

KIC 008934103

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})
008934103-01	OBS	4009.01	175.139098	296.033158	622.8	10.872	16.5	16.6	1.24	5497	3.37	3.39
008934103-02	OBS	4009.02	77.792890	190.130913	210.4	9.357	8.3	8.1	1.24	5497	1.98	10.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008934103-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008934103-02	OBS	PC	0.93	0	0	0	0	NO_COMMENT

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.

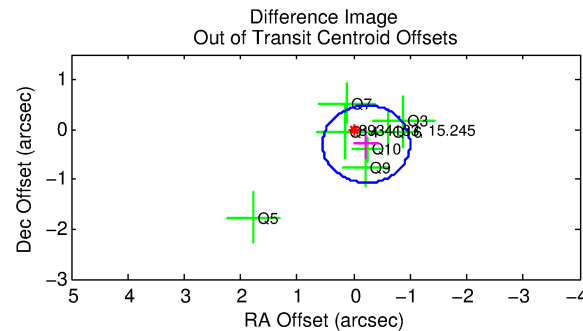
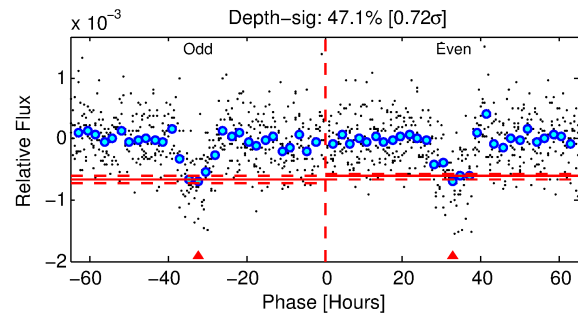
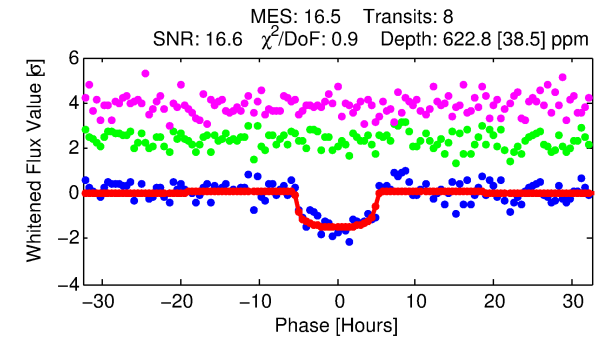
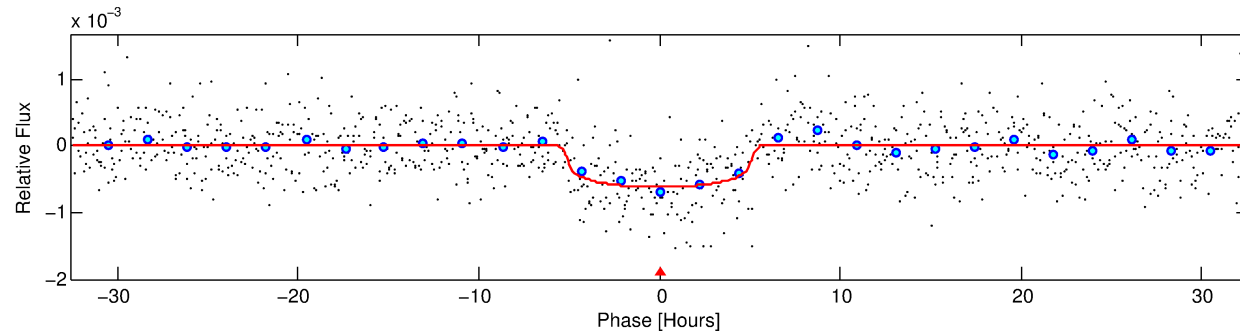
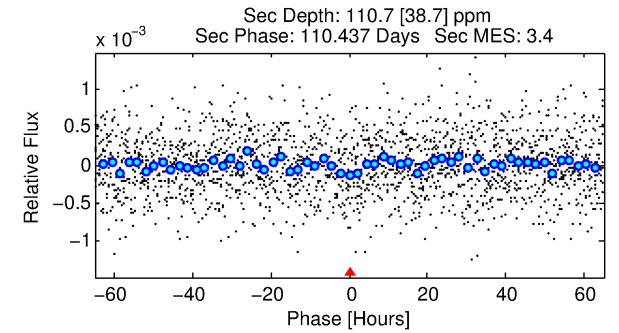
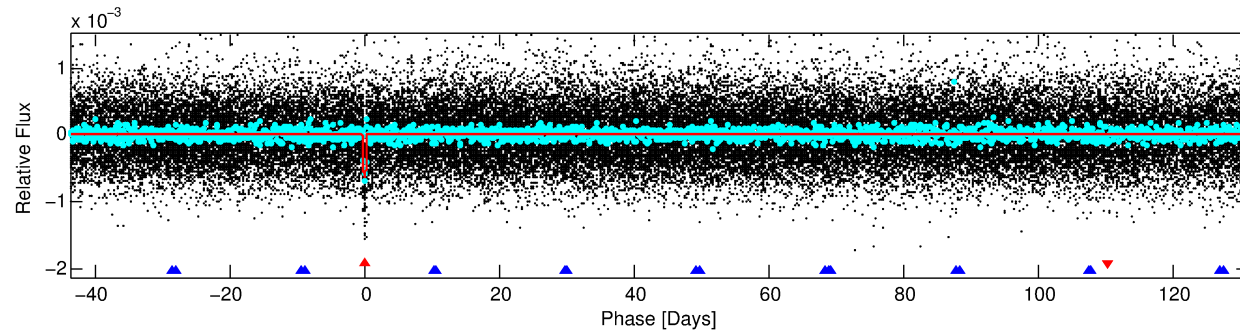
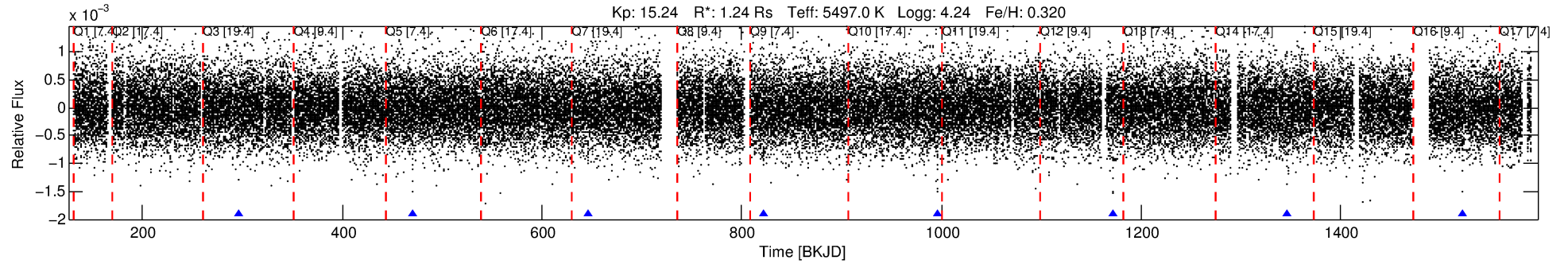
Ephemeris Match Information For 008934103-01

No Significant Match Found

DV One-Page Summary

KIC: 8934103 Candidate: 1 of 2 Period: 175.139 d

KOI: K04009.01 Corr: 0.988



DV Fit Results:

Period = 175.13910 [0.00258] d
Epoch = 296.0332 [0.0108] BKJD
Rp/R* = 0.0249 [0.0065]
a/R* = 85.92 [87.62]
b = 0.75 [0.60]
Seff = 3.39 [1.04]
Teq = 346 [26] K
Rp = 3.37 [1.09] Re
a = 0.6093 [0.1140] AU
Ag = 1991.31 [1383.53] [1.44σ]
Teffp = 3575 [563] K [5.73σ]

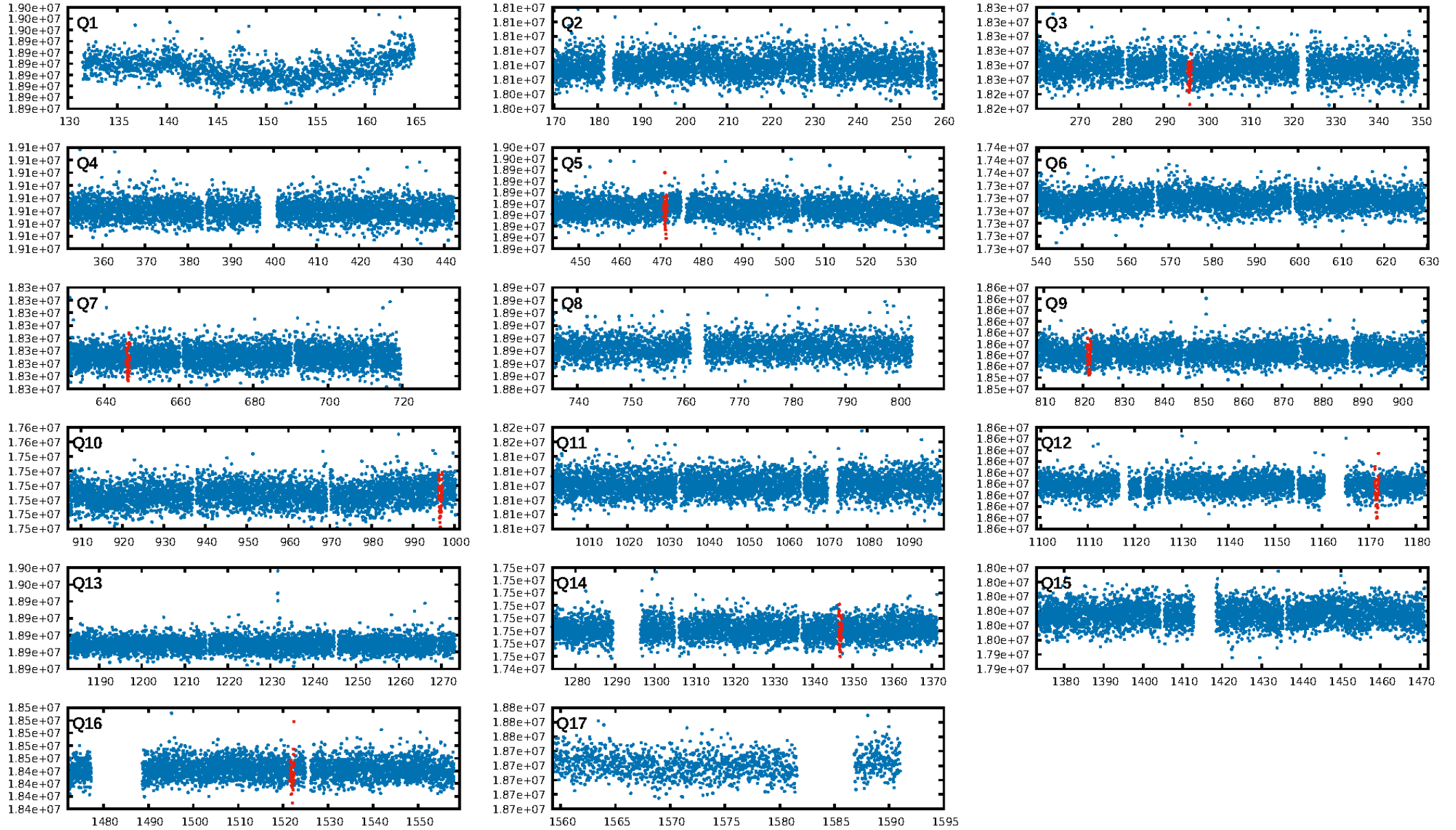
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [162.87σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 42.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.71e-58
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 2.236
Centroid-sig: 60.5%
Centroid-so: 0.451 arcsec [0.56σ]
OotOffset-rm: 0.371 arcsec [1.44σ]
KicOffset-rm: 0.600 arcsec [2.09σ]
OotOffset-st: 2/2/1/2 [7]
KicOffset-st: 2/2/1/2 [7]
DiffImageQuality-fgm: 1.00 [7/7]
DiffImageOverlap-fno: 1.00 [7/7]

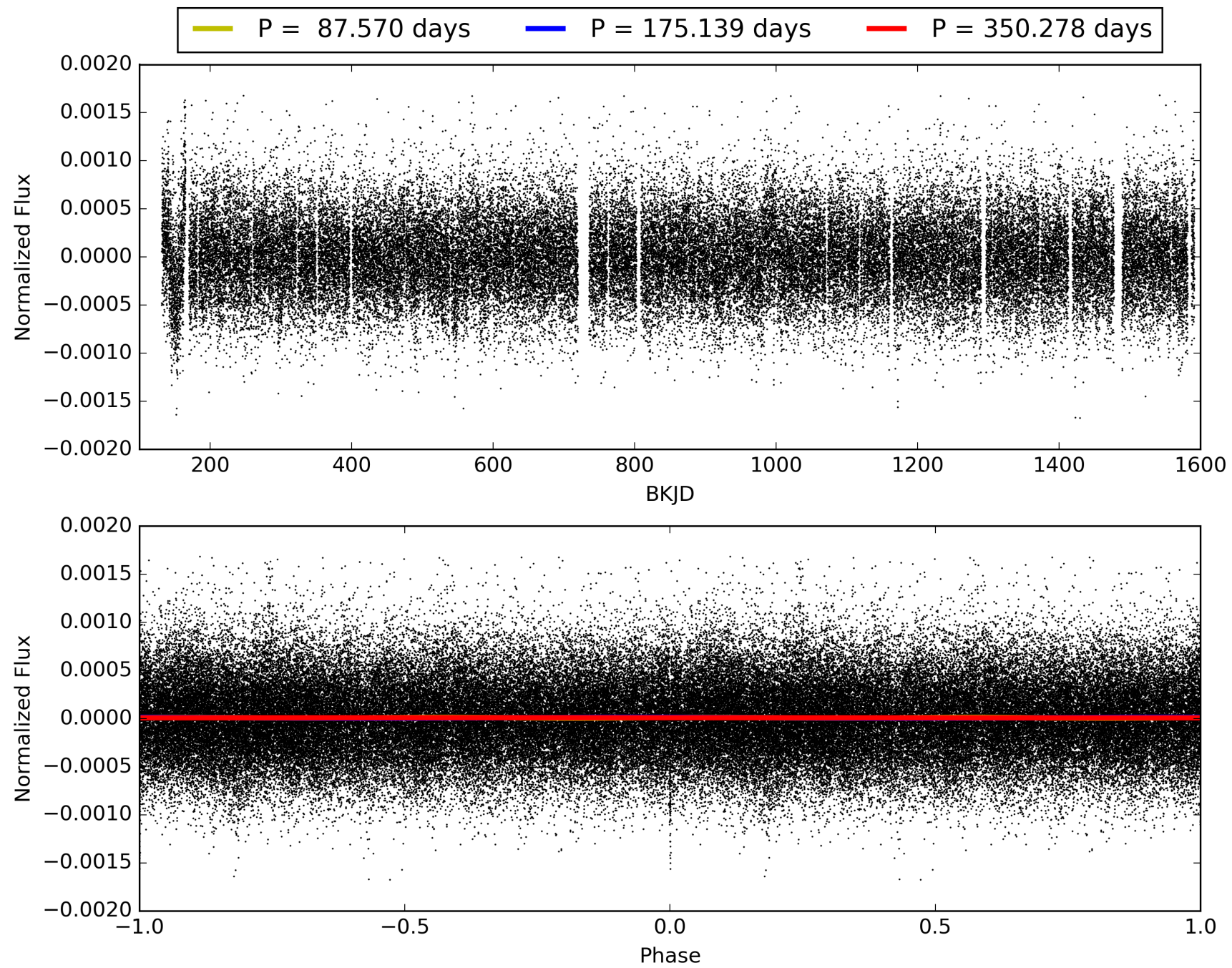
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:57:10 Z

