

KIC 008247638

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})
008247638-01	OBS	0907.01	16.514084	143.088898	955.4	4.227	43.1	46.7	0.87	5527	2.82	43.66
008247638-02	OBS	0907.02	30.132958	160.250205	972.0	5.190	32.9	35.6	0.87	5527	3.13	19.58
008247638-03	OBS	0907.04	99.641876	198.684349	970.5	4.553	19.4	19.4	0.87	5527	2.85	3.97
008247638-04	OBS	0907.03	4.790886	131.524685	234.9	2.962	16.1	18.2	0.87	5527	1.69	227.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008247638-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-04	OBS	PC	1.00	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.

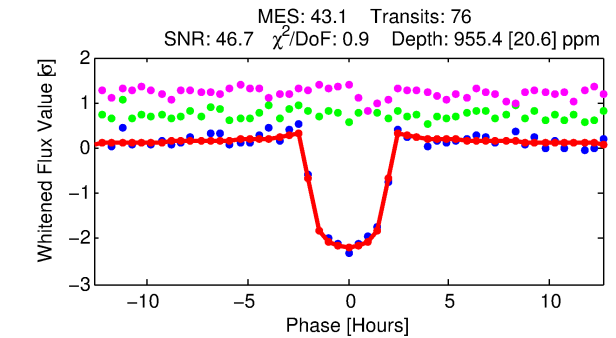
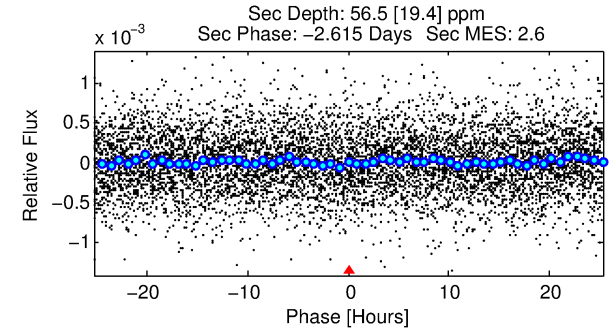
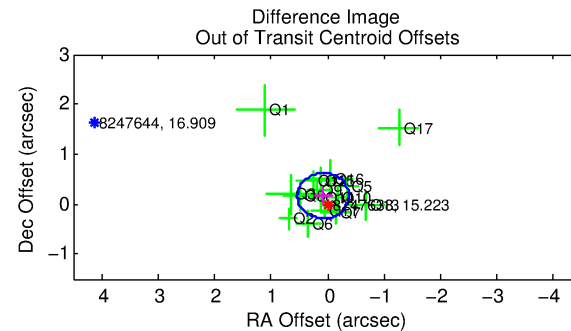
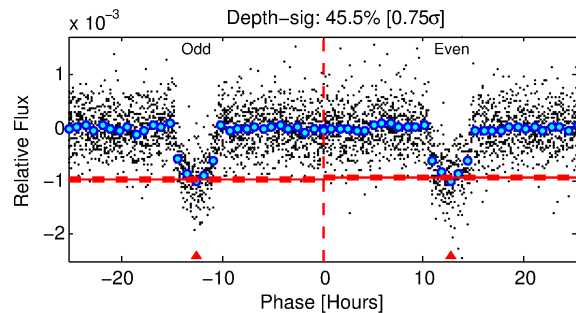
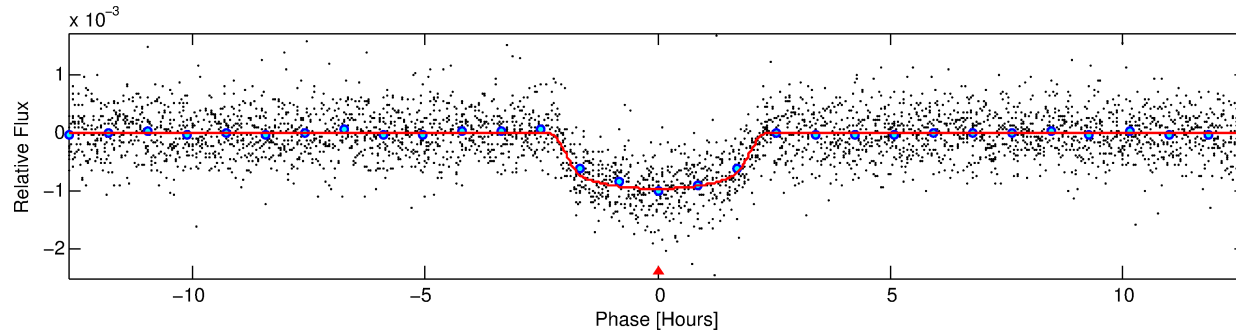
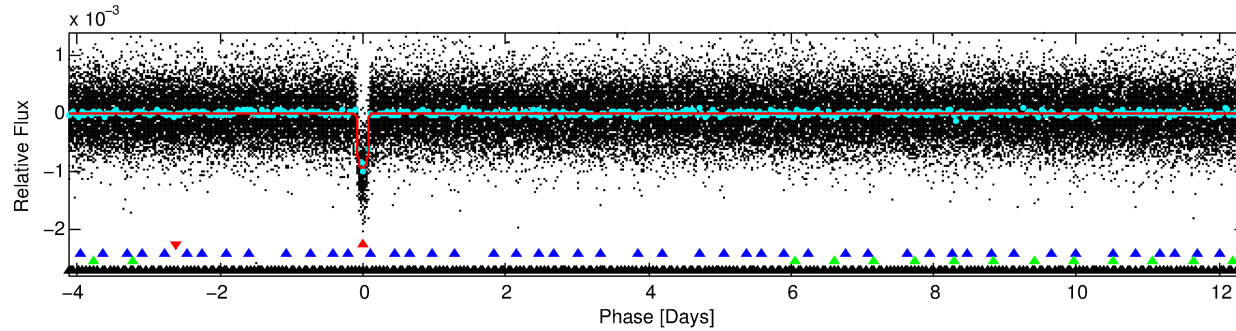
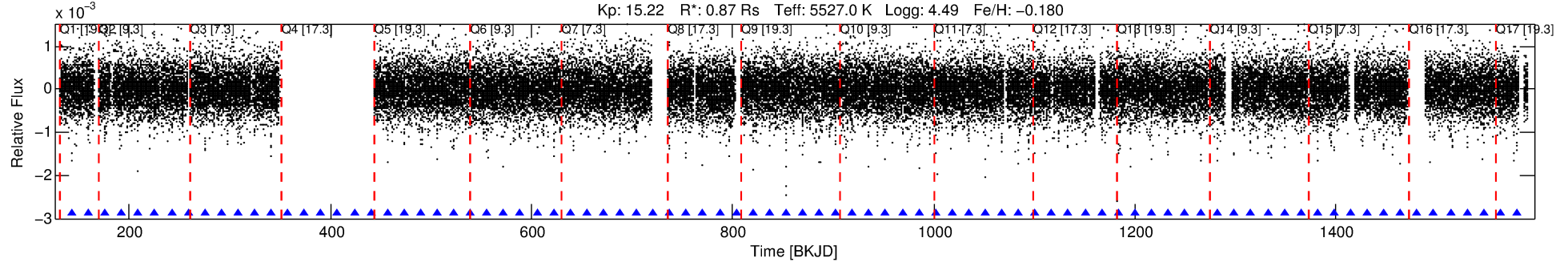
Ephemeris Match Information For 008247638-01

No Significant Match Found

DV One-Page Summary

KIC: 8247638 Candidate: 1 of 4 Period: 16.514 d
KOI: K00907.01 Name: Kepler-251c Corr: 0.987

Kp: 15.22 R*: 0.87 Rs Teff: 5527.0 K Logg: 4.49 Fe/H: -0.180



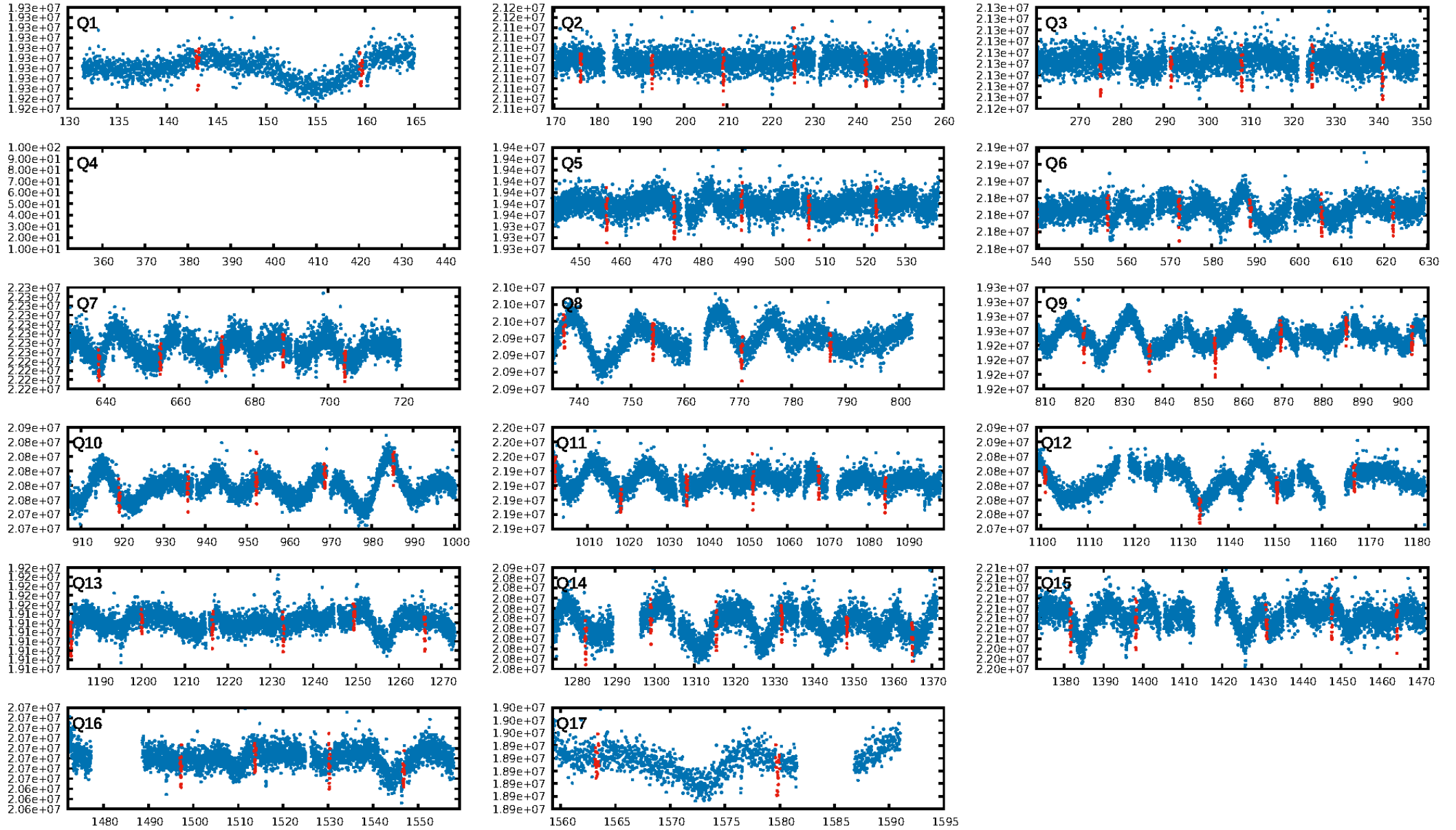
DV Fit Results:

Period = 16.51408 [0.00004] d
Epoch = 143.0889 [0.0018] BKJD
Rp/R* = 0.0298 [0.0062]
a/R* = 23.83 [20.32]
b = 0.65 [0.77]
Seff = 43.66 [6.82]
Teq = 655 [26] K
Rp = 2.82 [0.65] Re
a = 0.1198 [0.0107] AU
Ag = 56.33 [31.21] [1.77σ]
Teffp = 2776 [377] K [5.61σ]

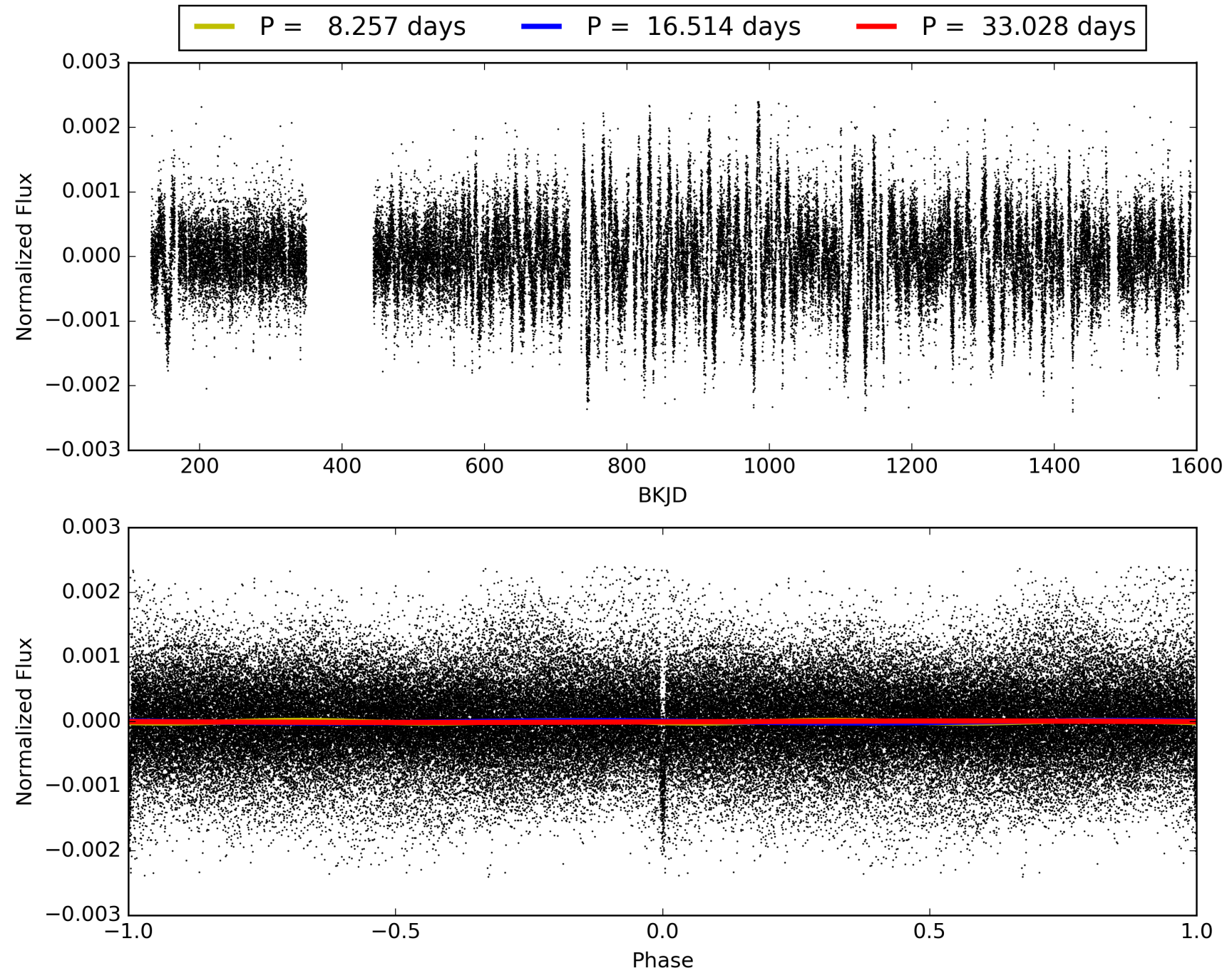
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.52σ]
LongPeriod-sig: 100.0% [48.83σ]
ModelChiSquare2-sig: 97.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [72/72]
GhostDiagnostic-chr: 7.486
Centroid-sig: 29.8%
Centroid-so: 0.153 arcsec [0.64σ]
OotOffset-rm: 0.183 arcsec [1.21σ]
KicOffset-rm: 0.071 arcsec [0.47σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 008247638-01, PDC Light Curves

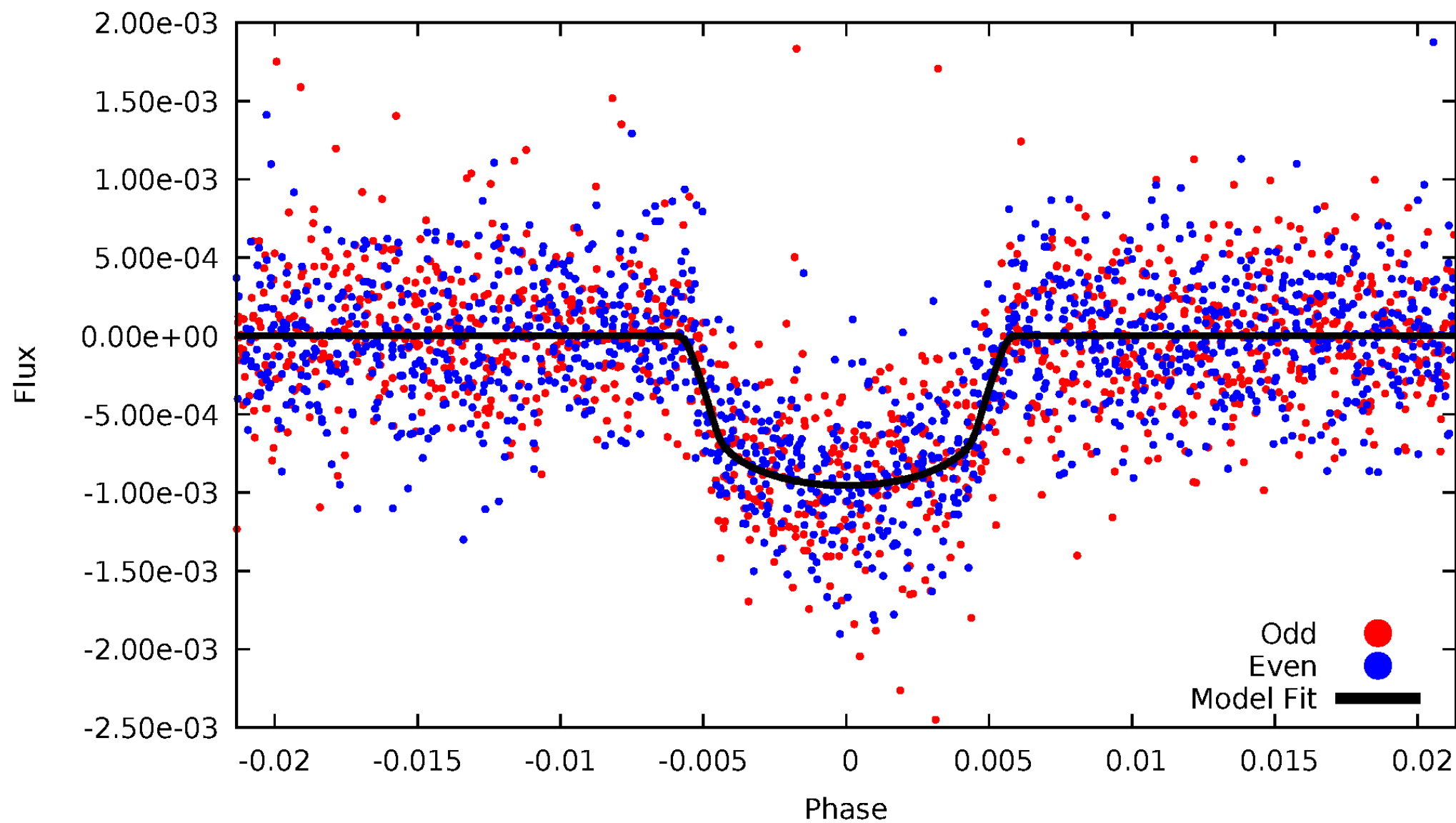


TCE 008247638-01



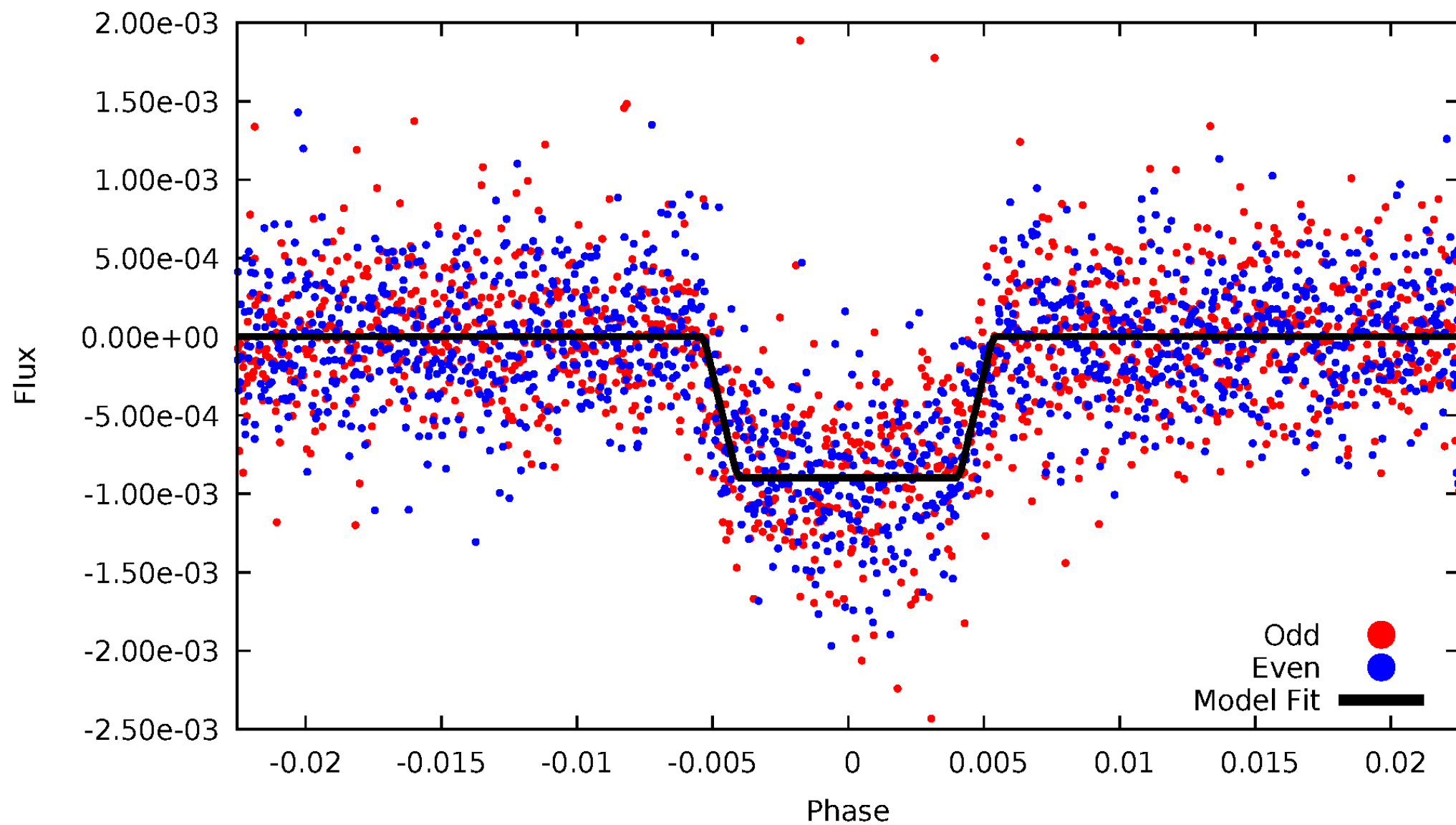
DV Odd/Even

TCE 008247638-01



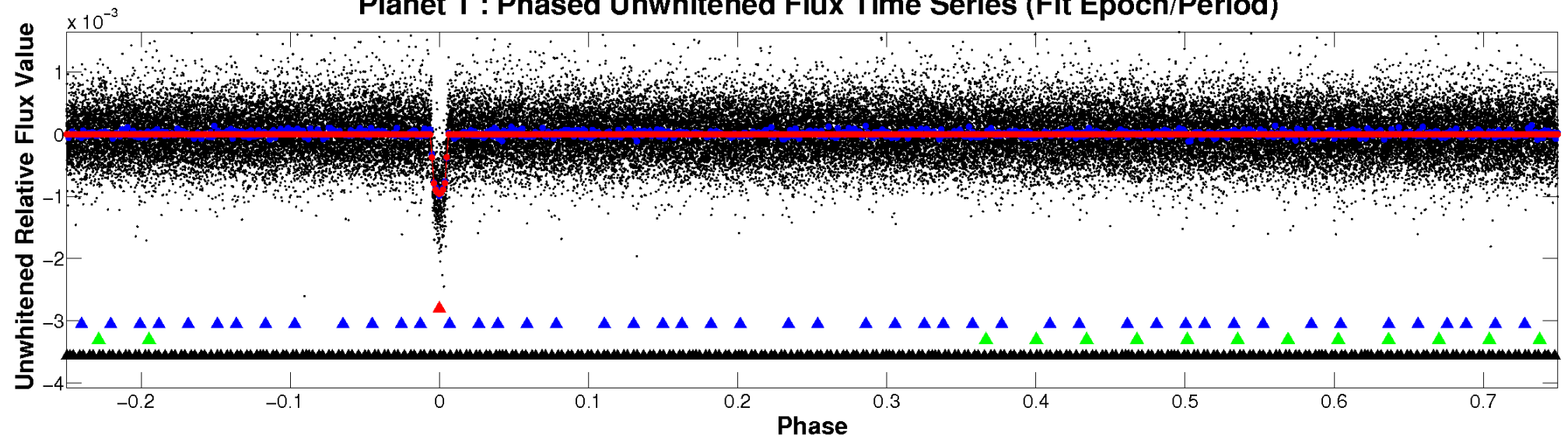
ALT Odd/Even

TCE 008247638-01

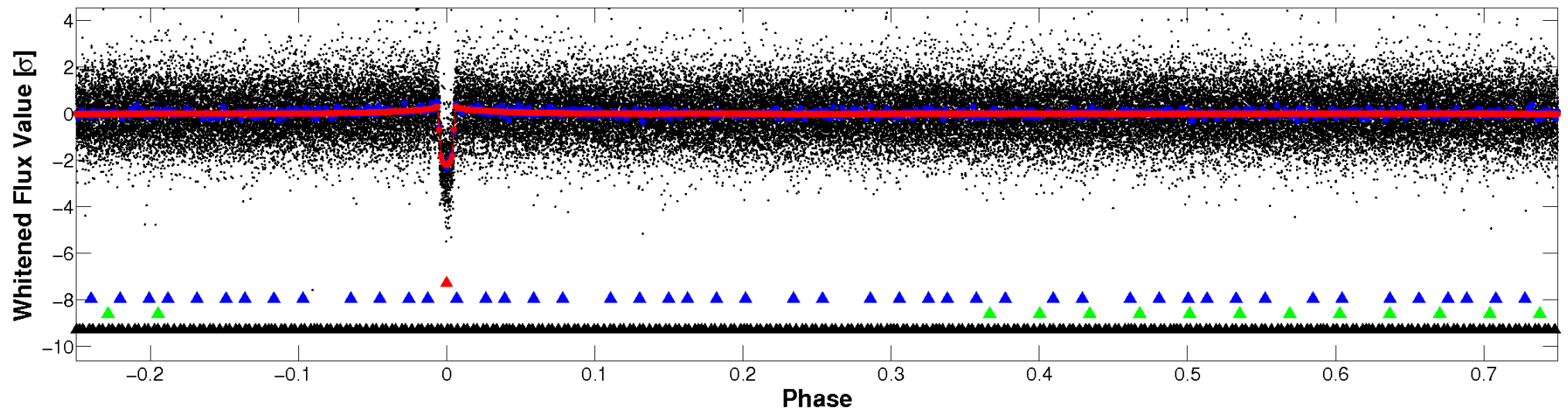


Non-Whitened Vs. Whitened Light Curve

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

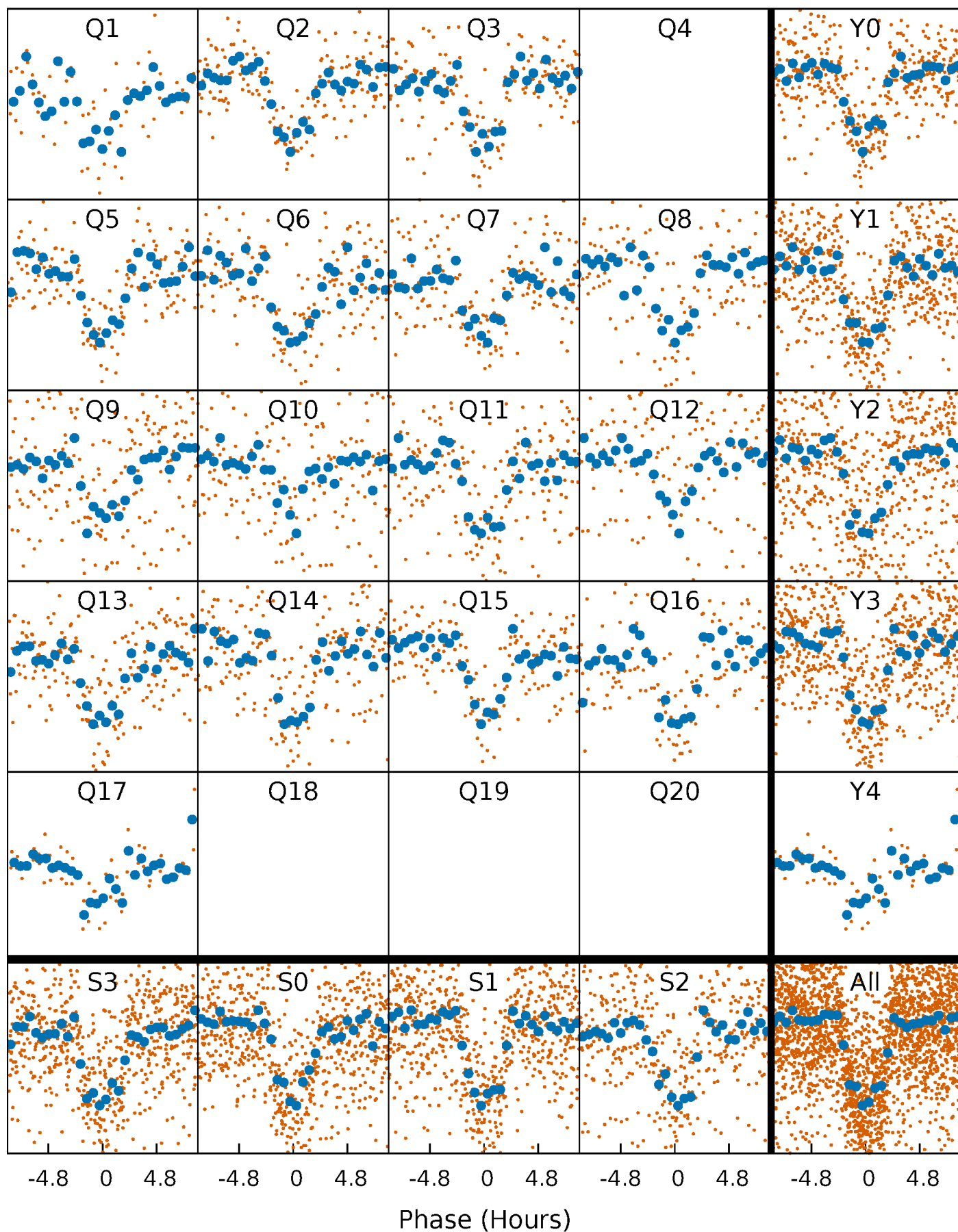


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



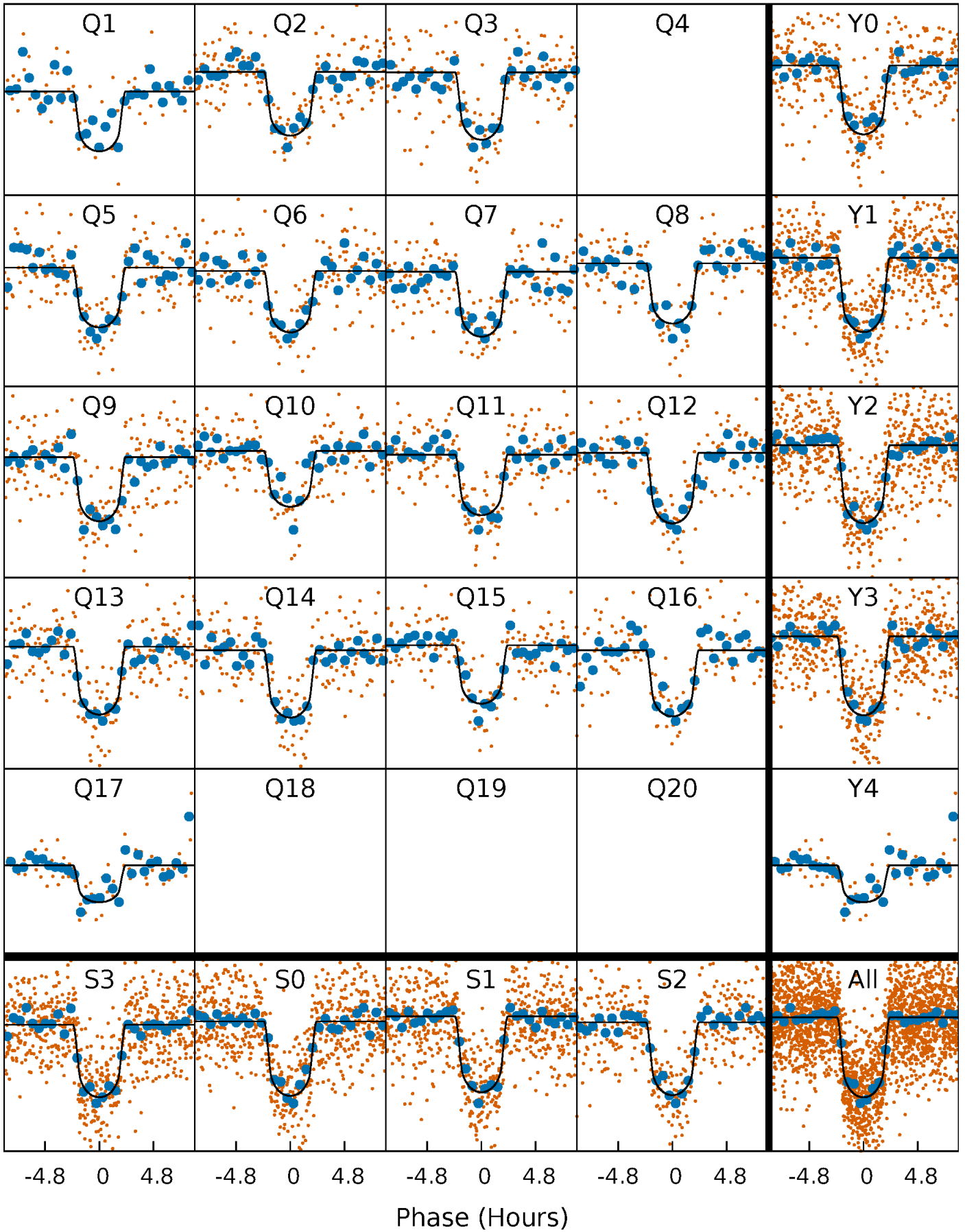
PDC Quarter-Phased Transit Curves

TCE 008247638-01 P= 16.514084 Days $T_0=143.088898$ (BKJD)



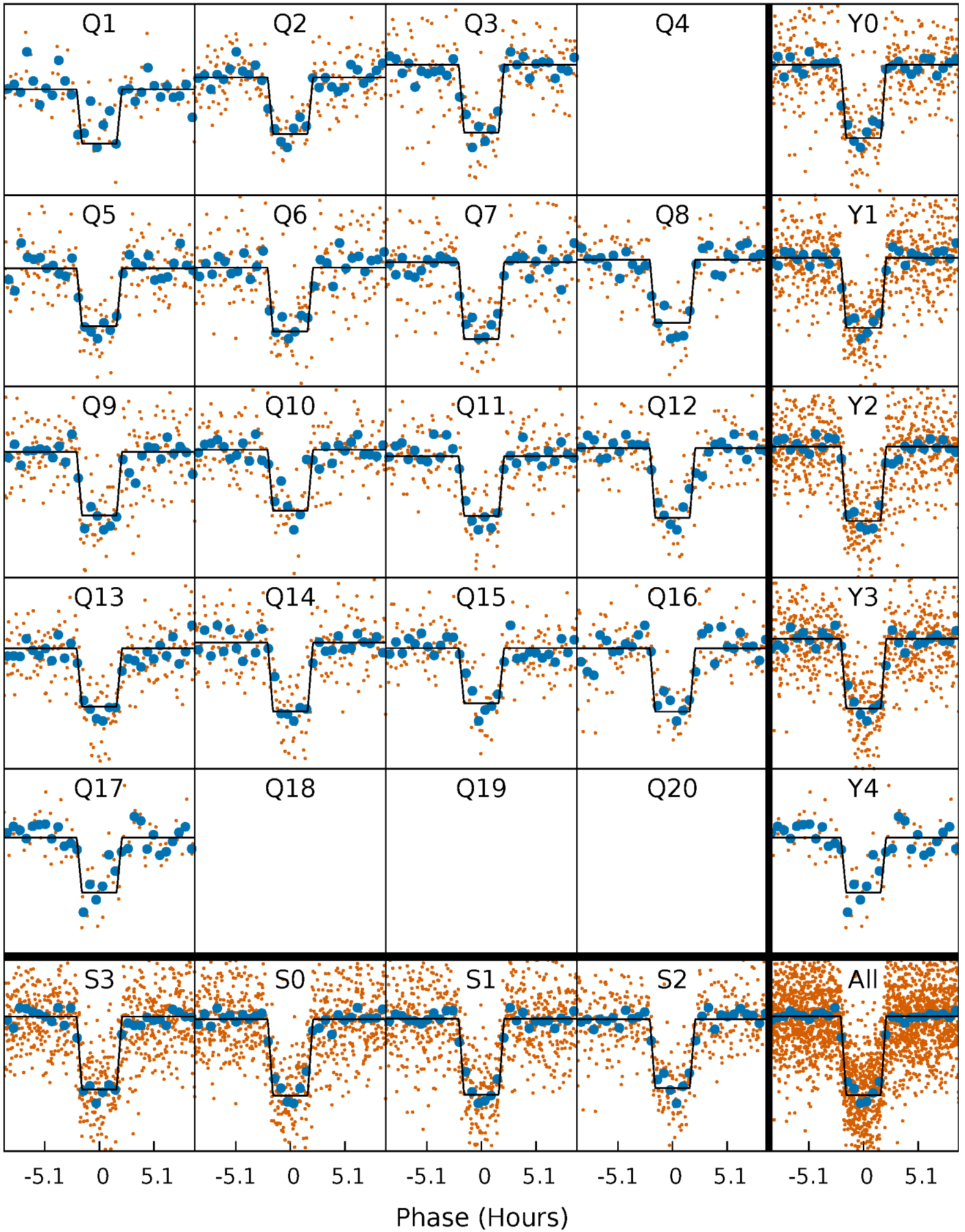
DV Quarter-Phased Transit Curves

TCE 008247638-01 P= 16.514084 Days $T_0=143.088898$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

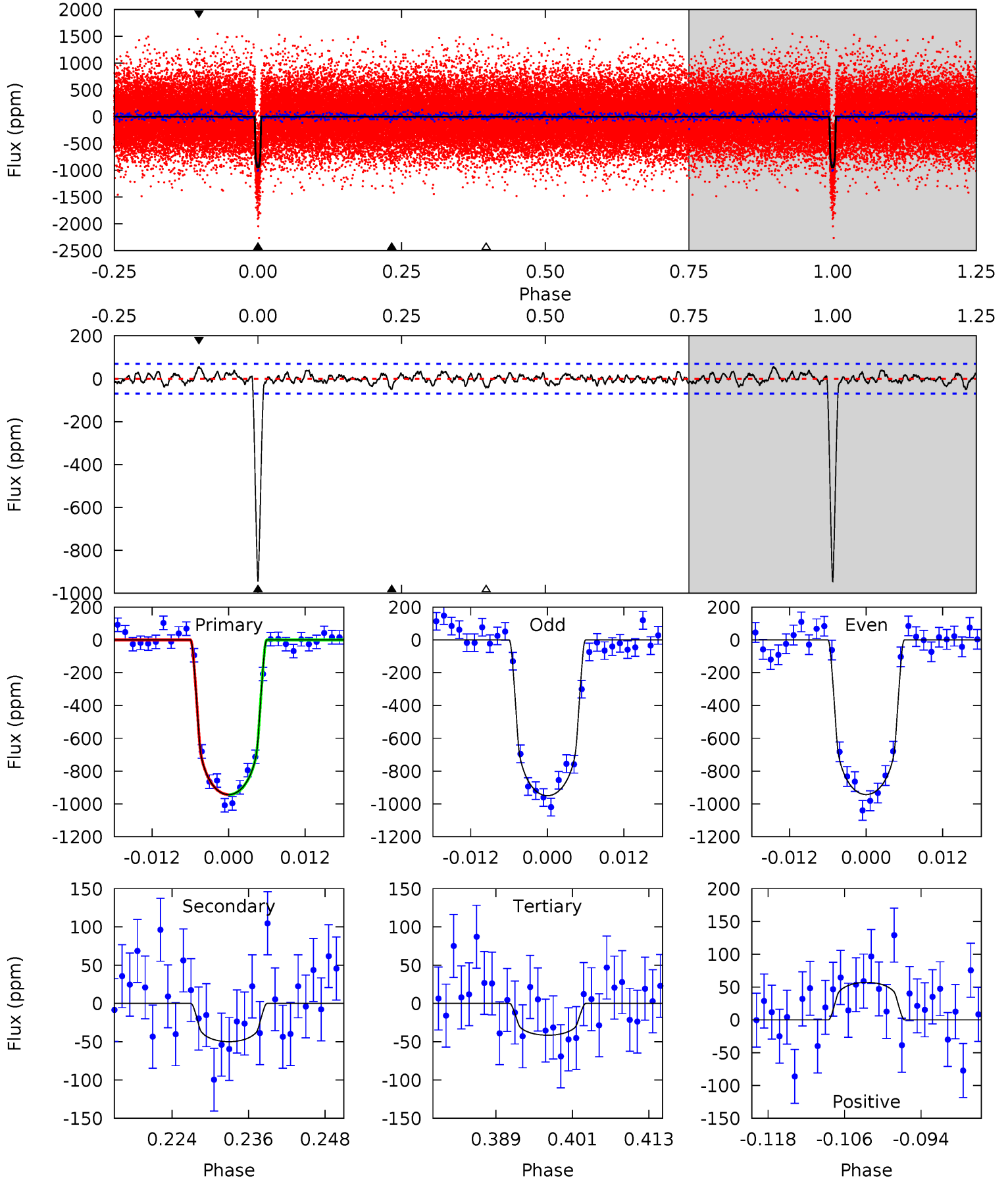
TCE 008247638-01 P= 16.513949 Days $T_0=143.096029$ (BKJD)



