

KIC 009016295

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})
009016295-01	OBS	0925.01	19.974485	131.681092	40199.0	4.241	1464.2	1341.3	1.00	6108	27.36	56.97
009016295-02	OBS	No	19.974482	143.733618	1946.1	4.063	72.1	70.5	1.00	6108	5.91	56.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009016295-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009016295-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 009016295-01

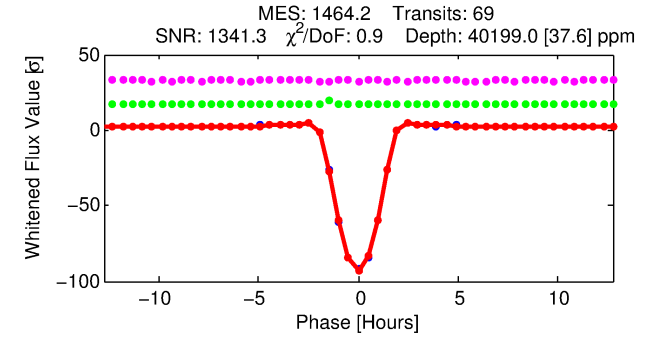
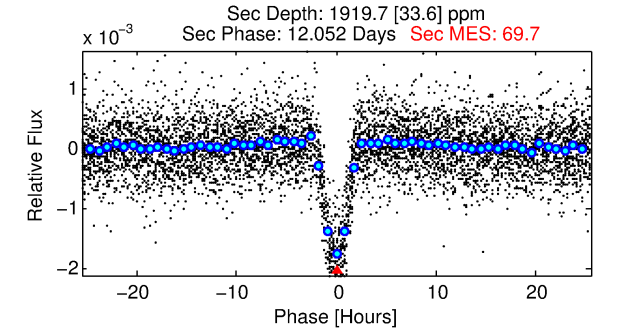
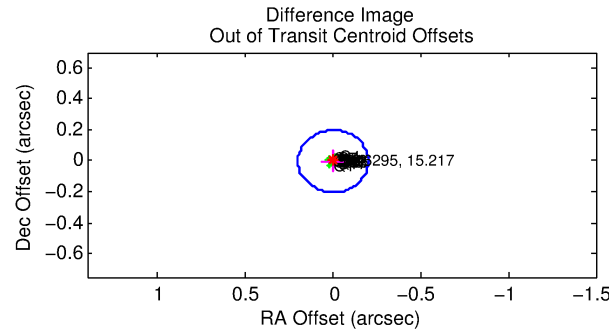
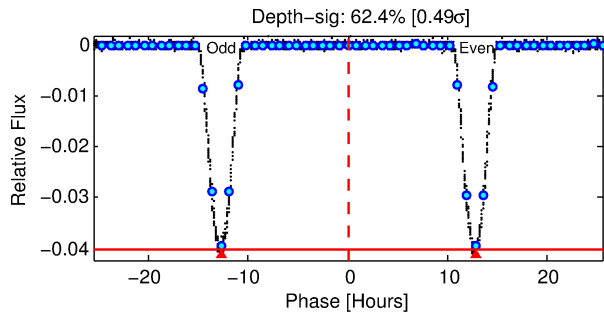
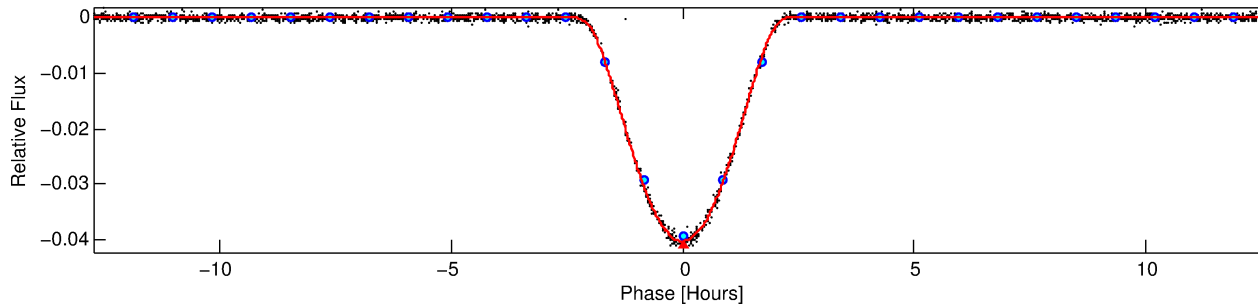
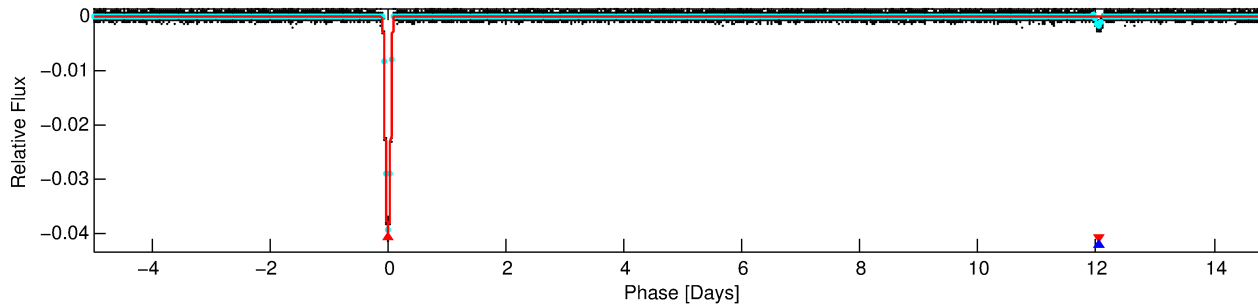
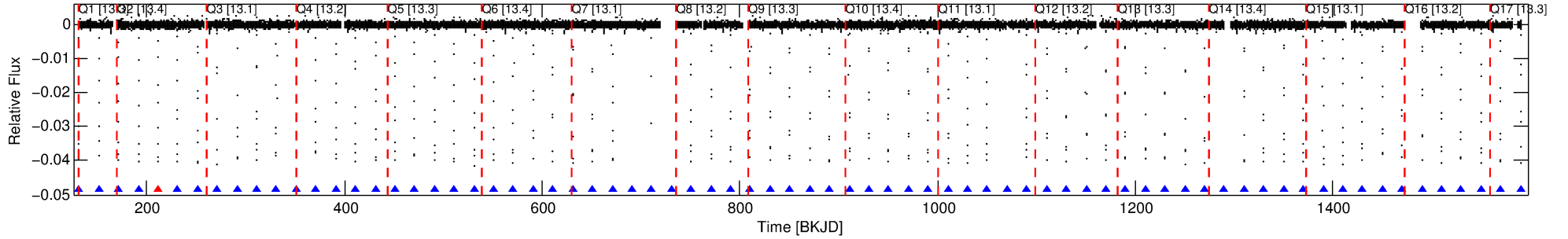
No Significant Match Found

DV One-Page Summary

KIC: 9016295 Candidate: 1 of 2 Period: 19.974 d

KOI: K00925.01 Corr: 1.000

Kp: 15.22 R*: 1.00 Rs Teff: 6108.0 K Logg: 4.47 Fe/H: -0.080



DV Fit Results:

Period = 19.97449 [0.00000] d
Epoch = 131.6811 [0.0001] BKJD
Rp/R* = 0.2515 [0.0047]
a/R* = 31.27 [0.09]
b = 0.90 [0.01]
Seff = 56.97 [24.05]
Teff = 701 [74] K
Rp = 27.36 [8.58] Re
a = 0.1475 [0.0397] AU
Ag = 30.70 [12.29] [2.42σ]
Teffp = 2550 [93] K [15.55σ]

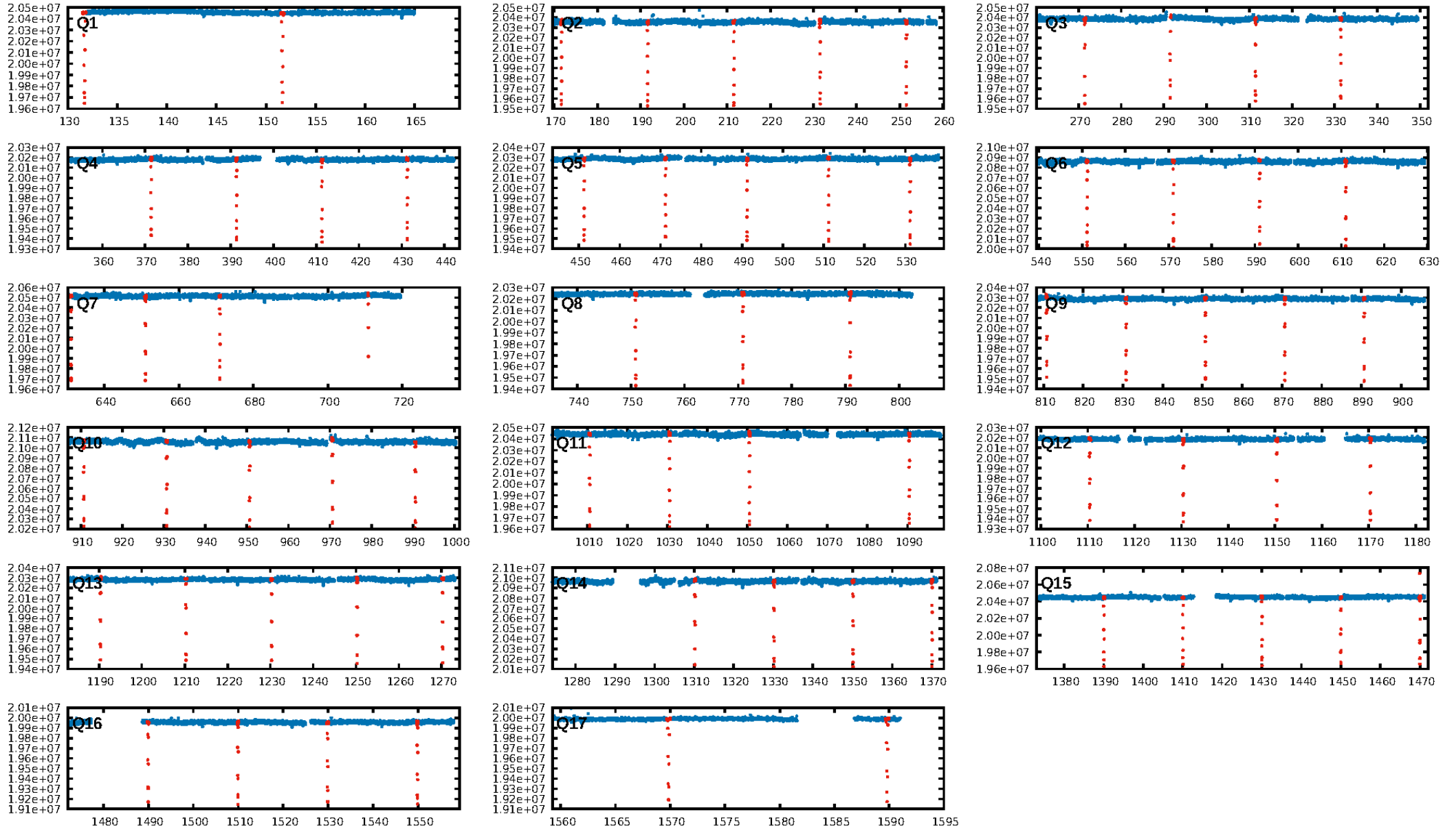
DV Diagnostic Results:

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: 0.98 [64/65]
GhostDiagnostic-chr: 4.31
Centroid-sig: 32.9%
Centroid-so: 0.044 arcsec [4.71σ]
OotOffset-rm: 0.004 arcsec [0.05σ]
KicOffset-rm: 0.119 arcsec [1.71σ]
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]

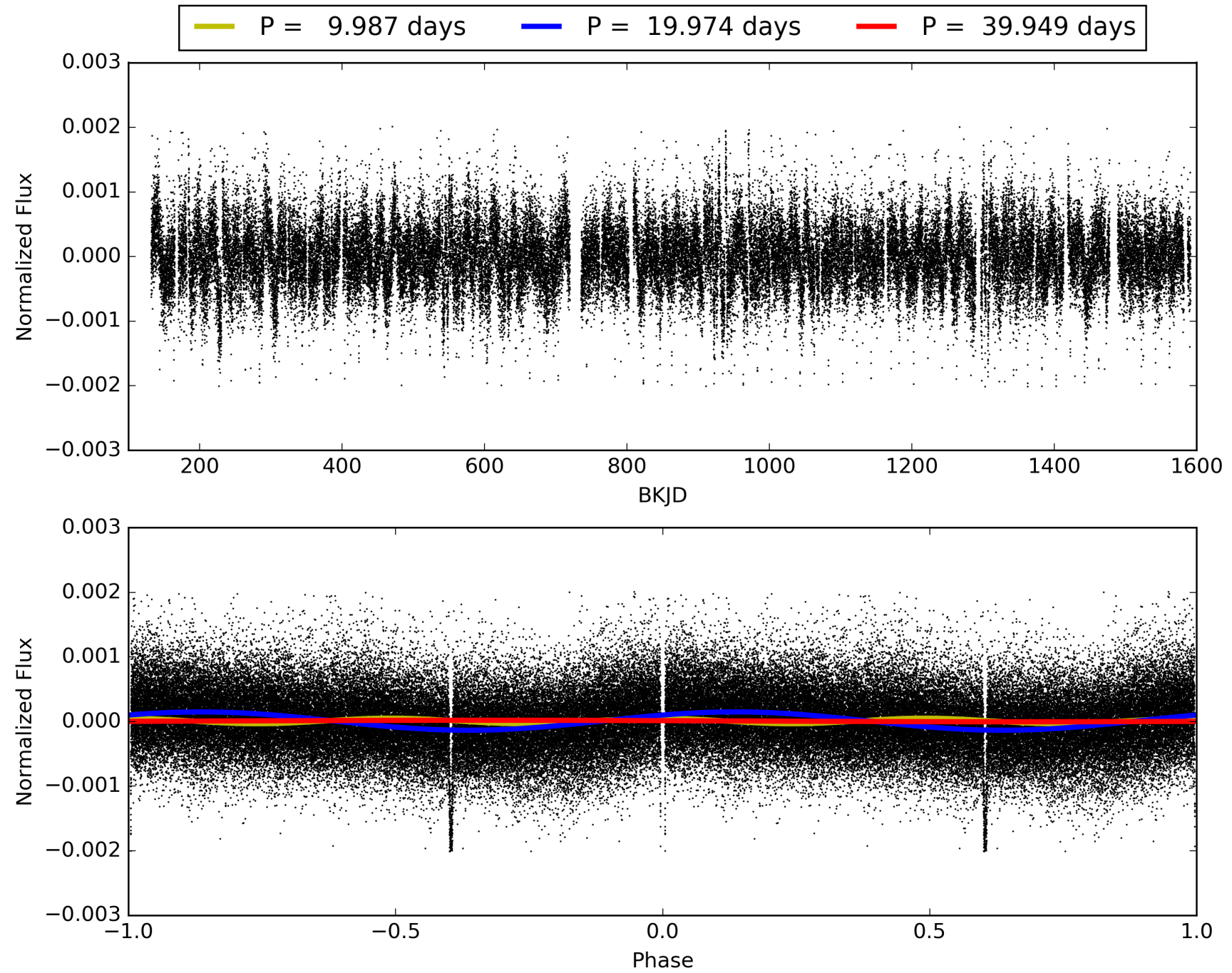
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:42:23 Z

