

# KIC 008556845

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008556845-01	OBS	No	375.180595	140.365536	890.4	15.000	14.9	-1.0	1.05	5936	3.12	1.13
008556845-02	OBS	No	377.728807	134.110513	710.1	33.135	10.6	10.4	1.05	5936	3.74	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008556845-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS
008556845-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

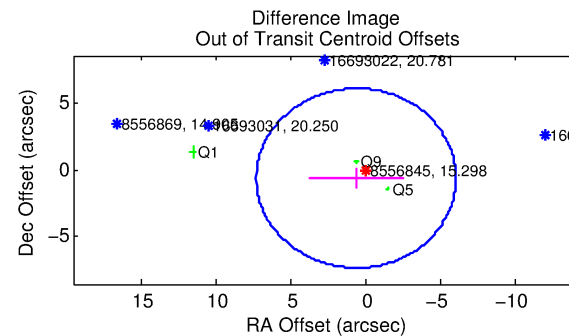
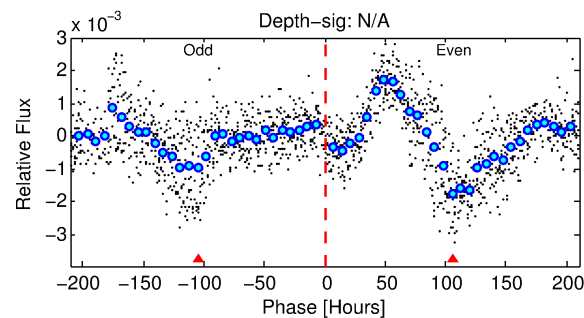
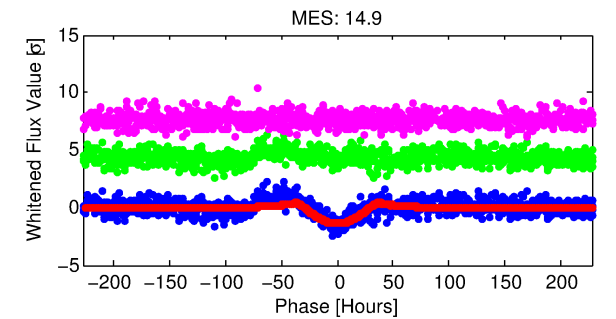
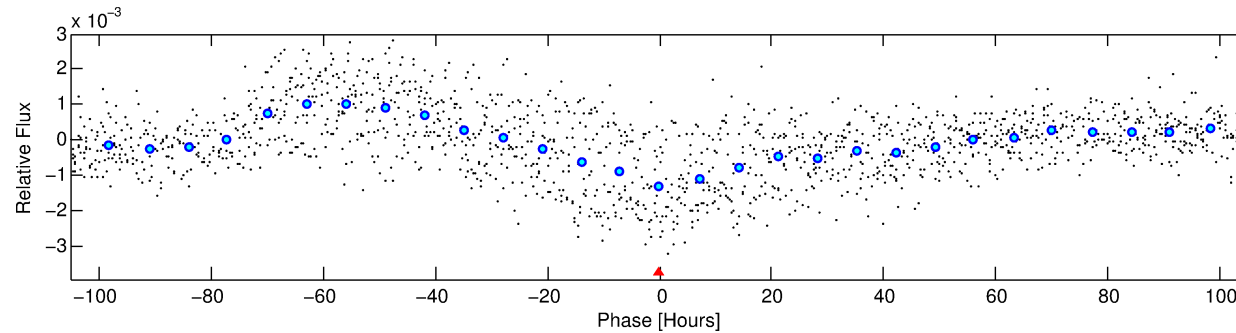
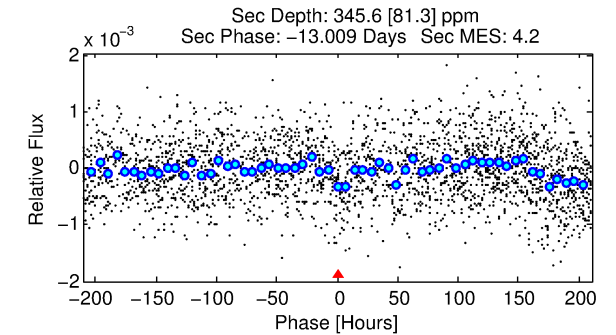
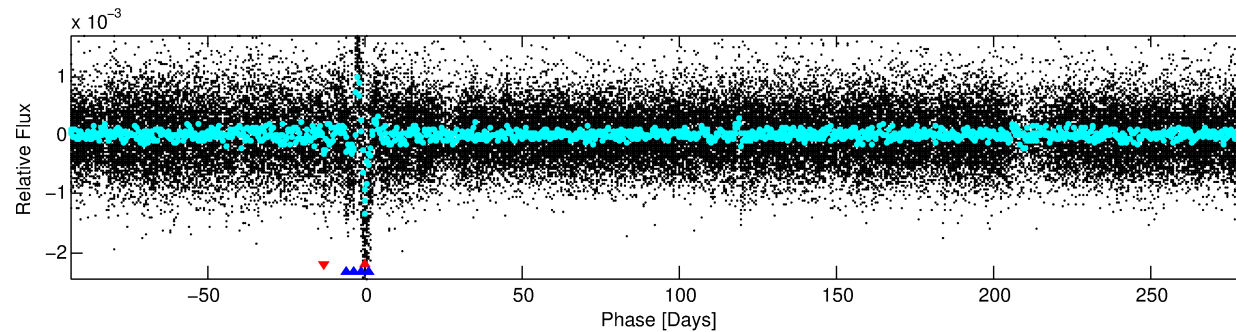
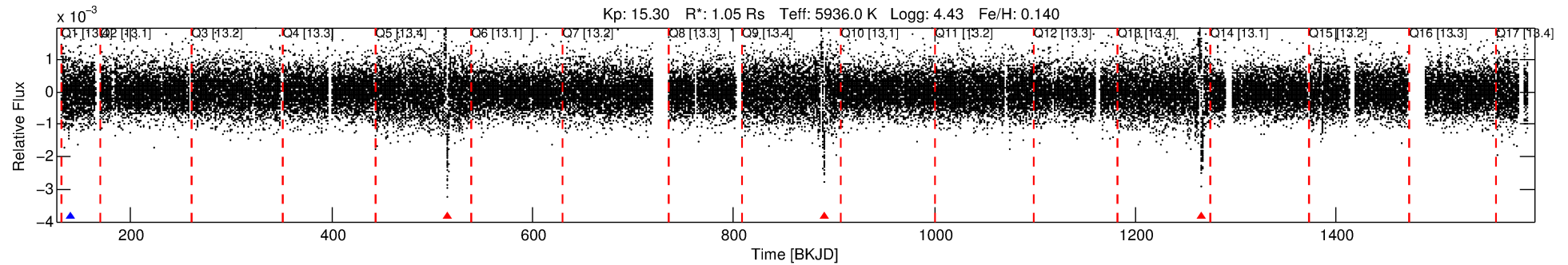
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008556845-01

No Significant Match Found

# DV One-Page Summary

KIC: 8556845 Candidate: 1 of 2 Period: 375.181 d



TPS TCE Results:

Period = 375.18060 d  
Epoch = 140.3655 BKJD

DV fit results are unavailable

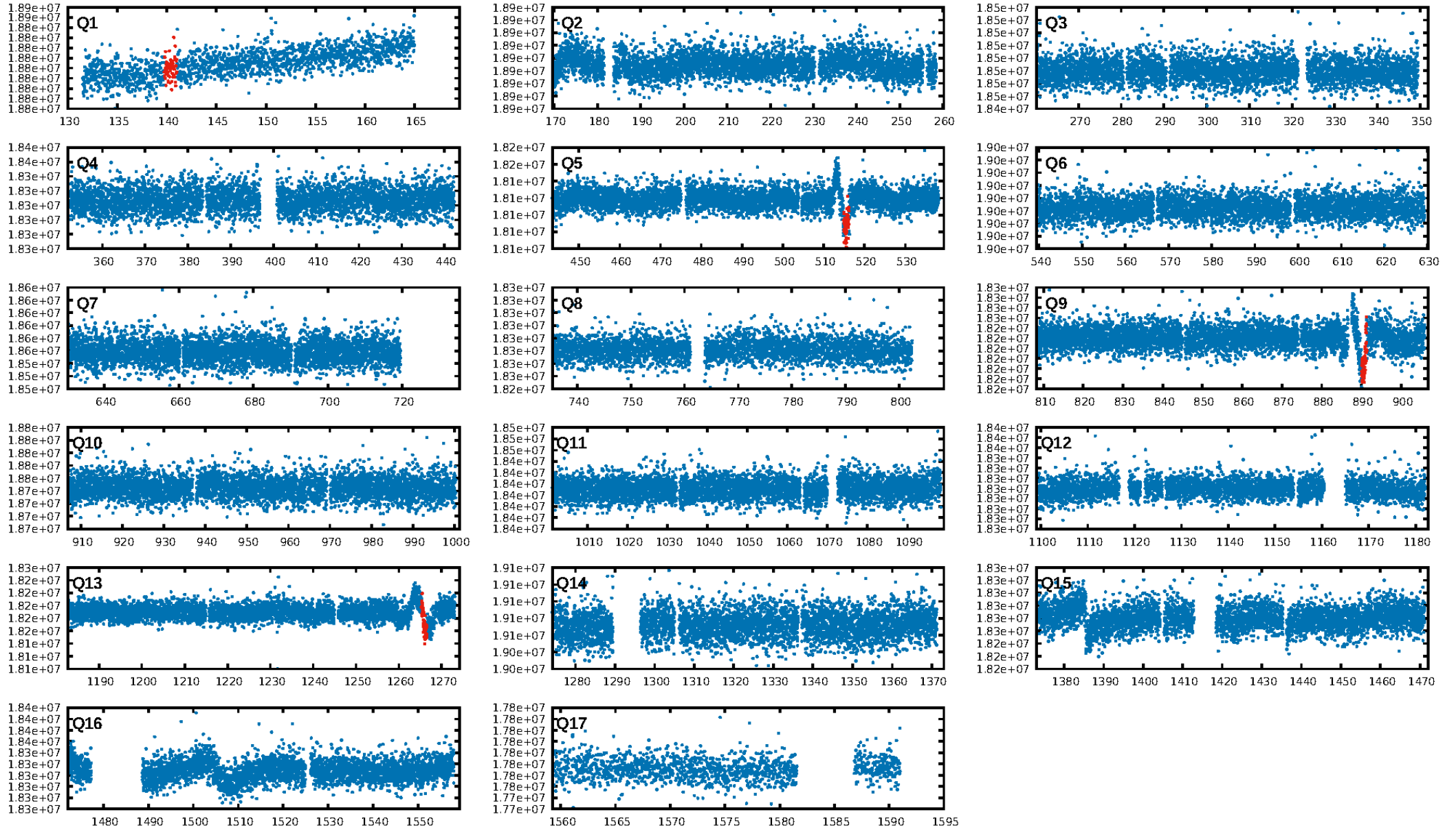
DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 90.7% [1.68σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.90e-52  
RollingBand-fgt: 0.00 [0/3]  
GhostDiagnostic-chr: 1.012  
Centroid-sig: 0.1%  
Centroid-so: 5.787 arcsec [2.71σ]  
OotOffset-rm: 0.861 arcsec [0.39σ]  
KicOffset-rm: 0.704 arcsec [0.21σ]  
OotOffset-st: 0/0/0/3 [3]  
KicOffset-st: 0/0/0/3 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.67 [2/3]

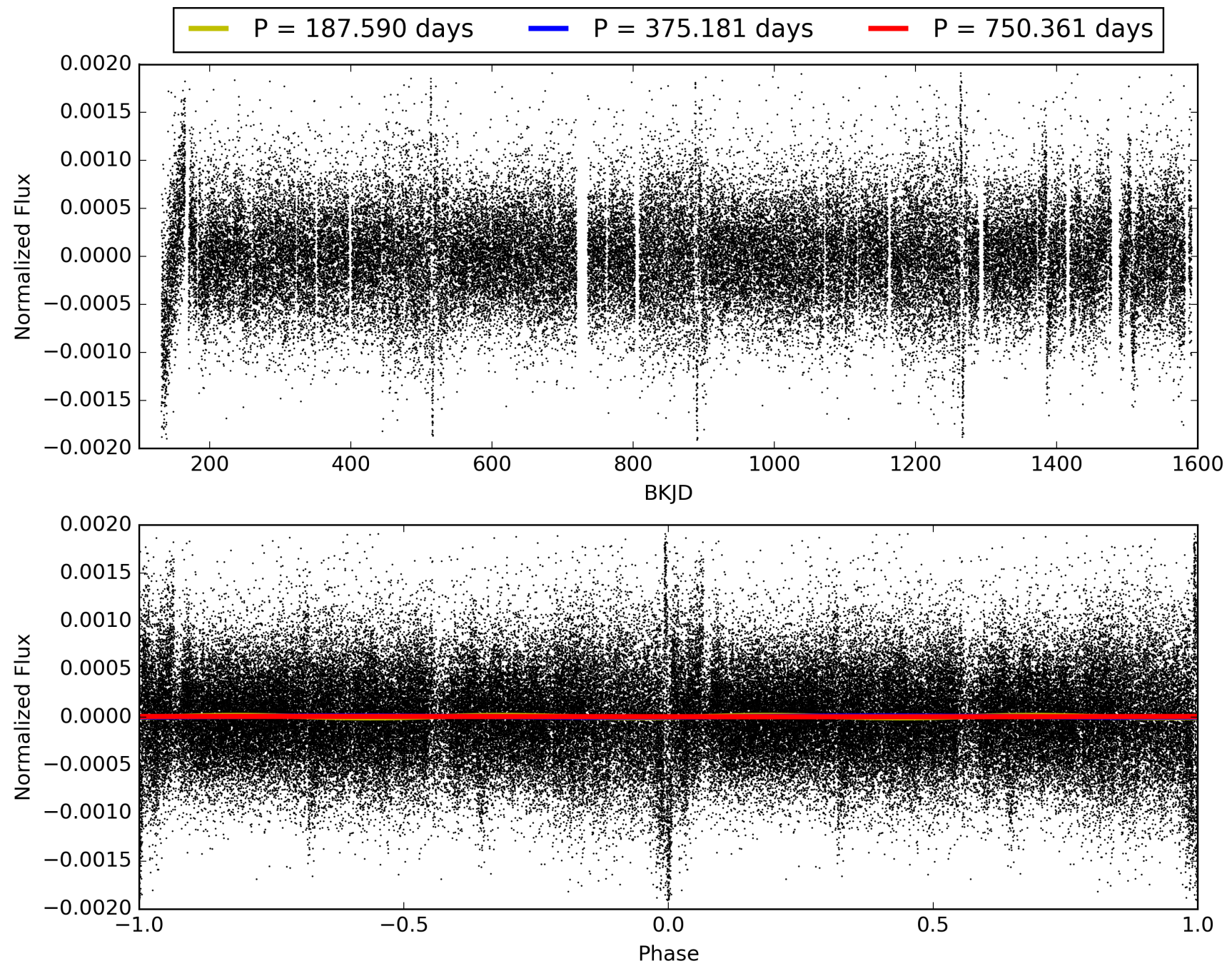
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:44:58 Z