DV Model-Shift Uniqueness Test

008247638-01, P = 16.514084 Days, E = 126.574814 Days

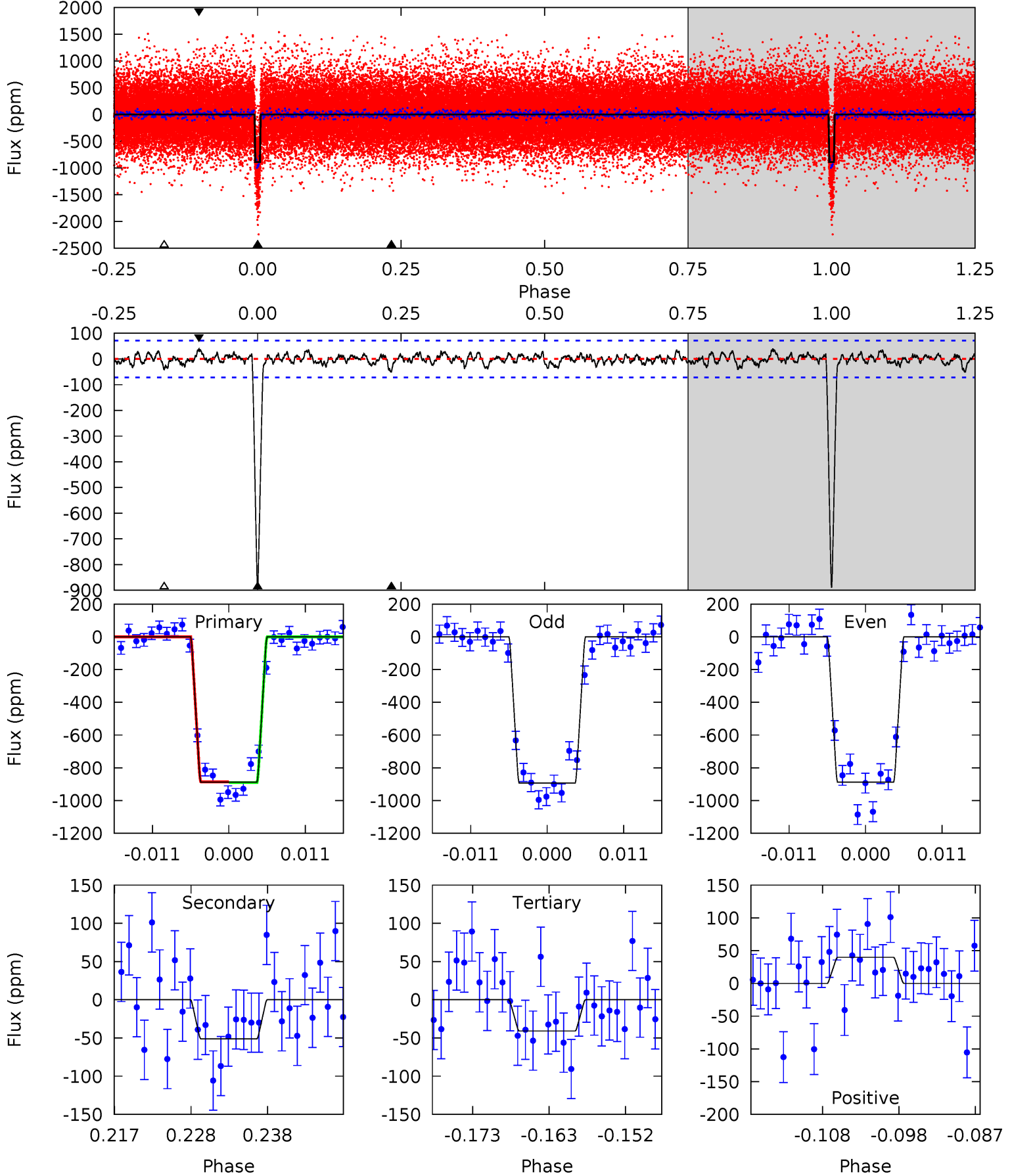
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
67.6	3.58	2.97	4.10	4.99	2.52	1.16	64.7	63.5	0.61	-0.52	0.25	0.98	0.06	0.05



Alt Model-Shift Uniqueness Test

008247638-01, P = 16.513949 Days, E = 126.582080 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
61.9	3.57	2.85	2.77	5.01	2.55	0.98	59.1	59.1	0.72	0.79	0.19	0.97	0.04	0.16



Stellar Parameters For KIC 008247638

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5527^{+111}_{-111}	$4.488^{+0.075}_{-0.075}$	$-0.180^{+0.150}_{-0.150}$	$0.866^{+0.089}_{-0.074}$	$0.841^{+0.060}_{-0.043}$	$1.824^{+0.471}_{-0.447}$
	+2%/-2%	+2%/-2%	+83%/-83%	+10%/-9%	+7%/-5%	+26%/-25%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008247638-01 / KOI 0907.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-50 ± 14	$2.81^{+0.61}_{-0.53}$	916^{+34}_{-30}	3253^{+256}_{-240}	50^{+31}_{-19}
Alt.	-51 ± 14	$2.81^{+0.66}_{-0.62}$	914^{+34}_{-30}	3272^{+268}_{-251}	51^{+36}_{-21}

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

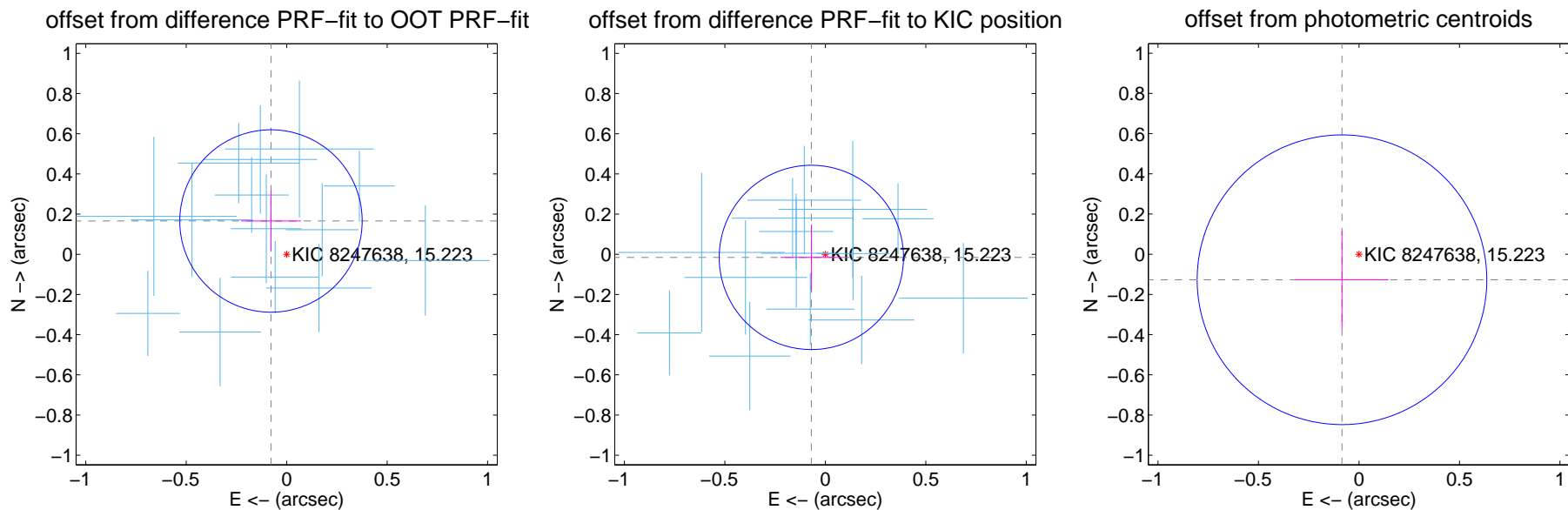
DV Centroid Data

Supplemental centroid analysis for 008247638-01. Kepler magnitude: 15.22. Transit SNR 46.68

There are 16 quarters with good PRF difference image offsets

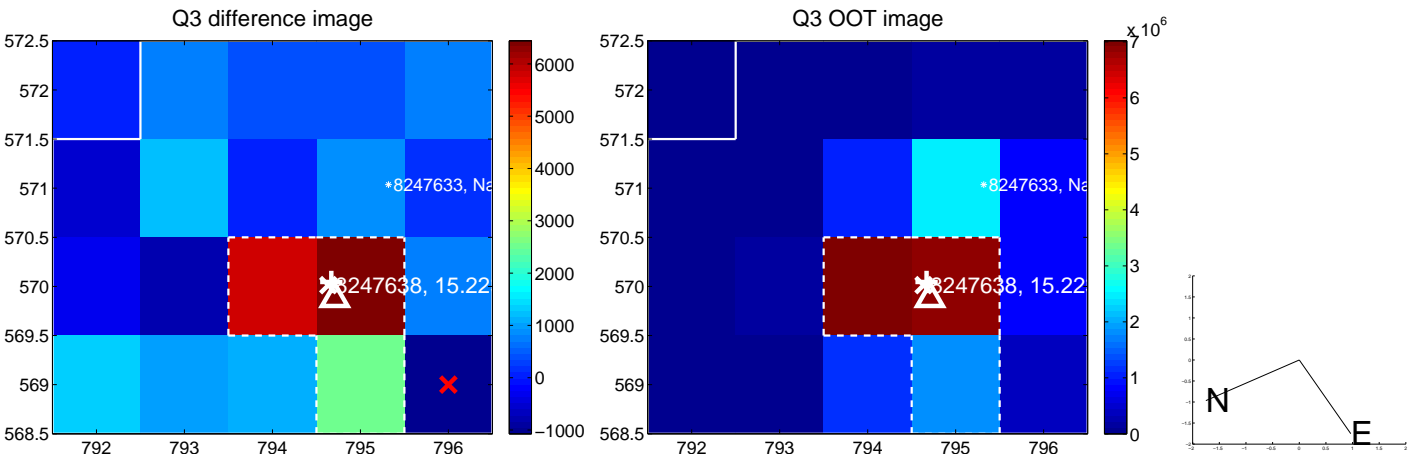
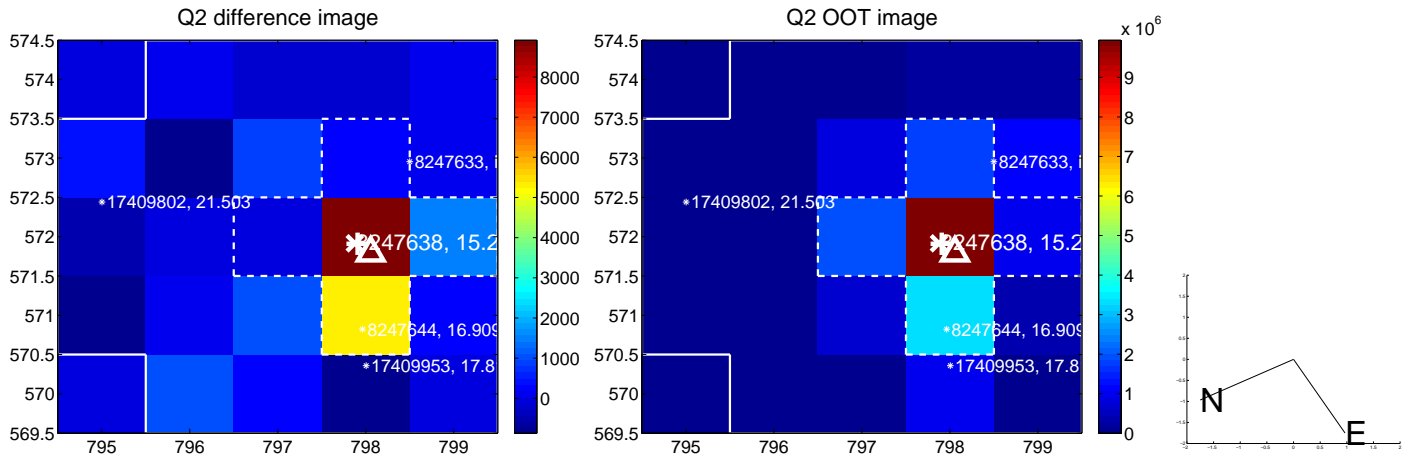
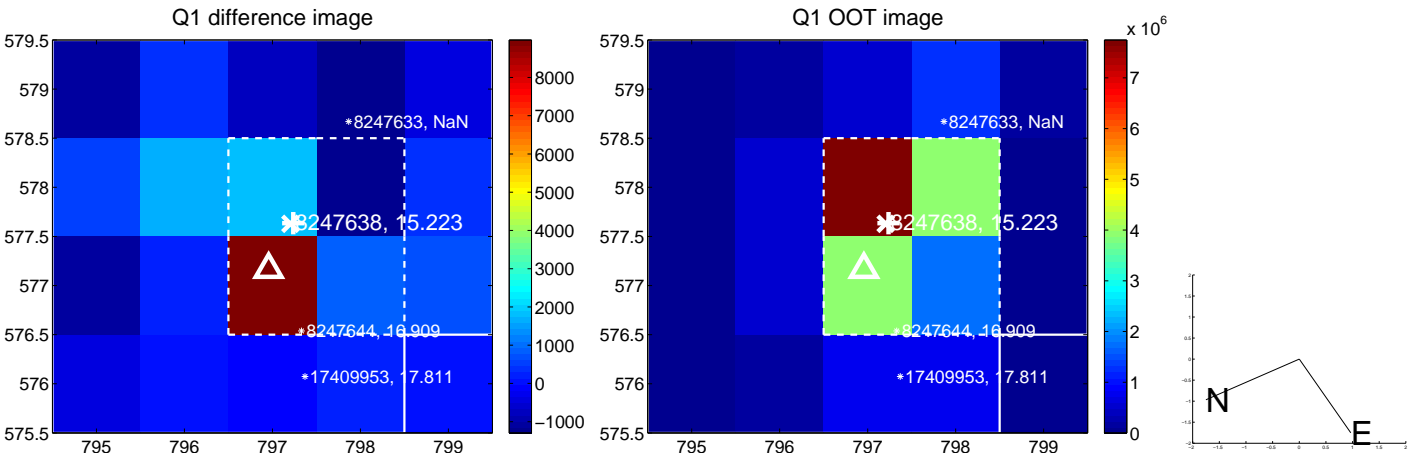
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.183 ± 0.151	1.21	0.078 ± 0.149	0.166 ± 0.153
PRF-fit source offset from KIC position	0.071 ± 0.153	0.47	0.070 ± 0.153	-0.016 ± 0.163
photometric centroid source offset	0.15 ± 0.24	0.64	0.08 ± 0.23	-0.13 ± 0.24

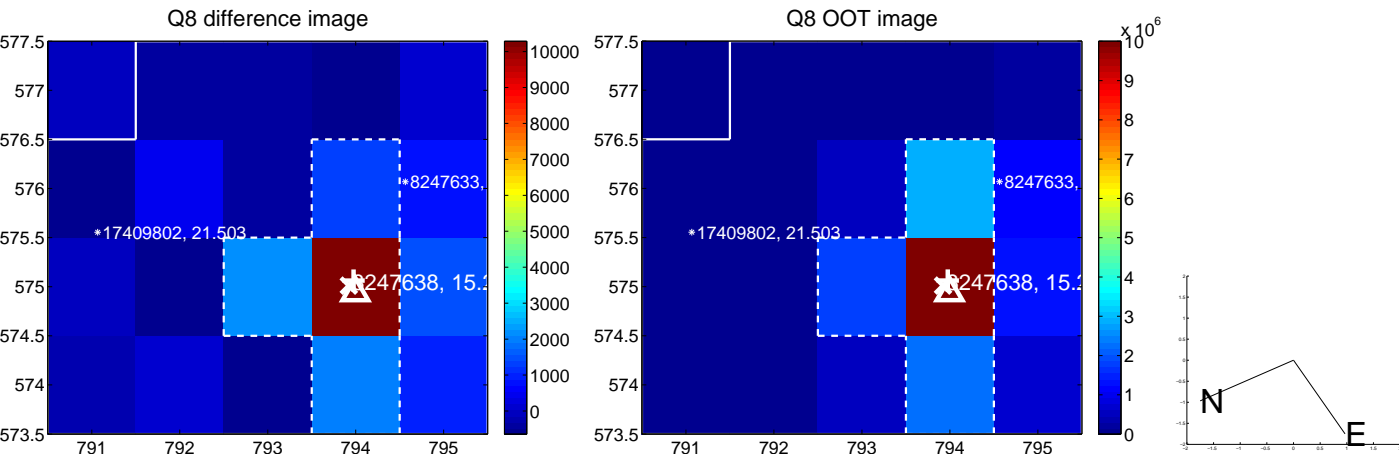
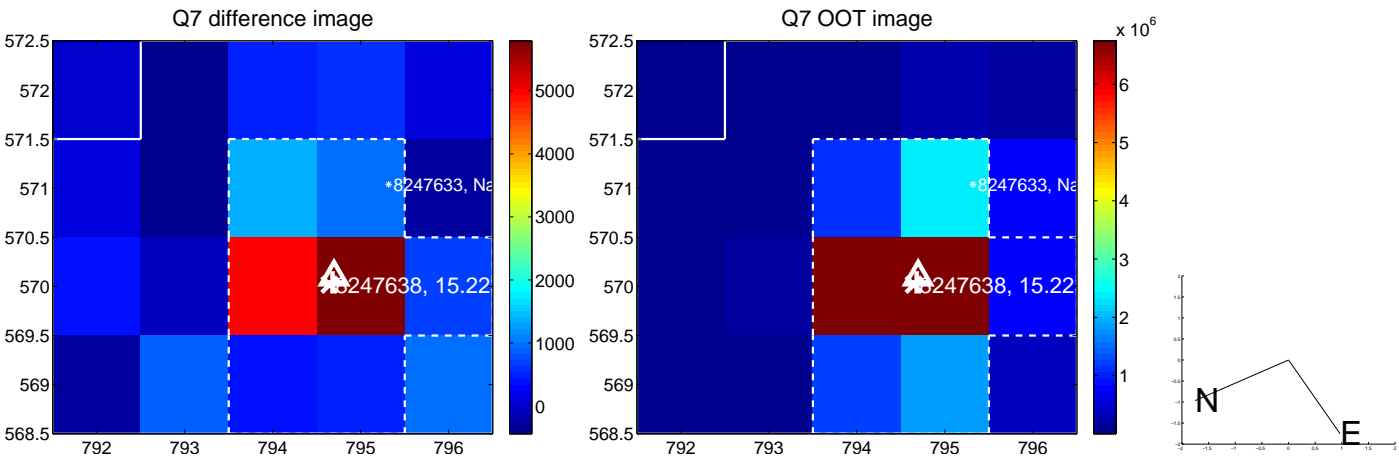
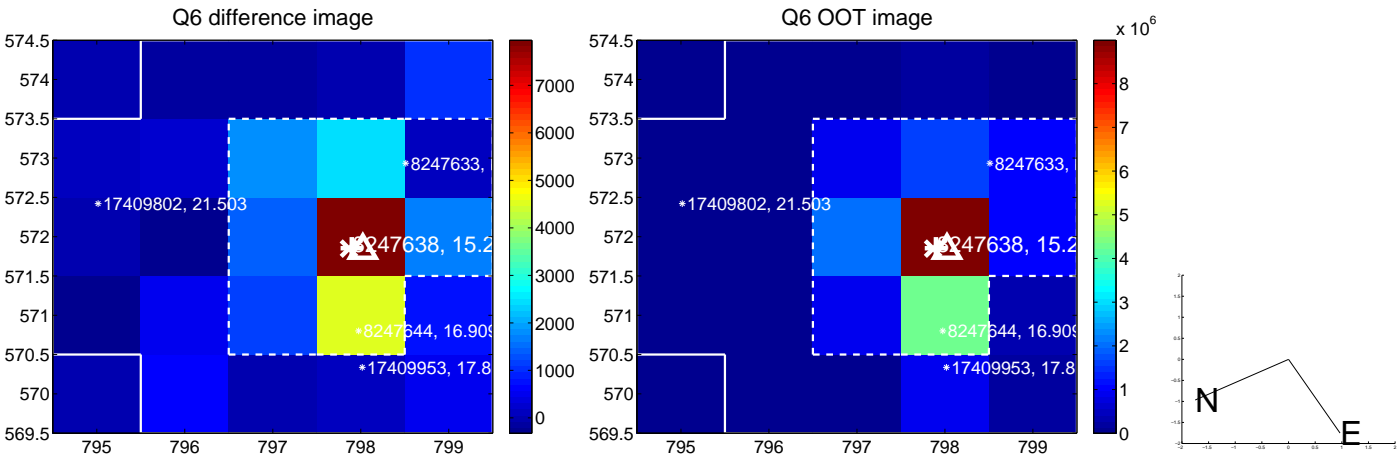
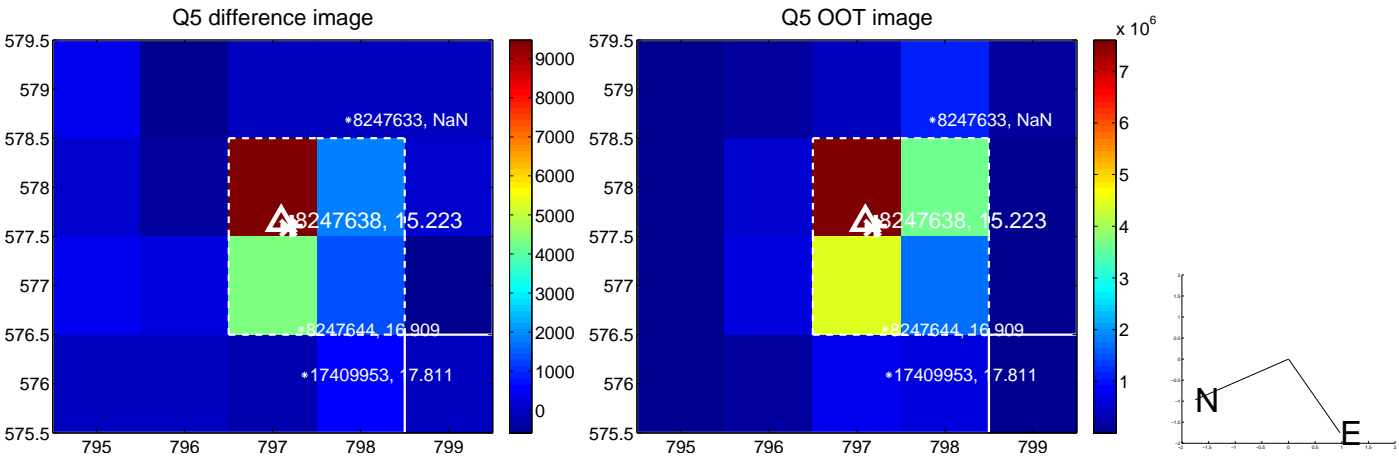


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

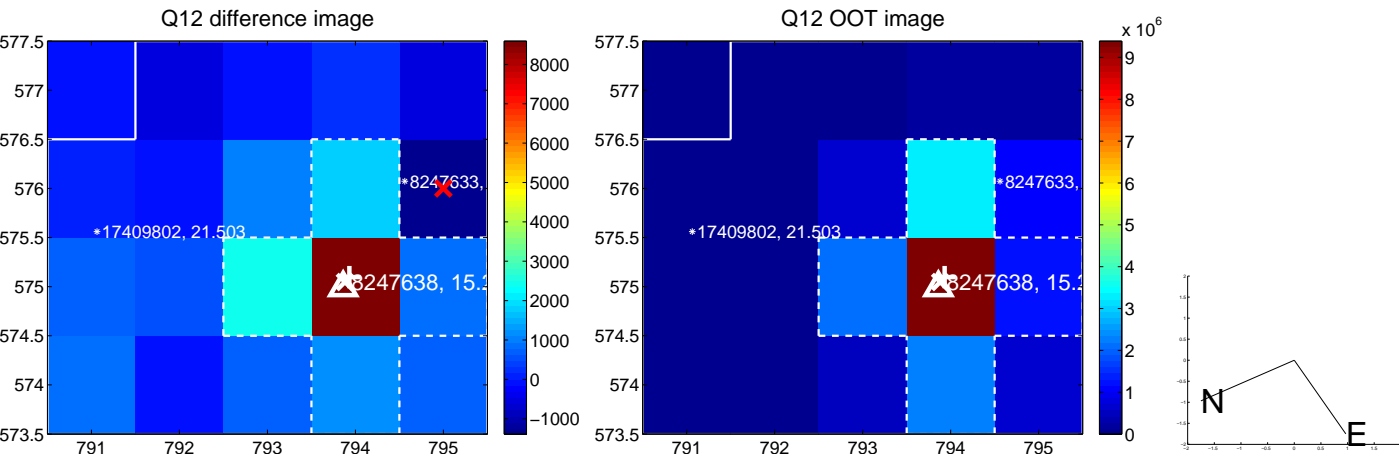
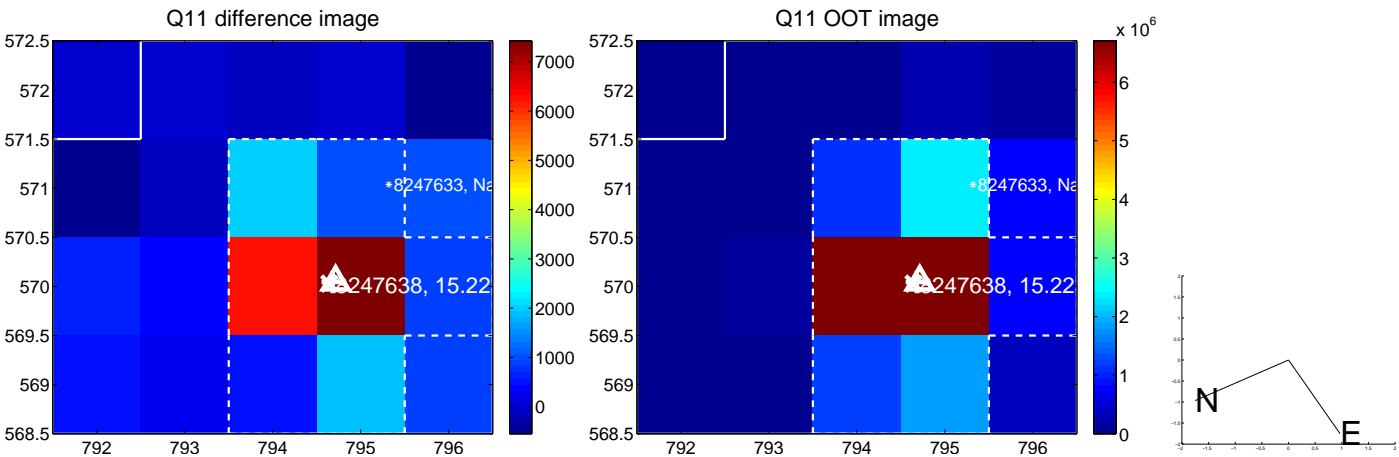
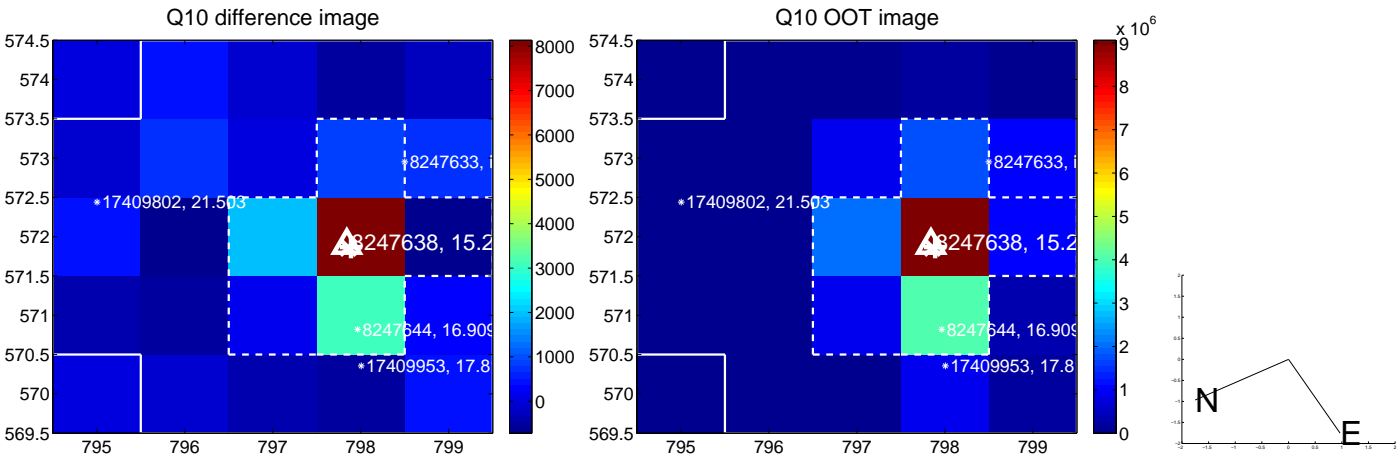
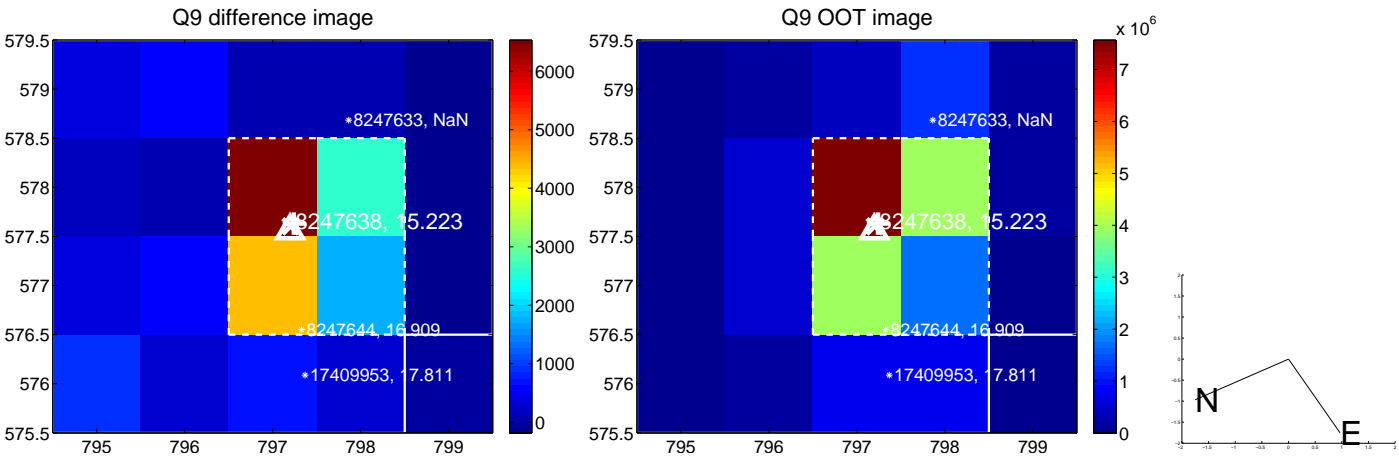
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



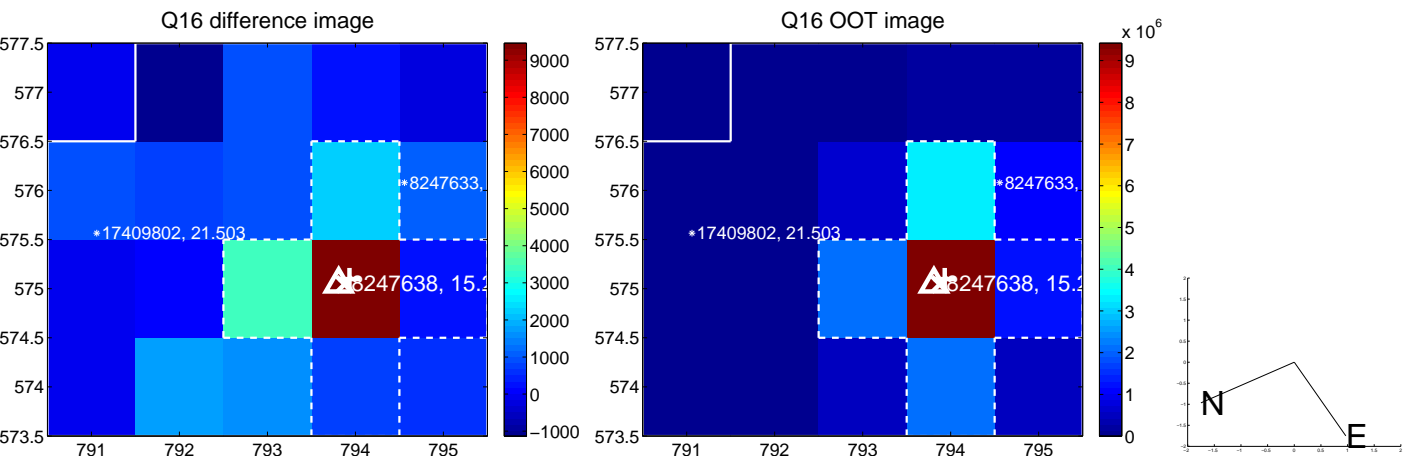
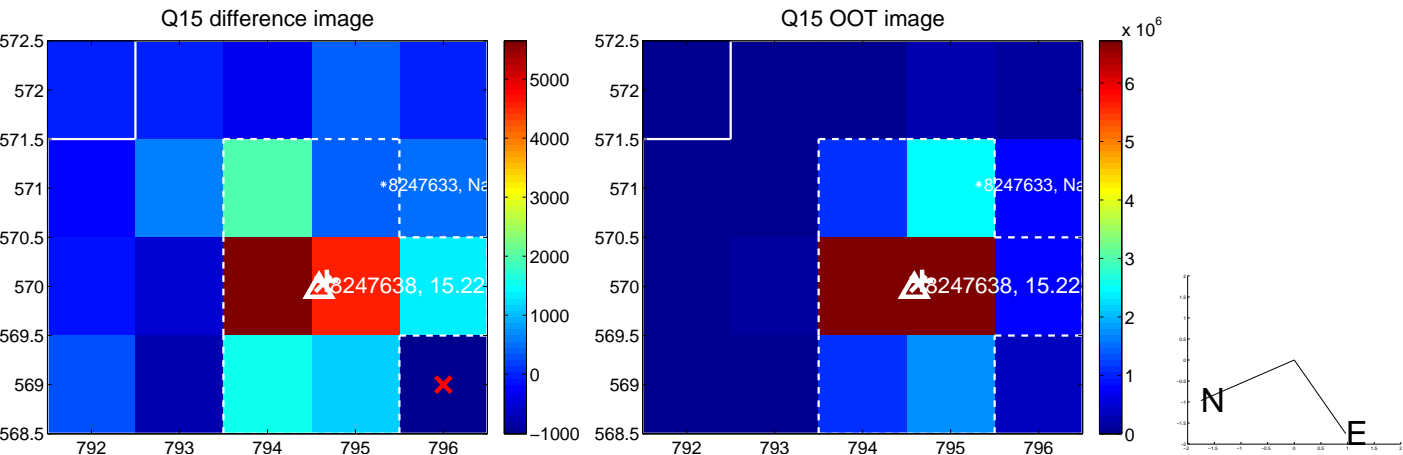
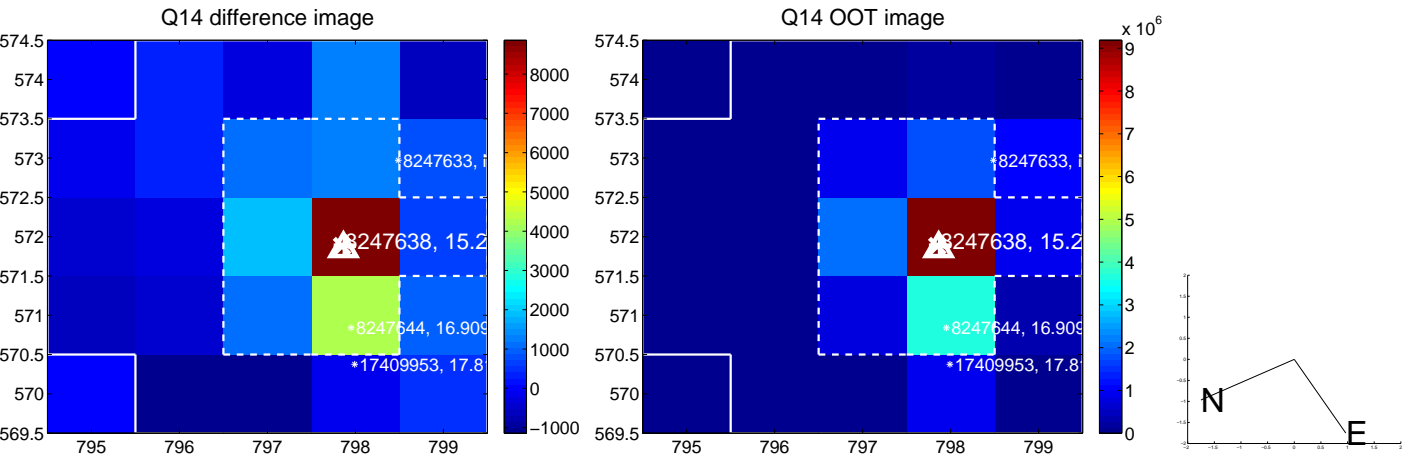
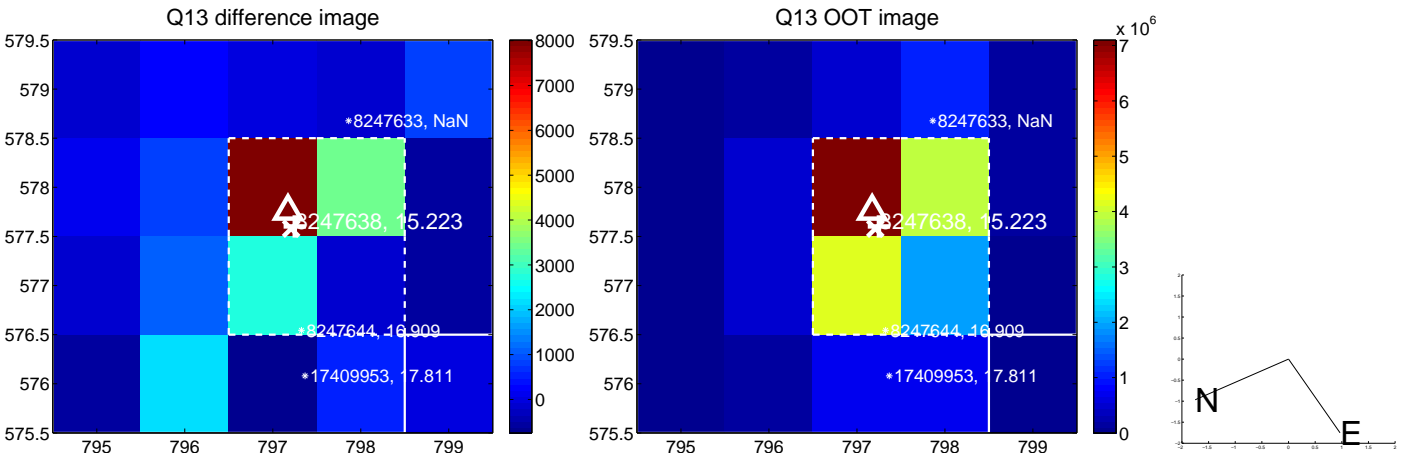
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



