

KIC 005209712

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})
005209712-01	OBS	No	0.566914	131.927081	22.3	2.640	11.4	11.7	2.58	8578	1.41	106752.82
005209712-02	OBS	No	0.918203	132.396999	20.9	3.772	9.1	6.5	2.58	8578	1.31	56124.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005209712-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005209712-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

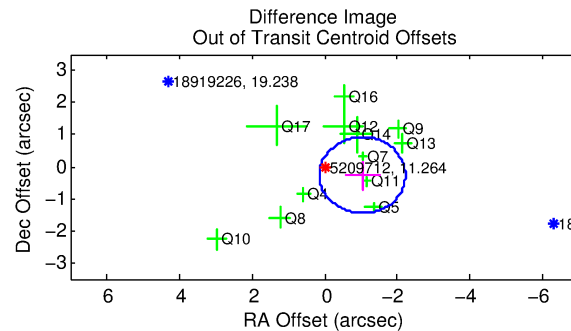
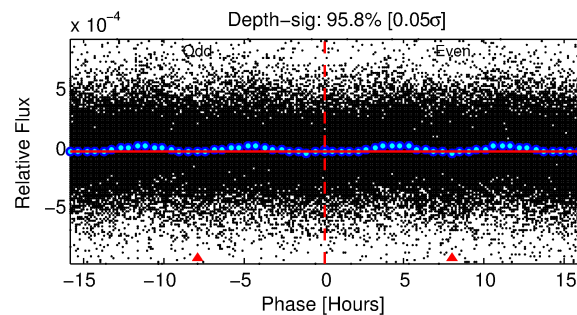
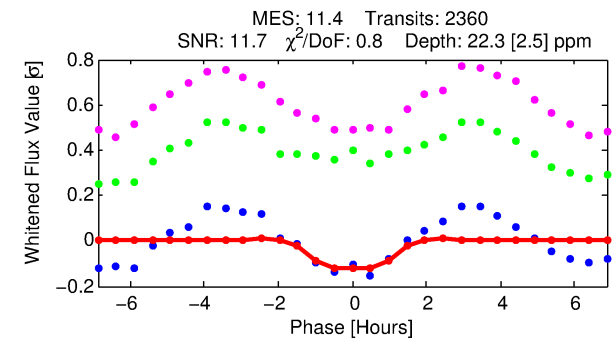
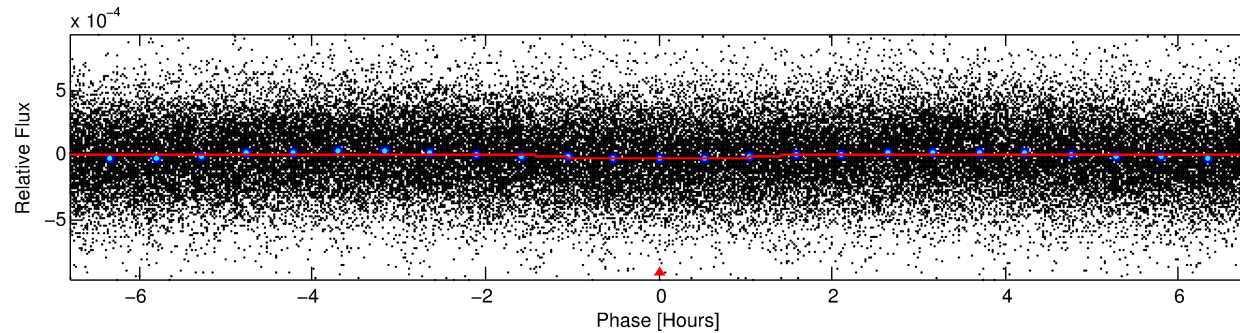
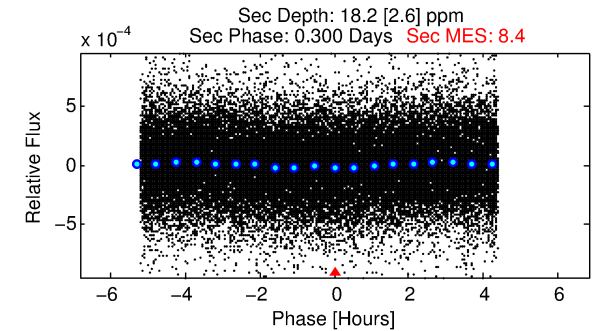
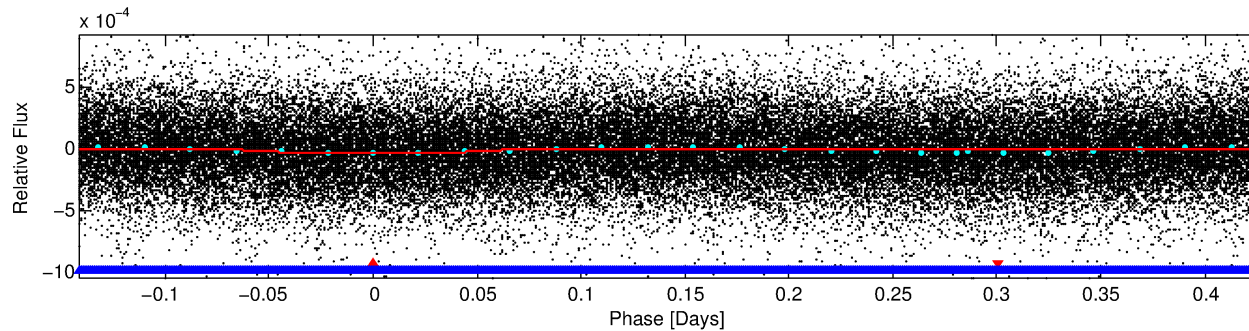
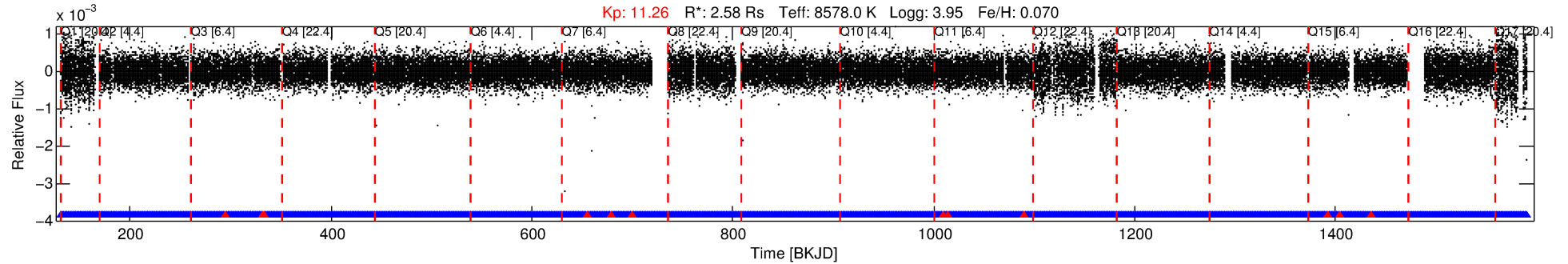
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005209712-01

No Significant Match Found

DV One-Page Summary

KIC: 5209712 Candidate: 1 of 2 Period: 0.567 d



DV Fit Results:

Period = 0.56691 [0.00001] d
Epoch = 131.9271 [0.0033] BKJD
Rp/R* = 0.0050 [0.0021]
a/R* = 1.19 [0.98]
b = 0.90 [0.60]
Seff = 106752.82 [51023.28]
Teq = 4609 [551] K
Rp = 1.41 [0.75] Re
a = 0.0174 [0.0051] AU
Ag = 1.52 [1.44] [0.36σ]
Teffp = 7915 [1700] K [1.85σ]

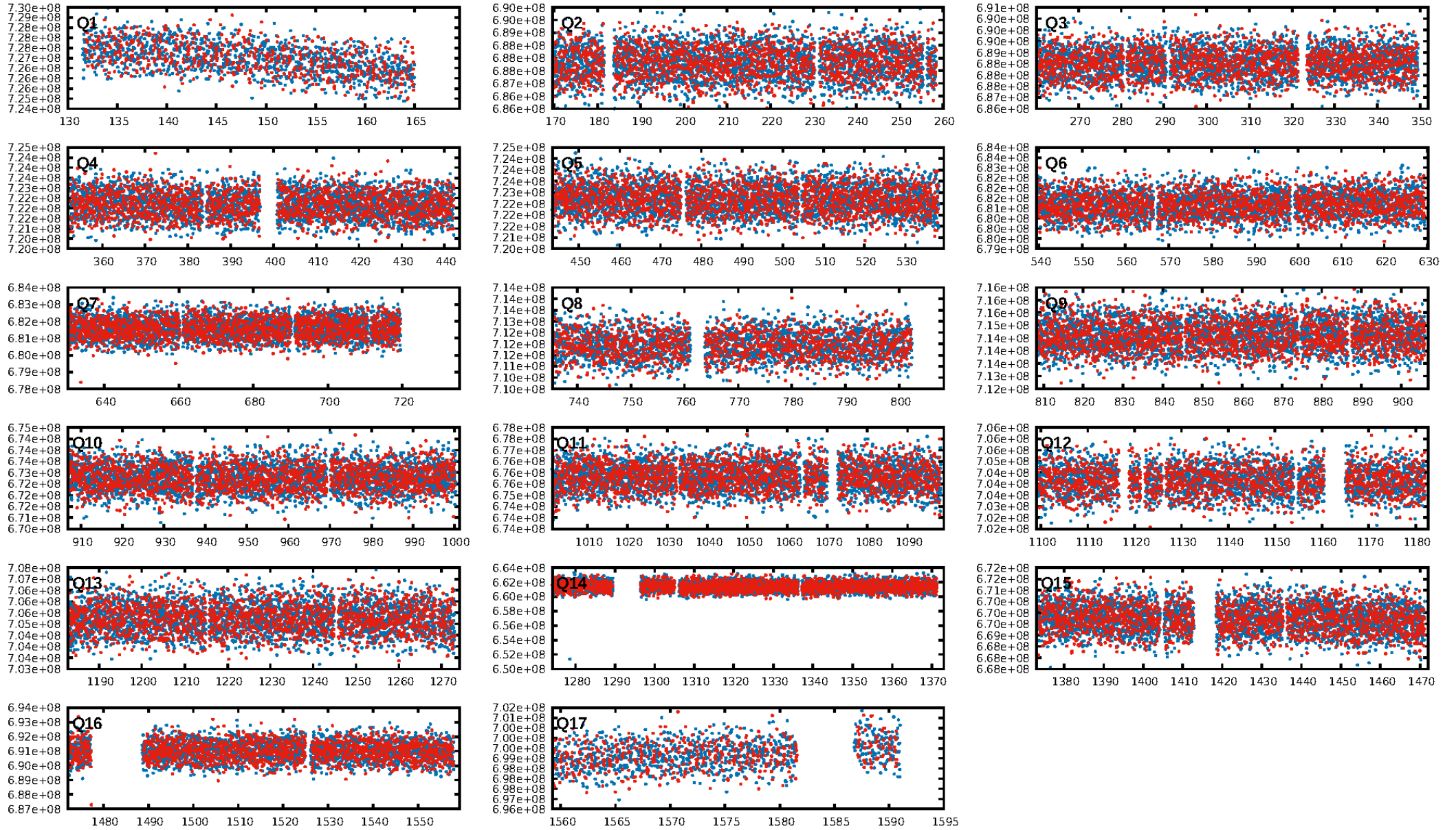
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 93.3% [1.83σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.23e-34
RollingBand-fgt: 0.99 [2242/2254]
GhostDiagnostic-chr: 2.148
Centroid-sig: 65.6%
Centroid-so: 0.283 arcsec [0.87σ]
OotOffset-rm: 1.069 arcsec [2.71σ]
KicOffset-rm: 1.050 arcsec [2.55σ]
OotOffset-st: 2/2/4/4 [12]
KicOffset-st: 2/2/4/4 [12]
DiffImageQuality-fgm: 0.42 [5/12]
DiffImageOverlap-fno: 1.00 [17/17]

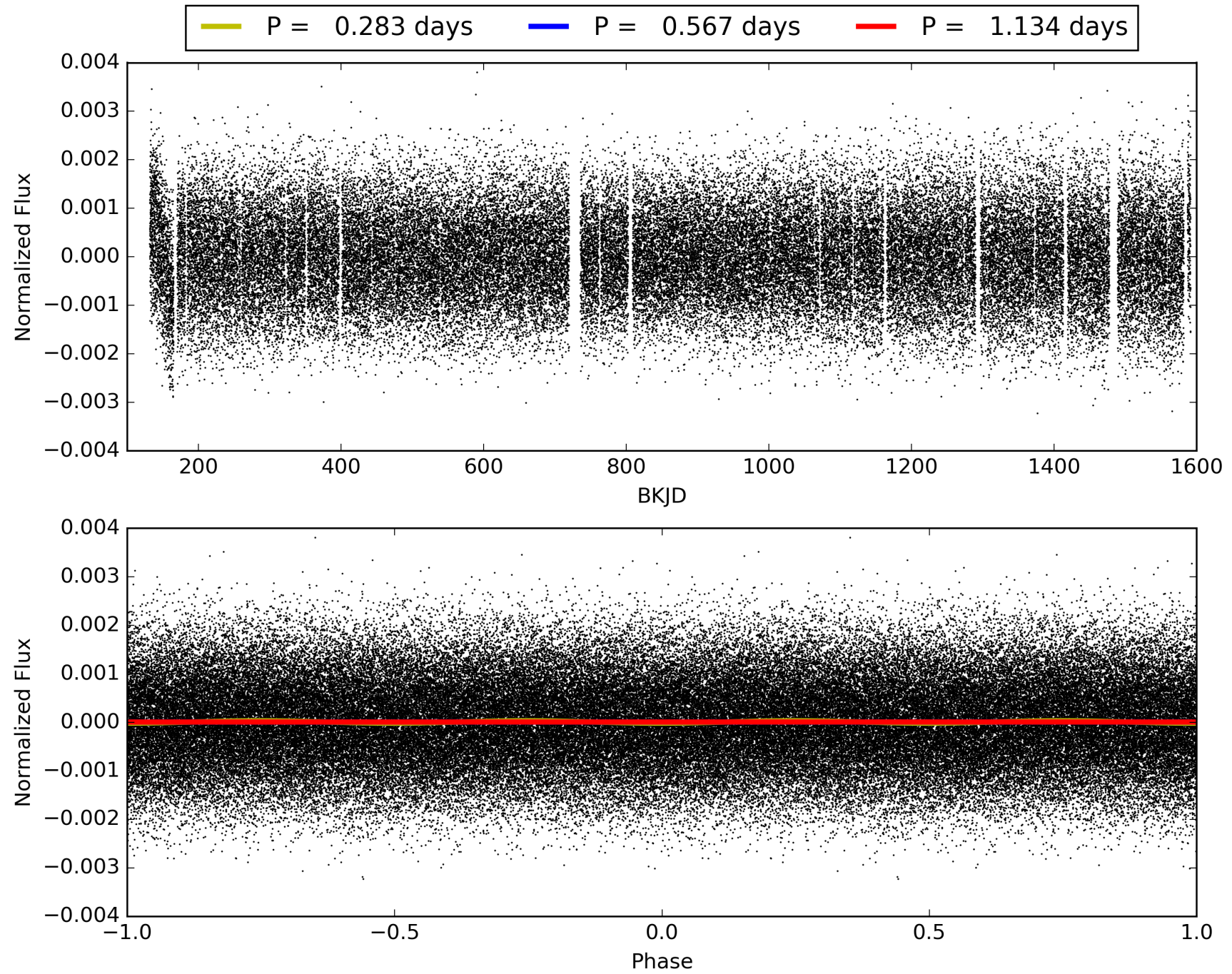
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:09:50 Z

