

# KIC 011876098

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011876098-01	OBS	No	10.363677	136.331724	104.5	33.081	15.6	21.6	2.90	6585	5.88	1234.14
011876098-02	OBS	No	10.363935	133.317418	81.4	40.479	9.6	17.9	2.90	6585	5.28	1234.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011876098-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011876098-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

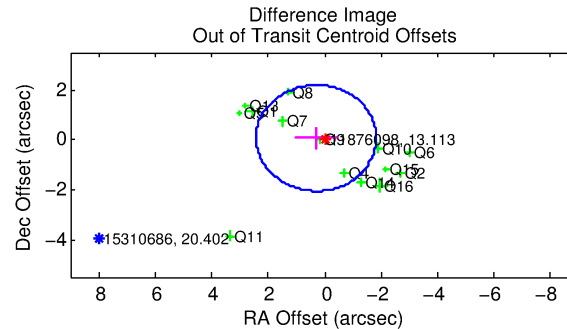
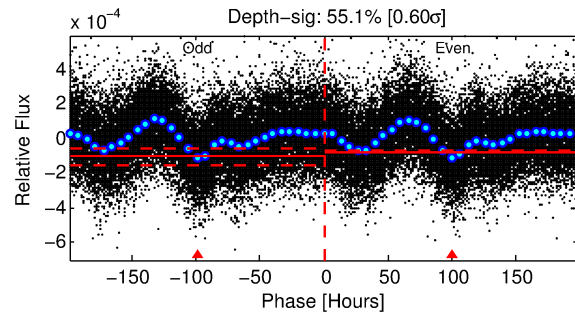
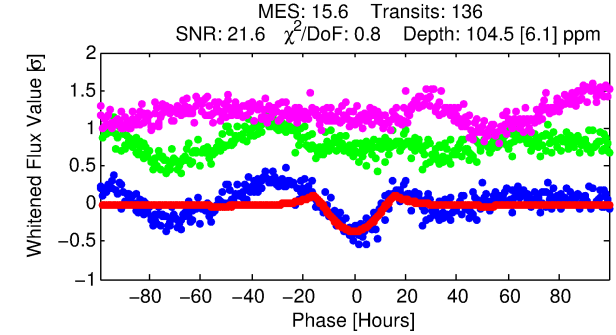
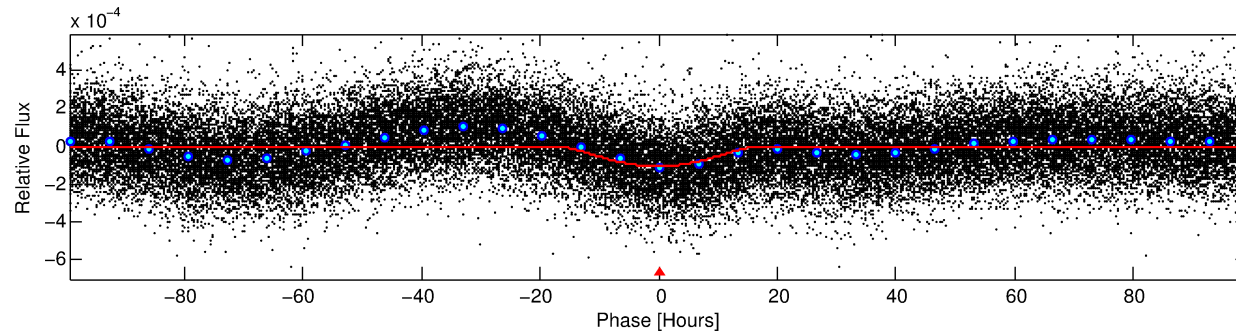
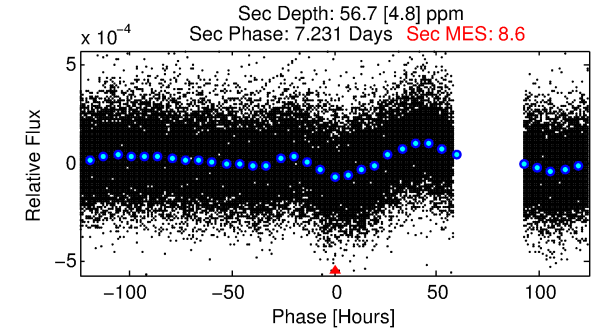
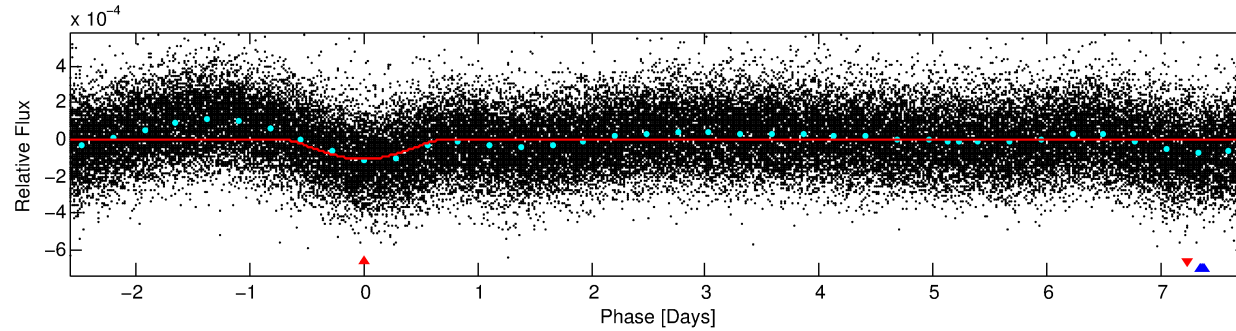
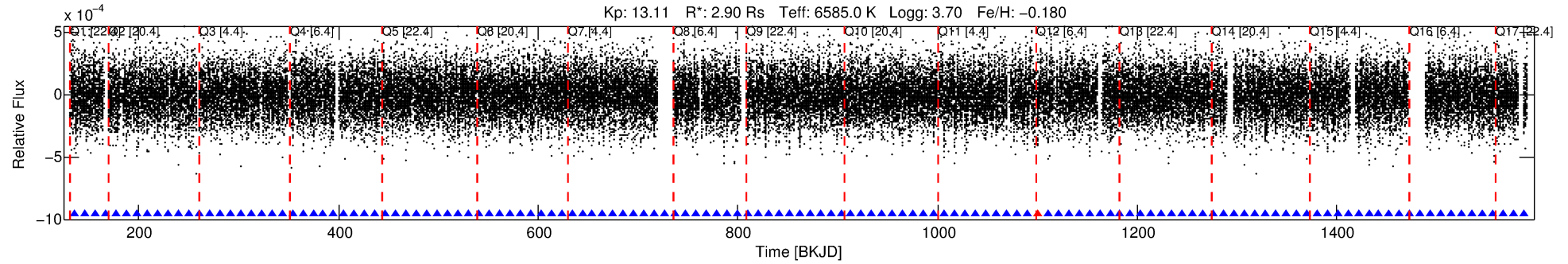
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011876098-01

No Significant Match Found

# DV One-Page Summary

KIC: 11876098 Candidate: 1 of 2 Period: 10.364 d



## DV Fit Results:

Period = 10.36368 [0.00034] d  
Epoch = 136.3317 [0.0282] BKJD  
Rp/R\* = 0.0186 [0.0149]  
a/R\* = 1.11 [0.03]  
b = 1.00 [0.02]  
Seff = 1234.14 [662.65]  
Teq = 1511 [203] K  
Rp = 5.88 [5.17] Re  
a = 0.1071 [0.0356] AU  
Ag = 10.36 [17.56] [0.53σ]  
Teffp = 4192 [1694] K [1.57σ]

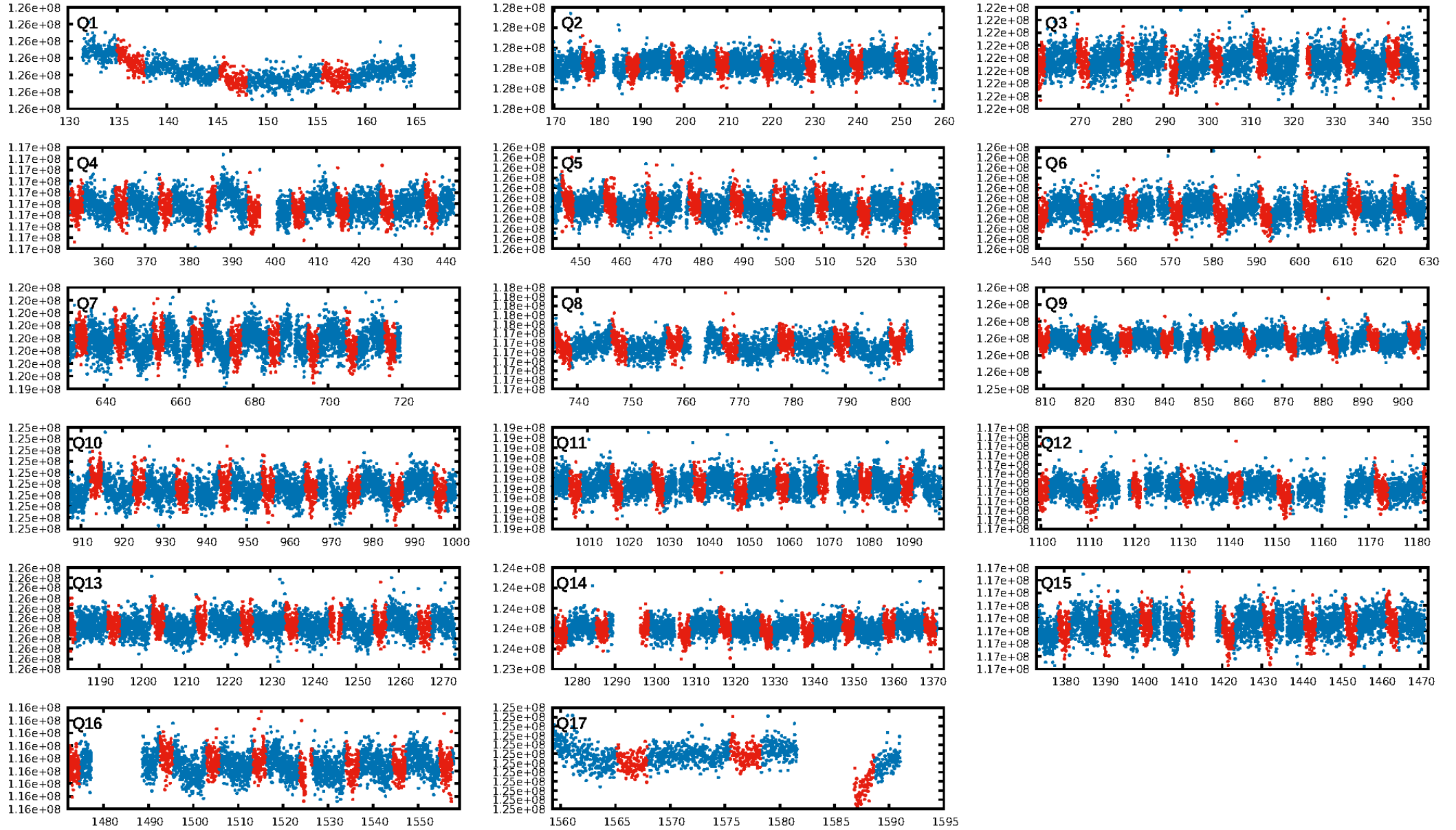
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.14e-65  
RollingBand-fgt: 0.99 [129/130]  
GhostDiagnostic-chr: 2.221  
Centroid-sig: 36.2%  
Centroid-so: 0.331 arcsec [0.63σ]  
OotOffset-rm: 0.307 arcsec [0.43σ]  
KicOffset-rm: 0.340 arcsec [0.51σ]  
OotOffset-st: 4/3/3/4 [14]  
KicOffset-st: 4/3/3/4 [14]  
DiffImageQuality-fgm: 0.71 [10/14]  
DiffImageOverlap-fno: 0.00 [0/17]

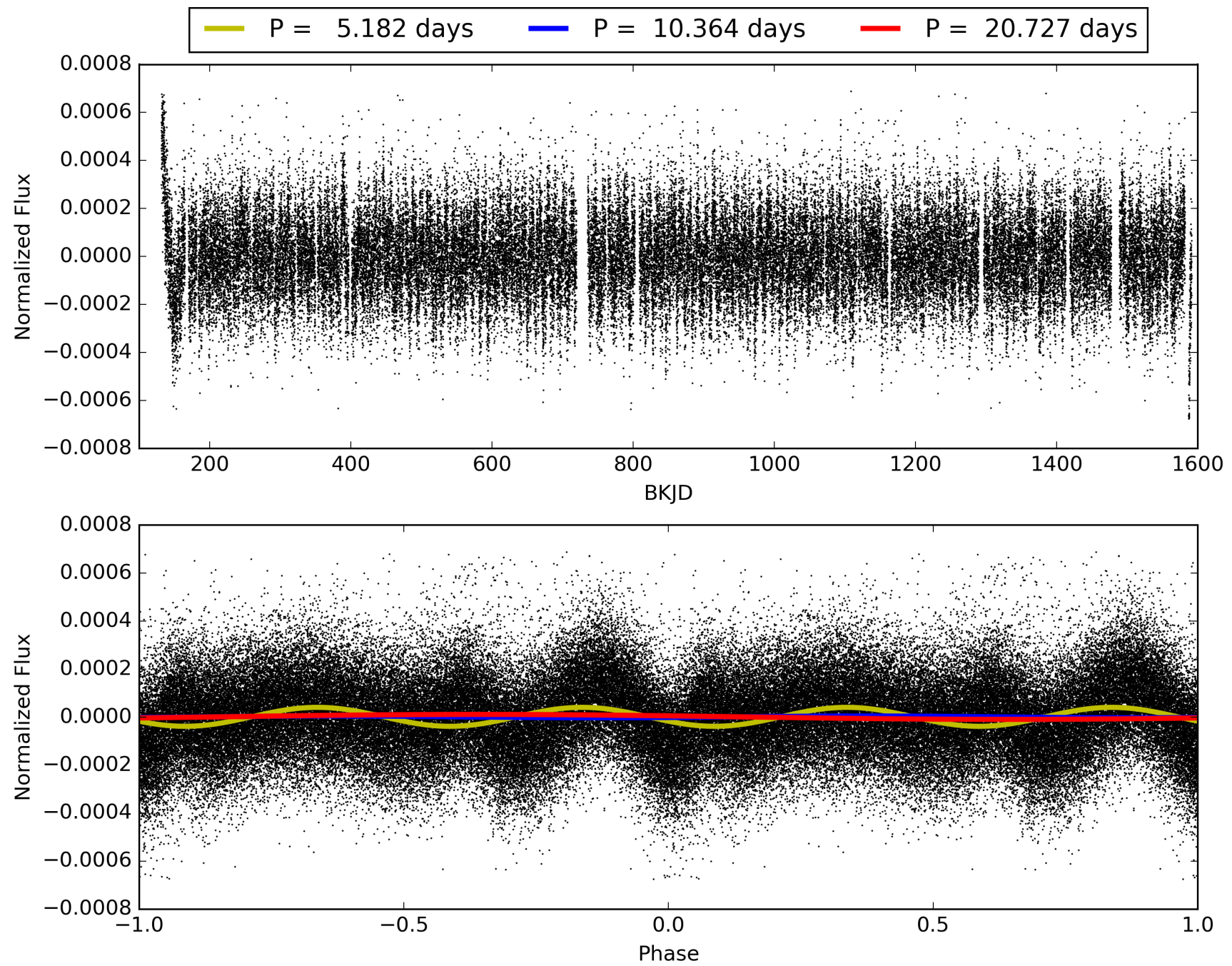
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:46:20 Z