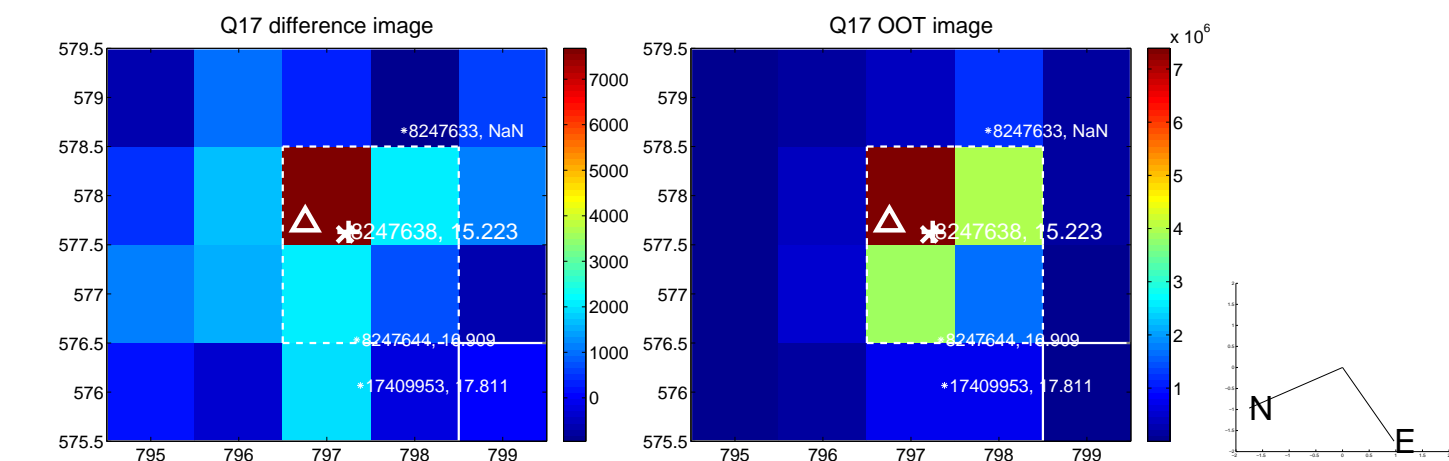
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



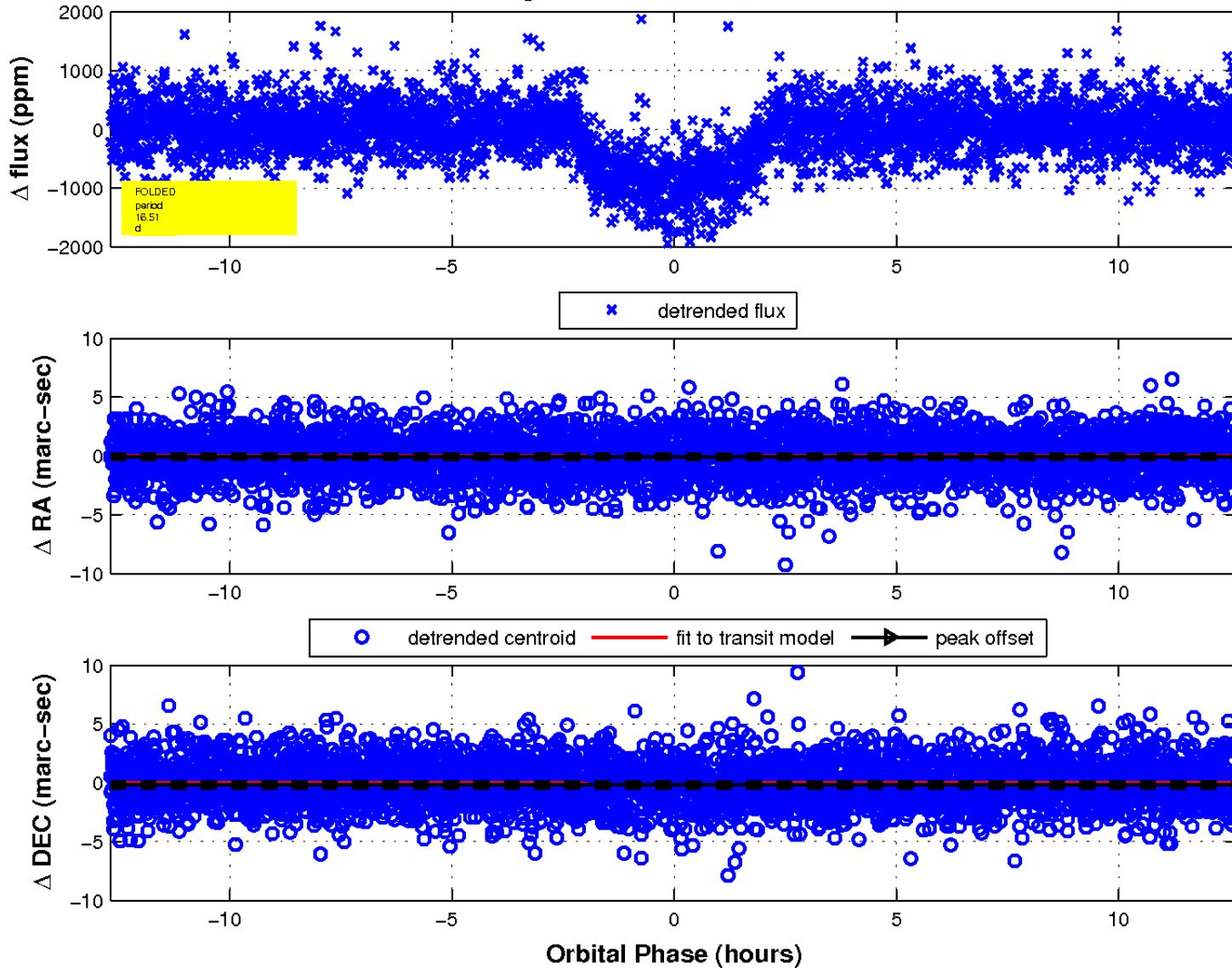
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



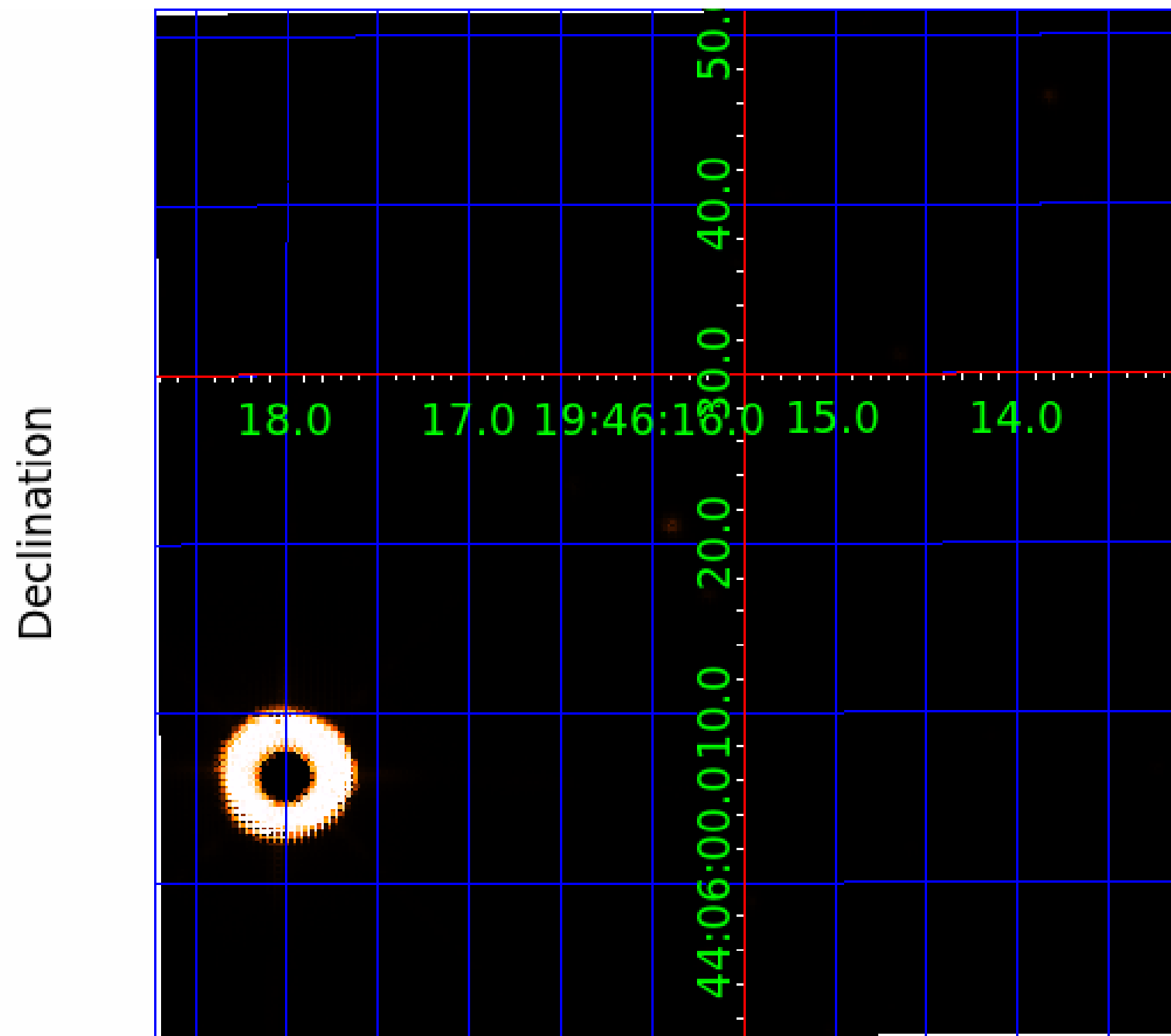
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



KIC 008247638

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})
008247638-01	OBS	0907.01	16.514084	143.088898	955.4	4.227	43.1	46.7	0.87	5527	2.82	43.66
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008247638-03	OBS	0907.04	99.641876	198.684349	970.5	4.553	19.4	19.4	0.87	5527	2.85	3.97
008247638-04	OBS	0907.03	4.790886	131.524685	234.9	2.962	16.1	18.2	0.87	5527	1.69	227.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008247638-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-04	OBS	PC	1.00	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.

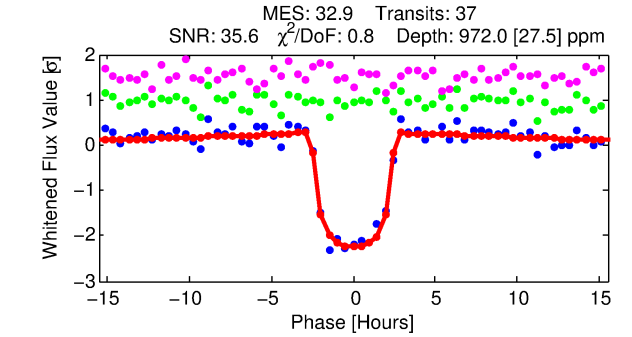
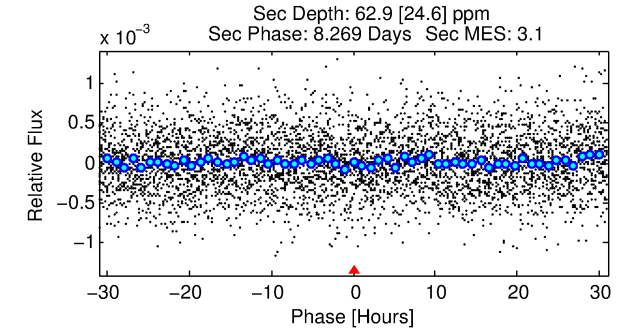
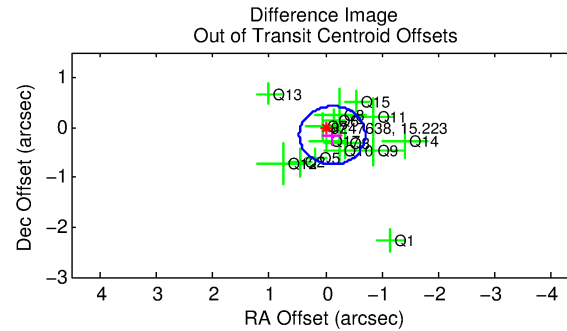
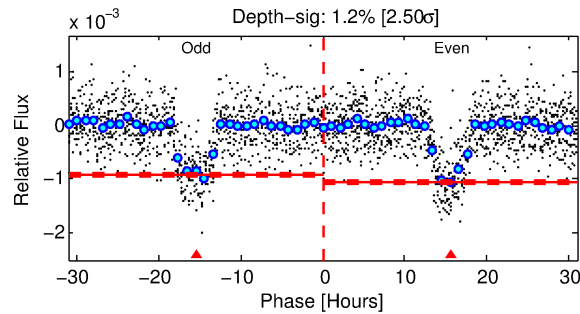
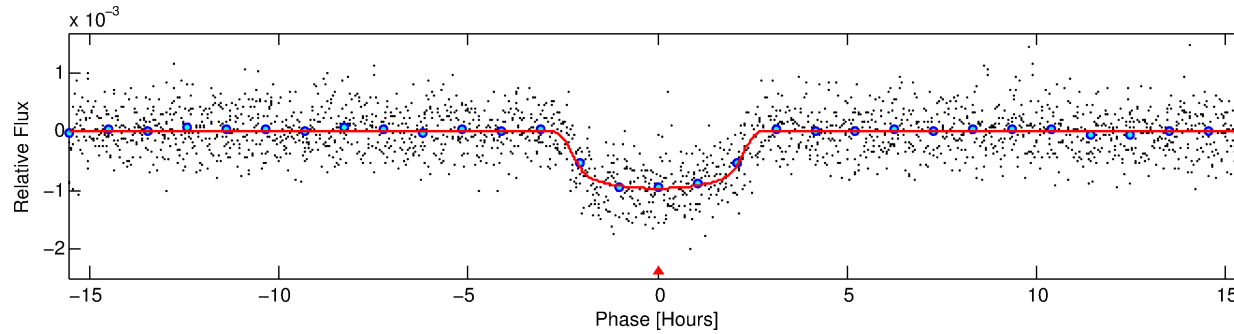
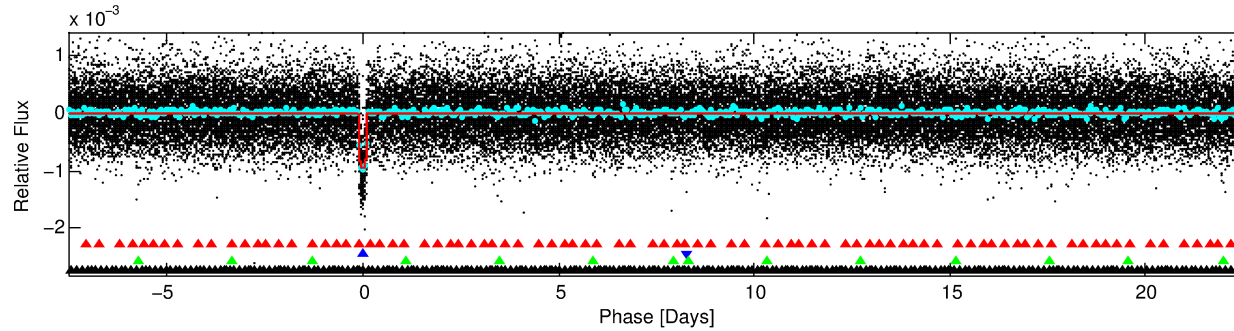
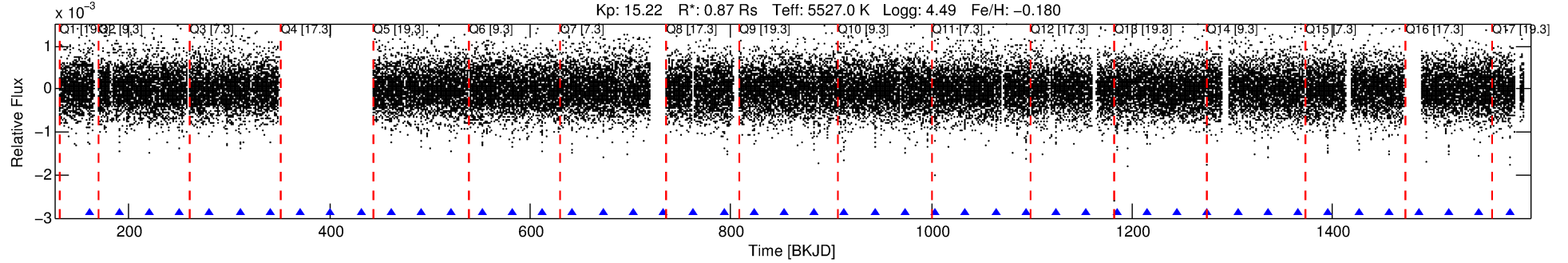
Ephemeris Match Information For 008247638-02

No Significant Match Found

DV One-Page Summary

KIC: 8247638 Candidate: 2 of 4 Period: 30.133 d
KOI: K00907.02 Name: Kepler-251d Corr: 0.997

Kp: 15.22 R*: 0.87 Rs Teff: 5527.0 K Logg: 4.49 Fe/H: -0.180



DV Fit Results:

Period = 30.13296 [0.00010] d
Epoch = 160.2502 [0.0028] BKJD
Rp/R* = 0.0332 [0.0018]
a/R* = 24.89 [5.63]
b = 0.87 [0.07]
Seff = 19.58 [3.06]
Teq = 536 [21] K
Rp = 3.14 [0.37] Re
a = 0.1790 [0.0160] AU
Ag = 112.75 [48.31] [2.31σ]
Teffp = 2702 [280] K [7.71σ]

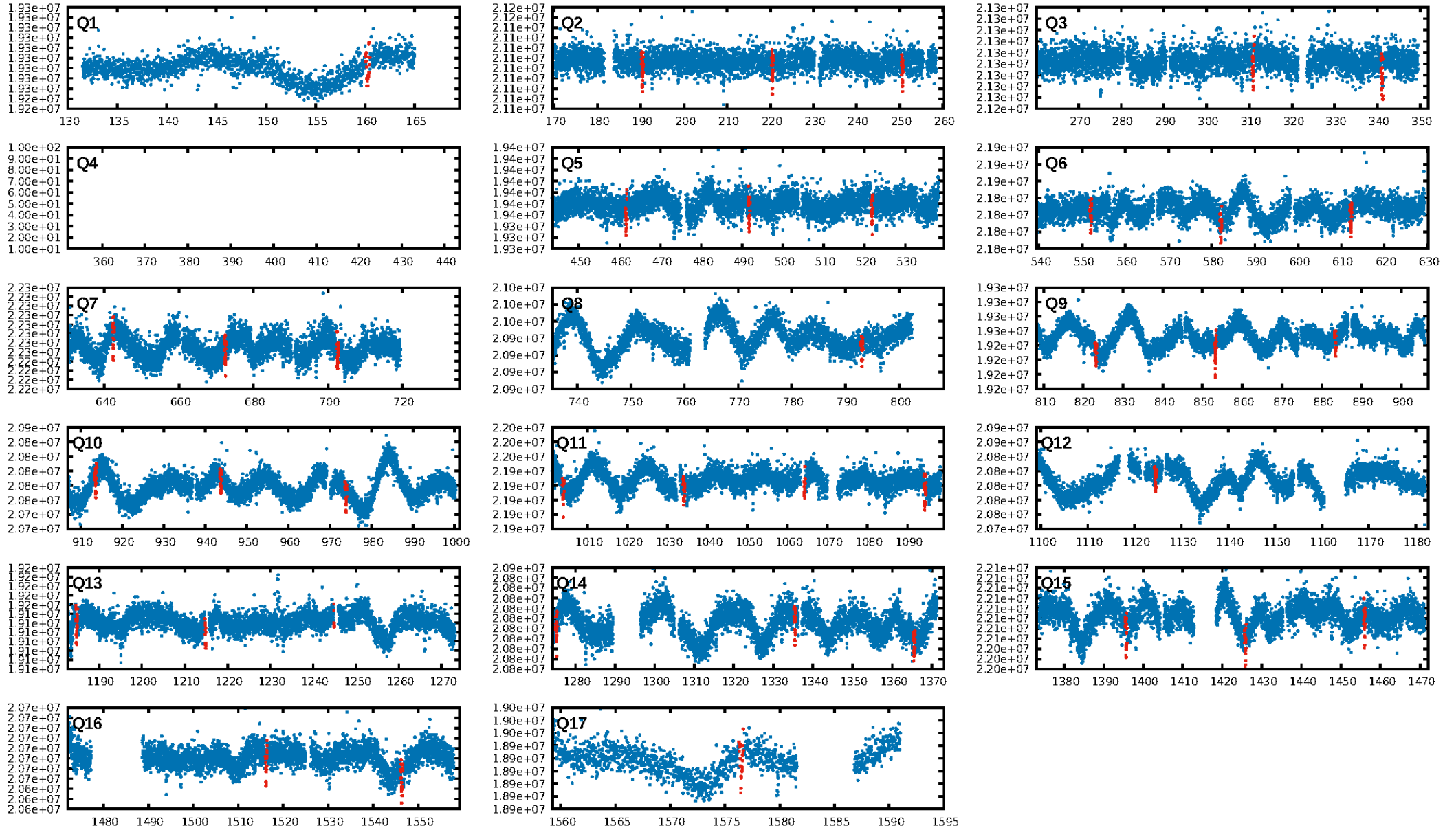
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [48.83σ]
LongPeriod-sig: 100.0% [241.62σ]
ModelChiSquare2-sig: 74.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.73e-231
RollingBand-fgt: 1.00 [35/35]
GhostDiagnostic-chr: 42.67
Centroid-sig: 18.7%
Centroid-so: 0.575 arcsec [1.85σ]
OotOffset-rm: 0.198 arcsec [1.02σ]
KicOffset-rm: 0.329 arcsec [1.70σ]
OotOffset-st: 4/4/2/5 [15]
KicOffset-st: 4/4/2/5 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 0.80 [12/15]

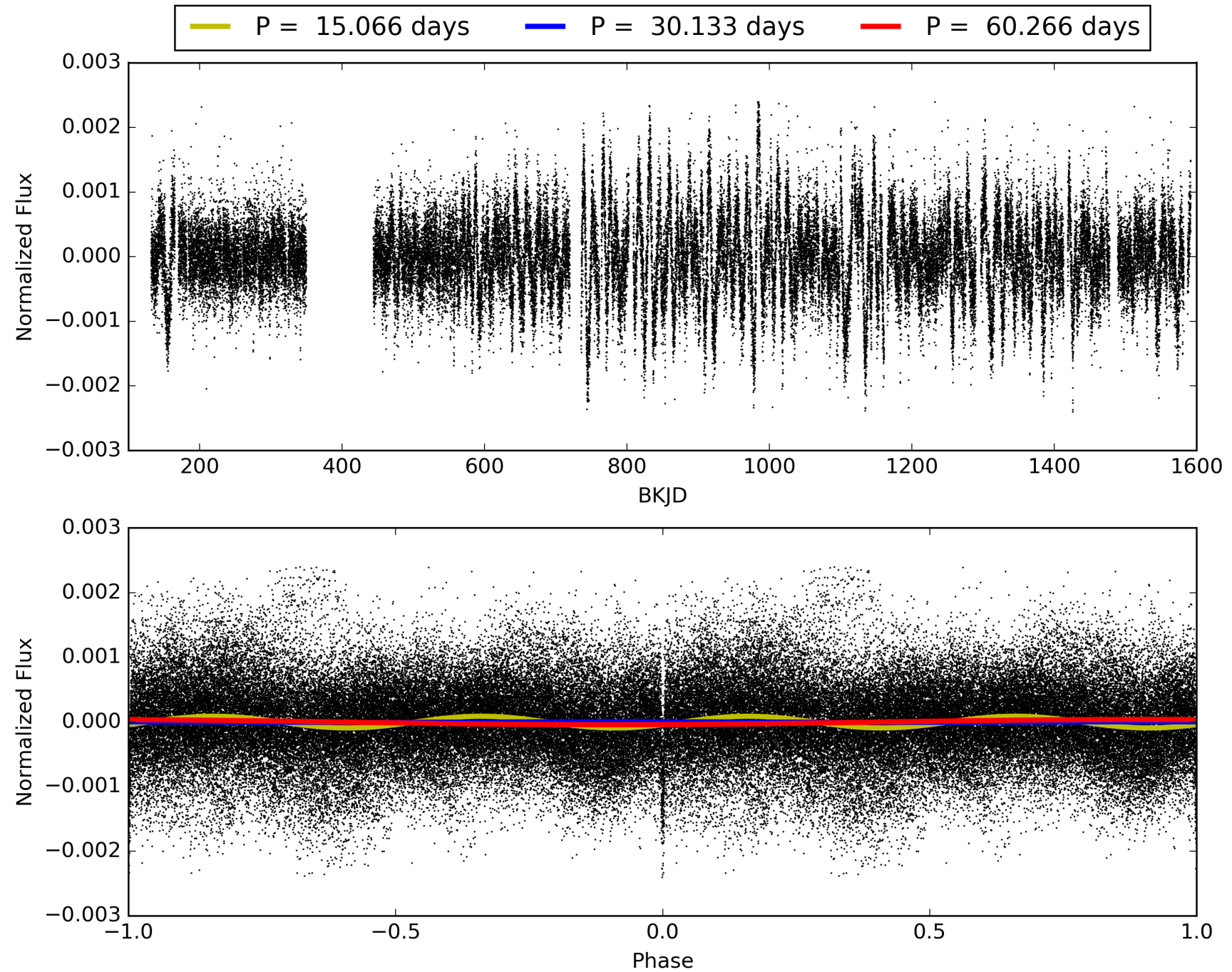
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:18:15 Z

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

TCE 008247638-02, PDC Light Curves

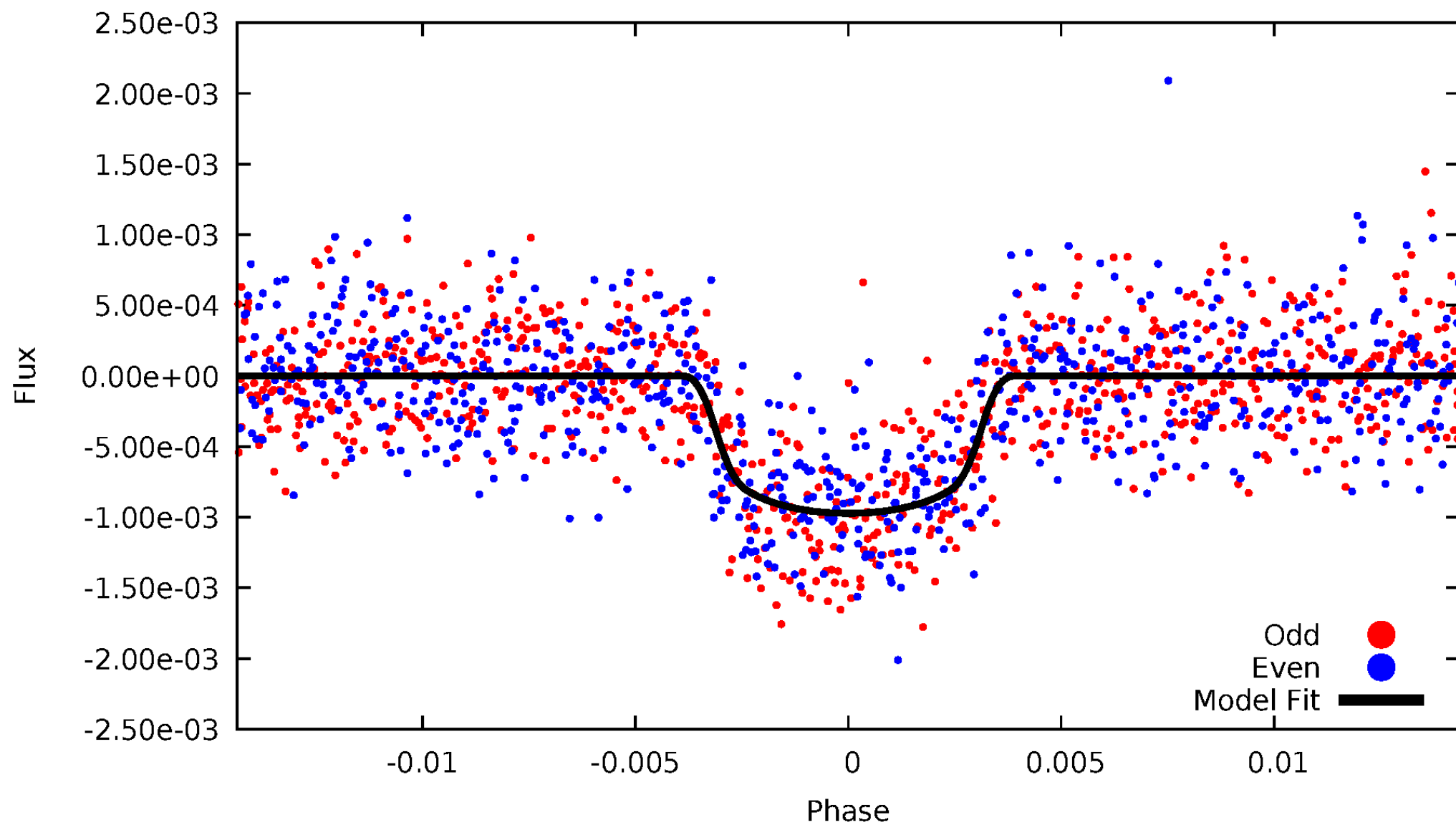


TCE 008247638-02



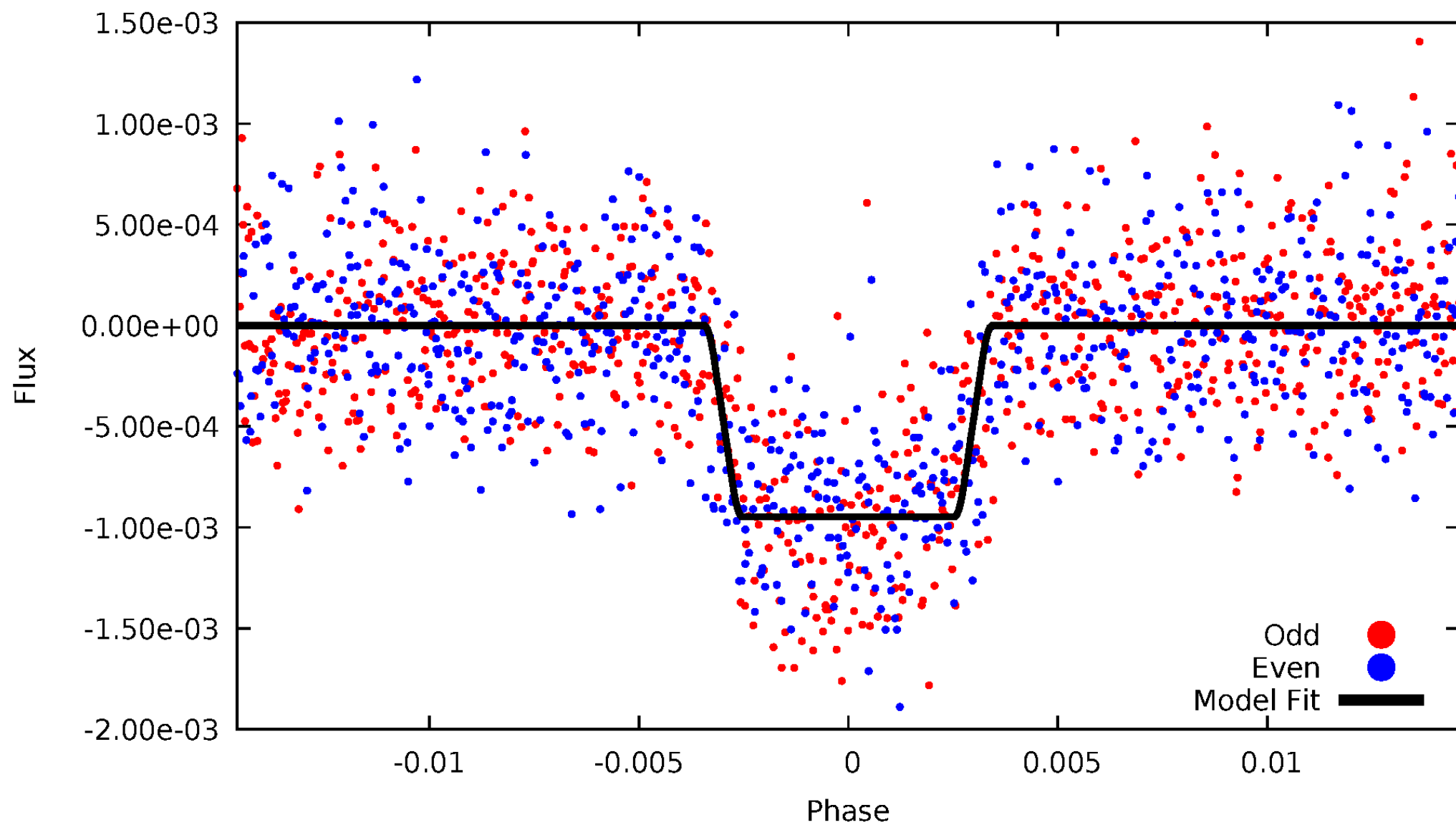
DV Odd/Even

TCE 008247638-02



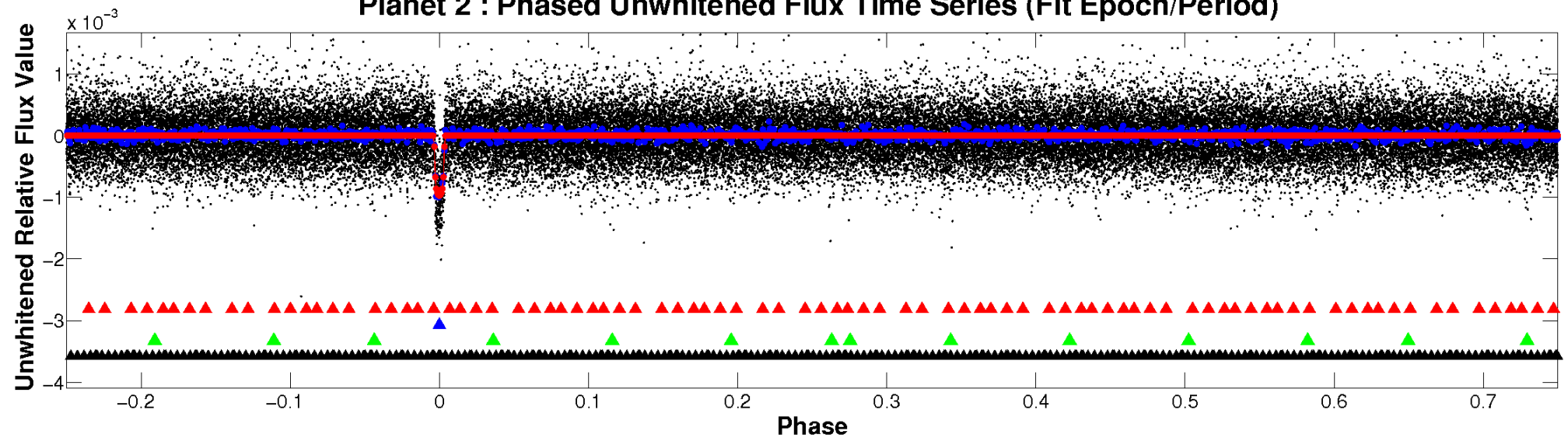
ALT Odd/Even

TCE 008247638-02

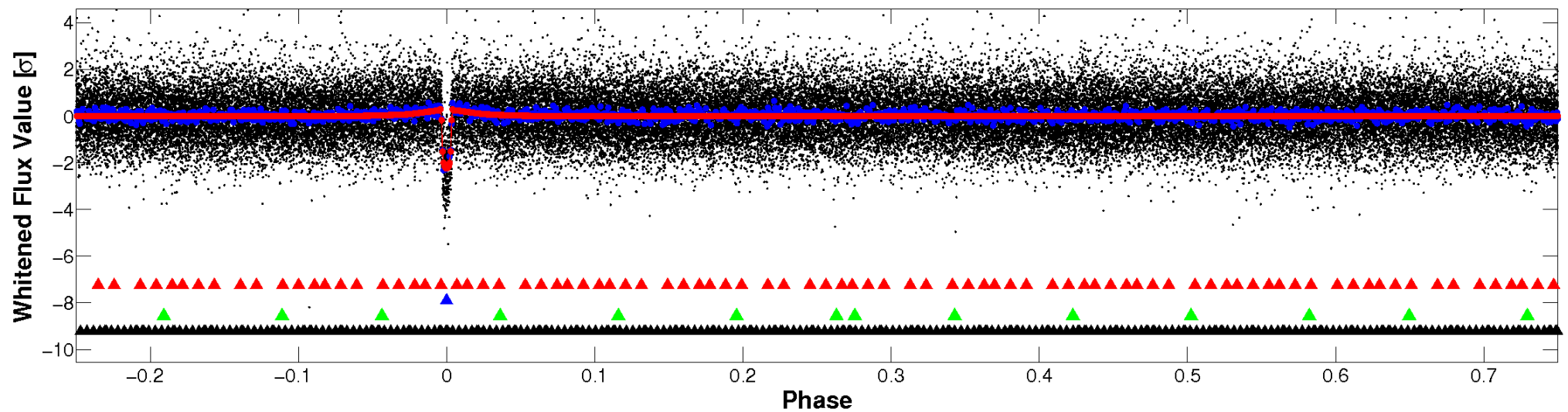


Non-Whitened Vs. Whitened Light Curve

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

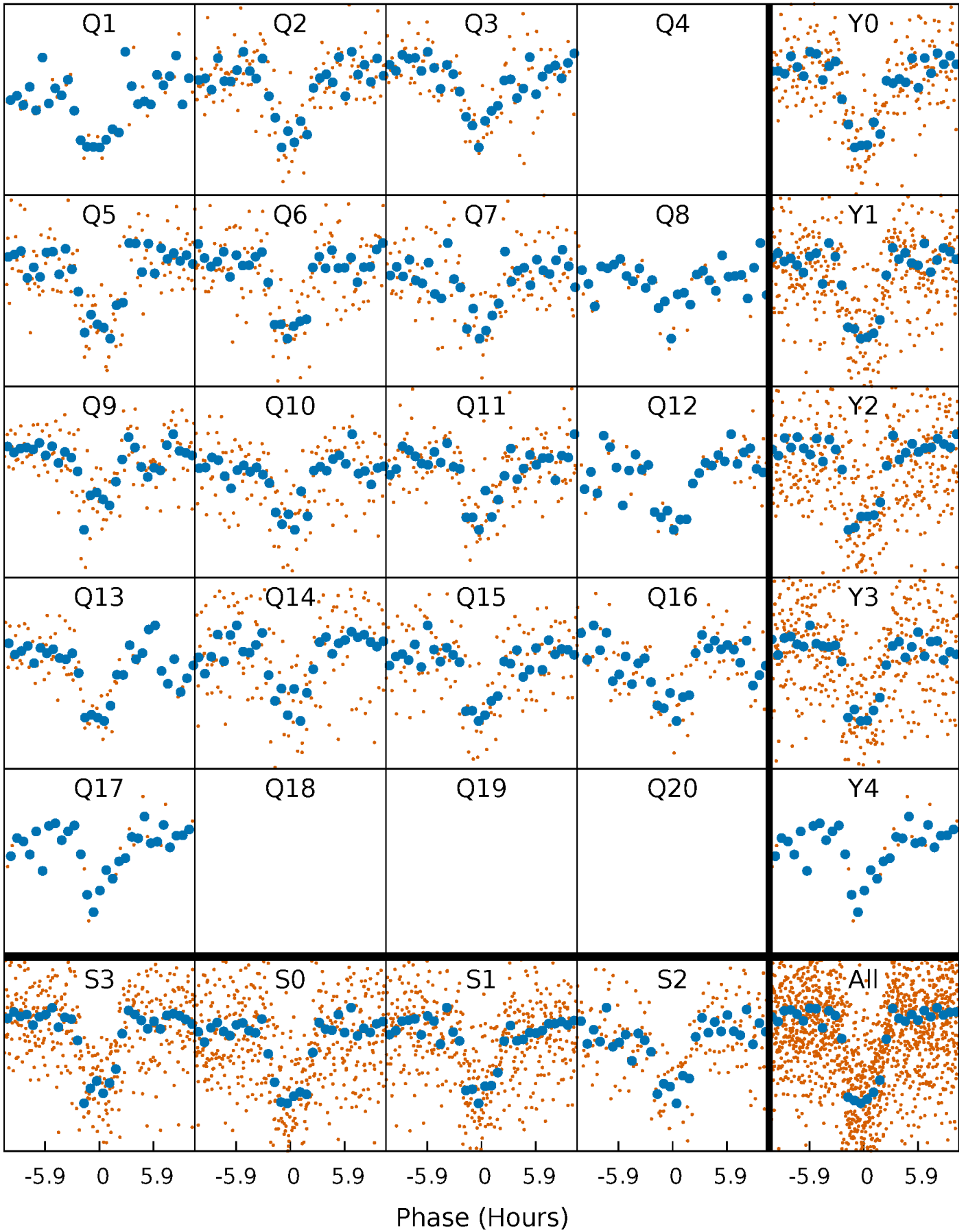


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



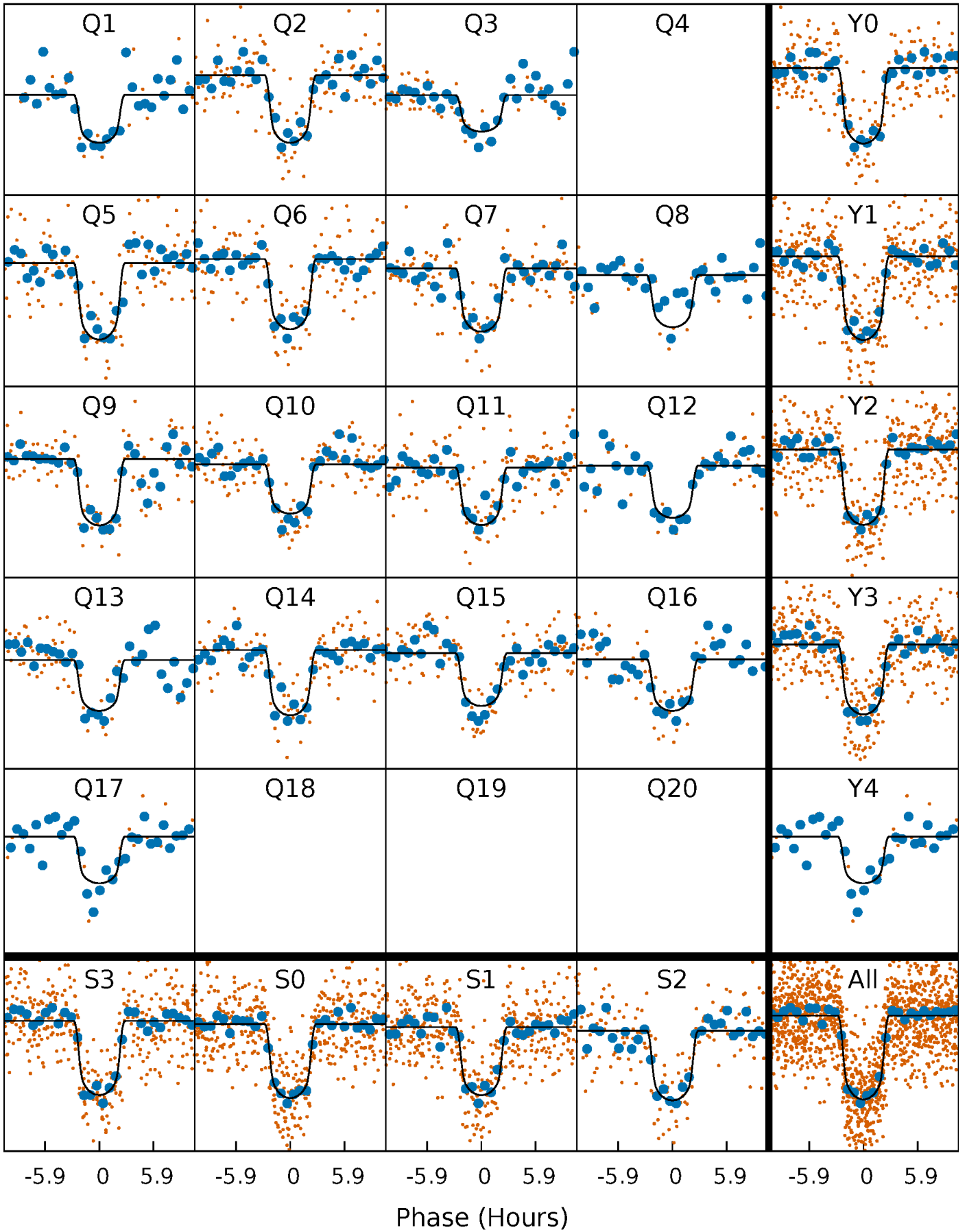
PDC Quarter-Phased Transit Curves

TCE 008247638-02 P= 30.132958 Days $T_0=160.250205$ (BKJD)



