

KIC 009655470

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})
009655470-01	OBS	No	1.276634	132.387967	133.1	7.614	8.8	10.5	1.90	7730	2.23	15061.69
009655470-02	OBS	No	0.634236	131.639129	245.0	3.824	11.0	11.7	1.90	7730	3.44	38279.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655470-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009655470-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

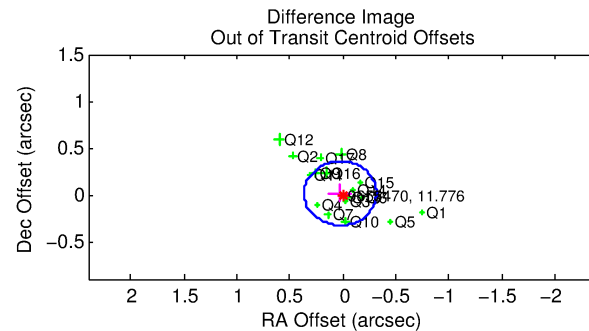
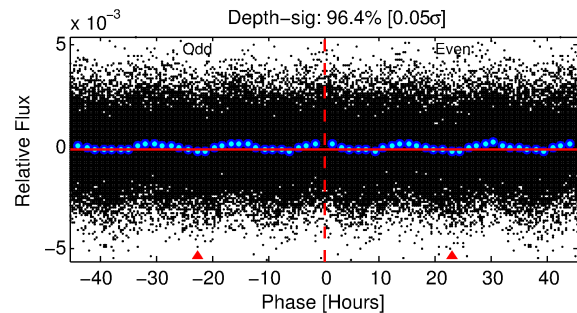
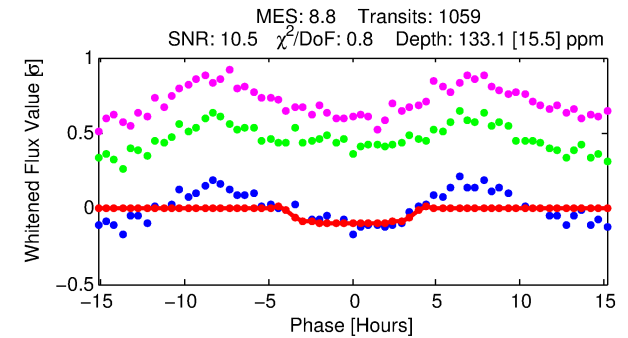
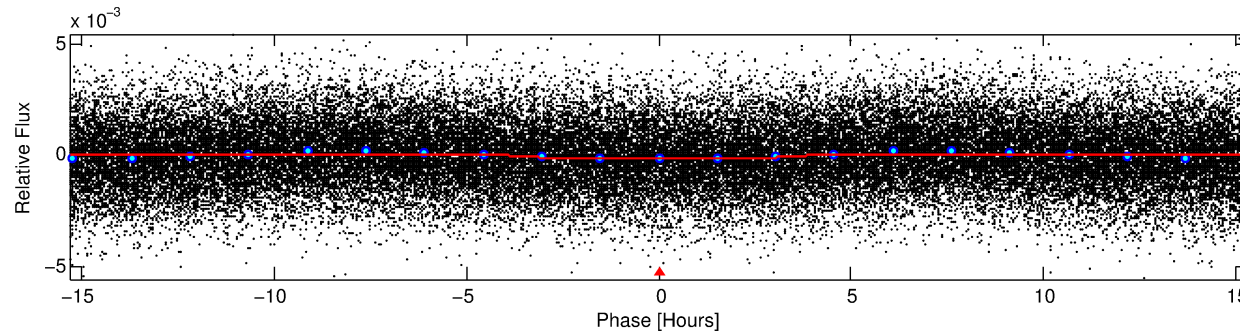
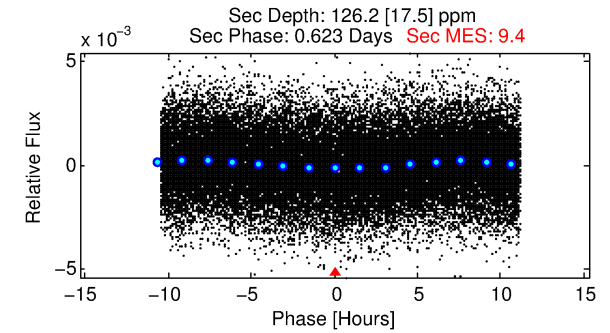
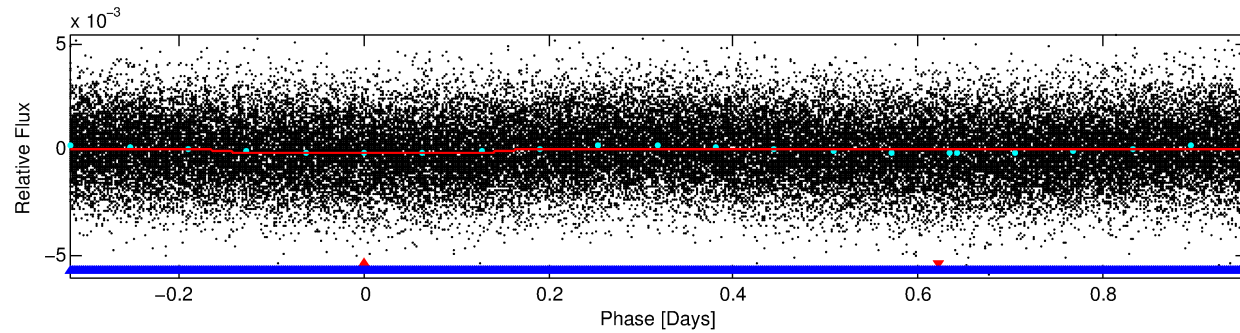
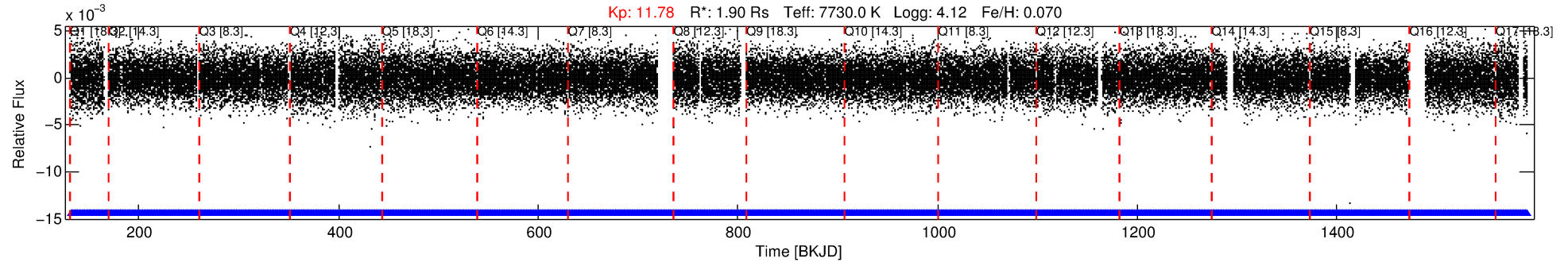
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009655470-01

No Significant Match Found

DV One-Page Summary

KIC: 9655470 Candidate: 1 of 2 Period: 1.277 d



DV Fit Results:

Period = 1.27663 [0.00002] d
Epoch = 132.3880 [0.0071] BKJD
Rp/R* = 0.0108 [0.0146]
a/R* = 1.42 [5.81]
b = 0.24 [32.23]
Seff = 15061.69 [5478.46]
Teq = 2825 [257] K
Rp = 2.23 [3.08] Re
a = 0.0277 [0.0063] AU
Ag = 10.66 [29.09] [0.33σ]
Teffp = 7892 [5356] K [0.94σ]

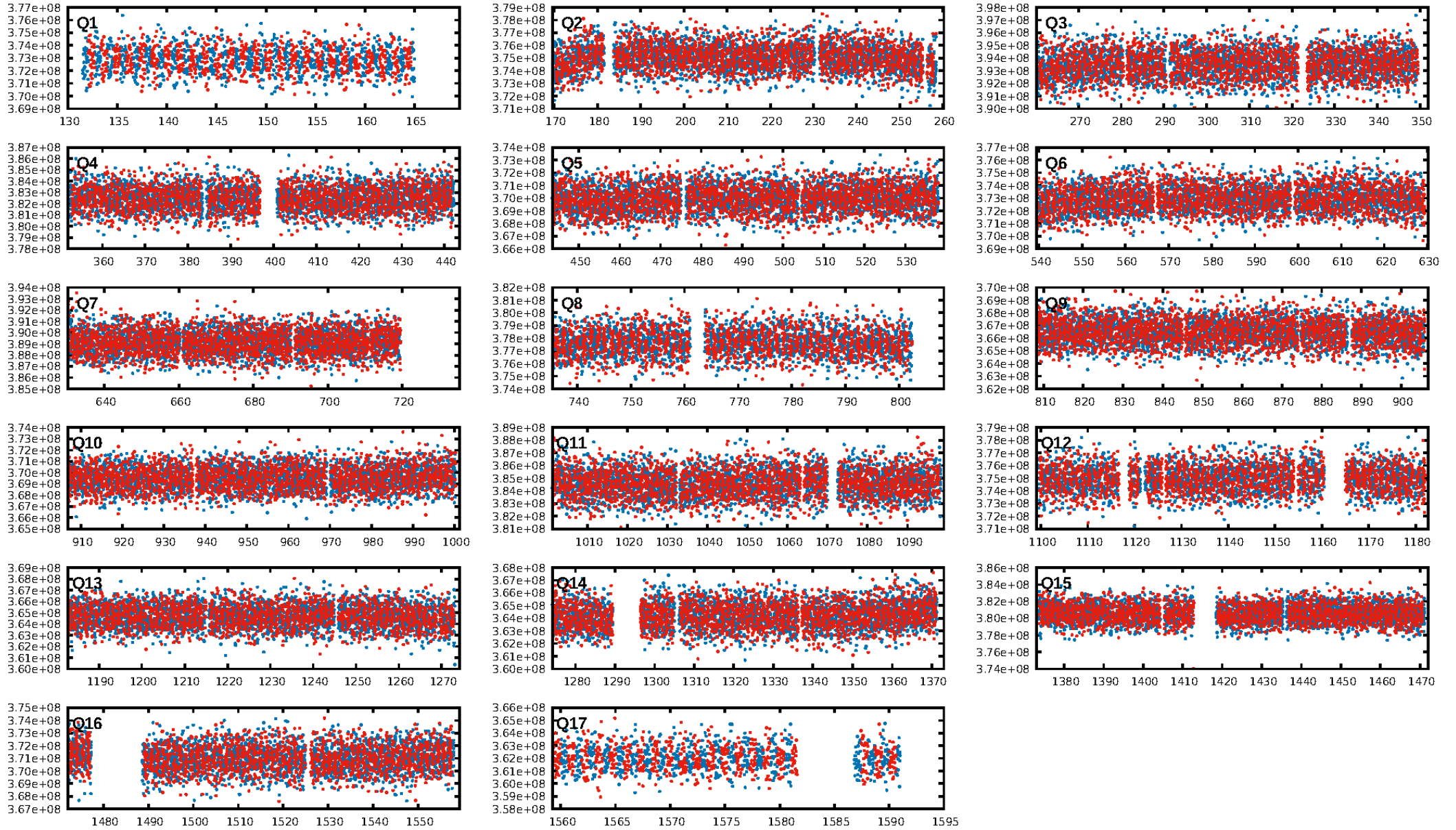
DV Diagnostic Results:

ShortPeriod-sig: 93.0% [1.81σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.70e-16
RollingBand-fgt: 1.00 [1012/1012]
GhostDiagnostic-chr: 3.02
Centroid-sig: N/A
Centroid-so: 0.045 arcsec [0.72σ]
OotOffset-rm: 0.028 arcsec [0.24σ]
KicOffset-rm: 0.015 arcsec [0.17σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

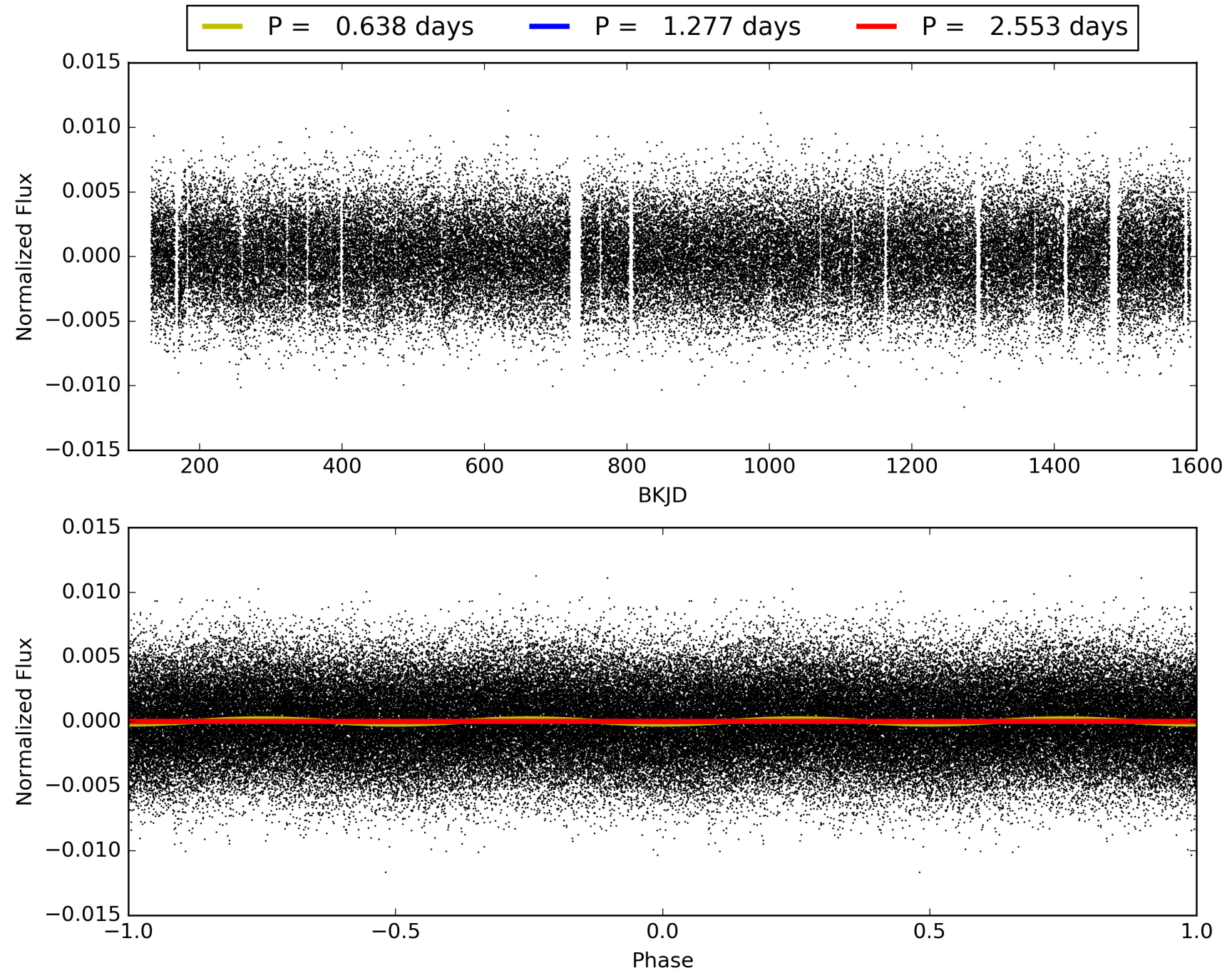
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 22:40:07 Z

