

KIC 004180099

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})
004180099-01	OBS	No	0.539798	131.993914	164.7	1.040	11.7	9.7	2.89	8076	3.86	124834.76
004180099-02	OBS	No	0.743563	131.968044	110.7	4.501	10.6	9.1	2.89	8076	3.09	81449.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004180099-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004180099-02	OBS	FP	0.00	1	0	0	0	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.

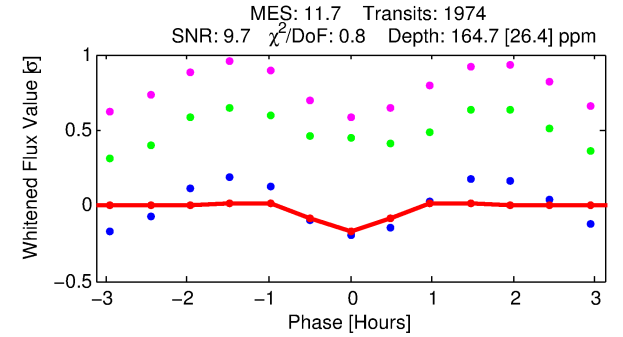
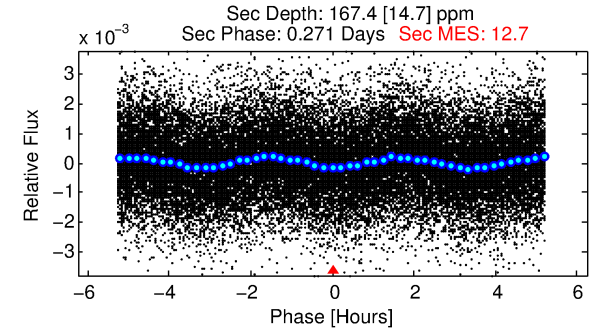
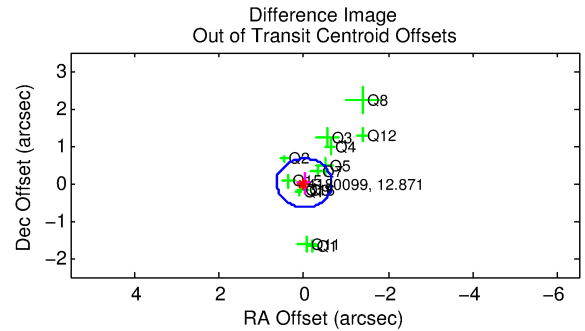
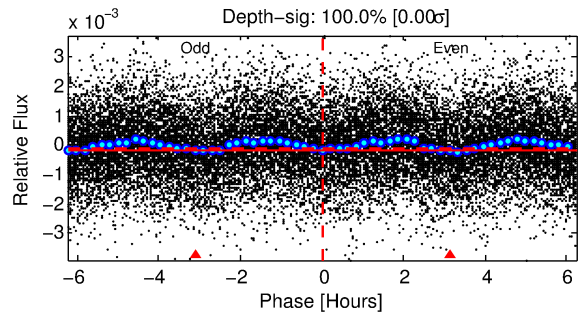
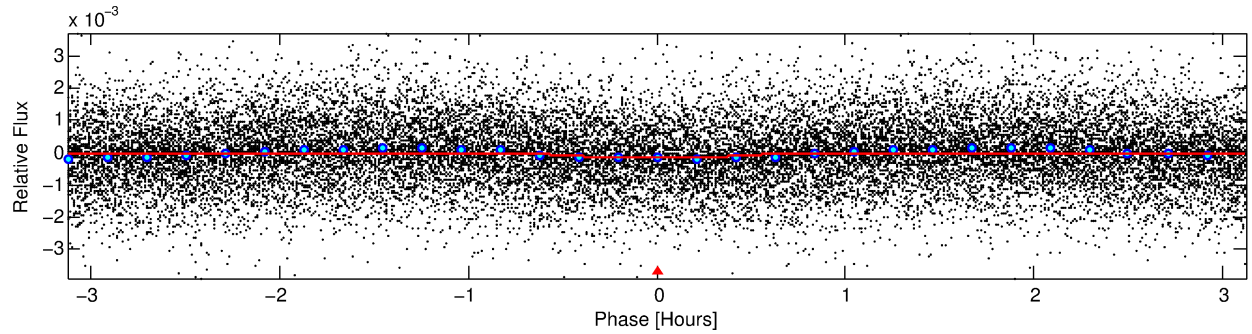
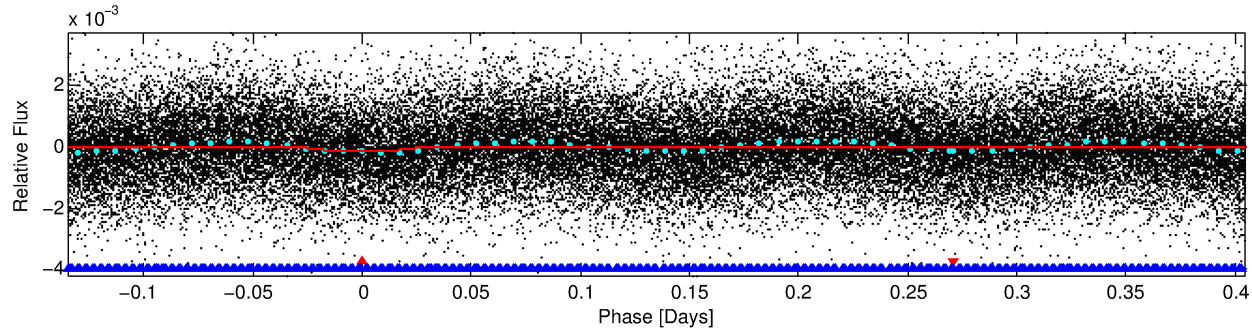
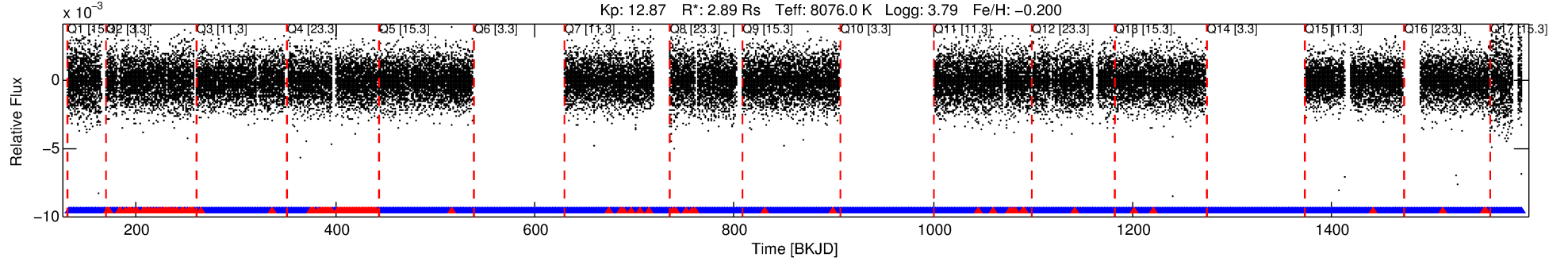
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004180099-01

No Significant Match Found

DV One-Page Summary

KIC: 4180099 Candidate: 1 of 2 Period: 0.540 d



DV Fit Results:

Period = 0.53980 [0.00001] d
Epoch = 131.9939 [0.0019] BKJD
Rp/R* = 0.0123 [0.0075]
a/R* = 3.56 [11.11]
b = 0.50 [5.10]
Seff = 124834.77 [87097.87]
Teq = 4793 [836] K
Rp = 3.86 [2.89] Re
a = 0.0160 [0.0067] AU
Ag = 1.57 [2.20] [0.26 σ]
Teffp = 8299 [2564] K [1.30 σ]

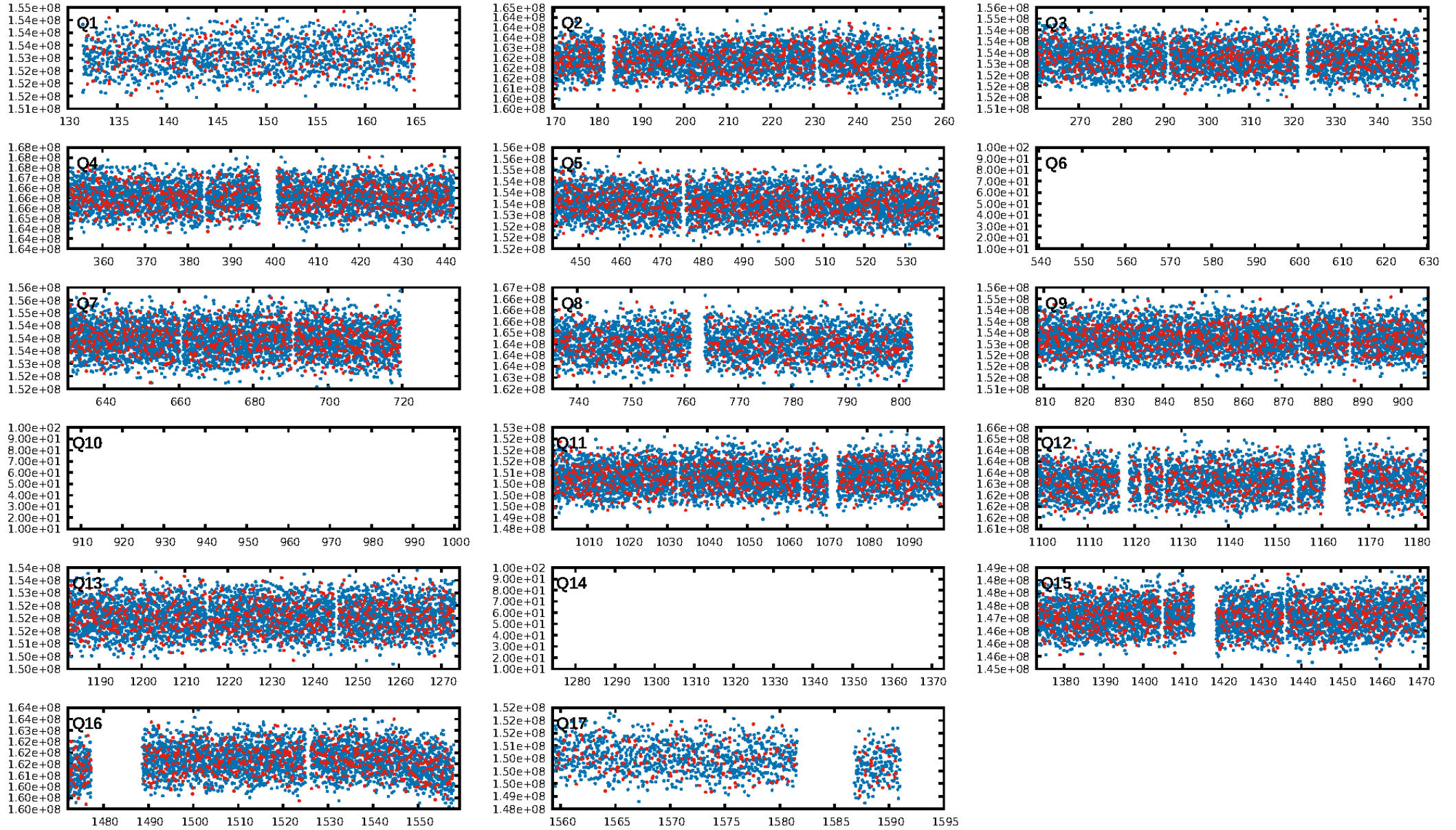
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 71.0% [1.06 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.57e-09
RollingBand-fgt: 0.91 [1701/1863]
GhostDiagnostic-chr: 1.637
Centroid-sig: 66.7%
Centroid-so: 0.194 arcsec [0.88 σ]
OotOffset-rm: 0.021 arcsec [0.10 σ]
OotOffset-st: 1/4/4/4 [13]
KicOffset-rm: 0.213 arcsec [1.04 σ]
KicOffset-st: 1/4/4/4 [13]
DiffImageQuality-fgm: 0.69 [9/13]
DiffImageOverlap-fno: 1.00 [14/14]

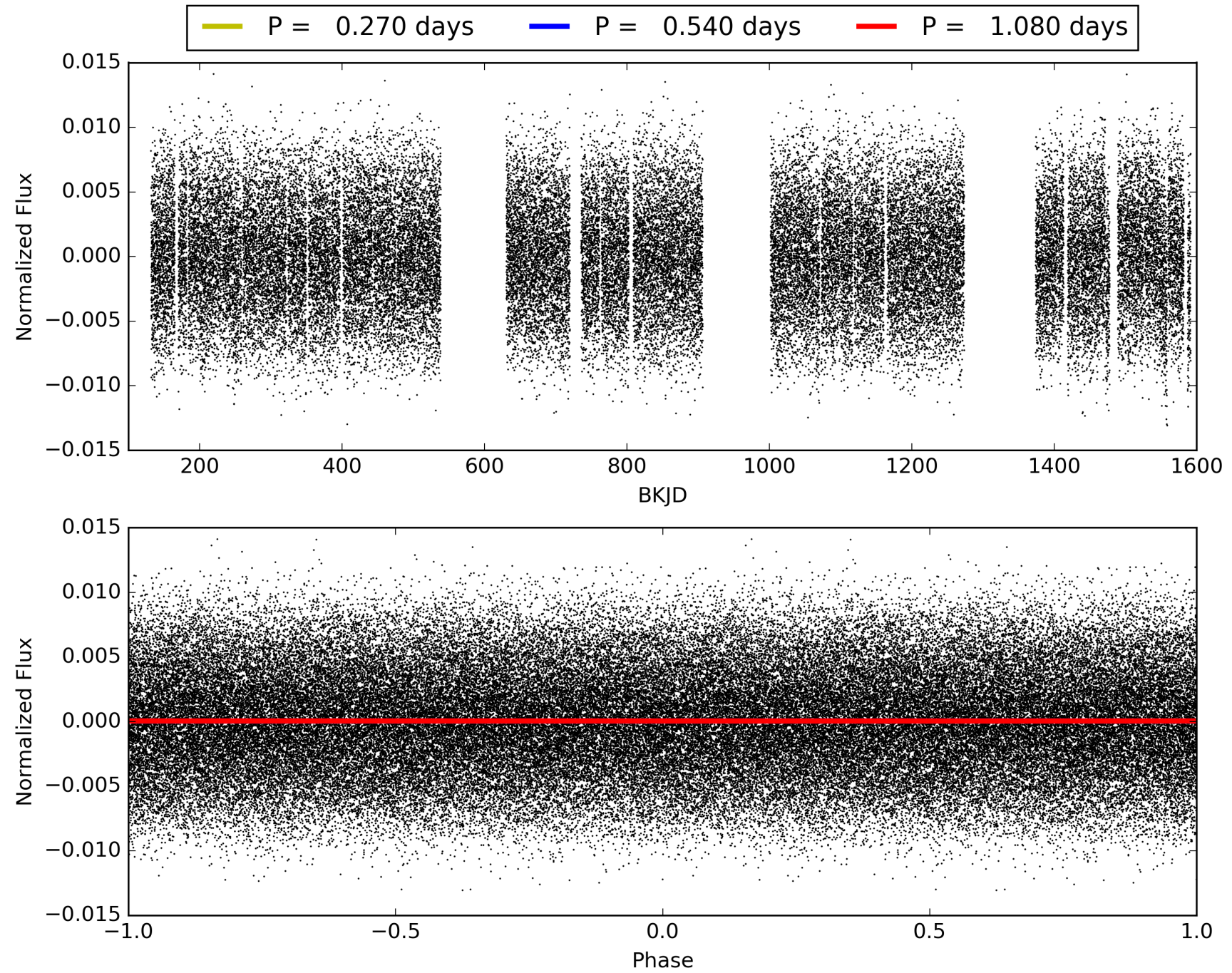
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:59:17 Z