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

TCE 005209712-01, PDC Light Curves

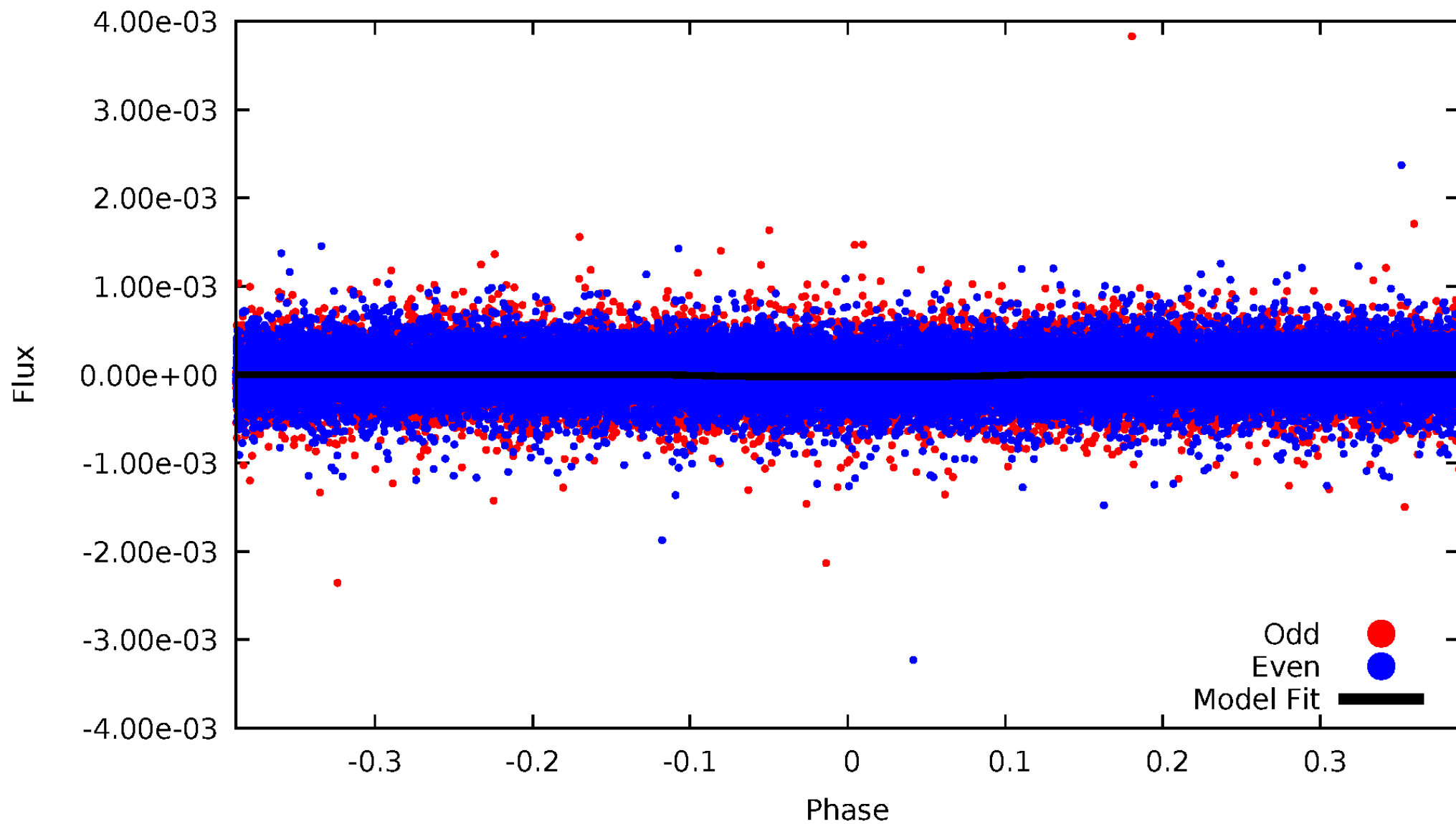


TCE 005209712-01



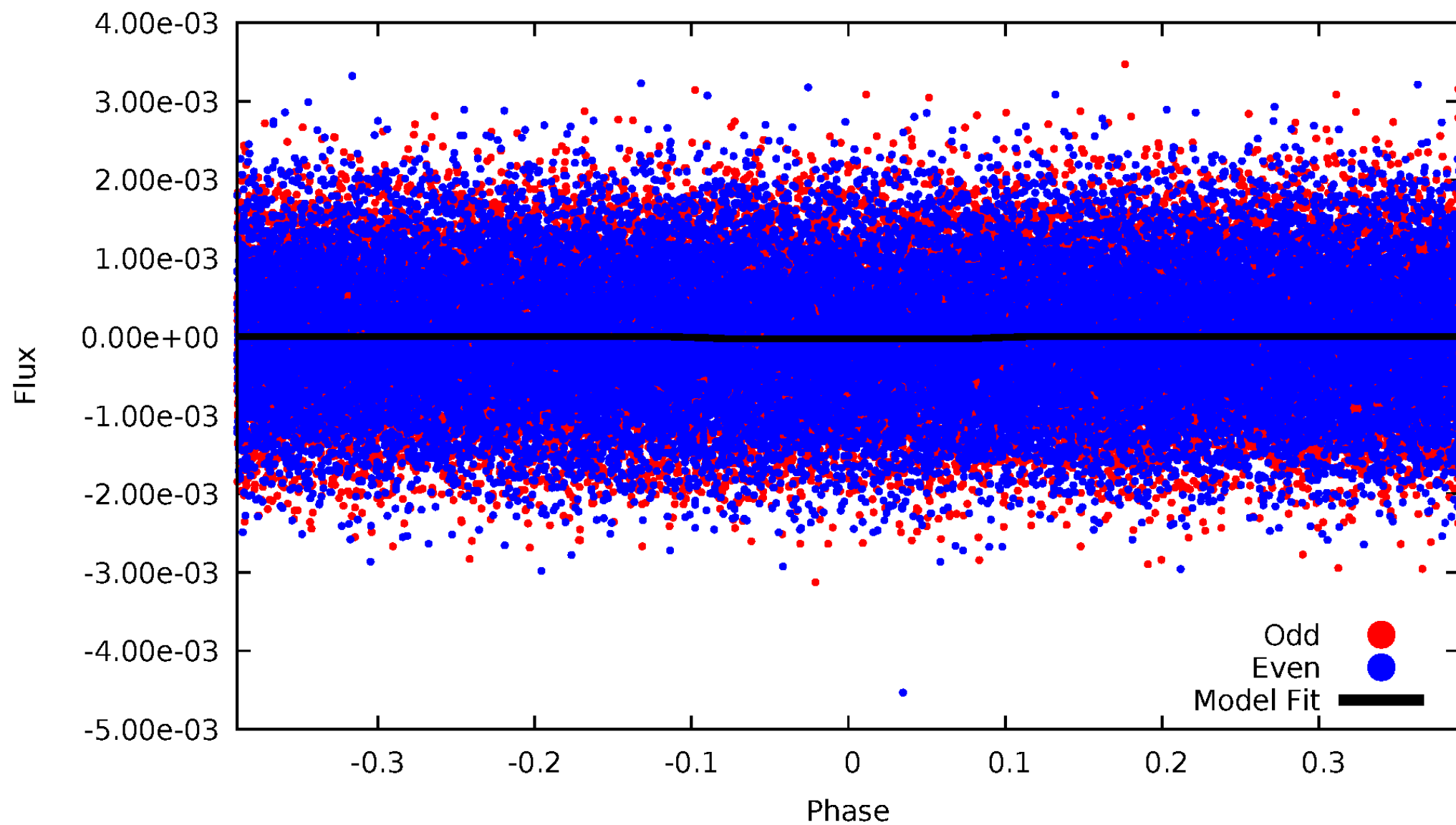
DV Odd/Even

TCE 005209712-01

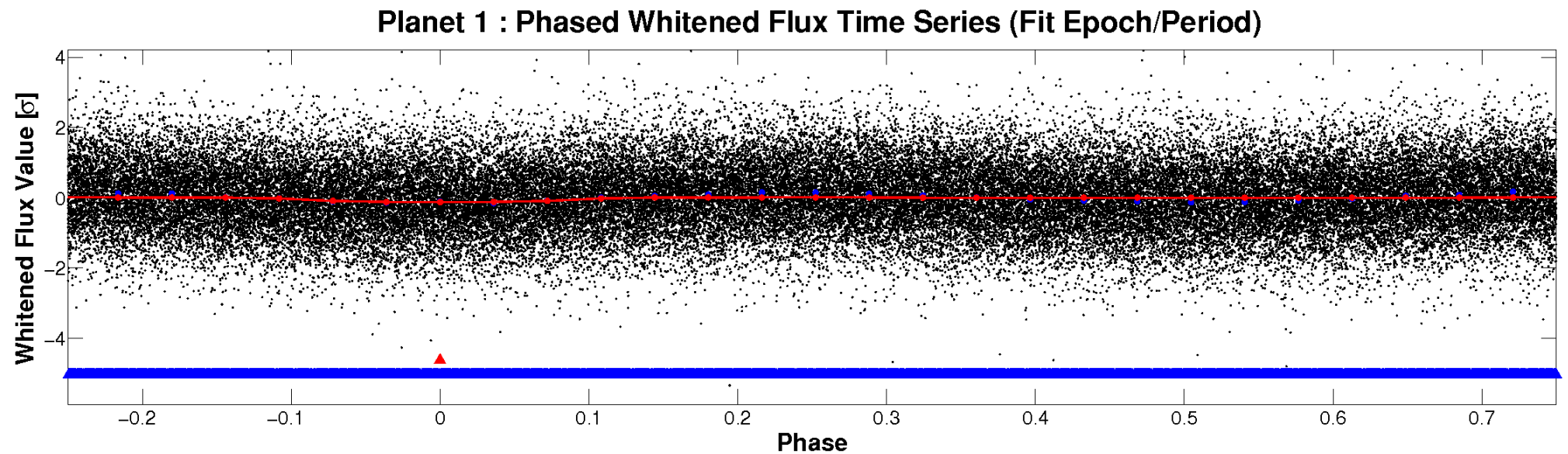
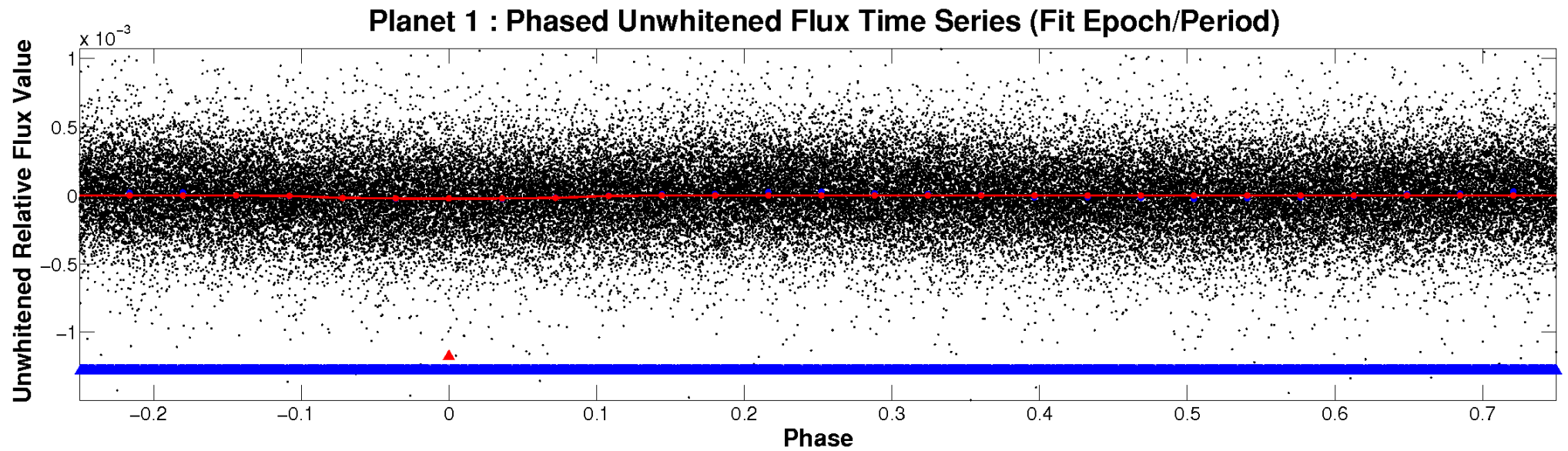


ALT Odd/Even

TCE 005209712-01

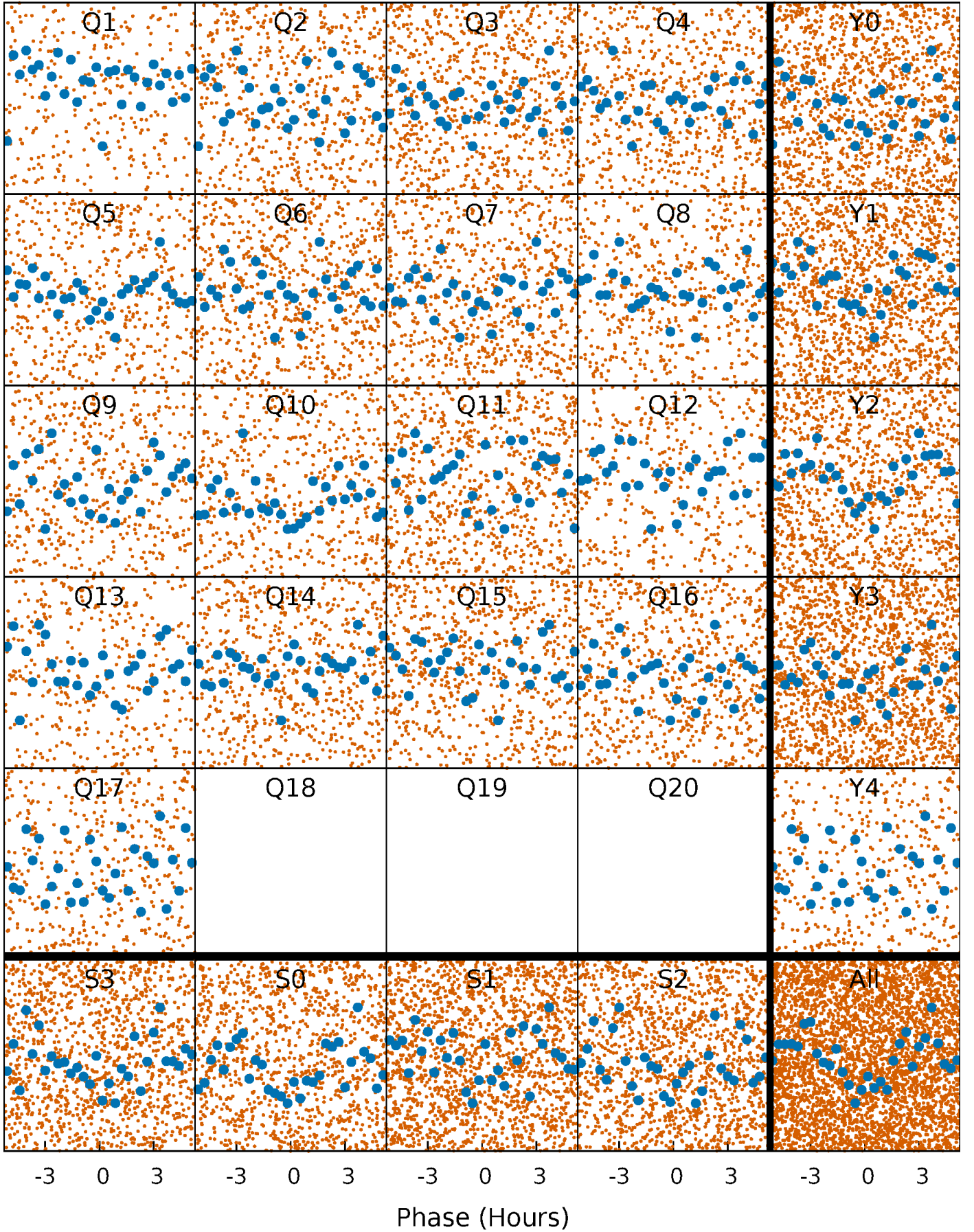


Non-Whitened Vs. Whitened Light Curve



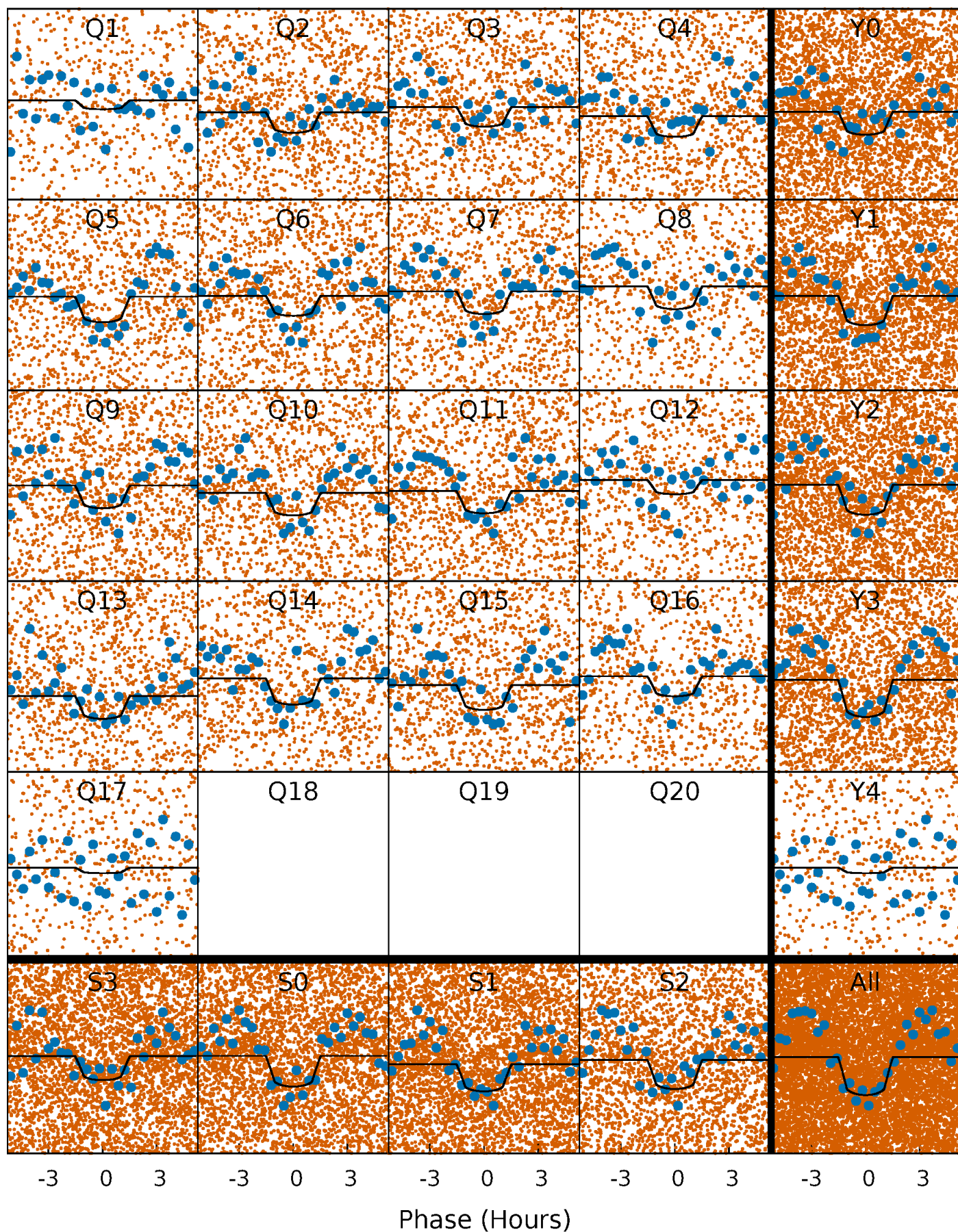
PDC Quarter-Phased Transit Curves

TCE 005209712-01 P= 0.566914 Days $T_0=131.927081$ (BKJD)