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

TCE 009655470-01, PDC Light Curves

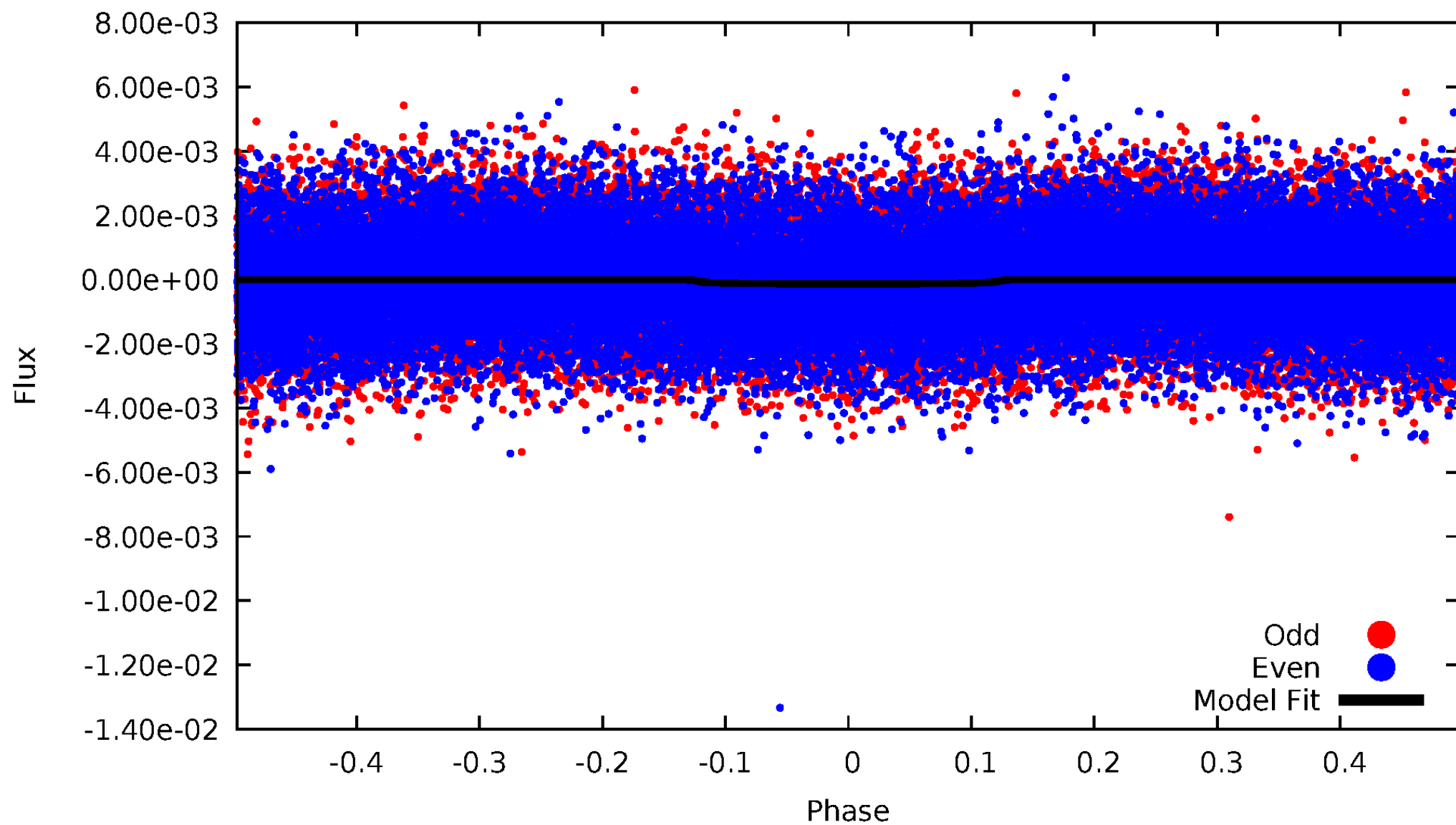


TCE 009655470-01



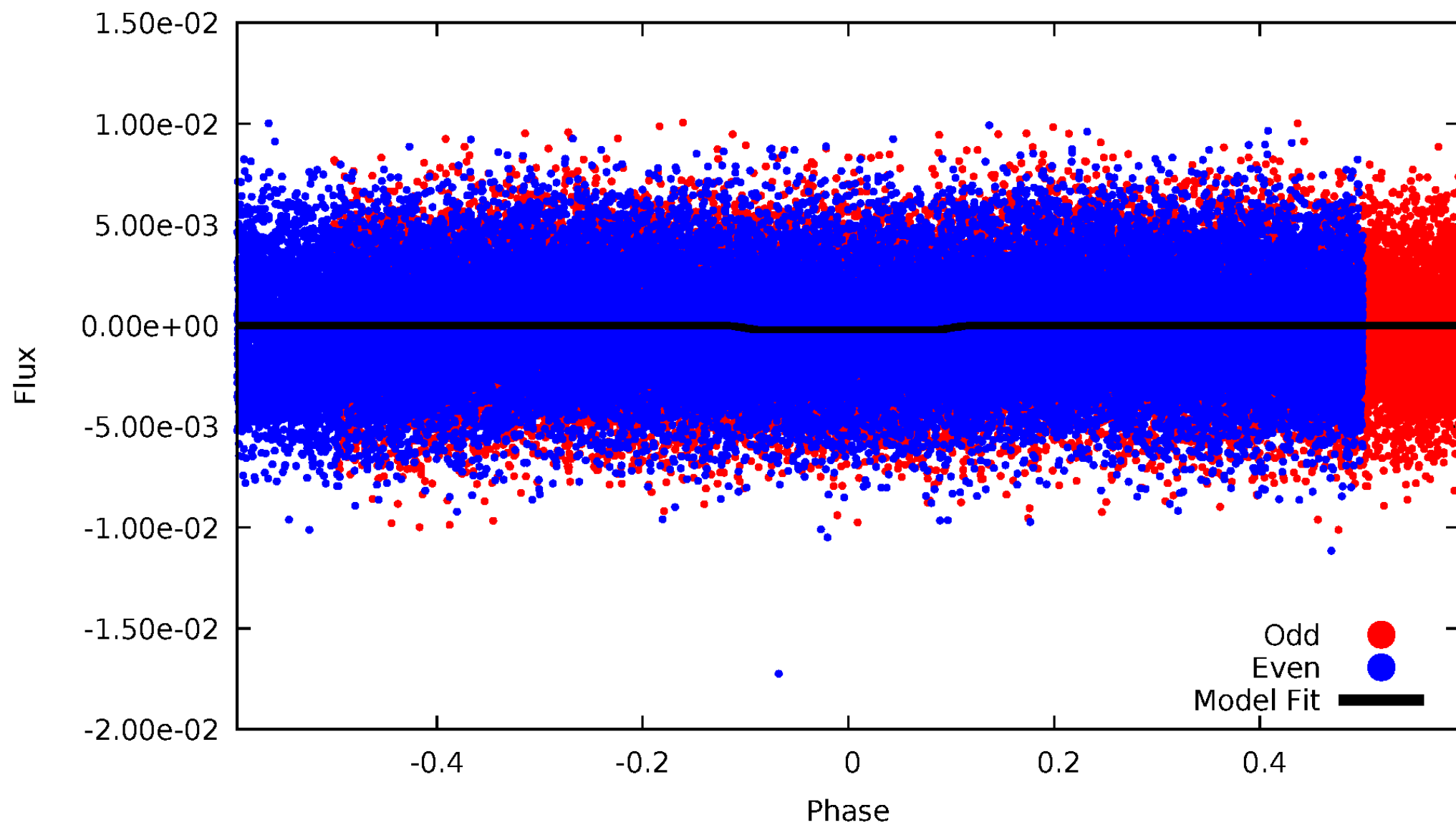
DV Odd/Even

TCE 009655470-01



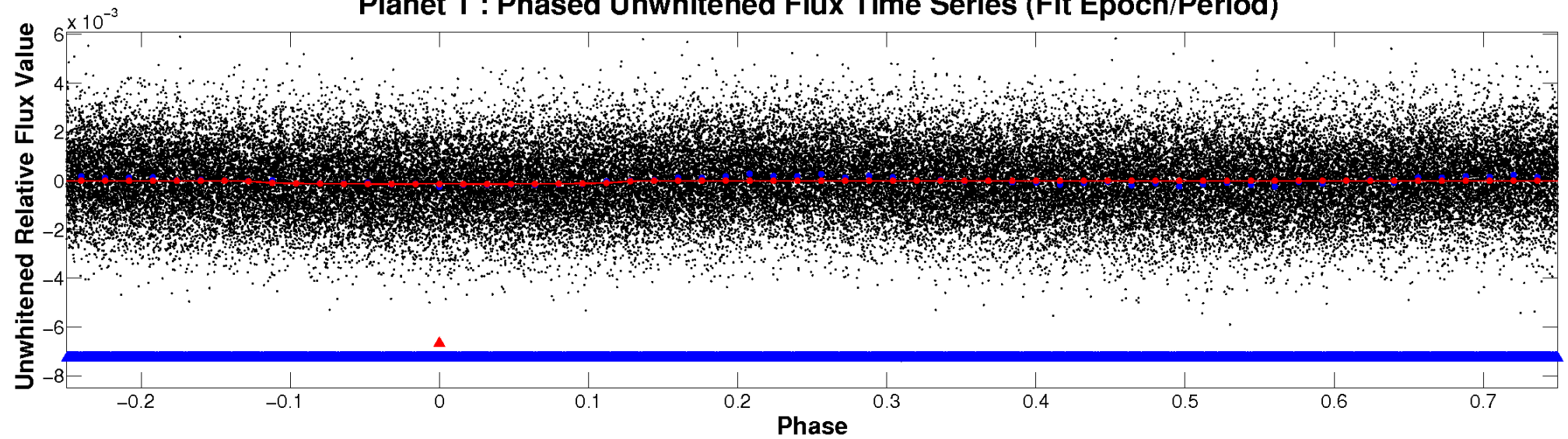
ALT Odd/Even

TCE 009655470-01

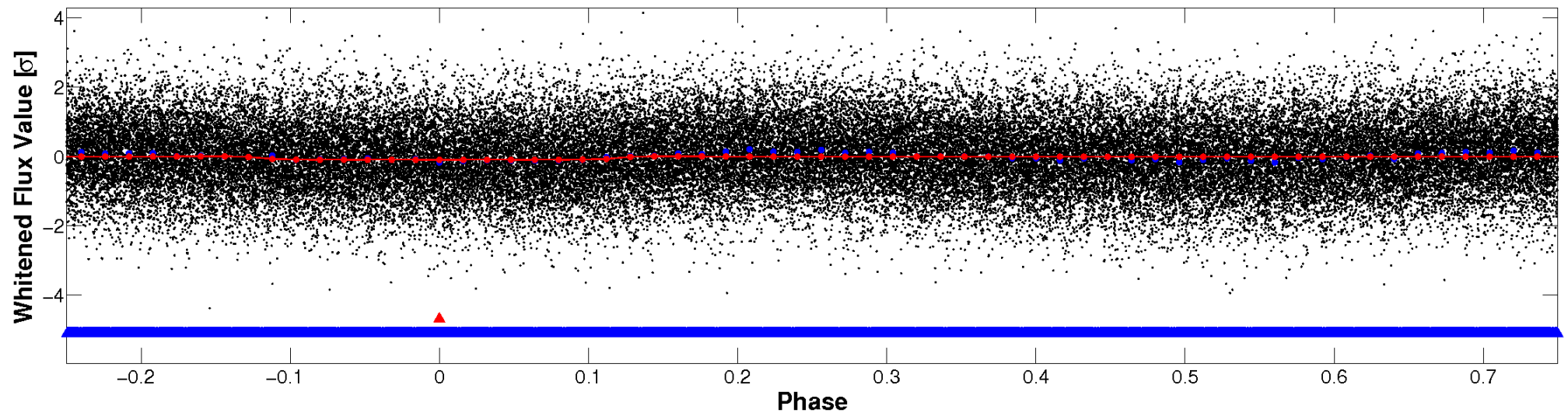


Non-Whitened Vs. Whitened Light Curve

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

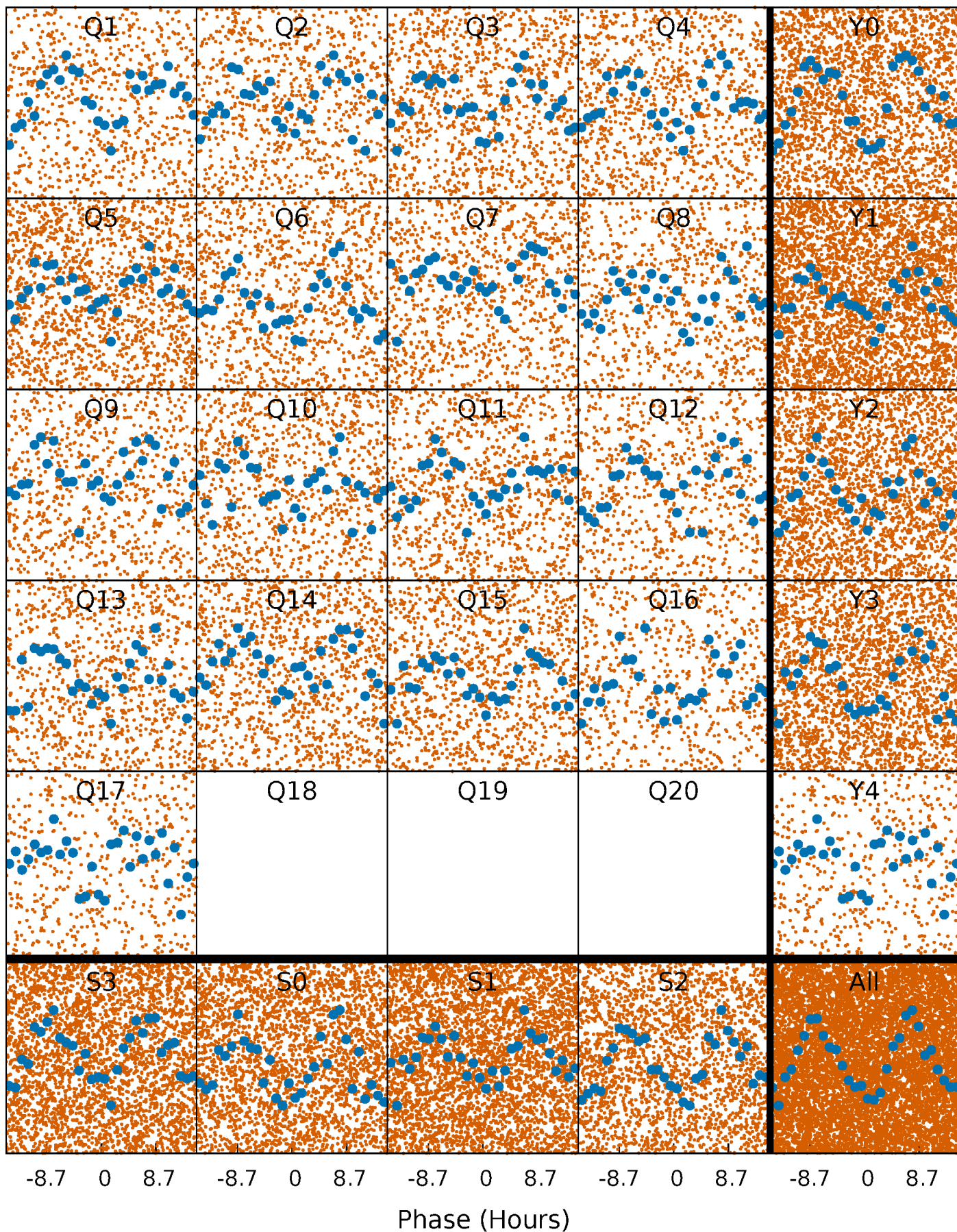


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



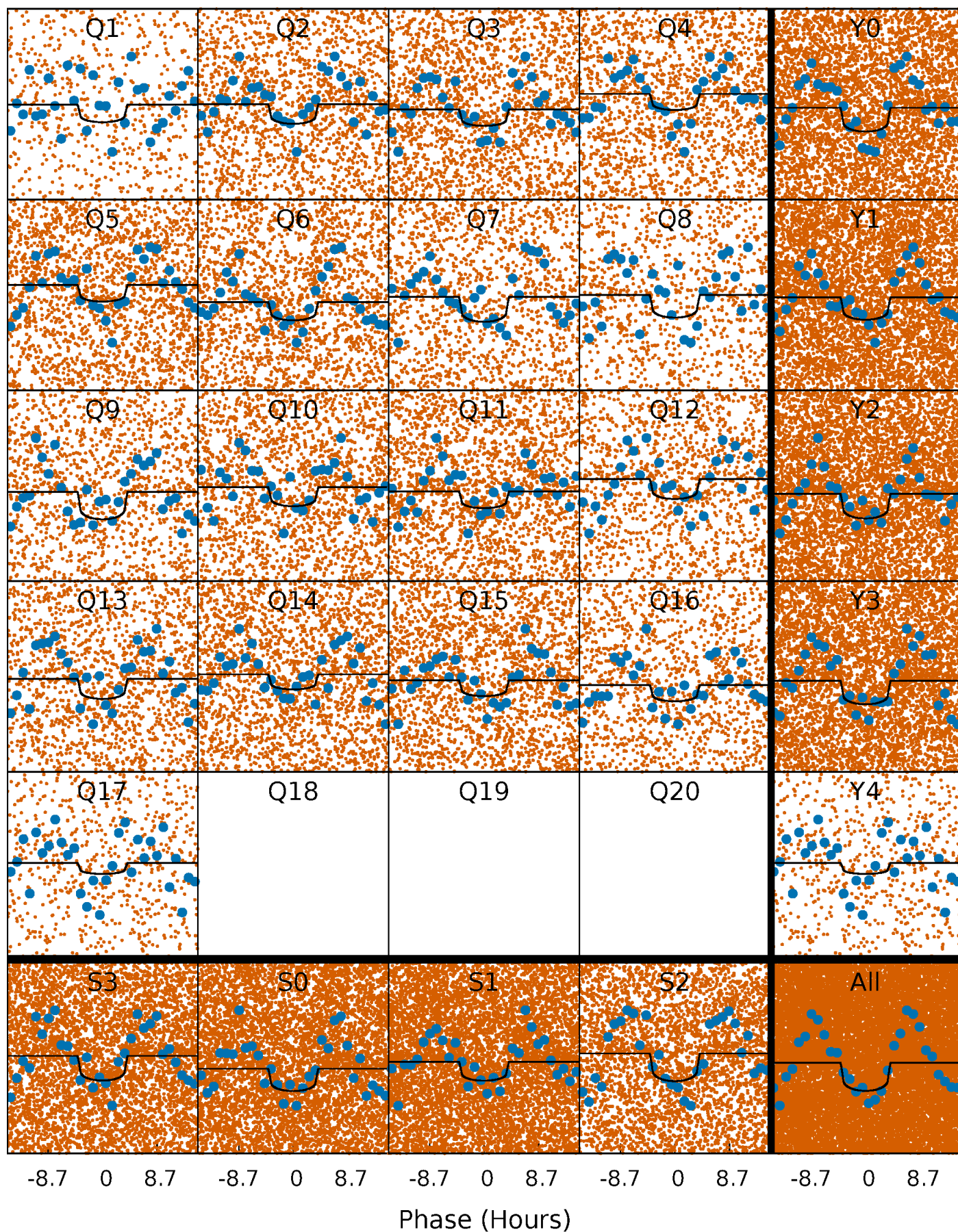
PDC Quarter-Phased Transit Curves

TCE 009655470-01 P= 1.276634 Days $T_0=132.387967$ (BKJD)



