

KIC 008439566

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})
008439566-01	OBS	No	0.858921	131.979153	23.6	4.138	9.6	3.6	3.39	8443	1.69	93376.87
008439566-02	OBS	No	1.781099	132.585412	126.8	5.785	9.3	10.6	3.39	8443	4.42	35312.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008439566-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008439566-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

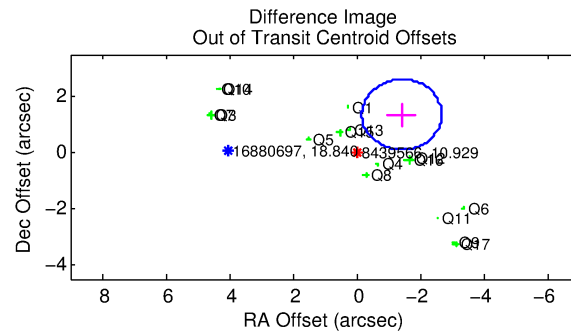
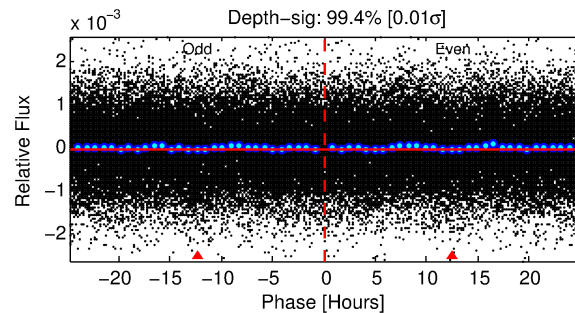
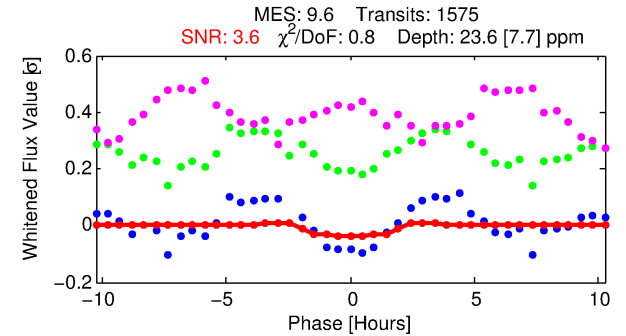
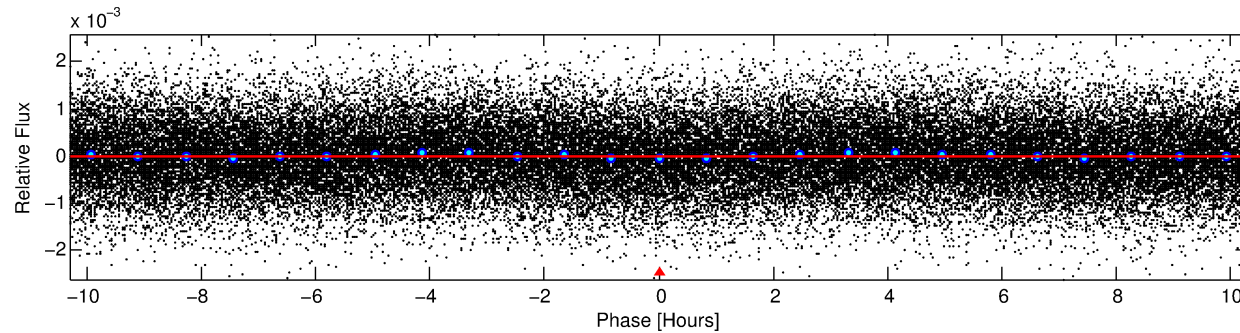
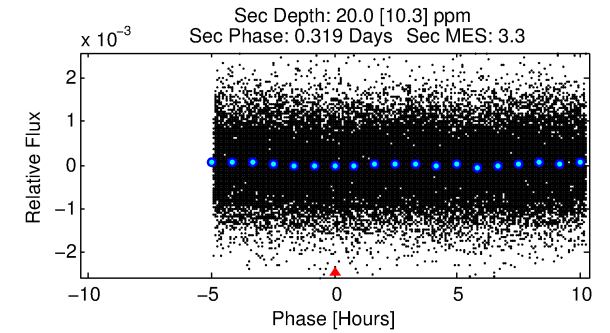
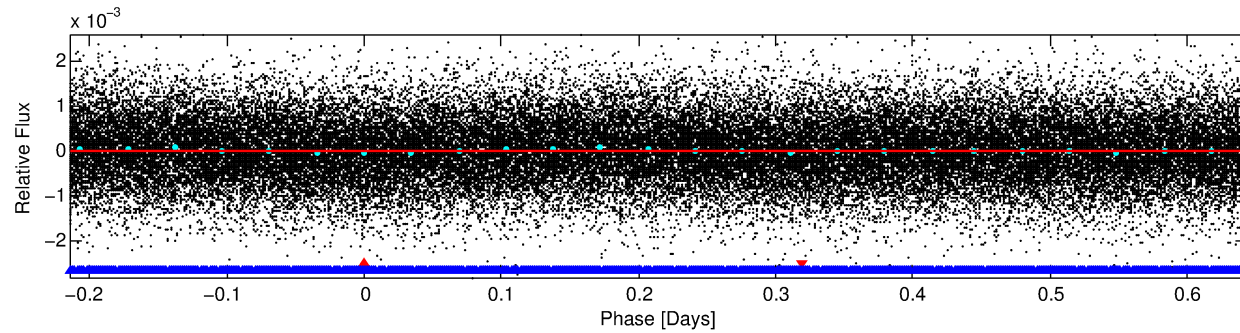
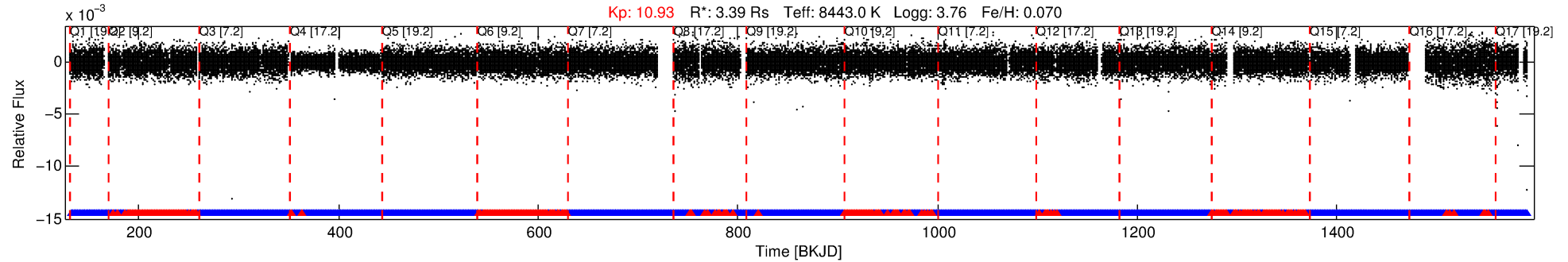
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008439566-01