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

TCE 009016295-01, PDC Light Curves

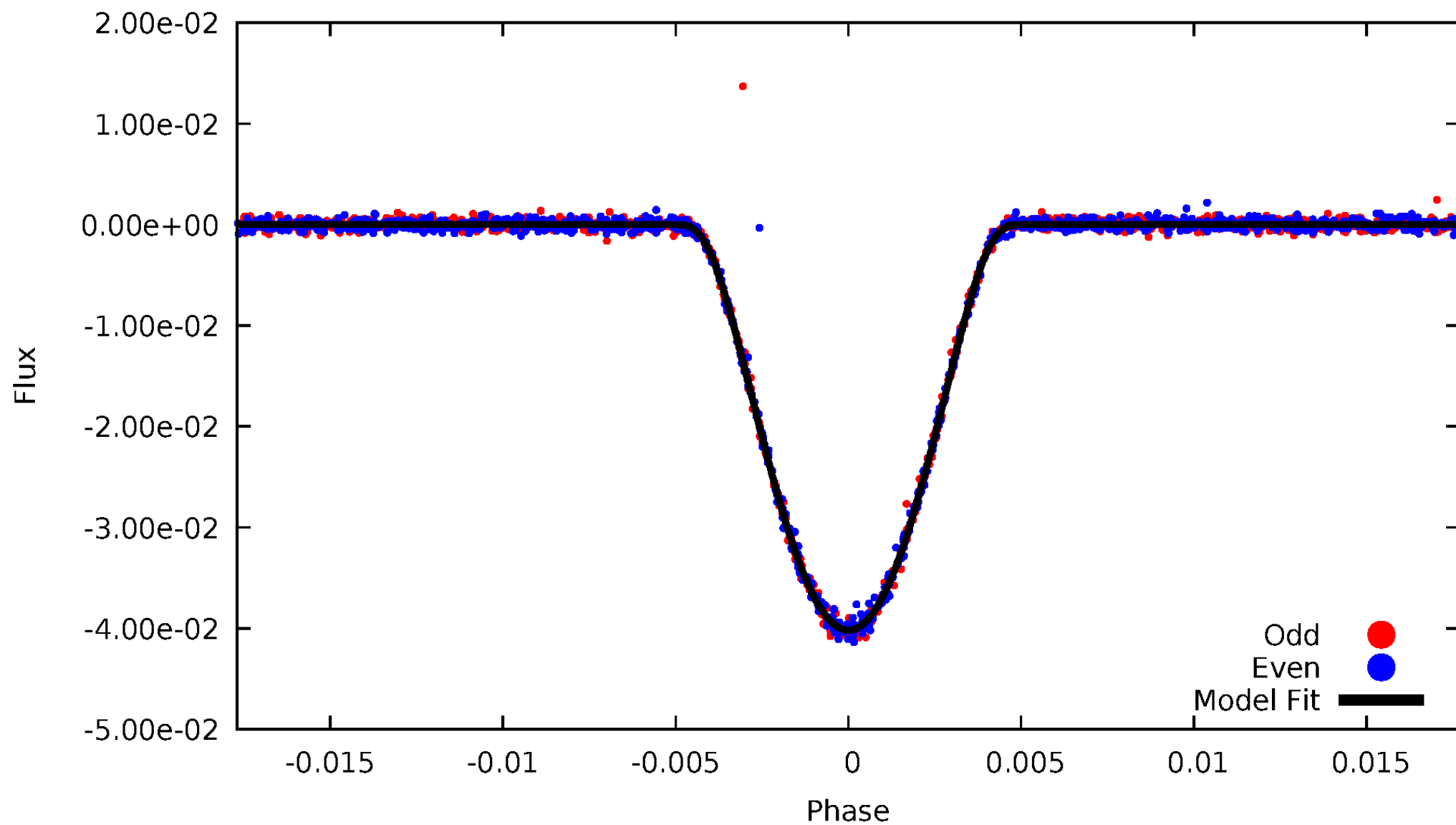


TCE 009016295-01



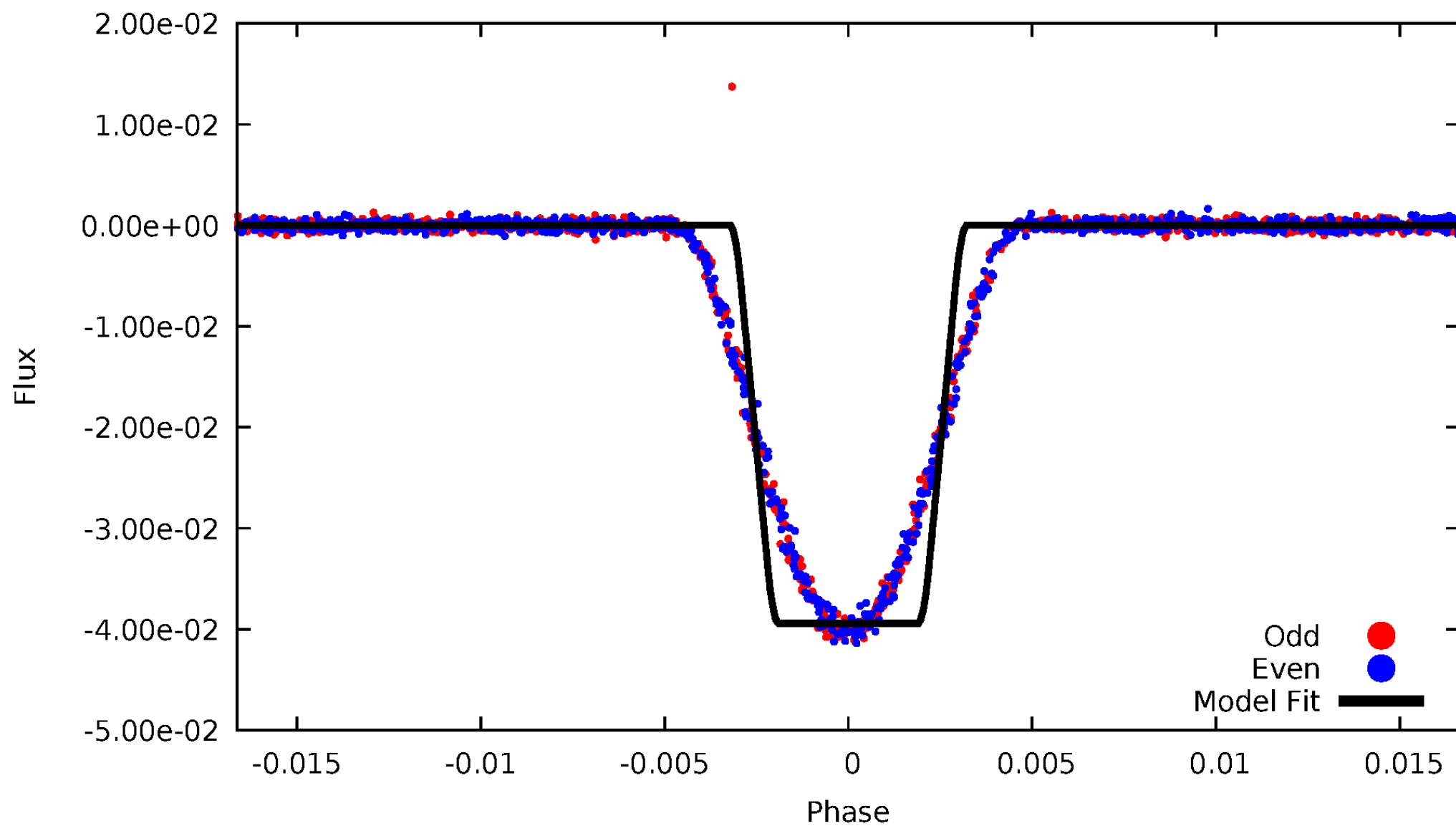
DV Odd/Even

TCE 009016295-01



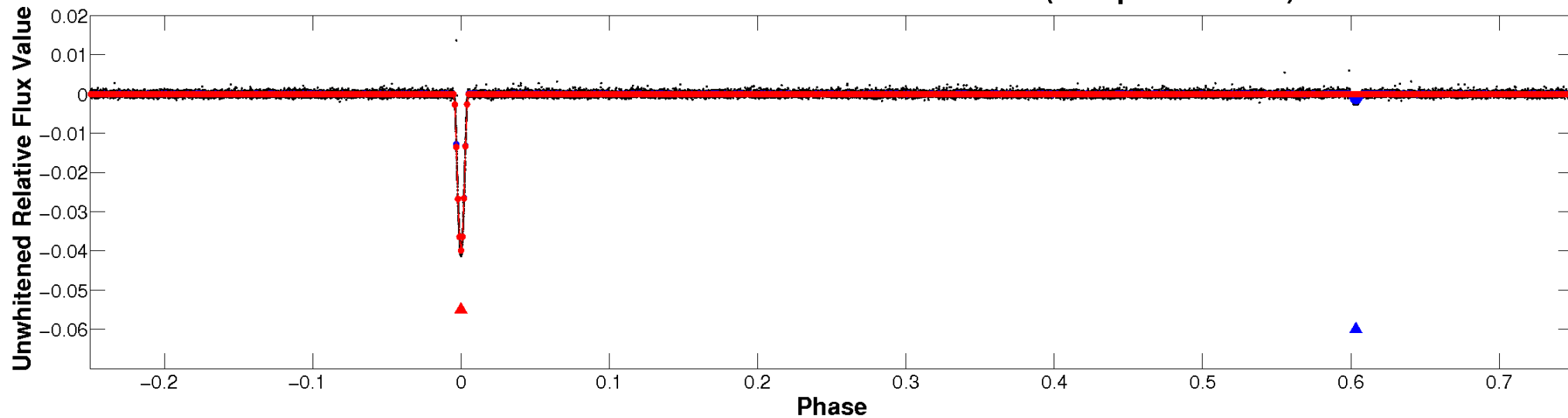
ALT Odd/Even

TCE 009016295-01

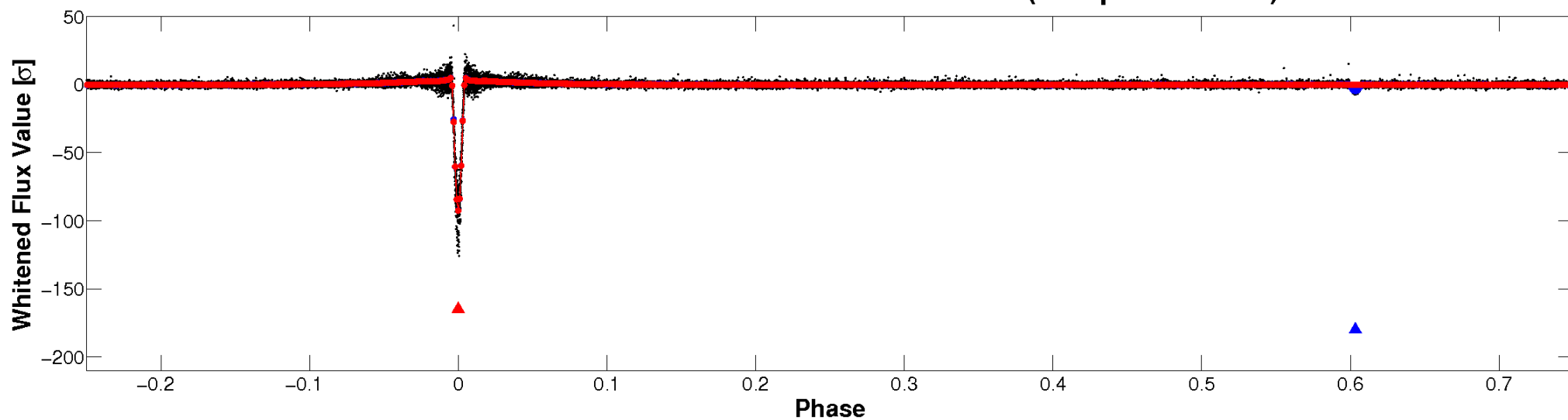


Non-Whitened Vs. Whitened Light Curve

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

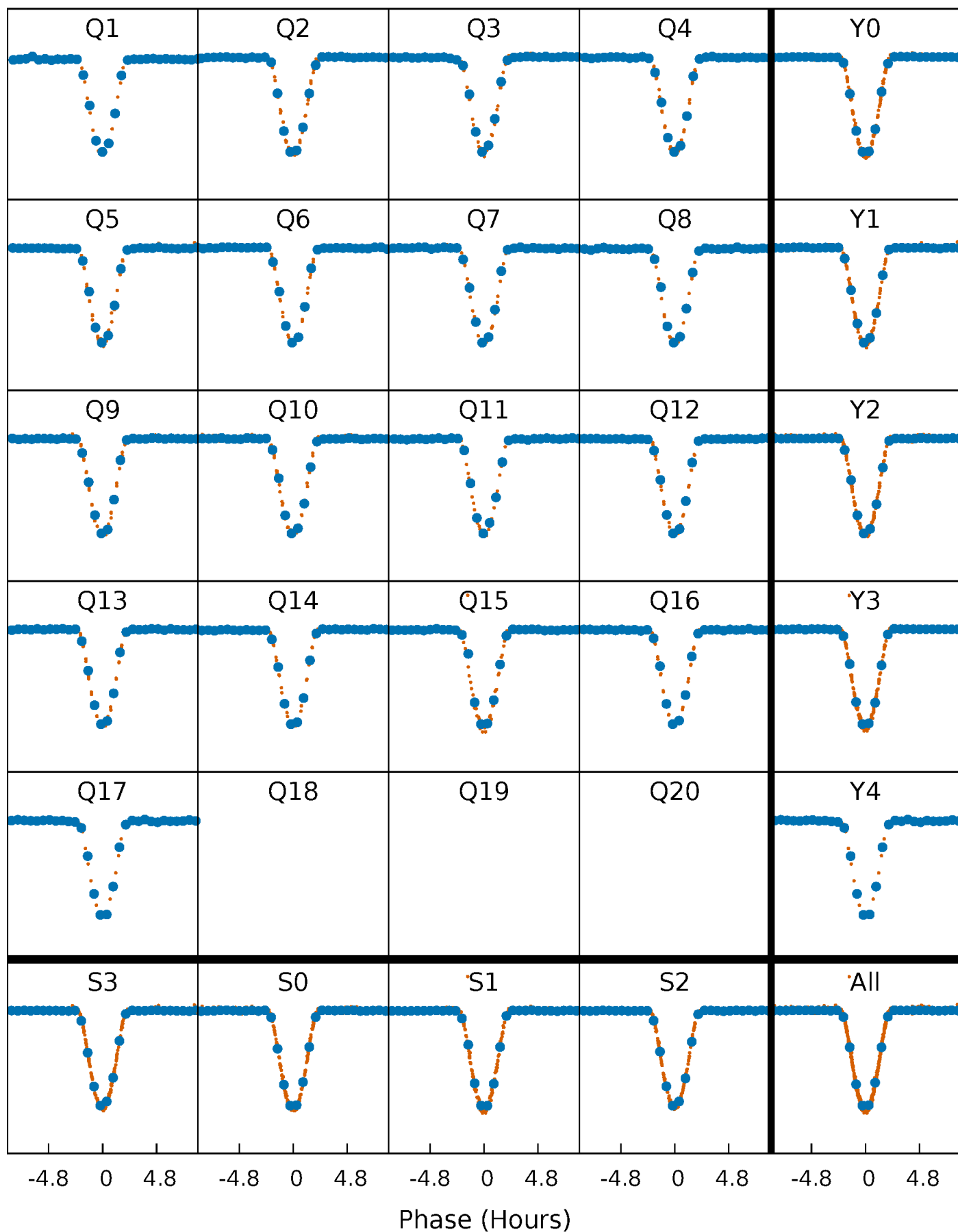


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



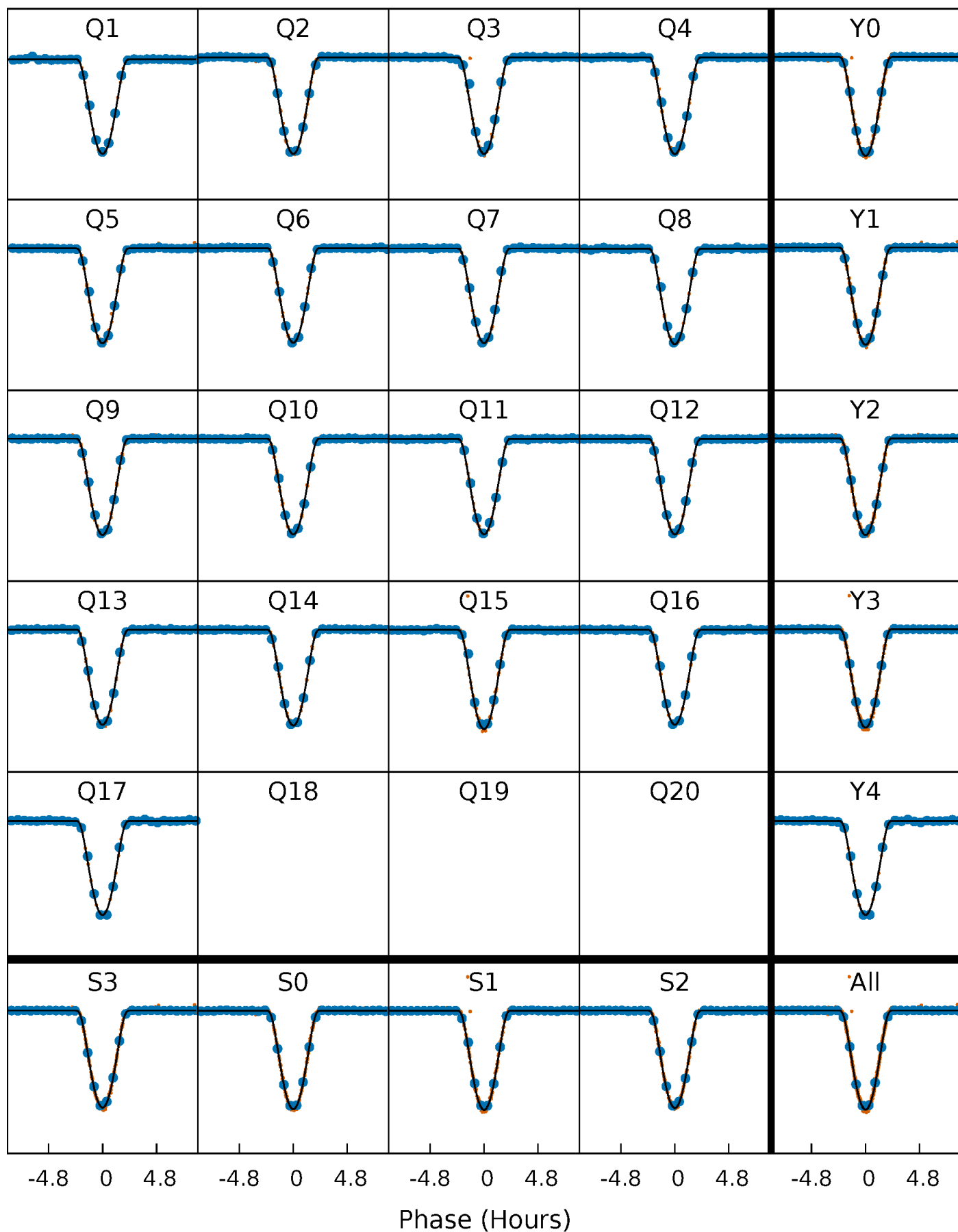
PDC Quarter-Phased Transit Curves

TCE 009016295-01 P= 19.974485 Days $T_0=131.681092$ (BKJD)



