

KIC 009896435

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})
009896435-01	OBS	3755.01	18.076623	146.255957	65004.4	3.140	389.5	352.6	0.76	4848	28.32	19.16
009896435-02	OBS	No	18.076589	137.350024	14708.7	2.596	88.5	85.2	0.76	4848	10.89	19.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009896435-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
009896435-02	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.

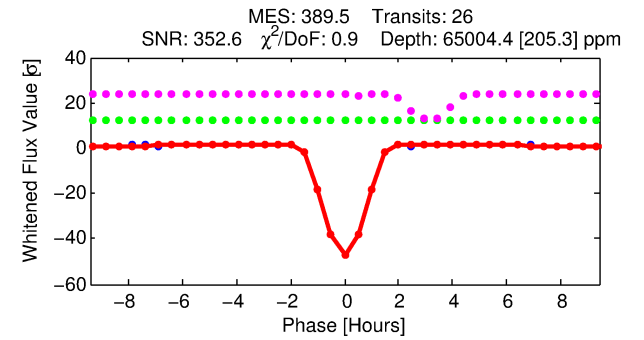
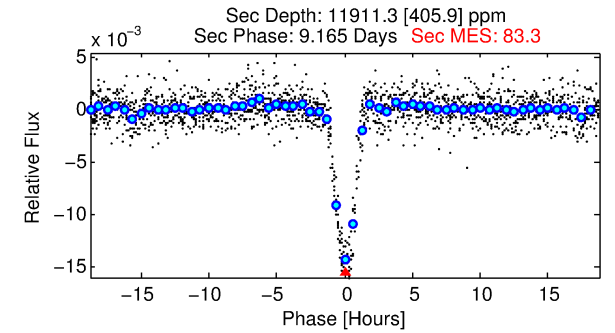
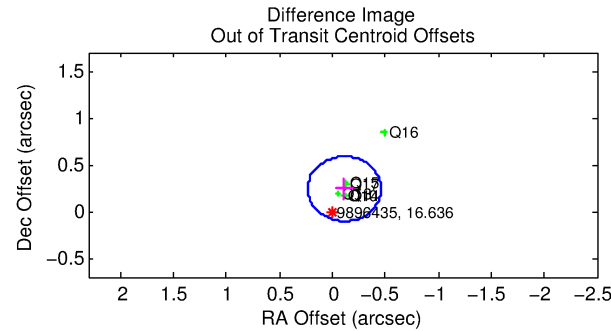
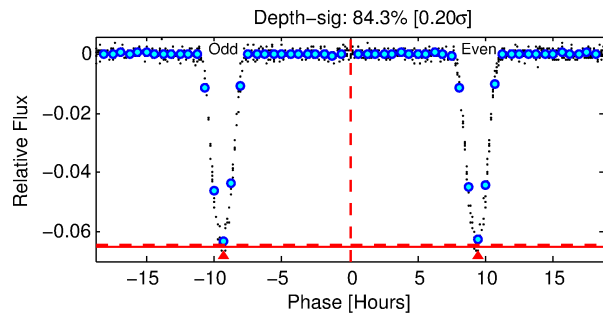
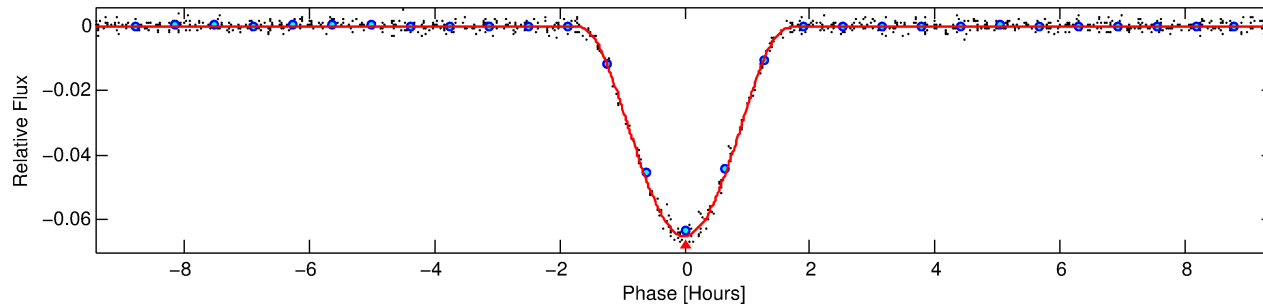
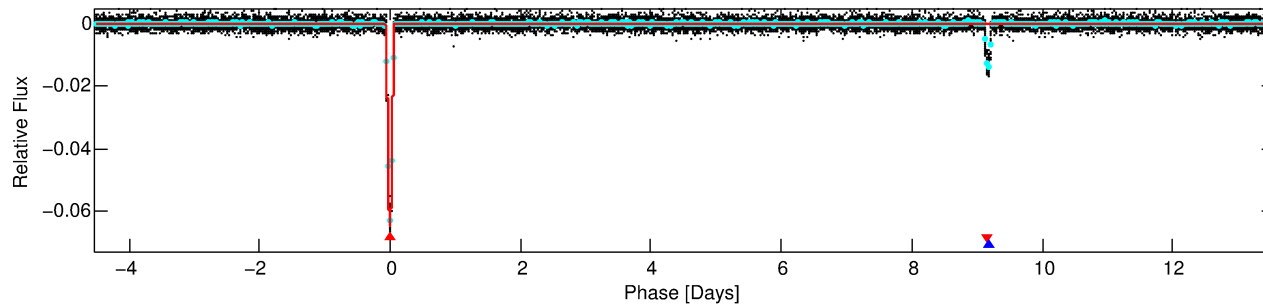
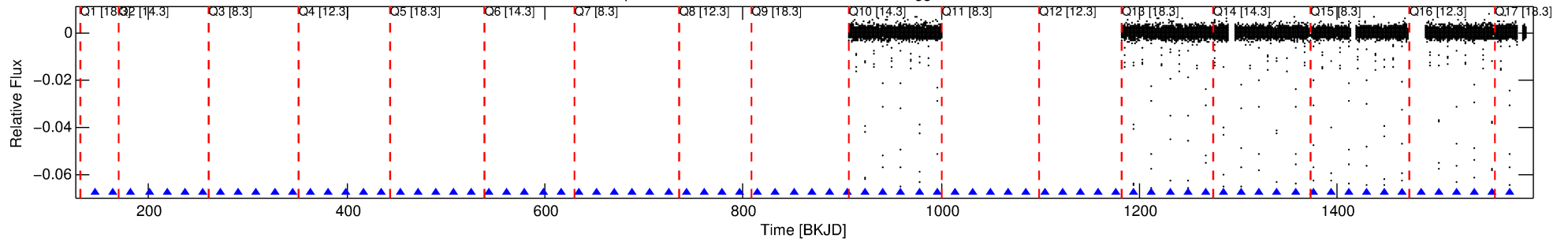
Ephemeris Match Information For 009896435-01

No Significant Match Found

DV One-Page Summary

KIC: 9896435 Candidate: 1 of 2 Period: 18.077 d
KOI: K03755.01 Corr: 0.997

Kp: 16.64 R*: 0.76 Rs Teff: 4848.0 K Logg: 4.55 Fe/H: 0.060



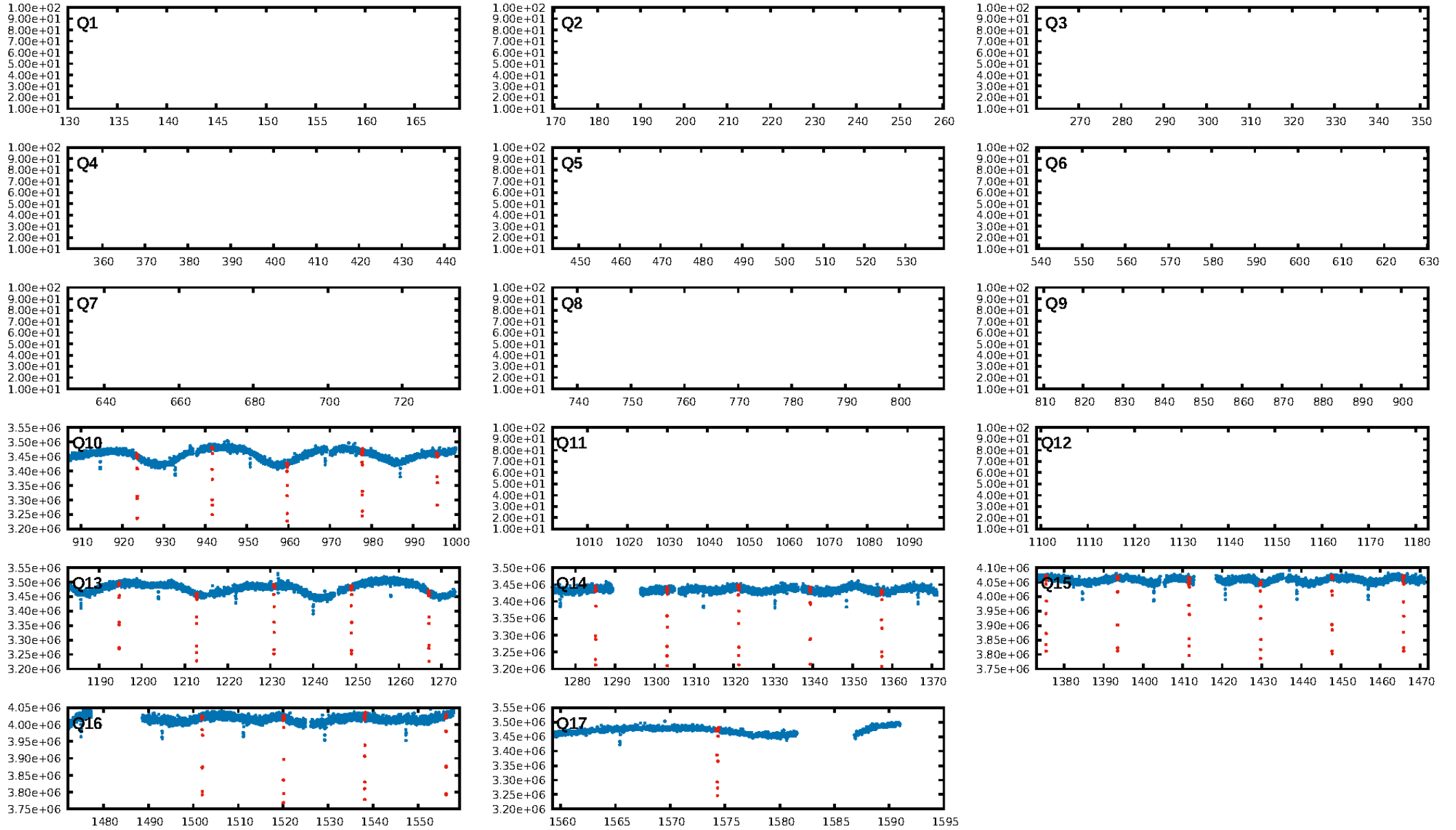
DV Fit Results:

Period = 18.07662 [0.00001] d
Epoch = 146.2560 [0.0006] BKJD
Rp/R* = 0.3397 [0.0554]
a/R* = 43.61 [0.31]
b = 0.90 [0.08]
Seff = 19.16 [3.56]
Teff = 533 [25] K
Rp = 28.32 [5.37] Re
a = 0.1228 [0.0100] AU
Ag = 123.17 [42.96] [2.84σ]
Teffp = 2748 [246] K [8.97σ]

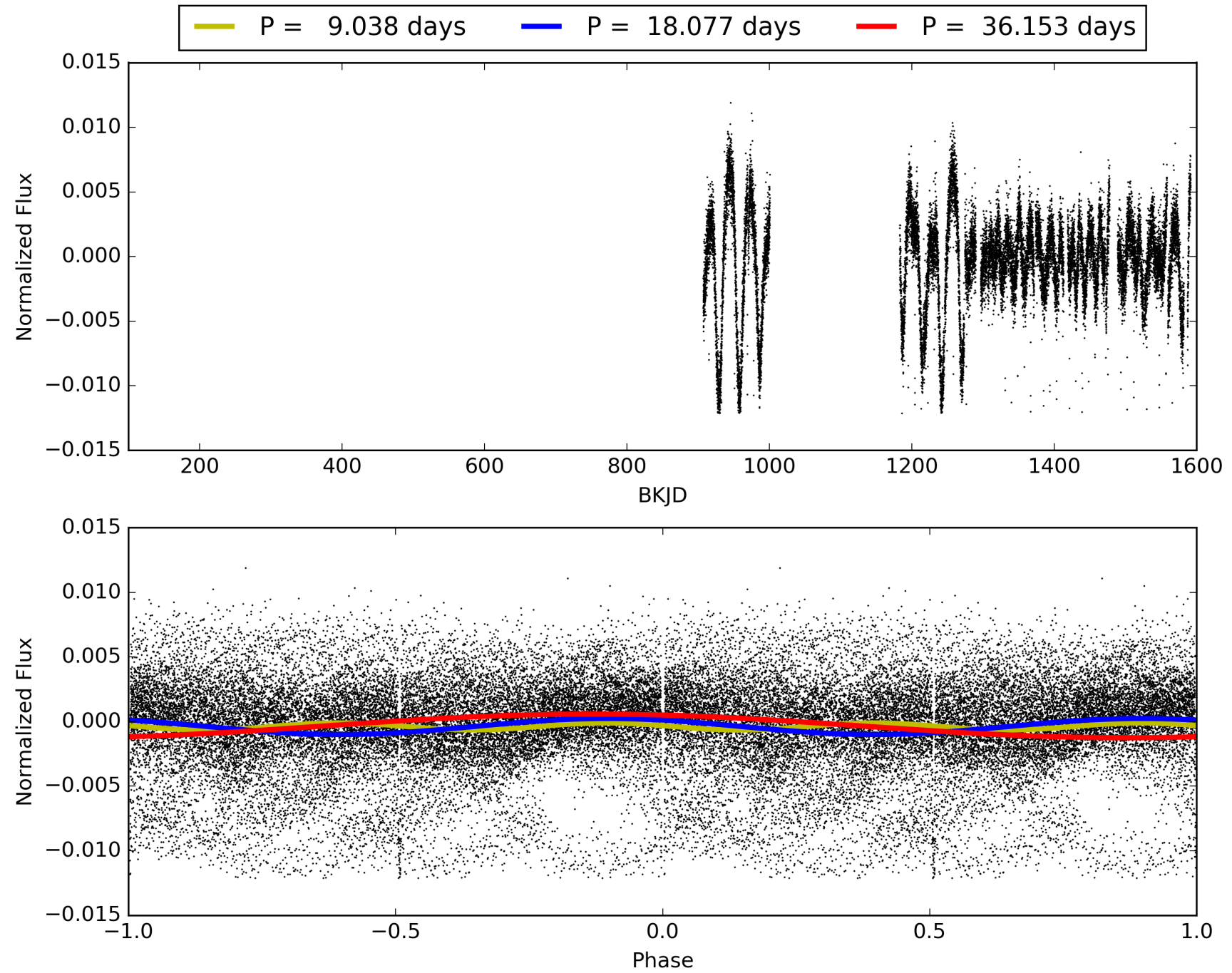
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [25/25]
GhostDiagnostic-chr: 2.33
Centroid-sig: 0.0%
Centroid-so: 0.530 arcsec [14.91σ]
OotOffset-rm: 0.267 arcsec [2.31σ]
KicOffset-rm: 0.969 arcsec [11.77σ]
OotOffset-st: 2/1/1/2 [6]
KicOffset-st: 2/1/1/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [6/6]

