

KIC 009334893

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})
009334893-01	OBS	2298.01	16.667250	141.760210	163.0	3.387	12.8	13.7	0.53	4729	0.79	11.49
009334893-02	OBS	2298.02	31.805956	150.673158	166.0	4.049	9.2	10.3	0.53	4729	0.80	4.85
009334893-03	OBS	No	314.422206	150.525802	412.9	3.652	8.6	7.1	0.53	4729	1.19	0.23
009334893-04	OBS	2298.03	2.472448	132.424436	42.0	2.190	7.7	8.0	0.53	4729	0.40	146.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009334893-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009334893-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009334893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009334893-04	OBS	PC	0.42	0	0	0	0	CENT_UNCERTAIN

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

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

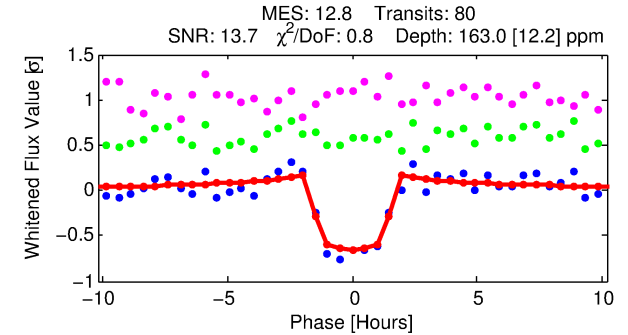
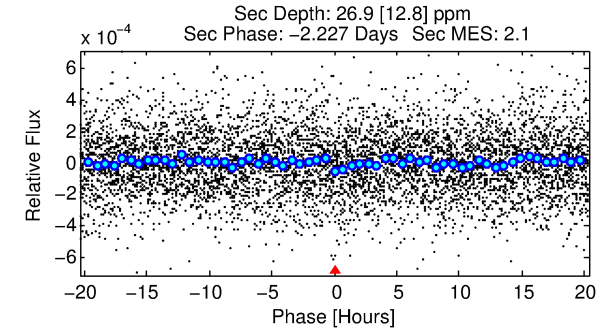
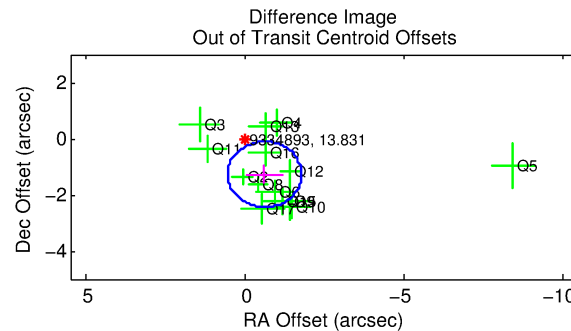
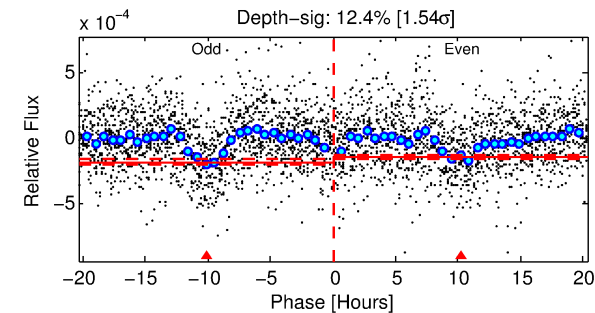
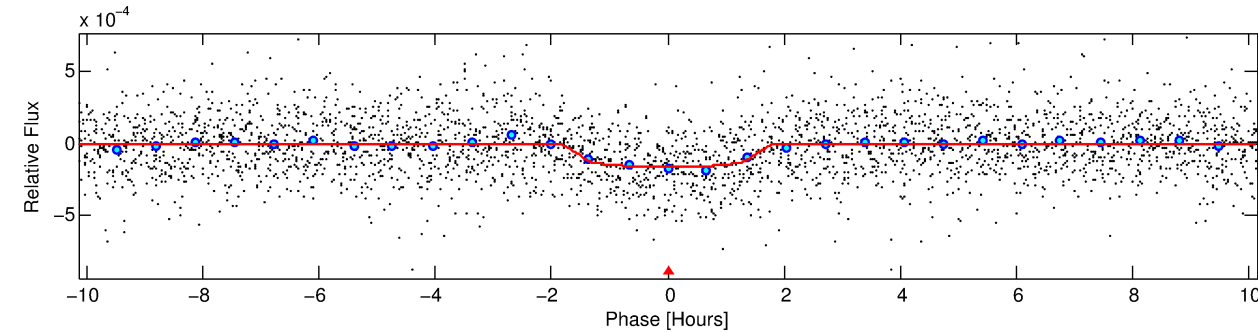
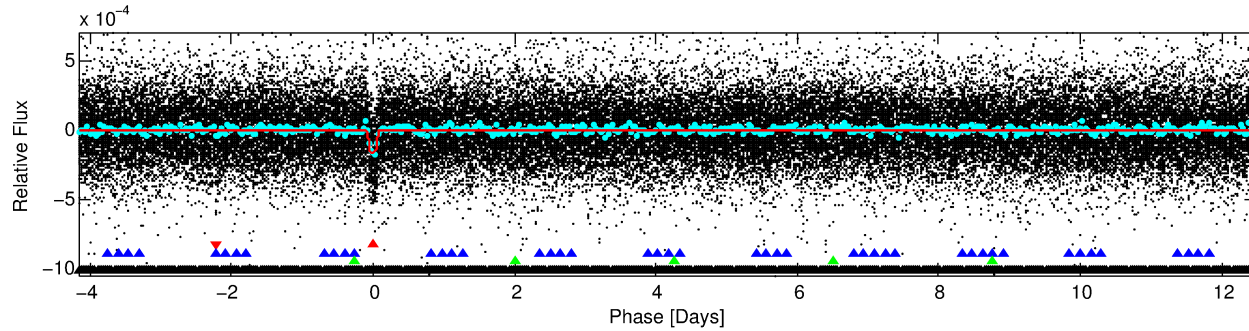
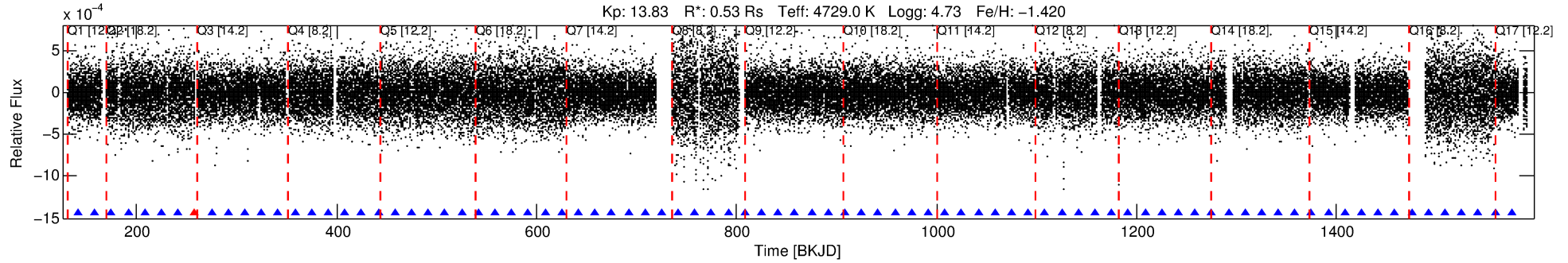
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009334893-01

No Significant Match Found

DV One-Page Summary

KIC: 9334893 Candidate: 1 of 4 Period: 16.667 d
KOI: K02298.01 Corr: 0.972



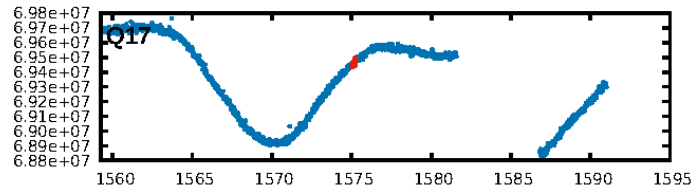
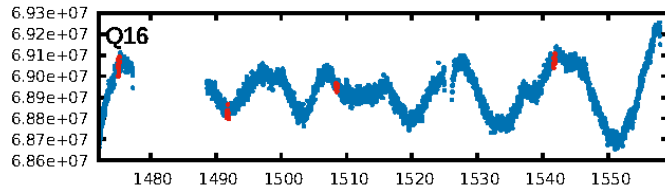
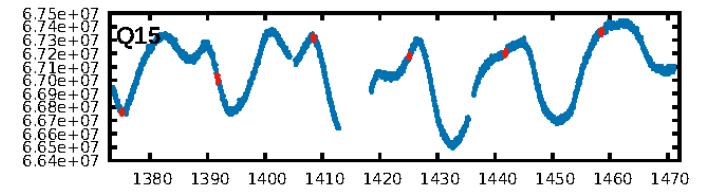
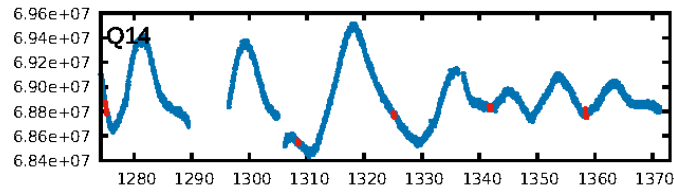
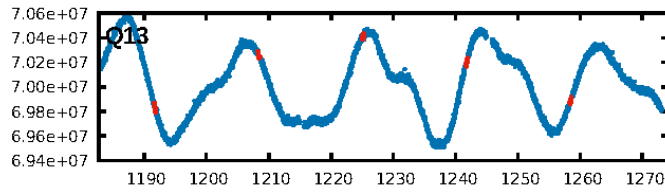
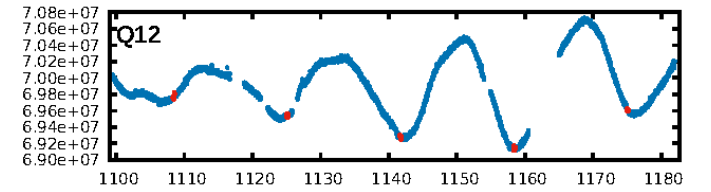
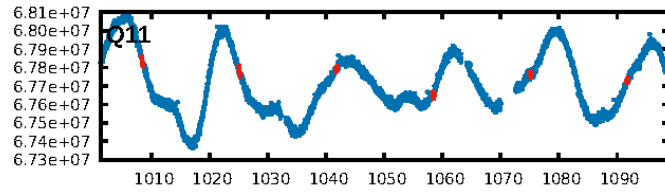
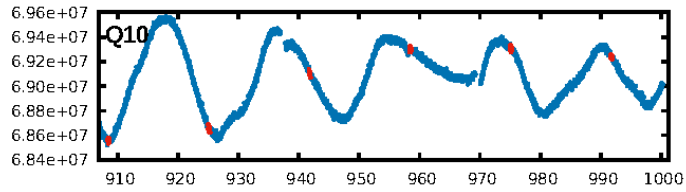
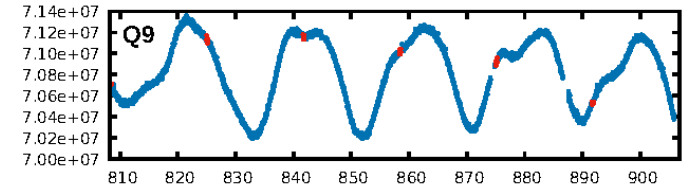
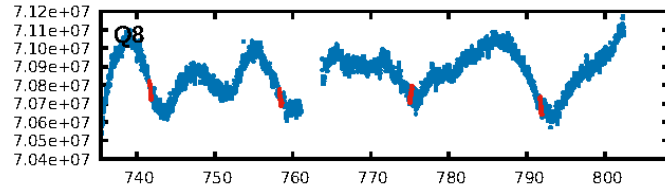
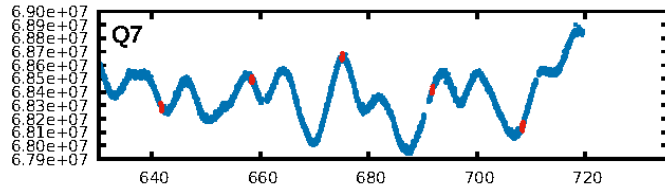
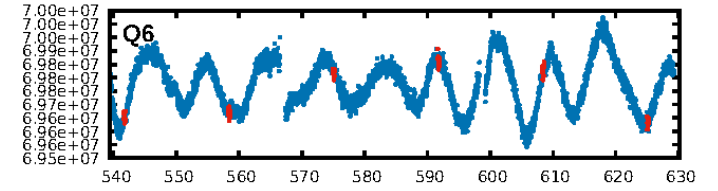
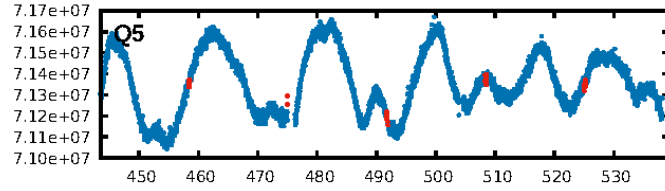
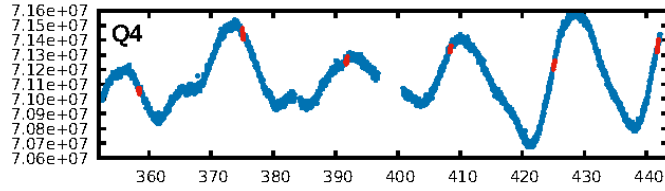
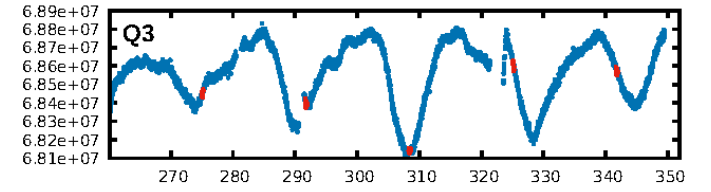
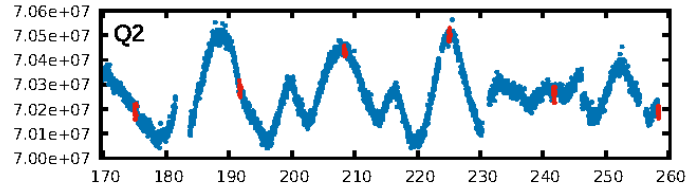
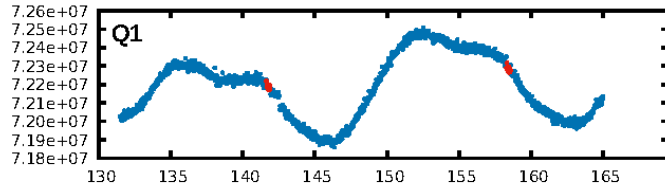
DV Fit Results:

Period = 16.66725 [0.00010] d
Epoch = 141.7602 [0.0049] BKJD
Rp/R* = 0.0137 [0.0067]
a/R* = 19.04 [39.95]
b = 0.88 [0.56]
Seff = 11.49 [1.67]
Teq = 469 [17] K
Rp = 0.79 [0.39] Re
a = 0.1037 [0.0055] AU
Ag = 258.11 [281.87] [0.91 σ]
Teffp = 2909 [797] K [3.06 σ]

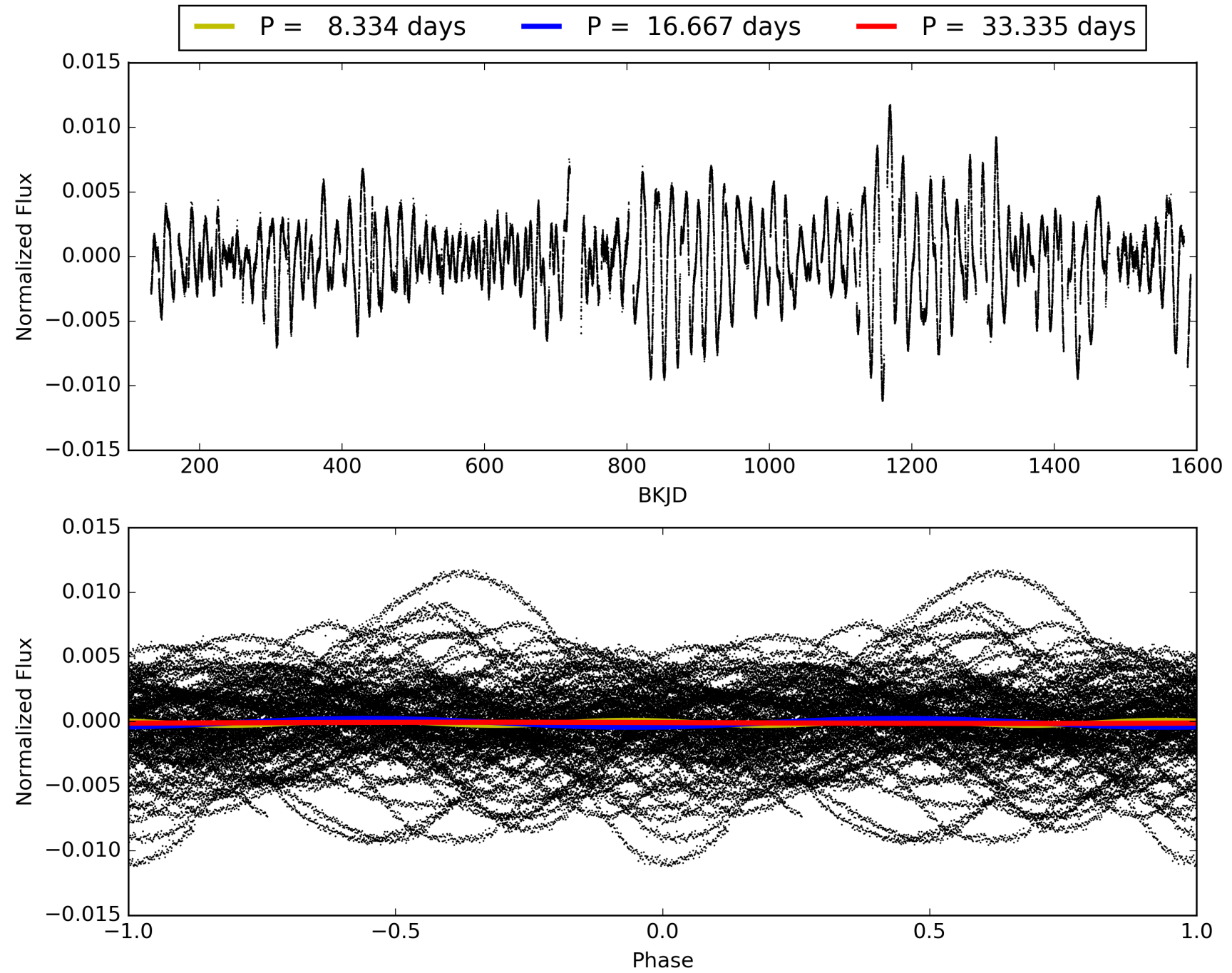
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [84.47 σ]
LongPeriod-sig: 100.0% [68.83 σ]
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.84e-36
RollingBand-fgt: 0.99 [76/77]
GhostDiagnostic-chr: 0.4499
Centroid-sig: 0.0%
Centroid-so: 1.639 arcsec [2.09 σ]
OotOffset-rm: 1.413 arcsec [3.64 σ]
KicOffset-rm: 1.153 arcsec [2.75 σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009334893-01, PDC Light Curves

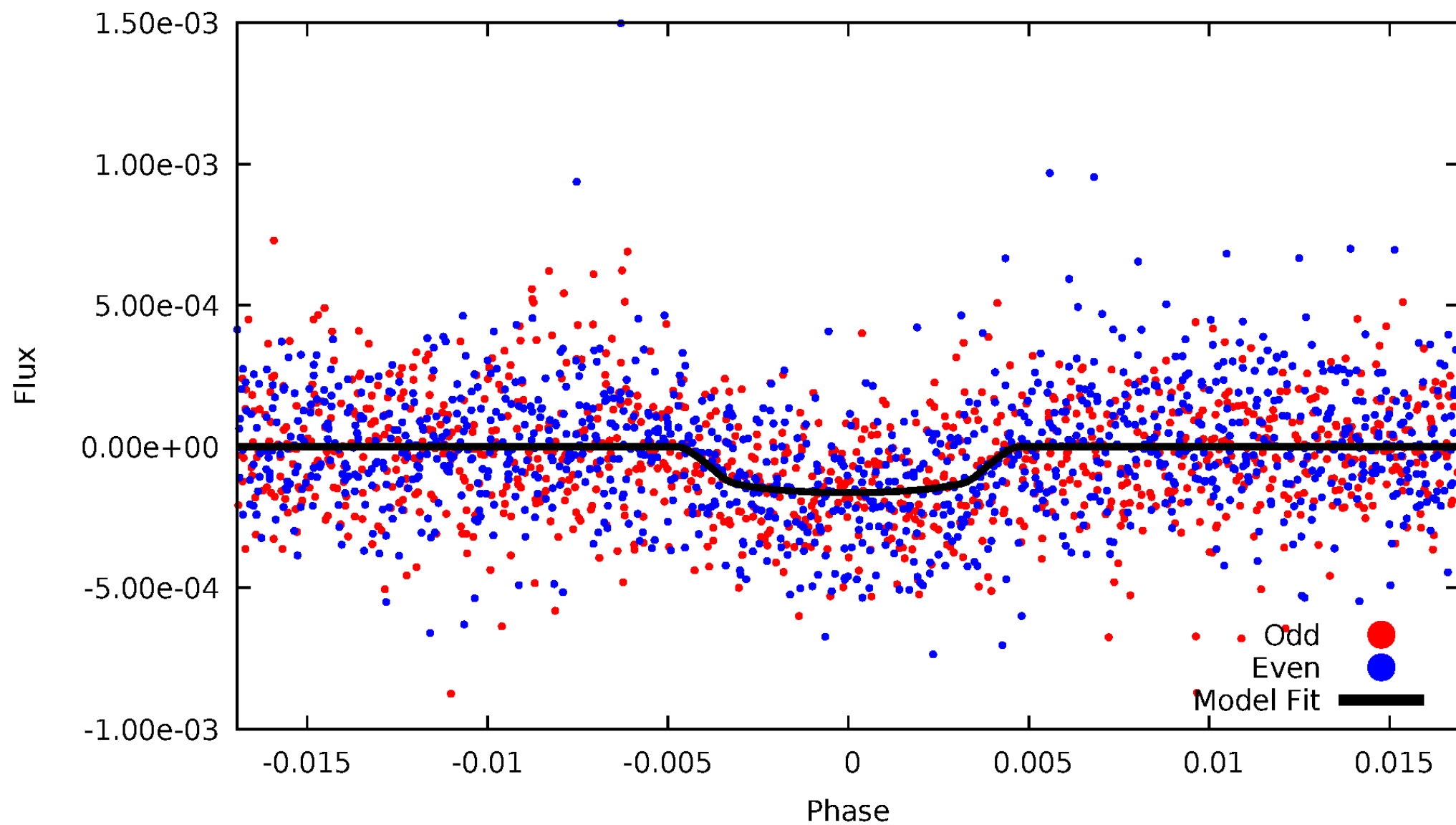


TCE 009334893-01



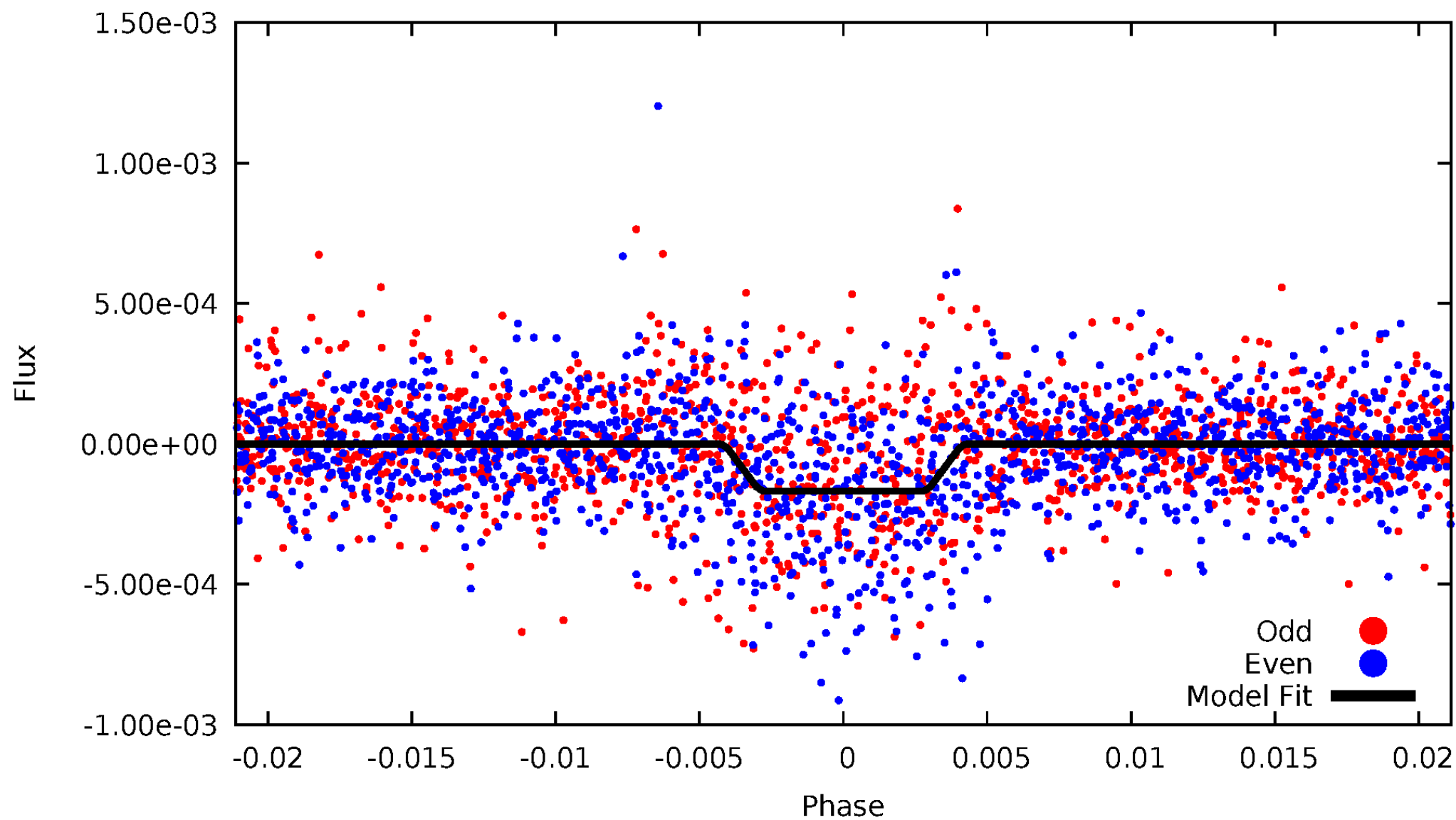
DV Odd/Even

TCE 009334893-01



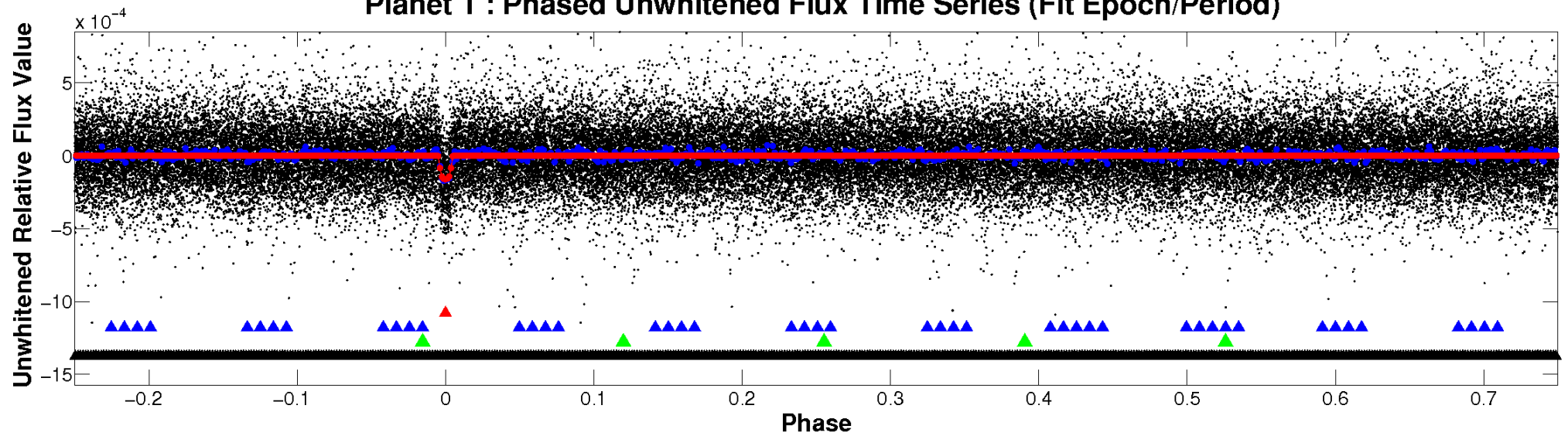
ALT Odd/Even

TCE 009334893-01

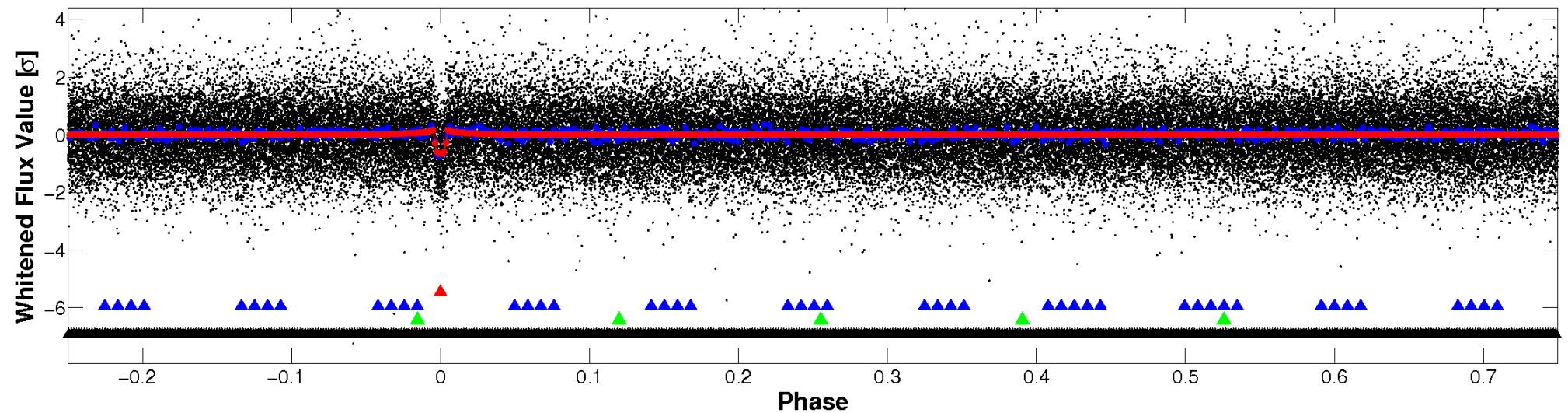


Non-Whitened Vs. Whitened Light Curve

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

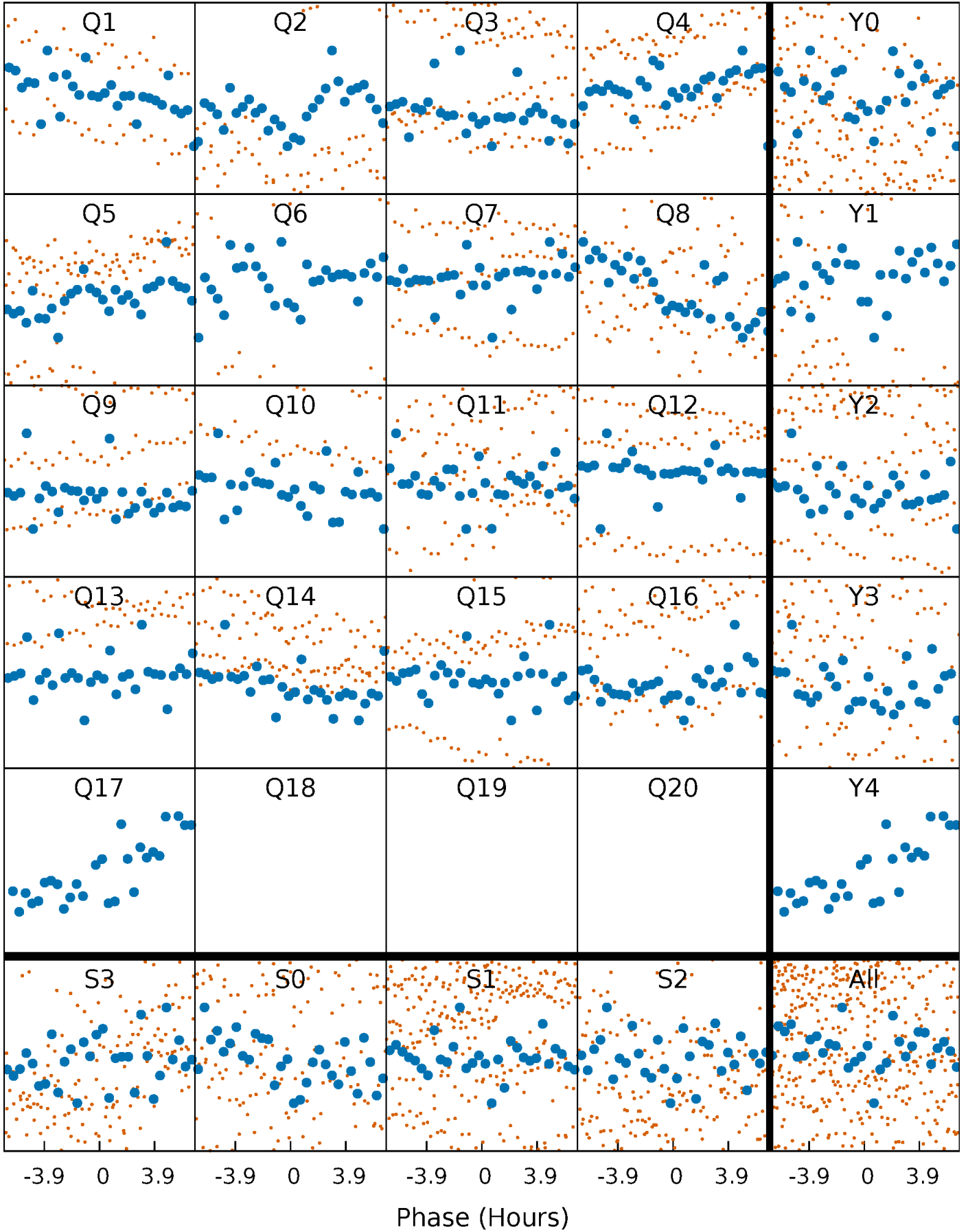


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



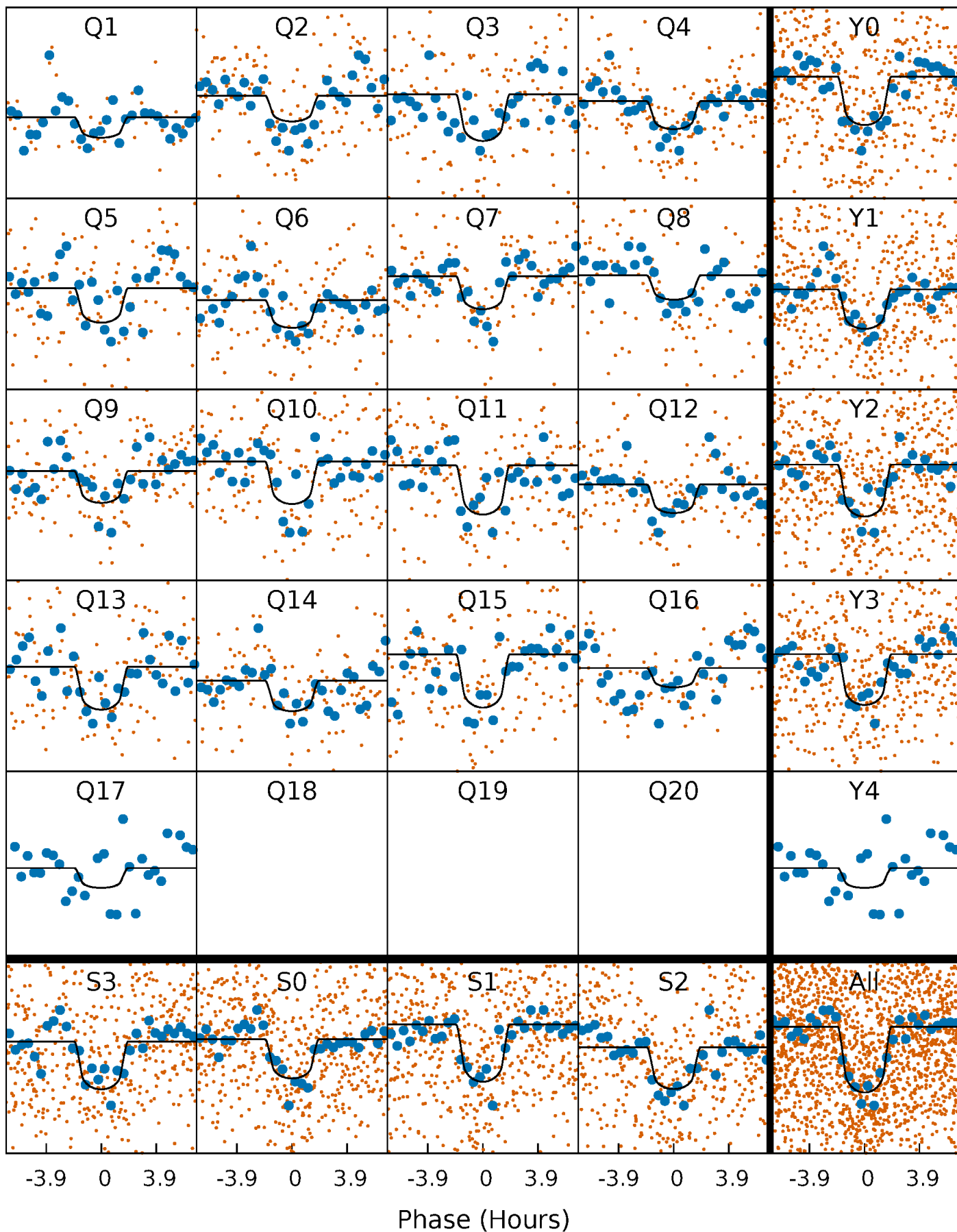
PDC Quarter-Phased Transit Curves

TCE 009334893-01 P= 16.667250 Days $T_0=141.760210$ (BKJD)



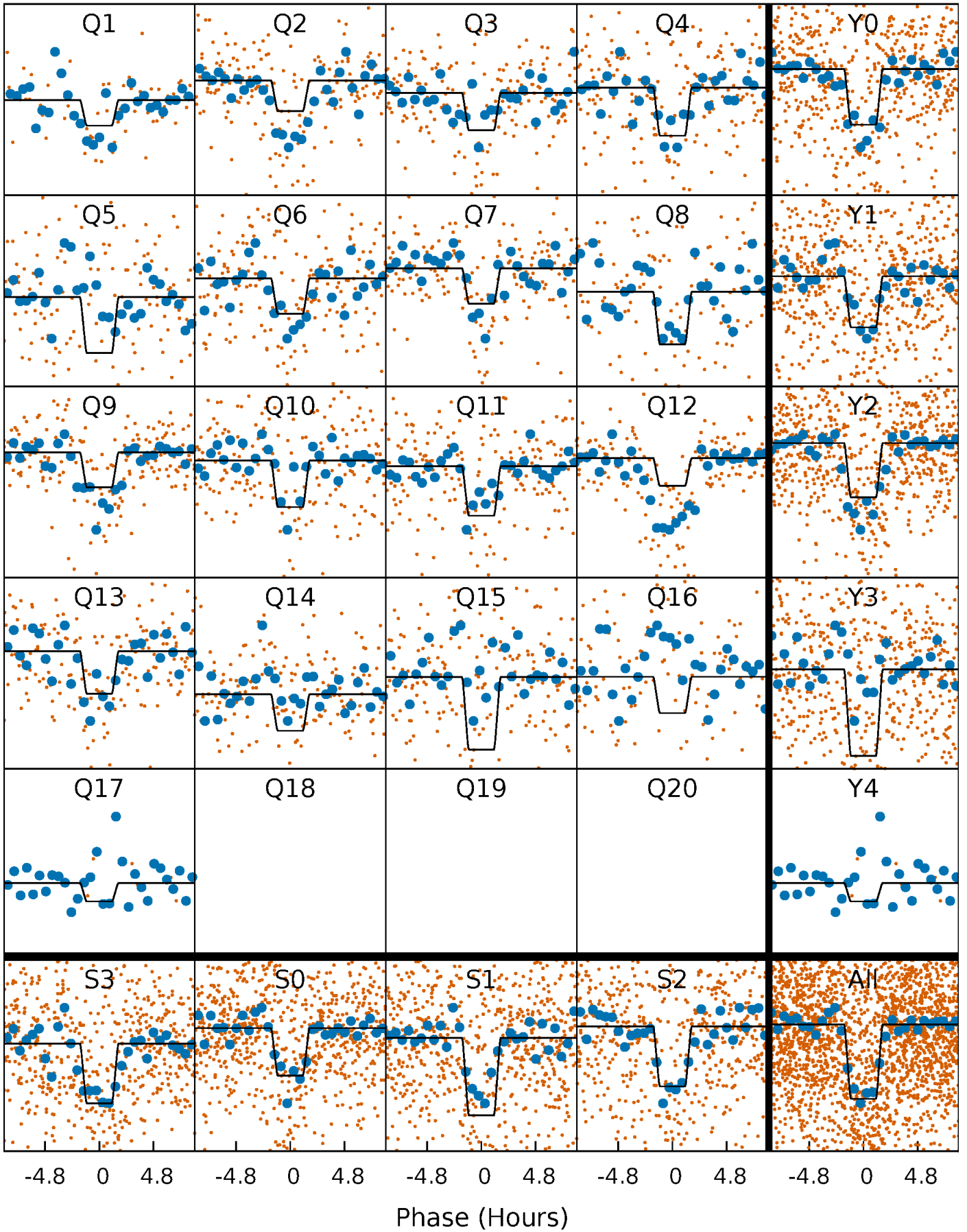
DV Quarter-Phased Transit Curves

TCE 009334893-01 P= 16.667250 Days $T_0=141.760210$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

