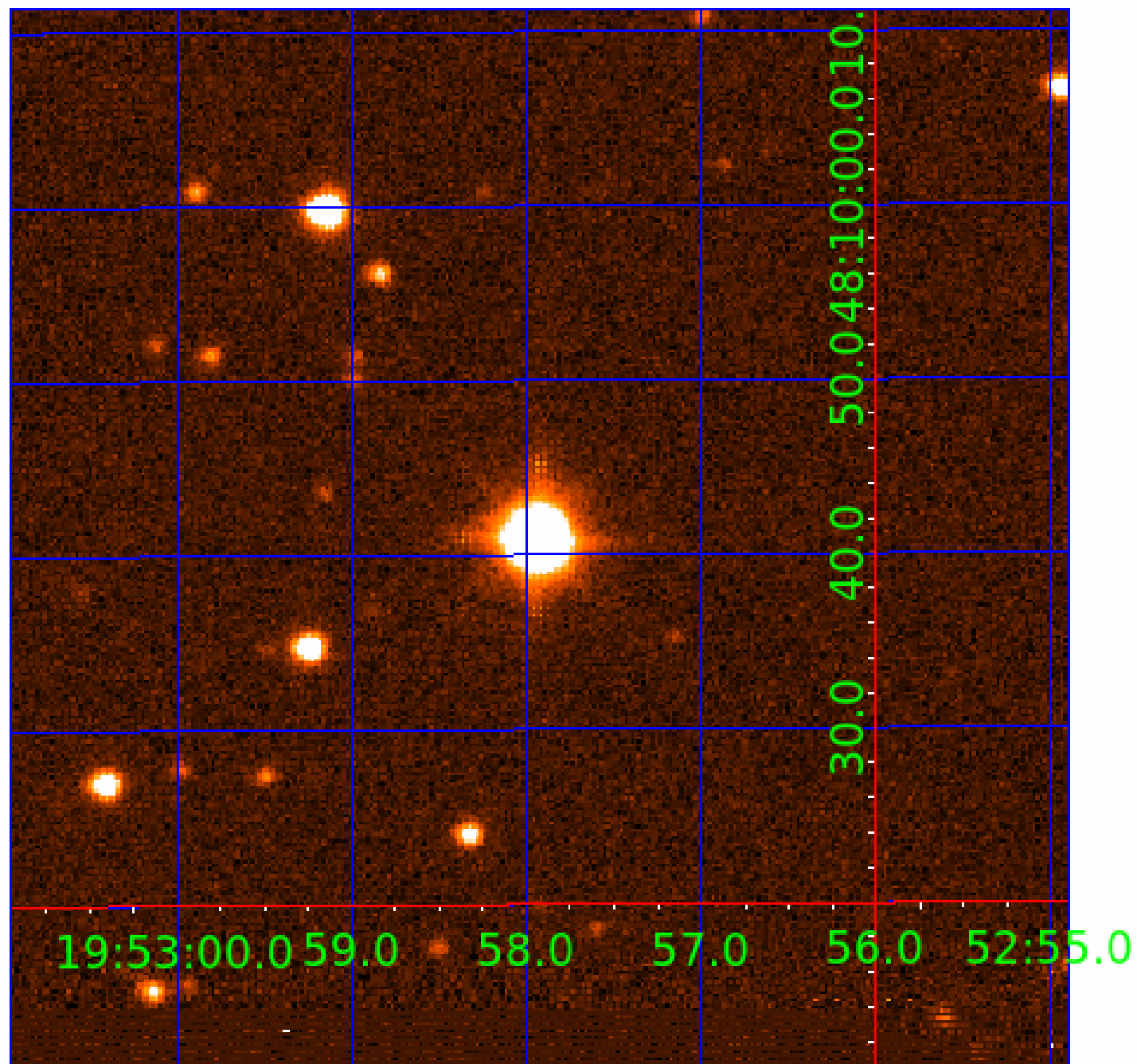


fluxWeightedCentroids, Planet 7 of 9



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

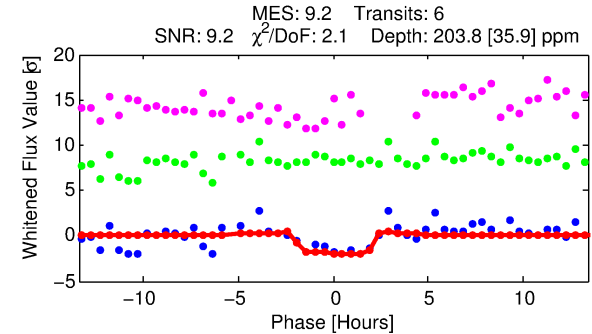
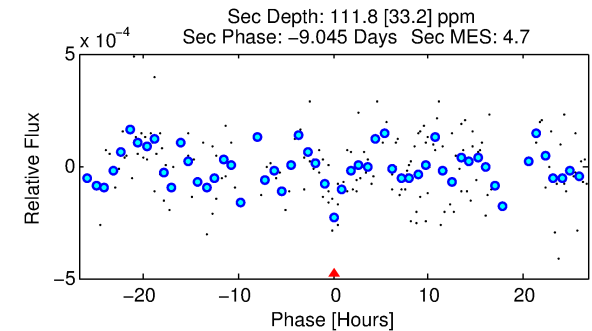
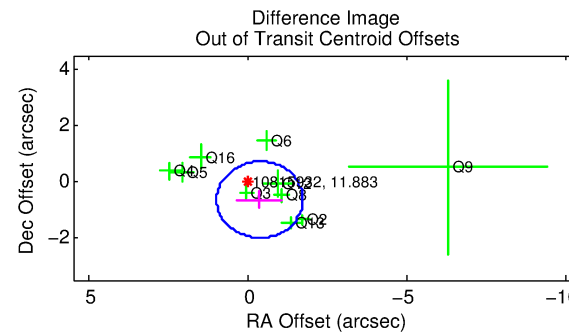
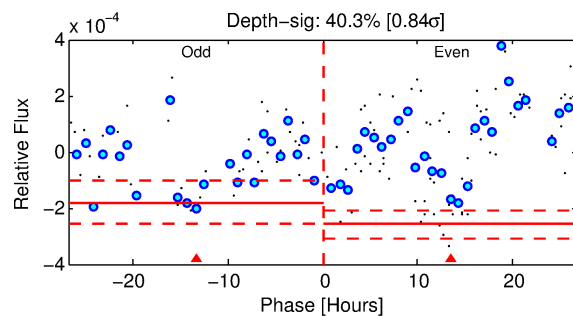
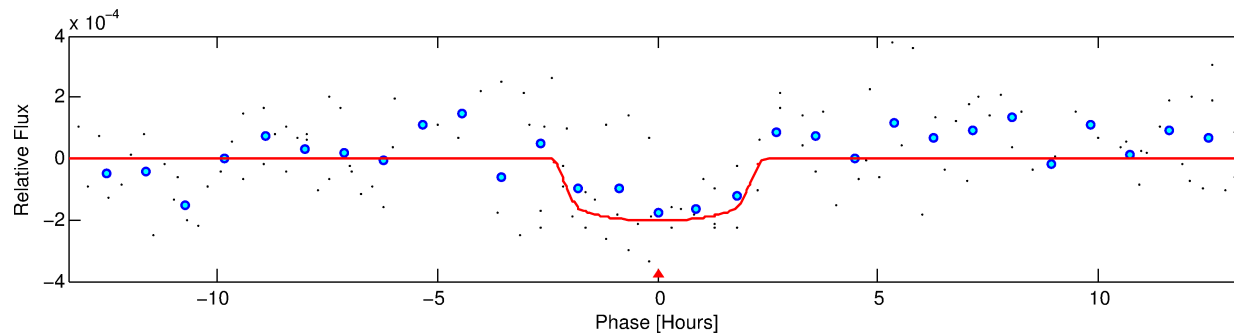
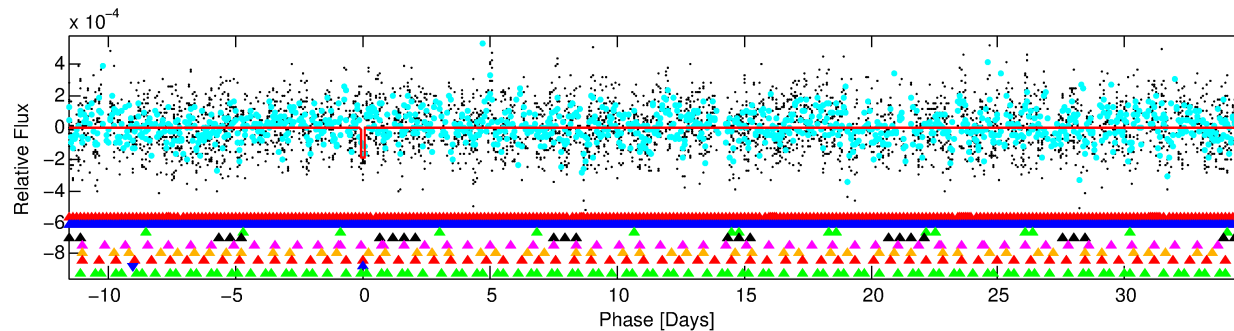
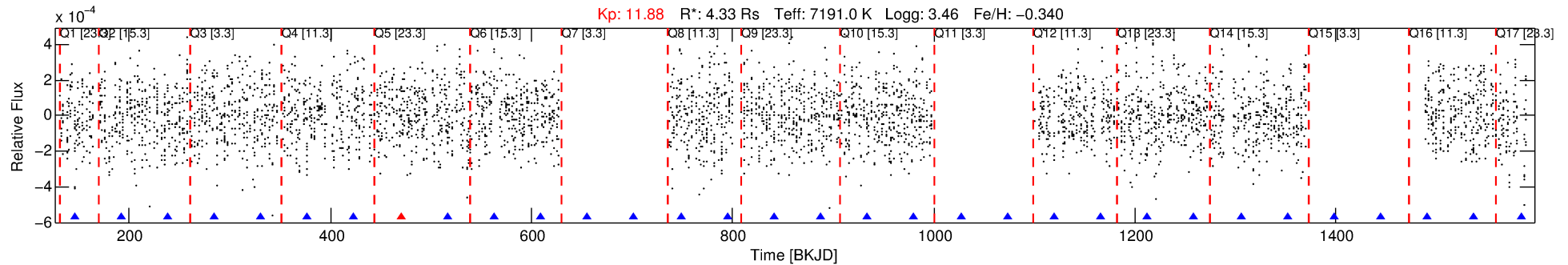
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010815932-08

No Significant Match Found

# DV One-Page Summary

KIC: 10815932 Candidate: 8 of 9 Period: 46.395 d



## DV Fit Results:

Period = 46.39450 [0.00067] d  
Epoch = 145.3813 [0.0121] BKJD  
Rp/R\* = 0.0147 [0.0126]  
a/R\* = 46.03 [203.85]  
b = 0.83 [1.64]  
Seff = 448.97 [514.07]  
Teq = 1174 [336] K  
Rp = 6.95 [7.41] Re  
a = 0.3161 [0.2134] AU  
Ag = 127.06 [263.27] [0.48 $\sigma$ ]  
Teff = 6093 [2655] K [1.84 $\sigma$ ]

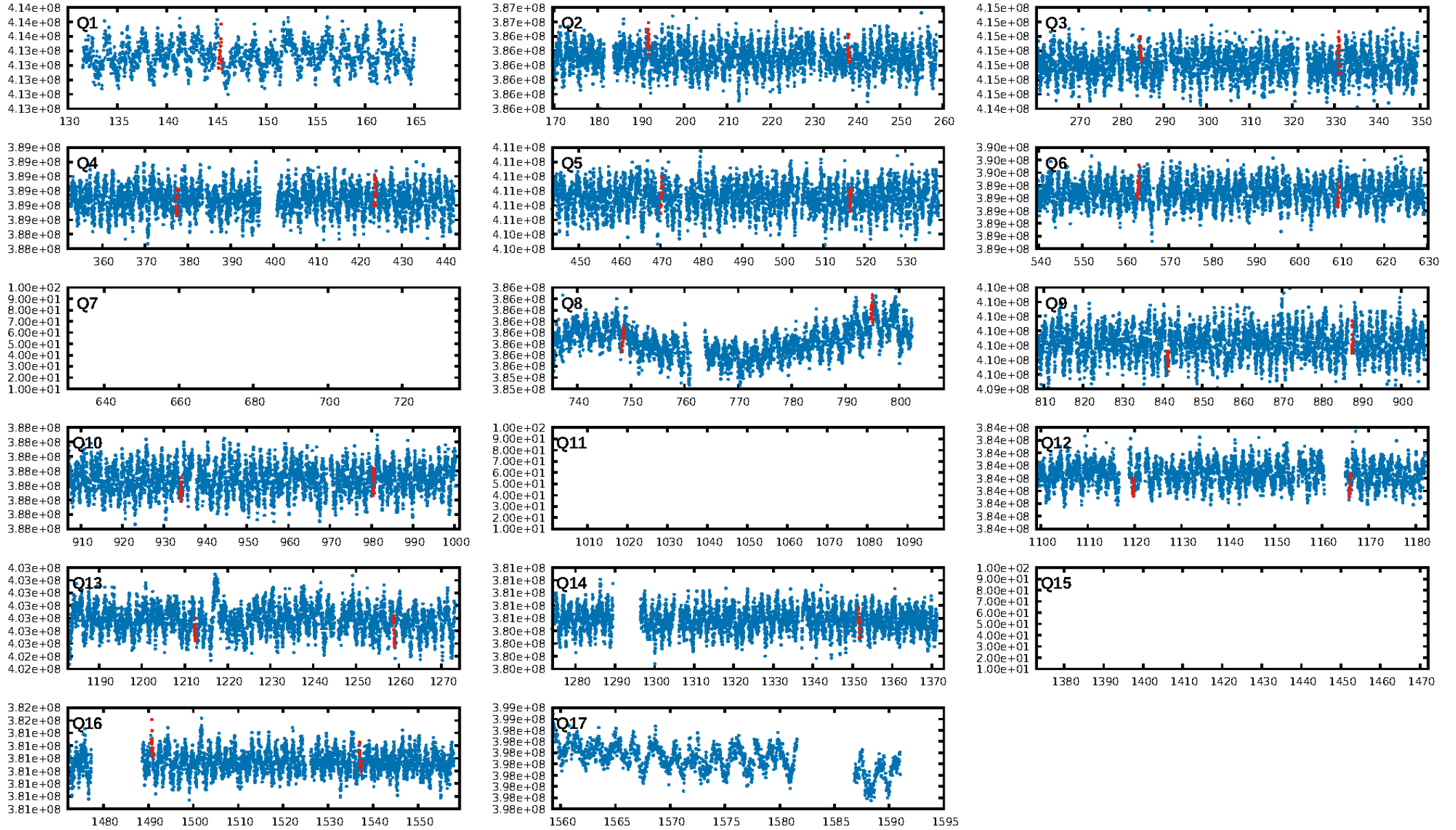
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [80.54 $\sigma$ ]  
LongPeriod-sig: 100.0% [55.21 $\sigma$ ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.83 [5/6]  
GhostDiagnostic-chr: 0.3201  
Centroid-sig: 68.3%  
Centroid-so: 0.133 arcsec [0.37 $\sigma$ ]  
OotOffset-rm: 0.737 arcsec [1.63 $\sigma$ ]  
OotOffset-st: 2/1/4/3 [10]  
KicOffset-rm: 0.817 arcsec [1.70 $\sigma$ ]  
KicOffset-st: 2/1/4/3 [10]  
DiffImageQuality-fgm: 0.40 [4/10]  
DiffImageOverlap-fno: 0.08 [1/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:22 Z

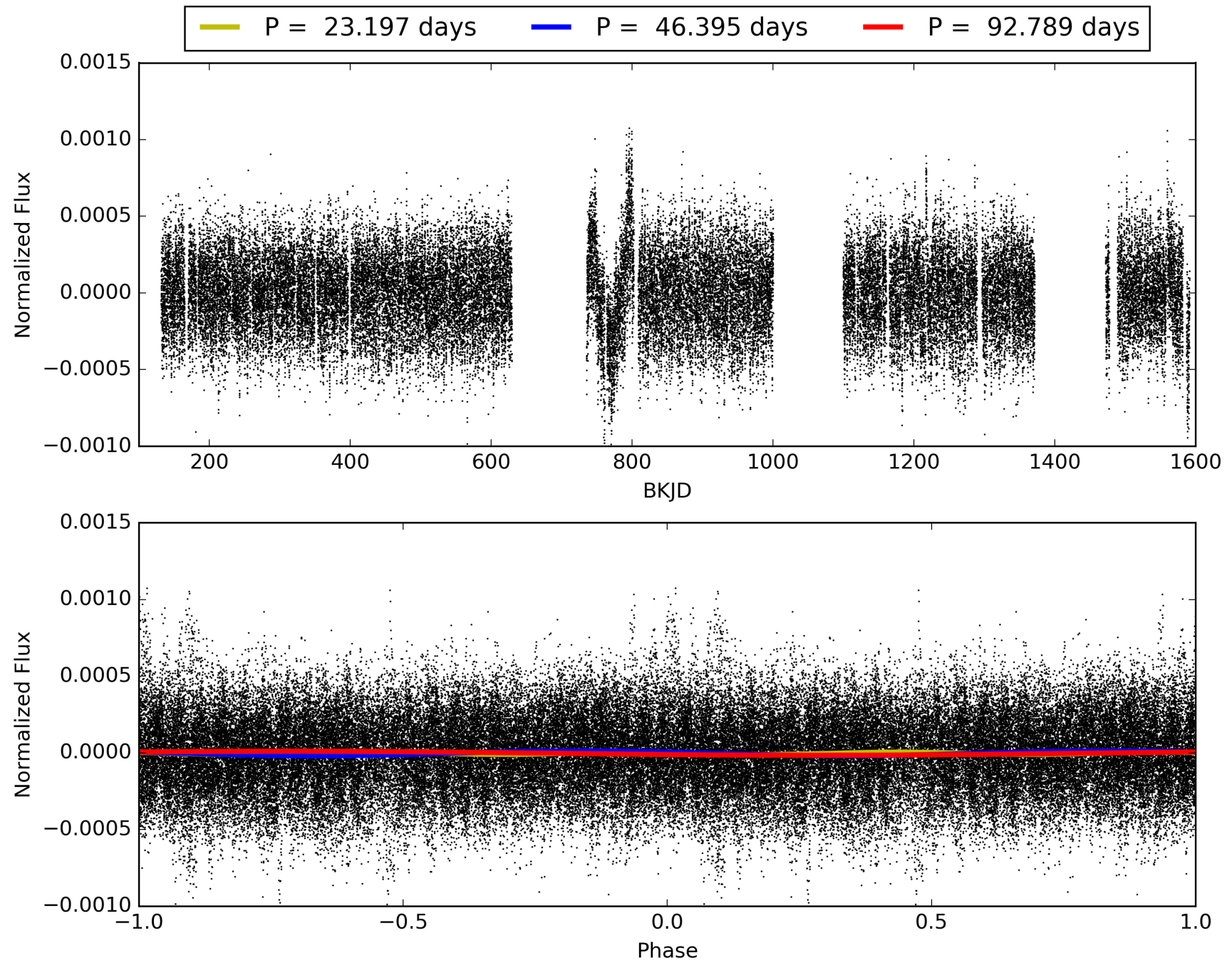
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010815932-08, PDC Light Curves



