

# KIC 006140059

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006140059-01	OBS	4123.01	44.623053	137.932235	123.8	13.049	14.9	14.7	1.24	6198	1.72	33.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006140059-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

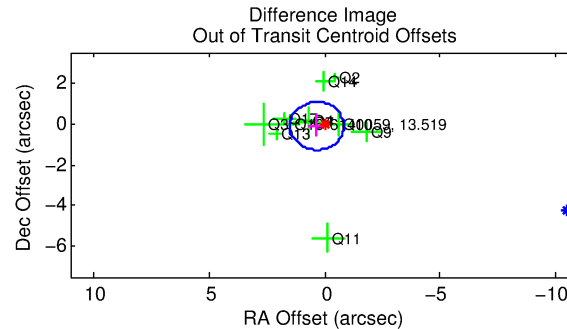
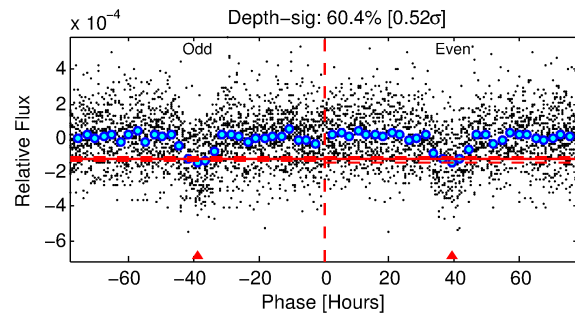
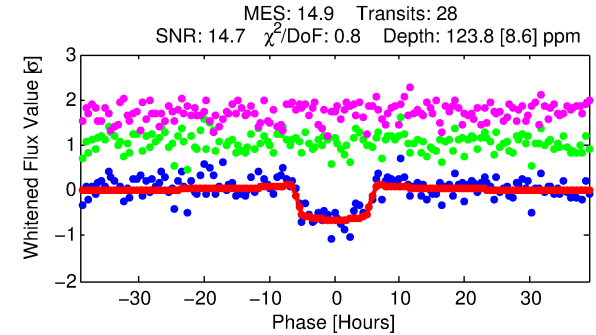
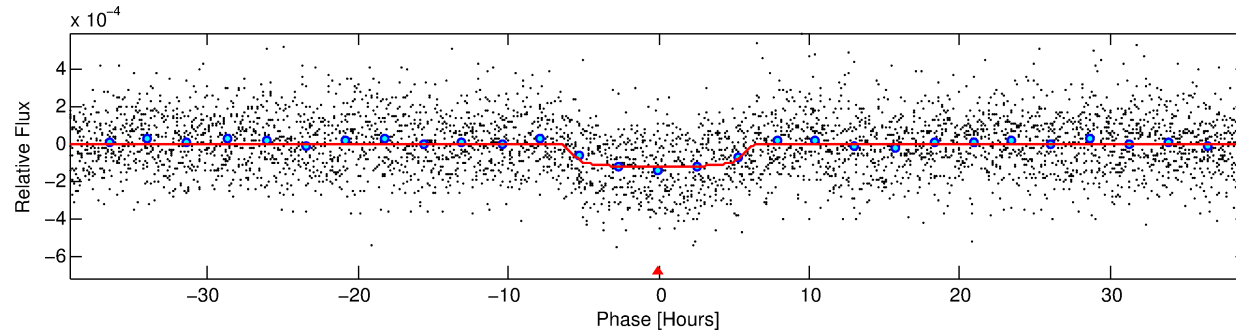
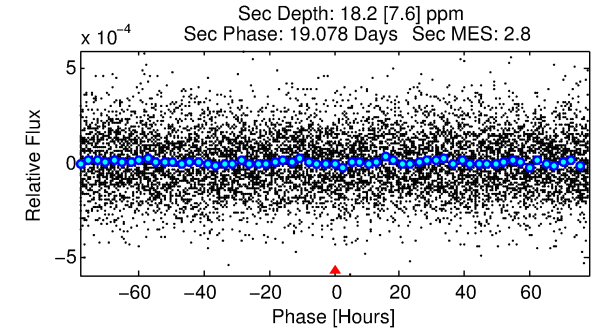
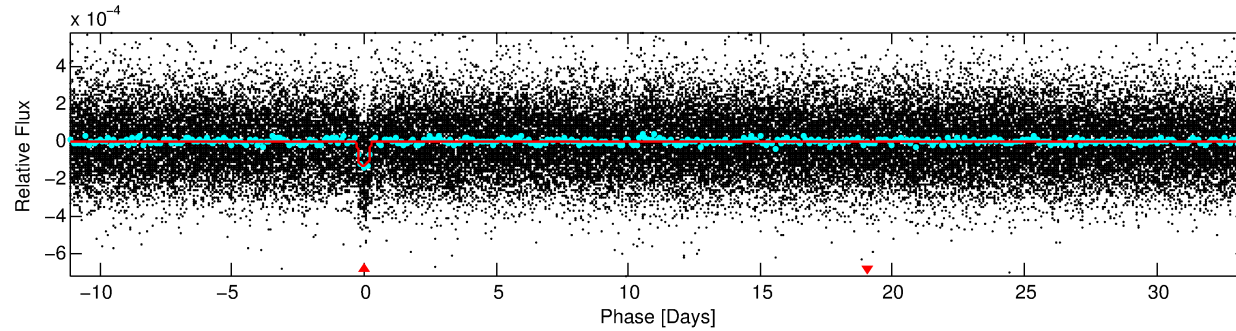
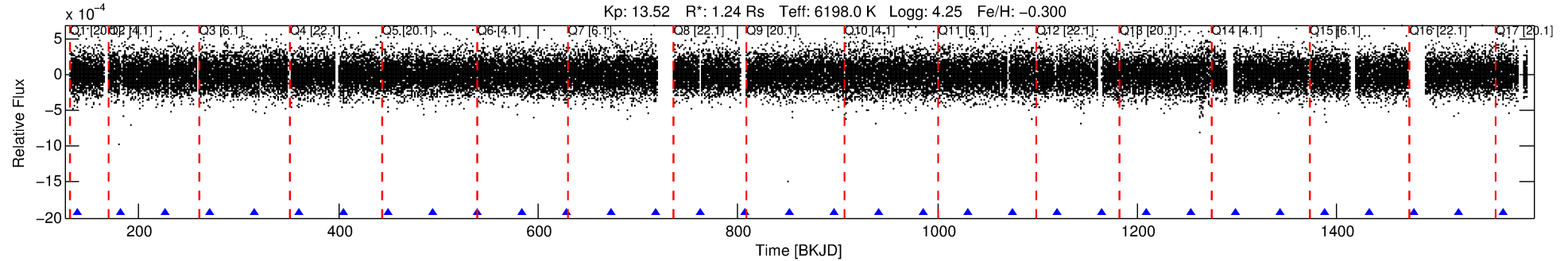
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006140059-01

No Significant Match Found

# DV One-Page Summary

KIC: 6140059 Candidate: 1 of 1 Period: 44.623 d  
KOI: K04123.01 Corr: 0.979



## DV Fit Results:

Period = 44.62305 [0.00080] d  
Epoch = 137.9322 [0.0149] BKJD  
Rp/R\* = 0.0127 [0.0008]  
a/R\* = 9.03 [2.44]  
b = 0.95 [0.03]  
Seff = 33.46 [13.03]  
Teq = 613 [60] K  
Rp = 1.72 [0.50] Re  
a = 0.2463 [0.0605] AU  
Ag = 204.92 [116.60] [1.75σ]  
Teffp = 3588 [409] K [7.20σ]

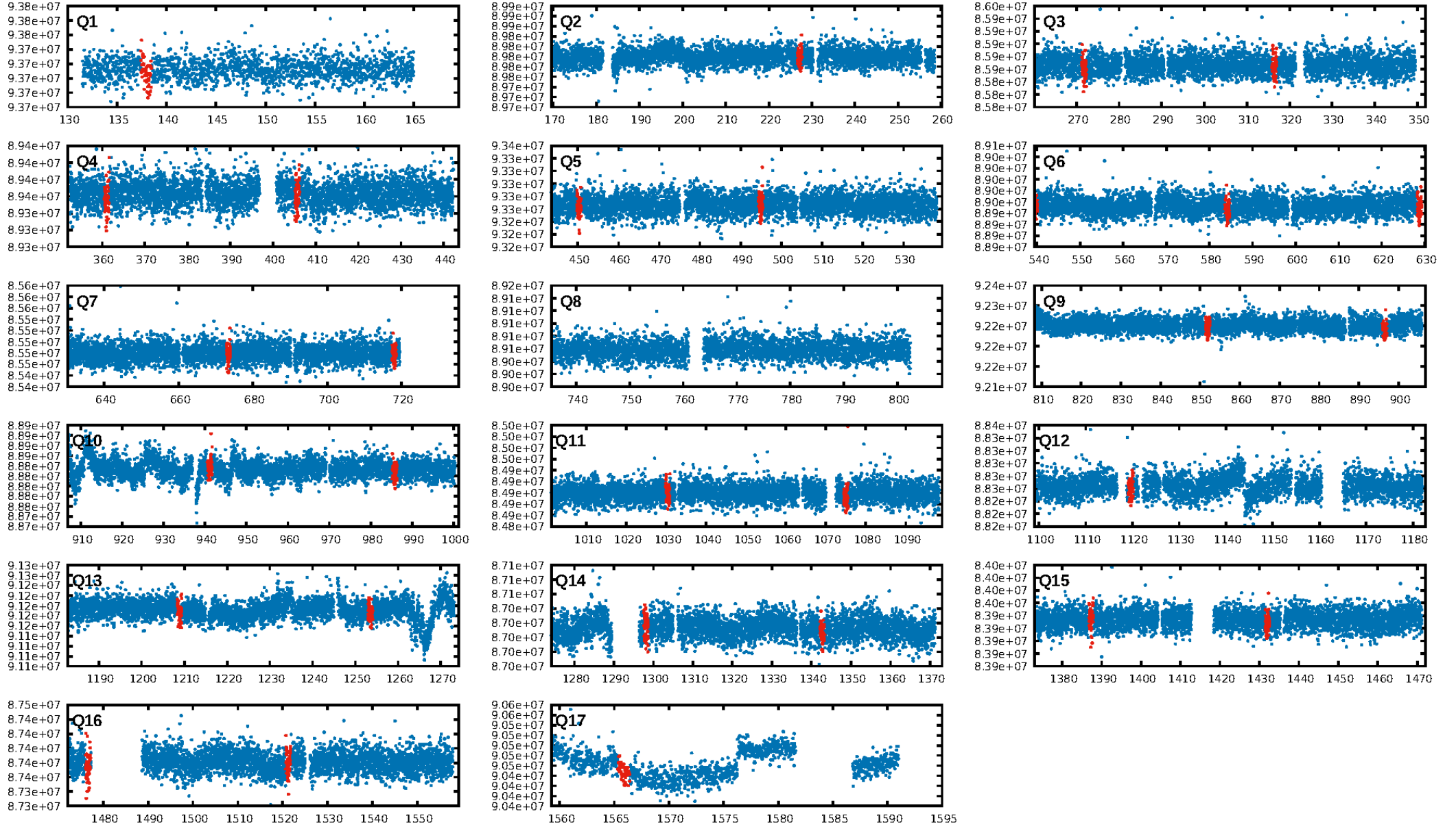
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 89.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 9.41e-44  
RollingBand-fgt: 1.00 [26/26]  
GhostDiagnostic-chr: 1.2  
Centroid-sig: 55.5%  
Centroid-so: 0.836 arcsec [0.95σ]  
OotOffset-rm: 0.358 arcsec [0.92σ]  
KicOffset-rm: 0.325 arcsec [0.76σ]  
OotOffset-st: 3/3/2/3 [11]  
KicOffset-st: 3/3/2/3 [11]  
DiffImageQuality-fgm: 0.82 [9/11]  
DiffImageOverlap-fno: 1.00 [15/15]

