

KIC 009674320

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})
009674320-01	OBS	7223.01	317.091319	297.799082	437.5	9.906	10.3	10.5	0.71	5366	1.61	0.54
009674320-02	OBS	No	450.142521	183.375941	499.1	7.584	7.1	7.2	0.71	5366	1.76	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009674320-01	OBS	PC	0.95	0	0	0	0	CENT_FEW_DIFFS
009674320-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

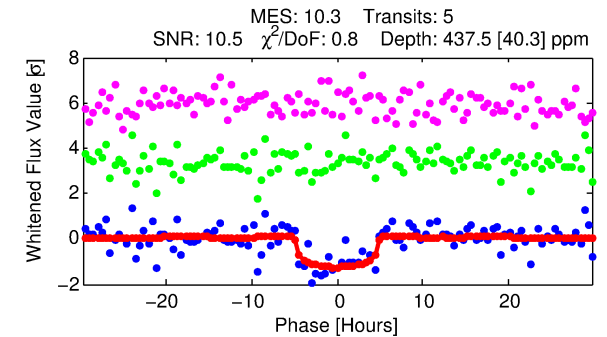
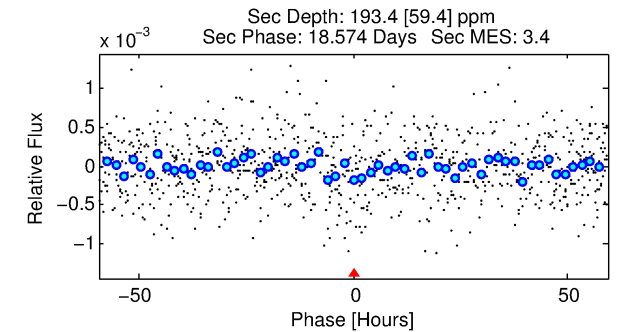
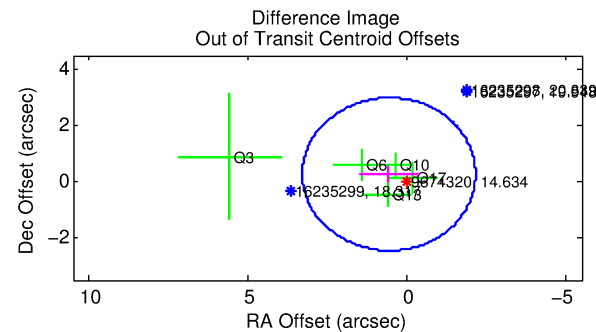
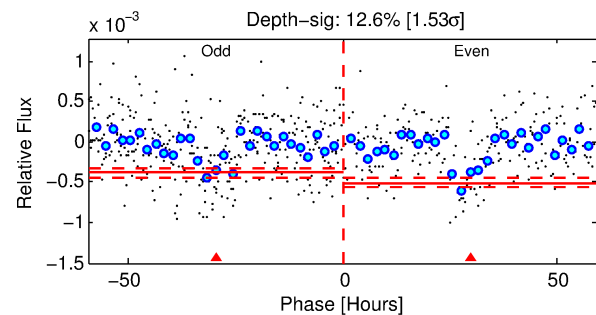
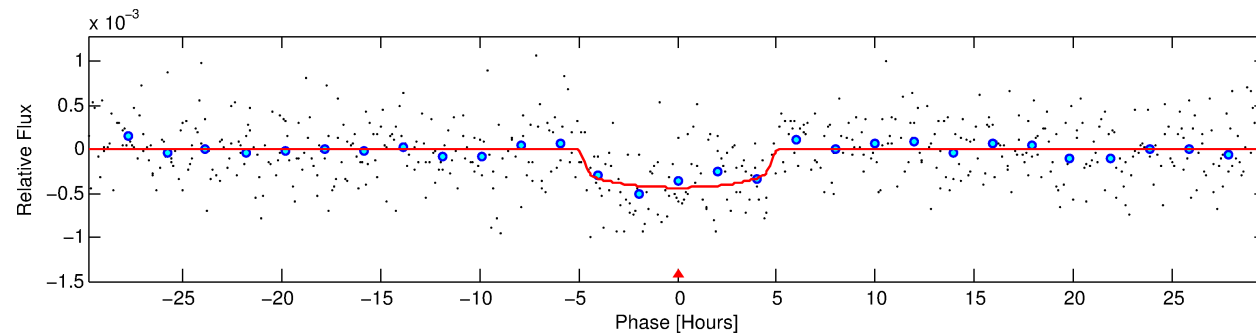
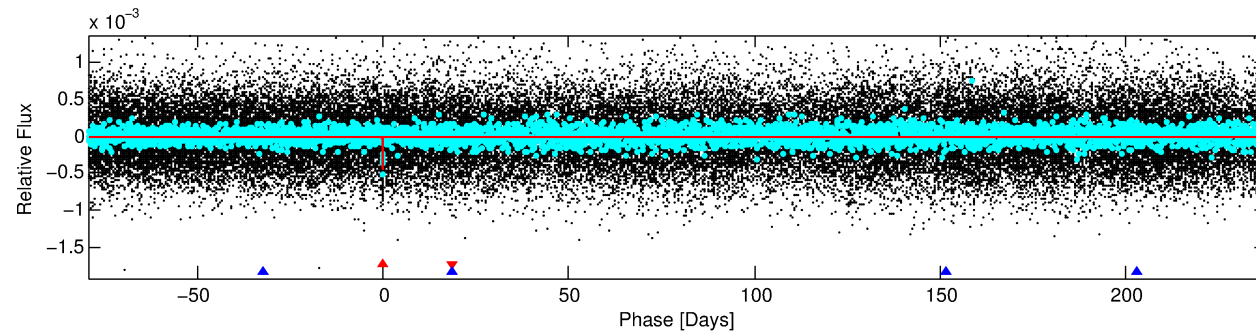
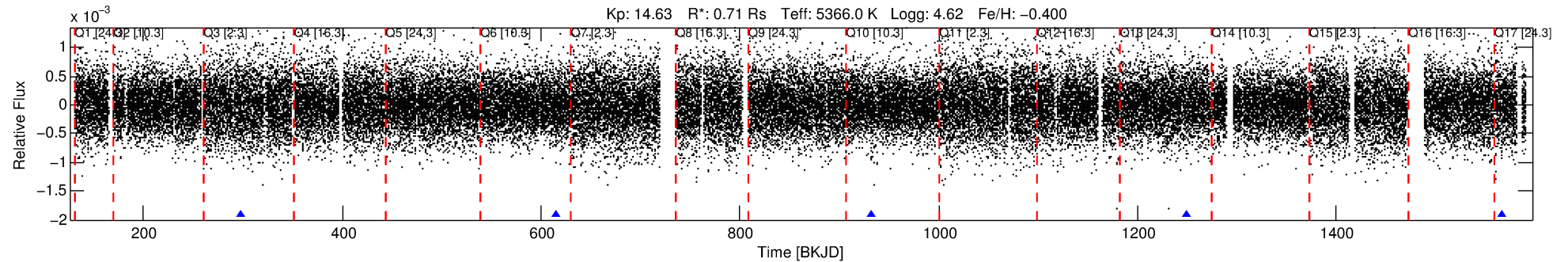
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 009674320-01

No Significant Match Found

KIC: 9674320 Candidate: 1 of 2 Period: 317.091 d
KOI: K07223.01 Corr: 0.895



DV Fit Results:

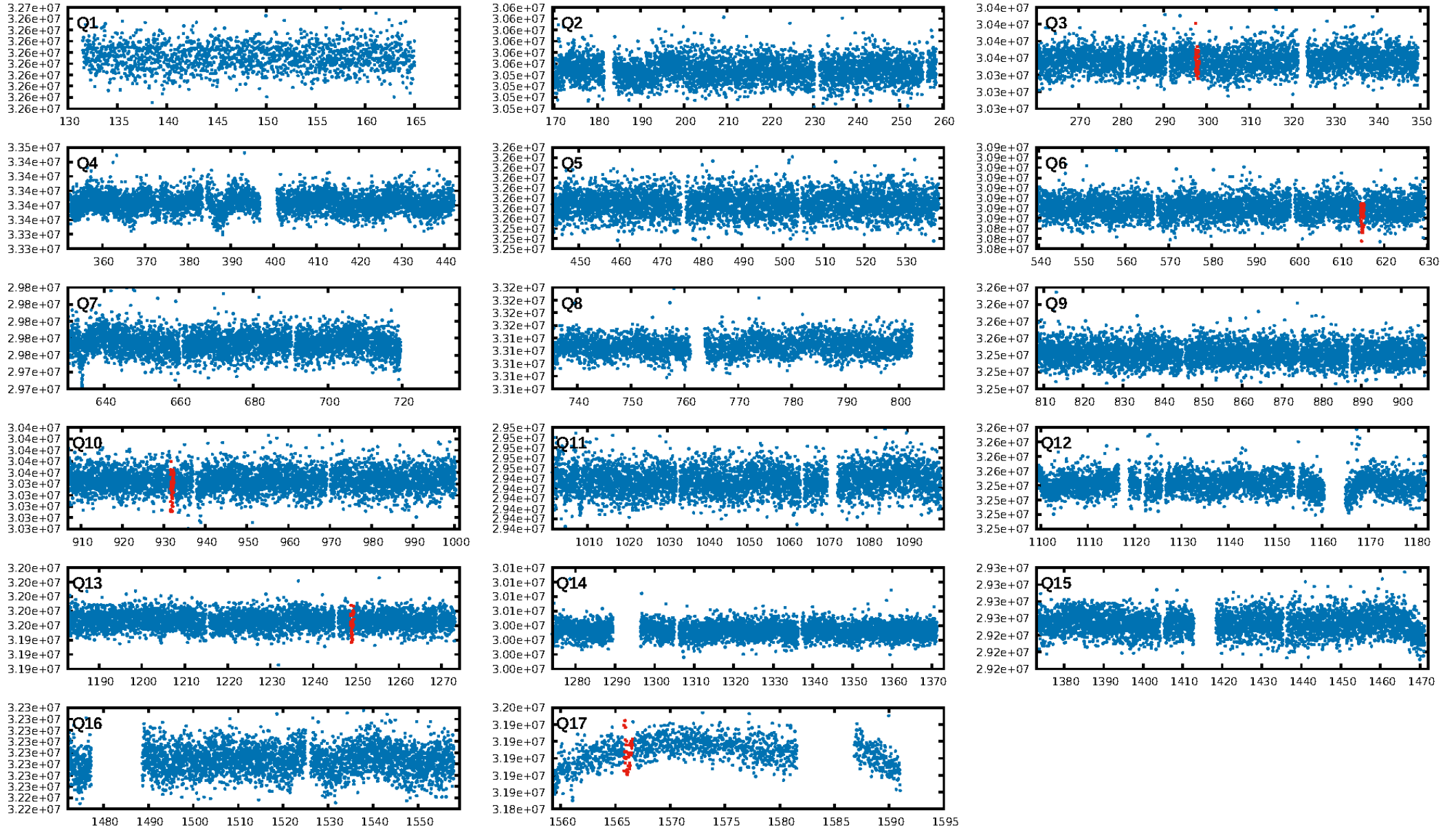
Period = 317.09132 [0.00624] d
 Epoch = 297.7991 [0.0161] BKJD
 Rp/R* = 0.0206 [0.0104]
 a/R* = 175.50 [363.55]
 b = 0.73 [1.37]
 Seff = 0.54 [0.12]
 Teq = 218 [13] K
 Rp = 1.61 [0.86] Re
 a = 0.8402 [0.1168] AU
 Ag = 29003.07 [31066.82] [0.93σ]
 Tefp = 4406 [1167] K [3.59σ]

DV Diagnostic Results:

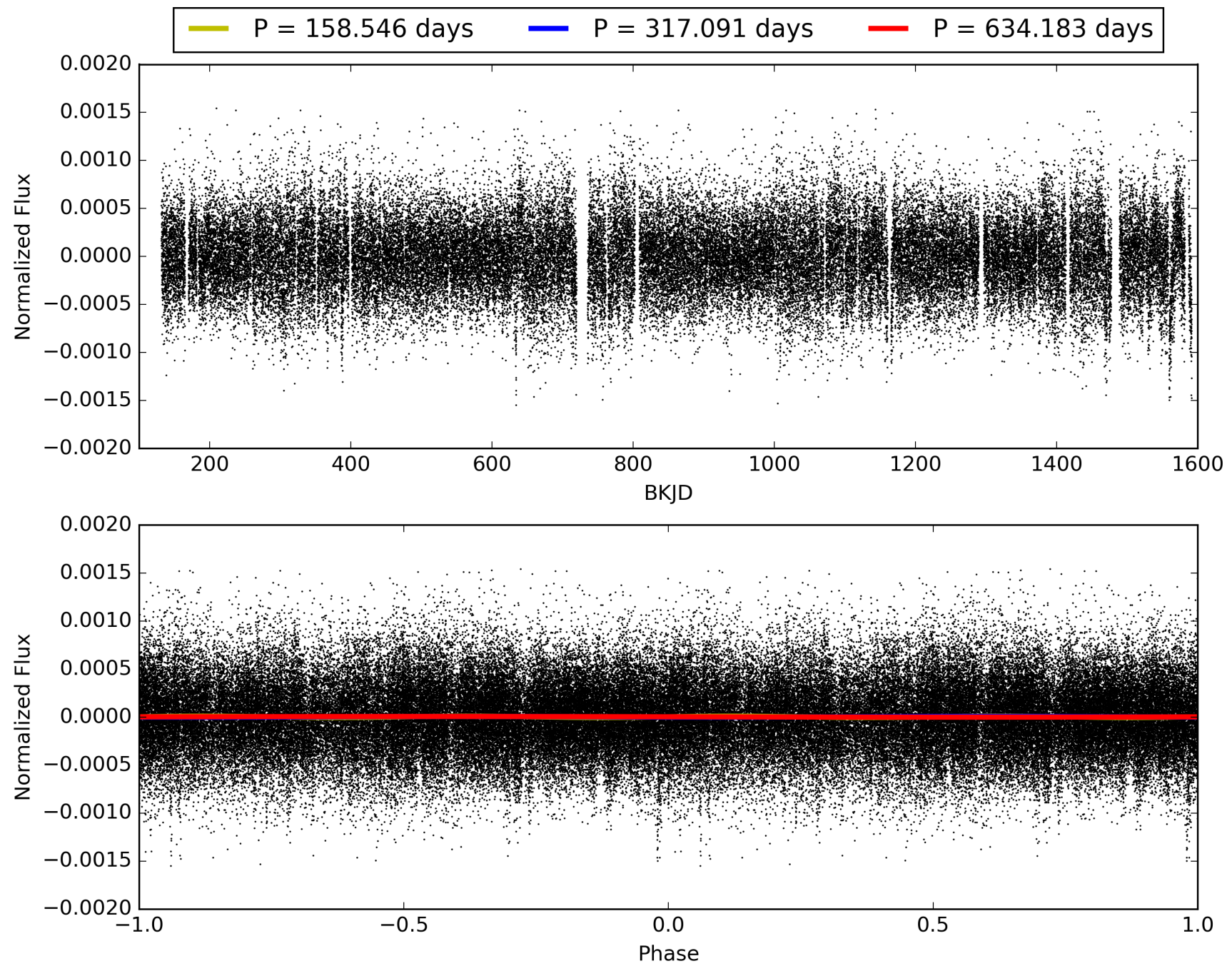
ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [255.95σ]
ModelChiSquare2-sig: 35.2%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 7.39e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.41

Centroid-sig: 6.5%
Centroid-so: 1.617 arcsec [1.58σ]
OotOffset-rm: 0.626 arcsec [0.69σ]
KicOffset-rm: 0.743 arcsec [0.89σ]
OotOffset-st: 2/1/0/2 [5]
KicOffset-st: 2/1/0/2 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 1.00 [5/5]

