

KIC 004450976

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})
004450976-01	OBS	No	12.044767	135.264476	169.2	15.288	27.6	29.7	1.89	6109	4.85	437.05
004450976-02	OBS	No	481.885724	194.206099	153.2	17.702	10.2	6.2	1.89	6109	2.87	3.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004450976-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004450976-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

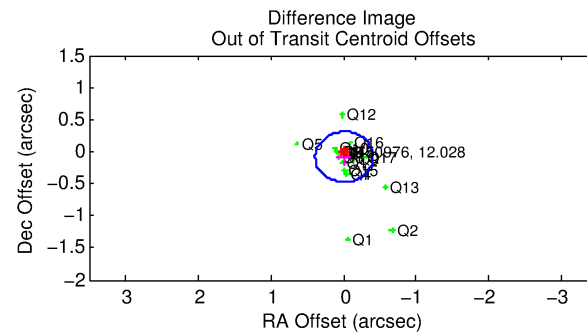
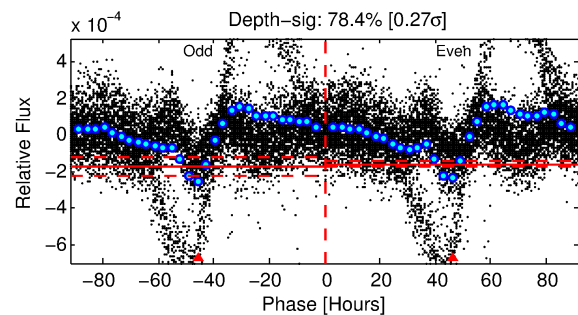
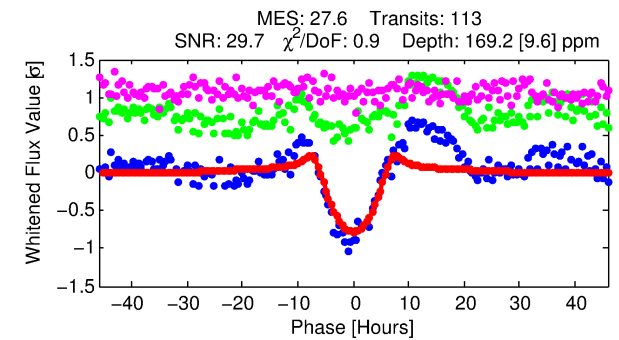
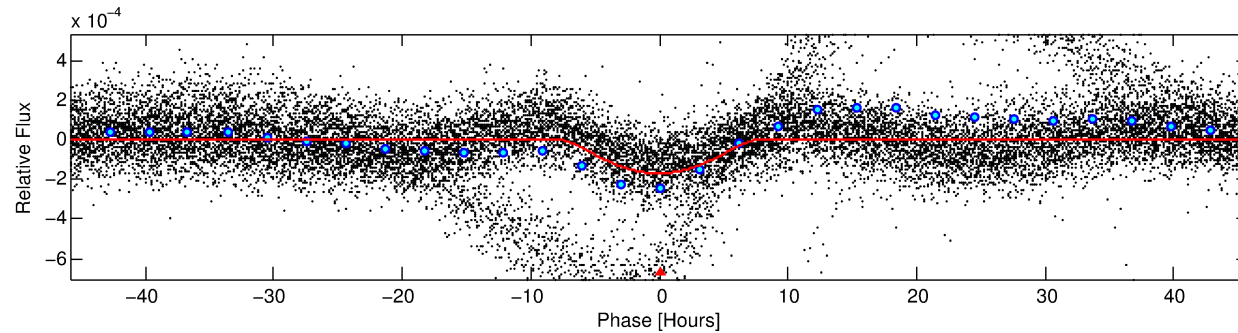
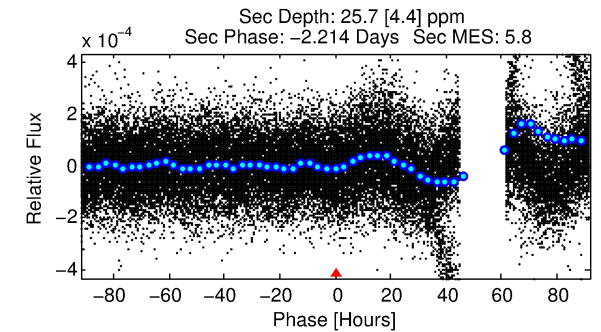
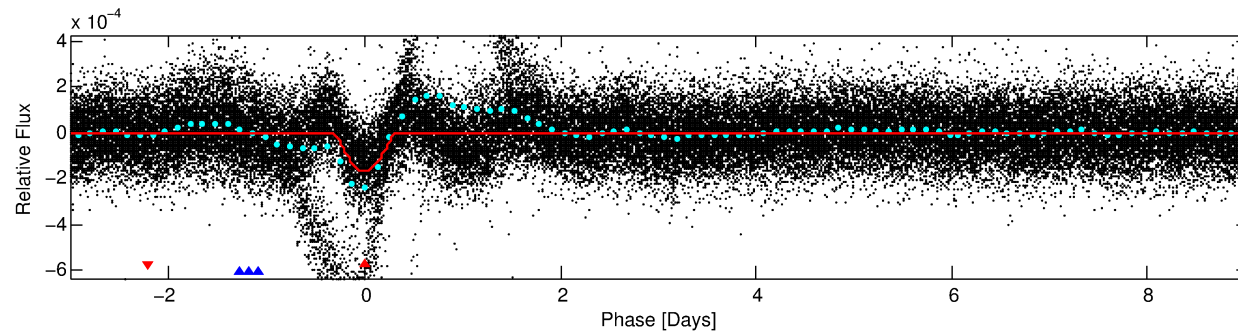
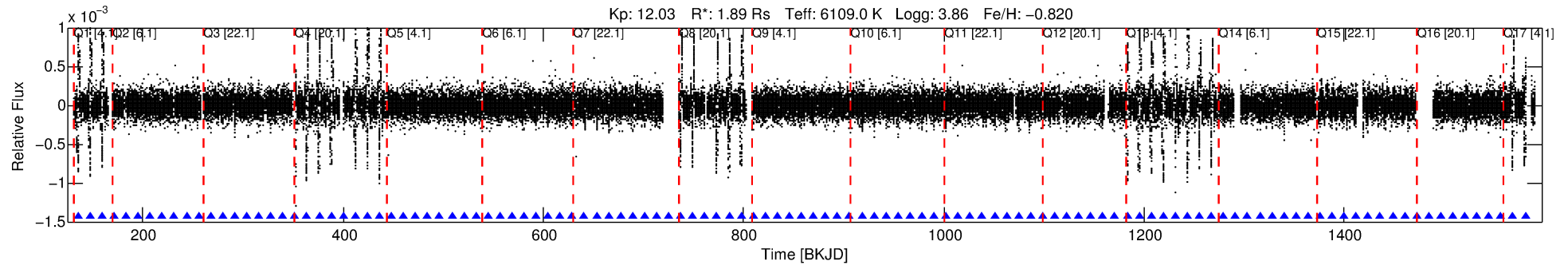
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004450976-01

No Significant Match Found

DV One-Page Summary

KIC: 4450976 Candidate: 1 of 2 Period: 12.045 d



DV Fit Results:

Period = 12.04477 [0.00015] d
Epoch = 135.2645 [0.0102] BKJD
Rp/R* = 0.0235 [0.0158]
a/R* = 1.66 [0.18]
b = 1.00 [0.02]
Seff = 437.05 [233.64]
Teq = 1166 [156] K
Rp = 4.85 [3.62] Re
a = 0.1009 [0.0325] AU
Ag = 6.12 [8.89] [0.58σ]
Teffp = 2836 [964] K [1.71σ]

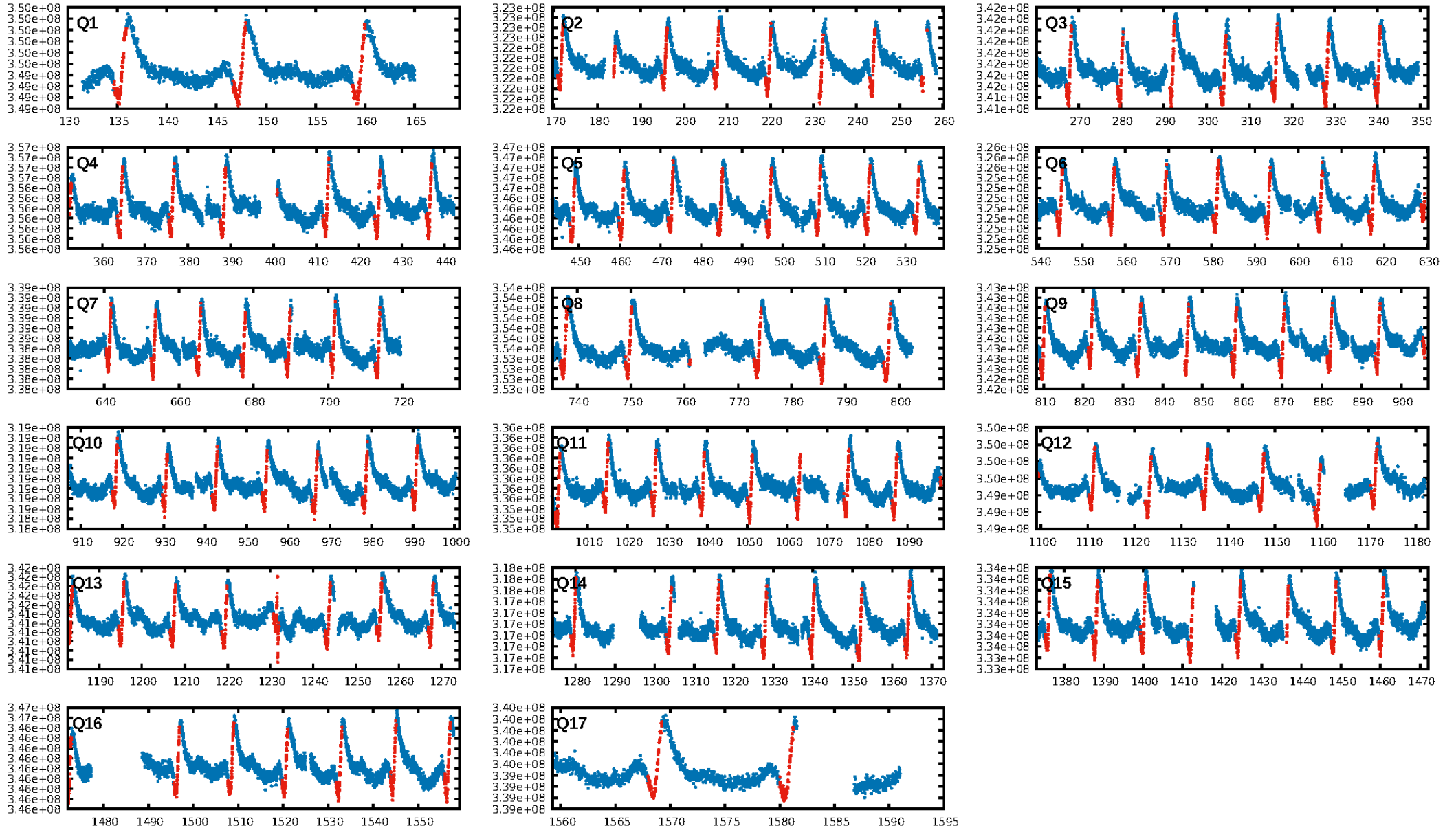
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [482.10σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.01e-144
RollingBand-fgt: 1.00 [108/108]
GhostDiagnostic-chr: 1.403
Centroid-sig: 59.7%
Centroid-so: 0.327 arcsec [1.63σ]
OotOffset-rm: 0.083 arcsec [0.63σ]
KicOffset-rm: 0.130 arcsec [1.00σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

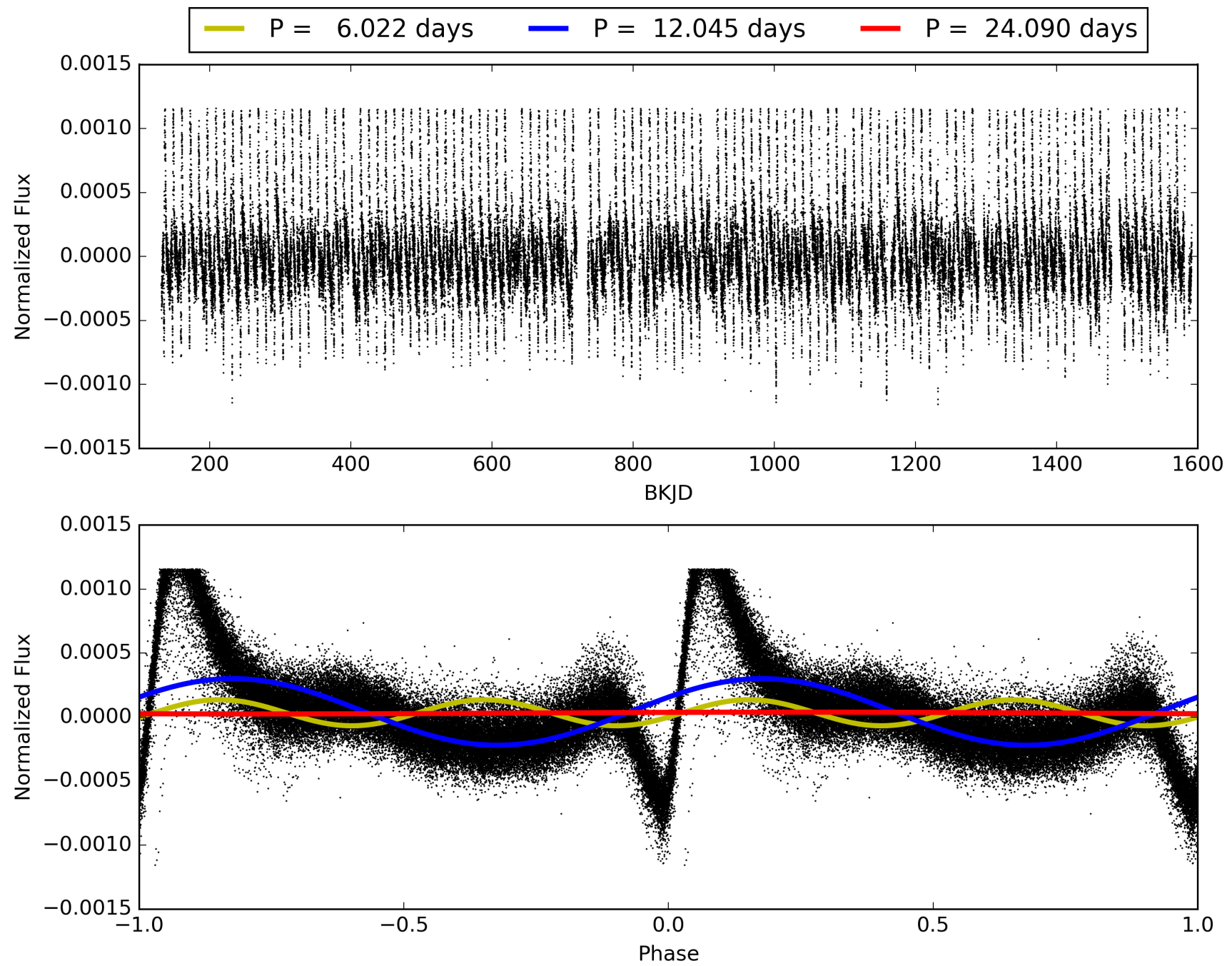
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:06:41 Z