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

# TCE 008556845-01, PDC Light Curves

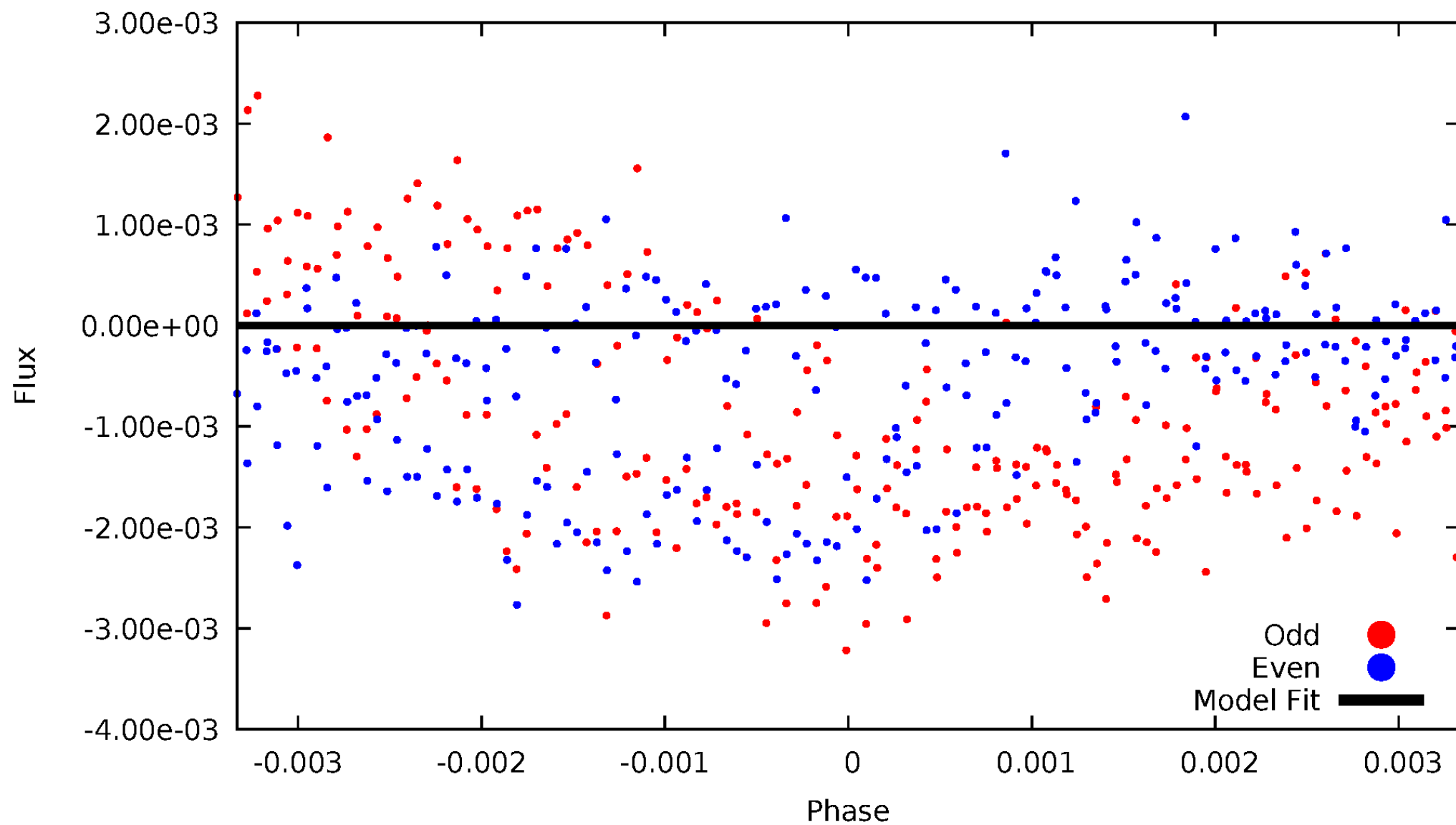


TCE 008556845-01



# DV Odd/Even

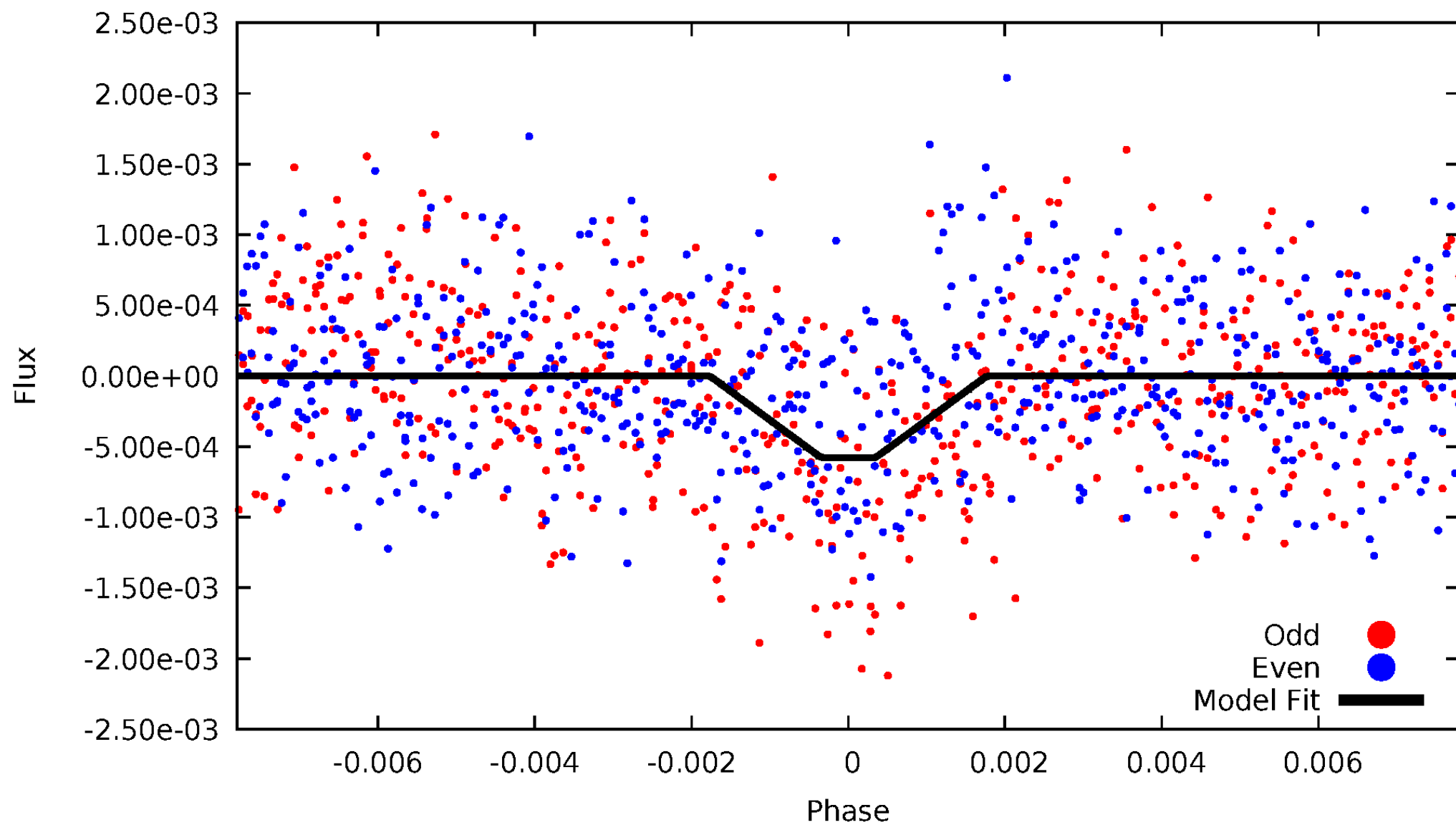
TCE 008556845-01



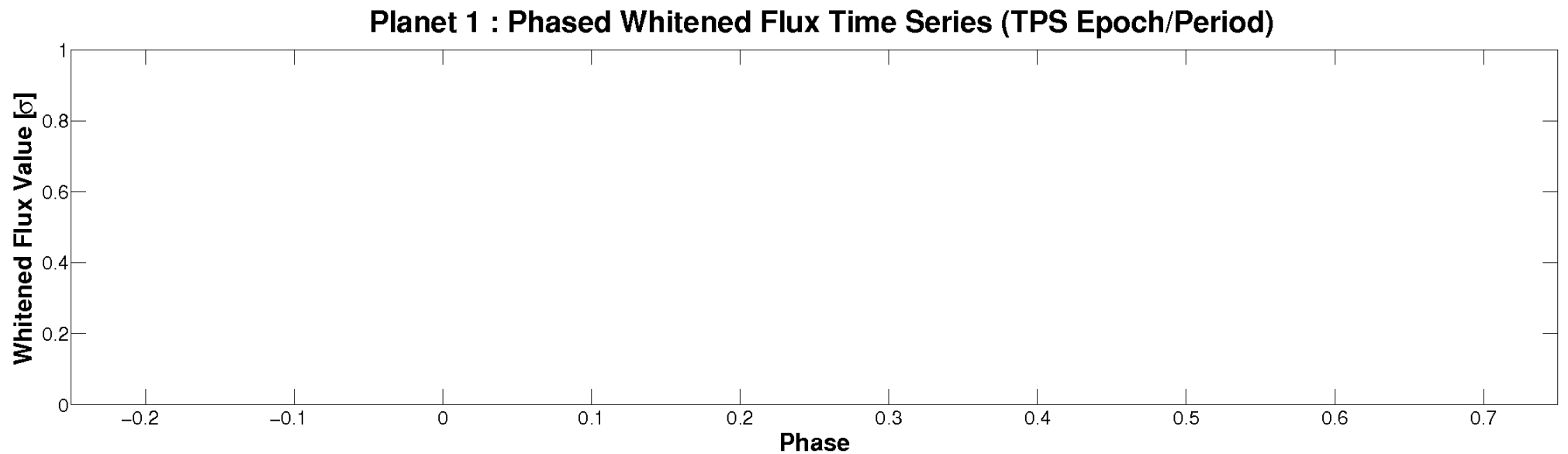
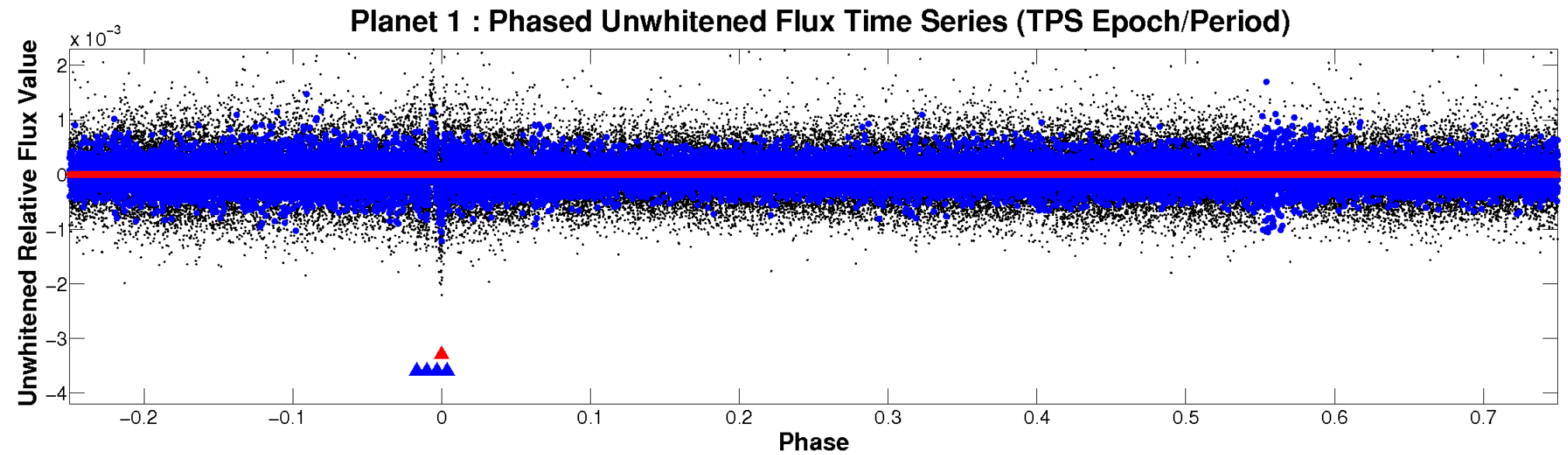


# ALT Odd/Even

TCE 008556845-01

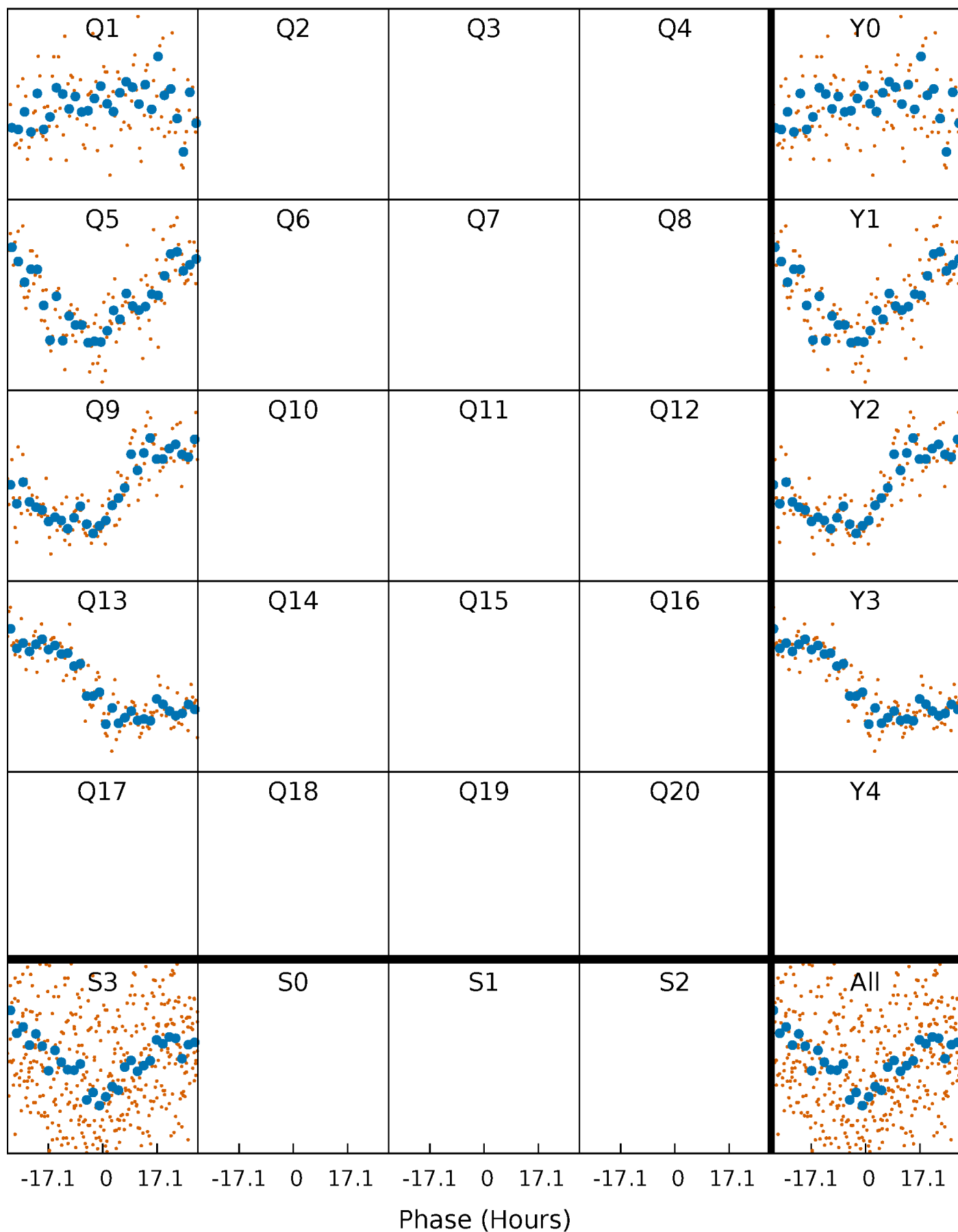


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

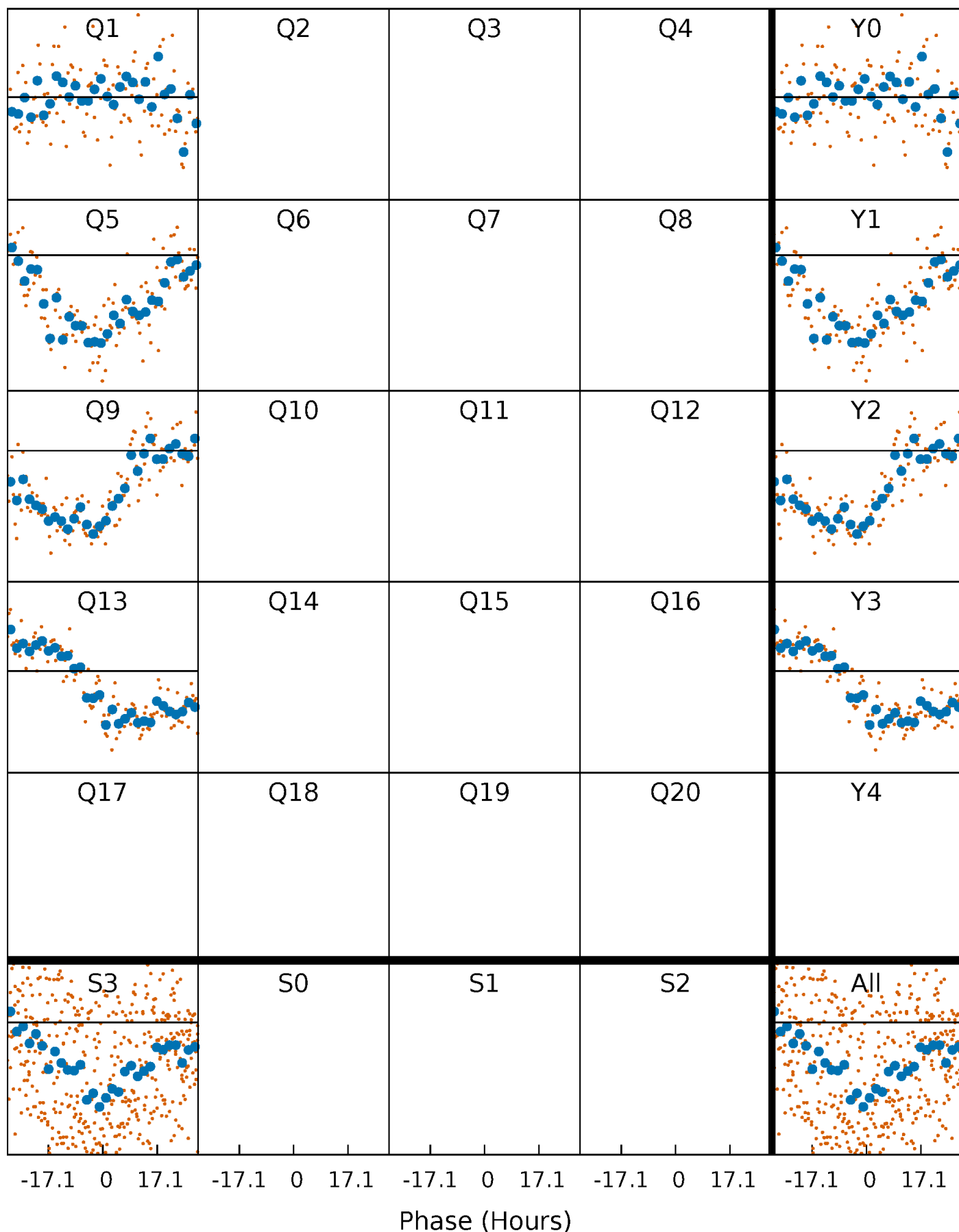
TCE 008556845-01     $P=375.180595$  Days     $T_0=140.365536$  (BKJD)