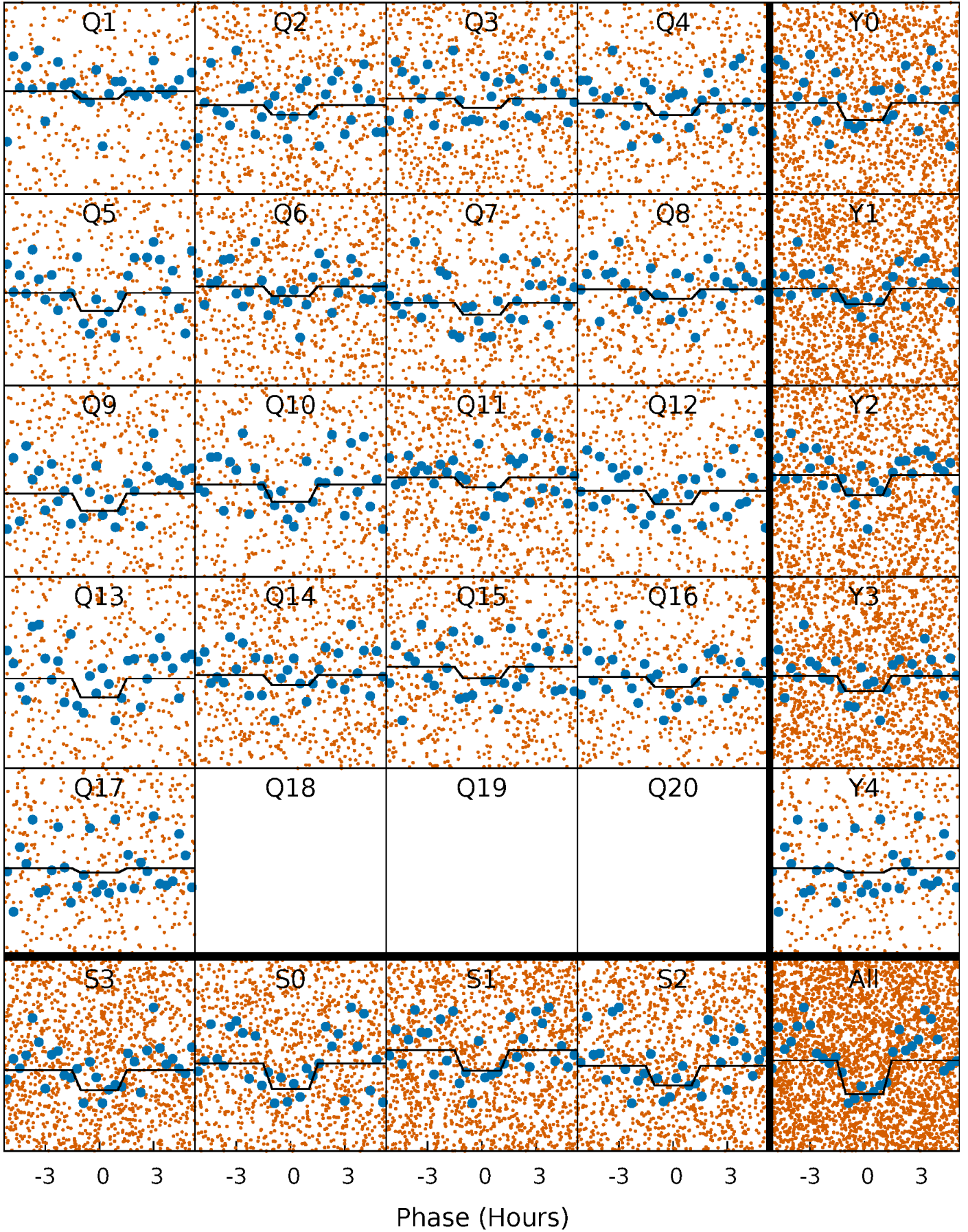
DV Quarter-Phased Transit Curves

TCE 005209712-01 P= 0.566914 Days $T_0=131.927081$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

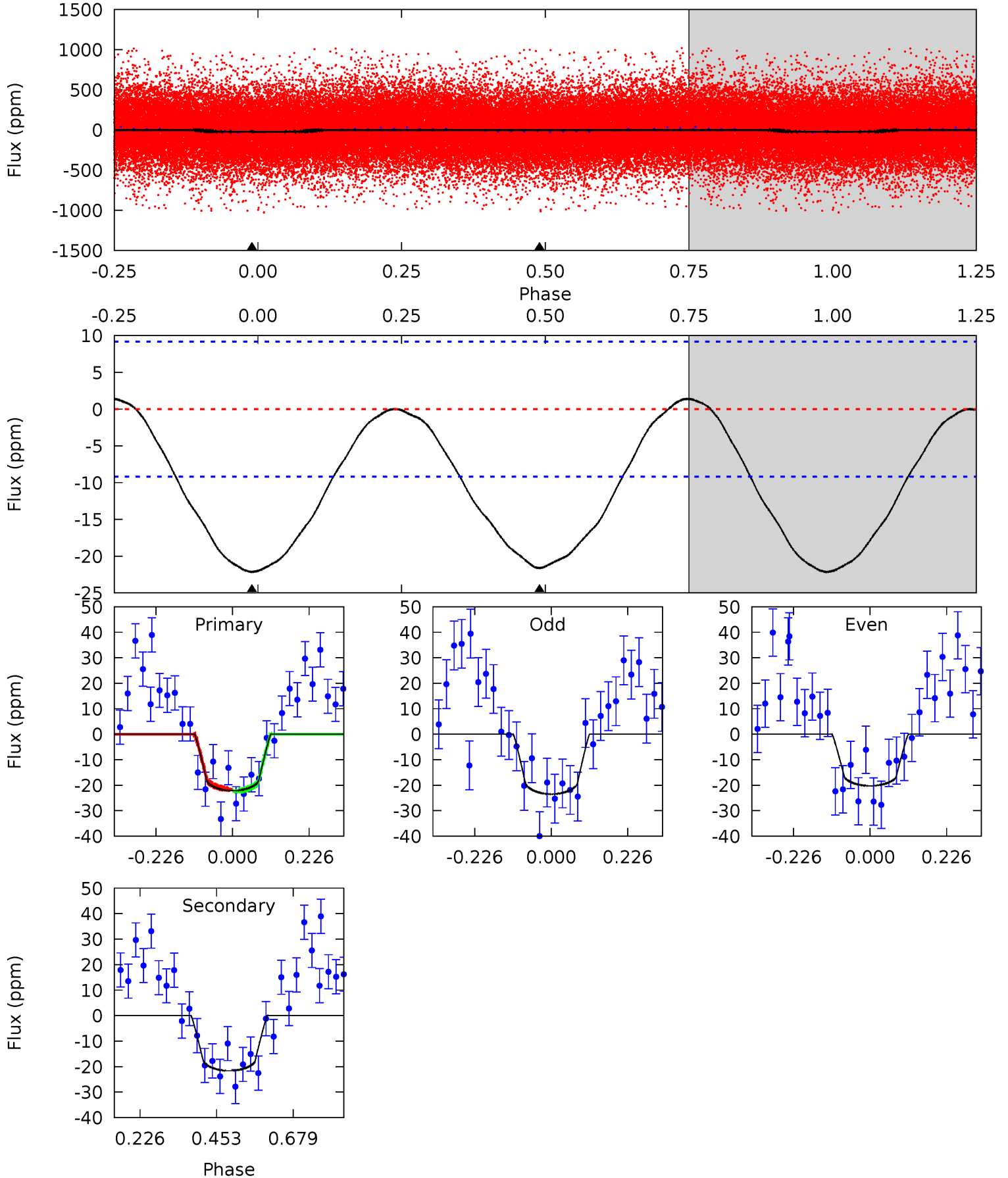
TCE 005209712-01 P= 0.566918 Days $T_0=131.927809$ (BKJD)



DV Model-Shift Uniqueness Test

005209712-01, P = 0.566914 Days, E = 131.360167 Days

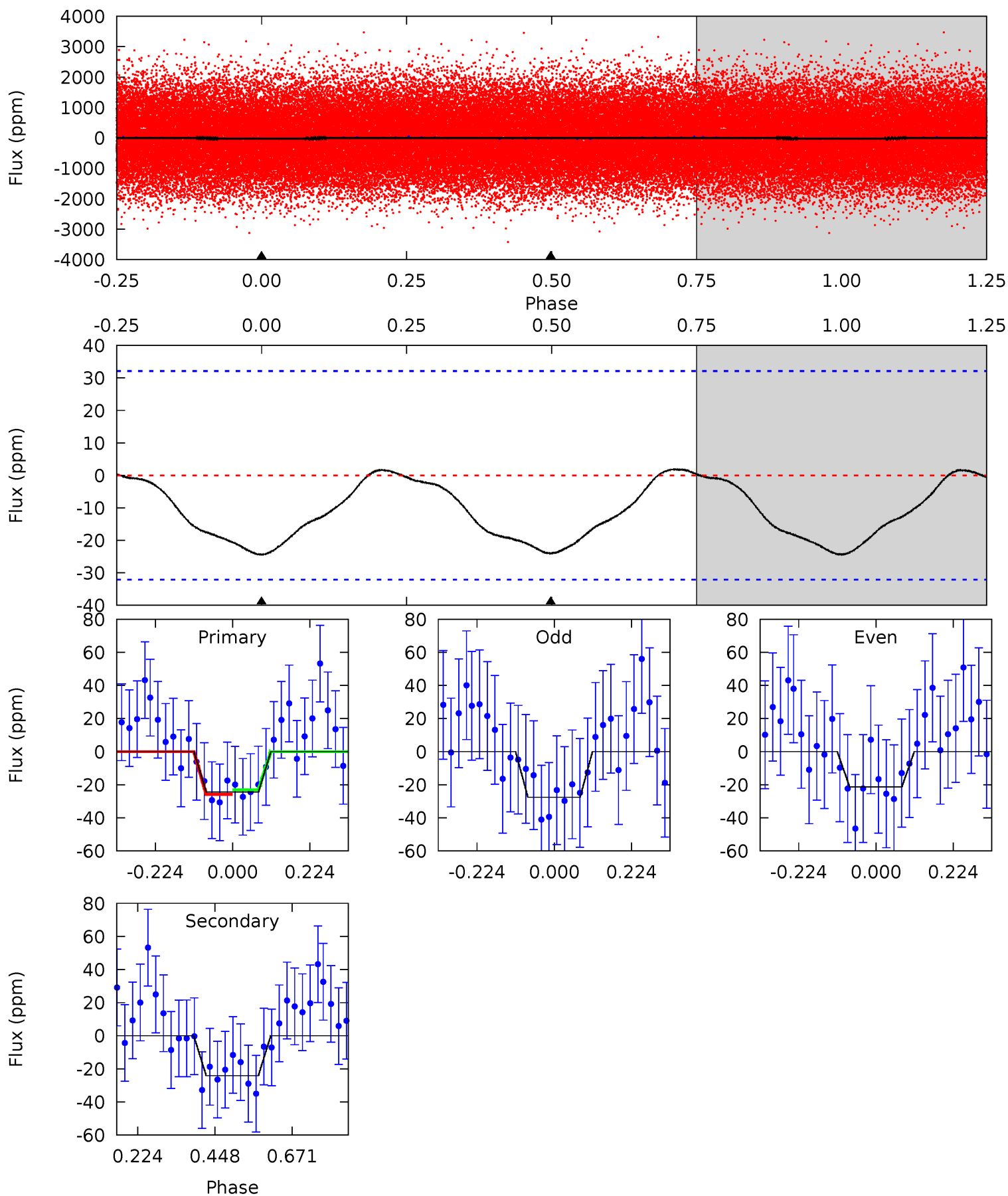
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	10.3	0	0	4.39	1.21	0.34	10.6	10.6	10.3	10.3	0.78	0.90	0.06	0.17



Alt Model-Shift Uniqueness Test

005209712-01, P = 0.566918 Days, E = 131.360891 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.35	3.30	0	0	4.39	1.22	0.14	3.35	3.35	3.30	3.30	0.42	0.78	0.07	0.19



Stellar Parameters For KIC 005209712

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8578^{+235}_{-404}	$3.953^{+0.247}_{-0.133}$	$0.070^{+0.250}_{-0.550}$	$2.576^{+0.701}_{-0.857}$	$2.170^{+0.314}_{-0.583}$	$0.179^{+0.275}_{-0.076}$
	+3%/-5%	+6%/-3%	+357%/-786%	+27%/-33%	+14%/-27%	+154%/-43%
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 005209712-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-22 ± 2	$1.34^{+0.62}_{-0.60}$	6333^{+454}_{-560}	7766^{+4069}_{-1806}	$1.996^{+4.329}_{-1.079}$
Alt.	-24 ± 7	$1.35^{+0.60}_{-0.58}$	6307^{+483}_{-552}	7944^{+4433}_{-1971}	$2.136^{+4.701}_{-1.233}$

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

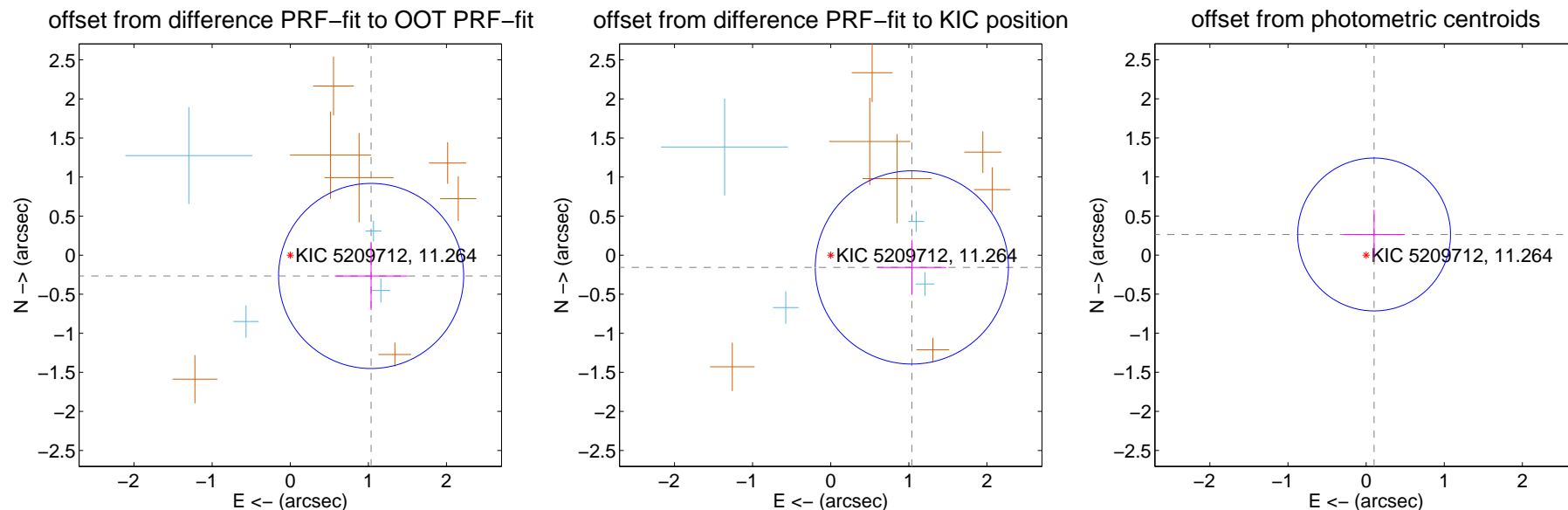
DV Centroid Data

Supplemental centroid analysis for 005209712-01. **Kepler magnitude: 11.26.** Transit SNR 11.71

There are 5 quarters with good PRF difference image offsets

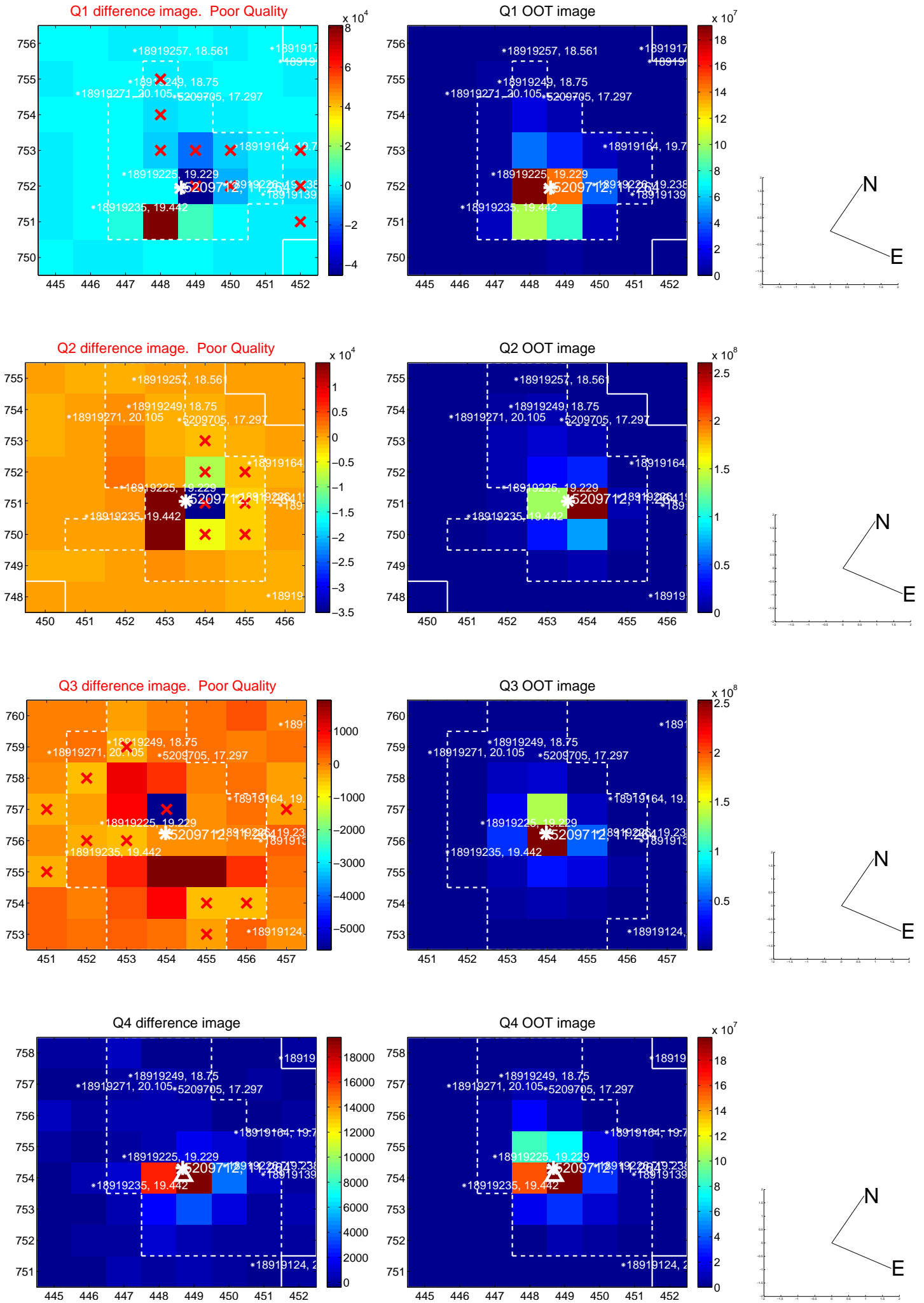
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.069 ± 0.395	2.71	-1.035 ± 0.465	-0.266 ± 0.437
PRF-fit source offset from KIC position	1.050 ± 0.412	2.55	-1.039 ± 0.440	-0.157 ± 0.352
photometric centroid source offset	0.28 ± 0.33	0.87	-0.10 ± 0.39	0.26 ± 0.32

