

KIC 009149789

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})
009149789-01	OBS	2874.01	0.705028	131.666262	153.0	1.035	18.6	24.3	0.77	5465	0.98	2176.70
009149789-02	OBS	No	0.705029	132.019066	132.5	1.050	18.7	21.5	0.77	5465	1.06	2176.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009149789-01	OBS	PC	0.99	0	0	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE
009149789-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 009149789-01

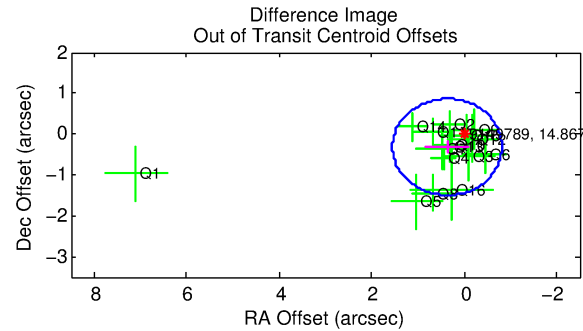
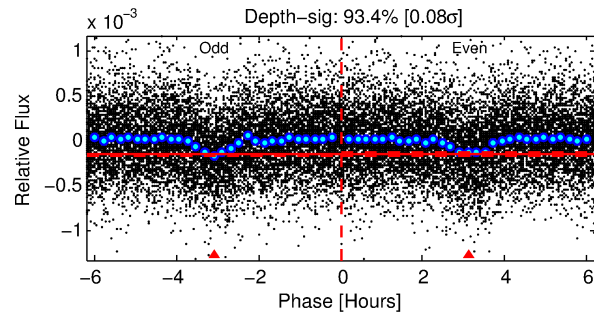
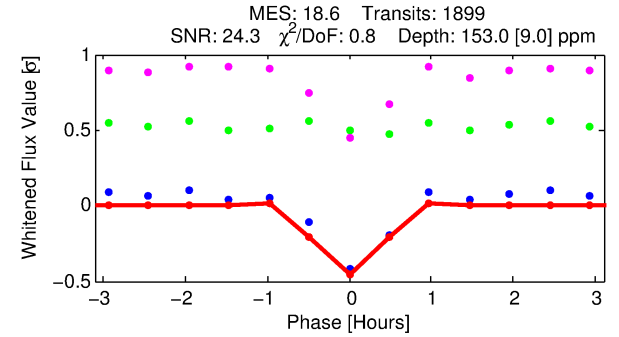
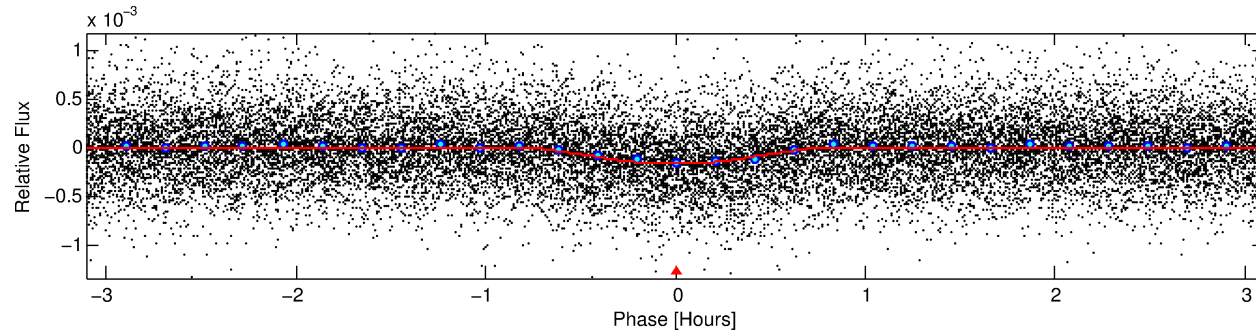
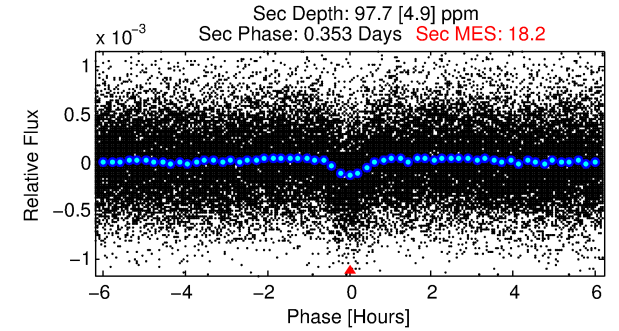
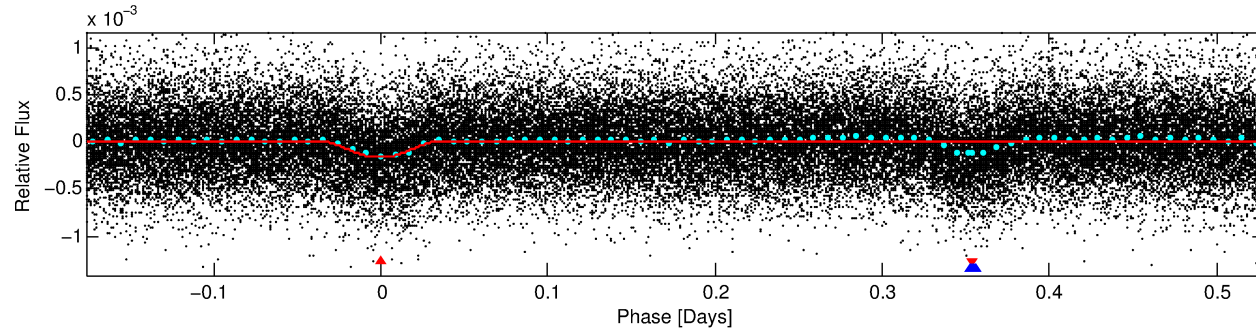
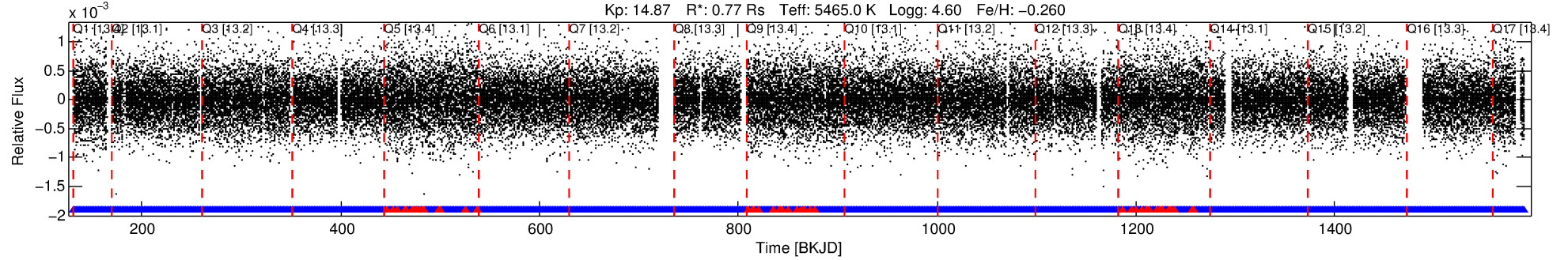
No Significant Match Found

DV One-Page Summary

KIC: 9149789 Candidate: 1 of 2 Period: 0.705 d

KOI: K02874 Corr: No Ephemeris Match

Kp: 14.87 R*: 0.77 Rs Teff: 5465.0 K Logg: 4.60 Fe/H: -0.260



DV Fit Results:

Period = 0.70503 [0.00000] d
Epoch = 131.6663 [0.0007] BKJD
Rp/R* = 0.0117 [0.0041]
a/R* = 4.61 [6.38]
b = 0.51 [2.14]
Seff = 2176.70 [552.21]
Teq = 1742 [110] K
Rp = 0.98 [0.39] Re
a = 0.0147 [0.0023] AU
Ag = 12.16 [8.97] [1.24σ]
Teffp = 5028 [896] K [3.64σ]

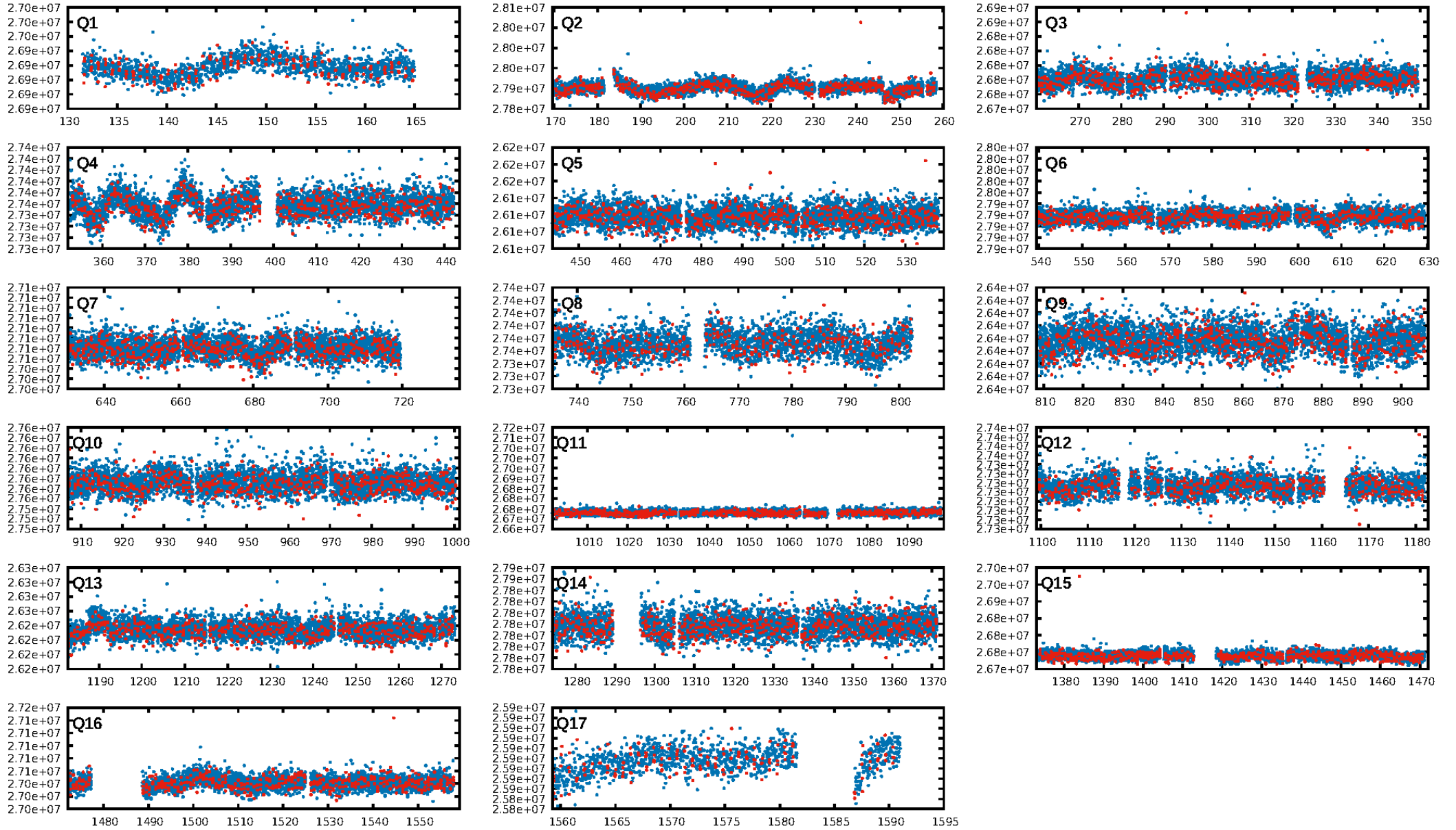
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.79e-76
RollingBand-fgt: 0.97 [1759/1813]
GhostDiagnostic-chr: 9.386
Centroid-sig: 17.8%
Centroid-so: 0.650 arcsec [1.07σ]
OotOffset-rm: 0.487 arcsec [1.24σ]
KicOffset-rm: 0.507 arcsec [1.58σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.88 [14/16]
DiffImageOverlap-fno: 1.00 [17/17]

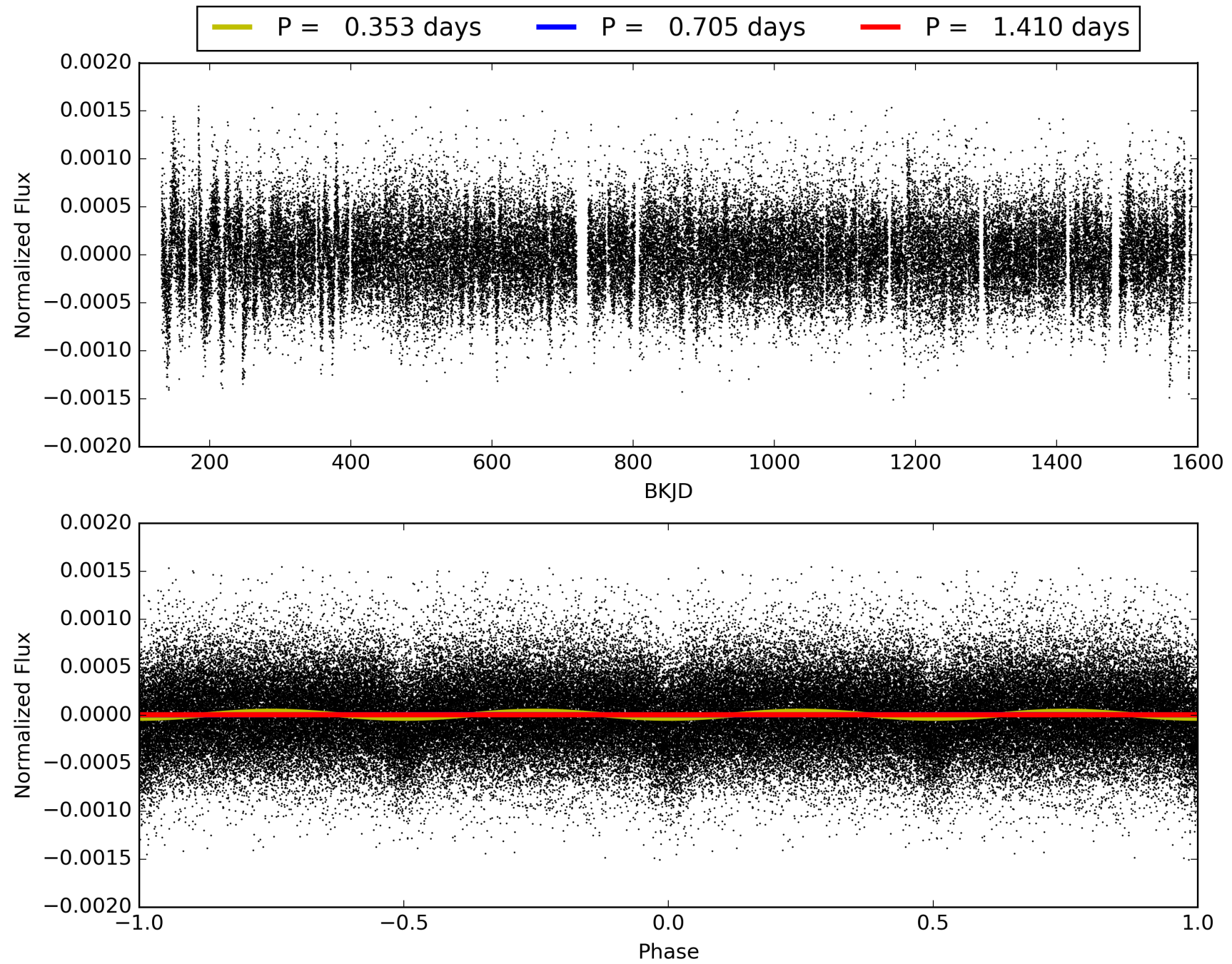
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:00:11 Z