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

TCE 004180099-01, PDC Light Curves

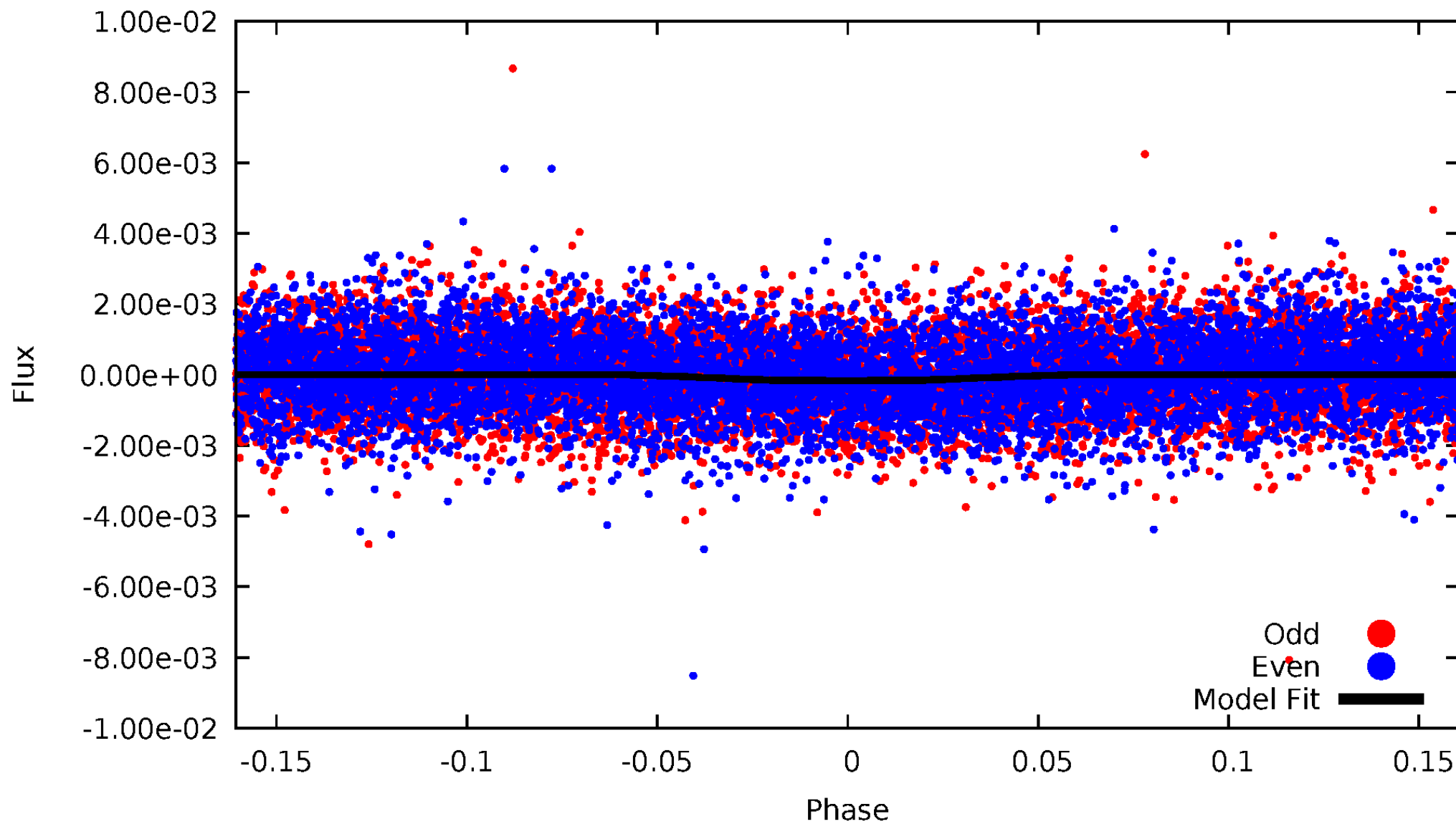


TCE 004180099-01



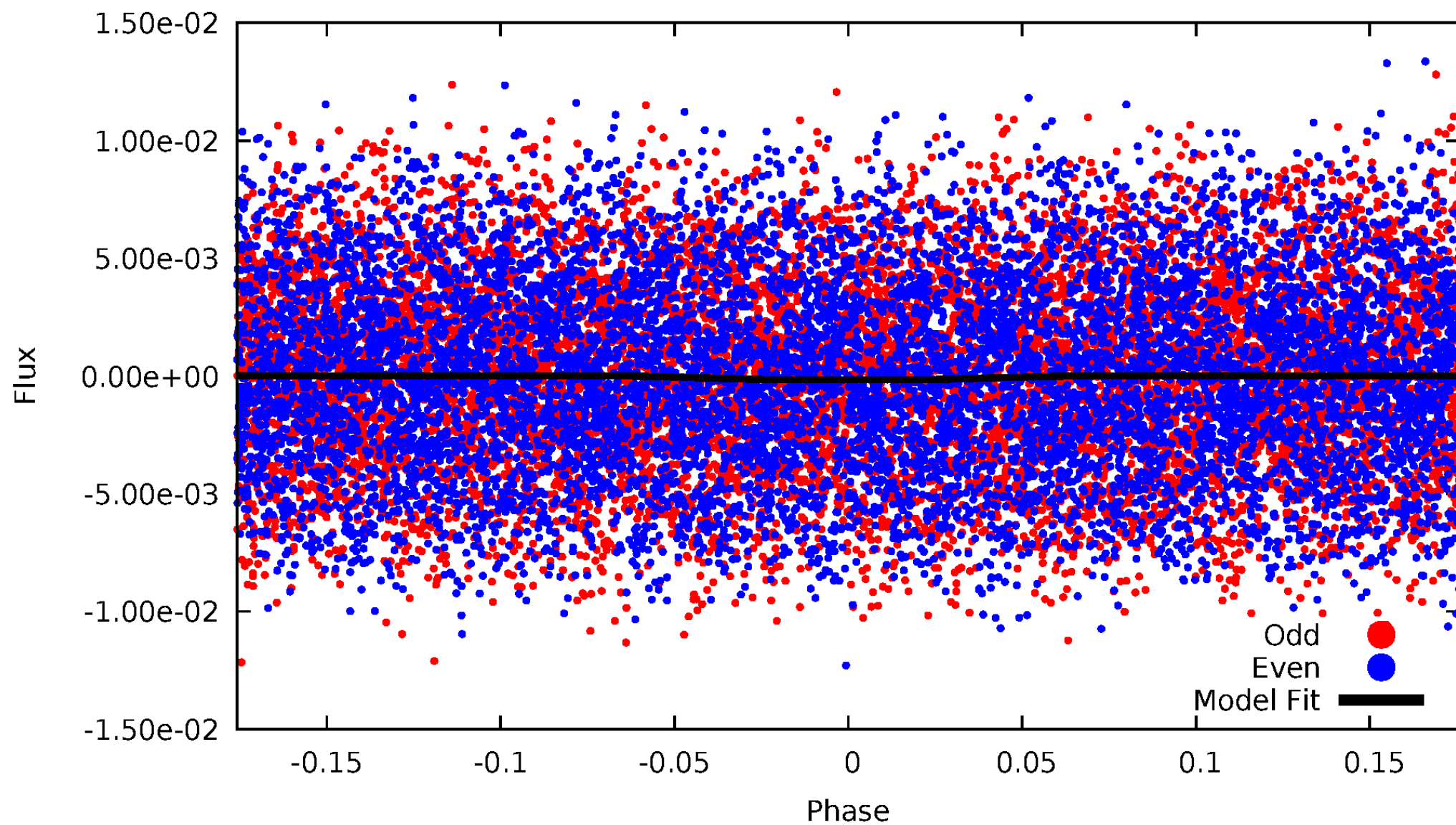
DV Odd/Even

TCE 004180099-01



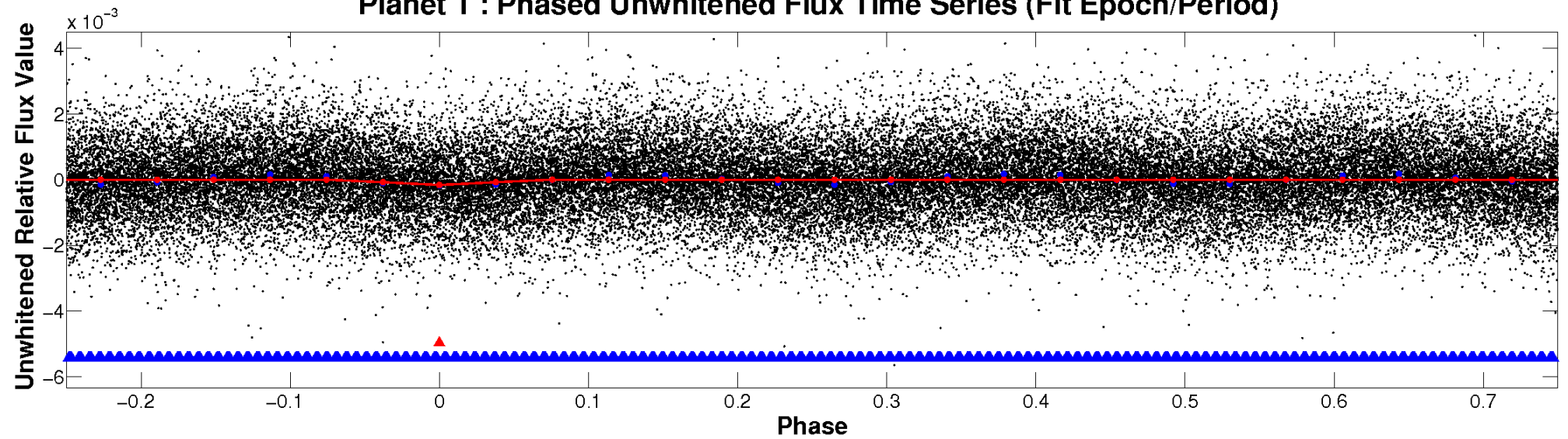
ALT Odd/Even

TCE 004180099-01

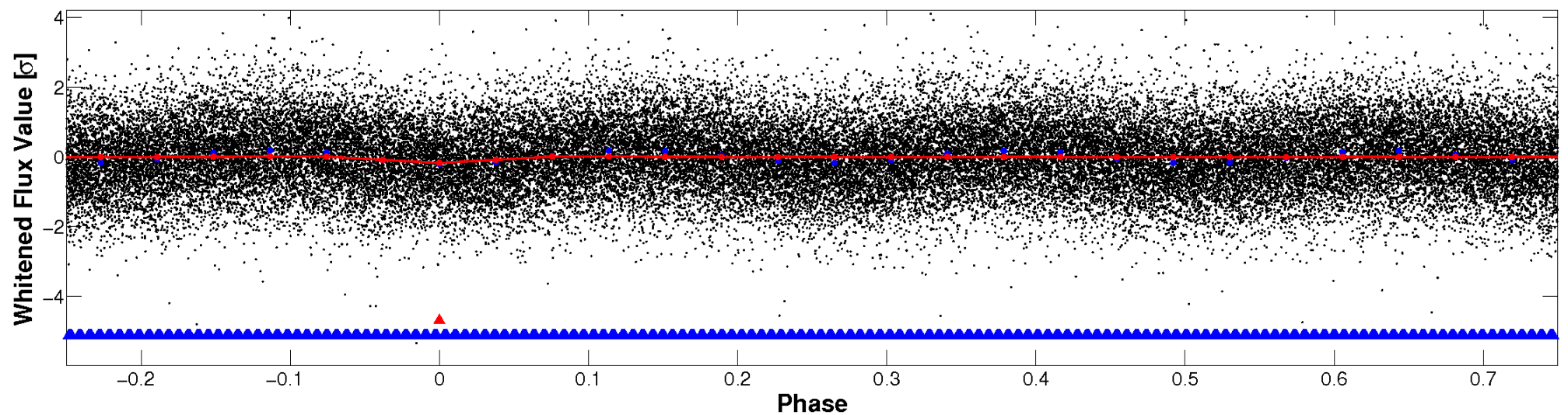


Non-Whitened Vs. Whitened Light Curve

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

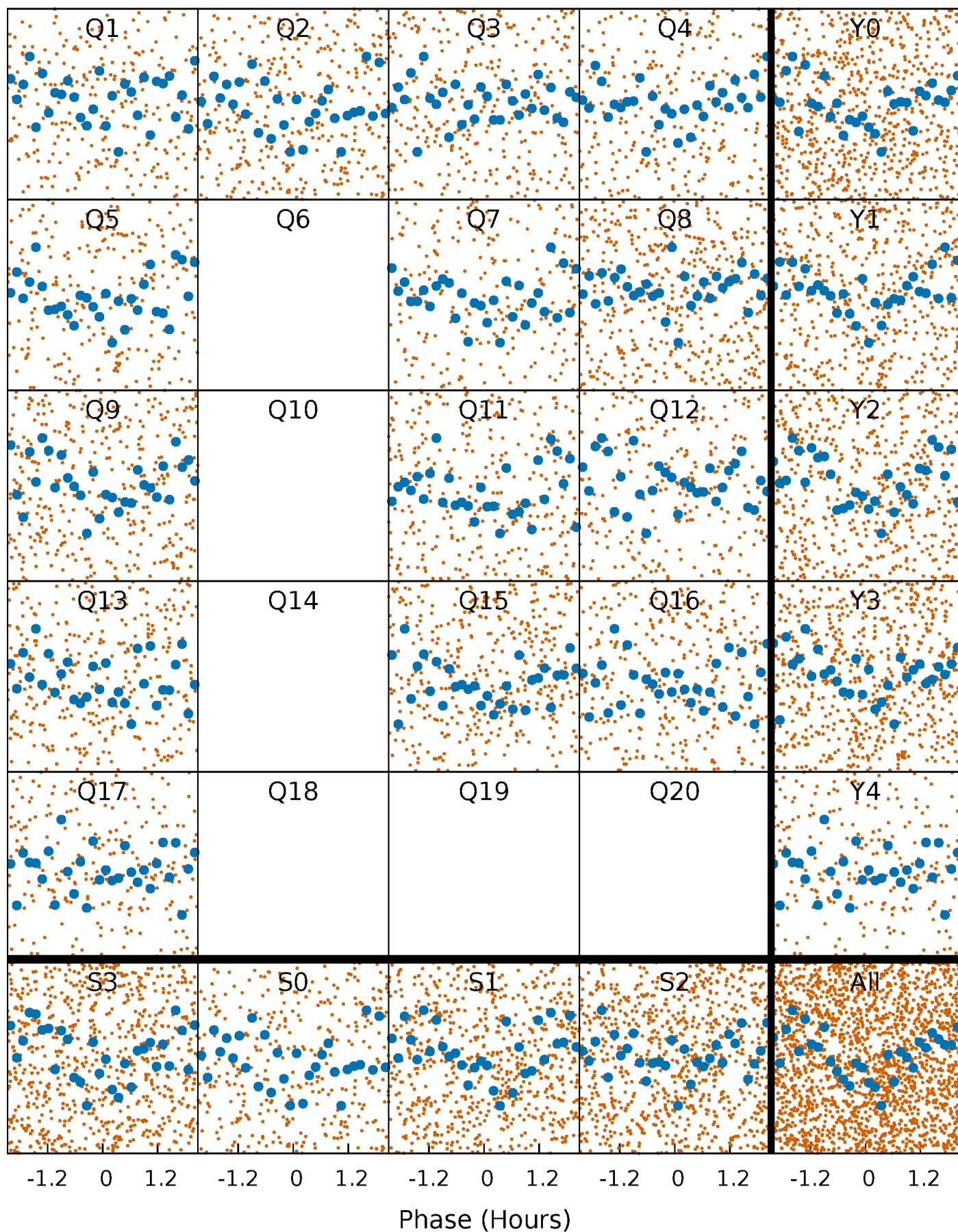


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



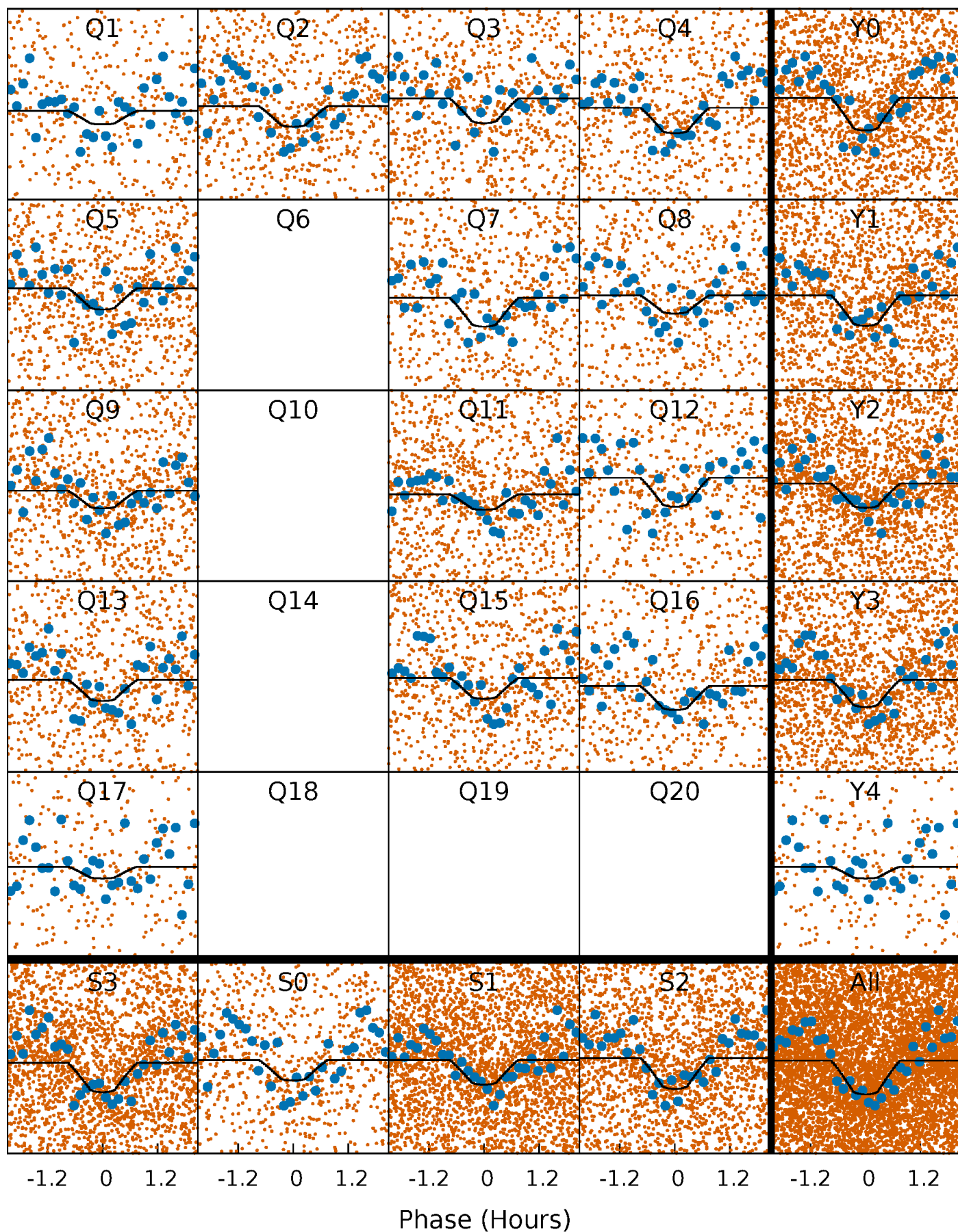
PDC Quarter-Phased Transit Curves

TCE 004180099-01 P= 0.539798 Days $T_0=131.993914$ (BKJD)



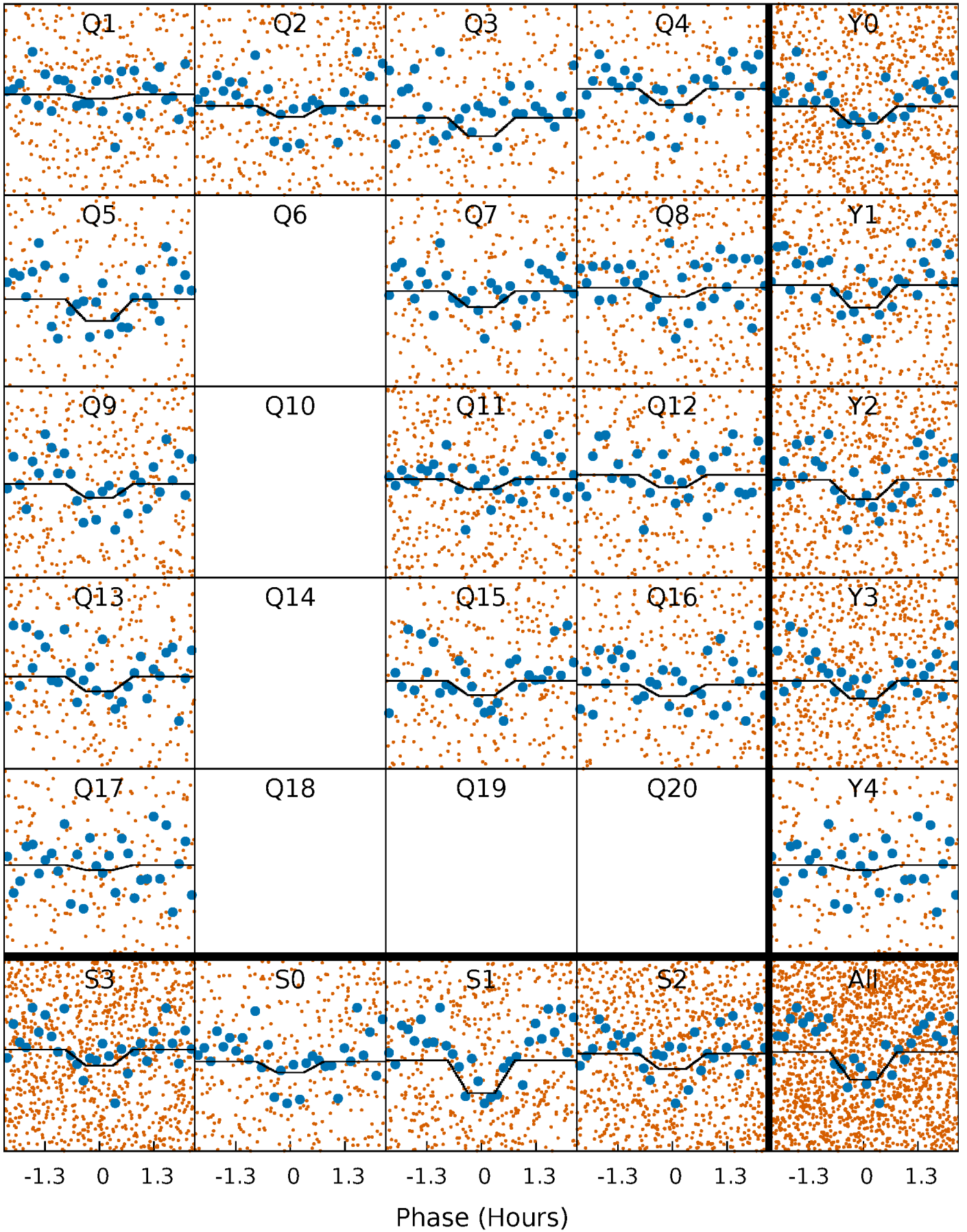
DV Quarter-Phased Transit Curves

TCE 004180099-01 P= 0.539798 Days $T_0=131.993914$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

