

KIC 008416220

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})
008416220-01	OBS	No	416.038438	469.892214	1283.6	7.528	9.5	1.9	0.19	3232	0.68	0.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008416220-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

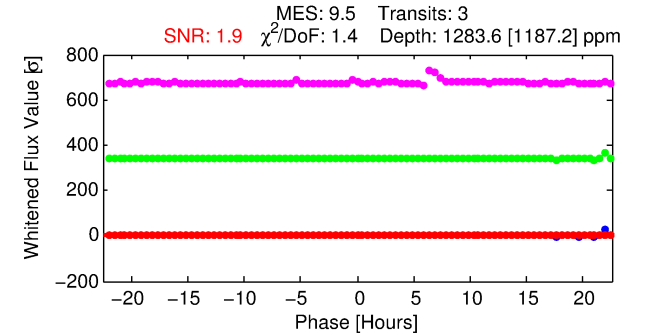
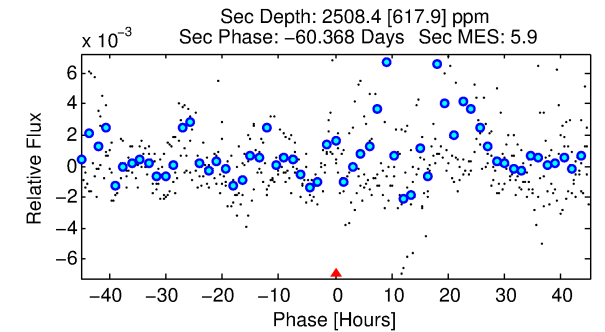
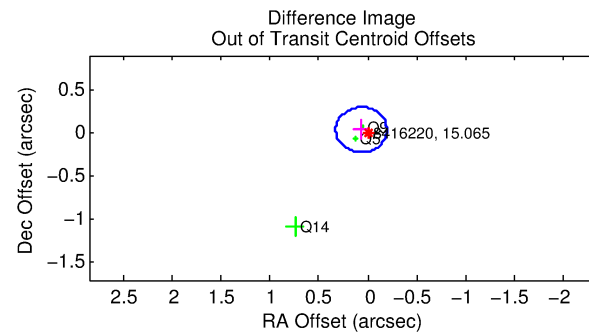
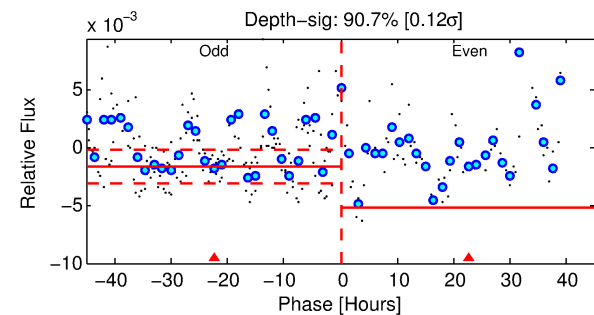
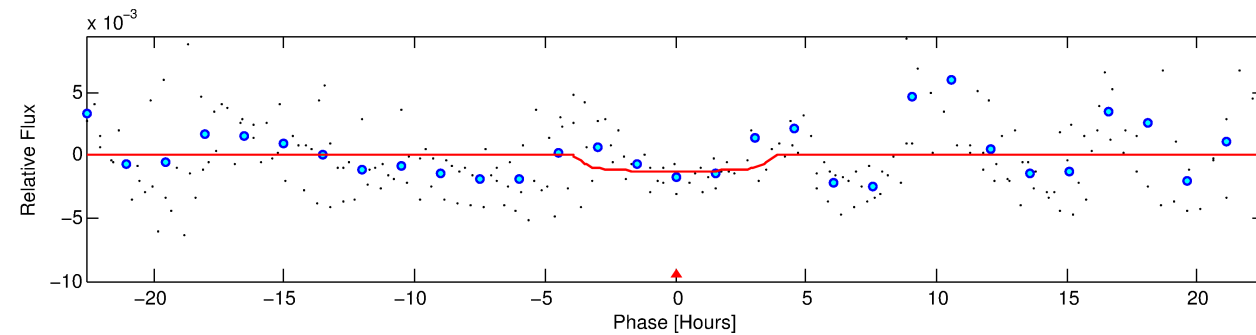
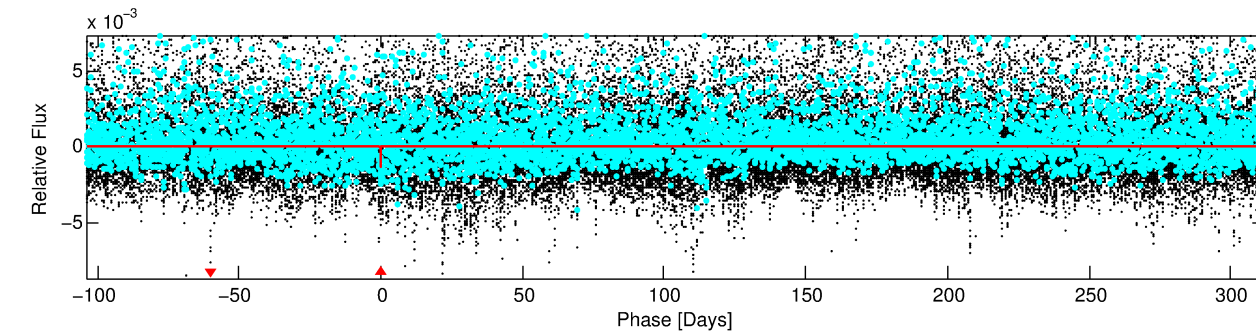
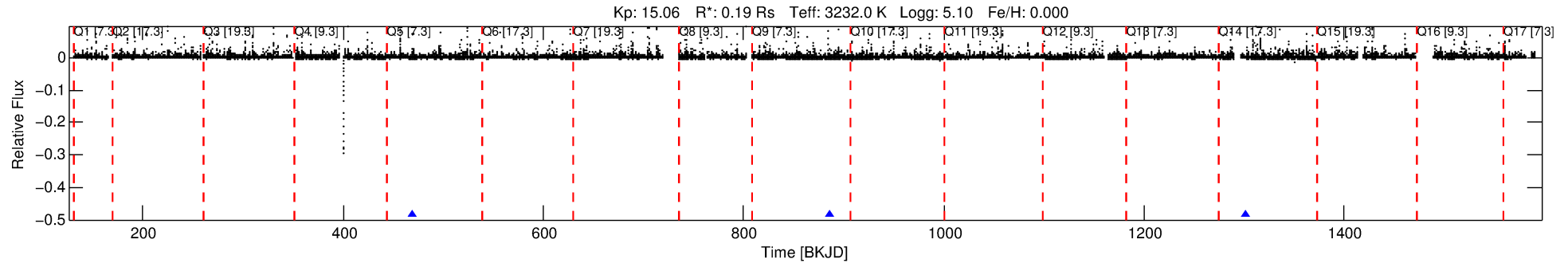
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008416220-01