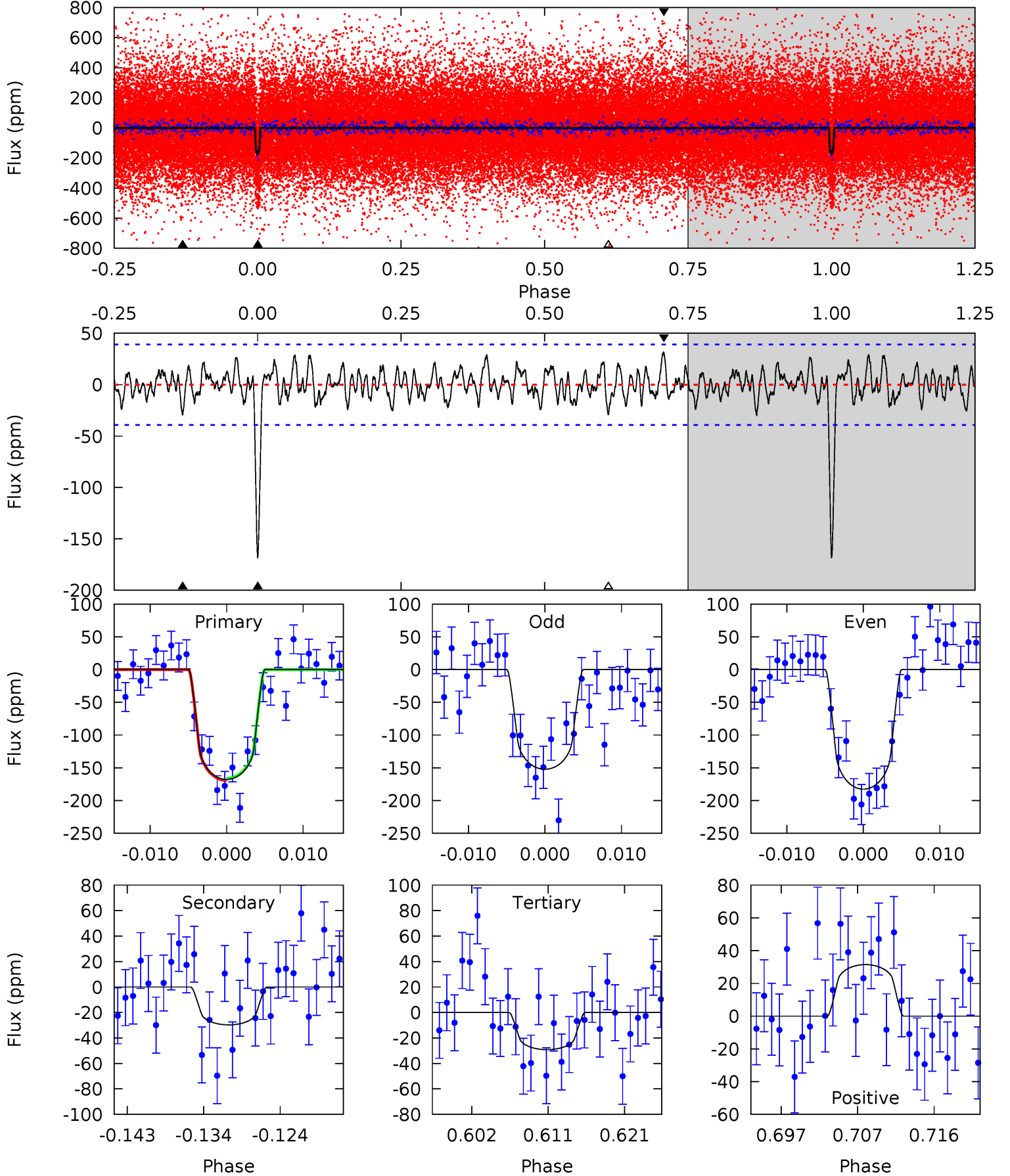
TCE 009334893-01 P= 16.667256 Days $T_0=141.762331$ (BKJD)



DV Model-Shift Uniqueness Test

009334893-01, P = 16.667250 Days, E = 125.092960 Days

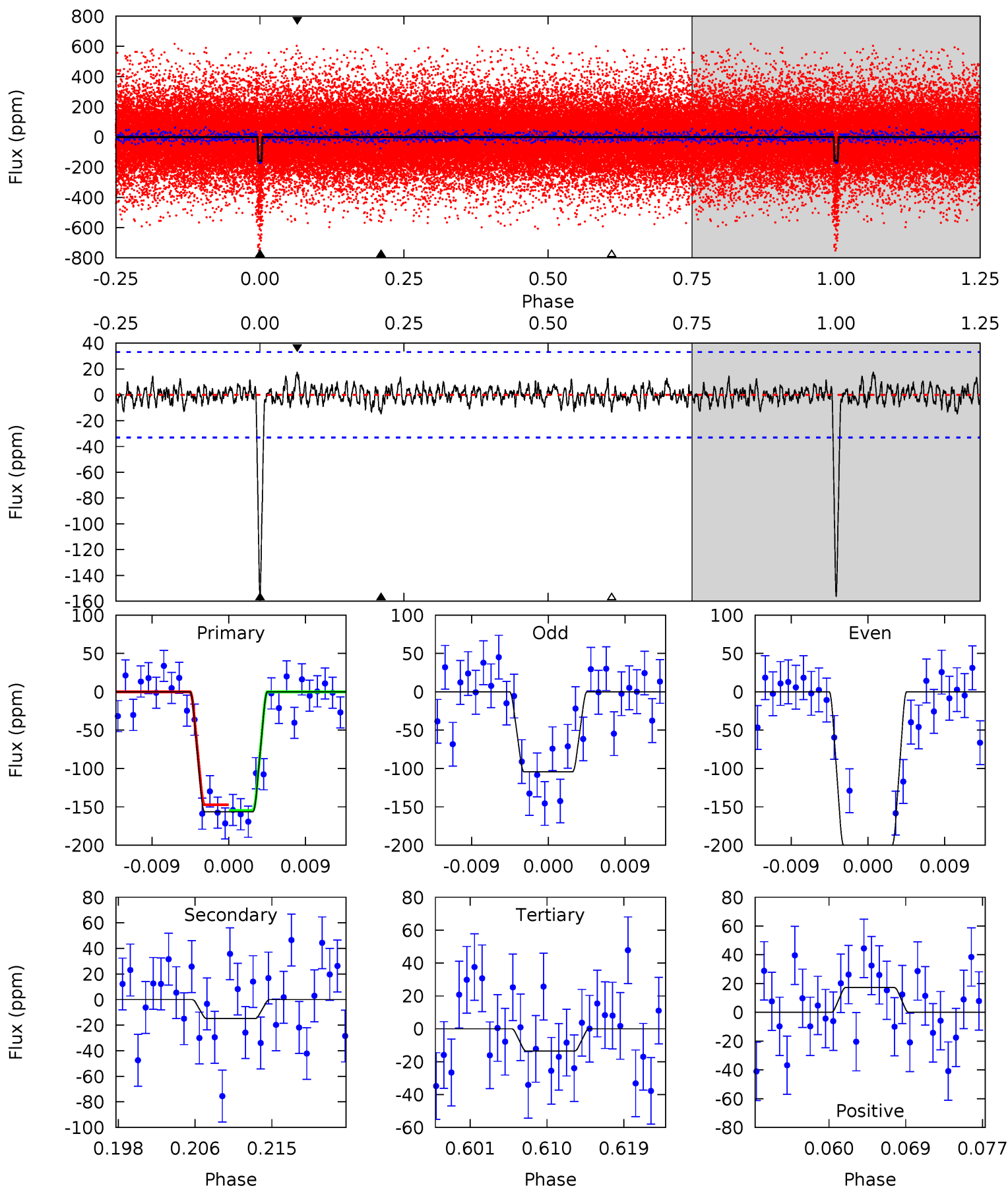
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.6	3.82	3.75	4.04	5.04	2.59	1.45	17.8	17.5	0.07	-0.23	1.96	1.03	0.16	0.18



Alt Model-Shift Uniqueness Test

009334893-01, P = 16.667256 Days, E = 125.095075 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.9	2.27	2.06	2.64	5.06	2.63	0.76	21.8	21.2	0.21	-0.37	7.37	1.23	0.10	0.56



Stellar Parameters For KIC 009334893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4729^{+143}_{-143}	$4.726^{+0.045}_{-0.024}$	$-1.420^{+0.300}_{-0.300}$	$0.525^{+0.028}_{-0.032}$	$0.534^{+0.036}_{-0.020}$	$5.206^{+0.940}_{-0.545}$
	+3%/-3%	+1%/-1%	+21%/-21%	+5%/-6%	+7%/-4%	+18%/-10%
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 009334893-01 / KOI 2298.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-30 ± 8	$0.77^{+0.39}_{-0.35}$	653^{+24}_{-21}	3409^{+761}_{-422}	294^{+676}_{-176}
Alt.	-15 ± 7	$0.77^{+0.40}_{-0.36}$	653^{+22}_{-22}	3081^{+731}_{-395}	149^{+416}_{-94}

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 $A_{obs} \gg 1.0$

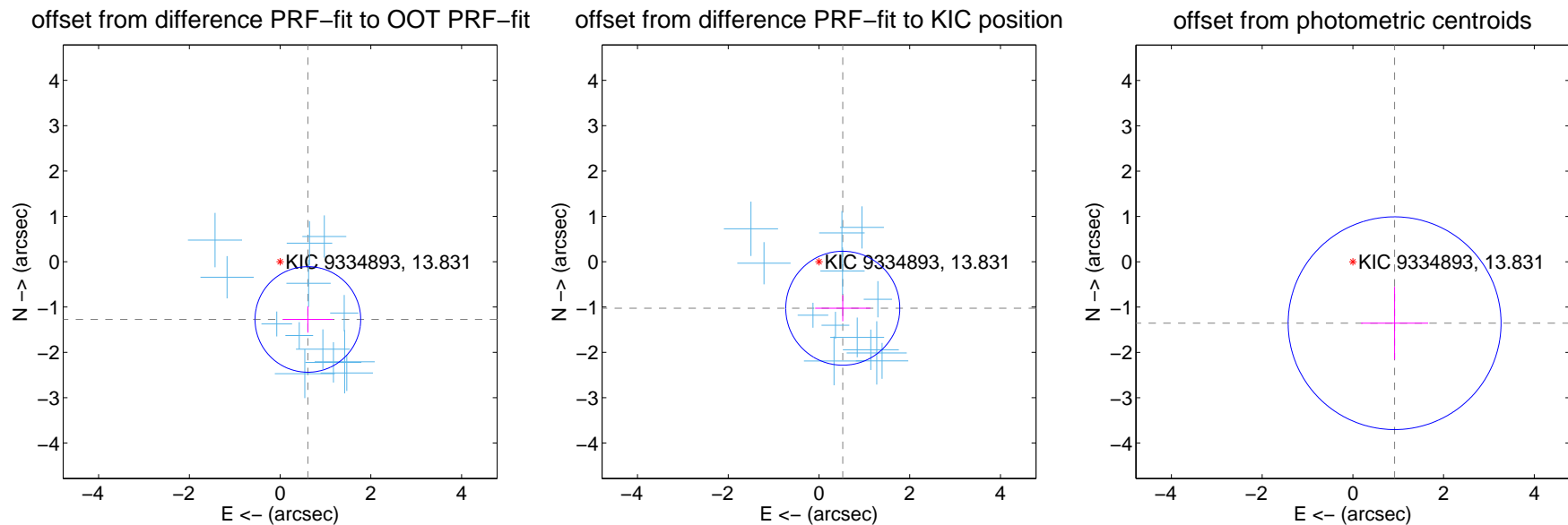
DV Centroid Data

Supplemental centroid analysis for 009334893-01. Kepler magnitude: 13.83. Transit SNR 13.70

There are 13 quarters with good PRF difference image offsets

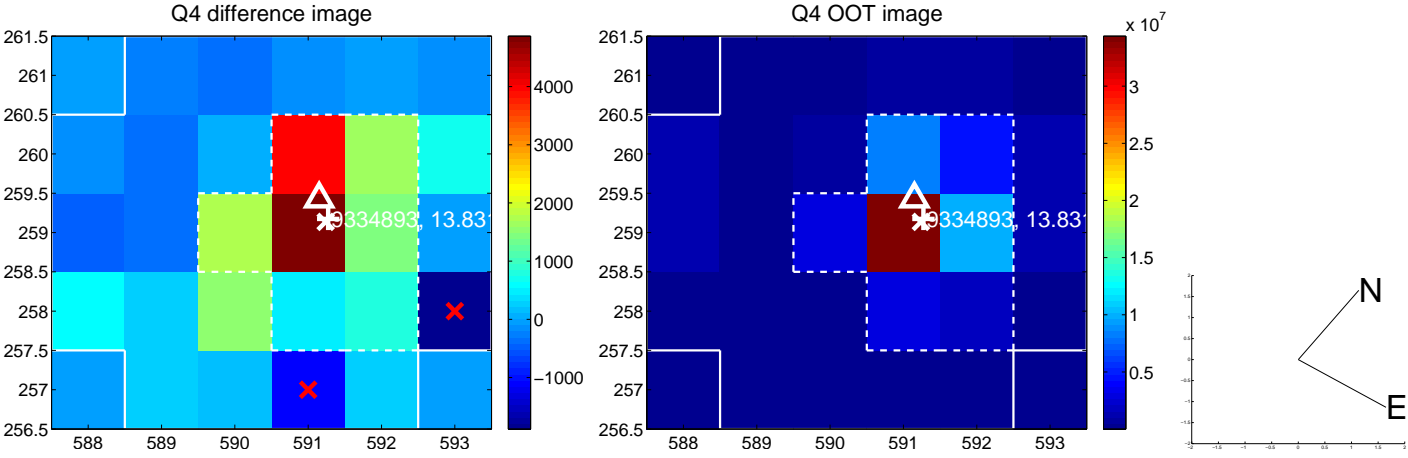
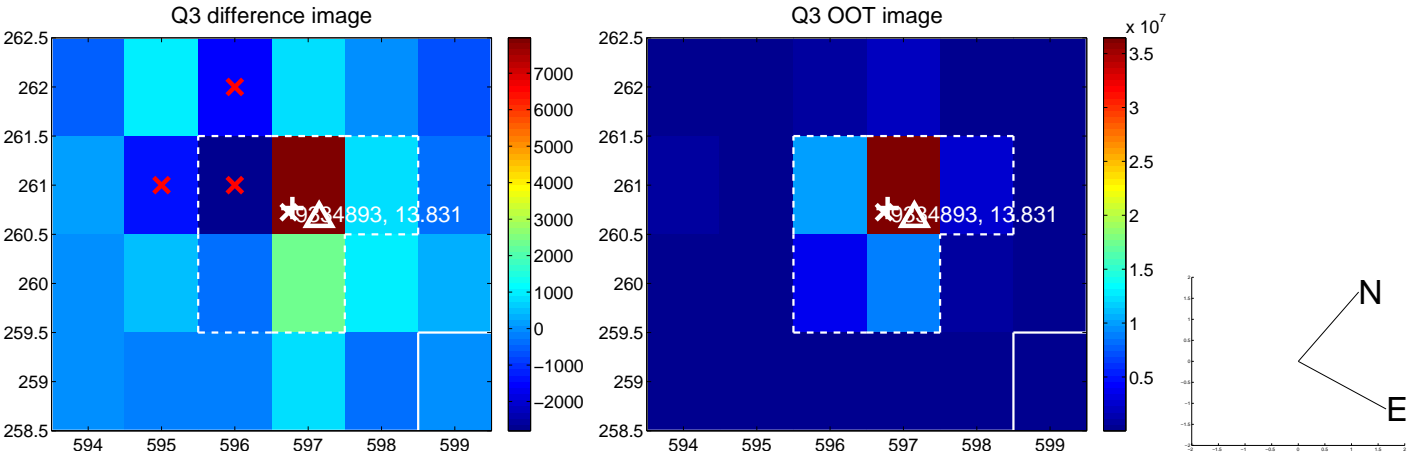
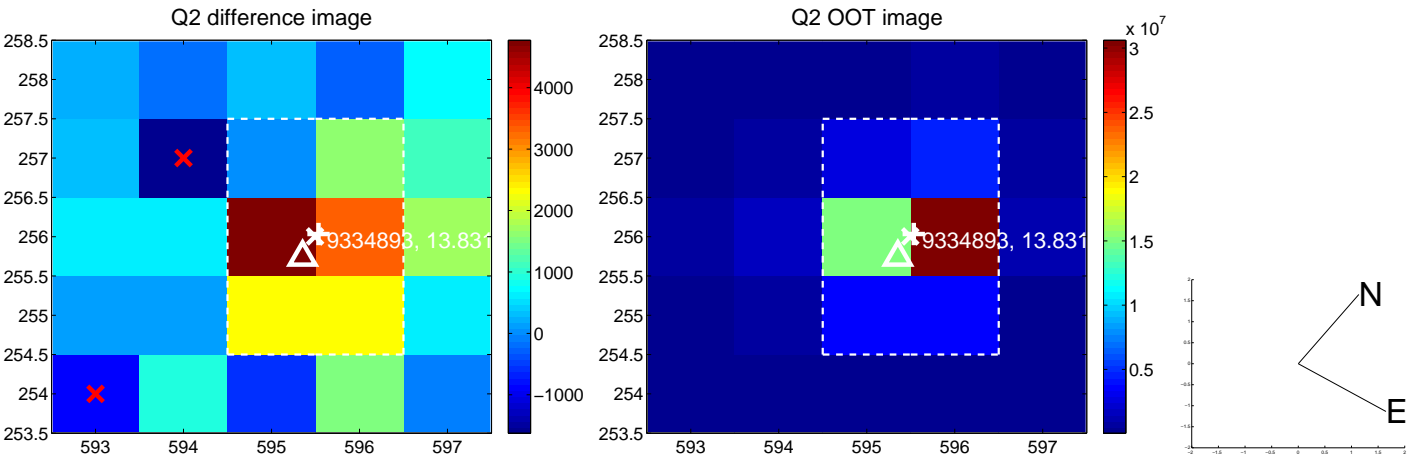
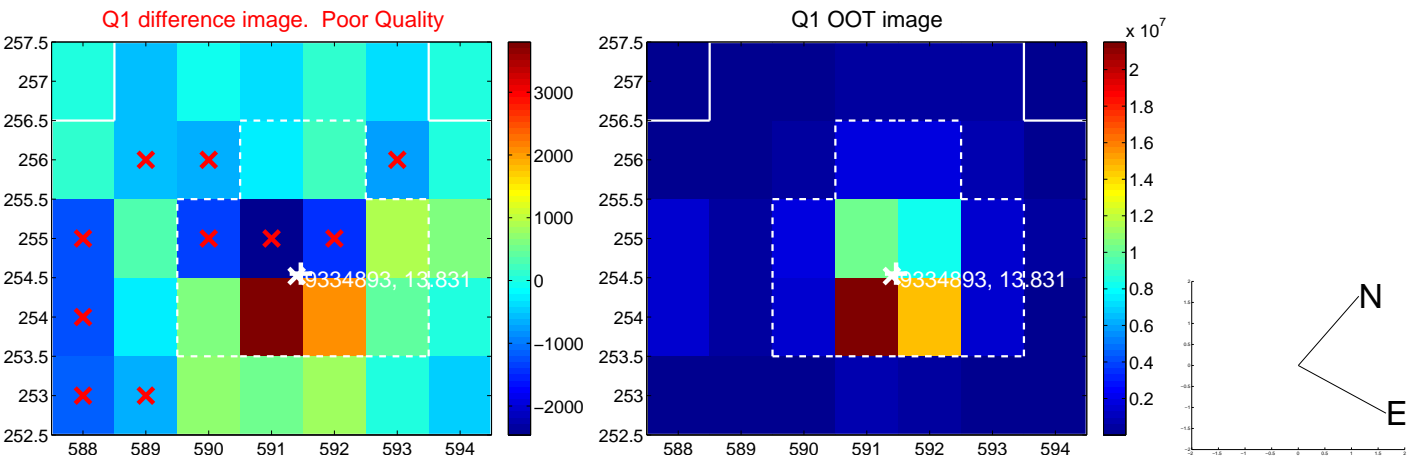
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.413 ± 0.388	3.64	-0.612 ± 0.549	-1.274 ± 0.291
PRF-fit source offset from KIC position	1.153 ± 0.419	2.75	-0.524 ± 0.608	-1.027 ± 0.287
photometric centroid source offset	1.64 ± 0.78	2.09	-0.92 ± 0.74	-1.36 ± 0.80

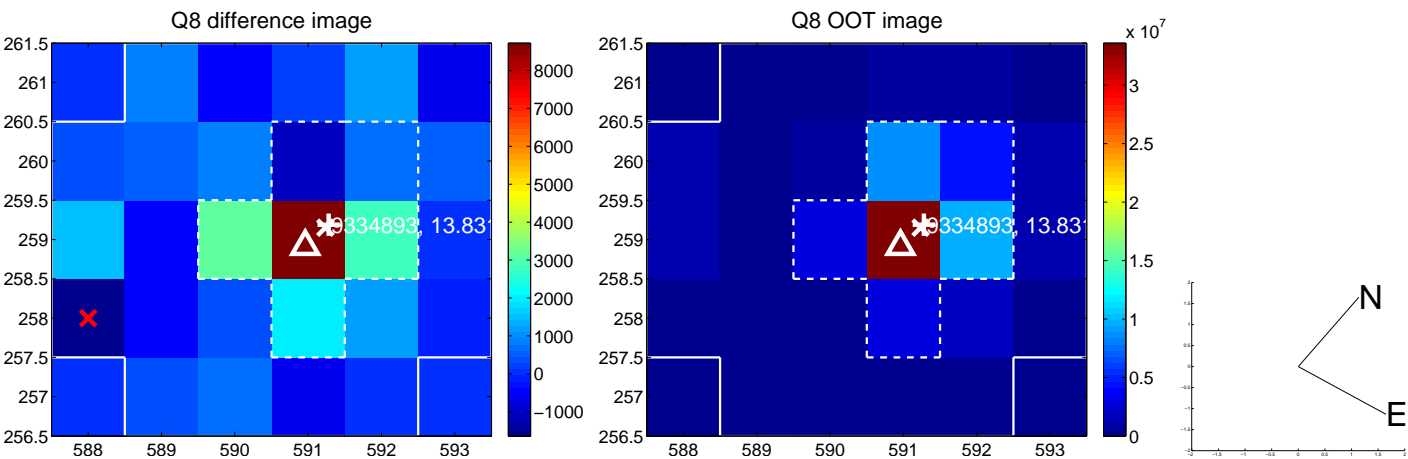
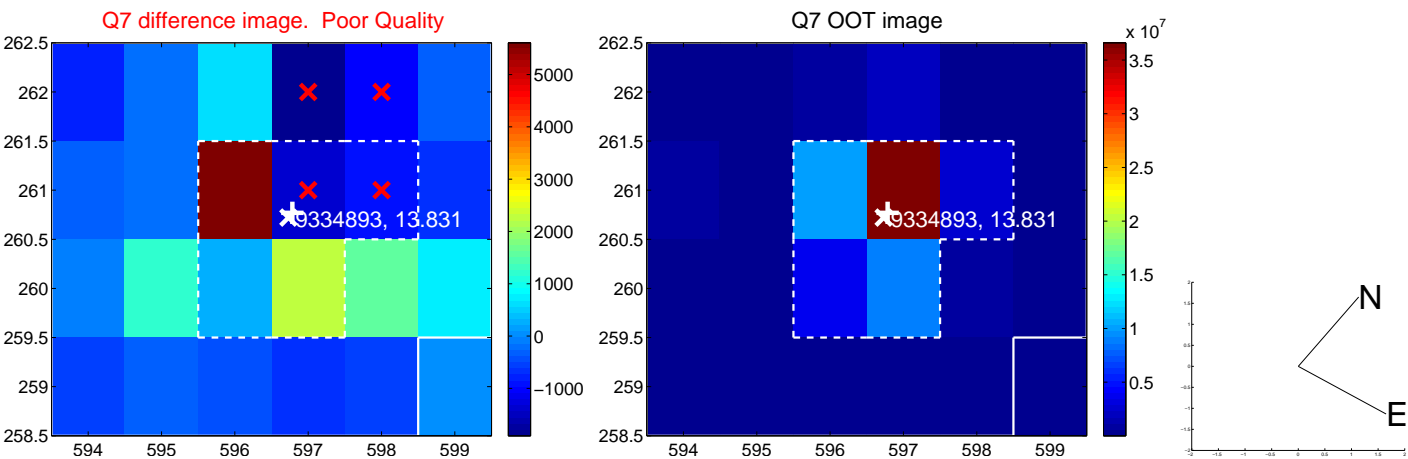
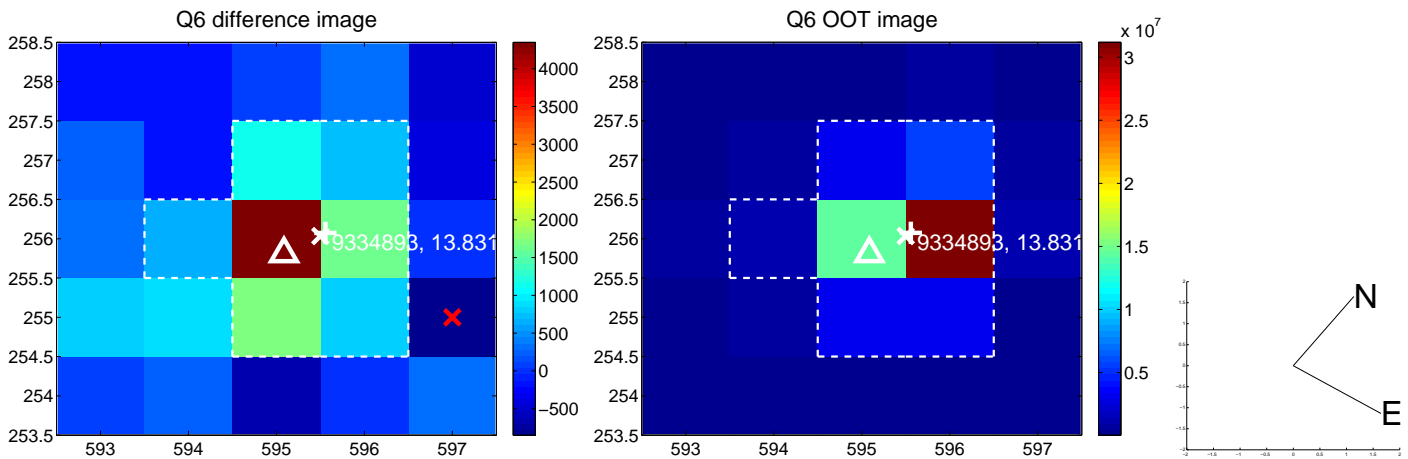
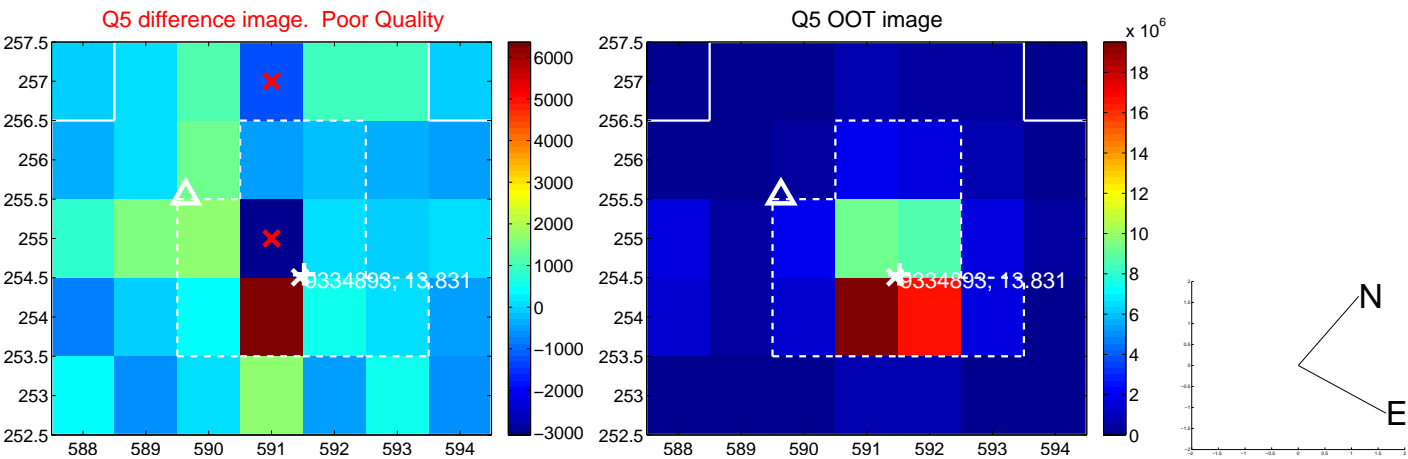


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

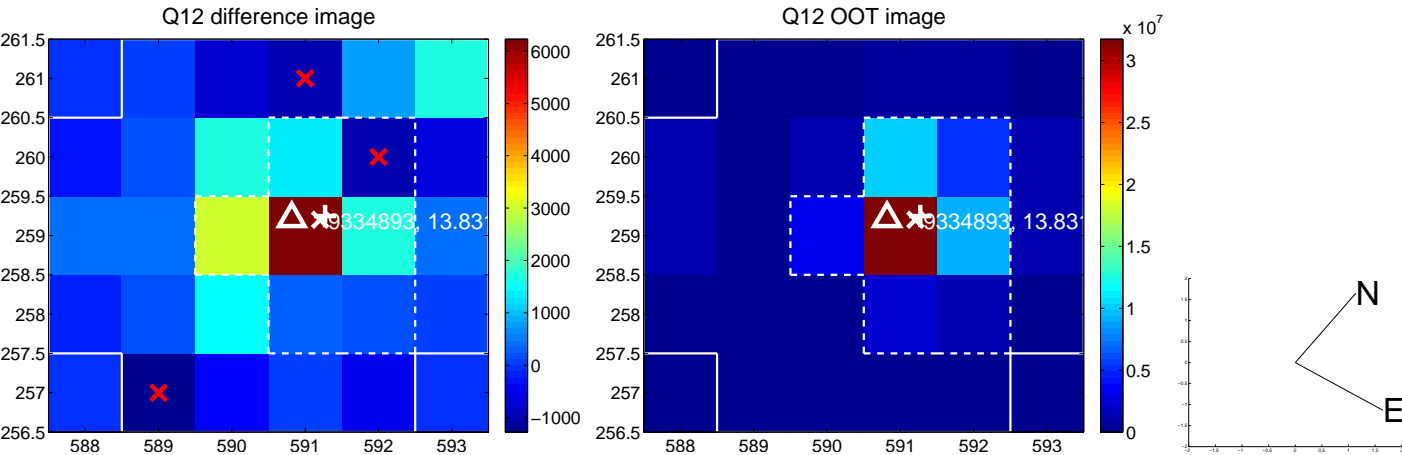
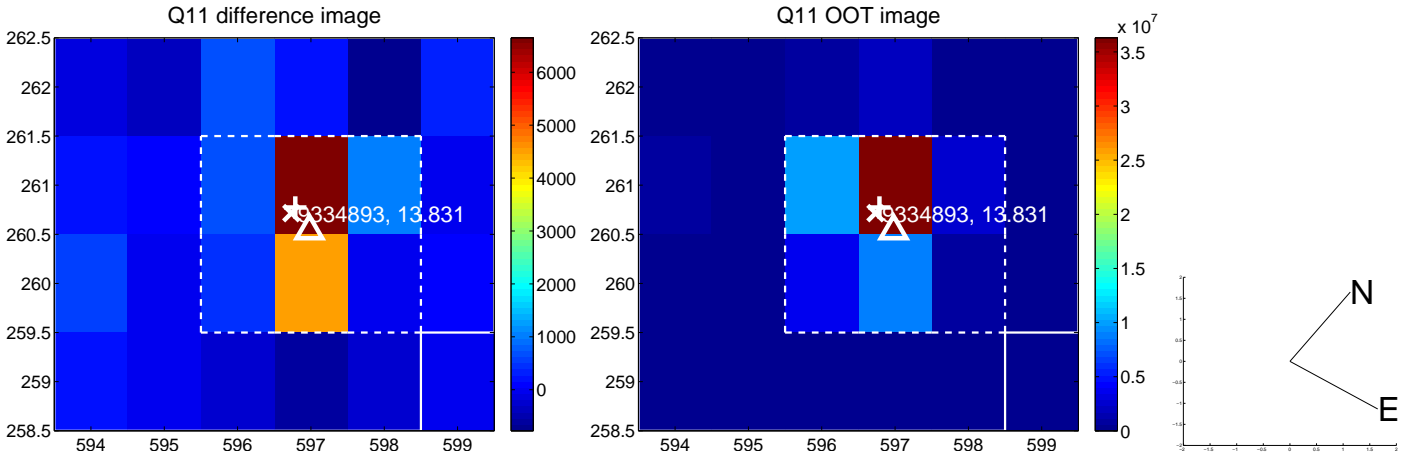
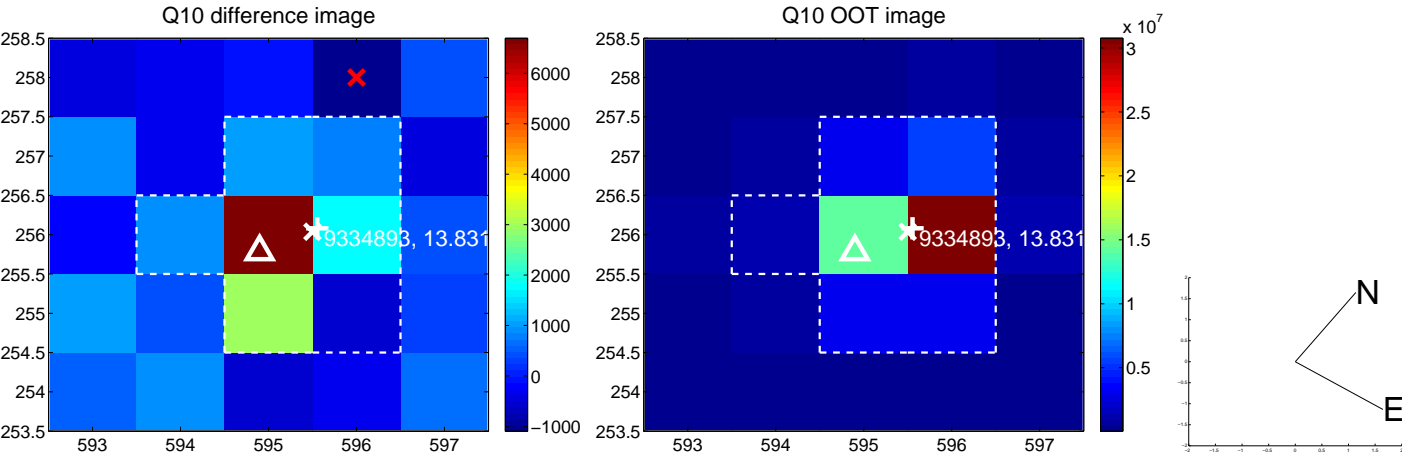
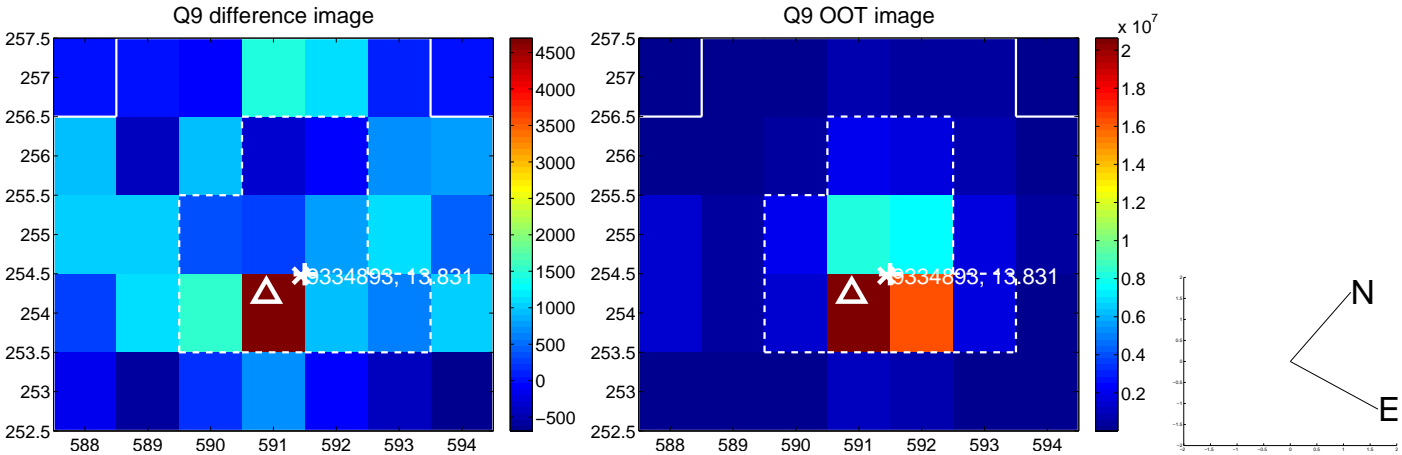
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



