

KIC 002449090

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})
002449090-01	OBS	3702.01	4.944042	134.192822	111700.4	4.508	883.1	702.4	1.00	5780	50.39	309.86
002449090-02	OBS	No	4.944041	131.721920	35496.6	4.377	278.8	258.0	1.00	5780	27.06	309.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002449090-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
002449090-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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

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

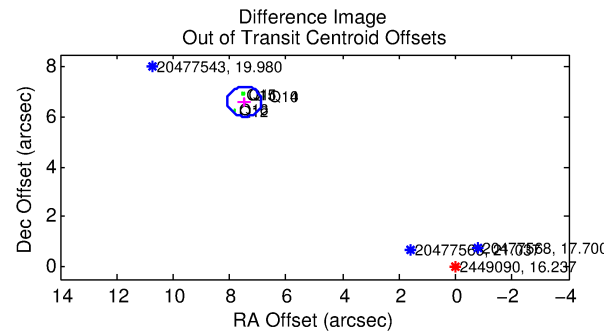
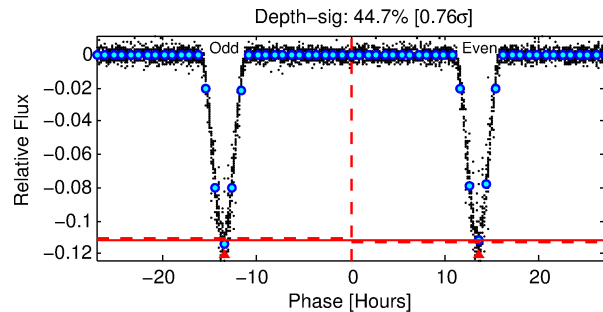
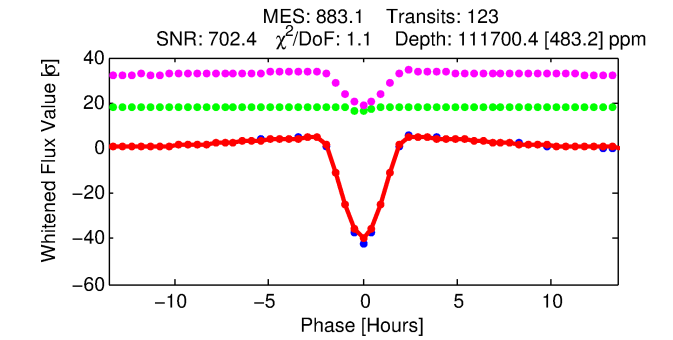
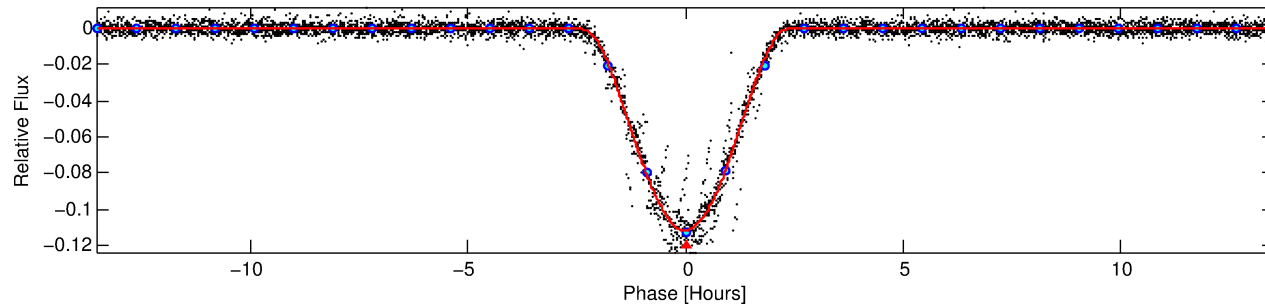
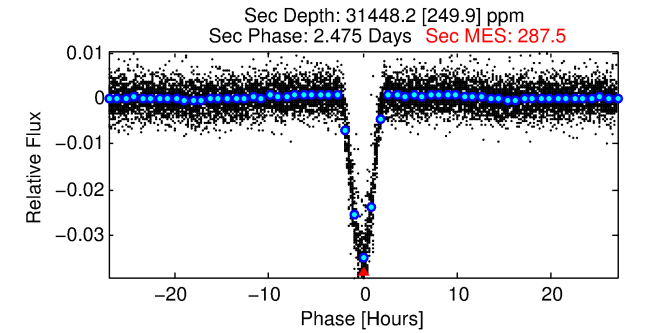
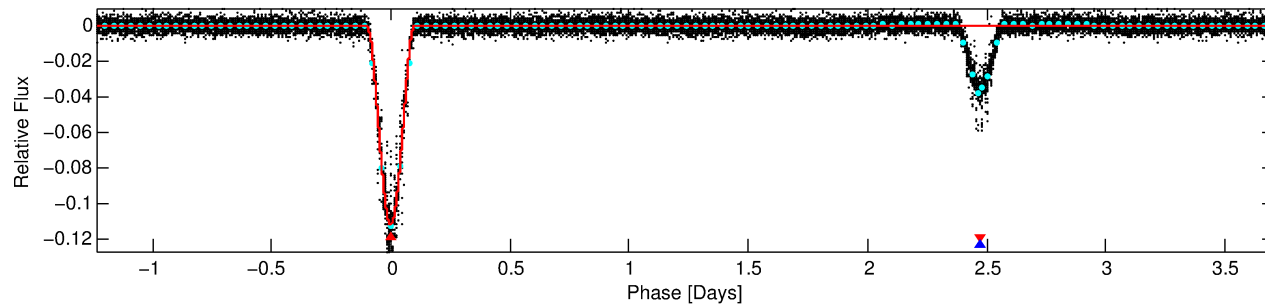
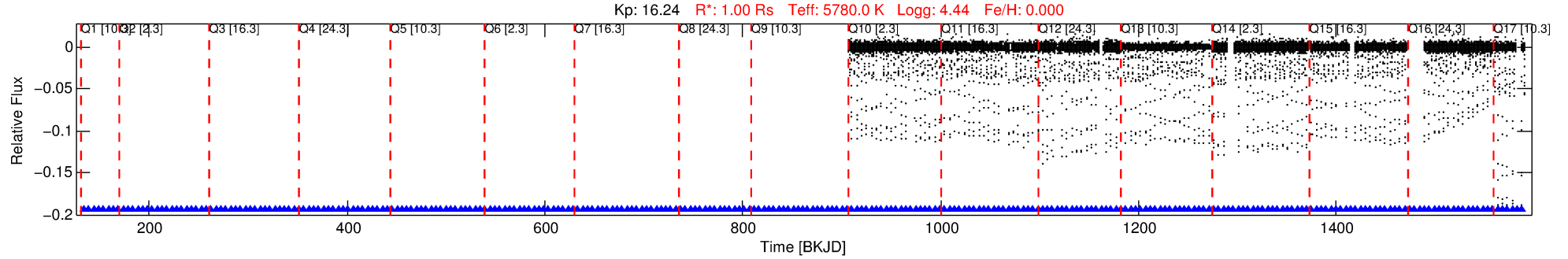
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002449090-01

No Significant Match Found

DV One-Page Summary

KIC: 2449090 Candidate: 1 of 2 Period: 4.944 d
KOI: K03702.01 Corr: 0.991



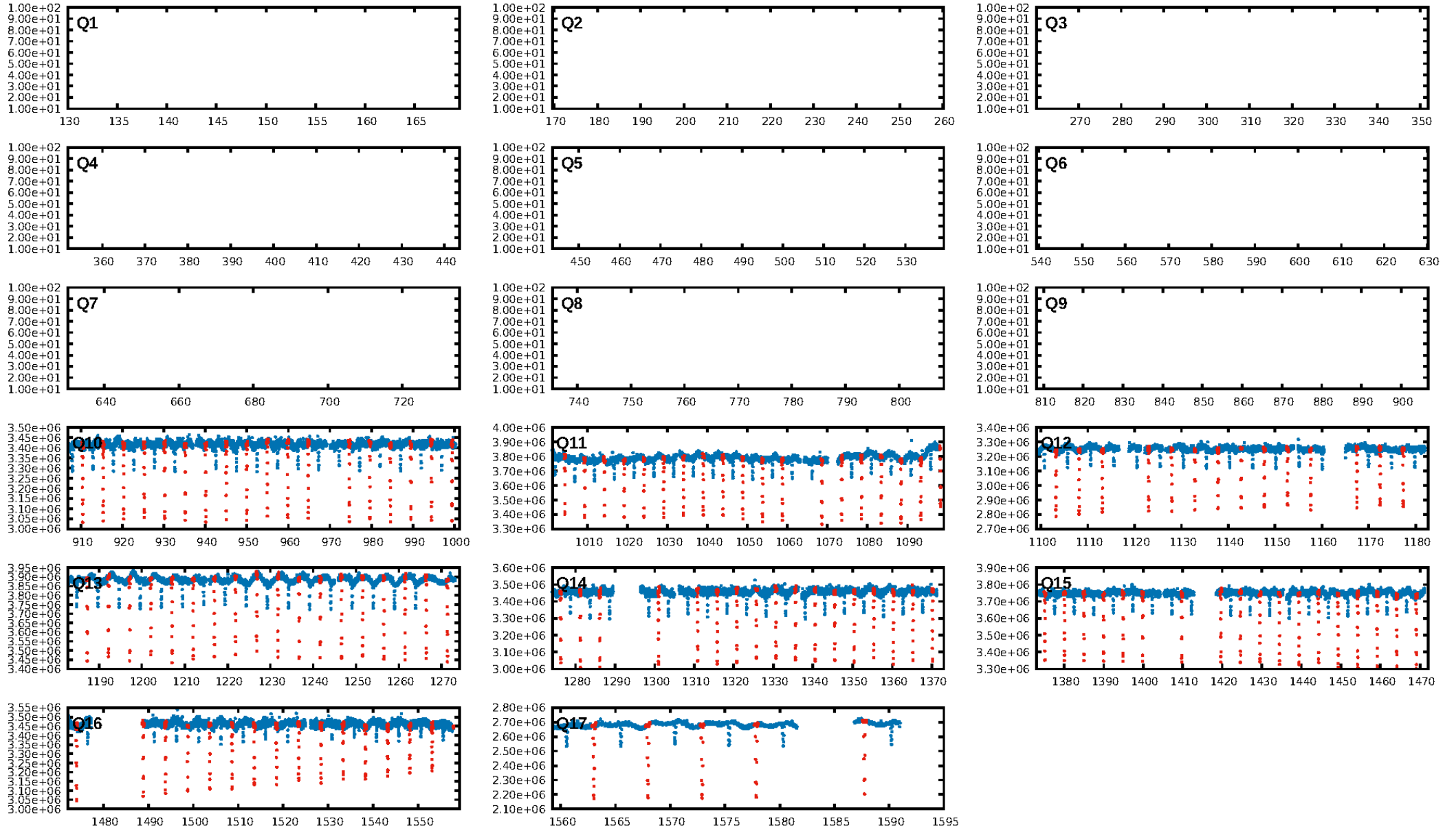
DV Fit Results:

Period = 4.94404 [0.00000] d
Epoch = 134.1928 [0.0003] BKJD
Rp/R* = 0.4618 [0.1393]
a/R* = 9.60 [0.17]
b = 0.92 [0.20]
Seff = 309.86 [0.00]
Teff = 1070 [0] K
Rp = 50.39 [15.20] Re
a = 0.0568 [0.0000] AU
Ag = 21.99 [13.27] [1.58σ]
Teffp = 3582 [540] K [4.65σ]

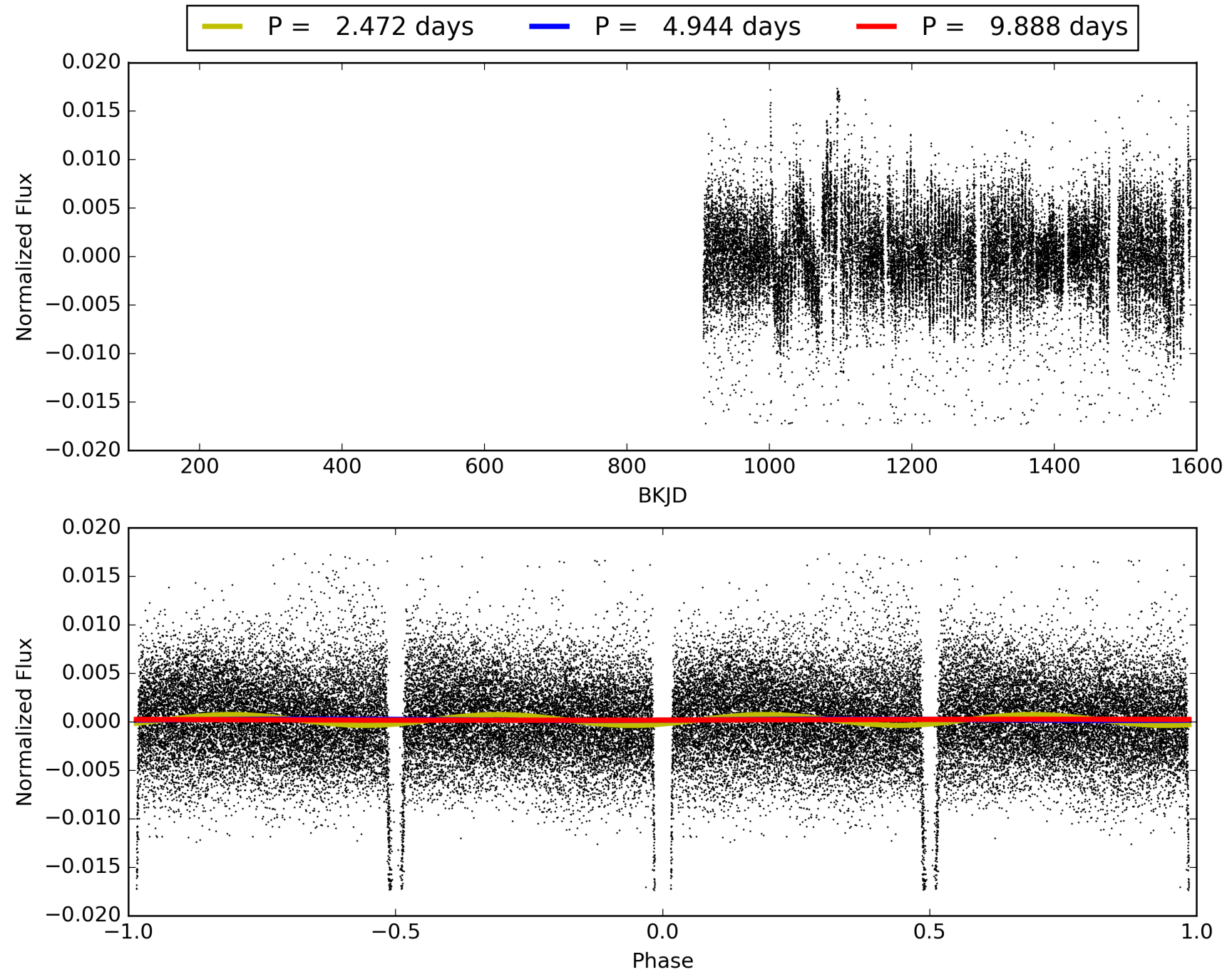
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [118/118]
GhostDiagnostic-chr: 2.506
Centroid-sig: 0.0%
Centroid-so: 2.426 arcsec [525.65σ]
OotOffset-rm: 9.979 arcsec [49.93σ]
KicOffset-rm: 1.115 arcsec [15.37σ]
OotOffset-st: 2/2/2/0 [6]
KicOffset-st: 2/2/2/2 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 1.00 [8/8]

