

# KIC 007836863

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007836863-01	OBS	No	1.267858	131.638598	106.6	3.380	9.3	8.4	0.82	5271	1.01	993.54
007836863-02	OBS	No	9.556922	131.643973	266.6	7.682	7.3	7.2	0.82	5271	1.52	67.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007836863-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
007836863-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET

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

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

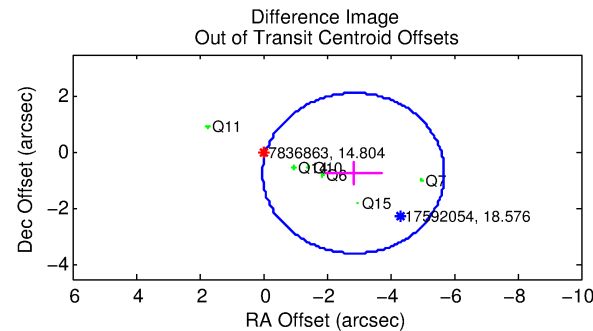
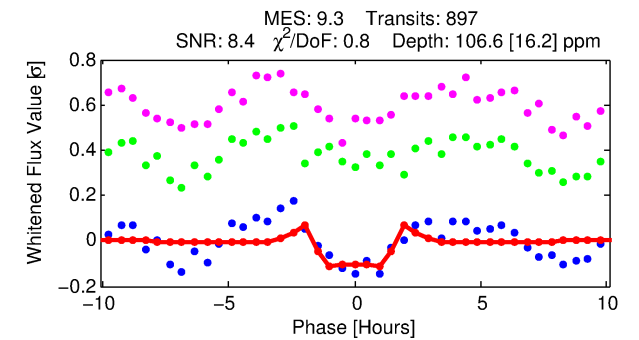
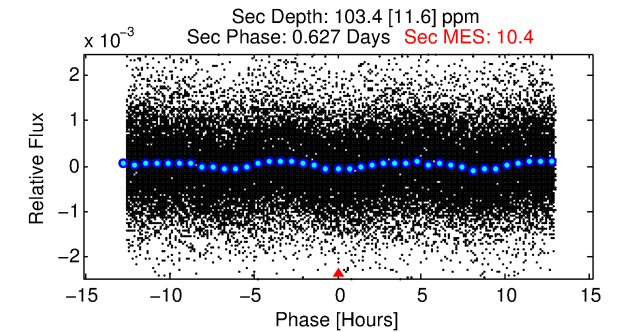
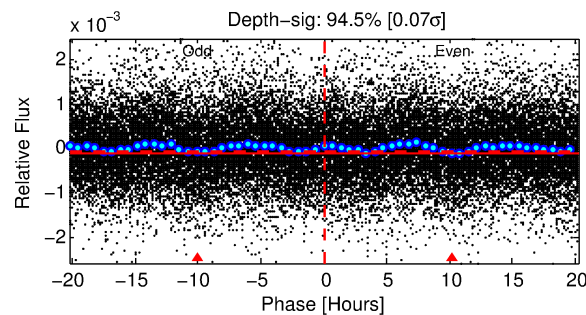
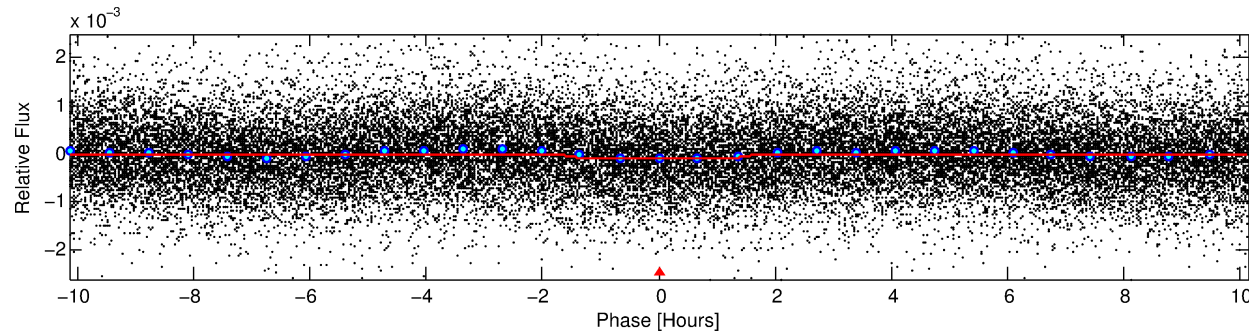
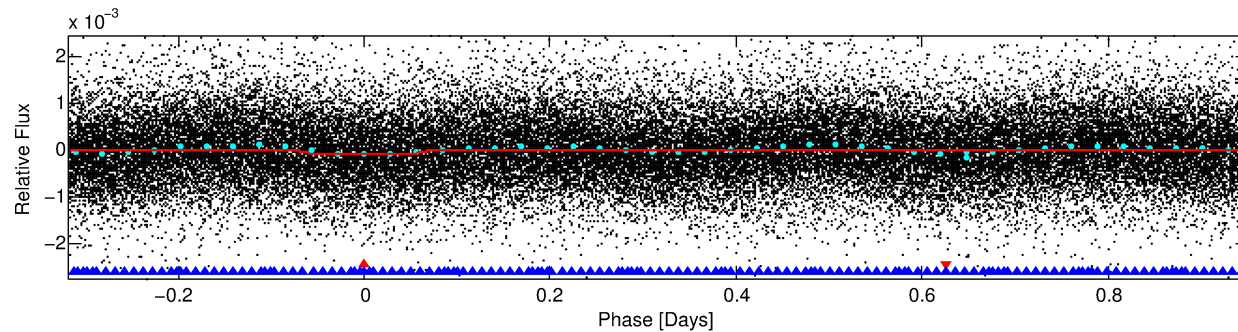
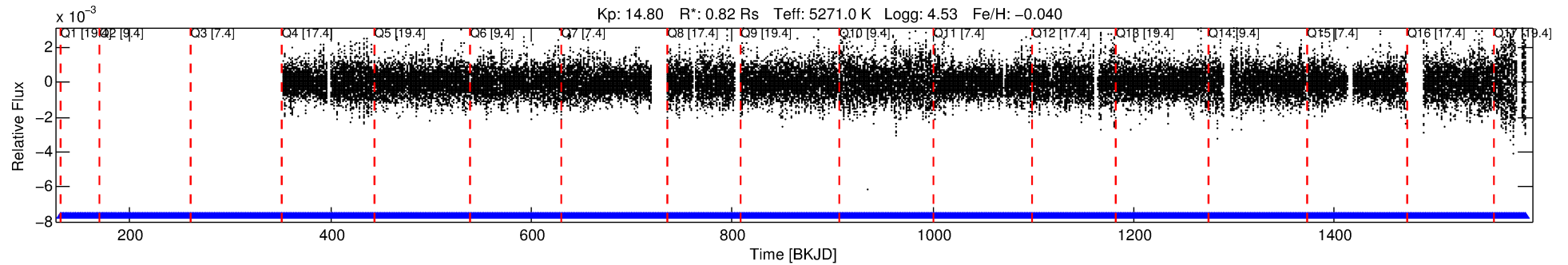
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007836863-01

No Significant Match Found

# DV One-Page Summary

KIC: 7836863 Candidate: 1 of 2 Period: 1.268 d



## DV Fit Results:

Period = 1.26786 [0.00001] d  
Epoch = 131.6386 [0.0025] BKJD  
Rp/R\* = 0.0114 [0.0044]  
a/R\* = 1.64 [1.67]  
b = 0.89 [0.37]  
Seff = 993.54 [236.34]  
Teq = 1432 [85] K  
Rp = 1.01 [0.42] Re  
a = 0.0216 [0.0029] AU  
Ag = 25.79 [20.62] [1.20σ]  
**Teff = 4988 [983] K [3.60σ]**

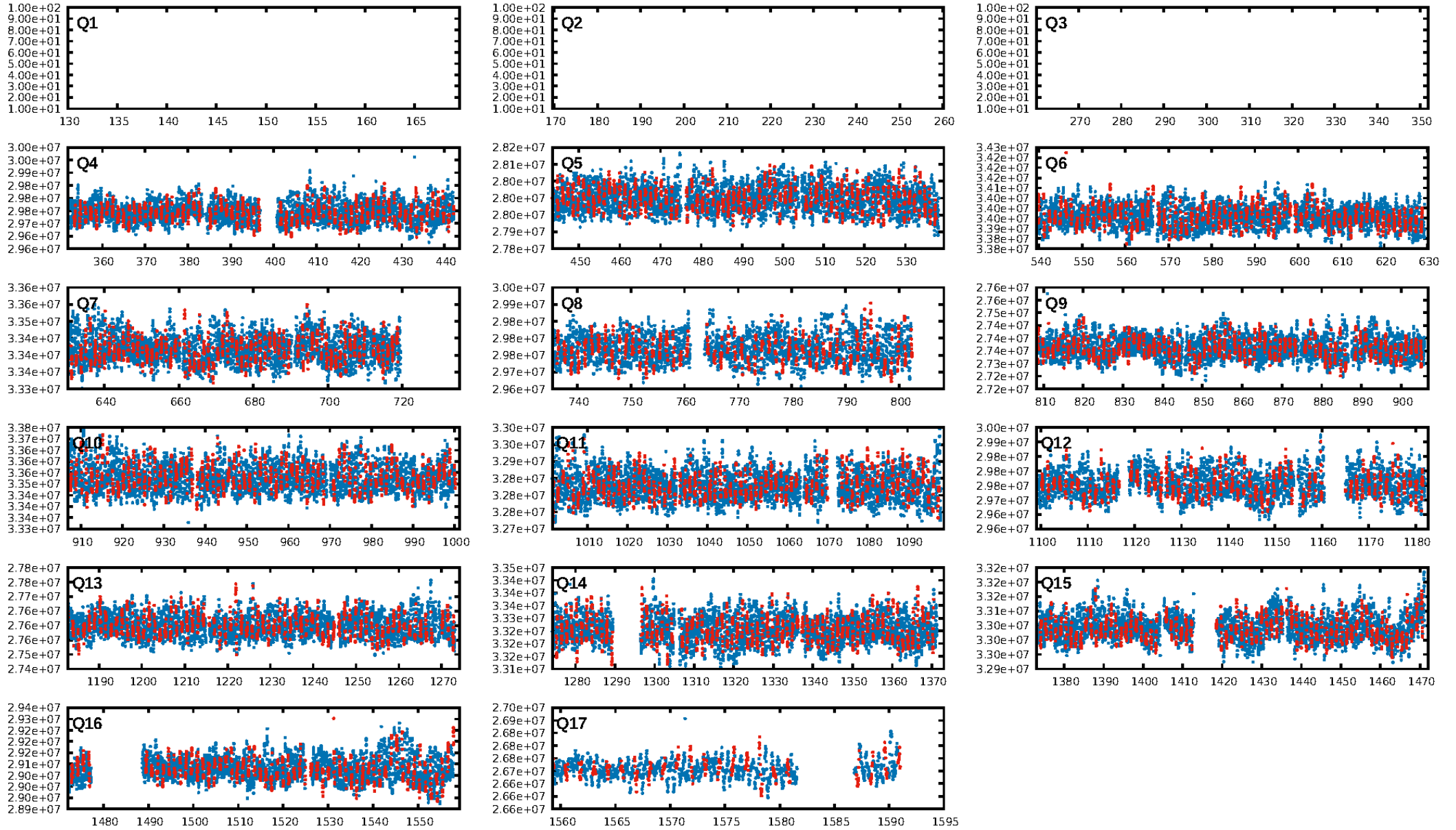
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [23.70σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.17e-16  
RollingBand-fgt: 1.00 [875/875]  
**GhostDiagnostic-chr: -0.907**  
Centroid-sig: 0.0%  
Centroid-so: 5.337 arcsec [15.30σ]  
OotOffset-rm: 2.938 arcsec [3.09σ]  
KicOffset-rm: 7.981 arcsec [41.91σ]  
OotOffset-st: 3/3/0/0 [6]  
KicOffset-st: 3/3/0/0 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 1.00 [14/14]

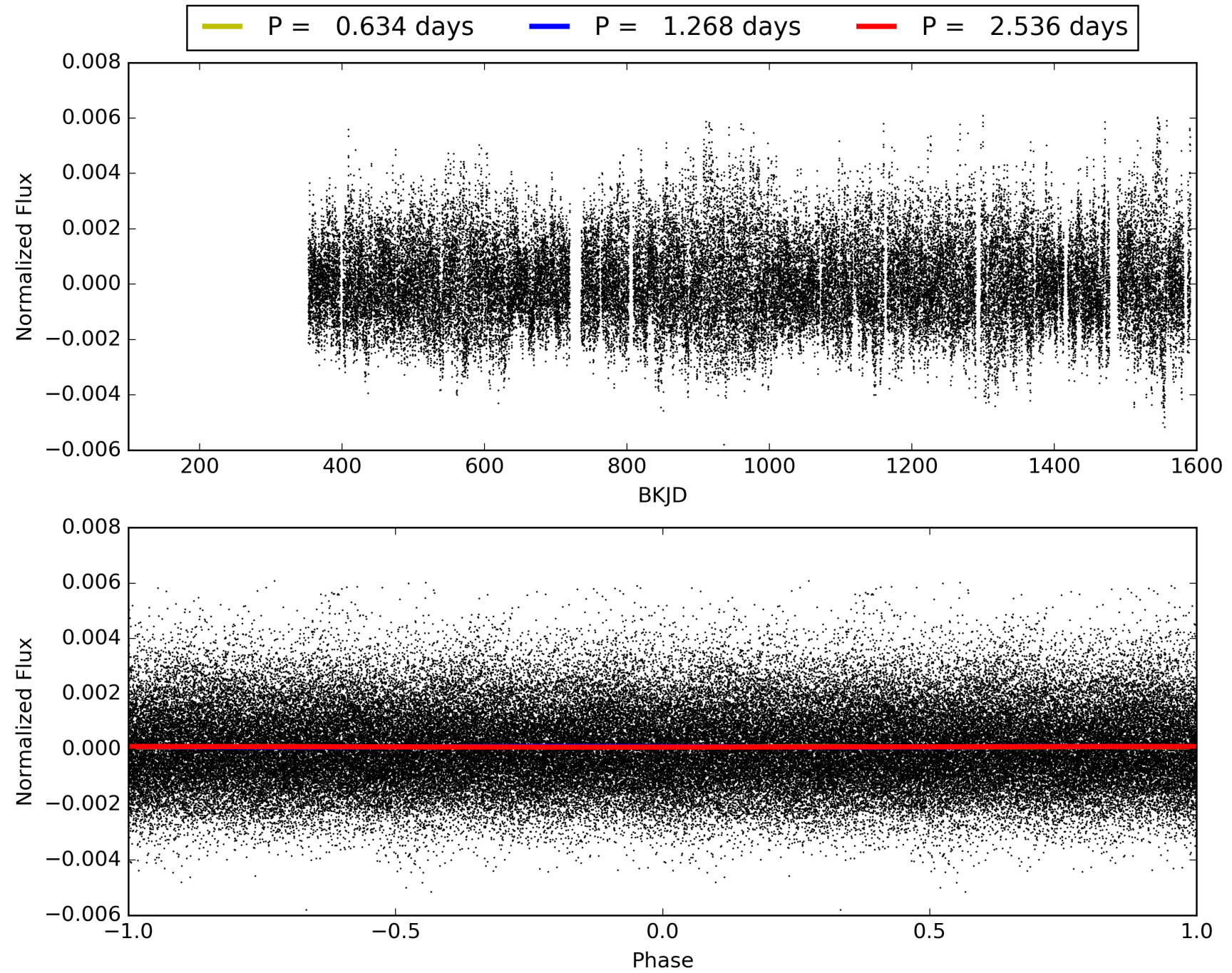
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:18:27 Z