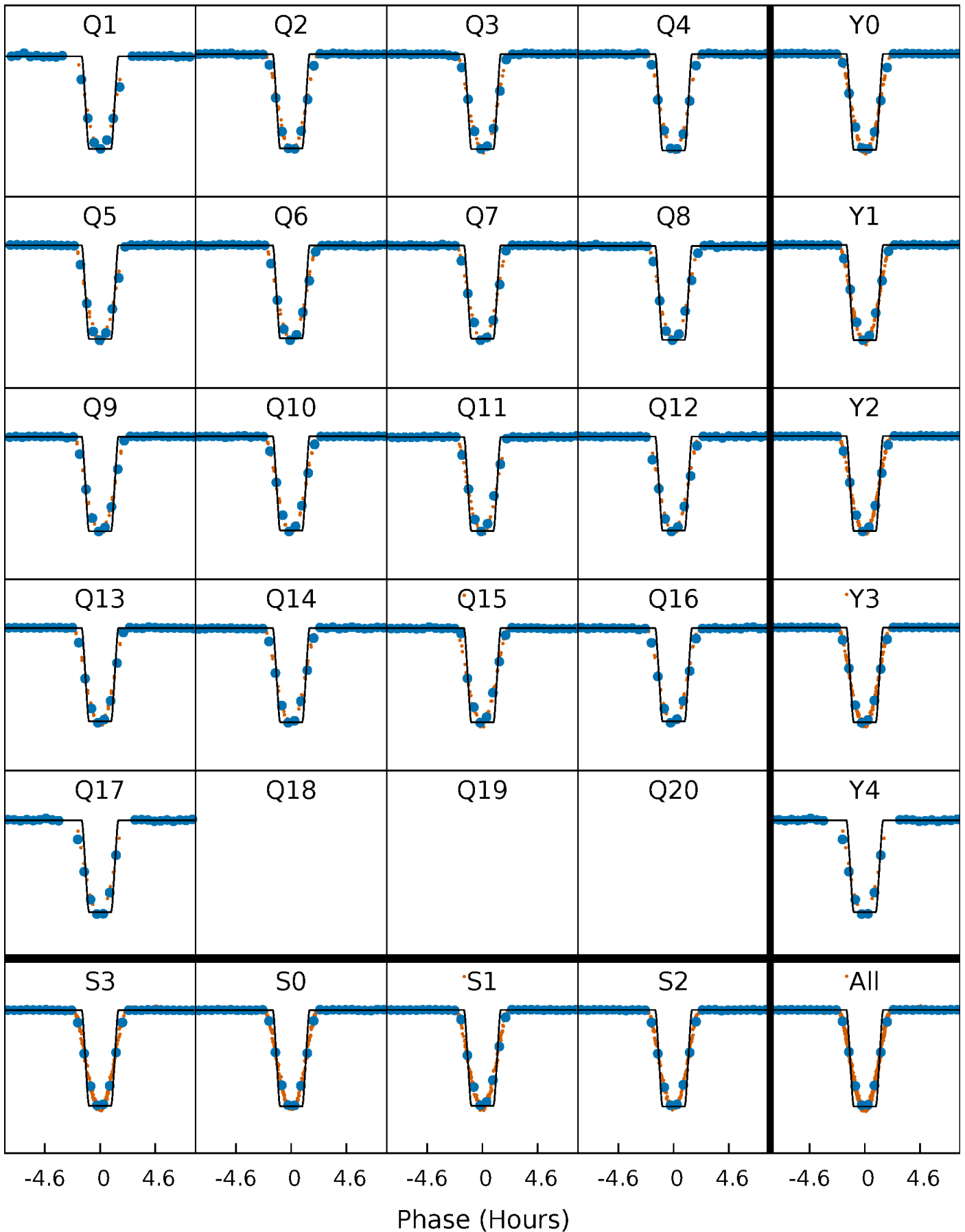
DV Quarter-Phased Transit Curves

TCE 009016295-01 P= 19.974485 Days $T_0=131.681092$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

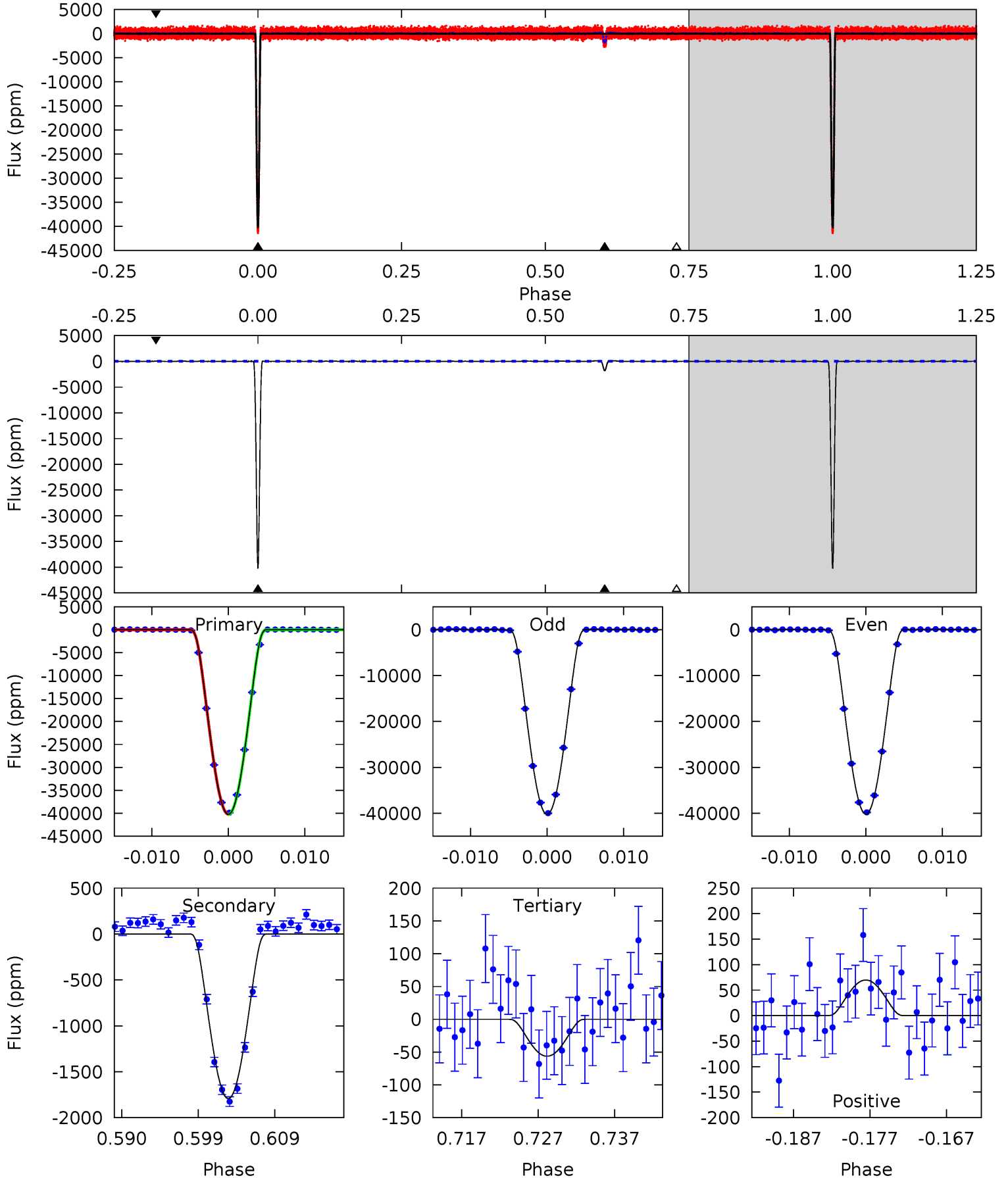
TCE 009016295-01 P= 19.974558 Days $T_0=131.678504$ (BKJD)



DV Model-Shift Uniqueness Test

009016295-01, P = 19.974485 Days, E = 111.706607 Days

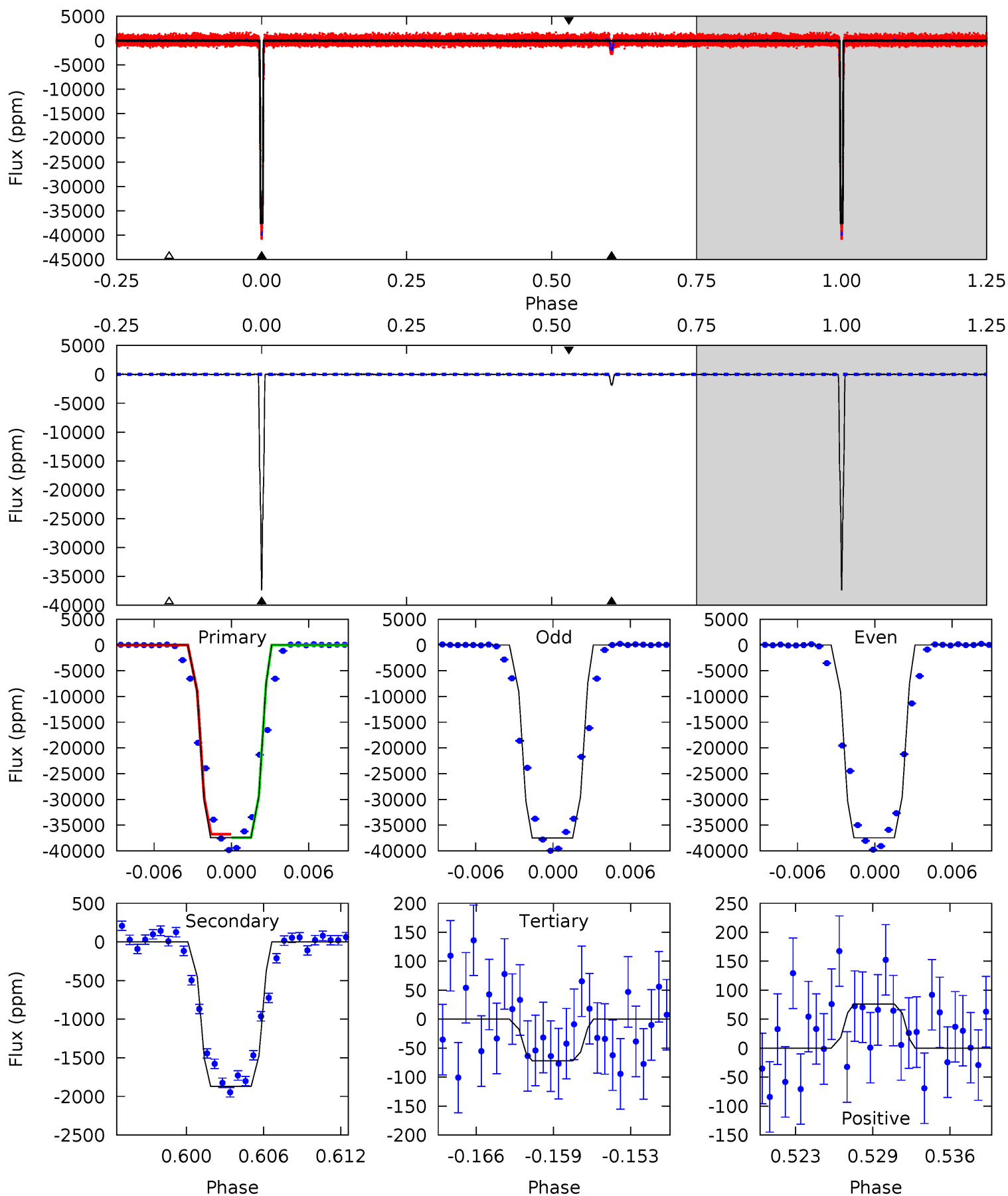
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2563	114.3	3.59	4.45	5.03	2.58	1.71	2560	2559	110.7	109.8	1.74	1.00	0.00	1.55



Alt Model-Shift Uniqueness Test

009016295-01, P = 19.974558 Days, E = 111.703946 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1486	74.2	2.85	3.02	5.11	2.73	1.04	1483	1483	71.4	71.2	0.20	1.00	0.00	11.4



Stellar Parameters For KIC 009016295

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6108^{+171}_{-214}	$4.471^{+0.052}_{-0.221}$	$-0.080^{+0.250}_{-0.300}$	$0.997^{+0.312}_{-0.104}$	$1.072^{+0.137}_{-0.150}$	$1.525^{+0.419}_{-0.782}$
	+3%/-4%	+1%/-5%	+312%/-375%	+31%/-10%	+13%/-14%	+27%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009016295-01 / KOI 0925.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1793 ± 16	$28.24^{+4.61}_{-2.45}$	999^{+75}_{-48}	3120^{+60}_{-63}	27^{+4}_{-7}
Alt.	-1869 ± 25	$22.22^{+3.70}_{-1.81}$	1002^{+71}_{-52}	3378^{+66}_{-81}	44^{+7}_{-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 $A_{\text{obs}} \gg 1.0$

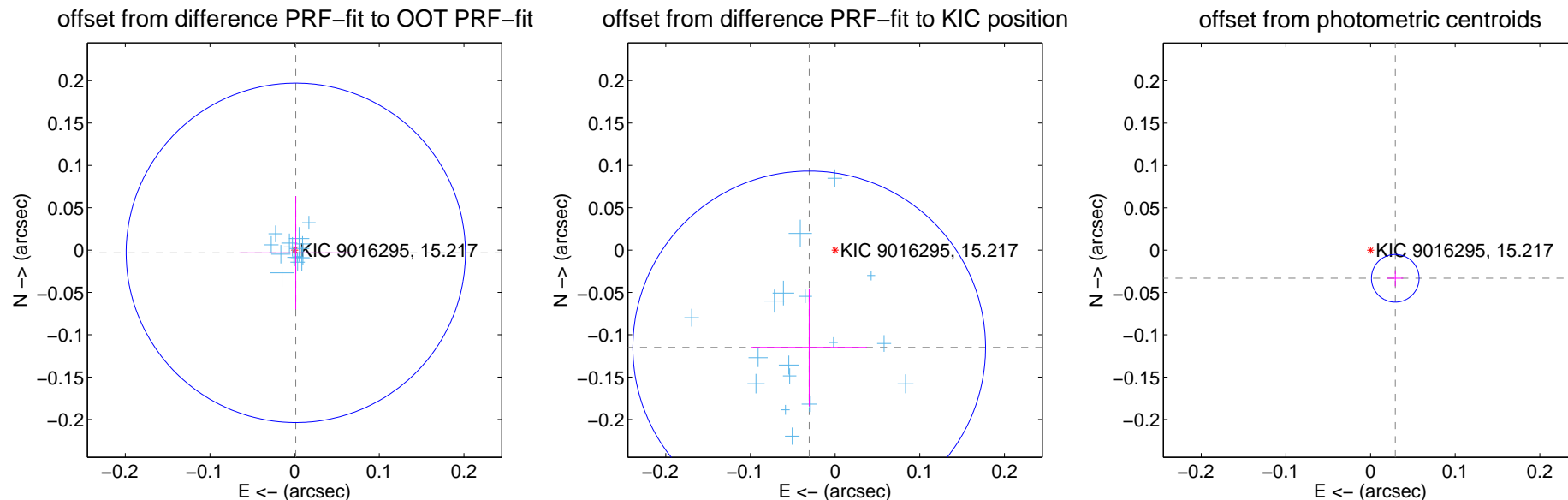
DV Centroid Data

Supplemental centroid analysis for 009016295-01. Kepler magnitude: 15.22. Transit SNR 1341.29

There are 17 quarters with good PRF difference image offsets

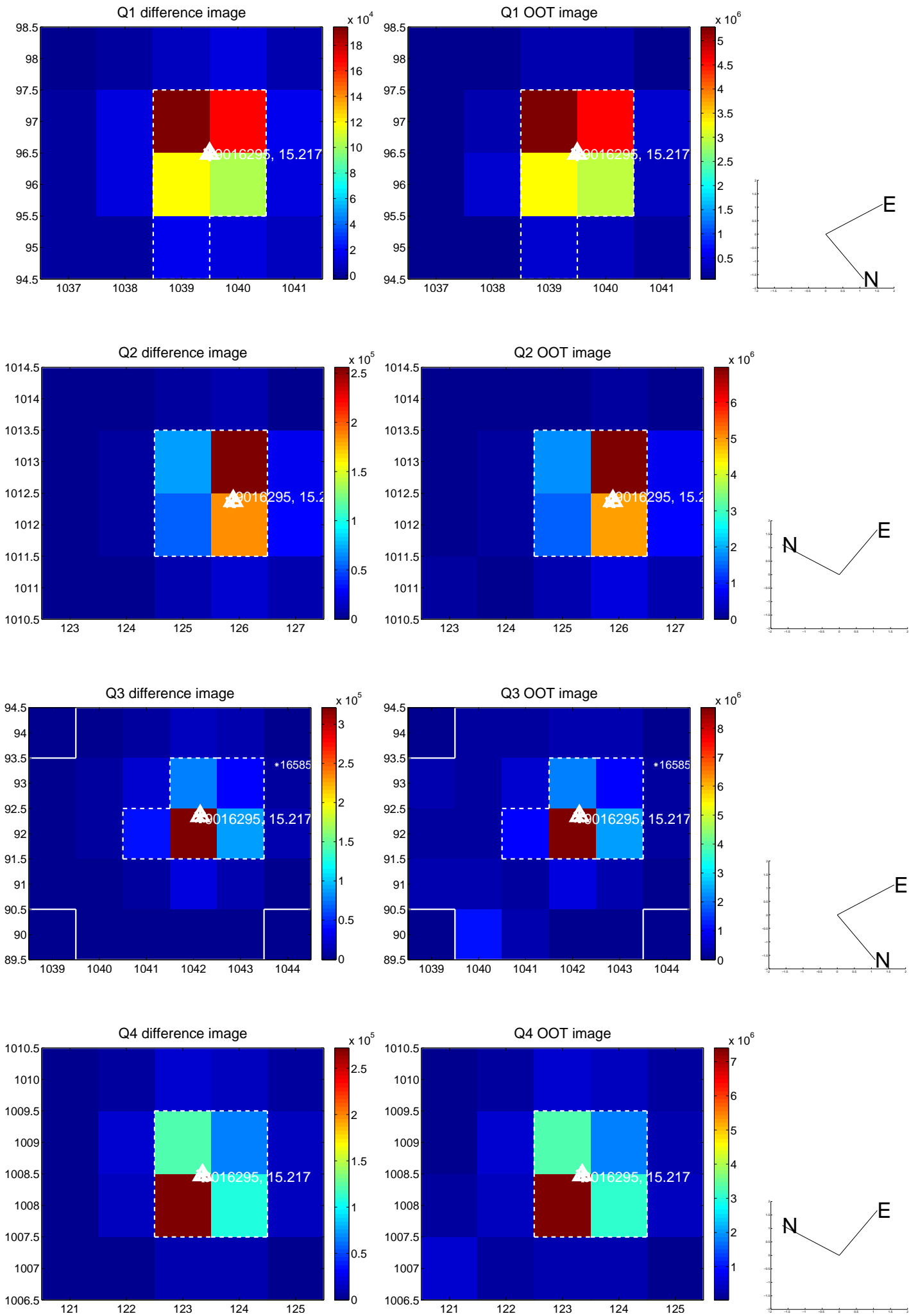
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.004 ± 0.067	0.05	-0.001 ± 0.067	-0.003 ± 0.067
PRF-fit source offset from KIC position	0.119 ± 0.069	1.71	0.031 ± 0.068	-0.115 ± 0.069
photometric centroid source offset	0.04 ± 0.01	4.71	-0.03 ± 0.01	-0.03 ± 0.01