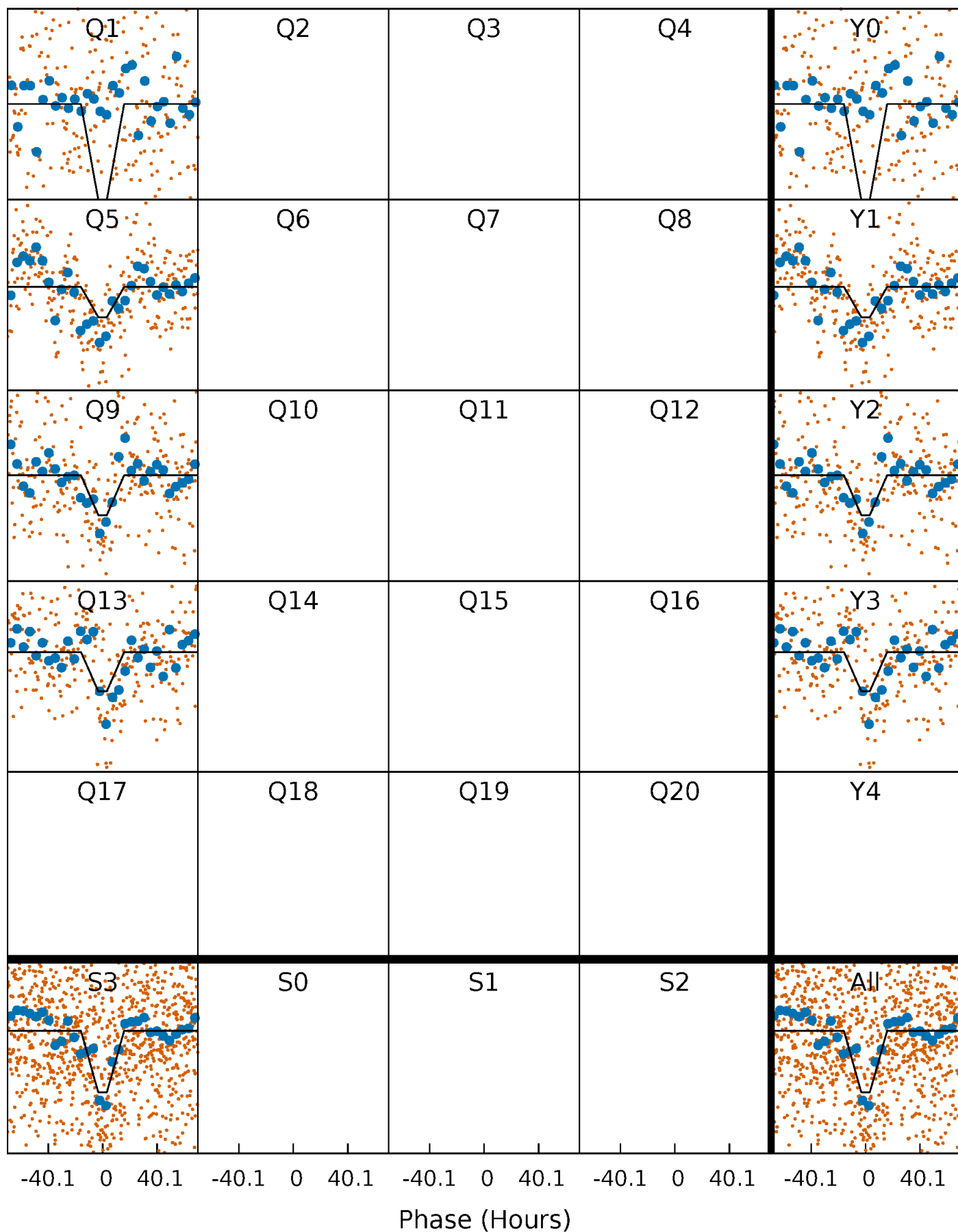
# DV Quarter-Phased Transit Curves

TCE 008556845-01     $P=375.180595$  Days     $T_0=140.365536$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

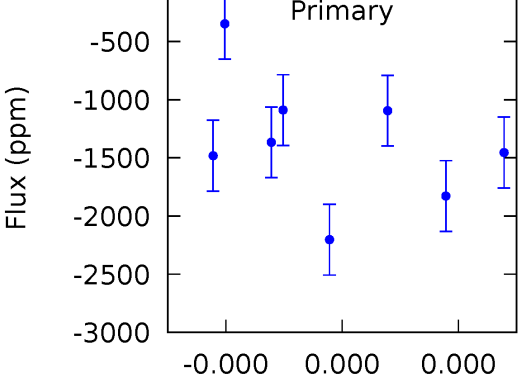
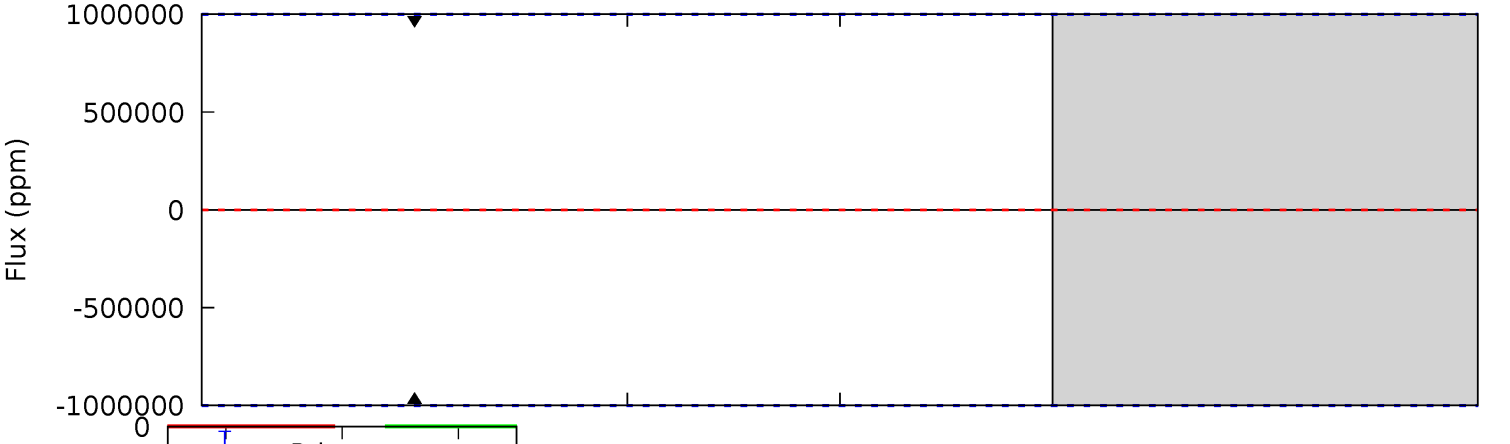
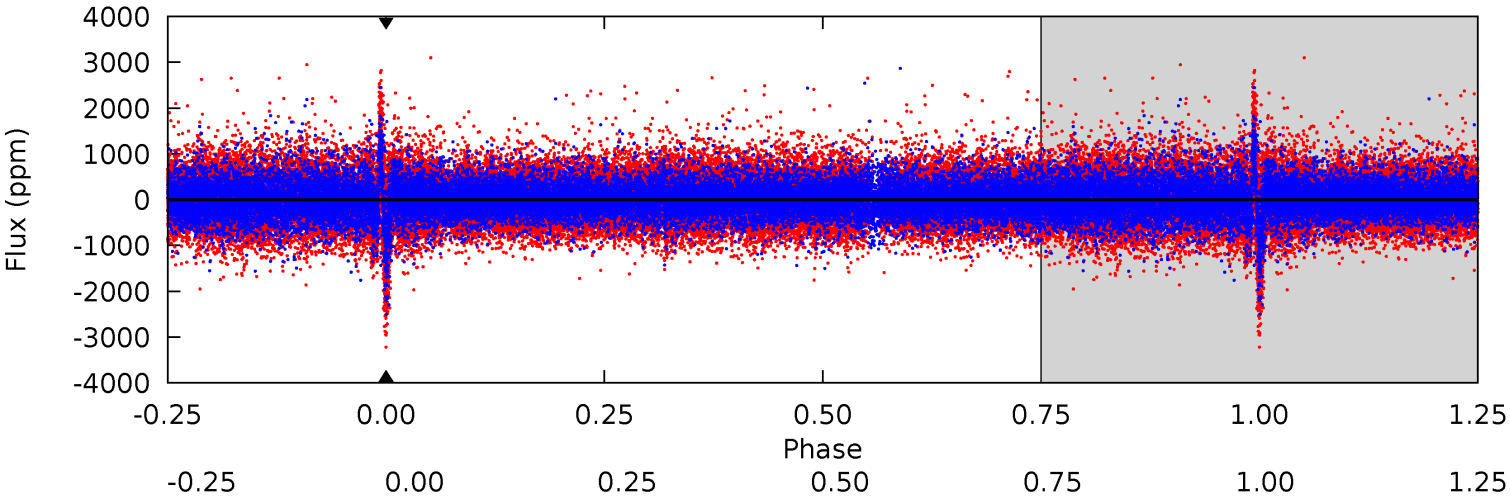
TCE 008556845-01 P=375.180595 Days  $T_0=140.296449$  (BKJD)



# DV Model-Shift Uniqueness Test

008556845-01, P = 375.180595 Days, E = 140.365536 Days

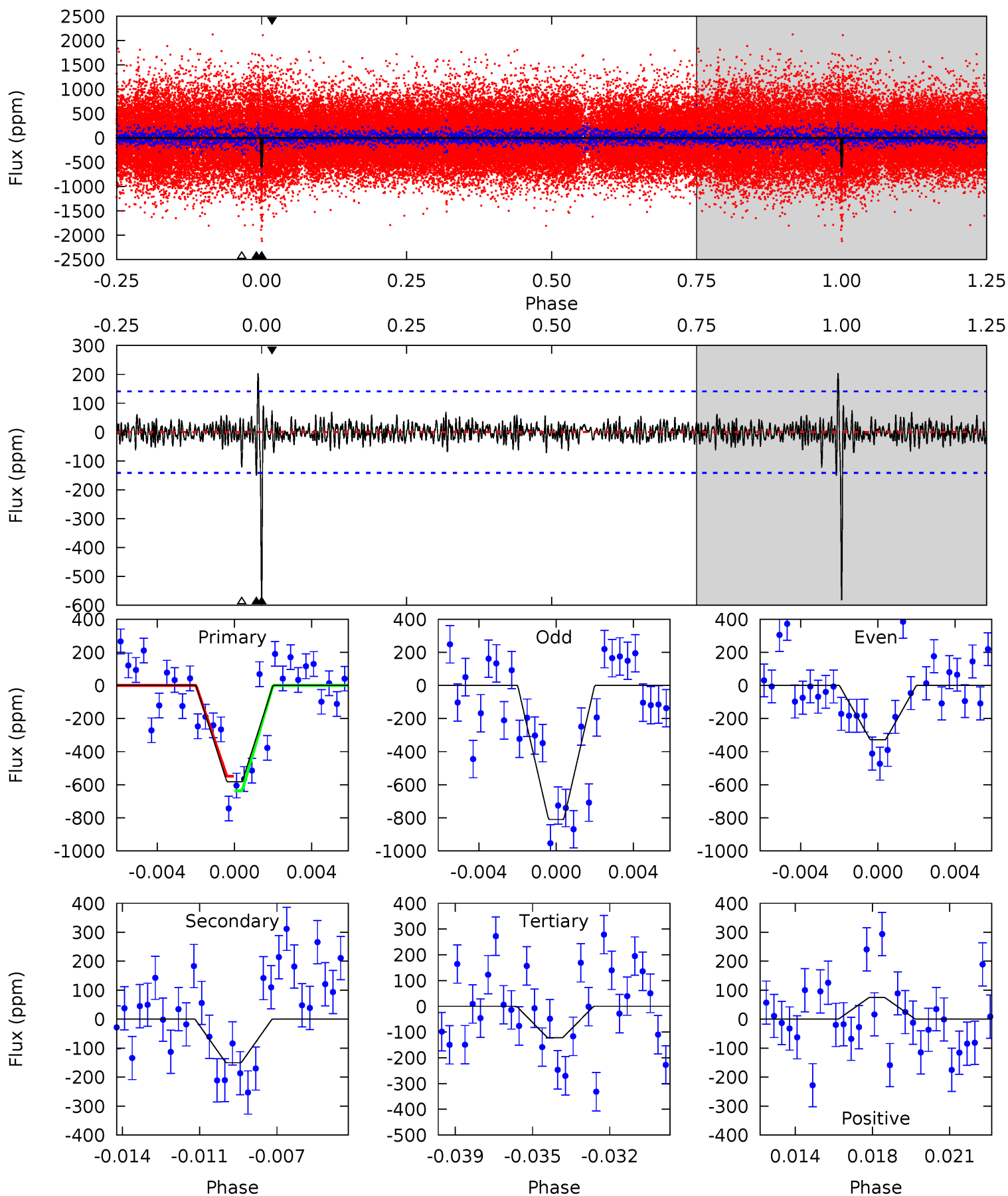
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

008556845-01, P = 375.180595 Days, E = 140.296449 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
21.5	5.56	4.50	2.79	5.22	2.92	0.87	17.0	18.7	1.06	2.77	8.93	0.88	0.26	1.61



### Stellar Parameters For KIC 008556845

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5936^{+166}_{-208}$	$4.427^{+0.070}_{-0.210}$	$0.140^{+0.200}_{-0.300}$	$1.055^{+0.330}_{-0.118}$	$1.084^{+0.136}_{-0.136}$	$1.301^{+0.469}_{-0.664}$
	+3%/-4%	+2%/-5%	+143%/-214%	+31%/-11%	+13%/-13%	+36%/-51%
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 008556845-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$9.36^{+10.46}_{-6.45}$	$373^{+27}_{-18}$	$3188^{+21473}_{-20897}$	$1779^{+1698508}_{-882951}$
Alt.	$-150 \pm 27$	$9.33^{+10.08}_{-6.48}$	$374^{+28}_{-20}$	$3009^{+1425}_{-507}$	$1017^{+10756}_{-780}$

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

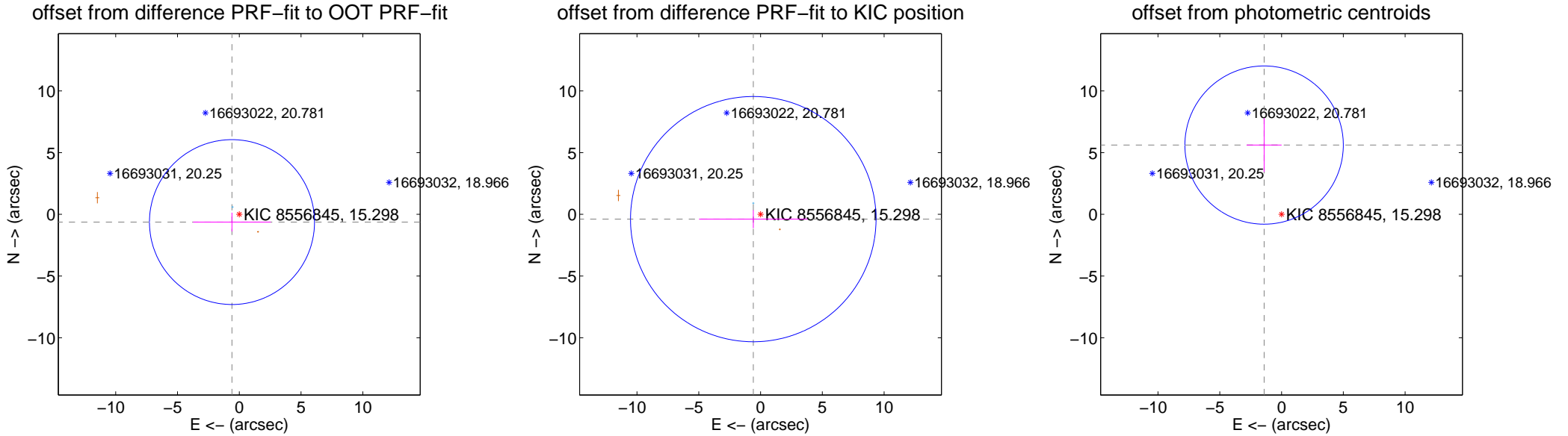
## DV Centroid Data

Supplemental centroid analysis for 008556845-01. Kepler magnitude: 15.30. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