TCE 009896435-01, PDC Light Curves

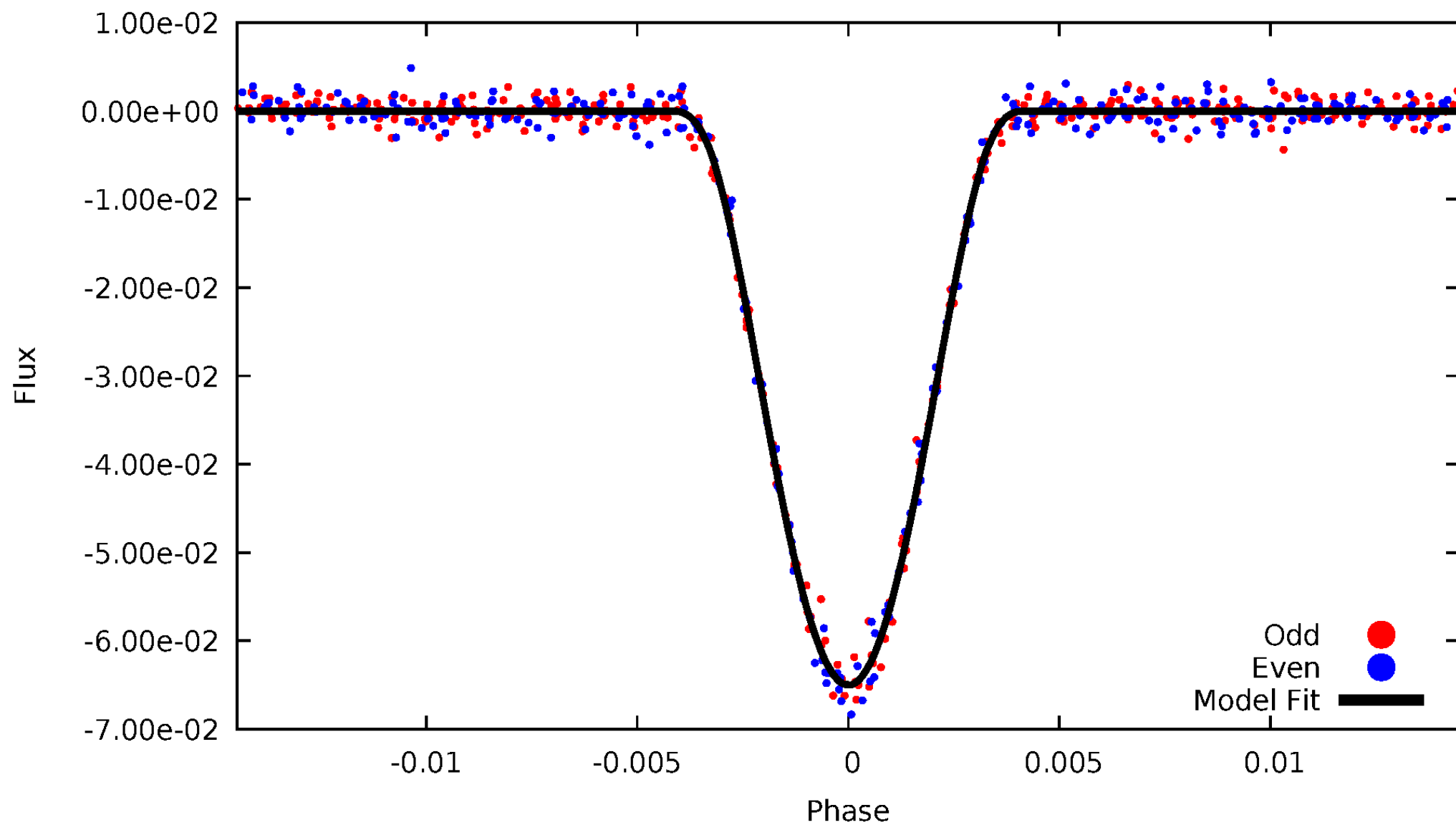


TCE 009896435-01



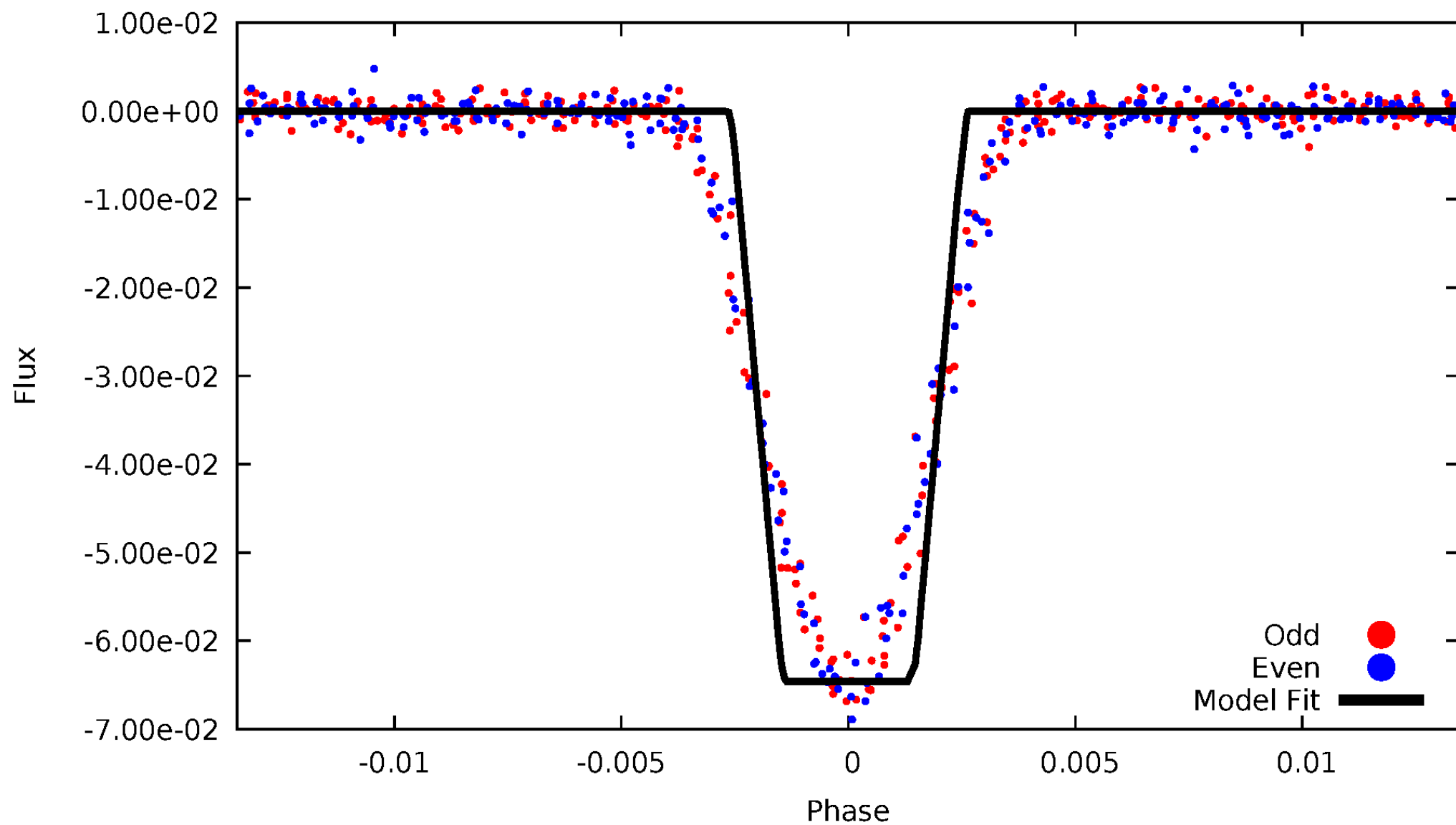
DV Odd/Even

TCE 009896435-01



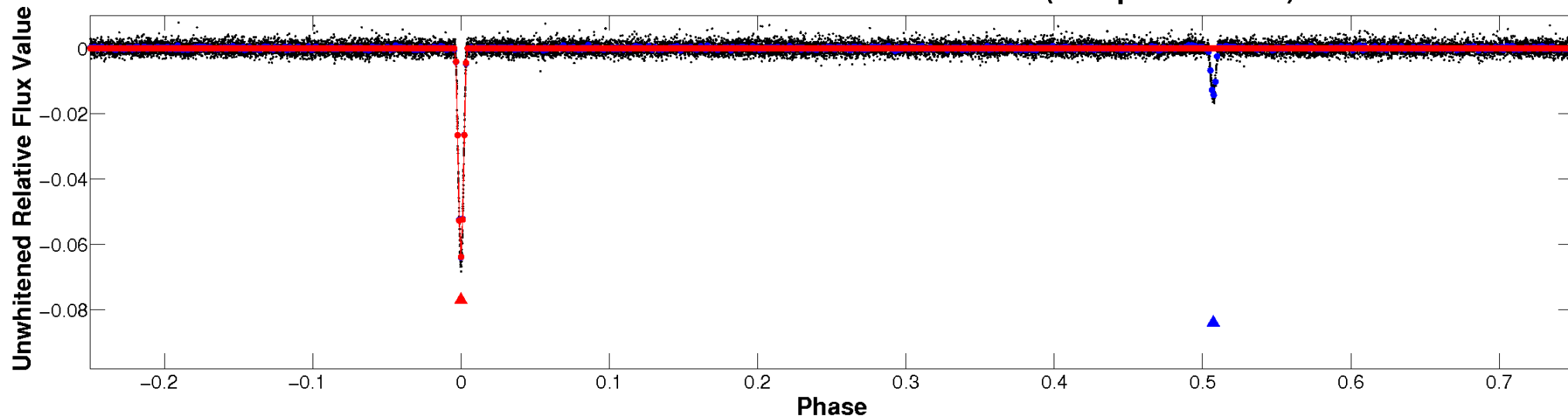
ALT Odd/Even

TCE 009896435-01

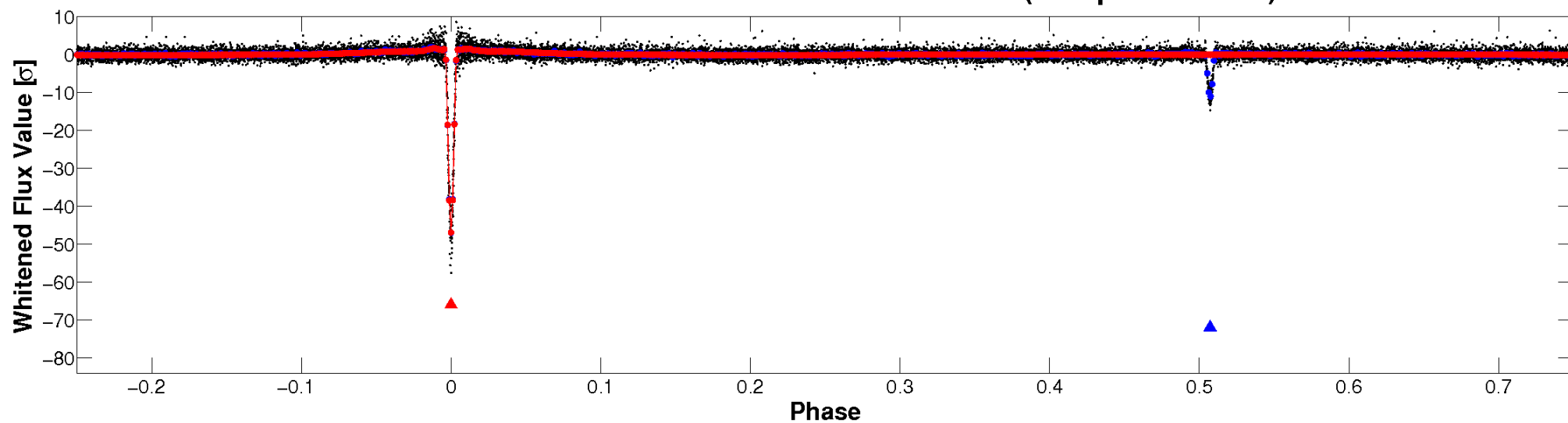


Non-Whitened Vs. Whitened Light Curve

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

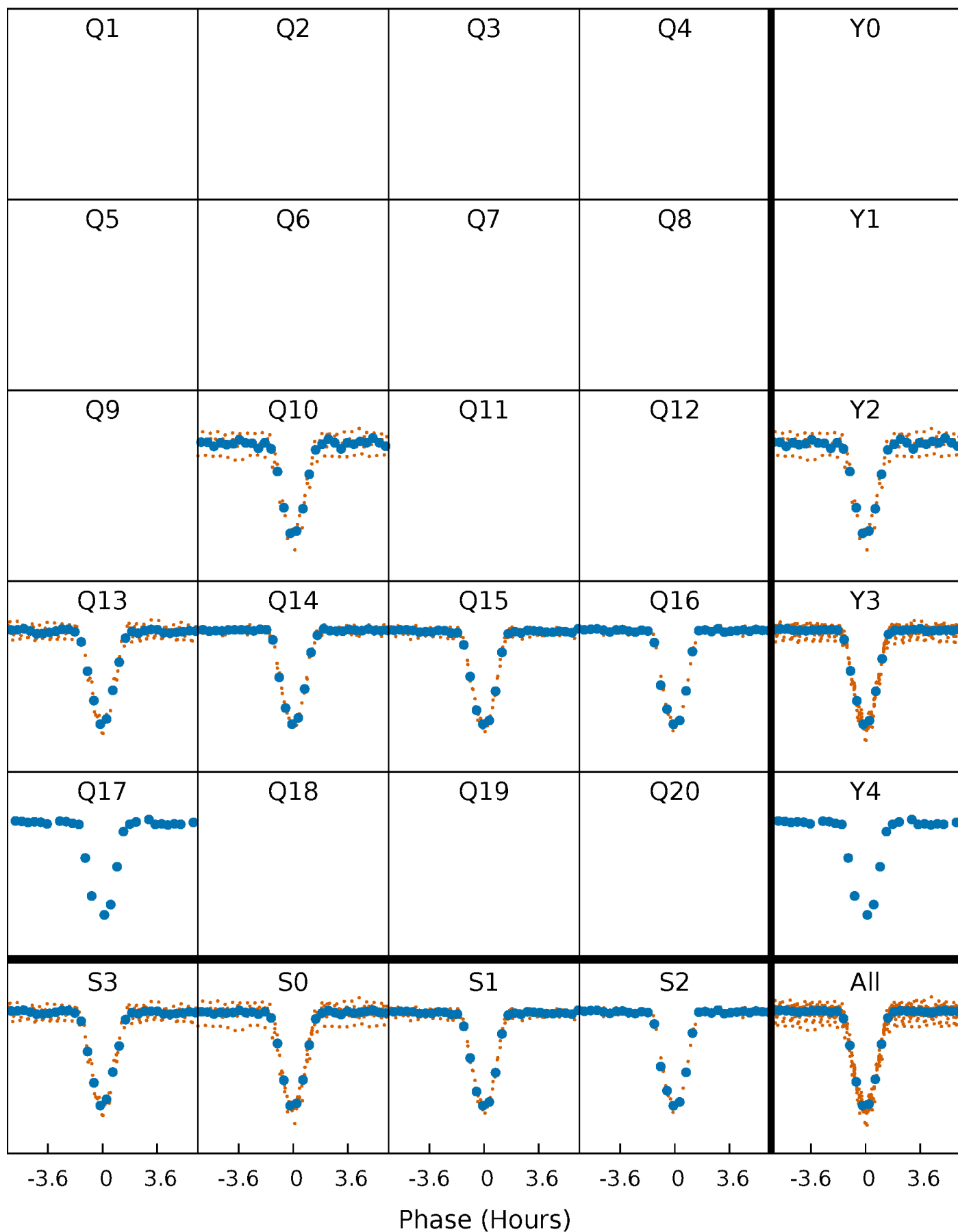


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



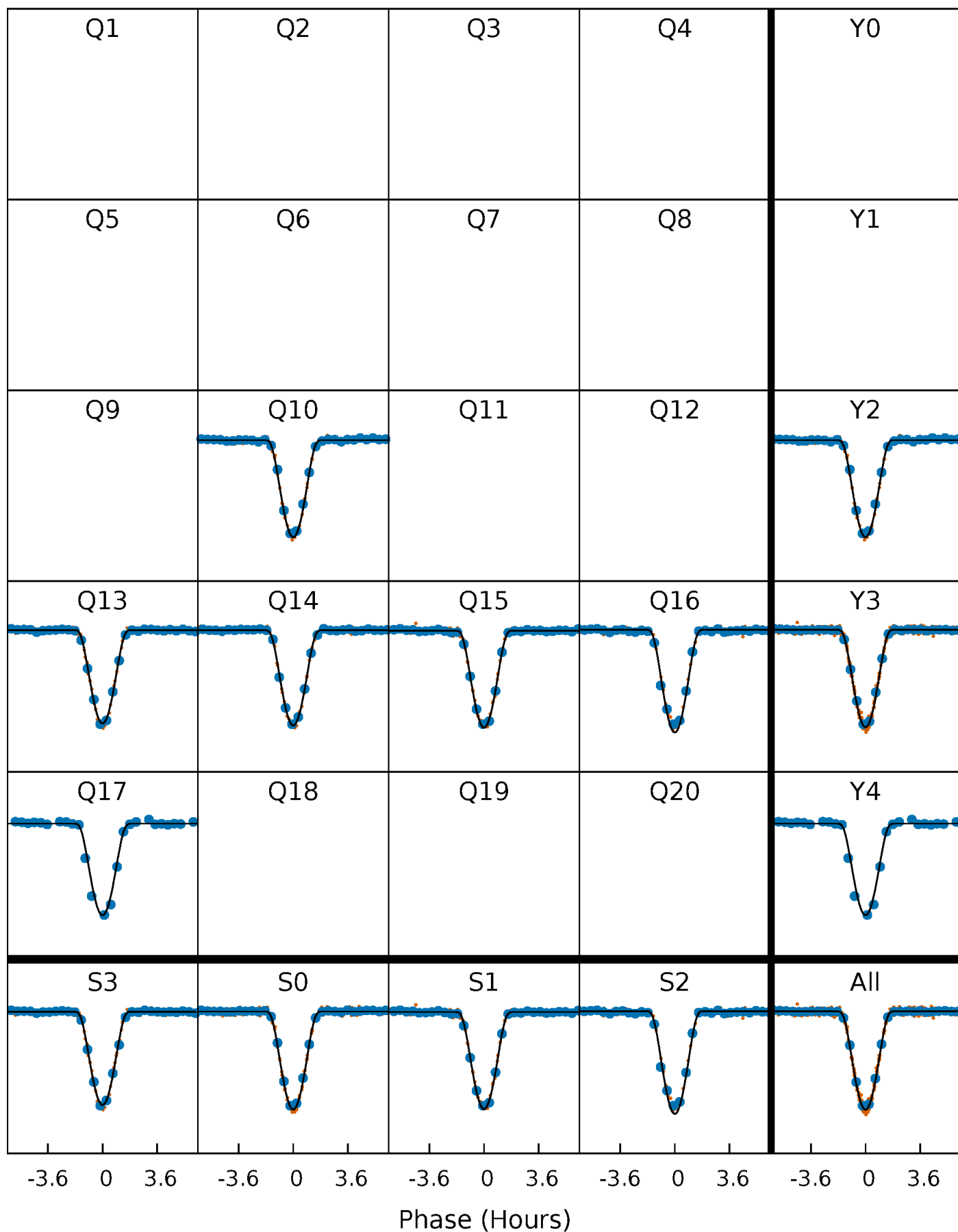
PDC Quarter-Phased Transit Curves

TCE 009896435-01 P= 18.076623 Days $T_0=146.255957$ (BKJD)



