

KIC 009409493

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})
009409493-01	OBS	8182.01	60.023727	158.942102	4324.3	5.128	9.2	8.3	0.66	4538	4.32	2.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009409493-01	OBS	FP	0.02	1	0	0	0	MOD_NONUNIQ_DV—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.

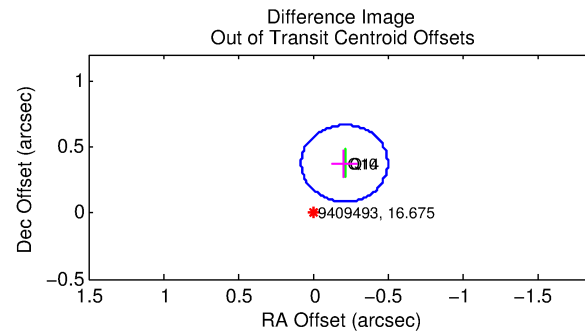
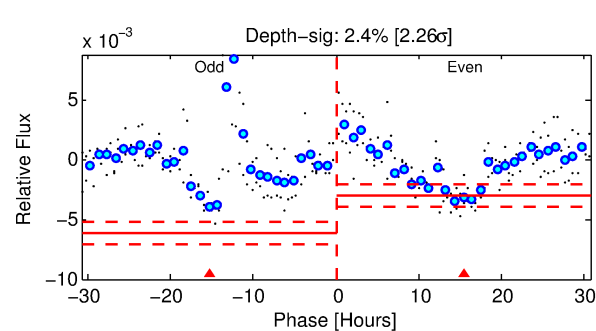
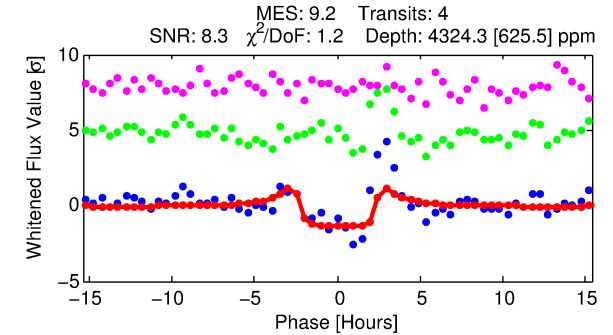
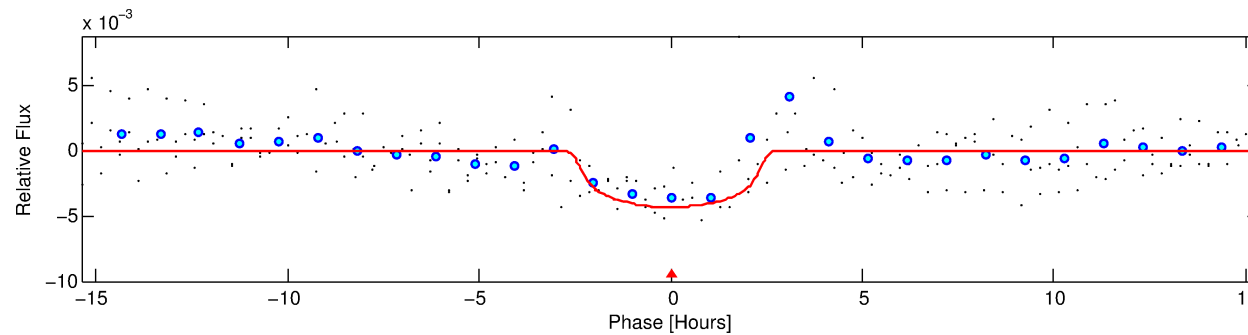
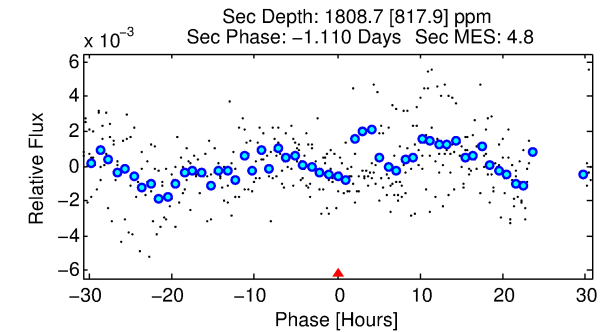
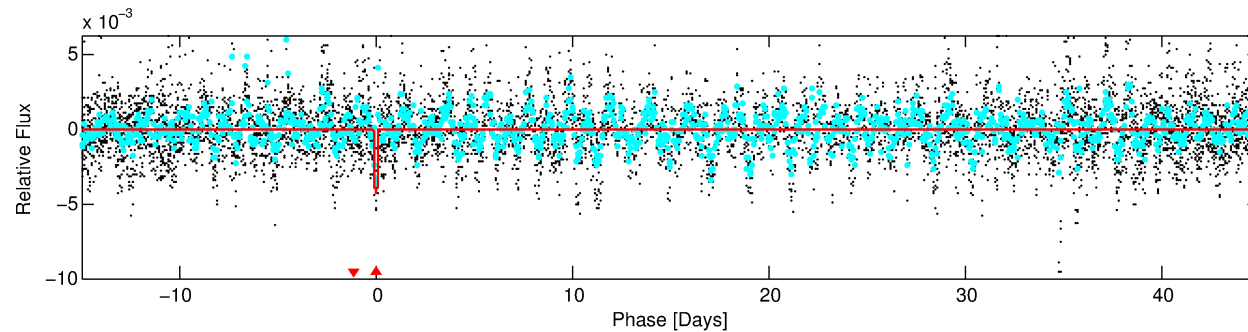
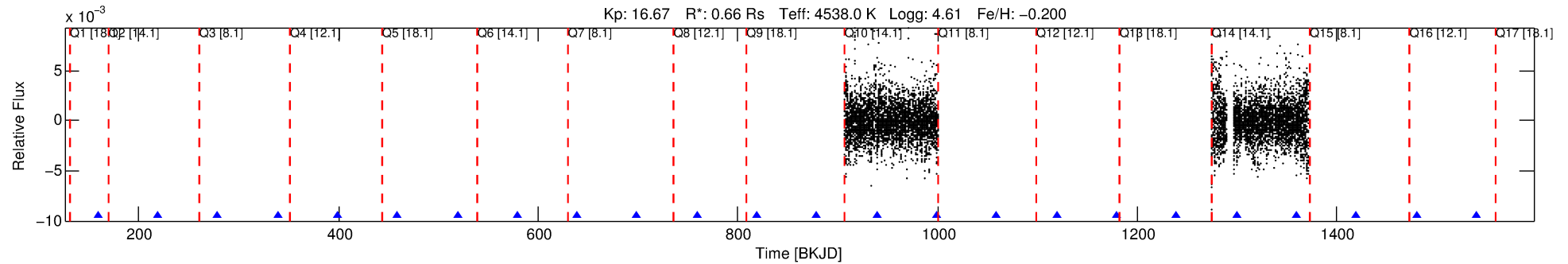
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009409493-01

No Significant Match Found

DV One-Page Summary

KIC: 9409493 Candidate: 1 of 1 Period: 60.024 d



DV Fit Results:

Period = 60.02373 [0.00138] d
Epoch = 158.9421 [0.0242] BKJD
Rp/R* = 0.0598 [0.0450]
a/R* = 86.08 [189.25]
b = 0.44 [4.09]
Seff = 2.48 [0.43]
Teq = 320 [14] K
Rp = 4.32 [3.28] Re
a = 0.2598 [0.0190] AU
Ag = 3592.18 [5658.14] [0.63σ]
Teffp = 3828 [1510] K [2.32σ]