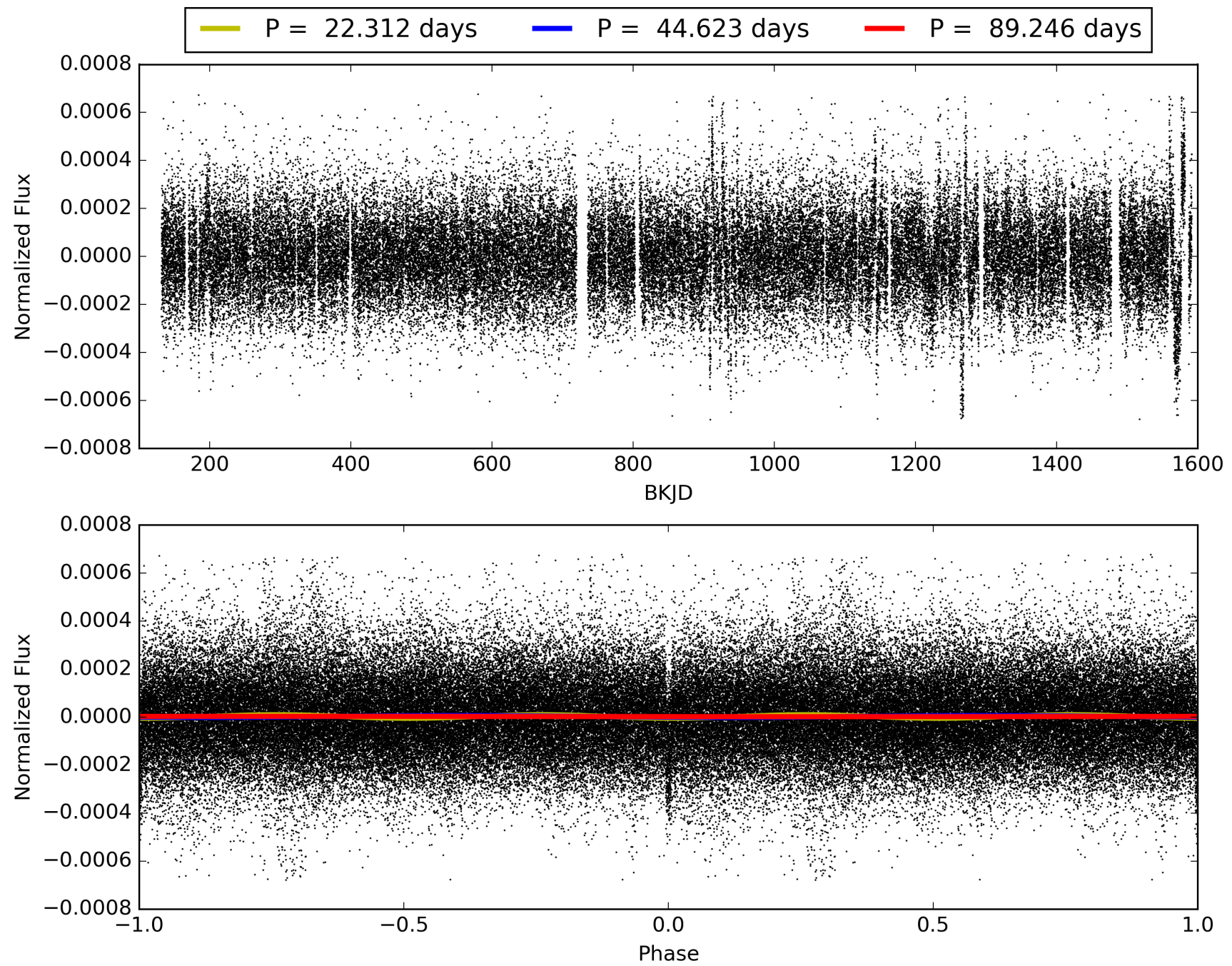
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 11:08:05 Z