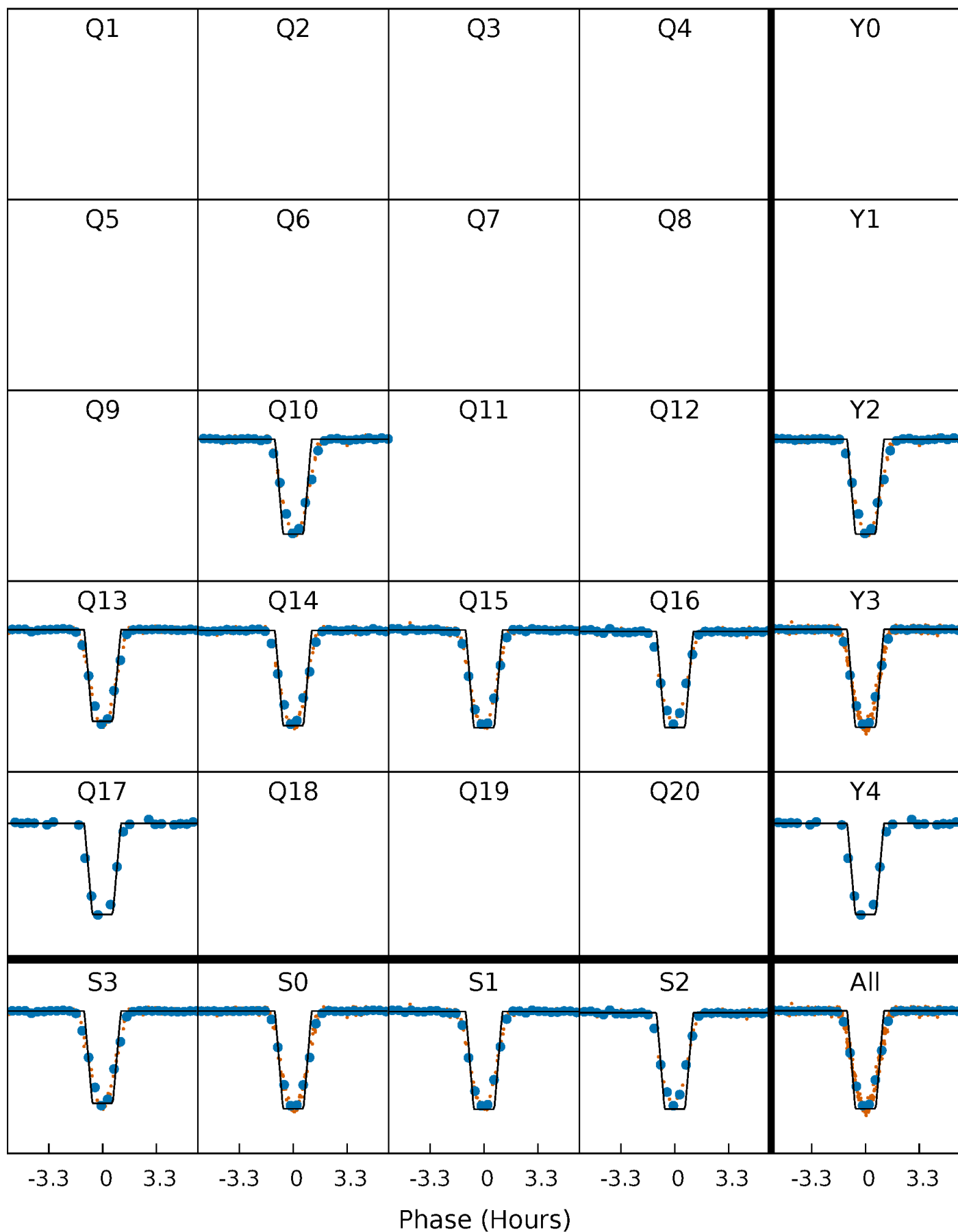
DV Quarter-Phased Transit Curves

TCE 009896435-01 P= 18.076623 Days $T_0=146.255957$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

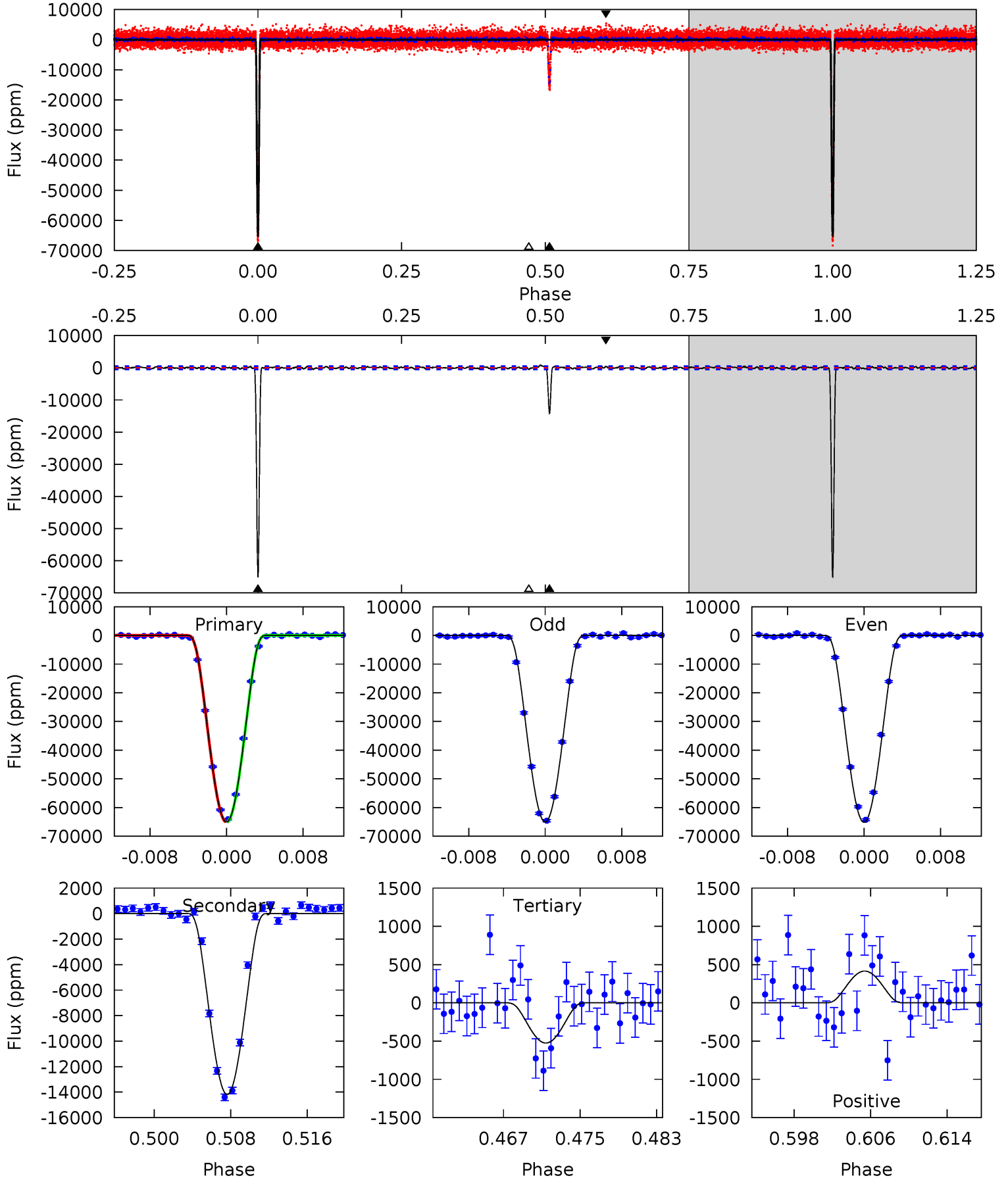
TCE 009896435-01 P= 18.076839 Days $T_0=146.242332$ (BKJD)



DV Model-Shift Uniqueness Test

009896435-01, P = 18.076623 Days, E = 146.255957 Days

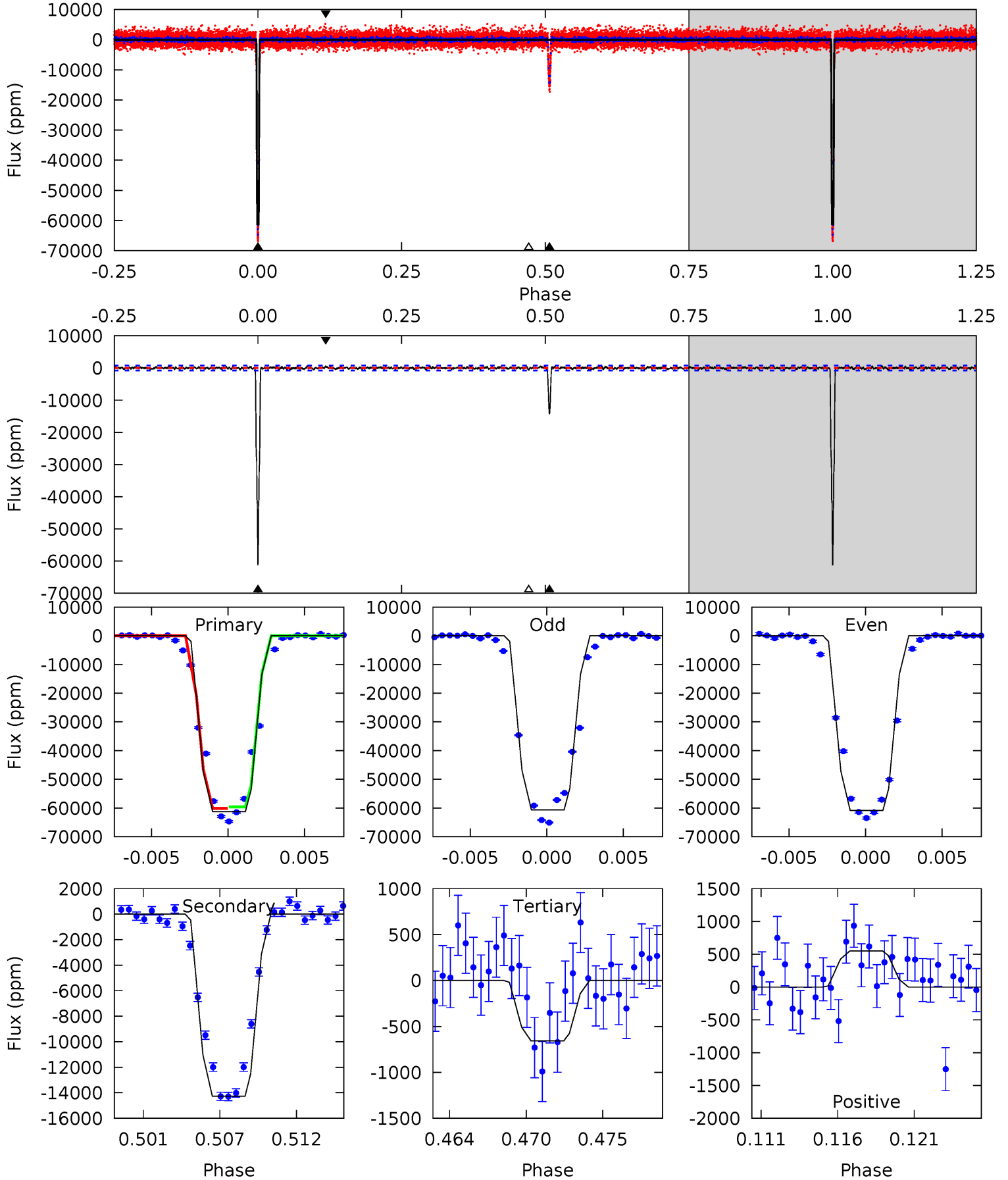
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
665.5	145.1	5.37	4.25	5.06	2.64	1.77	660.1	661.2	139.7	140.8	0.35	1.00	0.01	0.26



Alt Model-Shift Uniqueness Test

009896435-01, P = 18.076839 Days, E = 146.242332 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
397.1	92.5	4.26	3.56	5.15	2.79	1.09	392.8	393.5	88.2	88.9	0.68	0.99	0.01	1.23



Stellar Parameters For KIC 009896435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4848^{+173}_{-173}	$4.550^{+0.065}_{-0.040}$	$0.060^{+0.250}_{-0.300}$	$0.764^{+0.056}_{-0.074}$	$0.755^{+0.075}_{-0.062}$	$2.382^{+0.673}_{-0.364}$
	+4%/-4%	+1%/-1%	+417%/-500%	+7%/-10%	+10%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009896435-01 / KOI 3755.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-14176 ± 98	$28.38^{+4.89}_{-4.70}$	742^{+32}_{-32}	3343^{+215}_{-171}	151^{+63}_{-42}
Alt.	-14269 ± 154	$21.13^{+4.66}_{-4.81}$	741^{+29}_{-30}	3668^{+355}_{-236}	272^{+178}_{-88}

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 $A_{obs} \gg 1.0$

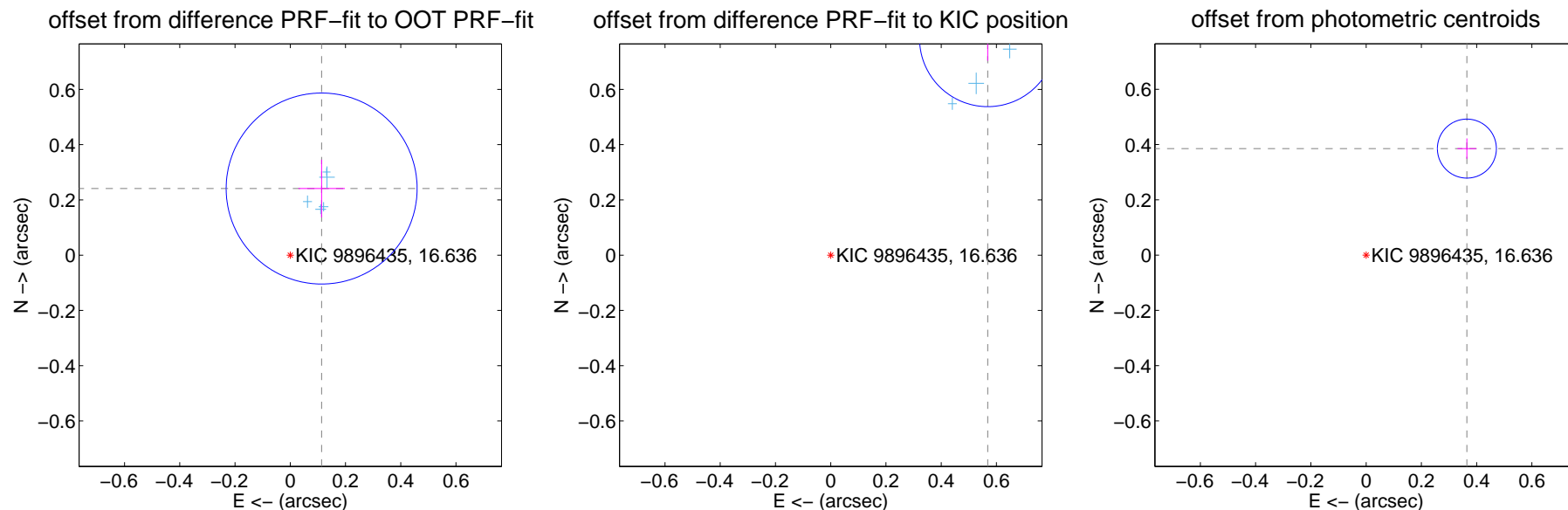
DV Centroid Data

Supplemental centroid analysis for 009896435-01. Kepler magnitude: 16.64. Transit SNR 352.59

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.52 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.267 ± 0.115	2.31	-0.114 ± 0.084	0.241 ± 0.104
PRF-fit source offset from KIC position	0.969 ± 0.082	11.77	-0.568 ± 0.071	0.784 ± 0.081
photometric centroid source offset	0.53 ± 0.04	14.91	-0.36 ± 0.03	0.39 ± 0.04



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.