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

# TCE 007836863-01, PDC Light Curves



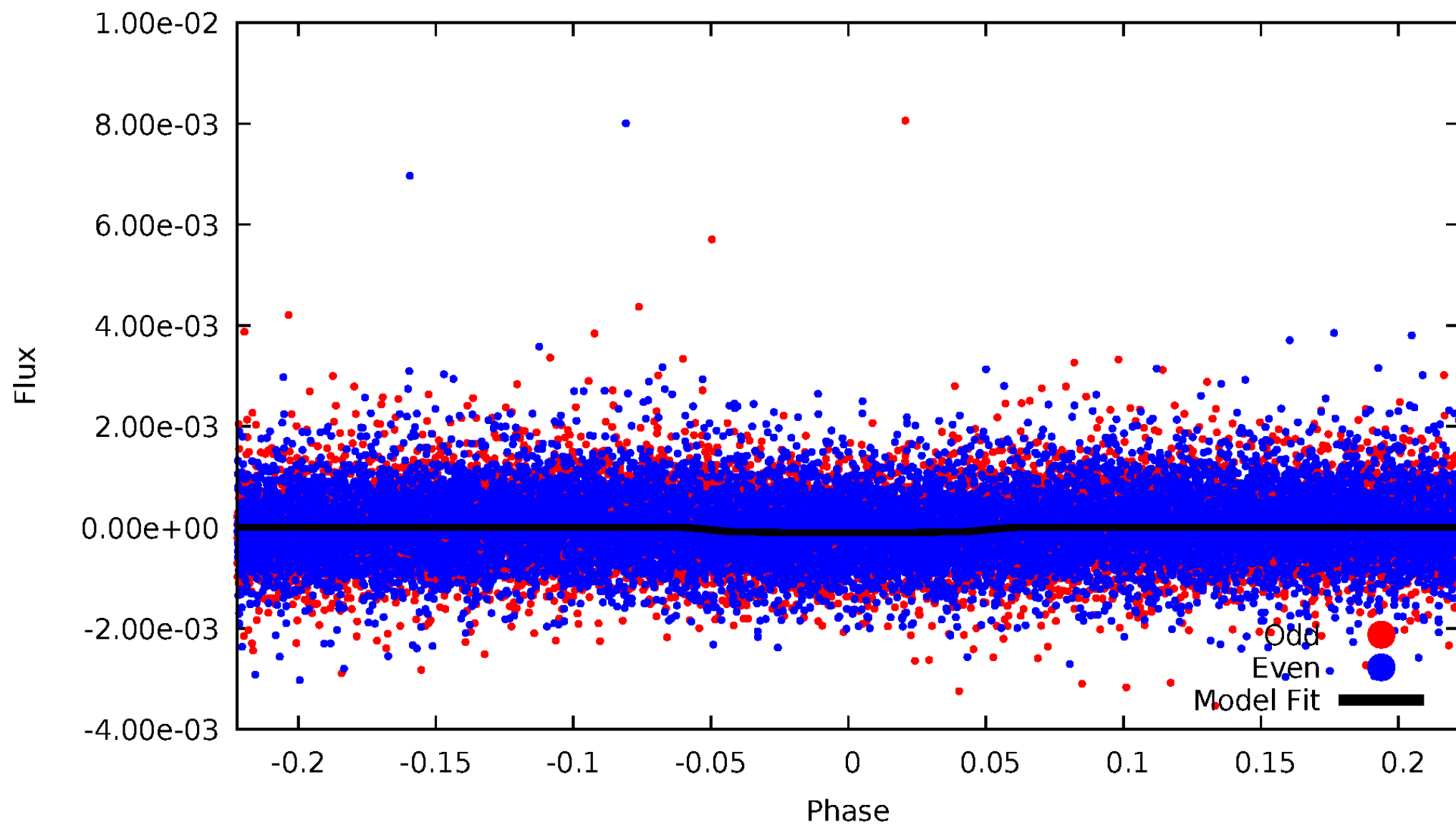
TCE 007836863-01





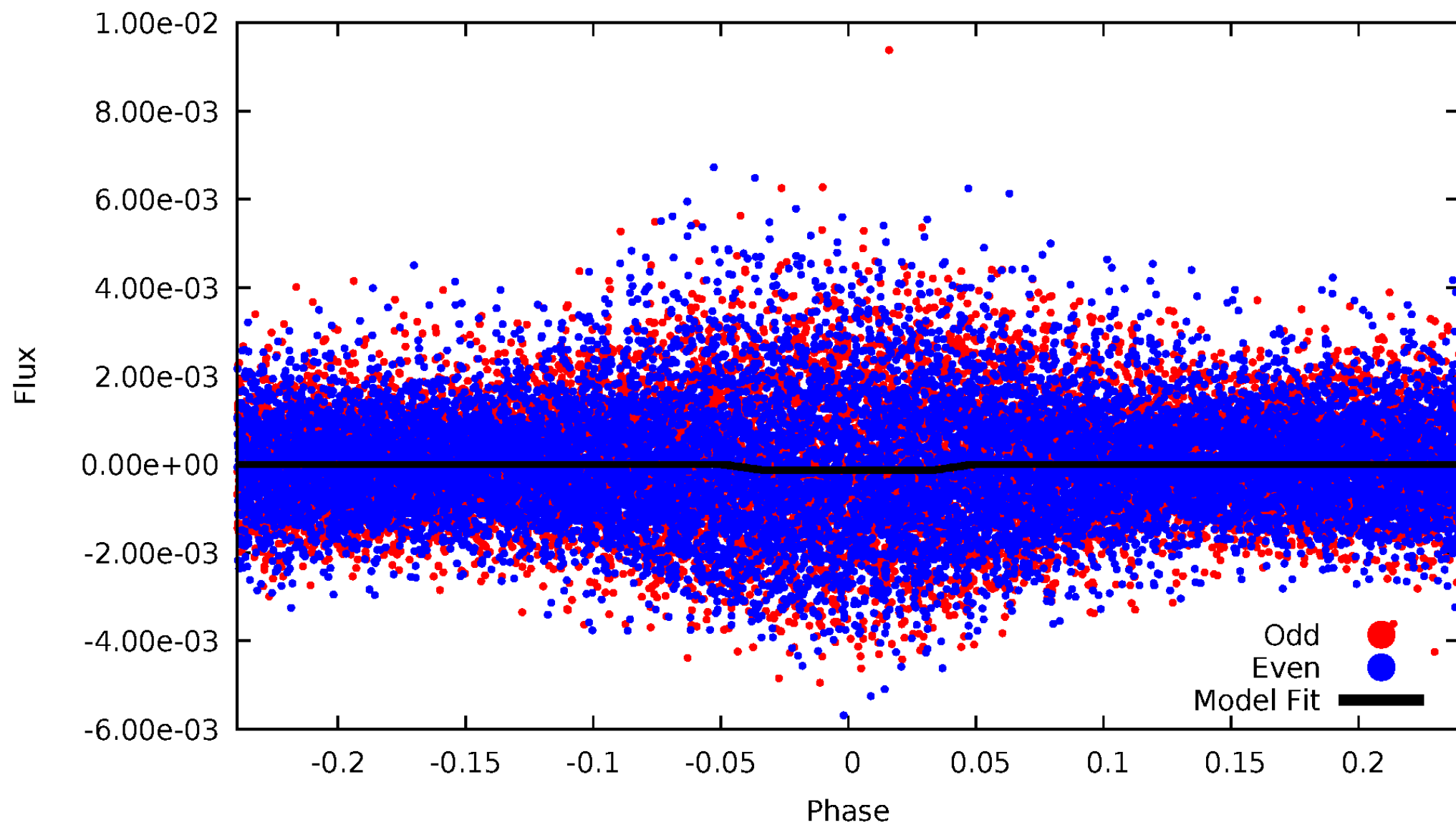
# DV Odd/Even

TCE 007836863-01

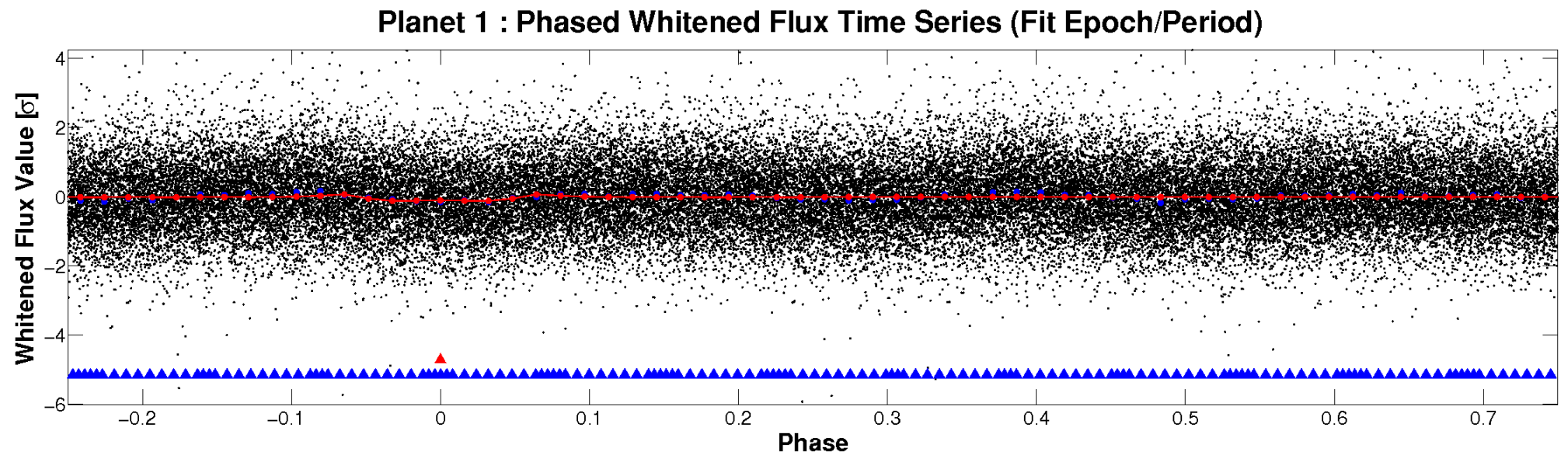
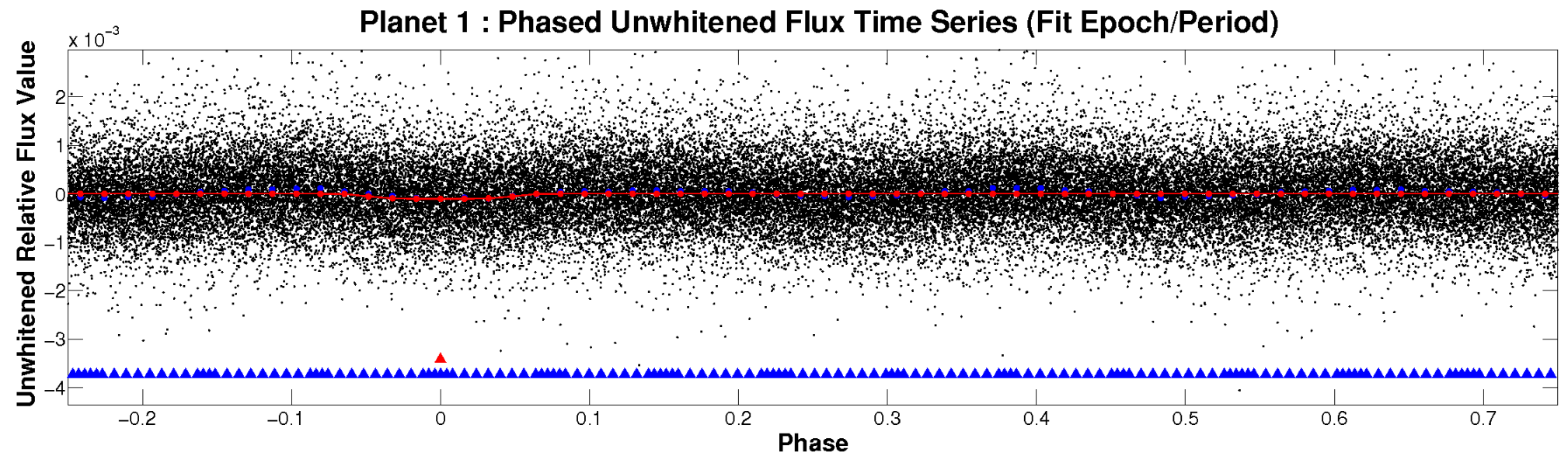


# ALT Odd/Even

TCE 007836863-01

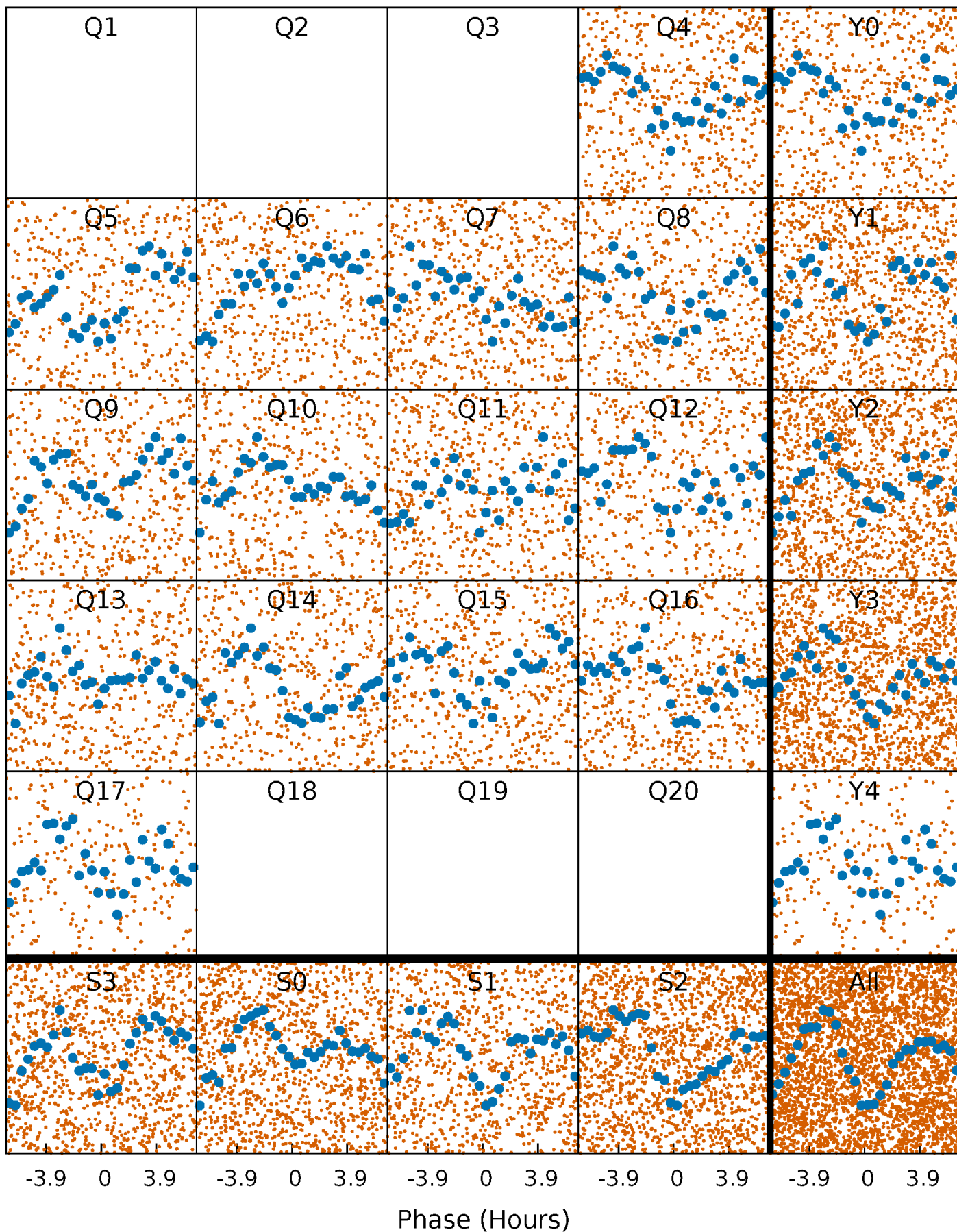


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

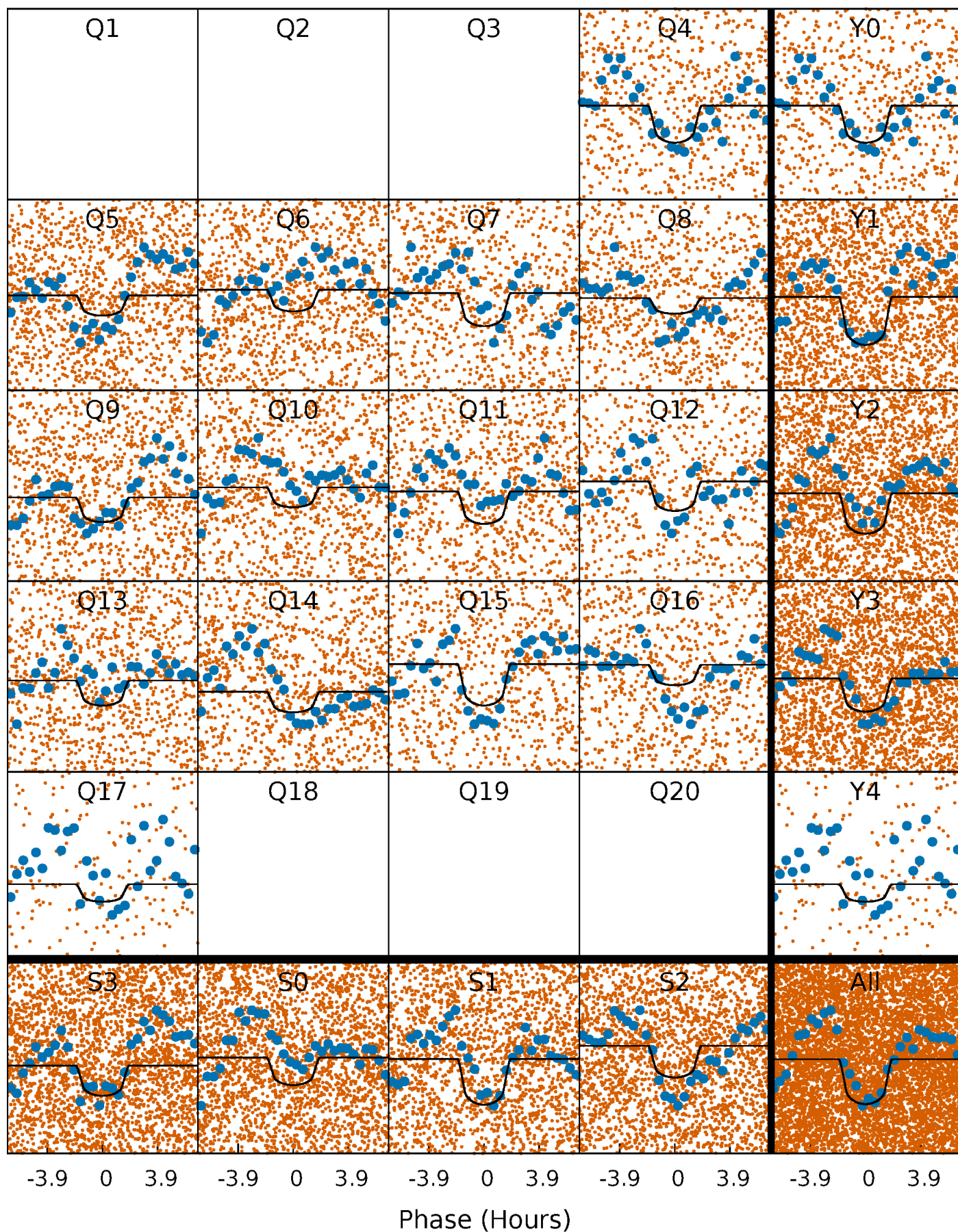
TCE 007836863-01 P= 1.267858 Days  $T_0=131.638598$  (BKJD)





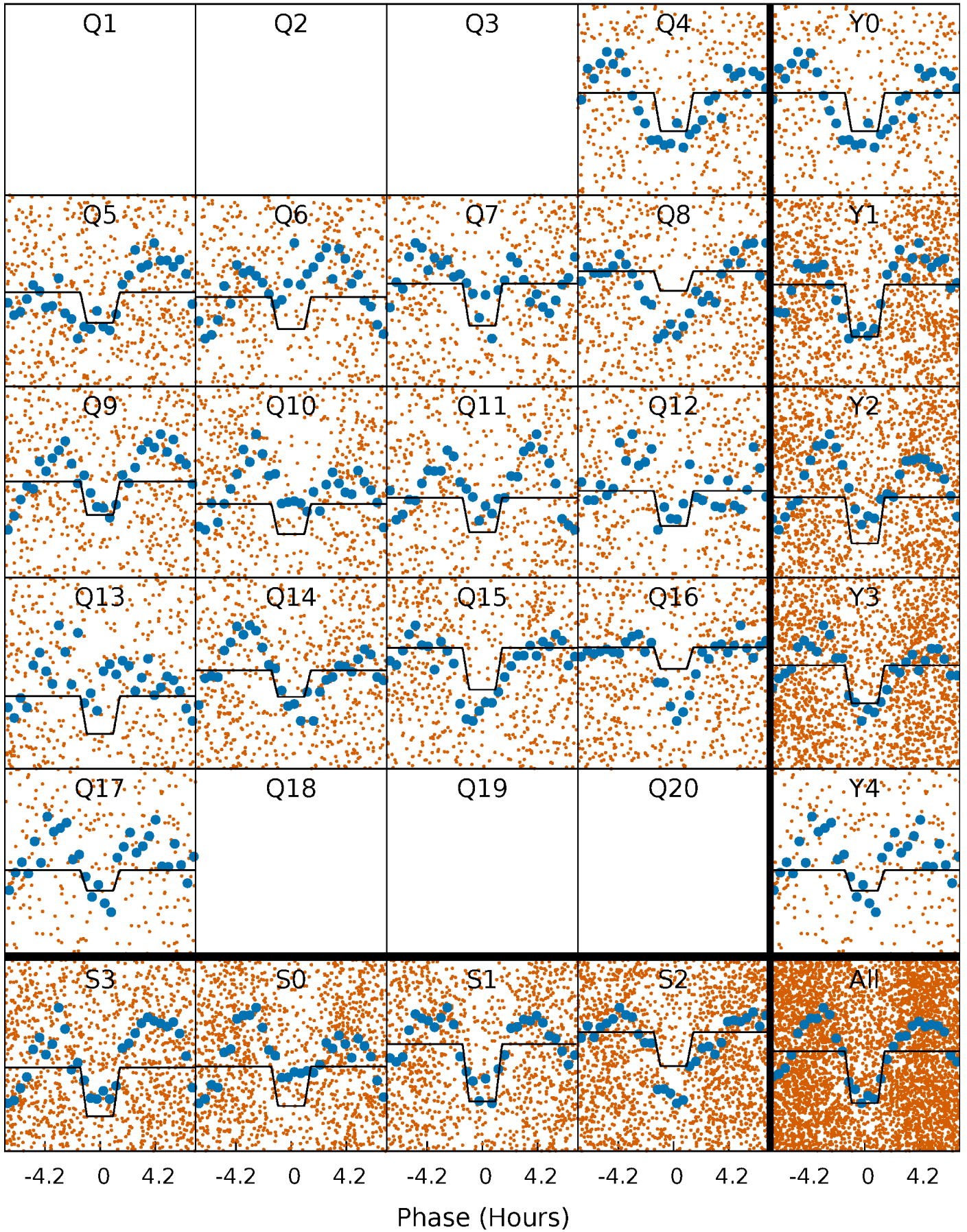
# DV Quarter-Phased Transit Curves

TCE 007836863-01 P= 1.267858 Days  $T_0=131.638598$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

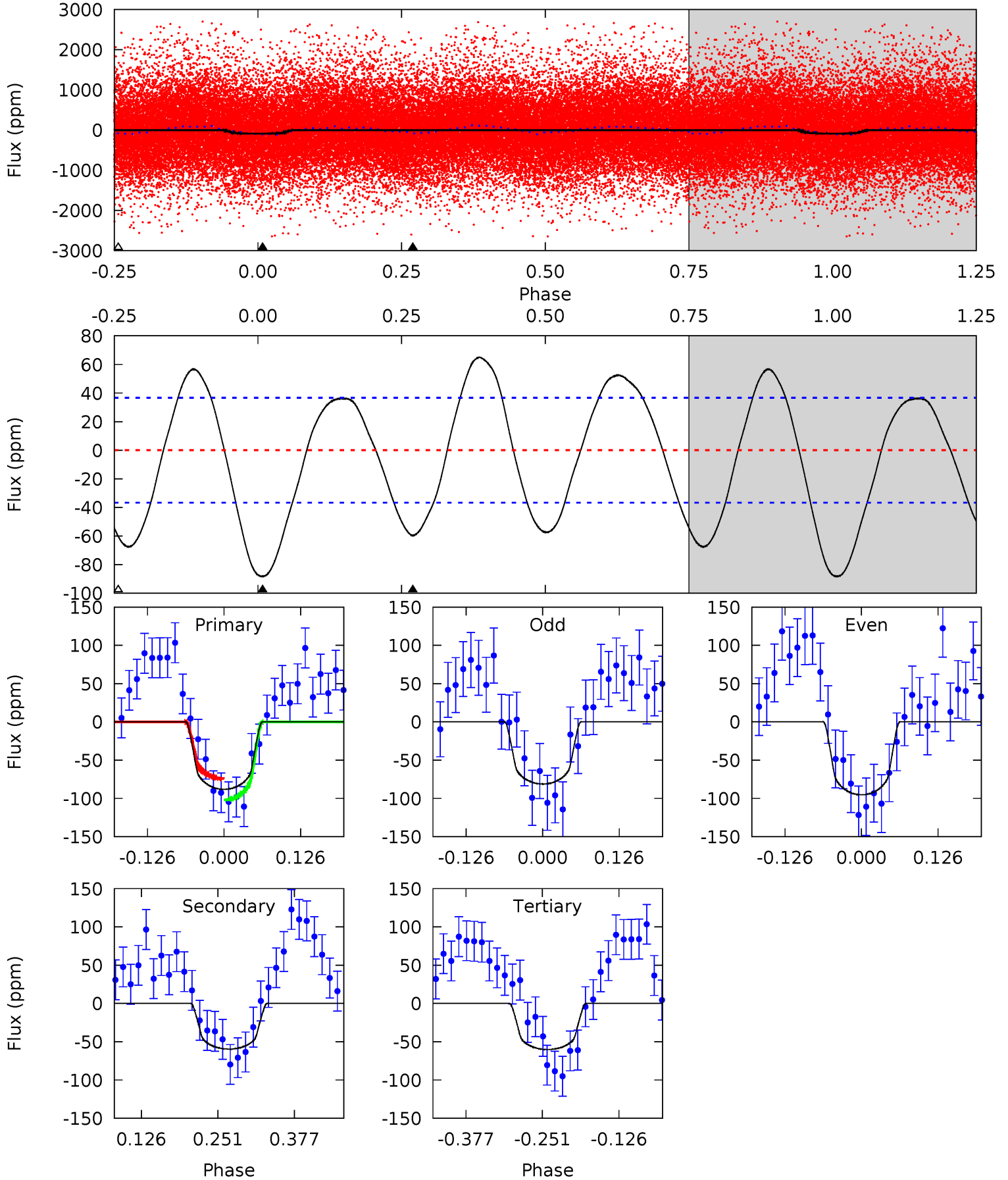
TCE 007836863-01 P= 1.267871 Days  $T_0=131.640242$  (BKJD)



# DV Model-Shift Uniqueness Test

007836863-01, P = 1.267858 Days, E = 131.638598 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
10.9	7.35	7.43	0	4.52	1.53	5.09	3.44	10.9	-0.08	7.35	0.87	0.96	0.42	1.72