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

TCE 009149789-01, PDC Light Curves

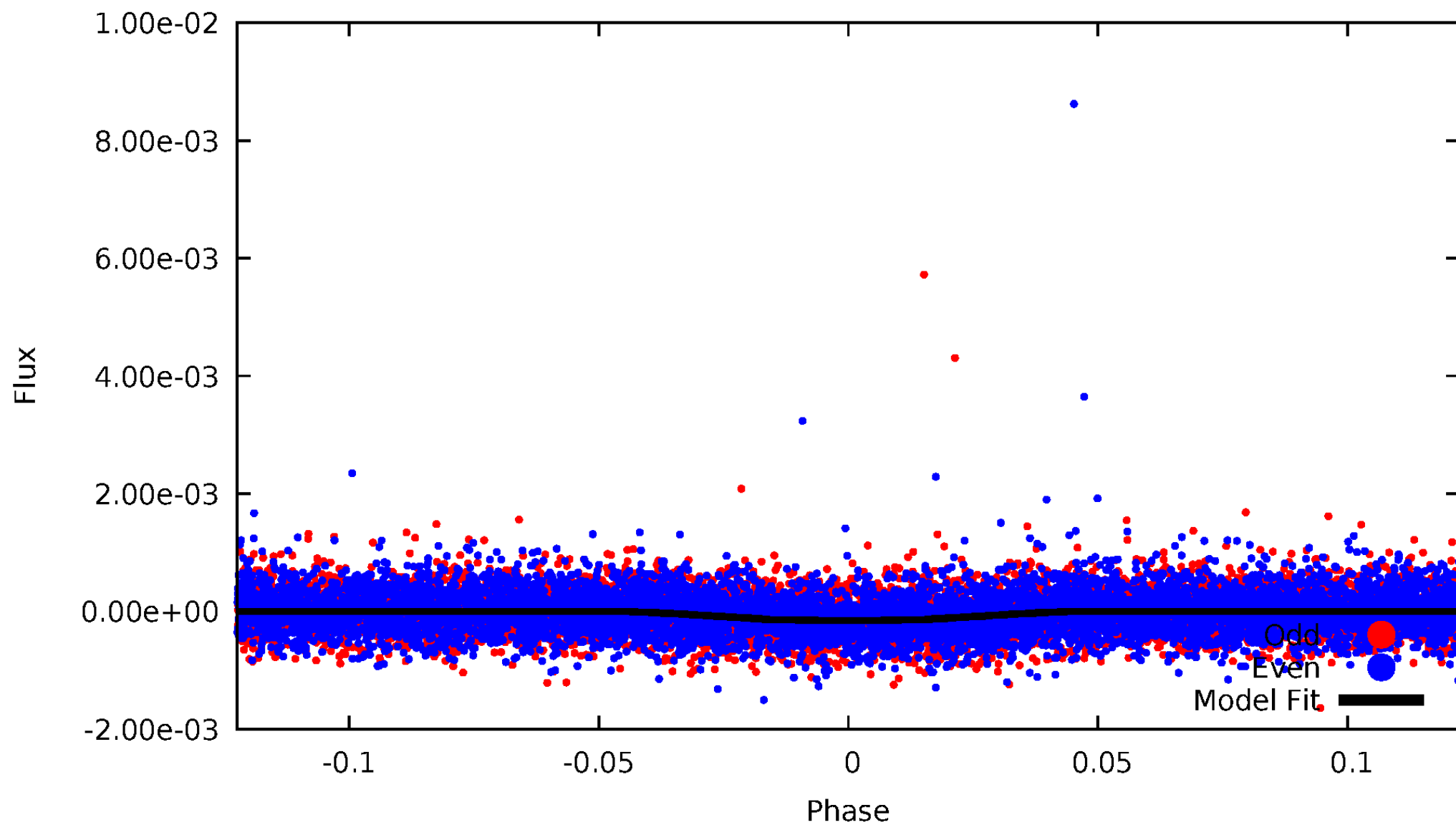


TCE 009149789-01



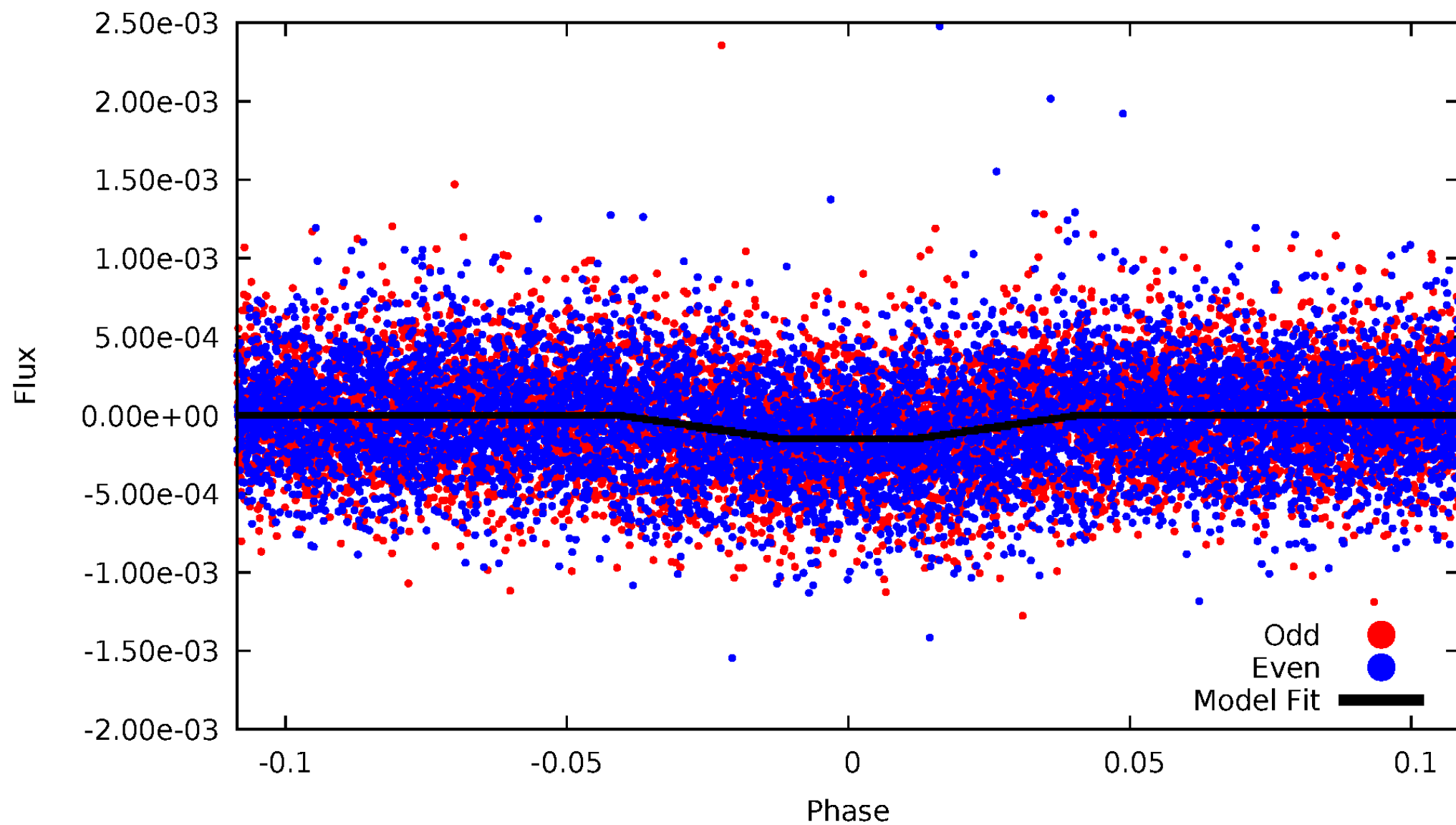
DV Odd/Even

TCE 009149789-01

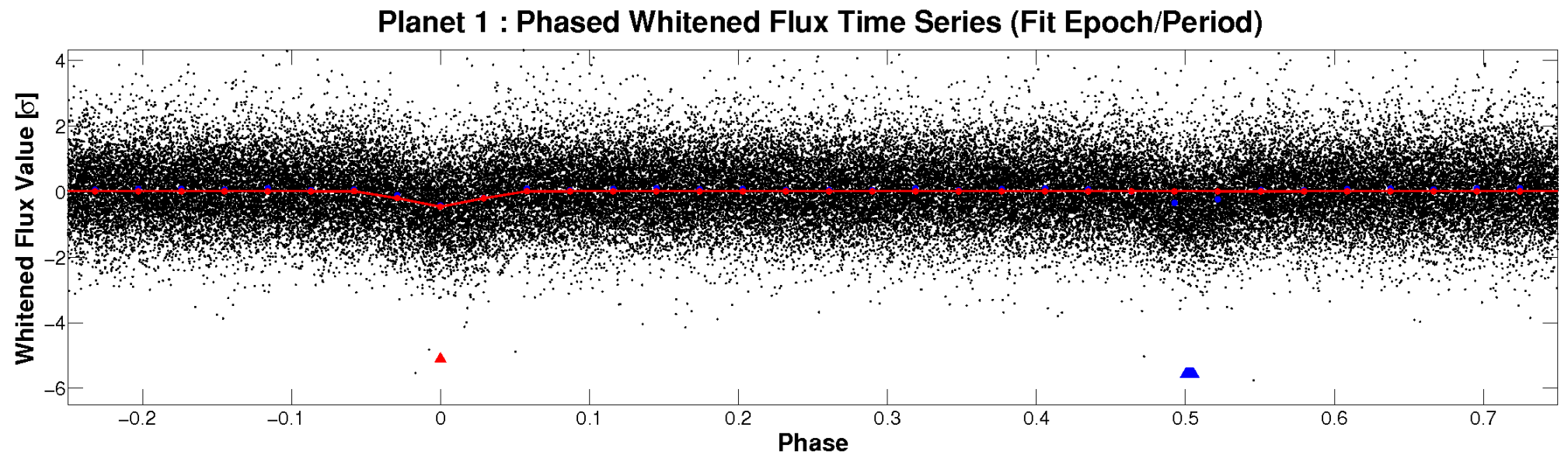
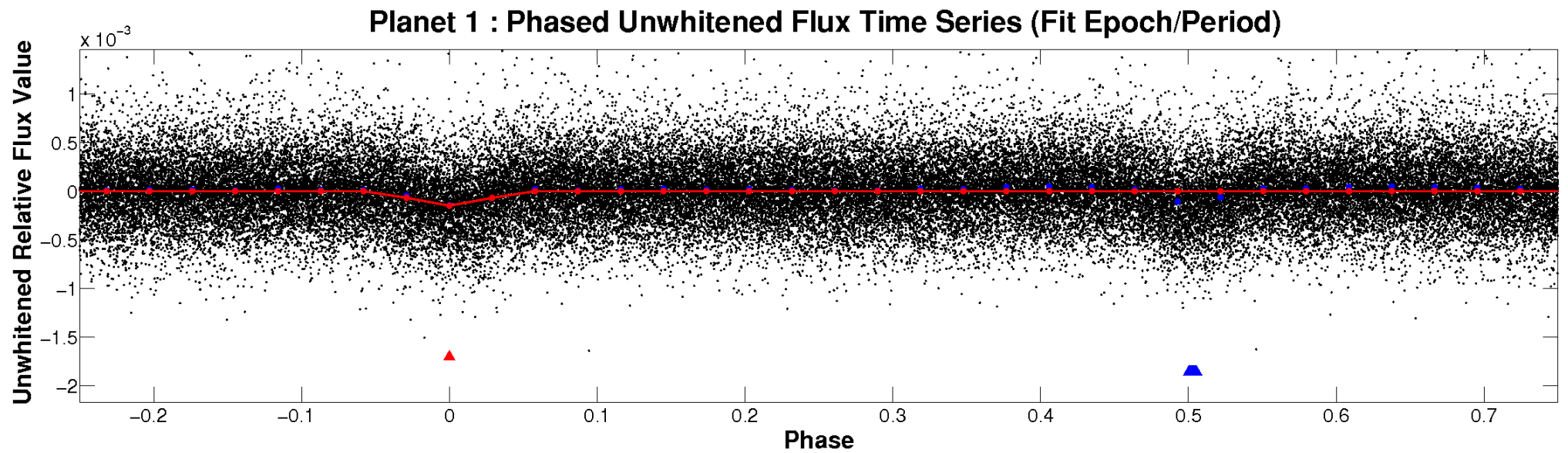


ALT Odd/Even

TCE 009149789-01

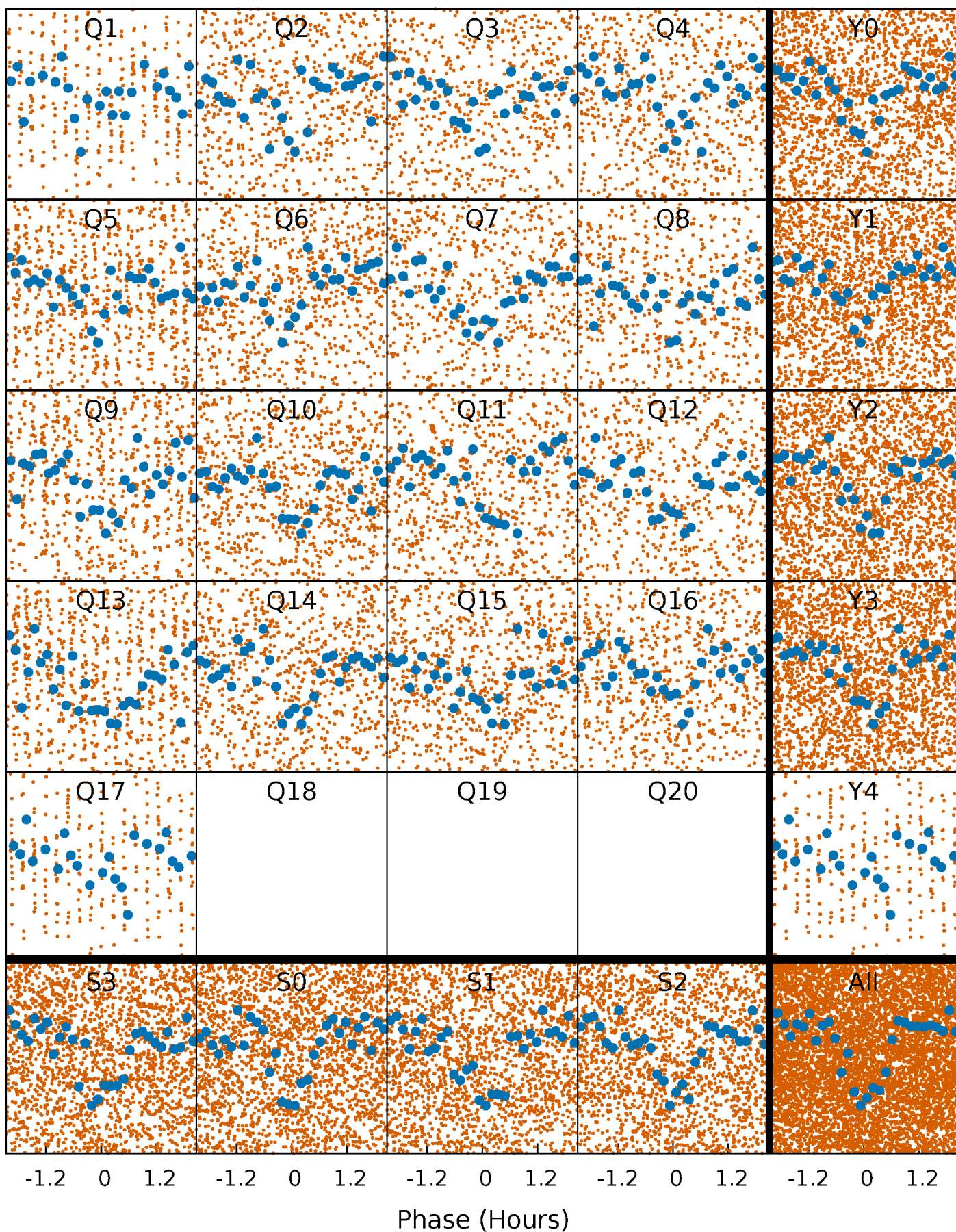


Non-Whitened Vs. Whitened Light Curve



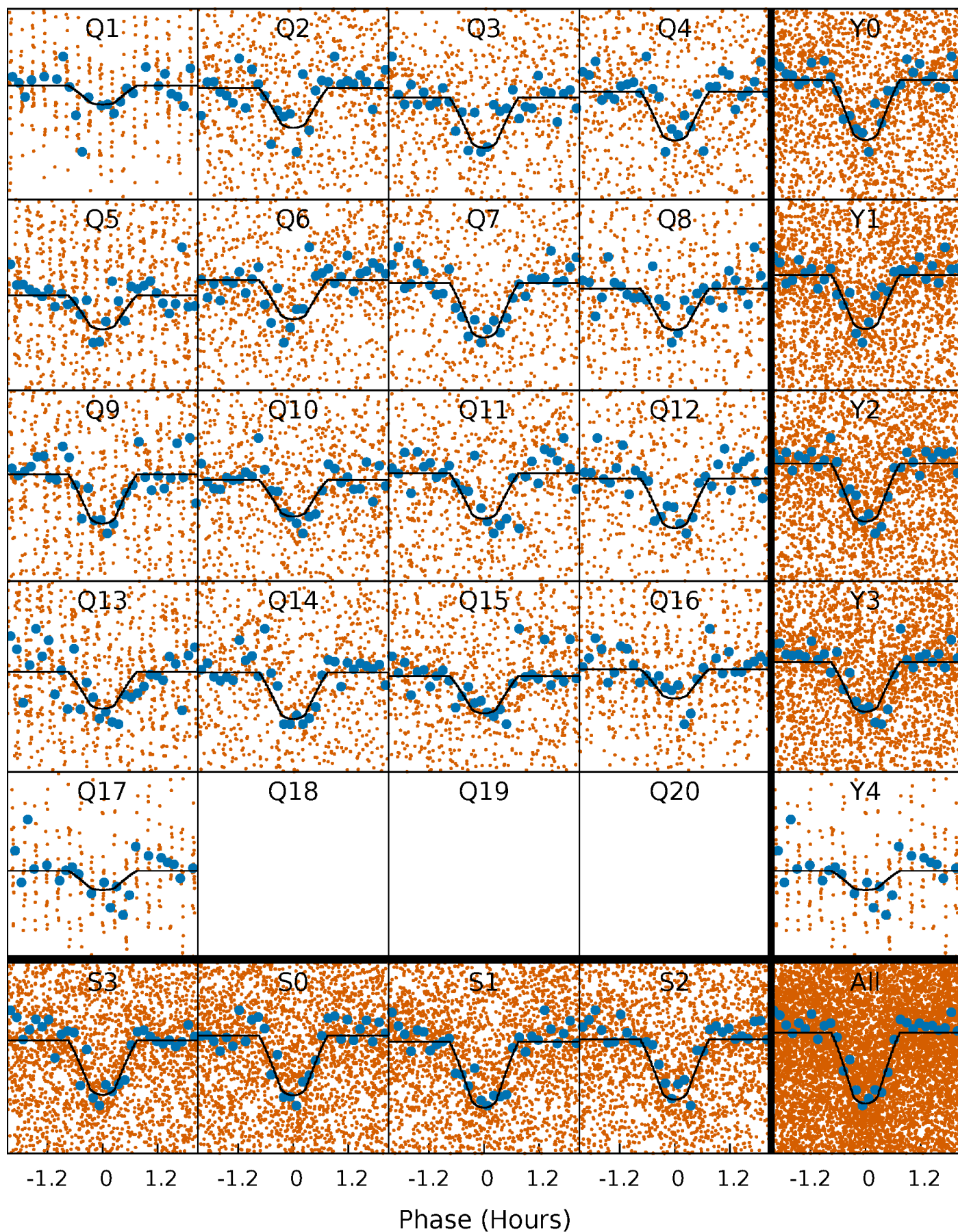
PDC Quarter-Phased Transit Curves

TCE 009149789-01 P= 0.705028 Days $T_0=131.666262$ (BKJD)