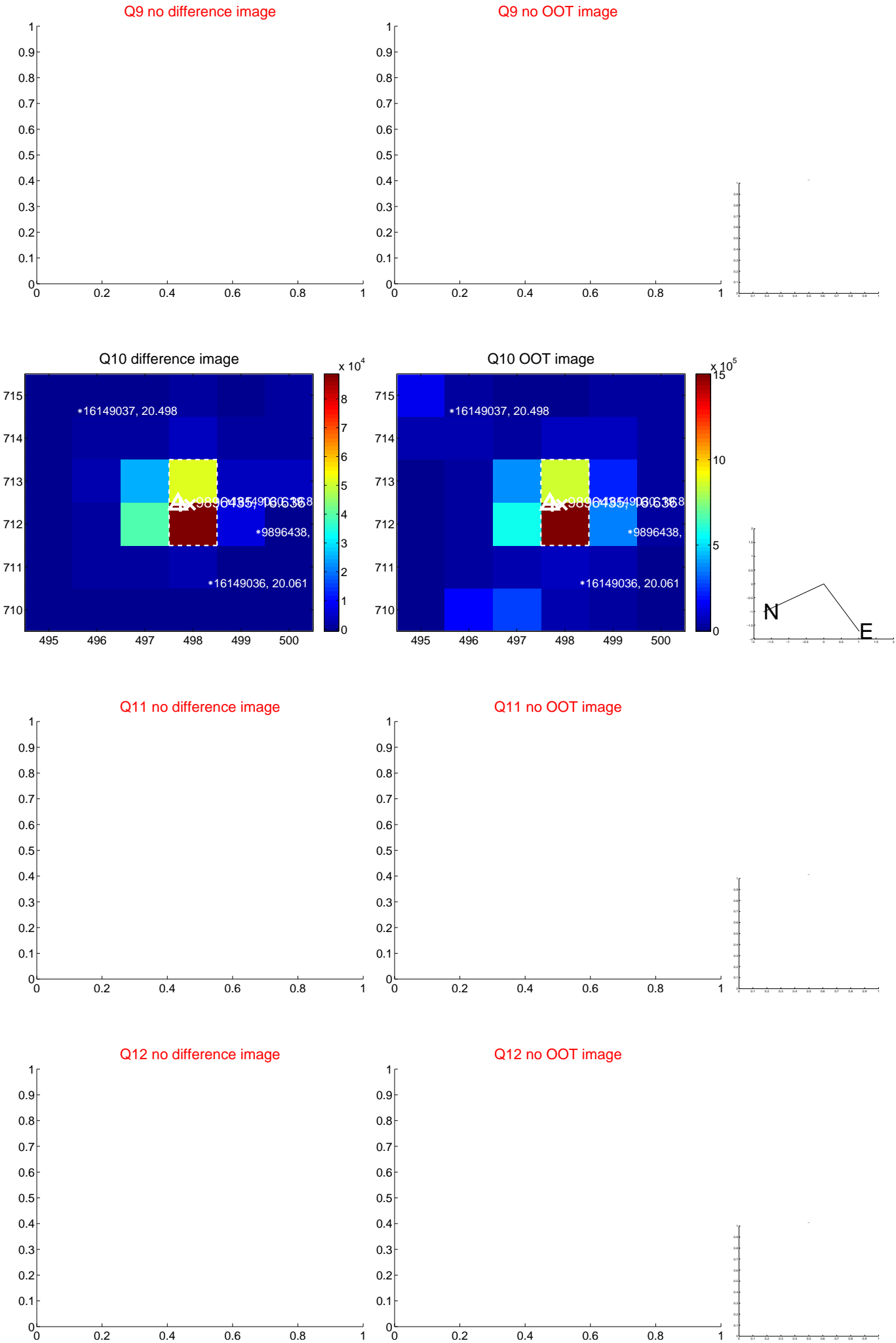
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



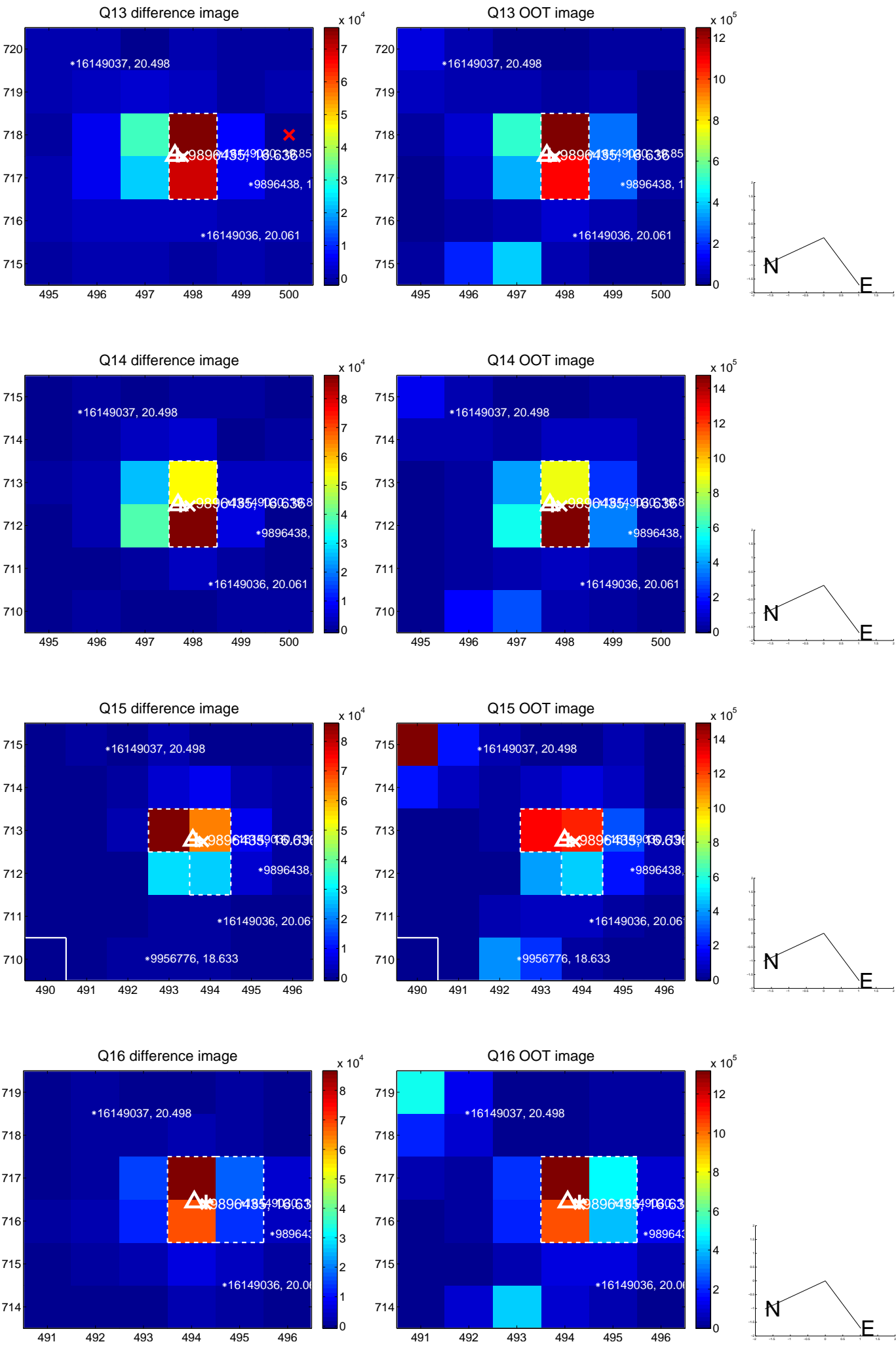
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



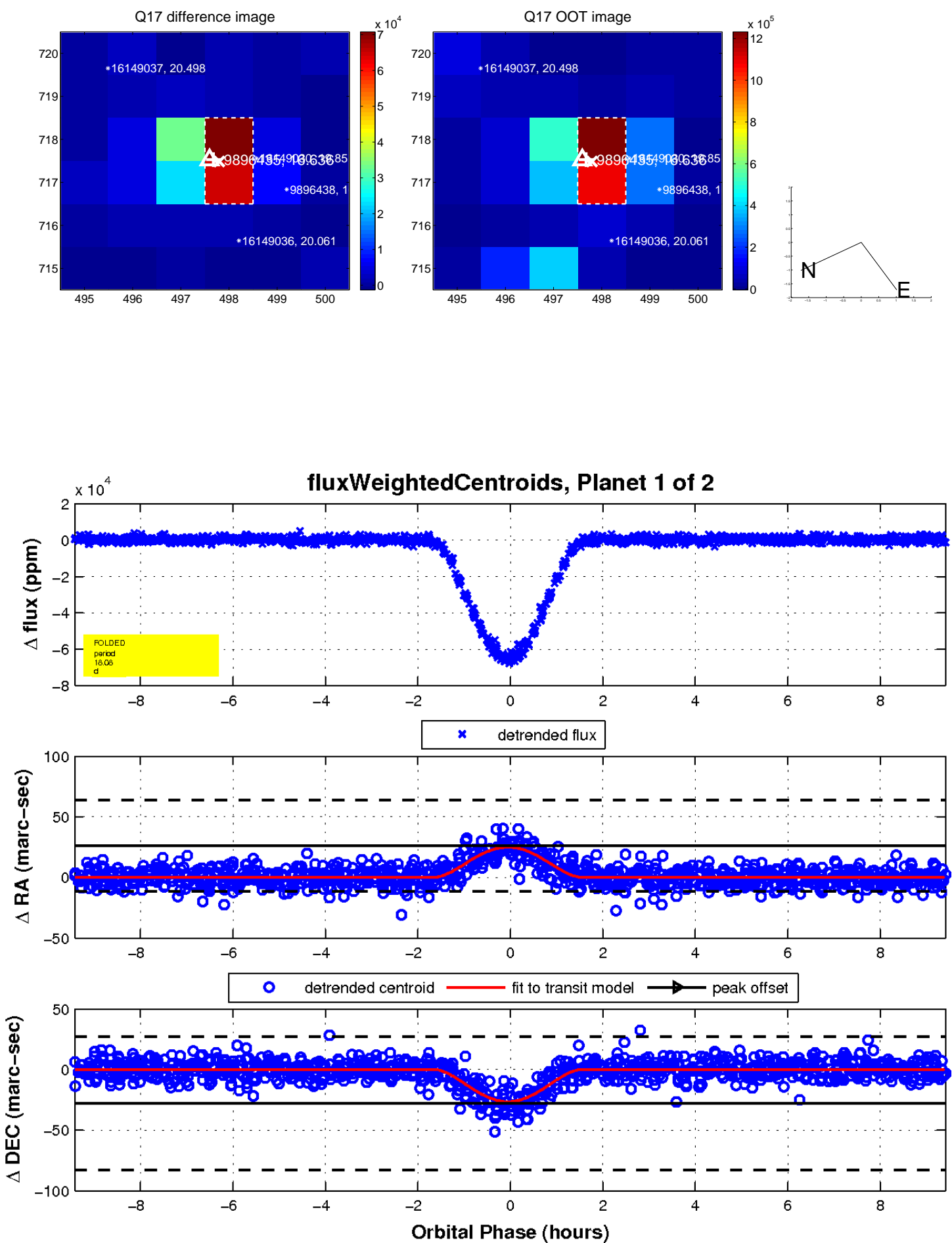
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

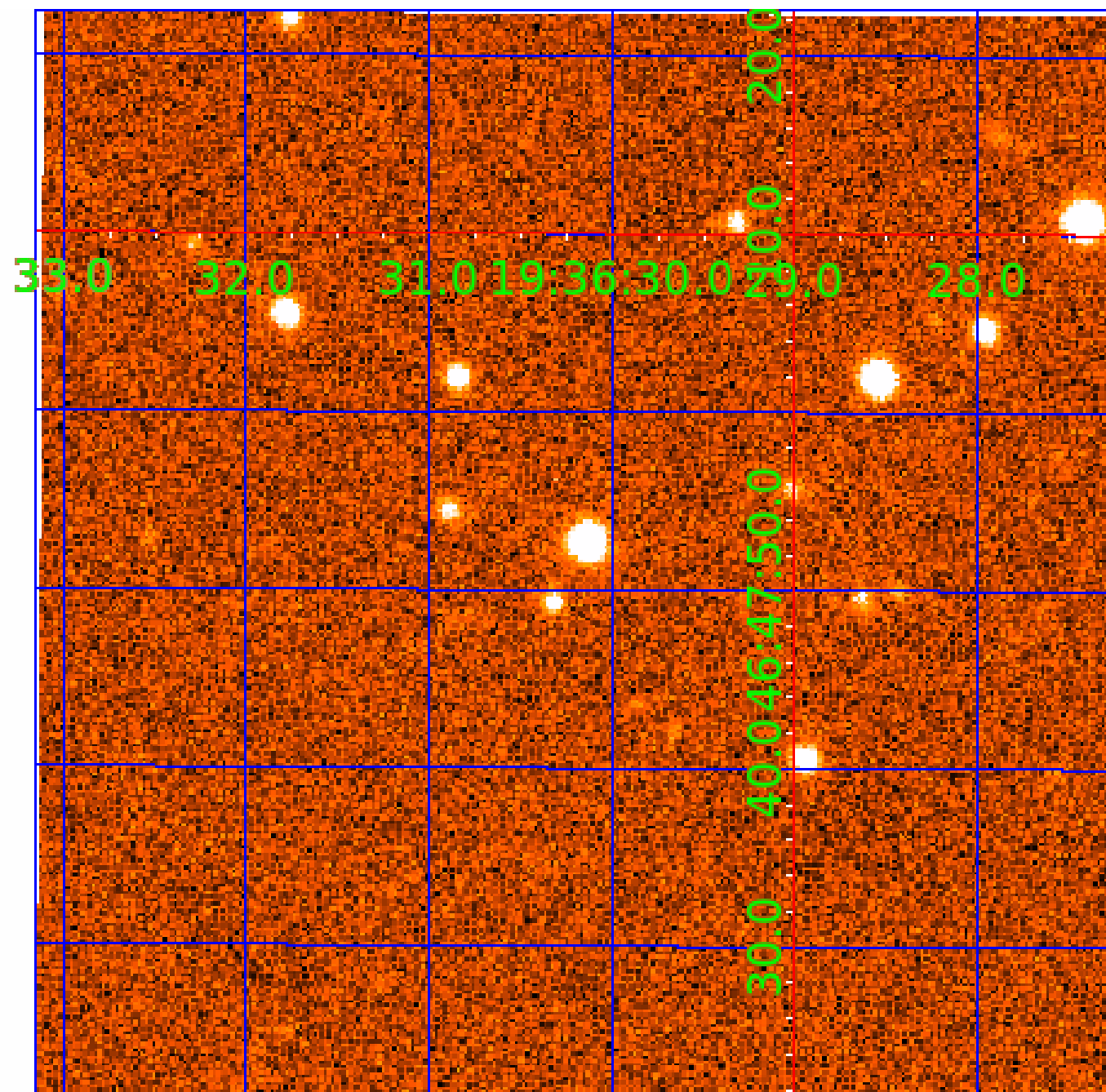


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009896435

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})
009896435-01	OBS	3755.01	18.076623	146.255957	65004.4	3.140	389.5	352.6	0.76	4848	28.32	19.16
009896435-02	OBS	No	18.076589	137.350024	14708.7	2.596	88.5	85.2	0.76	4848	10.89	19.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009896435-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS
009896435-02	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 009896435-02

