

KIC 009210943

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})
009210943-01	OBS	No	0.684690	131.737750	17.0	2.914	7.7	4.4	1.48	6872	0.71	14949.47
009210943-02	OBS	No	0.684668	132.188594	66.4	2.458	9.3	10.2	1.48	6872	1.40	14950.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009210943-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009210943-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_TER_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.

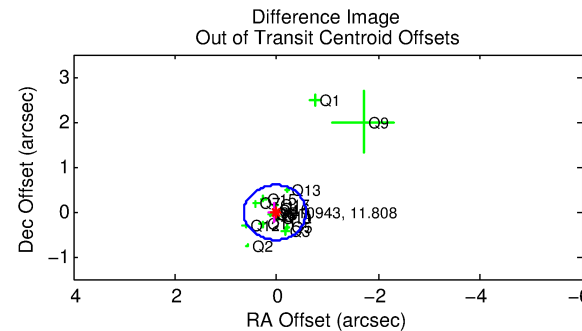
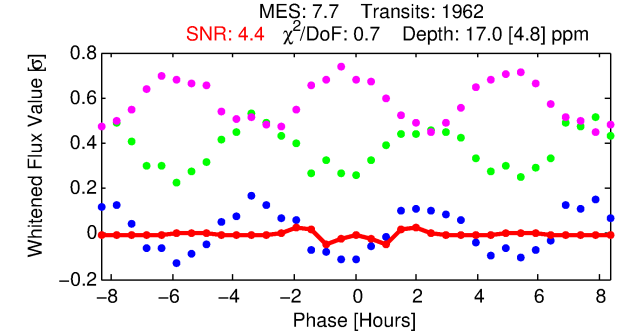
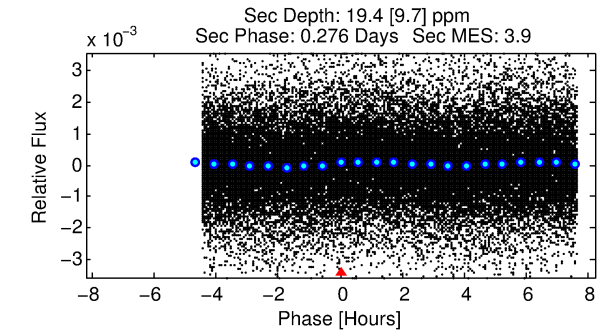
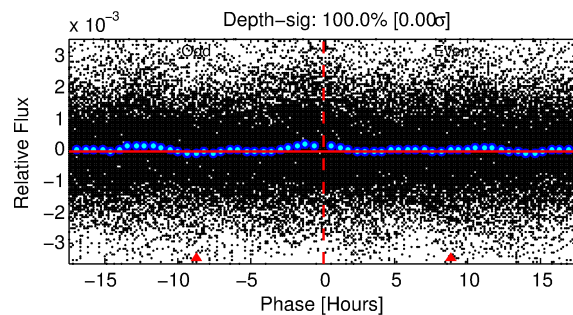
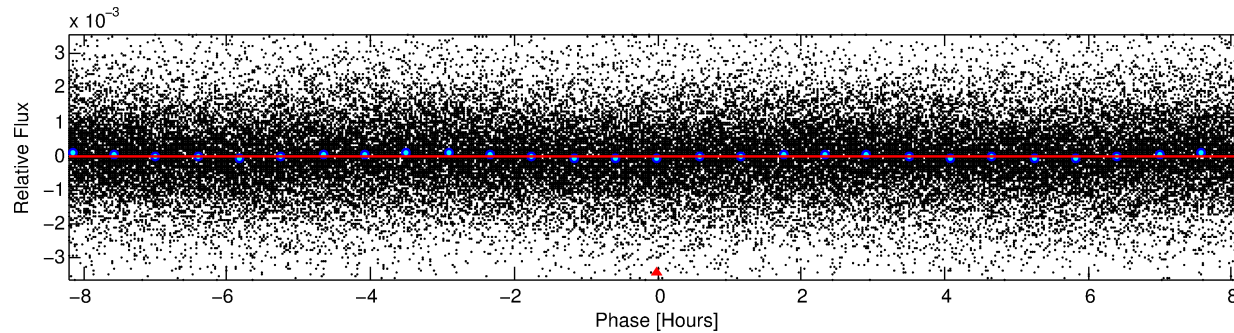
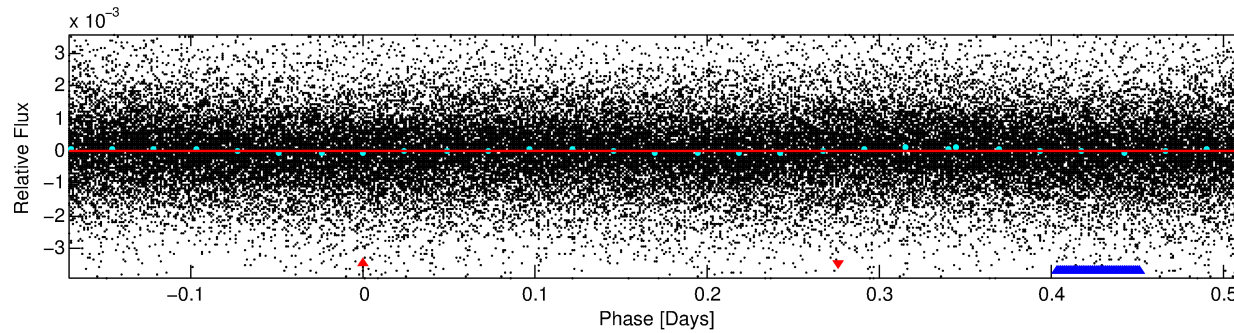
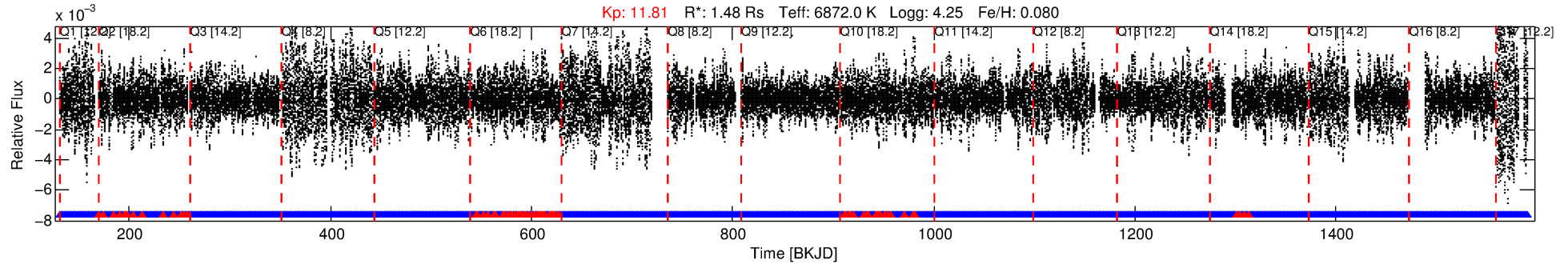
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009210943-01

No Significant Match Found

DV One-Page Summary

KIC: 9210943 Candidate: 1 of 2 Period: 0.685 d



DV Fit Results:

Period = 0.68469 [0.00002] d
Epoch = 131.7377 [0.0023] BKJD
Rp/R* = 0.0044 [0.0012]
a/R* = 1.23 [0.57]
b = 0.90 [0.29]
Seff = 14949.47 [6565.52]
Teq = 2820 [310] K
Rp = 0.71 [0.30] Re
a = 0.0171 [0.0048] AU
Ag = 6.18 [5.12] [1.01σ]
Teffp = 6873 [1284] K [3.07σ]

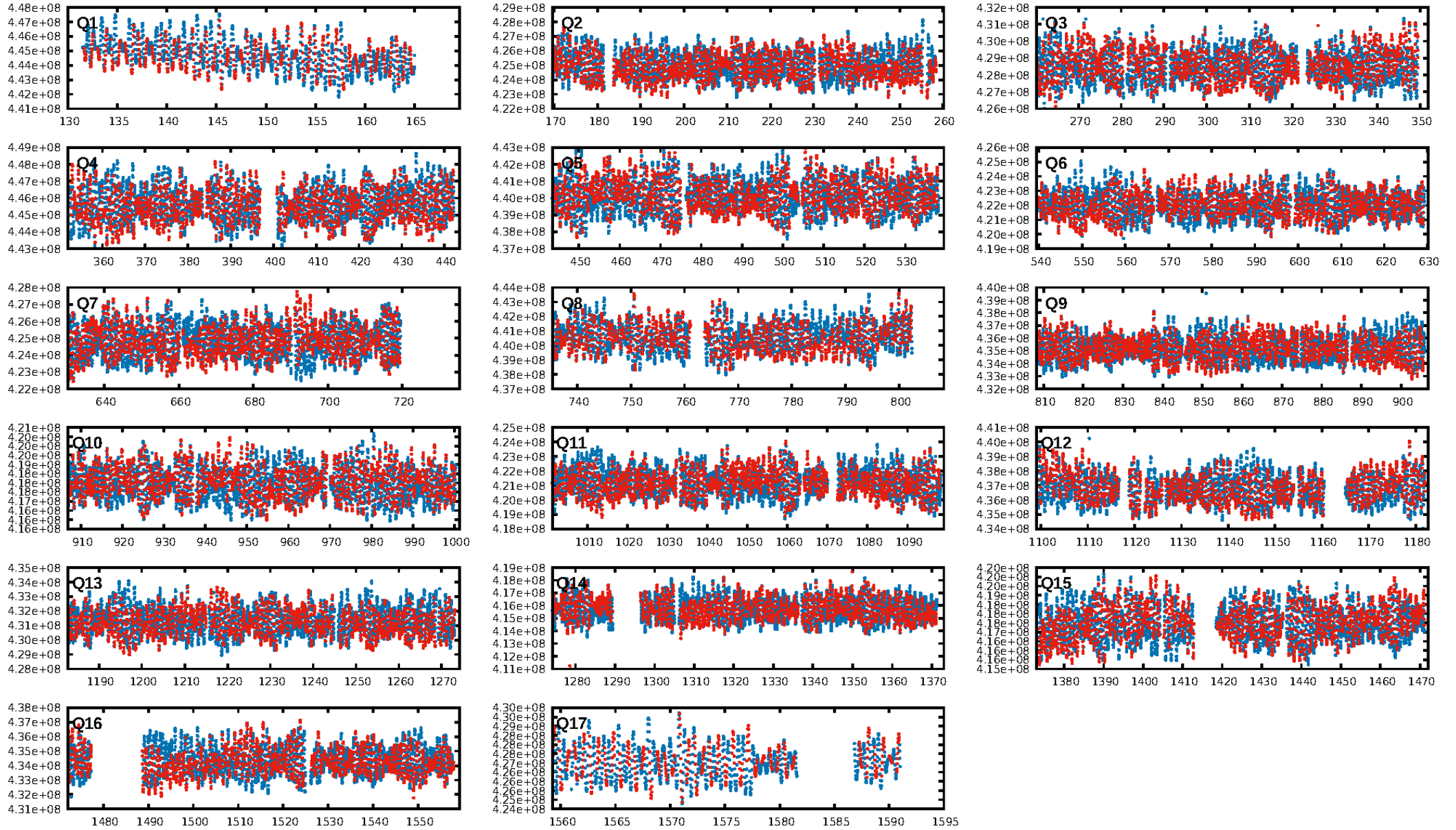
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.46e-12
RollingBand-fgt: 0.96 [1799/1874]
GhostDiagnostic-chr: 0.3793
Centroid-sig: 0.0%
Centroid-so: 1.570 arcsec [2.93σ]
OotOffset-rm: 0.041 arcsec [0.20σ]
KicOffset-rm: 0.047 arcsec [0.32σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.53 [9/17]
DiffImageOverlap-fno: 0.00 [0/17]

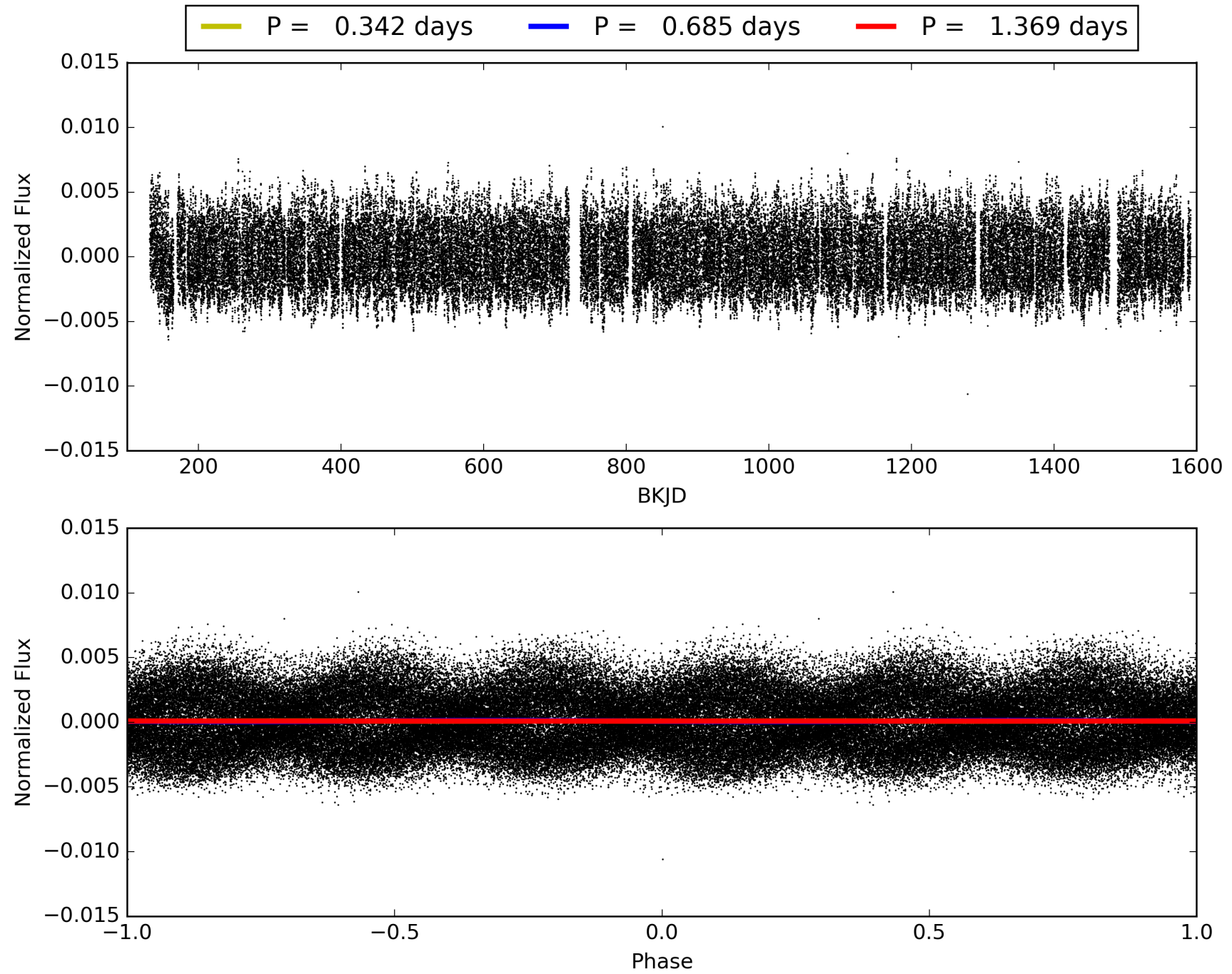
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:04:37 Z

