

KIC 009896438

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})
009896438-01	OBS	5728.01	18.076574	146.260341	28452.7	3.096	26.0	26.0	1.00	5780	21.75	55.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009896438-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_ALT—DEEP_V_SHAPED—CENT_RESOLVED_OFFSET—EPHEM_MATCH

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 009896438-01

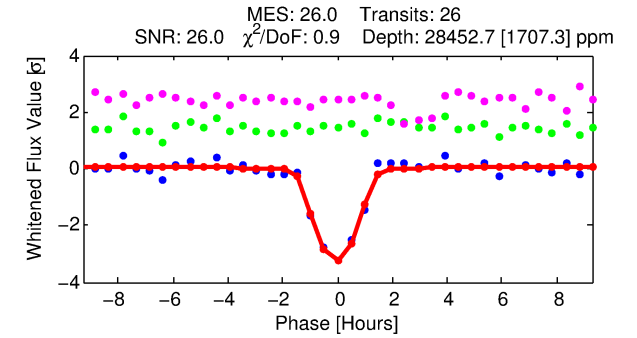
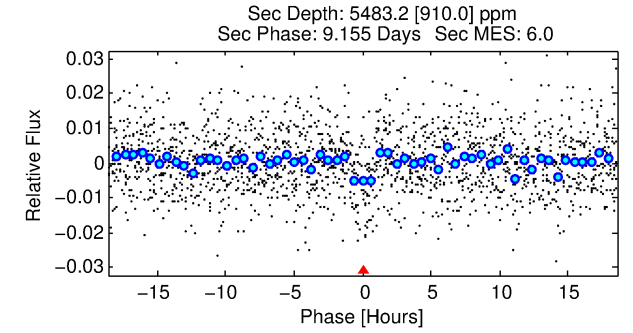
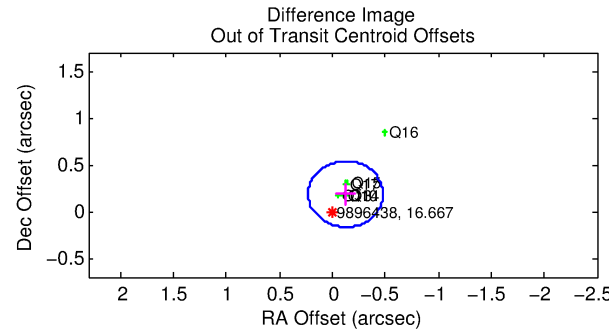
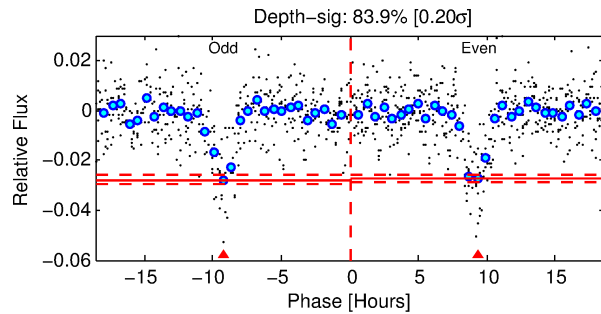
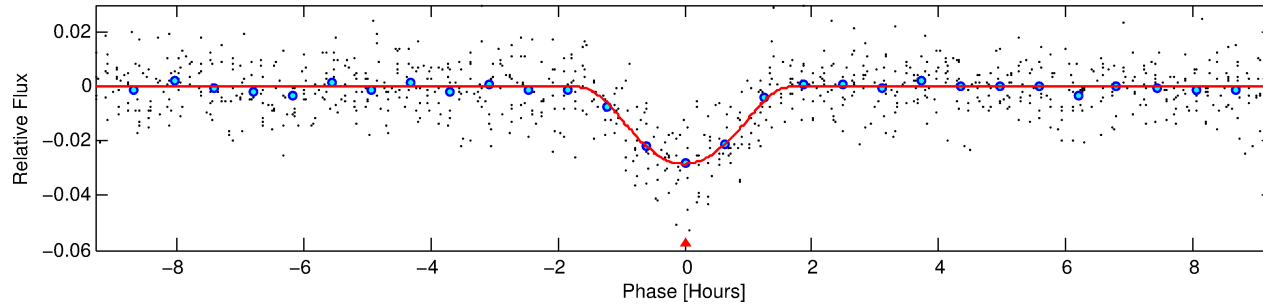
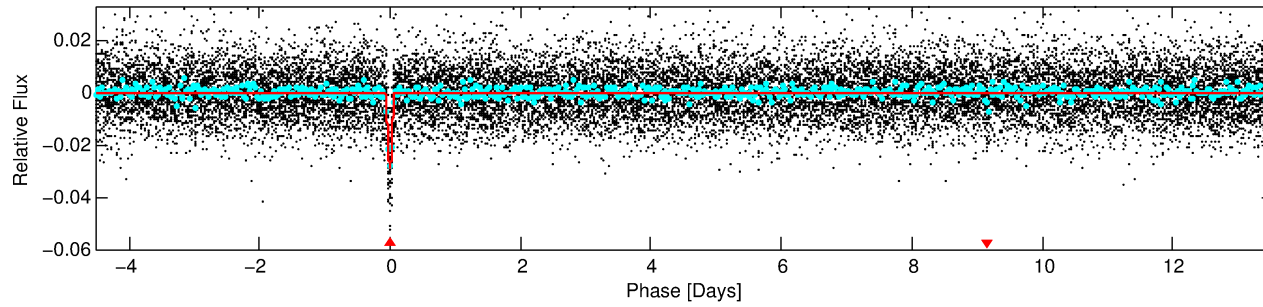
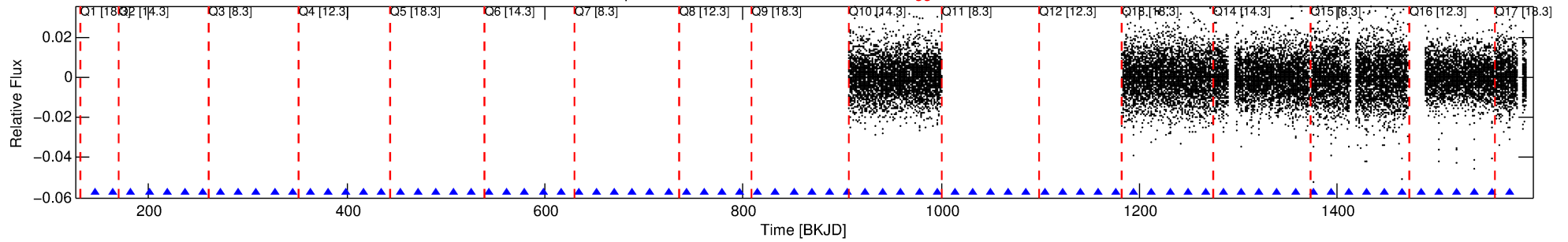
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009896438-01	9896438	3755.01	9896435	1:1	6.2	-1	1	16.64	16.67	2.94	Direct-PRF	0	0.06	0.09

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9896438 Candidate: 1 of 1 Period: 18.077 d
KOI: K05728.01 Corr: 0.976