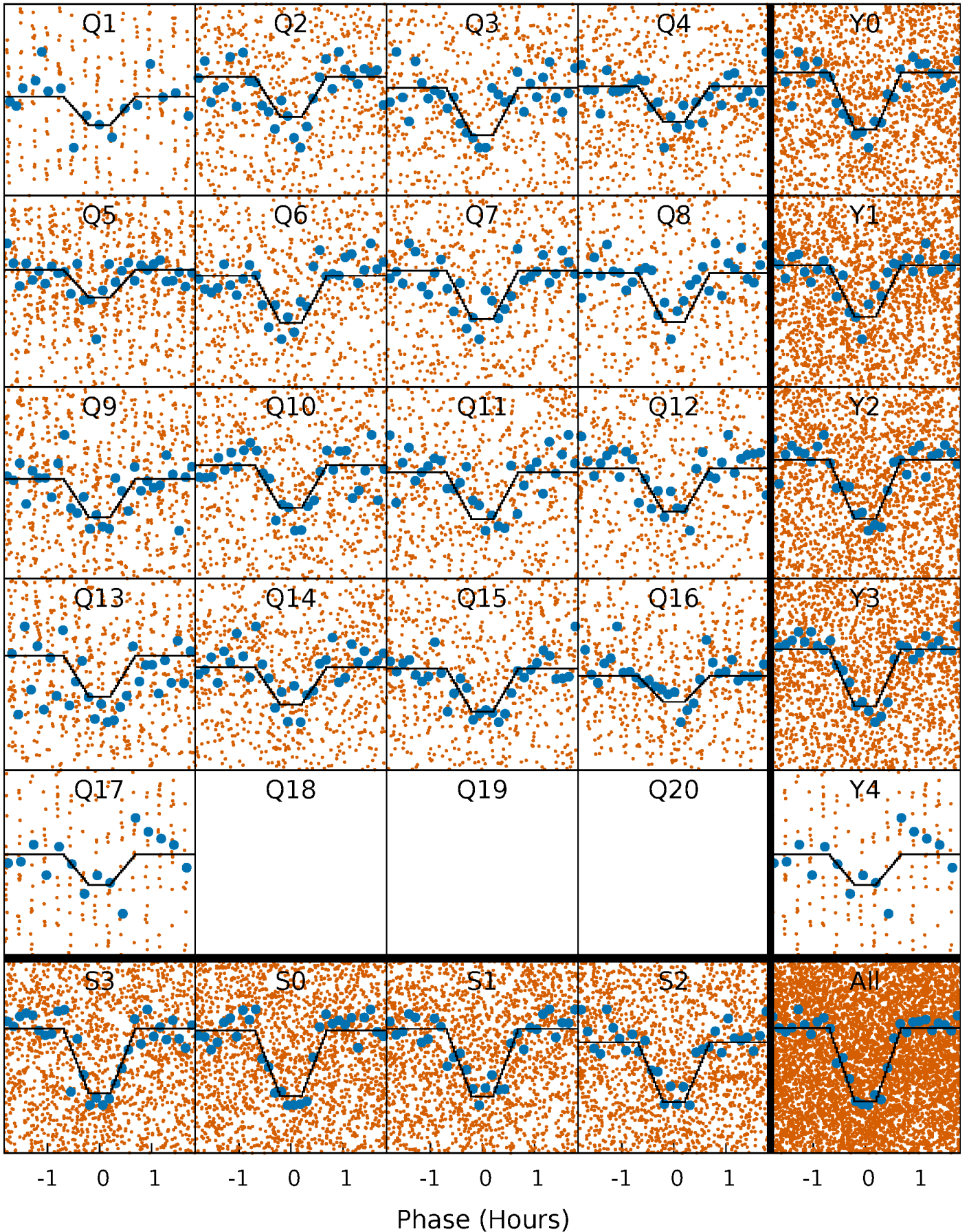
DV Quarter-Phased Transit Curves

TCE 009149789-01 P= 0.705028 Days $T_0=131.666262$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

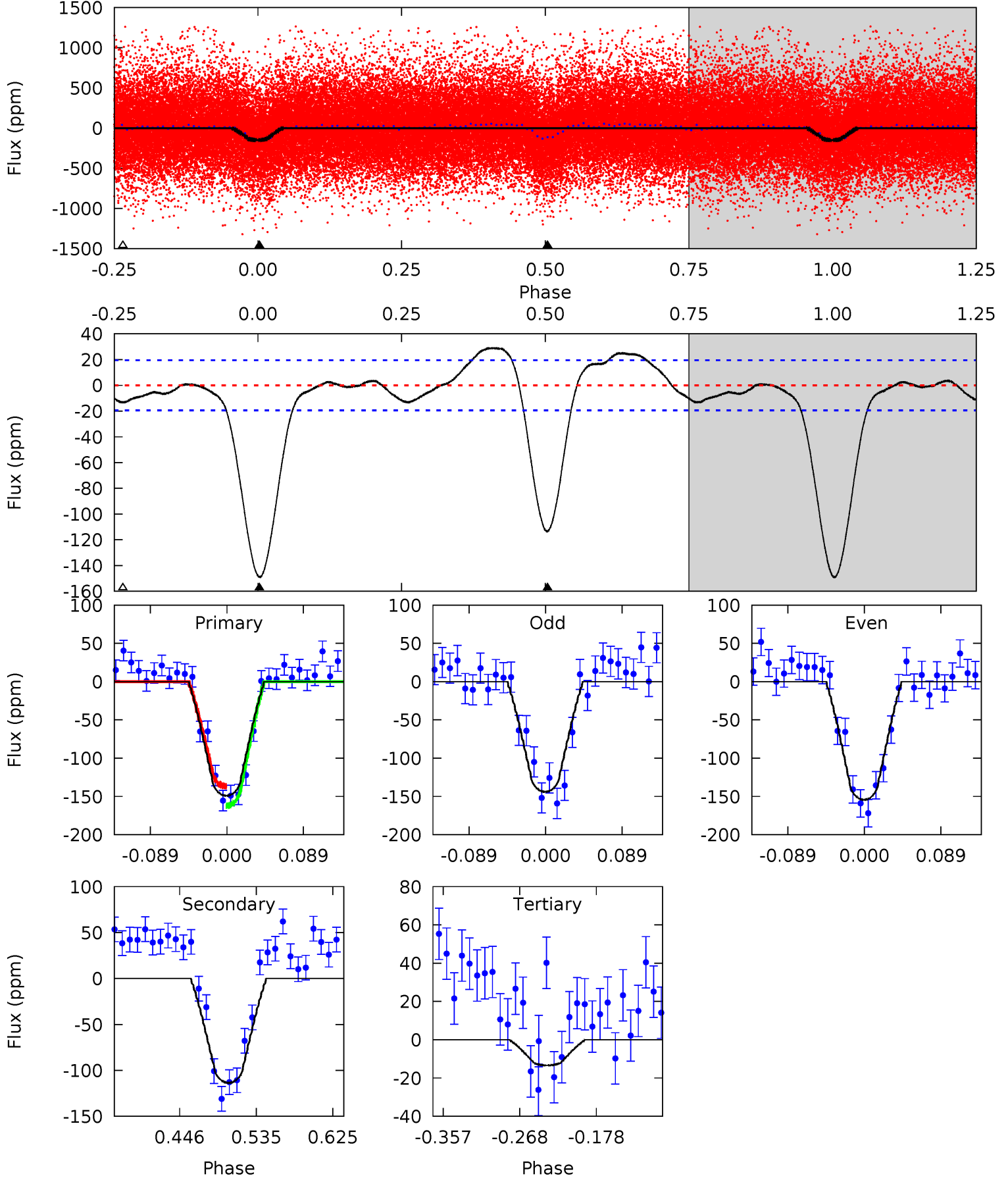
TCE 009149789-01 P= 0.705030 Days $T_0=131.666076$ (BKJD)



DV Model-Shift Uniqueness Test

009149789-01, P = 0.705028 Days, E = 130.961234 Days

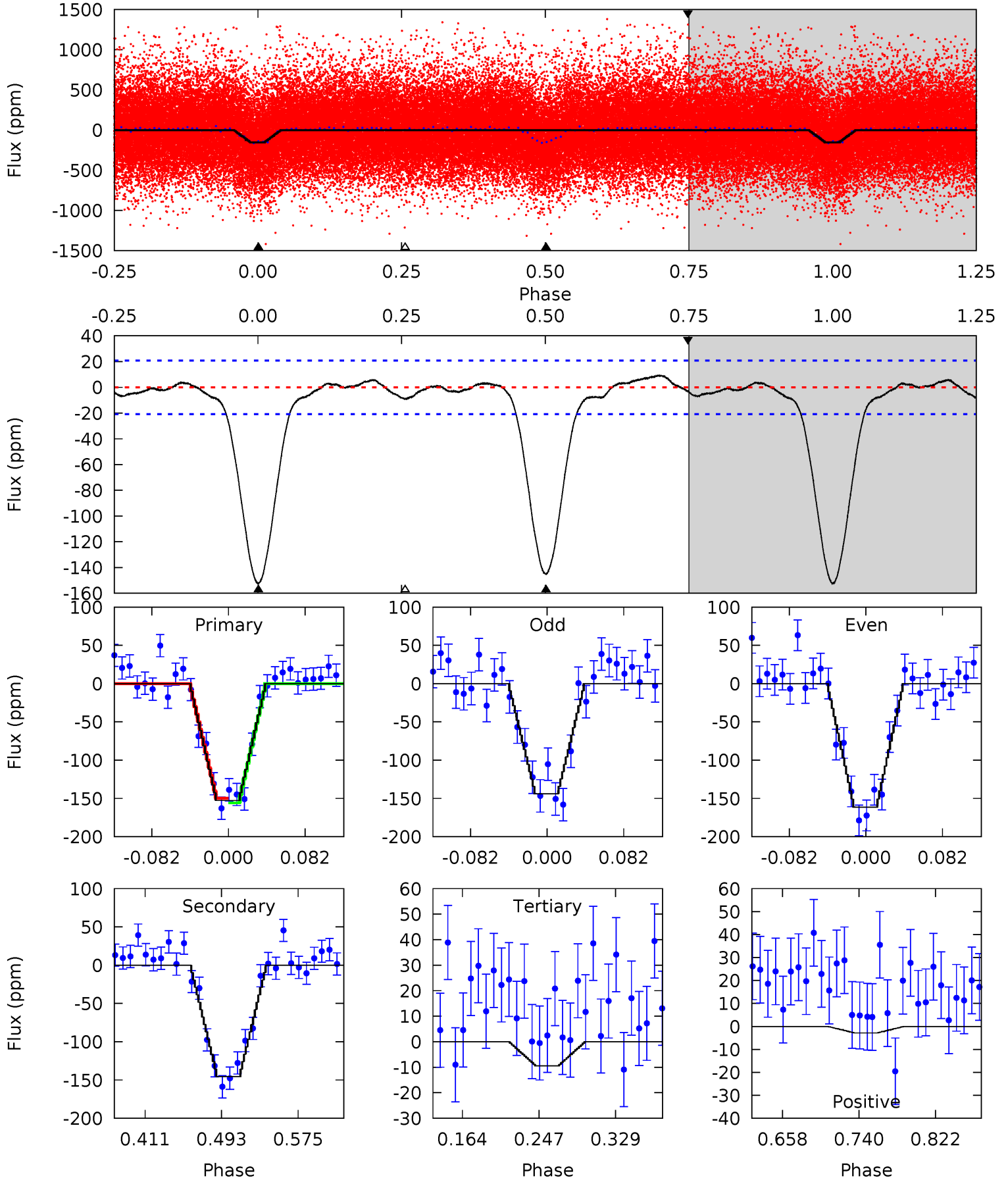
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.1	26.7	3.15	0	4.59	1.70	2.84	32.0	35.1	23.6	26.7	1.22	0.96	0.16	3.00



Alt Model-Shift Uniqueness Test

009149789-01, P = 0.705030 Days, E = 130.961046 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.8	32.2	2.09	-0.63	4.61	1.74	0.93	31.7	34.4	30.1	32.8	1.96	0.98	0.06	0.66



Stellar Parameters For KIC 009149789

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5465^{+162}_{-146}	$4.598^{+0.030}_{-0.120}$	$-0.260^{+0.300}_{-0.300}$	$0.766^{+0.147}_{-0.063}$	$0.857^{+0.080}_{-0.096}$	$2.691^{+0.453}_{-1.003}$
	+3%/-3%	+1%/-3%	+115%/-115%	+19%/-8%	+9%/-11%	+17%/-37%
Source	PHO1	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 009149789-01 / KOI 2874.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-114 ± 4	$1.03^{+0.35}_{-0.35}$	2483^{+114}_{-97}	5197^{+1225}_{-607}	13^{+18}_{-6}
Alt.	-145 ± 5	$1.08^{+0.34}_{-0.38}$	2474^{+117}_{-89}	5377^{+1205}_{-631}	15^{+19}_{-6}

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 $A_{\text{obs}} \gg 1.0$

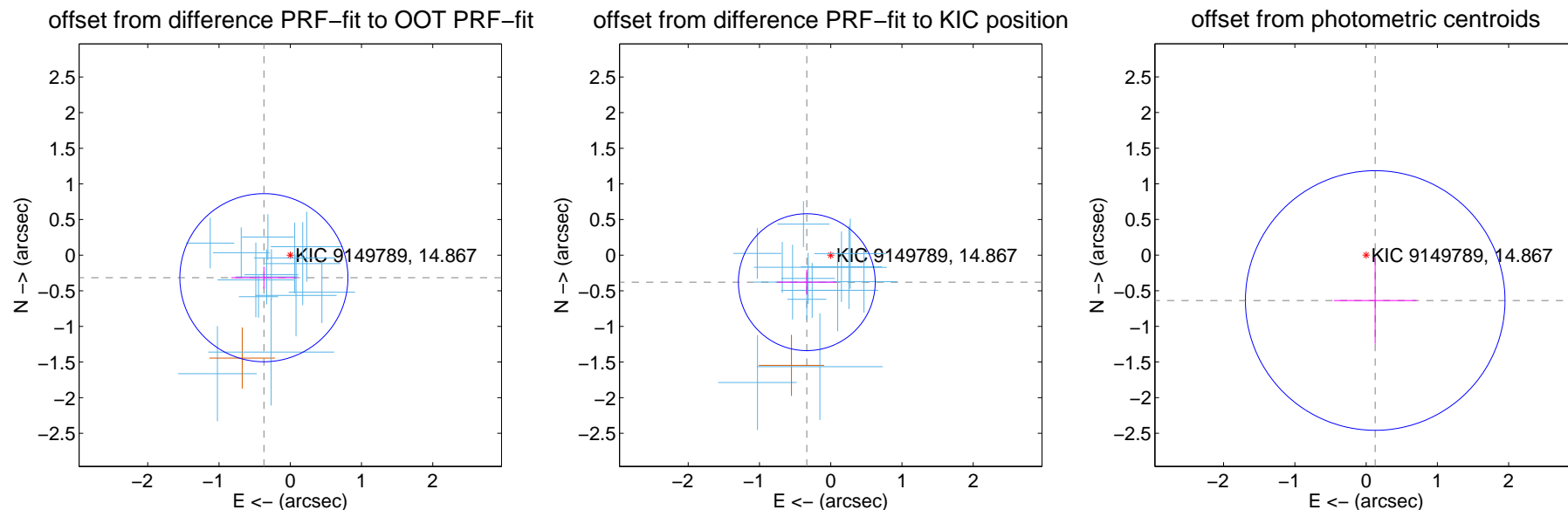
DV Centroid Data

Supplemental centroid analysis for 009149789-01. Kepler magnitude: 14.87. Transit SNR 24.31

There are 14 quarters with good PRF difference image offsets

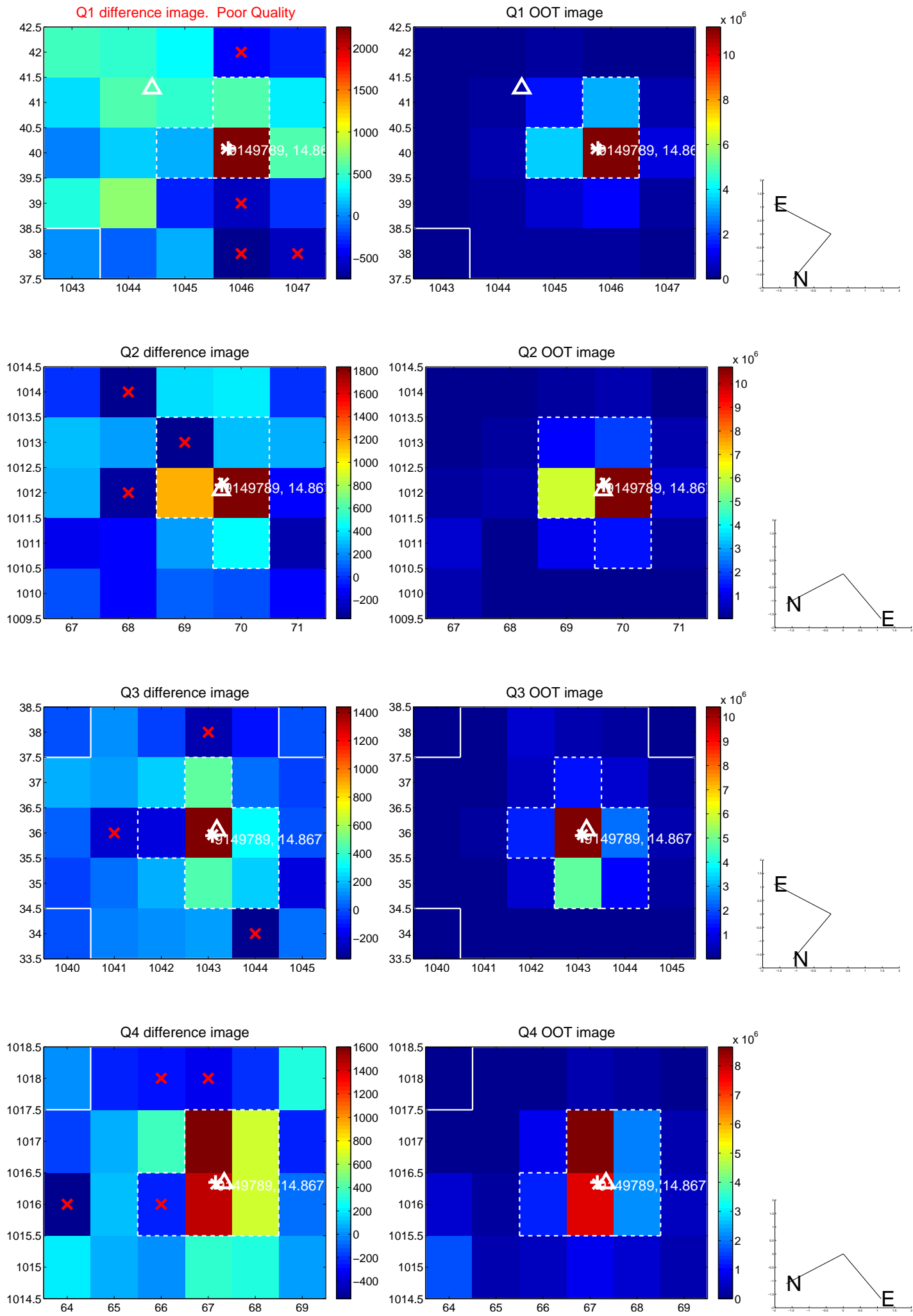
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.487 ± 0.393	1.24	0.370 ± 0.457	-0.316 ± 0.156
PRF-fit source offset from KIC position	0.507 ± 0.320	1.58	0.336 ± 0.414	-0.379 ± 0.176
photometric centroid source offset	0.65 ± 0.61	1.07	-0.13 ± 0.58	-0.64 ± 0.61

