

KIC 009138872

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})
009138872-01	OBS	No	0.516824	131.734972	112.7	0.566	10.2	11.2	2.05	7712	2.27	59544.20
009138872-02	OBS	No	0.743657	131.581219	59.0	7.176	7.7	10.1	2.05	7712	1.63	36654.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009138872-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
009138872-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

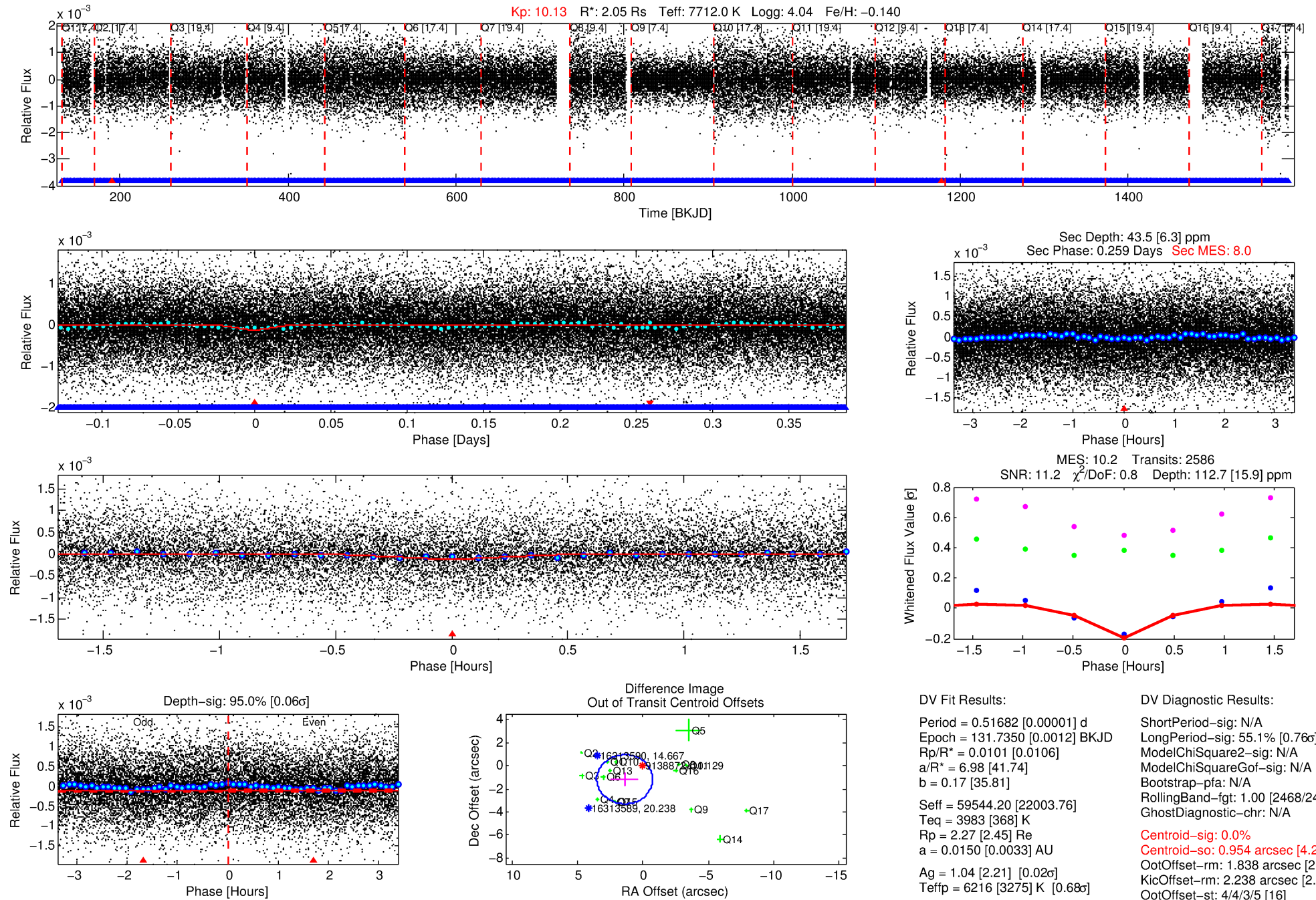
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009138872-01

No Significant Match Found

DV One-Page Summary

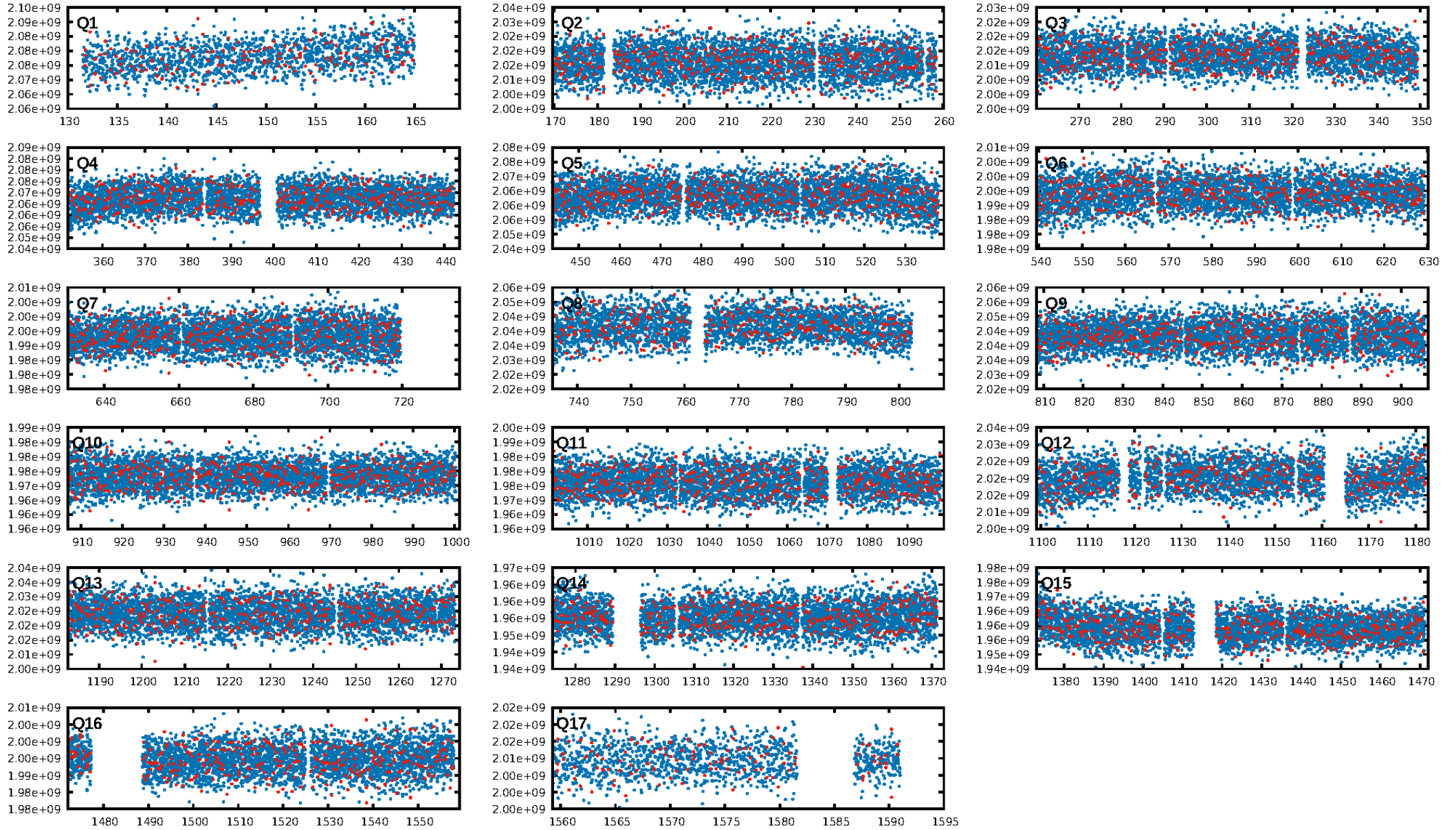
KIC: 9138872 Candidate: 1 of 2 Period: 0.517 d



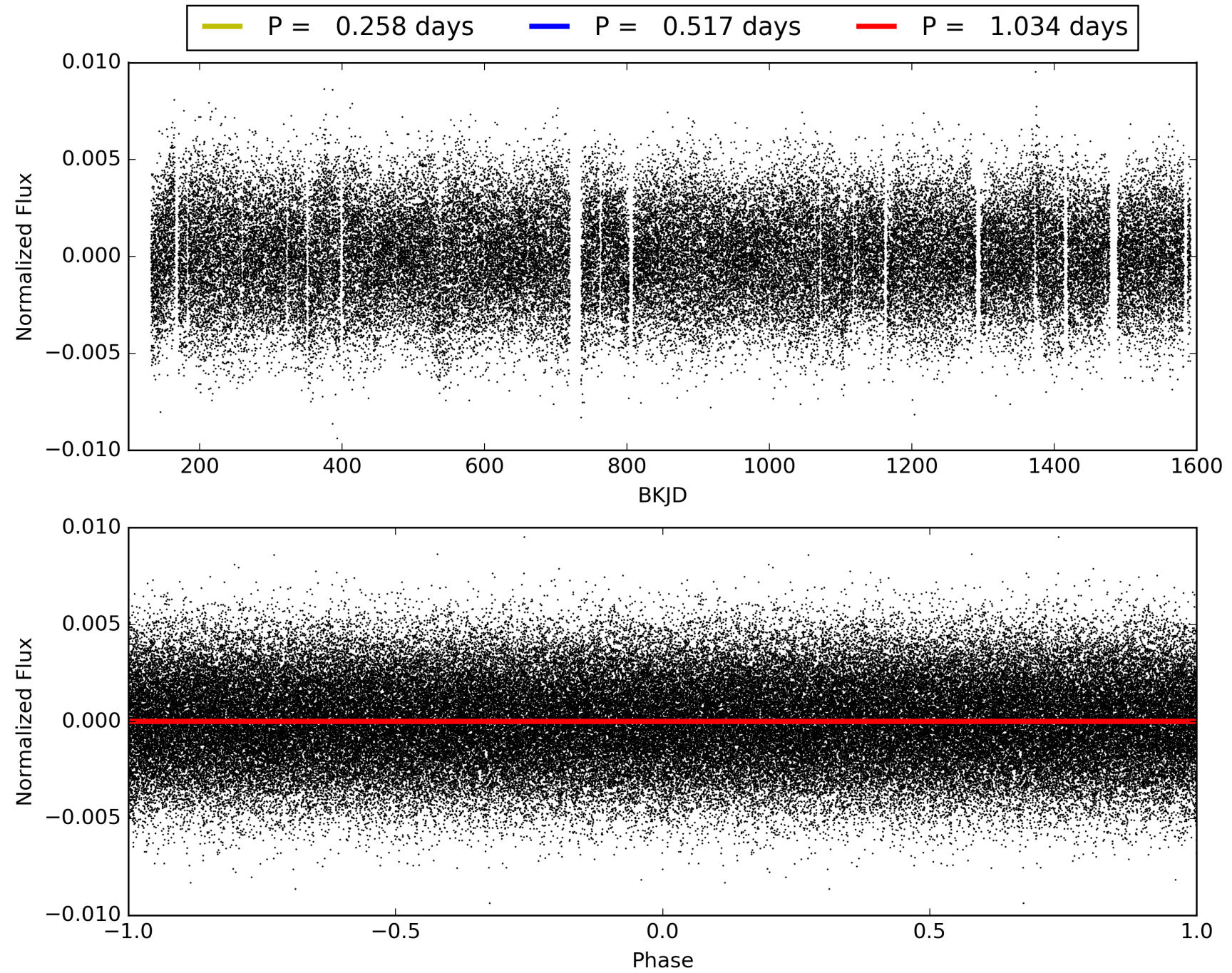
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:06:43 Z