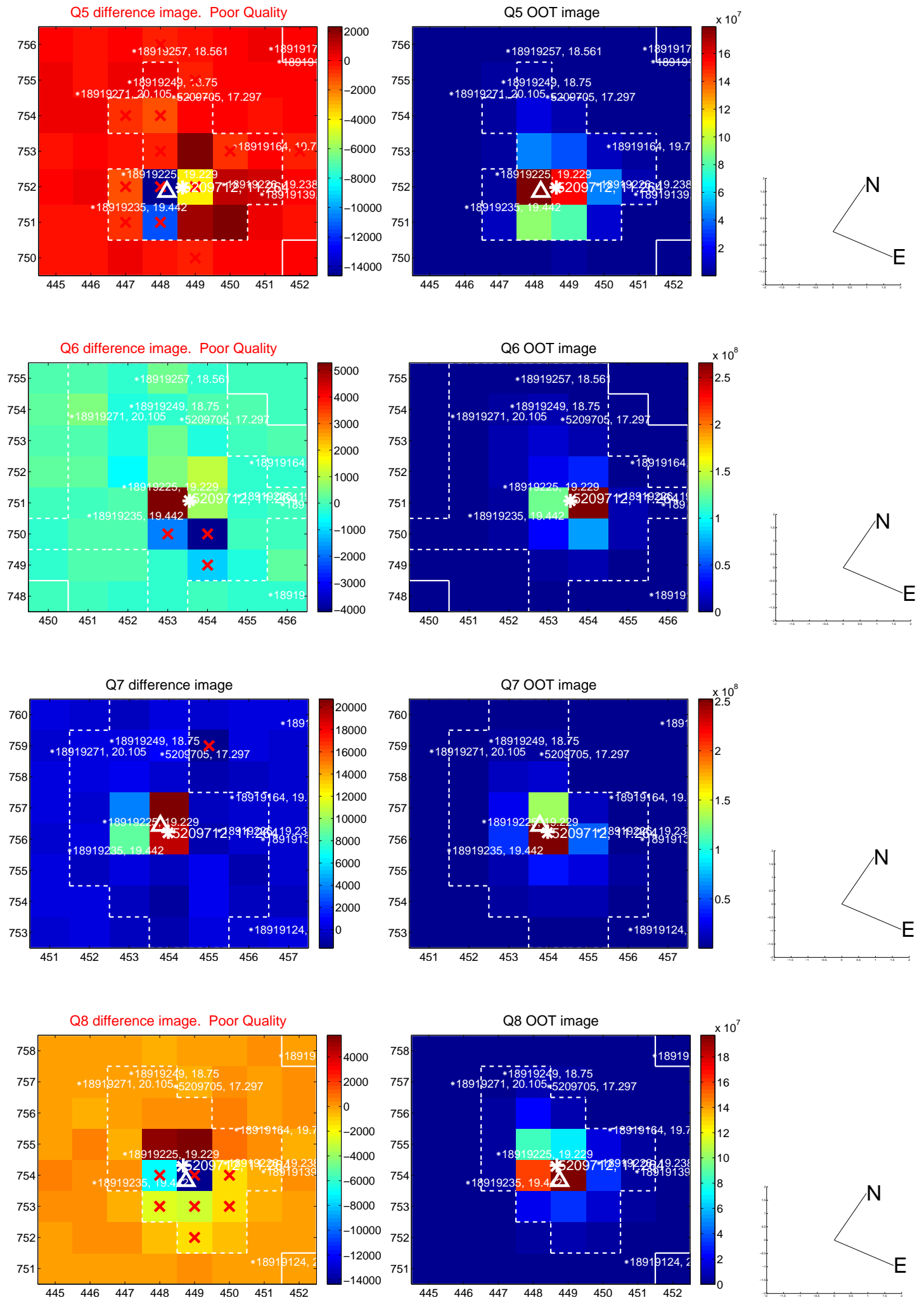


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

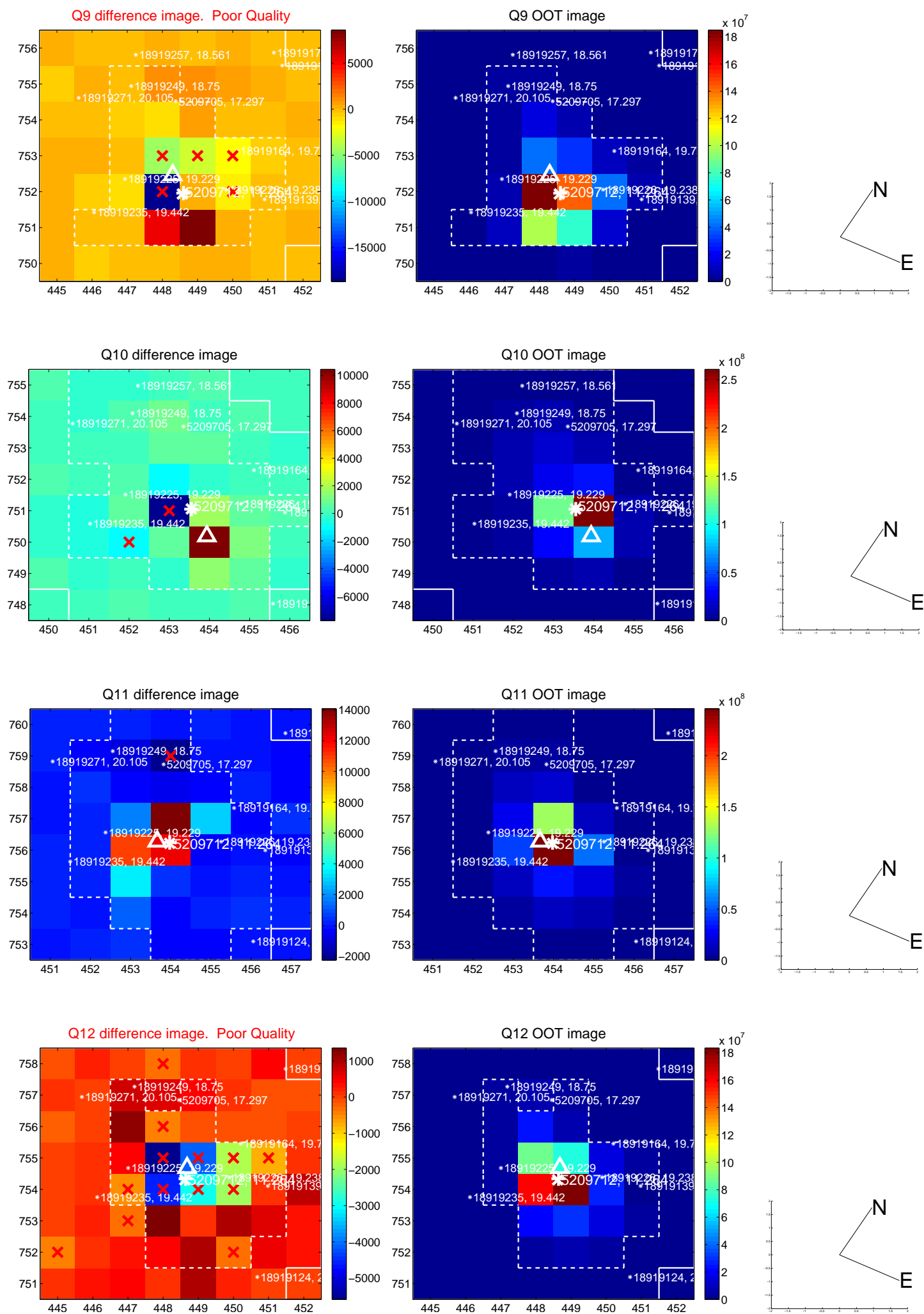
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



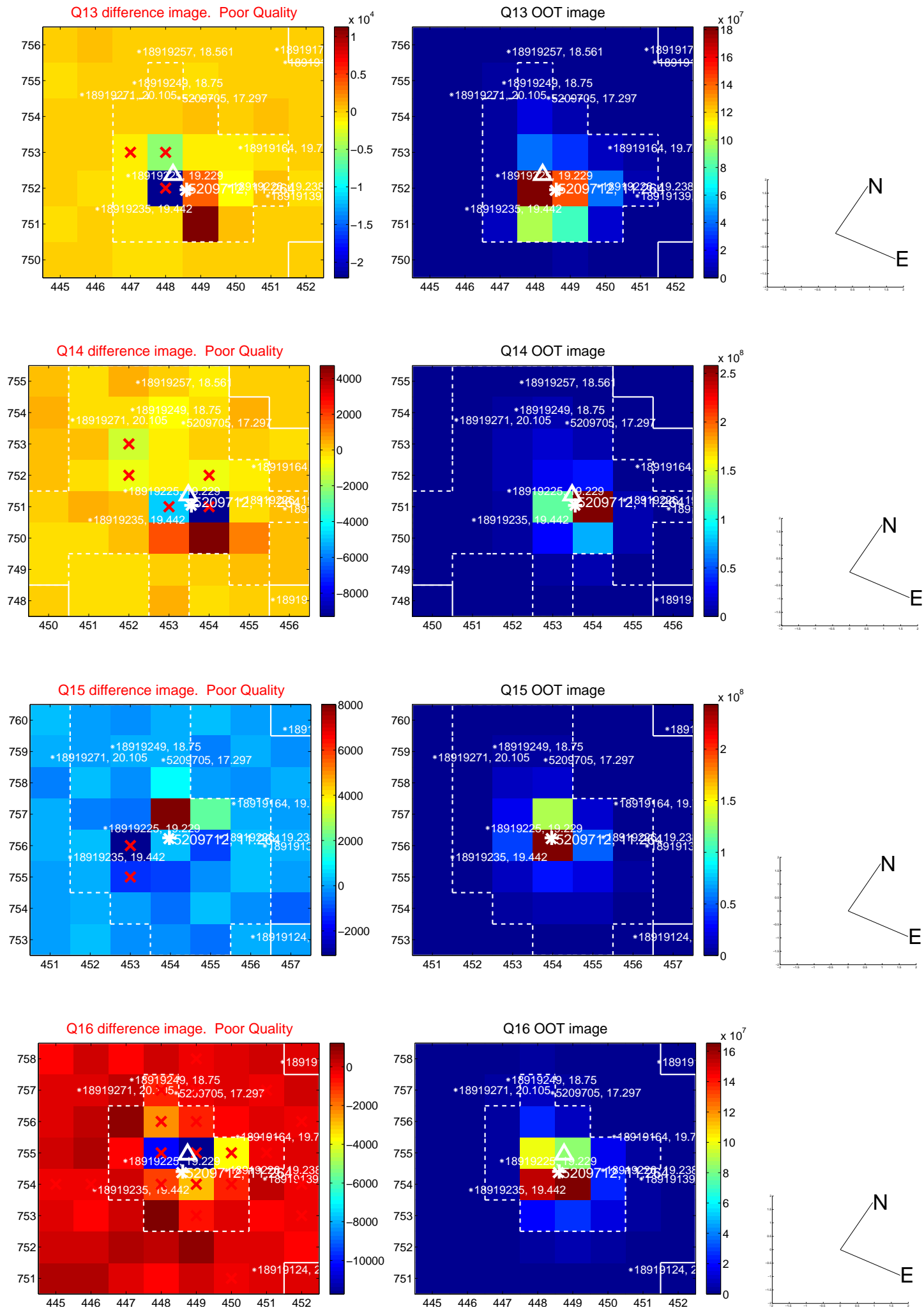
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



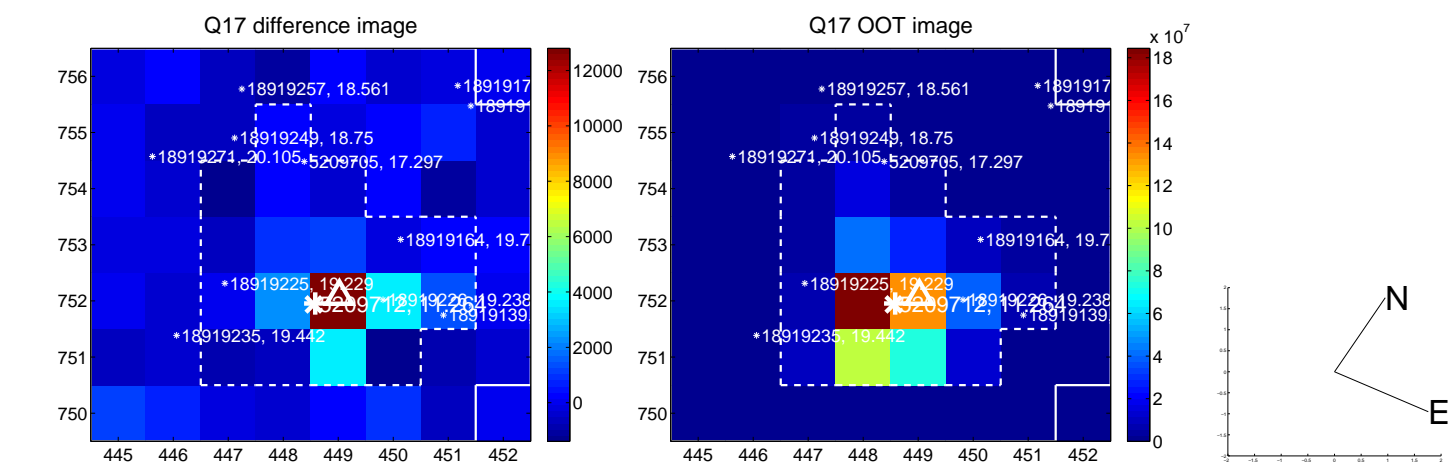
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



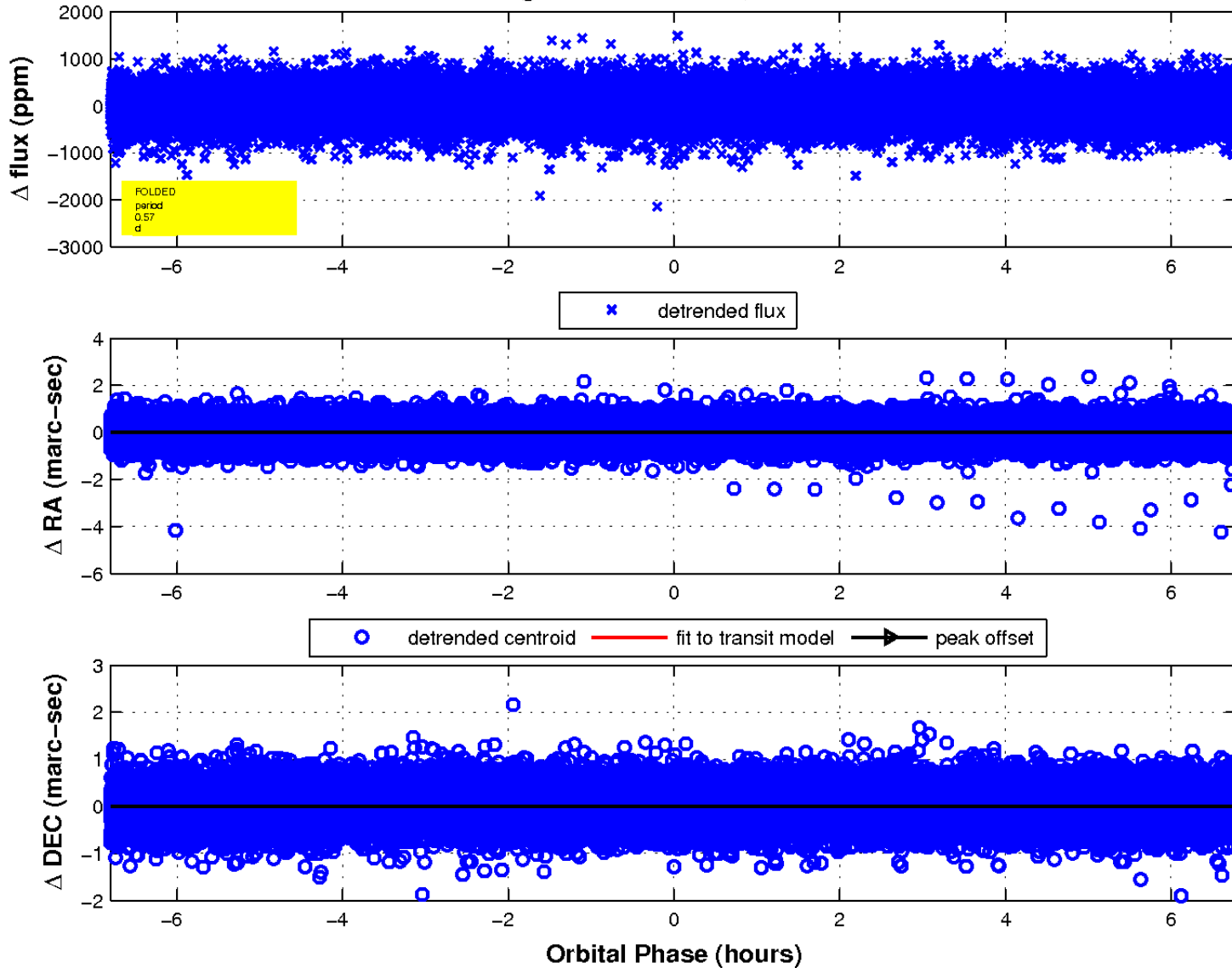
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

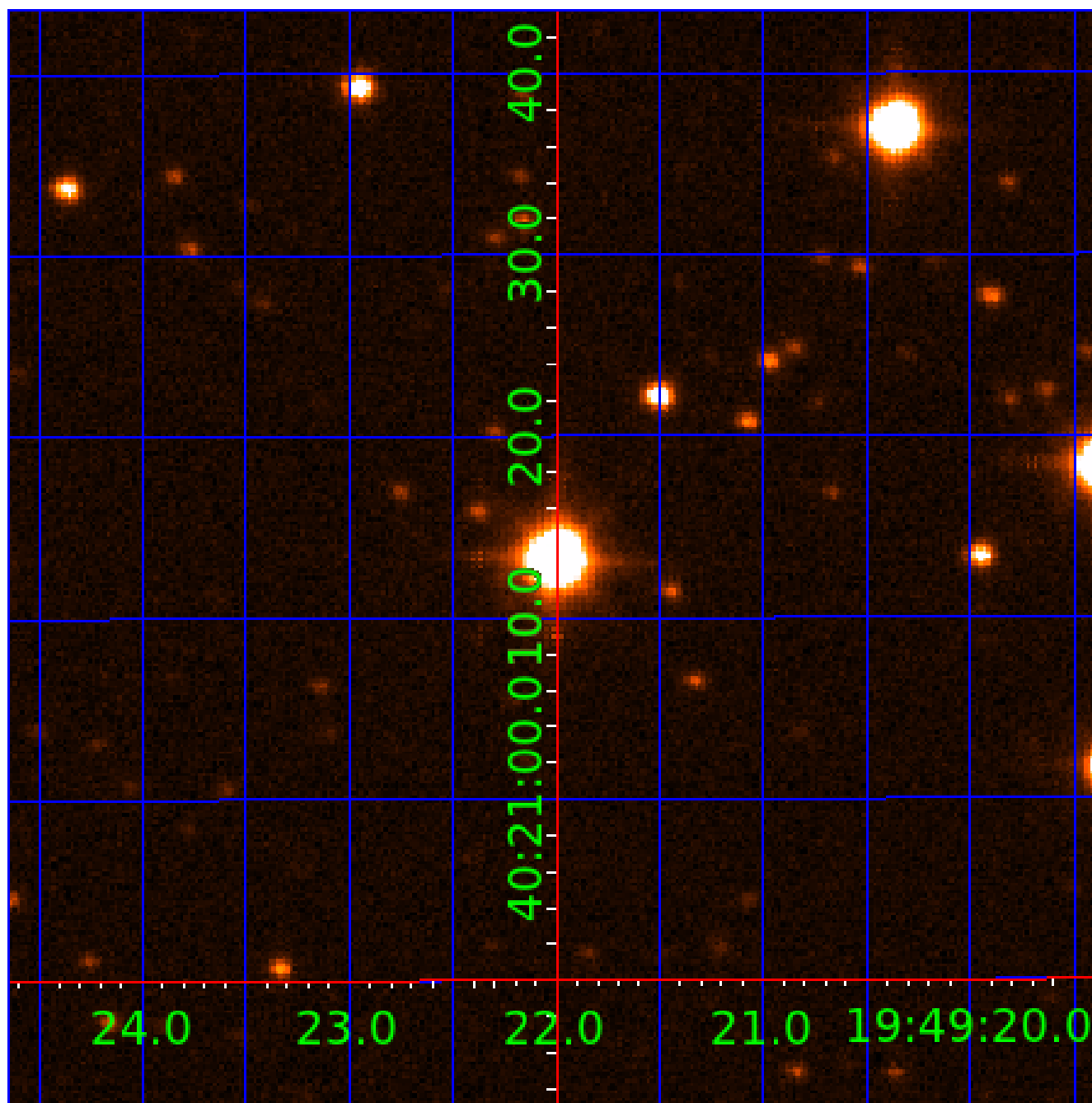


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 005209712

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})
005209712-01	OBS	No	0.566914	131.927081	22.3	2.640	11.4	11.7	2.58	8578	1.41	106752.82
005209712-02	OBS	No	0.918203	132.396999	20.9	3.772	9.1	6.5	2.58	8578	1.31	56124.31

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005209712-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
005209712-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_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.