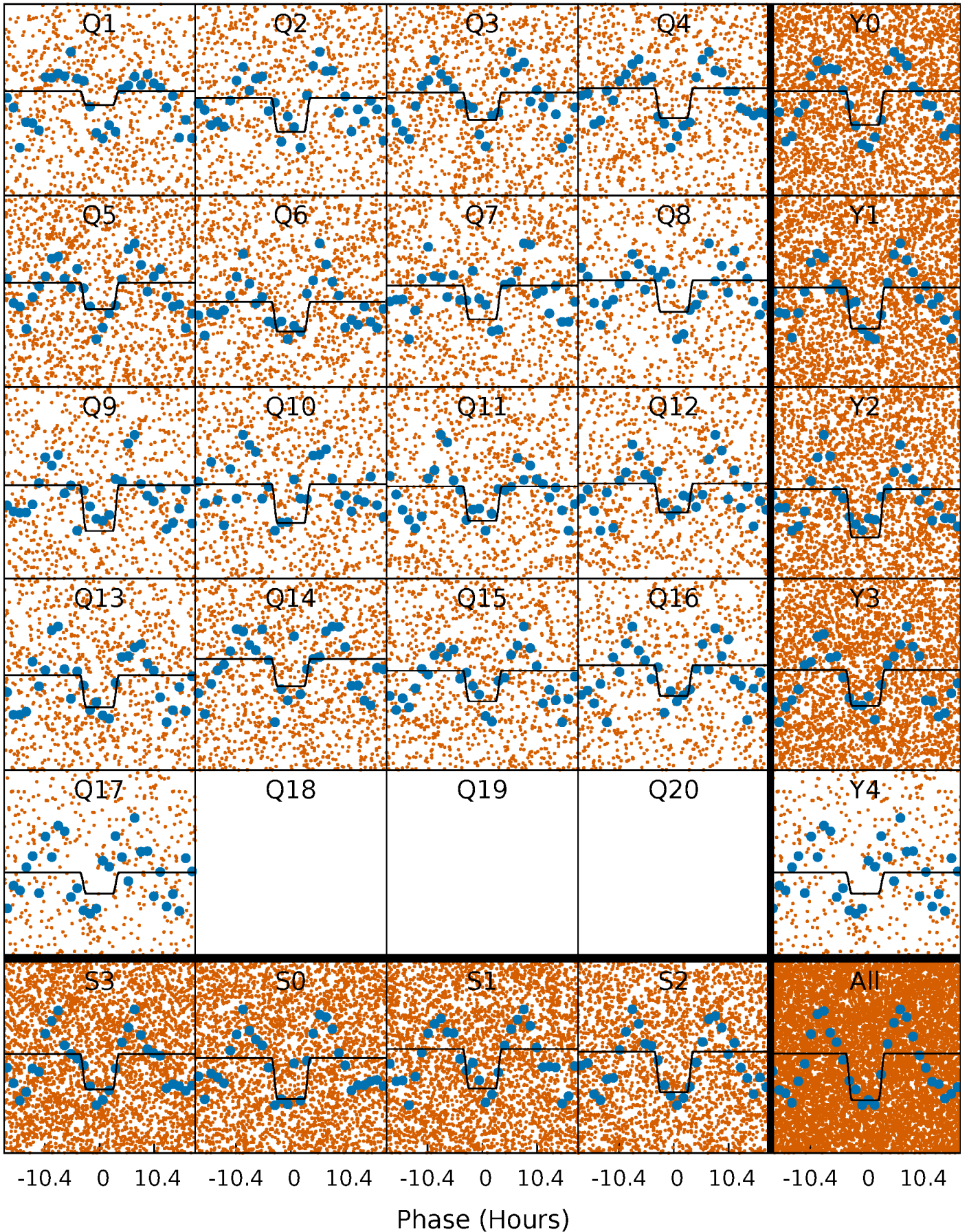
DV Quarter-Phased Transit Curves

TCE 009655470-01 P= 1.276634 Days $T_0=132.387967$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

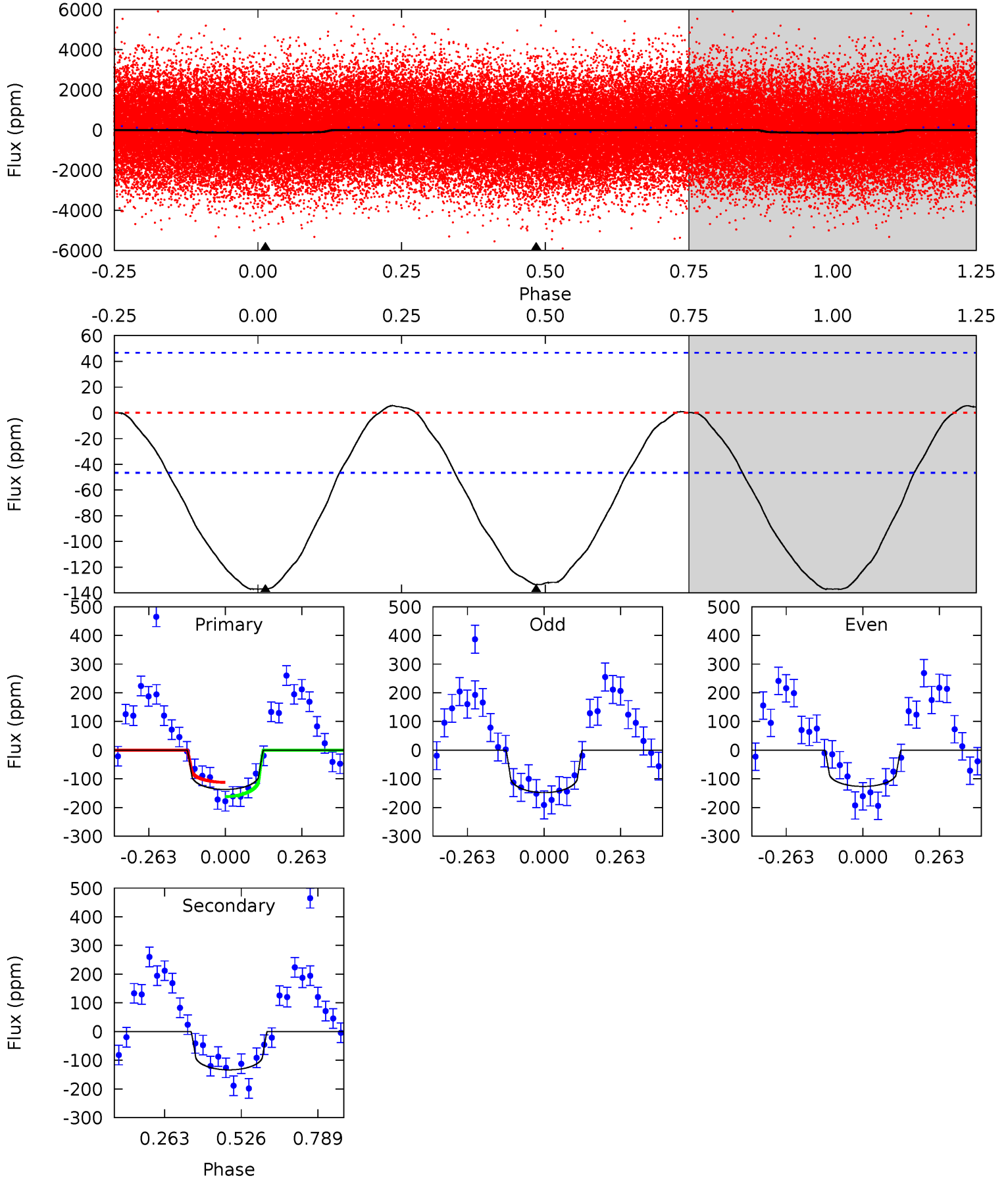
TCE 009655470-01 P= 1.276639 Days $T_0=132.398516$ (BKJD)



DV Model-Shift Uniqueness Test

009655470-01, P = 1.276634 Days, E = 131.111333 Days

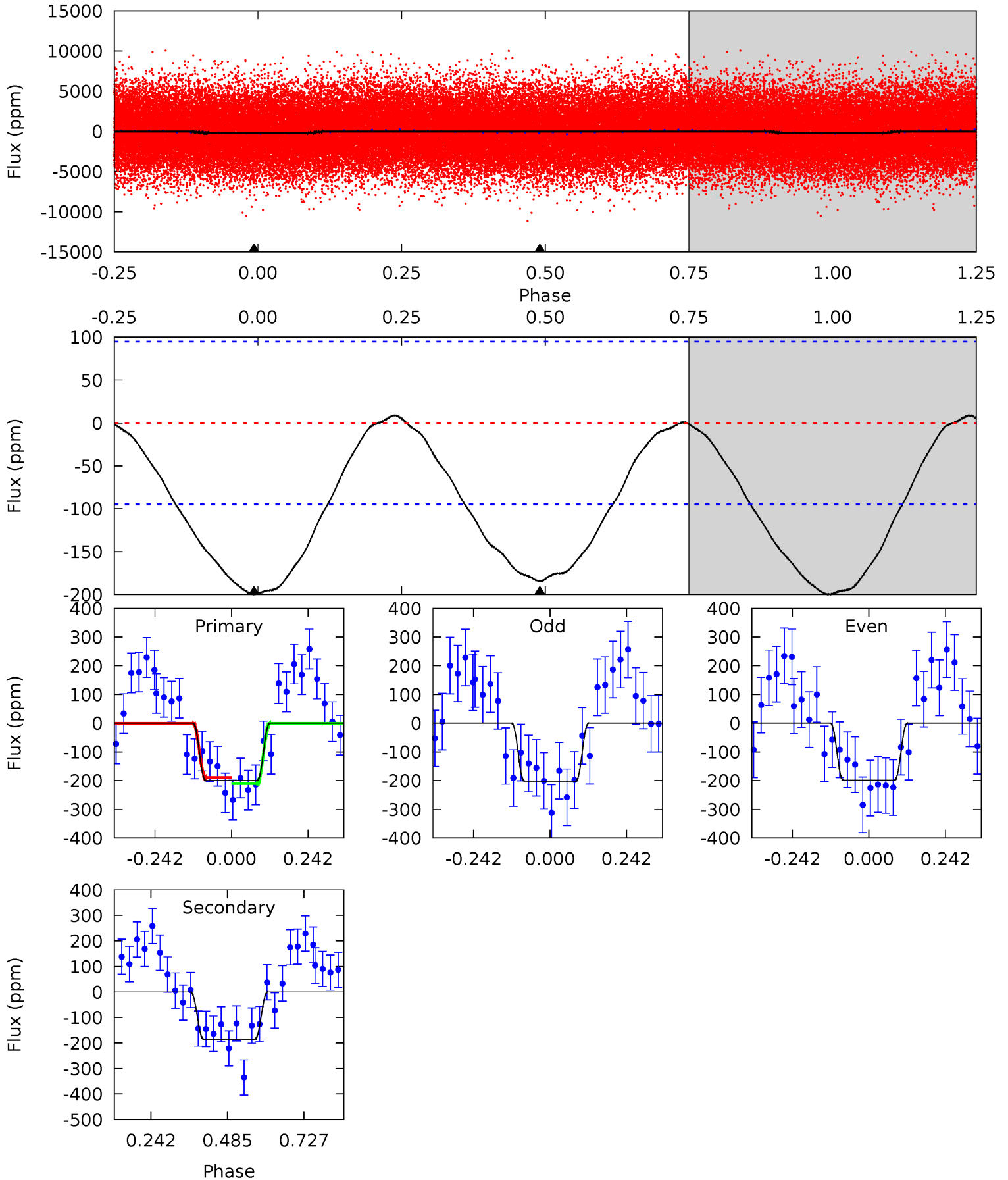
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	12.5	0	0	4.36	1.12	0.33	12.8	12.8	12.5	12.5	1.01	1.04	0.04	2.33



Alt Model-Shift Uniqueness Test

009655470-01, P = 1.276639 Days, E = 131.121877 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.21	8.50	0	0	4.38	1.17	0.23	9.21	9.21	8.50	8.50	0.08	1.01	0.04	0.48



Stellar Parameters For KIC 009655470

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7730^{+214}_{-322}	$4.120^{+0.116}_{-0.174}$	$0.070^{+0.200}_{-0.400}$	$1.899^{+0.519}_{-0.346}$	$1.733^{+0.181}_{-0.271}$	$0.357^{+0.201}_{-0.175}$
	+3%/-4%	+3%/-4%	+286%/-571%	+27%/-18%	+10%/-16%	+56%/-49%
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 009655470-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-134±11	$3.13^{+2.61}_{-2.01}$	3966^{+284}_{-243}	6553^{+7246}_{-1700}	$5.502^{+39.184}_{-3.790}$
Alt.	-184±22	$3.63^{+2.91}_{-2.11}$	3971^{+263}_{-233}	6601^{+5544}_{-1718}	$5.825^{+27.479}_{-3.999}$

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 $A_{obs} \gg 1.0$

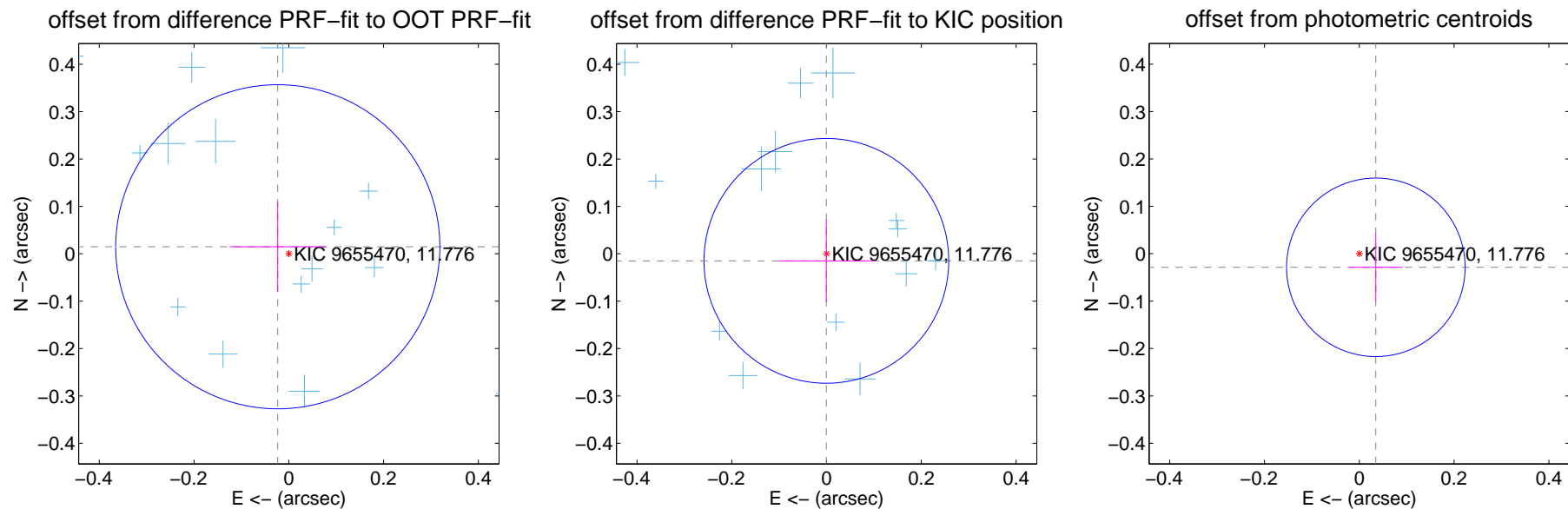
DV Centroid Data

Supplemental centroid analysis for 009655470-01. **Kepler magnitude: 11.78.** Transit SNR 10.53

There are 17 quarters with good PRF difference image offsets

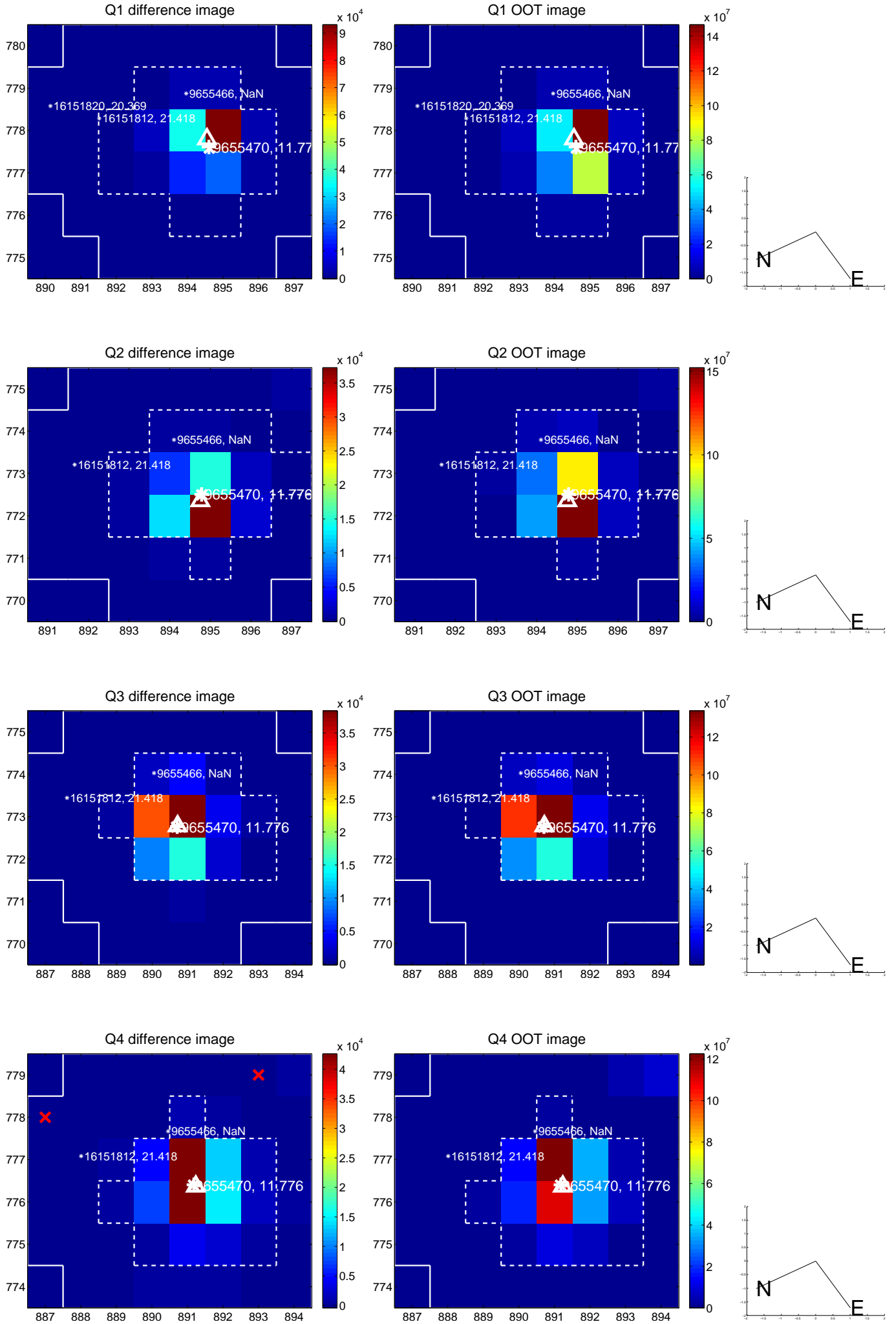
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.028 ± 0.114	0.24	0.023 ± 0.102	0.015 ± 0.094
PRF-fit source offset from KIC position	0.015 ± 0.086	0.17	0.000 ± 0.101	-0.015 ± 0.087
photometric centroid source offset	0.05 ± 0.06	0.72	-0.03 ± 0.06	-0.03 ± 0.07