No Significant Match Found

DV One-Page Summary

KIC: 8416220 Candidate: 1 of 1 Period: 416.038 d



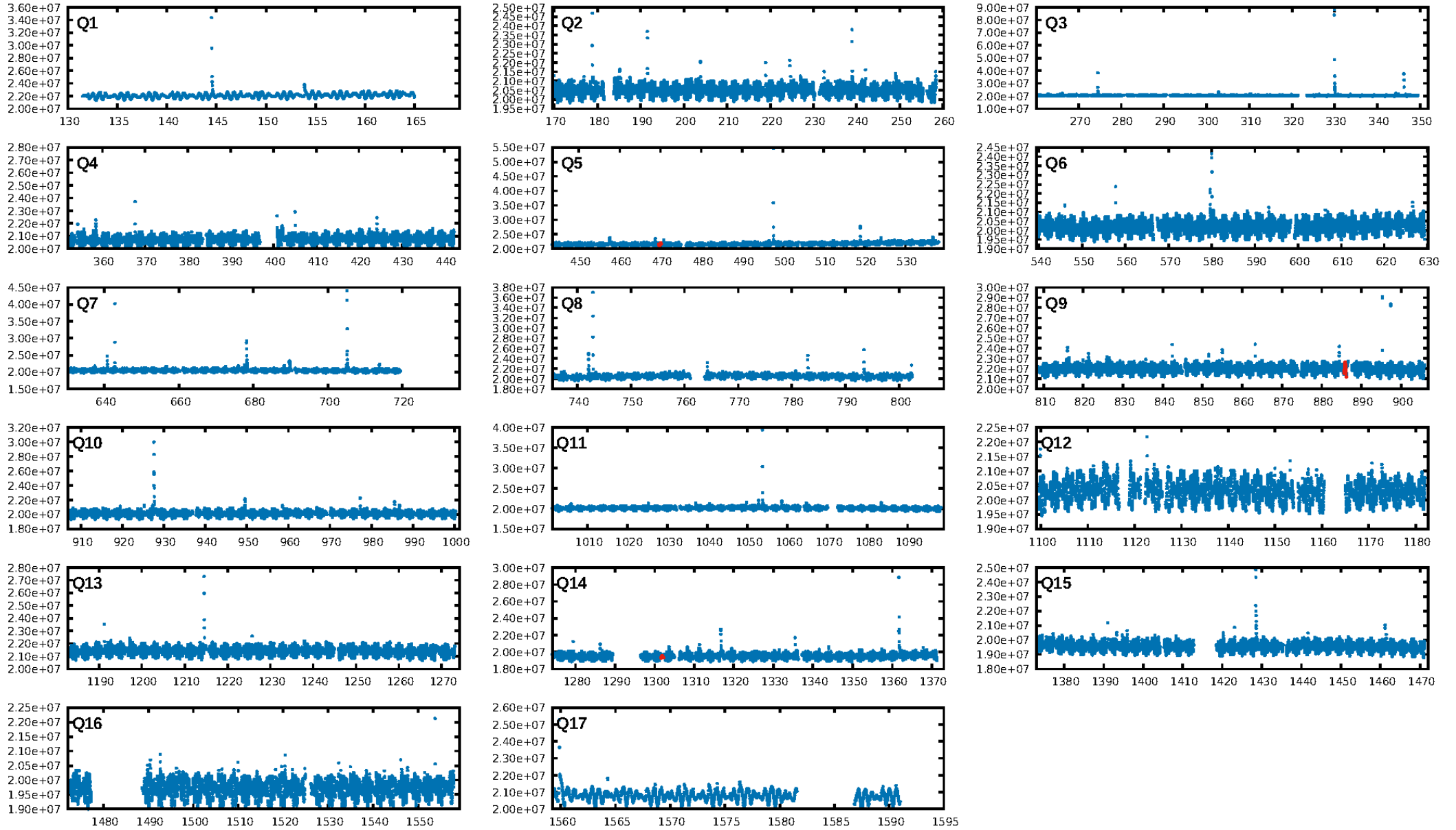
DV Fit Results:

Period = 416.03844 [0.02872] d
Epoch = 469.8922 [0.0389] BKJD
Rp/R* = 0.0327 [0.0890]
a/R* = 420.26 [4762.15]
b = 0.27 [37.93]
Seff = 0.01 [0.00]
Teff = 80 [3] K
Rp = 0.68 [1.85] Re
a = 0.6002 [0.0827] AU
Ag = 1083625.85 [5913671.26] [0.18 σ]
Teffp = 4002 [5458] K [0.72 σ]

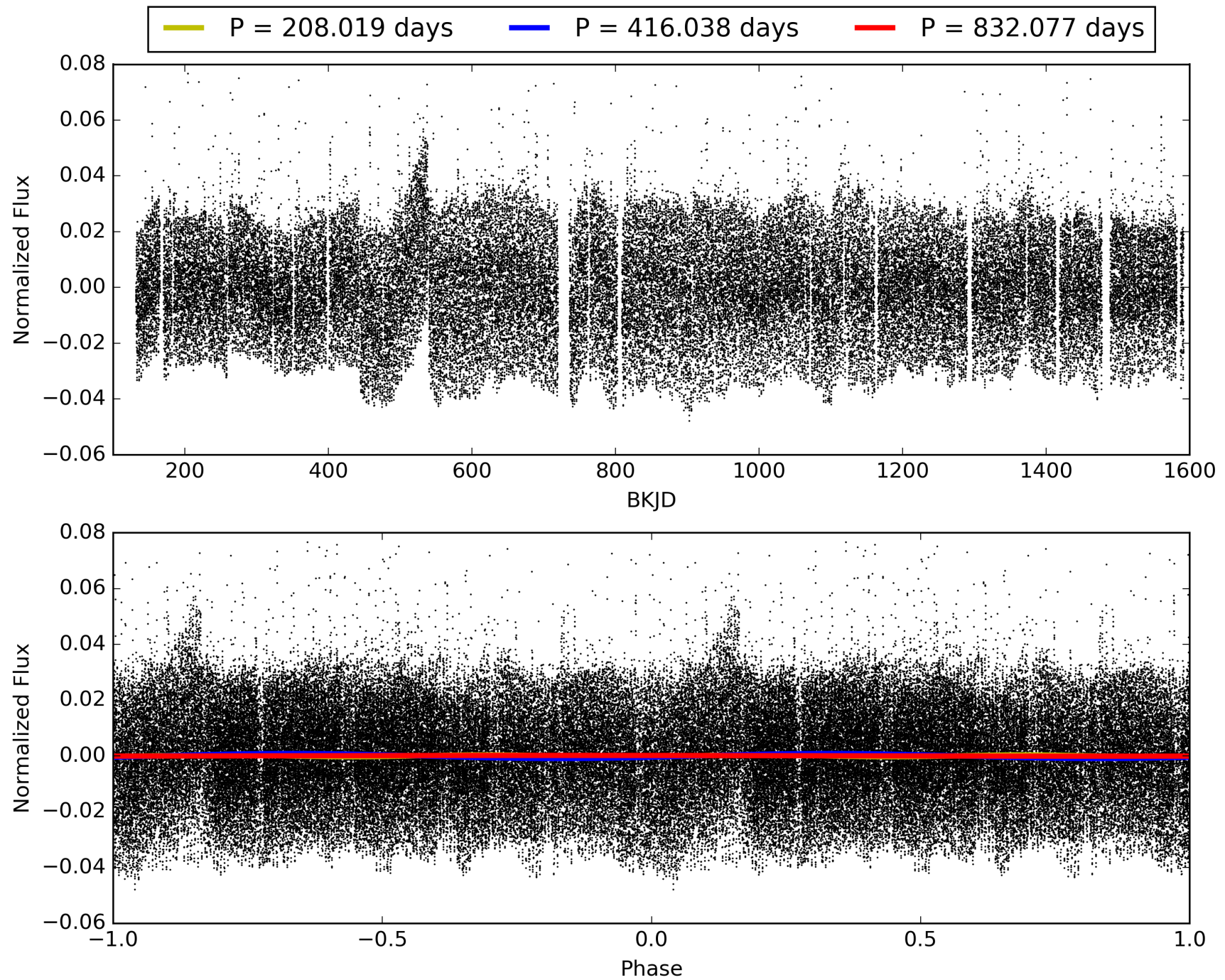
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 60.9%
ModelChiSquareGof-sig: 99.4%
Bootstrap-pfa: 1.14e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5038
Centroid-sig: 9.1%
Centroid-so: 1.029 arcsec [1.34 σ]
OotOffset-rm: 0.079 arcsec [0.91 σ]
OotOffset-st: 1/0/0/2 [3]
KicOffset-rm: 0.101 arcsec [1.02 σ]
KicOffset-st: 1/0/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008416220-01, PDC Light Curves