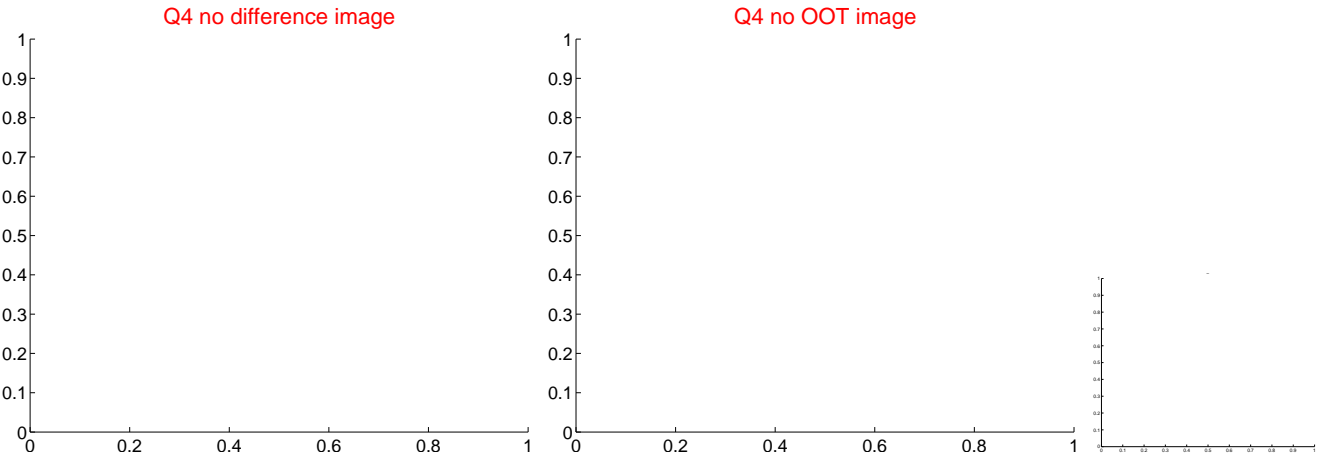
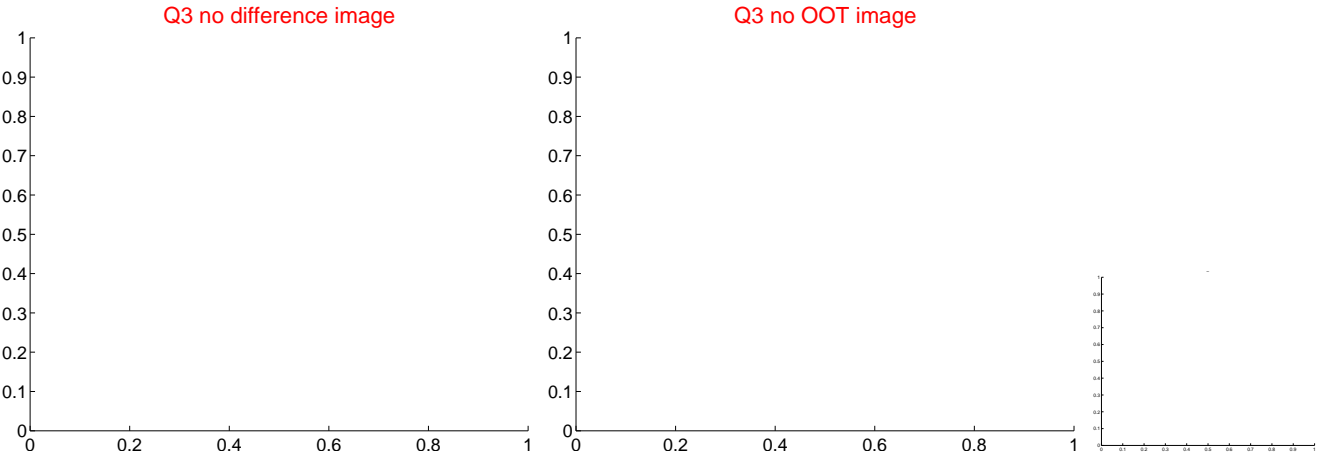
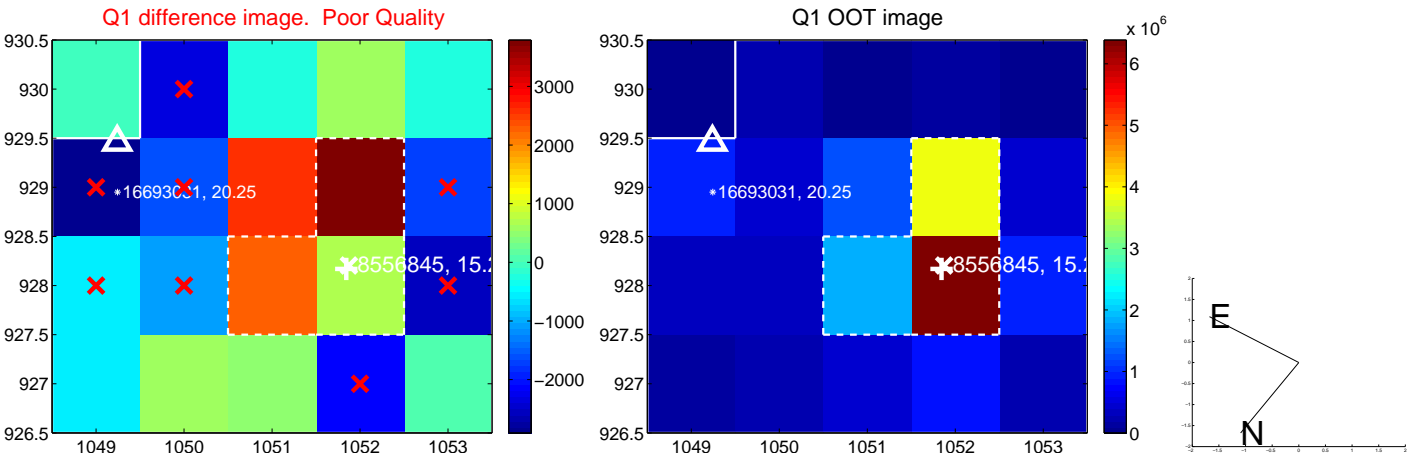
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.861 \pm 2.226$	0.39	$0.590 \pm 3.145$	$-0.627 \pm 0.765$
PRF-fit source offset from KIC position	$0.704 \pm 3.311$	0.21	$0.588 \pm 4.387$	$-0.388 \pm 0.734$
photometric centroid source offset	$5.79 \pm 2.14$	2.71	$1.41 \pm 1.42$	$5.61 \pm 2.17$



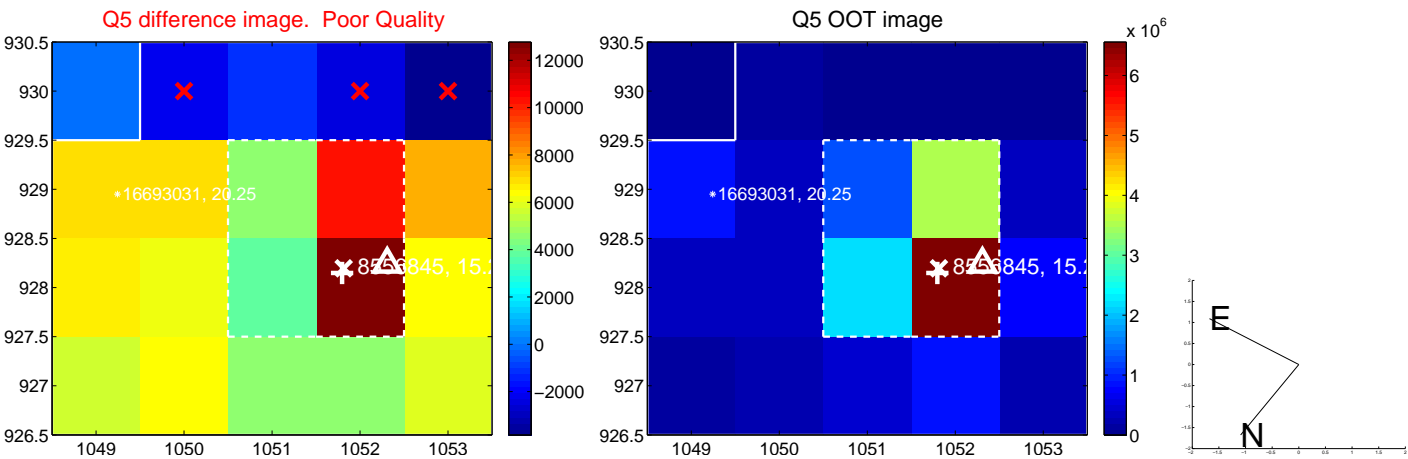
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



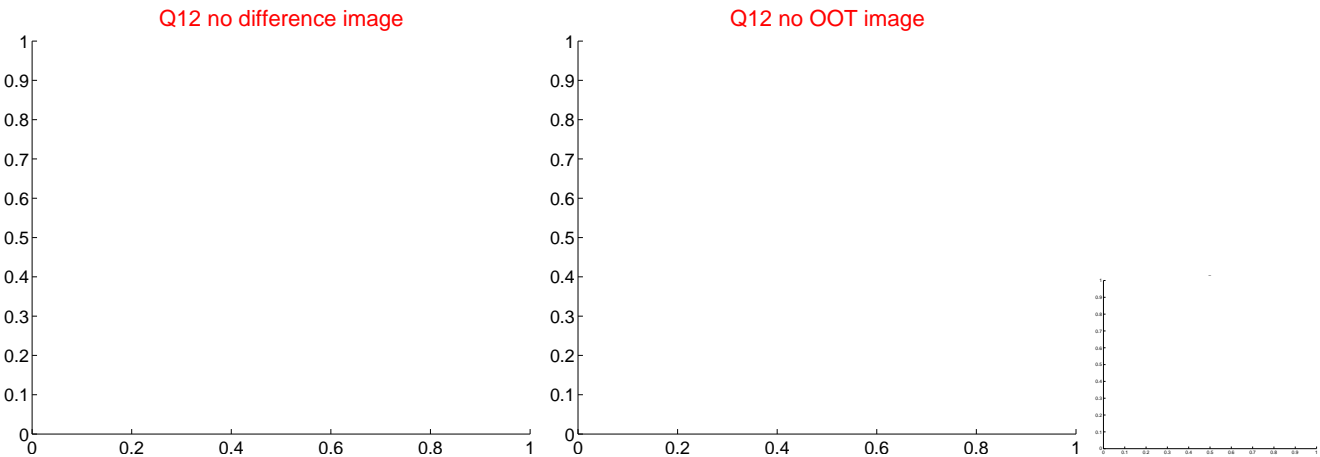
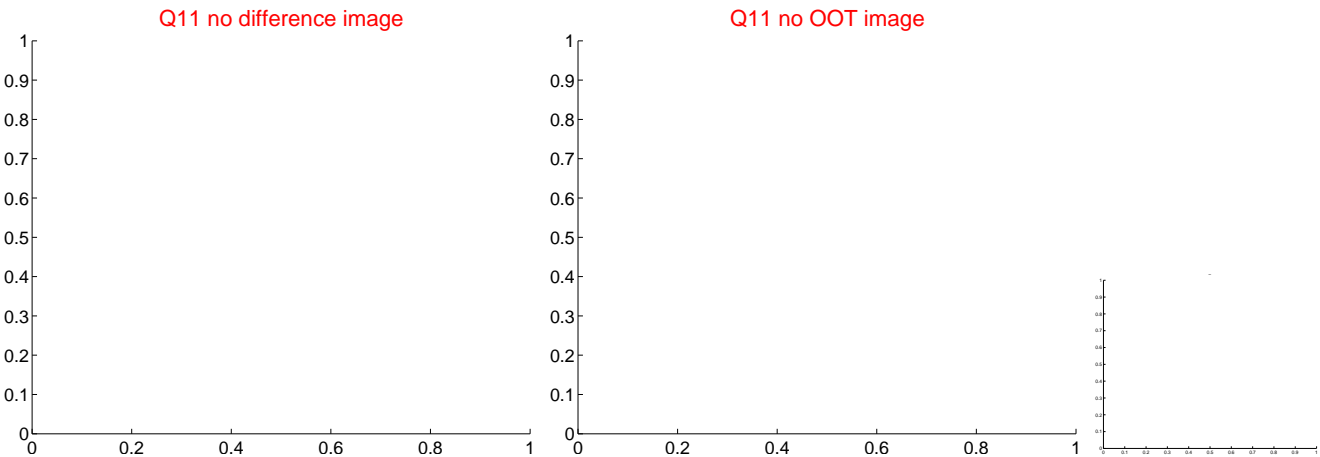
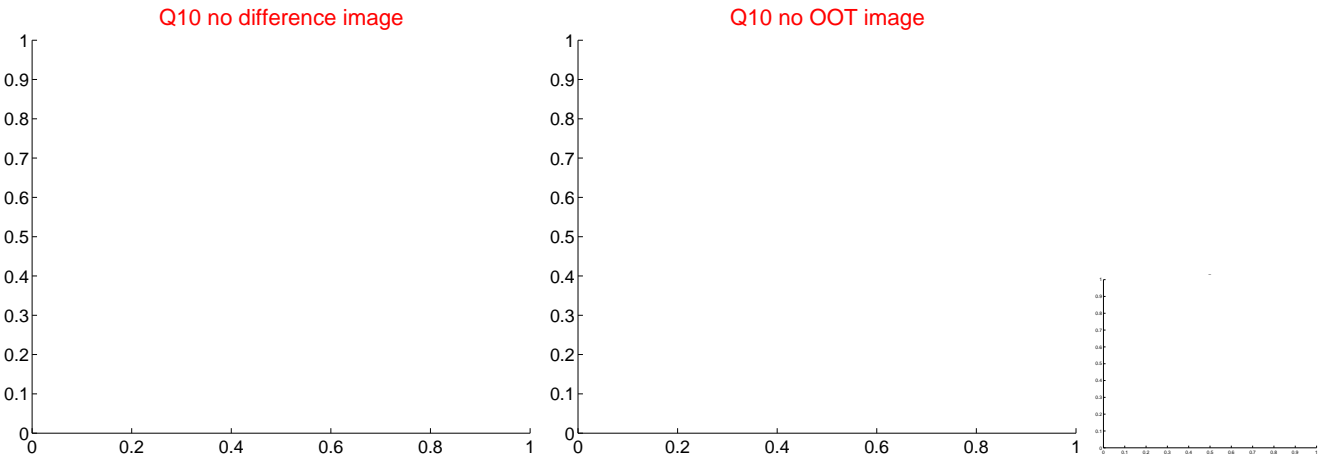
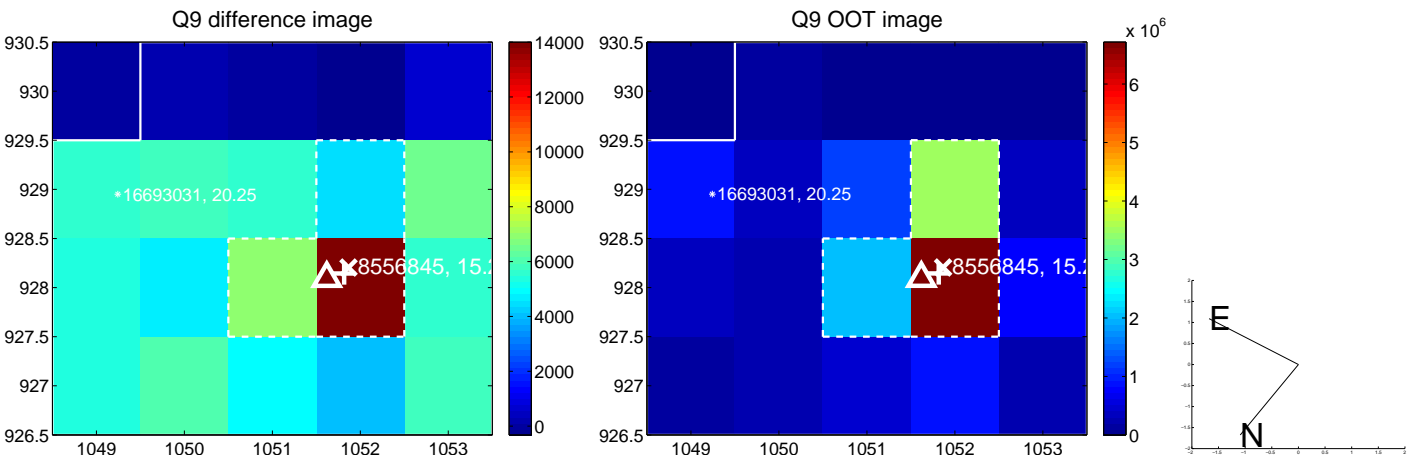
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