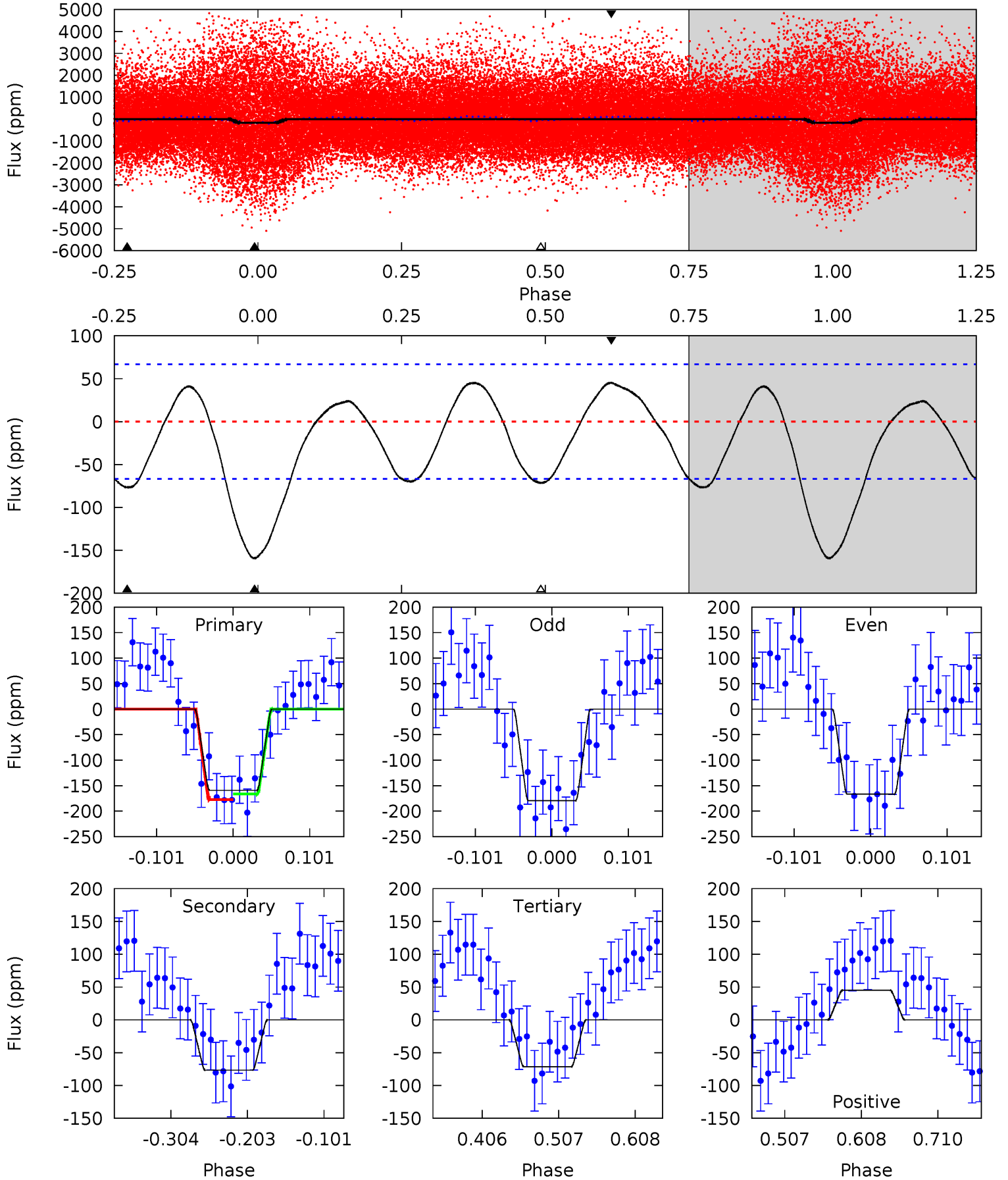




# Alt Model-Shift Uniqueness Test

007836863-01, P = 1.267871 Days, E = 131.640242 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
10.9	5.24	4.88	3.09	4.56	1.64	2.62	6.00	7.79	0.36	2.15	0.44	0.37	0.22	0.38





### Stellar Parameters For KIC 007836863

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5271^{+184}_{-184}$	$4.533^{+0.064}_{-0.104}$	$-0.040^{+0.300}_{-0.300}$	$0.817^{+0.132}_{-0.081}$	$0.831^{+0.093}_{-0.078}$	$2.145^{+0.580}_{-0.647}$
	+3%/-3%	+1%/-2%	+750%/-750%	+16%/-10%	+11%/-9%	+27%/-30%
Source	KIC0	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 007836863-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-60 \pm 8$	$1.02^{+0.42}_{-0.34}$	$2026^{+102}_{-102}$	$4486^{+849}_{-564}$	$14^{+19}_{-7}$
Alt.	$-77 \pm 15$	$1.05^{+0.41}_{-0.37}$	$2013^{+94}_{-88}$	$4649^{+971}_{-584}$	$17^{+25}_{-8}$

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

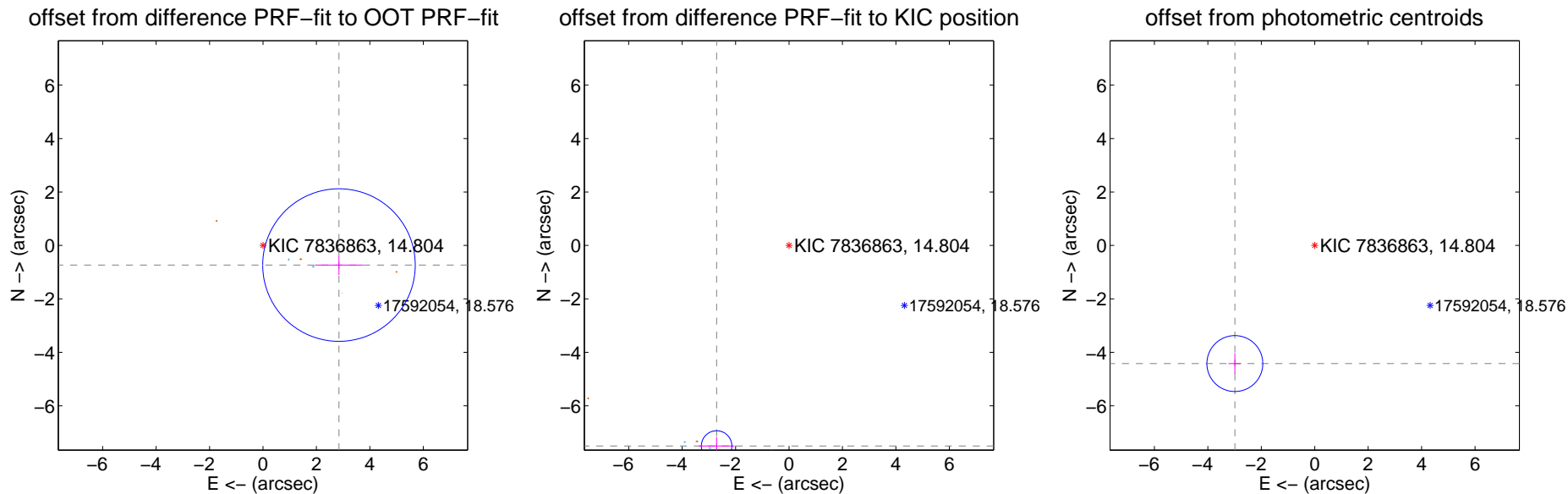
## DV Centroid Data

Supplemental centroid analysis for 007836863-01. Kepler magnitude: 14.80. Transit SNR 8.35

There are 2 quarters with good PRF difference image offsets

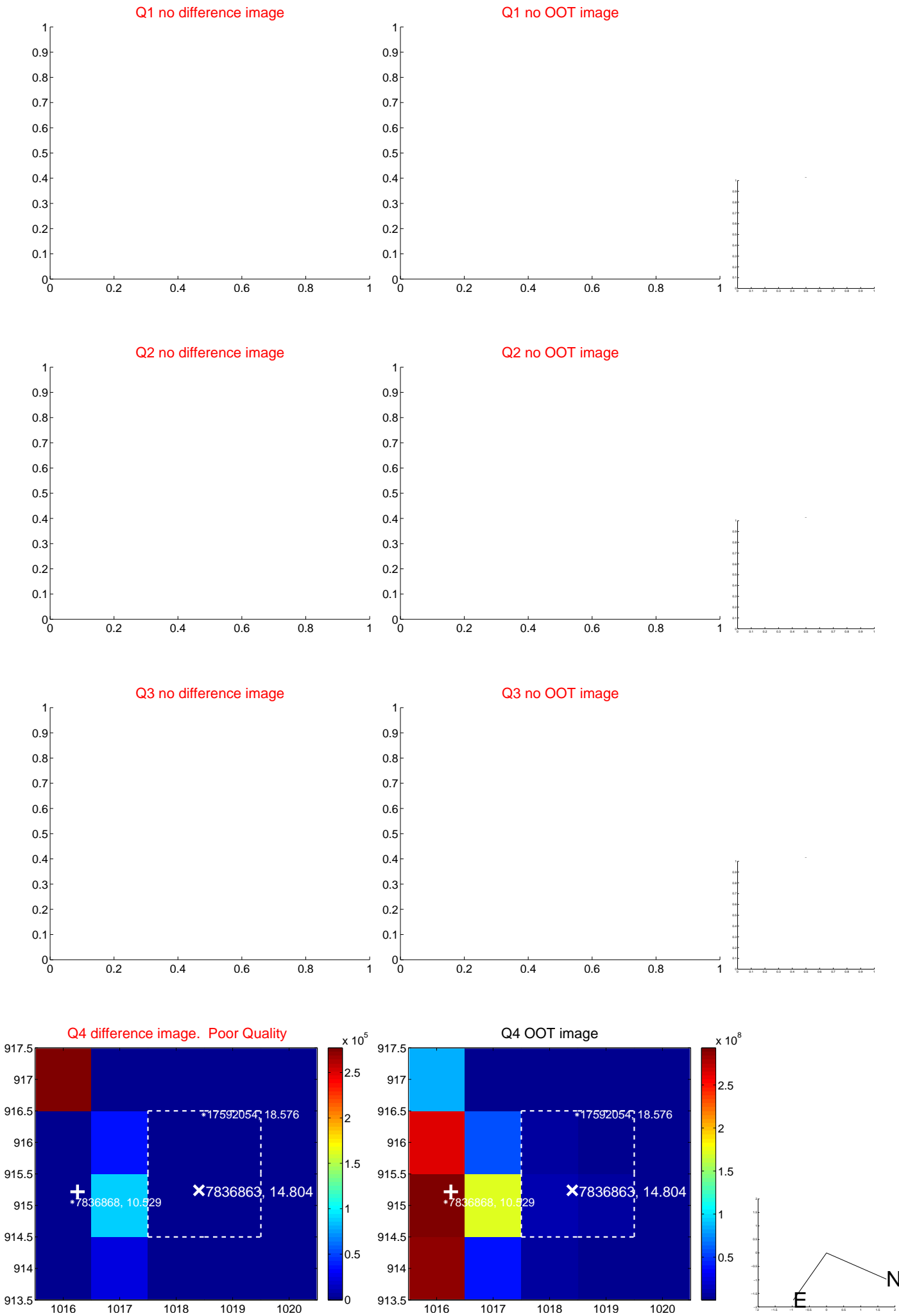
The OOT PRF centroid is offset from the target star catalog position by about 8.75 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.938 \pm 0.952$	3.09	$-2.845 \pm 0.898$	$-0.734 \pm 0.376$
PRF-fit source offset from KIC position	$7.981 \pm 0.190$	41.91	$2.710 \pm 0.671$	$-7.507 \pm 0.333$
photometric centroid source offset	$5.34 \pm 0.35$	15.30	$2.99 \pm 0.24$	$-4.42 \pm 0.39$

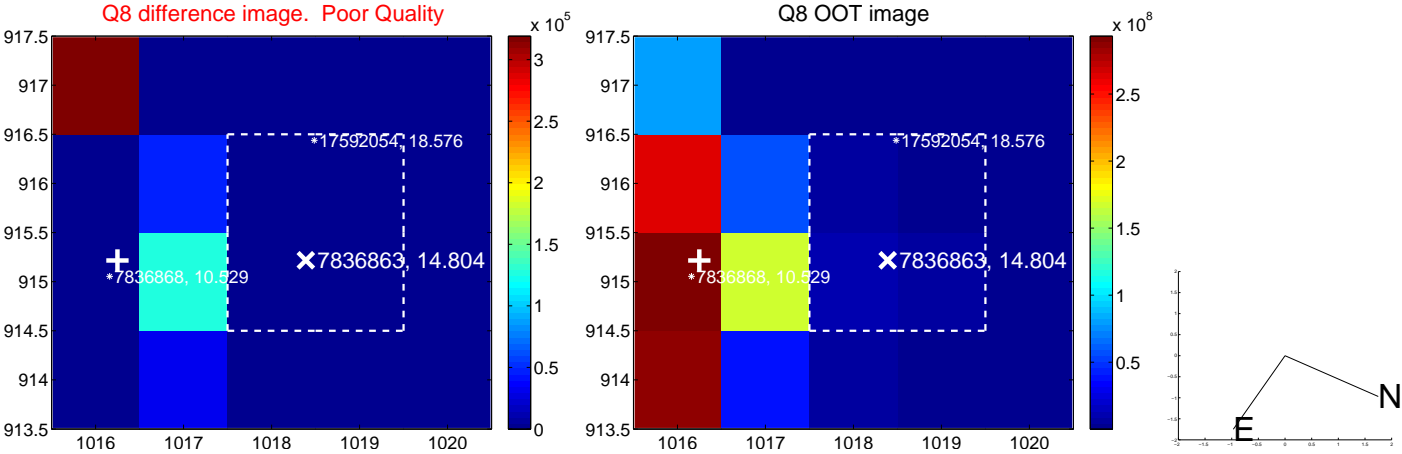
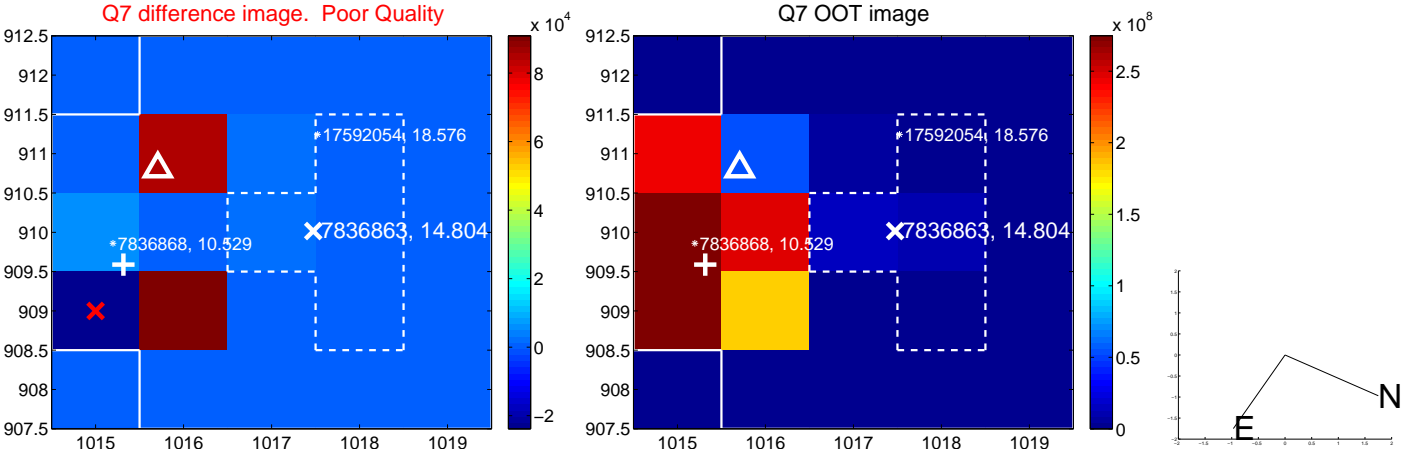
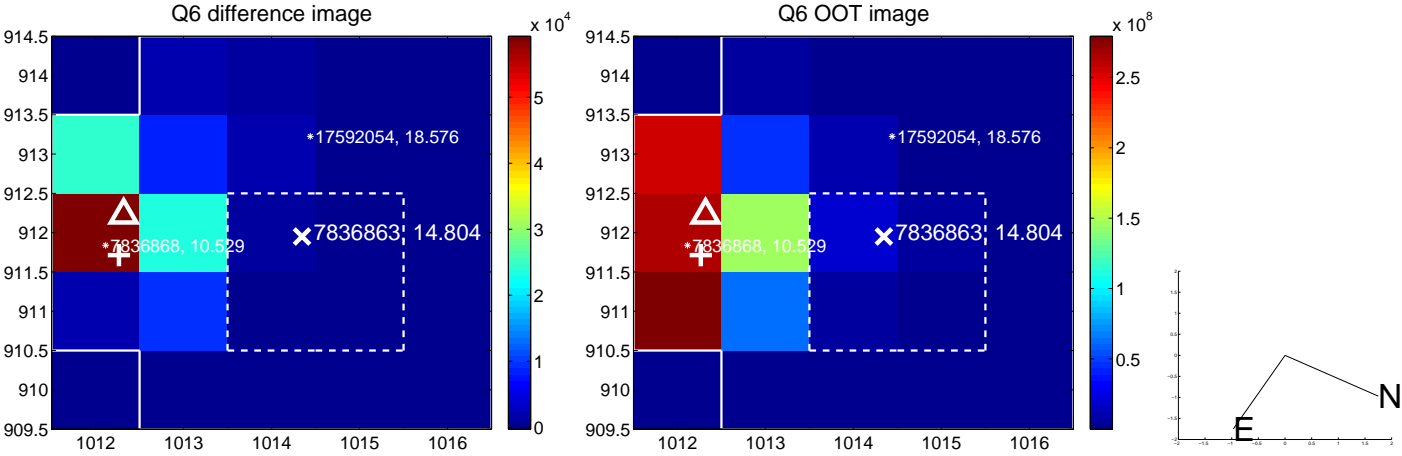
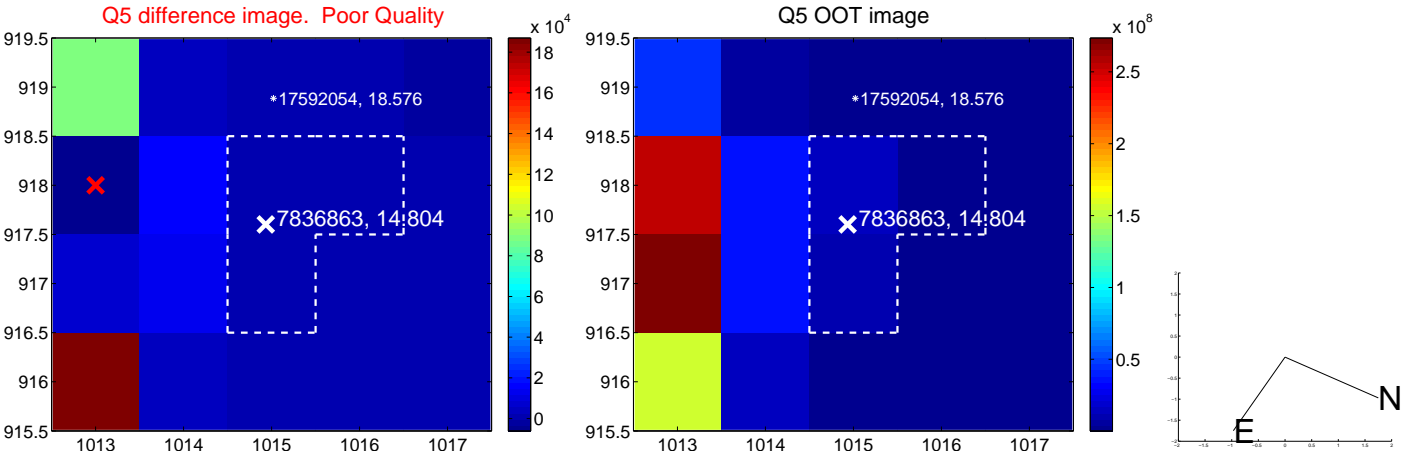