Kp: 16.67 R*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



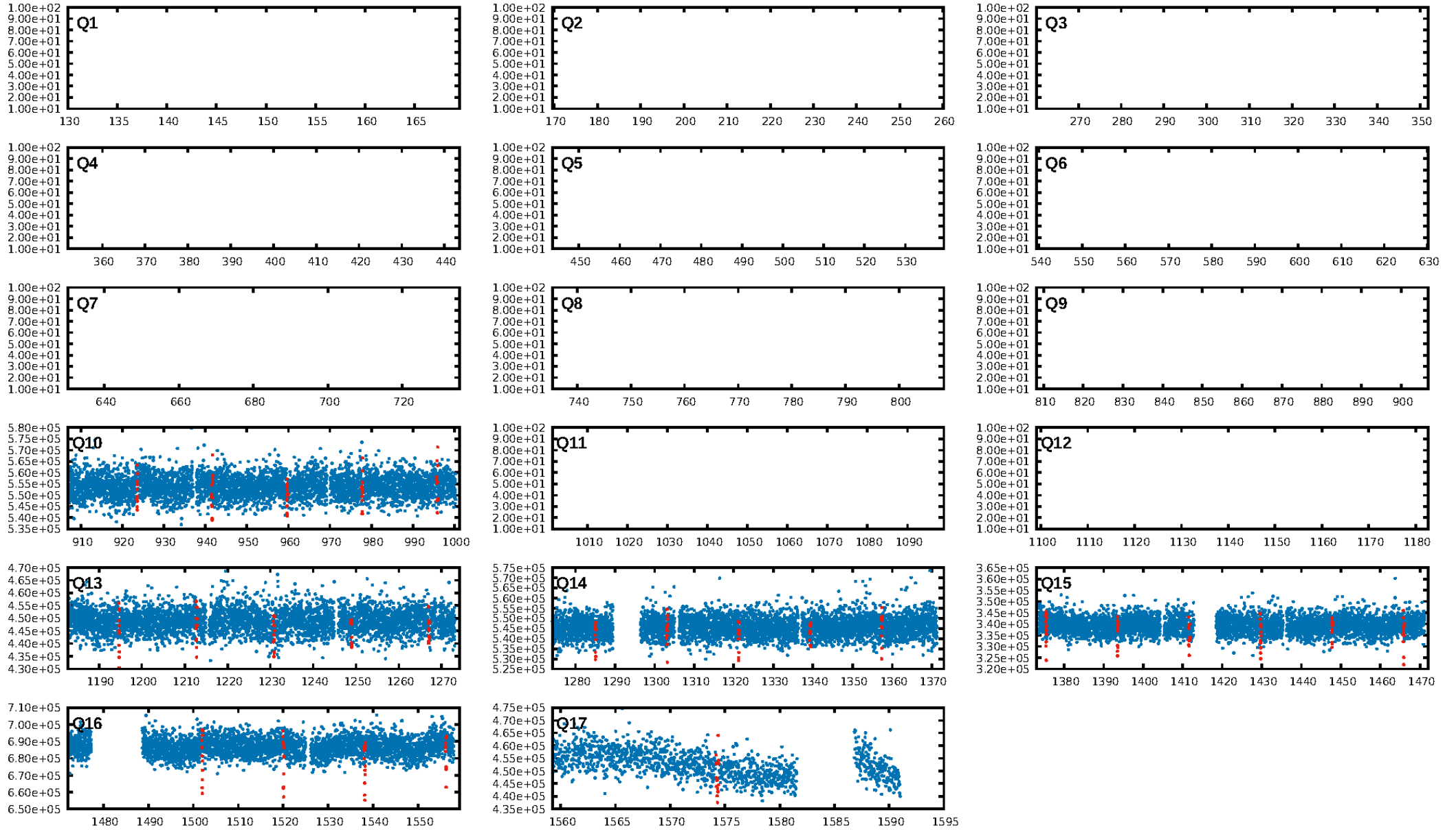
DV Fit Results:

Period = 18.07657 [0.00014] d
Epoch = 146.2603 [0.0089] BKJD
Rp/R* = 0.1993 [0.1246]
a/R* = 36.19 [6.51]
b = 0.88 [0.25]
Seff = 55.01 [0.00]
Teq = 694 [0] K
Rp = 21.75 [13.60] Re
a = 0.1348 [0.0000] AU
Ag = 115.94 [146.30] [0.79σ]
Teffp = 3523 [1111] K [2.55σ]

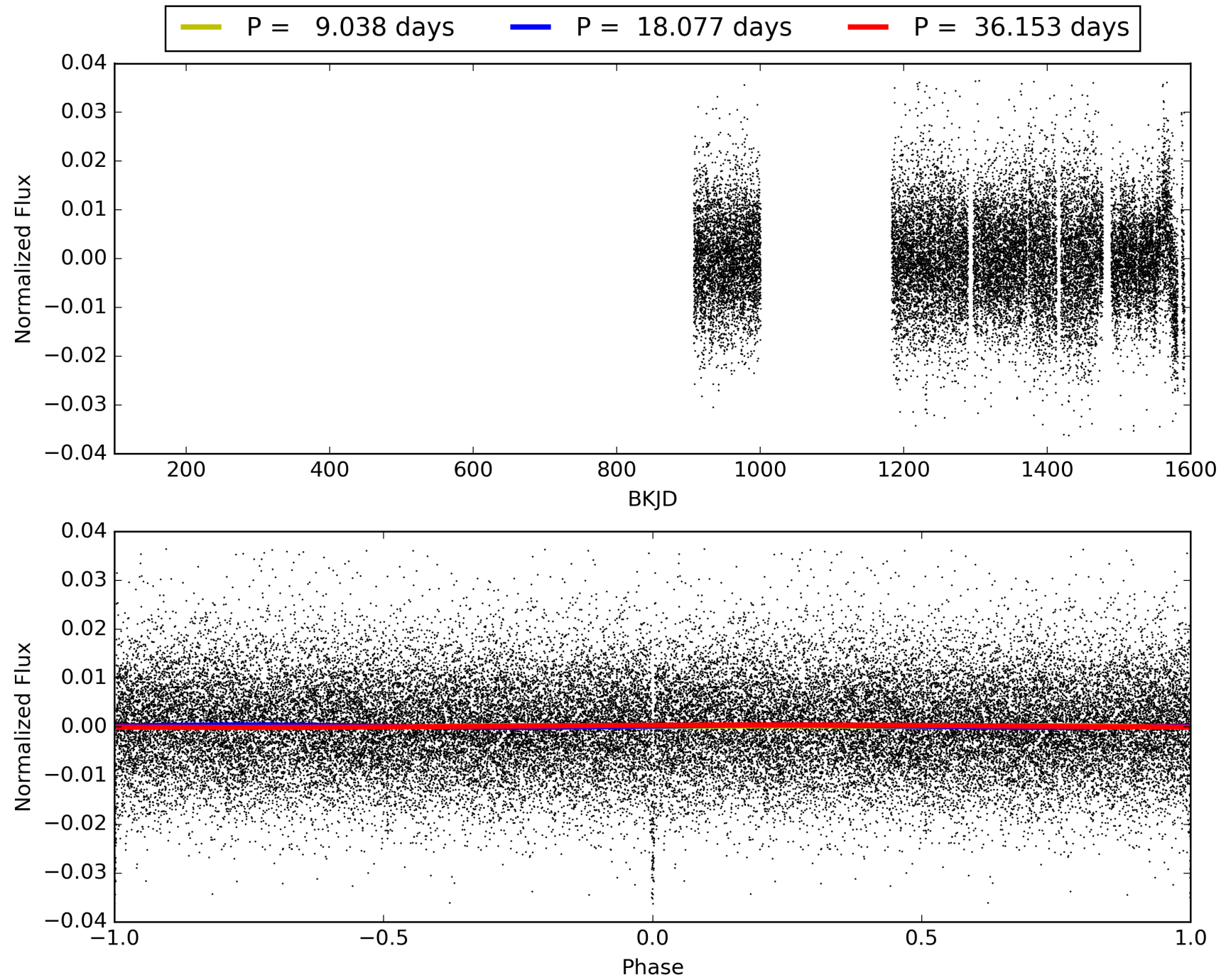
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 8.60e-154
RollingBand-fgt: 1.00 [25/25]
GhostDiagnostic-chr: -0.5163
Centroid-sig: 0.0%
Centroid-so: 5.912 arcsec [36.46σ]
OotOffset-rm: 0.223 arcsec [1.90σ]
KicOffset-rm: 7.076 arcsec [88.24σ]
OotOffset-st: 2/1/1/2 [6]
KicOffset-st: 2/1/1/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [6/6]