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

TCE 009210943-01, PDC Light Curves

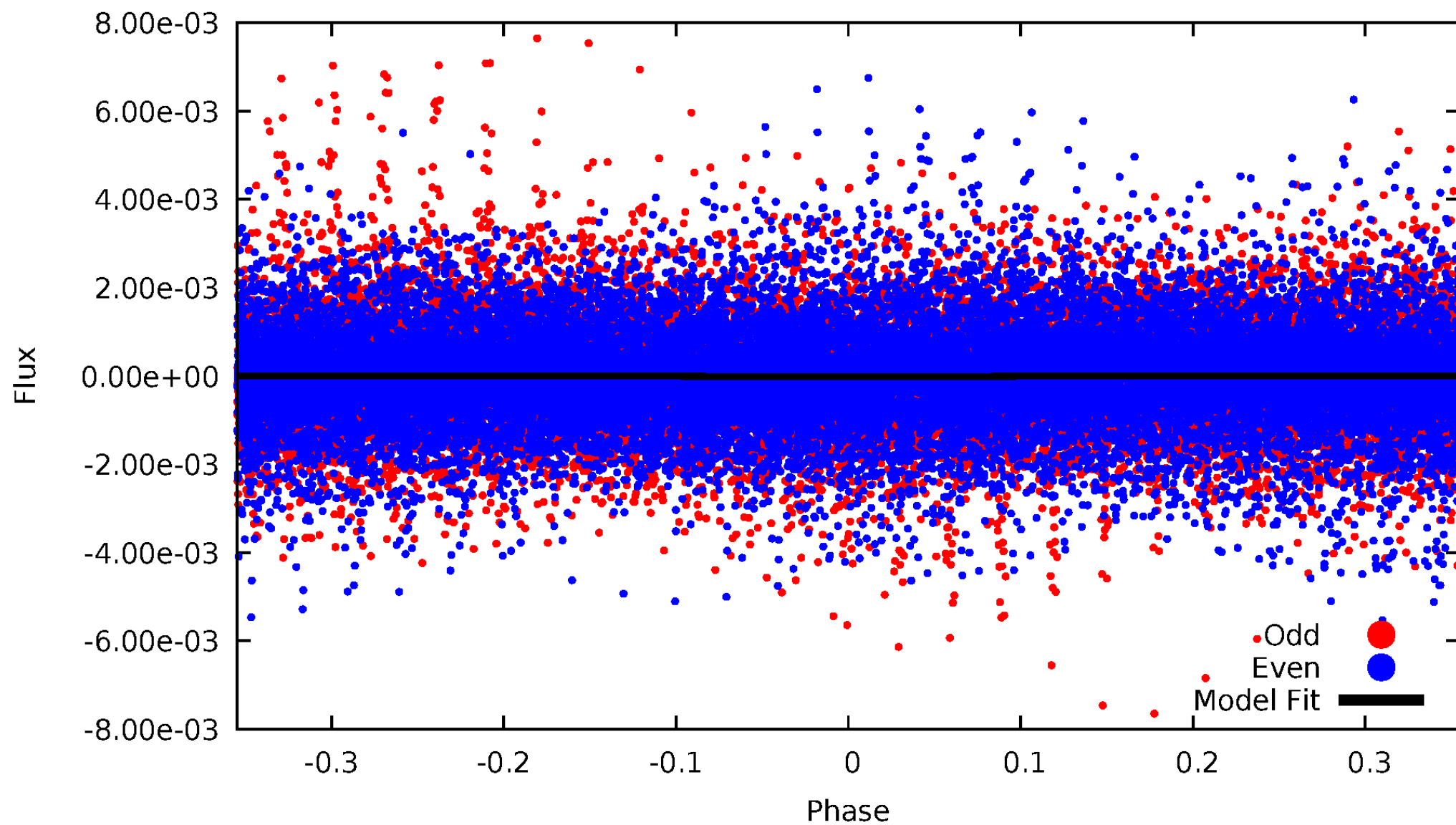


TCE 009210943-01



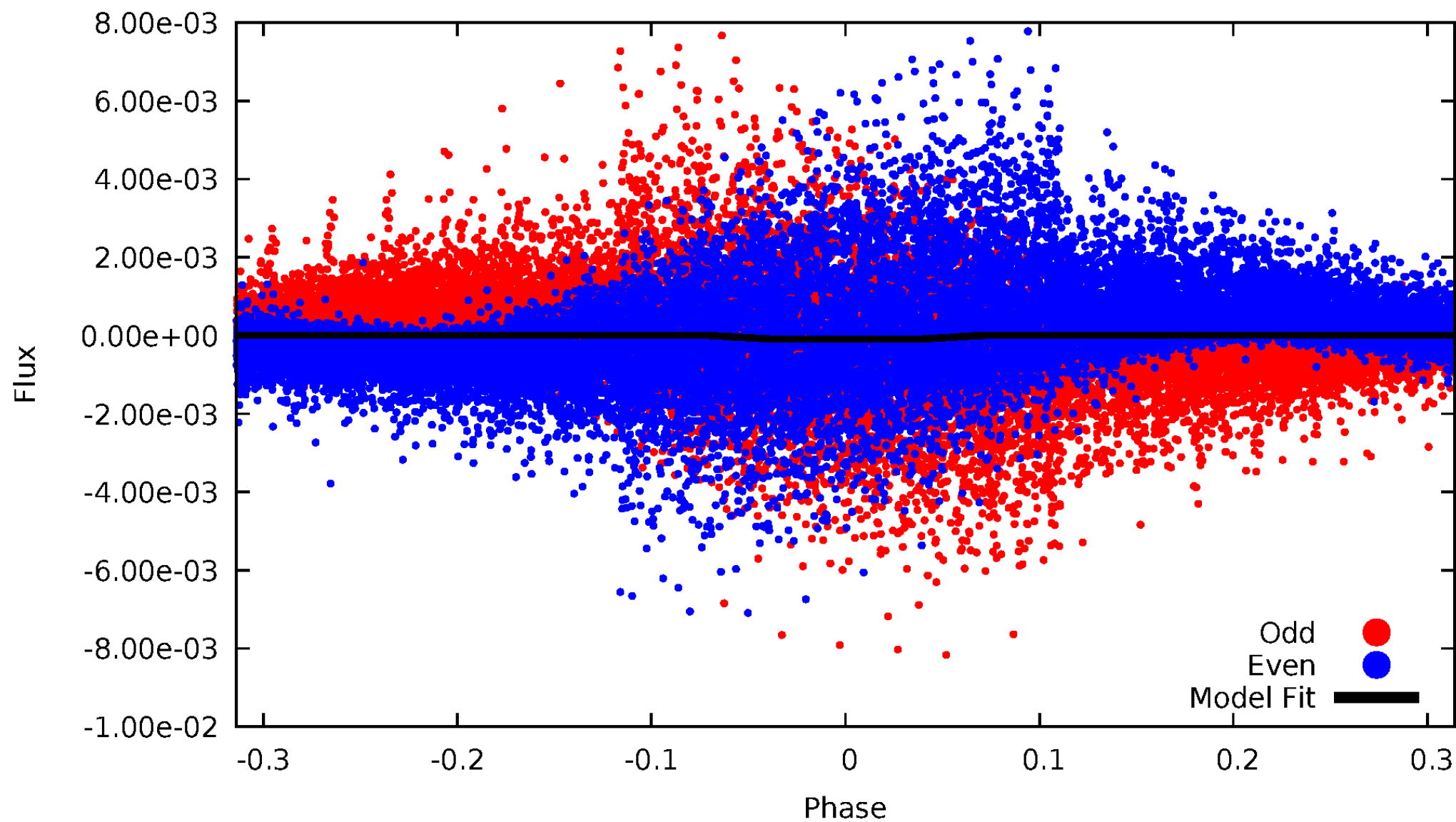
DV Odd/Even

TCE 009210943-01



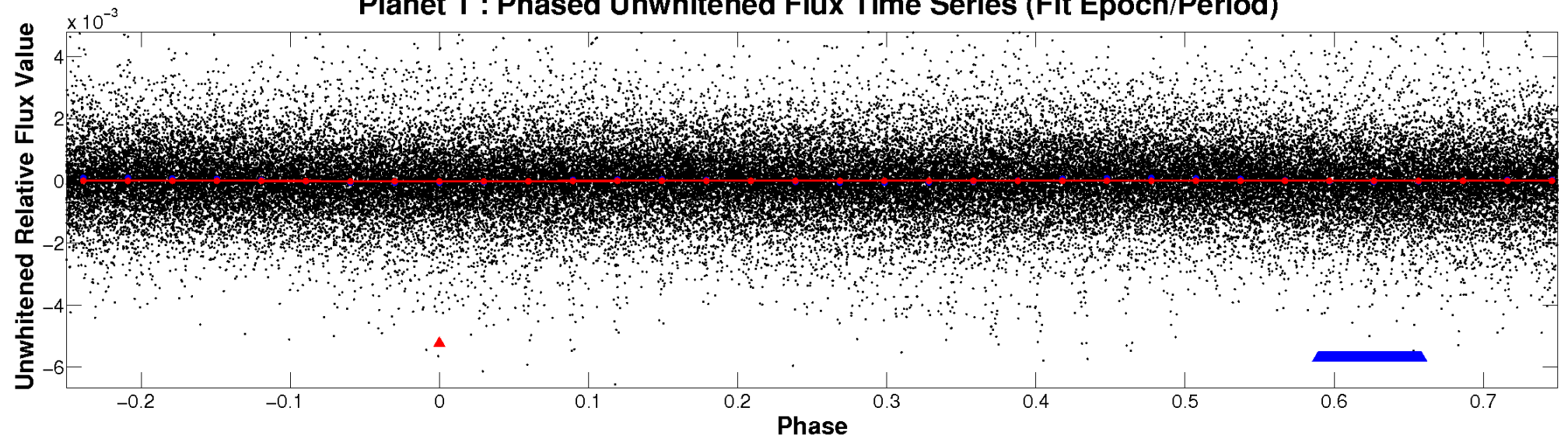
ALT Odd/Even

TCE 009210943-01

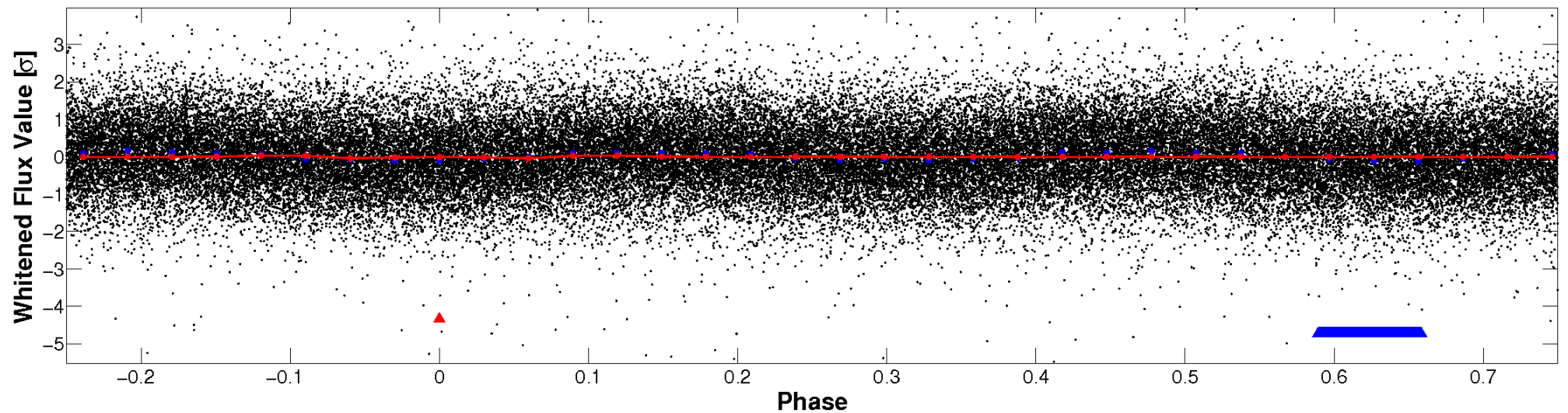


Non-Whitened Vs. Whitened Light Curve

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

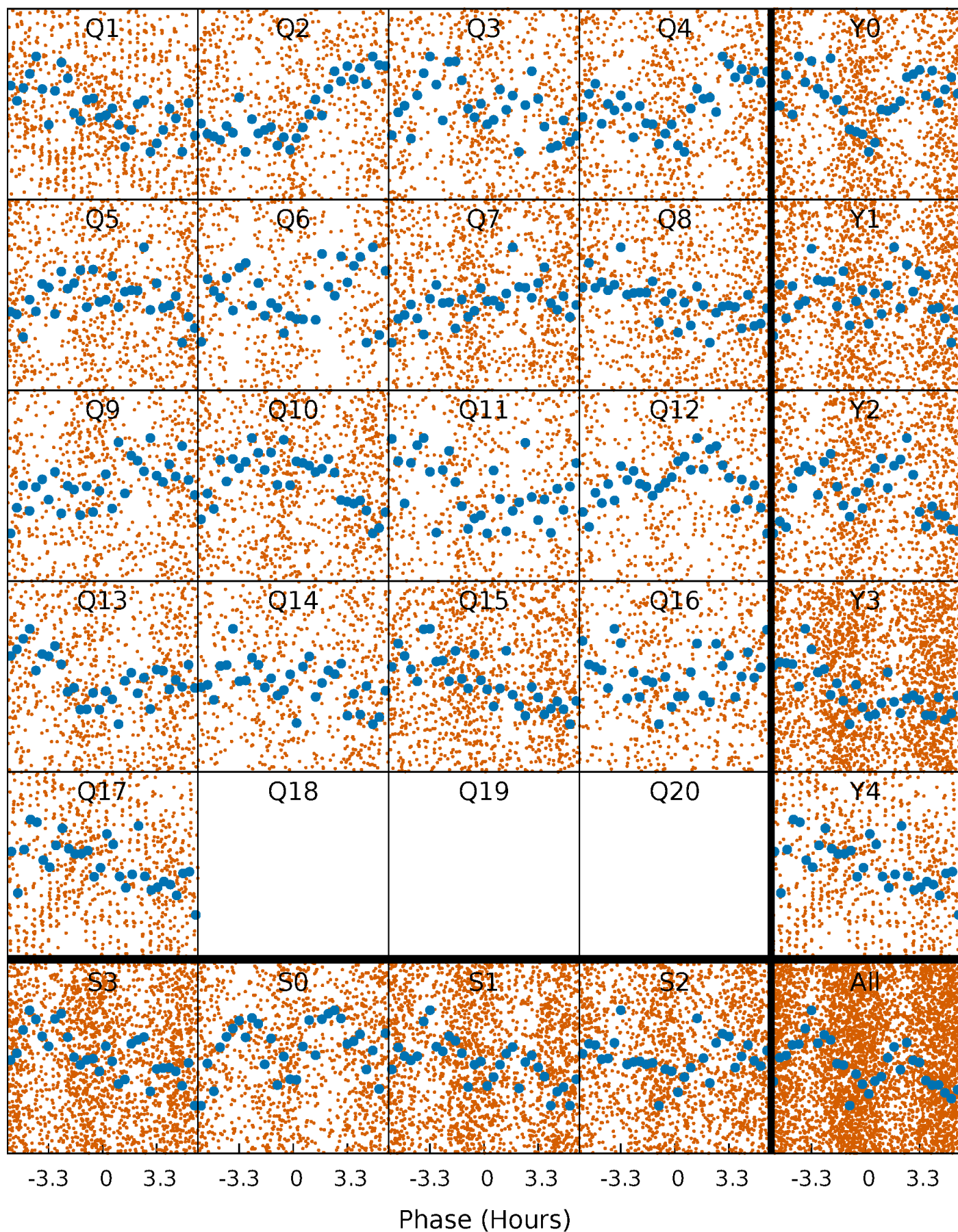


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



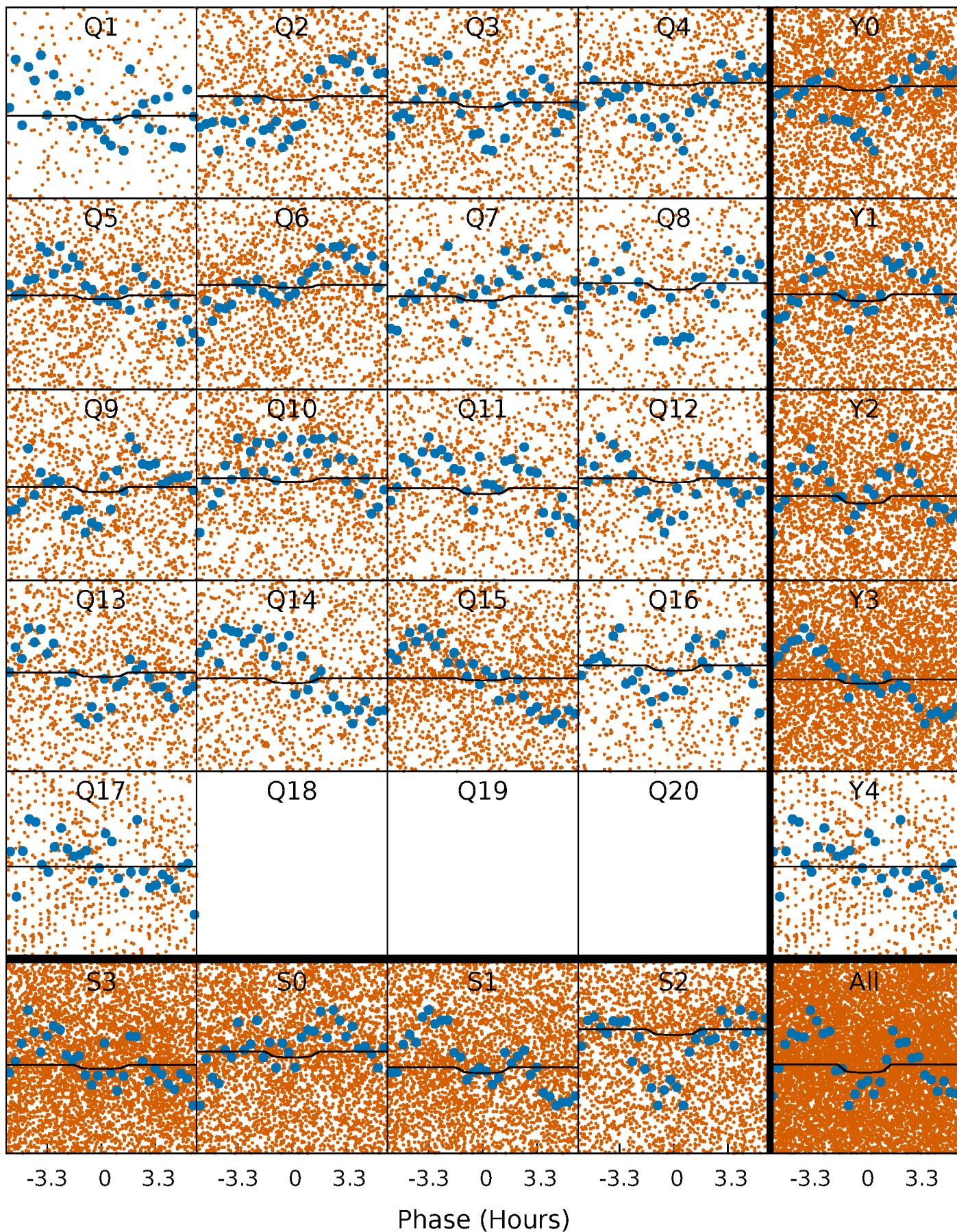
PDC Quarter-Phased Transit Curves

TCE 009210943-01 P= 0.684690 Days $T_0=131.737750$ (BKJD)



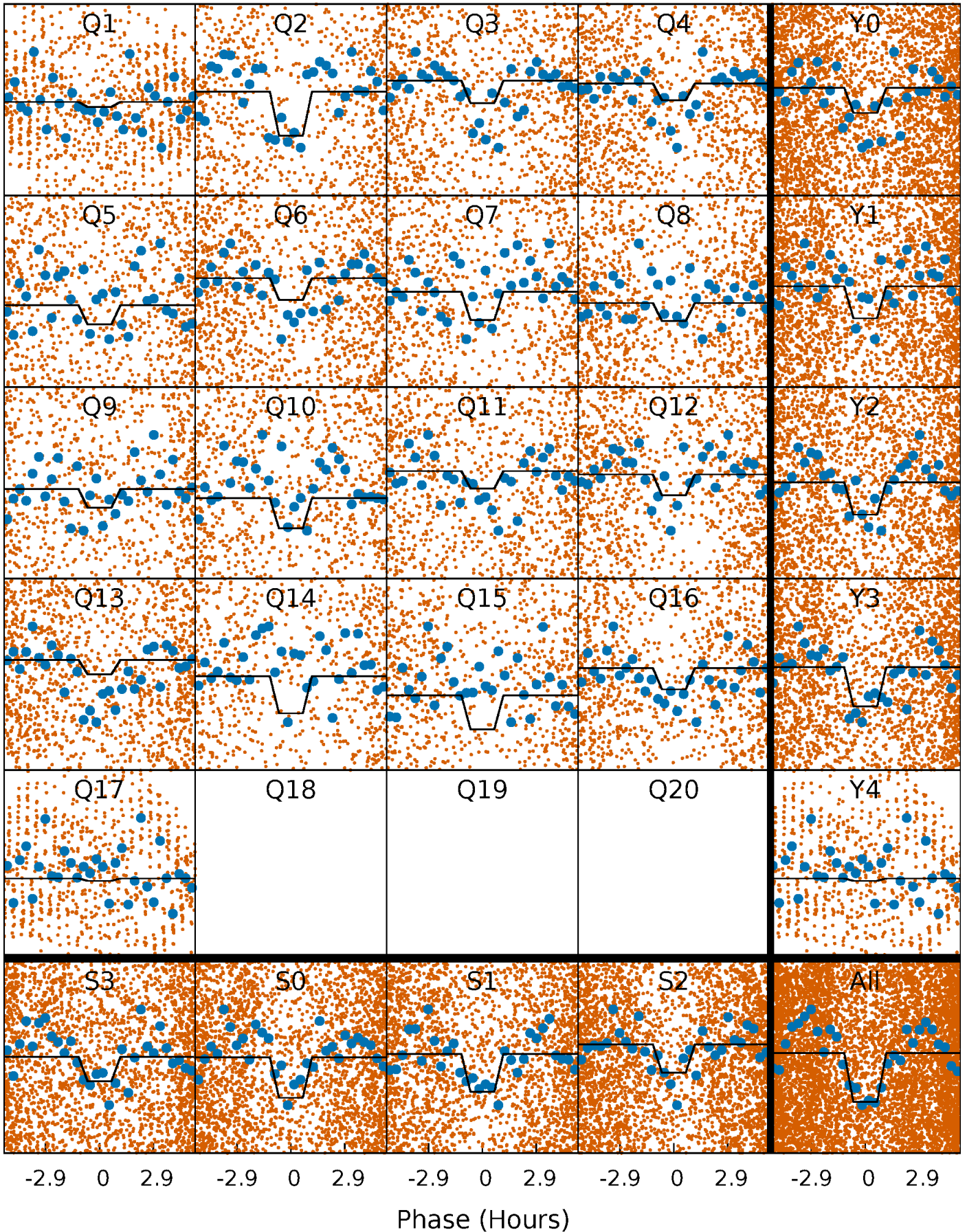
DV Quarter-Phased Transit Curves

TCE 009210943-01 P= 0.684690 Days $T_0=131.737750$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