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

# TCE 006140059-01, PDC Light Curves

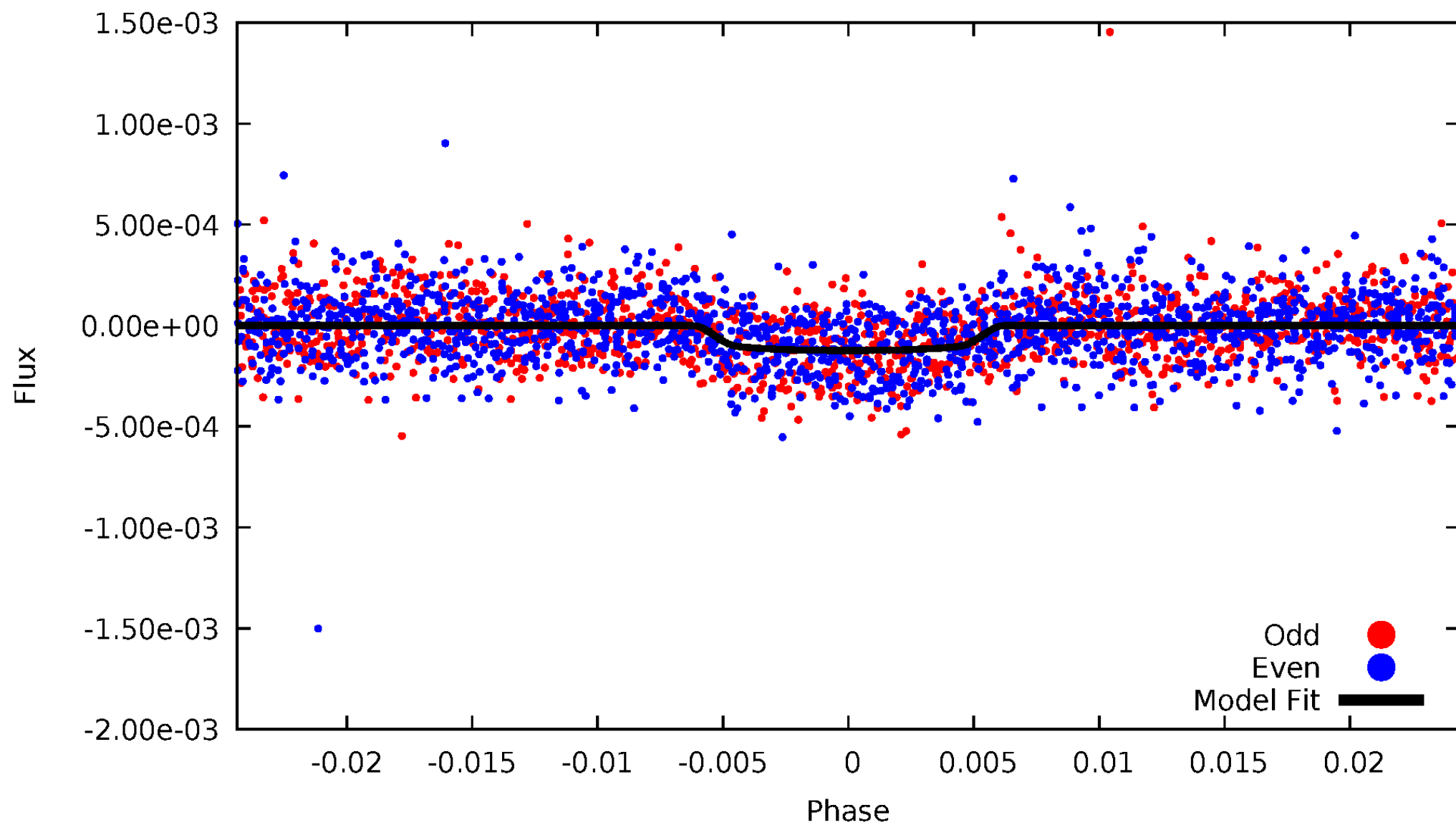


TCE 006140059-01



# DV Odd/Even

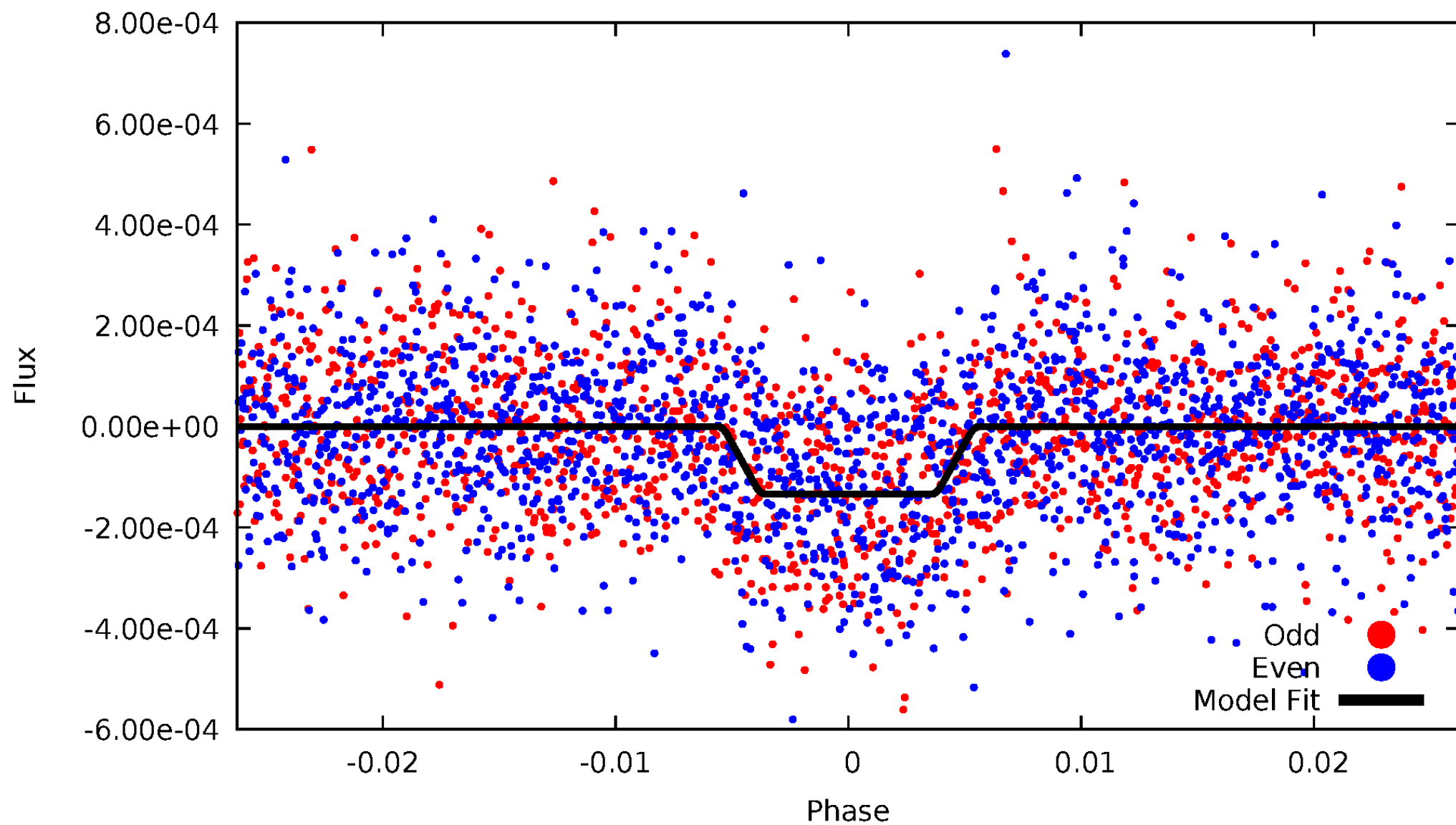
TCE 006140059-01



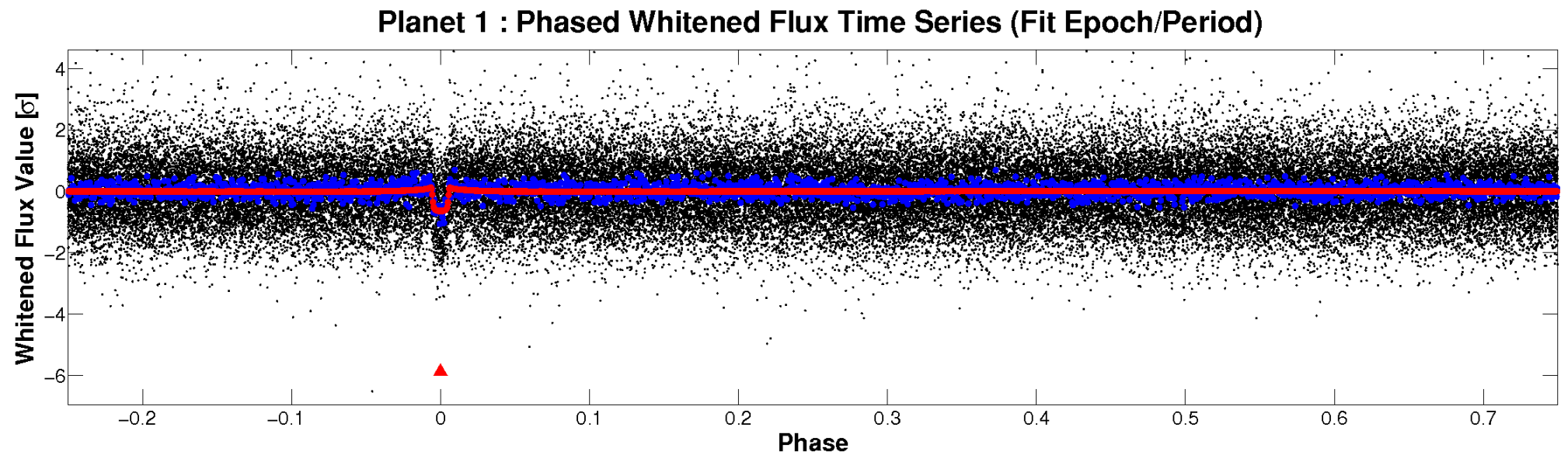
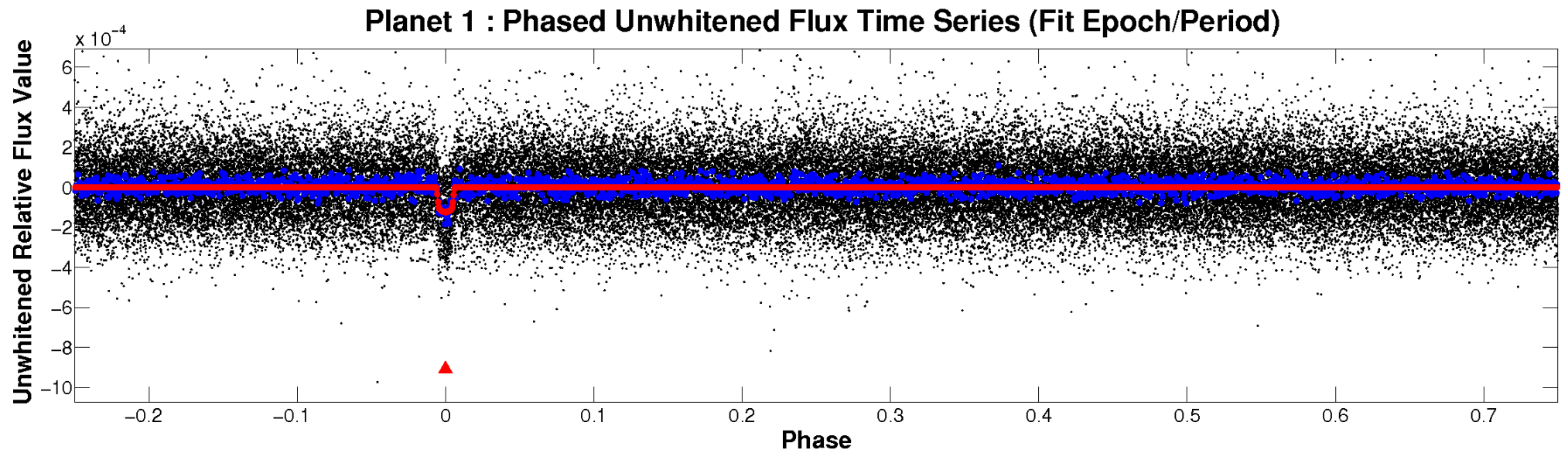