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

# TCE 011876098-01, PDC Light Curves



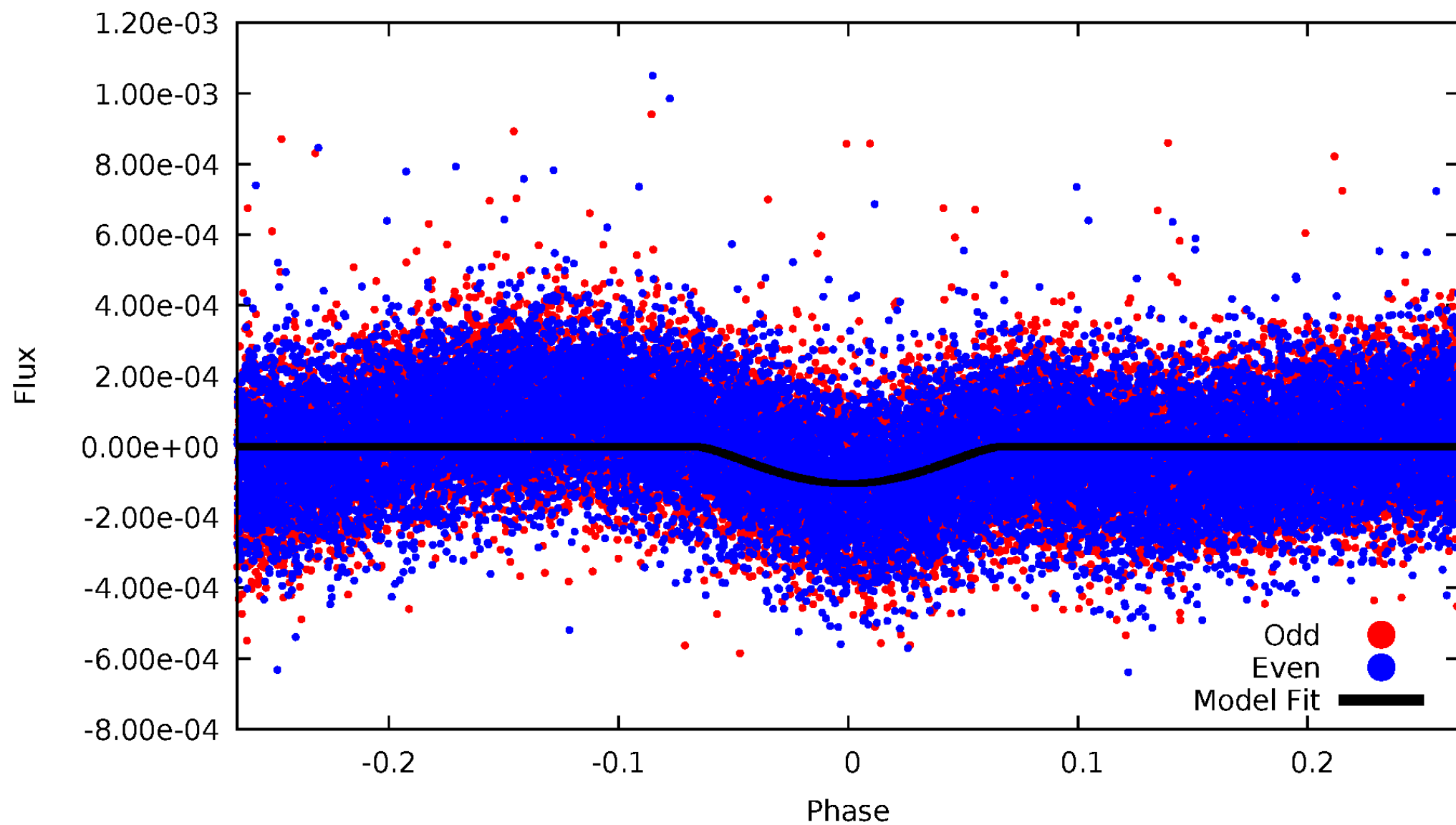
# TCE 011876098-01





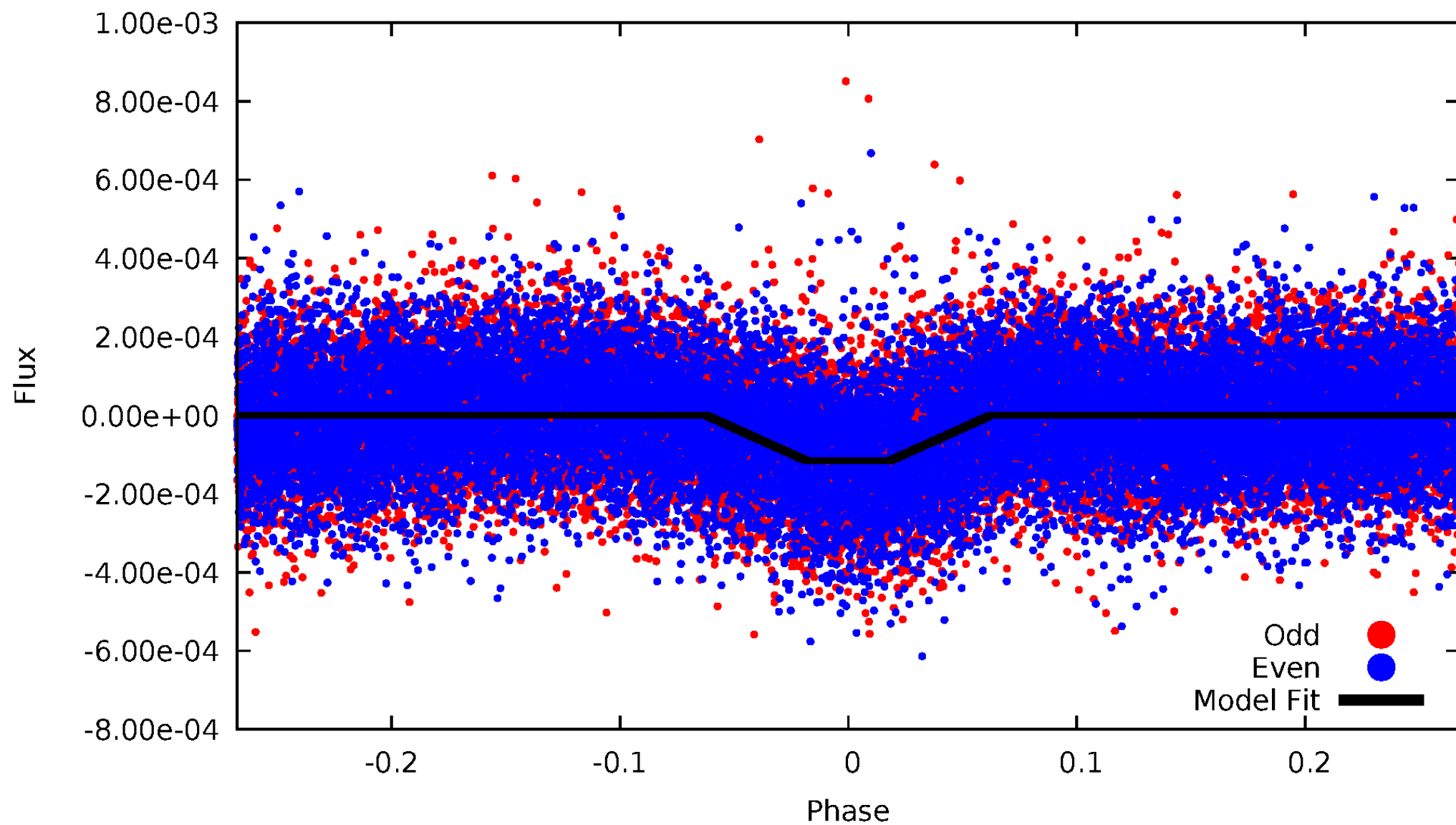
# DV Odd/Even

TCE 011876098-01

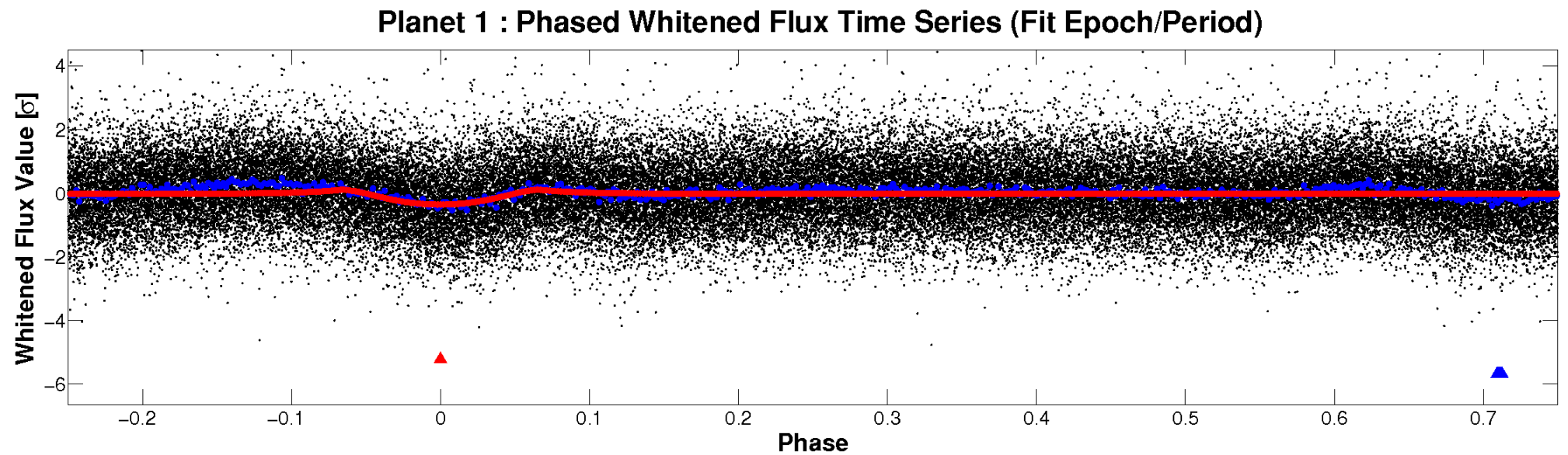
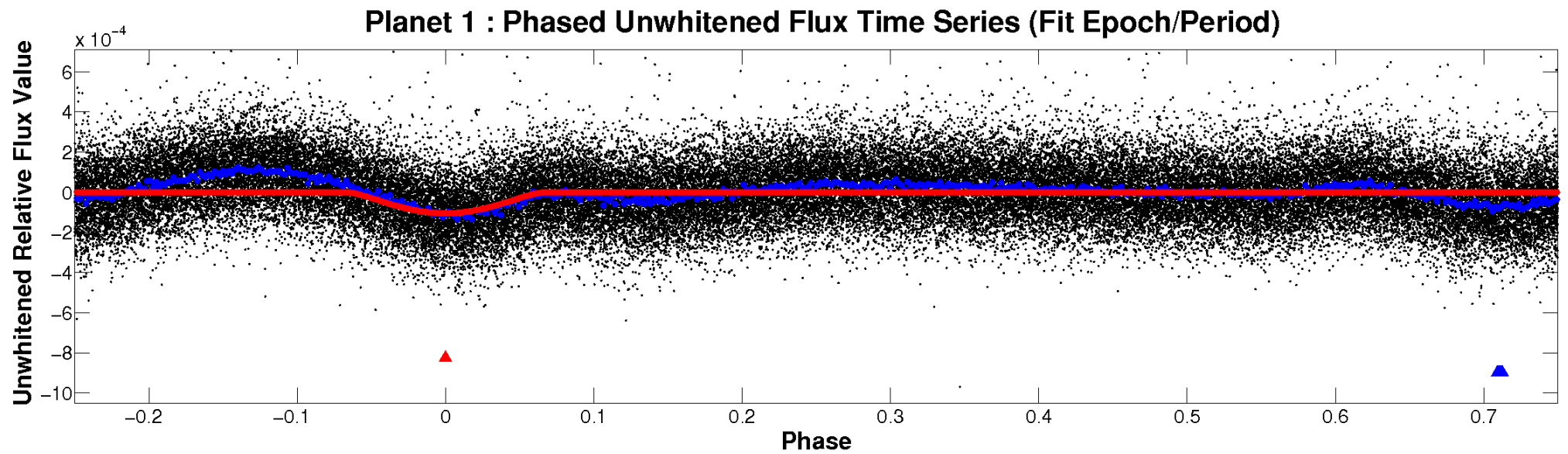


# ALT Odd/Even

TCE 011876098-01

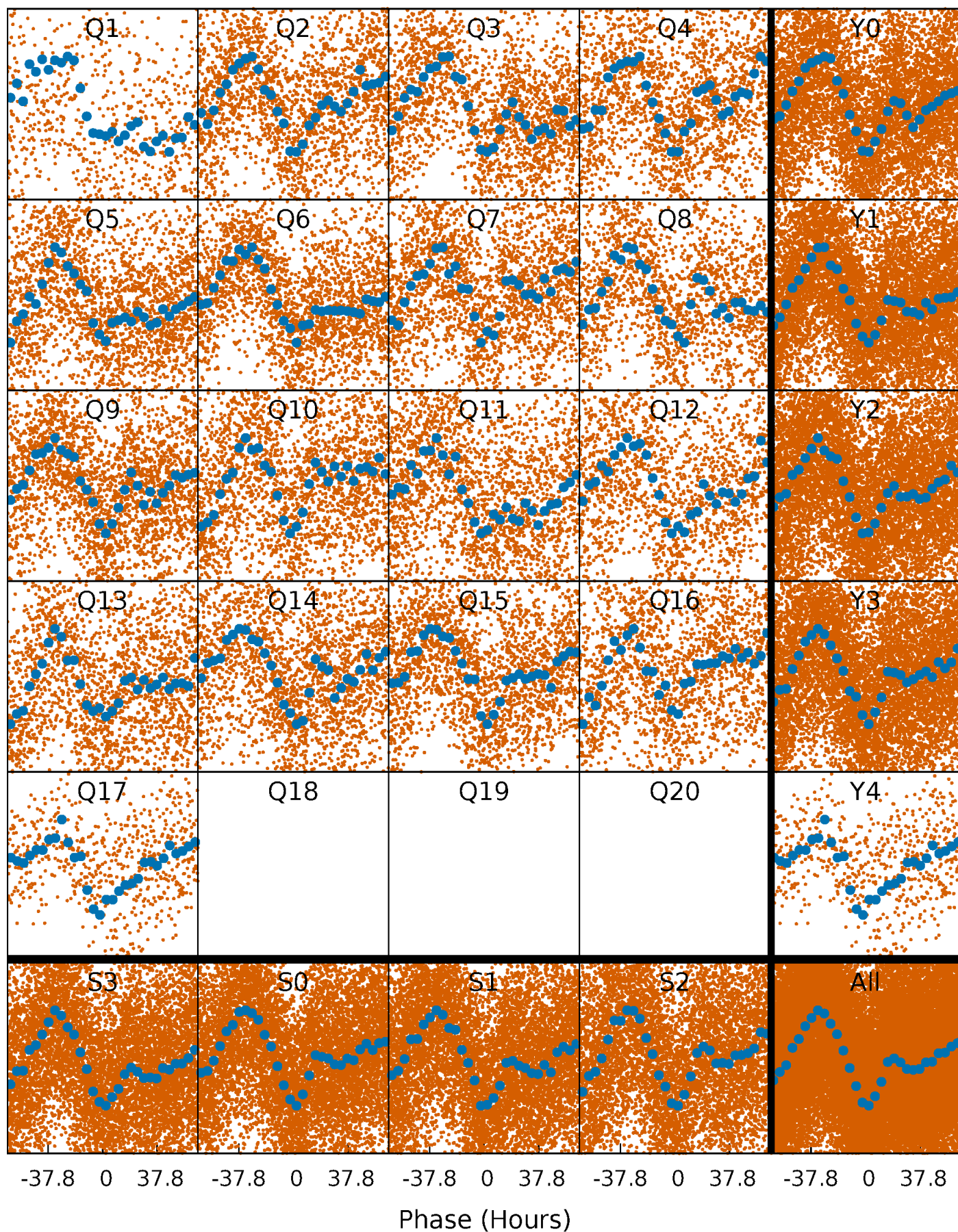


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

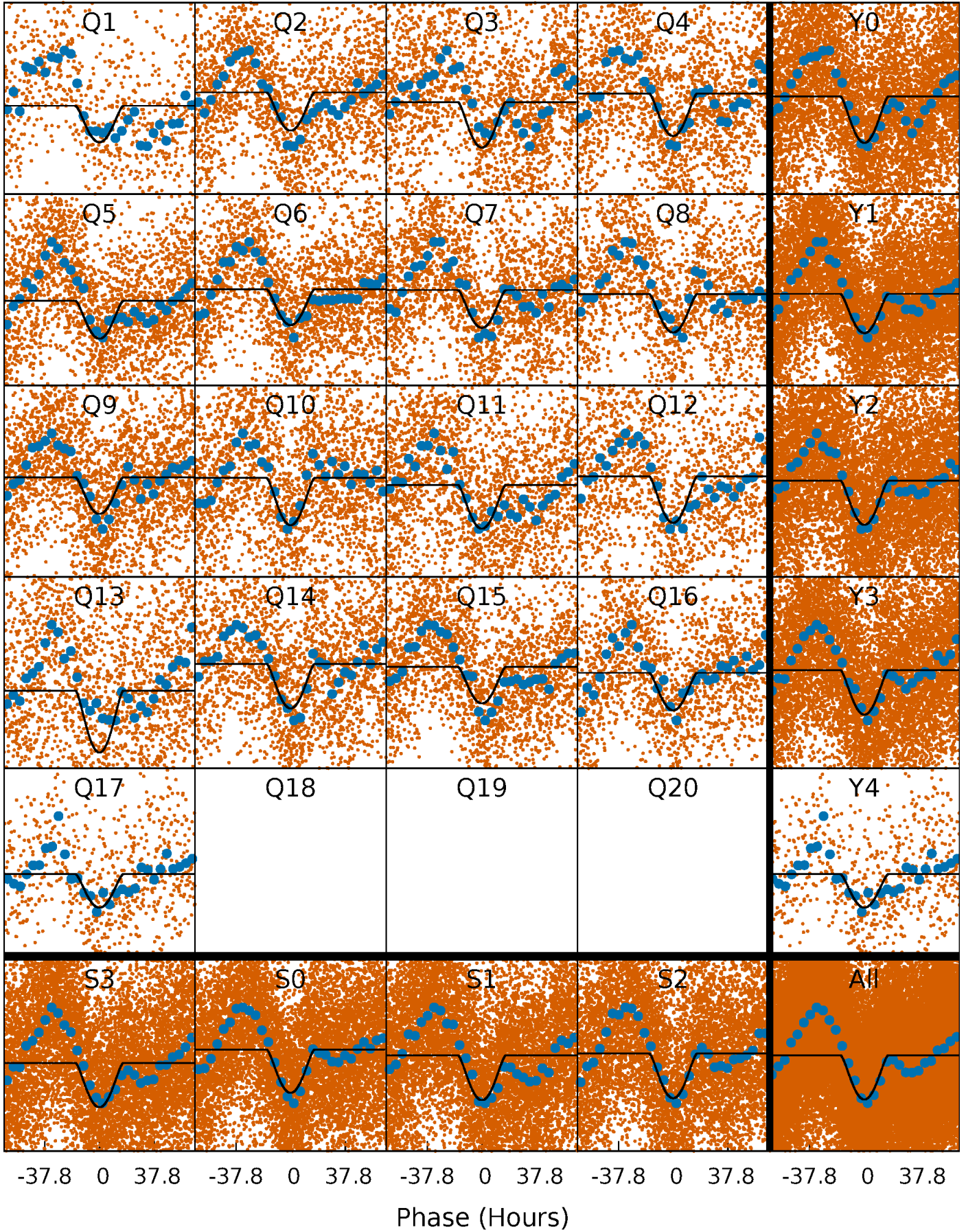
TCE 011876098-01 P= 10.363677 Days  $T_0=136.331724$  (BKJD)





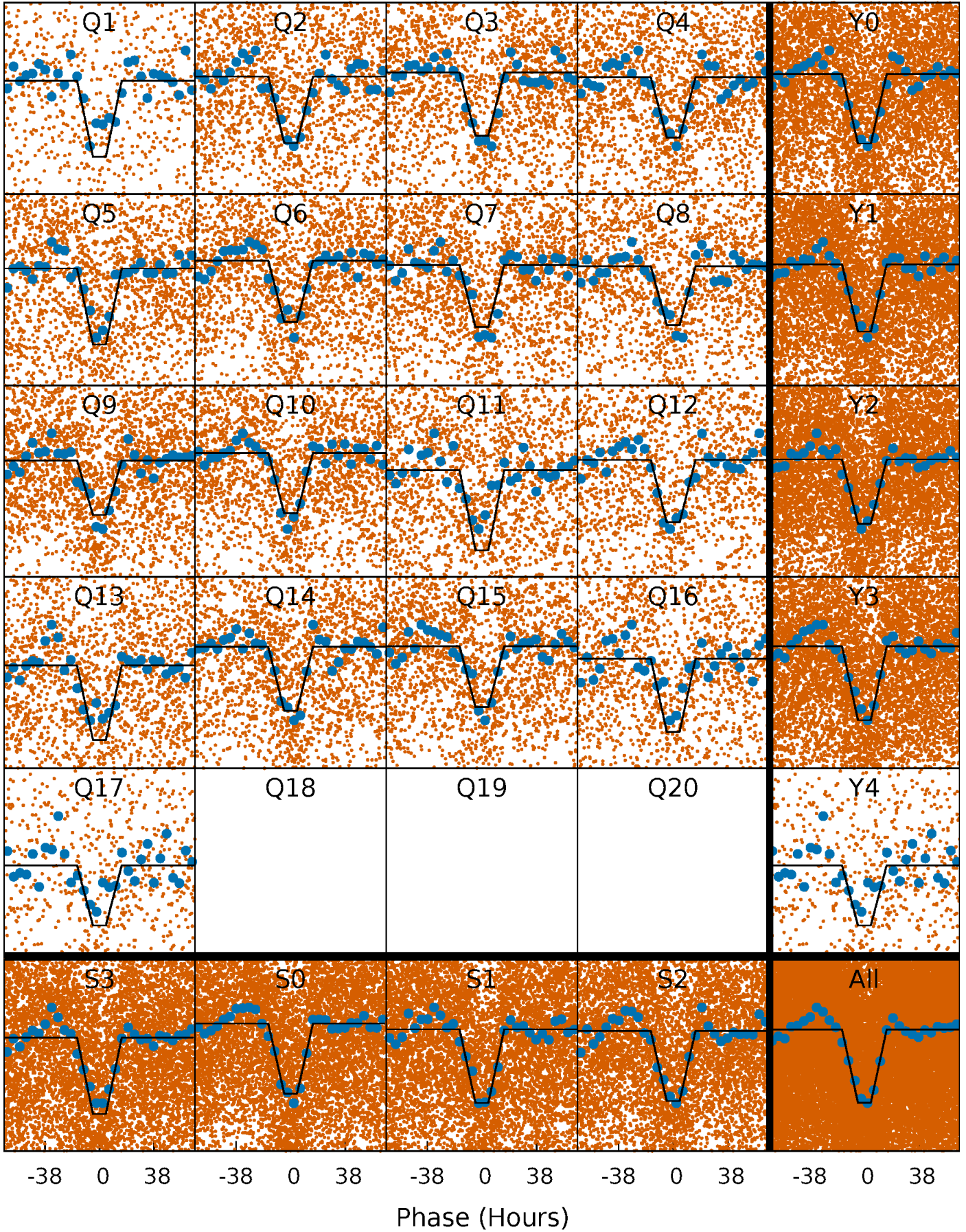
# DV Quarter-Phased Transit Curves

TCE 011876098-01 P= 10.363677 Days  $T_0=136.331724$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011876098-01 P= 10.364570 Days  $T_0=136.251365$  (BKJD)