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

TCE 008934103-01, PDC Light Curves

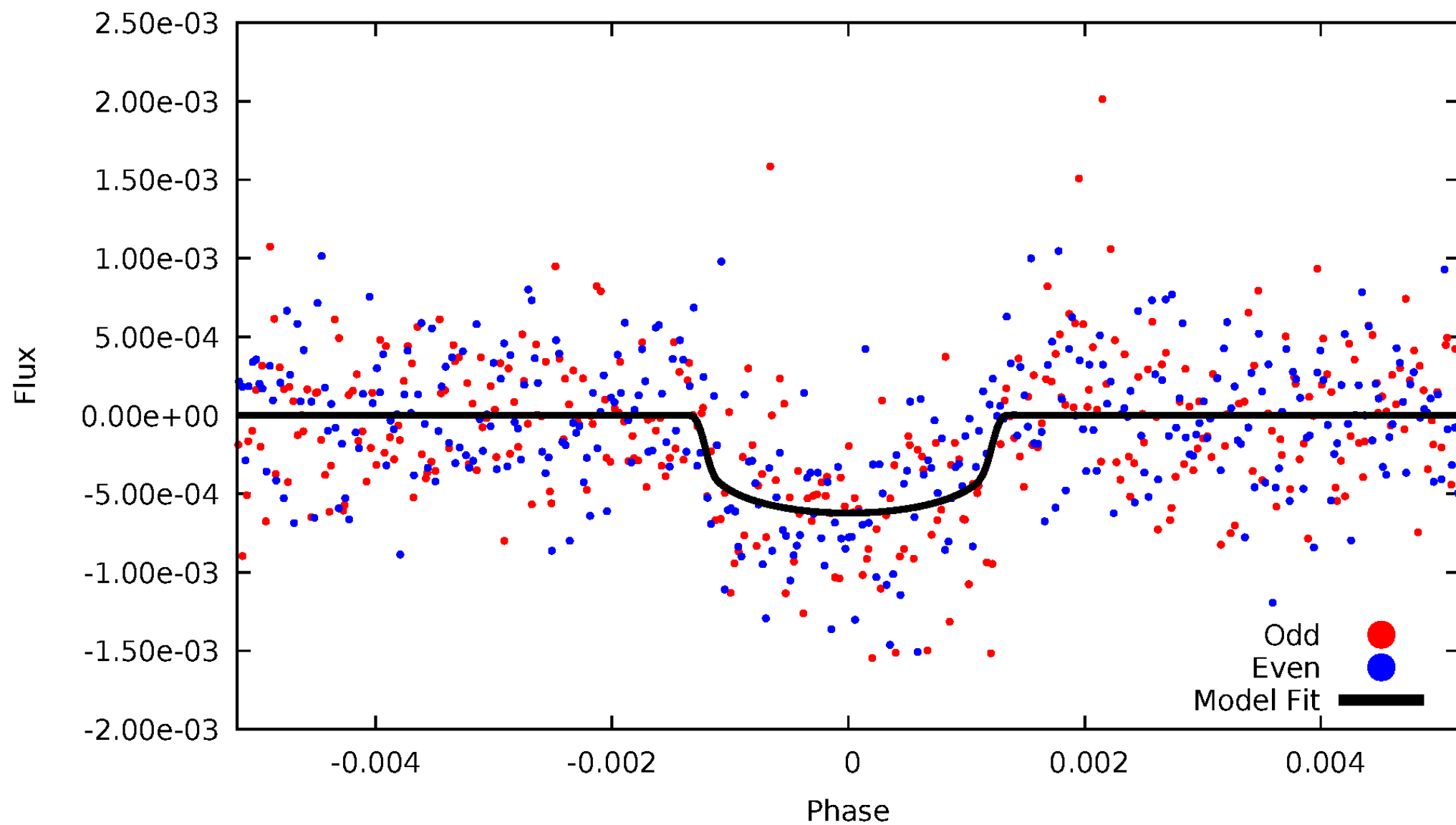


TCE 008934103-01



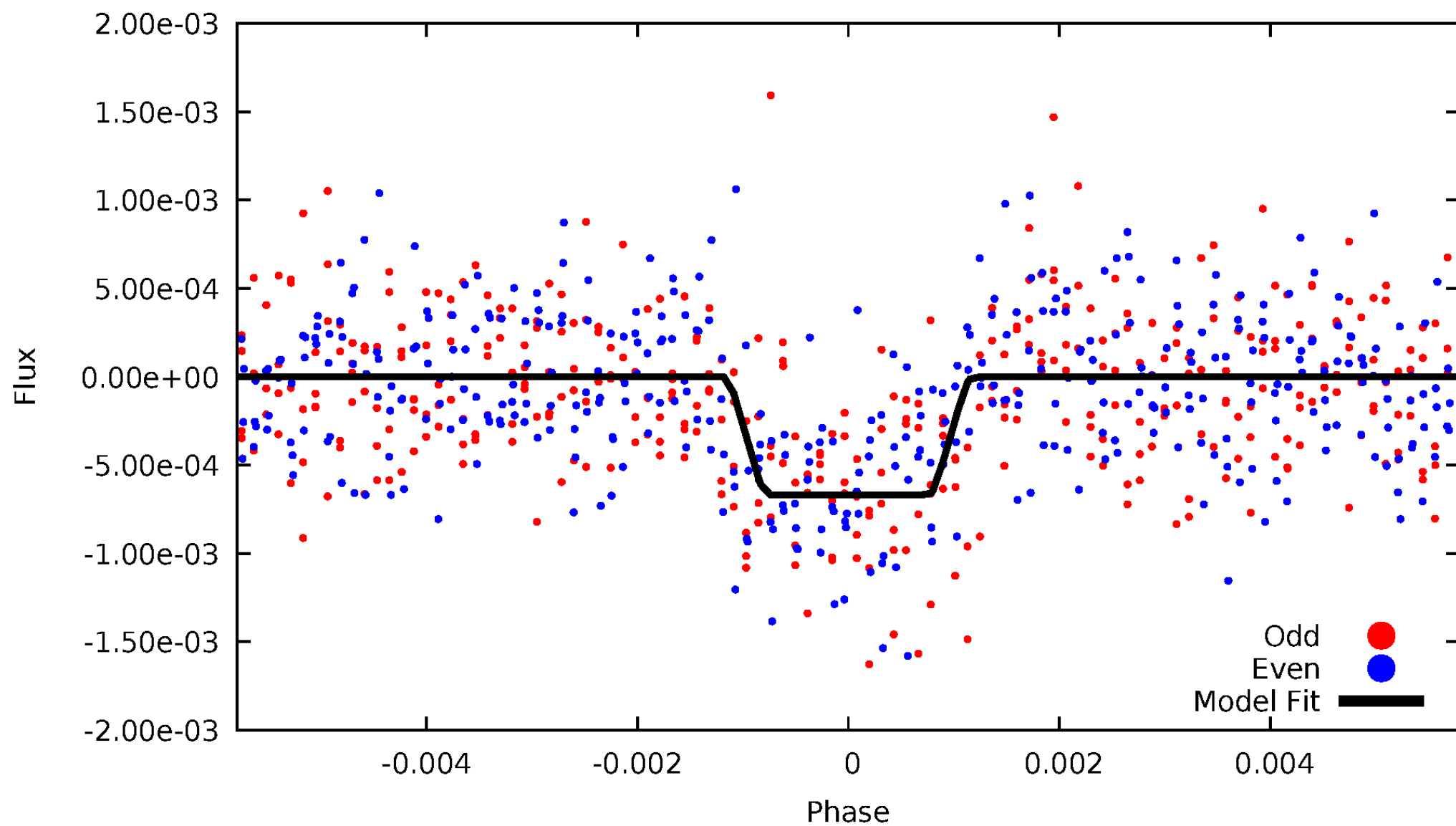
DV Odd/Even

TCE 008934103-01

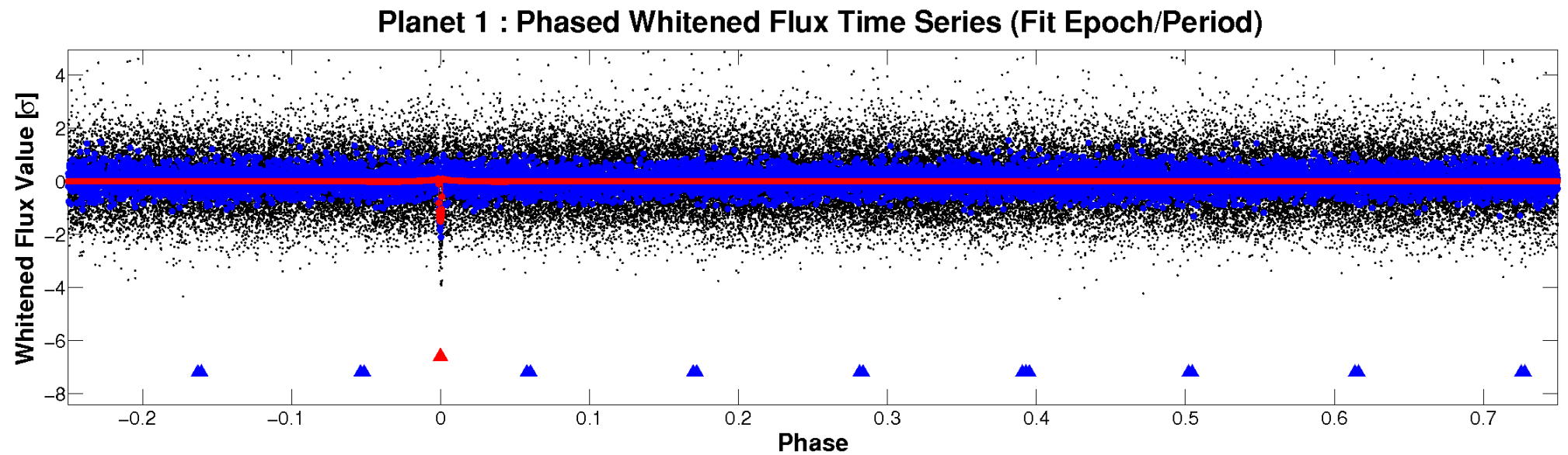
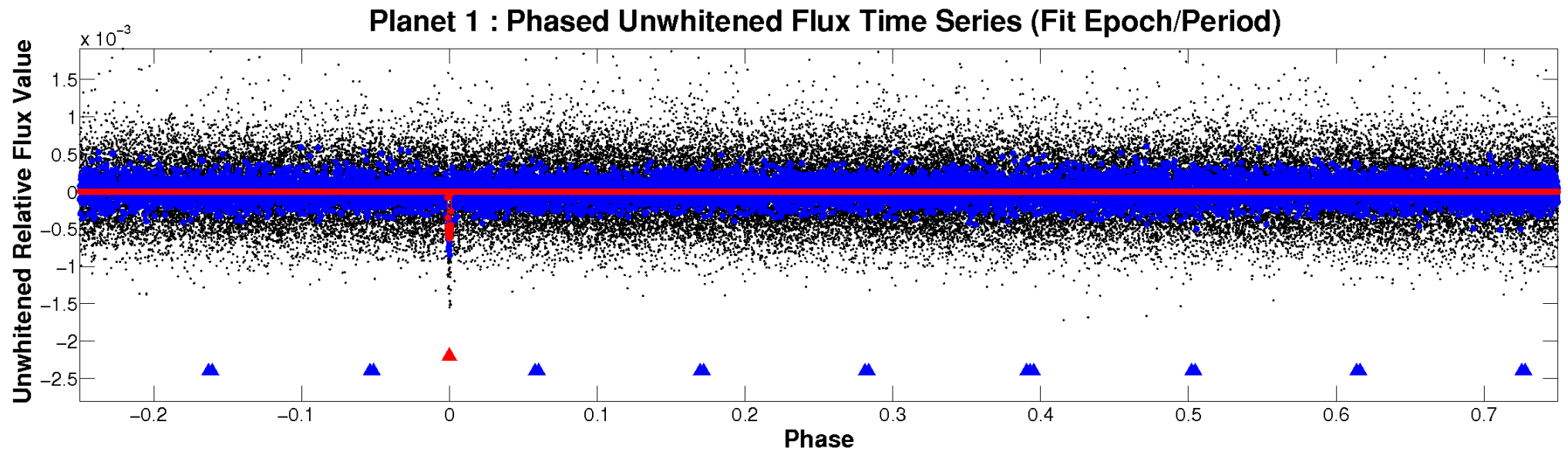


ALT Odd/Even

TCE 008934103-01

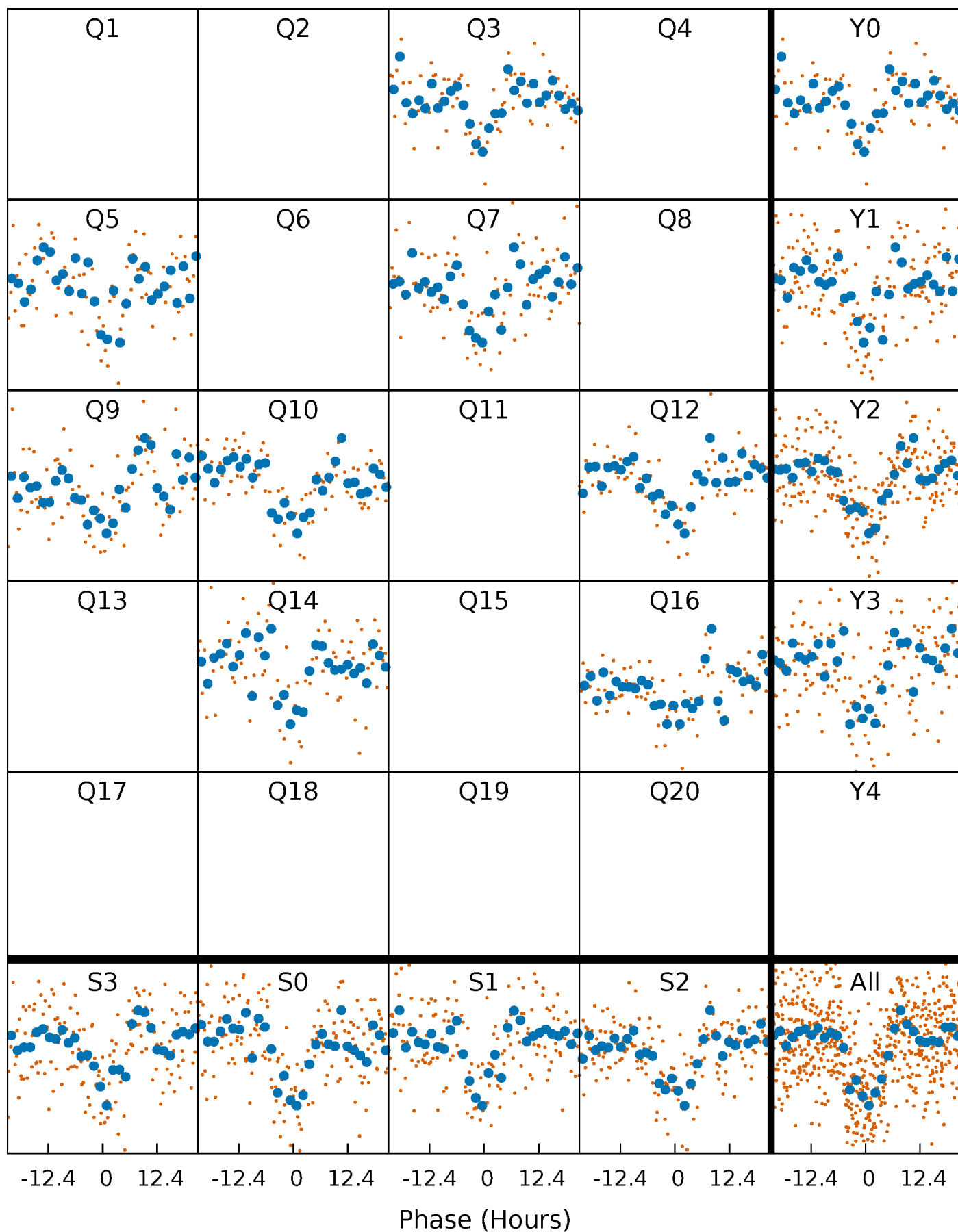


Non-Whitened Vs. Whitened Light Curve



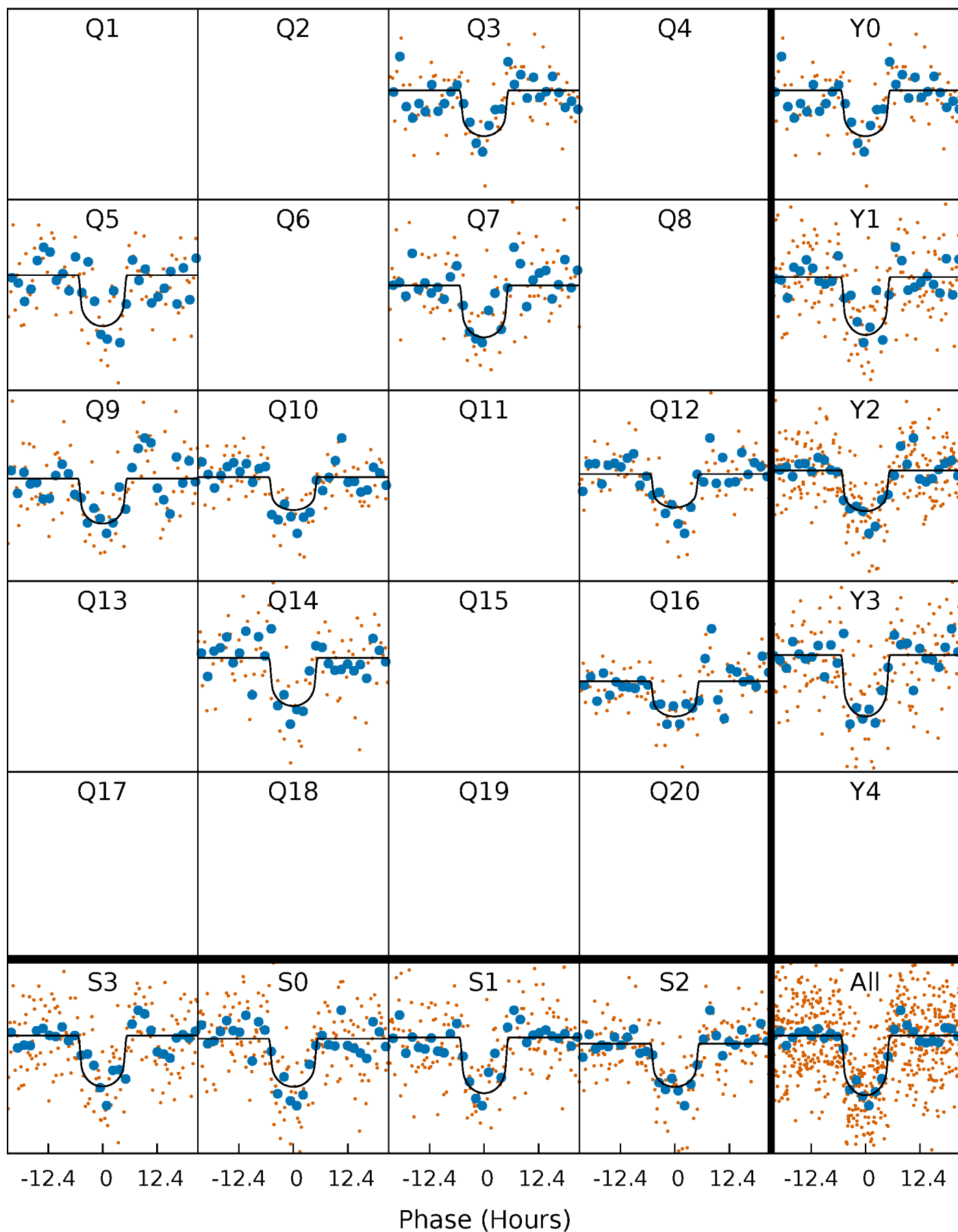
PDC Quarter-Phased Transit Curves

TCE 008934103-01 P=175.139098 Days $T_0=296.033158$ (BKJD)



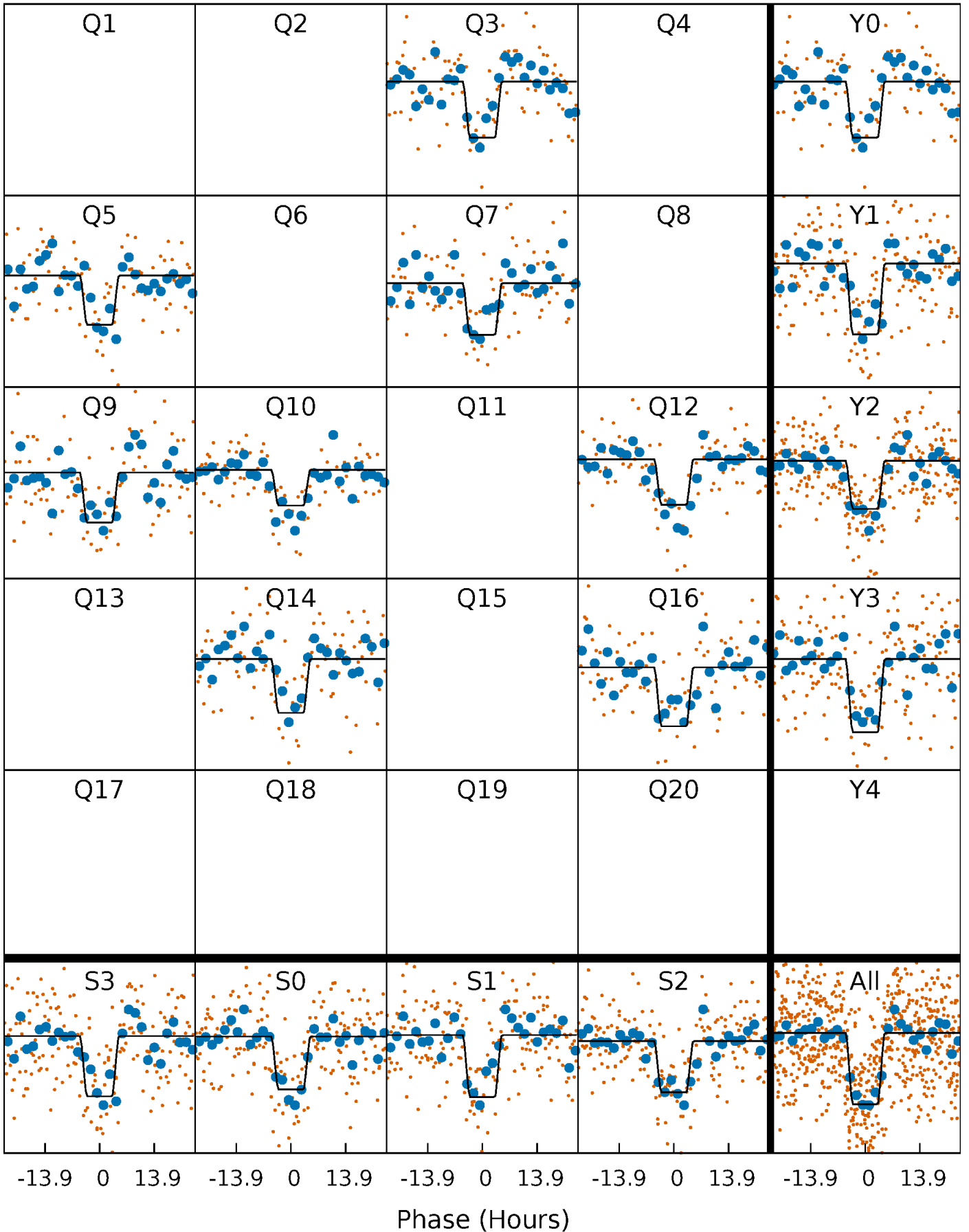
DV Quarter-Phased Transit Curves

TCE 008934103-01 P=175.139098 Days $T_0=296.033158$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