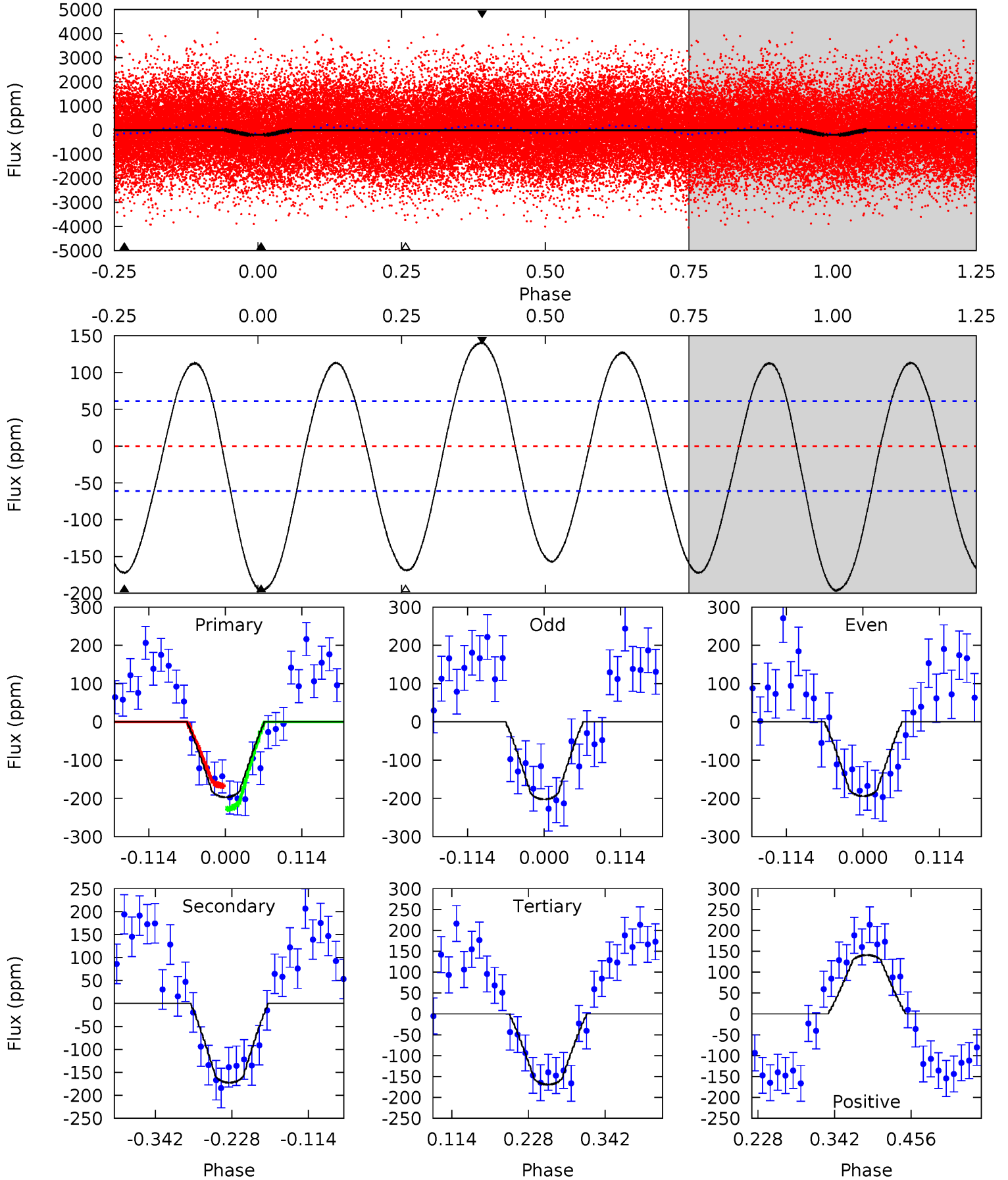
TCE 004180099-01 P= 0.539798 Days $T_0=131.993914$ (BKJD)



DV Model-Shift Uniqueness Test

004180099-01, P = 0.539798 Days, E = 131.454116 Days

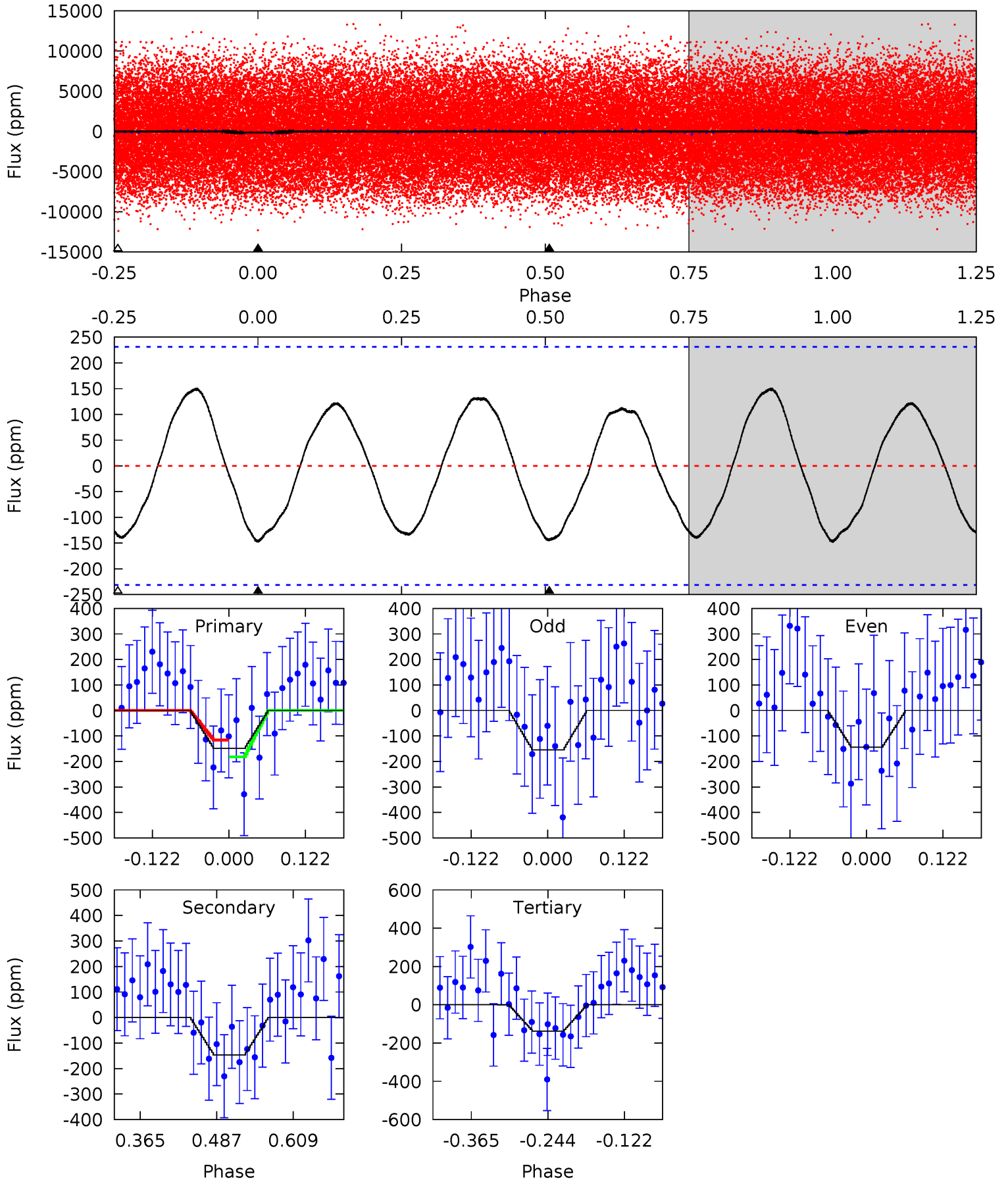
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.6	12.8	12.6	10.5	4.54	1.58	7.70	2.06	4.17	0.25	2.36	0.31	1.12	0.42	2.25



Alt Model-Shift Uniqueness Test

004180099-01, P = 0.539798 Days, E = 131.454116 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.92	2.86	2.70	0	4.52	1.55	1.80	0.22	2.92	0.17	2.86	0.10	1.17	0.50	0.64



Stellar Parameters For KIC 004180099

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8076^{+223}_{-335}	$3.786^{+0.399}_{-0.070}$	$-0.200^{+0.200}_{-0.350}$	$2.887^{+0.393}_{-1.256}$	$1.856^{+0.094}_{-0.377}$	$0.109^{+0.344}_{-0.026}$
	+3%/-4%	+11%/-2%	+100%/-175%	+14%/-44%	+5%/-20%	+316%/-24%
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 004180099-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-173 ± 13	$3.46^{+2.40}_{-1.80}$	6459^{+451}_{-668}	7906^{+6091}_{-2366}	$1.968^{+6.727}_{-1.290}$
Alt.	-146 ± 51	$3.53^{+2.43}_{-1.90}$	6458^{+441}_{-720}	7124^{+6427}_{-2397}	$1.600^{+6.113}_{-1.113}$

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 $A_{obs} \gg 1.0$

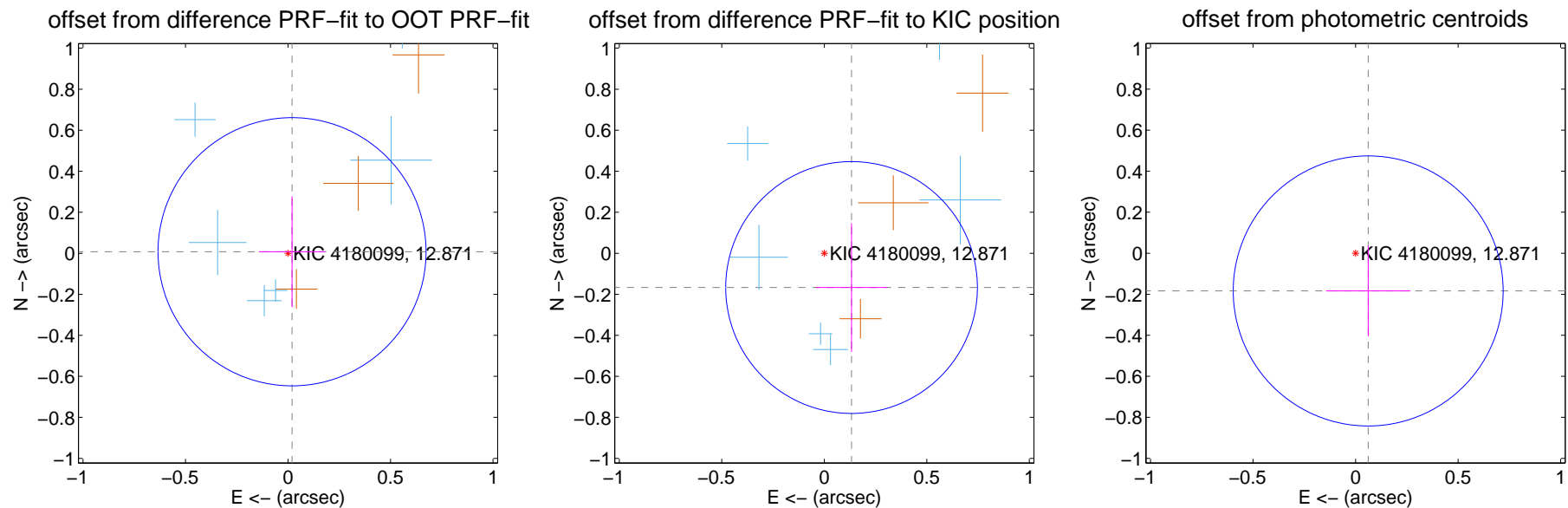
DV Centroid Data

Supplemental centroid analysis for 004180099-01. Kepler magnitude: 12.87. Transit SNR 9.68

There are 9 quarters with good PRF difference image offsets

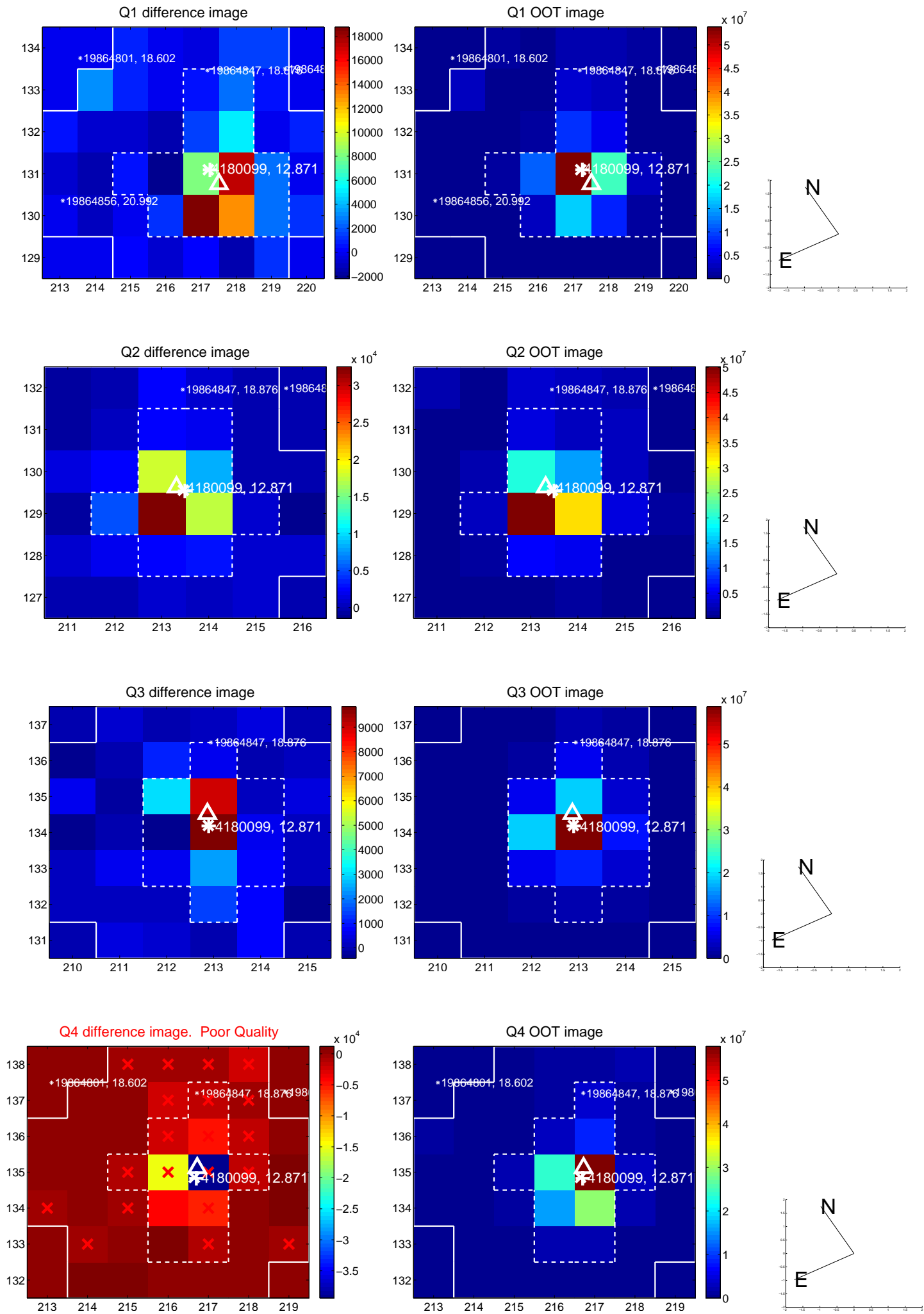
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.021 ± 0.218	0.10	-0.020 ± 0.162	0.007 ± 0.271
PRF-fit source offset from KIC position	0.213 ± 0.205	1.04	-0.133 ± 0.175	-0.167 ± 0.314
photometric centroid source offset	0.19 ± 0.22	0.88	-0.06 ± 0.21	-0.18 ± 0.22