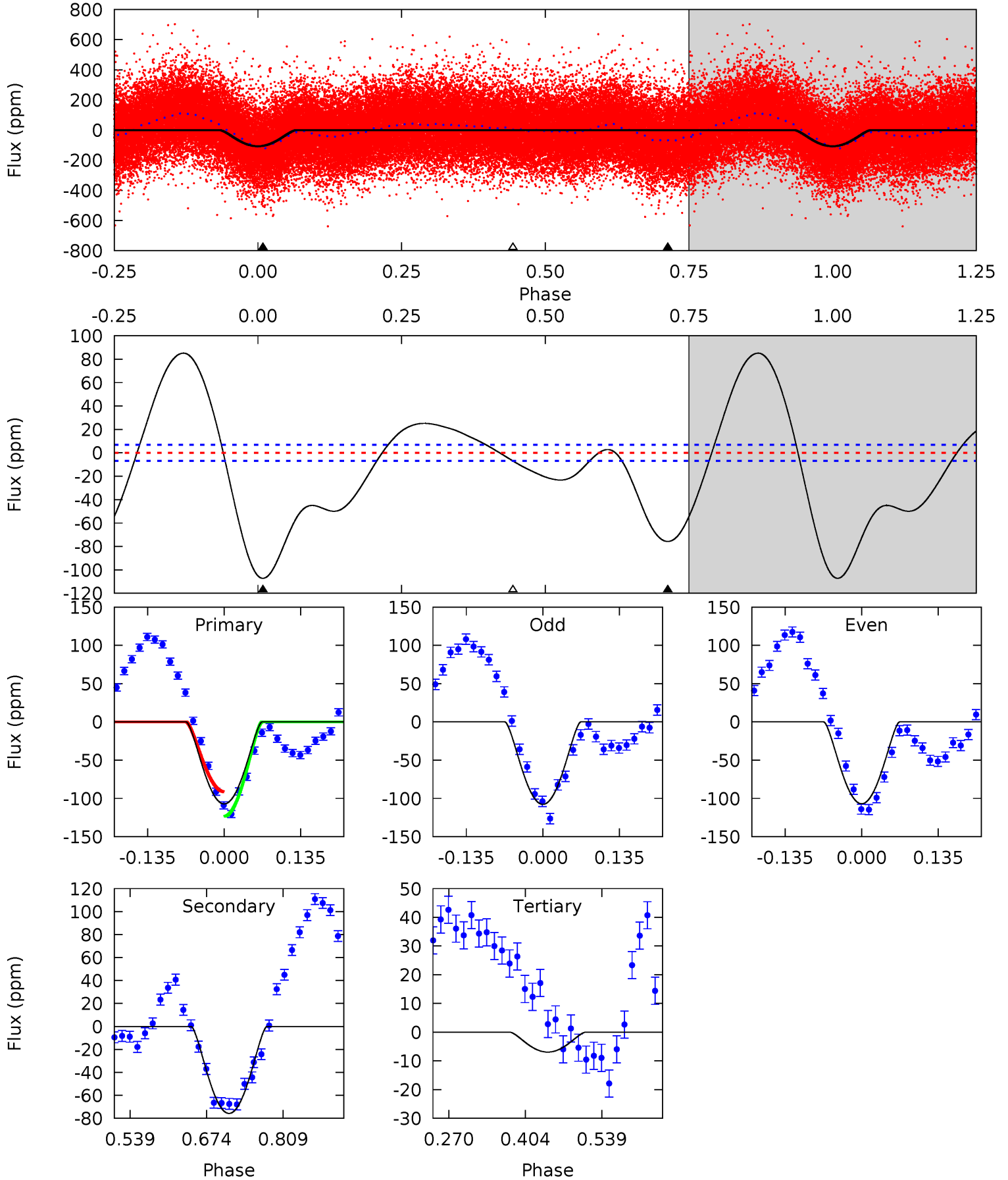




# DV Model-Shift Uniqueness Test

011876098-01,  $P = 10.363677$  Days,  $E = 125.968047$  Days

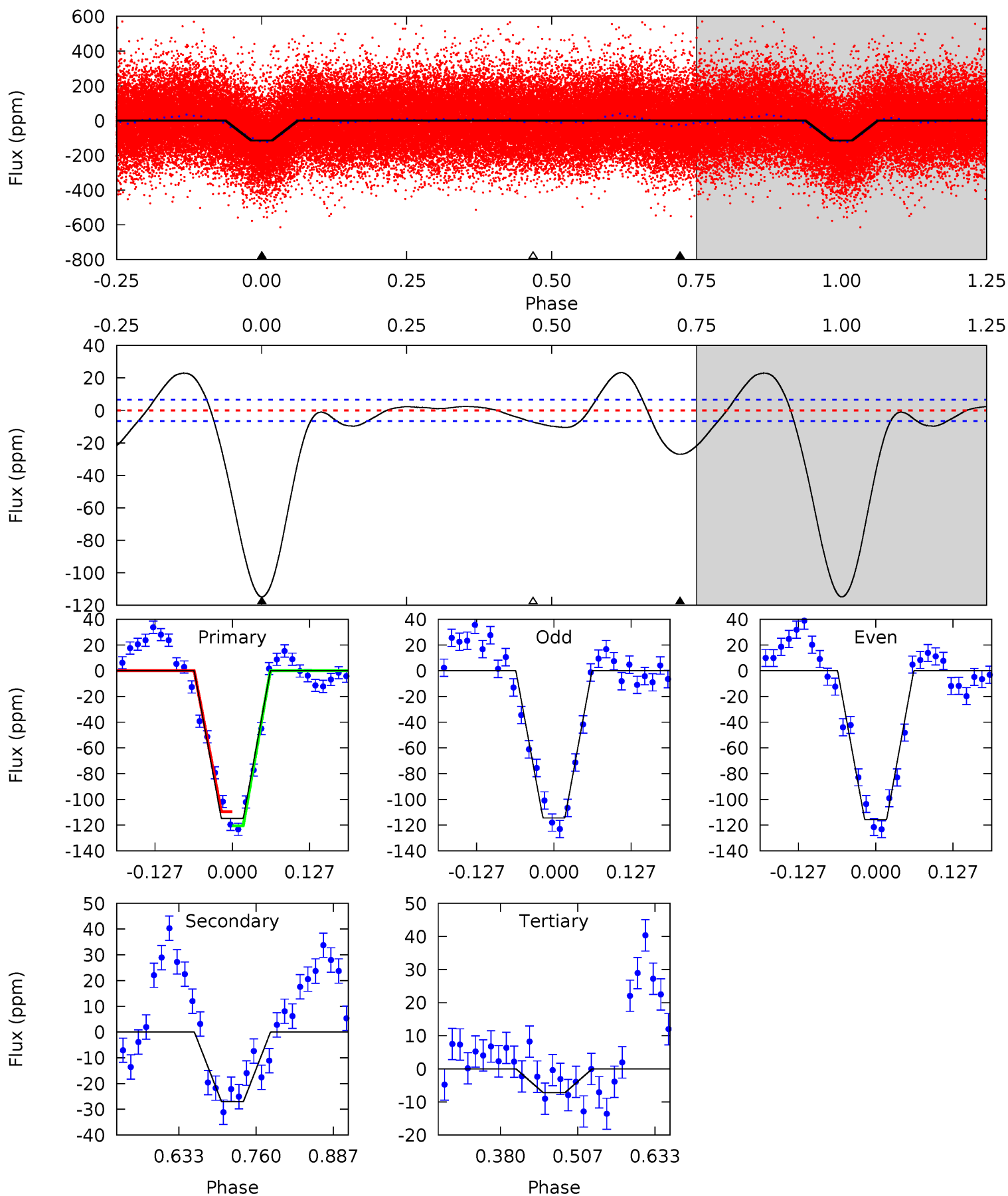
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
70.4	49.7	4.56	0	4.50	1.50	18.2	65.8	70.4	45.2	49.7	0.27	2.13	0.44	10.3



# Alt Model-Shift Uniqueness Test

011876098-01, P = 10.364570 Days, E = 125.886795 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
78.9	18.6	4.93	0	4.51	1.53	5.23	74.0	78.9	13.6	18.6	0.47	1.02	0.17	3.72





### Stellar Parameters For KIC 011876098

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6585^{+178}_{-198}$	$3.697^{+0.304}_{-0.076}$	$-0.180^{+0.300}_{-0.250}$	$2.900^{+0.441}_{-1.030}$	$1.529^{+0.253}_{-0.310}$	$0.088^{+0.183}_{-0.028}$
	+3%/-3%	+8%/-2%	+167%/-139%	+15%/-36%	+17%/-20%	+207%/-32%
Source	PHO1	FLK73	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 011876098-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-76 \pm 2$	$5.97^{+4.35}_{-3.32}$	$2065^{+121}_{-169}$	$4479^{+2047}_{-820}$	$14^{+57}_{-9}$
Alt.	$-27 \pm 1$	$4.57^{+4.14}_{-2.92}$	$2065^{+117}_{-173}$	$4057^{+2248}_{-786}$	$8.287^{+55.406}_{-6.017}$

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

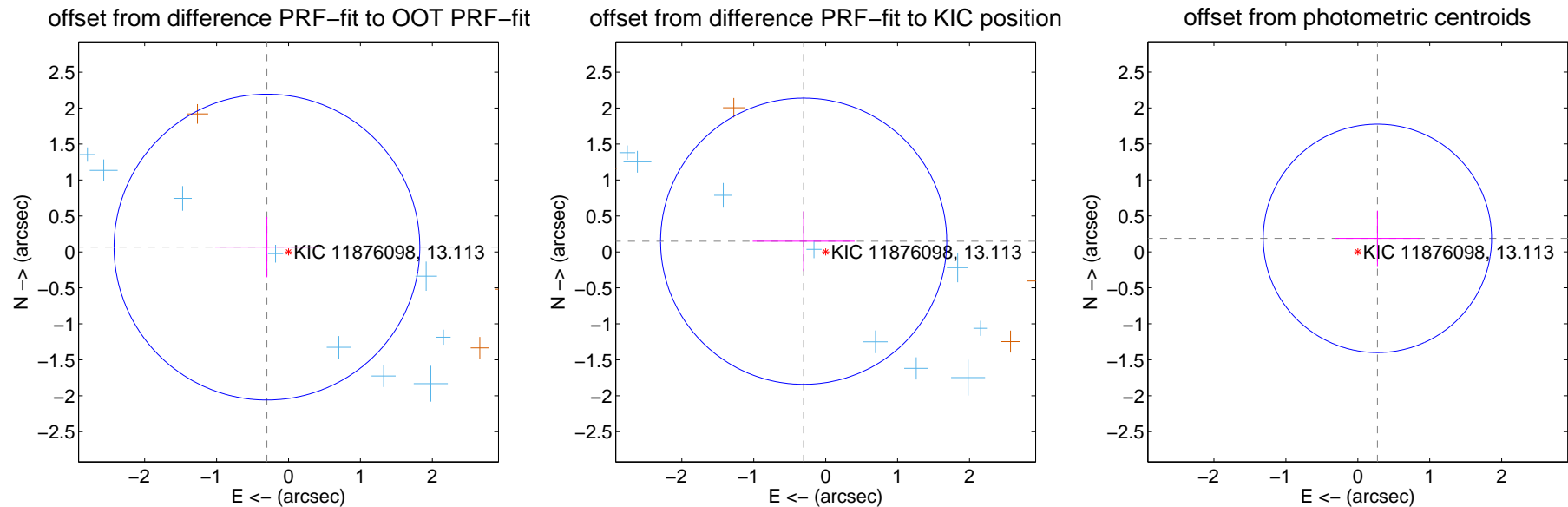
## DV Centroid Data

Supplemental centroid analysis for 011876098-01. Kepler magnitude: 13.11. Transit SNR 21.62

There are 10 quarters with good PRF difference image offsets

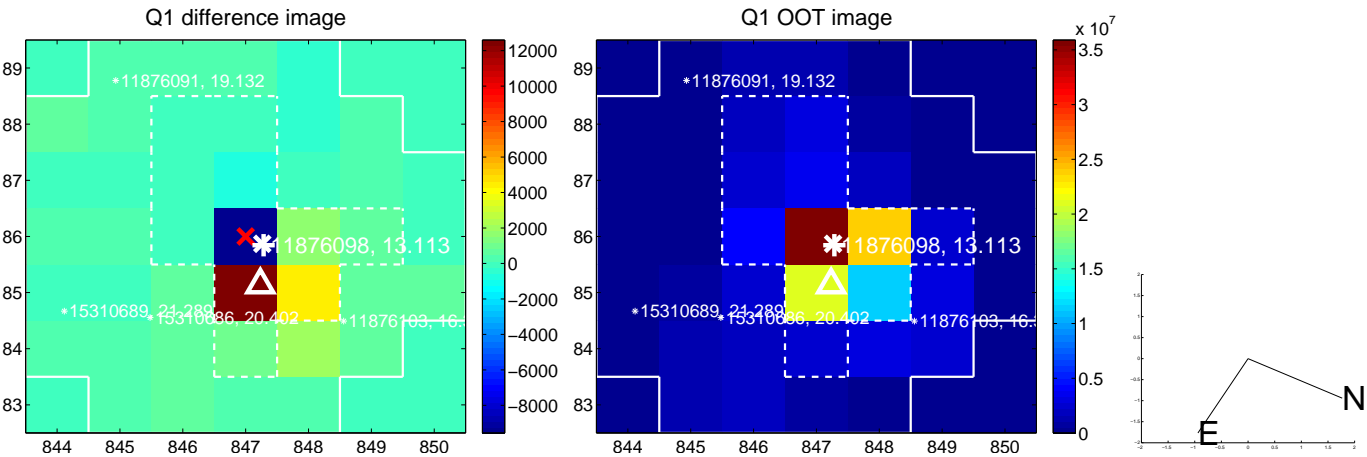
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.307 \pm 0.709$	0.43	$0.300 \pm 0.720$	$0.067 \pm 0.421$
PRF-fit source offset from KIC position	$0.340 \pm 0.663$	0.51	$0.306 \pm 0.709$	$0.148 \pm 0.416$
photometric centroid source offset	$0.33 \pm 0.53$	0.63	$-0.27 \pm 0.58$	$0.19 \pm 0.39$

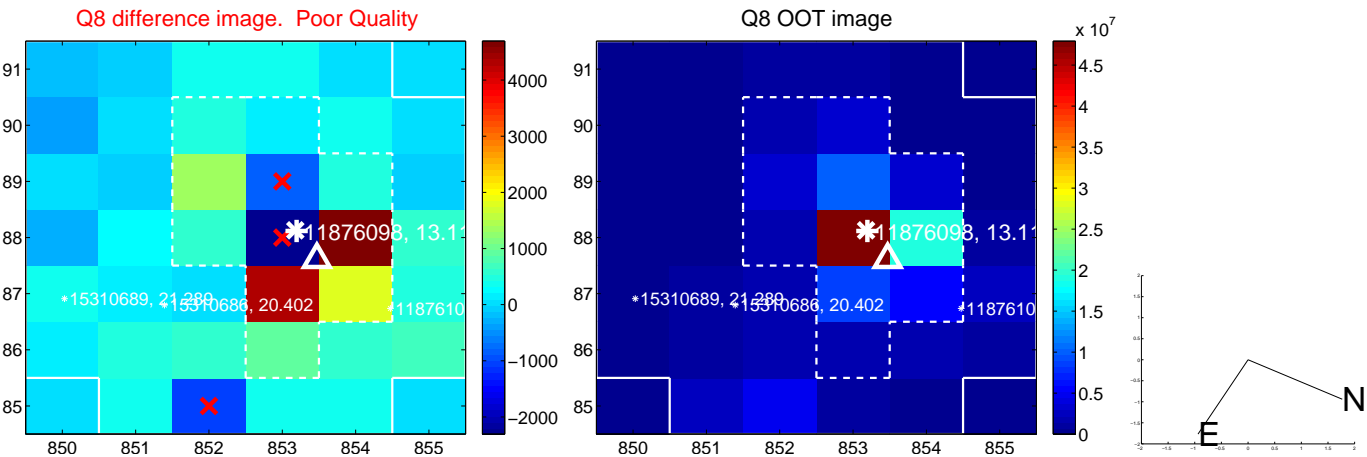
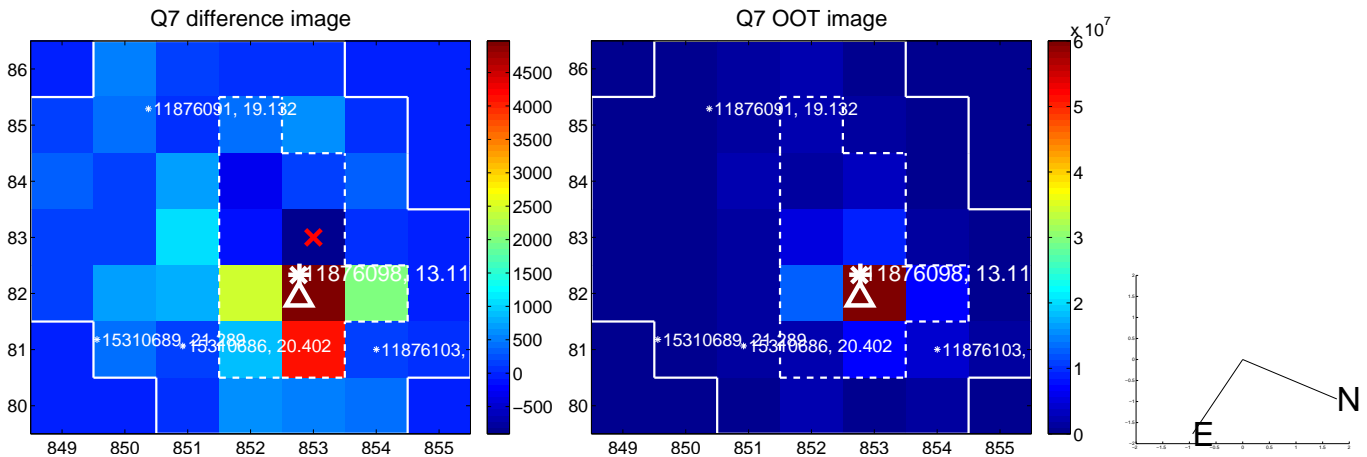
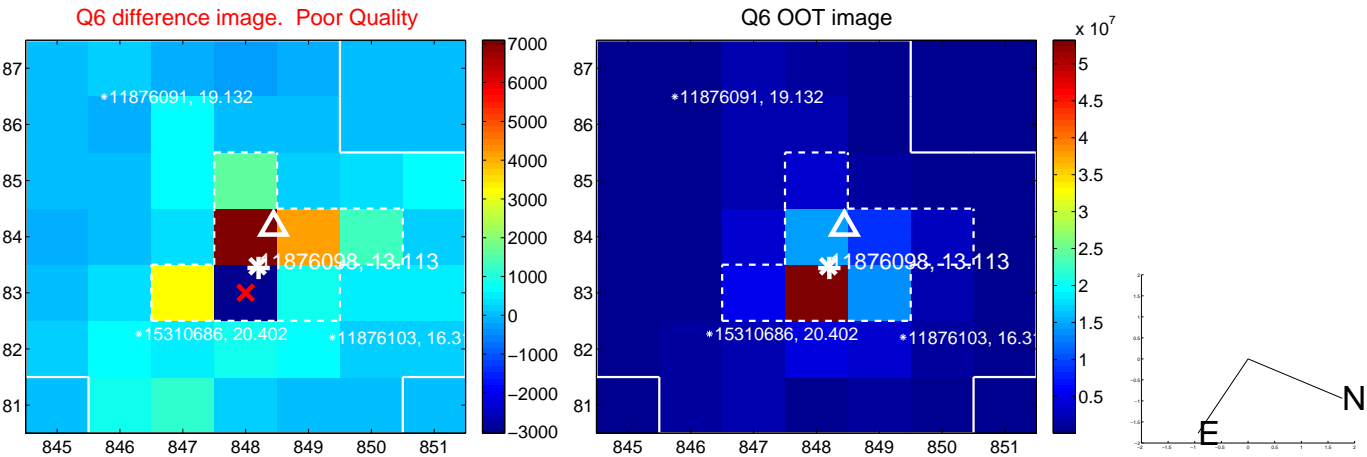
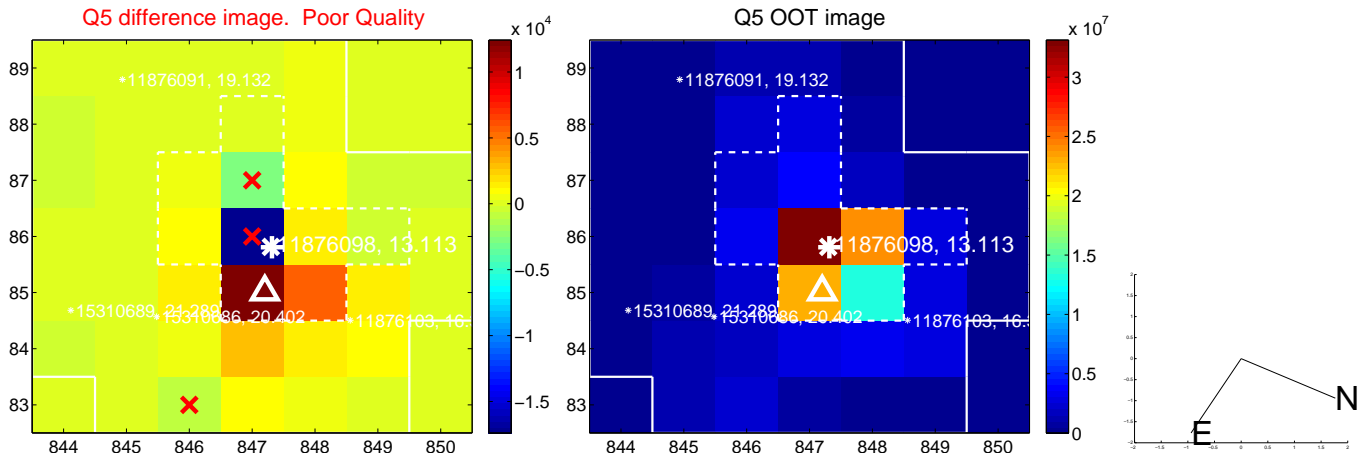