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

TCE 009138872-01, PDC Light Curves

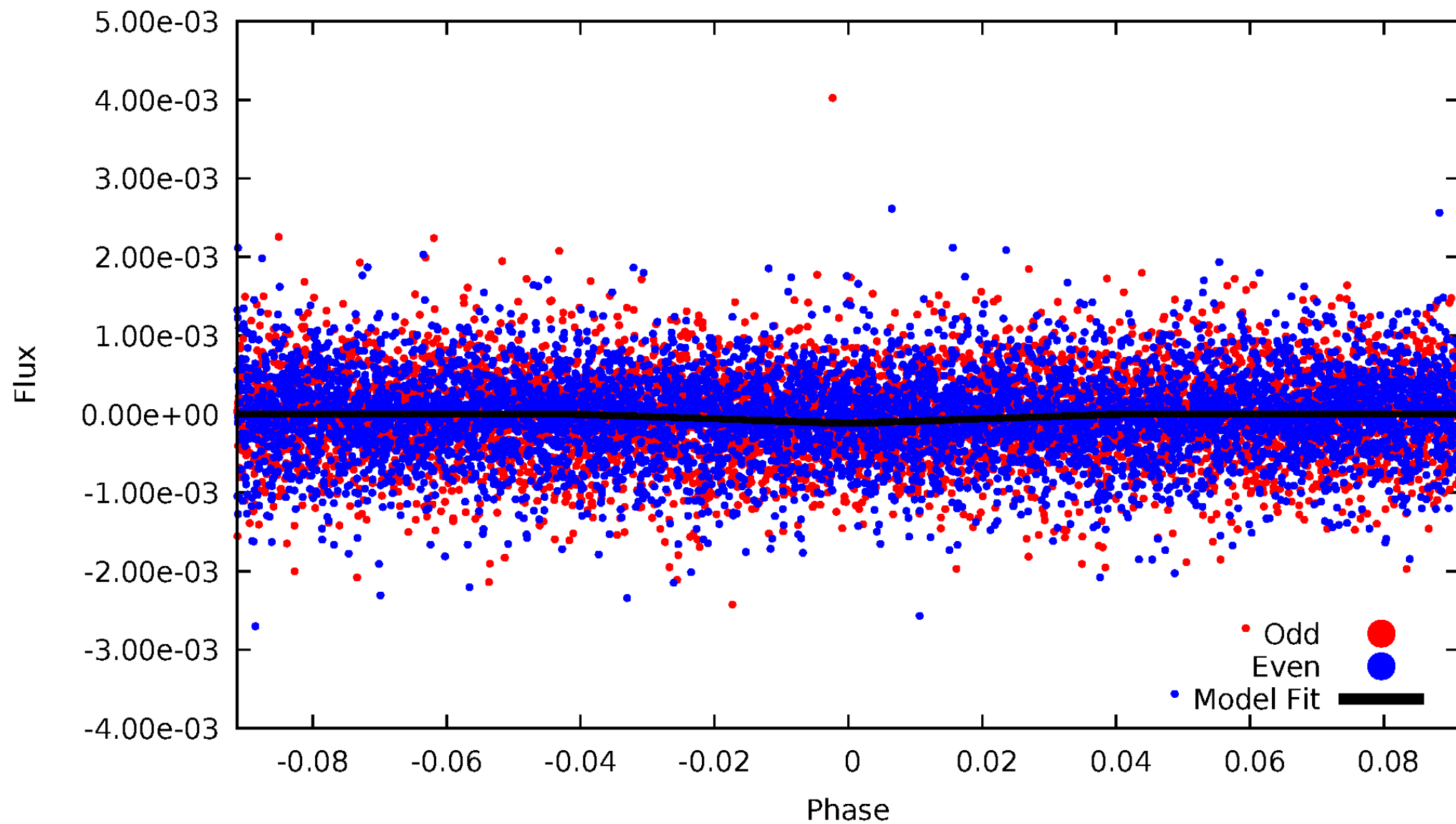


TCE 009138872-01



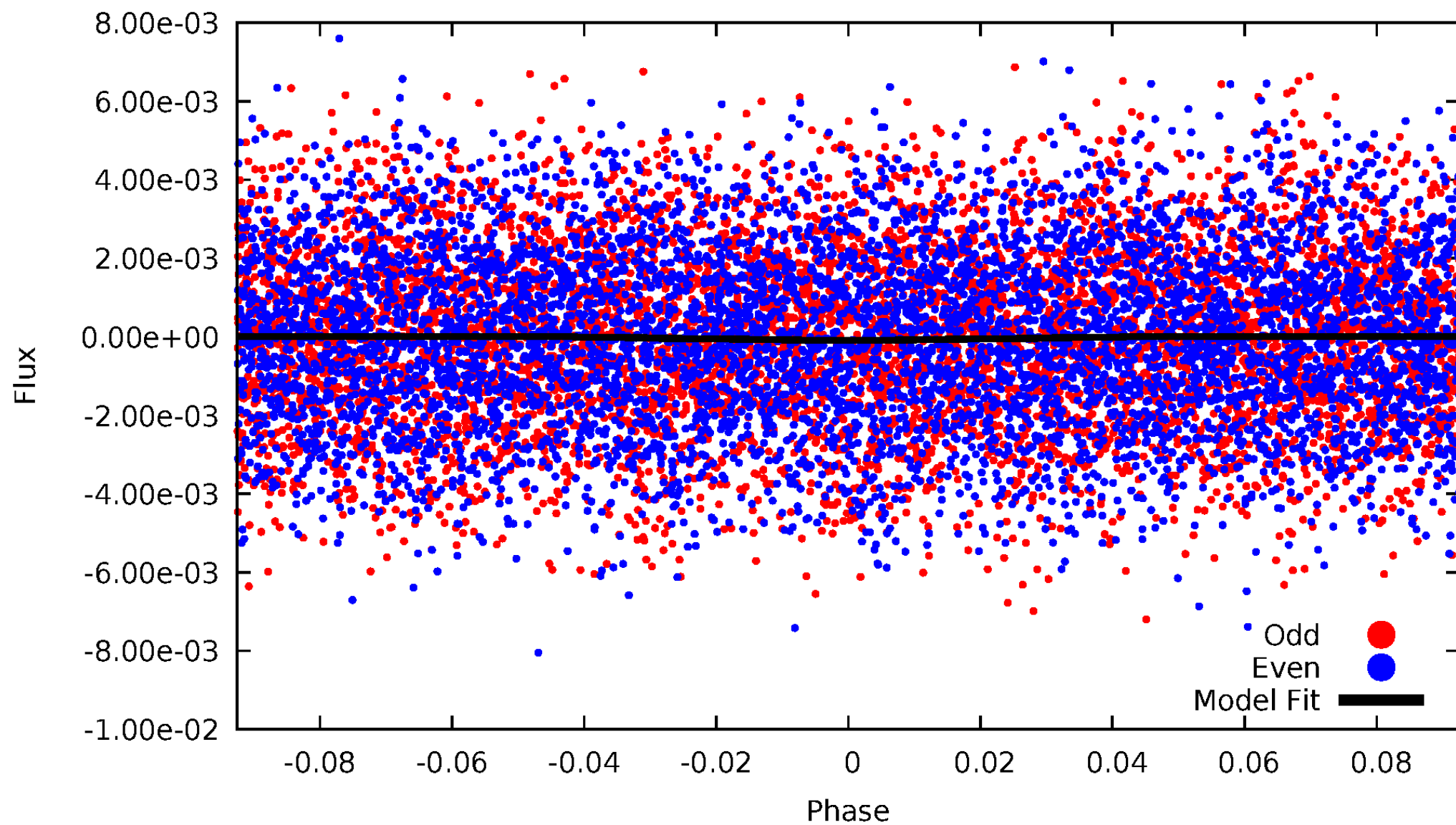
DV Odd/Even

TCE 009138872-01

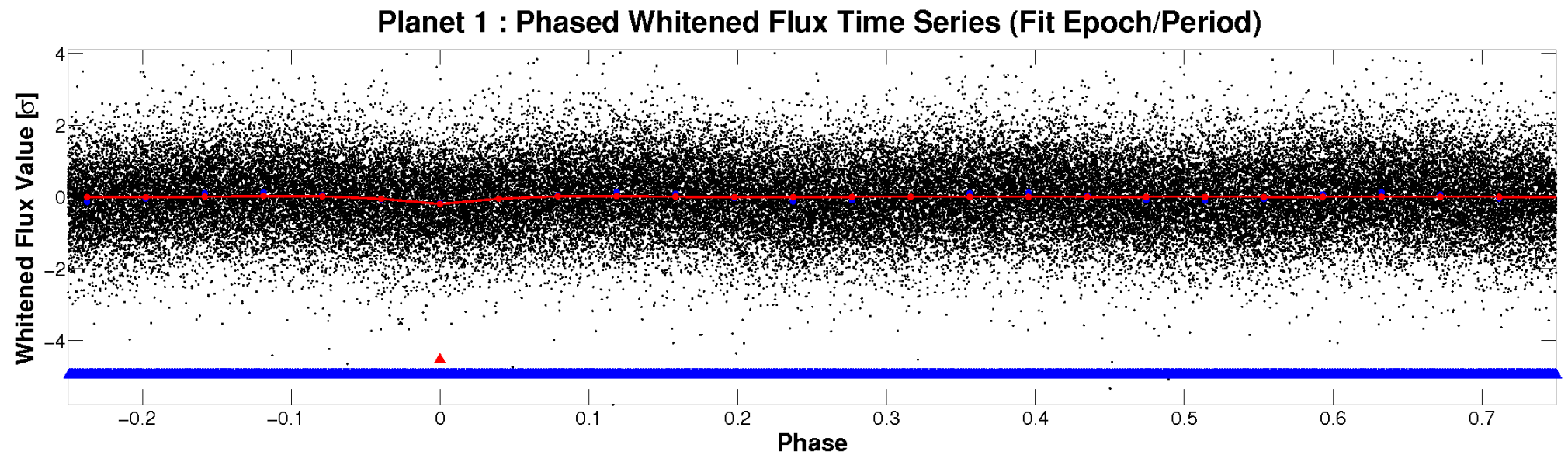
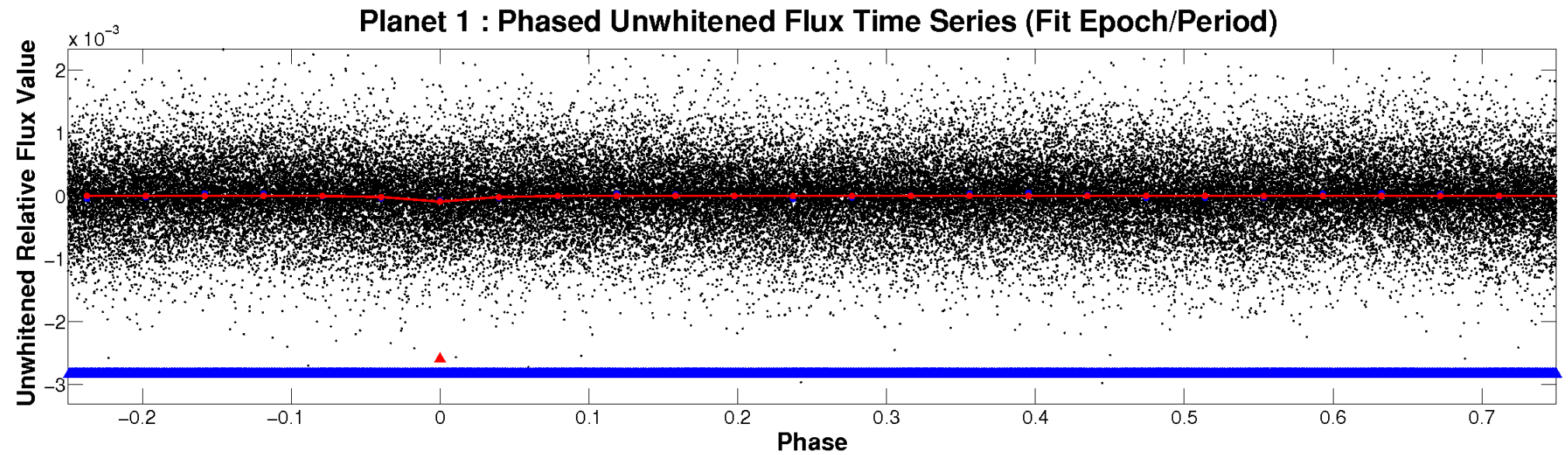


ALT Odd/Even

TCE 009138872-01

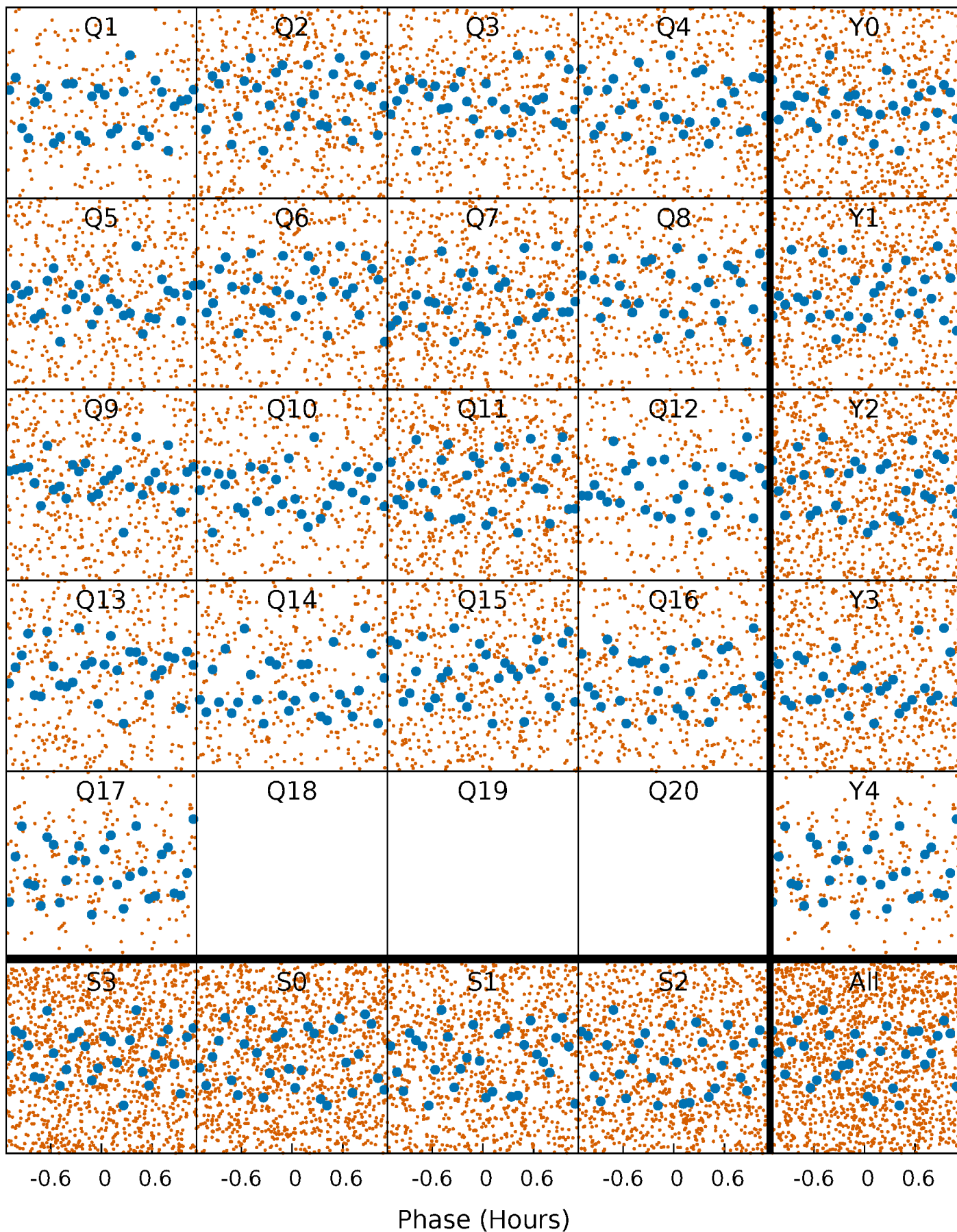


Non-Whitened Vs. Whitened Light Curve



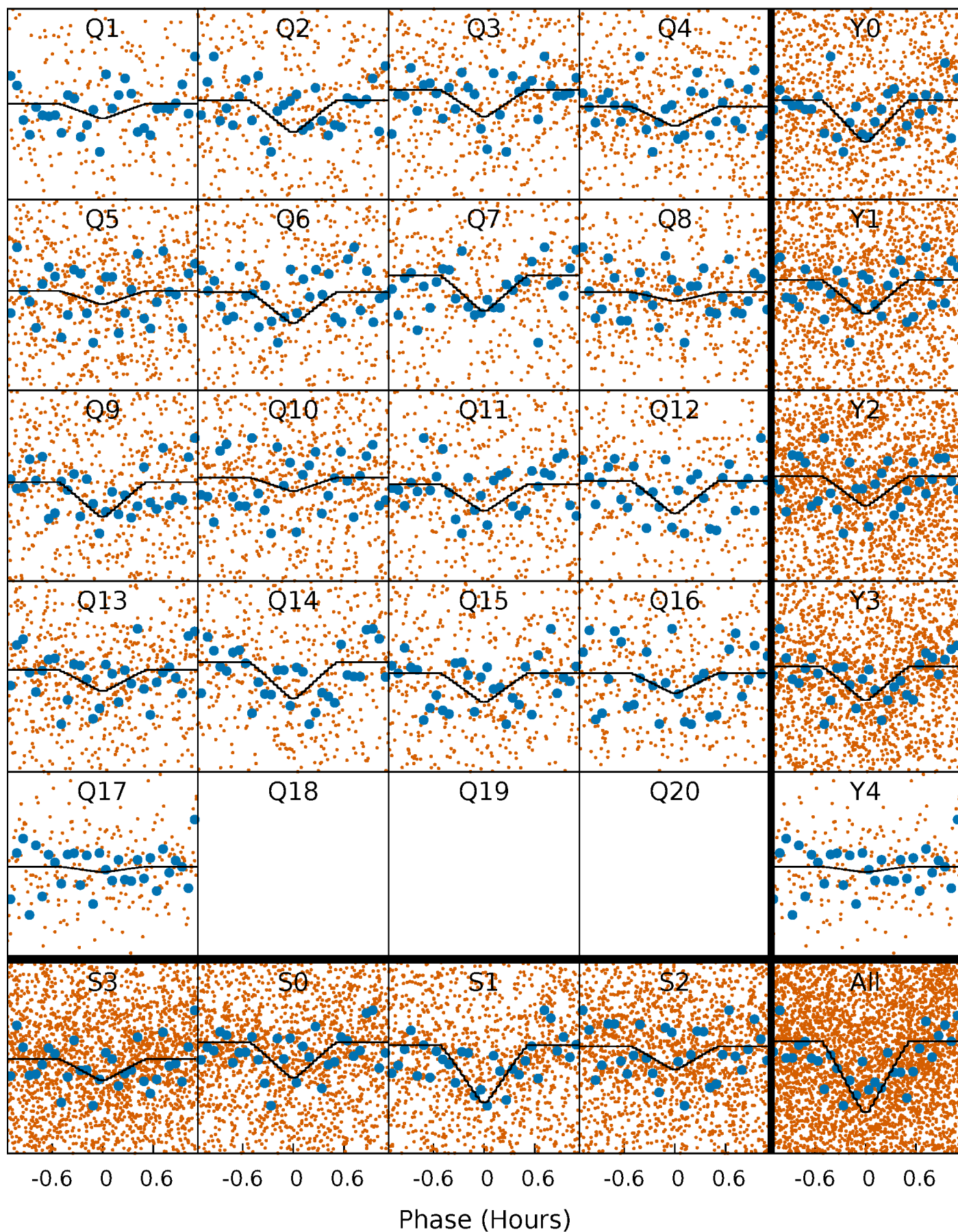
PDC Quarter-Phased Transit Curves

TCE 009138872-01 P= 0.516824 Days $T_0=131.734972$ (BKJD)



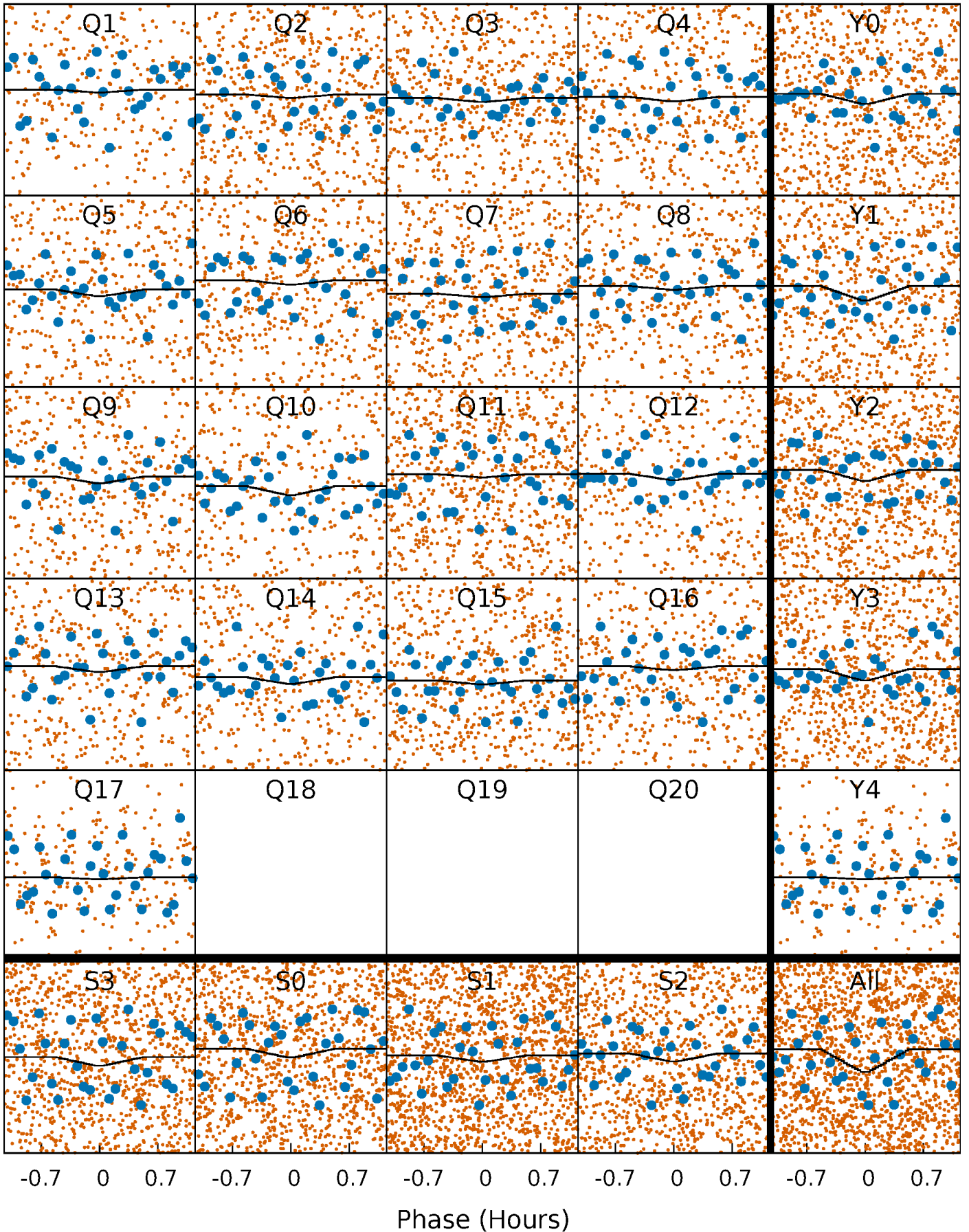
DV Quarter-Phased Transit Curves

TCE 009138872-01 P= 0.516824 Days $T_0=131.734972$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