TCE 009896438-01, PDC Light Curves

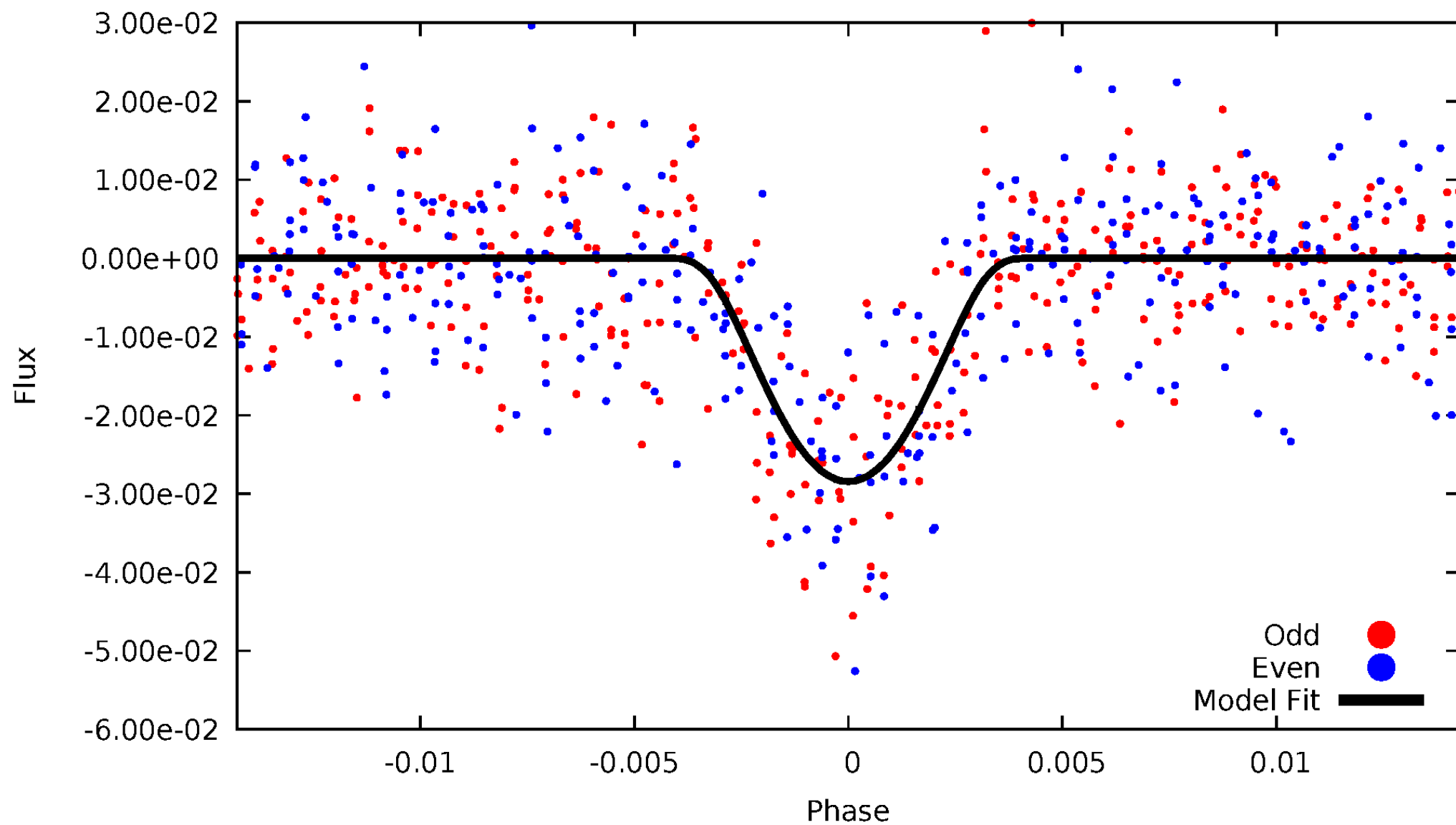


TCE 009896438-01



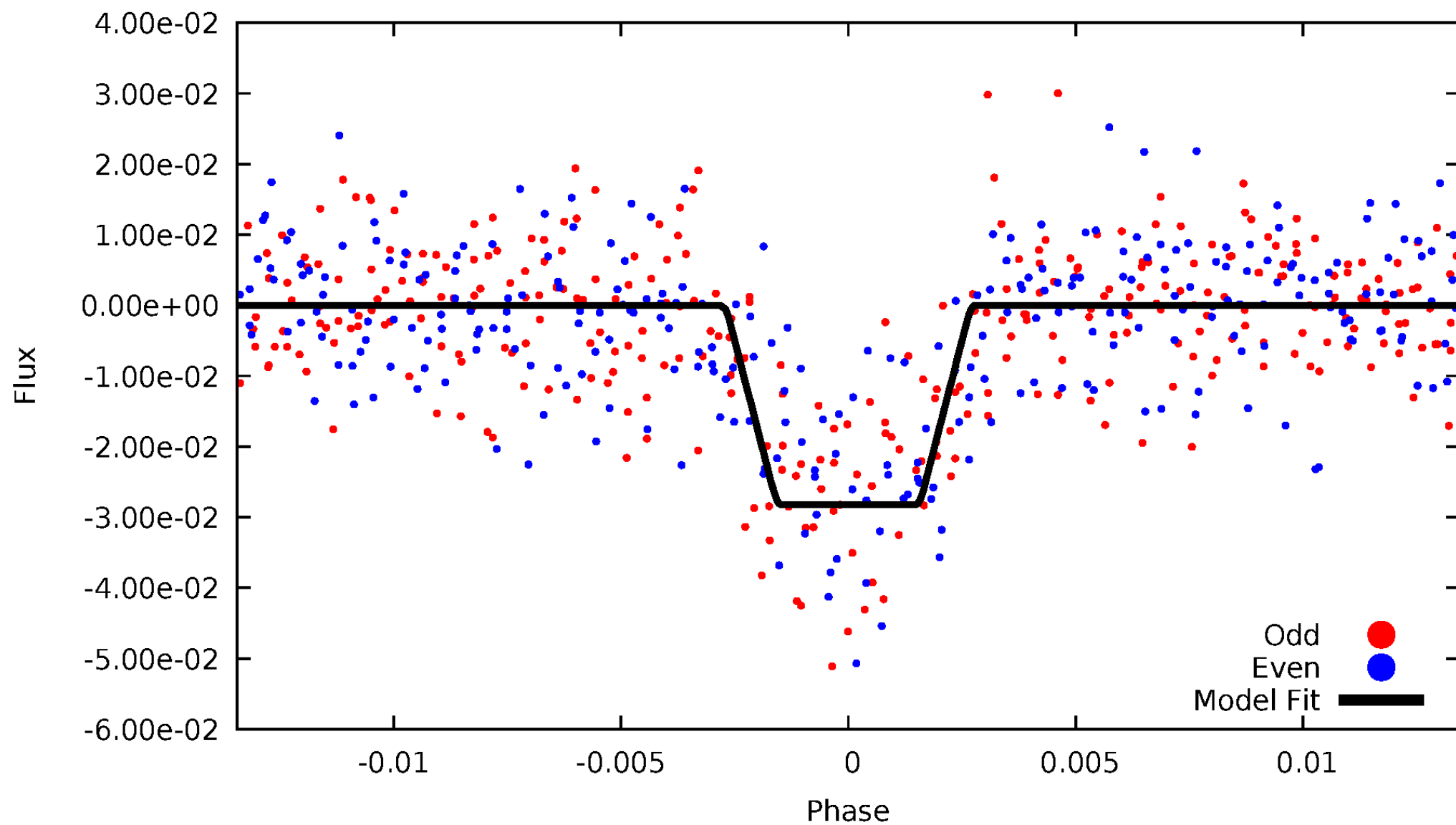
DV Odd/Even

TCE 009896438-01



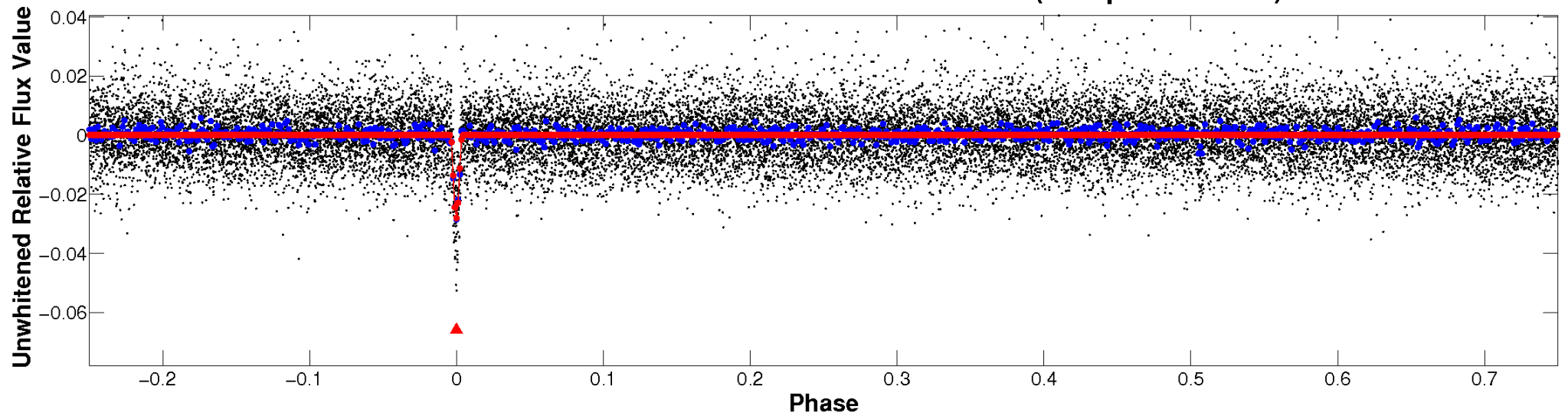
ALT Odd/Even

TCE 009896438-01

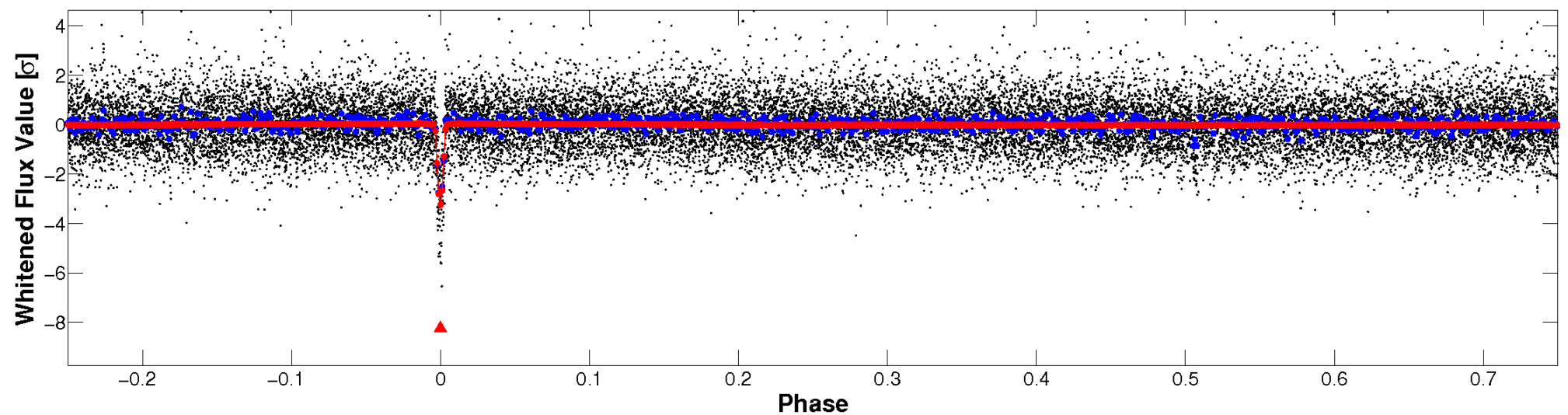


Non-Whitened Vs. Whitened Light Curve