TCE 002449090-01, PDC Light Curves

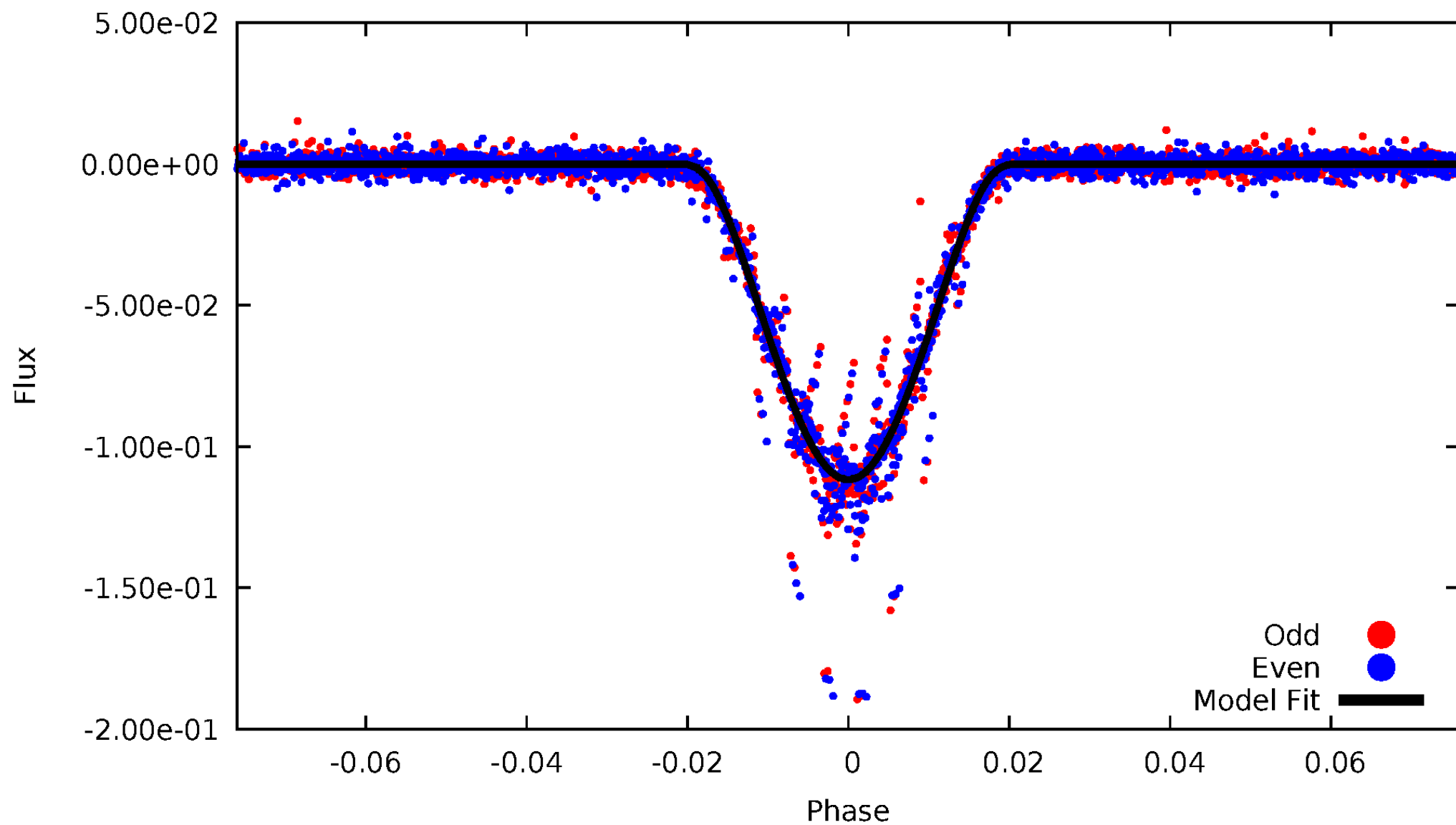


TCE 002449090-01



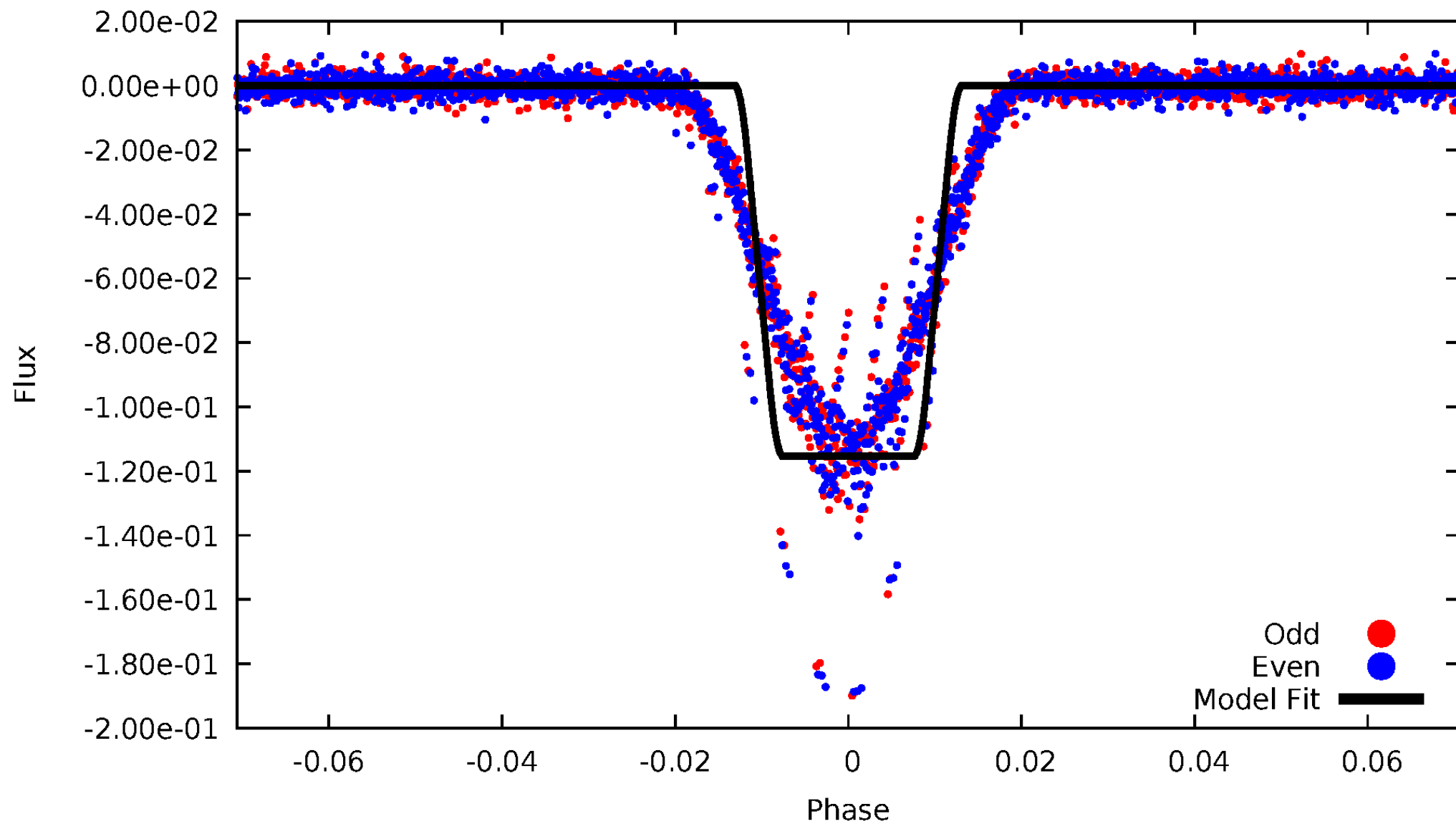
DV Odd/Even

TCE 002449090-01



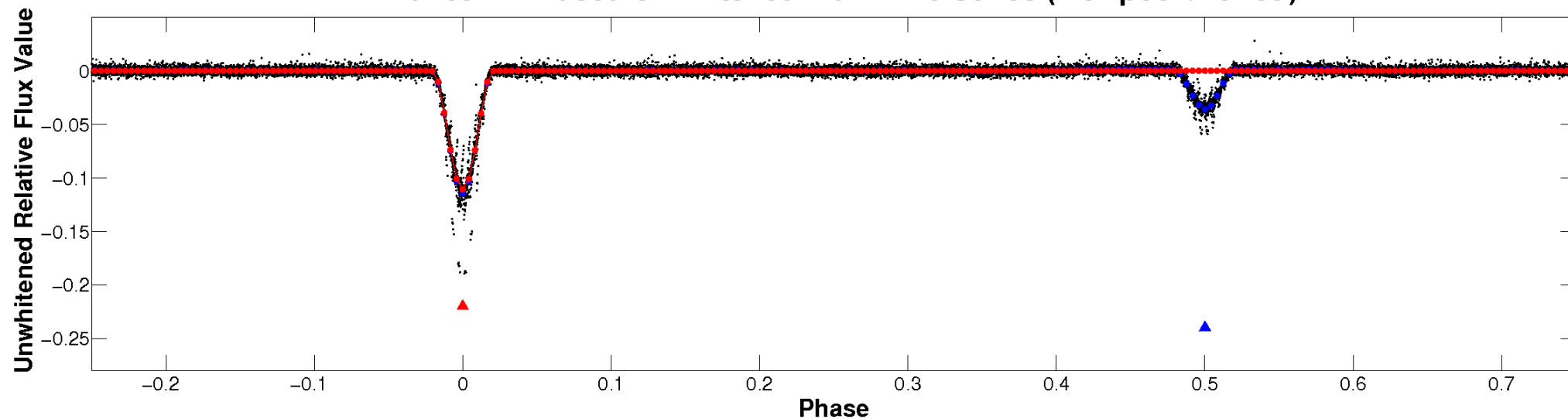
ALT Odd/Even

TCE 002449090-01

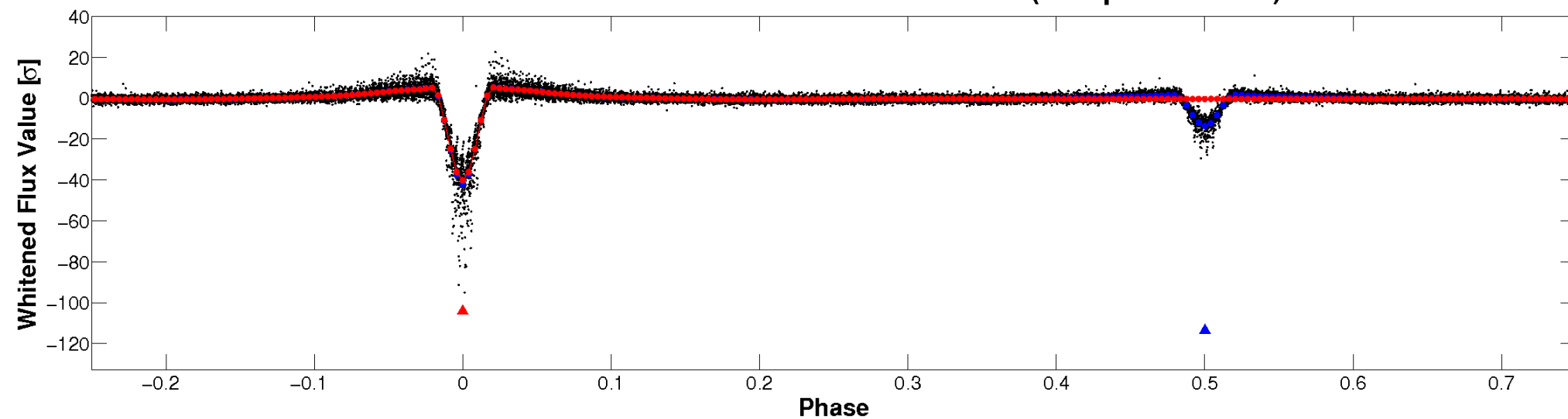


Non-Whitened Vs. Whitened Light Curve

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

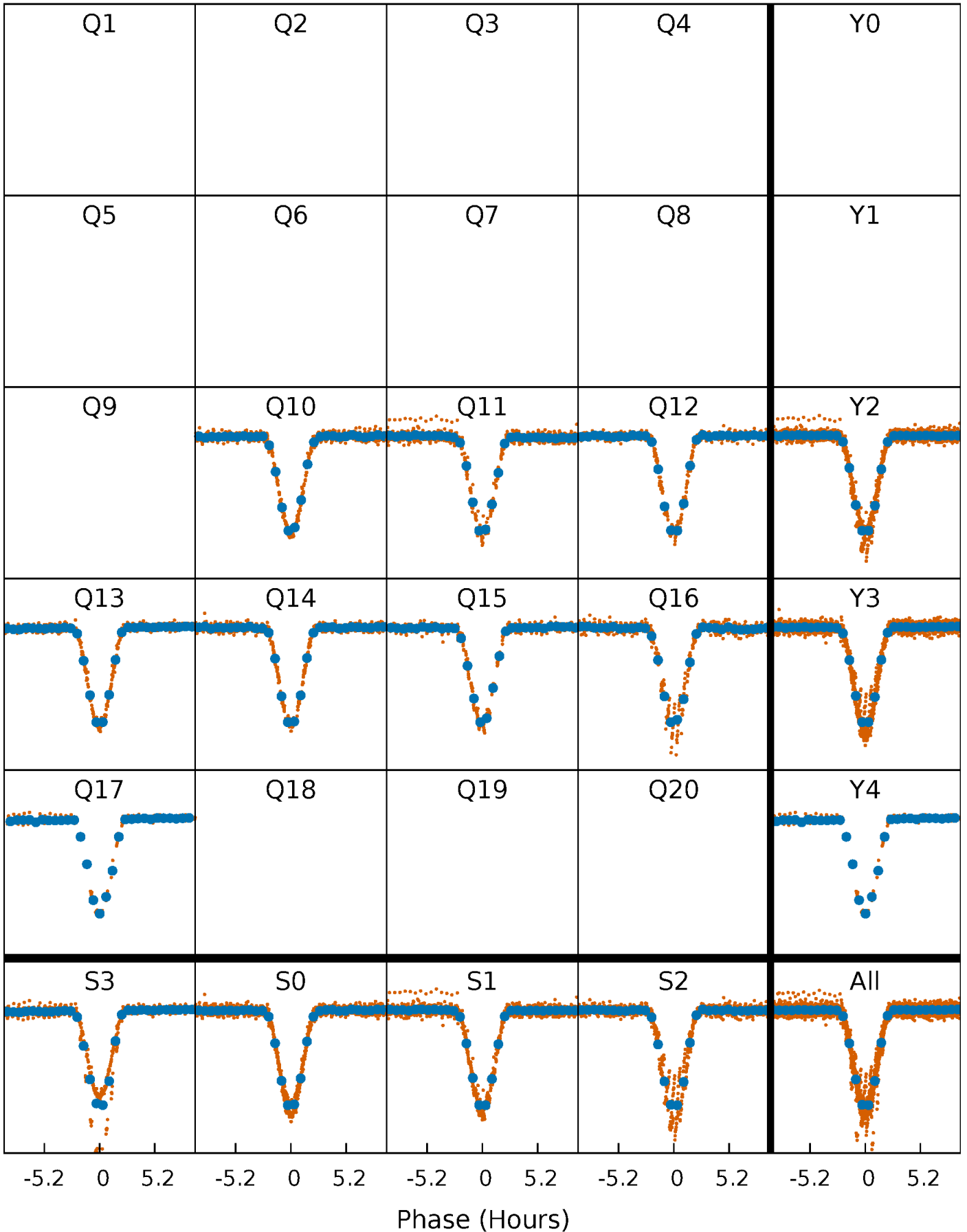


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



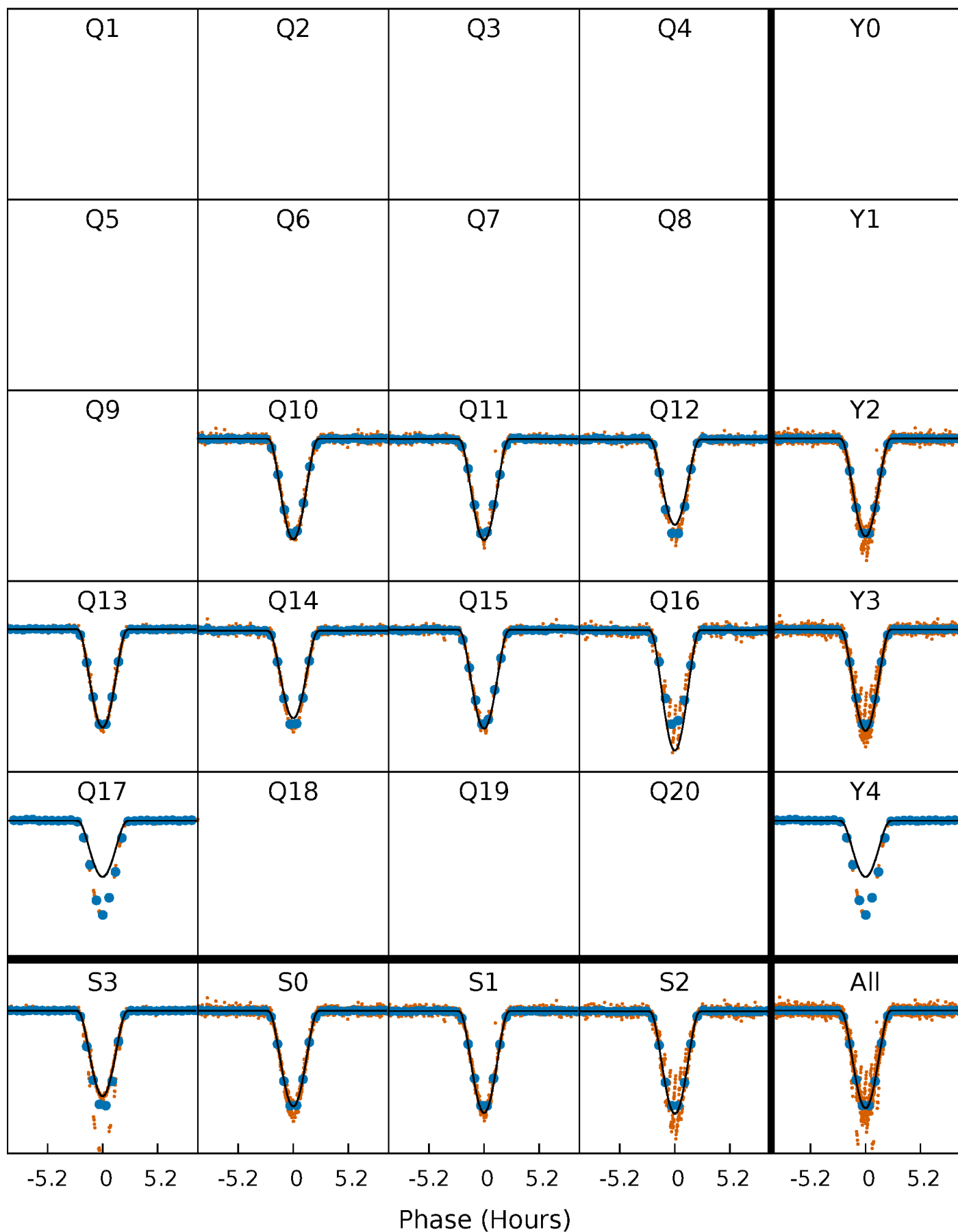
PDC Quarter-Phased Transit Curves

TCE 002449090-01 $P = 4.944042$ Days $T_0 = 134.192822$ (BKJD)