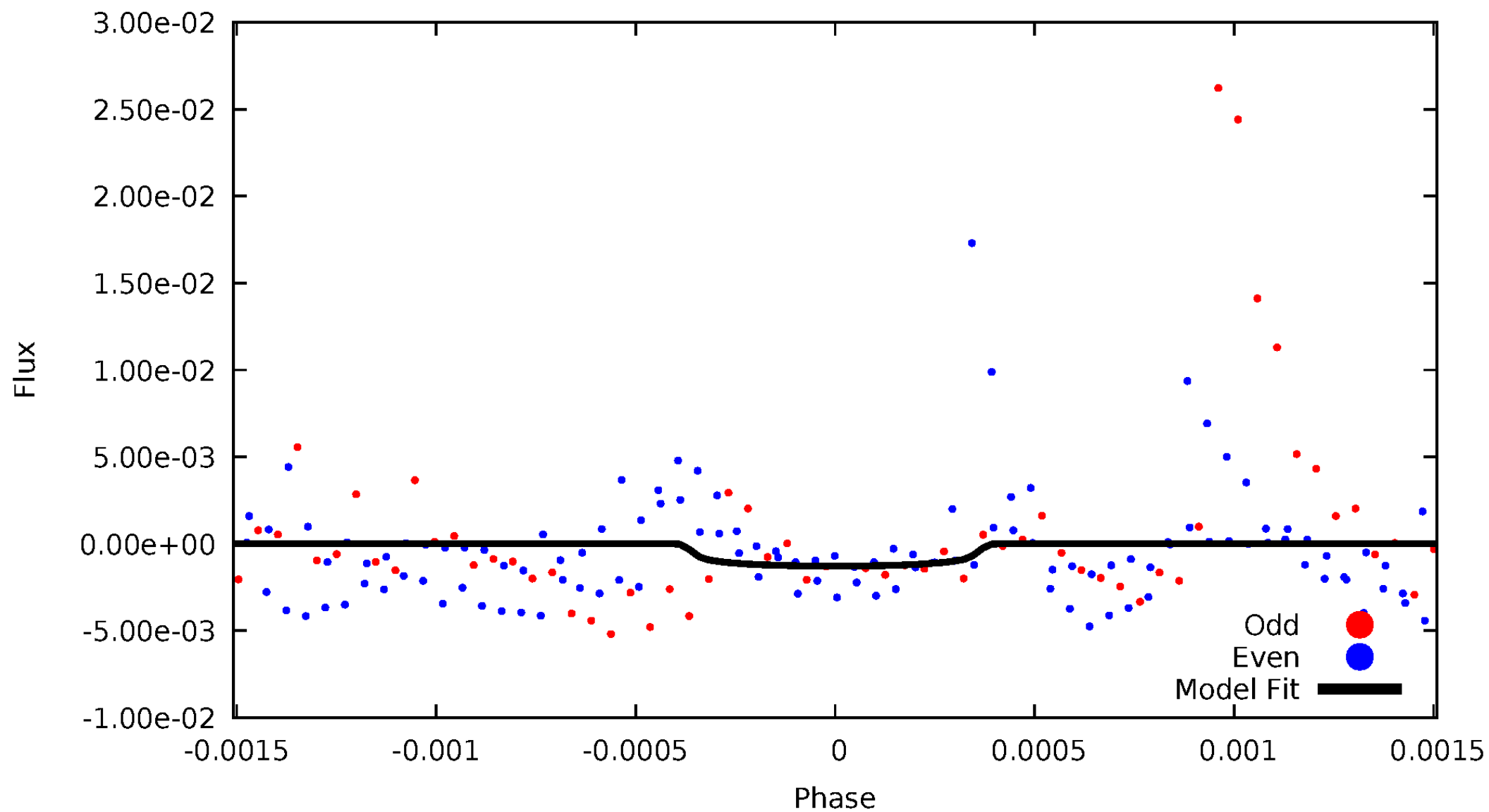


TCE 008416220-01



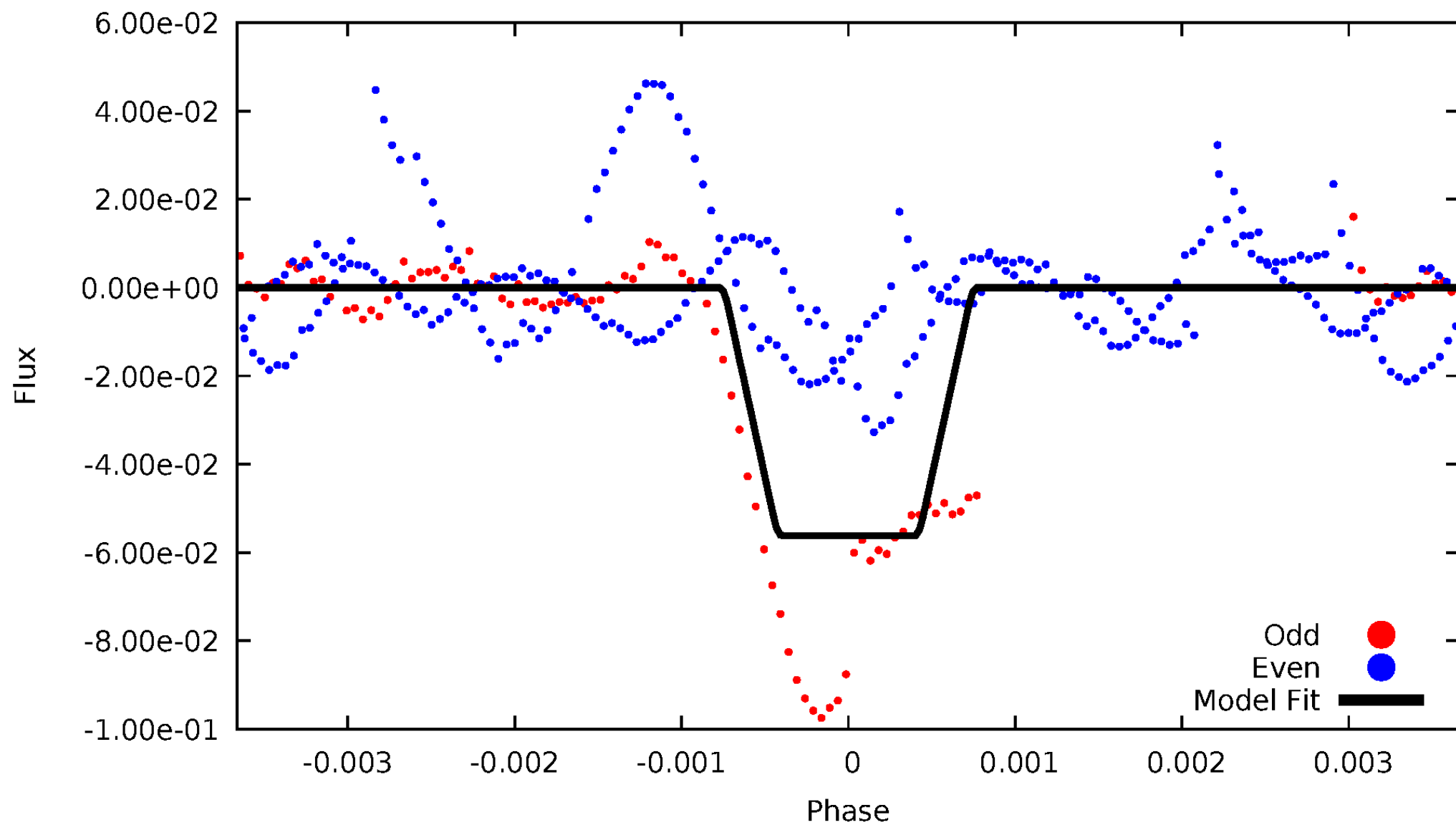
DV Odd/Even

TCE 008416220-01



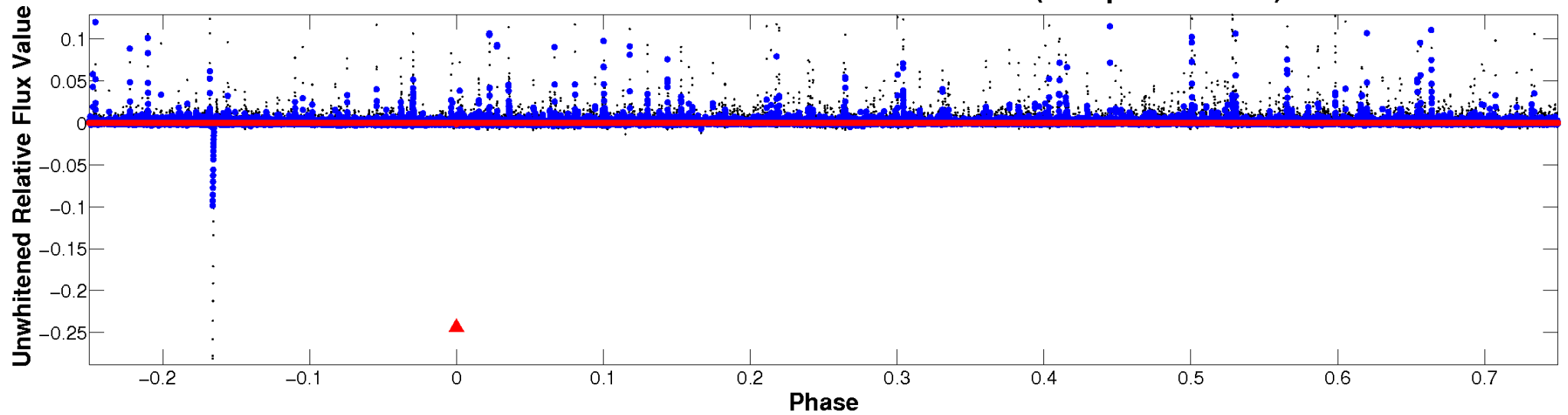
ALT Odd/Even

TCE 008416220-01

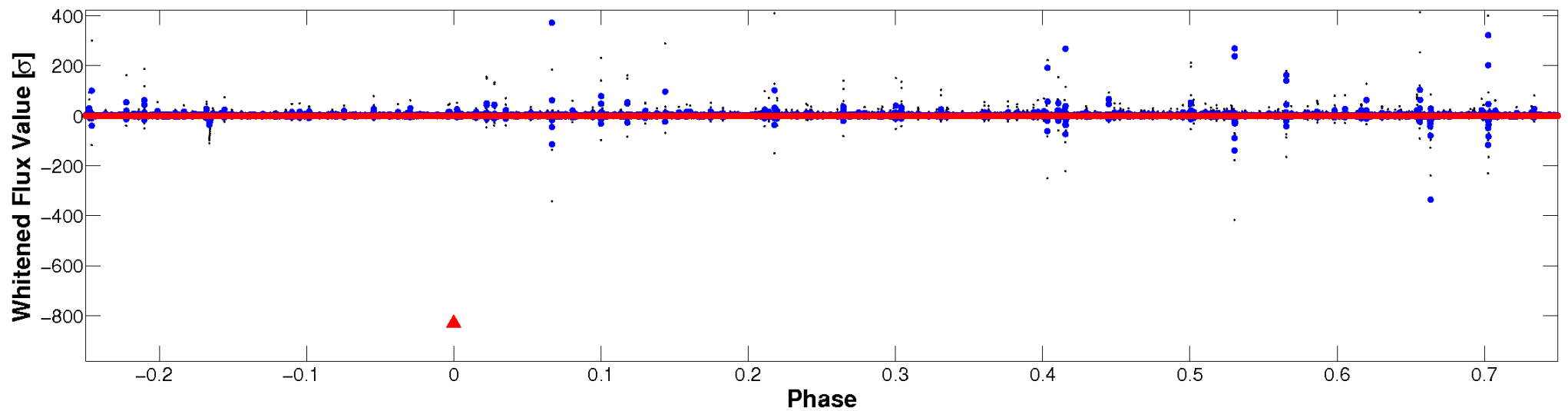