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

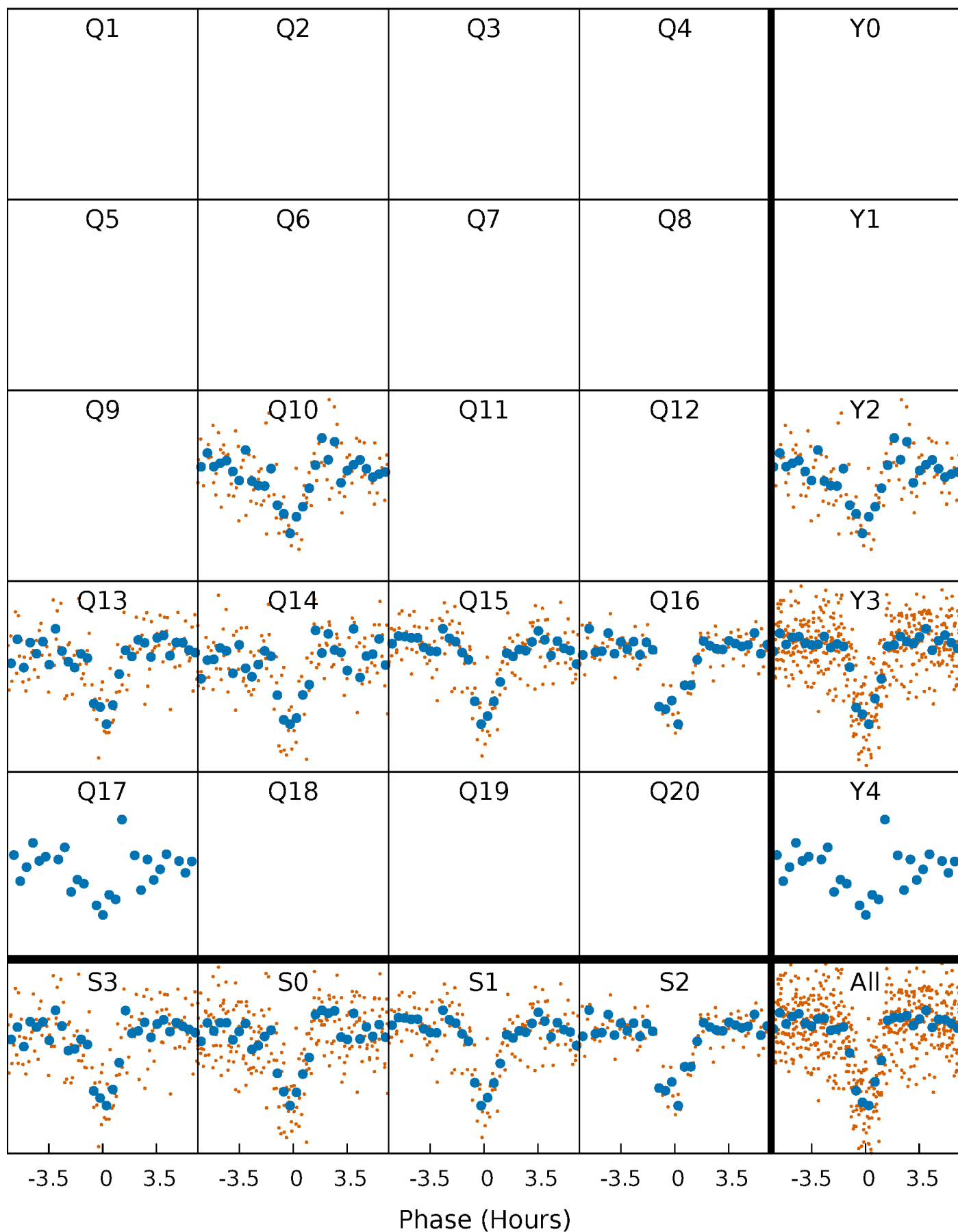


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



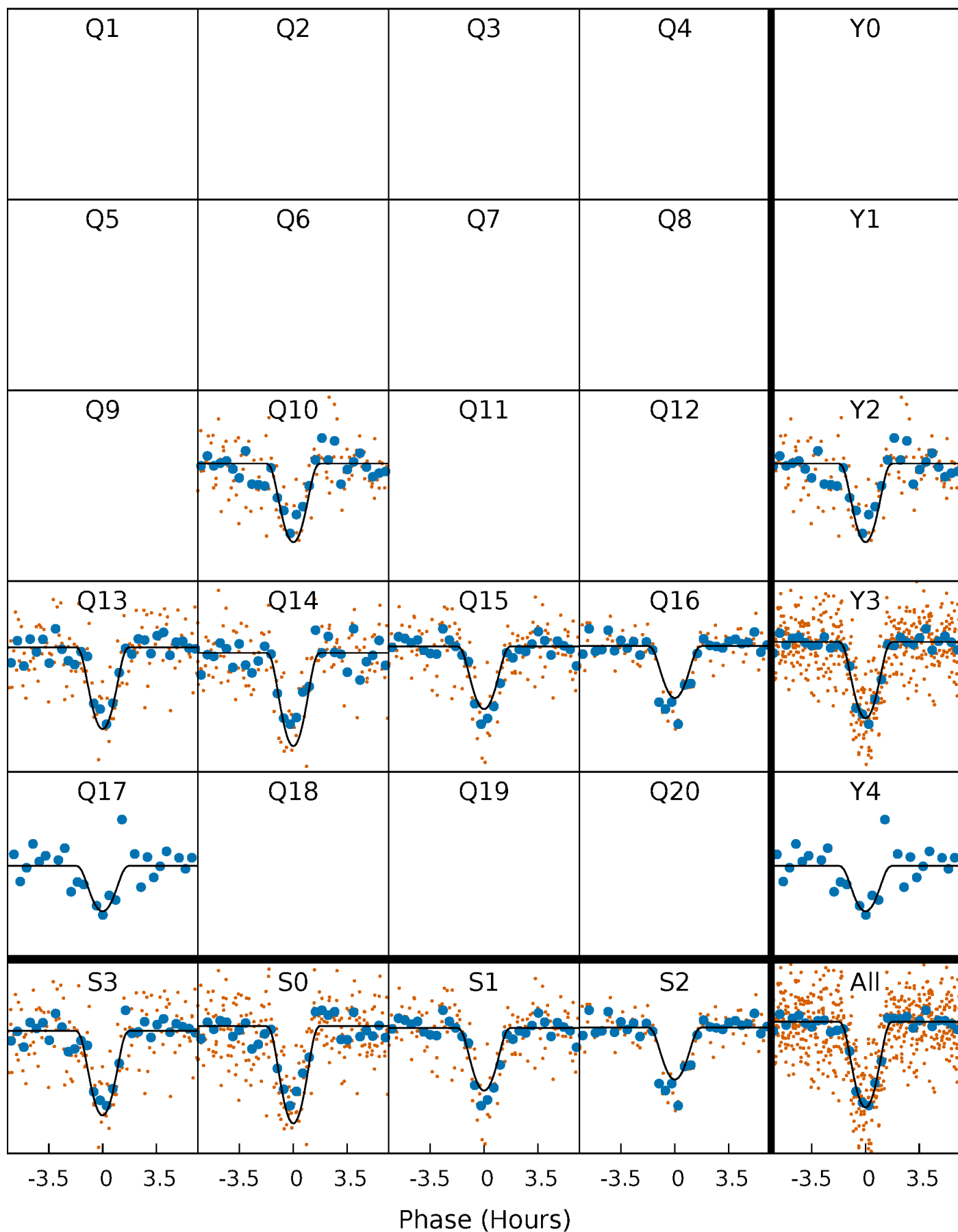
PDC Quarter-Phased Transit Curves

TCE 009896438-01 P= 18.076574 Days $T_0=146.260341$ (BKJD)