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

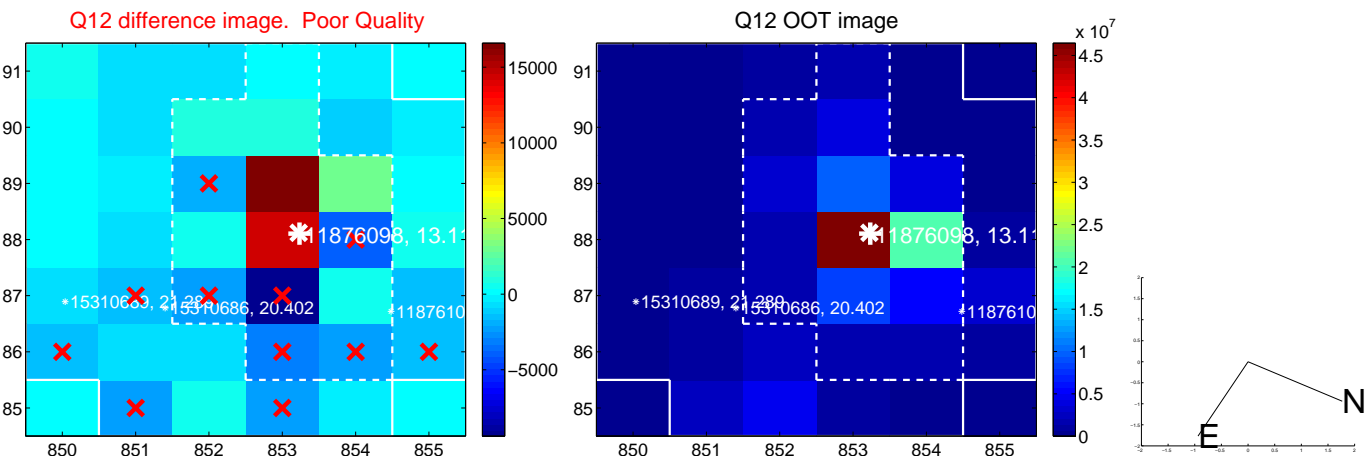
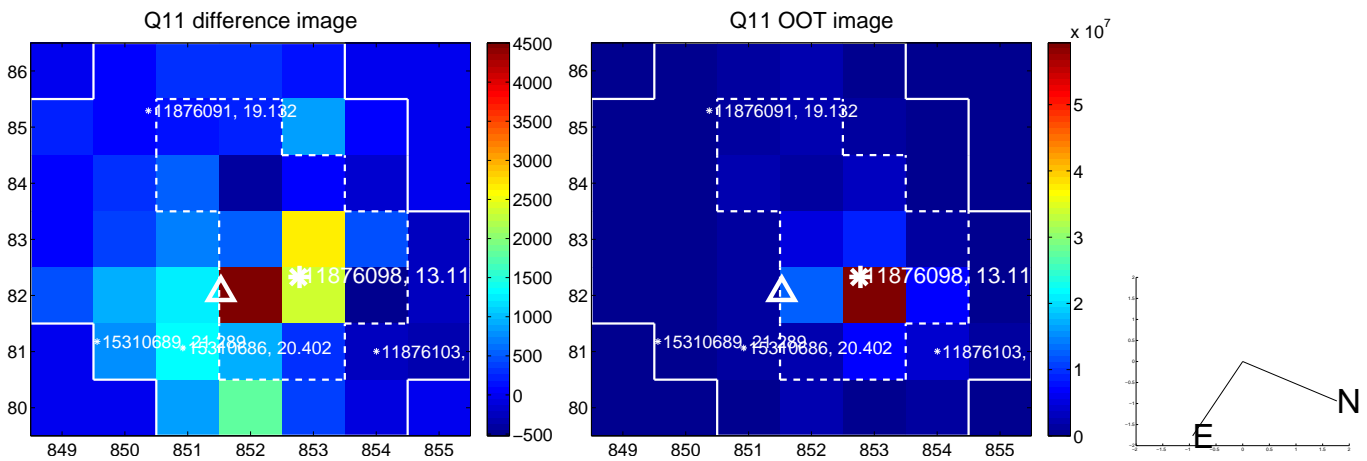
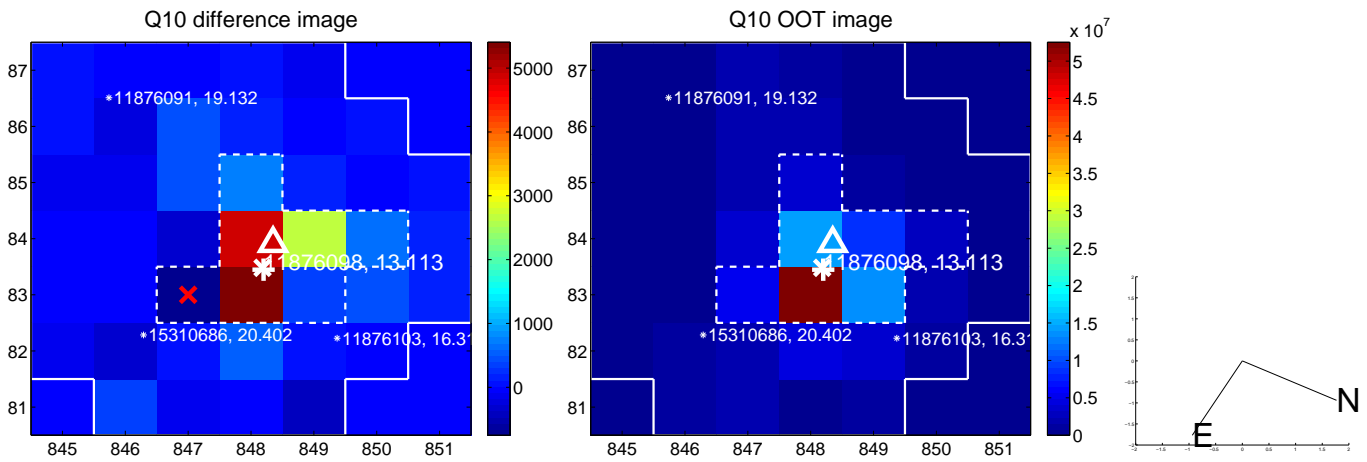
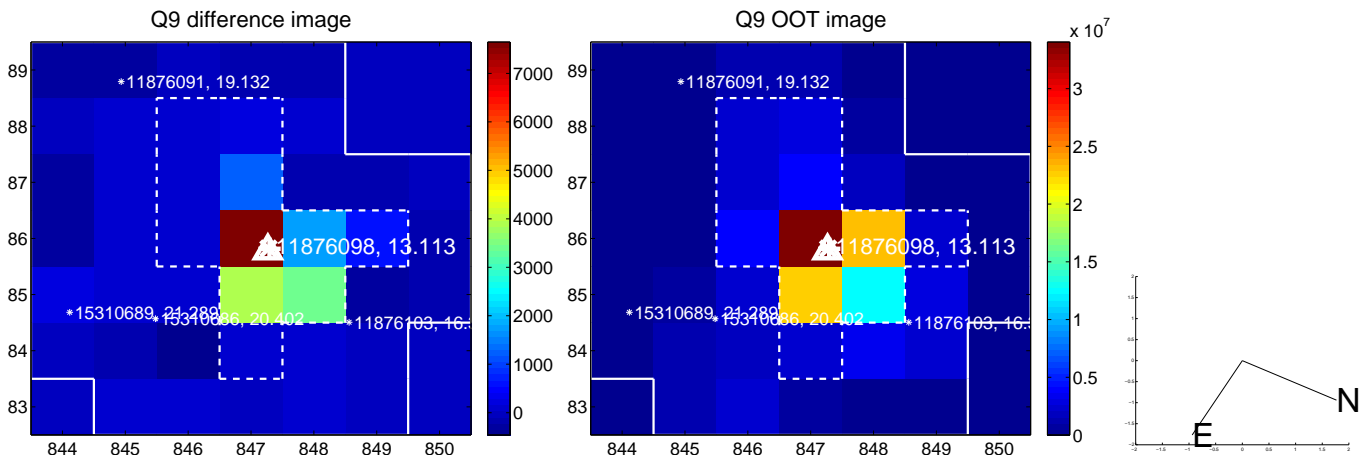


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

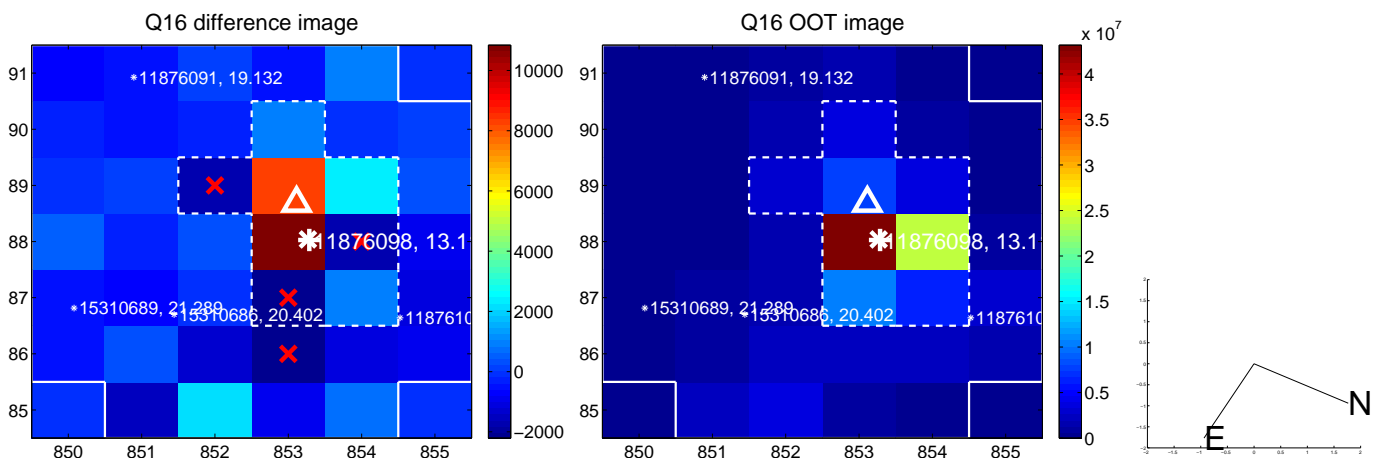
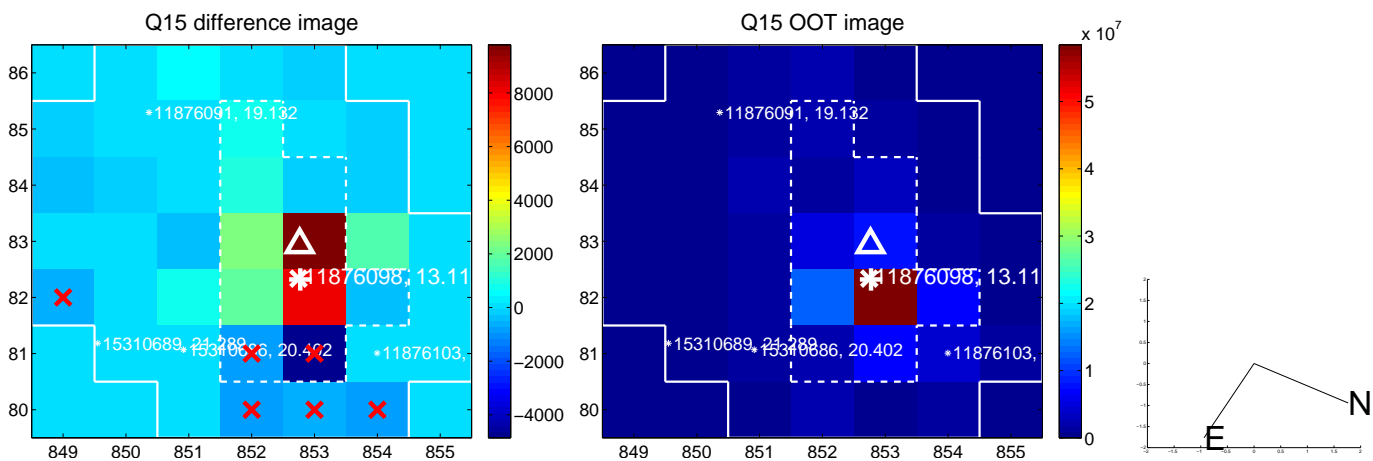
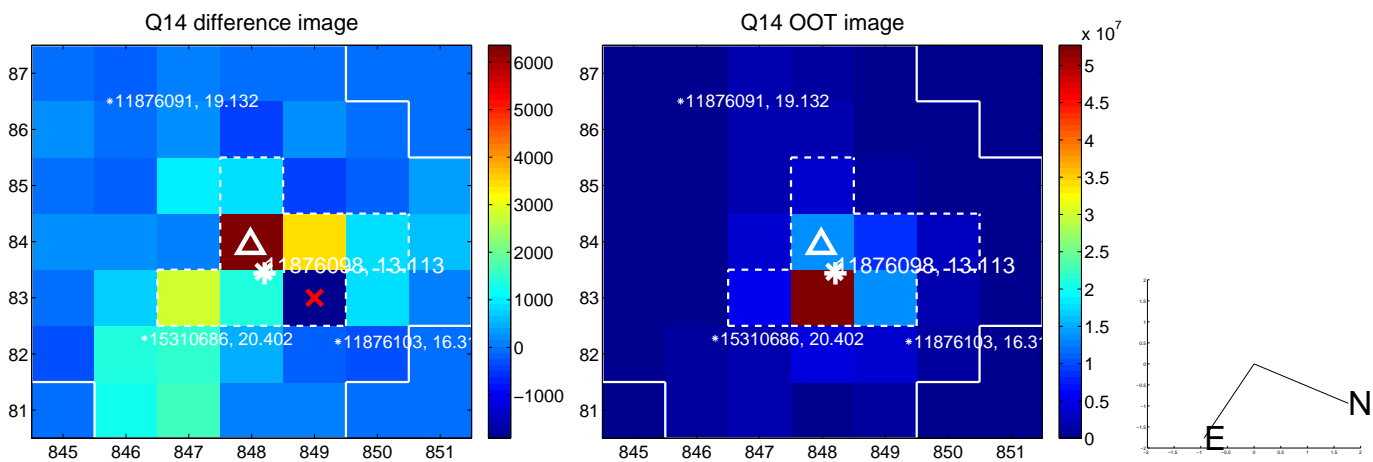
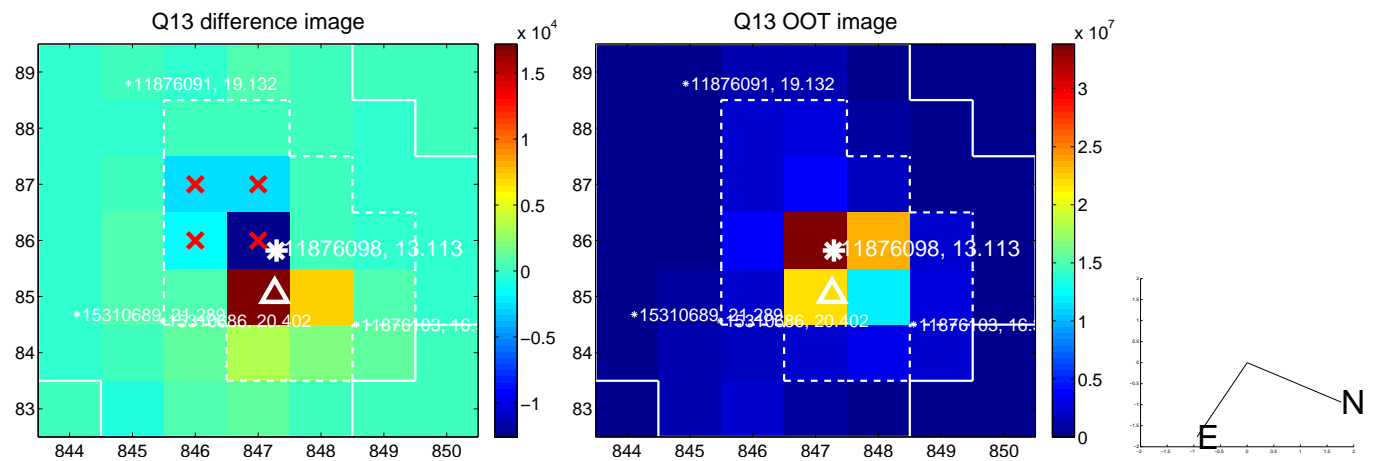




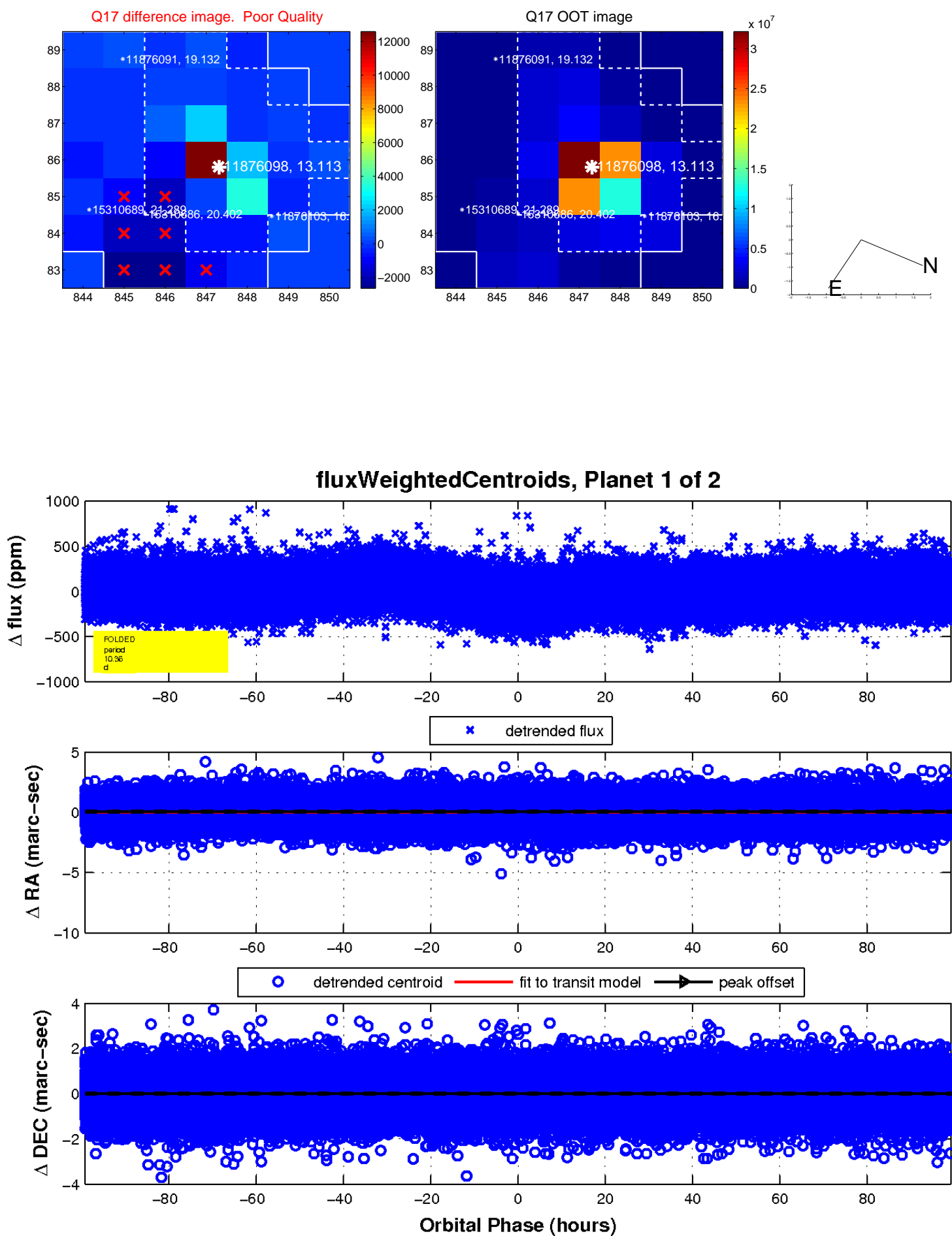
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