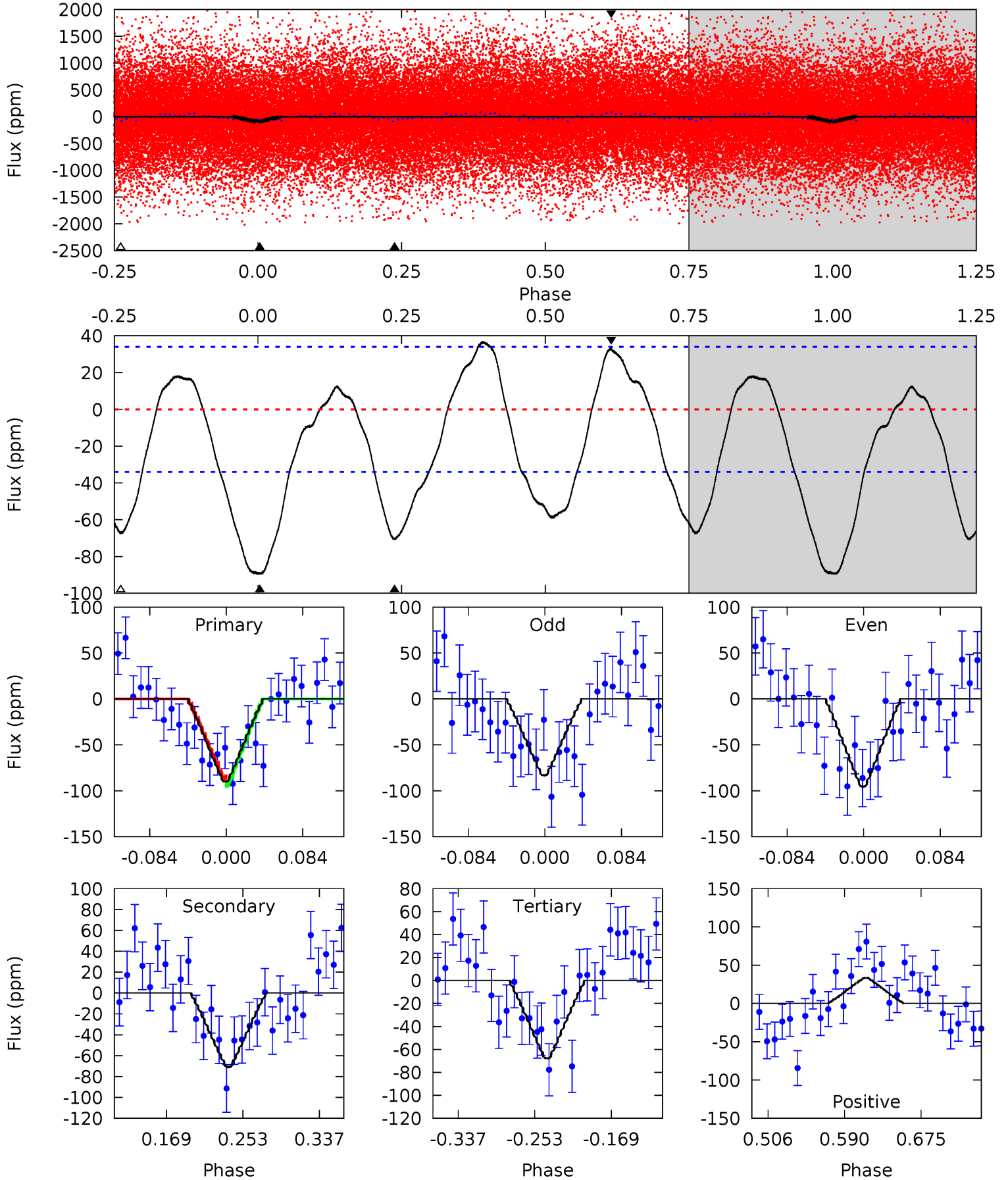
TCE 009138872-01 P= 0.516825 Days $T_0=131.736182$ (BKJD)



DV Model-Shift Uniqueness Test

009138872-01, P = 0.516824 Days, E = 131.218148 Days

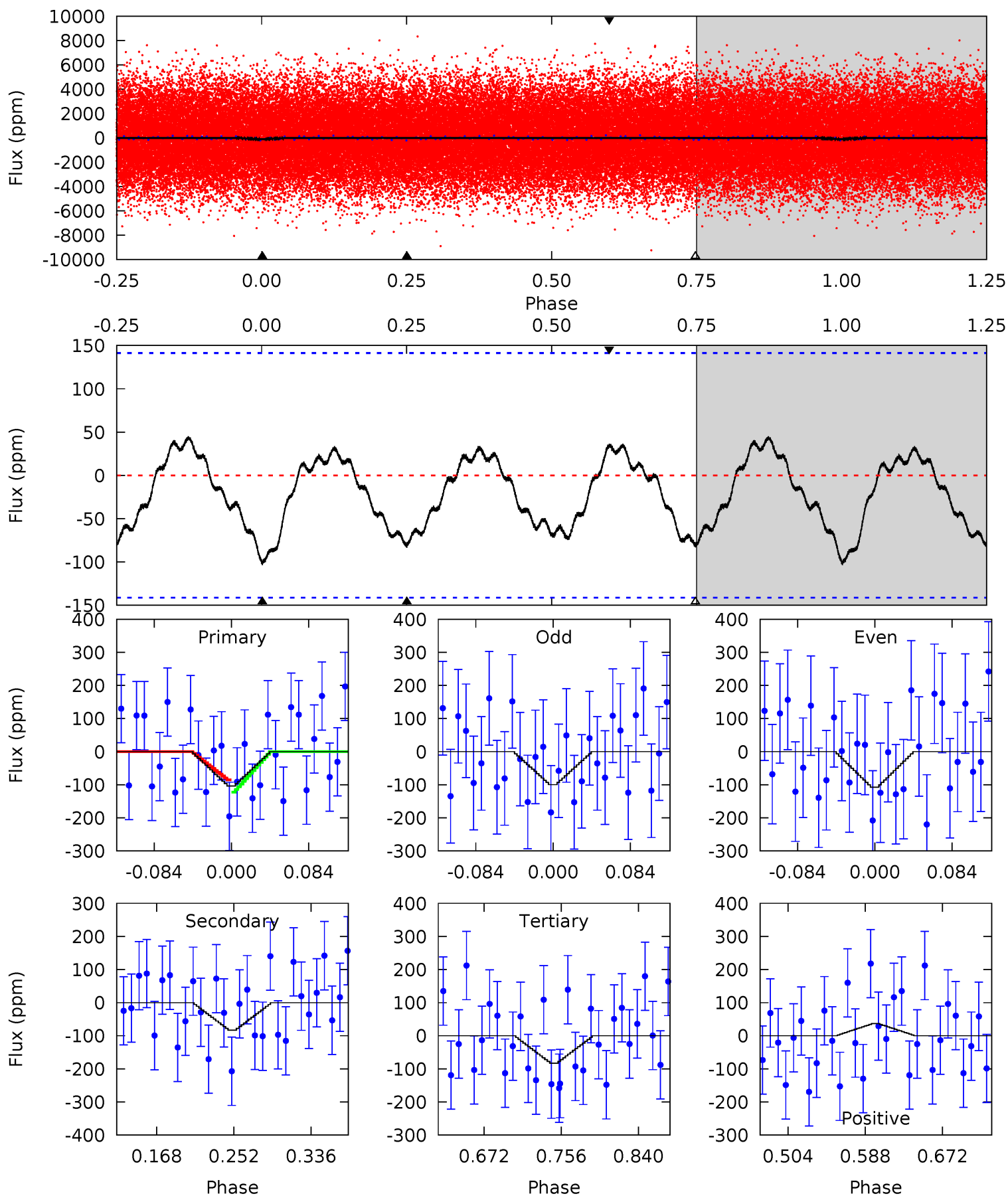
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	9.59	9.18	4.50	4.60	1.73	4.14	2.97	7.66	0.42	5.10	0.83	1.06	0.29	0.54



Alt Model-Shift Uniqueness Test

009138872-01, P = 0.516825 Days, E = 131.219357 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.38	2.71	2.70	1.19	4.60	1.73	1.18	0.67	2.18	0.01	1.52	0.13	1.37	0.30	0.61



Stellar Parameters For KIC 009138872

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7712^{+237}_{-316}	$4.038^{+0.187}_{-0.153}$	$-0.140^{+0.200}_{-0.350}$	$2.054^{+0.509}_{-0.509}$	$1.677^{+0.198}_{-0.298}$	$0.273^{+0.283}_{-0.121}$
	+3%/-4%	+5%/-4%	+143%/-250%	+25%/-25%	+12%/-18%	+104%/-44%
Source	KIC0	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 009138872-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-71 ± 7	$2.76^{+2.32}_{-1.75}$	5527^{+420}_{-389}	5637^{+5347}_{-2340}	$1.165^{+7.146}_{-0.824}$
Alt.	-83 ± 31	$2.78^{+2.03}_{-1.69}$	5519^{+402}_{-380}	5877^{+5861}_{-2322}	$1.283^{+7.554}_{-0.910}$

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 $A_{obs} \gg 1.0$

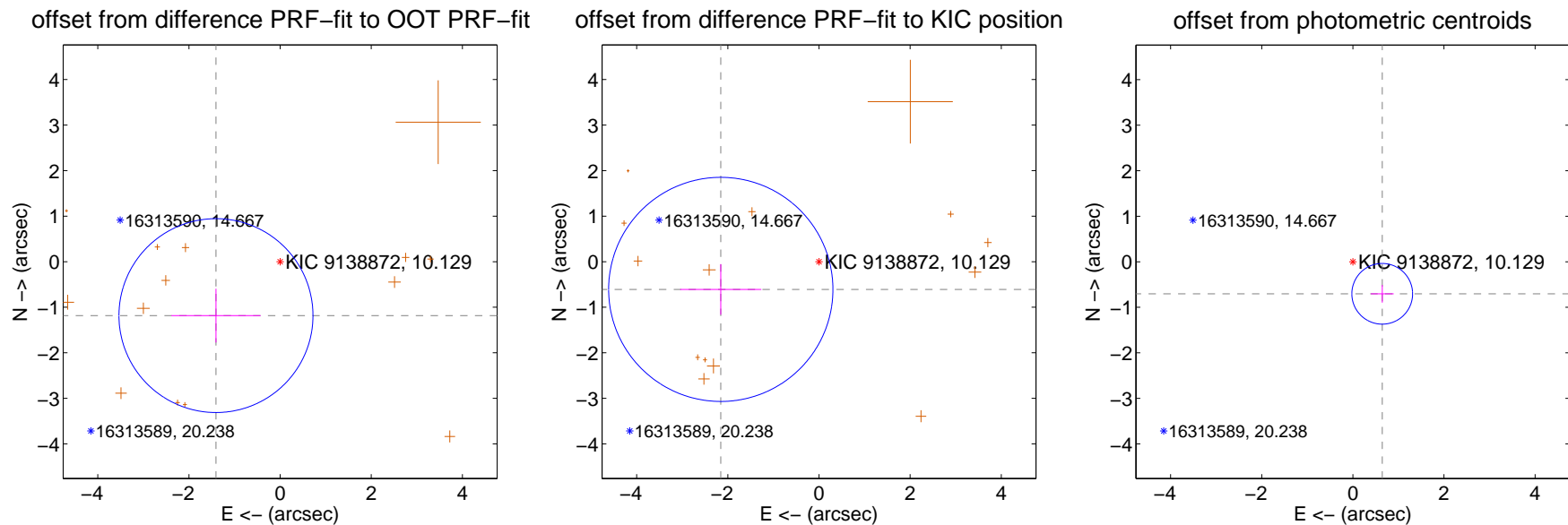
DV Centroid Data

Supplemental centroid analysis for 009138872-01. **Kepler magnitude: 10.13.** Transit SNR 11.24

There are 1 quarters with good PRF difference image offsets

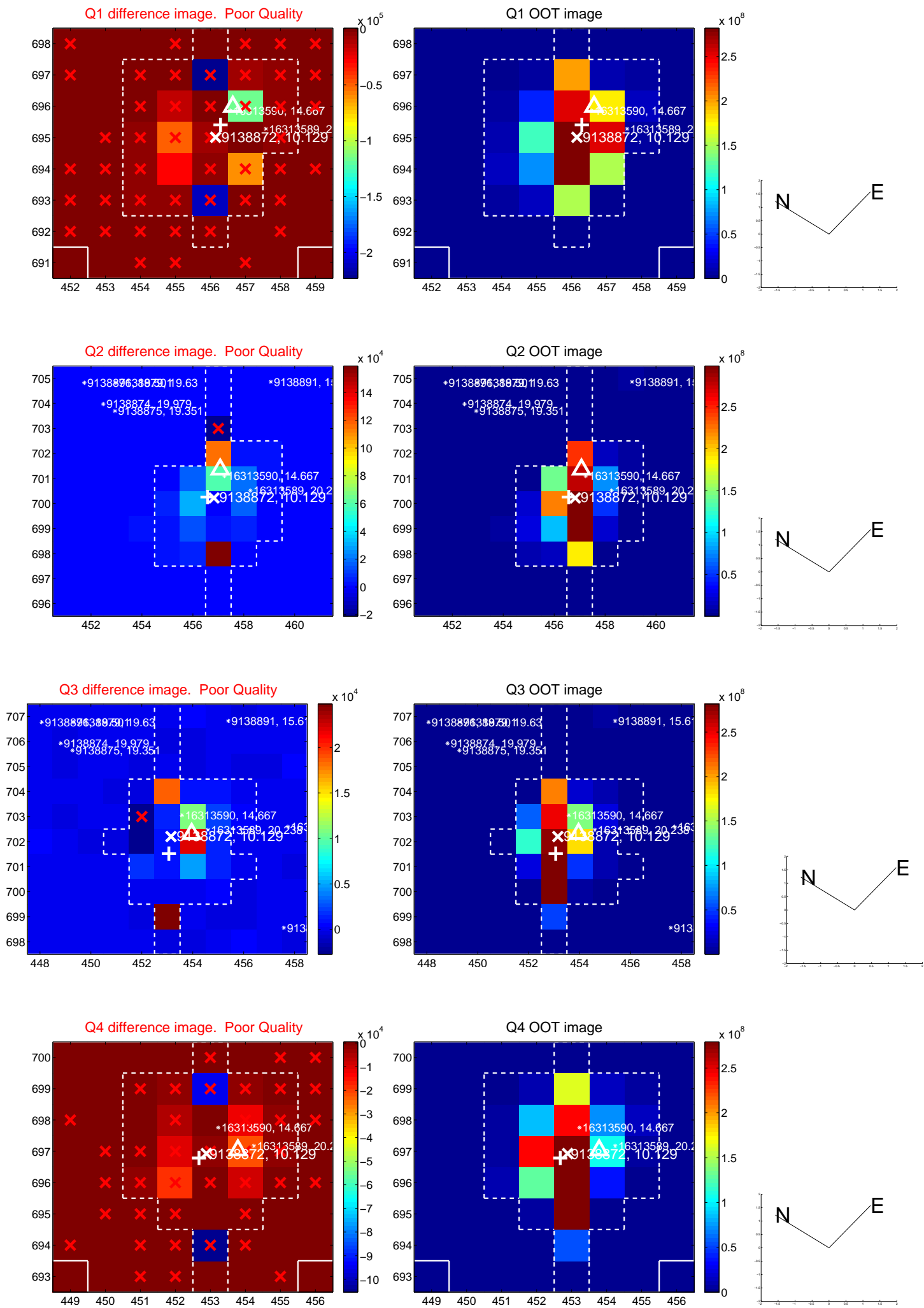
The direct PRF centroid is offset from the target star catalog position by about 1.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.838 ± 0.709	2.59	1.407 ± 0.977	-1.183 ± 0.591
PRF-fit source offset from KIC position	2.238 ± 0.820	2.73	2.154 ± 0.890	-0.608 ± 0.555
photometric centroid source offset	0.95 ± 0.22	4.29	-0.64 ± 0.25	-0.70 ± 0.19