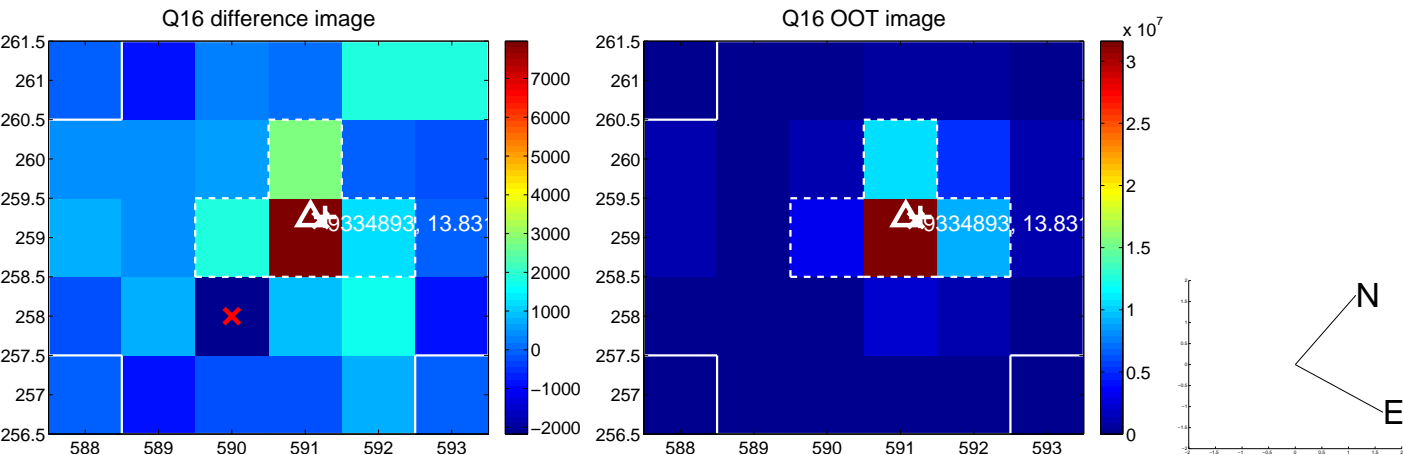
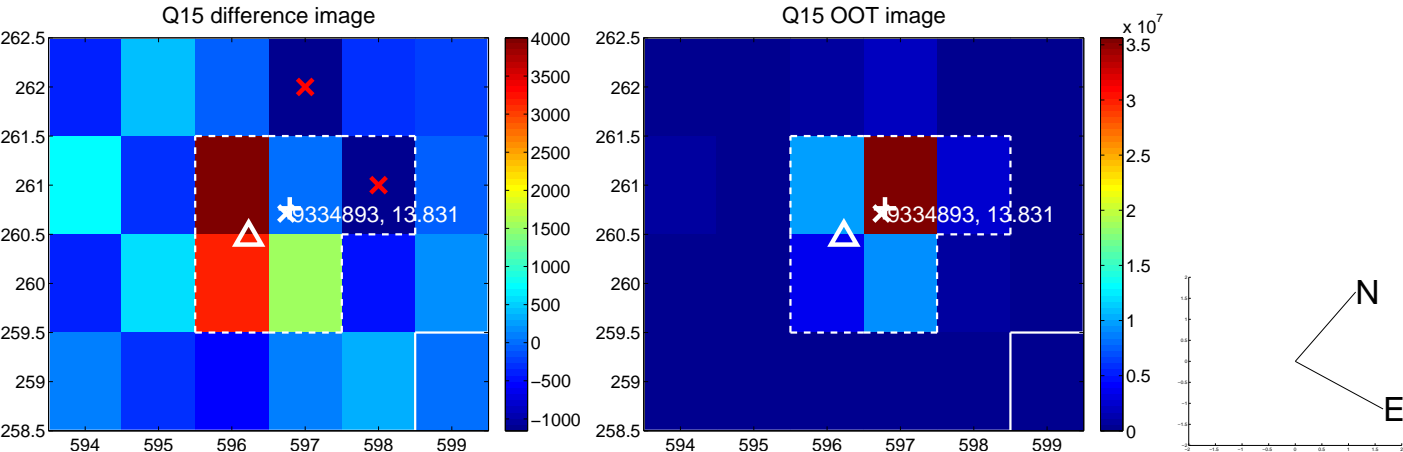
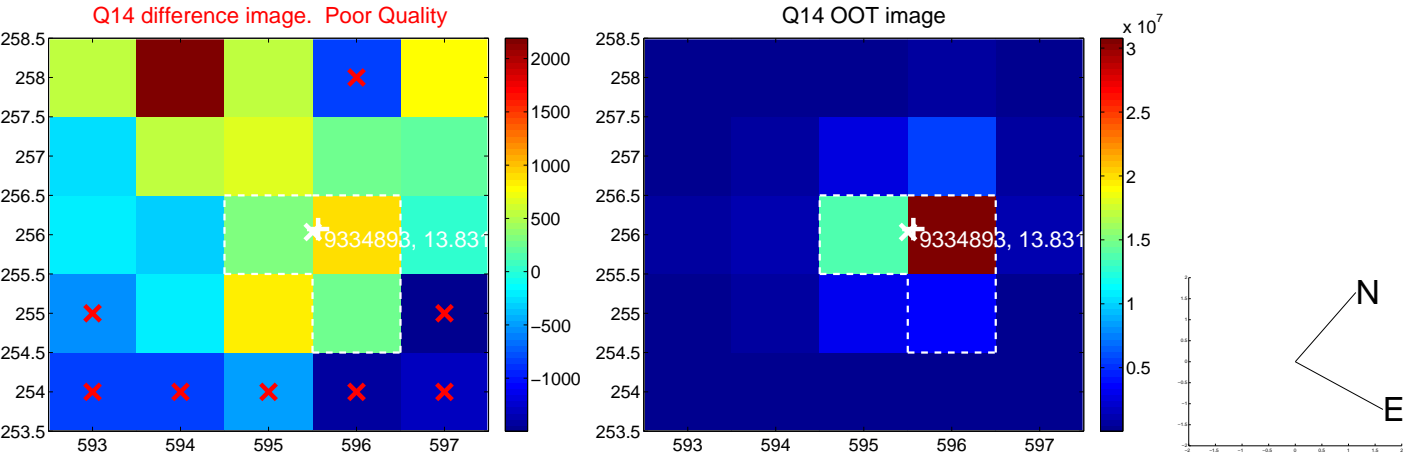
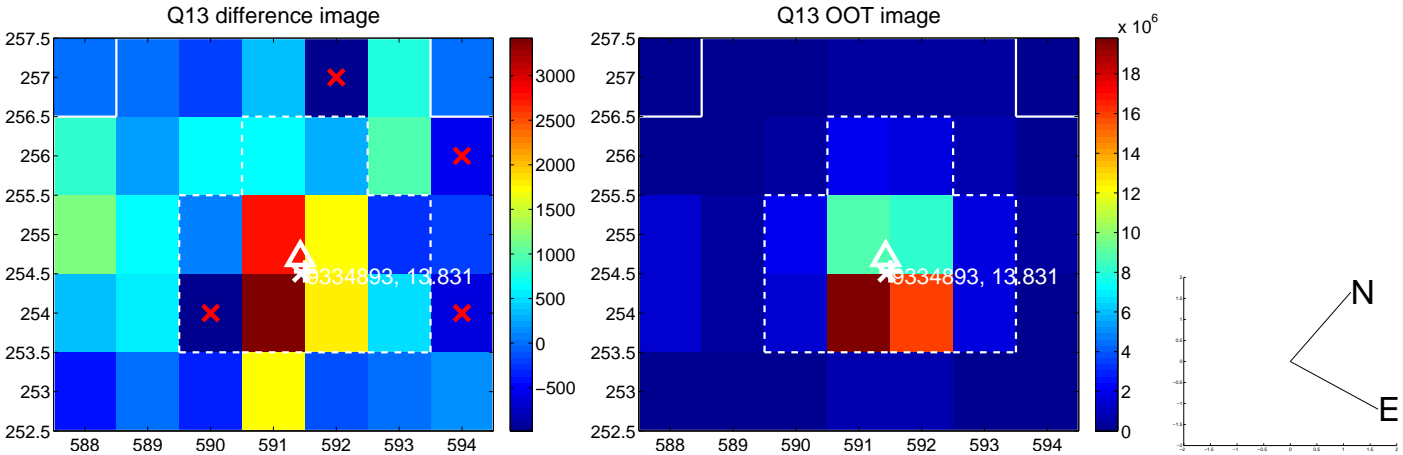
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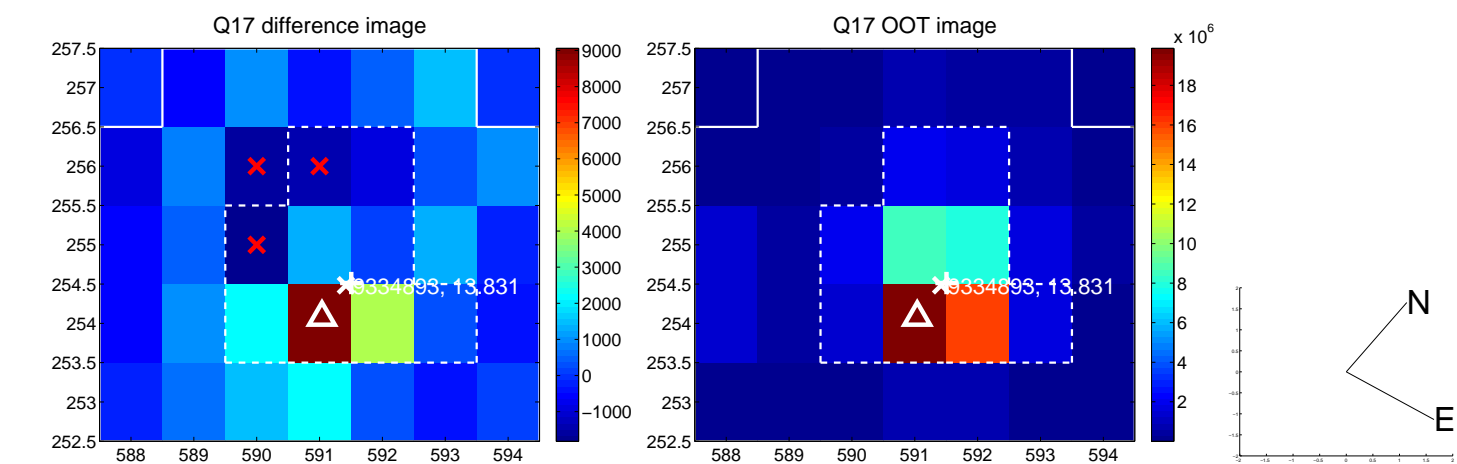
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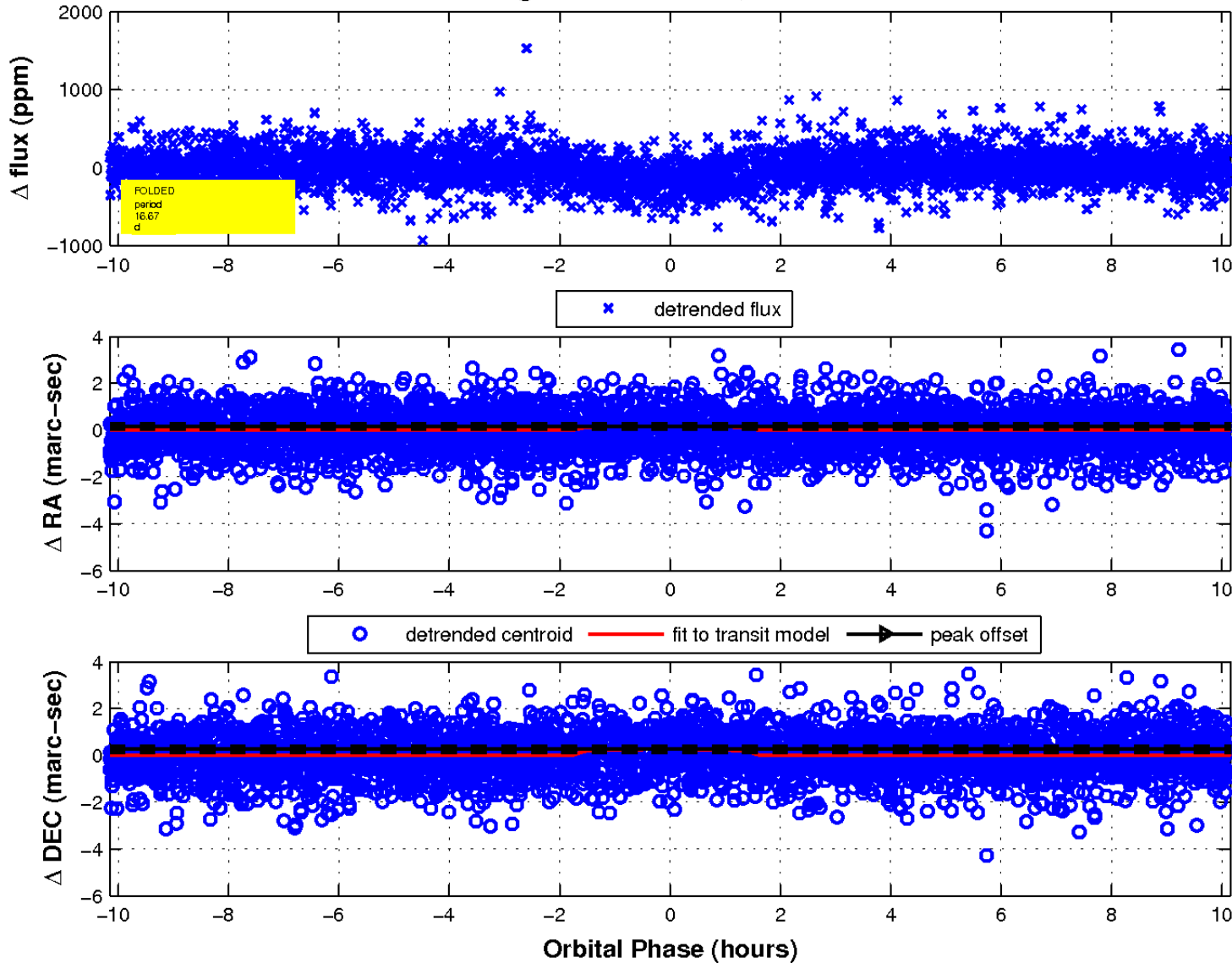
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fluxWeightedCentroids, Planet 1 of 4



This panel shows a deep-field astronomical image of a star field. A blue grid is overlaid on the image, with green numerical labels indicating coordinates. The labels include '52.0', '51.0', '19:13:50.0', '49.0', '48.0', '47.0' along the top edge and '7:40.0', '50.0', '45:48:00.0', '10.0', '20.0', '30.0' along the right edge. A prominent bright star is visible near the center of the grid.

Declination

KIC 009334893

Q1-17 DR25 TCE Parameters

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009334893-04	OBS	PC	0.42	0	0	0	0	CENT_UNCERTAIN

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

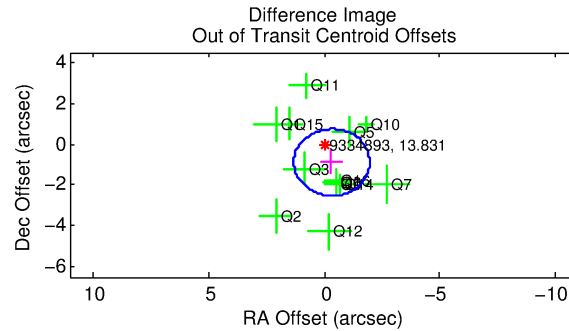
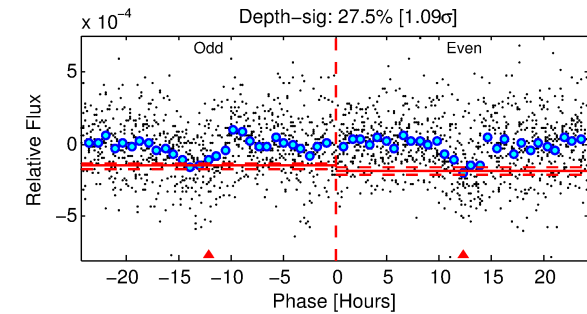
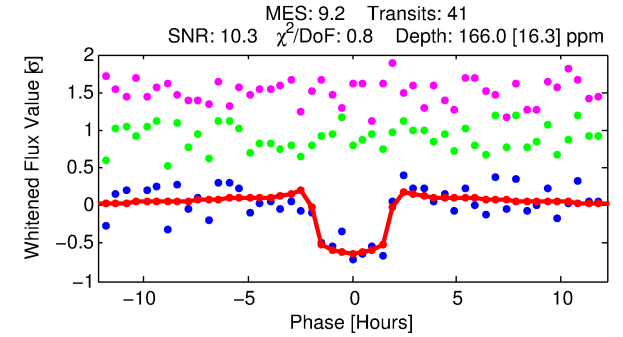
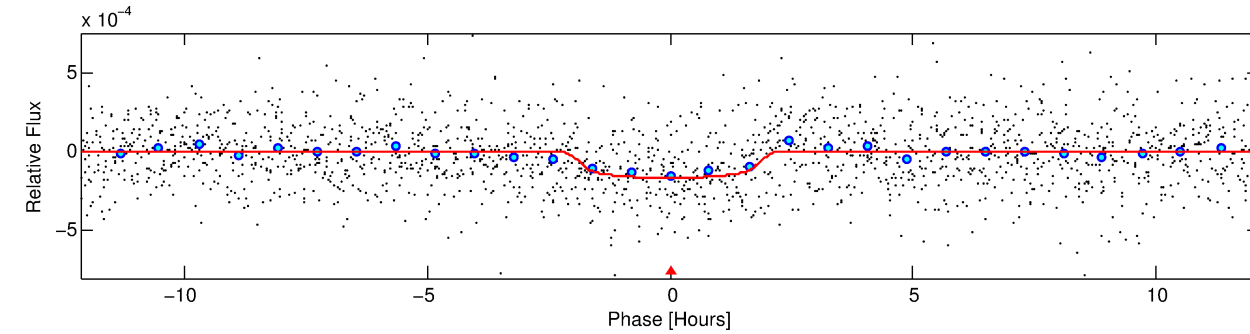
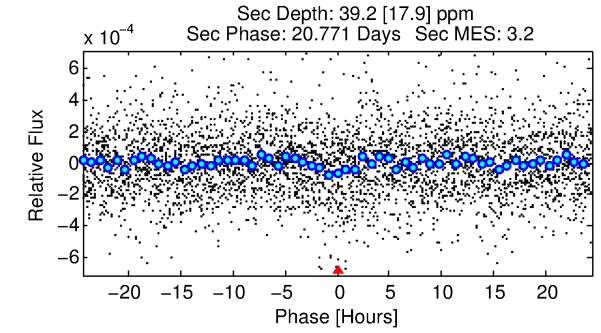
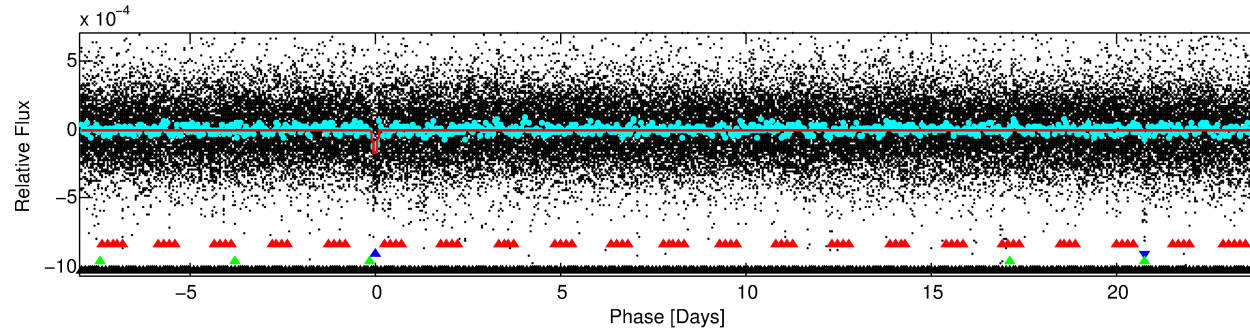
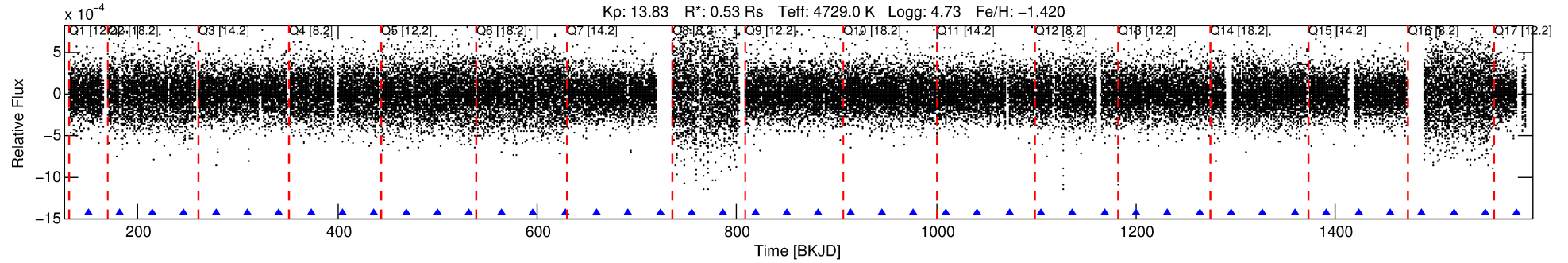
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009334893-02

No Significant Match Found

DV One-Page Summary

KIC: 9334893 Candidate: 2 of 4 Period: 31.806 d
KOI: K02298.02 Corr: 0.964



DV Fit Results:

Period = 31.80596 [0.00027] d
Epoch = 150.6732 [0.0073] BKJD
Rp/R* = 0.0140 [0.0060]
a/R* = 29.20 [53.35]
b = 0.89 [0.44]
Seff = 4.85 [0.70]
Teq = 378 [14] K
Rp = 0.80 [0.34] Re
a = 0.1595 [0.0085] AU
Ag = 855.73 [830.74] [1.03σ]
Teffp = 3165 [771] K [3.61σ]

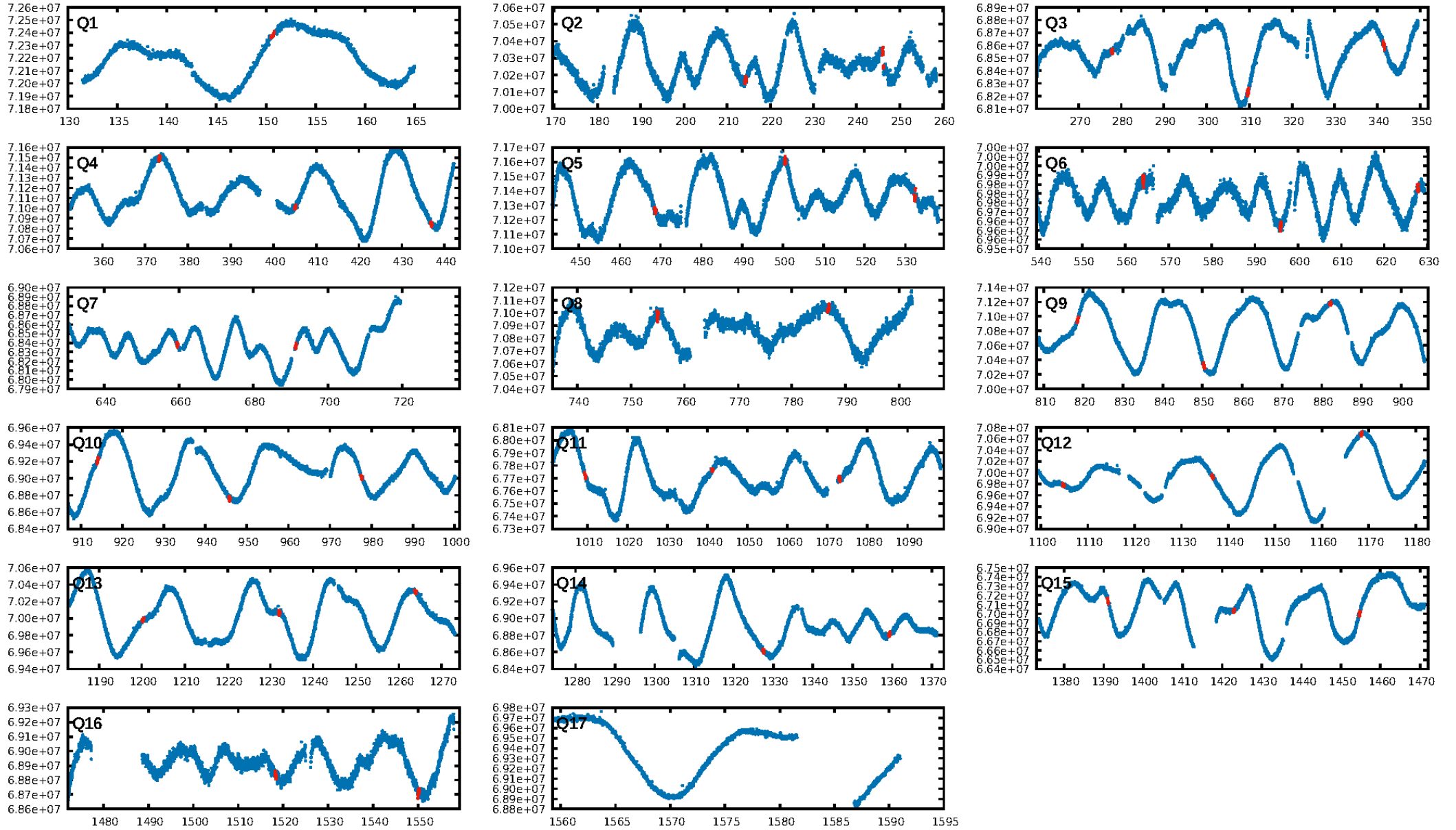
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [68.83σ]
LongPeriod-sig: 100.0% [1243.97σ]
ModelChiSquare2-sig: 96.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.49e-19
RollingBand-fgt: 1.00 [40/40]
GhostDiagnostic-chr: 0.7597
Centroid-sig: 9.7%
Centroid-so: 1.169 arcsec [1.19σ]
OotOffset-rm: 0.949 arcsec [1.74σ]
OotOffset-st: 4/4/2/3 [13]
KicOffset-rm: 0.651 arcsec [1.14σ]
KicOffset-st: 4/4/2/3 [13]
DiffImageQuality-fgm: 0.69 [9/13]
DiffImageOverlap-fno: 0.81 [13/16]

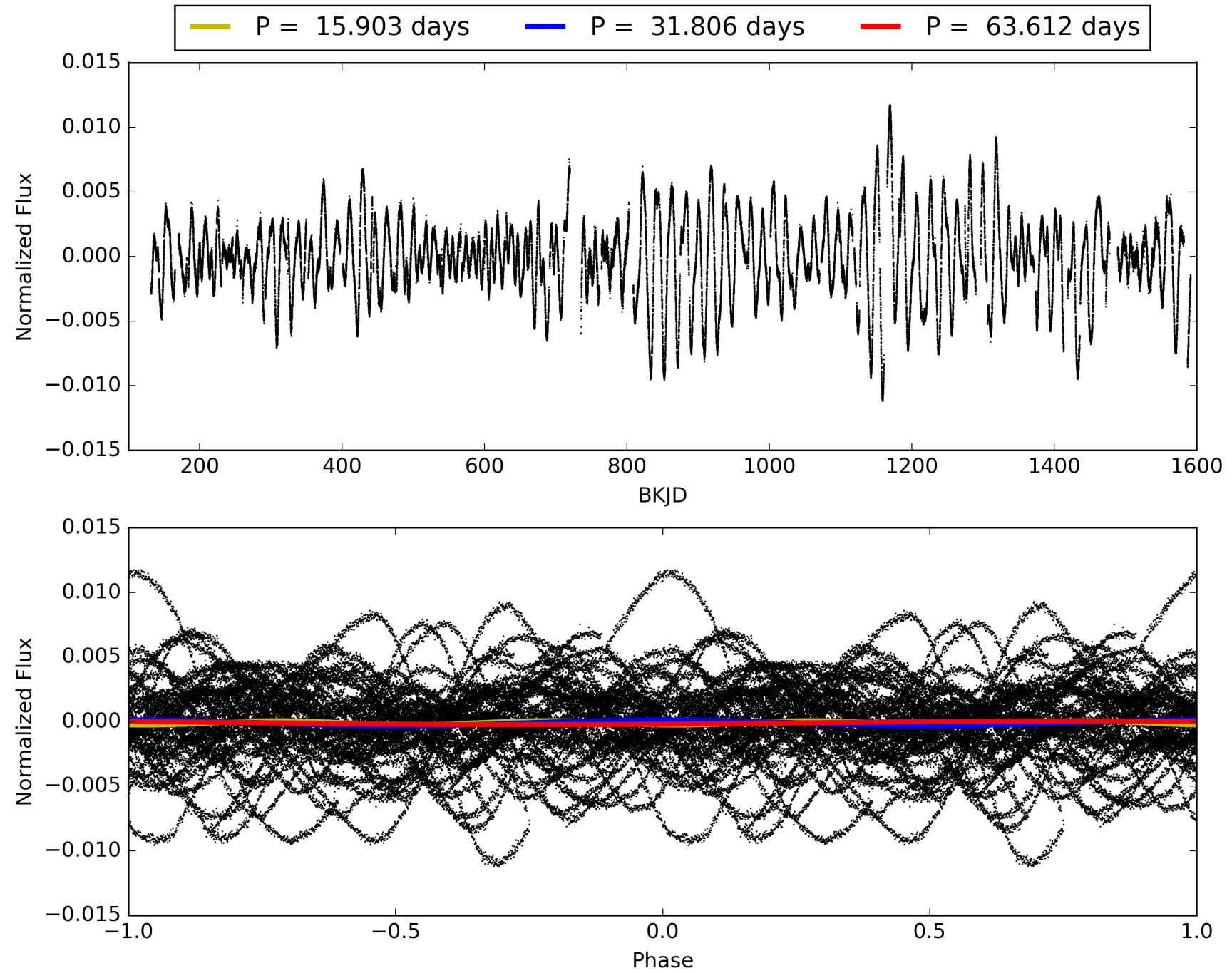
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:25:49 Z

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

TCE 009334893-02, PDC Light Curves

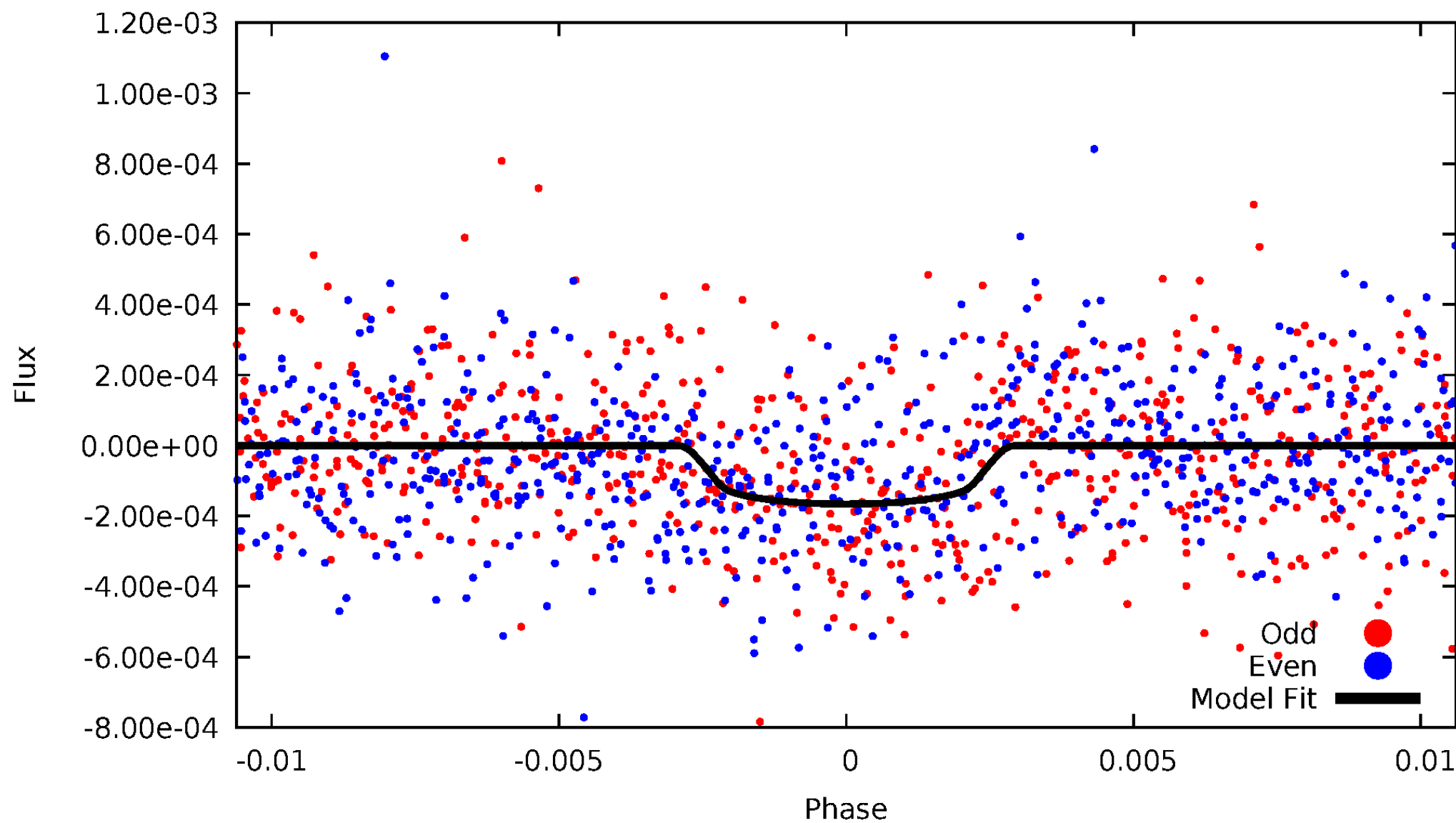


TCE 009334893-02



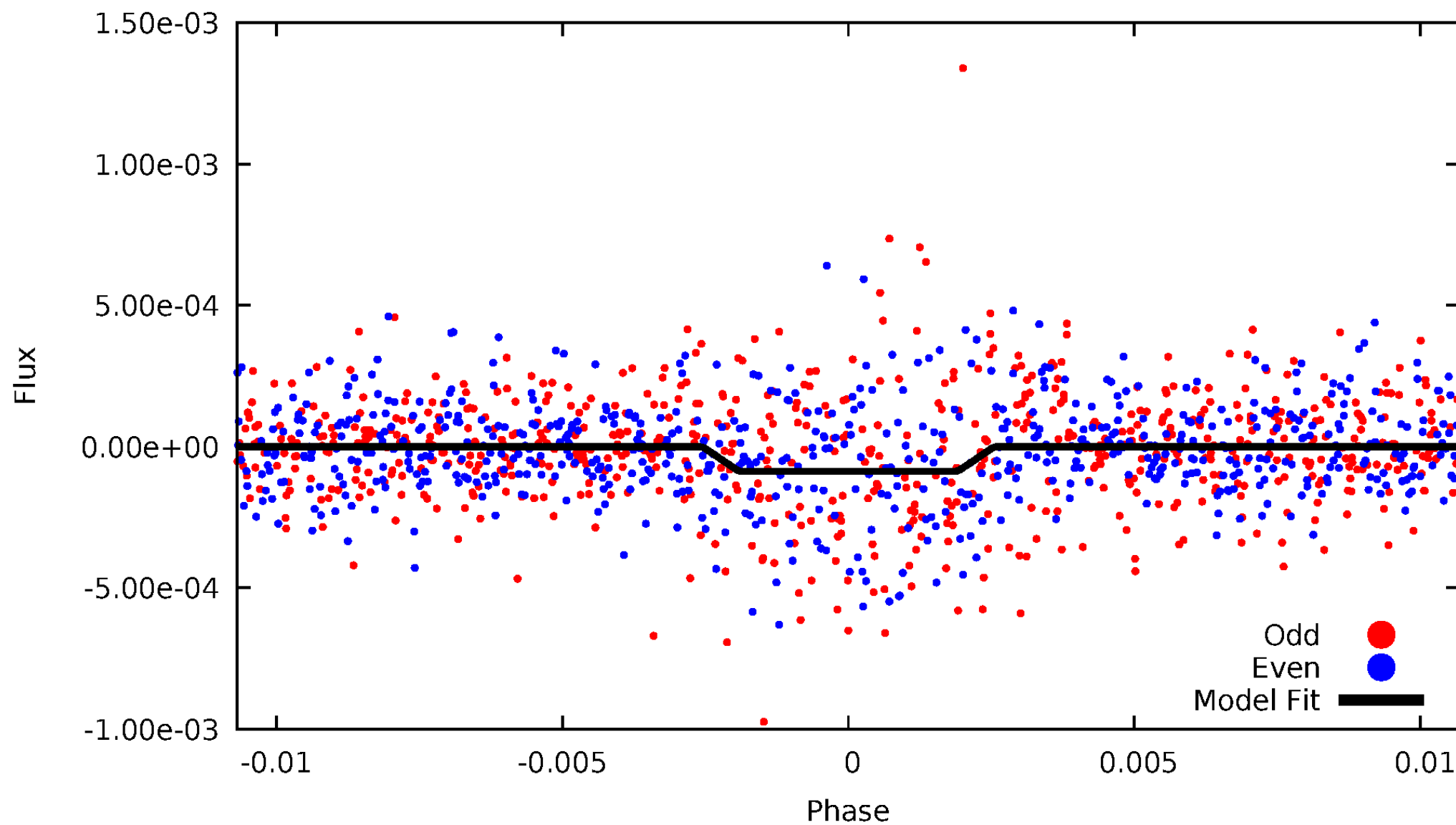
DV Odd/Even

TCE 009334893-02



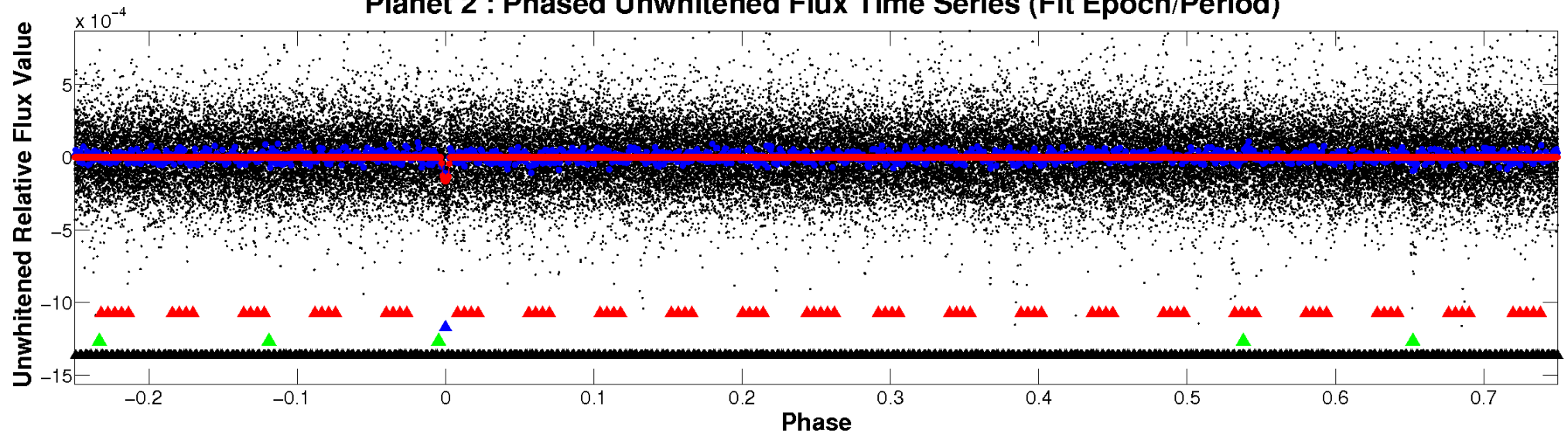
ALT Odd/Even

TCE 009334893-02

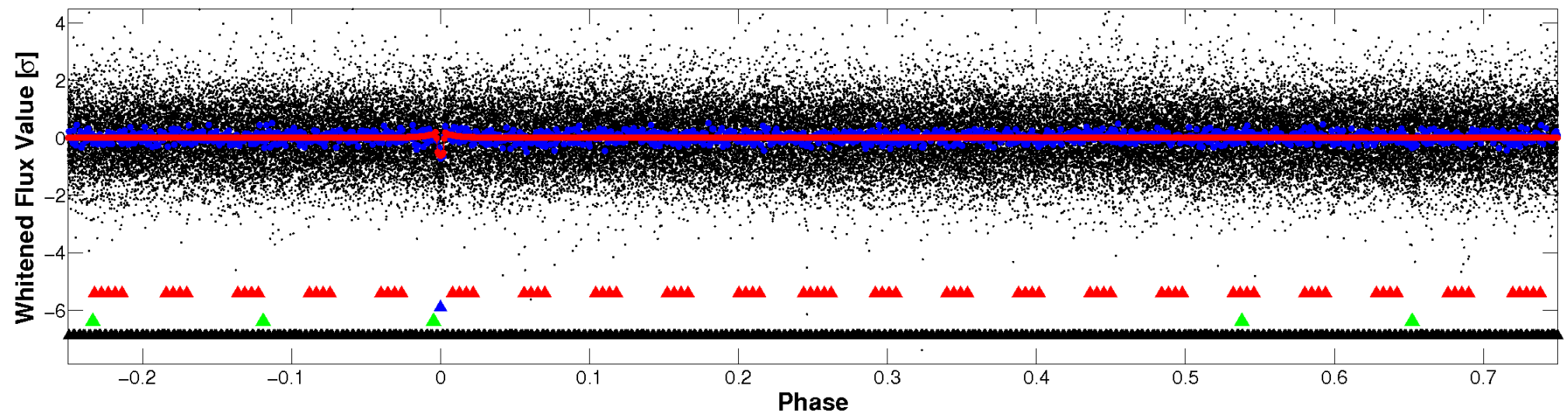


Non-Whitened Vs. Whitened Light Curve

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

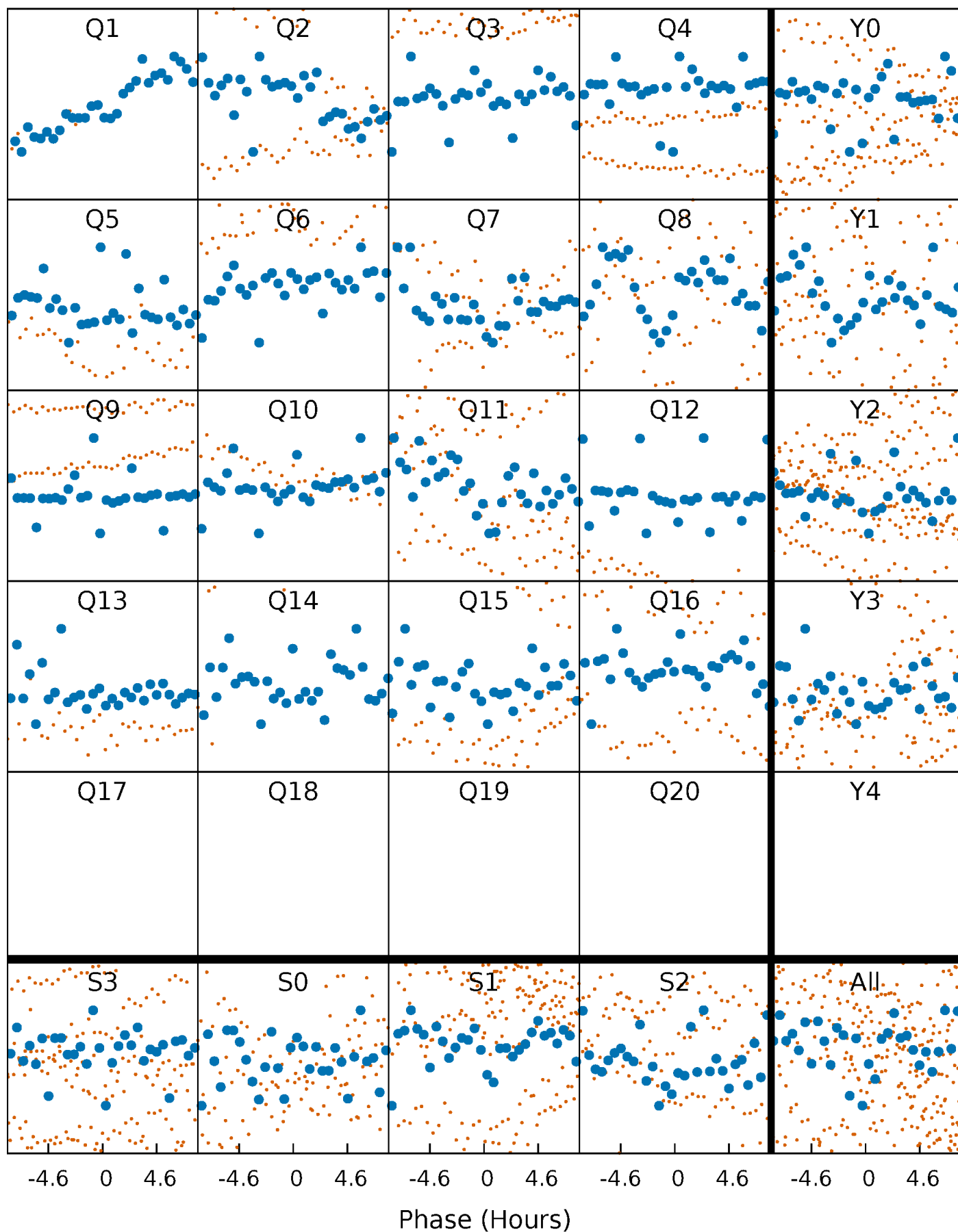


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



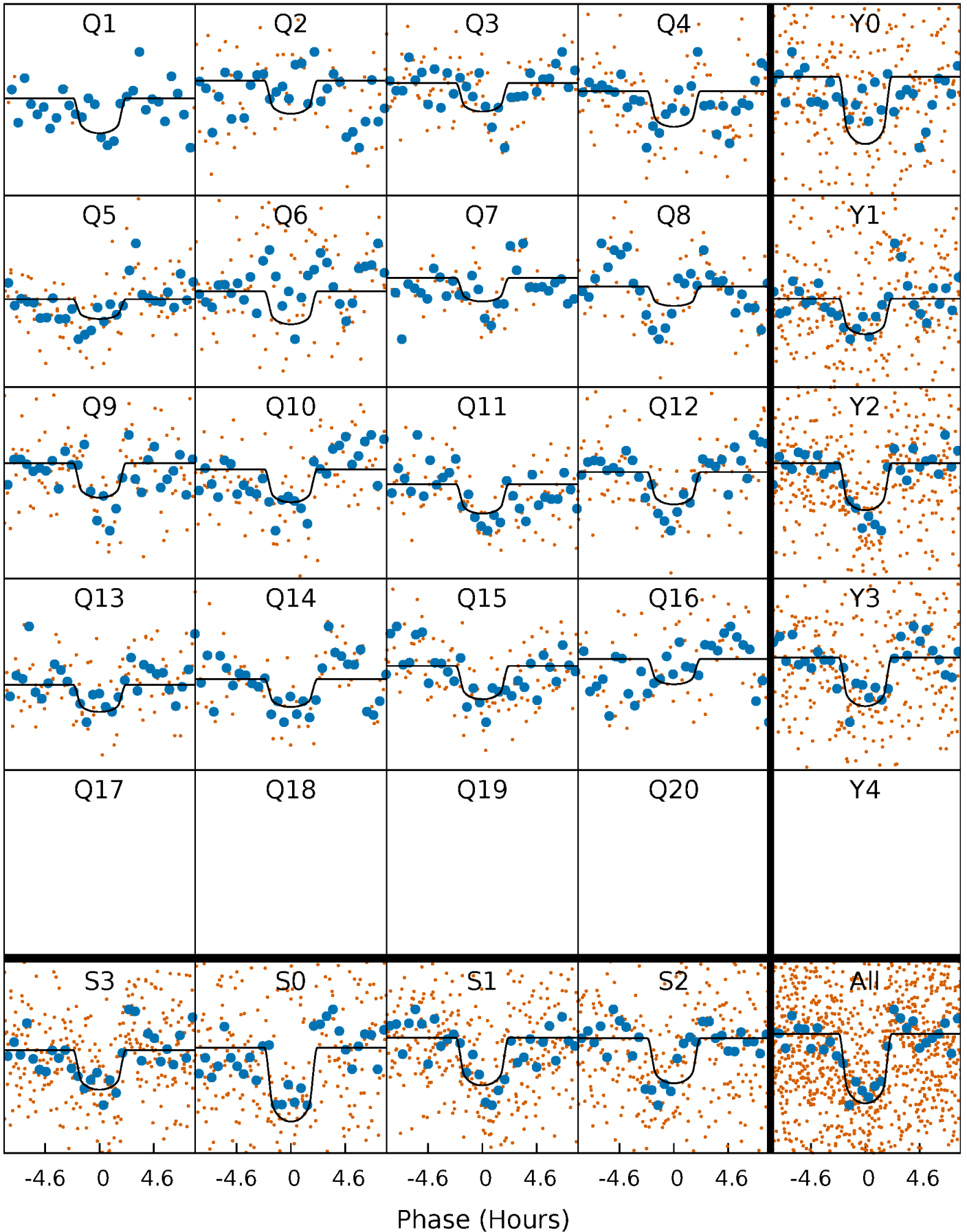
PDC Quarter-Phased Transit Curves

TCE 009334893-02 P= 31.805956 Days $T_0=150.673158$ (BKJD)



