

KIC 002969991

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})
002969991-01	OBS	No	3.409768	134.653633	58.2	8.014	12.1	12.5	1.54	6359	1.78	1810.63
002969991-02	OBS	No	3.409470	133.387843	11.4	17.072	11.3	4.2	1.54	6359	0.55	1810.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002969991-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002969991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

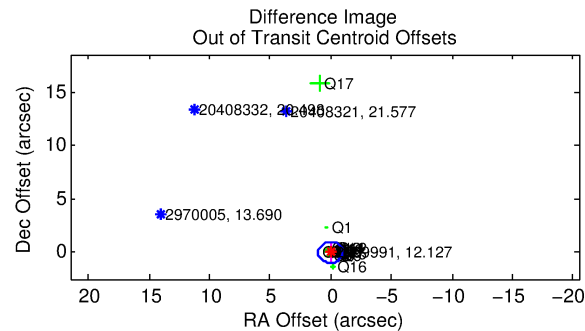
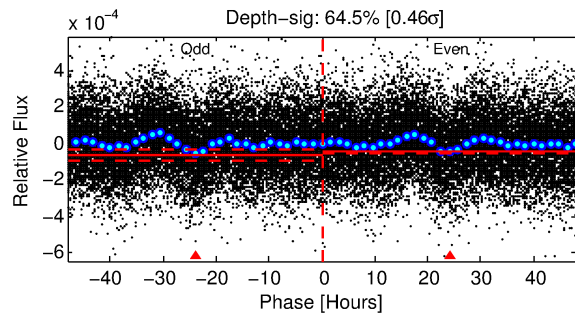
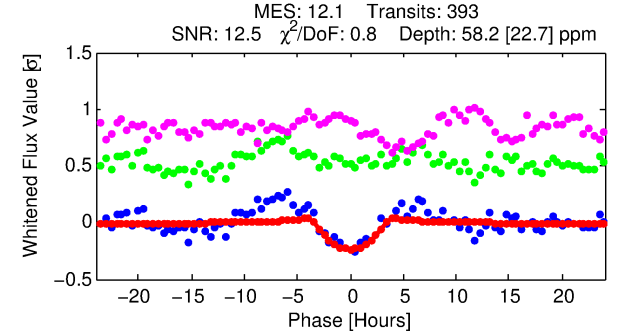
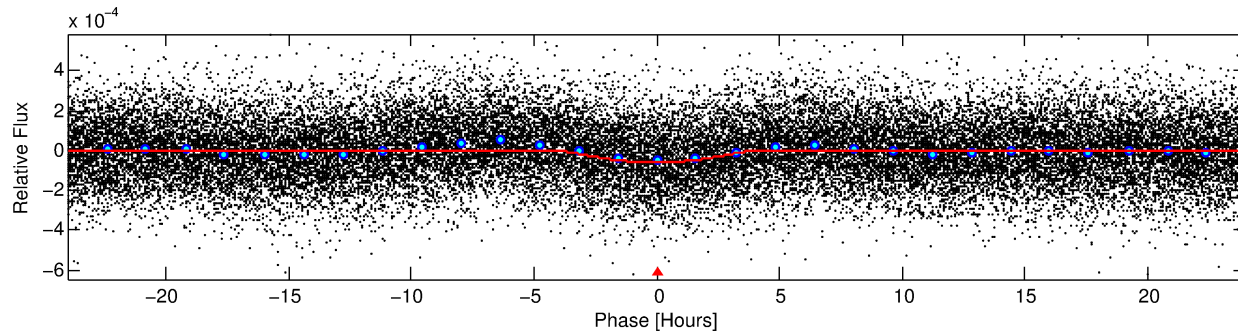
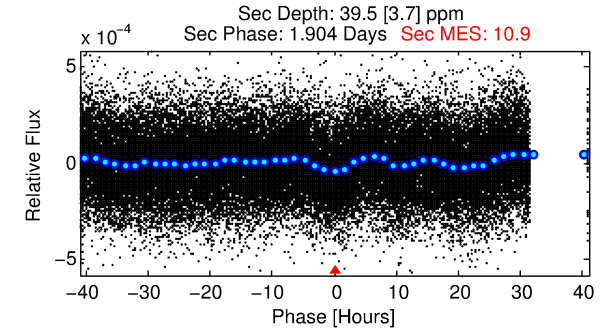
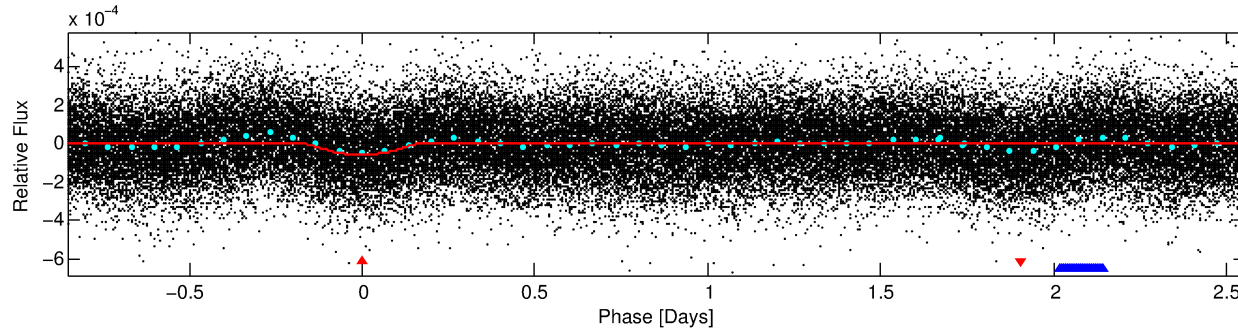
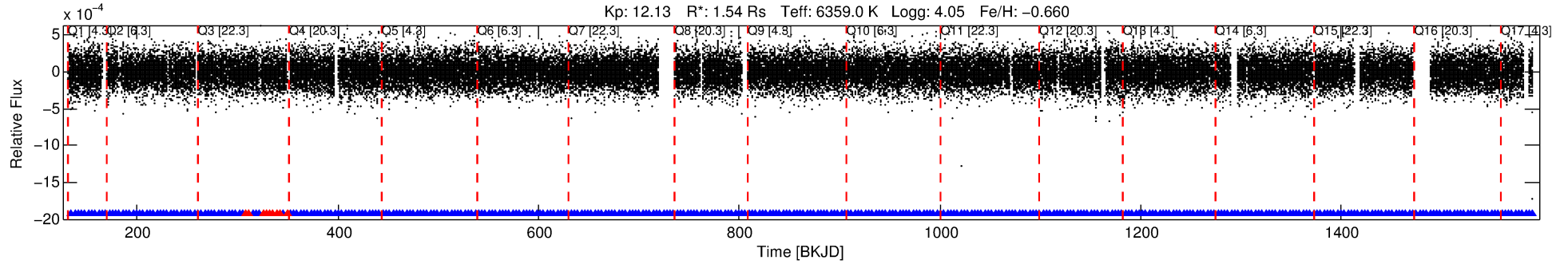
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002969991-01

No Significant Match Found

DV One-Page Summary

KIC: 2969991 Candidate: 1 of 2 Period: 3.410 d



DV Fit Results:

Period = 3.40977 [0.00005] d
Epoch = 134.6536 [0.0115] BKJD
Rp/R* = 0.0106 [0.0041]
a/R* = 1.17 [0.06]
b = 0.99 [0.01]
Seff = 1810.63 [1171.99]
Teq = 1663 [269] K
Rp = 1.78 [0.96] Re
a = 0.0438 [0.0168] AU
Ag = 13.23 [13.25] [0.92σ]
Teffp = 4905 [968] K [3.23σ]

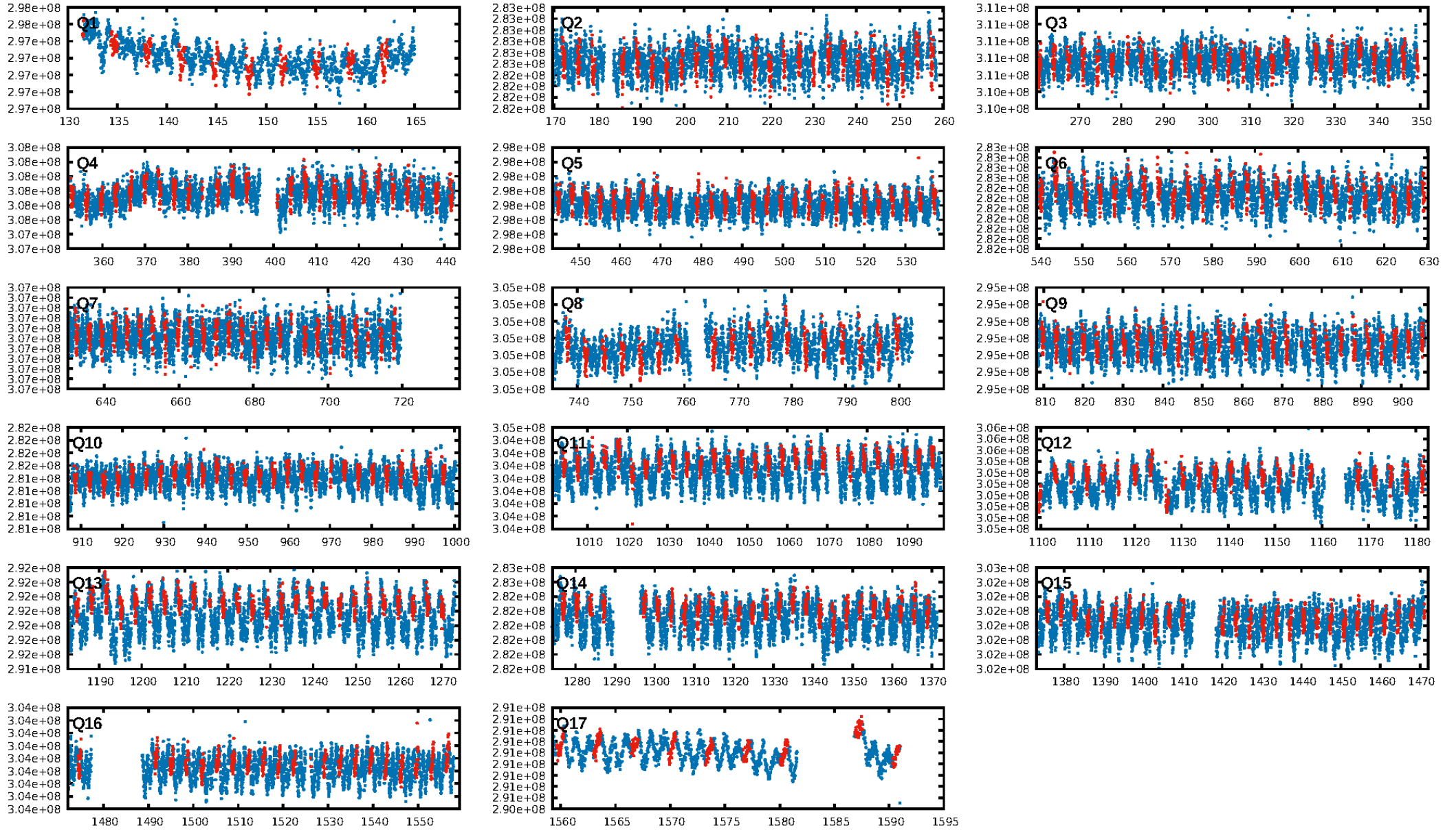
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.98 [366/375]
GhostDiagnostic-chr: 1.552
Centroid-sig: 2.7%
Centroid-so: 0.825 arcsec [1.64σ]
OotOffset-rm: 0.038 arcsec [0.12σ]
KicOffset-rm: 0.087 arcsec [0.46σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

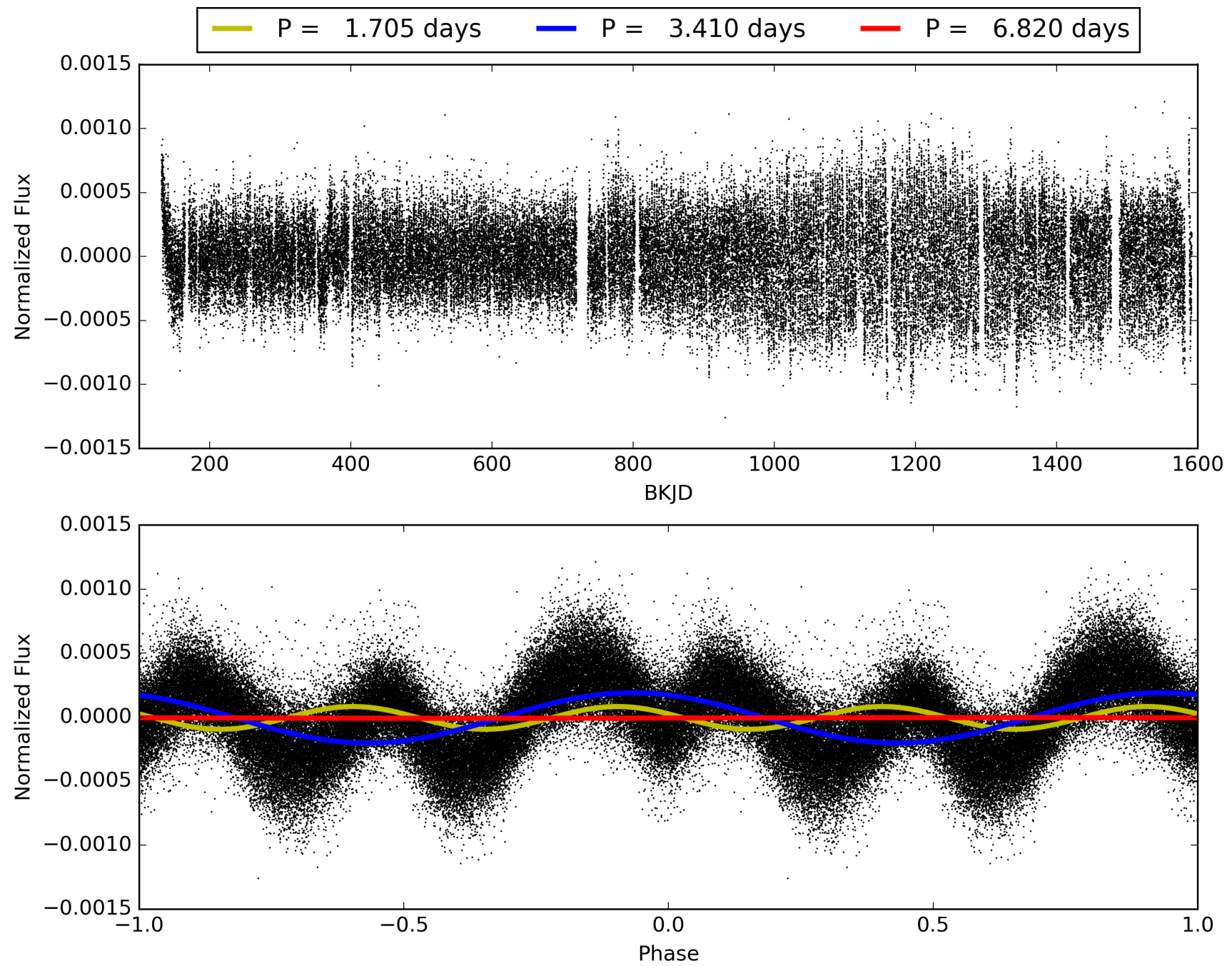
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:27:43 Z

