

KIC 009710702

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})
009710702-01	OBS	No	368.914248	500.097505	972.3	16.003	7.4	7.2	0.80	4860	2.55	0.38
009710702-02	OBS	No	522.958634	340.827879	1314.4	44.181	9.2	11.4	0.80	4860	4.35	0.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009710702-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
009710702-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

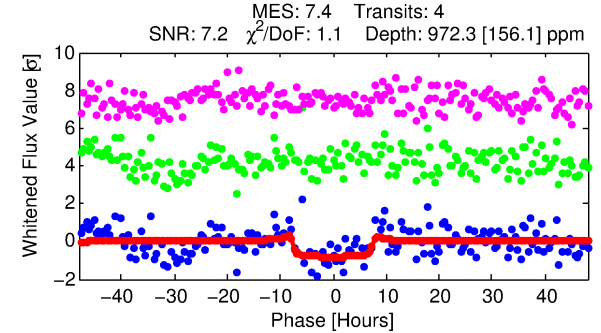
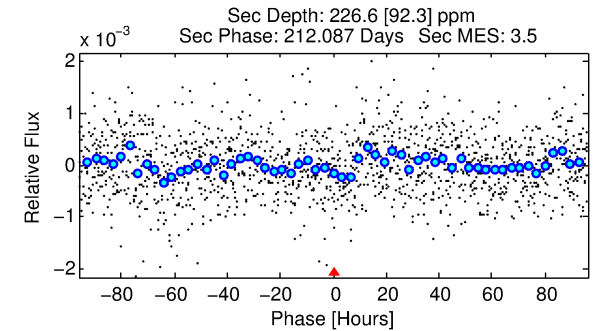
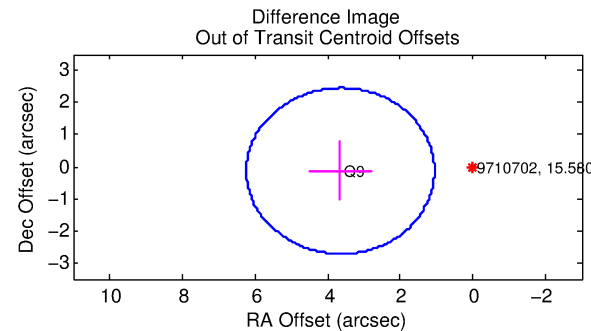
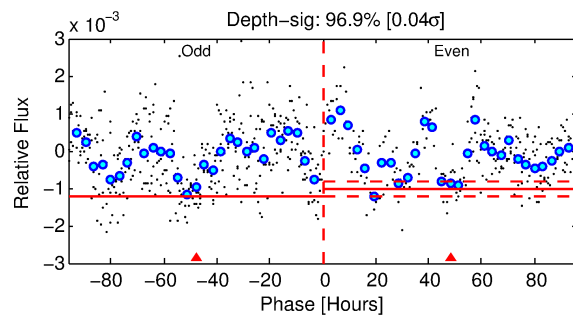
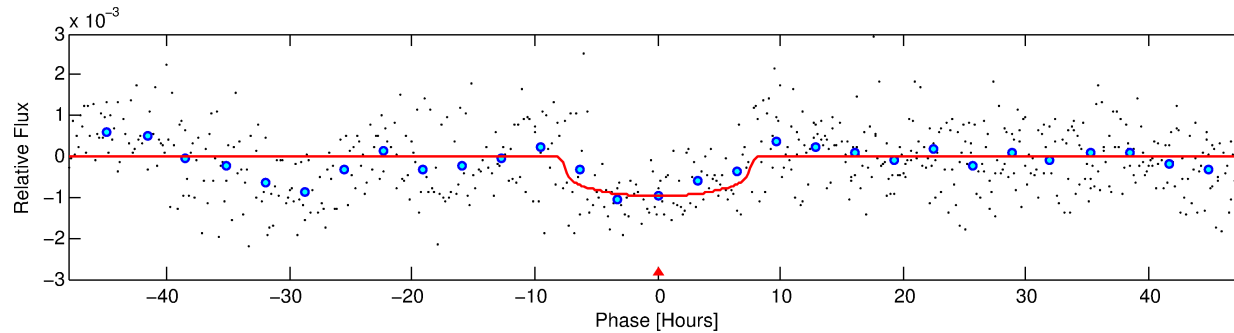
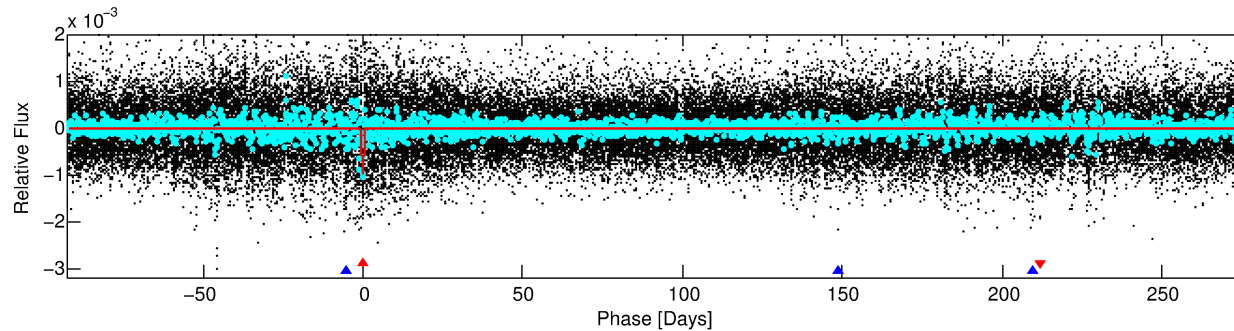
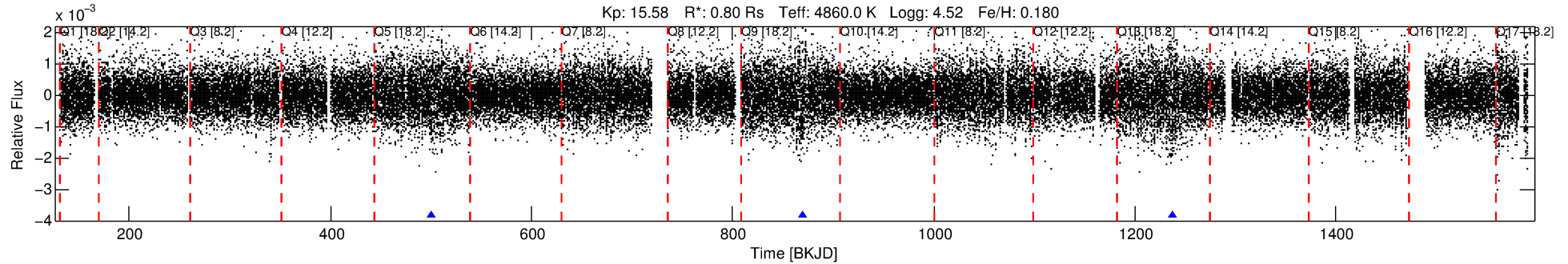
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009710702-01

No Significant Match Found

DV One-Page Summary

KIC: 9710702 Candidate: 1 of 2 Period: 368.914 d



DV Fit Results:

Period = 368.91425 [0.01609] d
Epoch = 500.0975 [0.0199] BKJD
Rp/R* = 0.0291 [0.0165]
a/R* = 151.99 [278.19]
b = 0.56 [2.27]
Seff = 0.38 [0.07]
Teq = 200 [9] K
Rp = 2.55 [1.47] Re
a = 0.9256 [0.0841] AU
Ag = 16450.86 [19977.87] [0.82 σ]
Teffp = 3495 [1059] K [3.11 σ]

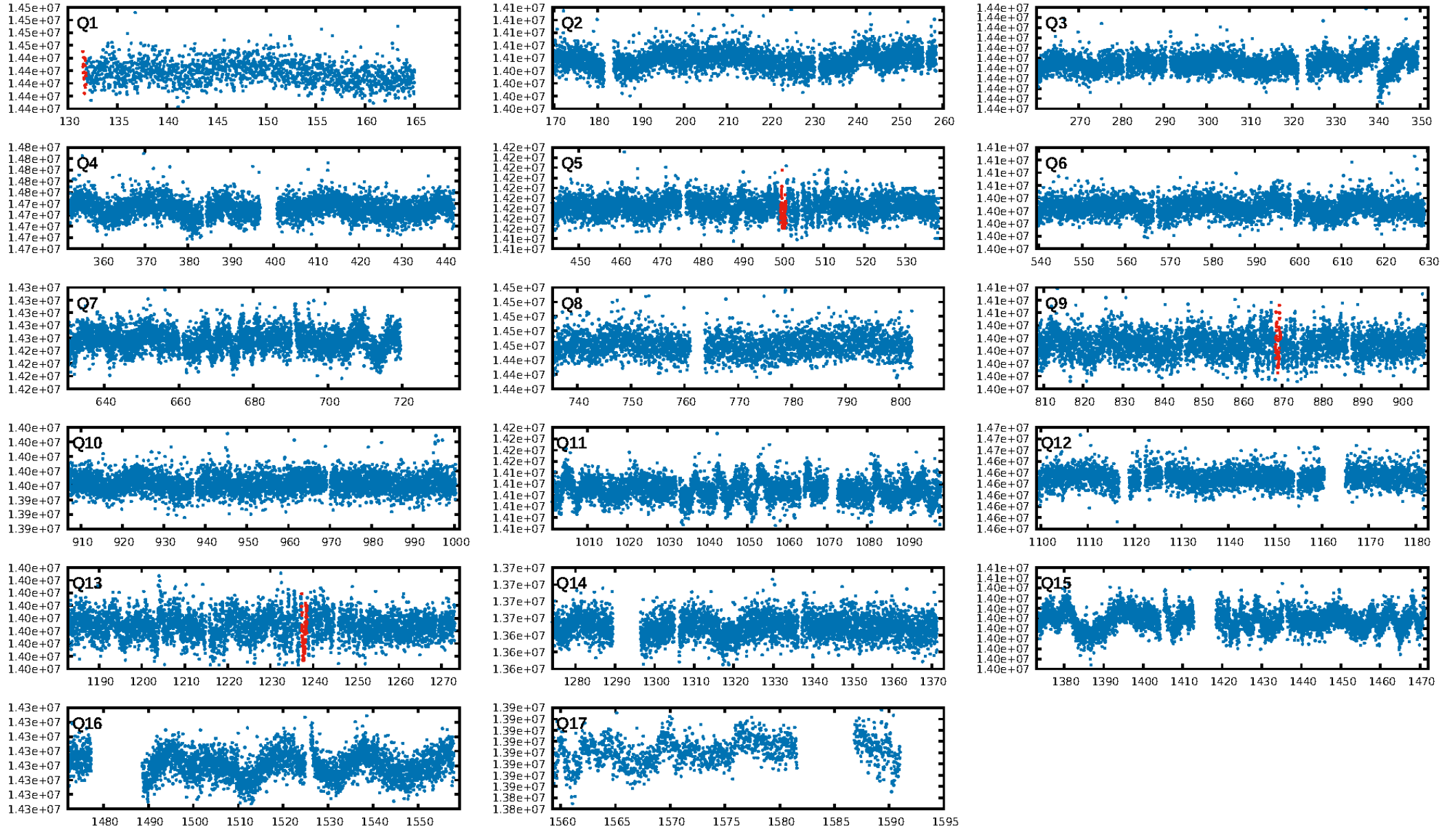
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [78.68 σ]
ModelChiSquare2-sig: 22.4%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 5.65e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.181
Centroid-sig: 77.5%
Centroid-so: 1.426 arcsec [0.56 σ]
OotOffset-rm: 3.646 arcsec [4.23 σ]
KicOffset-rm: 3.594 arcsec [4.17 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [3/3]

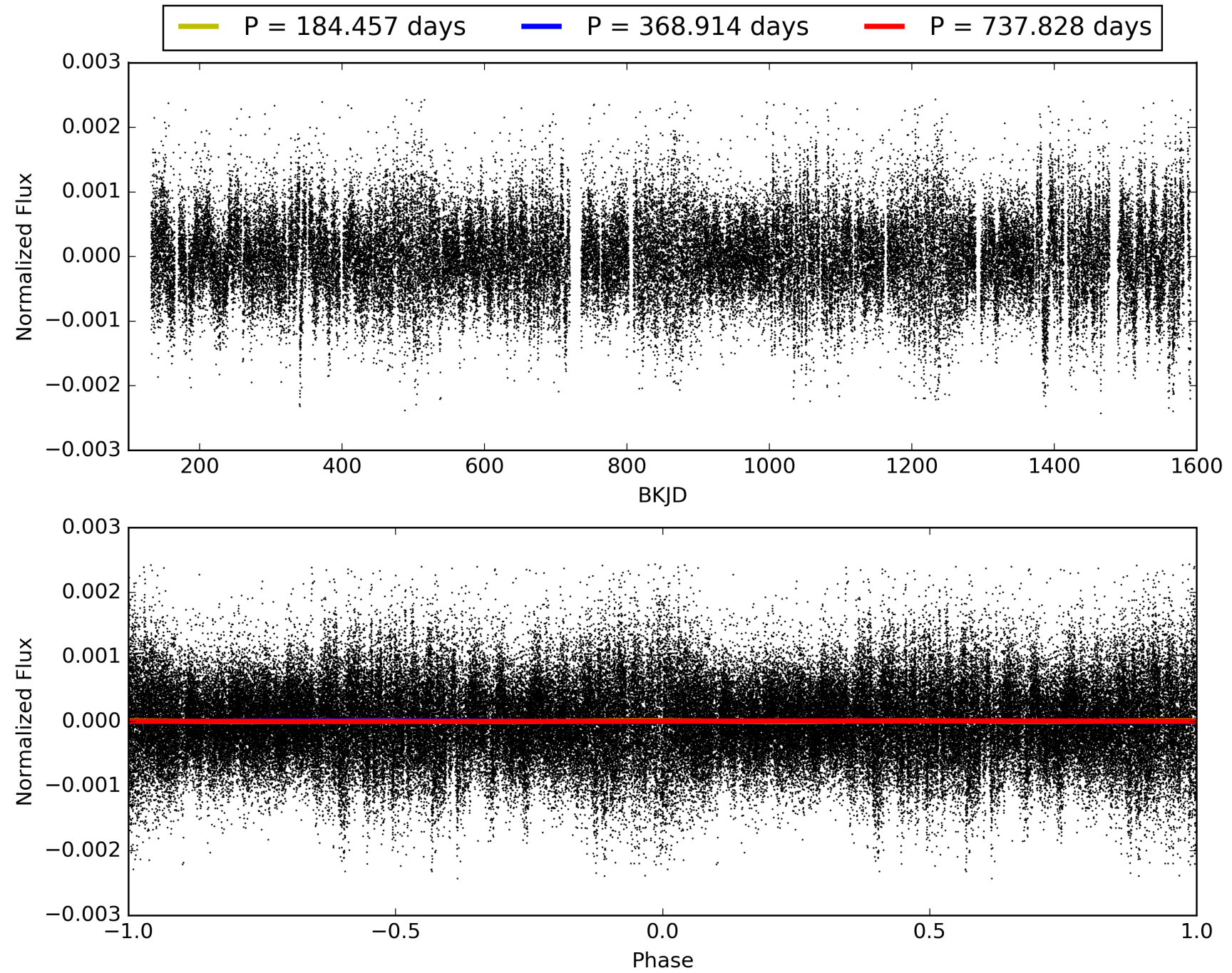
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:22:26 Z