TCE 009674320-01, PDC Light Curves

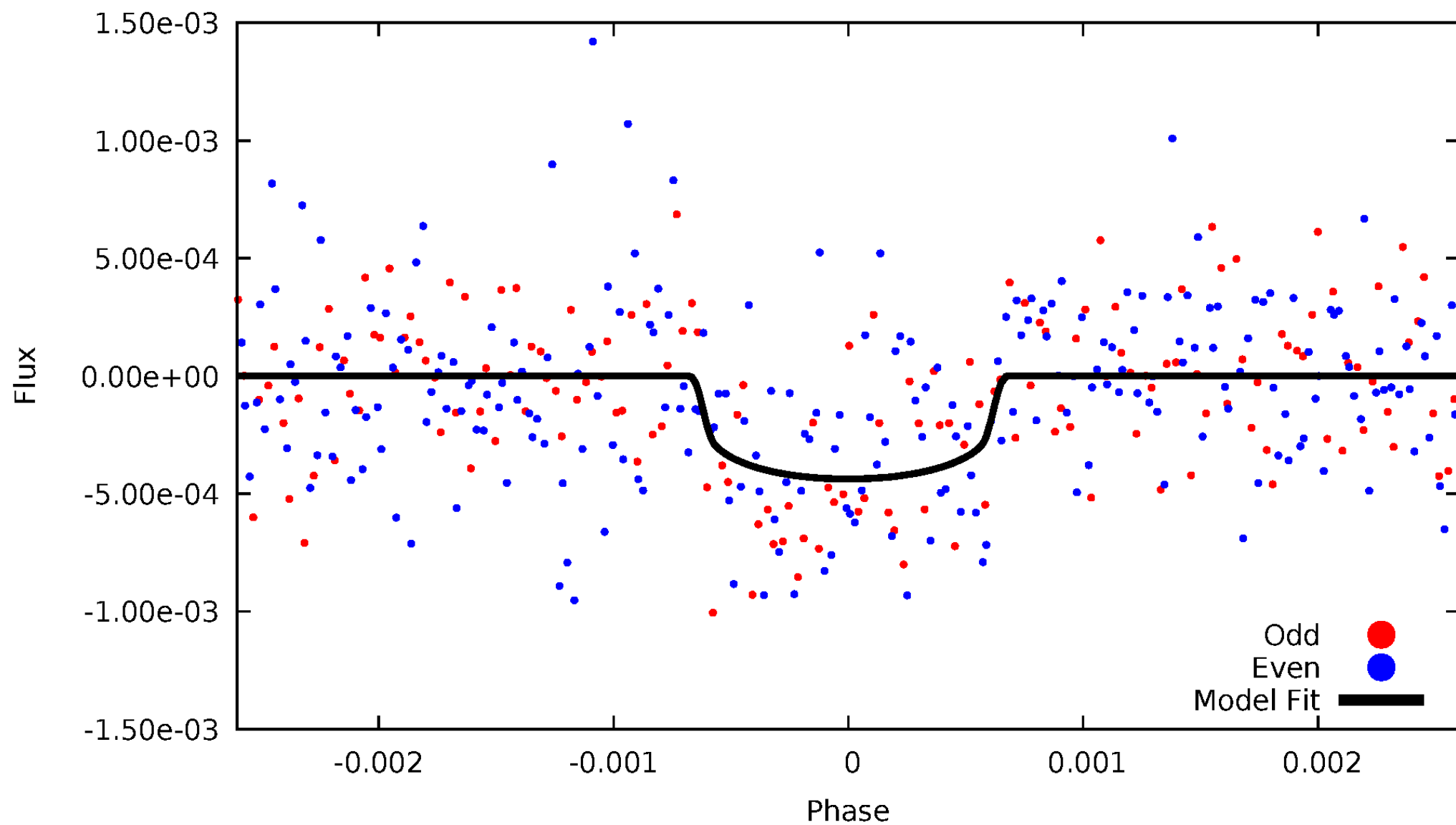


TCE 009674320-01



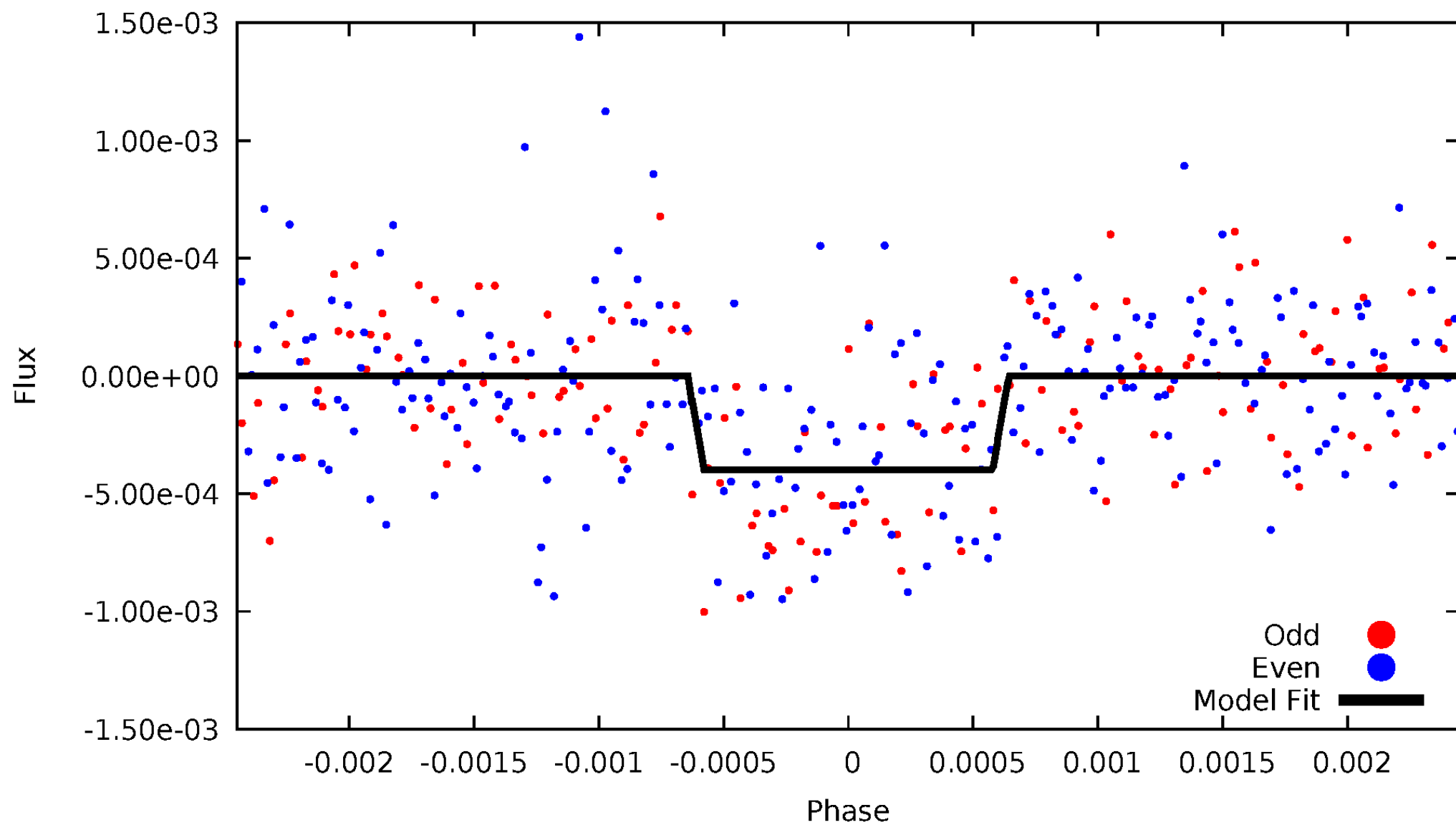
DV Odd/Even

TCE 009674320-01

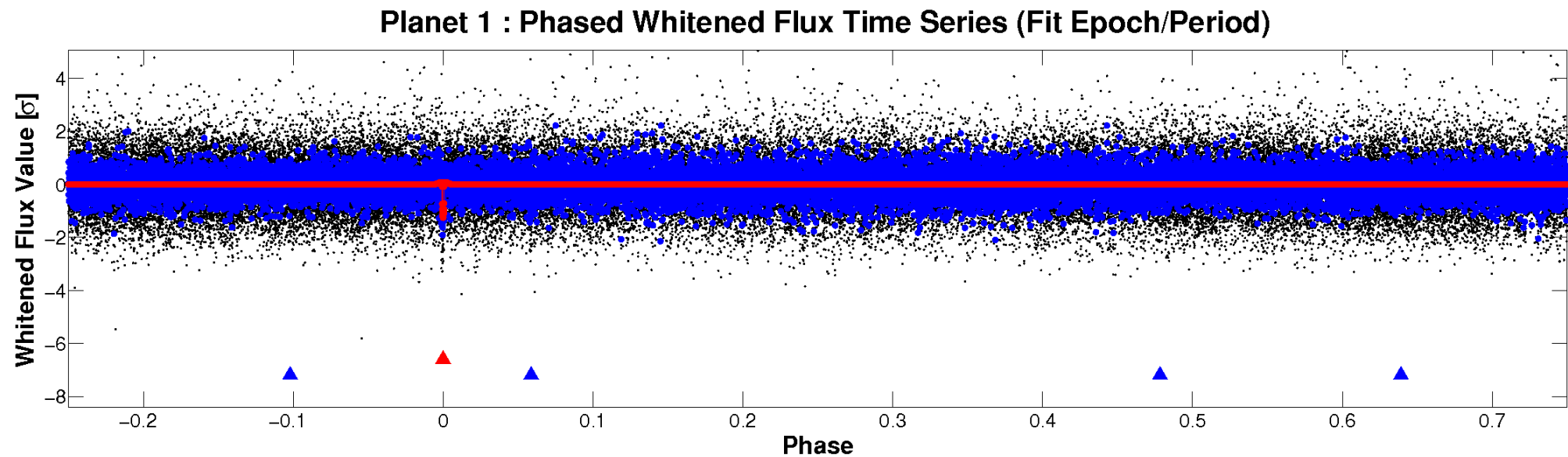
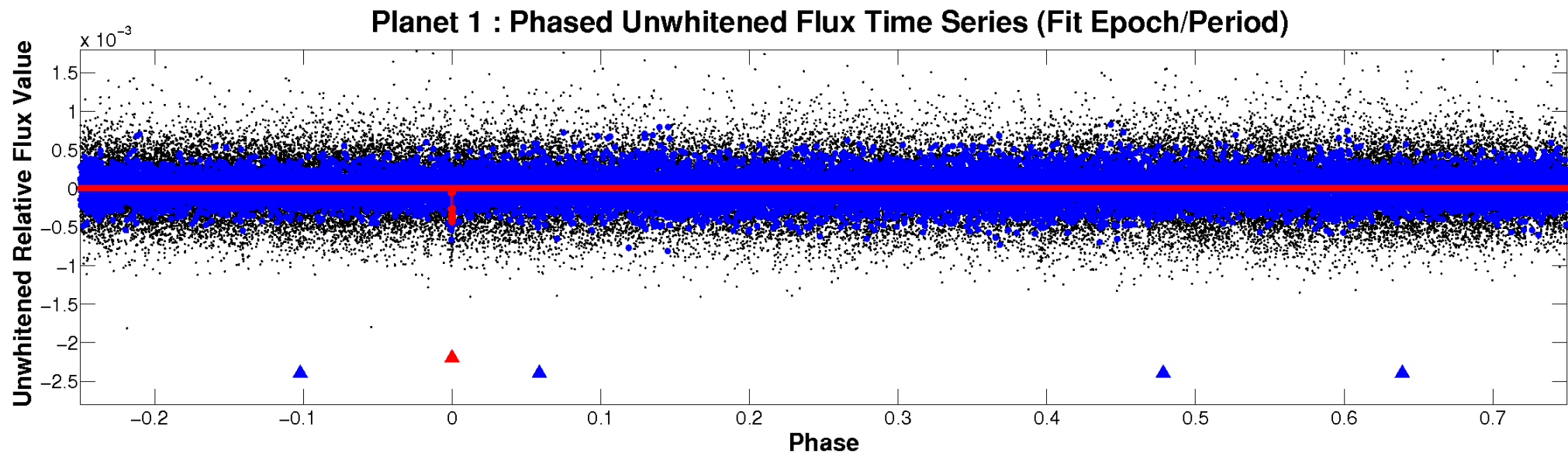


ALT Odd/Even

TCE 009674320-01

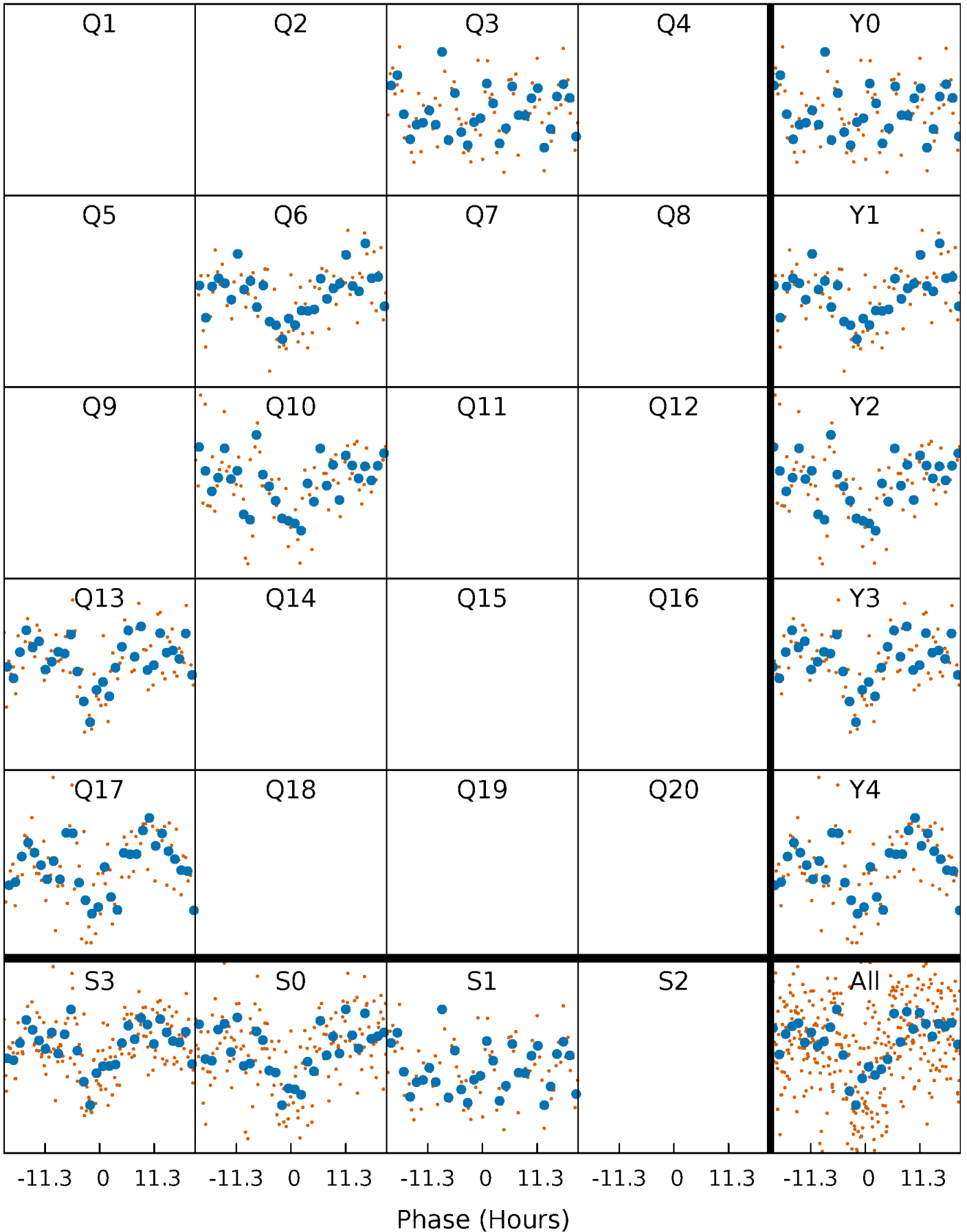


Non-Whitened Vs. Whitened Light Curve



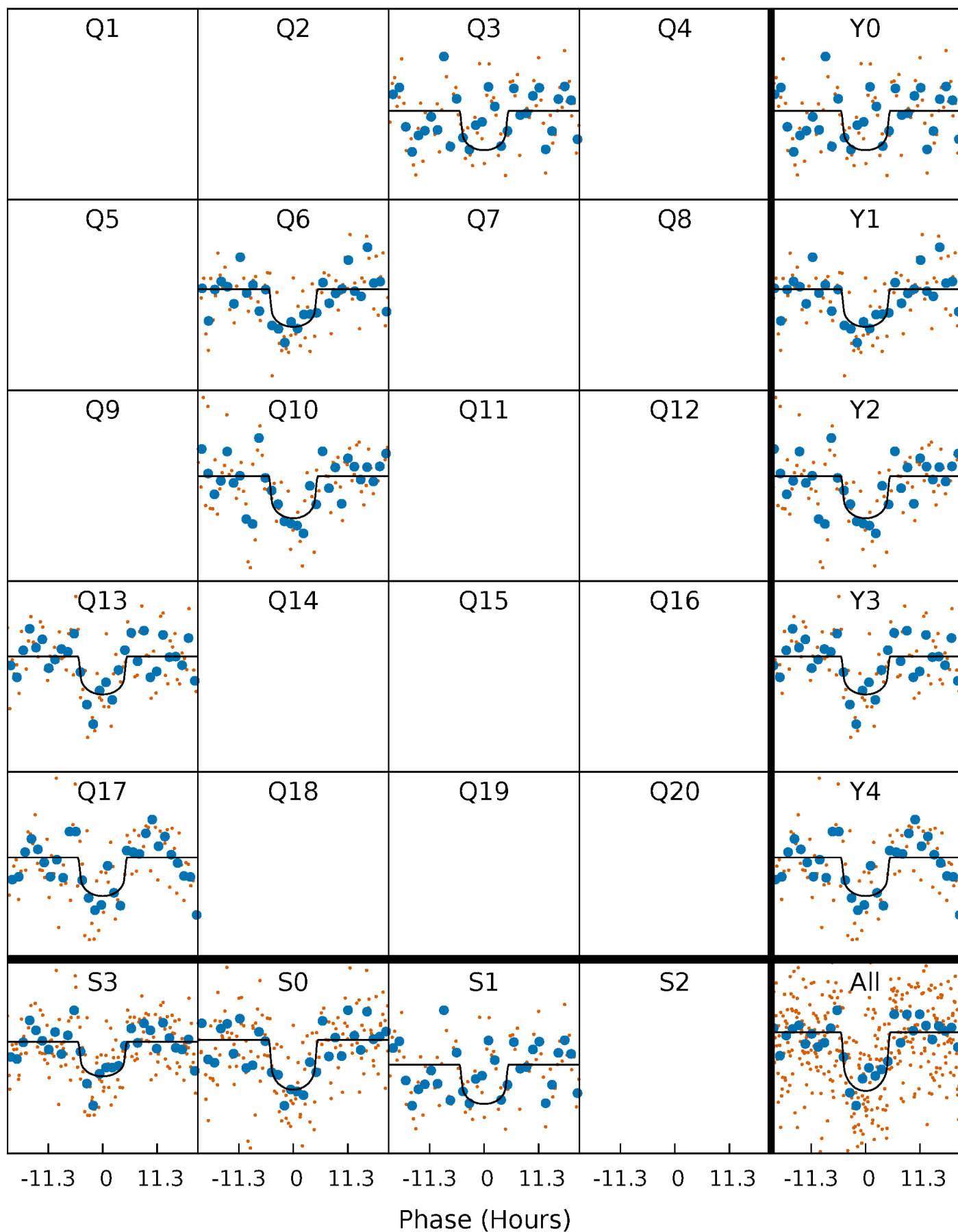
PDC Quarter-Phased Transit Curves

TCE 009674320-01 P=317.091319 Days $T_0=297.799082$ (BKJD)