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

TCE 002969991-01, PDC Light Curves

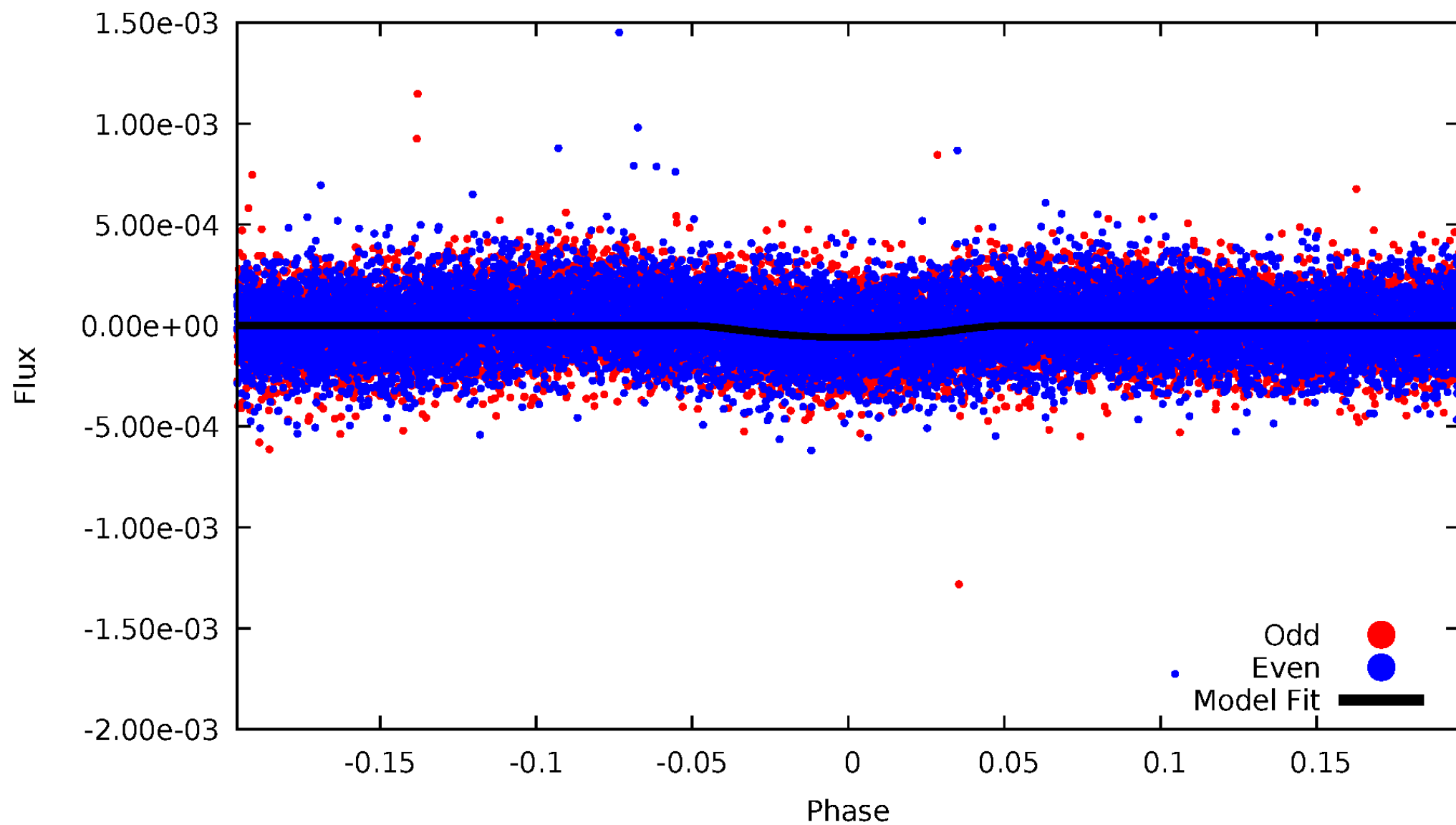


TCE 002969991-01



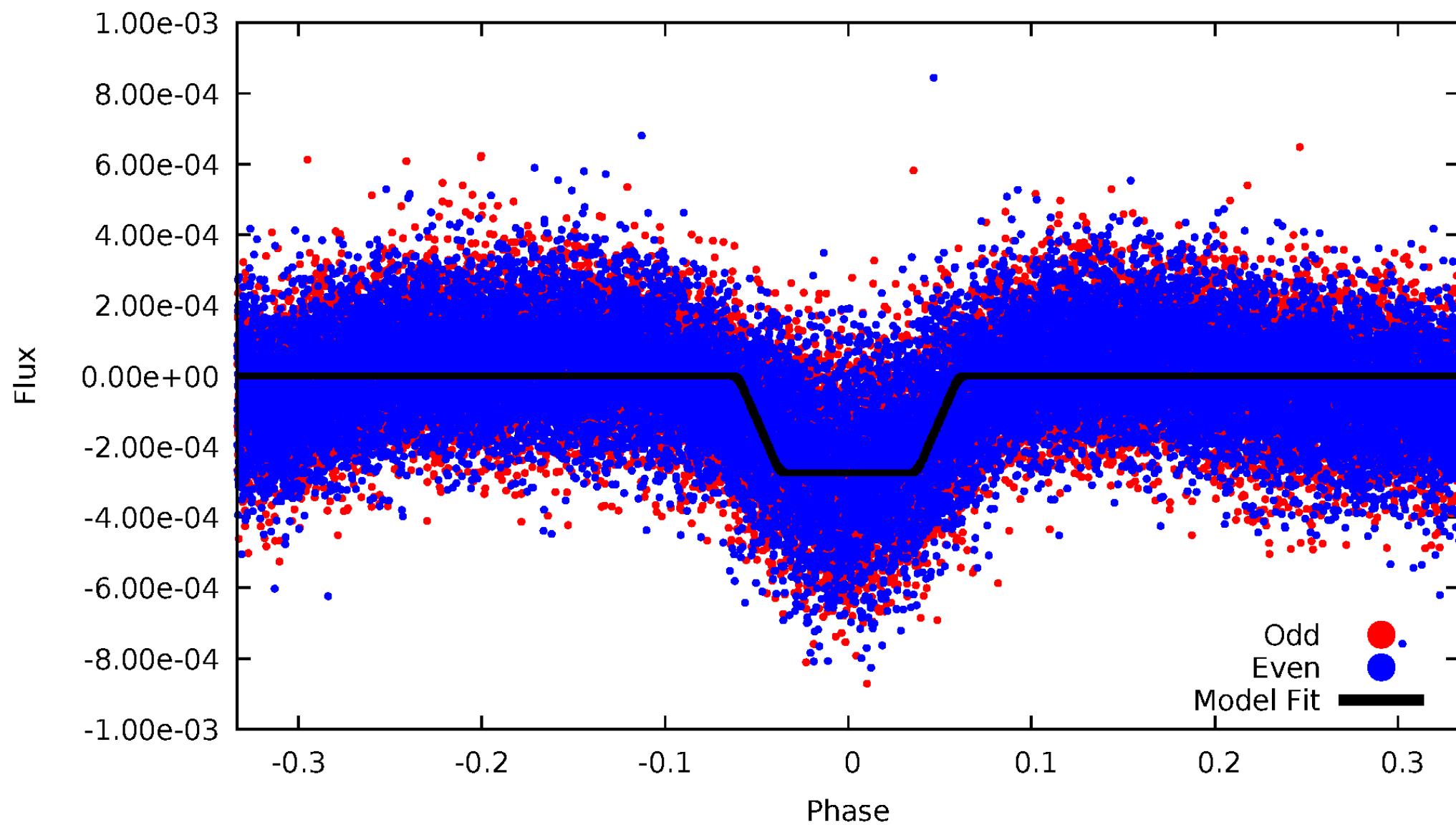
DV Odd/Even

TCE 002969991-01



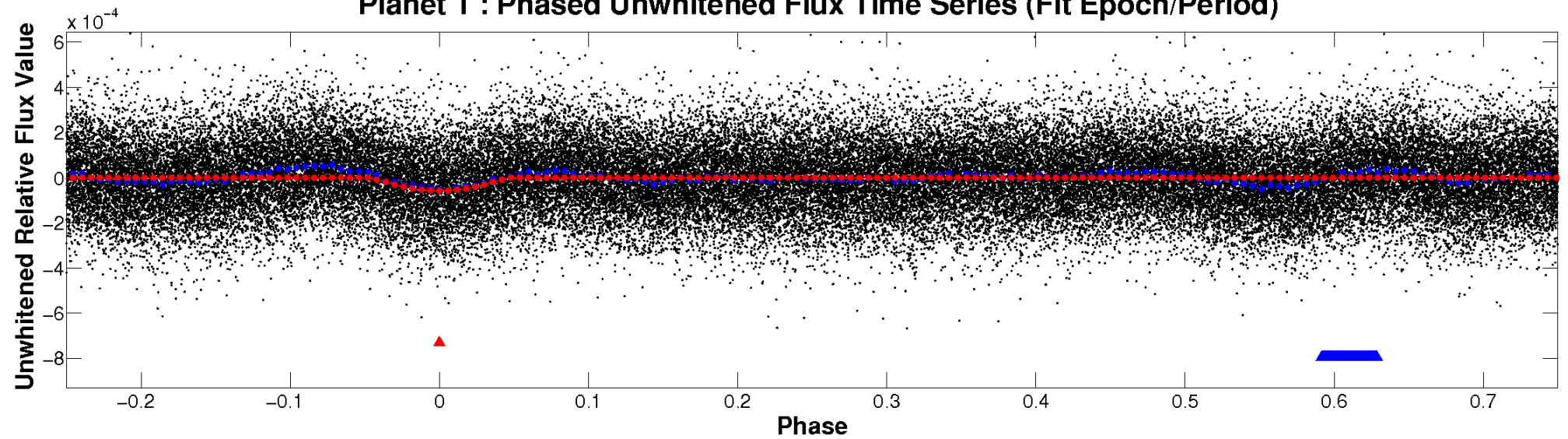
ALT Odd/Even

TCE 002969991-01

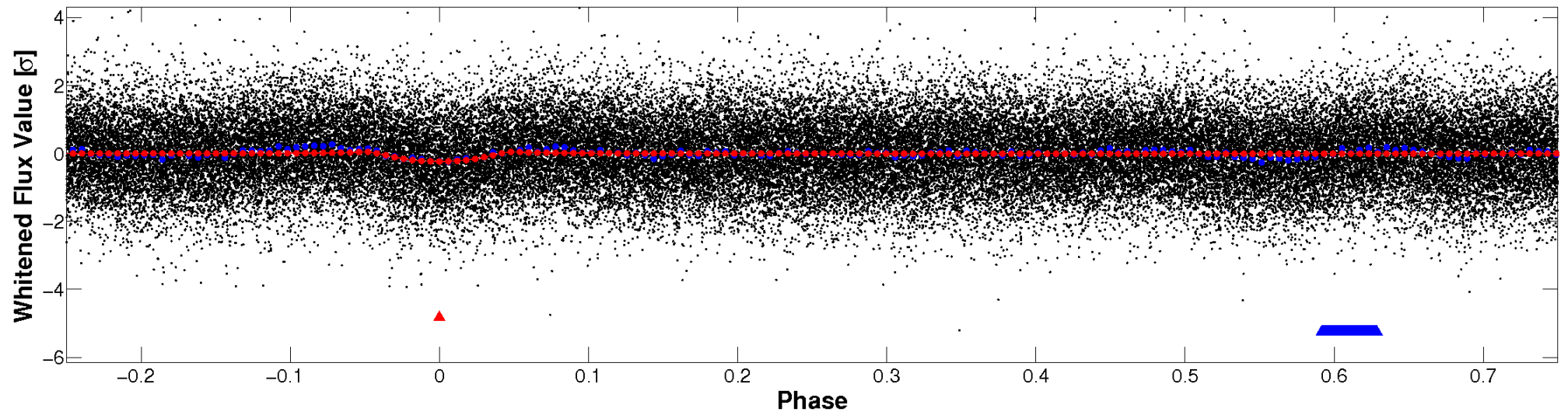


Non-Whitened Vs. Whitened Light Curve

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

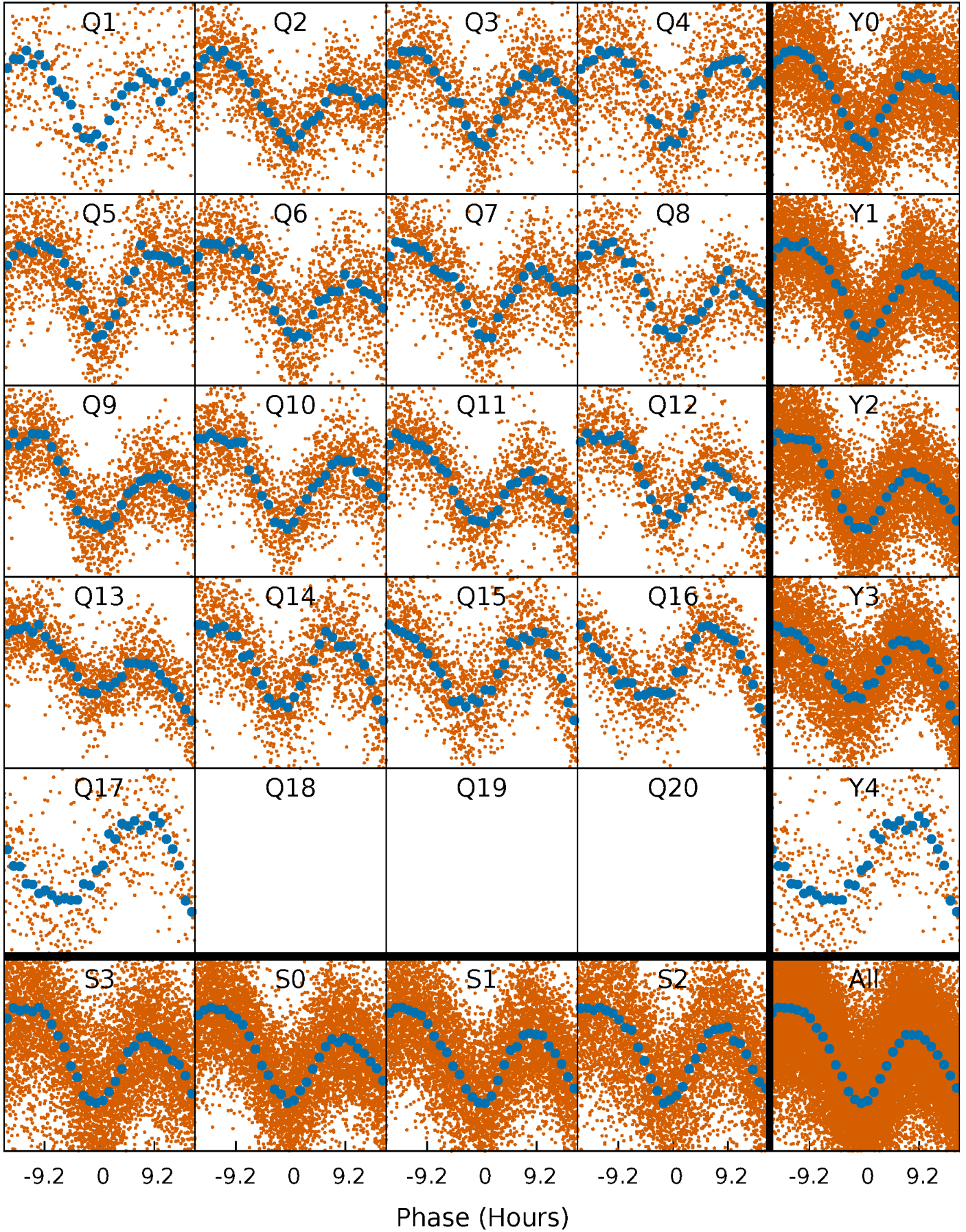


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



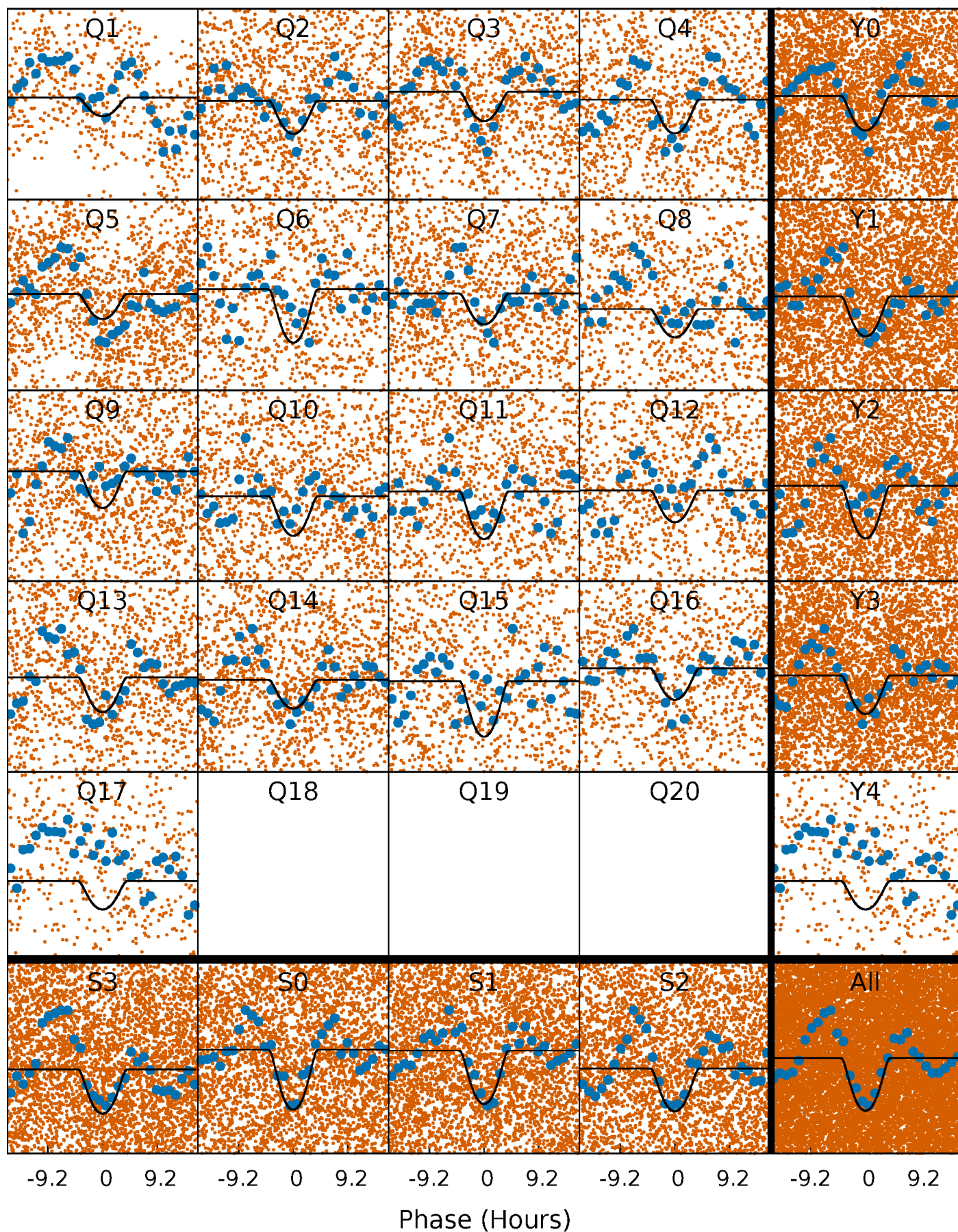
PDC Quarter-Phased Transit Curves

TCE 002969991-01 P= 3.409768 Days $T_0=134.653634$ (BKJD)