# ALT Odd/Even

TCE 006140059-01

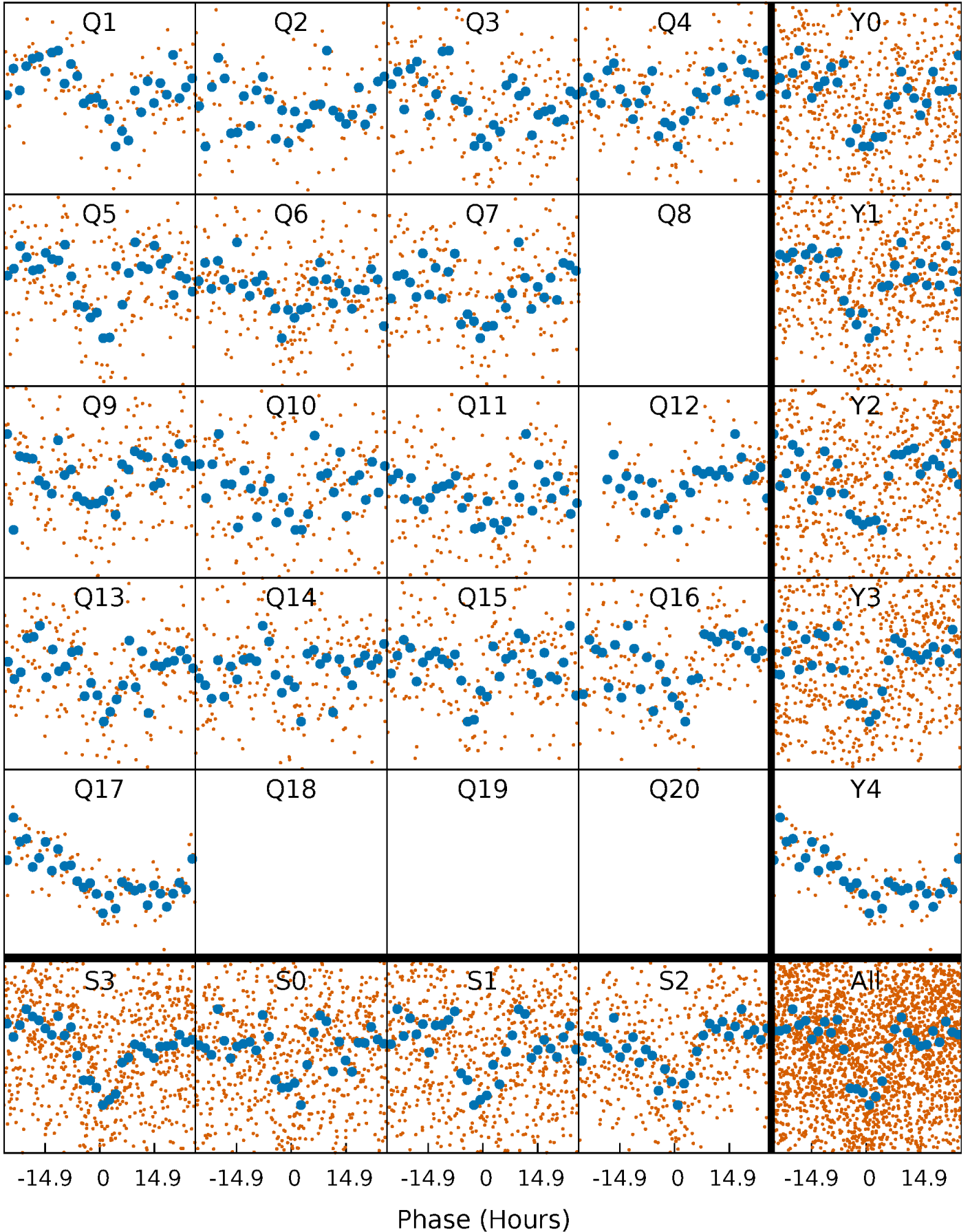


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

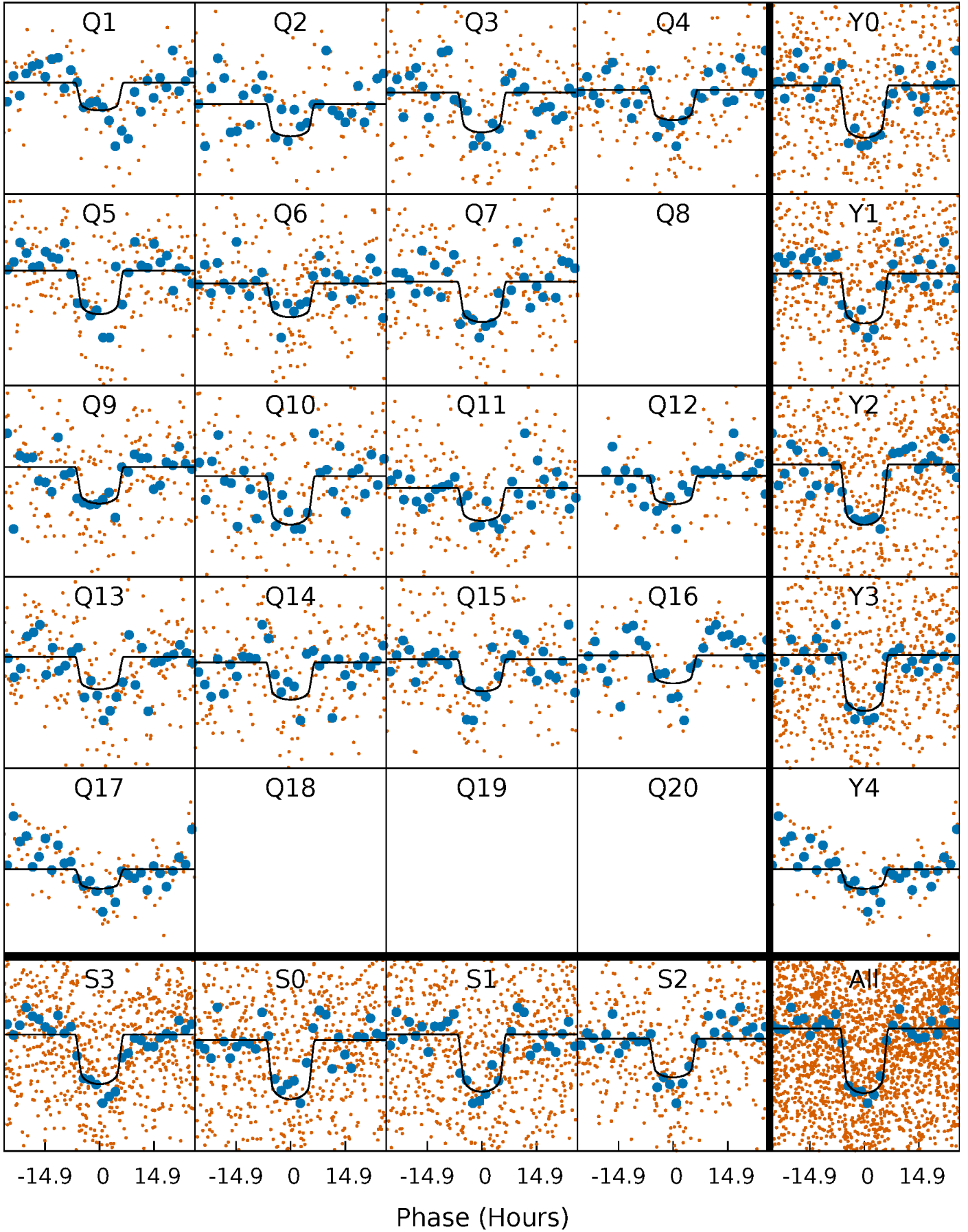
TCE 006140059-01 P= 44.623053 Days  $T_0=137.932235$  (BKJD)





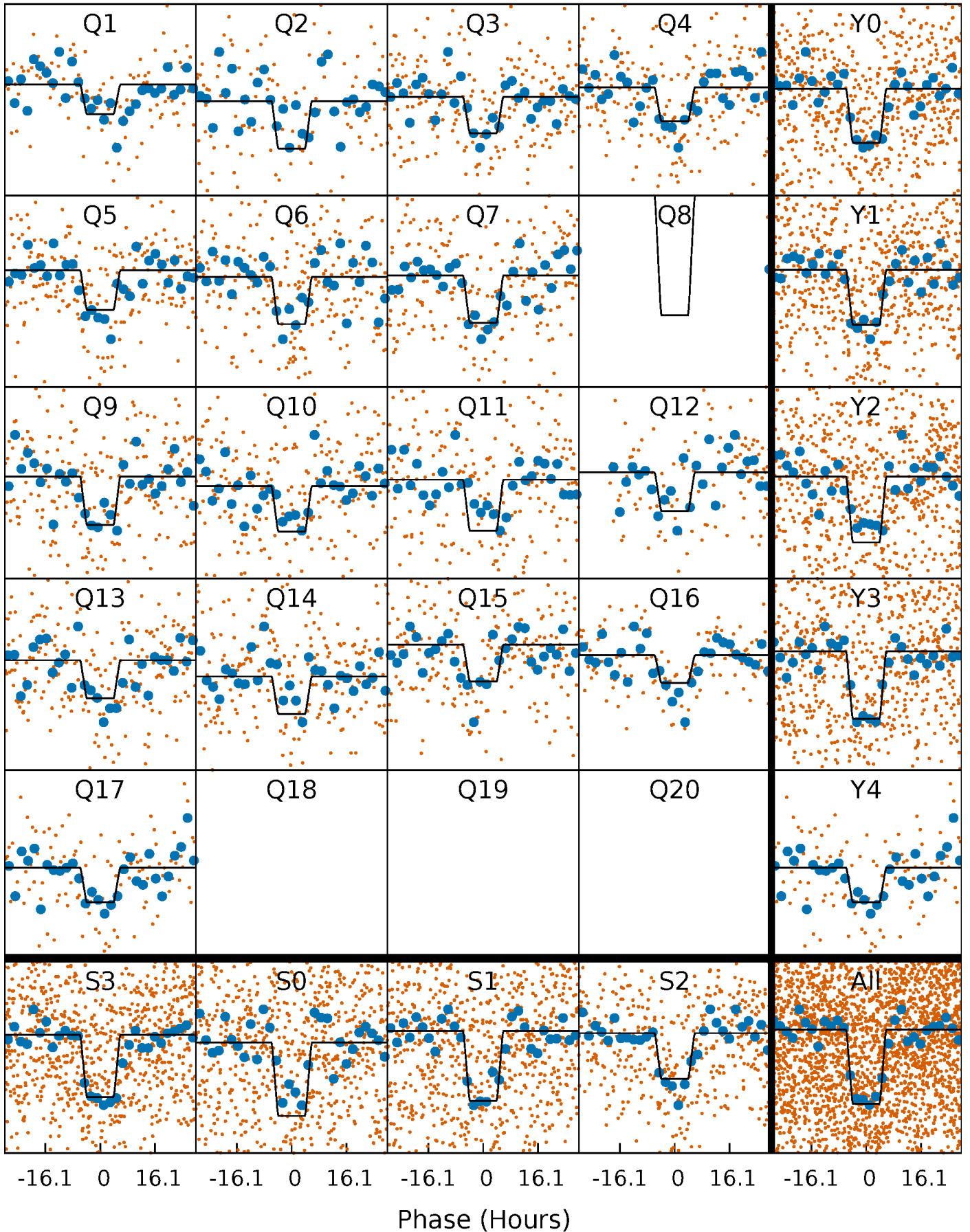
# DV Quarter-Phased Transit Curves

TCE 006140059-01 P= 44.623053 Days  $T_0=137.932235$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

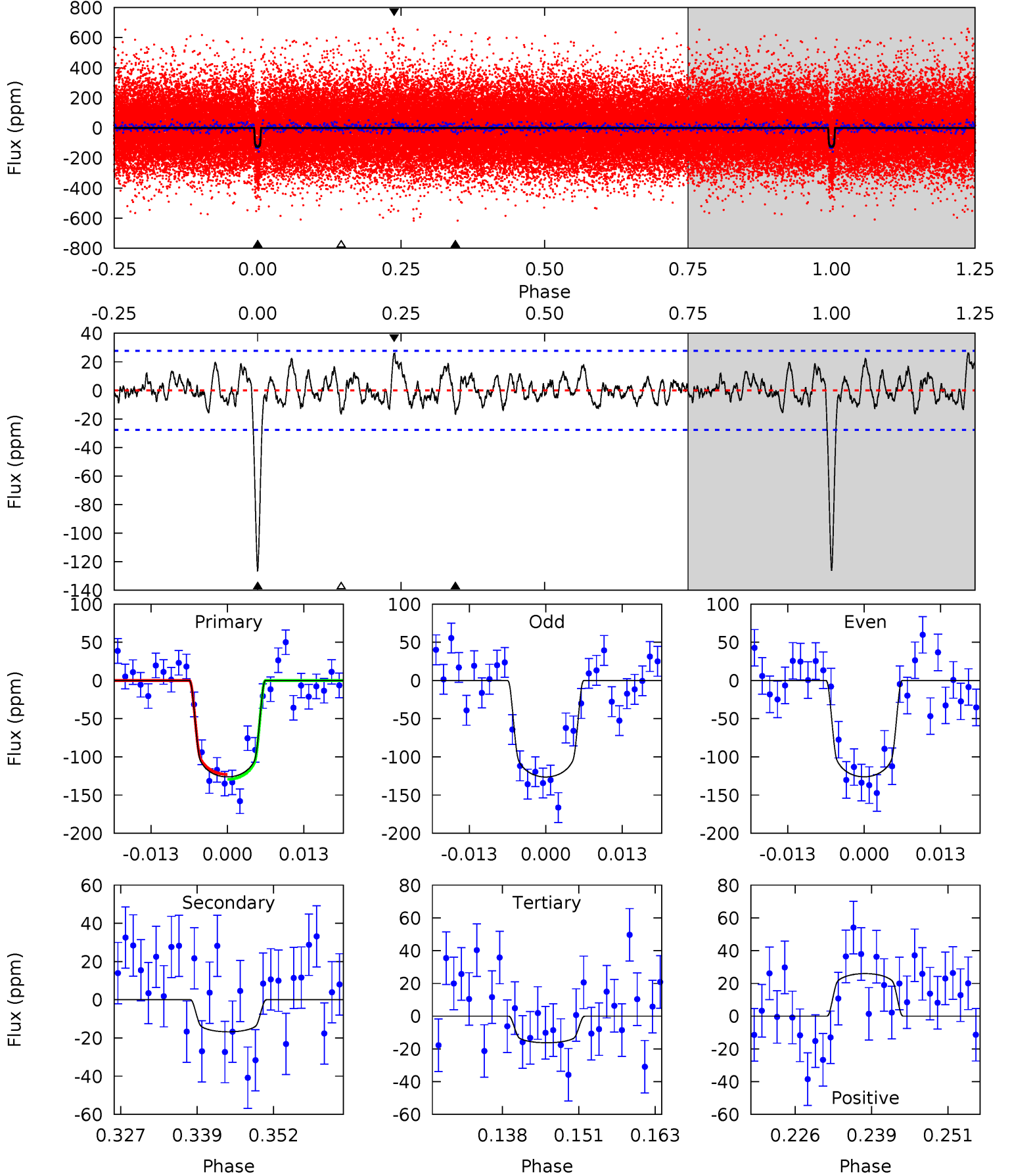
TCE 006140059-01 P= 44.622808 Days  $T_0=137.928365$  (BKJD)