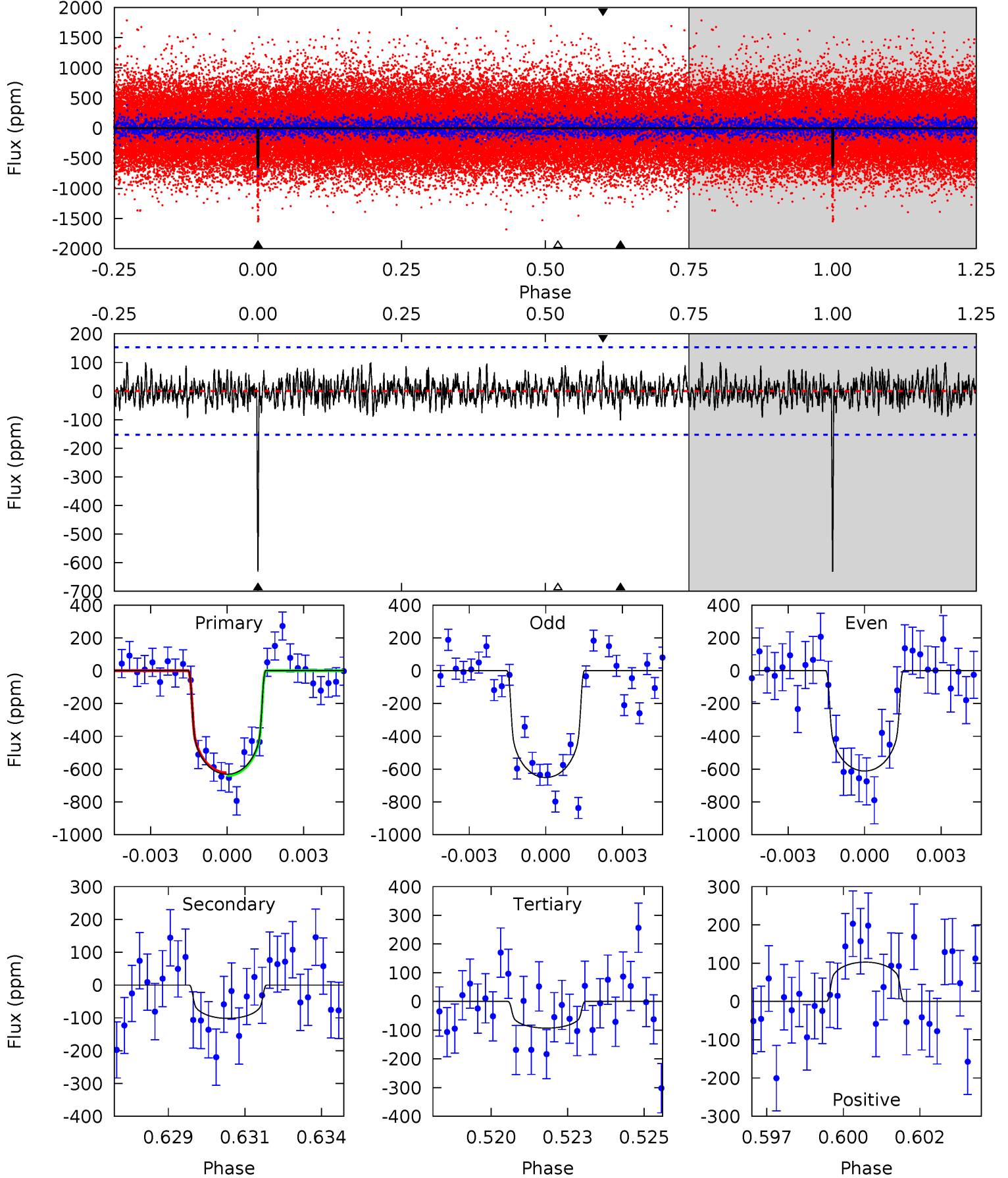
TCE 008934103-01 P=175.136043 Days $T_0=296.049590$ (BKJD)



DV Model-Shift Uniqueness Test

008934103-01, P = 175.139098 Days, E = 120.894060 Days

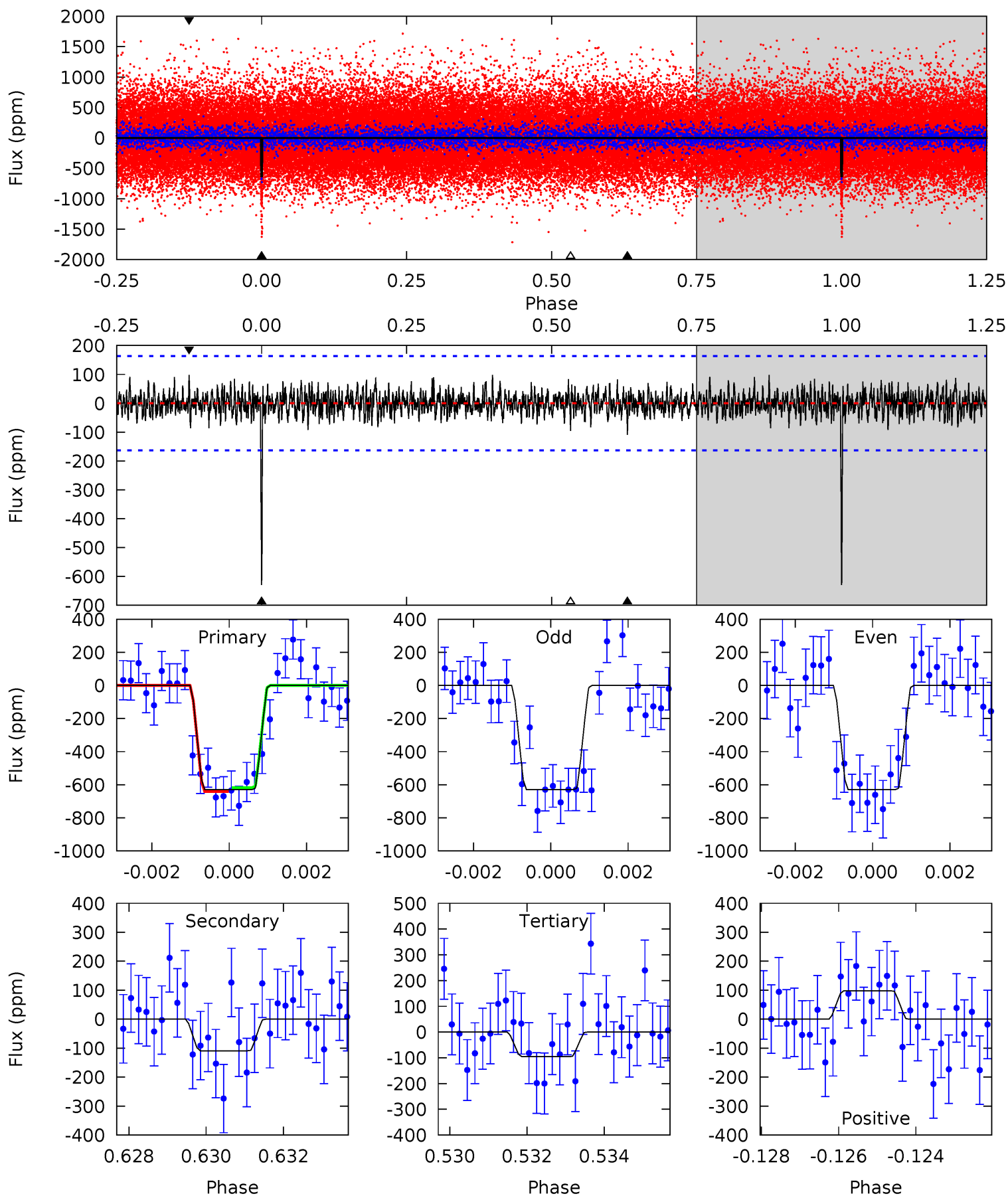
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	3.51	3.21	3.55	5.28	3.01	1.11	18.6	18.2	0.30	-0.04	0.68	1.08	0.14	0.29



Alt Model-Shift Uniqueness Test

008934103-01, P = 175.136043 Days, E = 120.913547 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.4	3.54	3.11	3.18	5.30	3.04	0.97	17.3	17.3	0.43	0.36	0.01	1.13	0.13	0.37



Stellar Parameters For KIC 008934103

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5497^{+83}_{-74}	$4.243^{+0.176}_{-0.108}$	$0.320^{+0.150}_{-0.150}$	$1.241^{+0.181}_{-0.241}$	$0.981^{+0.051}_{-0.051}$	$0.723^{+0.627}_{-0.230}$
	+2%/-1%	+4%/-3%	+47%/-47%	+15%/-19%	+5%/-5%	+87%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008934103-01 / KOI 4009.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-102 ± 29	$3.39^{+1.00}_{-0.90}$	483^{+23}_{-24}	3806^{+534}_{-320}	1742^{+1911}_{-787}
Alt.	-109 ± 31	$3.42^{+0.94}_{-0.87}$	483^{+20}_{-27}	3858^{+455}_{-346}	1892^{+1735}_{-825}

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 $A_{obs} \gg 1.0$

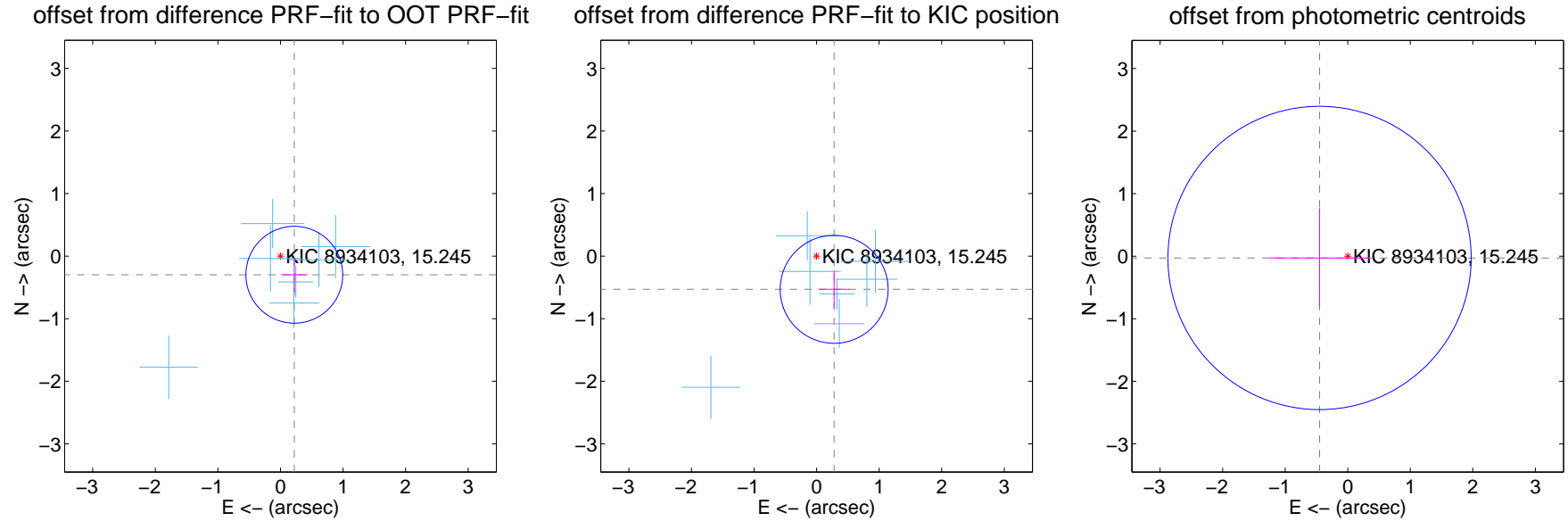
DV Centroid Data

Supplemental centroid analysis for 008934103-01. Kepler magnitude: 15.24. Transit SNR 16.59

There are 7 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

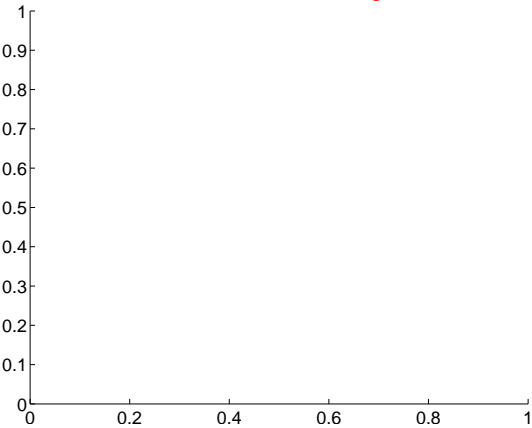
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.371 ± 0.258	1.44	-0.221 ± 0.213	-0.298 ± 0.280
PRF-fit source offset from KIC position	0.600 ± 0.288	2.09	-0.281 ± 0.246	-0.530 ± 0.298
photometric centroid source offset	0.45 ± 0.81	0.56	0.45 ± 0.81	-0.03 ± 0.79



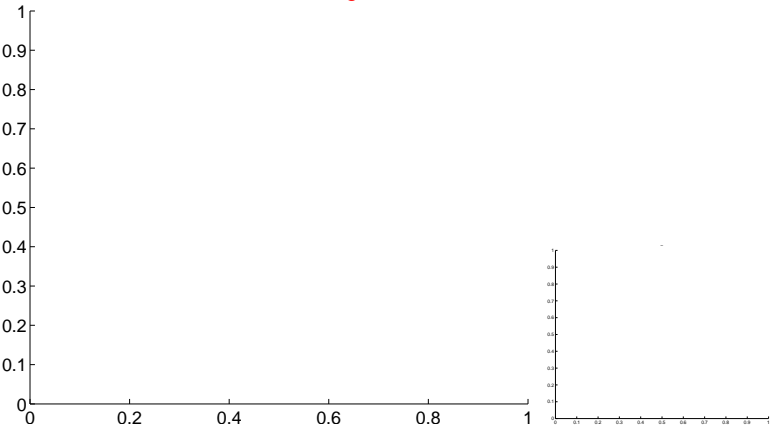
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

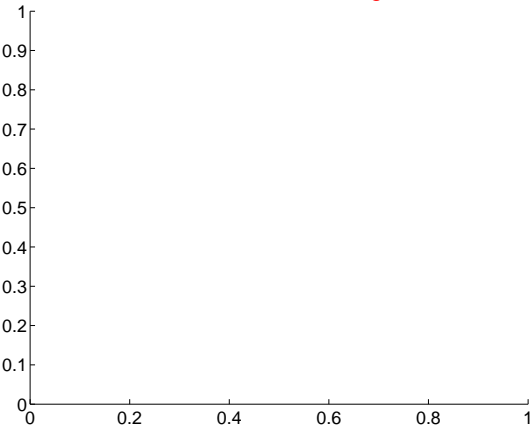
Q1 no difference image



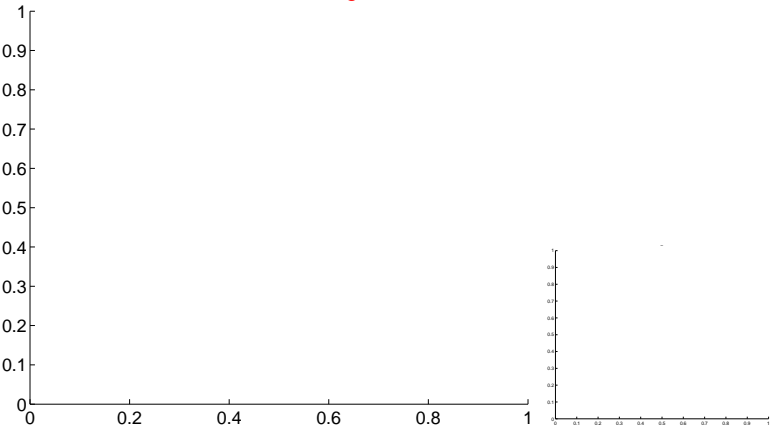
Q1 no OOT image



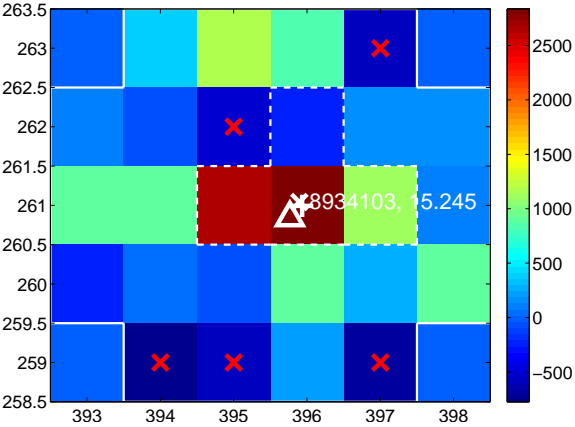
Q2 no difference image



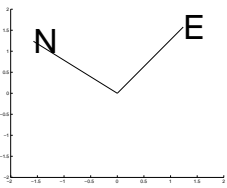
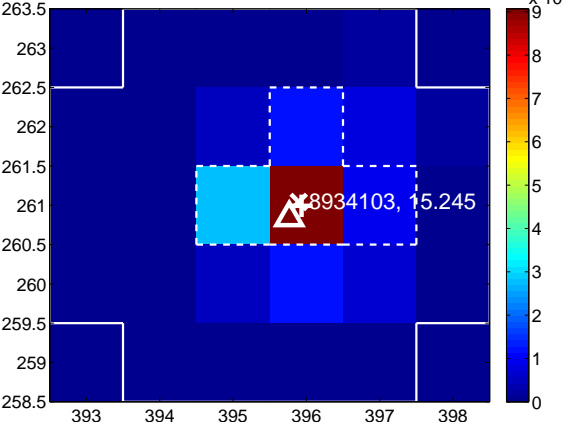
Q2 no OOT image