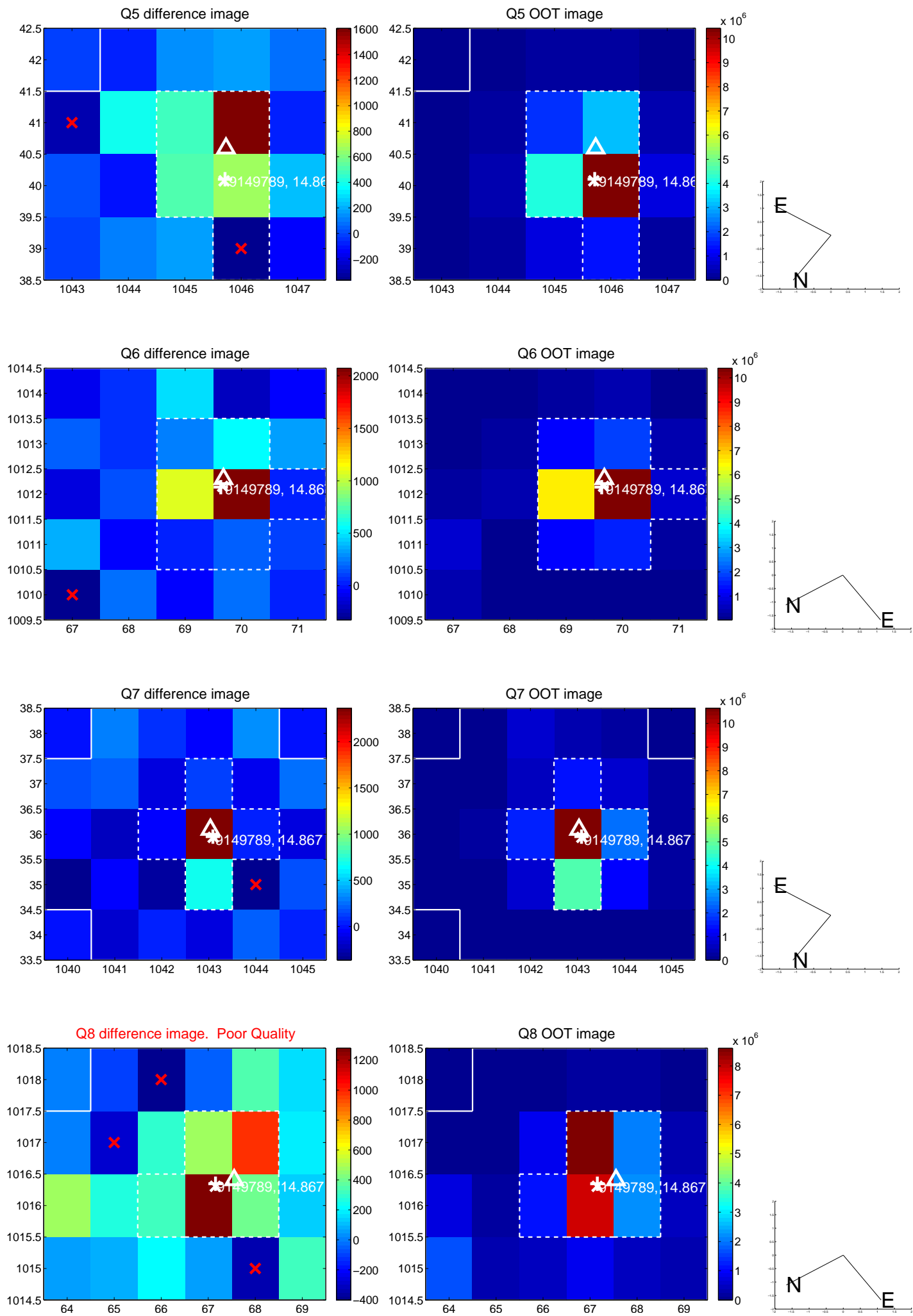


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

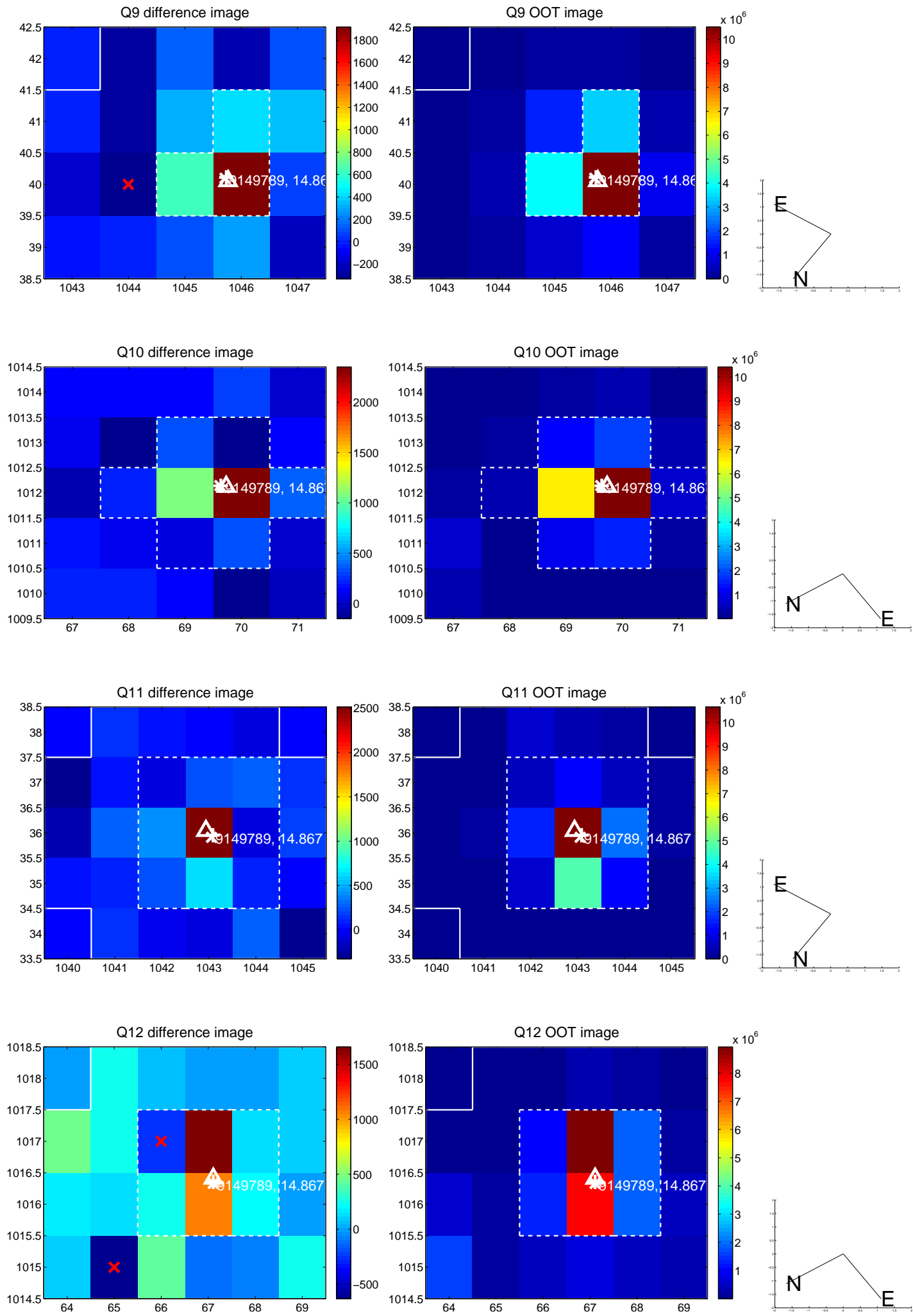
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



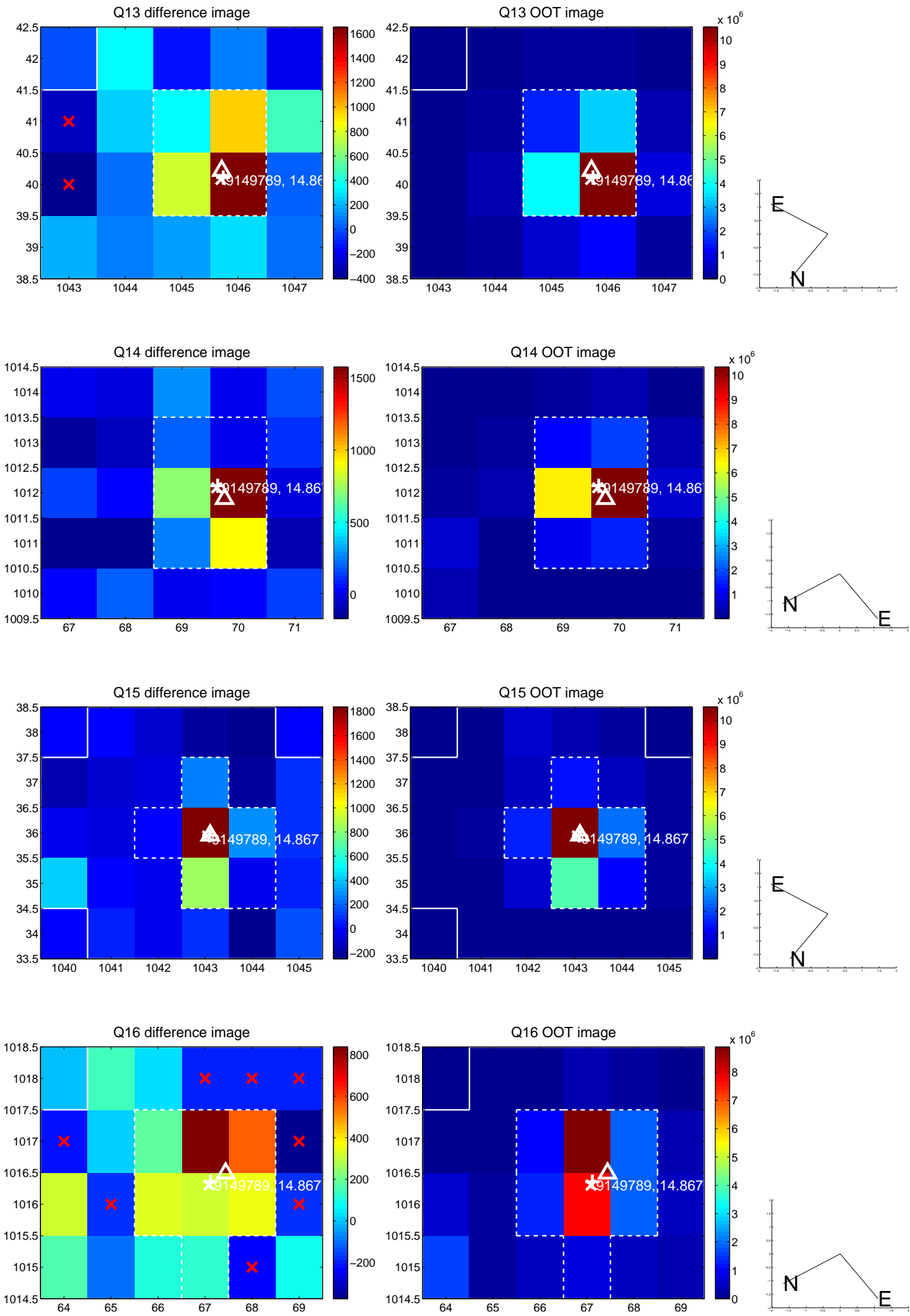
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



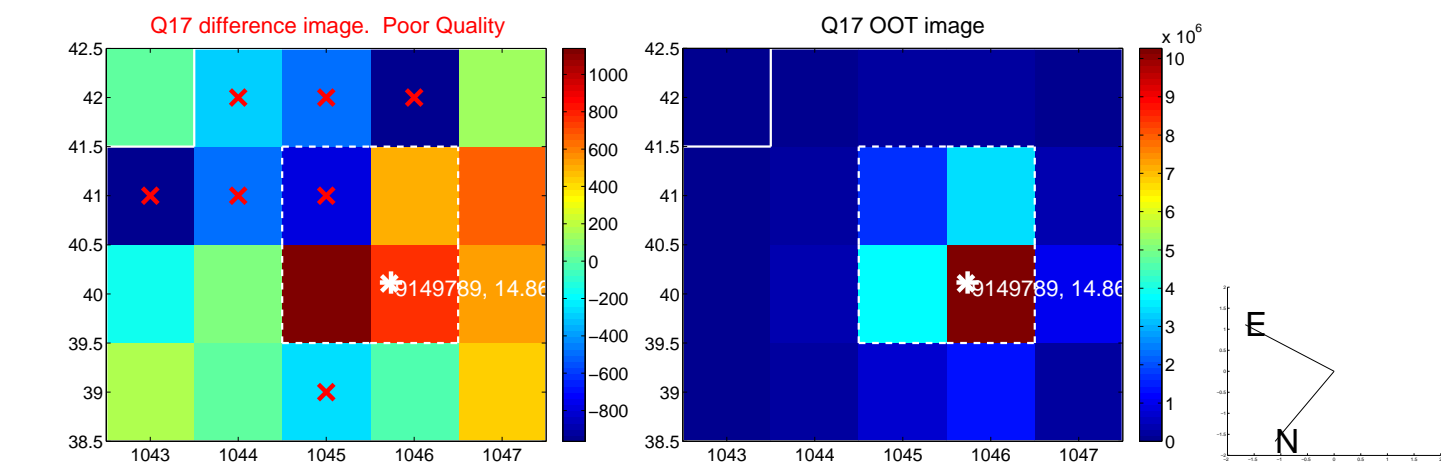
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



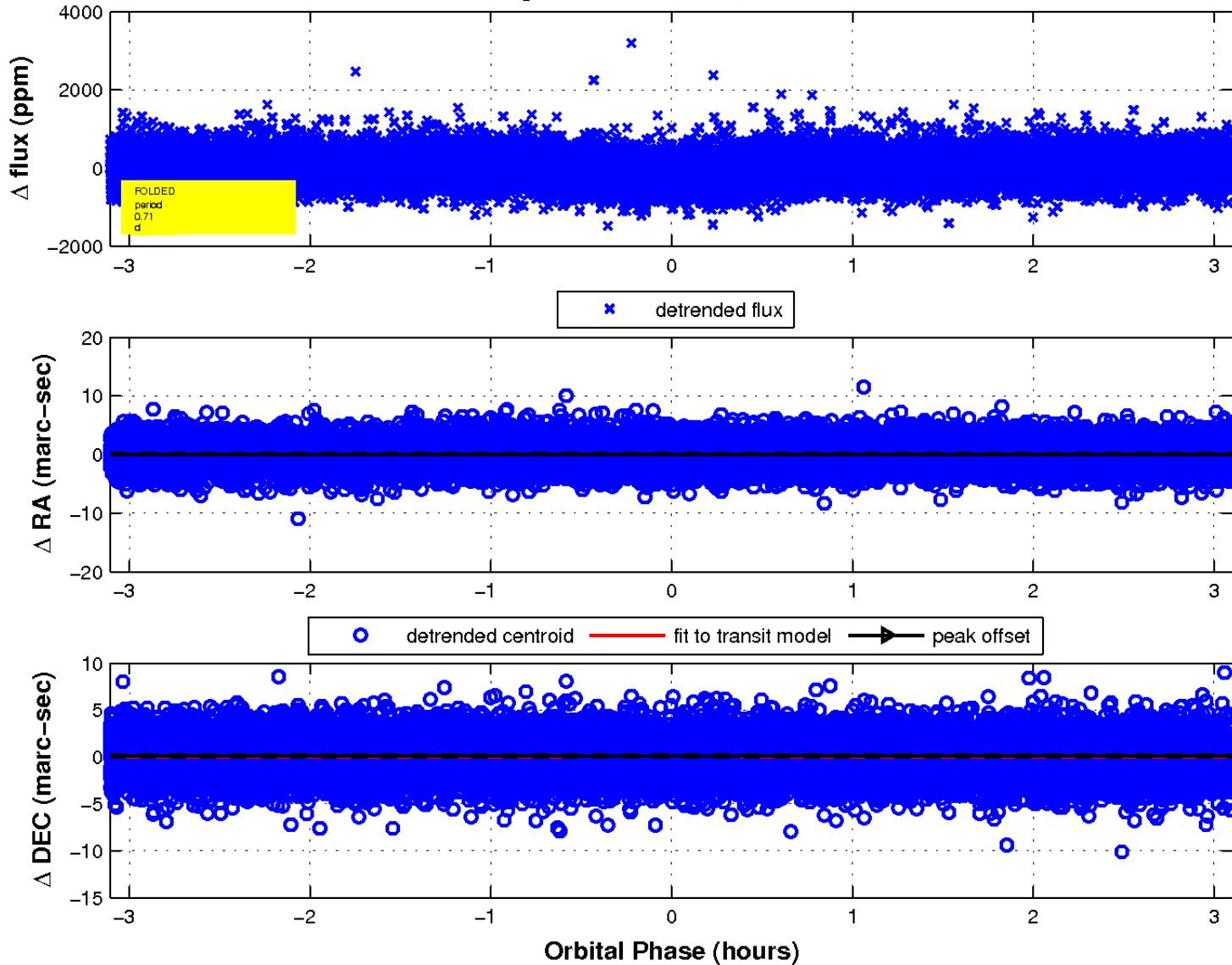
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