Non-Whitened Vs. Whitened Light Curve

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

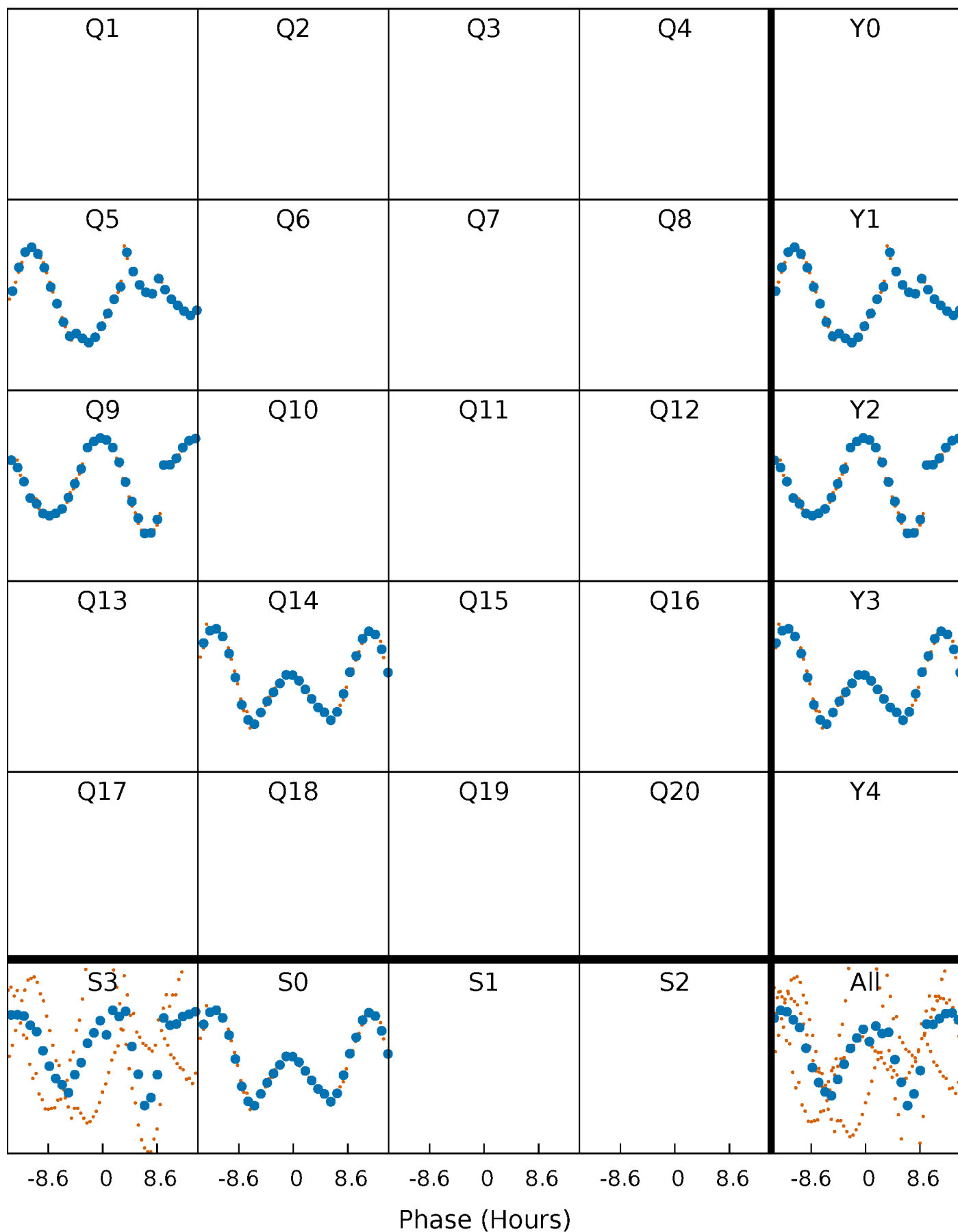


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



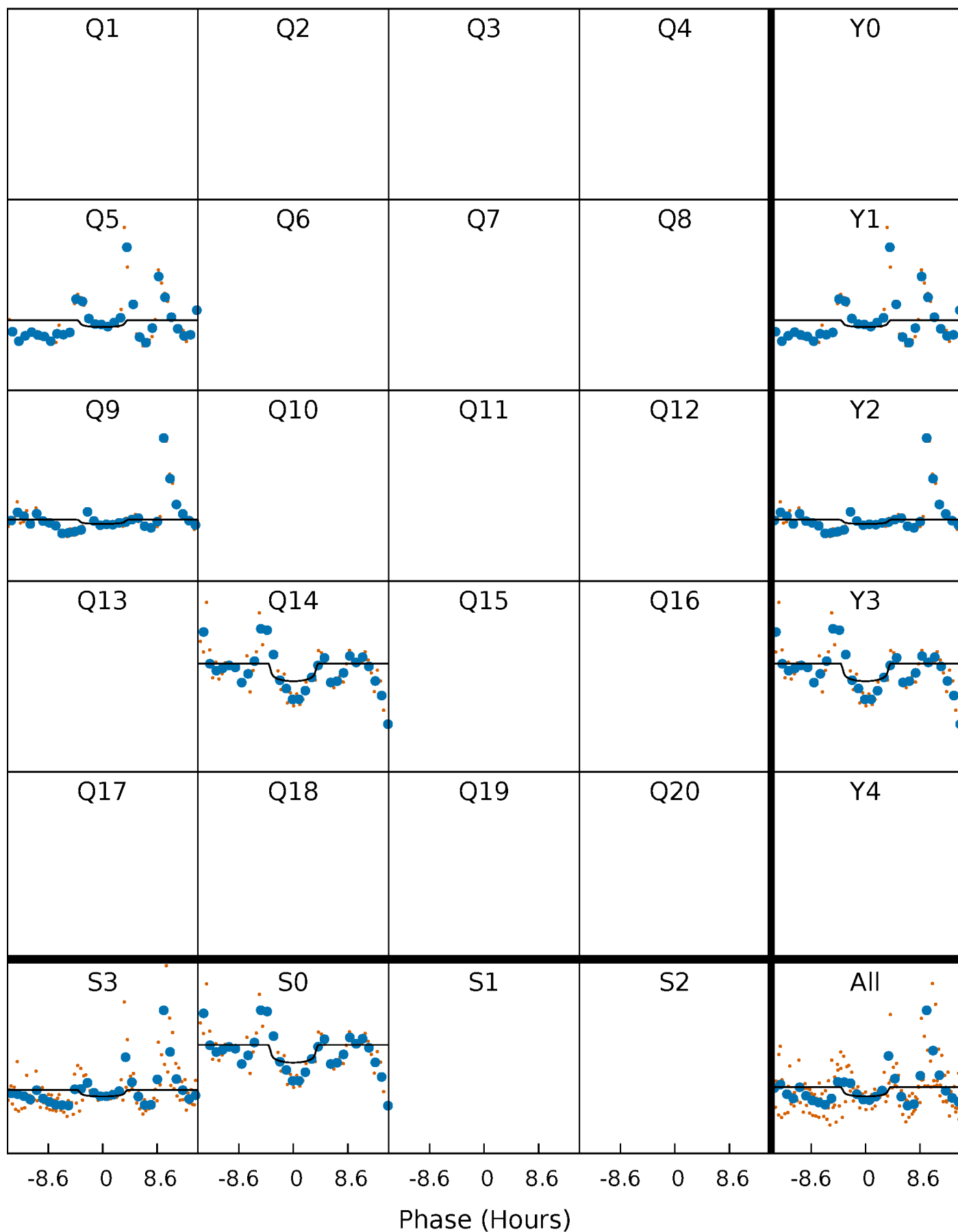
PDC Quarter-Phased Transit Curves