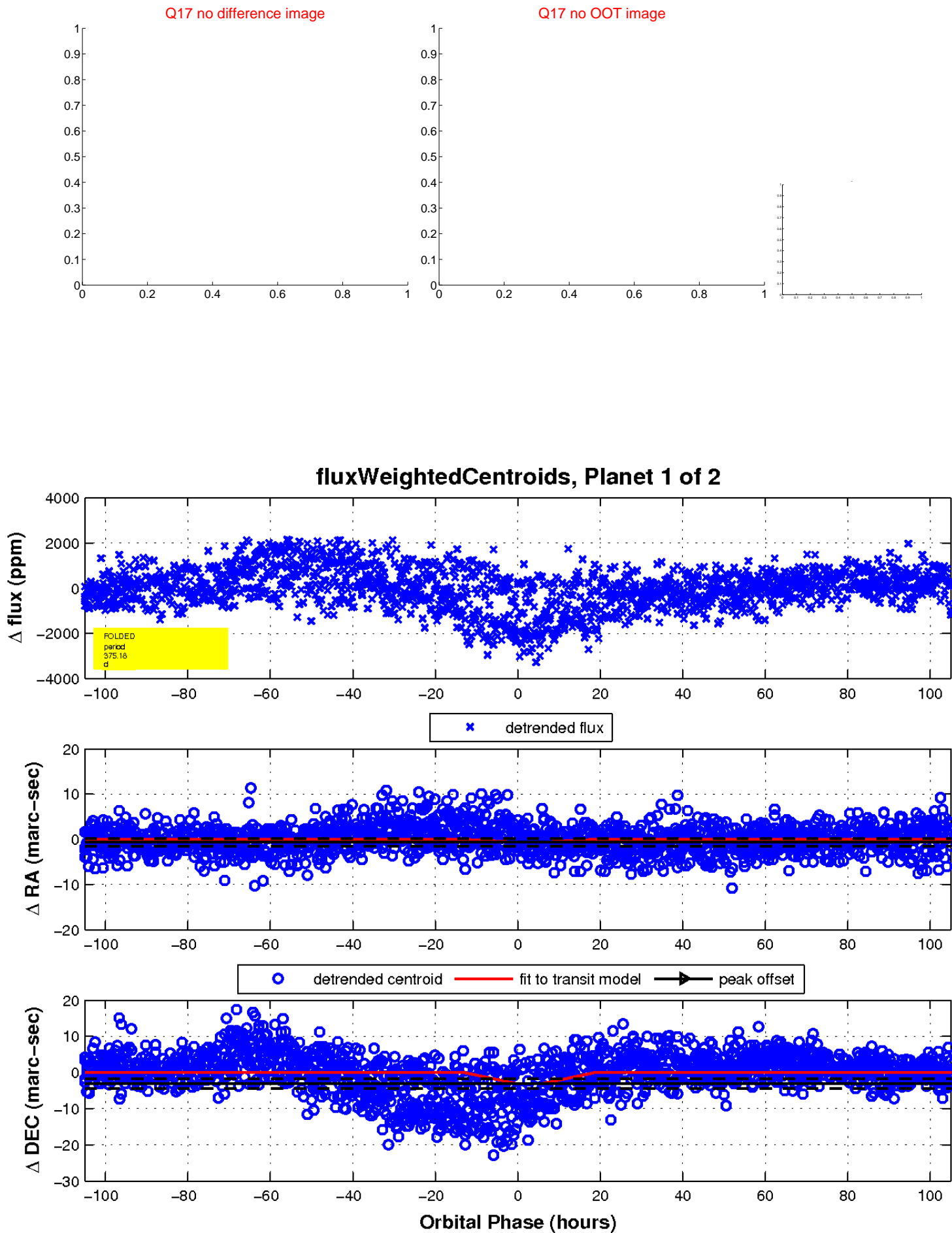
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



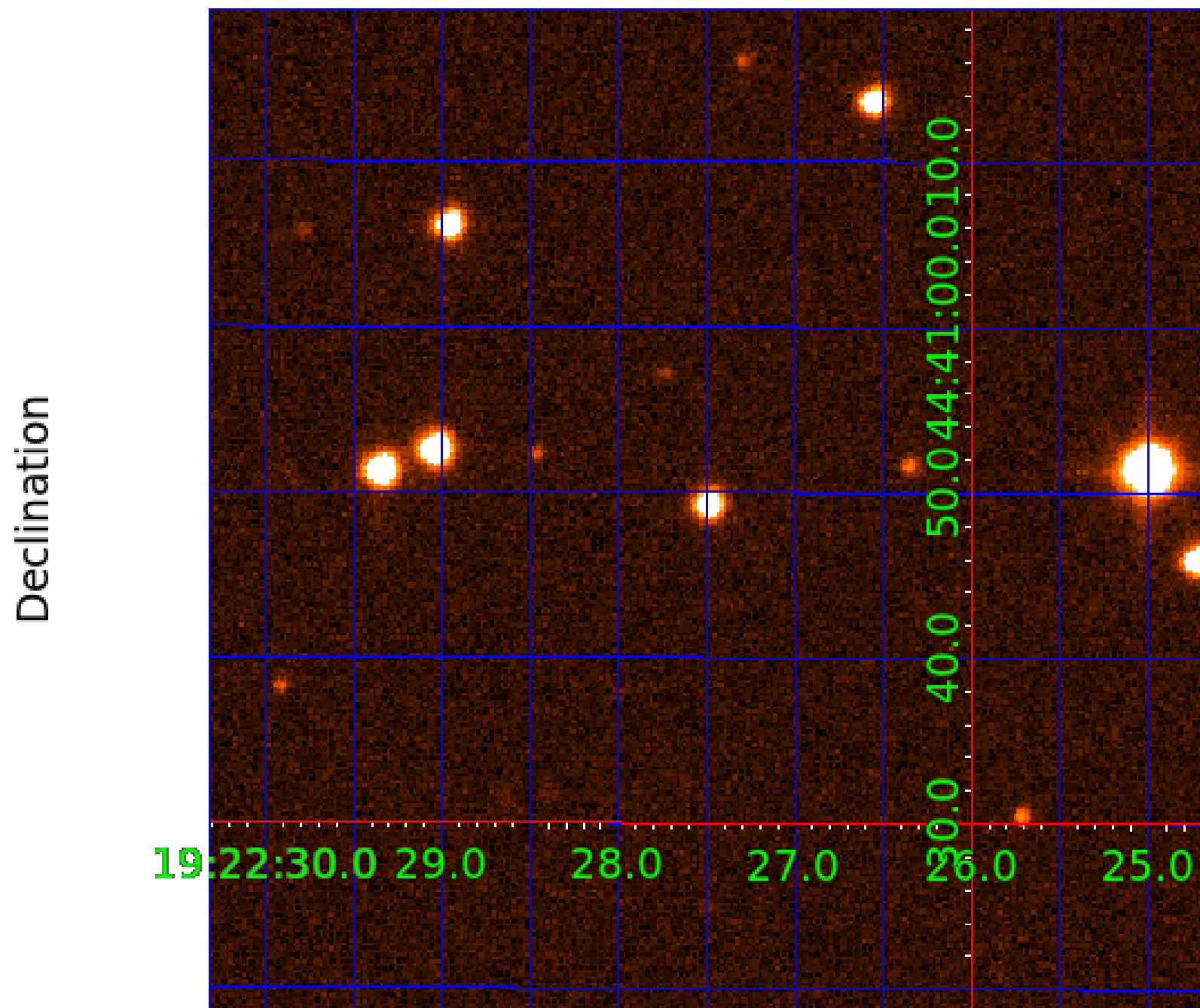
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 008556845

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008556845-01	OBS	No	375.180595	140.365536	890.4	15.000	14.9	-1.0	1.05	5936	3.12	1.13
008556845-02	OBS	No	377.728807	134.110513	710.1	33.135	10.6	10.4	1.05	5936	3.74	1.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008556845-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—CENT_NOFITS
008556845-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

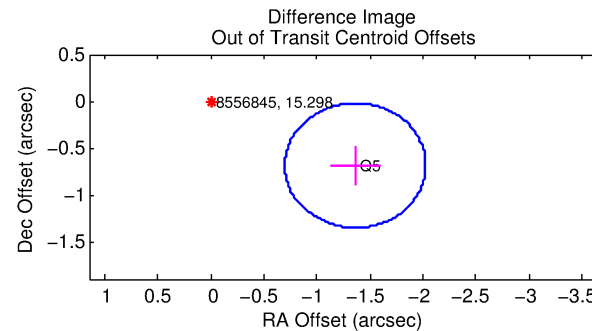
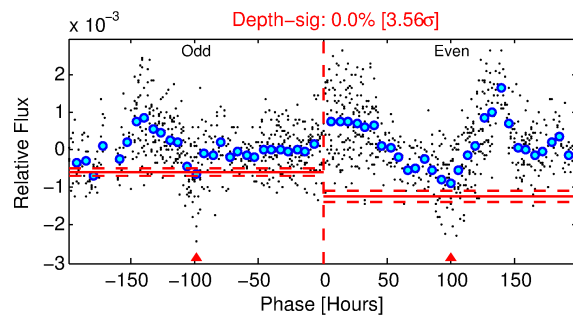
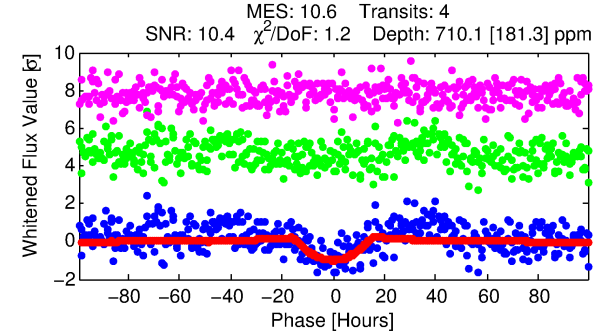
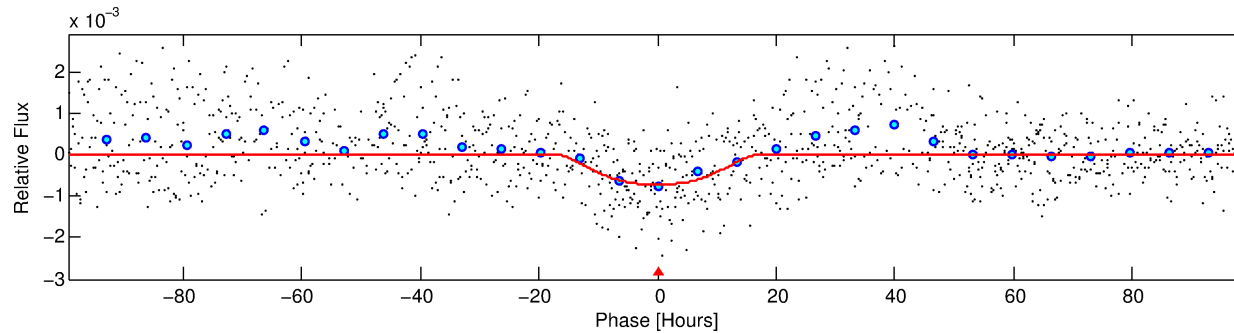
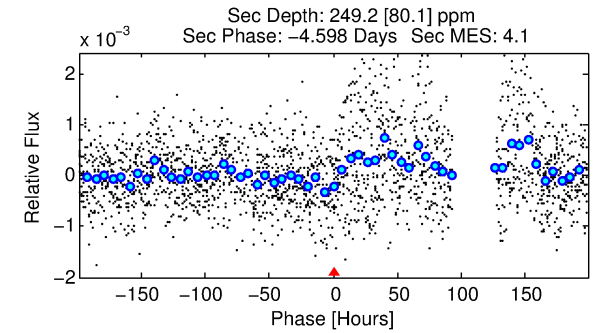
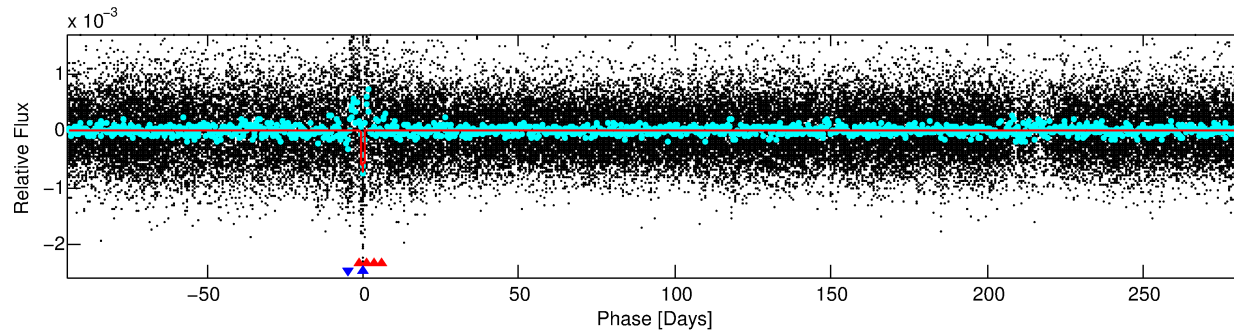
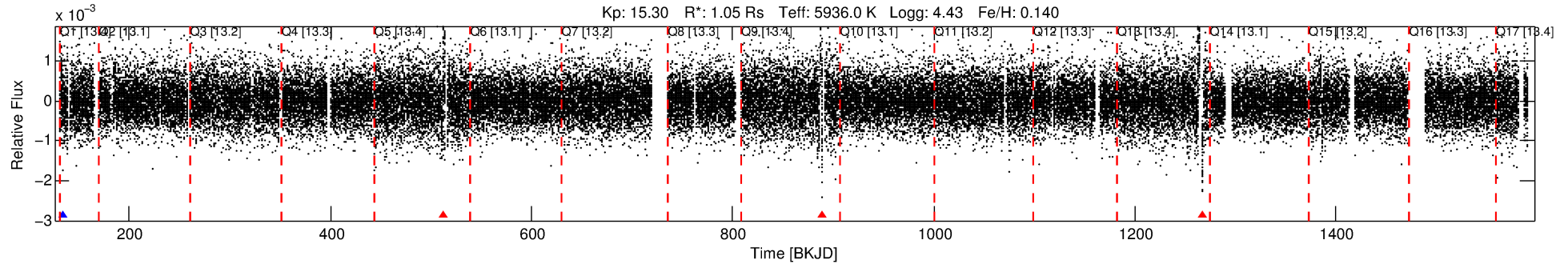
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008556845-02

No Significant Match Found

# DV One-Page Summary

KIC: 8556845 Candidate: 2 of 2 Period: 377.729 d



## DV Fit Results:

Period = 377.72881 [0.03799] d  
Epoch = 134.1105 [0.0607] BKJD  
Rp/R\* = 0.0325 [0.0072]  
a/R\* = 31.16 [7.74]  
b = 0.97 [0.03]  
Seff = 1.12 [0.46]  
Teq = 262 [27] K  
Rp = 3.74 [1.44] Re  
a = 1.0511 [0.2770] AU  
Ag = 10814.39 [7239.81] [1.49σ]  
Teffp = 4137 [585] K [6.61σ]

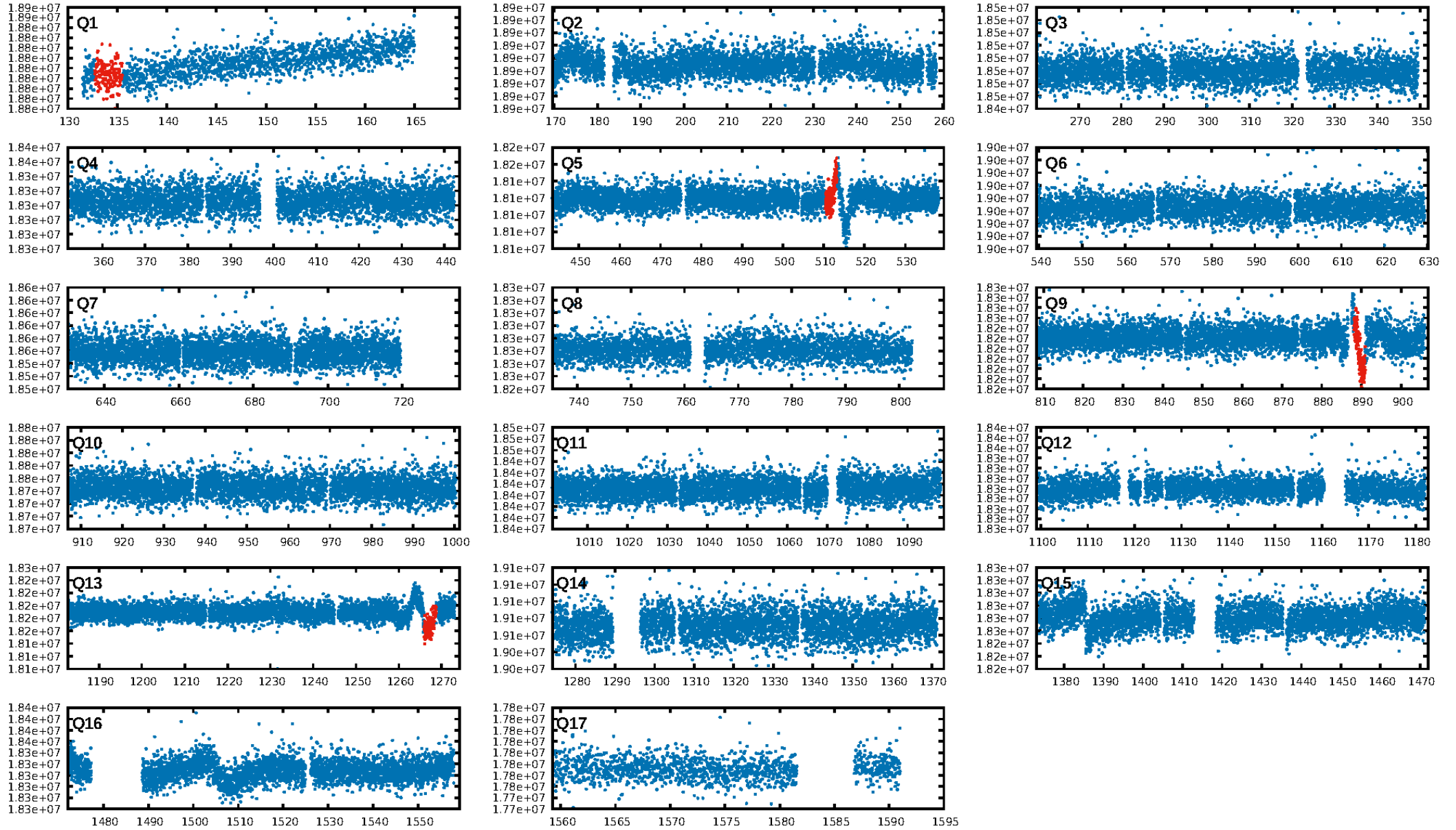
## DV Diagnostic Results:

ShortPeriod-sig: 90.7% [1.68σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.69e-27  
RollingBand-fgt: 0.00 [0/3]  
GhostDiagnostic-chr: 1.177  
Centroid-sig: 13.4%  
Centroid-so: 2.037 arcsec [1.22σ]  
OotOffset-rm: 1.525 arcsec [6.88σ]  
KicOffset-rm: 1.476 arcsec [6.57σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [2/2]

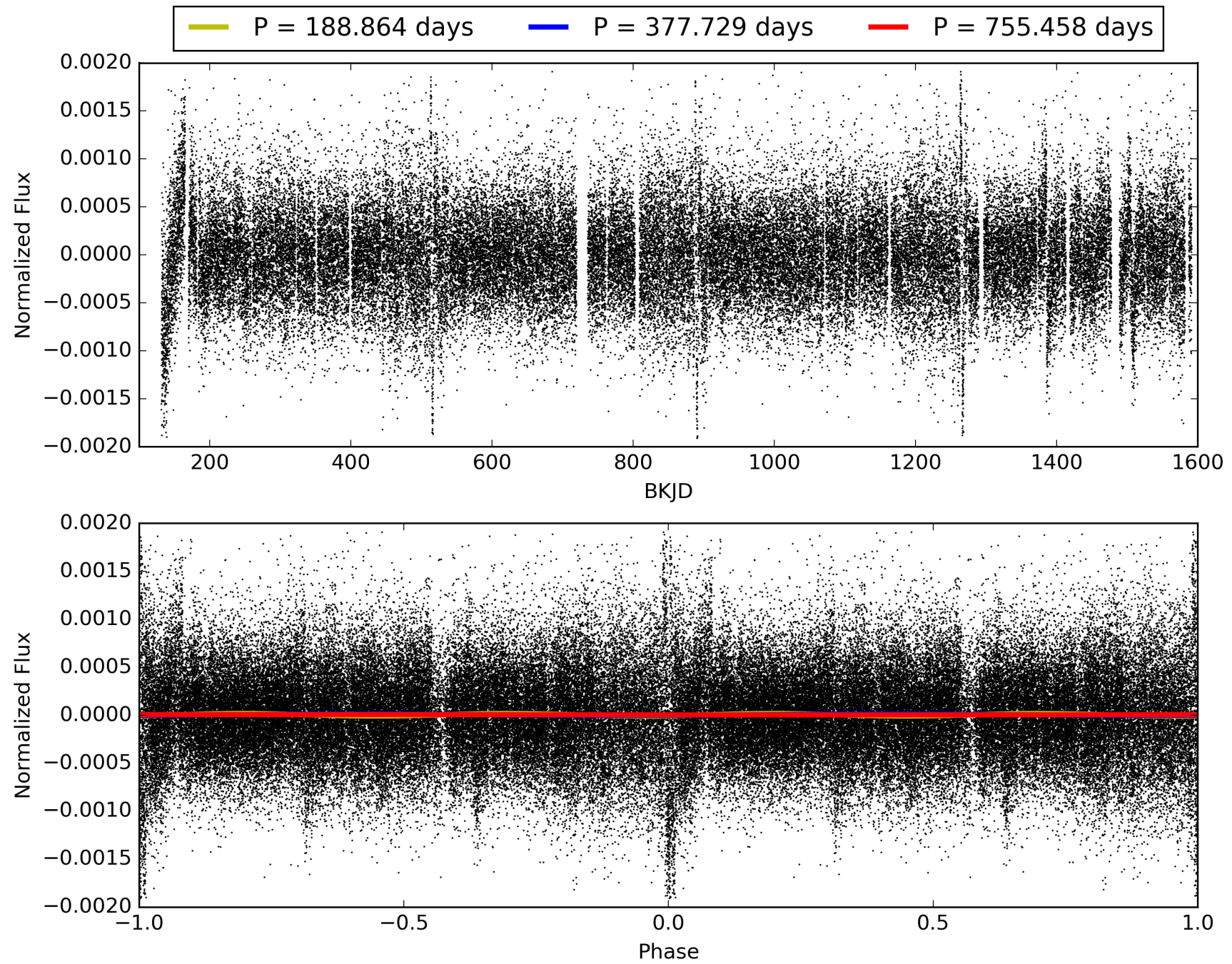
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:45:06 Z