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

TCE 004450976-01, PDC Light Curves

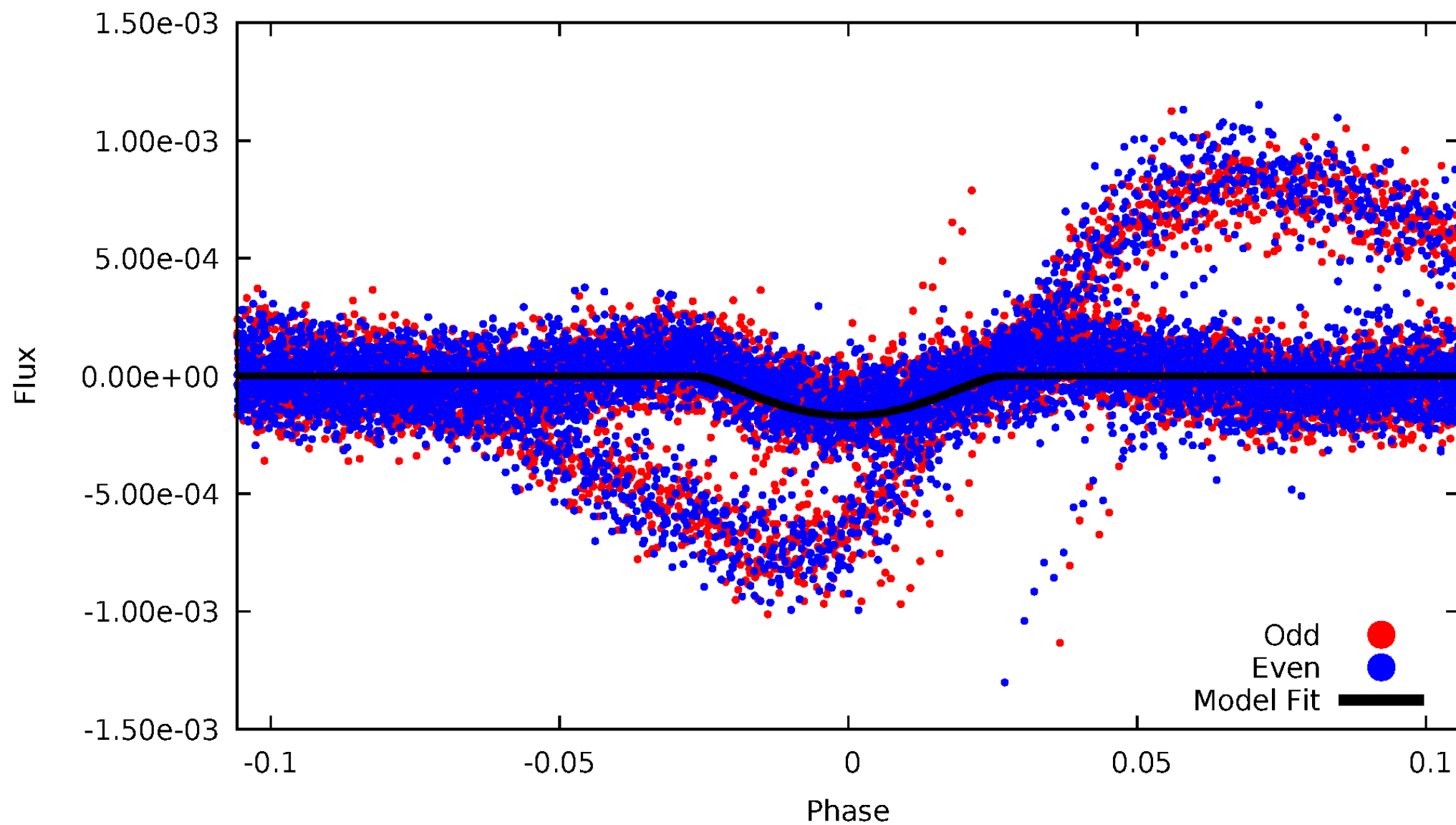


TCE 004450976-01



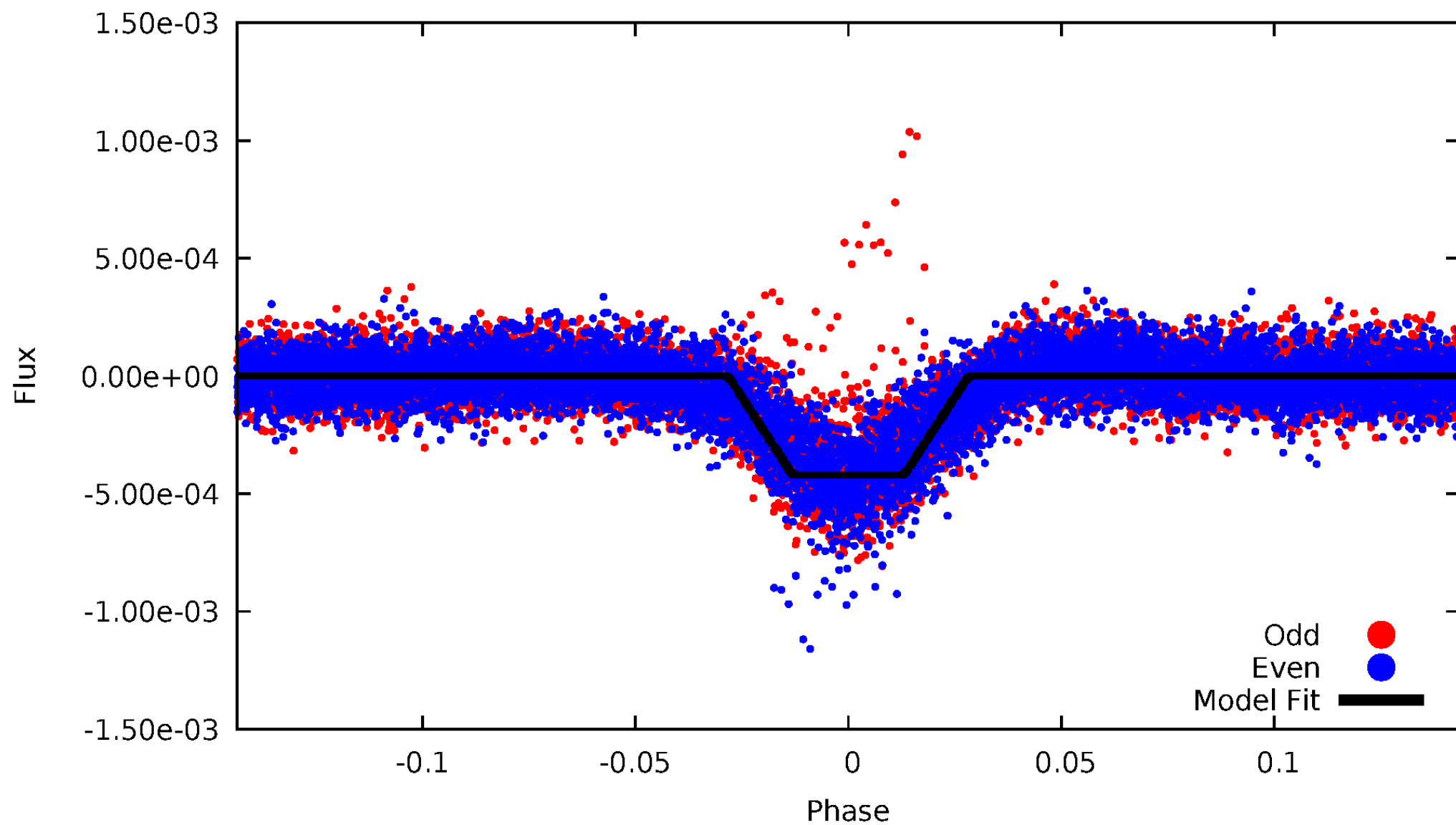
DV Odd/Even

TCE 004450976-01



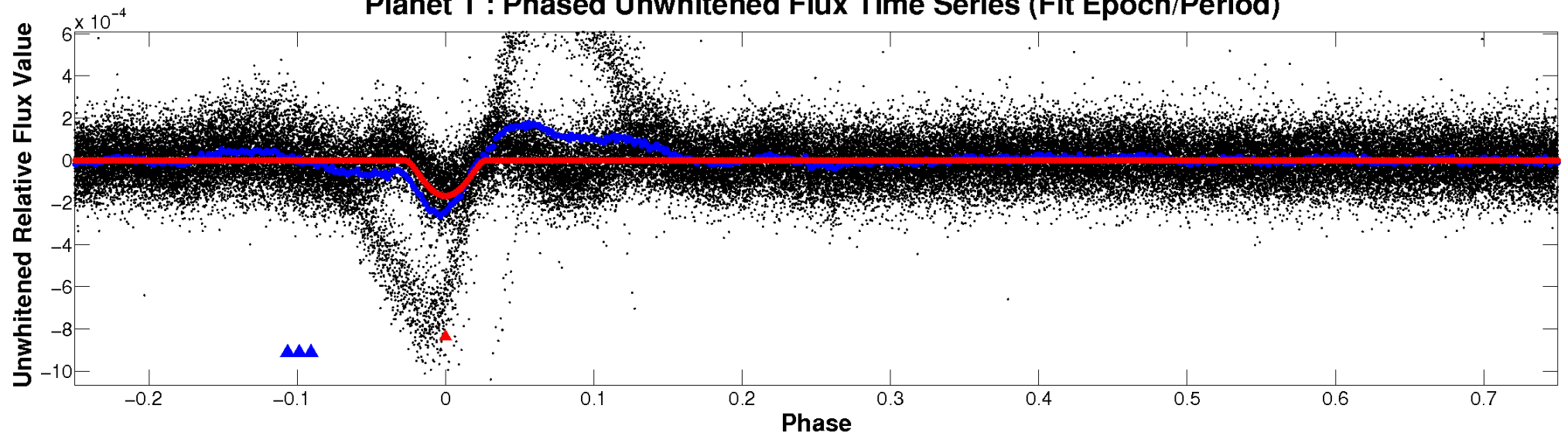
ALT Odd/Even

TCE 004450976-01

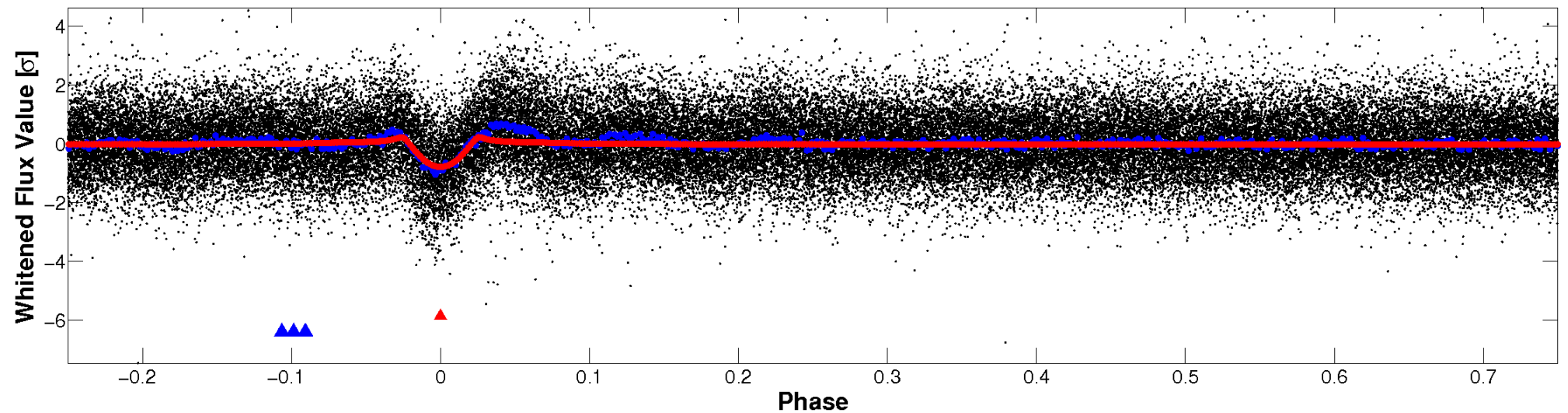


Non-Whitened Vs. Whitened Light Curve

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

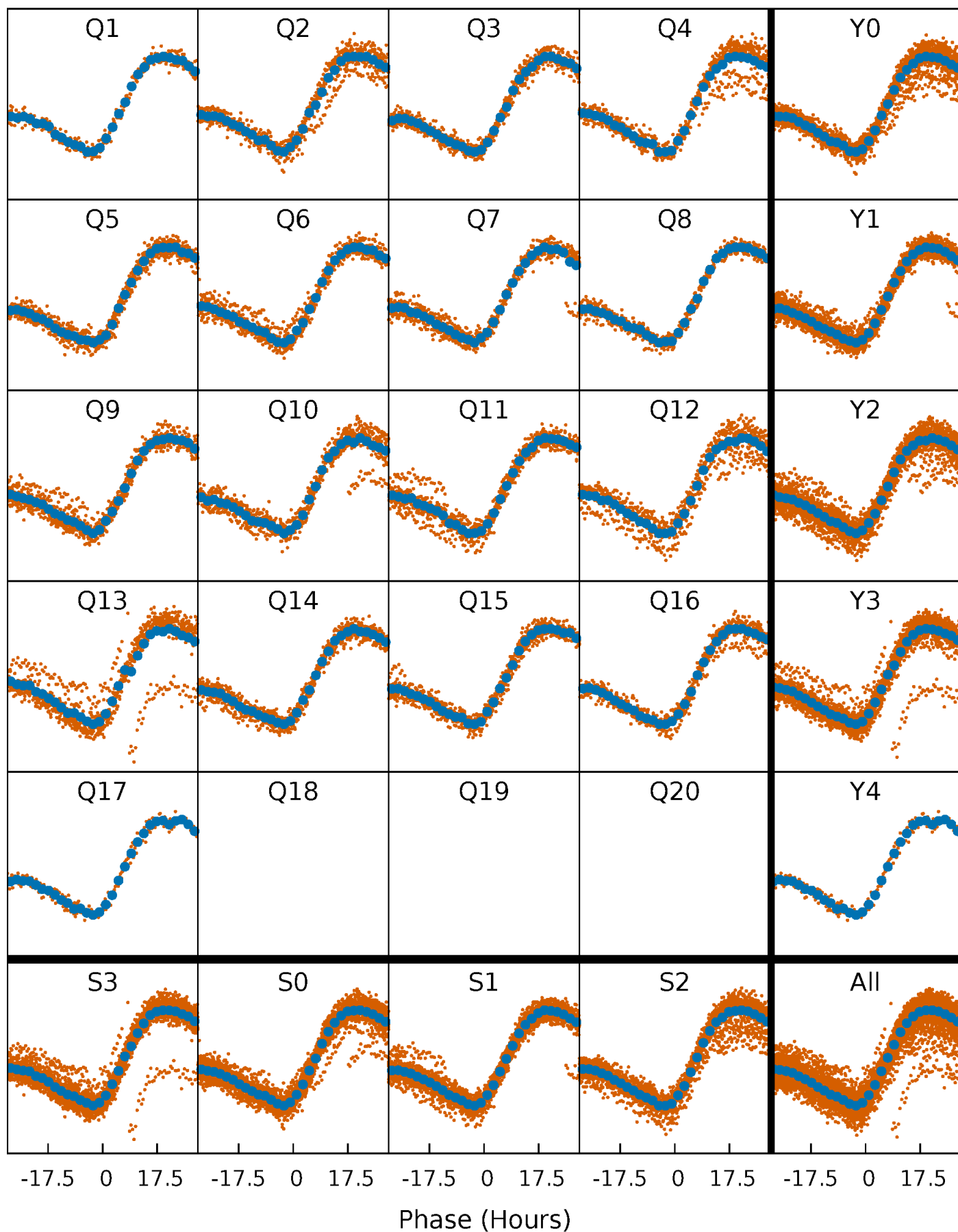


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



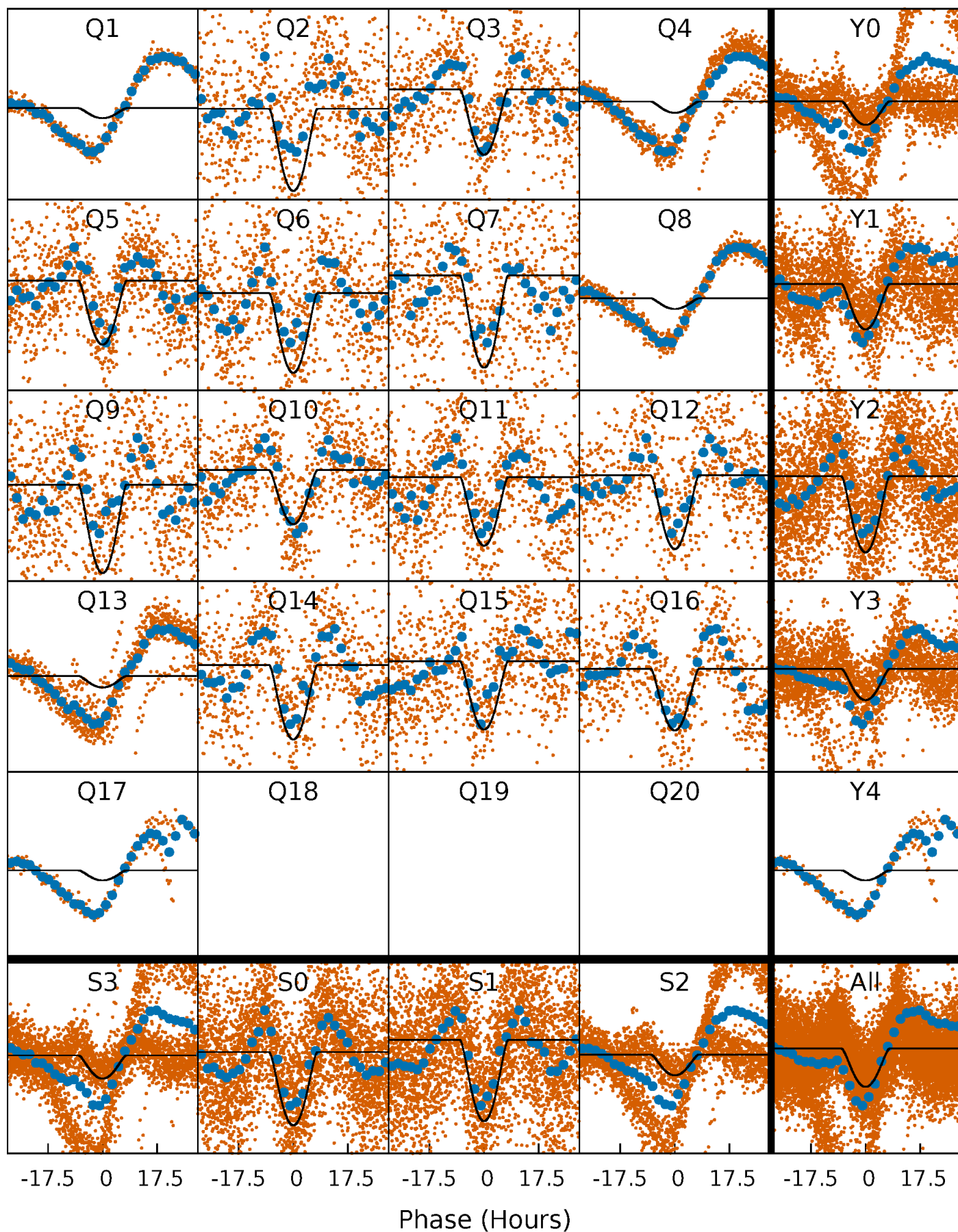
PDC Quarter-Phased Transit Curves

TCE 004450976-01 P= 12.044767 Days $T_0=135.264476$ (BKJD)