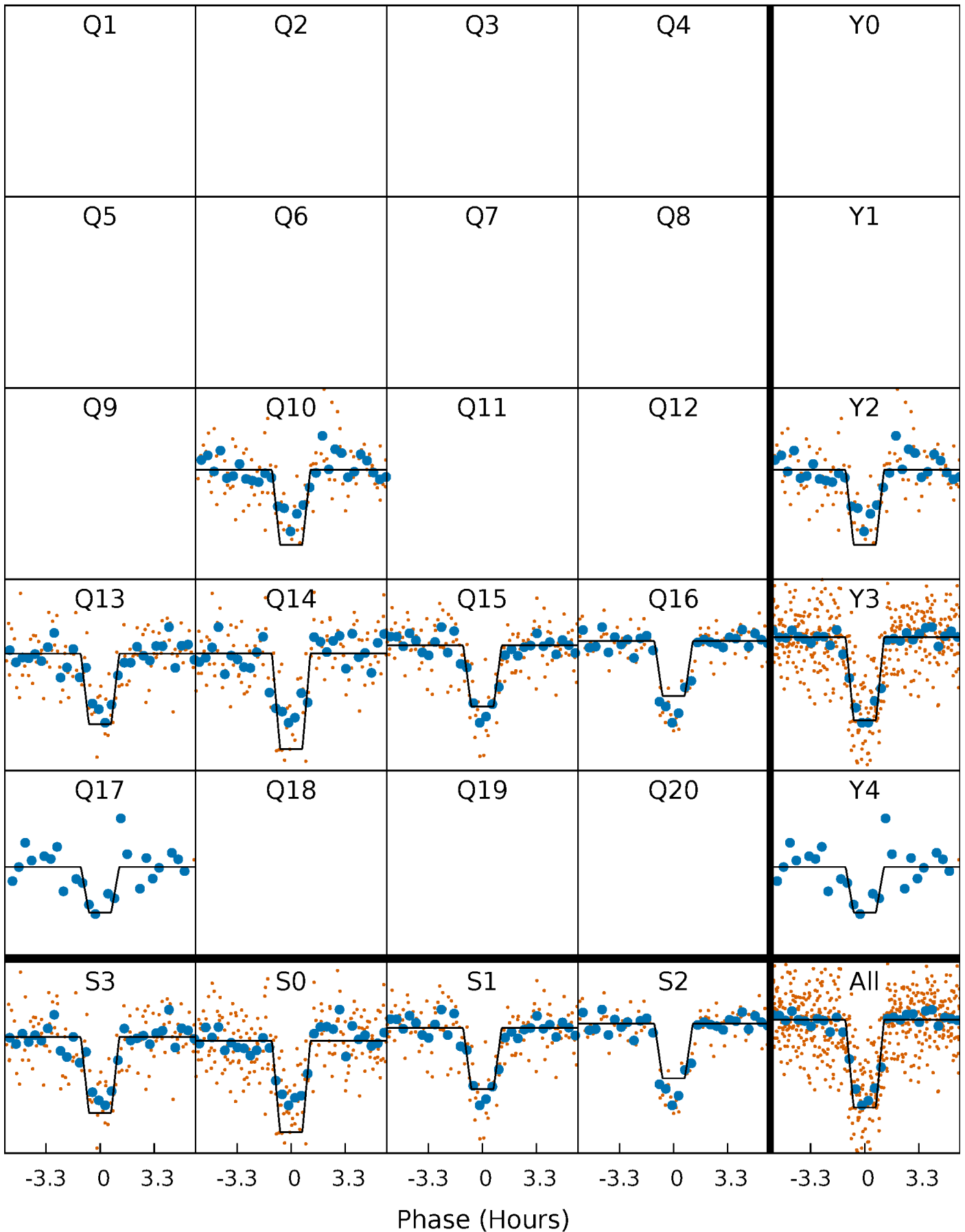
DV Quarter-Phased Transit Curves

TCE 009896438-01 P= 18.076574 Days $T_0=146.260341$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

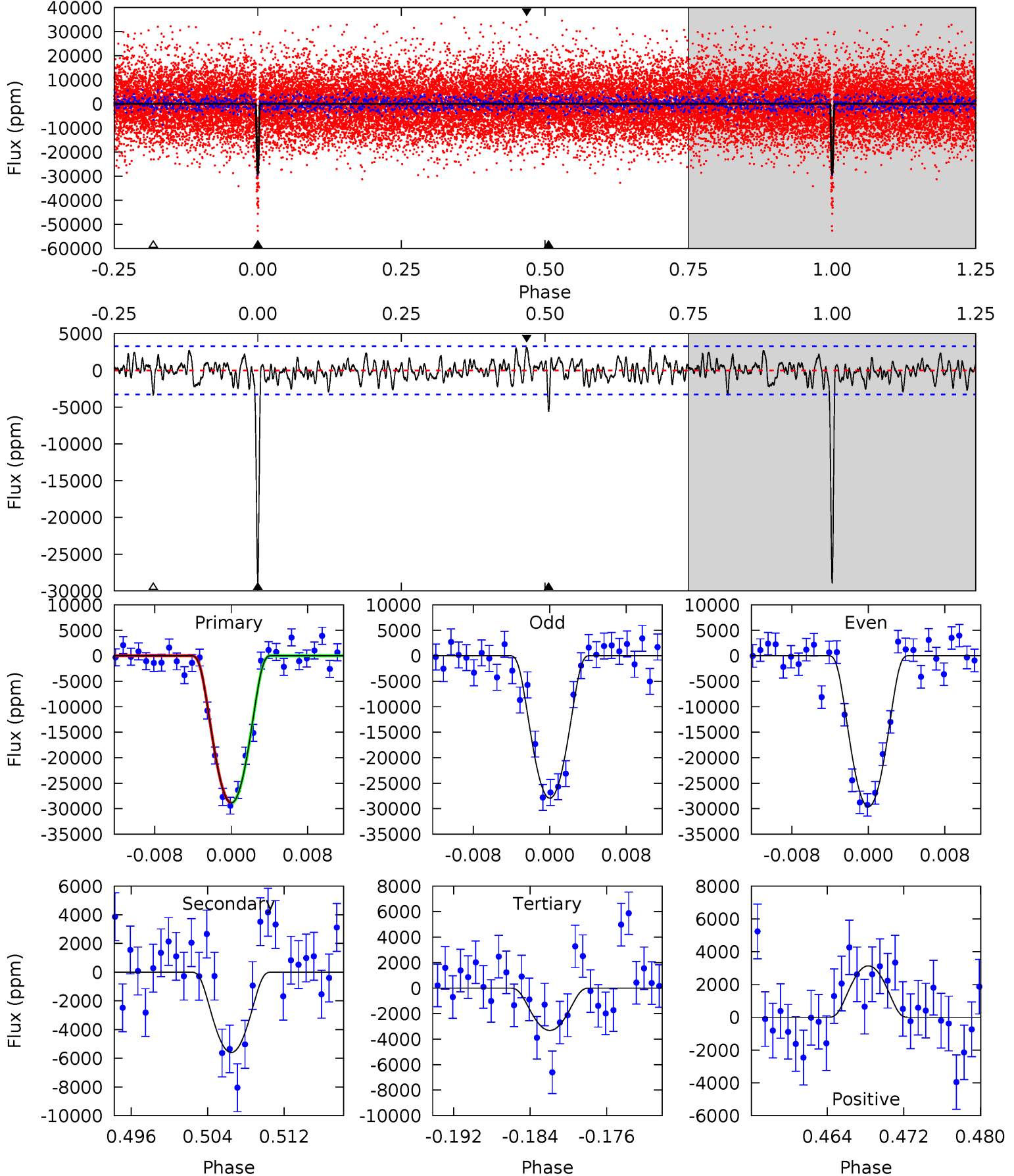
TCE 009896438-01 P= 18.076839 Days $T_0=146.241969$ (BKJD)