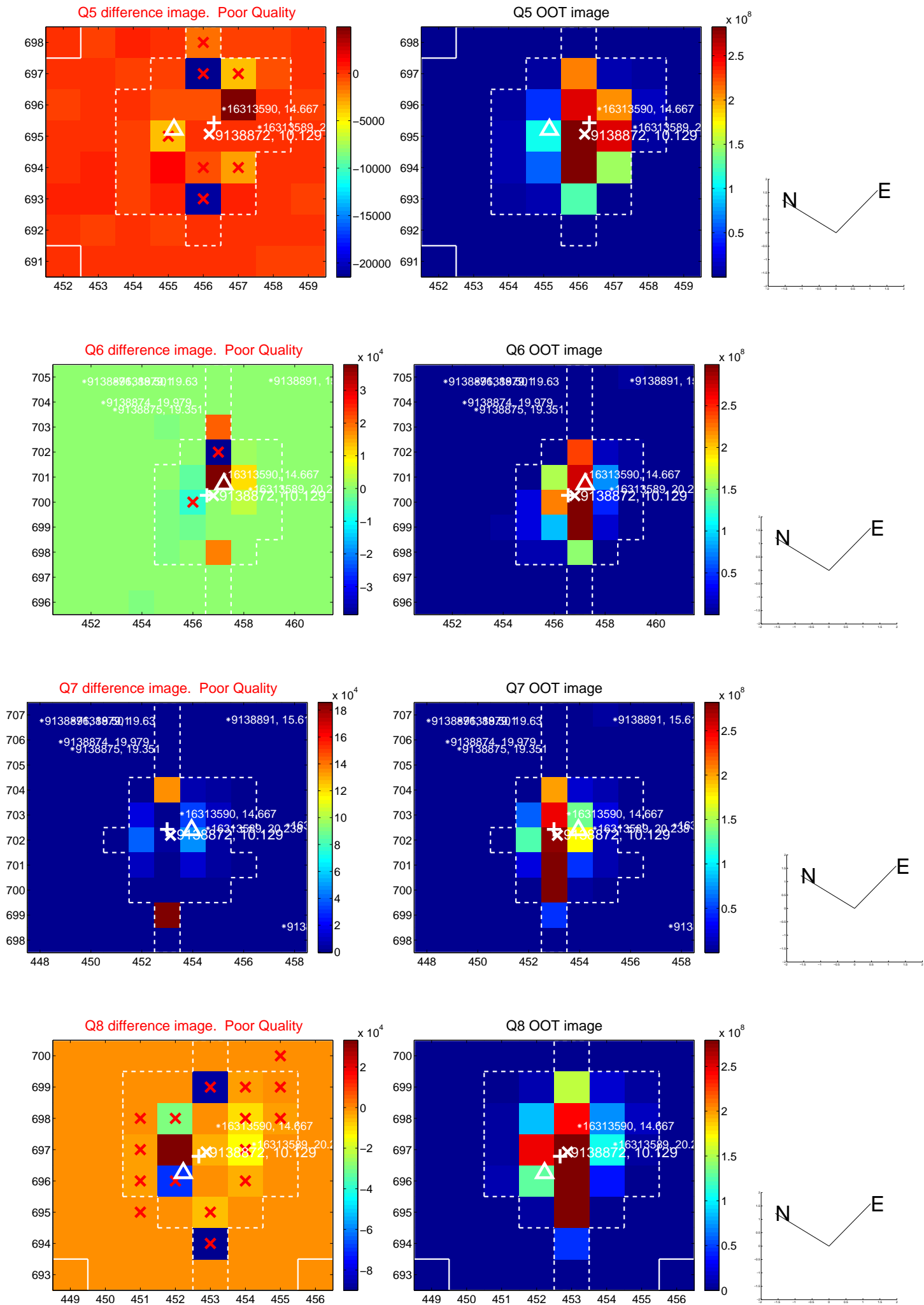


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

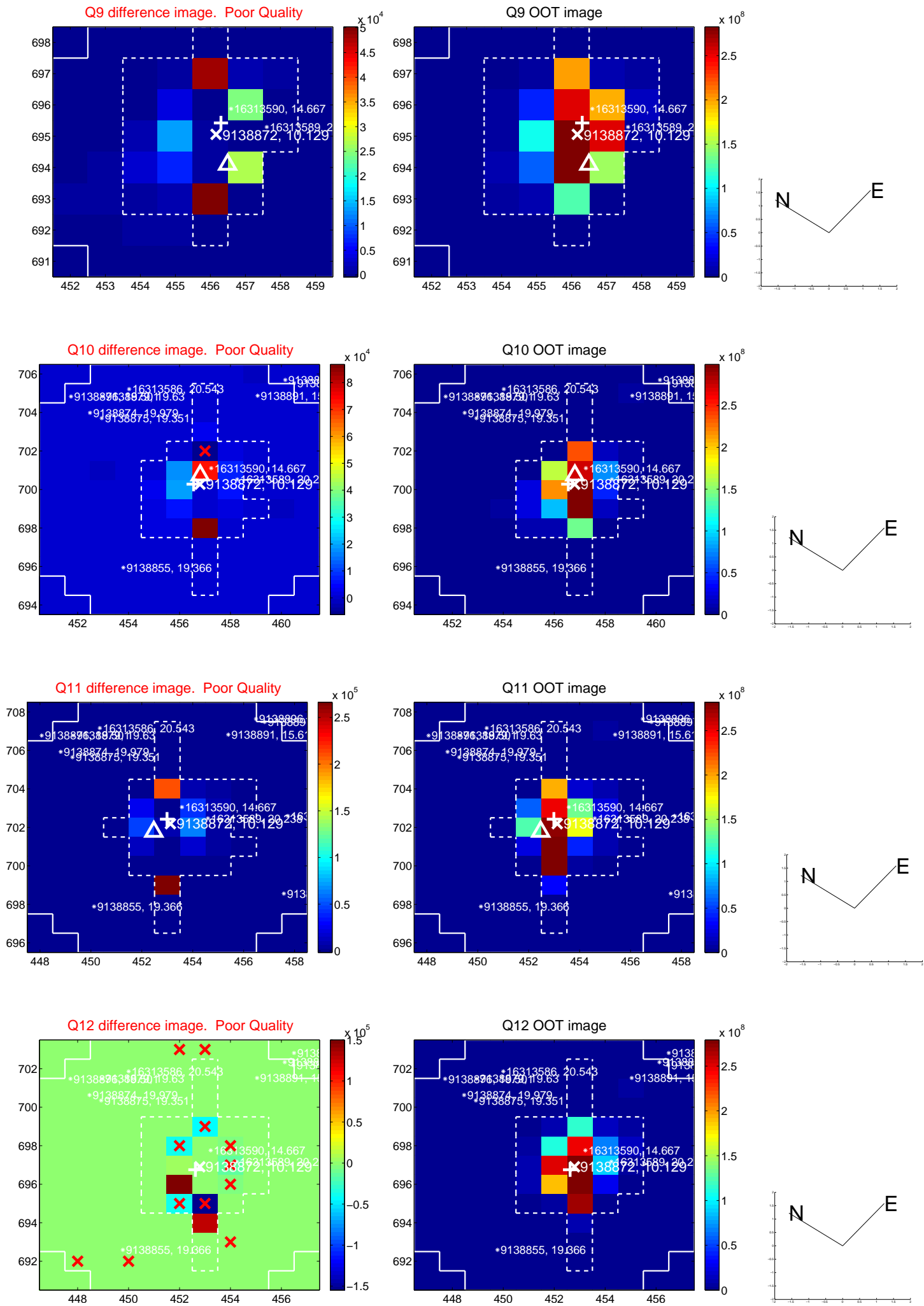
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



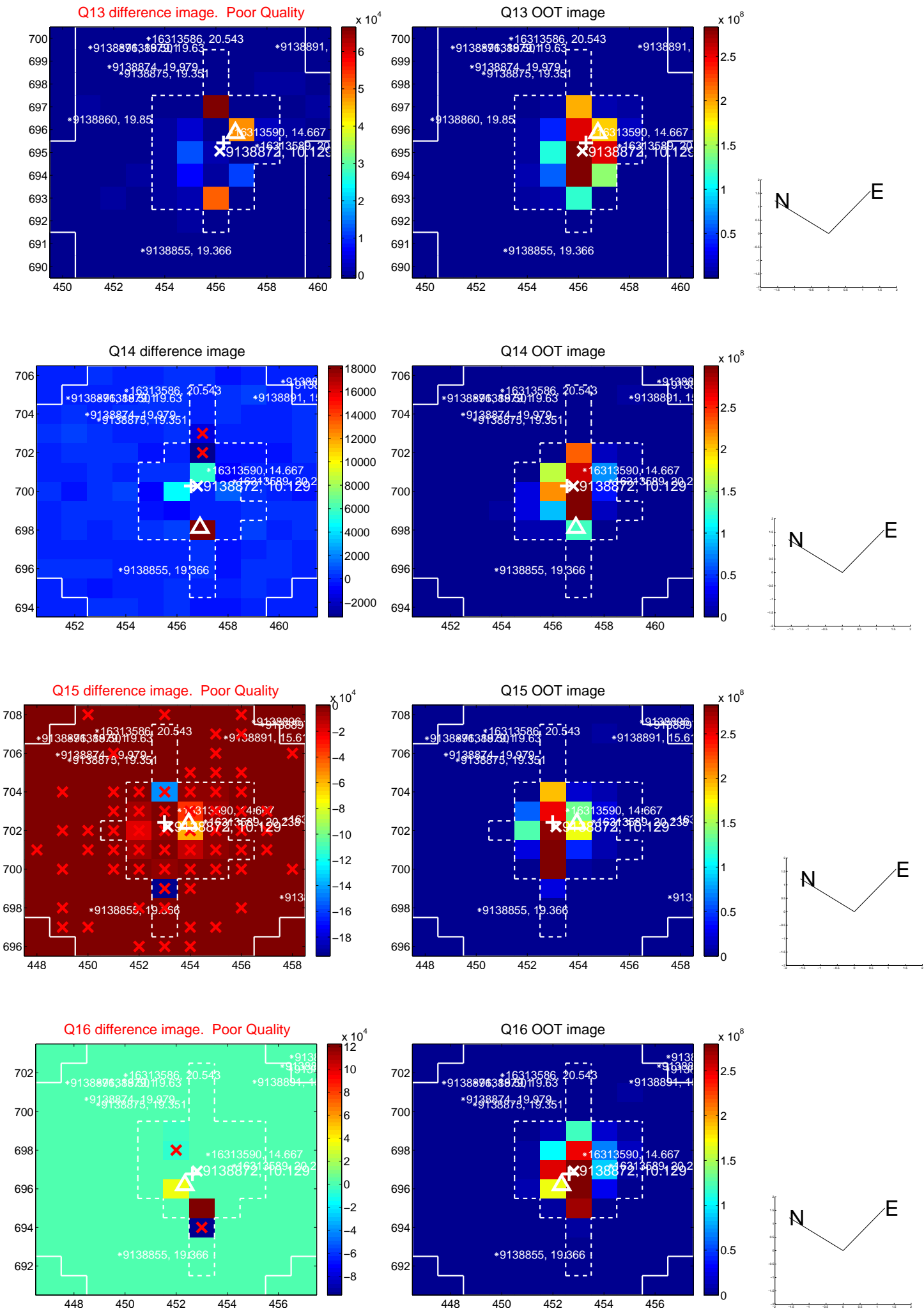
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



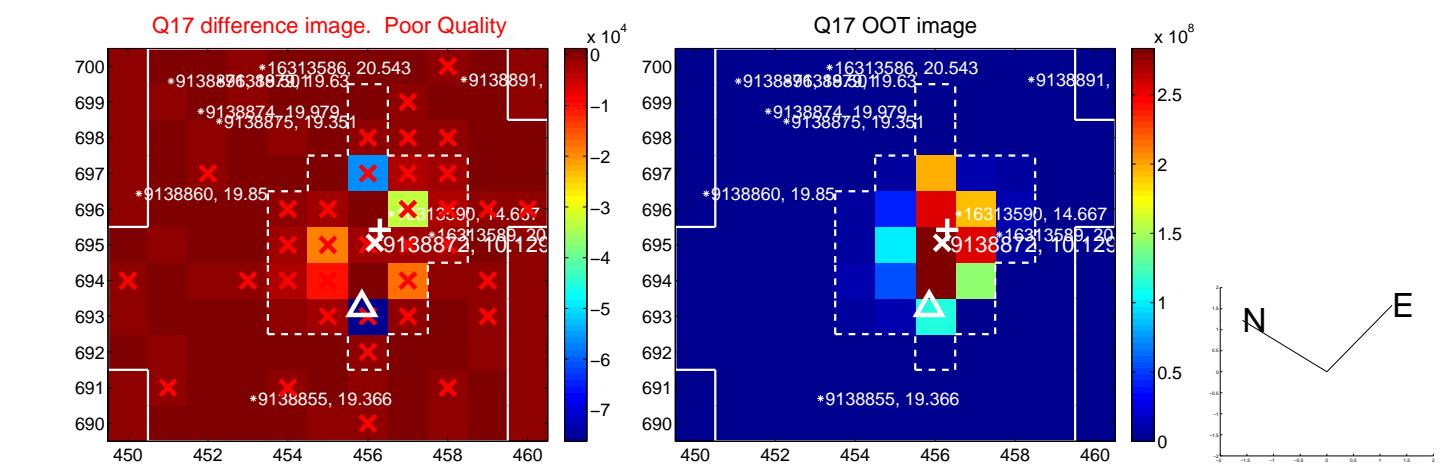
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



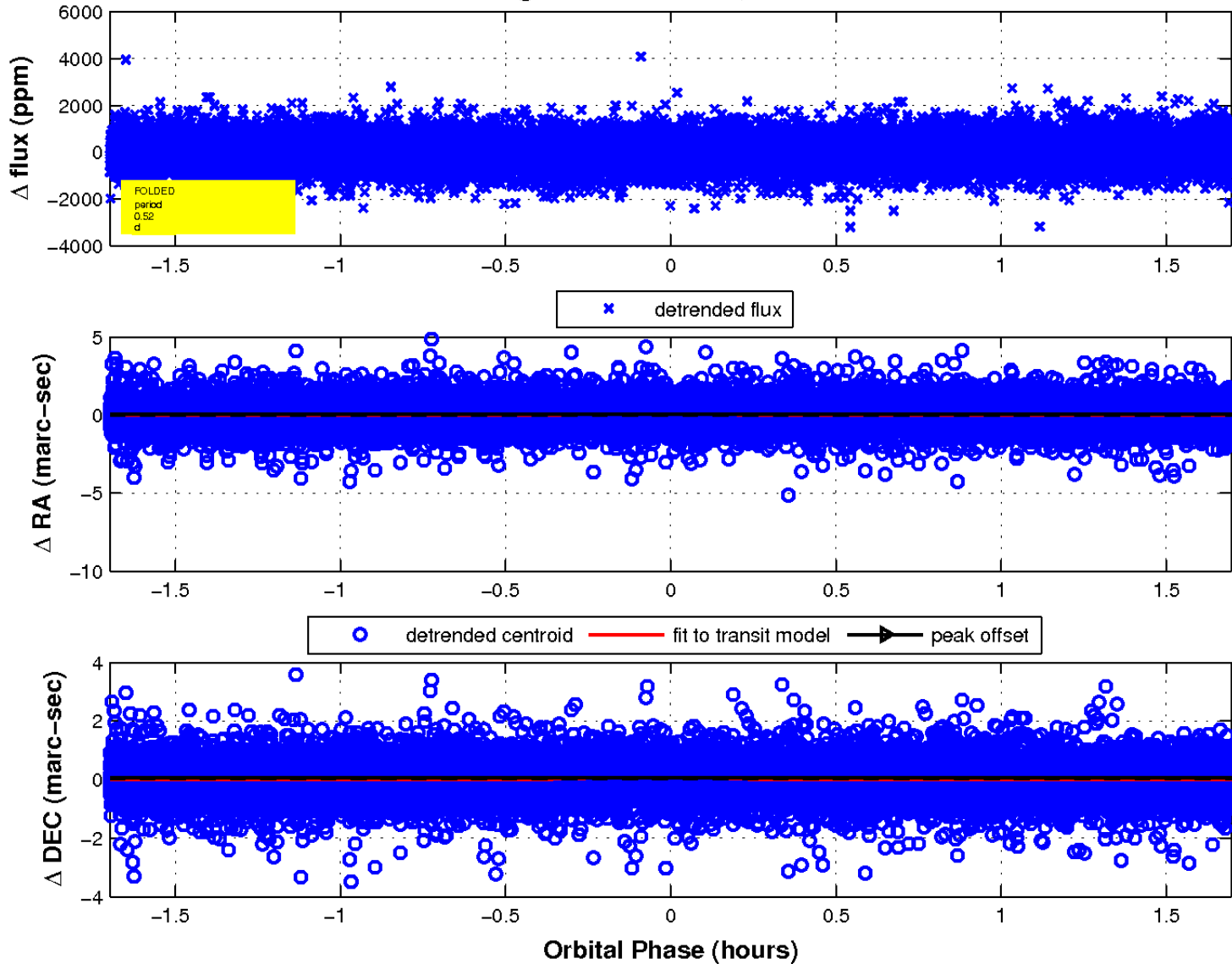
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



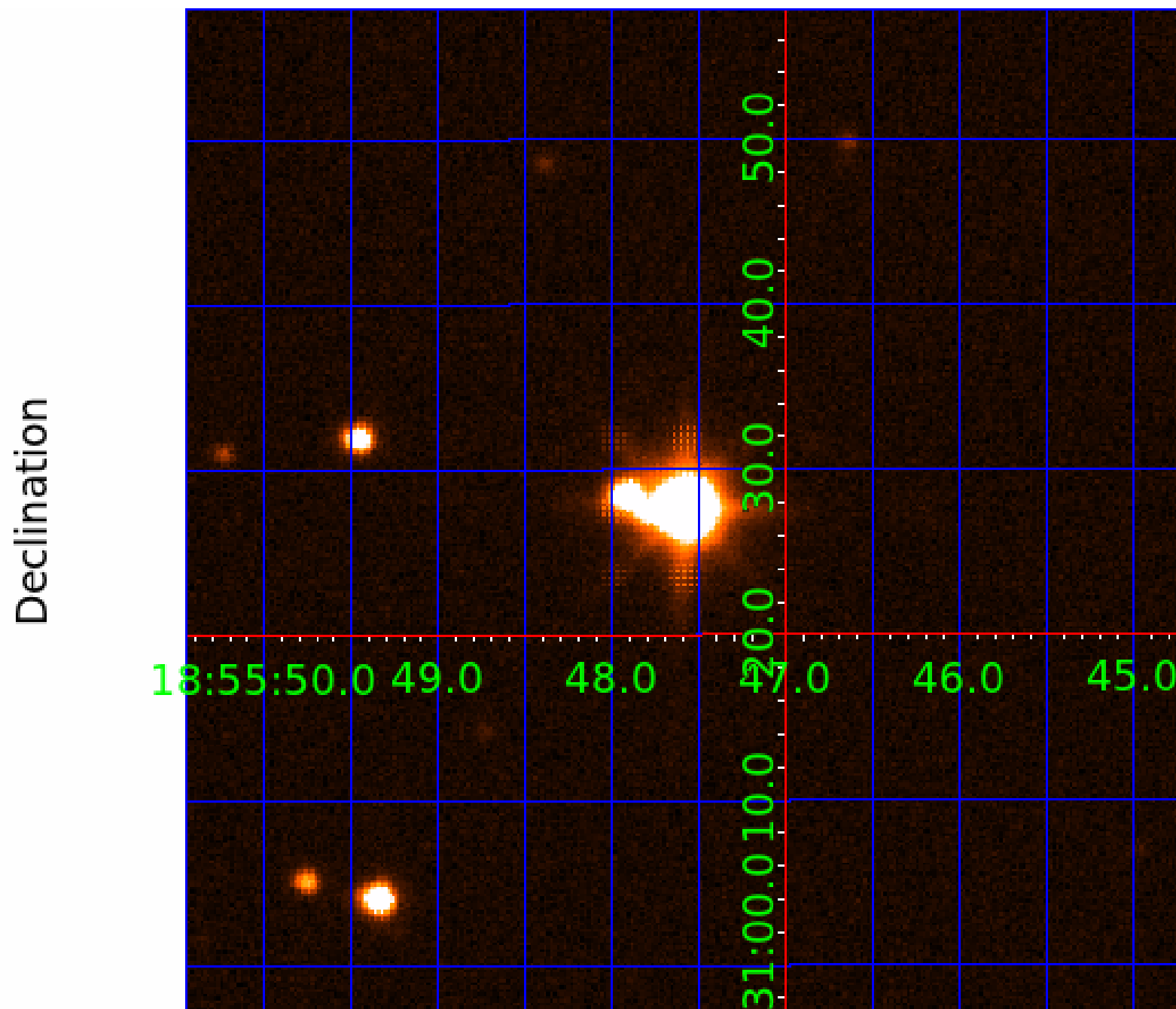
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 009138872