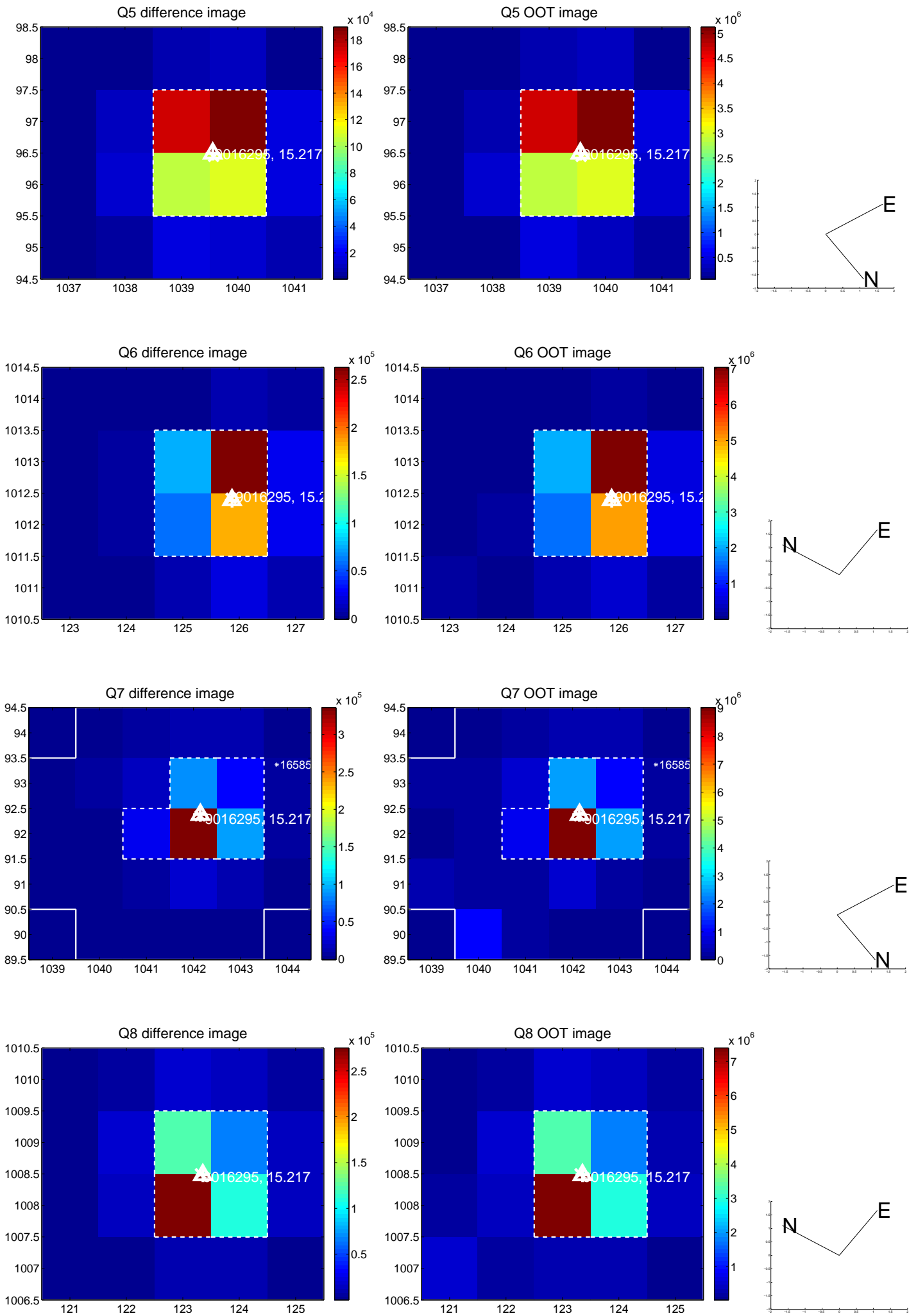


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

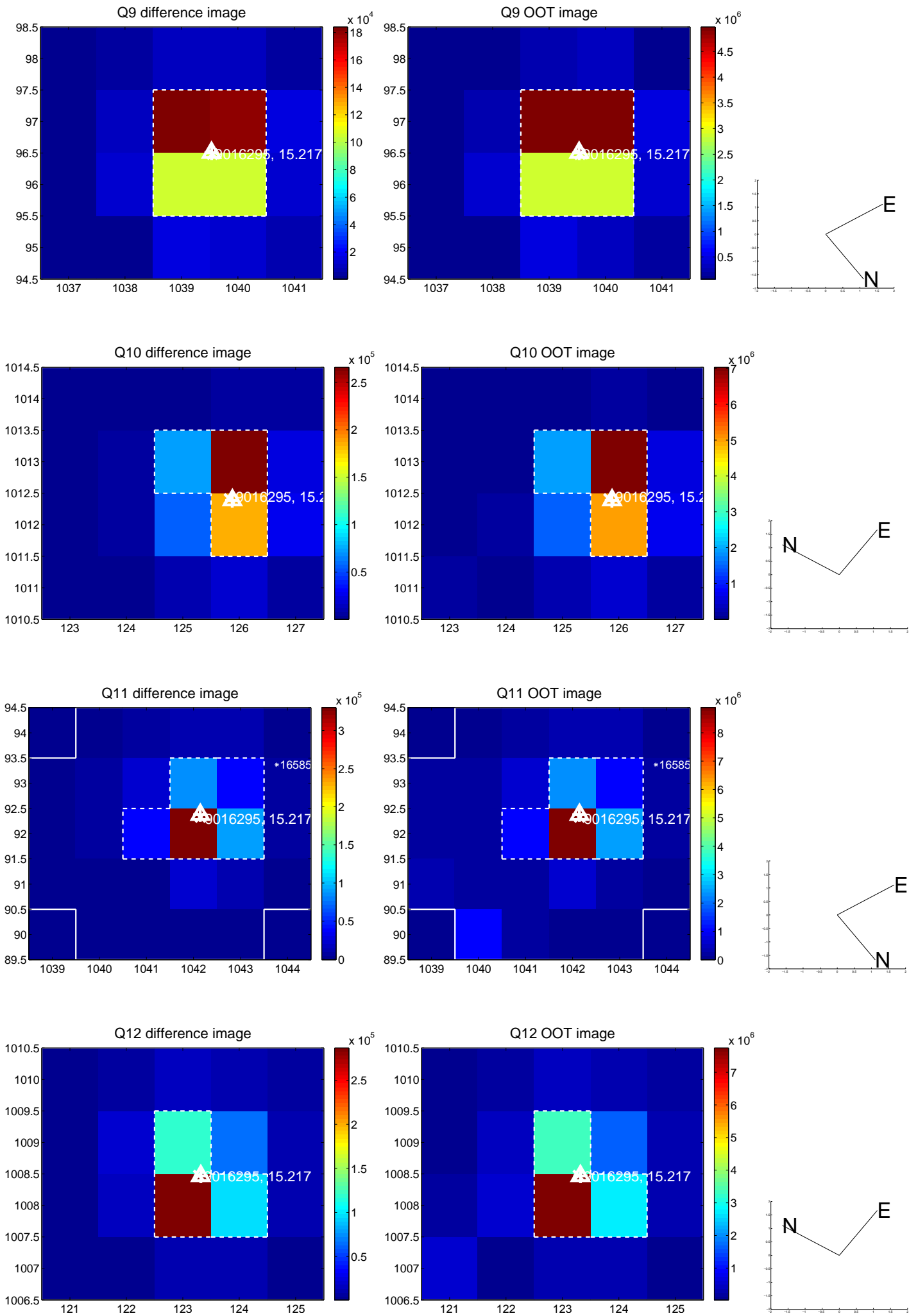
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



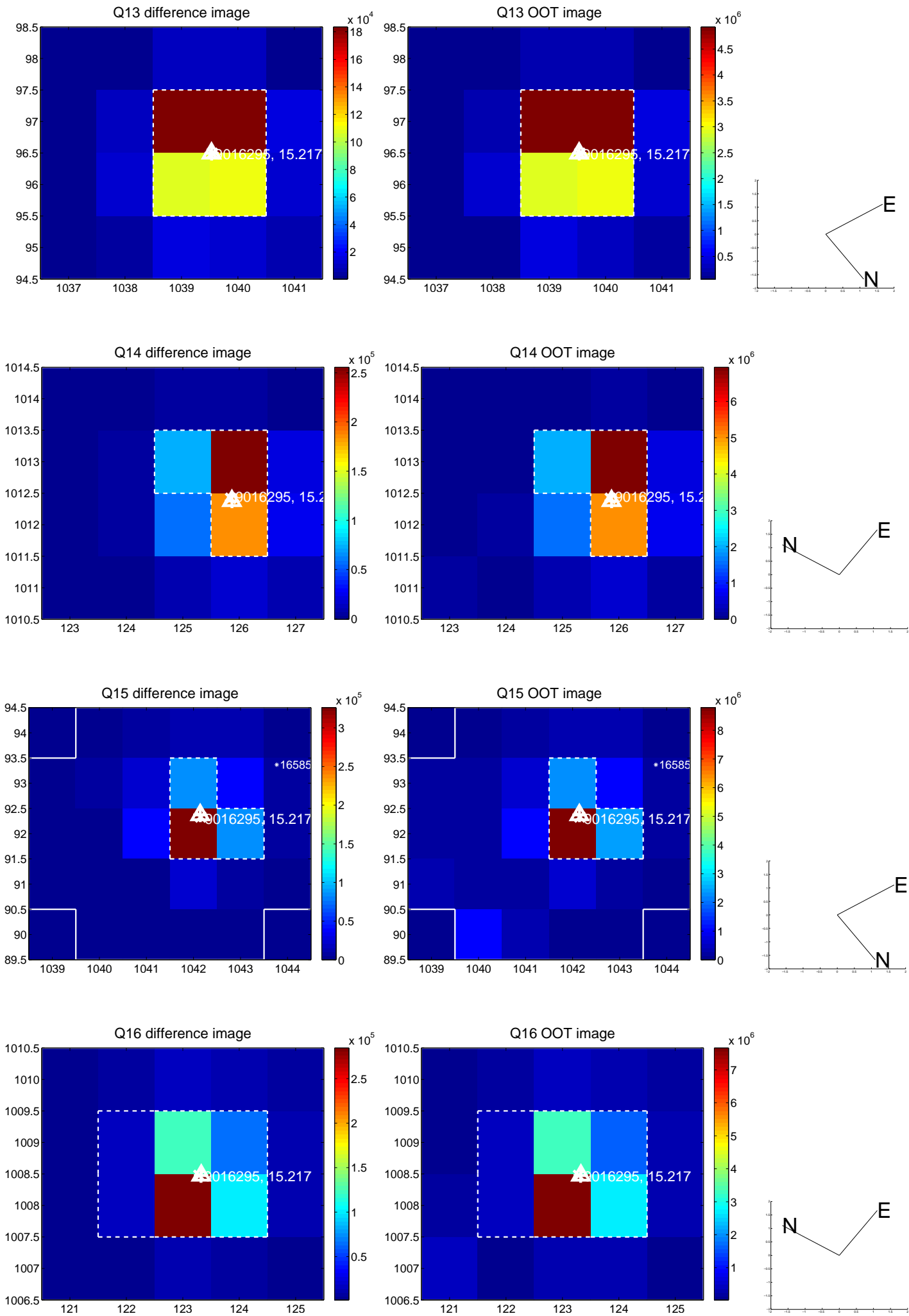
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



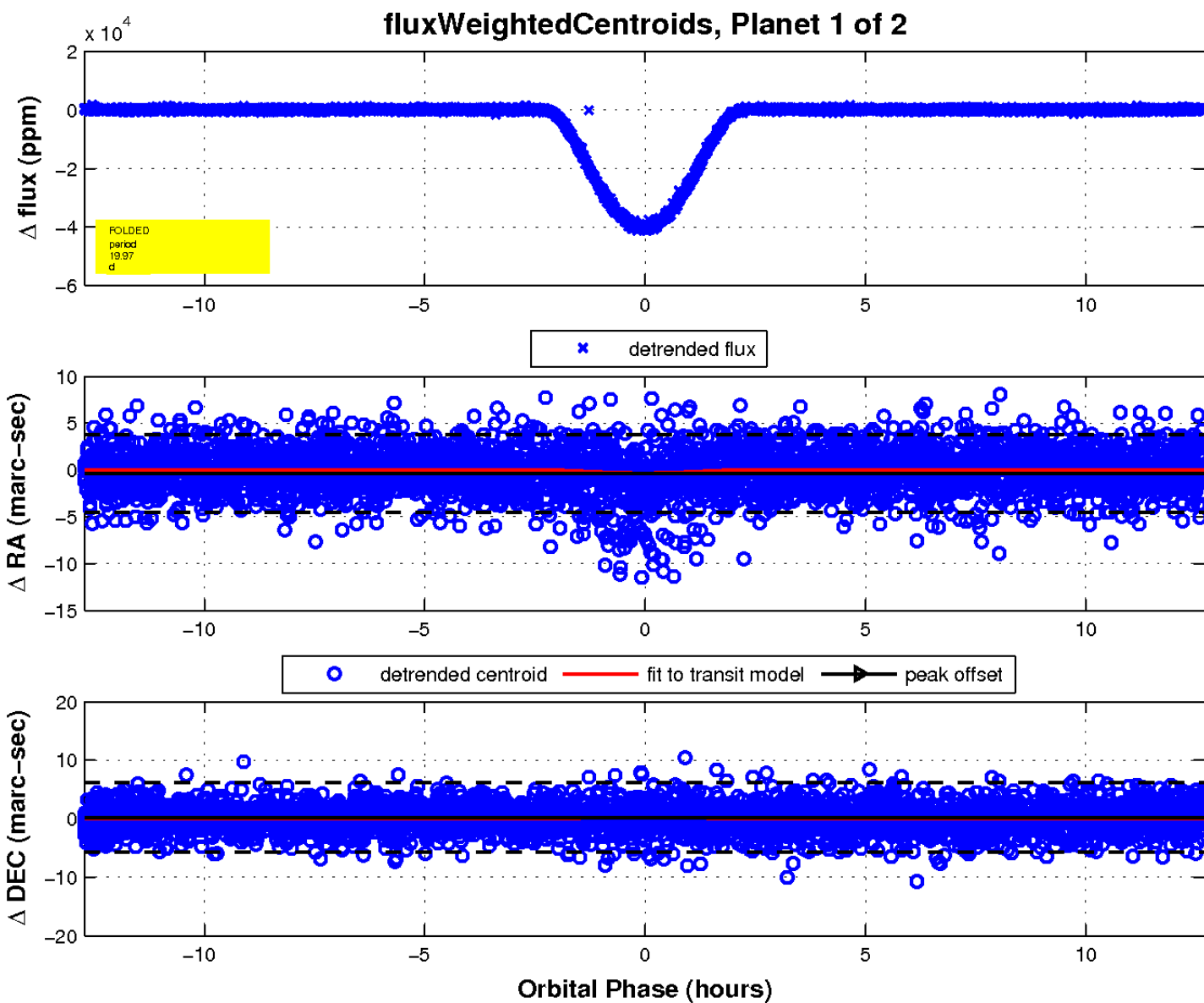
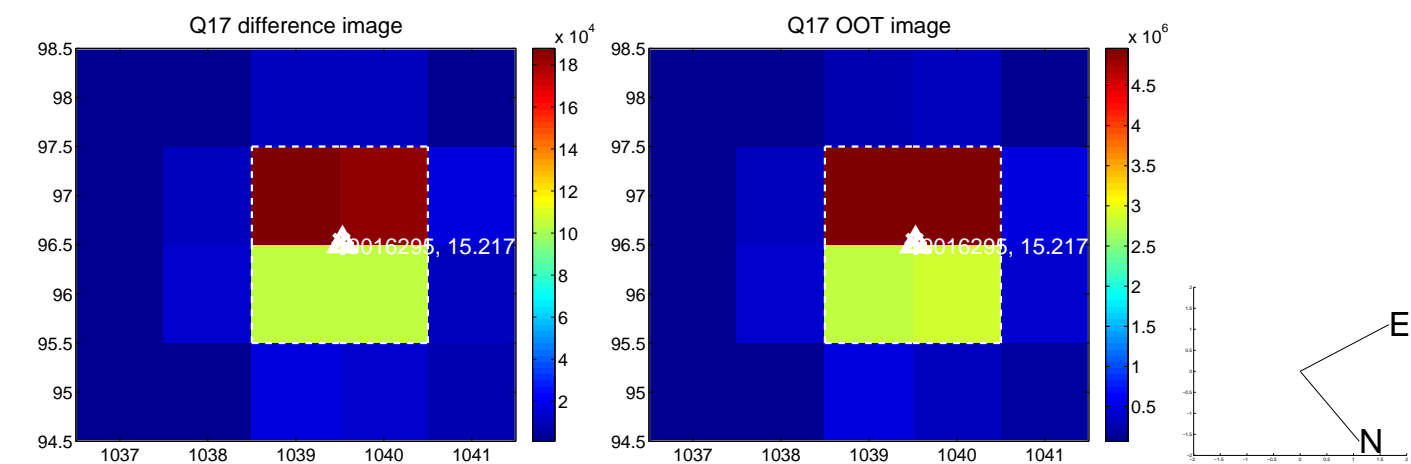
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