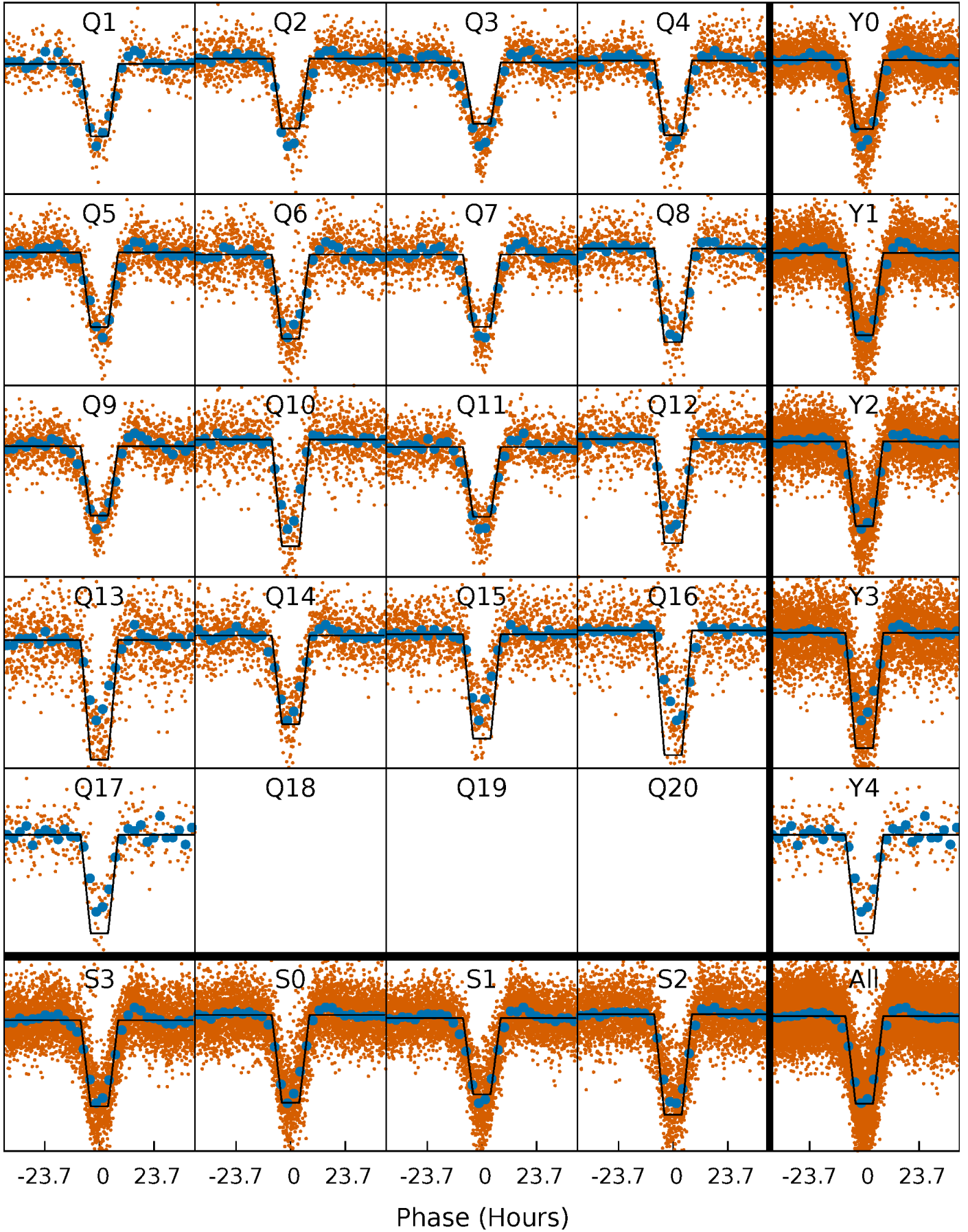
DV Quarter-Phased Transit Curves

TCE 004450976-01 P= 12.044767 Days $T_0=135.264476$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

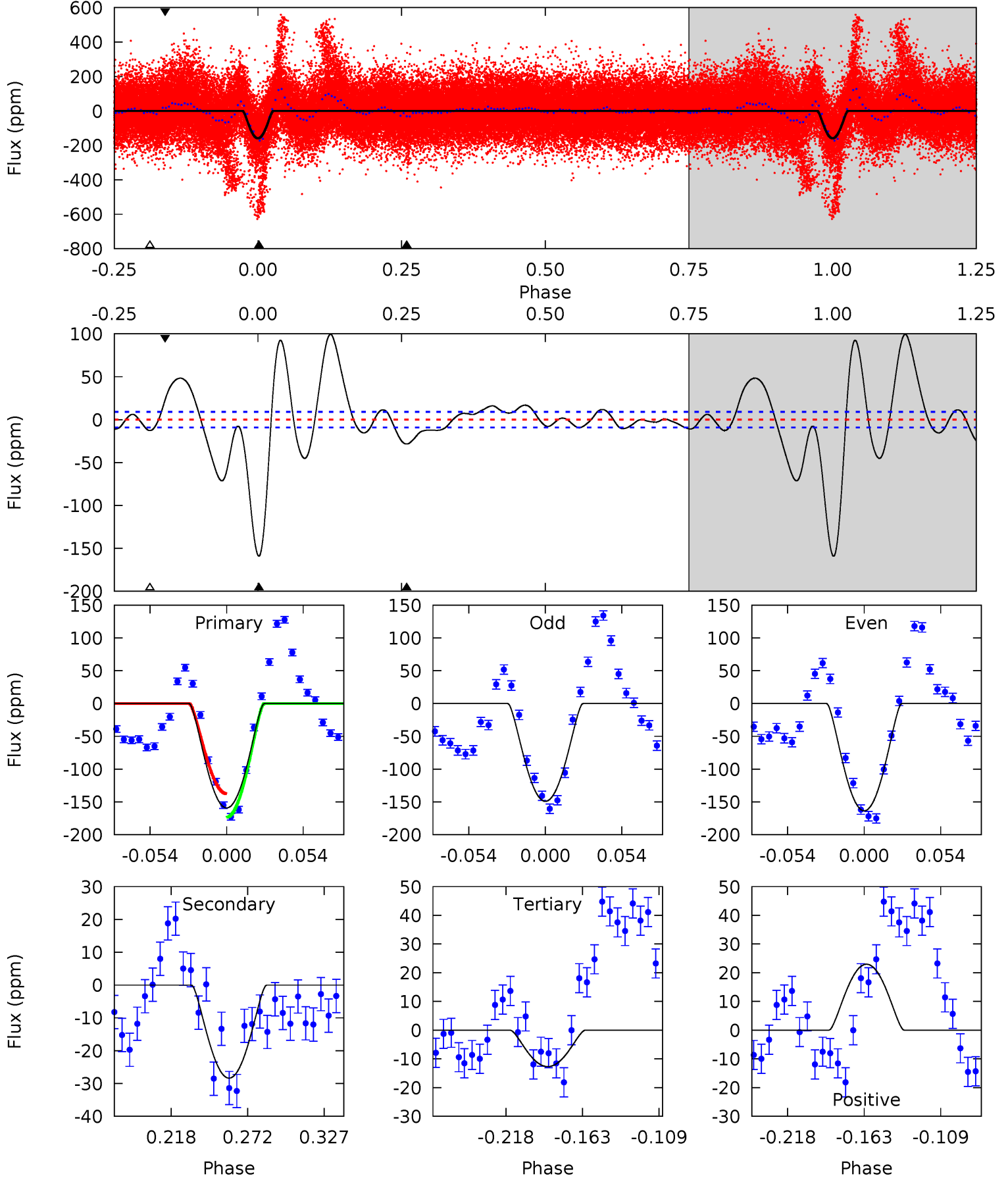
TCE 004450976-01 P= 12.044779 Days $T_0=135.245430$ (BKJD)



DV Model-Shift Uniqueness Test

004450976-01, P = 12.044767 Days, E = 123.219709 Days

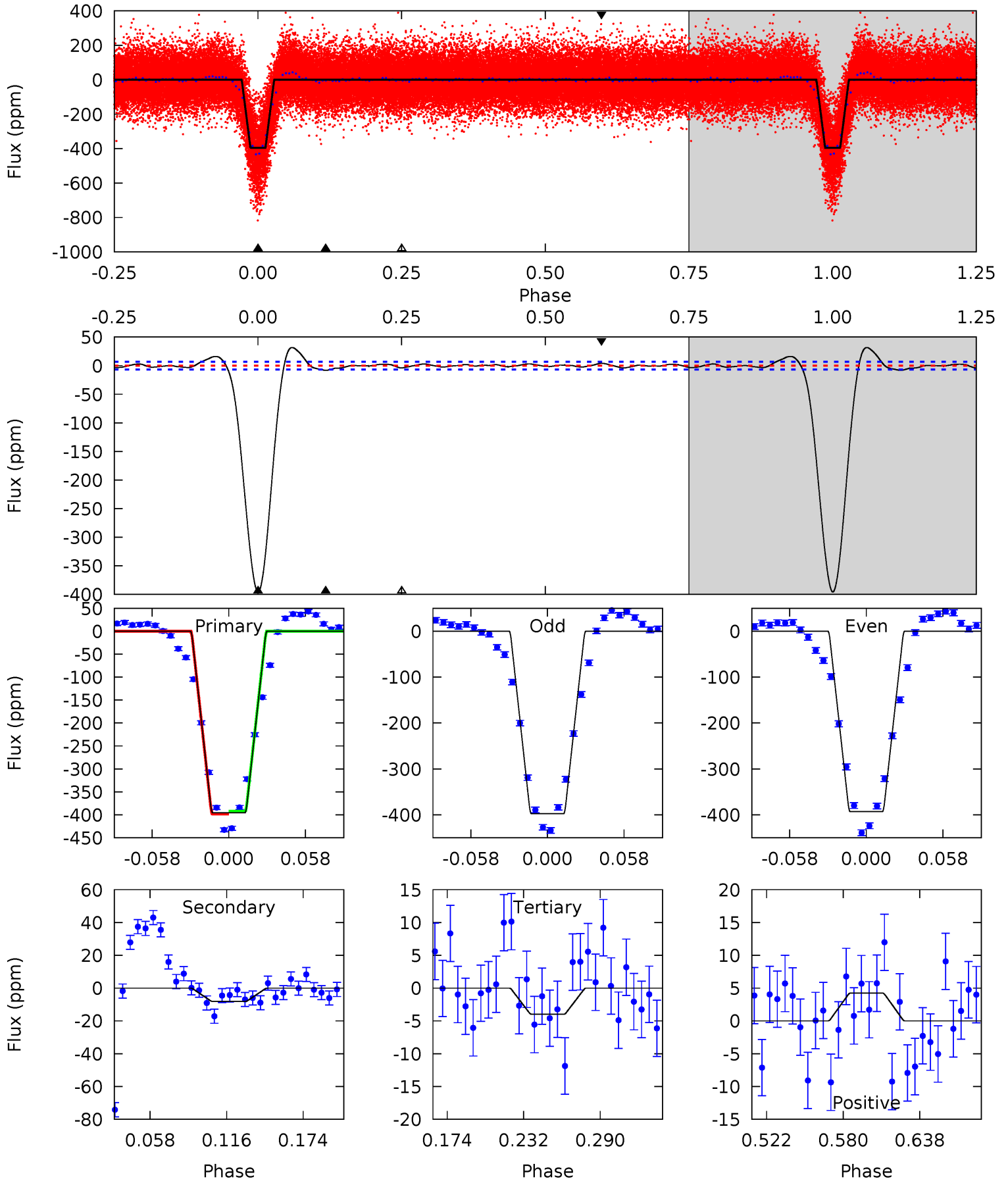
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.7	14.7	6.59	11.9	4.69	1.92	13.7	76.1	70.8	8.15	2.81	3.76	1.83	0.38	9.26



Alt Model-Shift Uniqueness Test

004450976-01, P = 12.044779 Days, E = 123.200651 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
275.0	5.69	2.77	2.94	4.68	1.90	2.52	272.2	272.1	2.92	2.75	1.65	1.02	0.07	2.08



Stellar Parameters For KIC 004450976

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6109^{+182}_{-164}	$3.861^{+0.308}_{-0.132}$	$-0.820^{+0.350}_{-0.250}$	$1.889^{+0.414}_{-0.621}$	$0.945^{+0.139}_{-0.126}$	$0.198^{+0.387}_{-0.079}$
	+3%/-3%	+8%/-3%	+43%/-30%	+22%/-33%	+15%/-13%	+196%/-40%
Source	PHO1	FLK73	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 004450976-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-28 ± 2	$4.84^{+3.19}_{-2.68}$	1610^{+110}_{-147}	3348^{+1156}_{-473}	$6.762^{+28.462}_{-4.265}$
Alt.	-8 ± 1	$4.43^{+3.03}_{-2.67}$	1595^{+123}_{-139}	2816^{+958}_{-438}	$2.353^{+12.379}_{-1.538}$

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 $A_{obs} \gg 1.0$

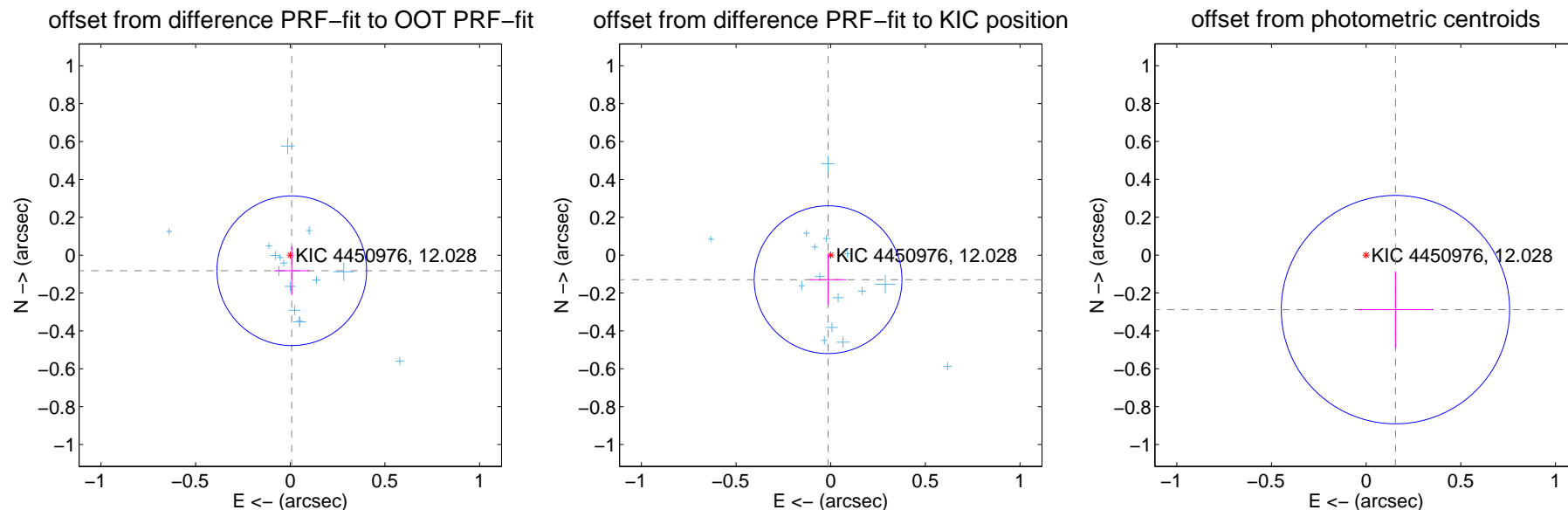
DV Centroid Data

Supplemental centroid analysis for 004450976-01. Kepler magnitude: 12.03. Transit SNR 29.74