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})
009138872-01	OBS	No	0.516824	131.734972	112.7	0.566	10.2	11.2	2.05	7712	2.27	59544.20
009138872-02	OBS	No	0.743657	131.581219	59.0	7.176	7.7	10.1	2.05	7712	1.63	36654.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009138872-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
009138872-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

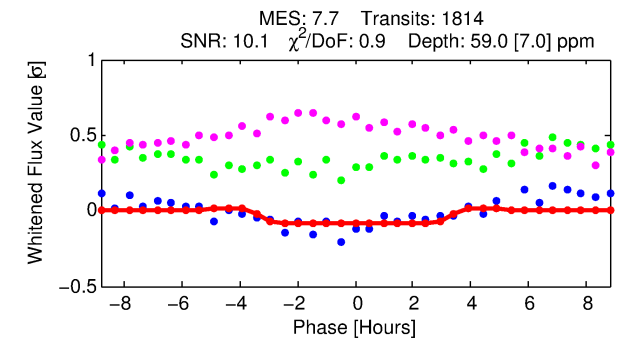
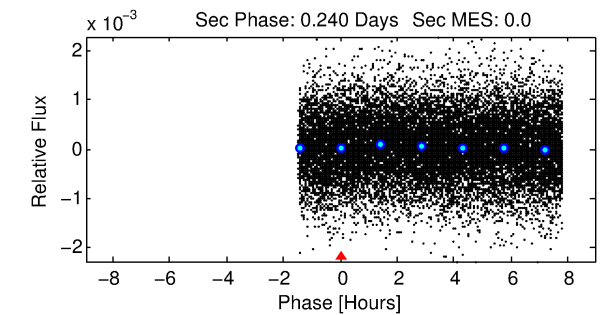
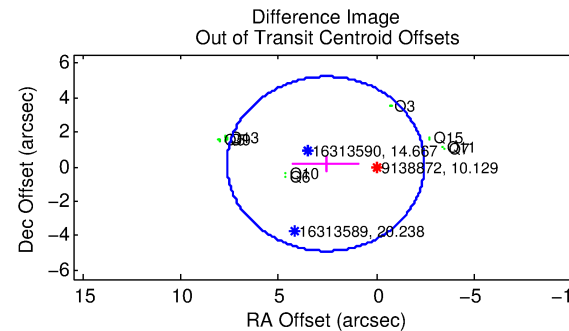
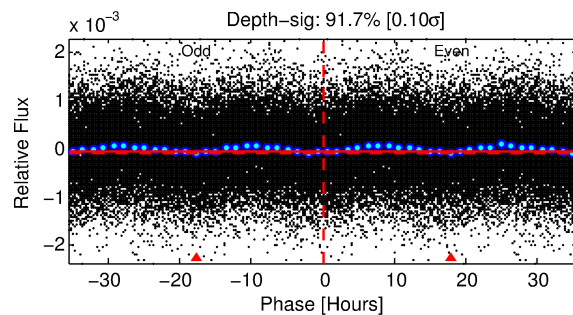
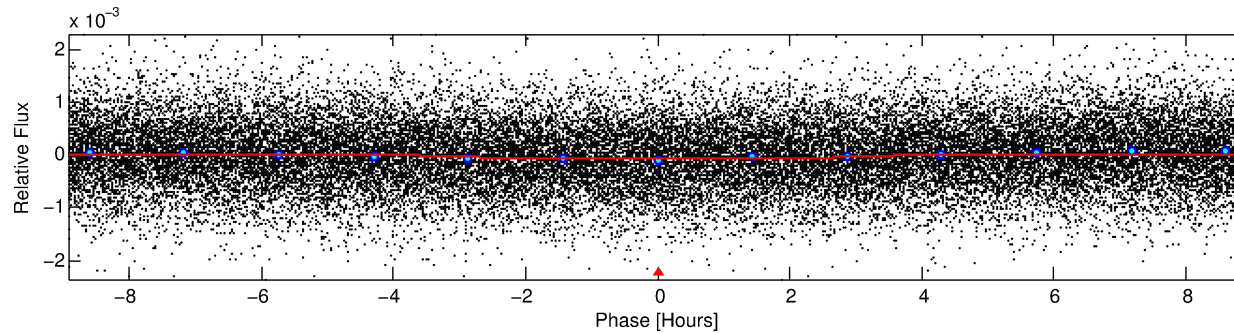
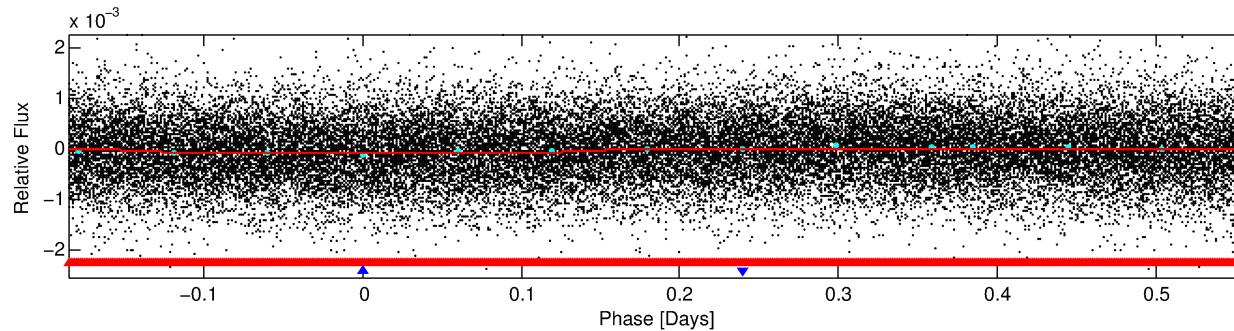
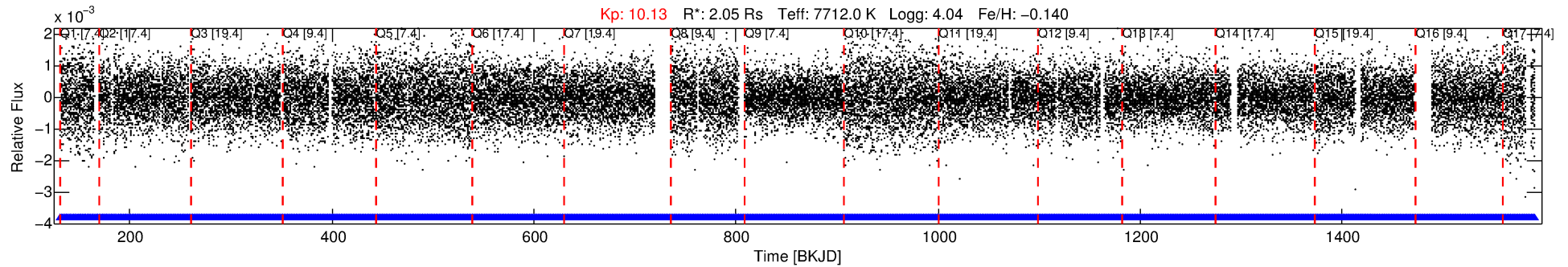
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009138872-02

No Significant Match Found

DV One-Page Summary

KIC: 9138872 Candidate: 2 of 2 Period: 0.744 d



DV Fit Results:

Period = 0.74366 [0.00001] d
Epoch = 131.5812 [0.0062] BKJD
Rp/R* = 0.0073 [0.0074]
a/R* = 1.05 [0.51]
b = 0.48 [9.52]
Seff = 36654.93 [13545.34]
Teq = 3528 [326] K
Rp = 1.63 [1.71] Re
a = 0.0191 [0.0042] AU
Ag = N/A
Teffp = N/A

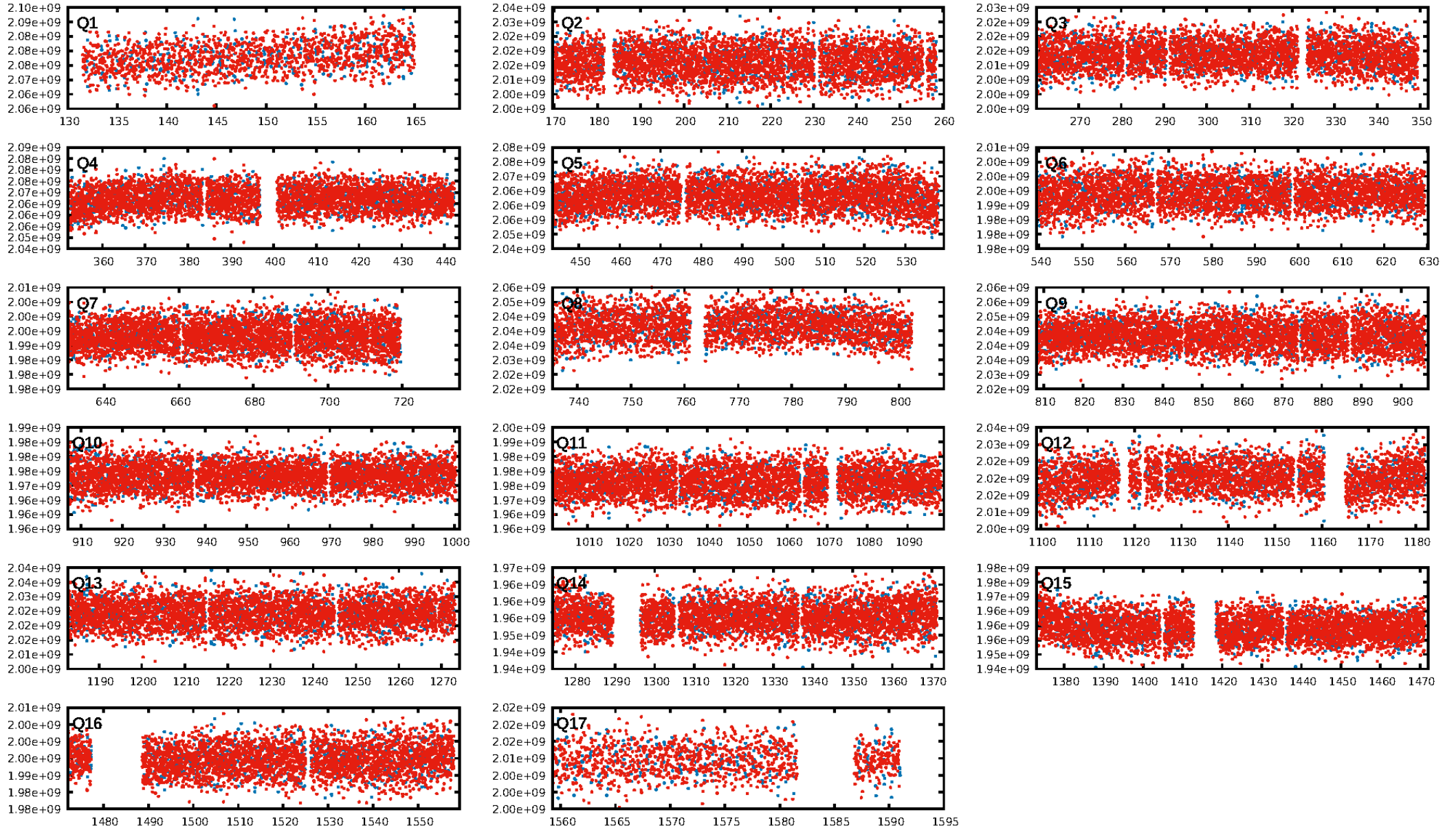
DV Diagnostic Results:

ShortPeriod-sig: 55.1% [0.76 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1731/1731]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 1.432 arcsec [7.06 σ]
OotOffset-rm: 2.591 arcsec [1.54 σ]
KicOffset-rm: 2.308 arcsec [1.60 σ]
OotOffset-st: 2/4/0/3 [9]
KicOffset-st: 2/4/0/3 [9]
DiffImageQuality-fgm: 0.33 [3/9]
DiffImageOverlap-fno: 0.00 [0/17]

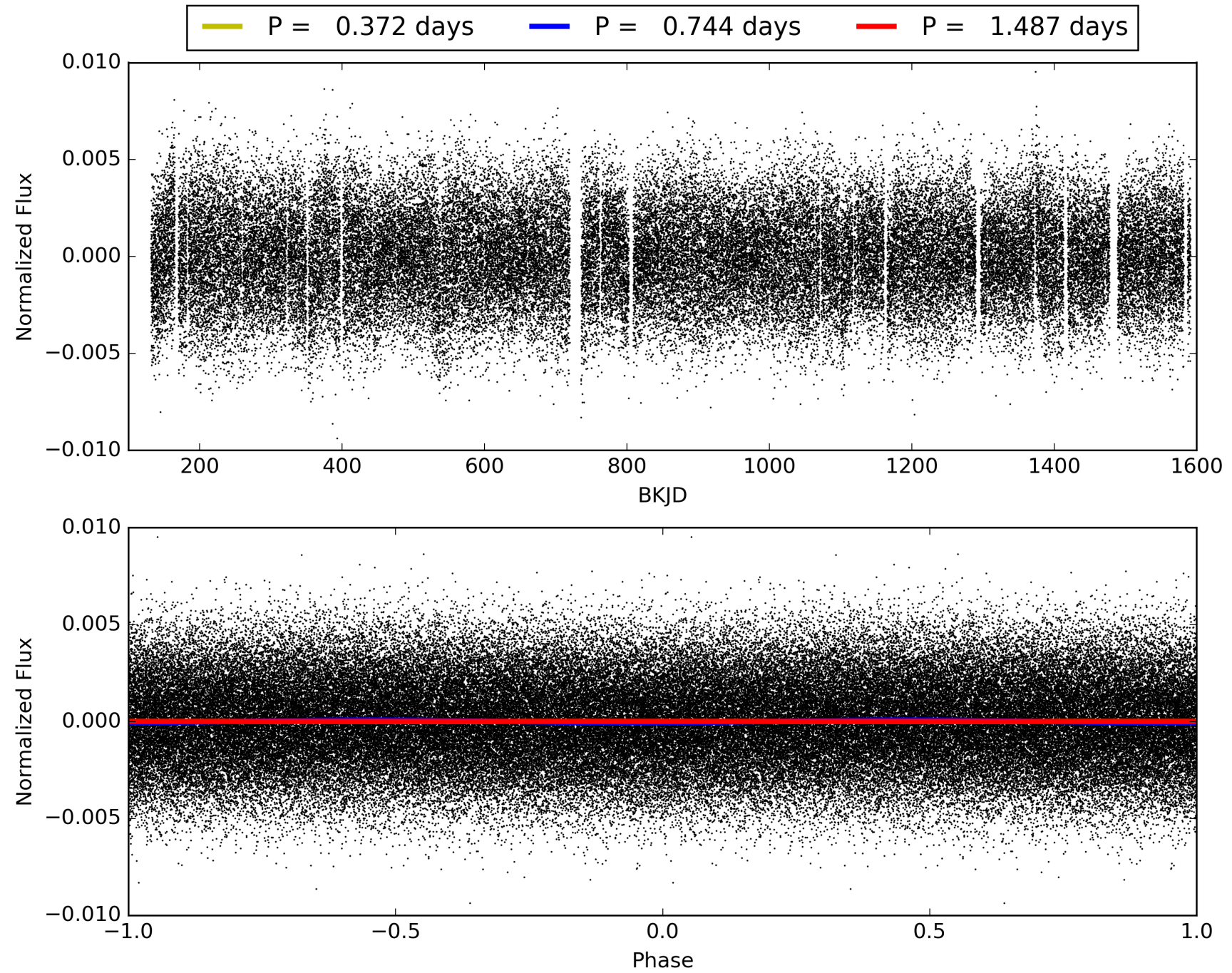
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:06:56 Z