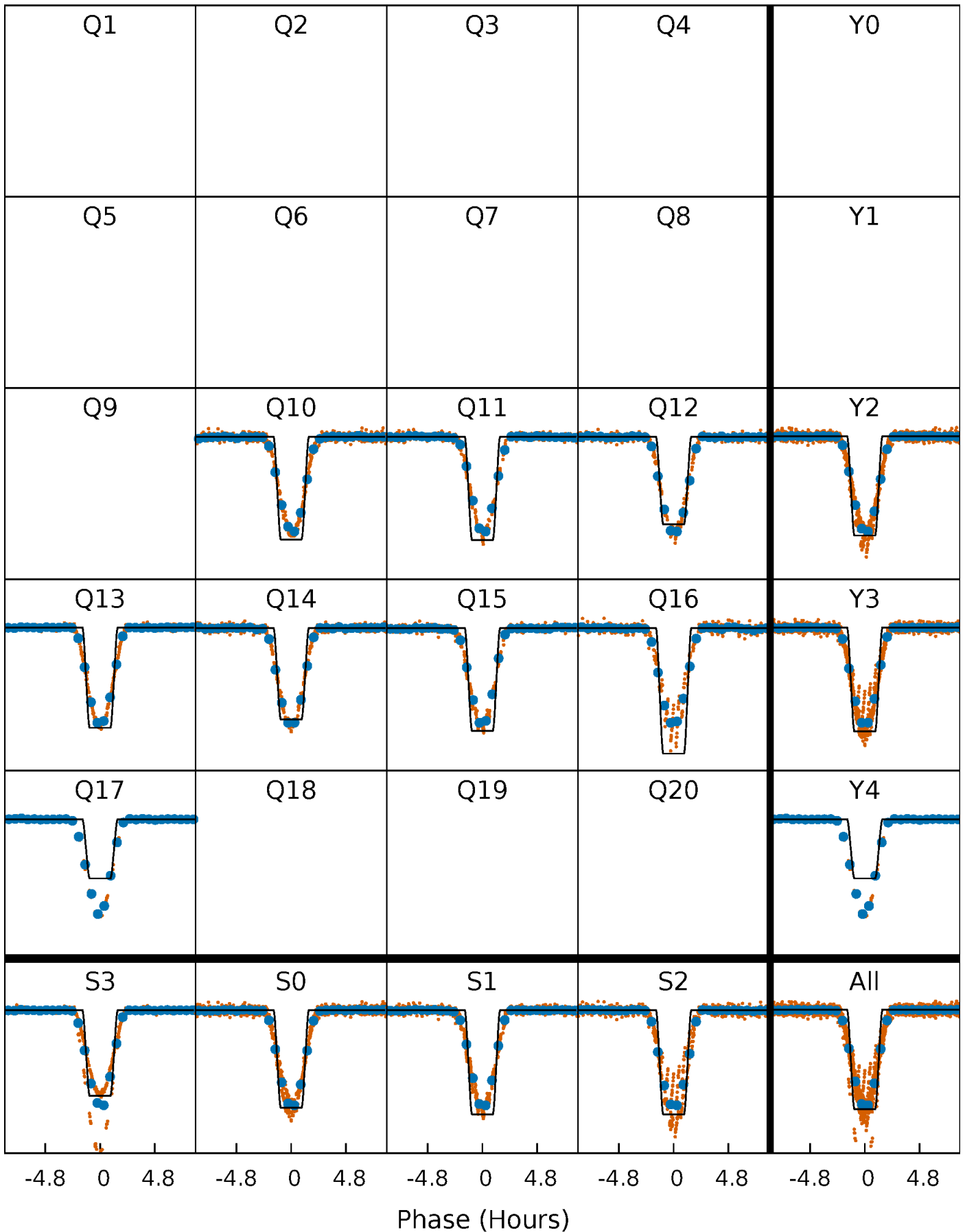
DV Quarter-Phased Transit Curves

TCE 002449090-01 P= 4.944042 Days $T_0=134.192822$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

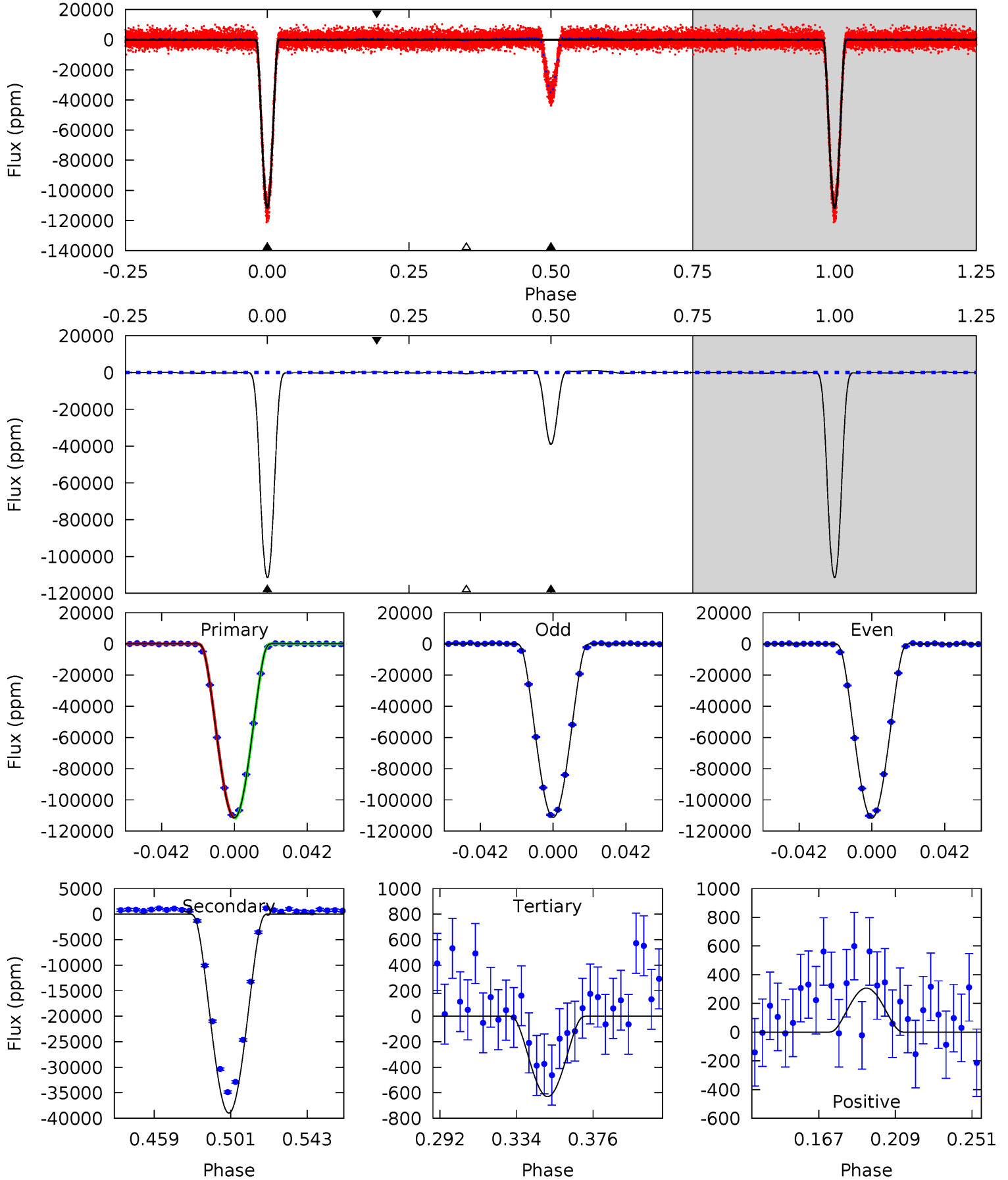
TCE 002449090-01 P= 4.944096 Days $T_0=134.180472$ (BKJD)



DV Model-Shift Uniqueness Test

002449090-01, P = 4.944042 Days, E = 134.192822 Days

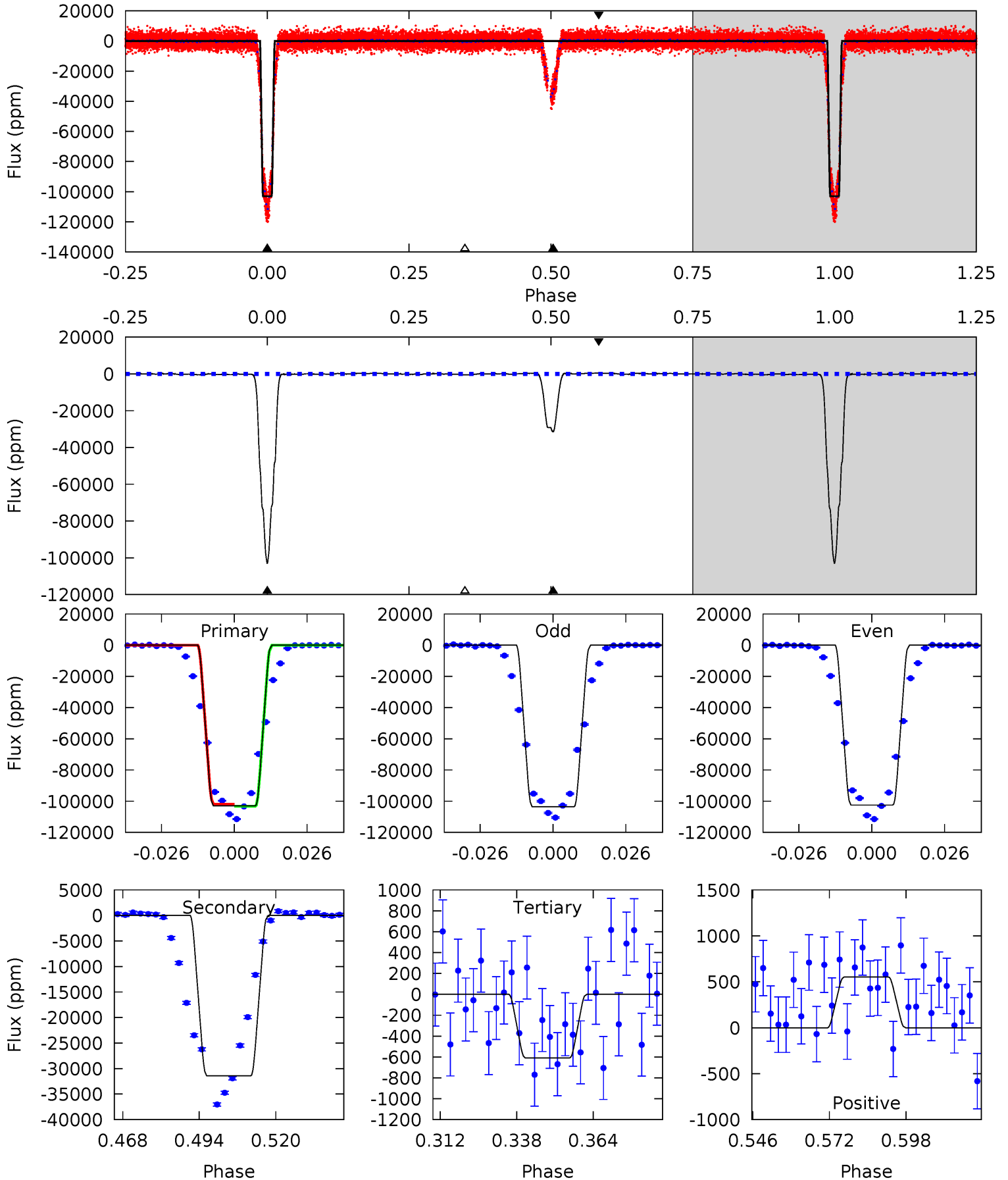
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1434	501.4	8.11	3.95	4.74	2.04	4.41	1426	1430	493.3	497.5	3.02	1.02	0.01	0



Alt Model-Shift Uniqueness Test

002449090-01, P = 4.944096 Days, E = 134.180472 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
842.8	257.2	4.99	4.52	4.84	2.23	1.66	837.8	838.3	252.2	252.7	4.23	1.03	0.01	5.71



Stellar Parameters For KIC 002449090

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002449090-01 / KOI 3702.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-38976 ± 78	$49.88^{+16.40}_{-15.16}$	1493^{+77}_{-72}	4099^{+610}_{-384}	29^{+30}_{-13}
Alt.	-31437 ± 122	$37.42^{+16.24}_{-14.30}$	1496^{+69}_{-76}	4363^{+1001}_{-527}	42^{+67}_{-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 $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

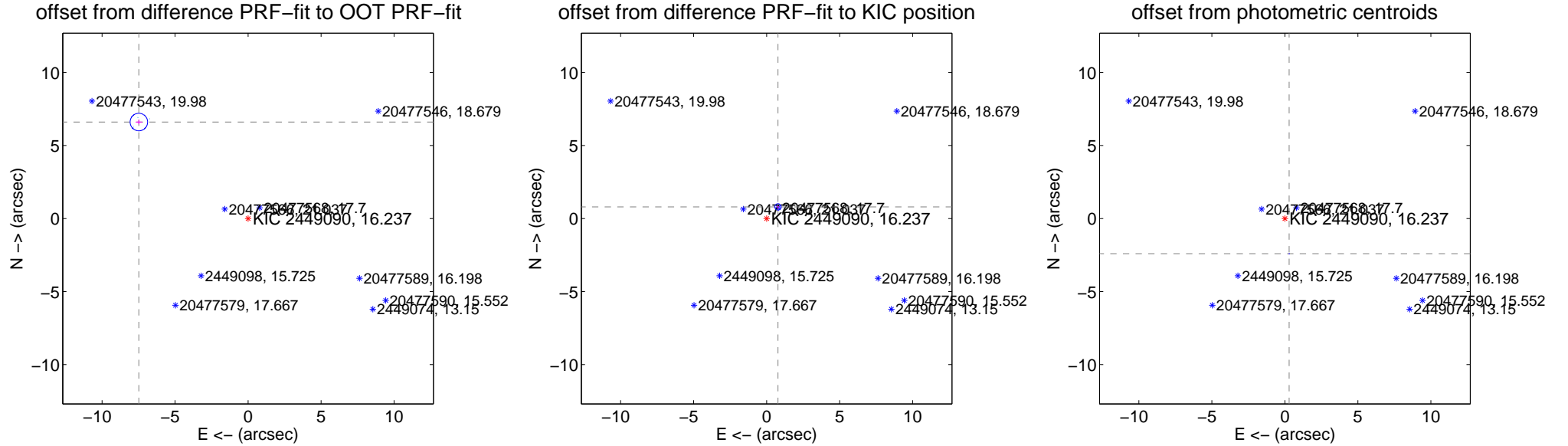
DV Centroid Data

Supplemental centroid analysis for 002449090-01. Kepler magnitude: 16.24. Transit SNR 702.35