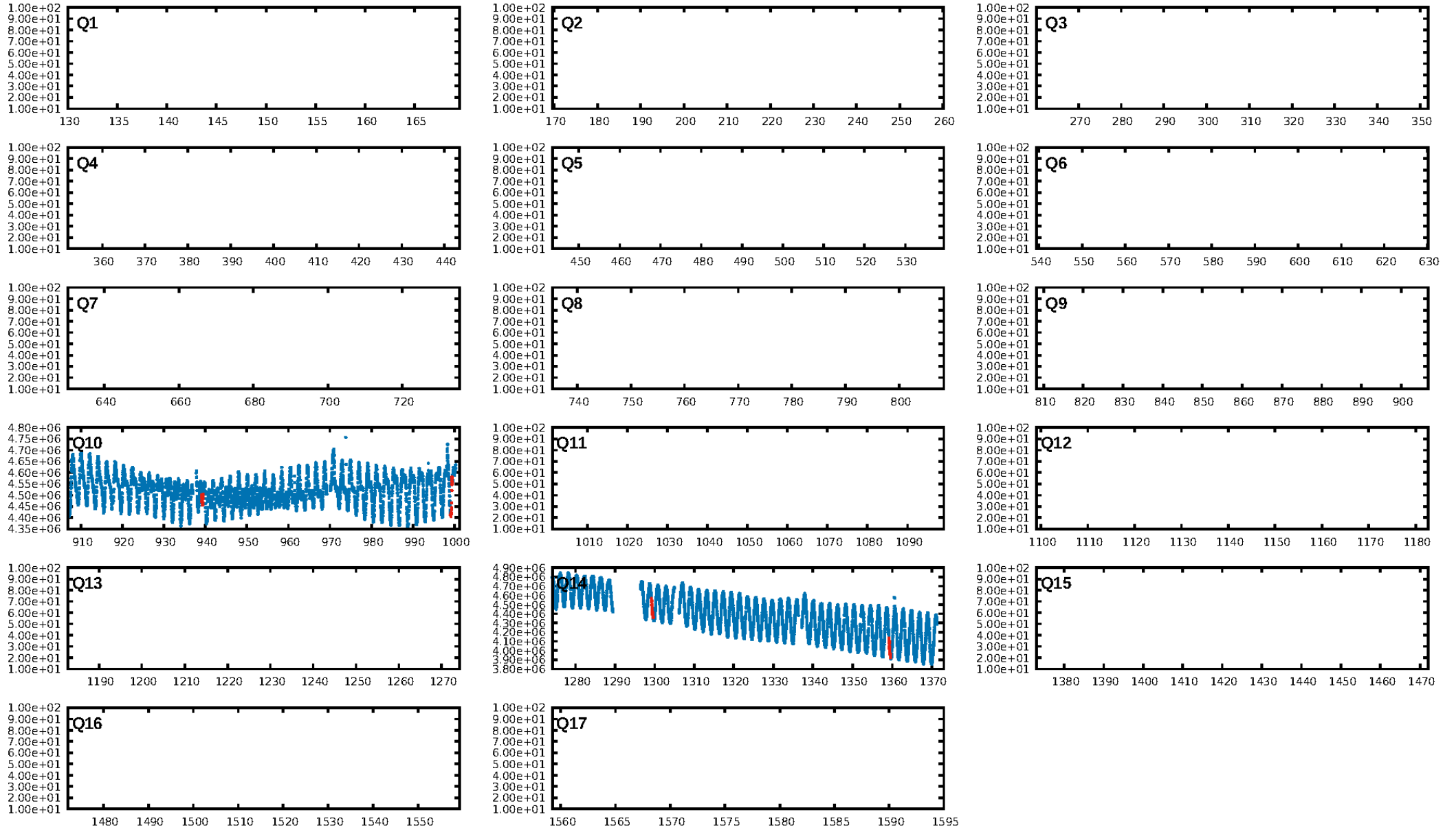
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 21.8%
ModelChiSquareGof-sig: 80.3%
Bootstrap-pfa: 2.46e-13
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.994
Centroid-sig: 57.7%
Centroid-so: 0.568 arcsec [0.90σ]
OotOffset-rm: 0.431 arcsec [4.46σ]
KicOffset-rm: 0.106 arcsec [1.06σ]
OotOffset-st: 2/0/0/0 [2]
KicOffset-st: 2/0/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

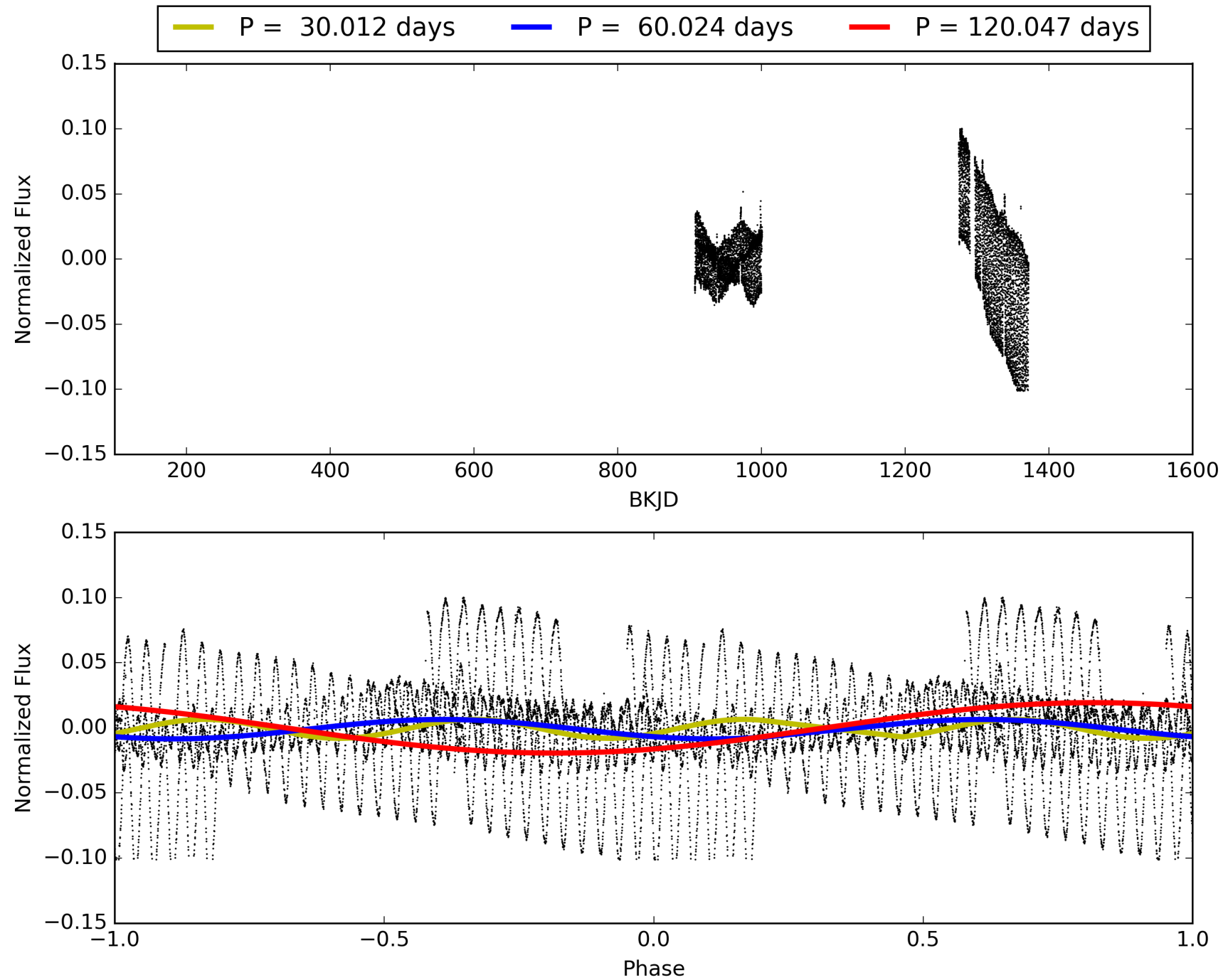
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:13:39 Z