TCE 008416220-01 P=416.038438 Days $T_0=469.892214$ (BKJD)



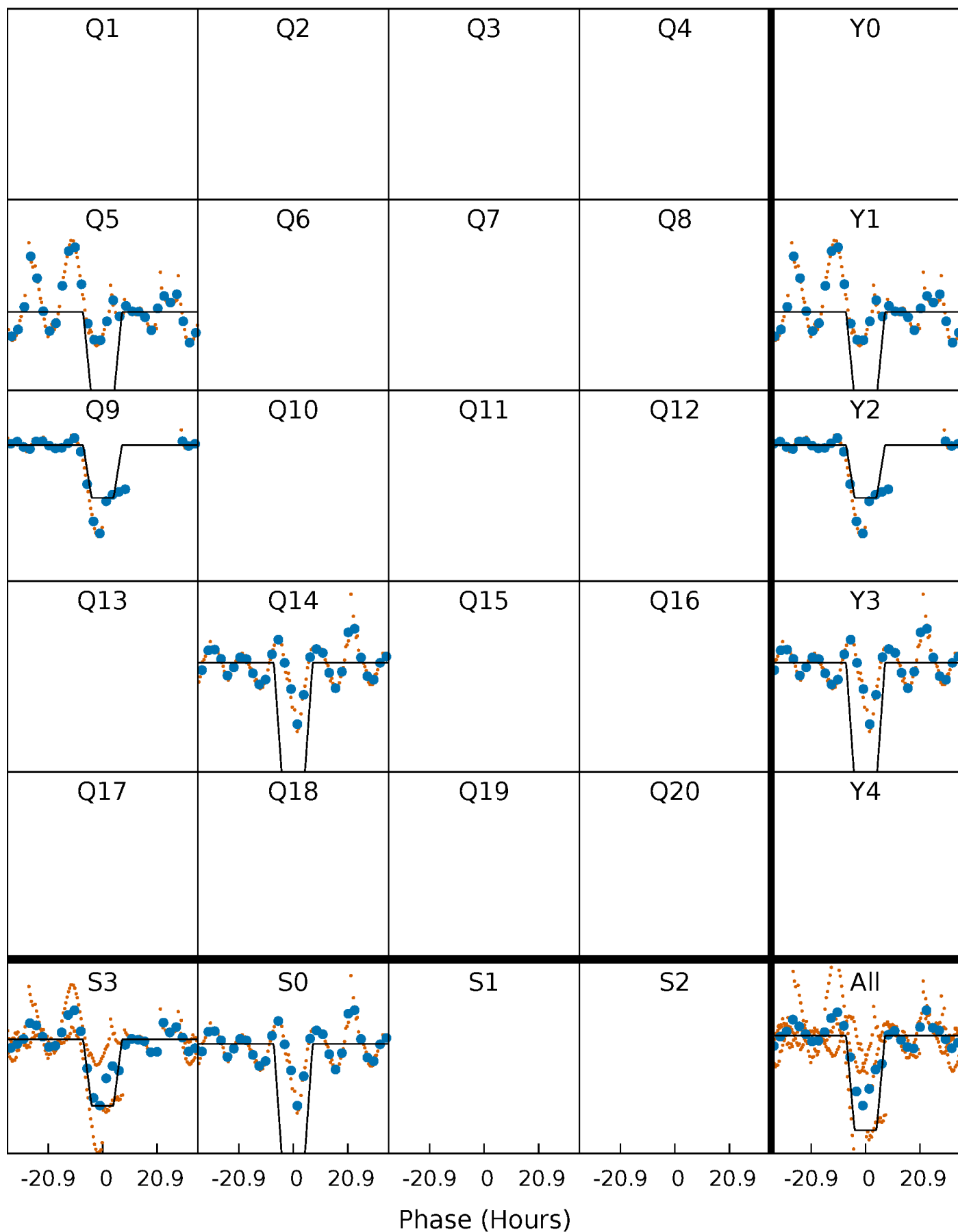
DV Quarter-Phased Transit Curves

TCE 008416220-01 P=416.038438 Days $T_0=469.892214$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