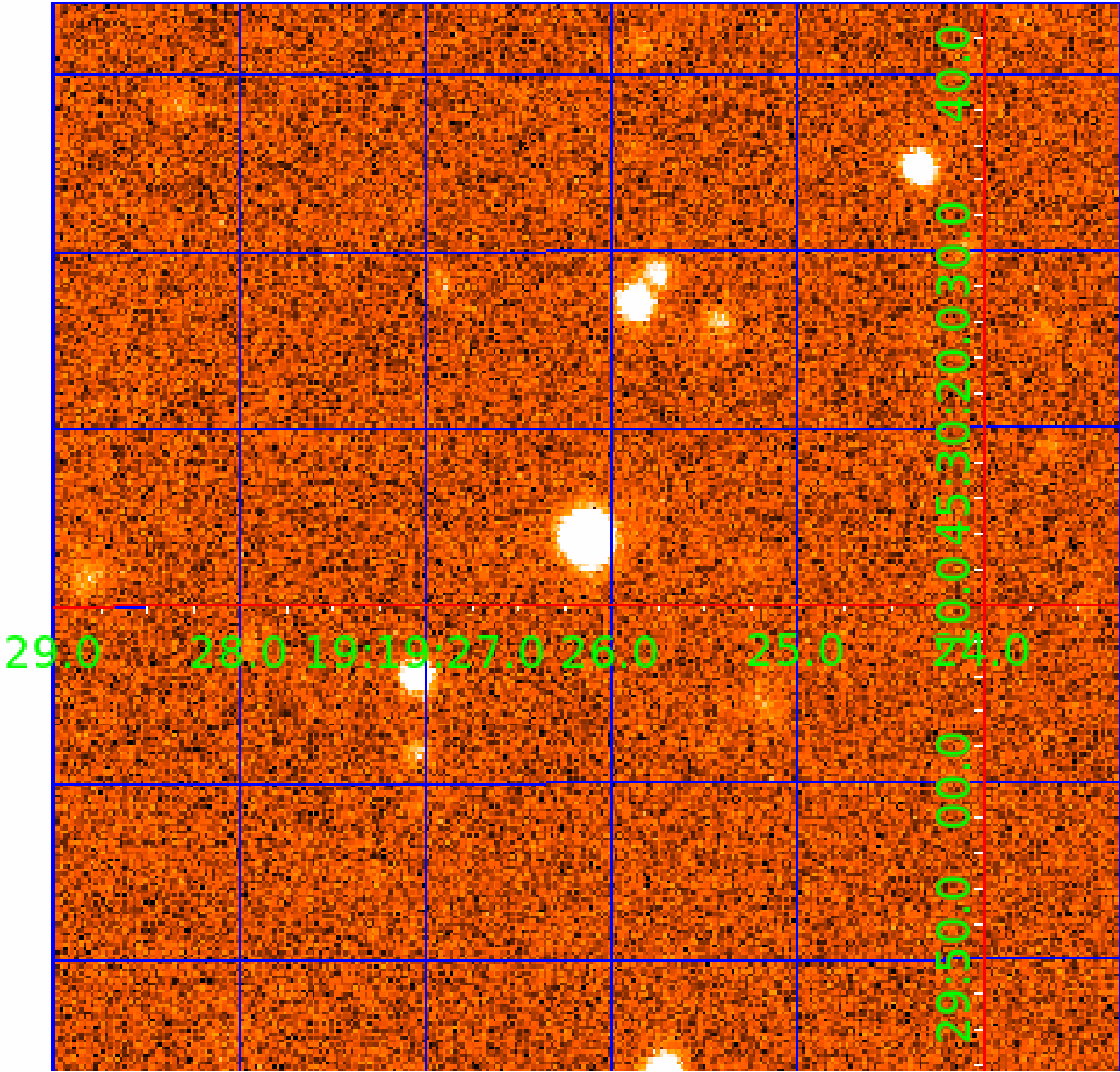


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009149789

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})
009149789-01	OBS	2874.01	0.705028	131.666262	153.0	1.035	18.6	24.3	0.77	5465	0.98	2176.70
009149789-02	OBS	No	0.705029	132.019066	132.5	1.050	18.7	21.5	0.77	5465	1.06	2176.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009149789-01	OBS	PC	0.99	0	0	0	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE
009149789-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 009149789-02

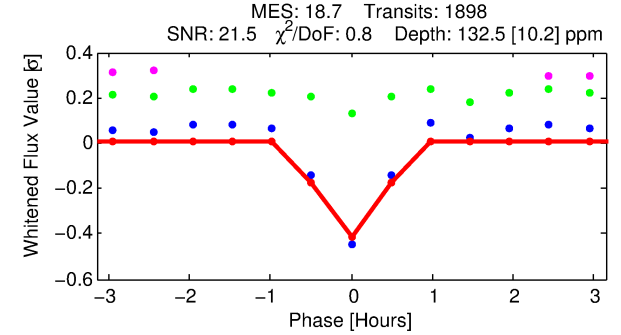
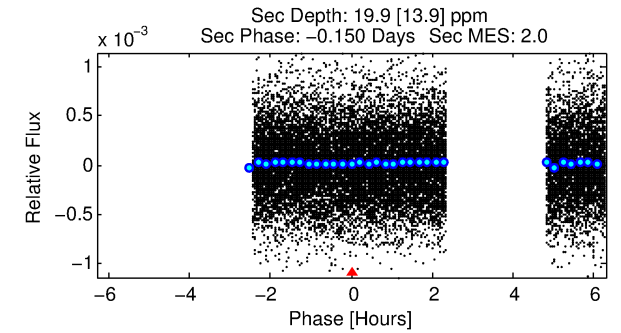
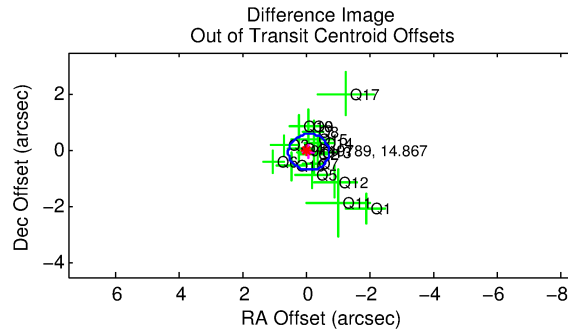
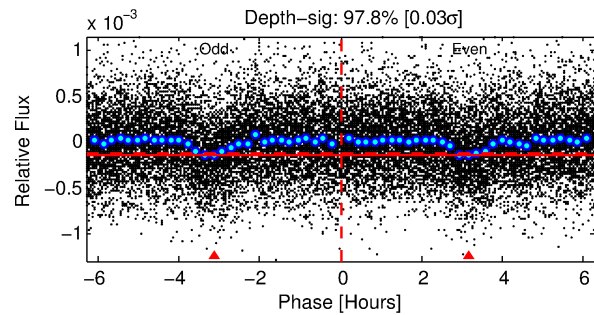
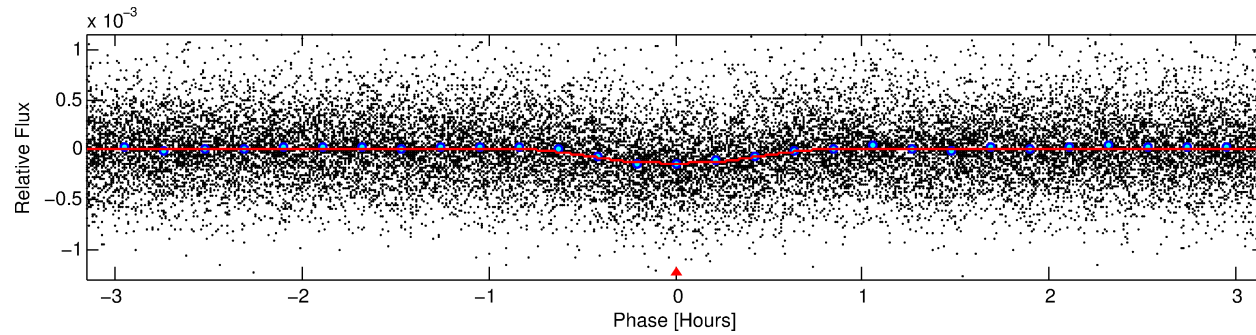
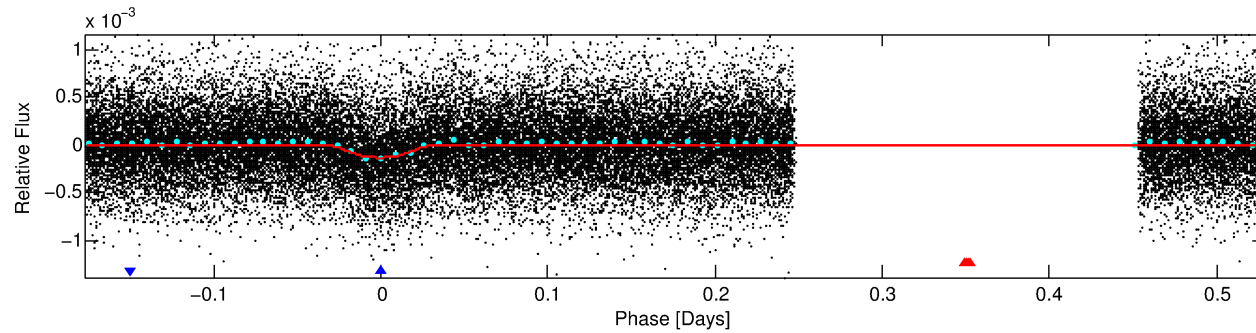
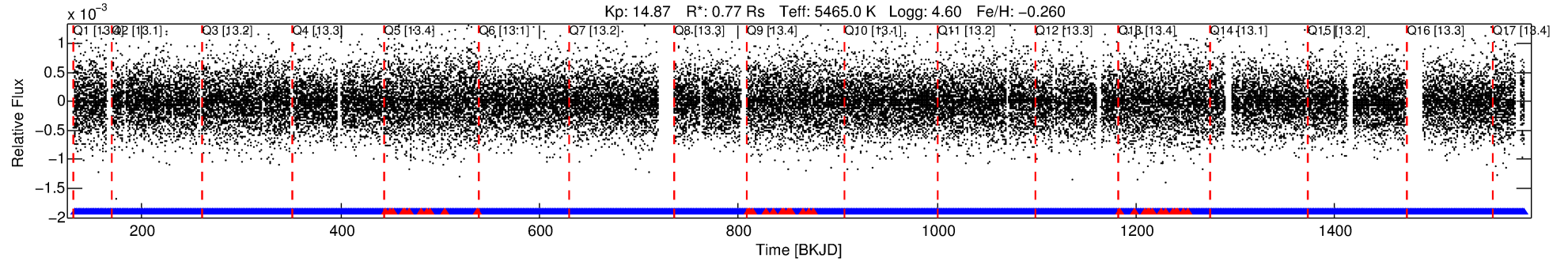
No Significant Match Found

DV One-Page Summary

KIC: 9149789 Candidate: 2 of 2 Period: 0.705 d

KOI: K02874 Corr: No Ephemeris Match

Kp: 14.87 R*: 0.77 Rs Teff: 5465.0 K Logg: 4.60 Fe/H: -0.260



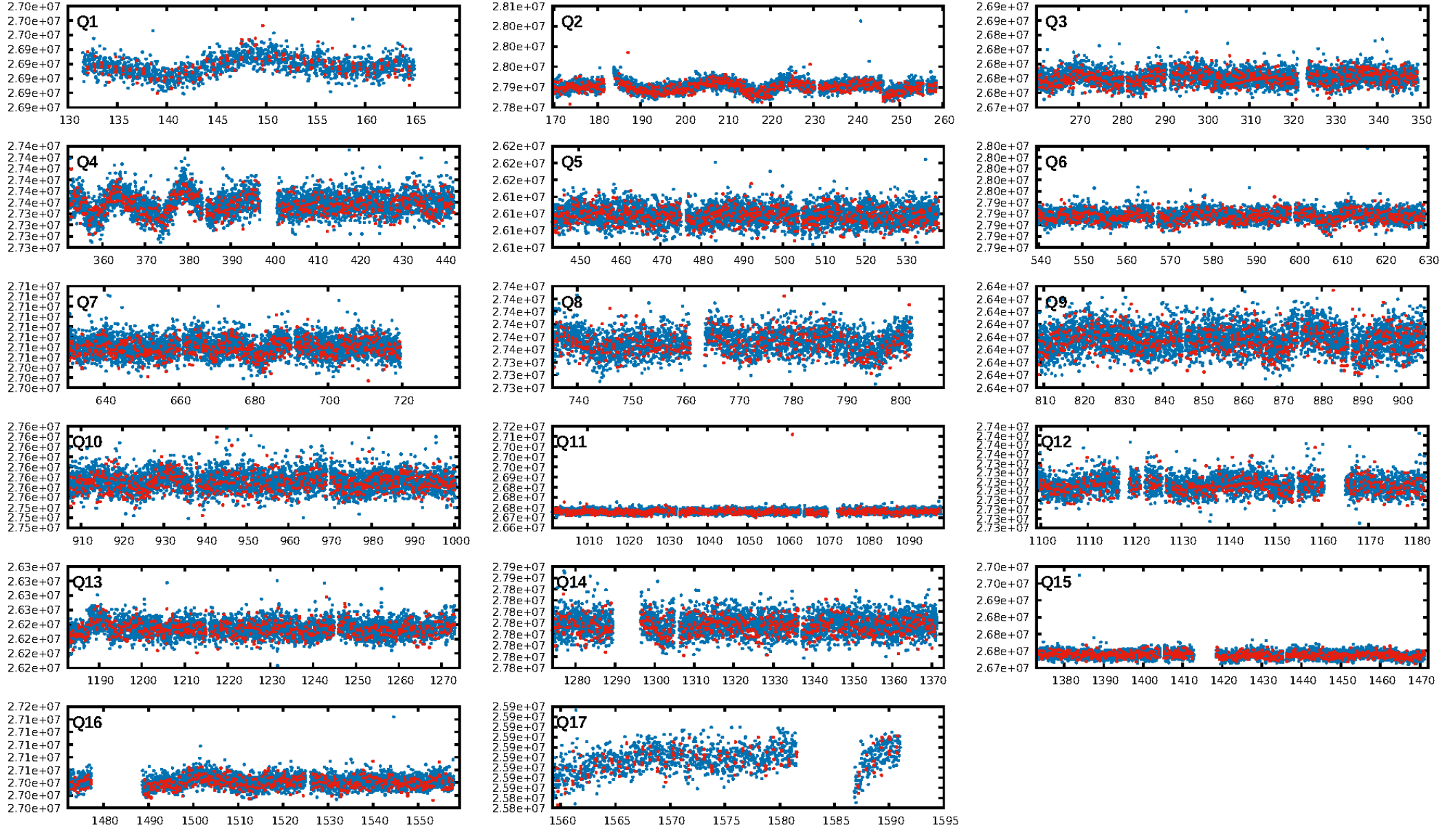
DV Fit Results:

Period = 0.70503 [0.00001] d
Epoch = 132.0191 [0.0009] BKJD
Rp/R* = 0.0127 [0.0062]
a/R* = 2.56 [4.79]
b = 0.90 [0.48]
Seff = 2176.70 [552.21]
Teq = 1742 [110] K
Rp = 1.06 [0.56] Re
a = 0.0147 [0.0023] AU
Ag = 2.08 [2.54] [0.43σ]
Teffp = 3235 [975] K [1.52σ]

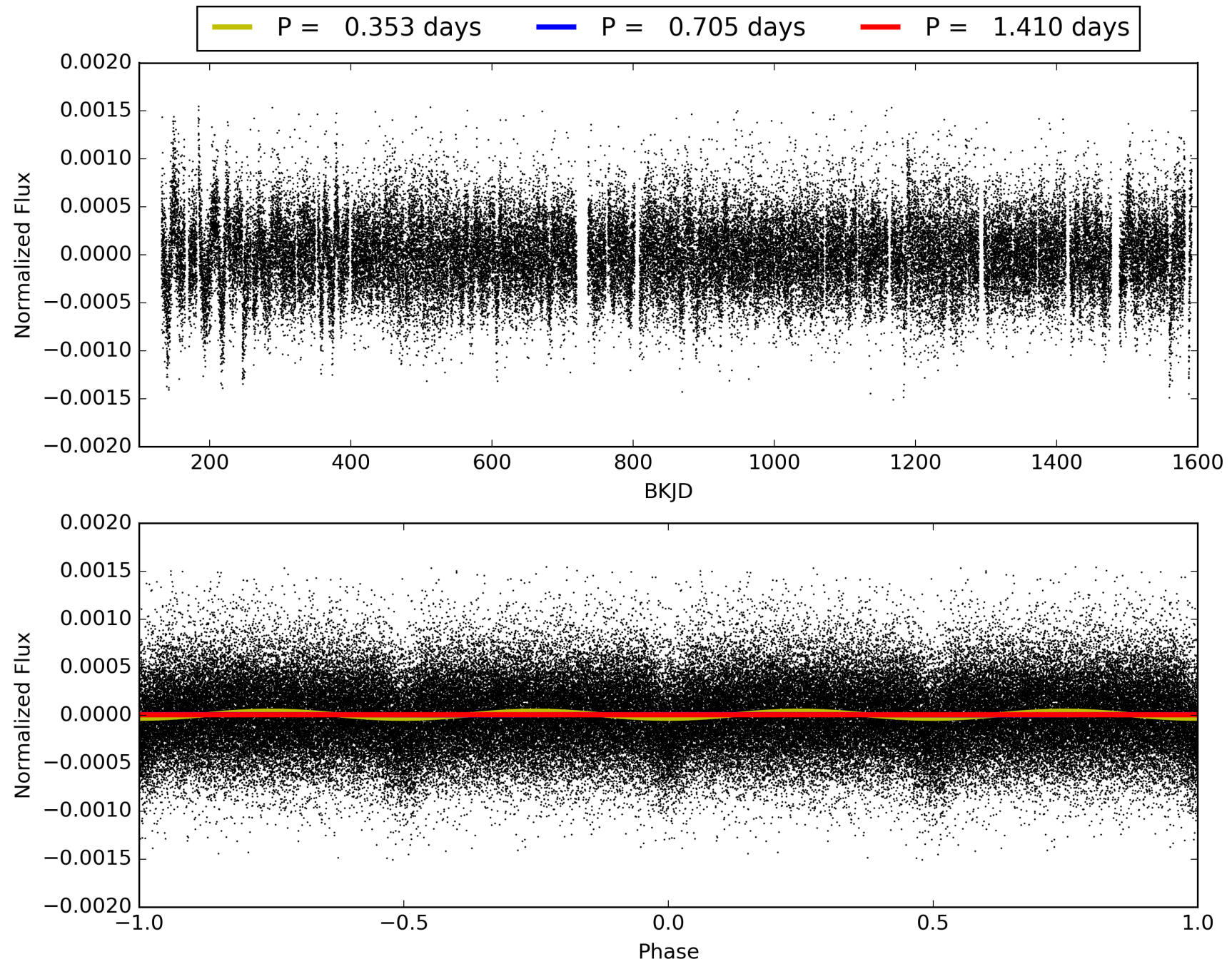
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.43e-77
RollingBand-fgt: 0.98 [1775/1813]
GhostDiagnostic-chr: 5.101
Centroid-sig: 0.3%
Centroid-so: 1.478 arcsec [2.14σ]
OotOffset-rm: 0.086 arcsec [0.40σ]
KicOffset-rm: 0.135 arcsec [0.53σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009149789-02, PDC Light Curves