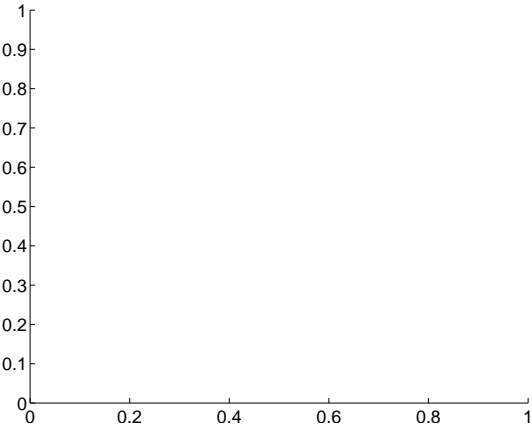
Q3 difference image



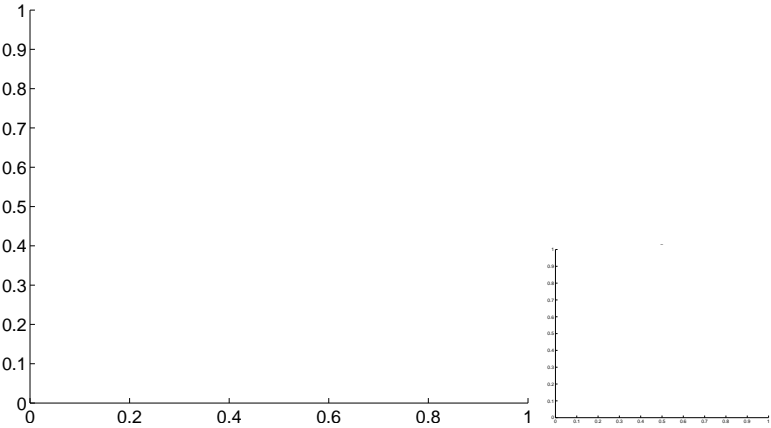
Q3 OOT image



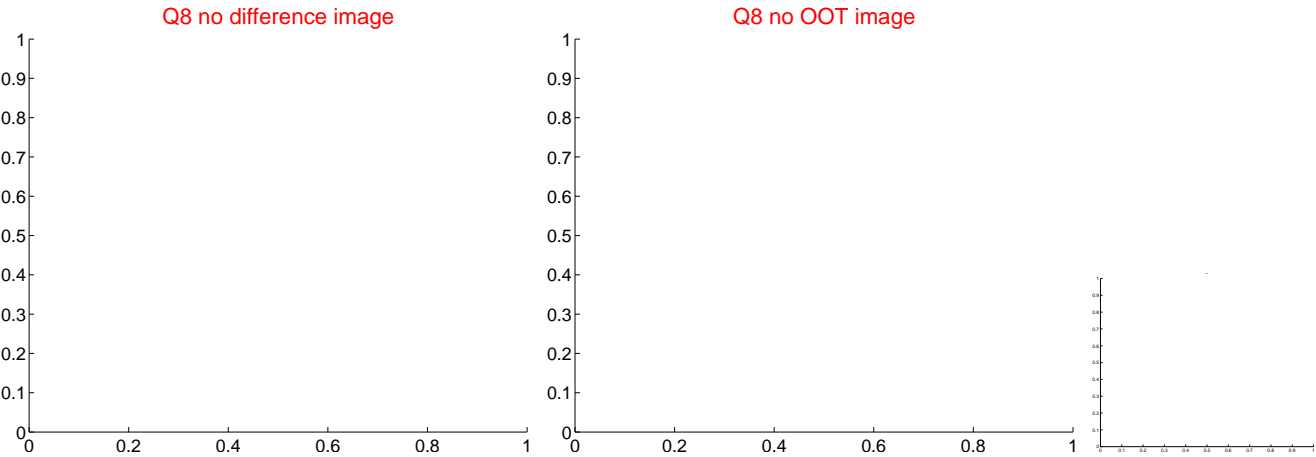
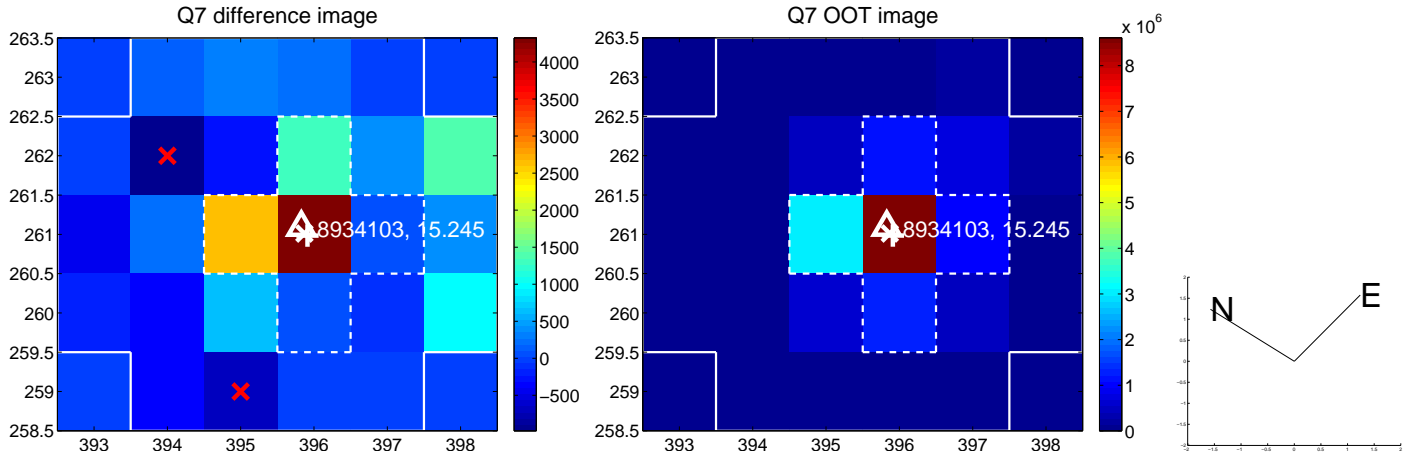
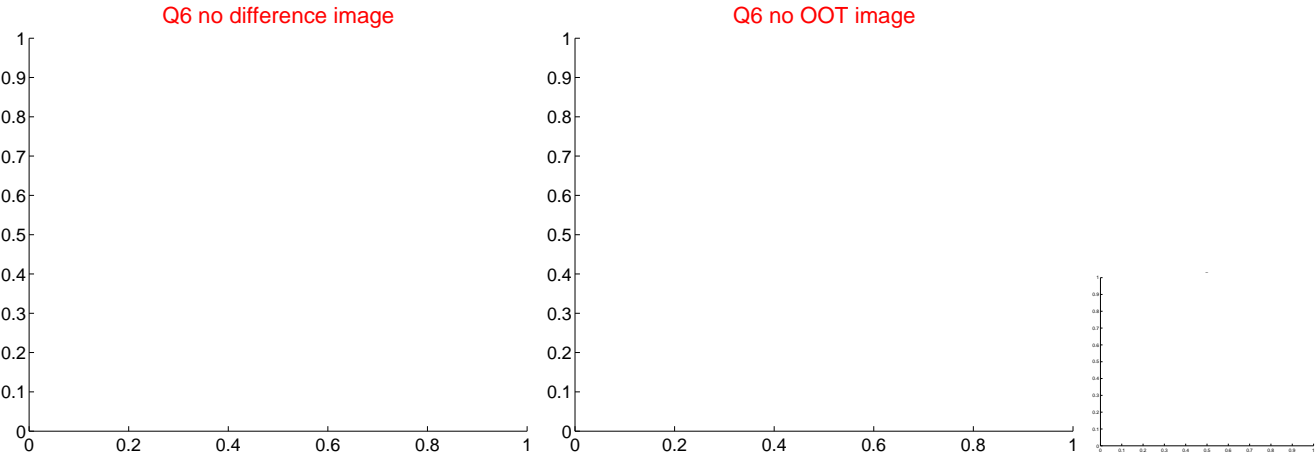
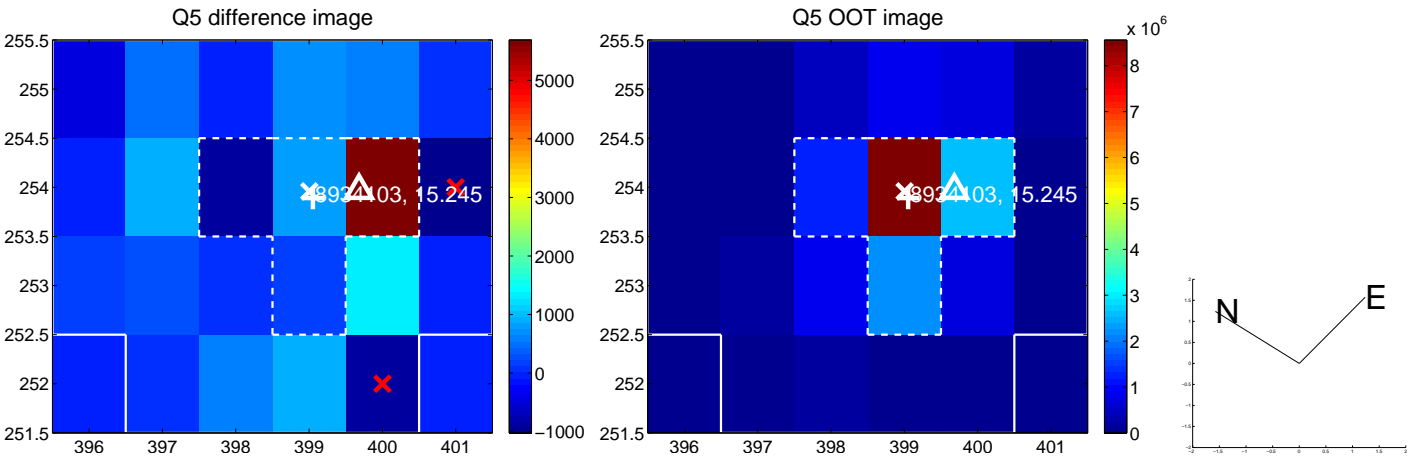
Q4 no difference image



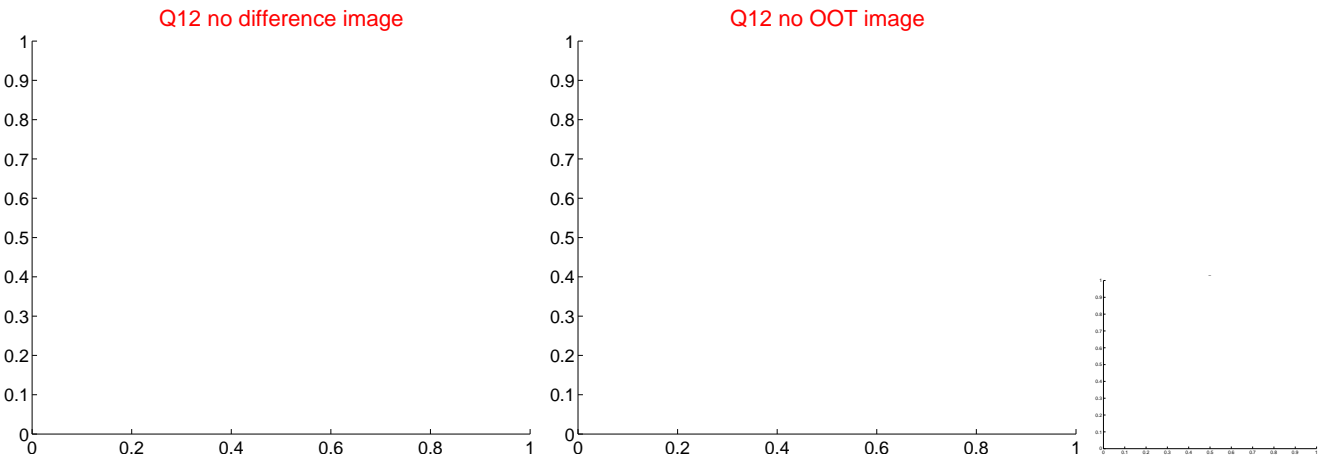
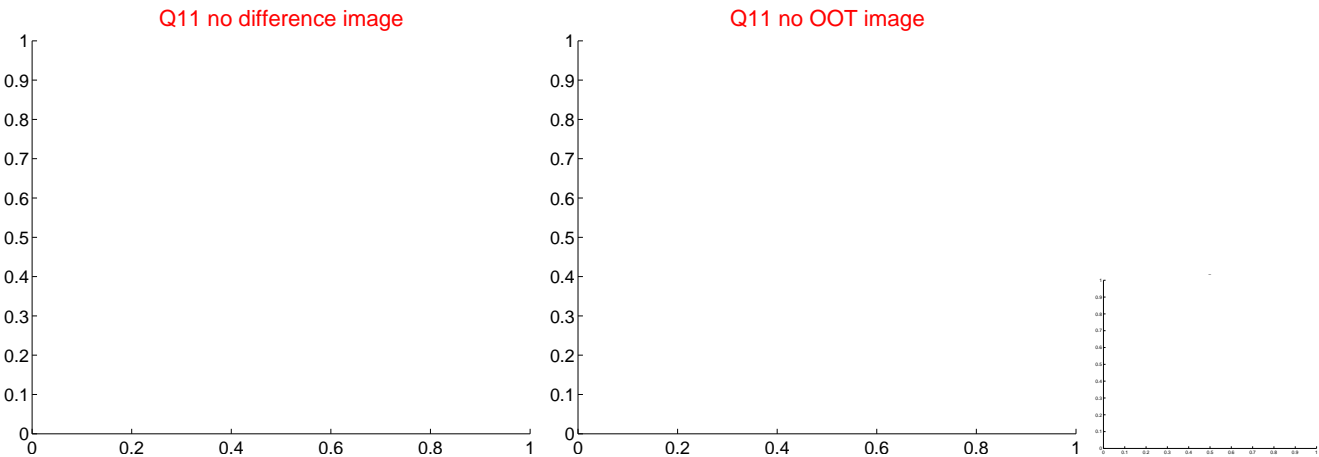
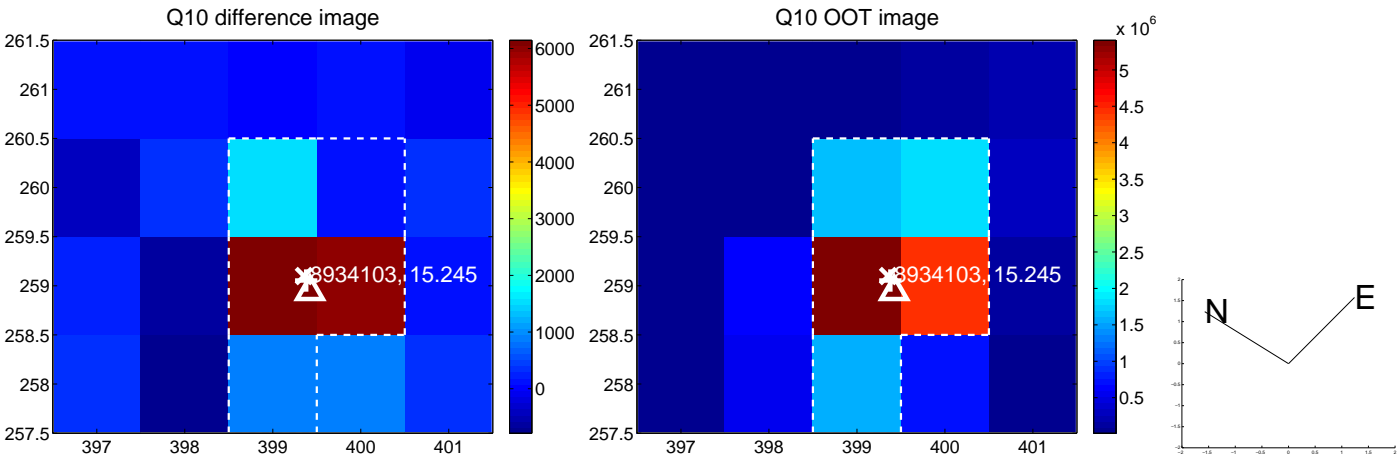
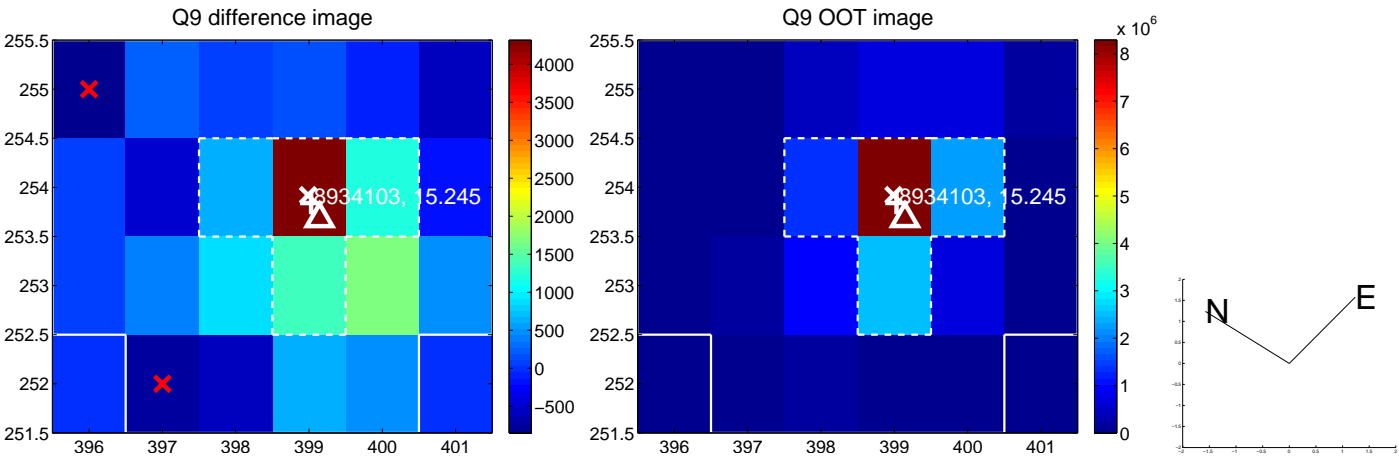
Q4 no OOT image



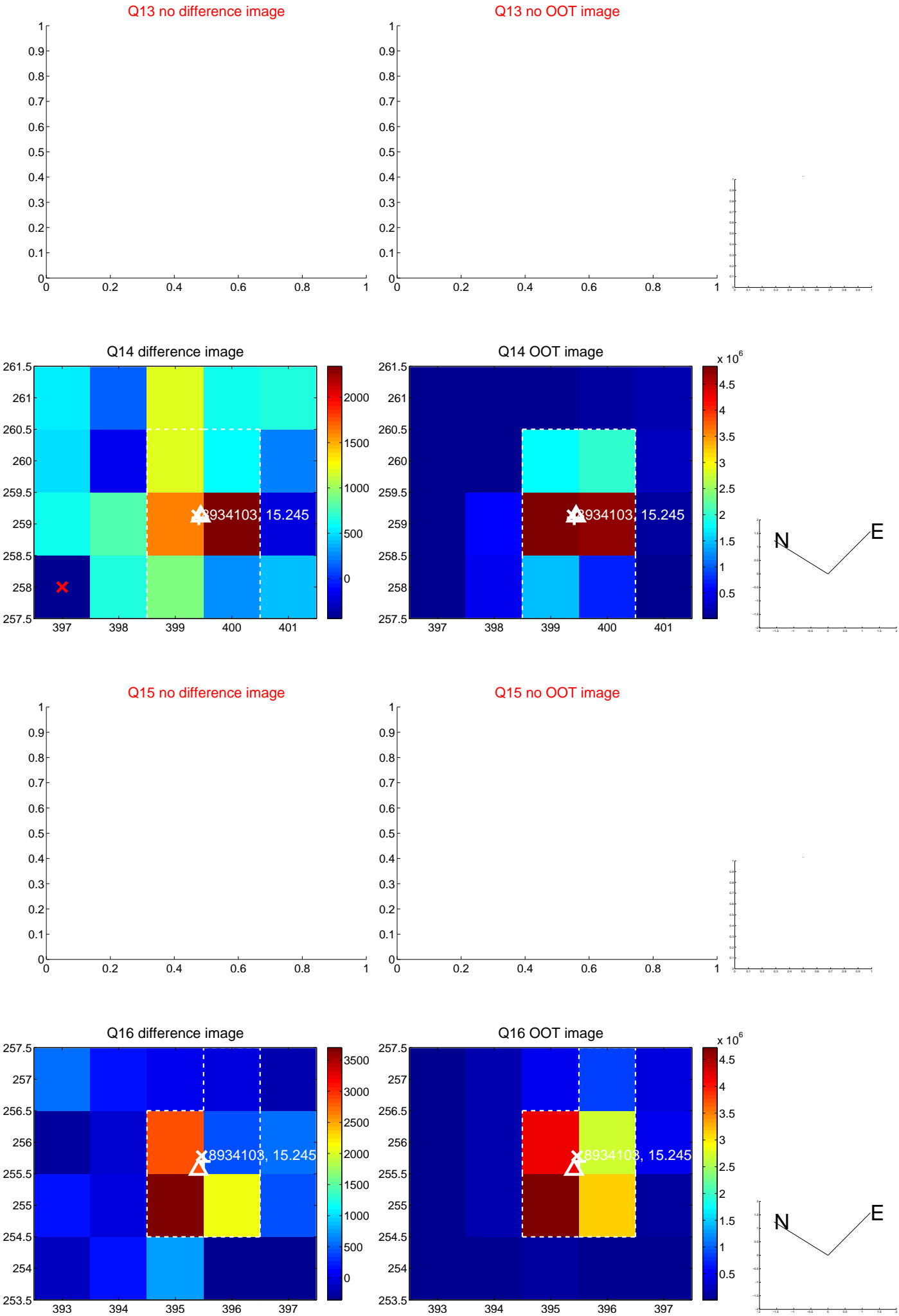
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



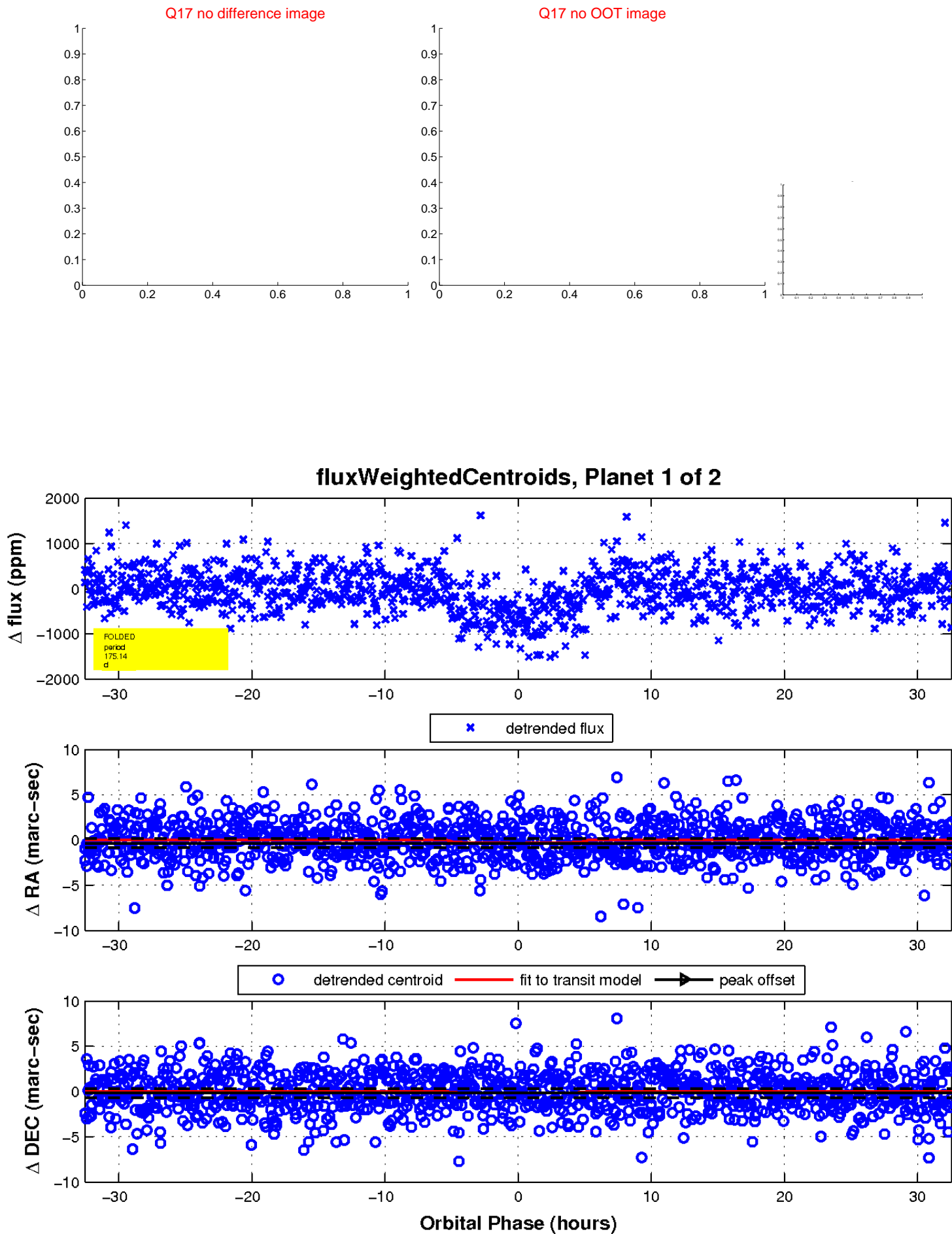
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