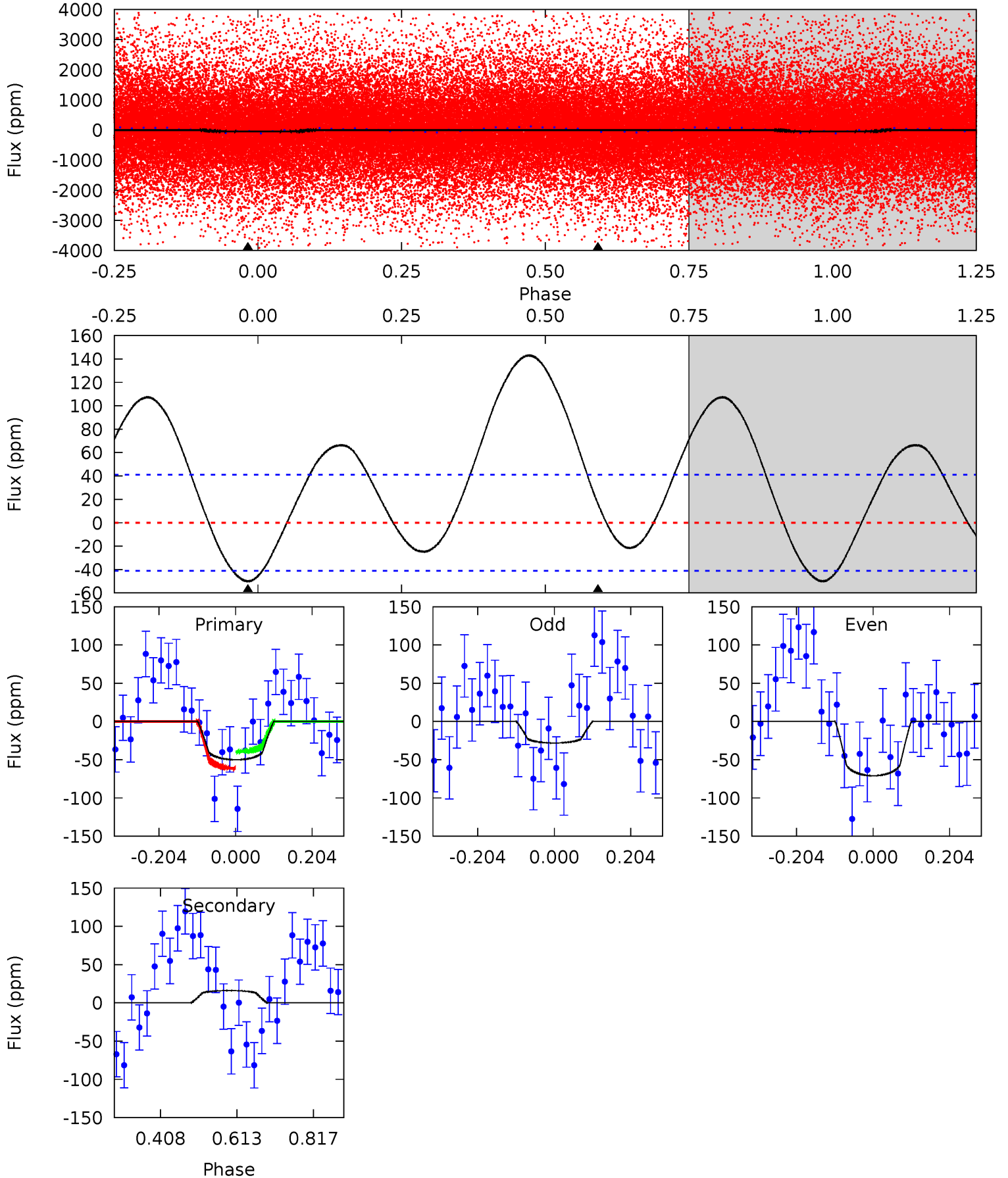
TCE 009210943-01 P= 0.684669 Days $T_0=131.738886$ (BKJD)



DV Model-Shift Uniqueness Test

009210943-01, P = 0.684690 Days, E = 131.053060 Days

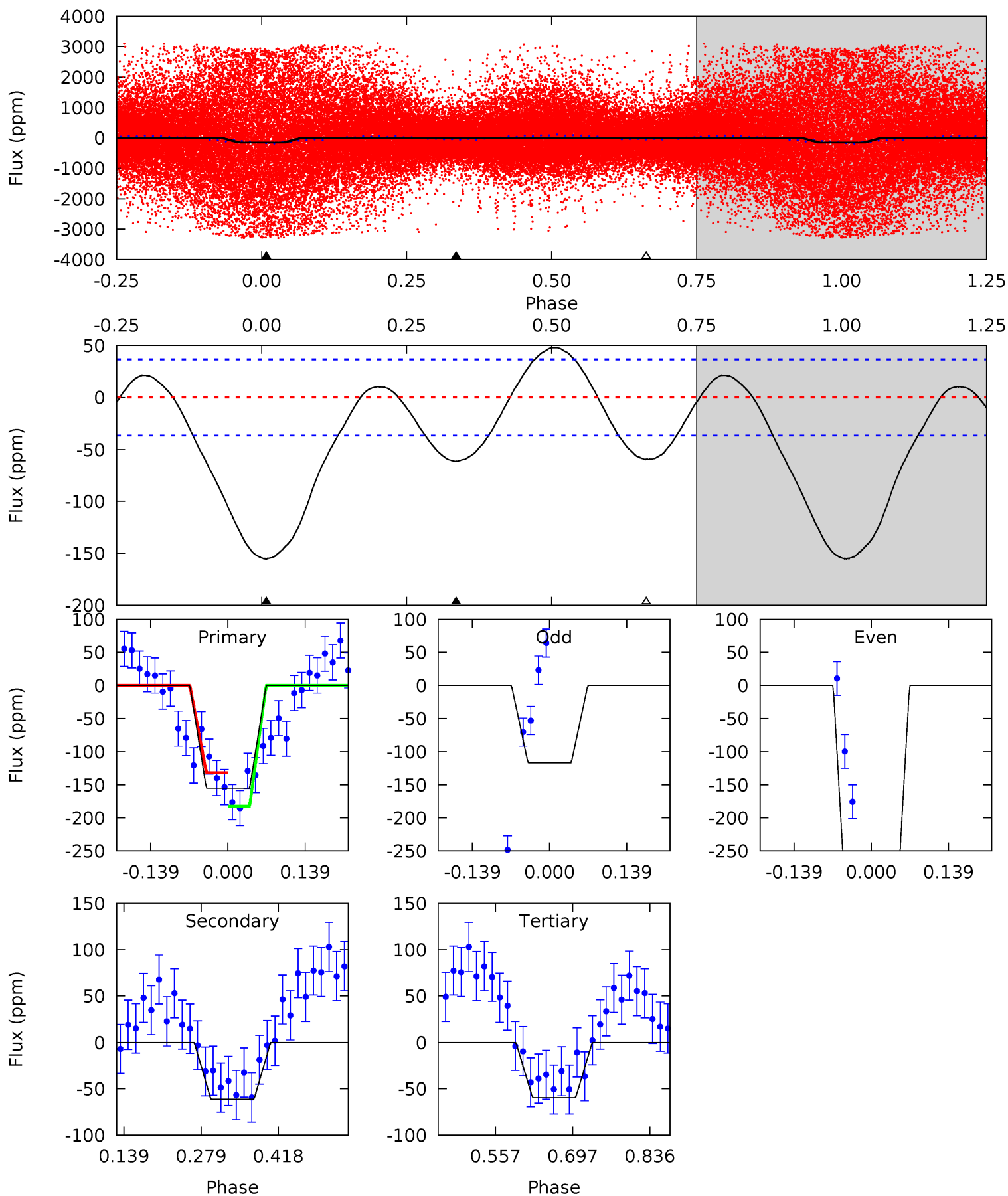
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.39	-1.73	0	0	4.41	1.27	2.74	5.39	5.39	-1.73	-1.73	2.29	1.52	0.74	1.14



Alt Model-Shift Uniqueness Test

009210943-01, P = 0.684669 Days, E = 131.054217 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	7.53	7.31	0	4.49	1.48	4.06	11.8	19.1	0.22	7.53	15.1	0.45	0.24	3.15



Stellar Parameters For KIC 009210943

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6872^{+189}_{-307}	$4.250^{+0.087}_{-0.217}$	$0.080^{+0.200}_{-0.350}$	$1.476^{+0.495}_{-0.228}$	$1.413^{+0.218}_{-0.218}$	$0.619^{+0.262}_{-0.352}$
	+3%/-4%	+2%/-5%	+250%/-438%	+34%/-15%	+15%/-15%	+42%/-57%
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 009210943-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	16 ± 9	$0.73^{+0.22}_{-0.19}$	4004^{+331}_{-244}	-6539^{+1304}_{-1442}	$-4.363^{+2.922}_{-4.792}$
Alt.	-61 ± 8	$1.60^{+0.33}_{-0.25}$	4006^{+313}_{-242}	6000^{+547}_{-449}	$3.766^{+1.617}_{-1.192}$

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 $A_{obs} \gg 1.0$

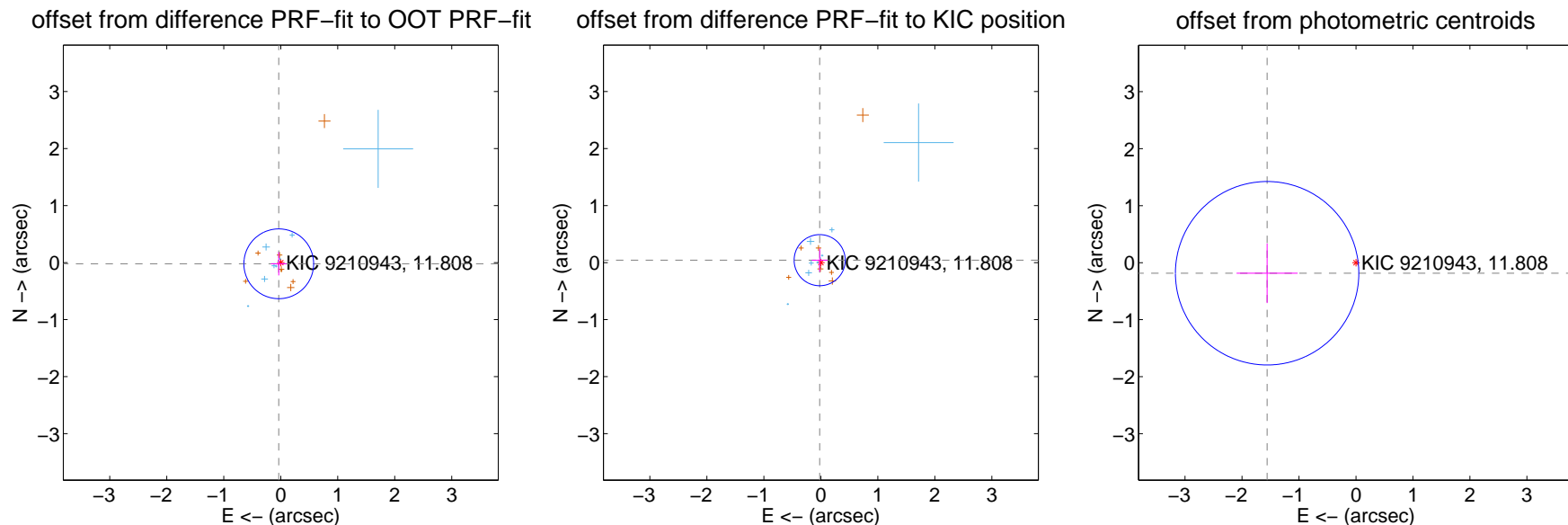
DV Centroid Data

Supplemental centroid analysis for 009210943-01. **Kepler magnitude: 11.81.** Transit SNR 4.35

There are 9 quarters with good PRF difference image offsets

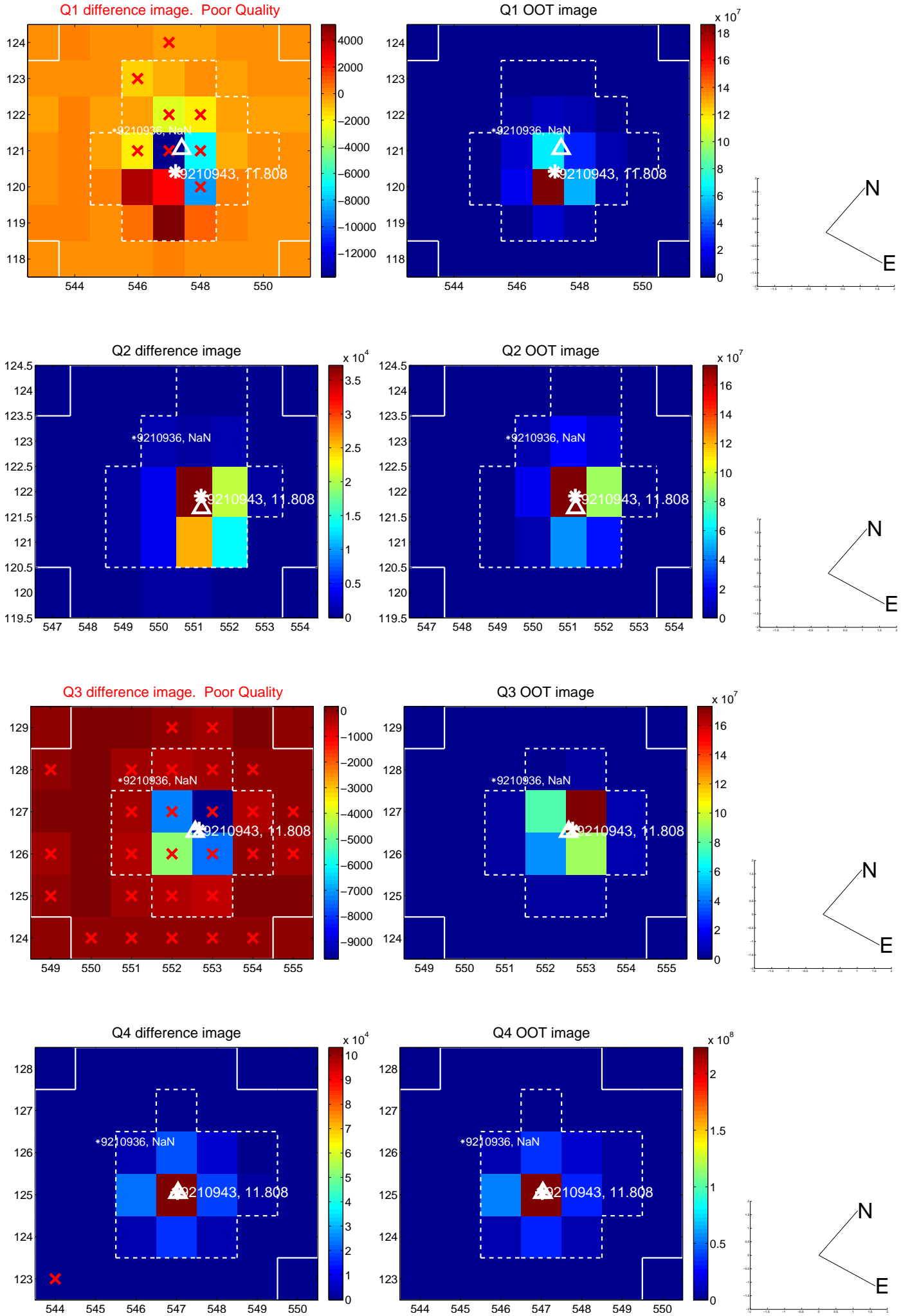
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.041 ± 0.204	0.20	0.035 ± 0.140	-0.021 ± 0.204
PRF-fit source offset from KIC position	0.047 ± 0.149	0.32	0.021 ± 0.137	0.042 ± 0.203
photometric centroid source offset	1.57 ± 0.54	2.93	1.56 ± 0.54	-0.19 ± 0.52