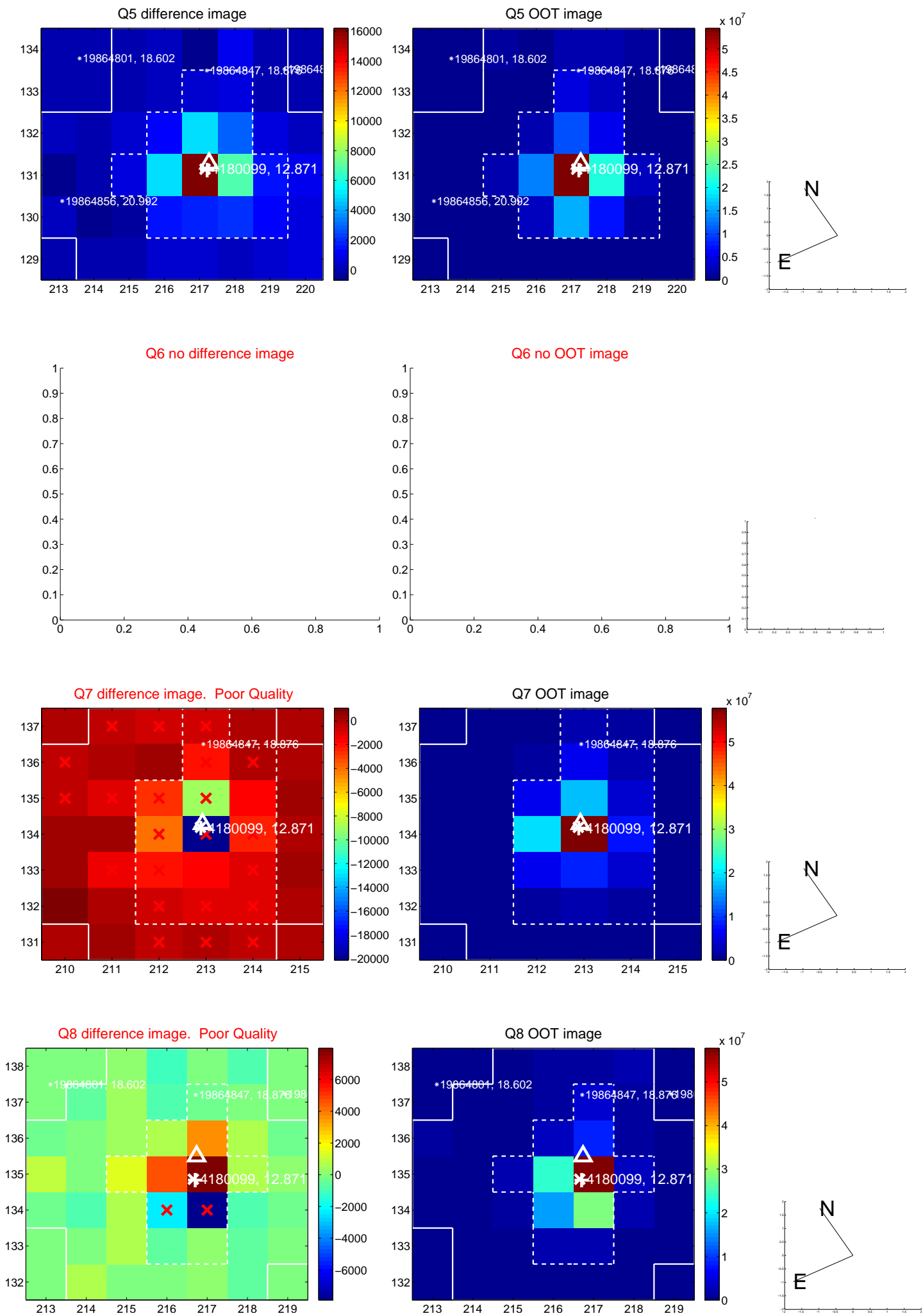


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

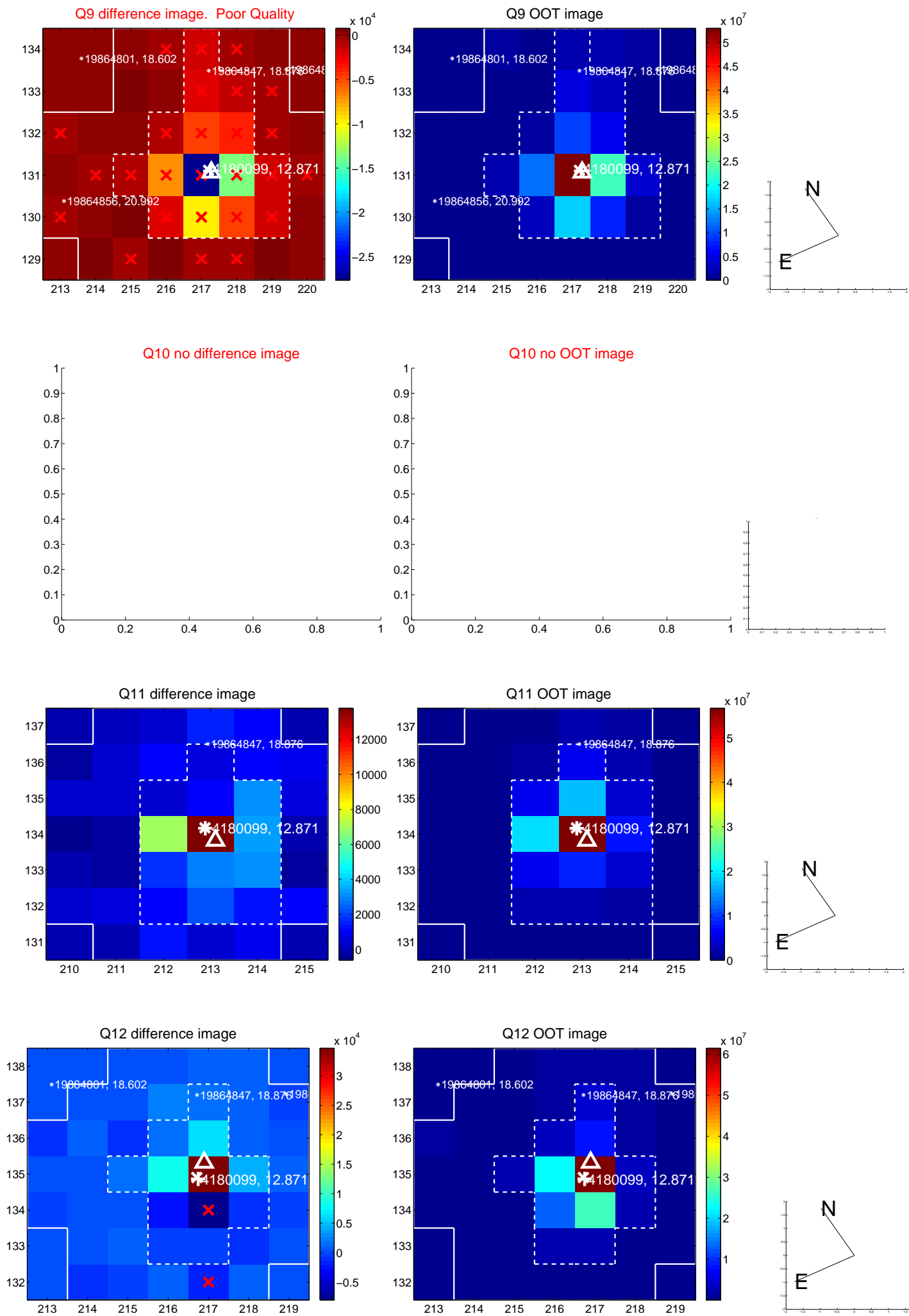
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



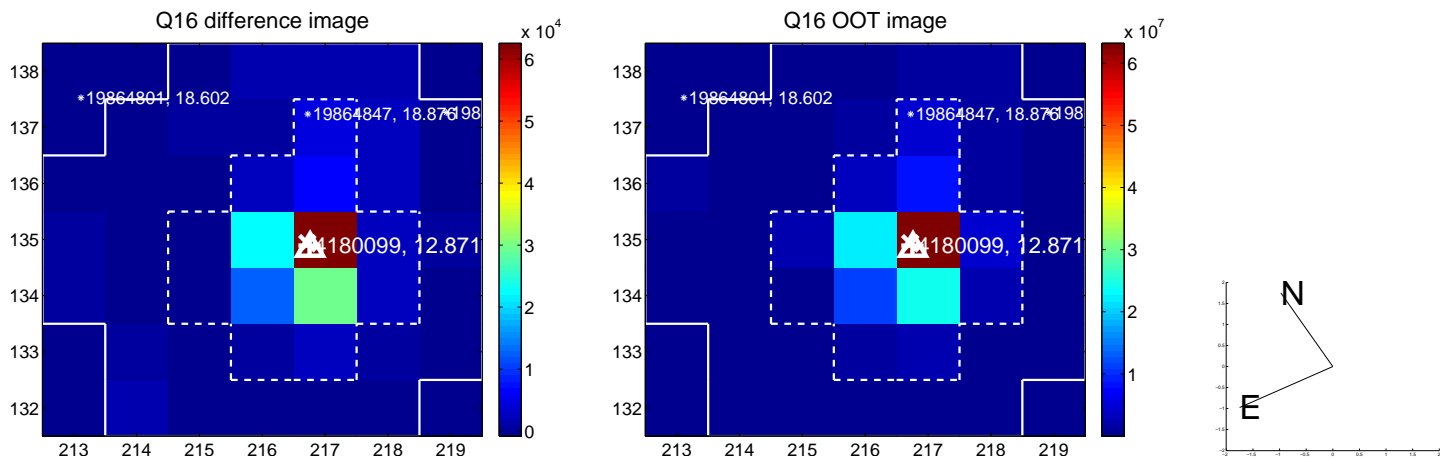
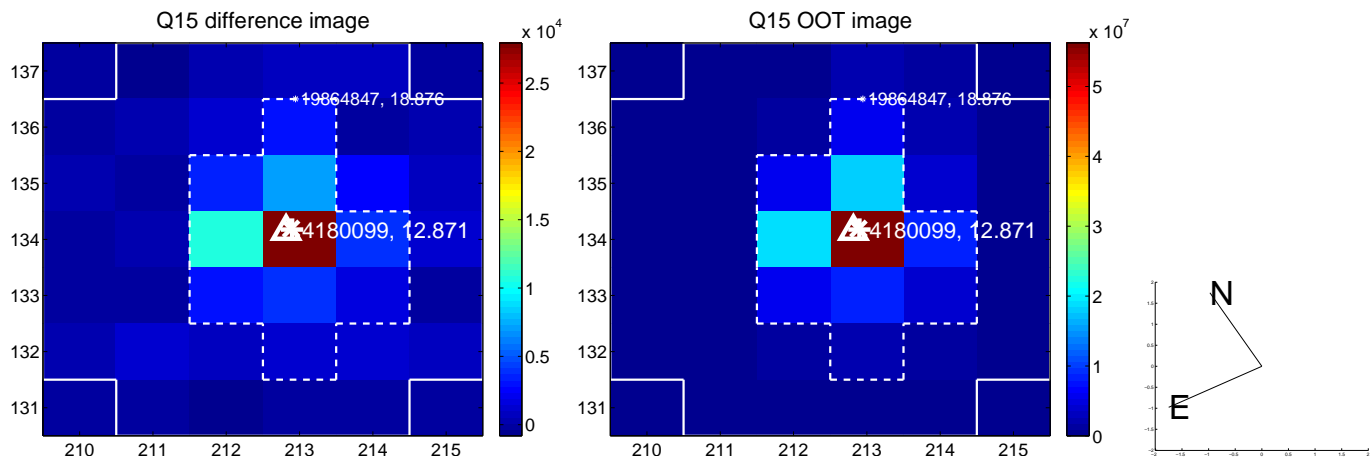
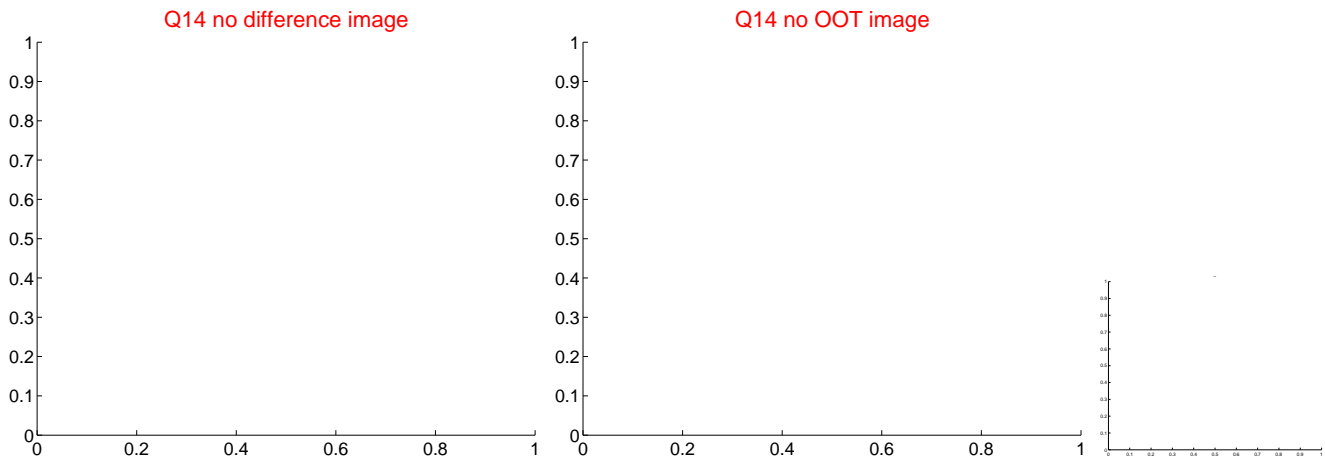
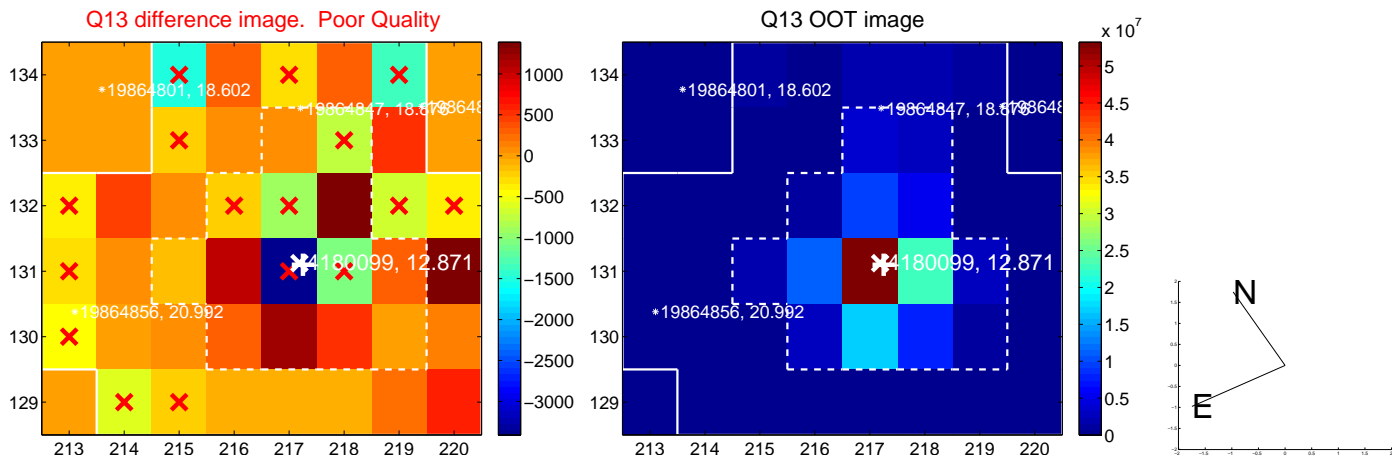
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



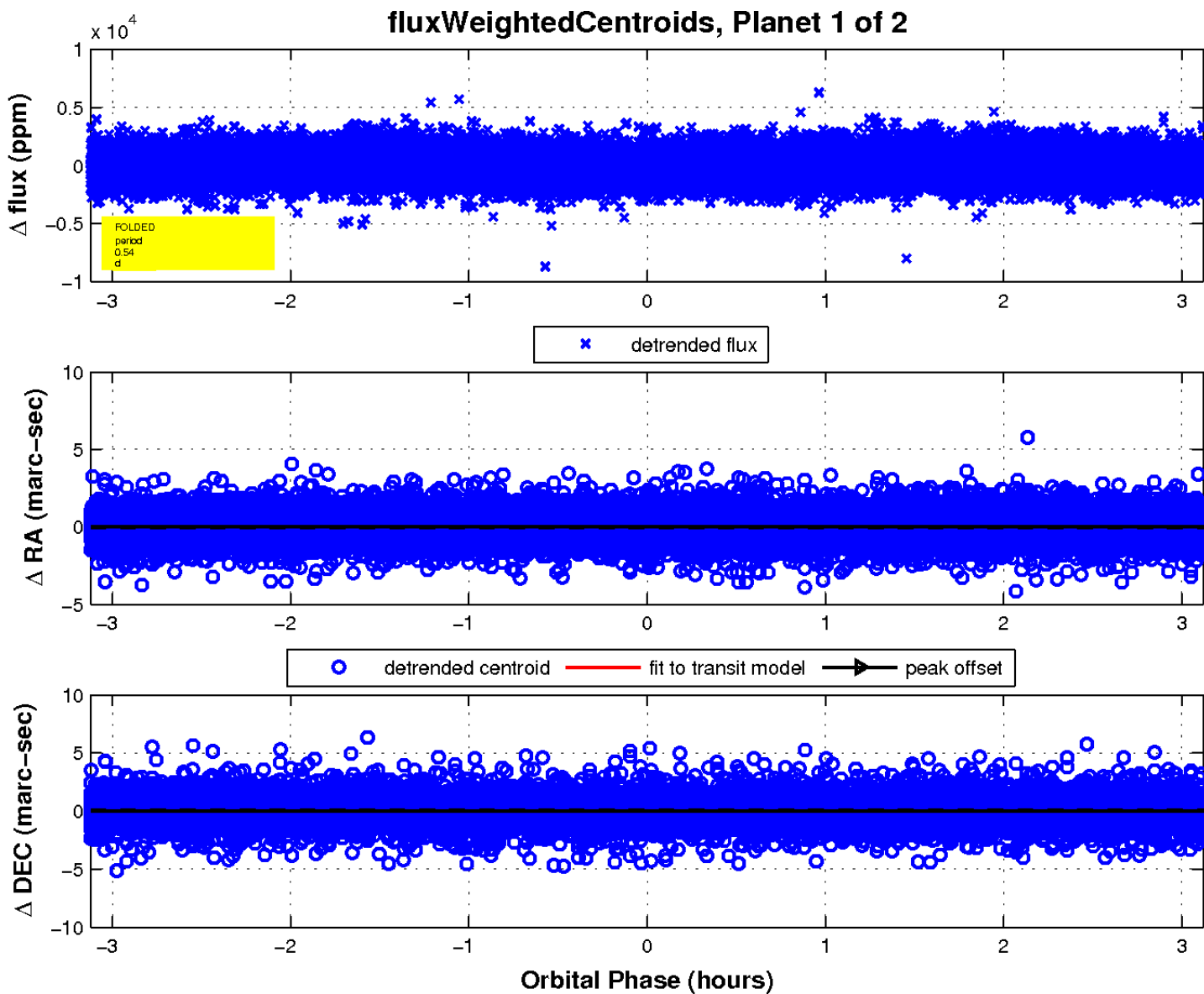
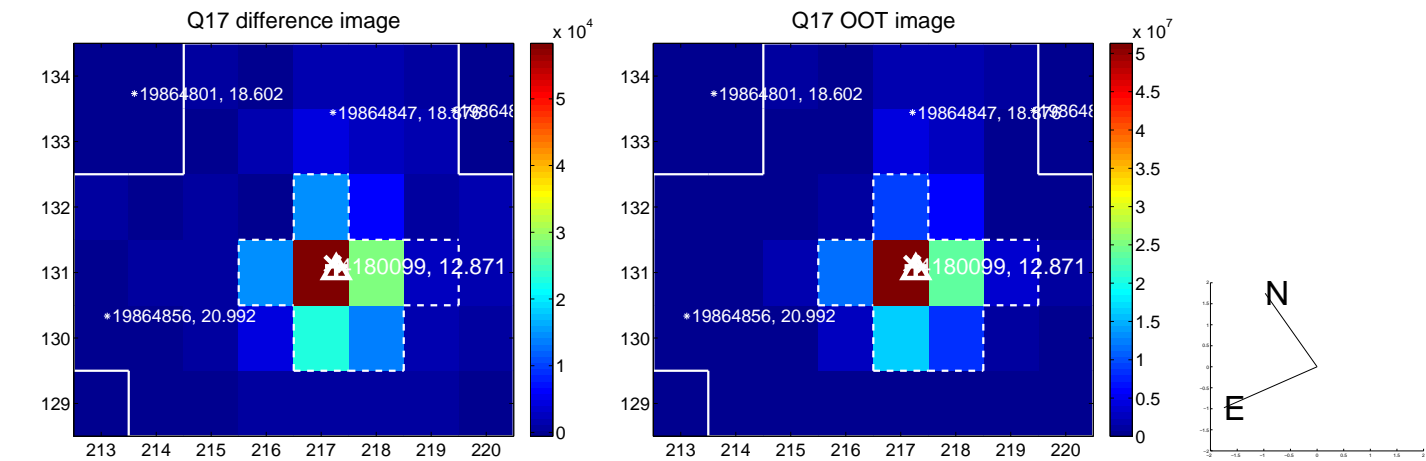
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