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

# TCE 008556845-02, PDC Light Curves

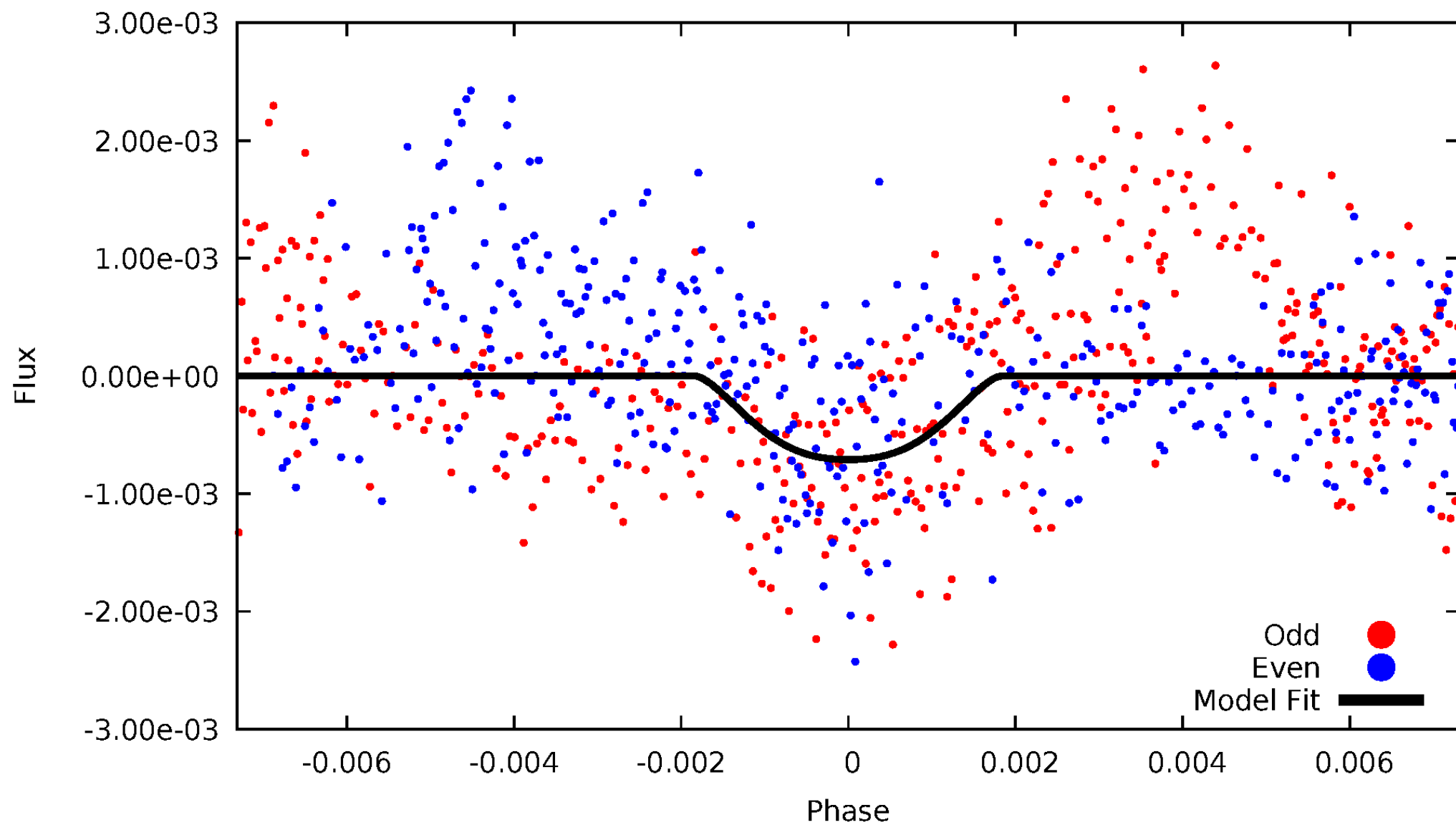


TCE 008556845-02



# DV Odd/Even

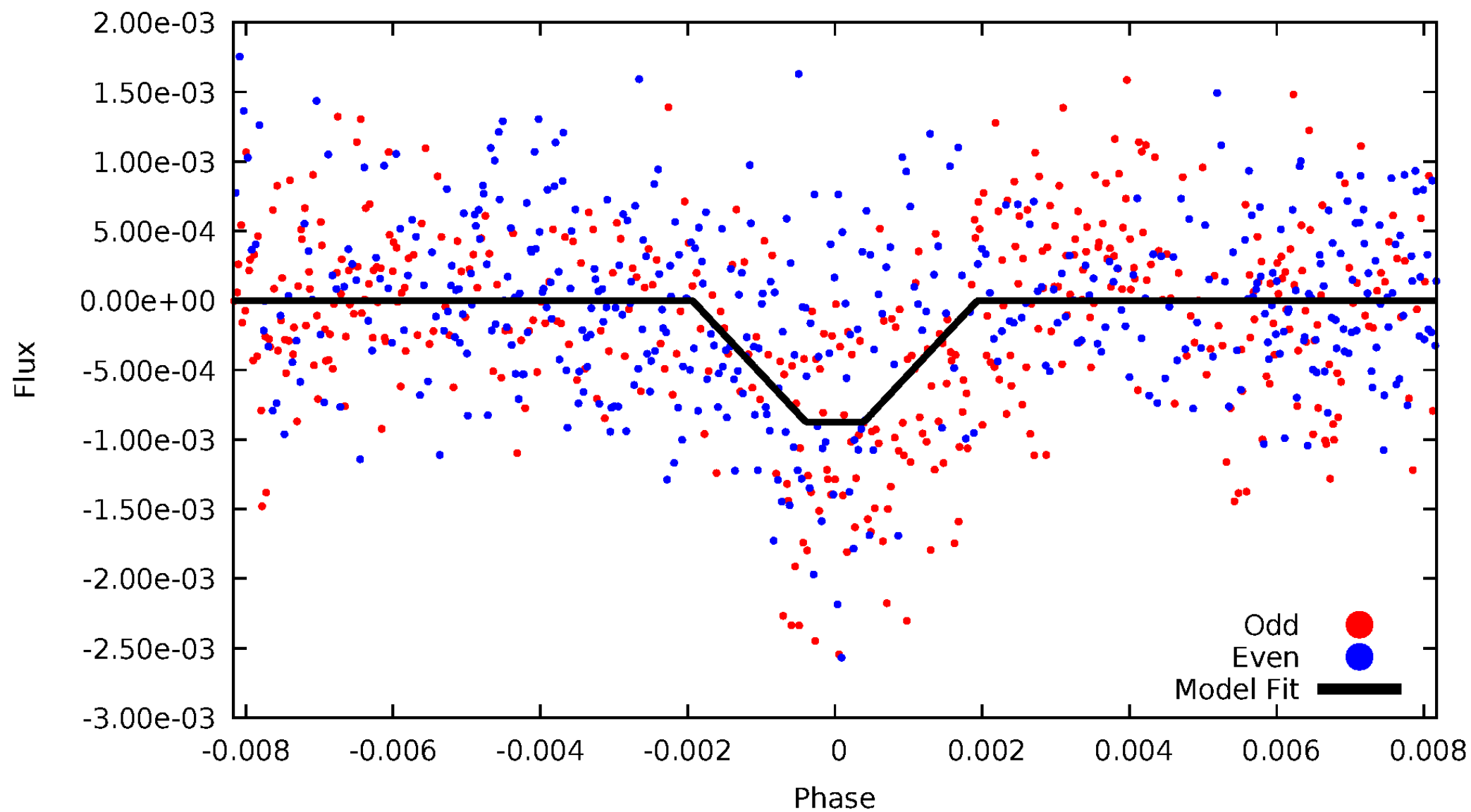
TCE 008556845-02





# ALT Odd/Even

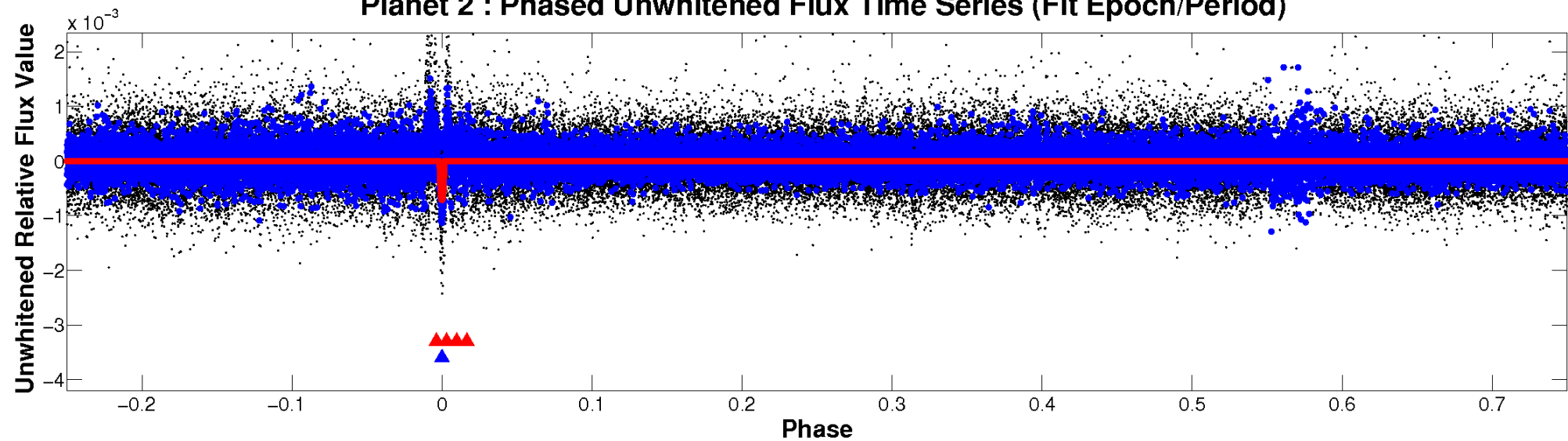
TCE 008556845-02



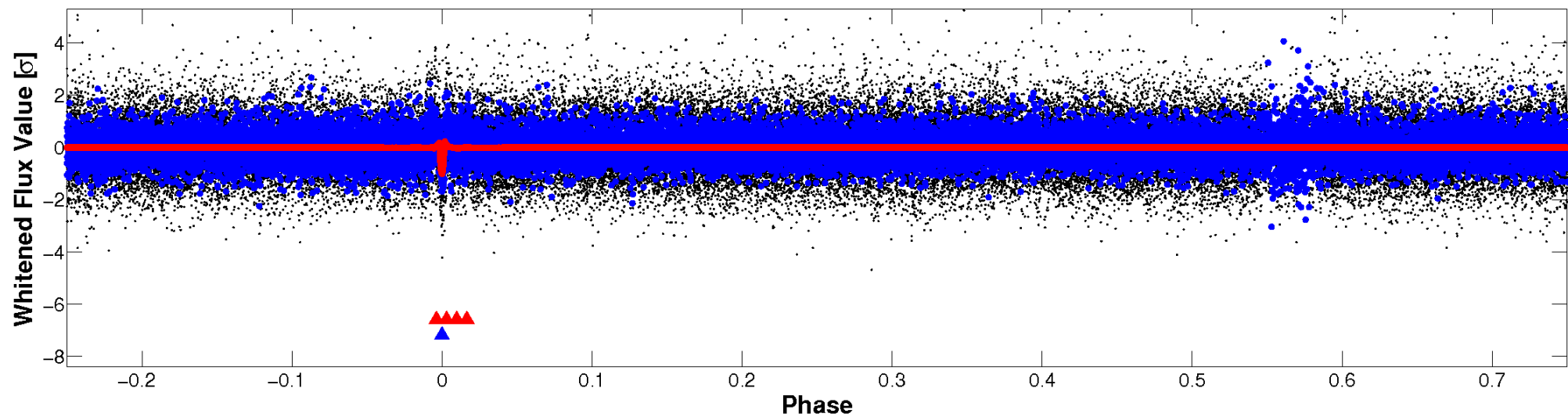


# Non-Whitened Vs. Whitened Light Curve

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

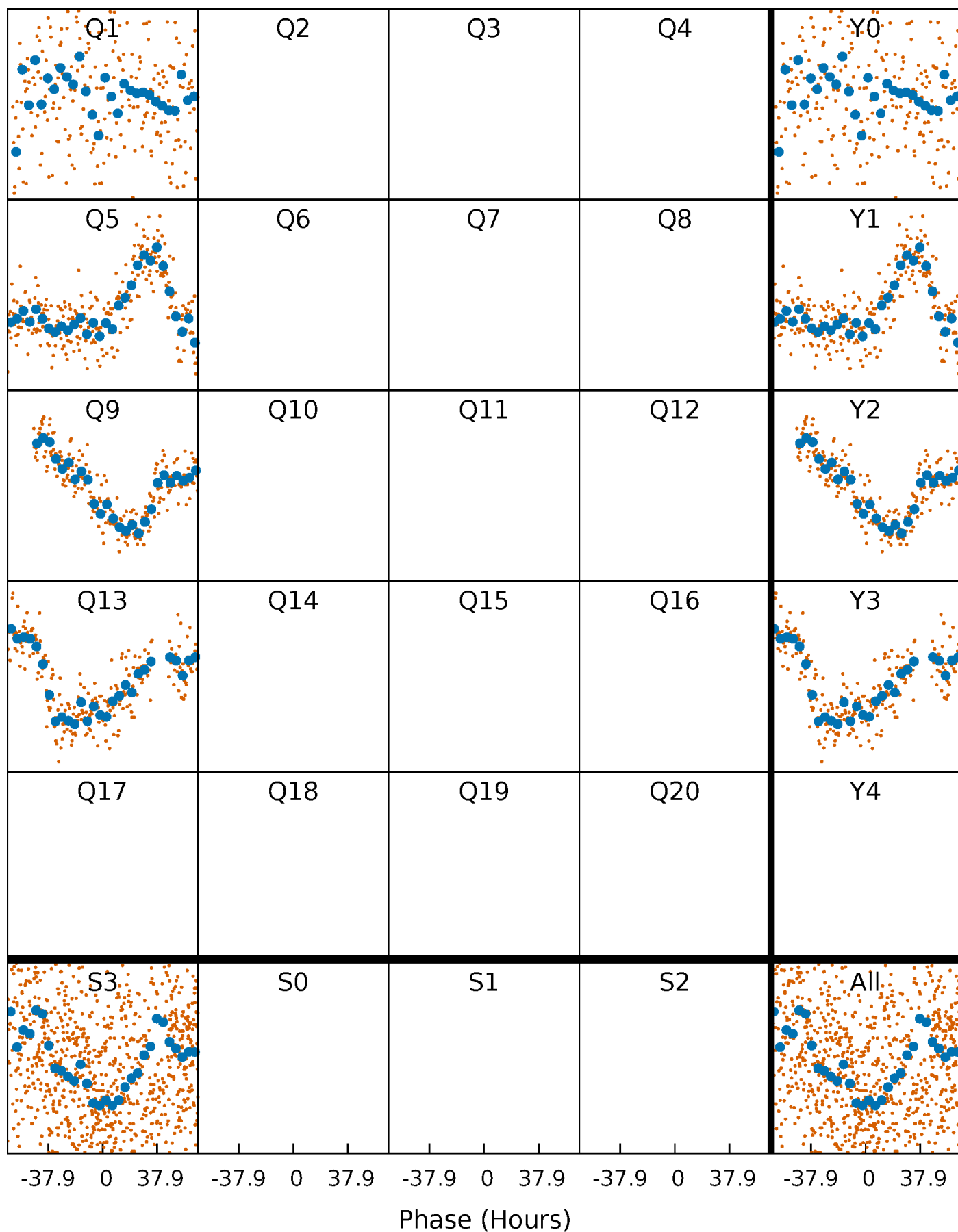


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



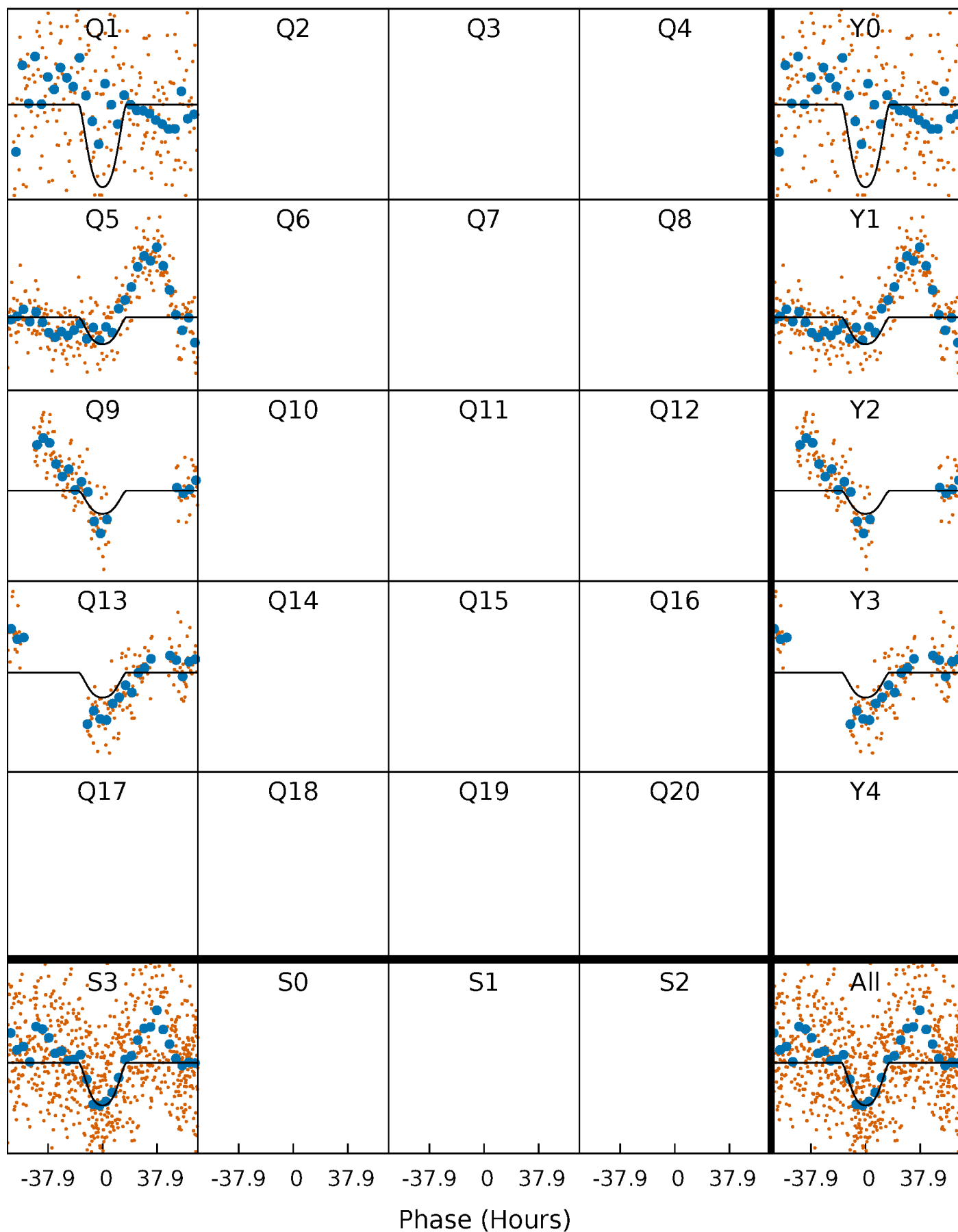
# PDC Quarter-Phased Transit Curves

TCE 008556845-02 P=377.728807 Days  $T_0=134.110513$  (BKJD)



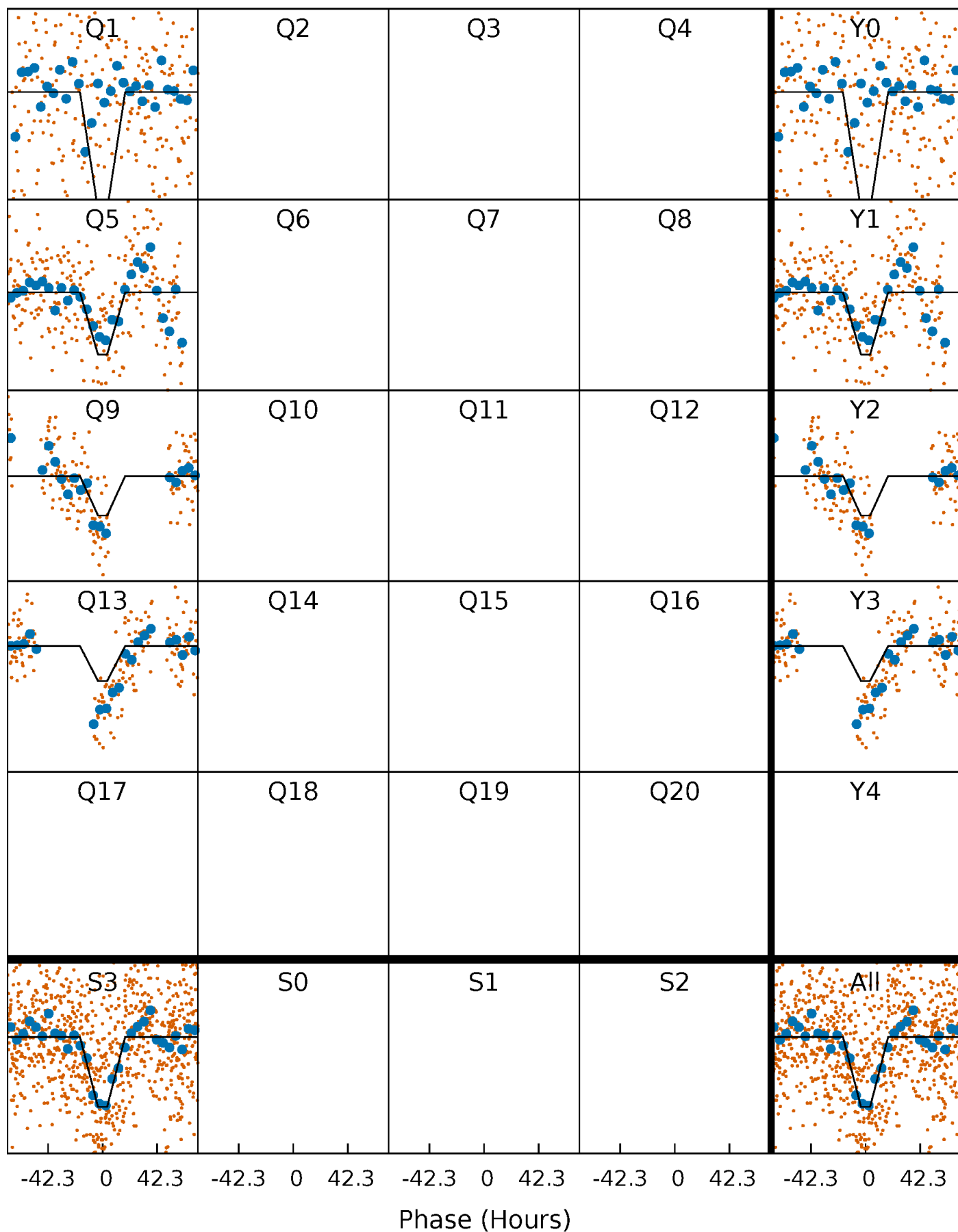
# DV Quarter-Phased Transit Curves

TCE 008556845-02 P=377.728807 Days  $T_0=134.110513$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

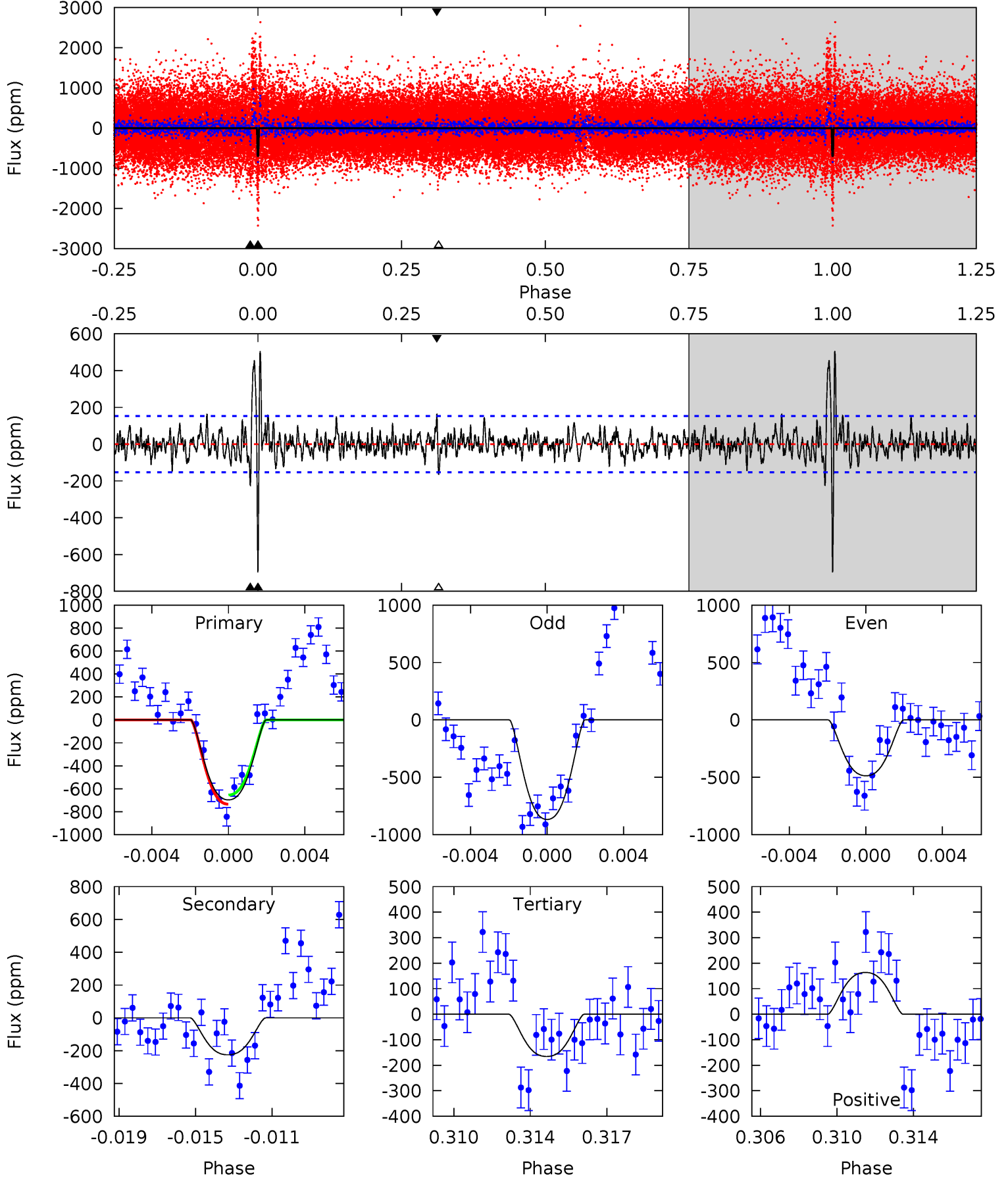
TCE 008556845-02 P=377.564510 Days  $T_0=134.436654$  (BKJD)



# DV Model-Shift Uniqueness Test

008556845-02, P = 377.728807 Days, E = 134.110513 Days

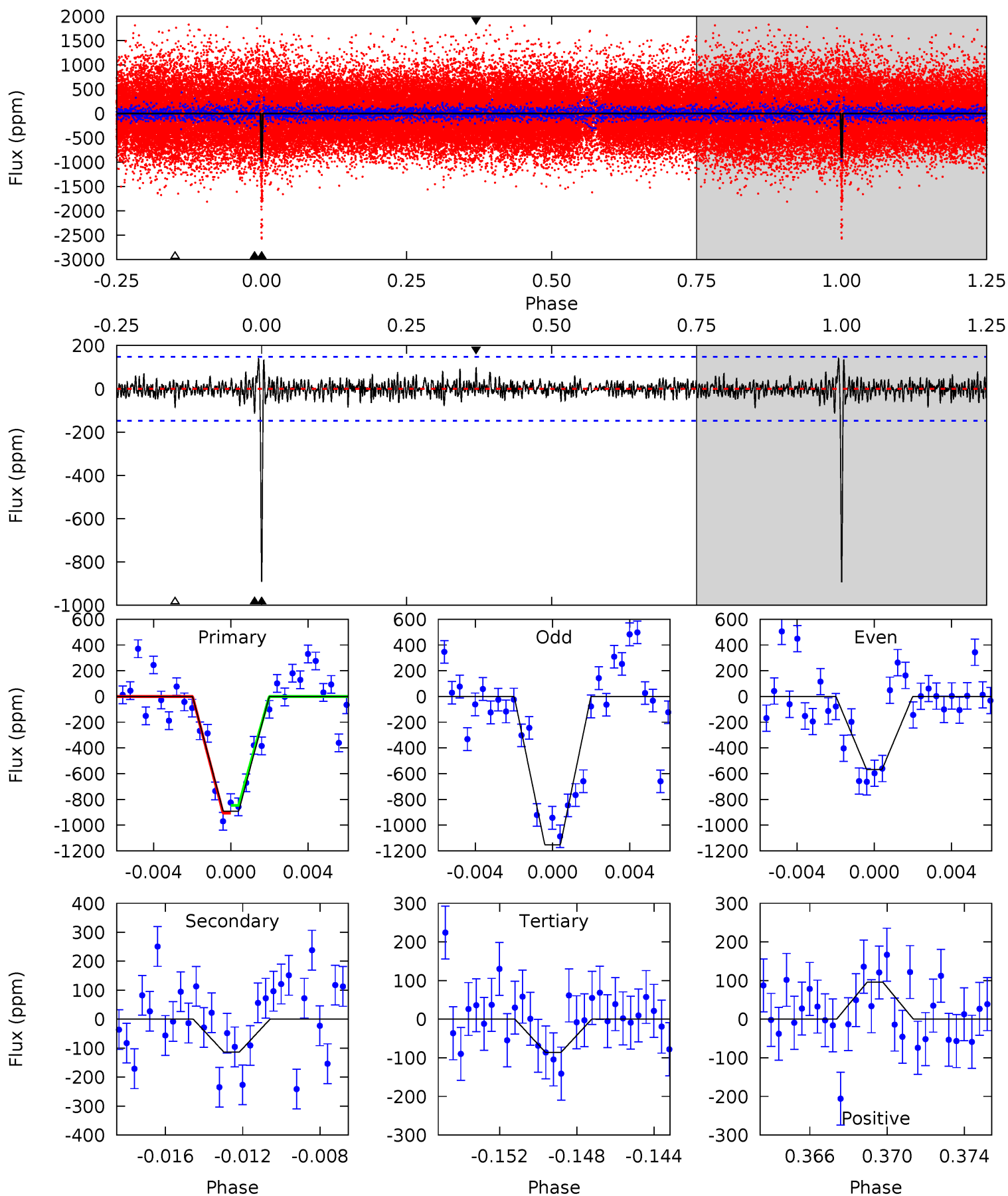
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	7.70	5.66	5.59	5.21	2.90	1.85	18.1	18.2	2.04	2.10	6.46	1.03	0.42	1.37