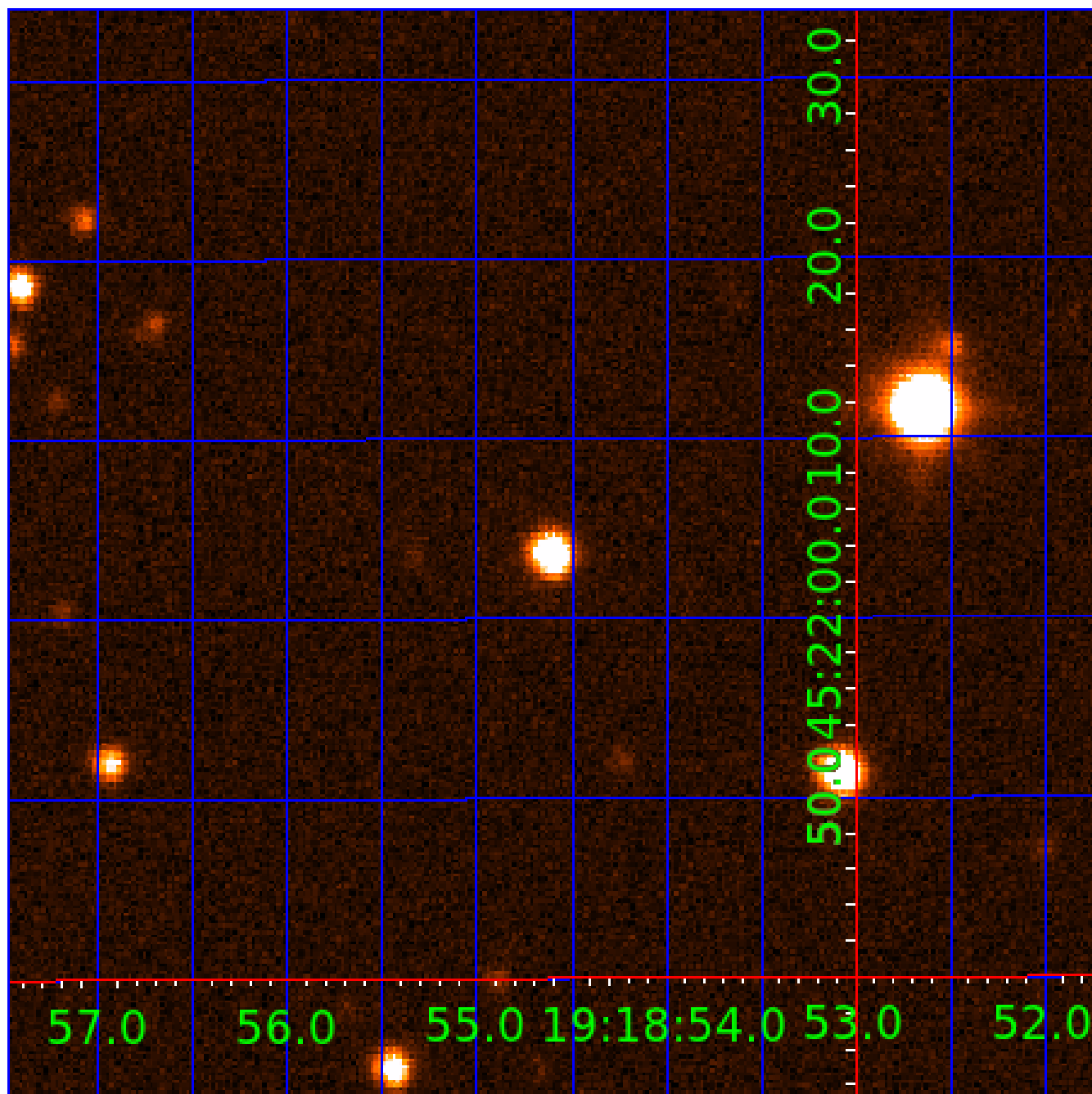


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009016295

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})
009016295-01	OBS	0925.01	19.974485	131.681092	40199.0	4.241	1464.2	1341.3	1.00	6108	27.36	56.97
009016295-02	OBS	No	19.974482	143.733618	1946.1	4.063	72.1	70.5	1.00	6108	5.91	56.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009016295-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009016295-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

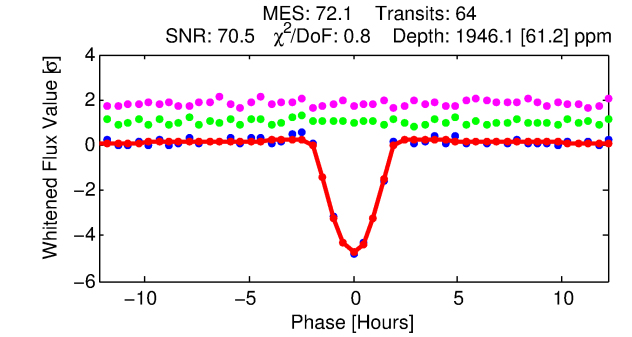
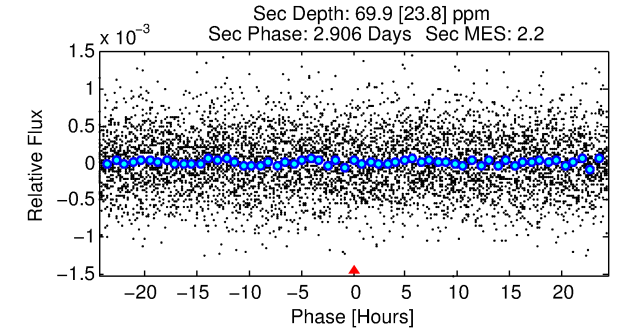
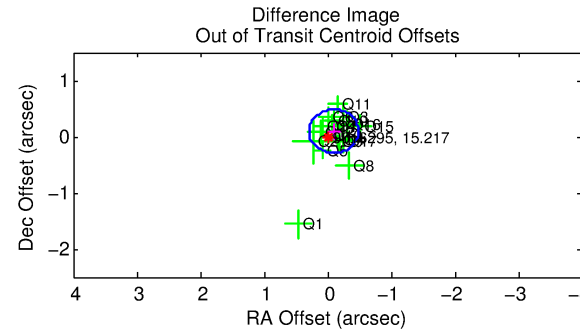
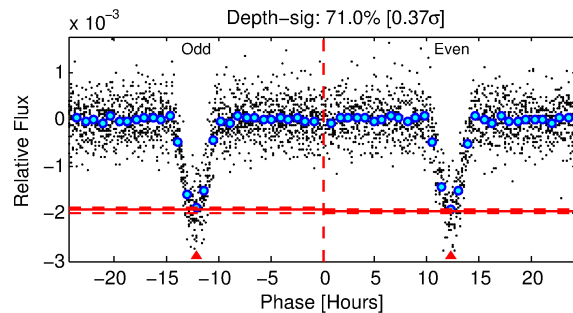
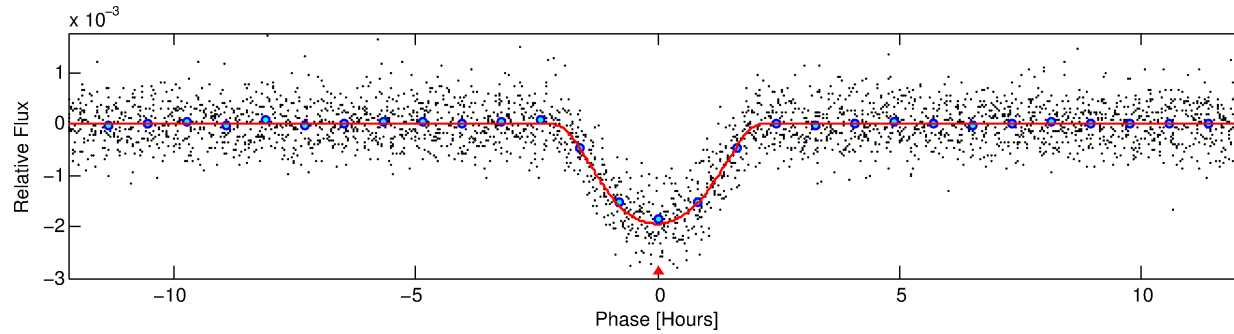
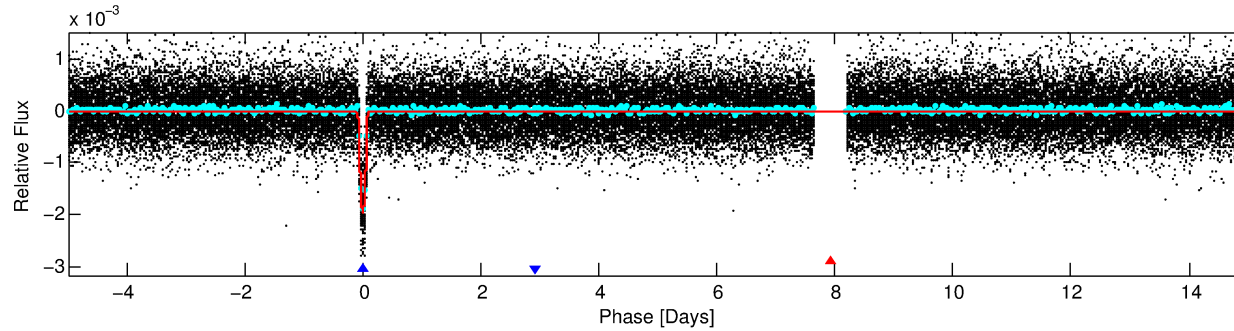
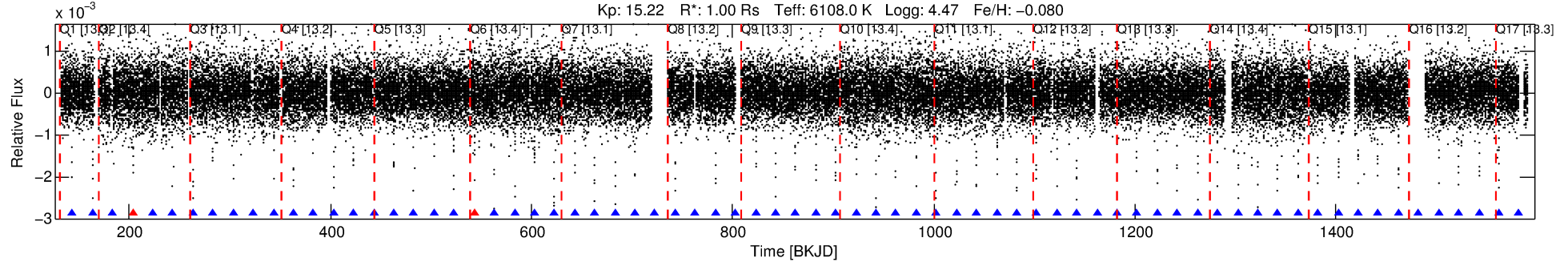
Ephemeris Match Information For 009016295-02

No Significant Match Found

DV One-Page Summary

KIC: 9016295 Candidate: 2 of 2 Period: 19.974 d
KOI: K00925 Corr: No Ephemeris Match

Kp: 15.22 R*: 1.00 Rs Teff: 6108.0 K Logg: 4.47 Fe/H: -0.080



DV Fit Results:

Period = 19.97448 [0.00003] d
Epoch = 143.7336 [0.0014] BKJD
Rp/R* = 0.0543 [0.0056]
a/R* = 16.35 [0.97]
b = 0.96 [0.01]
Seff = 56.97 [24.05]
Teq = 701 [74] K
Rp = 5.91 [1.95] Re
a = 0.1475 [0.0397] AU
Ag = 23.93 [13.47] [1.70σ]
Teffp = 2396 [252] K [6.45σ]

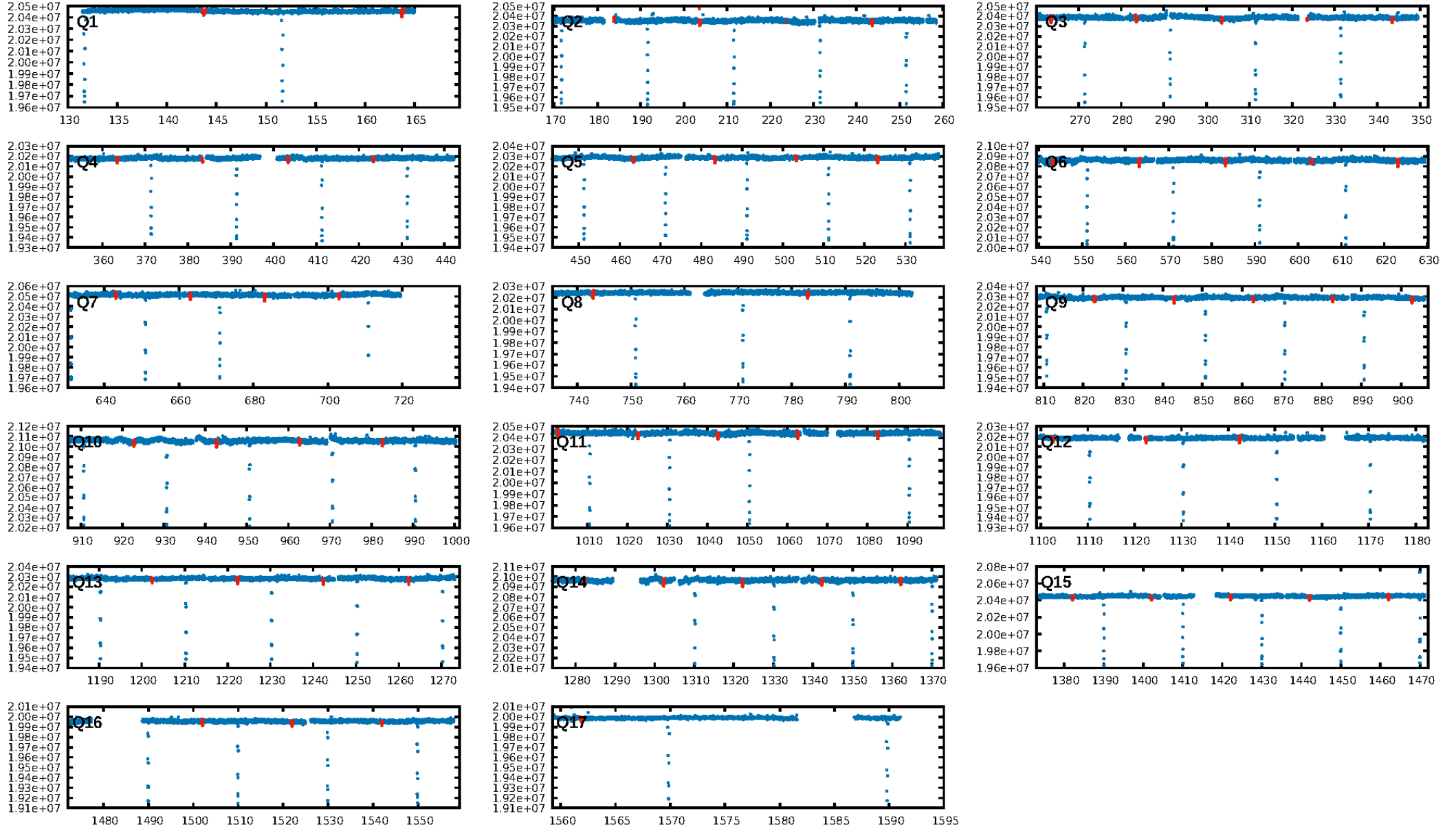
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 28.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.97 [59/61]
GhostDiagnostic-chr: 3.883
Centroid-sig: 5.0%
Centroid-so: 0.367 arcsec [1.88σ]
OotOffset-rm: 0.135 arcsec [1.05σ]
KicOffset-rm: 0.090 arcsec [0.86σ]
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]

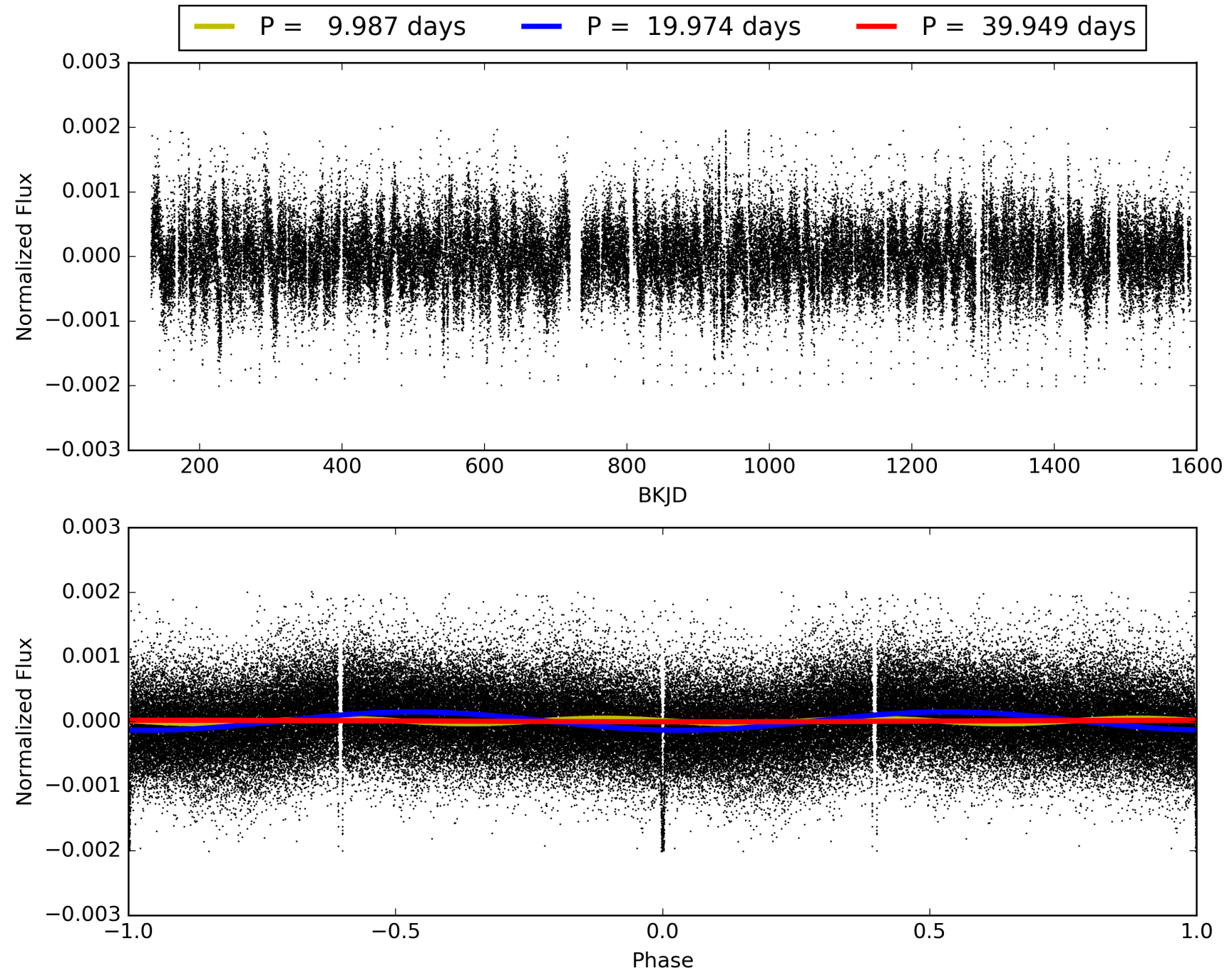
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:42:29 Z