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

TCE 009138872-02, PDC Light Curves

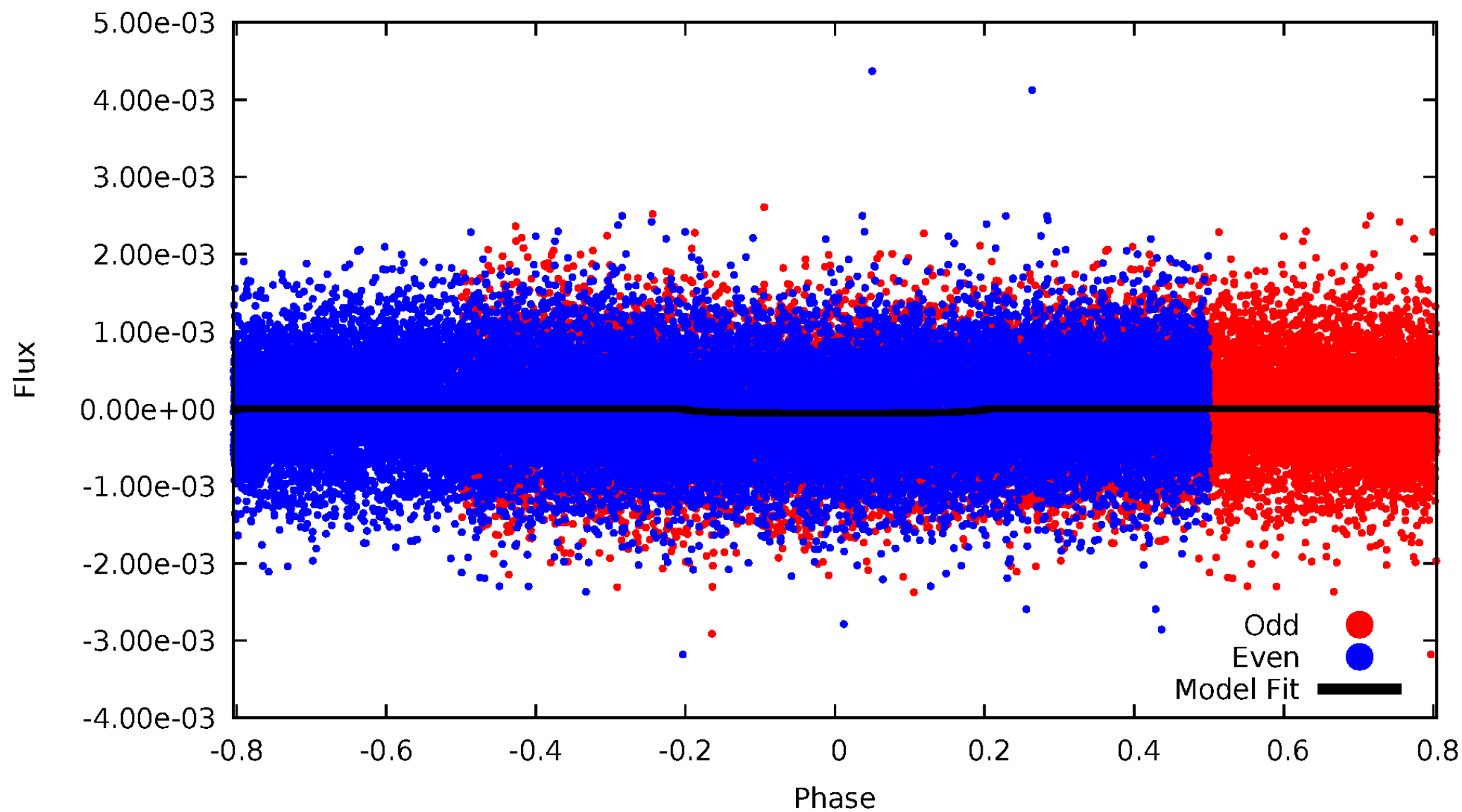


TCE 009138872-02



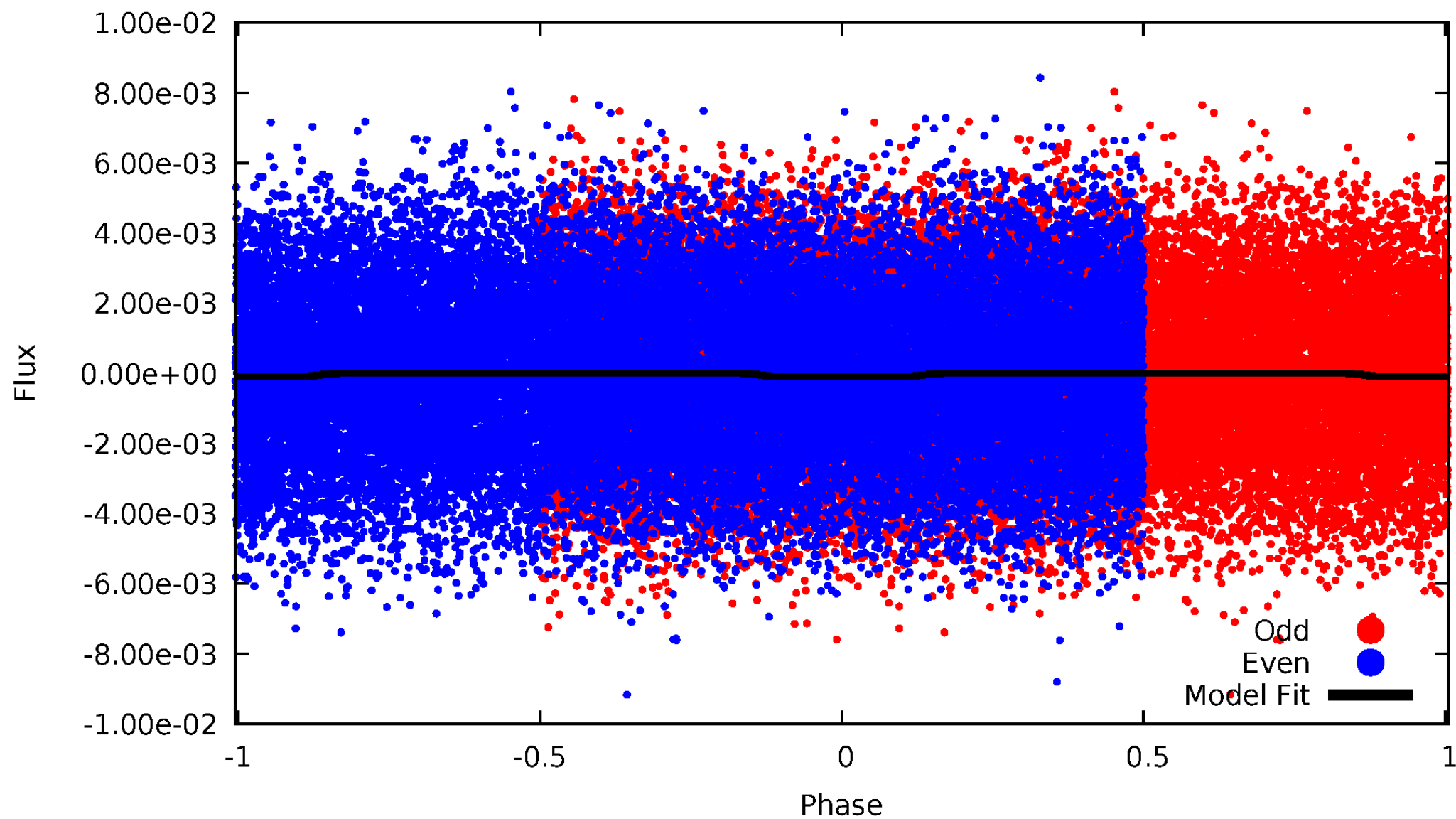
DV Odd/Even

TCE 009138872-02



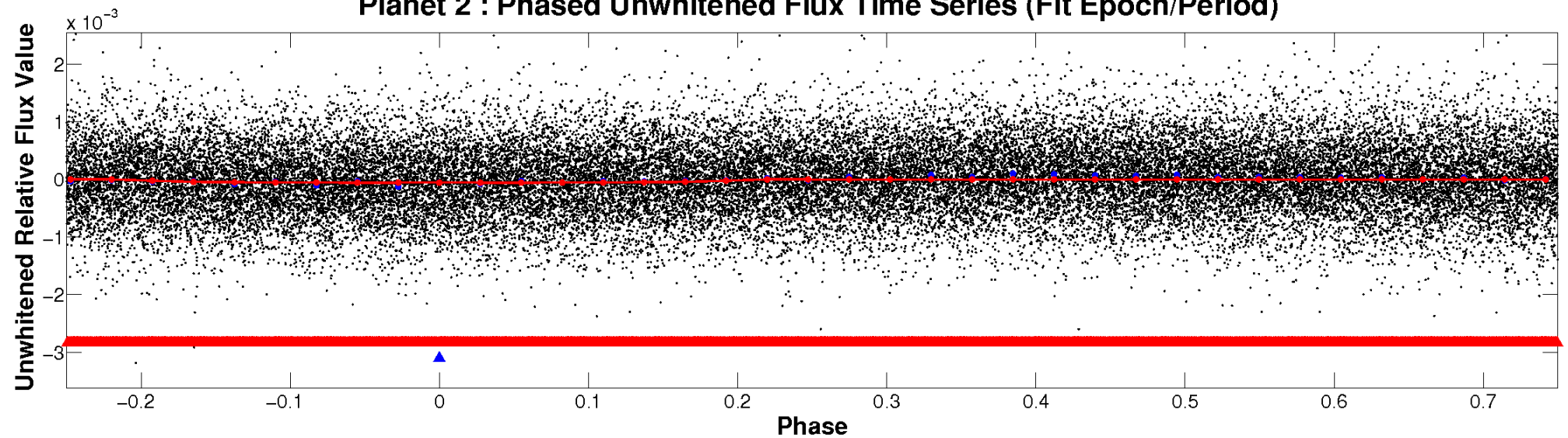
ALT Odd/Even

TCE 009138872-02

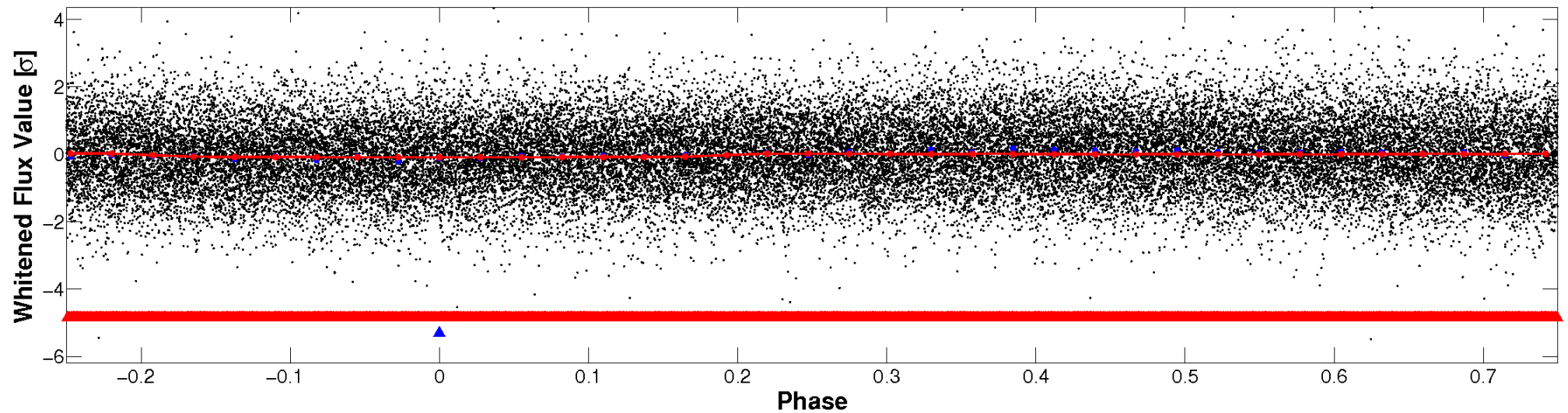


Non-Whitened Vs. Whitened Light Curve

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

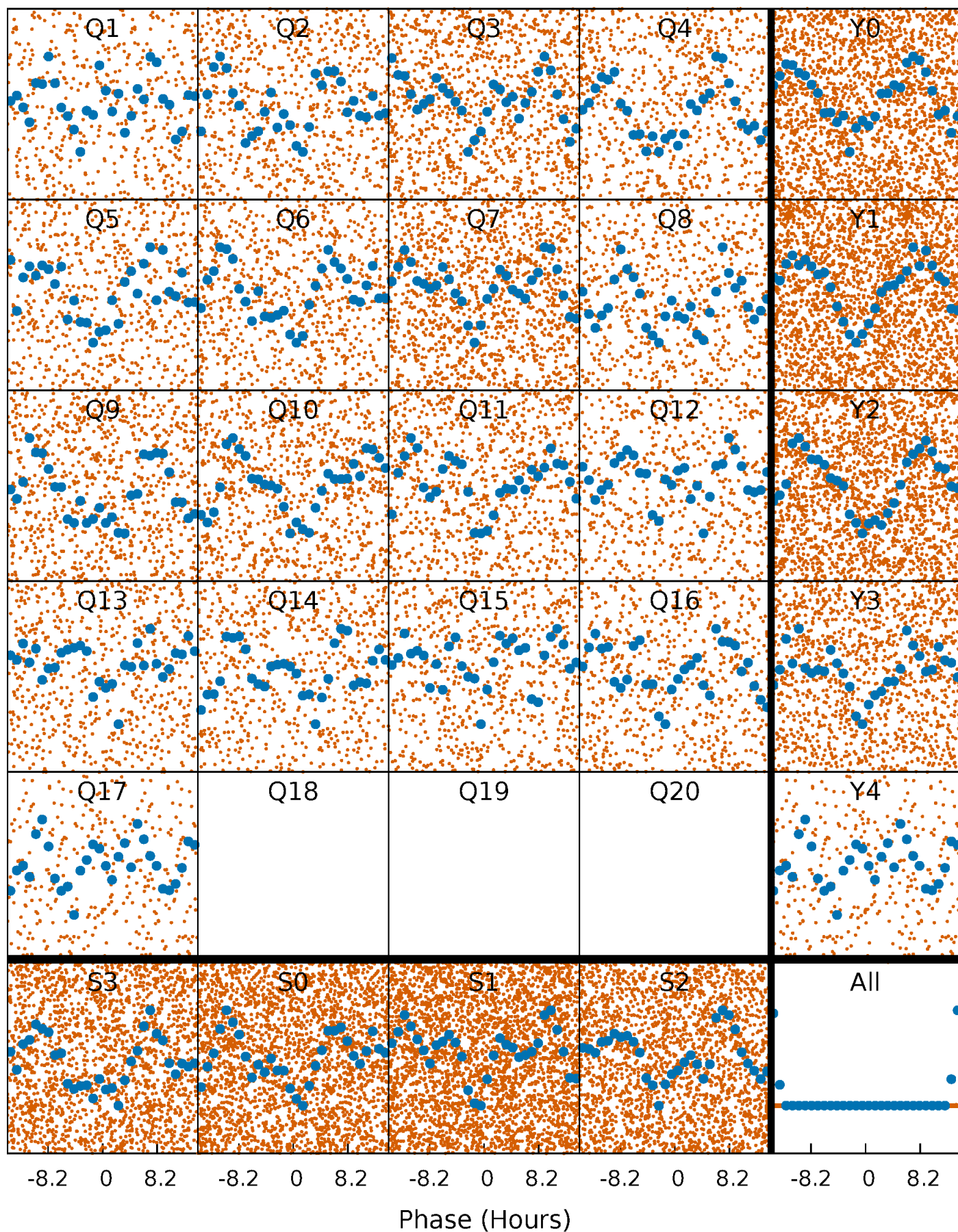


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



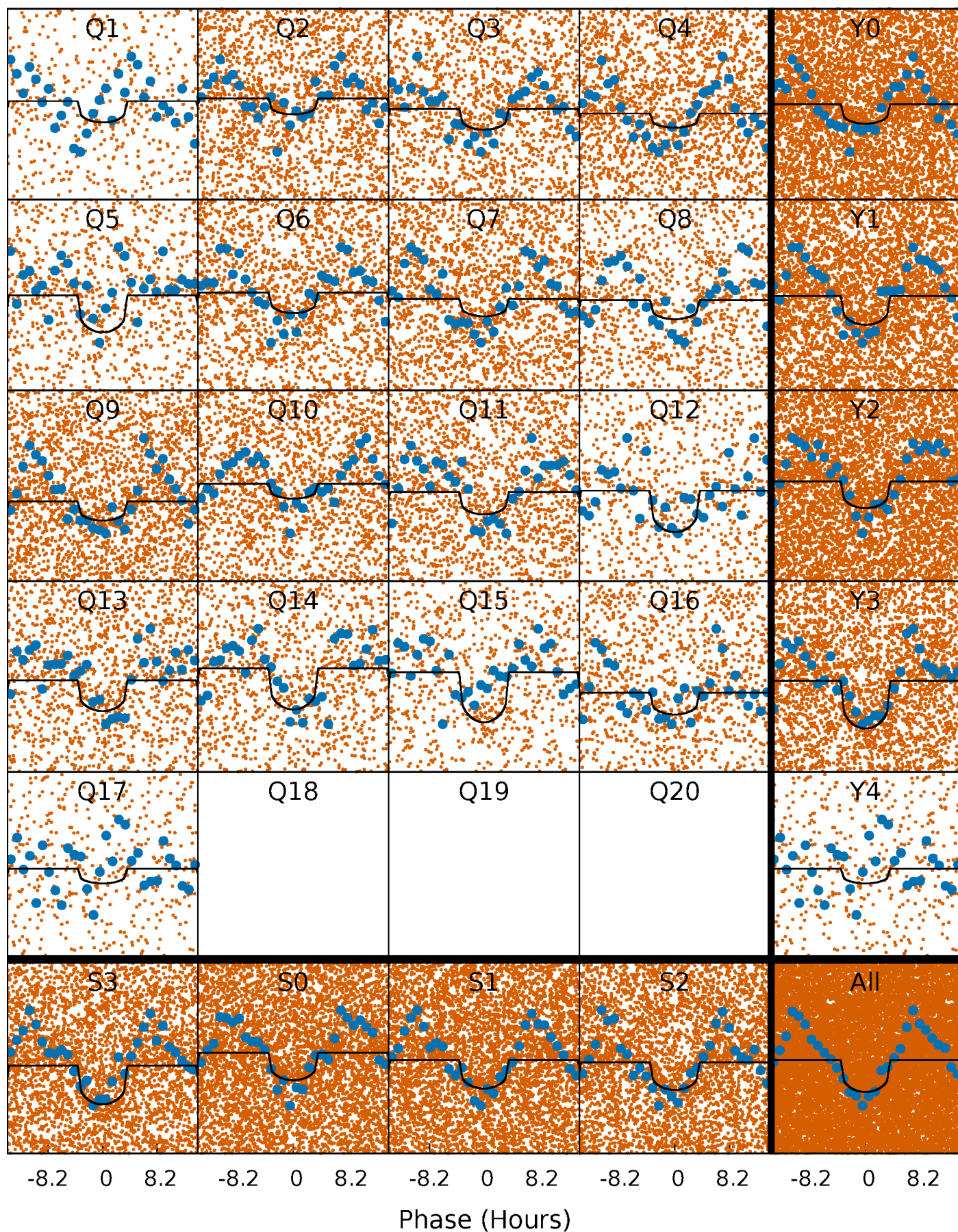
PDC Quarter-Phased Transit Curves

TCE 009138872-02 $P = 0.743657$ Days $T_0 = 131.581219$ (BKJD)