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

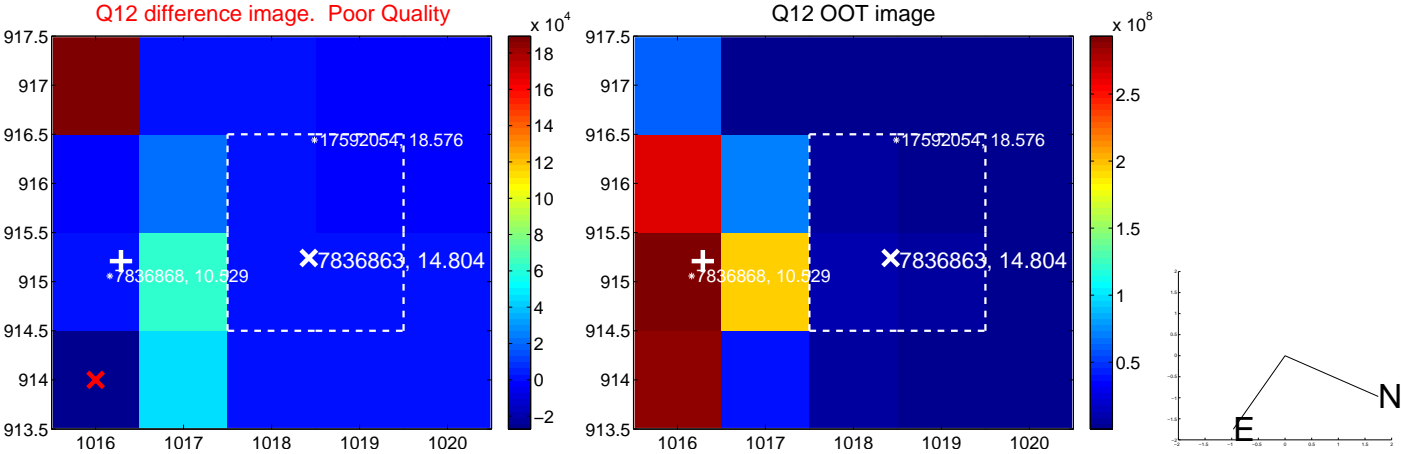
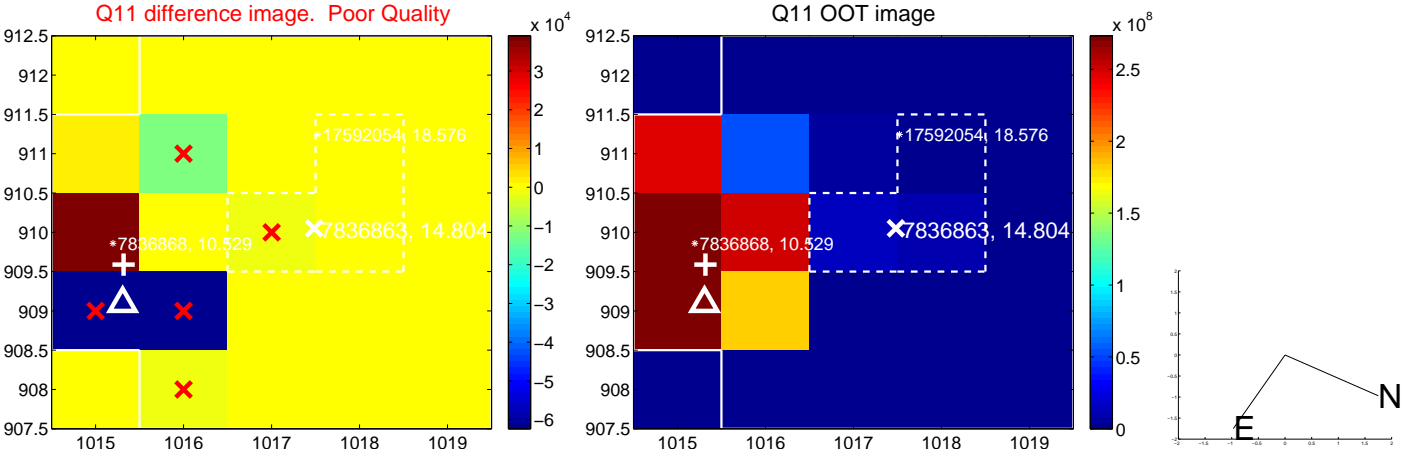
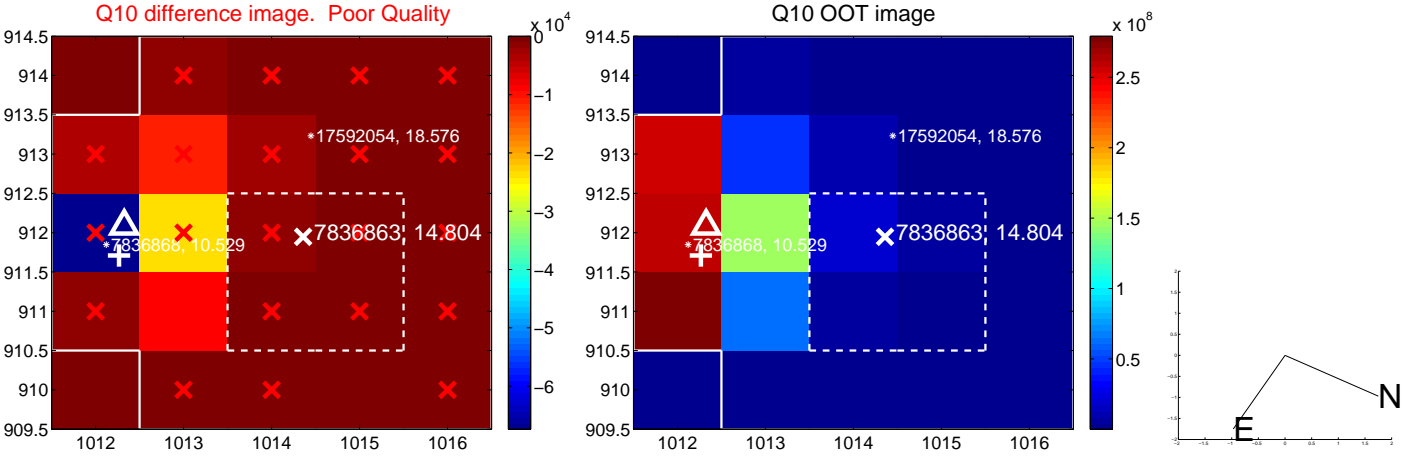
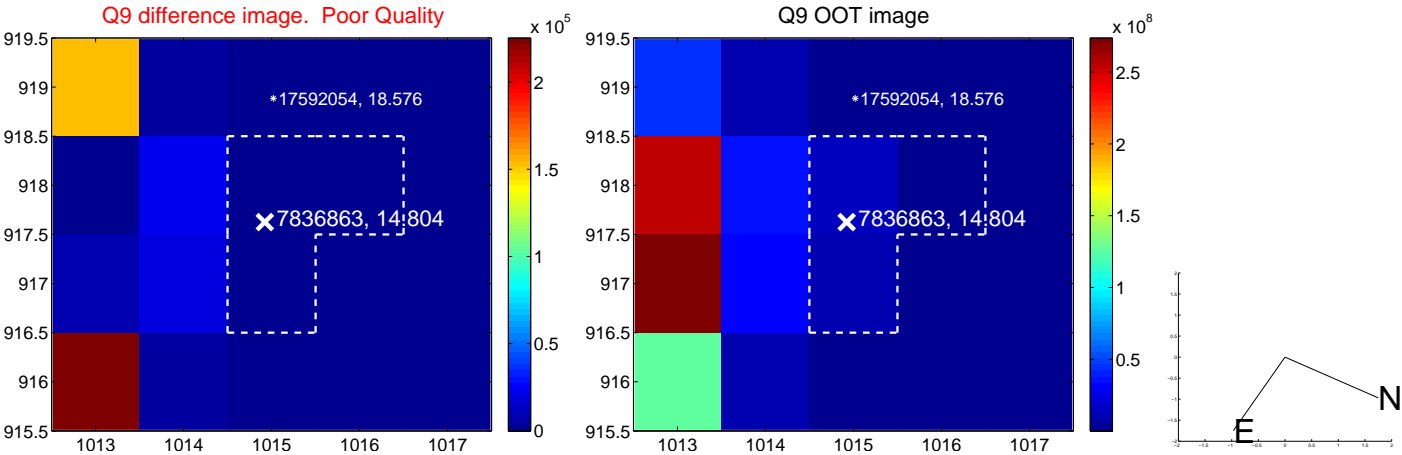


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

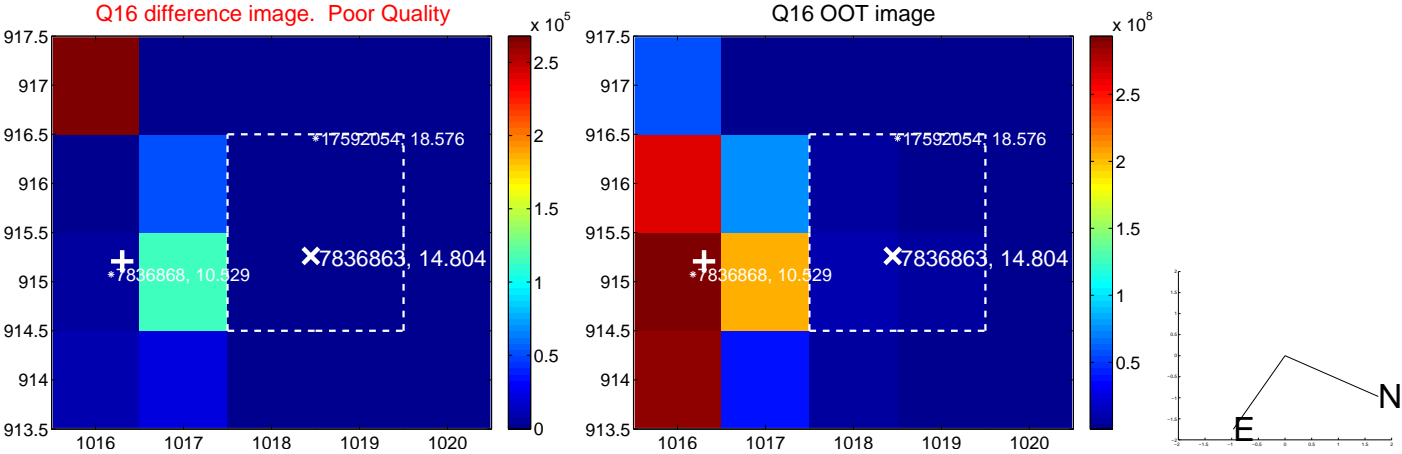
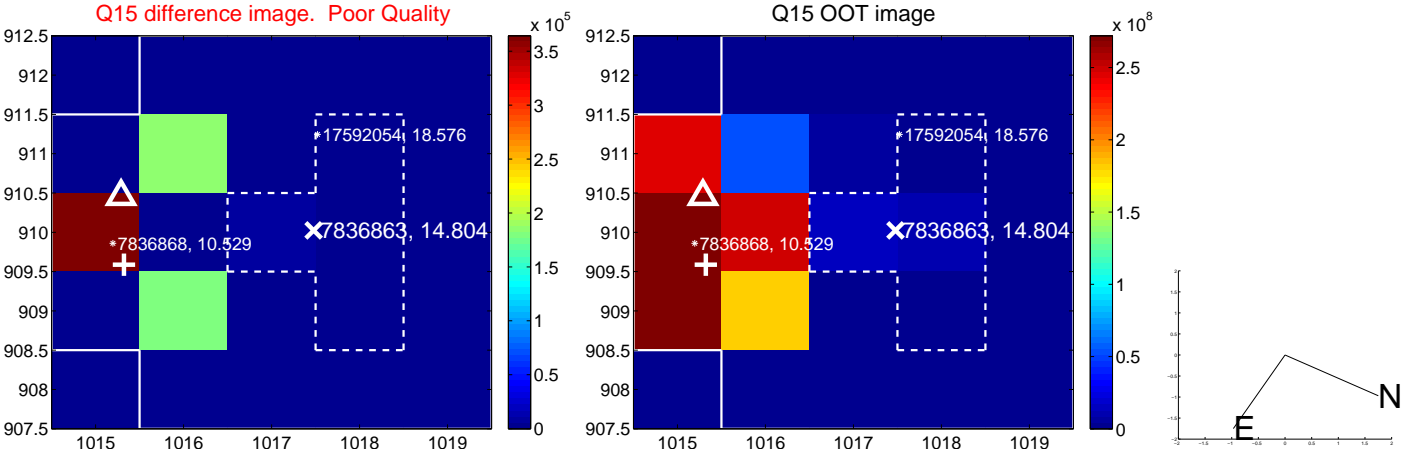
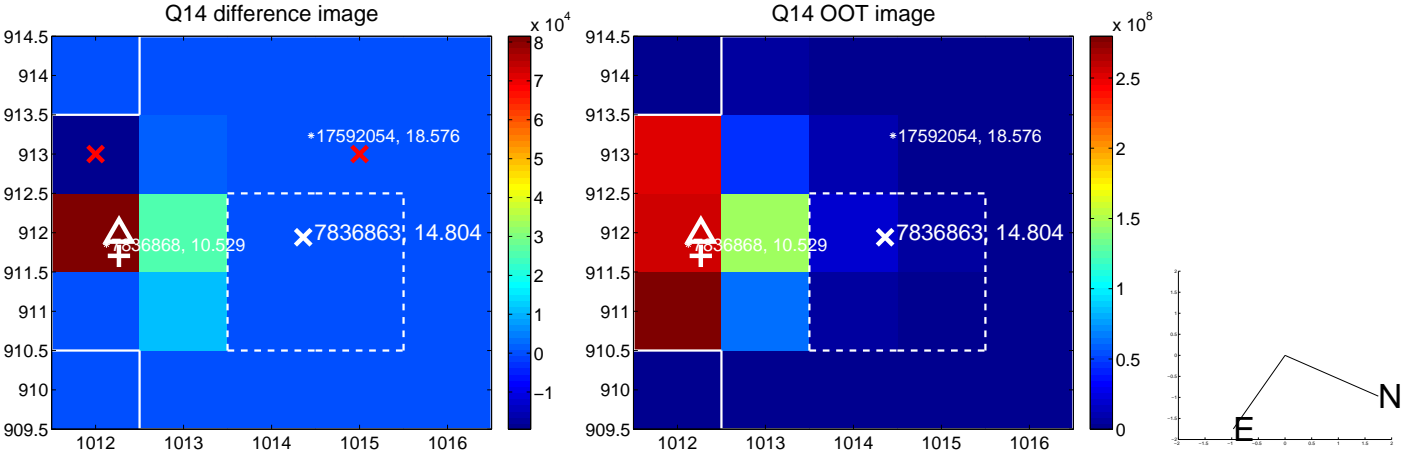
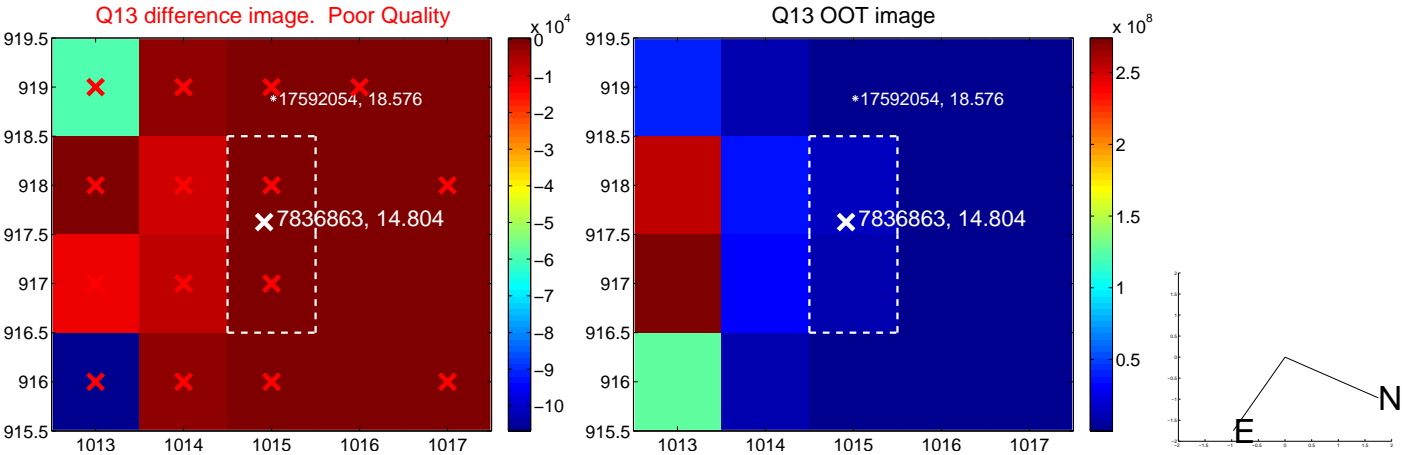




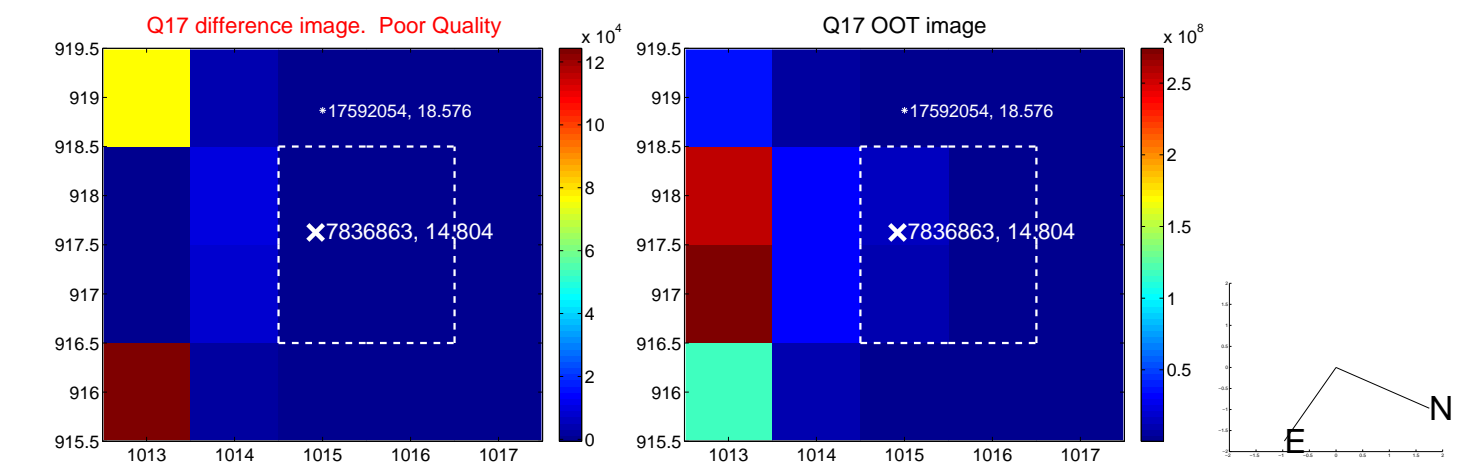
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



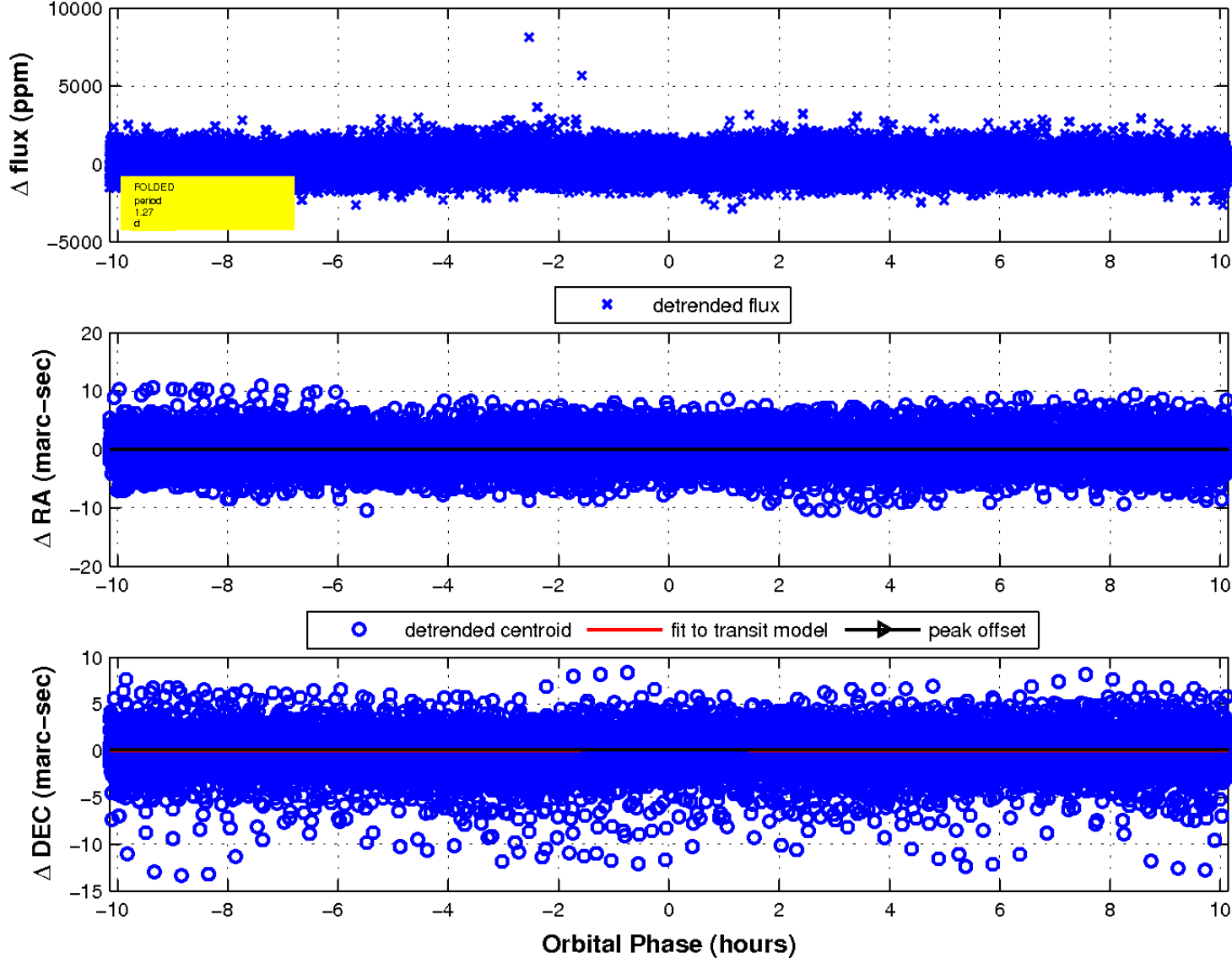
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