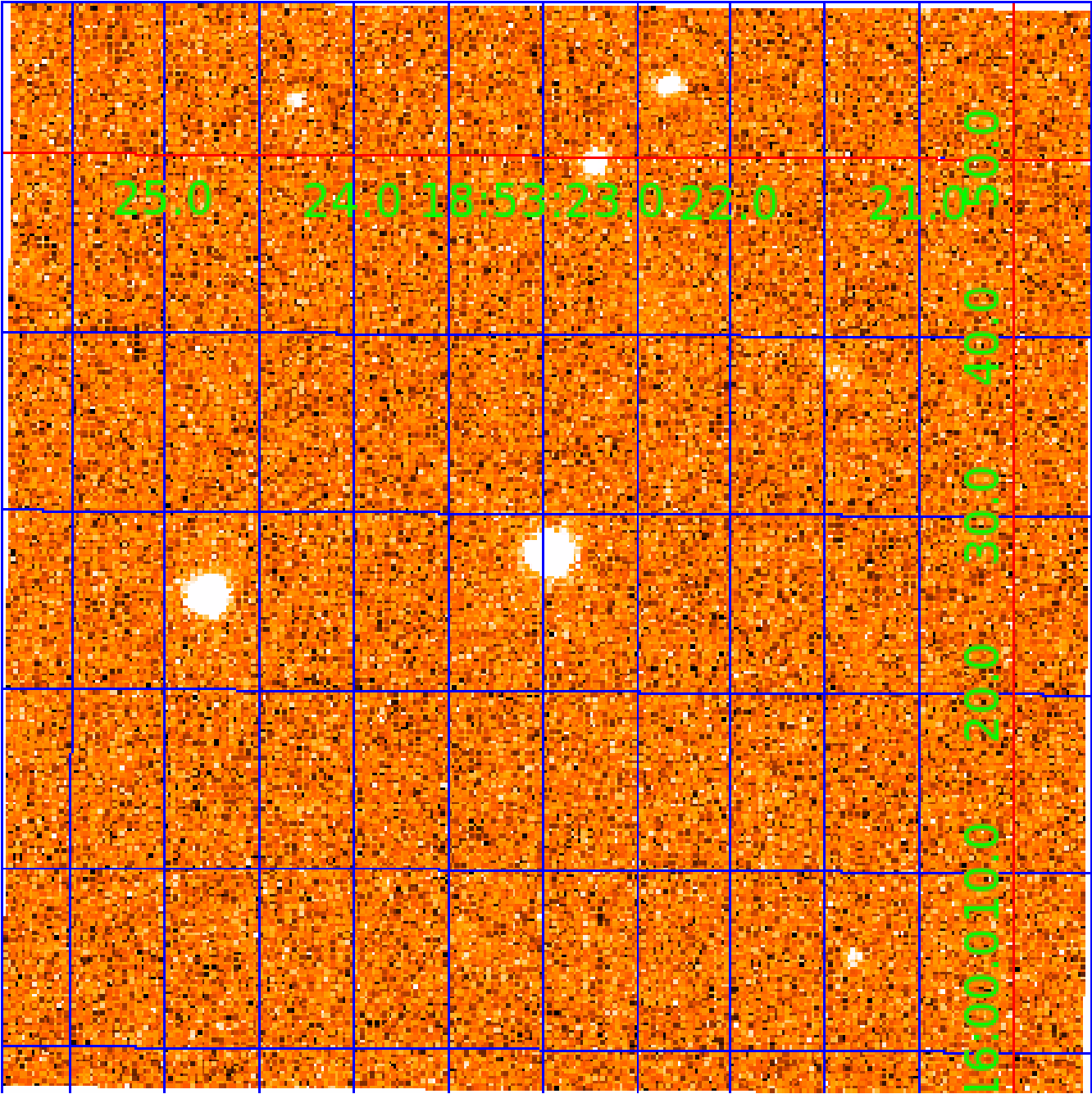


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008934103

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})
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008934103-02	OBS	4009.02	77.792890	190.130913	210.4	9.357	8.3	8.1	1.24	5497	1.98	10.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008934103-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008934103-02	OBS	PC	0.93	0	0	0	0	NO_COMMENT

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

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

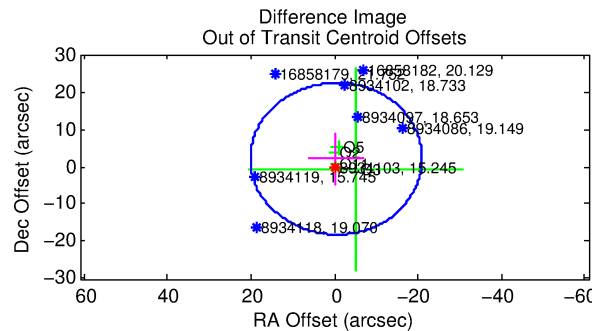
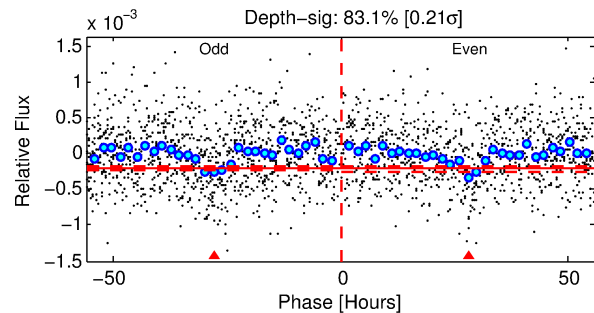
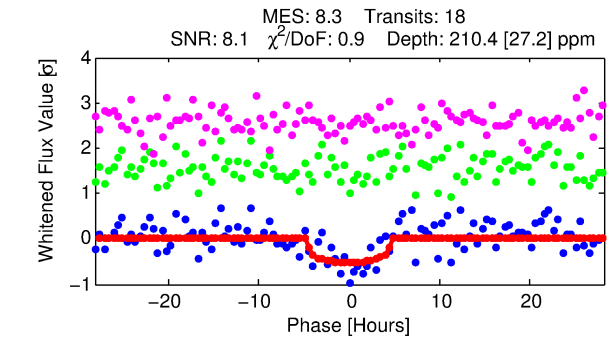
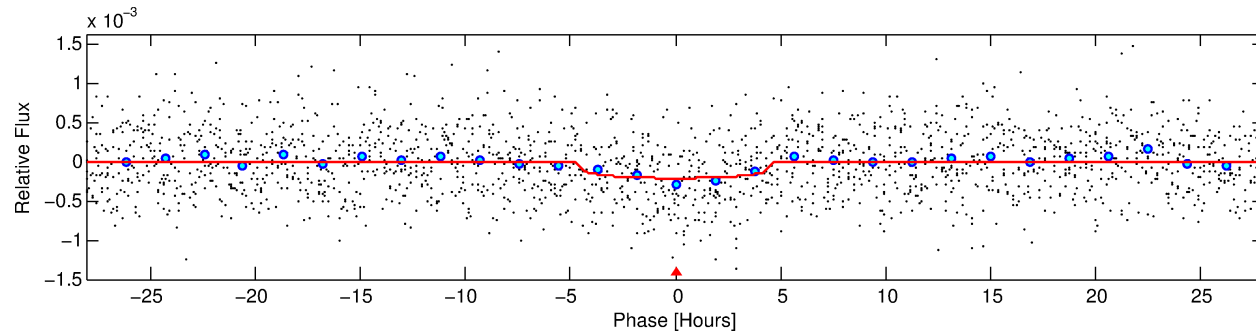
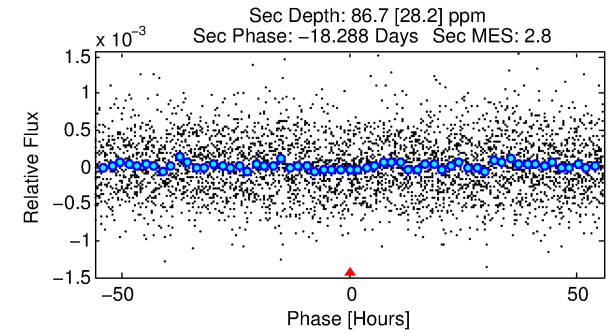
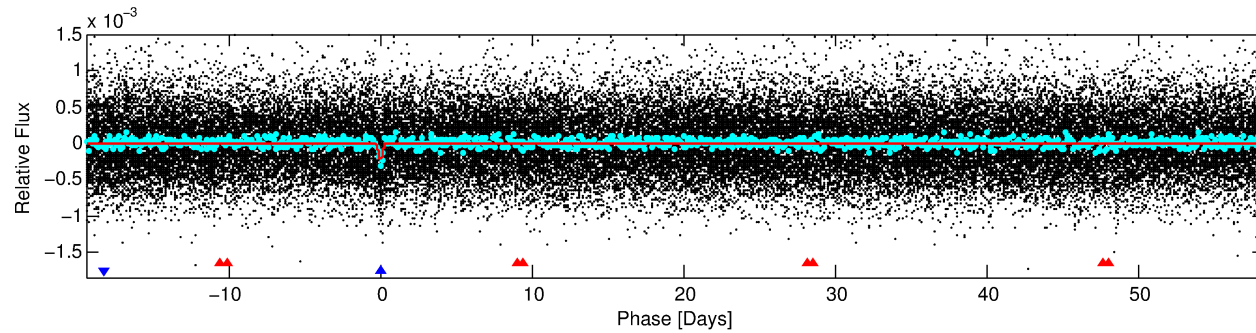
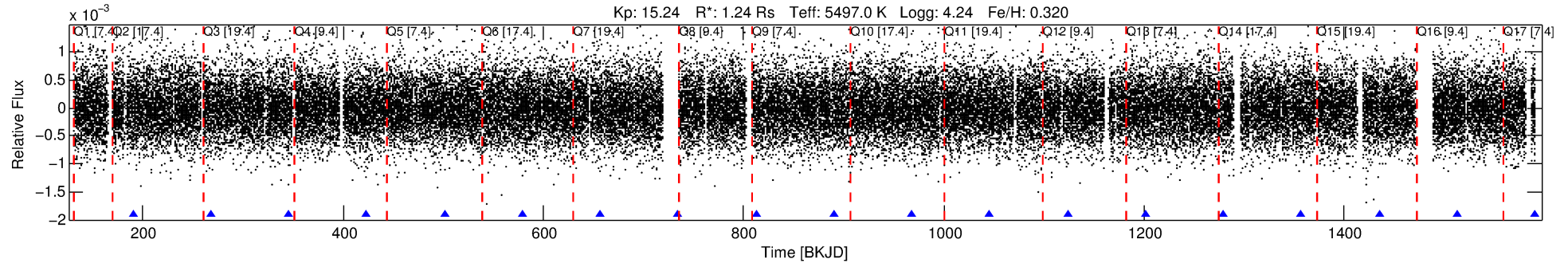
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008934103-02

No Significant Match Found

DV One-Page Summary

KIC: 8934103 Candidate: 2 of 2 Period: 77.793 d
KOI: K04009.02 Corr: 0.752



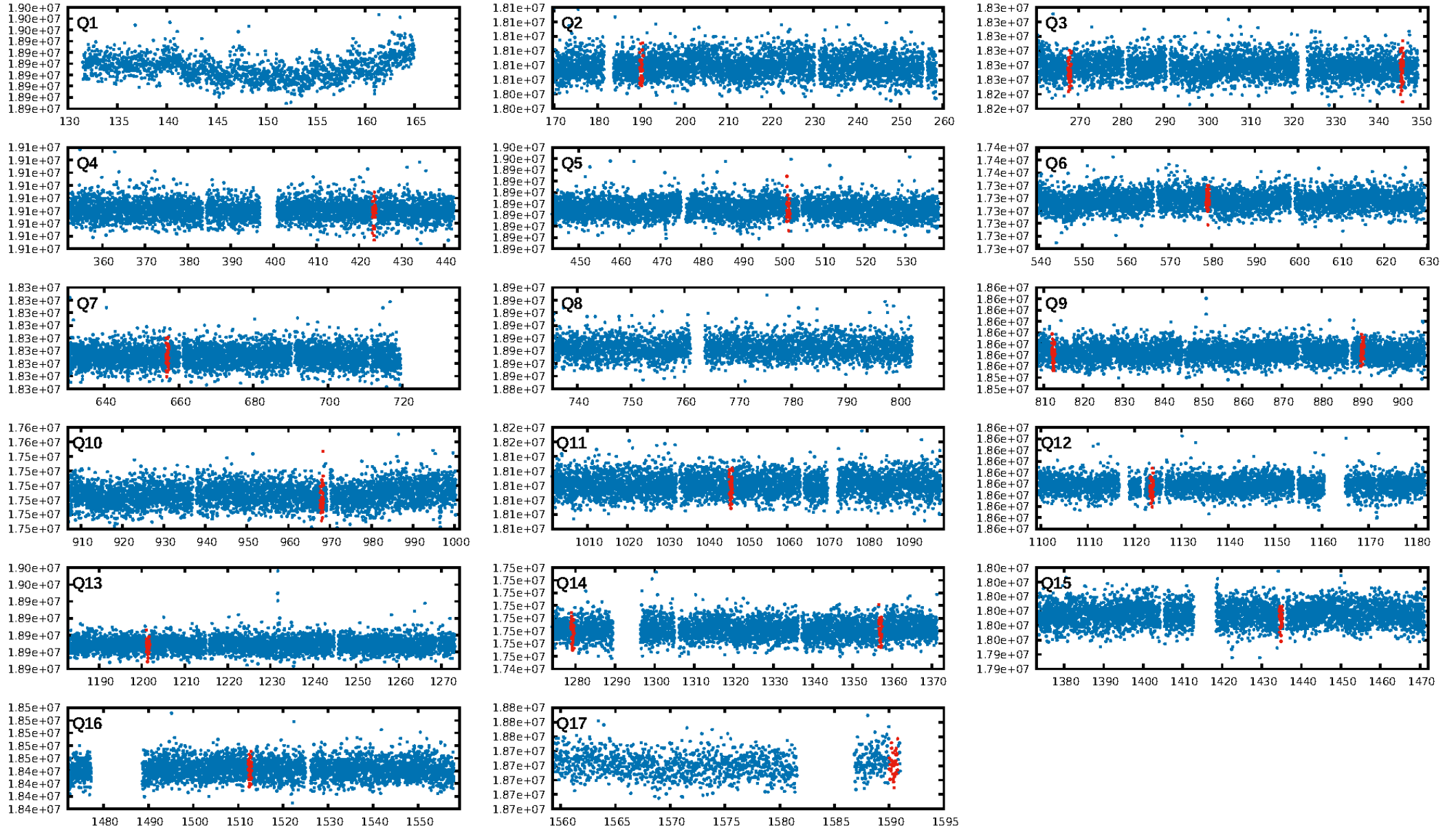
DV Fit Results:

Period = 77.79289 [0.00197] d
Epoch = 190.1309 [0.0205] BKJD
Rp/R* = 0.0146 [0.0118]
a/R* = 41.34 [133.75]
b = 0.78 [1.66]
Seff = 10.02 [3.06]
Teff = 454 [35] K
Rp = 1.98 [1.64] Re
a = 0.3547 [0.0664] AU
Ag = 1524.94 [2539.52] [0.60σ]
Teffp = 4383 [1796] K [2.19σ]

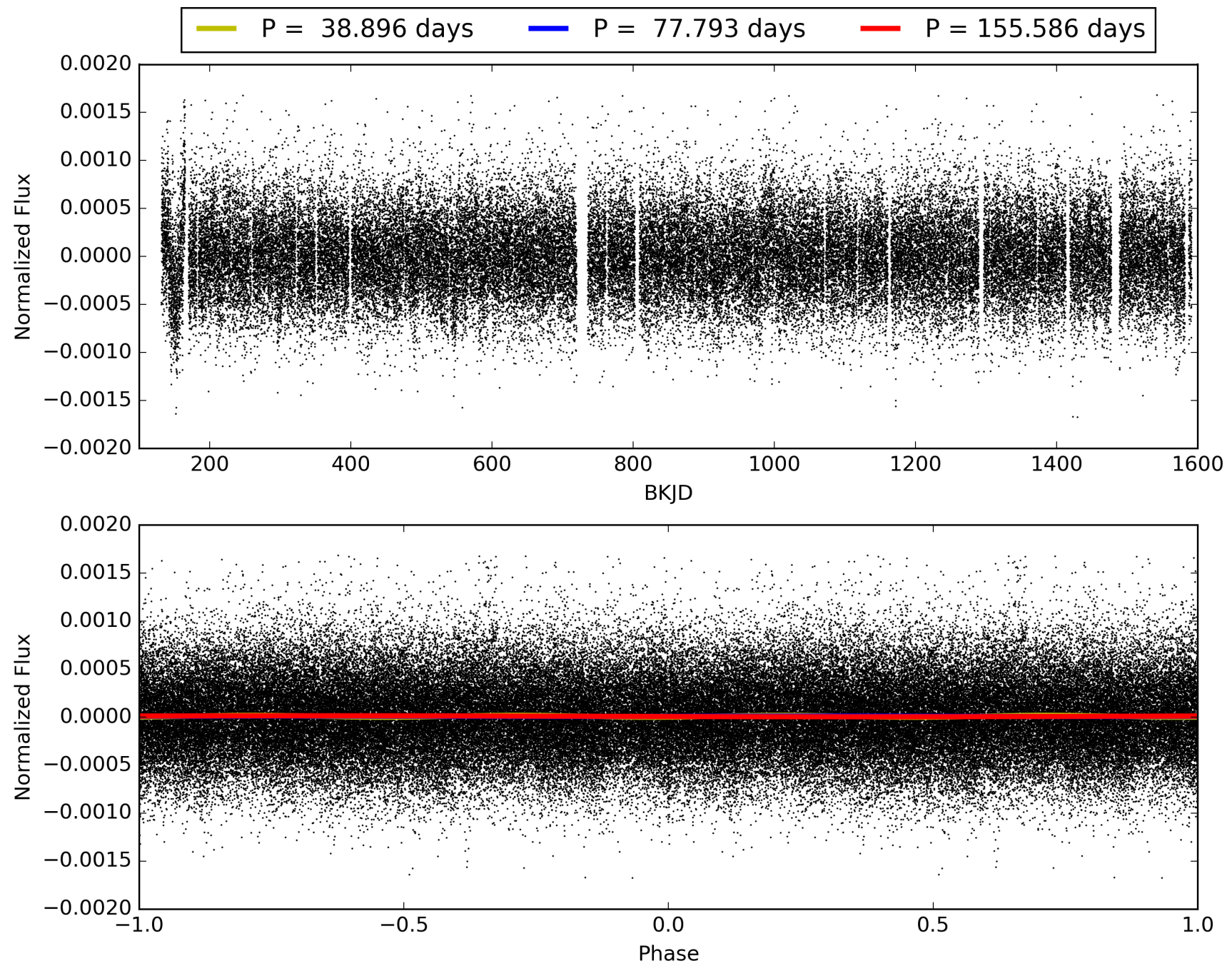
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [162.87σ]
ModelChiSquare2-sig: 70.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.41e-16
RollingBand-fgt: 1.00 [17/17]
GhostDiagnostic-chr: -3.495
Centroid-sig: 79.8%
Centroid-so: 0.537 arcsec [0.32σ]
OotOffset-rm: 2.182 arcsec [0.32σ]
KicOffset-rm: 1.966 arcsec [0.29σ]
OotOffset-st: 1/2/0/1 [4]
KicOffset-st: 1/2/0/1 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [11/11]