# DV Model-Shift Uniqueness Test

006140059-01, P = 44.623053 Days, E = 93.309182 Days

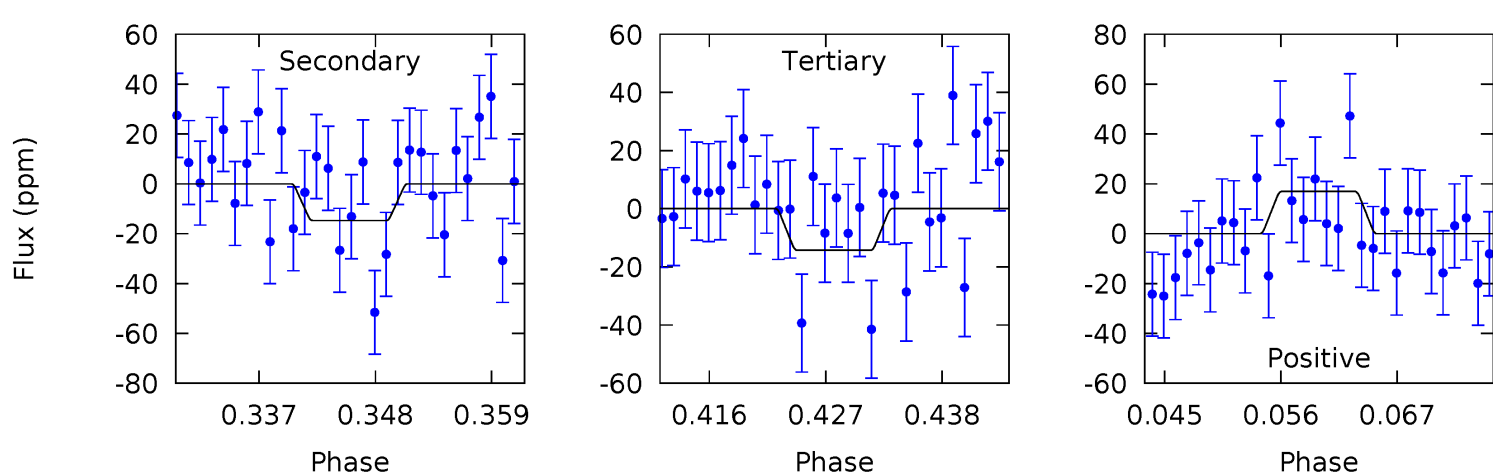
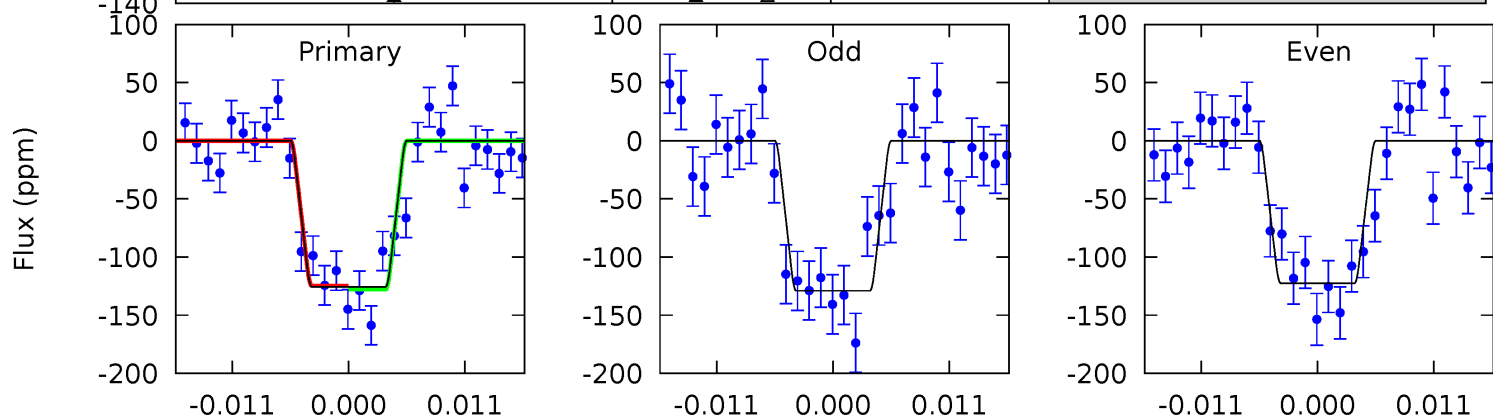
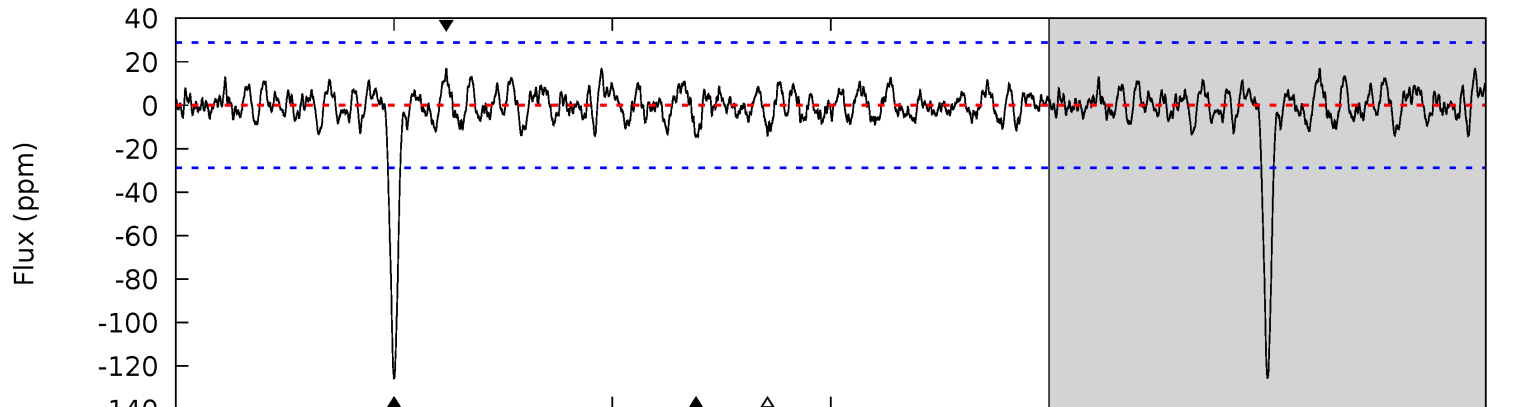
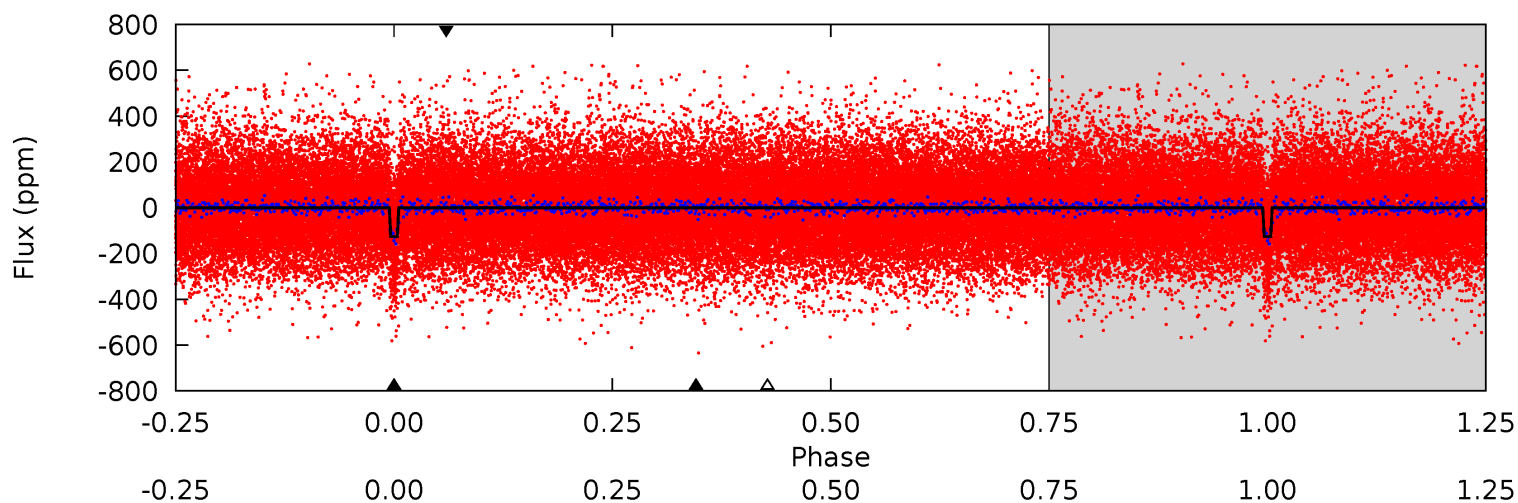
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.7	3.03	2.93	4.68	4.98	2.50	1.33	19.8	18.1	0.10	-1.65	0.02	1.00	0.17	0.59