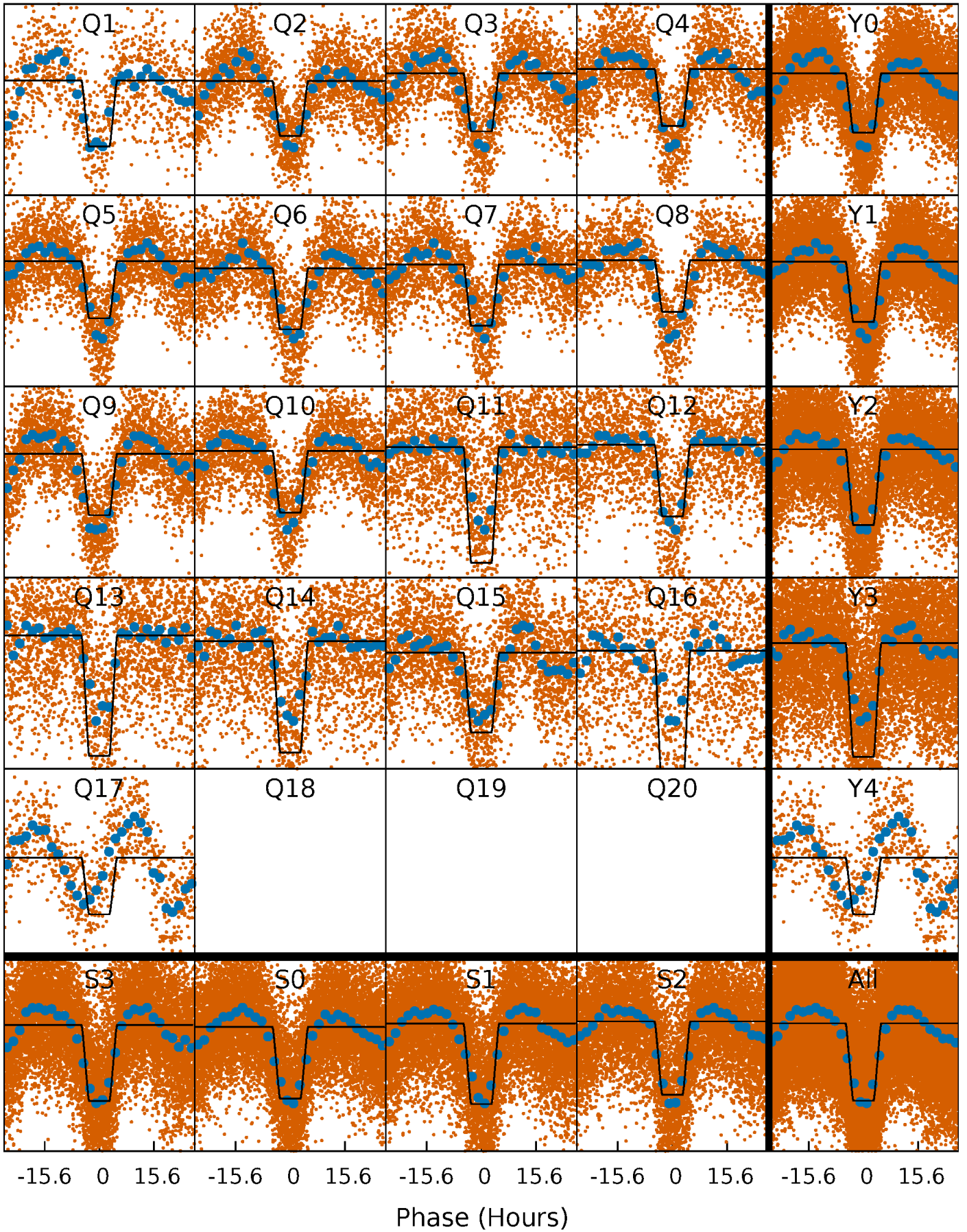
DV Quarter-Phased Transit Curves

TCE 002969991-01 P= 3.409768 Days $T_0=134.653634$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

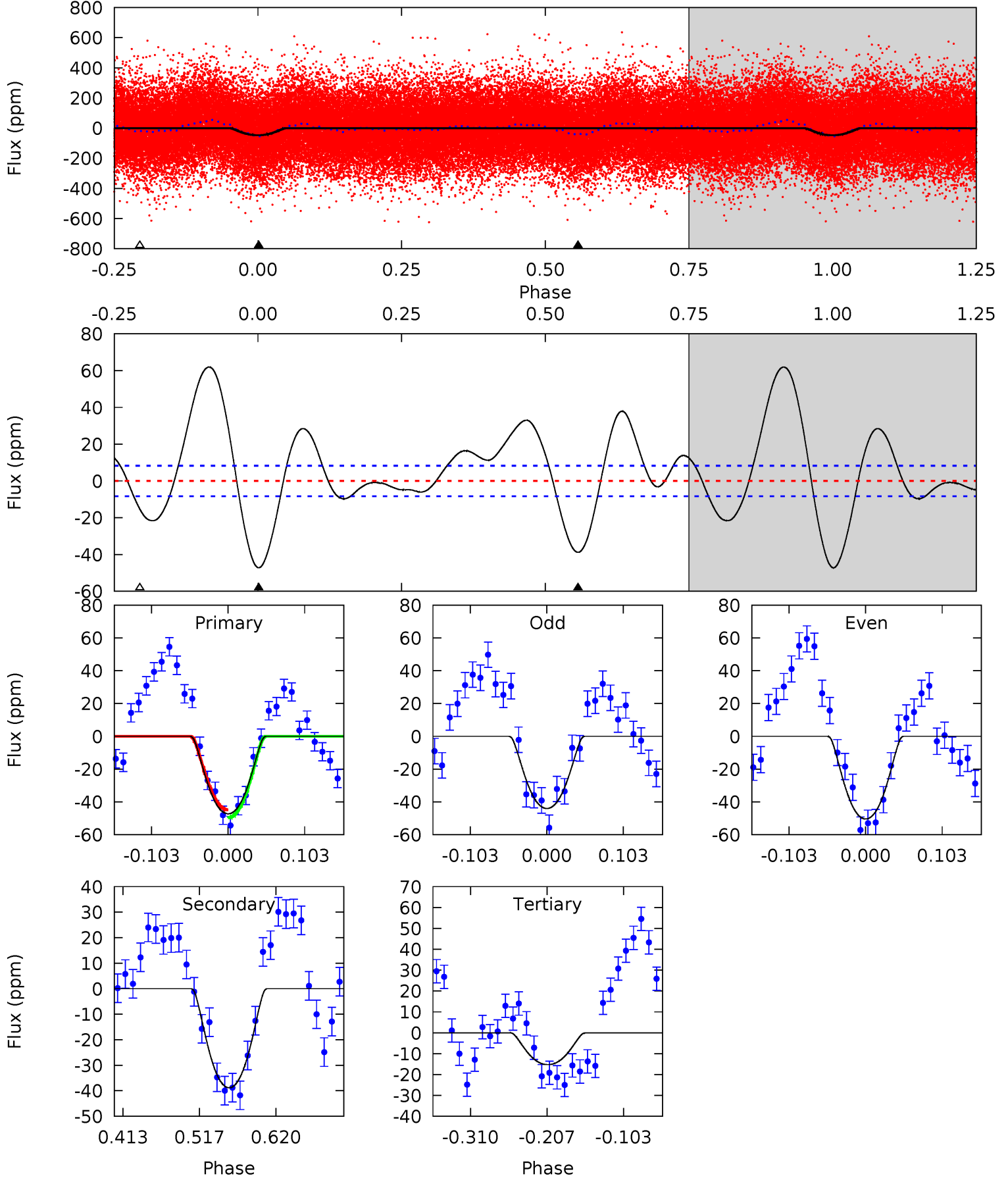
TCE 002969991-01 P= 3.409696 Days $T_0=134.643714$ (BKJD)



DV Model-Shift Uniqueness Test

002969991-01, P = 3.409768 Days, E = 131.243866 Days

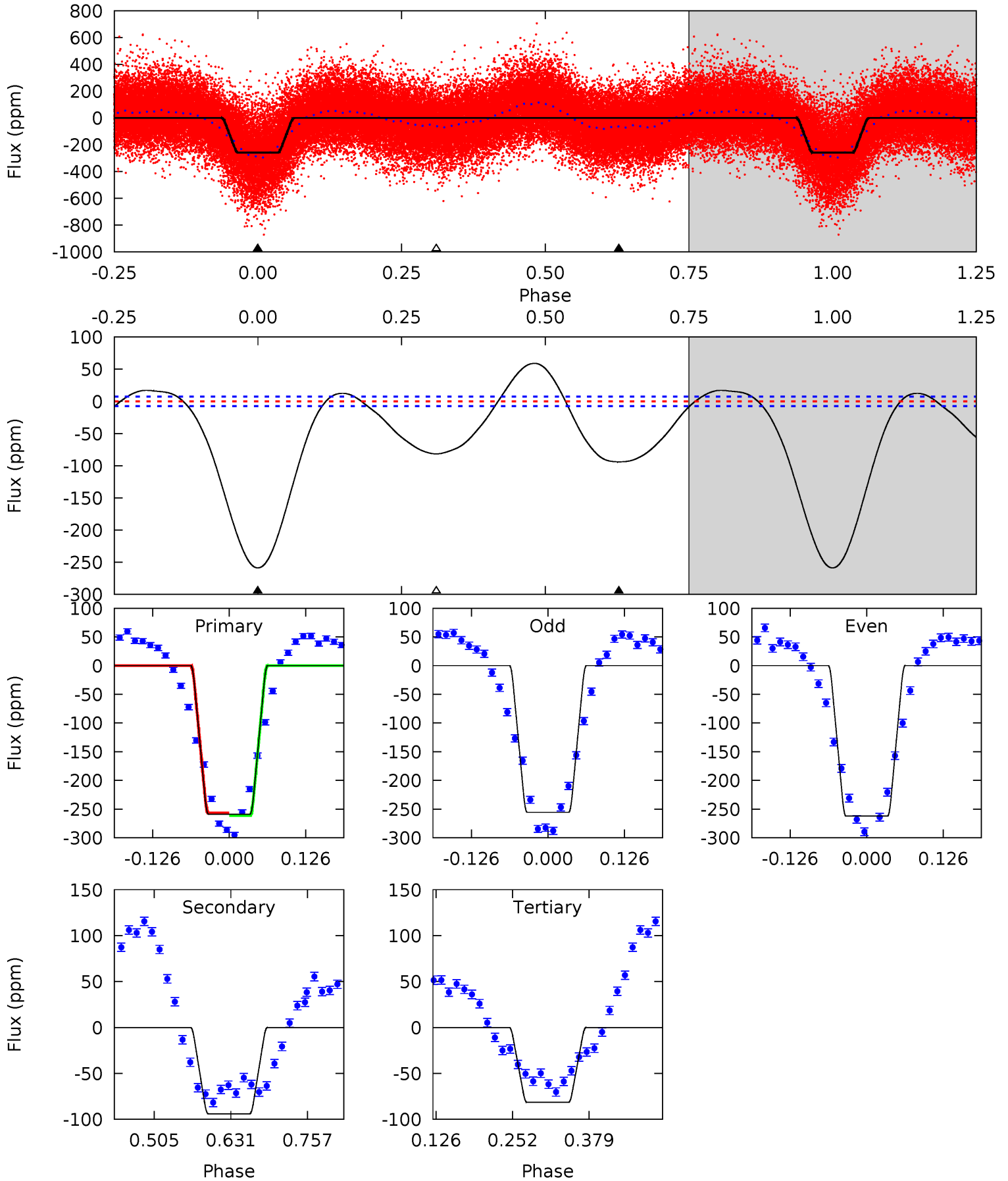
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.9	21.3	8.37	0	4.56	1.63	7.45	17.5	25.9	12.9	21.3	1.75	0.99	0.57	1.31



Alt Model-Shift Uniqueness Test

002969991-01, P = 3.409696 Days, E = 131.234018 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
158.0	57.4	49.8	0	4.52	1.53	25.6	108.2	158.0	7.56	57.4	2.03	0.96	0.19	1.33



Stellar Parameters For KIC 002969991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6359^{+201}_{-223}	$4.047^{+0.378}_{-0.162}$	$-0.660^{+0.300}_{-0.300}$	$1.540^{+0.386}_{-0.578}$	$0.963^{+0.128}_{-0.128}$	$0.372^{+1.007}_{-0.156}$
	+3%/-4%	+9%/-4%	+45%/-45%	+25%/-38%	+13%/-13%	+271%/-42%
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 002969991-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-39 ± 2	$1.68^{+0.77}_{-0.60}$	2302^{+192}_{-238}	4944^{+1083}_{-631}	15^{+22}_{-8}
Alt.	-94 ± 2	$2.66^{+0.88}_{-0.77}$	2309^{+168}_{-249}	4918^{+673}_{-443}	14^{+14}_{-6}

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 $A_{obs} \gg 1.0$

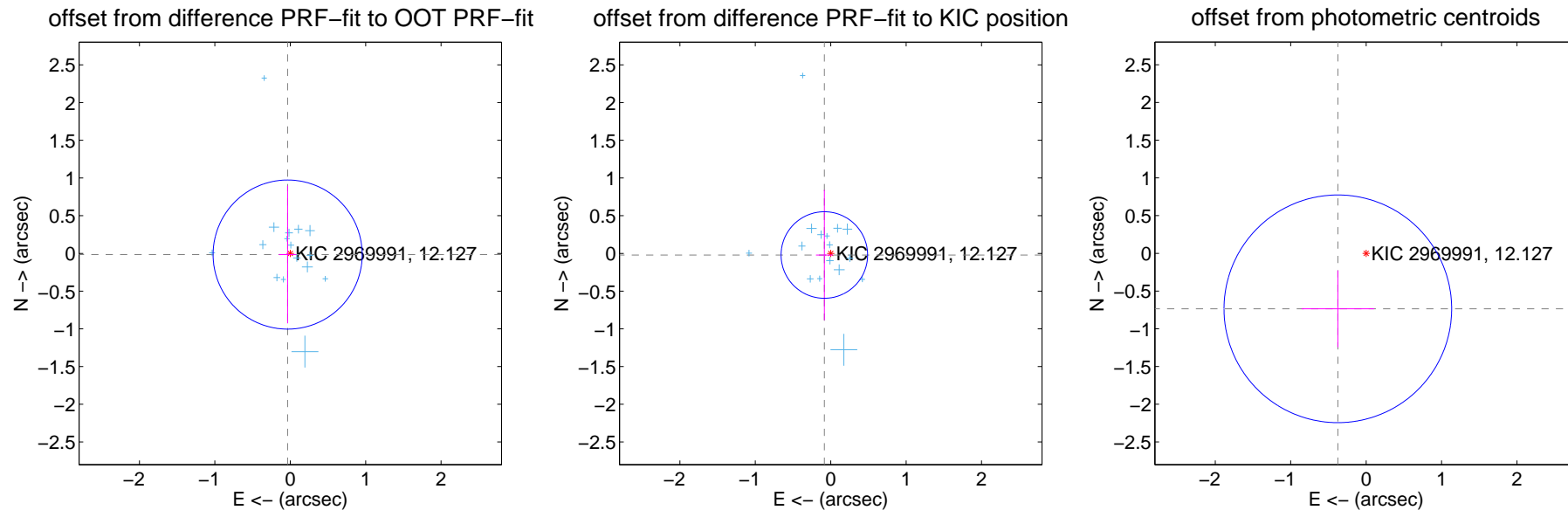
DV Centroid Data

Supplemental centroid analysis for 002969991-01. Kepler magnitude: 12.13. Transit SNR 12.52

There are 16 quarters with good PRF difference image offsets

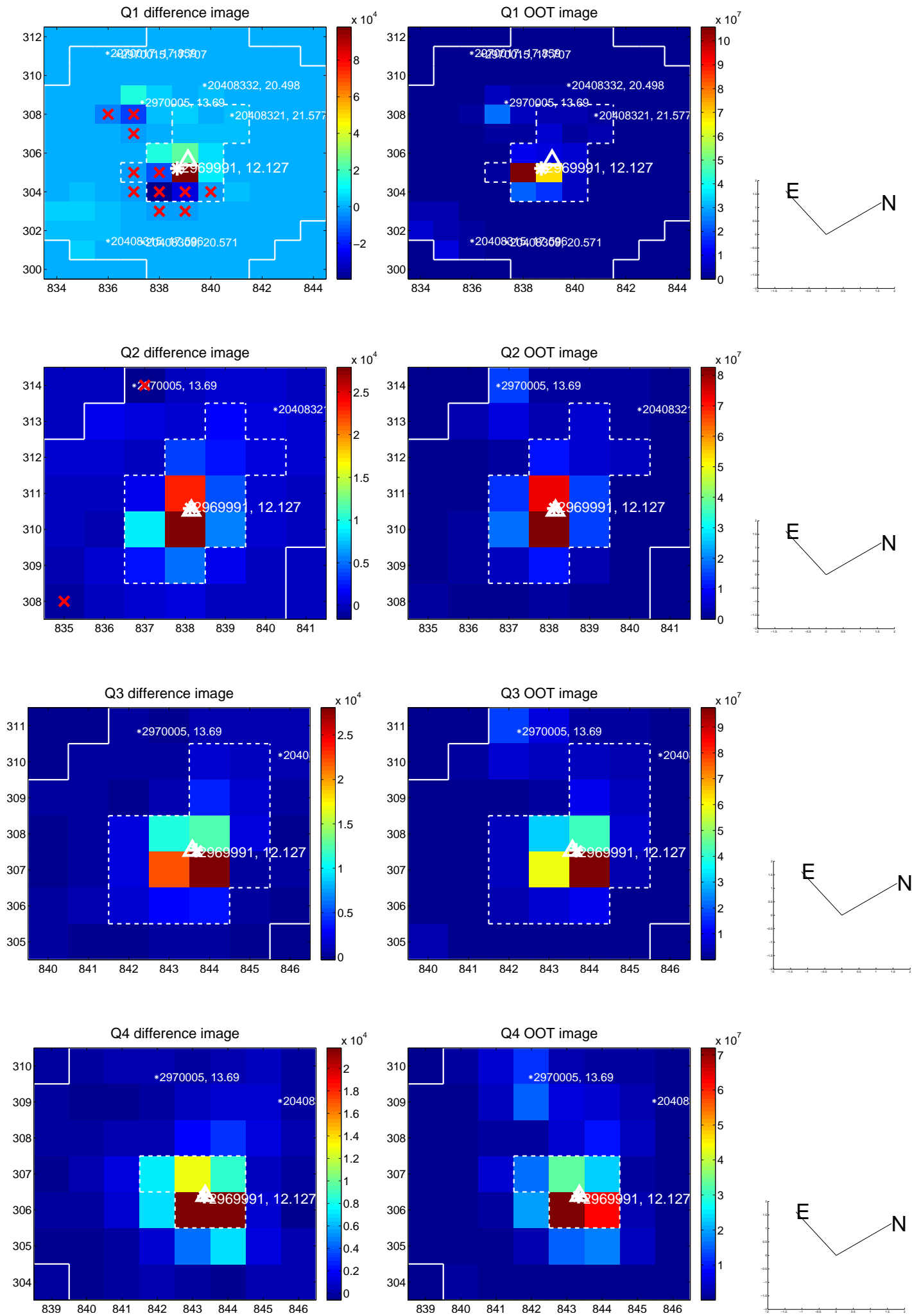
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.038 ± 0.330	0.12	0.035 ± 0.115	-0.015 ± 0.913
PRF-fit source offset from KIC position	0.087 ± 0.191	0.46	0.085 ± 0.111	-0.021 ± 0.863
photometric centroid source offset	0.83 ± 0.50	1.64	0.38 ± 0.48	-0.74 ± 0.51