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

TCE 009409493-01, PDC Light Curves

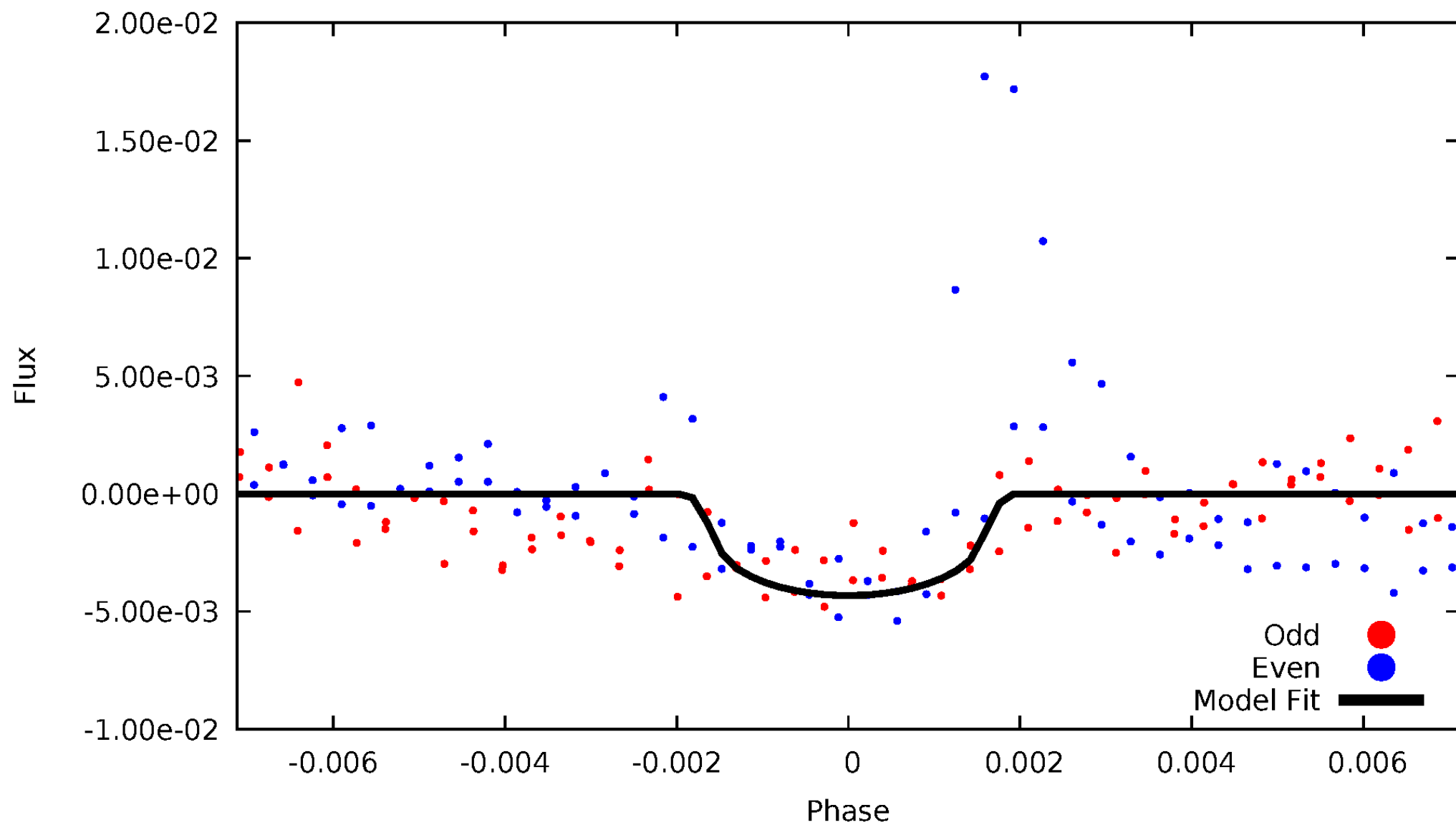


TCE 009409493-01



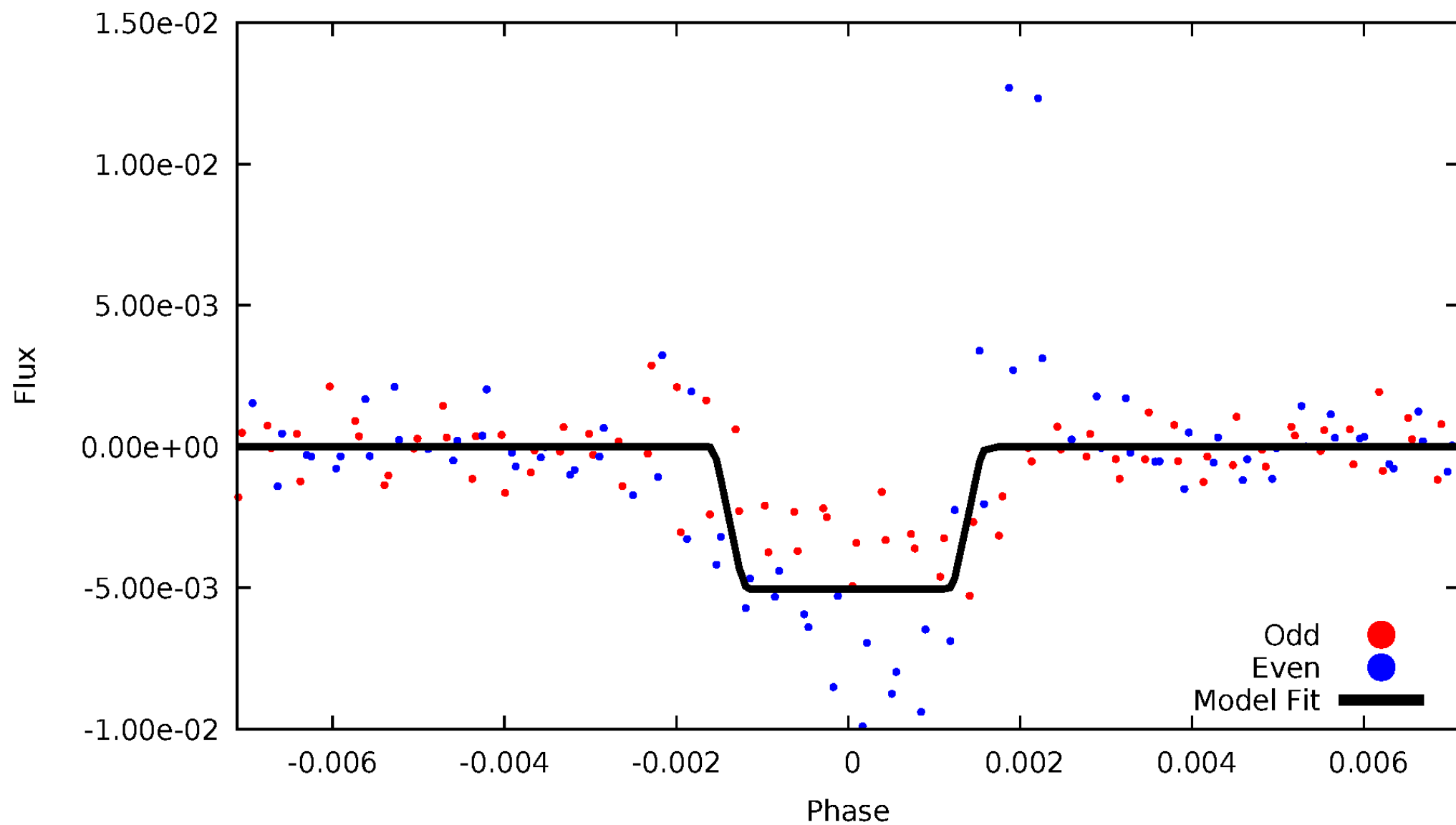
DV Odd/Even

TCE 009409493-01



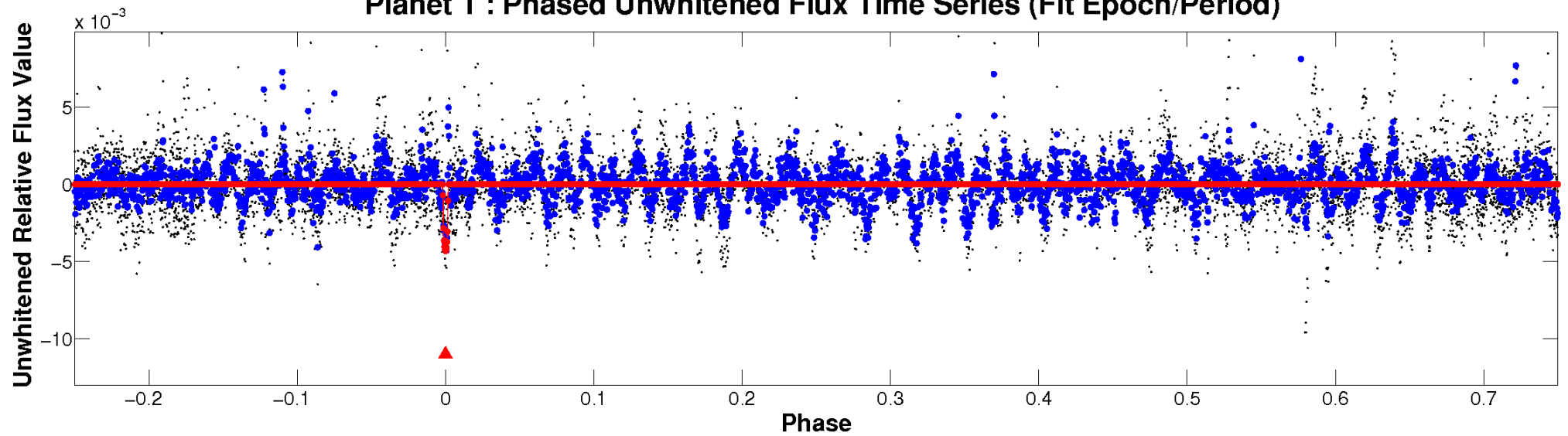
ALT Odd/Even

TCE 009409493-01