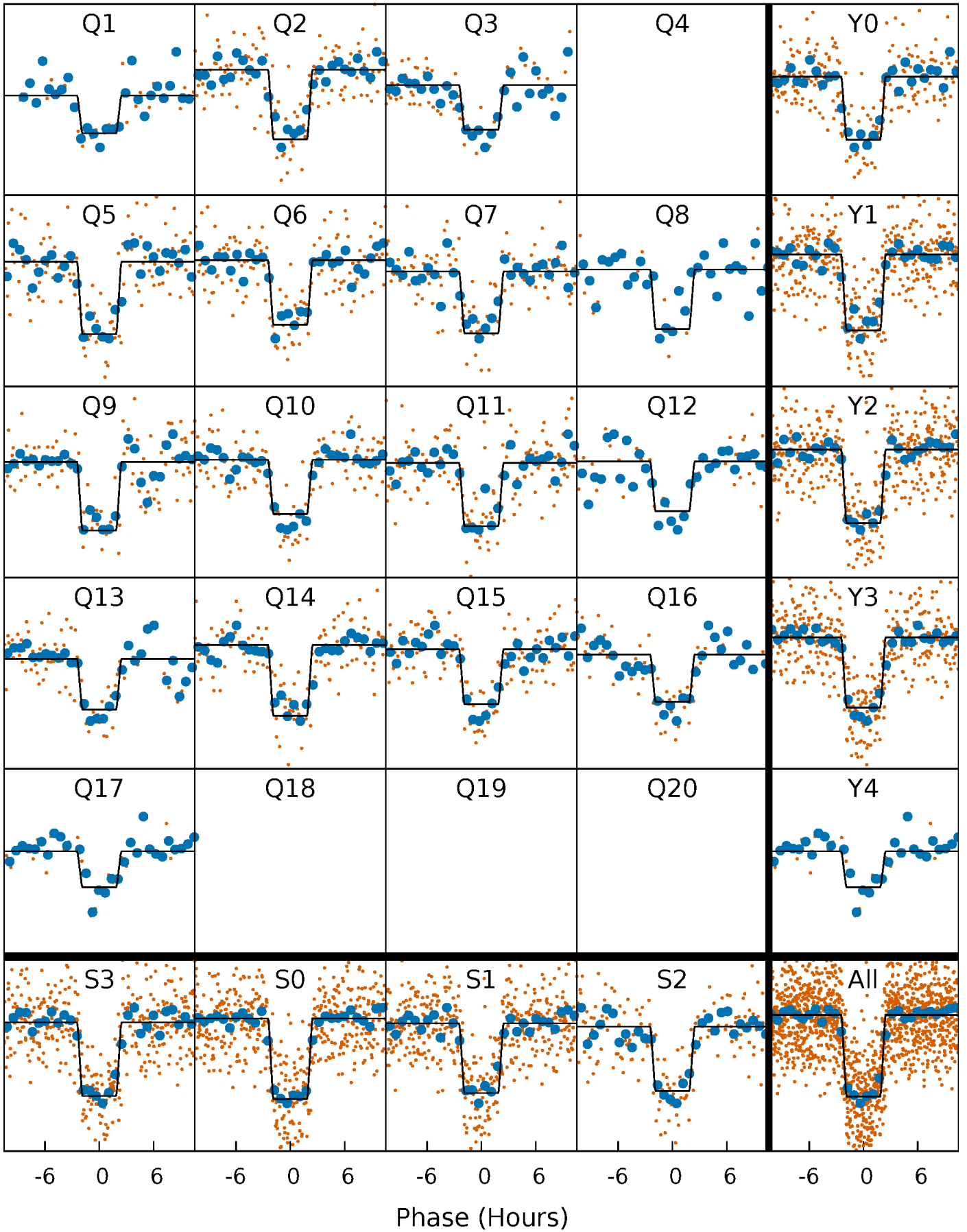
DV Quarter-Phased Transit Curves

TCE 008247638-02 P= 30.132958 Days $T_0=160.250205$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

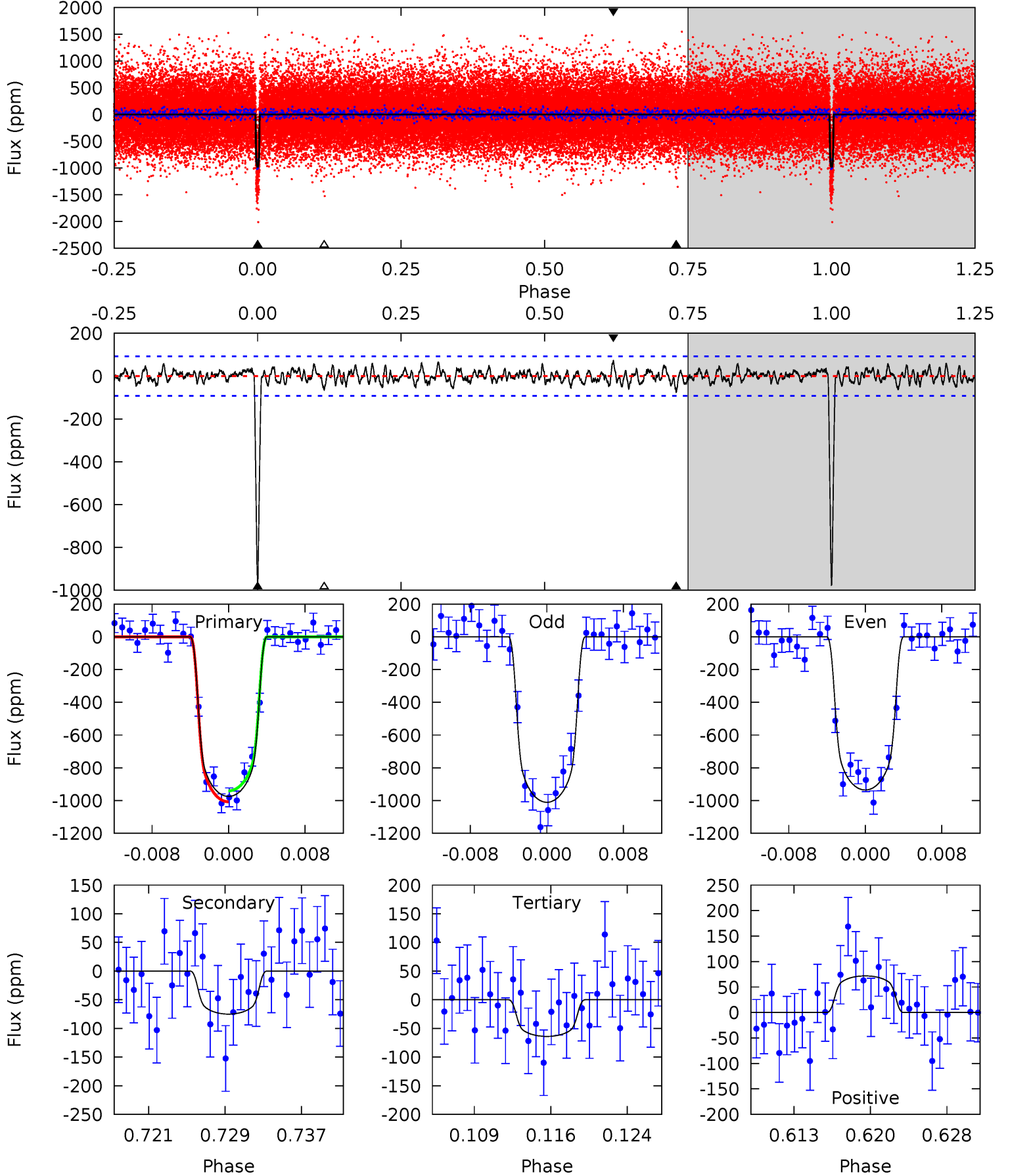
TCE 008247638-02 P= 30.132600 Days $T_0=160.258307$ (BKJD)



DV Model-Shift Uniqueness Test

008247638-02, $P = 30.132958$ Days, $E = 130.117247$ Days

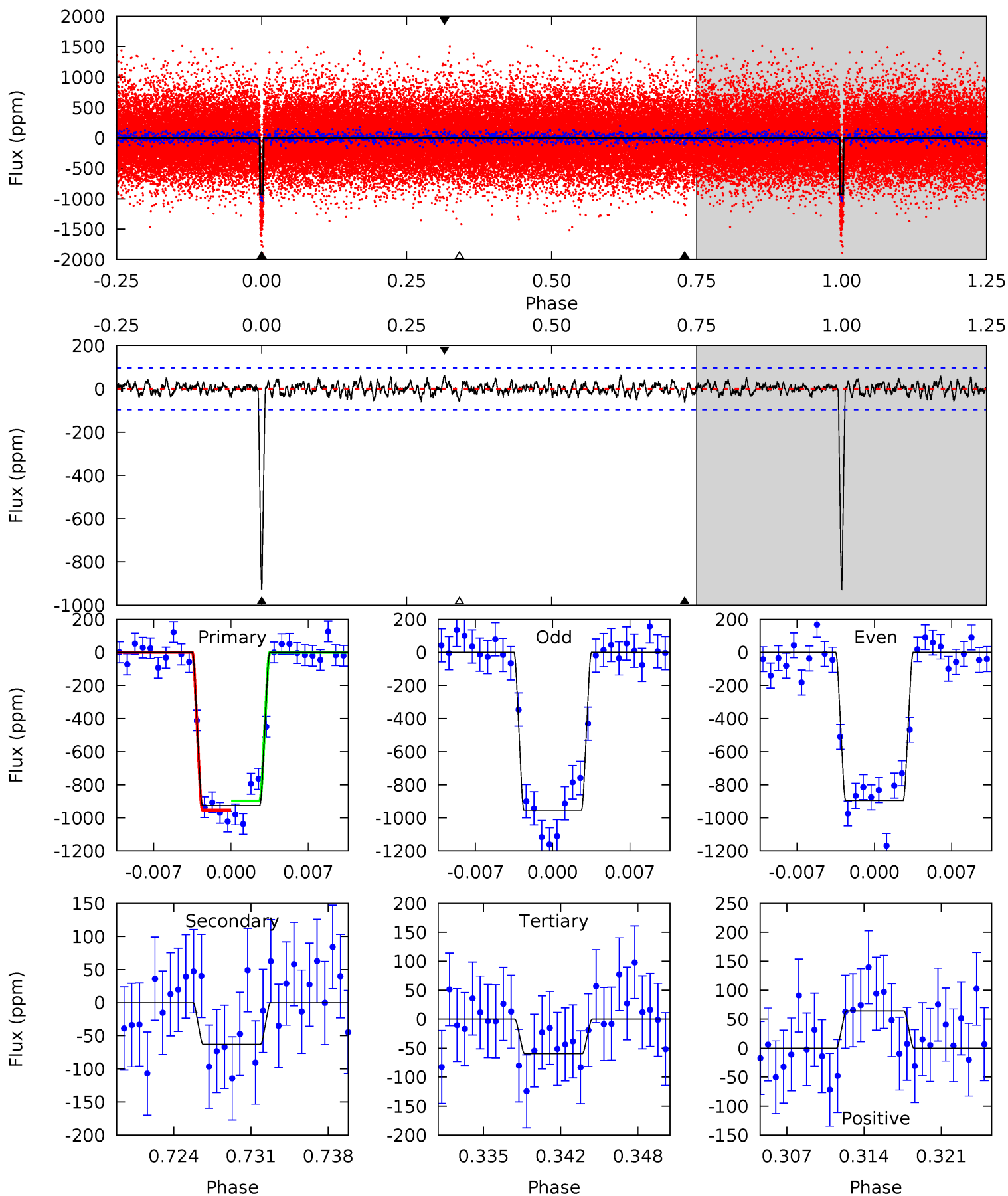
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.8	4.14	3.53	3.97	5.07	2.66	1.27	50.3	49.8	0.61	0.18	2.08	1.00	0.07	1.86



Alt Model-Shift Uniqueness Test

008247638-02, $P = 30.132600$ Days, $E = 130.125707$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.4	3.28	3.12	3.35	5.10	2.70	1.06	45.2	45.0	0.16	-0.08	1.52	0.98	0.06	1.44



Stellar Parameters For KIC 008247638

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5527^{+111}_{-111}	$4.488^{+0.075}_{-0.075}$	$-0.180^{+0.150}_{-0.150}$	$0.866^{+0.089}_{-0.074}$	$0.841^{+0.060}_{-0.043}$	$1.824^{+0.471}_{-0.447}$
	+2%/-2%	+2%/-2%	+83%/-83%	+10%/-9%	+7%/-5%	+26%/-25%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008247638-02 / KOI 0907.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-75 ± 18	$3.15^{+0.26}_{-0.25}$	751^{+26}_{-26}	3345^{+146}_{-150}	133^{+43}_{-36}
Alt.	-63 ± 19	$2.91^{+0.24}_{-0.24}$	747^{+29}_{-22}	3331^{+156}_{-198}	128^{+50}_{-44}

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

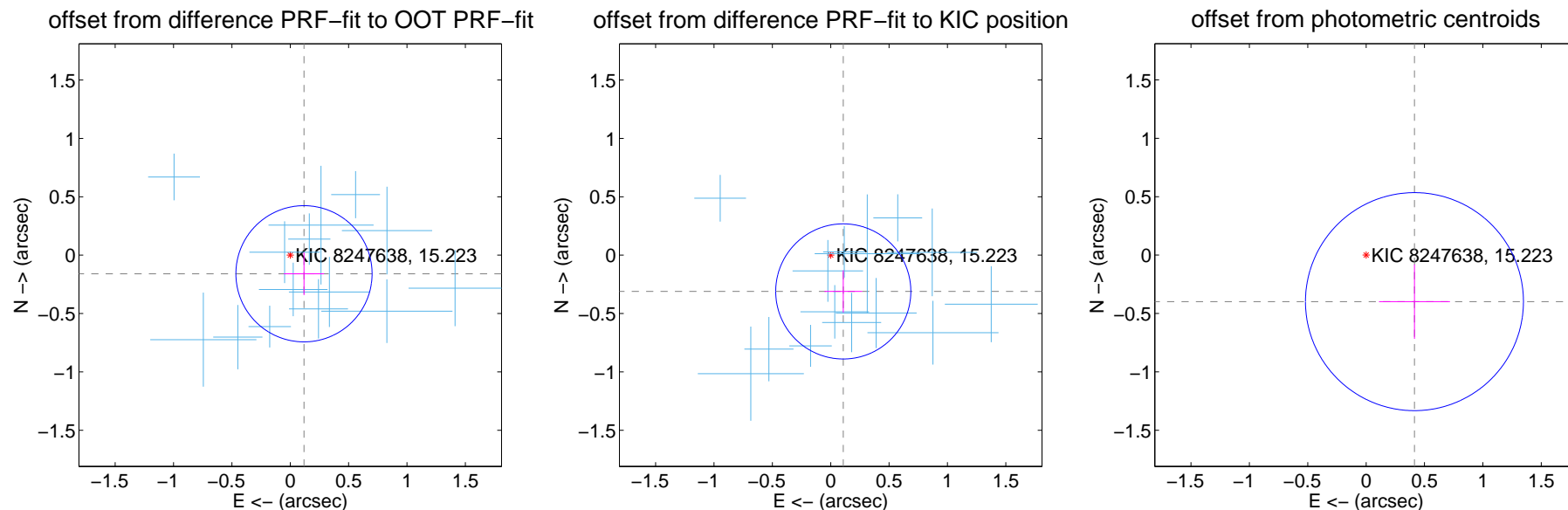
DV Centroid Data

Supplemental centroid analysis for 008247638-02. Kepler magnitude: 15.22. Transit SNR 35.64

There are 15 quarters with good PRF difference image offsets

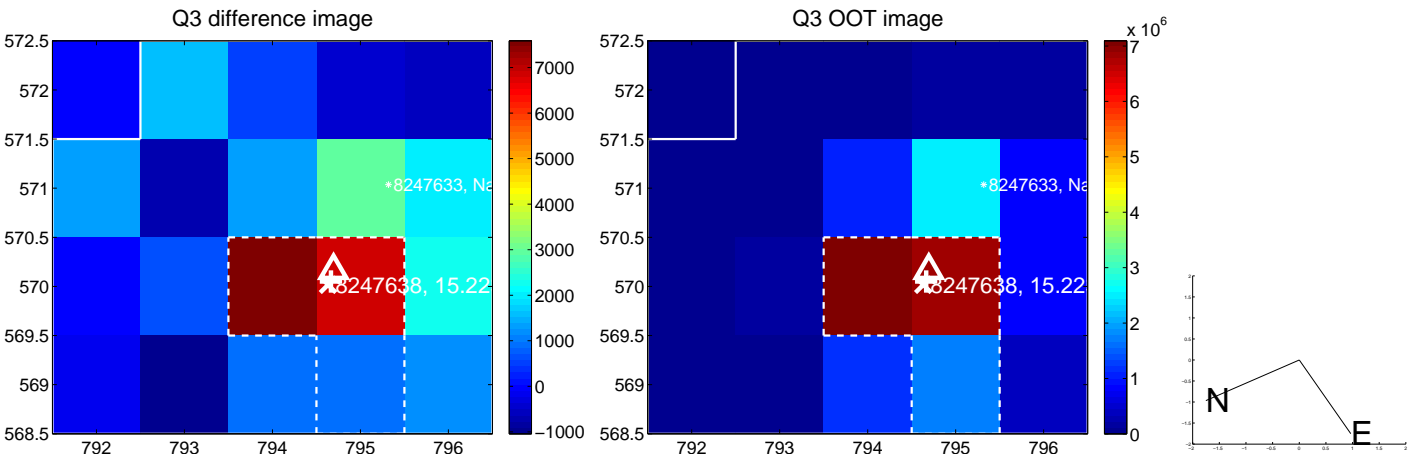
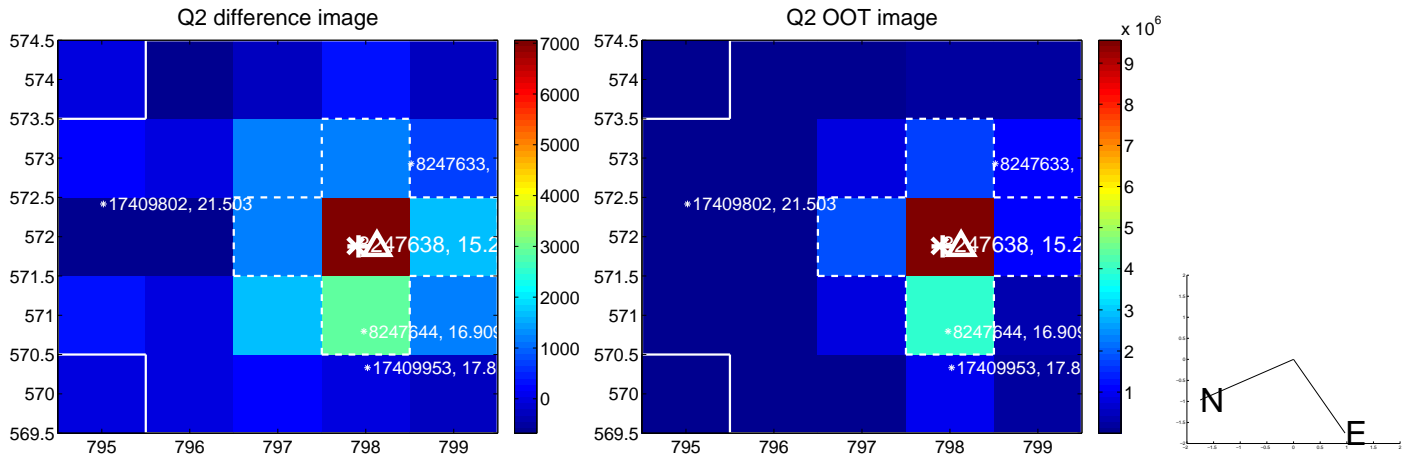
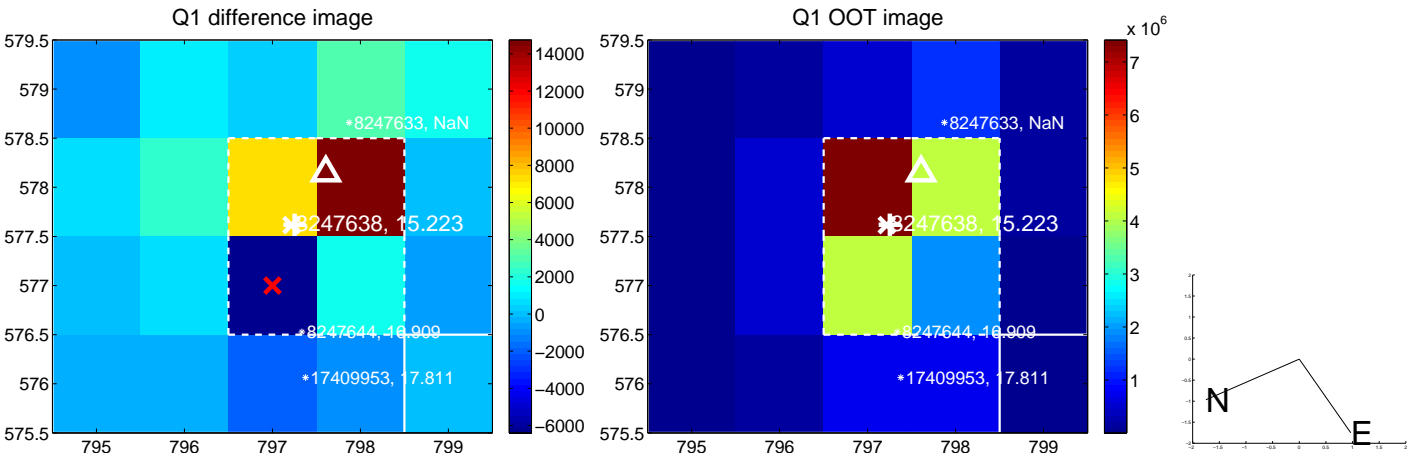
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.198 ± 0.194	1.02	-0.118 ± 0.172	-0.159 ± 0.183
PRF-fit source offset from KIC position	0.329 ± 0.193	1.70	-0.107 ± 0.161	-0.311 ± 0.181
photometric centroid source offset	0.57 ± 0.31	1.85	-0.41 ± 0.30	-0.40 ± 0.32

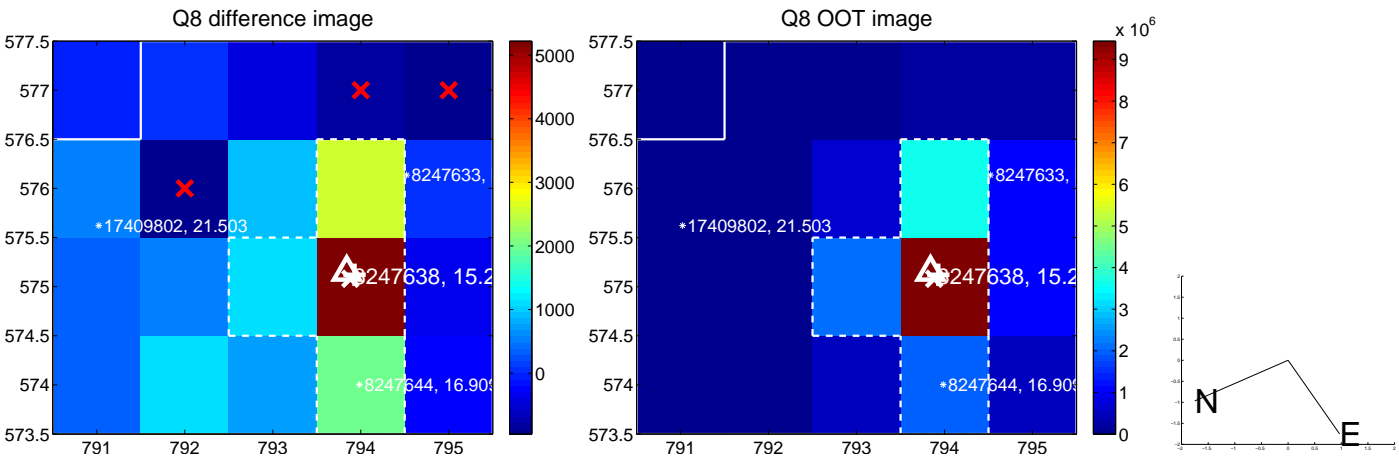
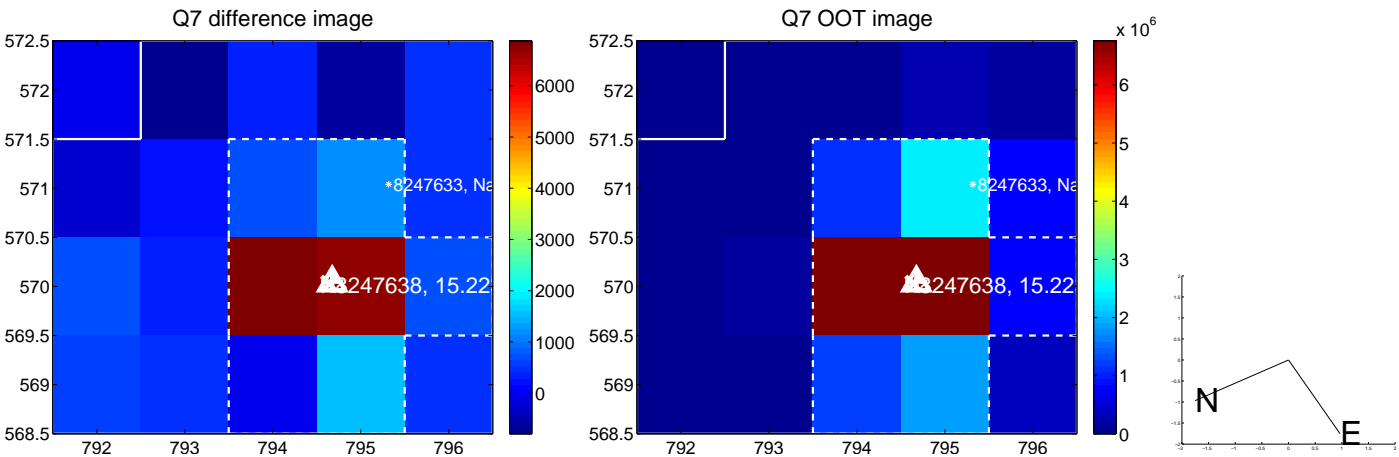
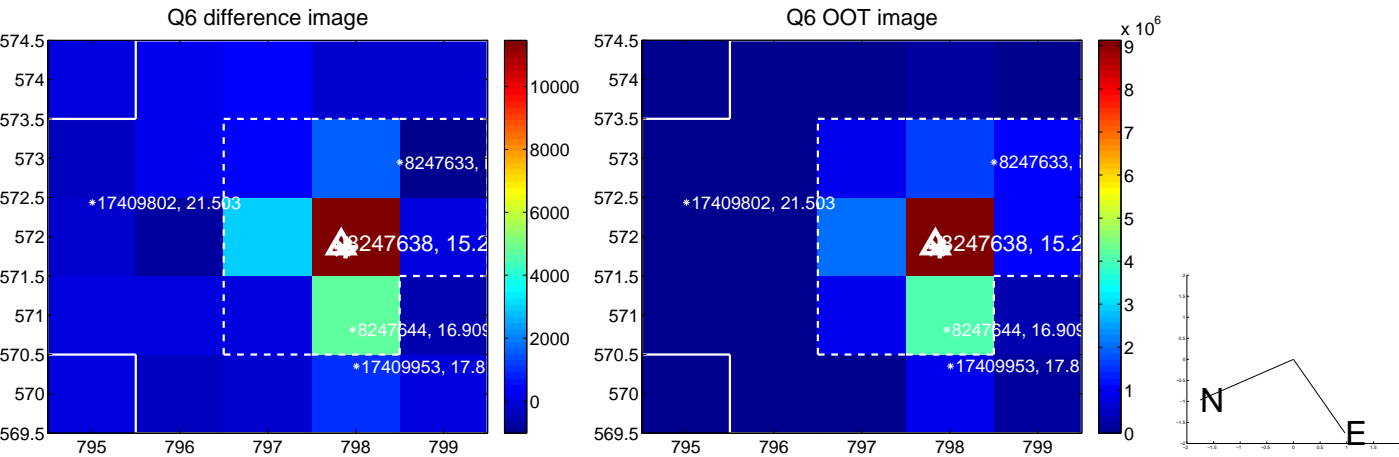
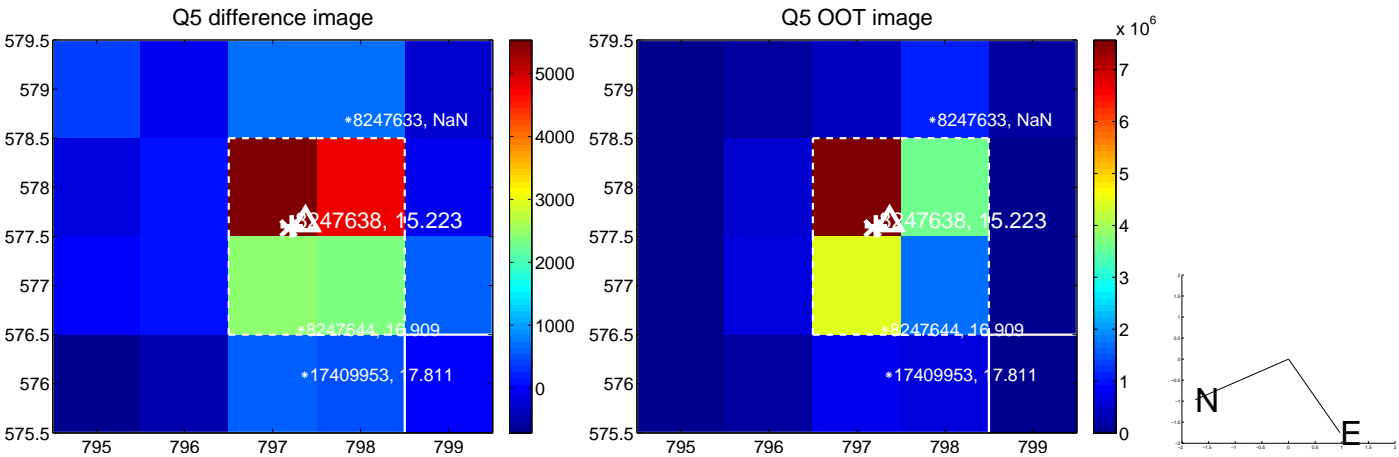


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

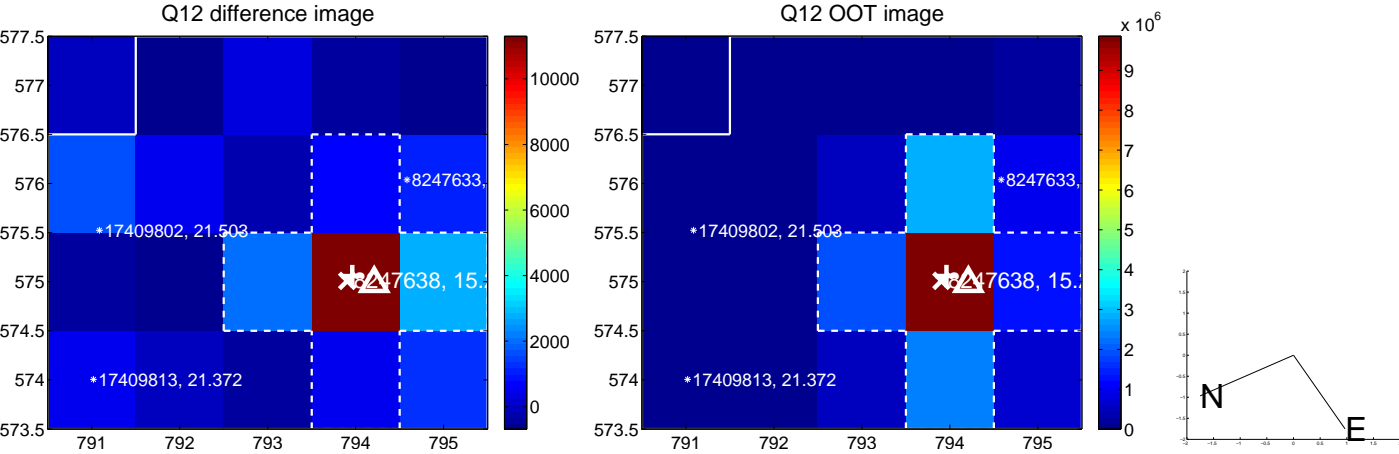
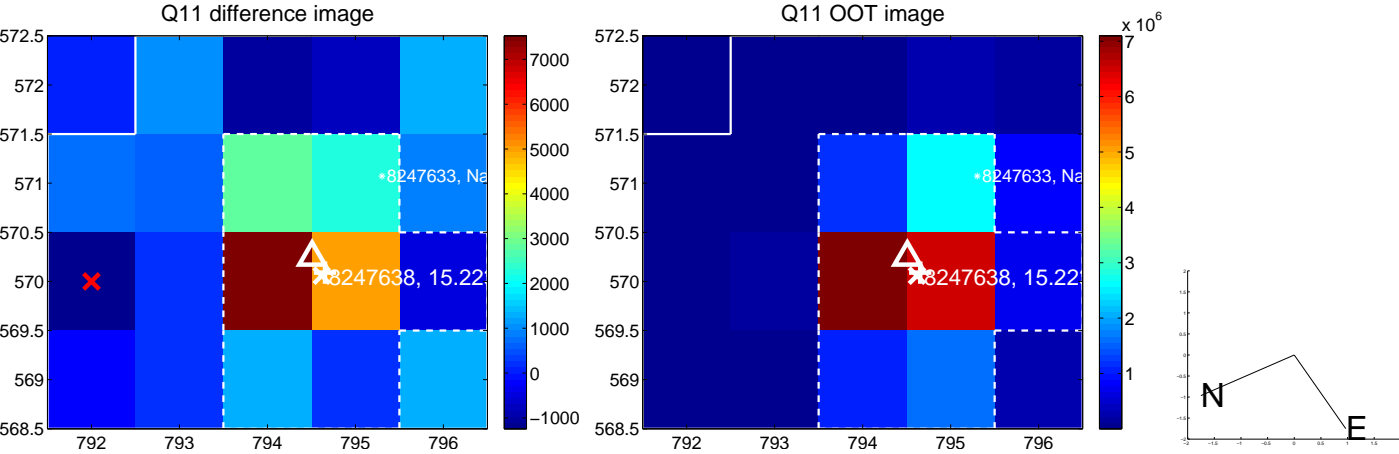
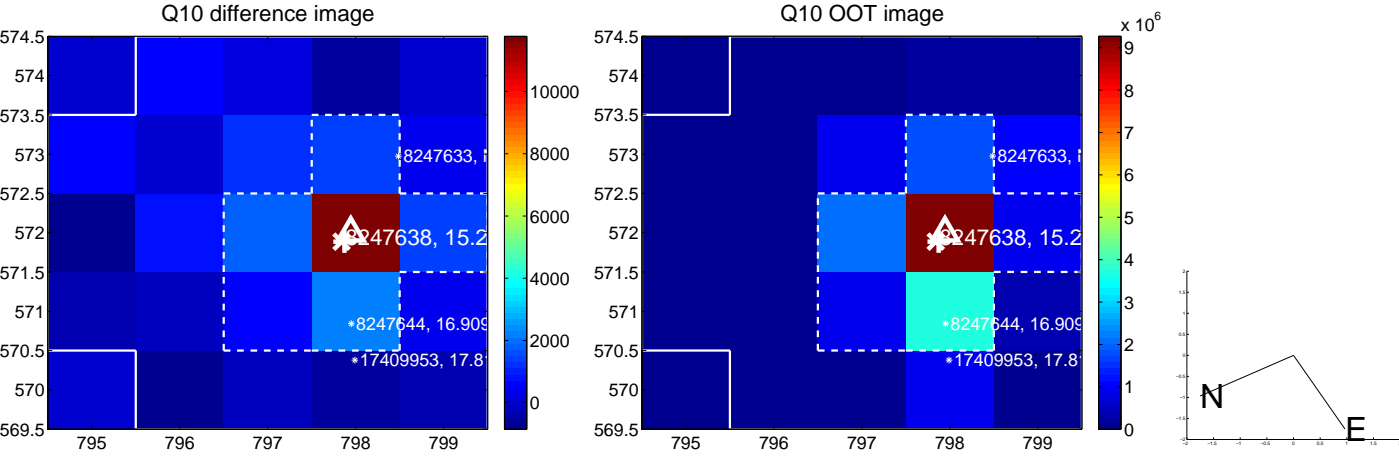
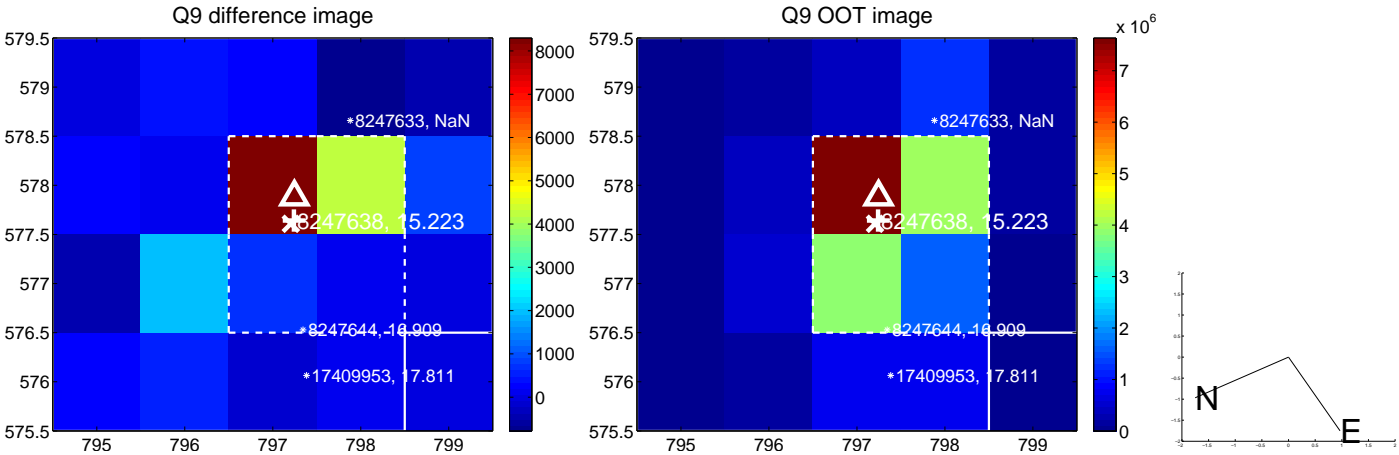
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