# Alt Model-Shift Uniqueness Test

006140059-01, P = 44.622808 Days, E = 93.305557 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
21.9	2.56	2.48	2.94	5.00	2.54	0.96	19.4	18.9	0.08	-0.38	0.56	0.98	0.12	0.25



### Stellar Parameters For KIC 006140059

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6198^{+169}_{-206}$	$4.252^{+0.204}_{-0.185}$	$-0.300^{+0.300}_{-0.300}$	$1.239^{+0.352}_{-0.256}$	$0.998^{+0.158}_{-0.115}$	$0.740^{+0.703}_{-0.356}$
	+3%/-3%	+5%/-4%	+100%/-100%	+28%/-21%	+16%/-12%	+95%/-48%
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 006140059-01 / KOI 4123.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-17 \pm 6$	$1.70^{+0.32}_{-0.25}$	$848^{+72}_{-60}$	$3849^{+240}_{-254}$	$188^{+97}_{-75}$
Alt.	$-15 \pm 6$	$1.53^{+0.27}_{-0.22}$	$848^{+65}_{-57}$	$3901^{+278}_{-344}$	$205^{+113}_{-104}$

$T_{max}$  = 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

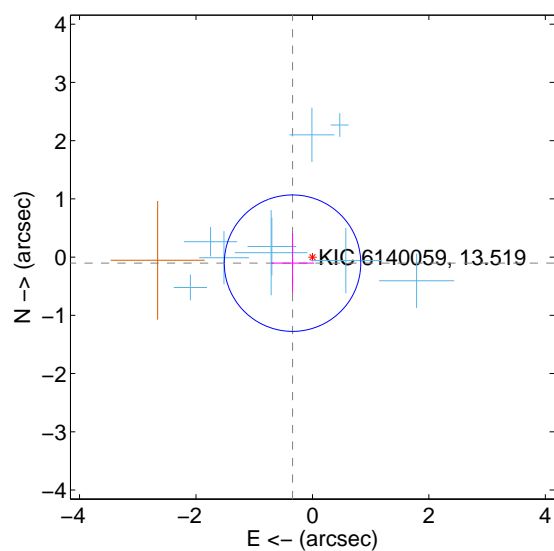
Supplemental centroid analysis for 006140059-01. Kepler magnitude: 13.52. Transit SNR 14.66

There are 9 quarters with good PRF difference image offsets

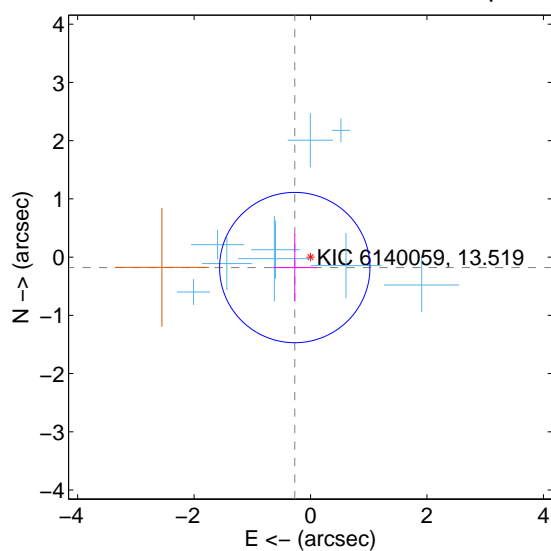
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.358 \pm 0.391$	0.92	$0.342 \pm 0.370$	$-0.104 \pm 0.511$
PRF-fit source offset from KIC position	$0.325 \pm 0.430$	0.76	$0.271 \pm 0.378$	$-0.180 \pm 0.578$
photometric centroid source offset	$0.84 \pm 0.88$	0.95	$-0.83 \pm 0.88$	$-0.04 \pm 0.88$

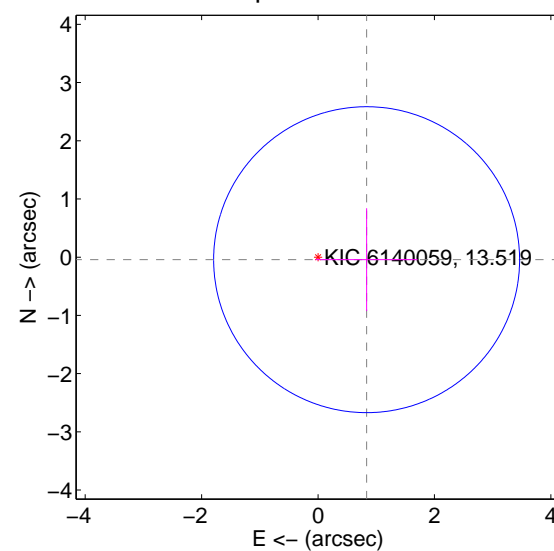
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