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

TCE 009016295-02, PDC Light Curves

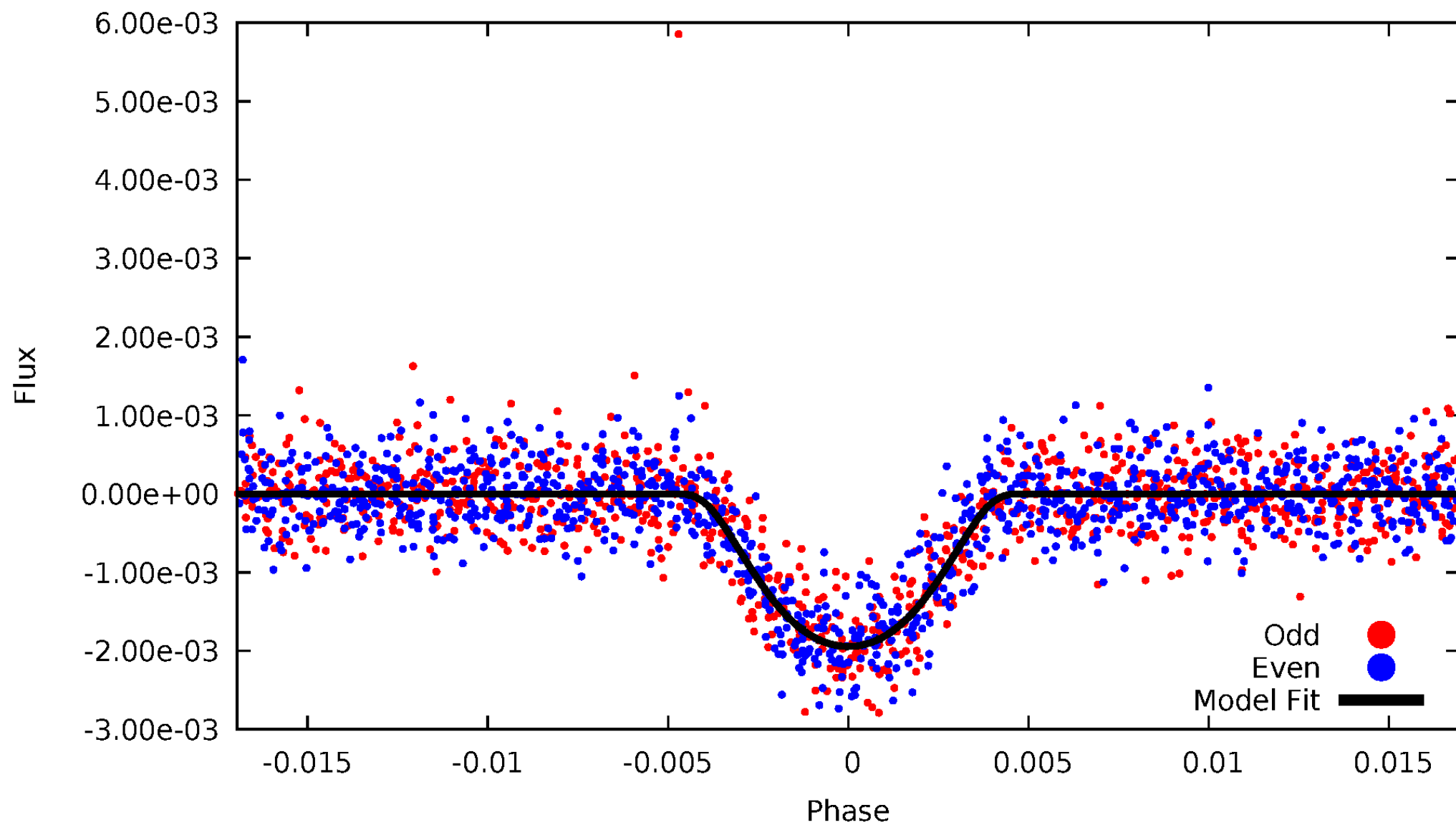


TCE 009016295-02



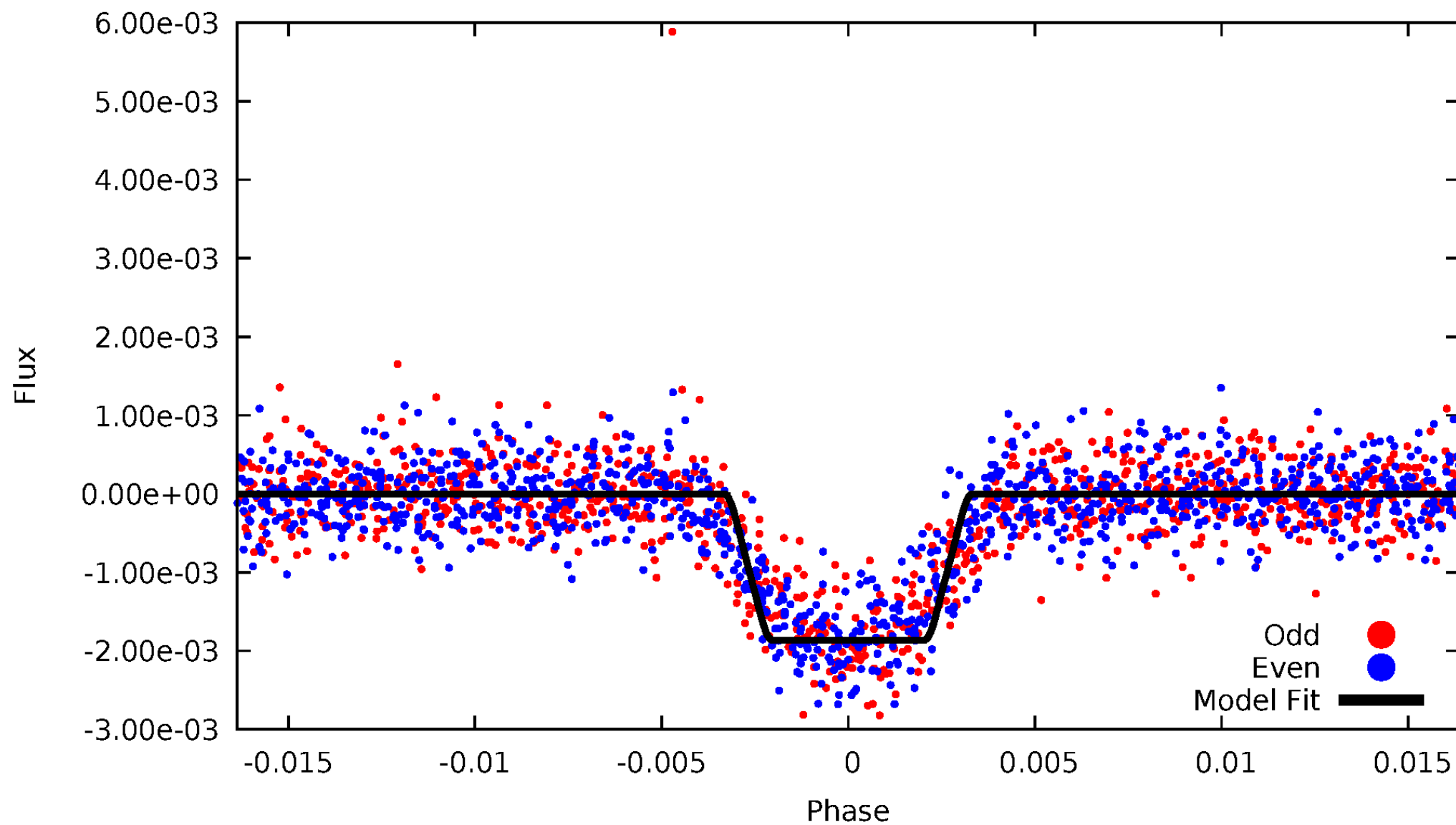
DV Odd/Even

TCE 009016295-02



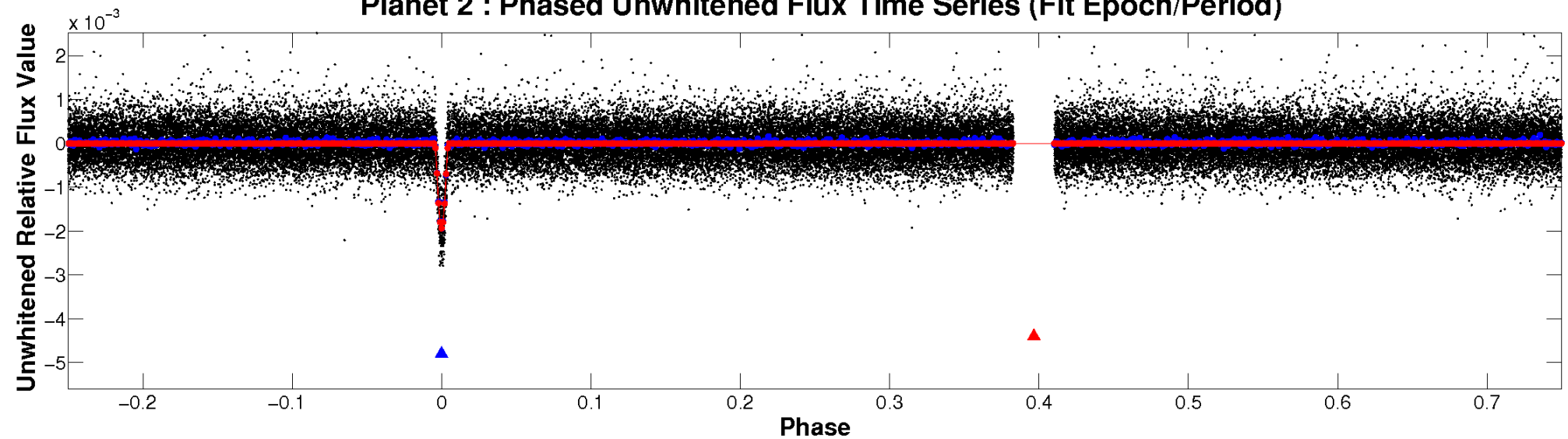
ALT Odd/Even

TCE 009016295-02

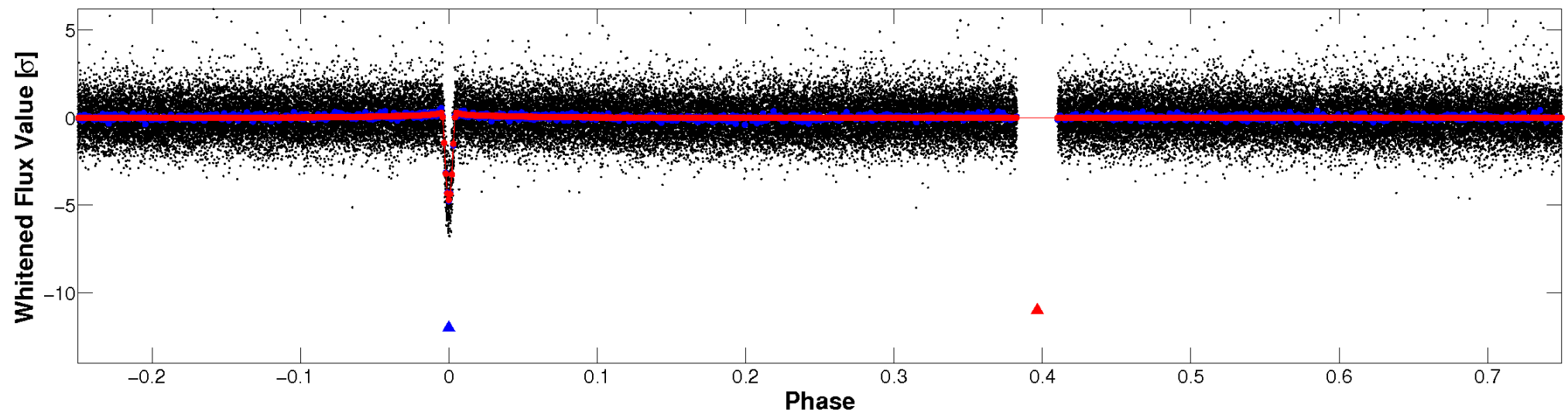


Non-Whitened Vs. Whitened Light Curve

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

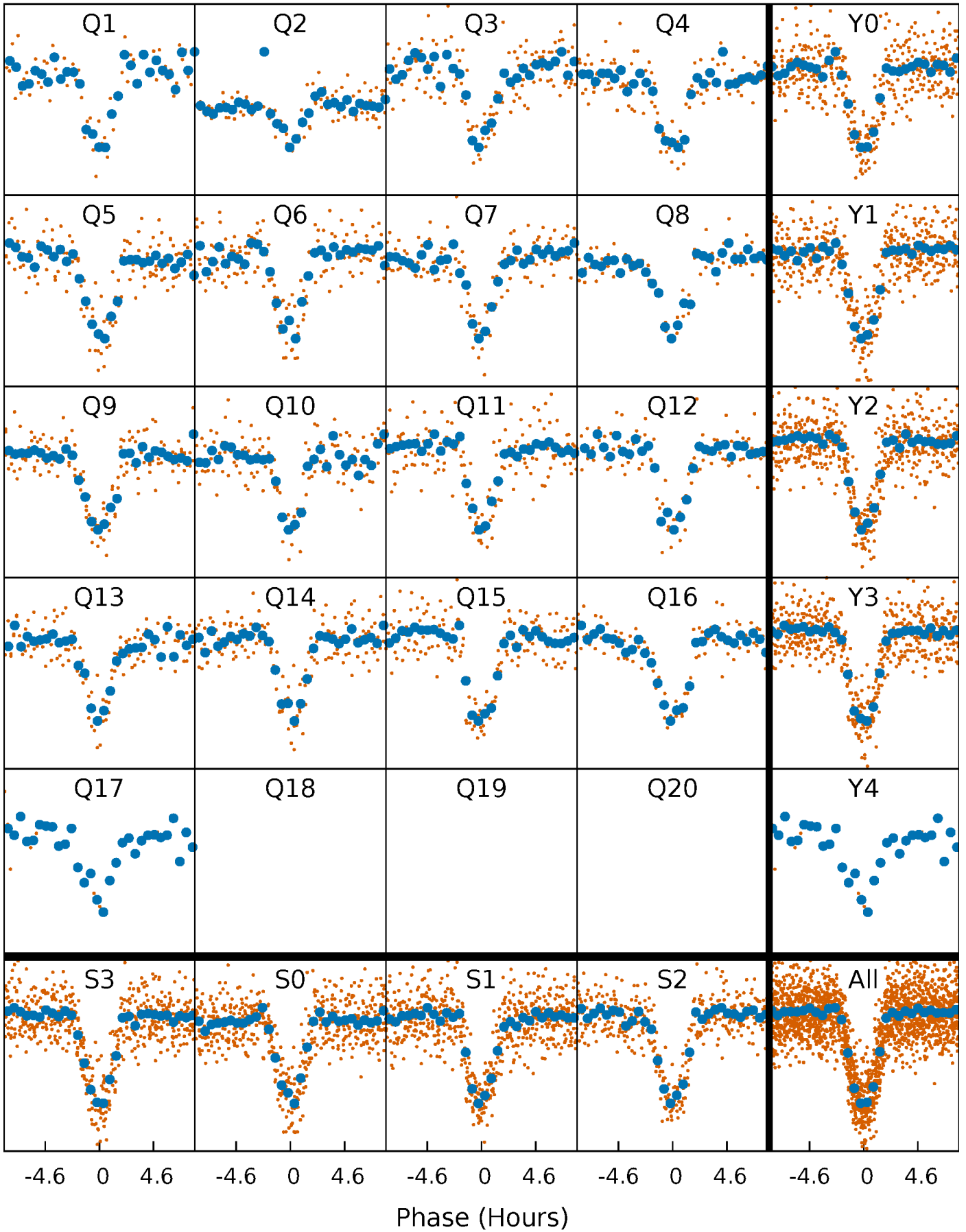


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



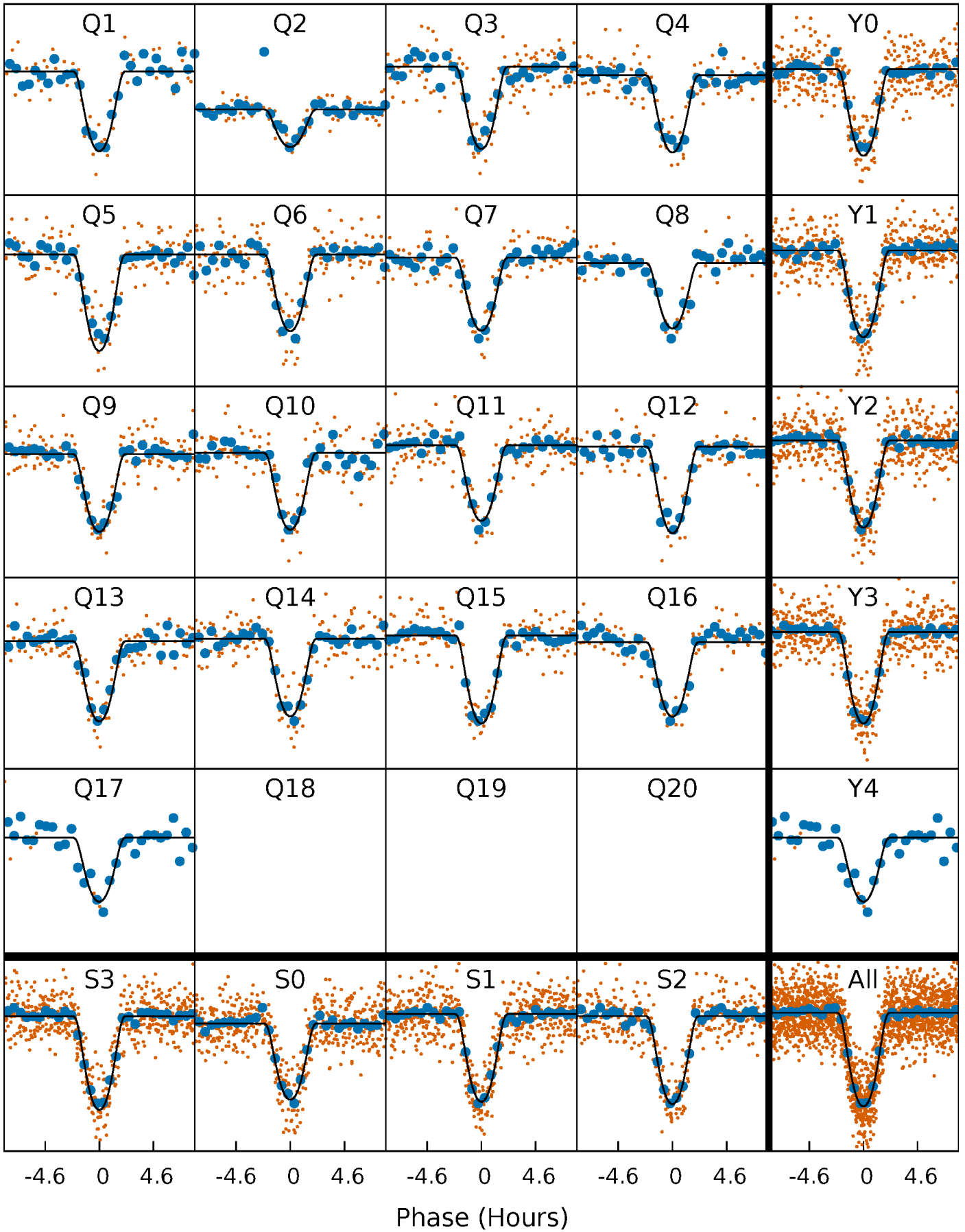
PDC Quarter-Phased Transit Curves

TCE 009016295-02 P= 19.974482 Days $T_0=143.733618$ (BKJD)