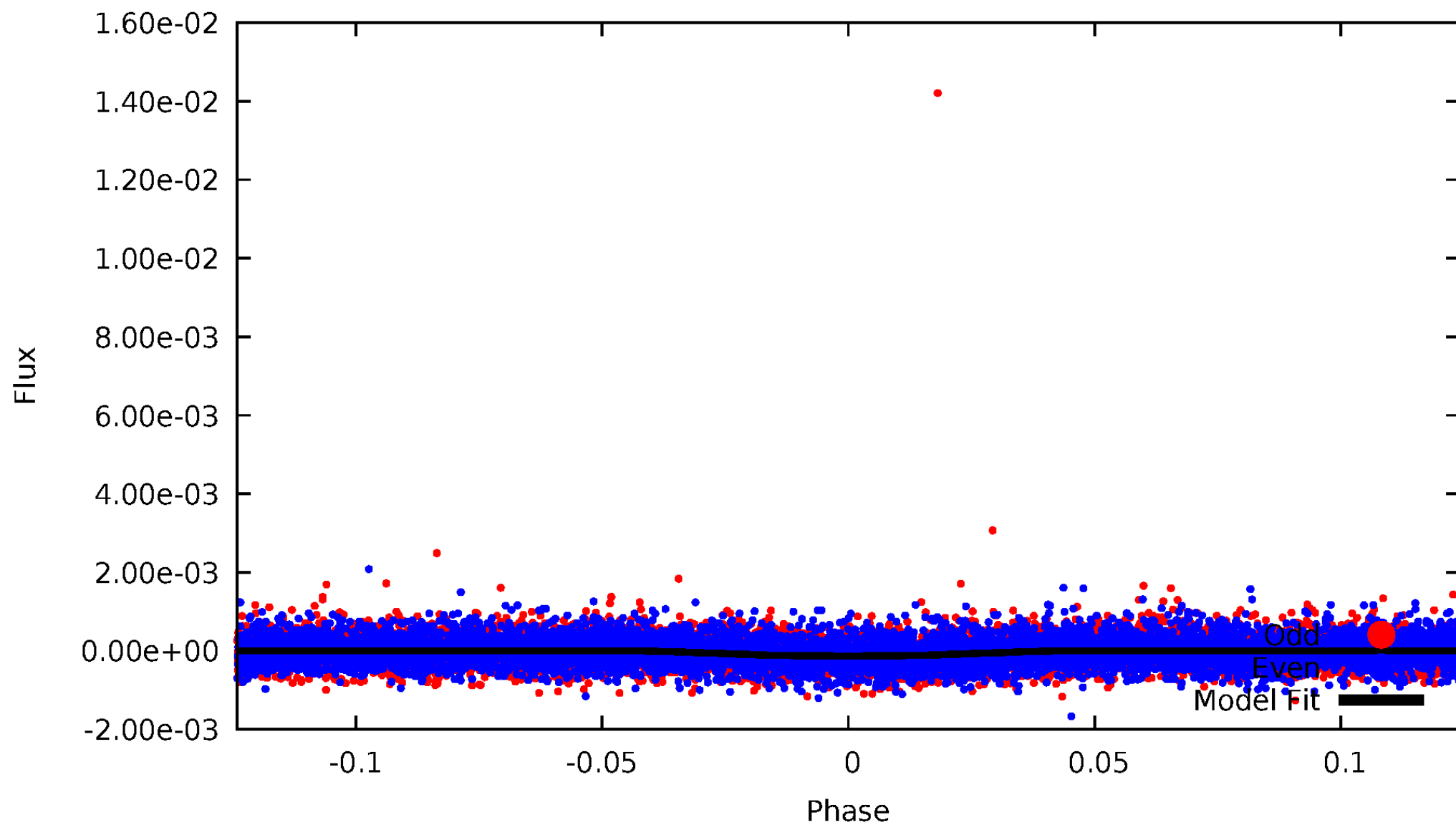


TCE 009149789-02



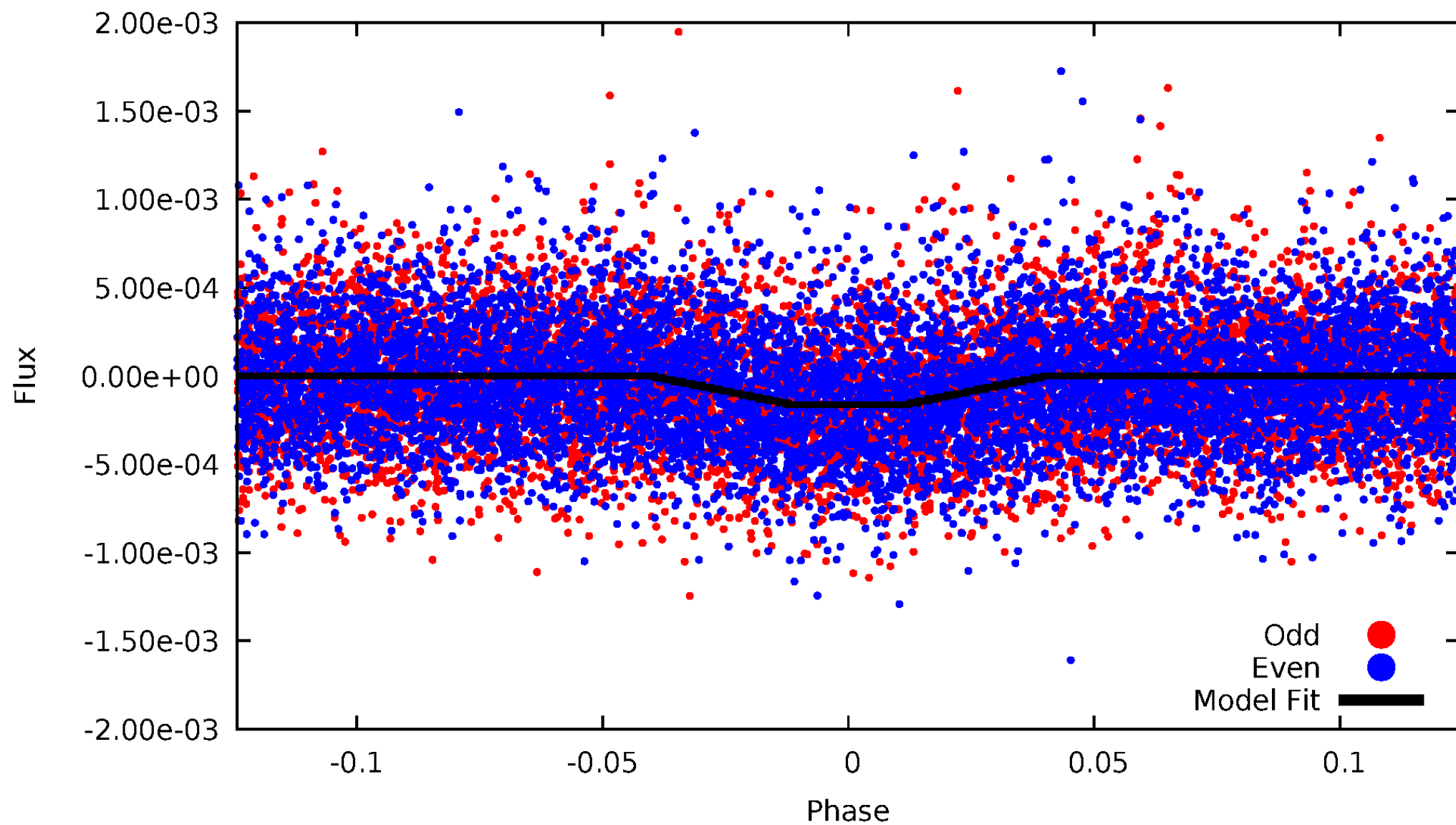
DV Odd/Even

TCE 009149789-02



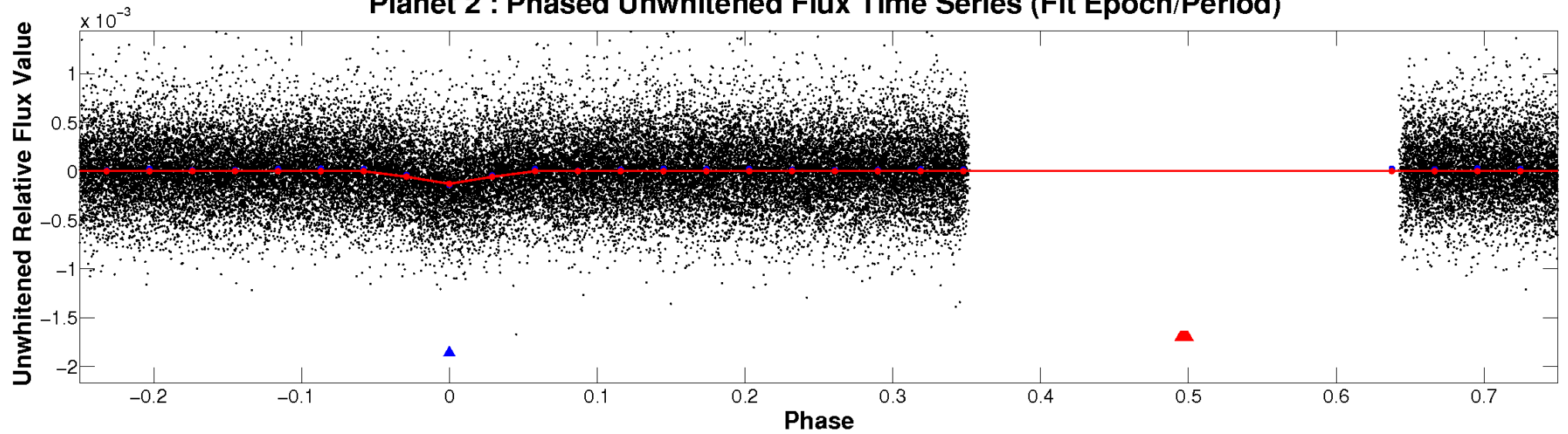
ALT Odd/Even

TCE 009149789-02

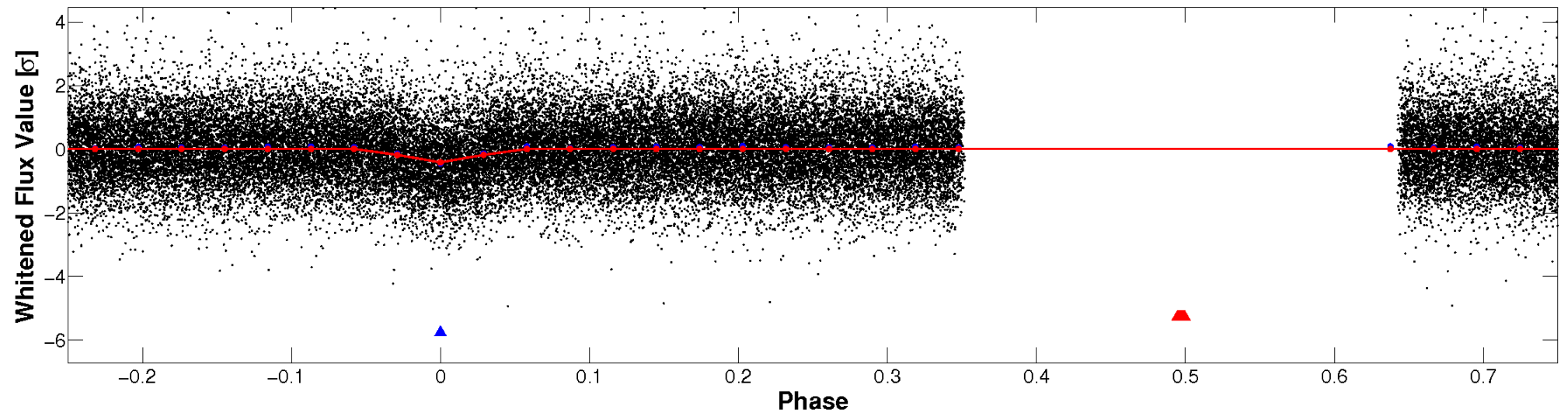


Non-Whitened Vs. Whitened Light Curve

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

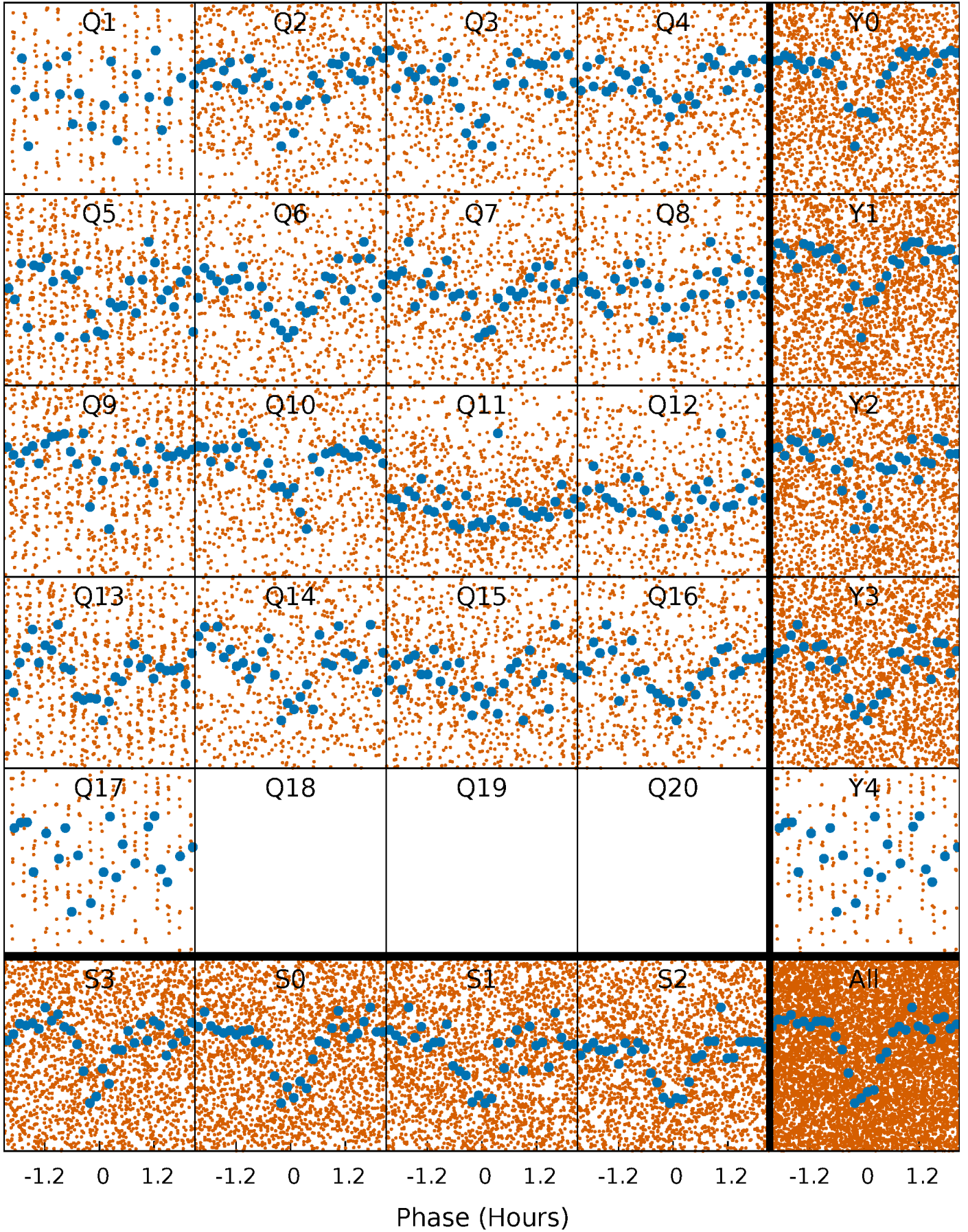


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



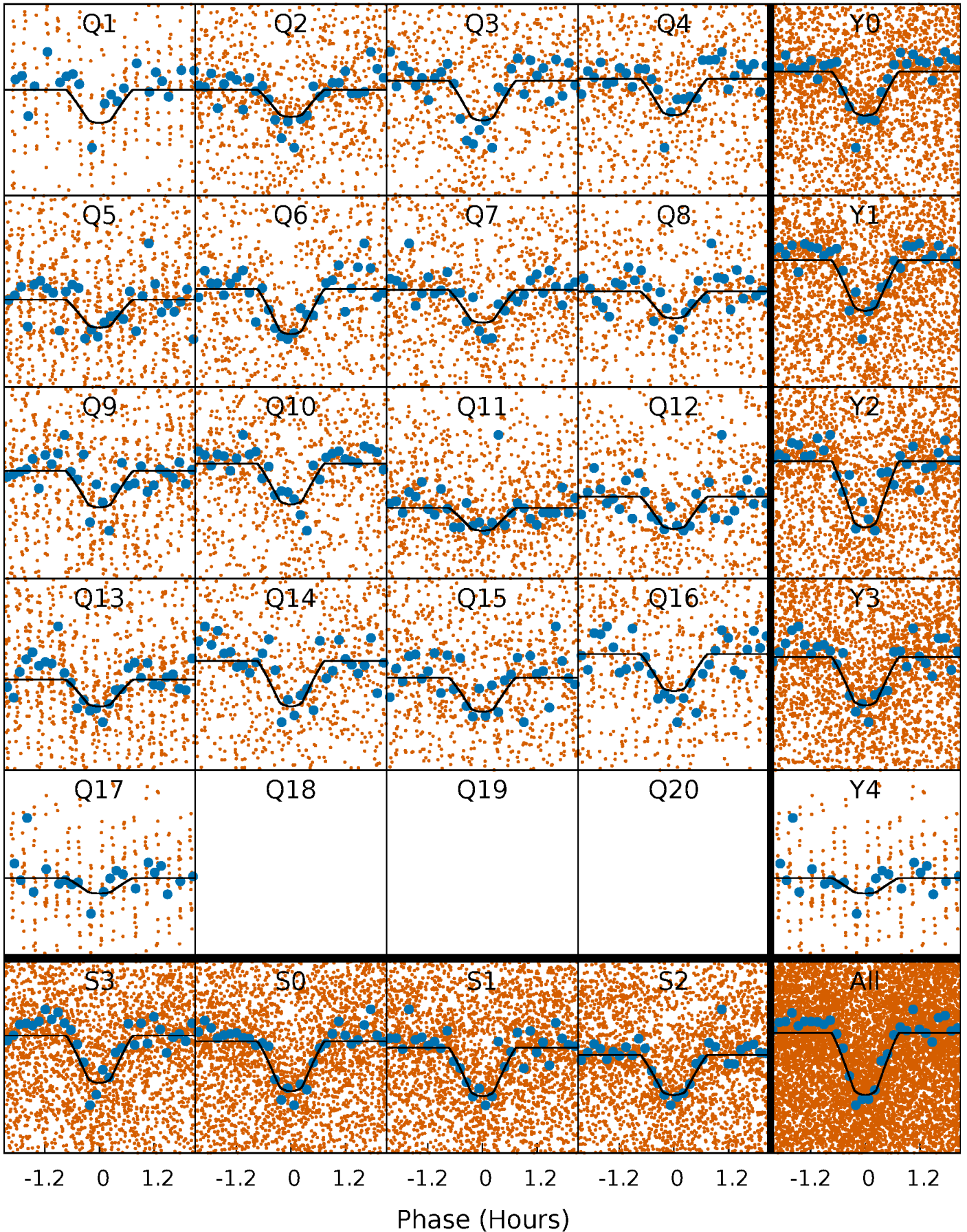
PDC Quarter-Phased Transit Curves

TCE 009149789-02 P= 0.705029 Days $T_0=132.019066$ (BKJD)