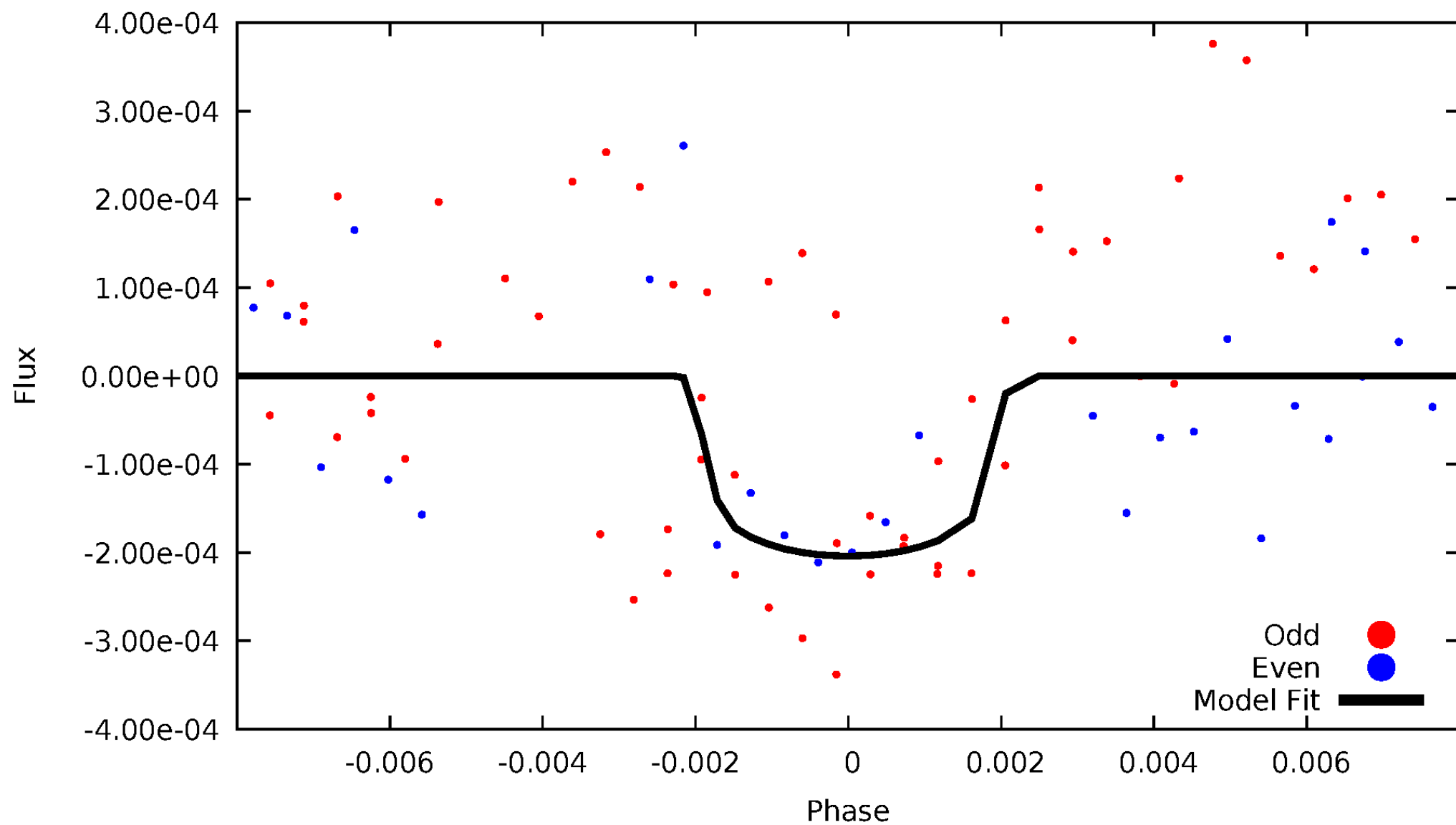


TCE 010815932-08



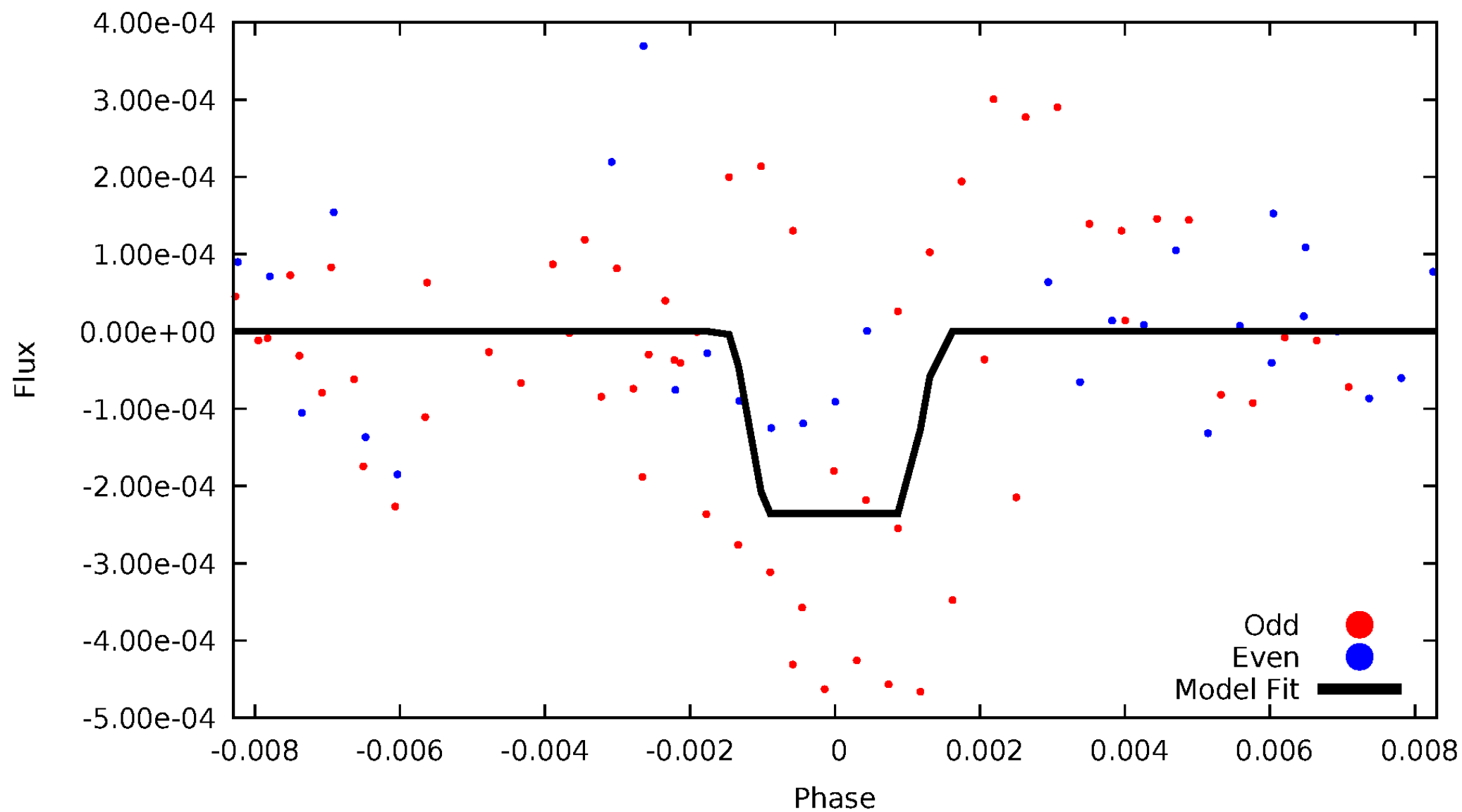
# DV Odd/Even

TCE 010815932-08



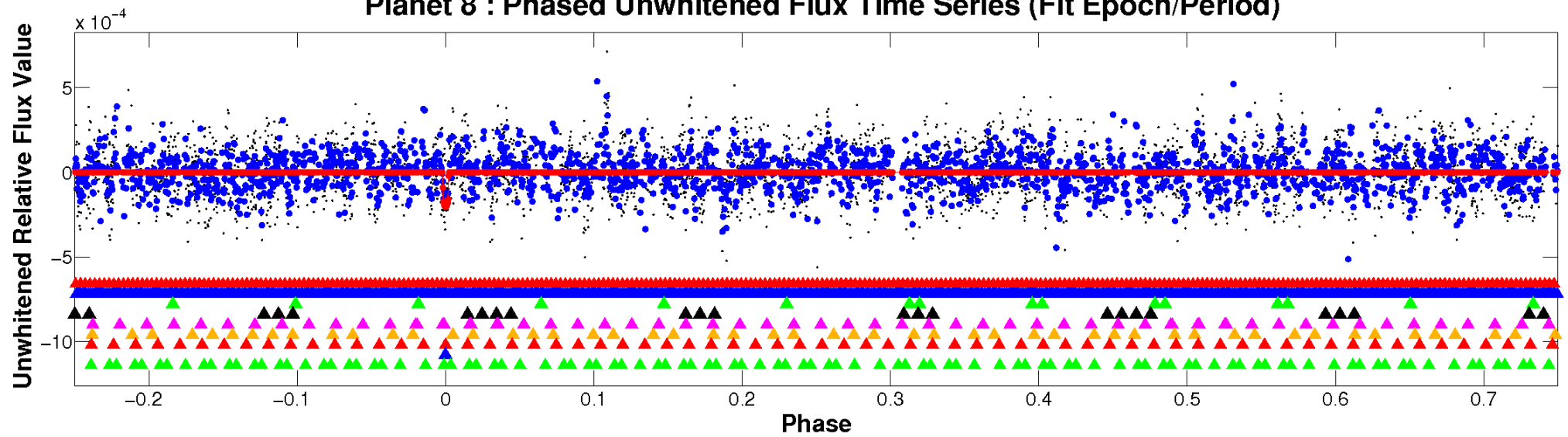
# ALT Odd/Even

TCE 010815932-08

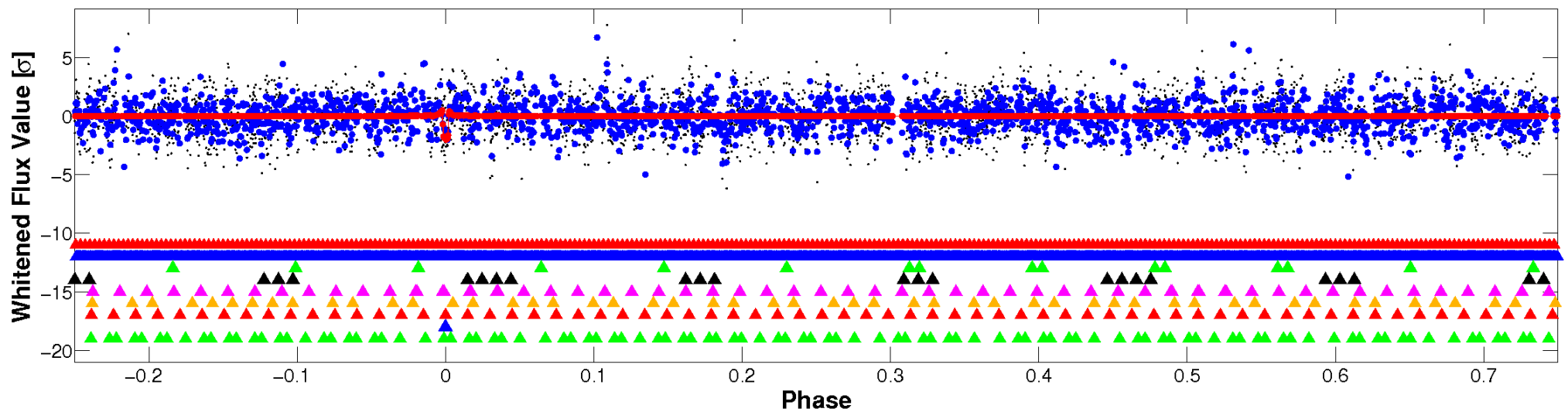


# Non-Whitened Vs. Whitened Light Curve

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

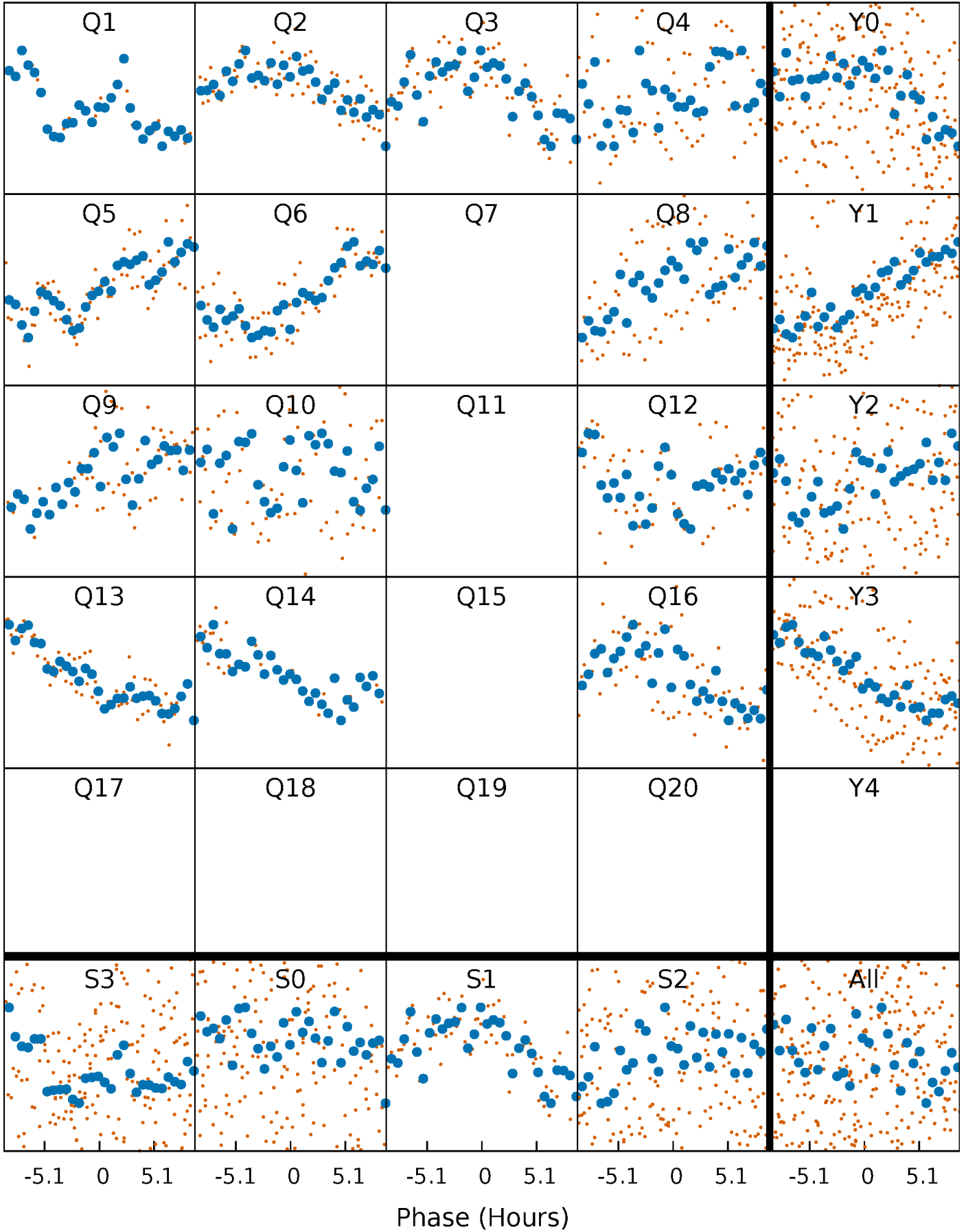


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



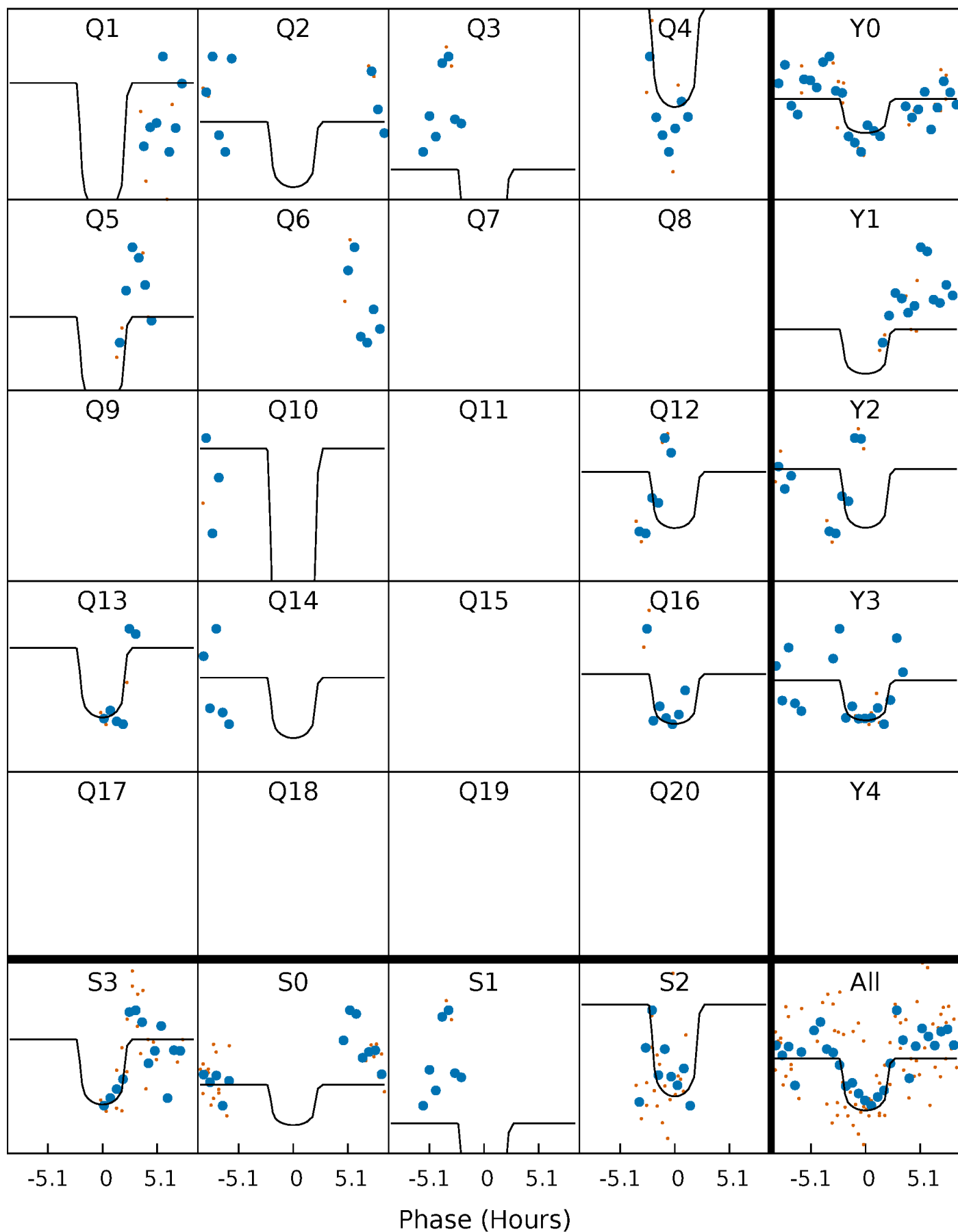
# PDC Quarter-Phased Transit Curves

TCE 010815932-08     $P = 46.394502$  Days     $T_0 = 145.381270$  (BKJD)



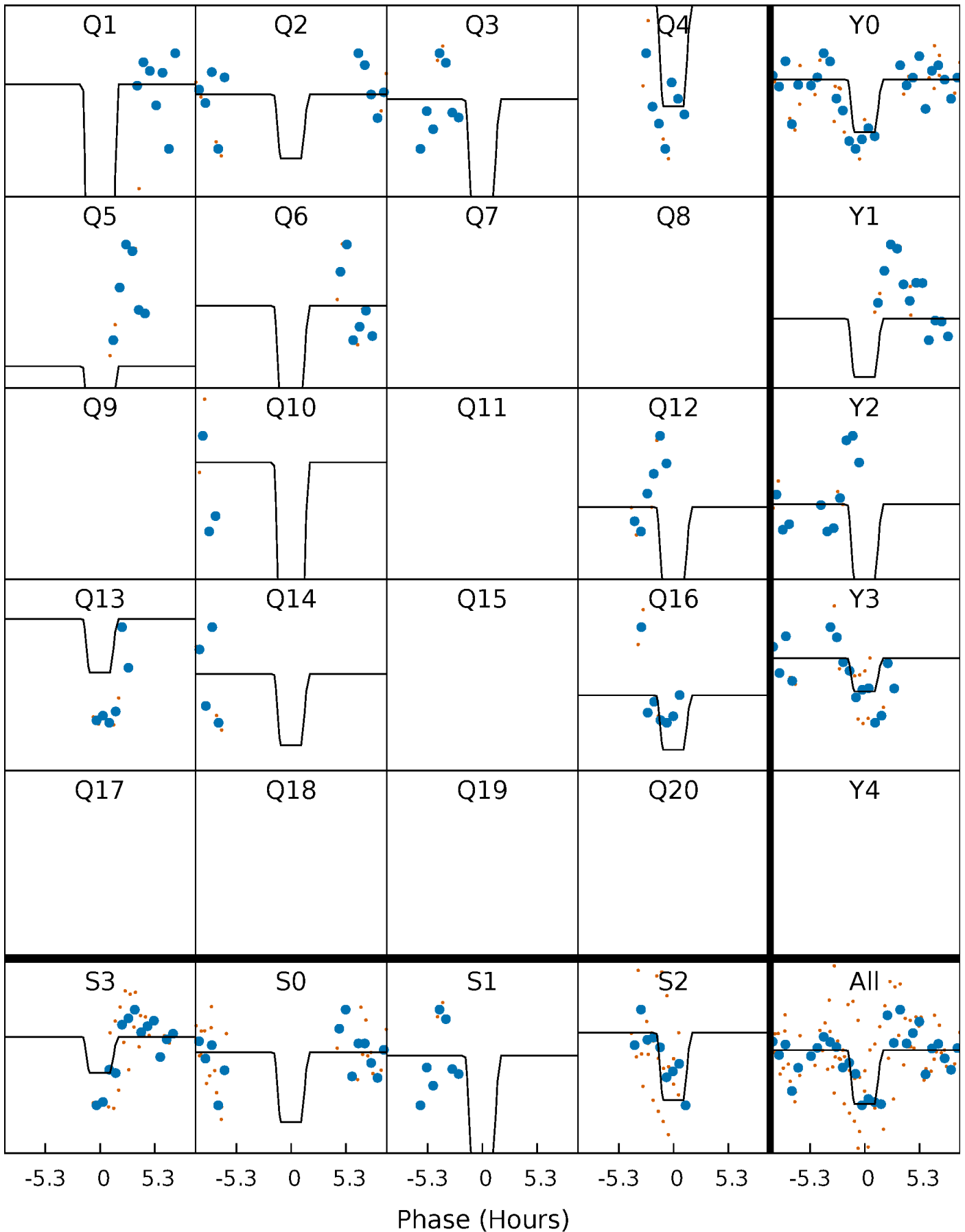
# DV Quarter-Phased Transit Curves

TCE 010815932-08     $P = 46.394502$  Days     $T_0 = 145.381270$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010815932-08     $P = 46.394851$  Days     $T_0 = 145.393271$  (BKJD)