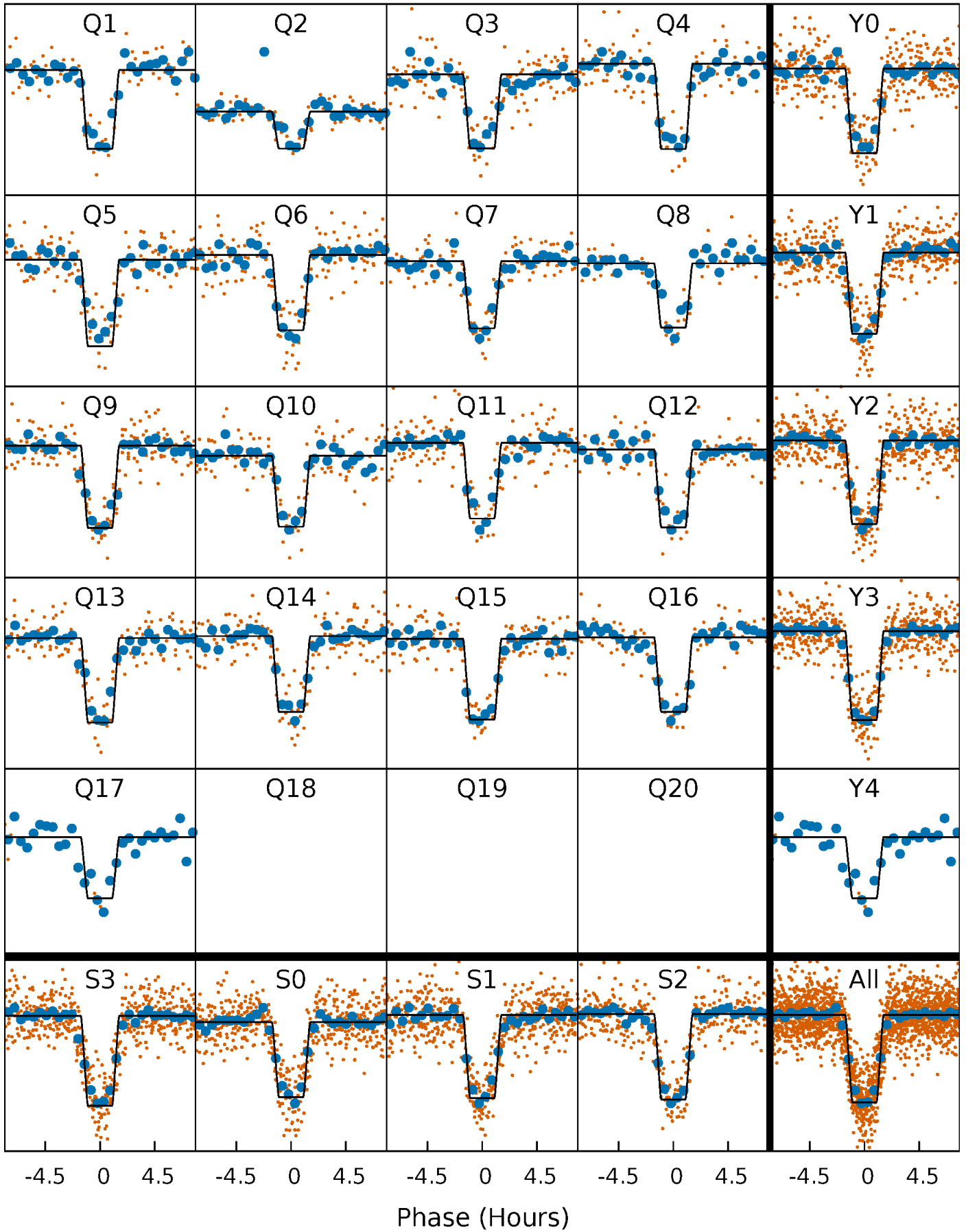
DV Quarter-Phased Transit Curves

TCE 009016295-02 P= 19.974482 Days $T_0=143.733618$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

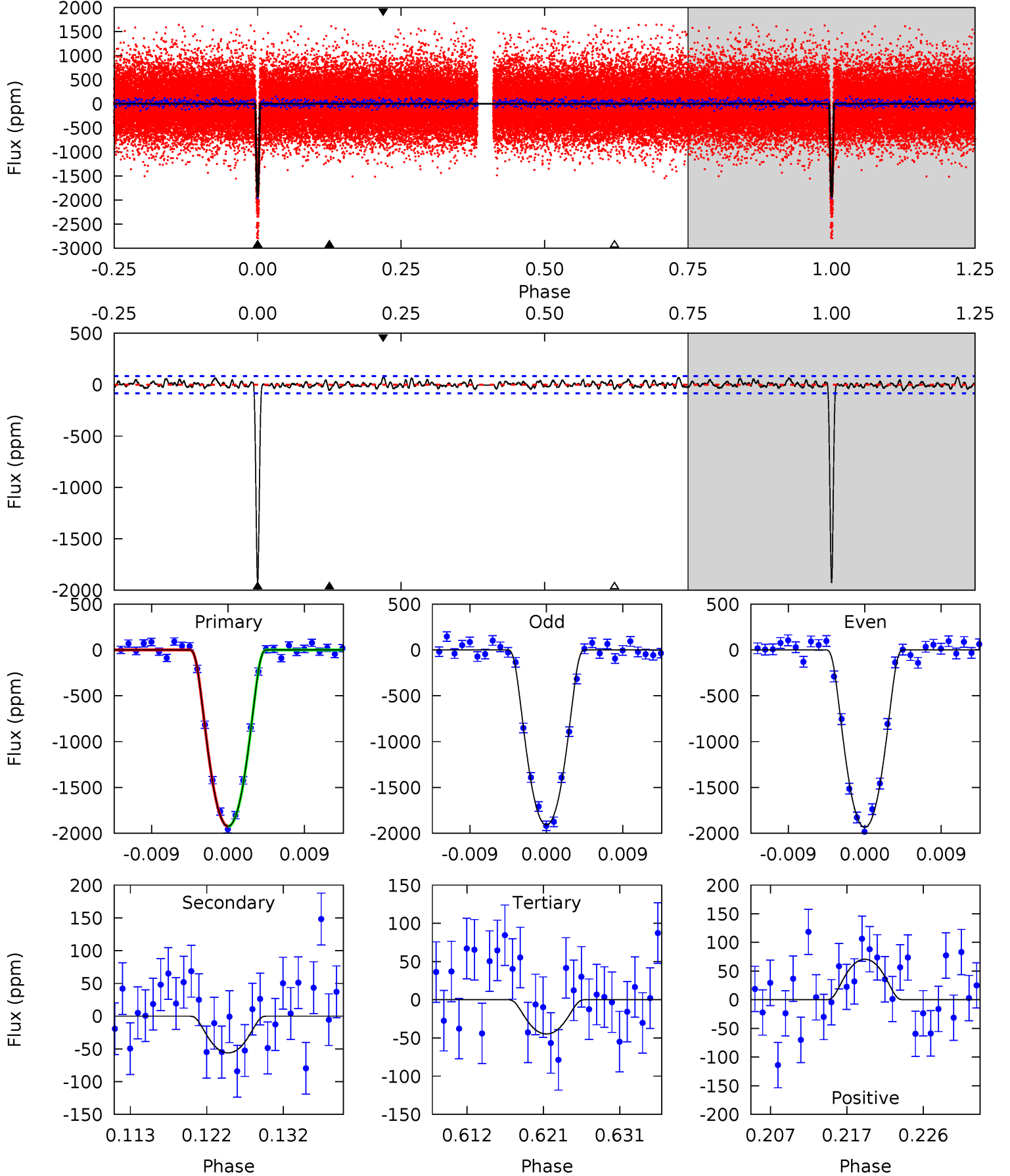
TCE 009016295-02 P= 19.974482 Days $T_0=143.733724$ (BKJD)



DV Model-Shift Uniqueness Test

009016295-02, $P = 19.974482$ Days, $E = 123.759136$ Days

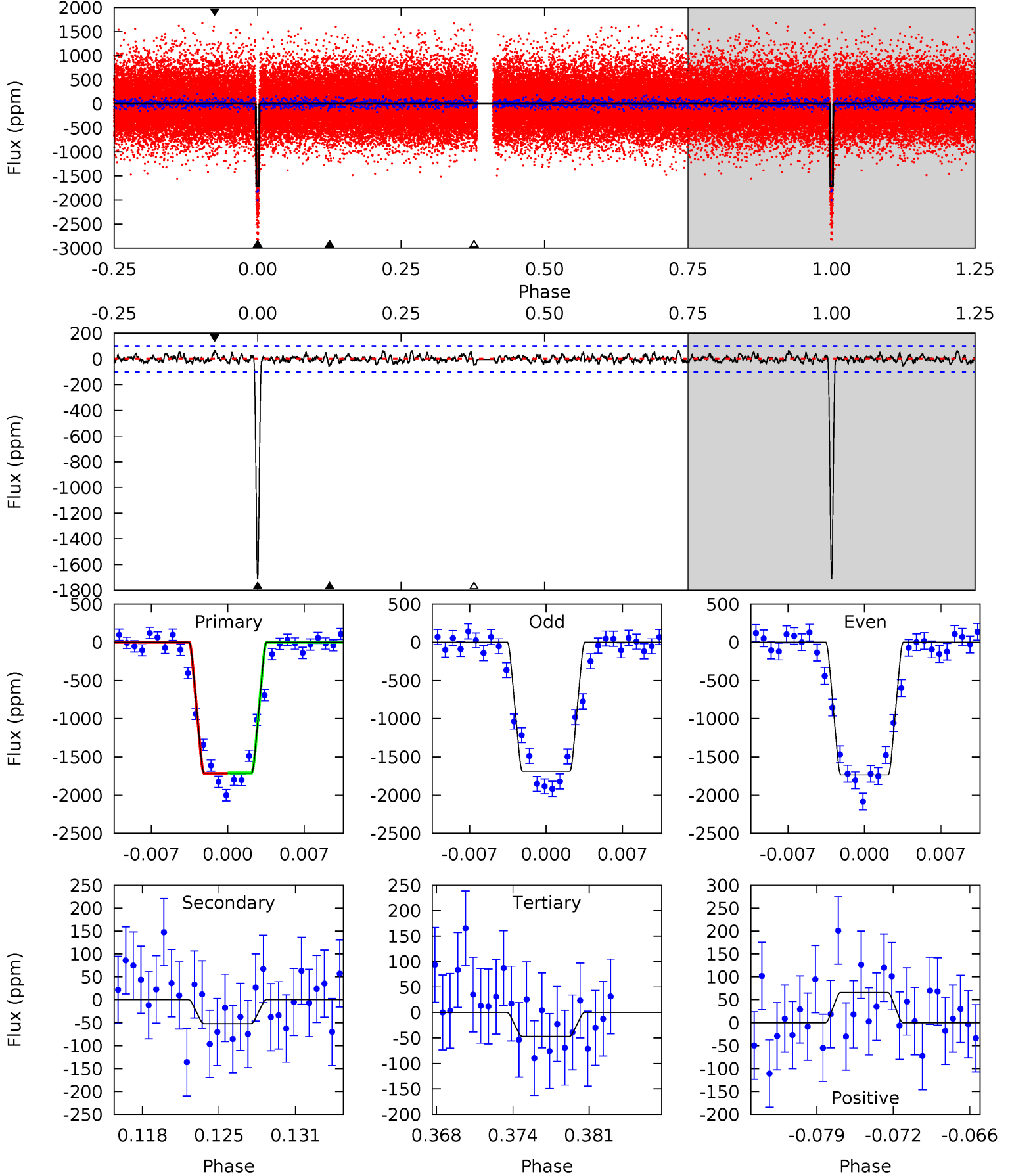
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
115.7	3.38	2.69	4.25	5.04	2.60	1.30	113.0	111.4	0.68	-0.87	0.77	1.00	0.04	0.04



Alt Model-Shift Uniqueness Test

009016295-02, $P = 19.974482$ Days, $E = 123.759242$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
86.4	2.62	2.36	3.32	5.11	2.72	1.00	84.0	83.0	0.26	-0.69	1.17	0.99	0.04	0.11



Stellar Parameters For KIC 009016295

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6108^{+171}_{-214}	$4.471^{+0.052}_{-0.221}$	$-0.080^{+0.250}_{-0.300}$	$0.997^{+0.312}_{-0.104}$	$1.072^{+0.137}_{-0.150}$	$1.525^{+0.419}_{-0.782}$
	+3%/-4%	+1%/-5%	+312%/-375%	+31%/-10%	+13%/-14%	+27%/-51%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009016295-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-56 ± 17	$6.16^{+1.27}_{-0.89}$	999^{+80}_{-50}	2936^{+161}_{-170}	16^{+8}_{-6}
Alt.	-52 ± 20	$4.92^{+0.98}_{-0.80}$	1001^{+80}_{-53}	3106^{+223}_{-248}	25^{+14}_{-12}

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 $A_{obs} \gg 1.0$

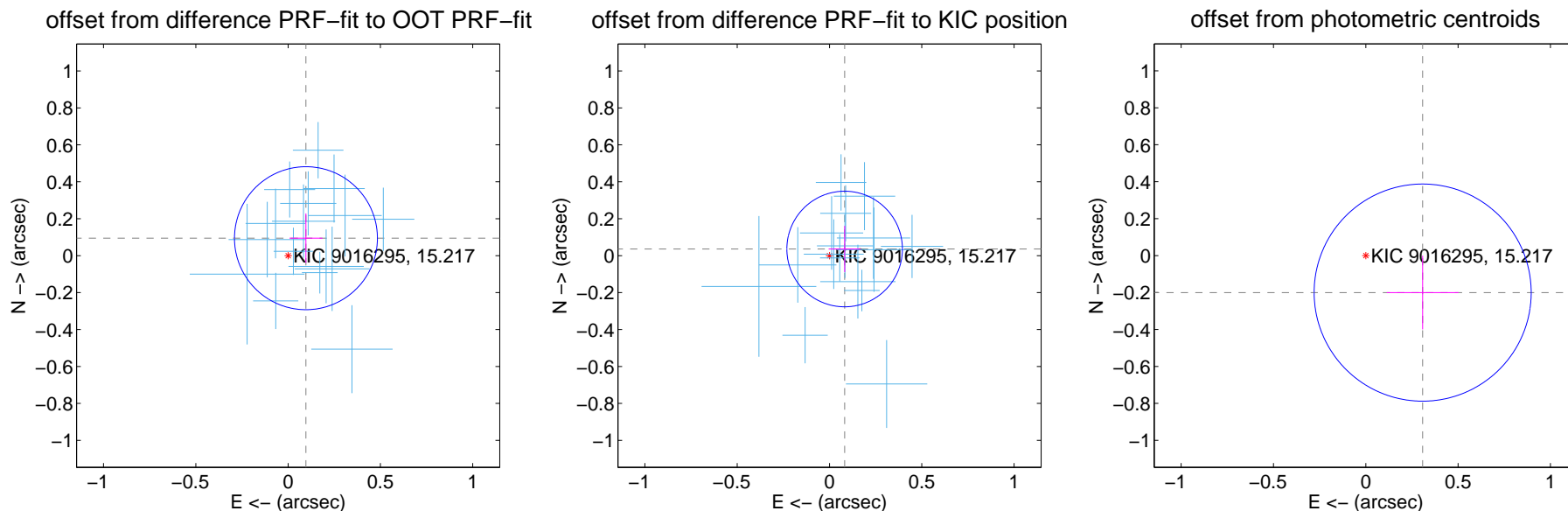
DV Centroid Data

Supplemental centroid analysis for 009016295-02. Kepler magnitude: 15.22. Transit SNR 70.48