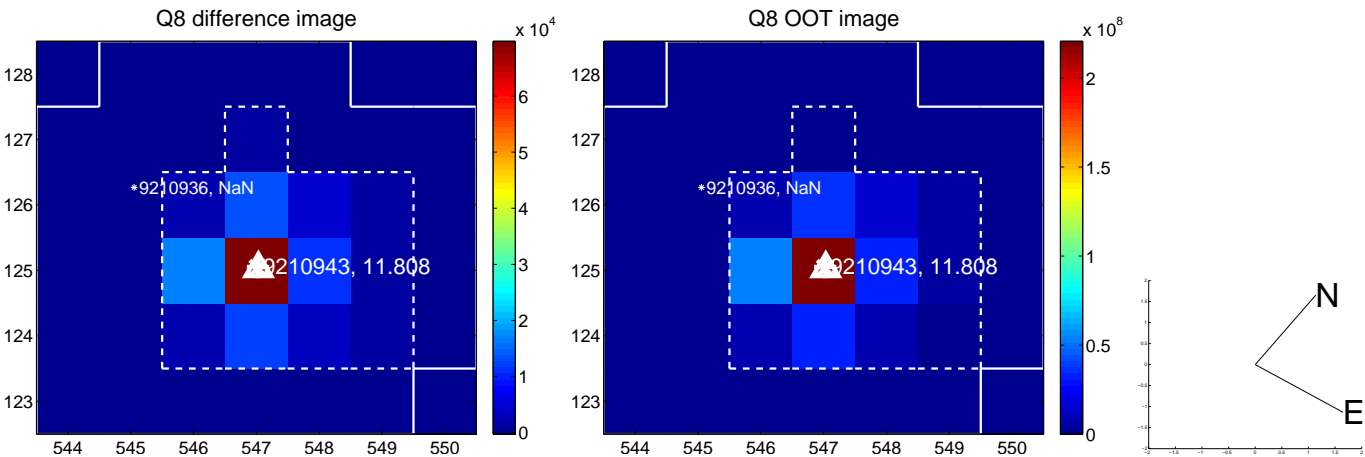
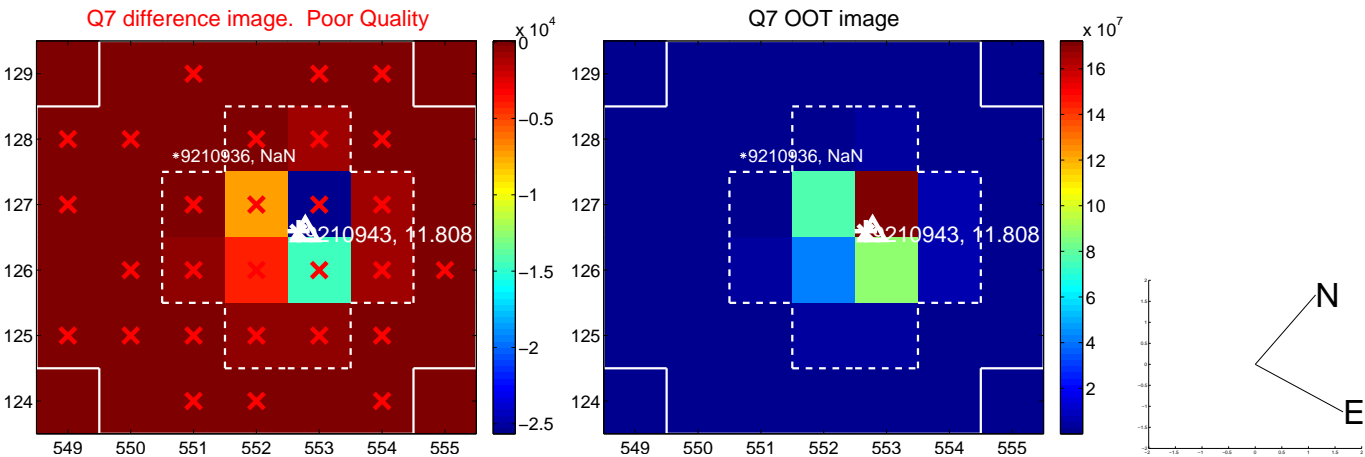
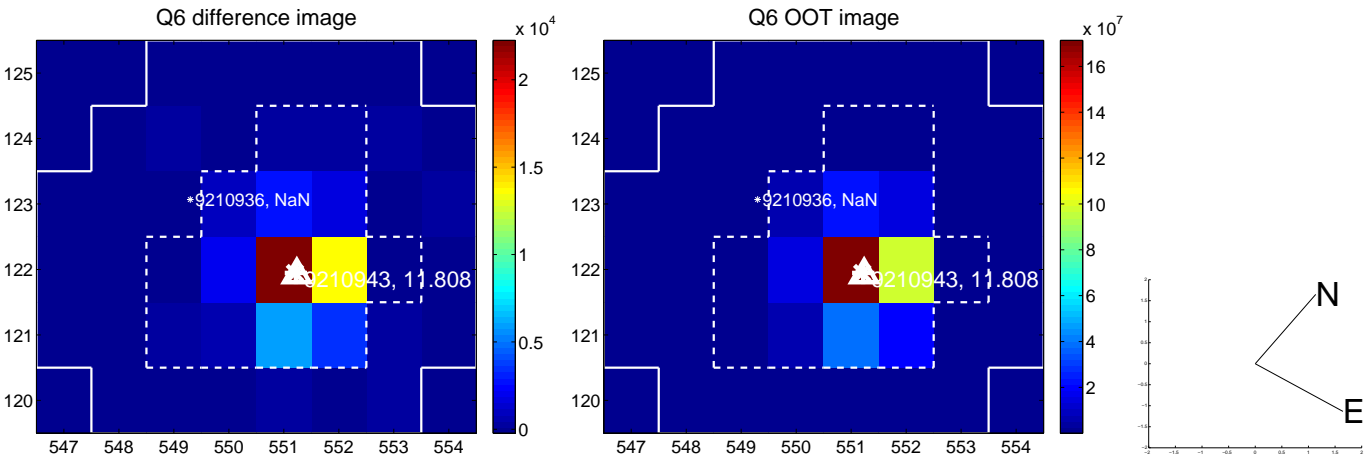
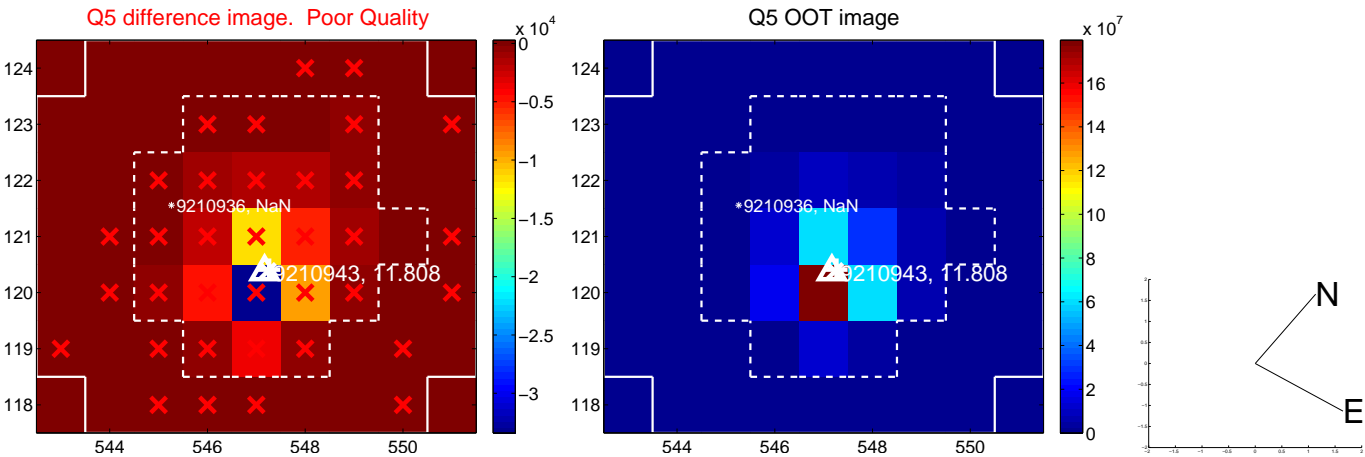


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

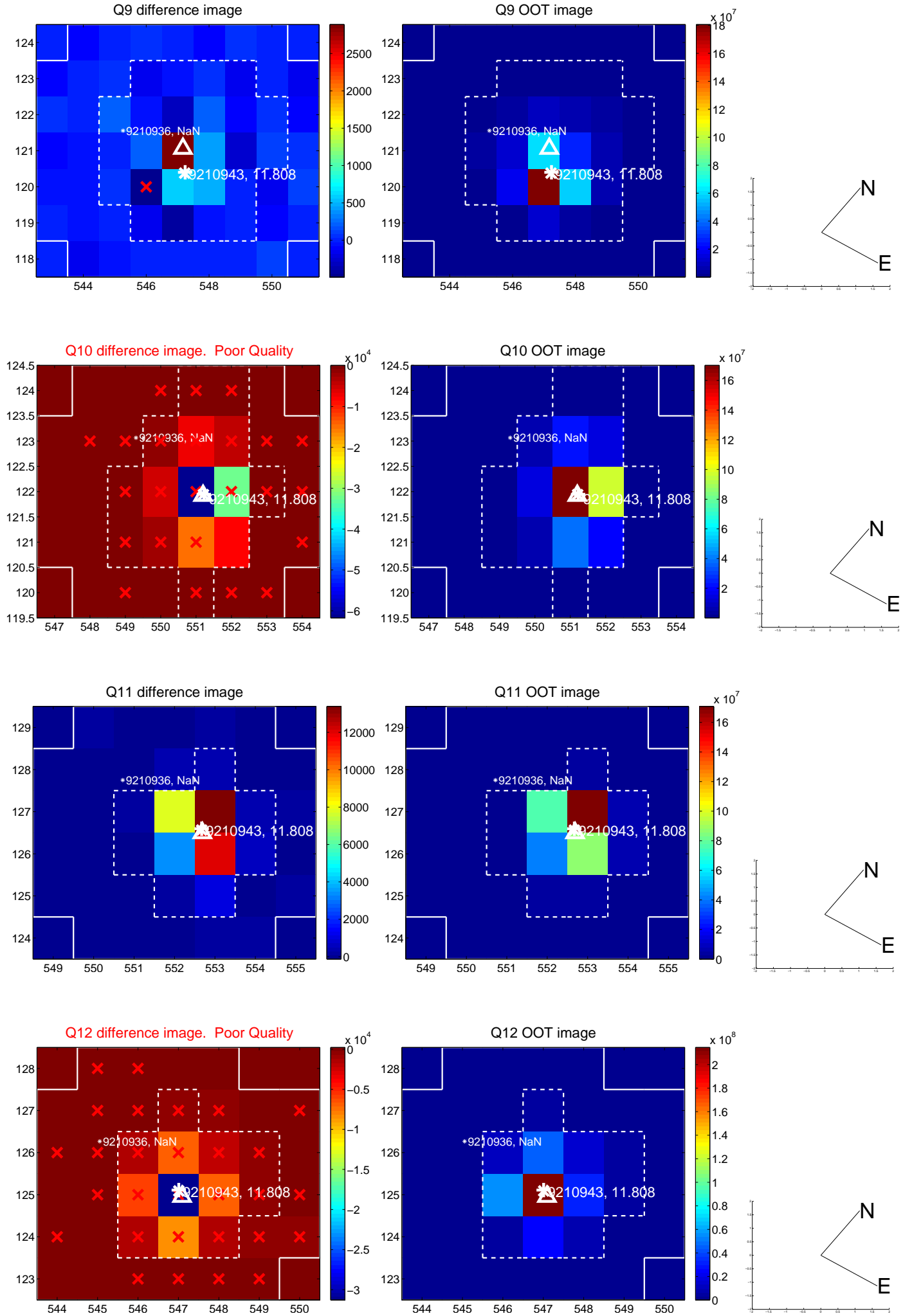
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



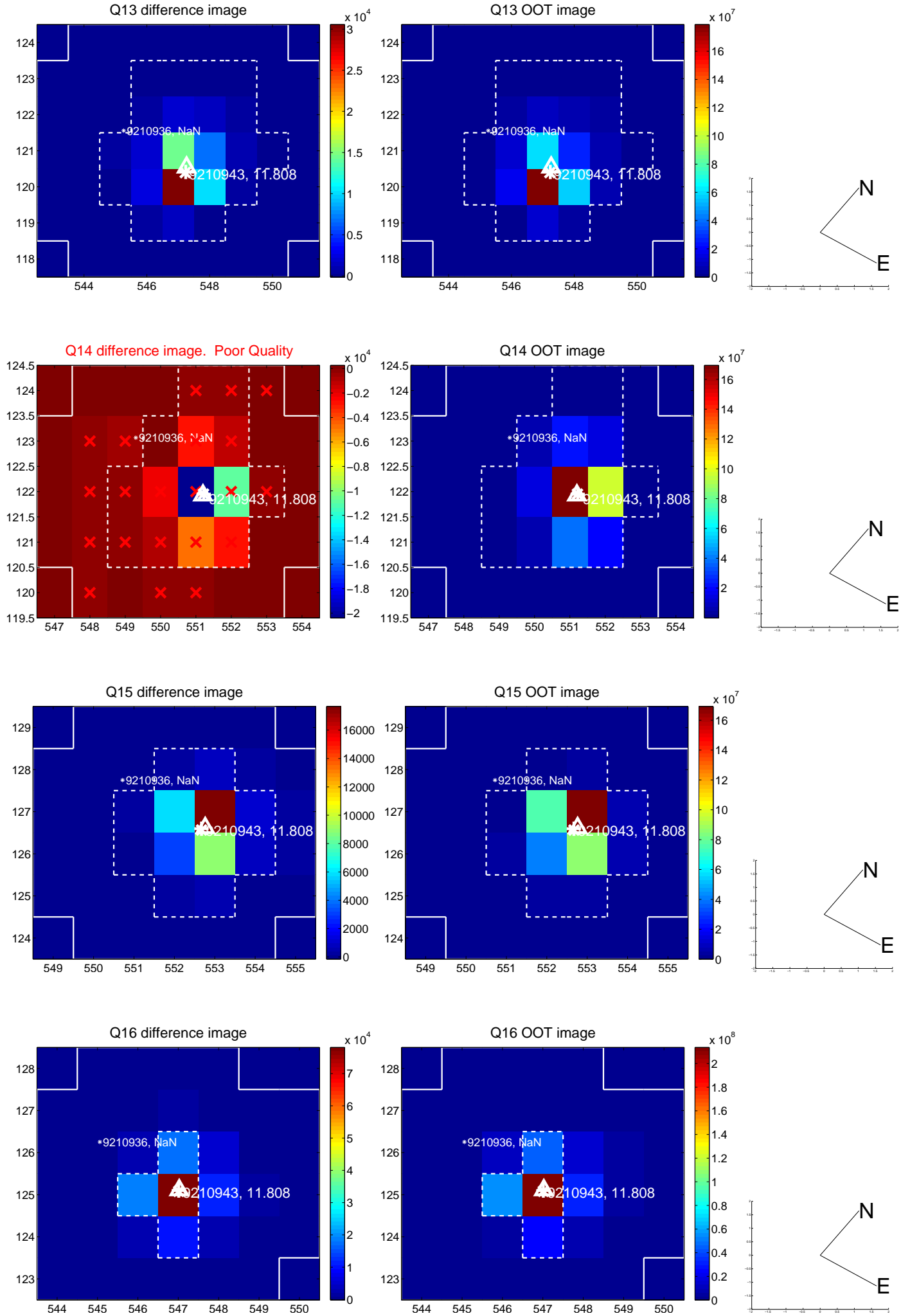
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



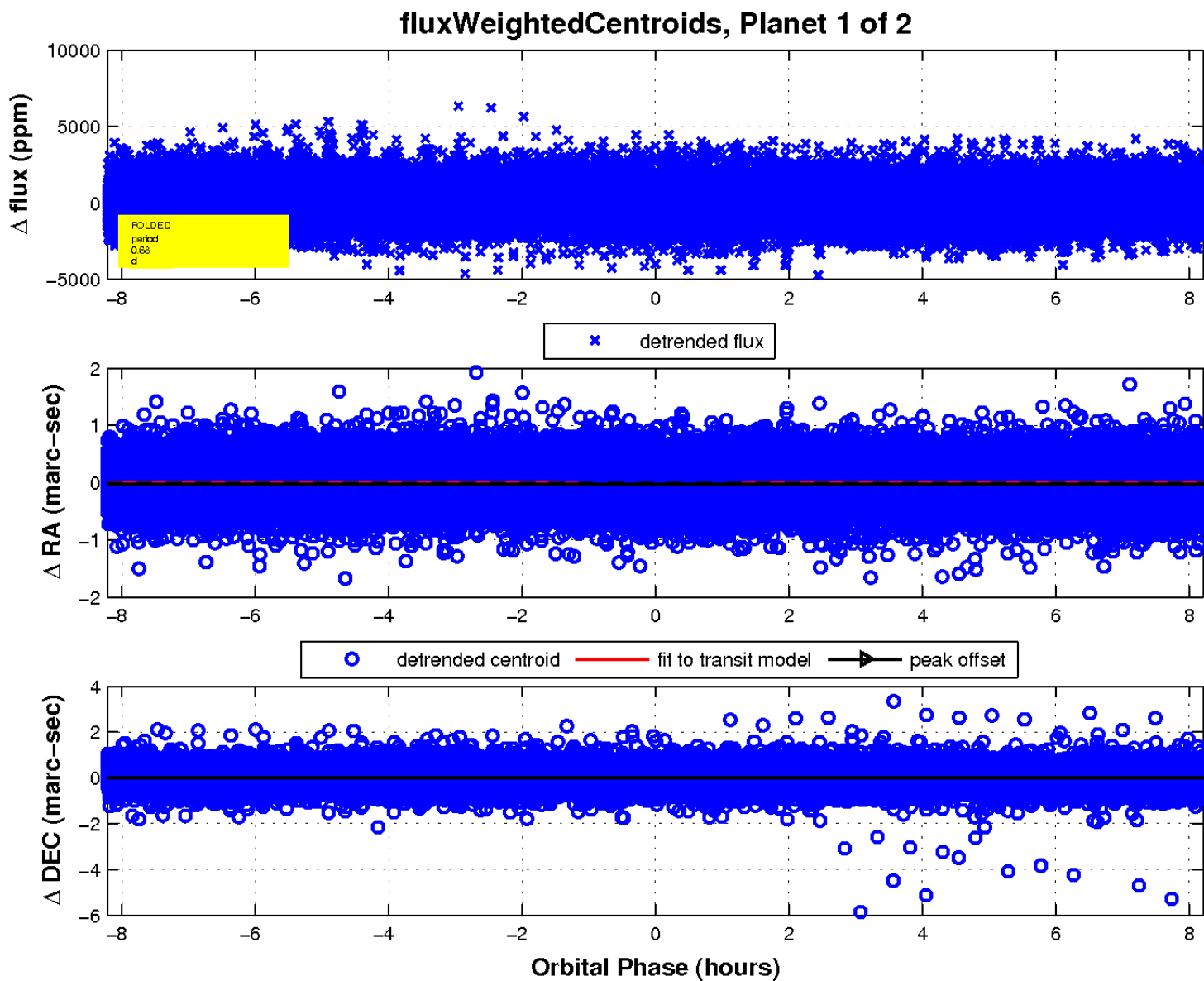
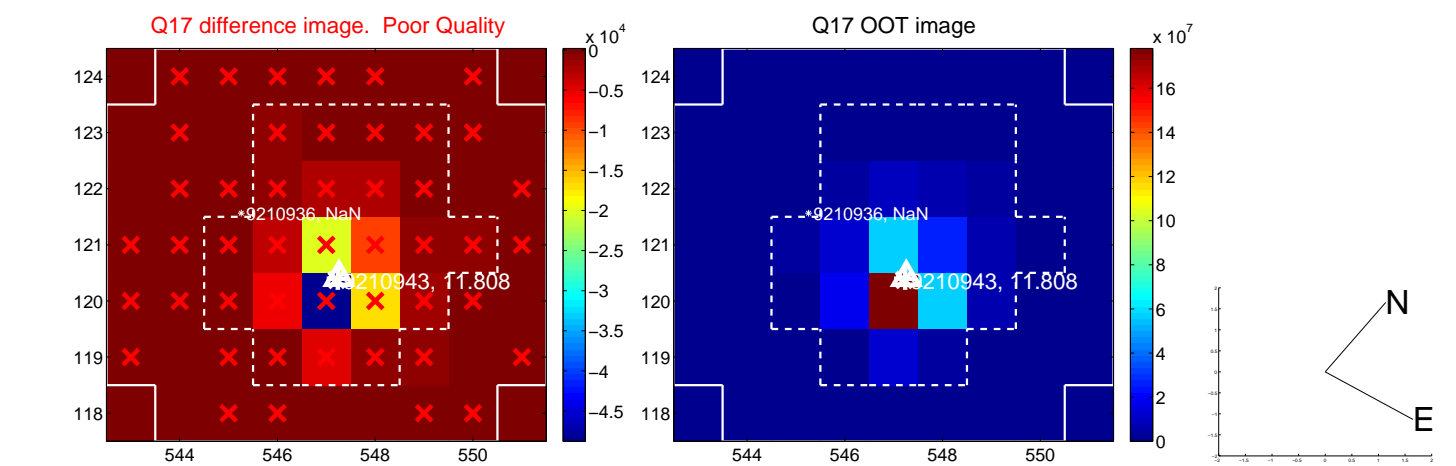
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

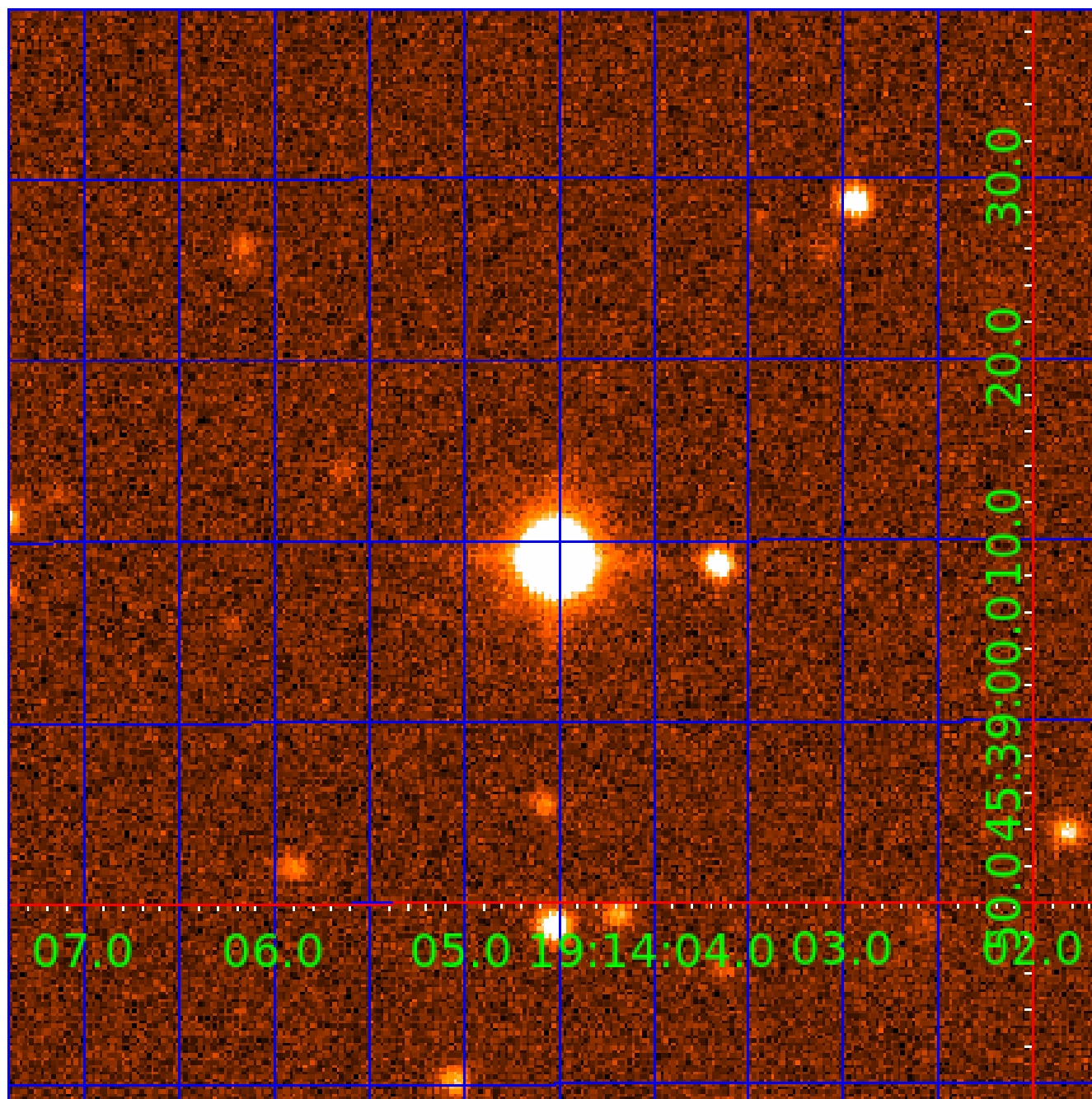


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009210943

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})
009210943-01	OBS	No	0.684690	131.737750	17.0	2.914	7.7	4.4	1.48	6872	0.71	14949.47
009210943-02	OBS	No	0.684668	132.188594	66.4	2.458	9.3	10.2	1.48	6872	1.40	14950.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009210943-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009210943-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_TER_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.