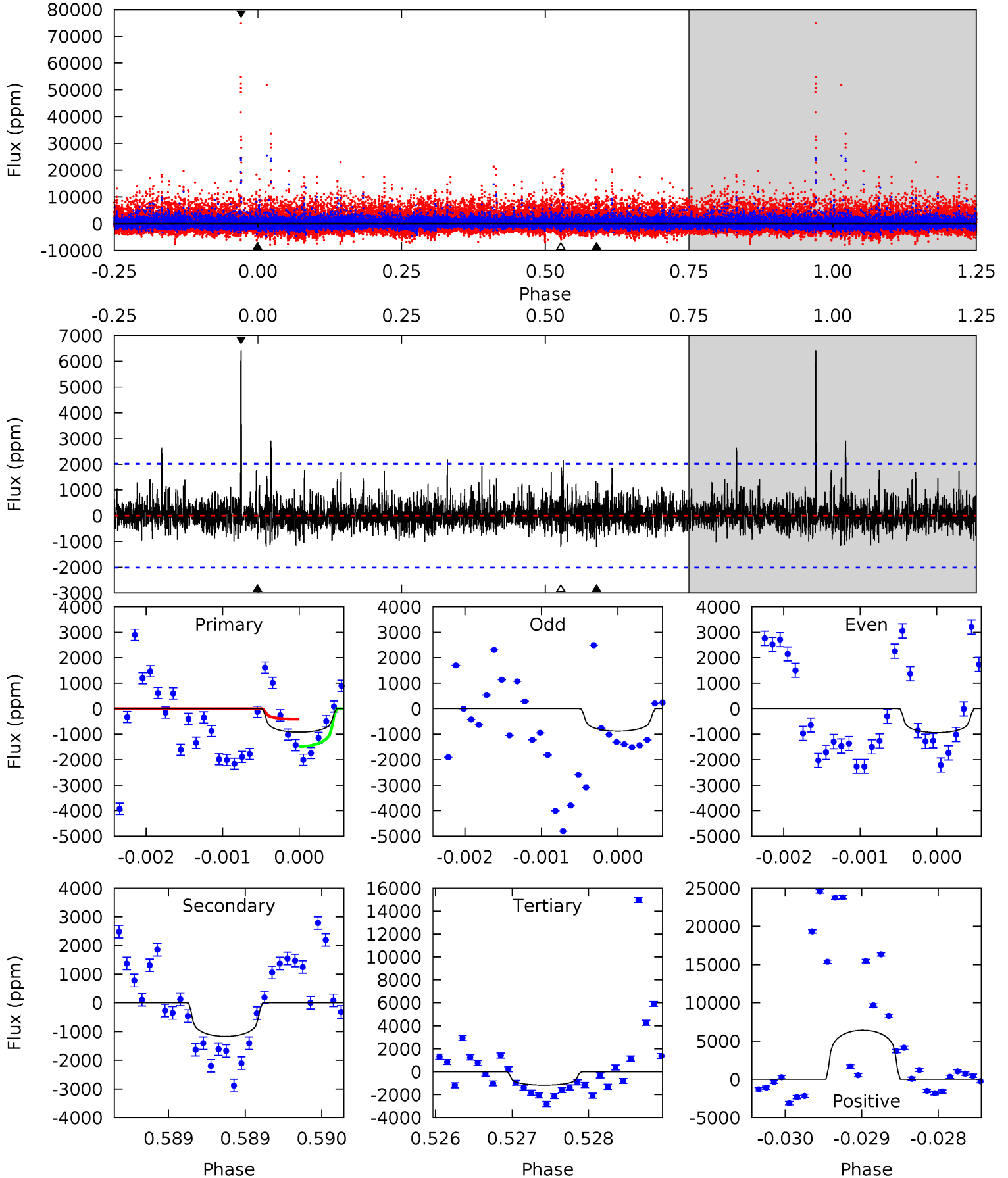
TCE 008416220-01 P=416.408708 Days $T_0=469.907153$ (BKJD)



DV Model-Shift Uniqueness Test

008416220-01, P = 416.038438 Days, E = 53.853776 Days

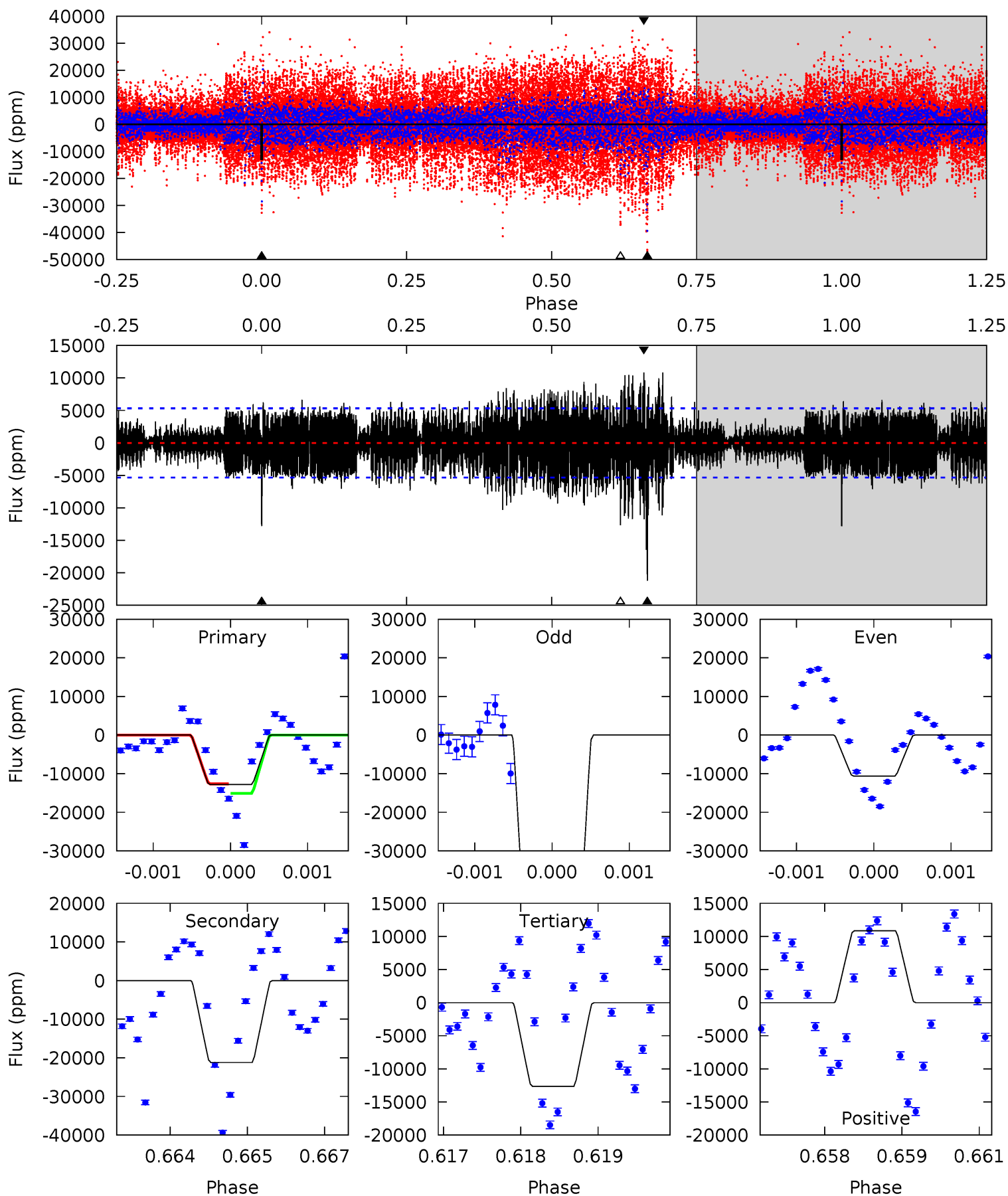
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.51	3.18	3.18	17.5	5.49	3.35	1.17	-0.67	-15.0	0.00	-14.3	0.02	0.73	0.85	1.47



Alt Model-Shift Uniqueness Test

008416220-01, P = 416.408708 Days, E = 53.498445 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	21.5	12.8	11.0	5.38	3.18	3.42	0.14	1.96	8.65	10.5	37.5	2.71	0.34	0



Stellar Parameters For KIC 008416220

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3232^{+41}_{-25}	$5.102^{+0.060}_{-0.060}$	$0.000^{+0.100}_{-0.100}$	$0.190^{+0.037}_{-0.028}$	$0.166^{+0.043}_{-0.026}$	$34.210^{+11.930}_{-8.845}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+19%/-15%	+26%/-16%	+35%/-26%
Source	PHO2	PHO2	PHO2	DSEP		