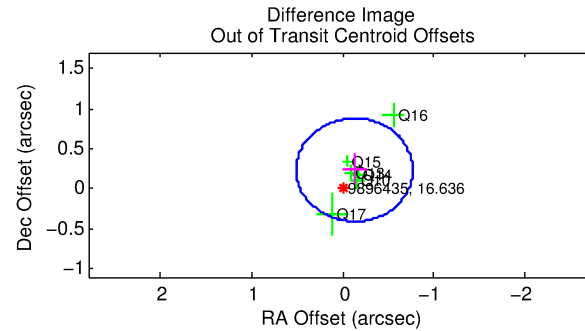
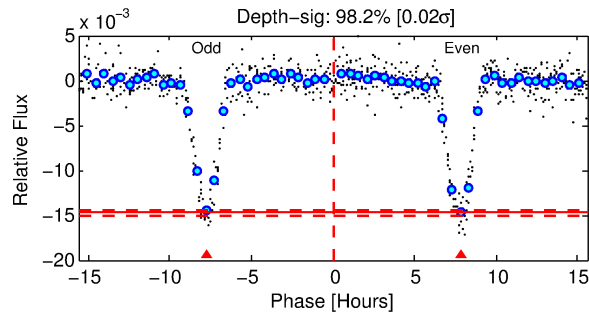
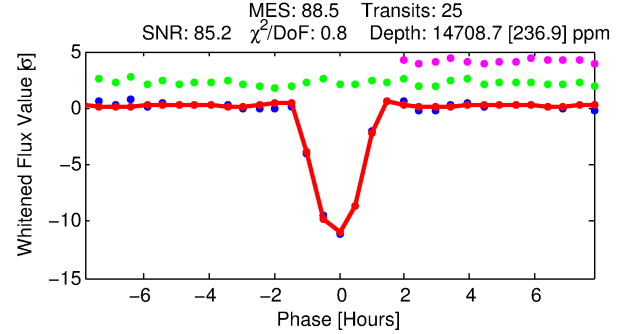
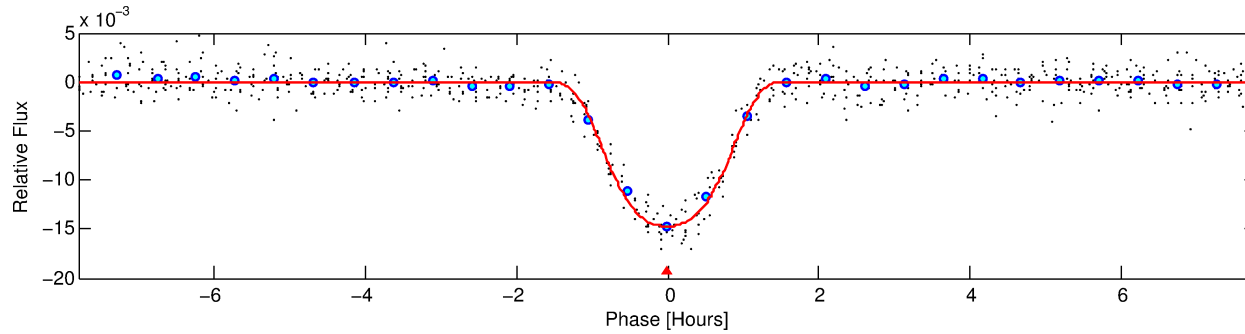
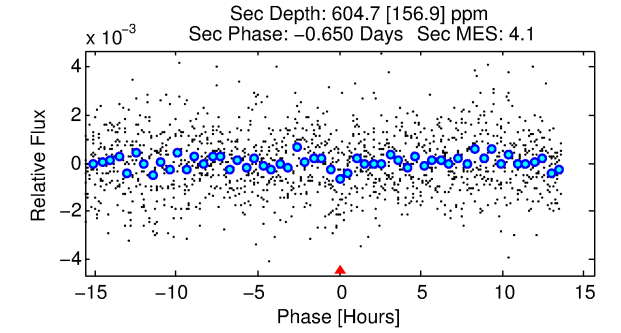
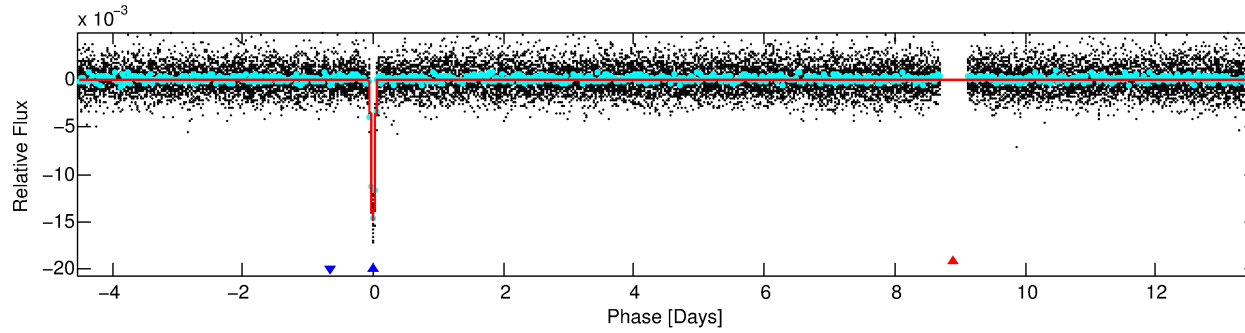
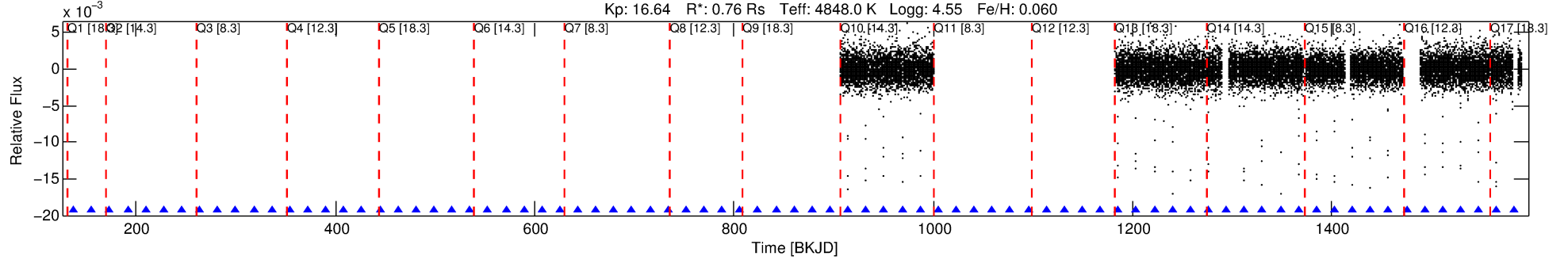
No Significant Match Found

DV One-Page Summary

KIC: 9896435 Candidate: 2 of 2 Period: 18.077 d

KOI: K03755 Corr: No Ephemeris Match

Kp: 16.64 R*: 0.76 Rs Teff: 4848.0 K Logg: 4.55 Fe/H: 0.060



DV Fit Results:

Period = 18.07659 [0.00003] d
Epoch = 137.3500 [0.0020] BKJD
Rp/R* = 0.1306 [0.0025]
a/R* = 40.00 [1.37]
b = 0.84 [0.01]
Seff = 19.16 [3.56]
Teq = 533 [25] K
Rp = 10.89 [1.08] Re
a = 0.1228 [0.0100] AU
Ag = 42.29 [12.18] [3.39σ]
Teffp = 2103 [157] K [9.87σ]

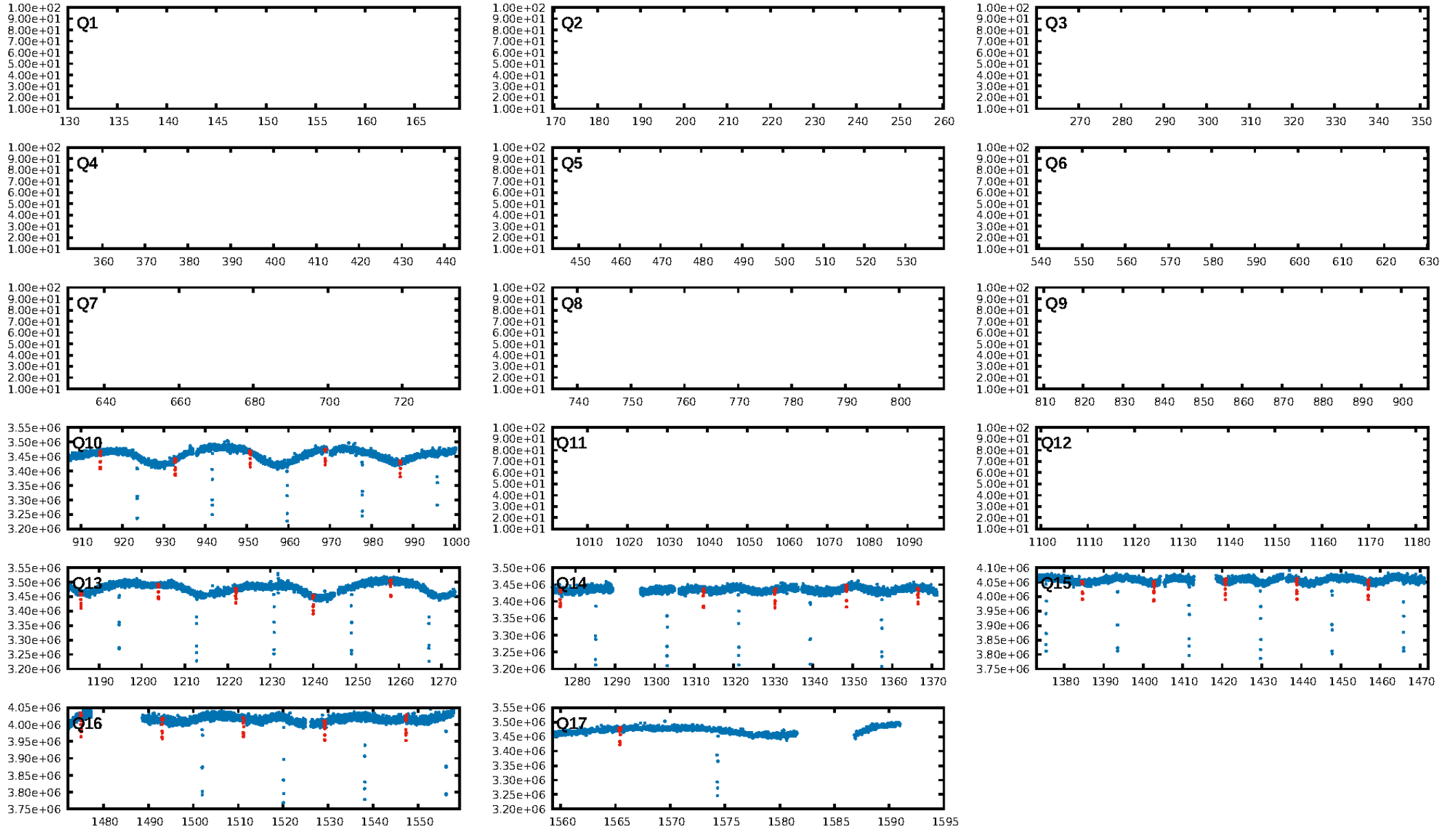
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 86.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [24/24]
GhostDiagnostic-chr: 3.153
Centroid-sig: 0.0%
Centroid-so: 0.610 arcsec [3.76σ]
OotOffset-rm: 0.267 arcsec [1.25σ]
KicOffset-rm: 0.943 arcsec [5.79σ]
OotOffset-st: 2/1/1/2 [6]
KicOffset-st: 2/1/1/2 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 1.00 [6/6]

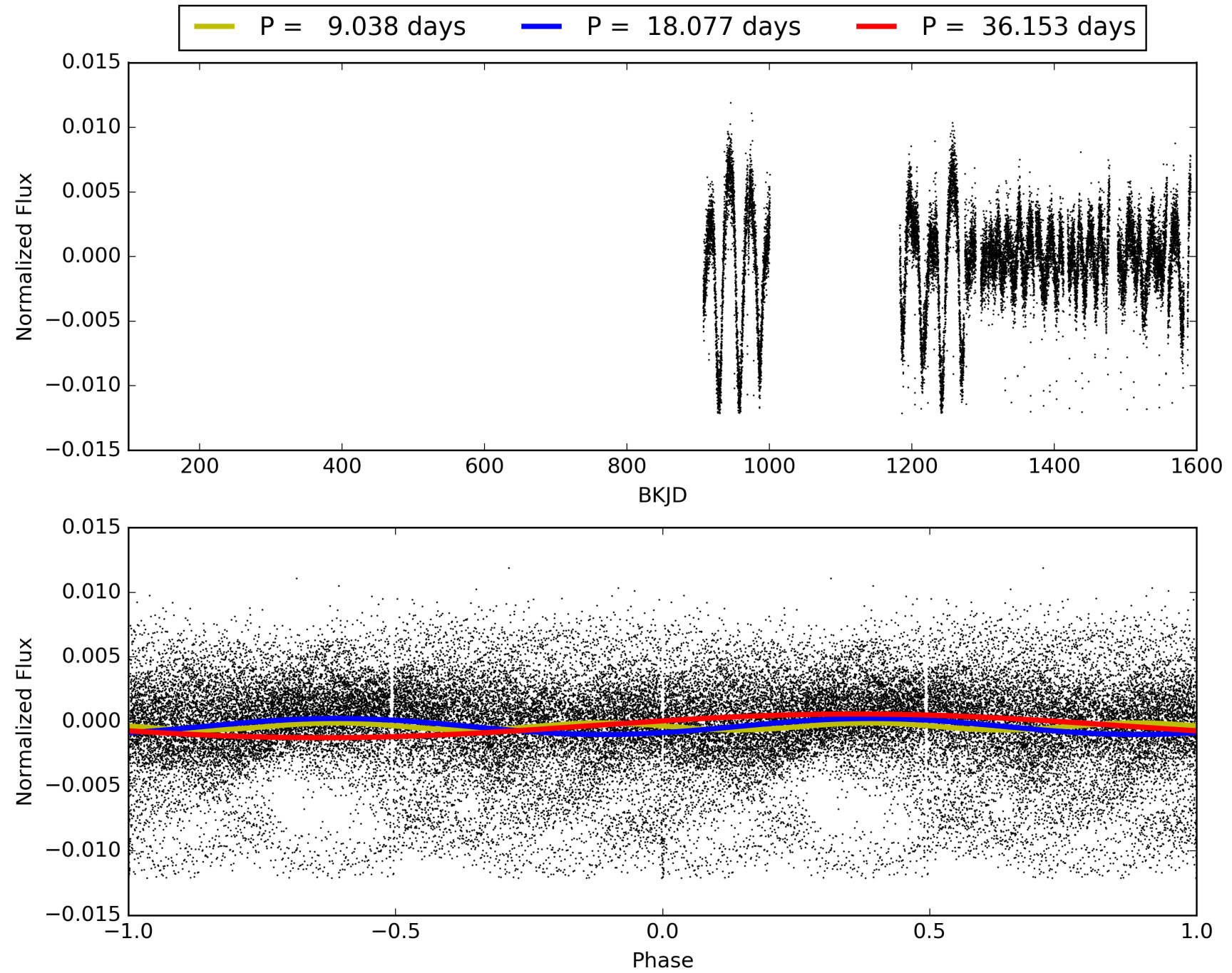
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:52:28 Z