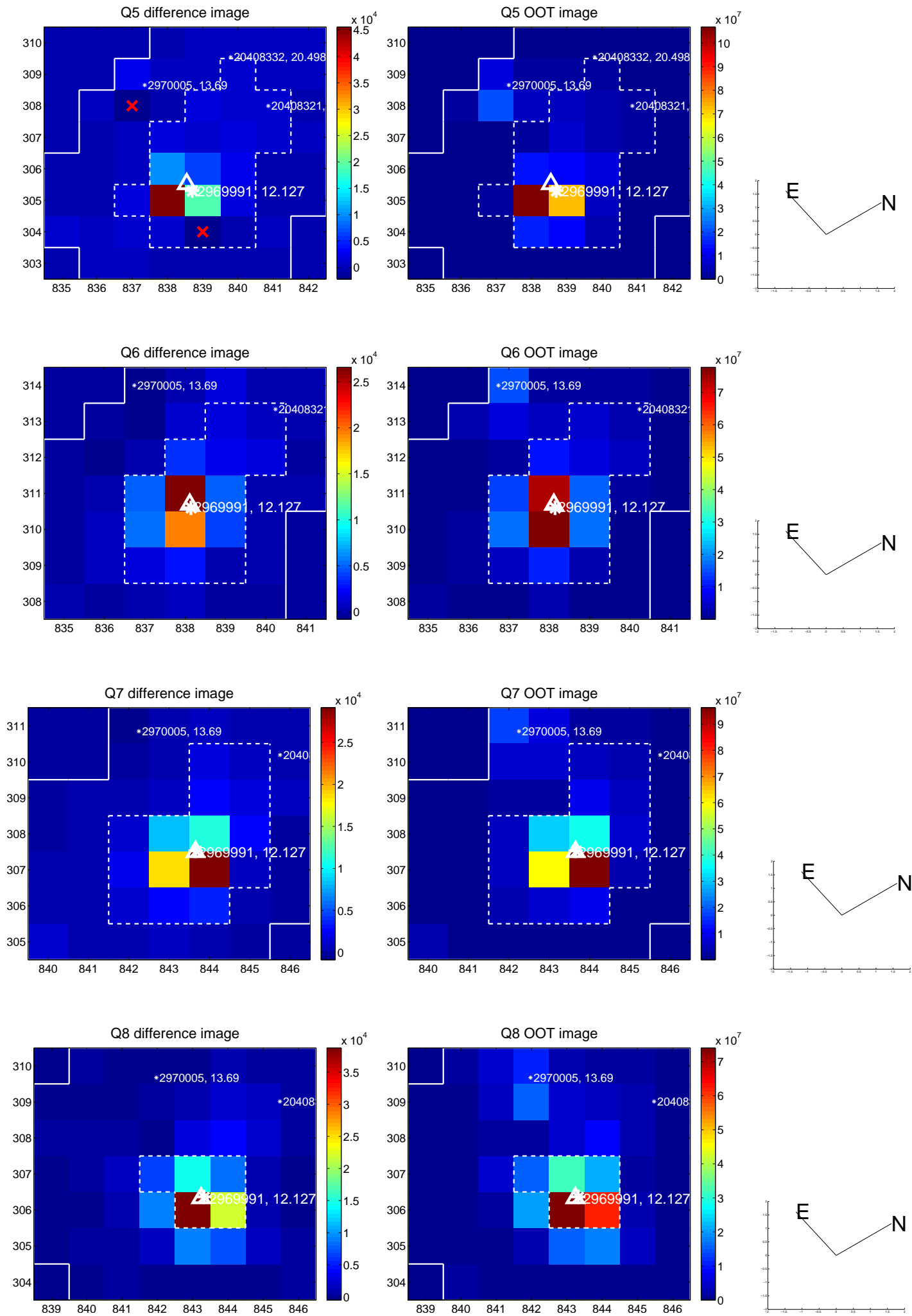


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

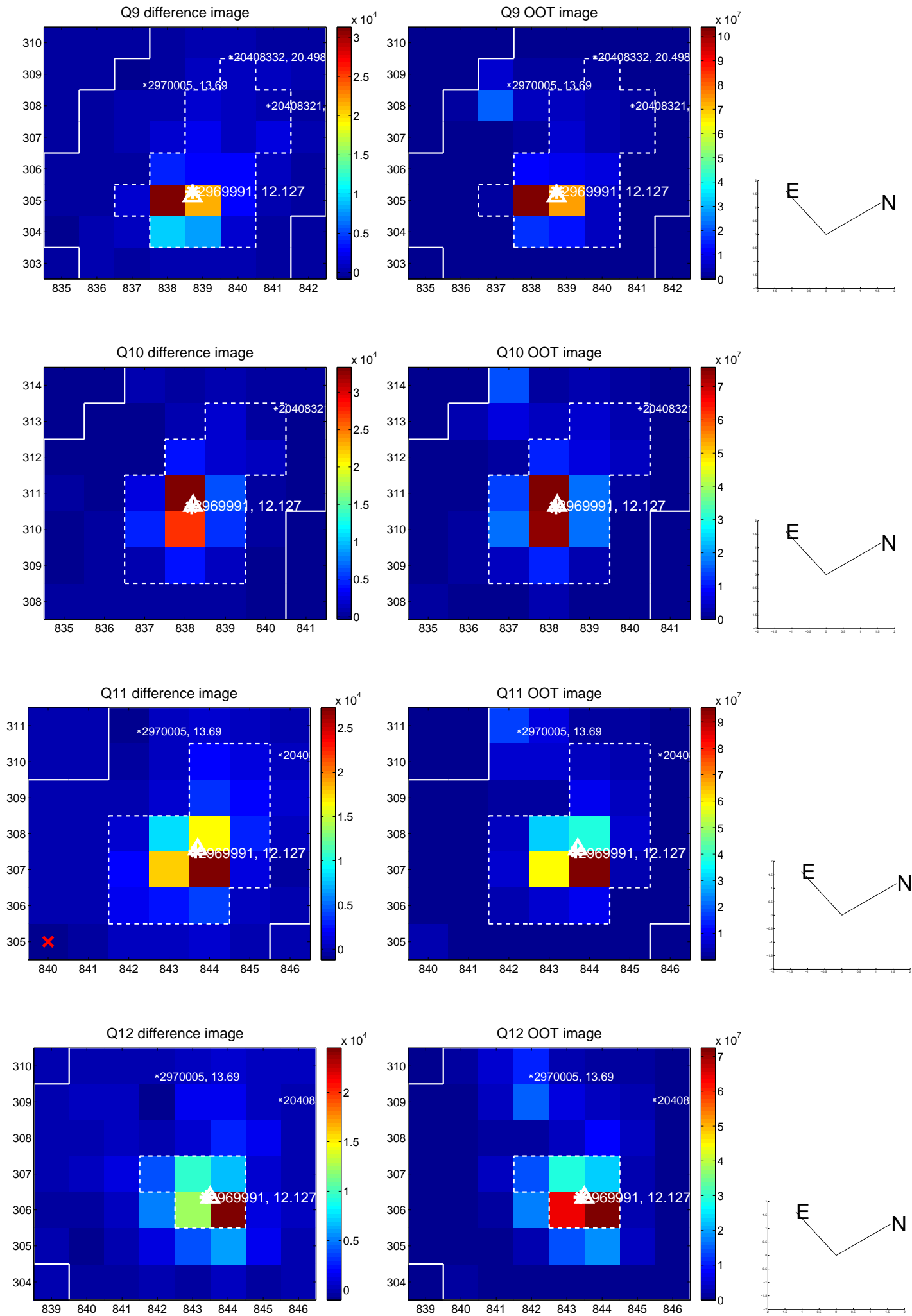
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



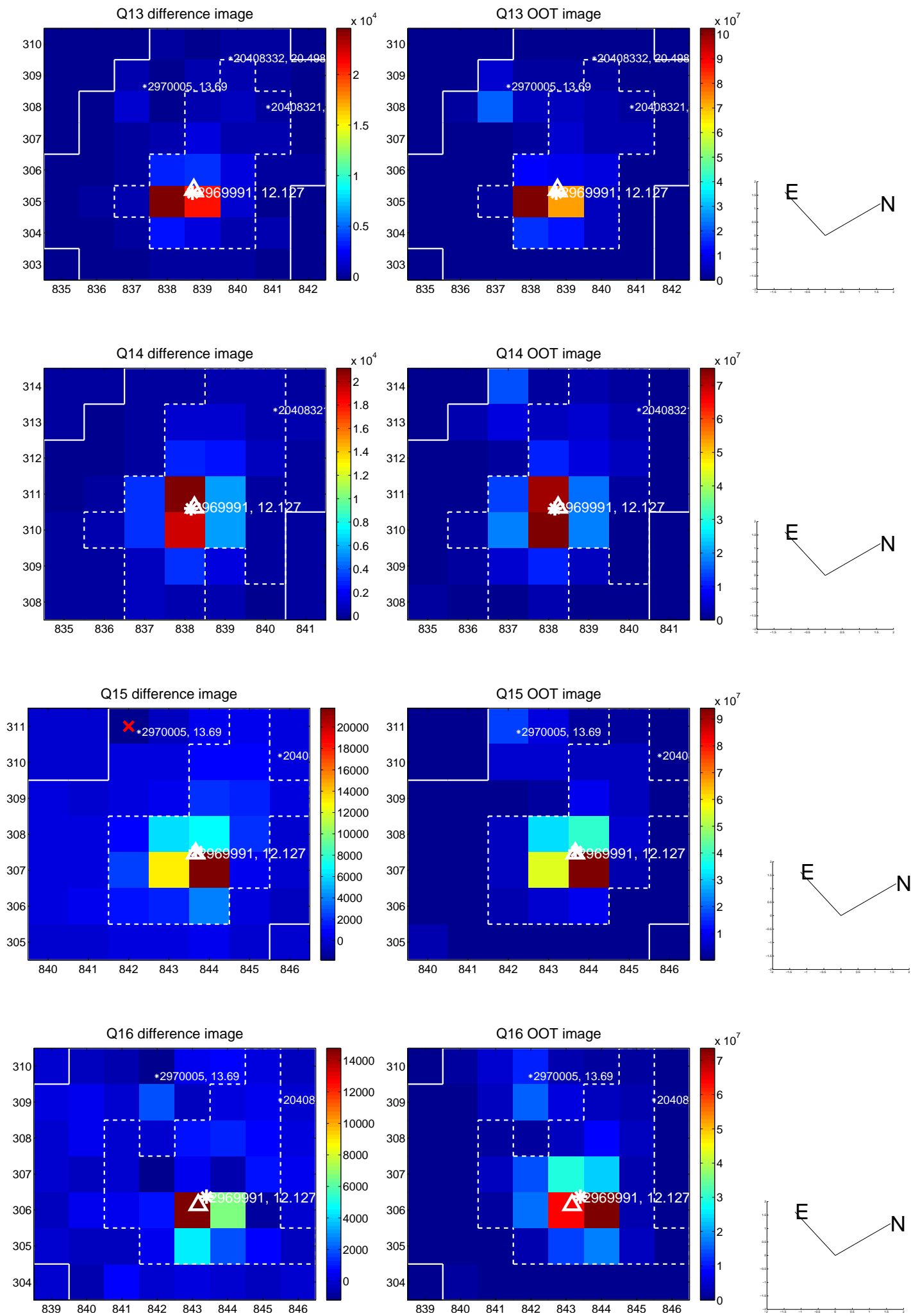
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



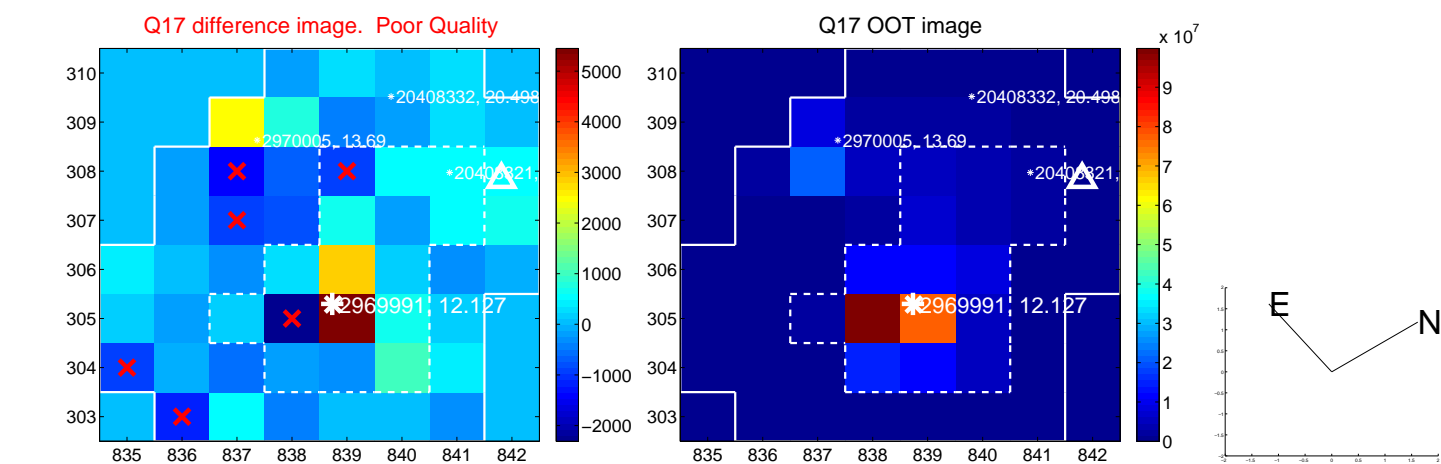
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



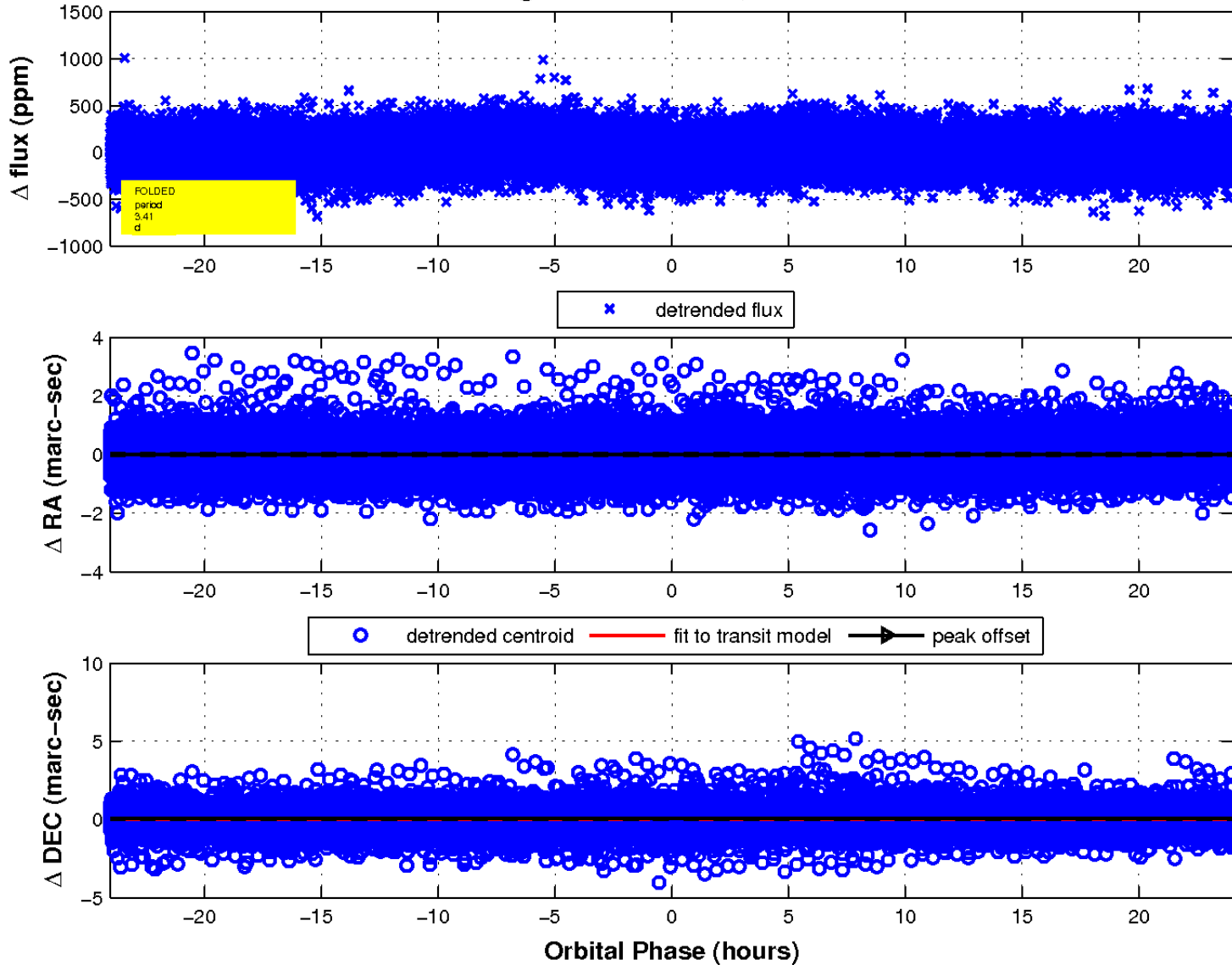
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