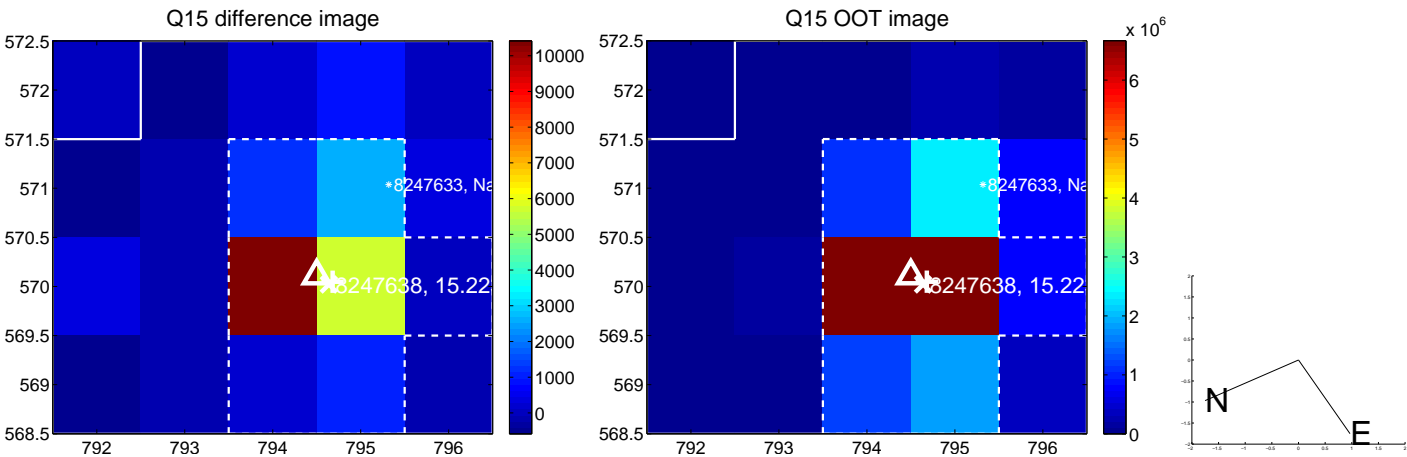
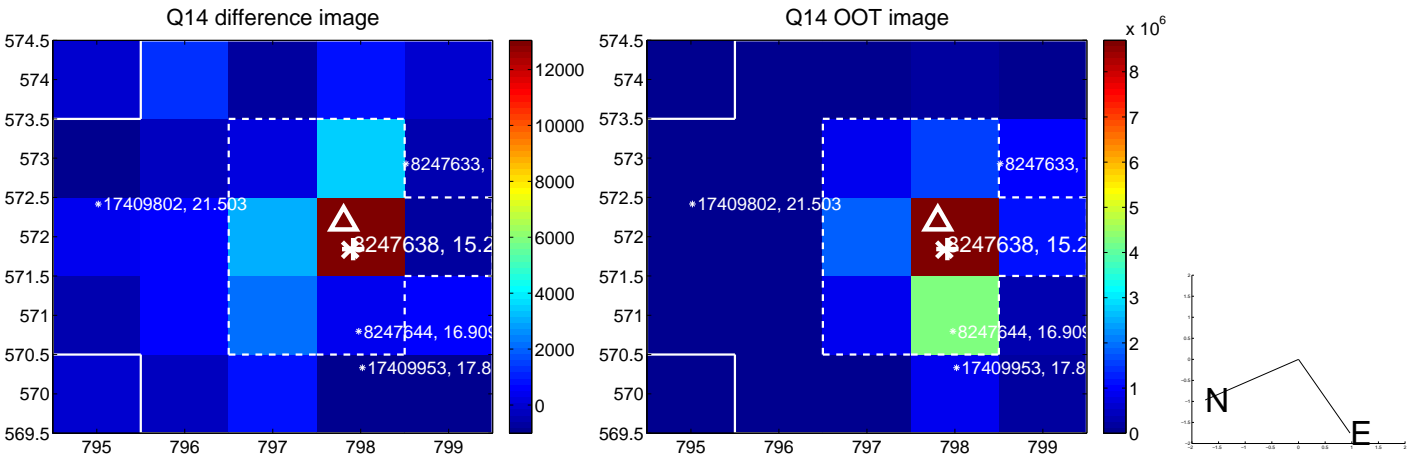
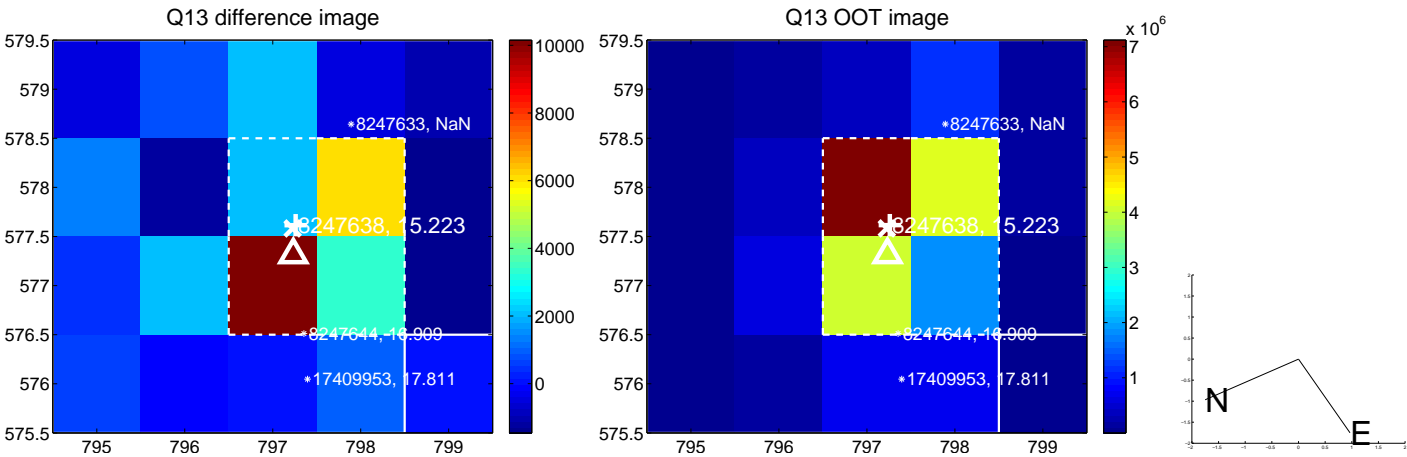
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



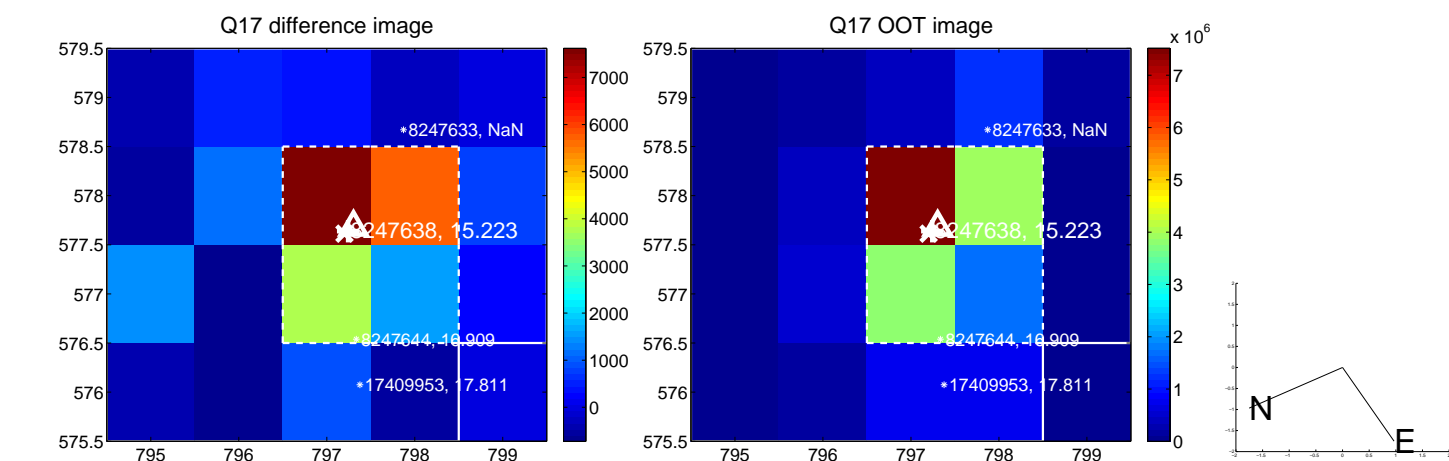
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



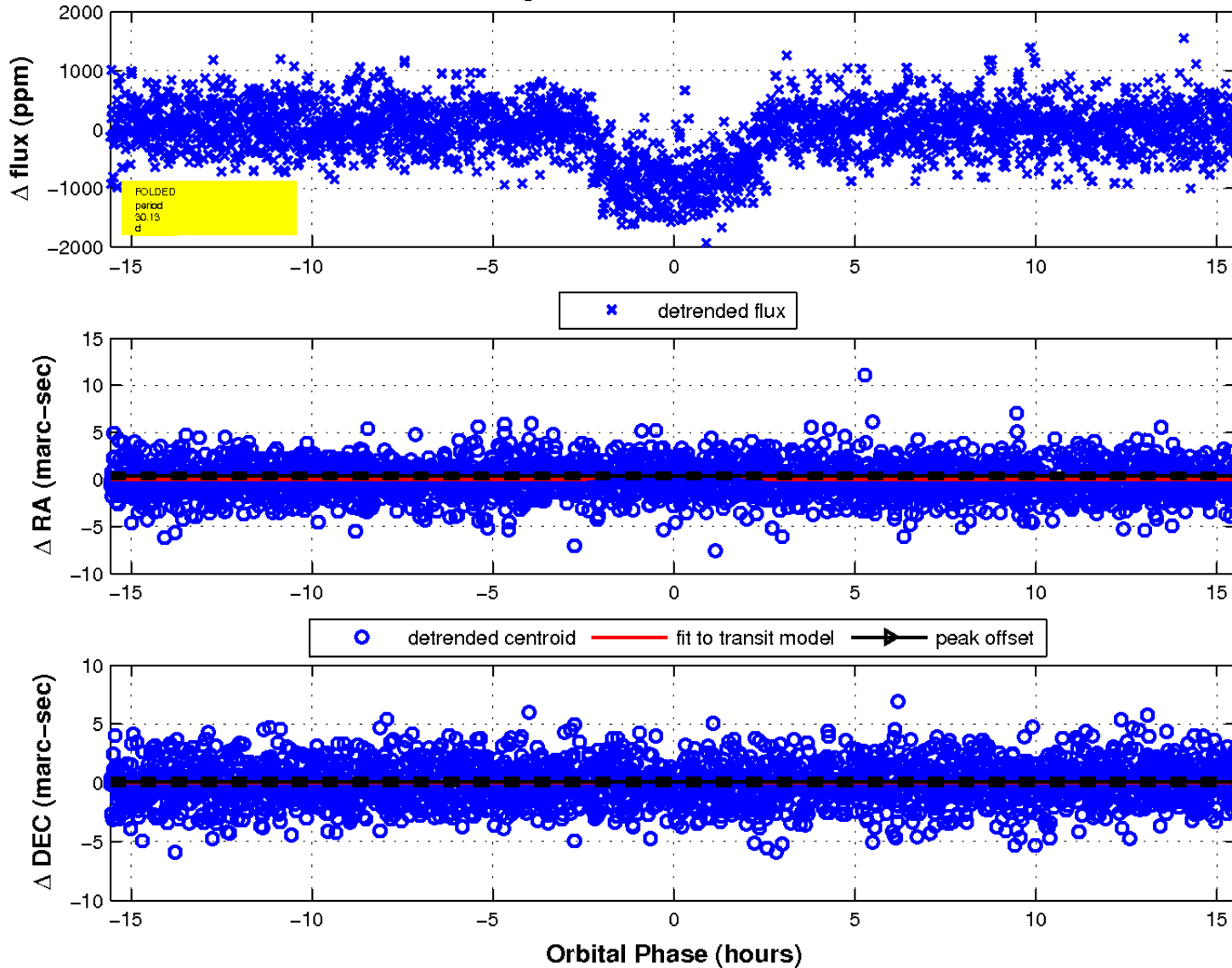
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



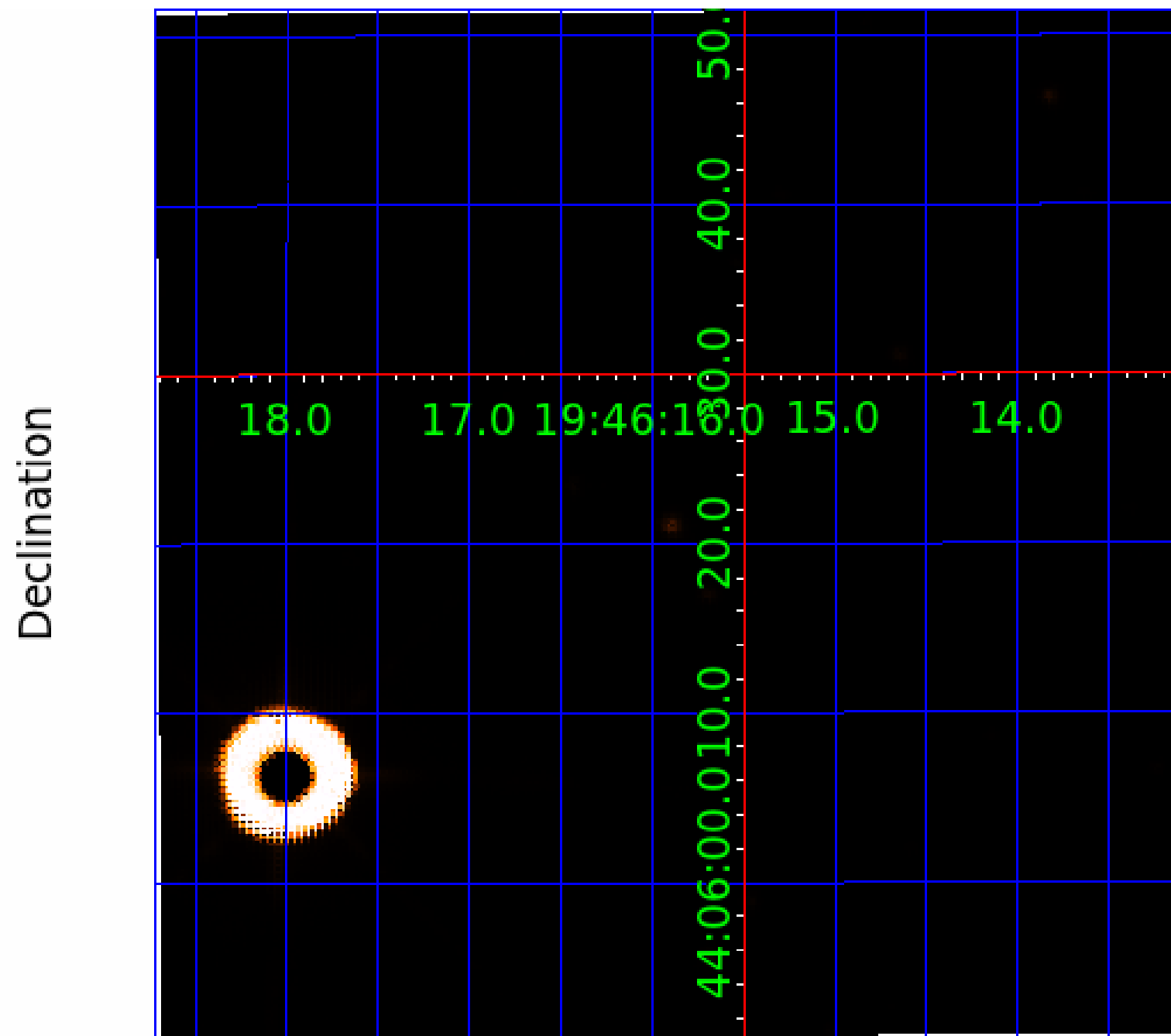
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 4



UKIRT Image



KIC 008247638

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})
008247638-01	OBS	0907.01	16.514084	143.088898	955.4	4.227	43.1	46.7	0.87	5527	2.82	43.66
008247638-02	OBS	0907.02	30.132958	160.250205	972.0	5.190	32.9	35.6	0.87	5527	3.13	19.58
008247638-03	OBS	0907.04	99.641876	198.684349	970.5	4.553	19.4	19.4	0.87	5527	2.85	3.97
008247638-04	OBS	0907.03	4.790886	131.524685	234.9	2.962	16.1	18.2	0.87	5527	1.69	227.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008247638-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-04	OBS	PC	1.00	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.

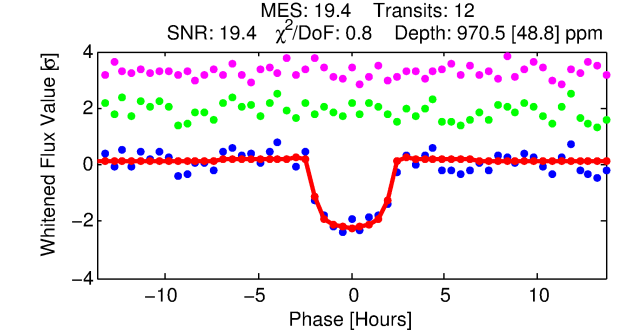
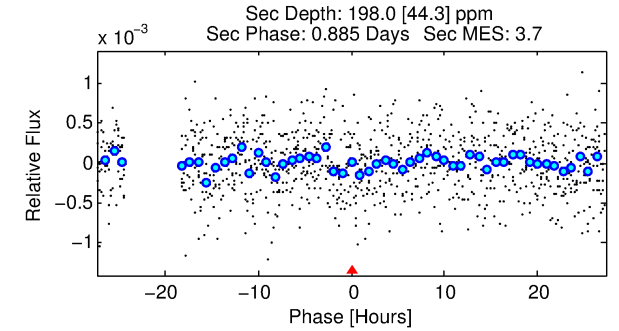
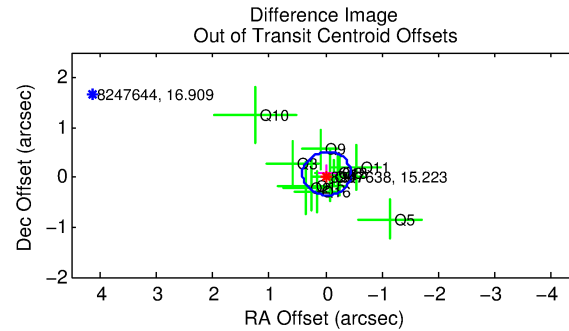
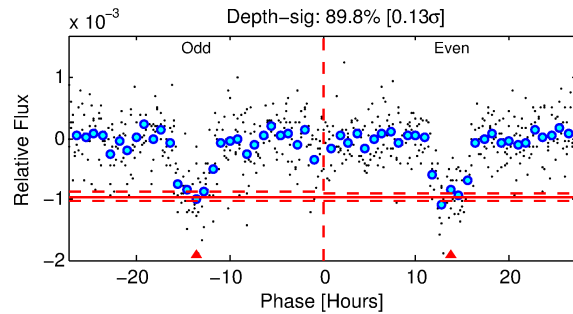
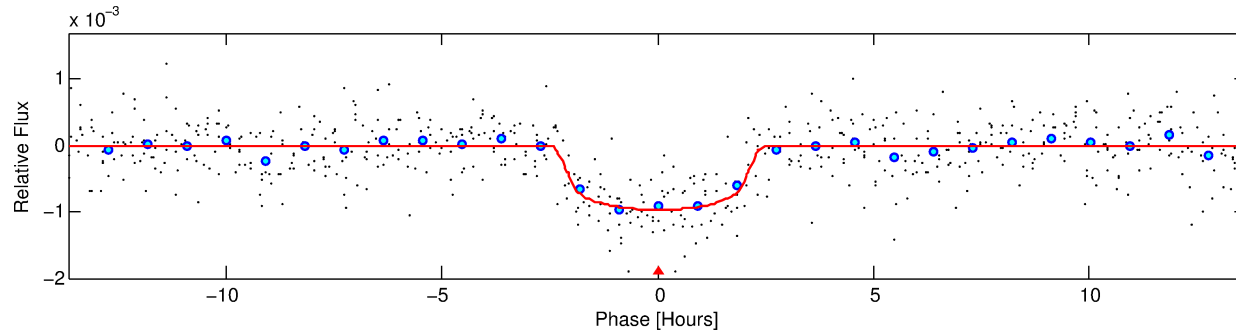
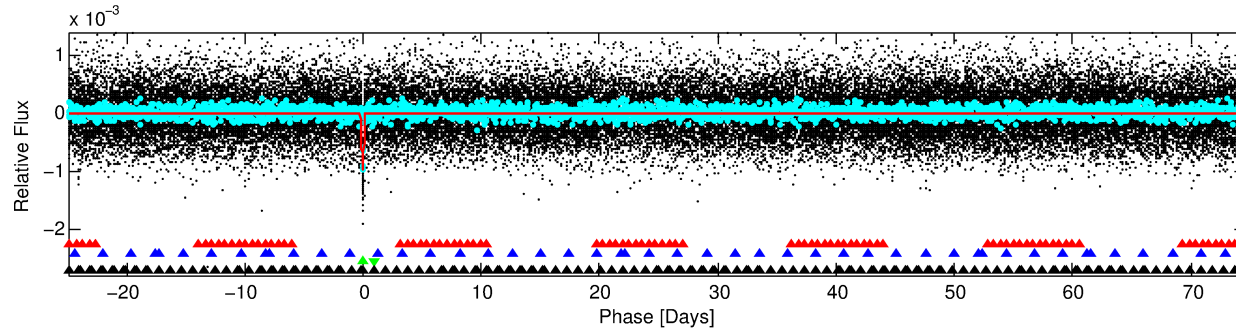
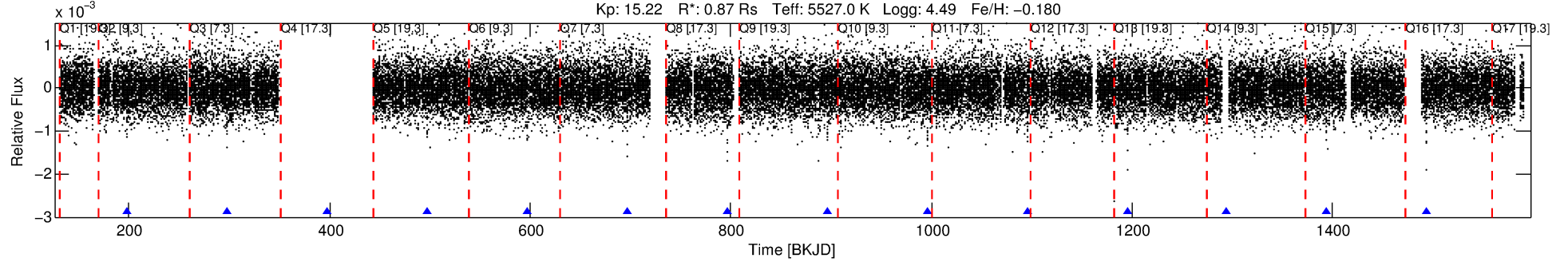
Ephemeris Match Information For 008247638-03

No Significant Match Found

DV One-Page Summary

KIC: 8247638 Candidate: 3 of 4 Period: 99.642 d
KOI: K00907.04 Name: Kepler-251e Corr: 0.981

Kp: 15.22 R*: 0.87 Rs Teff: 5527.0 K Logg: 4.49 Fe/H: -0.180



DV Fit Results:

Period = 99.64188 [0.00055] d
Epoch = 198.6843 [0.0043] BKJD
Rp/R* = 0.0302 [0.0146]
a/R* = 130.69 [260.13]
b = 0.67 [1.66]
Seff = 3.97 [0.62]
Teq = 360 [14] K
Rp = 2.85 [1.41] Re
a = 0.3972 [0.0355] AU
Ag = 2109.63 [2111.93] [1.00σ]
Teffp = 3773 [939] K [3.63σ]

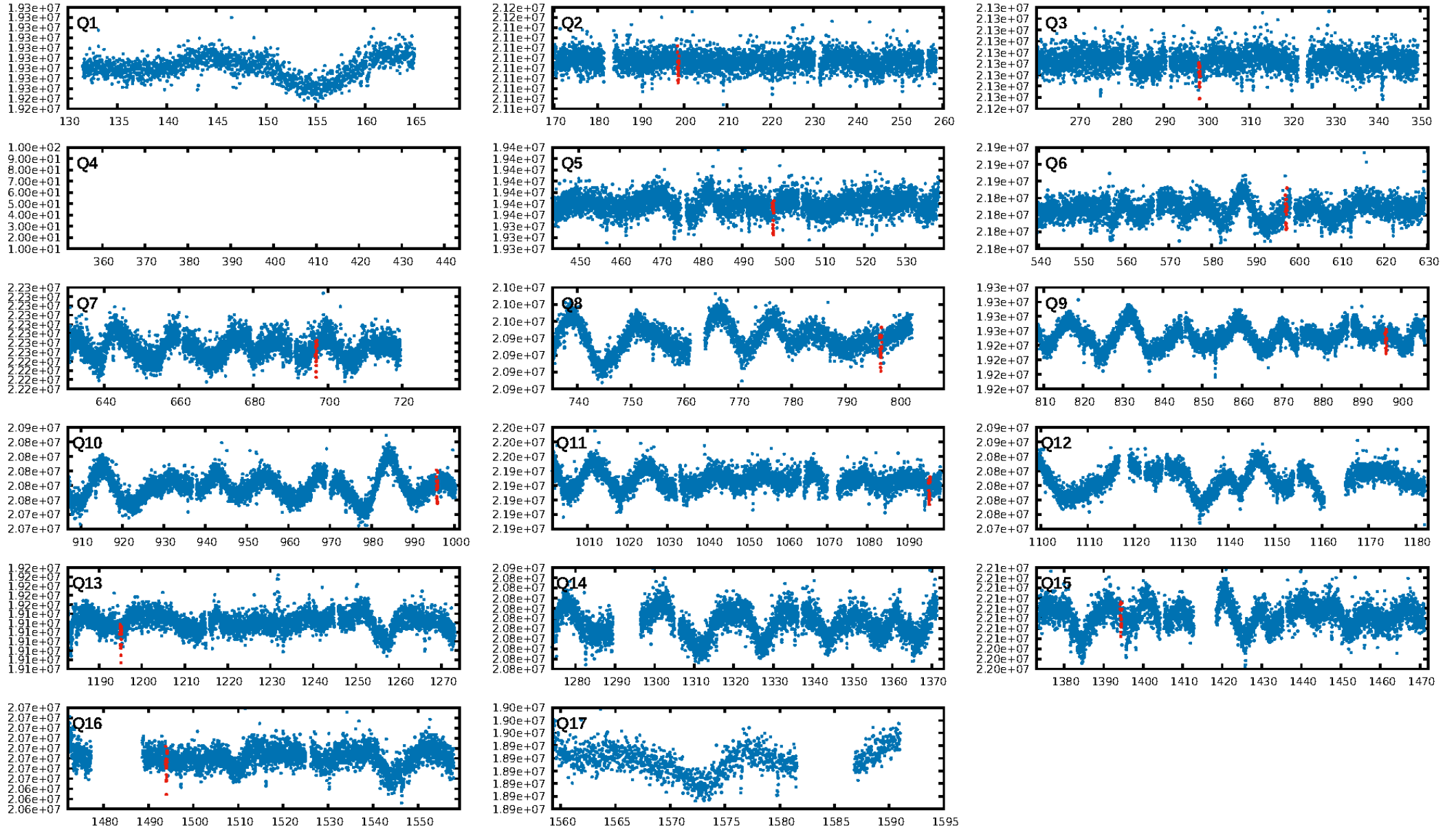
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [241.62σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 72.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.00e-77
RollingBand-fgt: 1.00 [12/12]
GhostDiagnostic-chr: -18.99
Centroid-sig: 47.6%
Centroid-so: 0.530 arcsec [0.96σ]
OotOffset-rm: 0.075 arcsec [0.52σ]
KicOffset-rm: 0.121 arcsec [0.62σ]
OotOffset-st: 3/4/2/3 [12]
KicOffset-st: 3/4/2/3 [12]
DiffImageQuality-fgm: 1.00 [12/12]
DiffImageOverlap-fno: 0.75 [9/12]

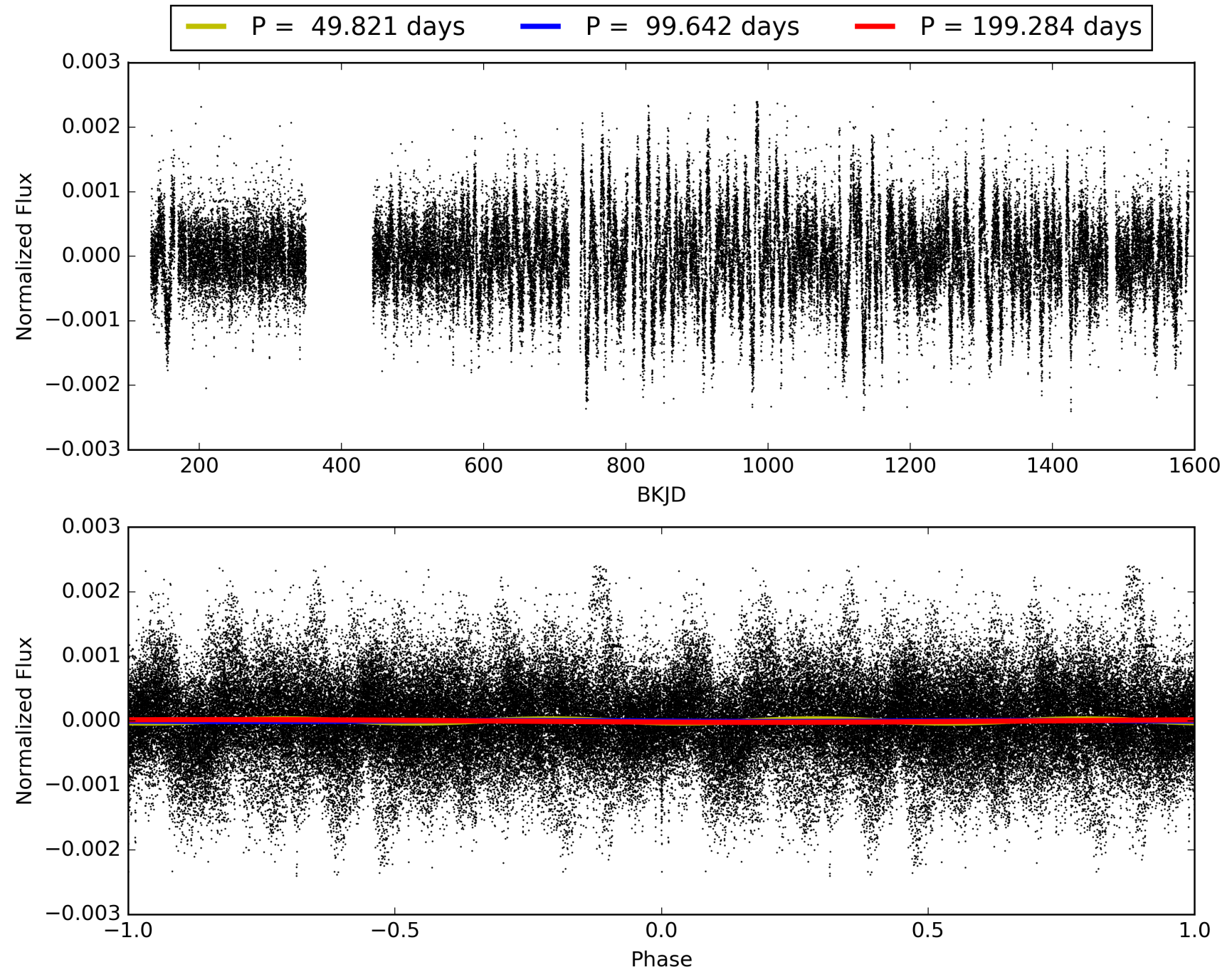
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:18:23 Z