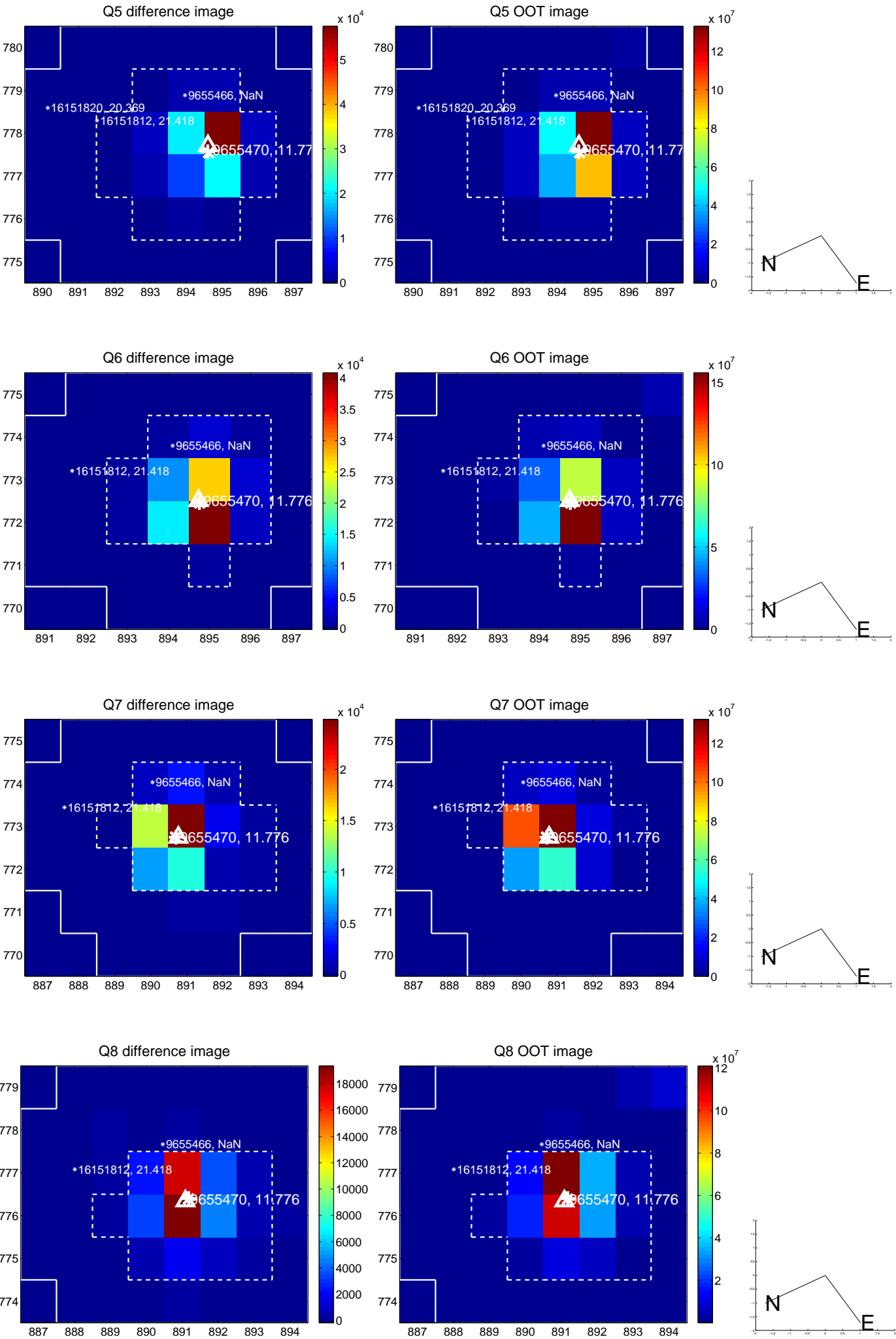


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

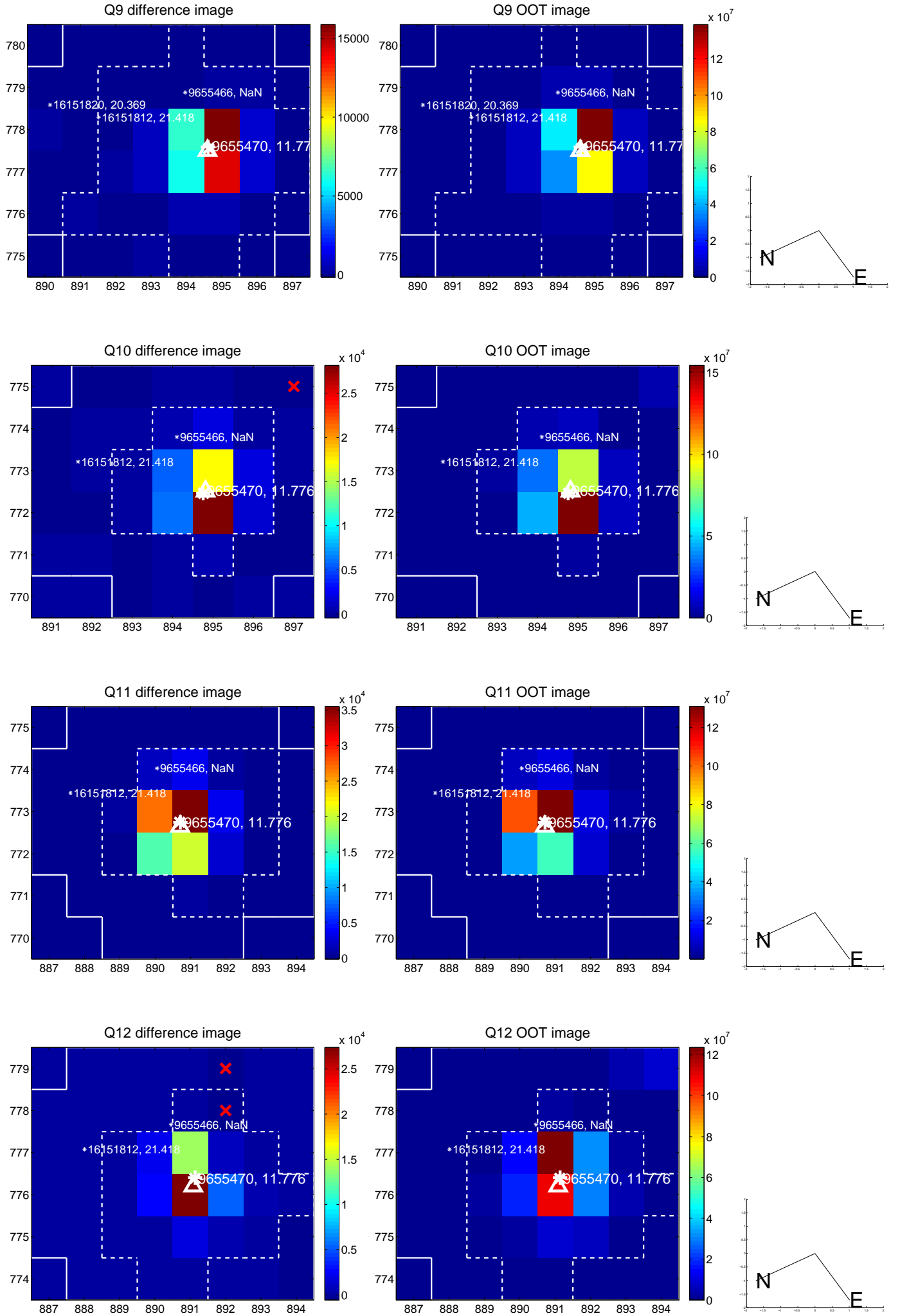
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



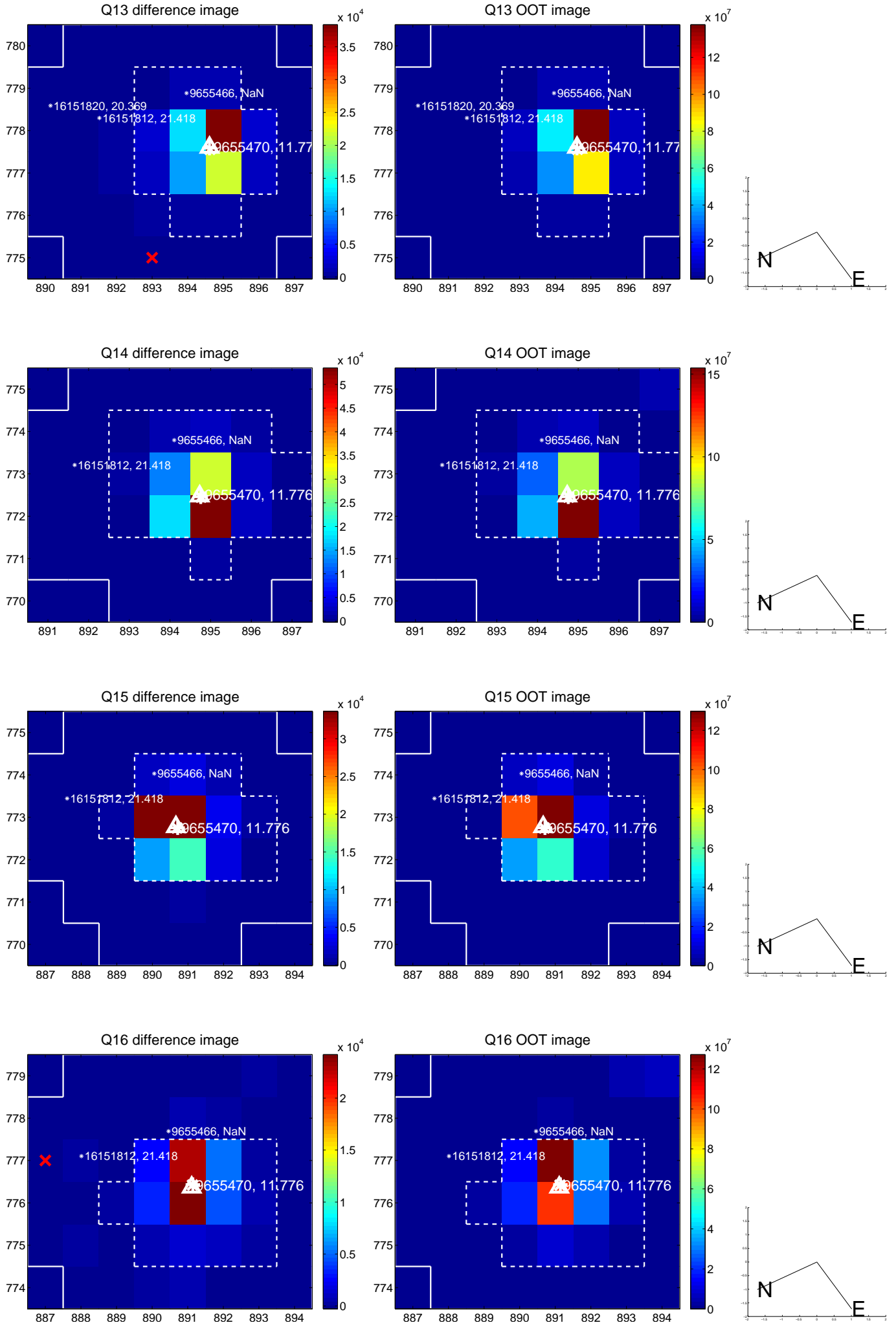
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



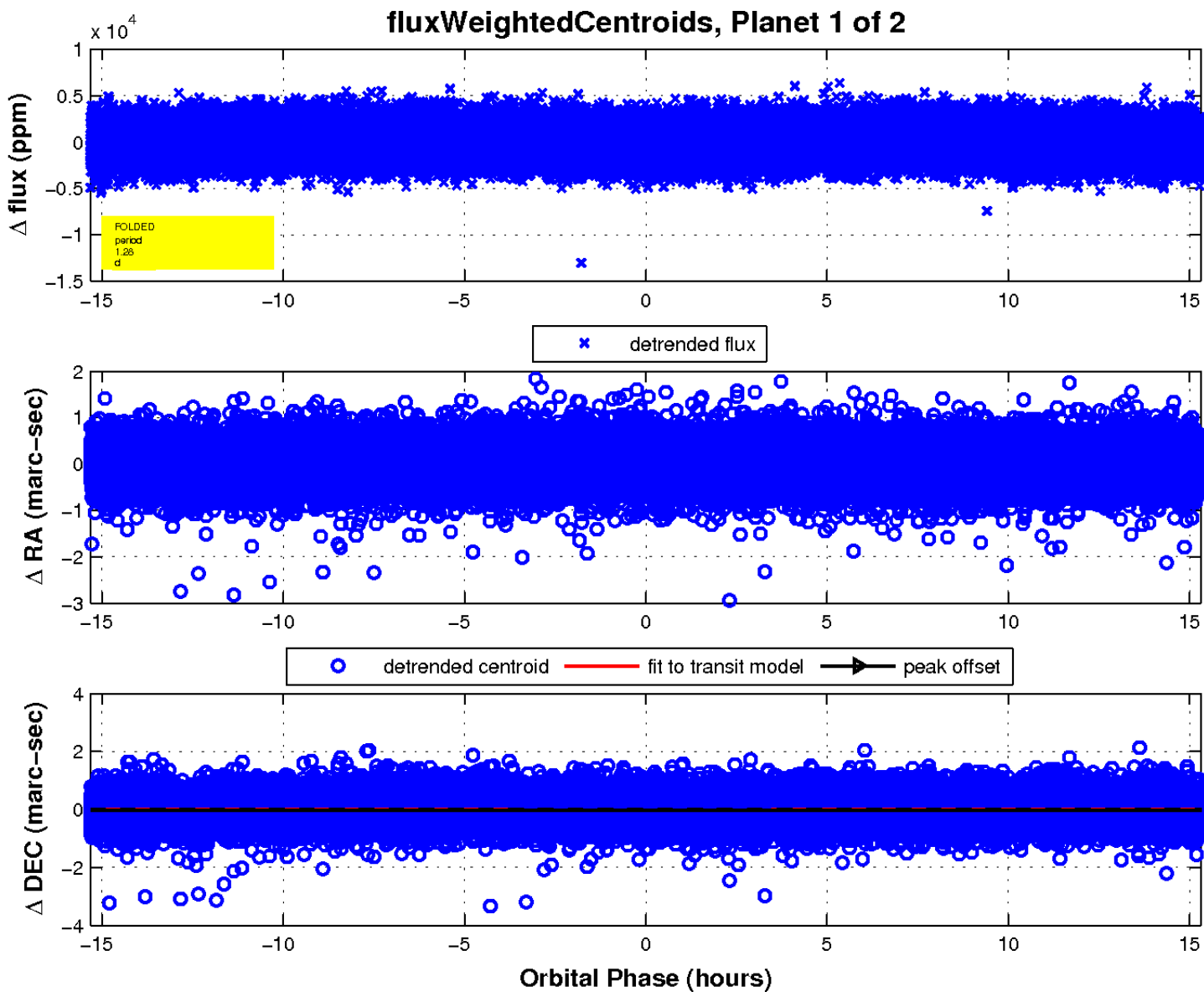
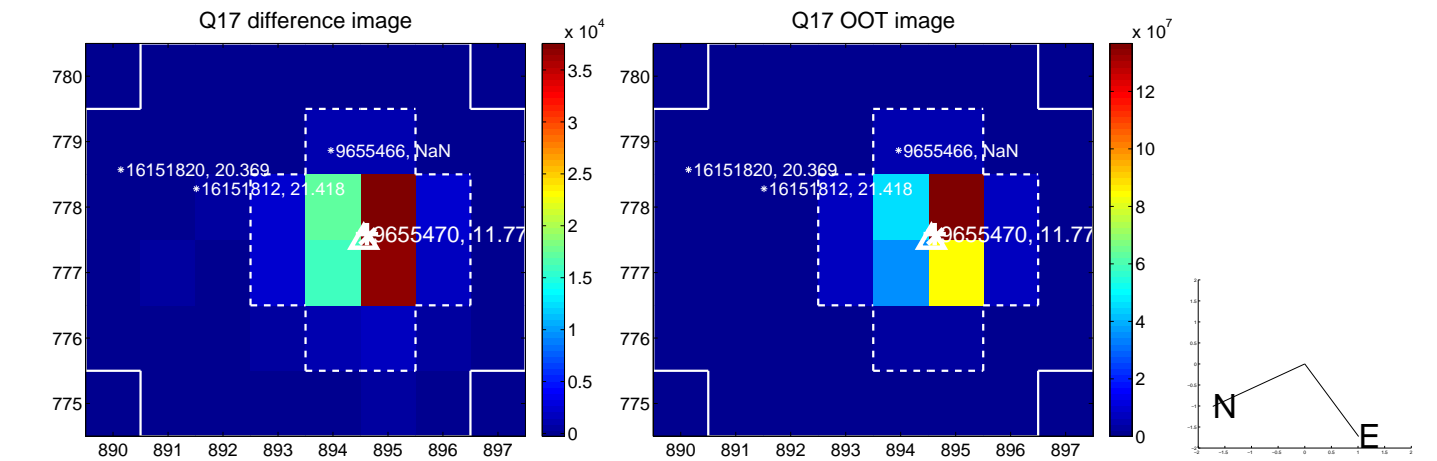
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