There are 17 quarters with good PRF difference image offsets

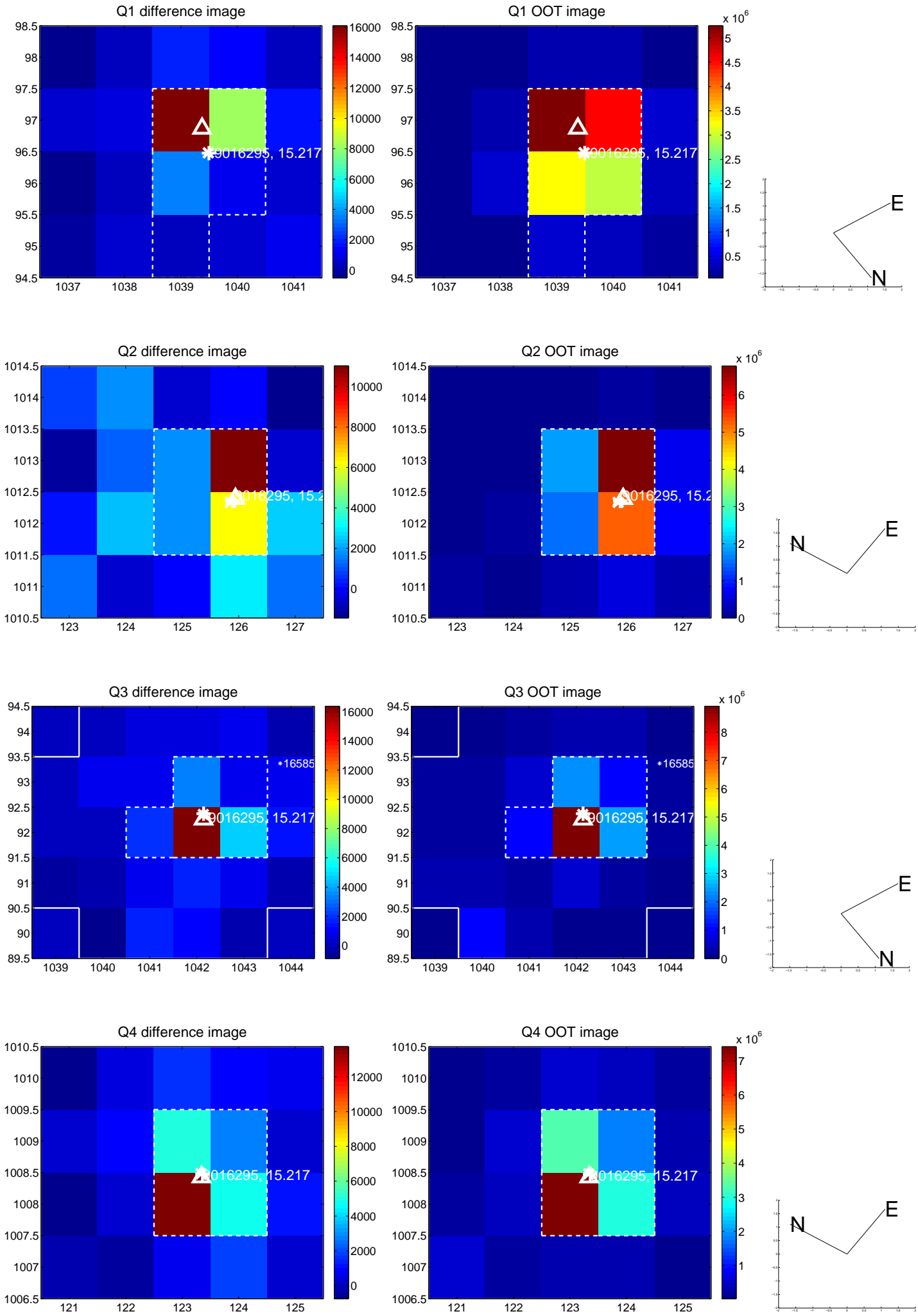
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.135 ± 0.129	1.05	-0.097 ± 0.089	0.094 ± 0.134
PRF-fit source offset from KIC position	0.090 ± 0.104	0.86	-0.082 ± 0.086	0.036 ± 0.125
photometric centroid source offset	0.37 ± 0.20	1.88	-0.31 ± 0.19	-0.20 ± 0.20

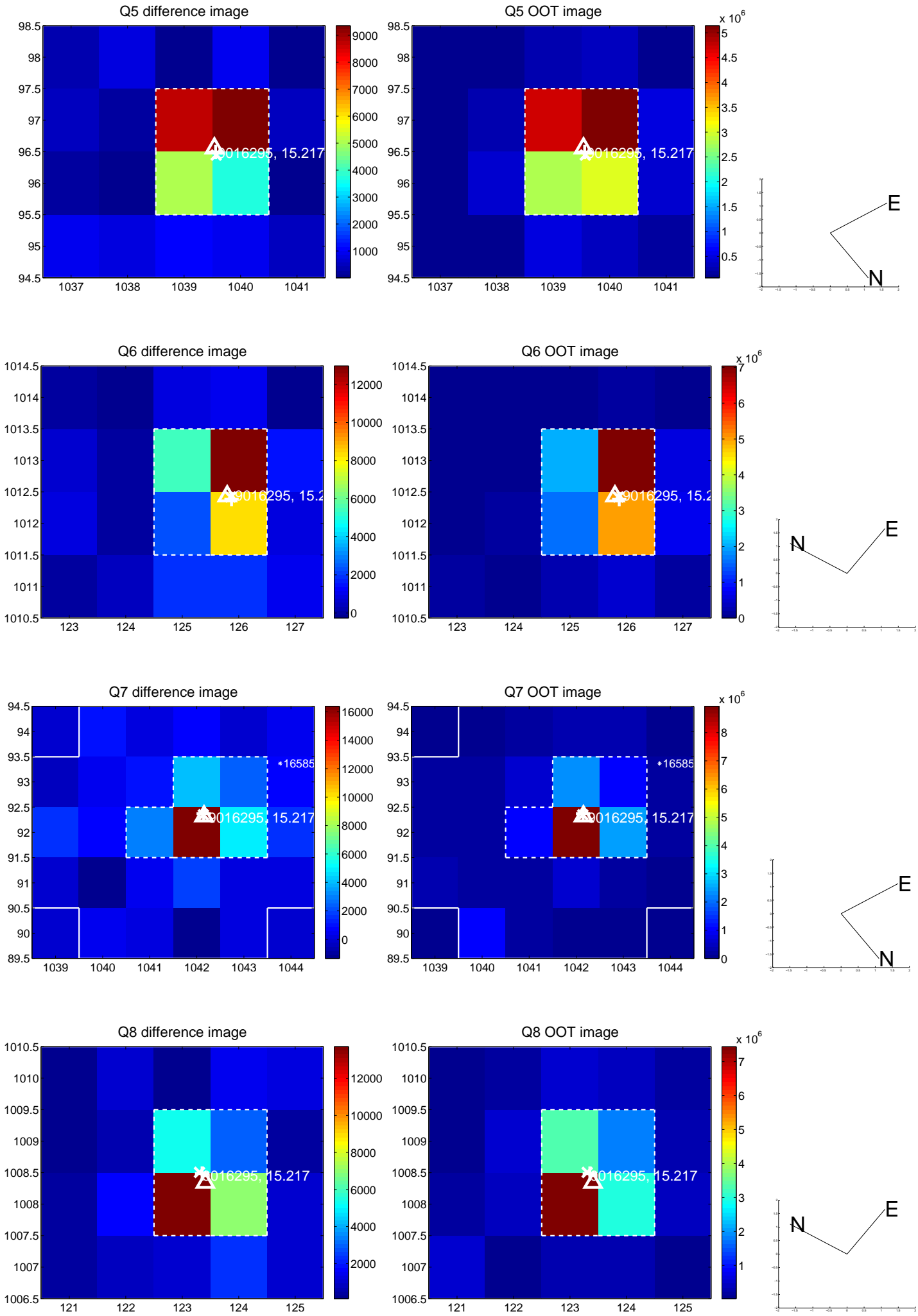


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

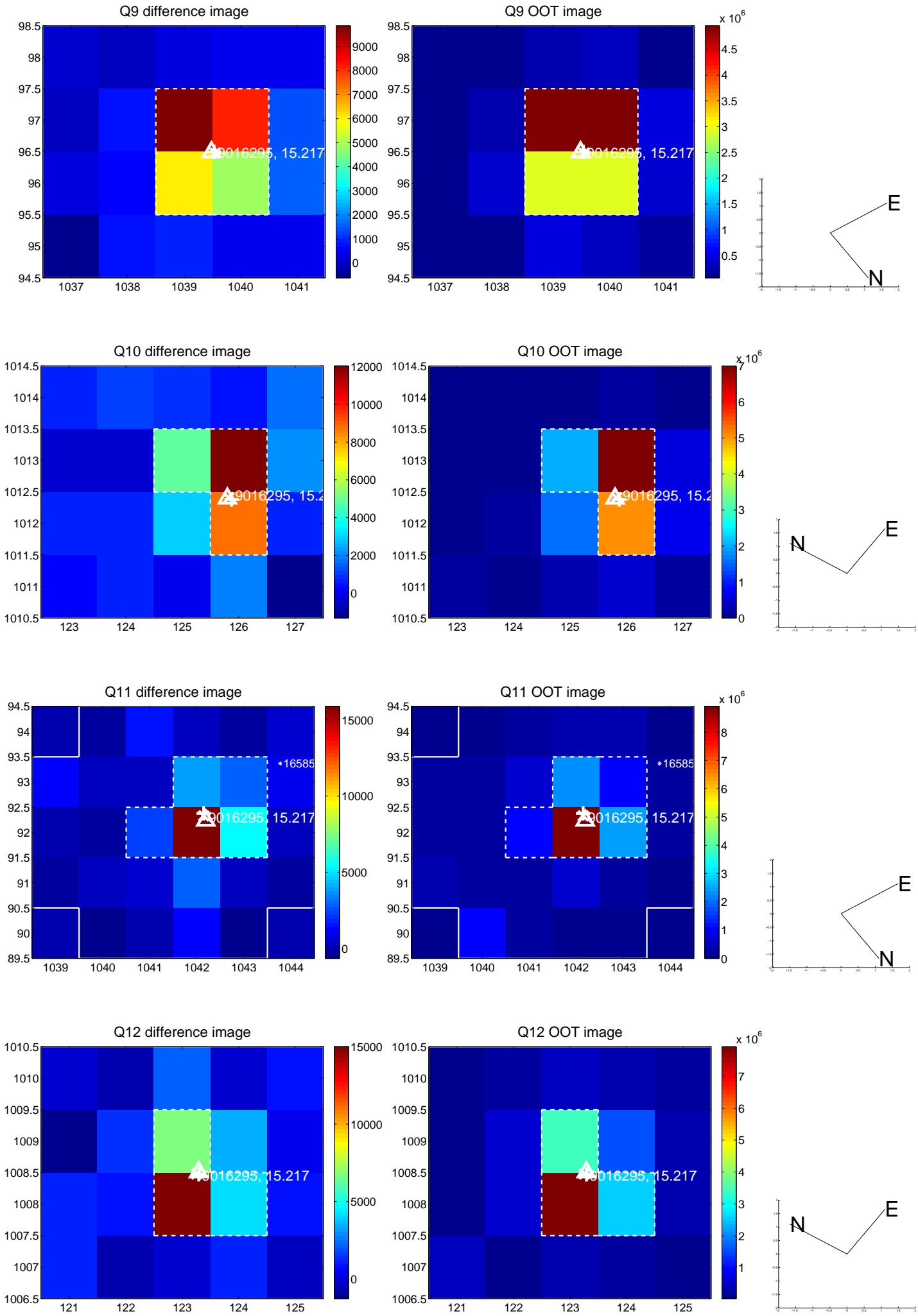
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



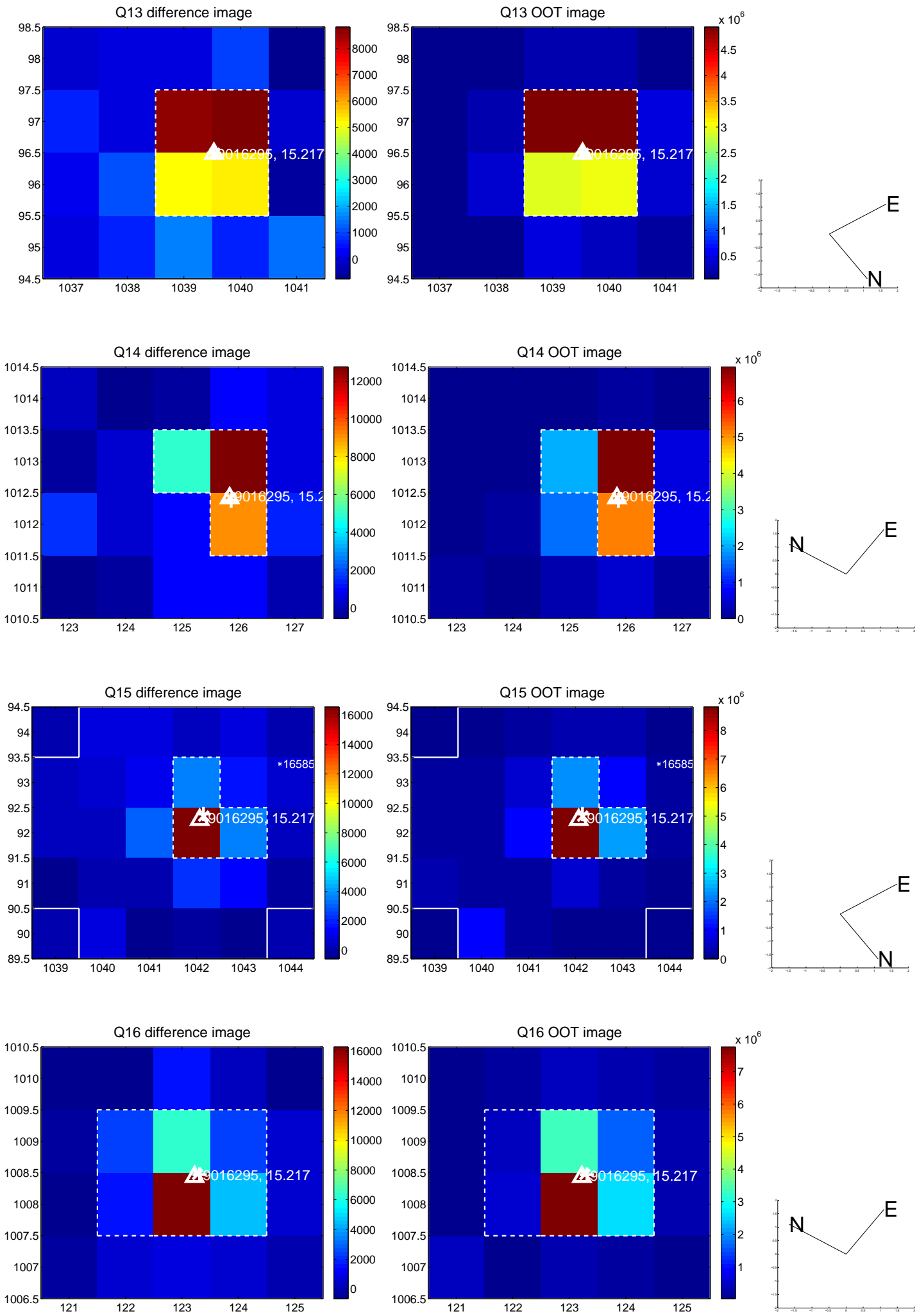
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



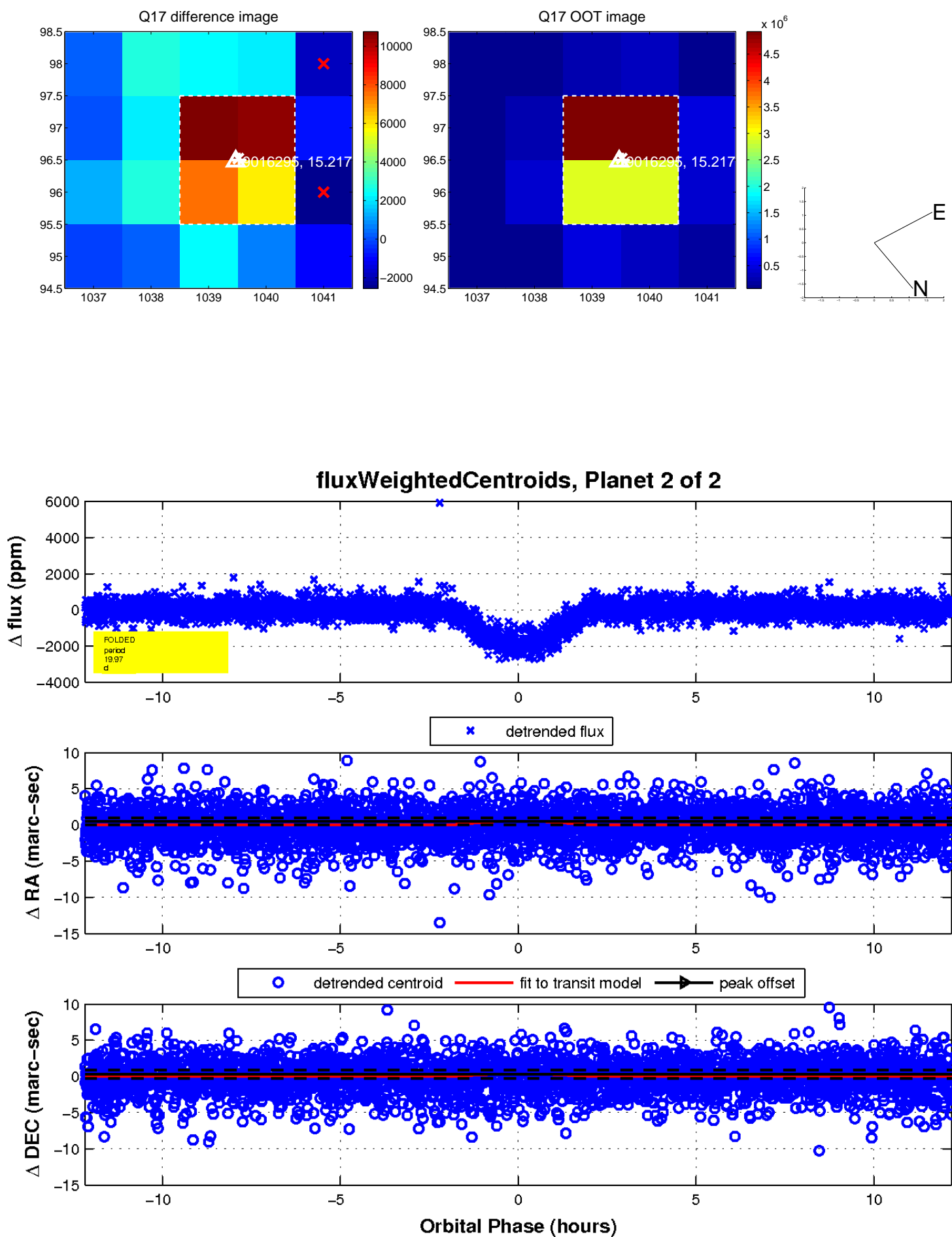
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