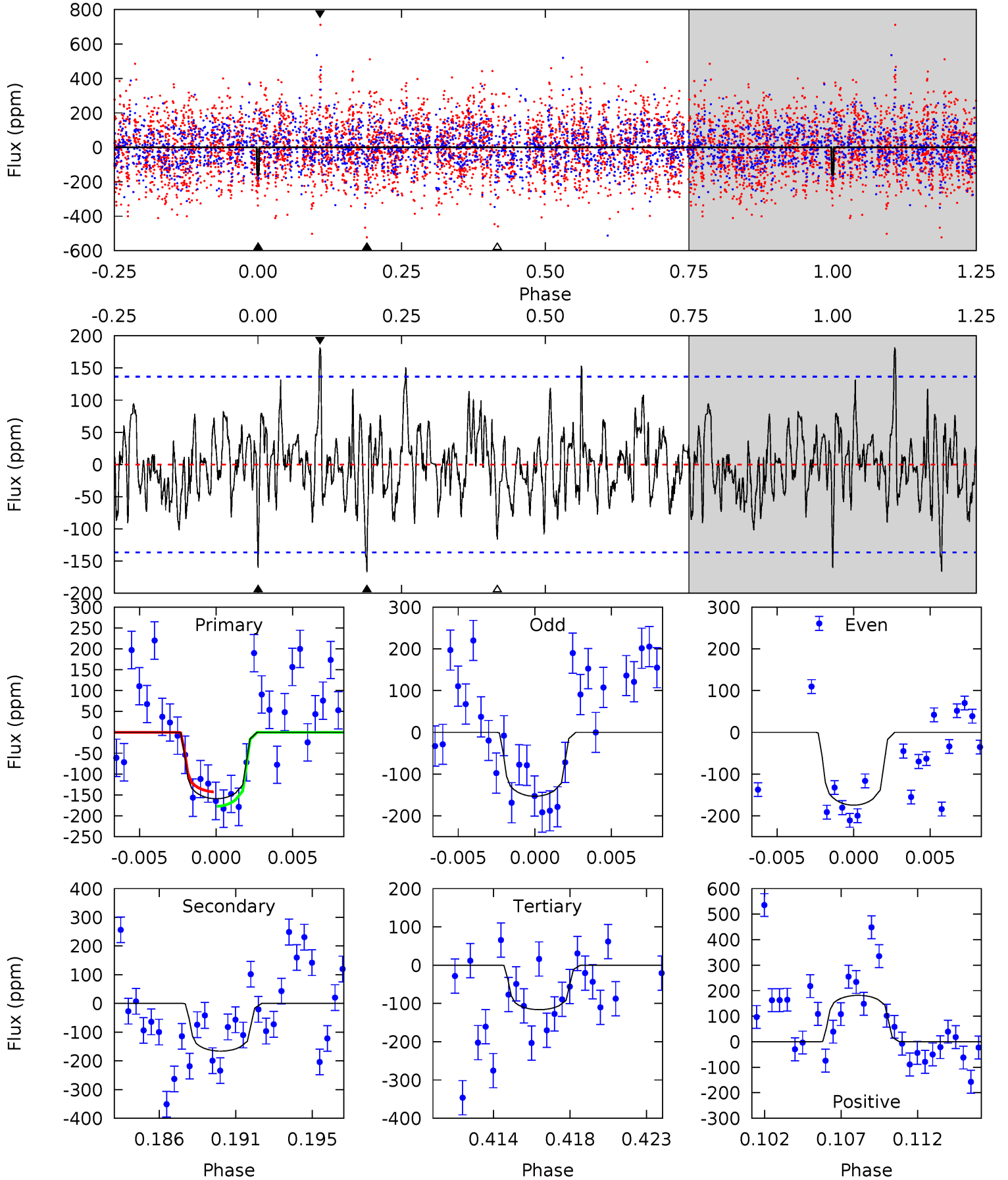




# DV Model-Shift Uniqueness Test

010815932-08, P = 46.394502 Days, E = 98.986768 Days

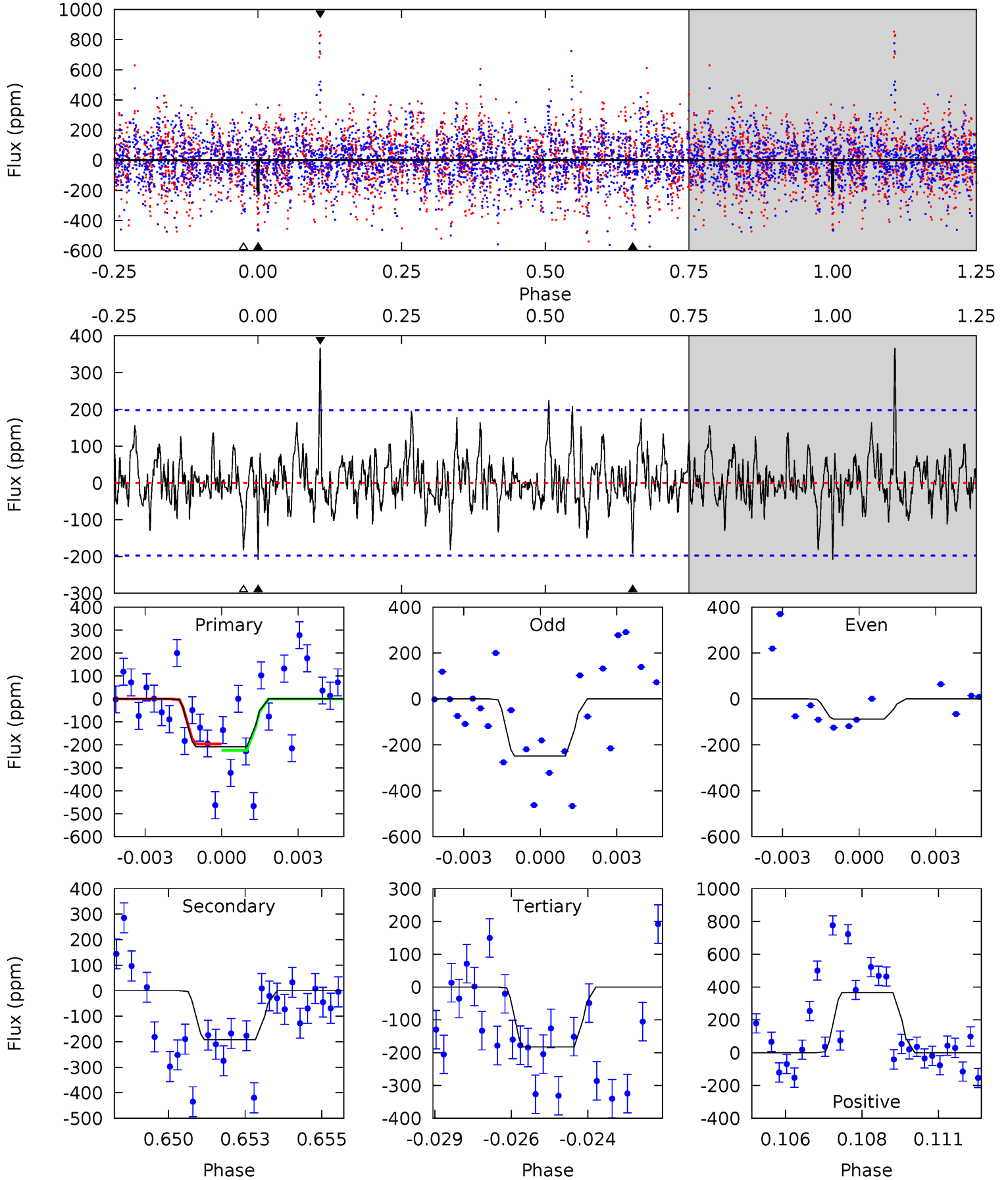
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.02	6.29	4.40	6.89	5.17	2.83	1.75	1.62	-0.86	1.89	-0.60	0.34	0.77	0.52	0.65



# Alt Model-Shift Uniqueness Test

010815932-08, P = 46.394851 Days, E = 98.998420 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
5.57	5.14	4.88	9.80	5.28	3.01	1.59	0.70	-4.23	0.26	-4.67	1.95	1.38	0.64	0.37



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	+3%/-4%	+20%/-2%	+88%/-88%	+7%/-64%	+6%/-33%	+1225%/-23%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-166 \pm 26$	$6.68^{+6.01}_{-4.16}$	$1582^{+108}_{-216}$	$6244^{+4767}_{-1477}$	$200^{+1160}_{-144}$
Alt.	$-192 \pm 37$	$6.70^{+5.66}_{-3.92}$	$1588^{+104}_{-244}$	$6463^{+4571}_{-1470}$	$230^{+992}_{-162}$

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

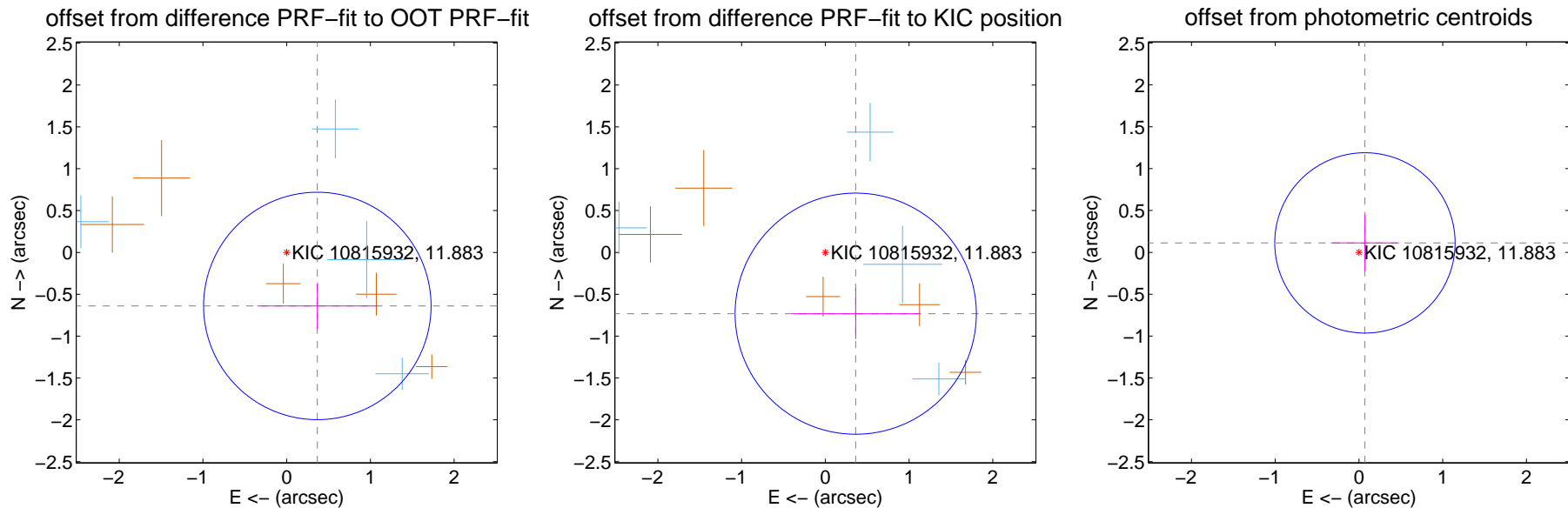
## DV Centroid Data

Supplemental centroid analysis for 010815932-08. **Kepler magnitude: 11.88.** Transit SNR 9.18

There are 4 quarters with good PRF difference image offsets

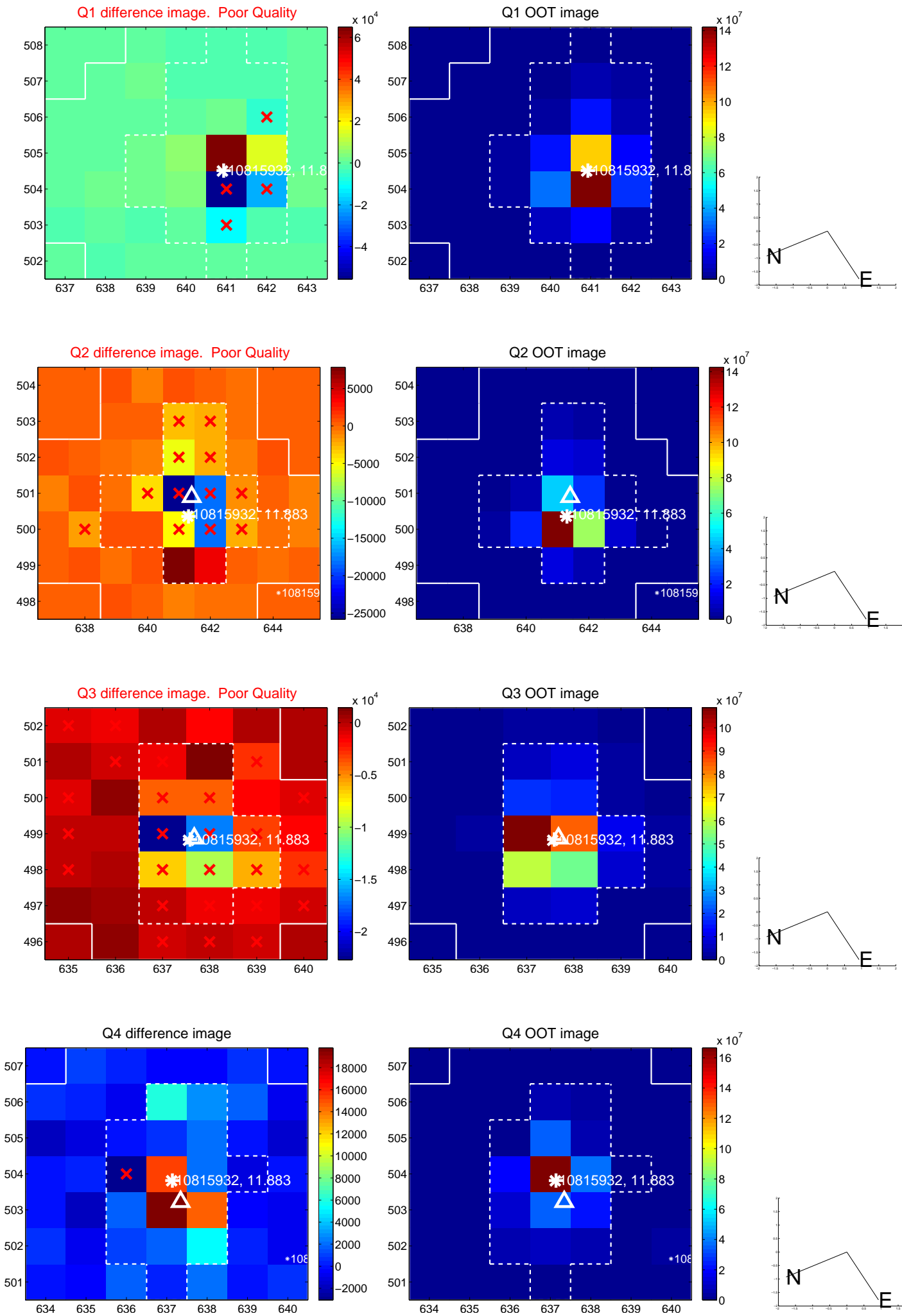
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.737 \pm 0.453$	1.63	$-0.366 \pm 0.718$	$-0.640 \pm 0.274$
PRF-fit source offset from KIC position	$0.817 \pm 0.480$	1.70	$-0.363 \pm 0.769$	$-0.732 \pm 0.303$
photometric centroid source offset	$0.13 \pm 0.36$	0.37	$-0.07 \pm 0.41$	$0.11 \pm 0.34$

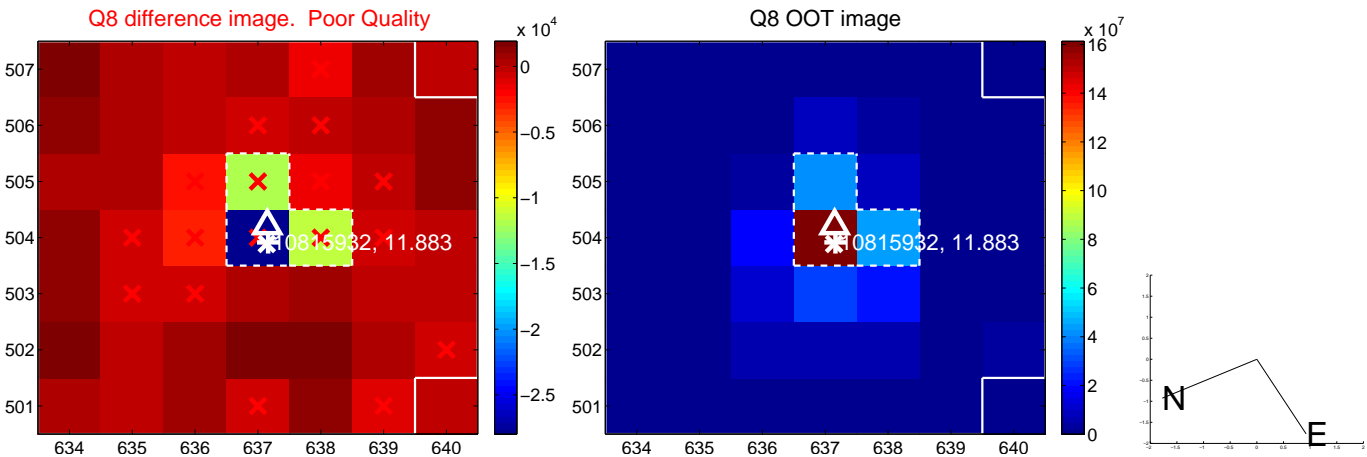
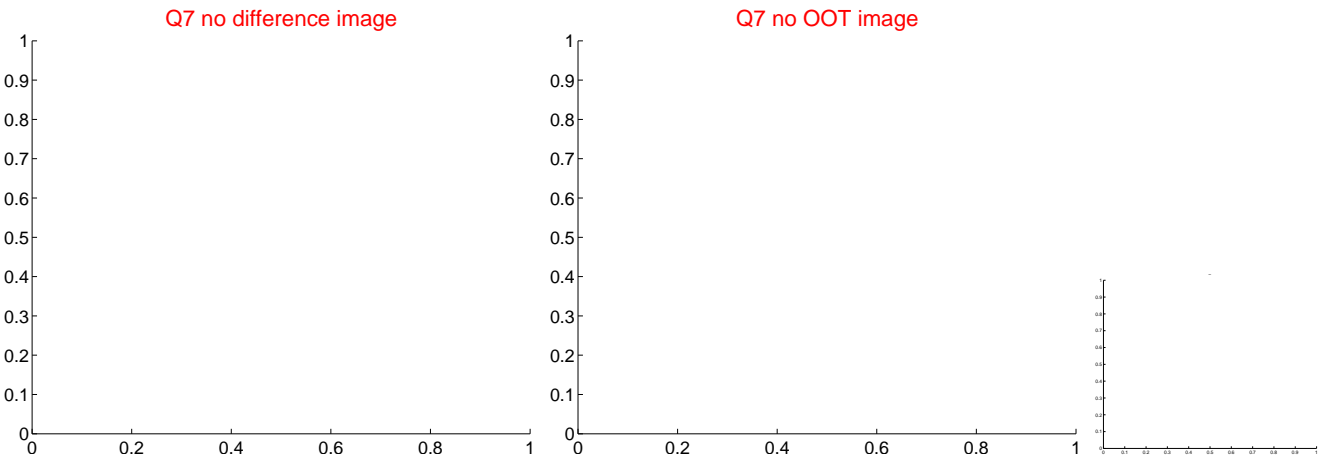
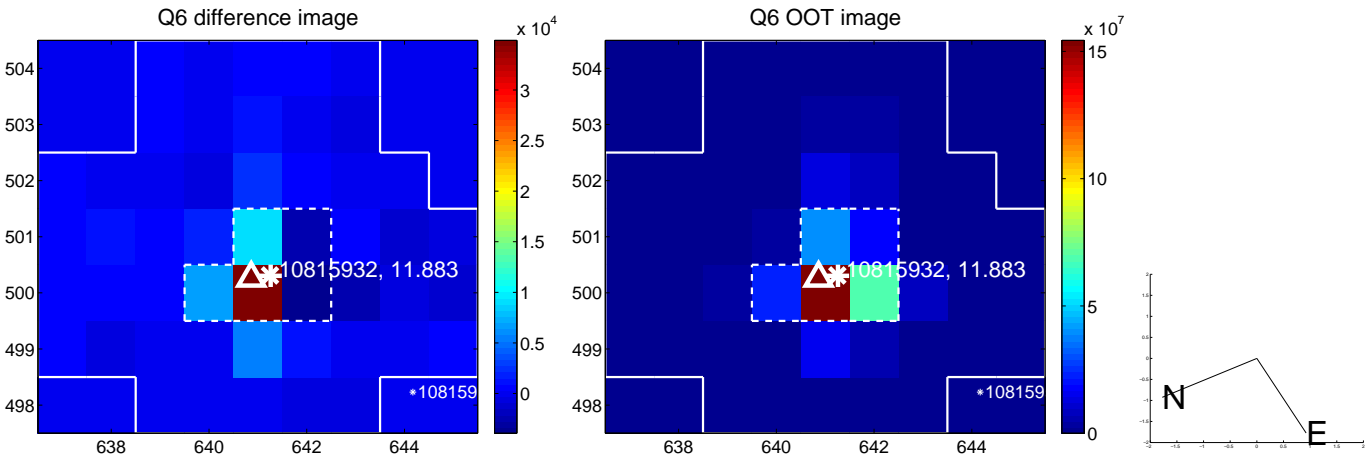
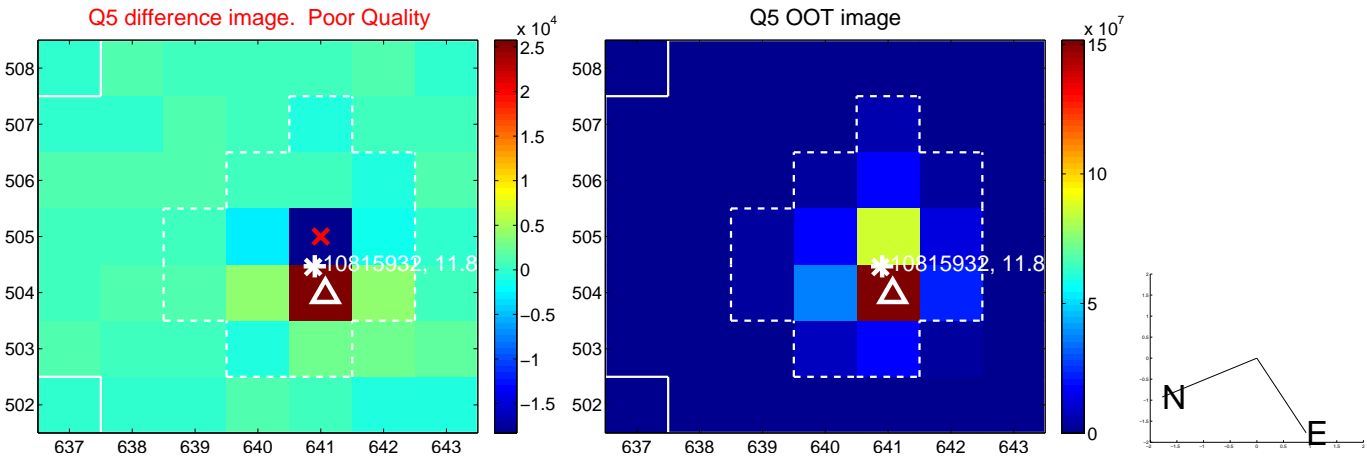