There are 8 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 10.25 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.979 ± 0.200	49.93	7.479 ± 0.223	6.605 ± 0.165
PRF-fit source offset from KIC position	1.115 ± 0.073	15.37	-0.780 ± 0.069	0.797 ± 0.072
photometric centroid source offset	2.43 ± 0.00	525.65	-0.29 ± 0.00	-2.41 ± 0.00



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

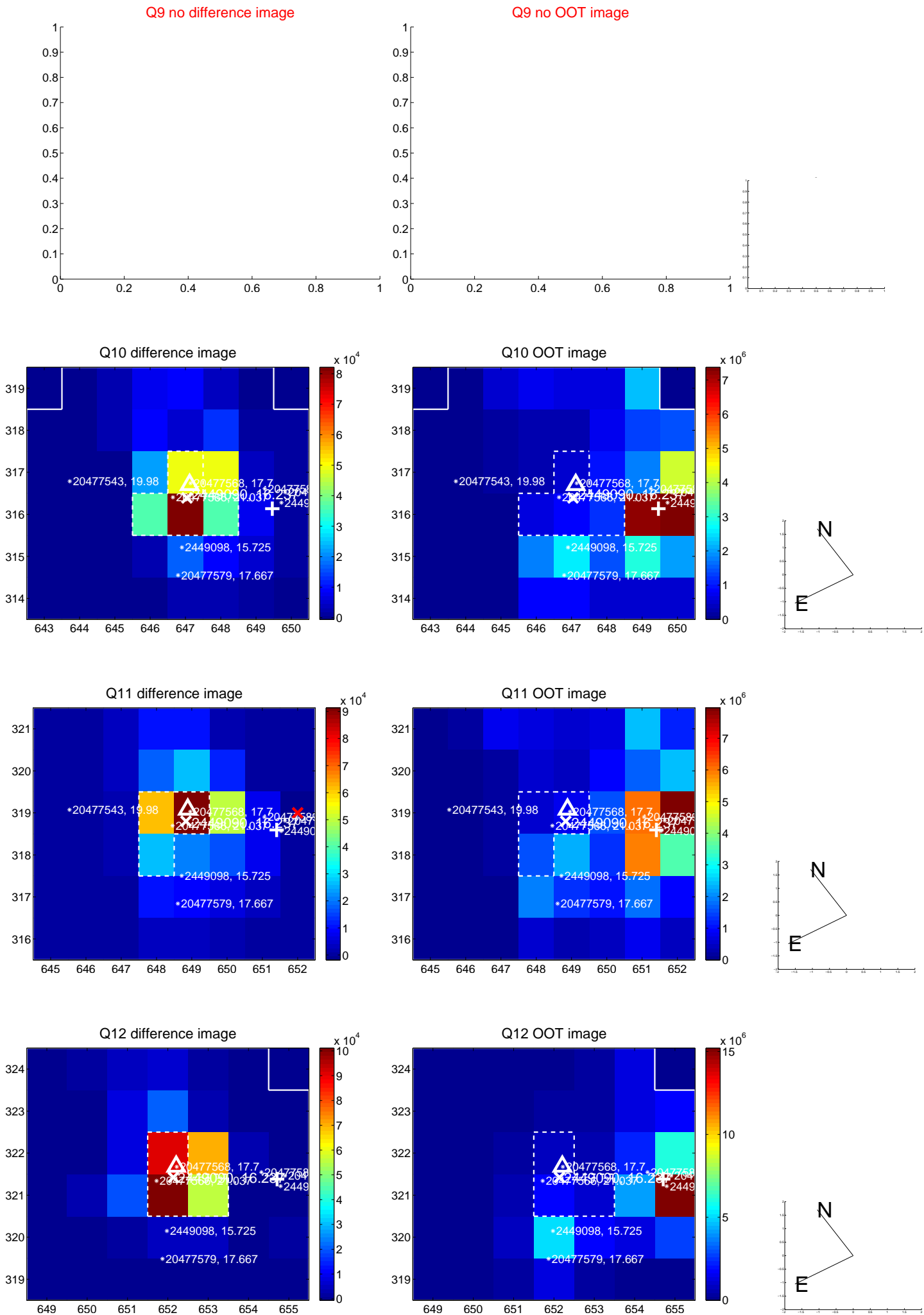
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



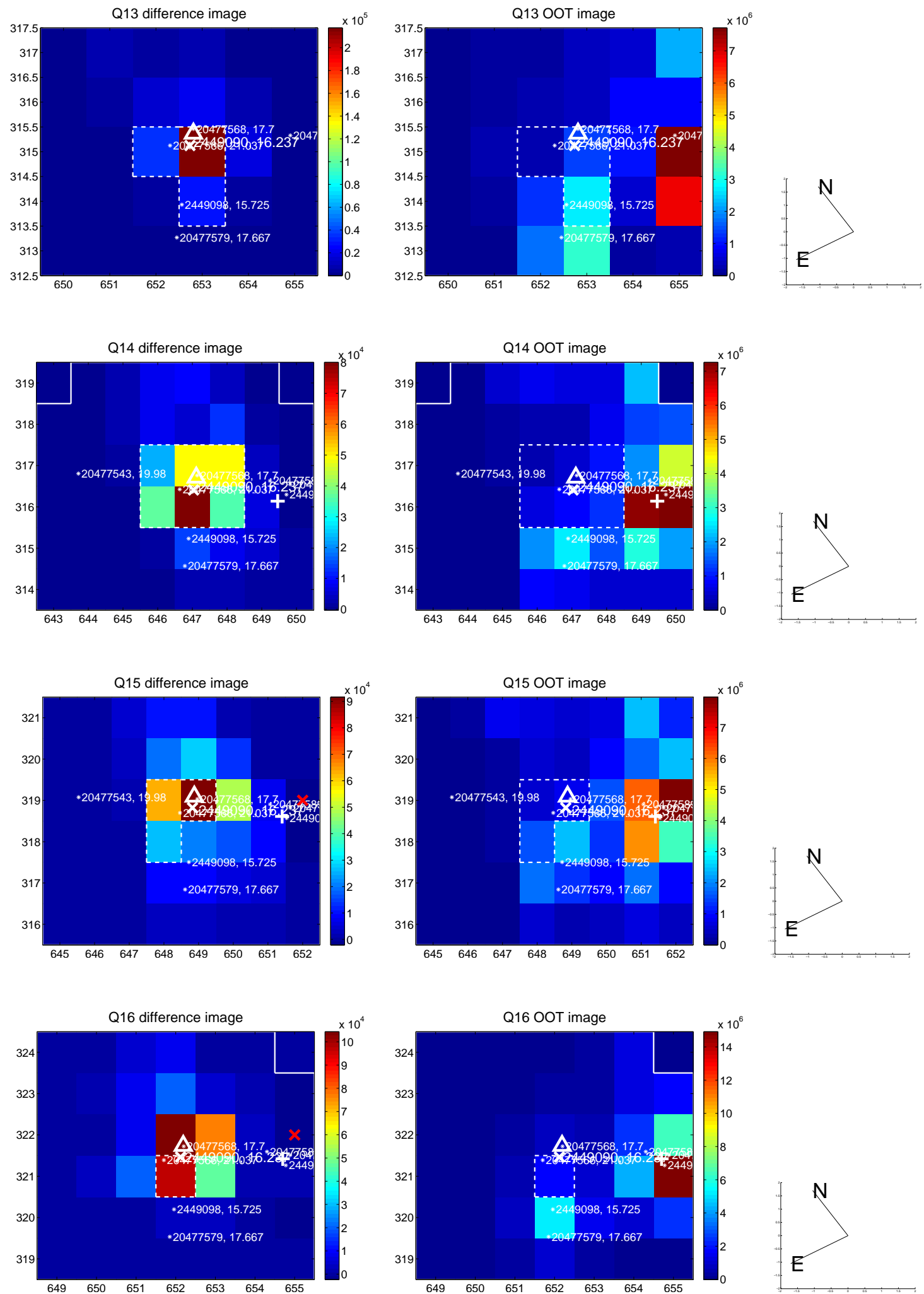
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



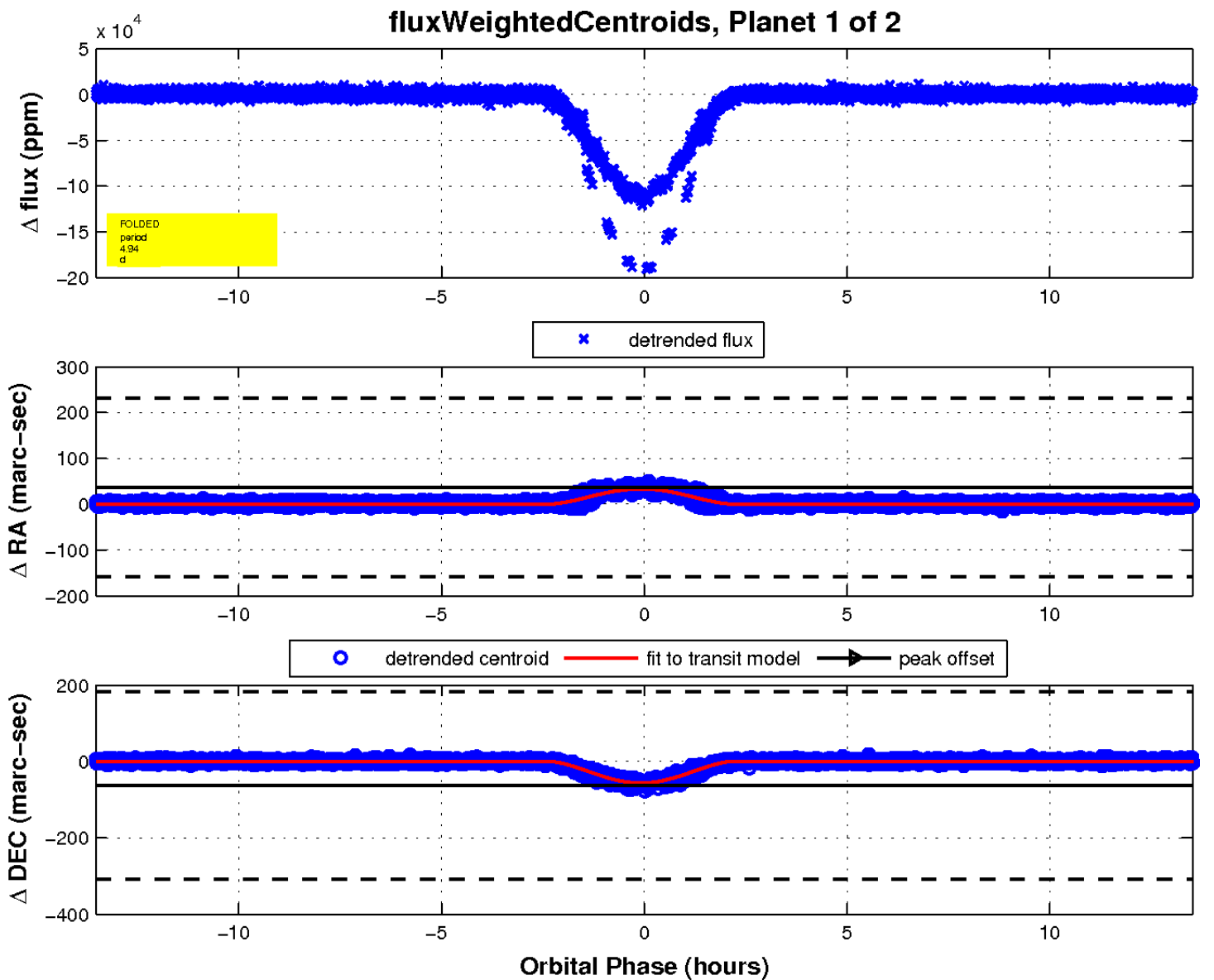
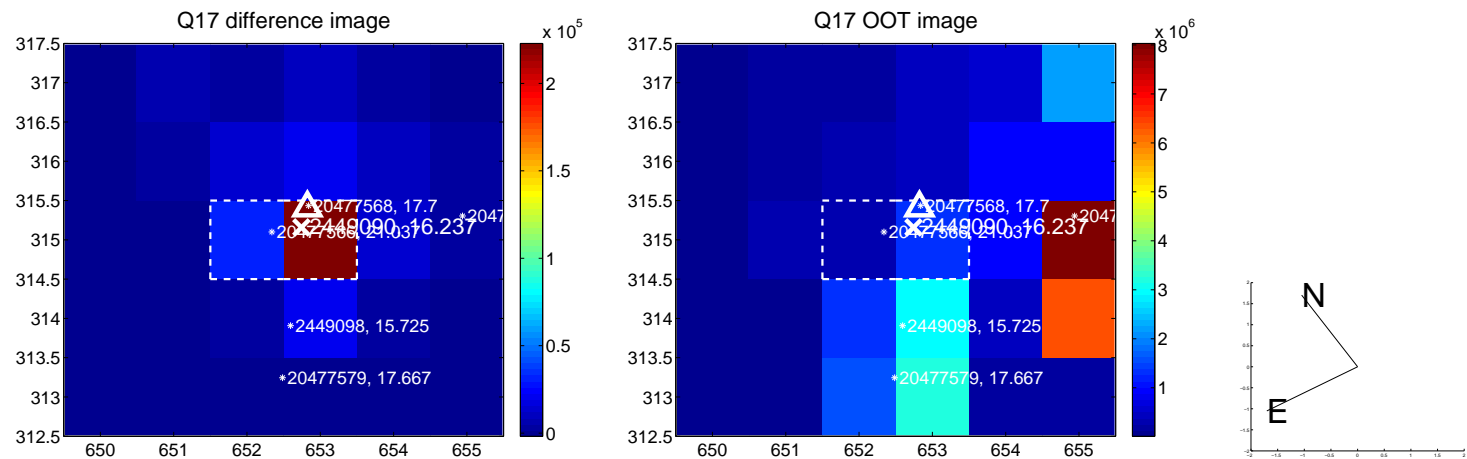
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