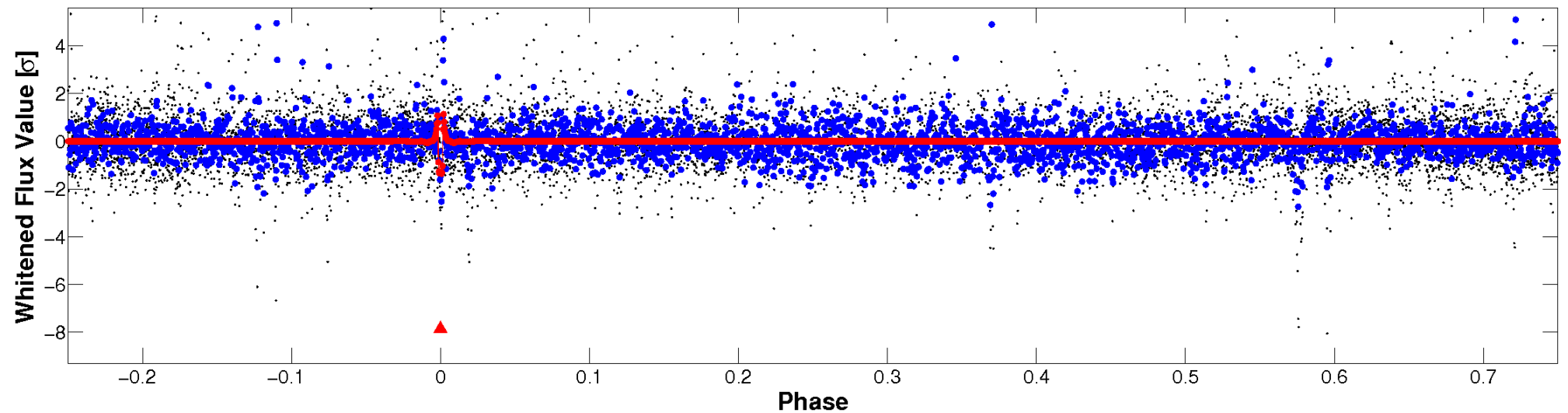


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

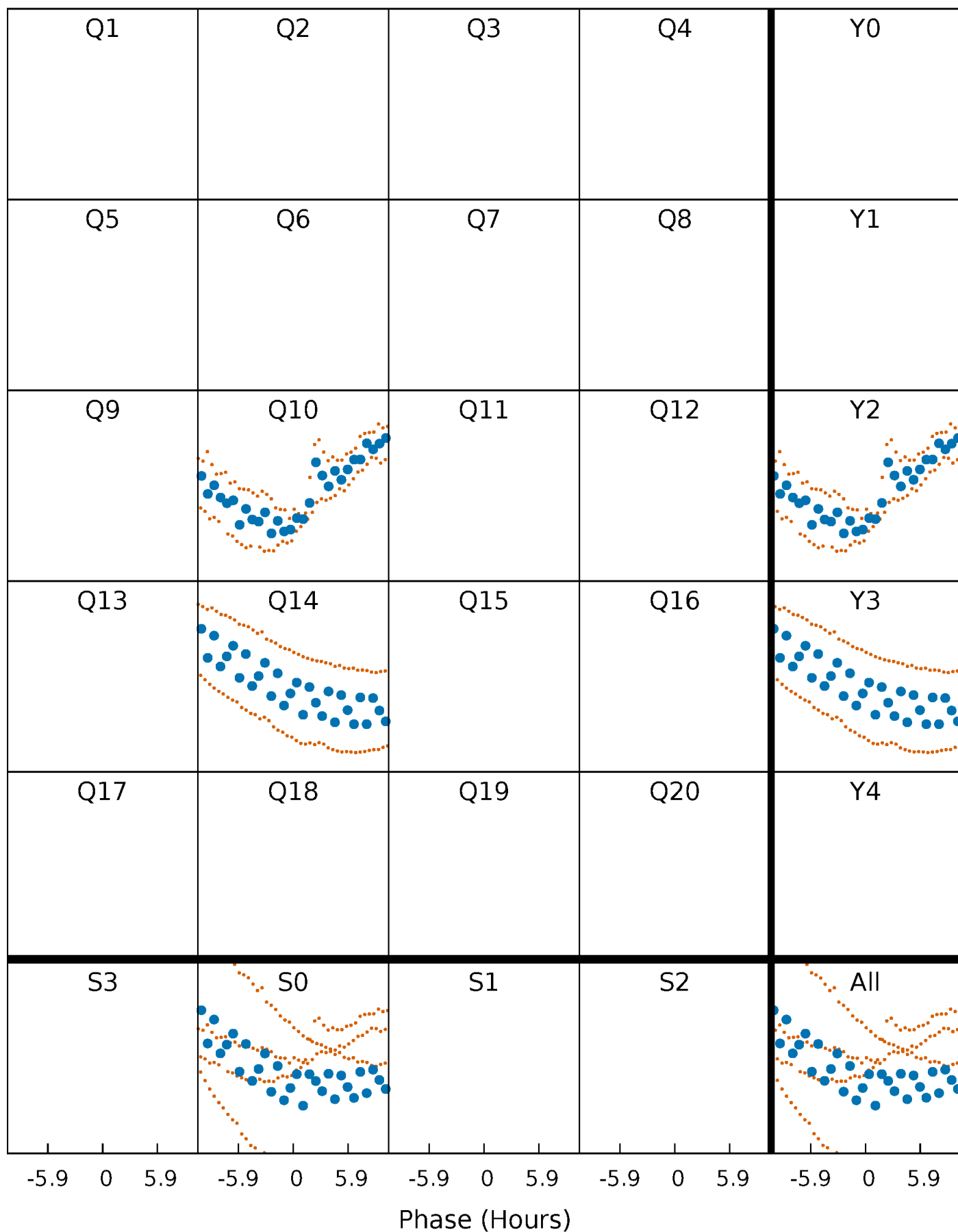


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



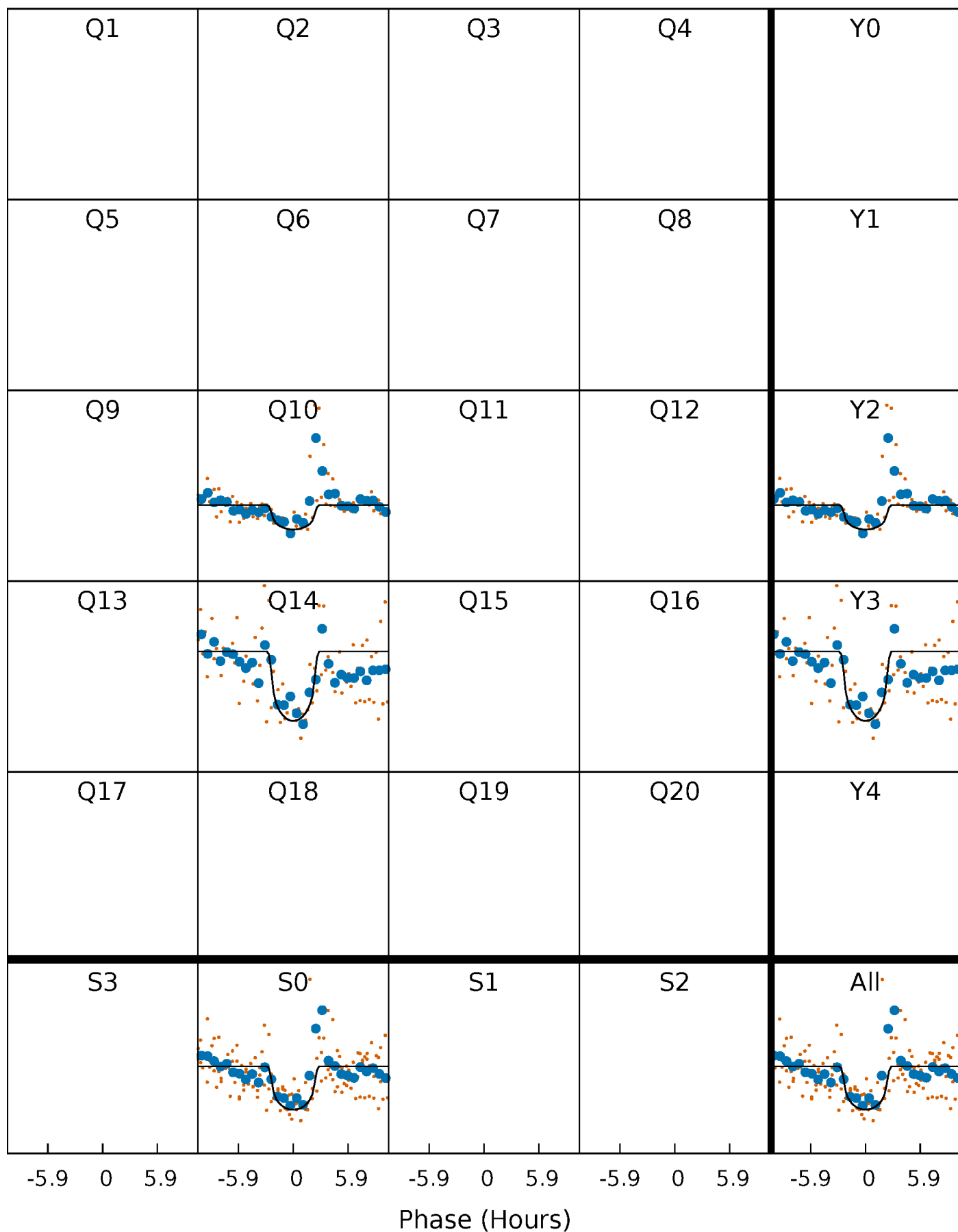
PDC Quarter-Phased Transit Curves

TCE 009409493-01 P= 60.023727 Days $T_0=158.942102$ (BKJD)