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

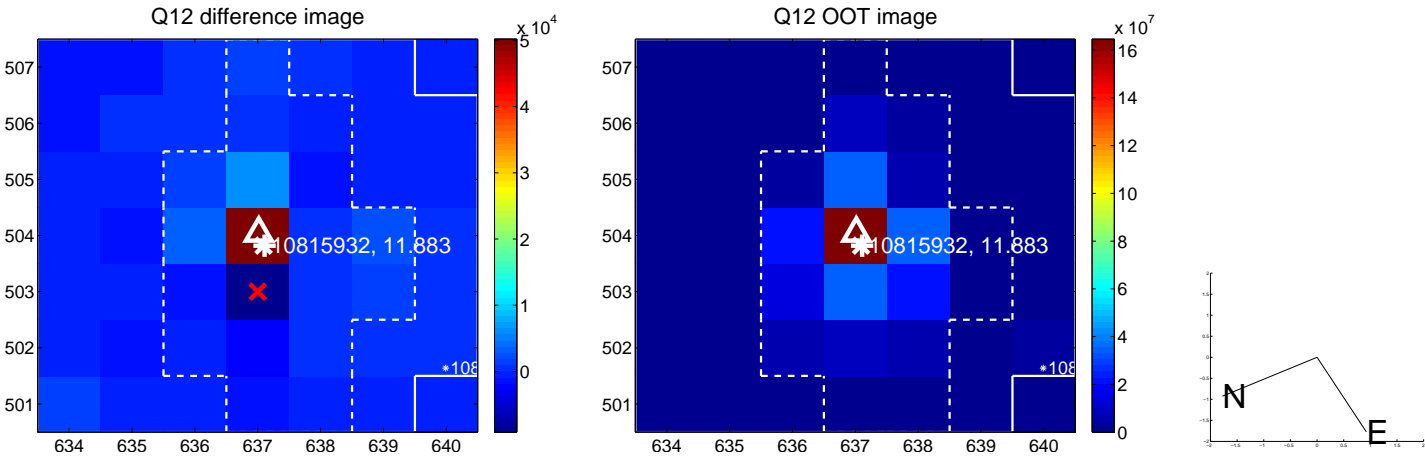
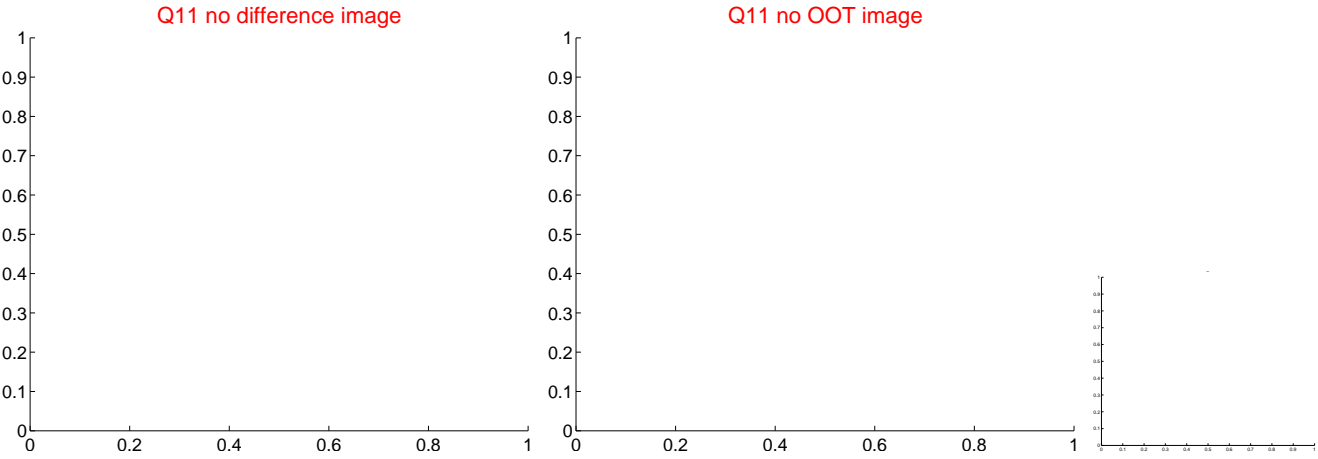
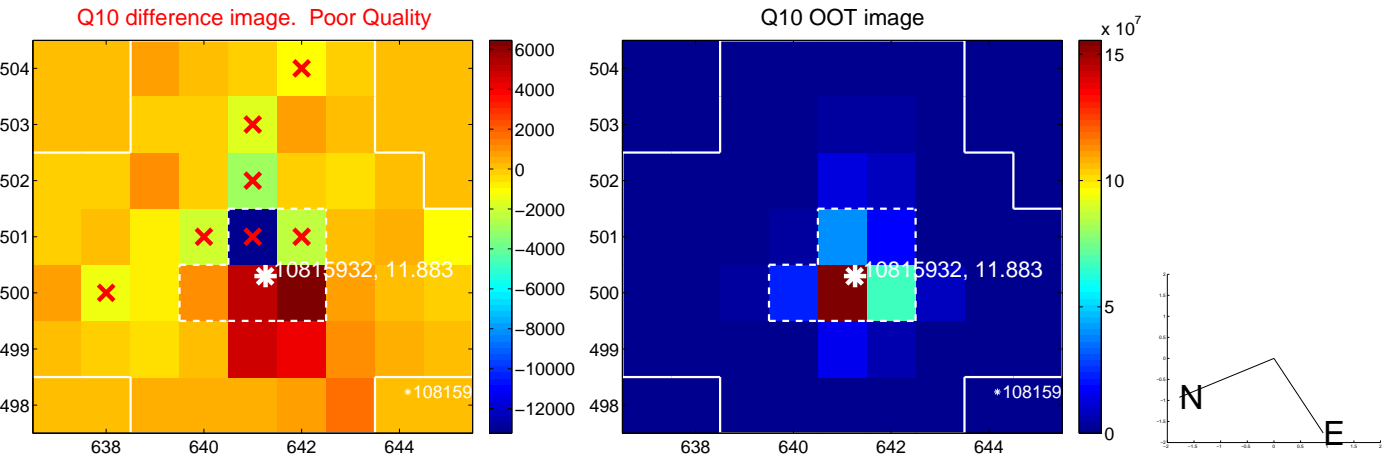
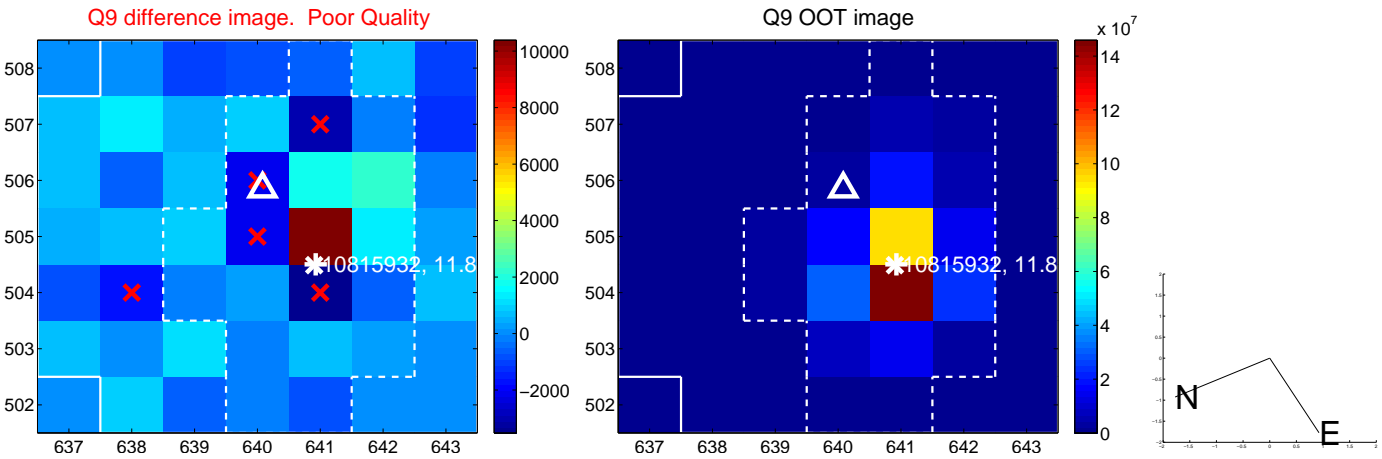
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



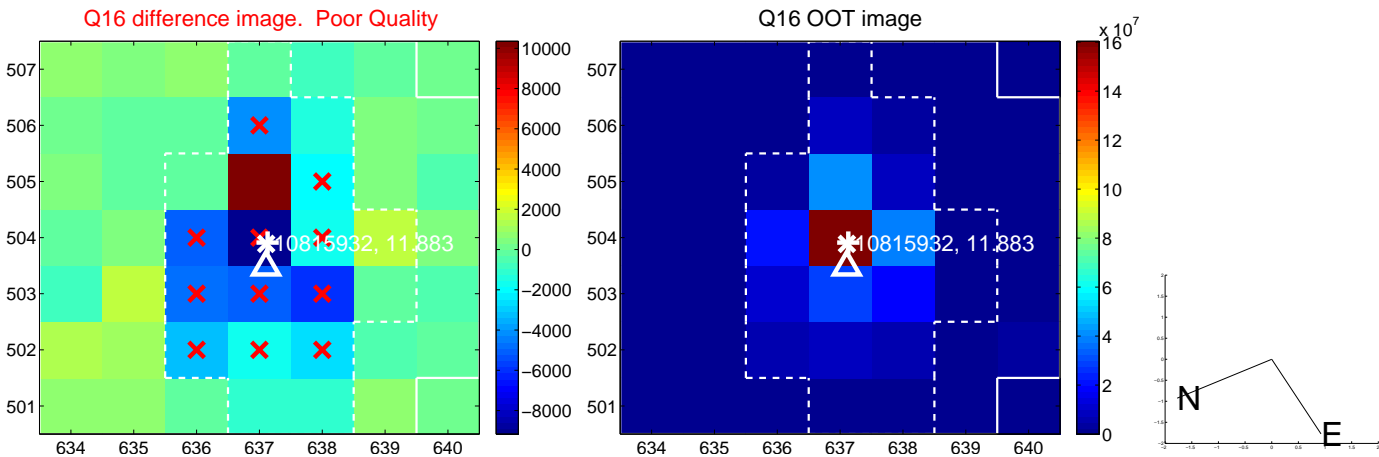
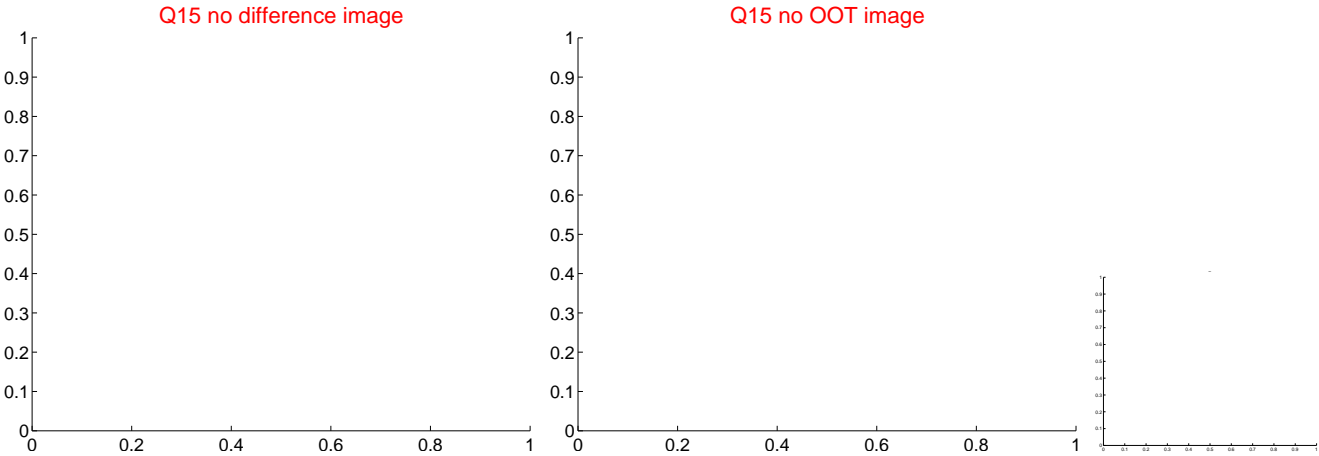
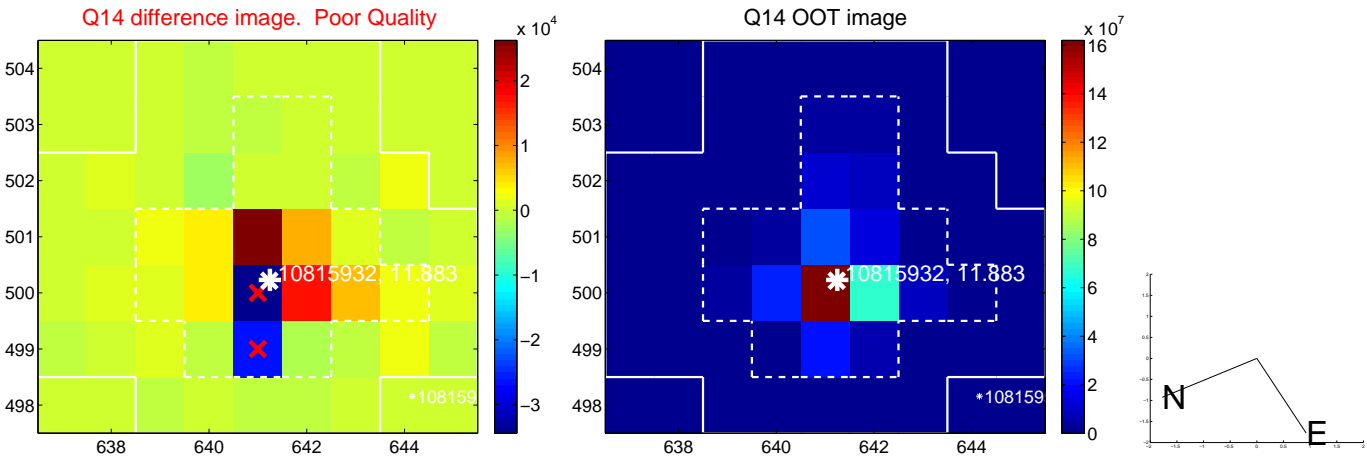
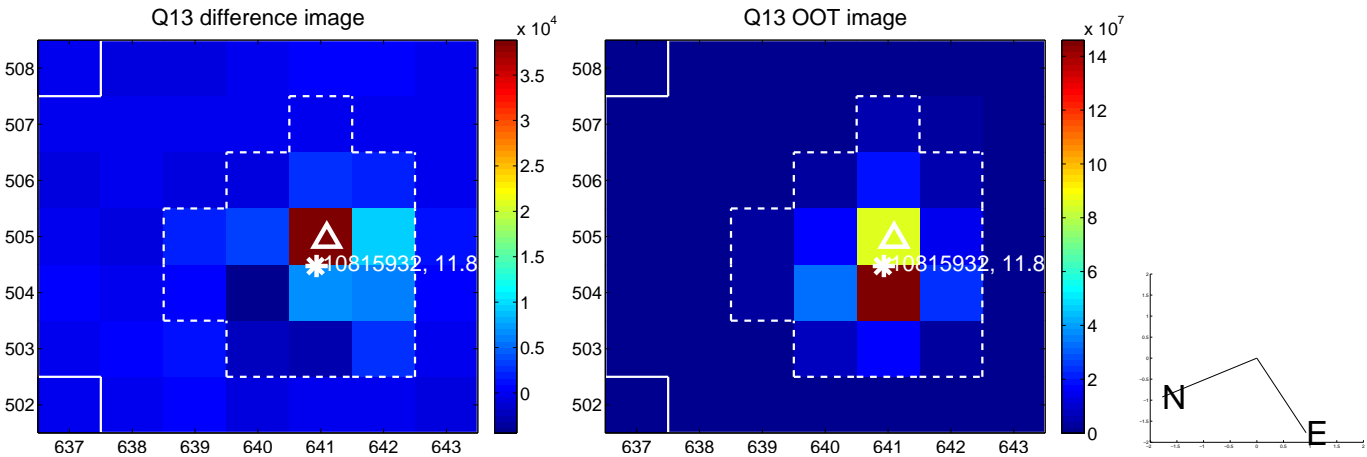
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