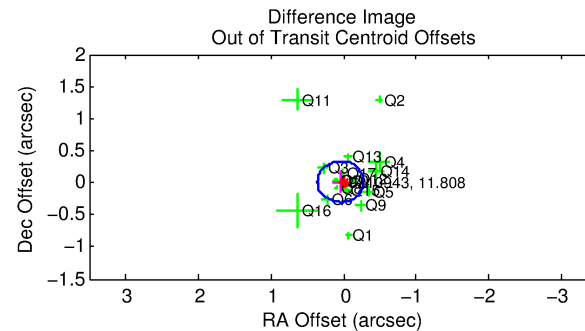
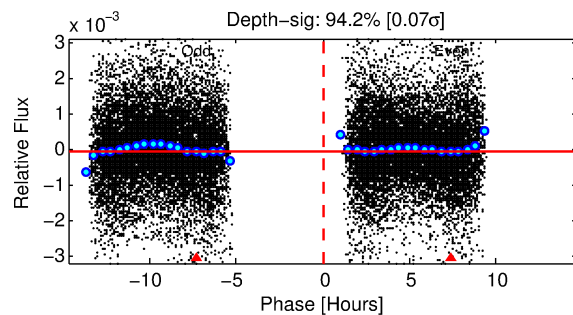
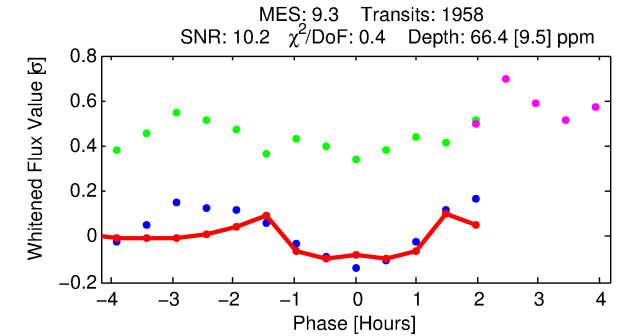
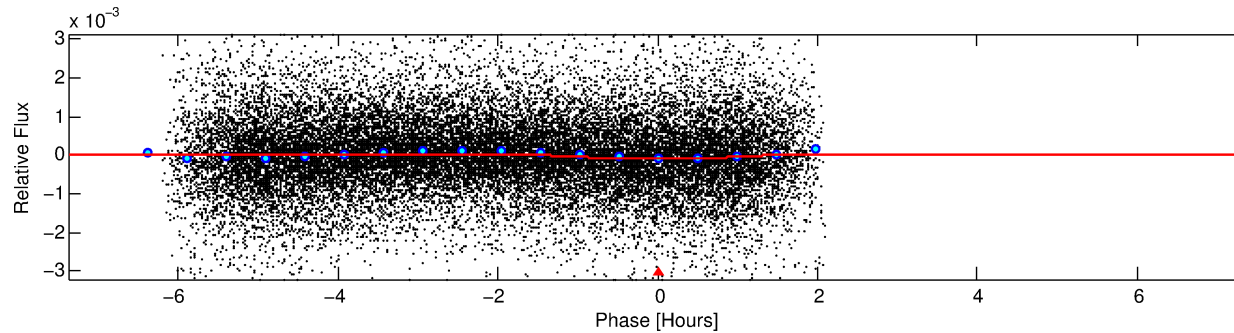
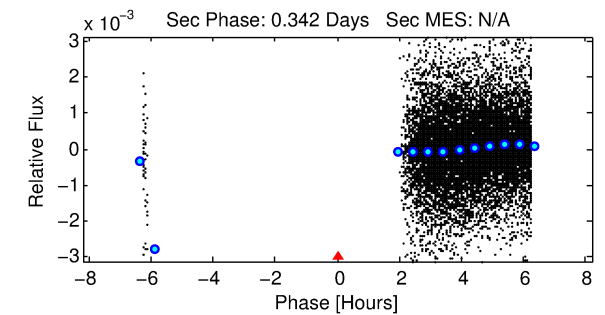
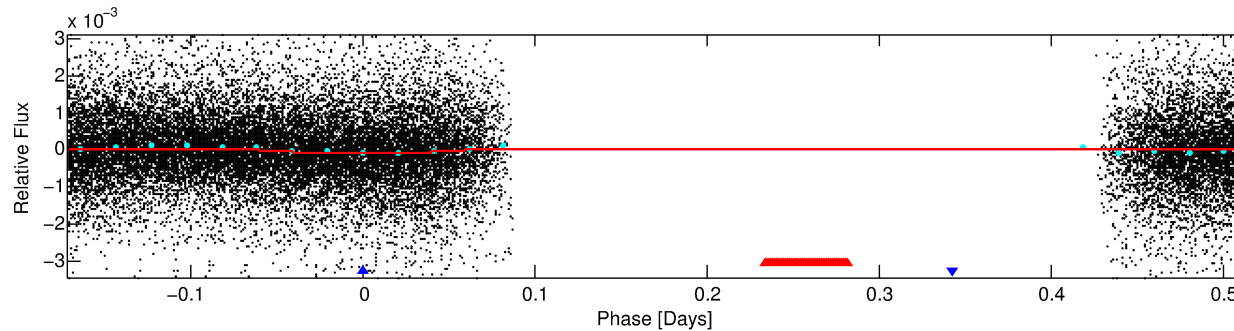
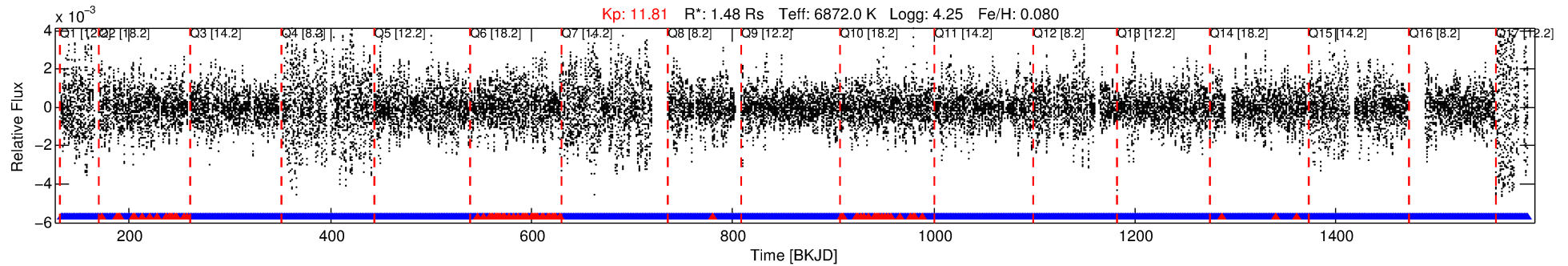
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009210943-02

No Significant Match Found

DV One-Page Summary

KIC: 9210943 Candidate: 2 of 2 Period: 0.685 d



DV Fit Results:

Period = 0.68467 [0.00001] d
Epoch = 132.1886 [0.0011] BKJD
Rp/R* = 0.0087 [0.0017]
a/R* = 1.36 [0.68]
b = 0.90 [0.24]
Seff = 14950.11 [6565.80]
Teq = 2820 [310] K
Rp = 1.40 [0.55] Re
a = 0.0171 [0.0048] AU

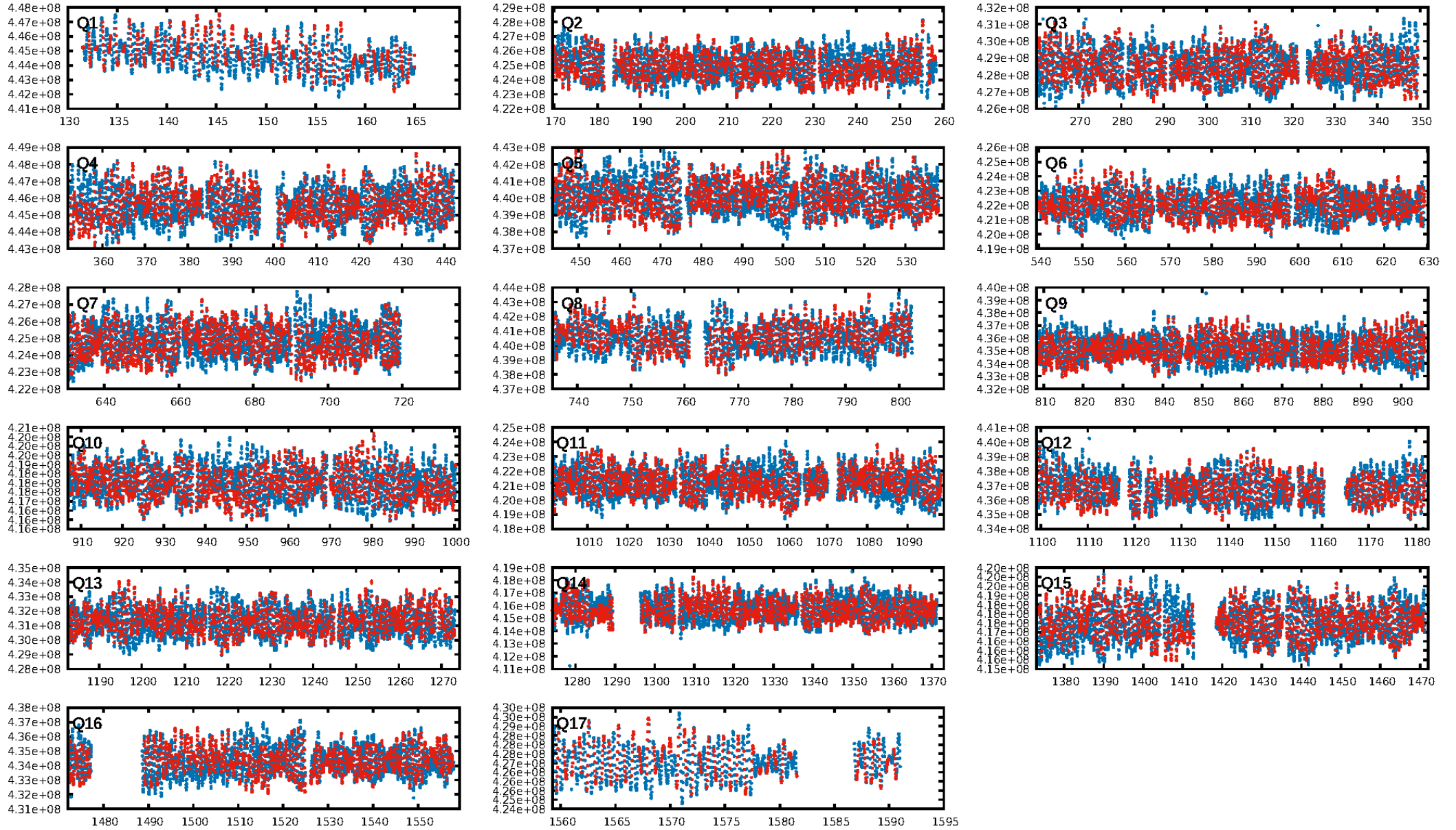
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.33e-17
RollingBand-fgt: 0.95 [1785/1870]
GhostDiagnostic-chr: 1.107
Centroid-sig: 1.6%
Centroid-so: 0.340 arcsec [2.30σ]
OotOffset-rm: 0.044 arcsec [0.41σ]
KicOffset-rm: 0.087 arcsec [0.64σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.53 [9/17]
DiffImageOverlap-fno: 0.00 [0/17]

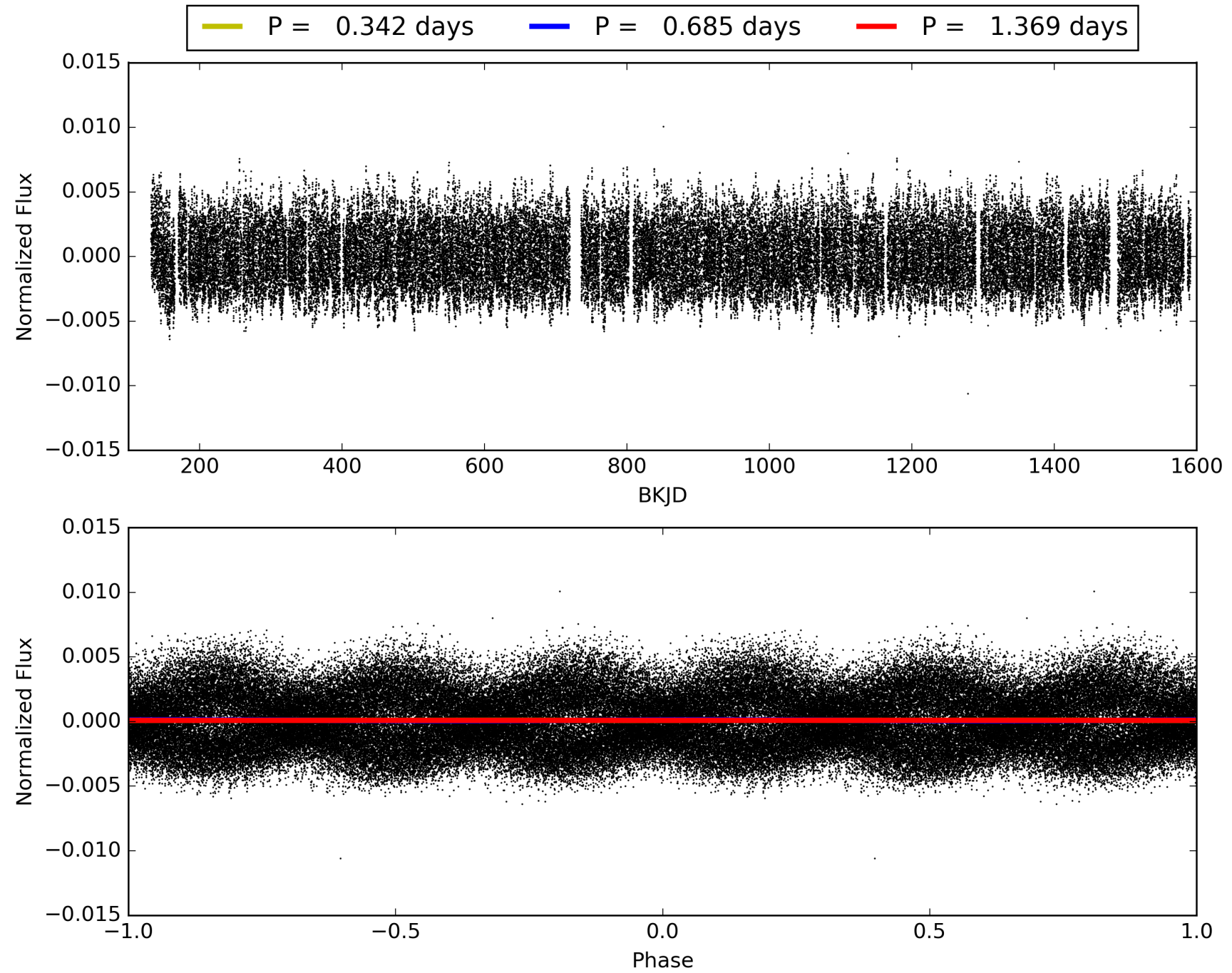
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:04:49 Z