No Significant Match Found

DV One-Page Summary

KIC: 8439566 Candidate: 1 of 2 Period: 0.859 d



DV Fit Results:

Period = 0.85892 [0.00003] d
Epoch = 131.9792 [0.0126] BKJD
Rp/R* = 0.0046 [0.0063]
a/R* = 1.62 [8.17]
b = 0.39 [18.04]
Seff = 93376.87 [63517.30]
Teq = 4457 [758] K
Rp = 1.69 [2.46] Re
a = 0.0237 [0.0099] AU
Ag = 2.15 [6.23] [0.19σ]
Teffp = 8350 [5895] K [0.65σ]

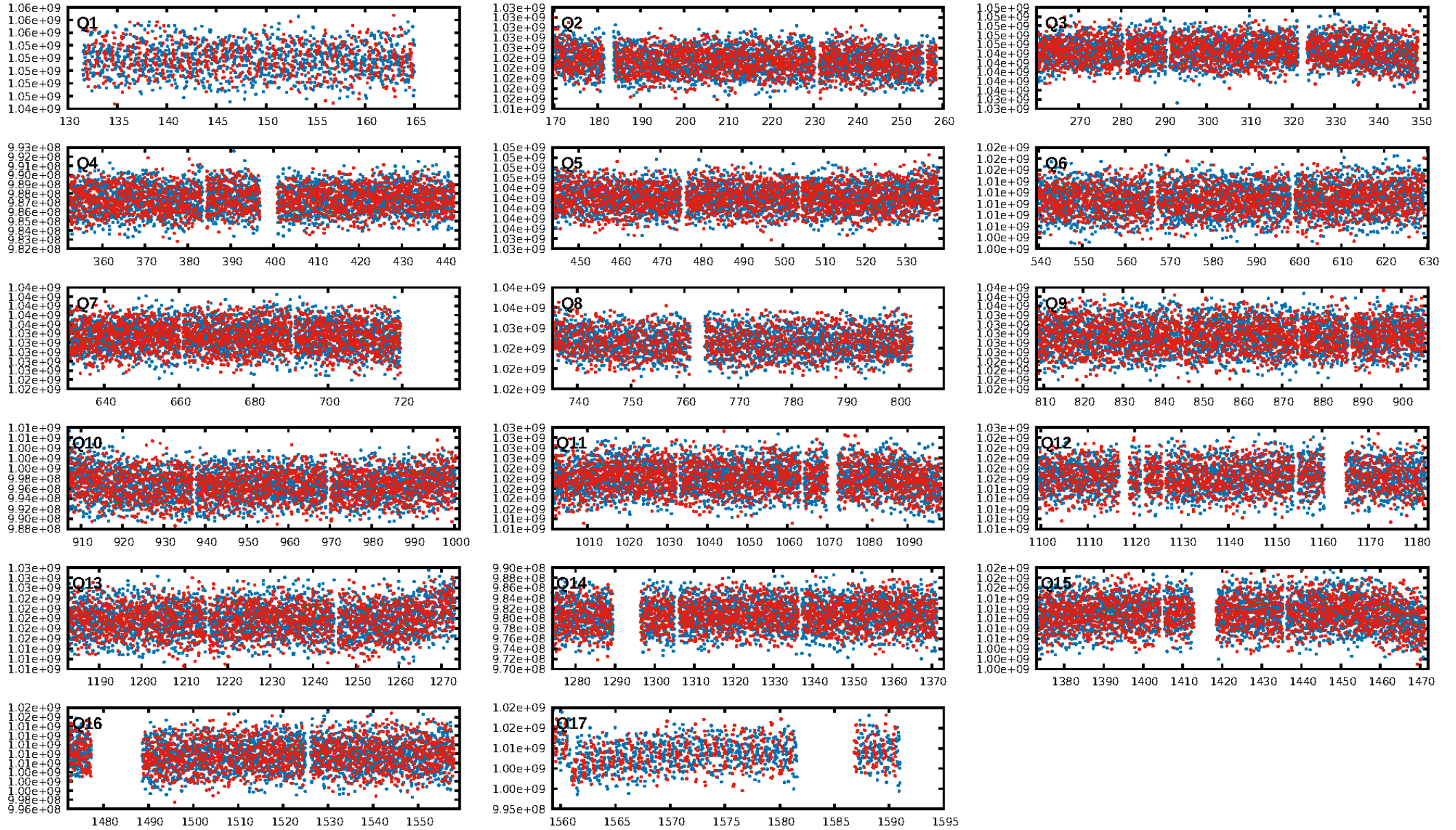
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 99.8% [3.11σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.74e-20
RollingBand-fgt: 0.79 [1187/1505]
GhostDiagnostic-chr: 1.105
Centroid-sig: N/A
Centroid-so: 0.083 arcsec [0.18σ]
OotOffset-rm: 1.967 arcsec [4.70σ]
KicOffset-rm: 2.101 arcsec [4.76σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.44 [7/16]
DiffImageOverlap-fno: 1.00 [17/17]