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

TCE 009896435-02, PDC Light Curves

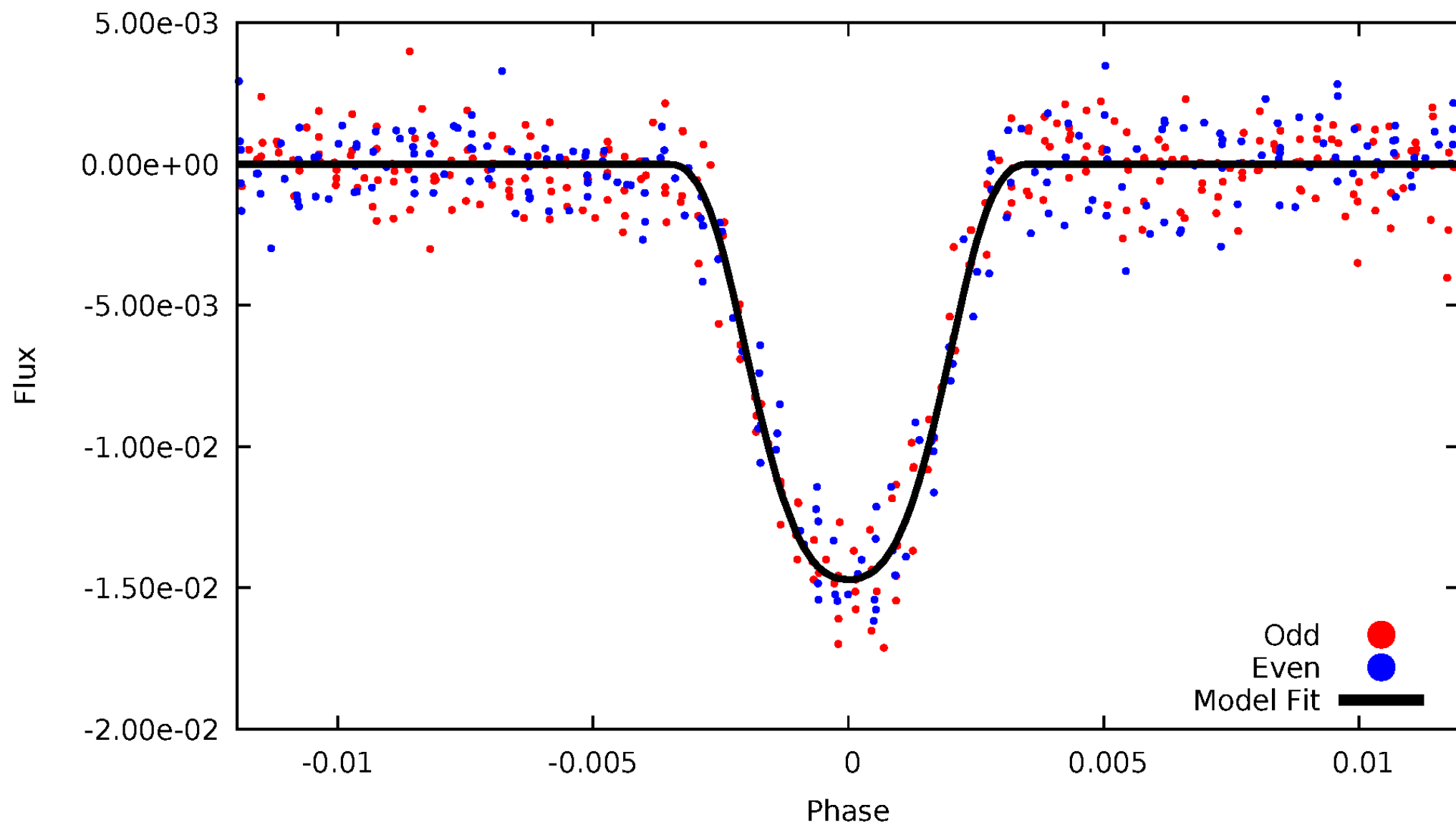


TCE 009896435-02



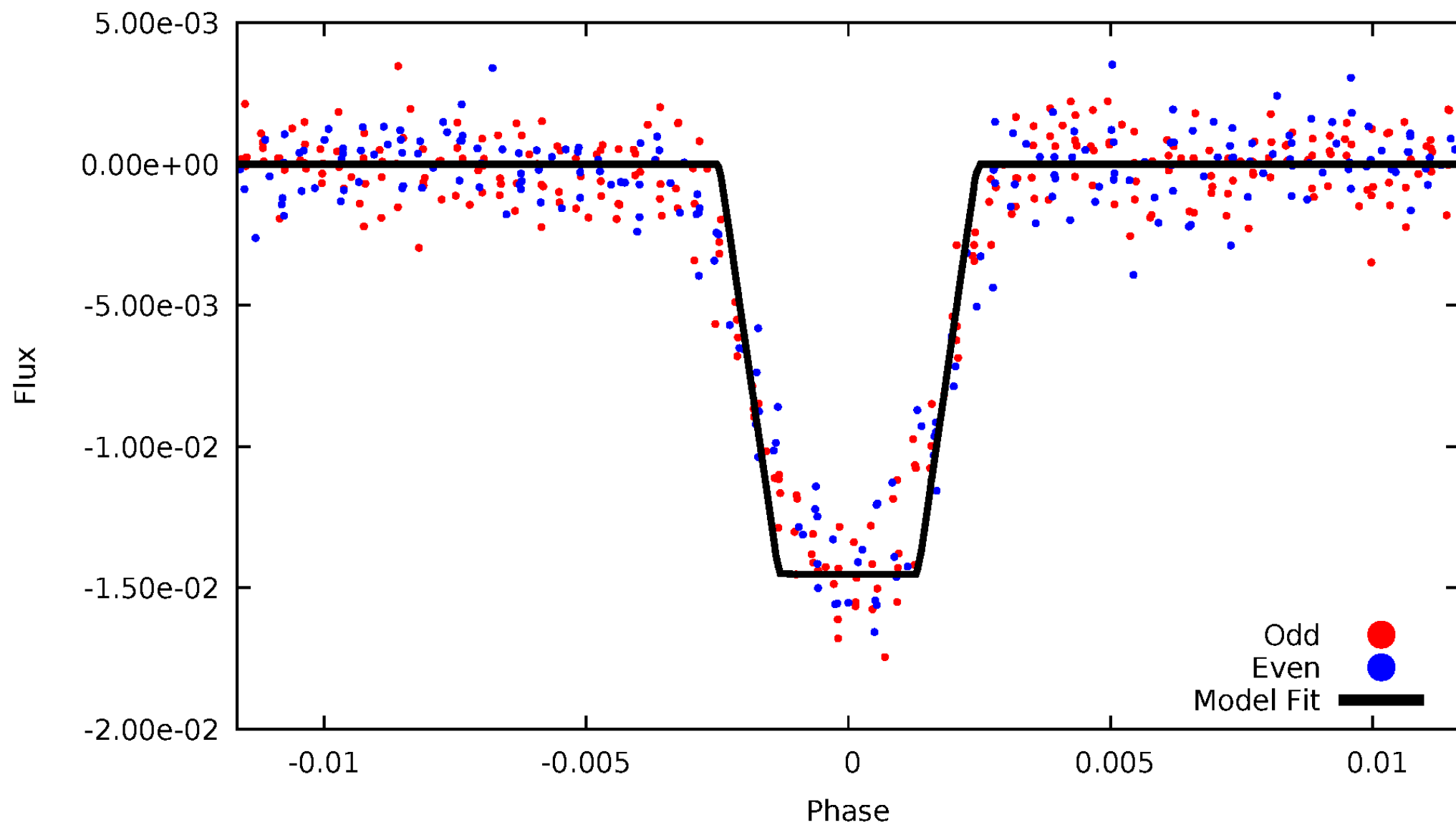
DV Odd/Even

TCE 009896435-02



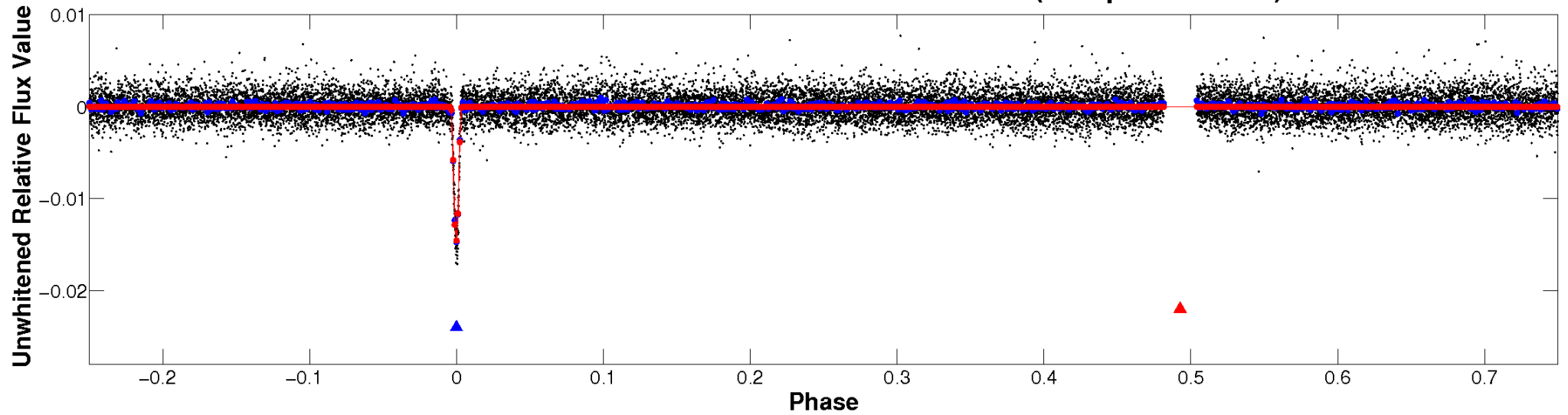
ALT Odd/Even

TCE 009896435-02

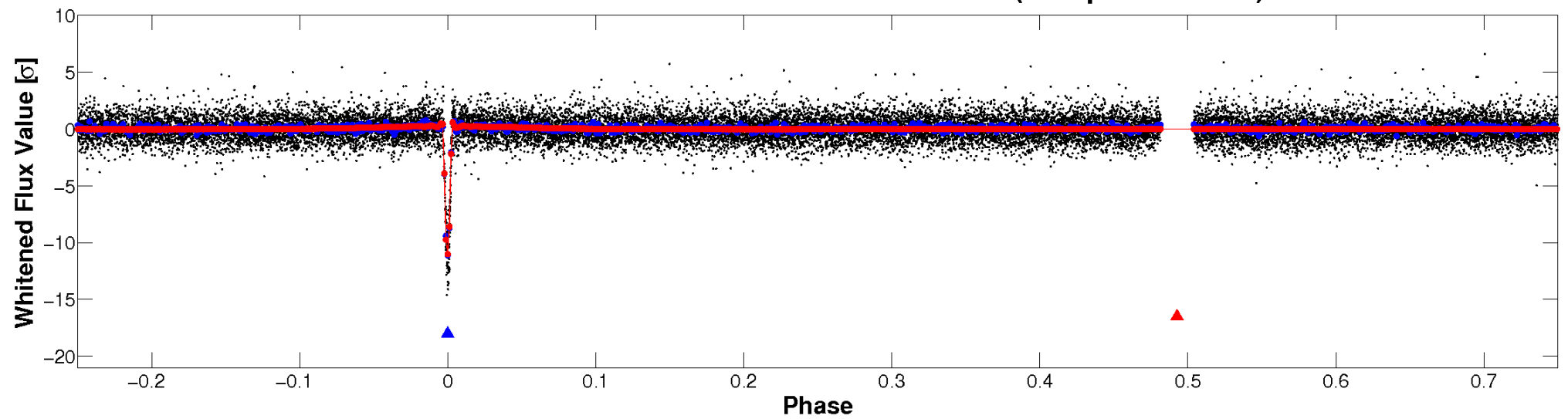


Non-Whitened Vs. Whitened Light Curve

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

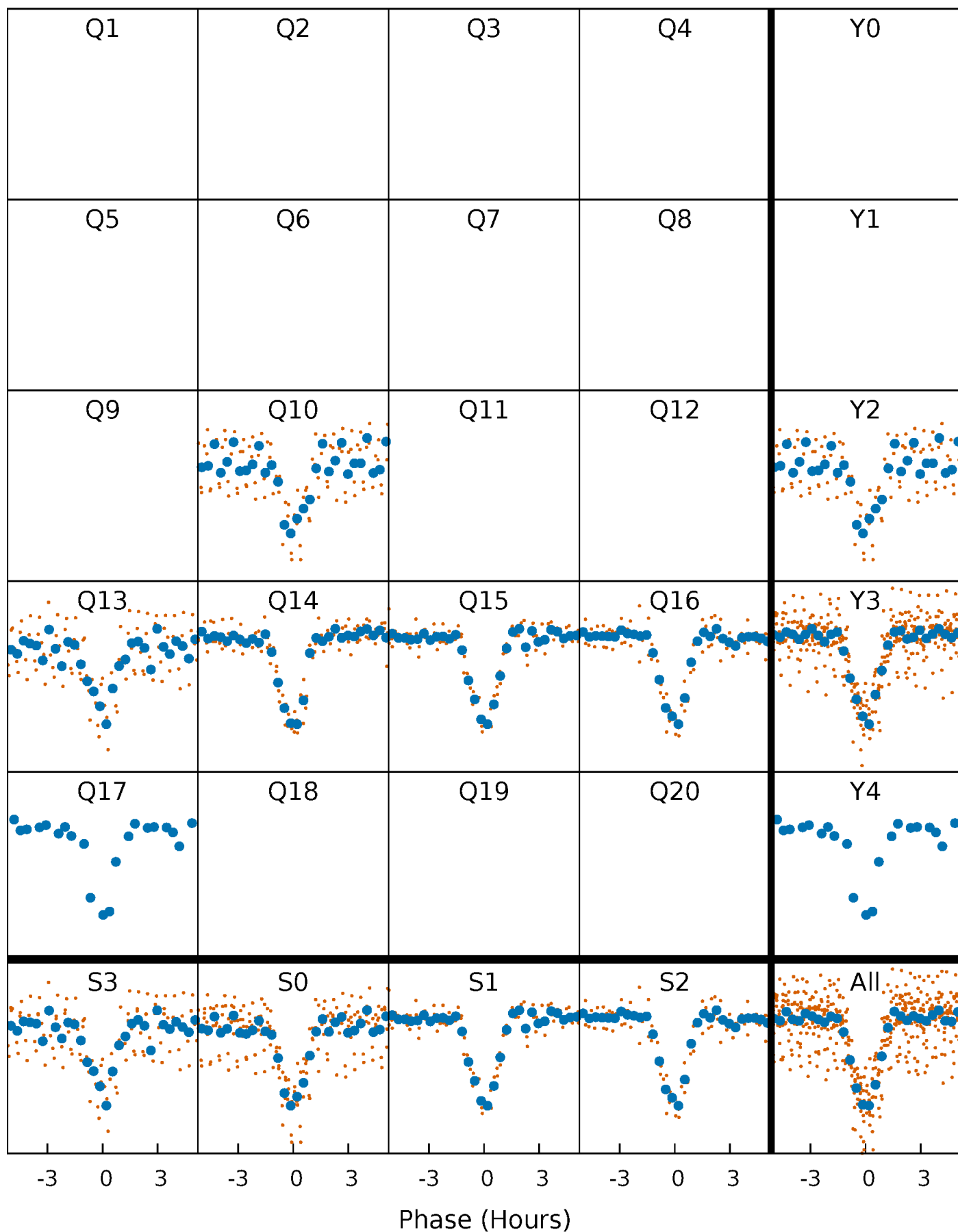


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



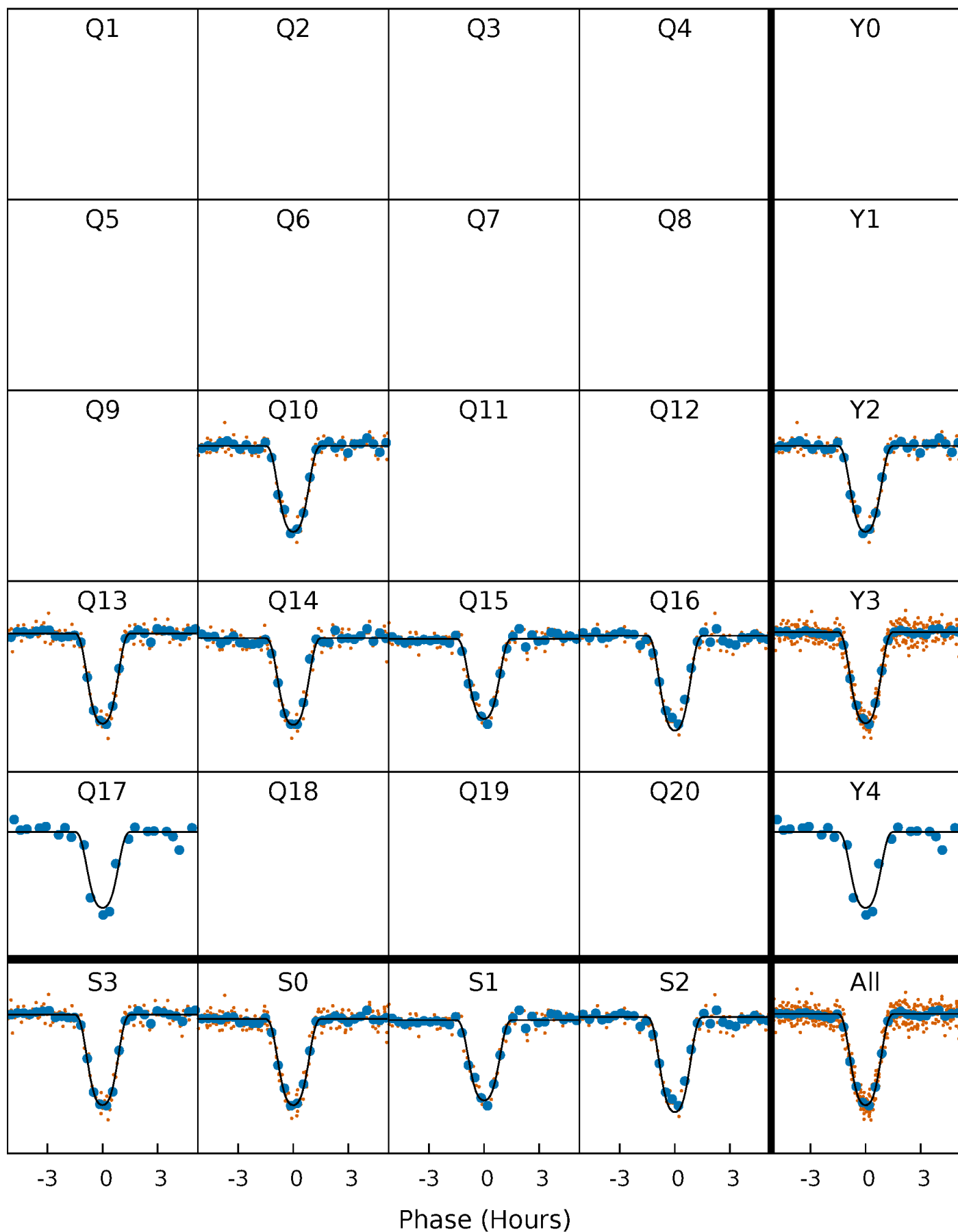
PDC Quarter-Phased Transit Curves

TCE 009896435-02 P= 18.076589 Days $T_0=137.350024$ (BKJD)