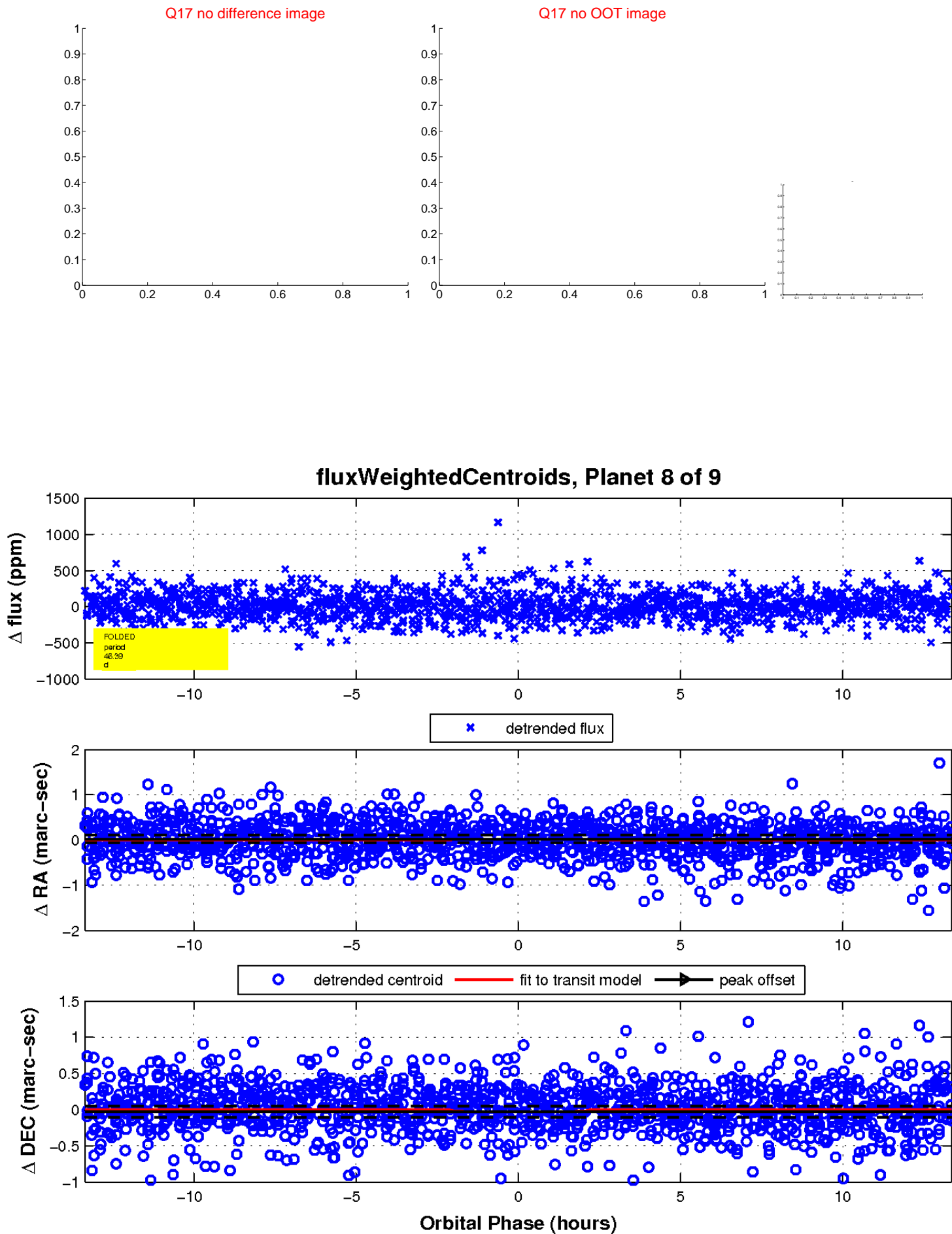


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



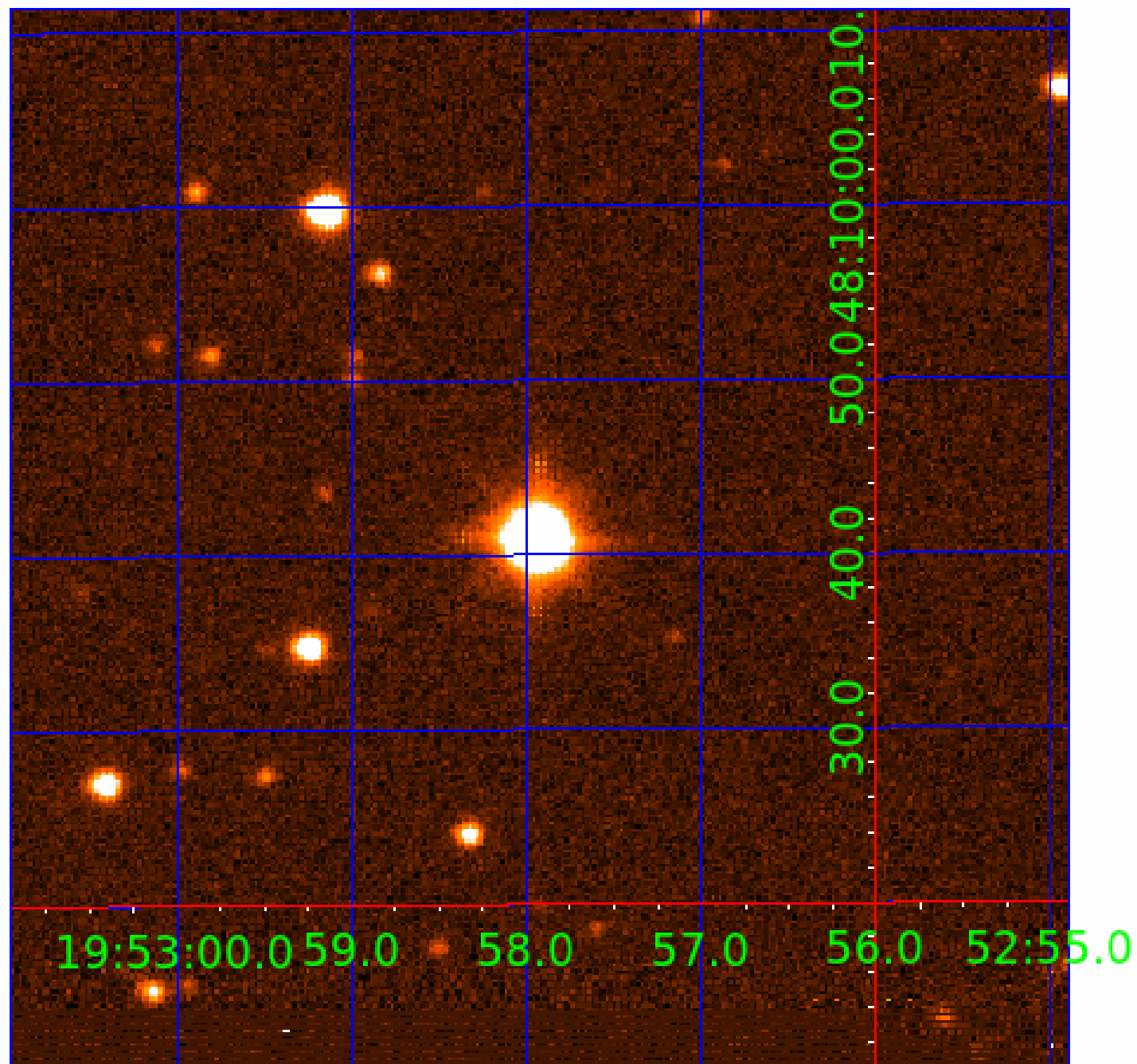


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010815932

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010815932-01	OBS	No	3.717540	133.511555	33.0	10.281	12.1	6.8	4.33	7191	2.92	12996.76
010815932-02	OBS	No	1.239156	132.596322	48.3	8.342	11.9	15.0	4.33	7191	3.03	56235.15
010815932-03	OBS	No	88.948627	217.810613	386.3	4.310	11.6	13.1	4.33	7191	16.50	188.50
010815932-04	OBS	No	59.585575	167.441005	299.9	3.616	11.3	12.8	4.33	7191	8.75	321.60
010815932-05	OBS	No	23.619739	144.450437	253.4	1.988	10.8	10.1	4.33	7191	7.83	1104.44
010815932-06	OBS	No	28.212795	138.720198	283.0	3.090	10.2	9.9	4.33	7191	7.99	871.46
010815932-07	OBS	No	21.466060	135.691781	132.4	11.348	10.1	8.4	4.33	7191	5.65	1254.60
010815932-08	OBS	No	46.394502	145.381270	203.8	4.450	9.2	9.2	4.33	7191	6.95	448.97
010815932-09	OBS	No	14.214240	140.421613	168.6	2.000	8.3	-1.0	4.33	7191	5.63	2173.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010815932-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD
010815932-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
010815932-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
010815932-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
010815932-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010815932-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

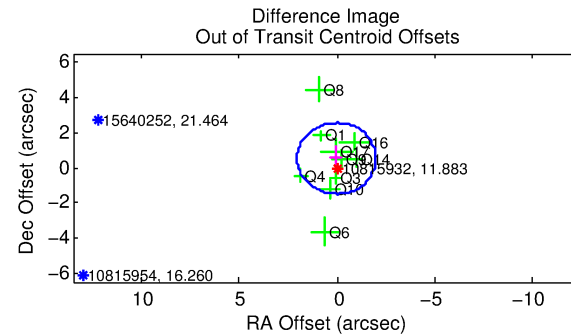
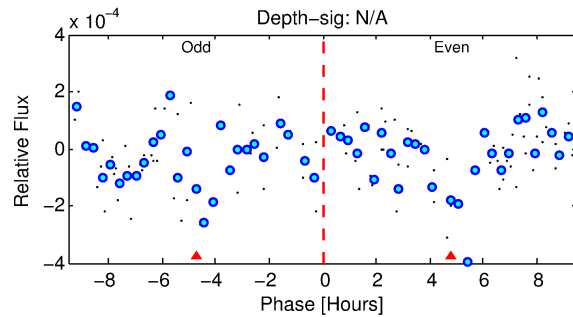
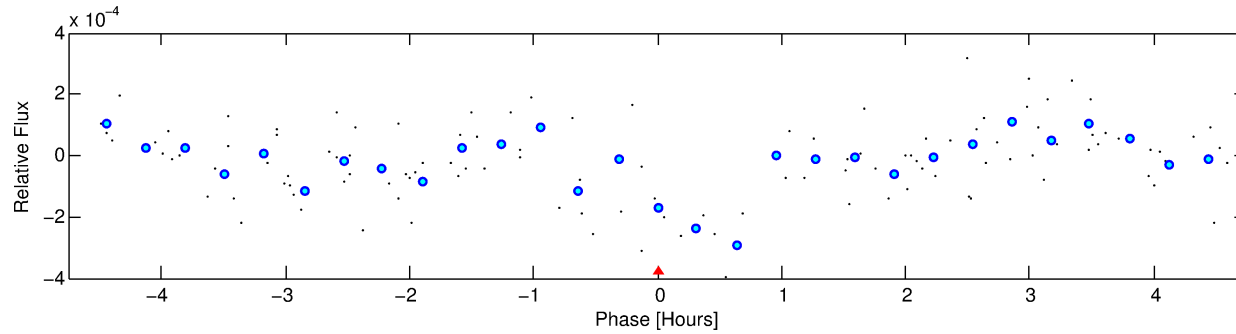
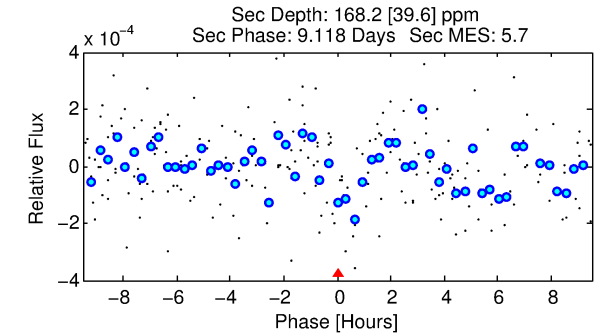
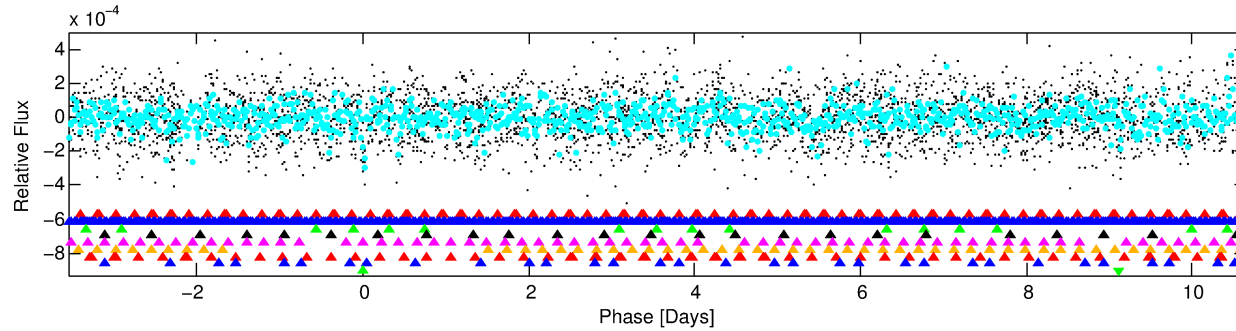
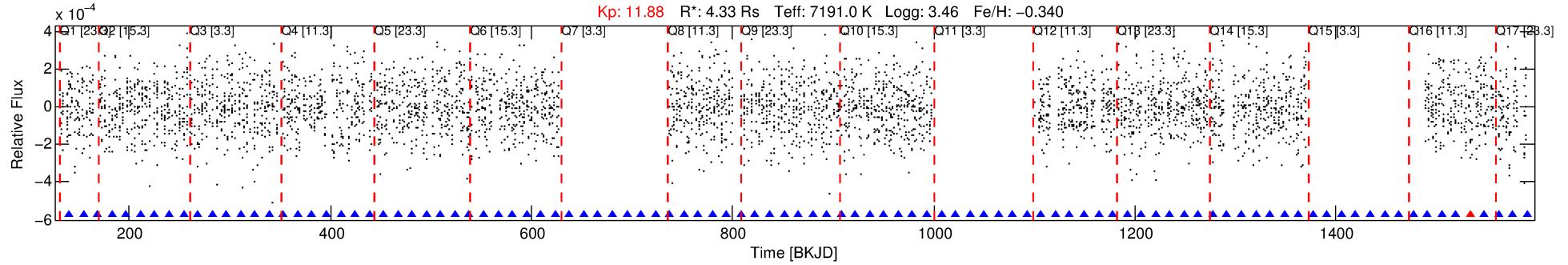
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010815932-09

No Significant Match Found

# DV One-Page Summary

KIC: 10815932 Candidate: 9 of 9 Period: 14.214 d



## TPS TCE Results:

Period = 14.21424 d  
Epoch = 140.4216 BKJD

DV fit results are unavailable

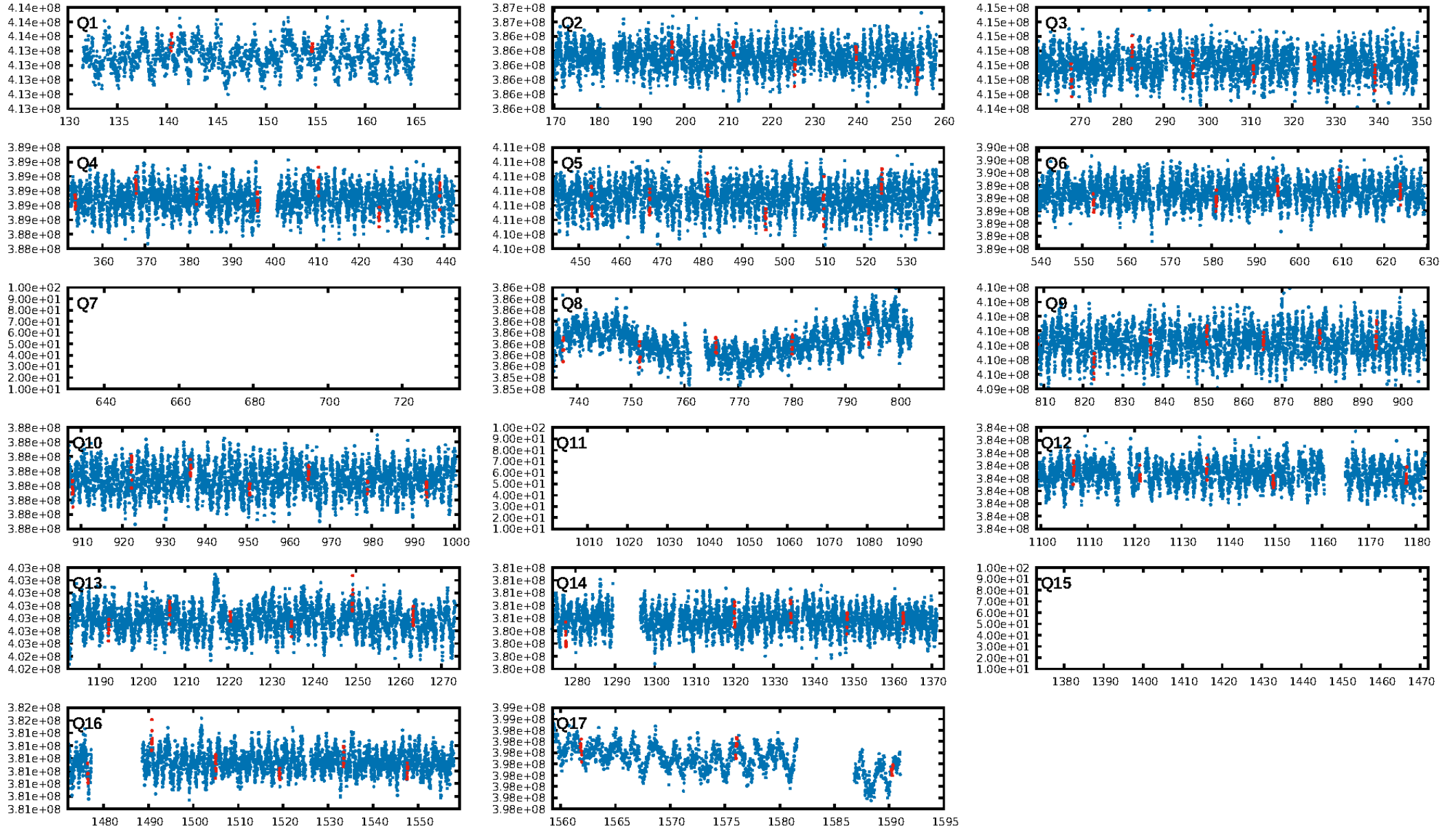
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [24.05 $\sigma$ ]  
LongPeriod-sig: 100.0% [15.10 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.83 [5/6]  
GhostDiagnostic-chr: 0.1594  
Centroid-sig: 0.1%  
Centroid-so: 0.436 arcsec [1.93 $\sigma$ ]  
OotOffset-rm: 0.535 arcsec [0.79 $\sigma$ ]  
KicOffset-rm: 0.435 arcsec [0.68 $\sigma$ ]  
OotOffset-st: 3/1/3/3 [10]  
KicOffset-st: 3/1/3/3 [10]  
DiffImageQuality-fgm: 0.50 [5/10]  
DiffImageOverlap-fno: 0.86 [12/14]

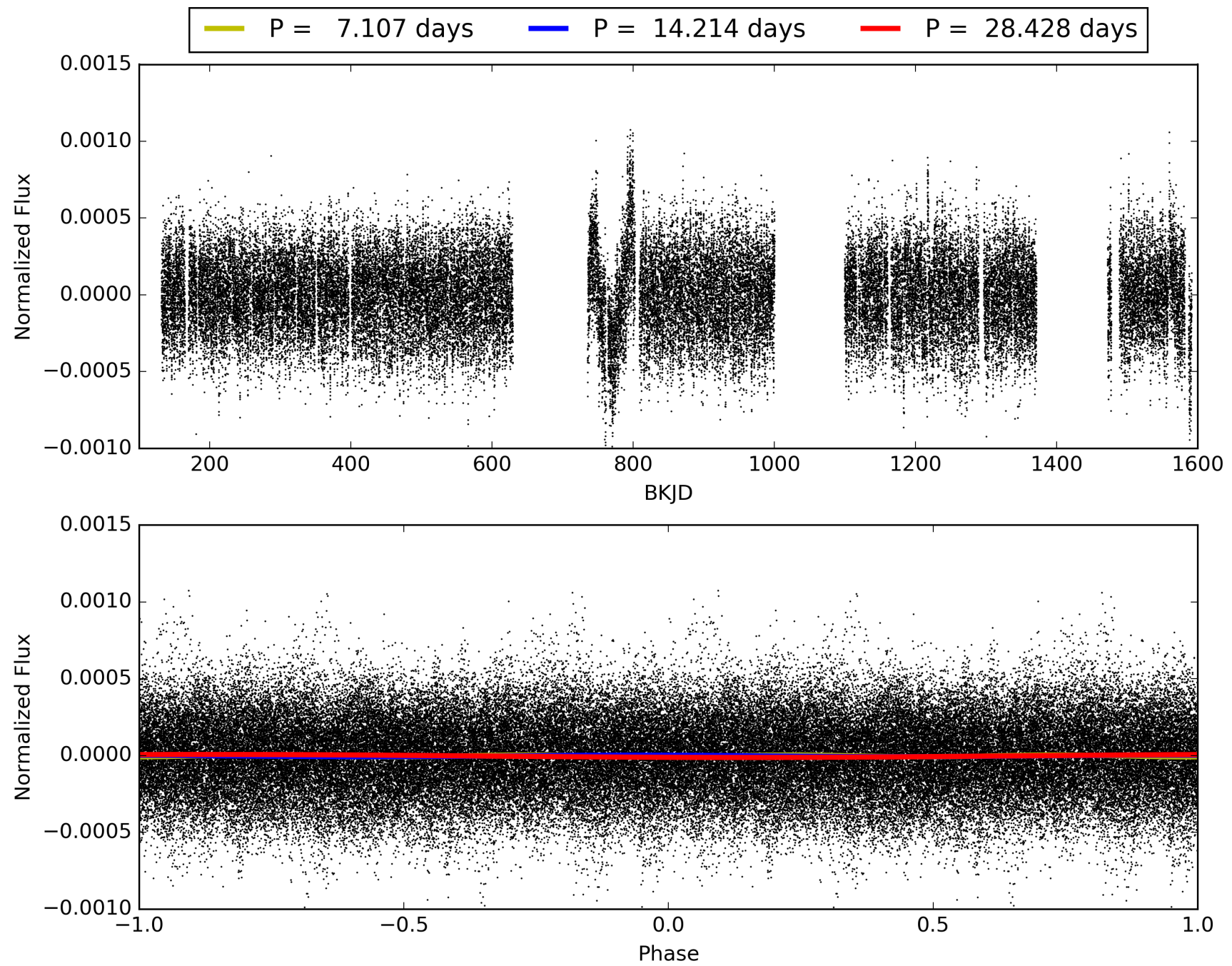
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 10:38:24 Z