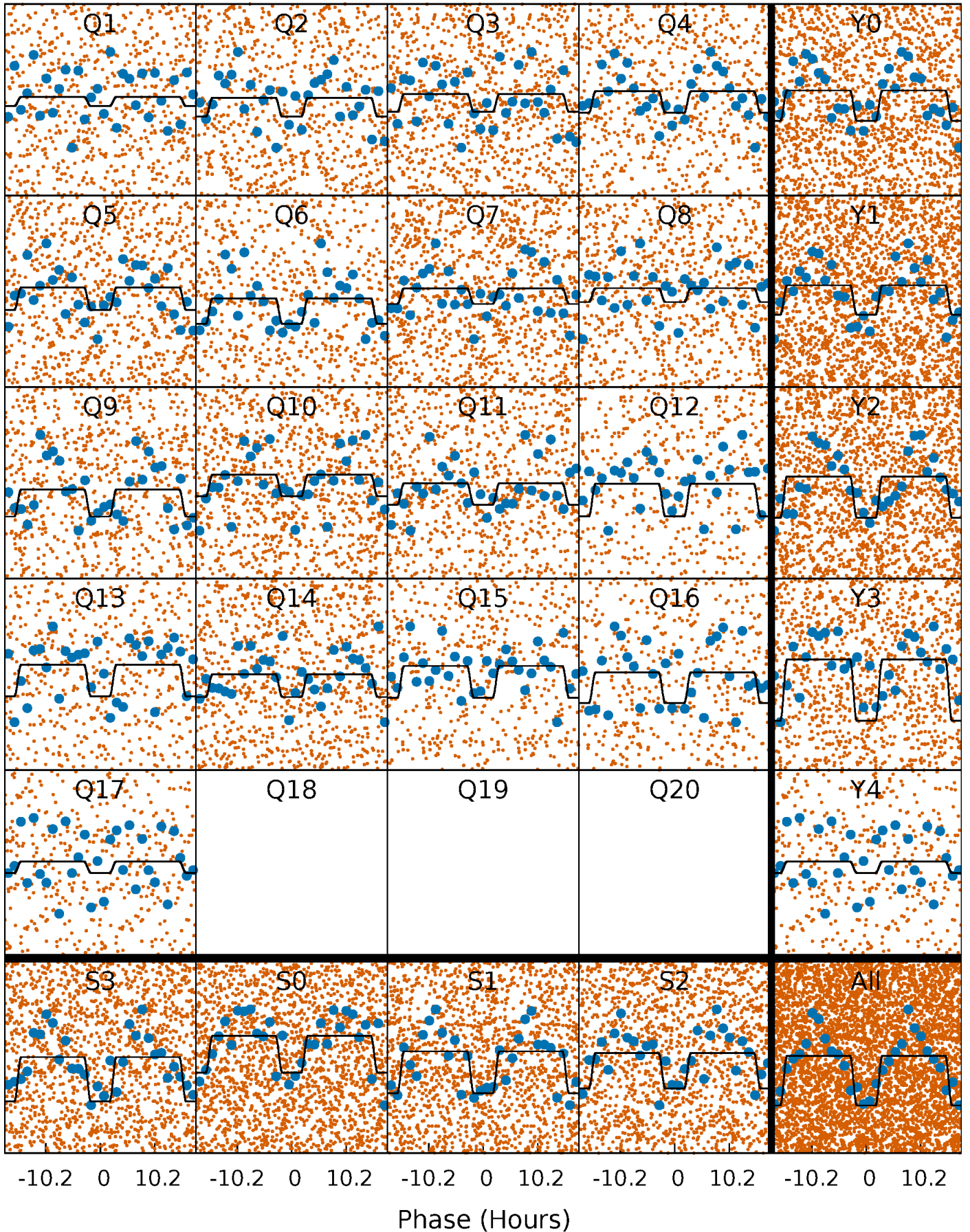
DV Quarter-Phased Transit Curves

TCE 009138872-02 P= 0.743657 Days $T_0=131.581219$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

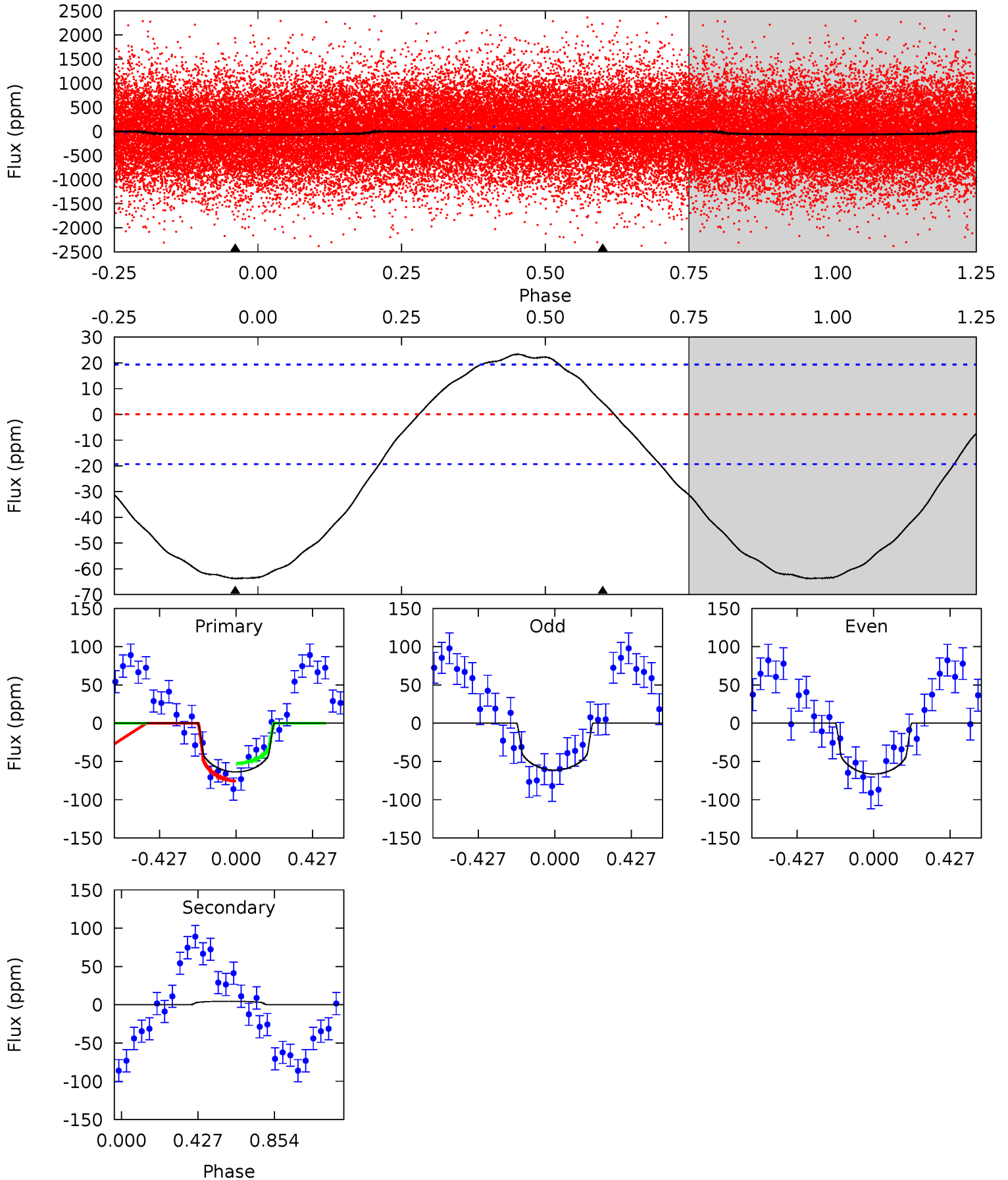
TCE 009138872-02 P= 0.743612 Days $T_0=131.593081$ (BKJD)



DV Model-Shift Uniqueness Test

009138872-02, P = 0.743657 Days, E = 130.837562 Days

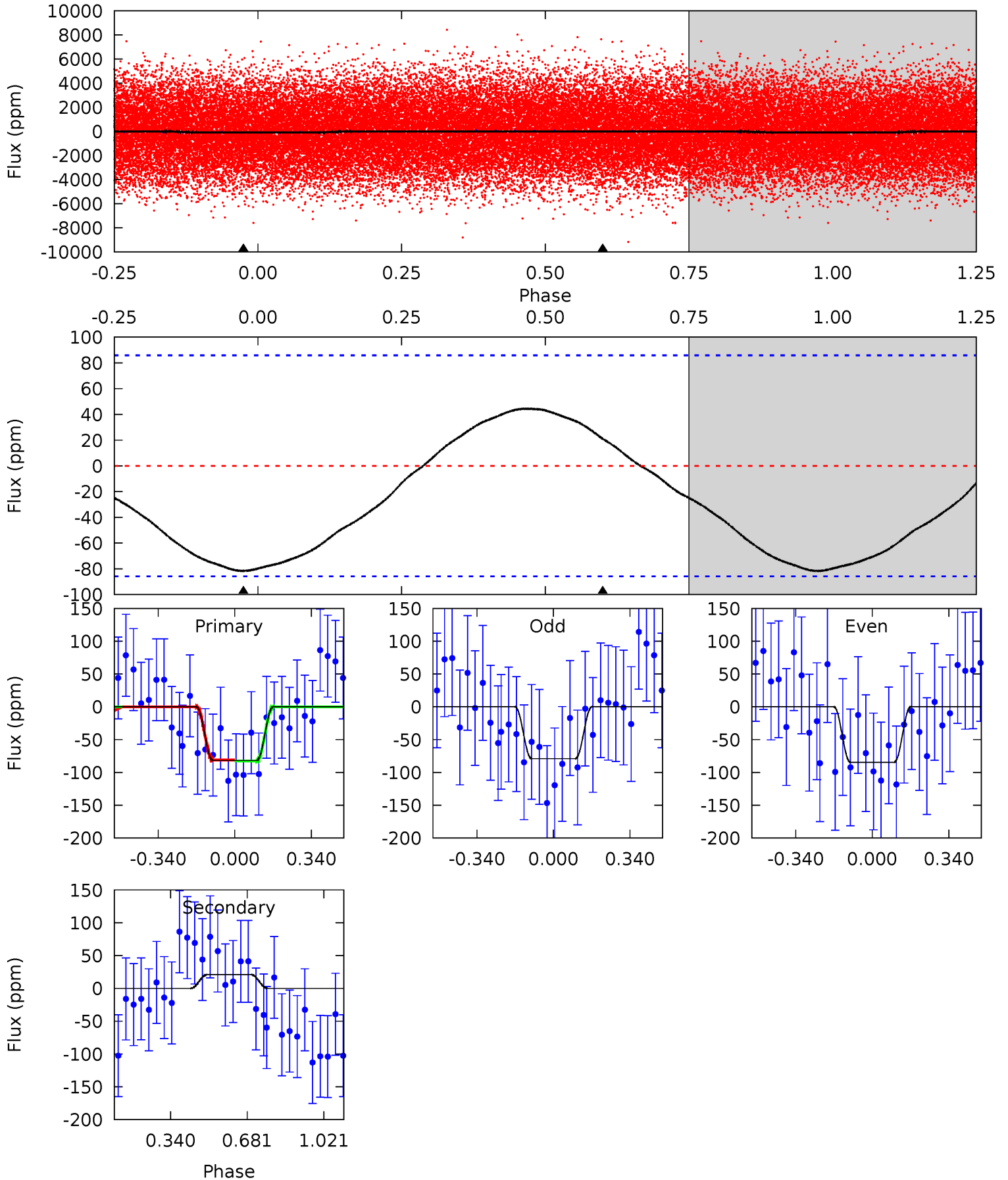
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	-1.01	0	0	4.25	0.79	1.54	14.0	14.0	-1.01	-1.01	0.56	1.04	0.27	2.49



Alt Model-Shift Uniqueness Test

009138872-02, P = 0.743612 Days, E = 130.849469 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.09	-1.05	0	0	4.30	0.95	0.55	4.09	4.09	-1.05	-1.05	0.14	0.11	0.35	0.04



Stellar Parameters For KIC 009138872

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7712^{+237}_{-316}	$4.038^{+0.187}_{-0.153}$	$-0.140^{+0.200}_{-0.350}$	$2.054^{+0.509}_{-0.509}$	$1.677^{+0.198}_{-0.298}$	$0.273^{+0.283}_{-0.121}$
	+3%/-4%	+5%/-4%	+143%/-250%	+25%/-25%	+12%/-18%	+104%/-44%
Source	KIC0	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 009138872-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	5 ± 5	$1.85^{+1.56}_{-1.16}$	4901^{+343}_{-363}	-4666^{+529}_{-1752}	$-0.196^{+0.195}_{-1.559}$
Alt.	21 ± 20	$2.26^{+1.72}_{-1.28}$	4928^{+339}_{-370}	-5215^{+1041}_{-2435}	$-0.575^{+0.567}_{-2.933}$

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

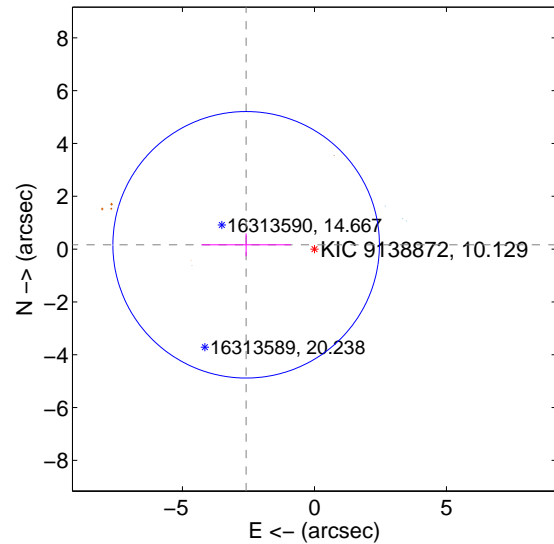
Supplemental centroid analysis for 009138872-02. **Kepler magnitude: 10.13.** Transit SNR 10.13

There are 3 quarters with good PRF difference image offsets

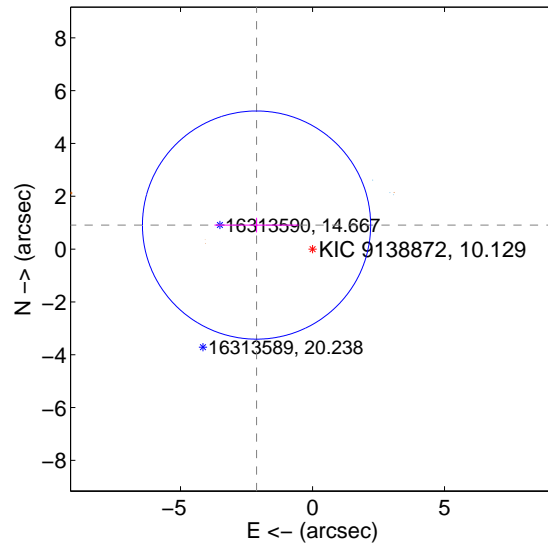
The direct PRF centroid is offset from the target star catalog position by about 1.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.591 ± 1.682	1.54	2.586 ± 1.692	0.163 ± 0.430
PRF-fit source offset from KIC position	2.308 ± 1.440	1.60	2.121 ± 1.593	0.910 ± 0.278
photometric centroid source offset	1.43 ± 0.20	7.06	-1.05 ± 0.23	-0.97 ± 0.17

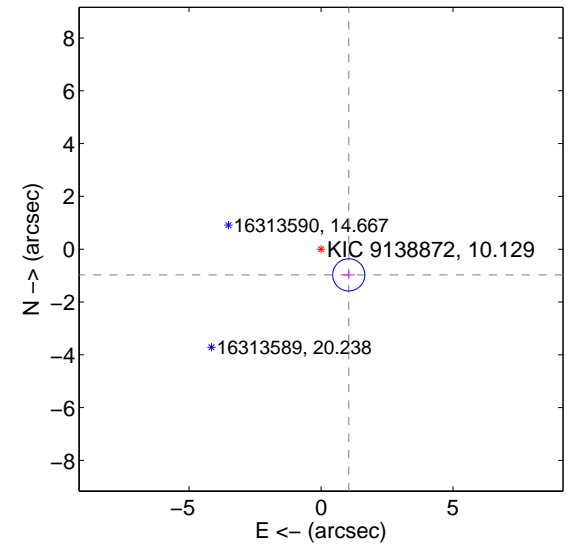
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