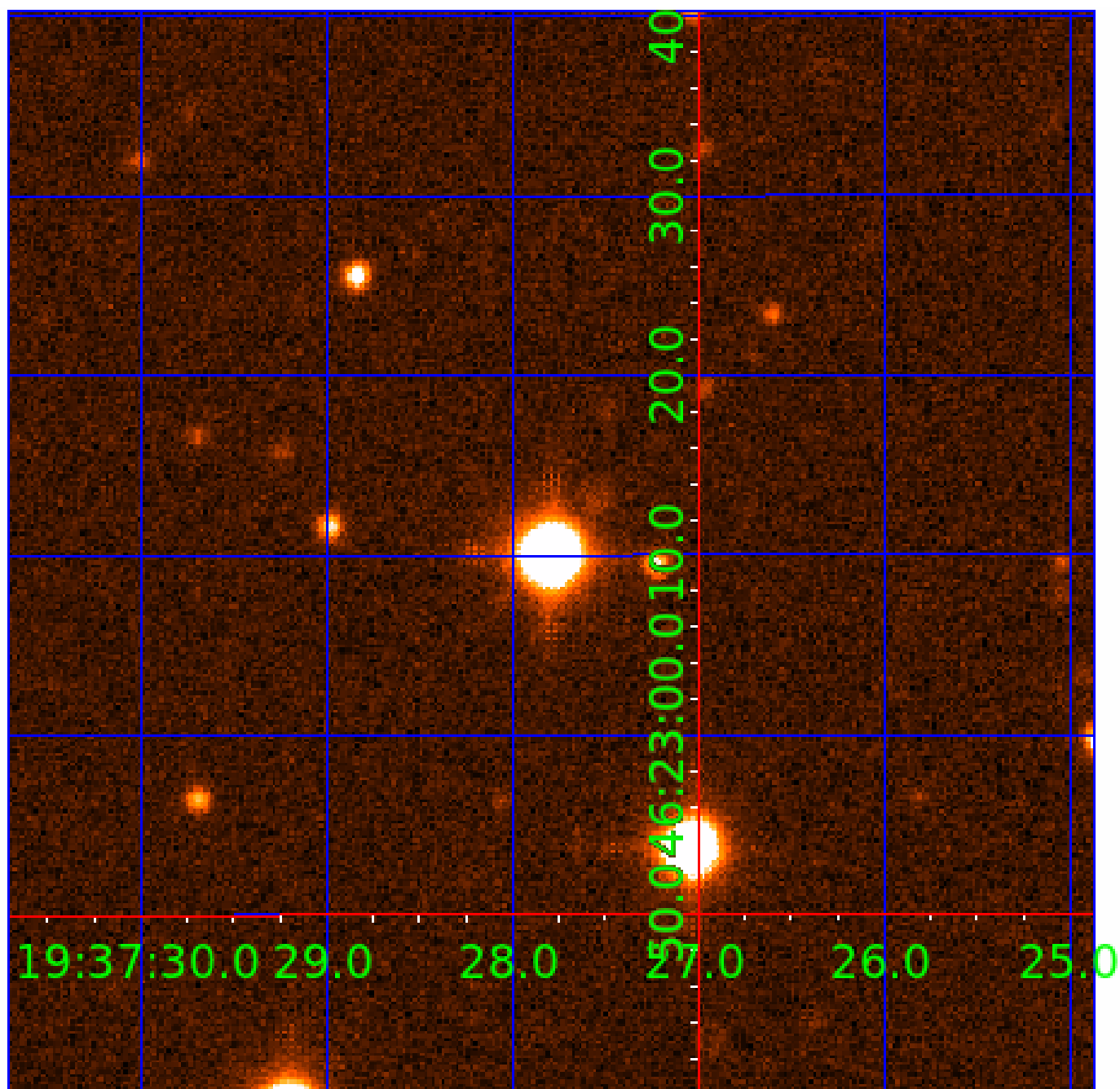


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009655470

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})
009655470-01	OBS	No	1.276634	132.387967	133.1	7.614	8.8	10.5	1.90	7730	2.23	15061.69
009655470-02	OBS	No	0.634236	131.639129	245.0	3.824	11.0	11.7	1.90	7730	3.44	38279.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655470-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009655470-02	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

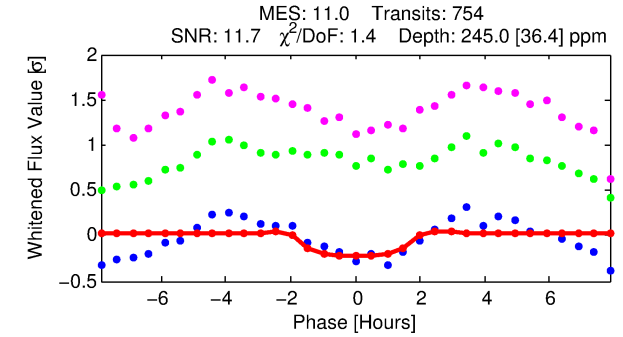
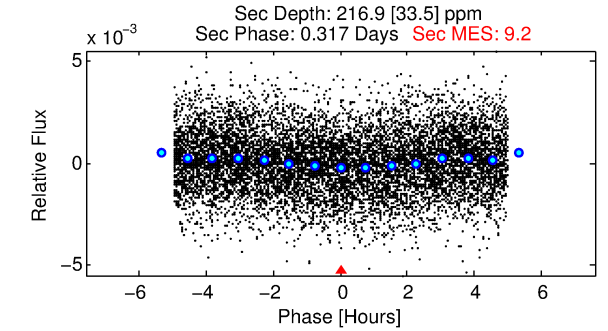
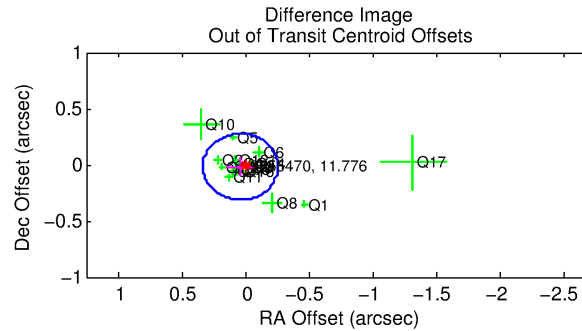
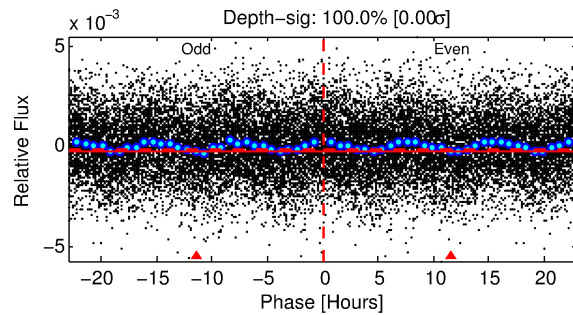
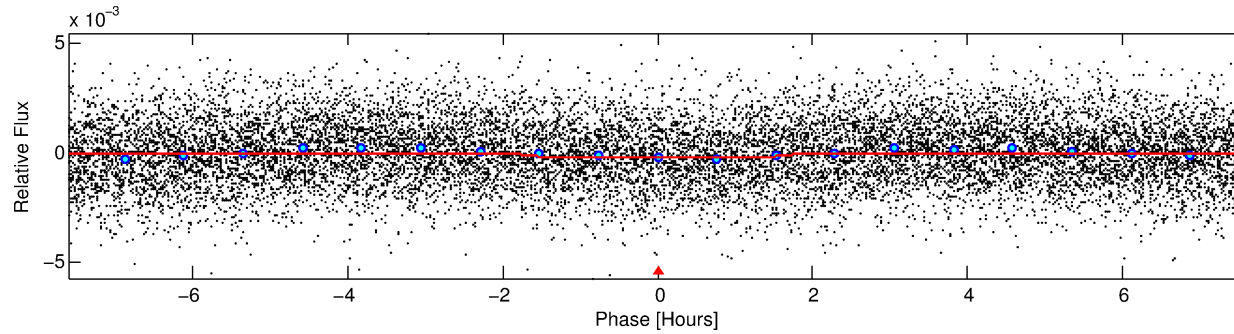
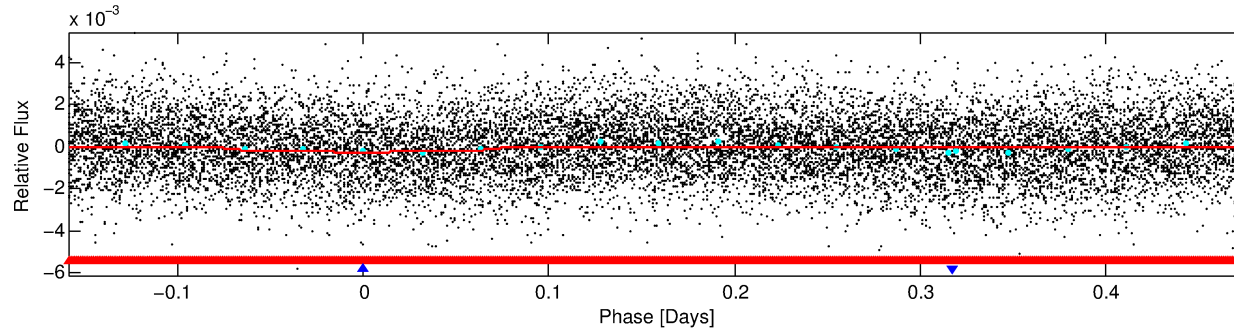
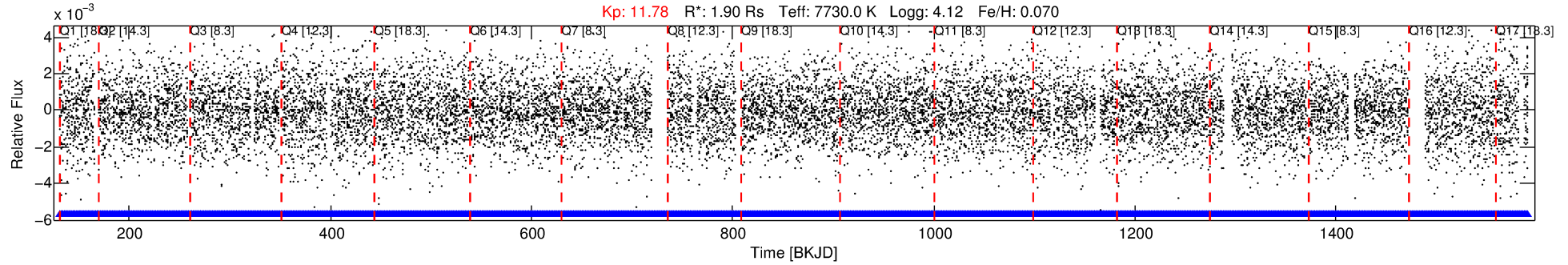
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009655470-02

No Significant Match Found

DV One-Page Summary

KIC: 9655470 Candidate: 2 of 2 Period: 0.634 d



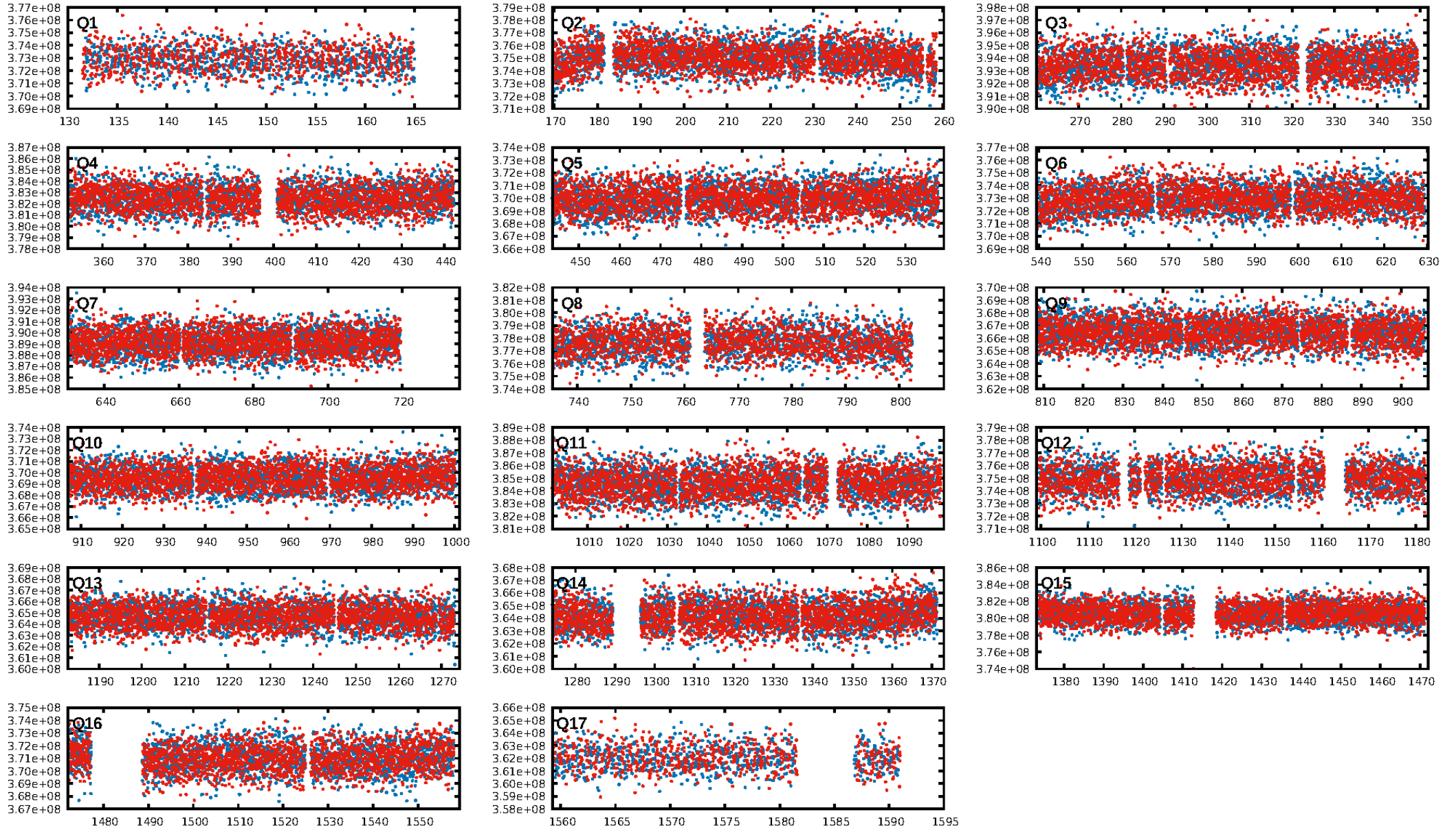
DV Fit Results:

Period = 0.63424 [0.00001] d
Epoch = 131.6391 [0.0047] BKJD
Rp/R* = 0.0166 [0.0049]
a/R* = 1.12 [0.40]
b = 0.90 [0.38]
Seff = 38279.06 [13923.43]
Teq = 3567 [324] K
Rp = 3.44 [1.38] Re
a = 0.0174 [0.0039] AU
Ag = 3.04 [2.09] [0.98σ]
Teffp = 7279 [1145] K [3.12σ]

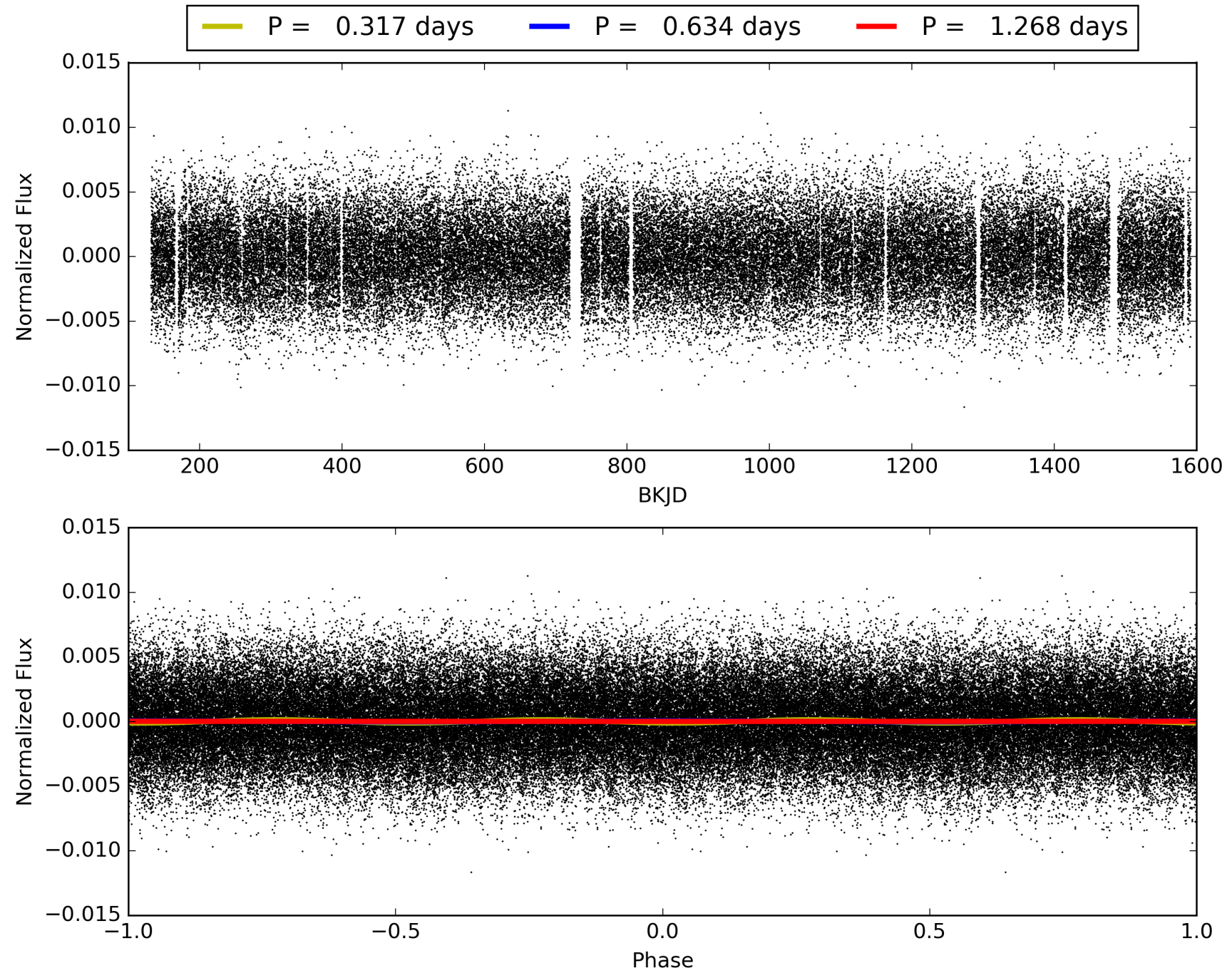
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 93.0% [1.81σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.32e-02
RollingBand-fgt: 1.00 [722/722]
GhostDiagnostic-chr: 1.275
Centroid-sig: N/A
Centroid-so: 0.191 arcsec [5.28σ]
OotOffset-rm: 0.042 arcsec [0.43σ]
KicOffset-rm: 0.078 arcsec [0.95σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 0.94 [16/17]