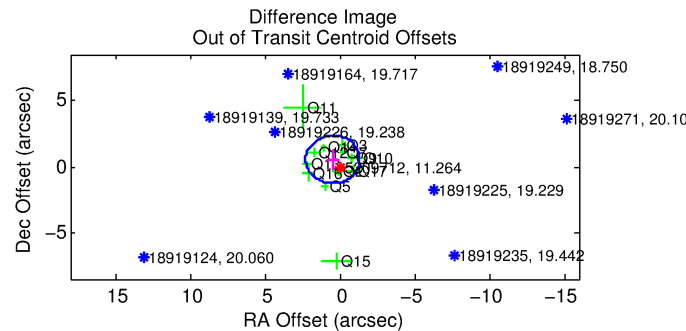
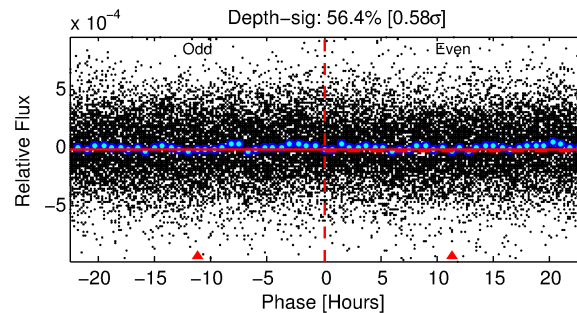
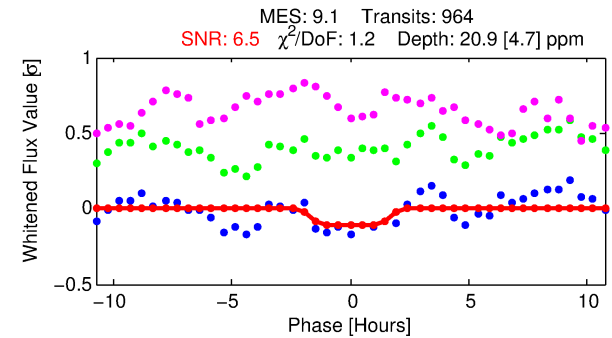
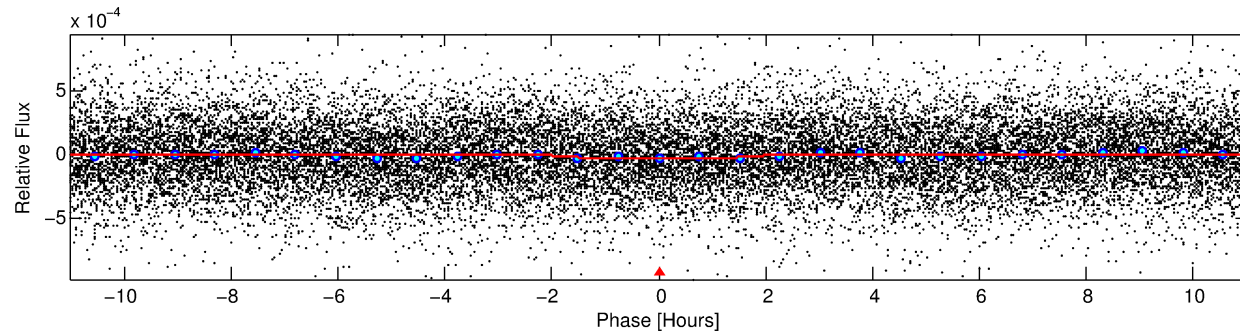
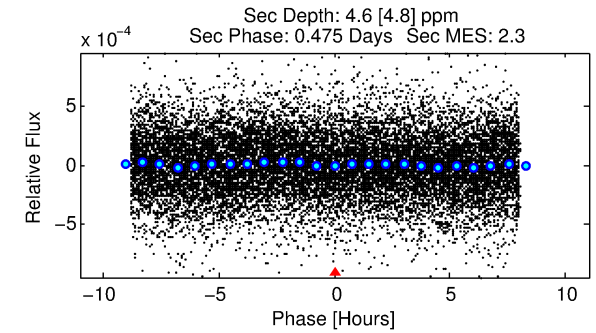
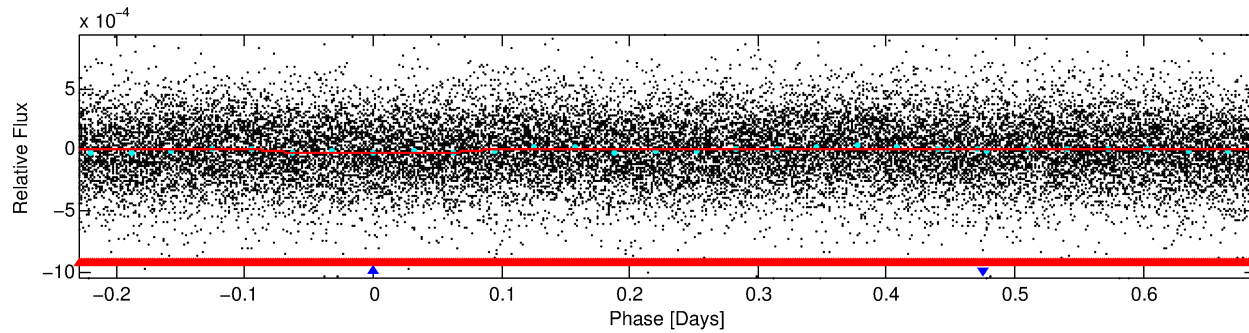
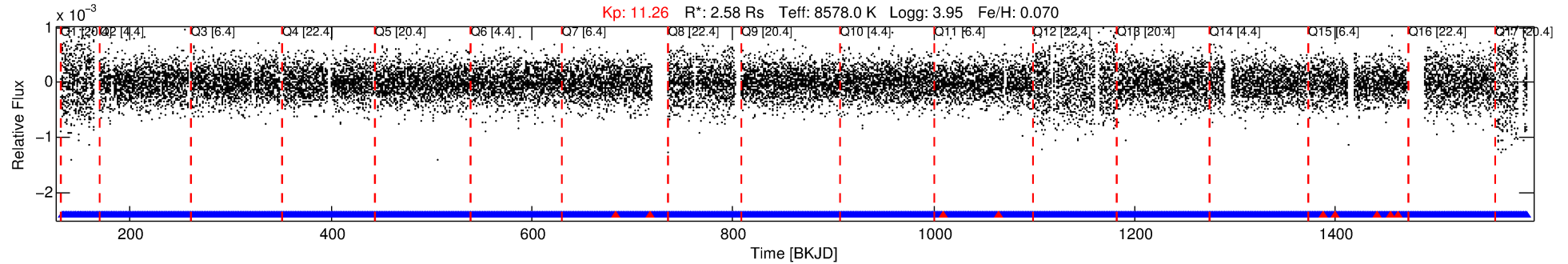
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005209712-02

No Significant Match Found

DV One-Page Summary

KIC: 5209712 Candidate: 2 of 2 Period: 0.918 d



DV Fit Results:

Period = 0.91820 [0.00002] d
Epoch = 132.3970 [0.0089] BKJD
Rp/R* = 0.0047 [0.0033]
a/R* = 1.39 [3.05]
b = 0.83 [1.77]
Seff = 56124.31 [26825.02]
Teq = 3925 [469] K
Rp = 1.31 [1.04] Re
a = 0.0239 [0.0070] AU
Ag = 0.85 [1.54] [-0.10σ]
Teffp = 5825 [2578] K [0.73σ]

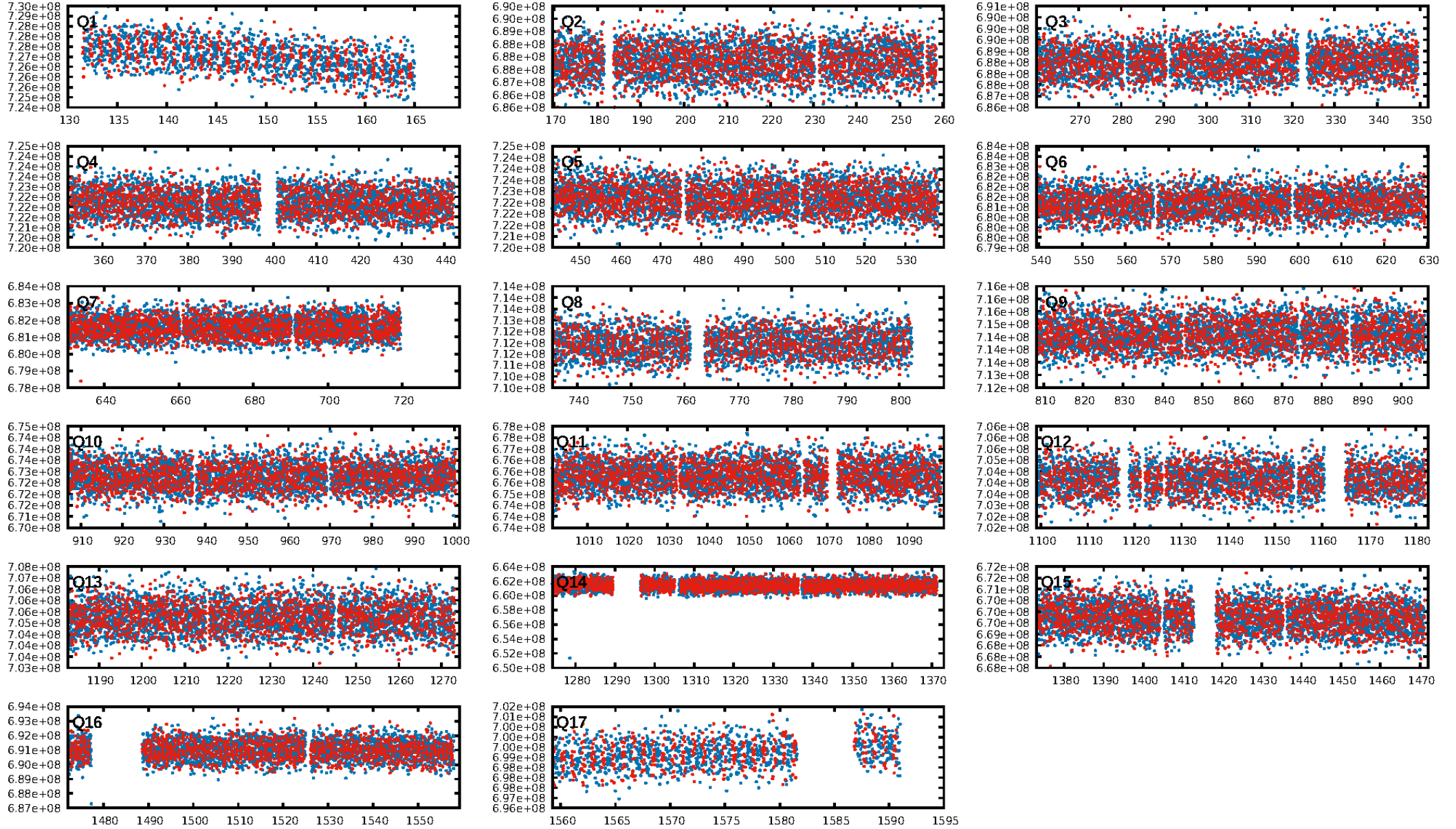
DV Diagnostic Results:

ShortPeriod-sig: 93.3% [1.83σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.16e-24
RollingBand-fgt: 0.99 [911/920]
GhostDiagnostic-chr: -36.87
Centroid-sig: 0.0%
Centroid-so: 1.002 arcsec [2.55σ]
OotOffset-rm: 0.714 arcsec [1.18σ]
KicOffset-rm: 0.782 arcsec [1.21σ]
OotOffset-st: 3/4/2/4 [13]
KicOffset-st: 3/4/2/4 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 0.00 [0/17]

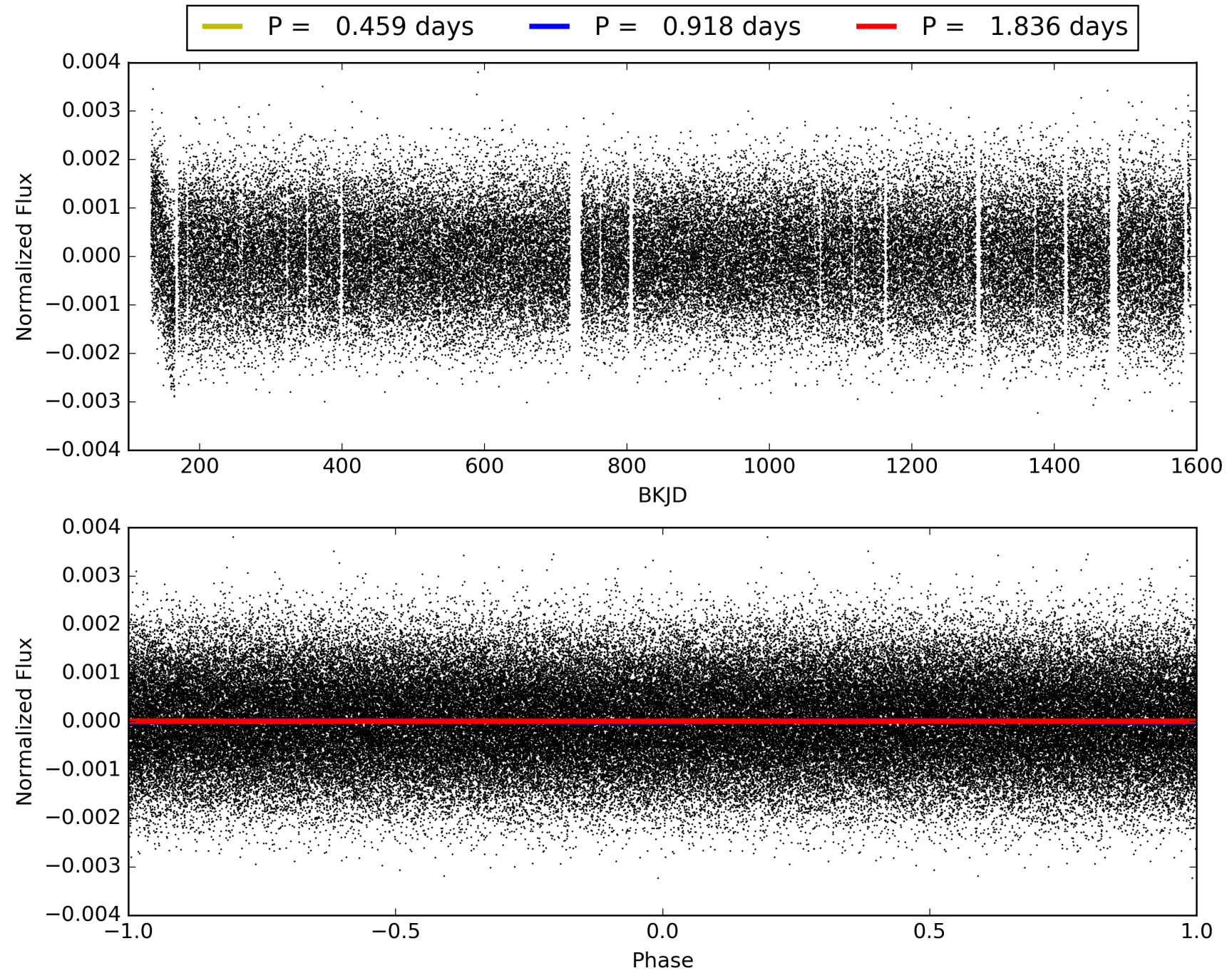
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:10:03 Z