DV Model-Shift Uniqueness Test

009896438-01, P = 18.076574 Days, E = 146.260341 Days

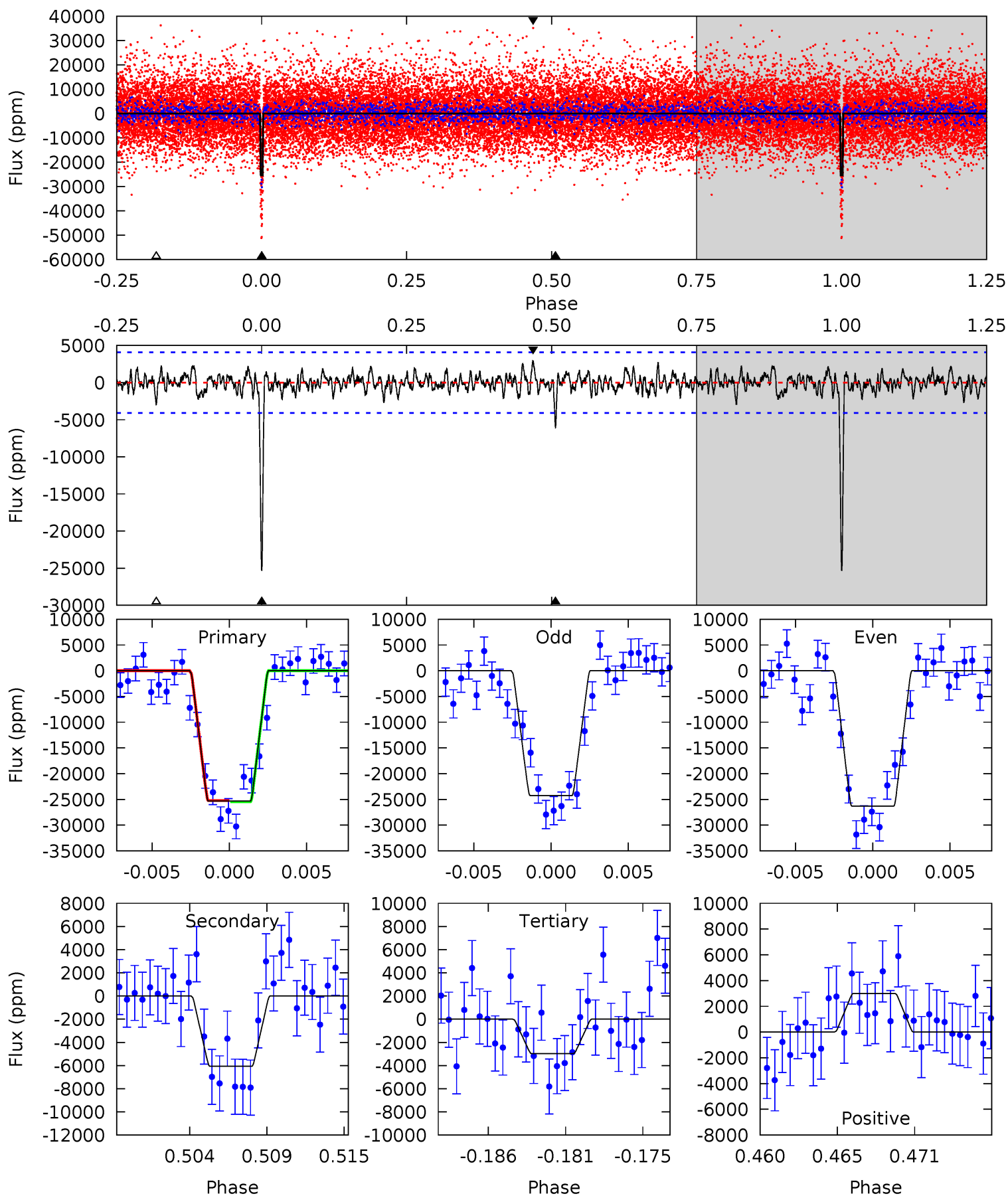
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.6	8.66	5.13	4.85	5.07	2.65	1.60	39.5	39.8	3.53	3.81	1.28	1.11	0.10	0.04



Alt Model-Shift Uniqueness Test

009896438-01, P = 18.076839 Days, E = 146.241969 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.9	7.65	3.74	3.77	5.14	2.78	1.15	28.2	28.2	3.91	3.88	1.30	1.07	0.11	0.13



Stellar Parameters For KIC 009896438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 009896438-01 / KOI 5728.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5602 ± 647	$22.74^{+13.33}_{-11.85}$	970^{+45}_{-47}	3830^{+1196}_{-536}	108^{+373}_{-66}
Alt.	-6064 ± 793	$20.48^{+13.37}_{-12.03}$	973^{+49}_{-47}	4051^{+1724}_{-644}	144^{+711}_{-92}

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

DV Centroid Data

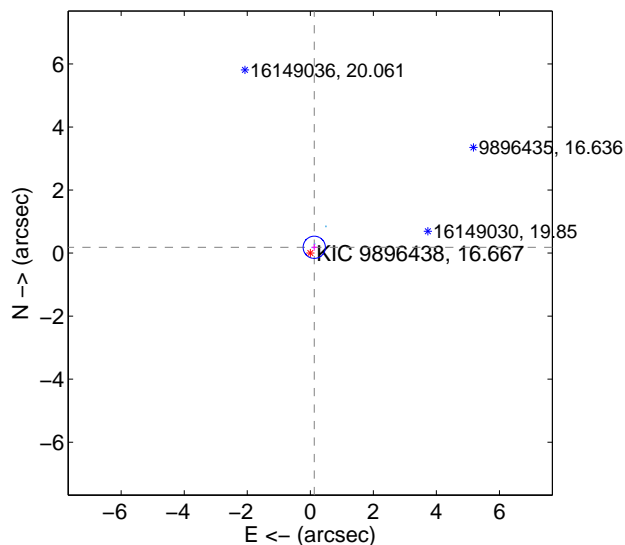
Supplemental centroid analysis for 009896438-01. Kepler magnitude: 16.67. Transit SNR 25.97

There are 6 quarters with good PRF difference image offsets

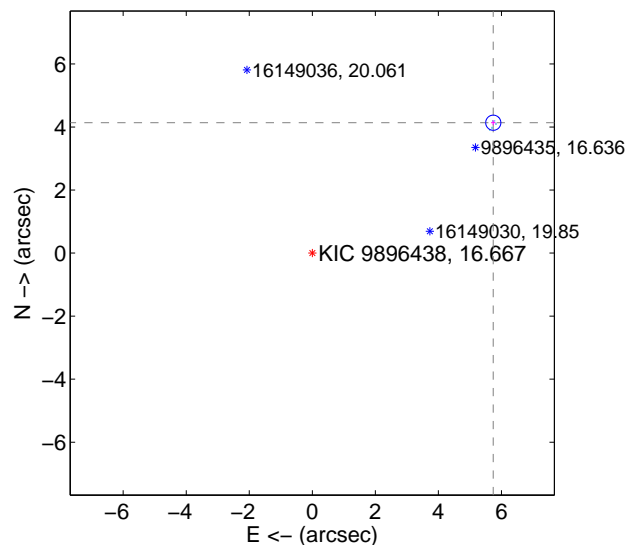
The OOT PRF centroid is offset from the target star catalog position by about 6.68 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.223 ± 0.117	1.90	-0.125 ± 0.083	0.184 ± 0.107
PRF-fit source offset from KIC position	7.076 ± 0.080	88.24	-5.741 ± 0.072	4.136 ± 0.081
photometric centroid source offset	5.91 ± 0.16	36.46	-5.18 ± 0.17	2.85 ± 0.13

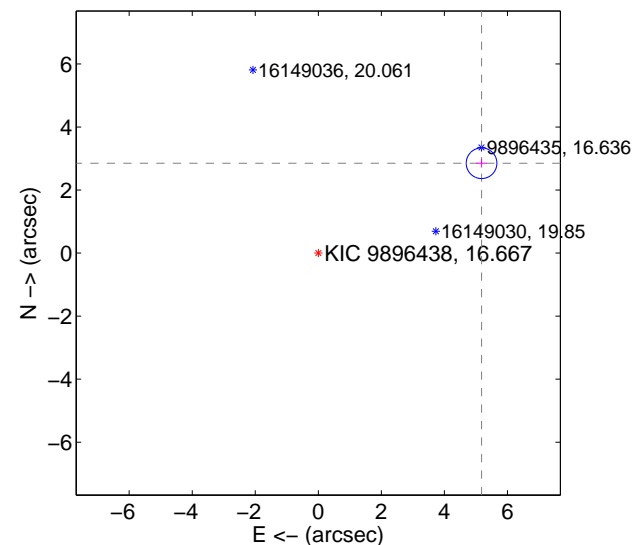
offset from difference PRF-fit to OOT PRF-fit



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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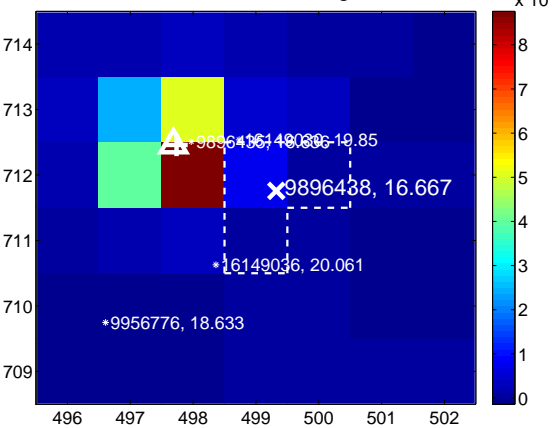
Q9 no difference image