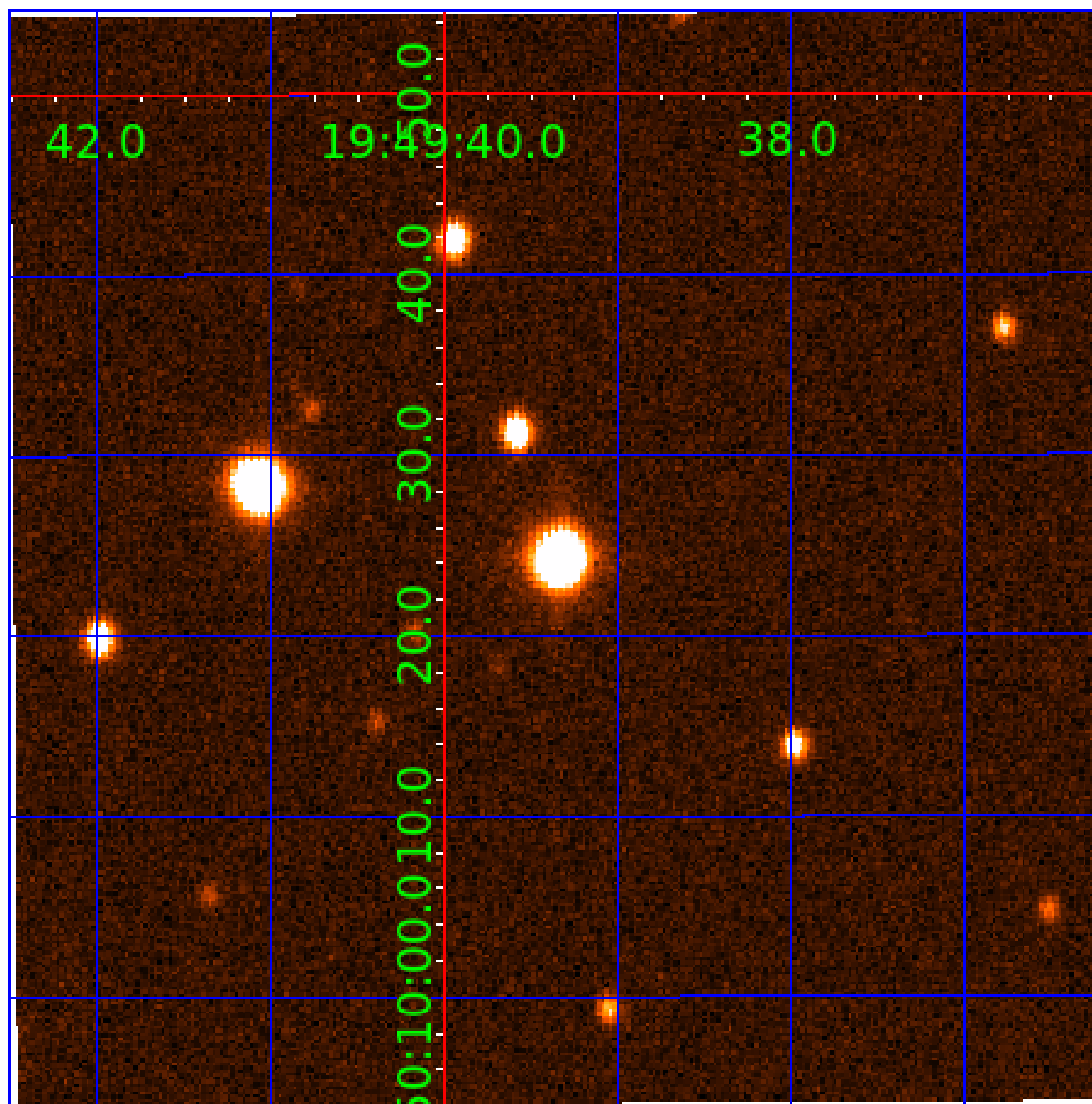


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 011876098

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011876098-01	OBS	No	10.363677	136.331724	104.5	33.081	15.6	21.6	2.90	6585	5.88	1234.14
011876098-02	OBS	No	10.363935	133.317418	81.4	40.479	9.6	17.9	2.90	6585	5.28	1234.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011876098-01	OBS	FP	0.00	1	0	0	0	LPP_DV
011876098-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

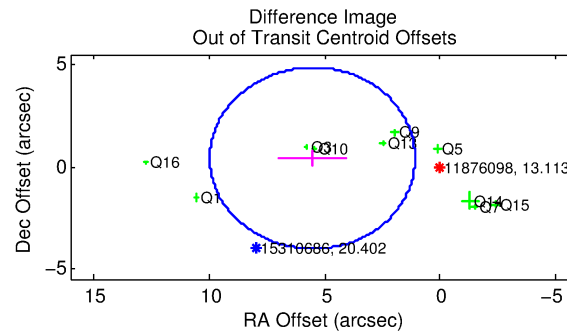
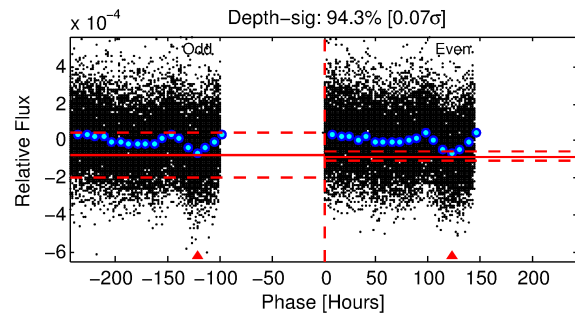
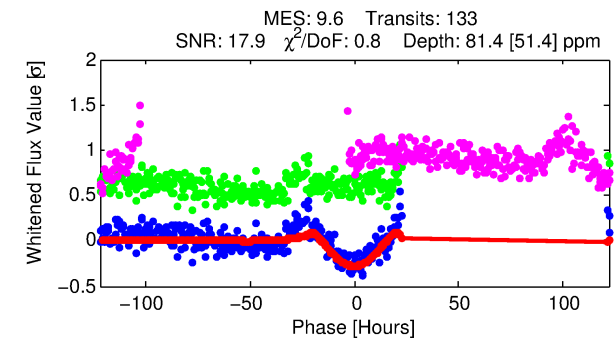
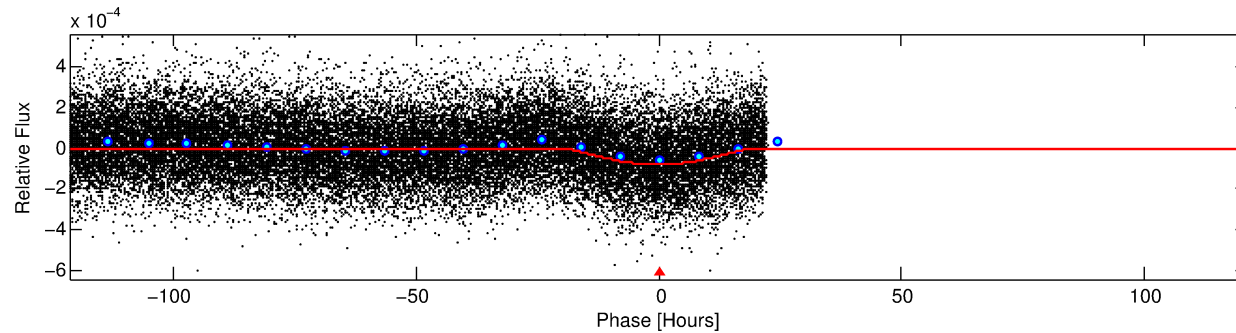
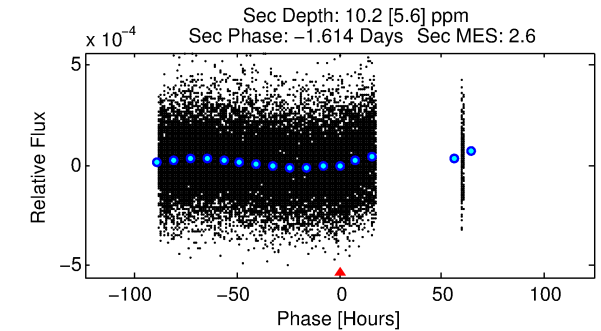
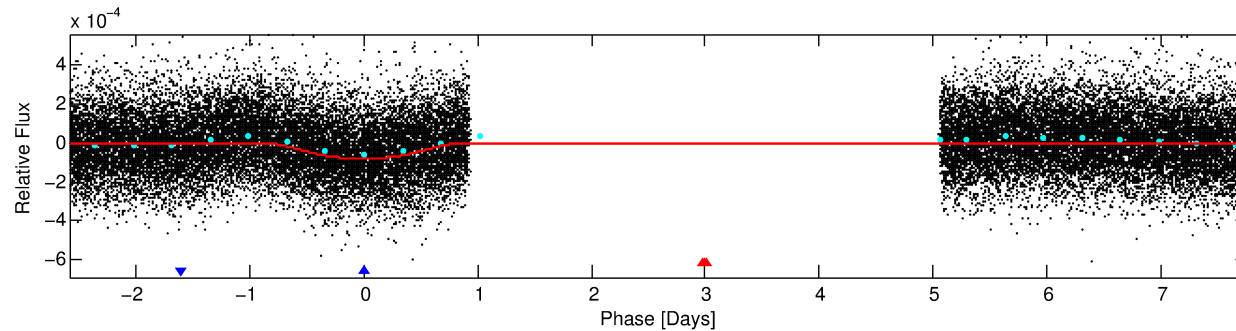
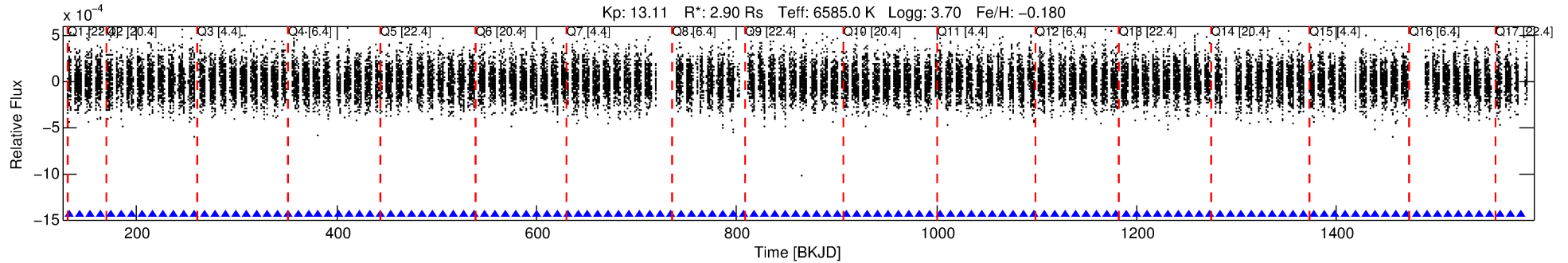
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011876098-02

No Significant Match Found

# DV One-Page Summary

KIC: 11876098 Candidate: 2 of 2 Period: 10.364 d



## DV Fit Results:

Period = 10.36393 [0.00049] d  
Epoch = 133.3174 [0.0395] BKJD  
Rp/R\* = 0.0167 [0.0168]  
a/R\* = 1.07 [0.01]  
b = 1.00 [0.02]  
Seff = 1234.10 [662.63]  
Teq = 1511 [203] K  
Rp = 5.28 [5.64] Re  
a = 0.1071 [0.0356] AU  
Ag = 2.31 [4.97] [0.26σ]  
Teffp = 2881 [1506] K [0.90σ]

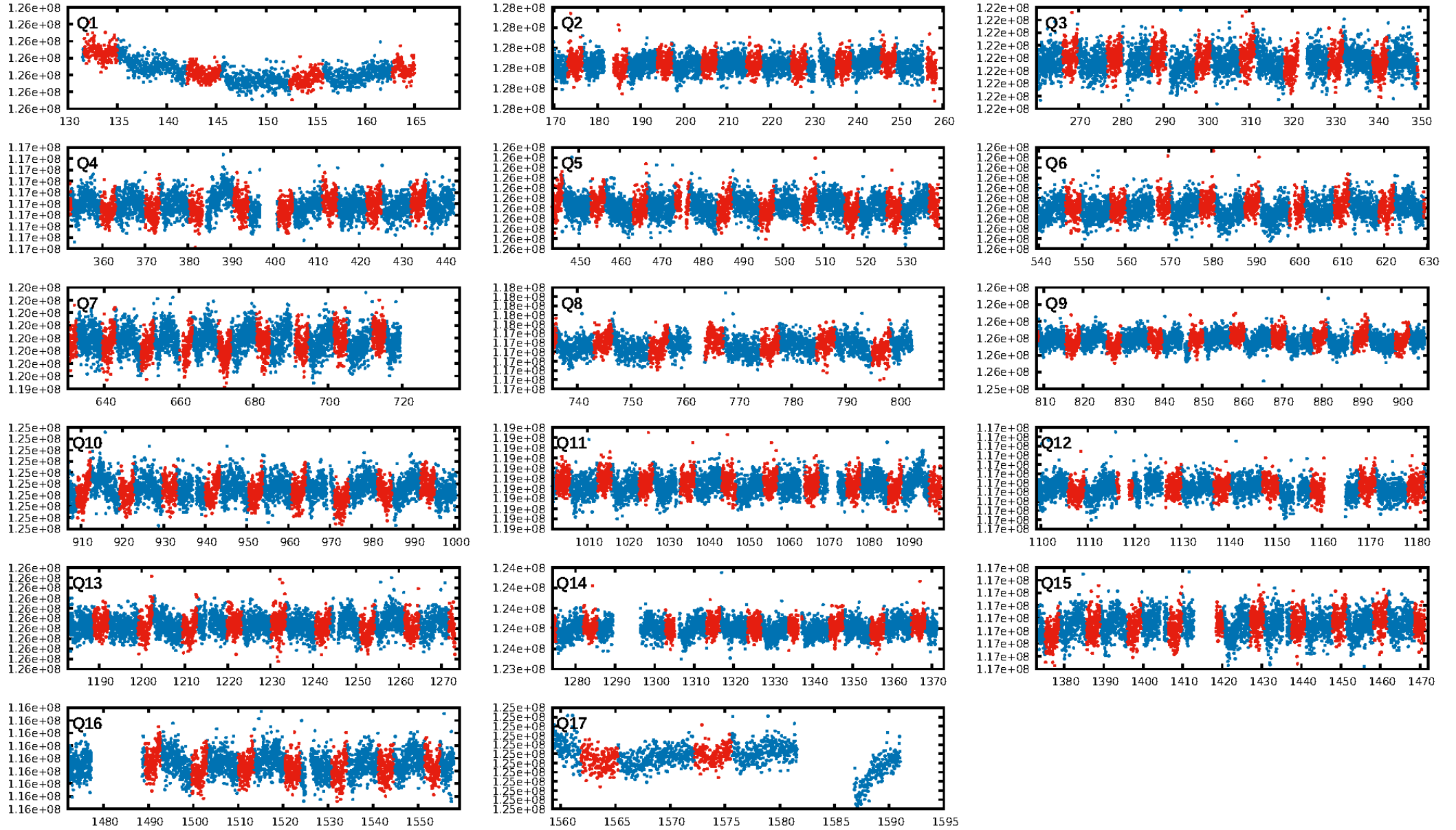
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.63e-27  
RollingBand-fgt: 1.00 [127/127]  
GhostDiagnostic-chr: 1.828  
Centroid-sig: 0.1%  
Centroid-so: 1.948 arcsec [2.74σ]  
OotOffset-rm: 5.537 arcsec [3.74σ]  
KicOffset-rm: 5.535 arcsec [3.59σ]  
OotOffset-st: 2/3/1/4 [10]  
KicOffset-st: 2/3/1/4 [10]  
DiffImageQuality-fgm: 0.50 [5/10]  
DiffImageOverlap-fno: 0.00 [0/17]

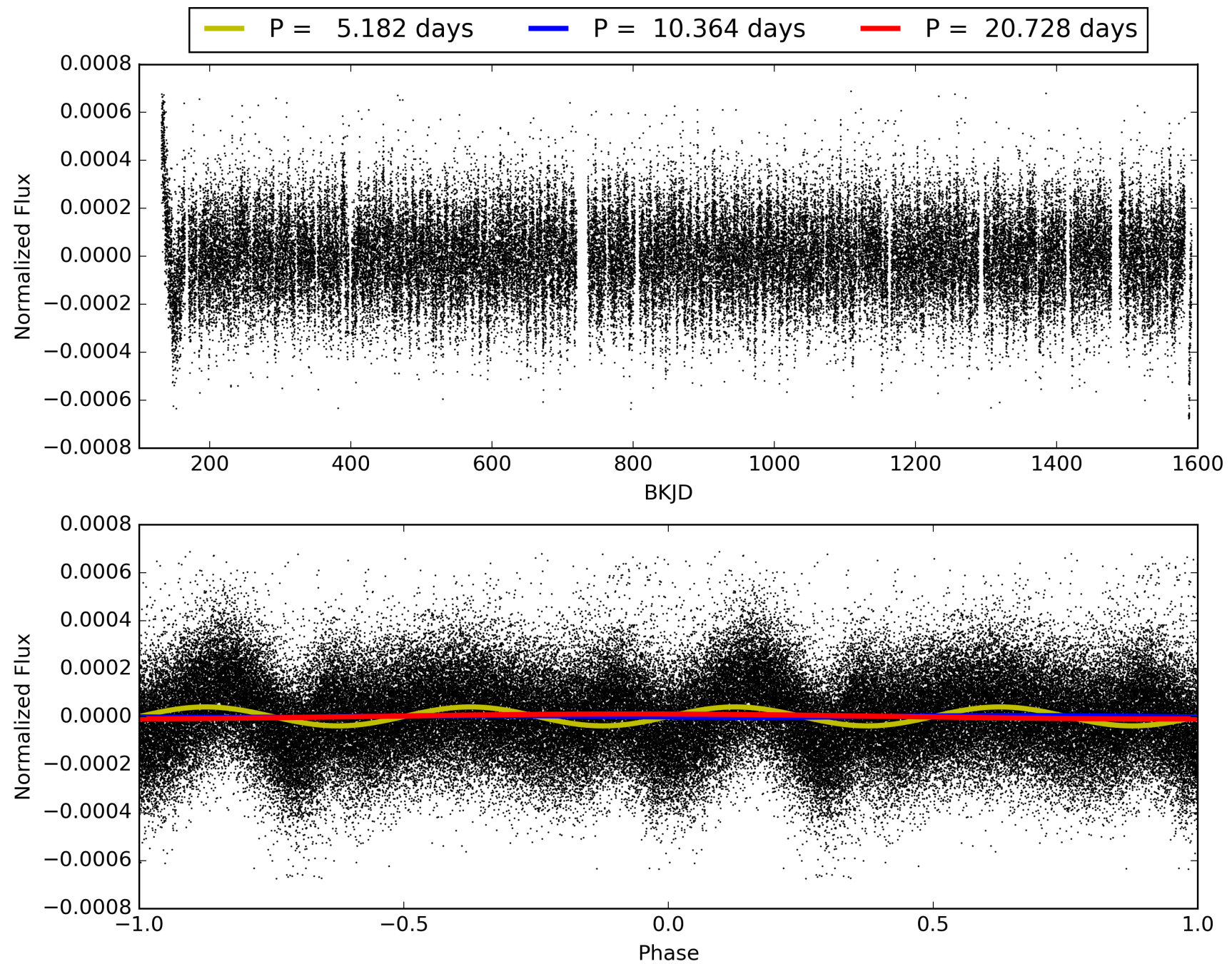
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:46:39 Z