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

TCE 009710702-01, PDC Light Curves

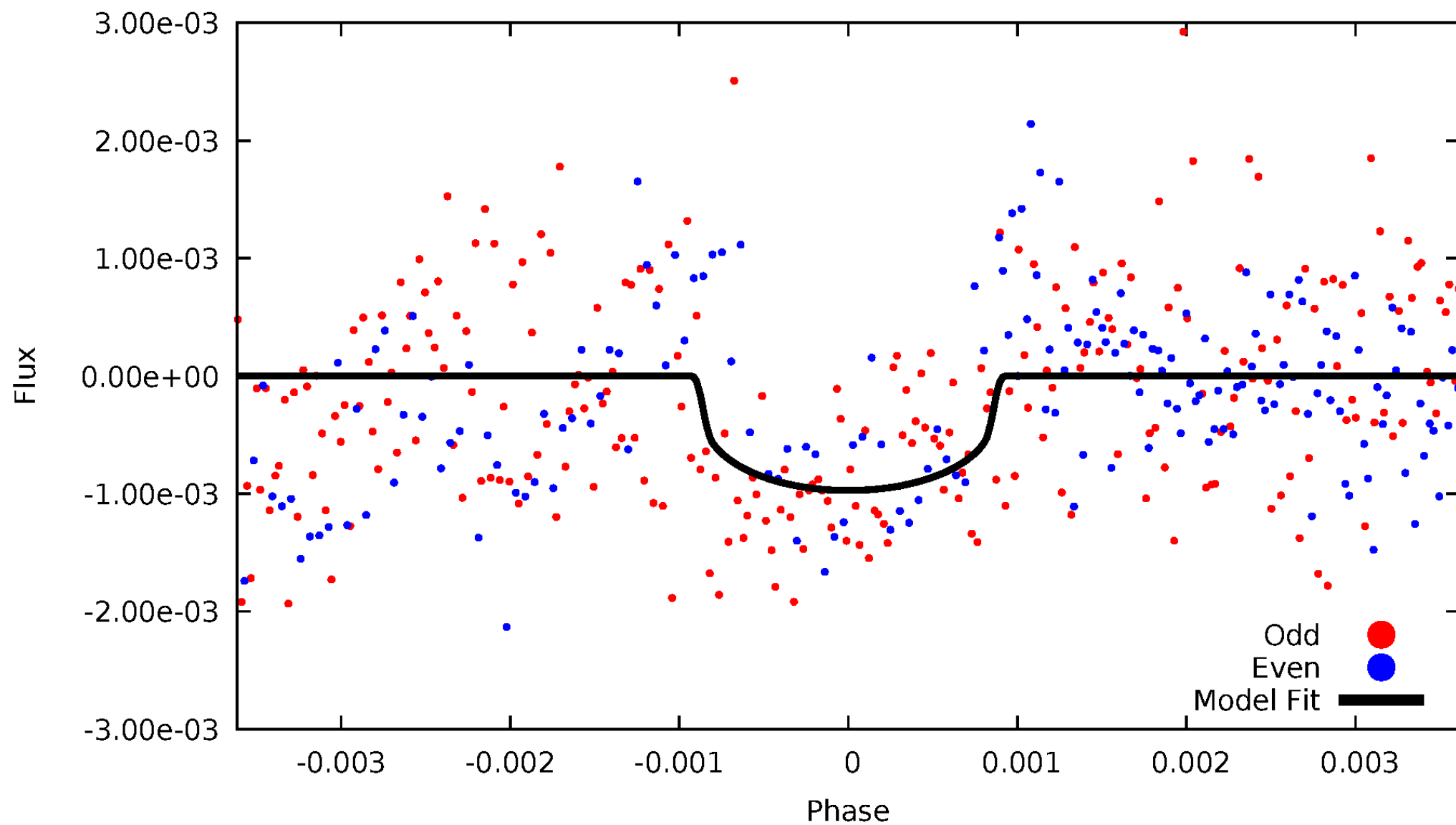


TCE 009710702-01



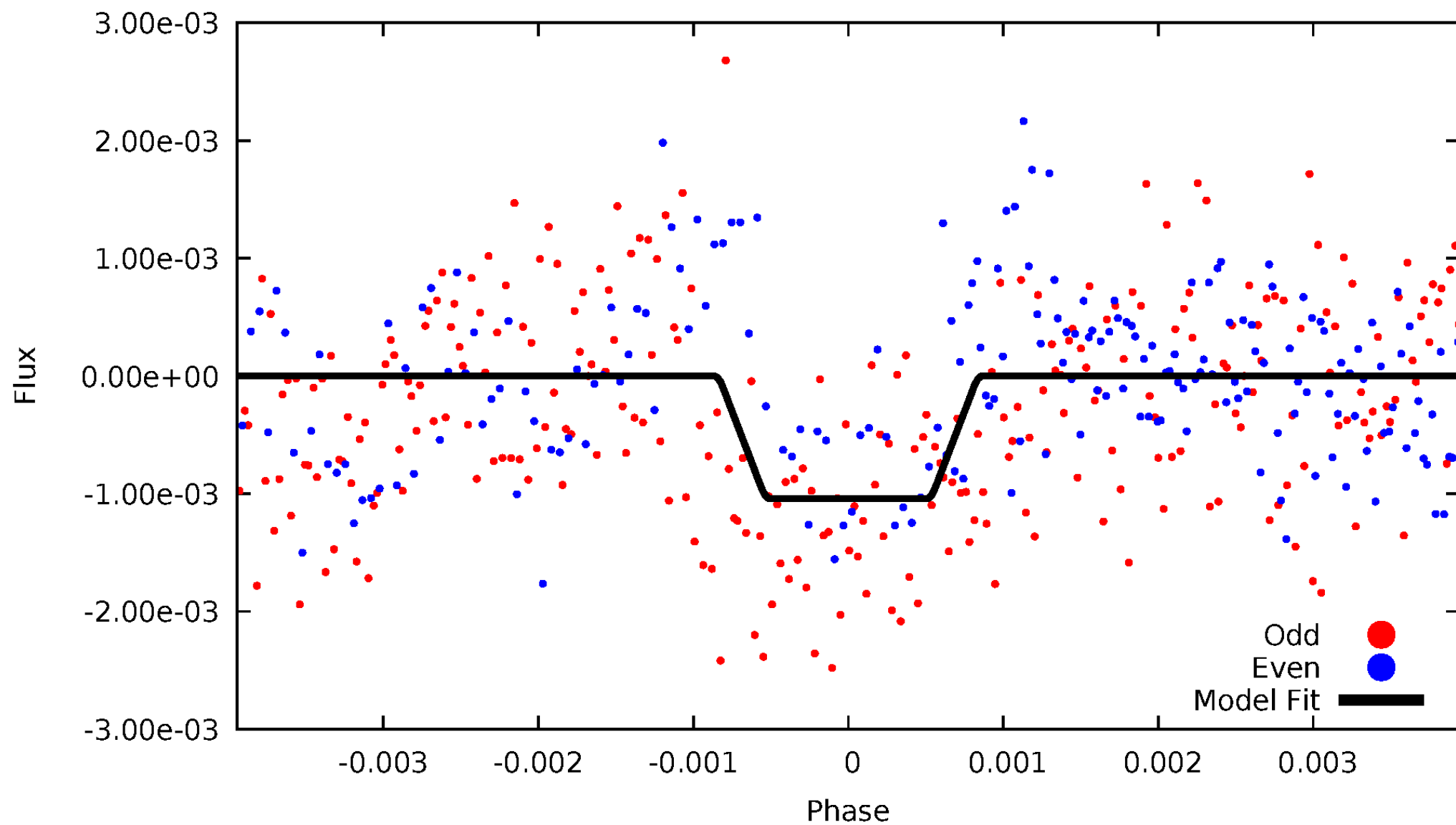
DV Odd/Even

TCE 009710702-01



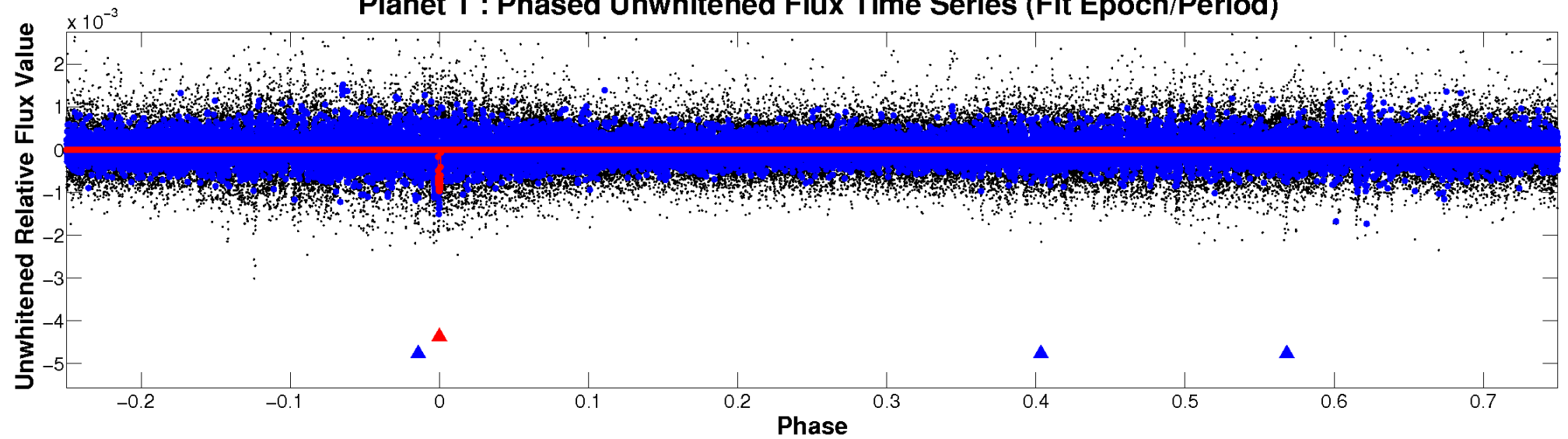
ALT Odd/Even

TCE 009710702-01

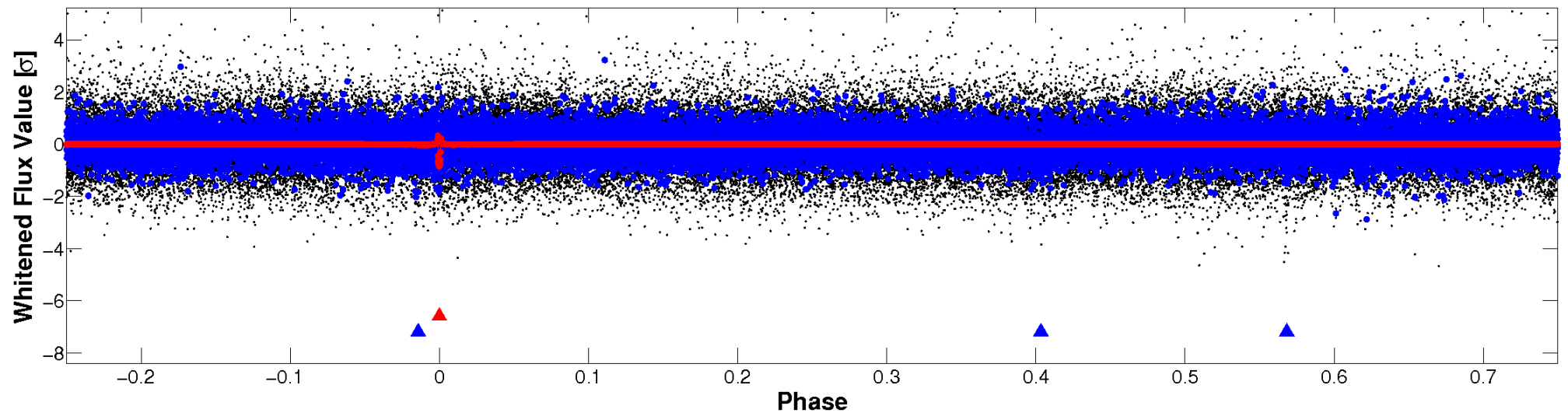


Non-Whitened Vs. Whitened Light Curve

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

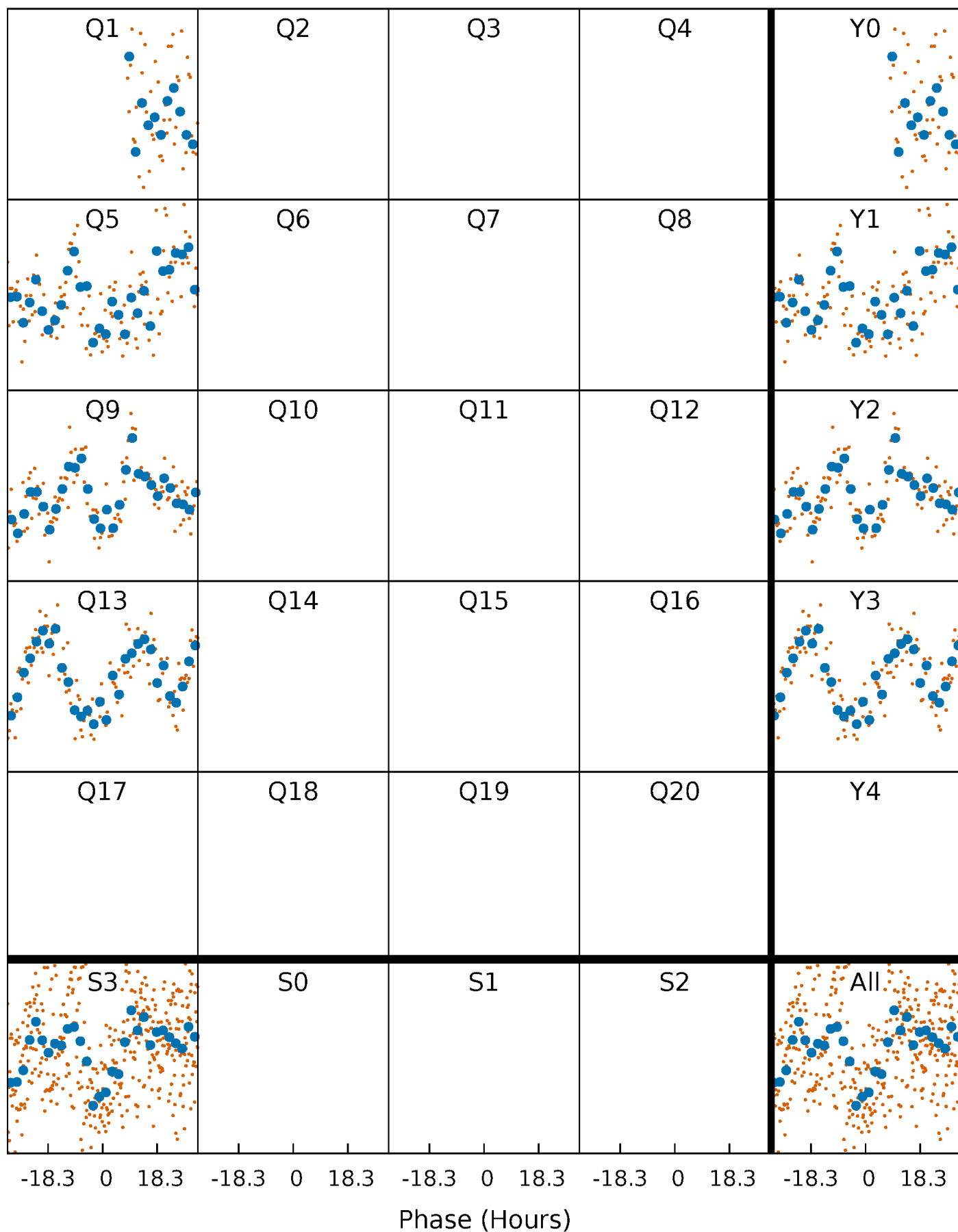