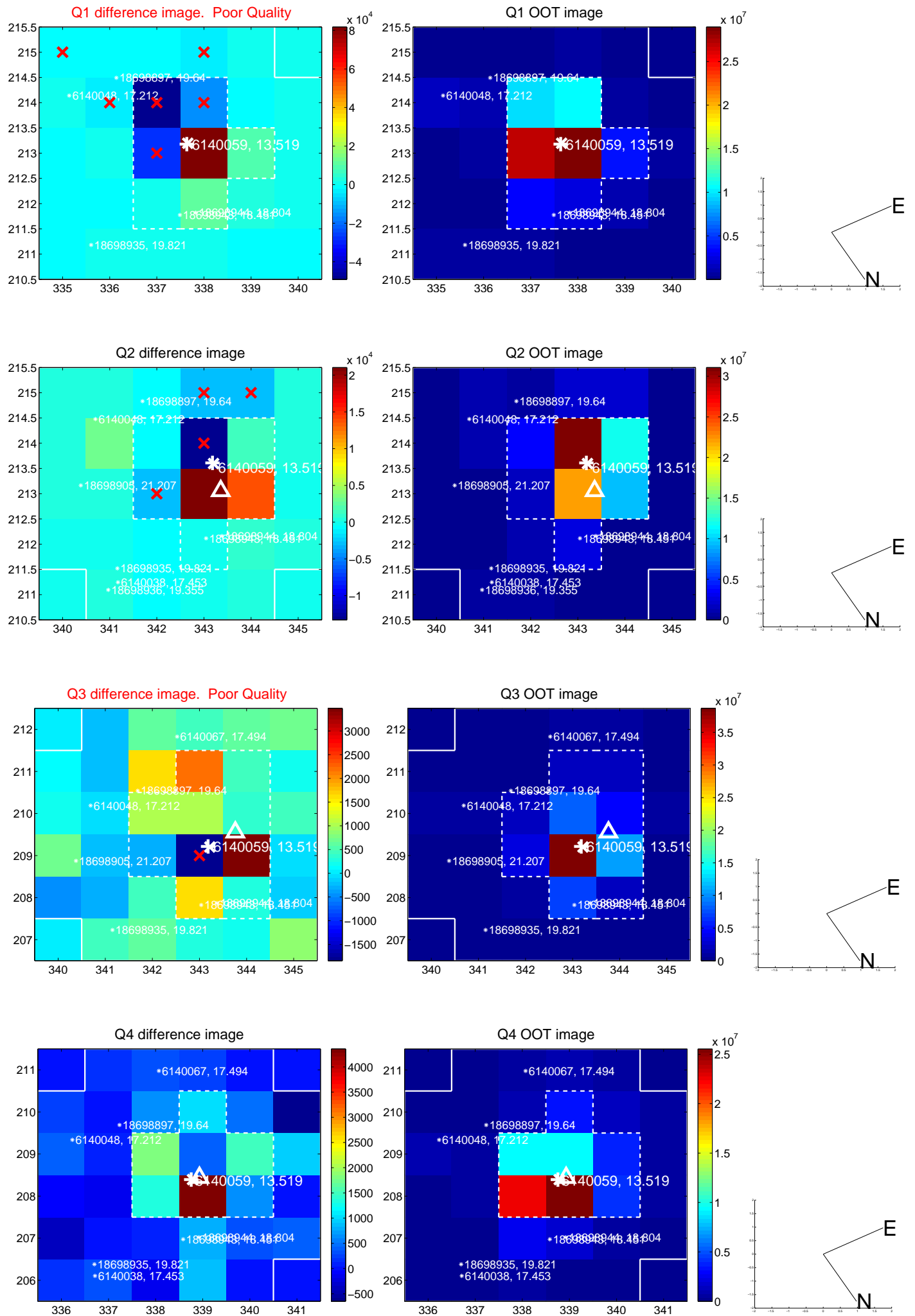


offset from photometric centroids

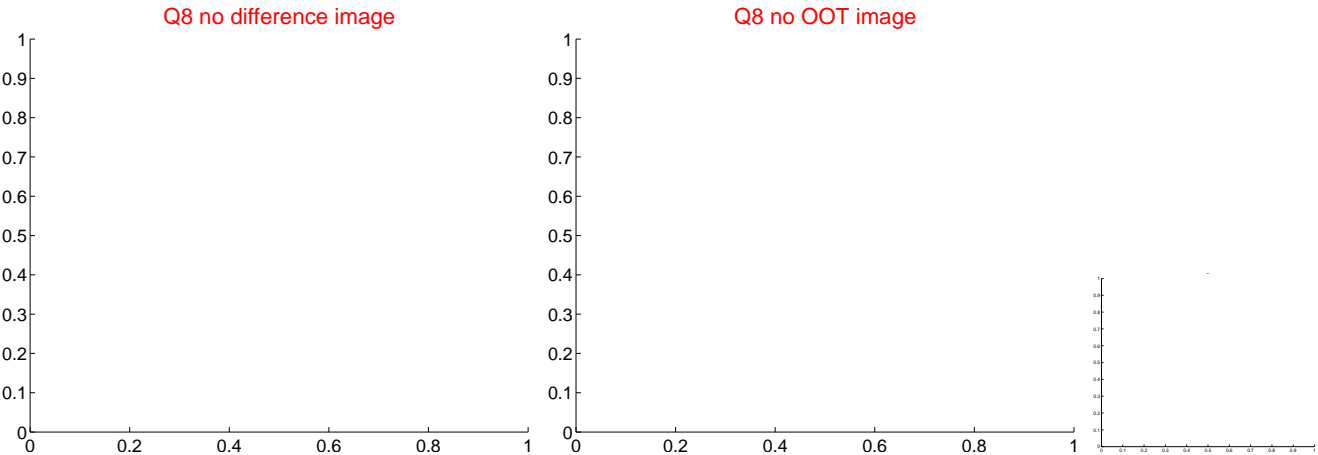
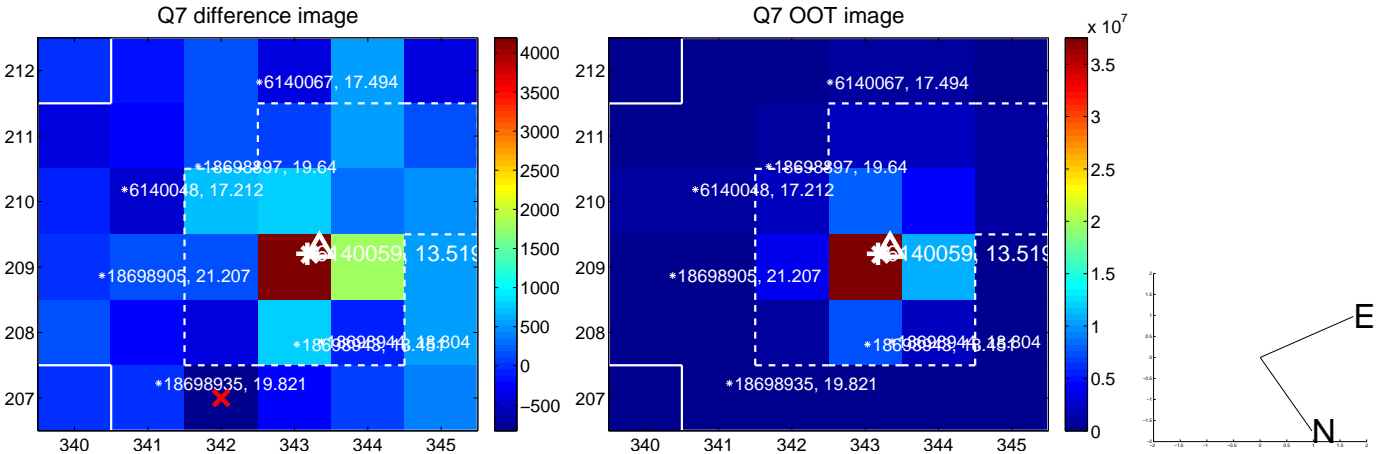
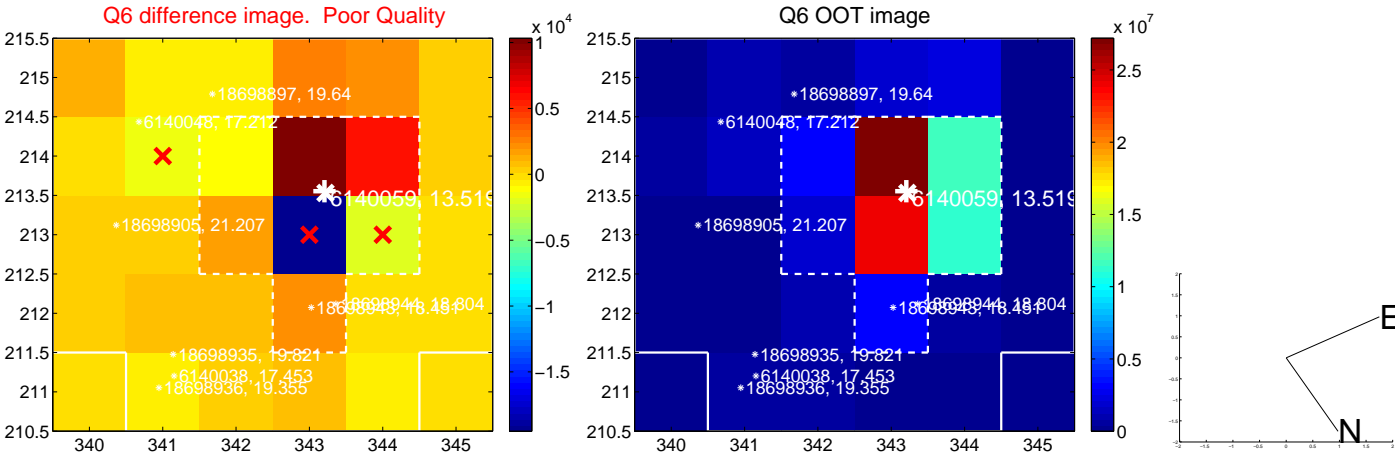
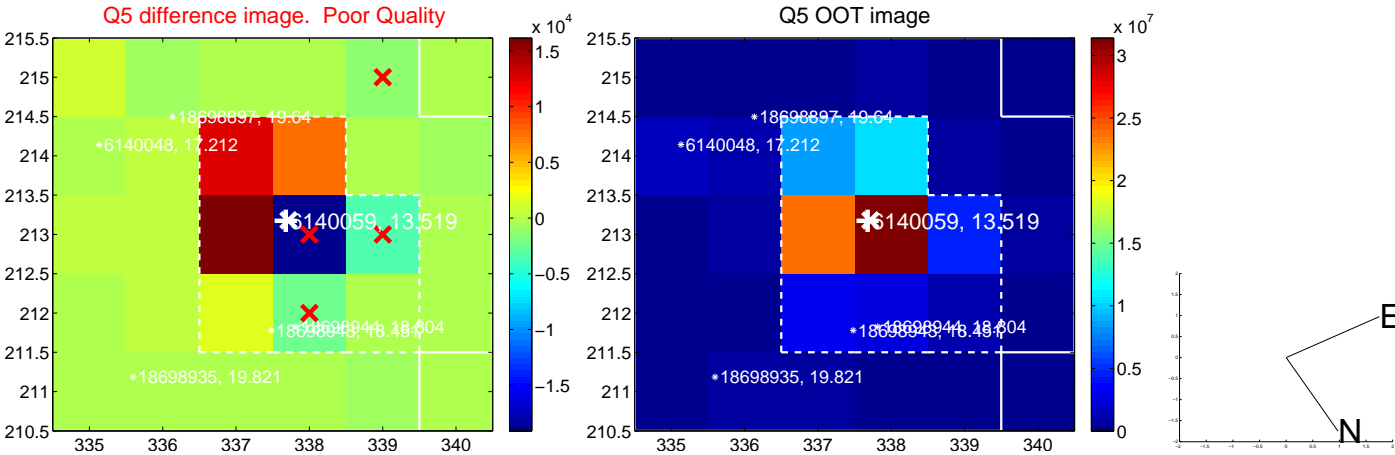