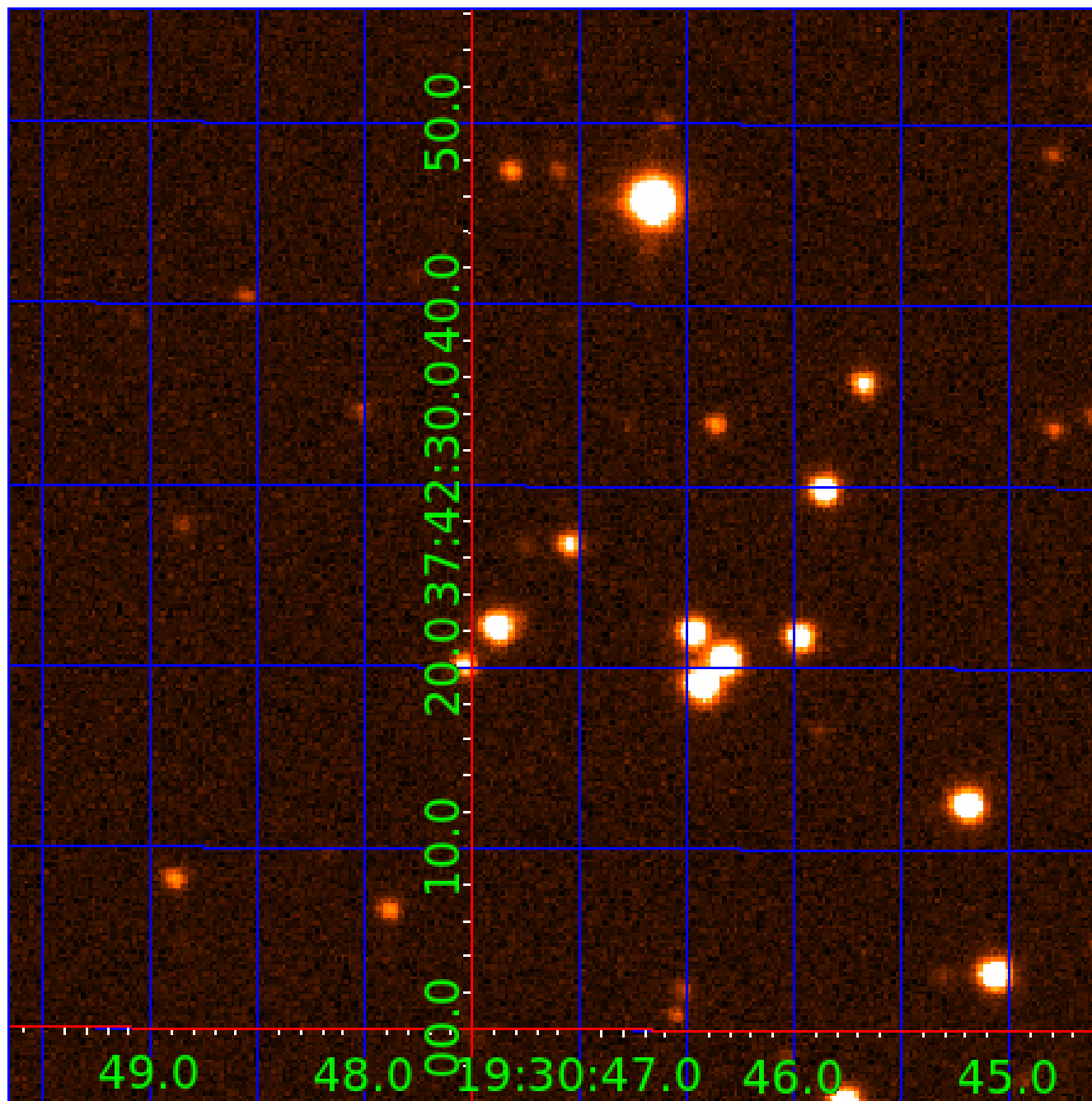


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002449090

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})
002449090-01	OBS	3702.01	4.944042	134.192822	111700.4	4.508	883.1	702.4	1.00	5780	50.39	309.86
002449090-02	OBS	No	4.944041	131.721920	35496.6	4.377	278.8	258.0	1.00	5780	27.06	309.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002449090-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
002449090-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_KIC_POS

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 002449090-02

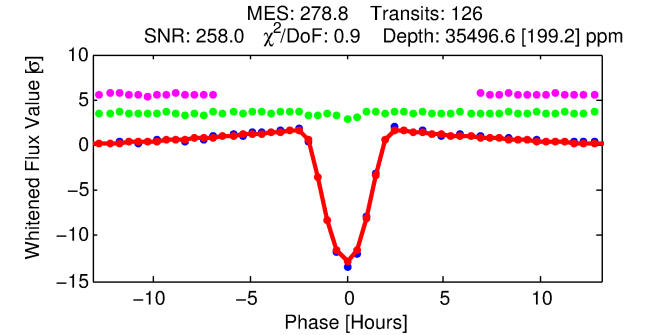
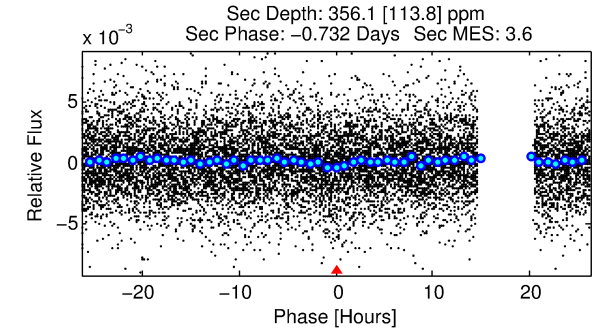
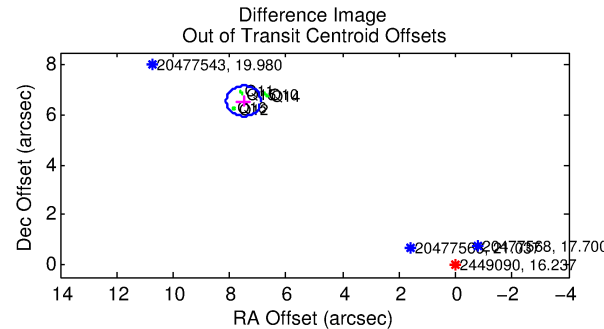
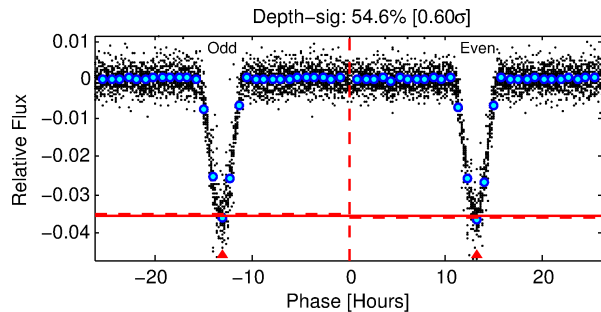
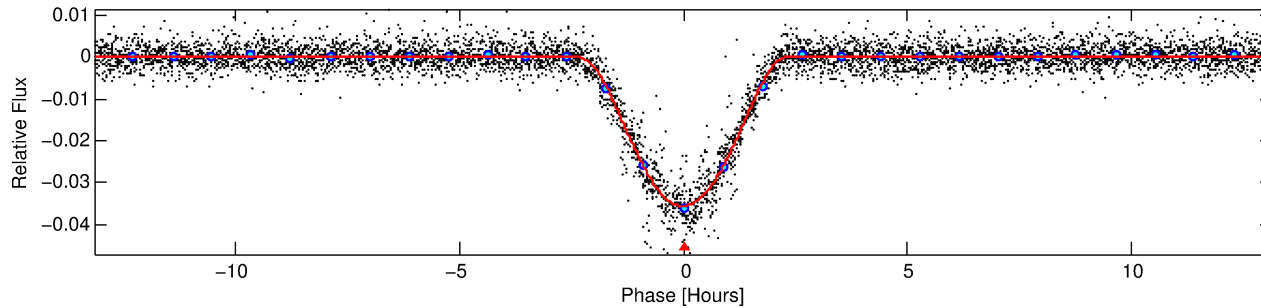
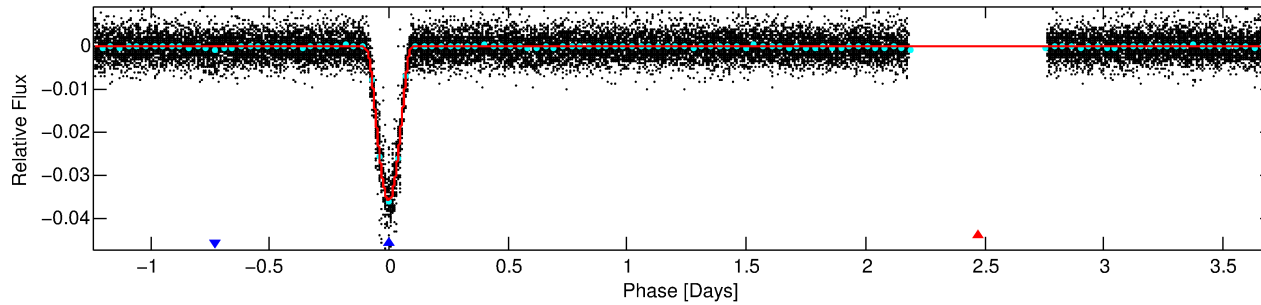
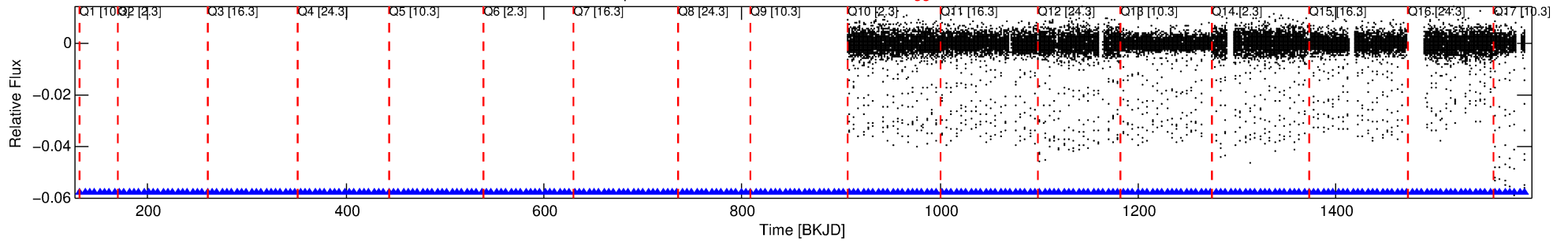
No Significant Match Found

DV One-Page Summary

KIC: 2449090 Candidate: 2 of 2 Period: 4.944 d

KOI: K03702 Corr: No Ephemeris Match

Kp: 16.24 R*: 1.00 Rs Teff: 5780.0 K Logg: 4.44 Fe/H: 0.000



DV Fit Results:

Period = 4.94404 [0.00000] d
Epoch = 131.7219 [0.0008] BKJD
Rp/R* = 0.2480 [0.0306]
a/R* = 7.33 [0.13]
b = 0.92 [0.05]
Seff = 309.86 [0.00]
Teff = 1070 [0] K
Rp = 27.06 [3.34] Re
a = 0.0568 [0.0000] AU
Ag = 0.86 [0.35] [-0.39σ]
Teffp = 1595 [161] K [3.26σ]

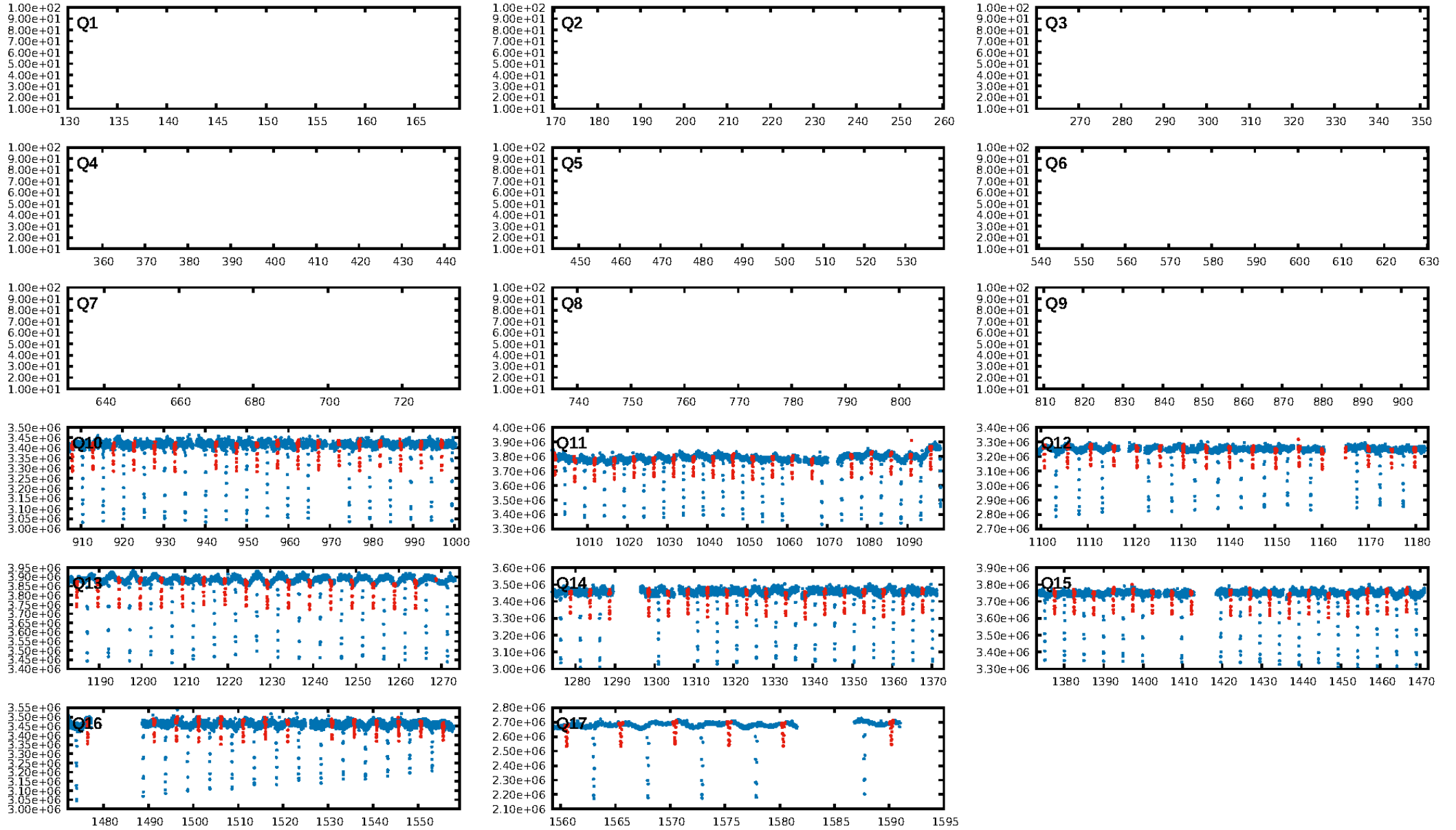
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [120/120]
GhostDiagnostic-chr: 1.658
Centroid-sig: 0.0%
Centroid-so: 2.411 arcsec [171.17σ]
OotOffset-rm: 9.967 arcsec [48.92σ]
KicOffset-rm: 1.108 arcsec [14.79σ]
OotOffset-st: 2/2/2/0 [6]
KicOffset-st: 2/2/2/2 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 1.00 [8/8]

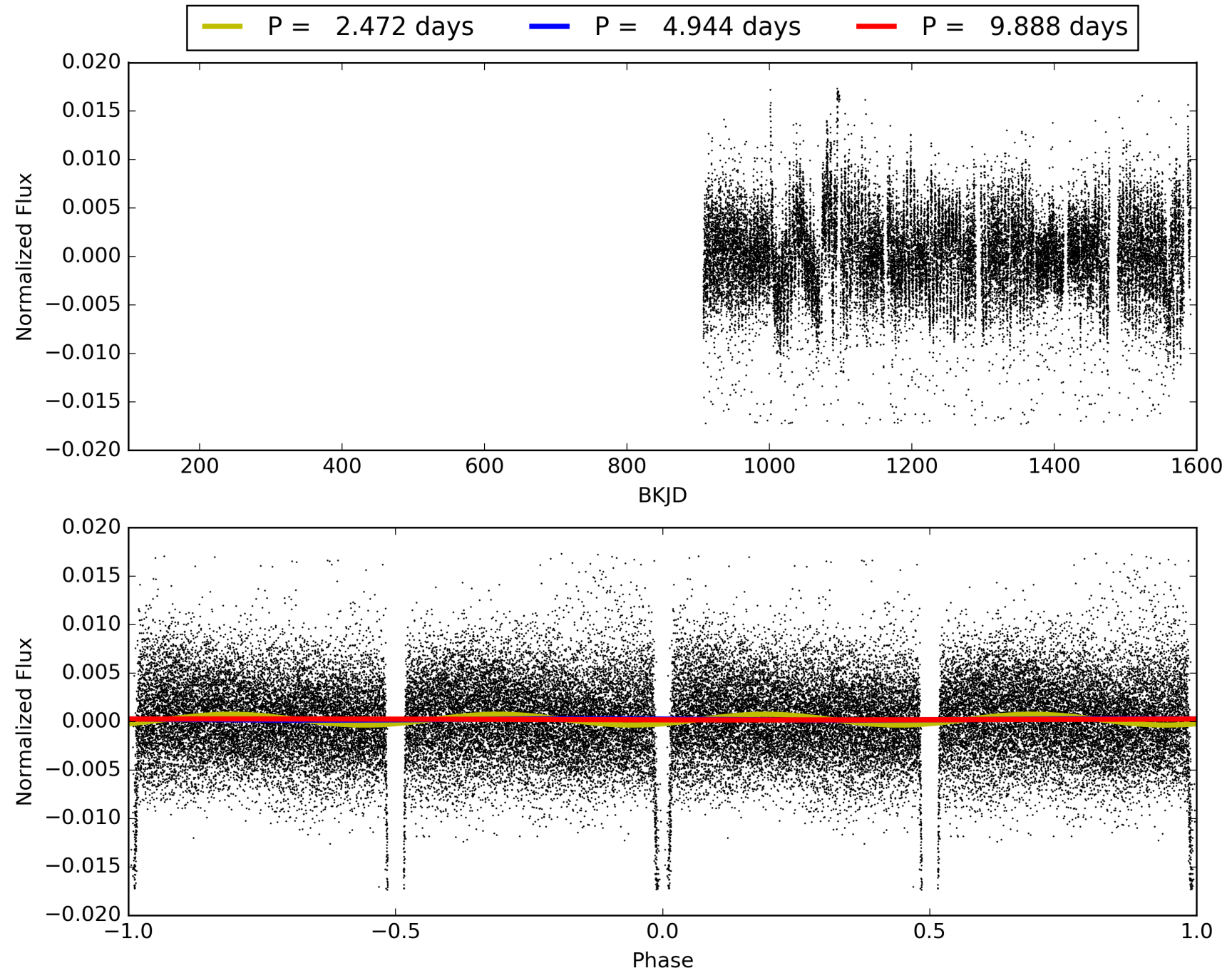
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 18:57:54 Z