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



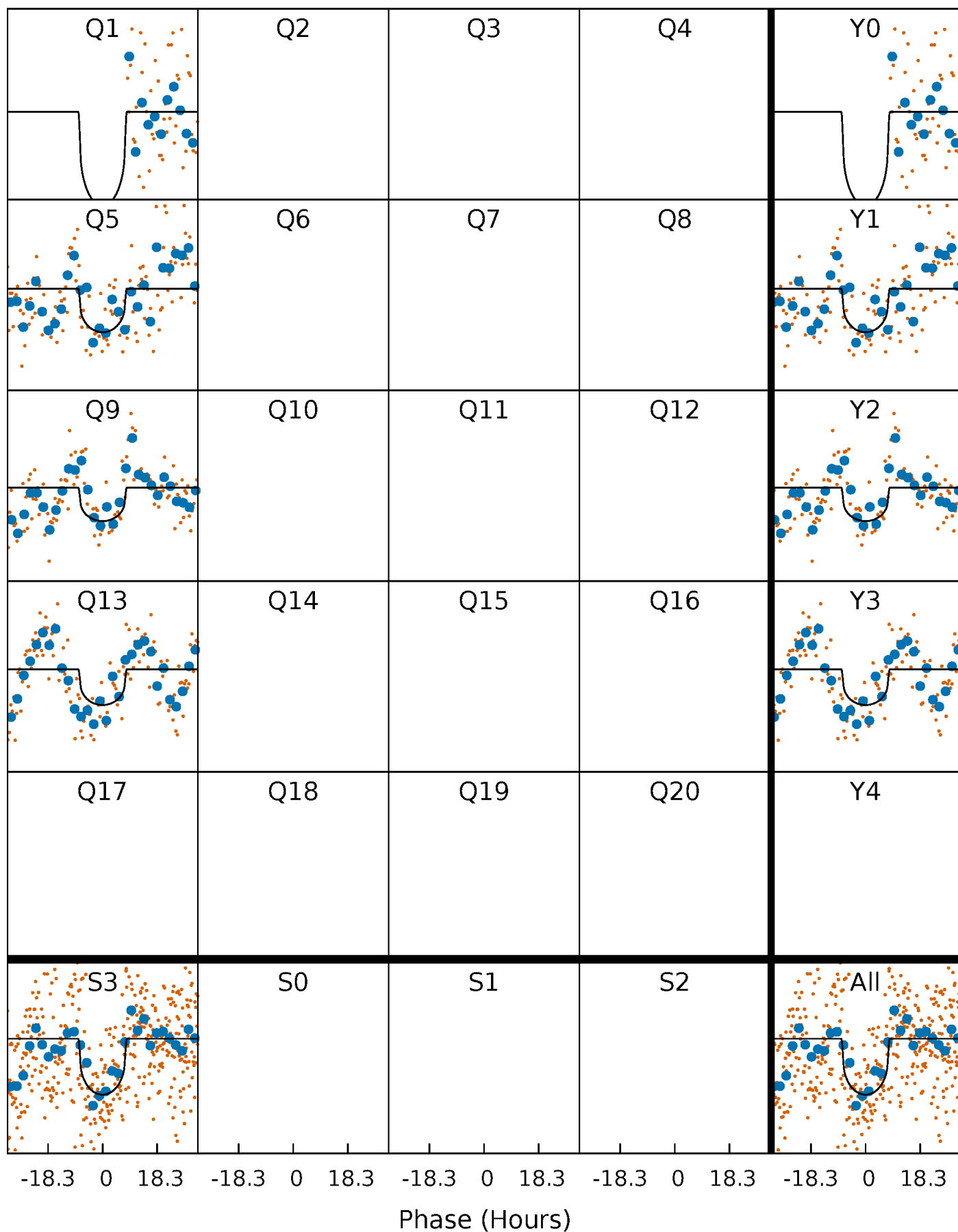
PDC Quarter-Phased Transit Curves

TCE 009710702-01 P=368.914248 Days $T_0=500.097505$ (BKJD)



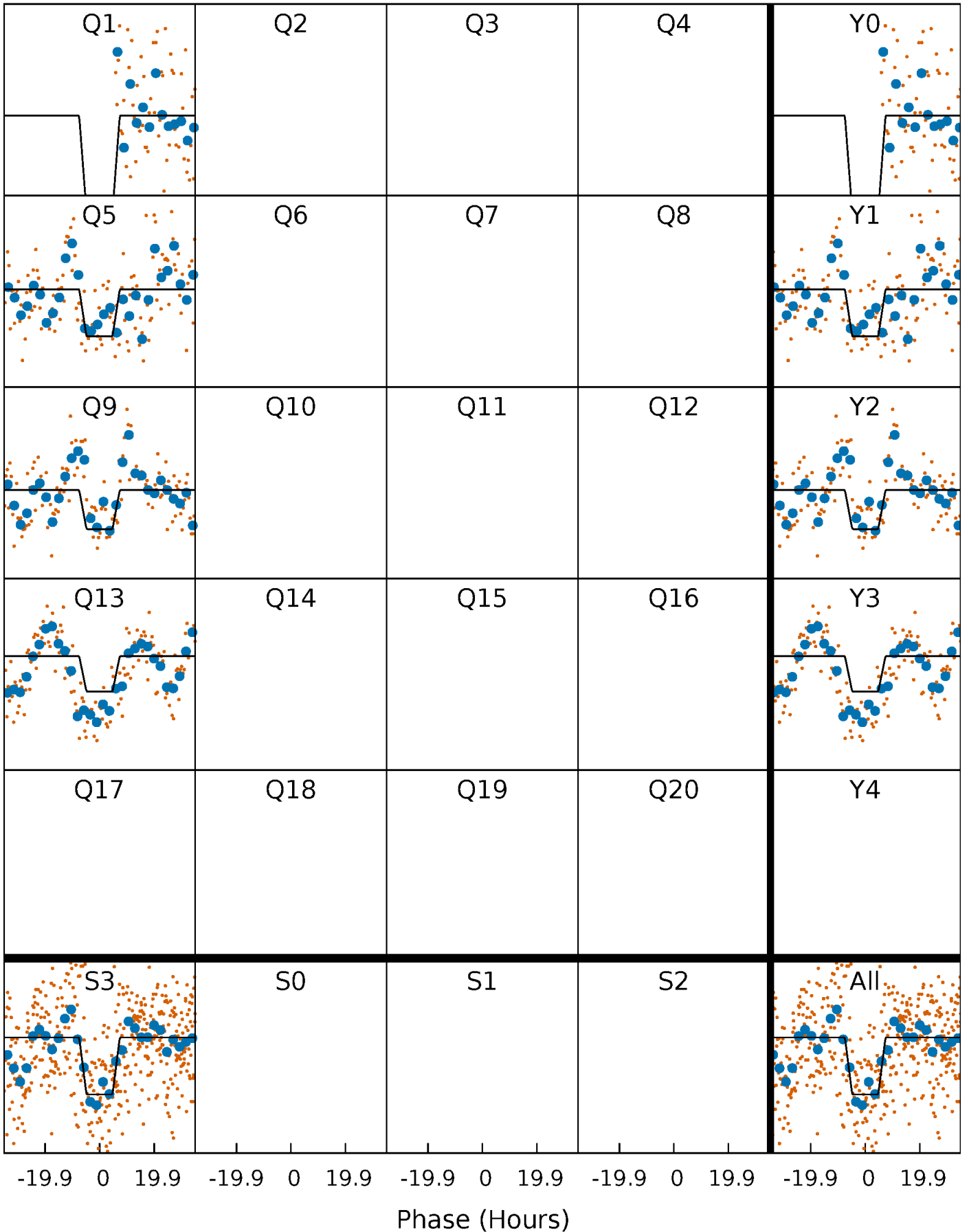
DV Quarter-Phased Transit Curves

TCE 009710702-01 P=368.914248 Days $T_0=500.097505$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

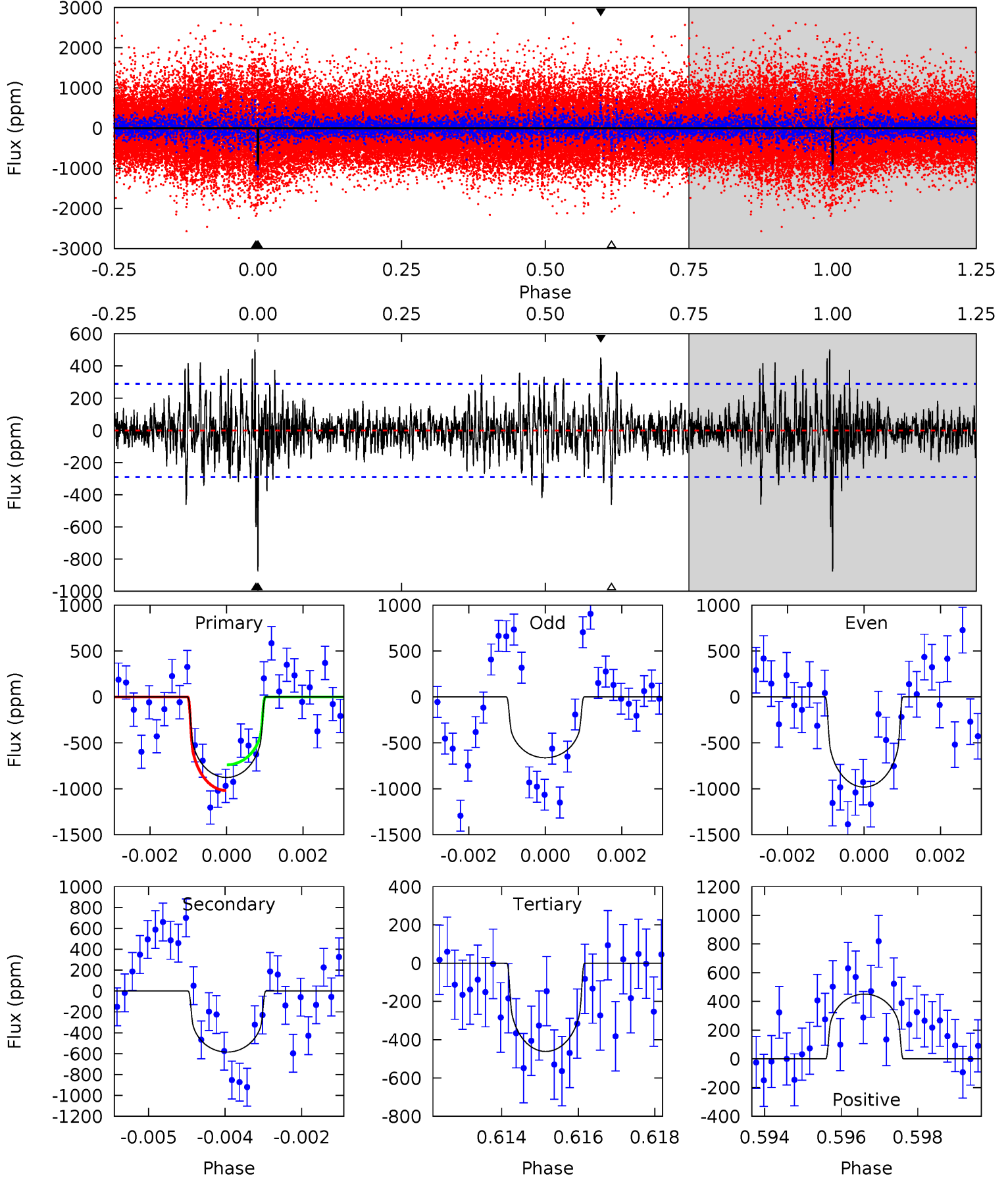
TCE 009710702-01 P=368.853003 Days $T_0=500.140157$ (BKJD)