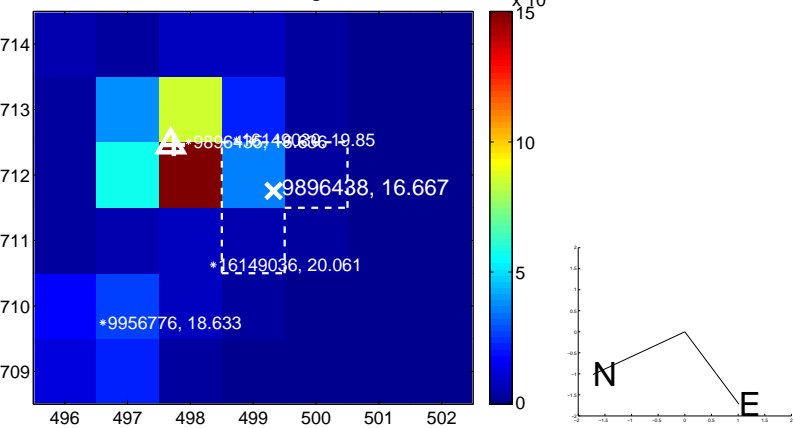
Q9 no OOT image



Q10 difference image



Q10 OOT image



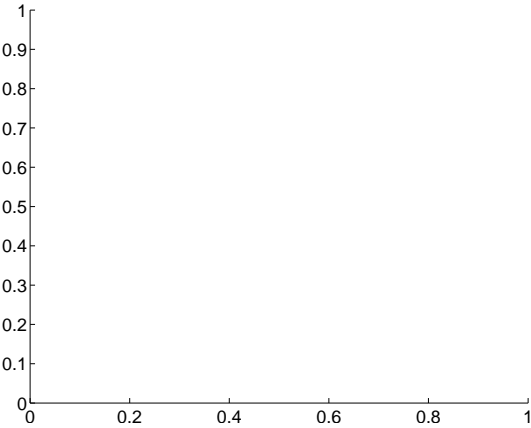
Q11 no difference image



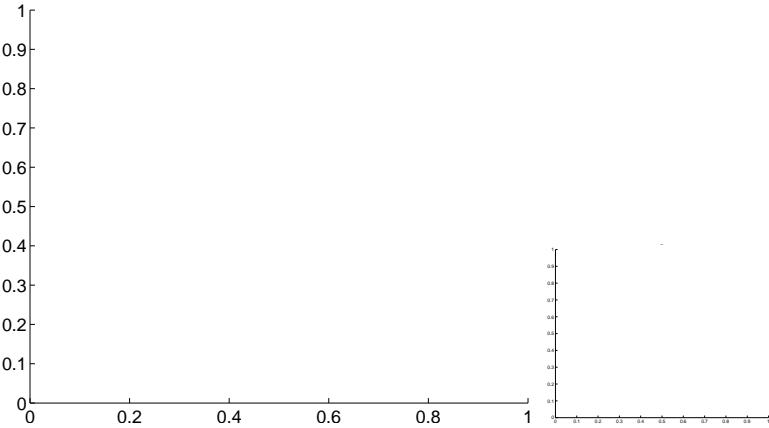
Q11 no OOT image



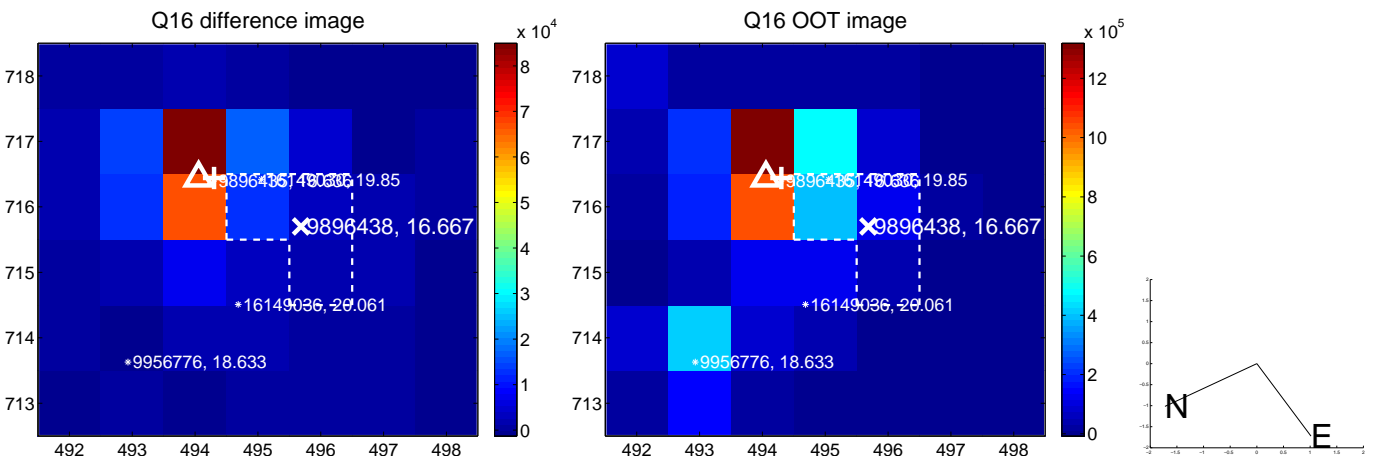
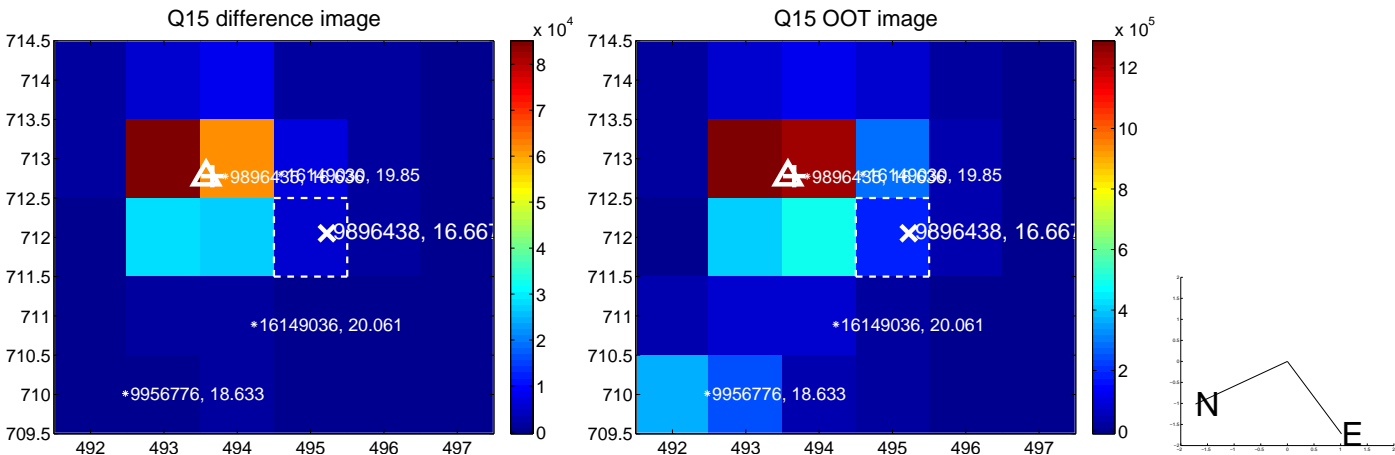
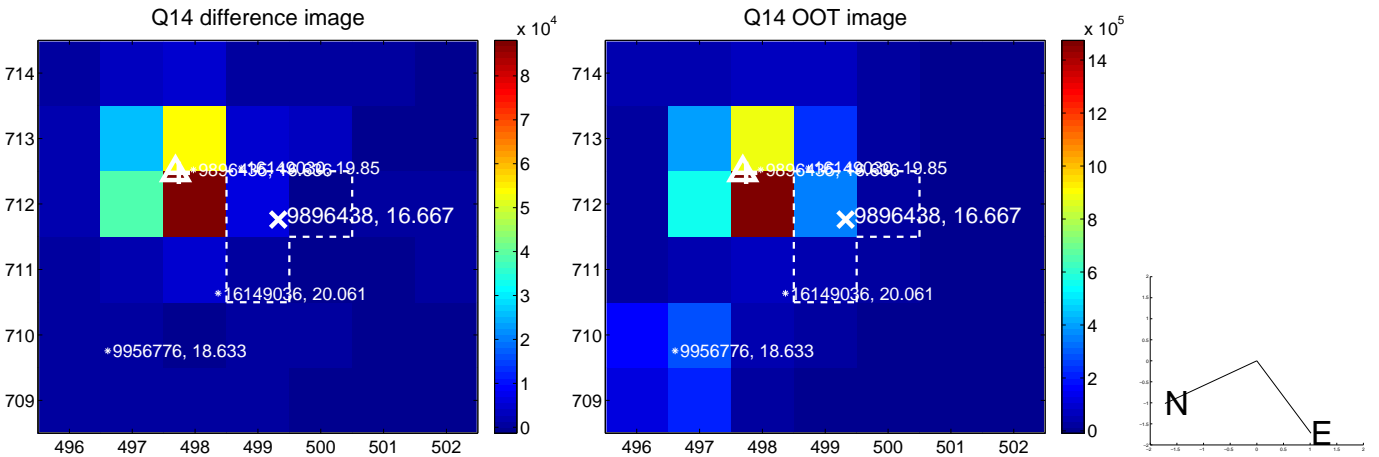
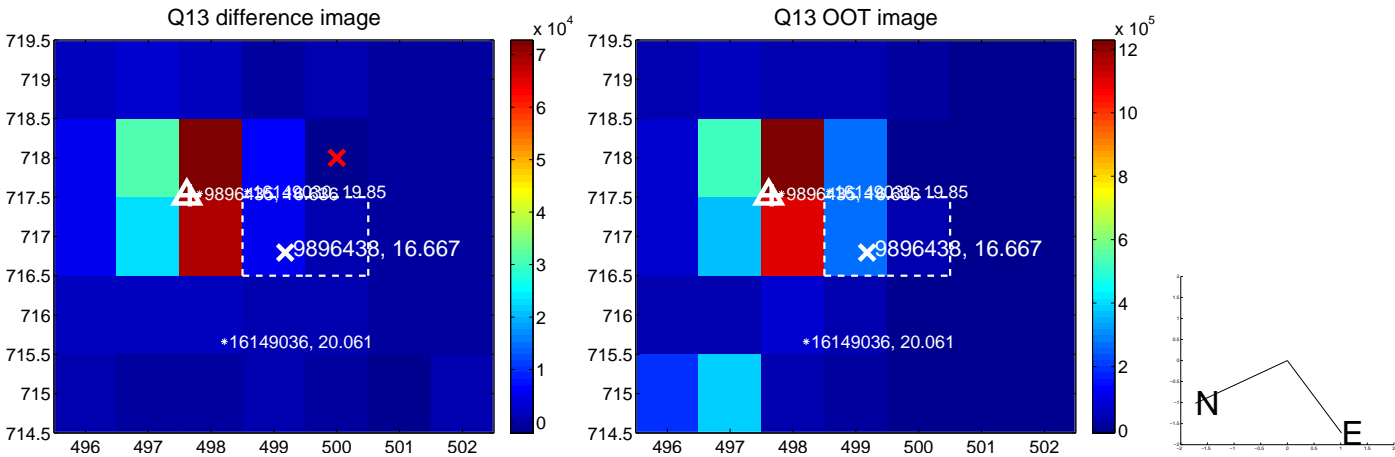
Q12 no difference image