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

TCE 009210943-02, PDC Light Curves

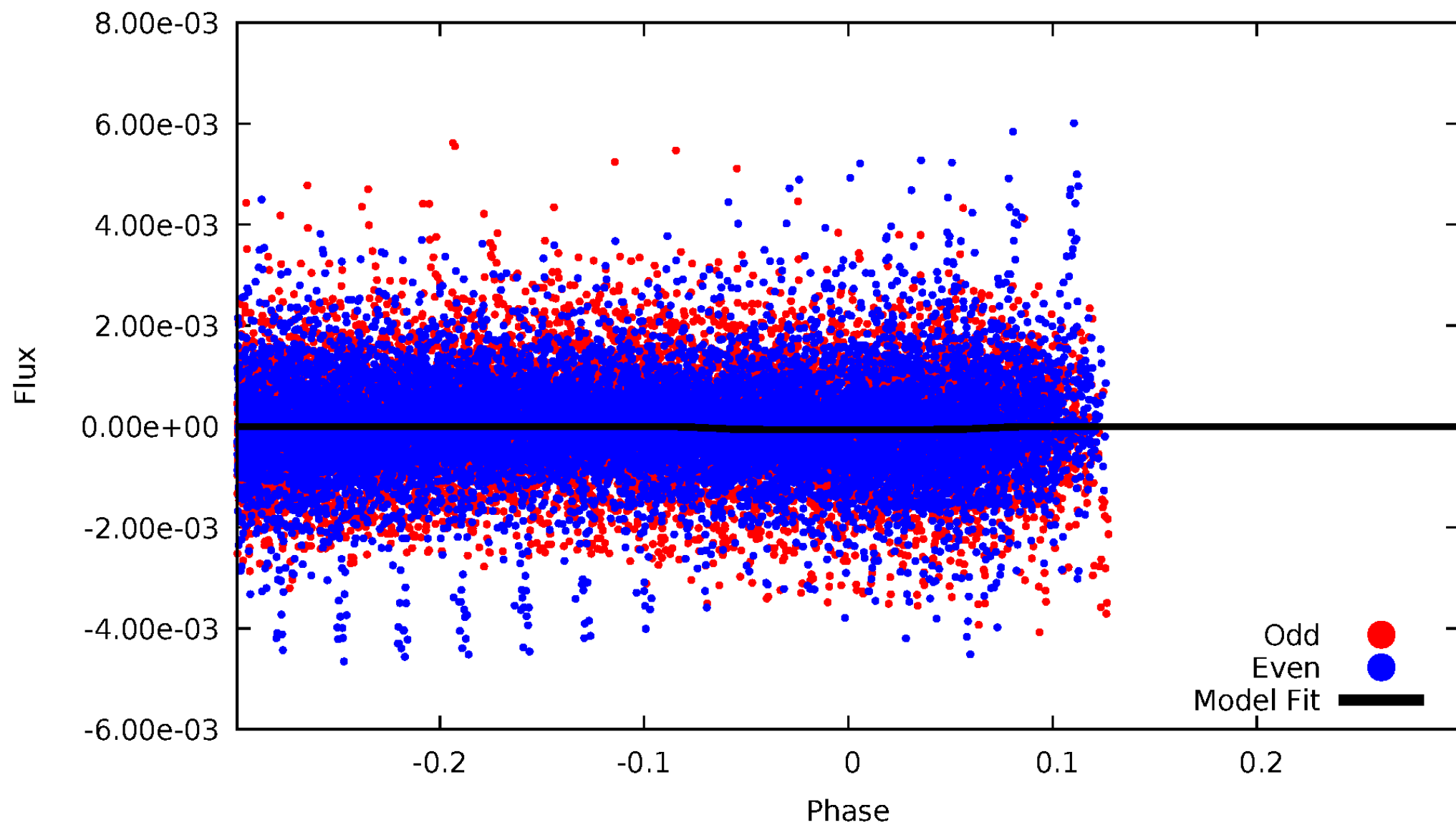


TCE 009210943-02



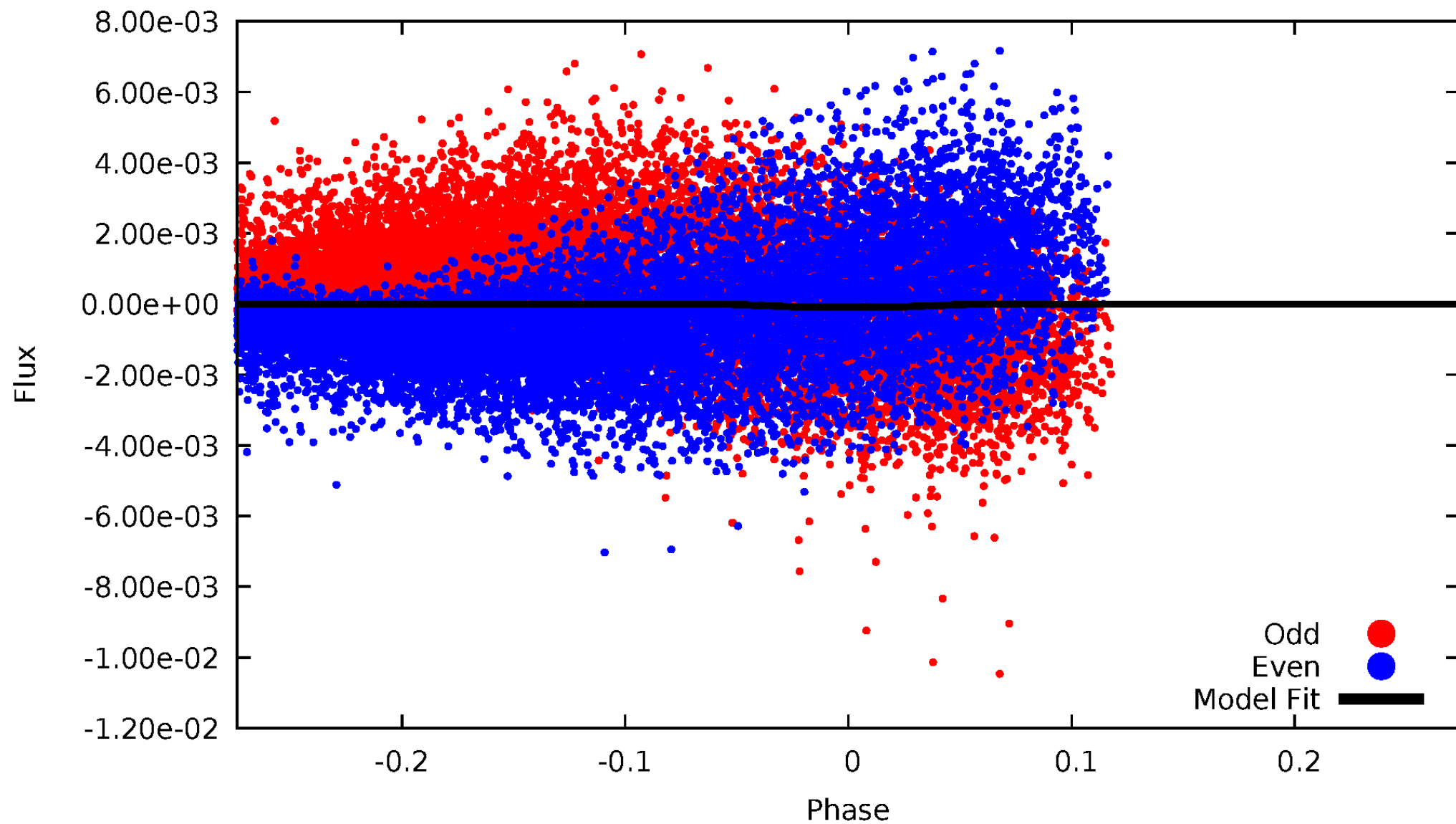
DV Odd/Even

TCE 009210943-02



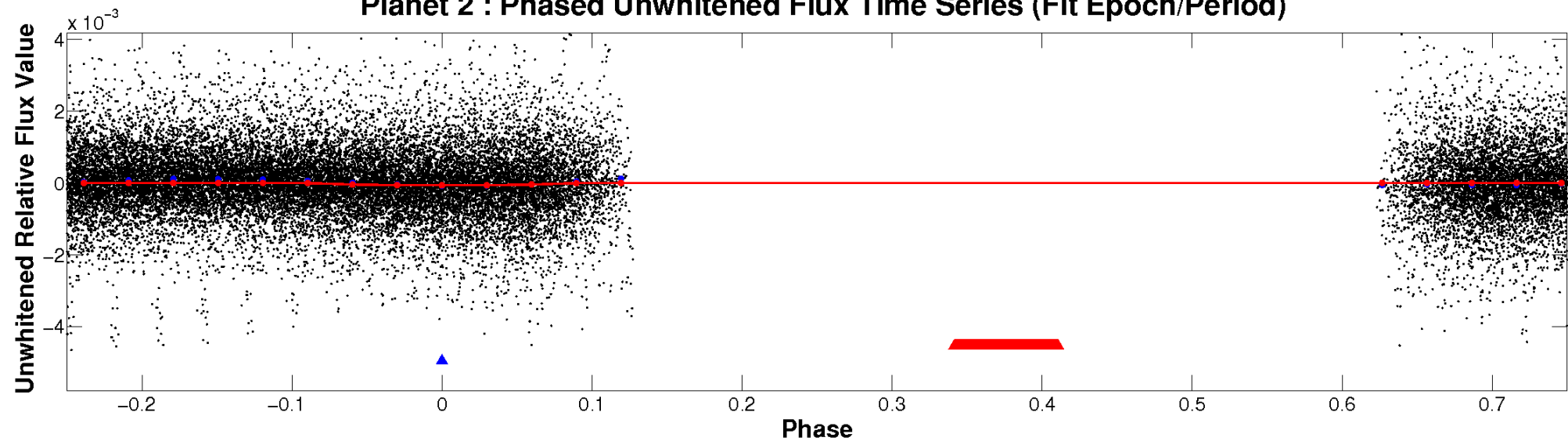
ALT Odd/Even

TCE 009210943-02

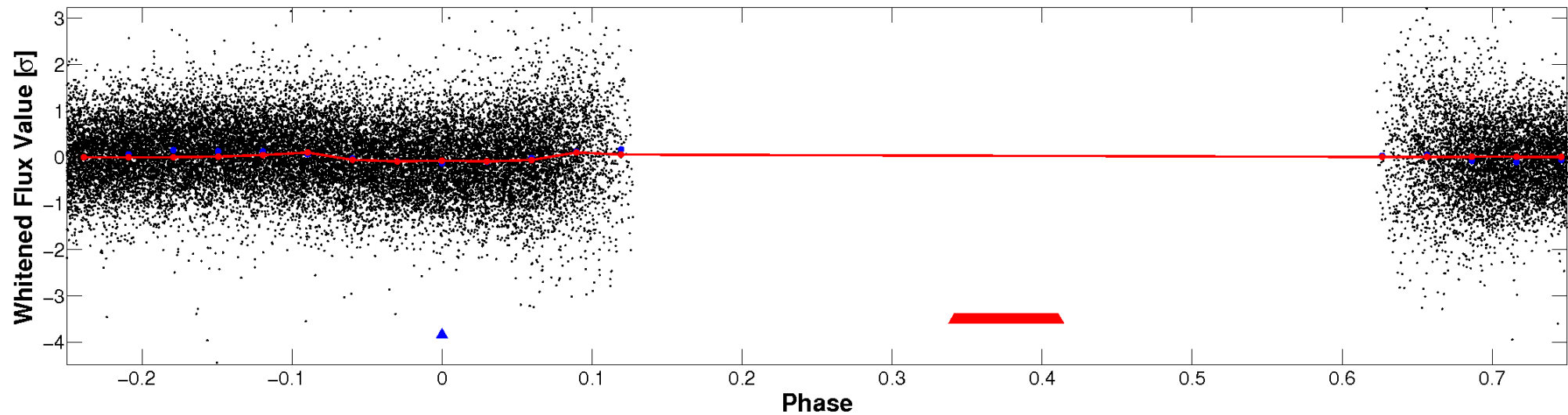


Non-Whitened Vs. Whitened Light Curve

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

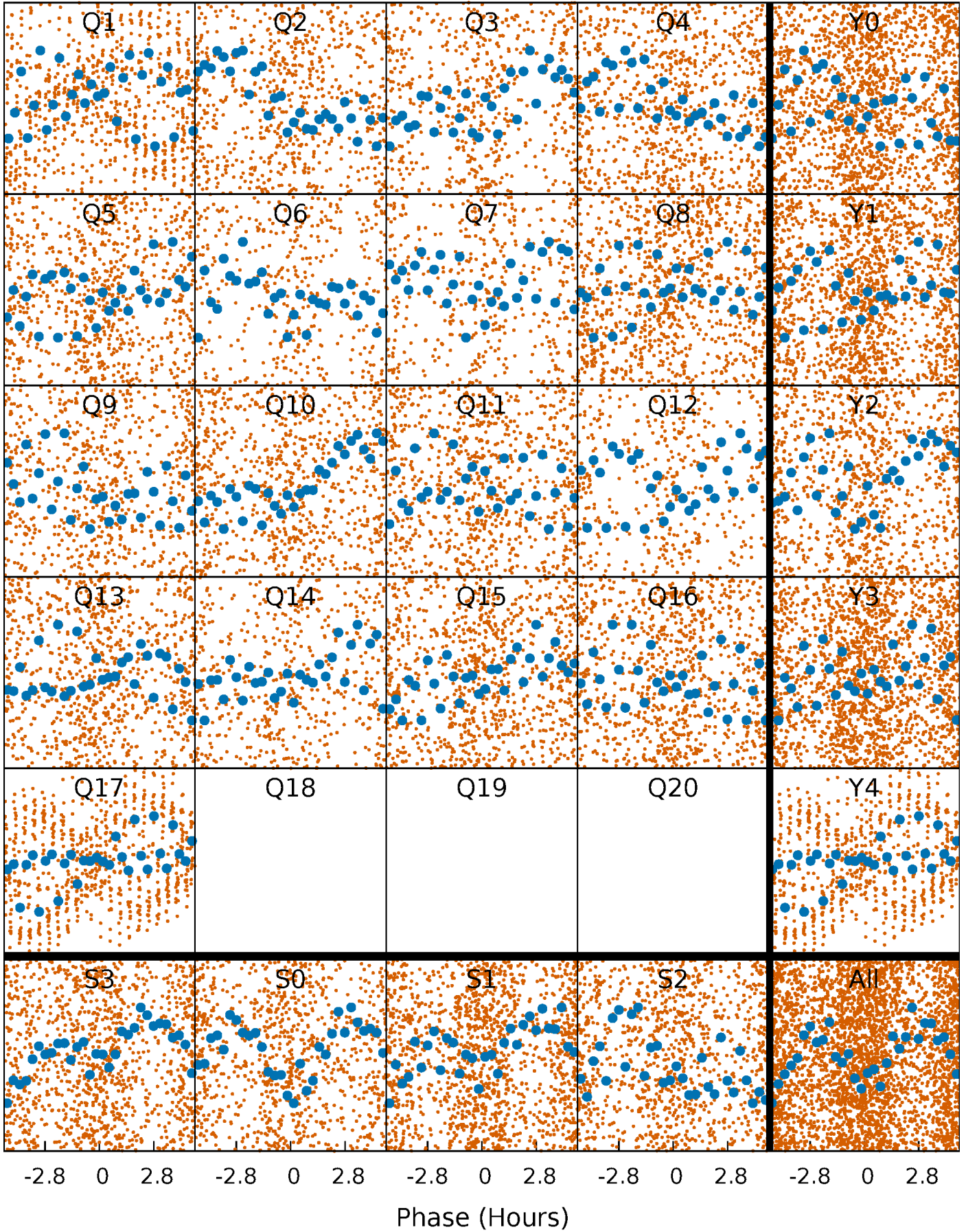


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



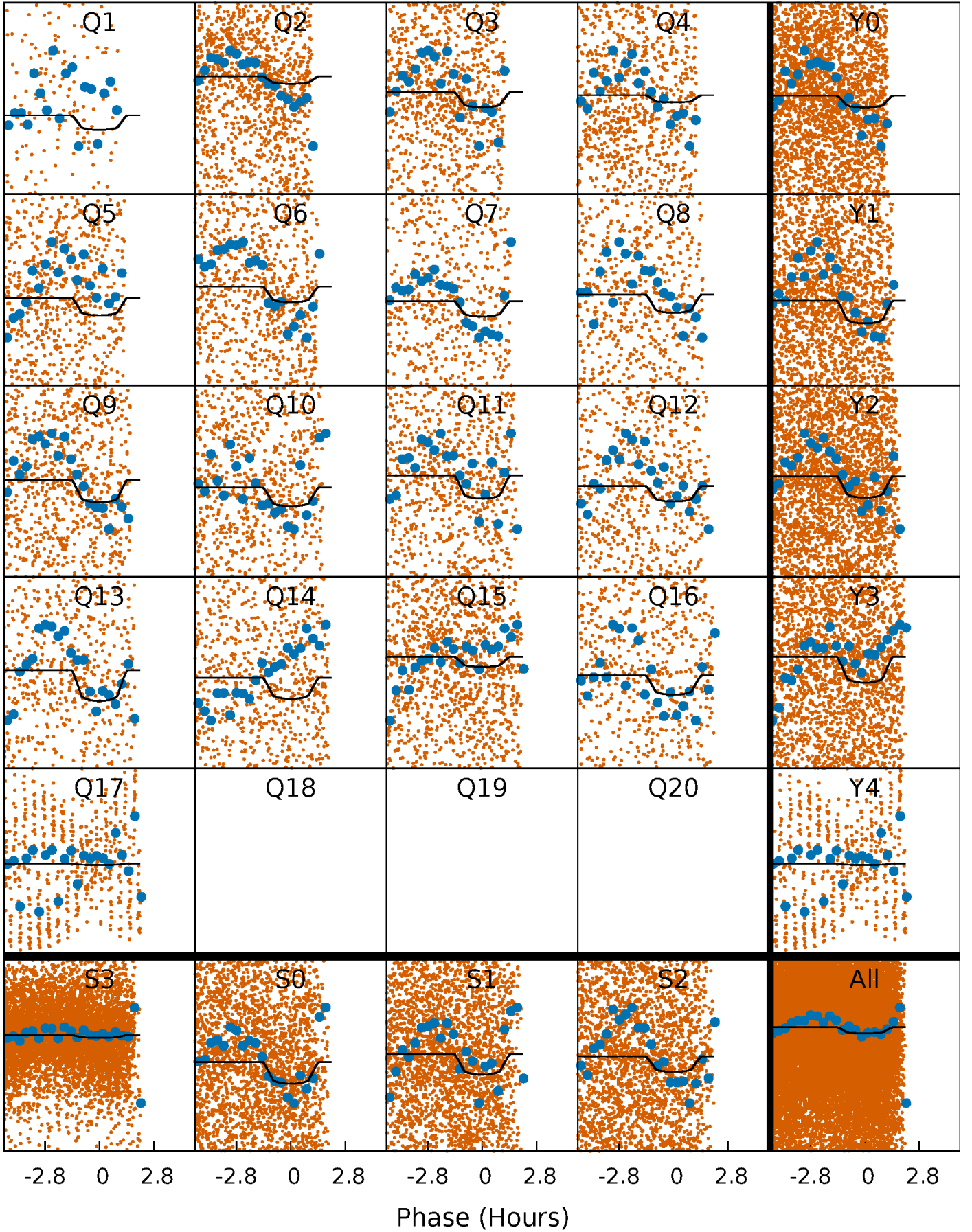
PDC Quarter-Phased Transit Curves

TCE 009210943-02 P= 0.684668 Days $T_0=132.188594$ (BKJD)



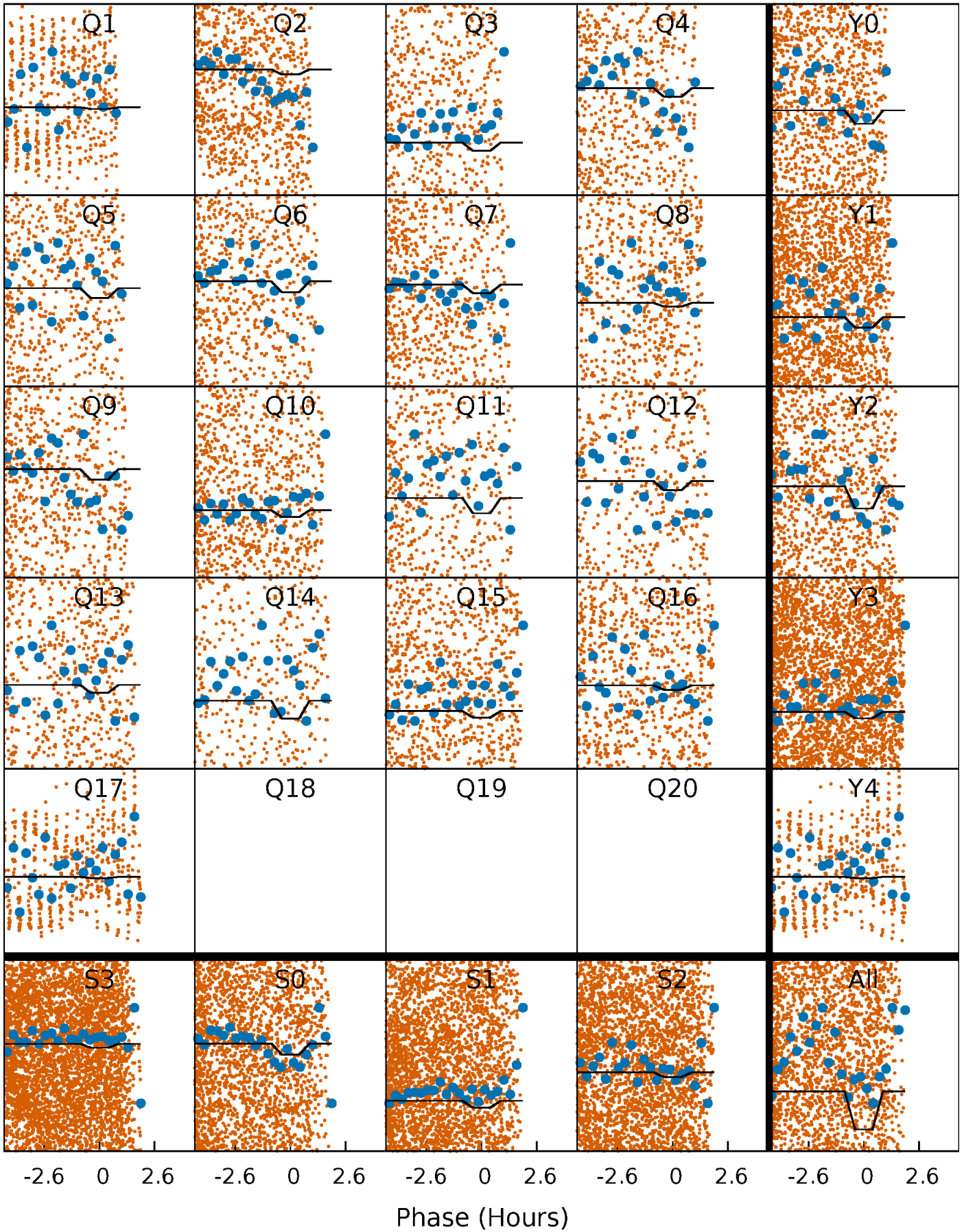
DV Quarter-Phased Transit Curves

TCE 009210943-02 P= 0.684668 Days $T_0=132.188594$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