There are 17 quarters with good PRF difference image offsets

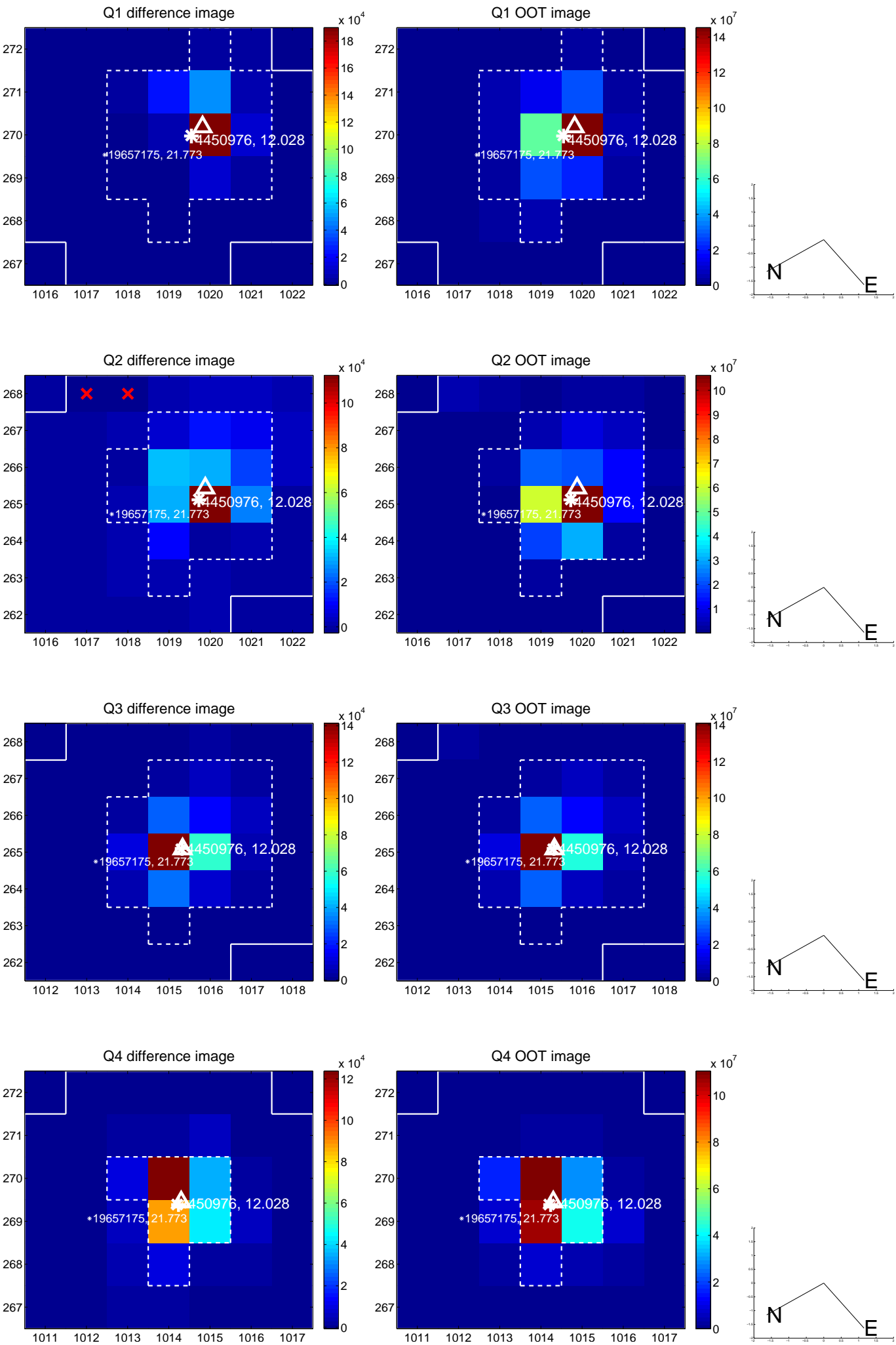
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.083 ± 0.132	0.63	-0.008 ± 0.092	-0.082 ± 0.129
PRF-fit source offset from KIC position	0.130 ± 0.130	1.00	0.014 ± 0.096	-0.130 ± 0.134
photometric centroid source offset	0.33 ± 0.20	1.63	-0.15 ± 0.20	-0.29 ± 0.20

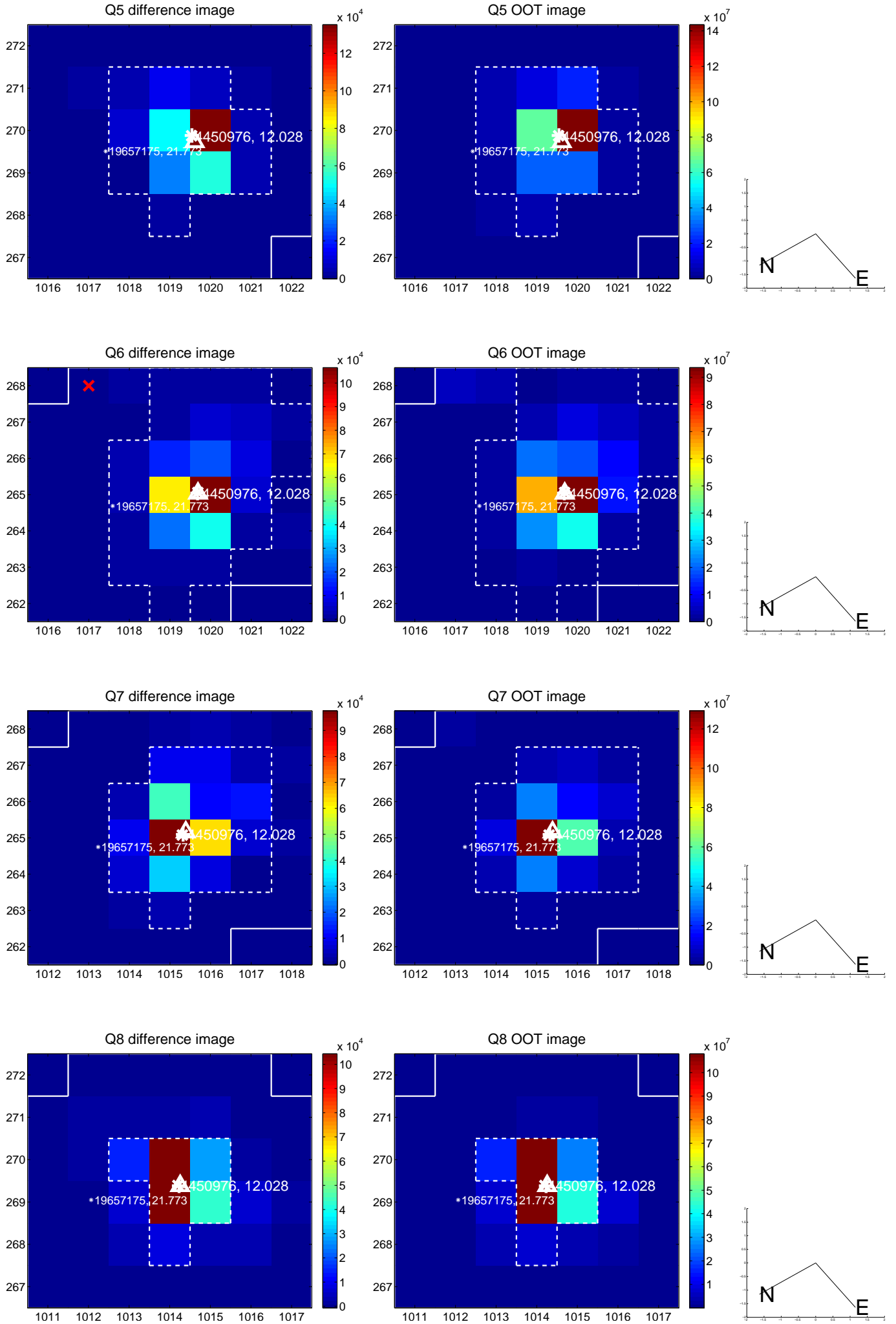


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

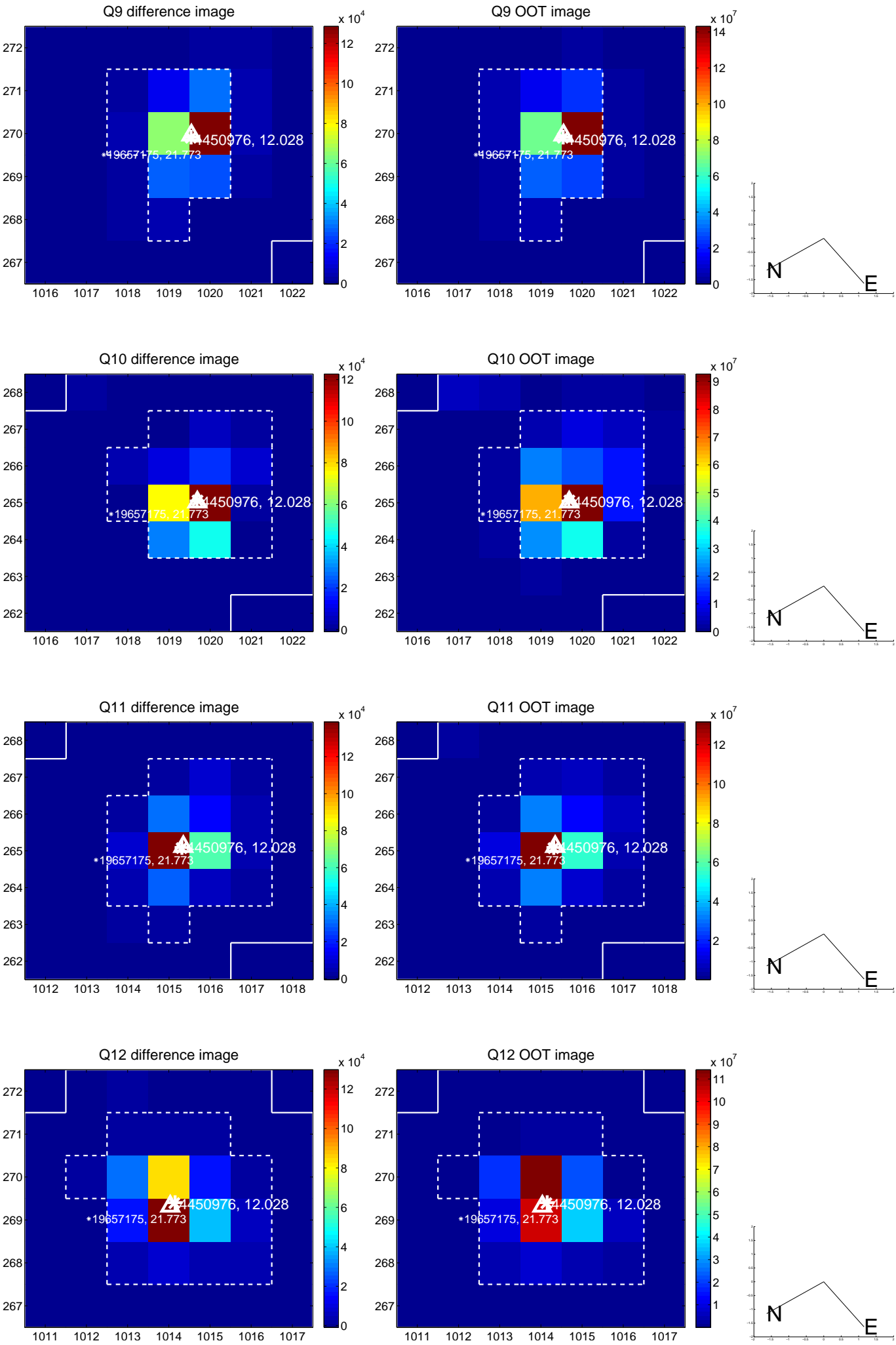
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



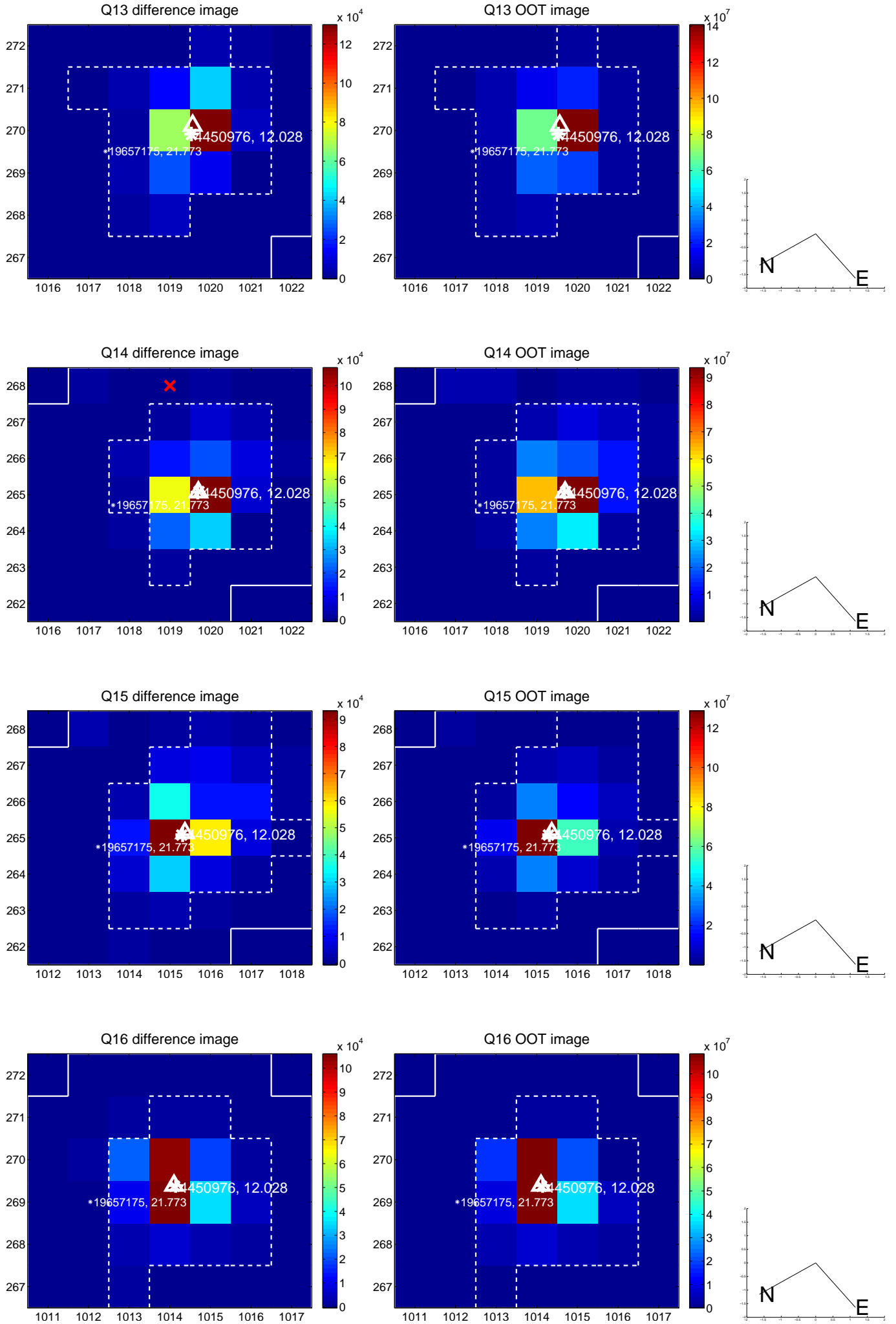
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



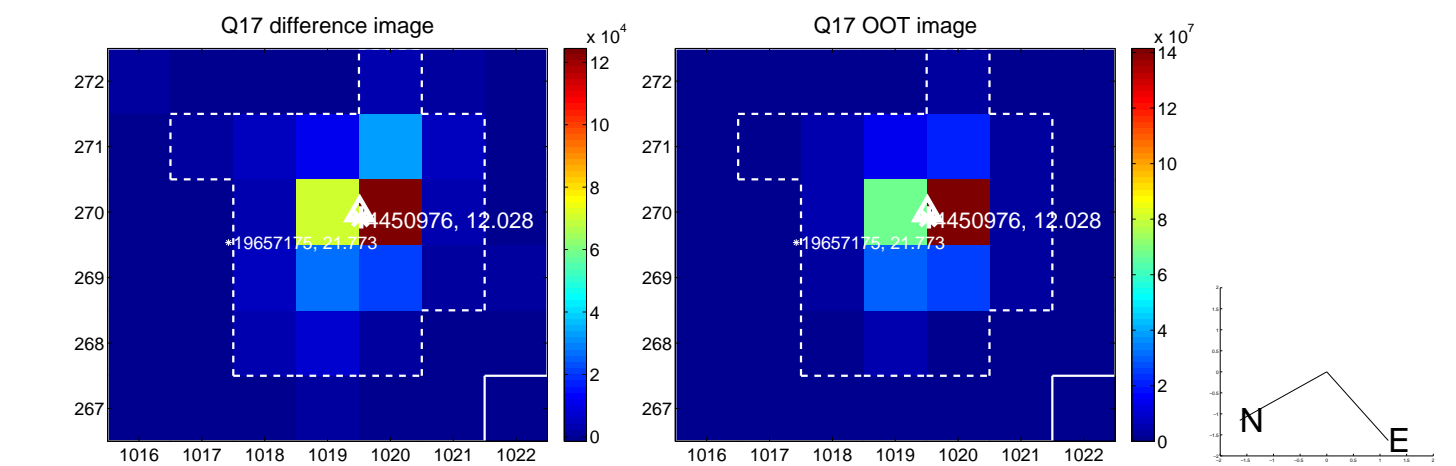
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