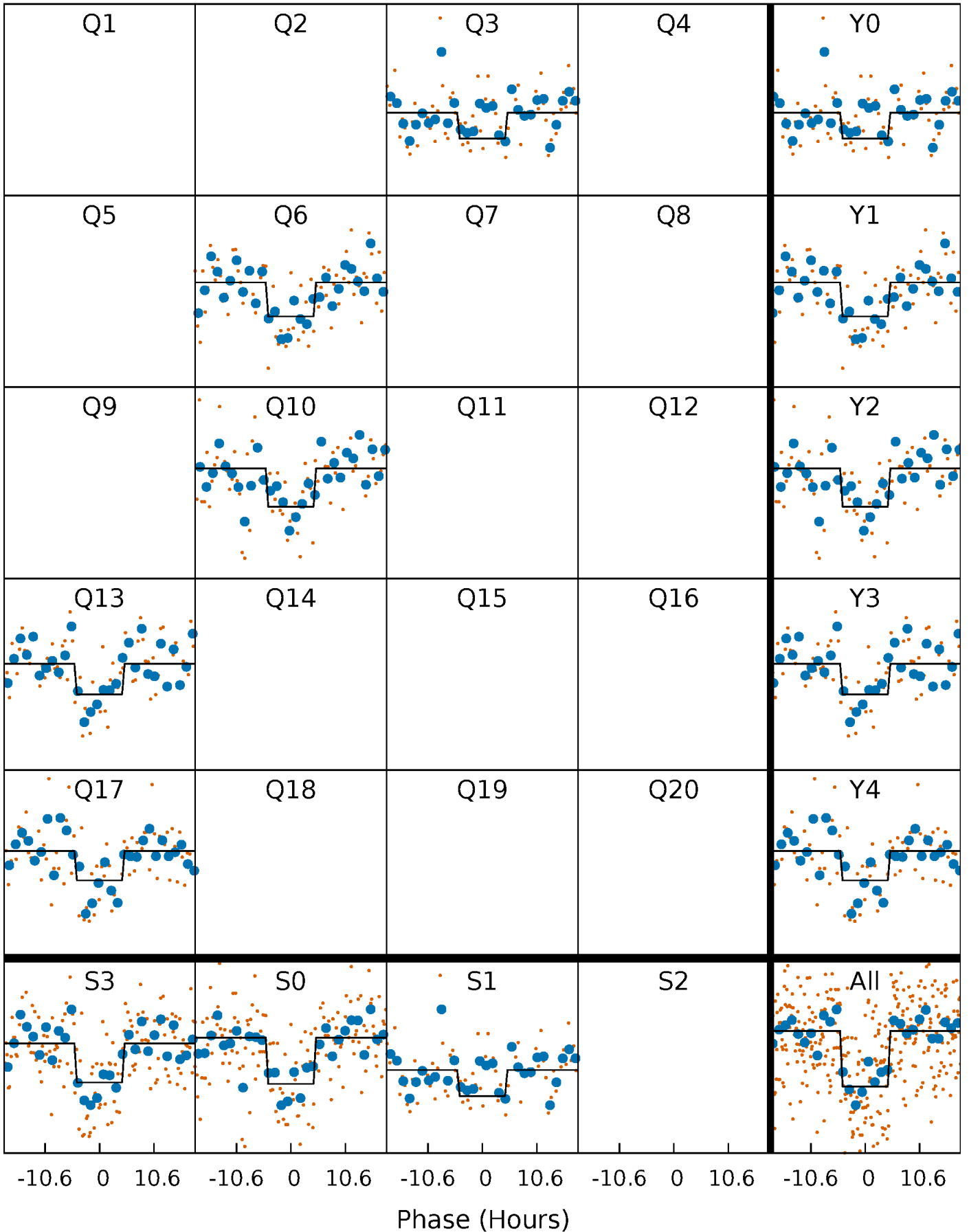
DV Quarter-Phased Transit Curves

TCE 009674320-01 P=317.091319 Days $T_0=297.799082$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

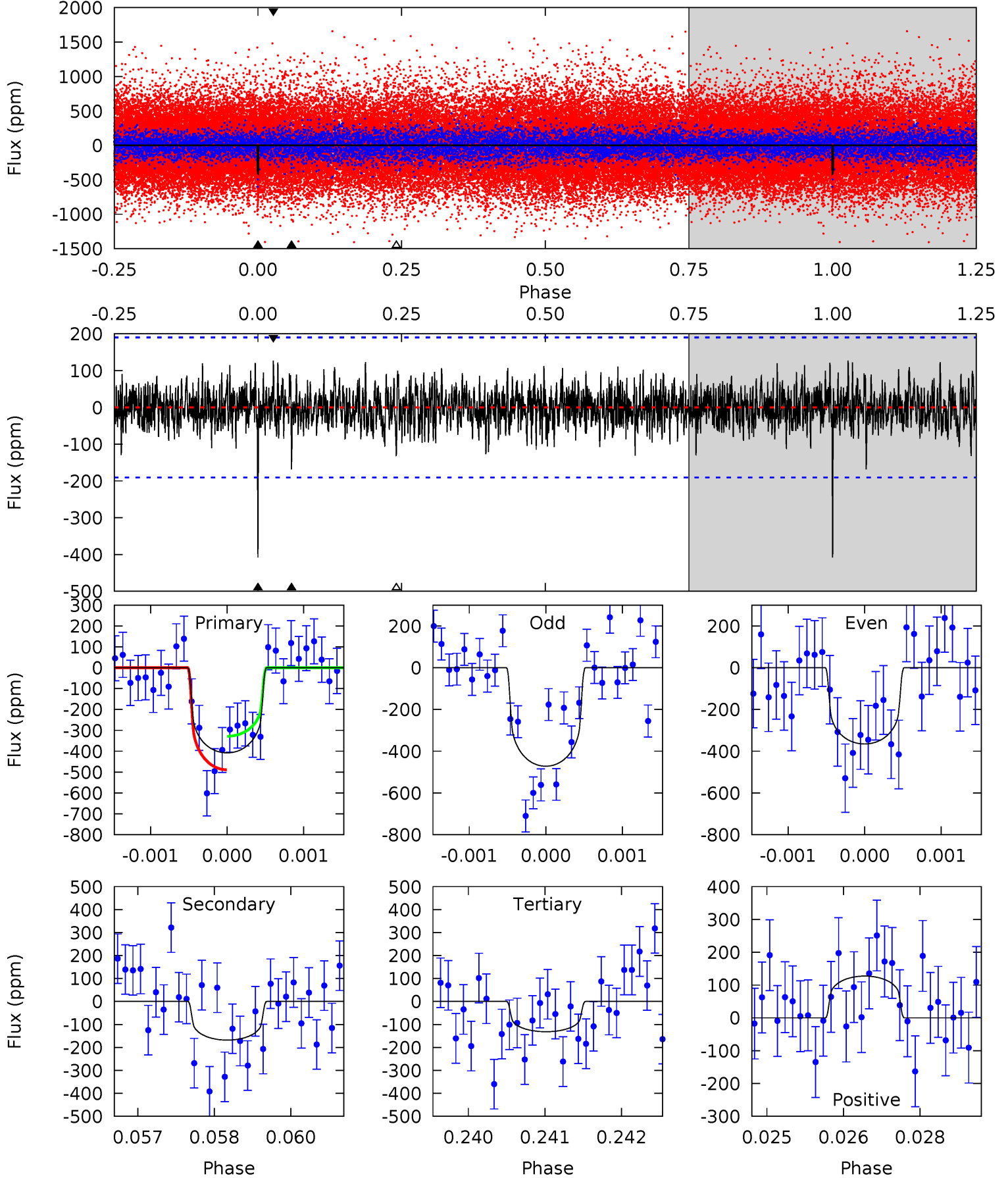
TCE 009674320-01 P=317.094795 Days $T_0=297.796079$ (BKJD)



DV Model-Shift Uniqueness Test

009674320-01, P = 317.091319 Days, E = 297.799082 Days

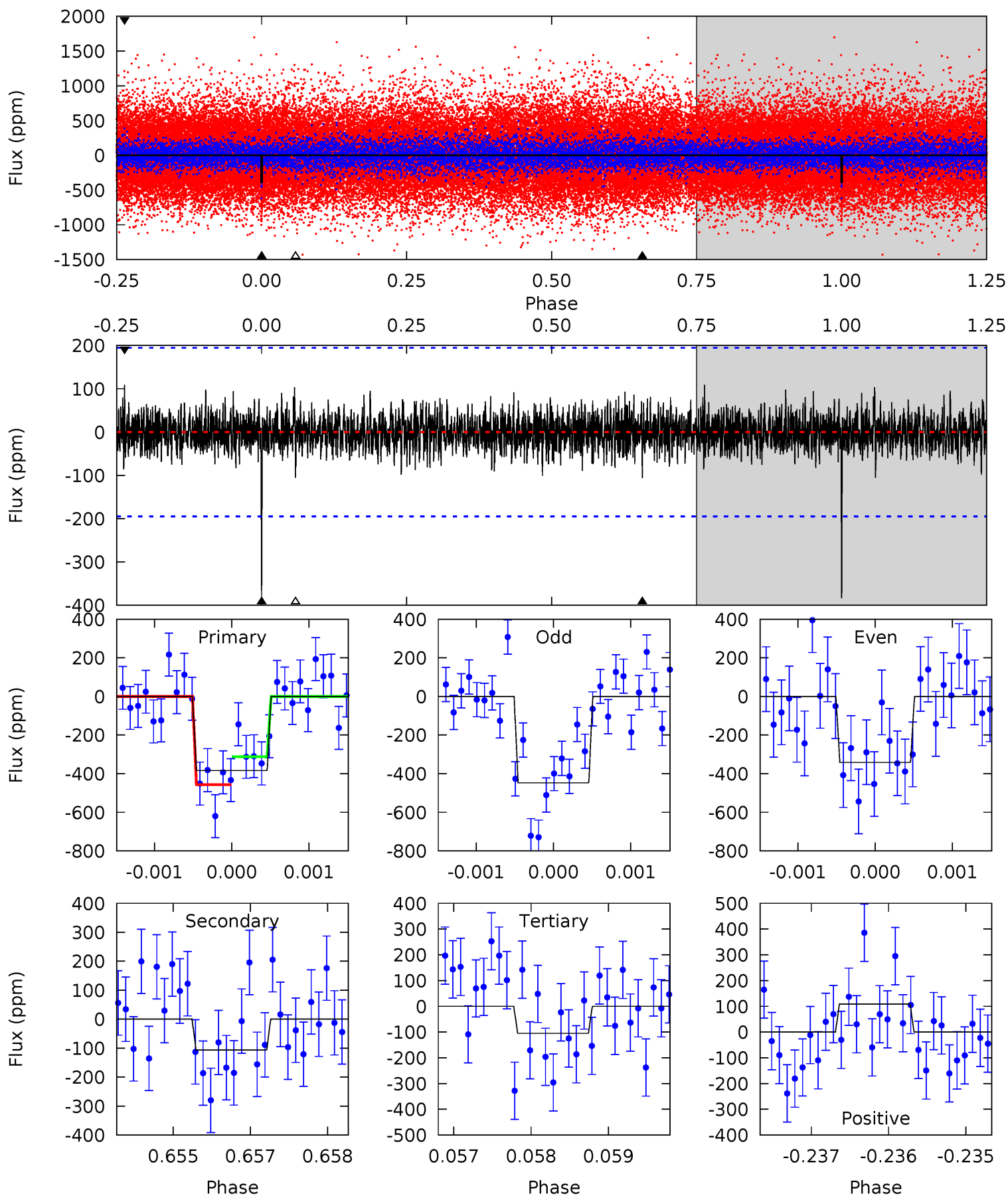
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	4.77	3.74	3.61	5.40	3.21	1.12	7.84	7.96	1.04	1.16	1.49	0.90	0.24	2.28



Alt Model-Shift Uniqueness Test

009674320-01, P = 317.094795 Days, E = 297.796079 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	2.96	2.92	3.03	5.41	3.22	0.81	7.75	7.64	0.04	-0.07	1.45	0.90	0.22	2.00



Stellar Parameters For KIC 009674320

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5366^{+160}_{-144}	$4.625^{+0.032}_{-0.104}$	$-0.400^{+0.350}_{-0.300}$	$0.715^{+0.122}_{-0.052}$	$0.793^{+0.084}_{-0.084}$	$3.059^{+0.438}_{-1.014}$
	+3%/-3%	+1%/-2%	+87%/-75%	+17%/-7%	+11%/-11%	+14%/-33%
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 009674320-01 / KOI 7223.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-168 ± 35	$1.65^{+0.89}_{-0.77}$	310^{+14}_{-12}	4420^{+1488}_{-635}	23549^{+62269}_{-14123}
Alt.	-106 ± 36	$1.67^{+0.77}_{-0.82}$	309^{+14}_{-10}	4076^{+1232}_{-555}	15147^{+39886}_{-8917}

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 $A_{obs} \gg 1.0$

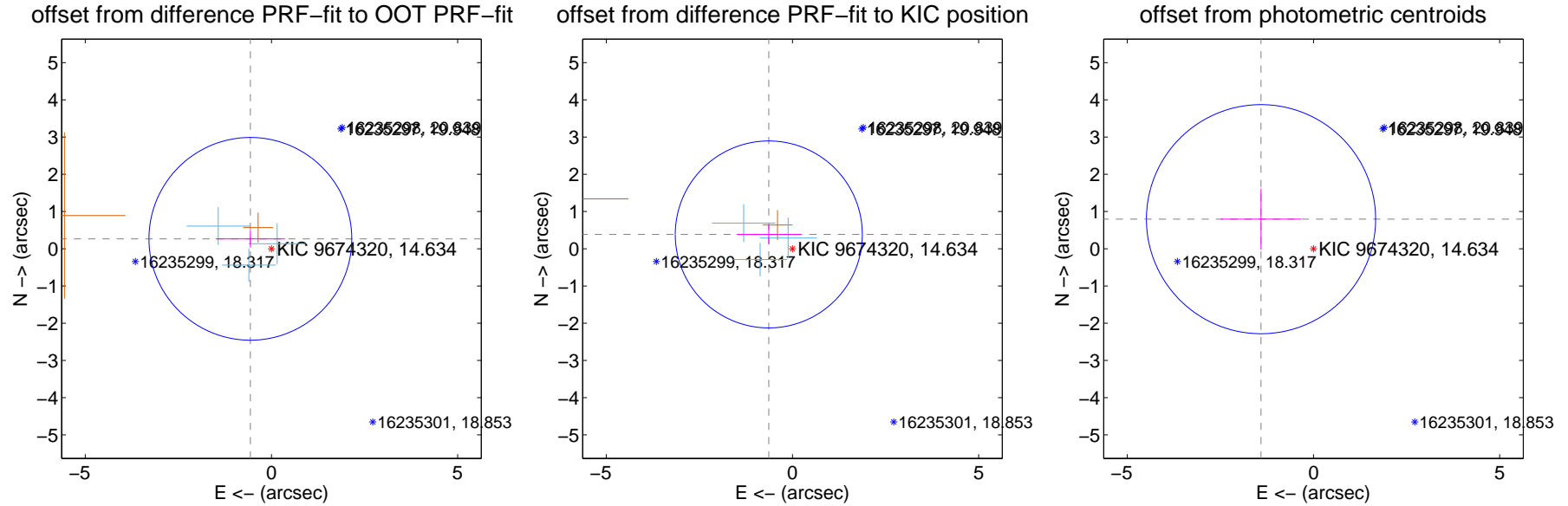
DV Centroid Data

Supplemental centroid analysis for 009674320-01. Kepler magnitude: 14.63. Transit SNR 10.48

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.626 ± 0.908	0.69	0.567 ± 0.931	0.267 ± 0.235
PRF-fit source offset from KIC position	0.743 ± 0.837	0.89	0.636 ± 0.863	0.385 ± 0.264
photometric centroid source offset	1.62 ± 1.03	1.58	1.41 ± 1.08	0.79 ± 0.82



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

Q1 no difference image



Q1 no OOT image



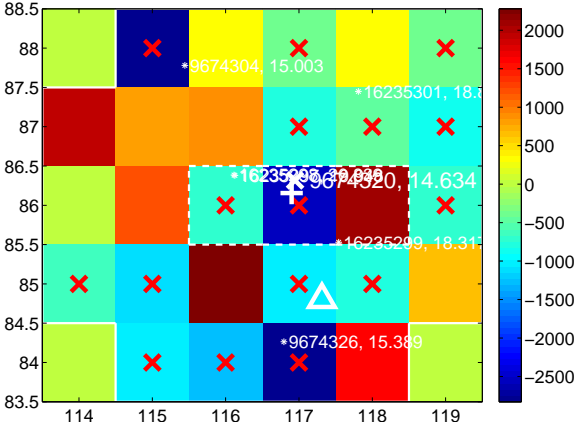
Q2 no difference image



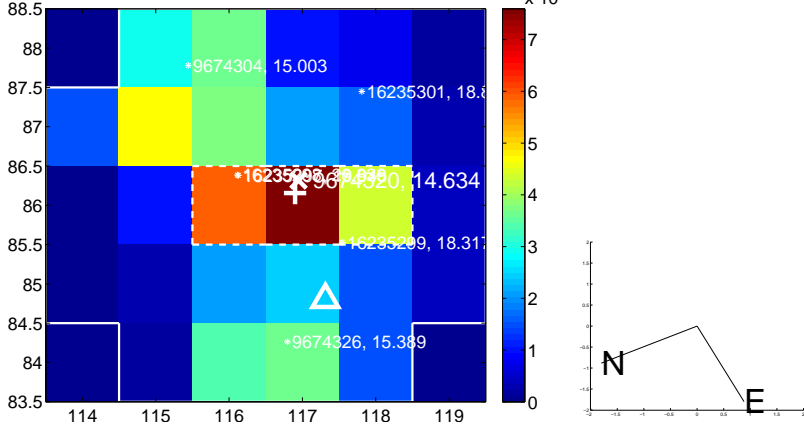
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