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

TCE 002449090-02, PDC Light Curves

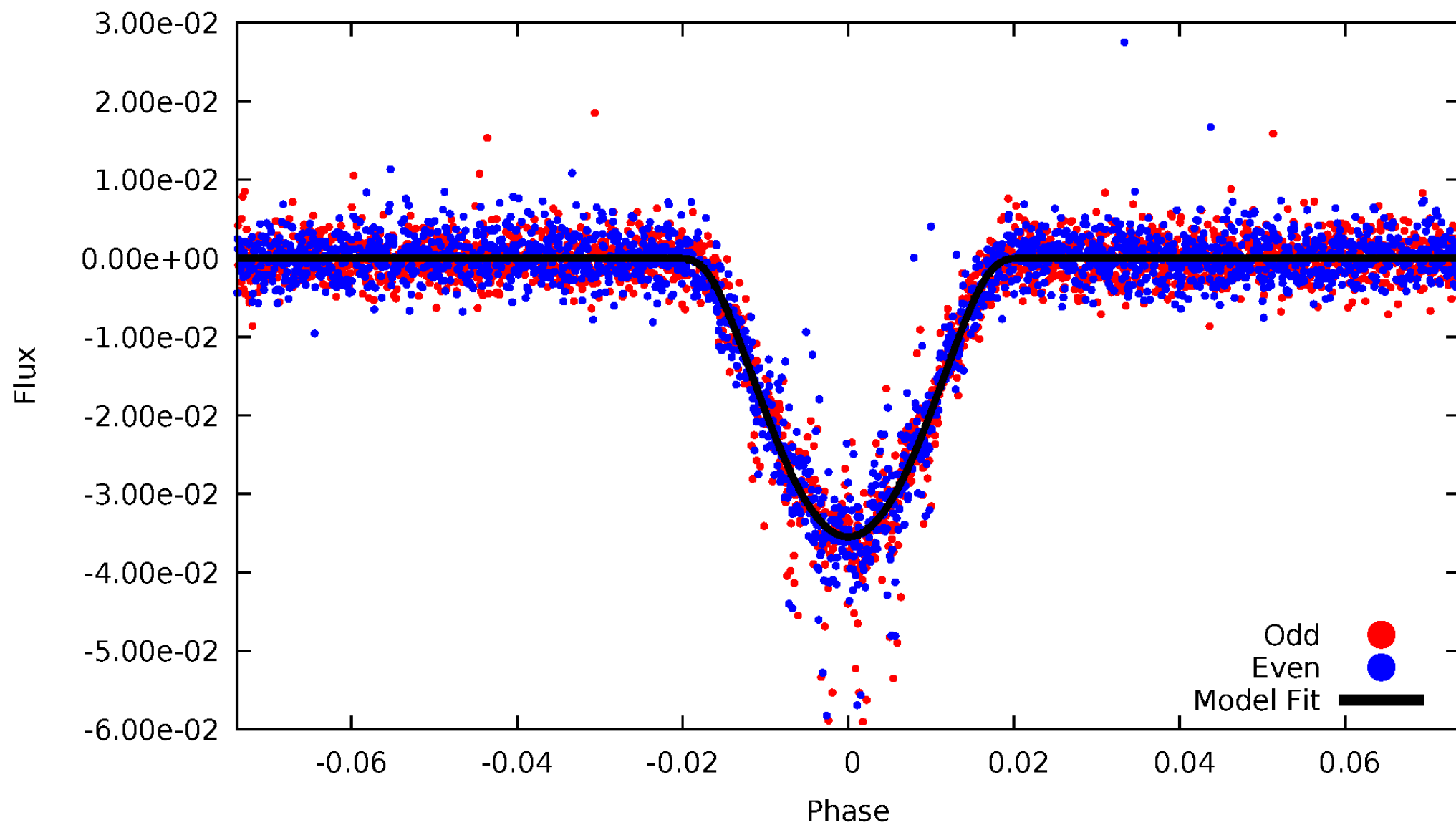


TCE 002449090-02



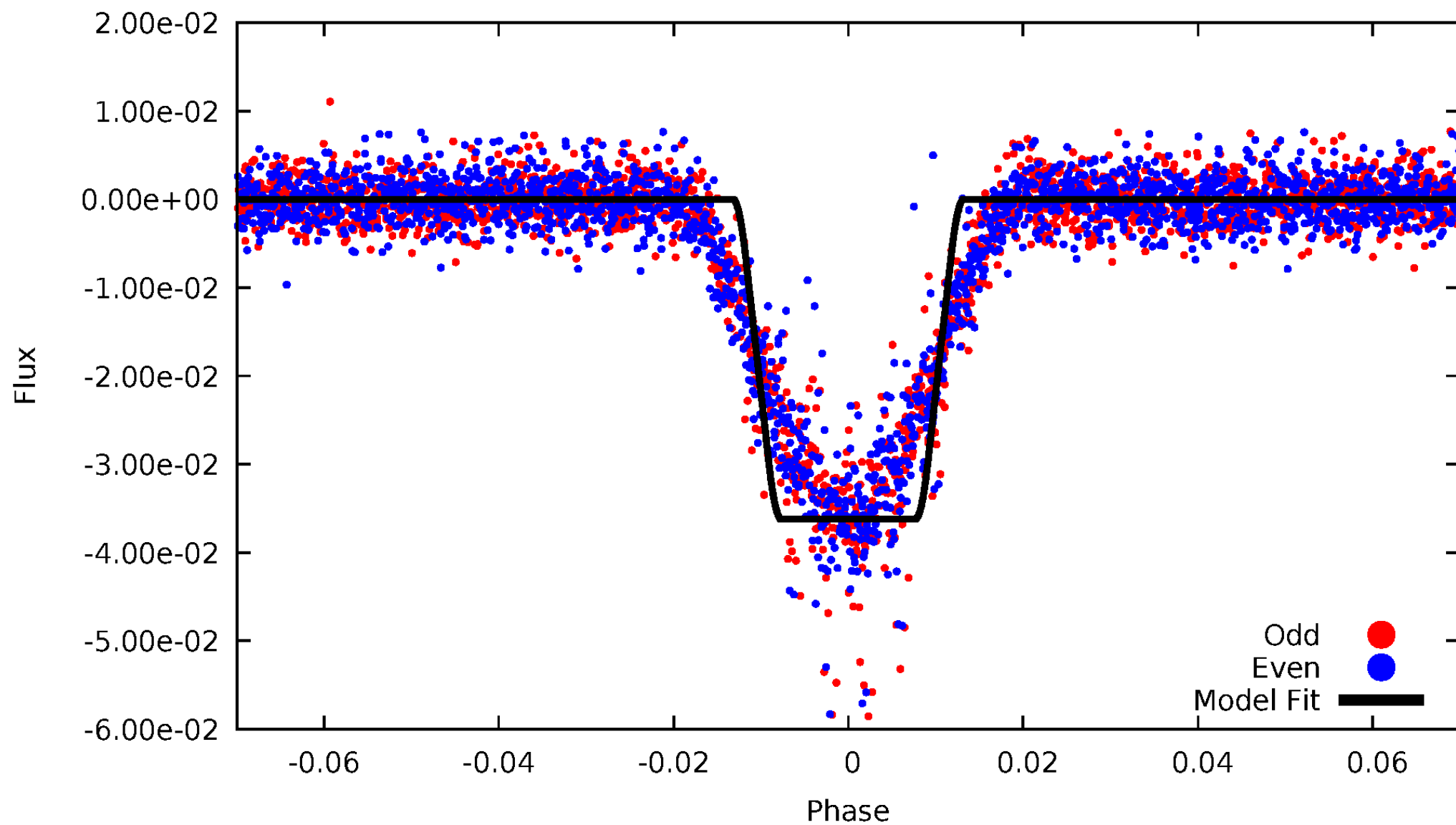
DV Odd/Even

TCE 002449090-02



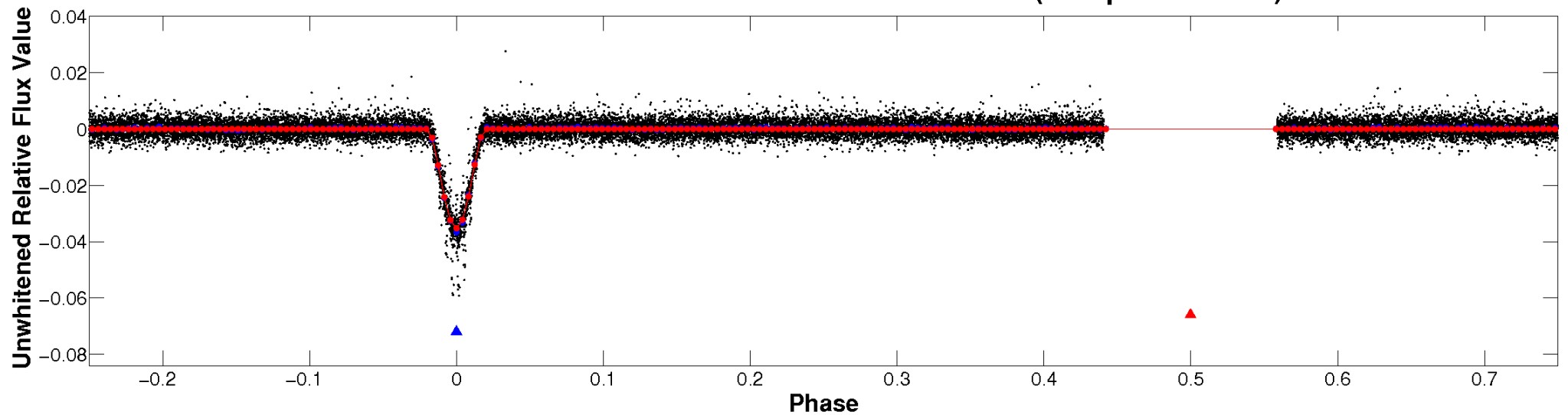
ALT Odd/Even

TCE 002449090-02

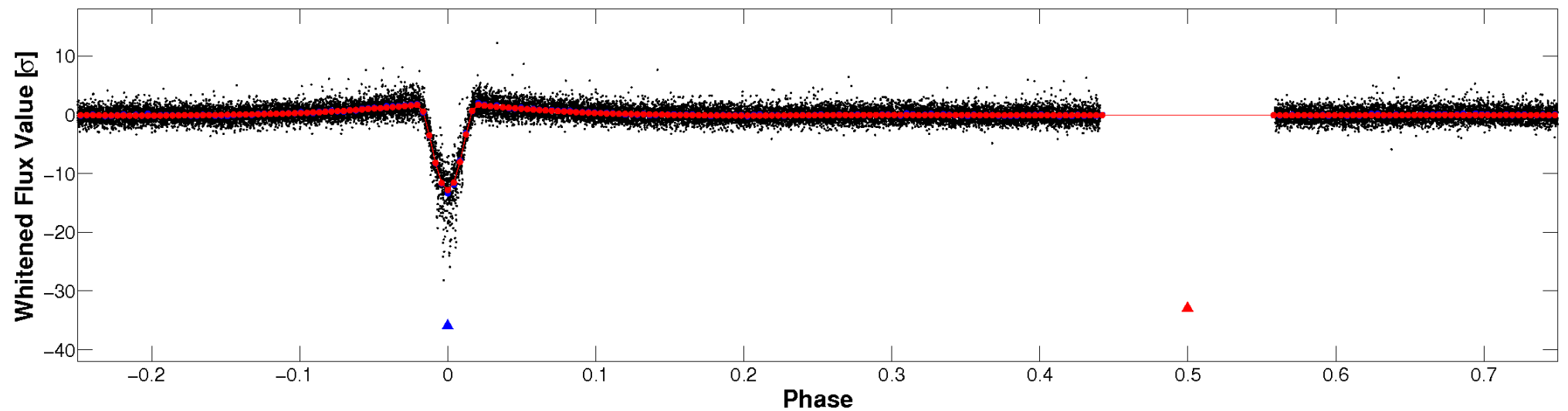


Non-Whitened Vs. Whitened Light Curve

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

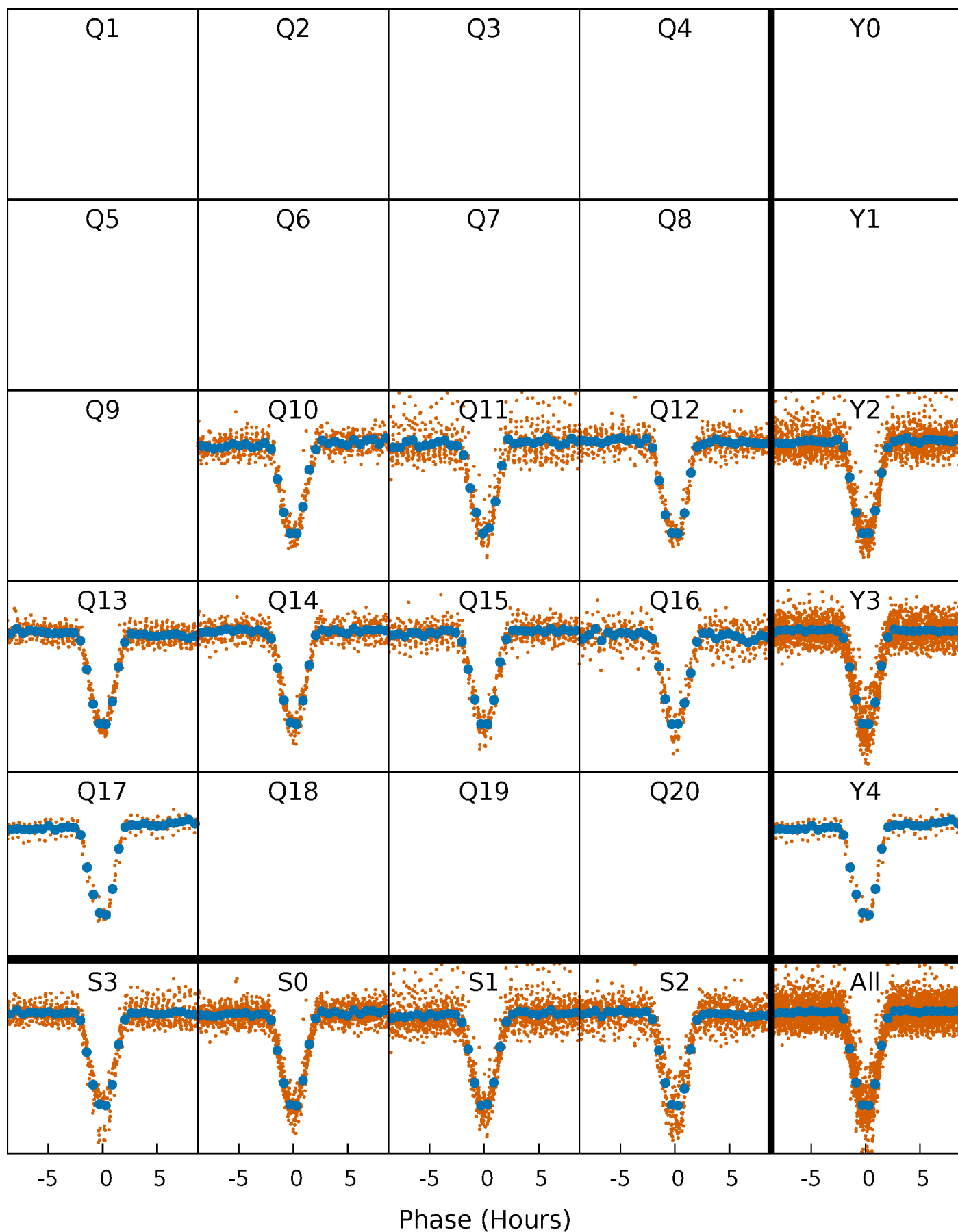


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



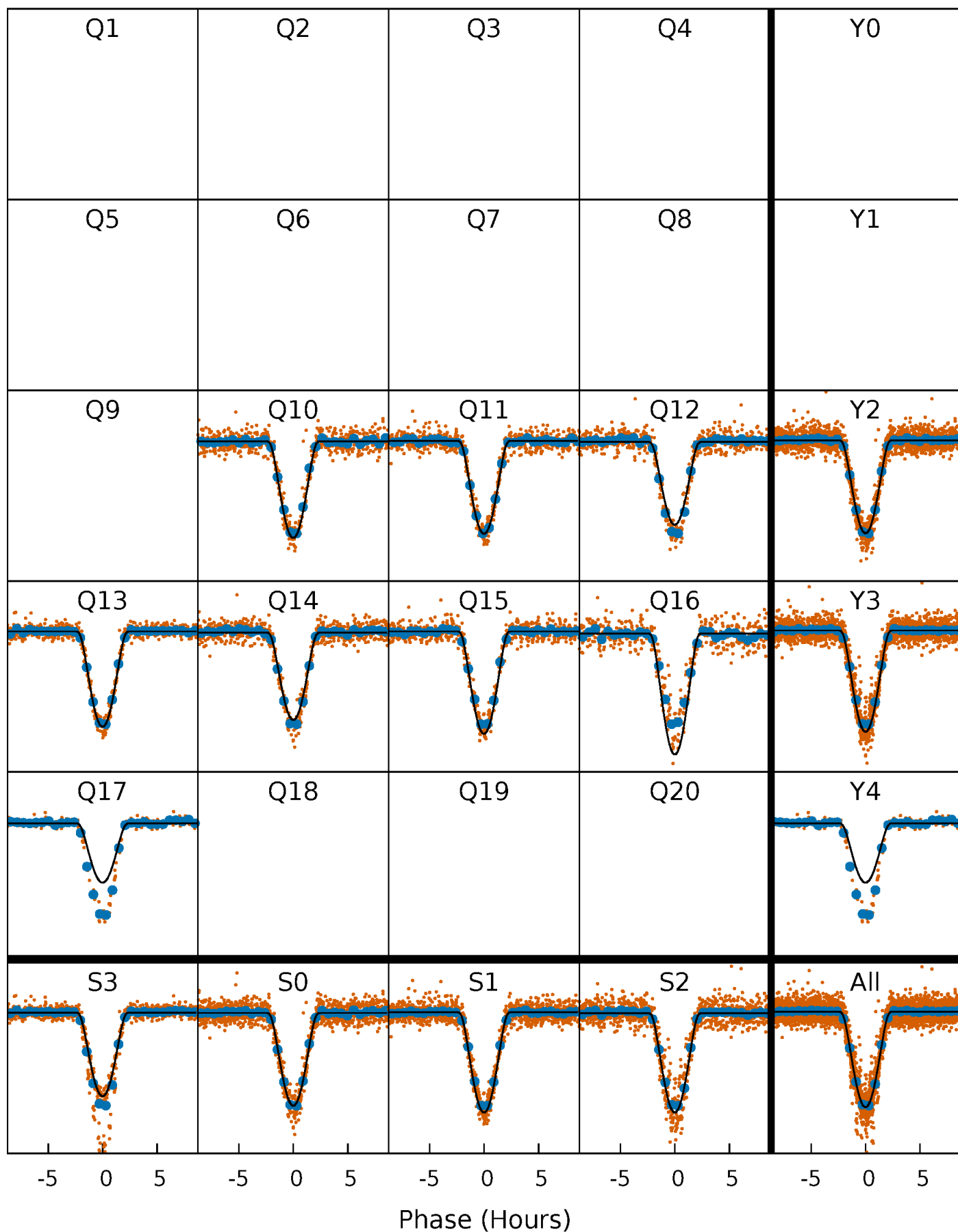
PDC Quarter-Phased Transit Curves

TCE 002449090-02 $P = 4.944041$ Days $T_0 = 131.721920$ (BKJD)



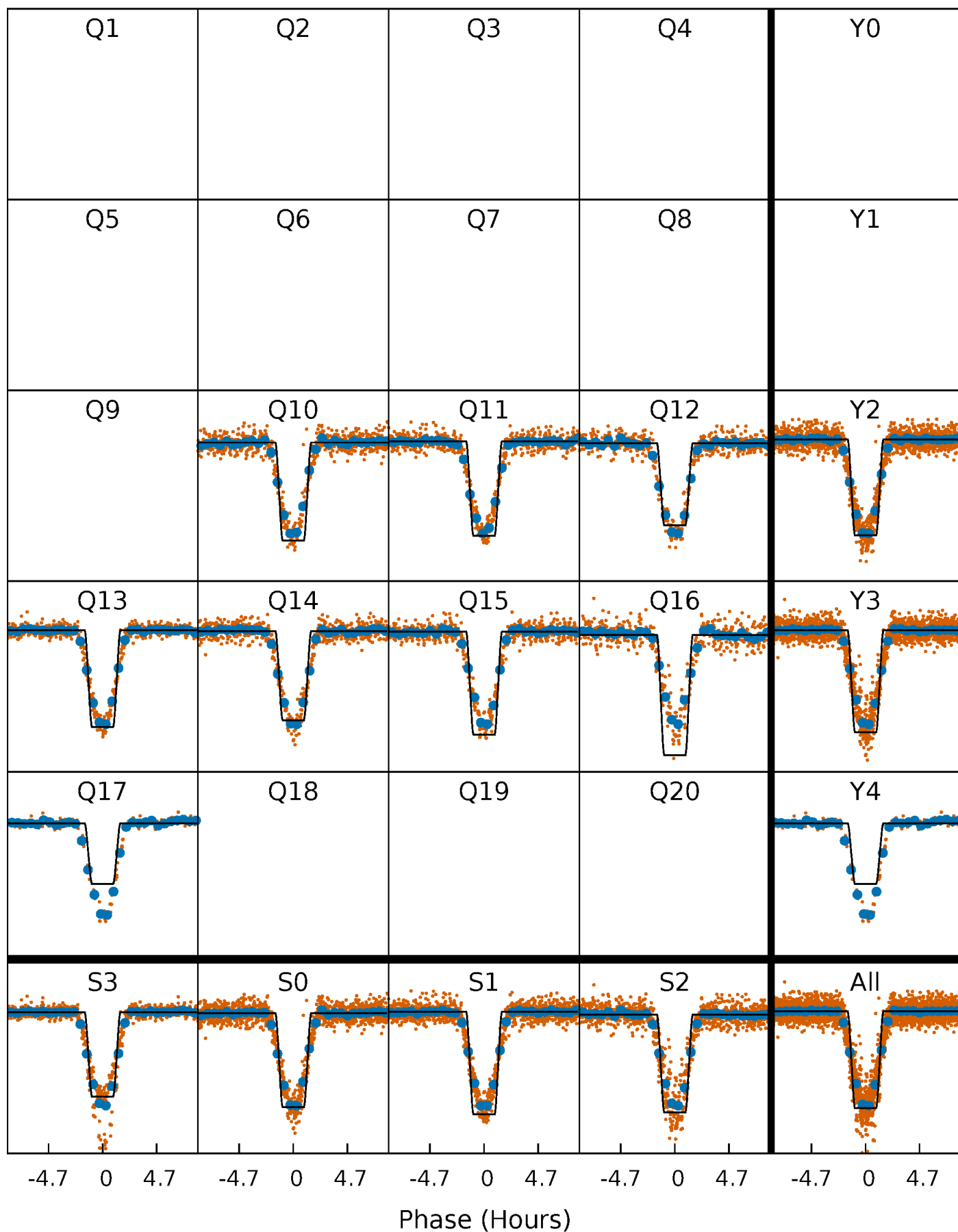
DV Quarter-Phased Transit Curves

TCE 002449090-02 $P = 4.944041$ Days $T_0 = 131.721920$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

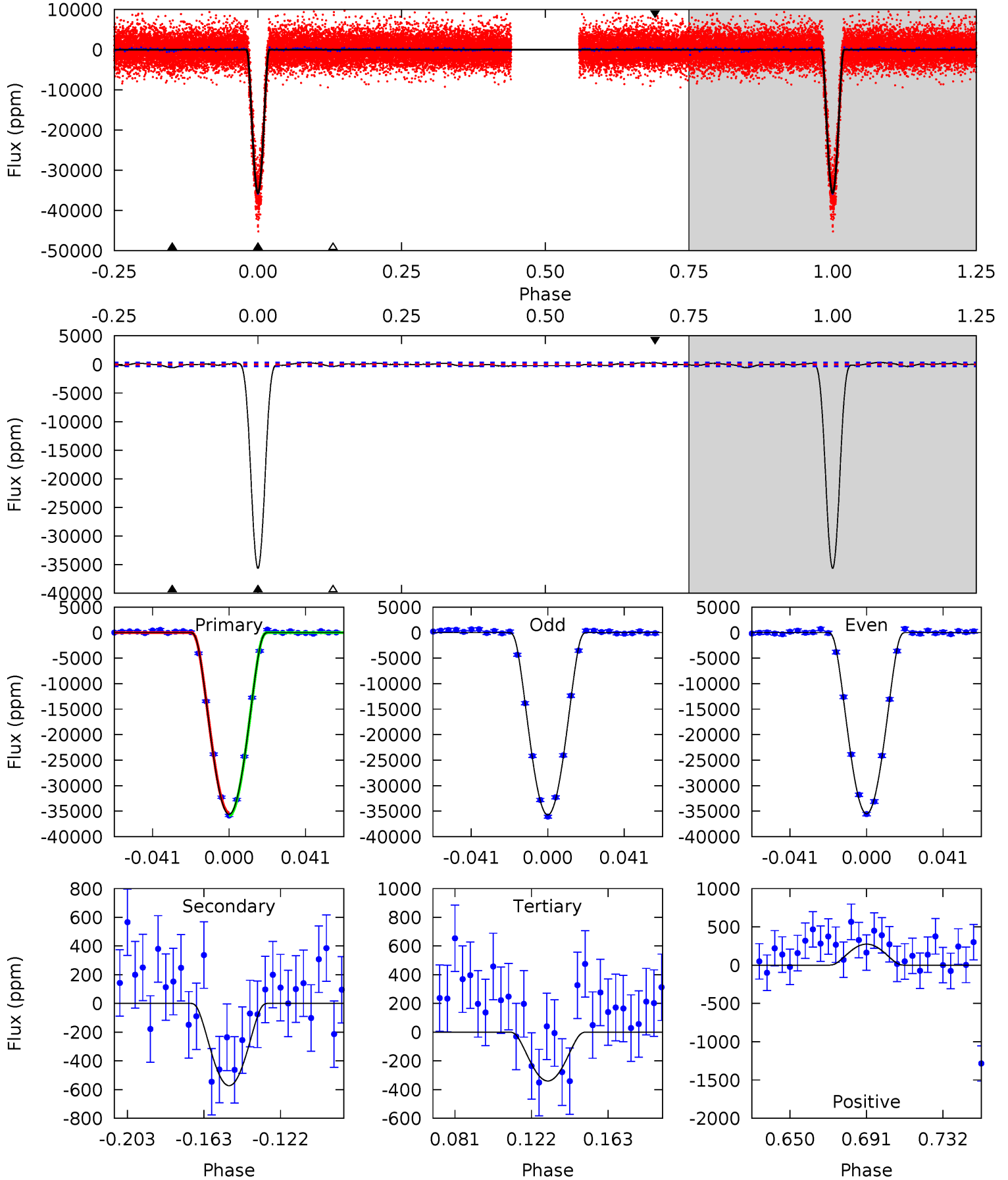