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

# TCE 010815932-09, PDC Light Curves



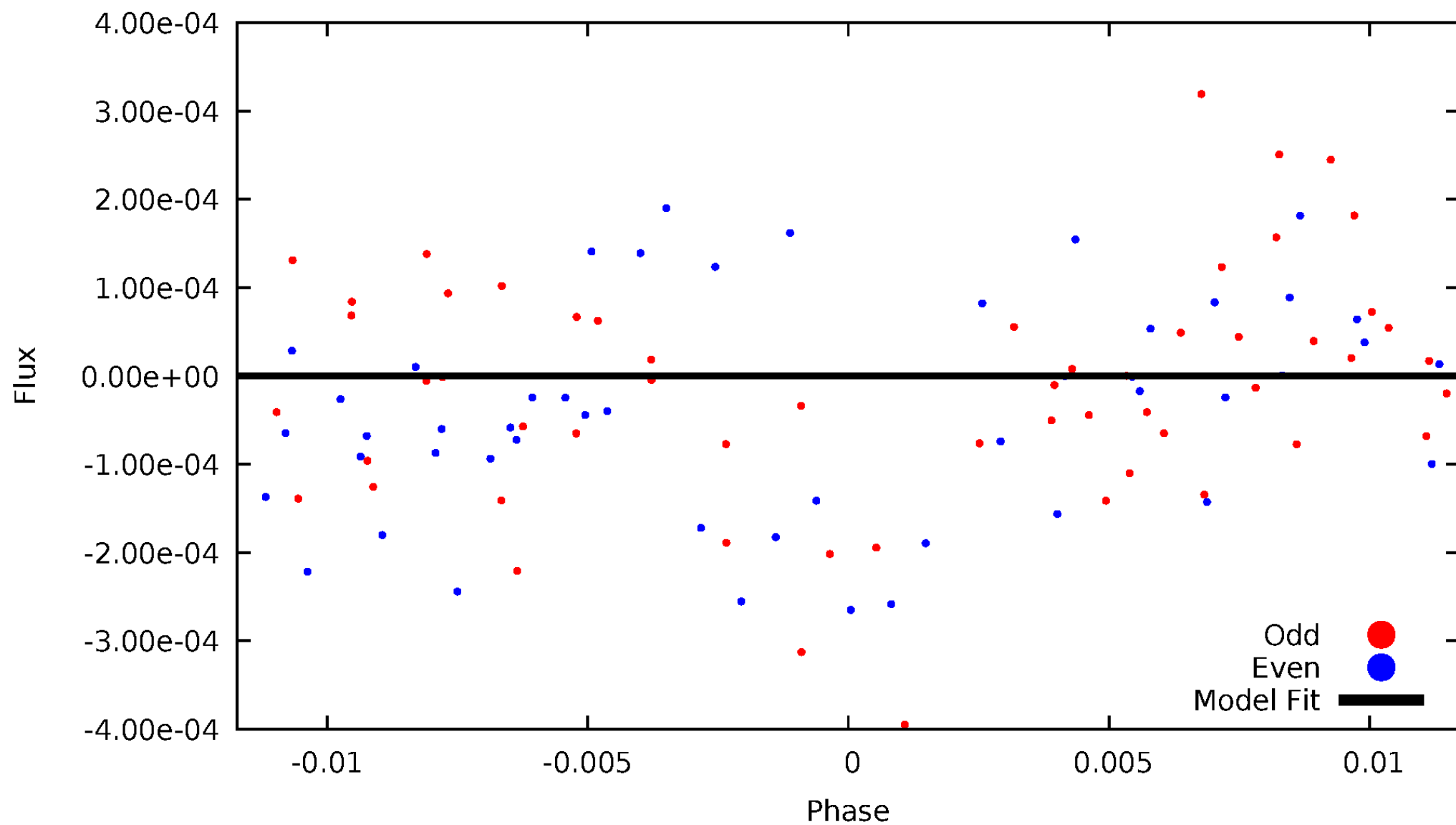
TCE 010815932-09





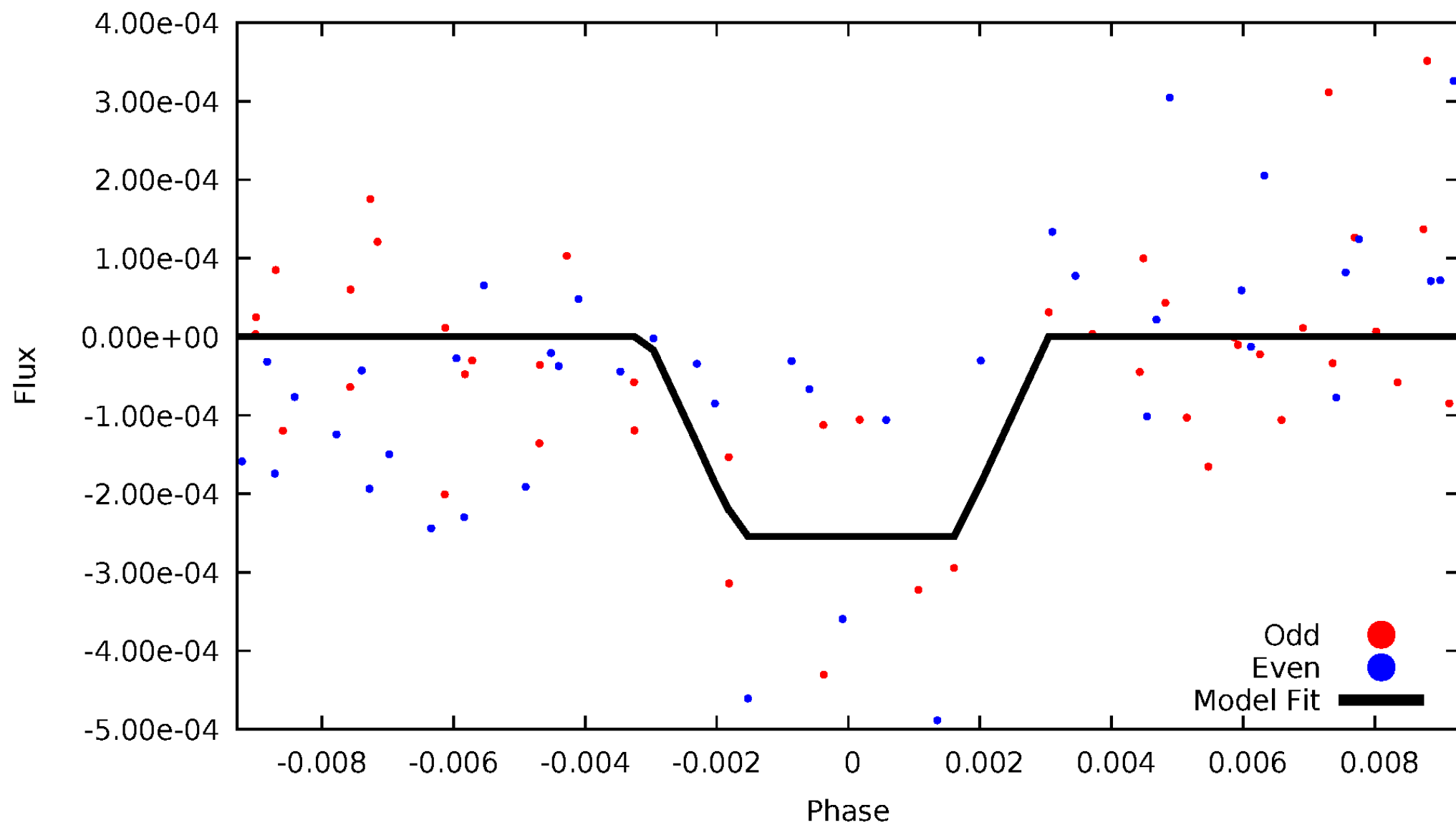
# DV Odd/Even

TCE 010815932-09



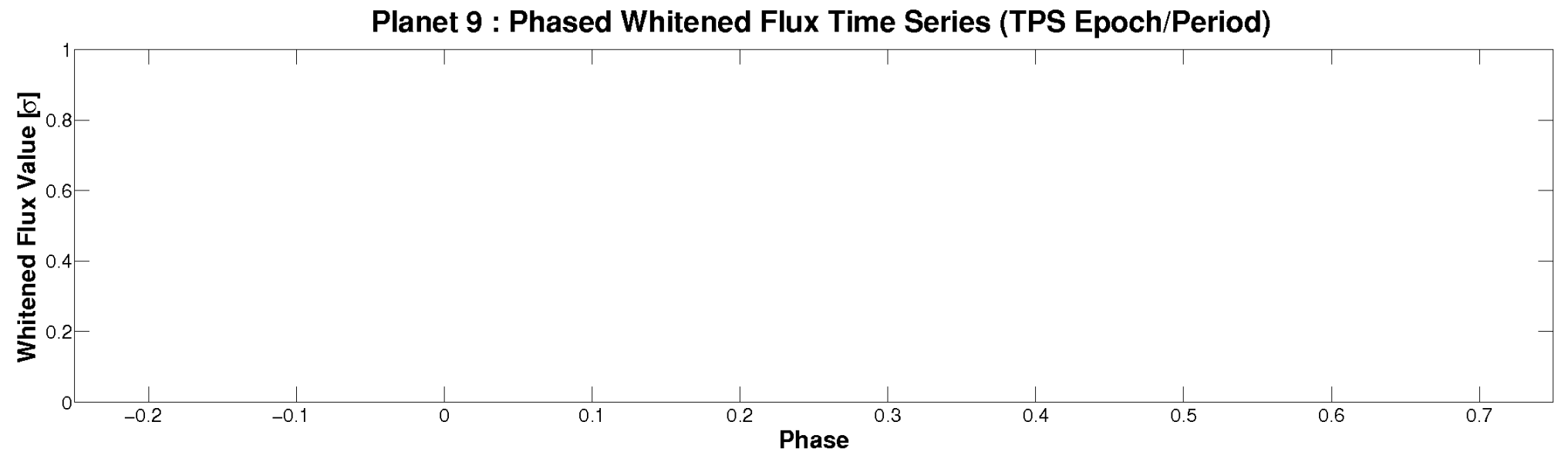
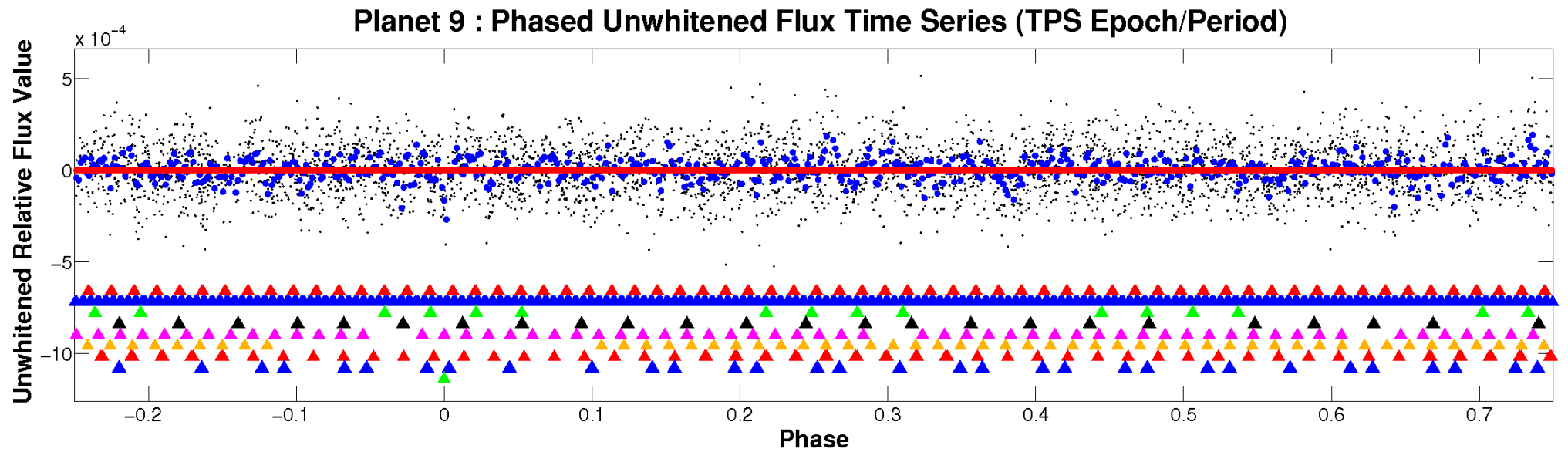
# ALT Odd/Even

TCE 010815932-09



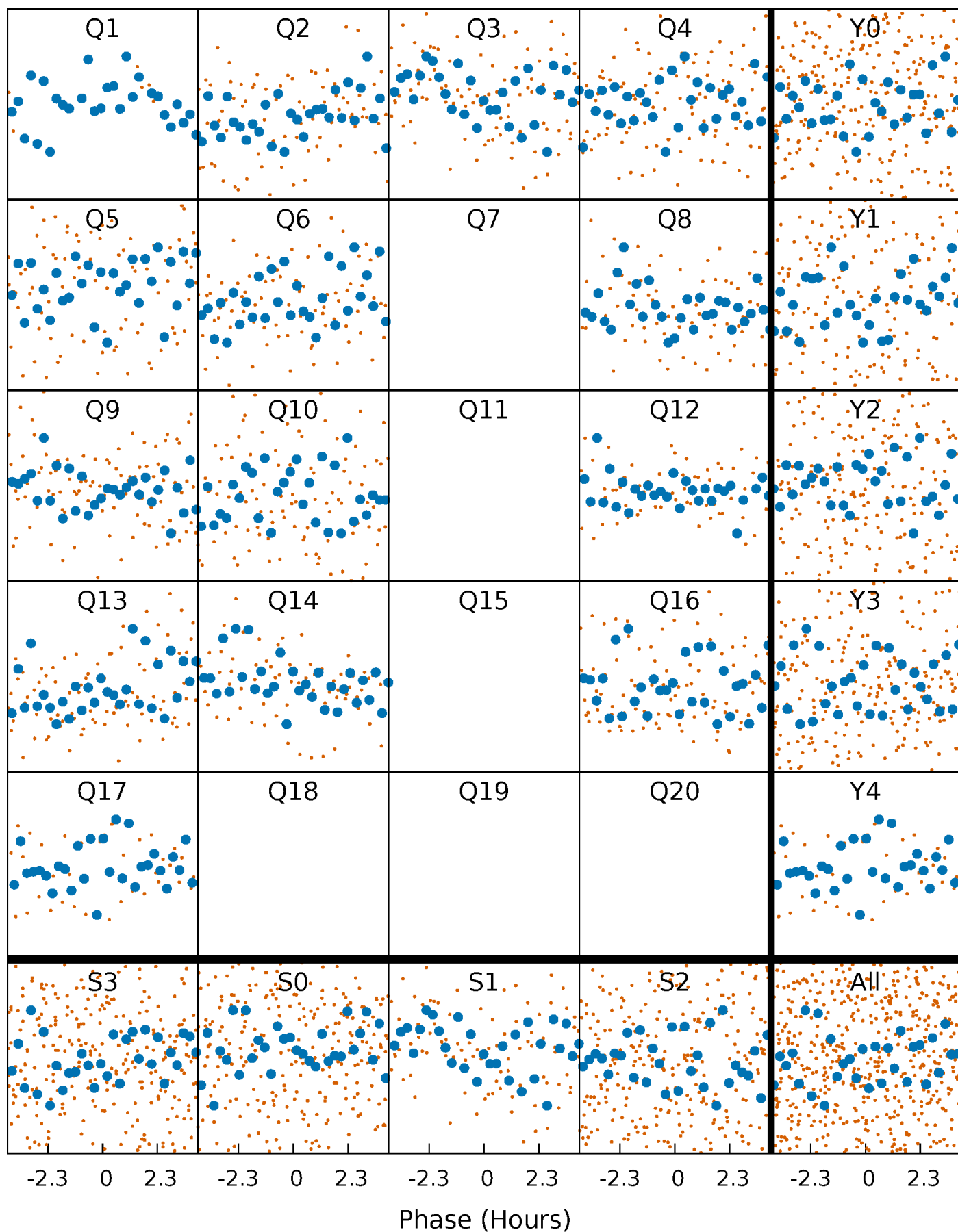


# Non-Whitened Vs. Whitened Light Curve



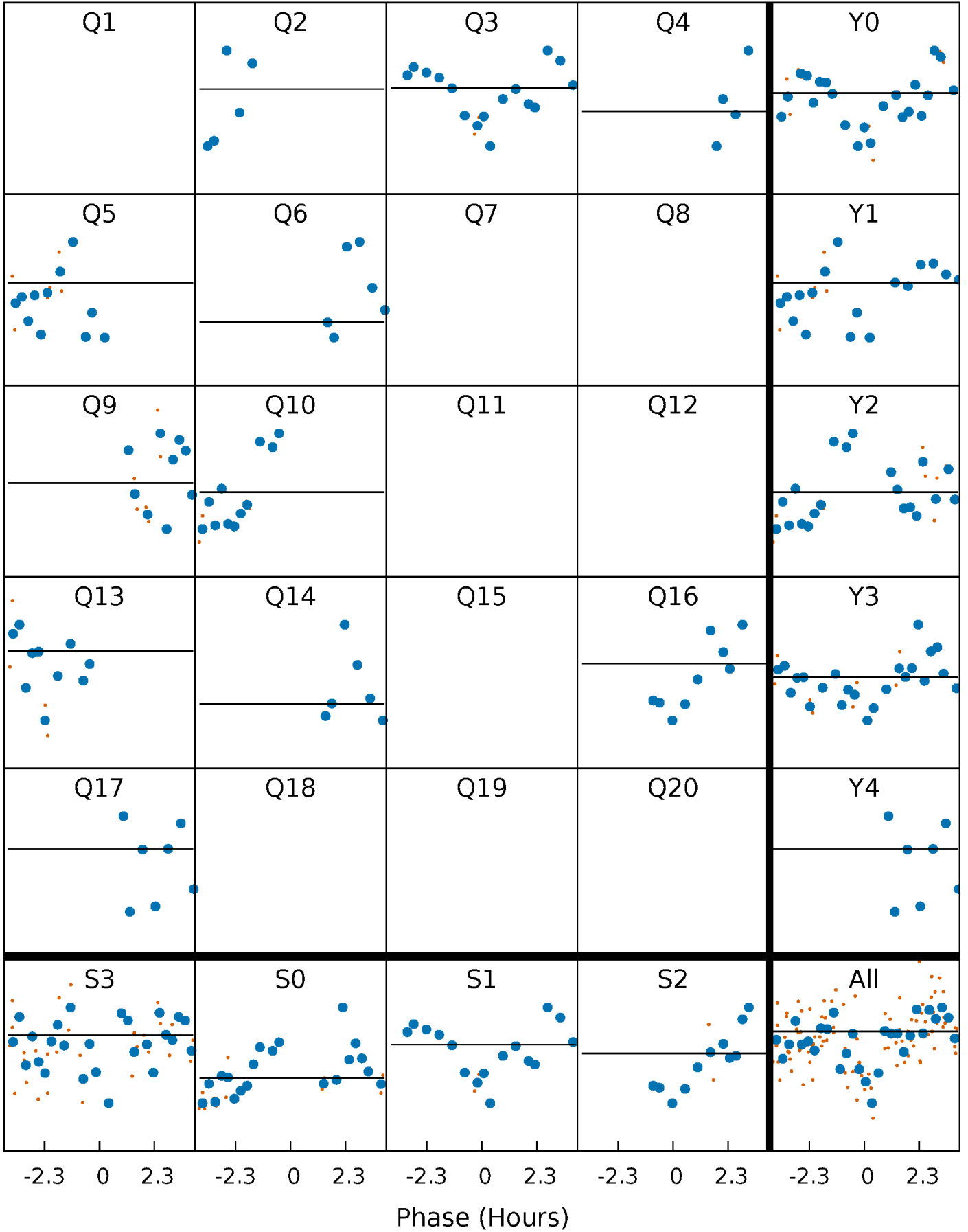
# PDC Quarter-Phased Transit Curves

TCE 010815932-09   P= 14.214240 Days    $T_0=140.421613$  (BKJD)



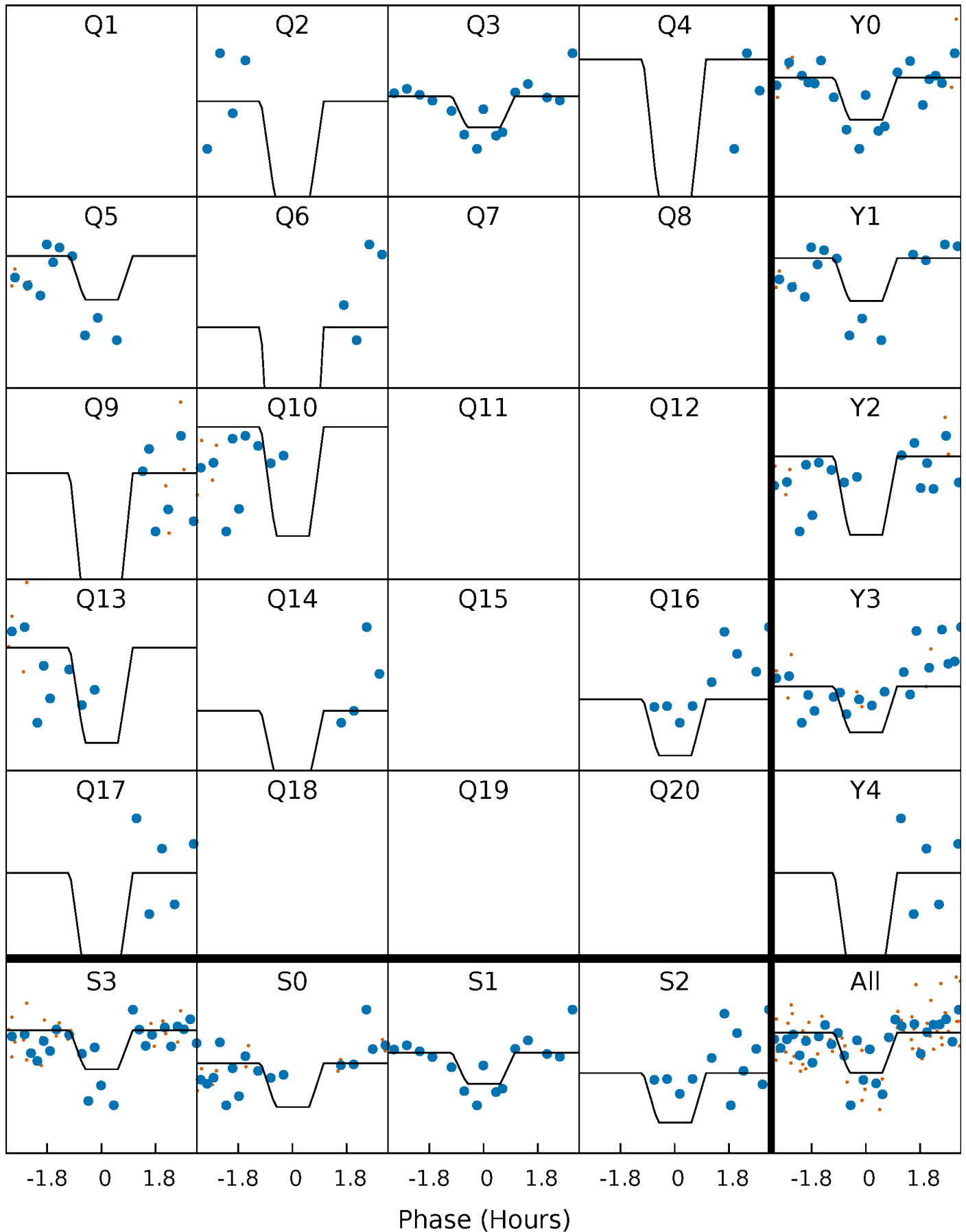
# DV Quarter-Phased Transit Curves

TCE 010815932-09     $P = 14.214240$  Days     $T_0 = 140.421613$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

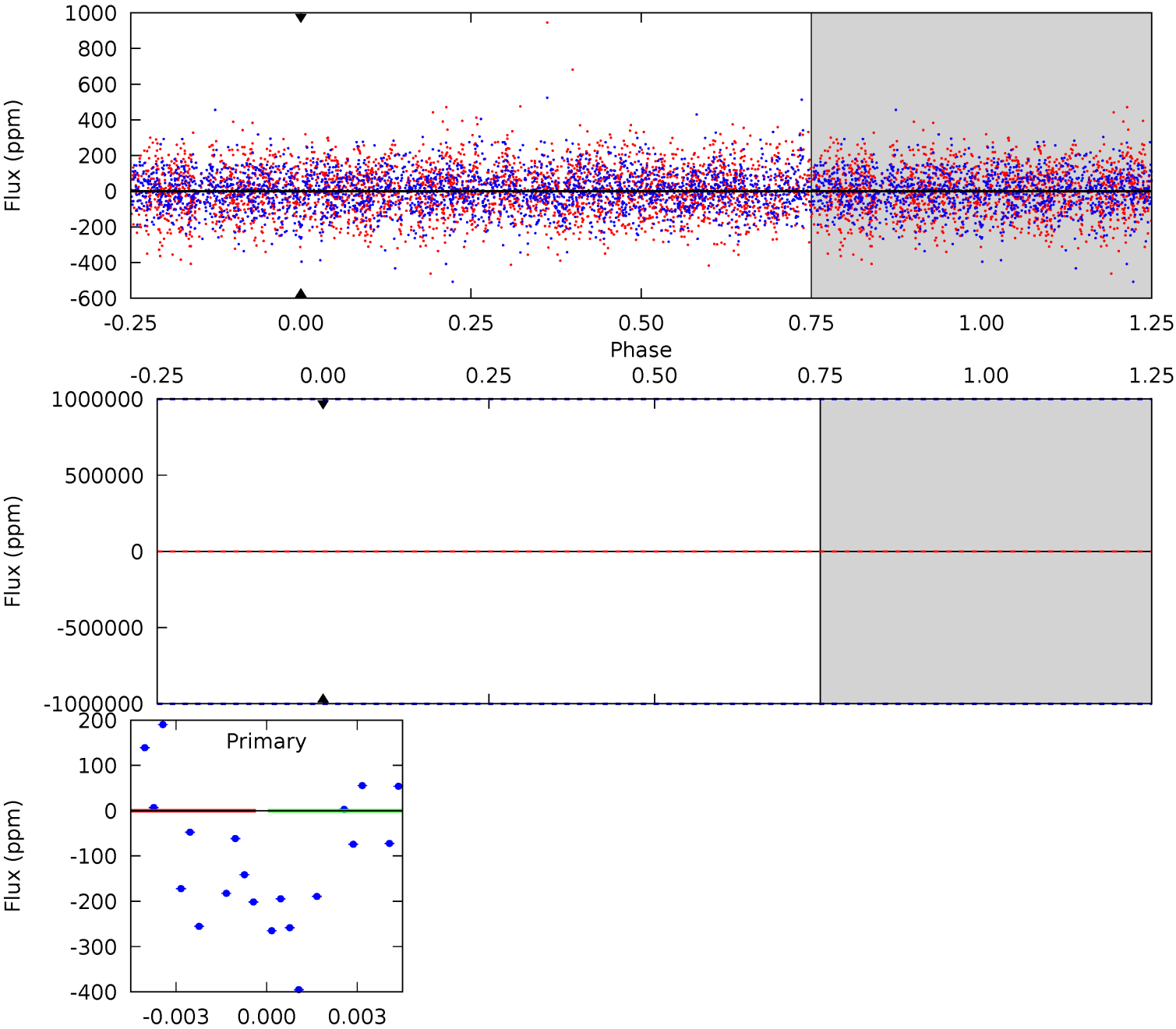
TCE 010815932-09   P= 14.214240 Days    $T_0=140.414115$  (BKJD)