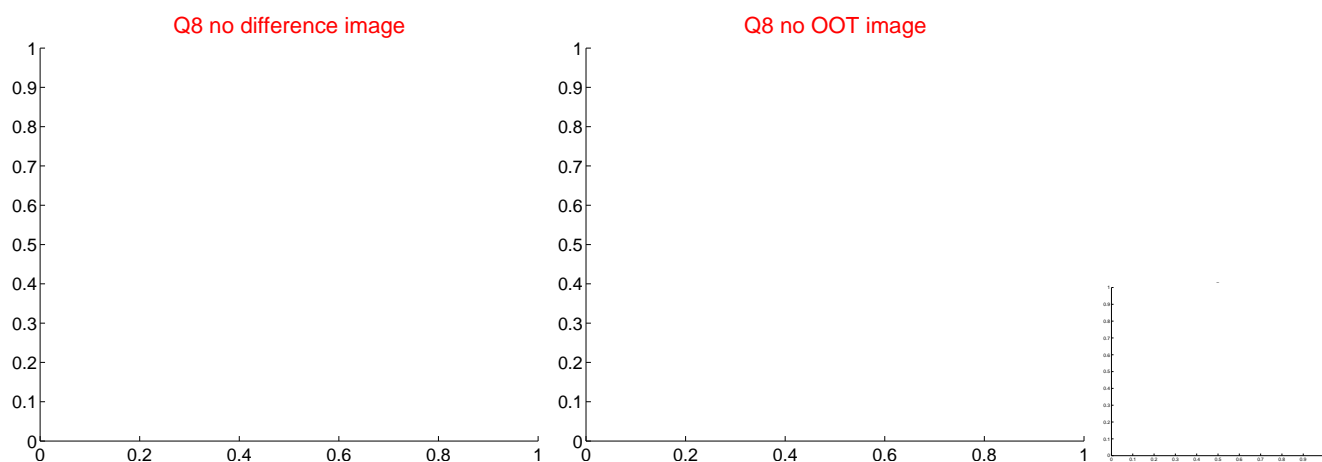
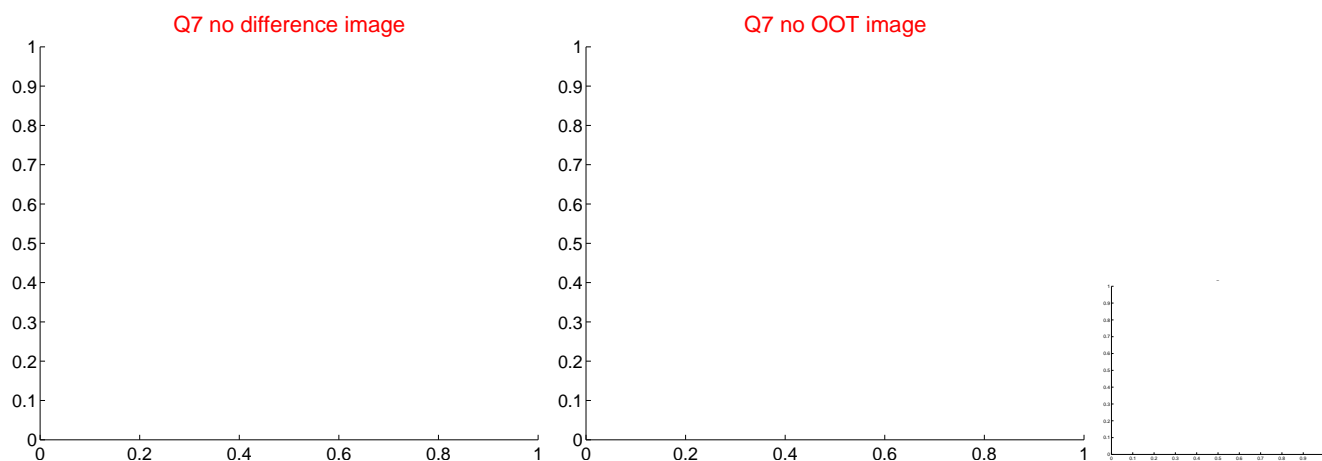
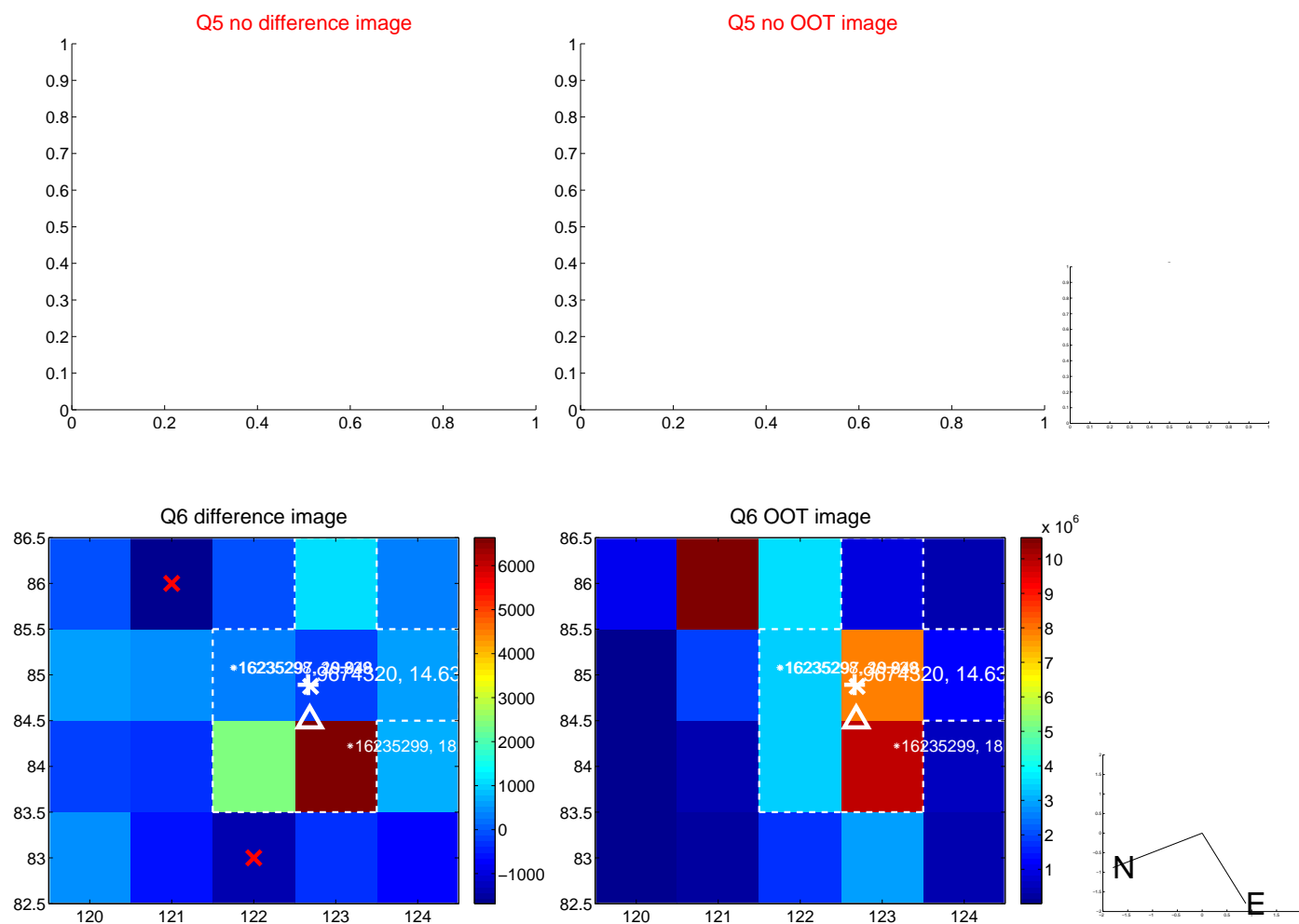
Q4 no difference image



Q4 no OOT image



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.

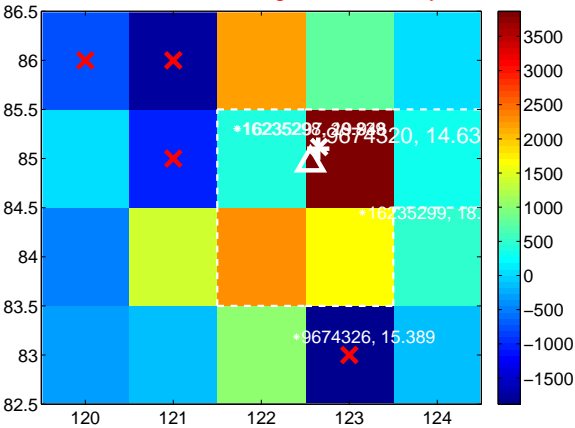
Q9 no difference image



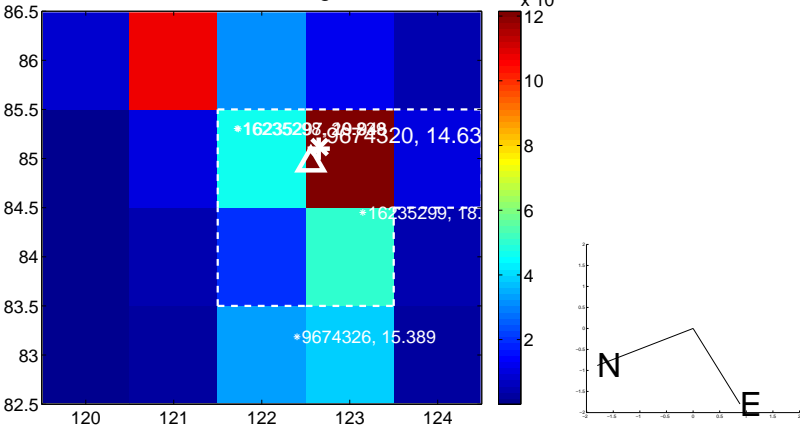
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



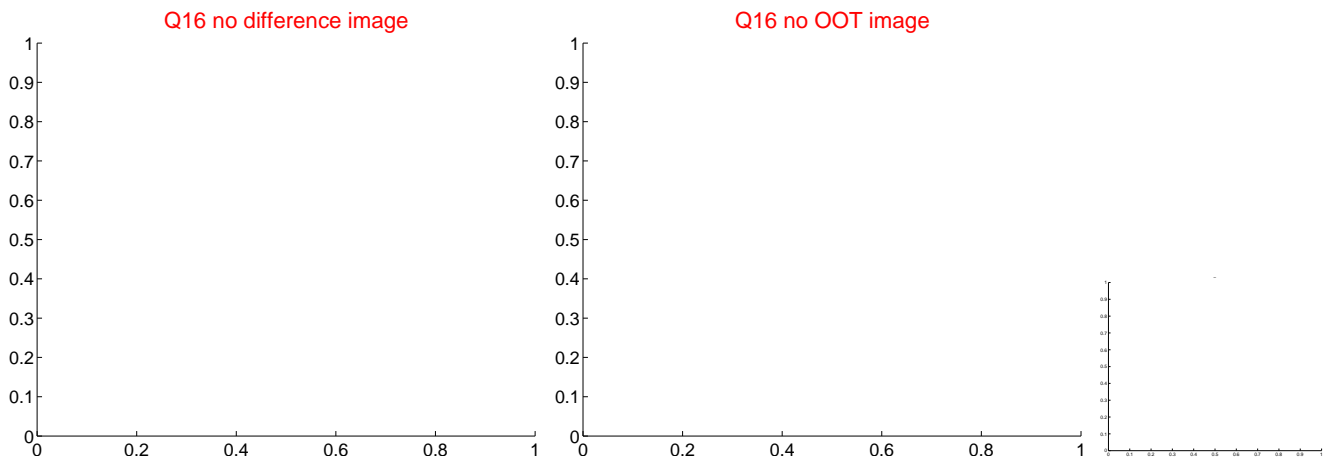
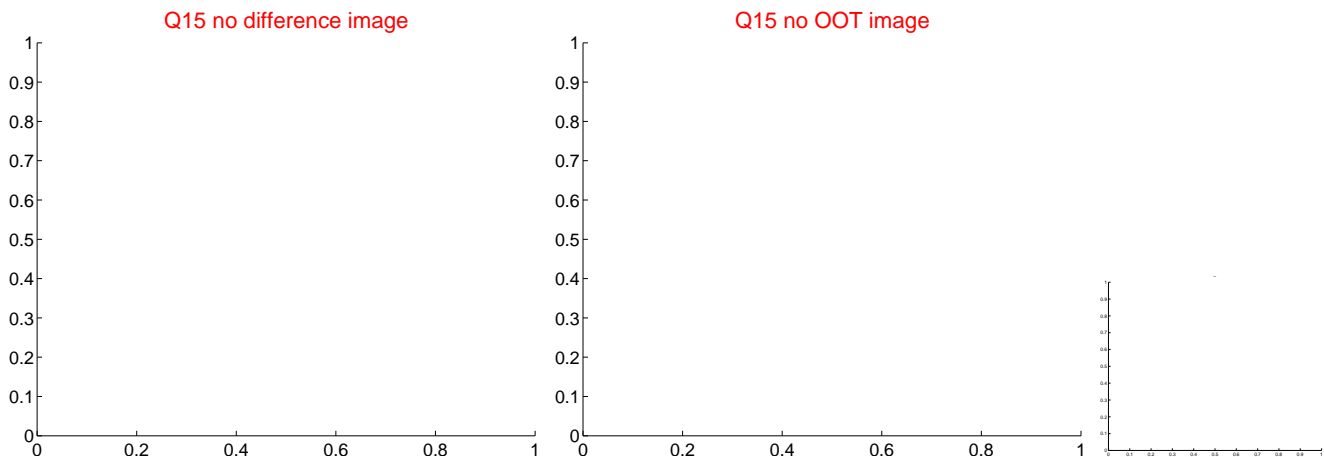
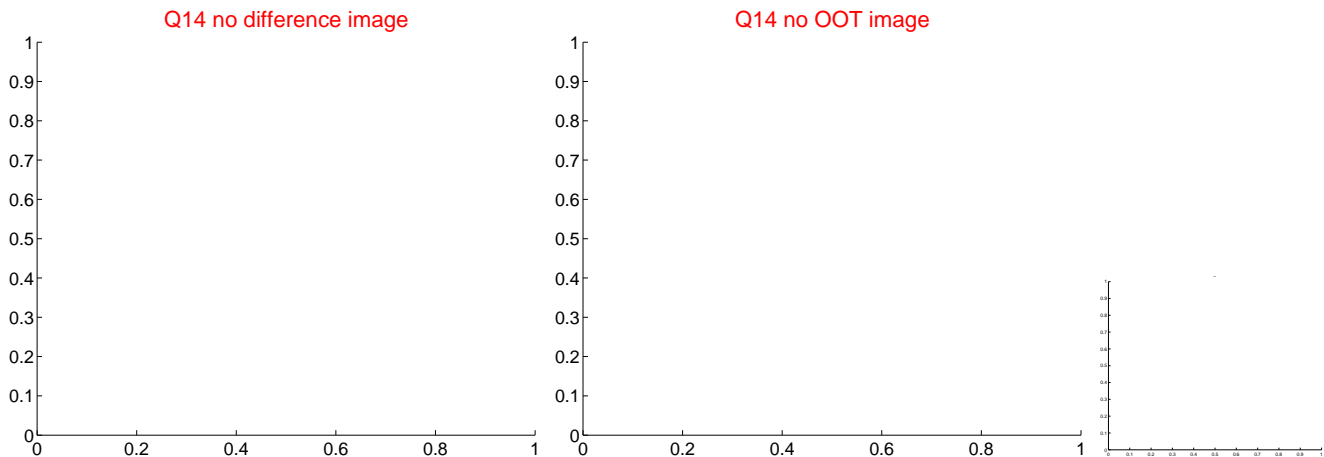
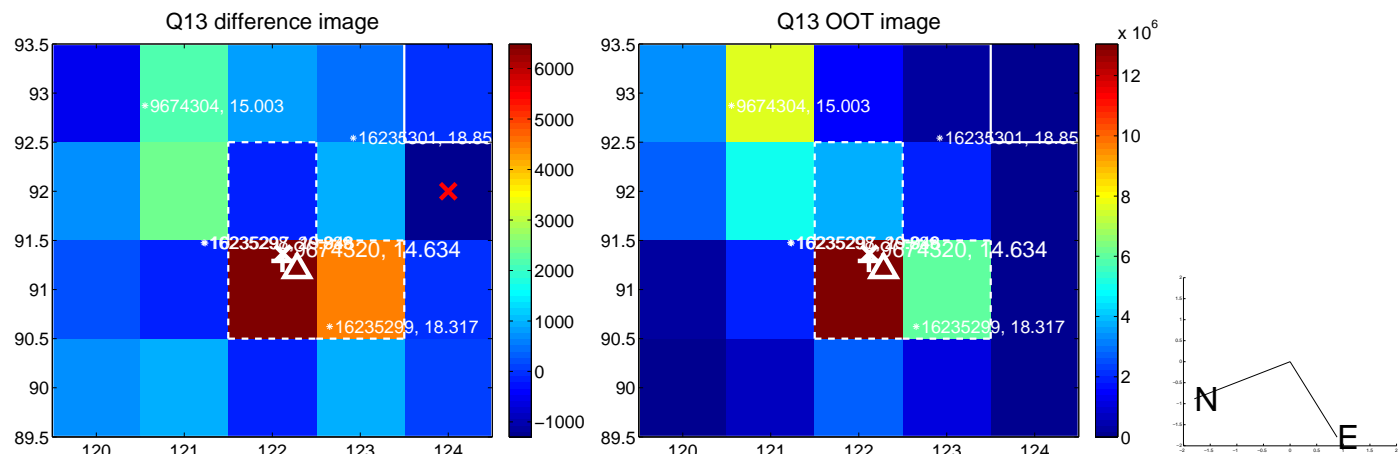
Q12 no difference image