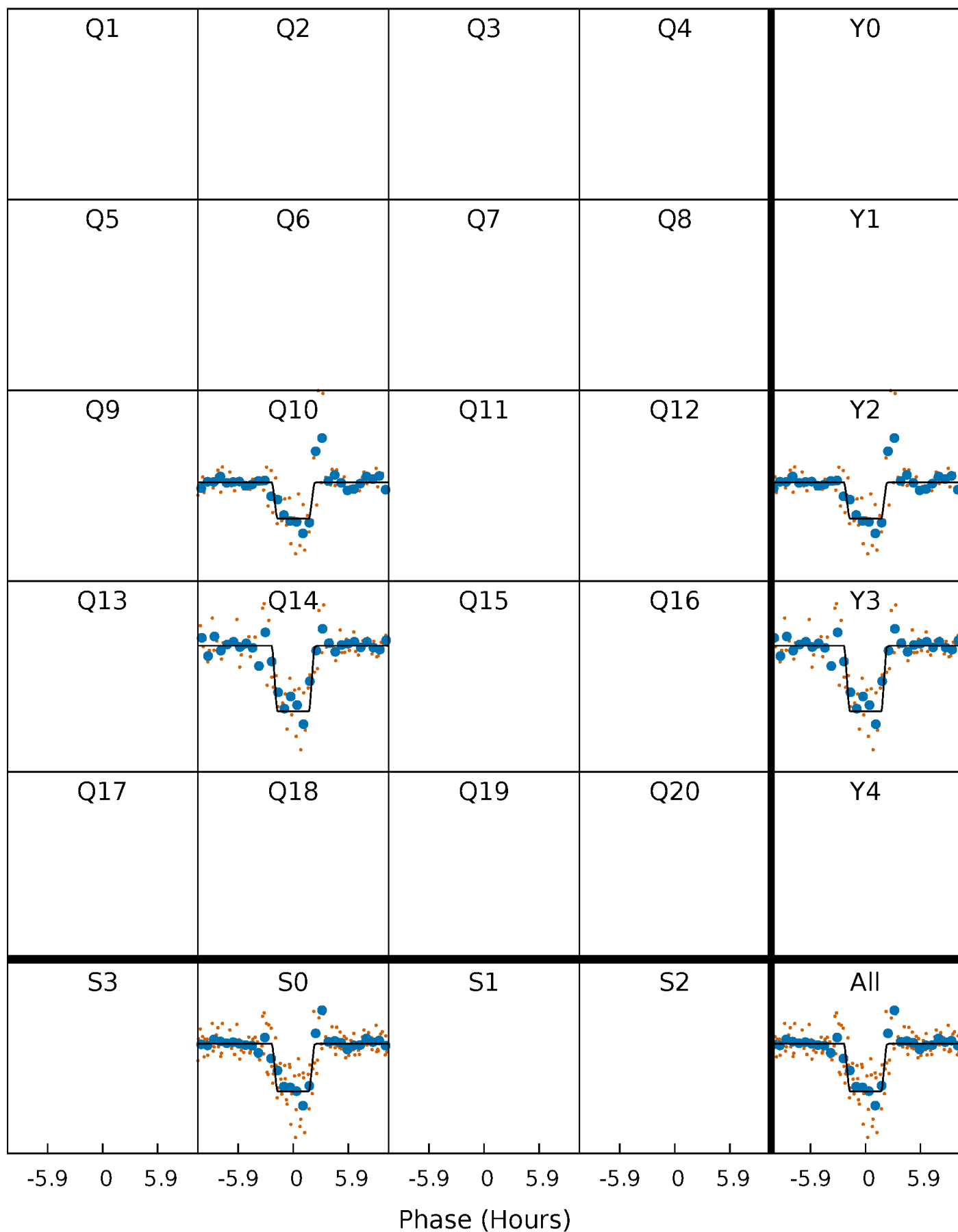
DV Quarter-Phased Transit Curves

TCE 009409493-01 P= 60.023727 Days $T_0=158.942102$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

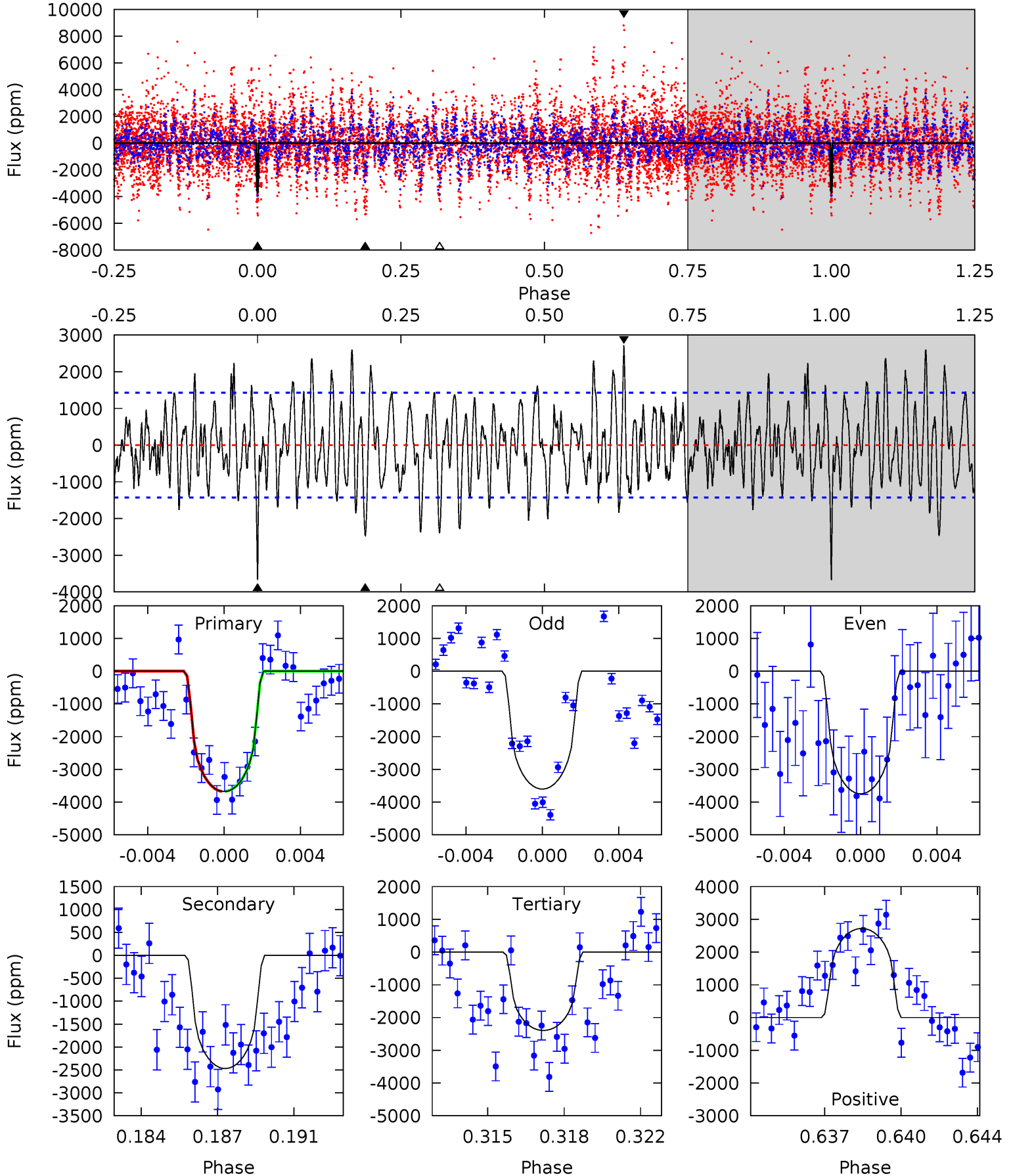
TCE 009409493-01 P= 60.026635 Days $T_0=158.884549$ (BKJD)