TCE 008934103-02, PDC Light Curves

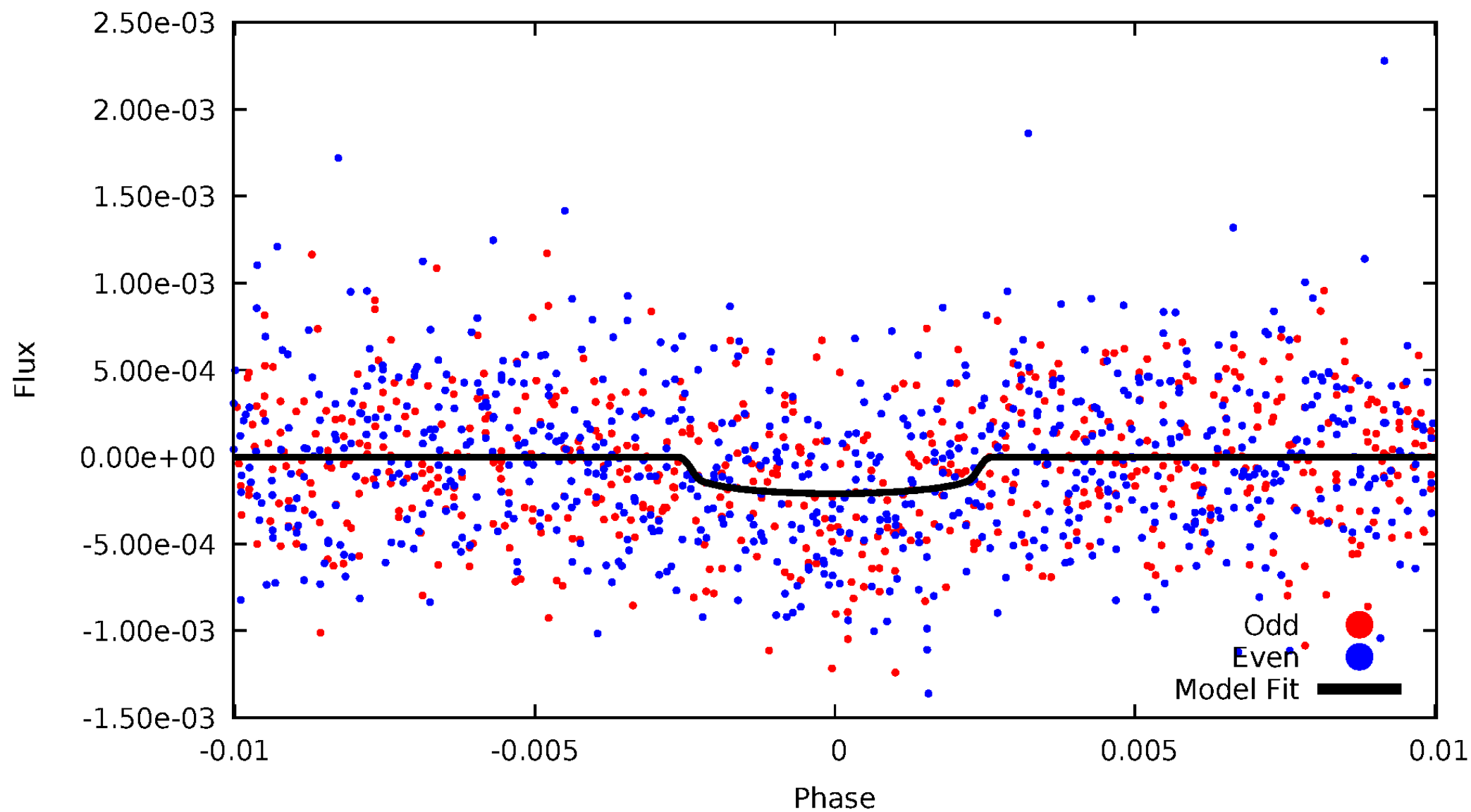


TCE 008934103-02



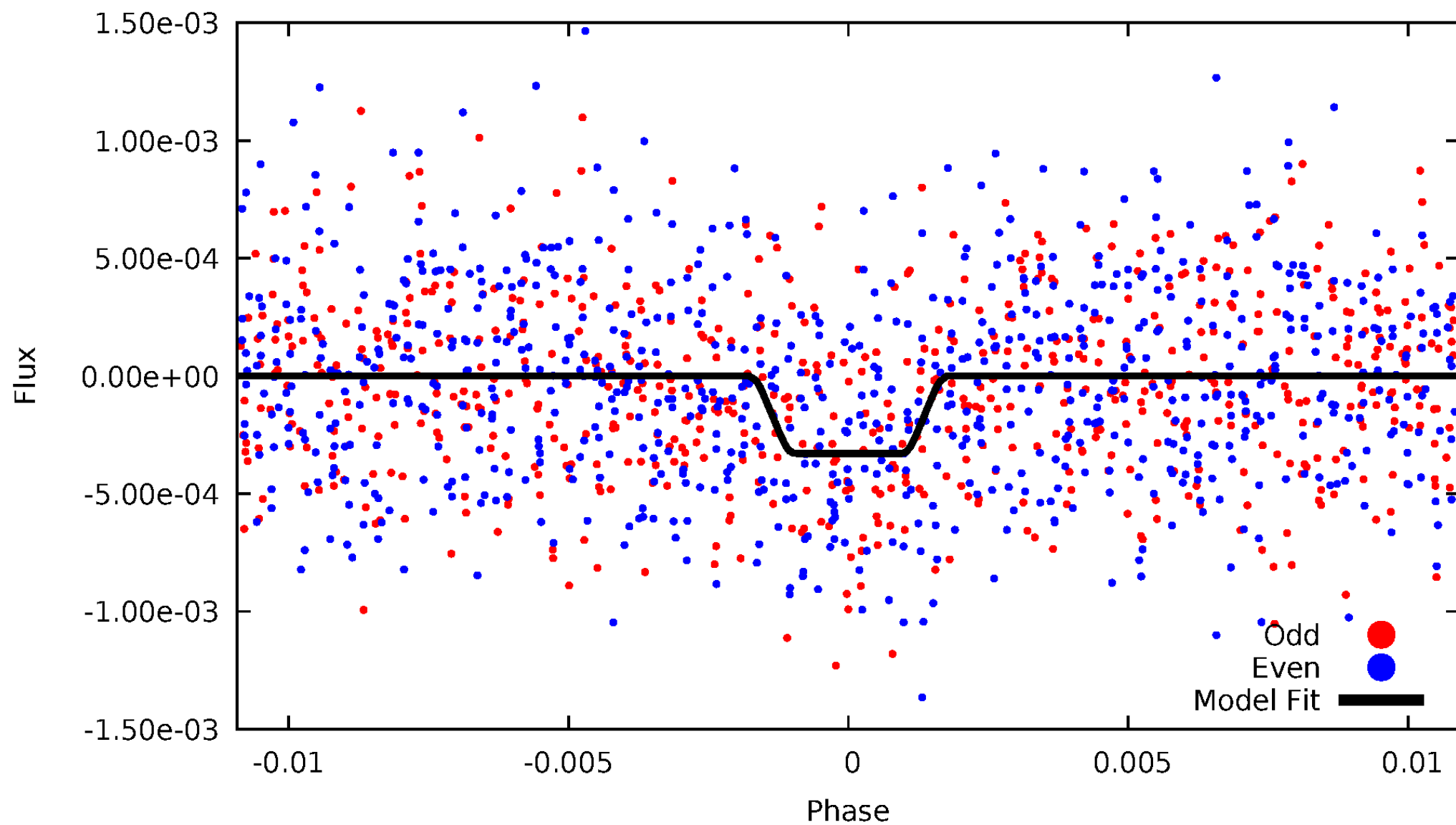
DV Odd/Even

TCE 008934103-02



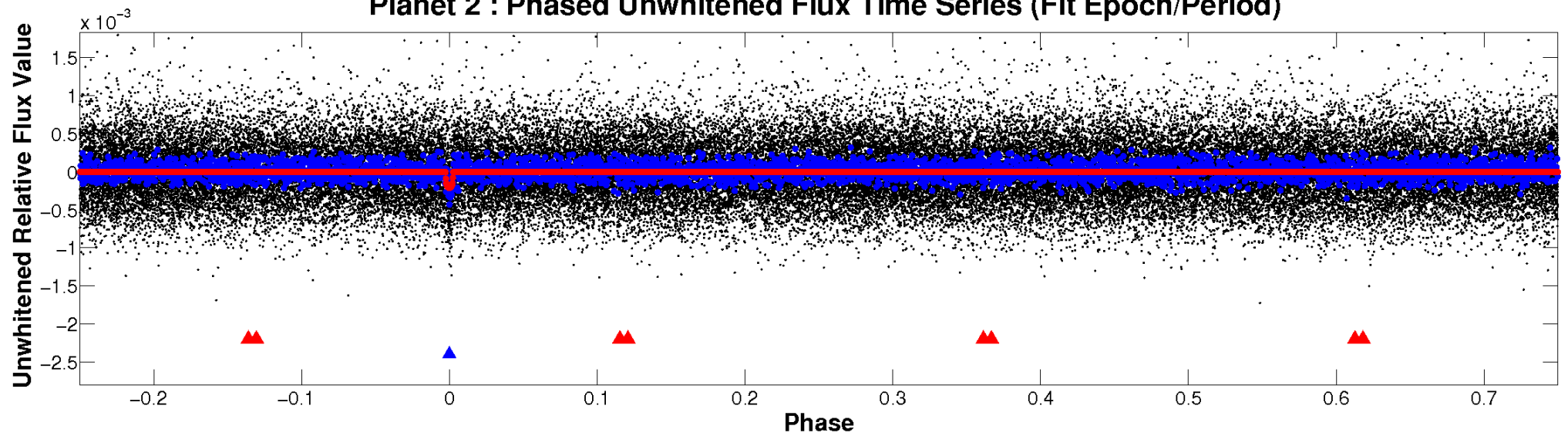
ALT Odd/Even

TCE 008934103-02

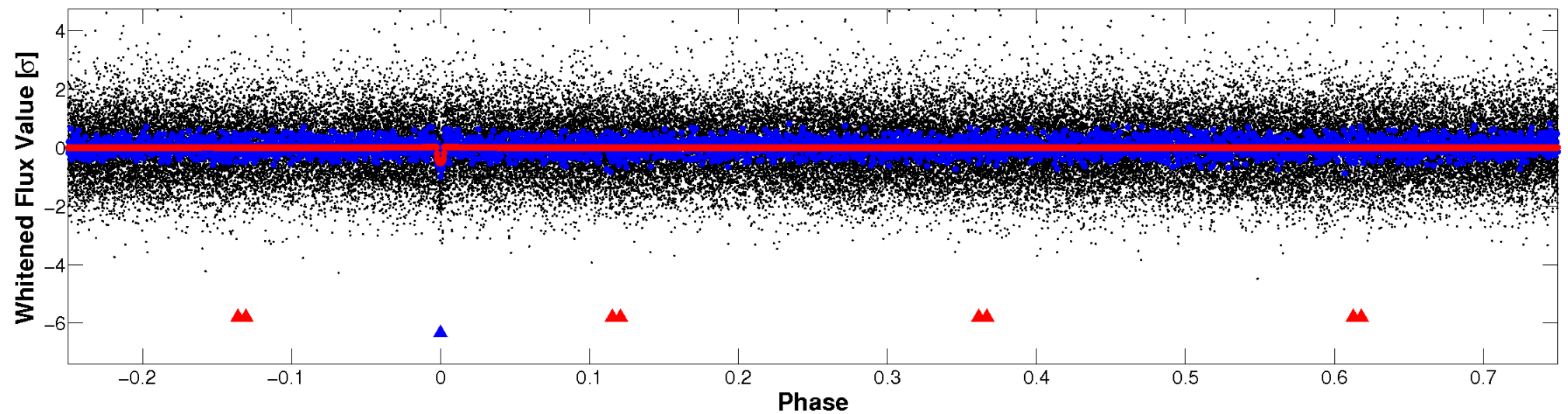


Non-Whitened Vs. Whitened Light Curve

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

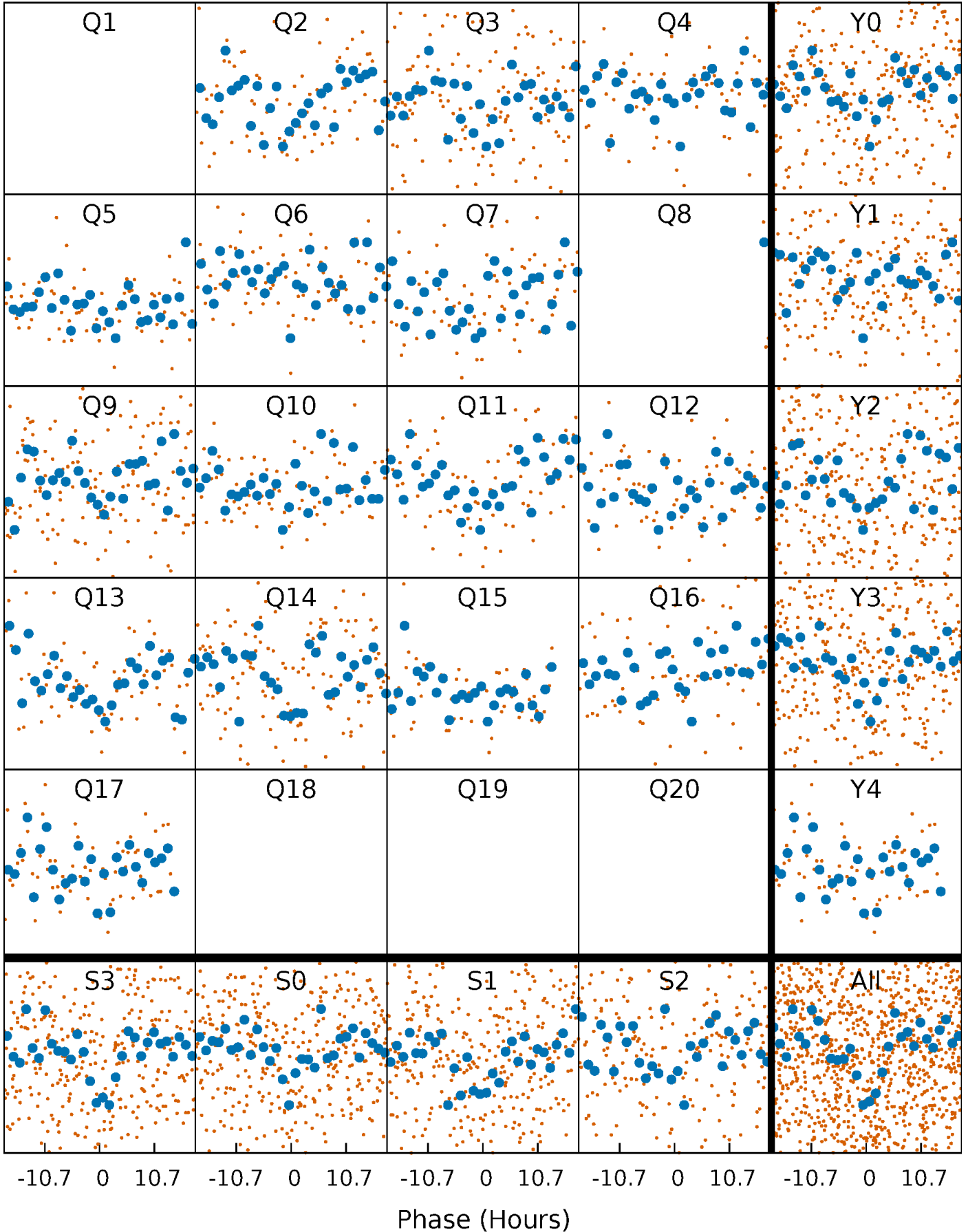


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



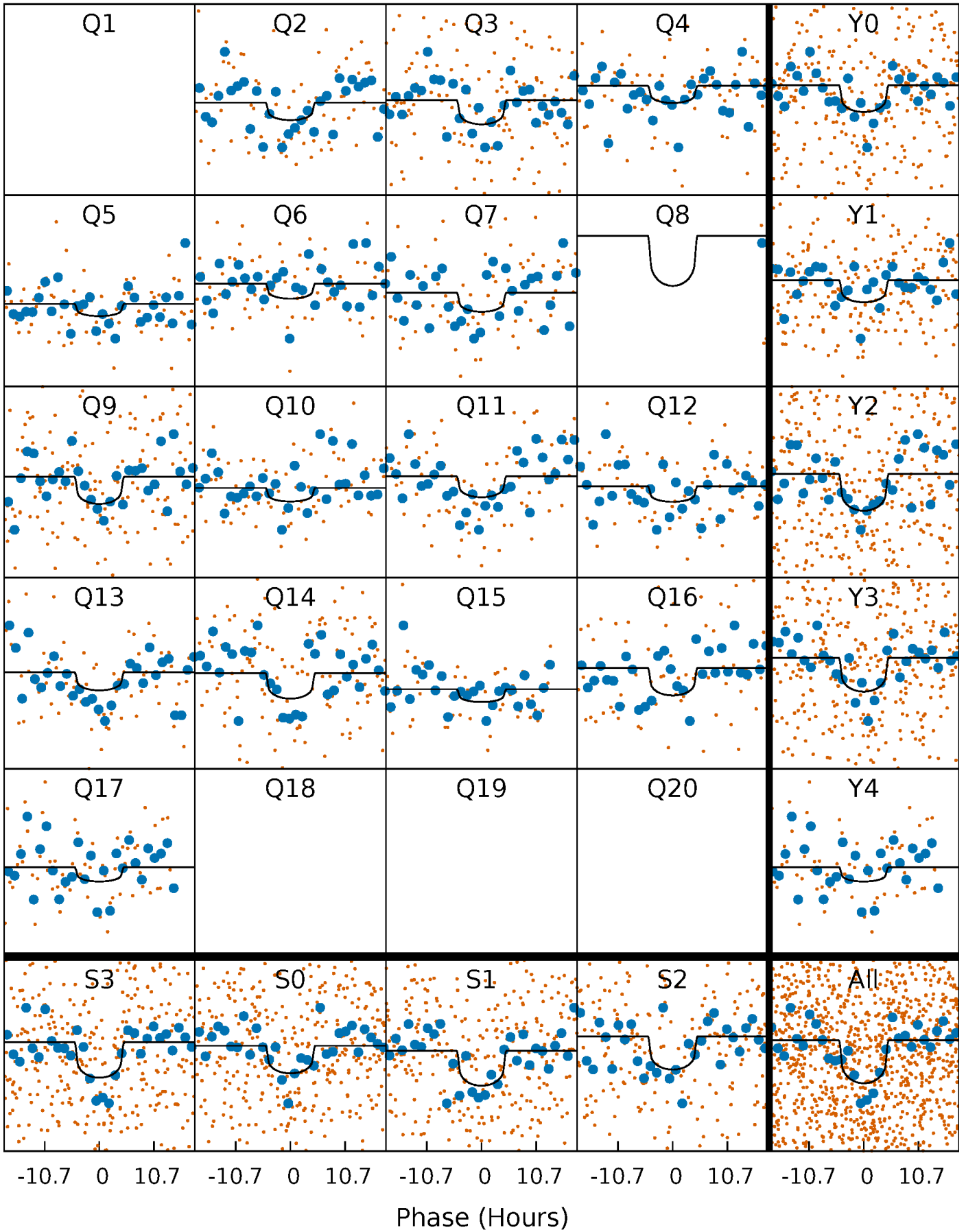
PDC Quarter-Phased Transit Curves

TCE 008934103-02 P= 77.792890 Days $T_0=190.130913$ (BKJD)