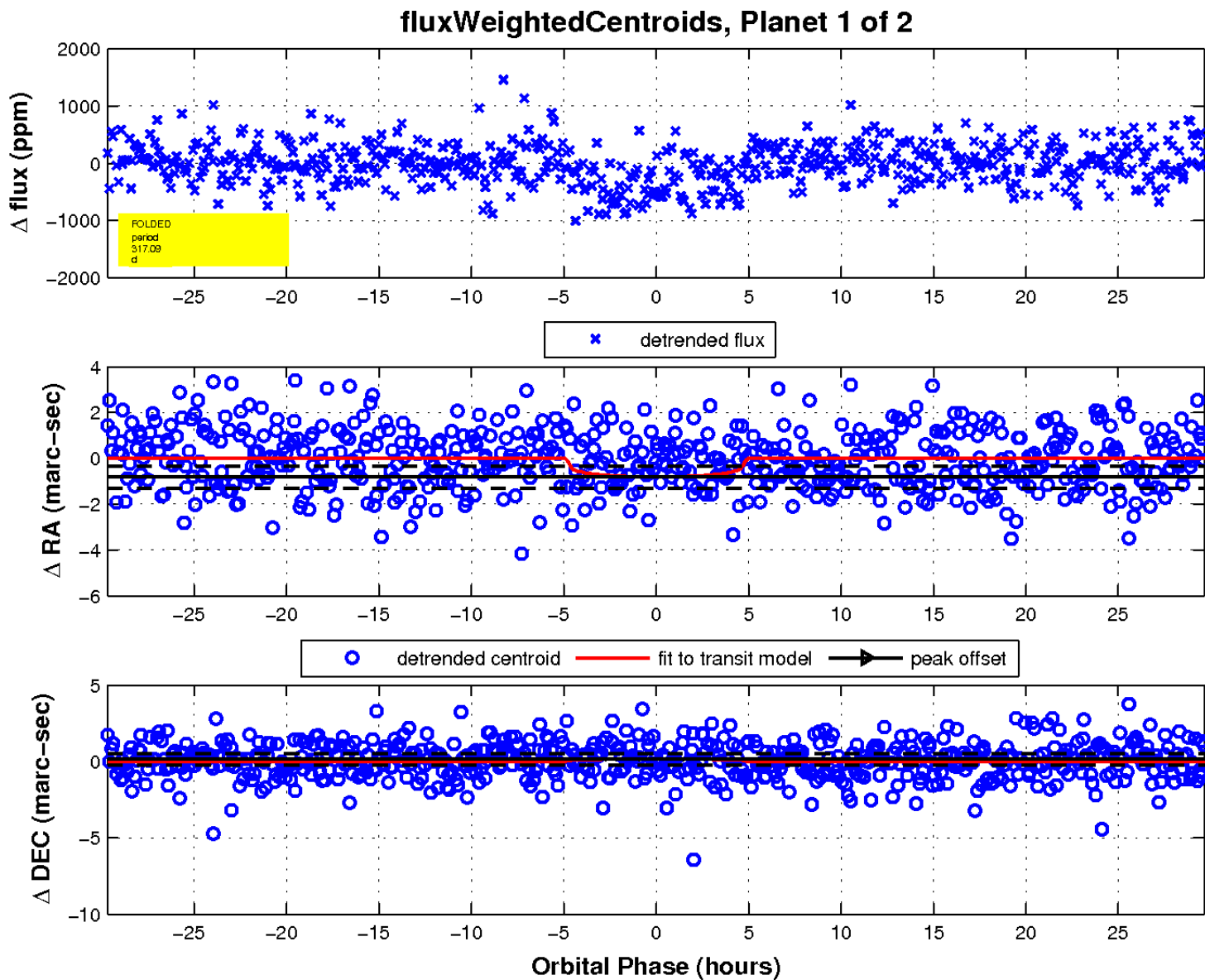
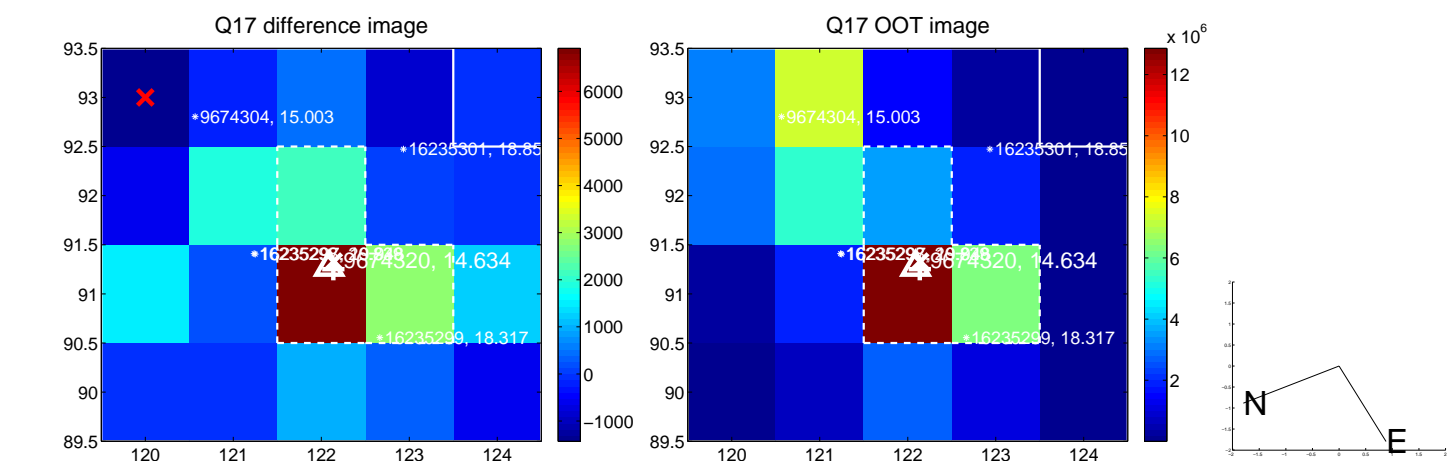
Q12 no OOT image



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

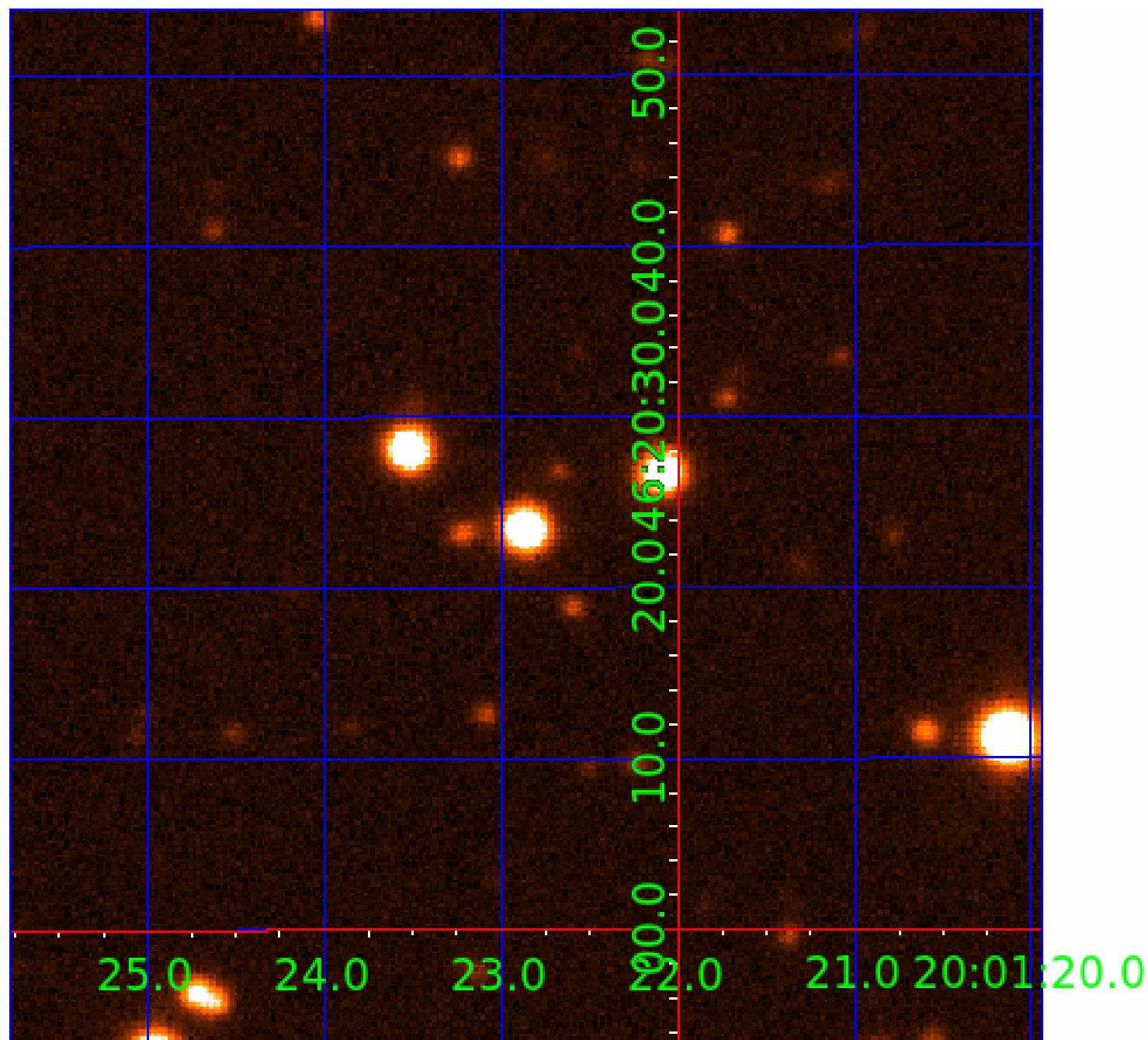


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009674320

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})
009674320-01	OBS	7223.01	317.091319	297.799082	437.5	9.906	10.3	10.5	0.71	5366	1.61	0.54
009674320-02	OBS	No	450.142521	183.375941	499.1	7.584	7.1	7.2	0.71	5366	1.76	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009674320-01	OBS	PC	0.95	0	0	0	0	CENT_FEW_DIFFS
009674320-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—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.

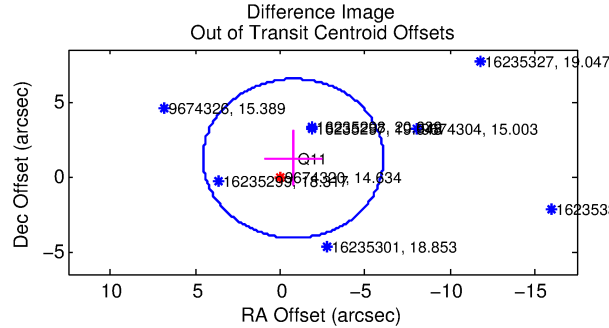
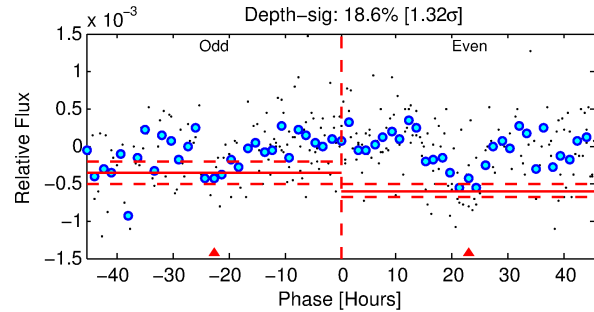
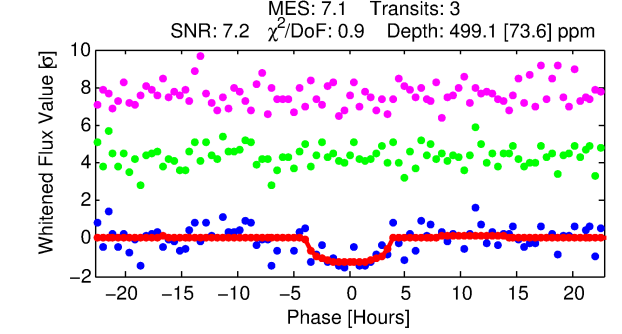
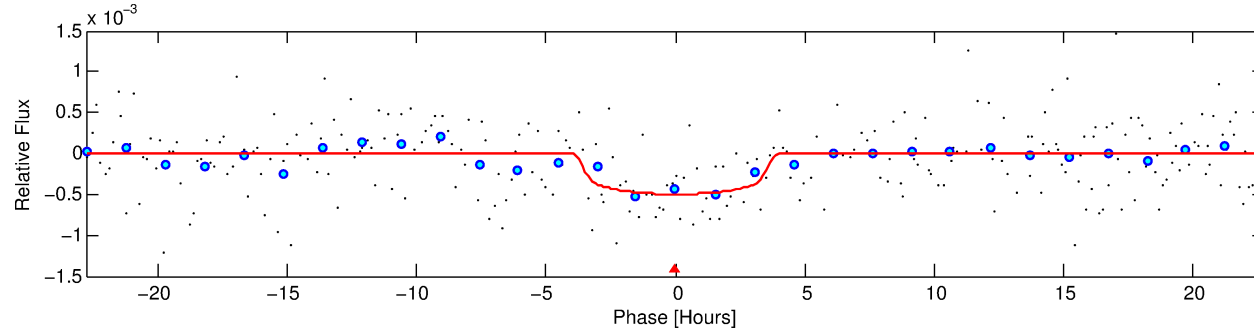
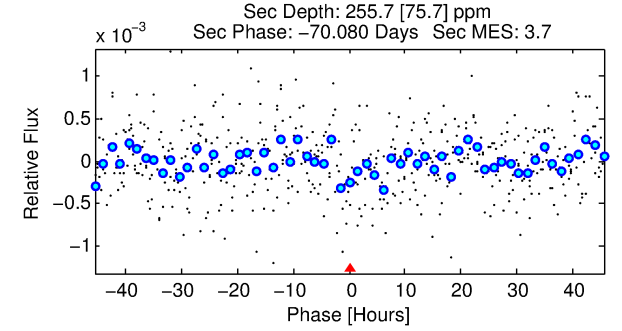
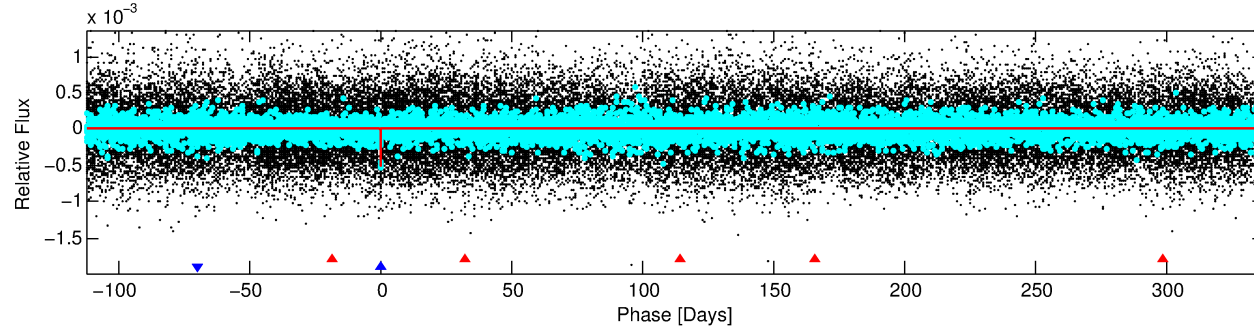
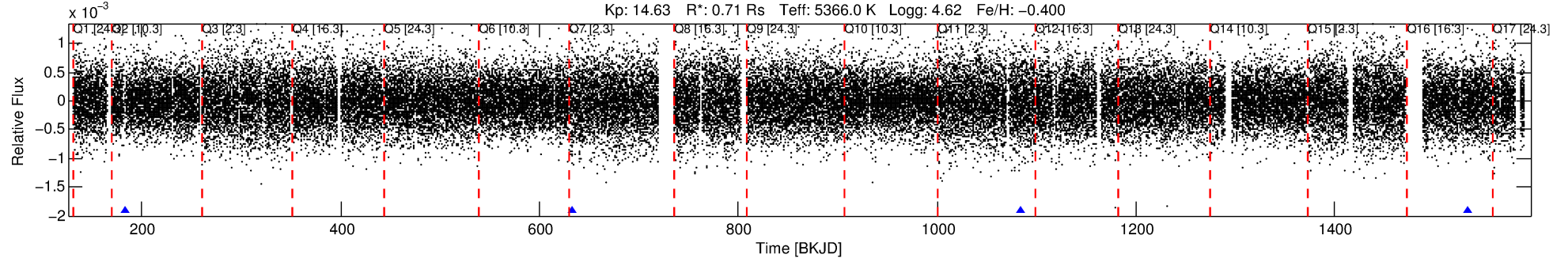
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009674320-02

No Significant Match Found

DV One-Page Summary

KIC: 9674320 Candidate: 2 of 2 Period: 450.143 d
KOI: K07223 Corr: No Ephemeris Match