TCE 002449090-02 $P = 4.944005$ Days $T_0 = 131.729692$ (BKJD)



DV Model-Shift Uniqueness Test

002449090-02, P = 4.944041 Days, E = 131.721920 Days

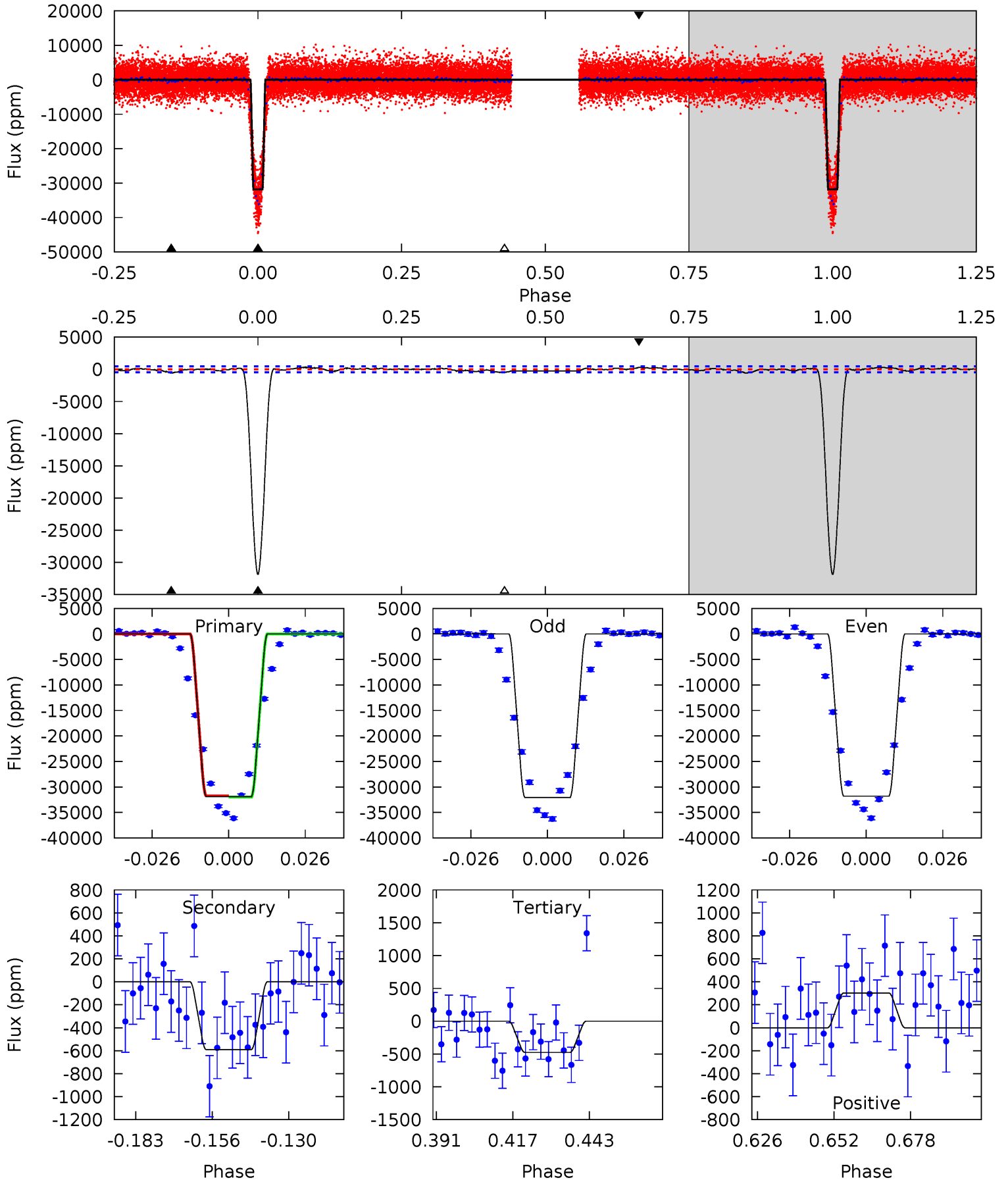
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
493.2	7.93	4.71	3.80	4.75	2.05	2.12	488.5	489.4	3.22	4.12	1.66	1.01	0.01	3.81



Alt Model-Shift Uniqueness Test

002449090-02, P = 4.944005 Days, E = 131.729692 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
337.6	6.26	5.05	3.21	4.84	2.23	1.69	332.5	334.4	1.21	3.05	1.27	1.01	0.01	1.20



Stellar Parameters For KIC 002449090

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002449090-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-573 ± 72	$27.05^{+3.57}_{-3.46}$	1497^{+71}_{-74}	2535^{+117}_{-117}	$1.409^{+0.505}_{-0.372}$
Alt.	-590 ± 94	$20.87^{+3.79}_{-3.69}$	1497^{+70}_{-70}	2750^{+181}_{-152}	$2.379^{+1.262}_{-0.726}$