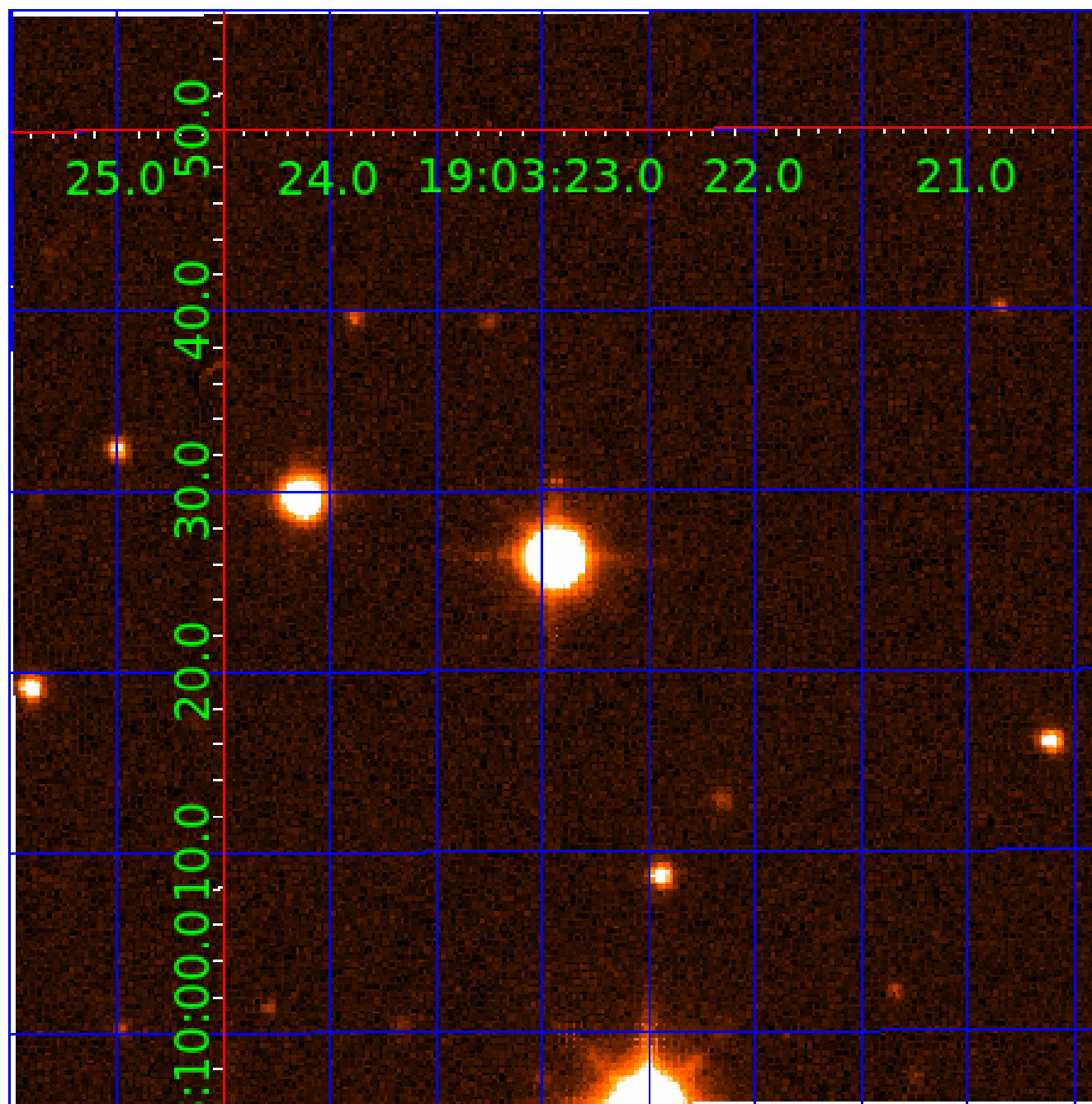


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 002969991

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})
002969991-01	OBS	No	3.409768	134.653633	58.2	8.014	12.1	12.5	1.54	6359	1.78	1810.63
002969991-02	OBS	No	3.409470	133.387843	11.4	17.072	11.3	4.2	1.54	6359	0.55	1810.84

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002969991-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
002969991-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

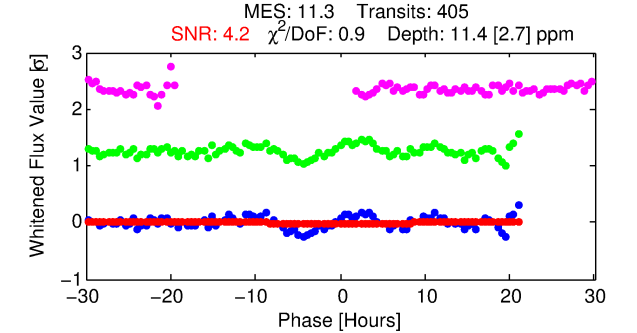
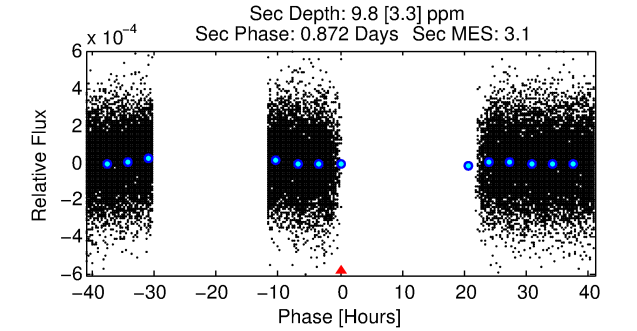
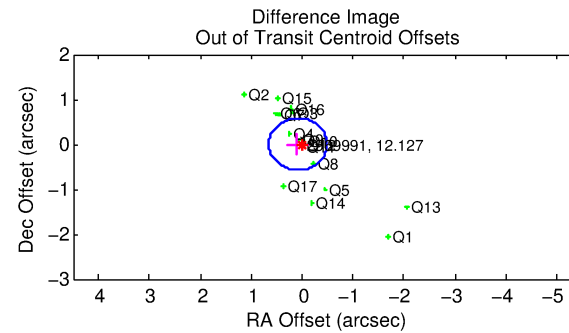
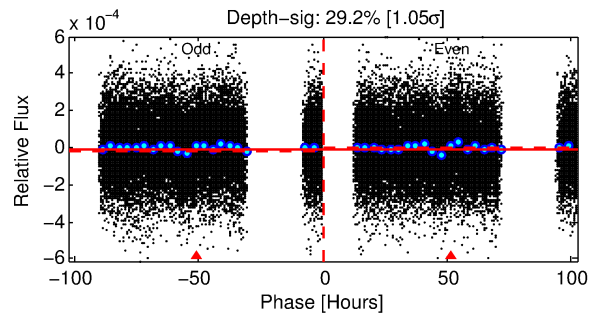
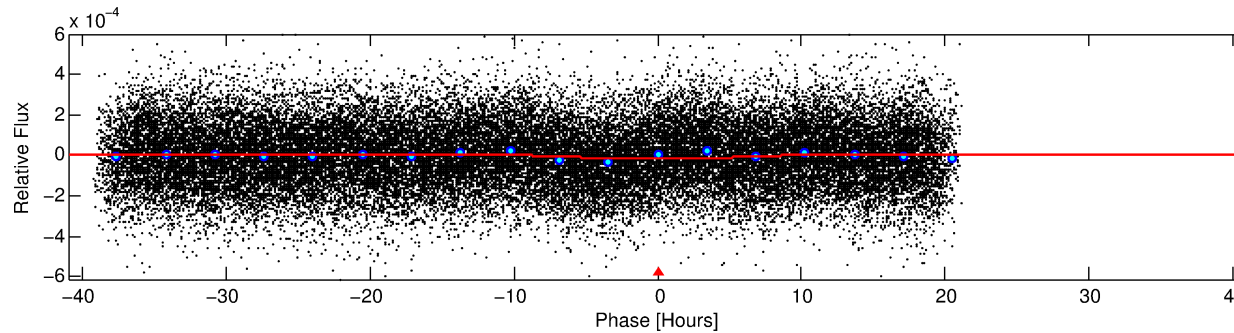
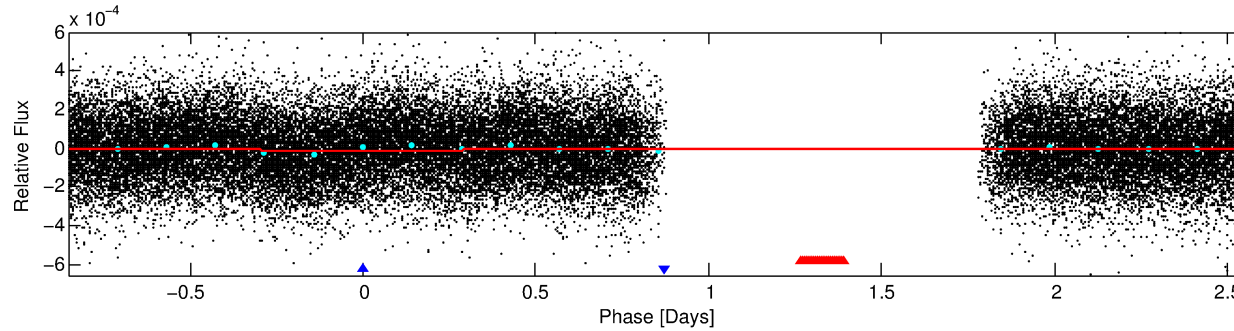
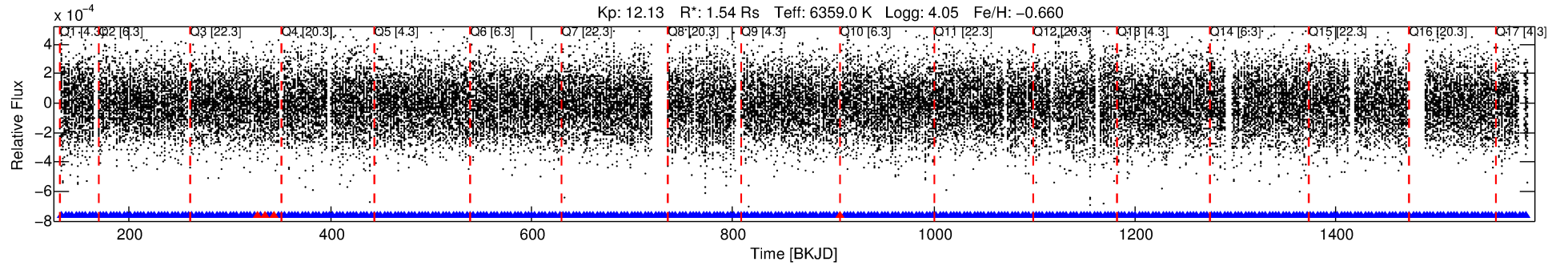
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002969991-02

No Significant Match Found

DV One-Page Summary

KIC: 2969991 Candidate: 2 of 2 Period: 3.409 d



DV Fit Results:

Period = 3.40947 [0.00010] d
Epoch = 133.3878 [0.0183] BKJD
Rp/R* = 0.0033 [0.0014]
a/R* = 1.38 [1.44]
b = 0.69 [1.69]
Seff = 1810.84 [1172.13]
Teq = 1663 [269] K
Rp = 0.55 [0.31] Re
a = 0.0438 [0.0168] AU
Ag = 33.67 [36.71] [0.89 σ]
Teffp = 6195 [1393] K [3.19 σ]

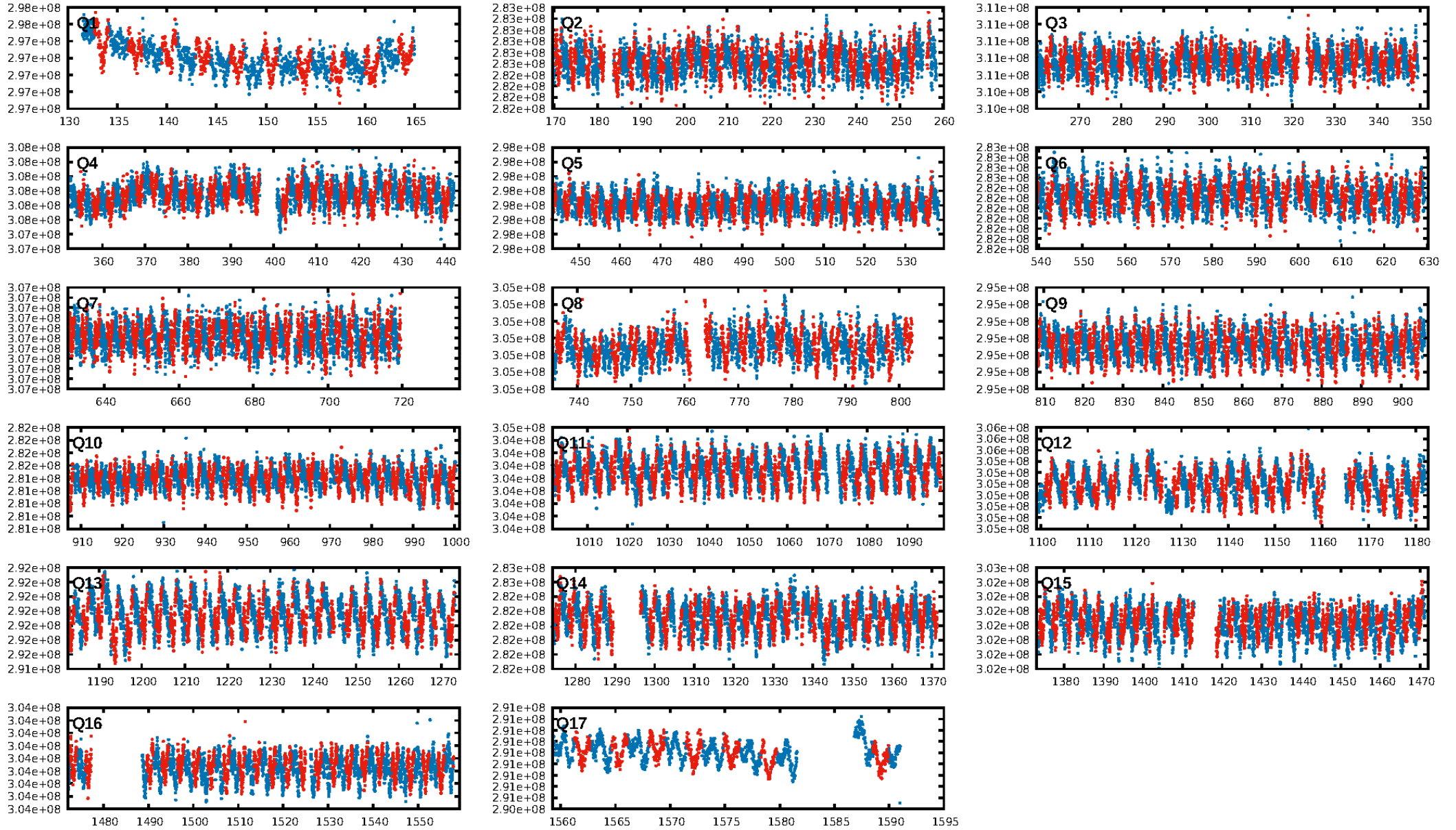
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [384/388]
GhostDiagnostic-chr: 0.3192
Centroid-sig: 0.0%
Centroid-so: 5.077 arcsec [3.20 σ]
OotOffset-rm: 0.089 arcsec [0.46 σ]
KicOffset-rm: 0.144 arcsec [0.81 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.29 [5/17]

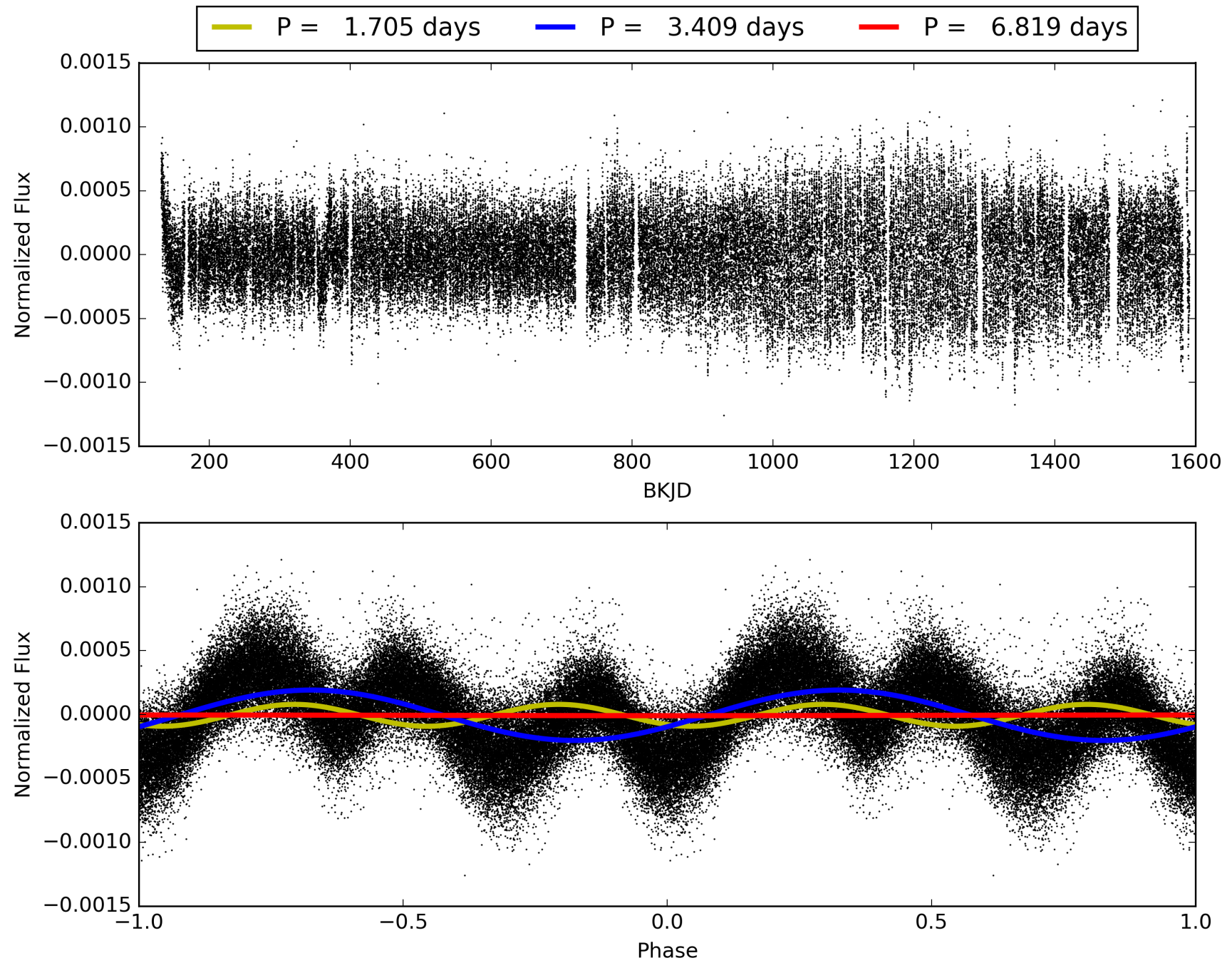
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:27:55 Z