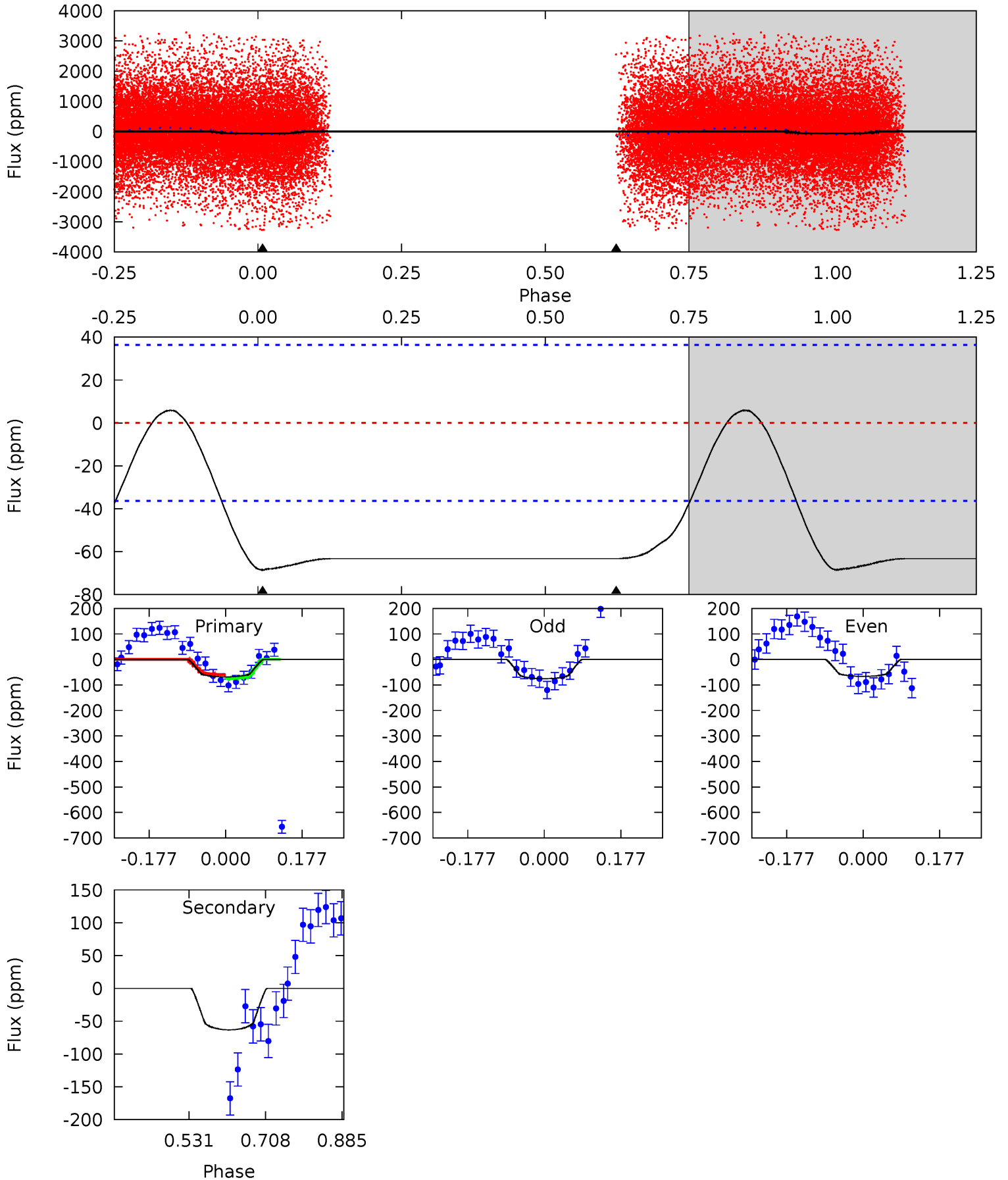
TCE 009210943-02 P= 0.684669 Days $T_0=132.193045$ (BKJD)



DV Model-Shift Uniqueness Test

009210943-02, P = 0.684668 Days, E = 131.503926 Days

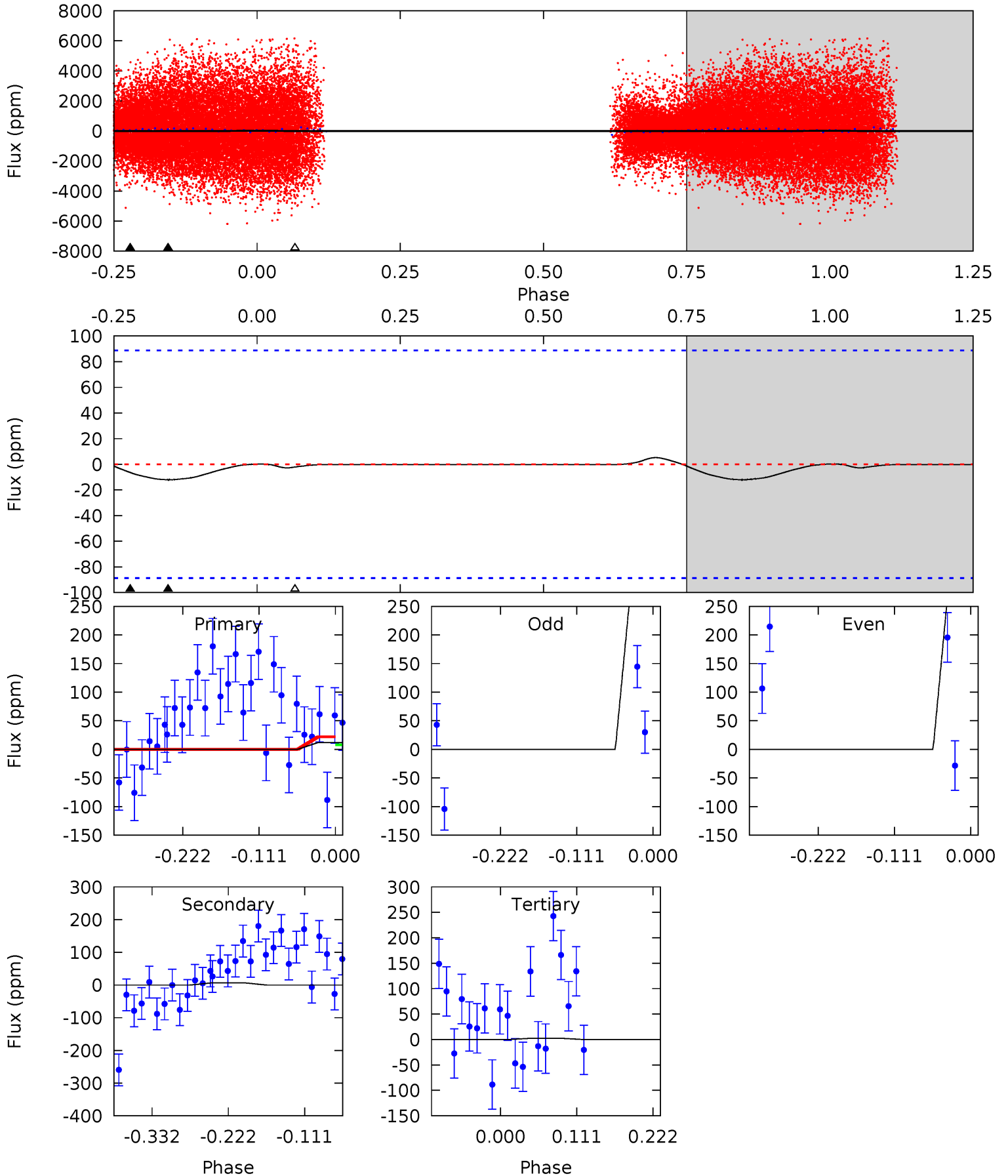
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.38	7.73	0	0	4.44	1.35	0.58	8.38	8.38	7.73	7.73	0.54	1.01	0.08	0.92



Alt Model-Shift Uniqueness Test

009210943-02, P = 0.684669 Days, E = 131.508376 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.62	0.33	0.11	0	4.54	1.59	0.12	0.51	0.62	0.22	0.33	0.09	-0.03	0.30	0.37



Stellar Parameters For KIC 009210943

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6872^{+189}_{-307}	$4.250^{+0.087}_{-0.217}$	$0.080^{+0.200}_{-0.350}$	$1.476^{+0.495}_{-0.228}$	$1.413^{+0.218}_{-0.218}$	$0.619^{+0.262}_{-0.352}$
	+3%/-4%	+2%/-5%	+250%/-438%	+34%/-15%	+15%/-15%	+42%/-57%
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 009210943-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-63 ± 8	$1.46^{+0.38}_{-0.34}$	4005^{+315}_{-252}	6365^{+997}_{-672}	$4.632^{+3.200}_{-1.697}$
Alt.	-6 ± 20	$1.41^{+0.41}_{-0.30}$	3986^{+312}_{-251}	3233^{+1937}_{-8093}	$0.413^{+1.600}_{-1.458}$

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 $A_{obs} \gg 1.0$

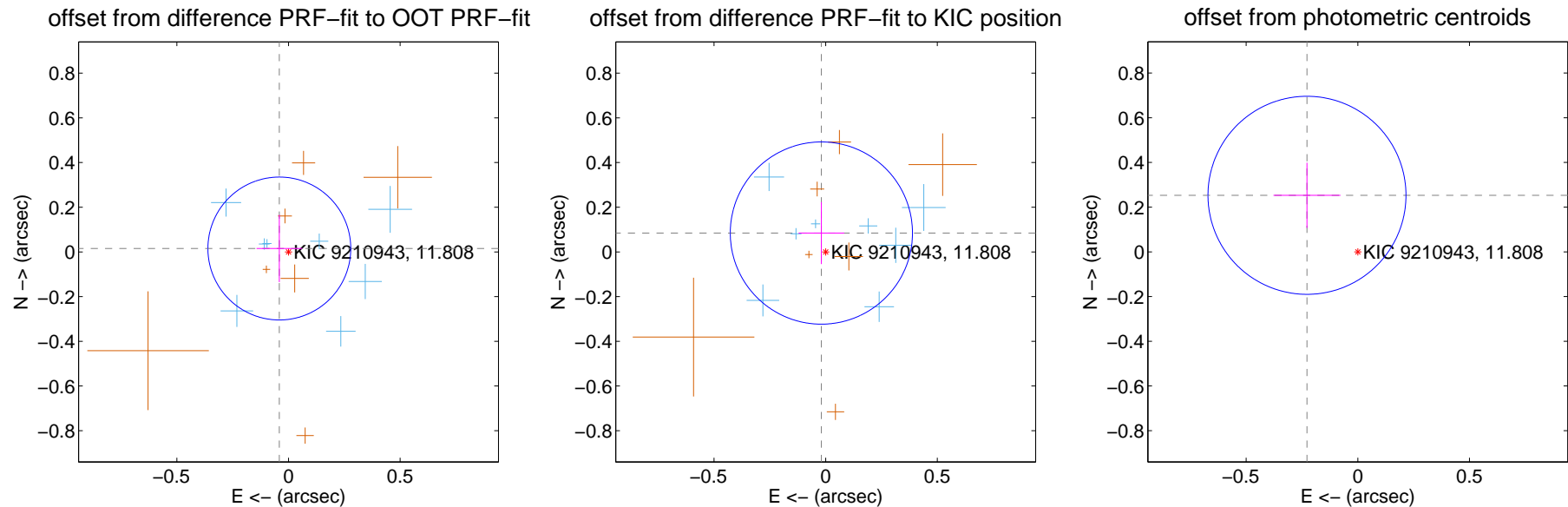
DV Centroid Data

Supplemental centroid analysis for 009210943-02. **Kepler magnitude: 11.81.** Transit SNR 10.17

There are 9 quarters with good PRF difference image offsets

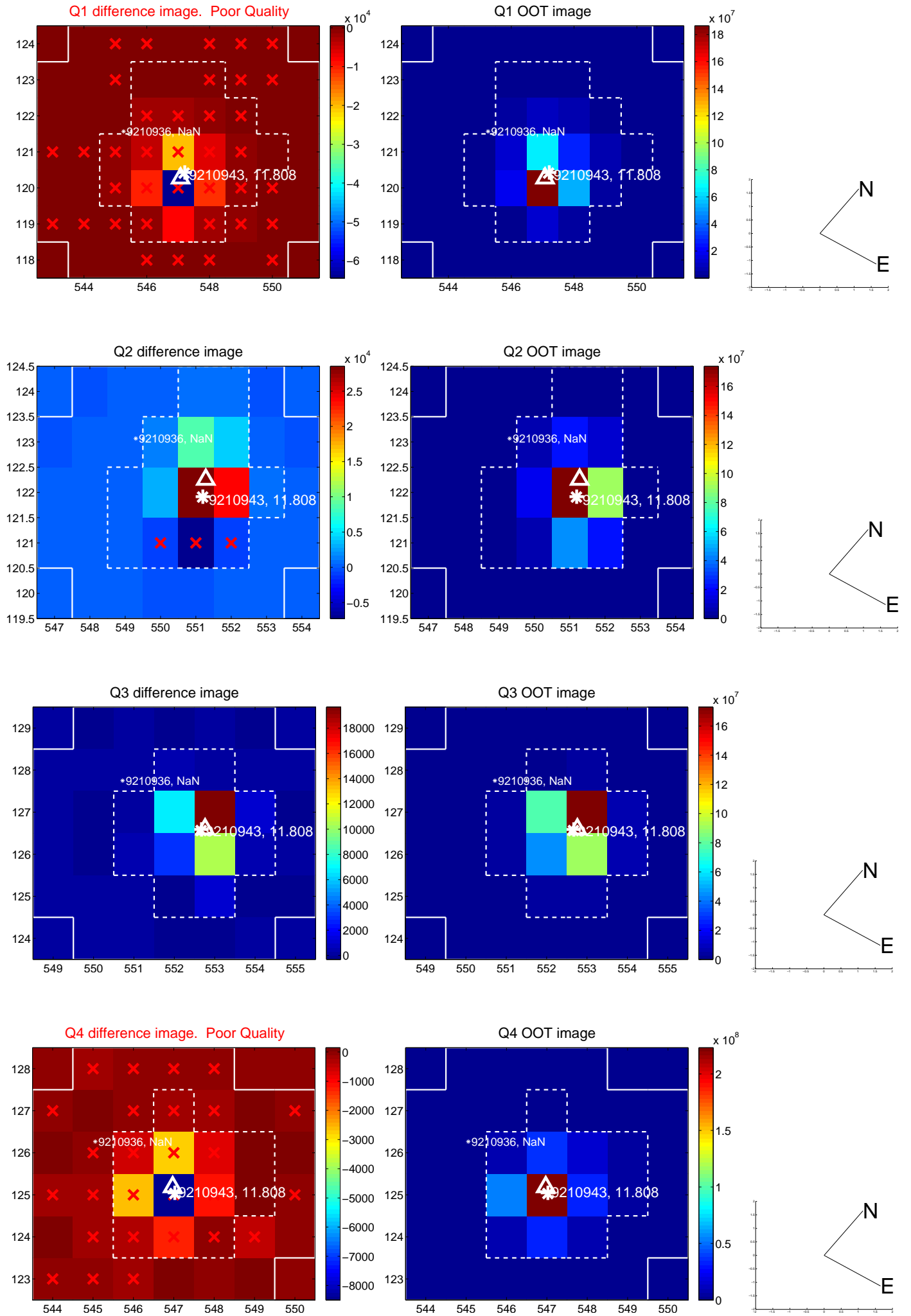
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.044 ± 0.107	0.41	0.041 ± 0.102	0.015 ± 0.150
PRF-fit source offset from KIC position	0.087 ± 0.136	0.64	0.019 ± 0.102	0.084 ± 0.139
photometric centroid source offset	0.34 ± 0.15	2.30	0.23 ± 0.15	0.25 ± 0.15