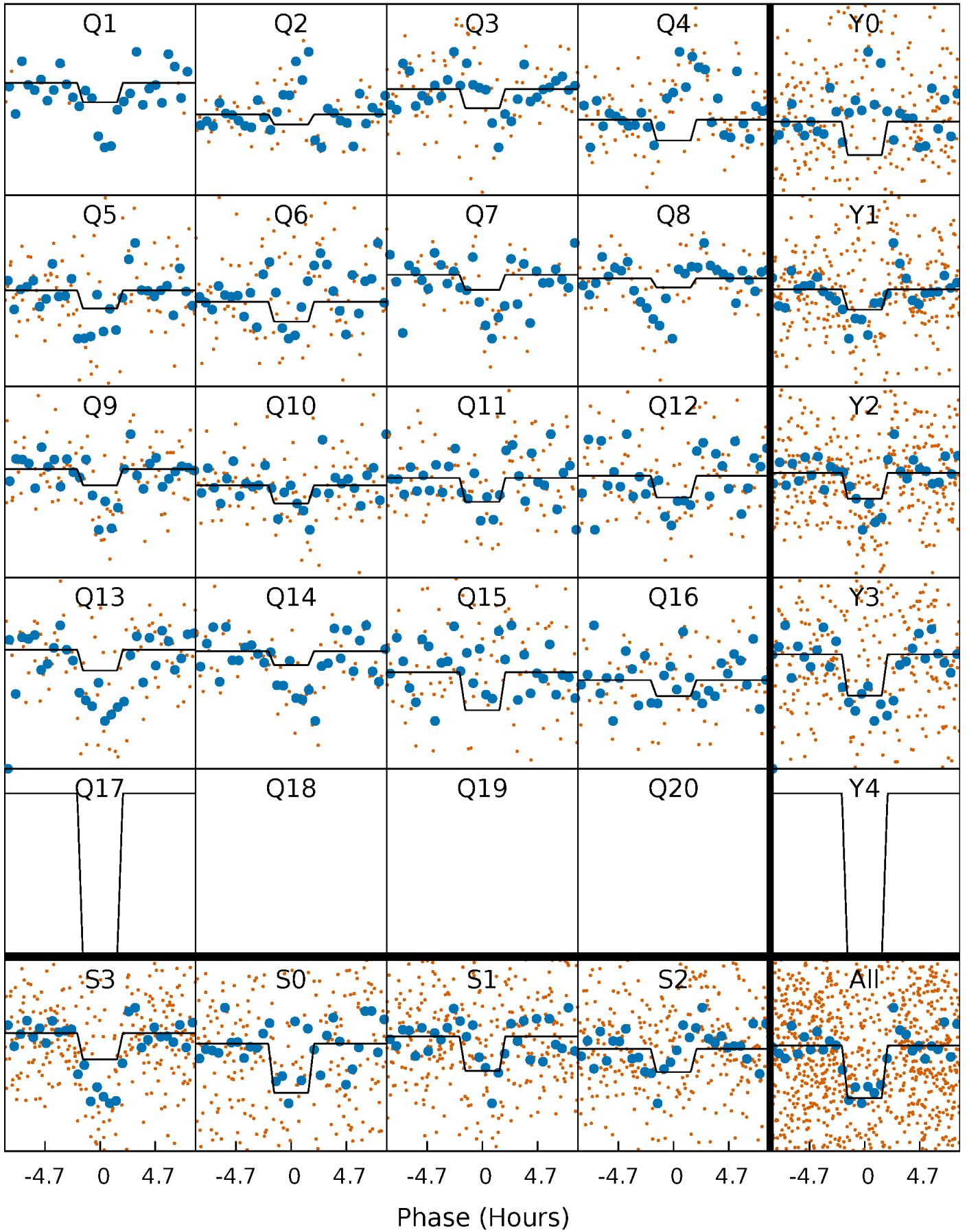
DV Quarter-Phased Transit Curves

TCE 009334893-02 P= 31.805956 Days $T_0=150.673158$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

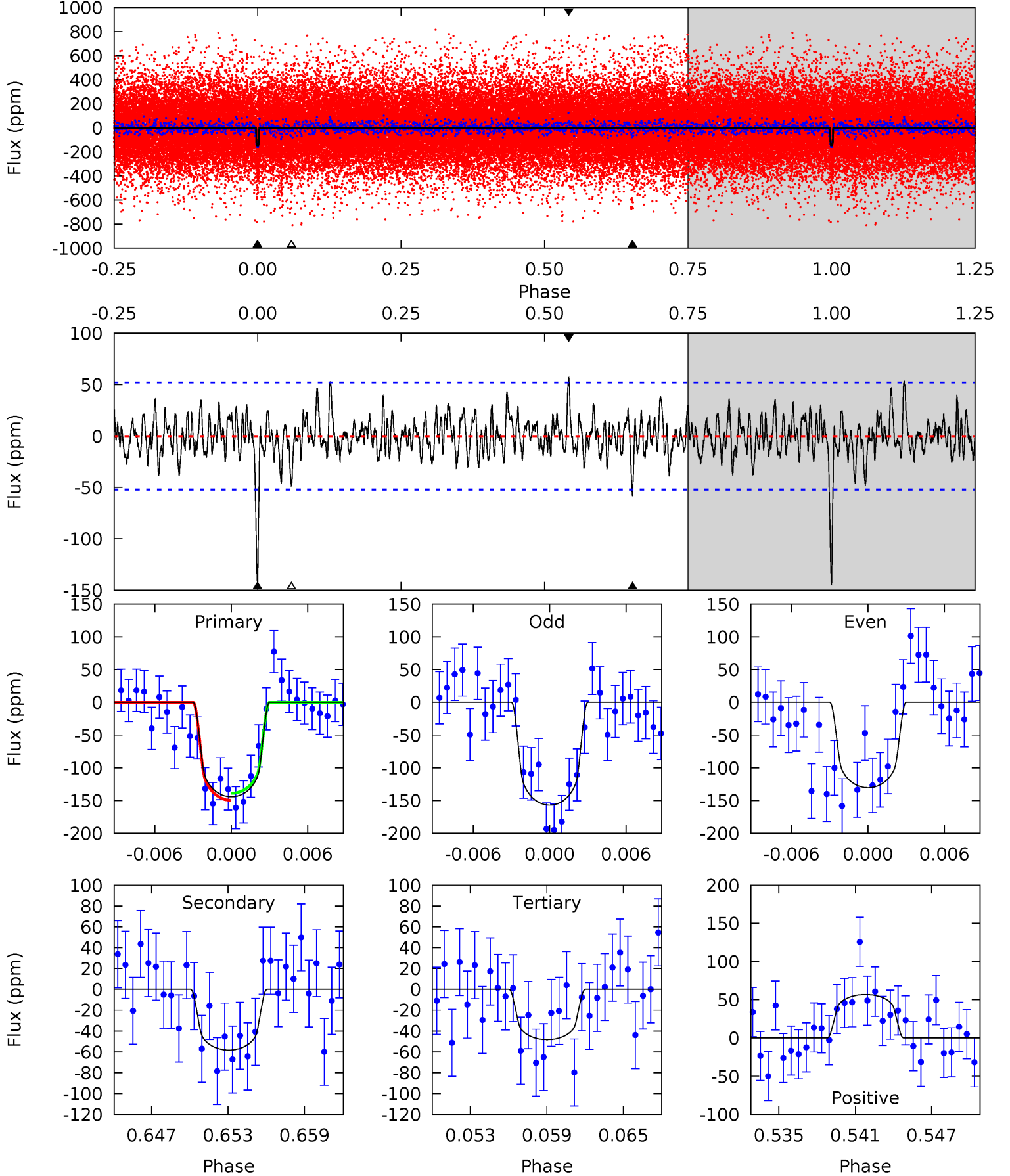
TCE 009334893-02 P= 31.805169 Days $T_0=150.687389$ (BKJD)



DV Model-Shift Uniqueness Test

009334893-02, P = 31.805956 Days, E = 118.867202 Days

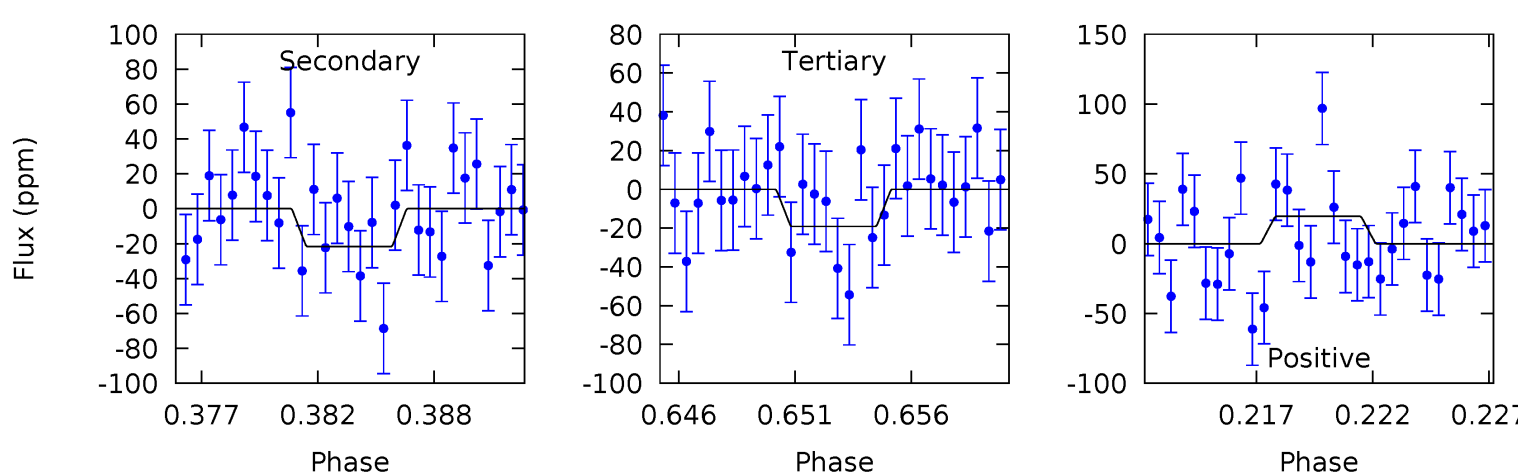
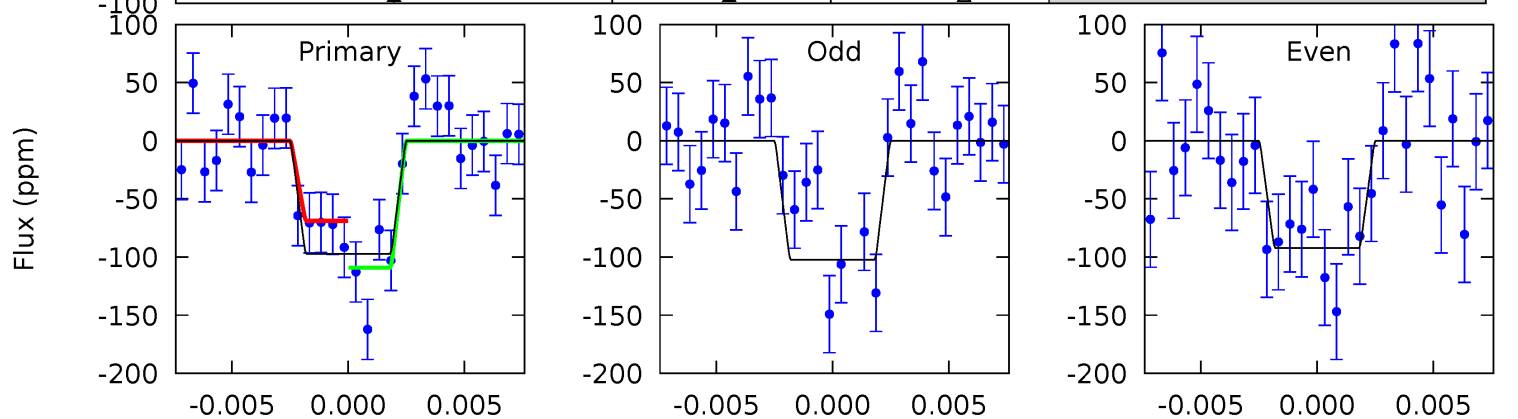
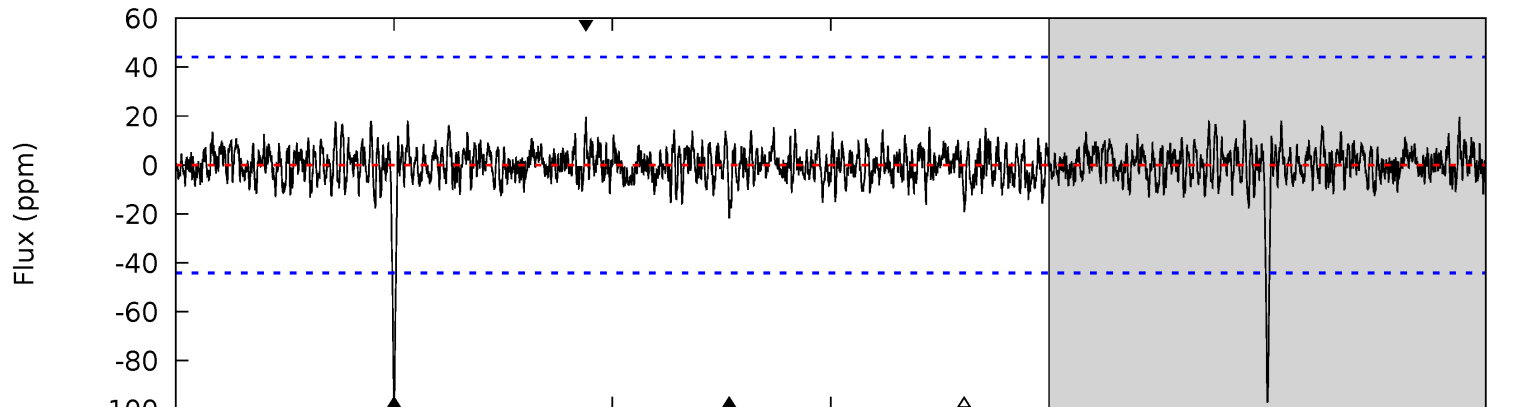
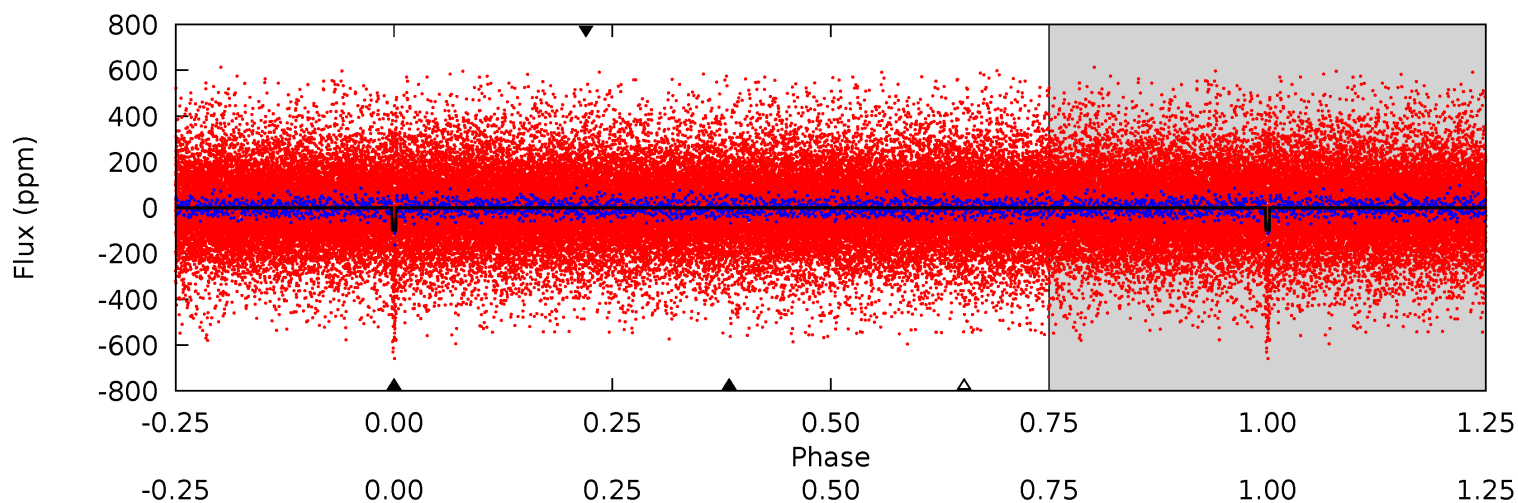
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	5.74	4.76	5.60	5.13	2.75	1.51	9.45	8.61	0.98	0.14	1.32	0.99	0.28	0.53



Alt Model-Shift Uniqueness Test

009334893-02, P = 31.805169 Days, E = 118.882220 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	2.54	2.23	2.28	5.15	2.80	0.66	9.09	9.04	0.30	0.25	0.59	0.85	0.17	0



Stellar Parameters For KIC 009334893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4729^{+143}_{-143}	$4.726^{+0.045}_{-0.024}$	$-1.420^{+0.300}_{-0.300}$	$0.525^{+0.028}_{-0.032}$	$0.534^{+0.036}_{-0.020}$	$5.206^{+0.940}_{-0.545}$
	+3%/-3%	+1%/-1%	+21%/-21%	+5%/-6%	+7%/-4%	+18%/-10%
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 009334893-02 / KOI 2298.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-58 ± 10	$0.80^{+0.33}_{-0.33}$	527^{+17}_{-17}	3780^{+837}_{-424}	1265^{+2458}_{-656}
Alt.	-22 ± 9	$0.56^{+0.31}_{-0.29}$	528^{+17}_{-19}	3625^{+1093}_{-555}	989^{+3341}_{-641}

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

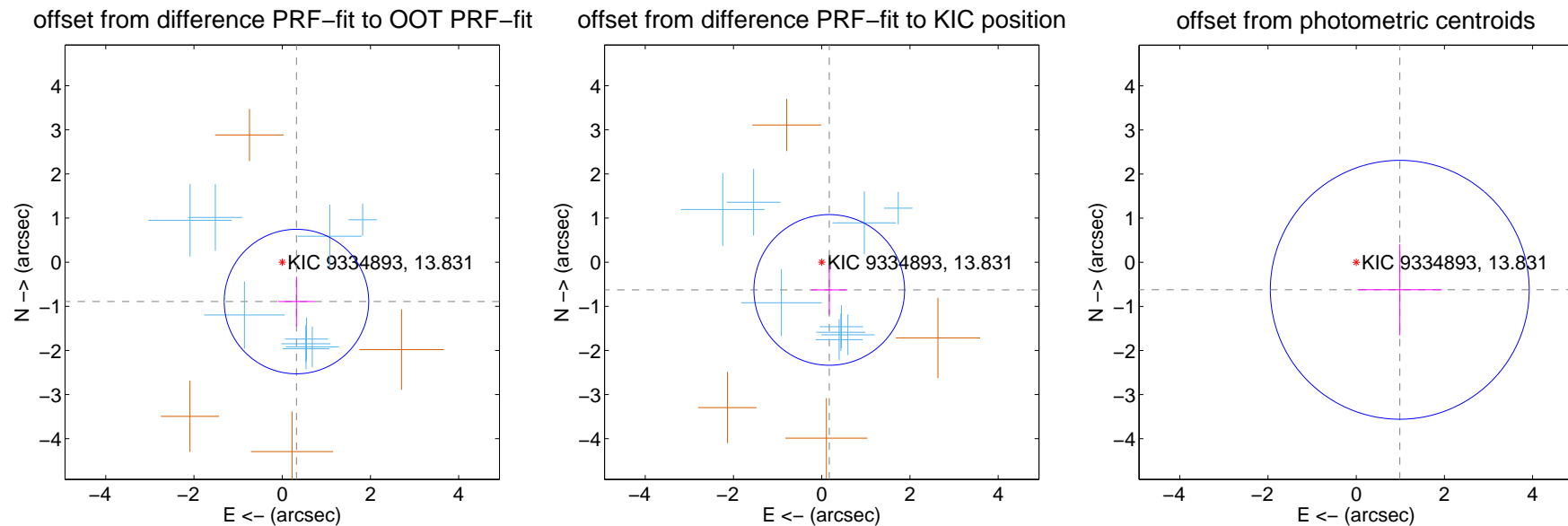
DV Centroid Data

Supplemental centroid analysis for 009334893-02. Kepler magnitude: 13.83. Transit SNR 10.28

There are 9 quarters with good PRF difference image offsets

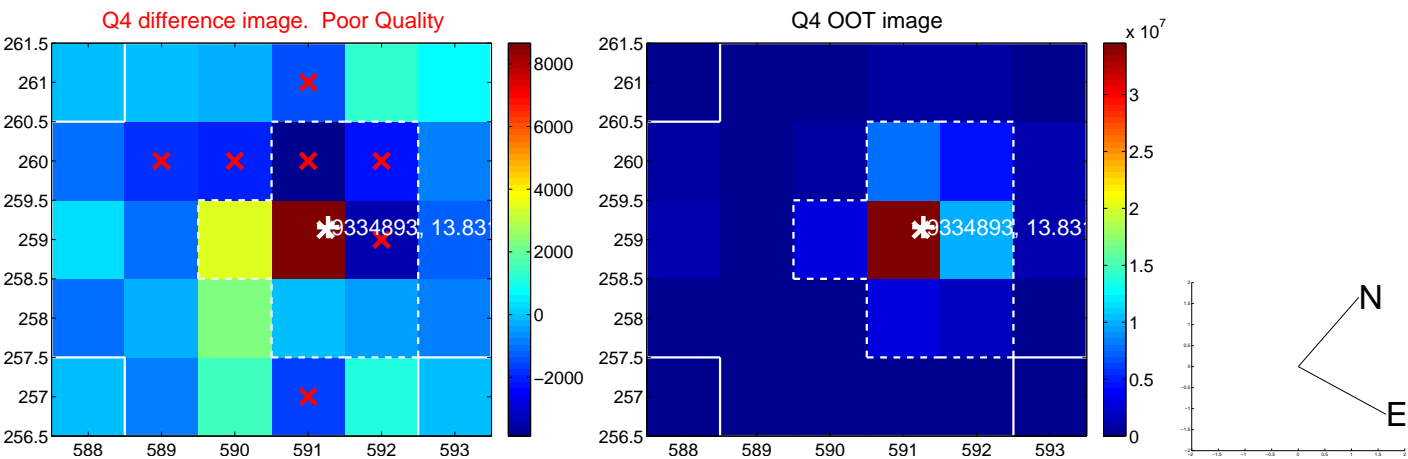
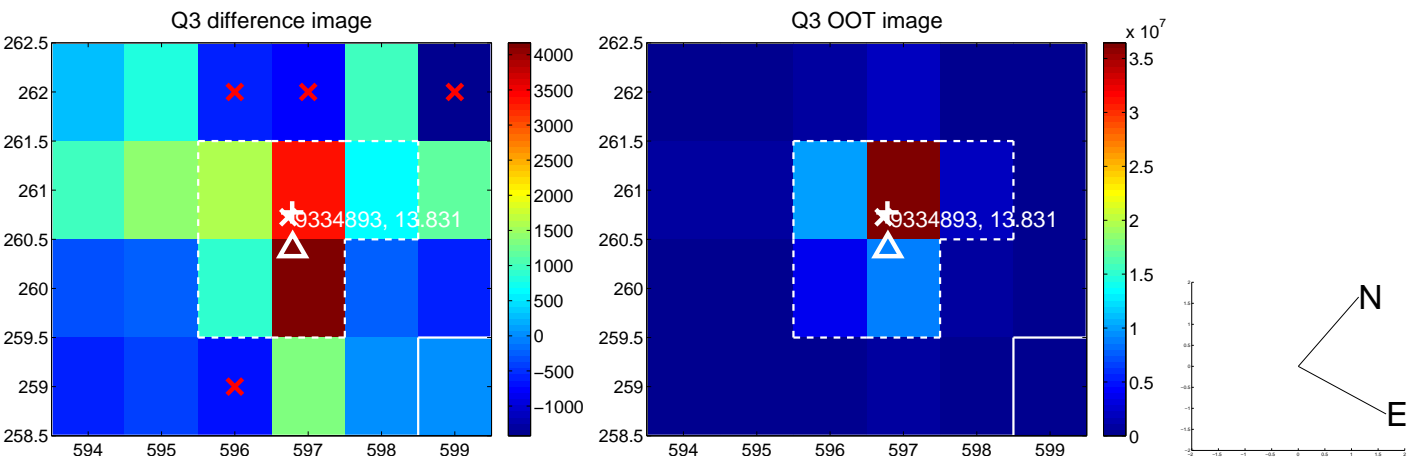
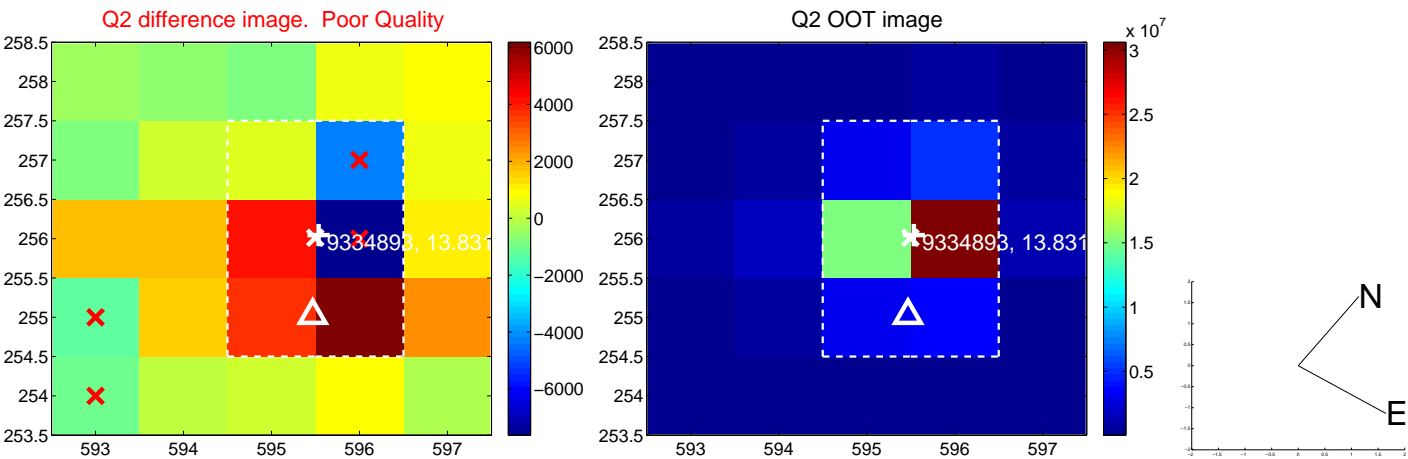
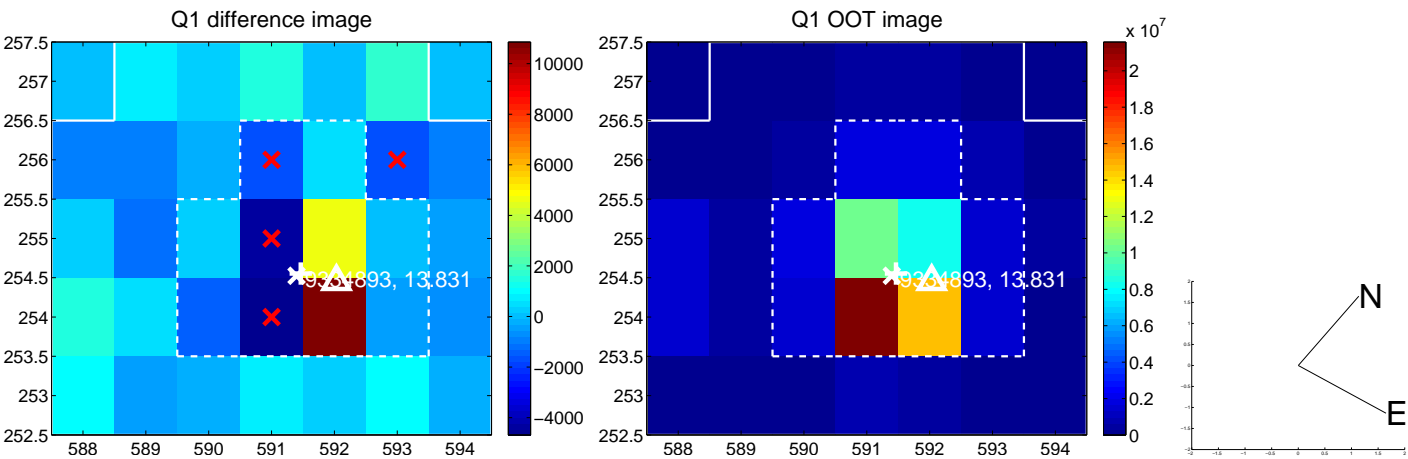
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.949 ± 0.546	1.74	-0.323 ± 0.412	-0.892 ± 0.561
PRF-fit source offset from KIC position	0.651 ± 0.569	1.14	-0.171 ± 0.407	-0.629 ± 0.562
photometric centroid source offset	1.17 ± 0.98	1.19	-0.99 ± 0.96	-0.62 ± 1.03

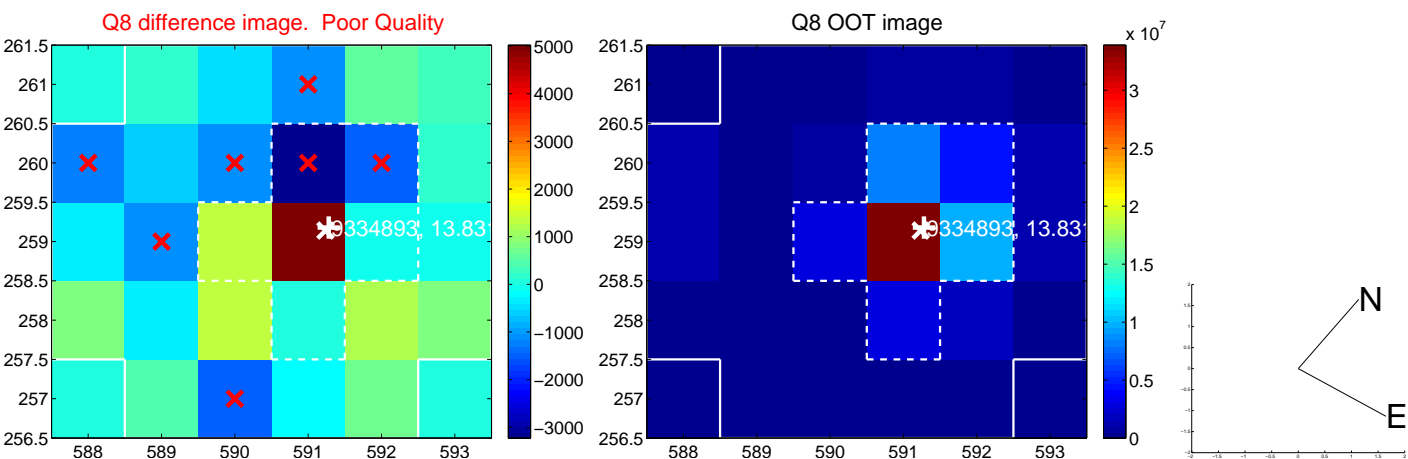
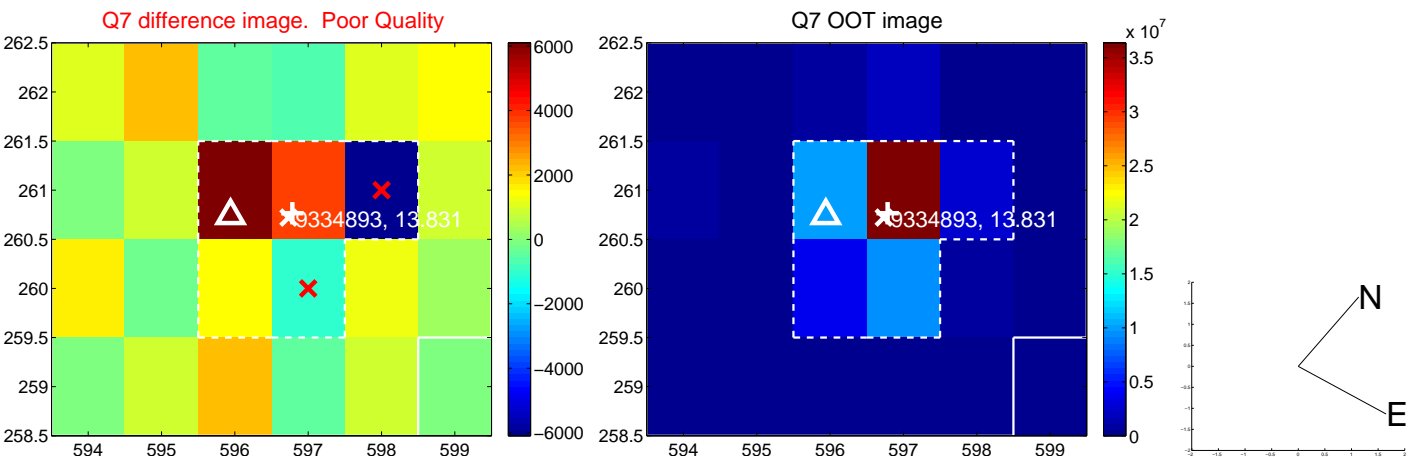
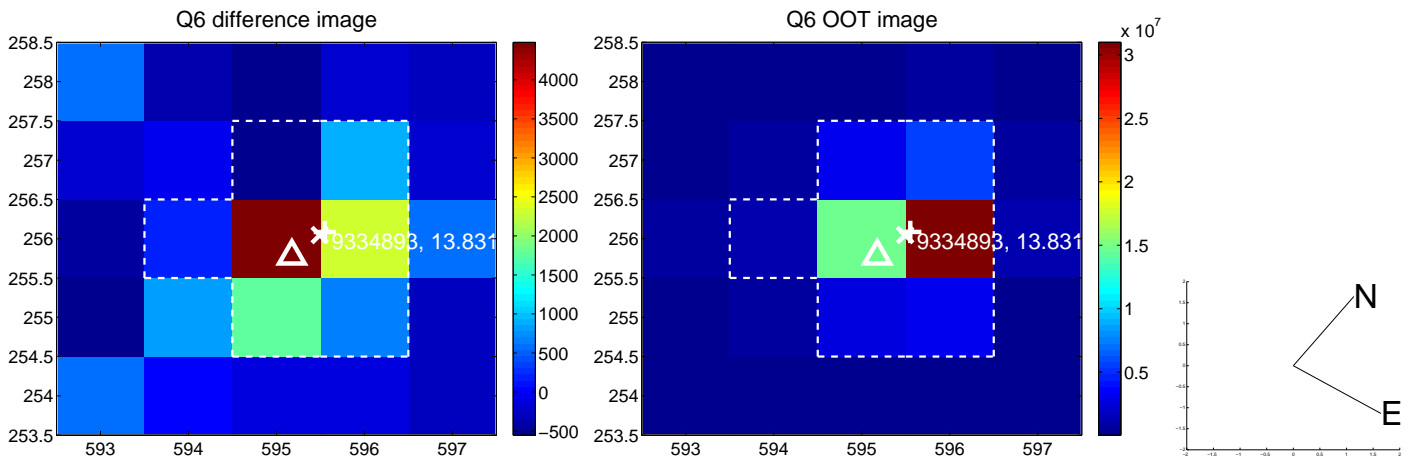
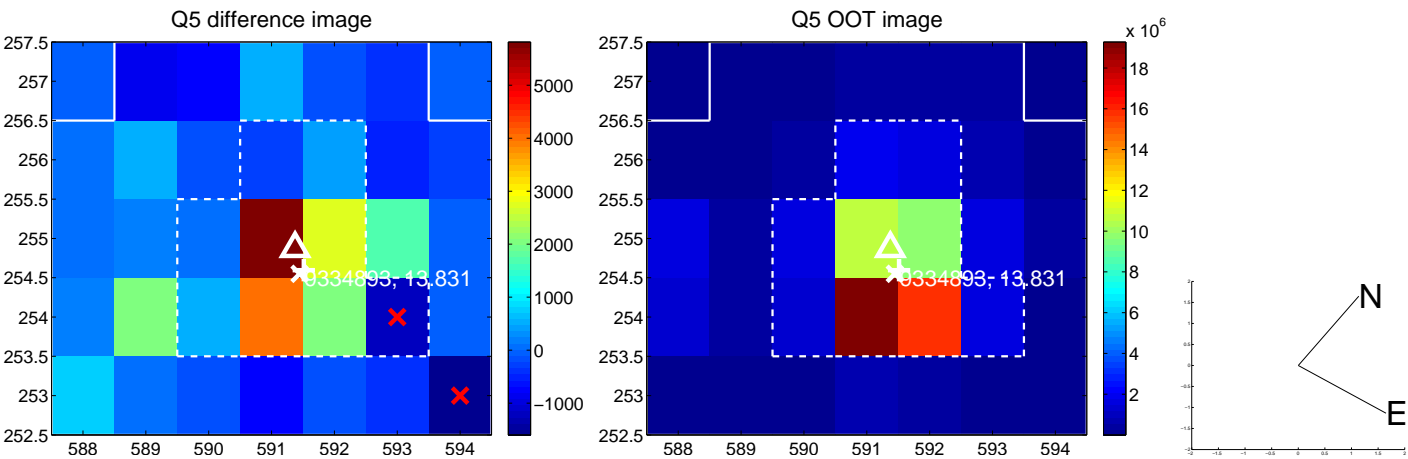


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

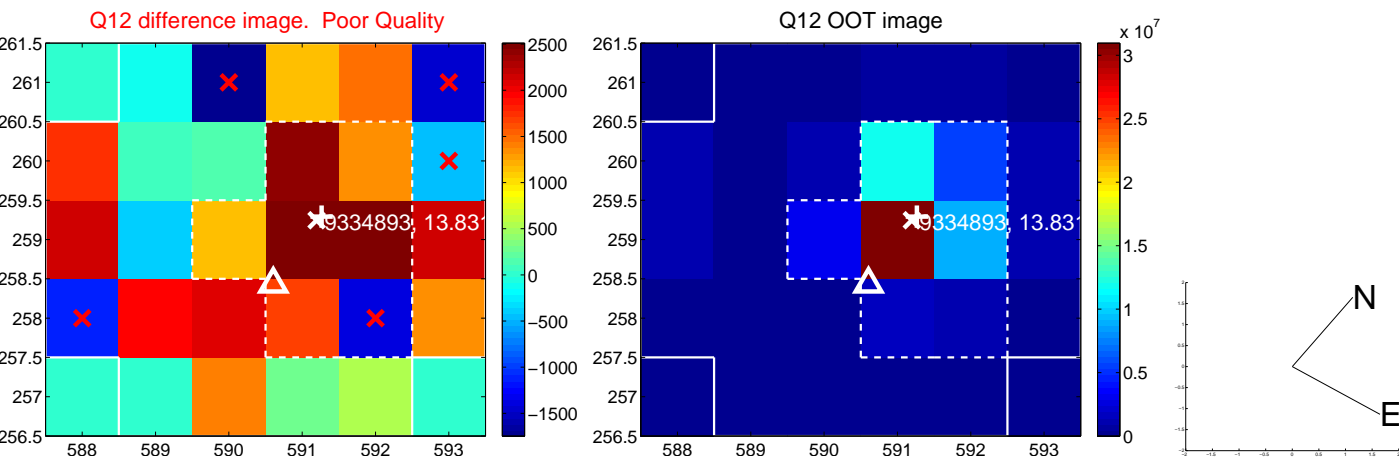
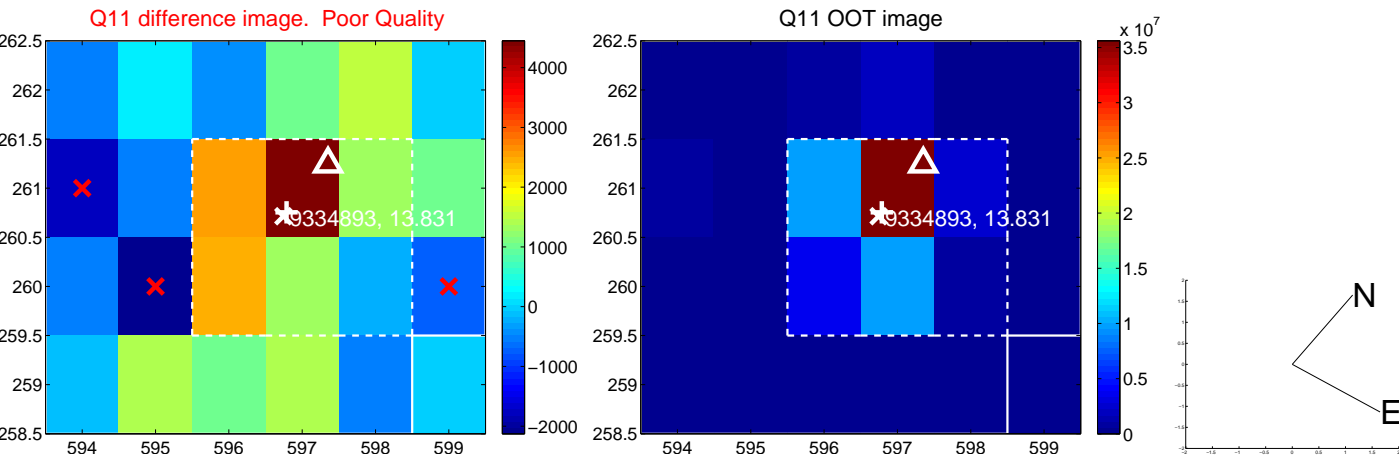
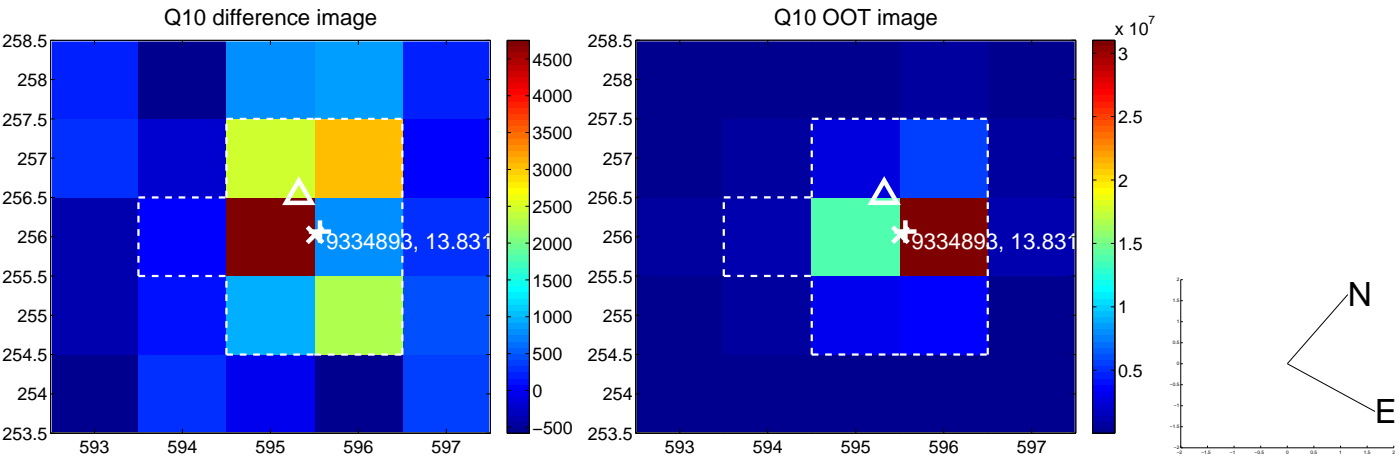
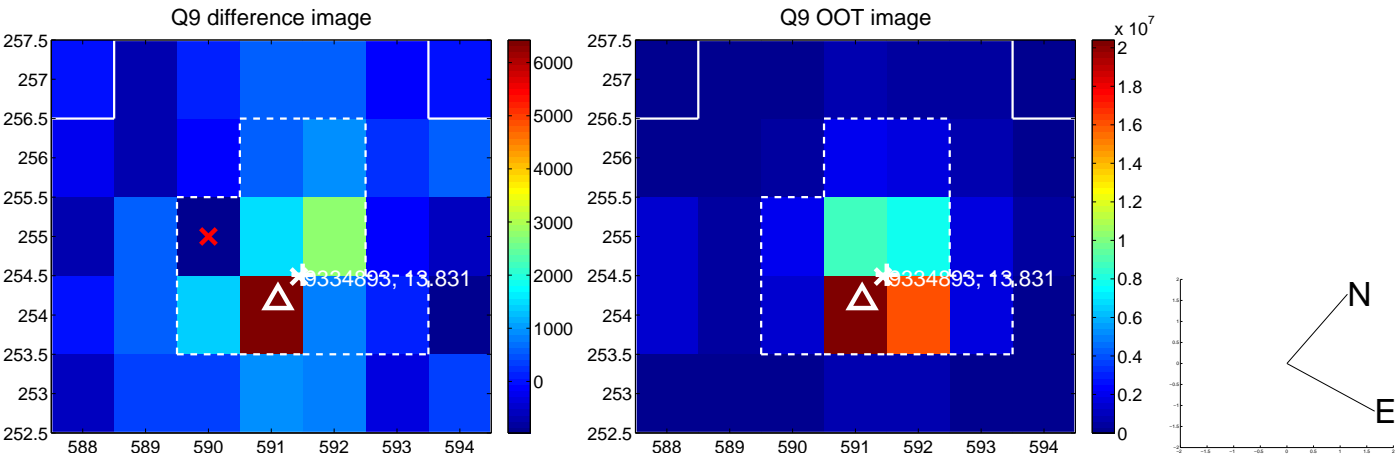
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