TCE 009655470-02, PDC Light Curves

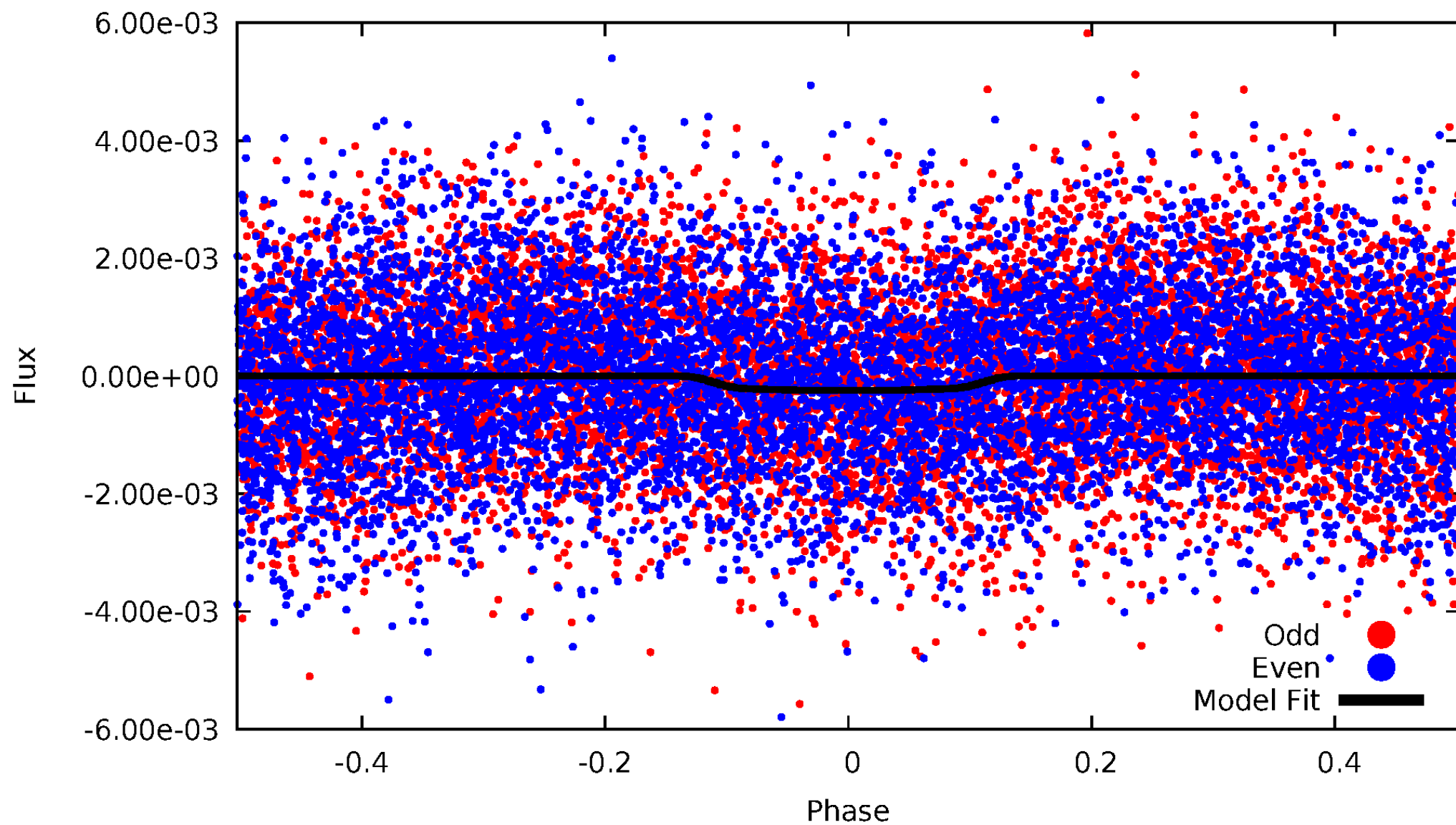


TCE 009655470-02



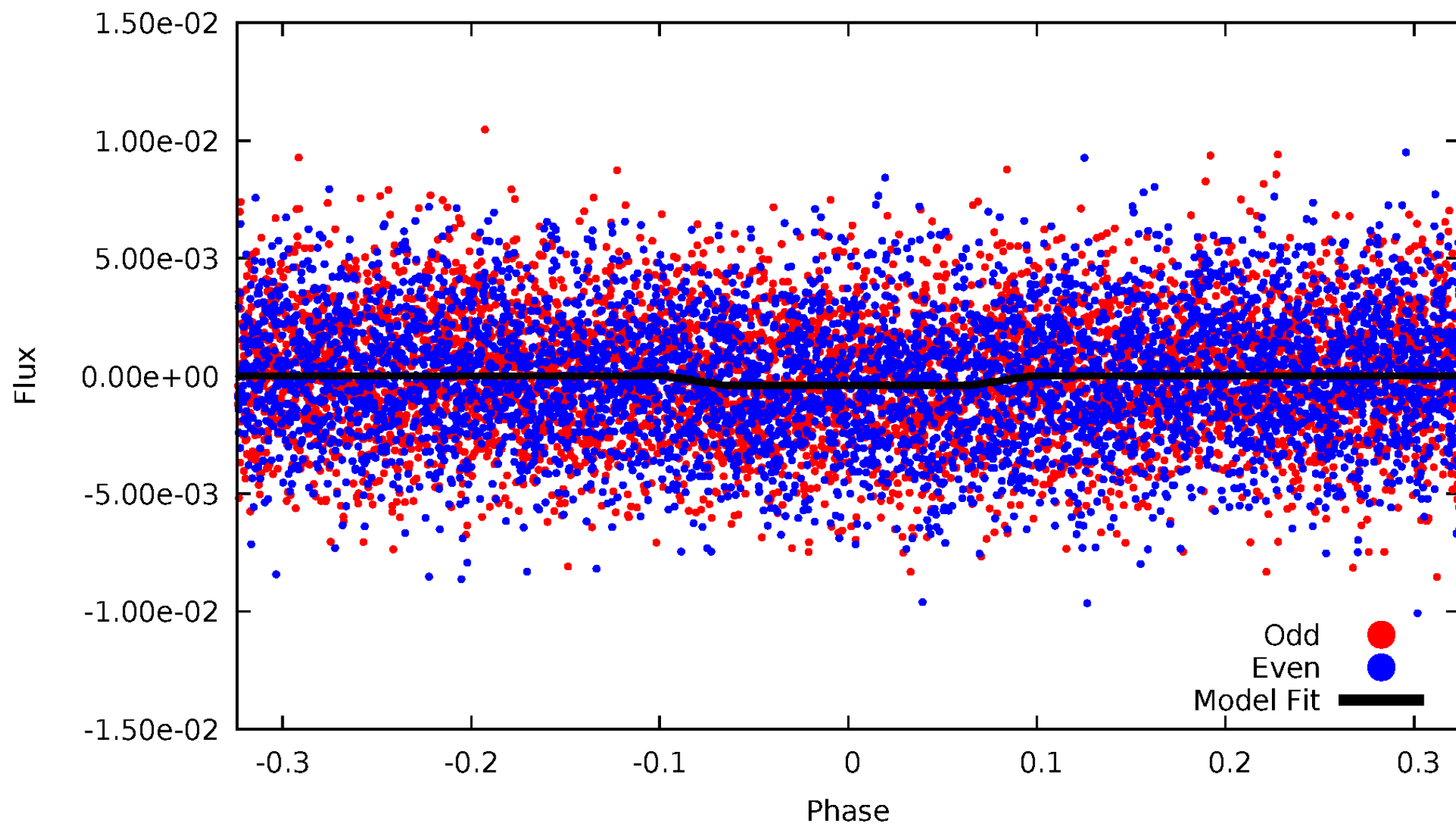
DV Odd/Even

TCE 009655470-02



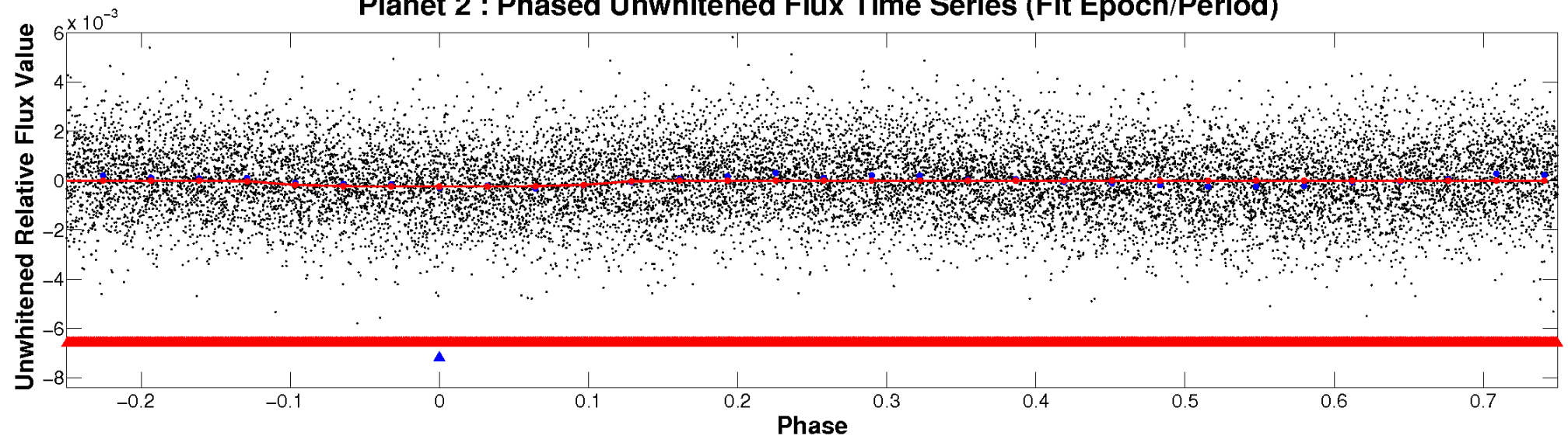
ALT Odd/Even

TCE 009655470-02

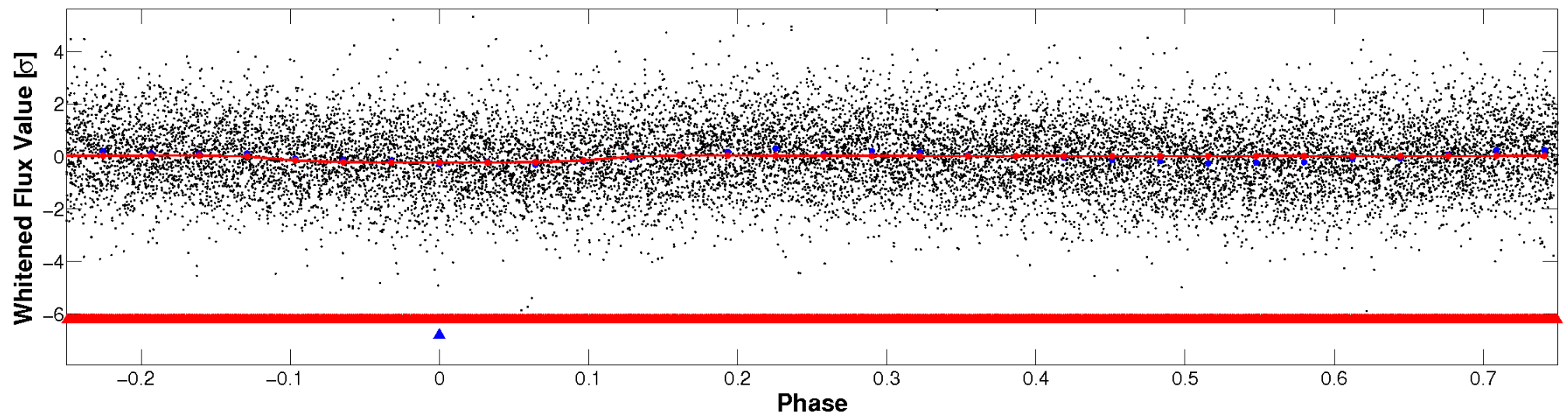


Non-Whitened Vs. Whitened Light Curve

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

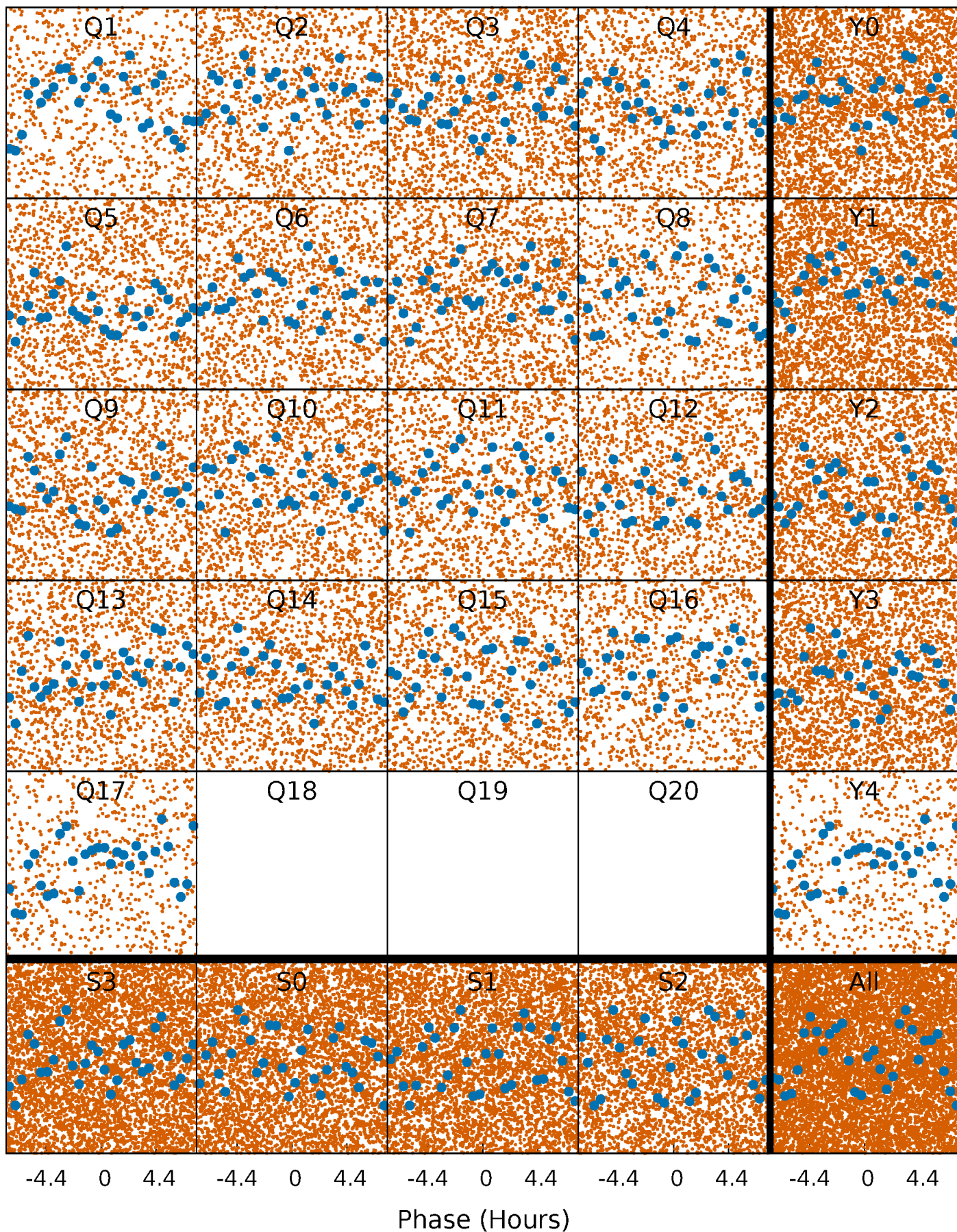


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



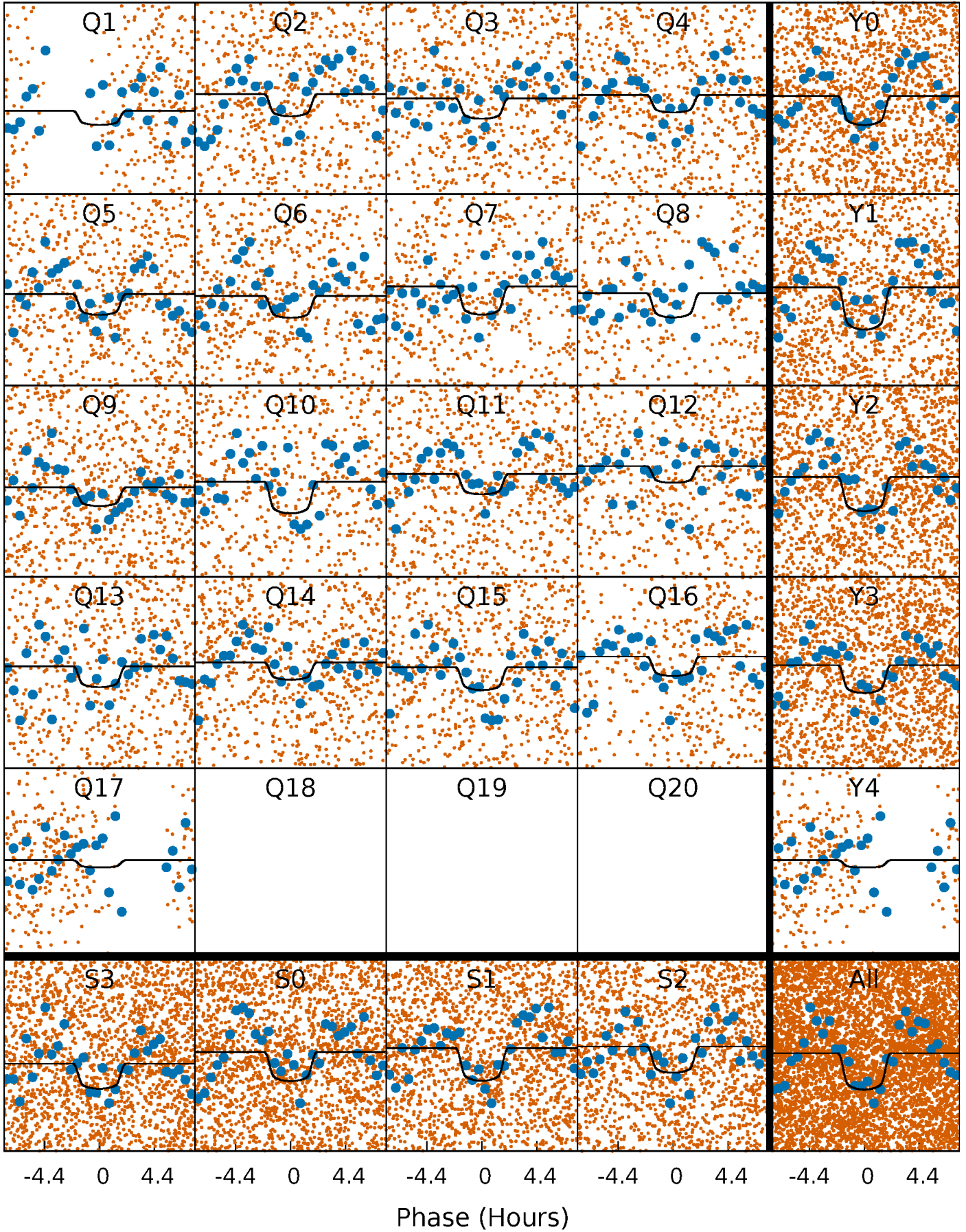
PDC Quarter-Phased Transit Curves

TCE 009655470-02 P= 0.634236 Days $T_0=131.639128$ (BKJD)