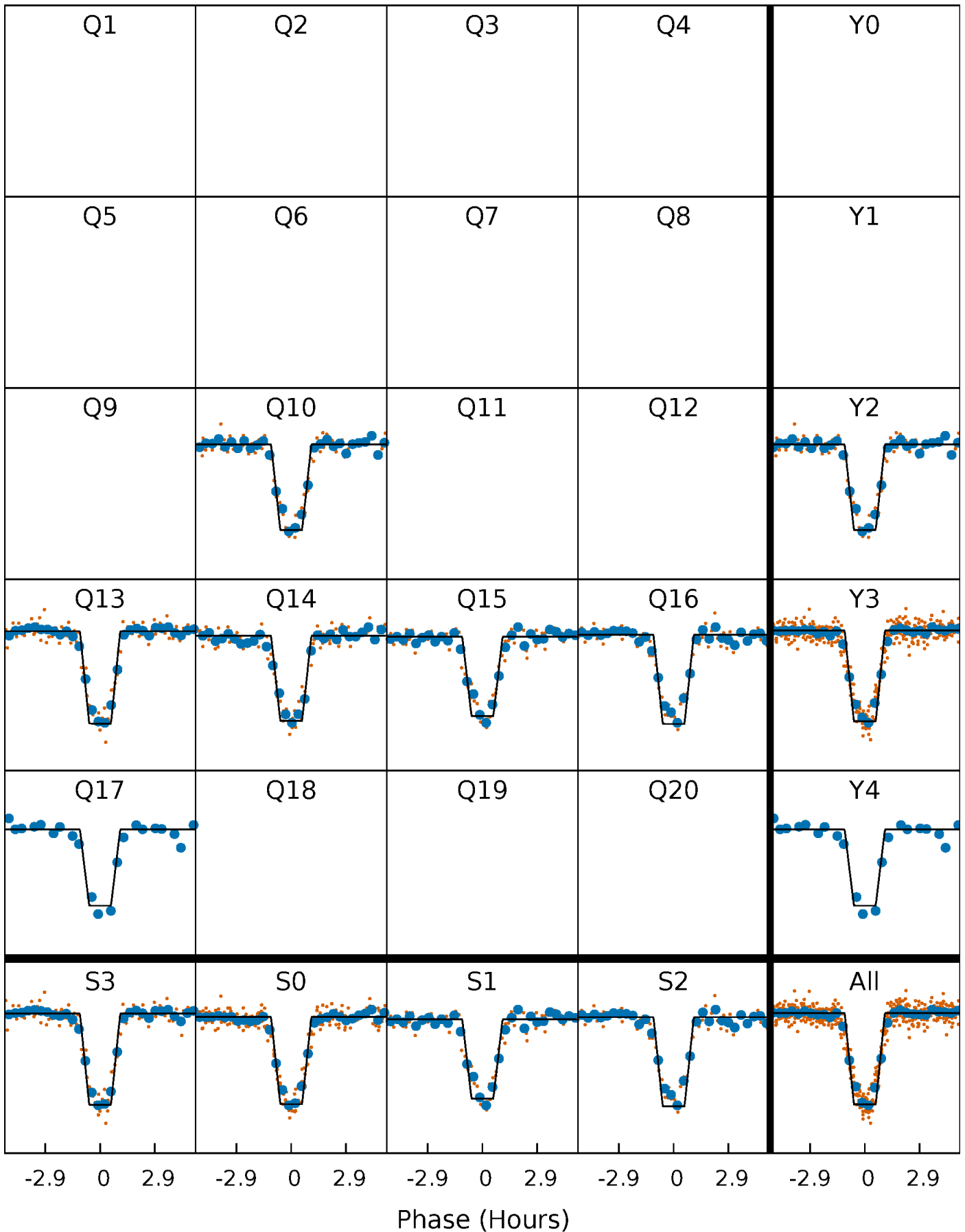
DV Quarter-Phased Transit Curves

TCE 009896435-02 P= 18.076589 Days $T_0=137.350024$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

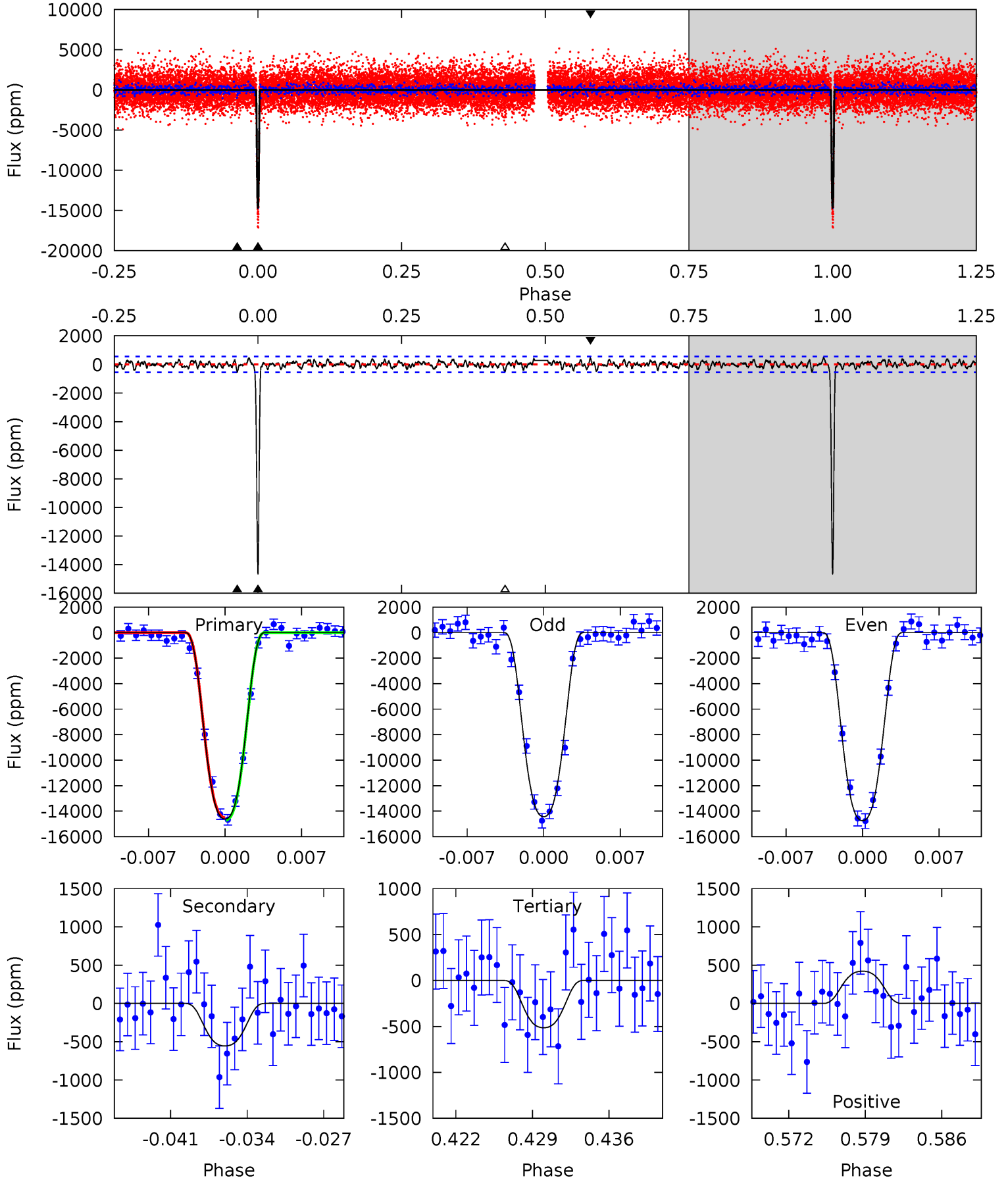
TCE 009896435-02 P= 18.076596 Days $T_0=137.349569$ (BKJD)



DV Model-Shift Uniqueness Test

009896435-02, P = 18.076589 Days, E = 137.350024 Days

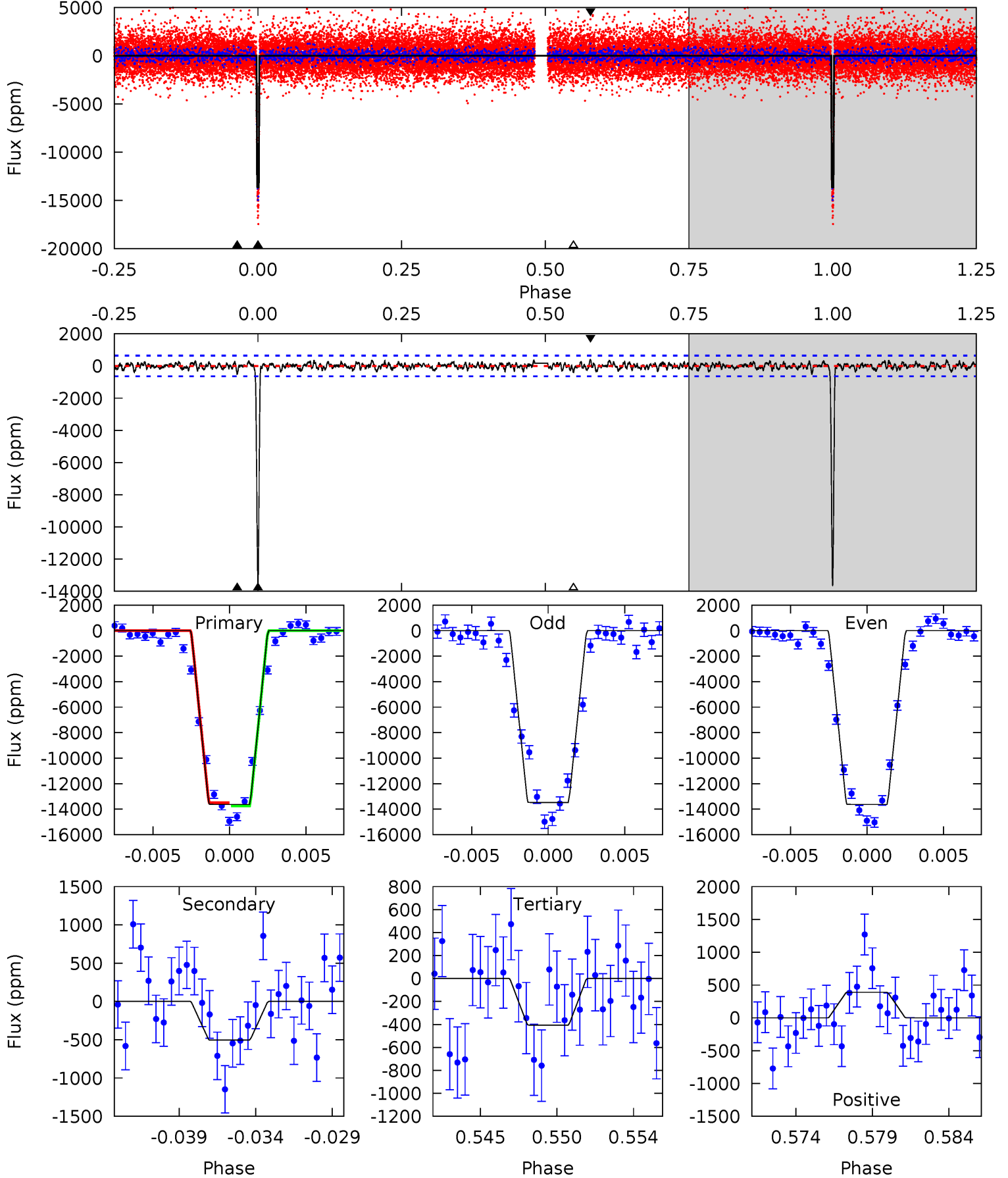
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
135.6	5.14	4.77	3.90	5.10	2.71	1.44	130.8	131.7	0.37	1.24	1.45	1.00	0.03	0.92



Alt Model-Shift Uniqueness Test

009896435-02, $P = 18.076596$ Days, $E = 137.349569$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
109.4	4.05	3.26	3.14	5.16	2.81	1.07	106.2	106.3	0.79	0.91	0.58	1.01	0.03	1.01



Stellar Parameters For KIC 009896435

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4848^{+173}_{-173}	$4.550^{+0.065}_{-0.040}$	$0.060^{+0.250}_{-0.300}$	$0.764^{+0.056}_{-0.074}$	$0.755^{+0.075}_{-0.062}$	$2.382^{+0.673}_{-0.364}$
	+4%/-4%	+1%/-1%	+417%/-500%	+7%/-10%	+10%/-8%	+28%/-15%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009896435-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-555 ± 108	$10.86^{+0.52}_{-0.64}$	743^{+30}_{-31}	2758^{+100}_{-97}	39^{+10}_{-9}
Alt.	-504 ± 125	$10.01^{+0.54}_{-0.61}$	743^{+31}_{-31}	2790^{+109}_{-122}	43^{+11}_{-11}

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

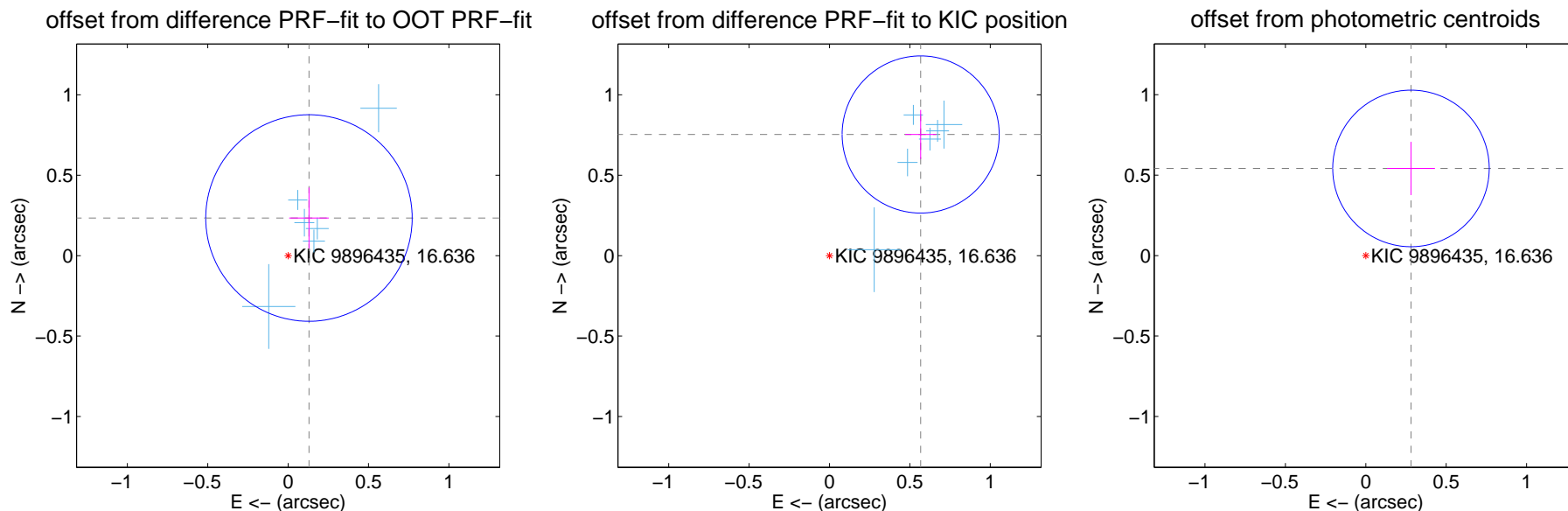
DV Centroid Data

Supplemental centroid analysis for 009896435-02. Kepler magnitude: 16.64. Transit SNR 85.25

There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.267 ± 0.214	1.25	-0.130 ± 0.123	0.234 ± 0.189
PRF-fit source offset from KIC position	0.943 ± 0.163	5.79	-0.567 ± 0.096	0.753 ± 0.152
photometric centroid source offset	0.61 ± 0.16	3.76	-0.28 ± 0.15	0.54 ± 0.17



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.