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

# TCE 011876098-02, PDC Light Curves

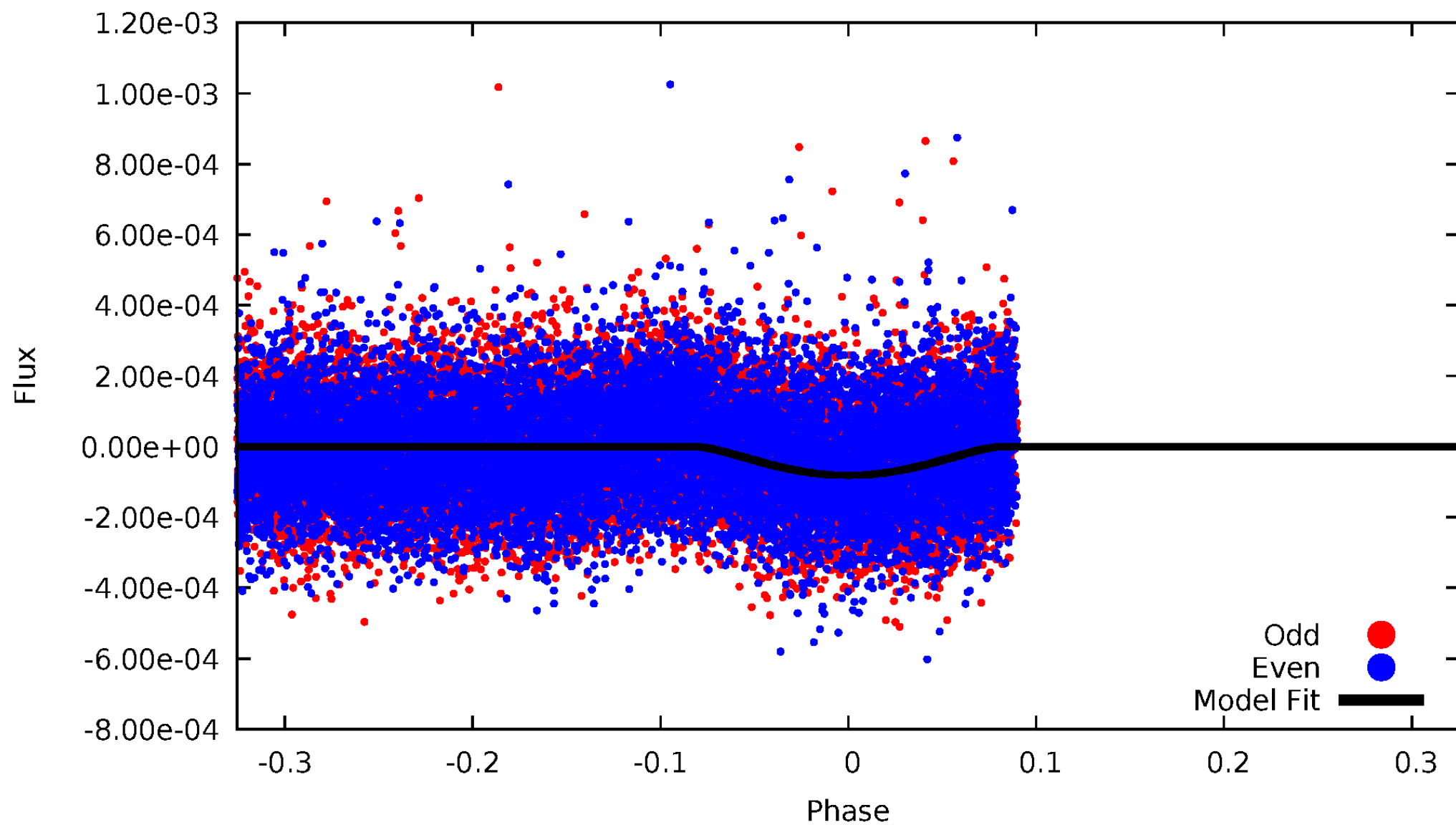


# TCE 011876098-02



# DV Odd/Even

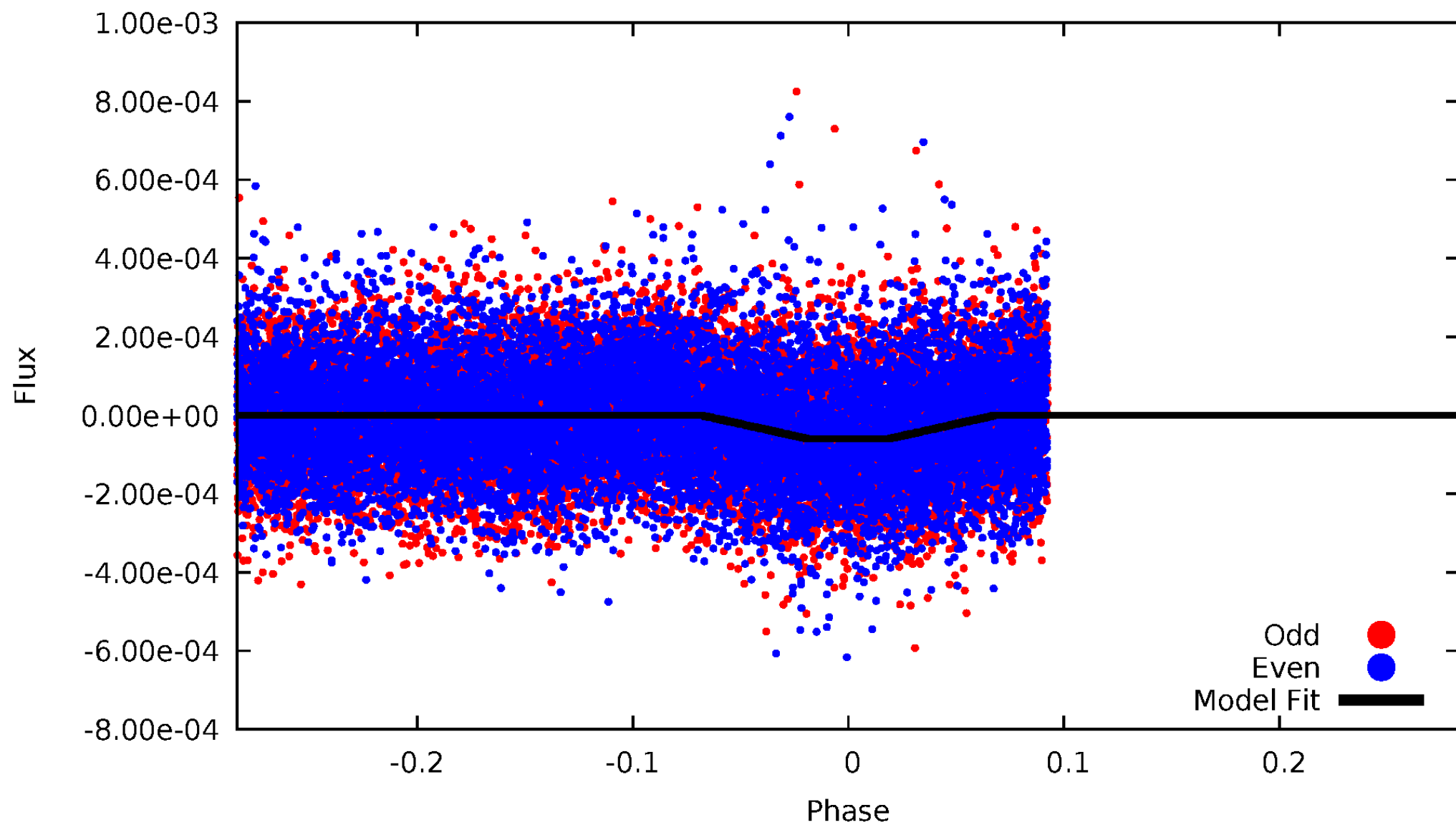
TCE 011876098-02





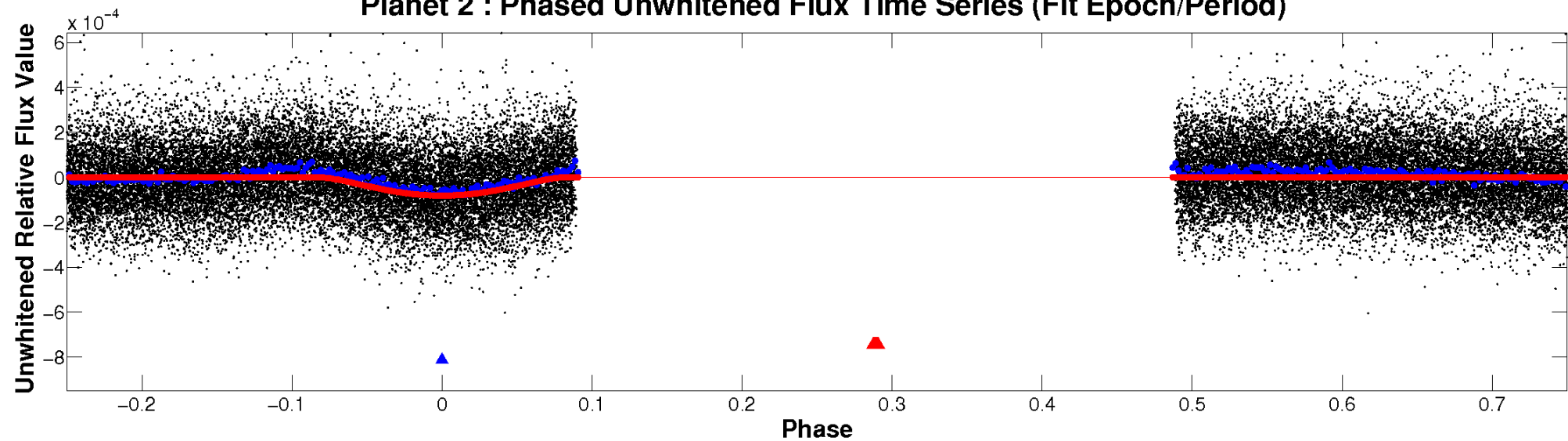
# ALT Odd/Even

TCE 011876098-02

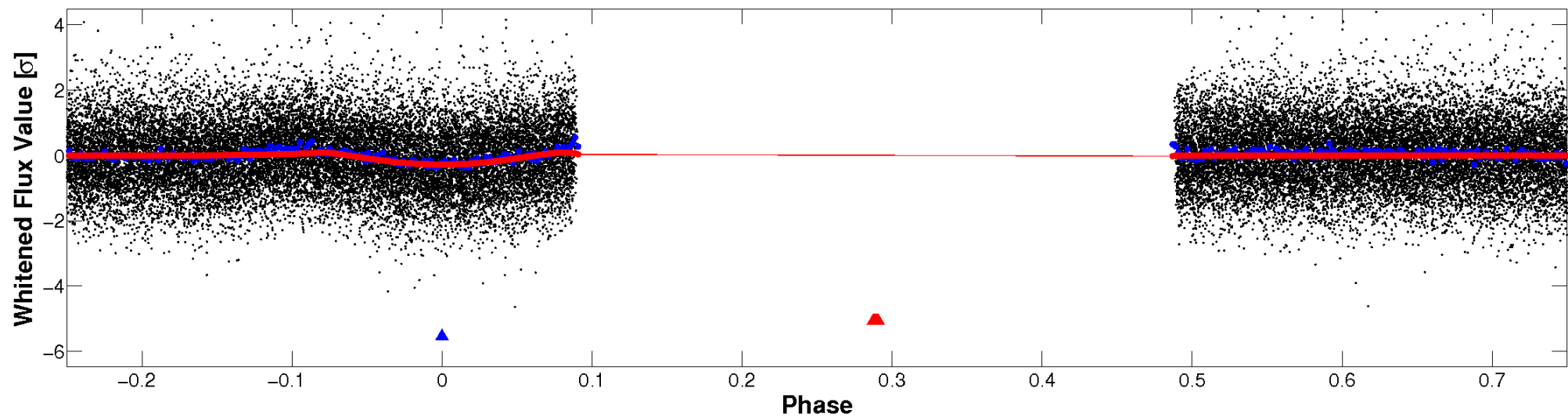


# Non-Whitened Vs. Whitened Light Curve

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

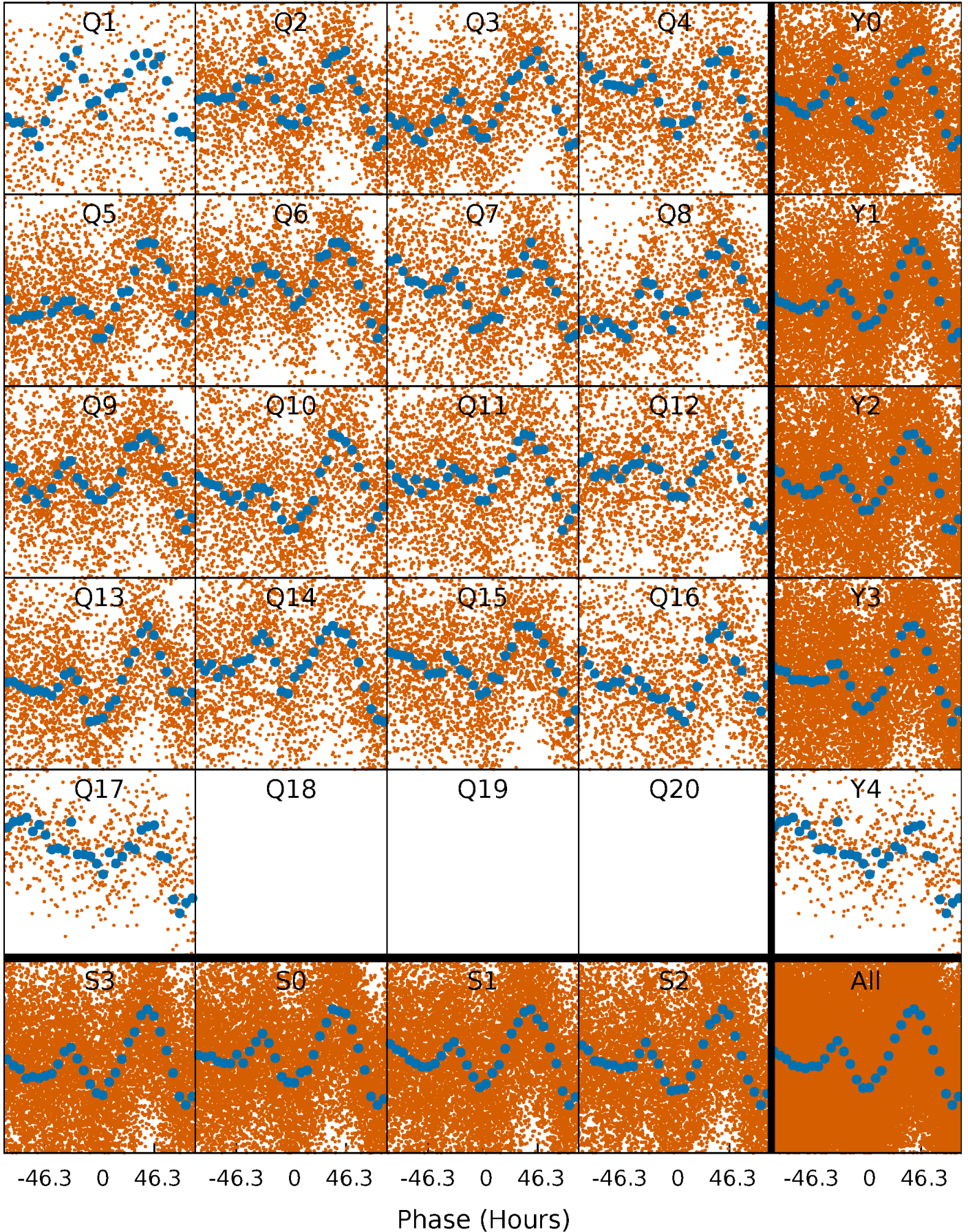


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

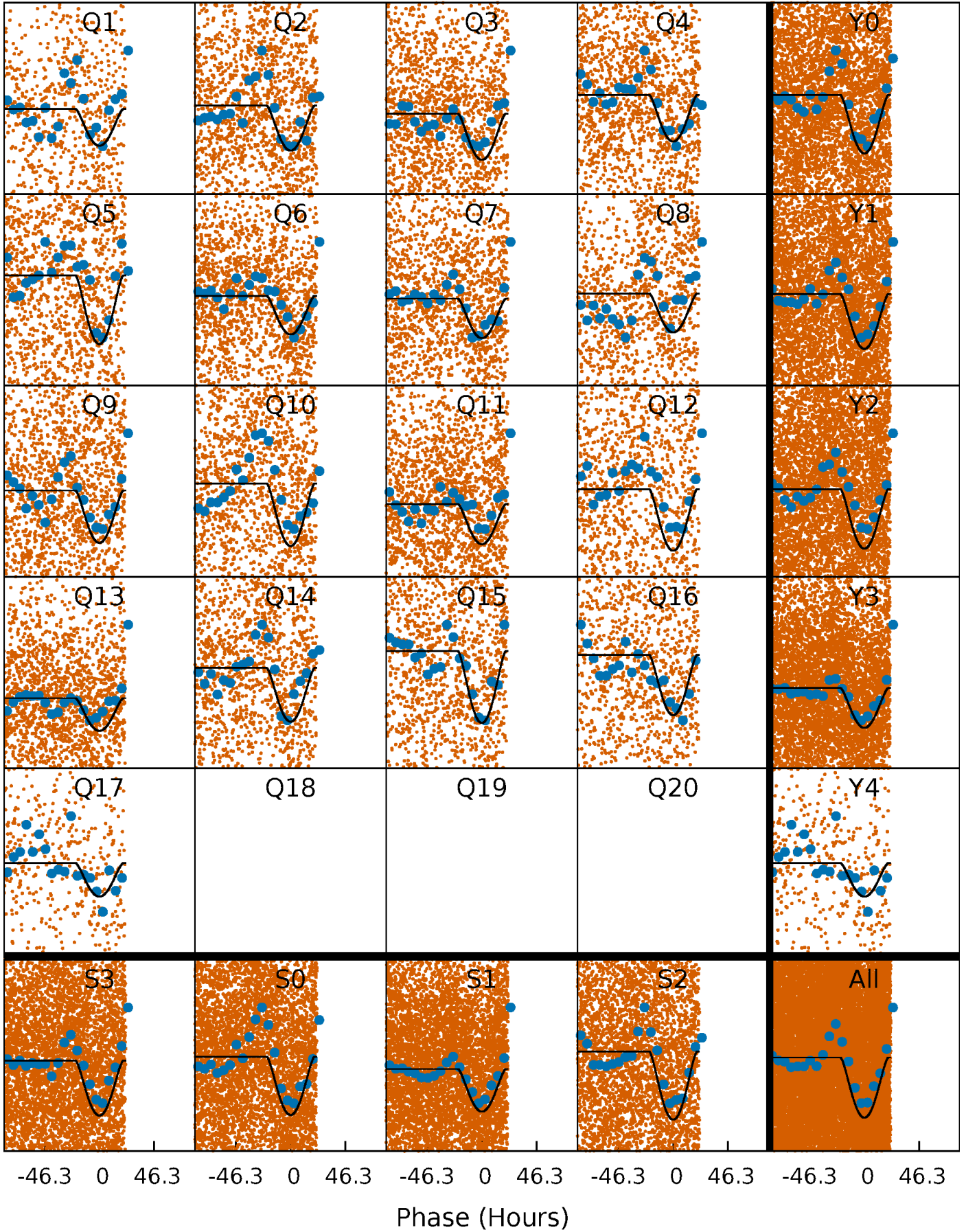
TCE 011876098-02   P= 10.363935 Days    $T_0=133.317419$  (BKJD)





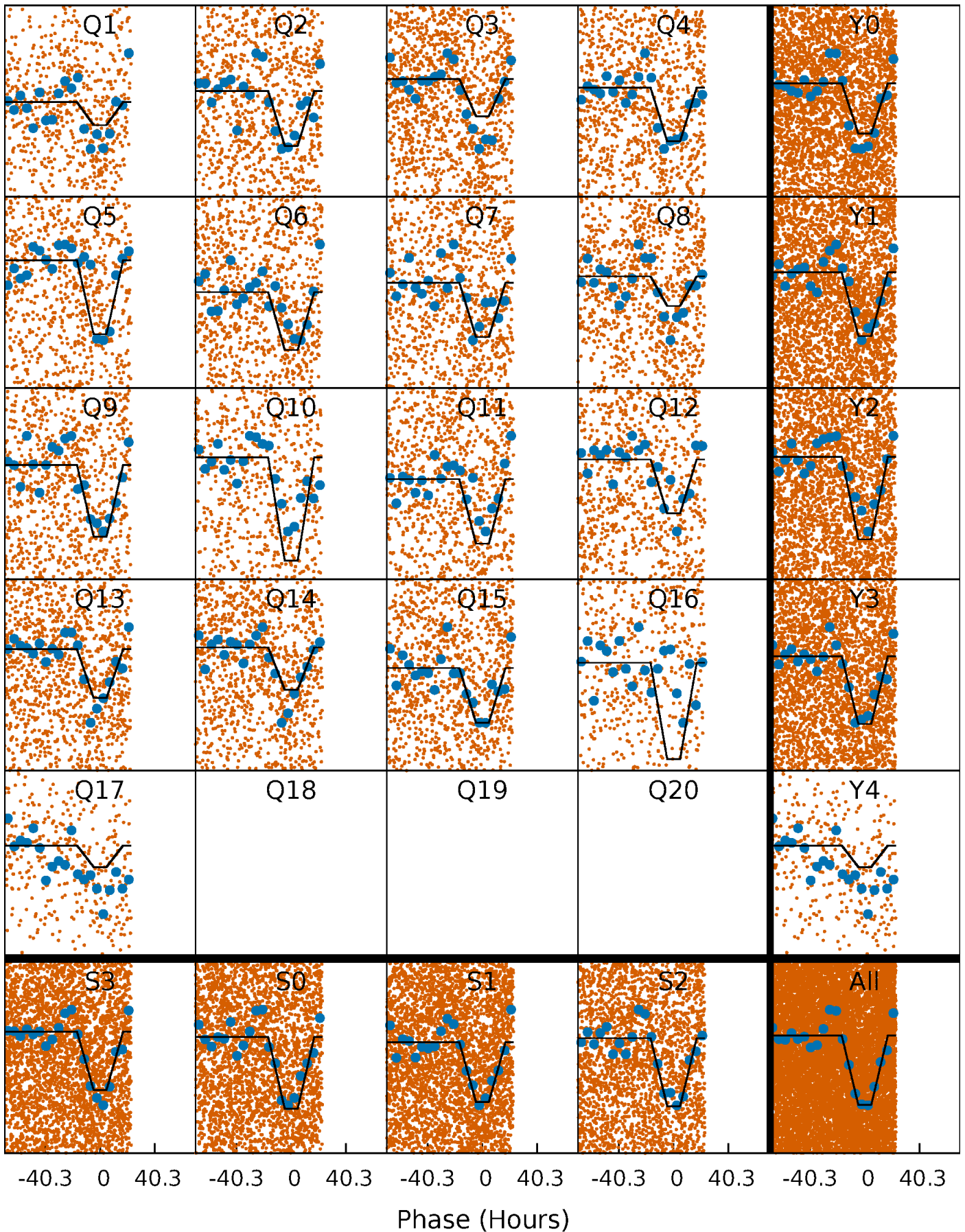
# DV Quarter-Phased Transit Curves

TCE 011876098-02   P= 10.363935 Days    $T_0=133.317419$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011876098-02 P= 10.363683 Days  $T_0=133.296283$  (BKJD)