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

TCE 002969991-02, PDC Light Curves

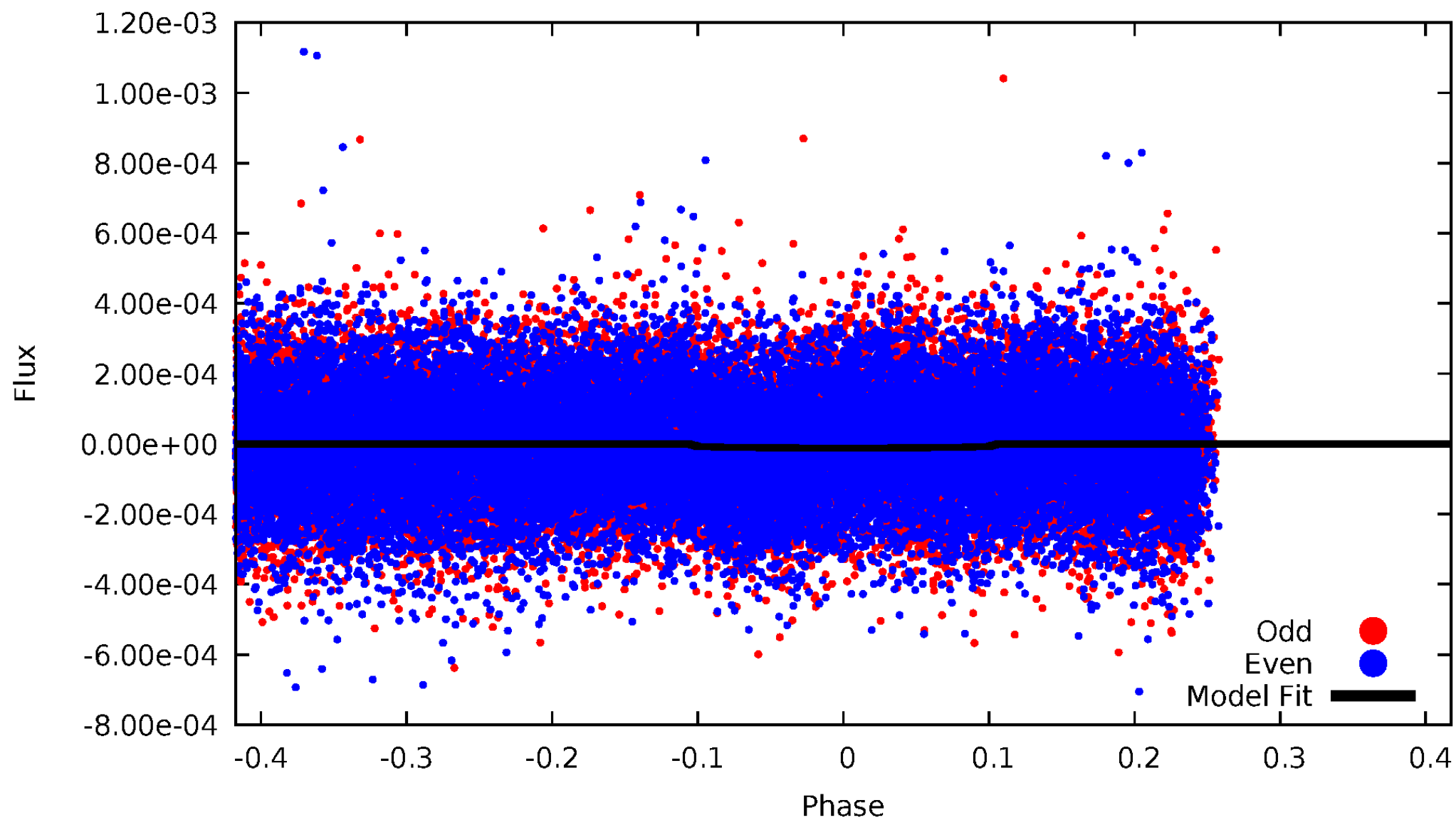


TCE 002969991-02



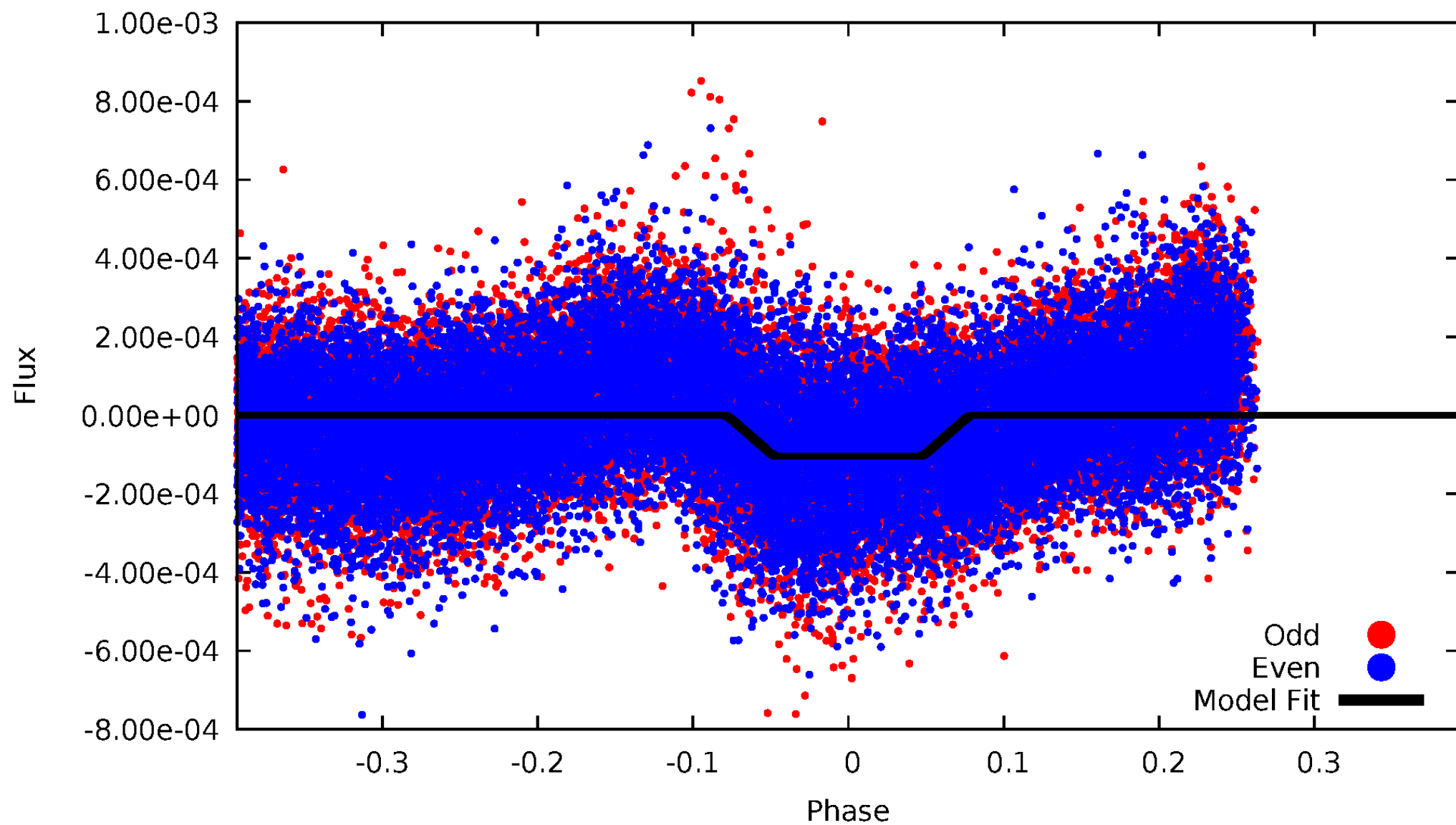
DV Odd/Even

TCE 002969991-02



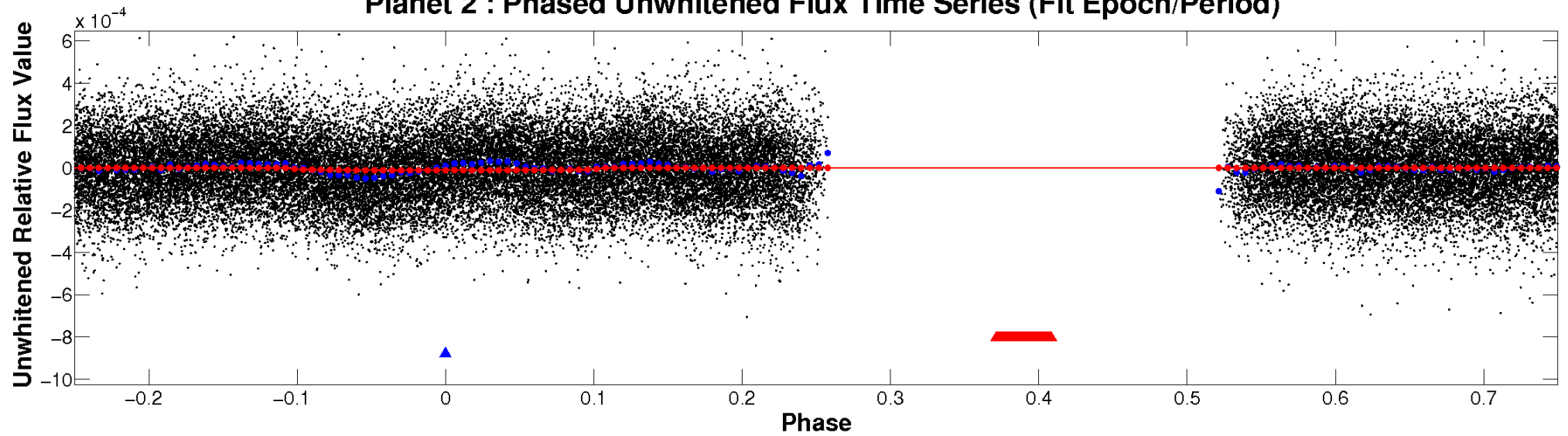
ALT Odd/Even

TCE 002969991-02

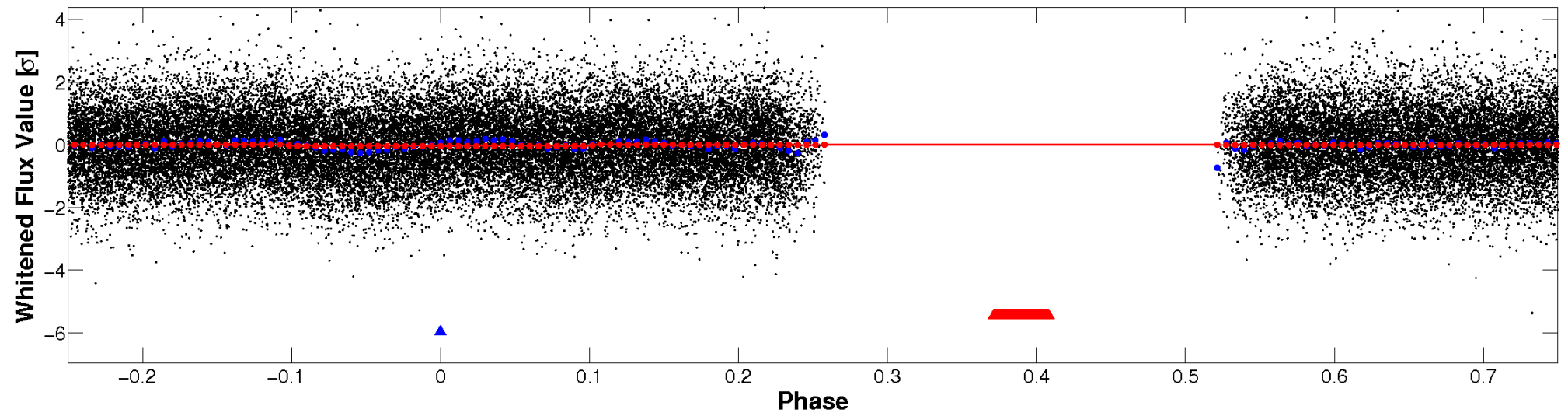


Non-Whitened Vs. Whitened Light Curve

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

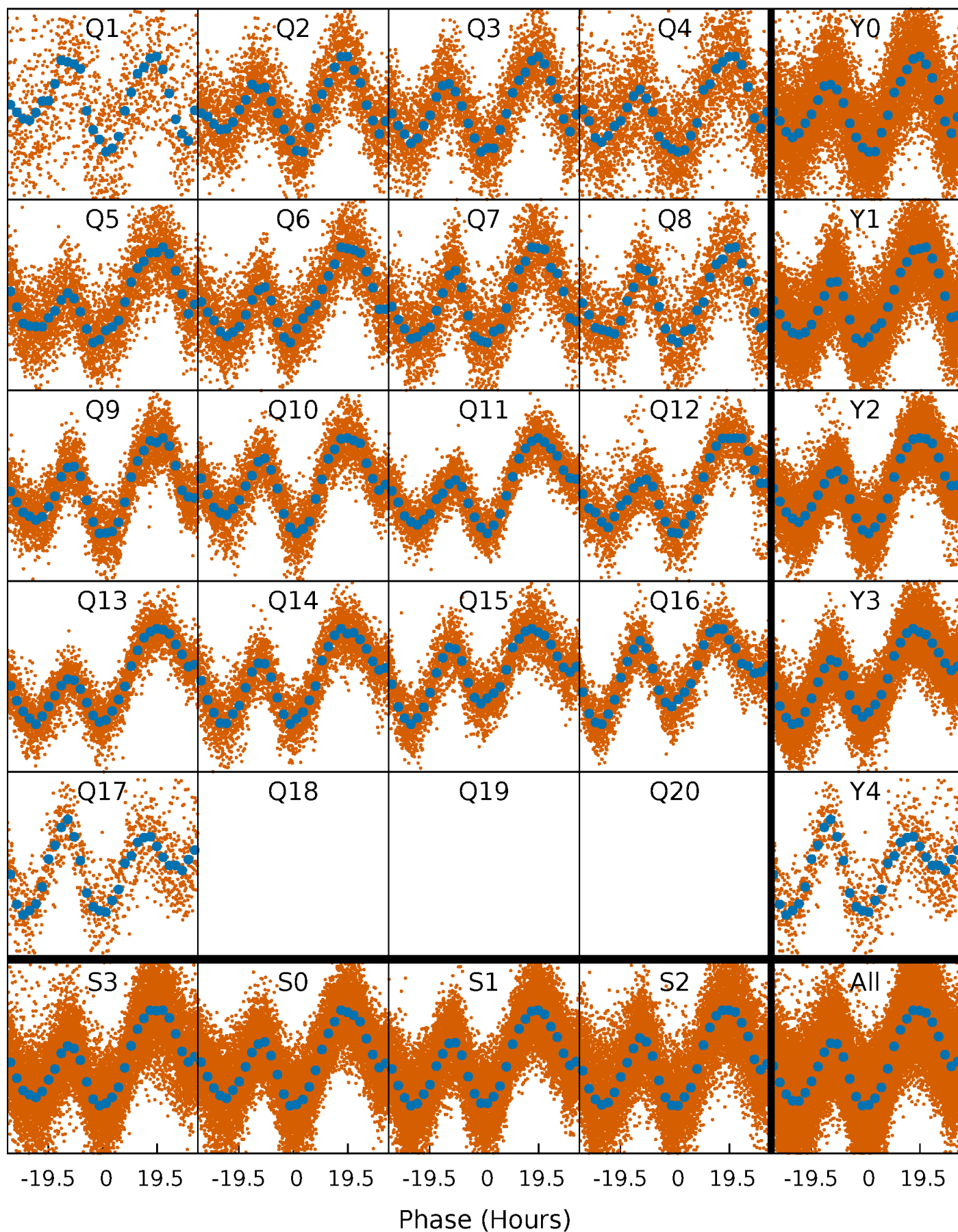


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



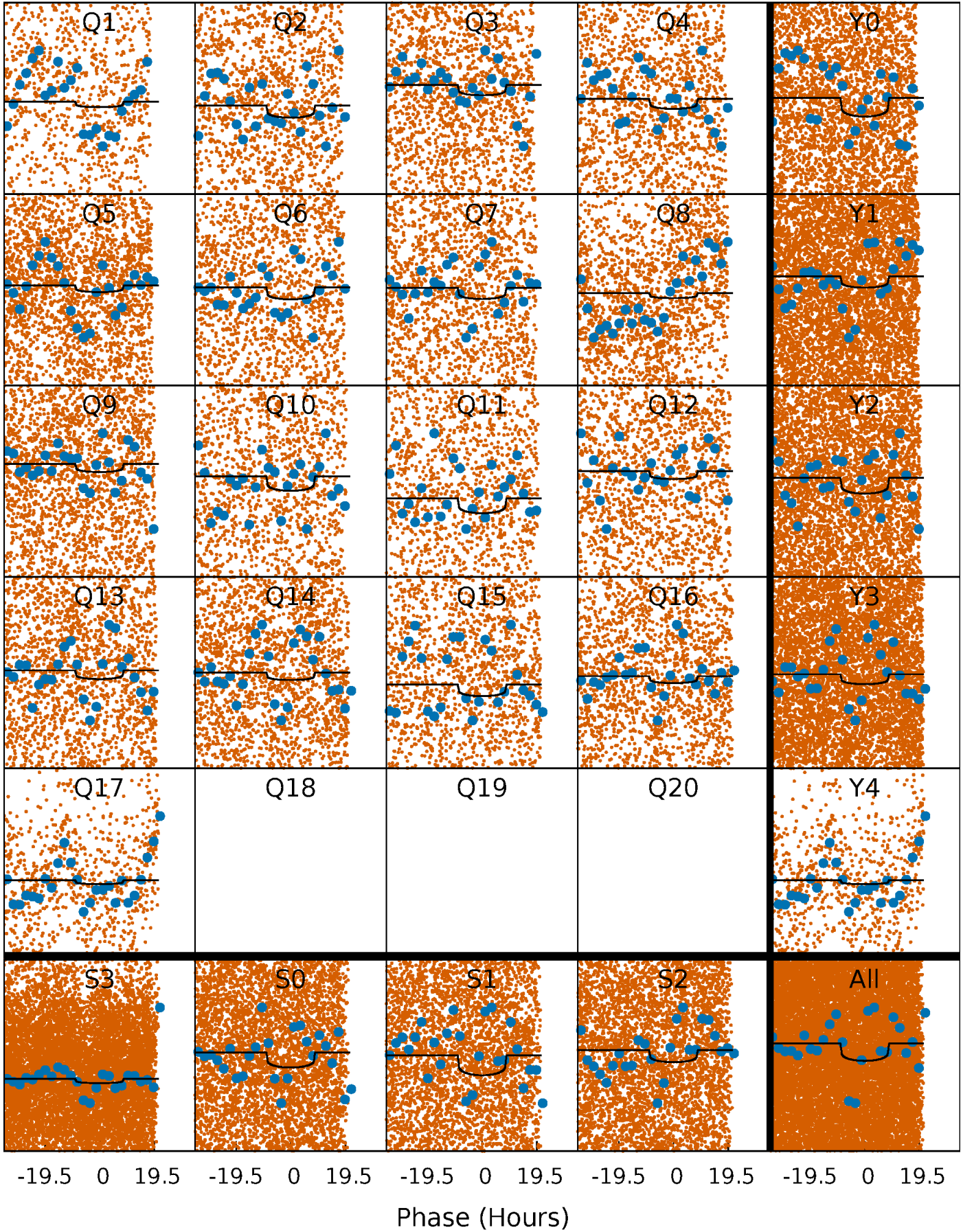
PDC Quarter-Phased Transit Curves

TCE 002969991-02 P= 3.409470 Days $T_0=133.387843$ (BKJD)