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

TCE 008247638-03, PDC Light Curves

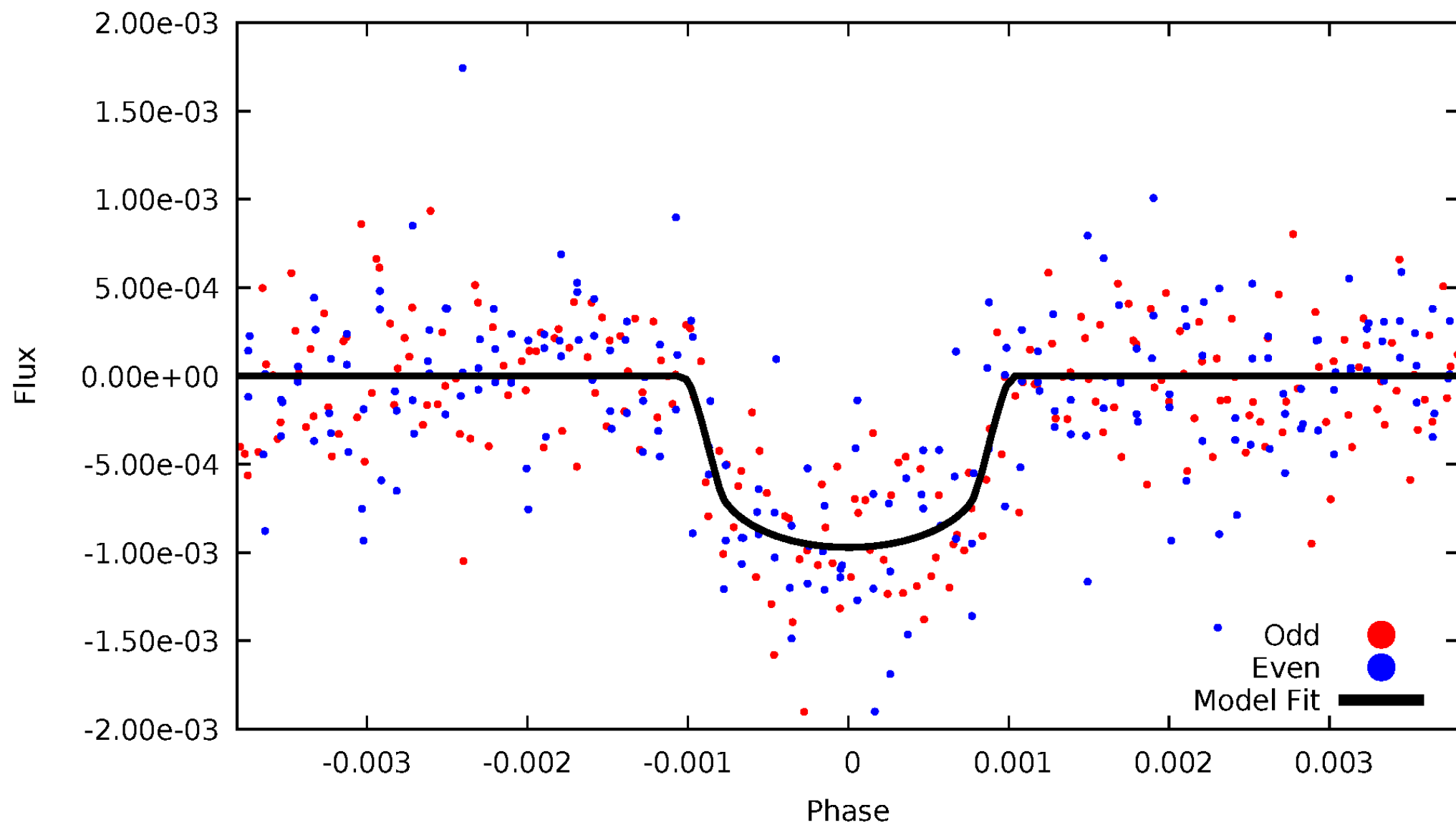


TCE 008247638-03



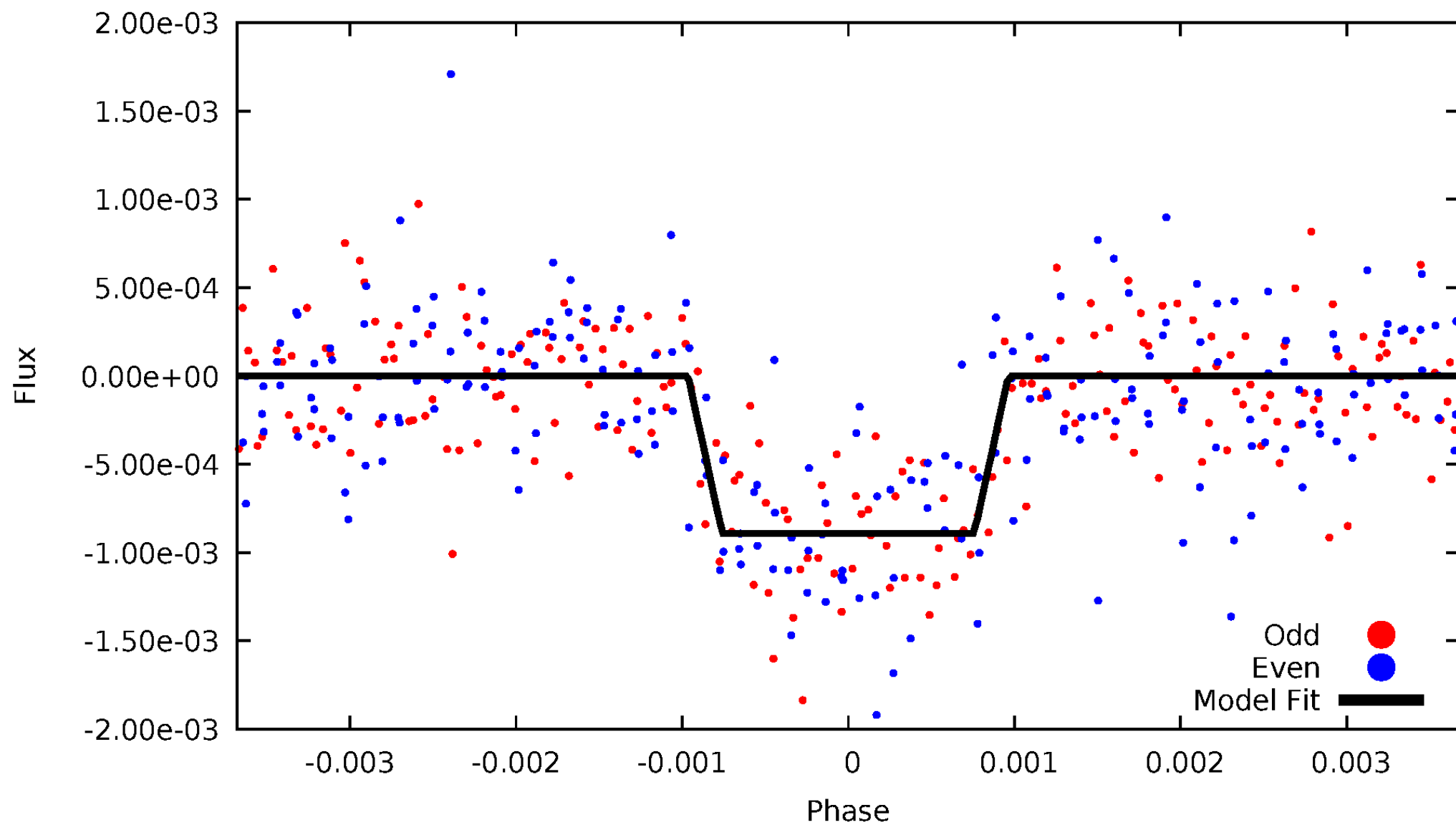
DV Odd/Even

TCE 008247638-03



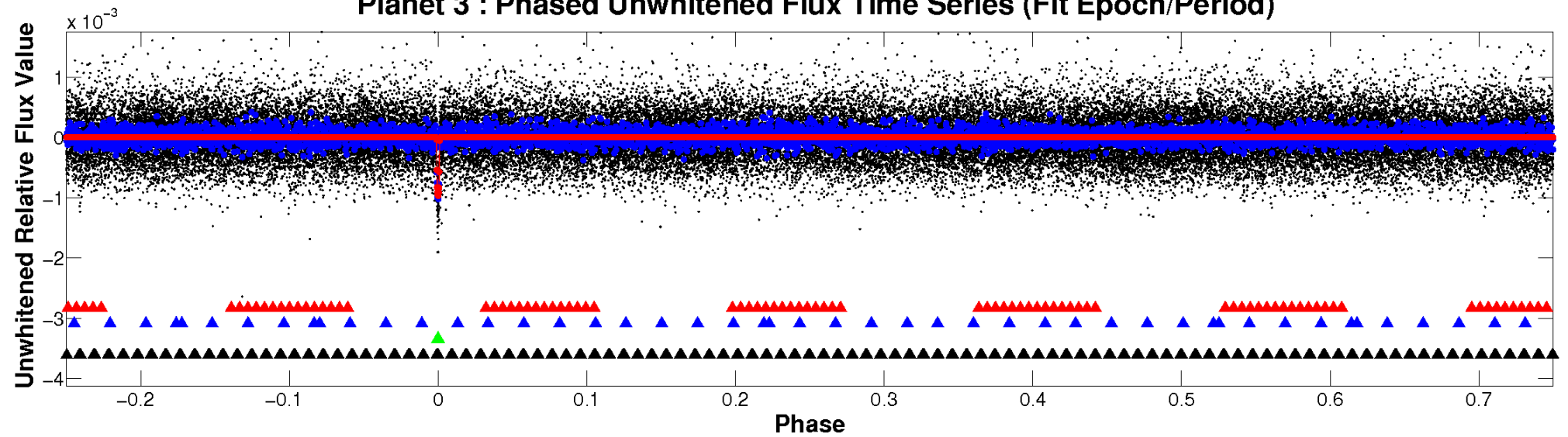
ALT Odd/Even

TCE 008247638-03

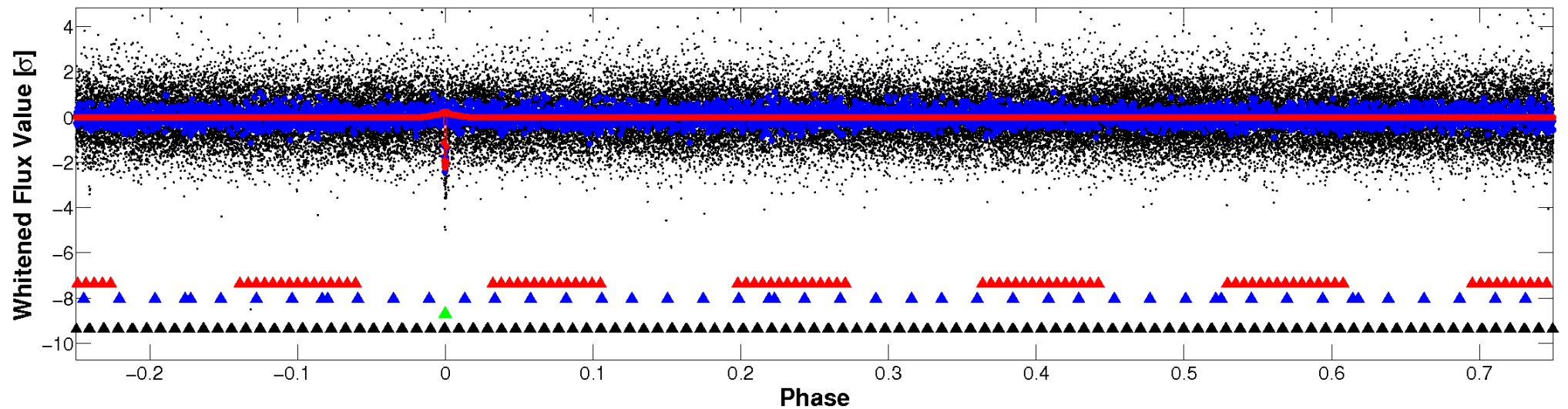


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

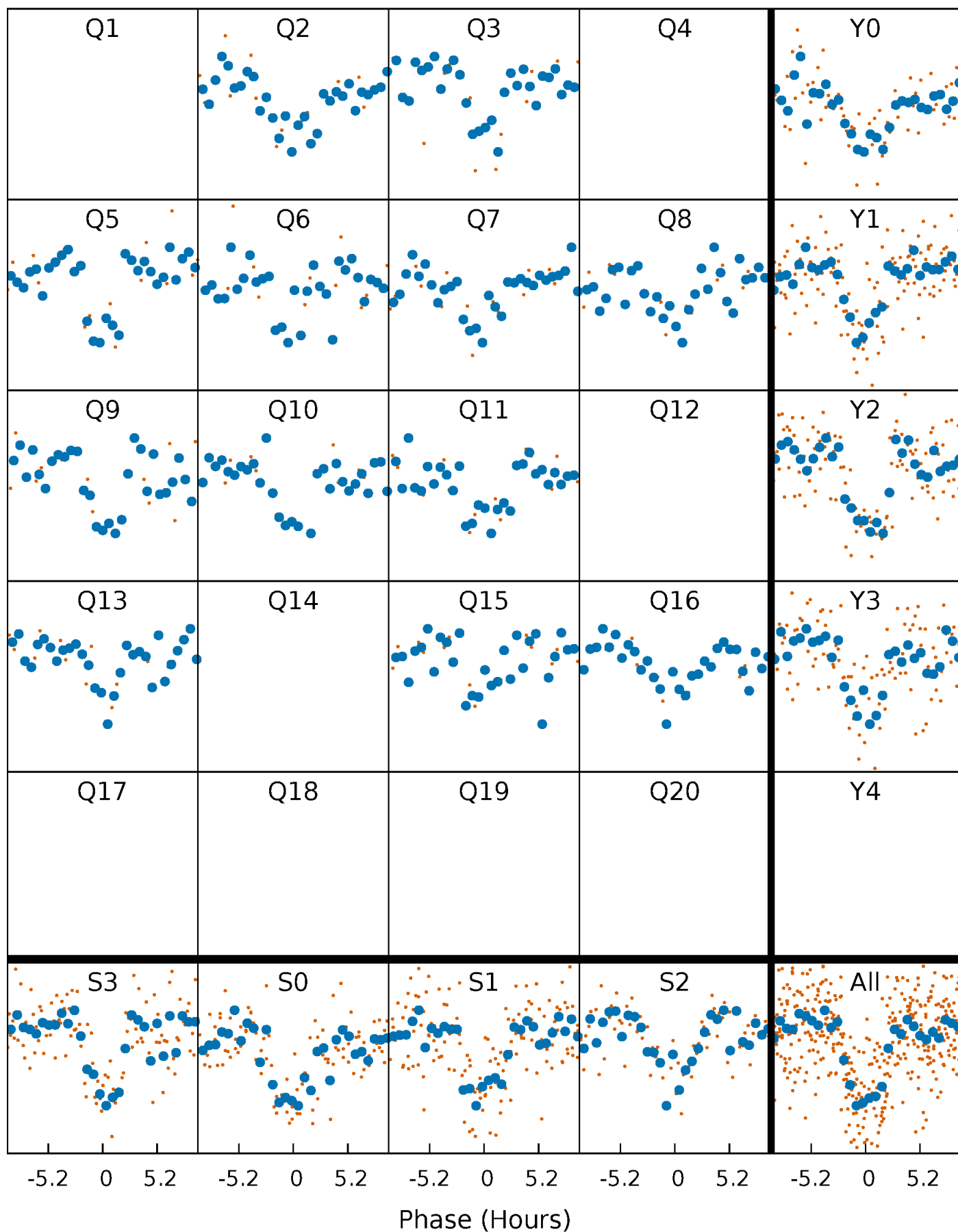


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



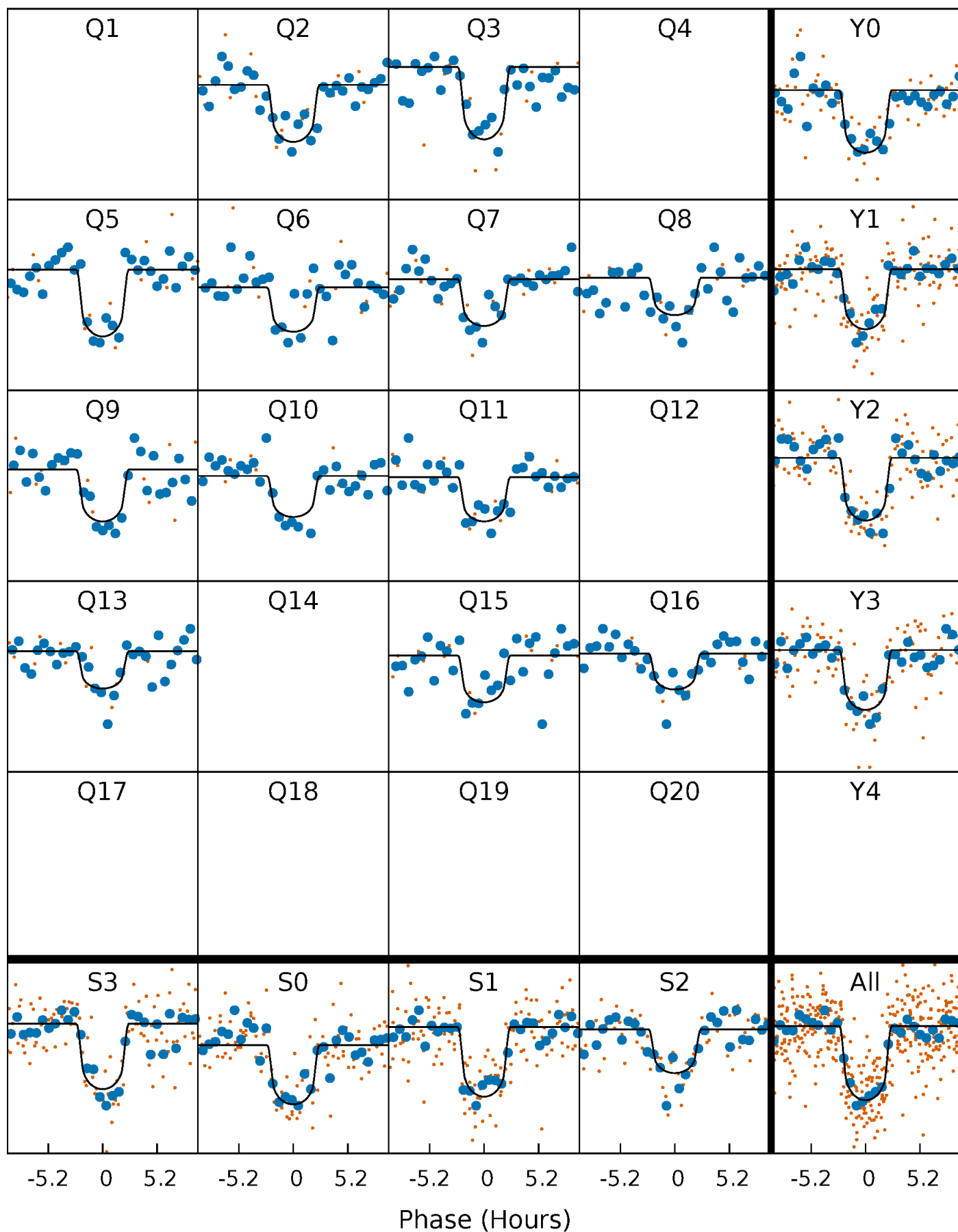
PDC Quarter-Phased Transit Curves

TCE 008247638-03 P= 99.641876 Days $T_0=198.684349$ (BKJD)



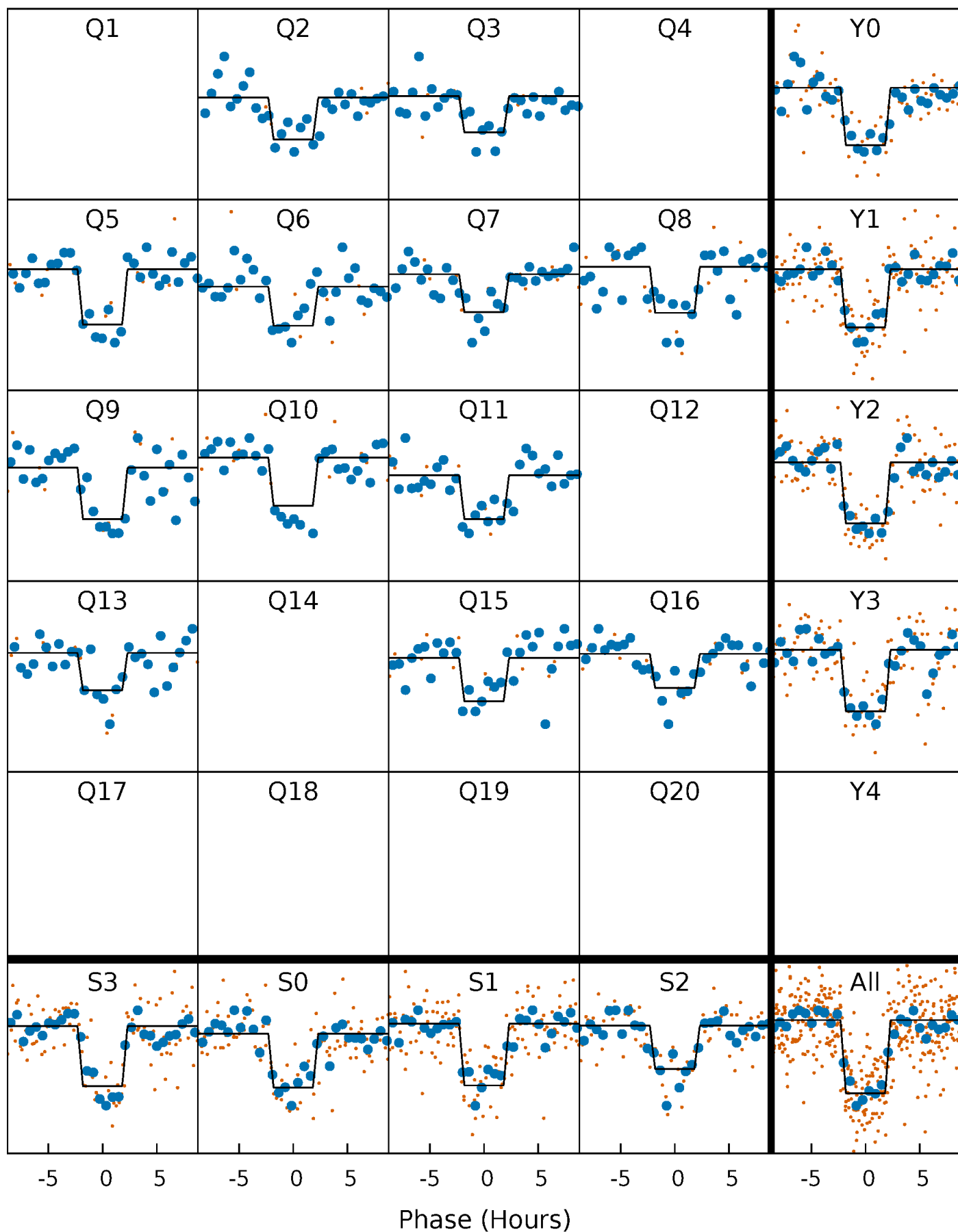
DV Quarter-Phased Transit Curves

TCE 008247638-03 P= 99.641876 Days $T_0=198.684349$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

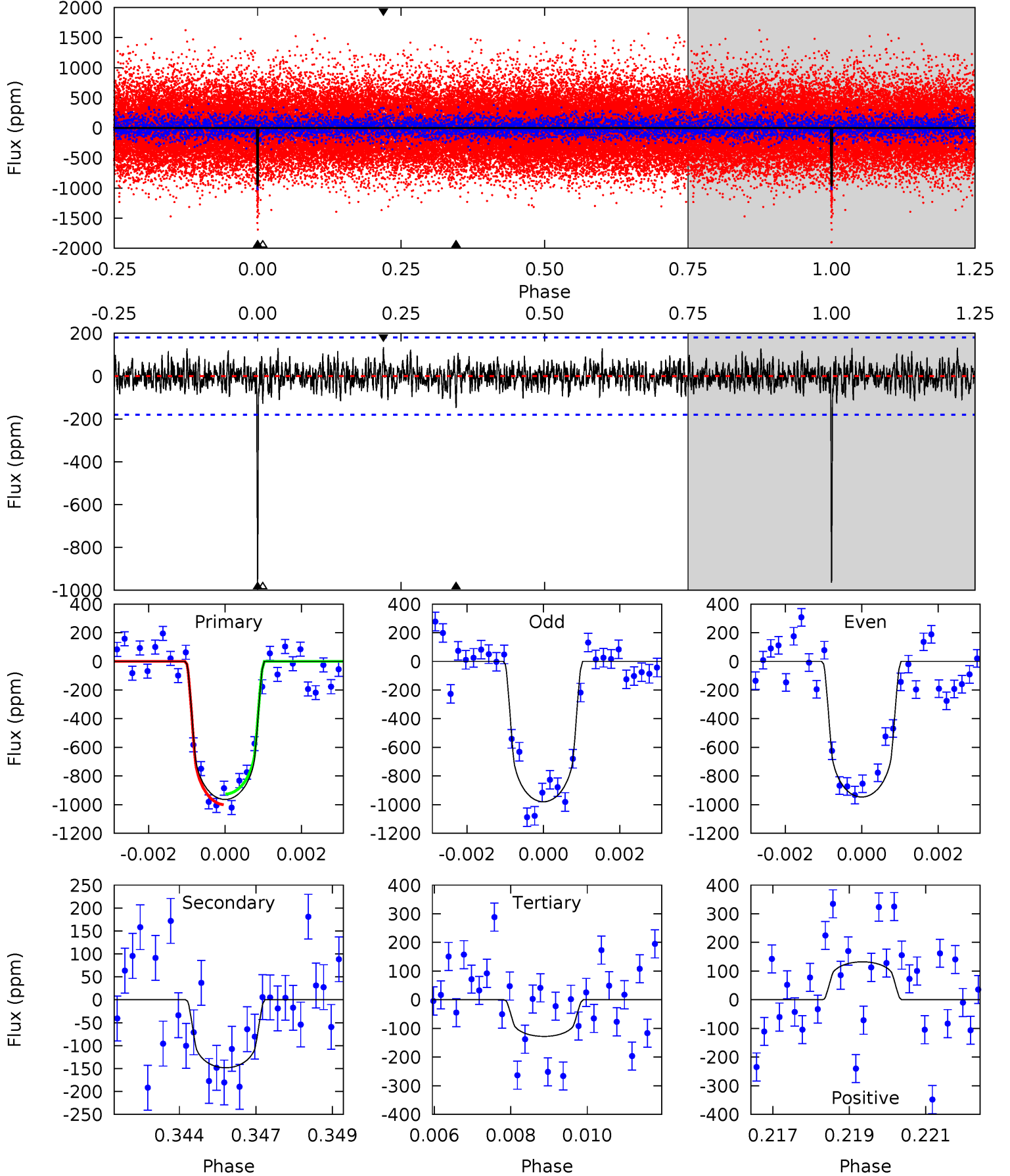
TCE 008247638-03 P= 99.642008 Days $T_0=198.682604$ (BKJD)



DV Model-Shift Uniqueness Test

008247638-03, P = 99.641876 Days, E = 99.042473 Days

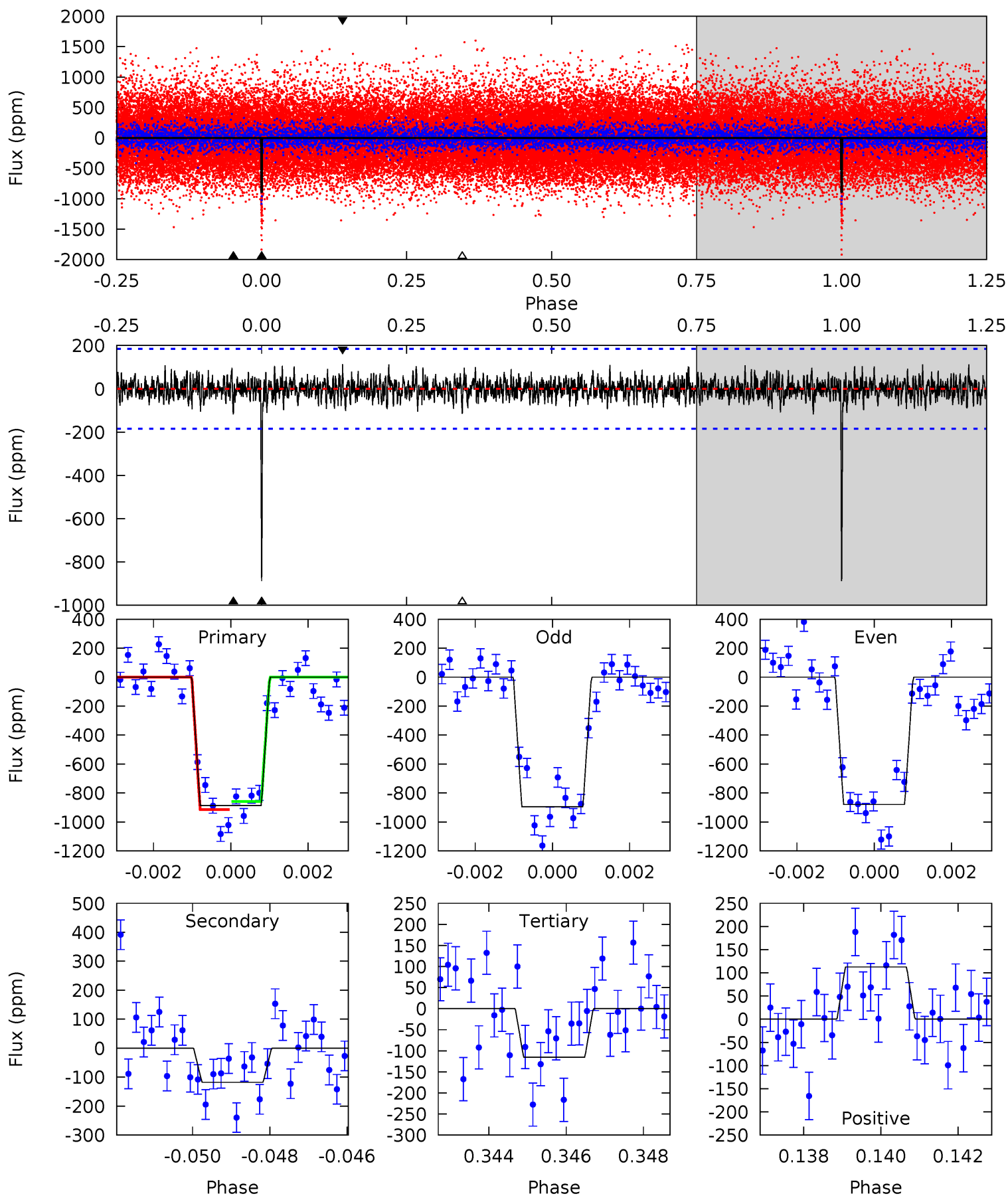
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.5	4.38	3.78	3.91	5.32	3.09	1.16	24.7	24.6	0.60	0.47	0.49	1.03	0.12	1.10



Alt Model-Shift Uniqueness Test

008247638-03, P = 99.642008 Days, E = 99.040596 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.7	3.41	3.34	3.26	5.33	3.10	0.99	22.3	22.4	0.06	0.15	0.24	1.01	0.11	0.82



Stellar Parameters For KIC 008247638

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5527^{+111}_{-111}	$4.488^{+0.075}_{-0.075}$	$-0.180^{+0.150}_{-0.150}$	$0.866^{+0.089}_{-0.074}$	$0.841^{+0.060}_{-0.043}$	$1.824^{+0.471}_{-0.447}$
	+2%/-2%	+2%/-2%	+83%/-83%	+10%/-9%	+7%/-5%	+26%/-25%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008247638-03 / KOI 0907.04

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-148 ± 34	$2.99^{+1.30}_{-1.41}$	504^{+16}_{-17}	3817^{+1032}_{-479}	1463^{+3955}_{-813}
Alt.	-118 ± 35	$2.81^{+1.35}_{-1.38}$	502^{+17}_{-16}	3688^{+1076}_{-471}	1238^{+3746}_{-718}

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

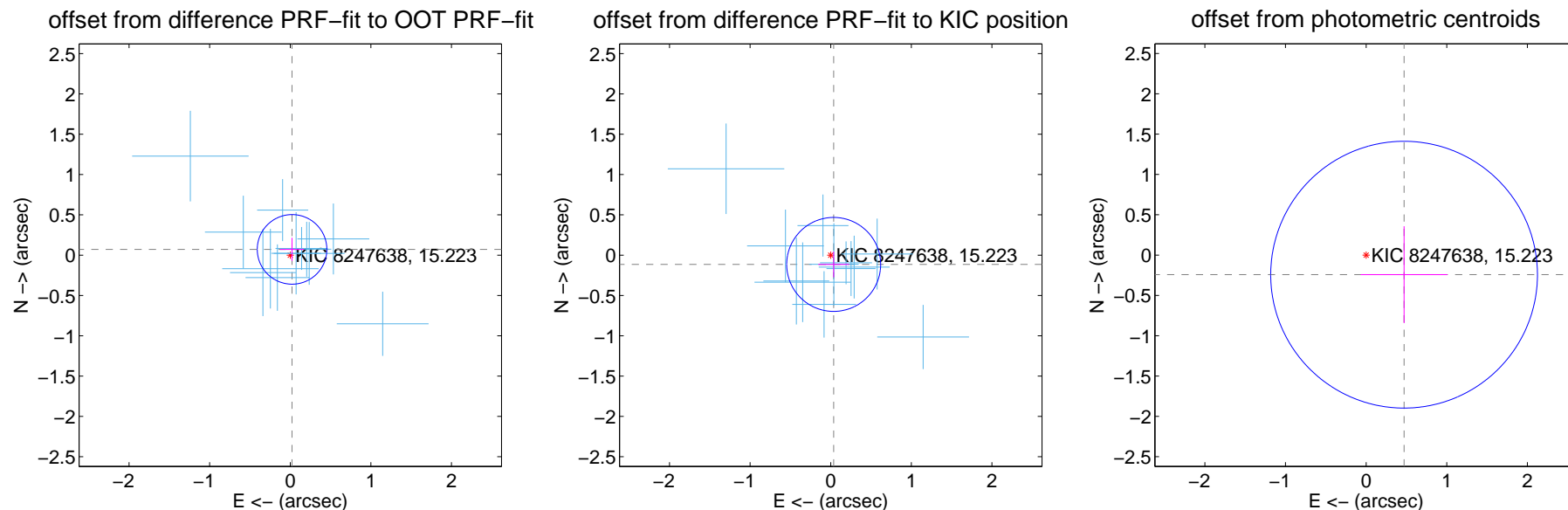
DV Centroid Data

Supplemental centroid analysis for 008247638-03. Kepler magnitude: 15.22. Transit SNR 19.42

There are 12 quarters with good PRF difference image offsets

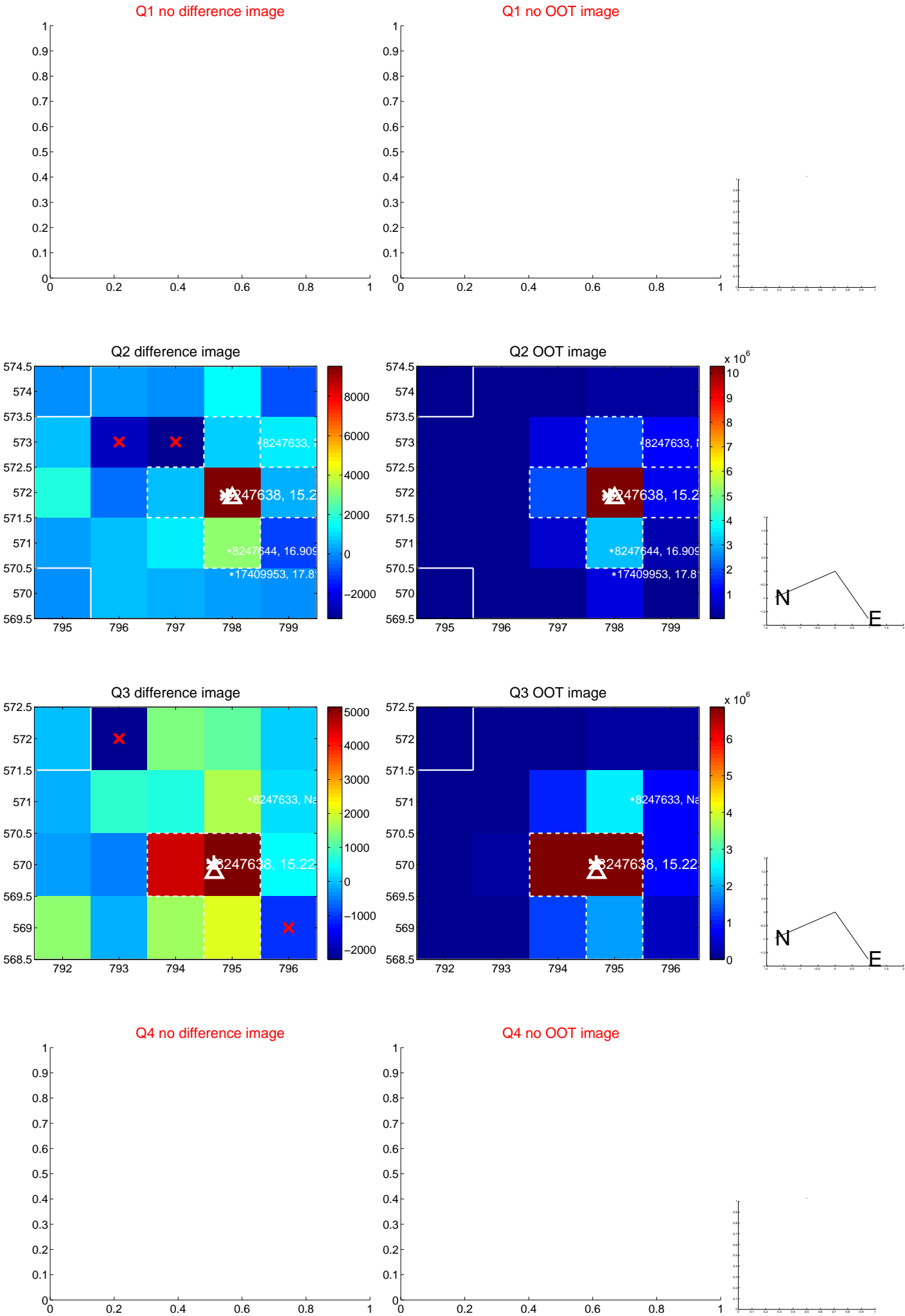
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.075 ± 0.144	0.52	-0.022 ± 0.149	0.072 ± 0.143
PRF-fit source offset from KIC position	0.121 ± 0.194	0.62	-0.037 ± 0.191	-0.115 ± 0.160
photometric centroid source offset	0.53 ± 0.55	0.96	-0.47 ± 0.54	-0.24 ± 0.60

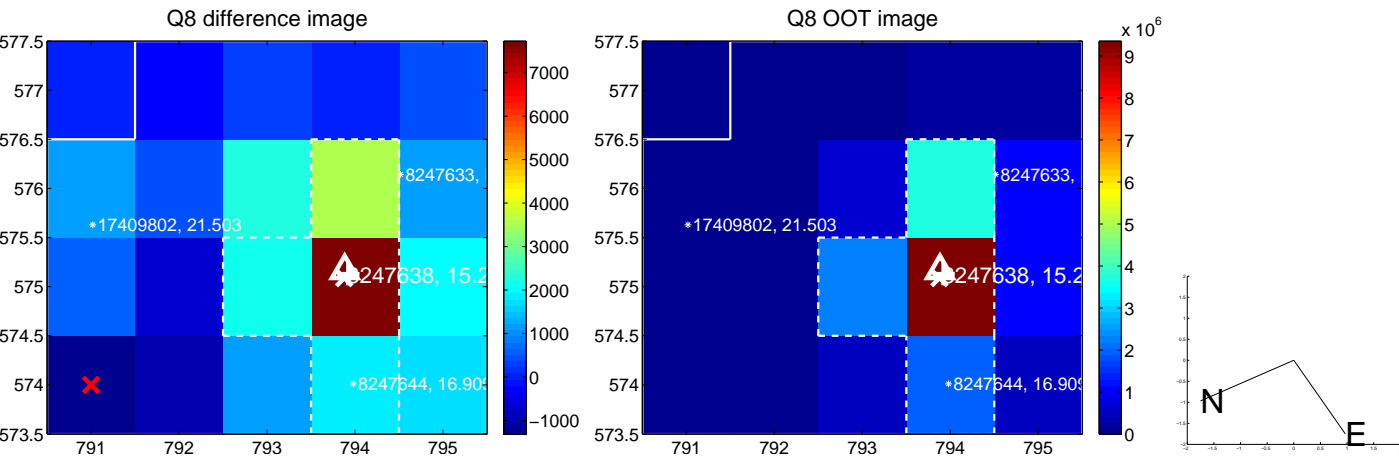
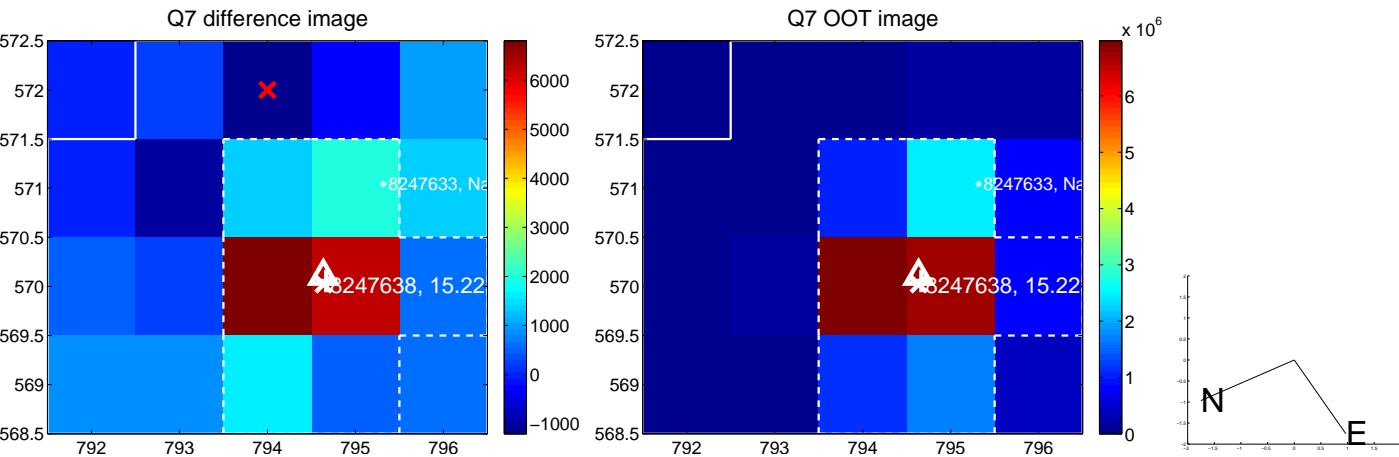
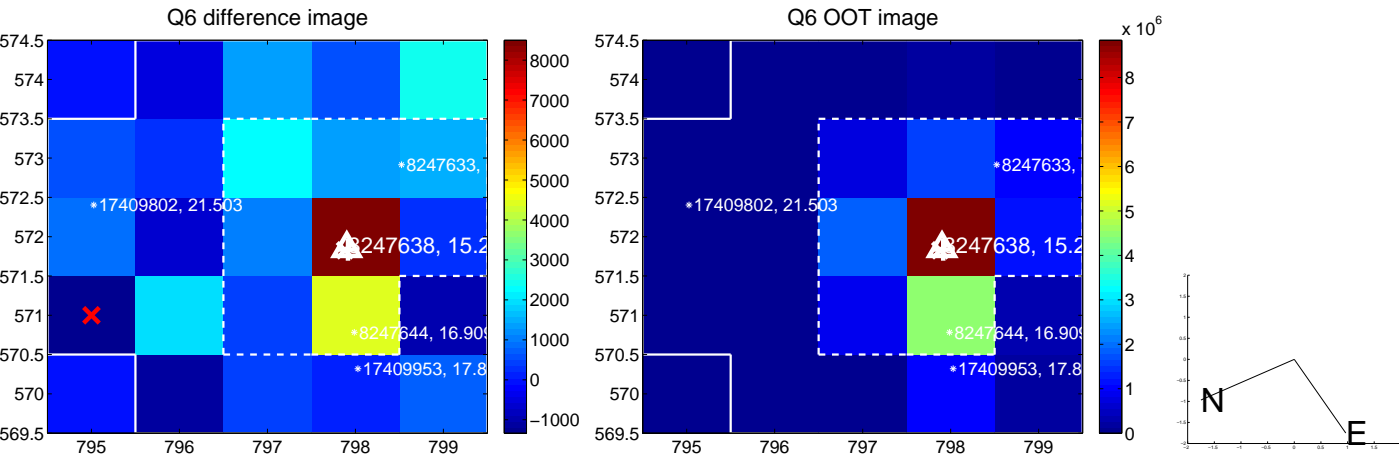
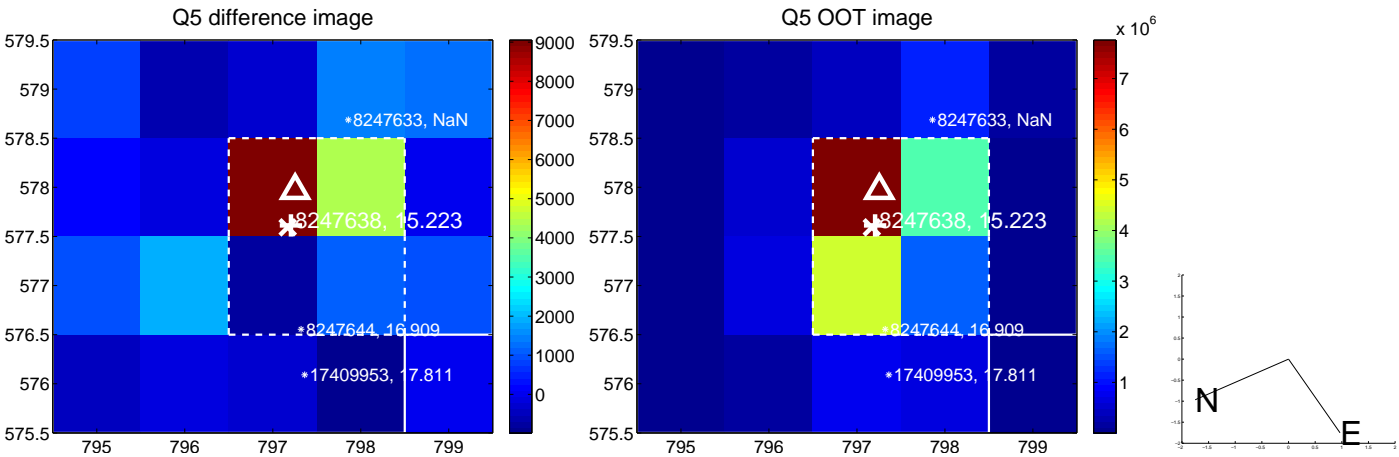


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

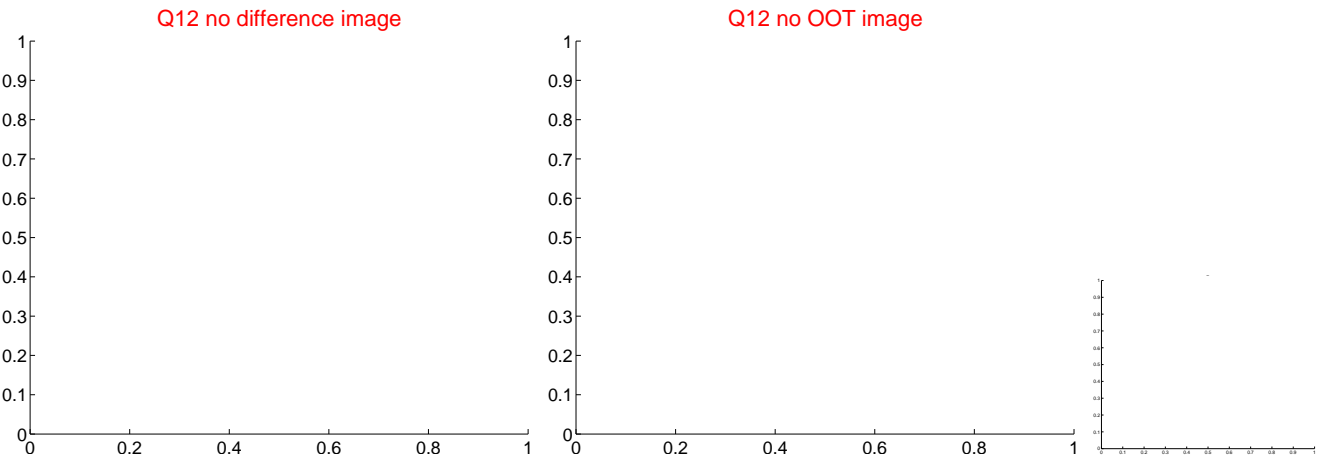
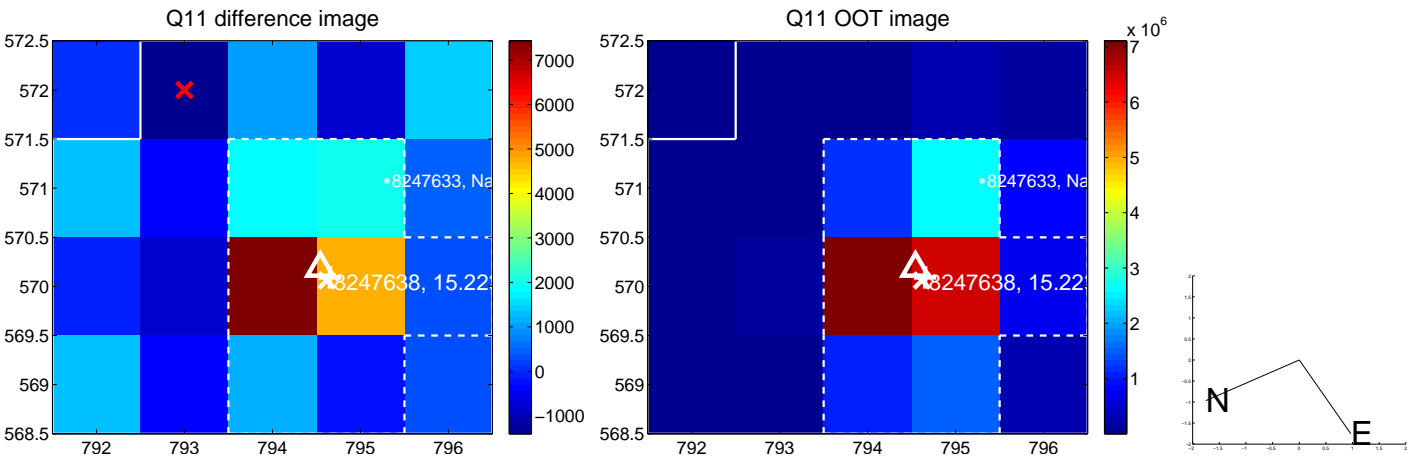
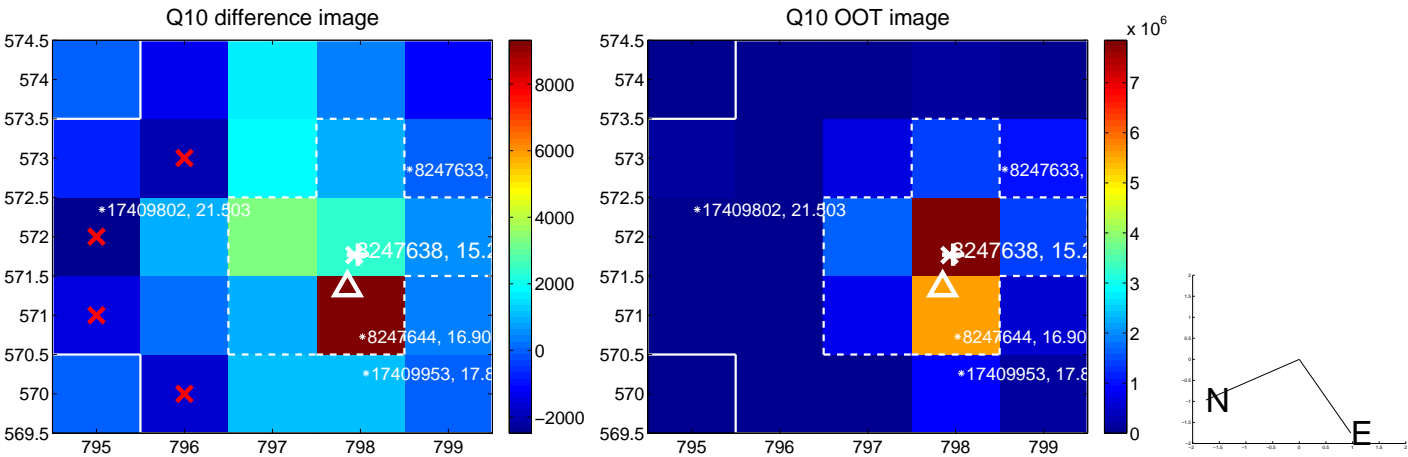
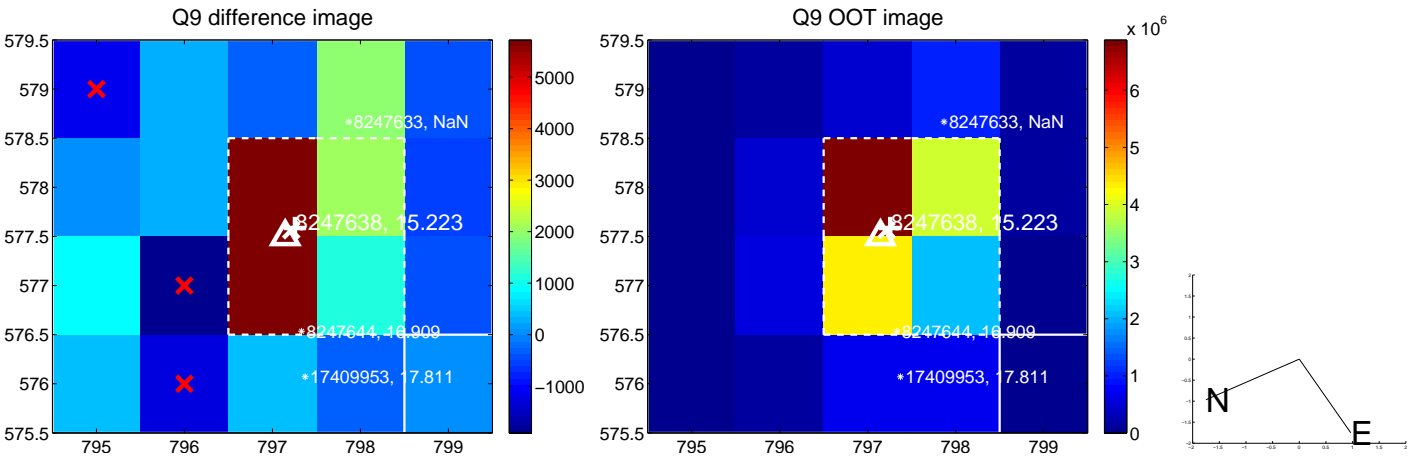
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