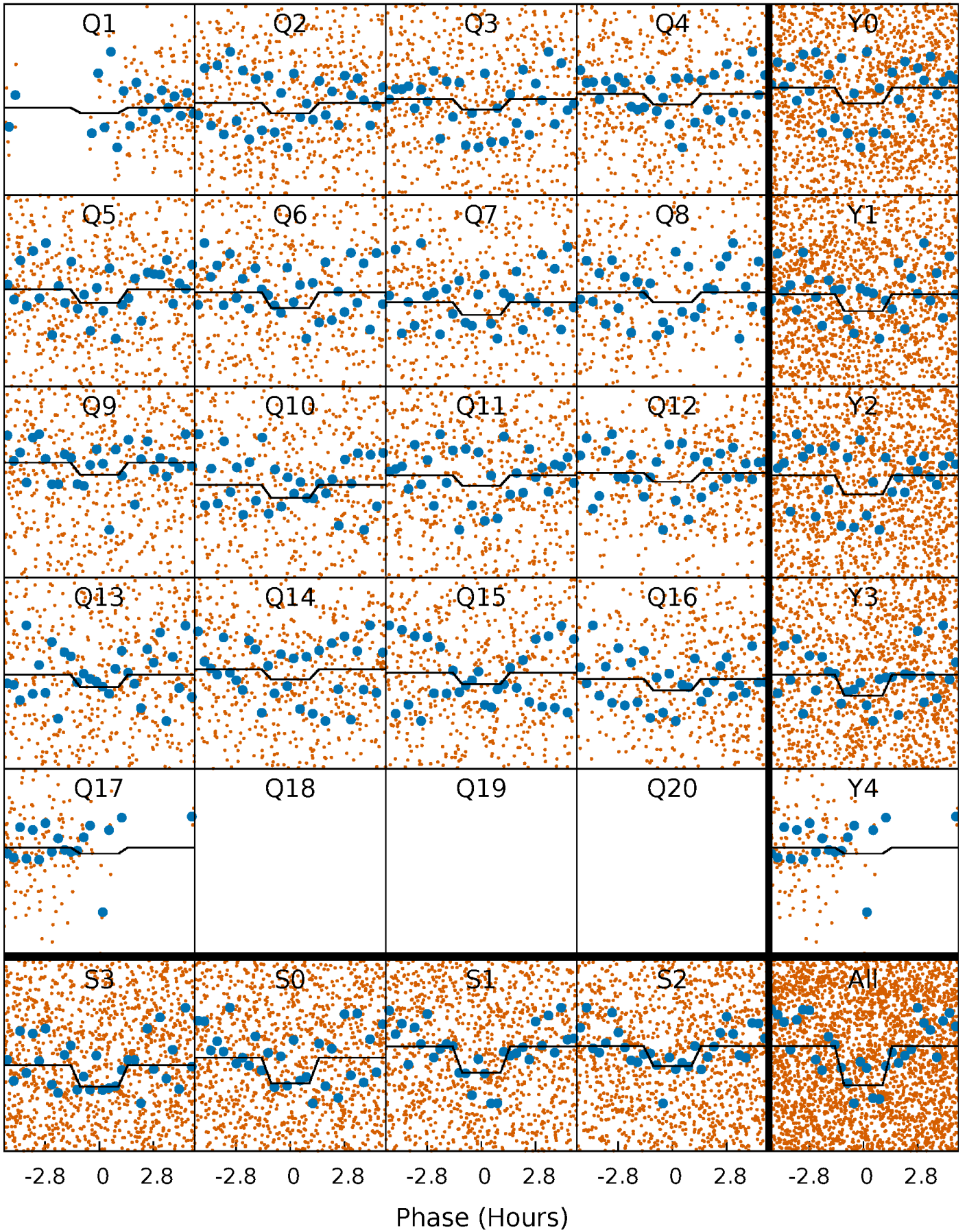
DV Quarter-Phased Transit Curves

TCE 009655470-02 P= 0.634236 Days $T_0=131.639128$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

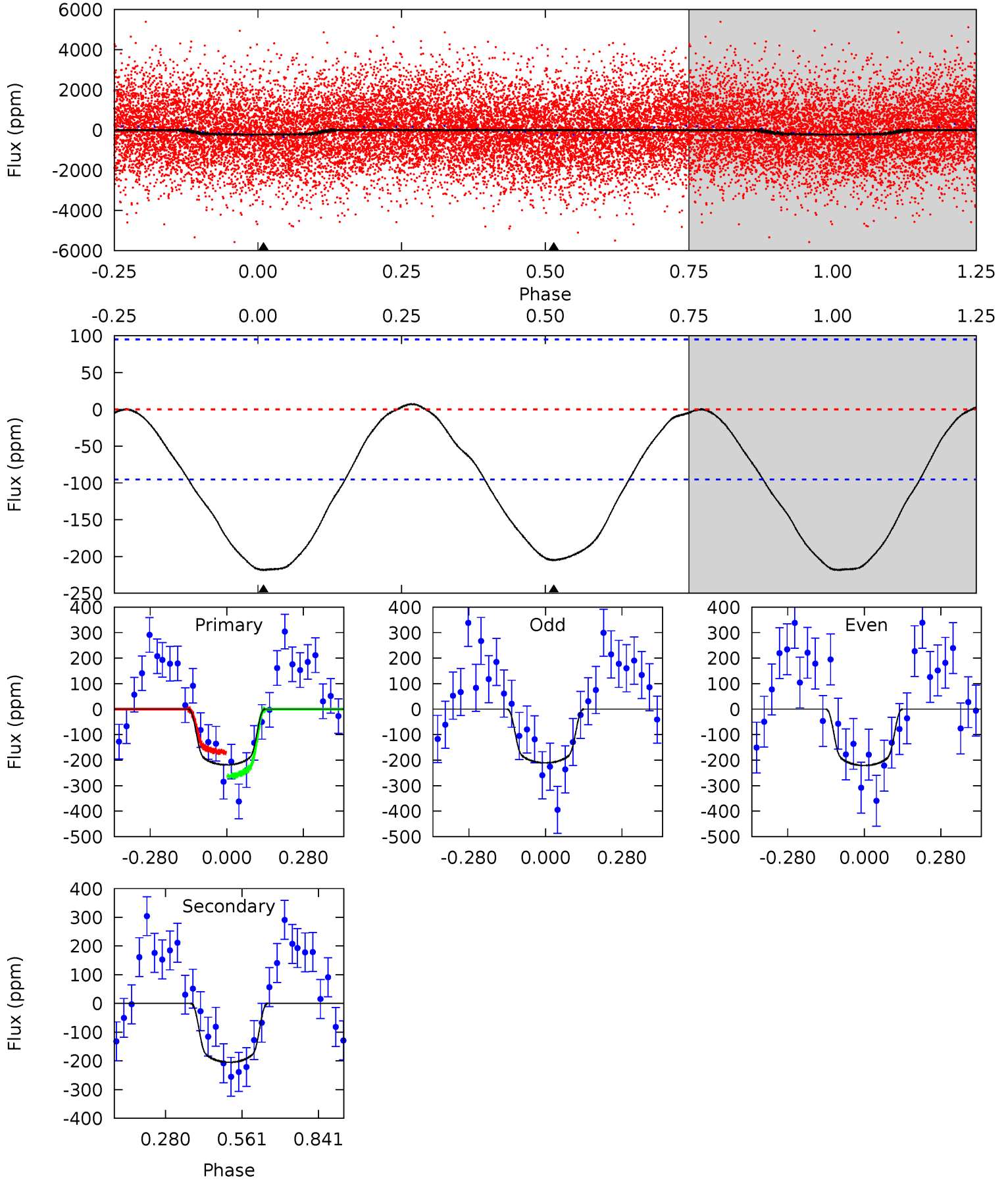
TCE 009655470-02 P= 0.634250 Days $T_0=131.632251$ (BKJD)



DV Model-Shift Uniqueness Test

009655470-02, P = 0.634236 Days, E = 131.004892 Days

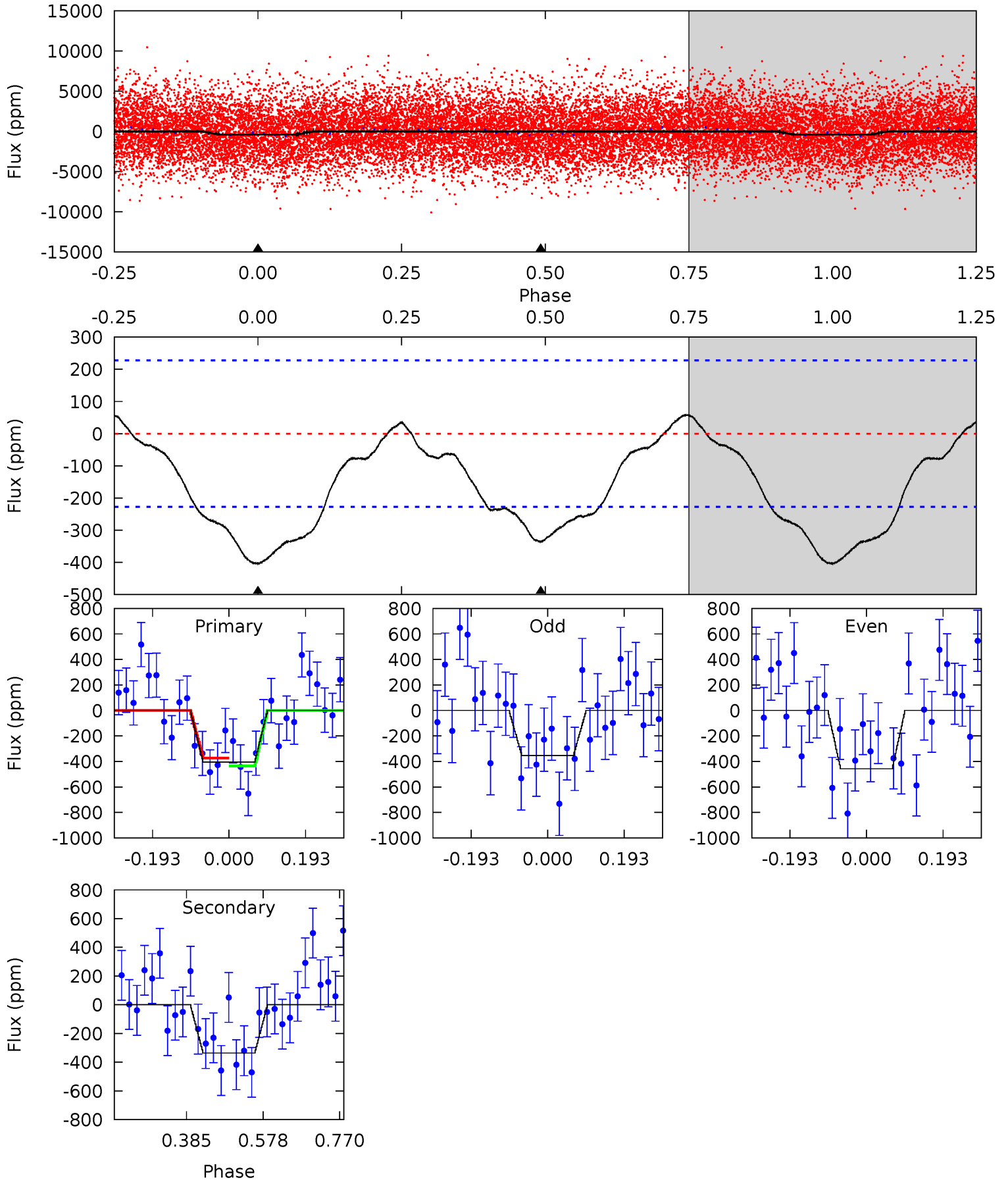
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.96	9.34	0	0	4.34	1.08	0.19	9.96	9.96	9.34	9.34	0.24	0.87	0.03	2.18



Alt Model-Shift Uniqueness Test

009655470-02, P = 0.634250 Days, E = 130.998001 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.87	6.54	0	0	4.43	1.30	0.70	7.87	7.87	6.54	6.54	1.02	0.86	0.13	0.58



Stellar Parameters For KIC 009655470

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7730^{+214}_{-322}	$4.120^{+0.116}_{-0.174}$	$0.070^{+0.200}_{-0.400}$	$1.899^{+0.519}_{-0.346}$	$1.733^{+0.181}_{-0.271}$	$0.357^{+0.201}_{-0.175}$
	+3%/-4%	+3%/-4%	+286%/-571%	+27%/-18%	+10%/-16%	+56%/-49%
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 009655470-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-205 ± 22	$3.48^{+1.12}_{-1.11}$	5019^{+332}_{-322}	6886^{+1782}_{-1081}	$2.790^{+3.044}_{-1.215}$
Alt.	-336 ± 51	$4.20^{+1.23}_{-1.05}$	5011^{+337}_{-283}	7010^{+1549}_{-919}	$2.979^{+2.634}_{-1.161}$

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 $A_{obs} \gg 1.0$

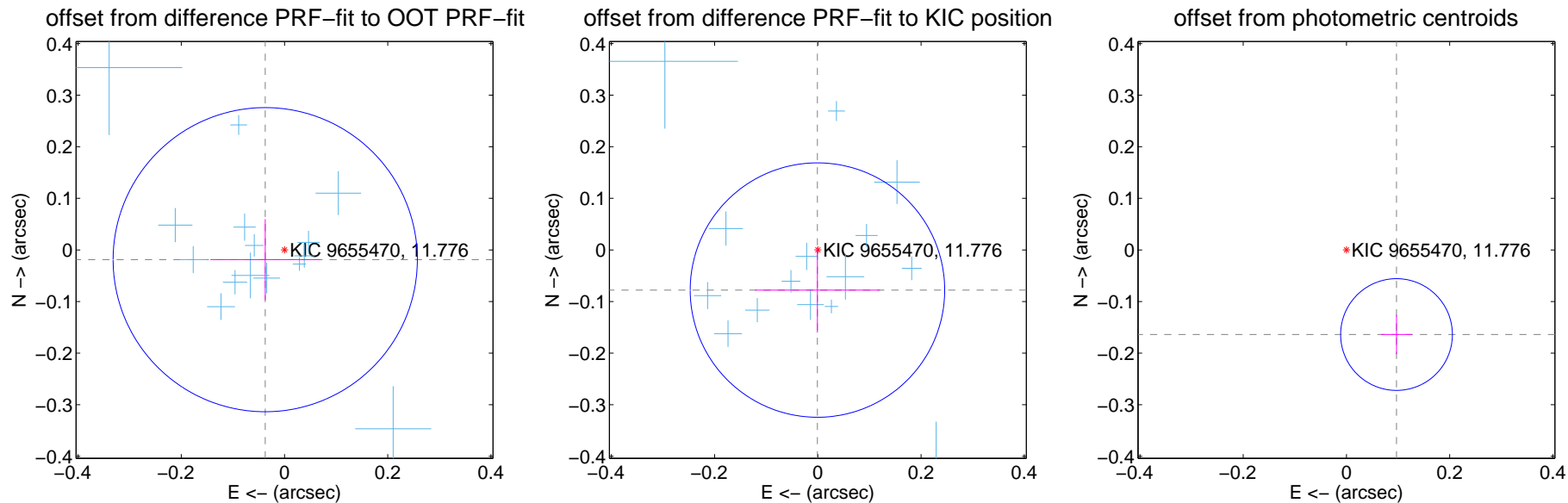
DV Centroid Data

Supplemental centroid analysis for 009655470-02. **Kepler magnitude: 11.78.** Transit SNR 11.68

There are 16 quarters with good PRF difference image offsets

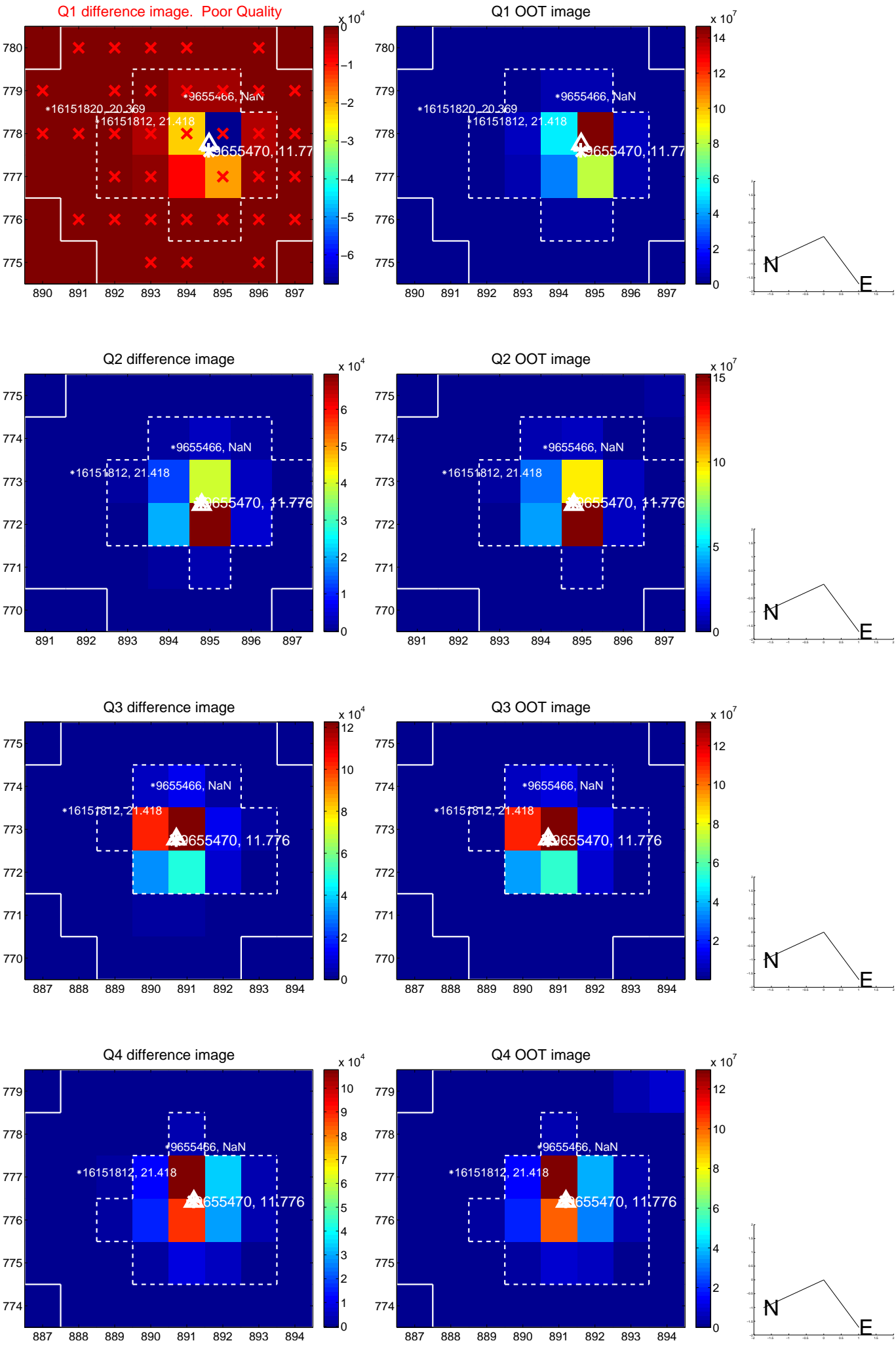
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.042 ± 0.098	0.43	0.037 ± 0.106	-0.019 ± 0.079
PRF-fit source offset from KIC position	0.078 ± 0.082	0.95	0.001 ± 0.121	-0.078 ± 0.082
photometric centroid source offset	0.19 ± 0.04	5.28	-0.10 ± 0.03	-0.16 ± 0.04