# DV Model-Shift Uniqueness Test

010815932-09, P = 14.214240 Days, E = 126.207373 Days

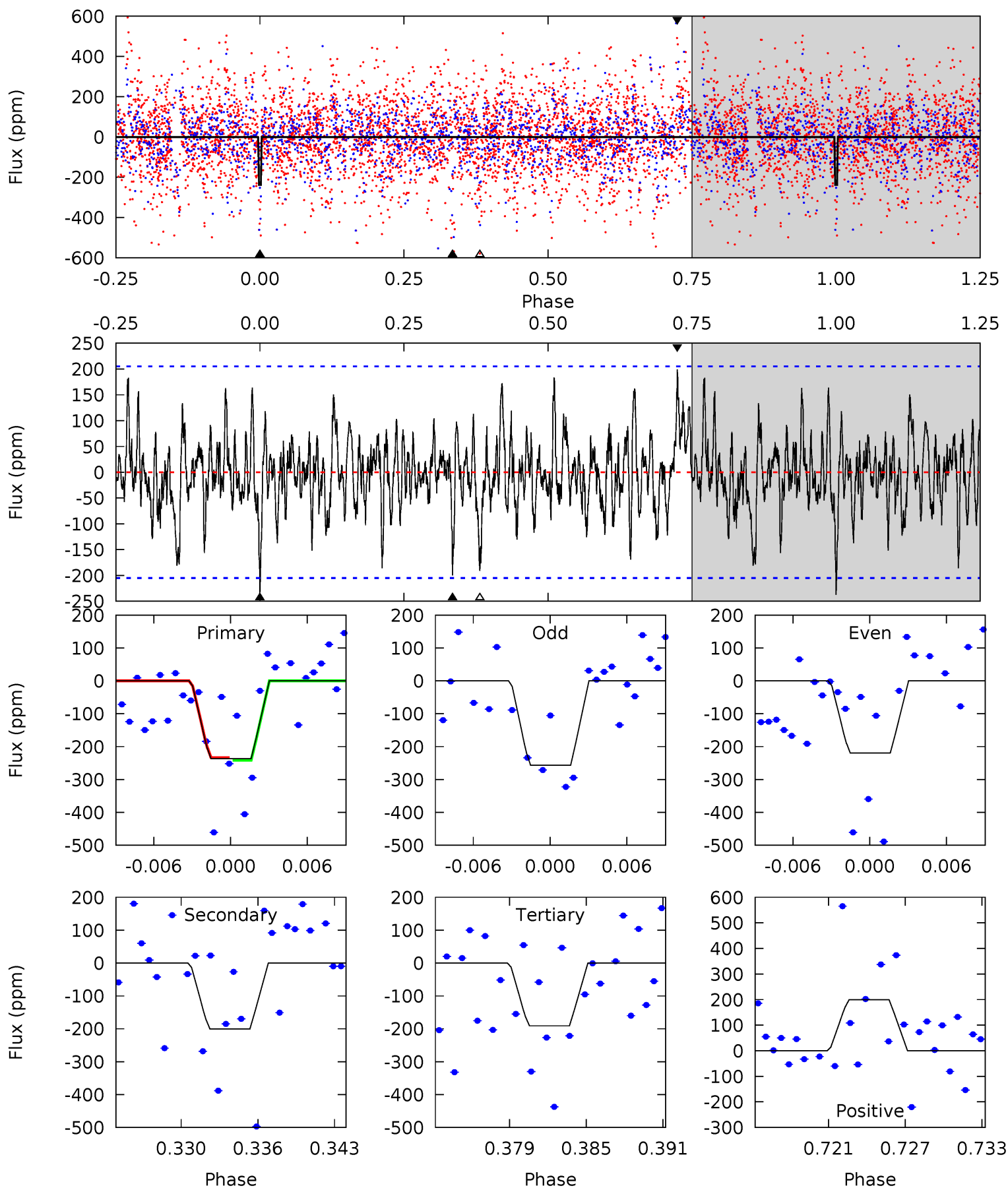
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010815932-09, P = 14.214240 Days, E = 126.199875 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
5.92	5.00	4.77	4.97	5.12	2.75	1.44	1.15	0.95	0.23	0.02	0.47	1.27	0.46	0.10



### Stellar Parameters For KIC 010815932

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7191^{+201}_{-302}$	$3.457^{+0.684}_{-0.076}$	$-0.340^{+0.300}_{-0.300}$	$4.327^{+0.306}_{-2.756}$	$1.959^{+0.116}_{-0.656}$	$0.034^{+0.417}_{-0.008}$
	$+3\%/-4\%$	$+20\%/-2\%$	$+88\%/-88\%$	$+7\%/-64\%$	$+6\%/-33\%$	$+1225\%/-23\%$
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 010815932-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$26.86^{+31.20}_{-17.65}$	$2357^{+149}_{-344}$	$6005^{+44440}_{-36198}$	$38^{+3158}_{-2117}$
Alt.	$-200 \pm 40$	$30.47^{+35.41}_{-20.75}$	$2359^{+156}_{-368}$	$3488^{+1687}_{-956}$	$2.439^{+18.504}_{-1.930}$

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

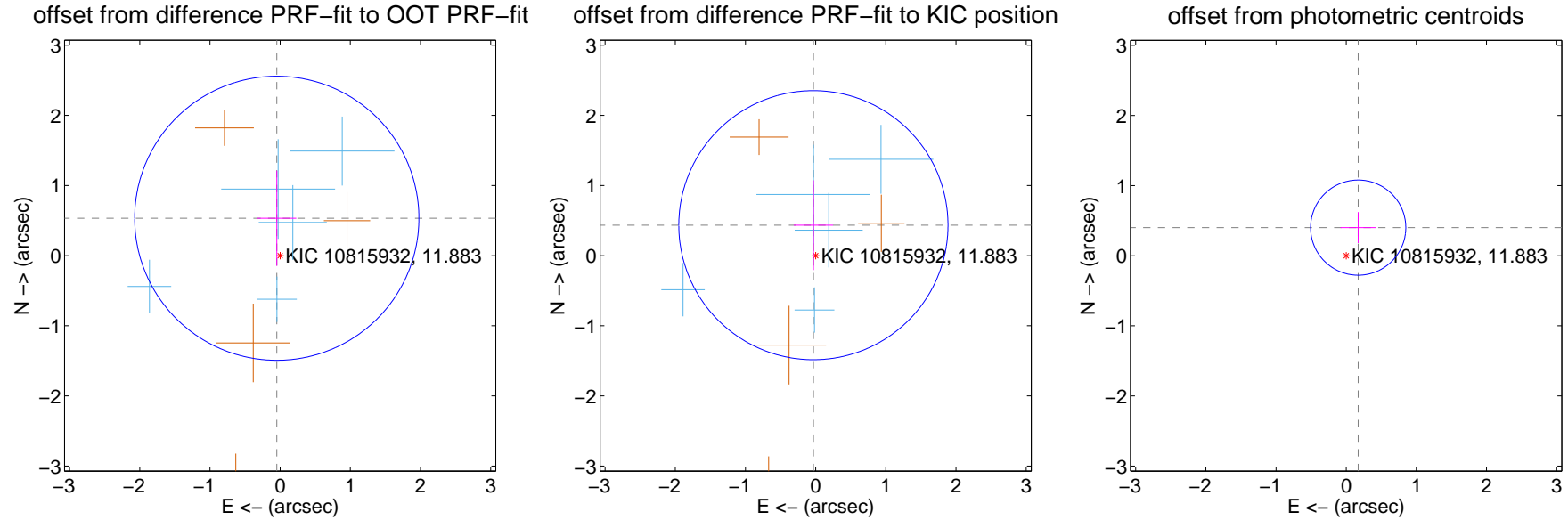
## DV Centroid Data

Supplemental centroid analysis for 010815932-09. **Kepler magnitude: 11.88.** Transit SNR -1.00

There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

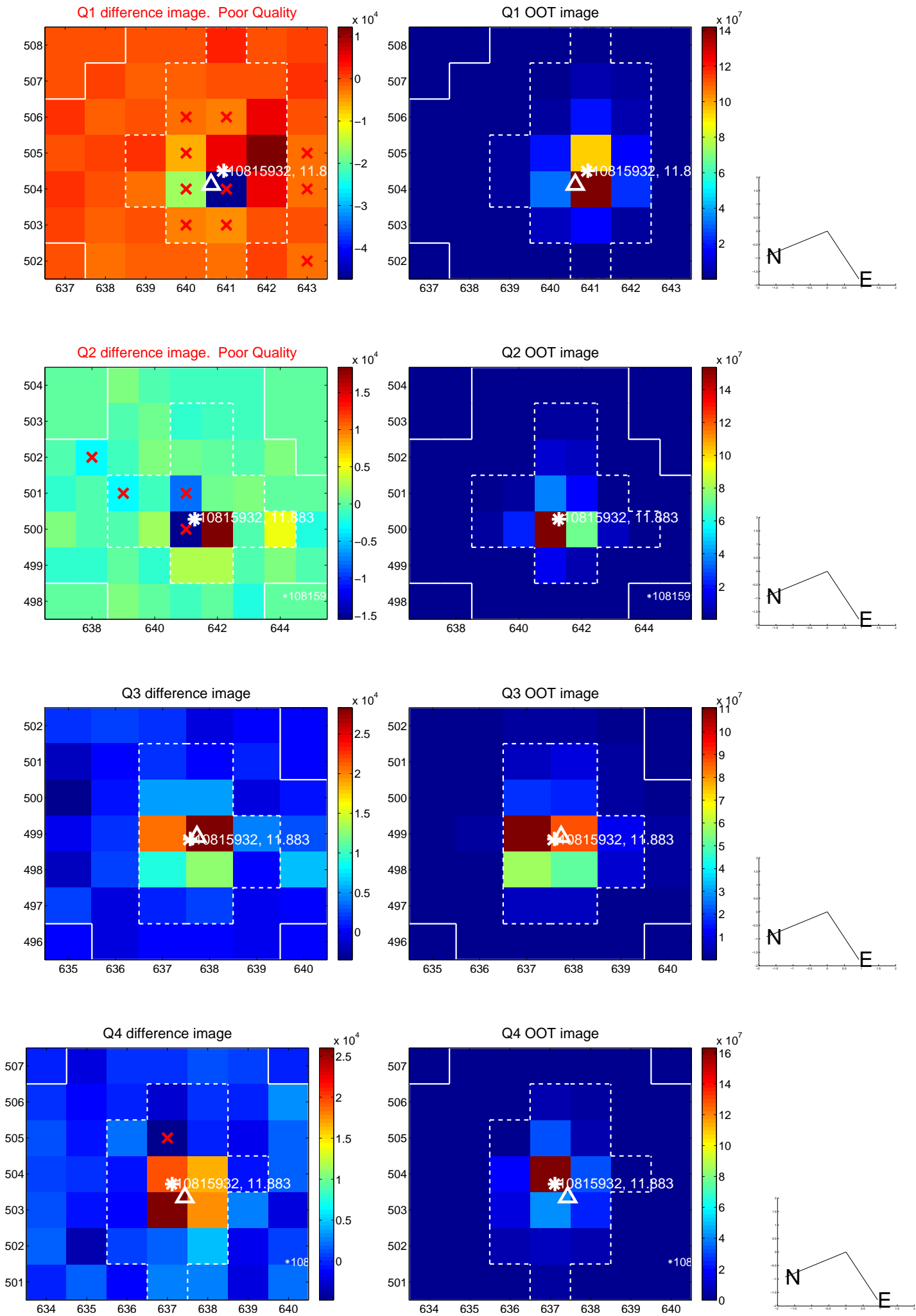
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.535 \pm 0.675$	0.79	$0.048 \pm 0.279$	$0.533 \pm 0.679$
PRF-fit source offset from KIC position	$0.435 \pm 0.639$	0.68	$0.032 \pm 0.279$	$0.434 \pm 0.640$
photometric centroid source offset	$0.44 \pm 0.23$	1.93	$-0.17 \pm 0.25$	$0.40 \pm 0.22$



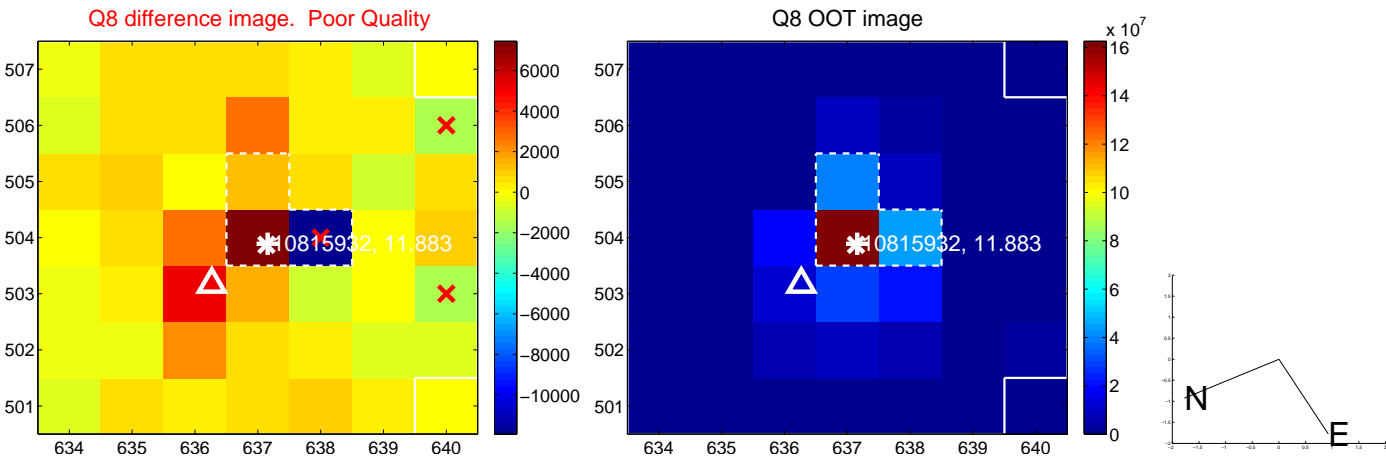
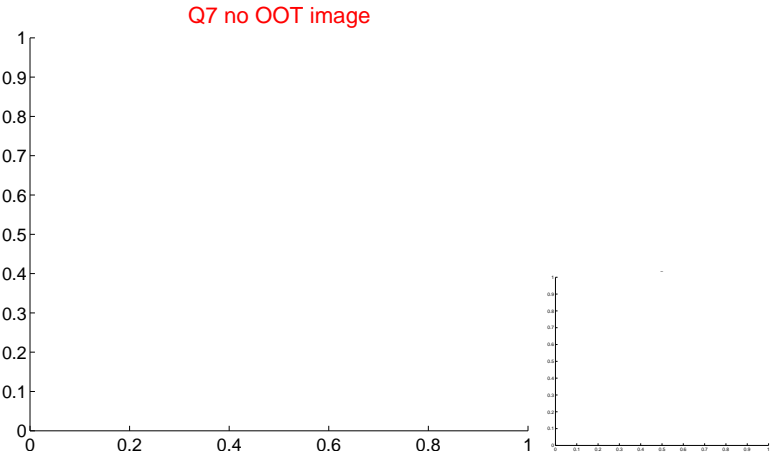
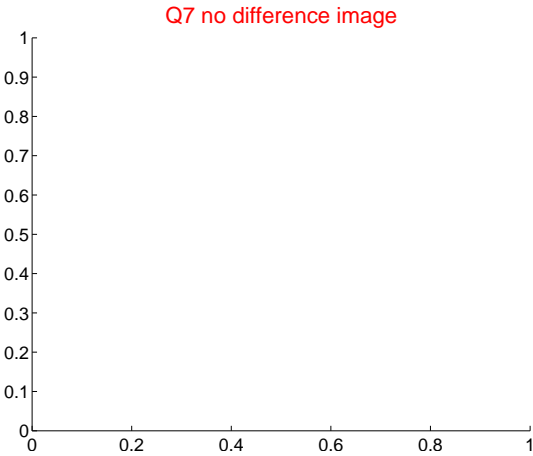
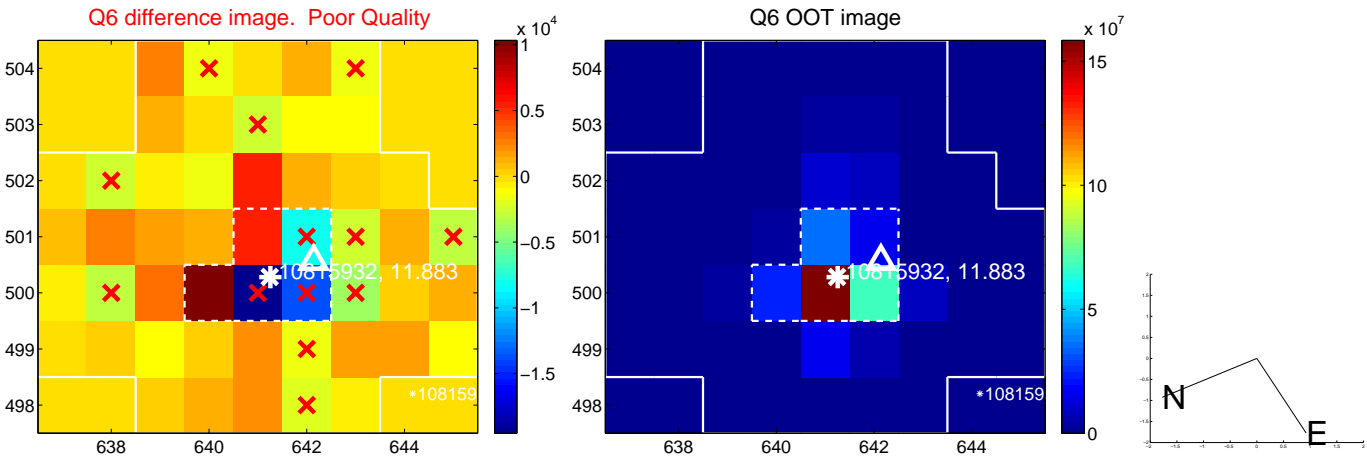
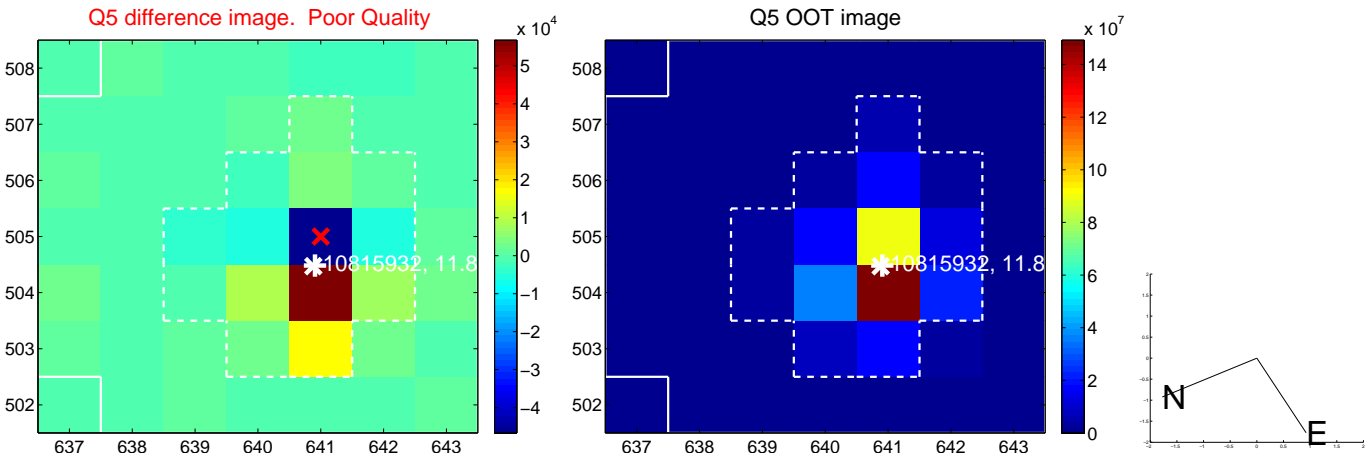
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