DV Model-Shift Uniqueness Test

009409493-01, P = 60.023727 Days, E = 158.942102 Days

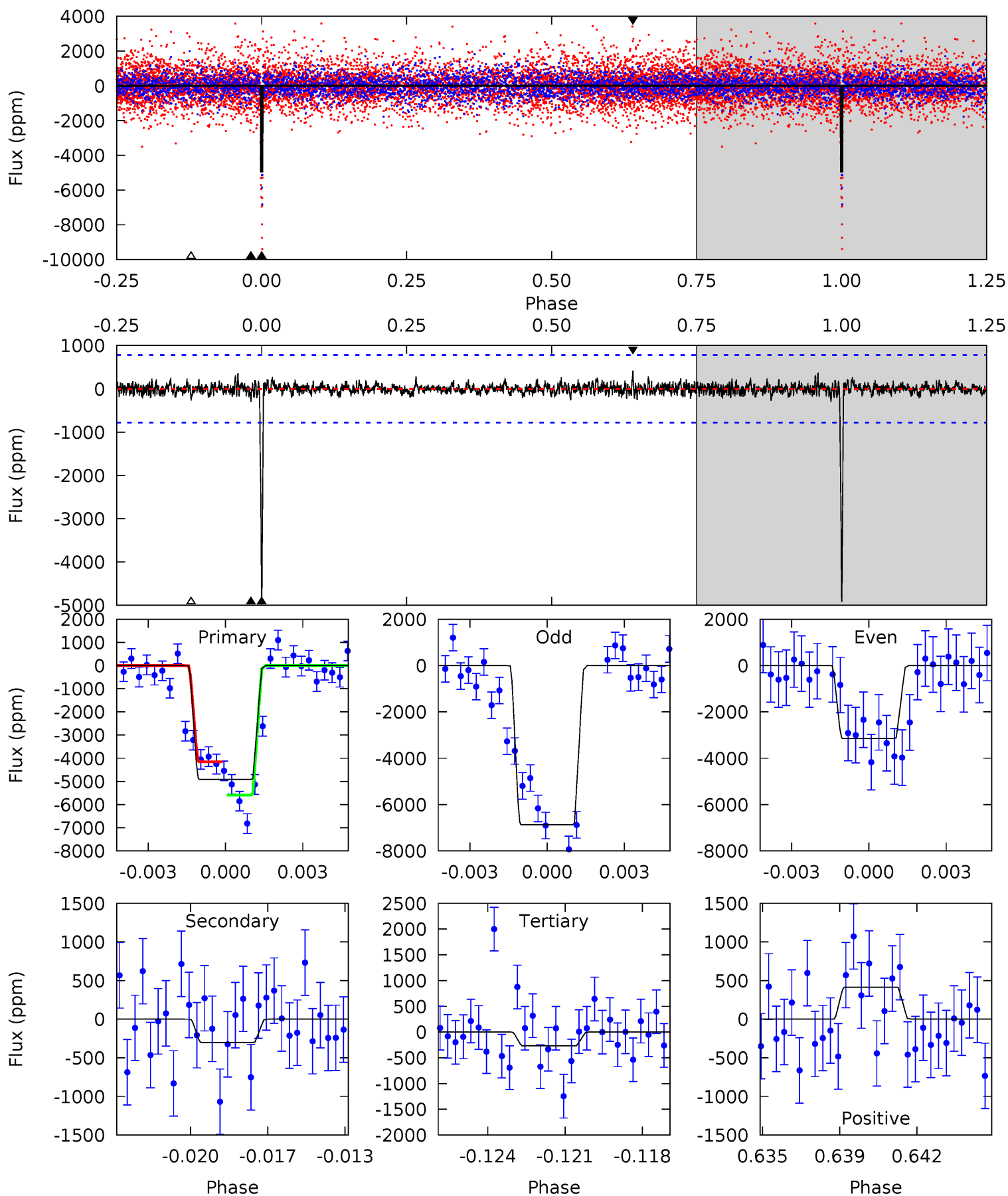
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	9.00	8.73	9.92	5.21	2.90	3.17	4.68	3.50	0.28	-0.91	0.24	0.92	0.43	0.01



Alt Model-Shift Uniqueness Test

009409493-01, P = 60.026635 Days, E = 158.884549 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.9	2.01	1.80	2.77	5.23	2.93	0.57	31.1	30.2	0.21	-0.76	13.3	1.08	0.08	4.73



Stellar Parameters For KIC 009409493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4538^{+159}_{-159}	$4.607^{+0.054}_{-0.027}$	$-0.200^{+0.300}_{-0.300}$	$0.663^{+0.048}_{-0.060}$	$0.650^{+0.073}_{-0.049}$	$3.136^{+0.784}_{-0.355}$
	+4%/-4%	+1%/-1%	+150%/-150%	+7%/-9%	+11%/-8%	+25%/-11%
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 009409493-01 / KOI 8182.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2469 ± 274	$4.59^{+3.04}_{-2.46}$	444^{+18}_{-18}	4123^{+1514}_{-673}	4455^{+16744}_{-2884}
Alt.	-300 ± 149	$5.34^{+3.25}_{-2.80}$	444^{+17}_{-18}	2792^{+778}_{-379}	351^{+1449}_{-238}

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

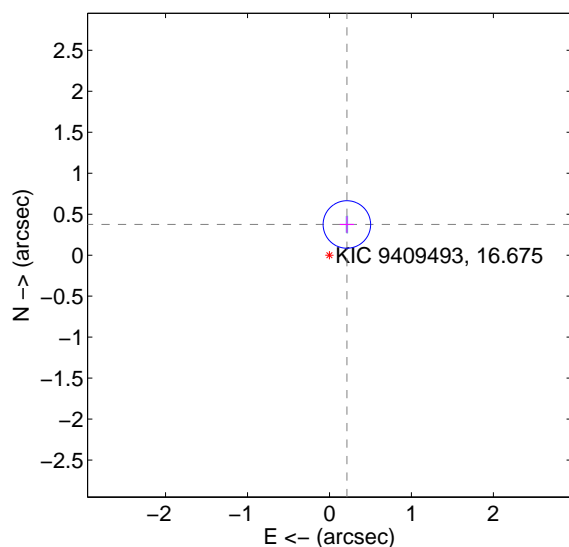
Supplemental centroid analysis for 009409493-01. Kepler magnitude: 16.68. Transit SNR 8.33

There are 2 quarters with good PRF difference image offsets

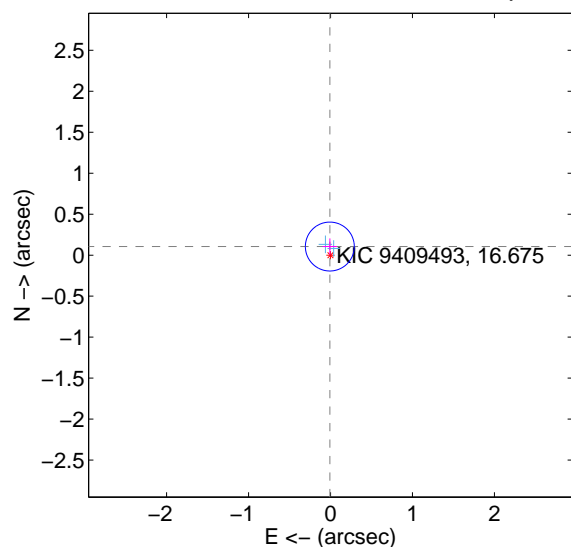
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.431 \pm 0.097	4.46	-0.212 \pm 0.087	0.375 \pm 0.100
PRF-fit source offset from KIC position	0.106 \pm 0.099	1.06	0.008 \pm 0.087	0.105 \pm 0.100
photometric centroid source offset	0.57 \pm 0.63	0.90	-0.41 \pm 0.49	-0.40 \pm 0.75

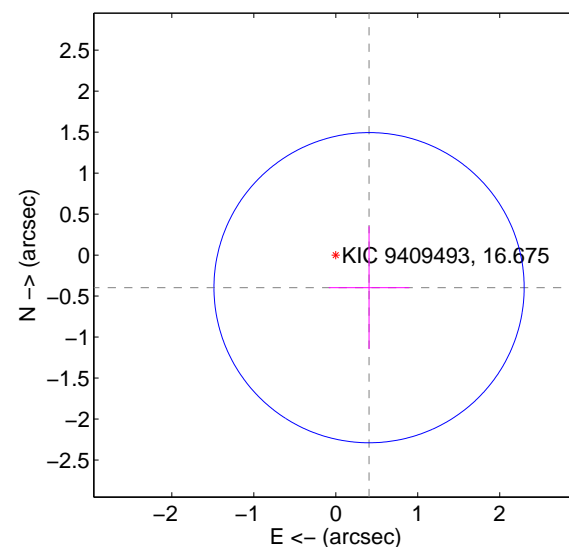
offset from difference PRF-fit to OOT PRF-fit