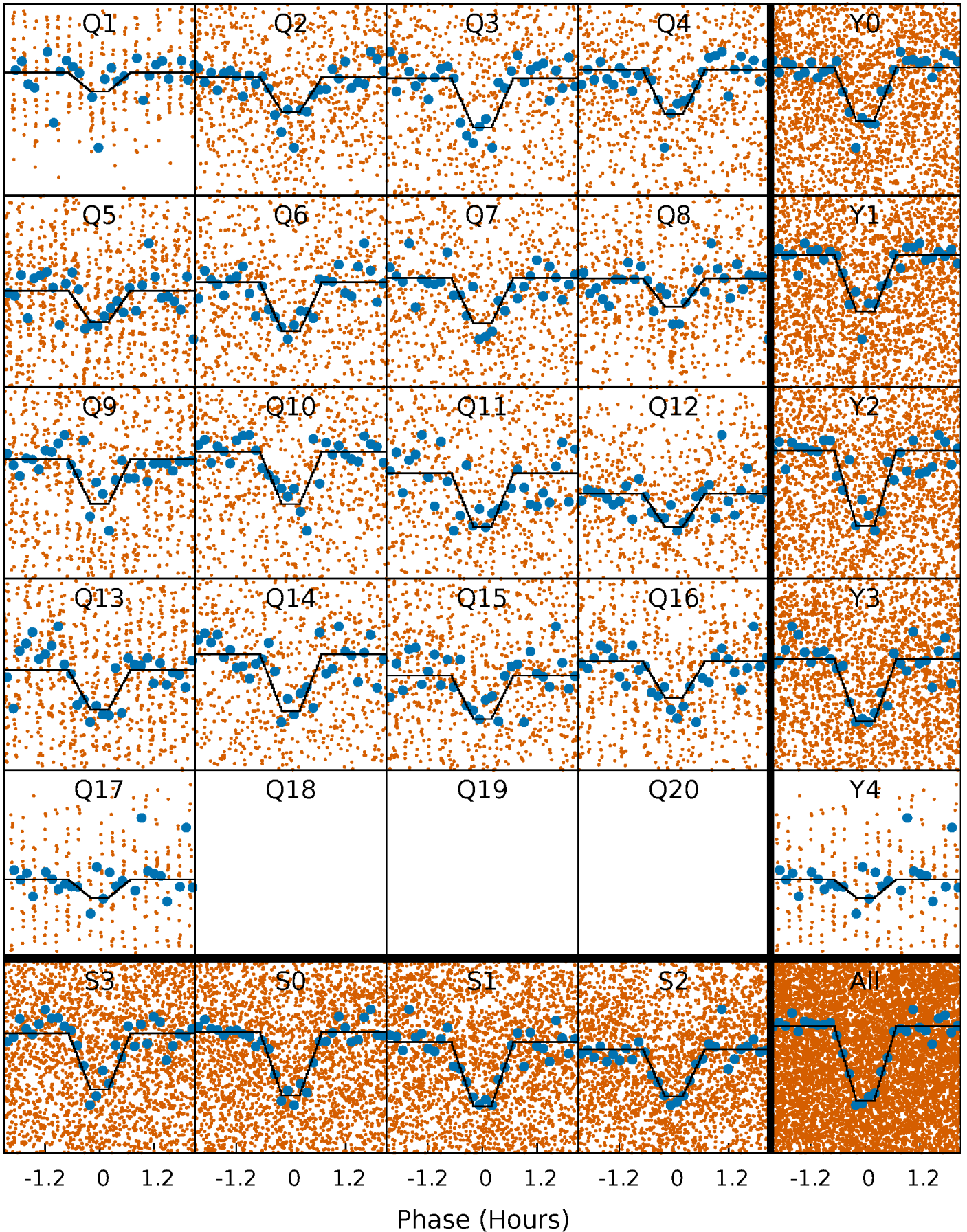
DV Quarter-Phased Transit Curves

TCE 009149789-02 P= 0.705029 Days $T_0=132.019066$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

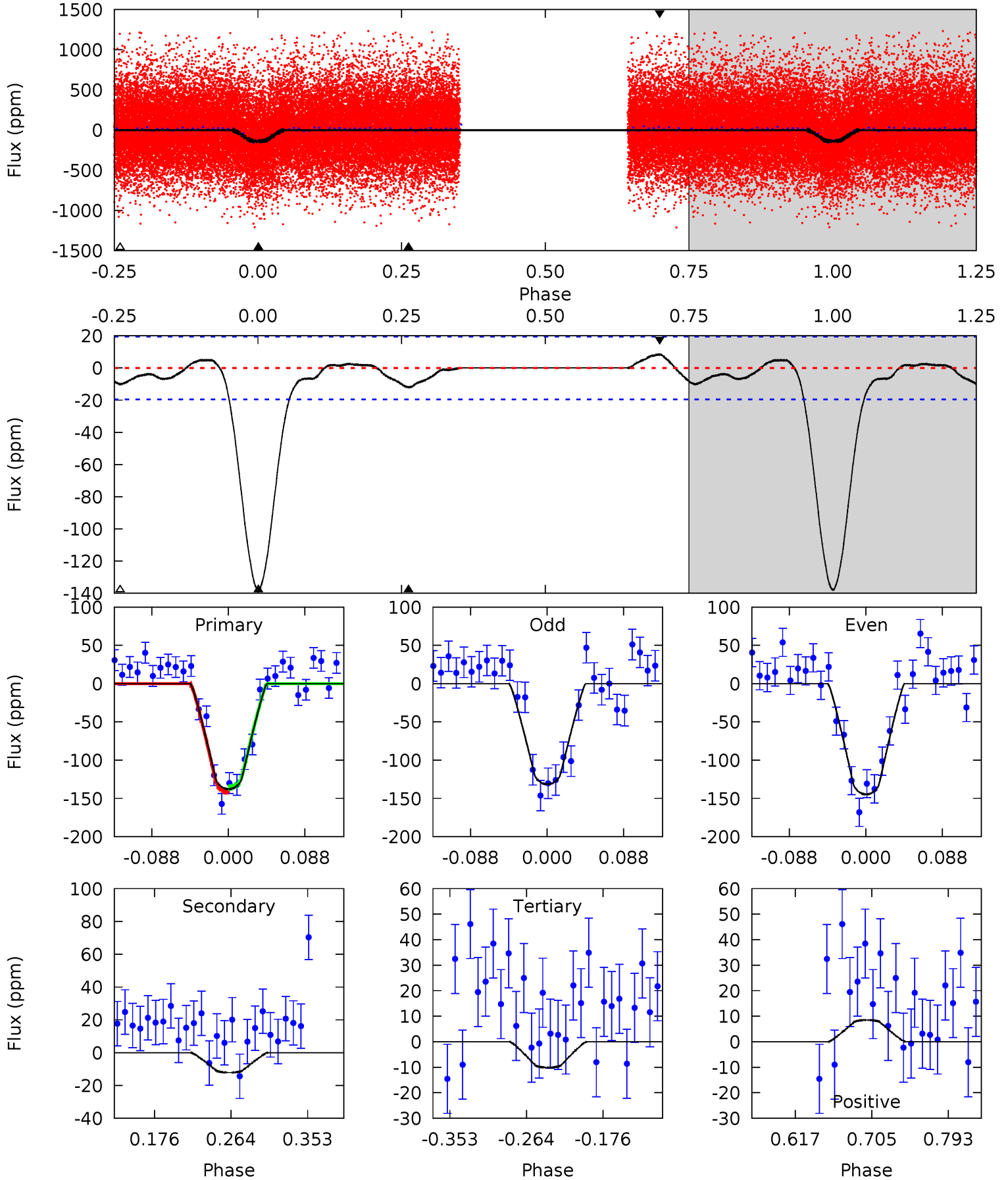
TCE 009149789-02 P= 0.705030 Days $T_0=132.019081$ (BKJD)



DV Model-Shift Uniqueness Test

009149789-02, P = 0.705029 Days, E = 131.314037 Days

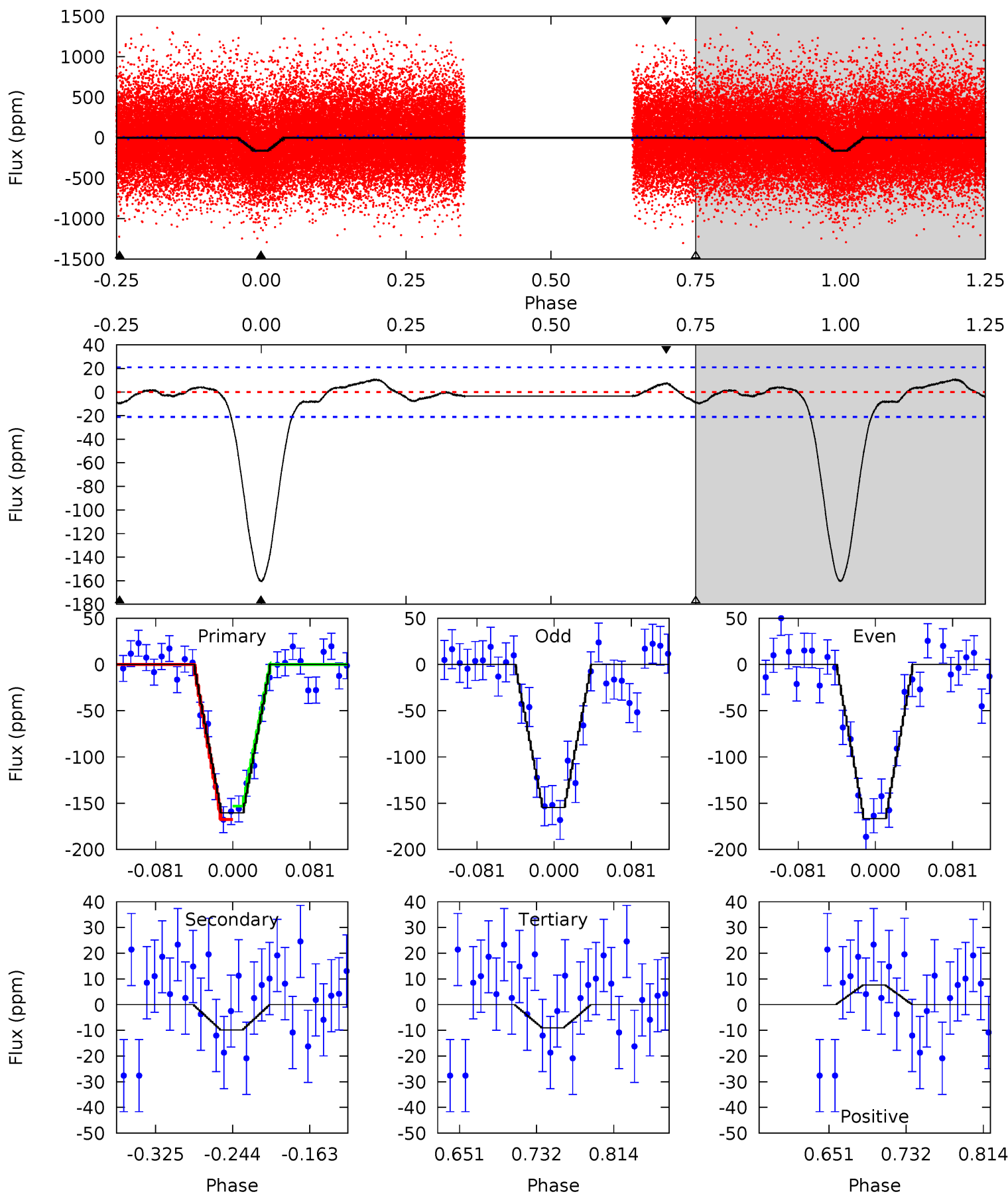
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.5	2.86	2.39	2.01	4.59	1.71	1.20	30.1	30.5	0.47	0.85	1.57	0.99	0.06	0.61



Alt Model-Shift Uniqueness Test

009149789-02, P = 0.705030 Days, E = 131.314051 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.2	2.16	1.98	1.68	4.61	1.74	1.11	33.2	33.5	0.18	0.48	1.32	0.92	0.06	1.59



Stellar Parameters For KIC 009149789

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5465^{+162}_{-146}	$4.598^{+0.030}_{-0.120}$	$-0.260^{+0.300}_{-0.300}$	$0.766^{+0.147}_{-0.063}$	$0.857^{+0.080}_{-0.096}$	$2.691^{+0.453}_{-1.003}$
	+3%/-3%	+1%/-3%	+115%/-115%	+19%/-8%	+9%/-11%	+17%/-37%
Source	PHO1	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 009149789-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-12 ± 4	$1.12^{+0.55}_{-0.53}$	2482^{+118}_{-96}	3204^{+896}_{-623}	$1.106^{+3.036}_{-0.644}$
Alt.	-10 ± 5	$1.14^{+0.47}_{-0.54}$	2473^{+127}_{-92}	3004^{+940}_{-1022}	$0.820^{+2.570}_{-0.506}$

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 $A_{\text{obs}} \gg 1.0$

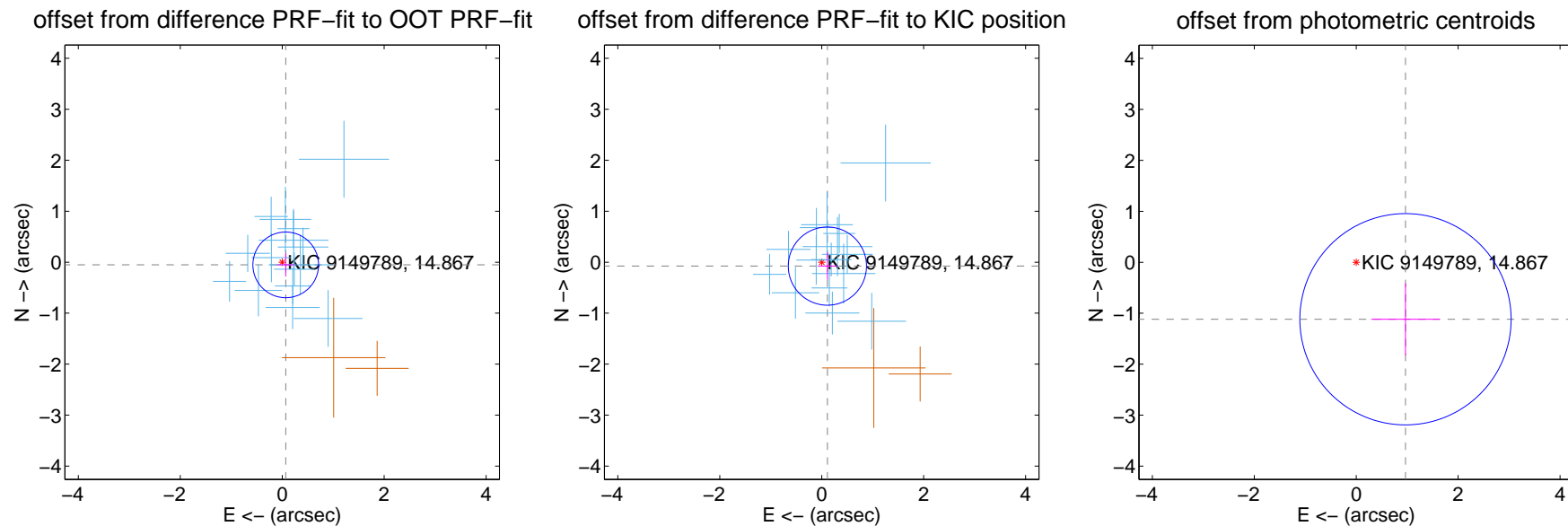
DV Centroid Data

Supplemental centroid analysis for 009149789-02. Kepler magnitude: 14.87. Transit SNR 21.50

There are 15 quarters with good PRF difference image offsets

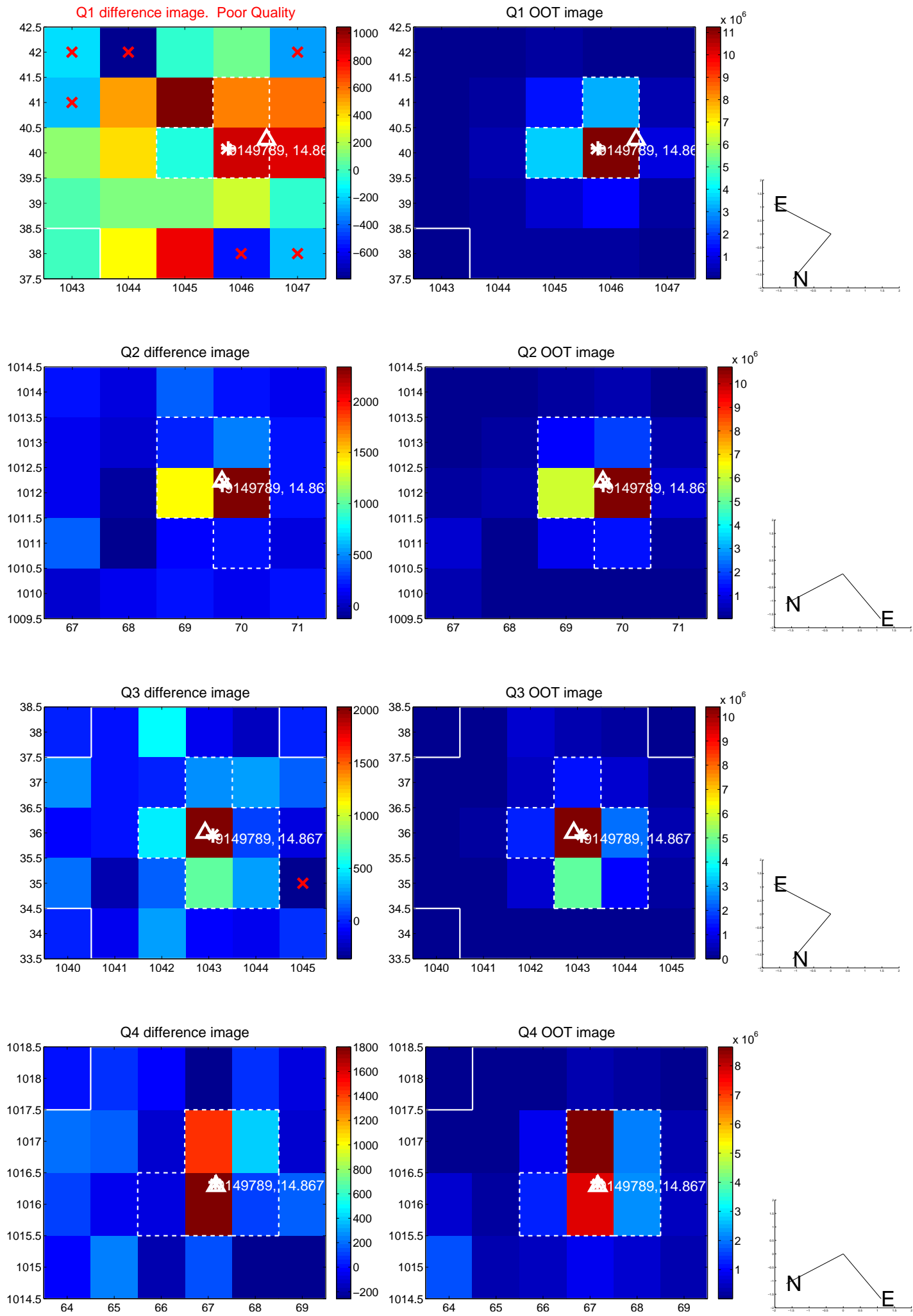
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.086 ± 0.215	0.40	-0.069 ± 0.172	-0.052 ± 0.228
PRF-fit source offset from KIC position	0.135 ± 0.256	0.53	-0.111 ± 0.189	-0.077 ± 0.265
photometric centroid source offset	1.48 ± 0.69	2.14	-0.97 ± 0.67	-1.12 ± 0.71