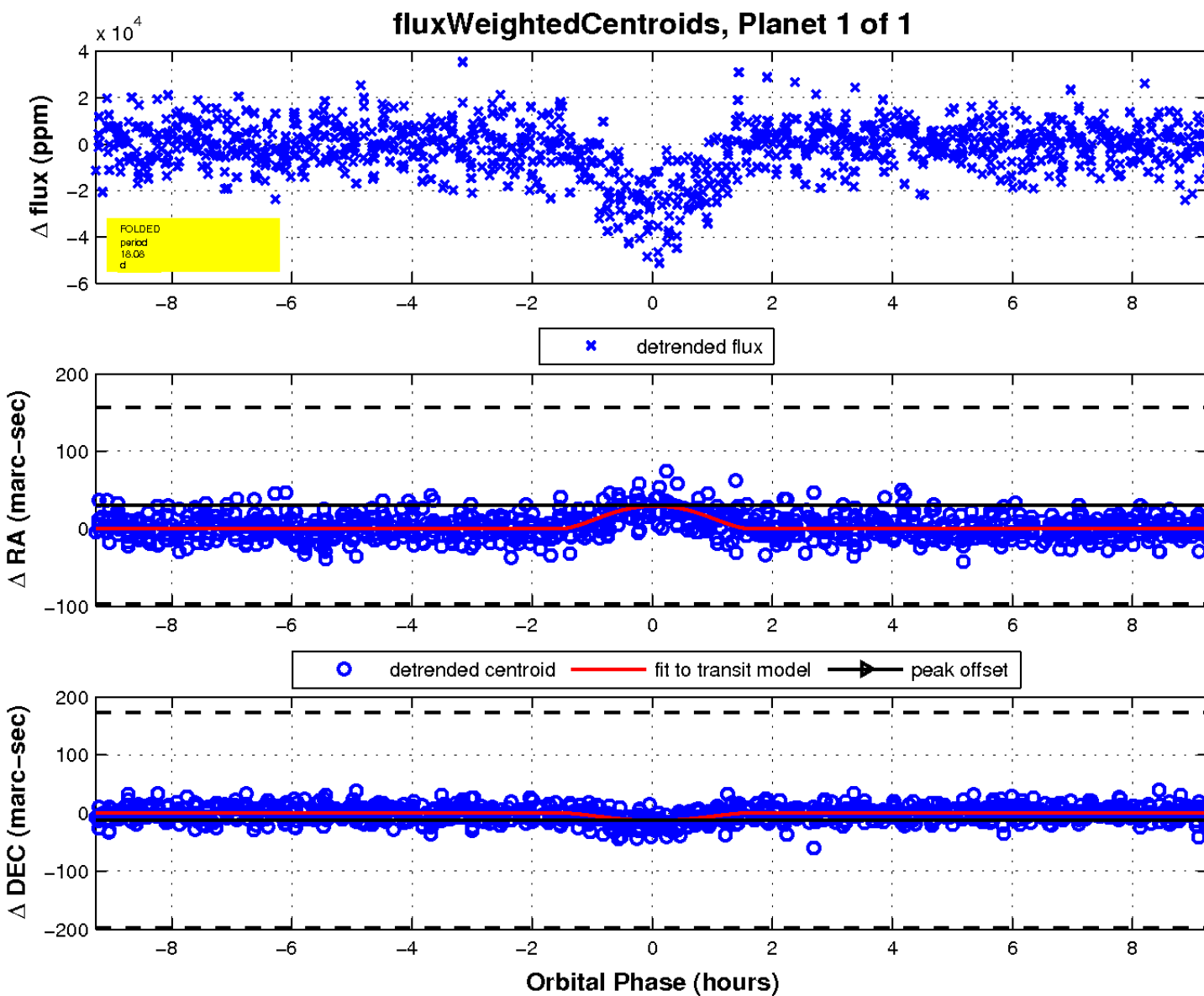
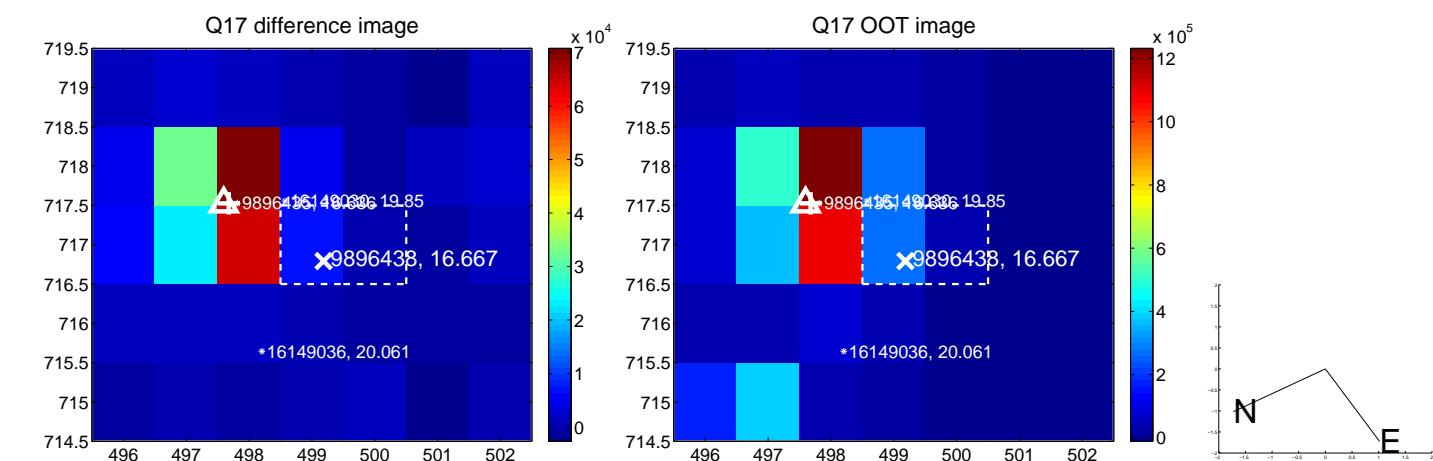
Q12 no OOT image



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



UKIRT Image

Declination