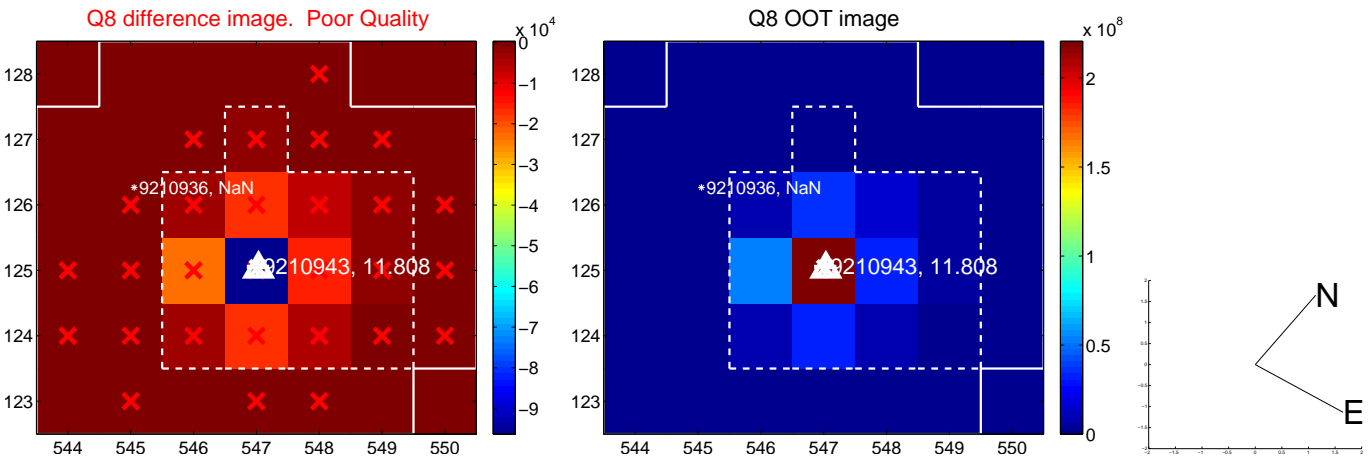
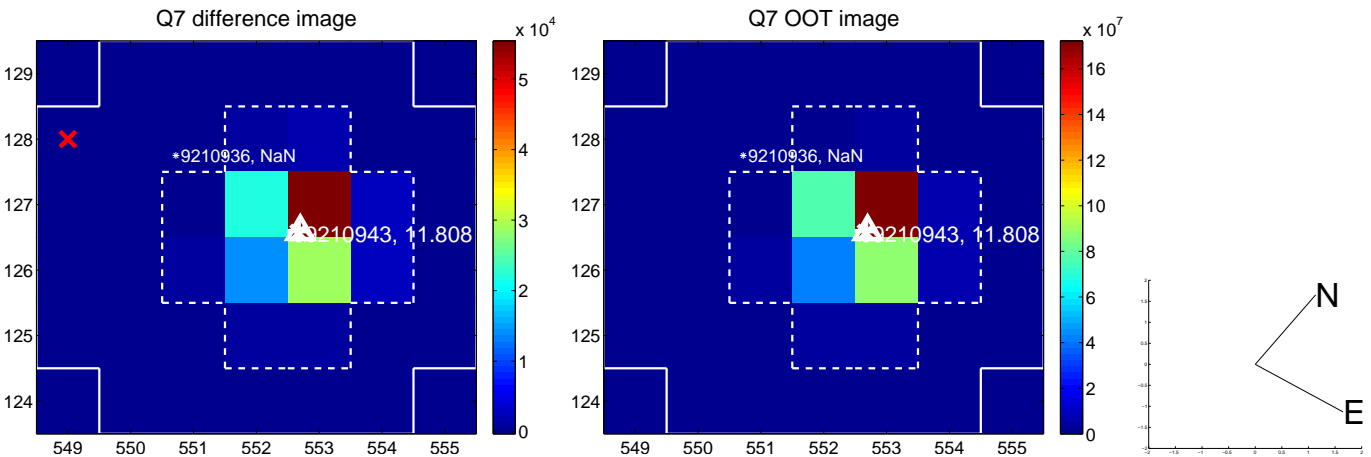
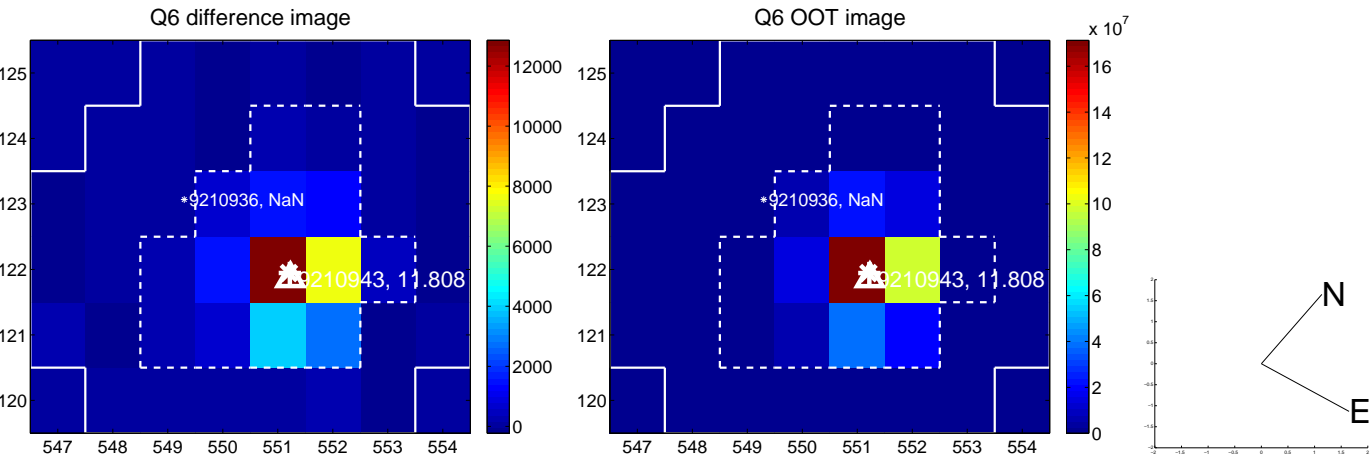
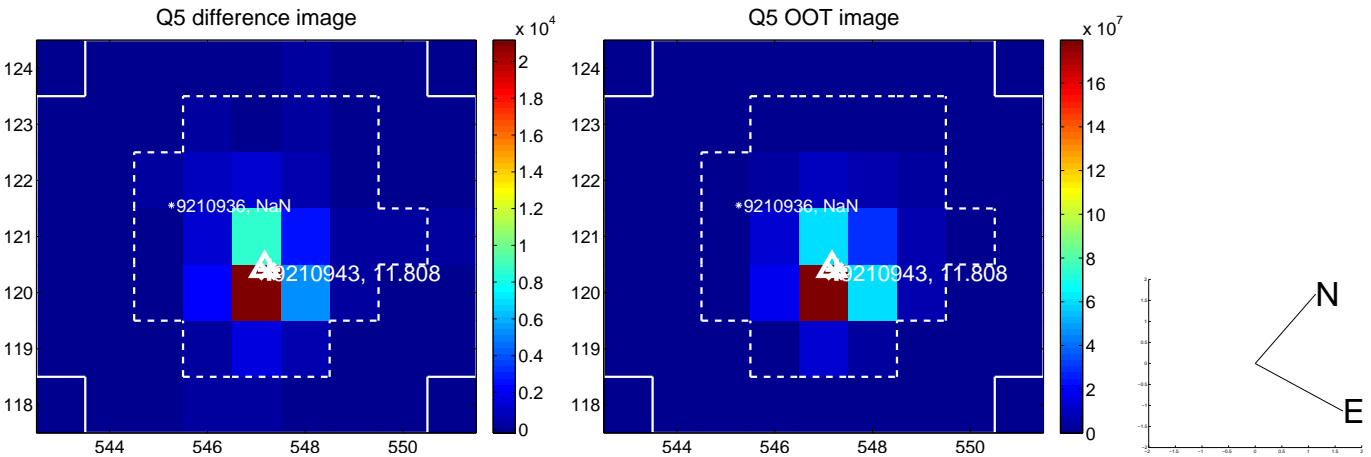


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

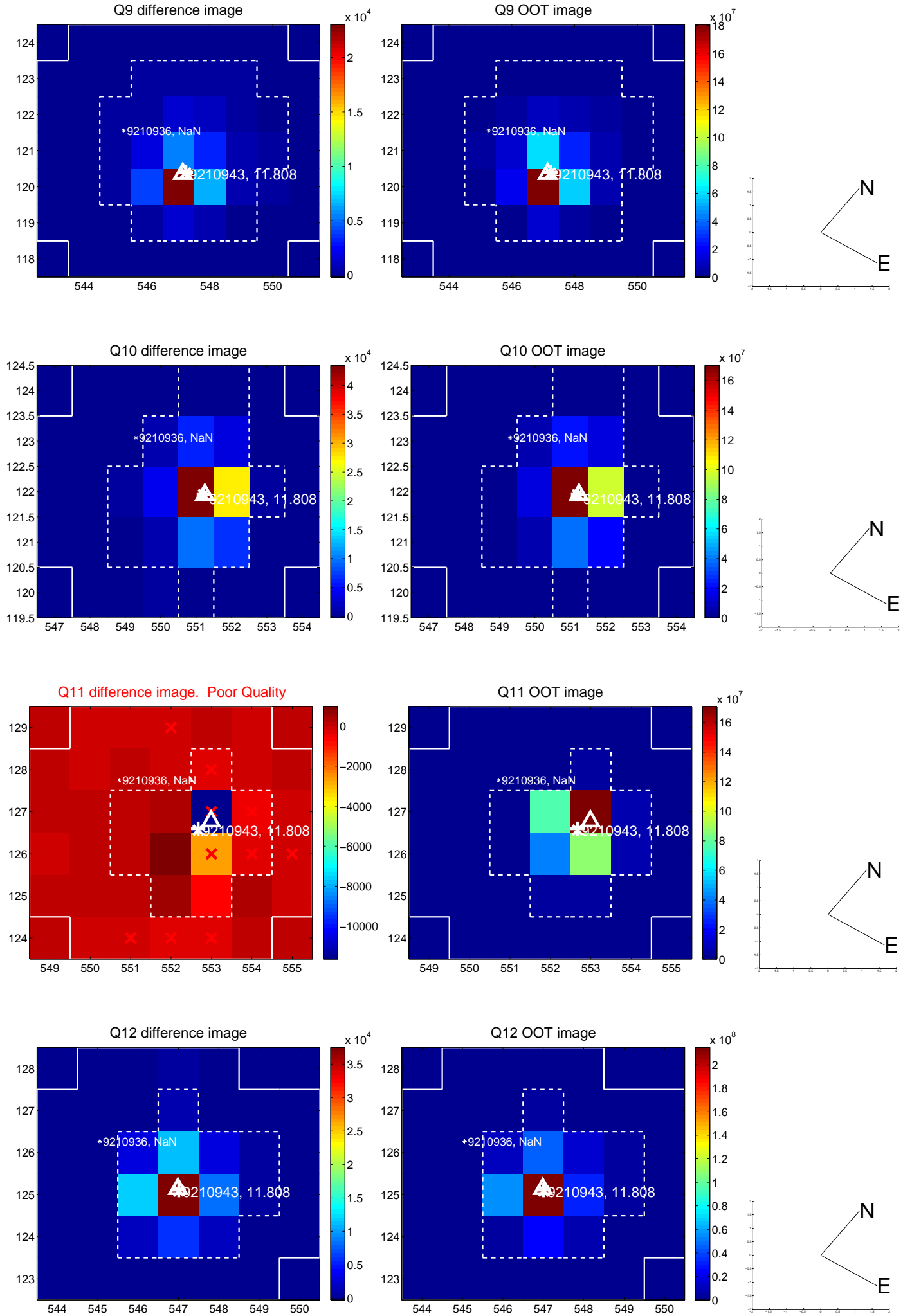
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



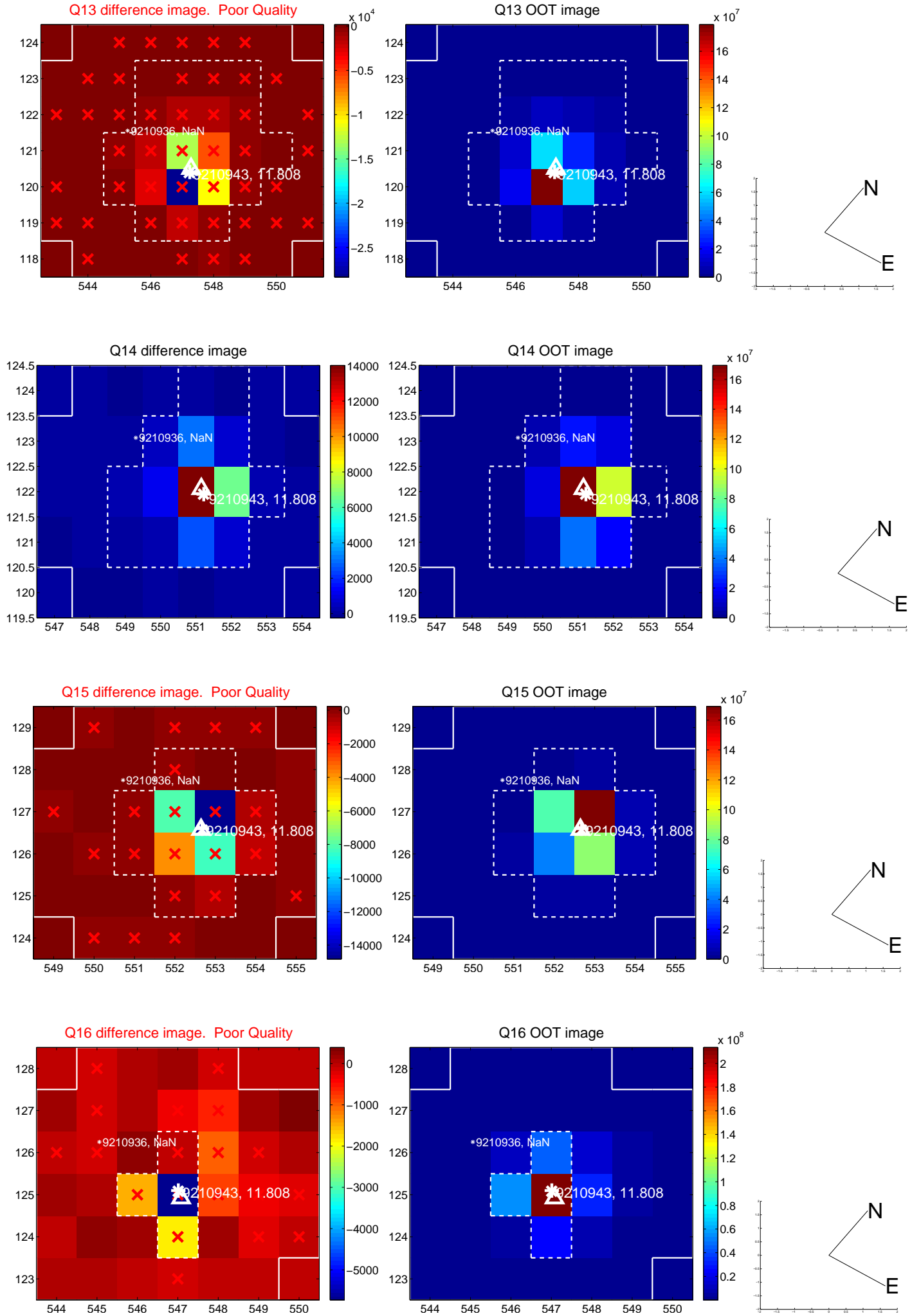
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



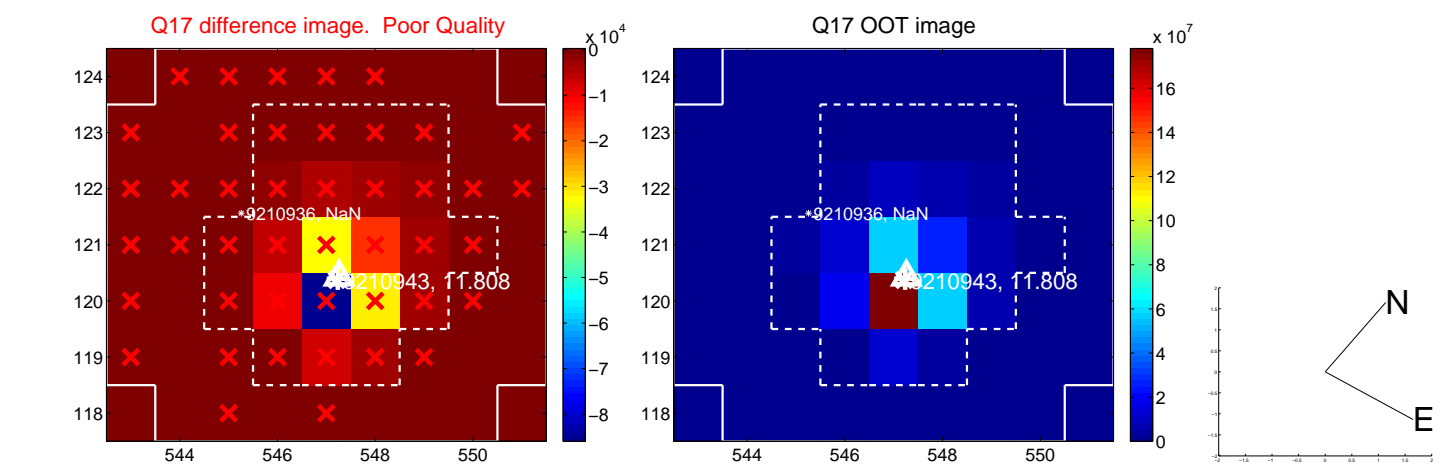
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



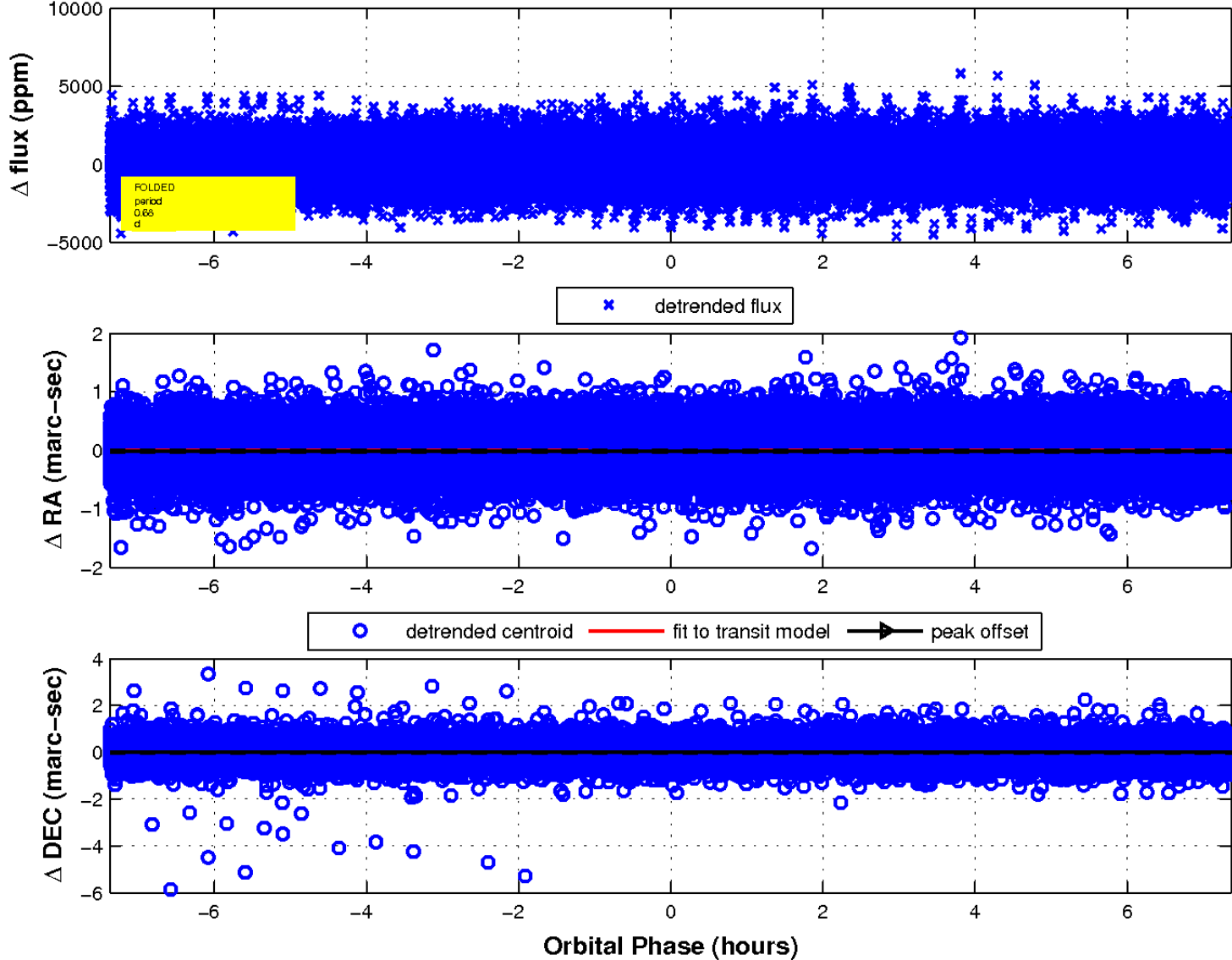
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