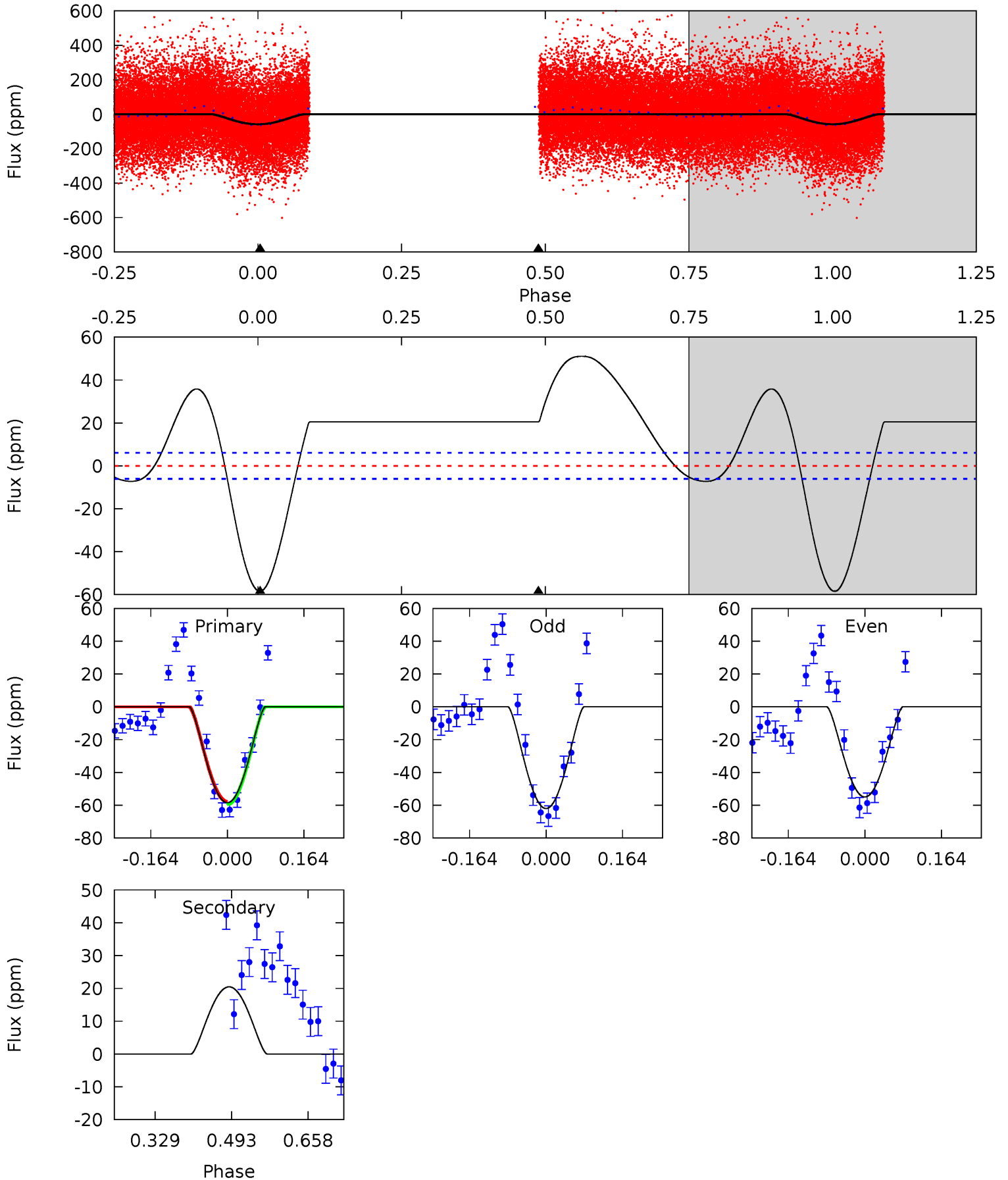




# DV Model-Shift Uniqueness Test

011876098-02, P = 10.363935 Days, E = 122.953484 Days

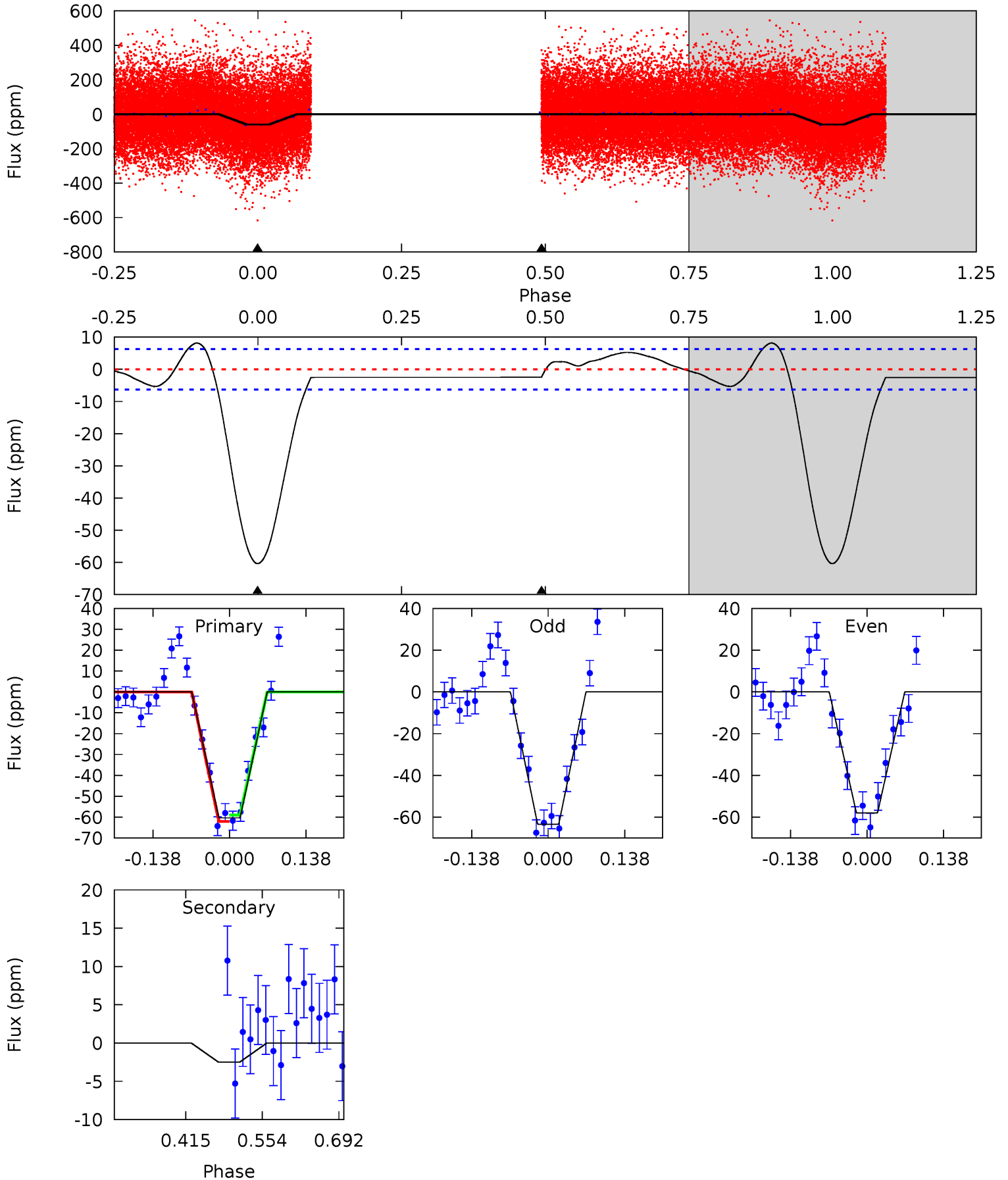
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.2	-15.1	0	0	4.46	1.39	7.66	43.2	43.2	-15.1	-15.1	2.58	1.02	0.47	0.62



# Alt Model-Shift Uniqueness Test

011876098-02, P = 10.363683 Days, E = 122.932600 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
43.1	1.78	0	0	4.50	1.48	2.49	43.1	43.1	1.78	1.78	1.94	0.96	0.12	1.07



### Stellar Parameters For KIC 011876098

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6585^{+178}_{-198}$	$3.697^{+0.304}_{-0.076}$	$-0.180^{+0.300}_{-0.250}$	$2.900^{+0.441}_{-1.030}$	$1.529^{+0.253}_{-0.310}$	$0.088^{+0.183}_{-0.028}$
	+3%/-3%	+8%/-2%	+167%/-139%	+15%/-36%	+17%/-20%	+207%/-32%
Source	PHO1	FLK73	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 011876098-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$20 \pm 1$	$5.92^{+5.00}_{-3.88}$	$2061^{+114}_{-182}$	$-3621^{+537}_{-1779}$	$-3.801^{+2.697}_{-27.438}$
Alt.	$-2 \pm 1$	$4.34^{+4.22}_{-3.08}$	$2067^{+115}_{-186}$	$2637^{+1539}_{-4973}$	$0.756^{+9.818}_{-0.607}$

$T_{\text{max}}$  = 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

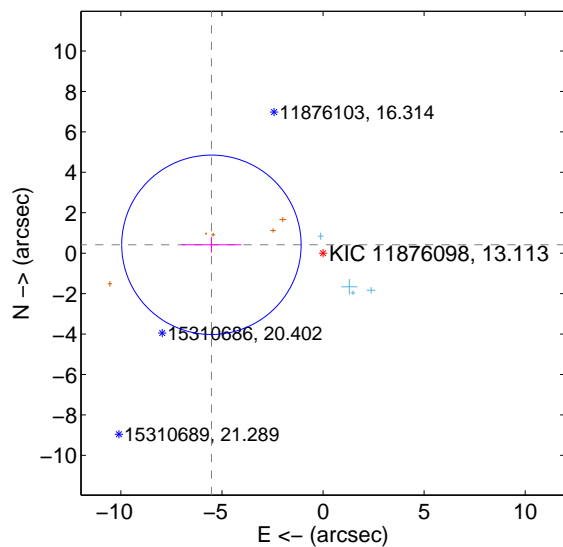
Supplemental centroid analysis for 011876098-02. Kepler magnitude: 13.11. Transit SNR 17.92

There are 5 quarters with good PRF difference image offsets

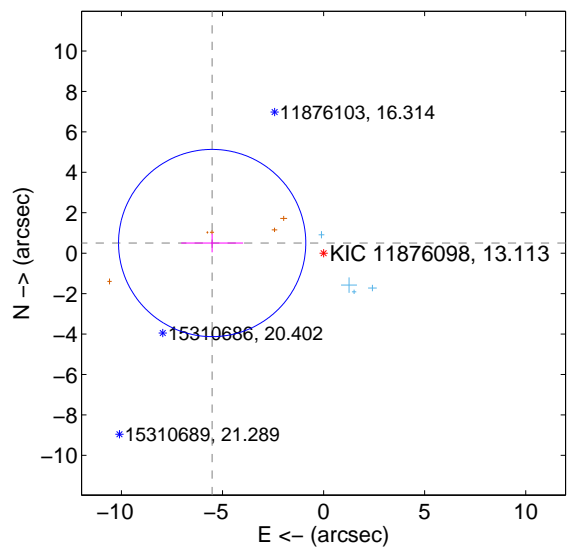
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.537 \pm 1.479$	3.74	$5.522 \pm 1.483$	$0.415 \pm 0.391$
PRF-fit source offset from KIC position	$5.535 \pm 1.544$	3.59	$5.512 \pm 1.533$	$0.502 \pm 0.462$
photometric centroid source offset	$1.95 \pm 0.71$	2.74	$1.85 \pm 0.73$	$-0.60 \pm 0.47$

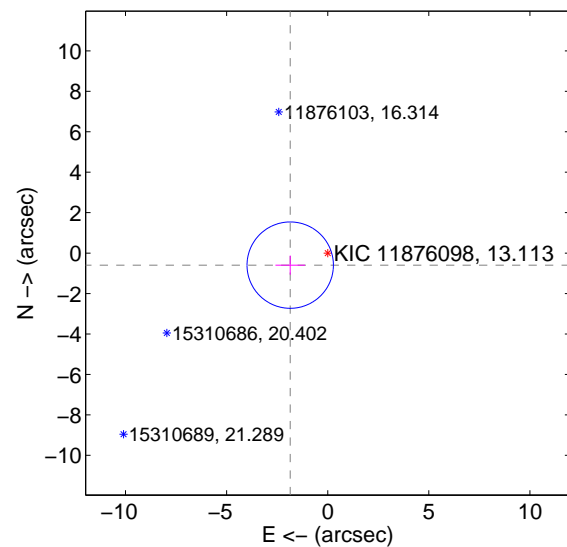
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

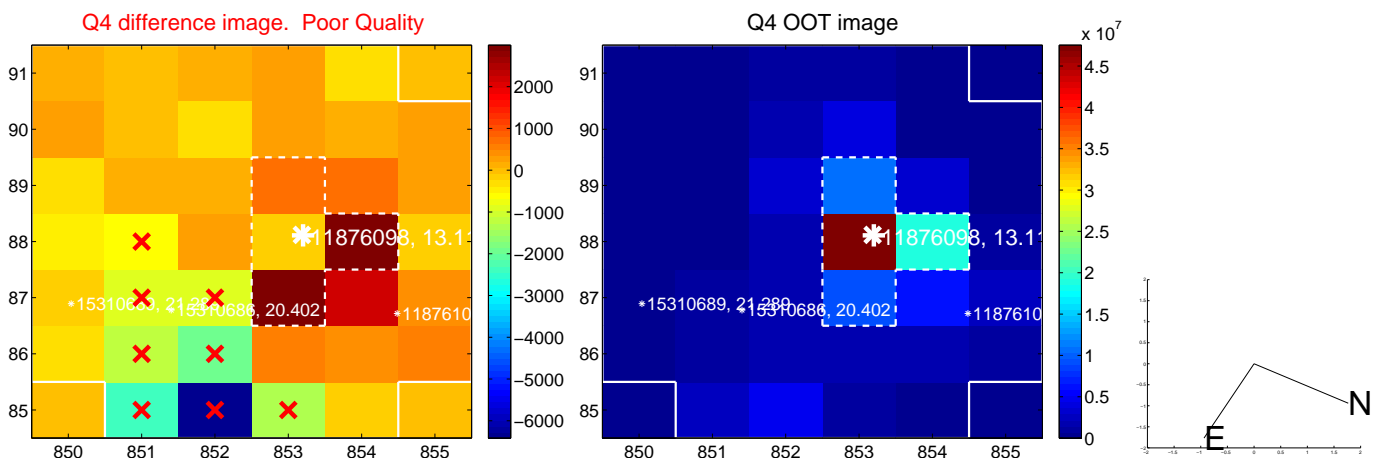
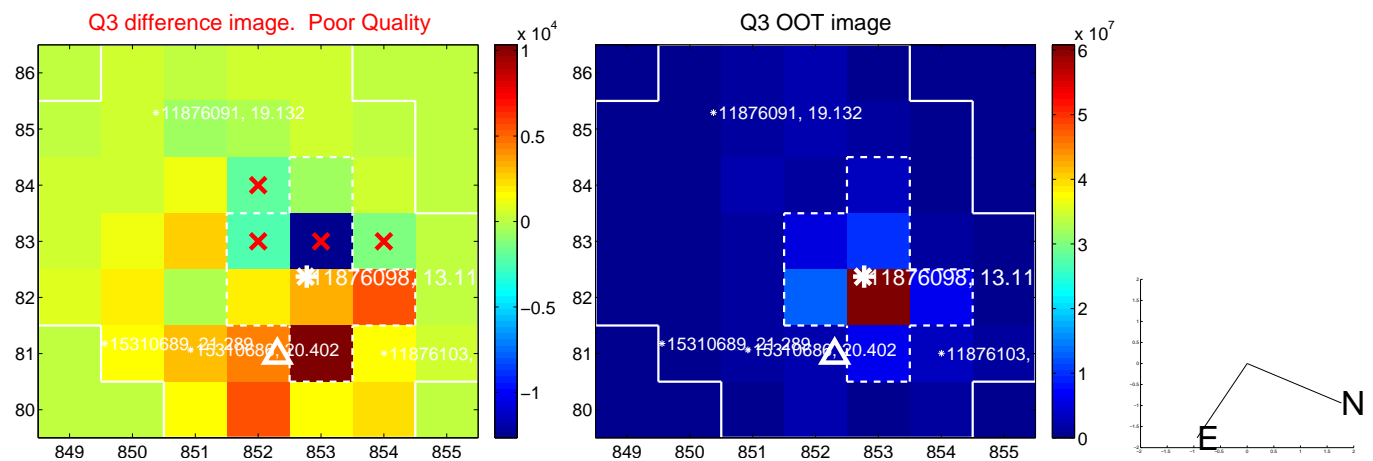
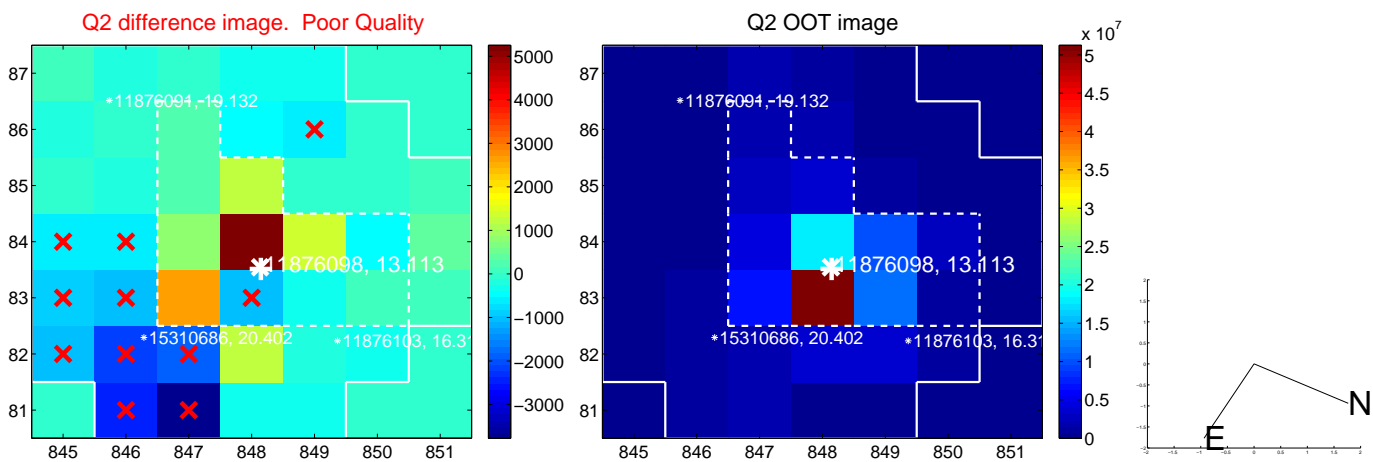
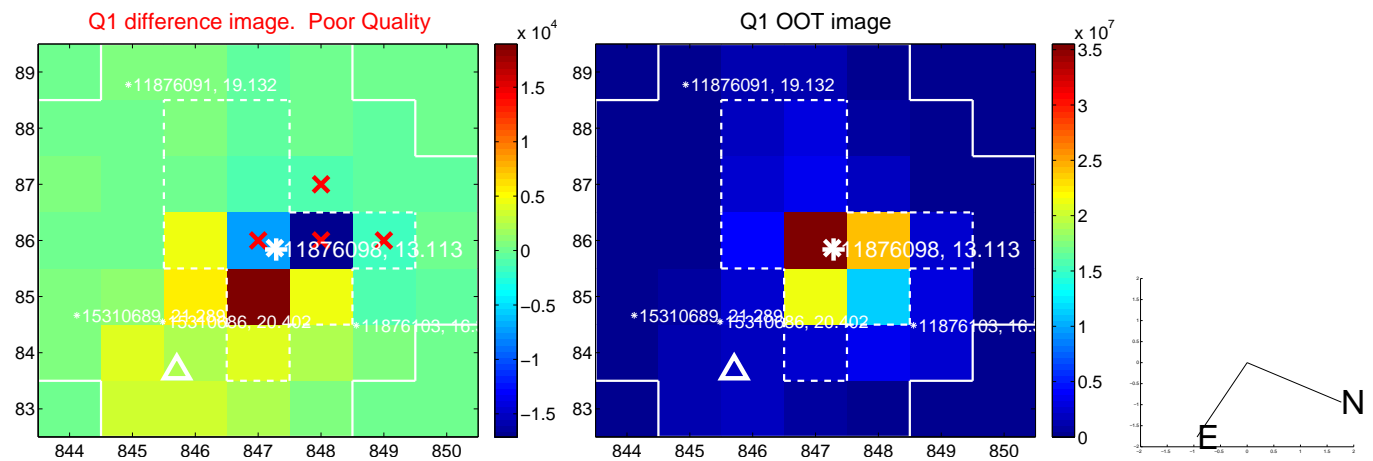