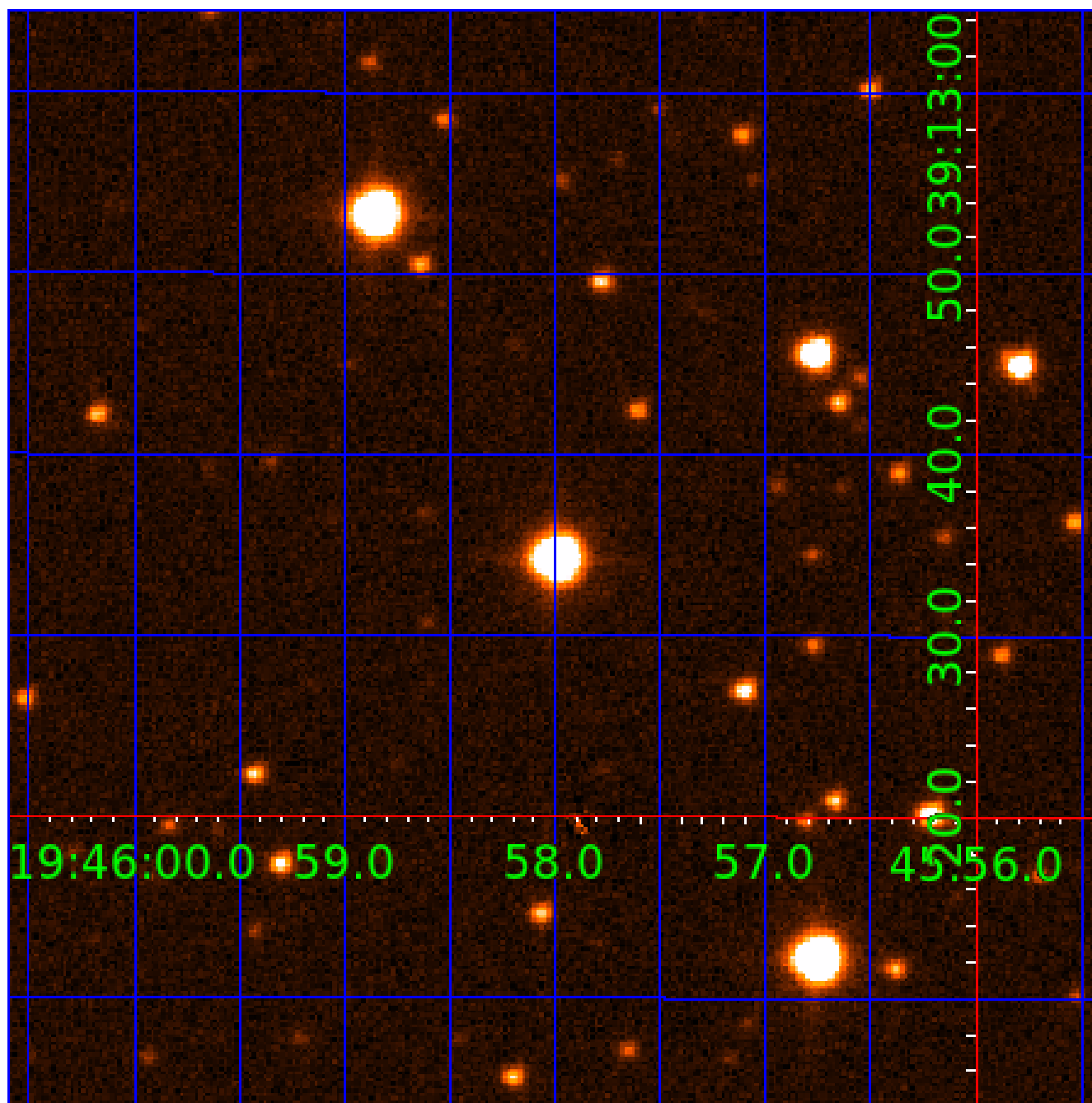


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004180099

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})
004180099-01	OBS	No	0.539798	131.993914	164.7	1.040	11.7	9.7	2.89	8076	3.86	124834.76
004180099-02	OBS	No	0.743563	131.968044	110.7	4.501	10.6	9.1	2.89	8076	3.09	81449.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004180099-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
004180099-02	OBS	FP	0.00	1	0	0	0	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.

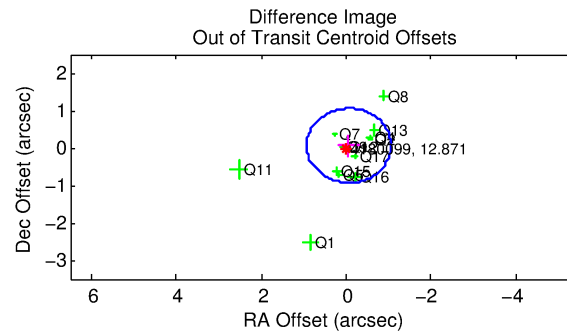
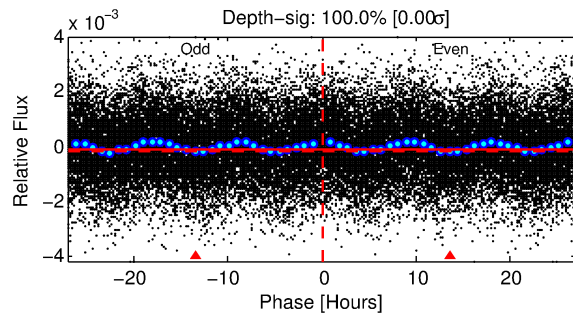
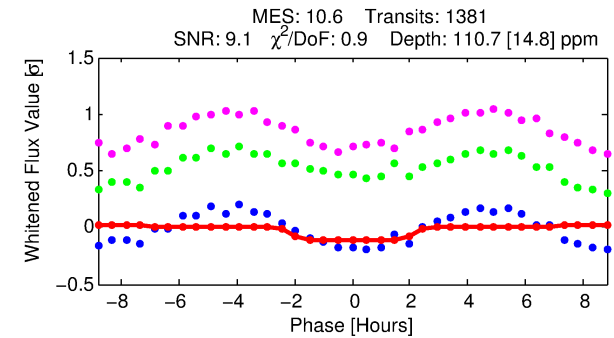
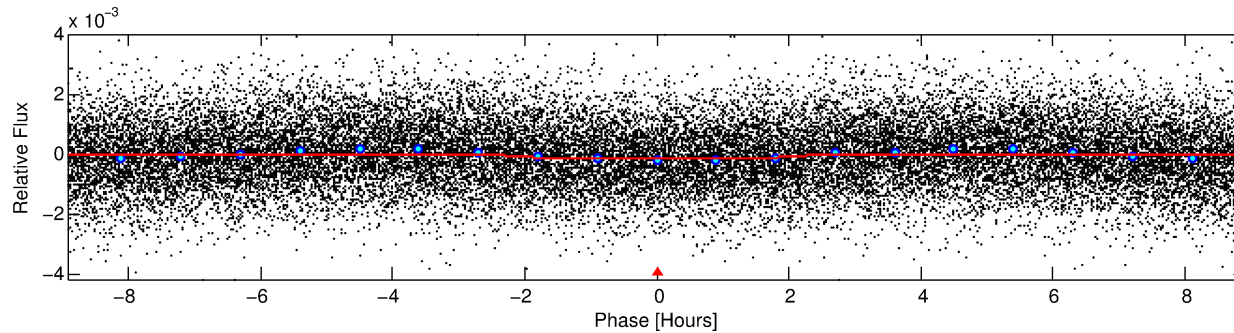
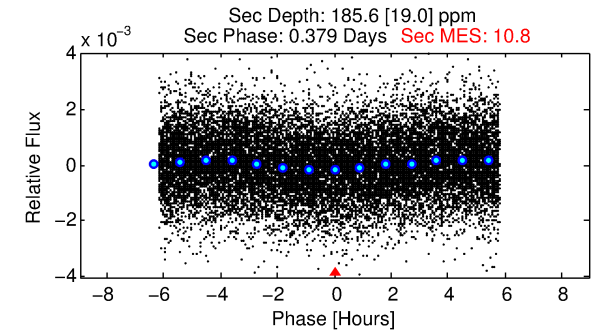
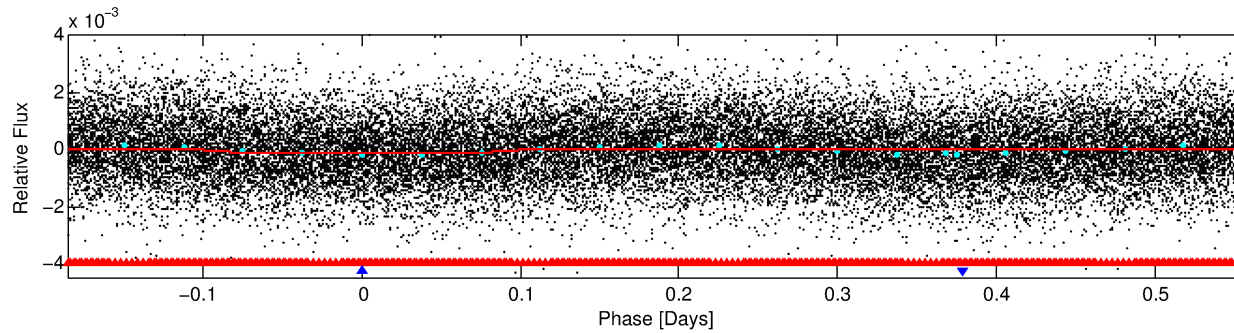
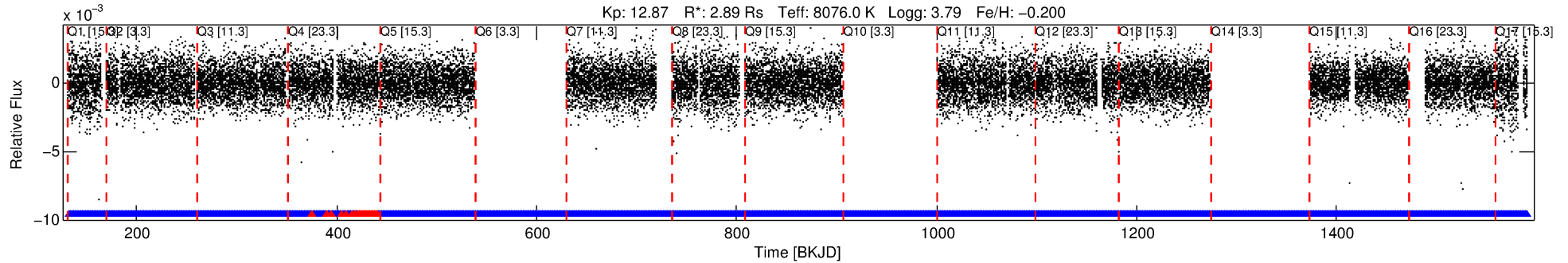
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004180099-02

No Significant Match Found

DV One-Page Summary

KIC: 4180099 Candidate: 2 of 2 Period: 0.744 d



DV Fit Results:

Period = 0.74356 [0.00001] d
Epoch = 131.9680 [0.0062] BKJD
Rp/R* = 0.0098 [0.0186]
a/R* = 1.39 [6.96]
b = 0.30 [32.11]
Seff = 81449.32 [56827.61]
Teq = 4308 [751] K
Rp = 3.09 [6.00] Re
a = 0.0197 [0.0083] AU
Ag = 4.18 [16.08] [0.20σ]
Teffp = 9522 [9031] K [0.58σ]

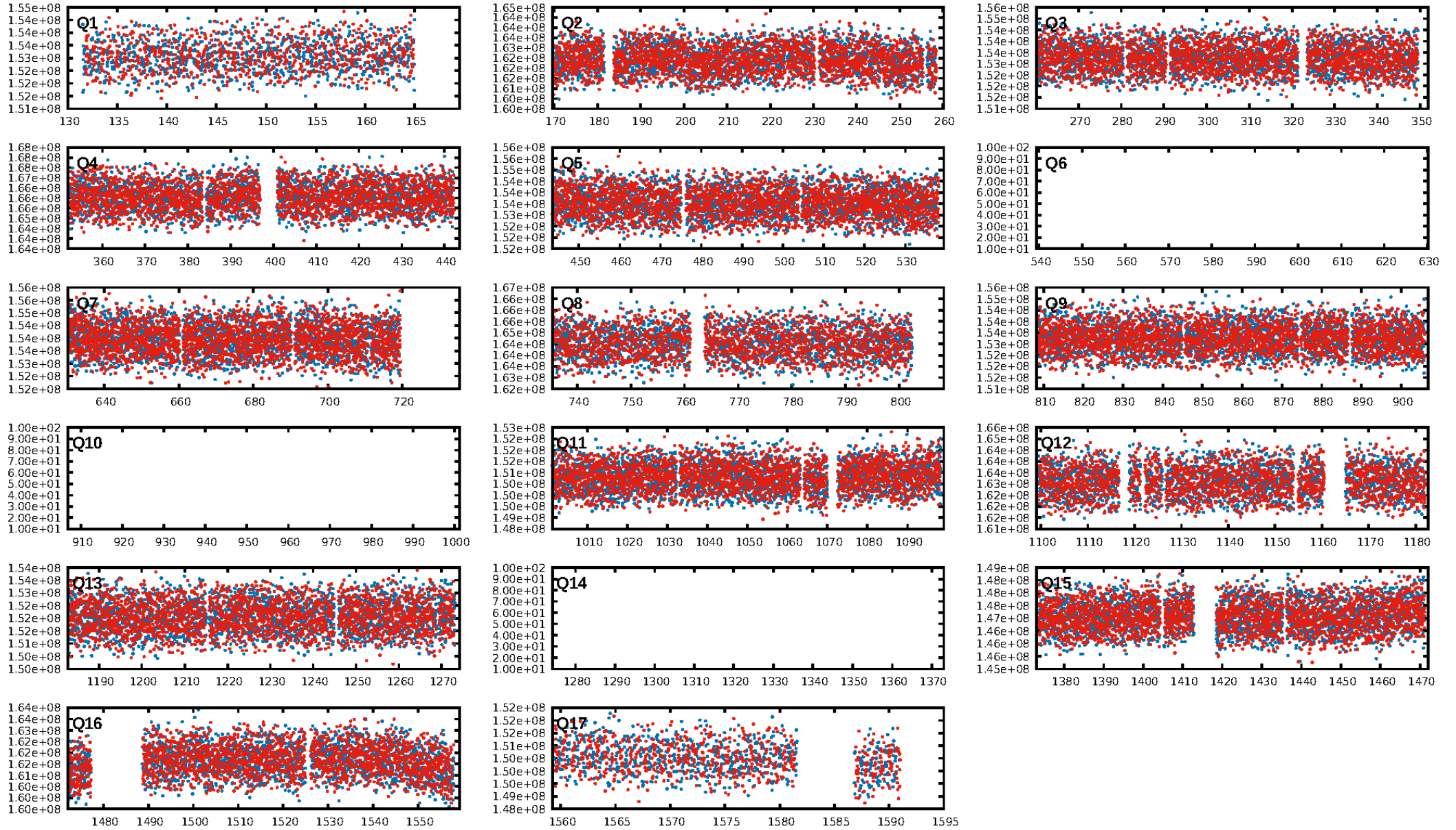
DV Diagnostic Results:

ShortPeriod-sig: 71.0% [1.06σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.24e-07
RollingBand-fgt: 0.98 [1273/1303]
GhostDiagnostic-chr: 2.972
Centroid-sig: 10.2%
Centroid-so: 0.144 arcsec [0.75σ]
OotOffset-rm: 0.092 arcsec [0.28σ]
KicOffset-rm: 0.185 arcsec [1.00σ]
OotOffset-st: 1/3/4/5 [13]
KicOffset-st: 1/3/4/5 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 0.00 [0/14]

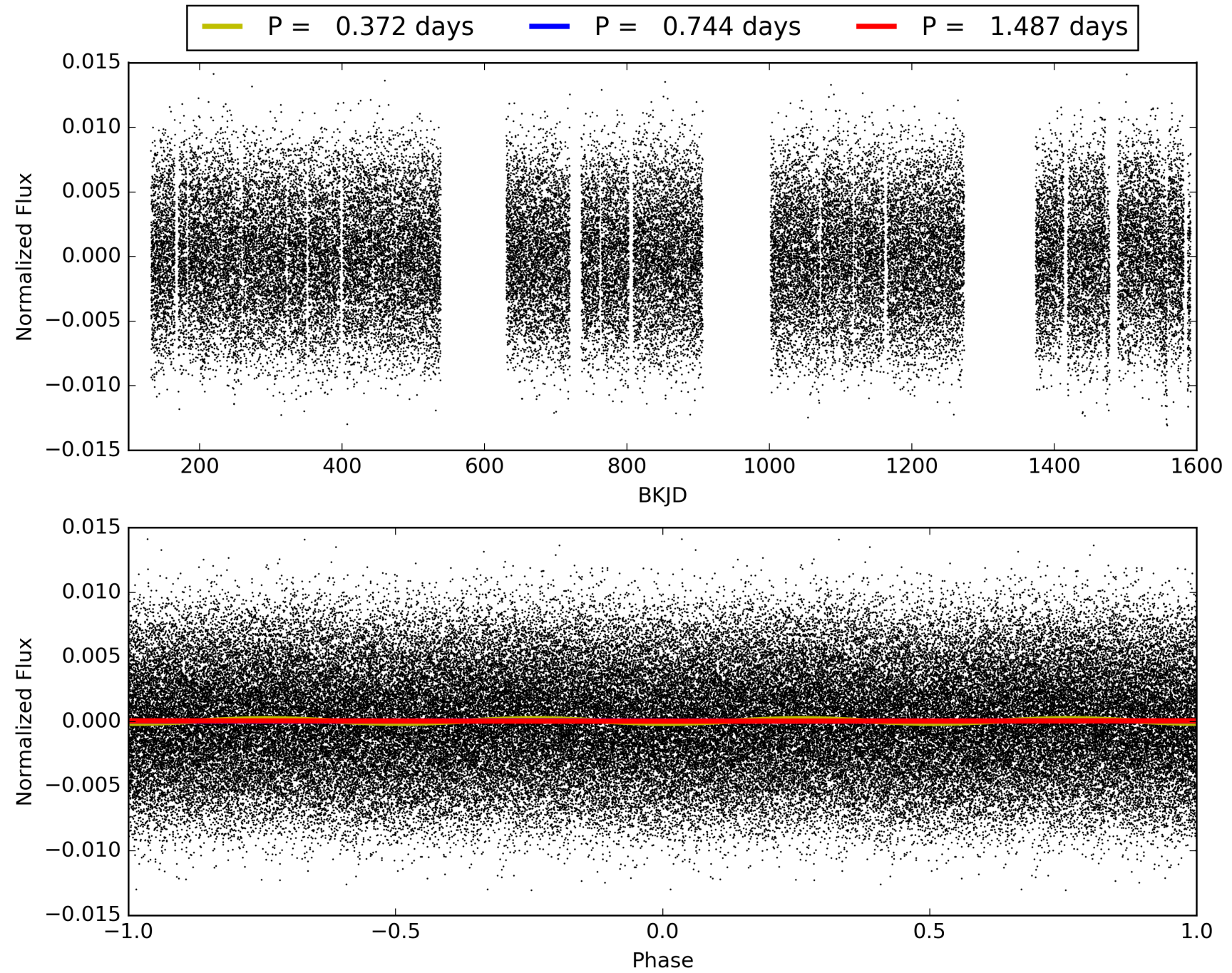
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:59:29 Z