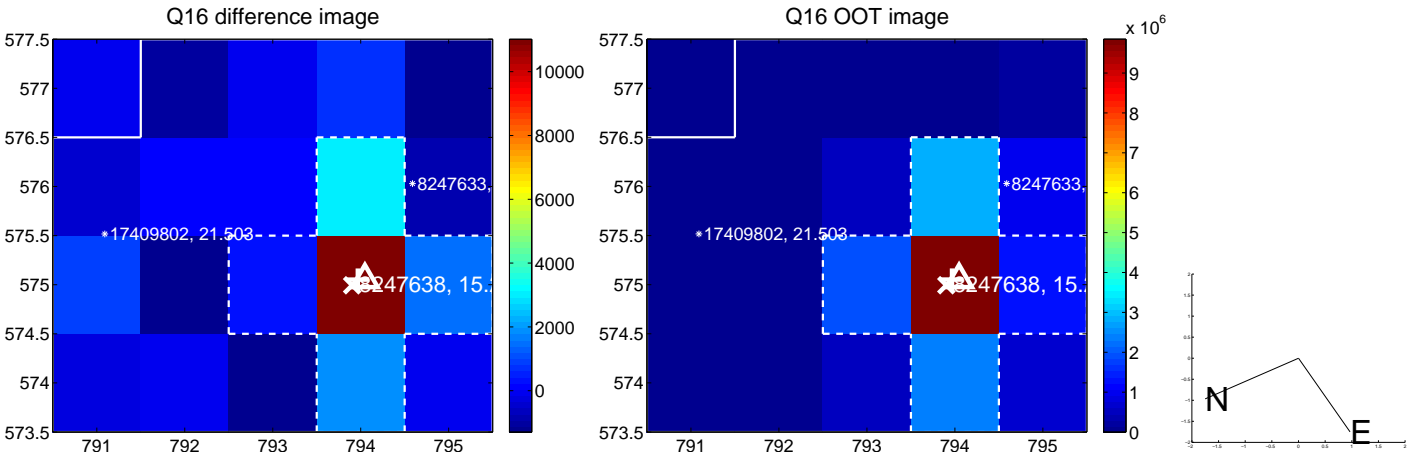
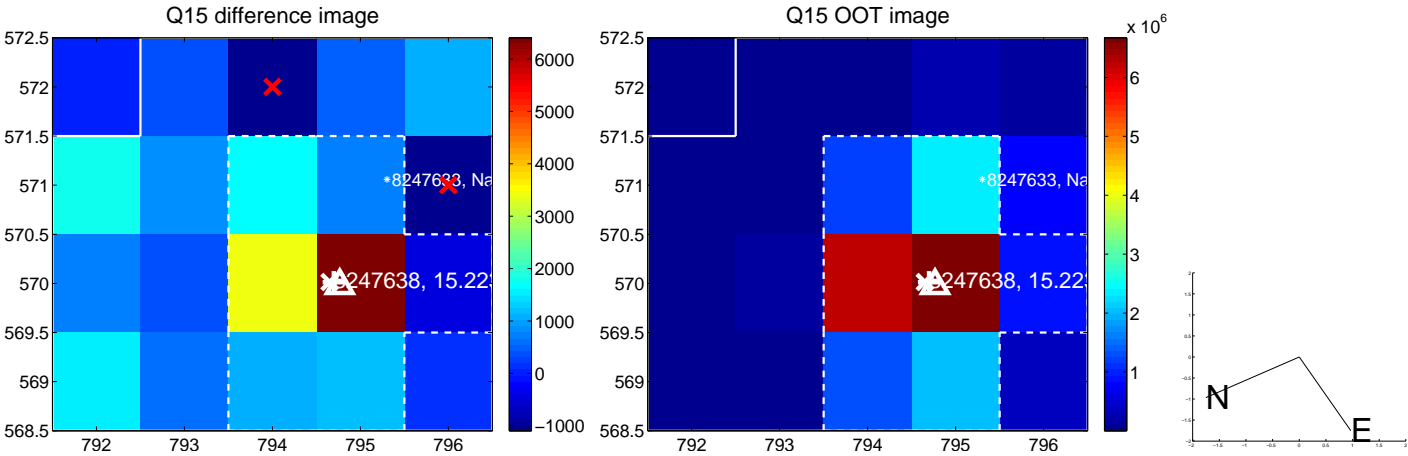
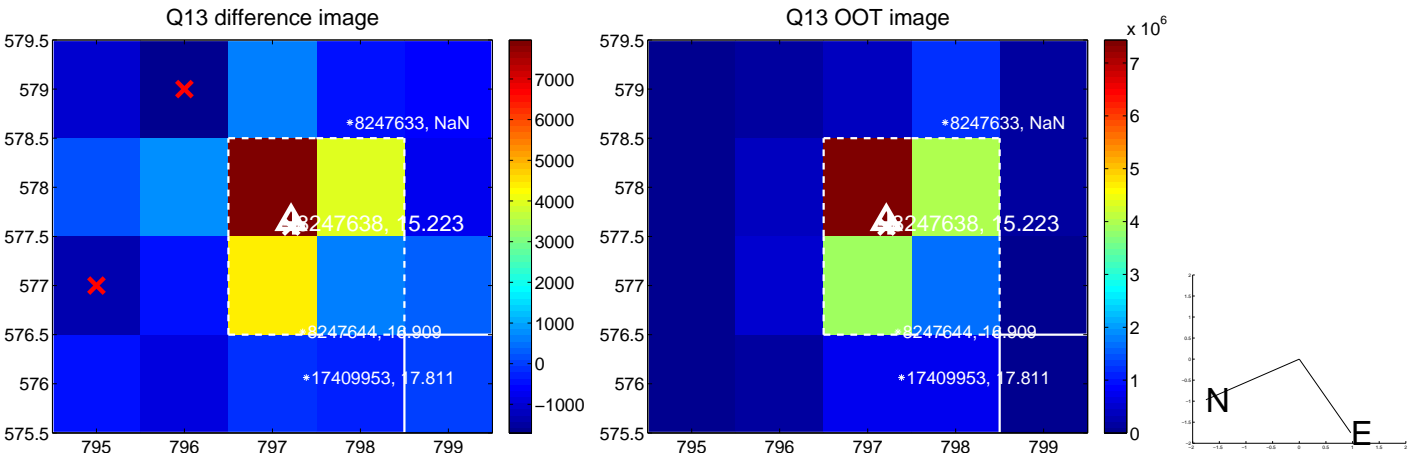
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



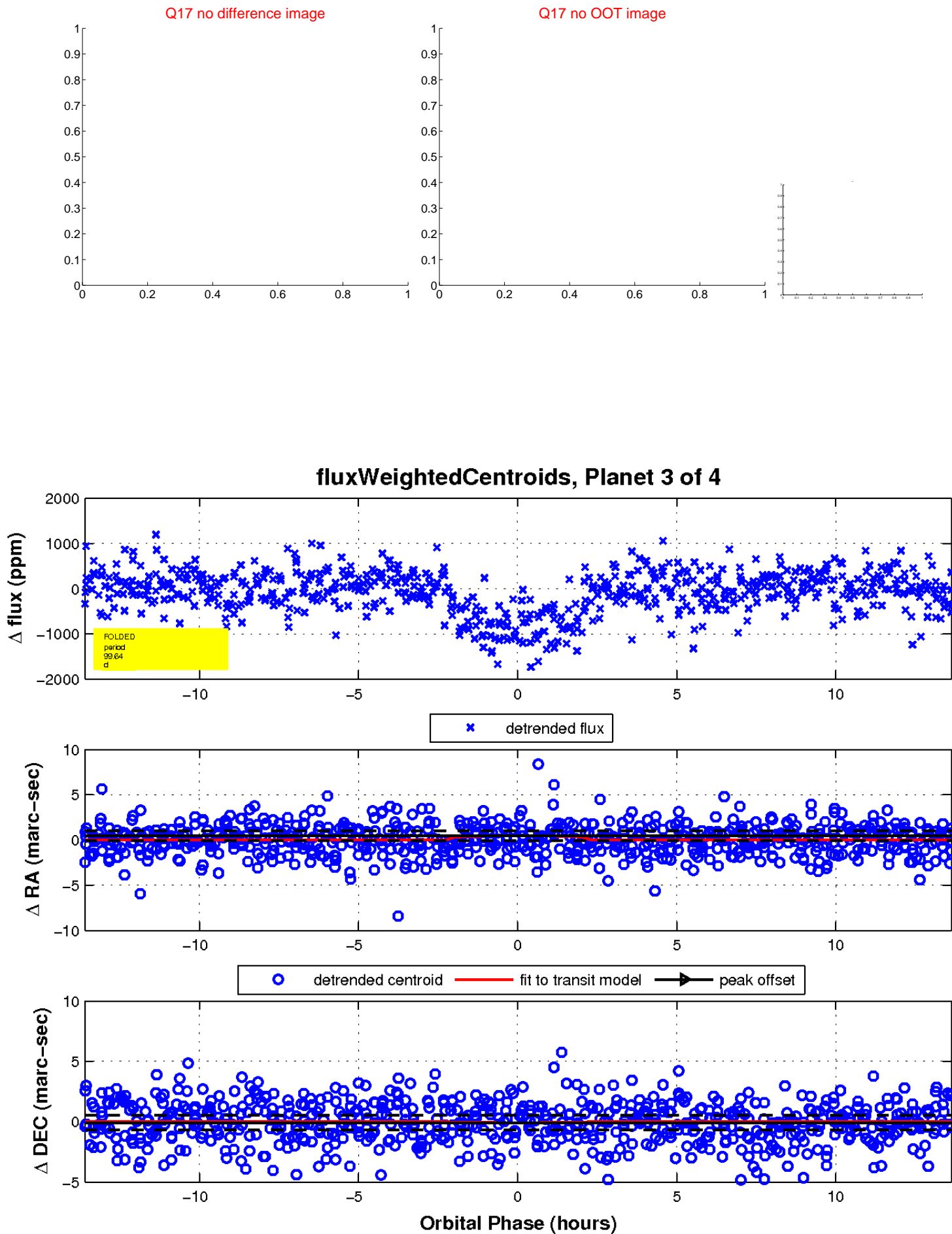
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



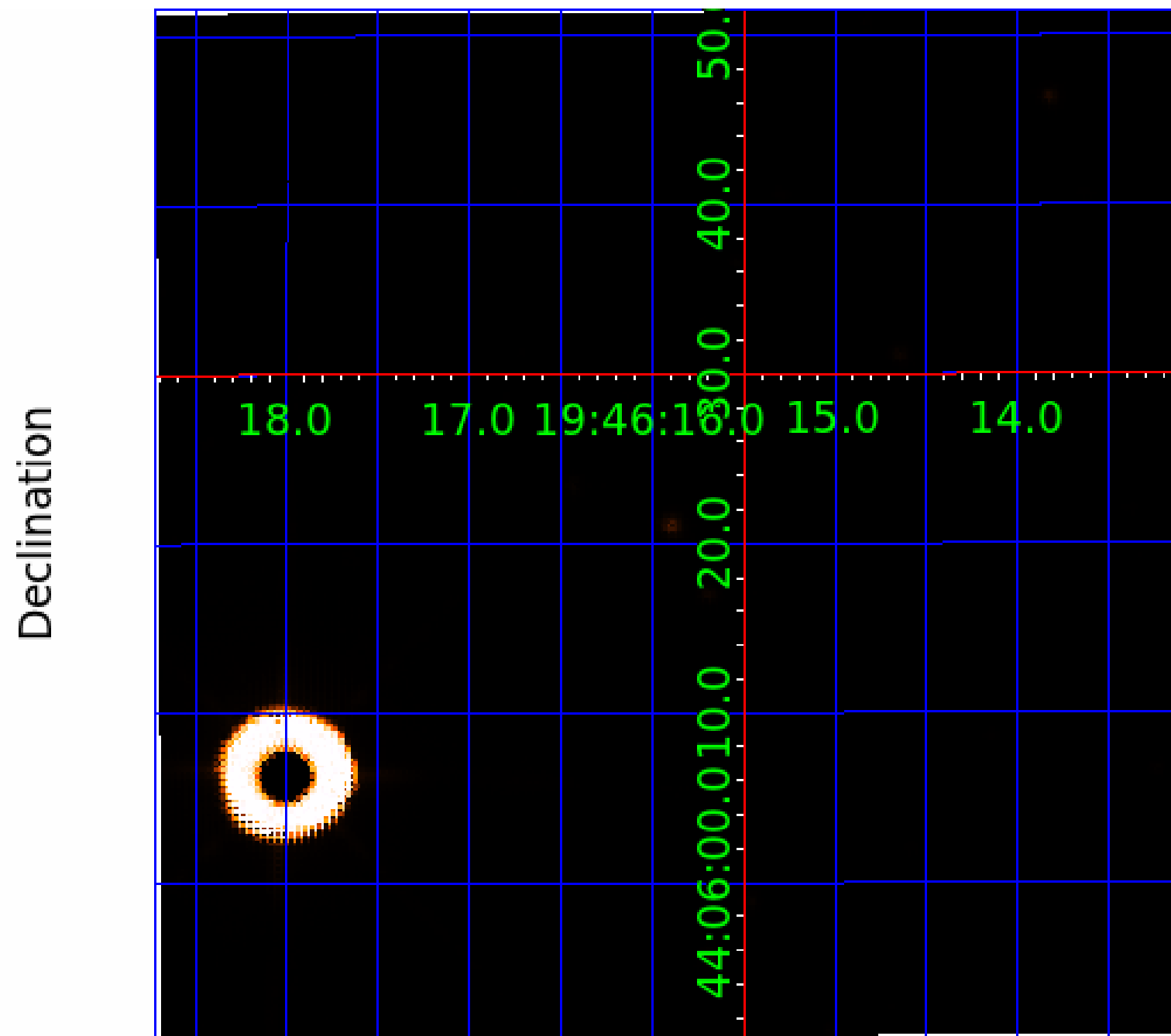
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008247638

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})
008247638-01	OBS	0907.01	16.514084	143.088898	955.4	4.227	43.1	46.7	0.87	5527	2.82	43.66
008247638-02	OBS	0907.02	30.132958	160.250205	972.0	5.190	32.9	35.6	0.87	5527	3.13	19.58
008247638-03	OBS	0907.04	99.641876	198.684349	970.5	4.553	19.4	19.4	0.87	5527	2.85	3.97
008247638-04	OBS	0907.03	4.790886	131.524685	234.9	2.962	16.1	18.2	0.87	5527	1.69	227.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008247638-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008247638-04	OBS	PC	1.00	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.

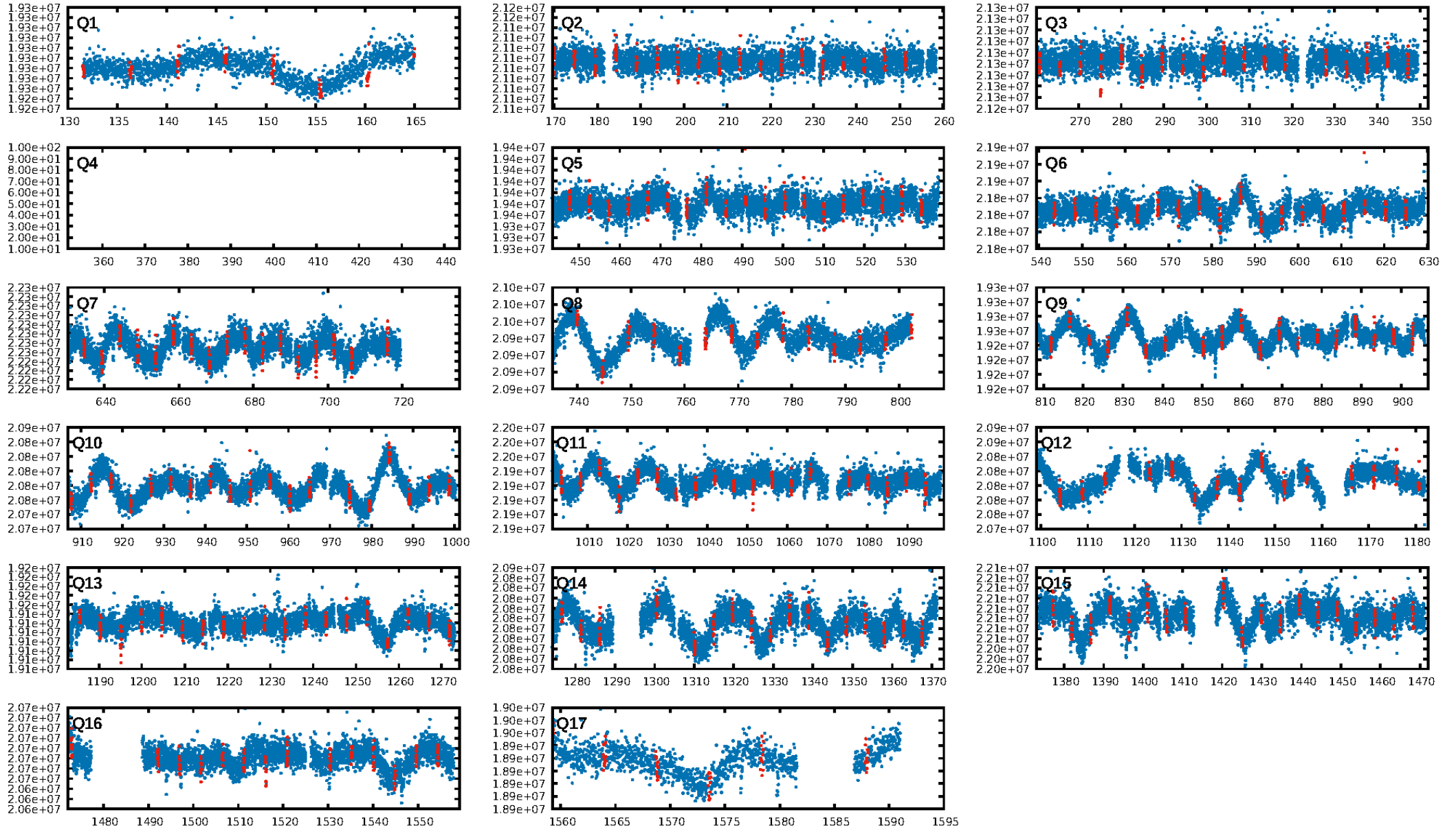
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008247638-04

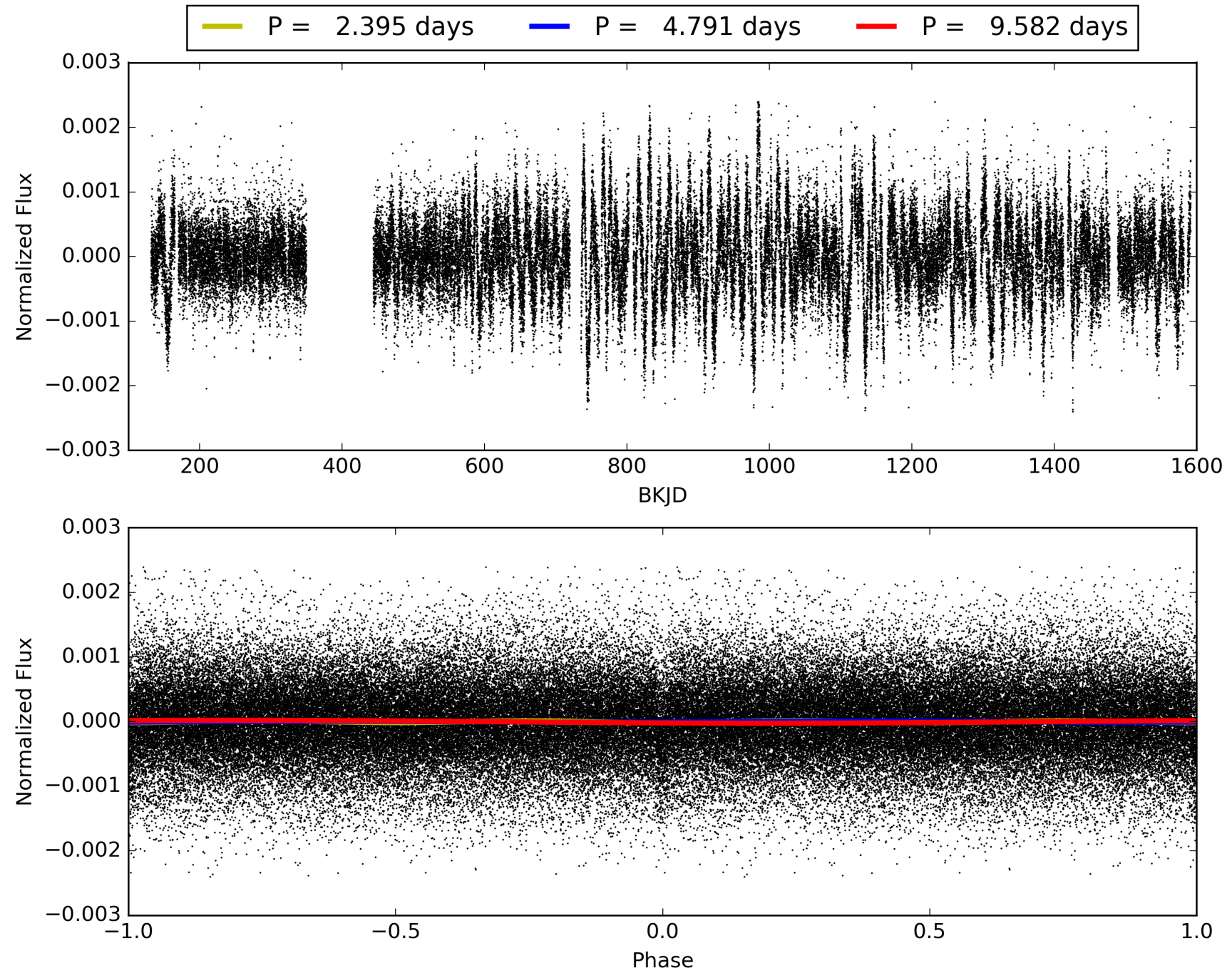
No Significant Match Found

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

TCE 008247638-04, PDC Light Curves

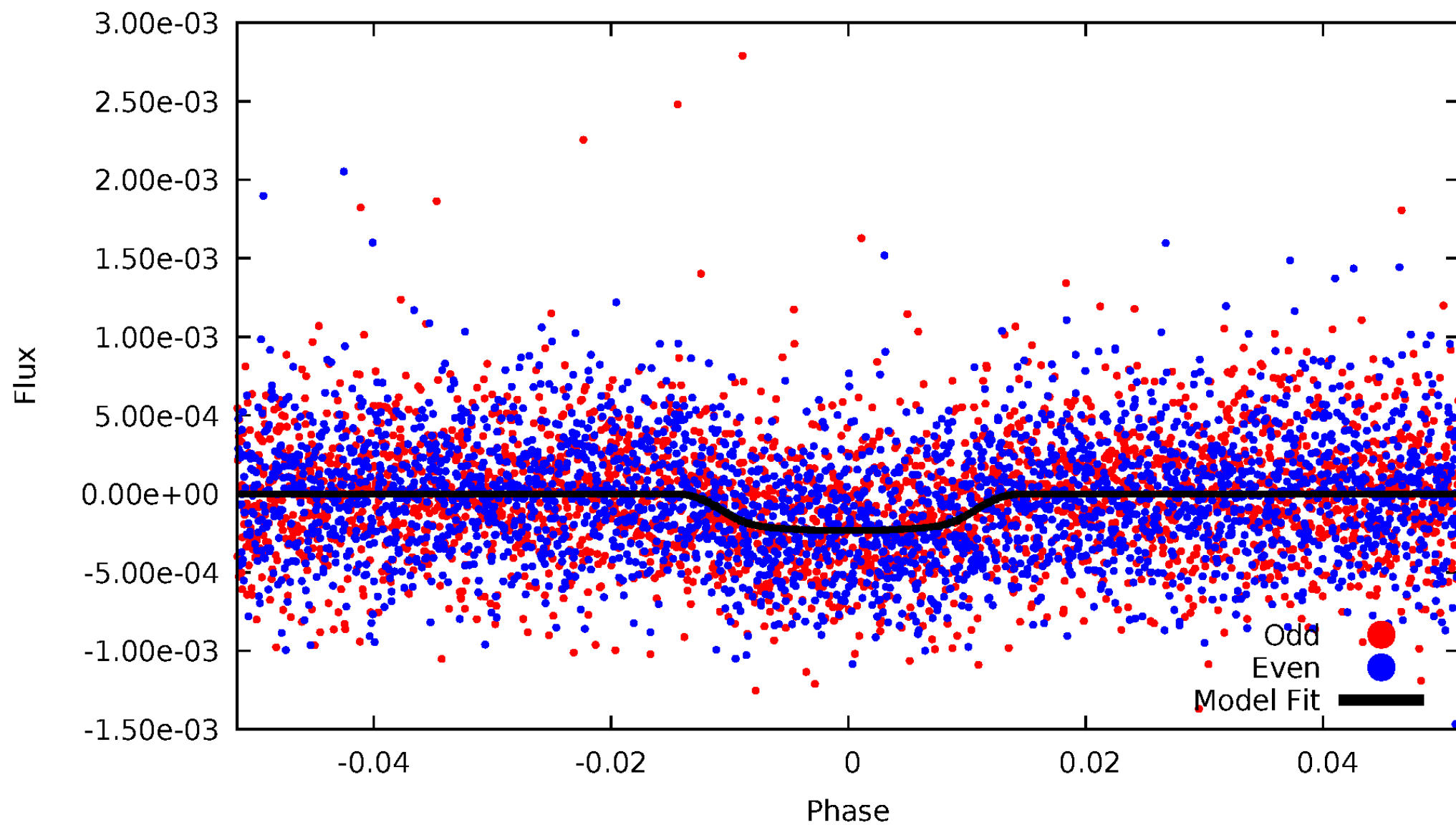


TCE 008247638-04



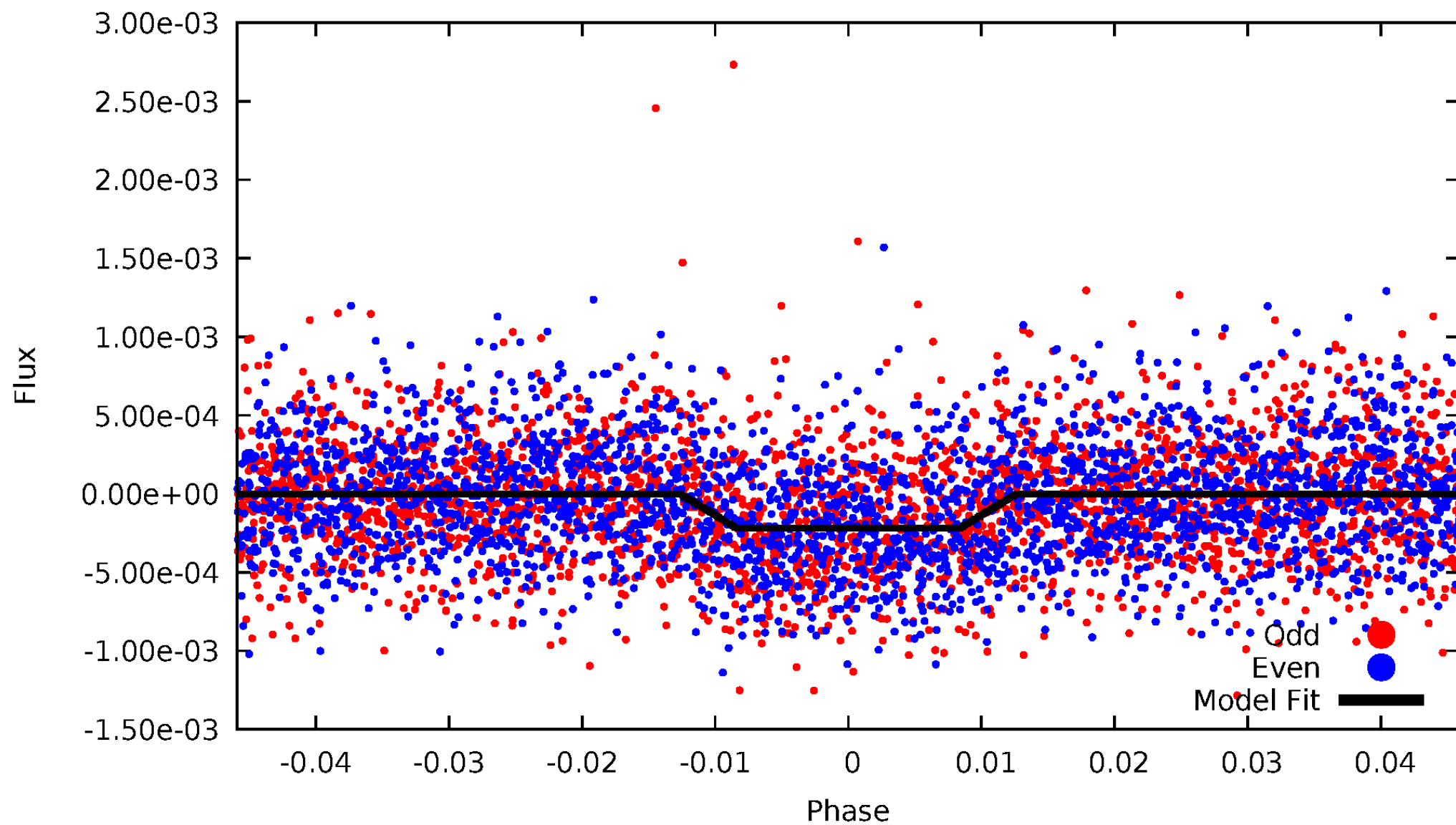
DV Odd/Even

TCE 008247638-04



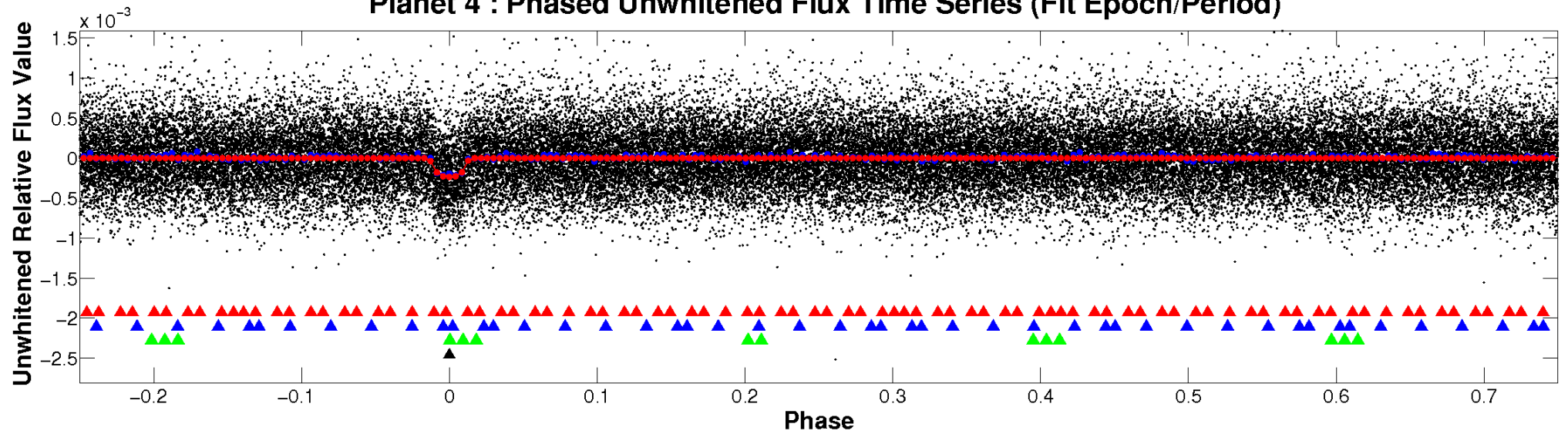
ALT Odd/Even

TCE 008247638-04

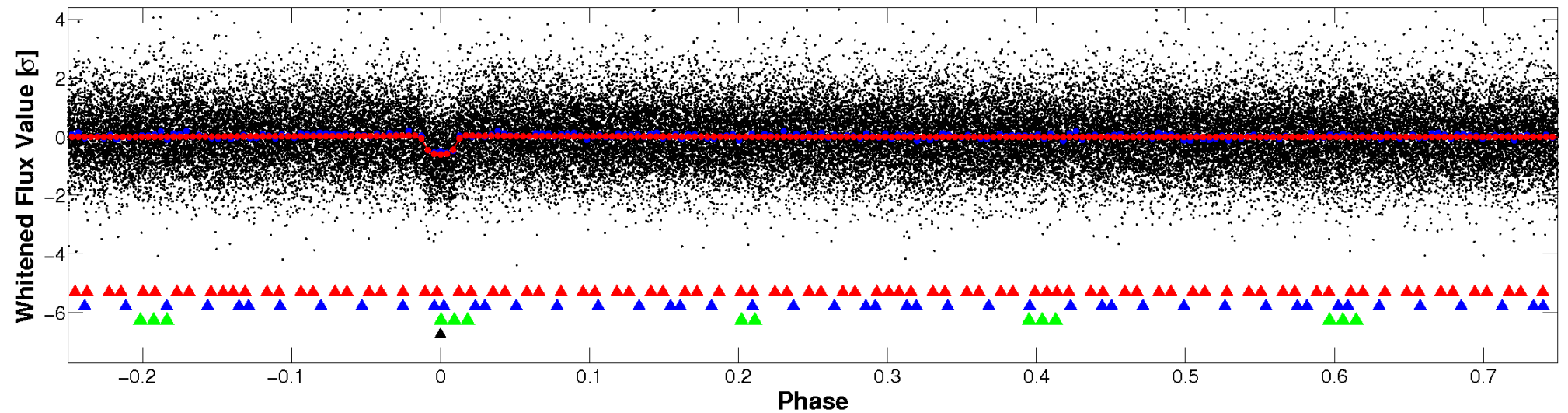


Non-Whitened Vs. Whitened Light Curve

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

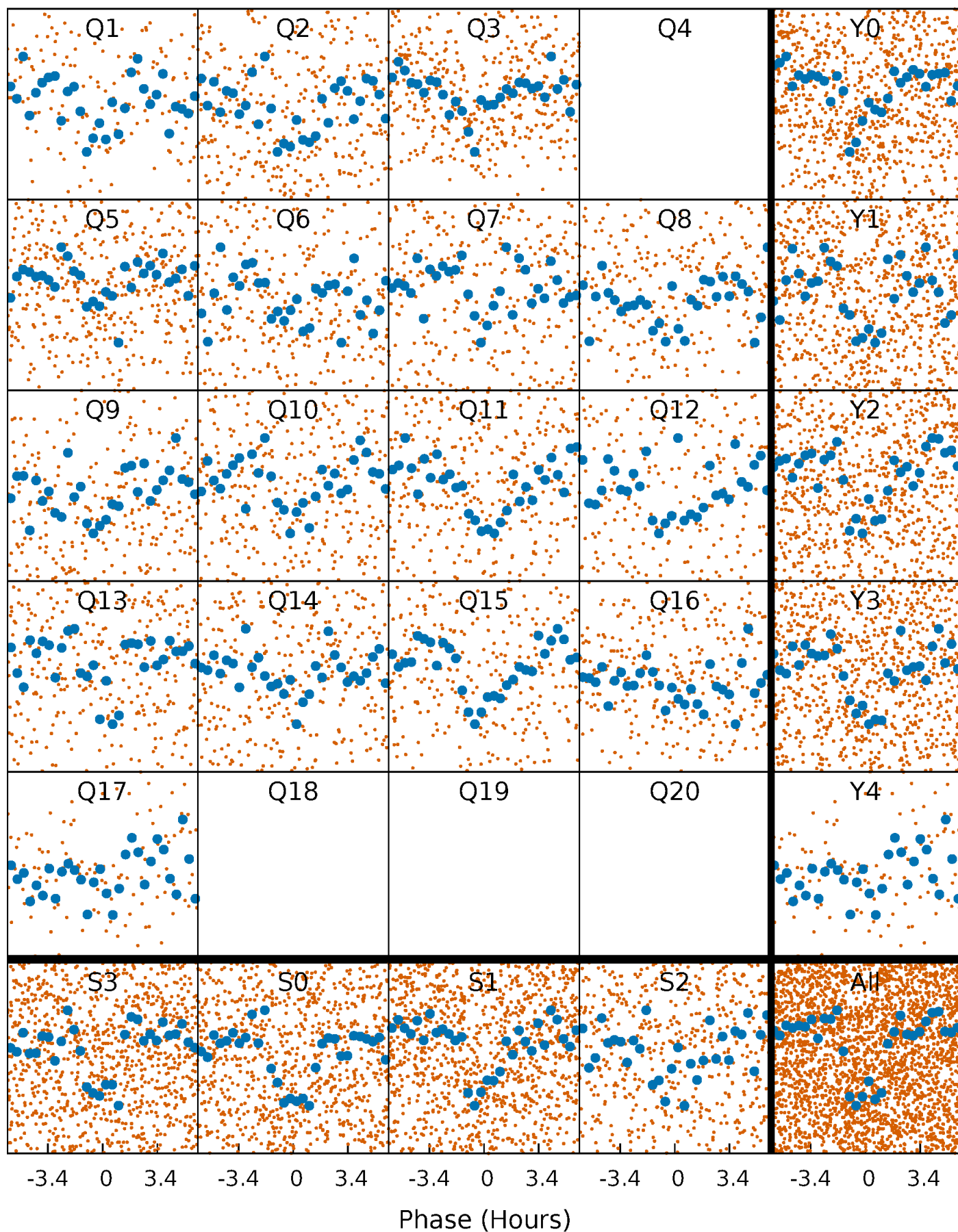


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



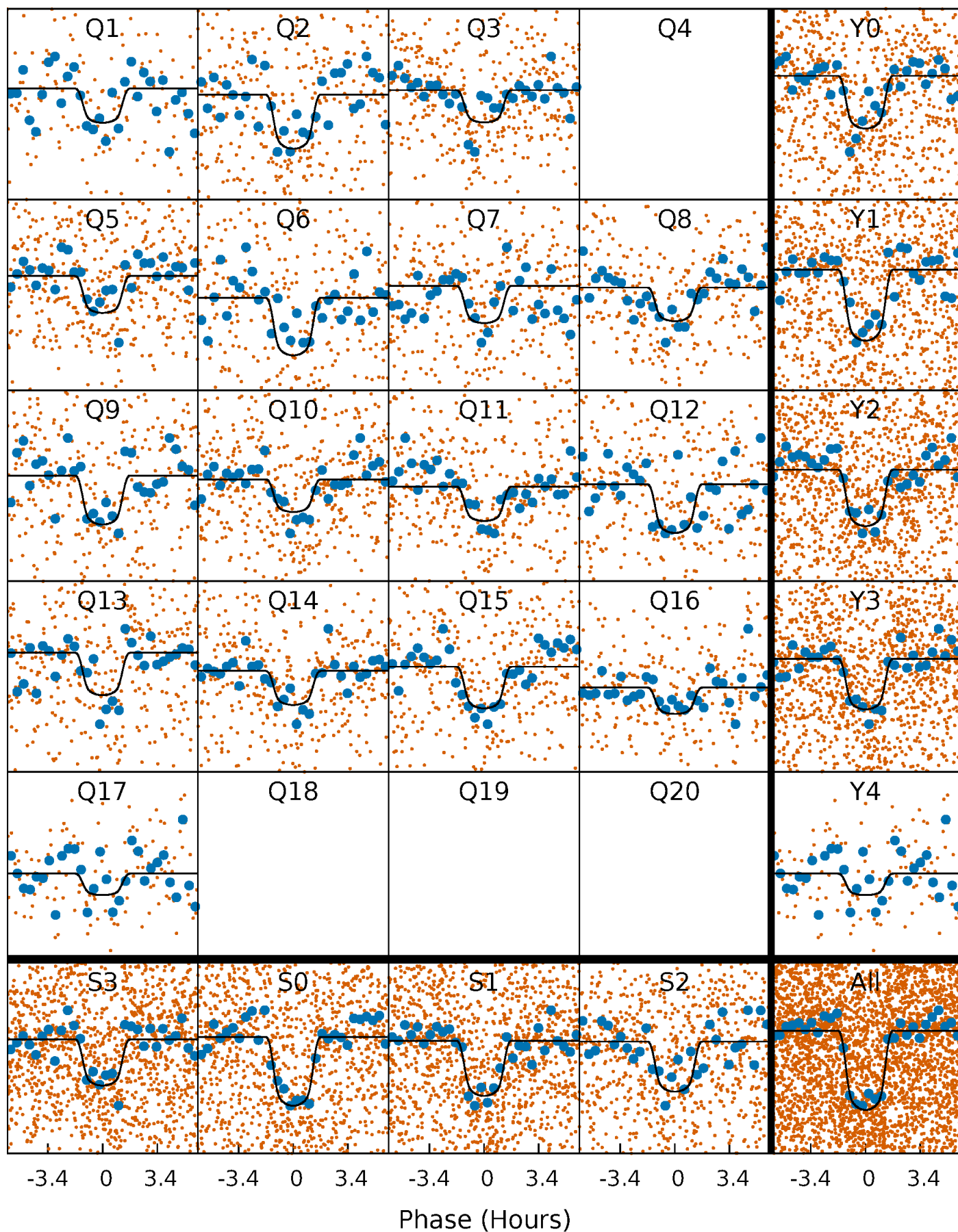
PDC Quarter-Phased Transit Curves

TCE 008247638-04 P= 4.790886 Days $T_0=131.524685$ (BKJD)