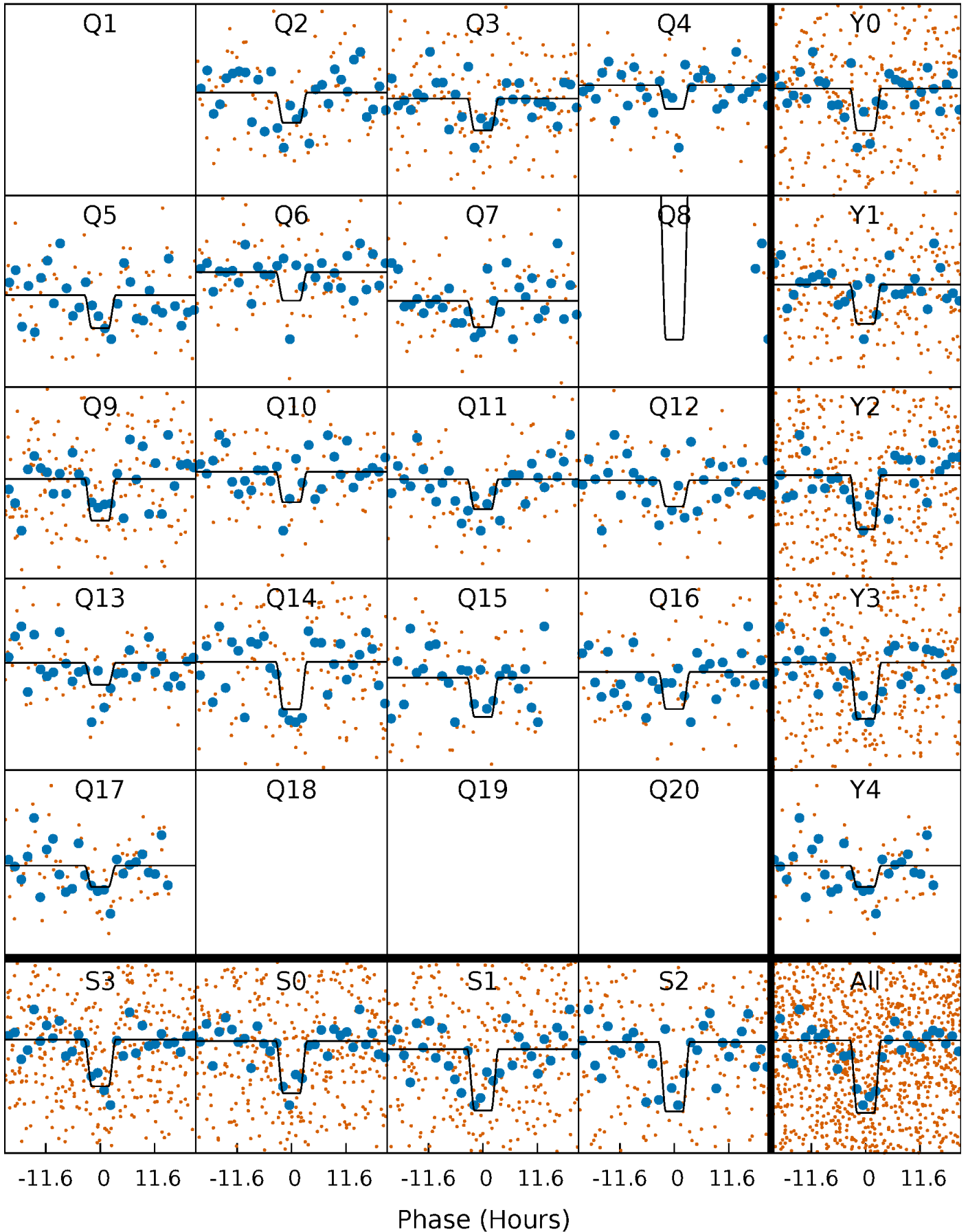
DV Quarter-Phased Transit Curves

TCE 008934103-02 P= 77.792890 Days $T_0=190.130913$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

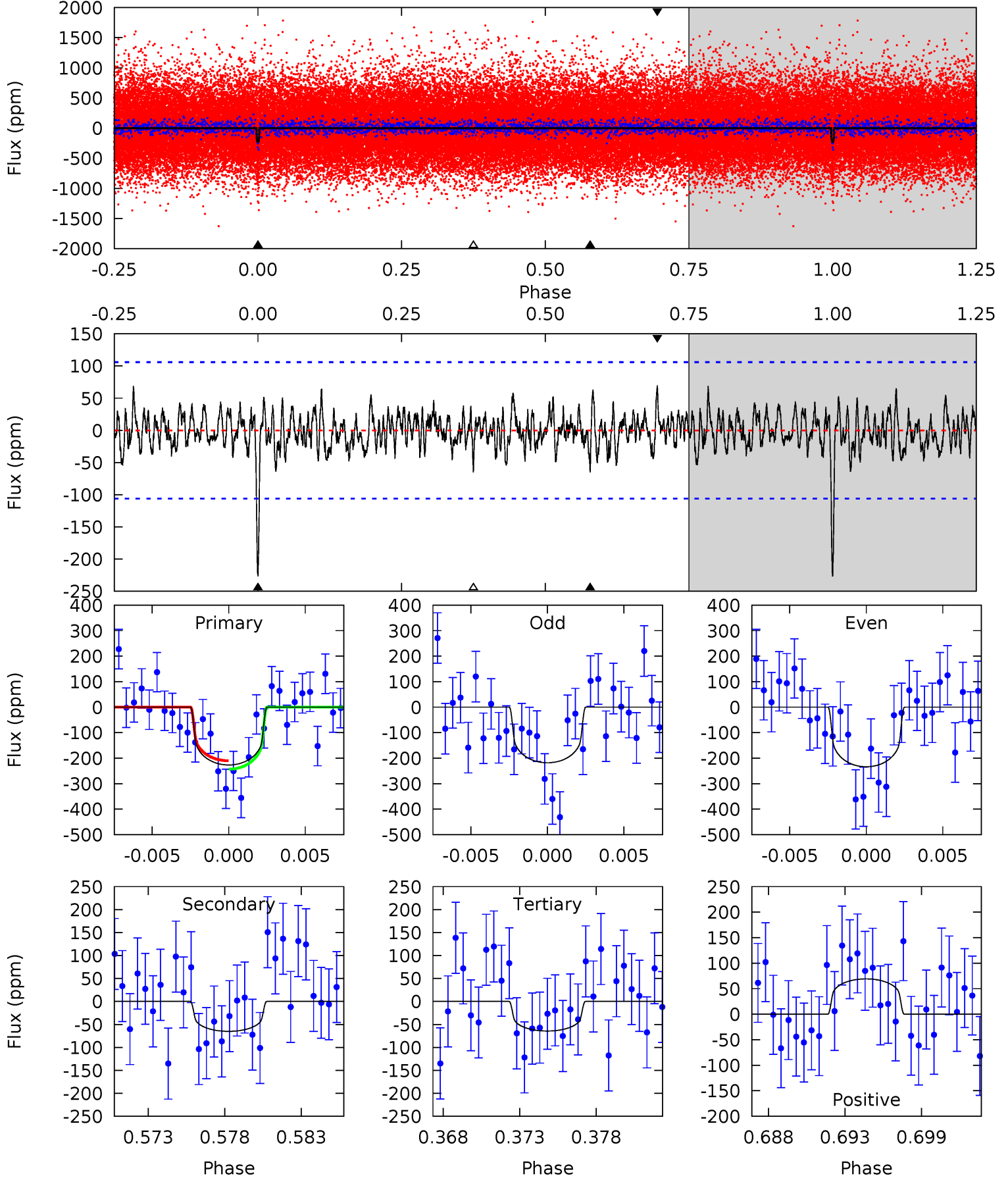
TCE 008934103-02 P= 77.791143 Days $T_0=190.153195$ (BKJD)



DV Model-Shift Uniqueness Test

008934103-02, P = 77.792890 Days, E = 112.338023 Days

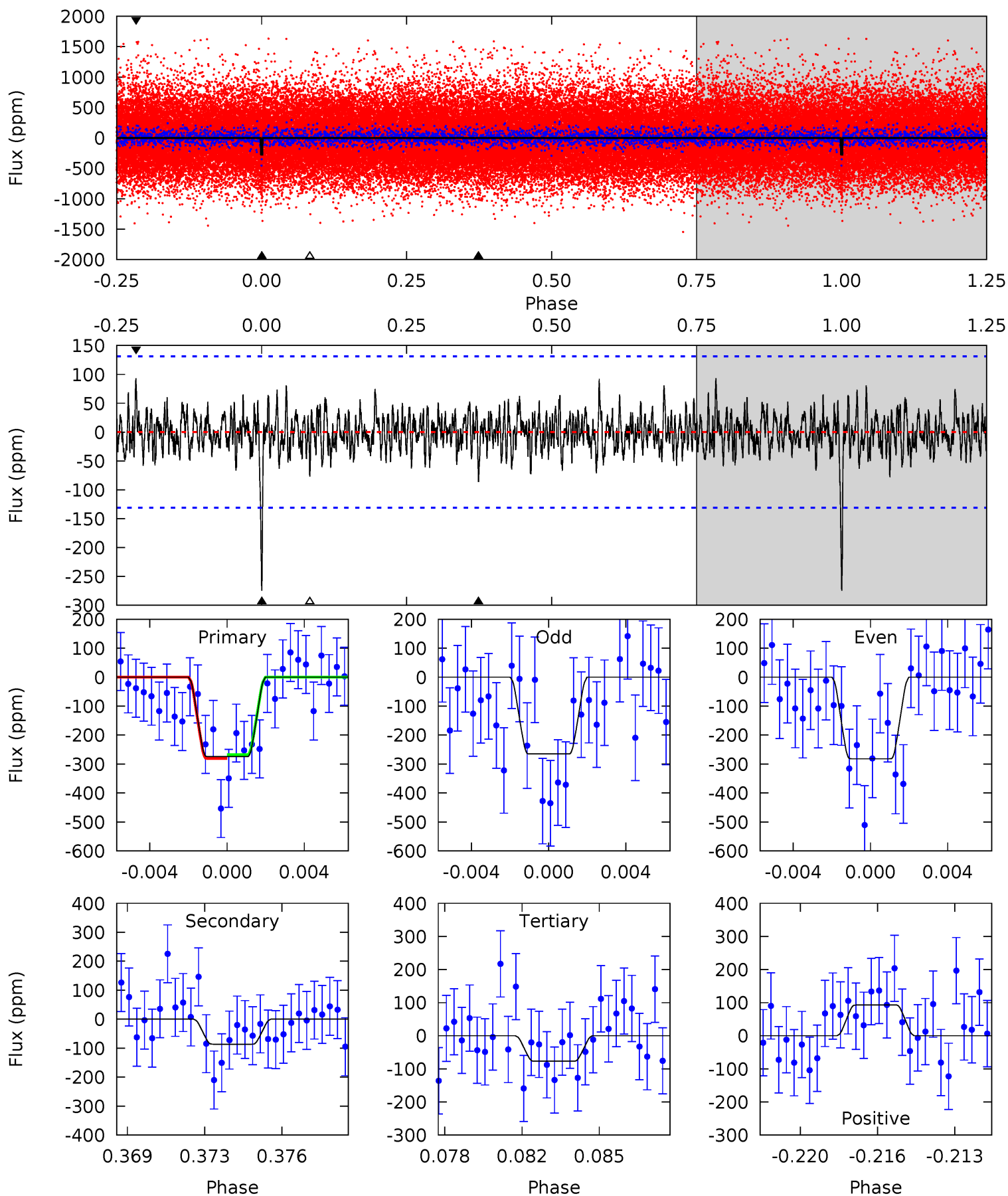
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	3.16	3.13	3.36	5.15	2.79	1.06	7.88	7.65	0.03	-0.20	0.38	1.03	0.23	0.80



Alt Model-Shift Uniqueness Test

008934103-02, P = 77.791143 Days, E = 112.362052 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	3.44	3.06	3.70	5.22	2.92	1.04	7.87	7.23	0.38	-0.26	0.33	1.06	0.25	0.26



Stellar Parameters For KIC 008934103

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5497^{+83}_{-74}	$4.243^{+0.176}_{-0.108}$	$0.320^{+0.150}_{-0.150}$	$1.241^{+0.181}_{-0.241}$	$0.981^{+0.051}_{-0.051}$	$0.723^{+0.627}_{-0.230}$
	+2%/-1%	+4%/-3%	+47%/-47%	+15%/-19%	+5%/-5%	+87%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008934103-02 / KOI 4009.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-65 ± 21	$2.19^{+1.44}_{-1.28}$	631^{+29}_{-34}	4103^{+1954}_{-682}	970^{+4548}_{-657}
Alt.	-86 ± 25	$2.60^{+1.62}_{-1.37}$	634^{+28}_{-33}	4067^{+1525}_{-613}	859^{+3153}_{-533}

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 $A_{obs} \gg 1.0$

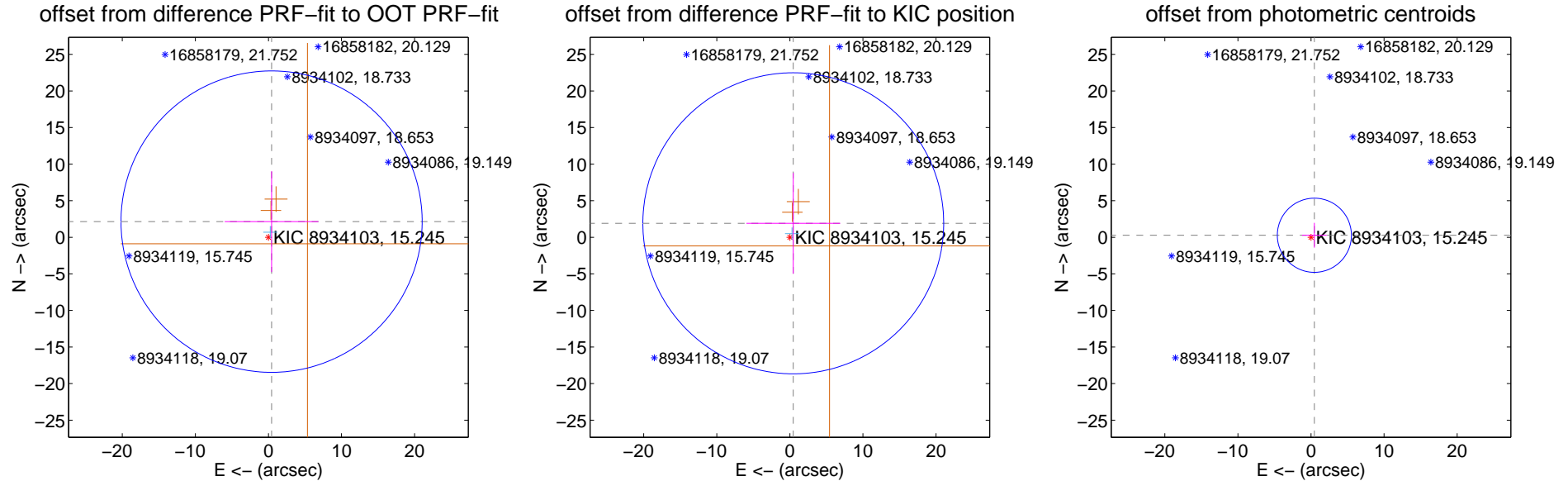
DV Centroid Data

Supplemental centroid analysis for 008934103-02. Kepler magnitude: 15.24. Transit SNR 8.11

There are 1 quarters with good PRF difference image offsets

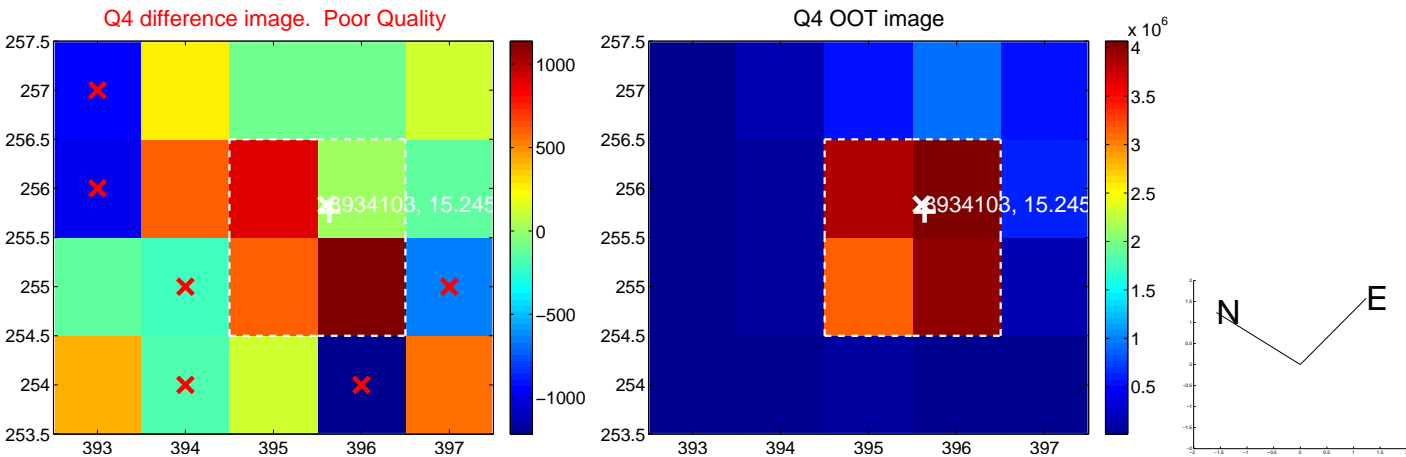
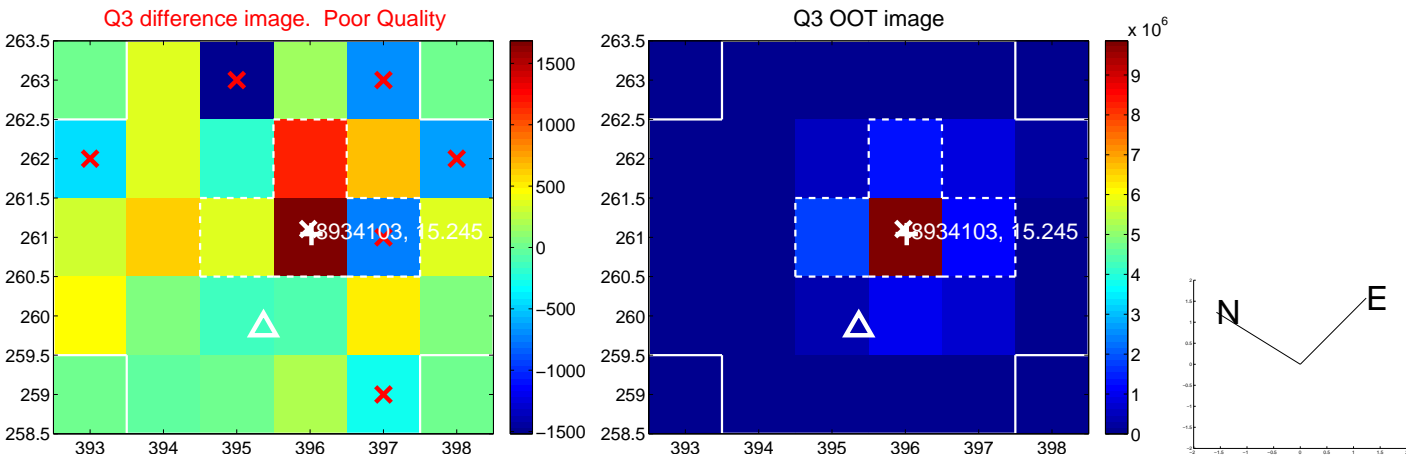
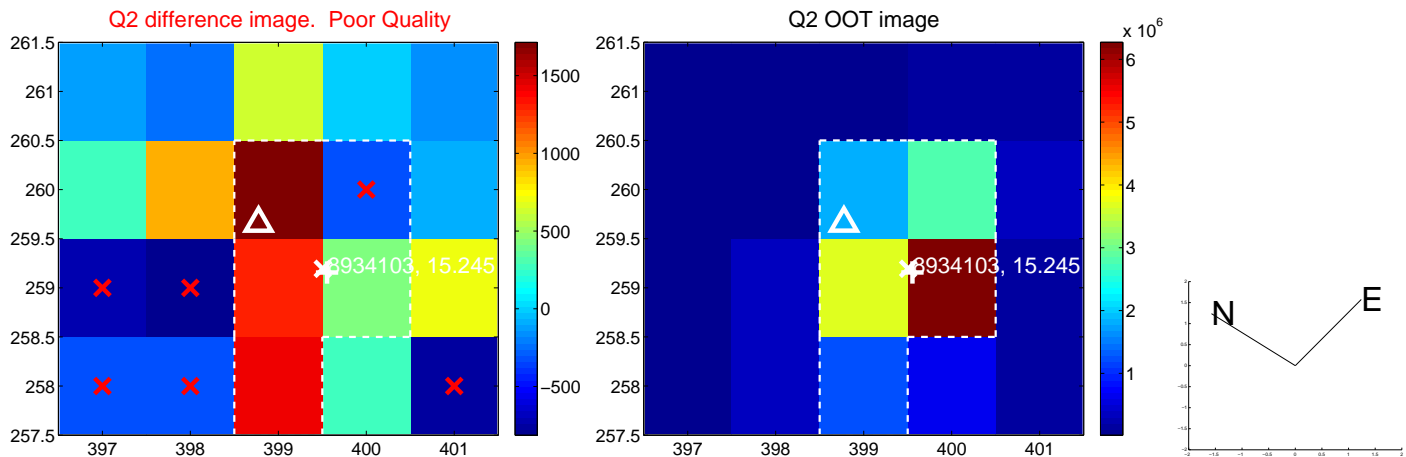
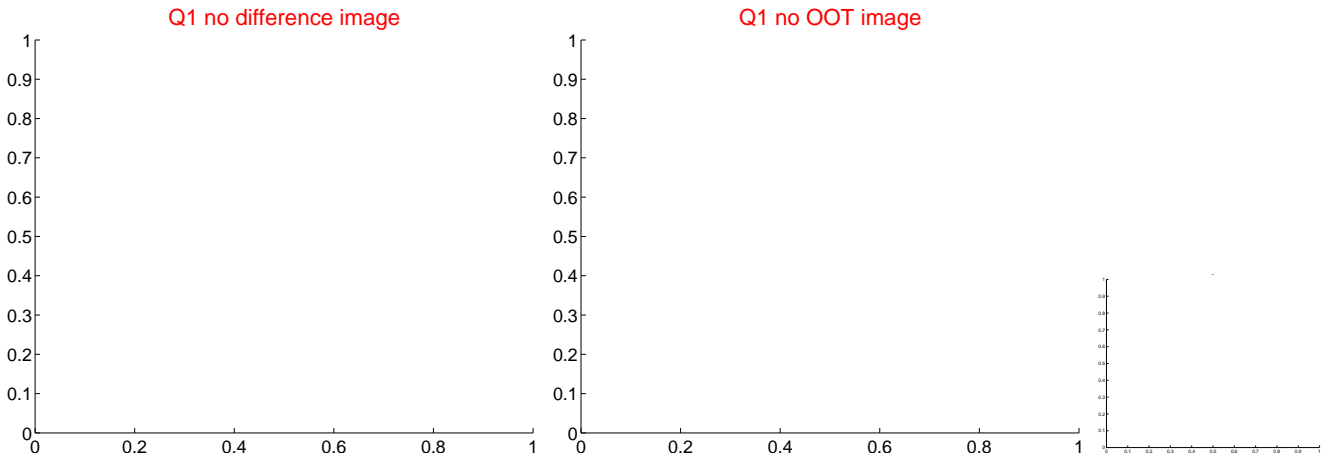
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.182 ± 6.867	0.32	-0.430 ± 6.409	2.139 ± 6.885
PRF-fit source offset from KIC position	1.966 ± 6.859	0.29	-0.465 ± 6.409	1.910 ± 6.885
photometric centroid source offset	0.54 ± 1.69	0.32	-0.46 ± 1.69	0.28 ± 1.69