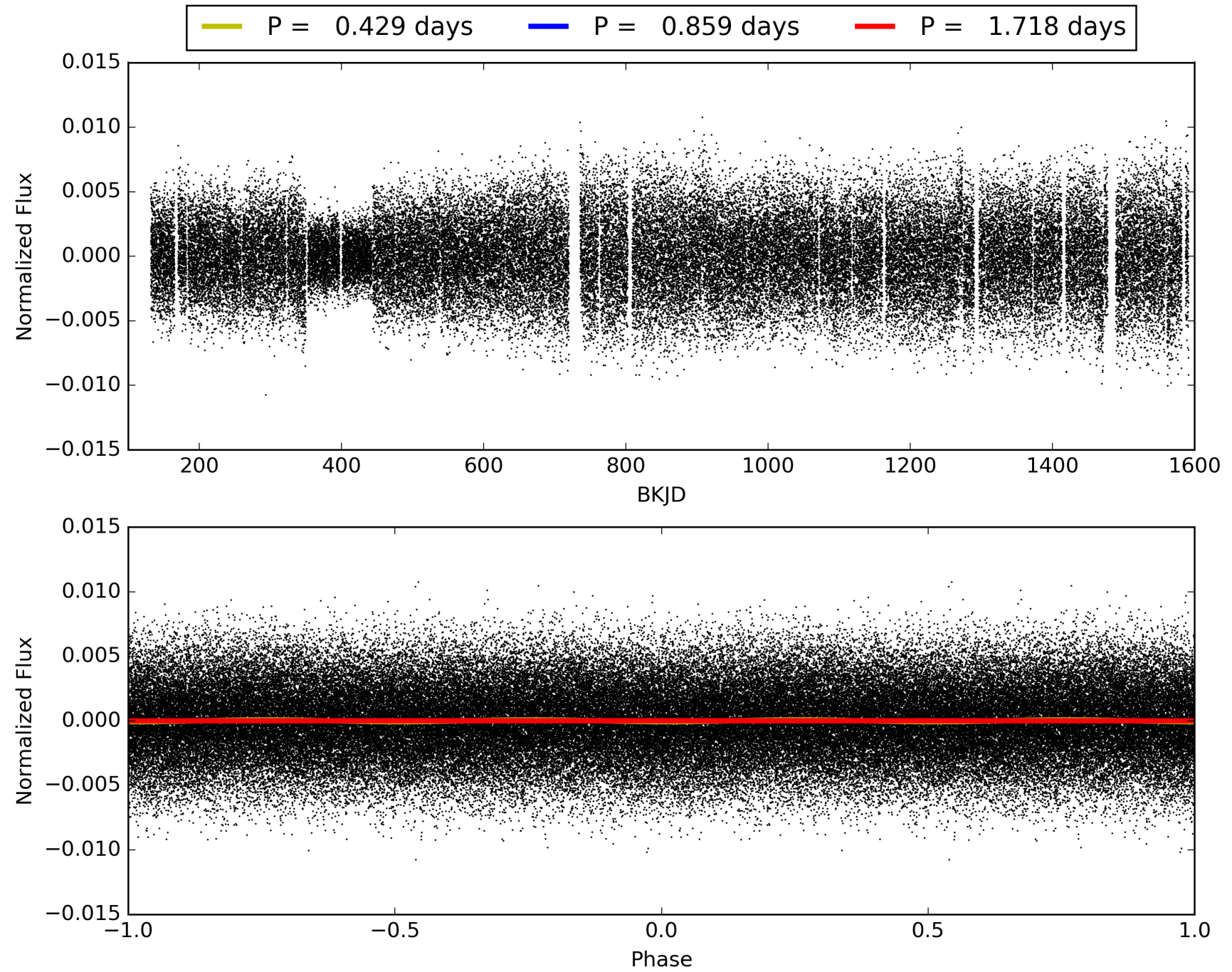
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:19:32 Z