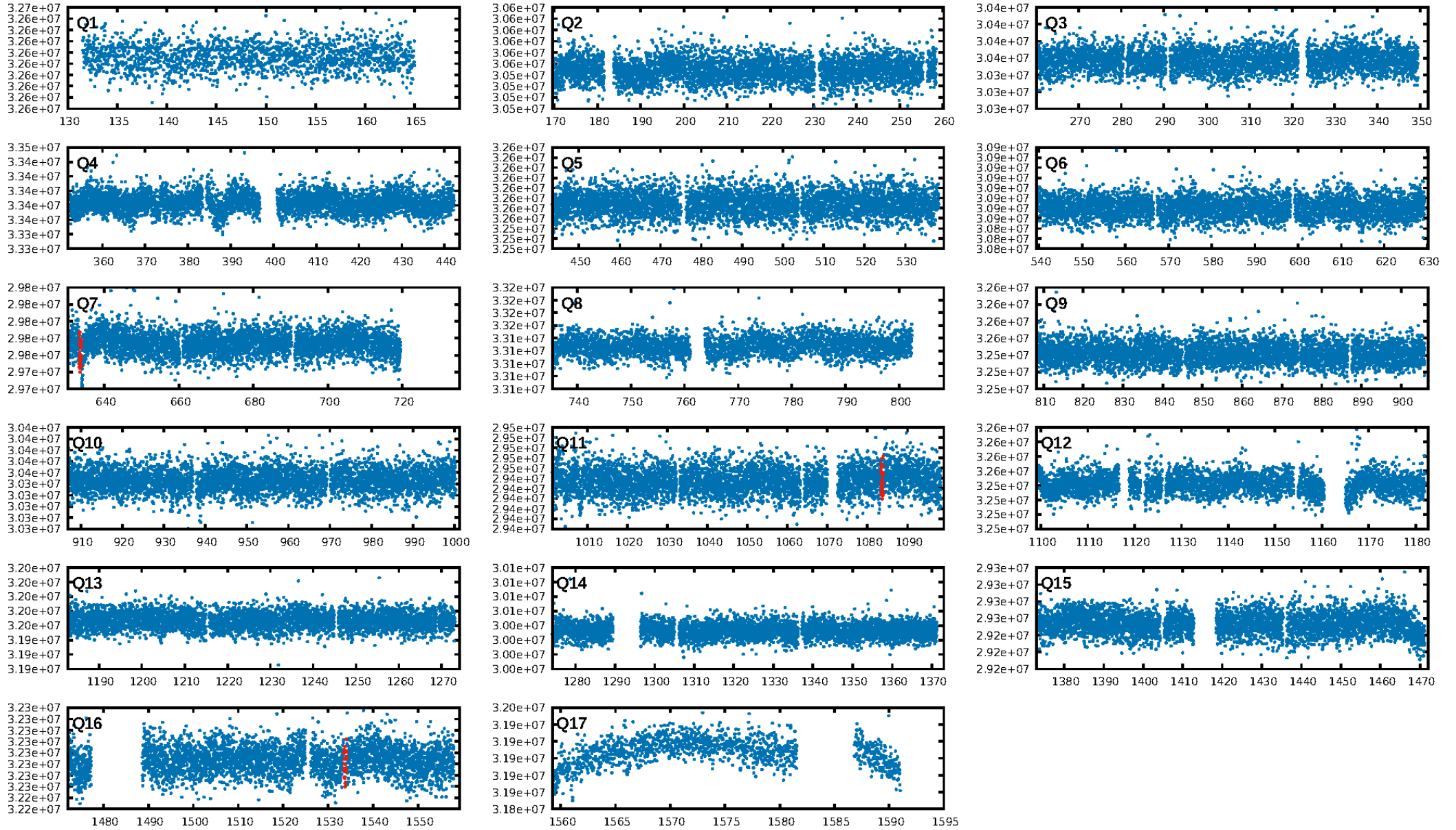
DV Fit Results:

Period = 450.14252 [0.01215] d
Epoch = 183.3759 [0.0284] BKJD
Rp/R* = 0.0225 [0.0169]
a/R* = 299.85 [944.86]
b = 0.78 [1.60]
Seff = 0.34 [0.08]
Teq = 194 [11] K
Rp = 1.76 [1.35] Re
a = 1.0612 [0.1475] AU
Ag = 51218.26 [78827.96] [0.65 σ]
Teff = 4520 [1730] K [2.50 σ]

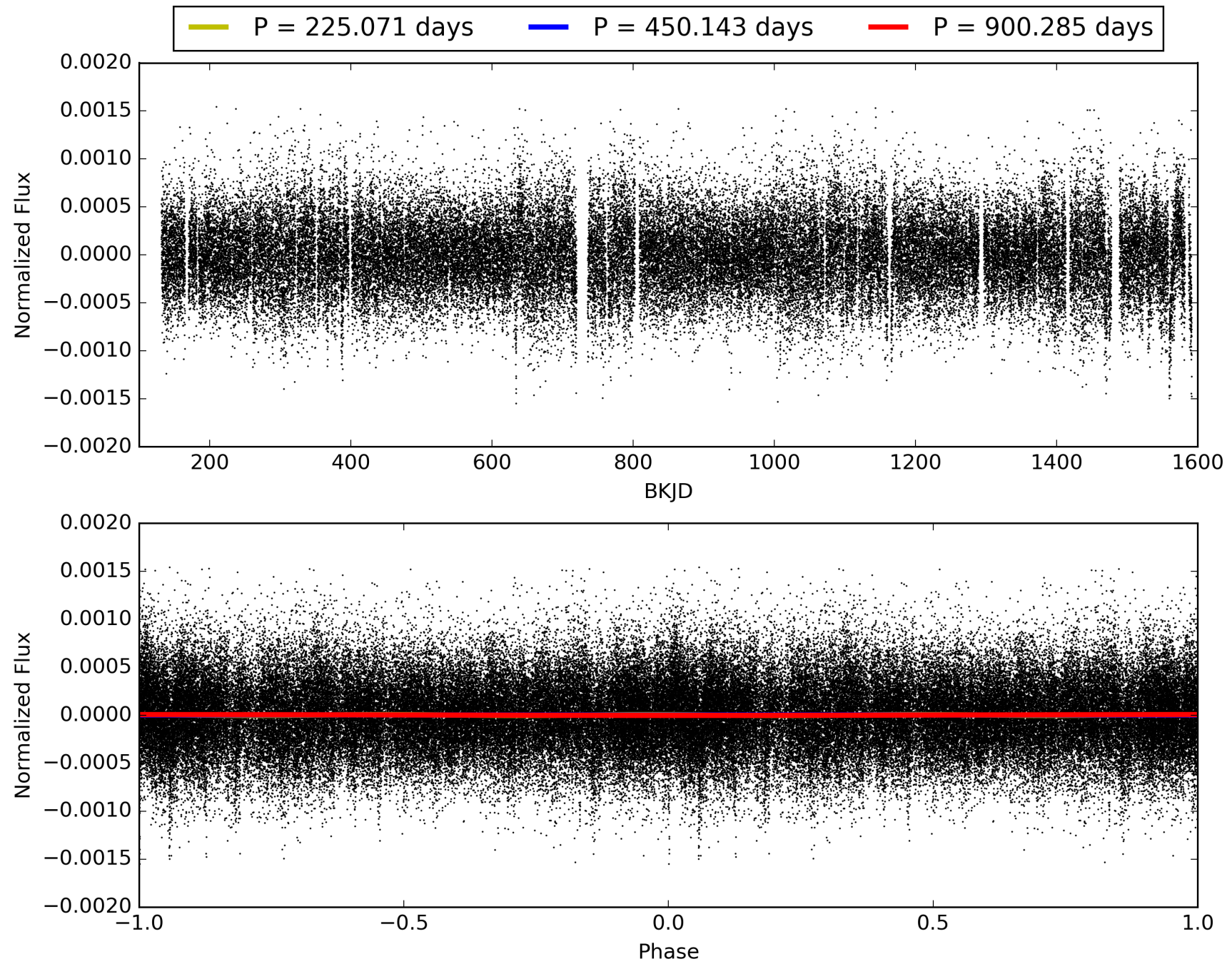
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [255.95 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.2%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: 7.96e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.8
Centroid-sig: 29.5%
Centroid-so: 1.073 arcsec [0.52 σ]
OotOffset-rm: 1.440 arcsec [0.81 σ]
KicOffset-rm: 1.635 arcsec [0.91 σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [1/1]