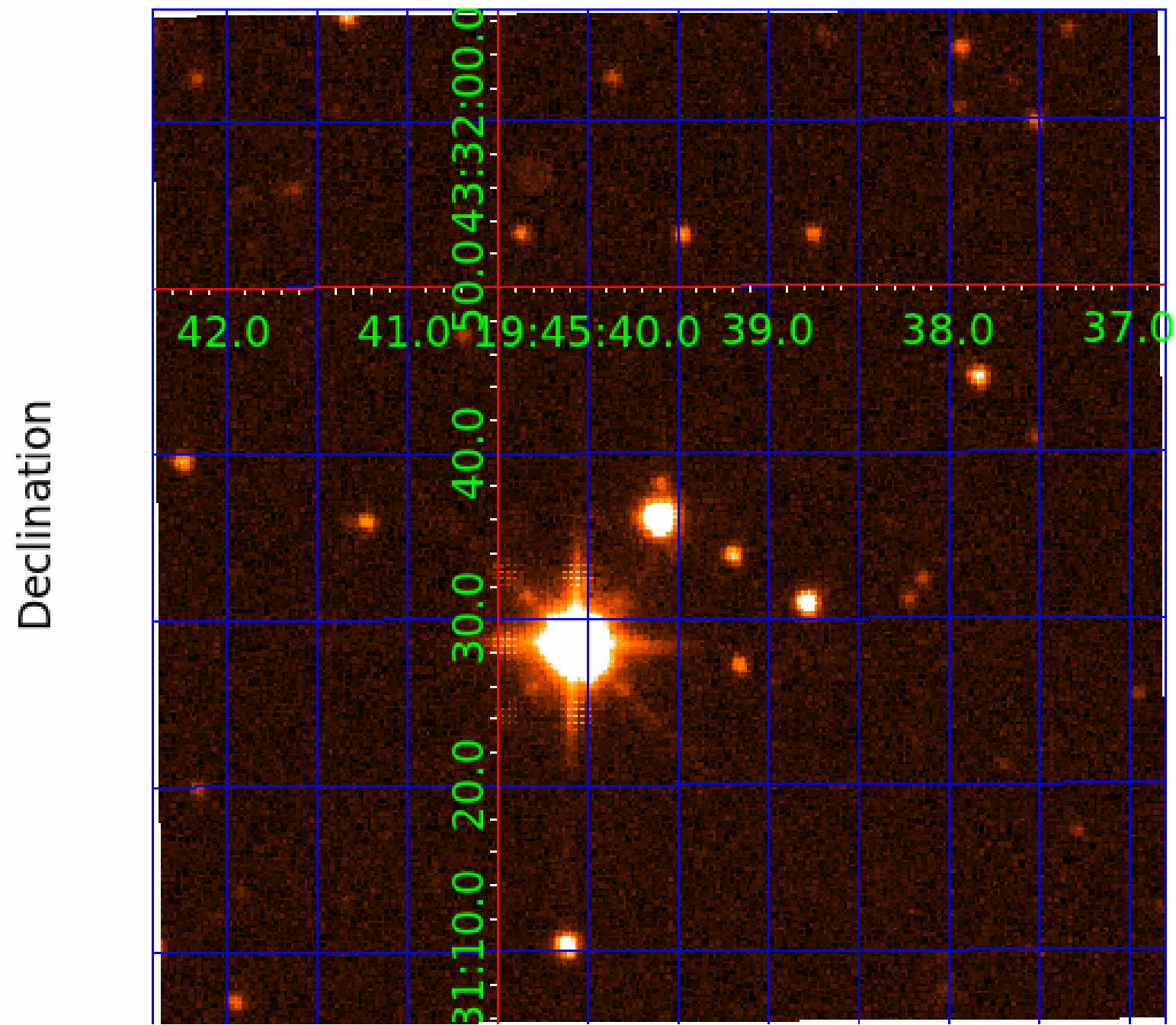
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 007836863

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007836863-01	OBS	No	1.267858	131.638598	106.6	3.380	9.3	8.4	0.82	5271	1.01	993.54
007836863-02	OBS	No	9.556922	131.643973	266.6	7.682	7.3	7.2	0.82	5271	1.52	67.22

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007836863-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET
007836863-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—CENT_RESOLVED_OFFSET

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

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

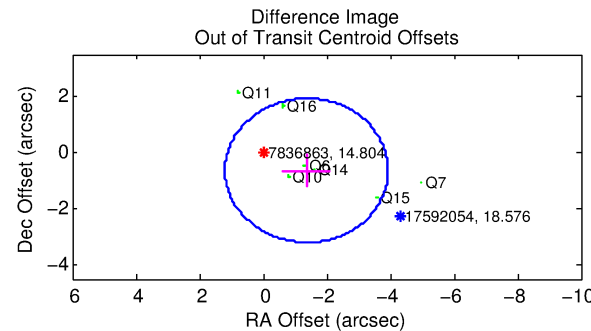
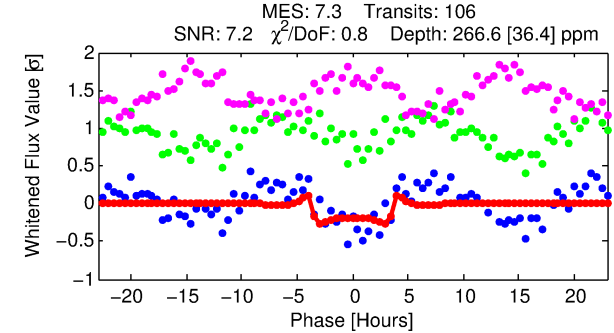
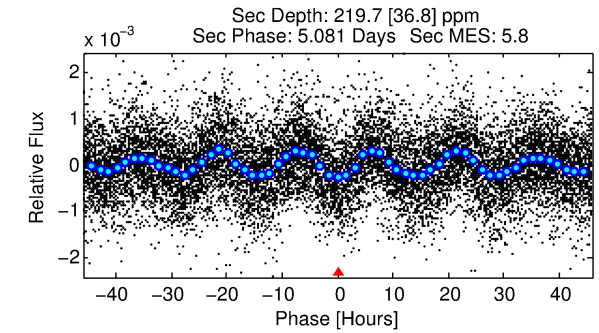
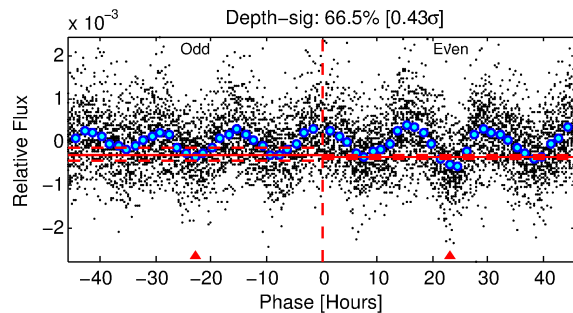
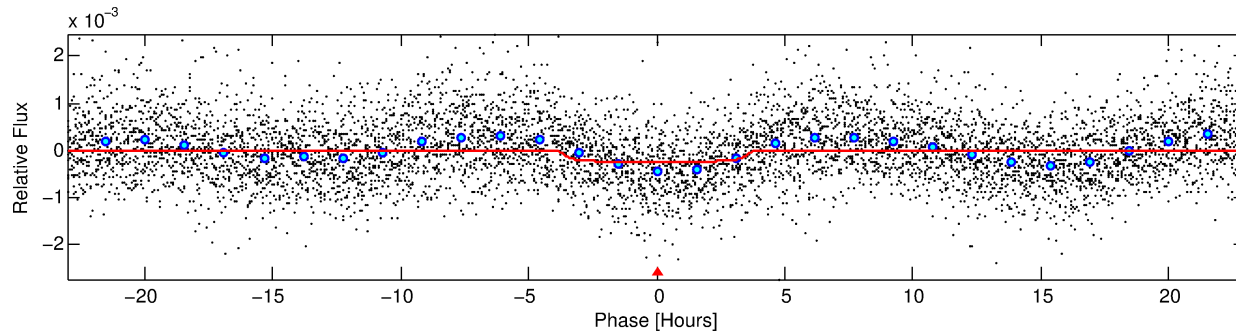
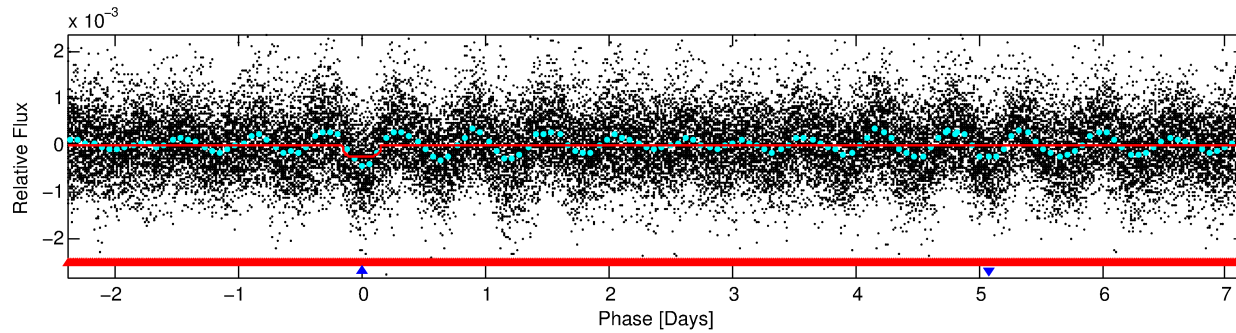
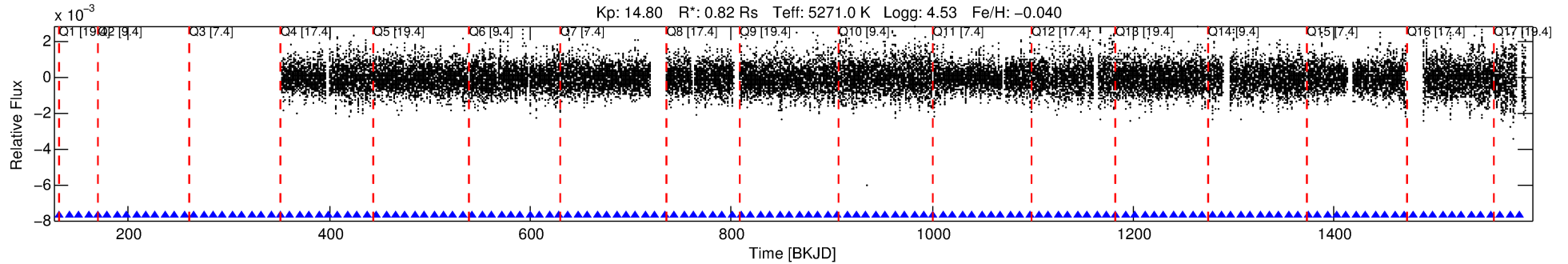
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007836863-02

No Significant Match Found

# DV One-Page Summary

KIC: 7836863 Candidate: 2 of 2 Period: 9.557 d



## DV Fit Results:

Period = 9.55692 [0.00011] d  
Epoch = 131.6440 [0.0098] BKJD  
Rp/R\* = 0.0170 [0.0047]  
a/R\* = 5.63 [5.88]  
b = 0.83 [0.40]  
Seff = 67.22 [15.99]  
Teq = 730 [43] K  
Rp = 1.52 [0.49] Re  
a = 0.0829 [0.0111] AU  
Ag = 360.42 [219.48] [1.64σ]  
Teff = 4919 [731] K [5.72σ]

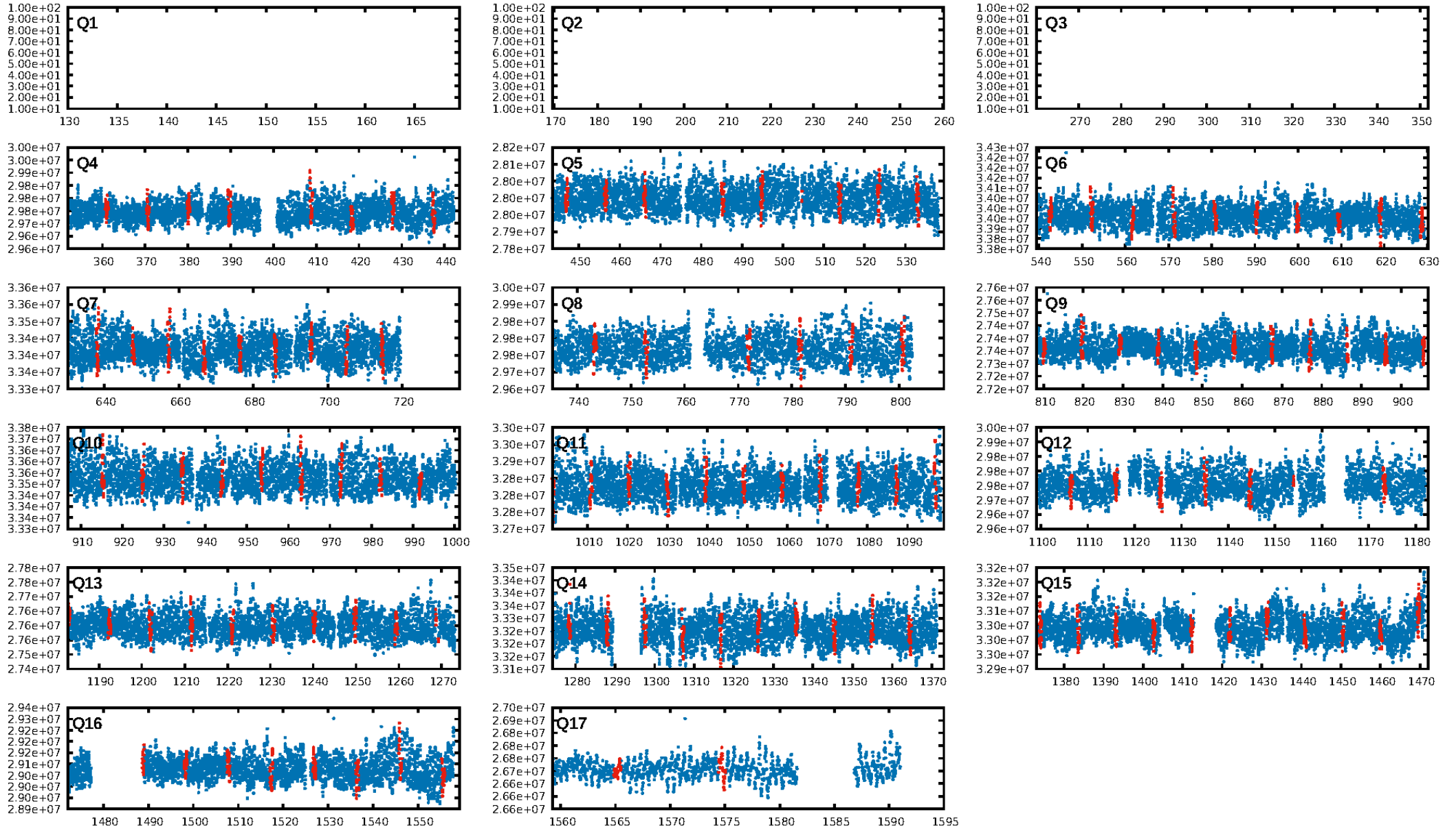
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.70σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 96.9%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 8.71e-12**  
RollingBand-fgt: 1.00 [104/104]  
**GhostDiagnostic-chr: -1.642**  
Centroid-sig: 13.6%  
**Centroid-so: 4.700 arcsec [12.69σ]**  
OotOffset-rm: 1.503 arcsec [1.76σ]  
**KicOffset-rm: 8.174 arcsec [18.03σ]**  
OotOffset-st: 3/3/1/0 [7]  
KicOffset-st: 3/3/1/1 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 0.00 [0/14]

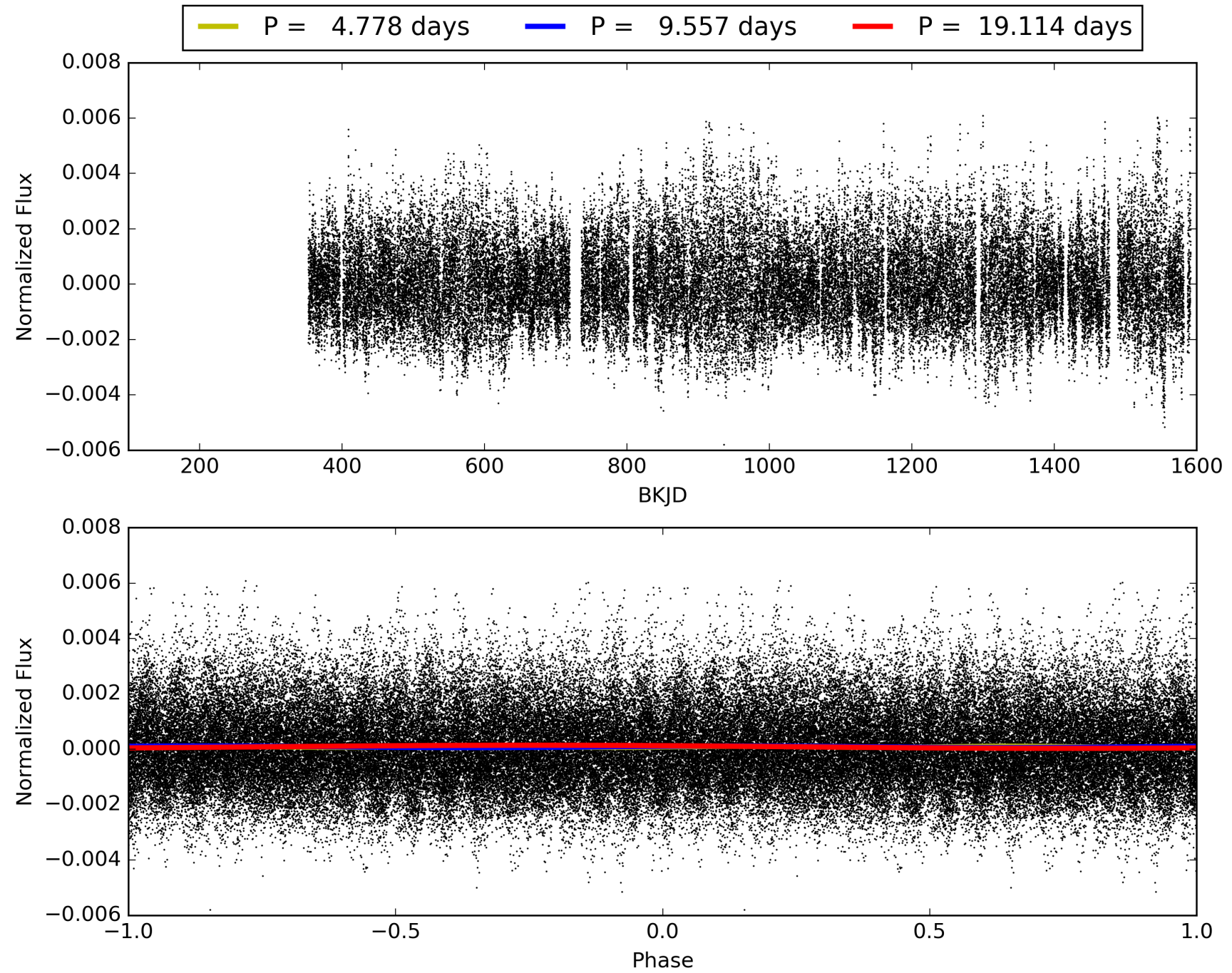
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:18:36 Z