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

TCE 004180099-02, PDC Light Curves

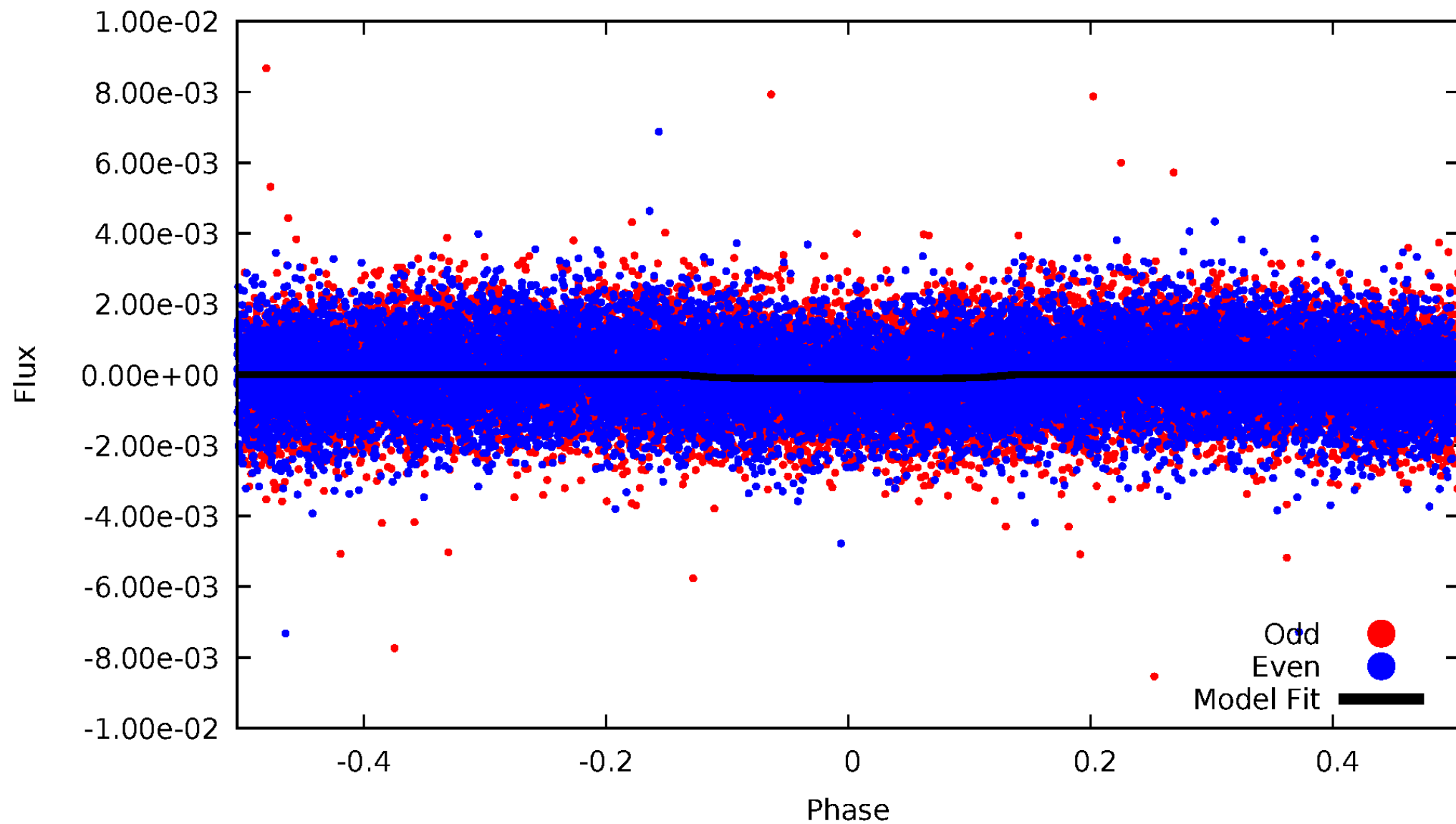


TCE 004180099-02



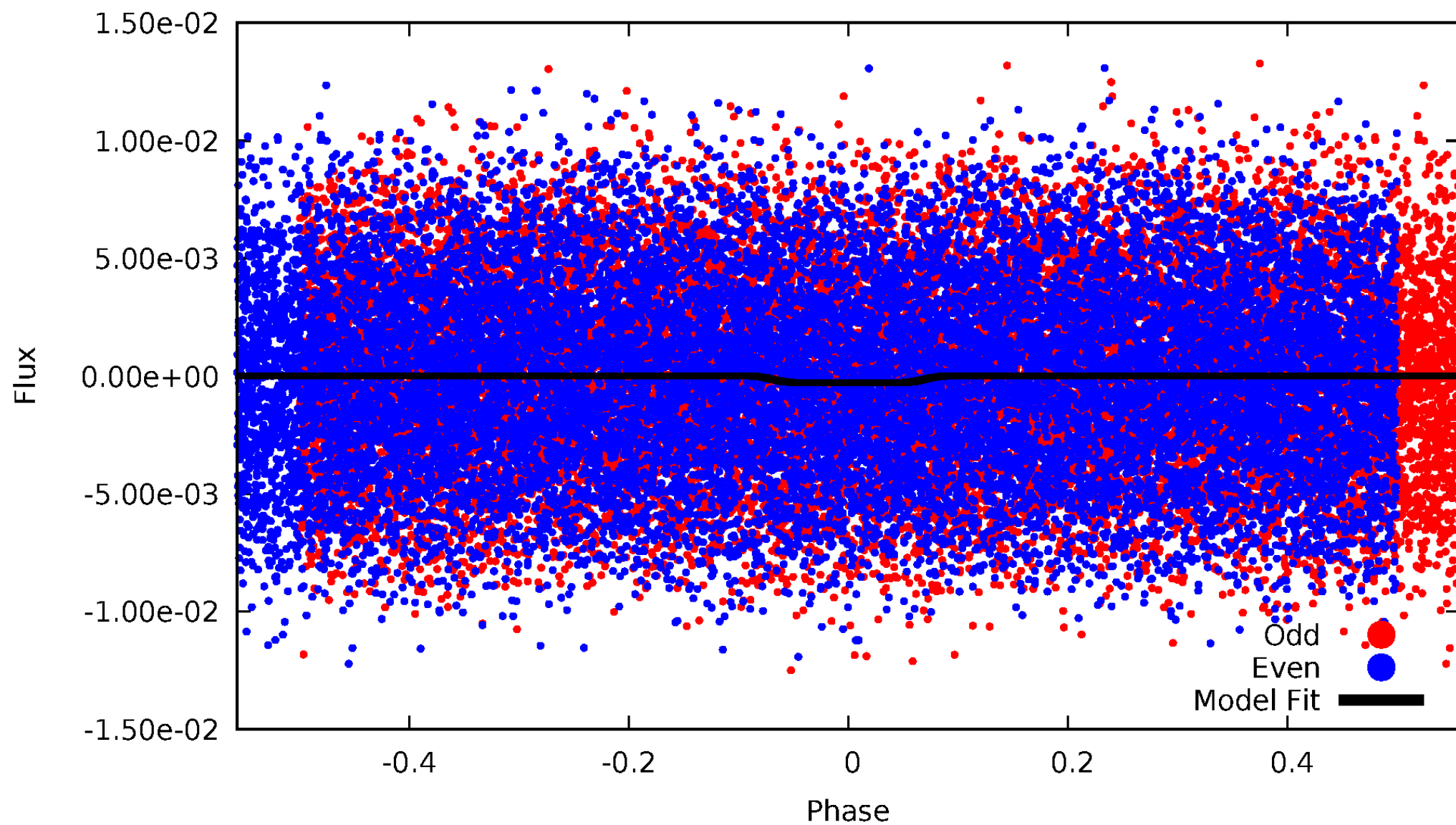
DV Odd/Even

TCE 004180099-02



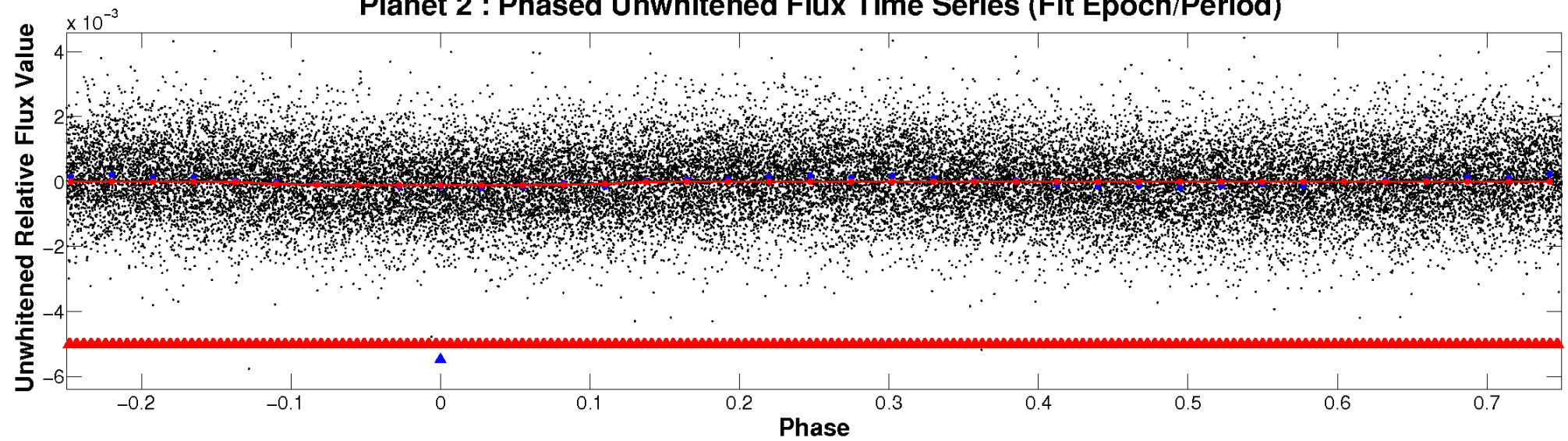
ALT Odd/Even

TCE 004180099-02

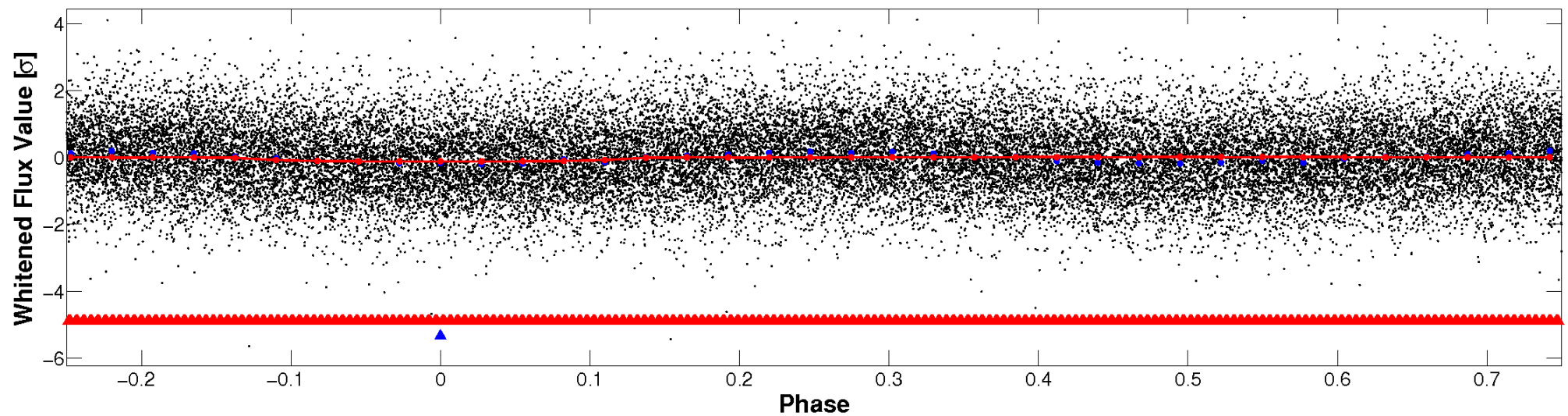


Non-Whitened Vs. Whitened Light Curve

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

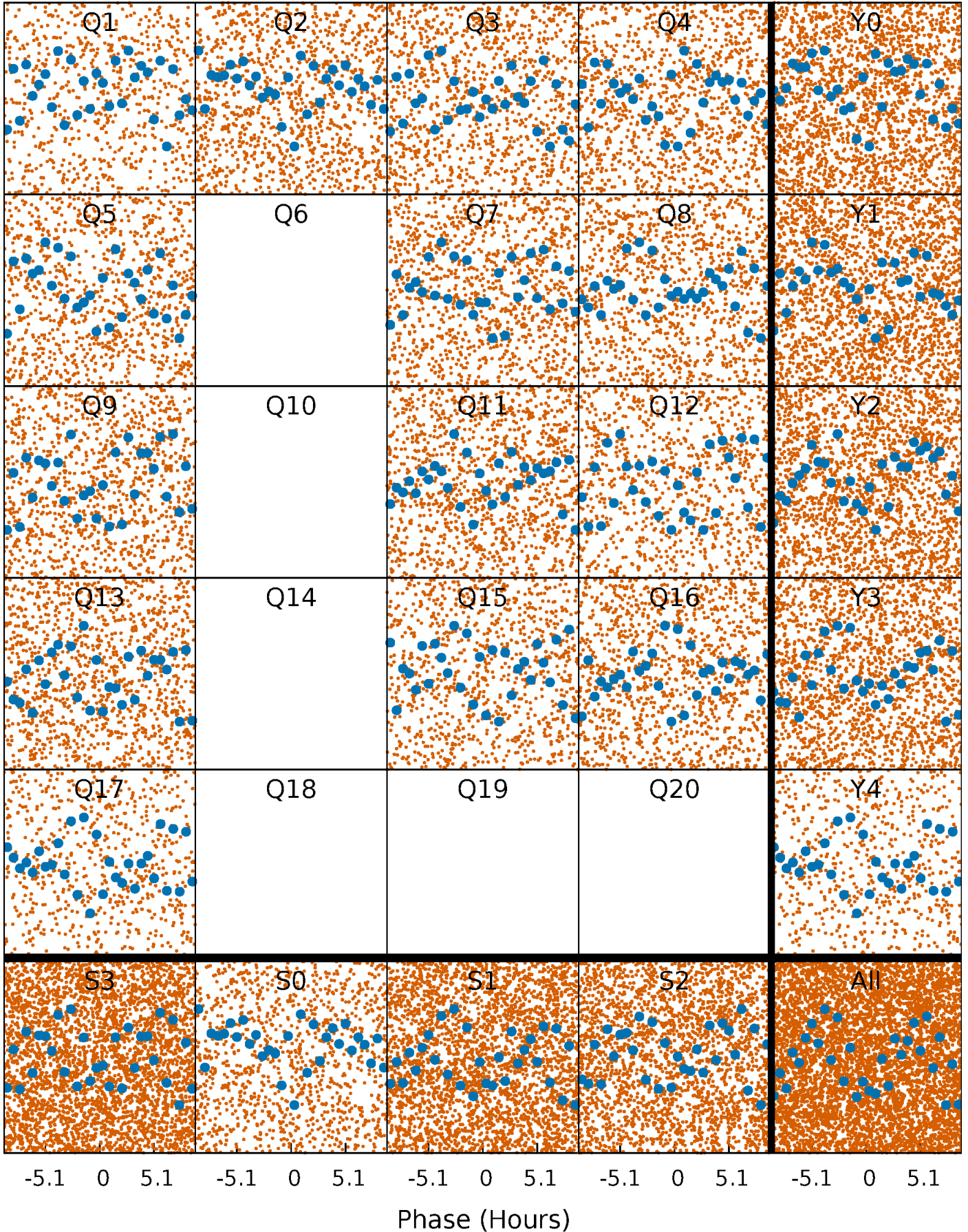


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



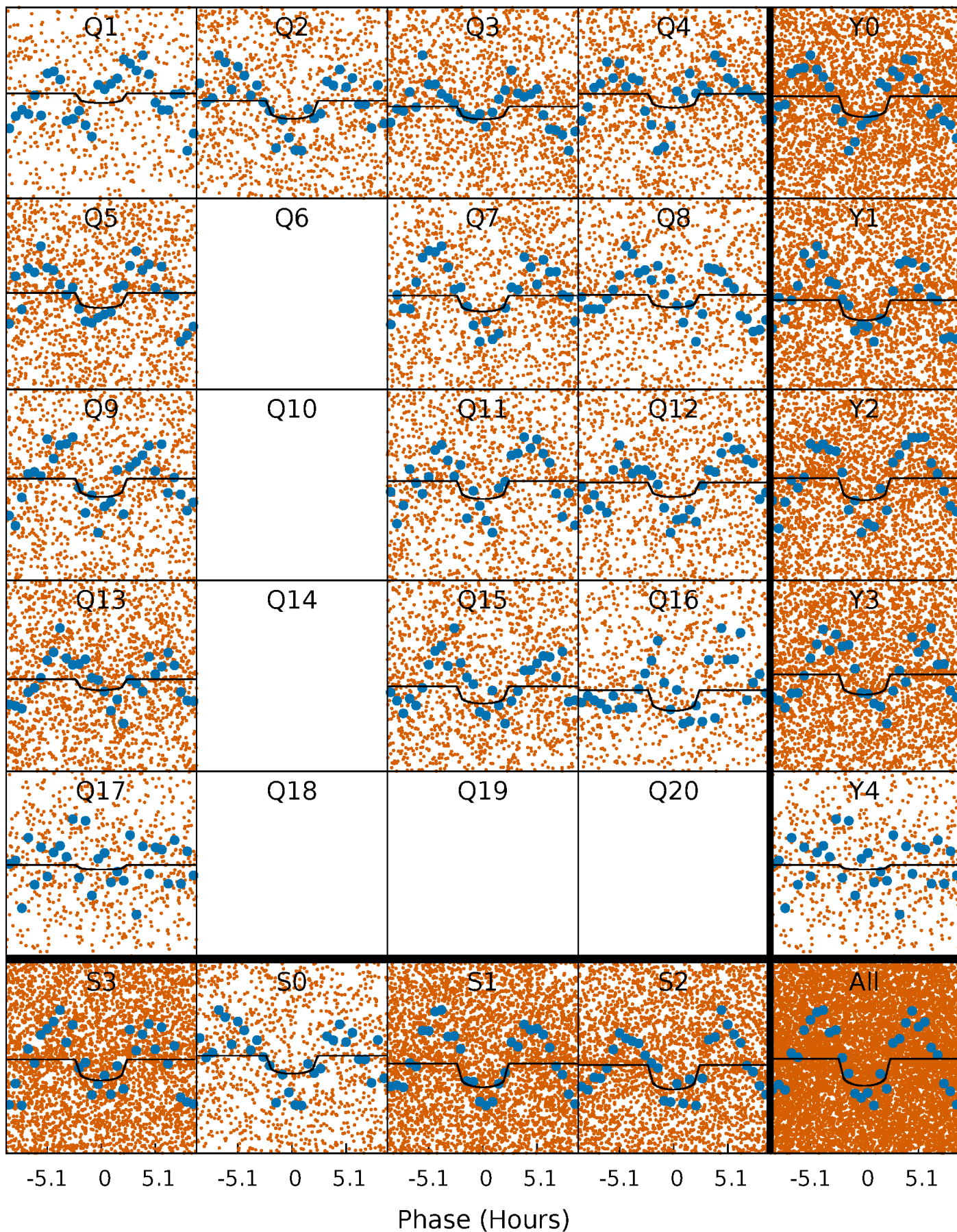
PDC Quarter-Phased Transit Curves

TCE 004180099-02 P= 0.743563 Days $T_0=131.968044$ (BKJD)