DV Model-Shift Uniqueness Test

009710702-01, P = 368.914248 Days, E = 131.183257 Days

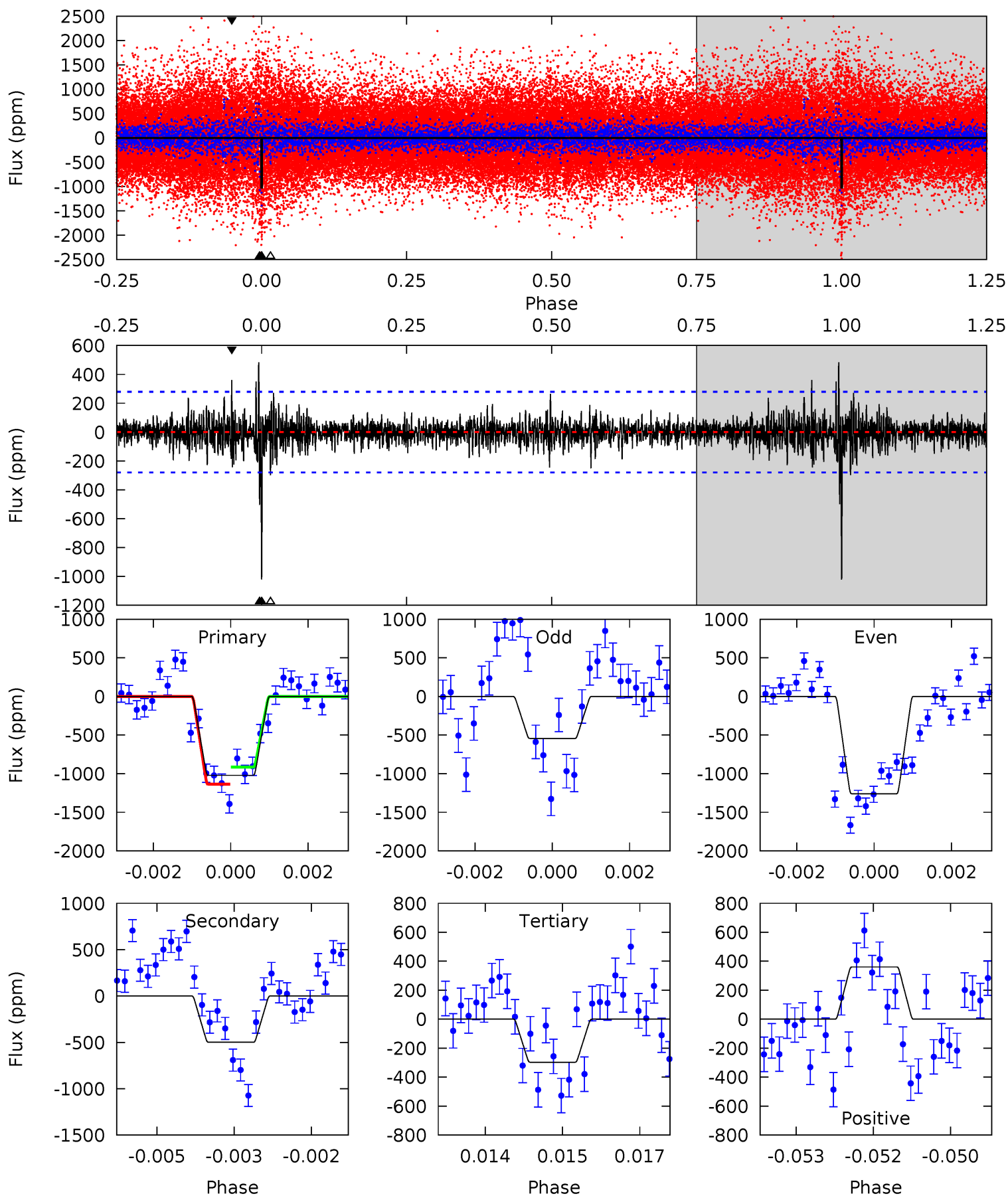
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	10.8	8.52	8.33	5.34	3.12	1.94	7.67	7.86	2.28	2.47	2.80	1.10	0.36	2.57



Alt Model-Shift Uniqueness Test

009710702-01, P = 368.853003 Days, E = 131.287154 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.6	9.55	5.69	6.91	5.35	3.14	1.24	13.9	12.6	3.86	2.64	6.64	0.64	0.32	2.09



Stellar Parameters For KIC 009710702

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4860^{+144}_{-144}	$4.520^{+0.084}_{-0.056}$	$0.180^{+0.250}_{-0.300}$	$0.802^{+0.054}_{-0.077}$	$0.775^{+0.066}_{-0.060}$	$2.119^{+0.673}_{-0.356}$
	+3%/-3%	+2%/-1%	+139%/-167%	+7%/-10%	+9%/-8%	+32%/-17%
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 009710702-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-585 ± 54	$2.62^{+1.31}_{-1.29}$	278^{+10}_{-11}	4455^{+1542}_{-619}	$40526^{+111676}_{-22600}$
Alt.	-499 ± 52	$2.90^{+1.44}_{-1.41}$	279^{+9}_{-11}	4171^{+1304}_{-577}	27452^{+80801}_{-15124}

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

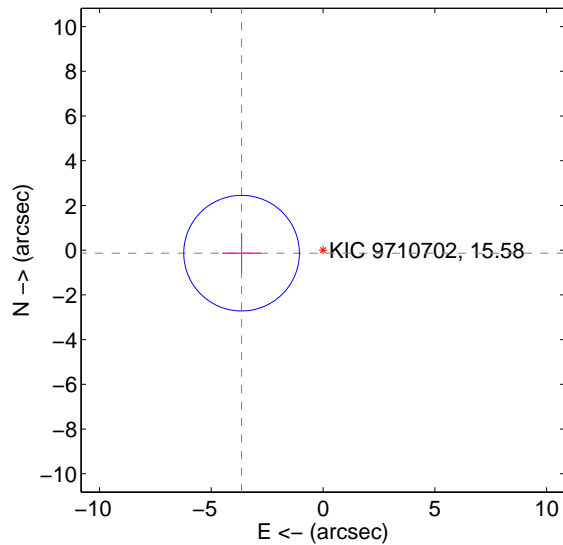
Supplemental centroid analysis for 009710702-01. Kepler magnitude: 15.58. Transit SNR 7.19

There are 0 quarters with good PRF difference image offsets

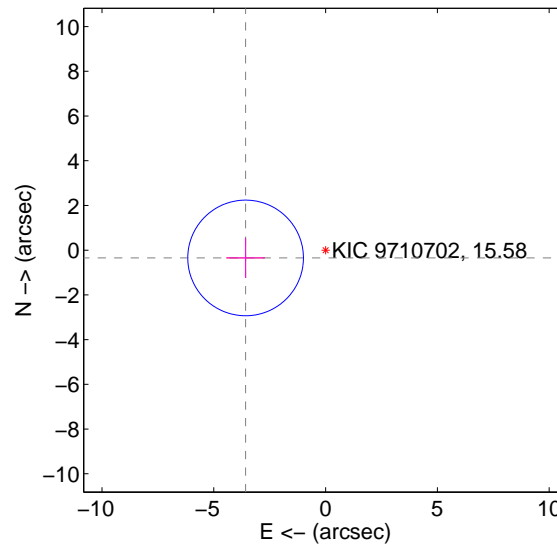
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.646 ± 0.862	4.23	3.643 ± 0.862	-0.134 ± 0.892
PRF-fit source offset from KIC position	3.594 ± 0.862	4.17	3.577 ± 0.862	-0.347 ± 0.892
photometric centroid source offset	1.43 ± 2.53	0.56	-0.86 ± 1.91	-1.14 ± 2.83

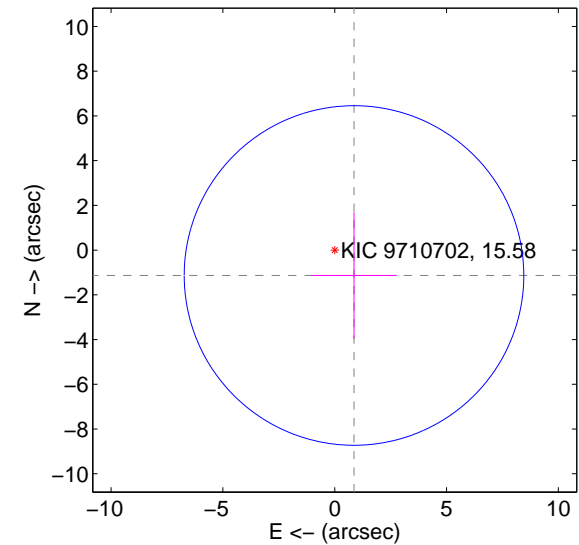
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

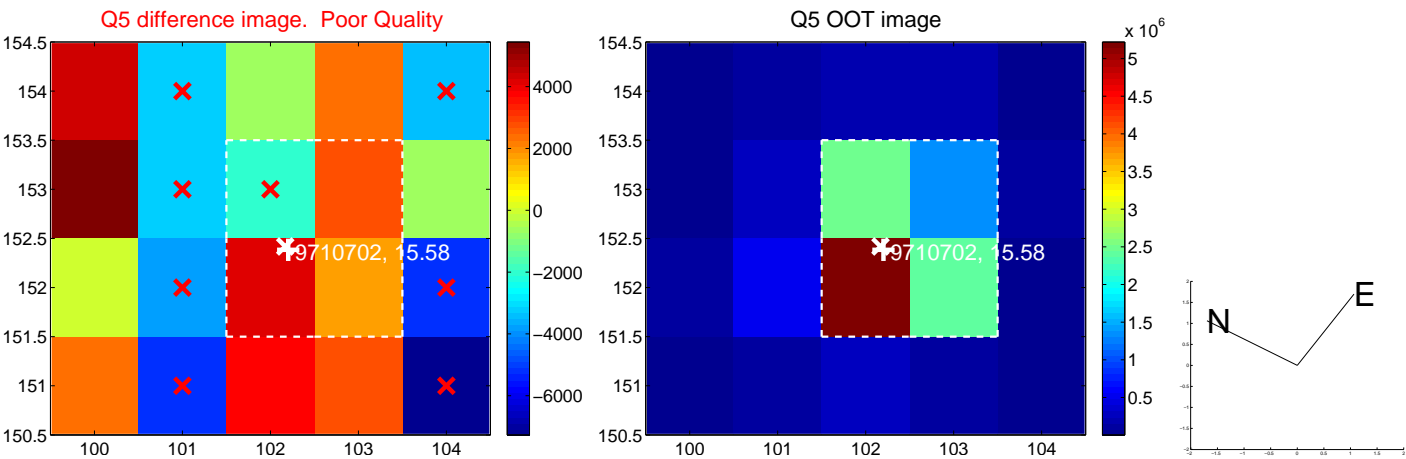


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

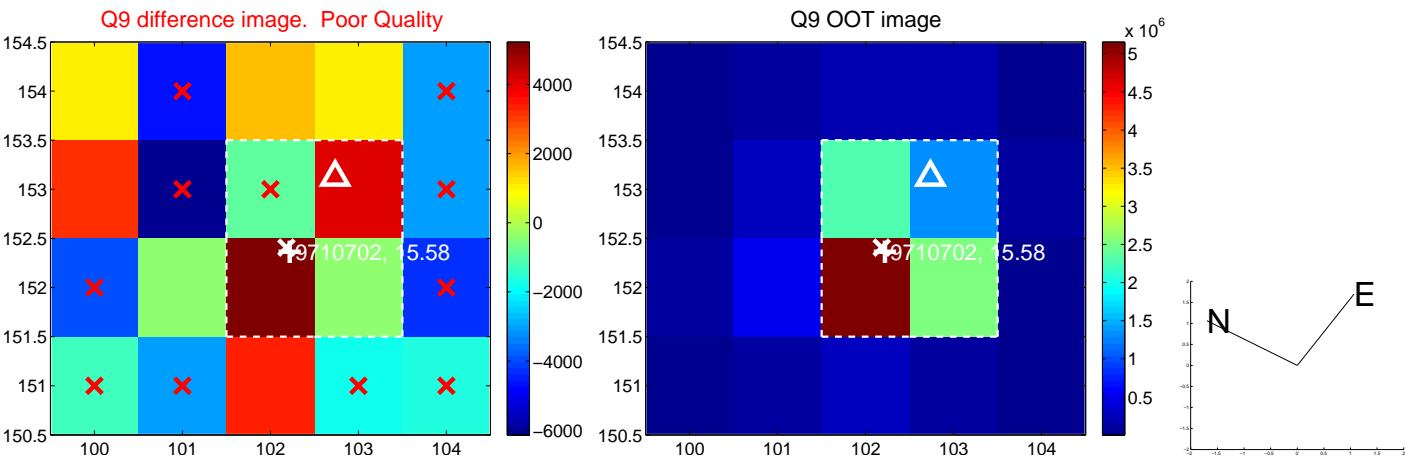
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



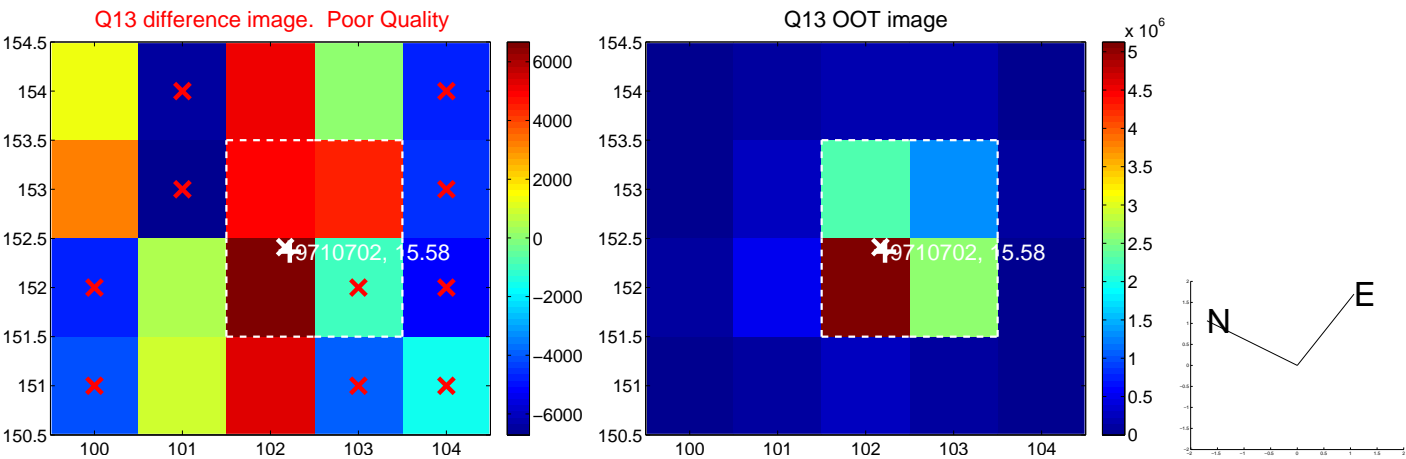
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