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

# TCE 007836863-02, PDC Light Curves



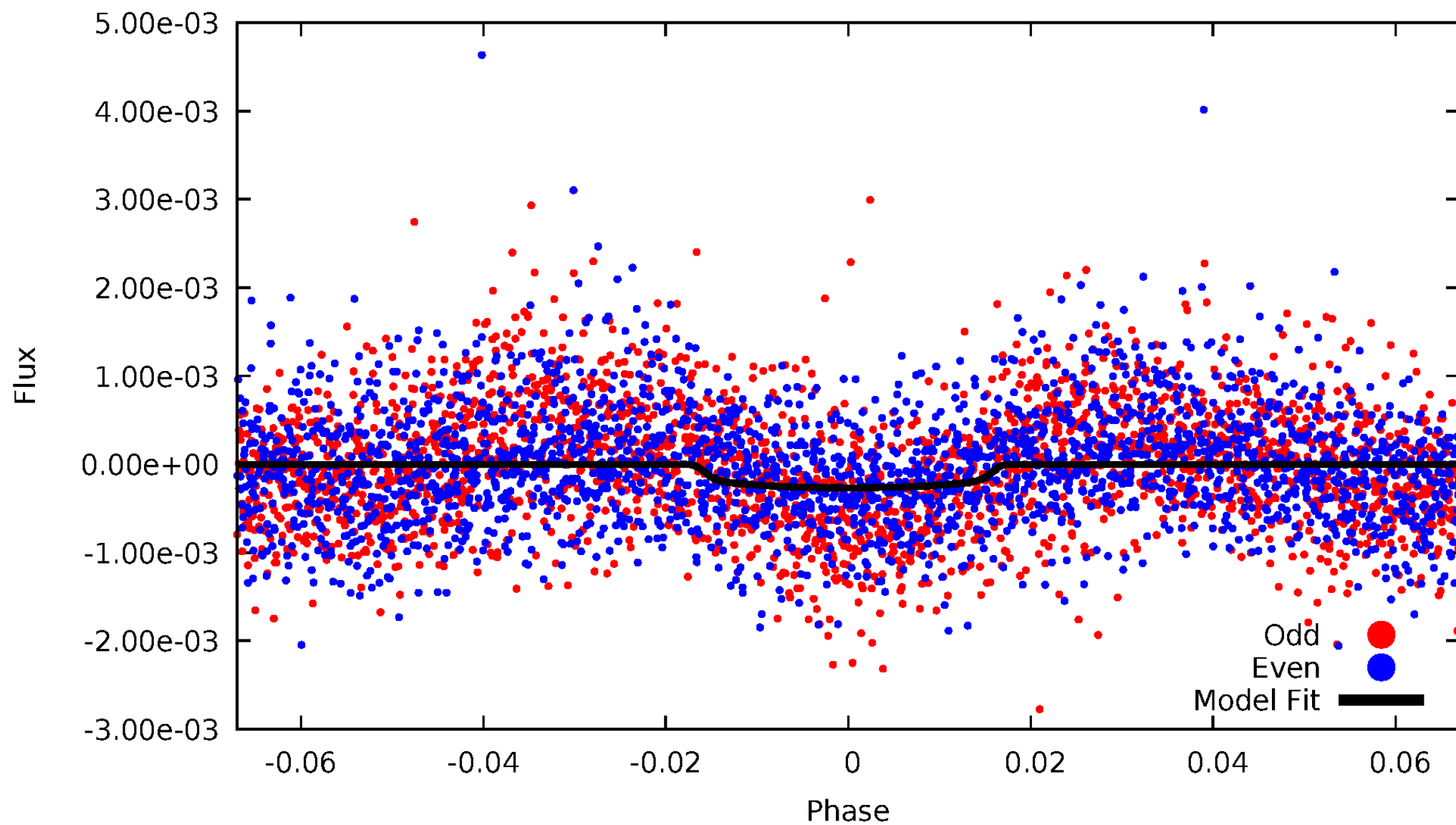
TCE 007836863-02





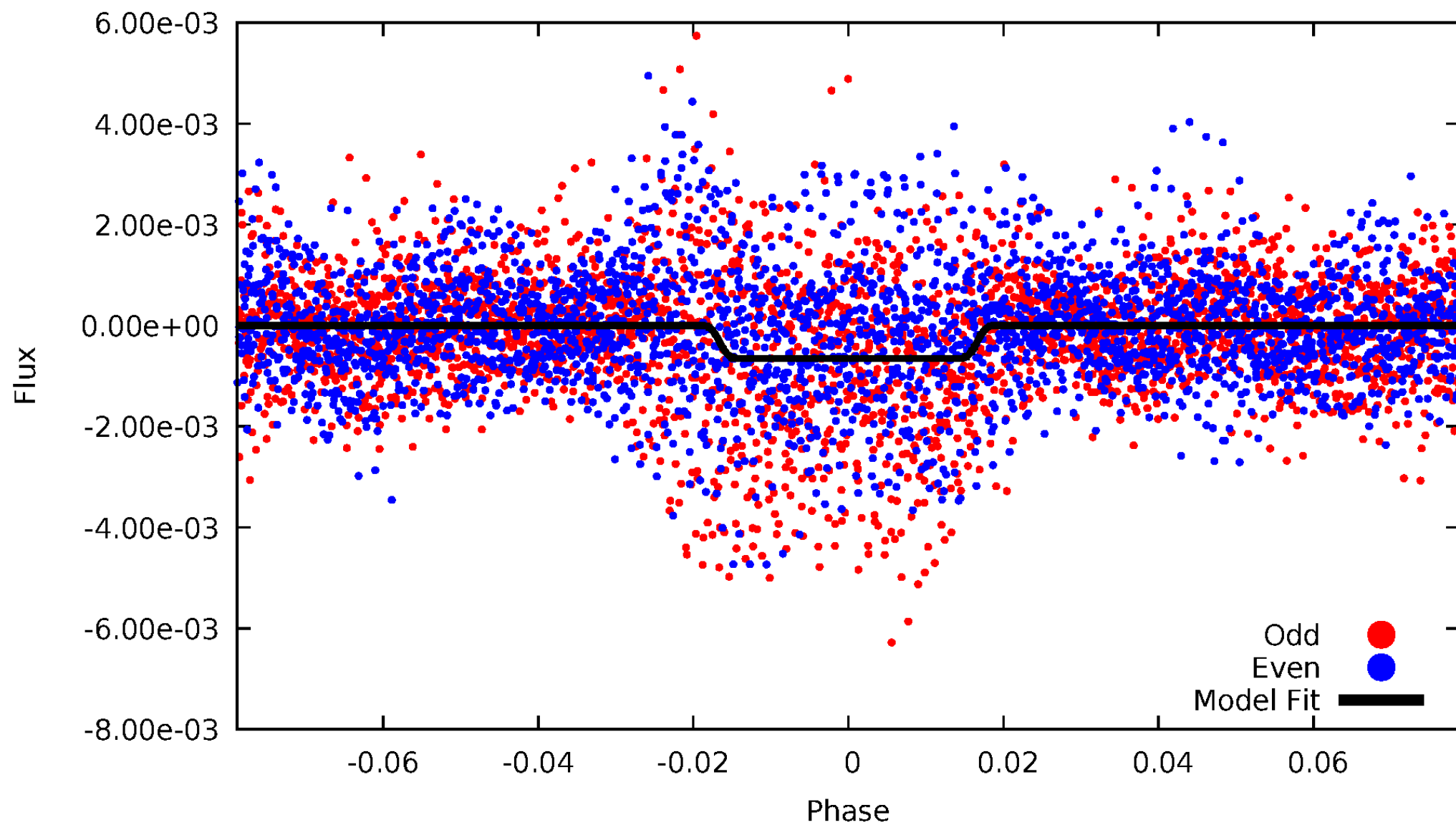
# DV Odd/Even

TCE 007836863-02



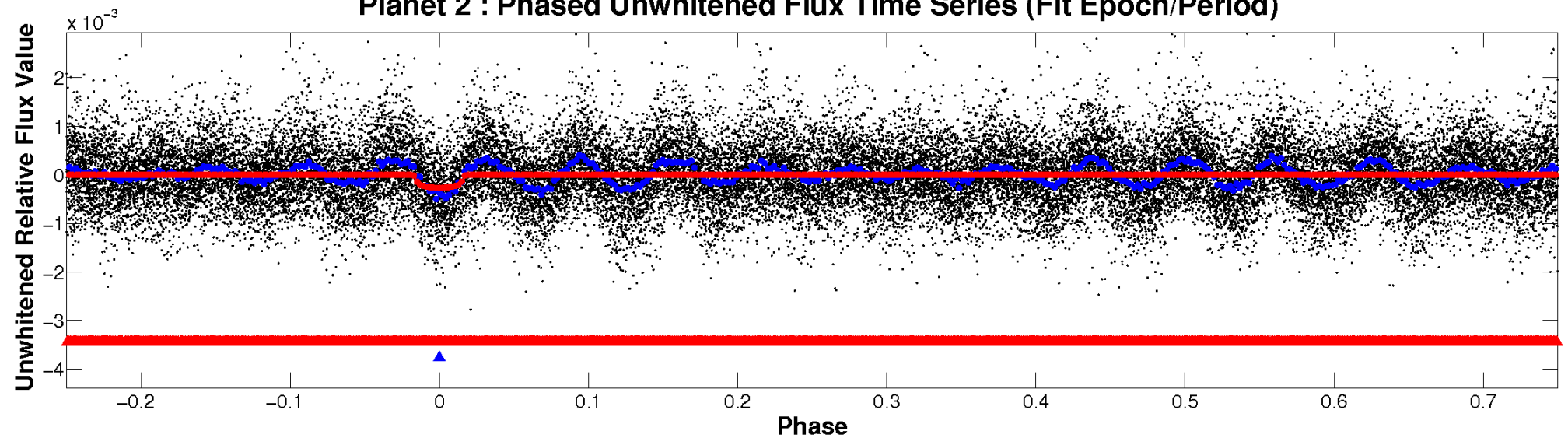
# ALT Odd/Even

TCE 007836863-02

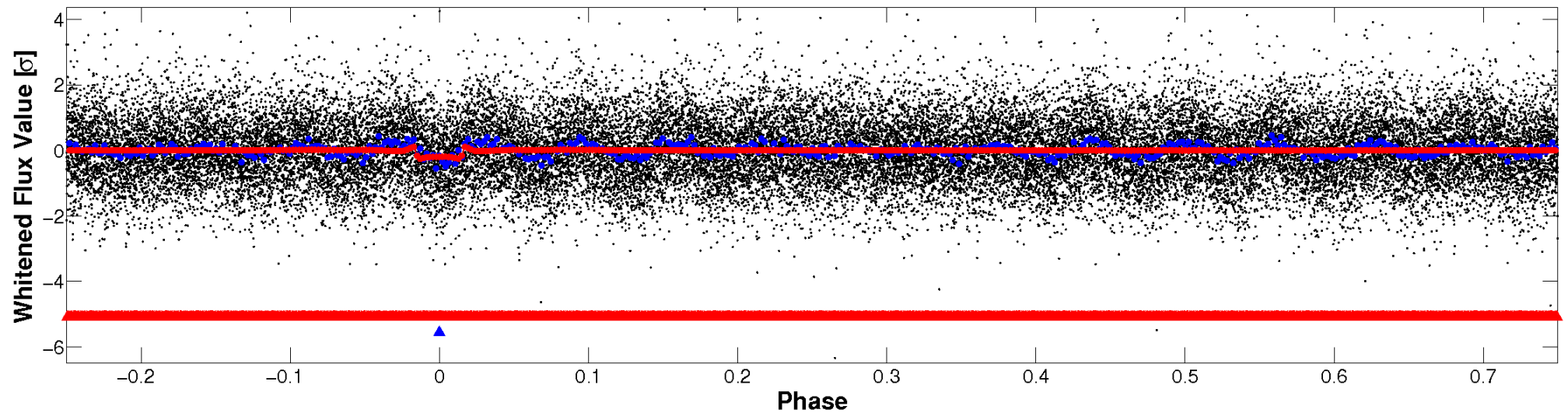


# Non-Whitened Vs. Whitened Light Curve

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

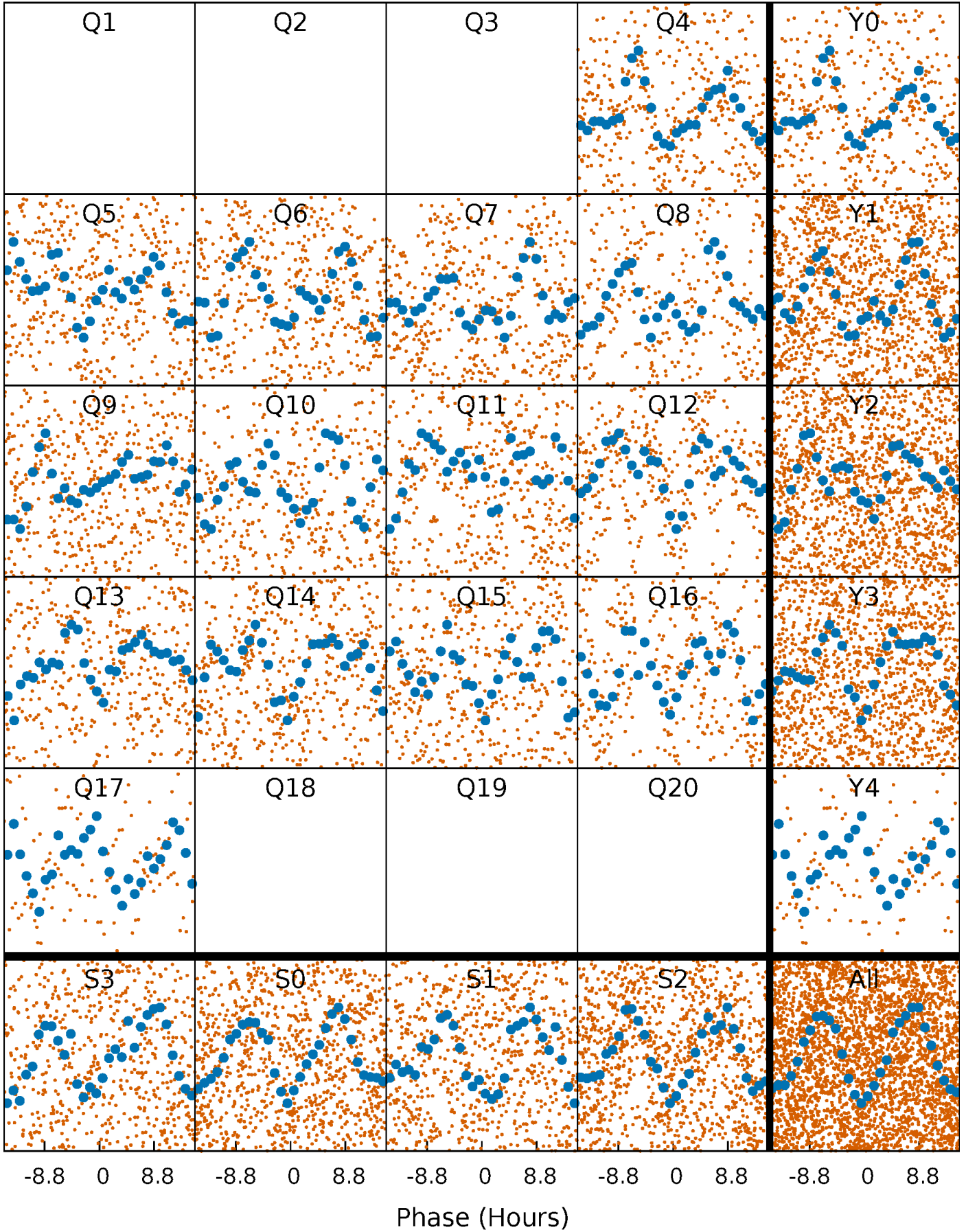


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



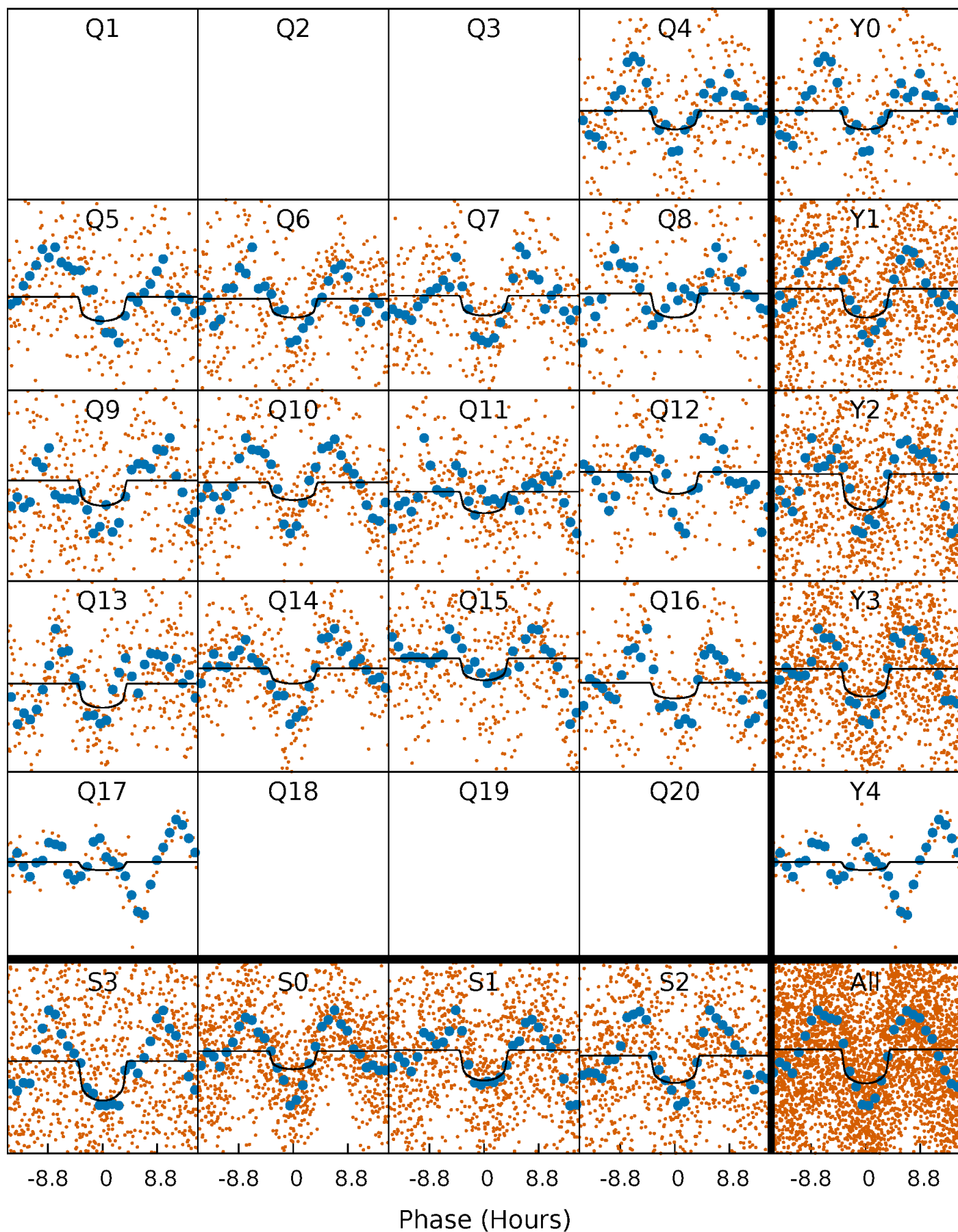
# PDC Quarter-Phased Transit Curves

TCE 007836863-02 P= 9.556922 Days  $T_0=131.643973$  (BKJD)



# DV Quarter-Phased Transit Curves

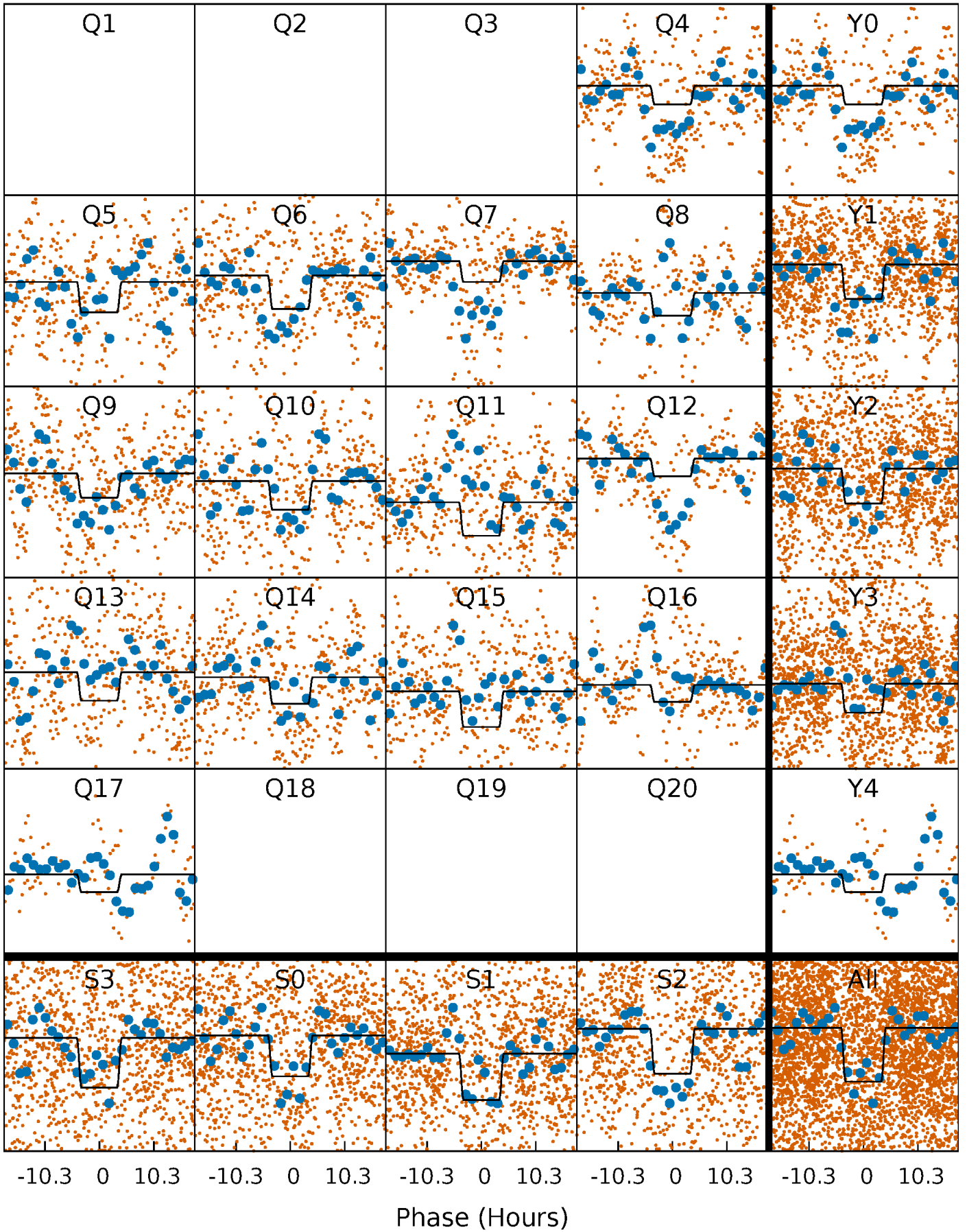
TCE 007836863-02 P= 9.556922 Days  $T_0=131.643973$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007836863-02 P= 9.556559 Days  $T_0=131.703663$  (BKJD)