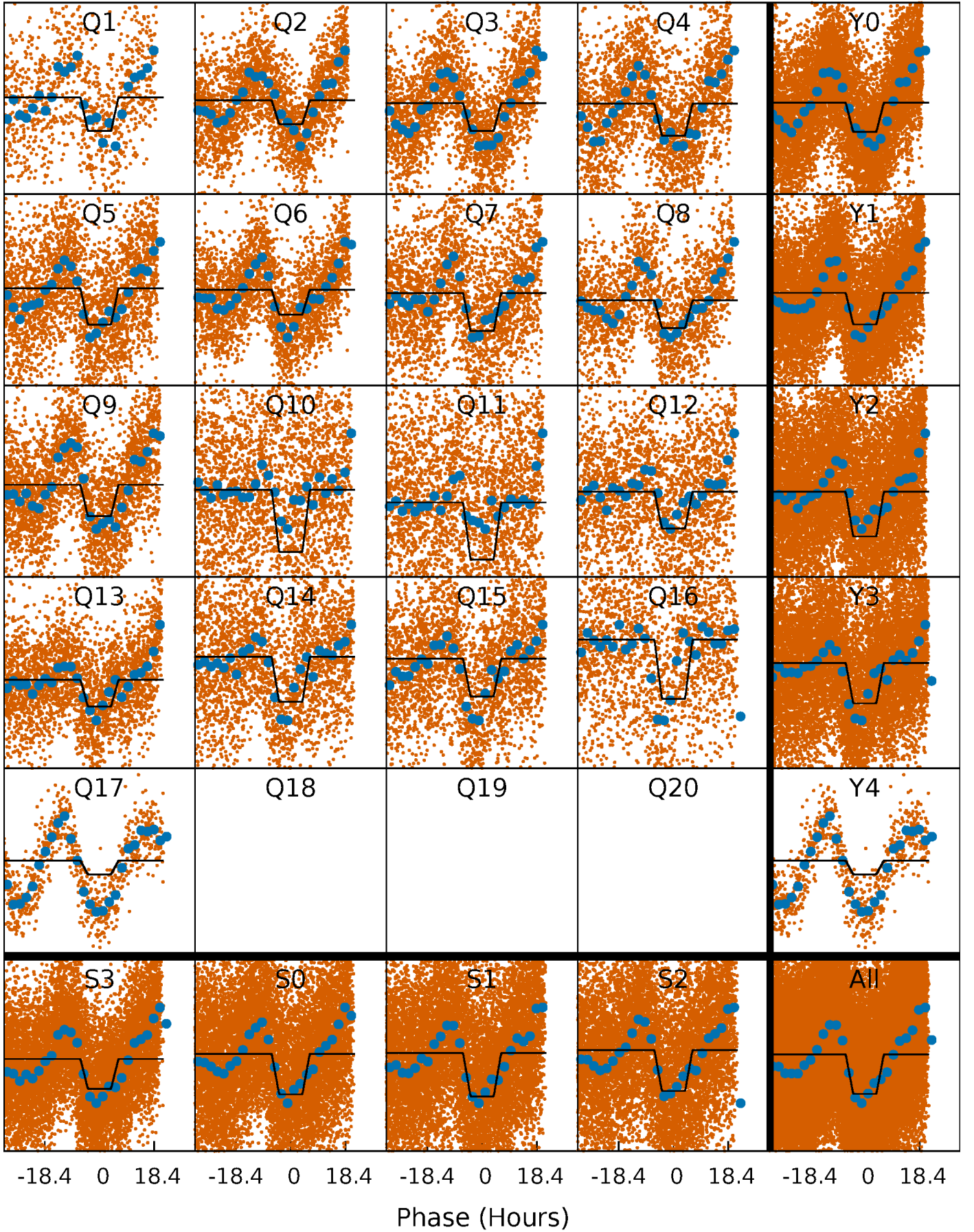
DV Quarter-Phased Transit Curves

TCE 002969991-02 P= 3.409470 Days $T_0=133.387843$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

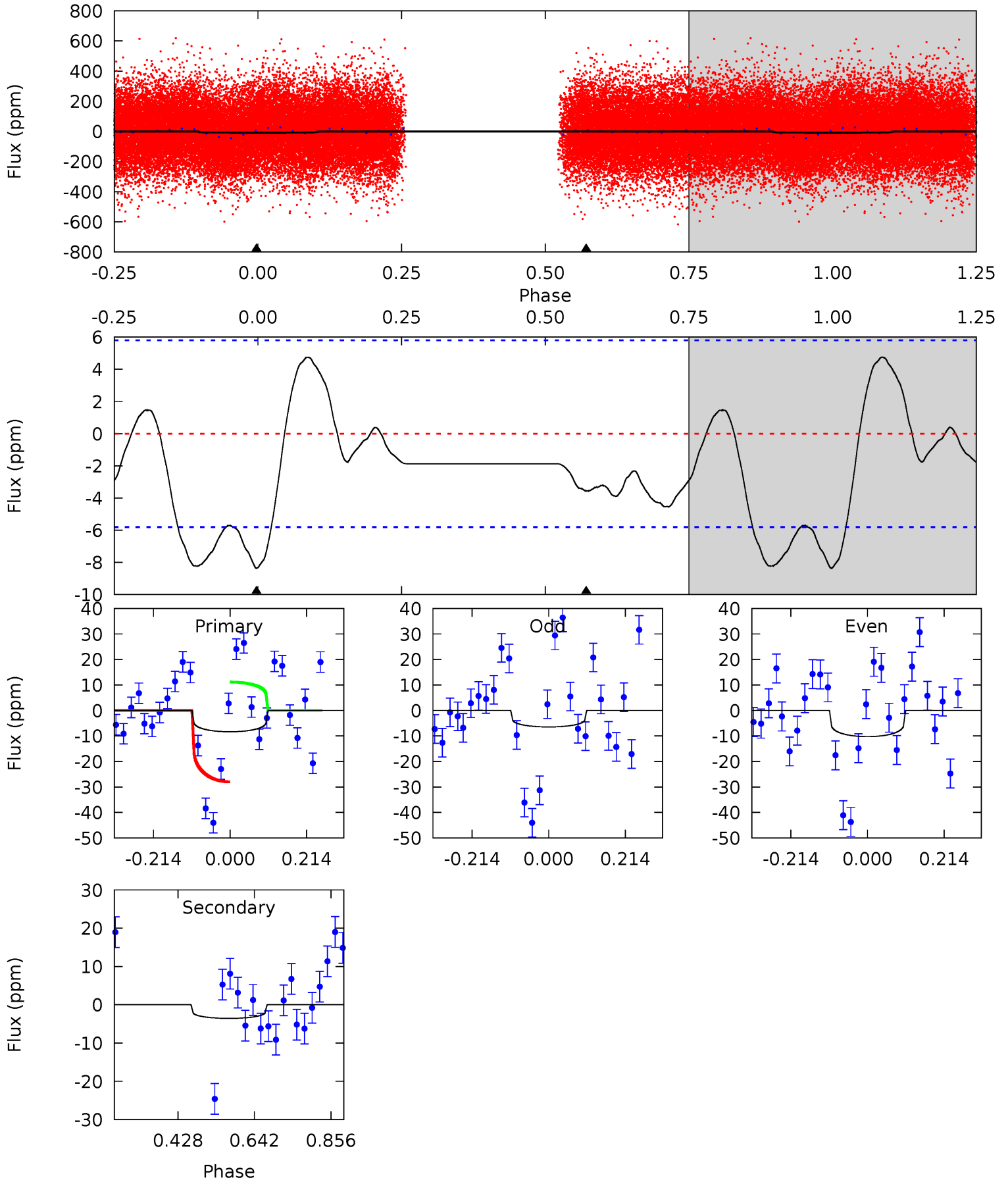
TCE 002969991-02 P= 3.409519 Days $T_0=133.348445$ (BKJD)



DV Model-Shift Uniqueness Test

002969991-02, P = 3.409470 Days, E = 129.978373 Days

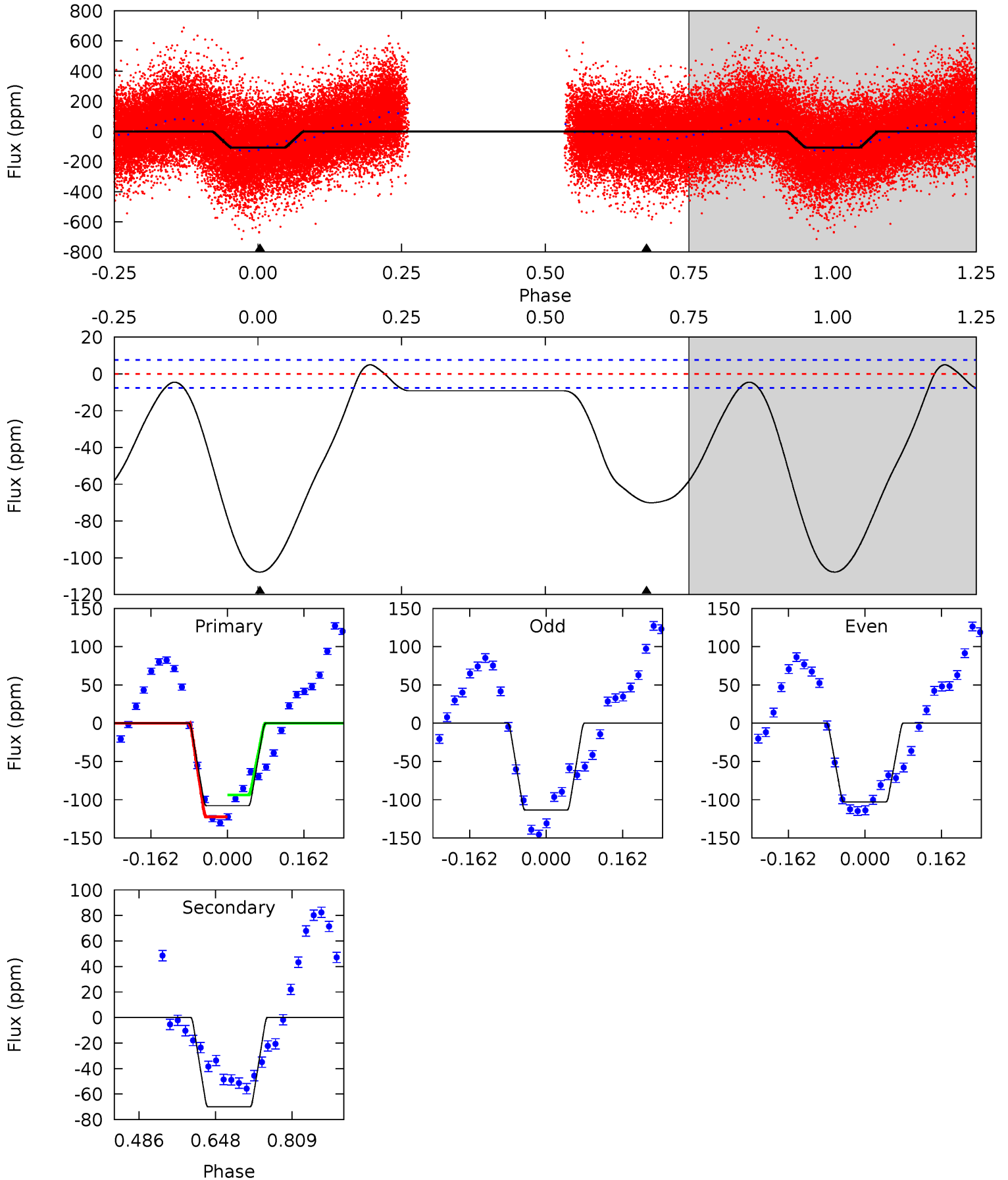
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.35	2.69	0	0	4.40	1.24	0.60	6.35	6.35	2.69	2.69	1.45	1.12	0.36	6.61



Alt Model-Shift Uniqueness Test

002969991-02, P = 3.409519 Days, E = 129.938926 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
63.4	41.1	0	0	4.46	1.40	2.57	63.4	63.4	41.1	41.1	3.13	1.09	0.04	9.34



Stellar Parameters For KIC 002969991

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6359^{+201}_{-223}	$4.047^{+0.378}_{-0.162}$	$-0.660^{+0.300}_{-0.300}$	$1.540^{+0.386}_{-0.578}$	$0.963^{+0.128}_{-0.128}$	$0.372^{+1.007}_{-0.156}$
	+3%/-4%	+9%/-4%	+45%/-45%	+25%/-38%	+13%/-13%	+271%/-42%
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 002969991-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-4 ± 1	$0.54^{+0.27}_{-0.23}$	2296^{+190}_{-258}	4760^{+1329}_{-701}	12^{+26}_{-8}
Alt.	-70 ± 2	$1.66^{+0.38}_{-0.39}$	2297^{+191}_{-250}	5736^{+481}_{-365}	27^{+19}_{-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

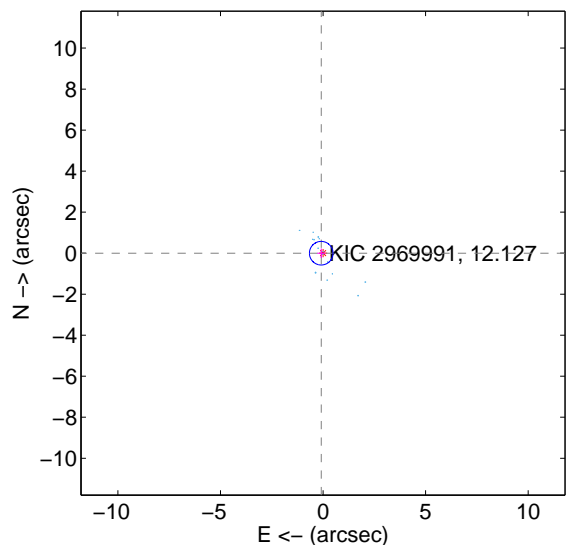
Supplemental centroid analysis for 002969991-02. Kepler magnitude: 12.13. Transit SNR 4.24

There are 17 quarters with good PRF difference image offsets

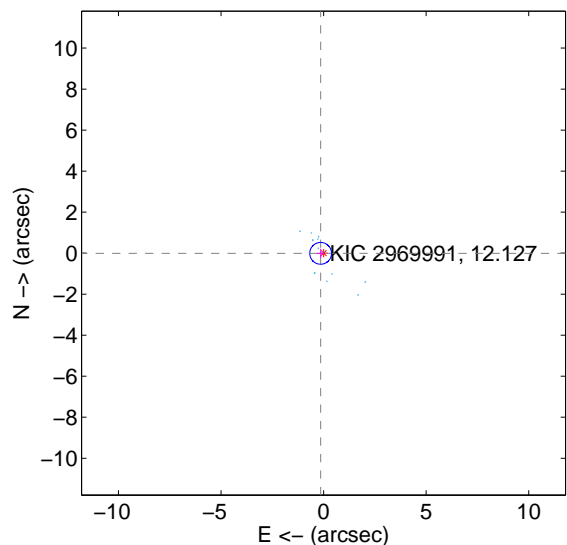
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.089 ± 0.192	0.46	0.088 ± 0.195	-0.002 ± 0.233
PRF-fit source offset from KIC position	0.144 ± 0.177	0.81	0.143 ± 0.187	-0.009 ± 0.230
photometric centroid source offset	5.08 ± 1.58	3.20	-4.55 ± 1.56	-2.24 ± 1.69

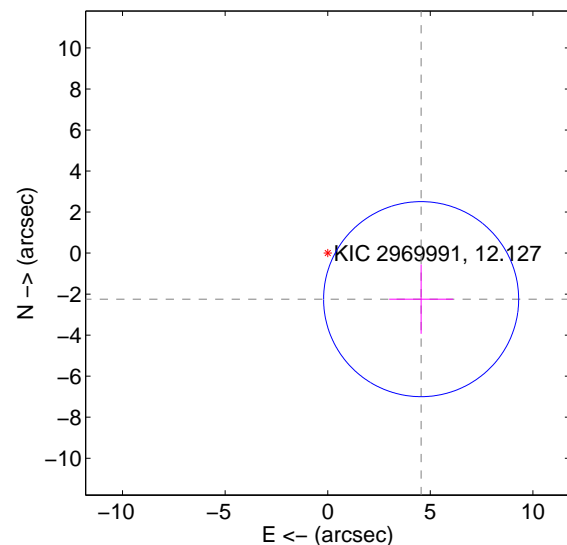
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