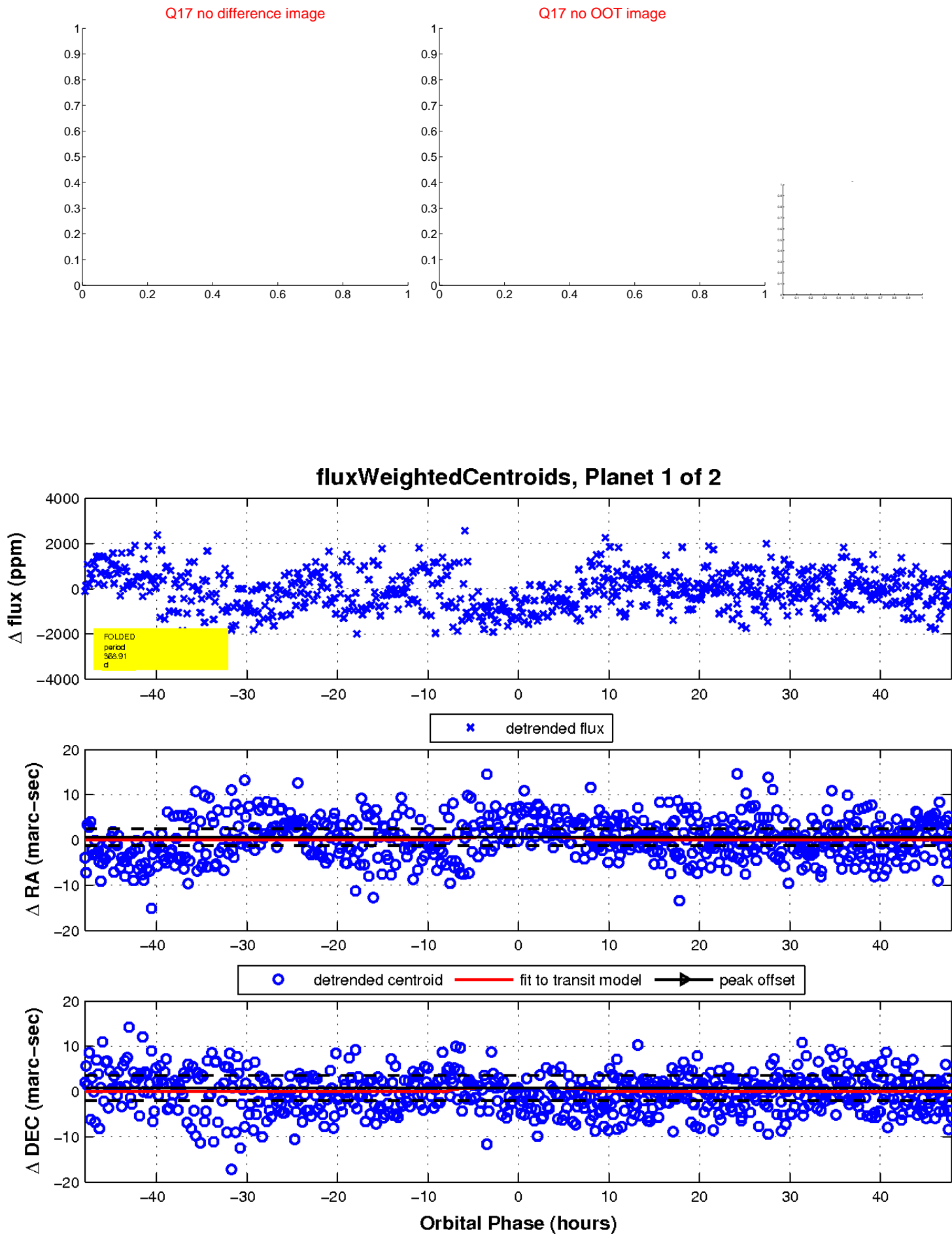
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

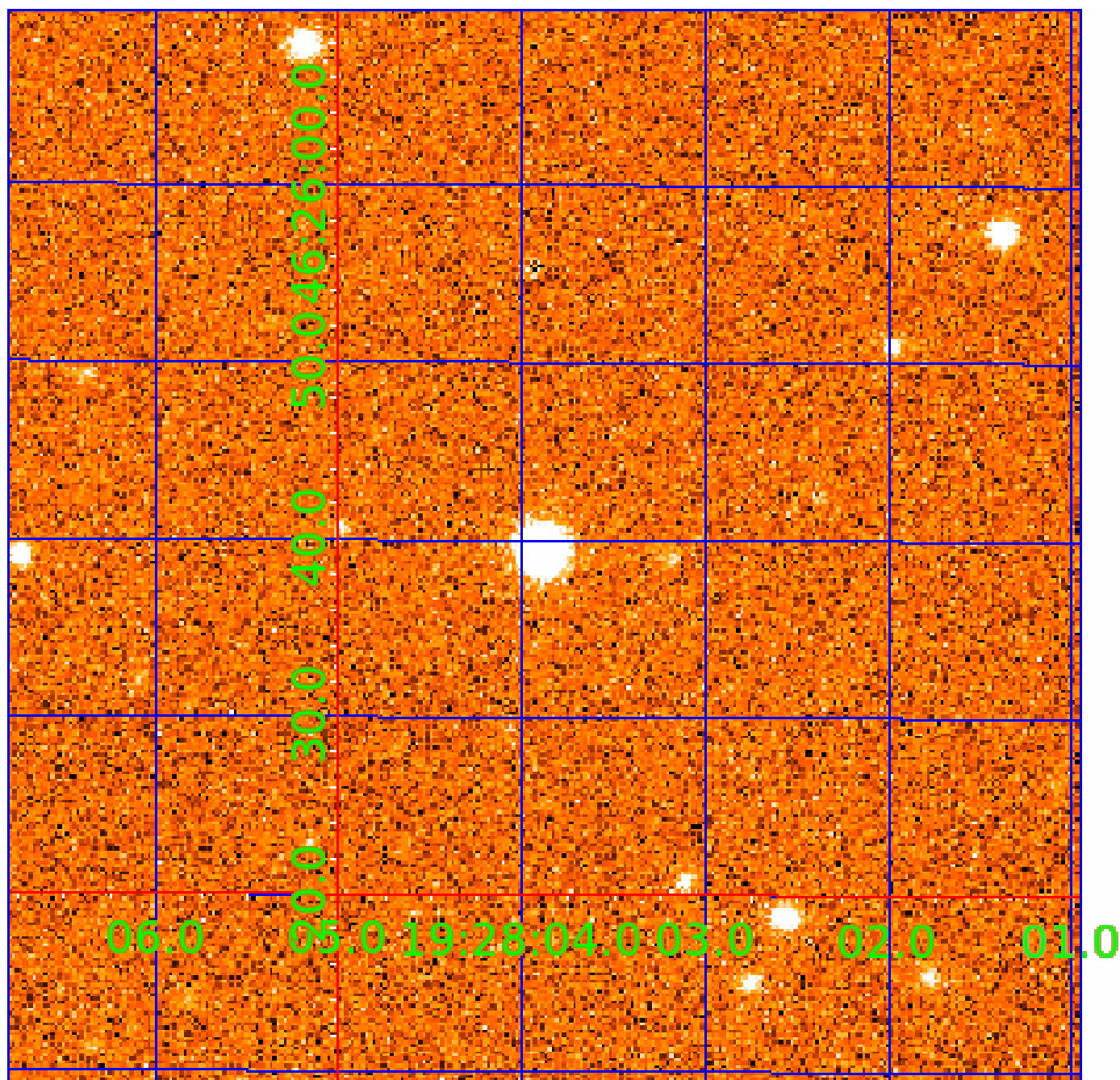


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009710702

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})
009710702-01	OBS	No	368.914248	500.097505	972.3	16.003	7.4	7.2	0.80	4860	2.55	0.38
009710702-02	OBS	No	522.958634	340.827879	1314.4	44.181	9.2	11.4	0.80	4860	4.35	0.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009710702-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
009710702-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

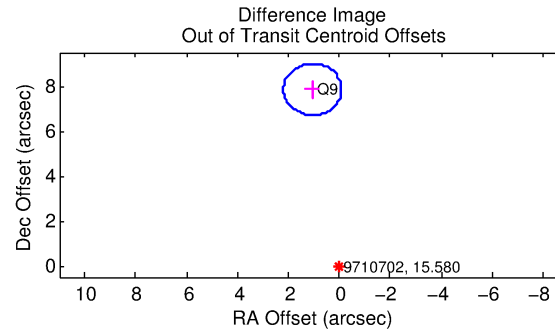
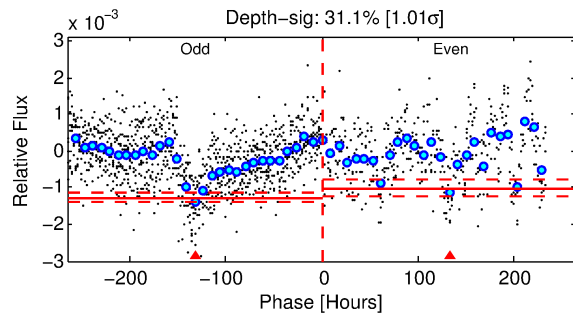
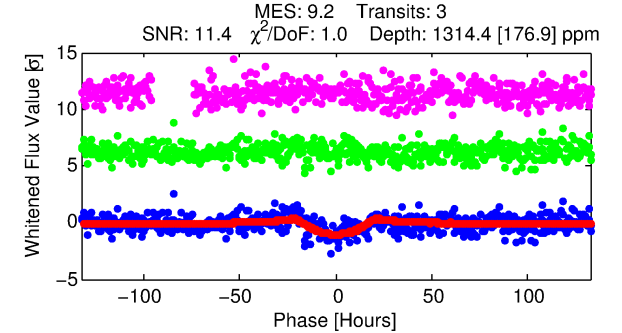
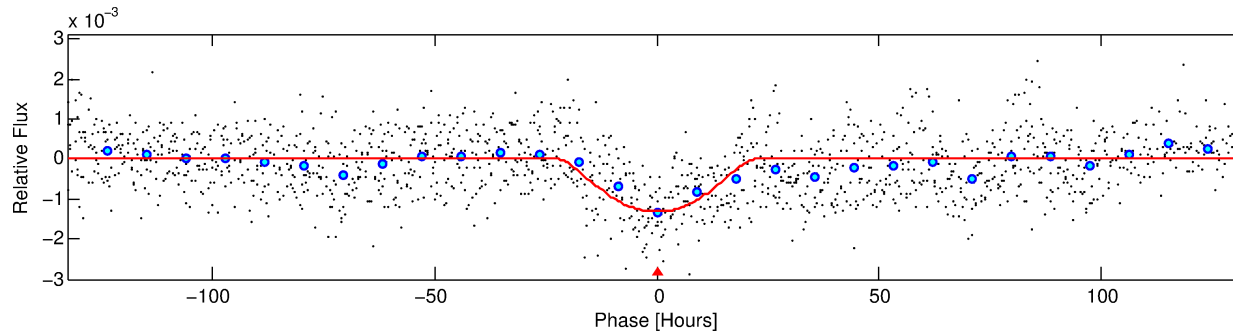
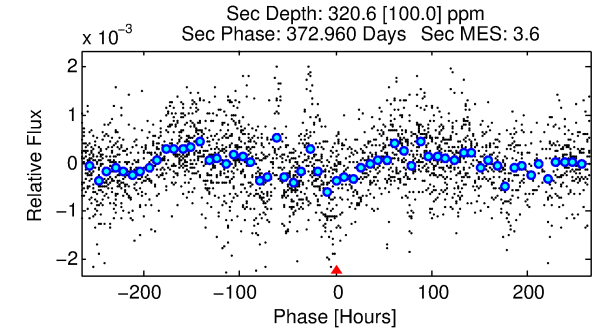
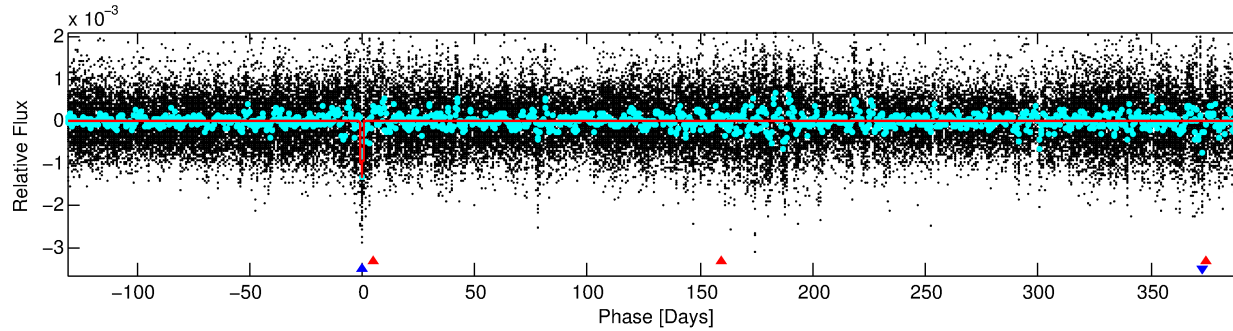
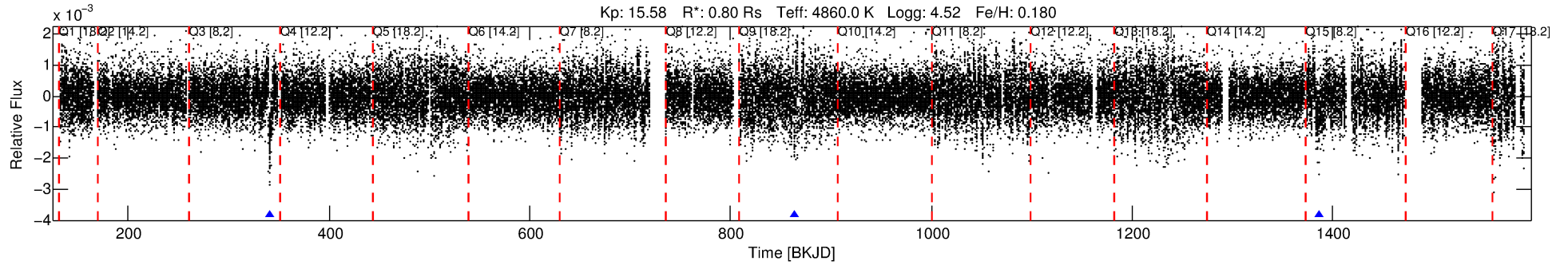
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009710702-02