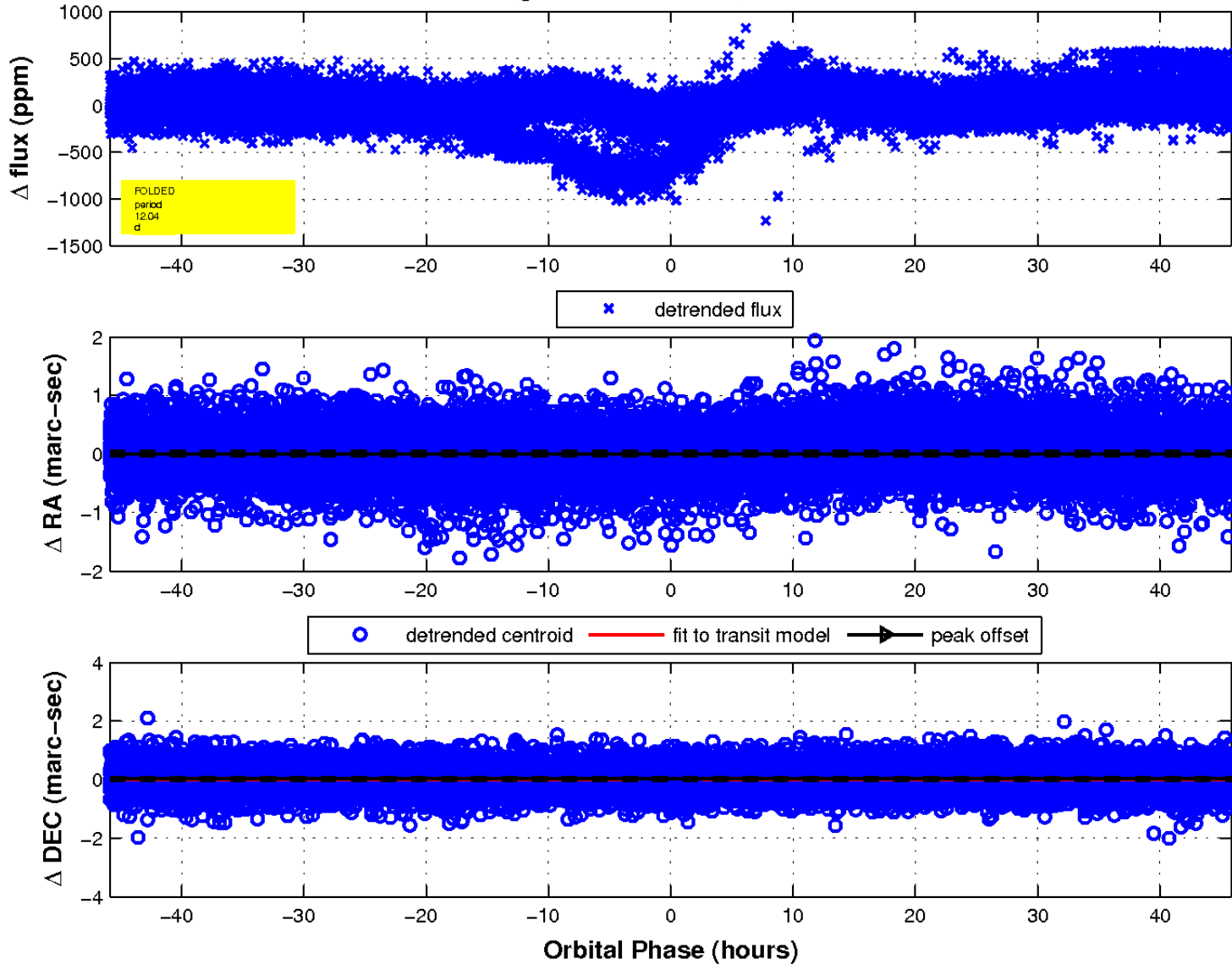
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



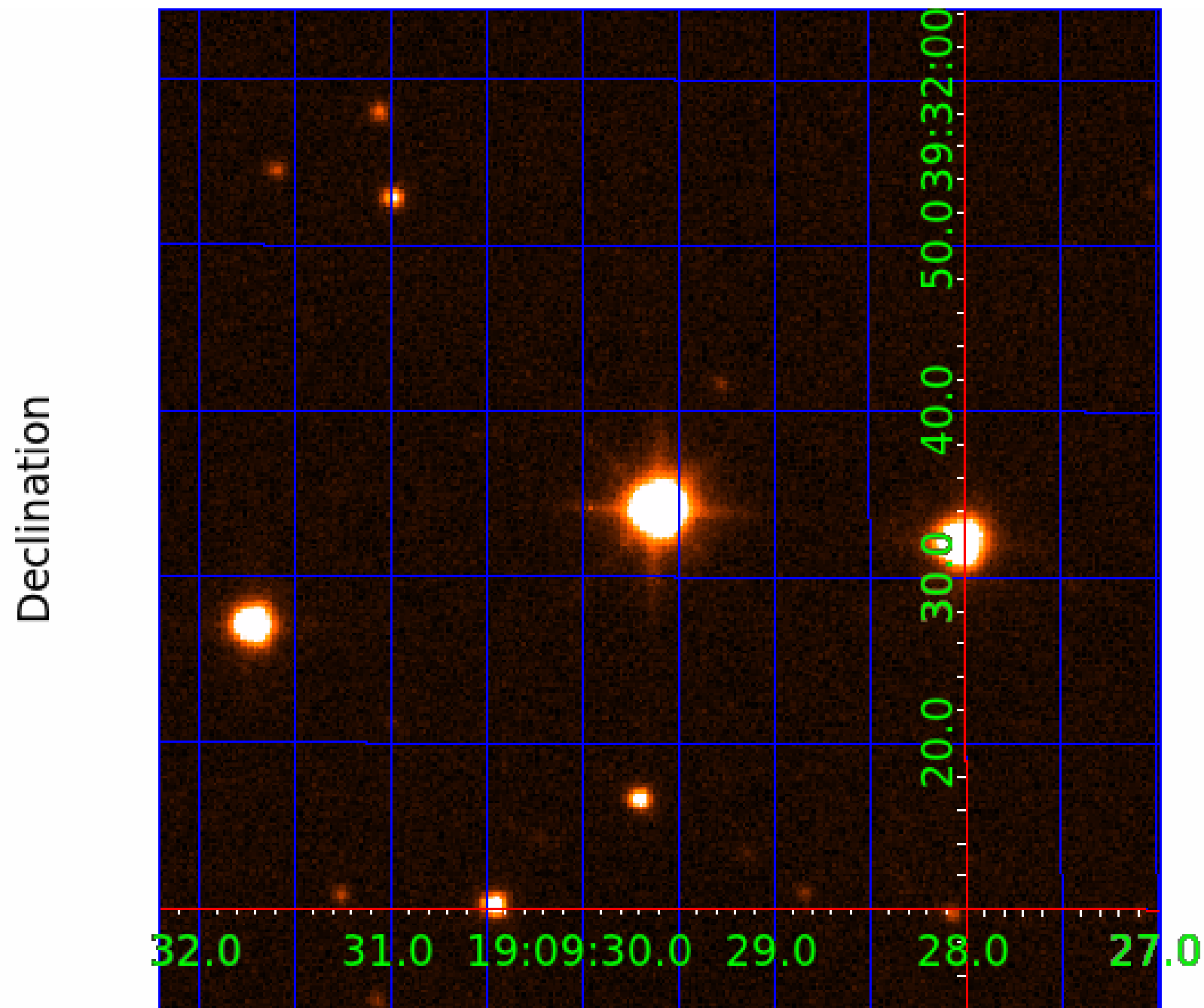
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 004450976

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})
004450976-01	OBS	No	12.044767	135.264476	169.2	15.288	27.6	29.7	1.89	6109	4.85	437.05
004450976-02	OBS	No	481.885724	194.206099	153.2	17.702	10.2	6.2	1.89	6109	2.87	3.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004450976-01	OBS	FP	0.00	1	0	0	0	LPP_DV
004450976-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

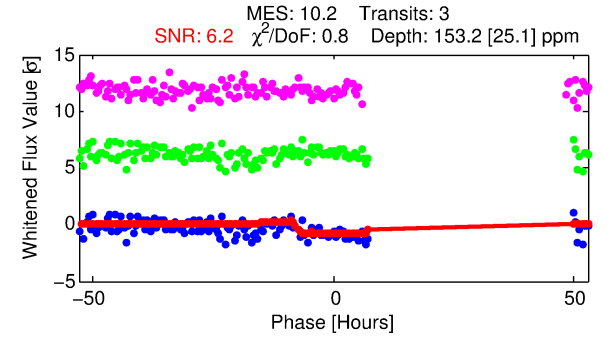
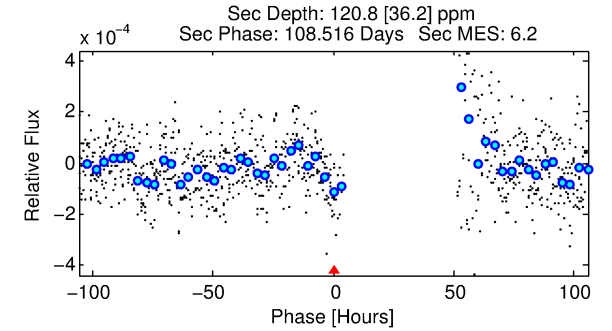
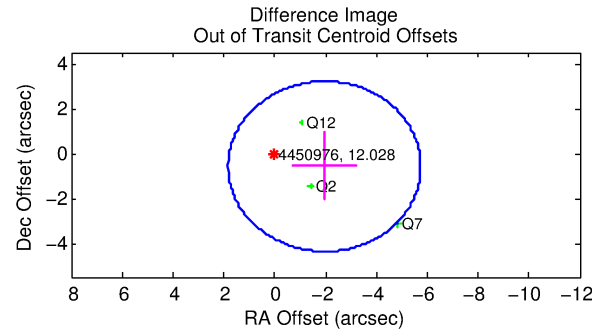
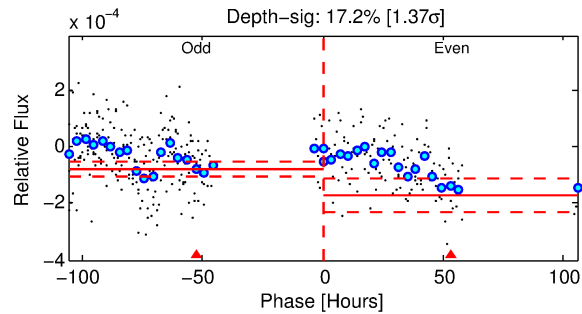
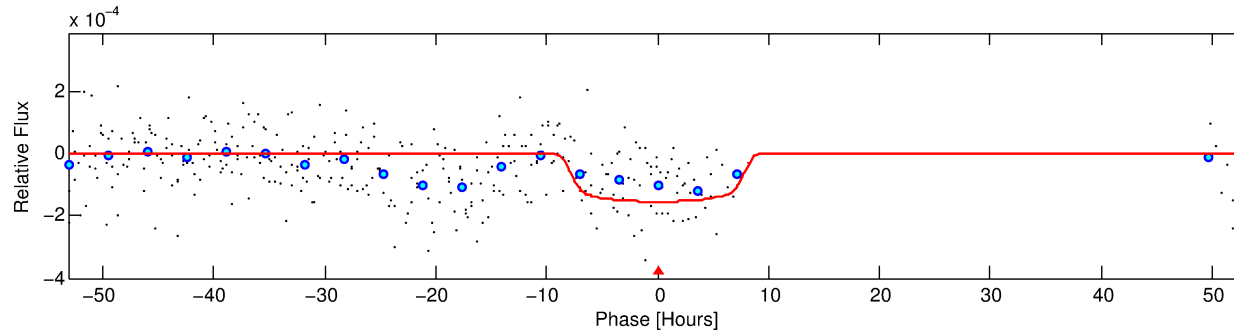
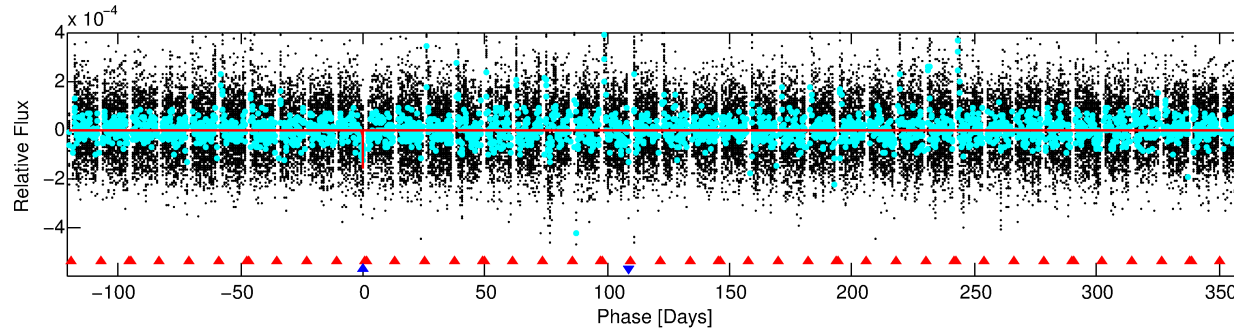
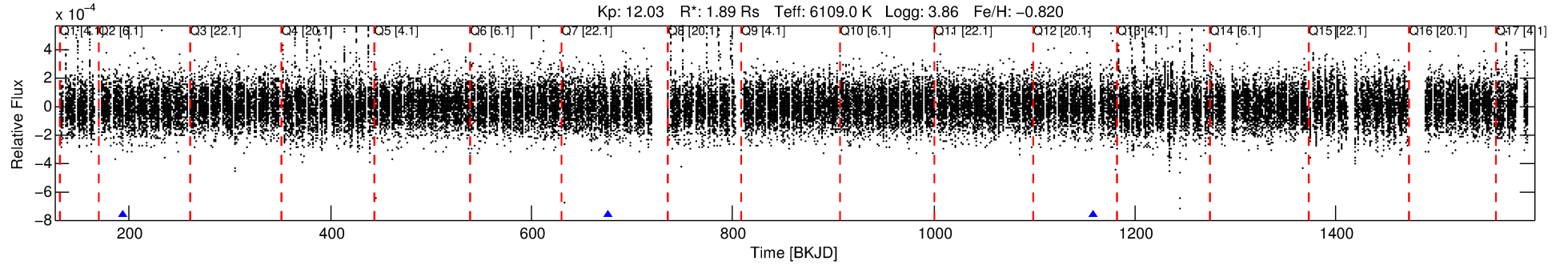
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004450976-02

No Significant Match Found

DV One-Page Summary

KIC: 4450976 Candidate: 2 of 2 Period: 481.886 d



DV Fit Results:

Period = 481.88572 [0.02742] d
Epoch = 194.2061 [0.0400] BKJD
Rp/R* = 0.0139 [0.0017]
a/R* = 76.87 [38.17]
b = 0.94 [0.05]
Seff = 3.19 [1.71]
Teq = 341 [46] K
Rp = 2.87 [1.01] Re
a = 1.1807 [0.3806] AU
Ag = 11245.19 [7284.63] [1.54 σ]
Teffp = 5427 [547] K [9.27 σ]

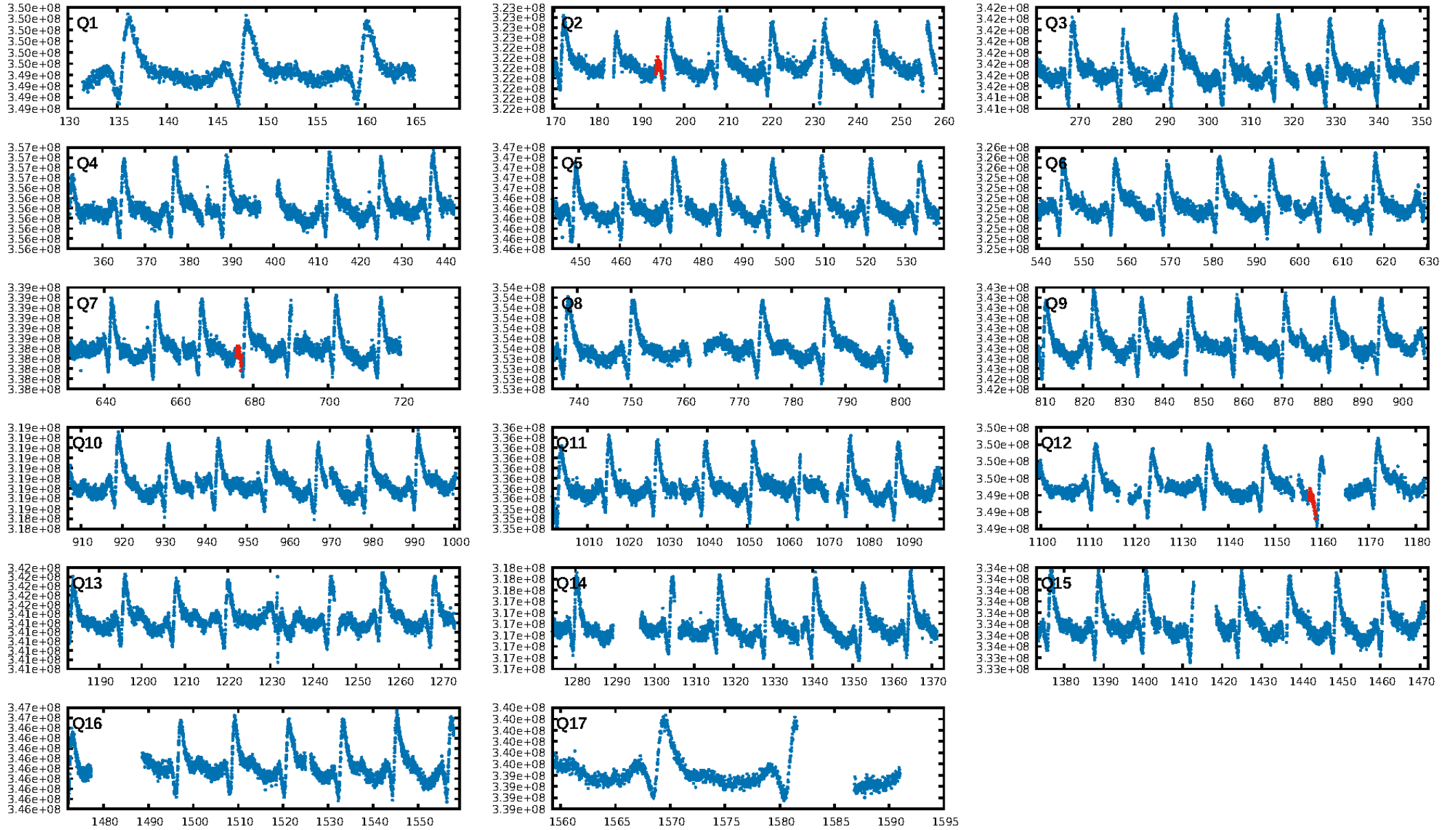
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [482.10 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 22.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.44e-15
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8163
Centroid-sig: 10.1%
Centroid-so: 1.582 arcsec [1.17 σ]
OotOffset-rm: 2.043 arcsec [1.62 σ]
KicOffset-rm: 2.065 arcsec [1.61 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 0.00 [0/3]