TCE 009674320-02, PDC Light Curves

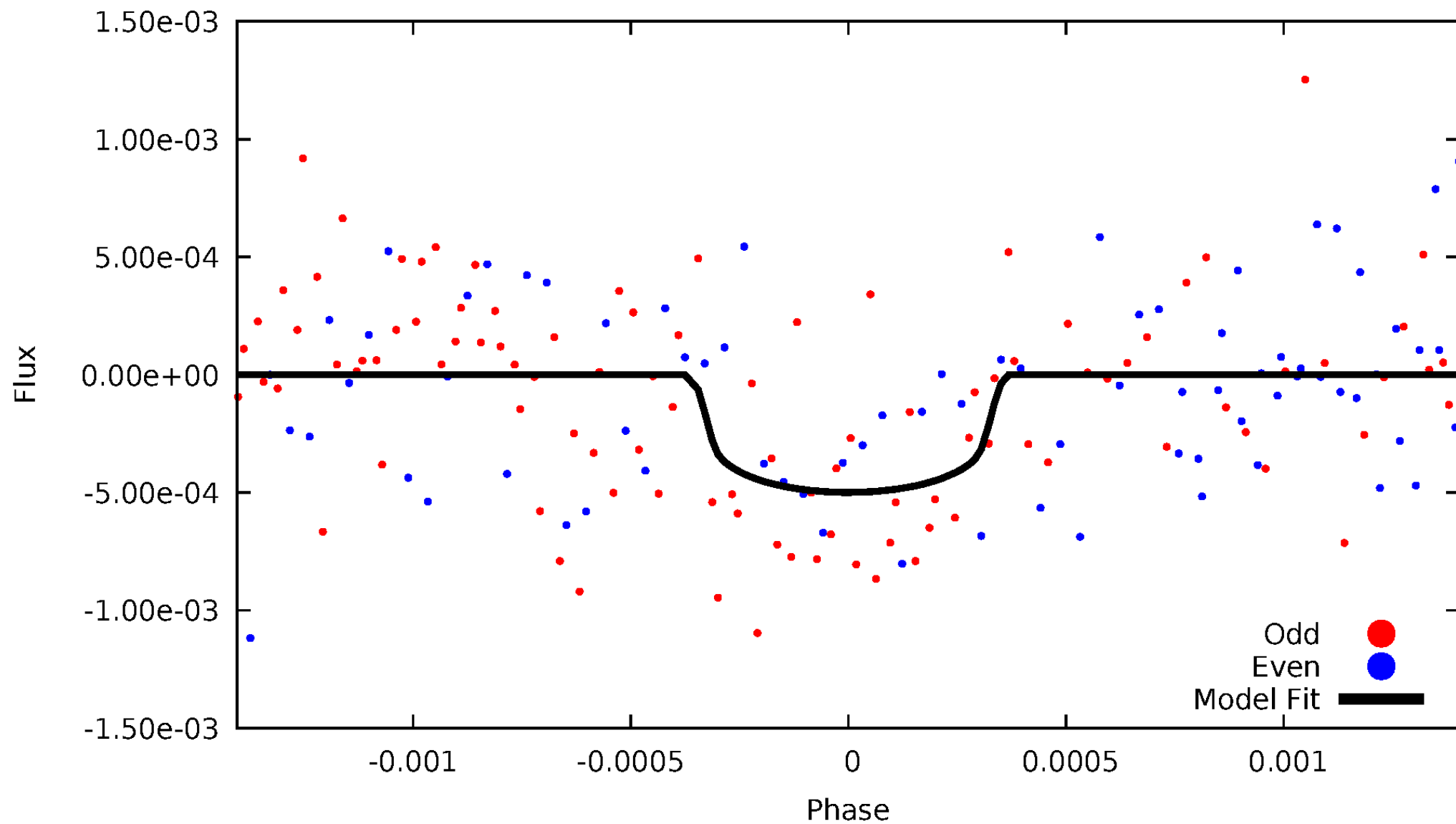


TCE 009674320-02



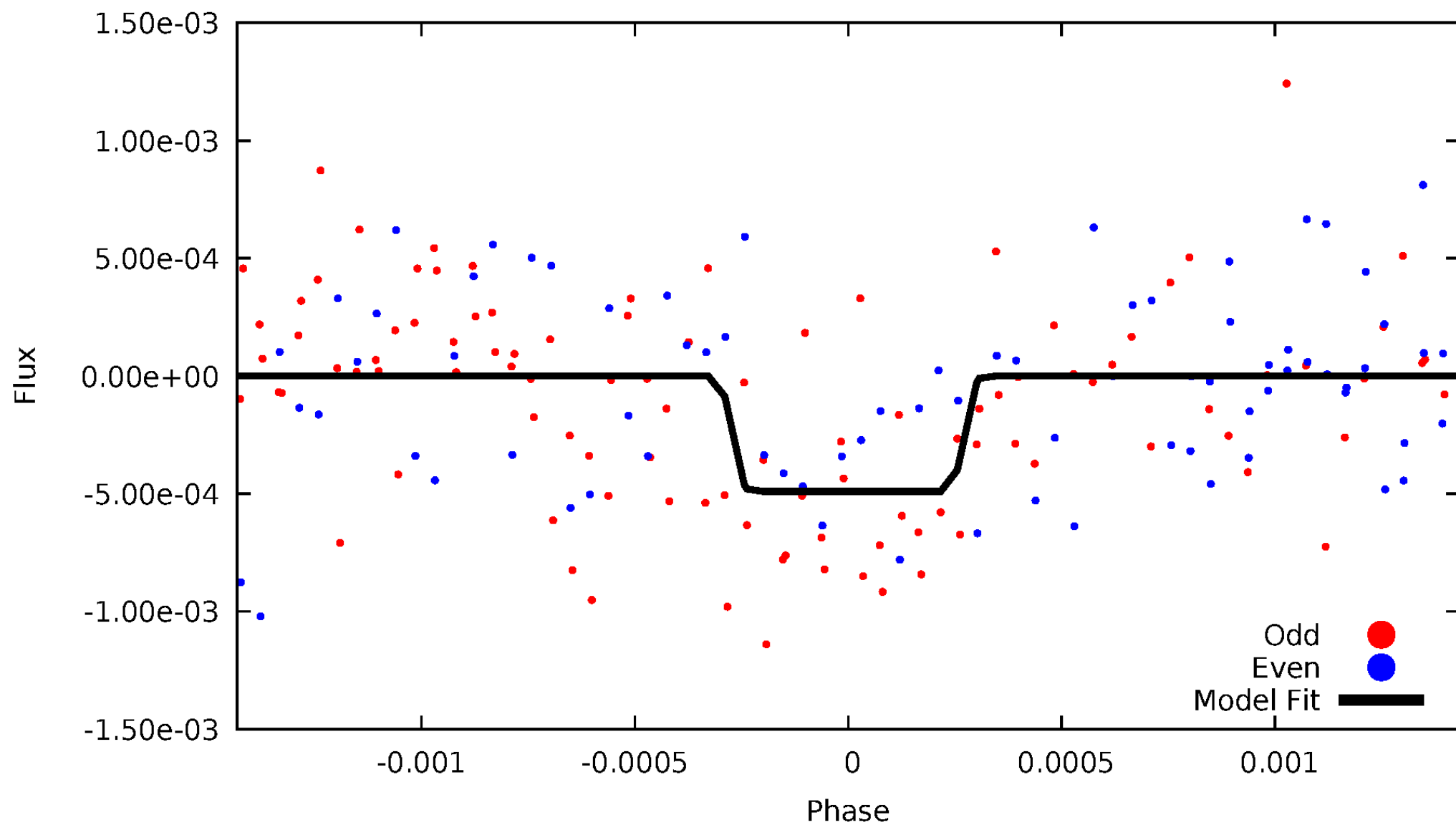
DV Odd/Even

TCE 009674320-02



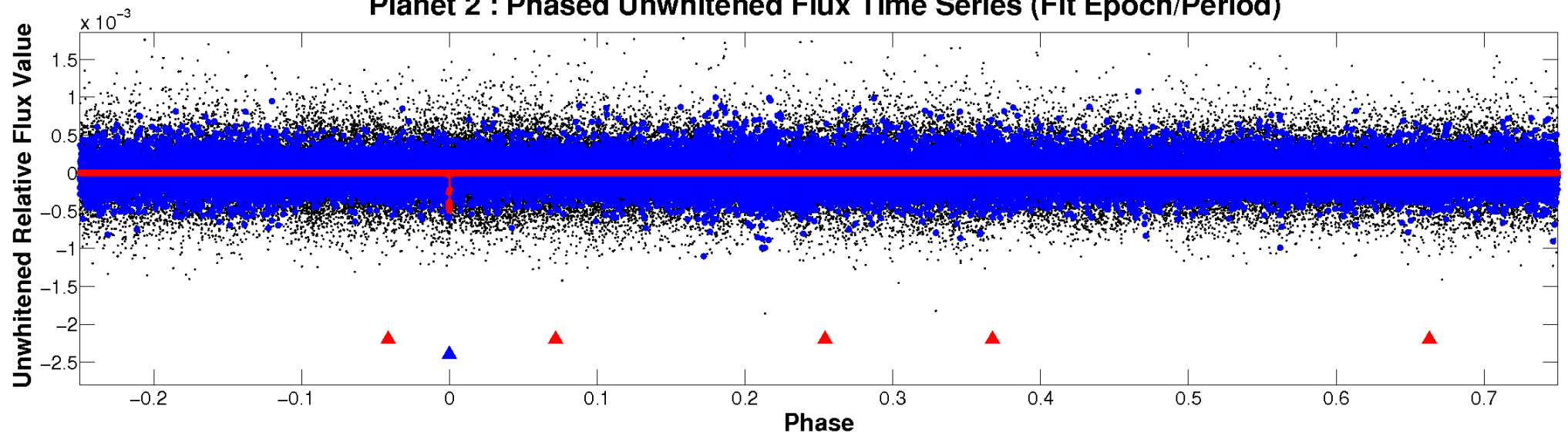
ALT Odd/Even

TCE 009674320-02

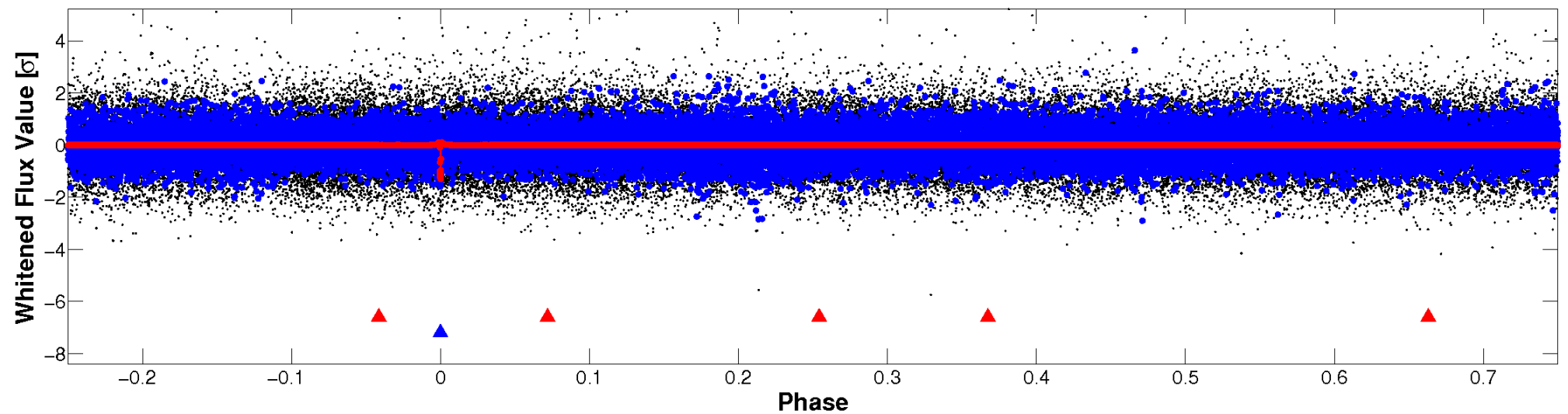


Non-Whitened Vs. Whitened Light Curve

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



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



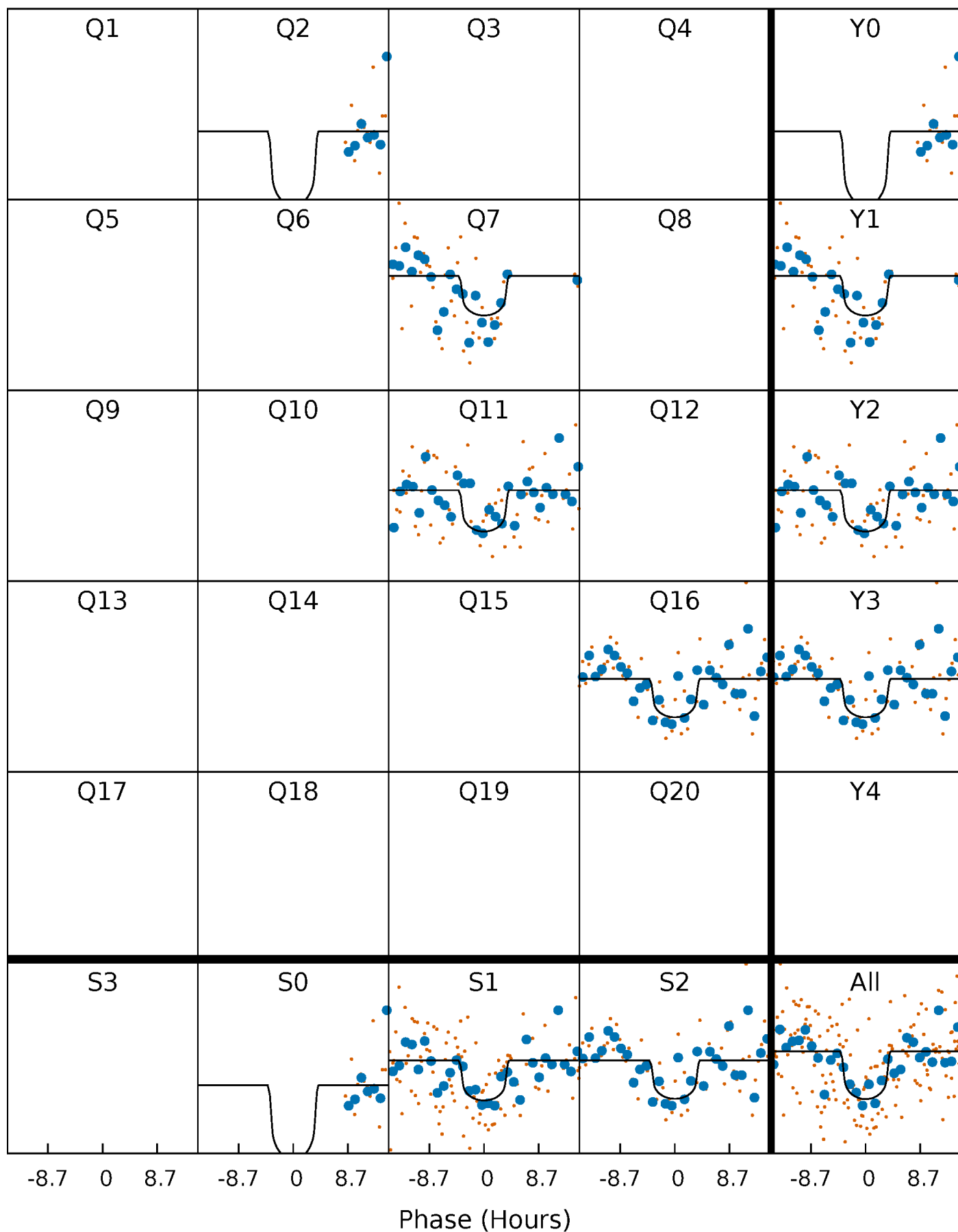
PDC Quarter-Phased Transit Curves

TCE 009674320-02 P=450.142521 Days $T_0=183.375941$ (BKJD)



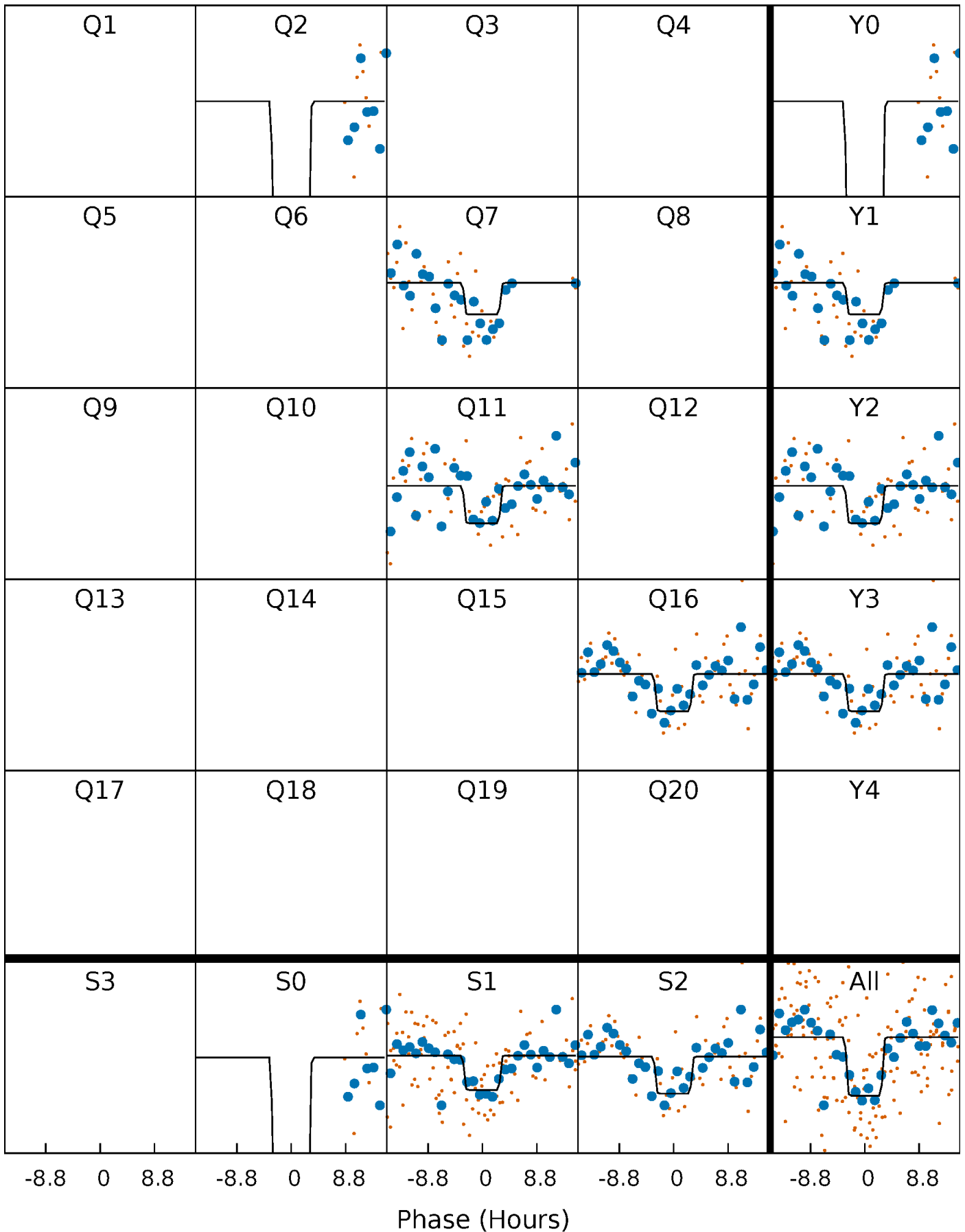
DV Quarter-Phased Transit Curves

TCE 009674320-02 $P=450.142521$ Days $T_0=183.375941$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

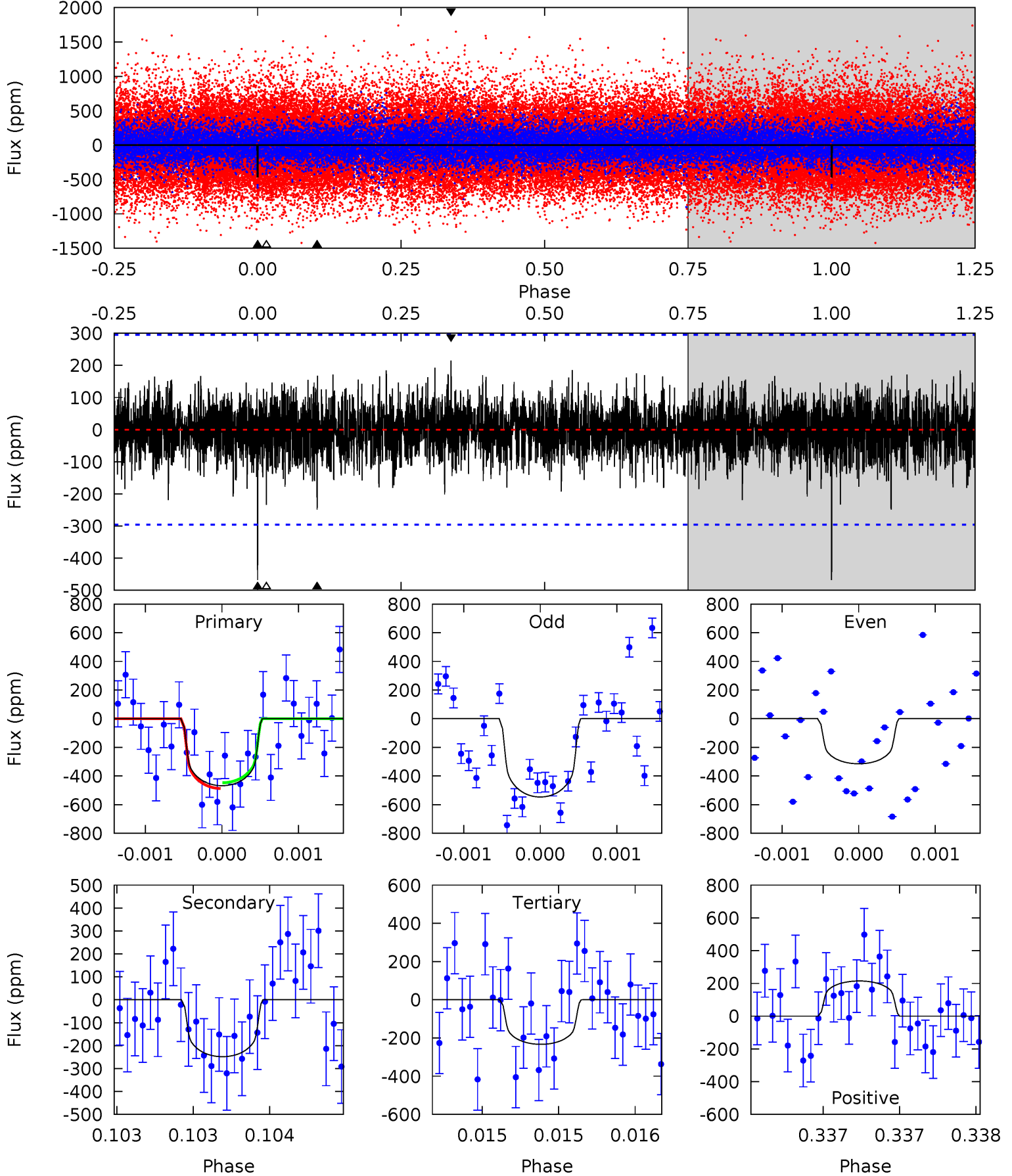
TCE 009674320-02 P=450.151327 Days $T_0=183.359664$ (BKJD)



DV Model-Shift Uniqueness Test

009674320-02, P = 450.142521 Days, E = 183.375941 Days

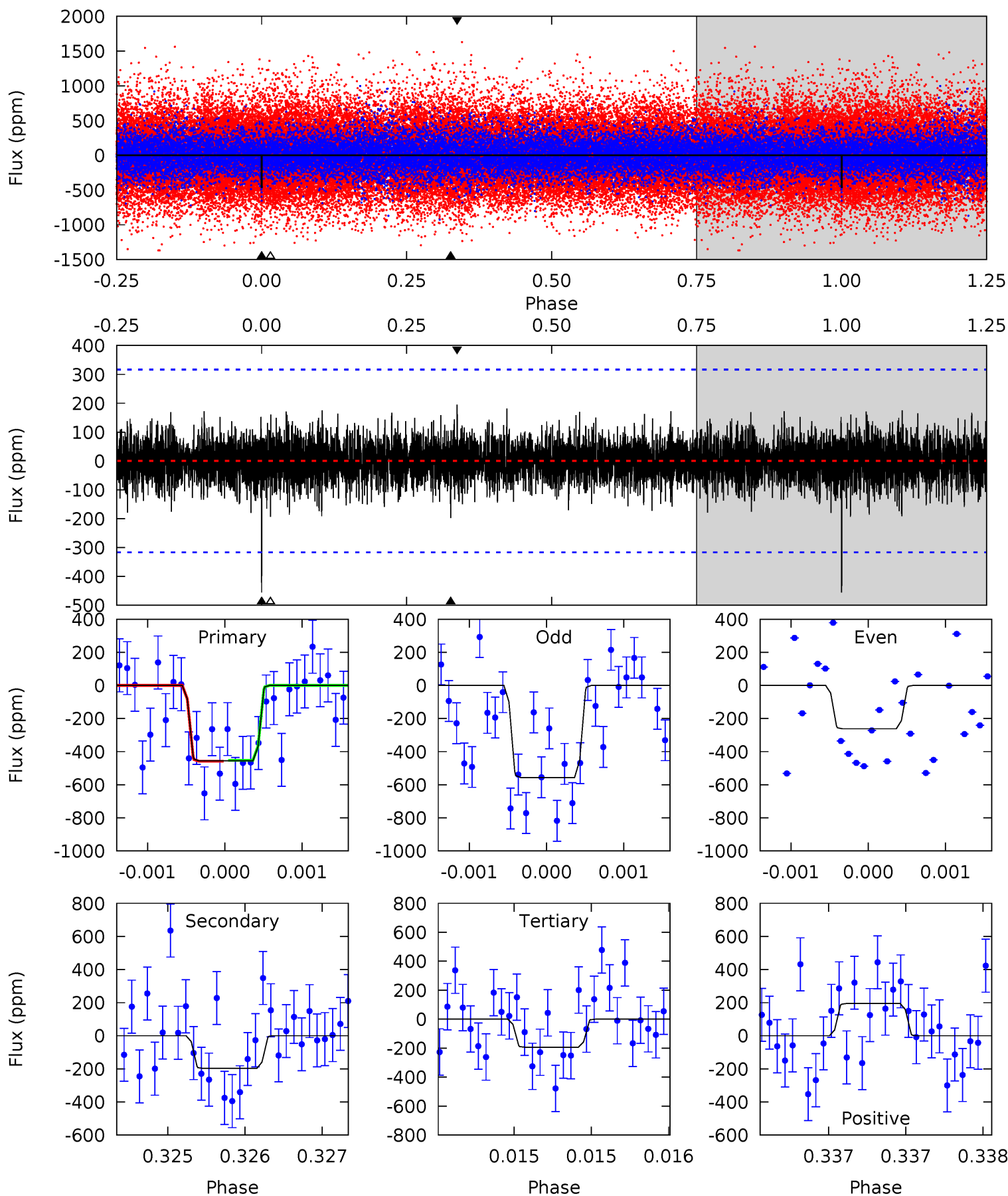
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.73	4.63	4.35	4.01	5.51	3.39	1.07	4.38	4.73	0.28	0.63	2.06	1.09	0.31	0.38