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 $A_{obs} \gg 1.0$

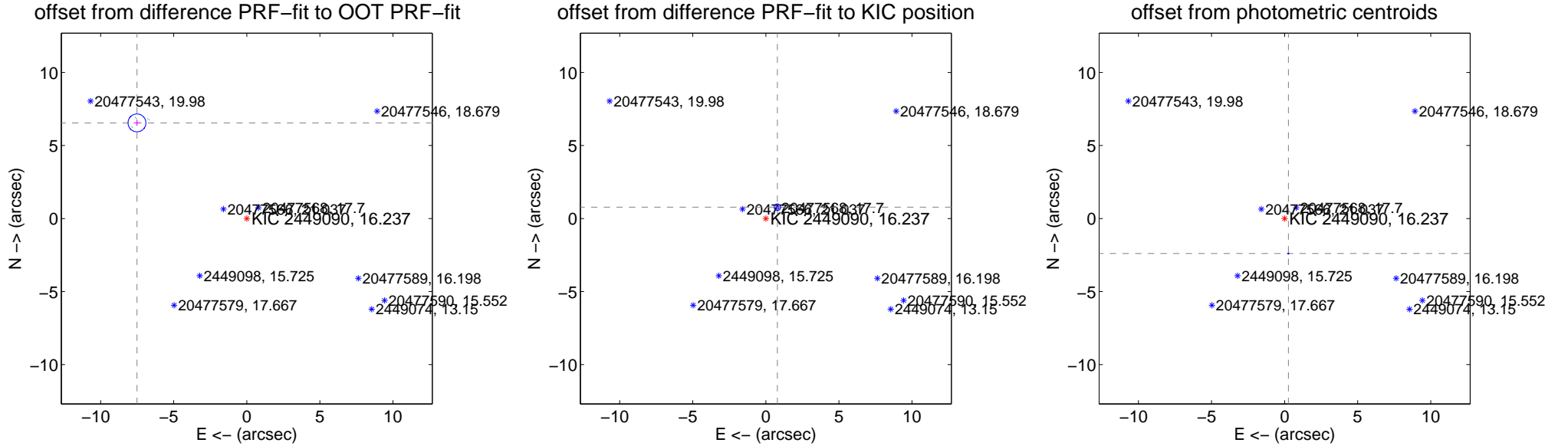
DV Centroid Data

Supplemental centroid analysis for 002449090-02. Kepler magnitude: 16.24. Transit SNR 258.00

There are 8 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 10.24 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.967 ± 0.204	48.92	7.514 ± 0.230	6.548 ± 0.163
PRF-fit source offset from KIC position	1.108 ± 0.075	14.79	-0.791 ± 0.073	0.776 ± 0.074
photometric centroid source offset	2.41 ± 0.01	171.17	-0.26 ± 0.01	-2.40 ± 0.01



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

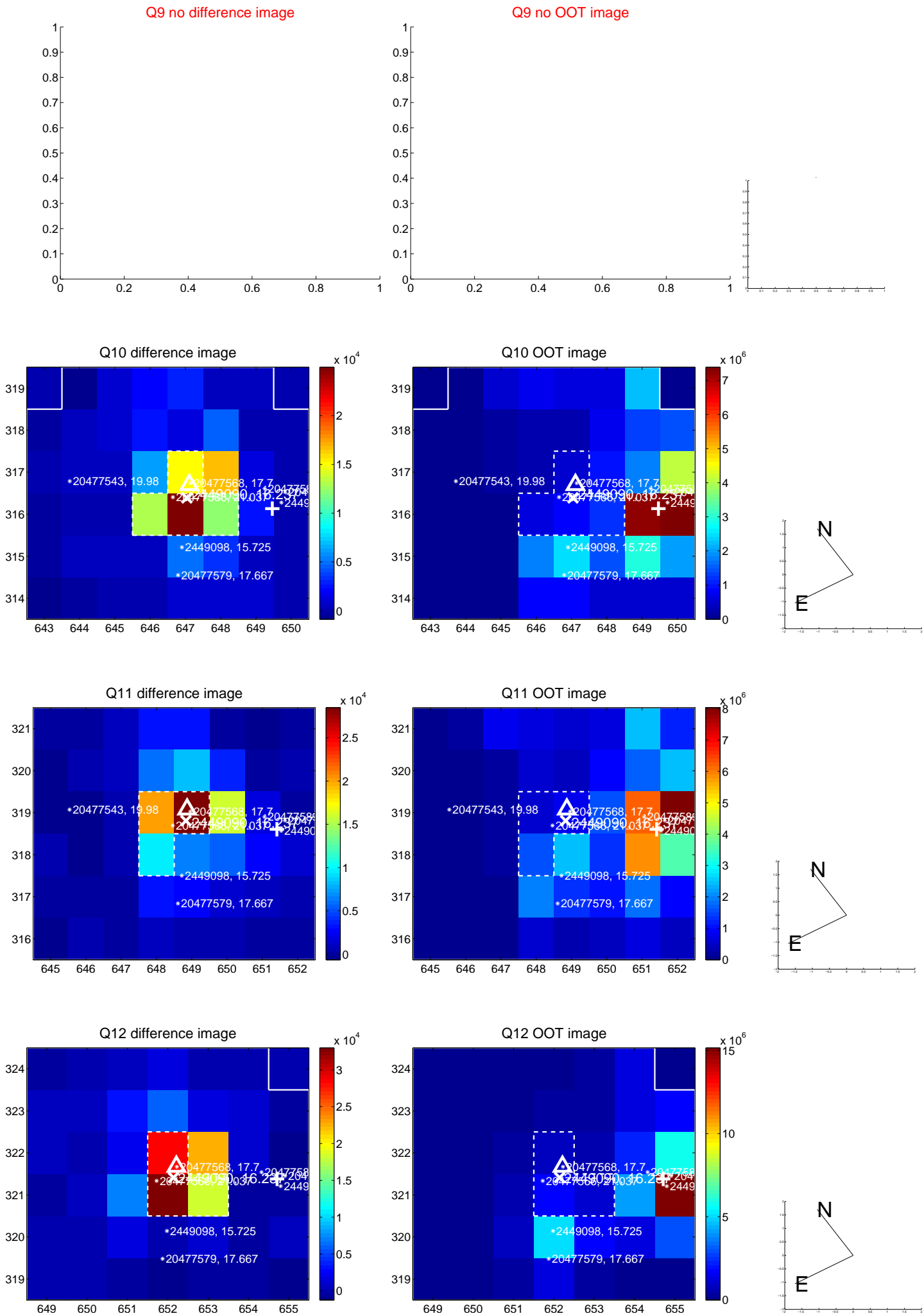
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



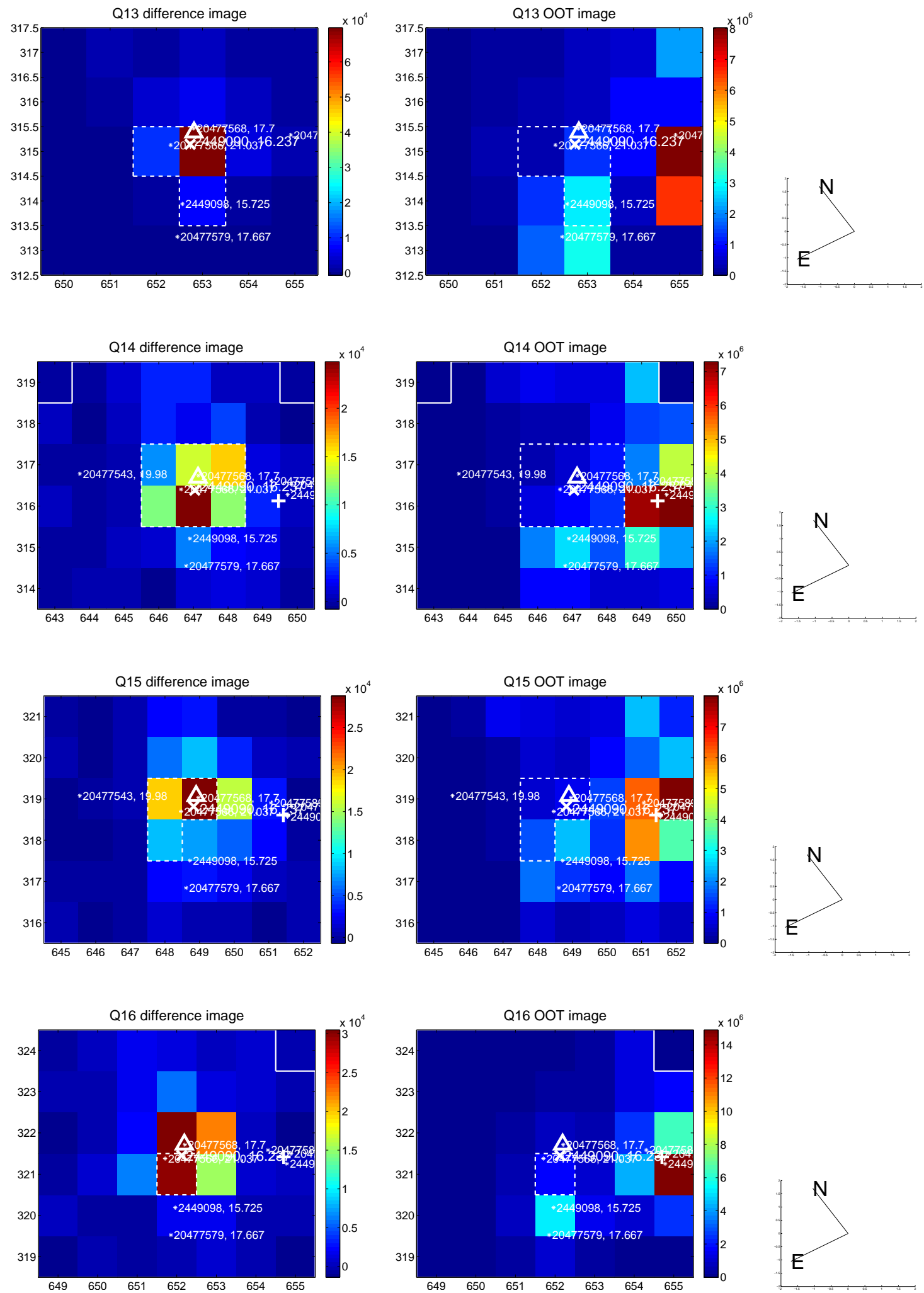
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



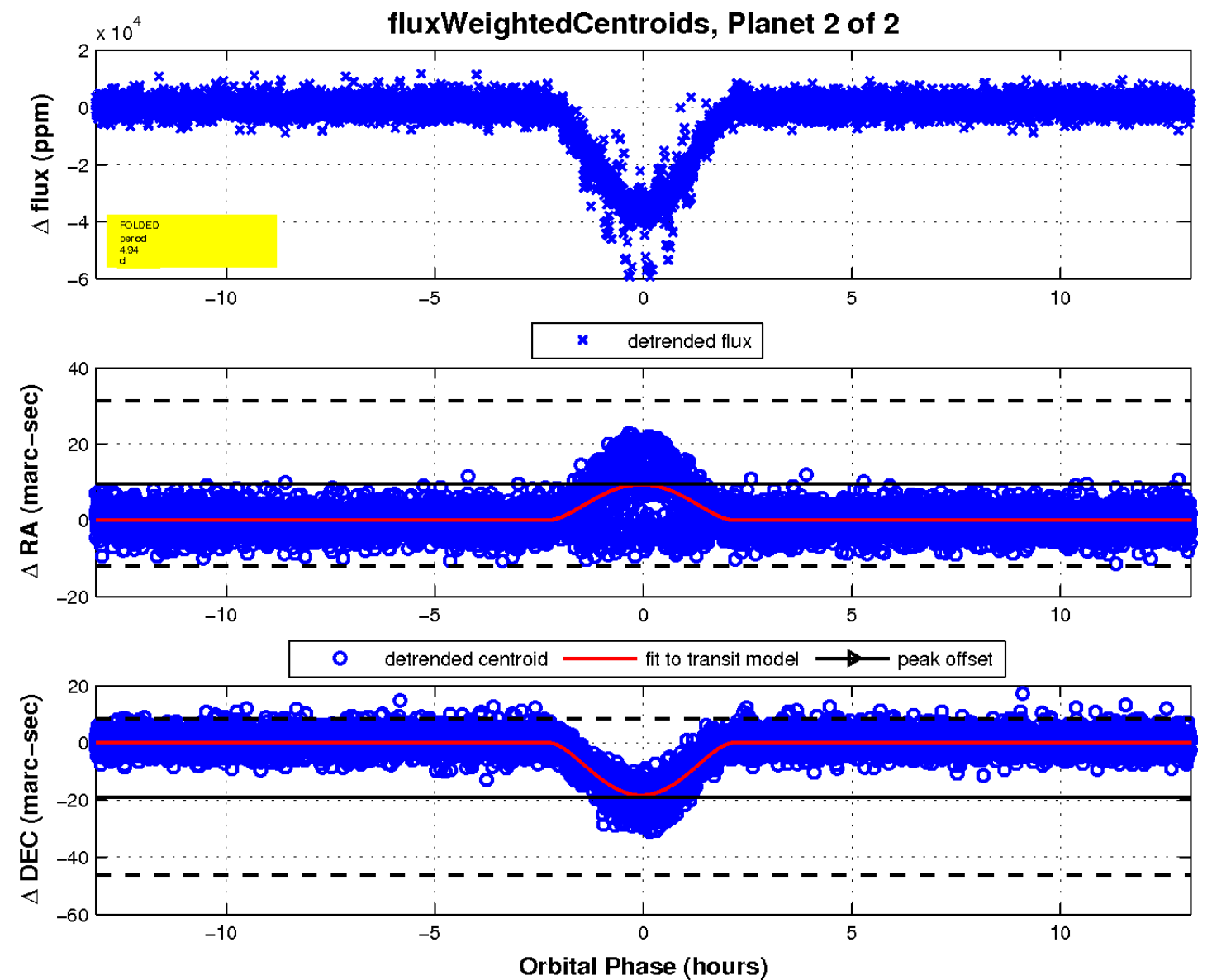
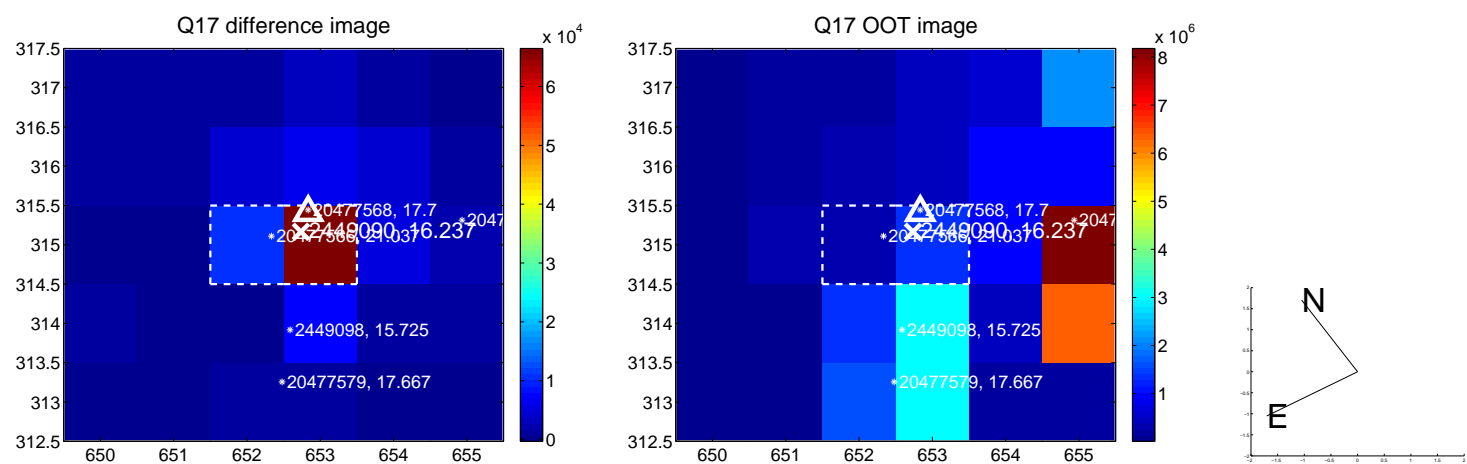
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