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

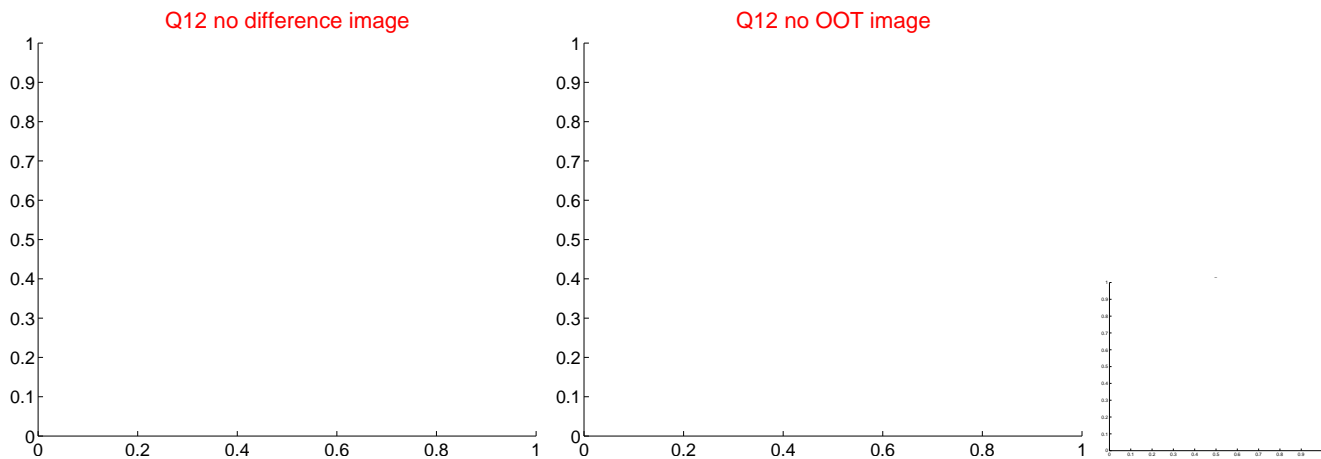
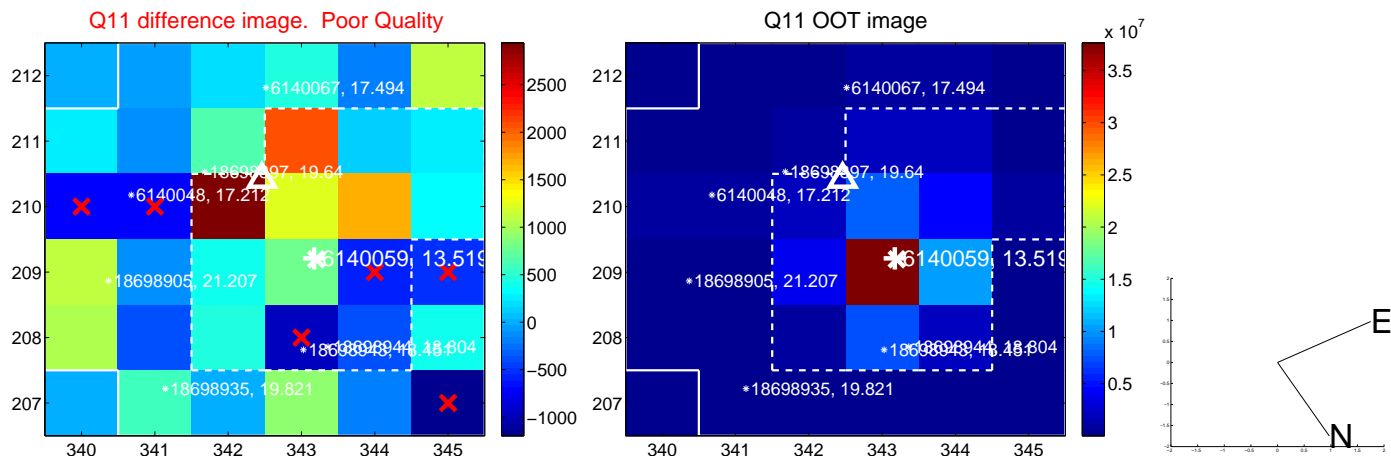
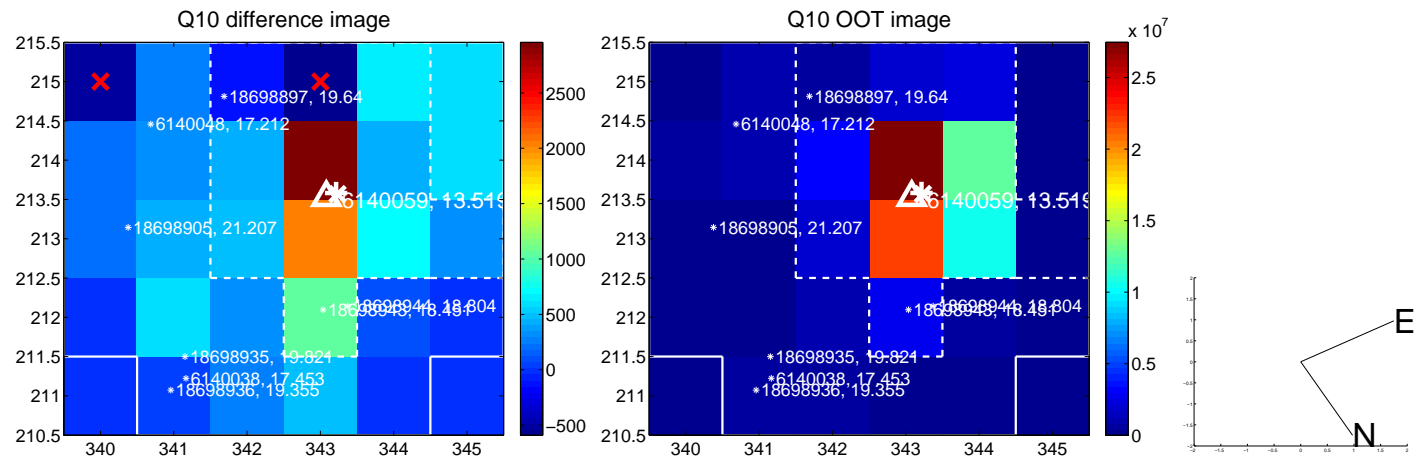
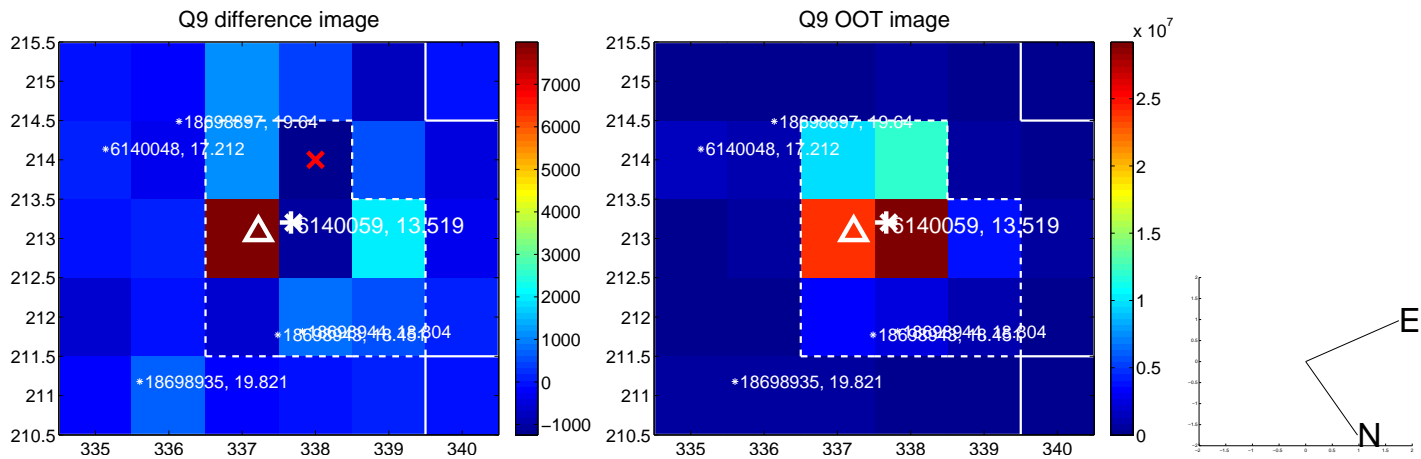
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



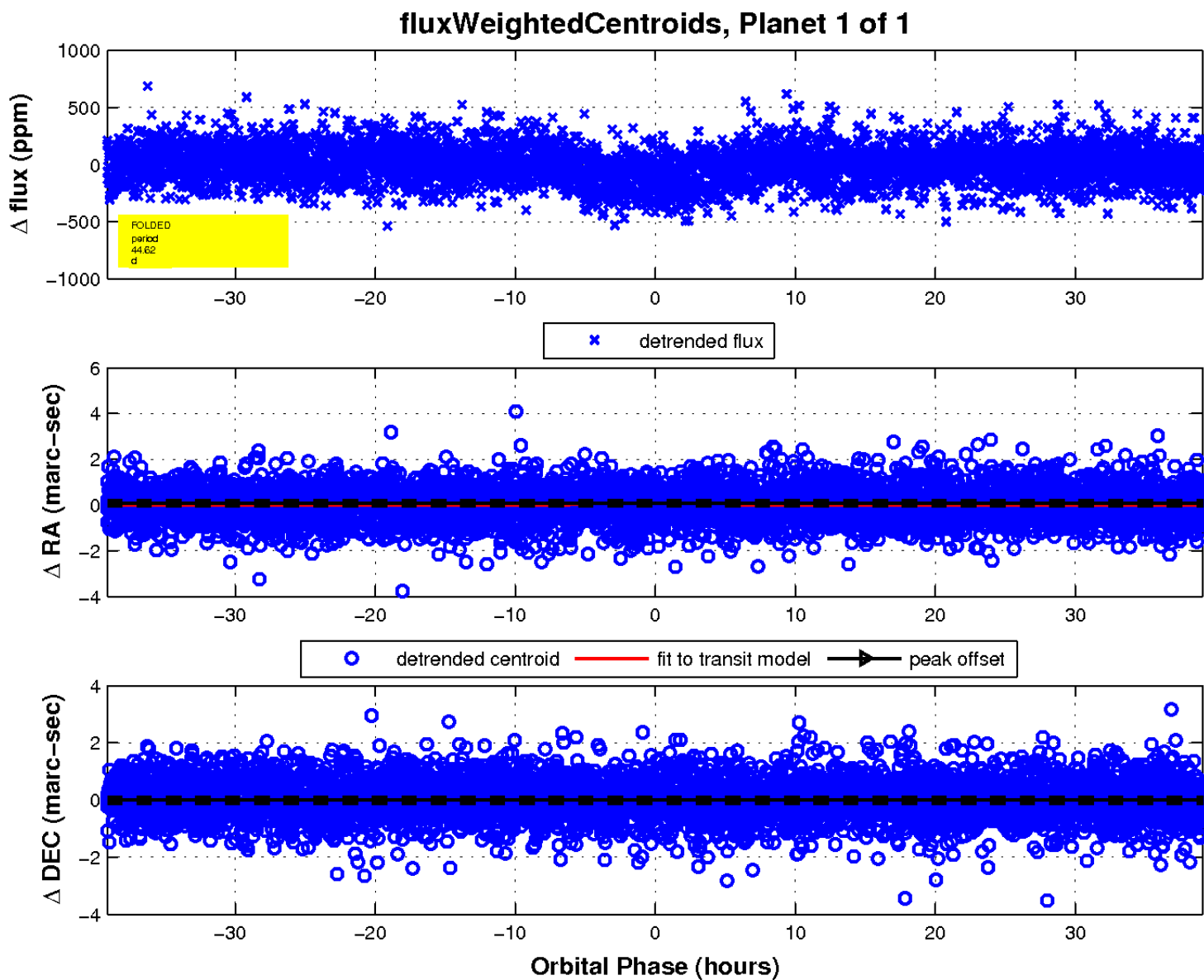
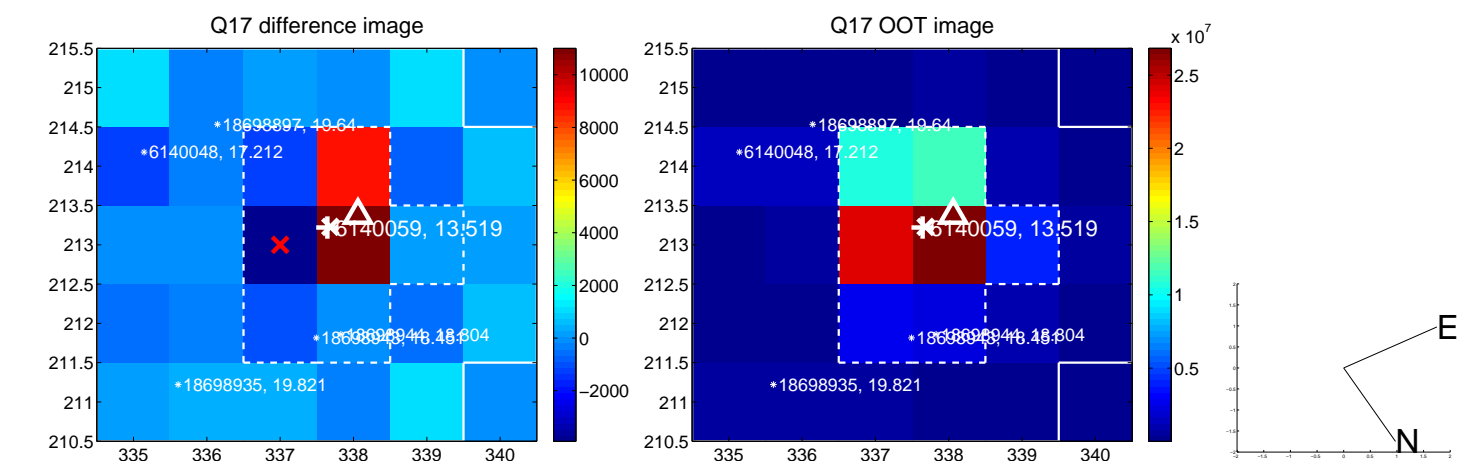
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.







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



UKIRT Image

Declination