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

TCE 005209712-02, PDC Light Curves

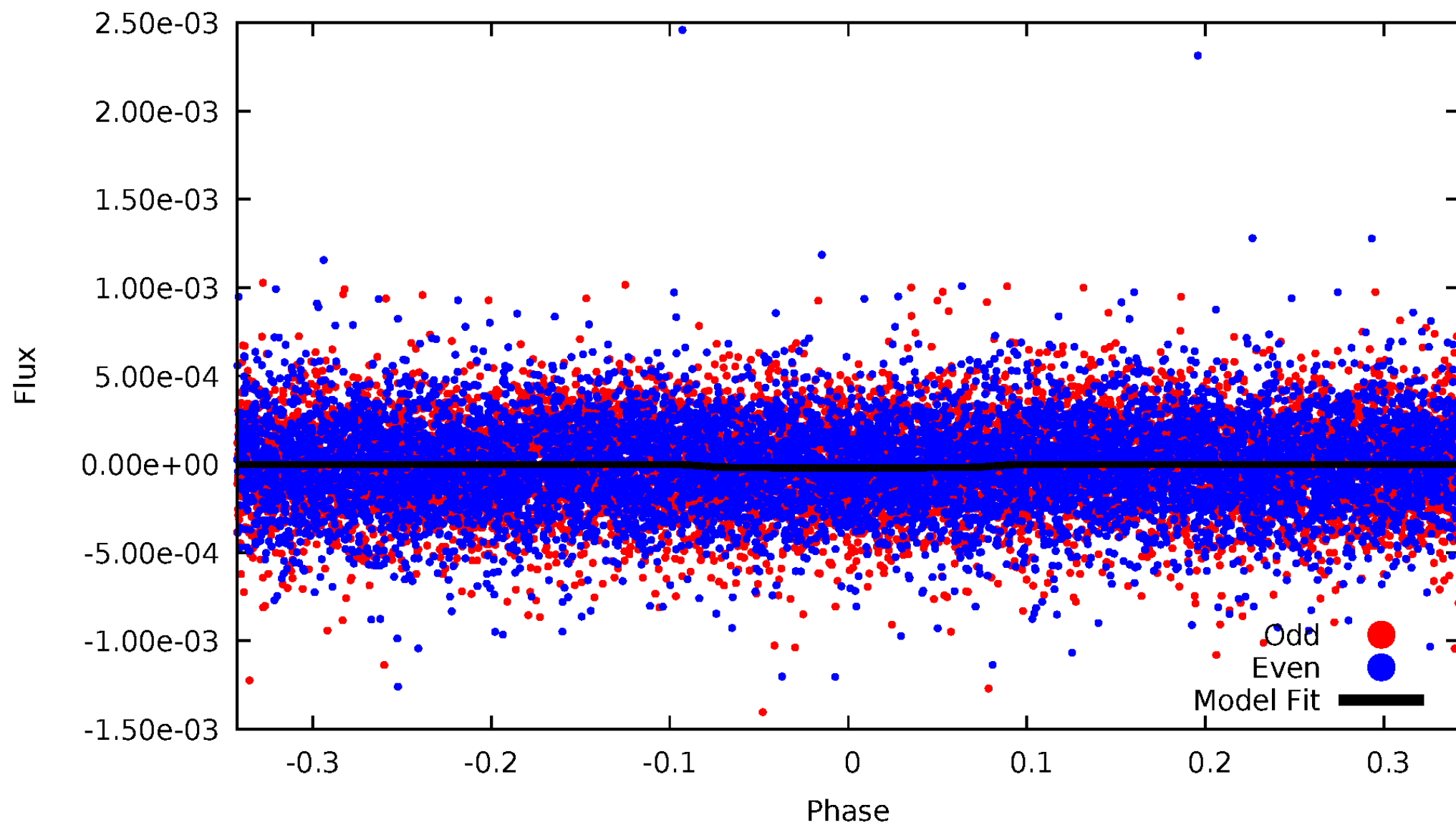


TCE 005209712-02



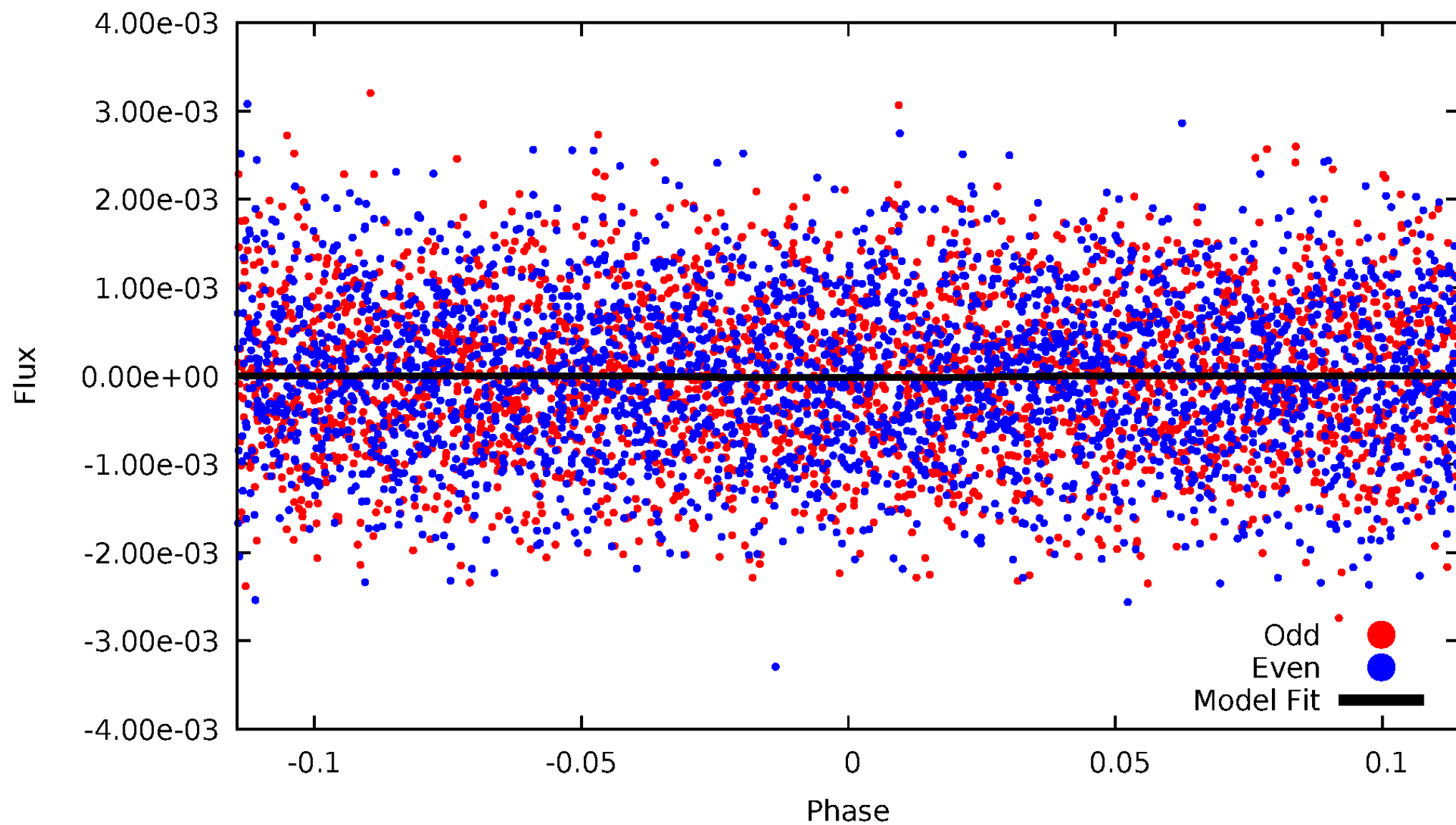
DV Odd/Even

TCE 005209712-02



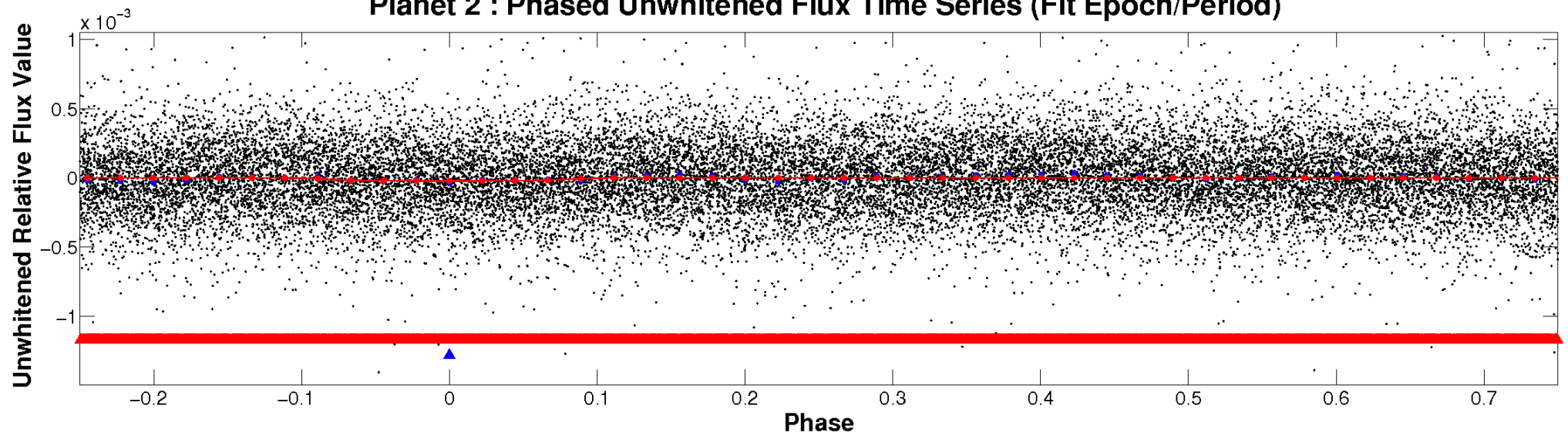
ALT Odd/Even

TCE 005209712-02

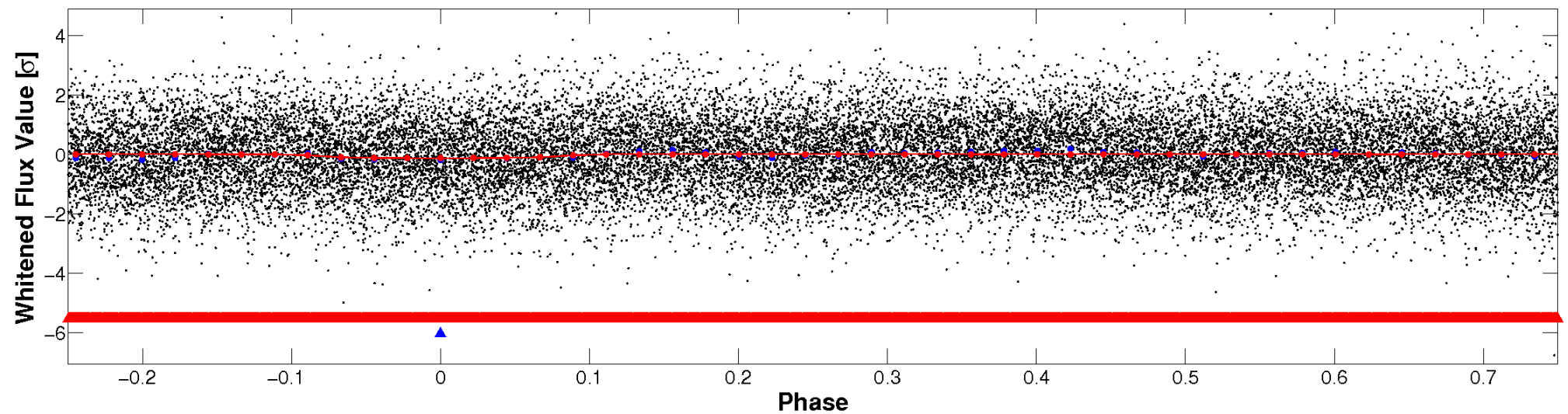


Non-Whitened Vs. Whitened Light Curve

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

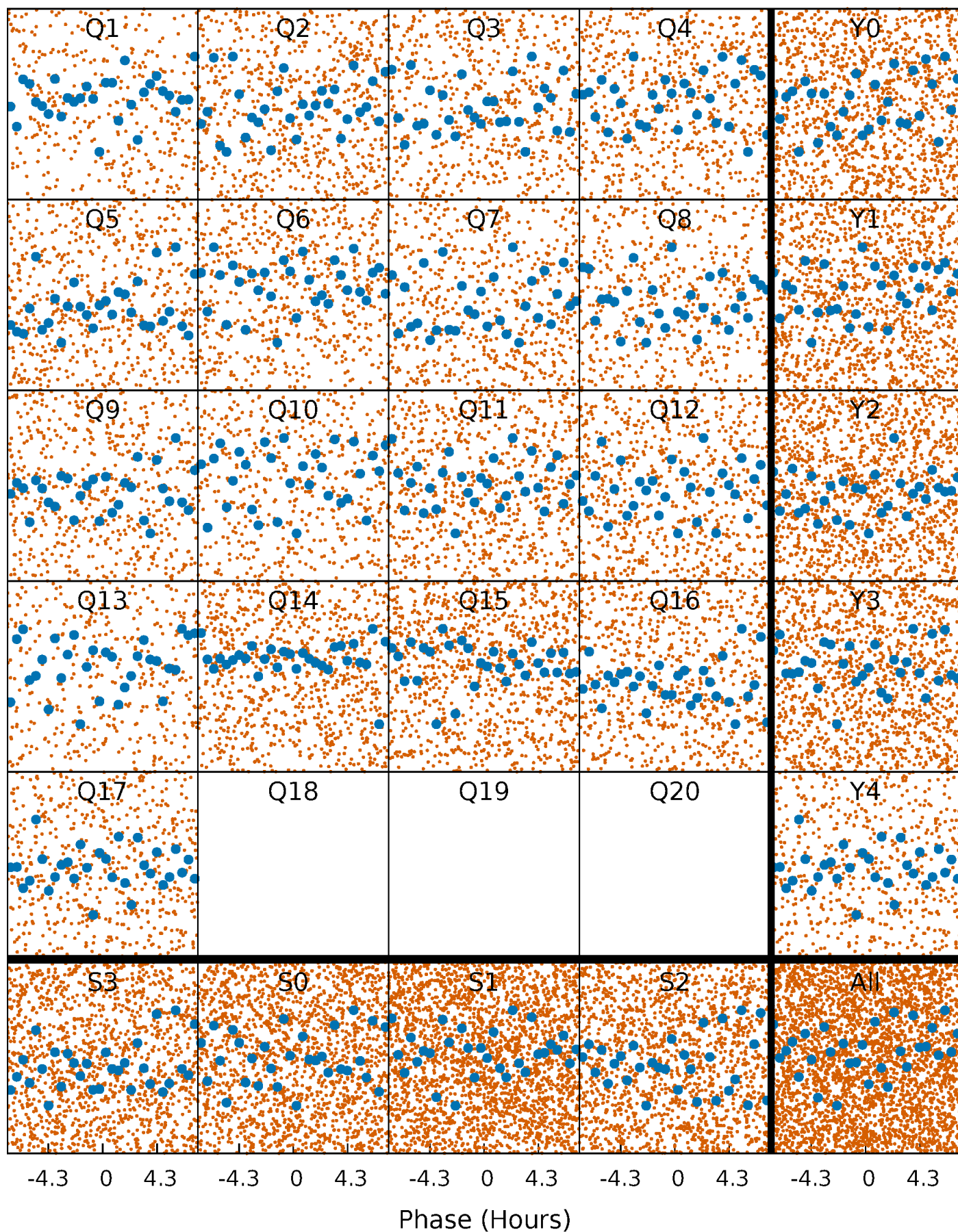


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



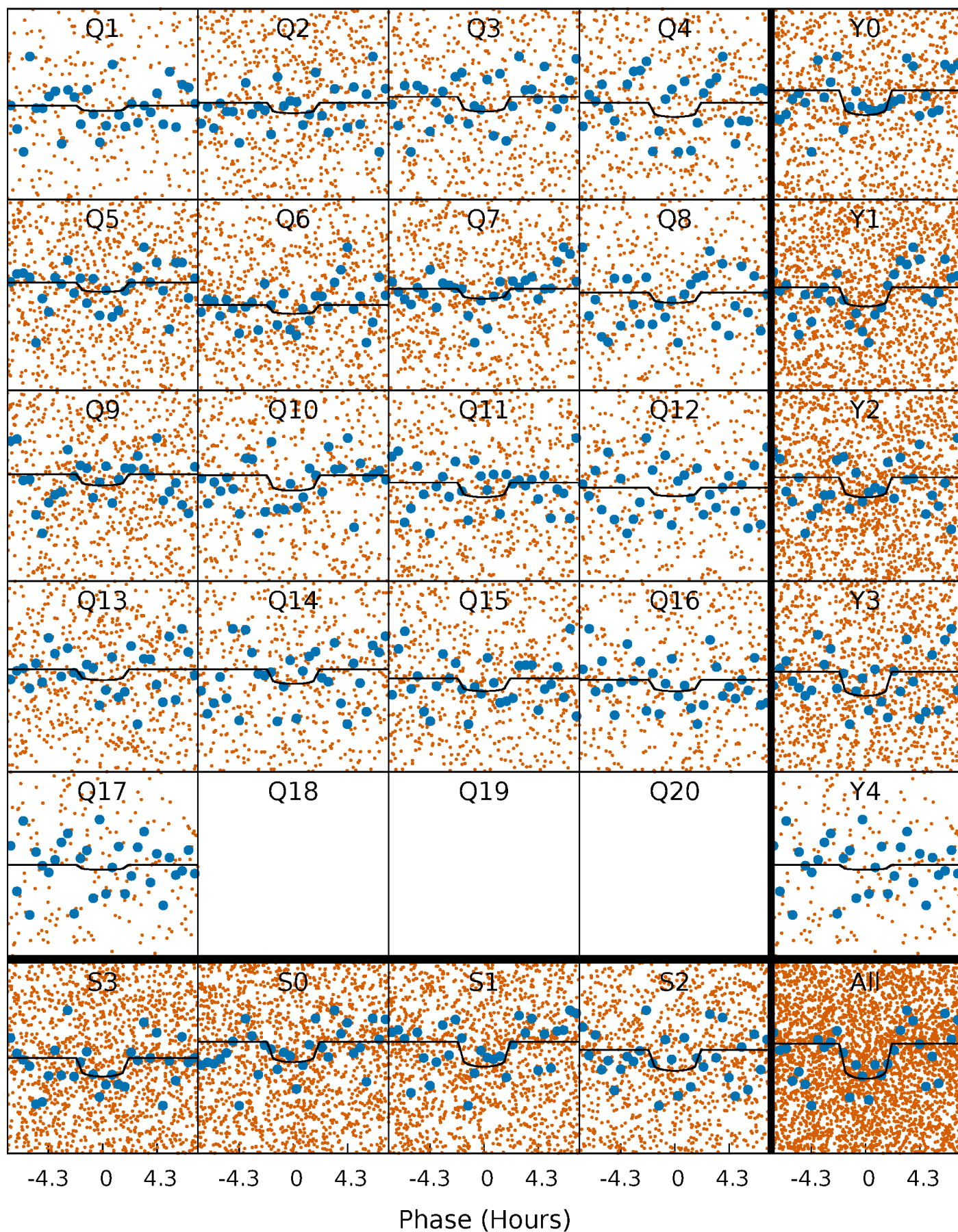
PDC Quarter-Phased Transit Curves

TCE 005209712-02 P= 0.918203 Days $T_0=132.396999$ (BKJD)