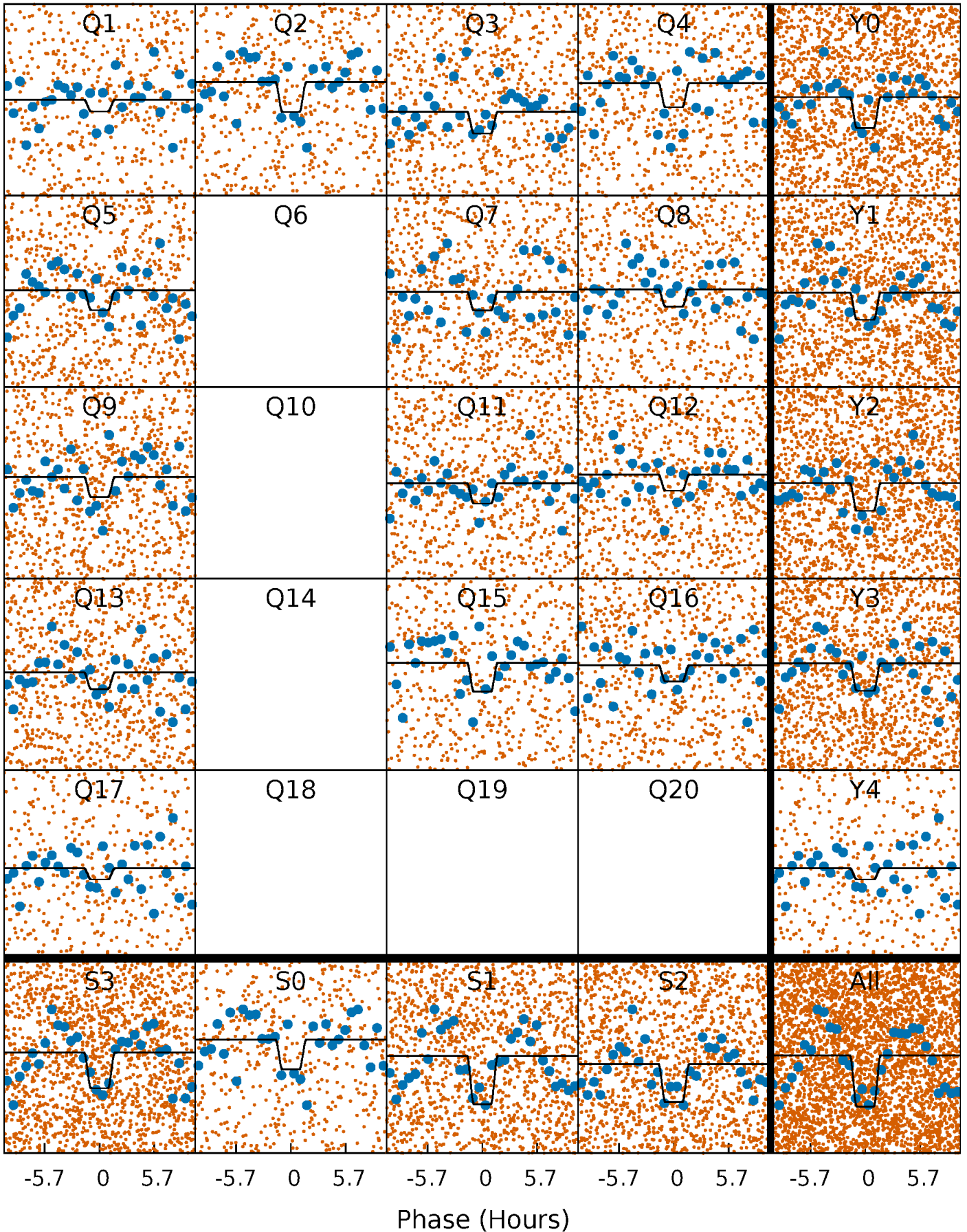
DV Quarter-Phased Transit Curves

TCE 004180099-02 P= 0.743563 Days $T_0=131.968044$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

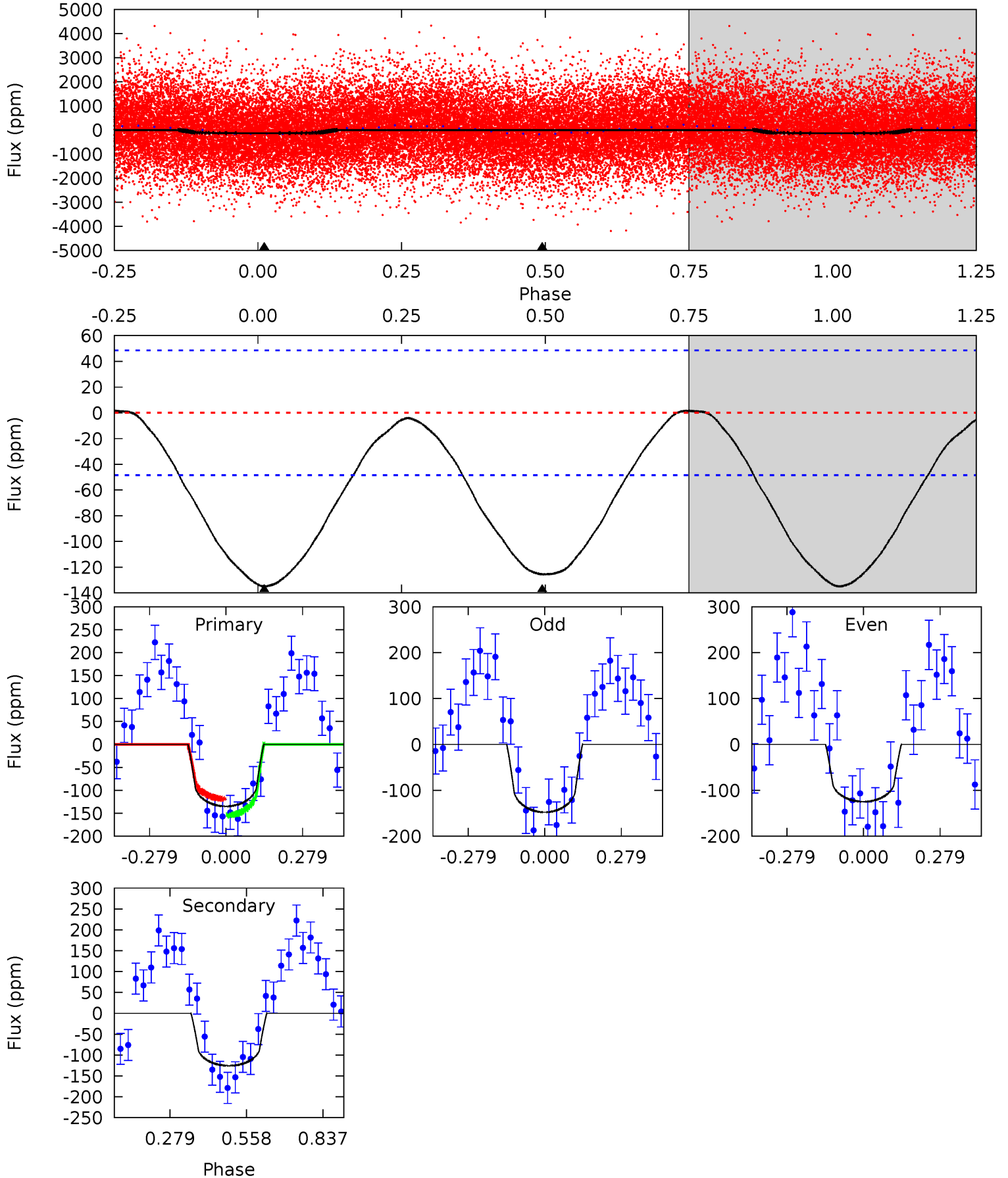
TCE 004180099-02 $P = 0.743633$ Days $T_0 = 131.908766$ (BKJD)



DV Model-Shift Uniqueness Test

004180099-02, P = 0.743563 Days, E = 131.224481 Days

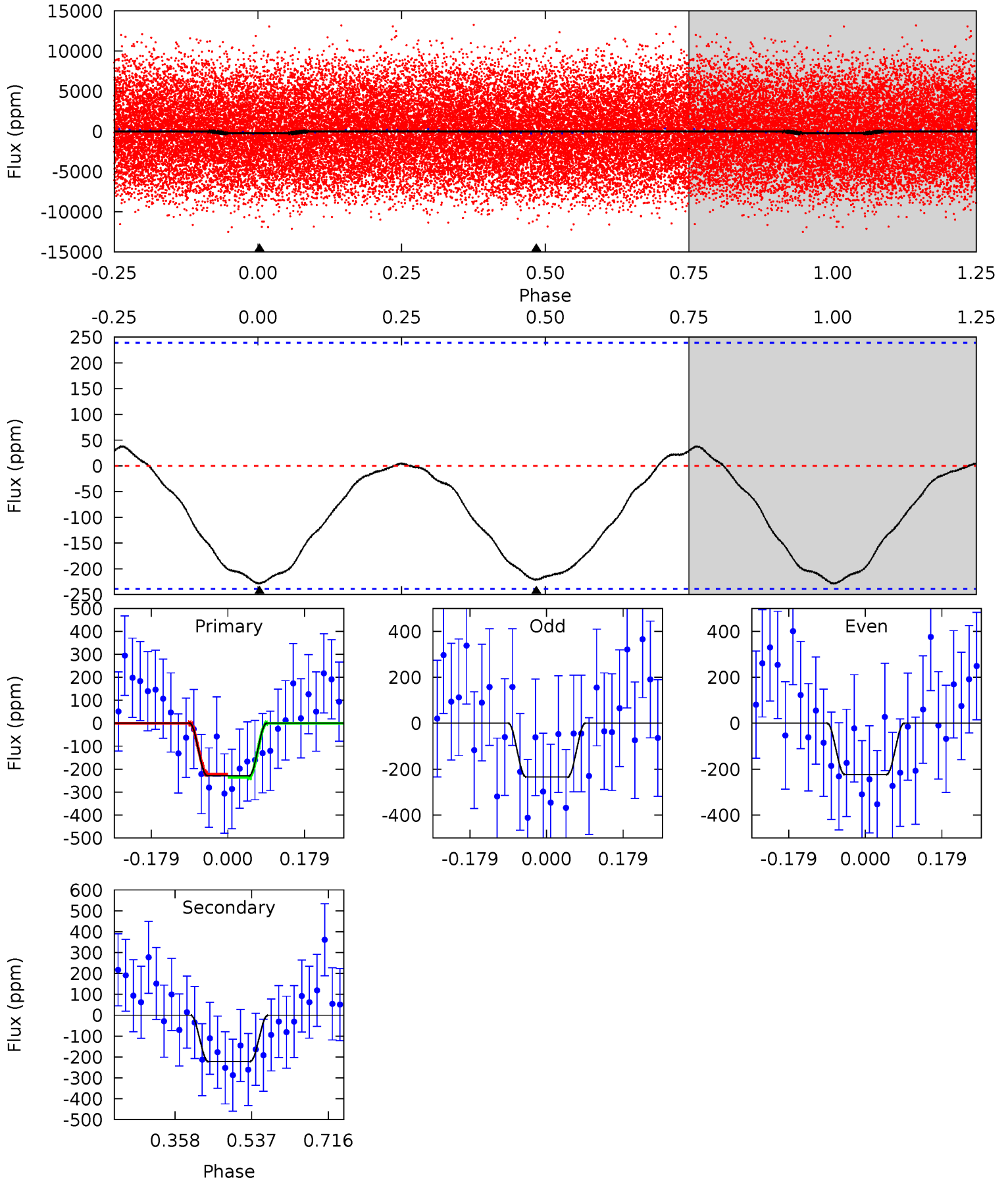
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	11.2	0	0	4.34	1.08	0.29	12.1	12.1	11.2	11.2	1.02	1.06	0.01	1.63



Alt Model-Shift Uniqueness Test

004180099-02, P = 0.743633 Days, E = 131.165133 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.26	4.12	0	0	4.44	1.34	0.34	4.26	4.26	4.12	4.12	0.10	1.19	0.14	0.13



Stellar Parameters For KIC 004180099

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8076^{+223}_{-335}	$3.786^{+0.399}_{-0.070}$	$-0.200^{+0.200}_{-0.350}$	$2.887^{+0.393}_{-1.256}$	$1.856^{+0.094}_{-0.377}$	$0.109^{+0.344}_{-0.026}$
	+3%/-4%	+11%/-2%	+100%/-175%	+14%/-44%	+5%/-20%	+316%/-24%
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 004180099-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-126 ± 11	$4.64^{+4.58}_{-3.03}$	5790^{+404}_{-601}	5932^{+7211}_{-2934}	$1.233^{+8.981}_{-0.917}$
Alt.	-222 ± 54	$6.22^{+5.05}_{-4.12}$	5803^{+417}_{-606}	5935^{+6974}_{-2352}	$1.152^{+8.809}_{-0.798}$

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 $A_{obs} \gg 1.0$

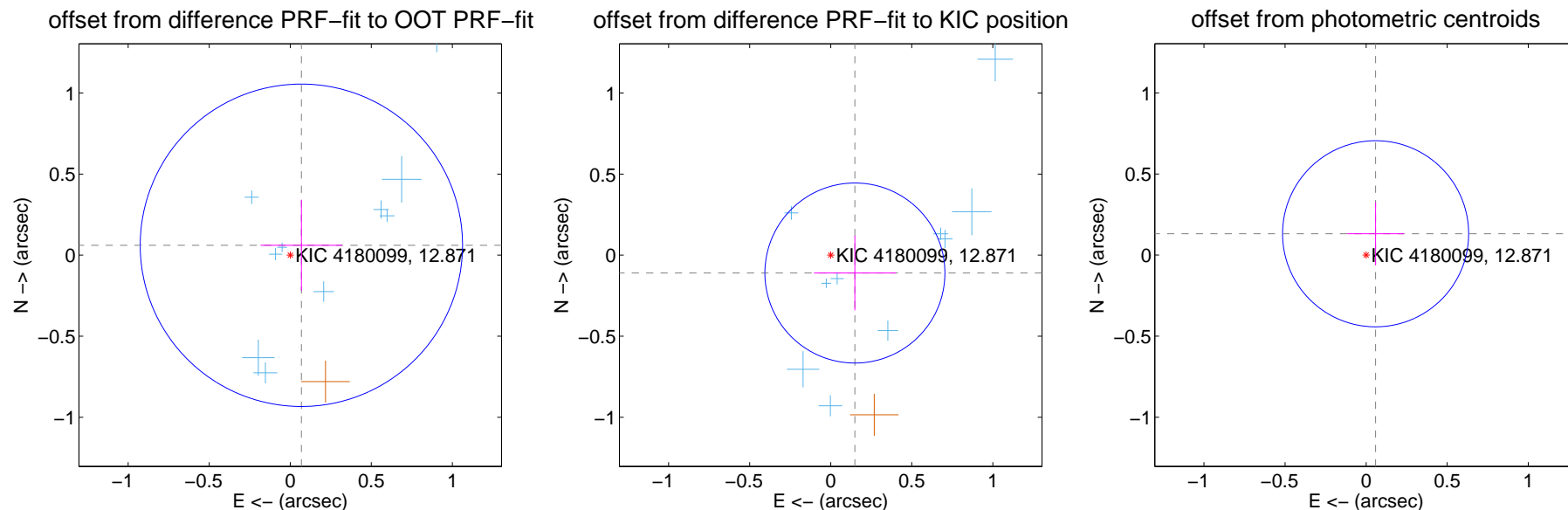
DV Centroid Data

Supplemental centroid analysis for 004180099-02. Kepler magnitude: 12.87. Transit SNR 9.15

There are 11 quarters with good PRF difference image offsets

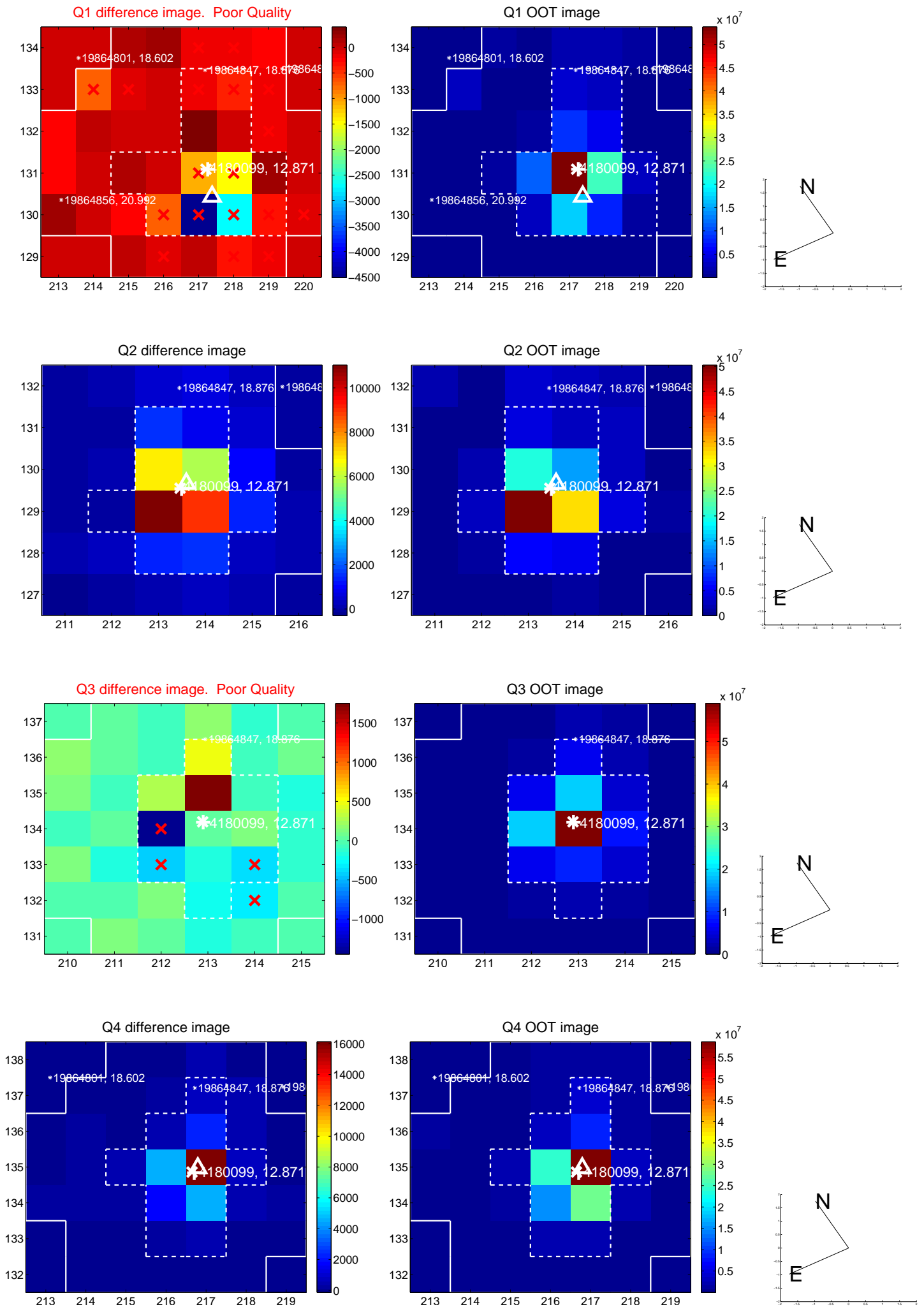
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.092 ± 0.331	0.28	-0.069 ± 0.252	0.061 ± 0.281
PRF-fit source offset from KIC position	0.185 ± 0.185	1.00	-0.149 ± 0.253	-0.110 ± 0.231
photometric centroid source offset	0.14 ± 0.19	0.75	-0.06 ± 0.18	0.13 ± 0.19