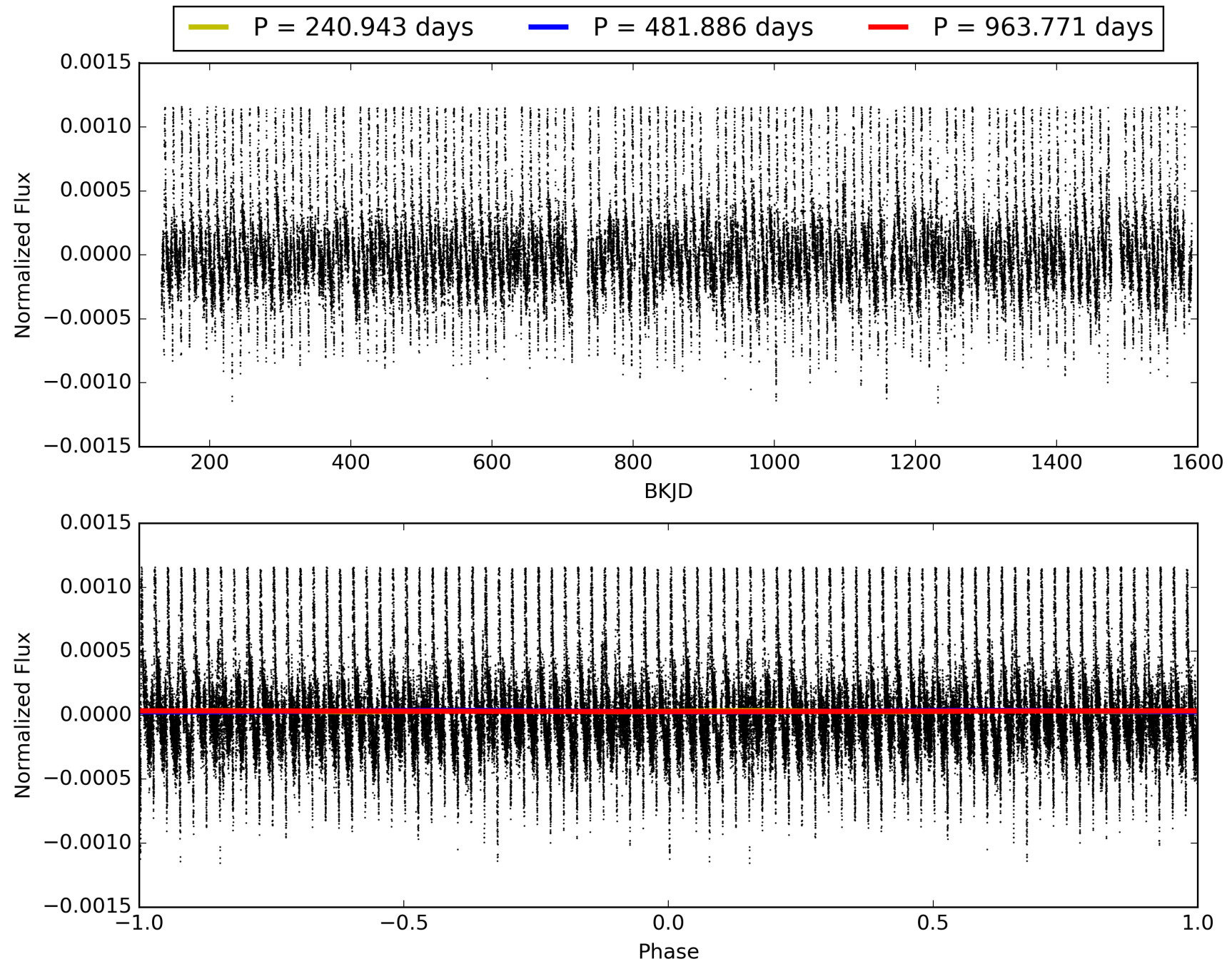
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:06:51 Z