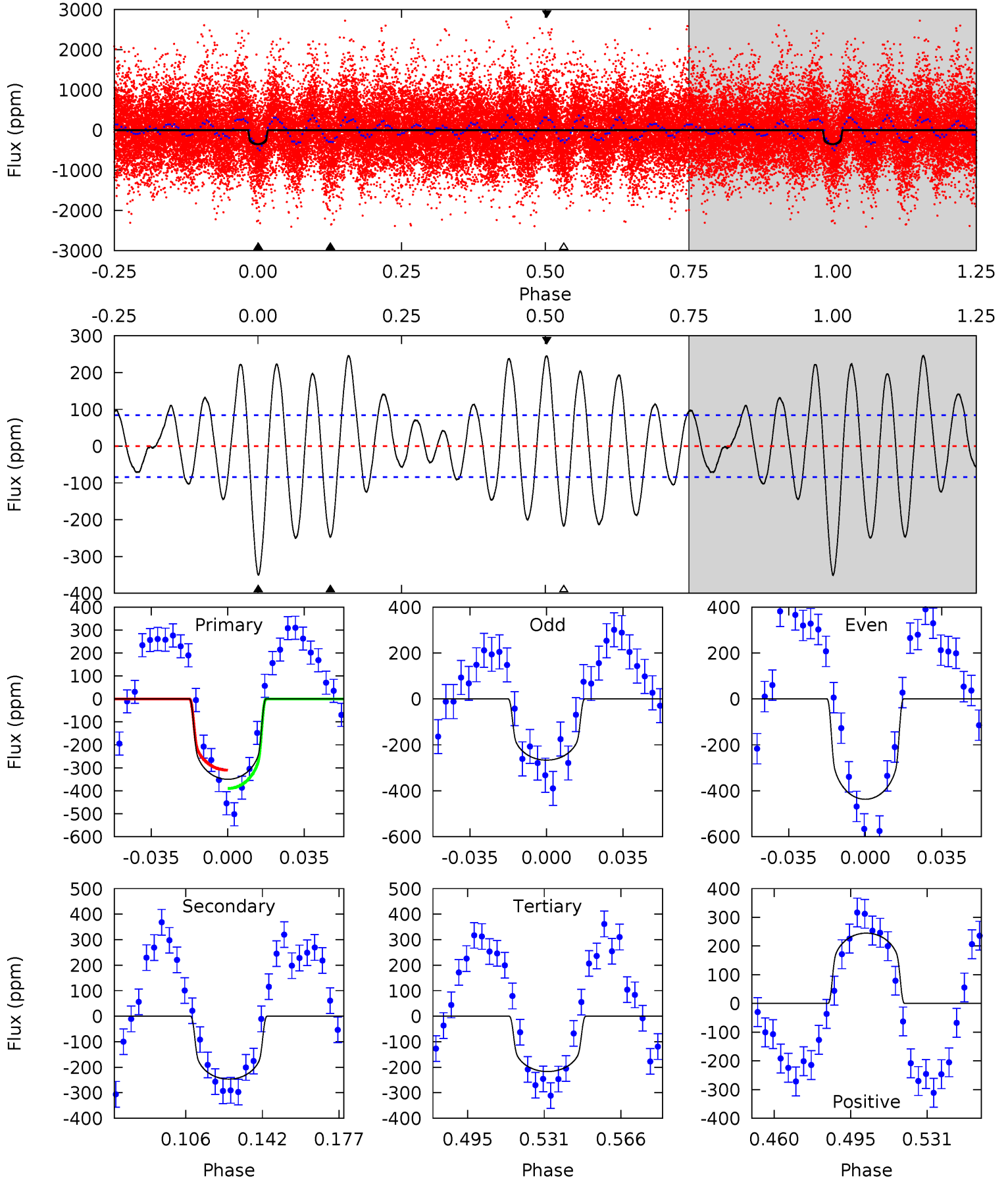




# DV Model-Shift Uniqueness Test

007836863-02, P = 9.556922 Days, E = 131.643973 Days

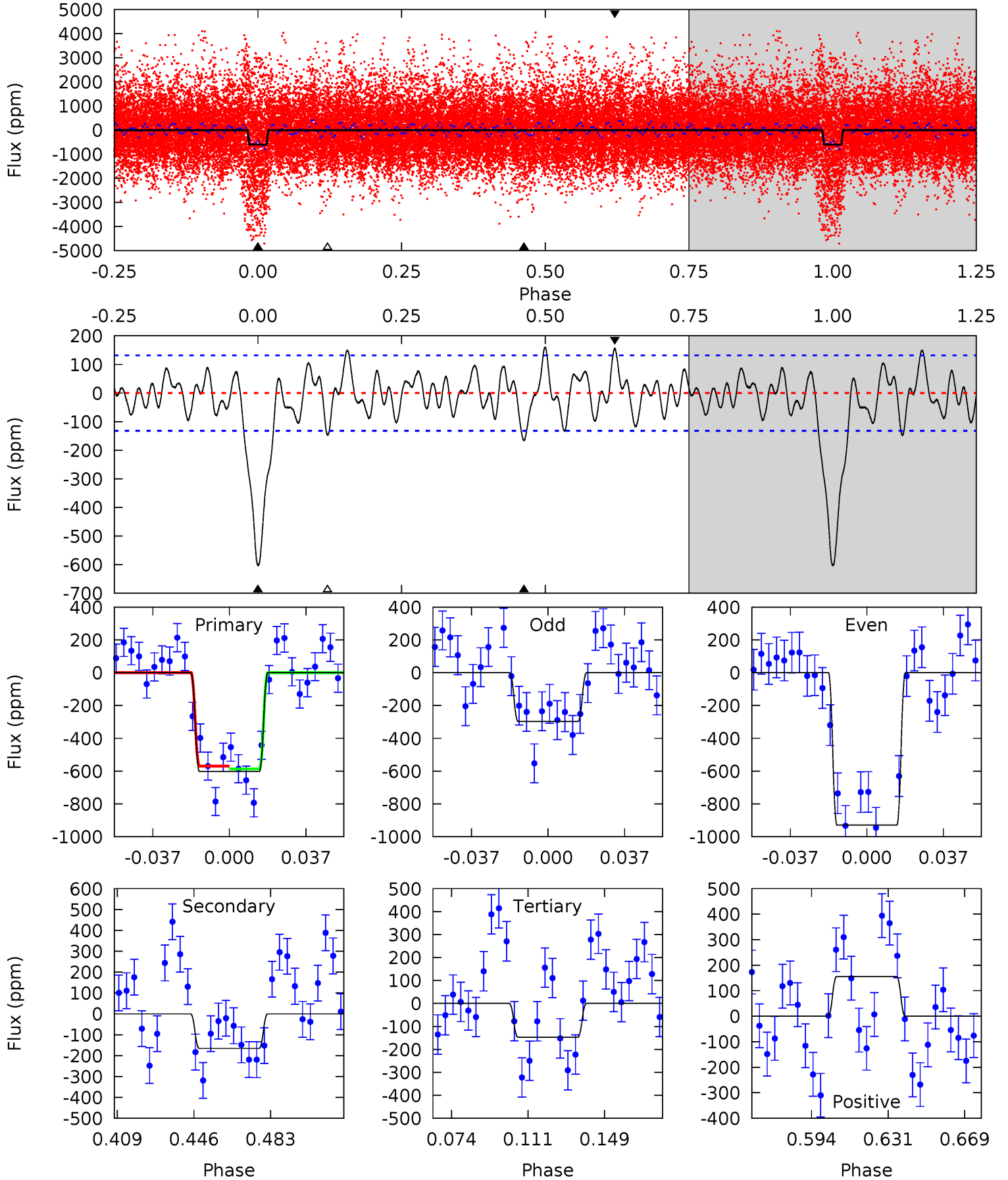
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	14.0	12.3	13.9	4.78	2.10	6.23	7.55	5.97	1.69	0.10	4.84	0.89	0.41	2.27



# Alt Model-Shift Uniqueness Test

007836863-02, P = 9.556559 Days, E = 131.703663 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	5.98	5.31	5.63	4.77	2.08	2.05	16.5	16.2	0.67	0.35	11.4	1.15	0.21	0.31



### Stellar Parameters For KIC 007836863

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5271^{+184}_{-184}$	$4.533^{+0.064}_{-0.104}$	$-0.040^{+0.300}_{-0.300}$	$0.817^{+0.132}_{-0.081}$	$0.831^{+0.093}_{-0.078}$	$2.145^{+0.580}_{-0.647}$
	+3%/-3%	+1%/-2%	+750%/-750%	+16%/-10%	+11%/-9%	+27%/-30%
Source	KIC0	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 007836863-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-247 \pm 18$	$1.53^{+0.45}_{-0.44}$	$1029^{+47}_{-47}$	$5114^{+832}_{-535}$	$401^{+385}_{-162}$
Alt.	$-165 \pm 28$	$2.29^{+0.45}_{-0.46}$	$1026^{+53}_{-44}$	$4023^{+380}_{-285}$	$119^{+73}_{-40}$

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

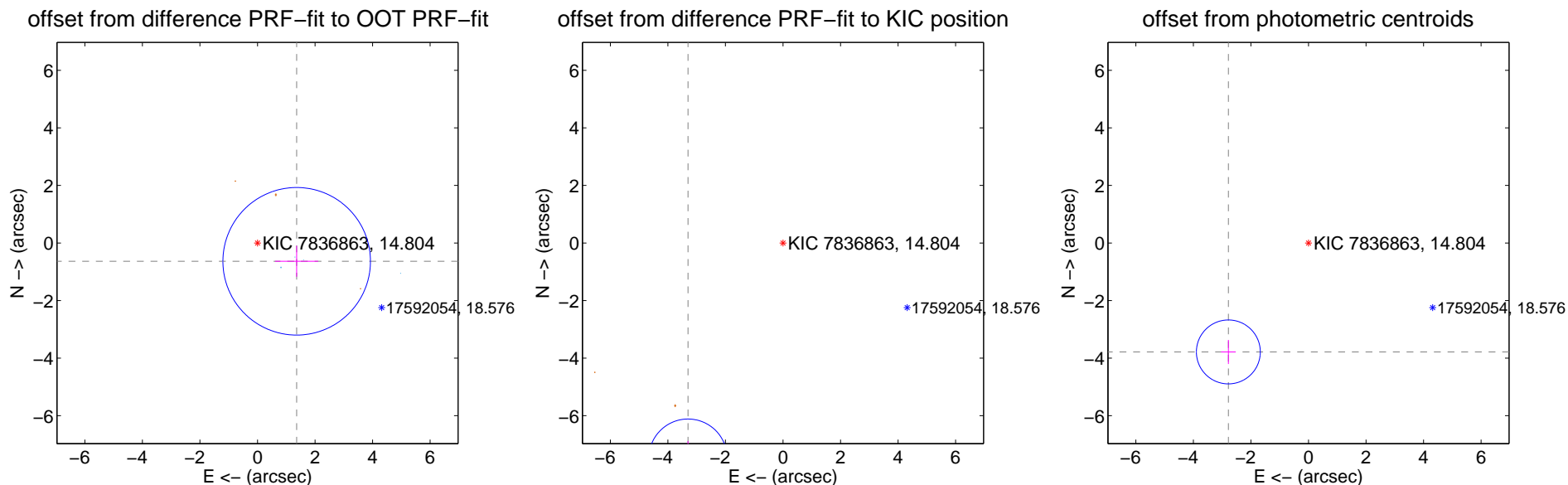
## DV Centroid Data

Supplemental centroid analysis for 007836863-02. Kepler magnitude: 14.80. Transit SNR 7.19

There are 4 quarters with good PRF difference image offsets

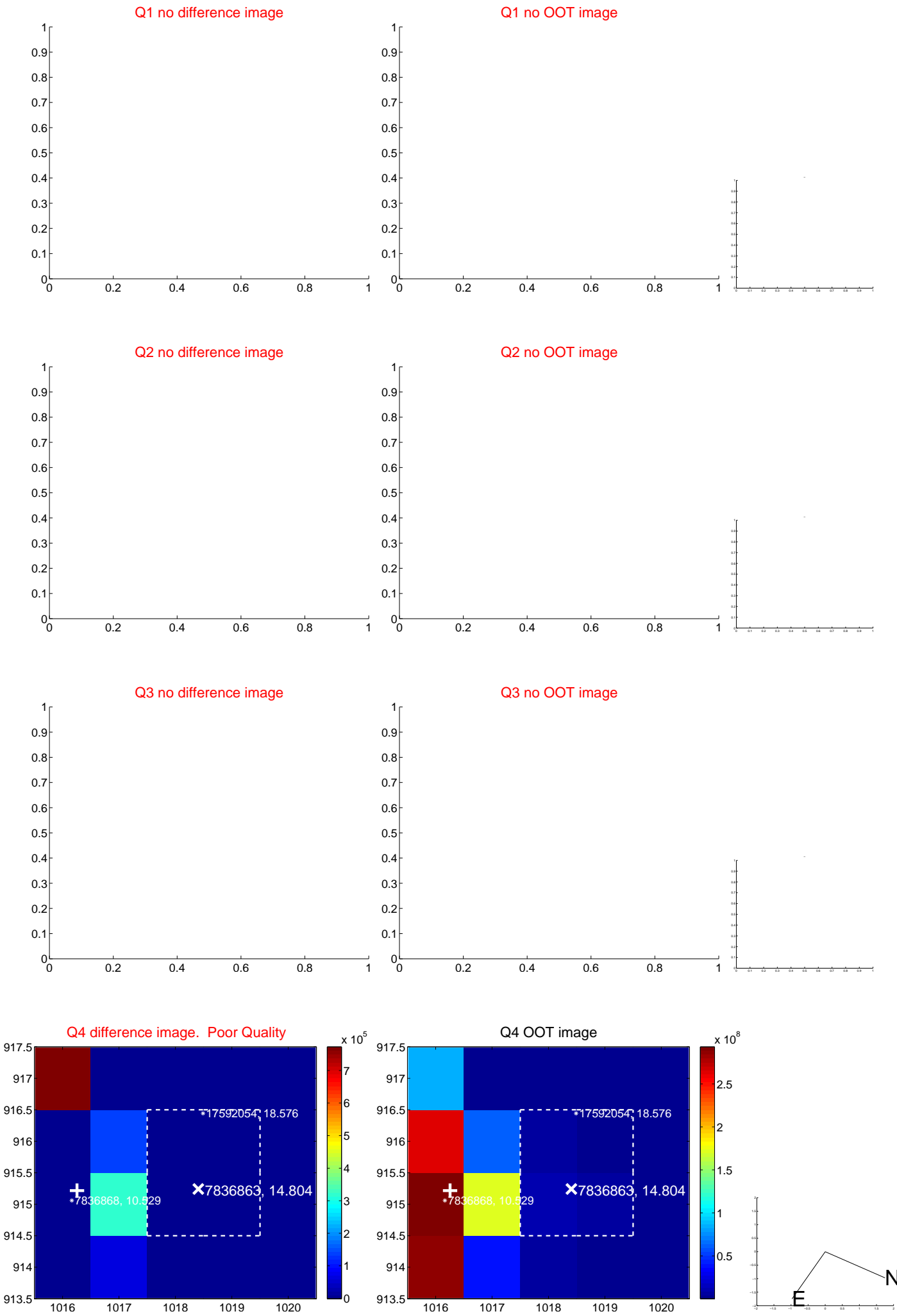
The OOT PRF centroid is offset from the target star catalog position by about 8.54 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.503 \pm 0.855$	1.76	$-1.362 \pm 0.749$	$-0.636 \pm 0.537$
PRF-fit source offset from KIC position	$8.174 \pm 0.453$	18.03	$3.302 \pm 0.546$	$-7.478 \pm 0.597$
photometric centroid source offset	$4.70 \pm 0.37$	12.69	$2.79 \pm 0.26$	$-3.79 \pm 0.42$



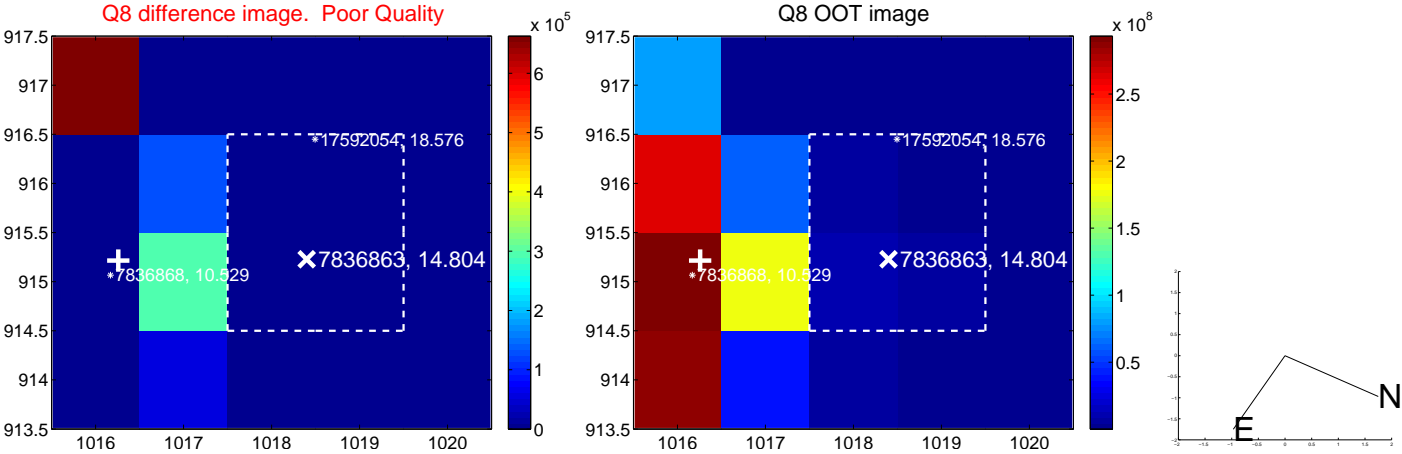
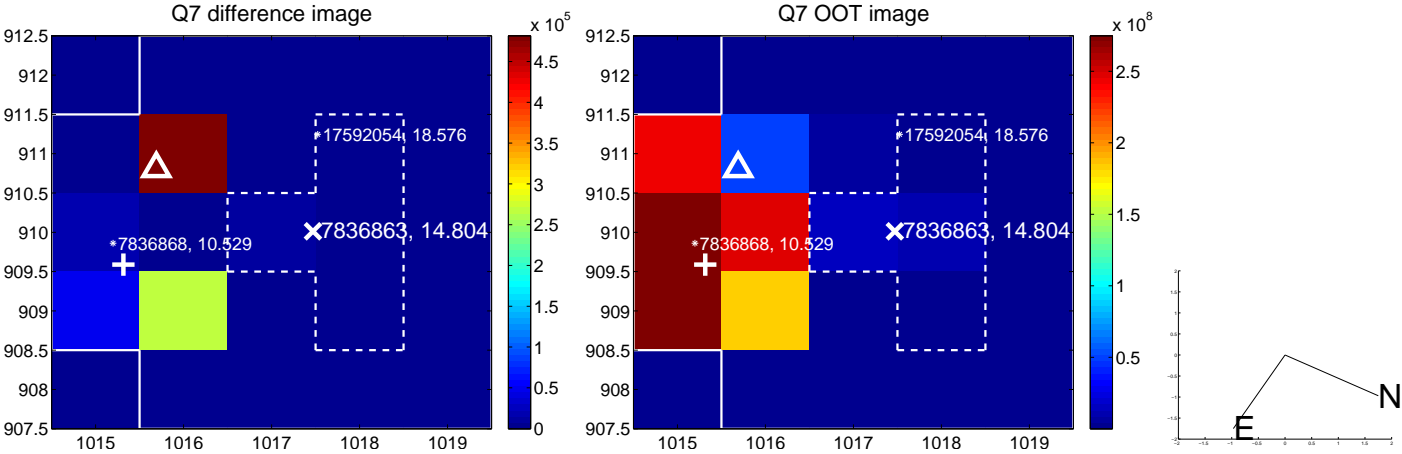
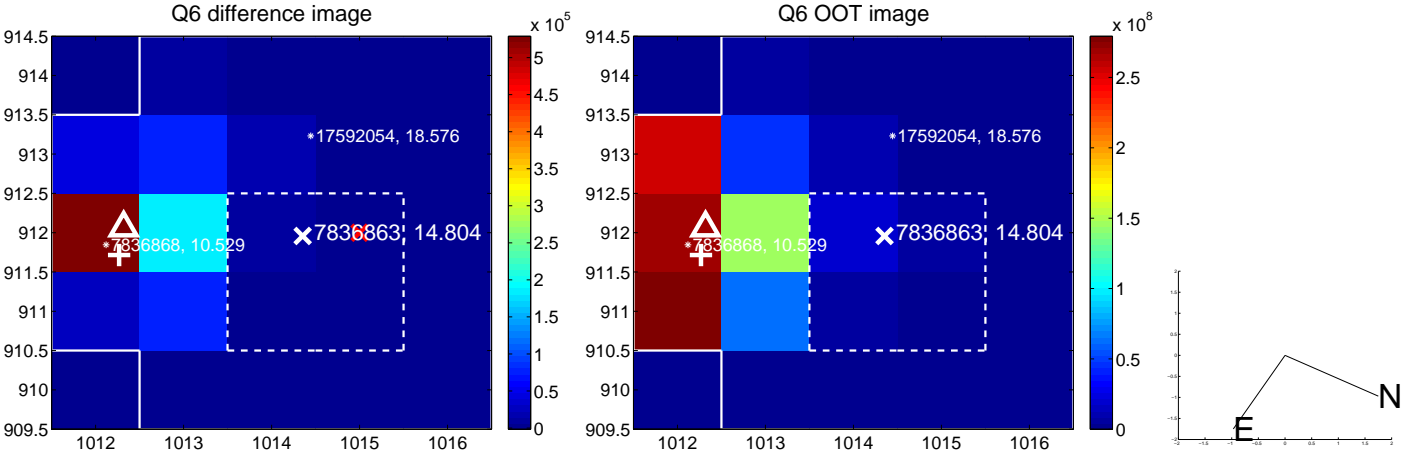
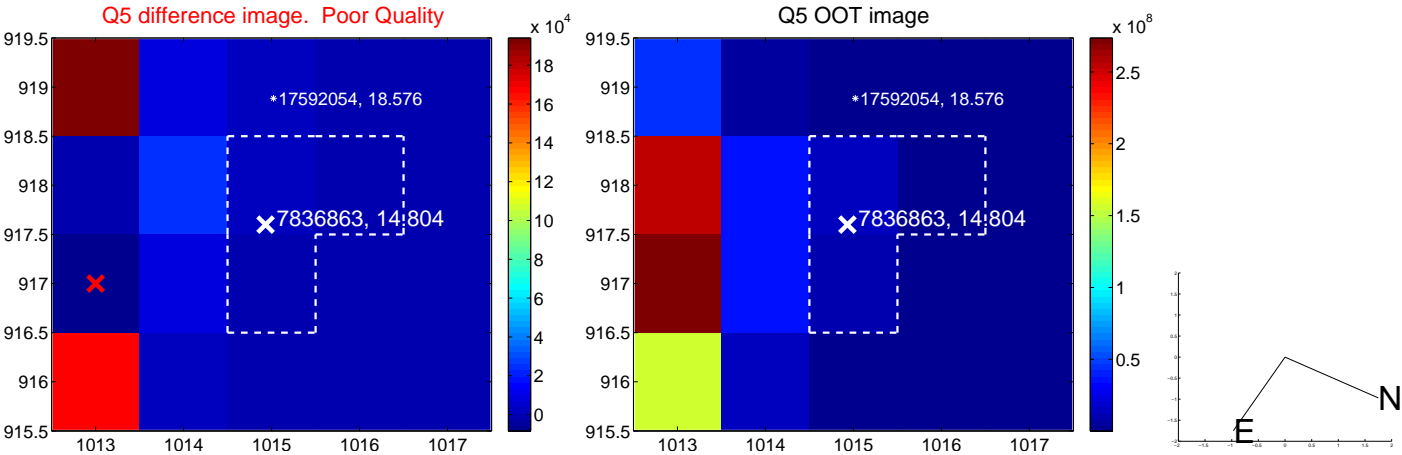
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