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- σ uncertainty. Blue circle: three- σ . 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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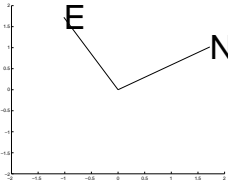
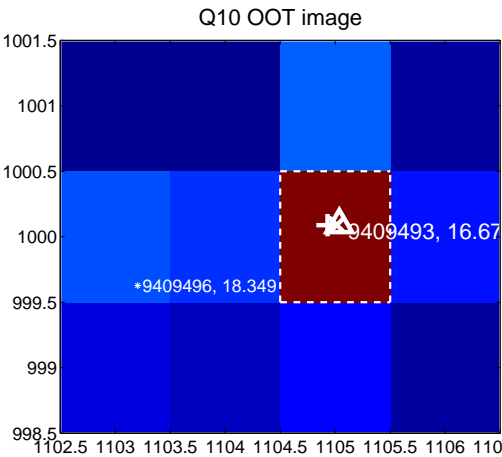
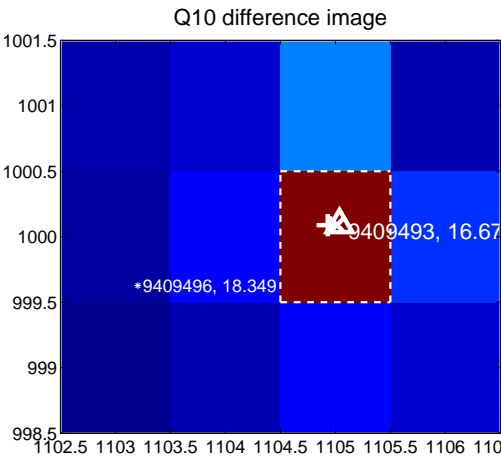