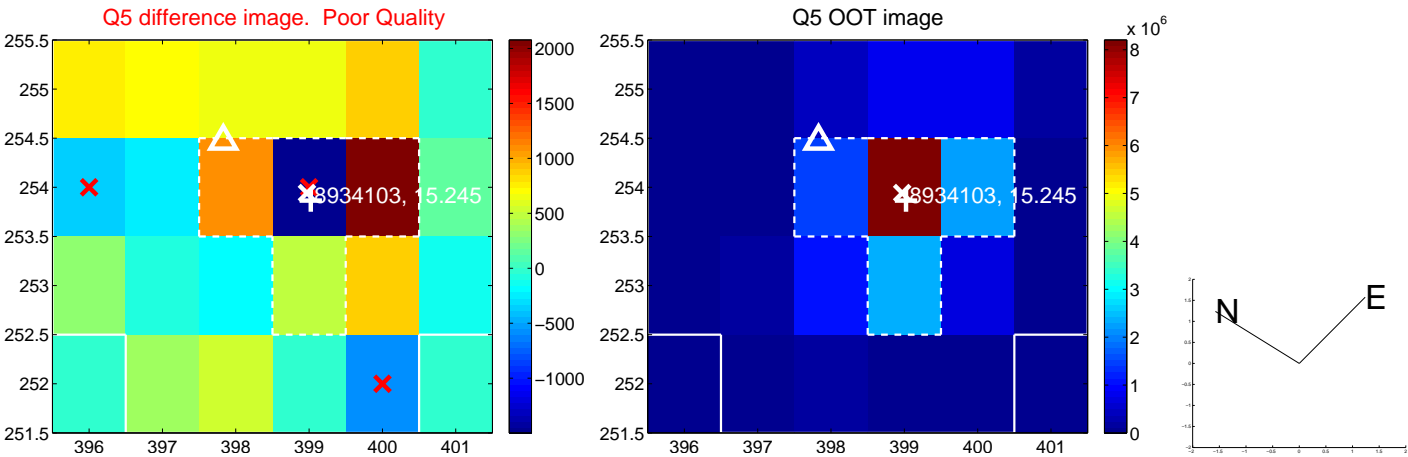


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

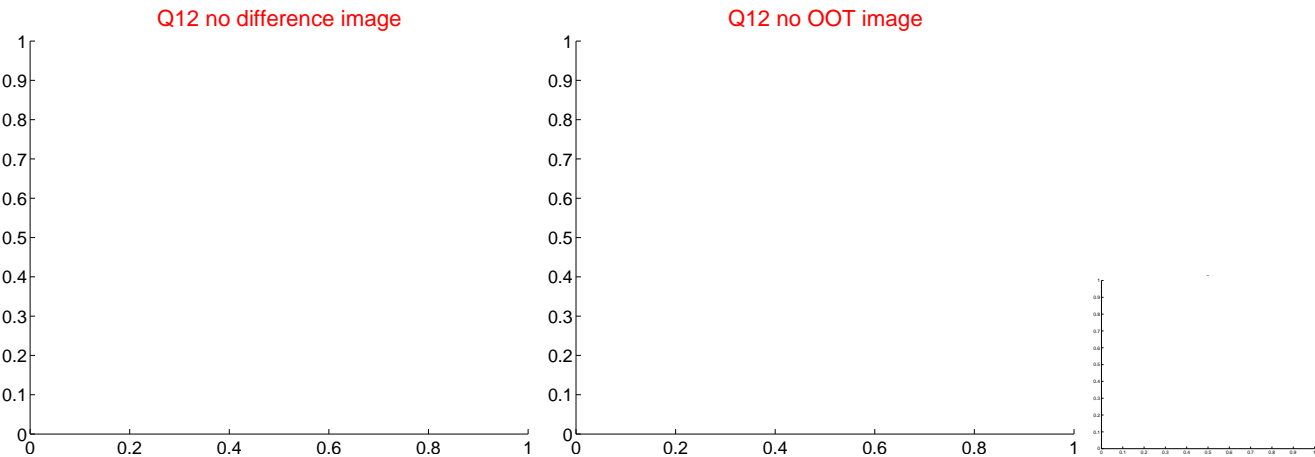
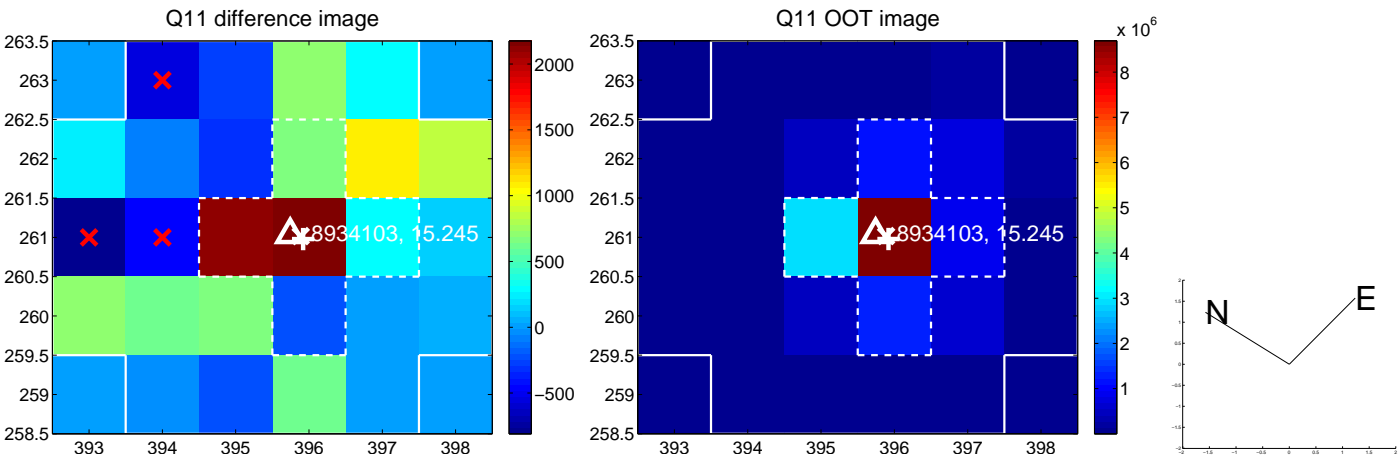
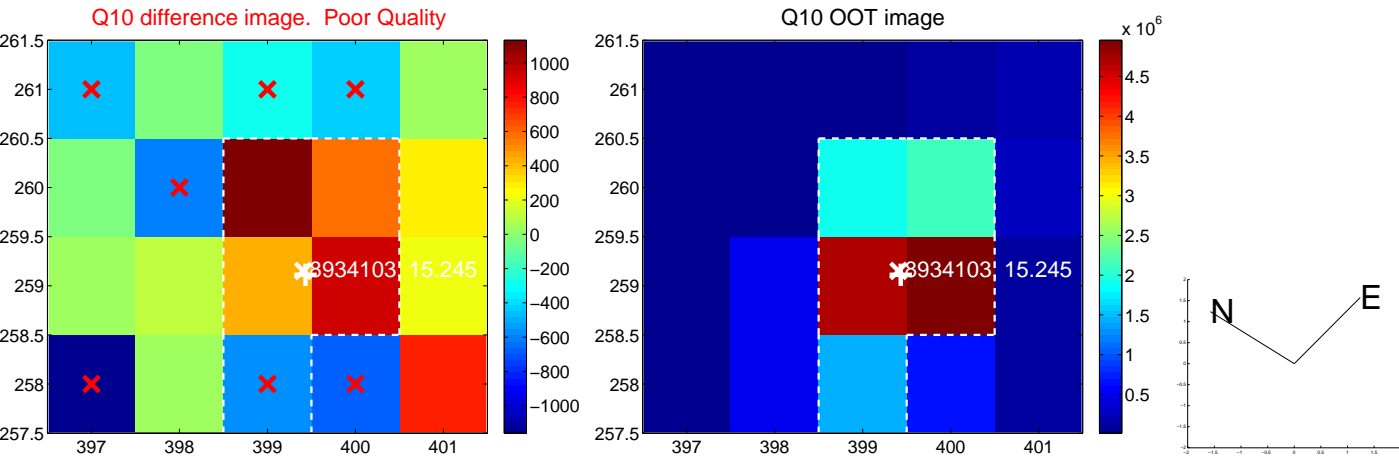
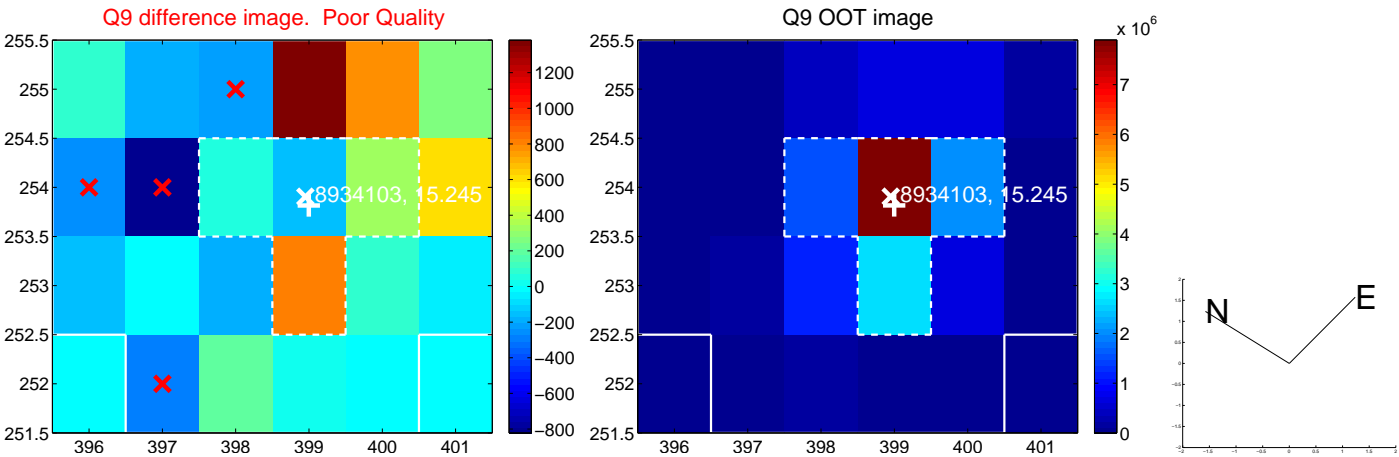
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



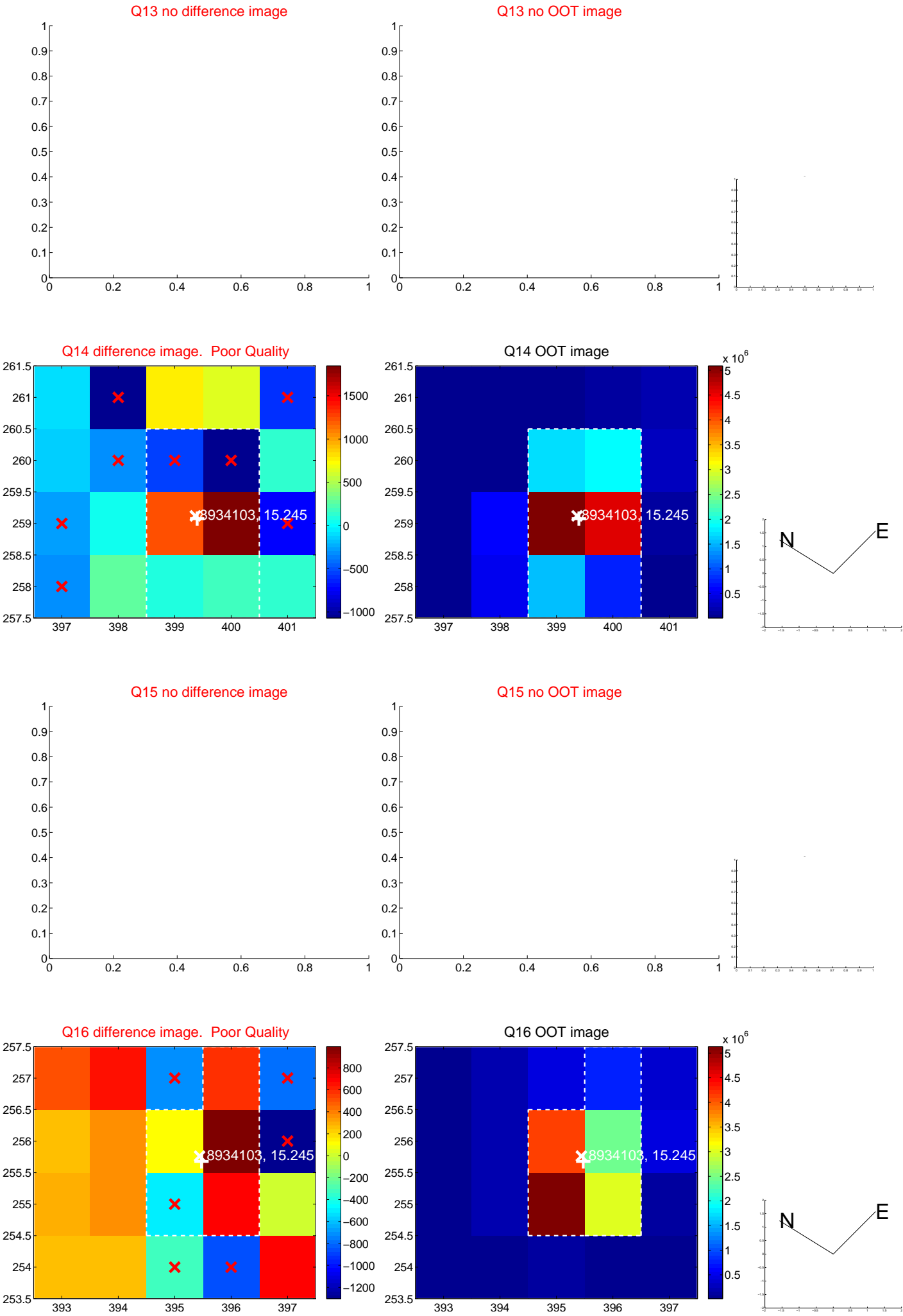
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



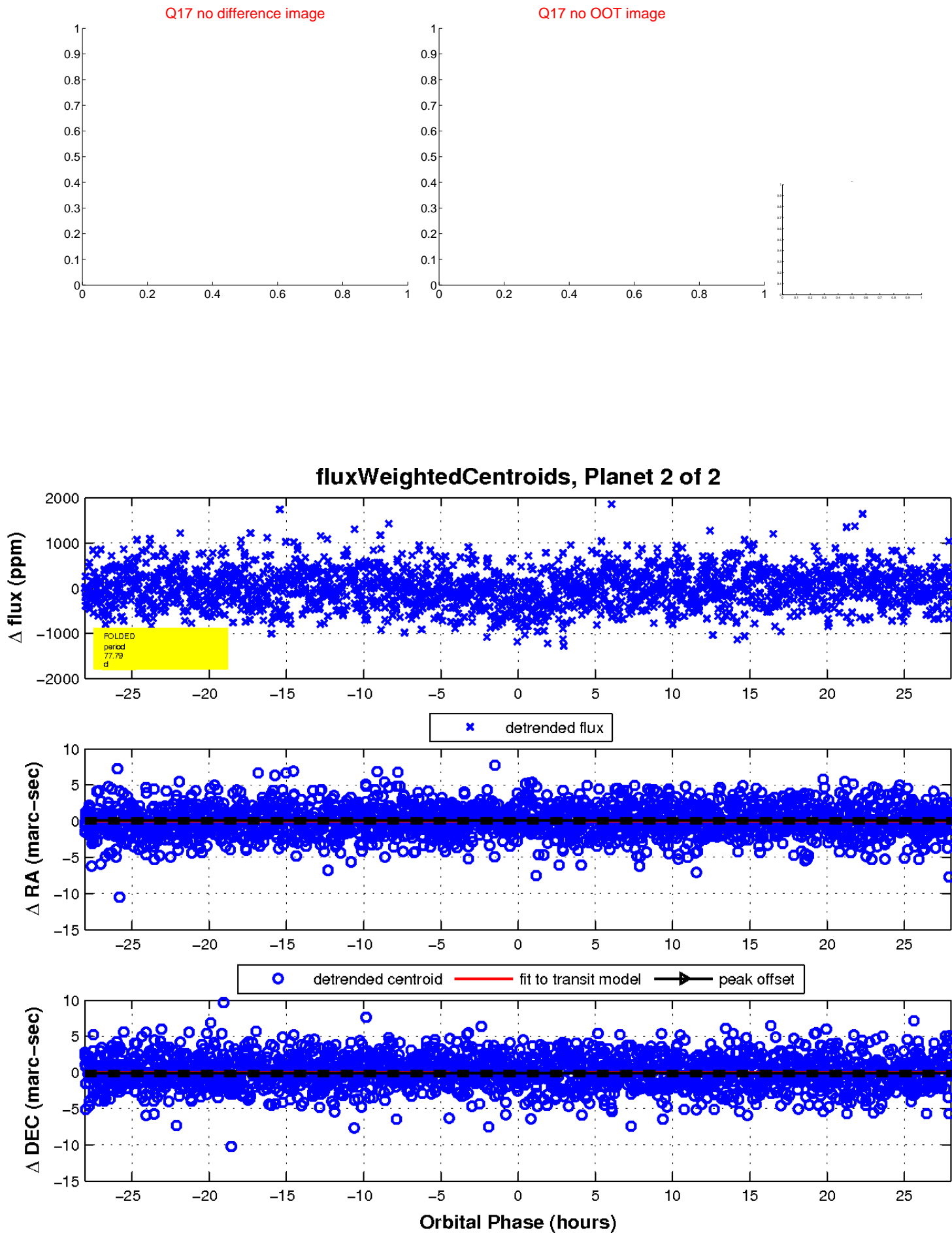
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