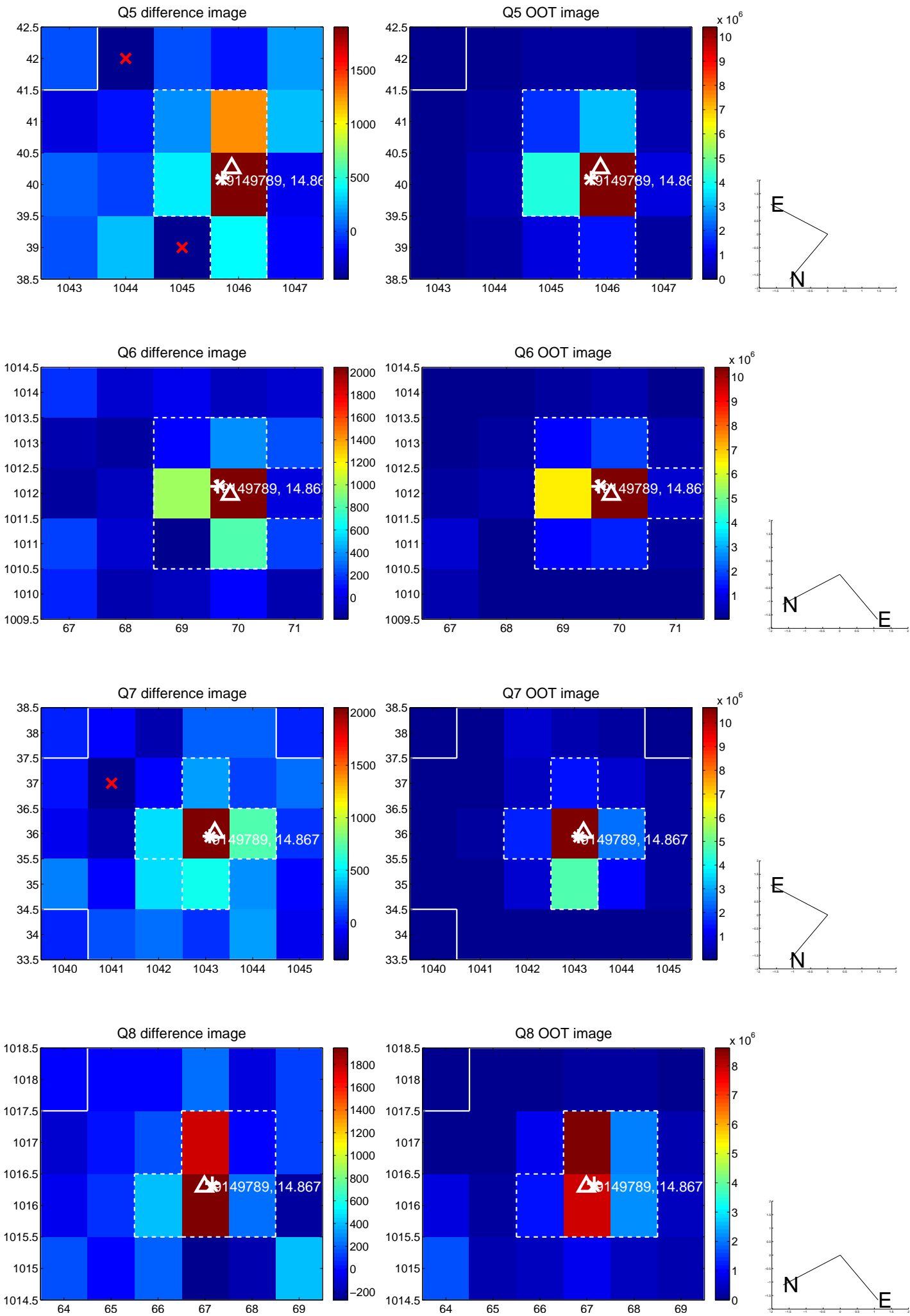


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

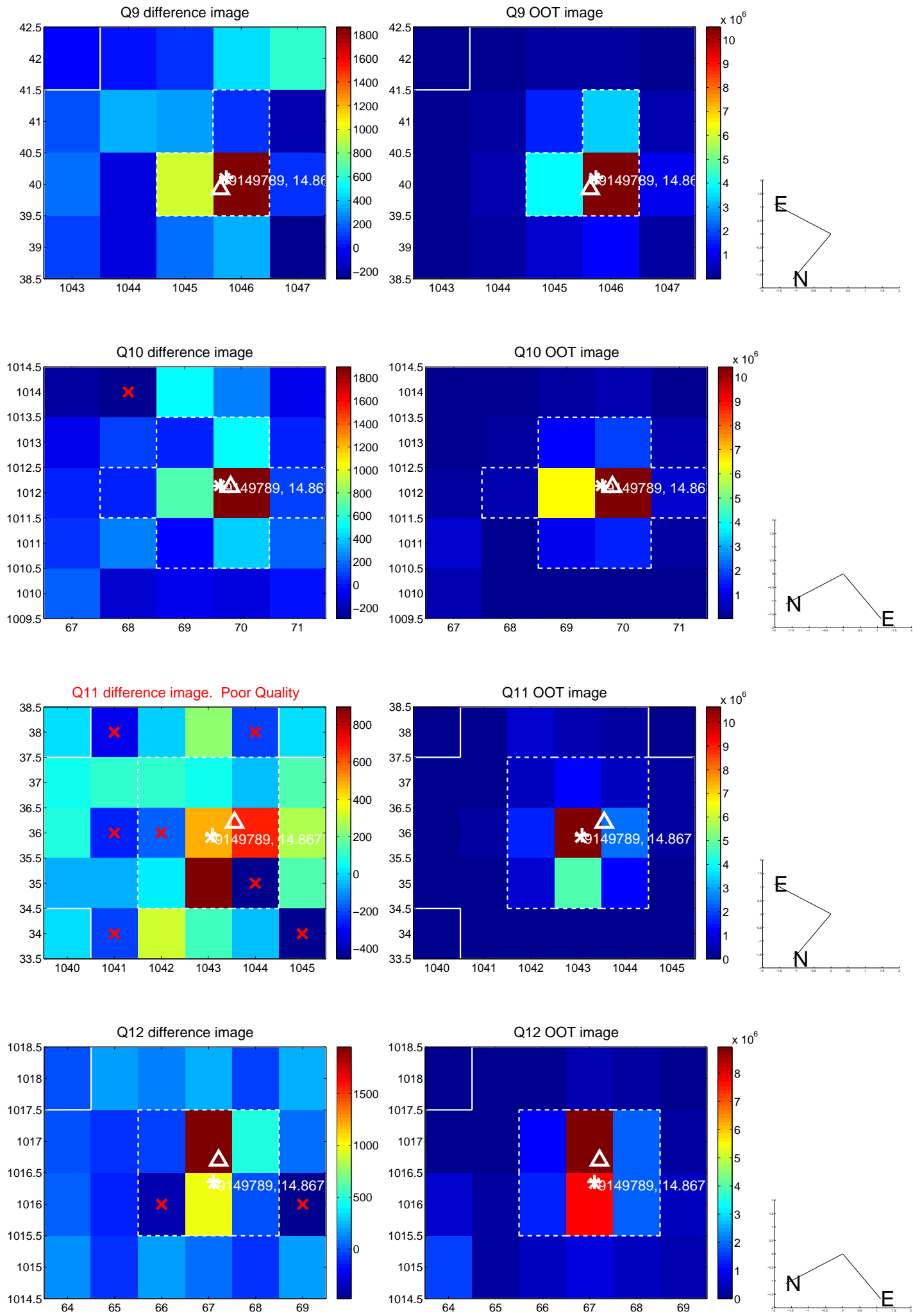
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



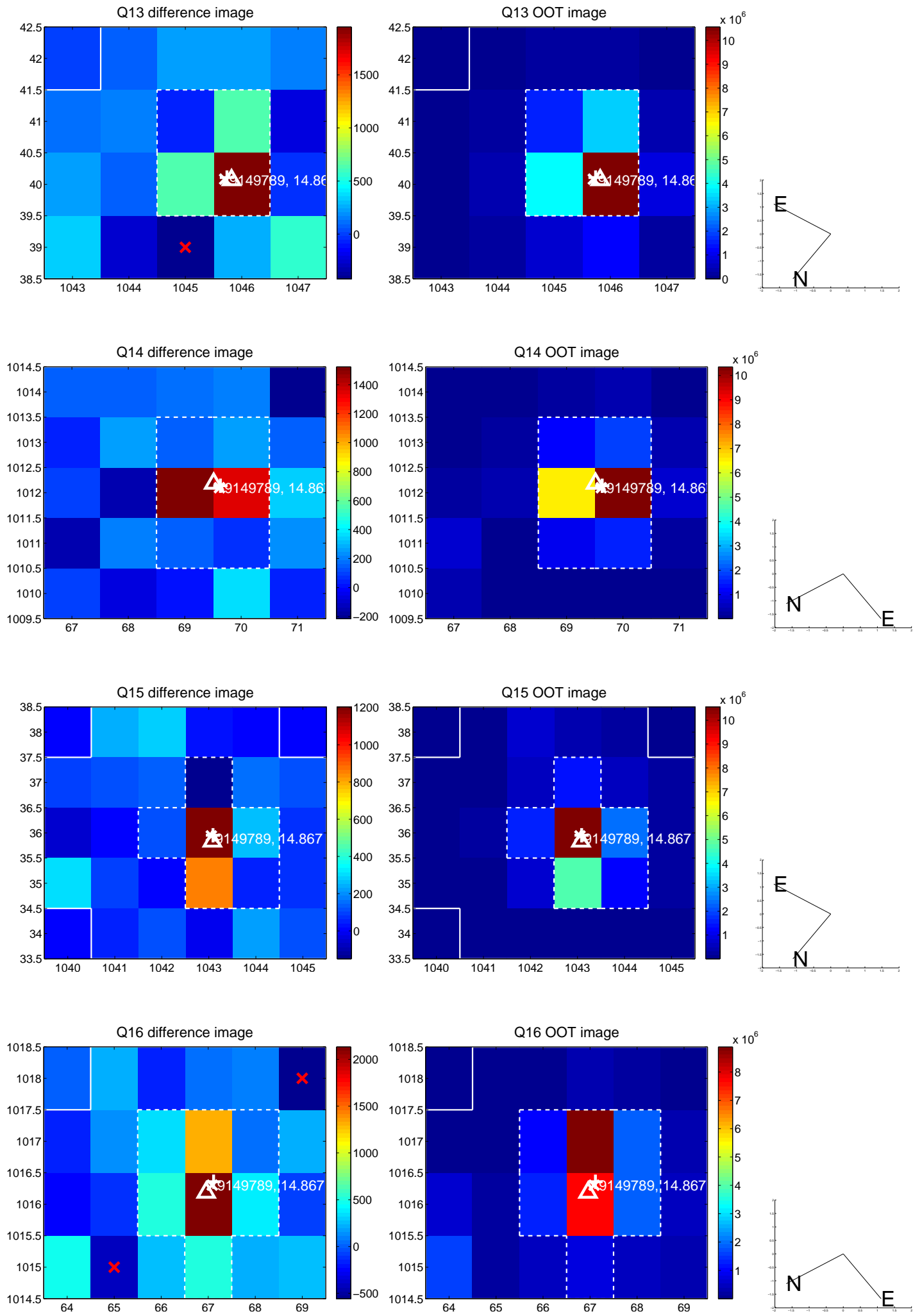
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



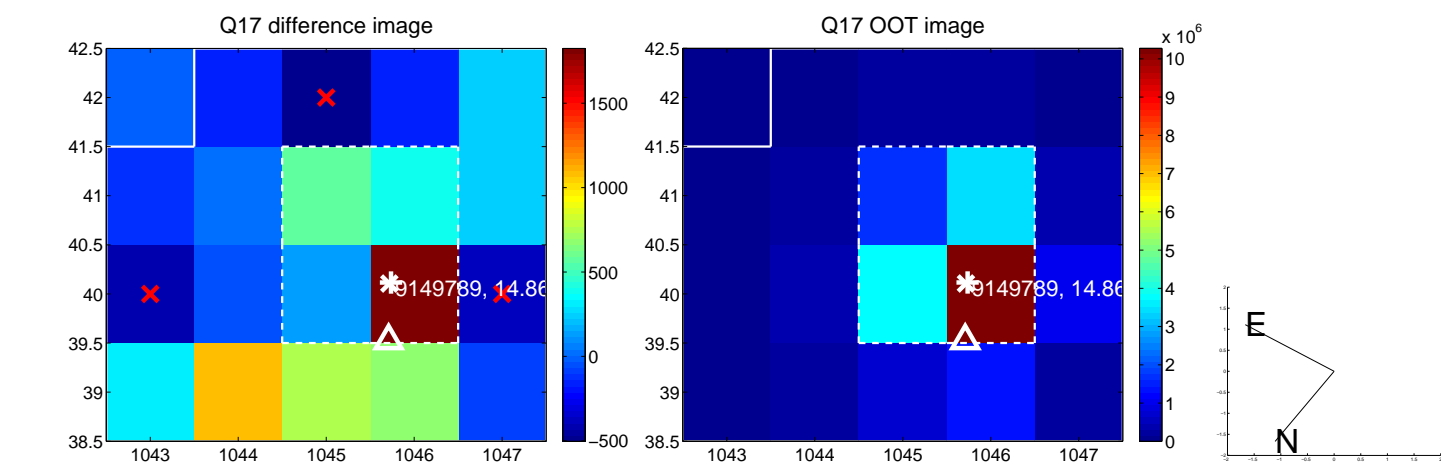
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



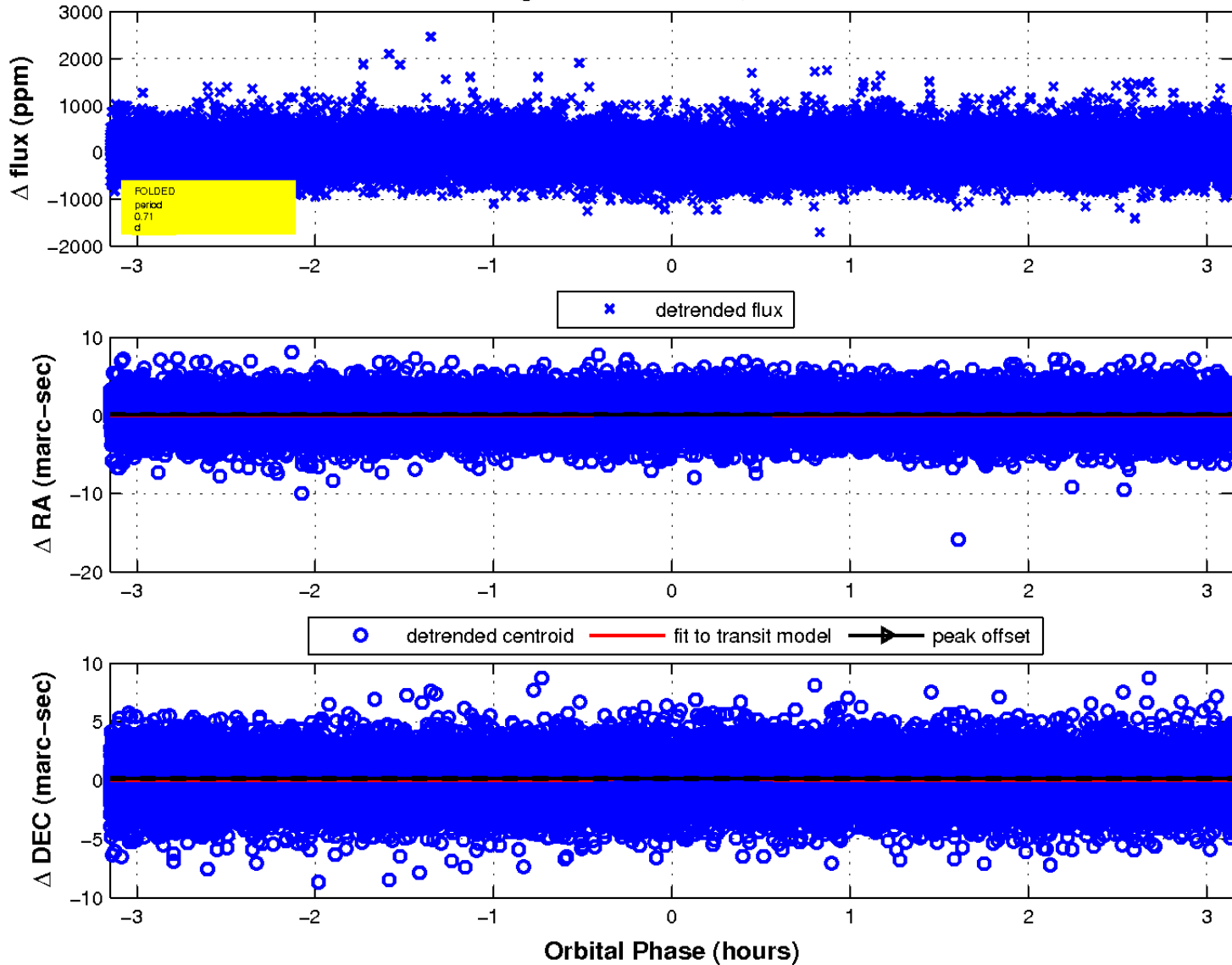
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