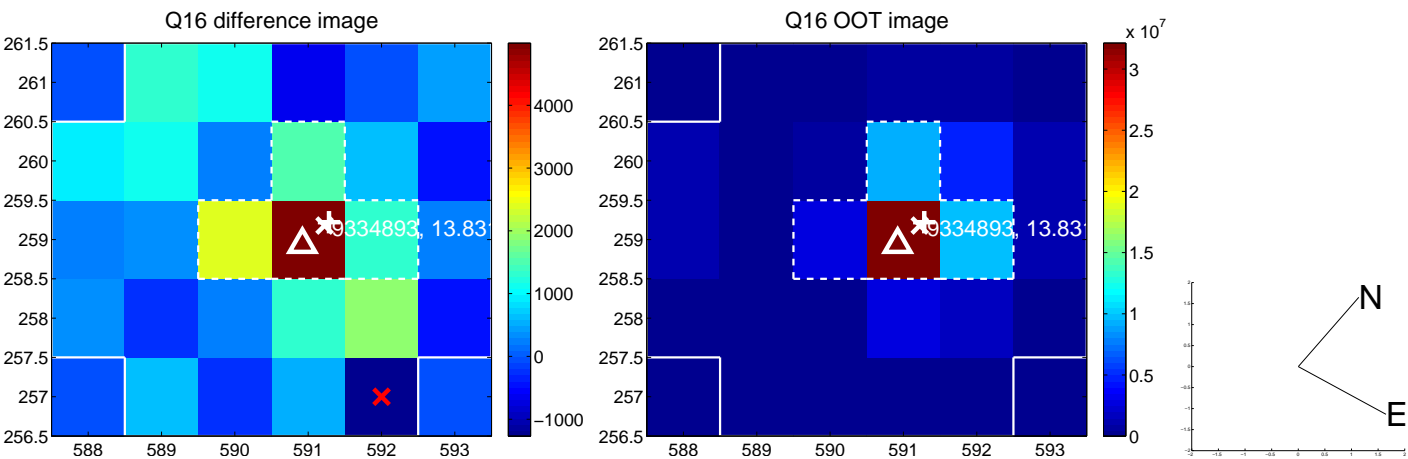
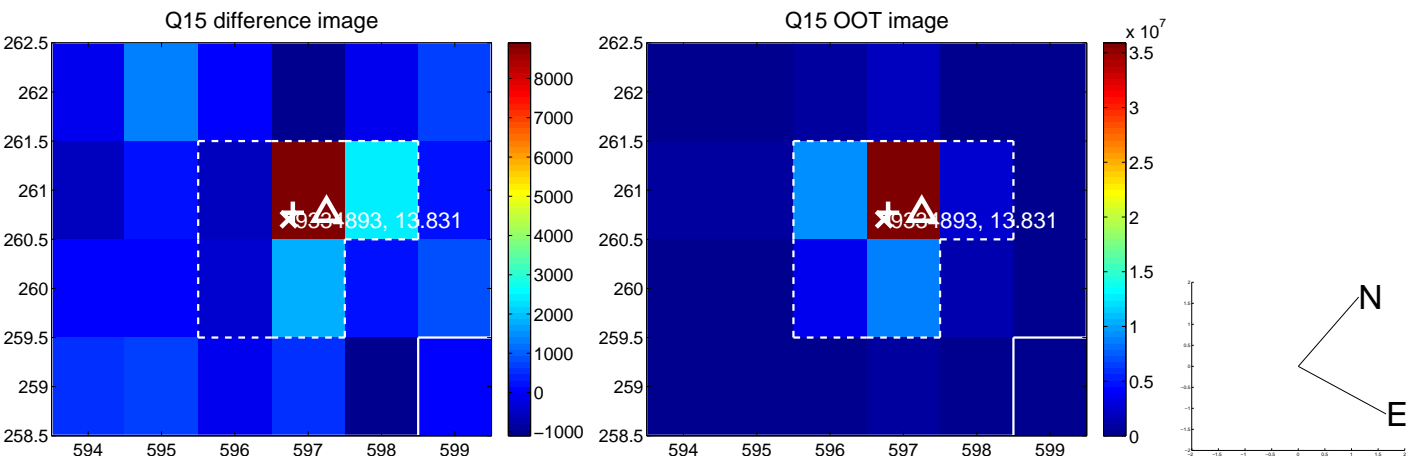
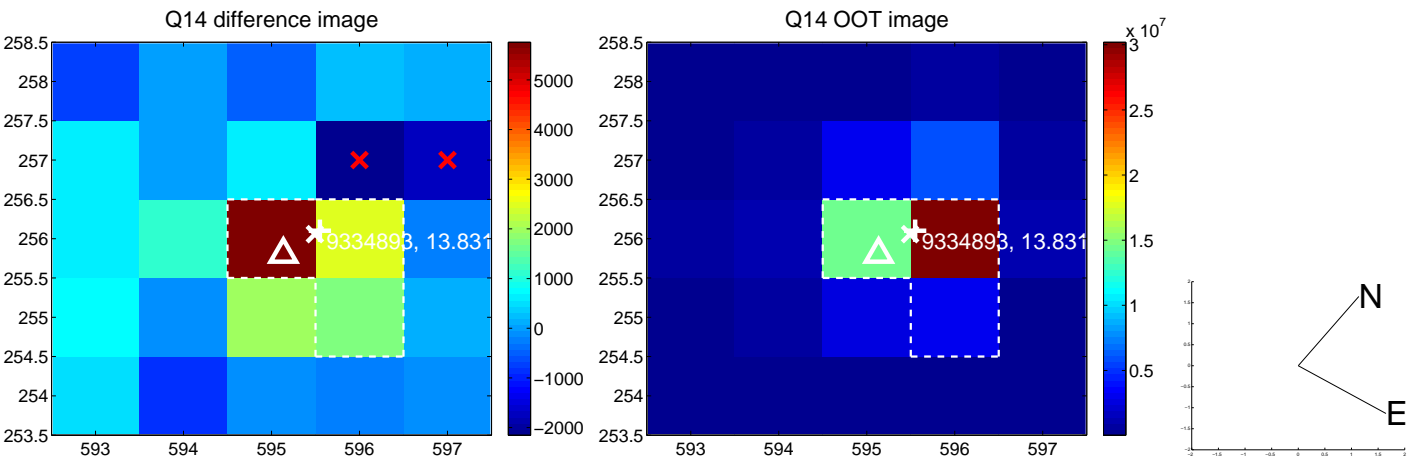
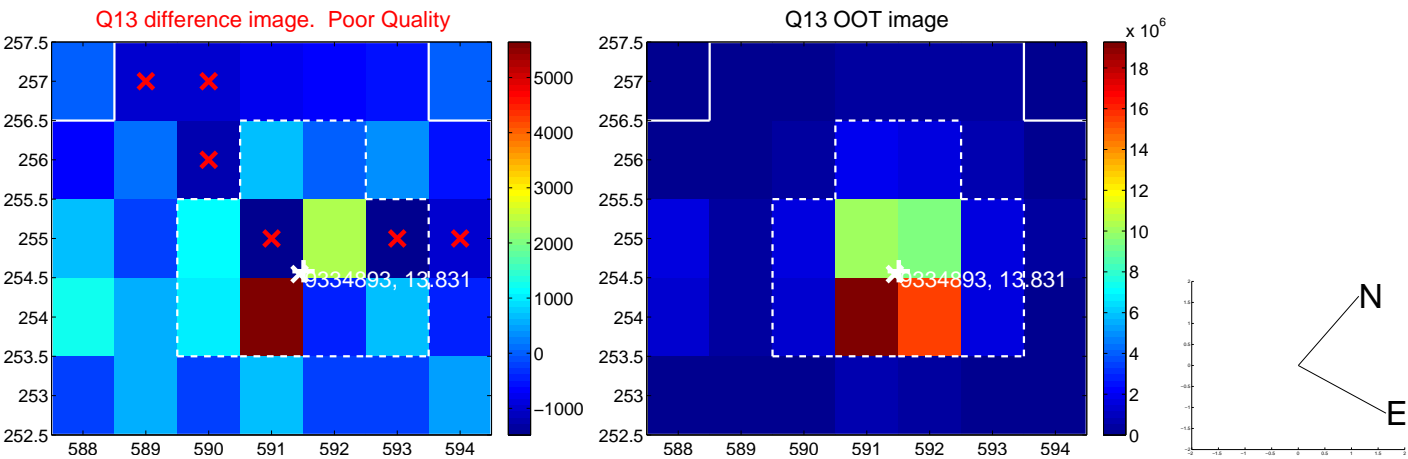
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



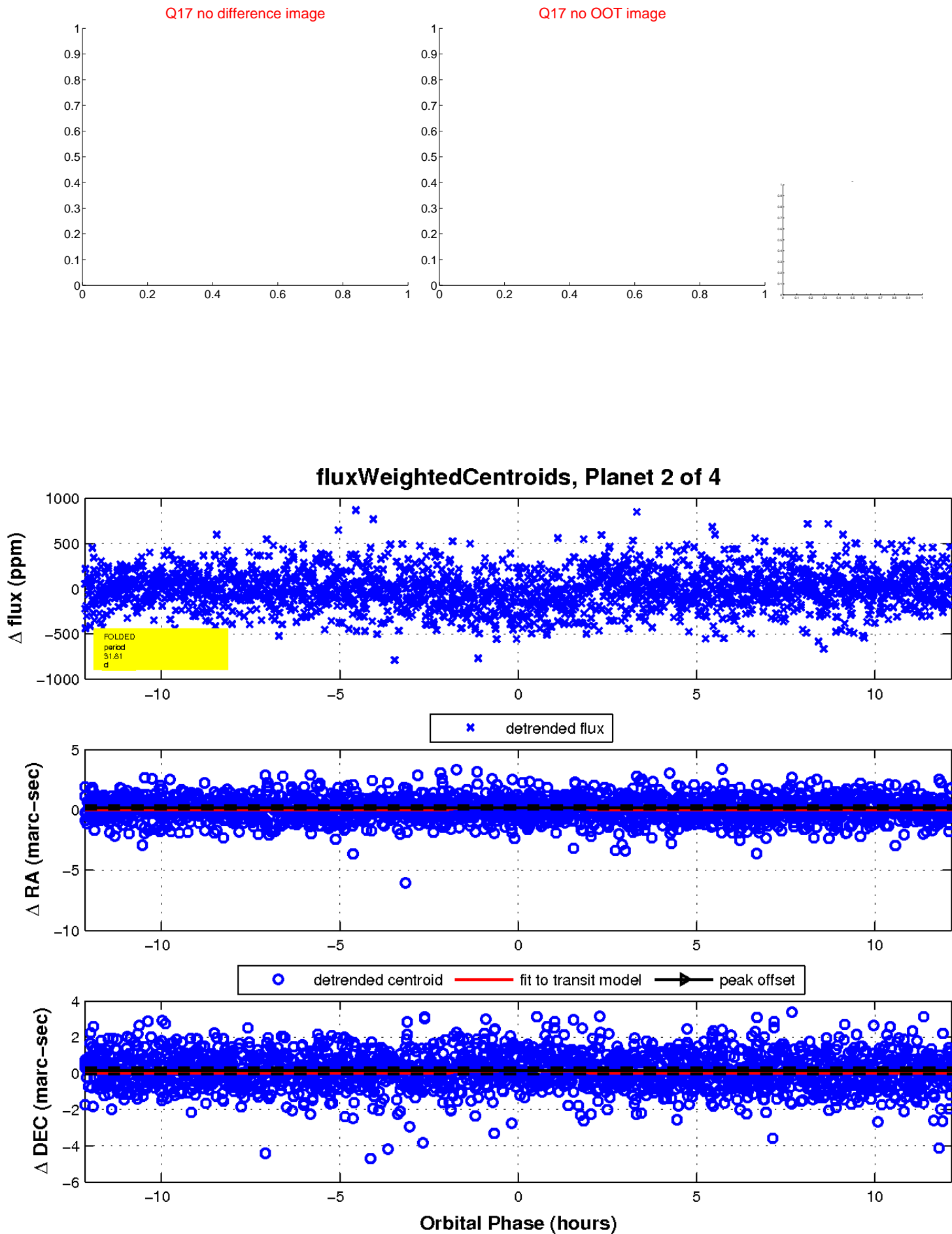
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



This astronomical image shows a field of stars against a dark, noisy background. A blue grid is overlaid on the image, with green numerical labels indicating coordinates. The labels are arranged in two rows: the top row shows values 52.0, 51.0, 19:13:50.0, 49.0, 48.0, and 47.0; the bottom row shows values 7.40.0, 50.0, 45.48:00.0, 10.0, 20.0, and 40.0. The stars are concentrated in the central region of the image, with a prominent bright star near the center.

Declination

KIC 009334893

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})
009334893-01	OBS	2298.01	16.667250	141.760210	163.0	3.387	12.8	13.7	0.53	4729	0.79	11.49
009334893-02	OBS	2298.02	31.805956	150.673158	166.0	4.049	9.2	10.3	0.53	4729	0.80	4.85
009334893-03	OBS	No	314.422206	150.525802	412.9	3.652	8.6	7.1	0.53	4729	1.19	0.23
009334893-04	OBS	2298.03	2.472448	132.424436	42.0	2.190	7.7	8.0	0.53	4729	0.40	146.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009334893-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009334893-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009334893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009334893-04	OBS	PC	0.42	0	0	0	0	CENT_UNCERTAIN

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.

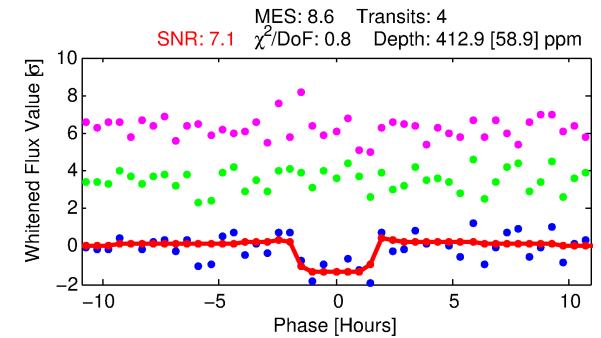
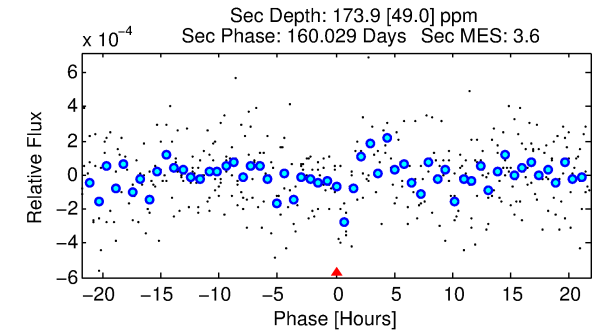
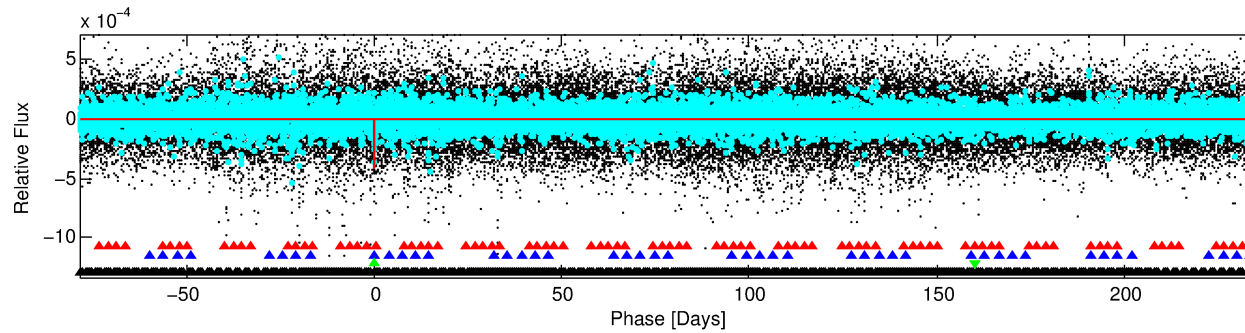
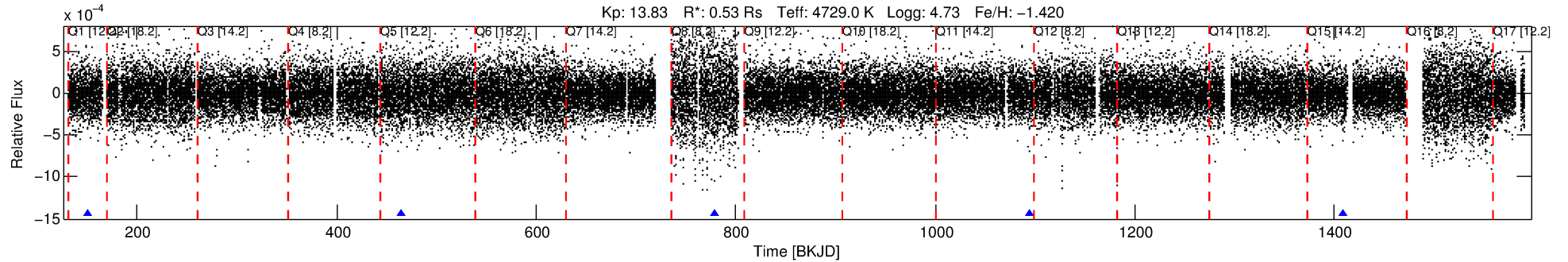
Ephemeris Match Information For 009334893-03

No Significant Match Found

DV One-Page Summary

KIC: 9334893 Candidate: 3 of 4 Period: 314.422 d

KOI: K02298 Corr: No Ephemeris Match

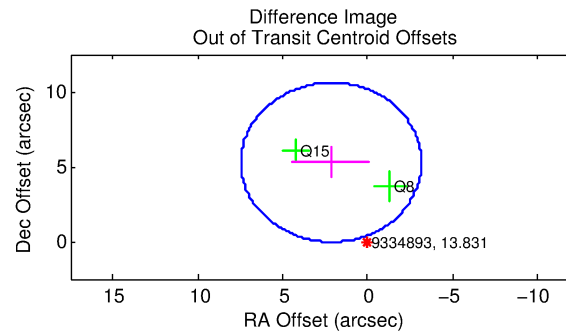
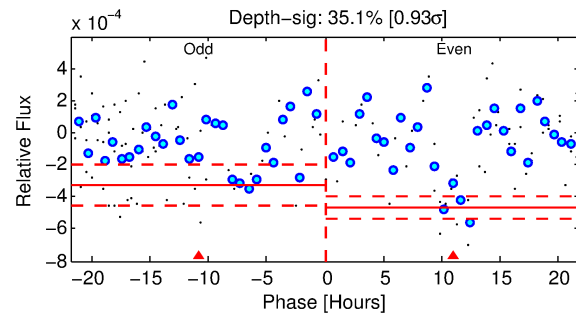
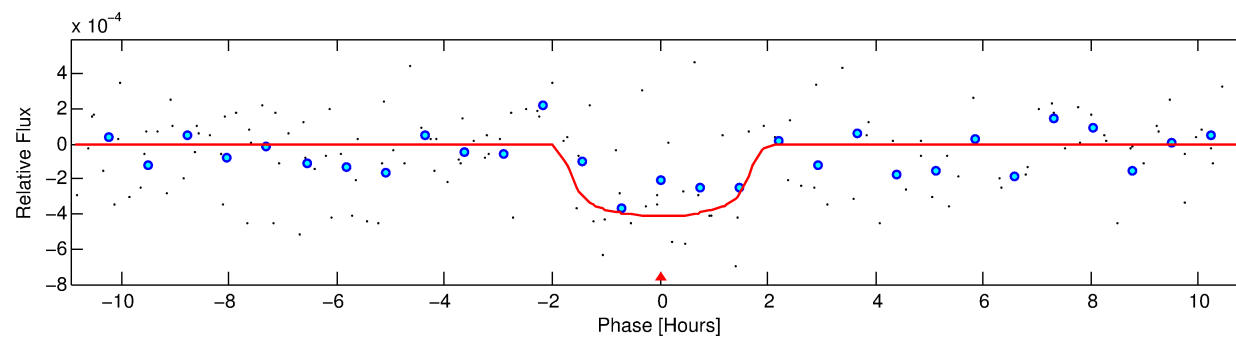


DV Fit Results:

Period = 314.42221 [0.00571] d
Epoch = 150.5258 [0.0153] BKJD
Rp/R* = 0.0208 [0.0254]
a/R* = 407.17 [2088.02]
b = 0.81 [2.17]
Seff = 0.23 [0.03]
Teq = 176 [6] K
Rp = 1.19 [1.46] Re
a = 0.7348 [0.0392] AU
Ag = 36277.55 [89091.54] [0.41σ]
Teffp = 3763 [2312] K [1.55σ]

DV Diagnostic Results:

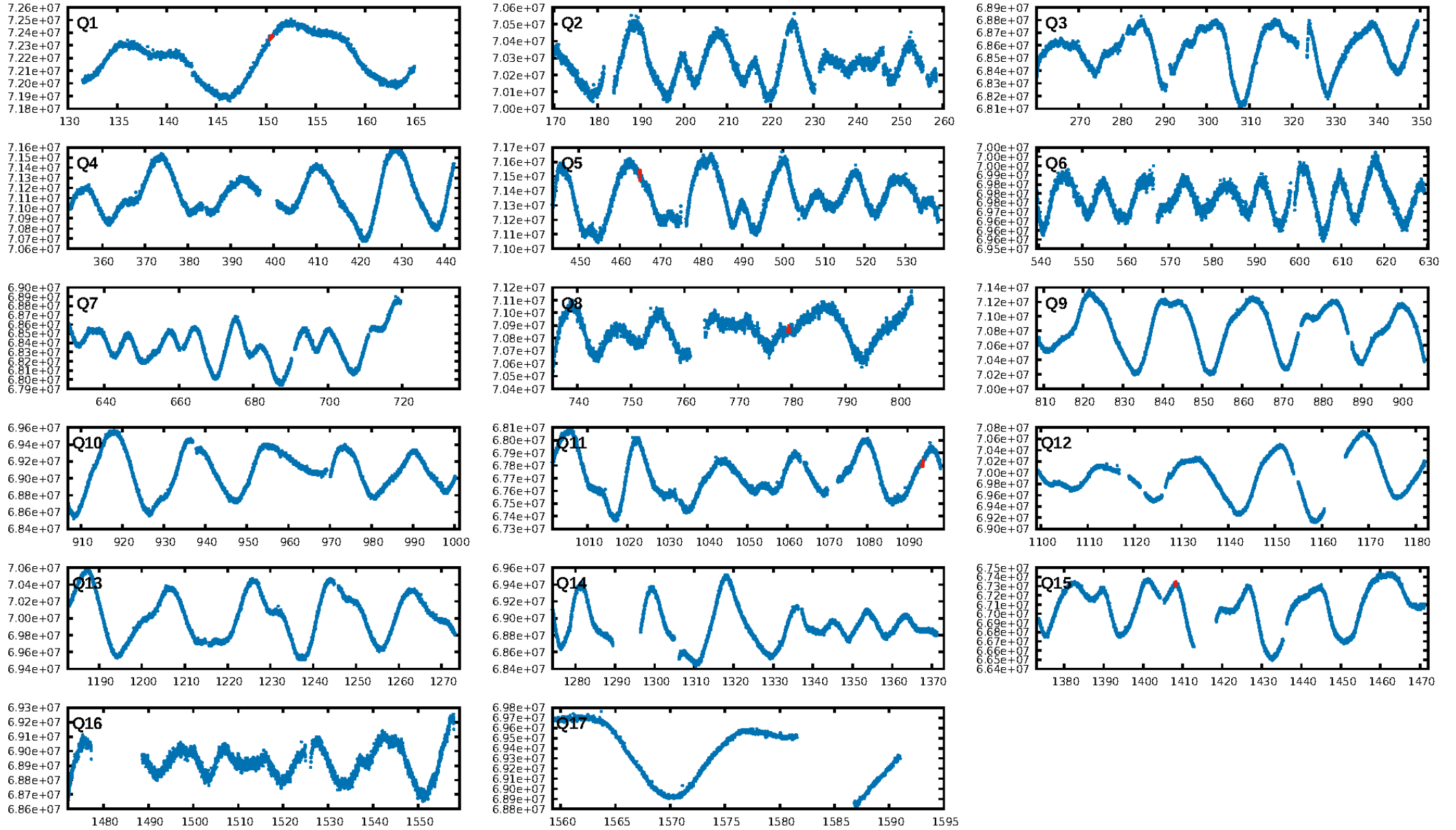
ShortPeriod-sig: 100.0% [1243.97σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 20.3%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 1.45e-13
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -13.62
Centroid-sig: 9.1%
Centroid-so: 1.847 arcsec [1.63σ]
OotOffset-rm: 5.696 arcsec [3.21σ]
KicOffset-rm: 5.943 arcsec [3.47σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.50 [2/4]



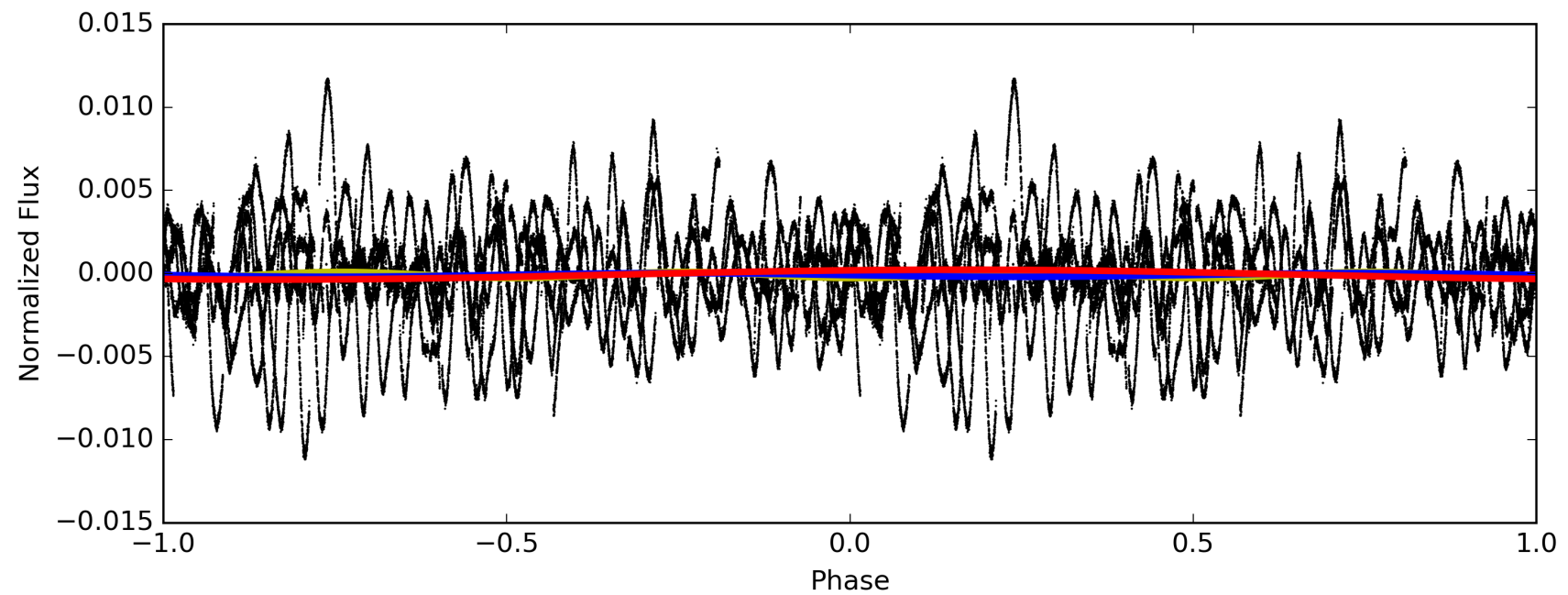
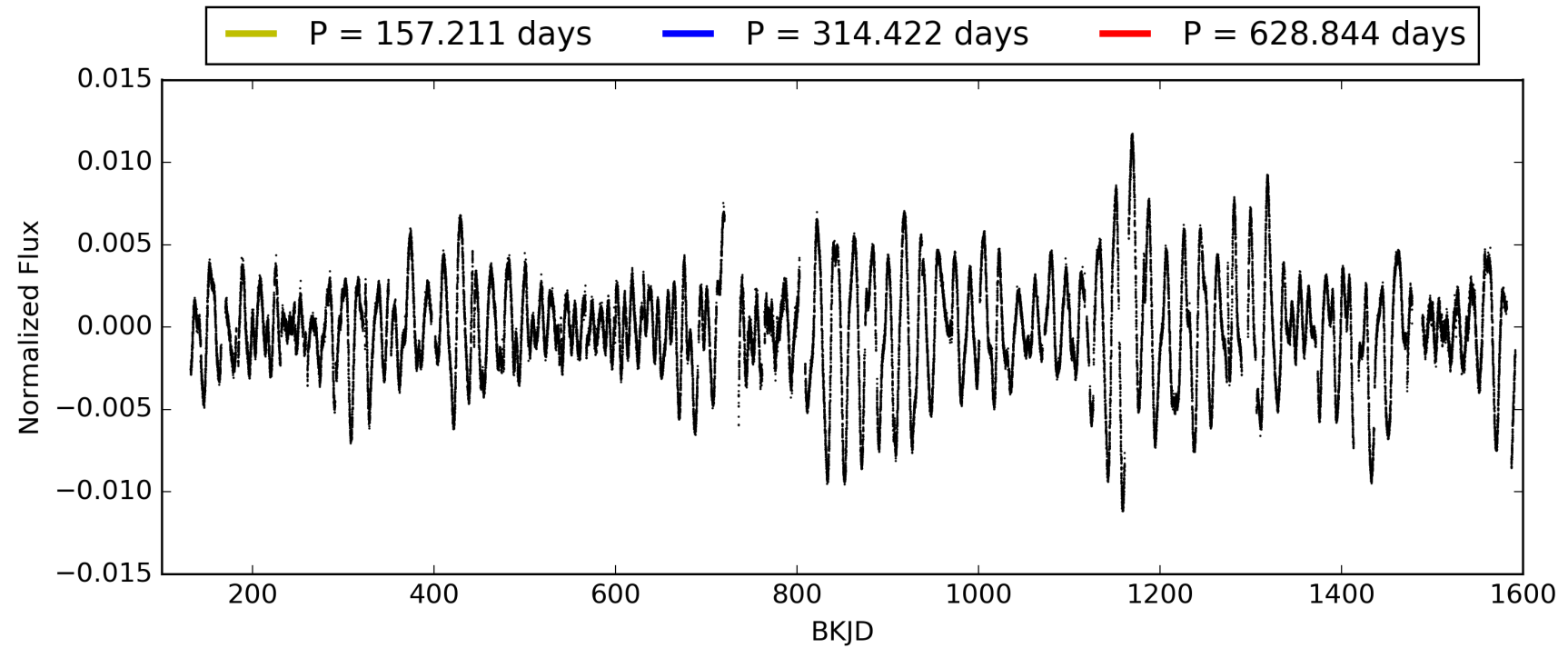
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:26:03 Z

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

TCE 009334893-03, PDC Light Curves

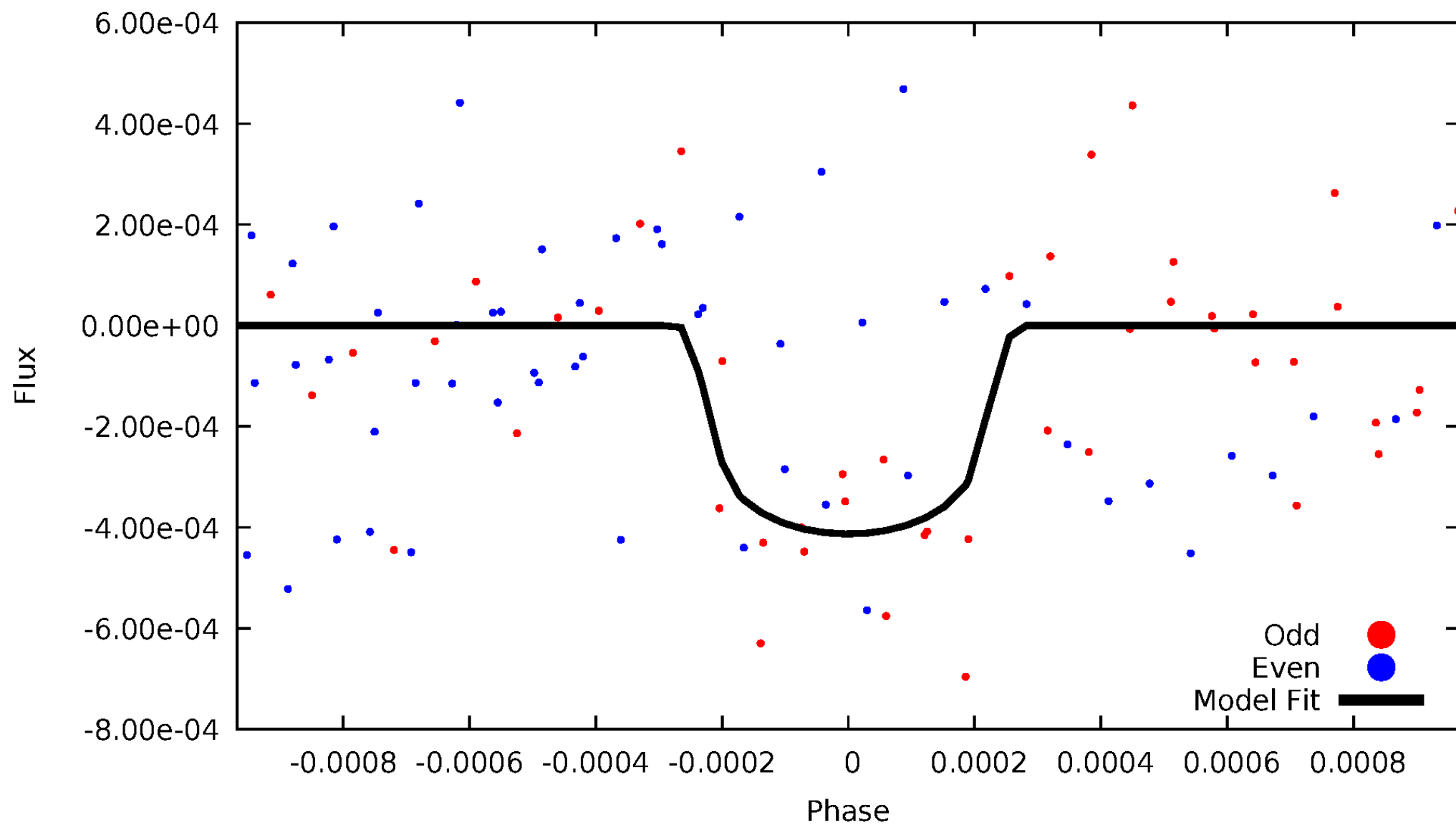


TCE 009334893-03



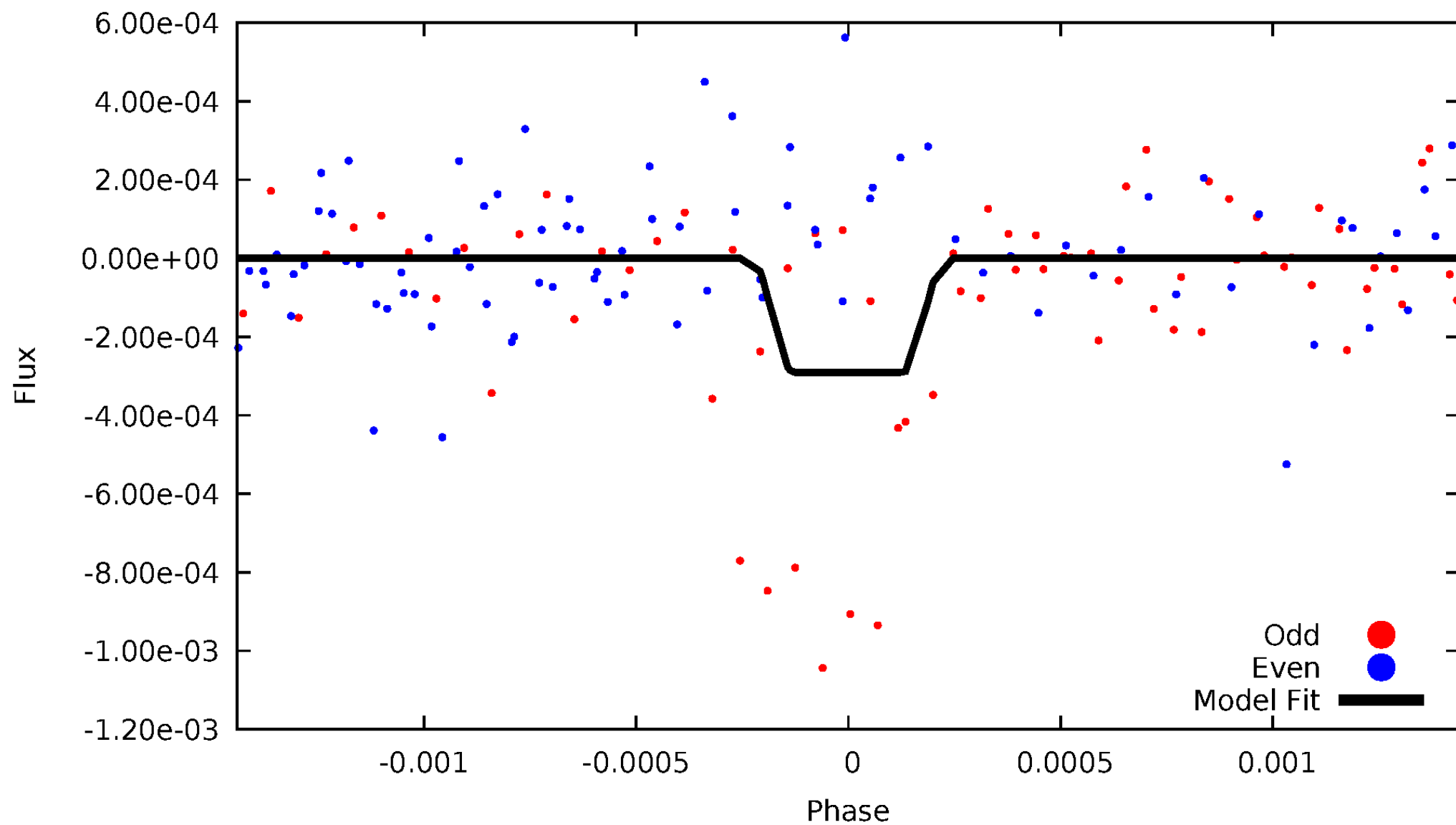
DV Odd/Even

TCE 009334893-03

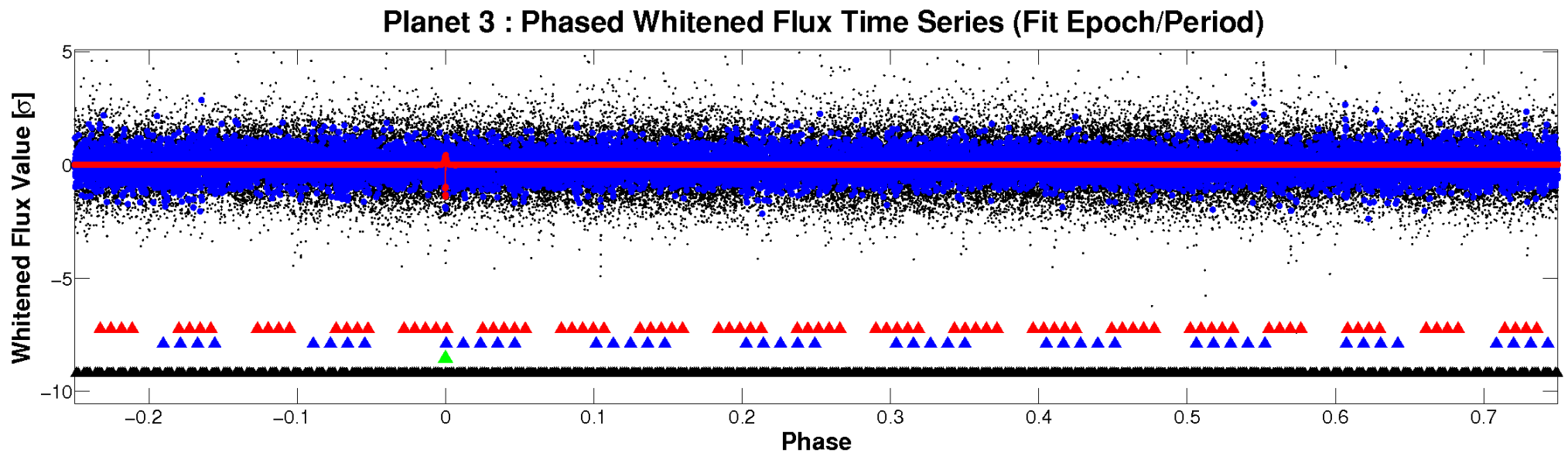
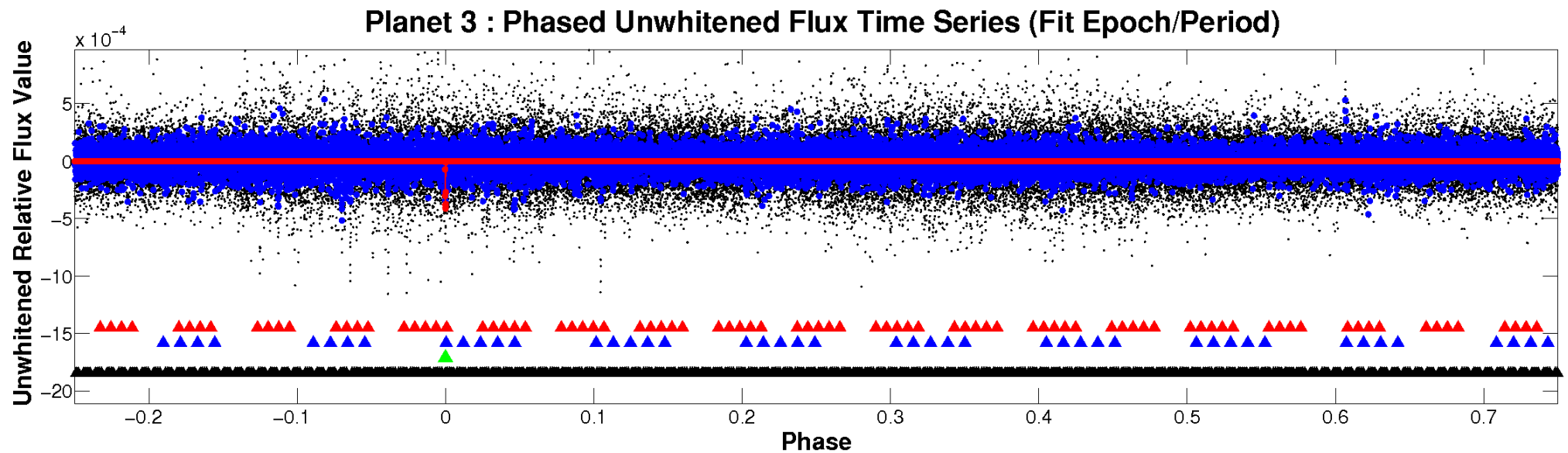