Alt Model-Shift Uniqueness Test

009674320-02, P = 450.151327 Days, E = 183.359664 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.98	3.45	3.39	3.41	5.54	3.43	0.88	4.59	4.57	0.07	0.05	2.46	1.15	0.30	0.05



Stellar Parameters For KIC 009674320

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5366^{+160}_{-144}	$4.625^{+0.032}_{-0.104}$	$-0.400^{+0.350}_{-0.300}$	$0.715^{+0.122}_{-0.052}$	$0.793^{+0.084}_{-0.084}$	$3.059^{+0.438}_{-1.014}$
	+3%/-3%	+1%/-2%	+87%/-75%	+17%/-7%	+11%/-11%	+14%/-33%
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 009674320-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-248 ± 54	$1.98^{+1.24}_{-1.16}$	276^{+12}_{-10}	4445^{+2107}_{-730}	$37585^{+183280}_{-23777}$
Alt.	-197 ± 57	$1.92^{+1.25}_{-1.12}$	275^{+12}_{-9}	4304^{+2011}_{-730}	$33426^{+153382}_{-22471}$

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

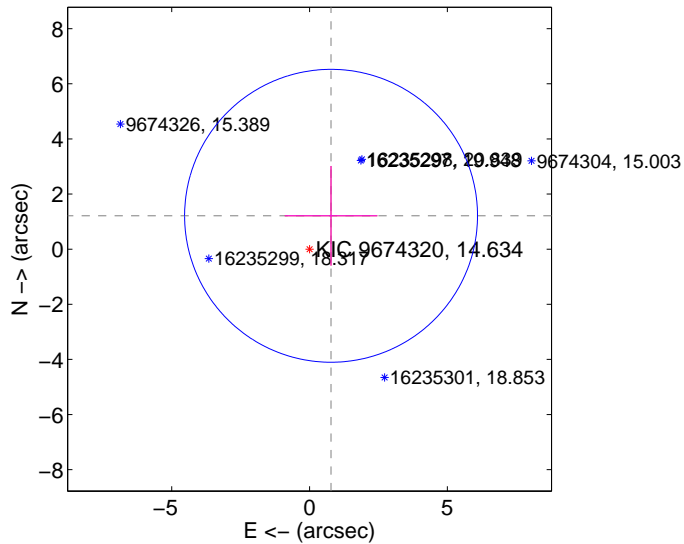
Supplemental centroid analysis for 009674320-02. Kepler magnitude: 14.63. Transit SNR 7.18

There are 0 quarters with good PRF difference image offsets

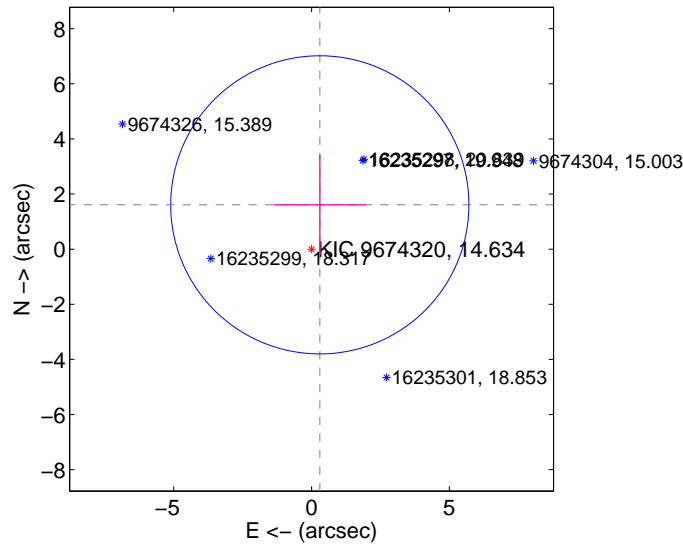
The direct PRF centroid is offset from the target star catalog position by about 0.62 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.440 ± 1.771	0.81	-0.780 ± 1.682	1.211 ± 1.807
PRF-fit source offset from KIC position	1.635 ± 1.803	0.91	-0.299 ± 1.682	1.608 ± 1.807
photometric centroid source offset	1.07 ± 2.08	0.52	1.05 ± 2.10	0.21 ± 1.41

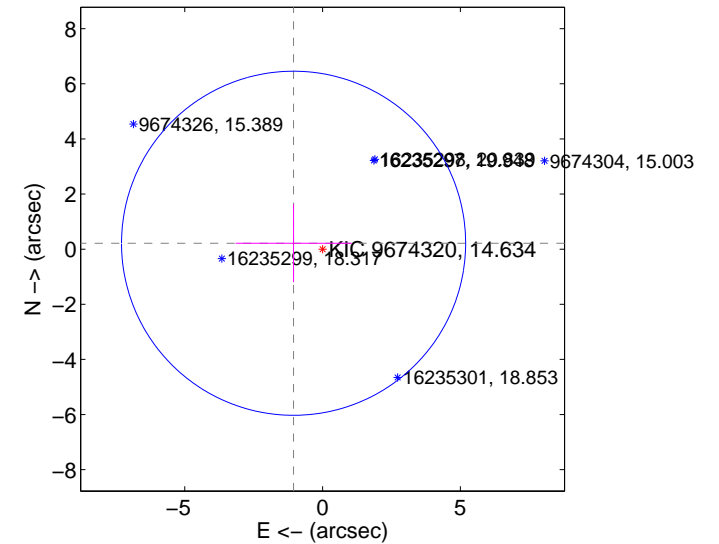
offset from difference PRF-fit to OOT PRF-fit



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.

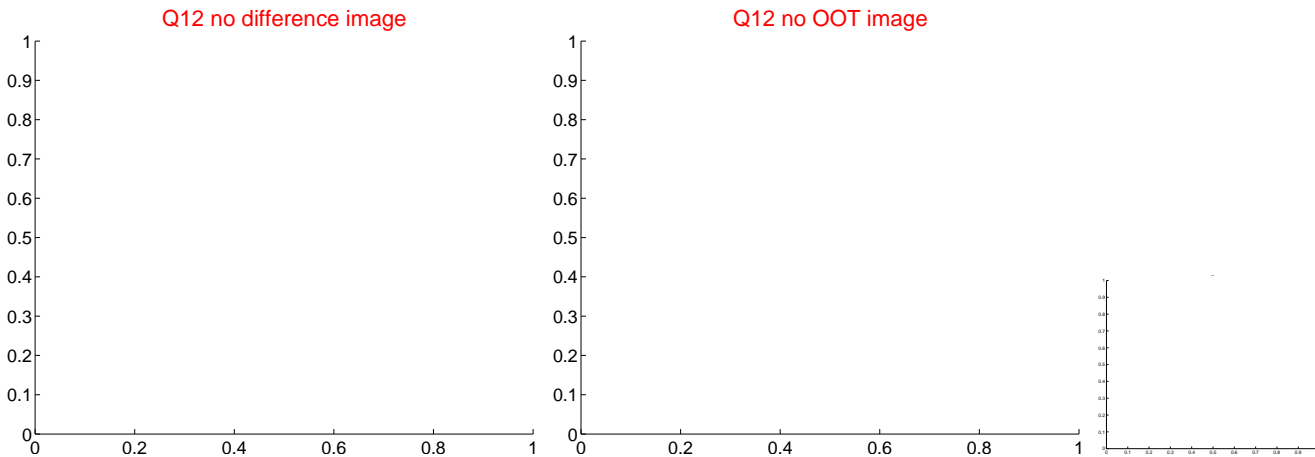
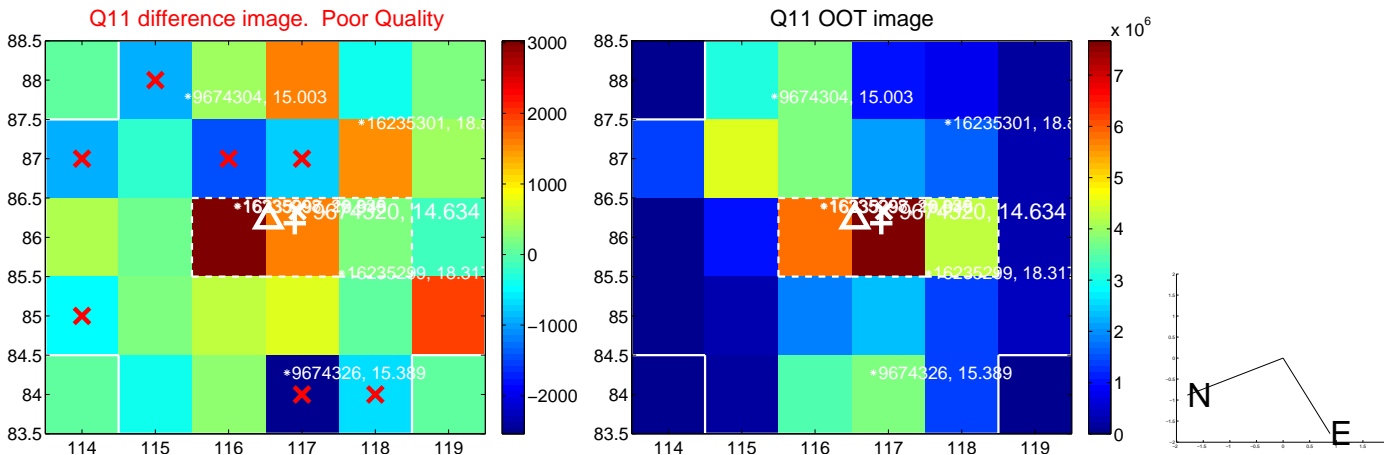
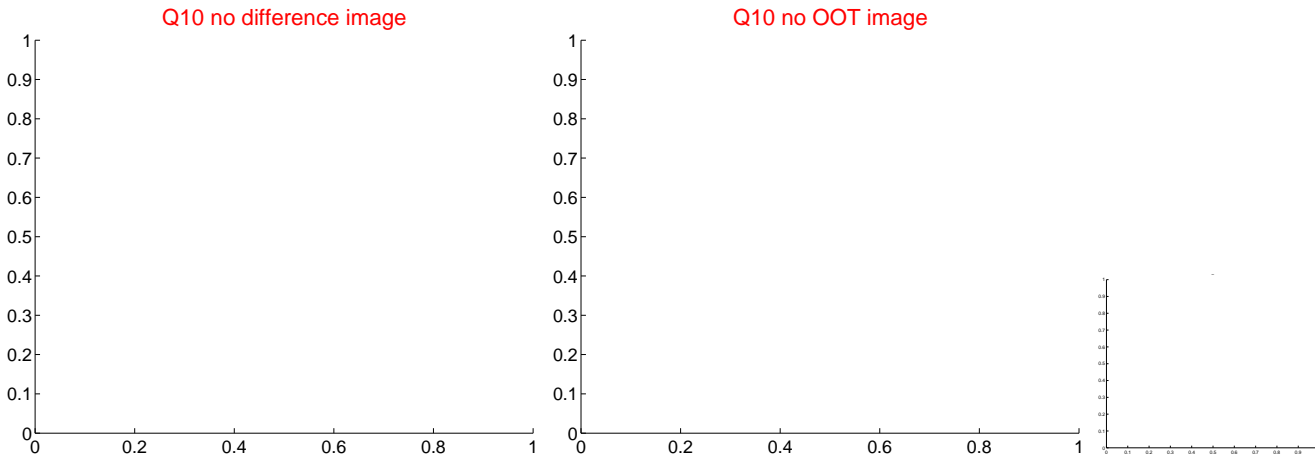
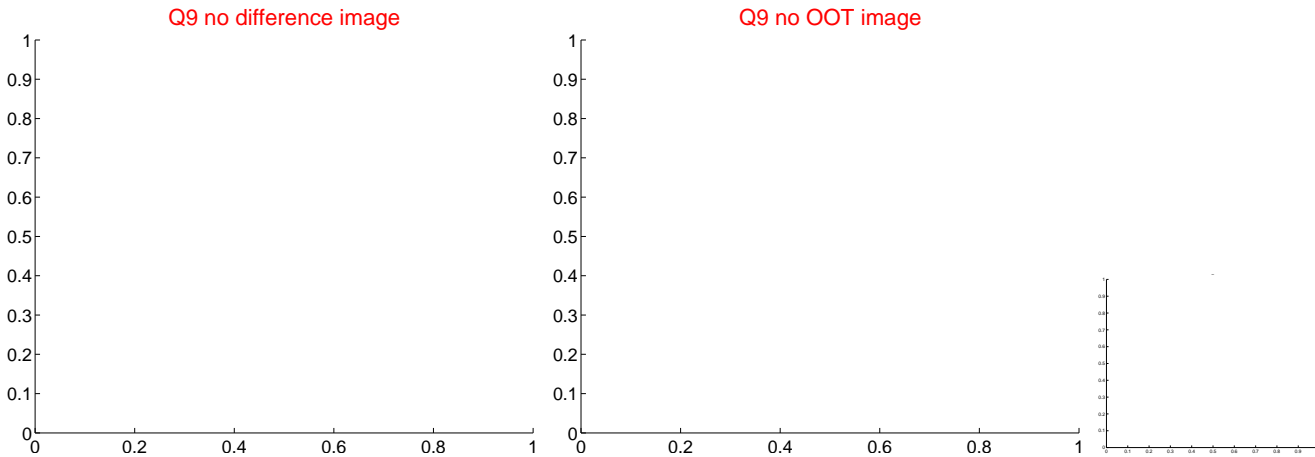
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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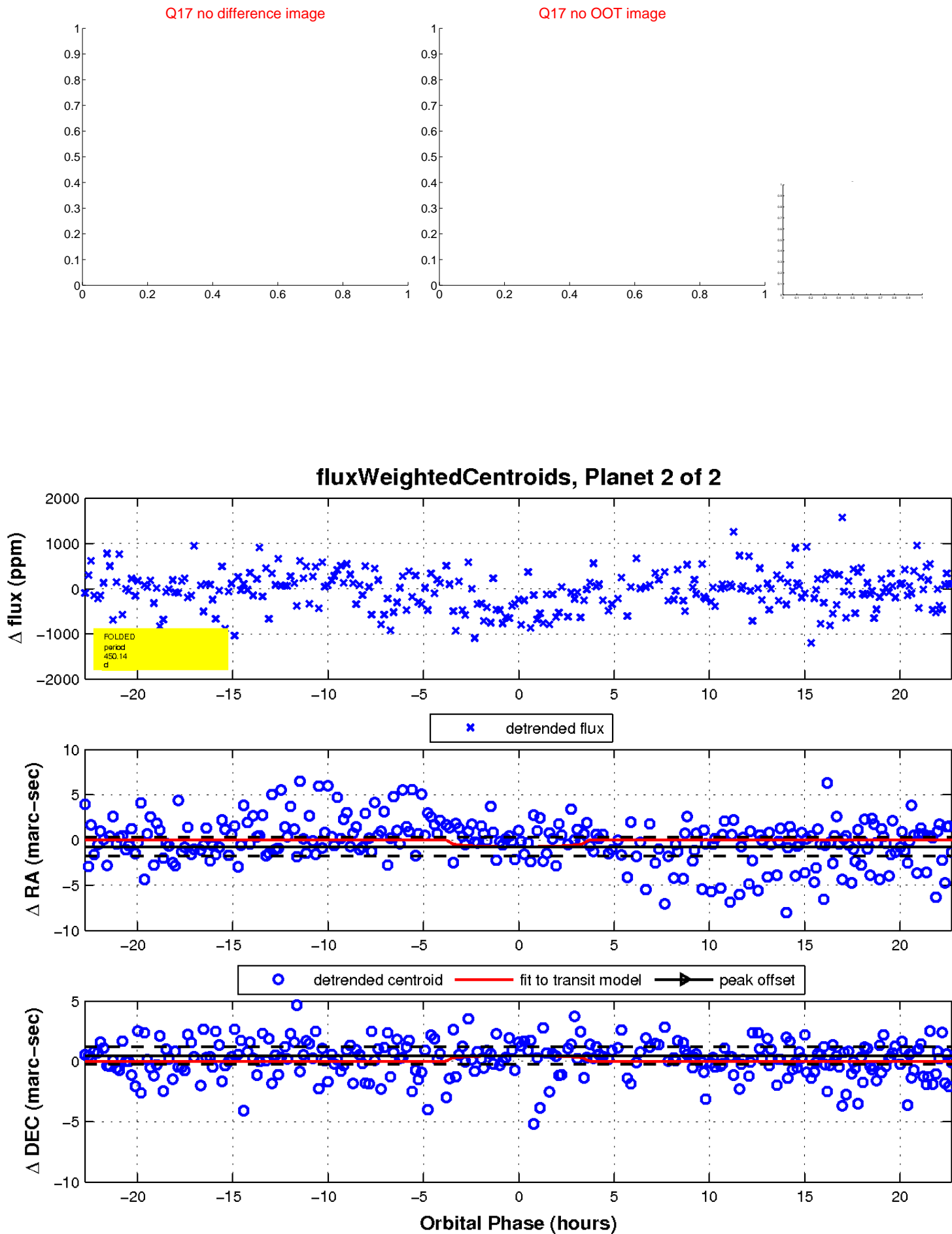
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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UKIRT Image

Declination