No Significant Match Found

DV One-Page Summary

KIC: 9710702 Candidate: 2 of 2 Period: 522.959 d



DV Fit Results:

Period = 522.95863 [0.04442] d
Epoch = 340.8279 [0.0503] BKJD
Rp/R* = 0.0497 [0.0259]
a/R* = 36.41 [8.51]
b = 0.97 [0.06]
Seff = 0.24 [0.04]
Teq = 178 [8] K
Rp = 4.35 [2.31] Re
a = 1.1680 [0.1061] AU
Ag = 12700.35 [13951.38] [0.91σ]
Teff = 2916 [799] K [3.43σ]

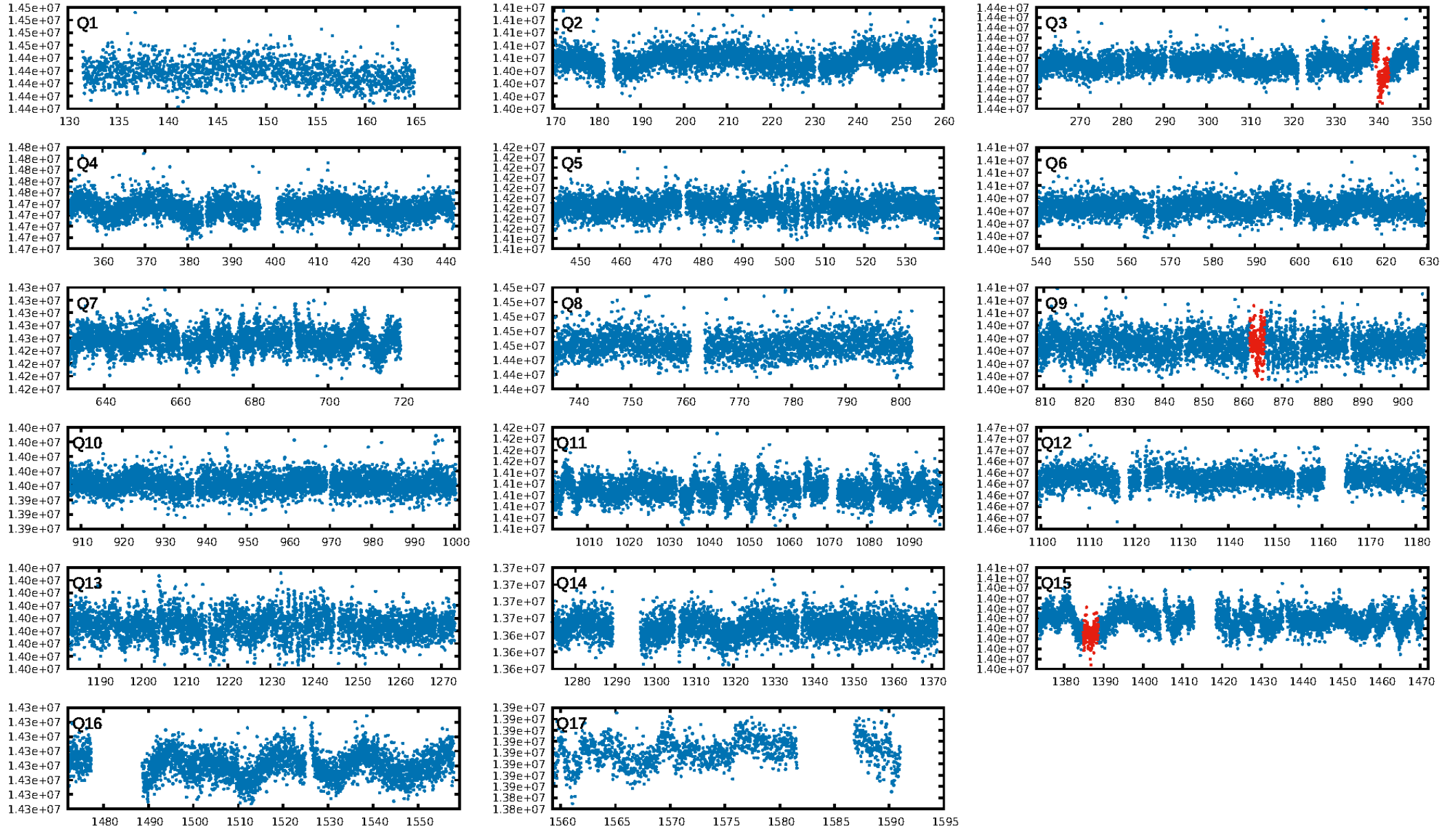
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [78.68σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 7.7%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 5.18e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.412
Centroid-sig: 88.5%
Centroid-so: 0.296 arcsec [0.23σ]
OotOffset-rm: 7.920 arcsec [20.78σ]
KicOffset-rm: 7.698 arcsec [20.19σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

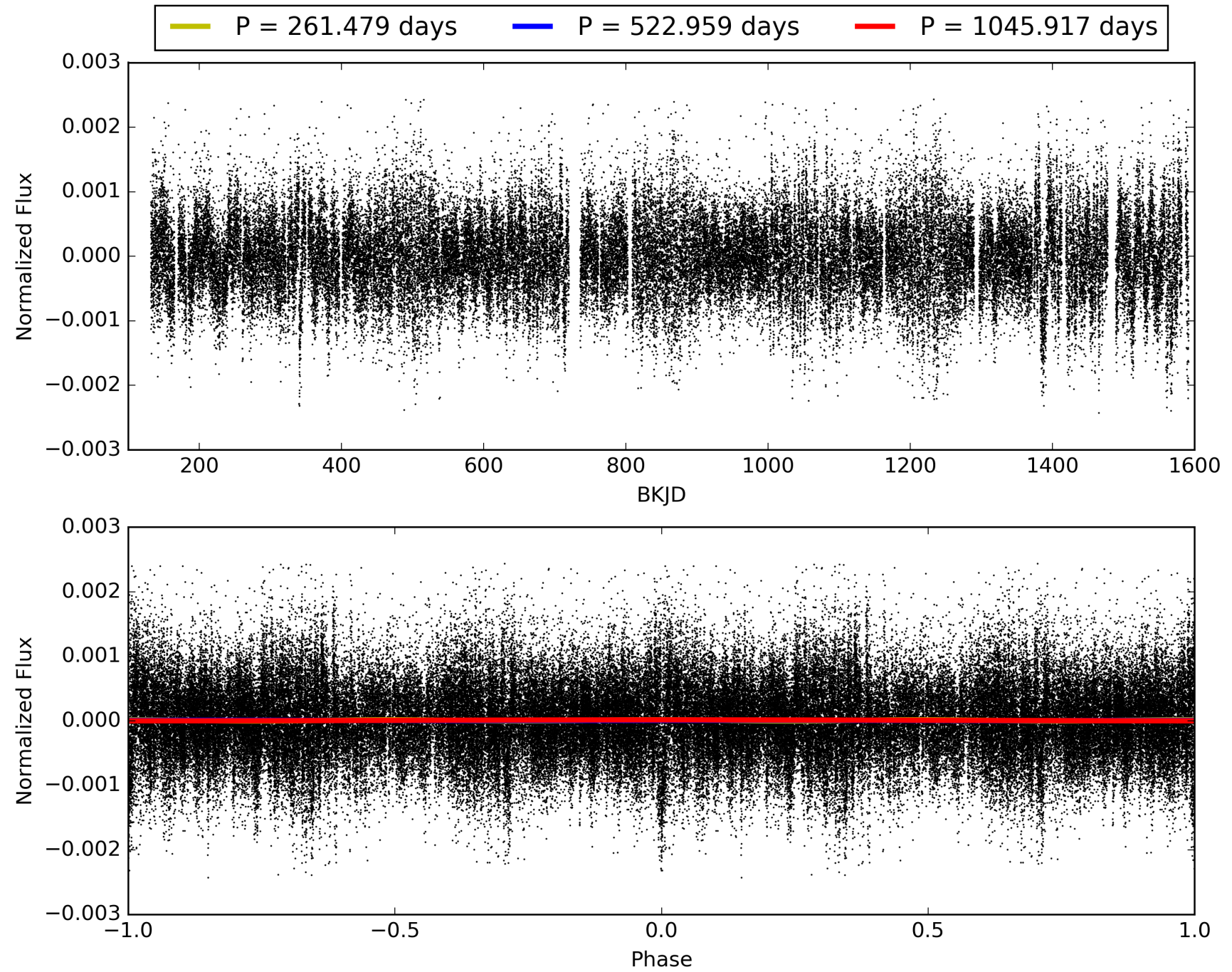
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:22:34 Z