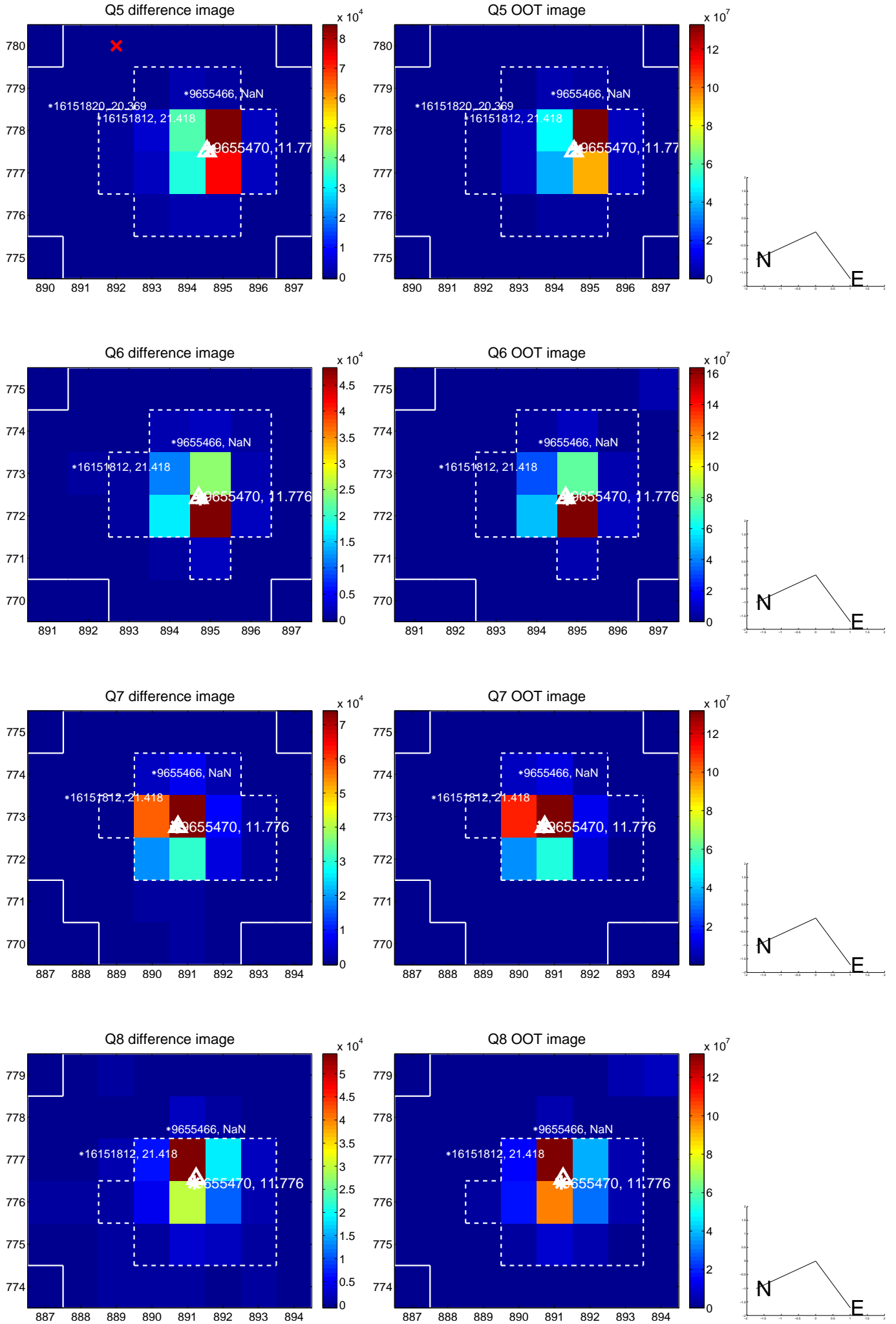


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

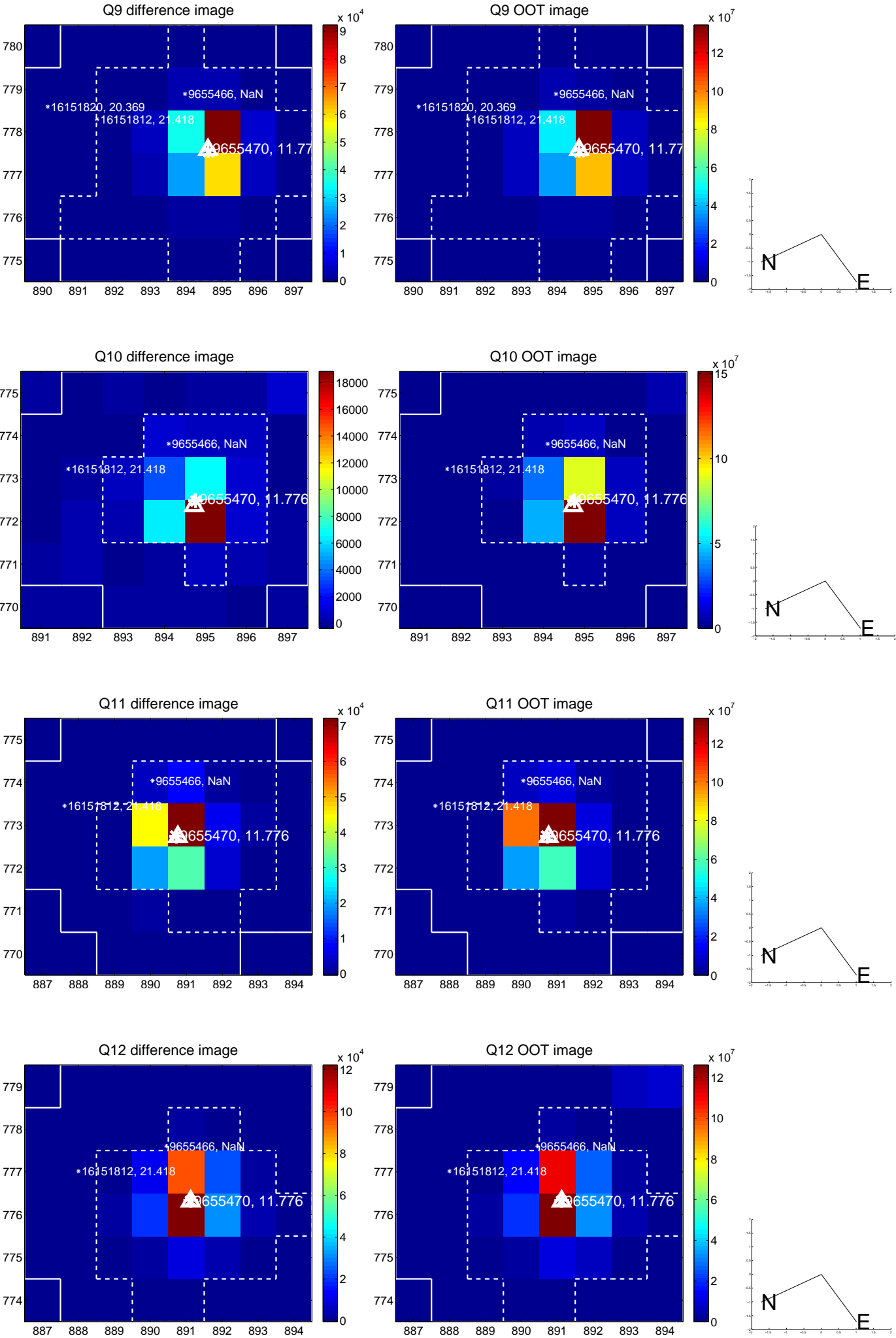
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



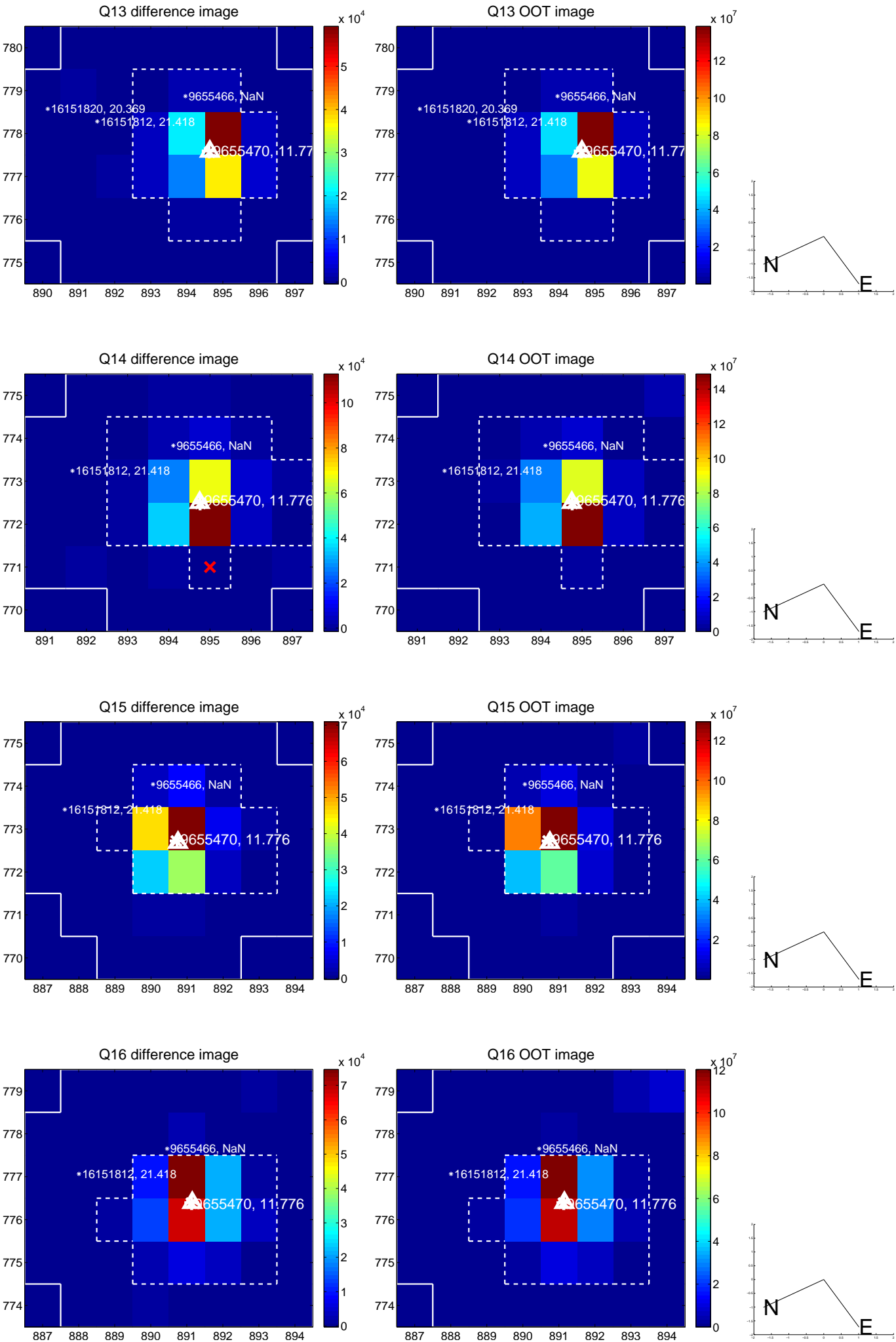
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



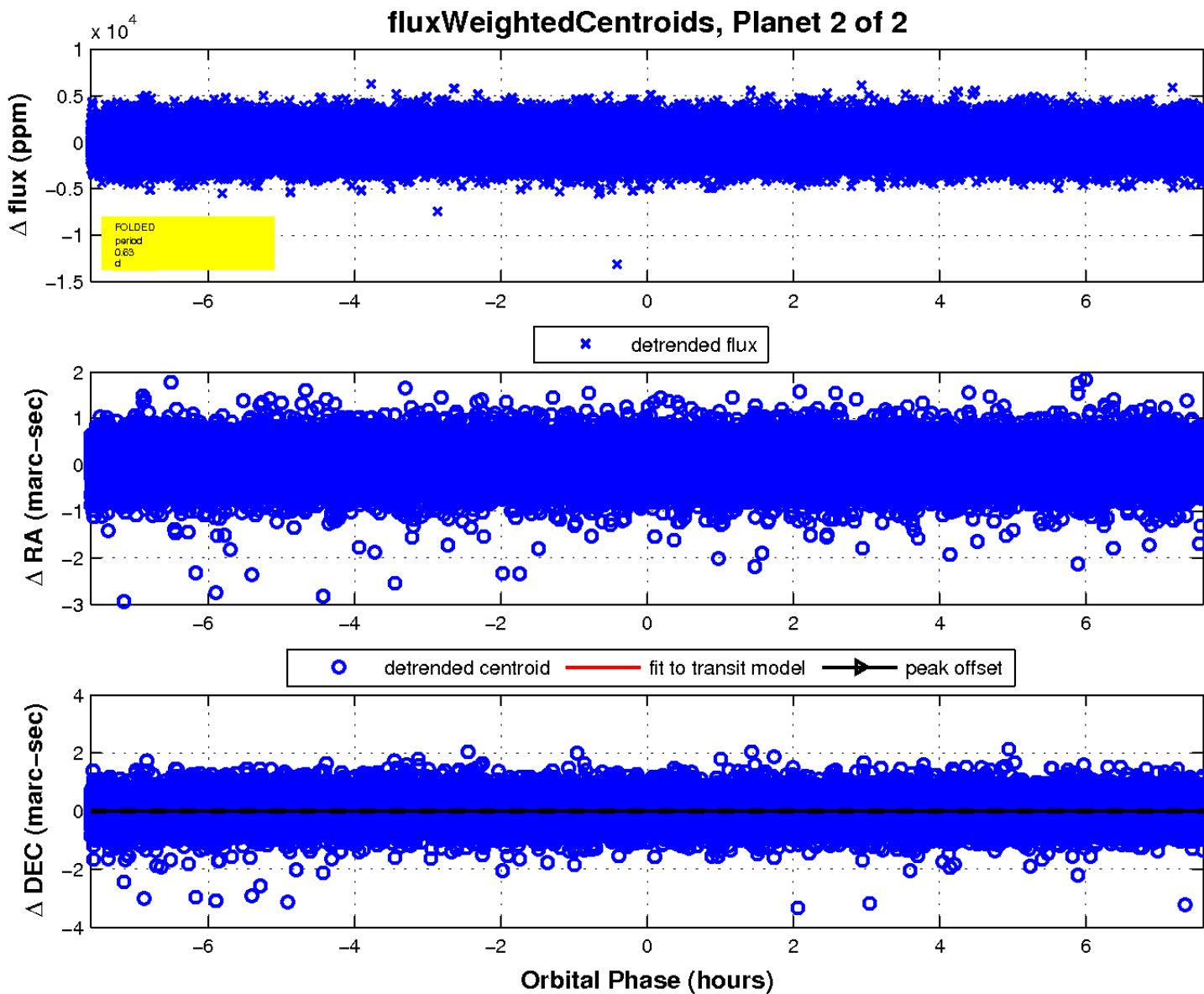
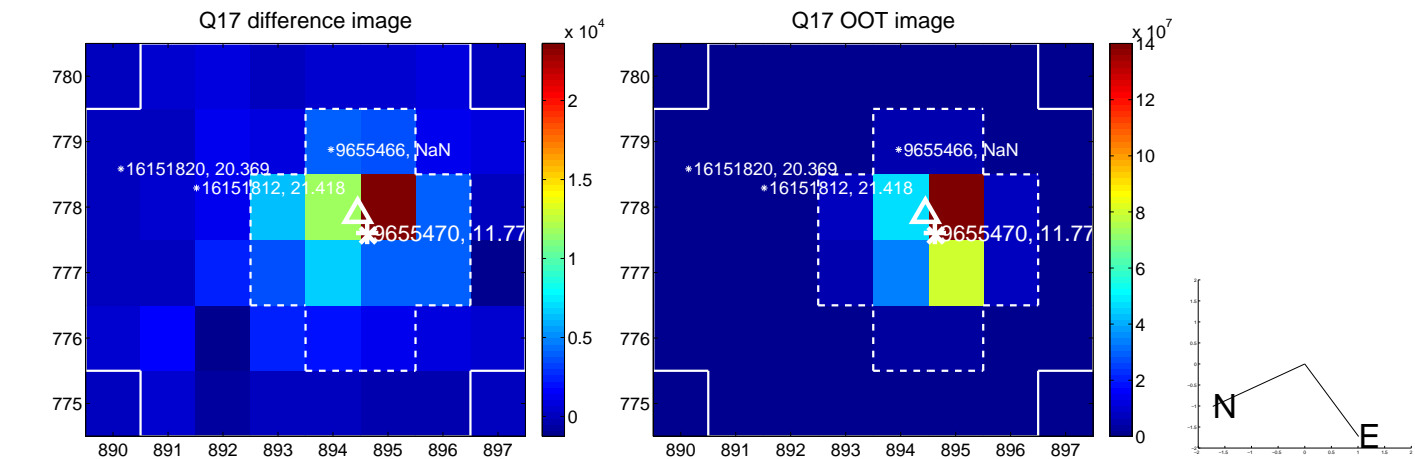
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