ALT Odd/Even

TCE 009334893-03

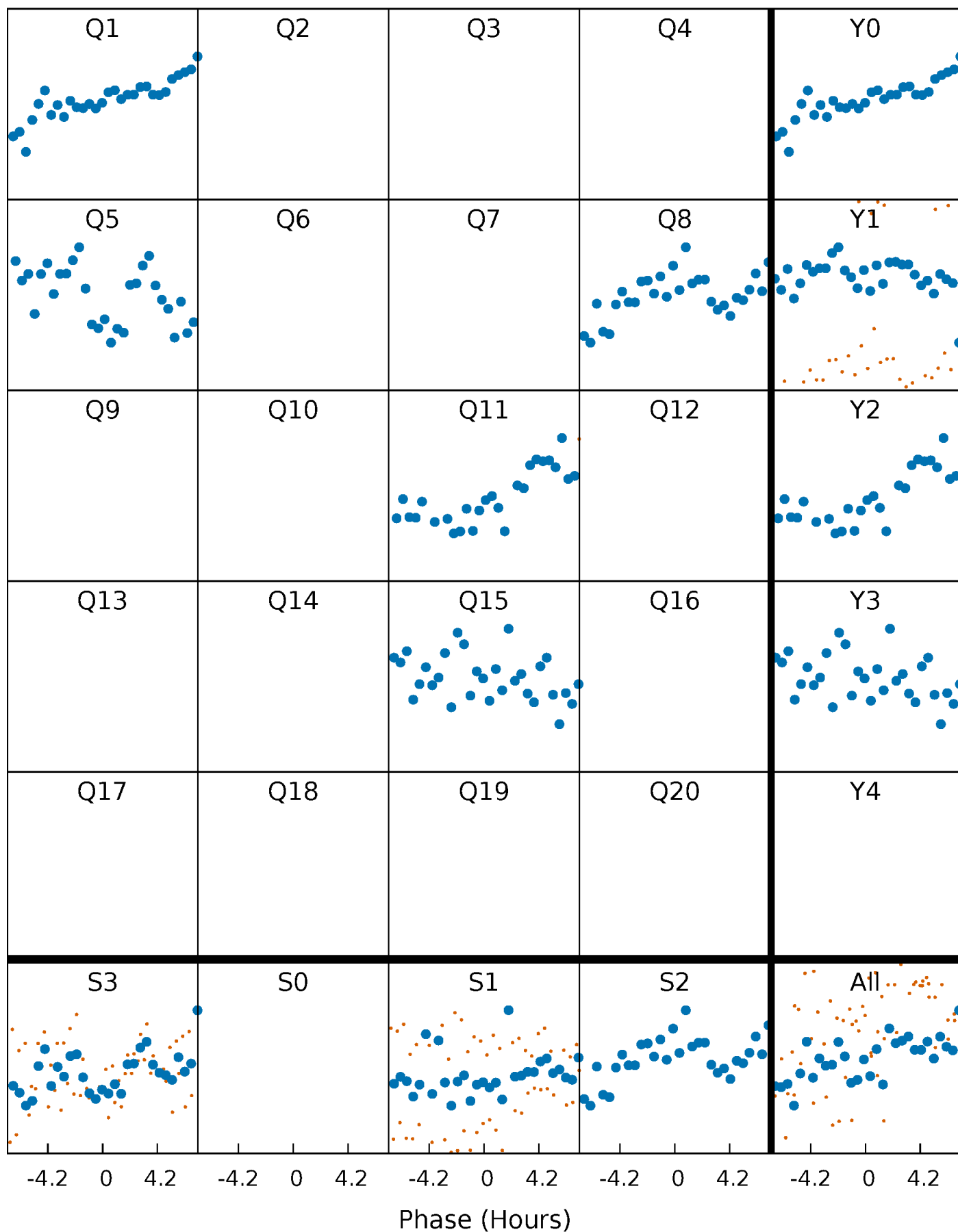


Non-Whitened Vs. Whitened Light Curve



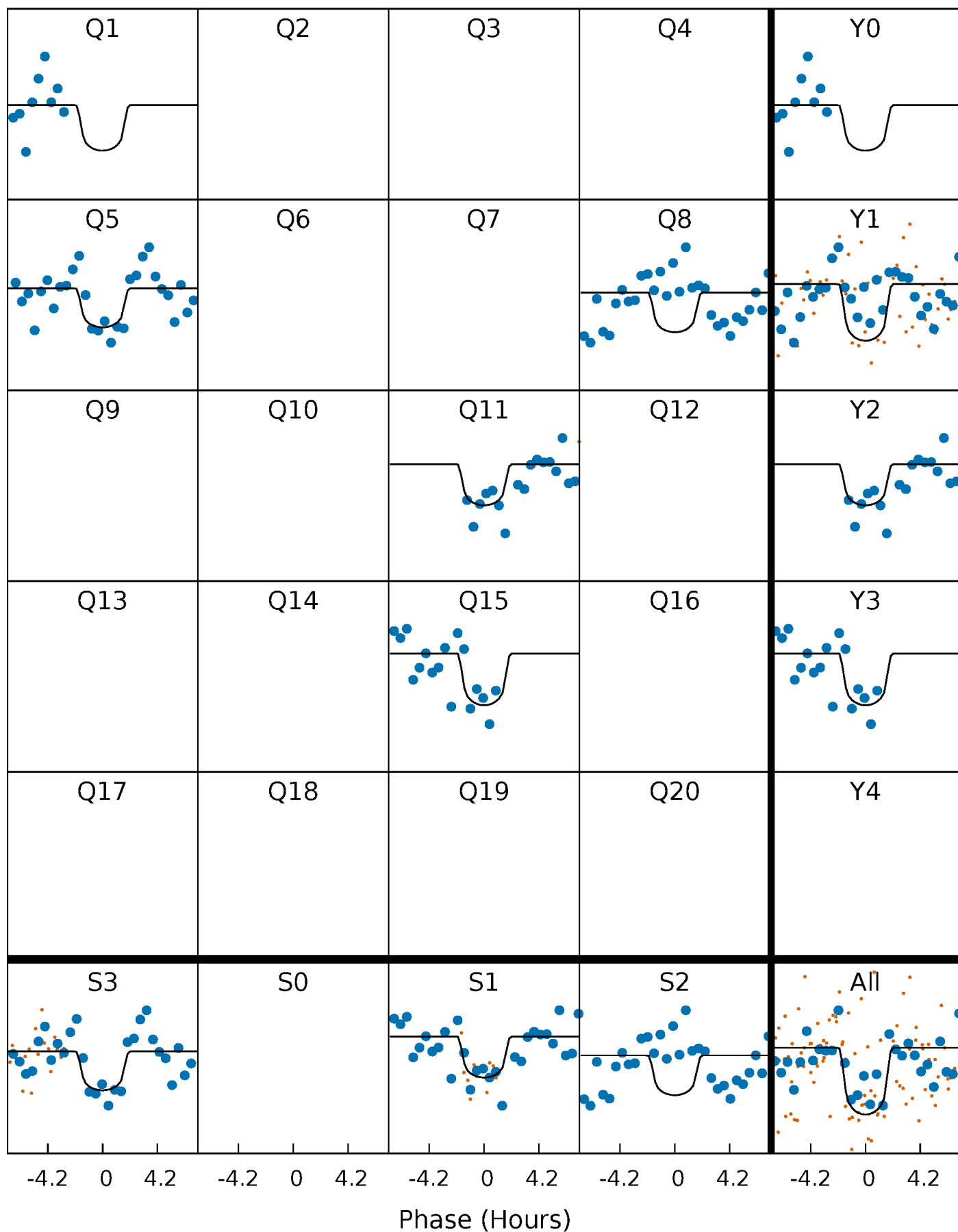
PDC Quarter-Phased Transit Curves

TCE 009334893-03 $P=314.422206$ Days $T_0=150.525802$ (BKJD)



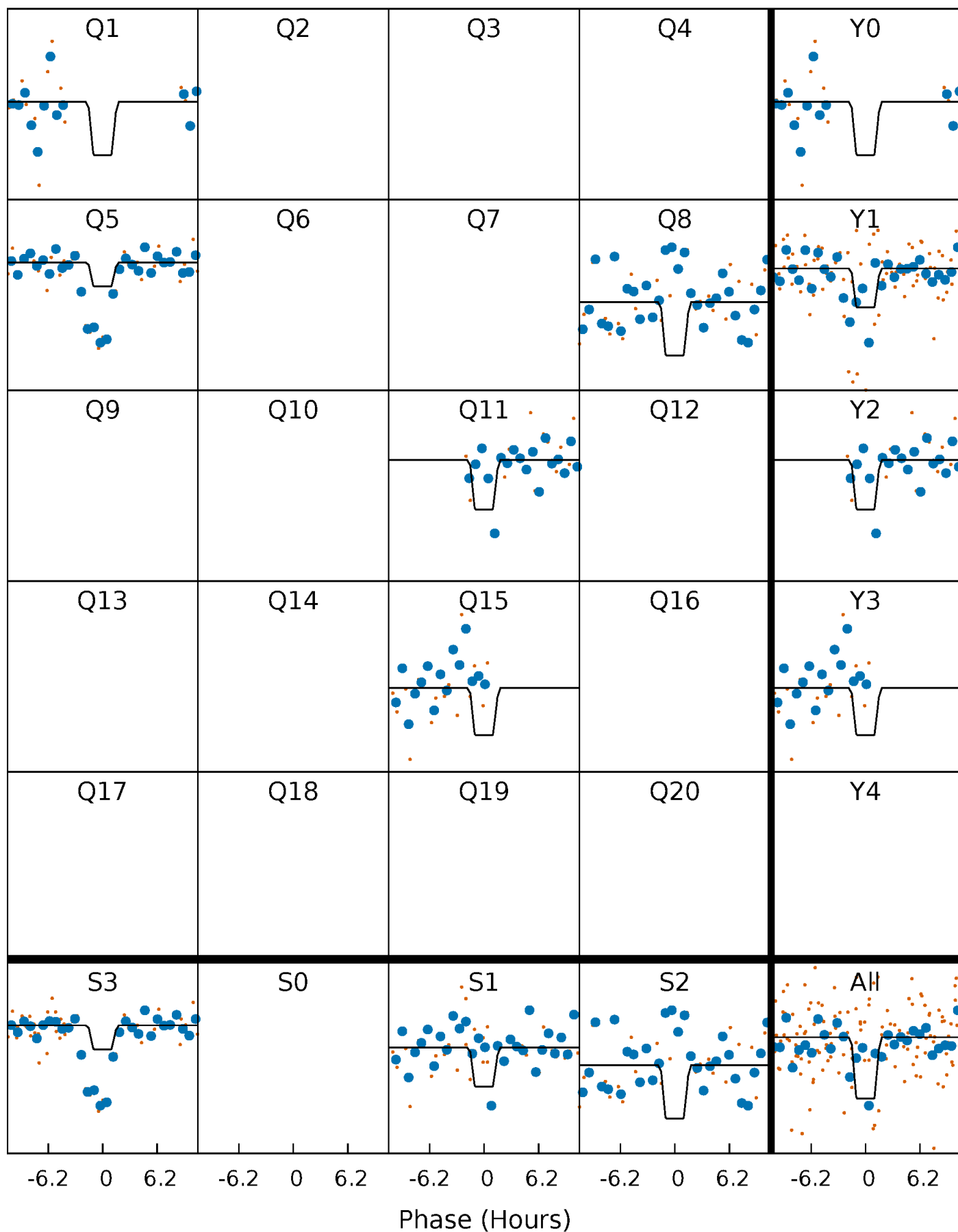
DV Quarter-Phased Transit Curves

TCE 009334893-03 $P=314.422206$ Days $T_0=150.525802$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

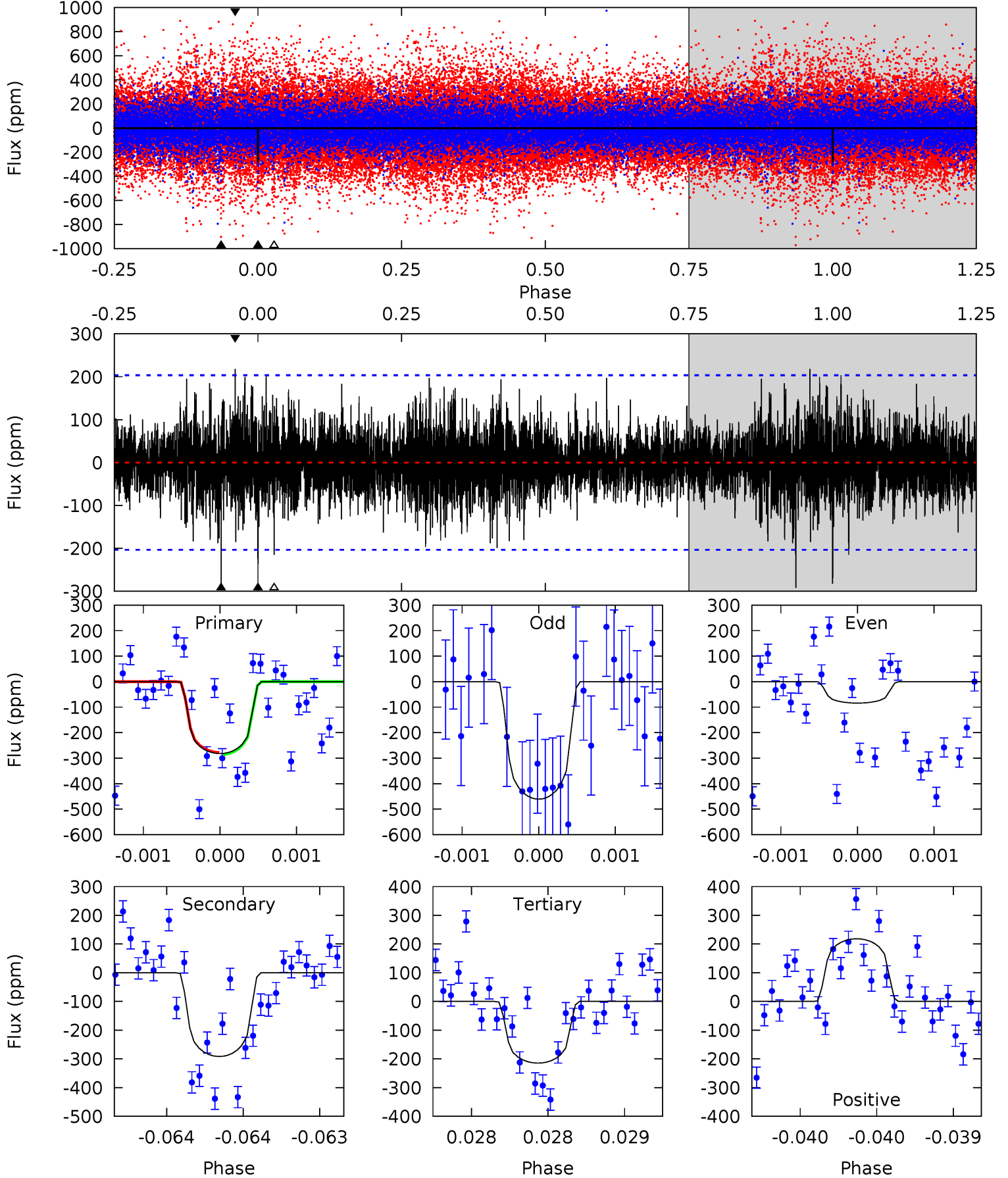
TCE 009334893-03 $P=314.414068$ Days $T_0=150.571818$ (BKJD)



DV Model-Shift Uniqueness Test

009334893-03, P = 314.422206 Days, E = 150.525802 Days

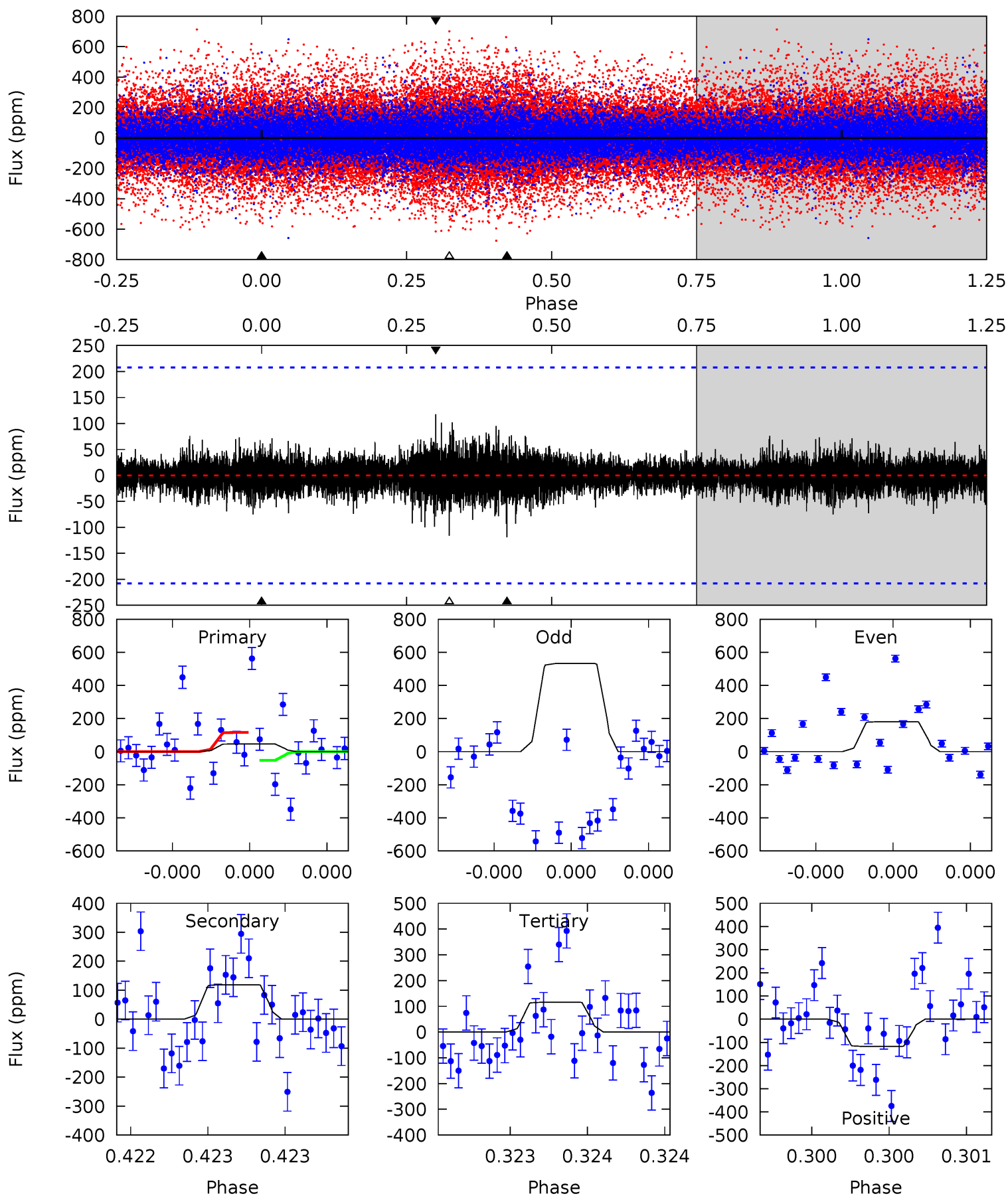
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.71	7.98	5.87	5.97	5.57	3.47	1.45	1.84	1.74	2.11	2.01	5.22	0.68	0.43	0.11



Alt Model-Shift Uniqueness Test

009334893-03, P = 314.414068 Days, E = 150.571818 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.25	3.21	3.13	3.17	5.61	3.54	0.54	-1.88	-1.92	0.08	0.04	5.31	9.58	0.50	0.83



Stellar Parameters For KIC 009334893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4729^{+143}_{-143}	$4.726^{+0.045}_{-0.024}$	$-1.420^{+0.300}_{-0.300}$	$0.525^{+0.028}_{-0.032}$	$0.534^{+0.036}_{-0.020}$	$5.206^{+0.940}_{-0.545}$
	+3%/-3%	+1%/-1%	+21%/-21%	+5%/-6%	+7%/-4%	+18%/-10%
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 009334893-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-292 ± 37	$1.61^{+1.25}_{-1.00}$	245^{+8}_{-8}	3884^{+1962}_{-647}	$32192^{+212138}_{-21559}$
Alt.	-119 ± 37	$1.43^{+1.18}_{-0.88}$	246^{+8}_{-8}	3481^{+1495}_{-573}	16500^{+98466}_{-11592}

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 $A_{obs} \gg 1.0$

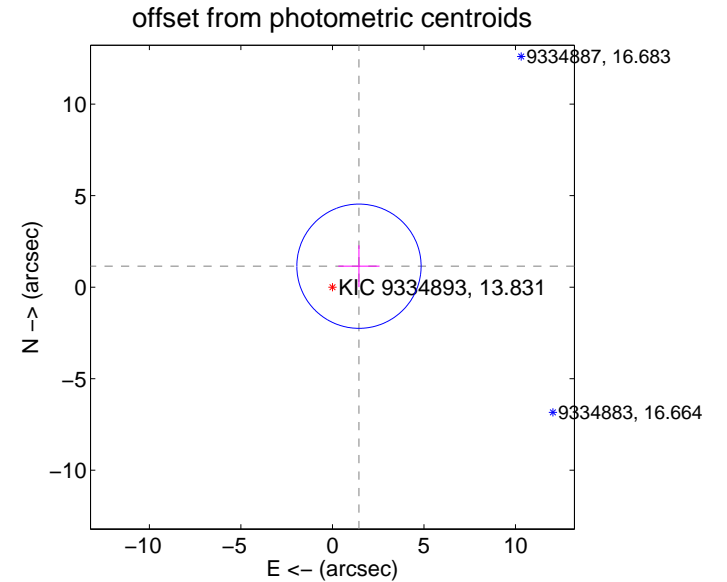
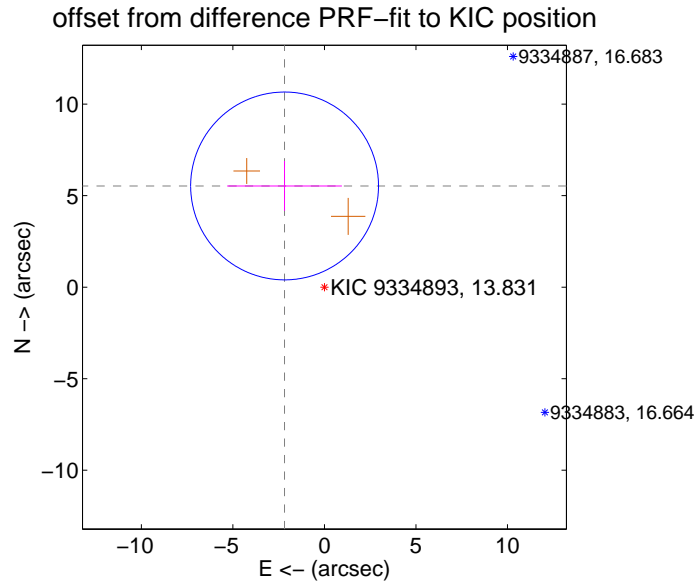
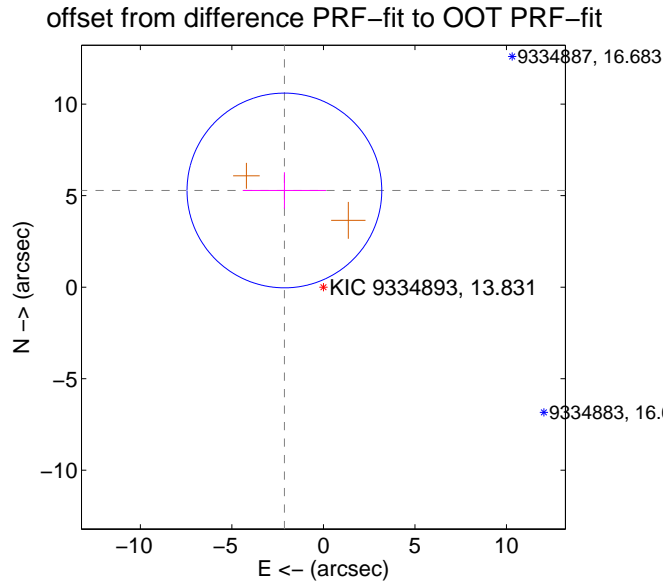
DV Centroid Data

Supplemental centroid analysis for 009334893-03. Kepler magnitude: 13.83. Transit SNR 7.05

There are 0 quarters with good PRF difference image offsets

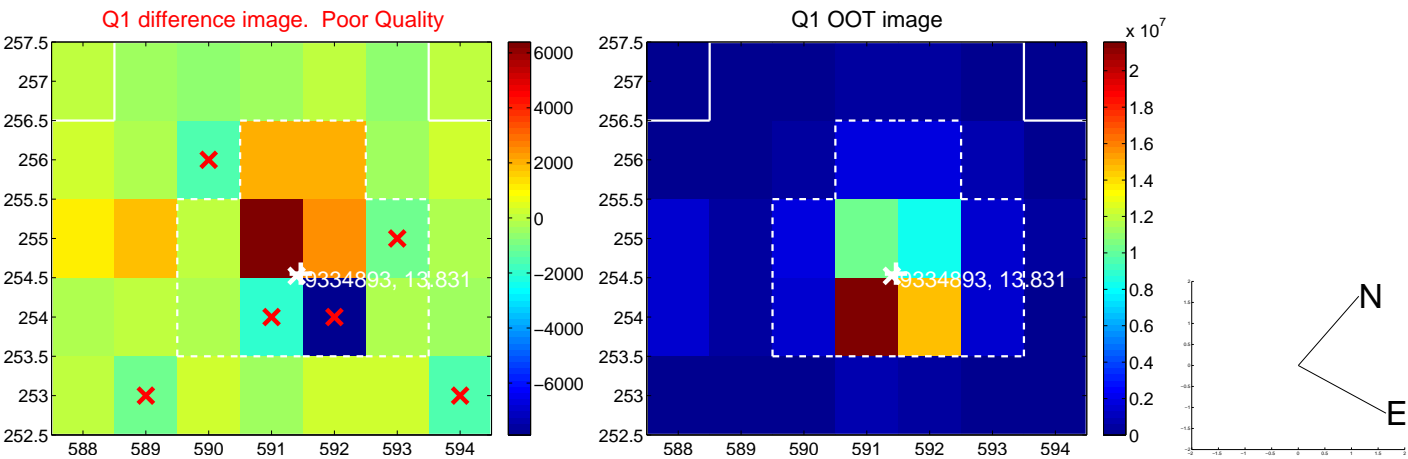
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.696 \pm 1.773	3.21	2.132 \pm 2.274	5.282 \pm 0.996
PRF-fit source offset from KIC position	5.943 \pm 1.710	3.47	2.177 \pm 3.134	5.530 \pm 1.362
photometric centroid source offset	1.85 \pm 1.13	1.63	-1.45 \pm 1.13	1.14 \pm 1.14

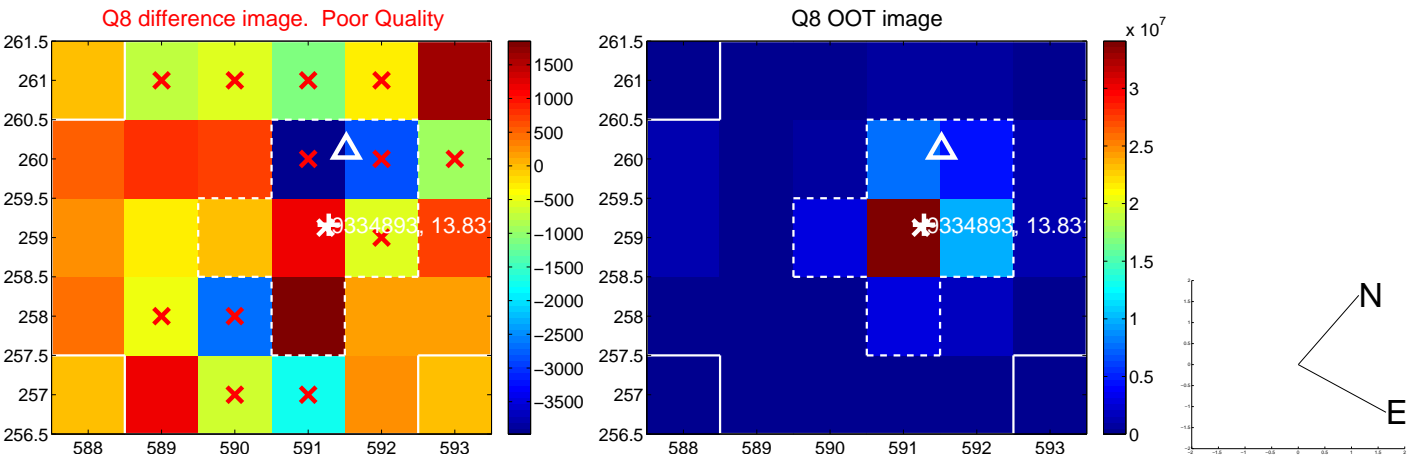
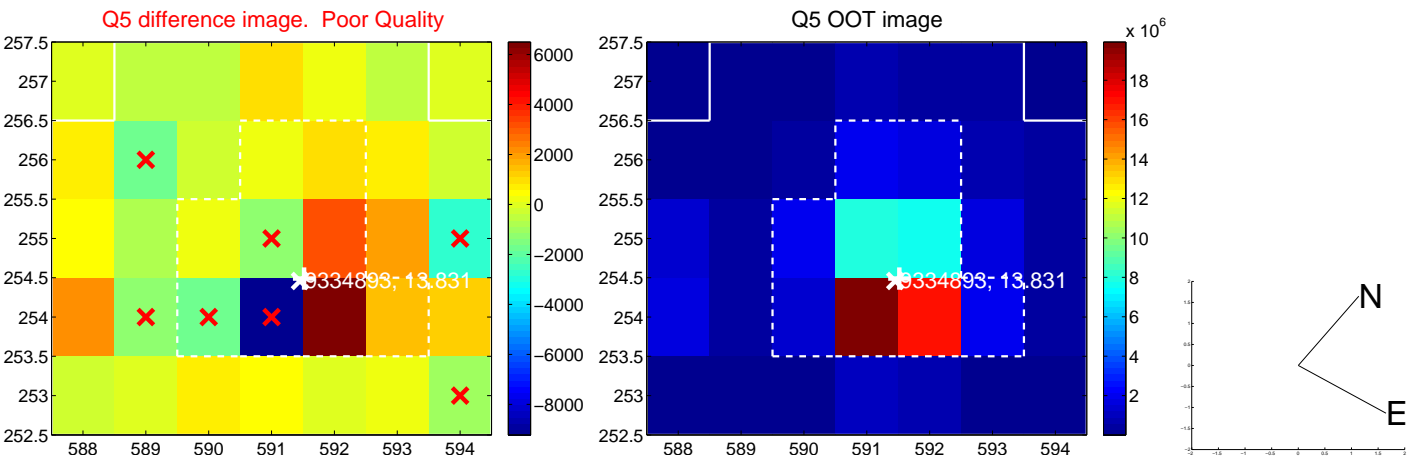


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



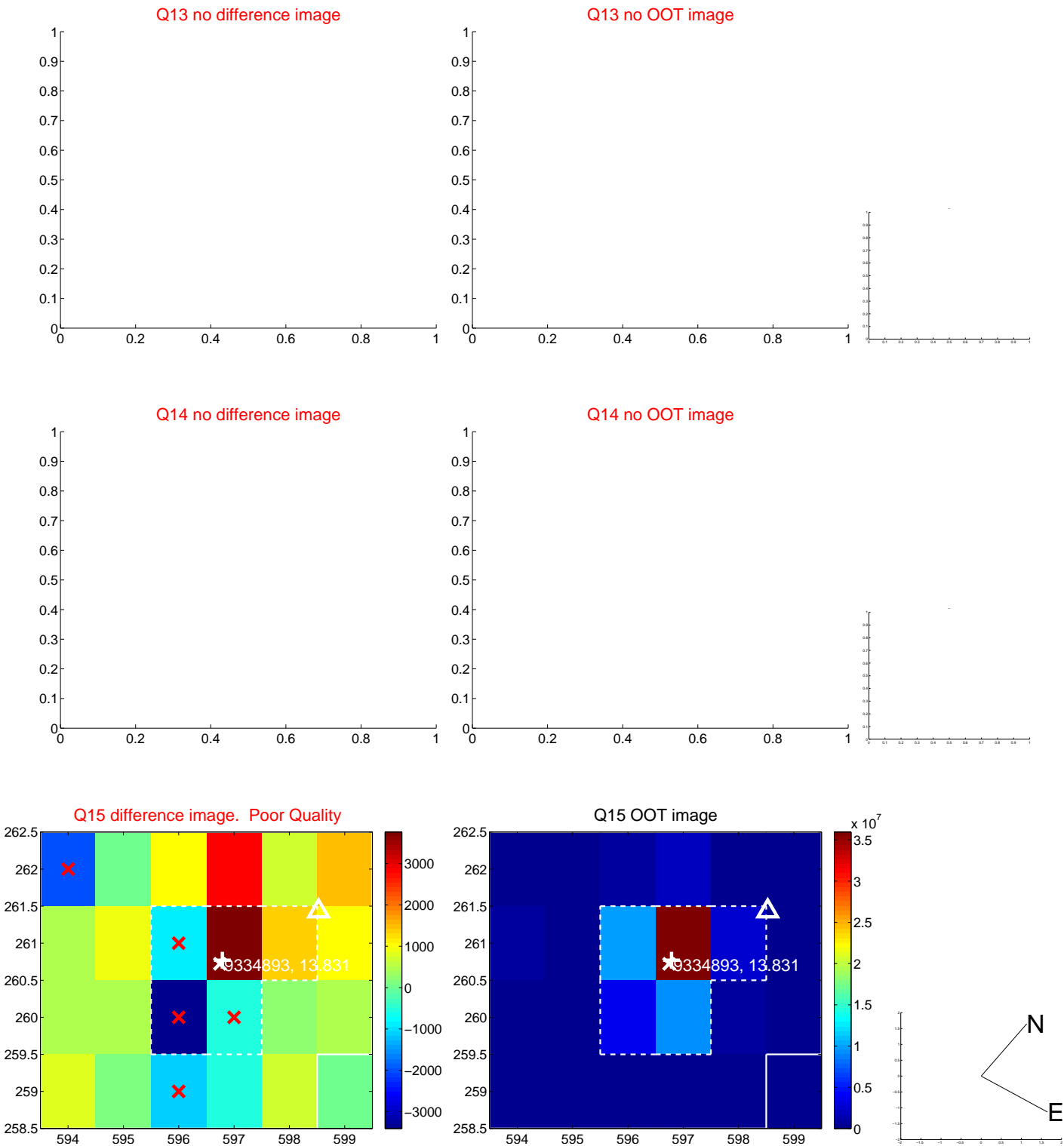
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



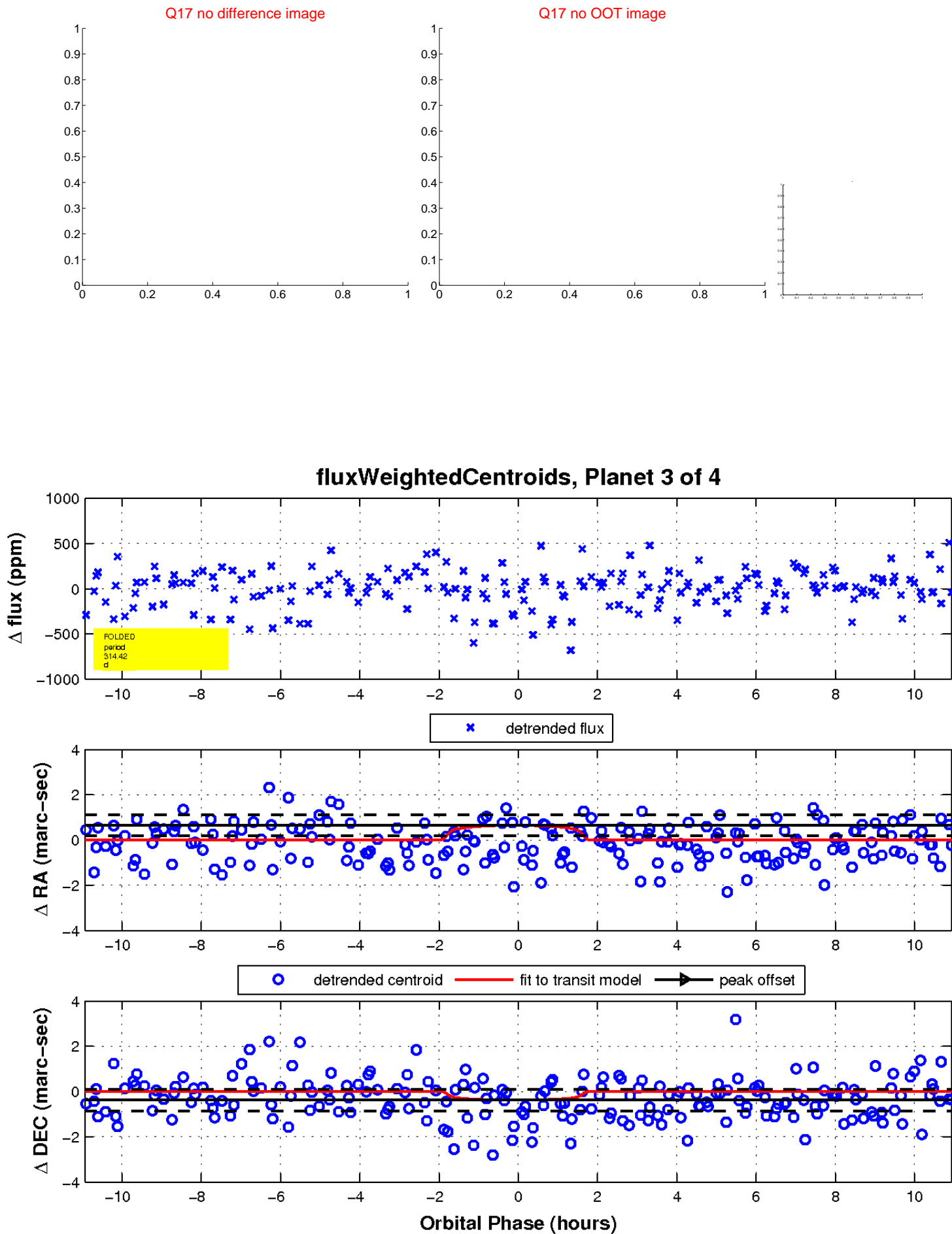
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

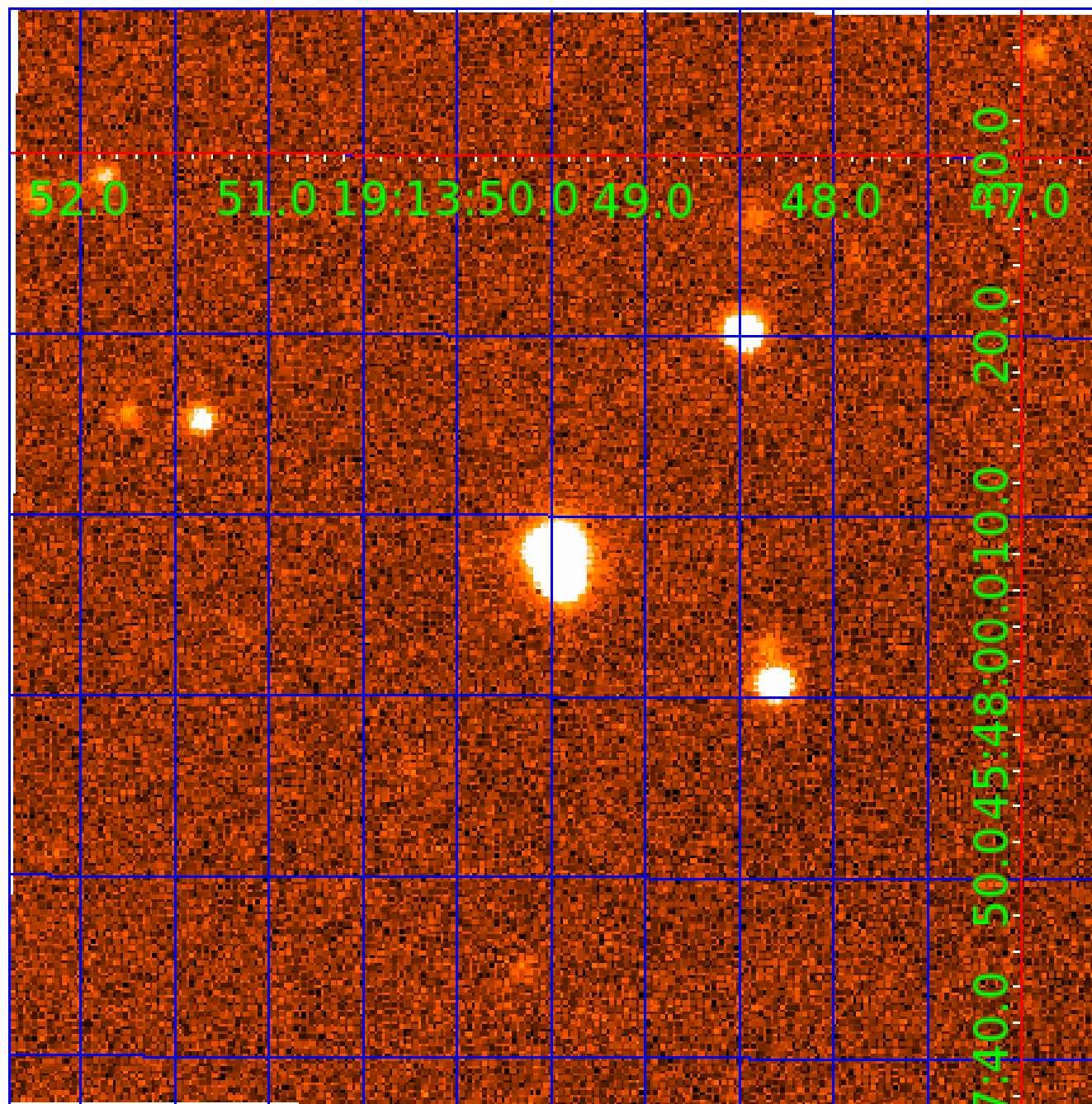


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009334893

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})
009334893-01	OBS	2298.01	16.667250	141.760210	163.0	3.387	12.8	13.7	0.53	4729	0.79	11.49
009334893-02	OBS	2298.02	31.805956	150.673158	166.0	4.049	9.2	10.3	0.53	4729	0.80	4.85
009334893-03	OBS	No	314.422206	150.525802	412.9	3.652	8.6	7.1	0.53	4729	1.19	0.23
009334893-04	OBS	2298.03	2.472448	132.424436	42.0	2.190	7.7	8.0	0.53	4729	0.40	146.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009334893-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009334893-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009334893-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
009334893-04	OBS	PC	0.42	0	0	0	0	CENT_UNCERTAIN

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.