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

TCE 008439566-01, PDC Light Curves

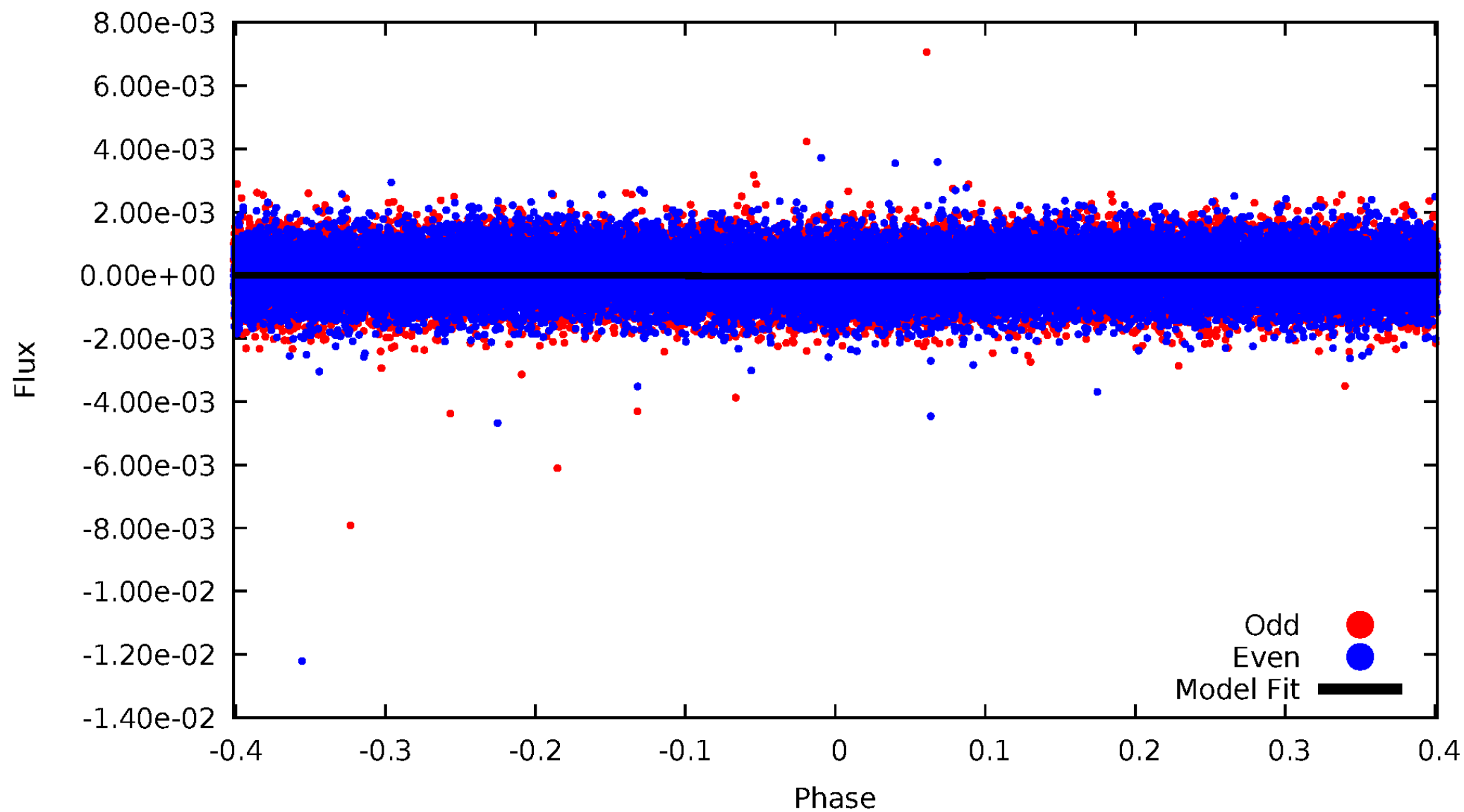