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

TCE 009710702-02, PDC Light Curves

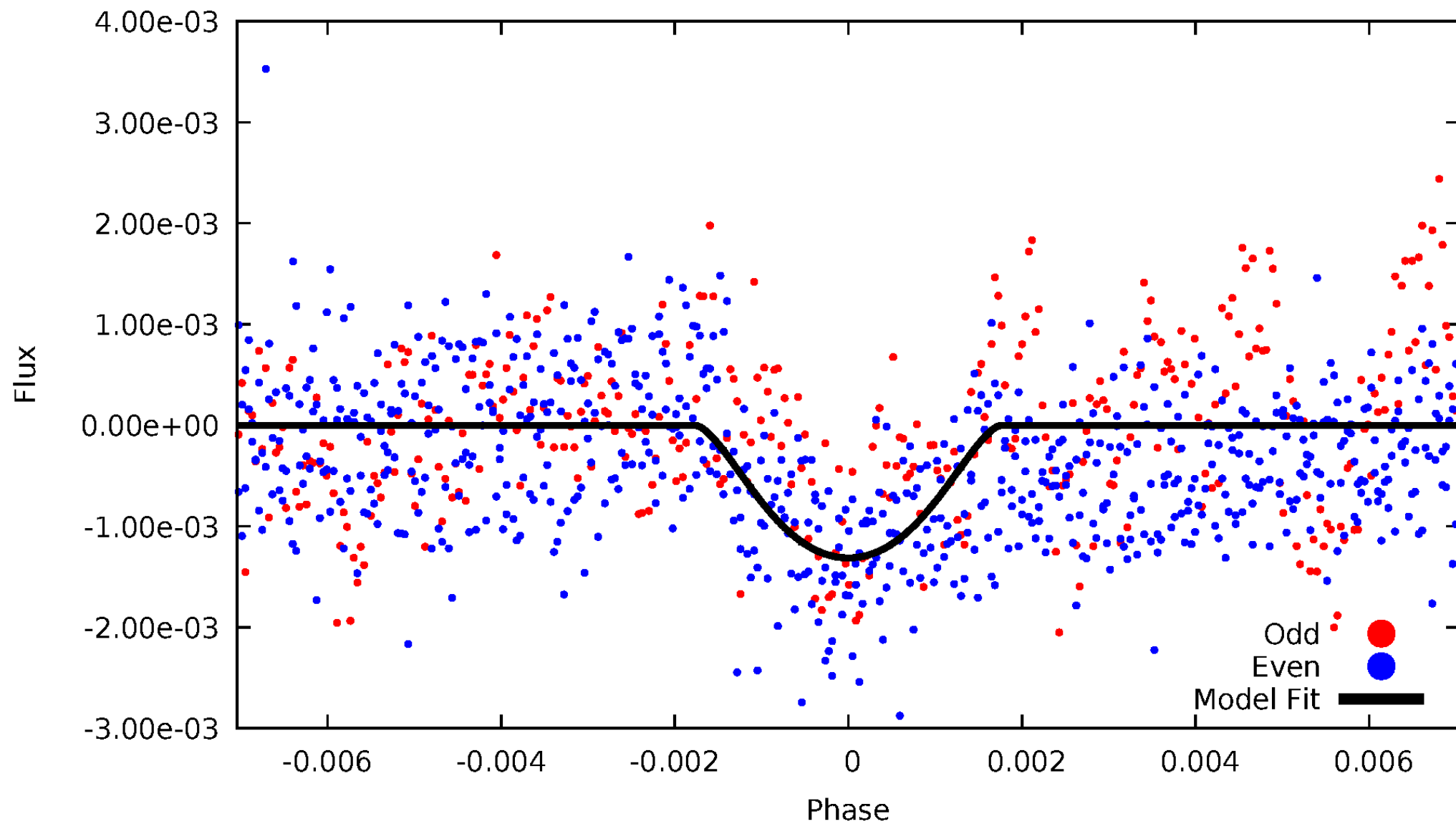


TCE 009710702-02



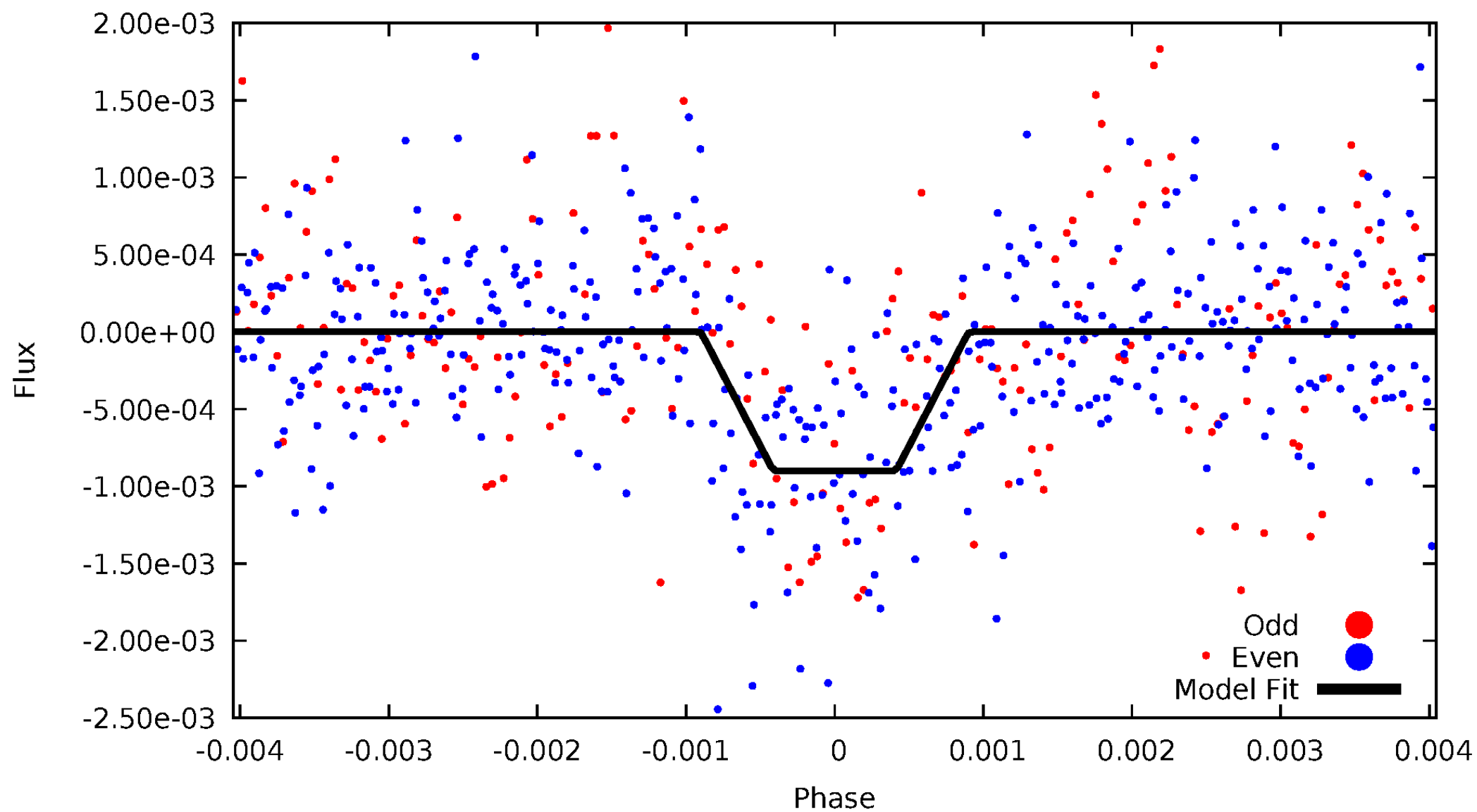
DV Odd/Even

TCE 009710702-02



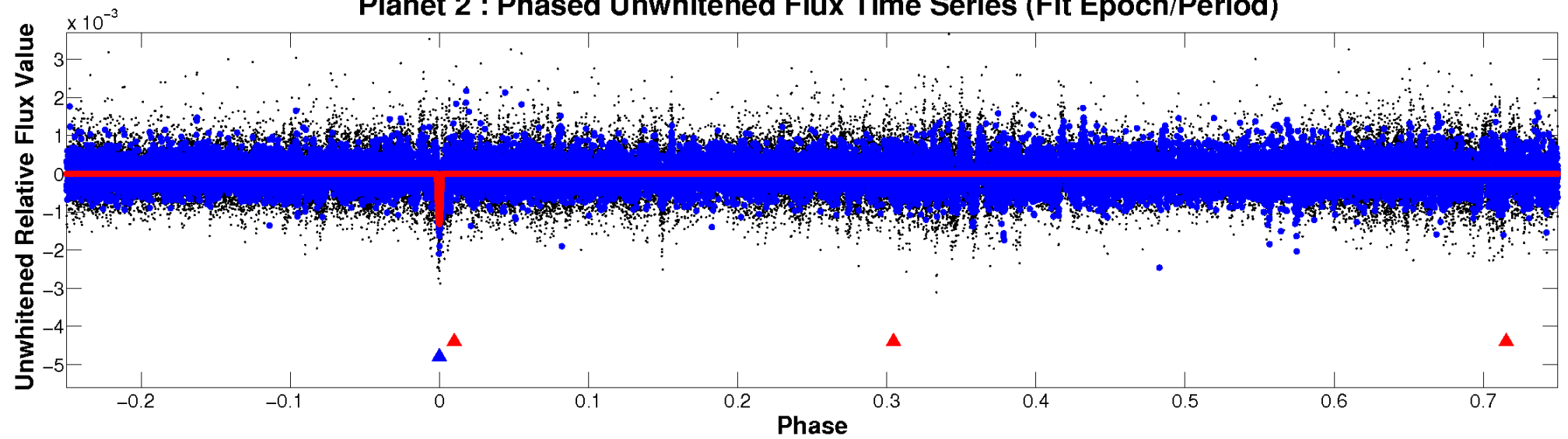
ALT Odd/Even

TCE 009710702-02

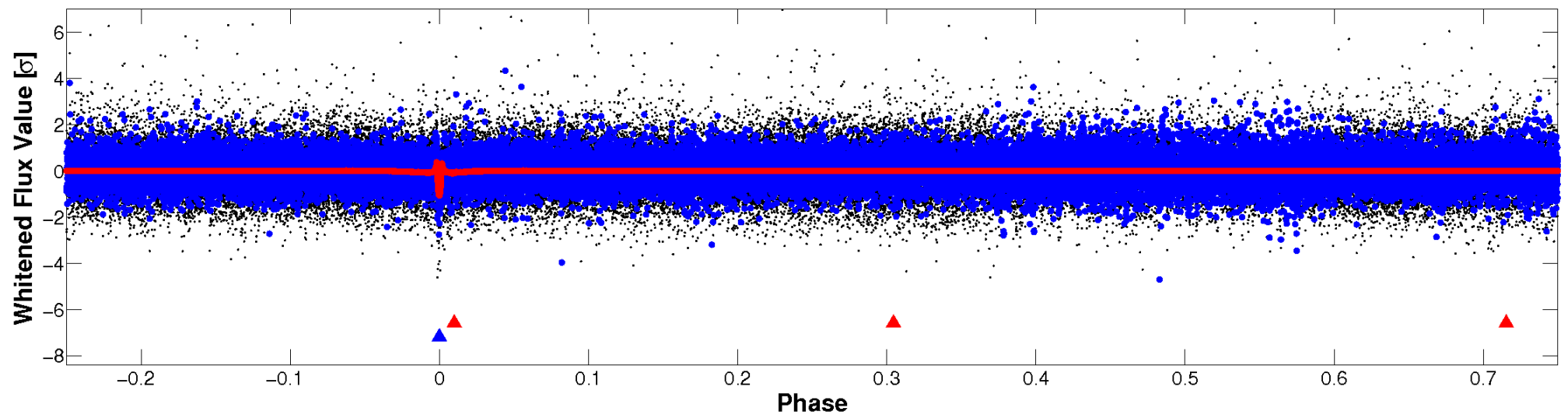


Non-Whitened Vs. Whitened Light Curve

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 009710702-02 $P=522.958634$ Days $T_0=340.827879$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 009710702-02 $P=522.958634$ Days $T_0=340.827879$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

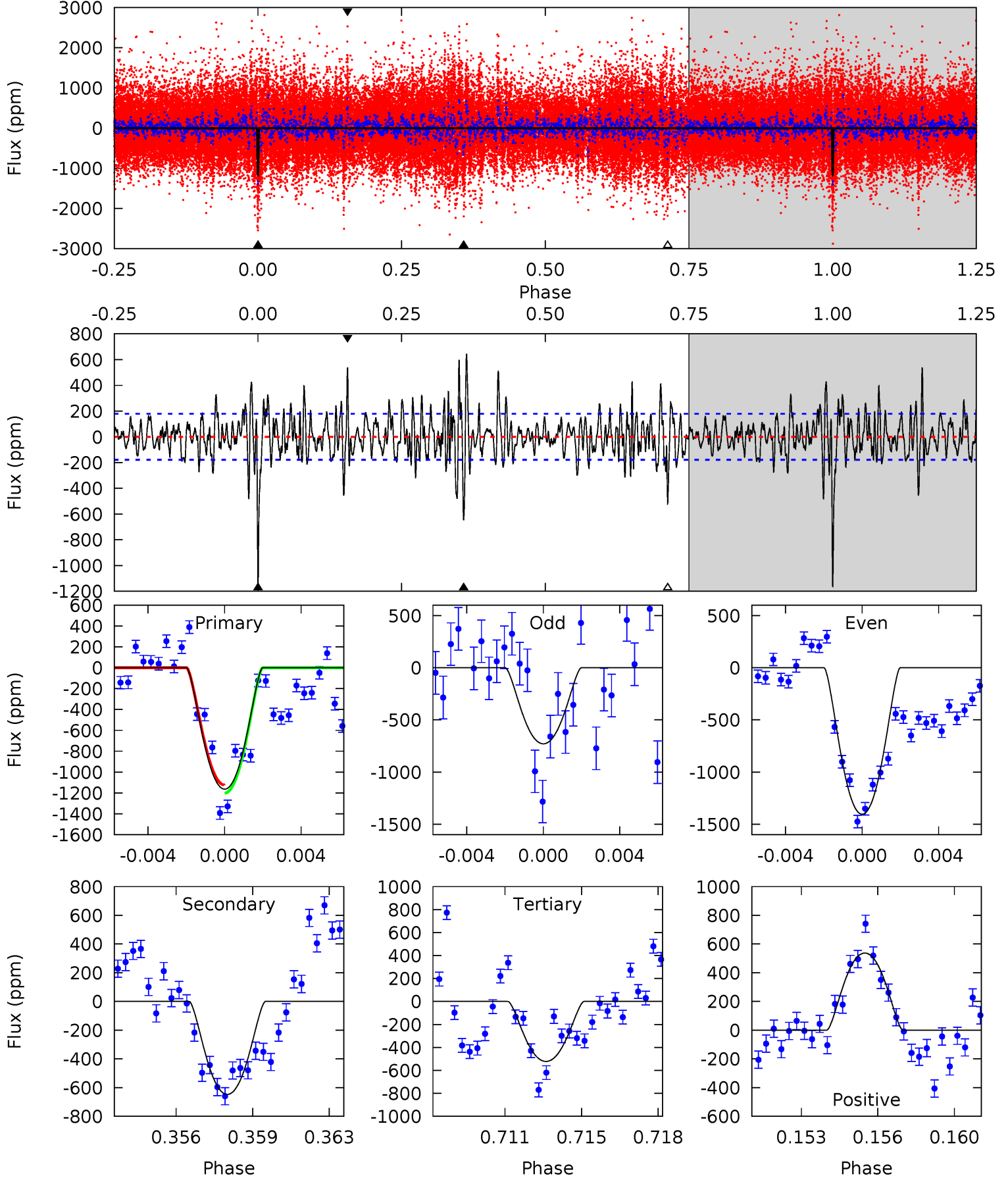
TCE 009710702-02 P=523.180870 Days $T_0=340.569397$ (BKJD)



DV Model-Shift Uniqueness Test

009710702-02, P = 522.958634 Days, E = 340.827879 Days

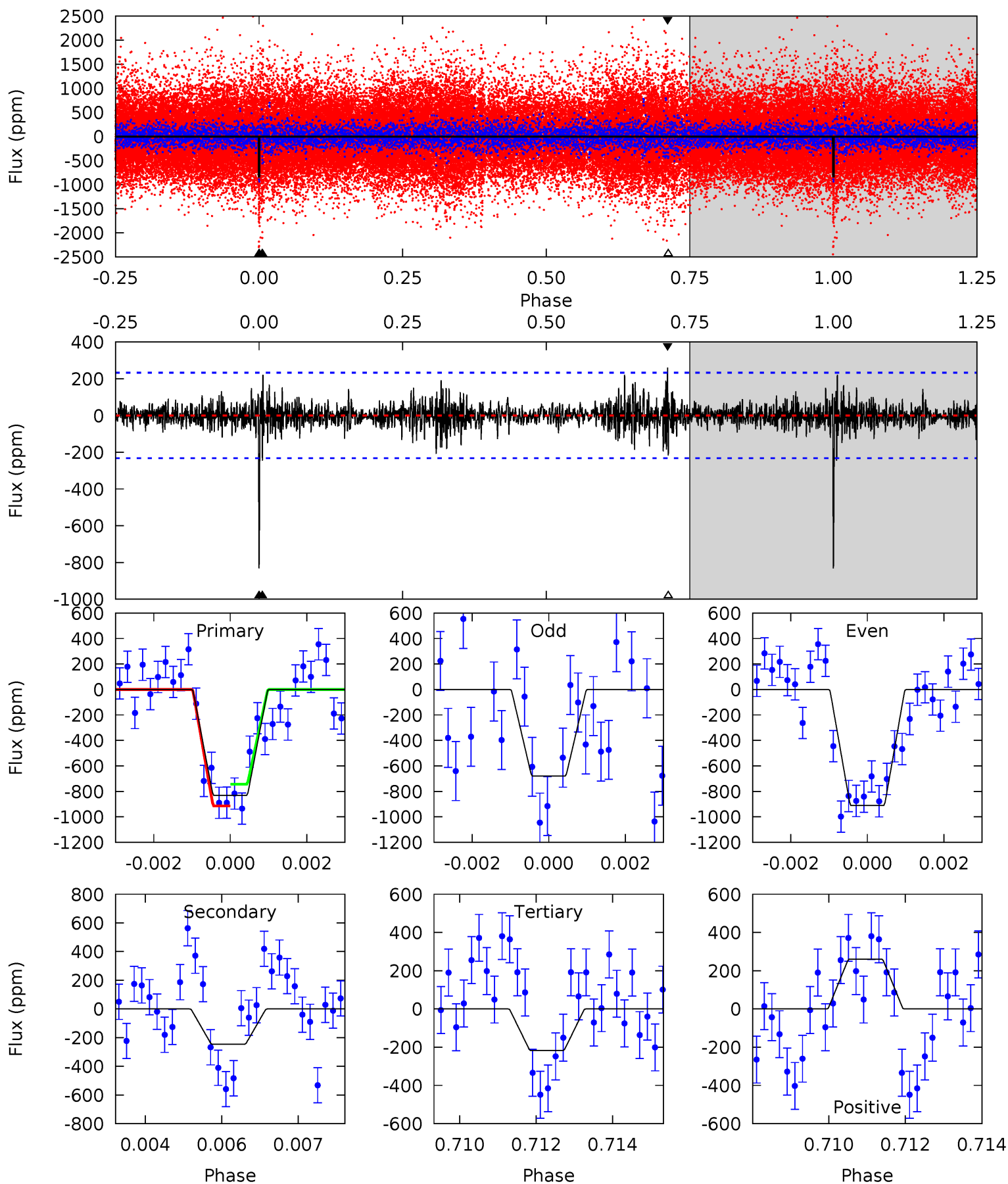
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.0	18.9	15.3	15.7	5.22	2.92	4.26	18.8	18.3	3.66	3.22	9.35	1.21	0.36	1.15