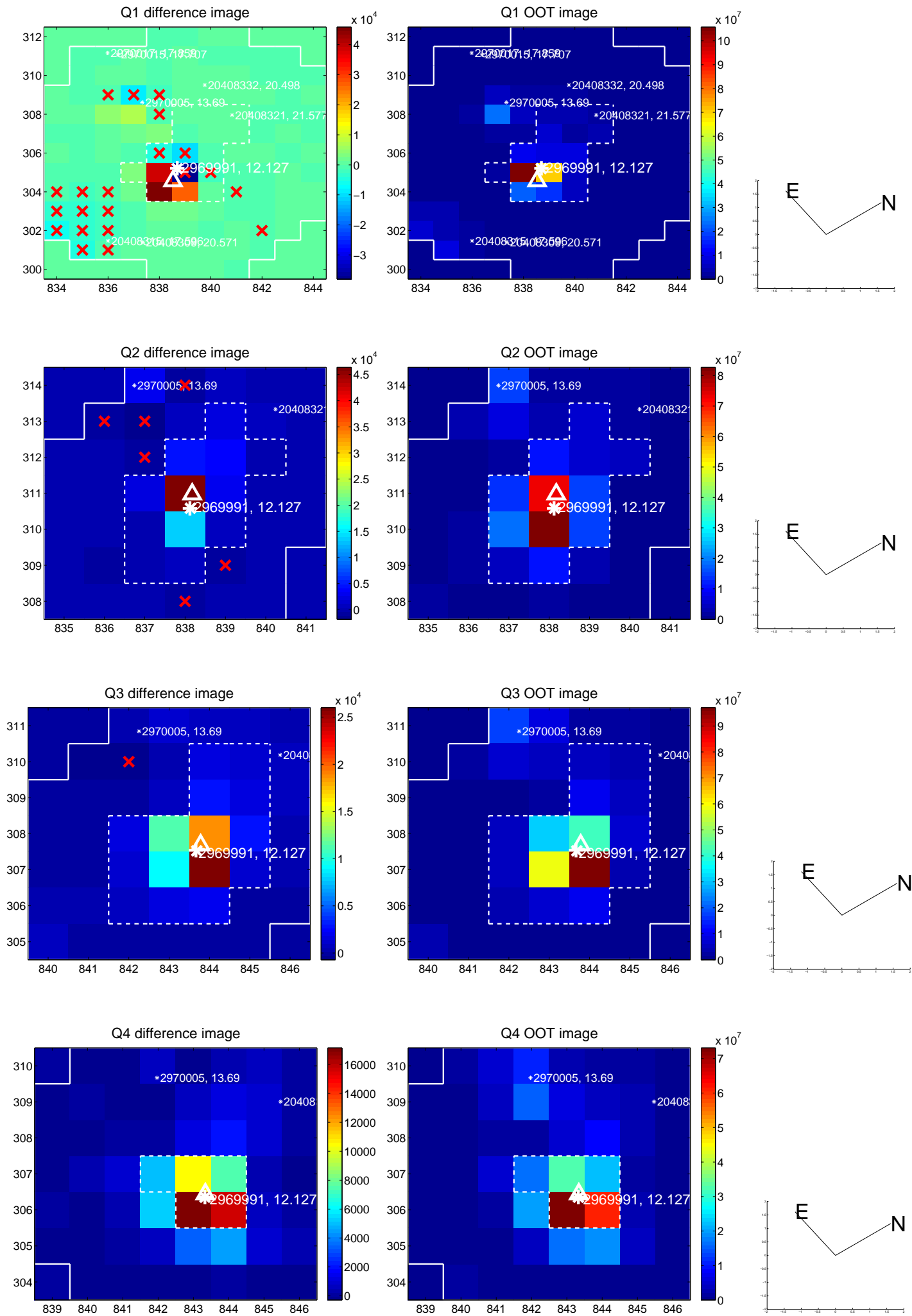


offset from photometric centroids

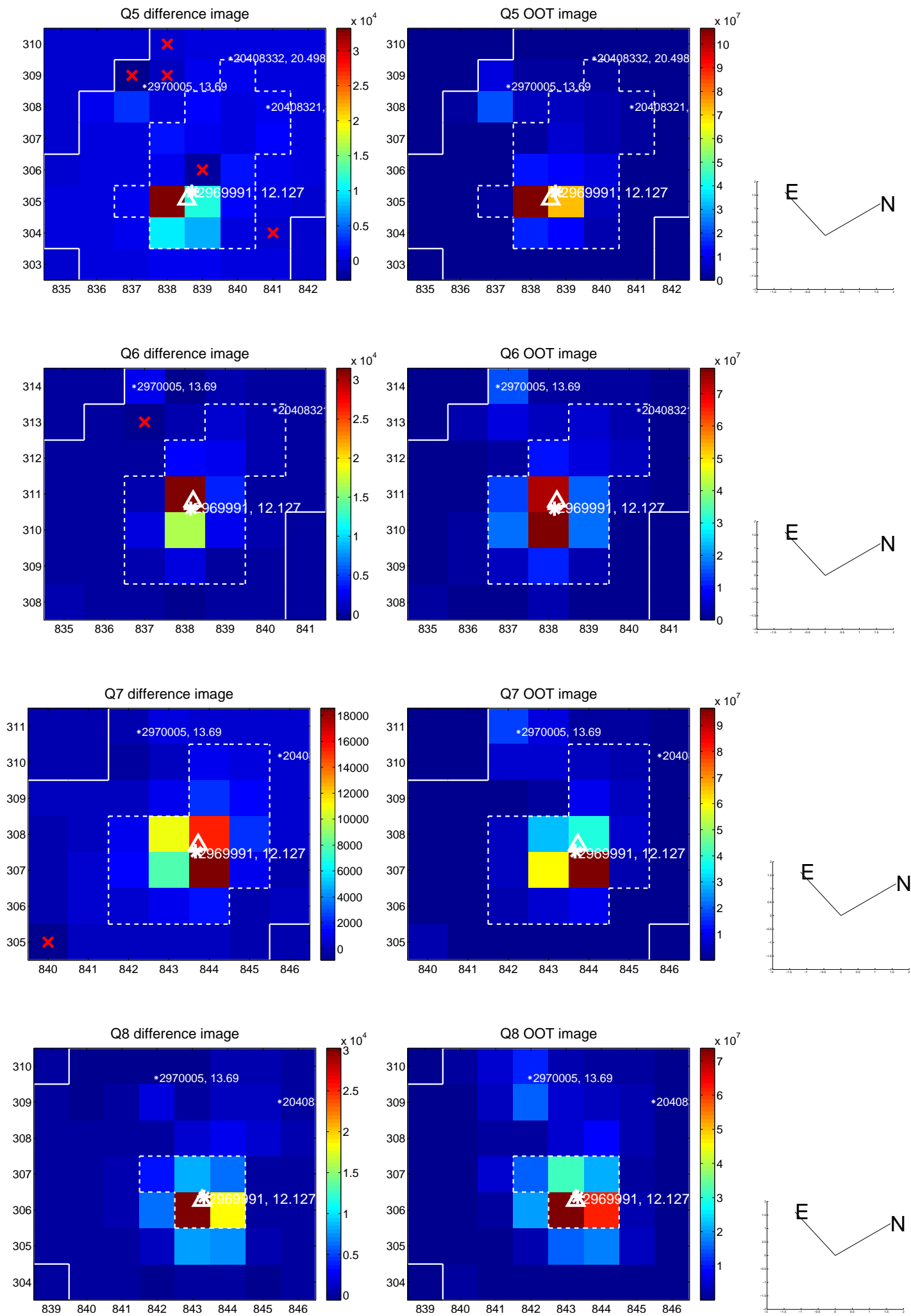


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

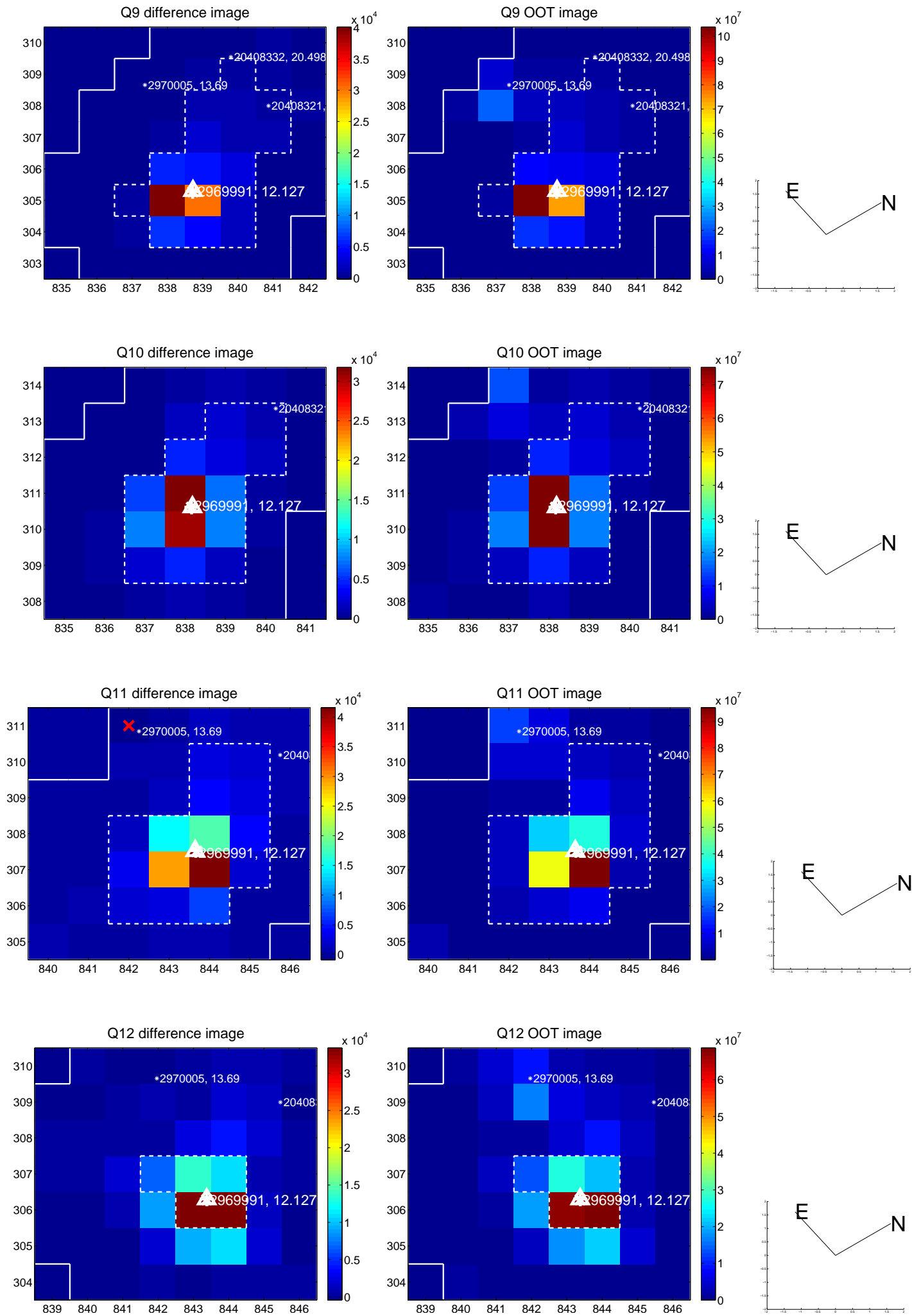
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



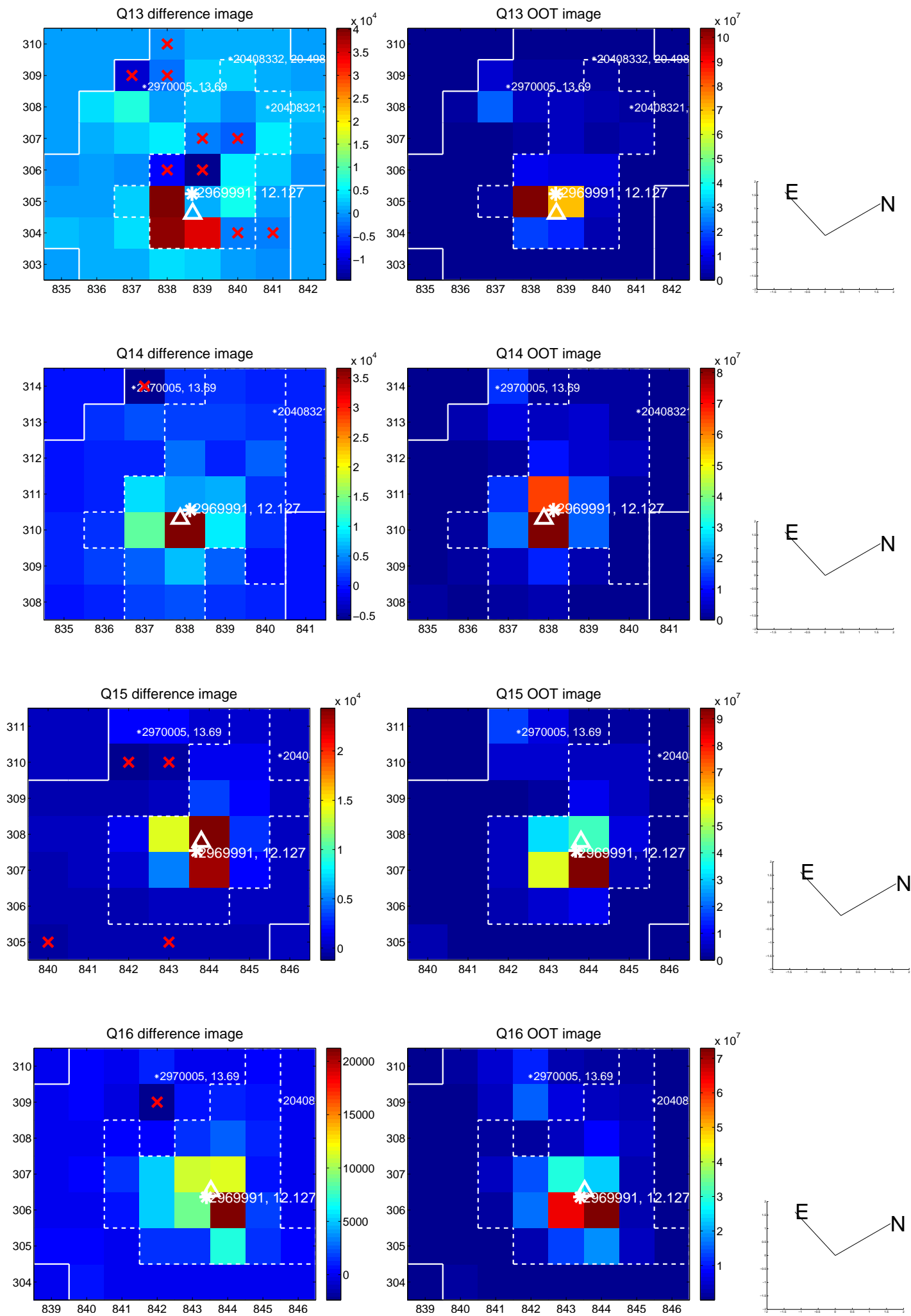
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



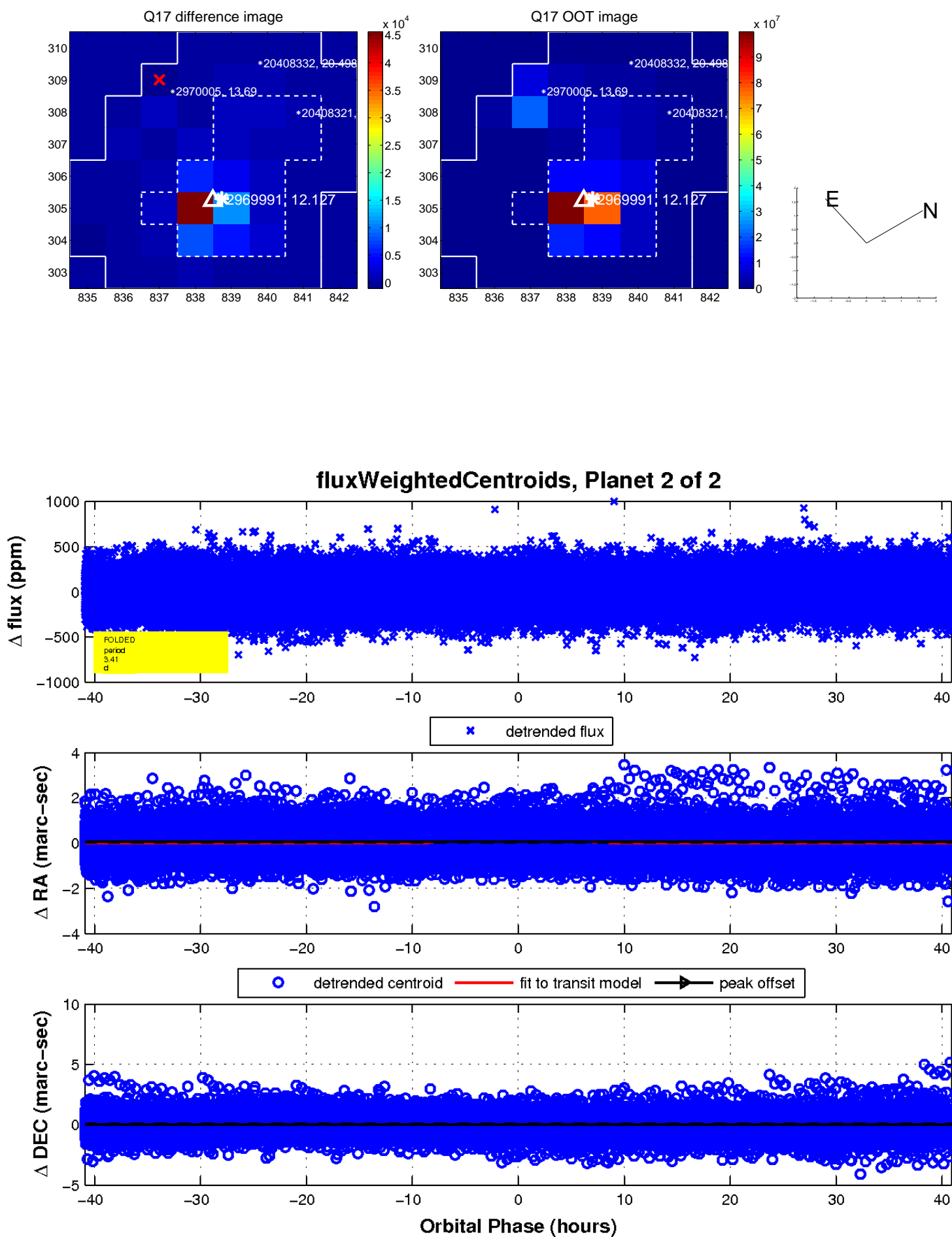
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