TCE 008439566-01



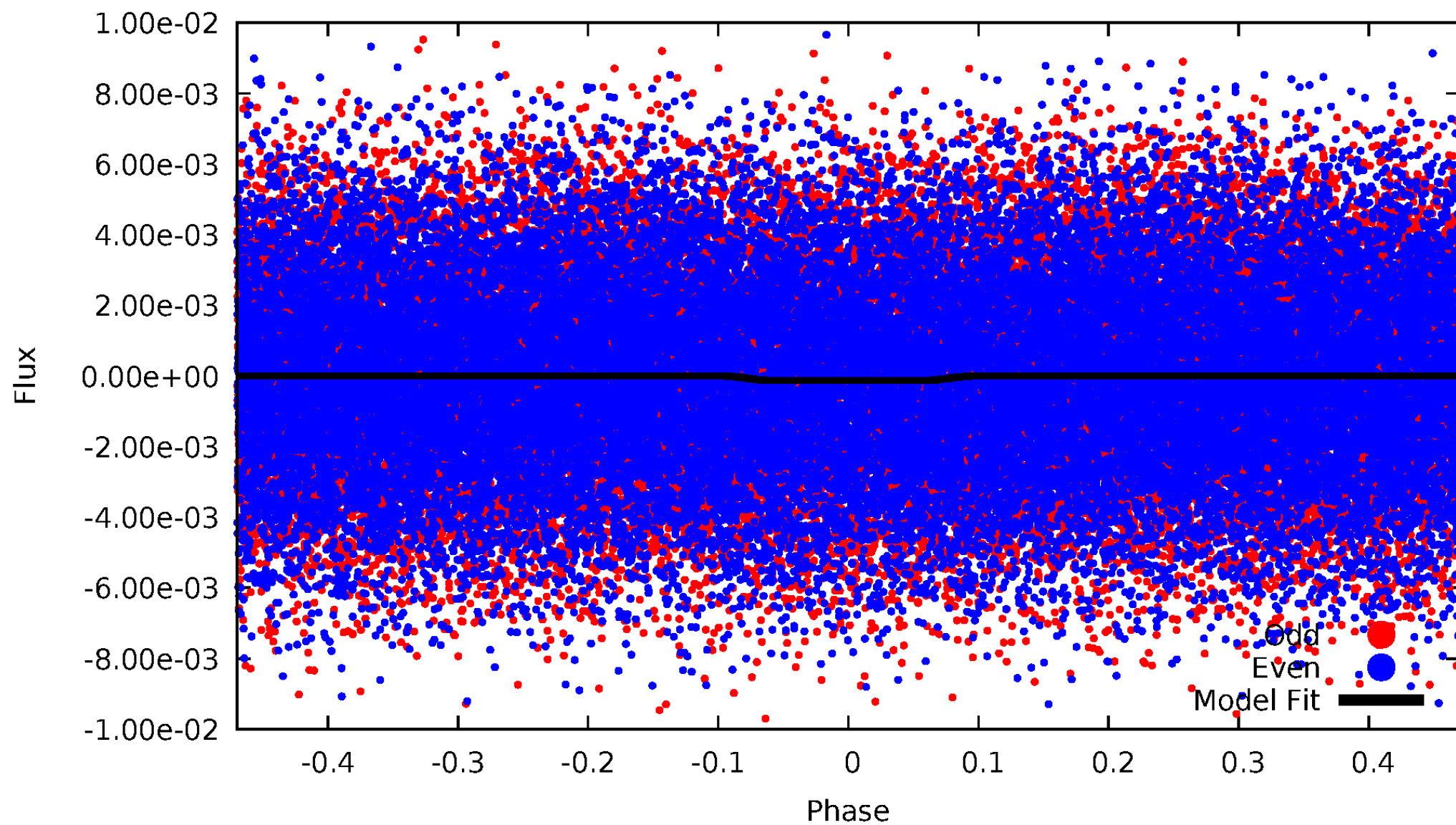
DV Odd/Even

TCE 008439566-01