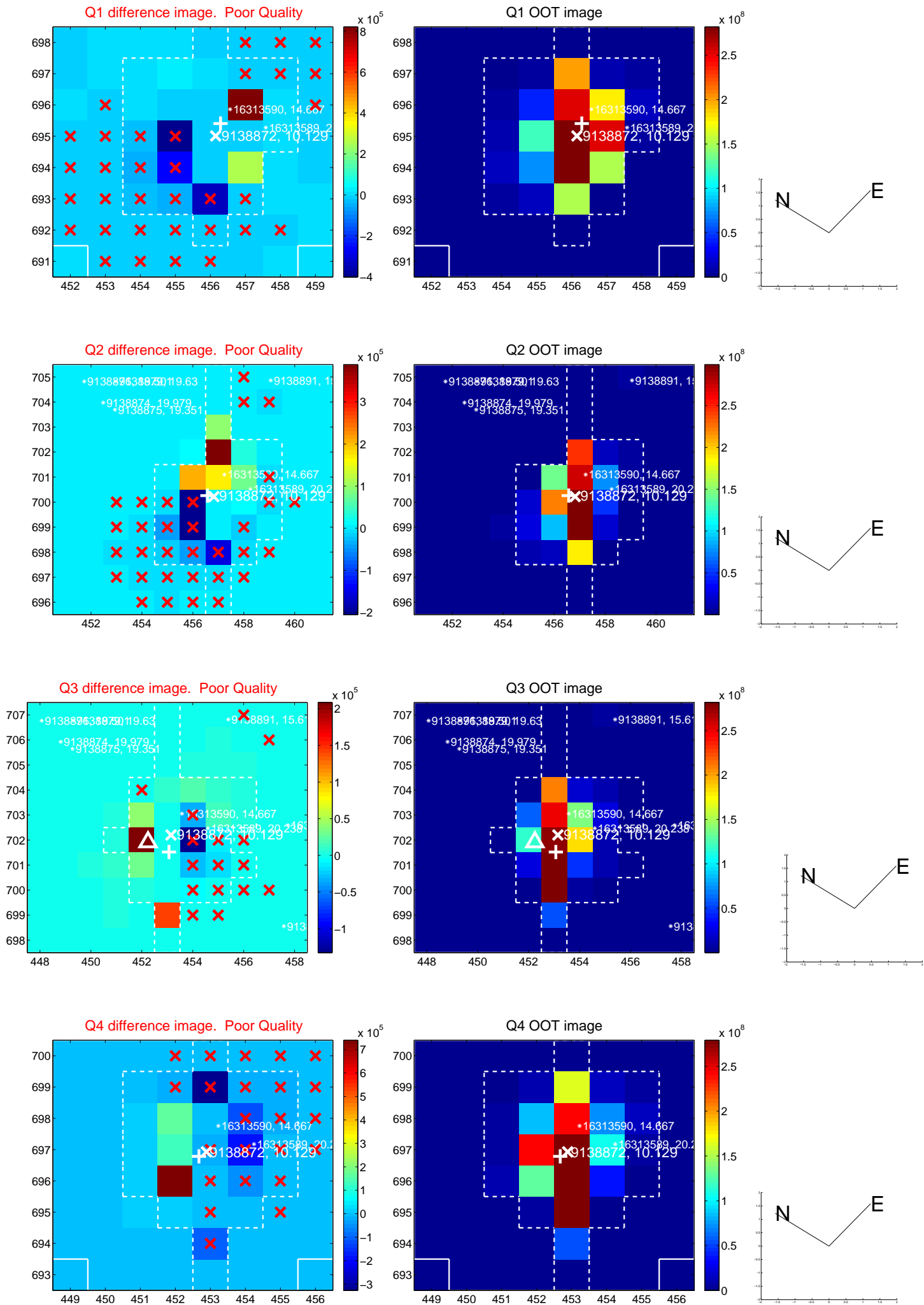


offset from photometric centroids

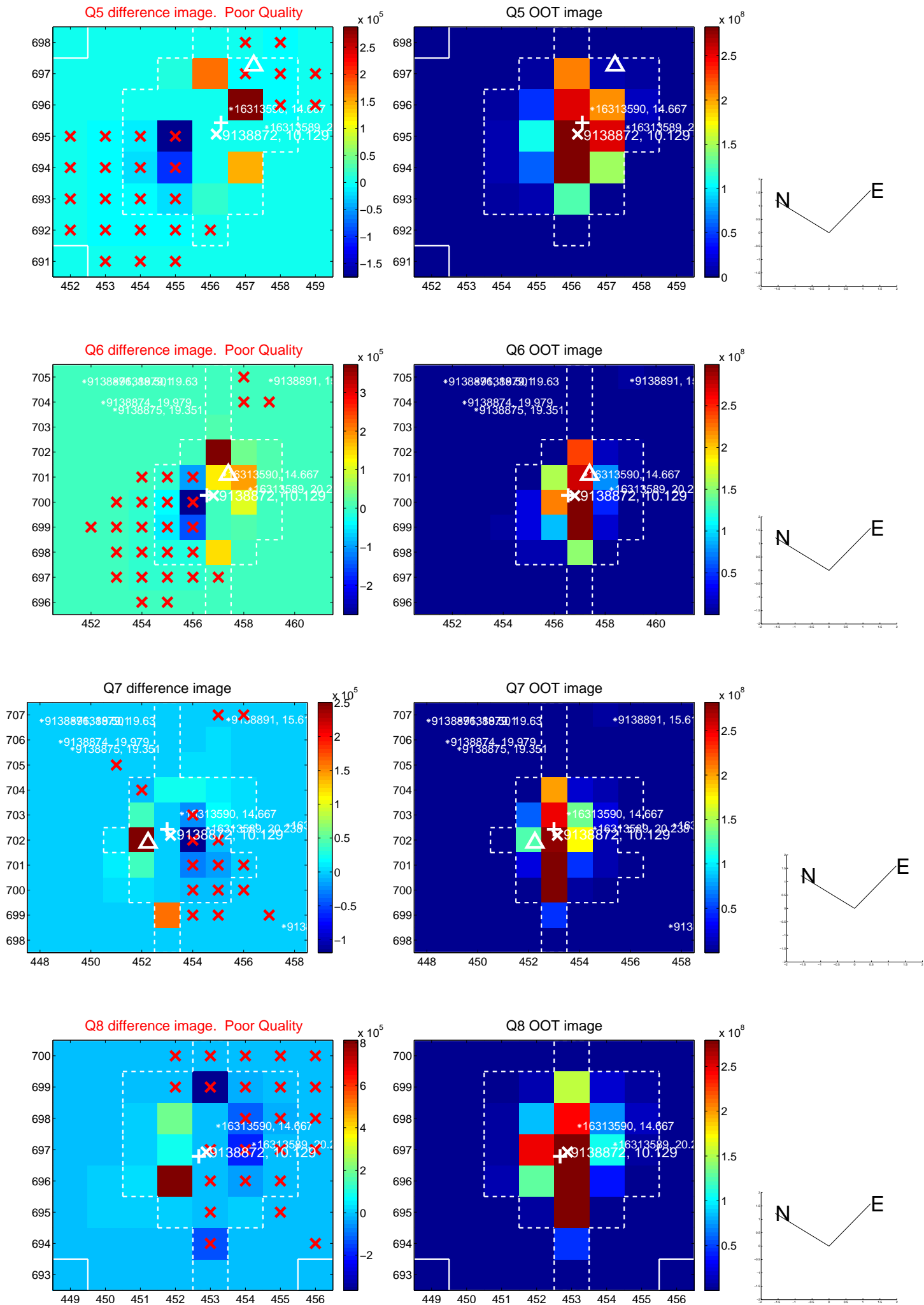


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

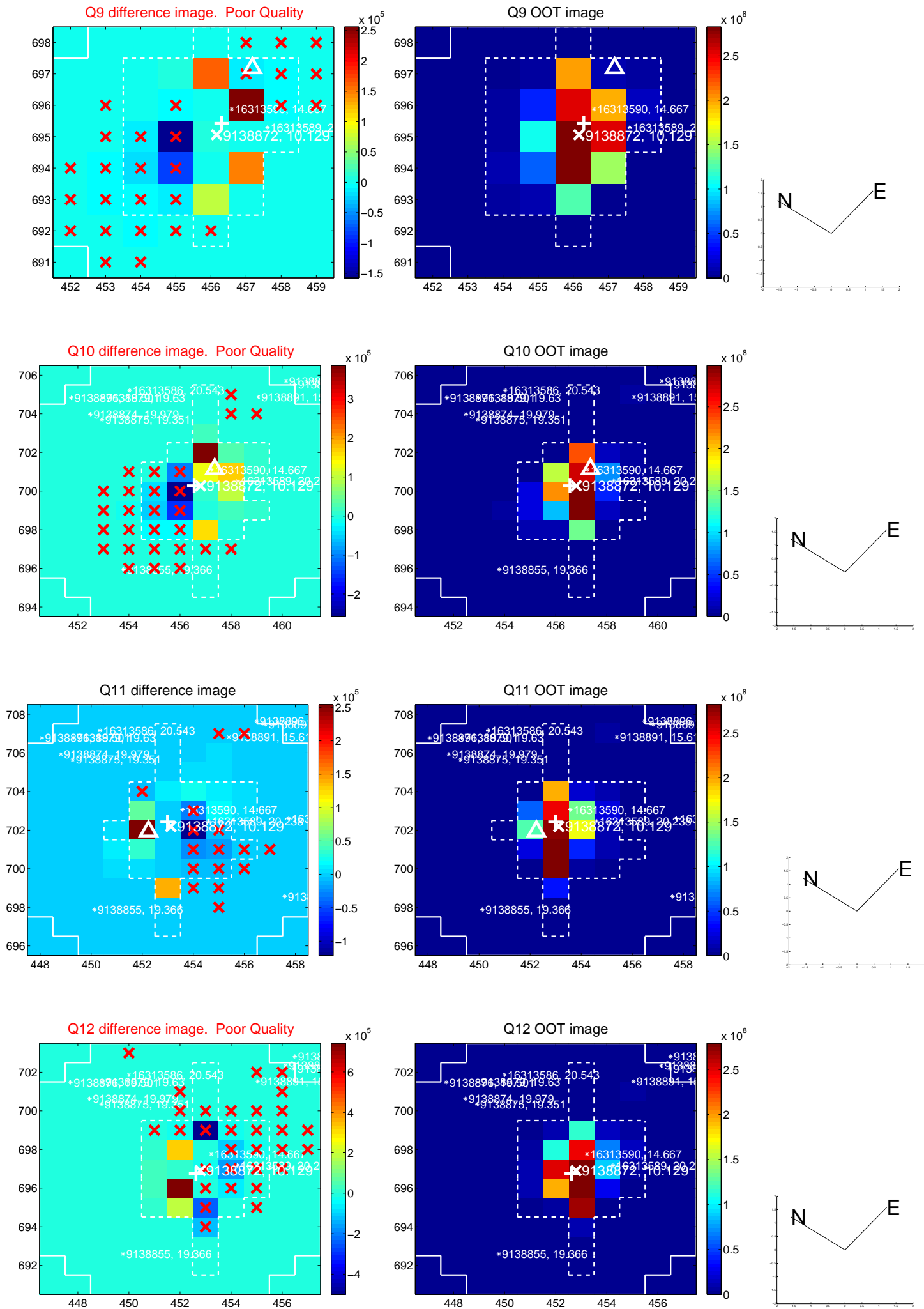
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



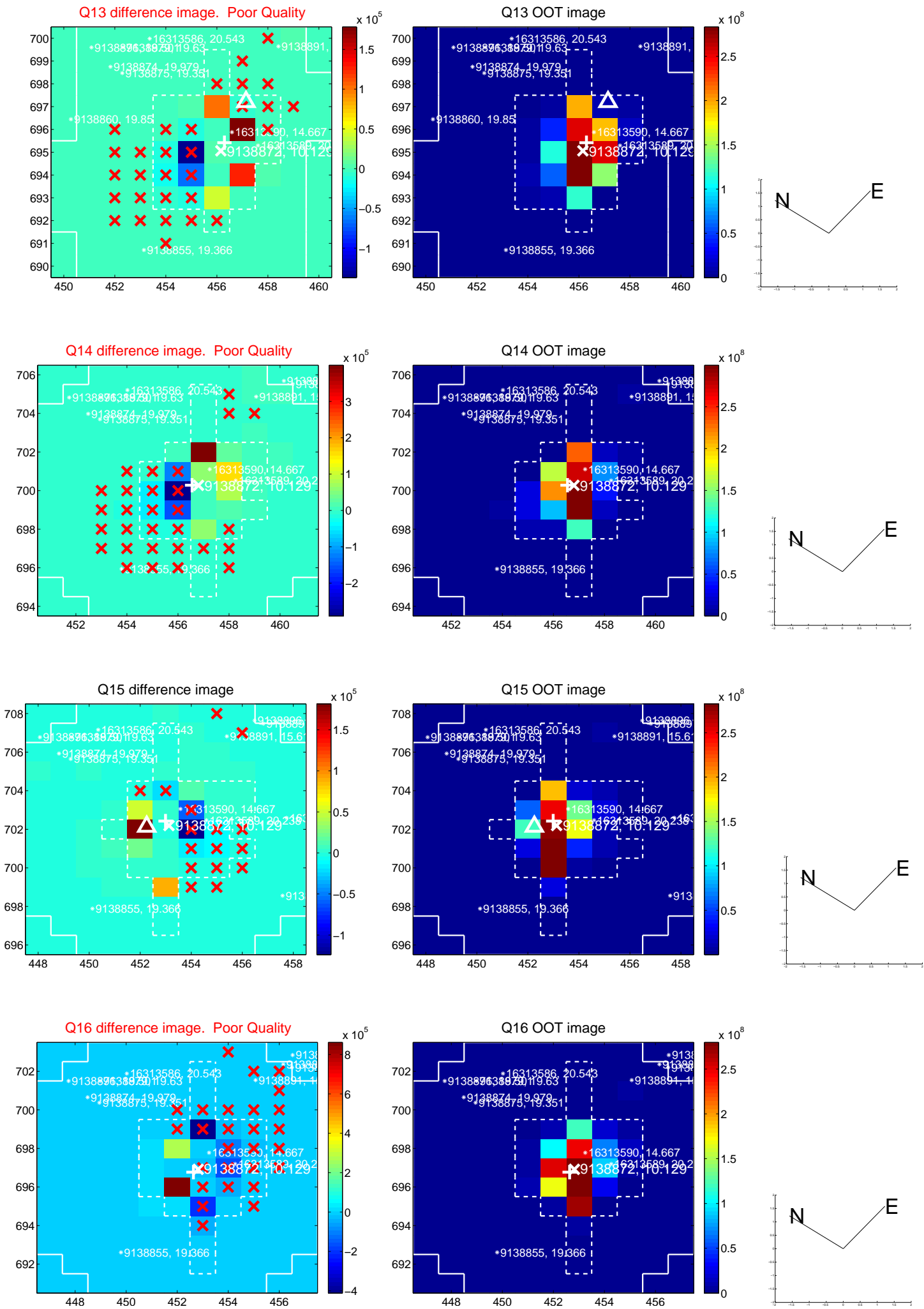
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



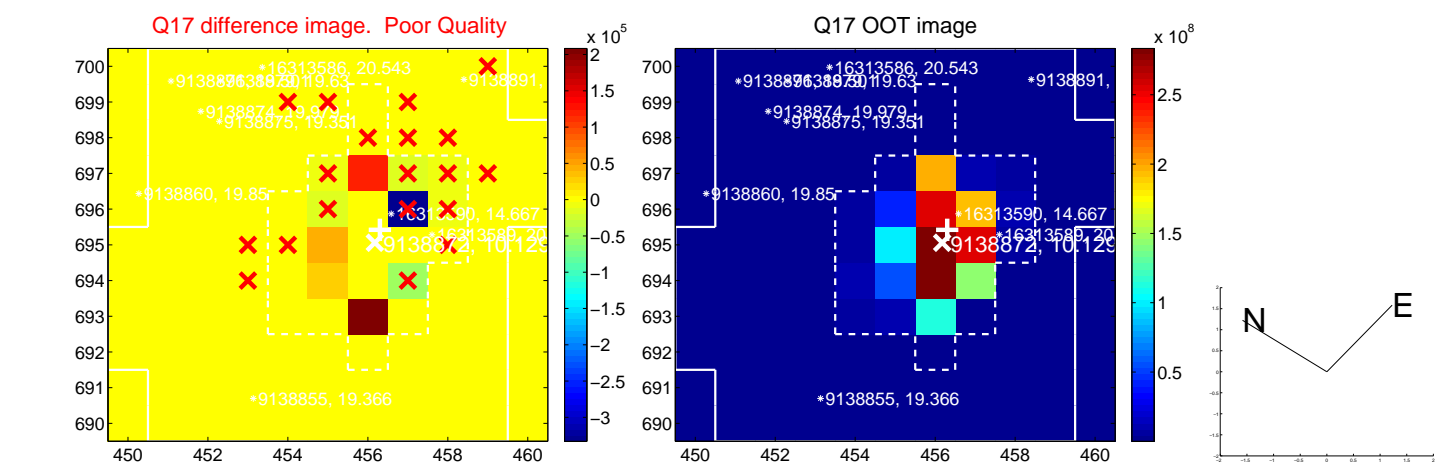
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



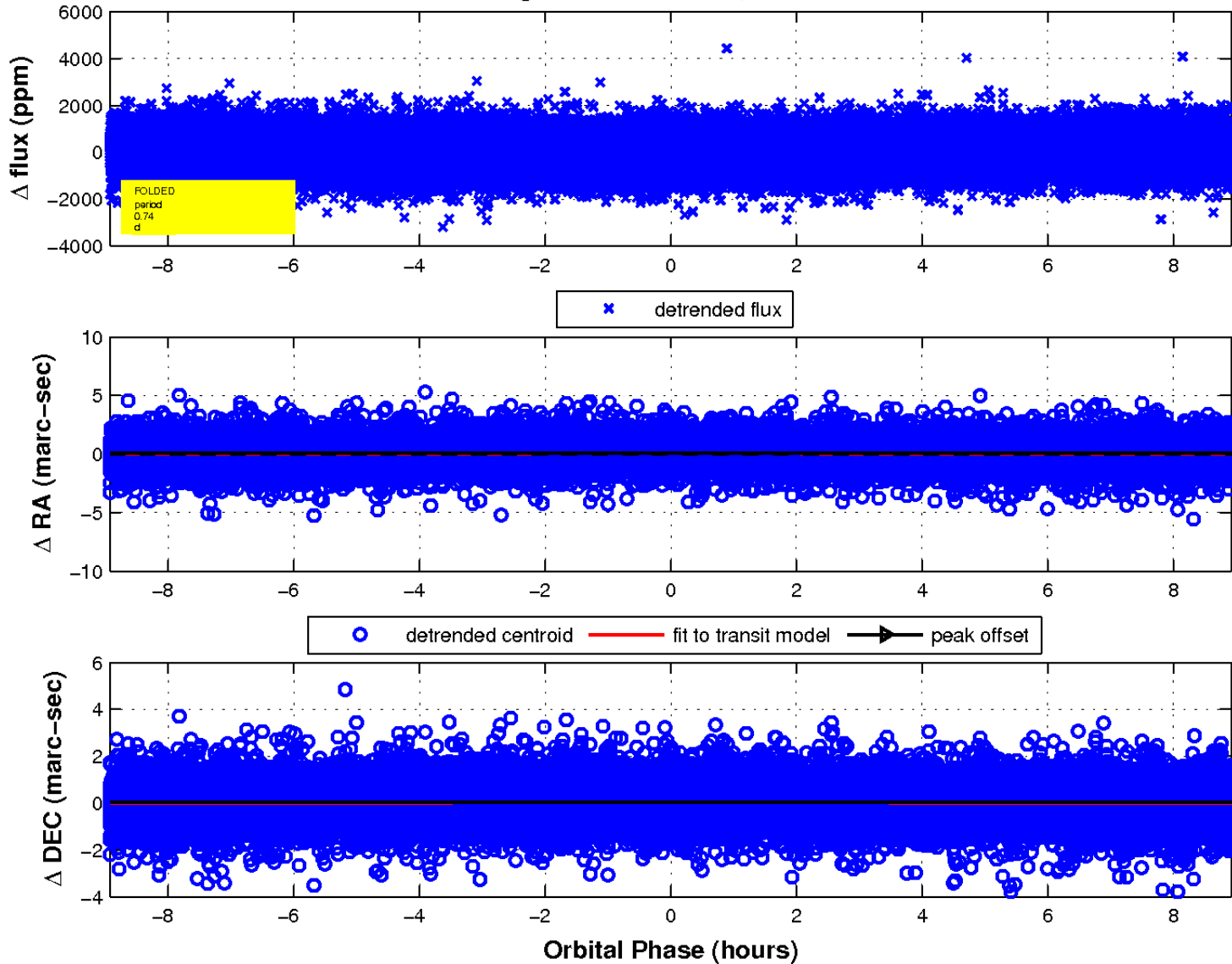
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