offset from photometric centroids



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

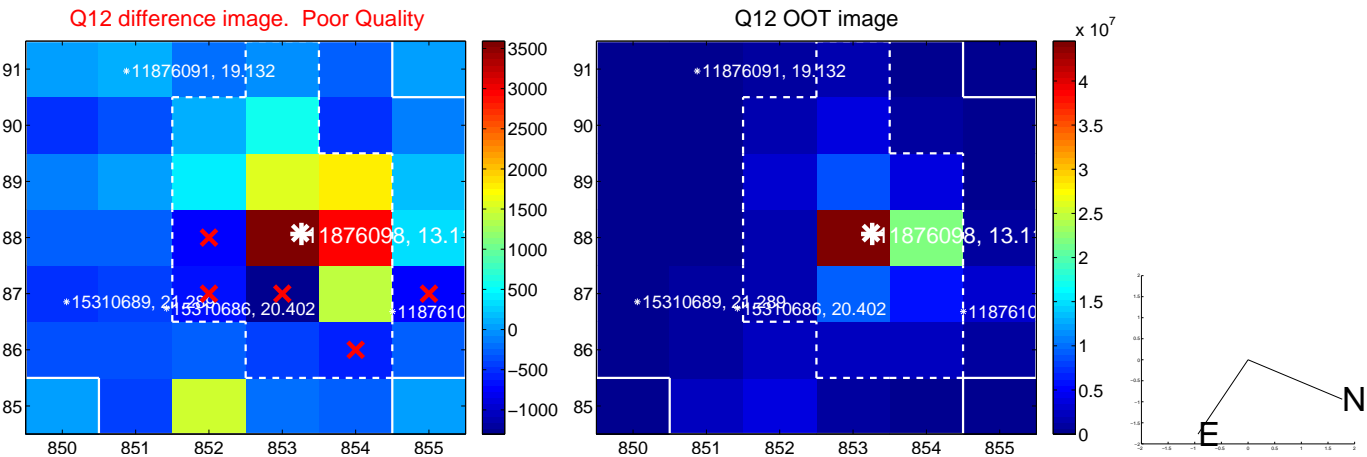
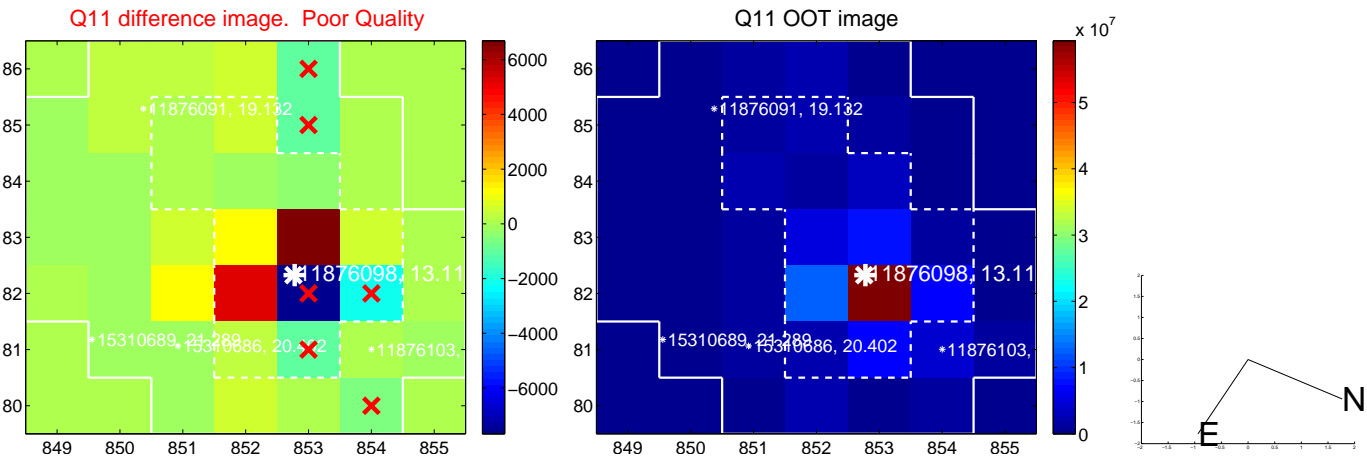
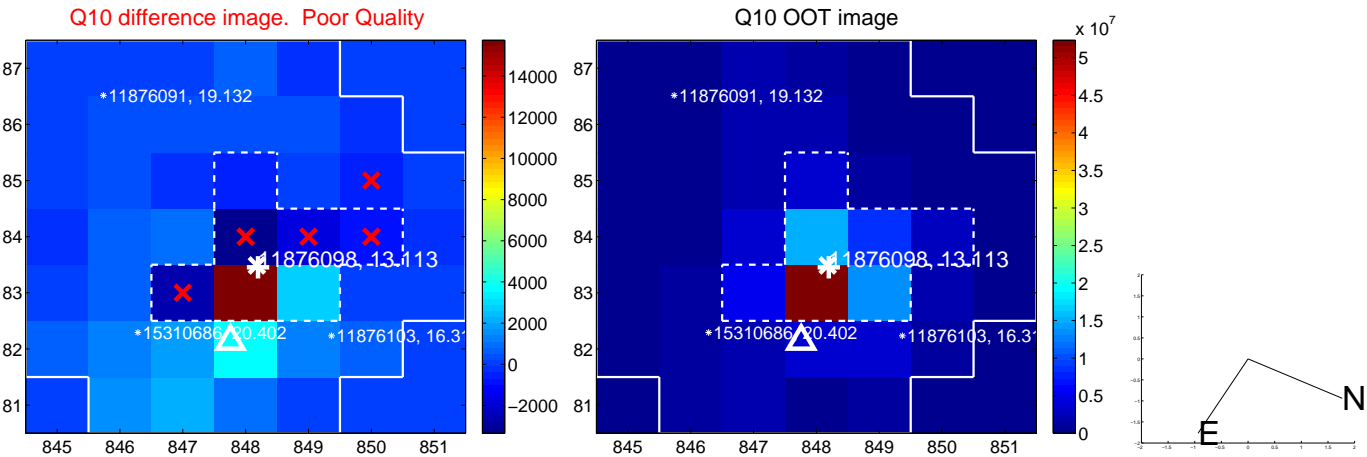
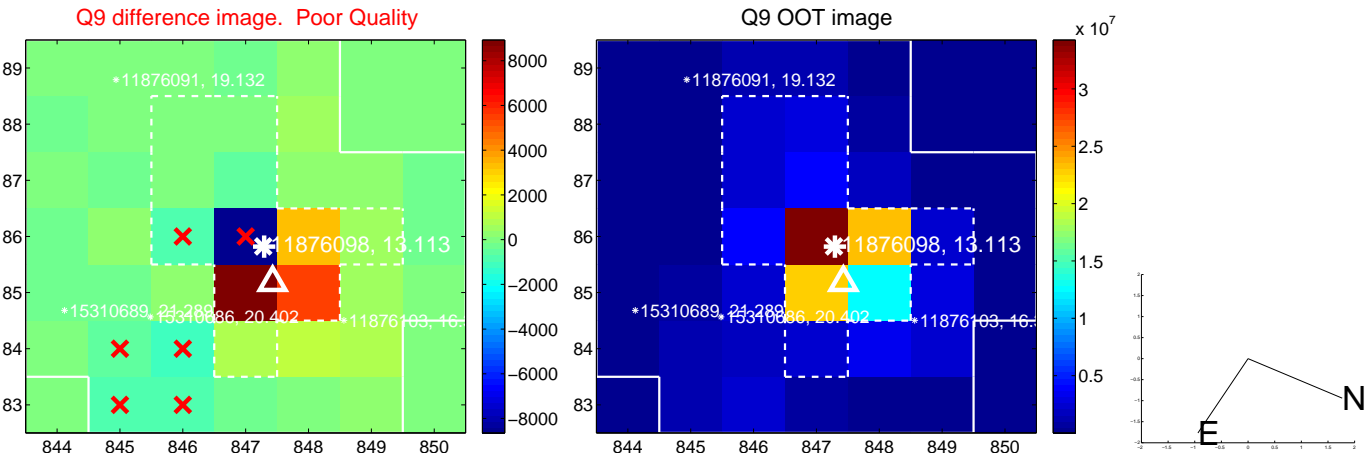
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



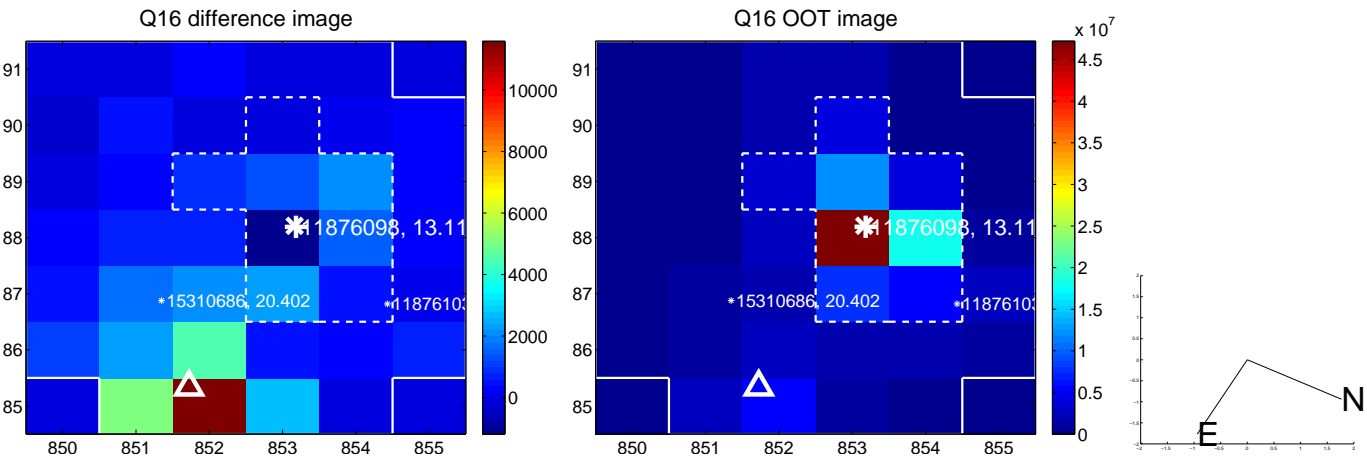
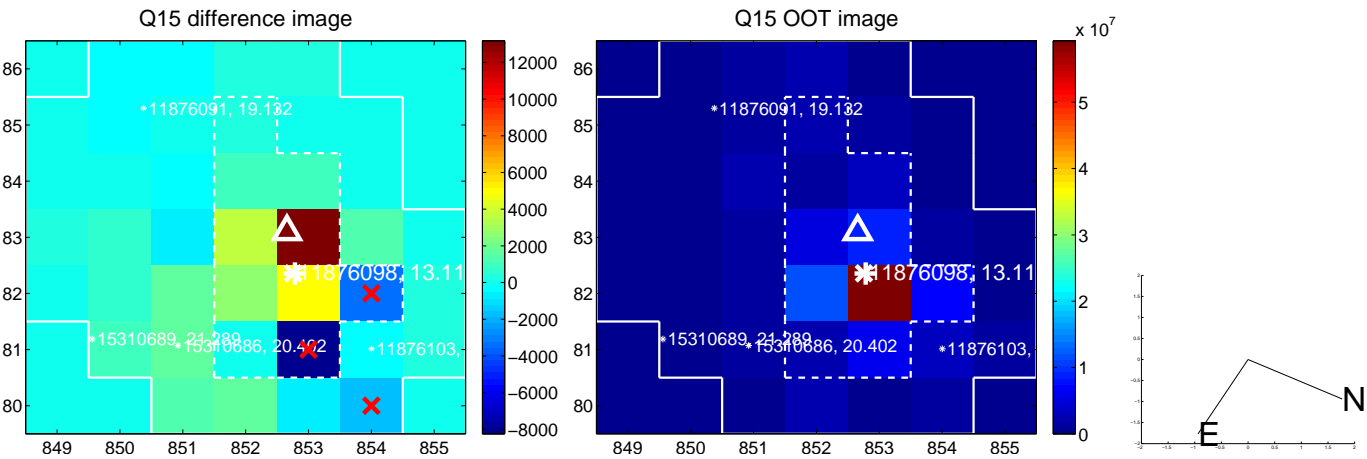
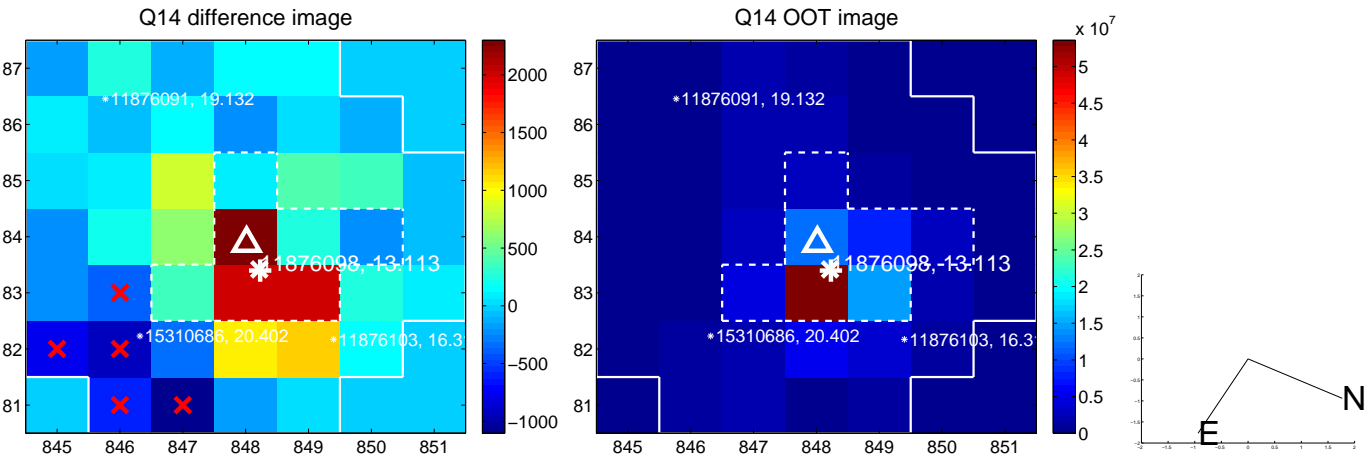
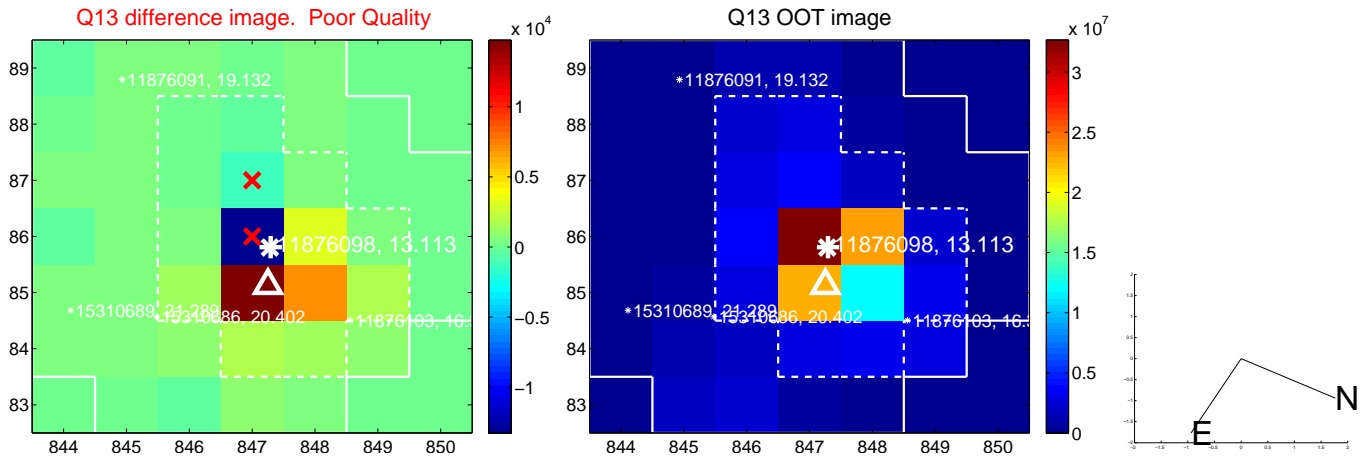




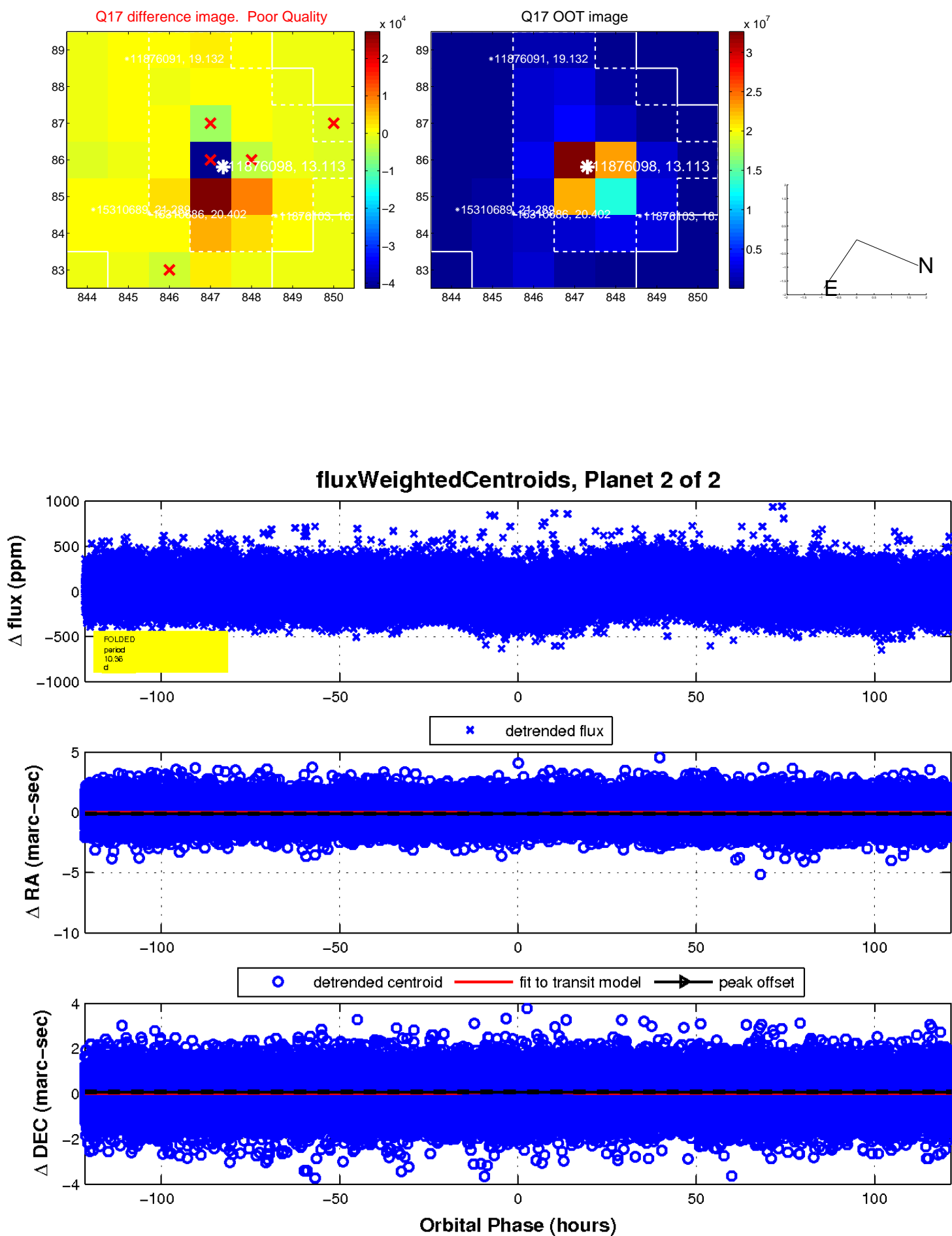
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