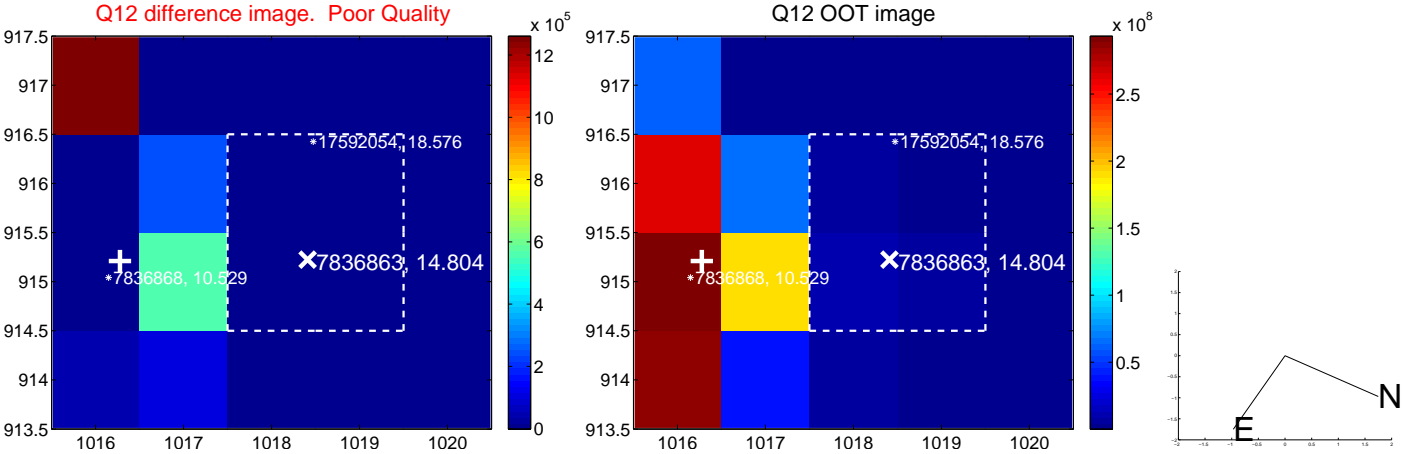
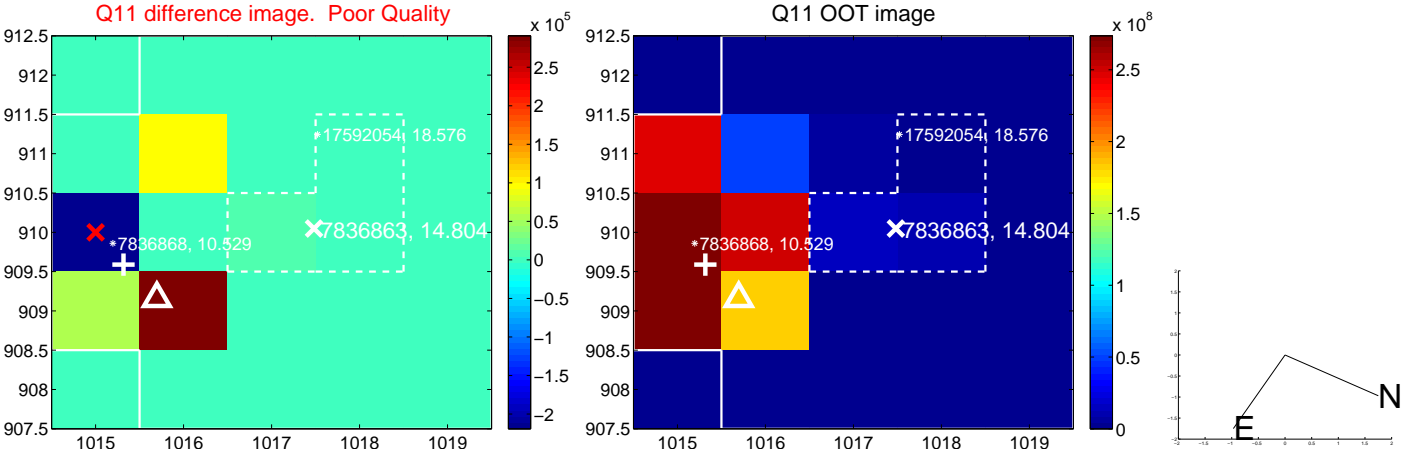
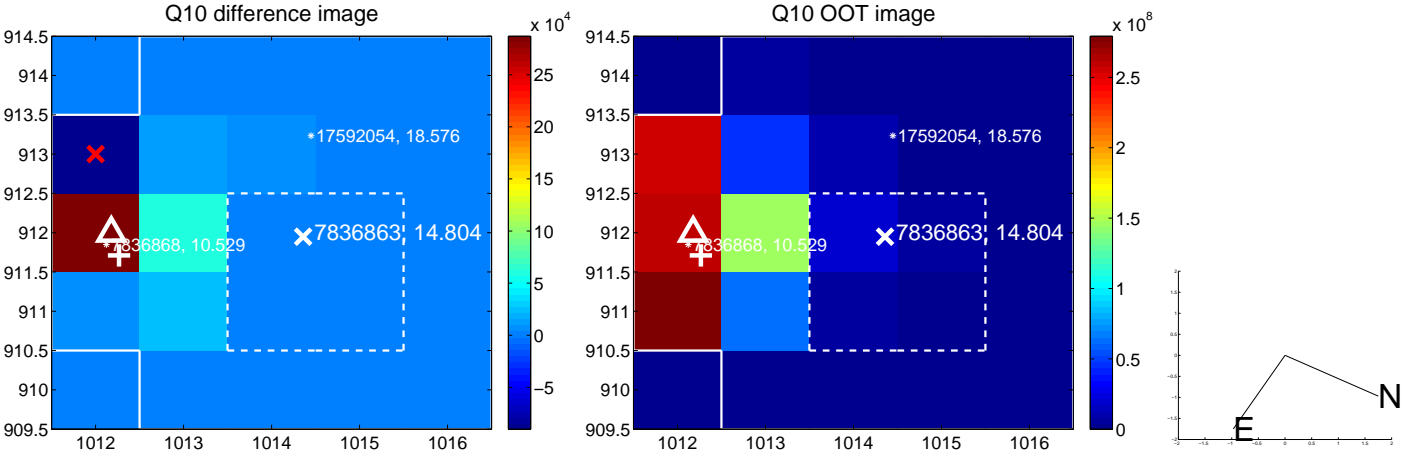
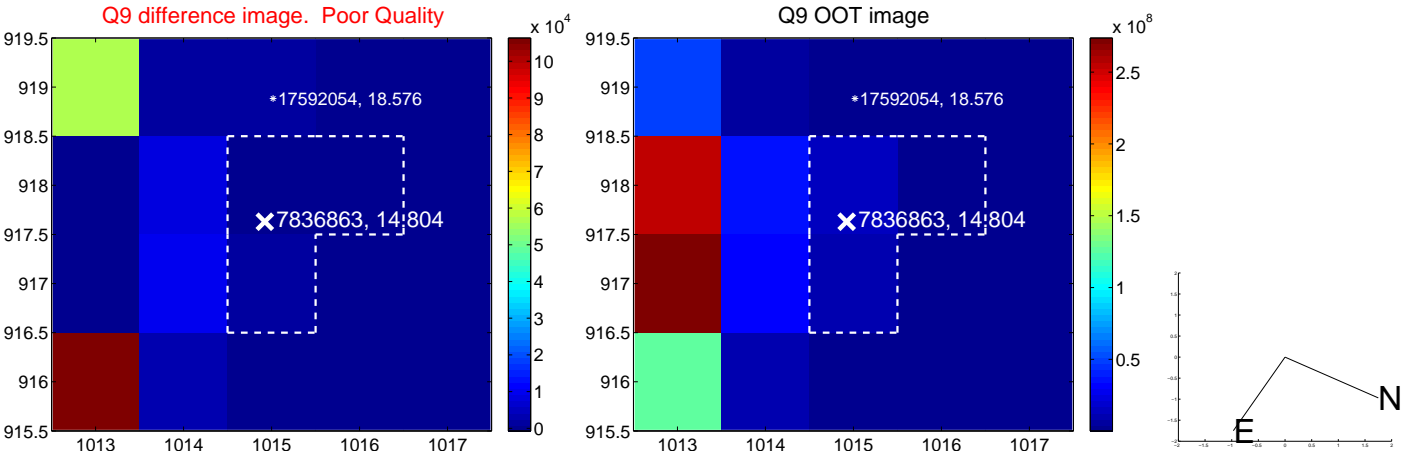




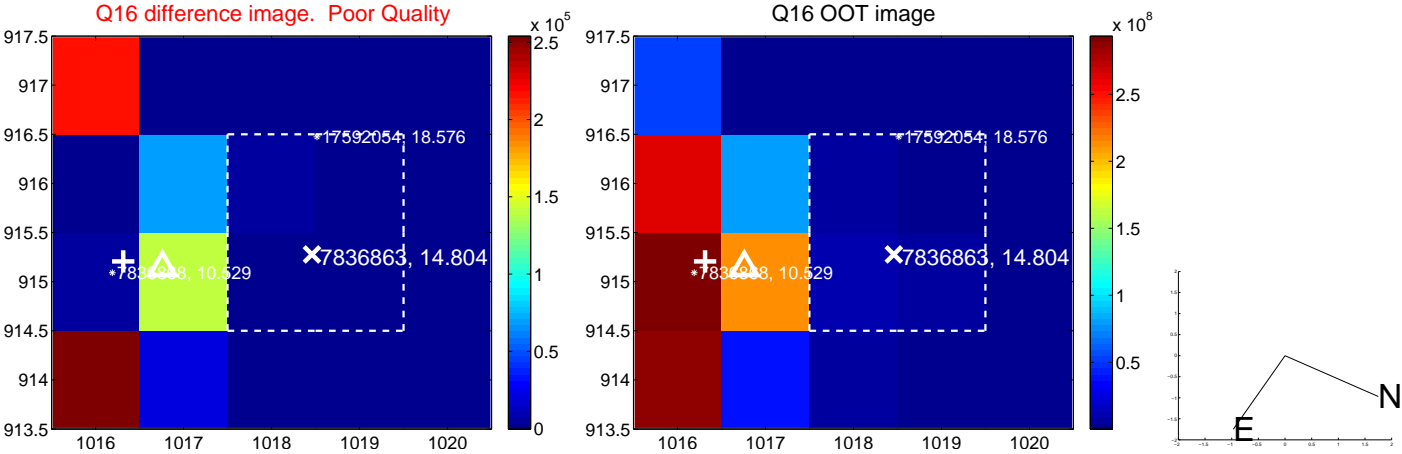
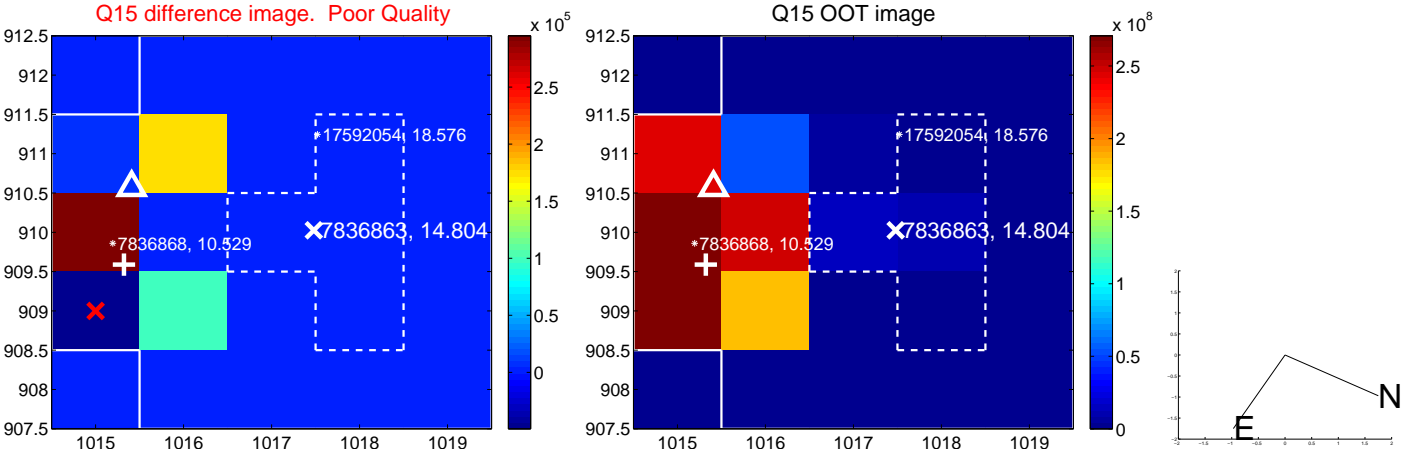
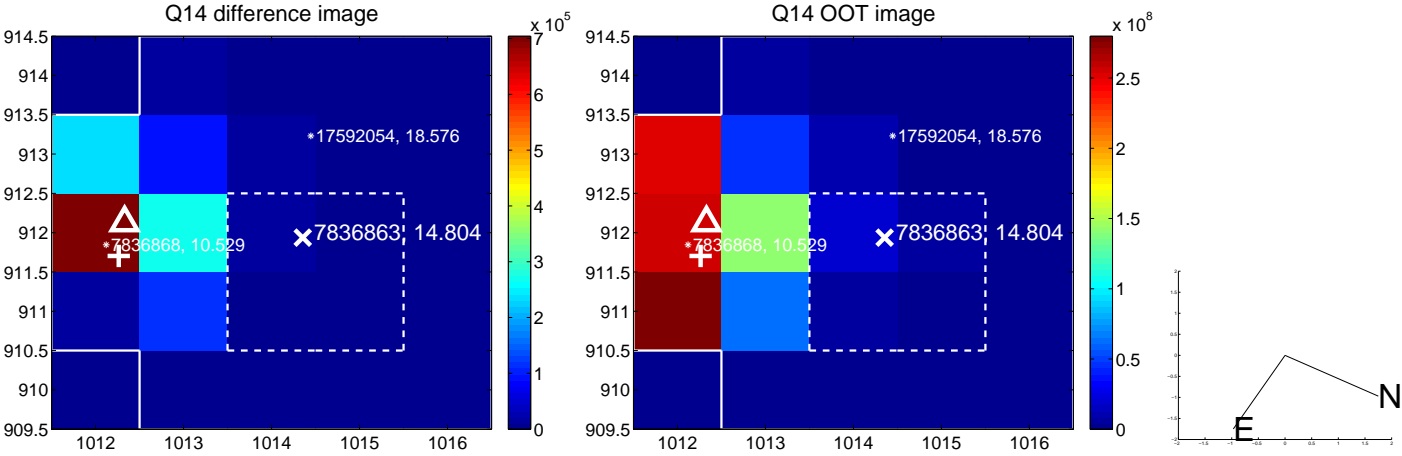
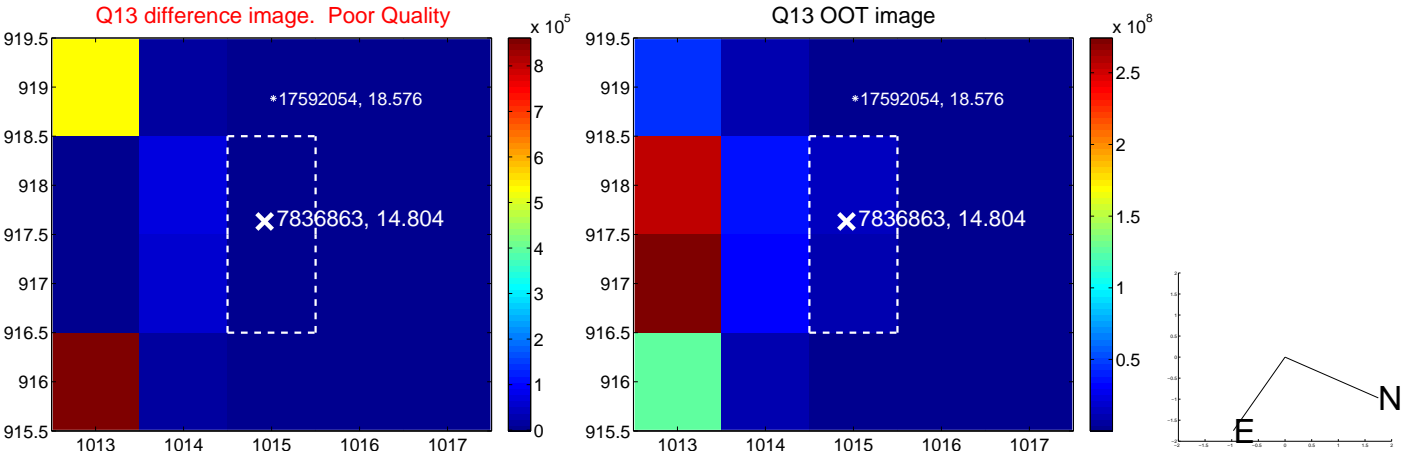
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



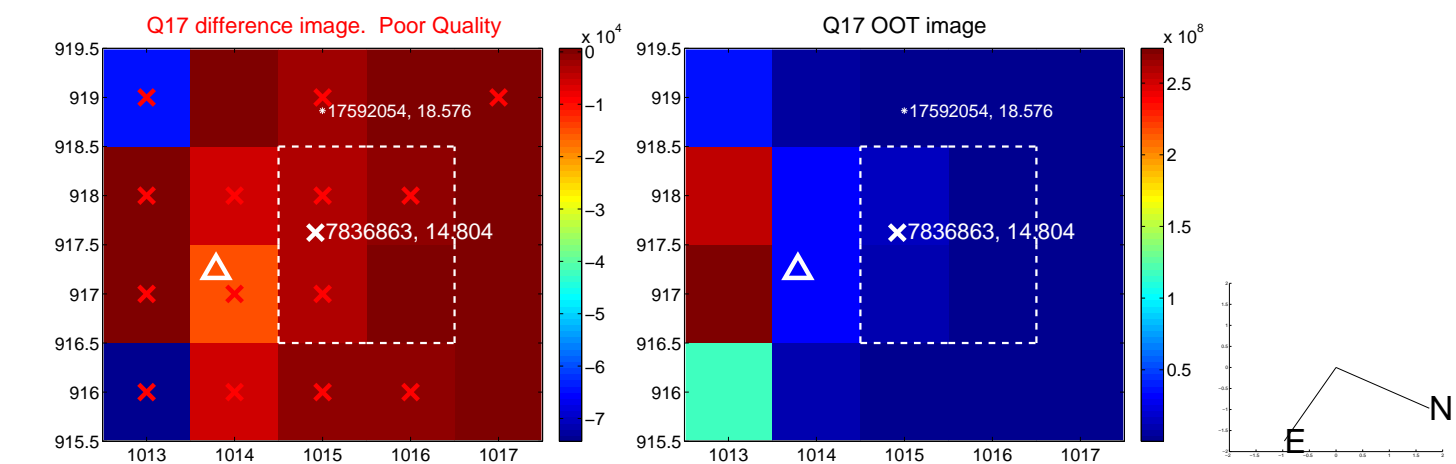
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



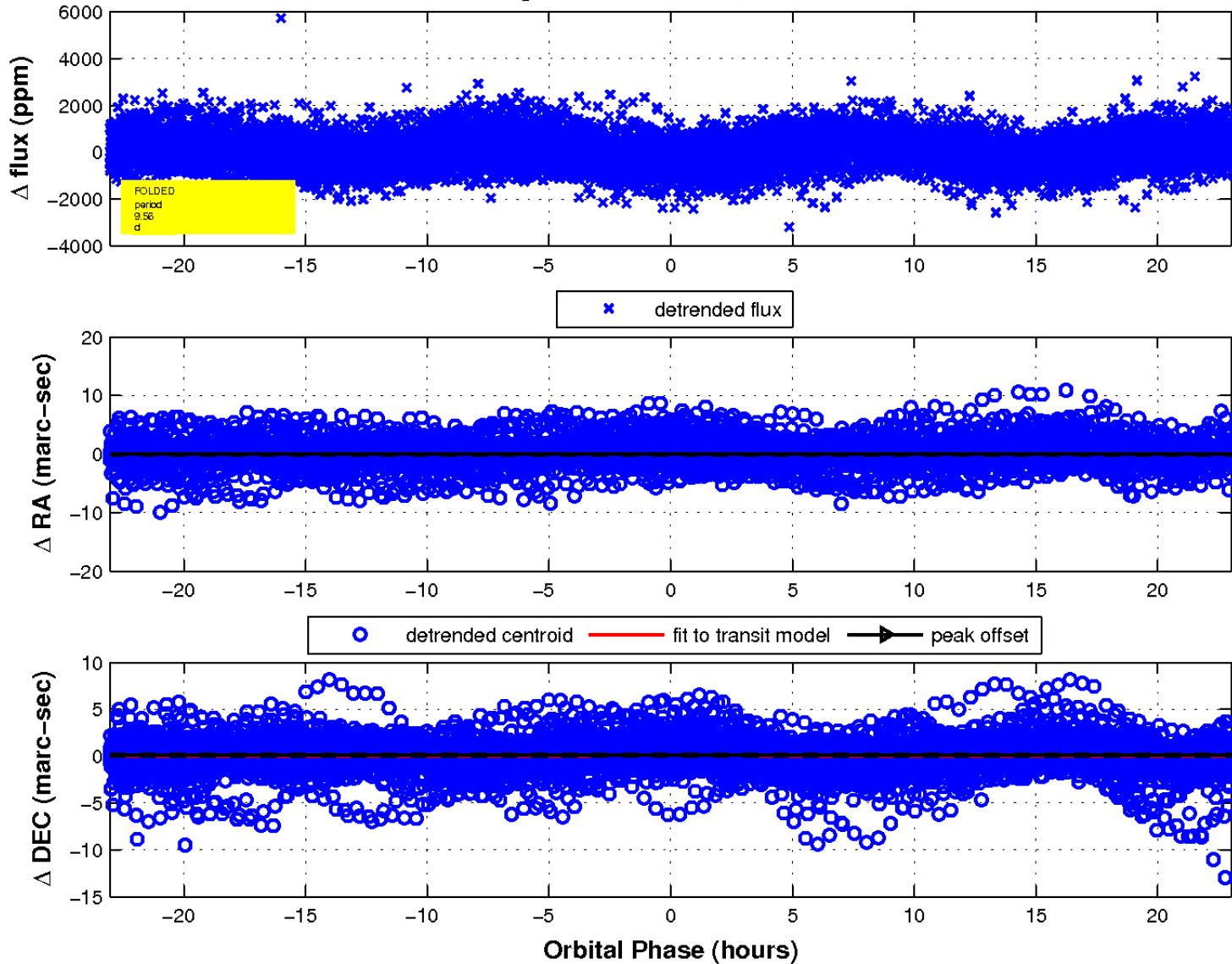
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