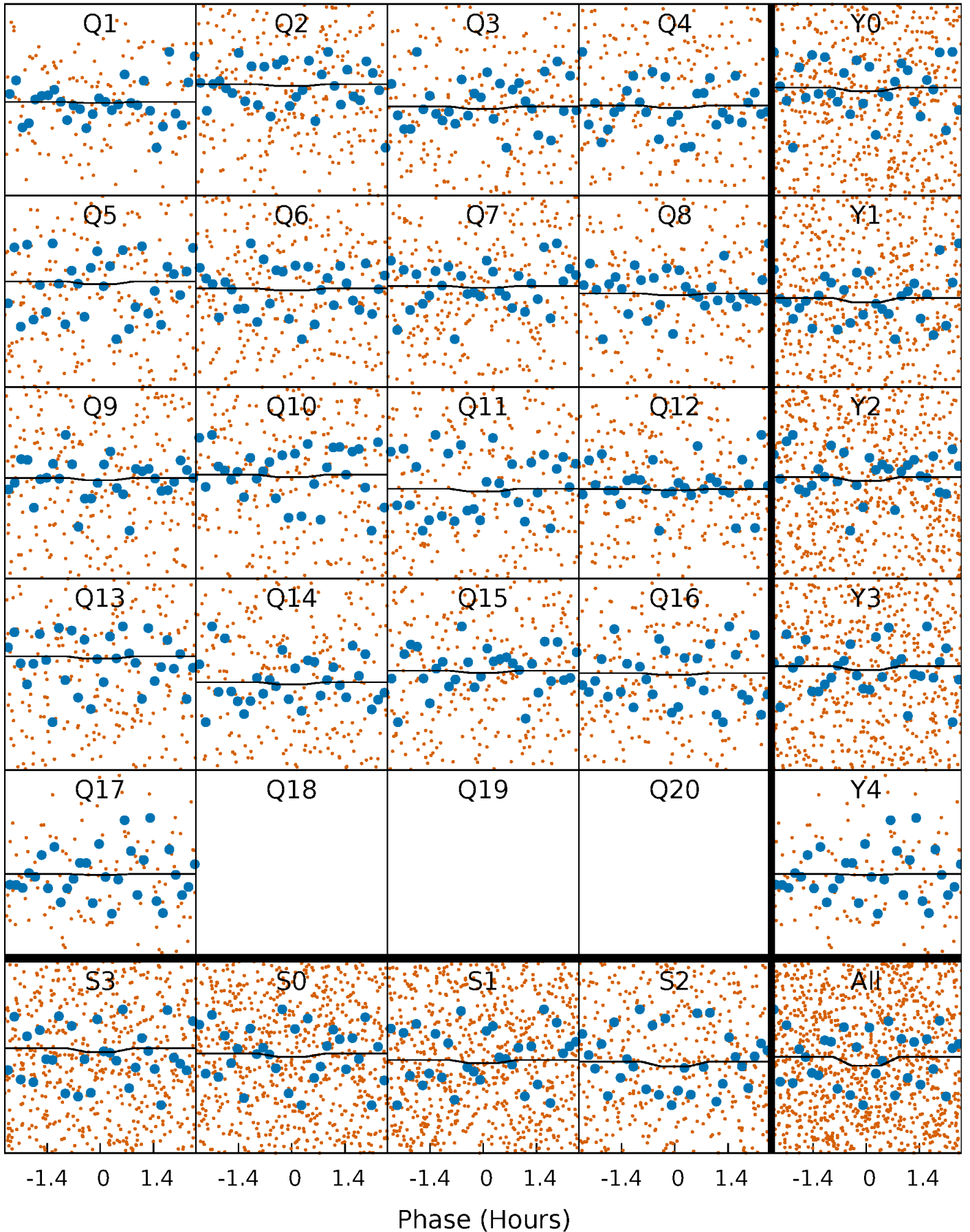
DV Quarter-Phased Transit Curves

TCE 005209712-02 P= 0.918203 Days $T_0=132.396999$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

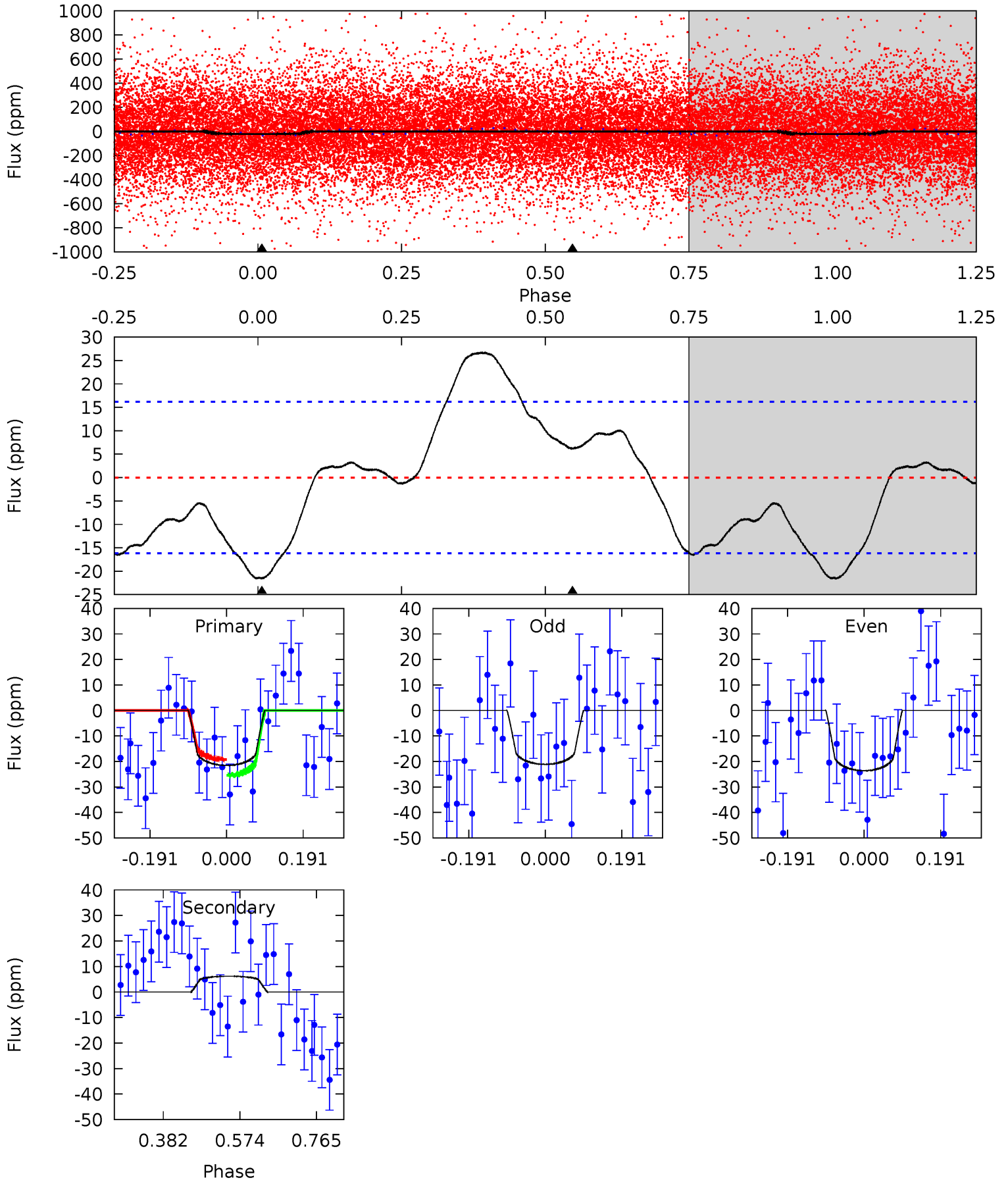
TCE 005209712-02 P= 0.918202 Days $T_0=132.402279$ (BKJD)



DV Model-Shift Uniqueness Test

005209712-02, P = 0.918203 Days, E = 131.478796 Days

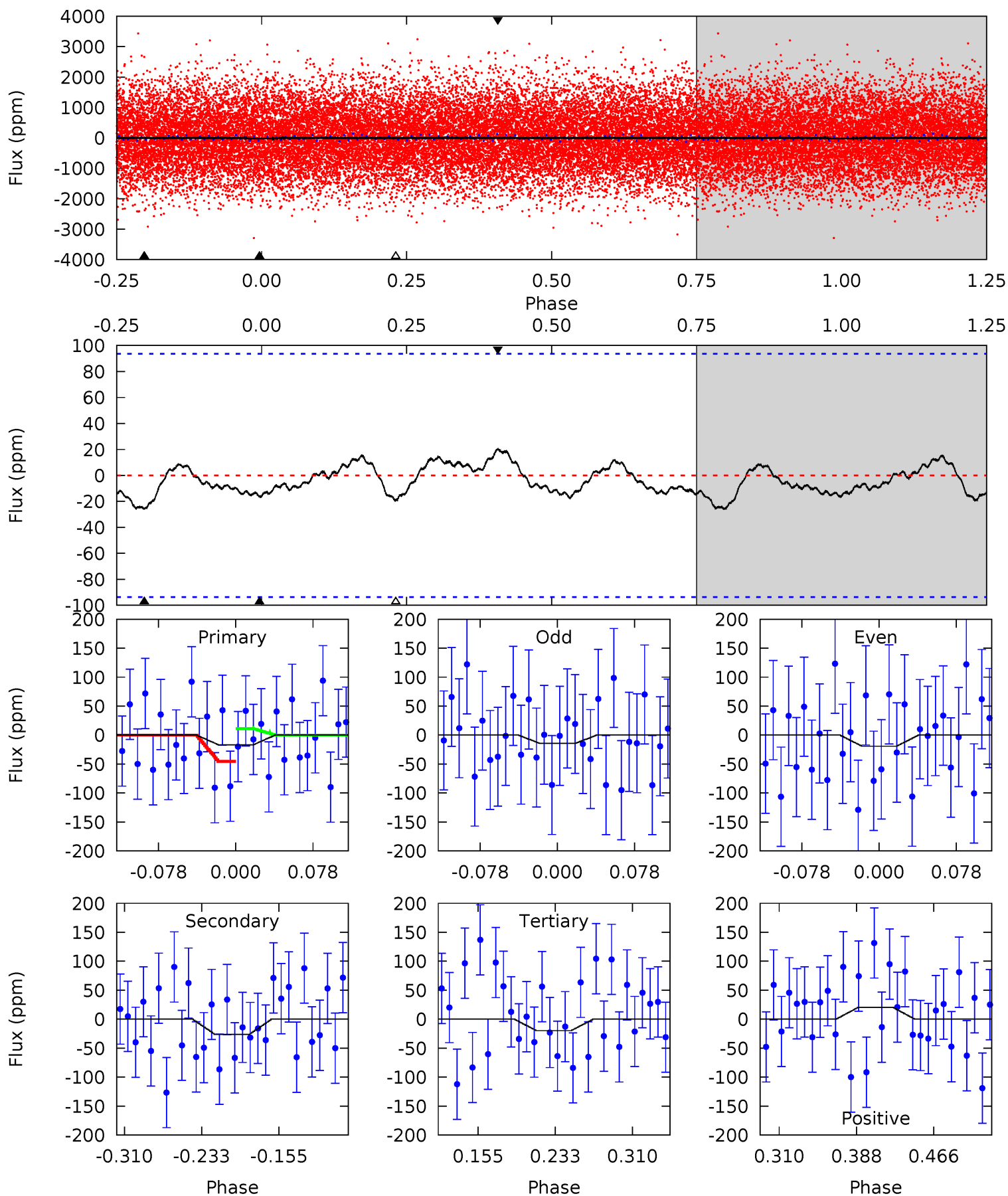
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.89	-1.69	0	0	4.43	1.31	3.26	5.89	5.89	-1.69	-1.69	0.35	0.54	0.55	0.87



Alt Model-Shift Uniqueness Test

005209712-02, P = 0.918202 Days, E = 131.484077 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.83	1.29	0.97	1.01	4.62	1.76	0.48	-0.14	-0.18	0.32	0.28	0.12	0.74	0.44	0.84



Stellar Parameters For KIC 005209712

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8578^{+235}_{-404}	$3.953^{+0.247}_{-0.133}$	$0.070^{+0.250}_{-0.550}$	$2.576^{+0.701}_{-0.857}$	$2.170^{+0.314}_{-0.583}$	$0.179^{+0.275}_{-0.076}$
	+3%/-5%	+6%/-3%	+357%/-786%	+27%/-33%	+14%/-27%	+154%/-43%
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 005209712-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	6 ± 4	$1.34^{+0.94}_{-0.79}$	5385^{+357}_{-488}	-5988^{+1082}_{-3467}	$-0.962^{+0.760}_{-4.924}$
Alt.	-26 ± 20	$1.26^{+0.89}_{-0.76}$	5376^{+427}_{-446}	8210^{+10919}_{-3406}	$4.203^{+24.625}_{-3.499}$

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

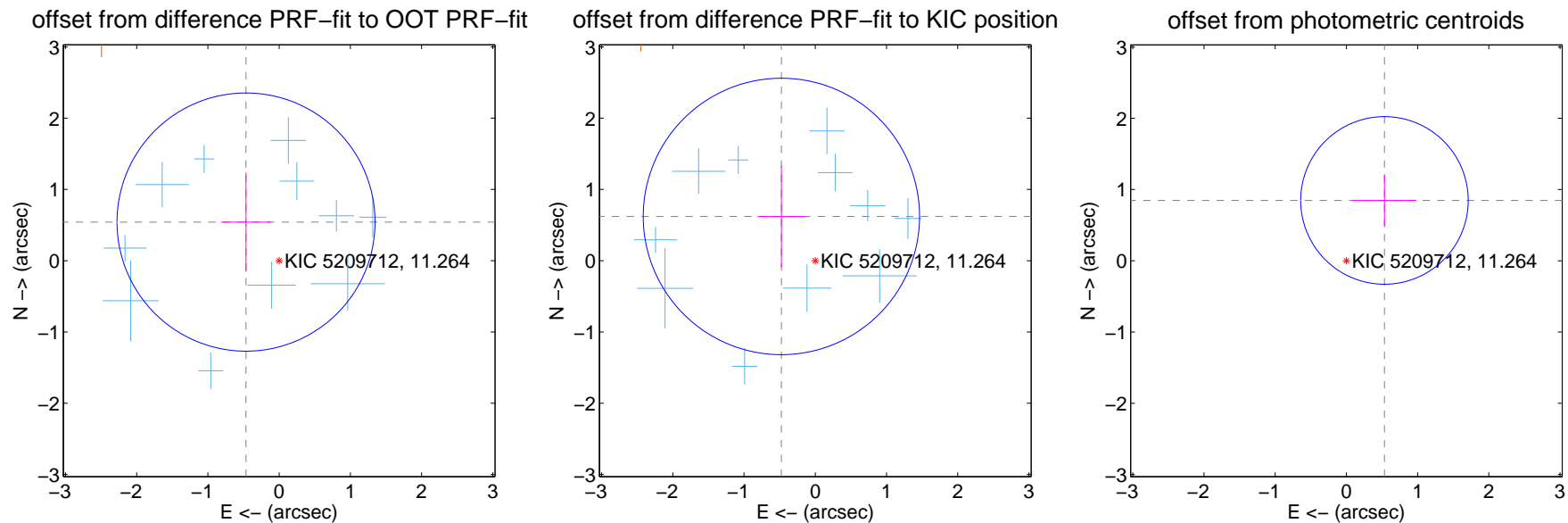
DV Centroid Data

Supplemental centroid analysis for 005209712-02. **Kepler magnitude: 11.26.** Transit SNR 6.51

There are 11 quarters with good PRF difference image offsets

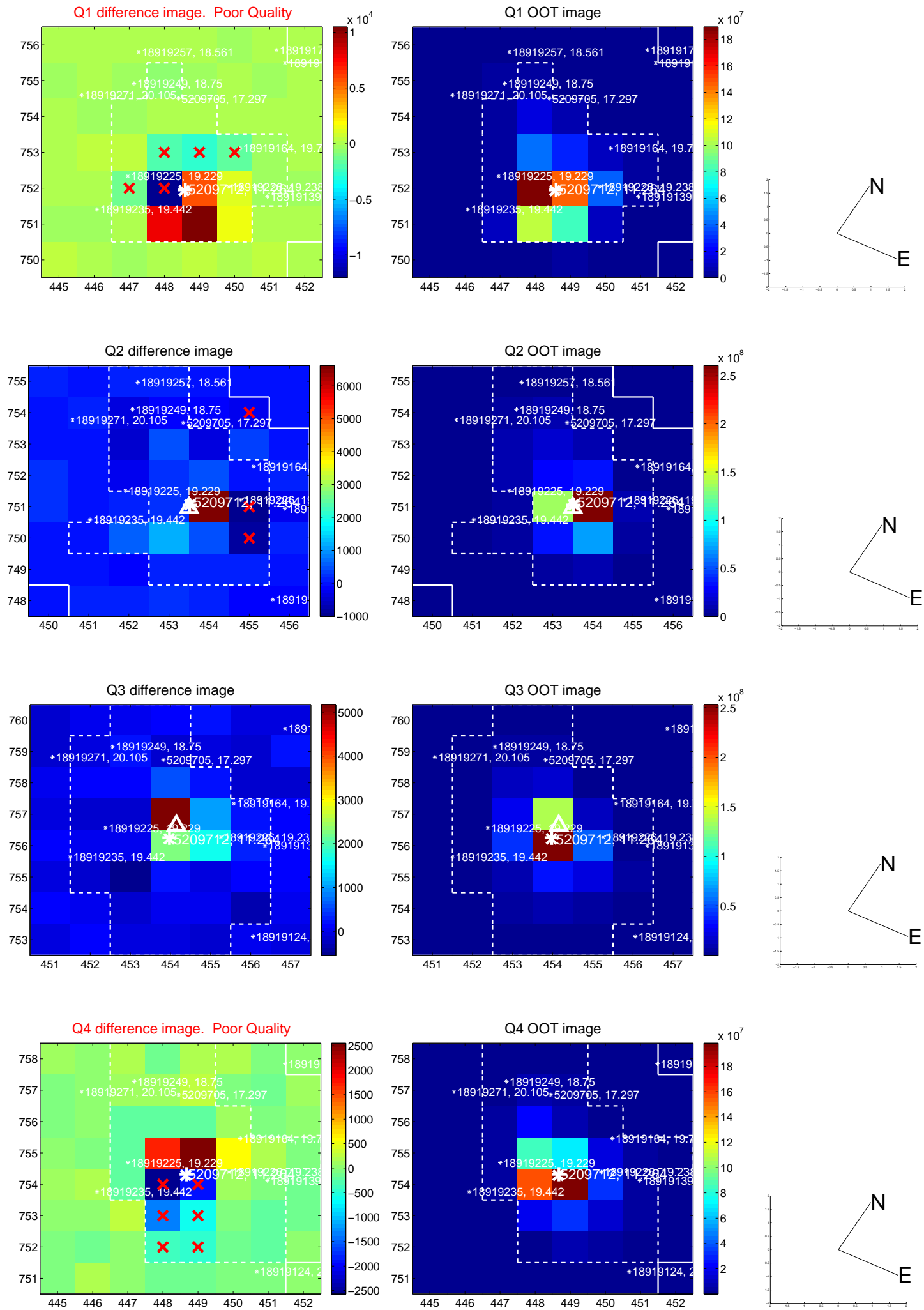
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.714 ± 0.604	1.18	0.465 ± 0.349	0.542 ± 0.695
PRF-fit source offset from KIC position	0.782 ± 0.647	1.21	0.476 ± 0.331	0.621 ± 0.714
photometric centroid source offset	1.00 ± 0.39	2.55	-0.53 ± 0.45	0.85 ± 0.37