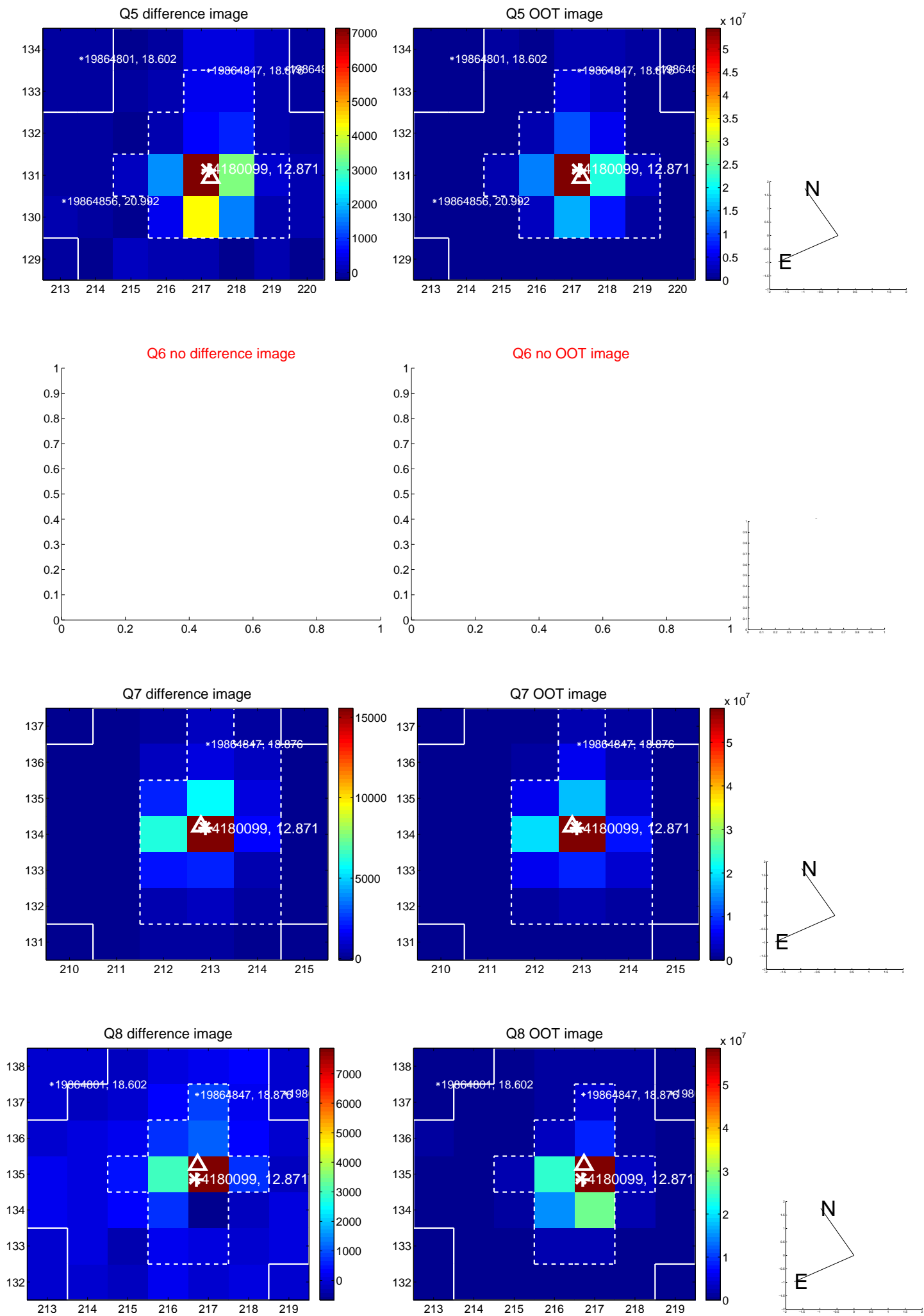


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

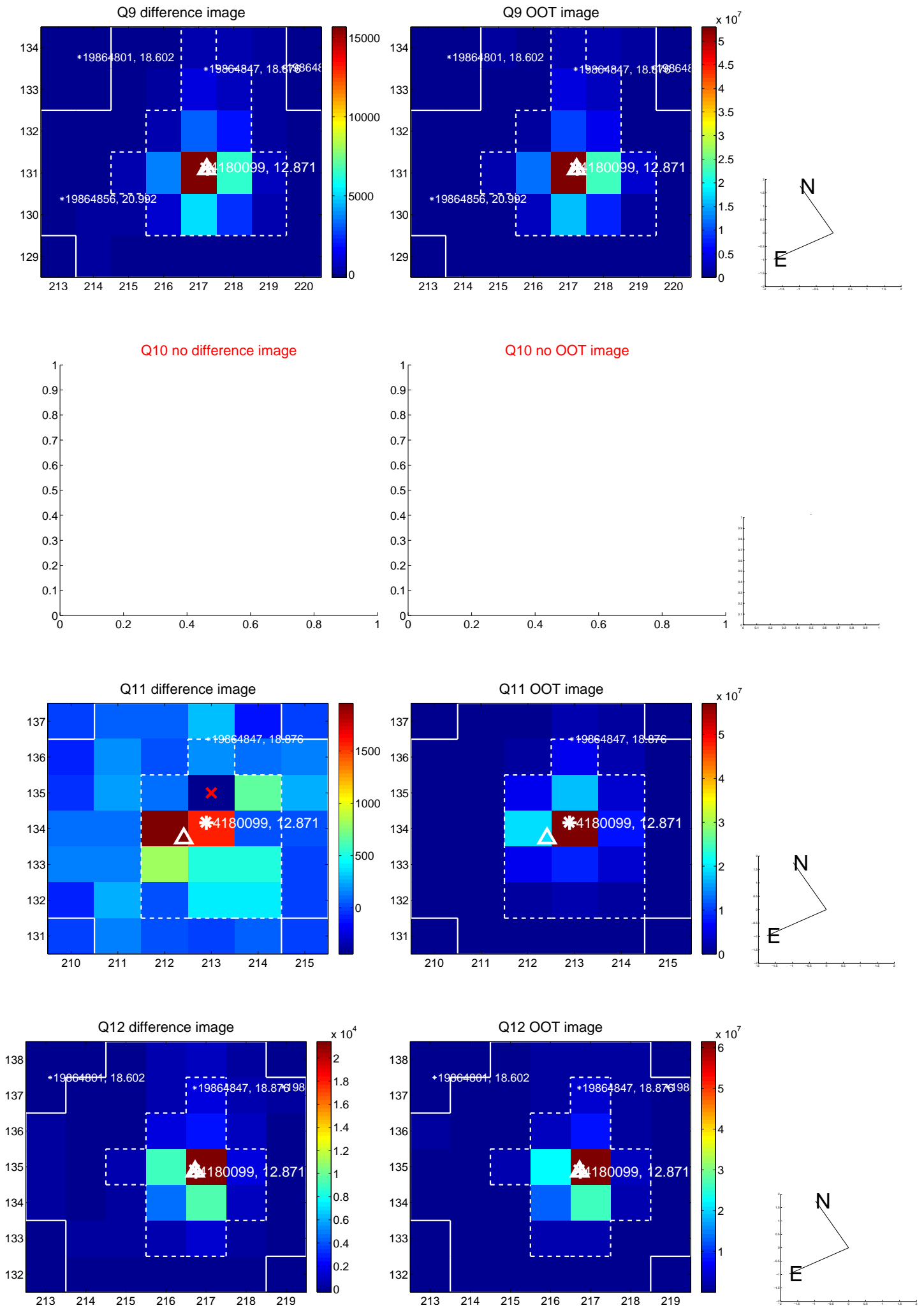
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



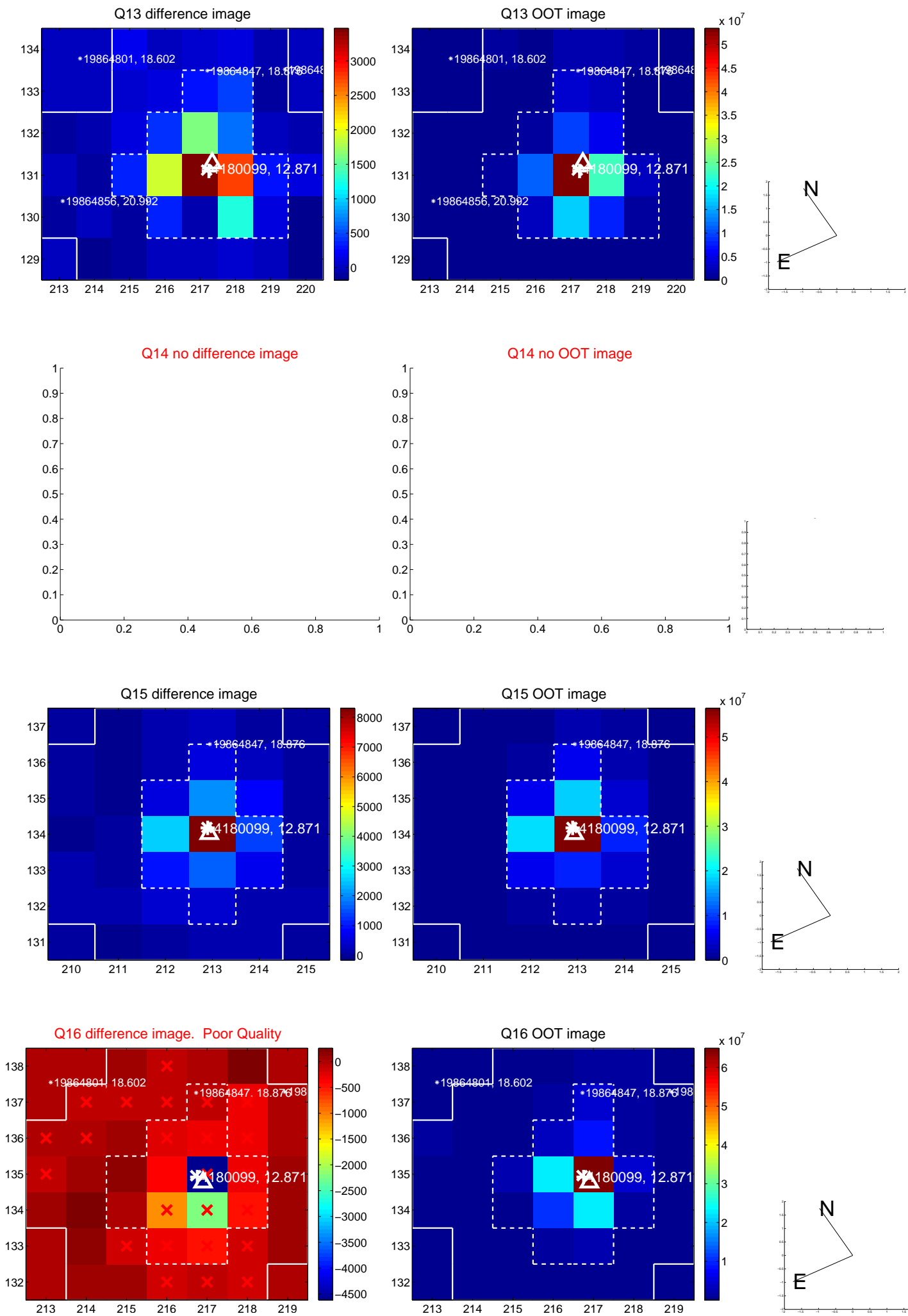
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



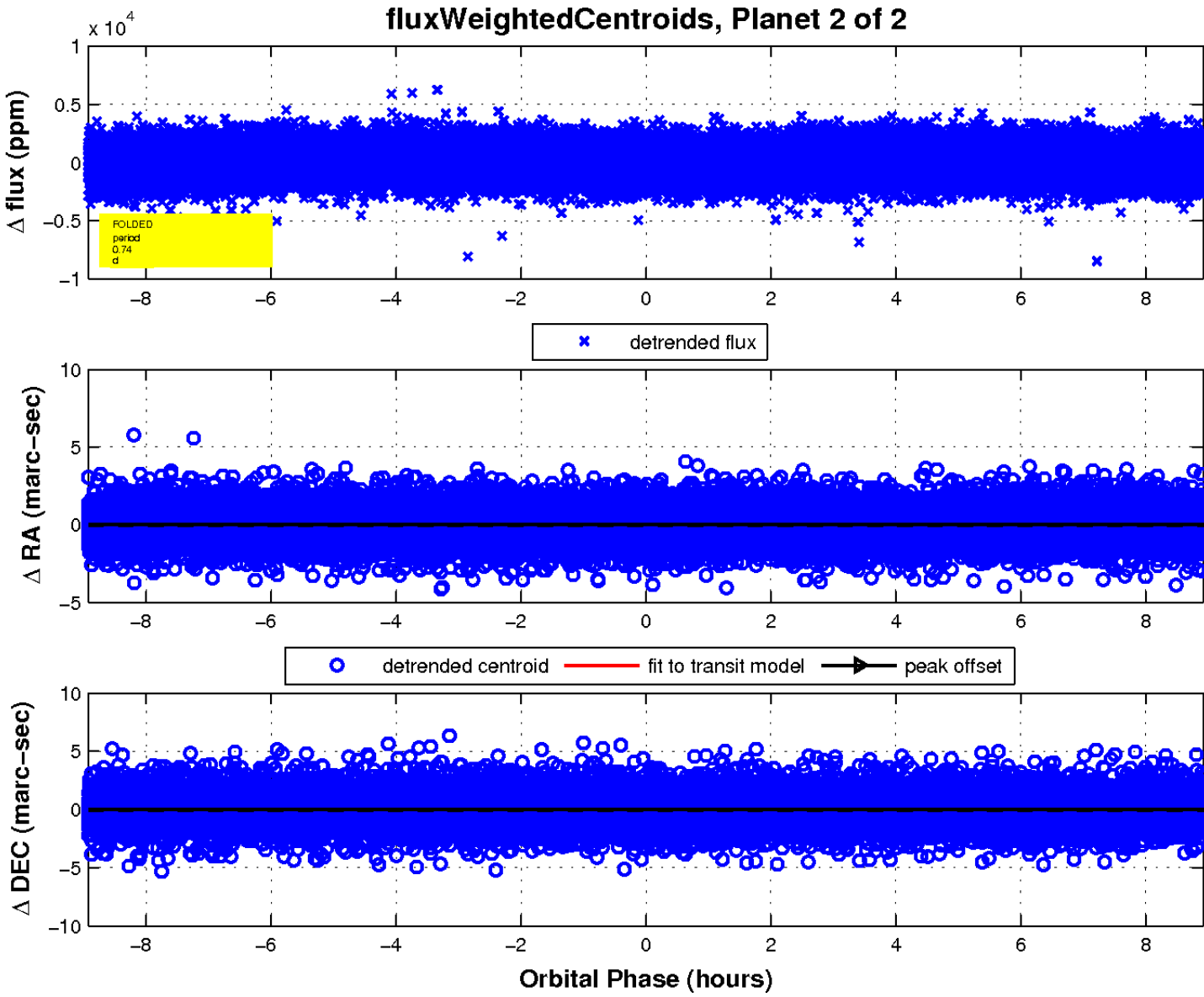
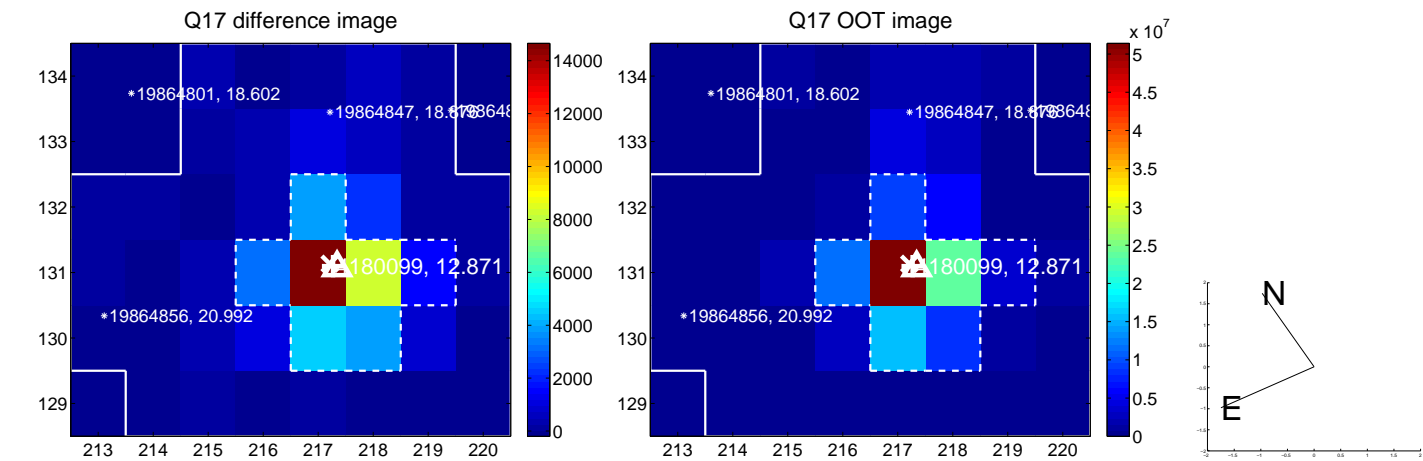
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