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

Secondary Eclipse Parameters for KIC 008416220-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1168 ± 367	$1.48^{+1.59}_{-1.04}$	112^{+4}_{-3}	2659^{+1012}_{-450}	$107215^{+939171}_{-84864}$
Alt.	-21206 ± 988	$5.01^{+2.04}_{-1.95}$	112^{+4}_{-3}	2816^{+395}_{-227}	$174022^{+273470}_{-86774}$

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 $A_{\text{obs}} \gg 1.0$

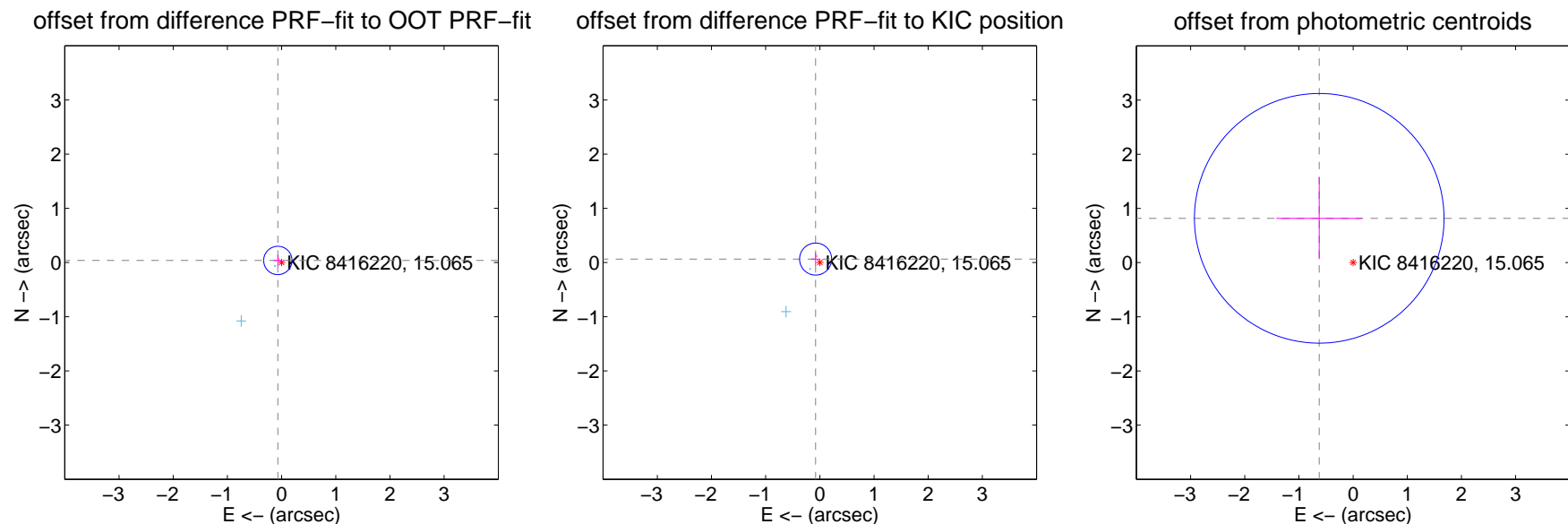
DV Centroid Data

Supplemental centroid analysis for 008416220-01. Kepler magnitude: 15.06. Transit SNR 1.89

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.079 ± 0.087	0.91	0.069 ± 0.081	0.039 ± 0.103
PRF-fit source offset from KIC position	0.101 ± 0.099	1.02	0.078 ± 0.085	0.064 ± 0.116
photometric centroid source offset	1.03 ± 0.77	1.34	0.63 ± 0.79	0.82 ± 0.75

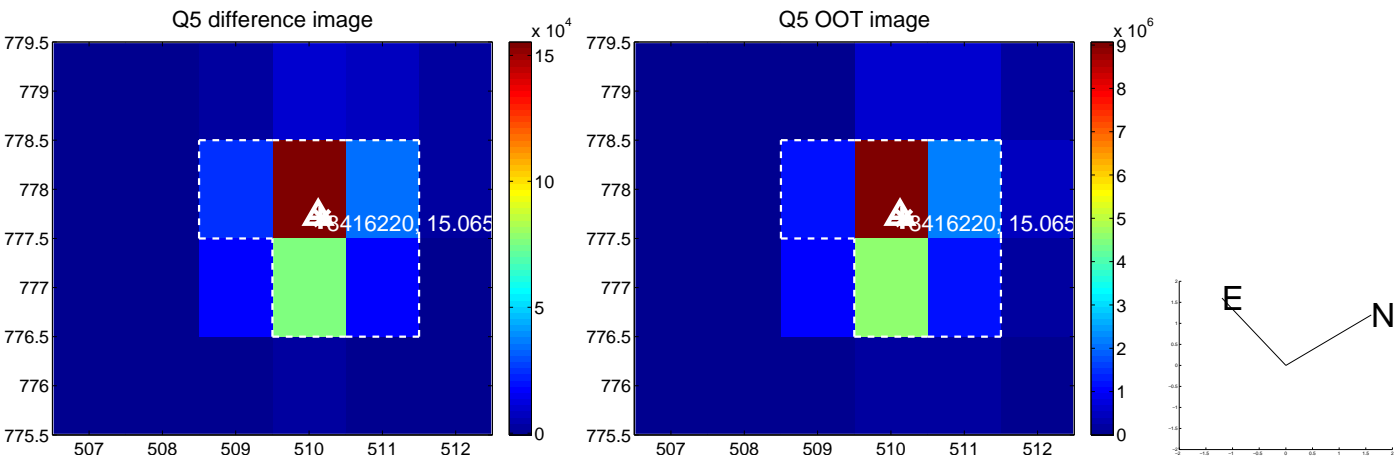


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

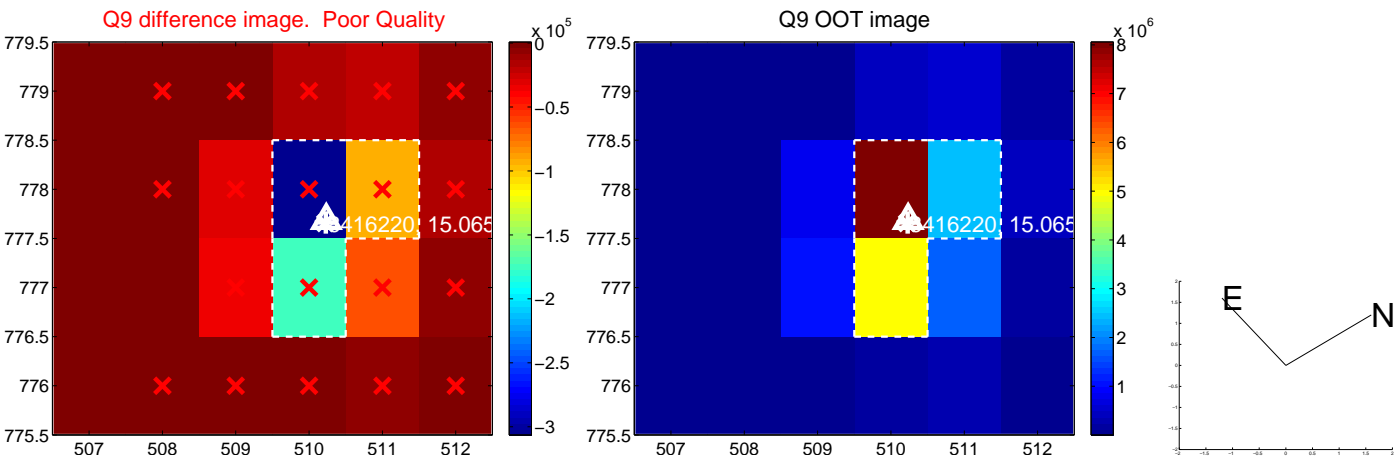
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.