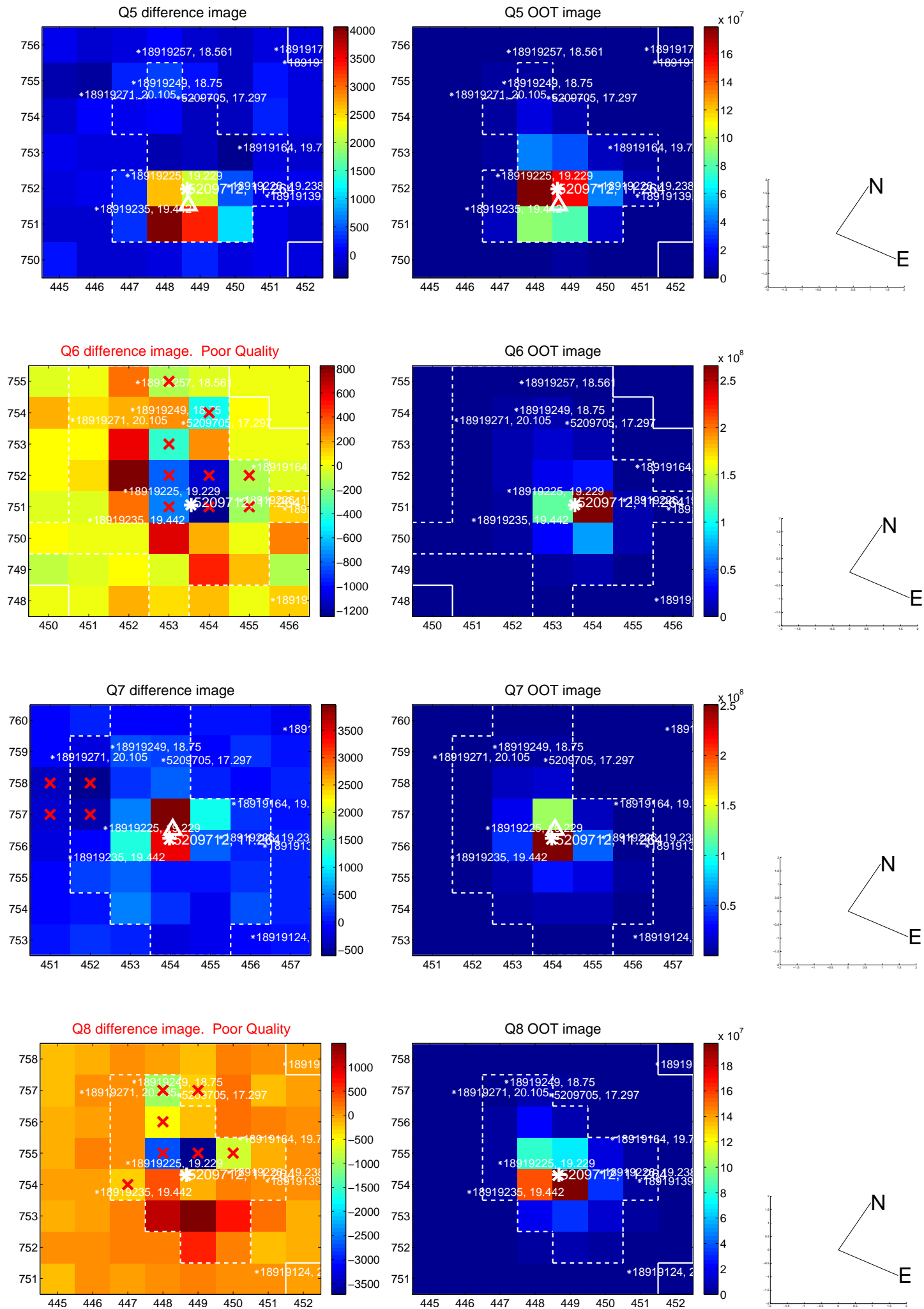


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

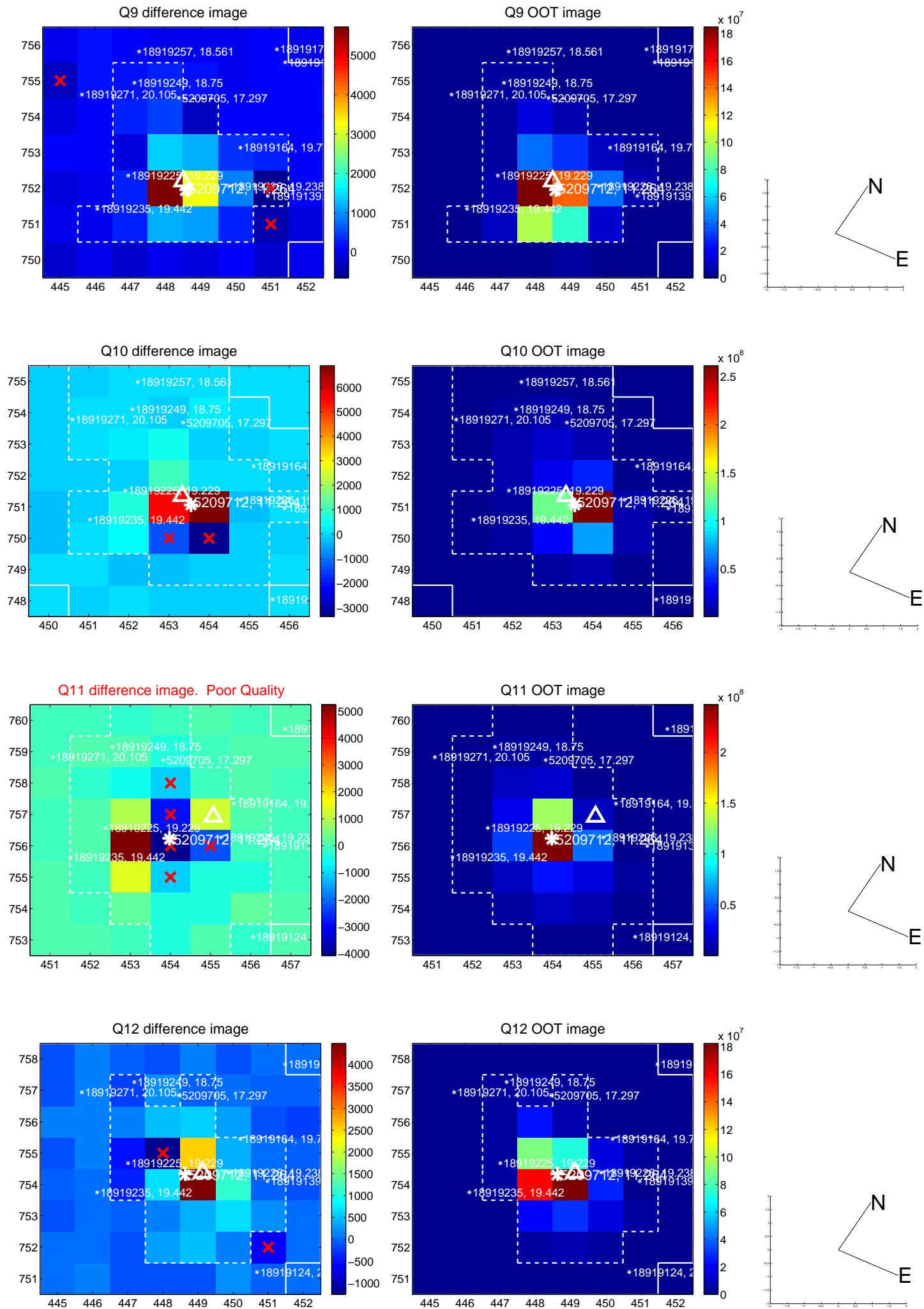
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



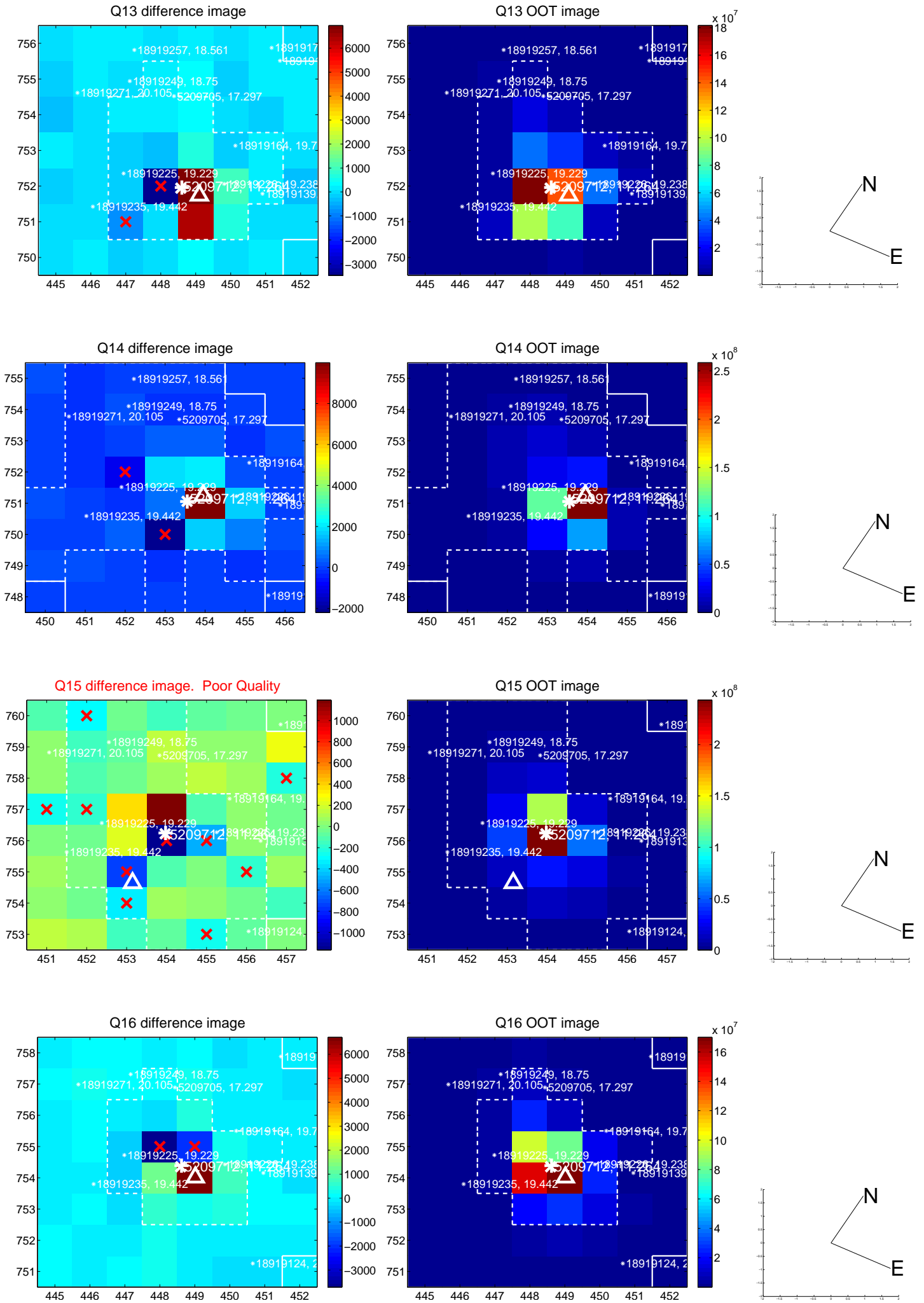
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



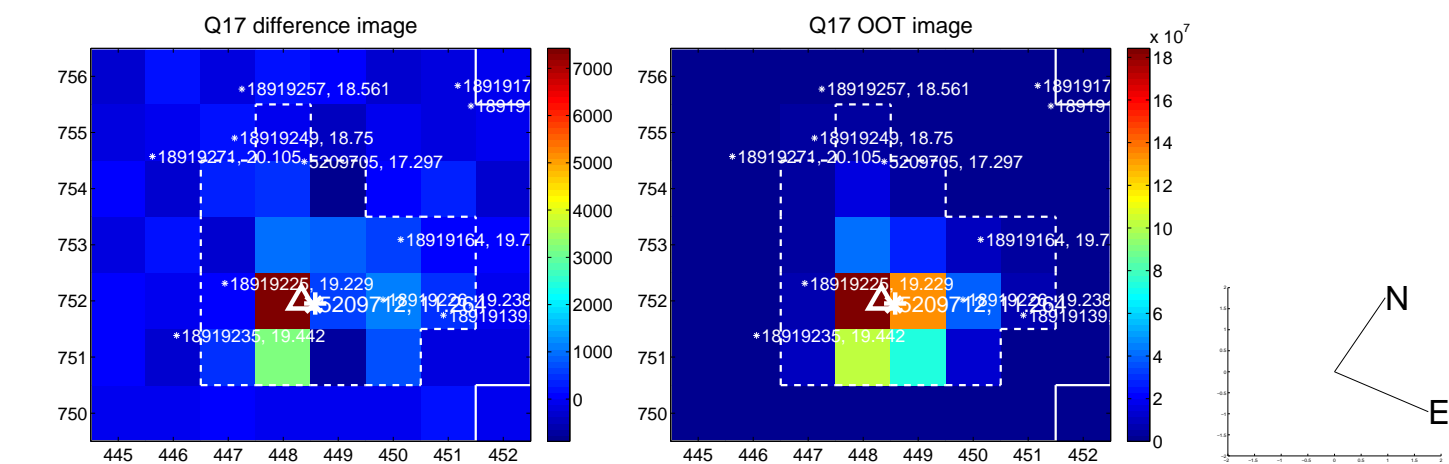
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



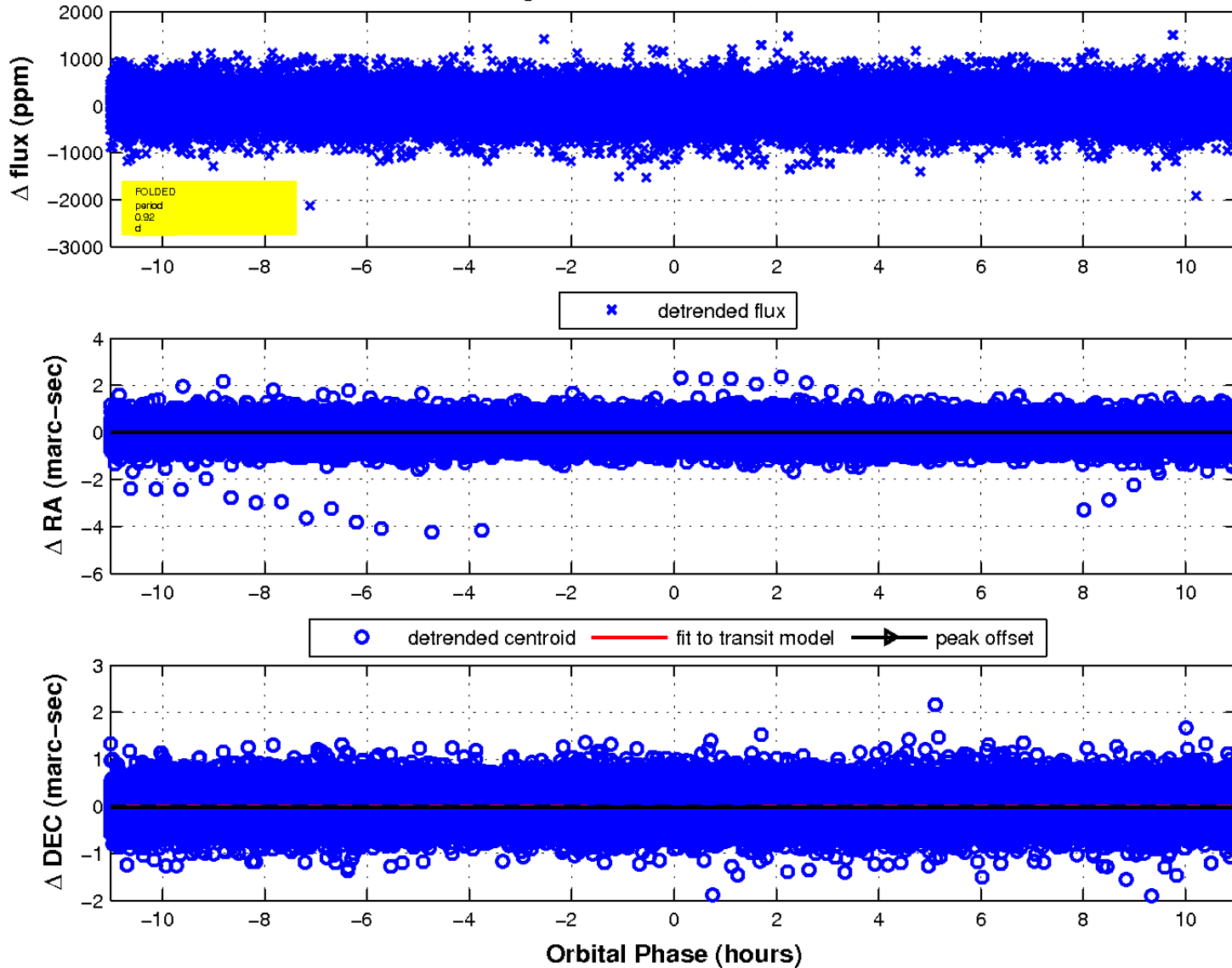
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