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

TCE 004450976-02, PDC Light Curves

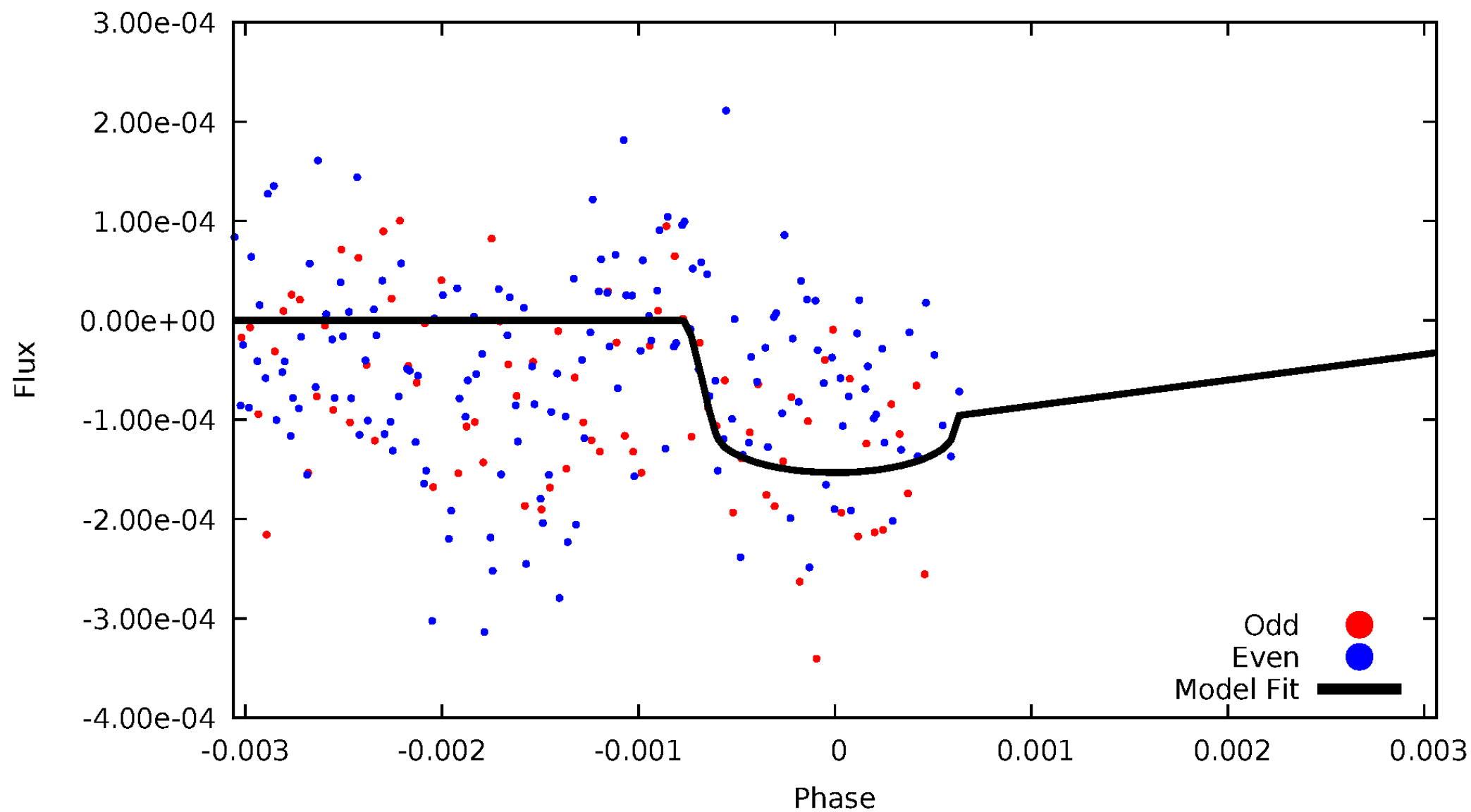


TCE 004450976-02



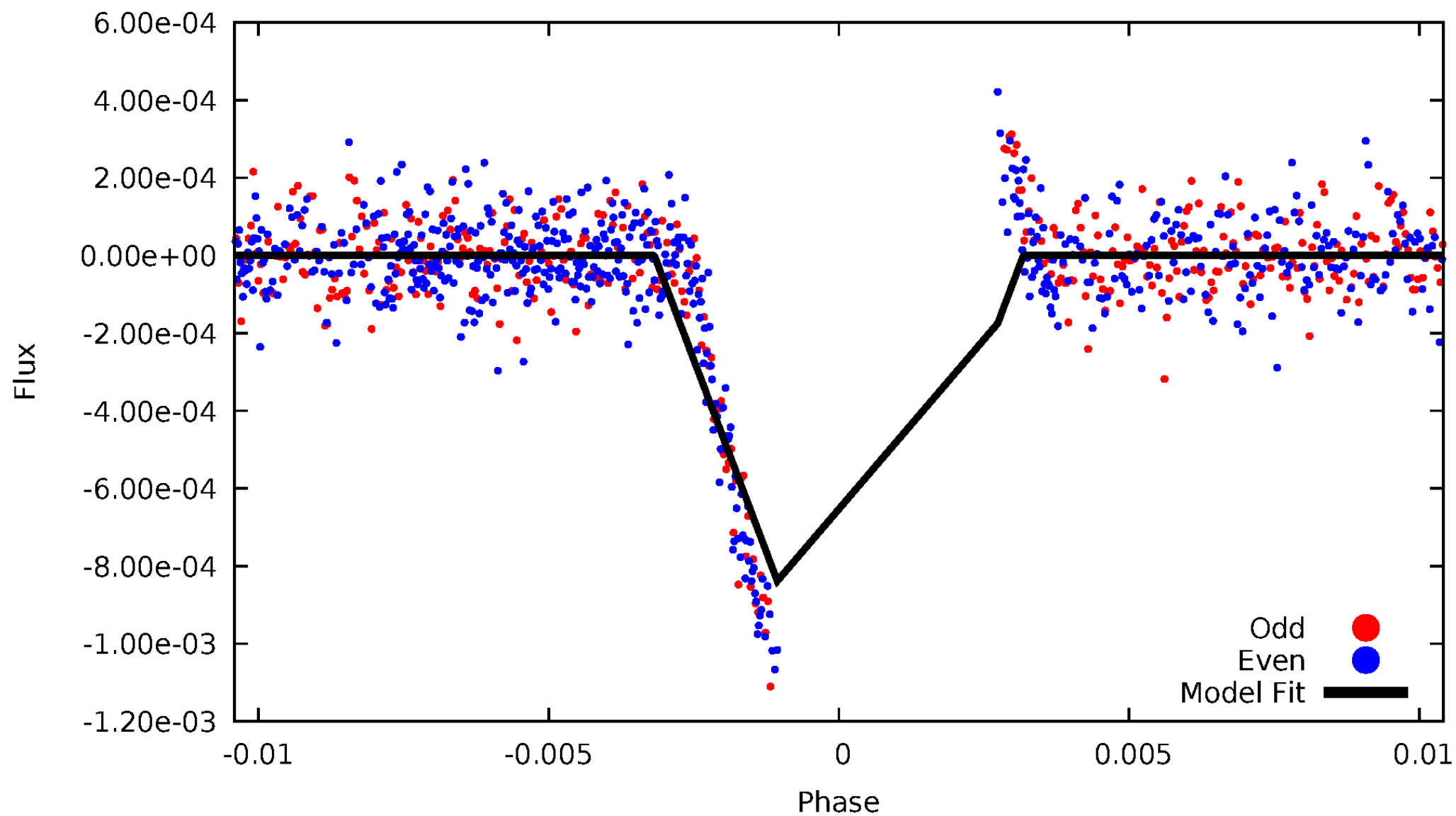
DV Odd/Even

TCE 004450976-02



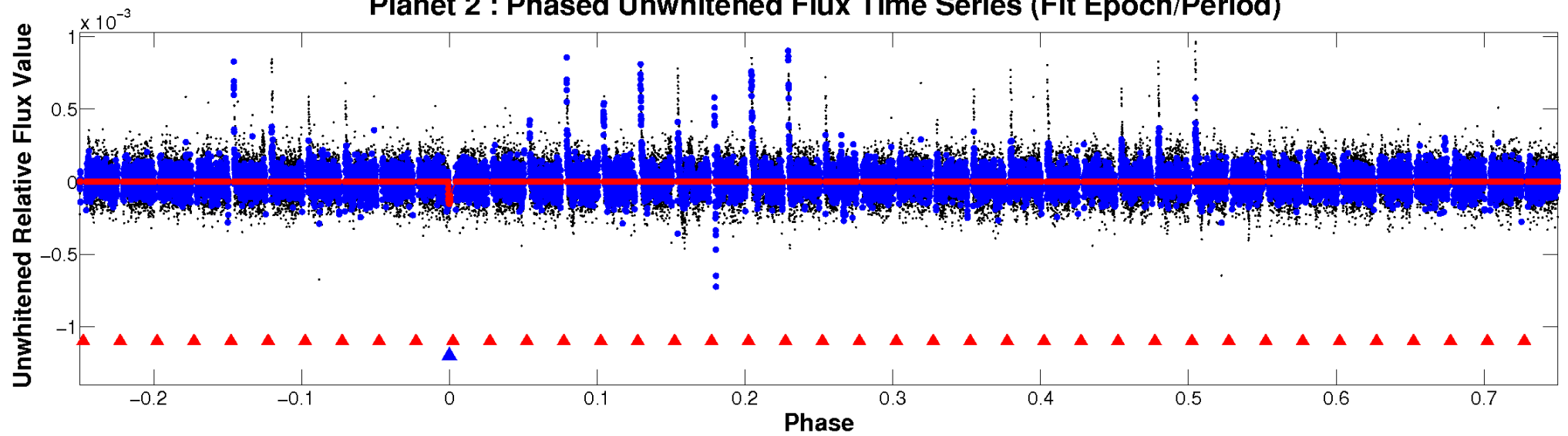
ALT Odd/Even

TCE 004450976-02

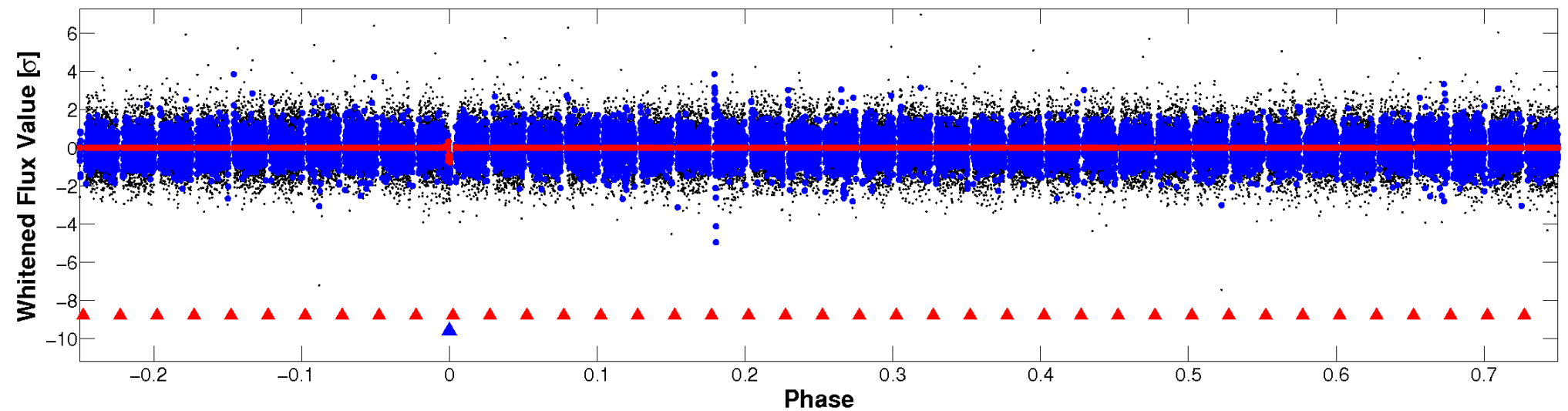


Non-Whitened Vs. Whitened Light Curve

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

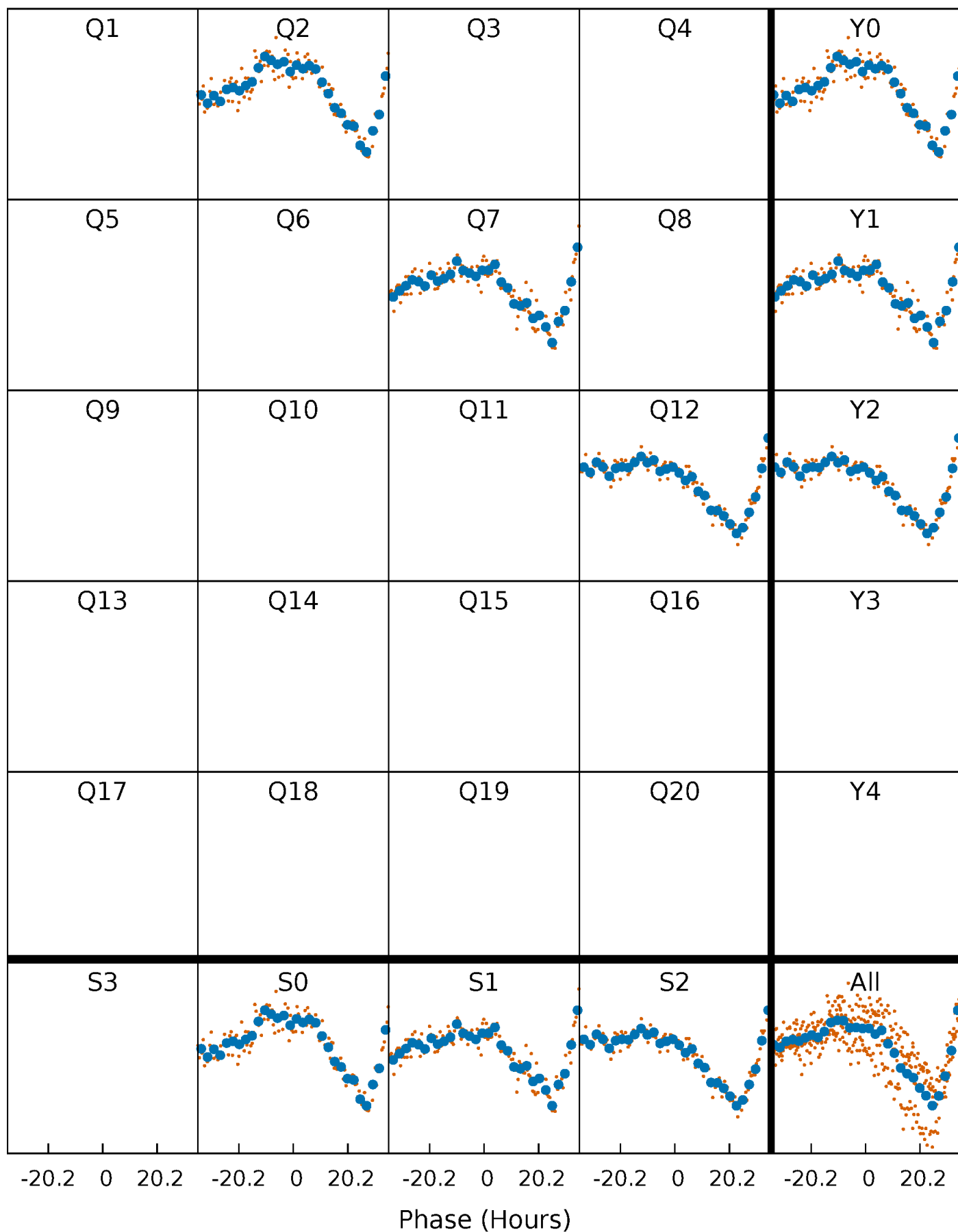


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 004450976-02 $P=481.885724$ Days $T_0=194.206099$ (BKJD)



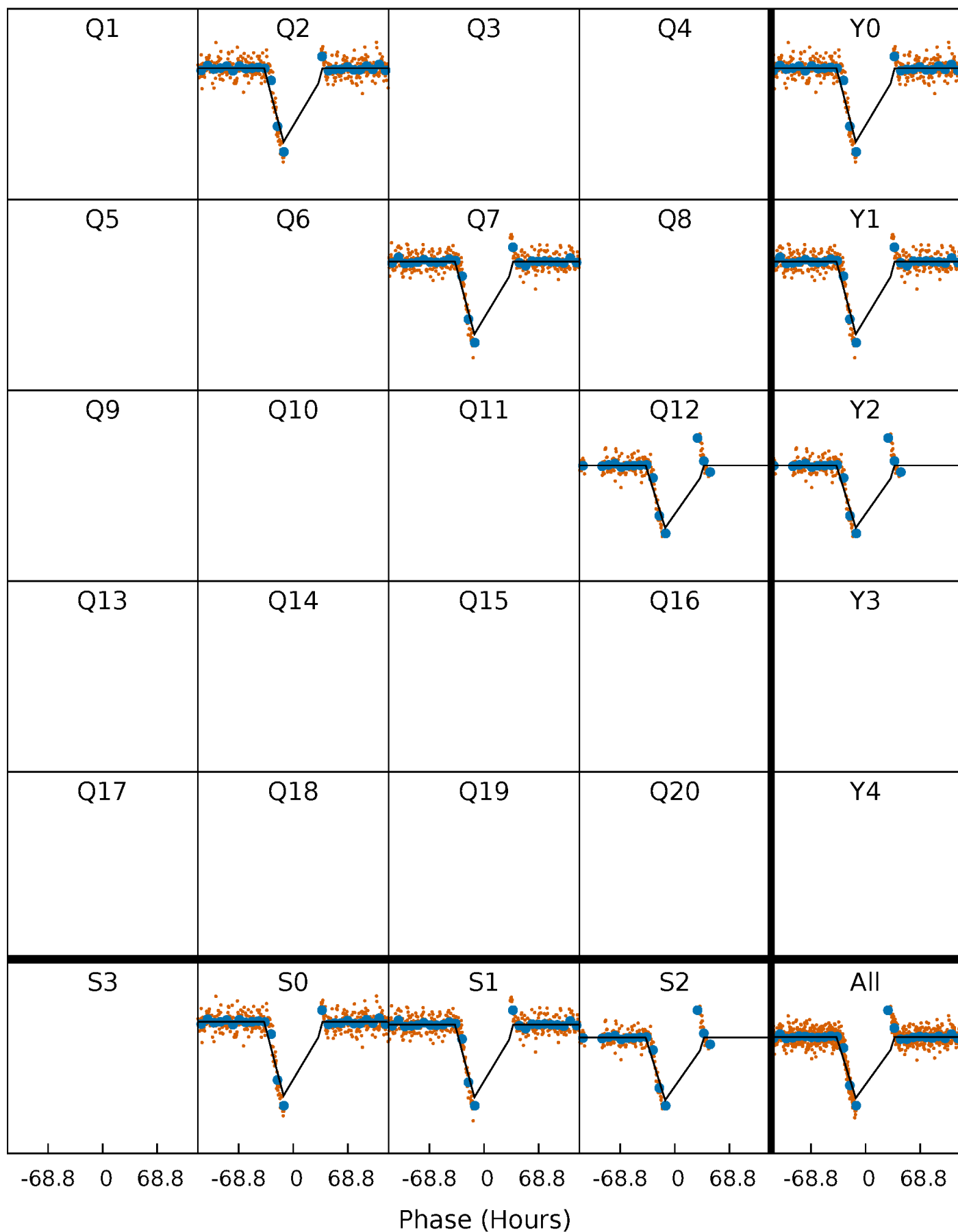
DV Quarter-Phased Transit Curves

TCE 004450976-02 $P=481.885724$ Days $T_0=194.206099$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

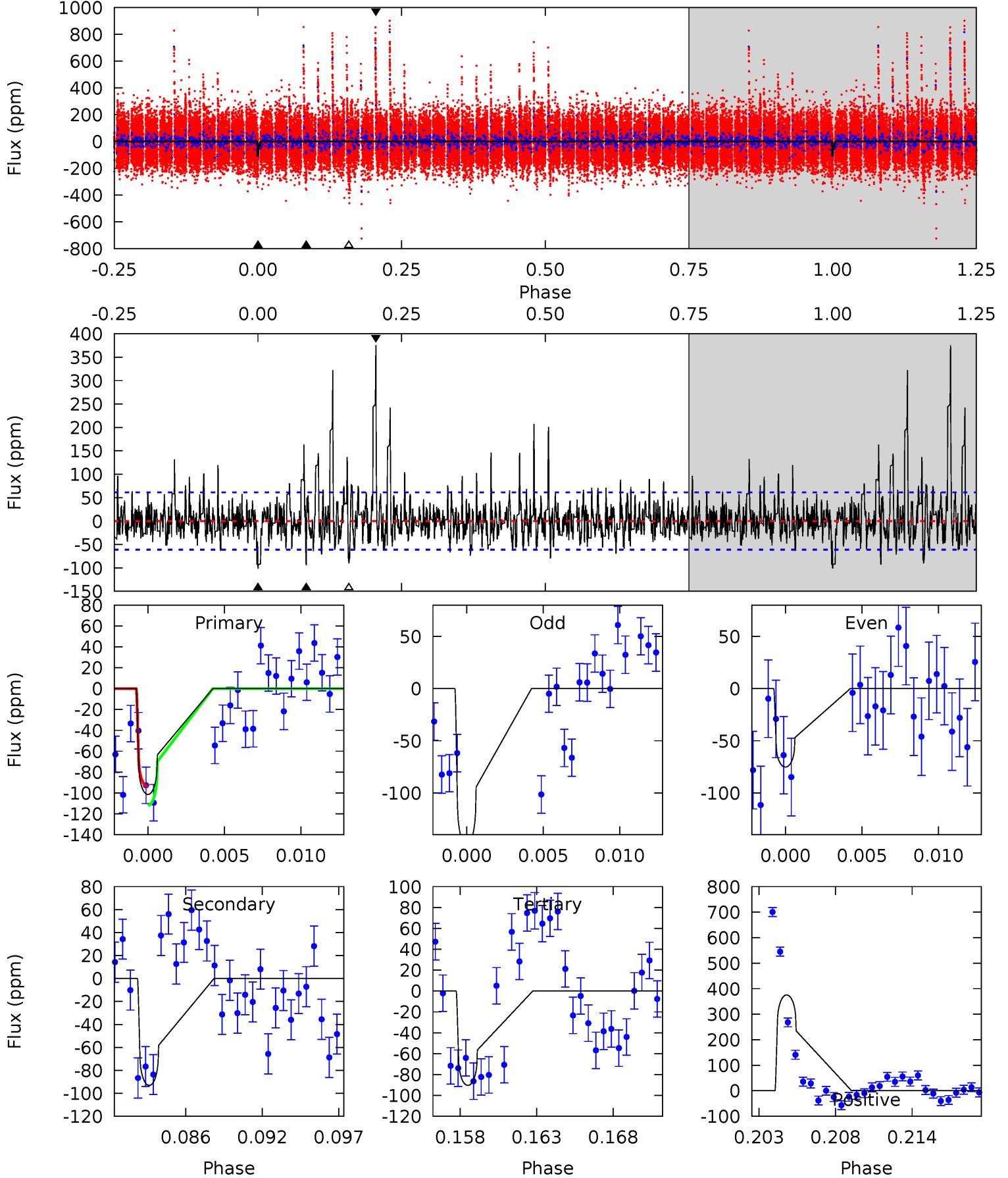
TCE 004450976-02 P=481.857401 Days $T_0=195.022305$ (BKJD)



DV Model-Shift Uniqueness Test

004450976-02, P = 481.885724 Days, E = 194.206099 Days

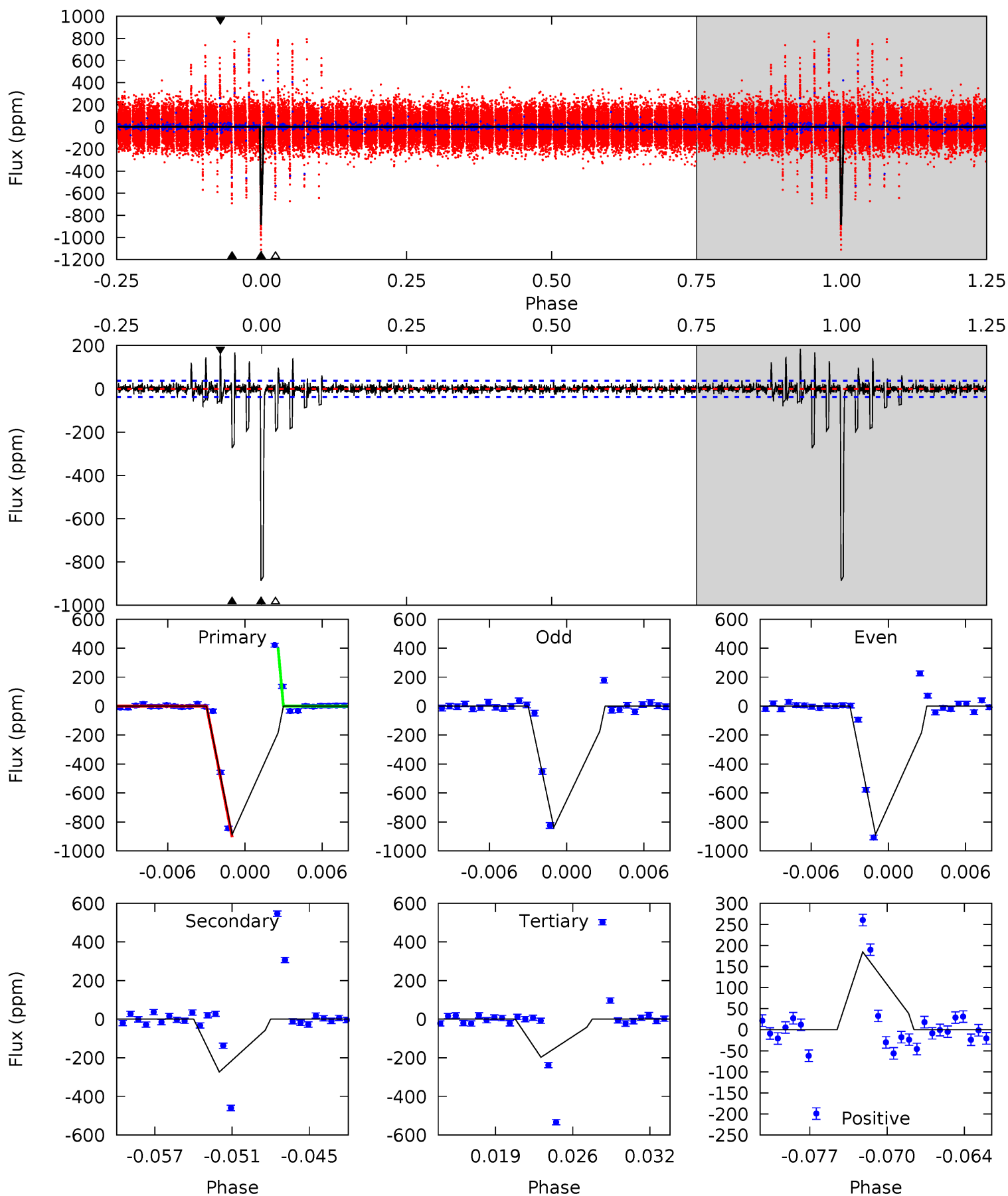
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.54	7.84	7.61	31.6	5.15	2.80	3.05	0.93	-23.1	0.23	-23.8	2.97	1.29	0.79	0.73



Alt Model-Shift Uniqueness Test

004450976-02, P = 481.857401 Days, E = 195.022305 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
120.0	37.0	26.7	25.0	5.11	2.73	2.30	93.3	95.0	10.3	12.0	3.16	0.99	0.17	24.7



Stellar Parameters For KIC 004450976

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6109^{+182}_{-164}	$3.861^{+0.308}_{-0.132}$	$-0.820^{+0.350}_{-0.250}$	$1.889^{+0.414}_{-0.621}$	$0.945^{+0.139}_{-0.126}$	$0.198^{+0.387}_{-0.079}$
	+3%/-3%	+8%/-3%	+43%/-30%	+22%/-33%	+15%/-13%	+196%/-40%
Source	PHO1	FLK73	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 004450976-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-93 ± 12	$2.79^{+0.55}_{-0.62}$	470^{+32}_{-43}	5148^{+356}_{-319}	9258^{+5356}_{-2937}
Alt.	-273 ± 7	$6.33^{+0.95}_{-1.18}$	470^{+34}_{-44}	4596^{+163}_{-133}	5320^{+2461}_{-1276}