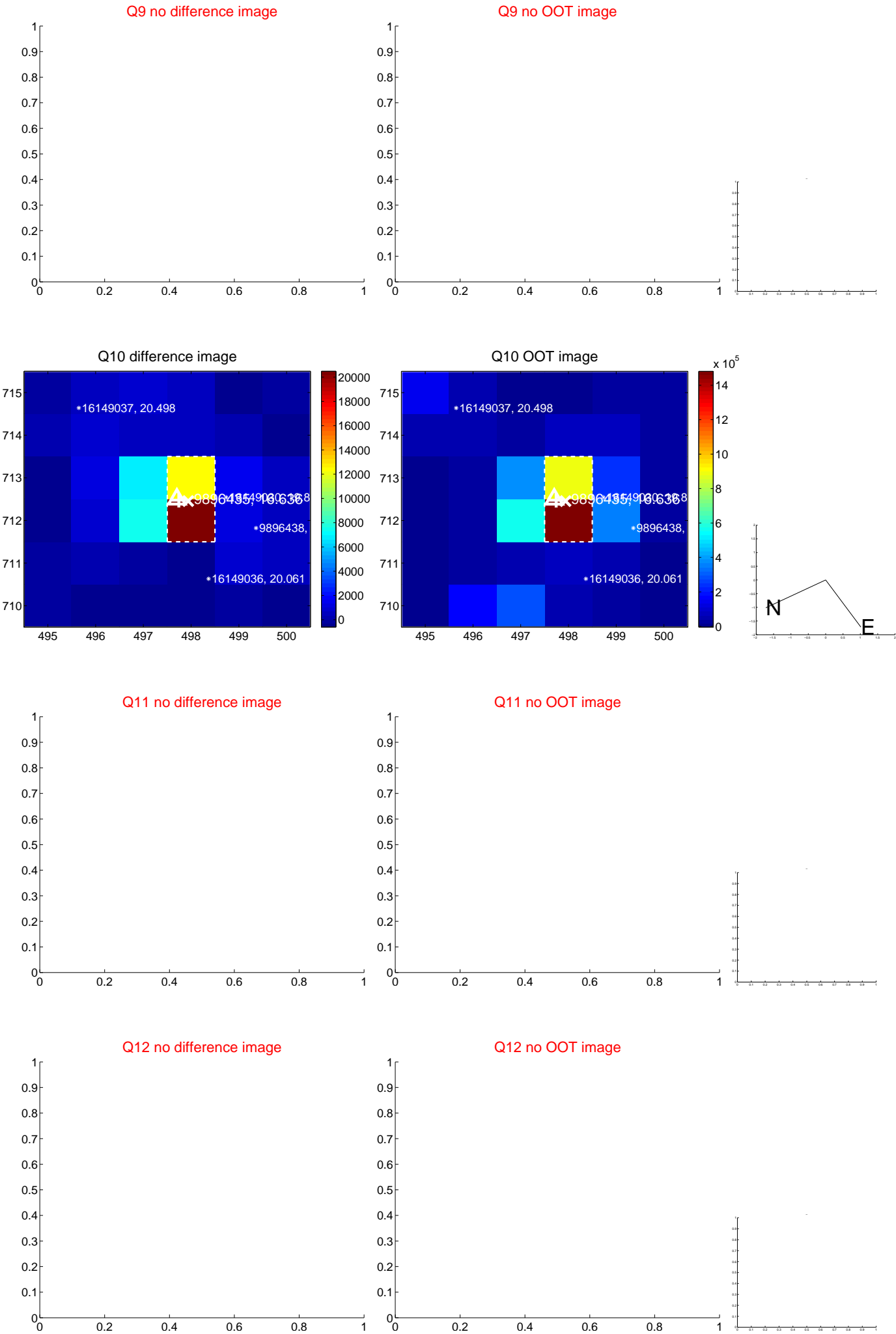
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



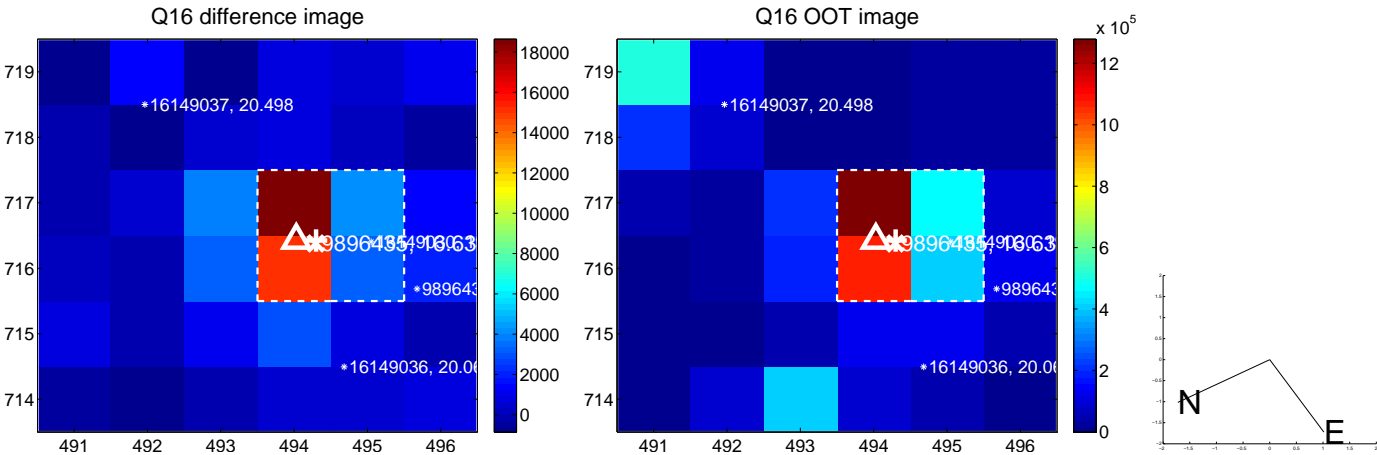
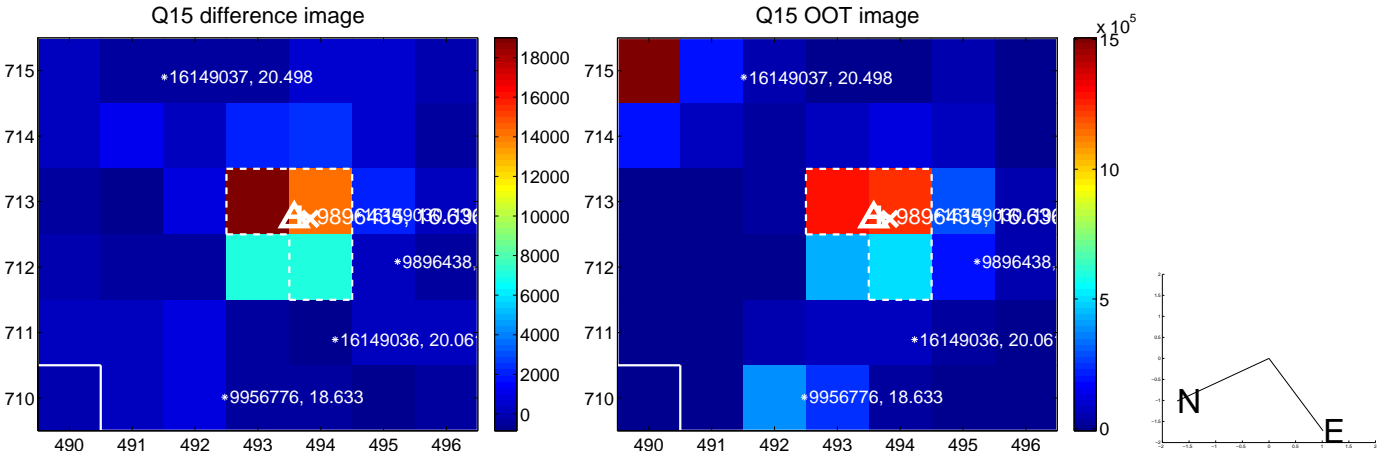
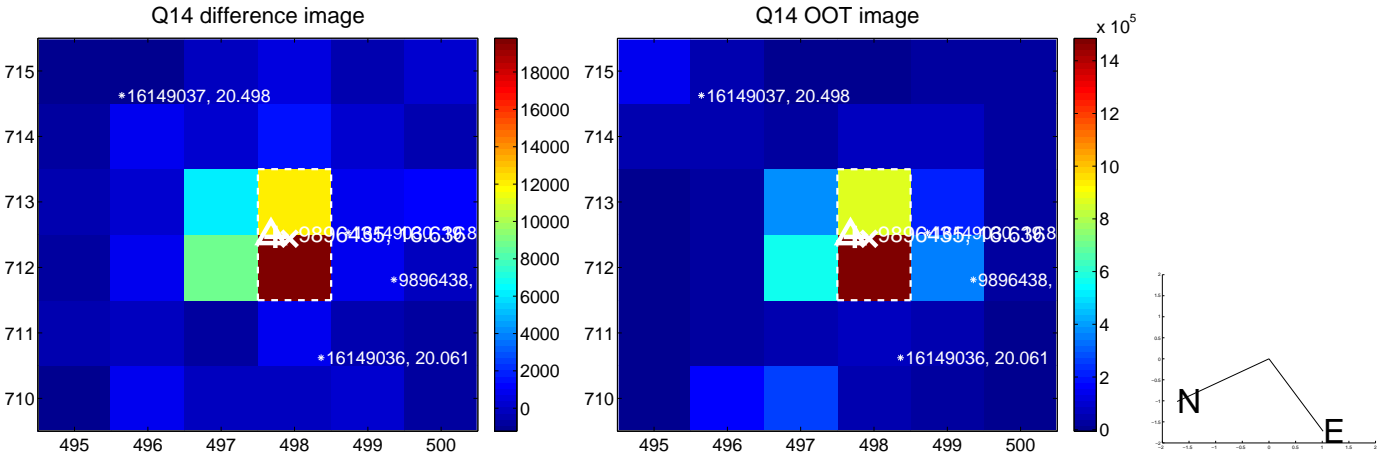
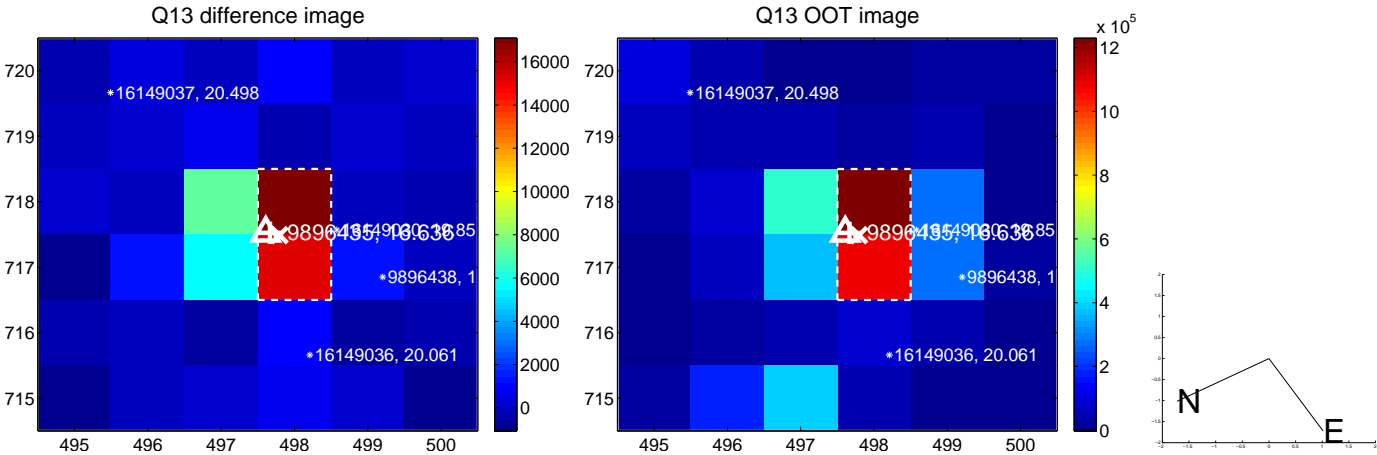
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



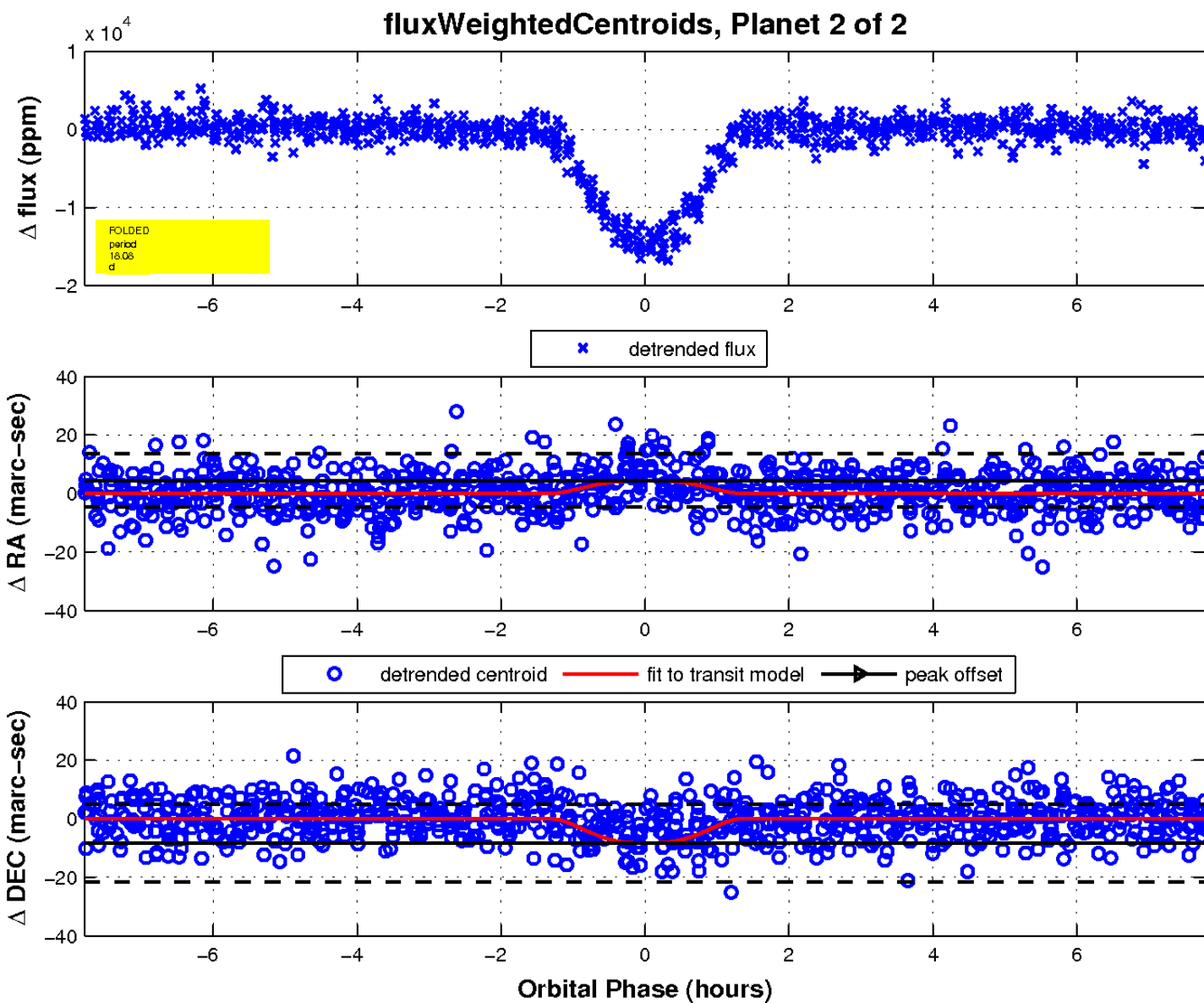
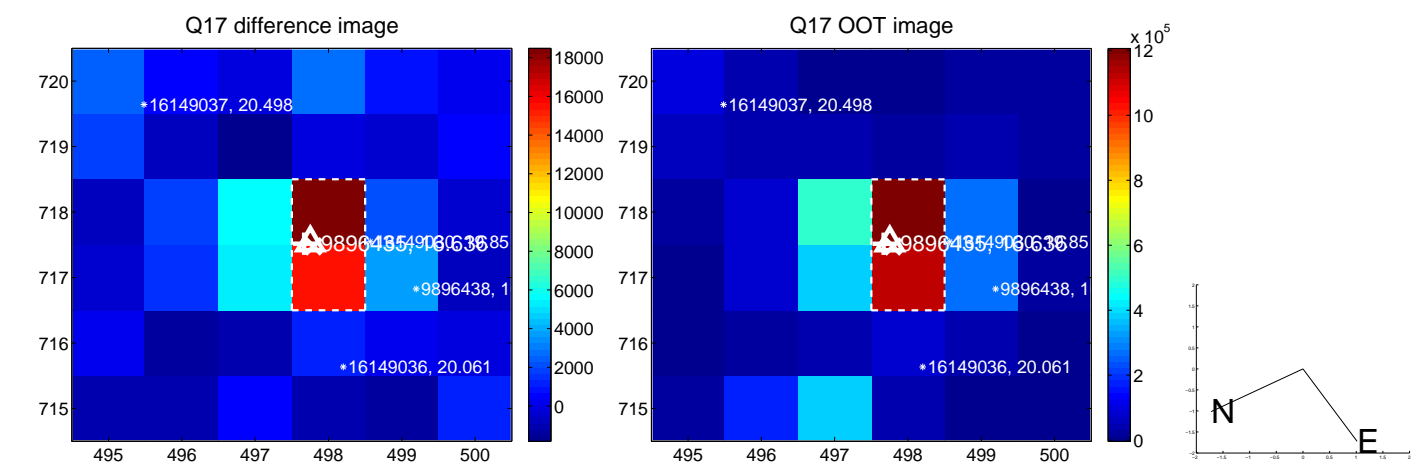
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