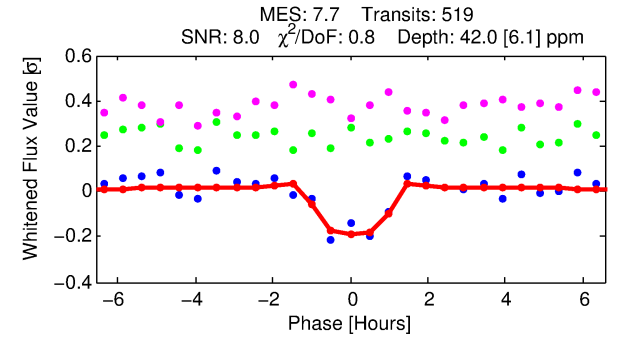
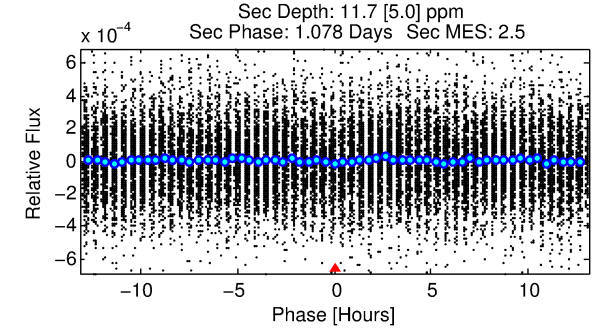
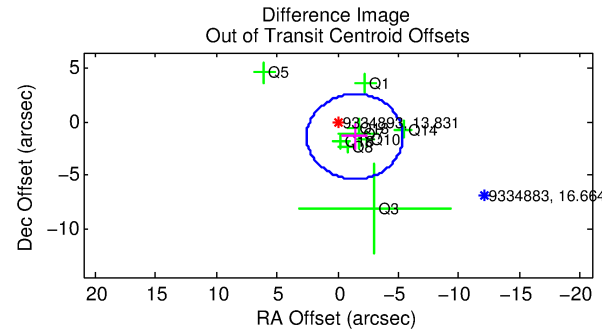
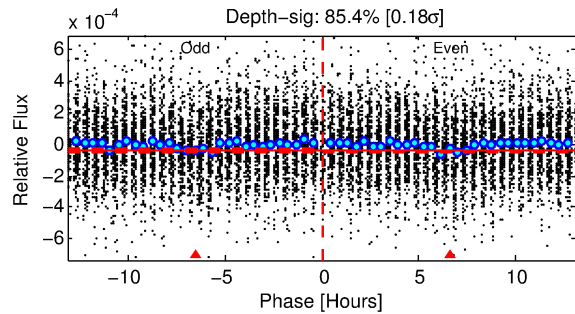
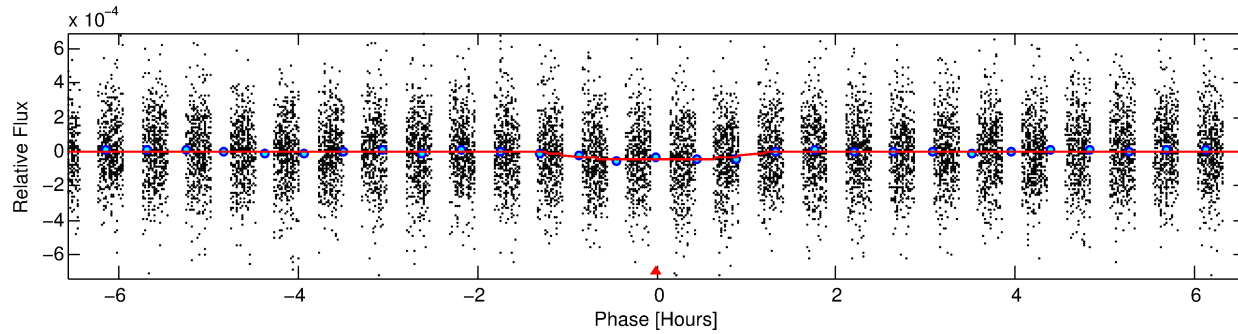
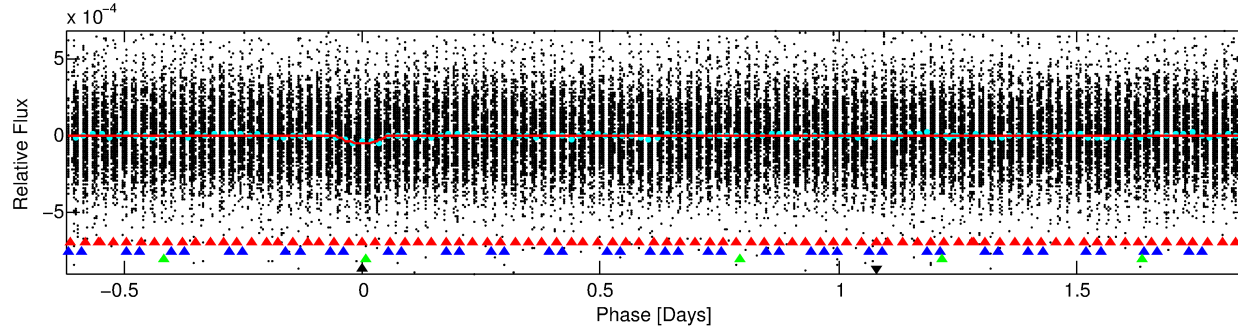
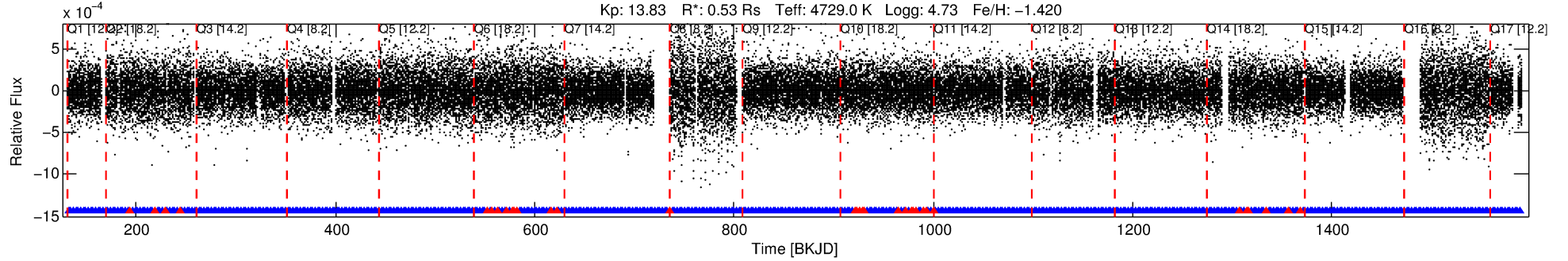
Ephemeris Match Information For 009334893-04

No Significant Match Found

DV One-Page Summary

KIC: 9334893 Candidate: 4 of 4 Period: 2.472 d
KOI: K02298 Corr: No Ephemeris Match

Kp: 13.83 R*: 0.53 Rs Teff: 4729.0 K Logg: 4.73 Fe/H: -1.420



DV Fit Results:

Period = 2.47245 [0.00002] d
Epoch = 132.4244 [0.0043] BKJD
Rp/R* = 0.0070 [0.0049]
a/R* = 4.18 [11.98]
b = 0.89 [0.73]
Seff = 146.30 [21.23]
Teq = 887 [32] K
Rp = 0.40 [0.28] Re
a = 0.0291 [0.0015] AU
Ag = 33.45 [48.85] [0.66σ]
Teffp = 3298 [1206] K [2.00σ]

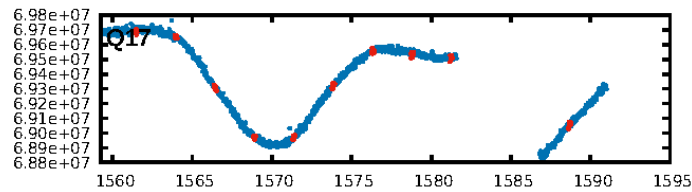
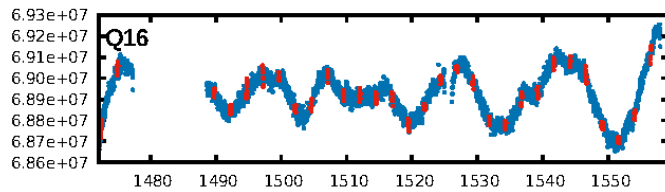
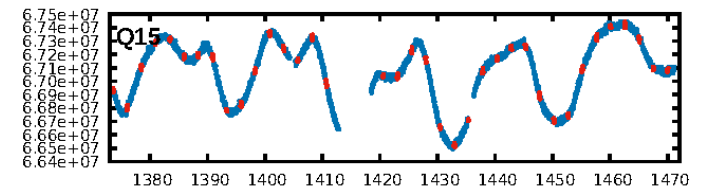
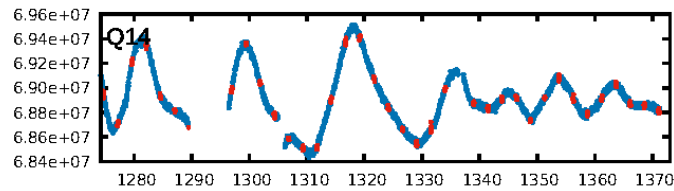
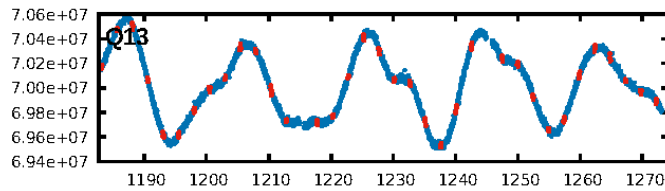
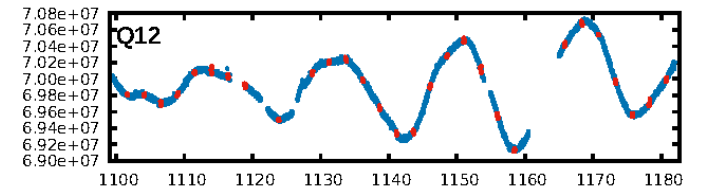
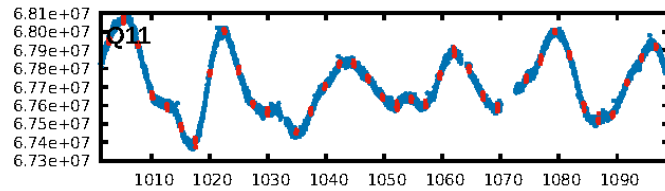
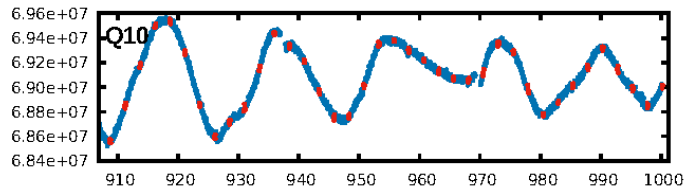
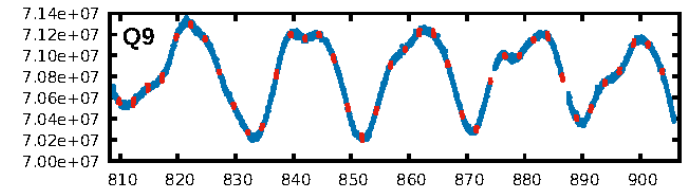
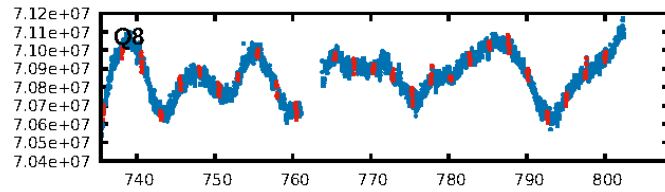
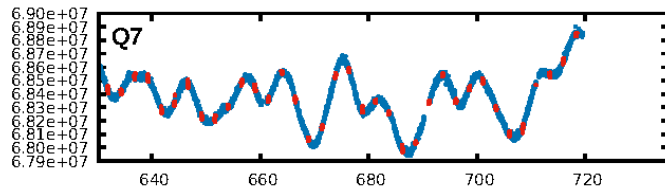
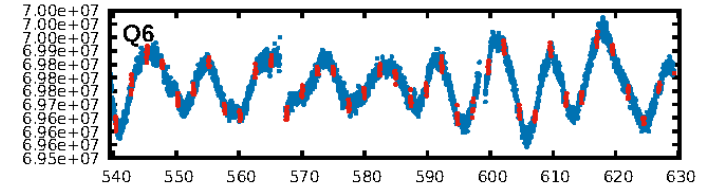
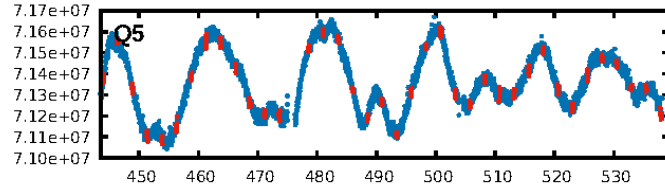
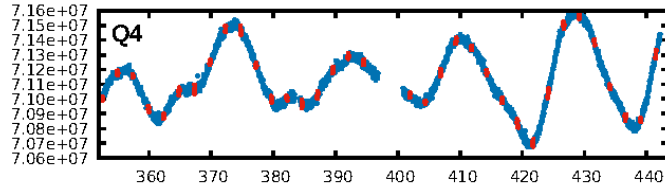
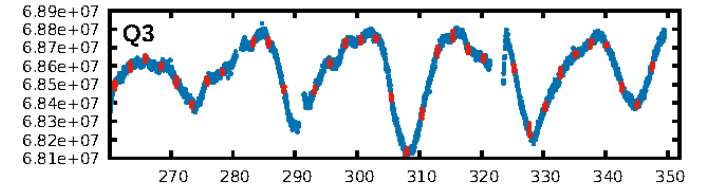
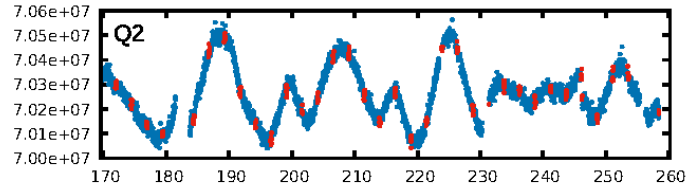
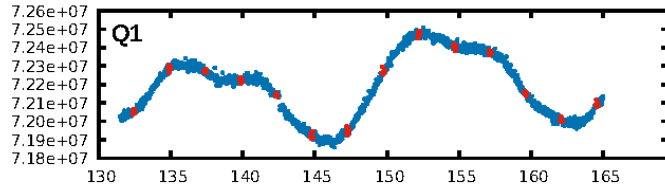
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [84.47σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.63e-14
RollingBand-fgt: 0.93 [462/495]
GhostDiagnostic-chr: 1.432
Centroid-sig: 0.0%
Centroid-so: 2.598 arcsec [1.85σ]
OotOffset-rm: 1.961 arcsec [1.48σ]
KicOffset-rm: 1.714 arcsec [1.31σ]
OotOffset-st: 2/2/2/3 [9]
KicOffset-st: 2/2/2/3 [9]
DiffImageQuality-fgm: 0.33 [3/9]
DiffImageOverlap-fno: 1.00 [17/17]

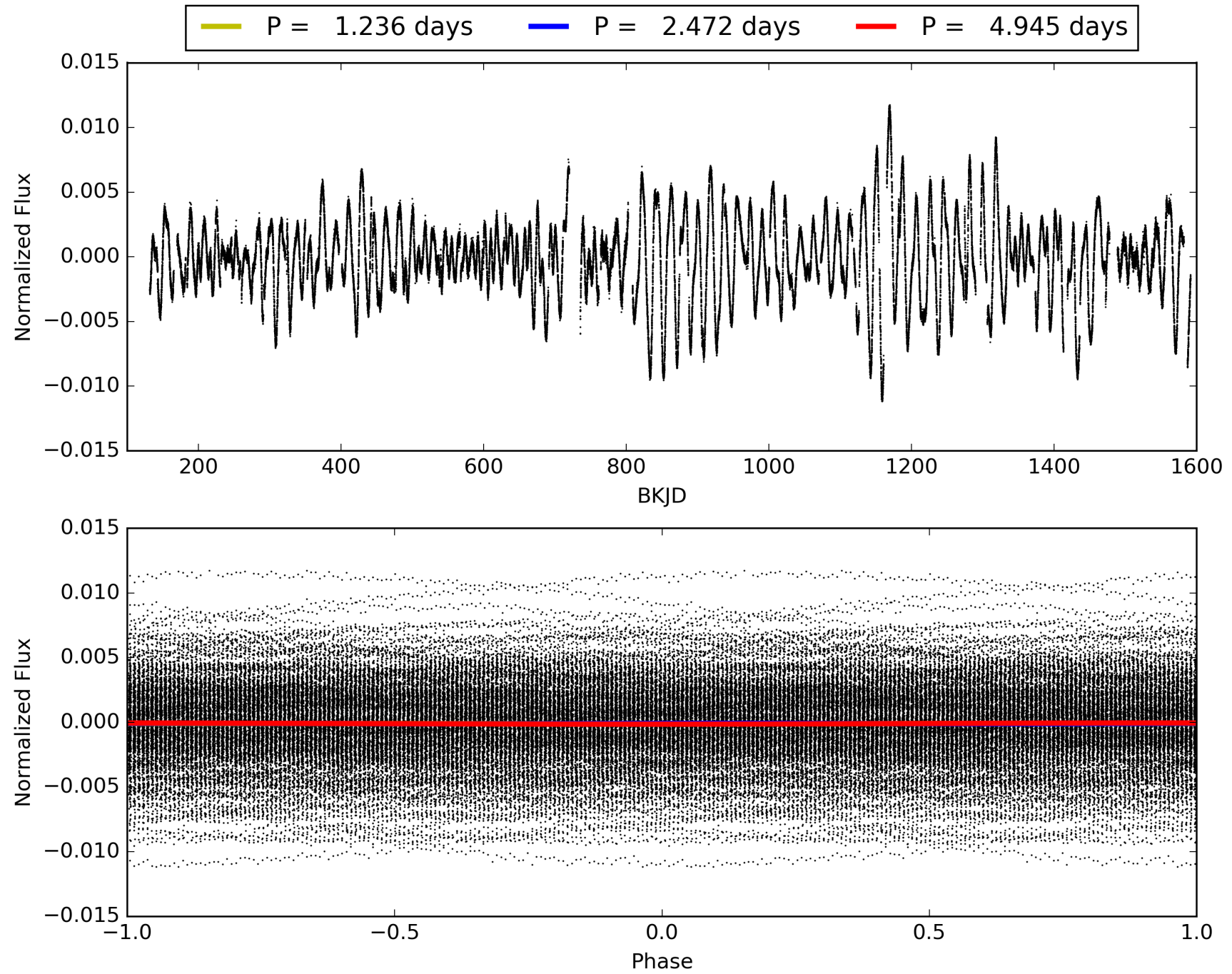
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:26:09 Z

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

TCE 009334893-04, PDC Light Curves

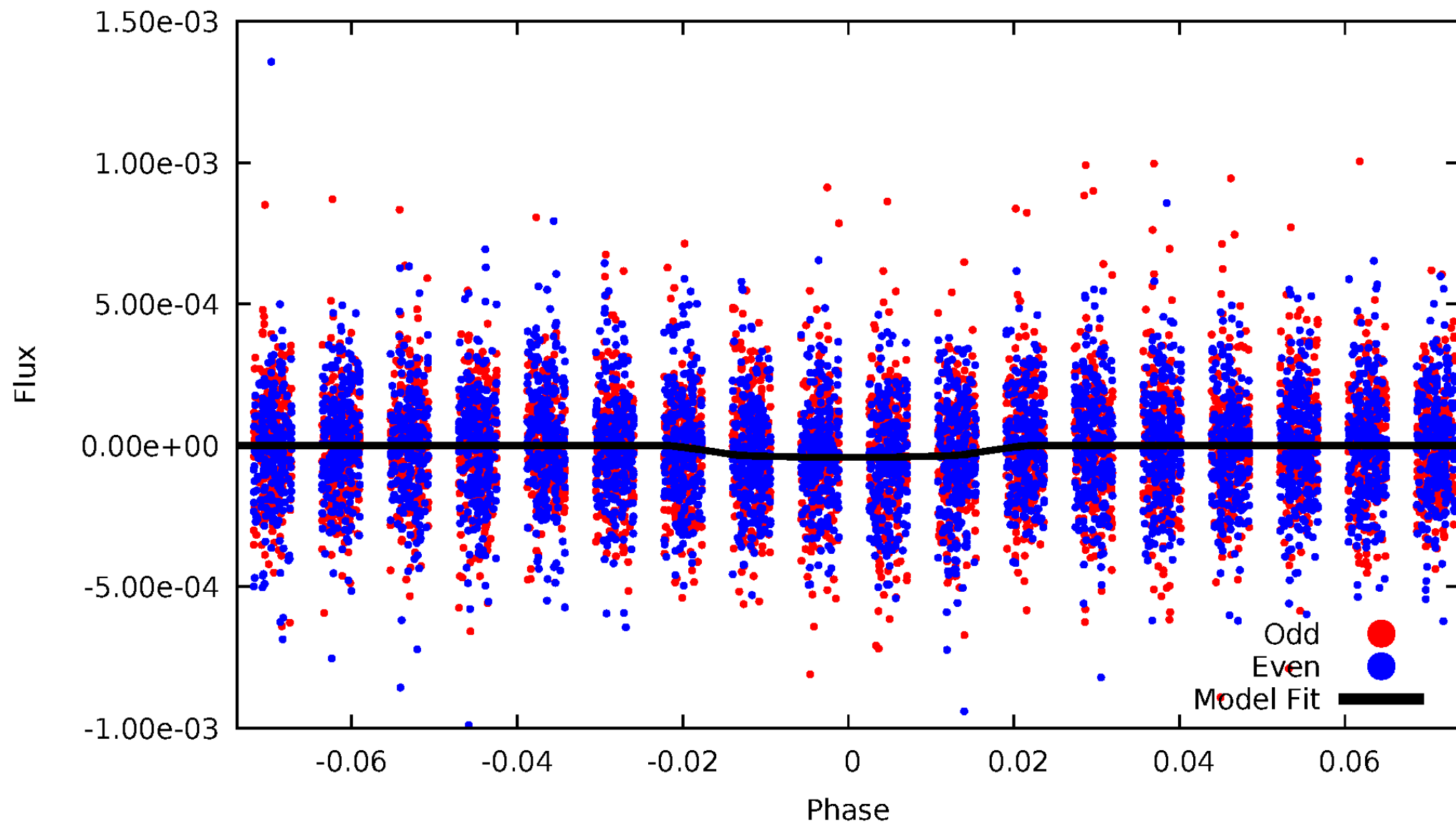


TCE 009334893-04



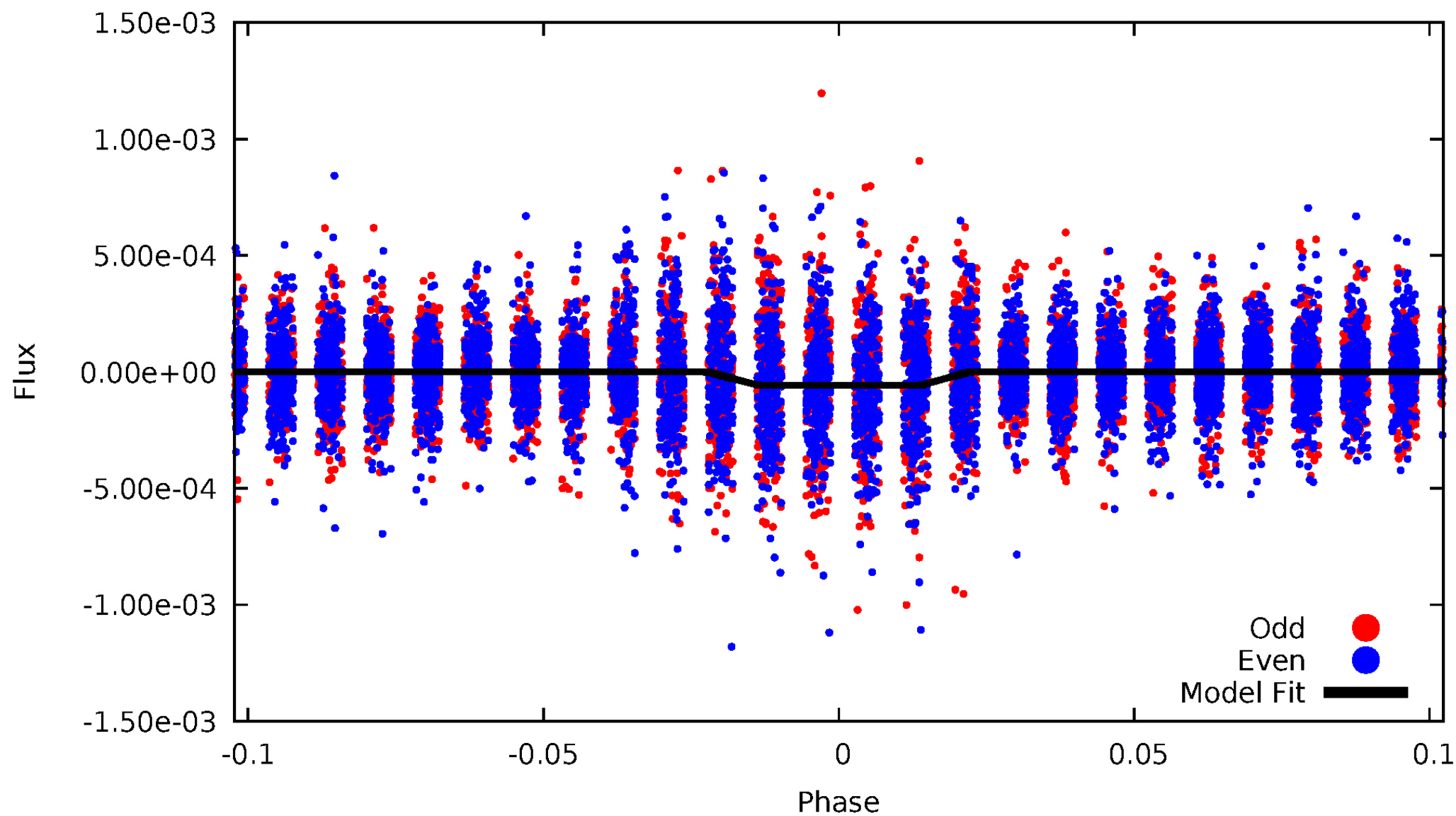
DV Odd/Even

TCE 009334893-04



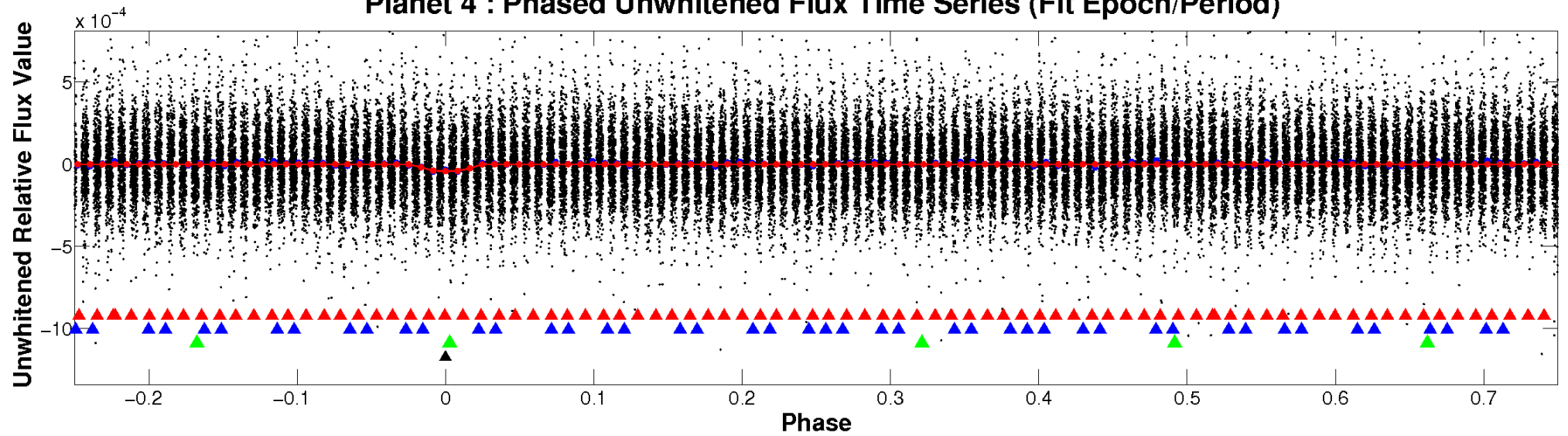
ALT Odd/Even

TCE 009334893-04

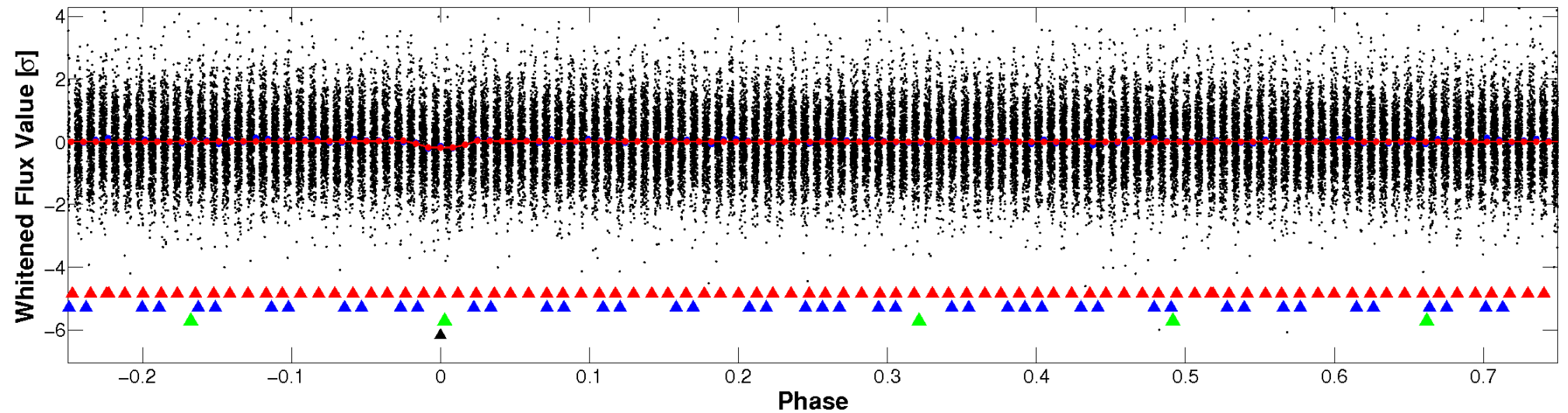


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

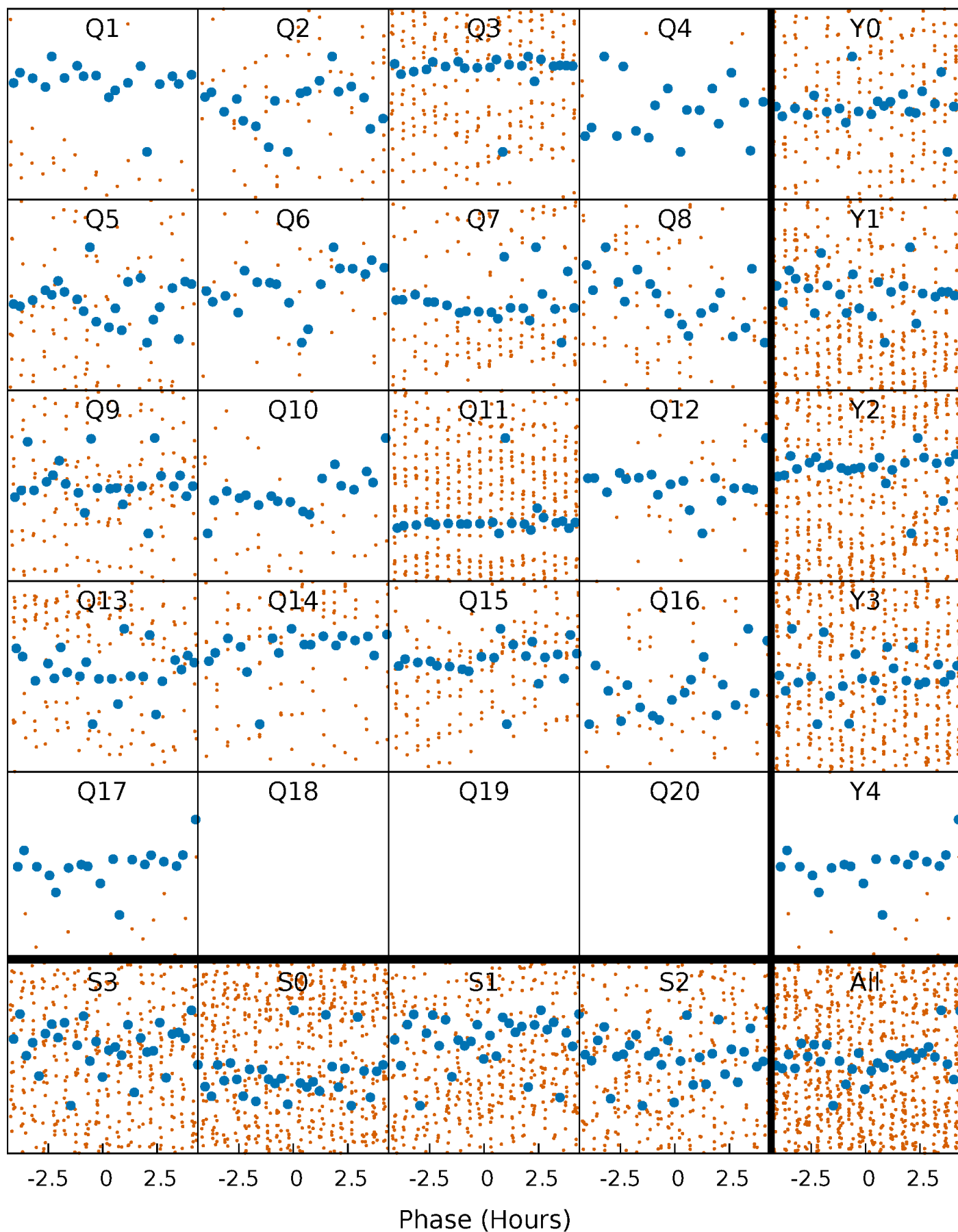


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



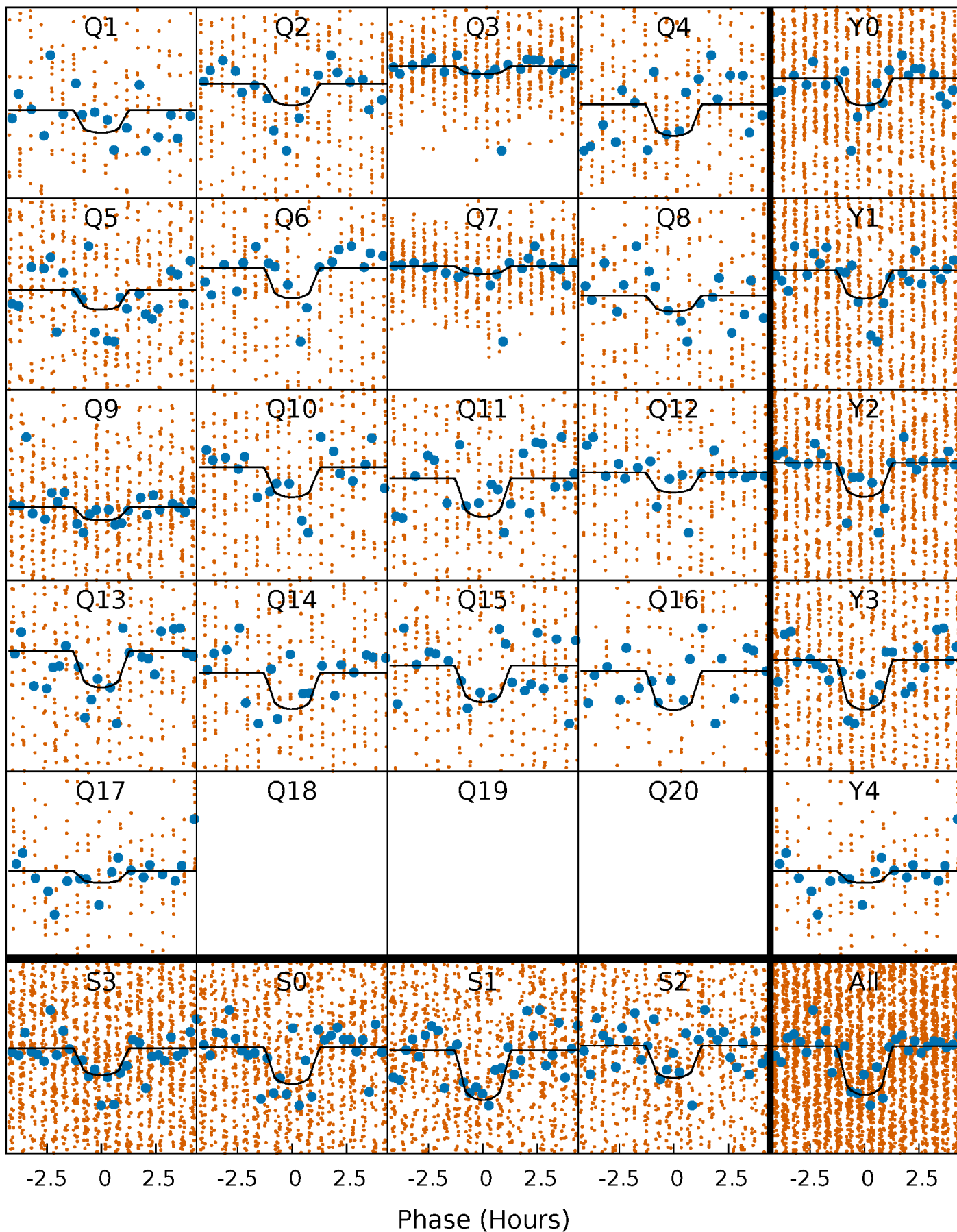
PDC Quarter-Phased Transit Curves

TCE 009334893-04 P= 2.472448 Days $T_0=132.424436$ (BKJD)



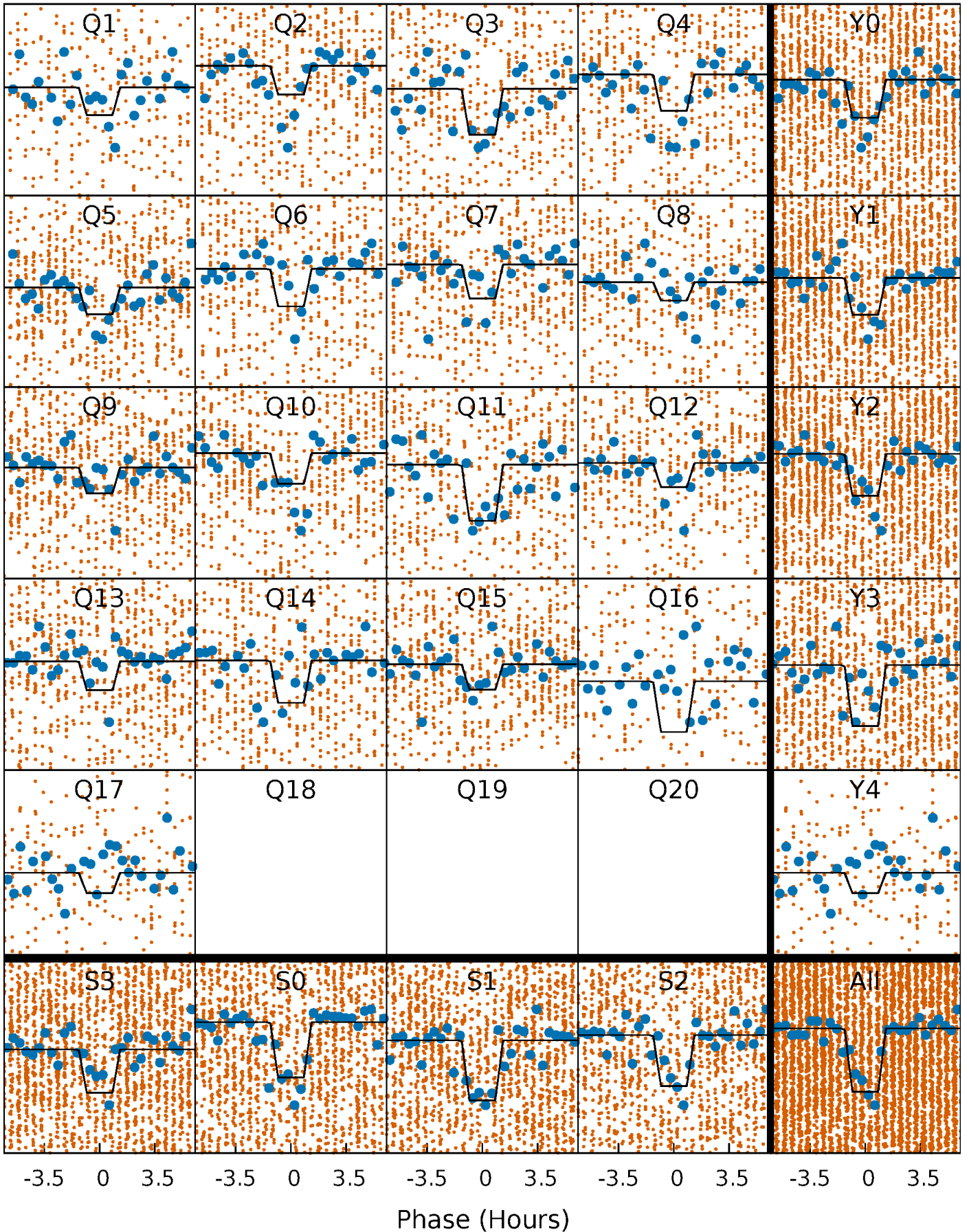
DV Quarter-Phased Transit Curves

TCE 009334893-04 P= 2.472448 Days $T_0=132.424436$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