Alt Model-Shift Uniqueness Test

009710702-02, P = 523.180870 Days, E = 340.569397 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	5.64	4.98	5.98	5.34	3.12	1.12	14.1	13.1	0.67	-0.33	2.53	1.22	0.24	1.96



Stellar Parameters For KIC 009710702

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4860^{+144}_{-144}	$4.520^{+0.084}_{-0.056}$	$0.180^{+0.250}_{-0.300}$	$0.802^{+0.054}_{-0.077}$	$0.775^{+0.066}_{-0.060}$	$2.119^{+0.673}_{-0.356}$
	+3%/-3%	+2%/-1%	+139%/-167%	+7%/-10%	+9%/-8%	+32%/-17%
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 009710702-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-647 ± 34	$4.42^{+2.35}_{-2.09}$	247^{+9}_{-10}	3751^{+1050}_{-477}	25161^{+64216}_{-14574}
Alt.	-246 ± 44	$3.00^{+1.91}_{-1.79}$	248^{+9}_{-10}	3651^{+1508}_{-559}	$21658^{+110341}_{-14426}$

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

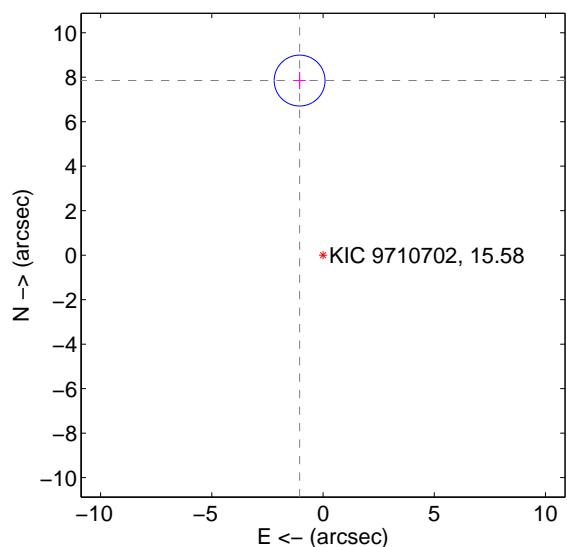
Supplemental centroid analysis for 009710702-02. Kepler magnitude: 15.58. Transit SNR 11.37

There are 0 quarters with good PRF difference image offsets

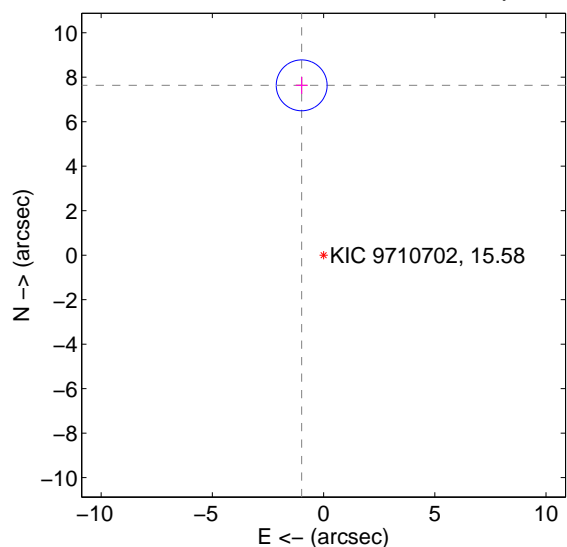
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.920 ± 0.381	20.78	1.053 ± 0.269	7.850 ± 0.383
PRF-fit source offset from KIC position	7.698 ± 0.381	20.19	0.985 ± 0.269	7.635 ± 0.383
photometric centroid source offset	0.30 ± 1.28	0.23	0.26 ± 1.26	-0.15 ± 1.36

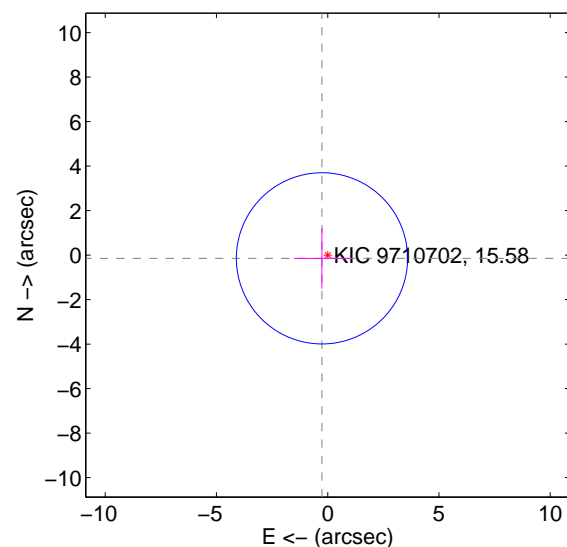
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

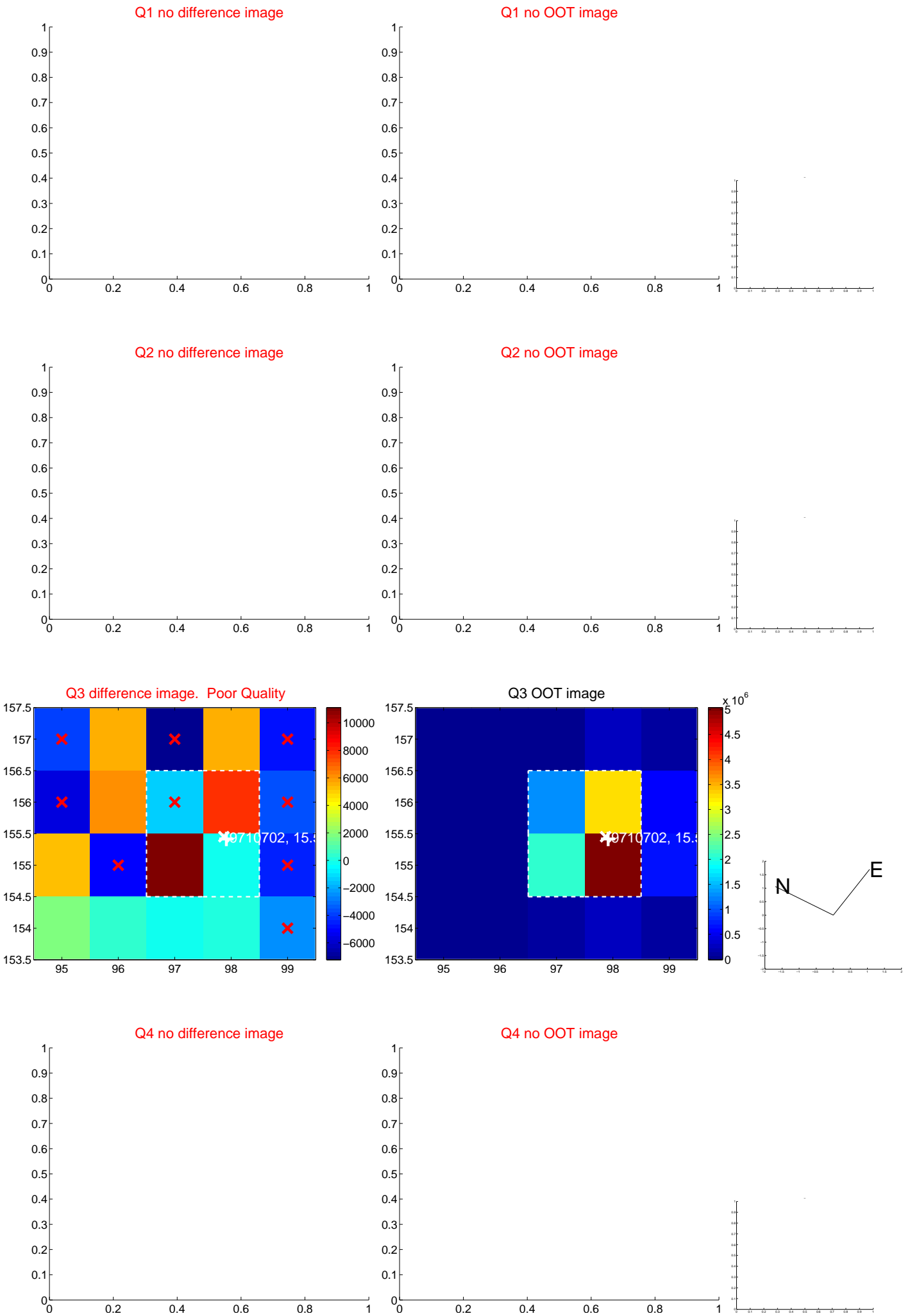


offset from photometric centroids



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.

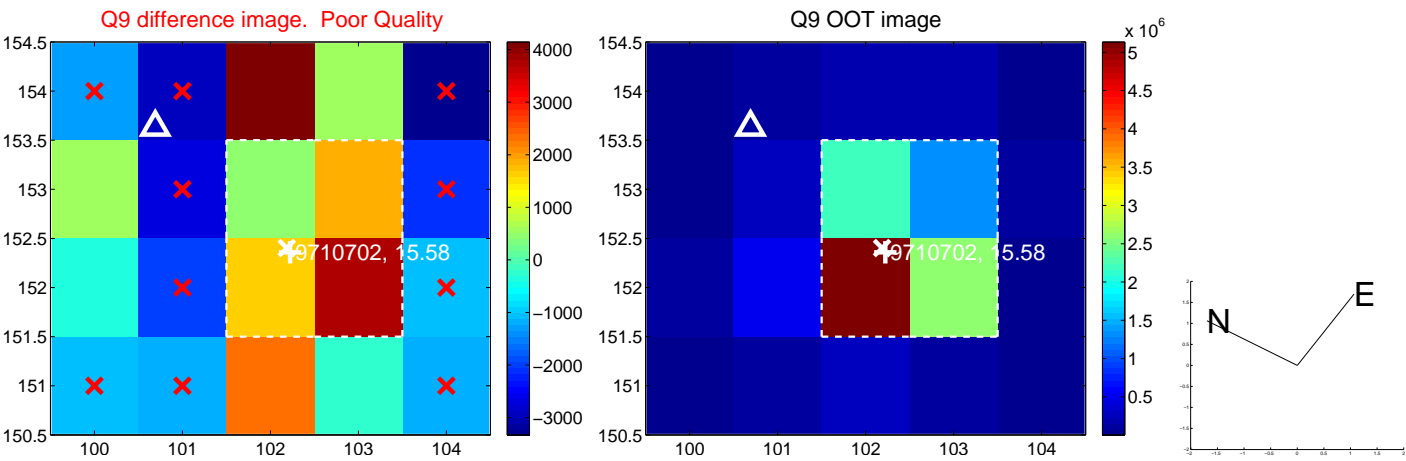
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



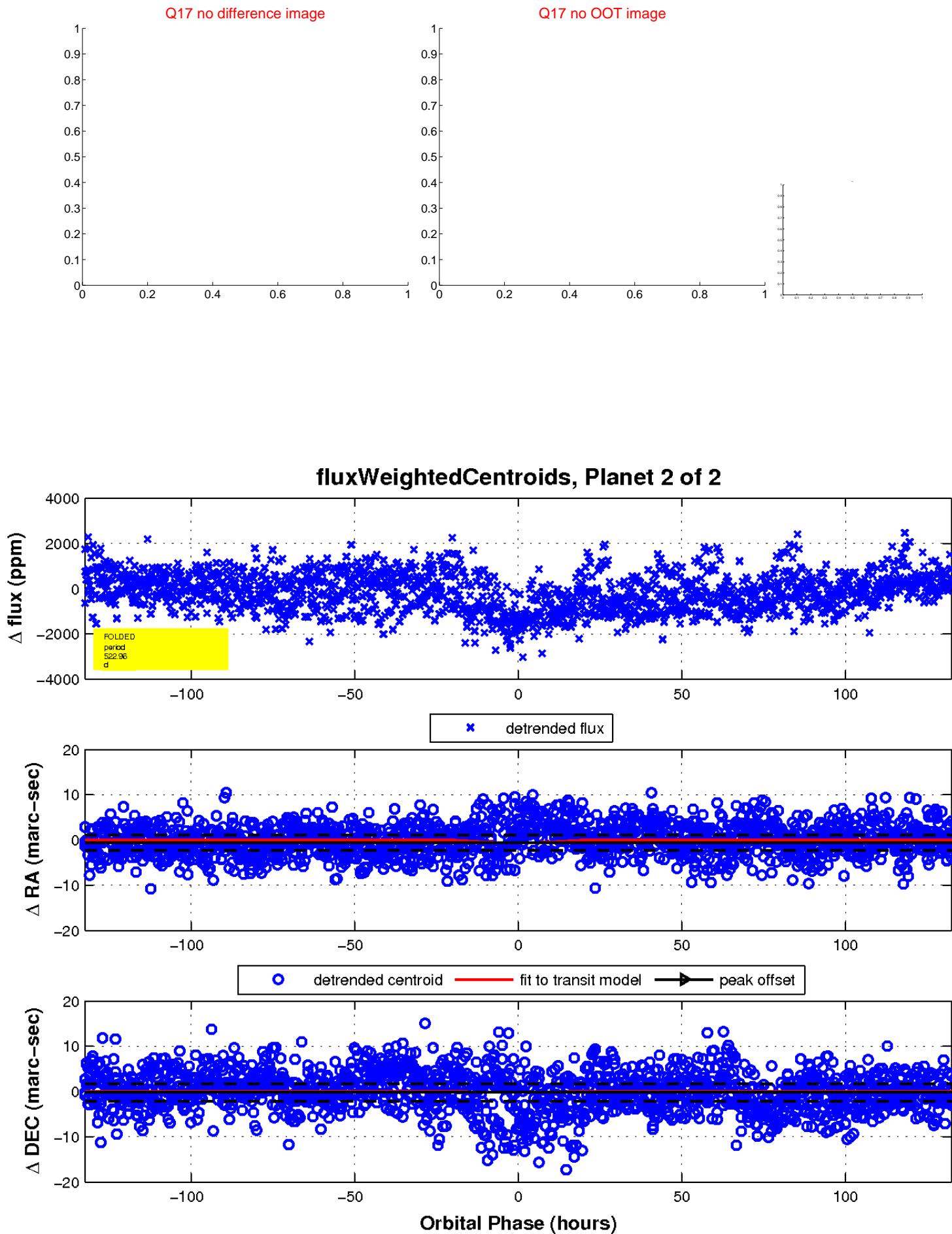
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