# Alt Model-Shift Uniqueness Test

008556845-02, P = 377.564510 Days, E = 134.436654 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
31.4	4.00	3.03	3.38	5.20	2.89	0.88	28.4	28.0	0.97	0.61	10.3	0.98	0.14	1.07





### Stellar Parameters For KIC 008556845

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5936^{+166}_{-208}$	$4.427^{+0.070}_{-0.210}$	$0.140^{+0.200}_{-0.300}$	$1.055^{+0.330}_{-0.118}$	$1.084^{+0.136}_{-0.136}$	$1.301^{+0.469}_{-0.664}$
	+3%/-4%	+2%/-5%	+143%/-214%	+31%/-11%	+13%/-13%	+36%/-51%
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 008556845-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-225 \pm 29$	$3.83^{+1.08}_{-0.93}$	$372^{+26}_{-20}$	$4282^{+467}_{-351}$	$9170^{+6685}_{-3677}$
Alt.	$-114 \pm 28$	$3.47^{+1.13}_{-0.88}$	$373^{+27}_{-20}$	$3924^{+457}_{-359}$	$5613^{+4967}_{-2584}$

$T_{max}$  = 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

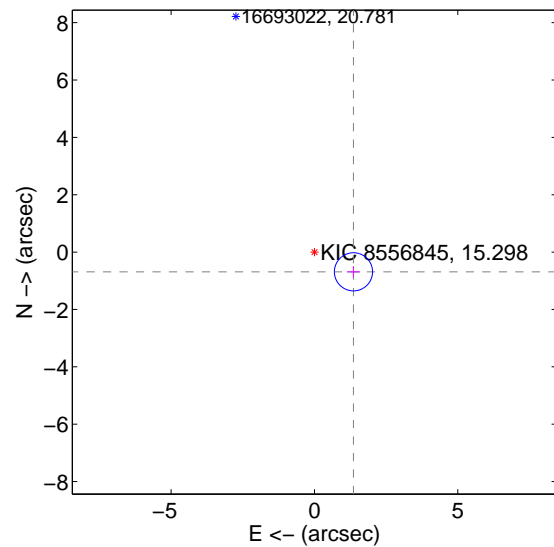
Supplemental centroid analysis for 008556845-02. Kepler magnitude: 15.30. Transit SNR 10.37

There are 1 quarters with good PRF difference image offsets

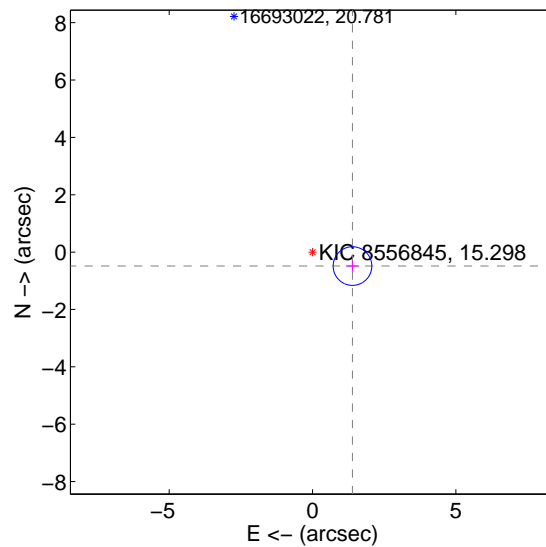
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.525 \pm 0.222$	6.88	$-1.361 \pm 0.228$	$-0.687 \pm 0.196$
PRF-fit source offset from KIC position	$1.476 \pm 0.225$	6.57	$-1.393 \pm 0.228$	$-0.487 \pm 0.196$
photometric centroid source offset	$2.04 \pm 1.67$	1.22	$-0.10 \pm 1.08$	$2.03 \pm 1.67$

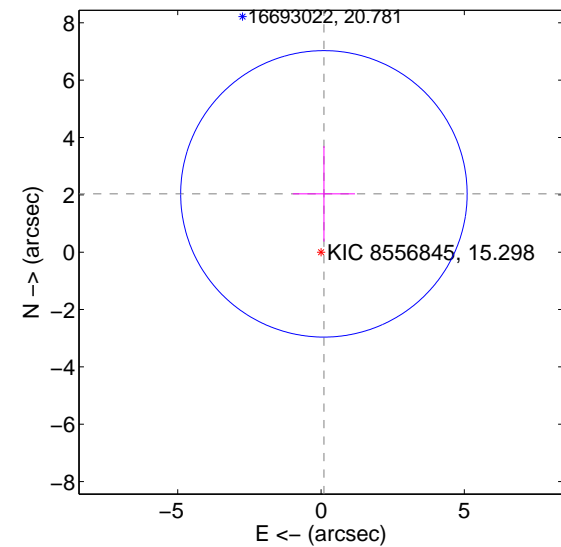
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

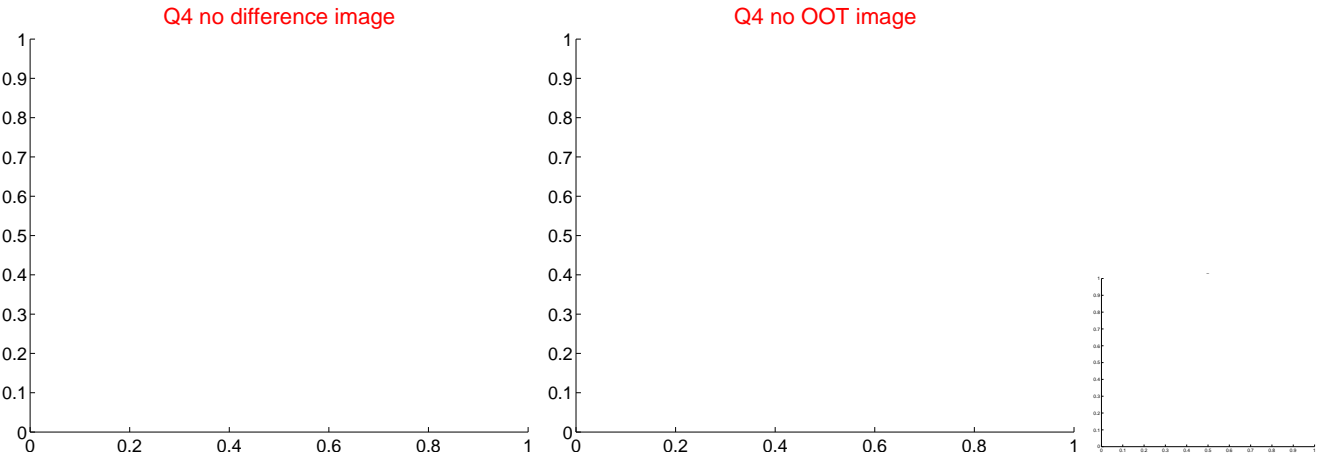
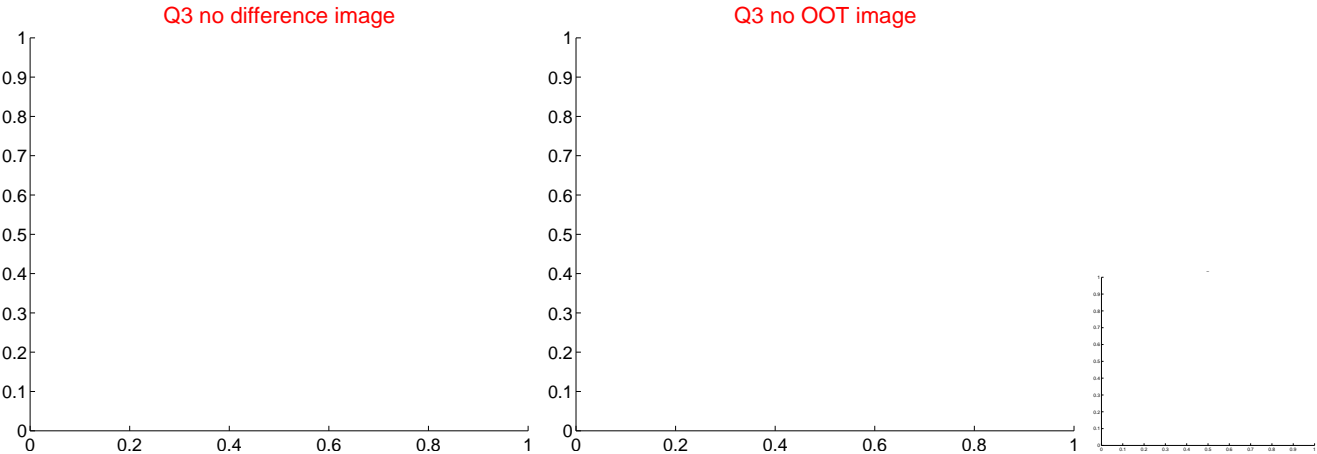
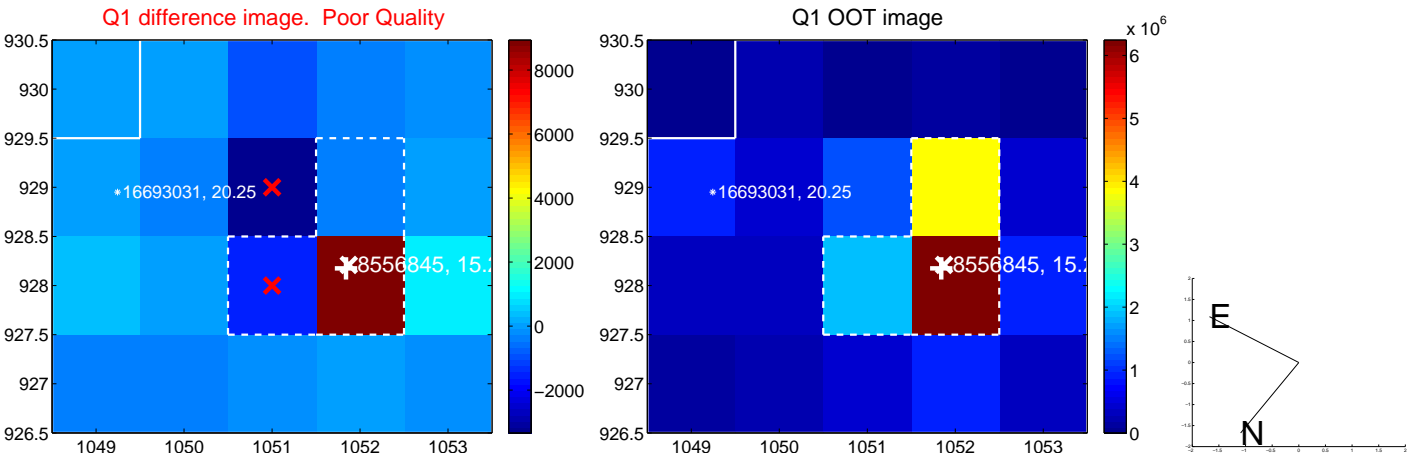


offset from photometric centroids

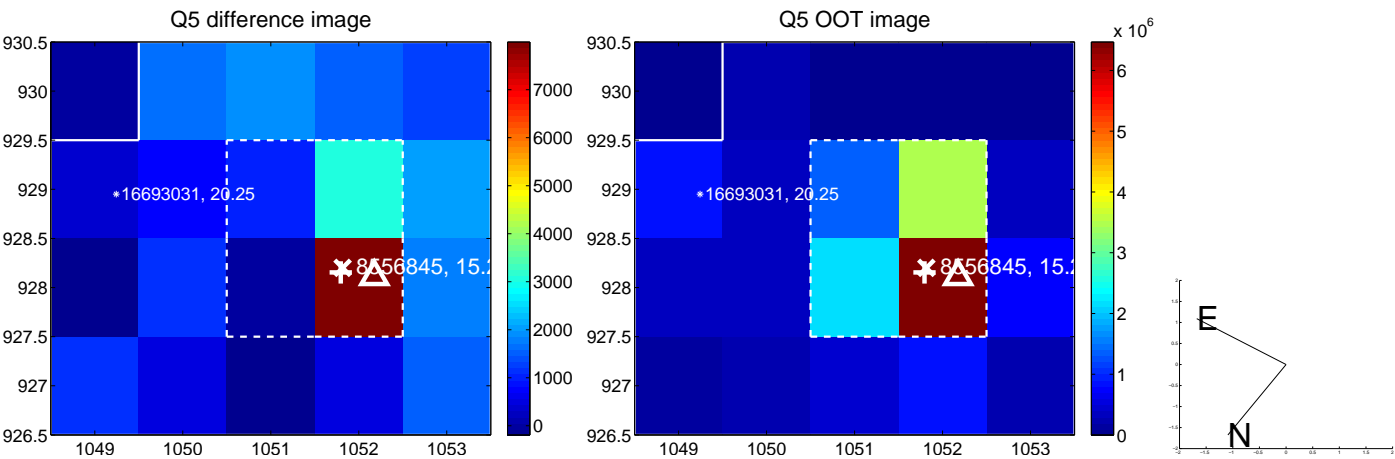


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



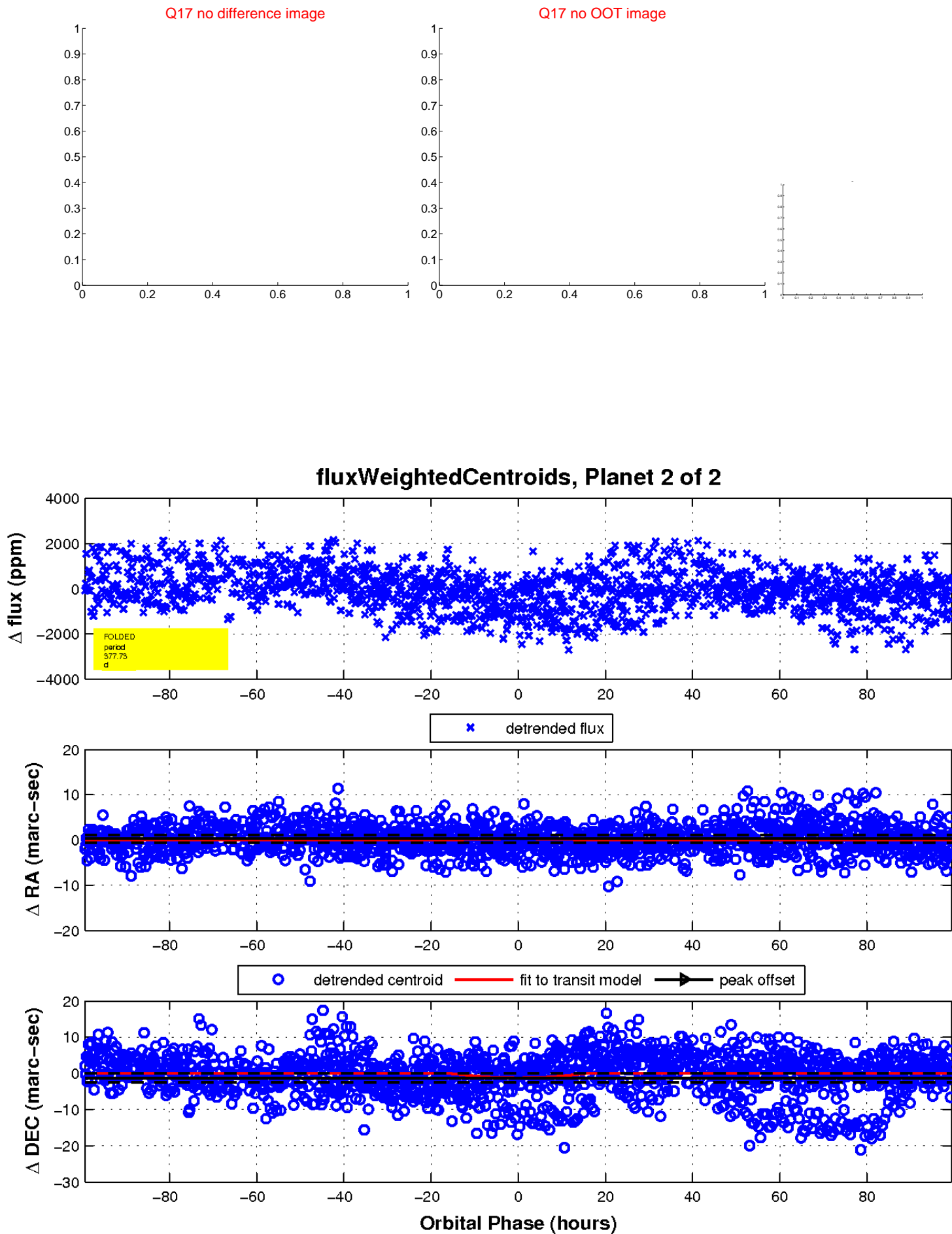
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