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

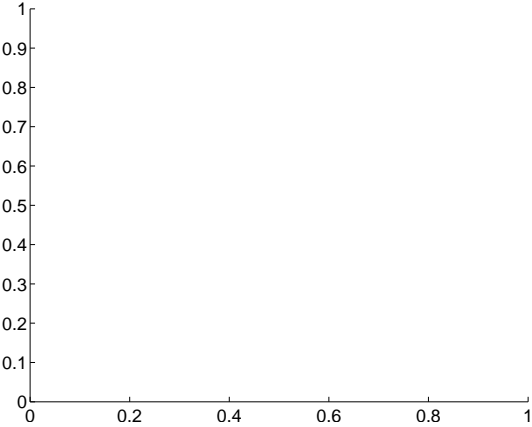
Q9 no difference image



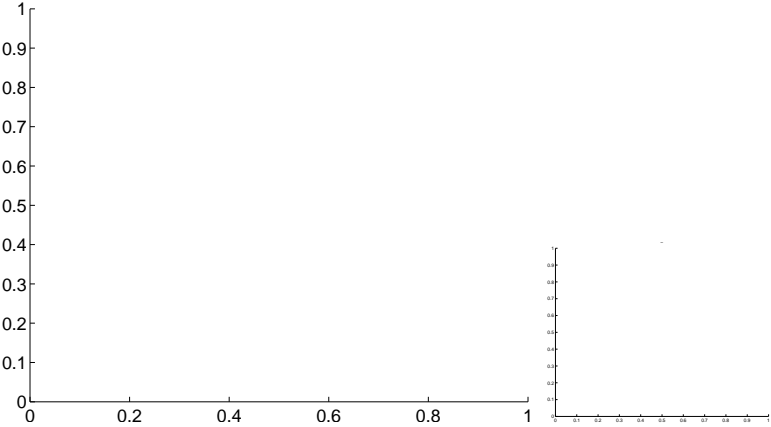
Q9 no OOT image



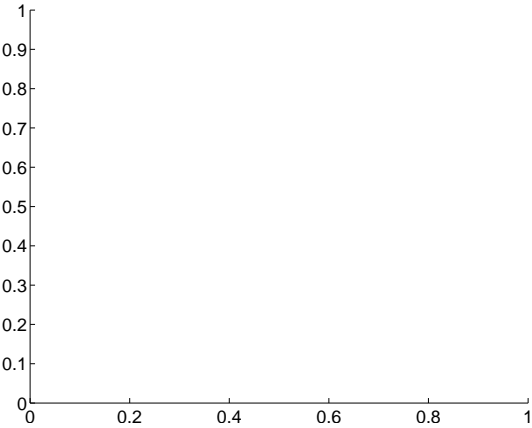
Q11 no difference image



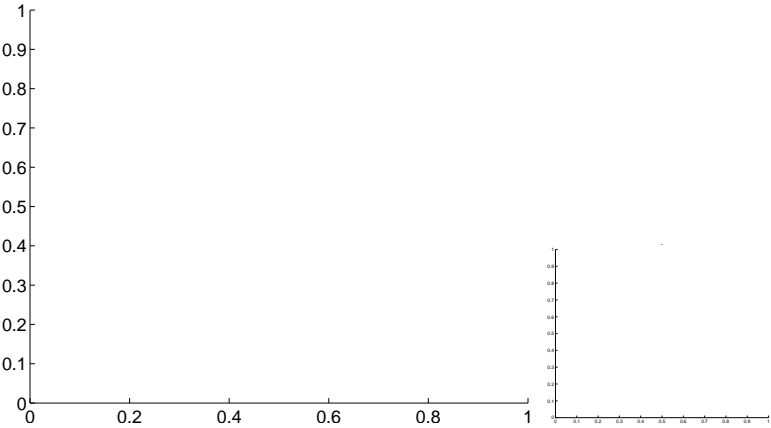
Q11 no OOT image



Q12 no difference image

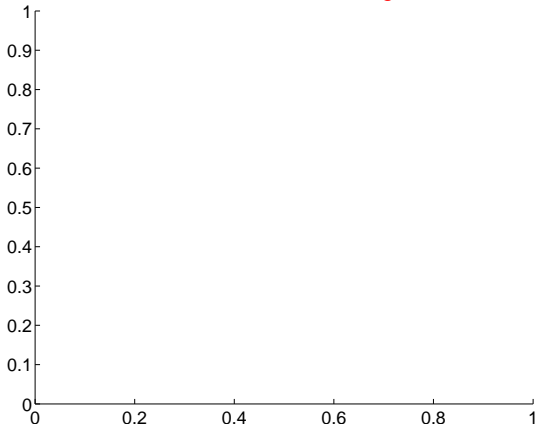


Q12 no OOT image

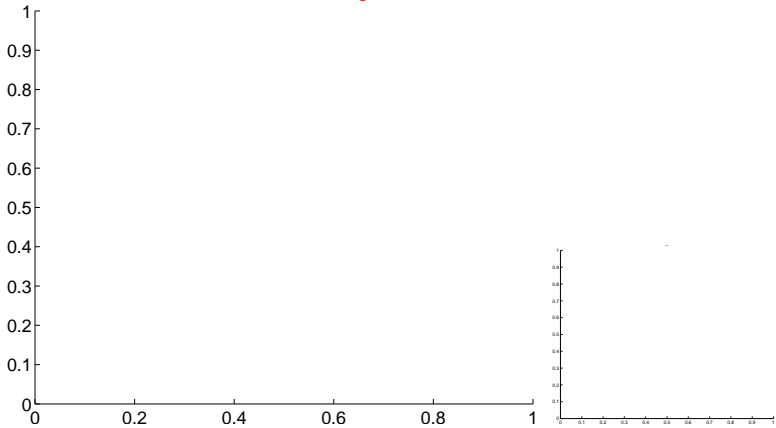


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

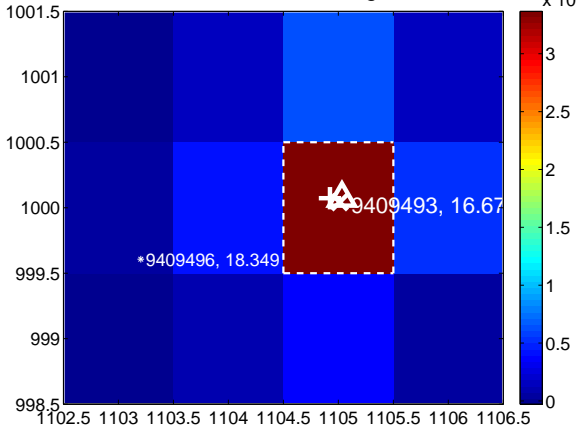
Q13 no difference image



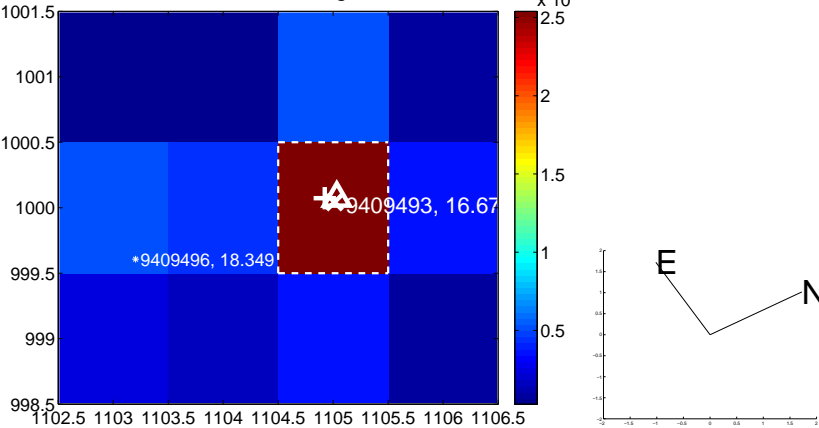
Q13 no OOT image



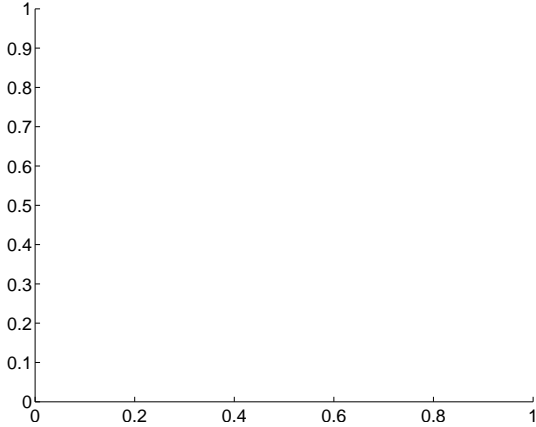
Q14 difference image



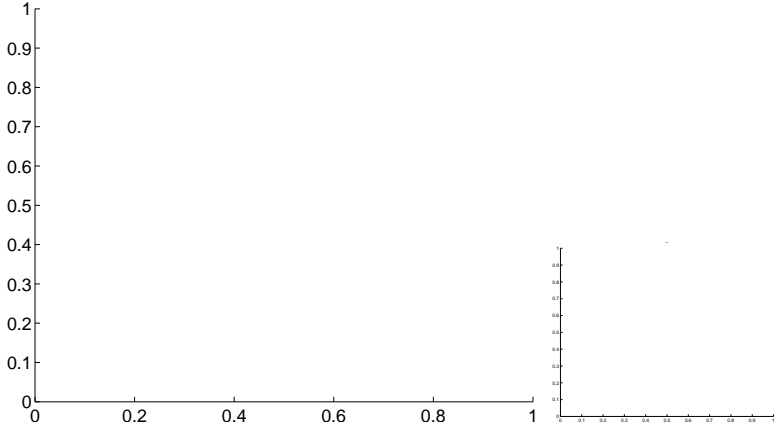
Q14 OOT image



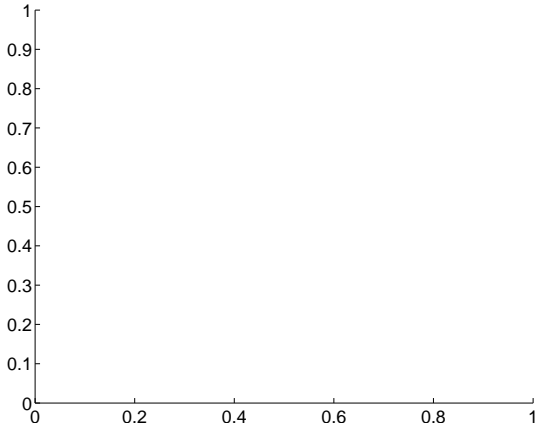
Q15 no difference image



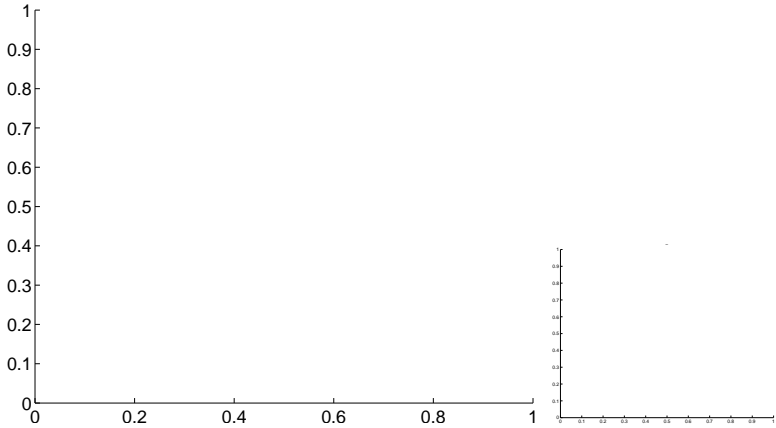
Q15 no OOT image



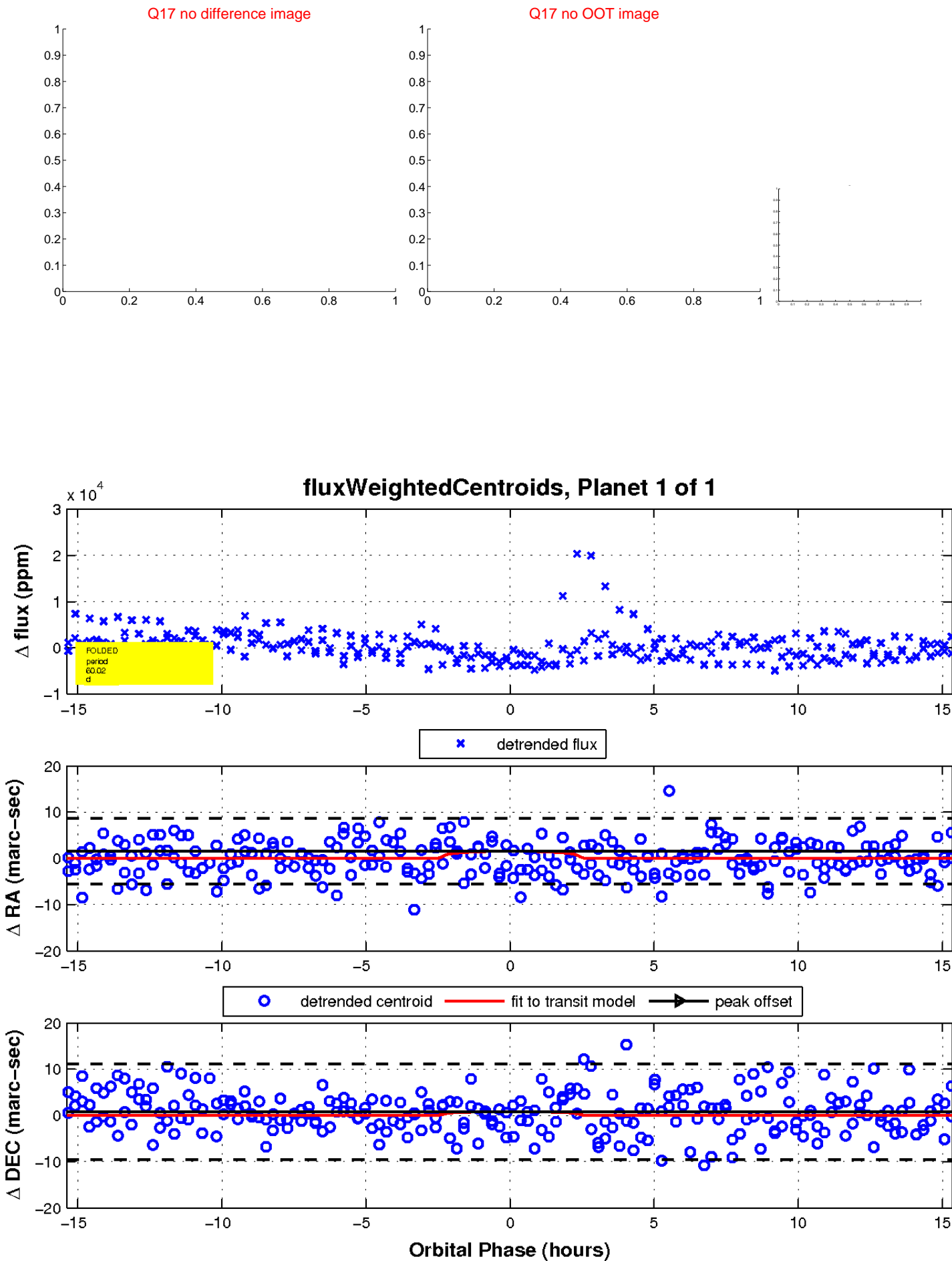
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