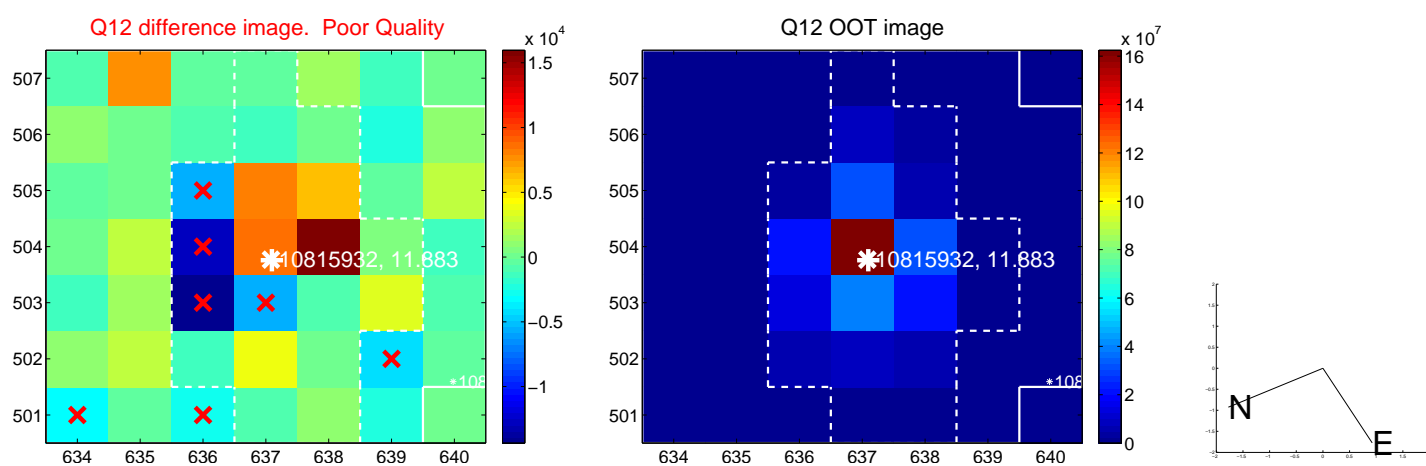
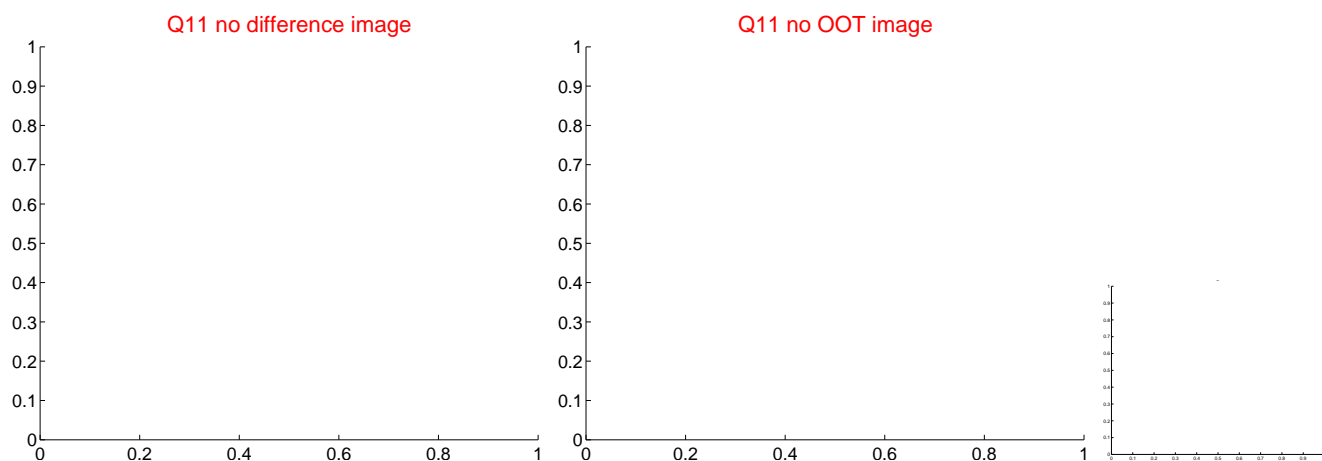
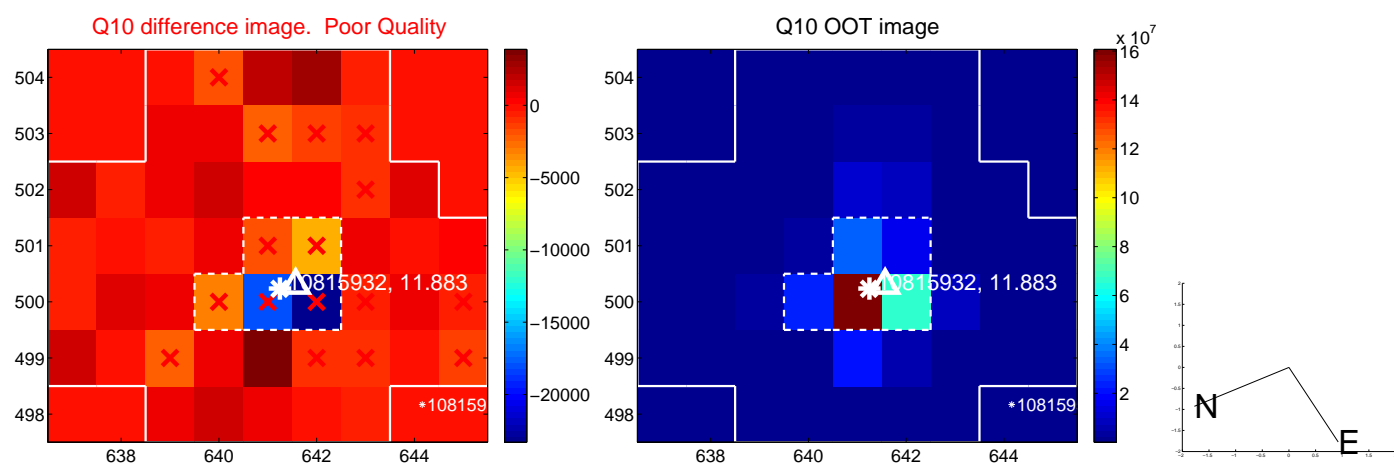
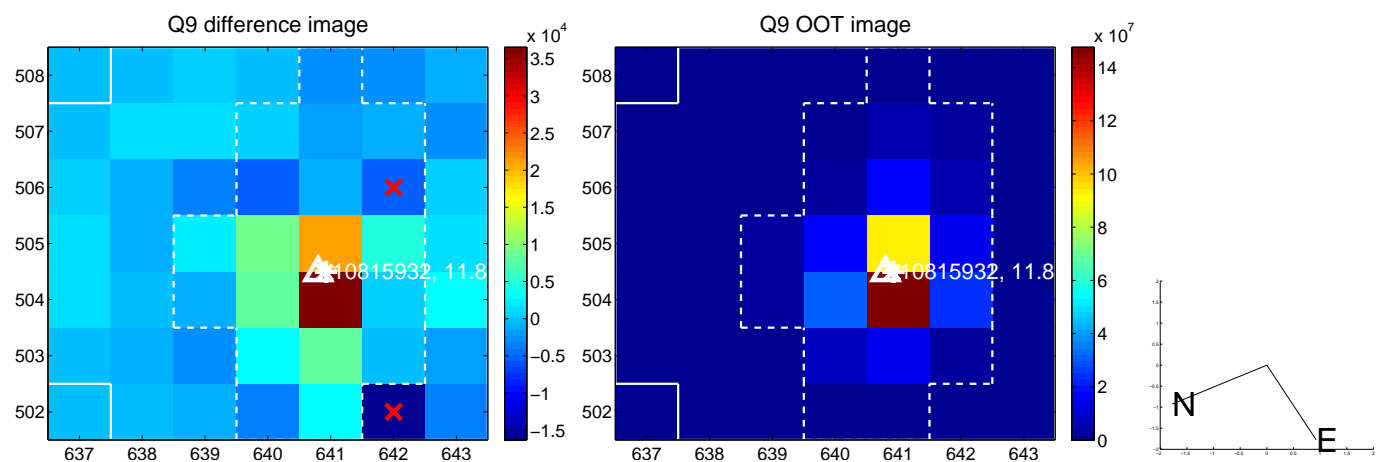
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



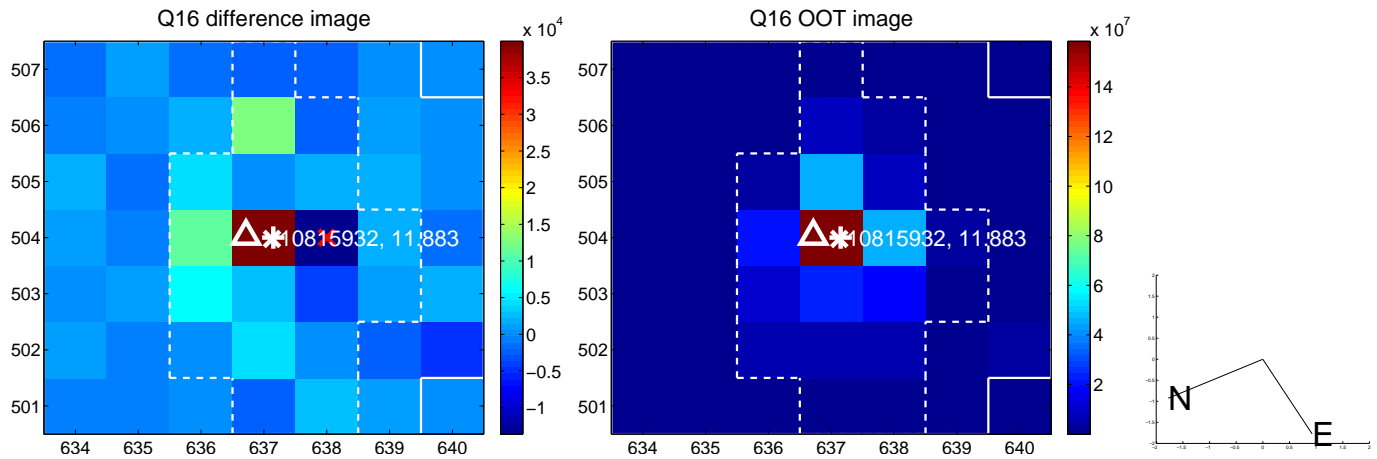
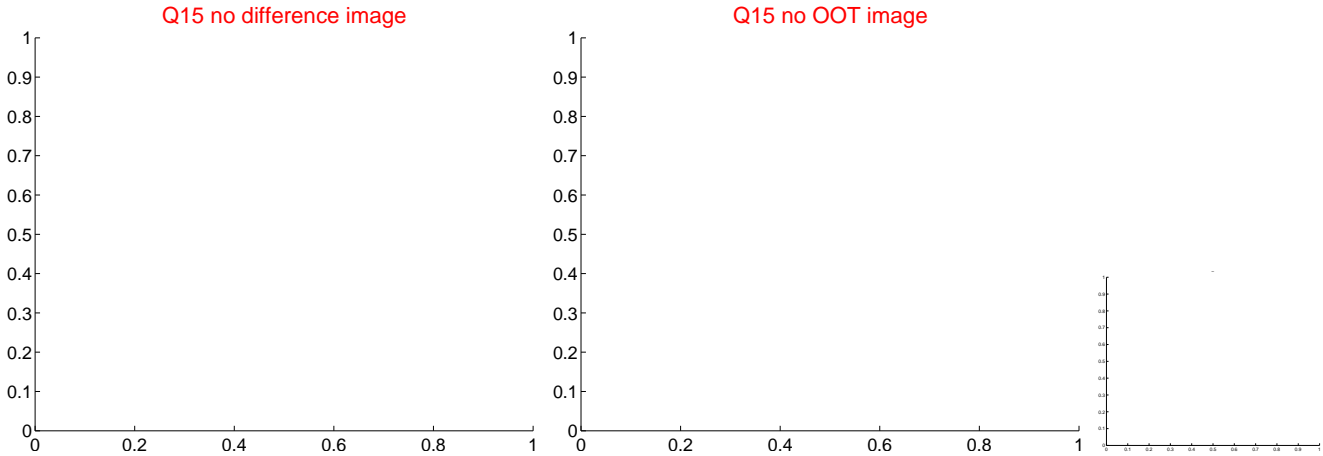
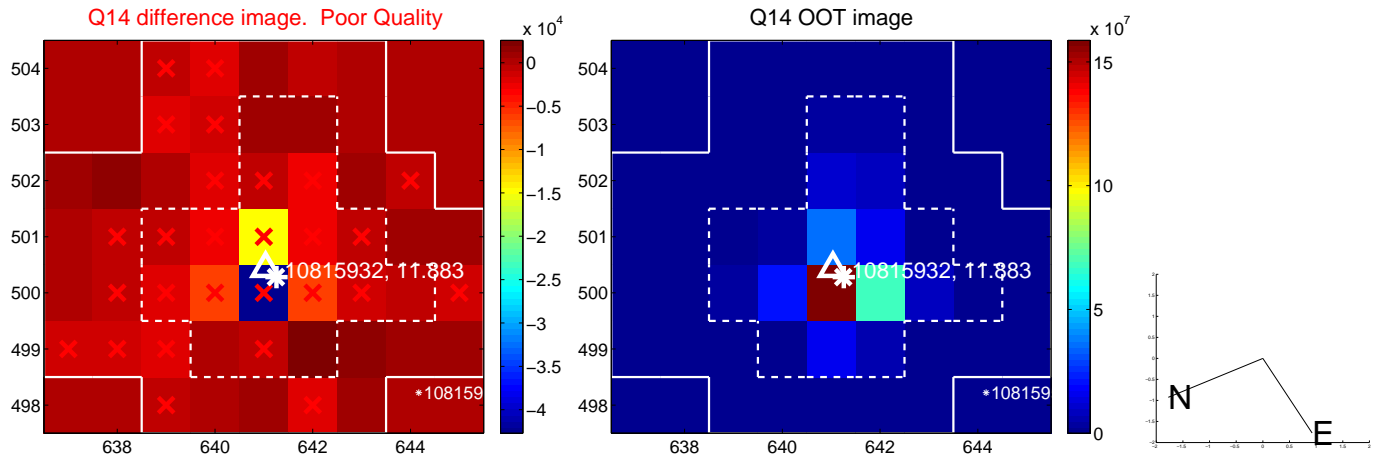
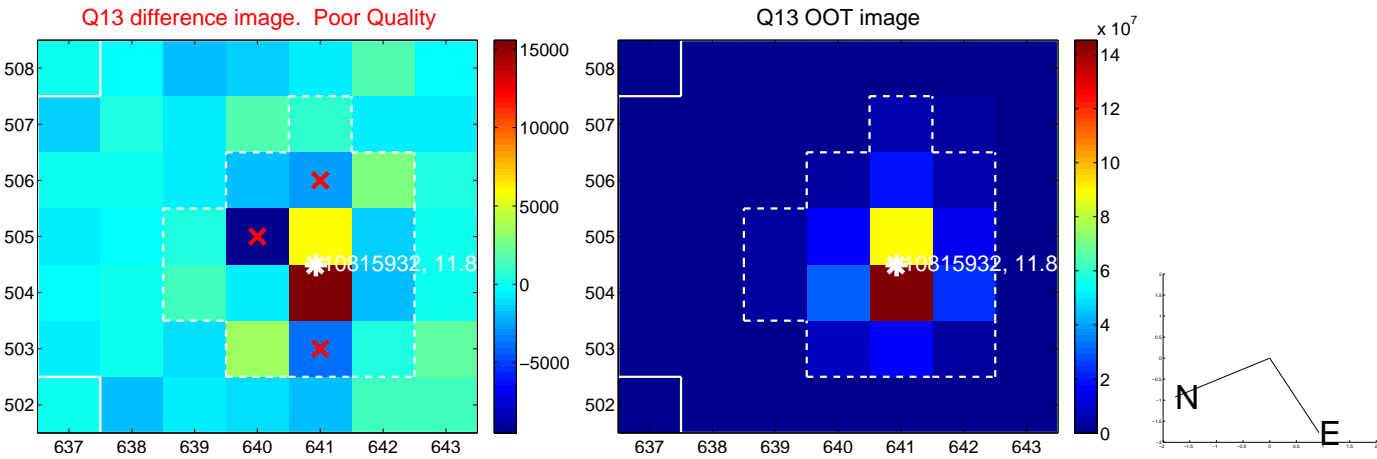
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



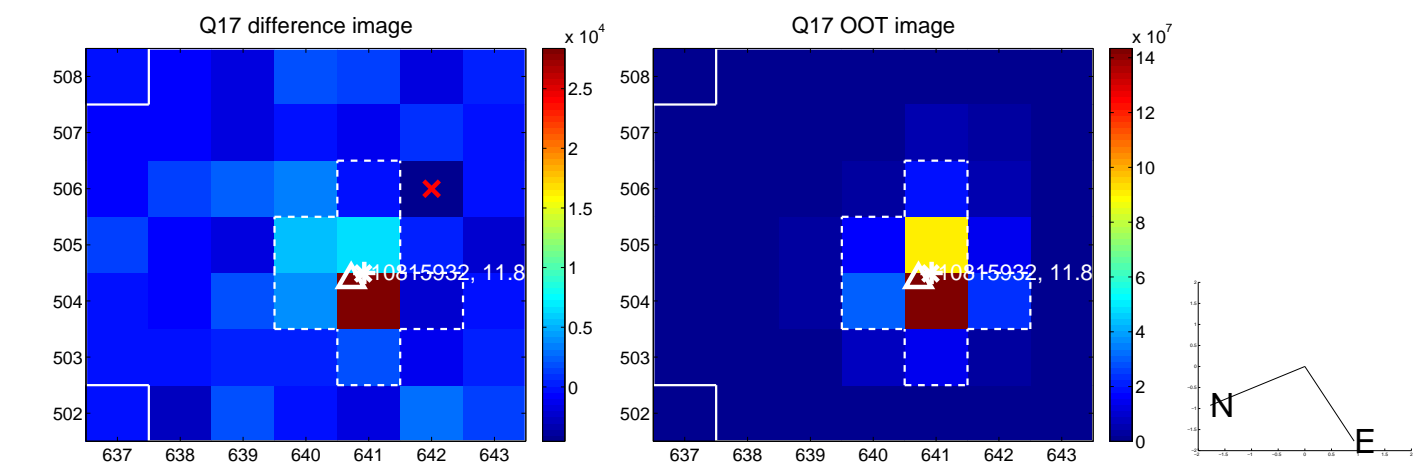
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



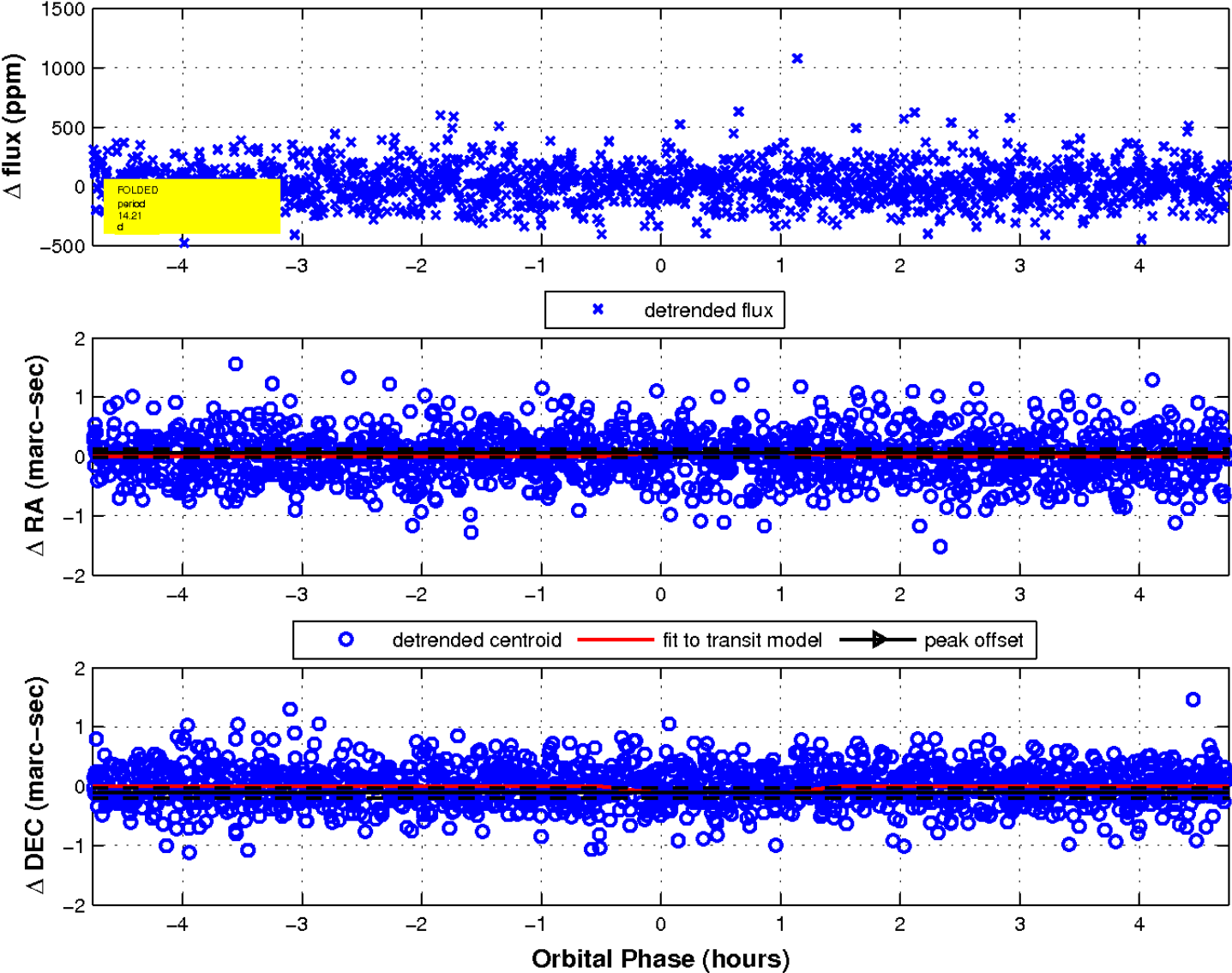
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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UKIRT Image

Declination