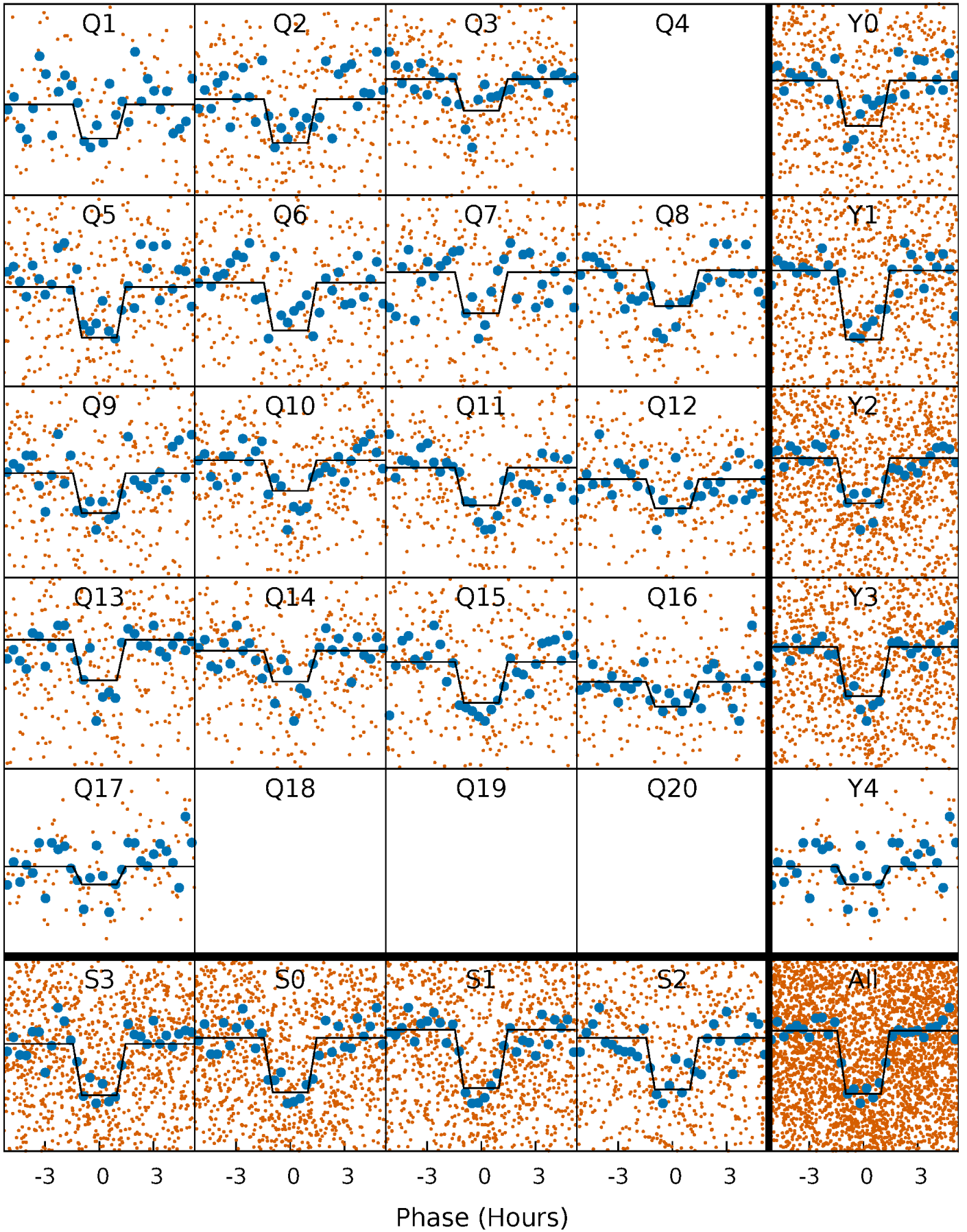
DV Quarter-Phased Transit Curves

TCE 008247638-04 P= 4.790886 Days $T_0=131.524685$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

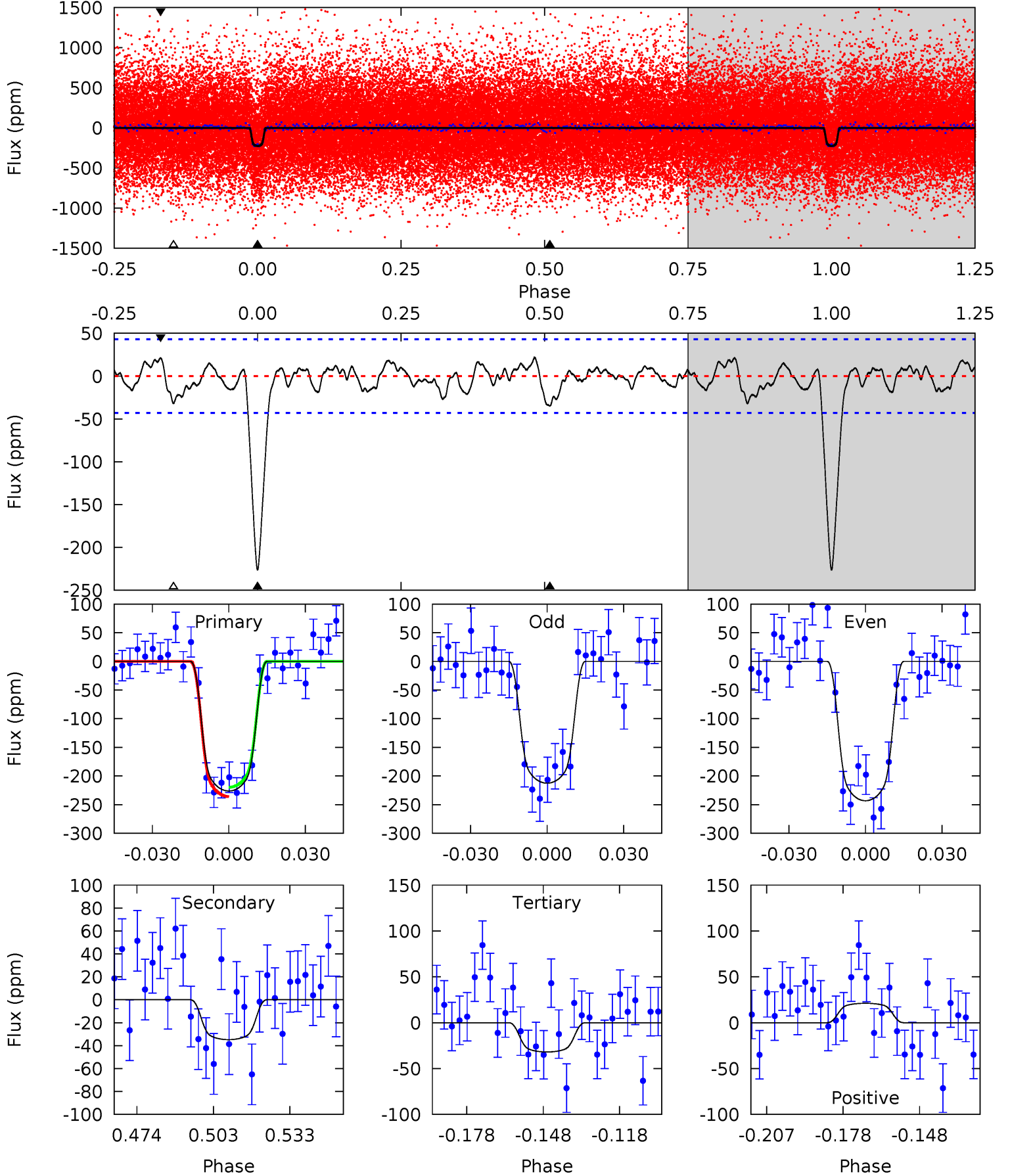
TCE 008247638-04 P= 4.790913 Days $T_0=131.520533$ (BKJD)



DV Model-Shift Uniqueness Test

008247638-04, P = 4.790886 Days, E = 126.733799 Days

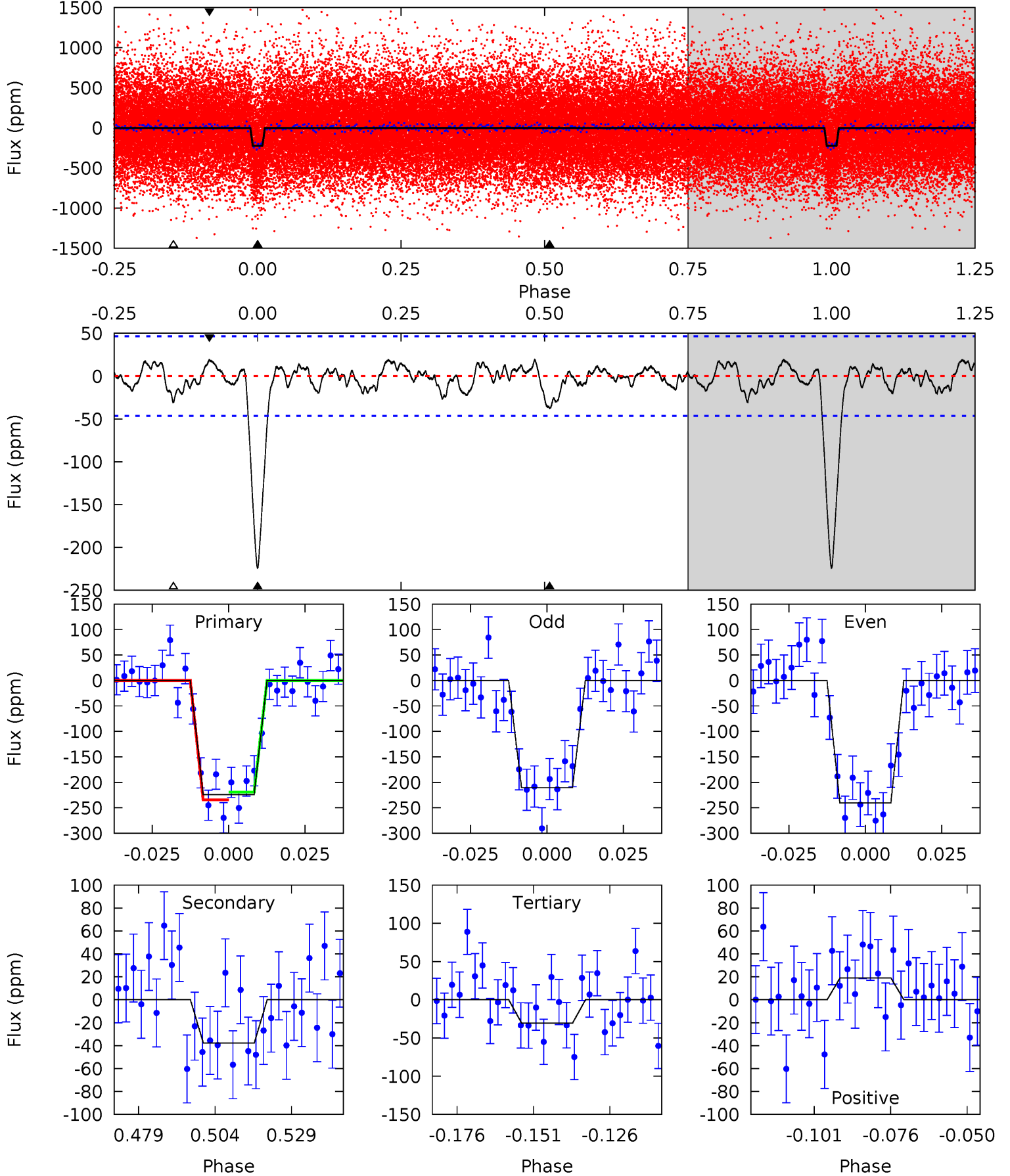
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.3	3.90	3.58	2.36	4.81	2.18	1.18	21.7	23.0	0.32	1.53	1.72	0.99	0.09	0.90



Alt Model-Shift Uniqueness Test

008247638-04, P = 4.790913 Days, E = 126.729620 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.3	3.93	3.18	1.98	4.85	2.24	1.06	20.2	21.4	0.75	1.95	1.57	0.99	0.08	0.81



Stellar Parameters For KIC 008247638

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5527^{+111}_{-111}	$4.488^{+0.075}_{-0.075}$	$-0.180^{+0.150}_{-0.150}$	$0.866^{+0.089}_{-0.074}$	$0.841^{+0.060}_{-0.043}$	$1.824^{+0.471}_{-0.447}$
	+2%/-2%	+2%/-2%	+83%/-83%	+10%/-9%	+7%/-5%	+26%/-25%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 008247638-04 / KOI 0907.03

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-35 ± 9	$1.69^{+0.21}_{-0.20}$	1383^{+47}_{-44}	3612^{+210}_{-220}	19^{+8}_{-6}
Alt.	-38 ± 10	$1.40^{+0.20}_{-0.20}$	1387^{+45}_{-46}	3891^{+294}_{-260}	29^{+14}_{-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 $A_{obs} \gg 1.0$

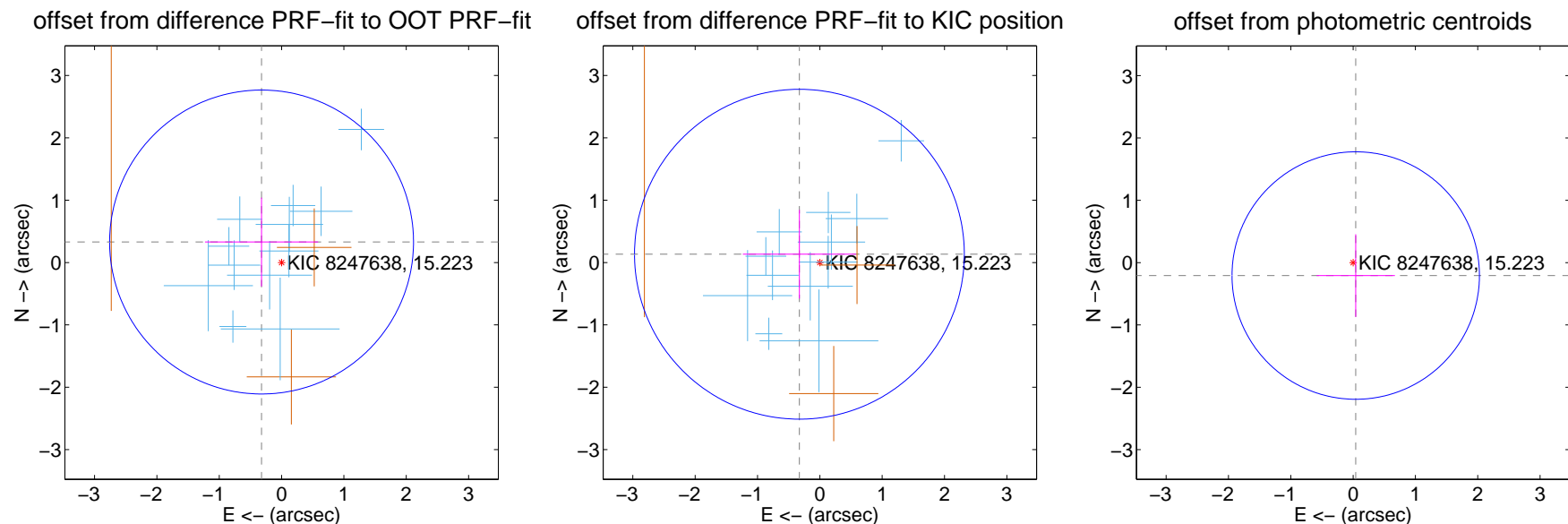
DV Centroid Data

Supplemental centroid analysis for 008247638-04. Kepler magnitude: 15.22. Transit SNR 18.18

There are 12 quarters with good PRF difference image offsets

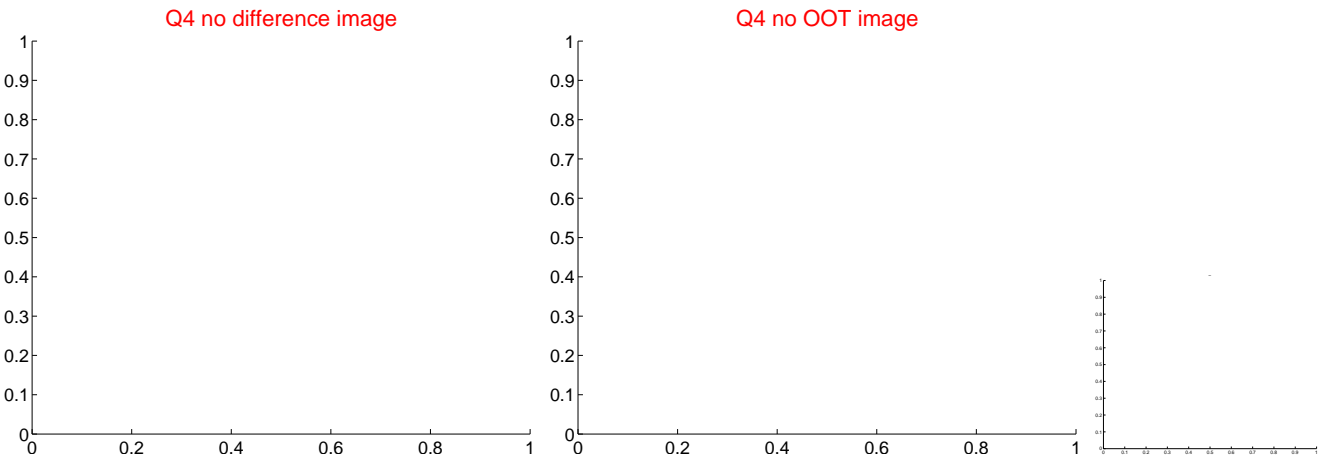
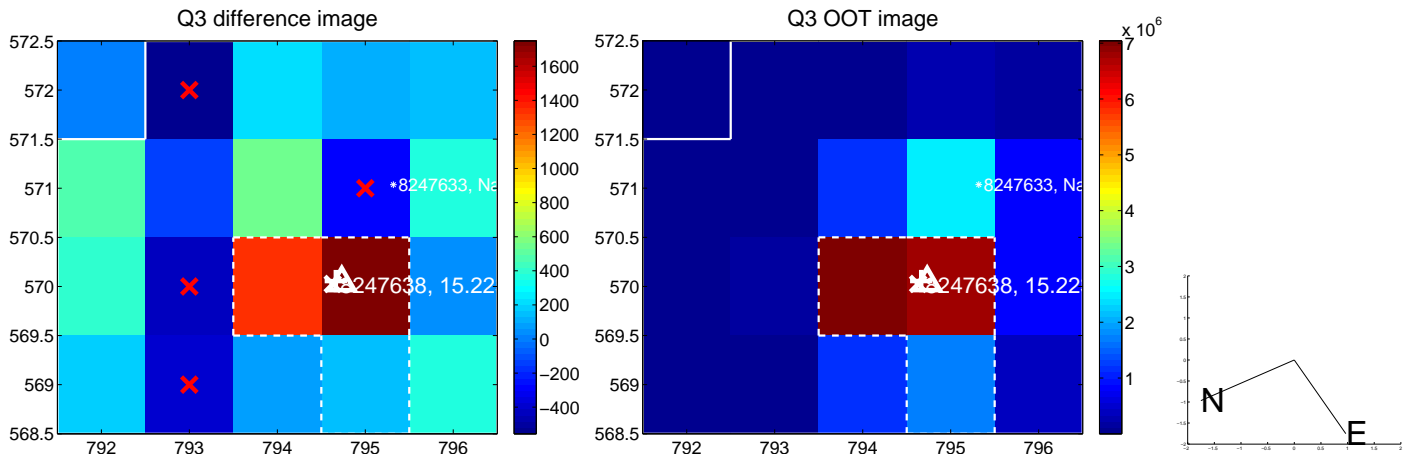
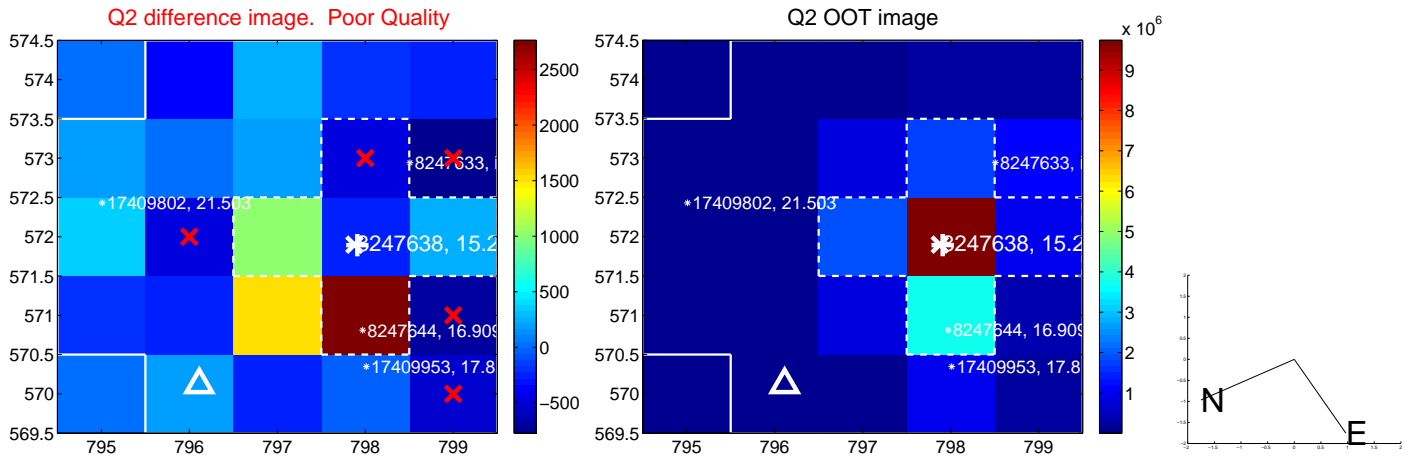
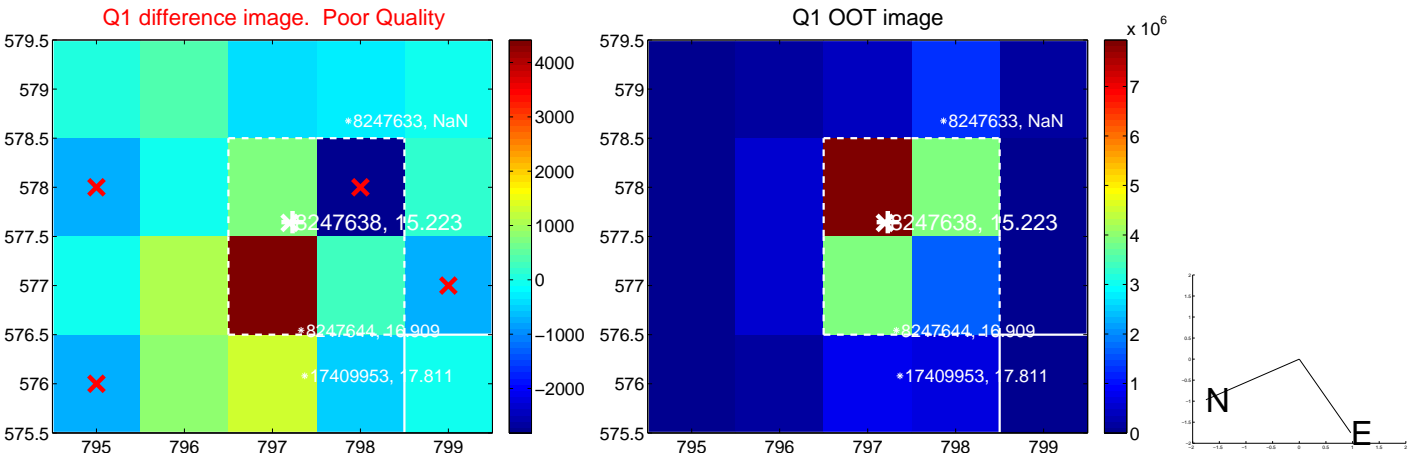
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.460 ± 0.813	0.57	0.321 ± 0.907	0.329 ± 0.711
PRF-fit source offset from KIC position	0.354 ± 0.882	0.40	0.328 ± 0.907	0.133 ± 0.711
photometric centroid source offset	0.21 ± 0.66	0.32	-0.04 ± 0.63	-0.21 ± 0.66

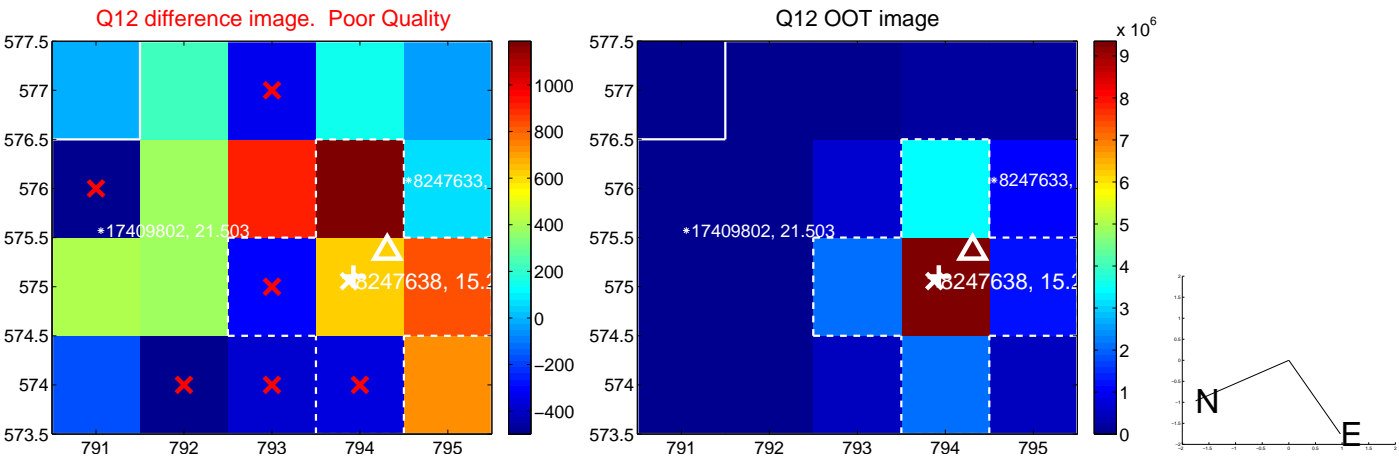
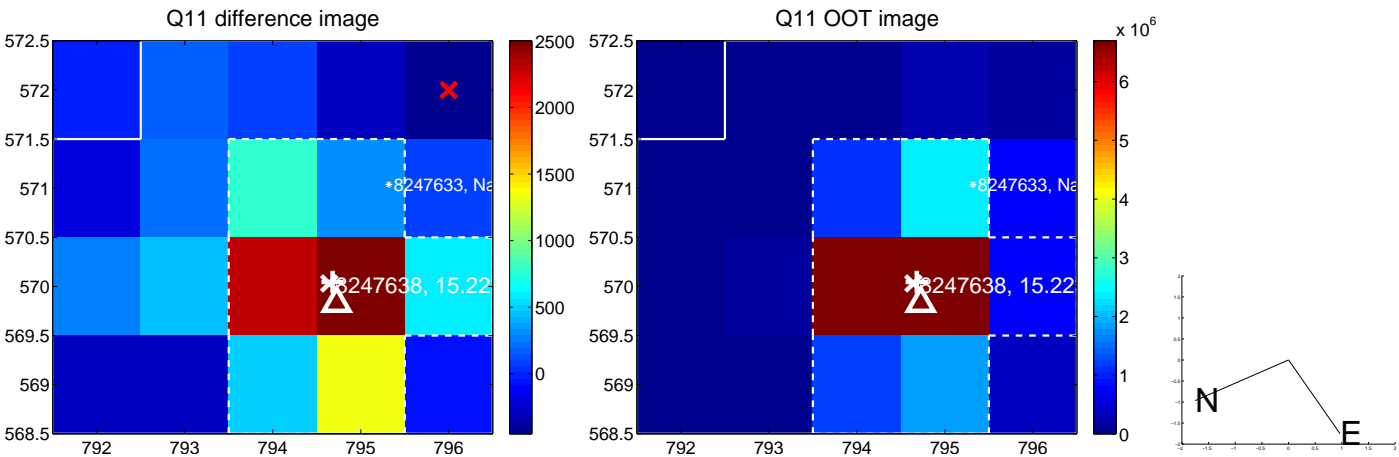
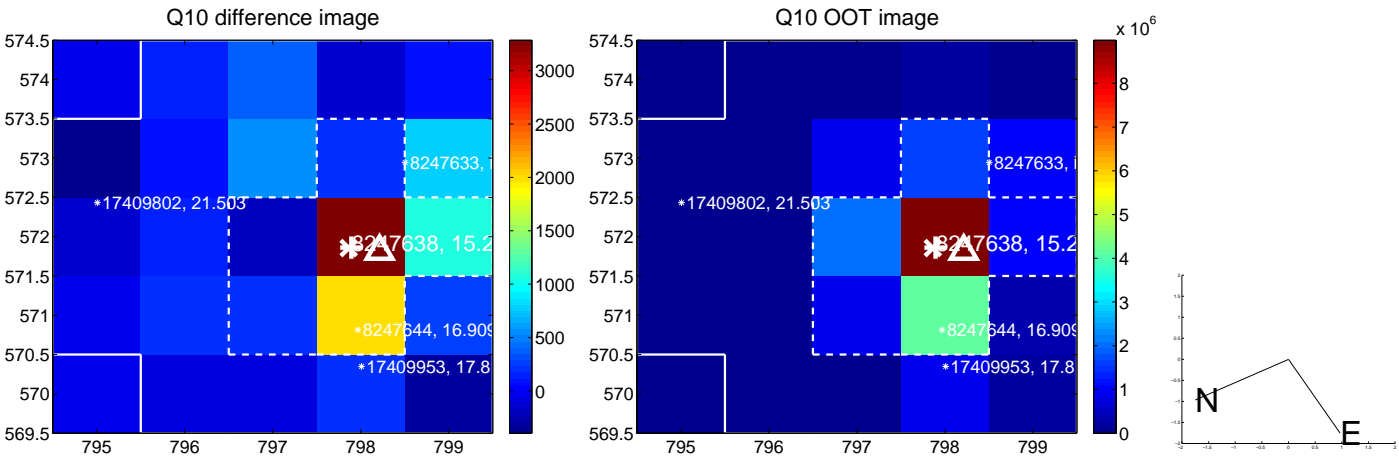
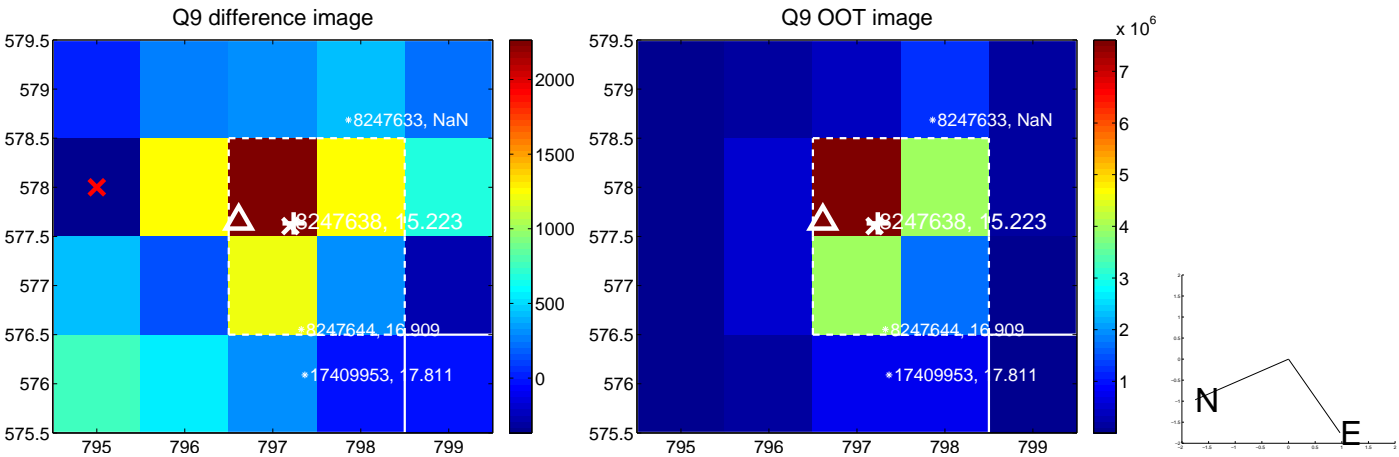


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

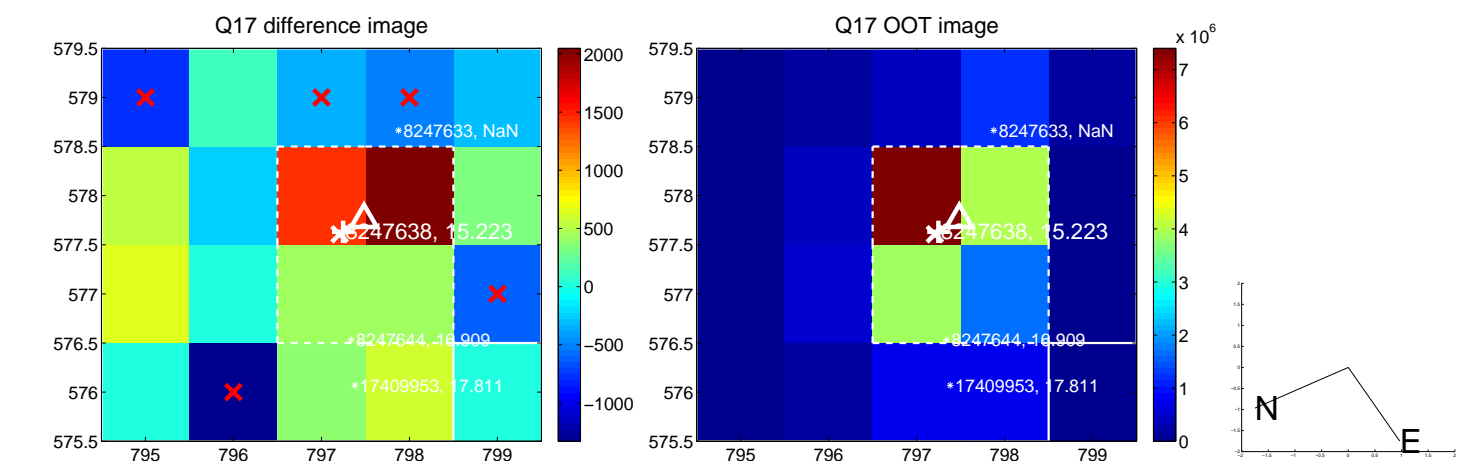
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



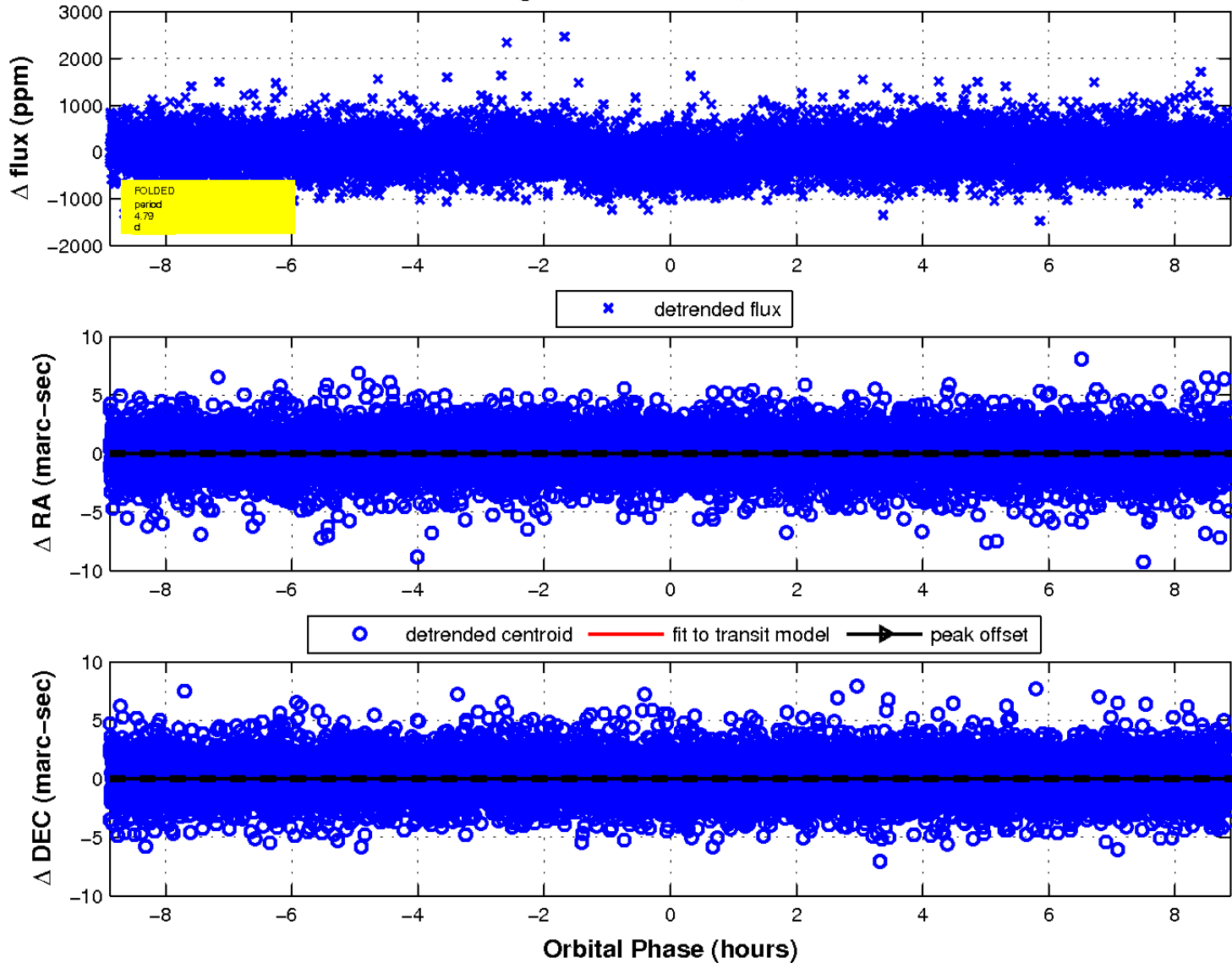
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