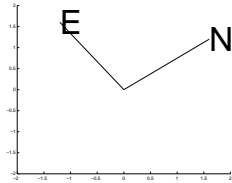
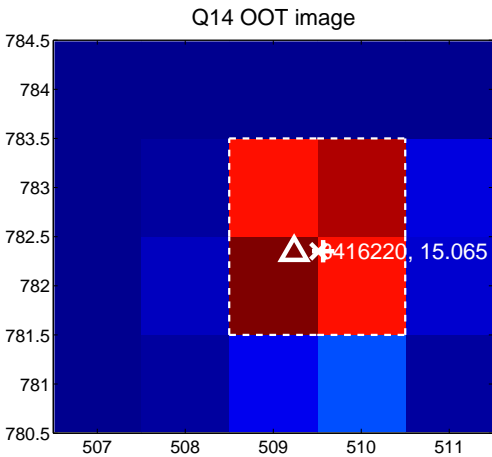
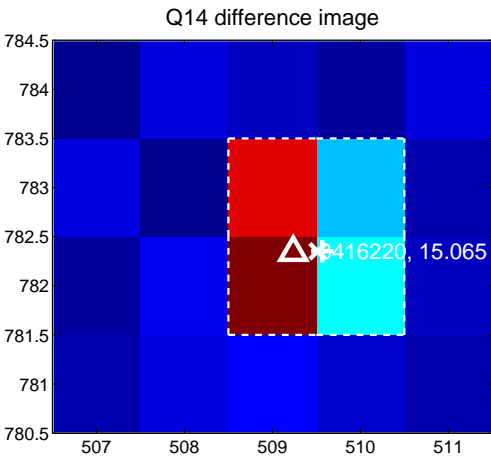


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

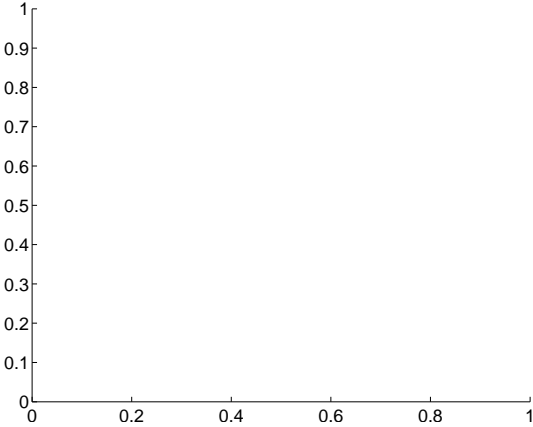
Q13 no difference image



Q13 no OOT image



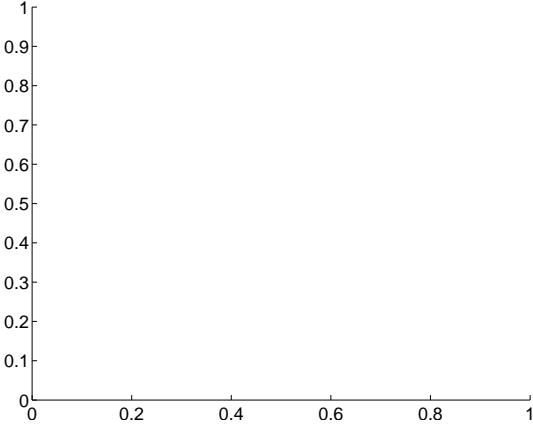
Q15 no difference image



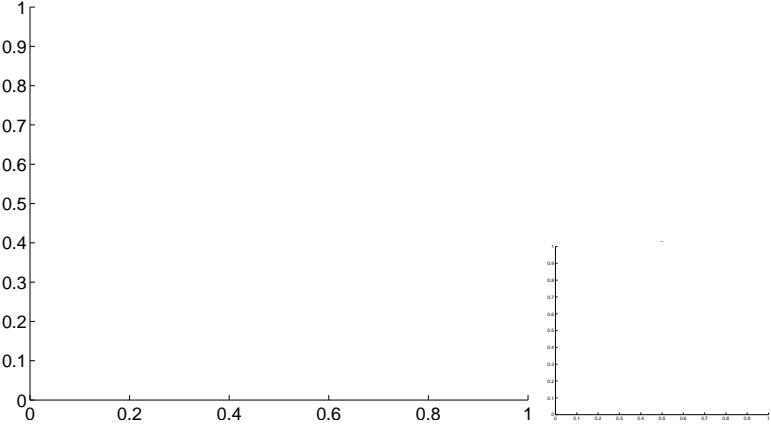
Q15 no OOT image



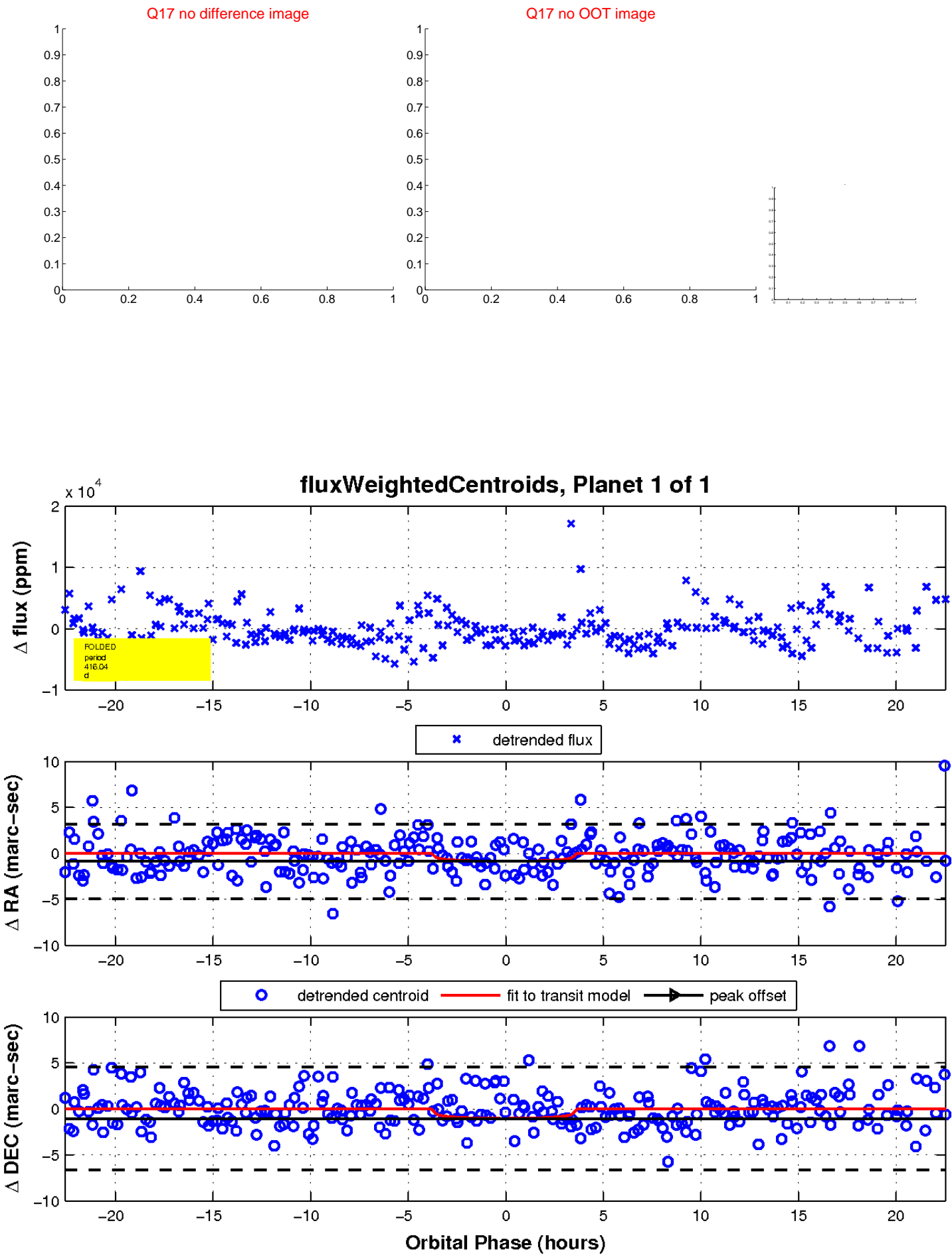
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