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

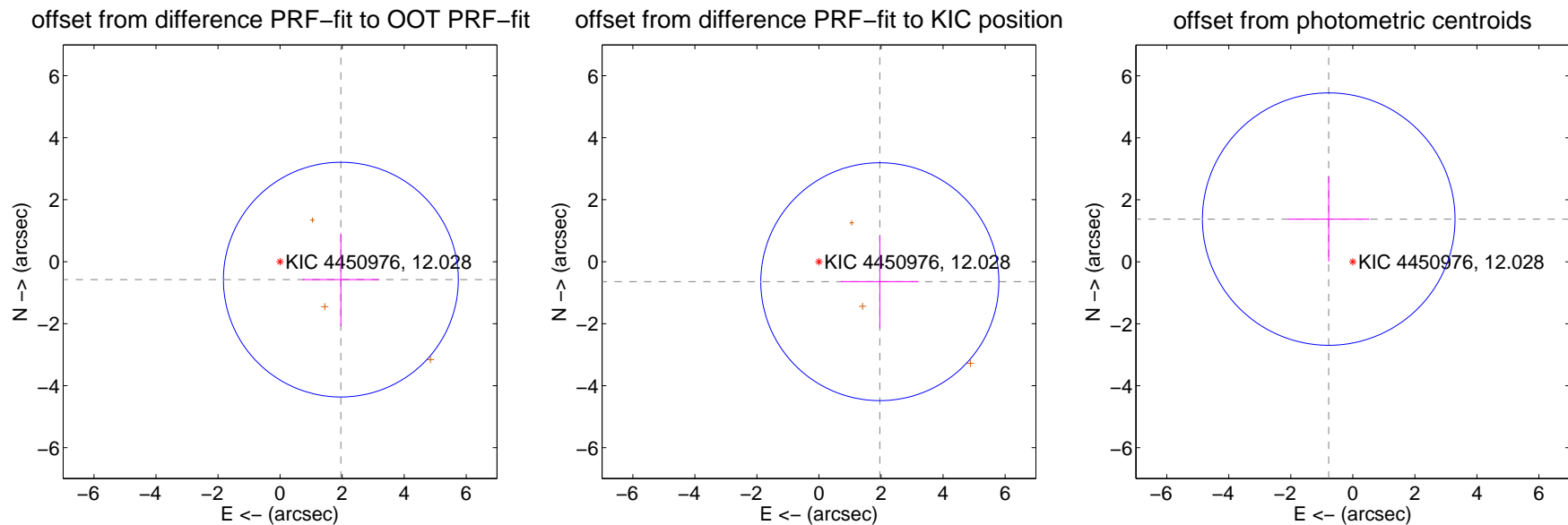
DV Centroid Data

Supplemental centroid analysis for 004450976-02. Kepler magnitude: 12.03. Transit SNR 6.15

There are 0 quarters with good PRF difference image offsets

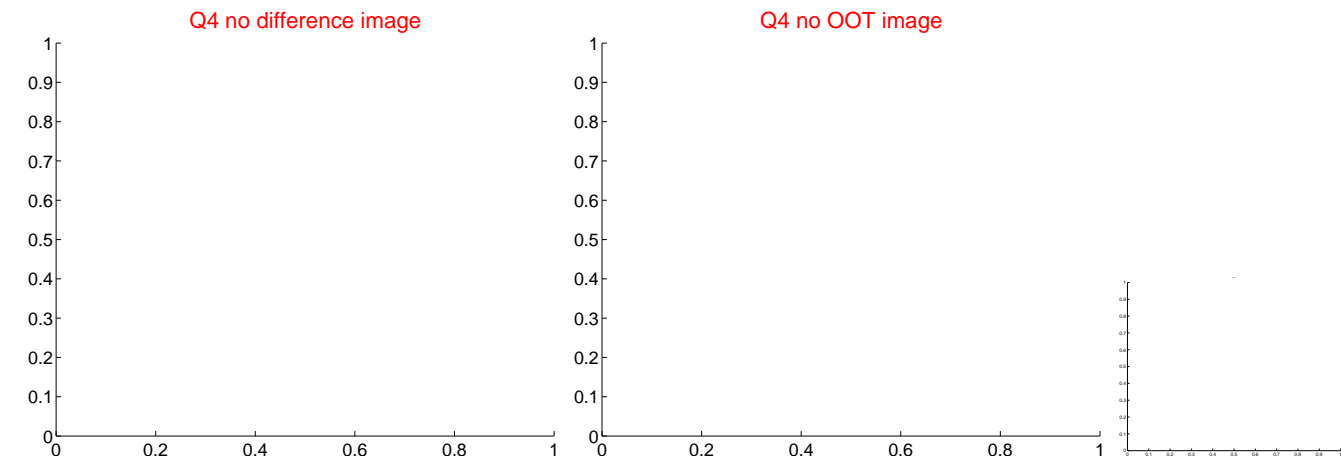
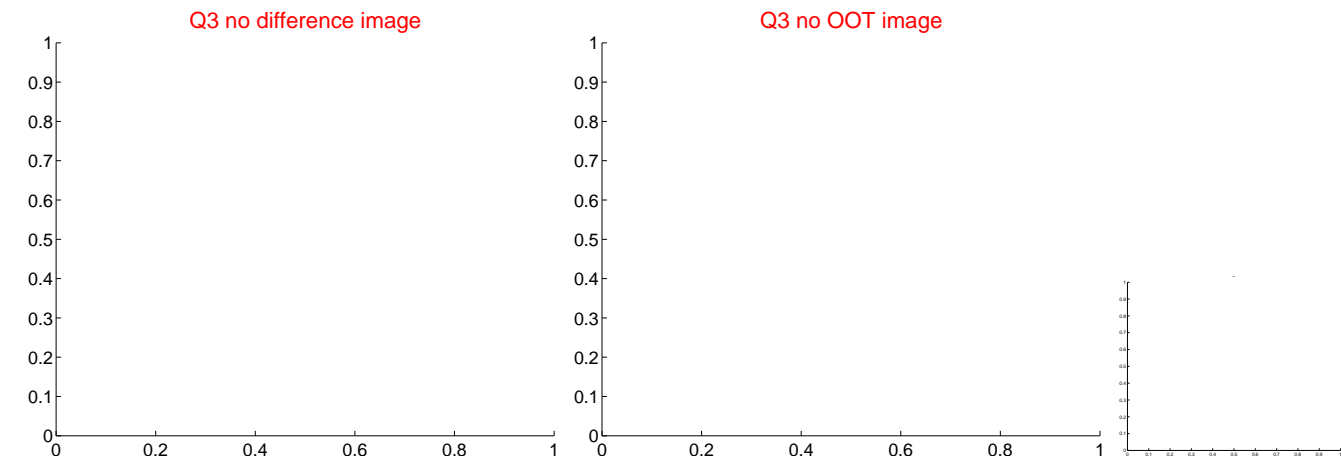
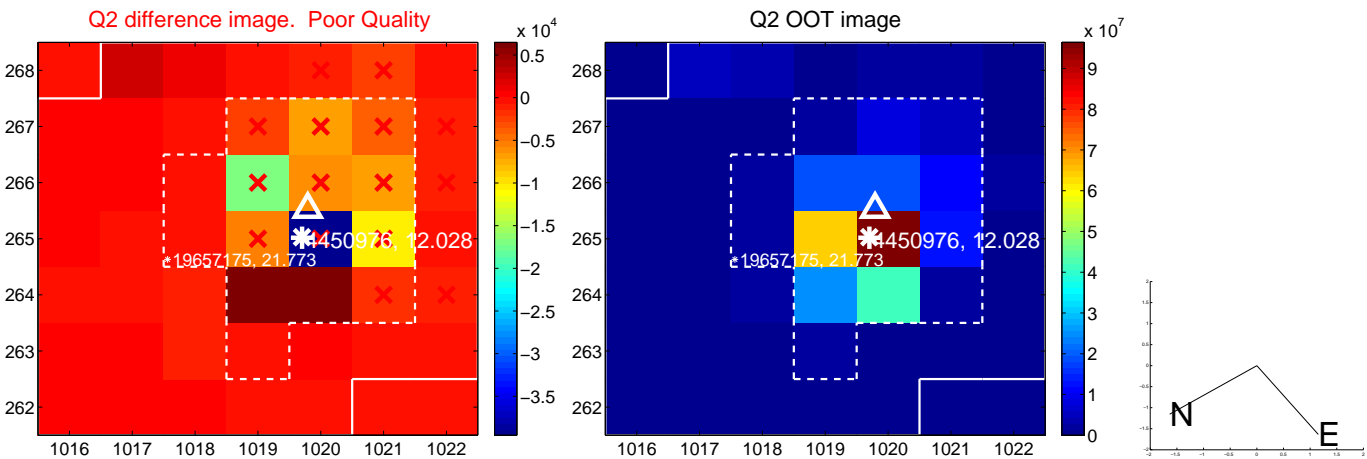
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.043 ± 1.262	1.62	-1.959 ± 1.239	-0.579 ± 1.499
PRF-fit source offset from KIC position	2.065 ± 1.279	1.61	-1.961 ± 1.254	-0.645 ± 1.489
photometric centroid source offset	1.58 ± 1.36	1.17	0.78 ± 1.31	1.38 ± 1.37

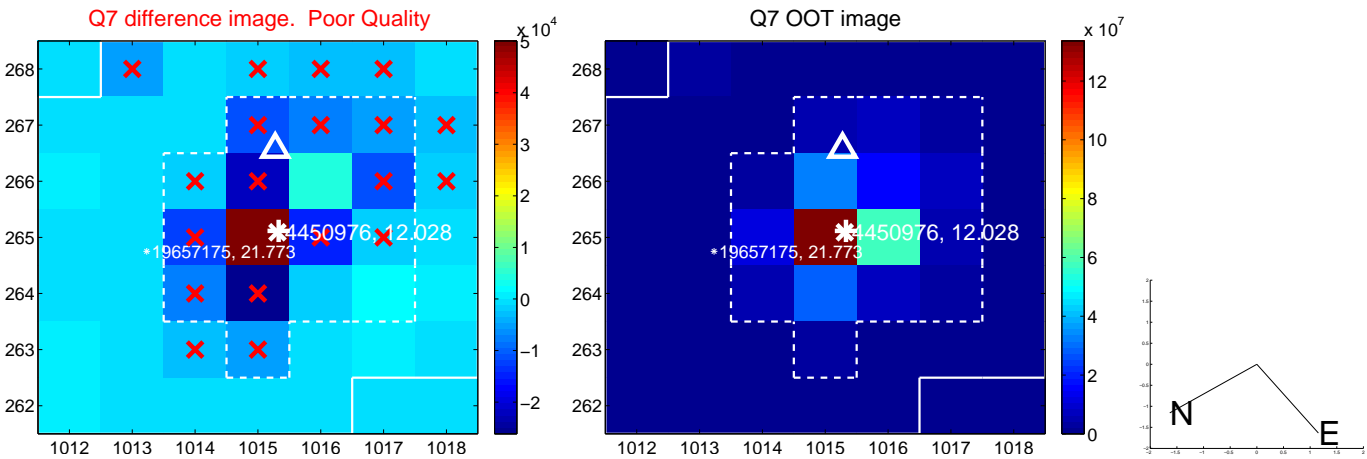


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

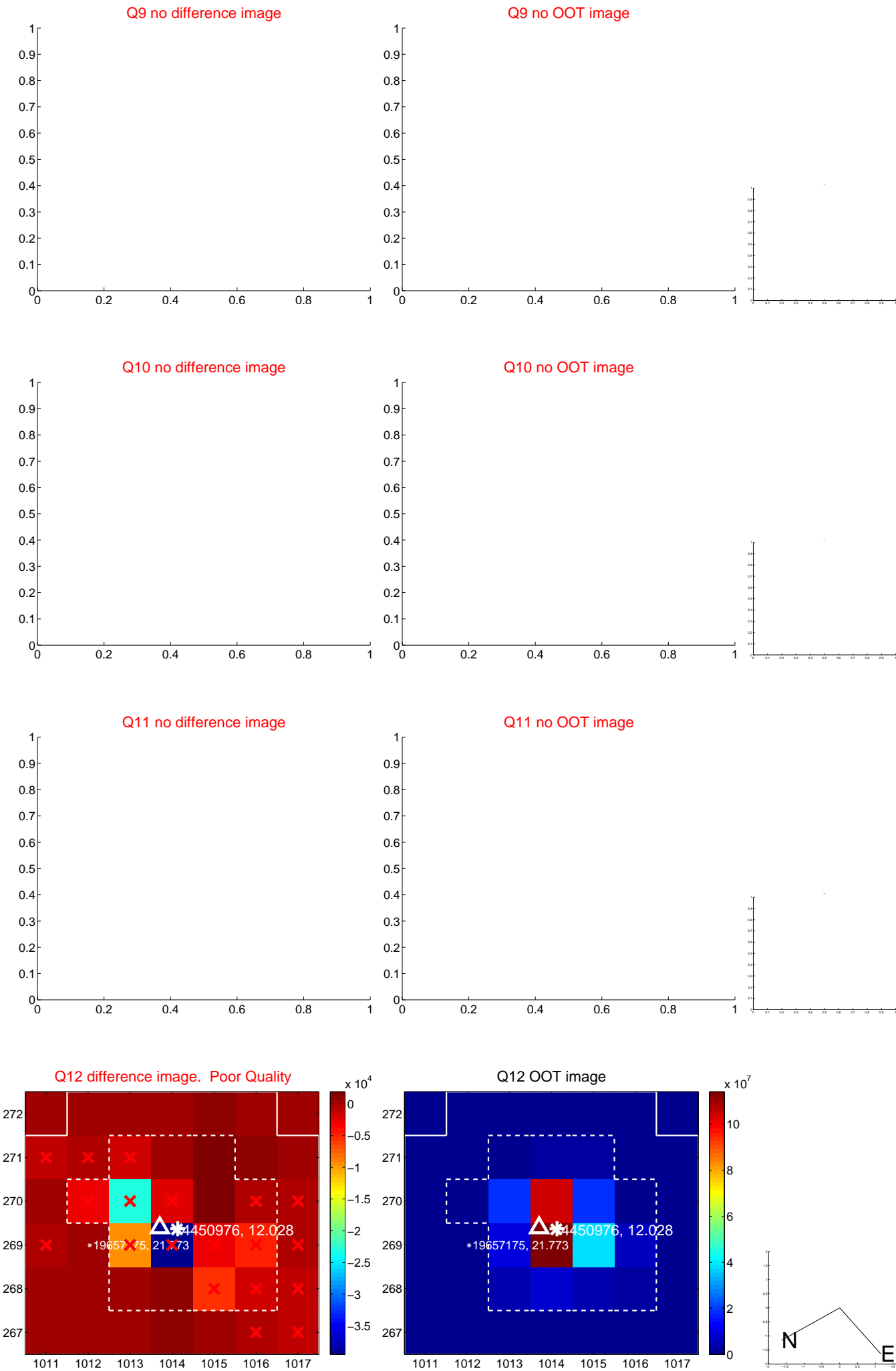
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



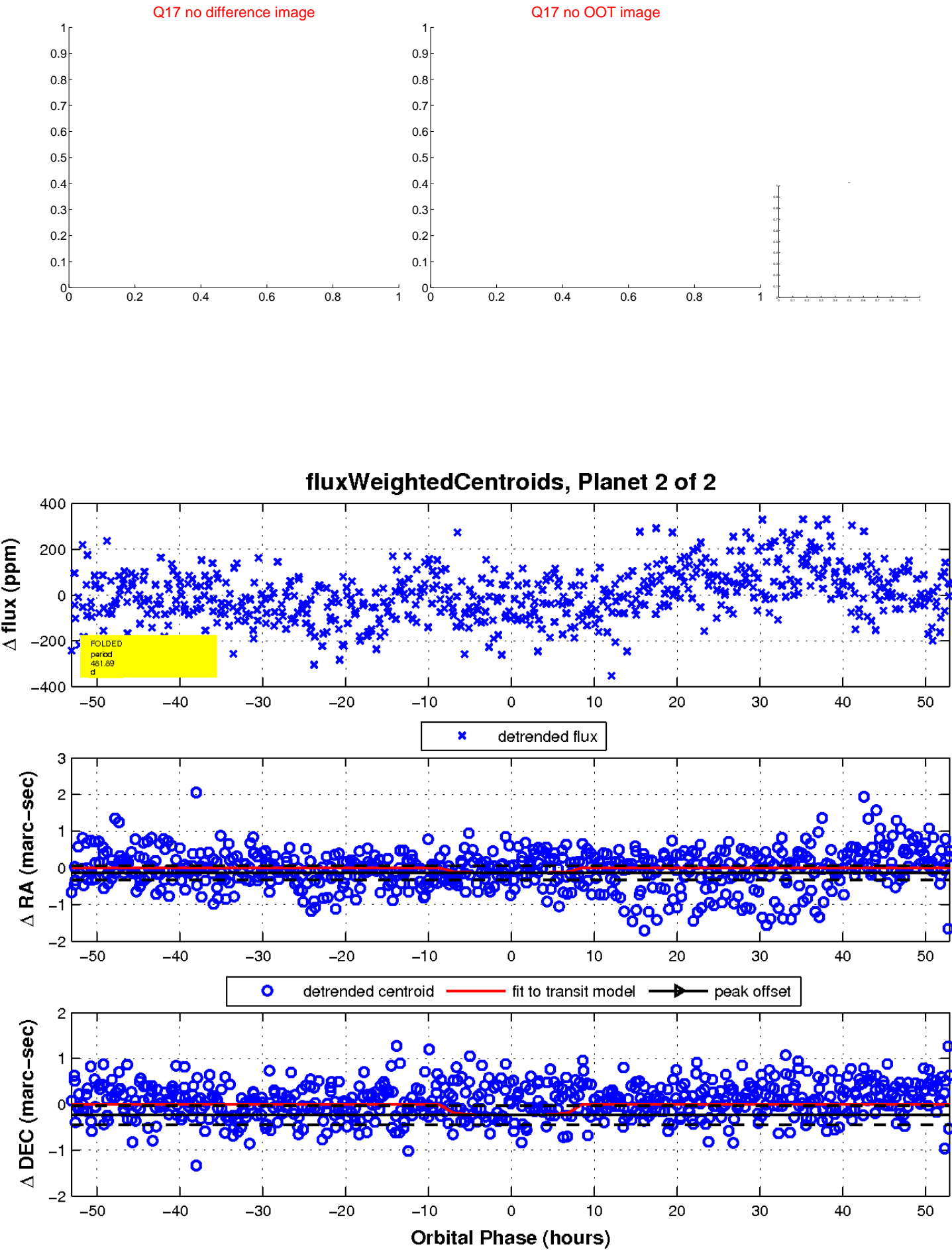
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