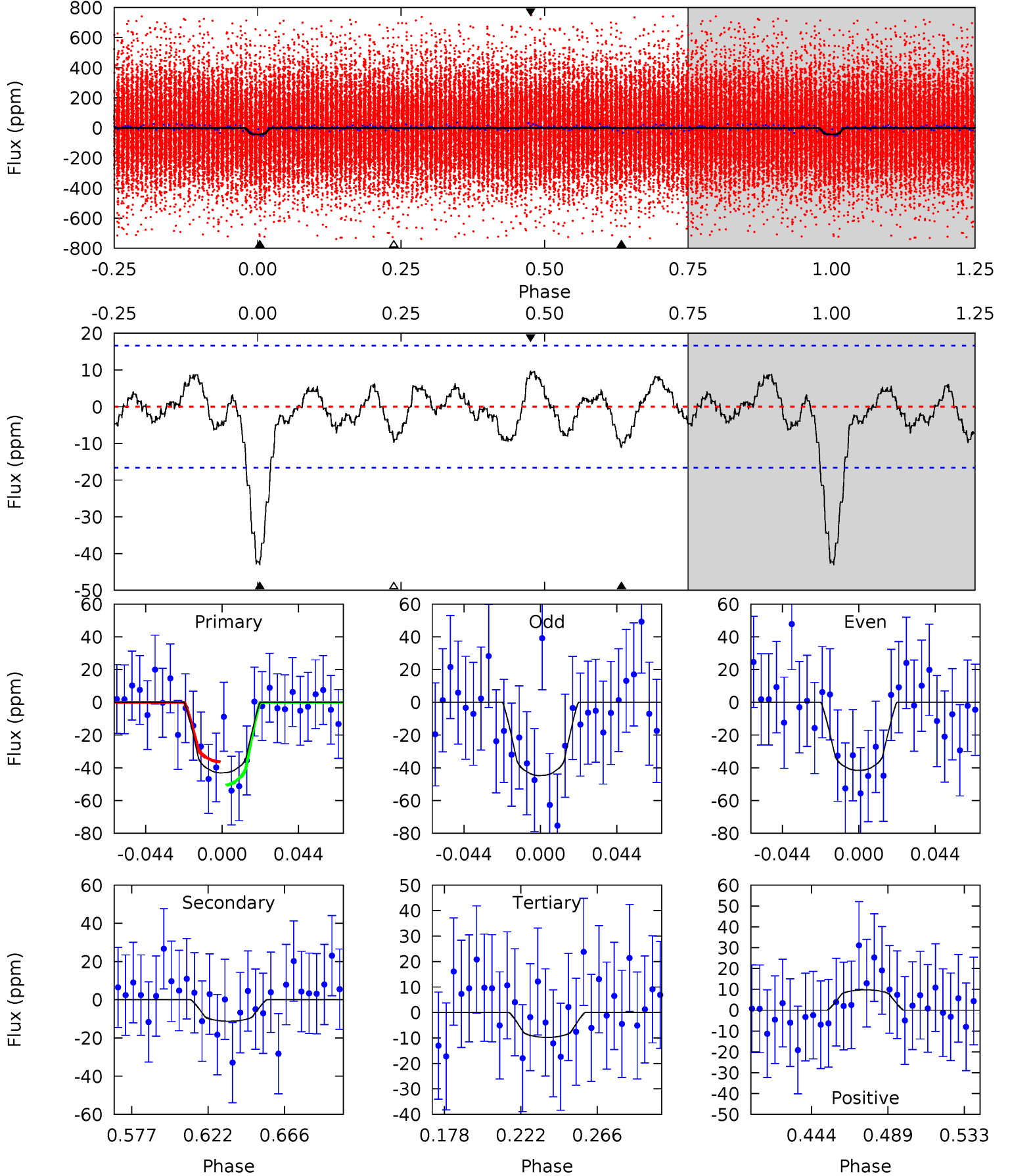
TCE 009334893-04 P= 2.472451 Days $T_0=132.423676$ (BKJD)



DV Model-Shift Uniqueness Test

009334893-04, P = 2.472448 Days, E = 129.951988 Days

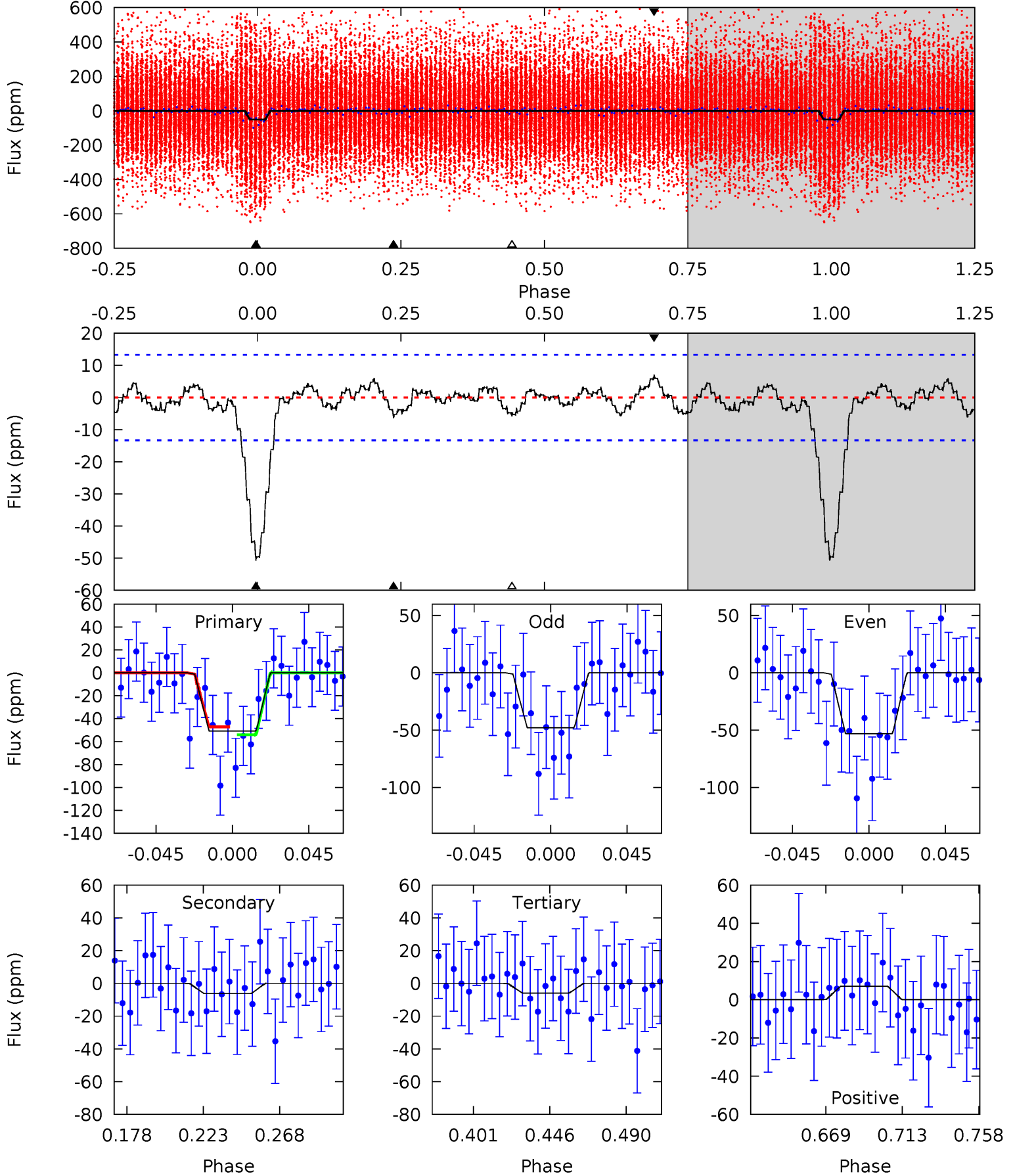
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	3.20	2.78	2.78	4.73	2.01	1.23	9.50	9.50	0.42	0.42	0.45	1.08	0.18	2.03



Alt Model-Shift Uniqueness Test

009334893-04, P = 2.472451 Days, E = 129.951225 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	2.21	2.08	2.52	4.73	2.01	0.89	16.0	15.6	0.13	-0.31	0.90	1.34	0.12	1.21



Stellar Parameters For KIC 009334893

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4729^{+143}_{-143}	$4.726^{+0.045}_{-0.024}$	$-1.420^{+0.300}_{-0.300}$	$0.525^{+0.028}_{-0.032}$	$0.534^{+0.036}_{-0.020}$	$5.206^{+0.940}_{-0.545}$
	+3%/-3%	+1%/-1%	+21%/-21%	+5%/-6%	+7%/-4%	+18%/-10%
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 009334893-04 / KOI 2298.03

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-11 ± 4	$0.41^{+0.26}_{-0.24}$	1236^{+41}_{-40}	3586^{+1384}_{-577}	30^{+153}_{-20}
Alt.	-6 ± 3	$0.45^{+0.27}_{-0.25}$	1232^{+39}_{-41}	3148^{+873}_{-443}	14^{+46}_{-9}

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

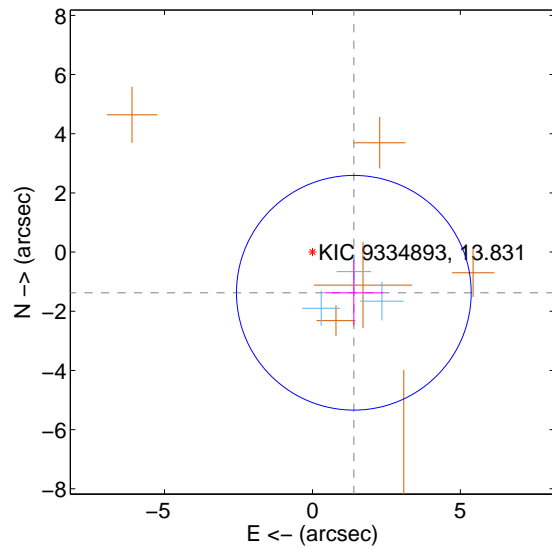
Supplemental centroid analysis for 009334893-04. Kepler magnitude: 13.83. Transit SNR 7.99

There are 3 quarters with good PRF difference image offsets

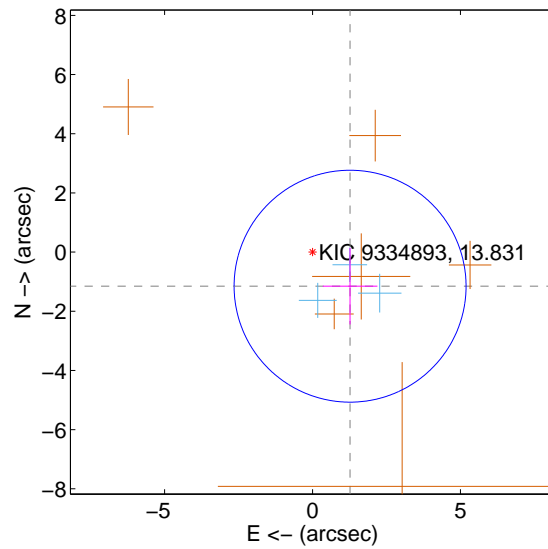
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.961 ± 1.322	1.48	-1.399 ± 0.994	-1.374 ± 1.109
PRF-fit source offset from KIC position	1.714 ± 1.306	1.31	-1.269 ± 0.923	-1.153 ± 1.293
photometric centroid source offset	2.60 ± 1.41	1.85	-0.63 ± 1.32	-2.52 ± 1.41

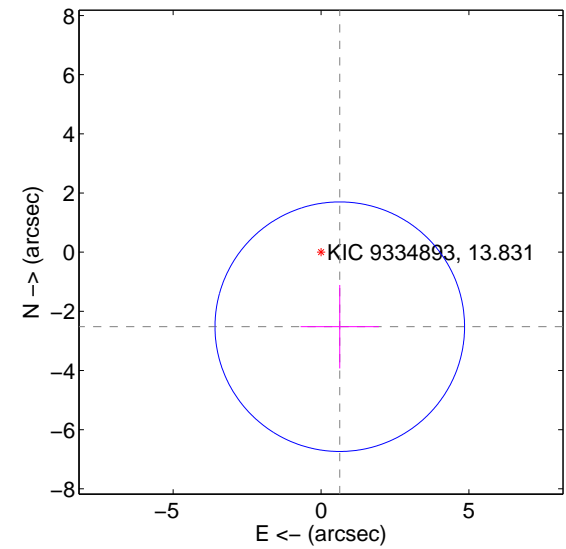
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

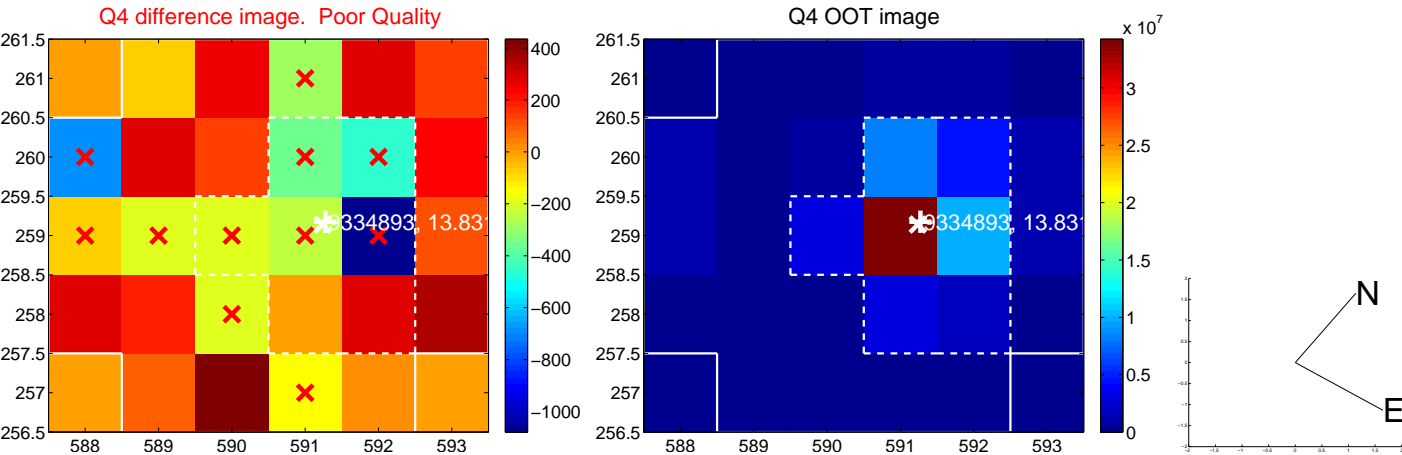
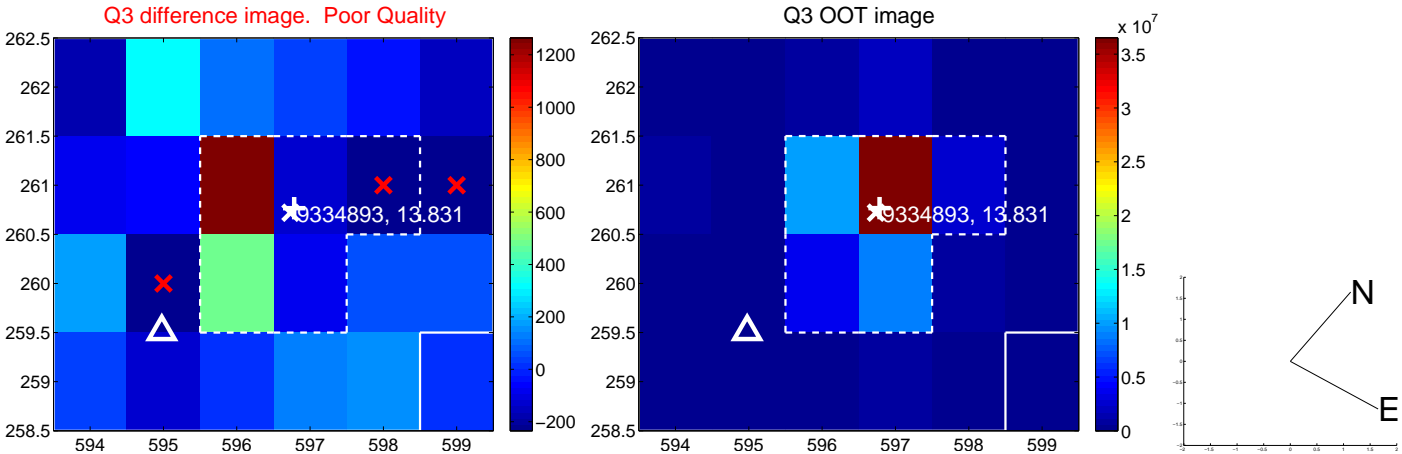
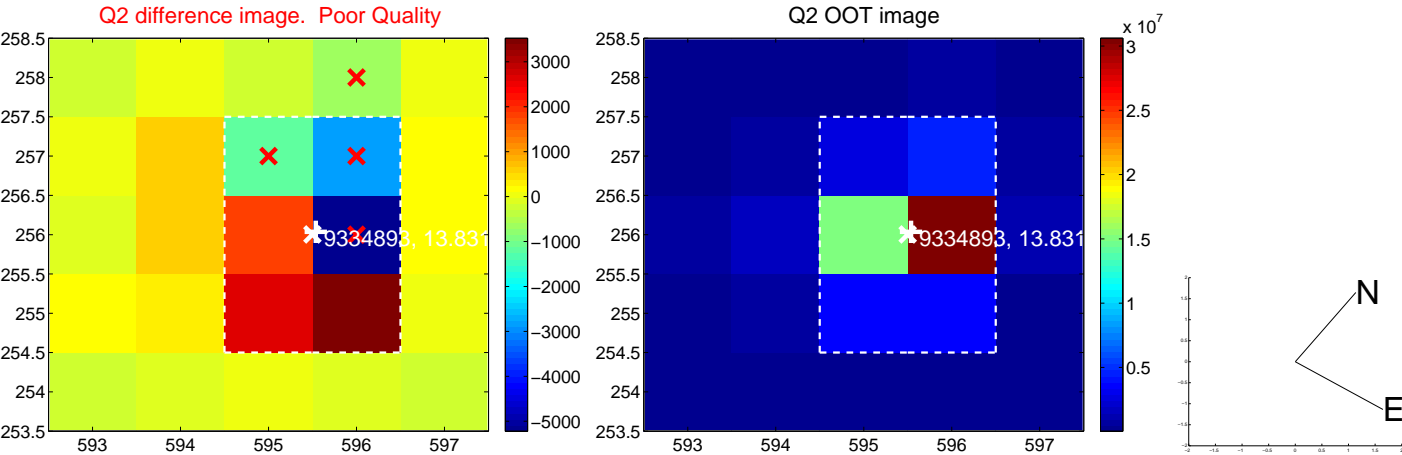
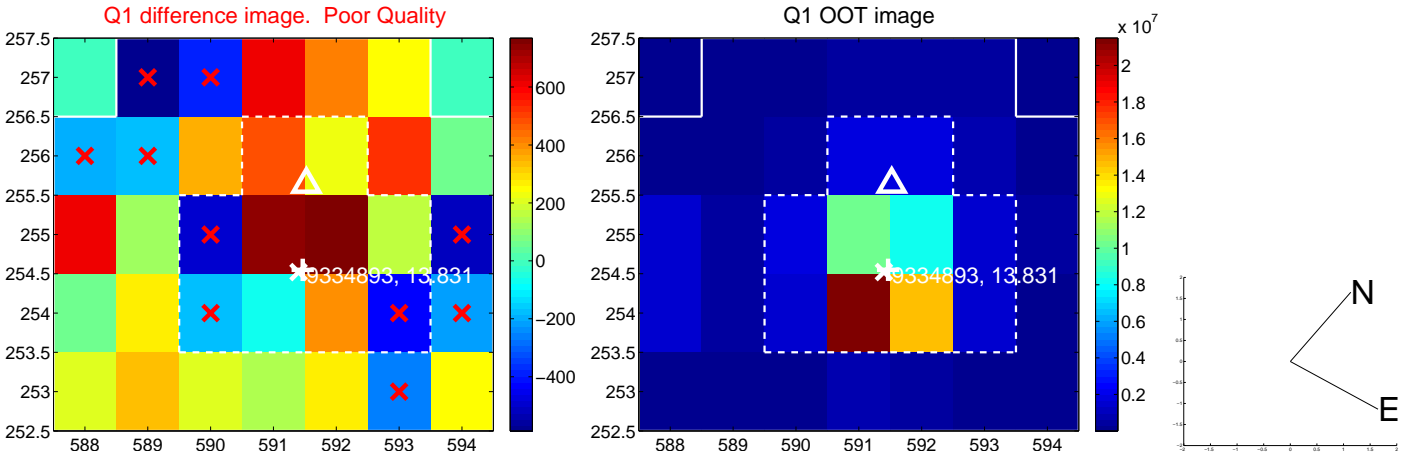


offset from photometric centroids

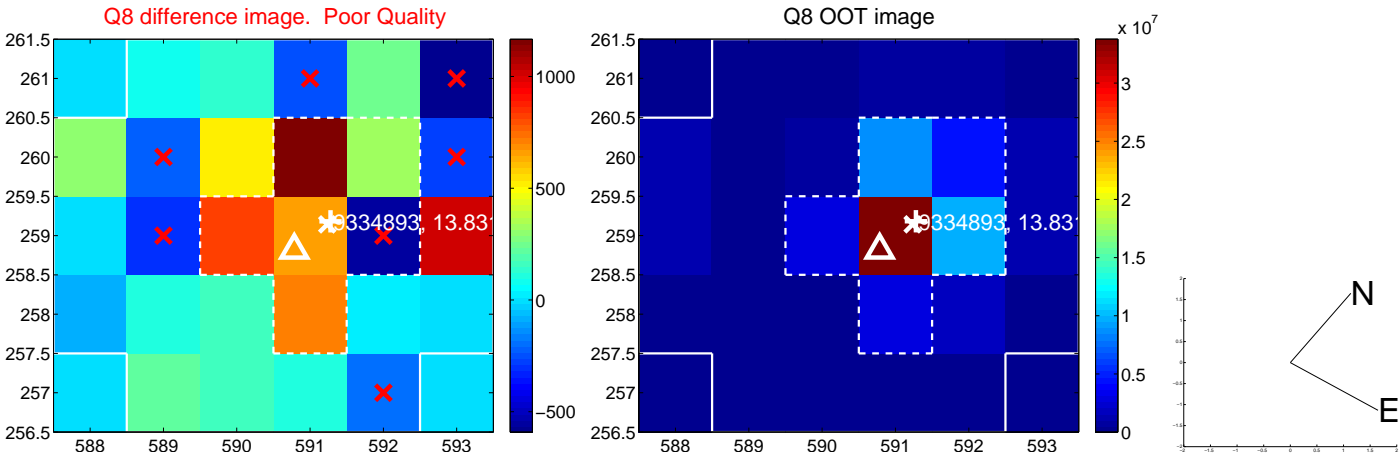
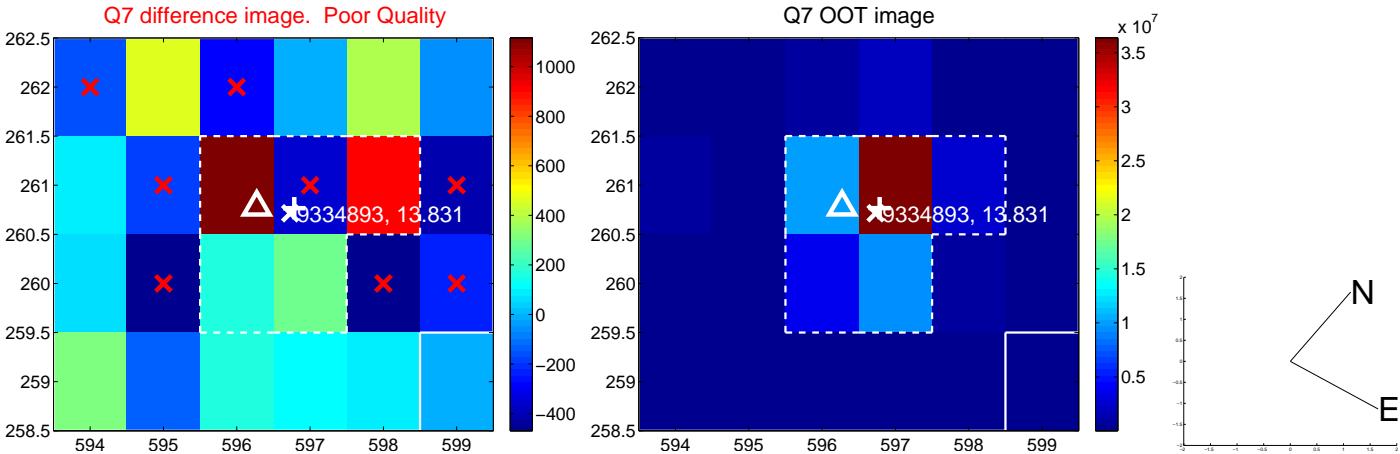
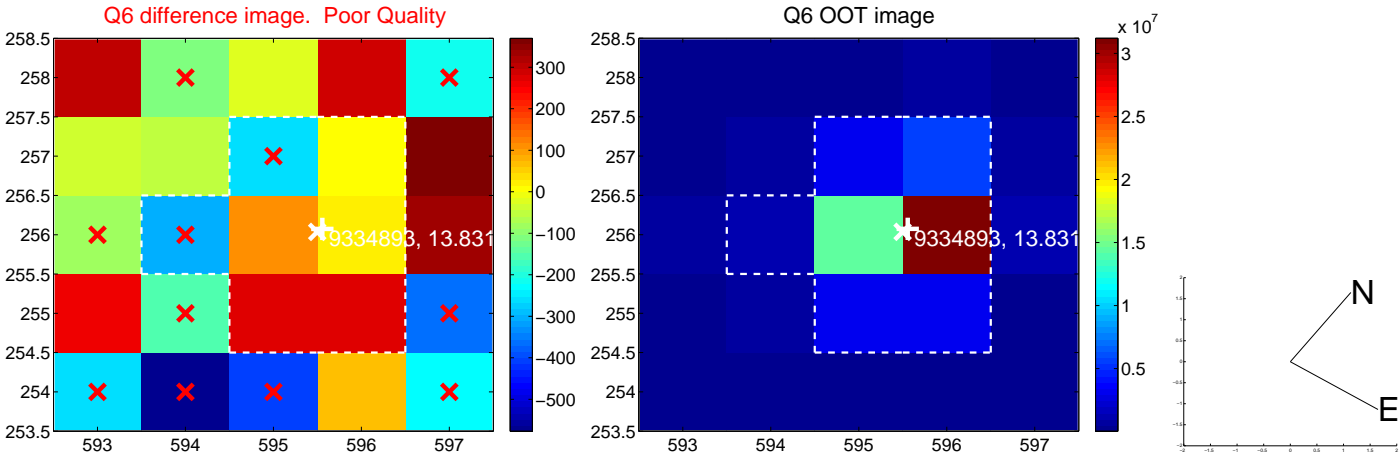
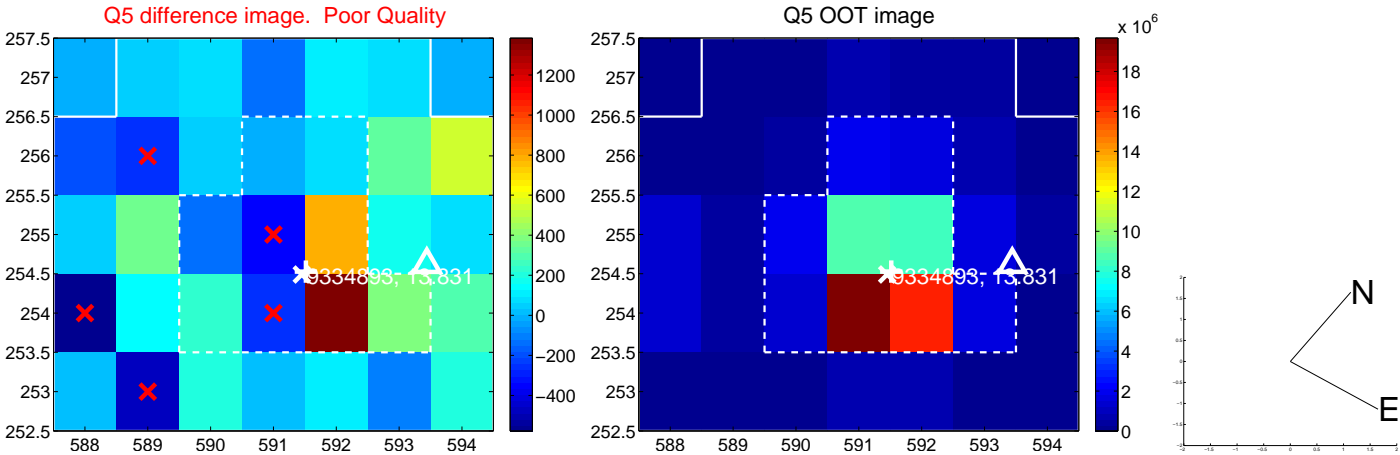


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

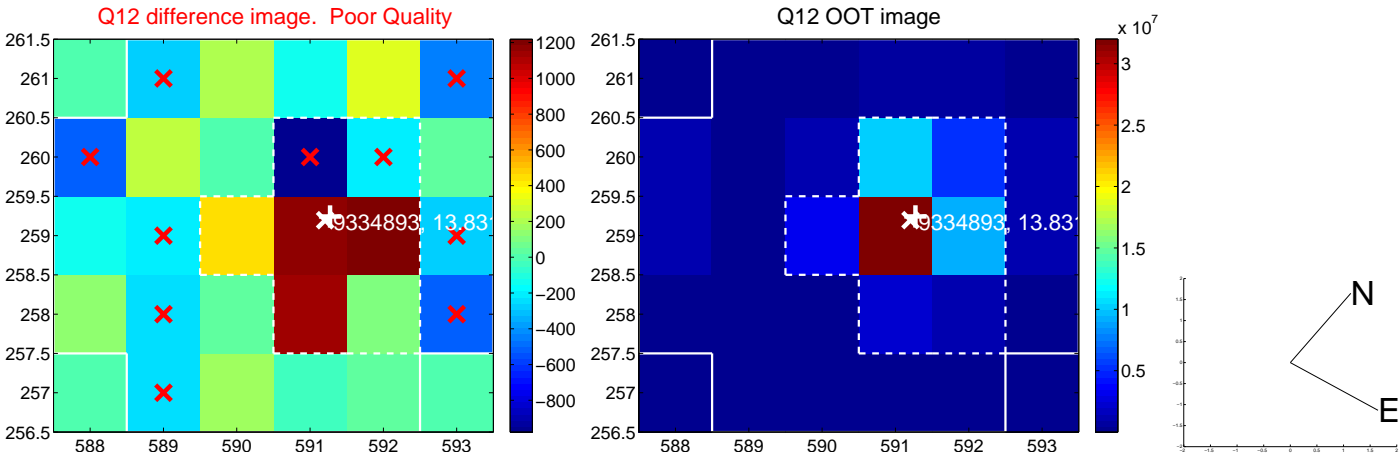
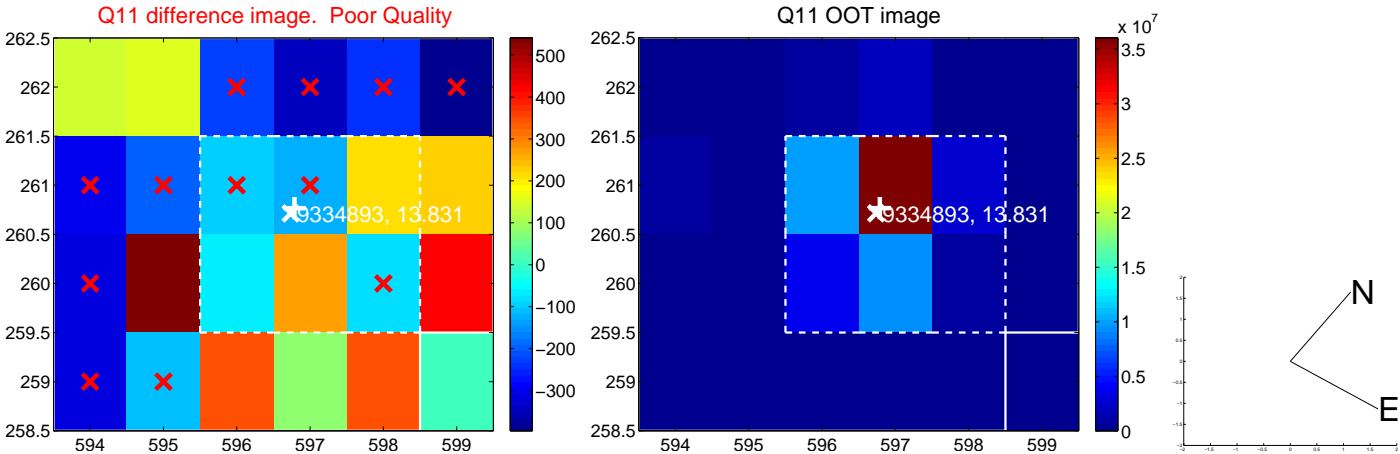
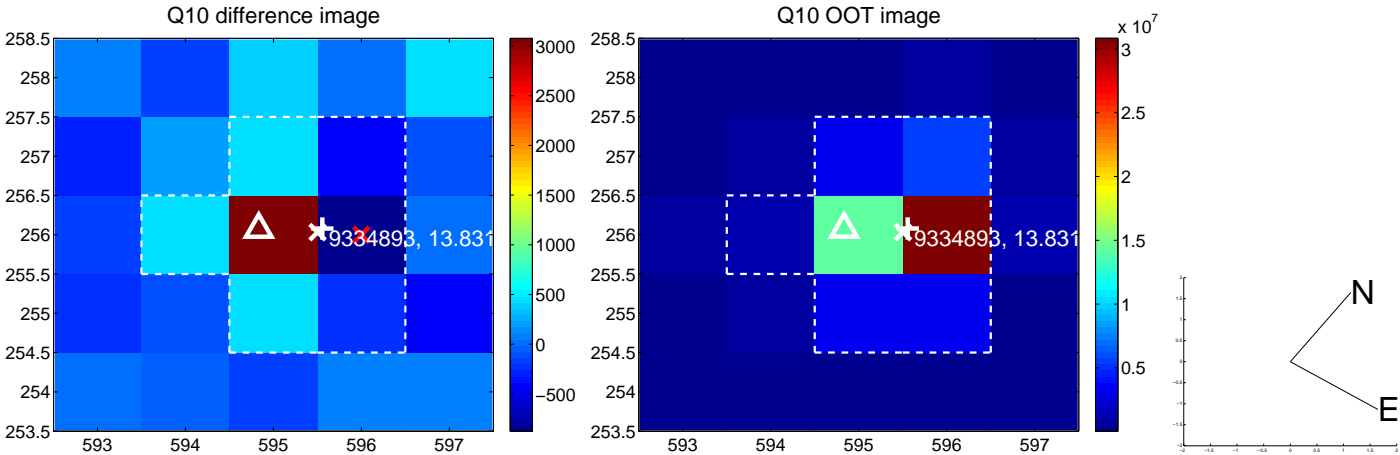
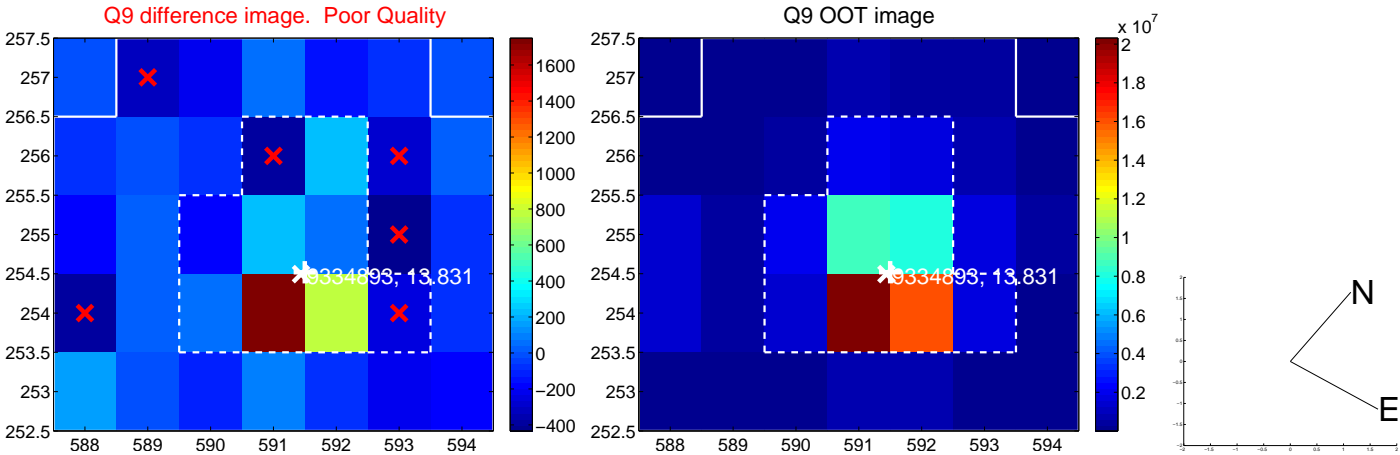
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



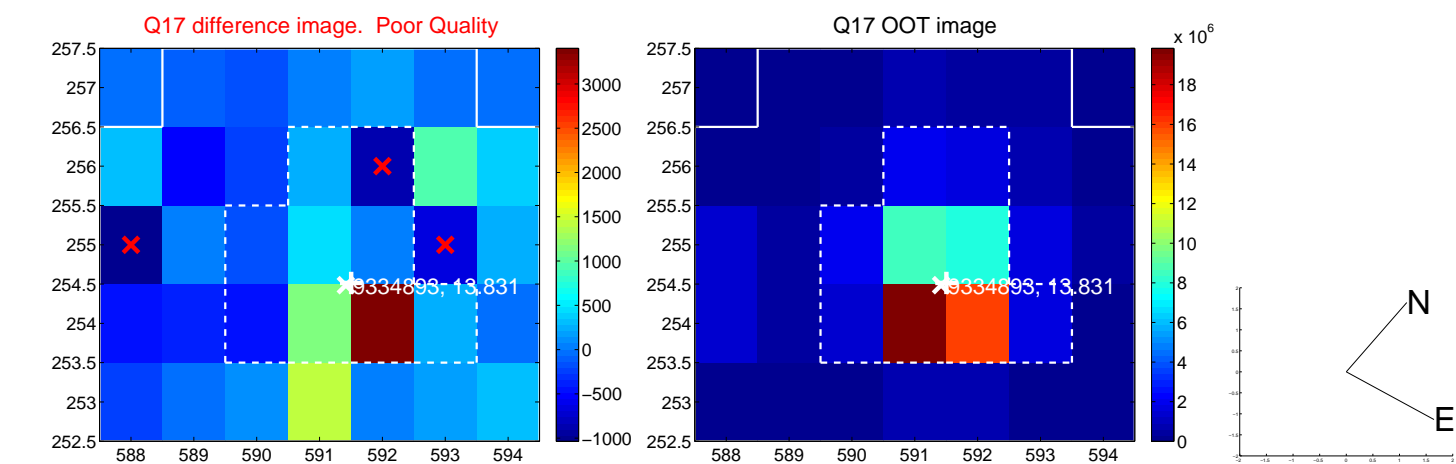
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



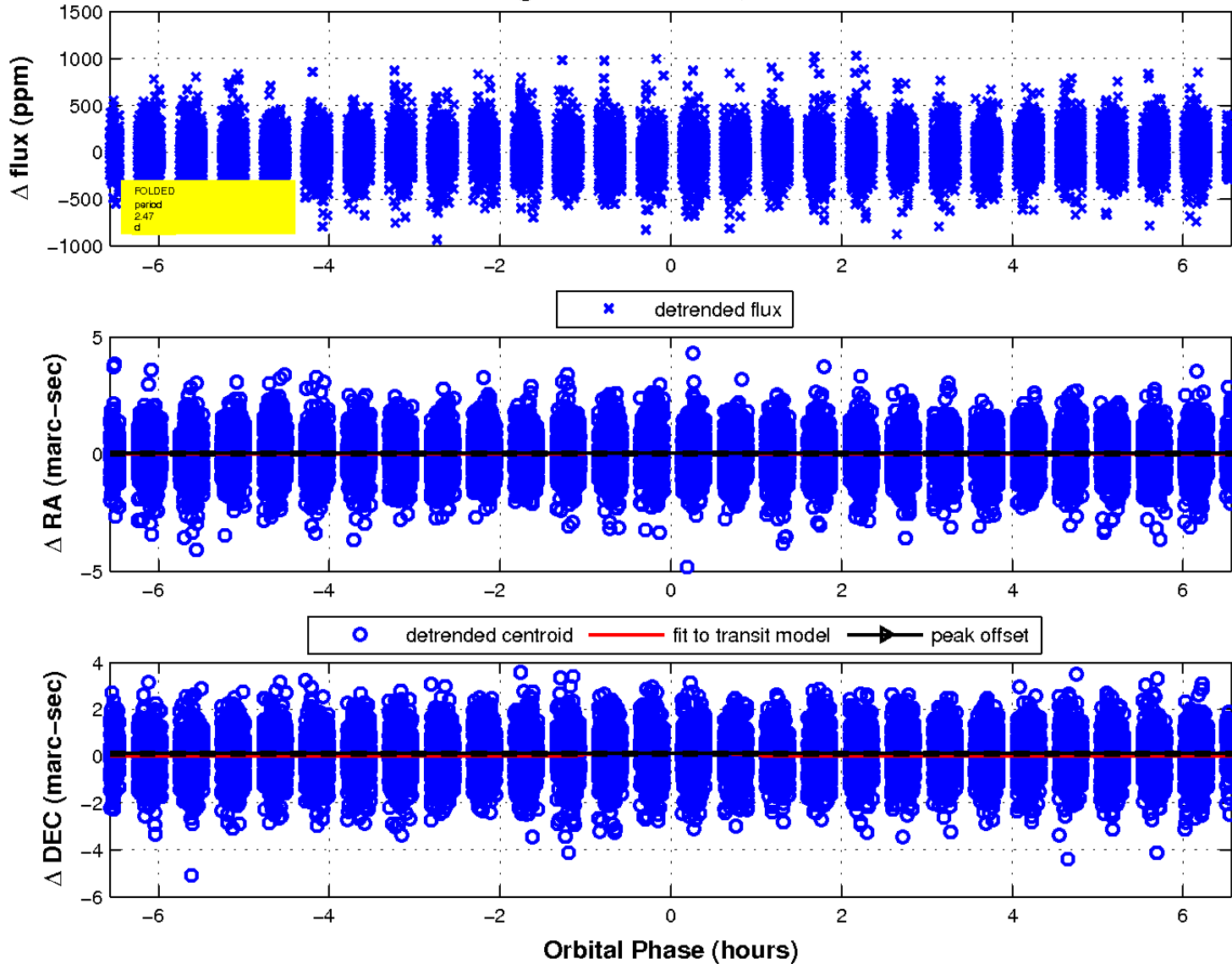
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



This panel shows a deep-field astronomical image of a star field. A blue grid is overlaid on the image, with green numerical labels indicating coordinates. The labels include '52.0', '51.0', '19:13:50.0', '49.0', '48.0', '47.0' along the top edge and '7:40.0', '50.0', '45:48:00.0', '10.0', '20.0', '30.0' along the right edge. The image displays several bright stars against a dark, noisy background.

Declination