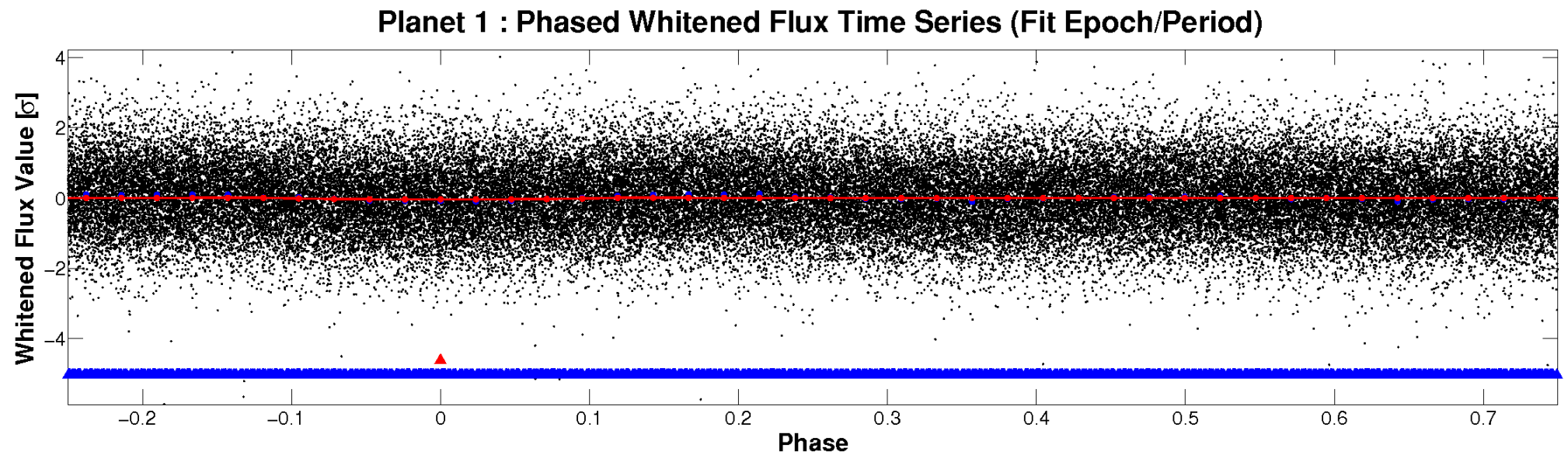
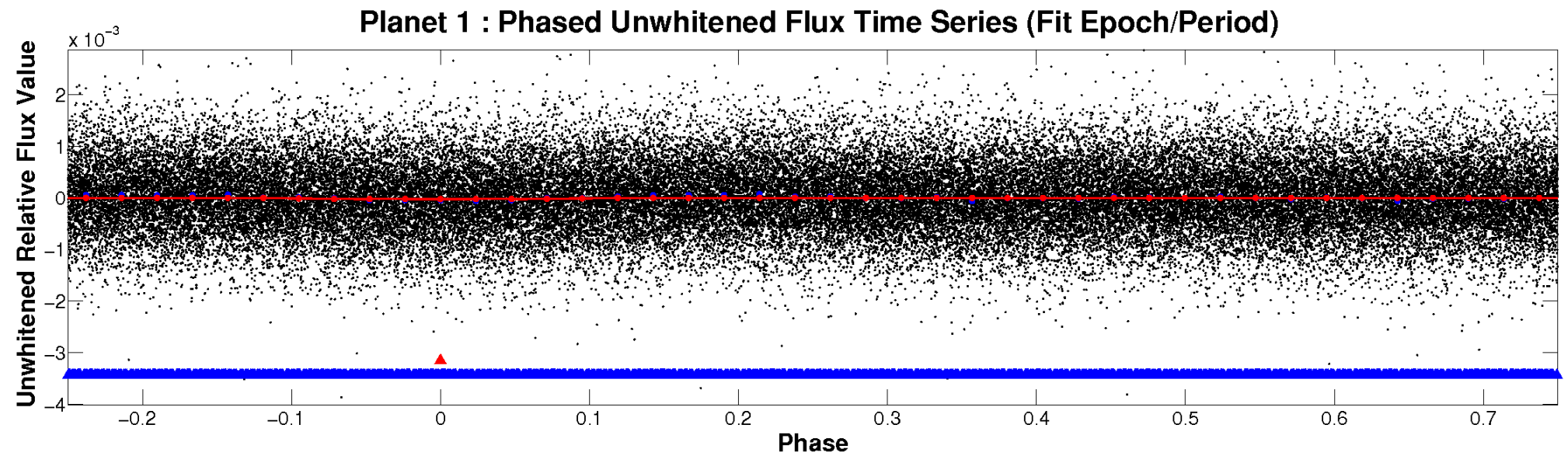


ALT Odd/Even

TCE 008439566-01

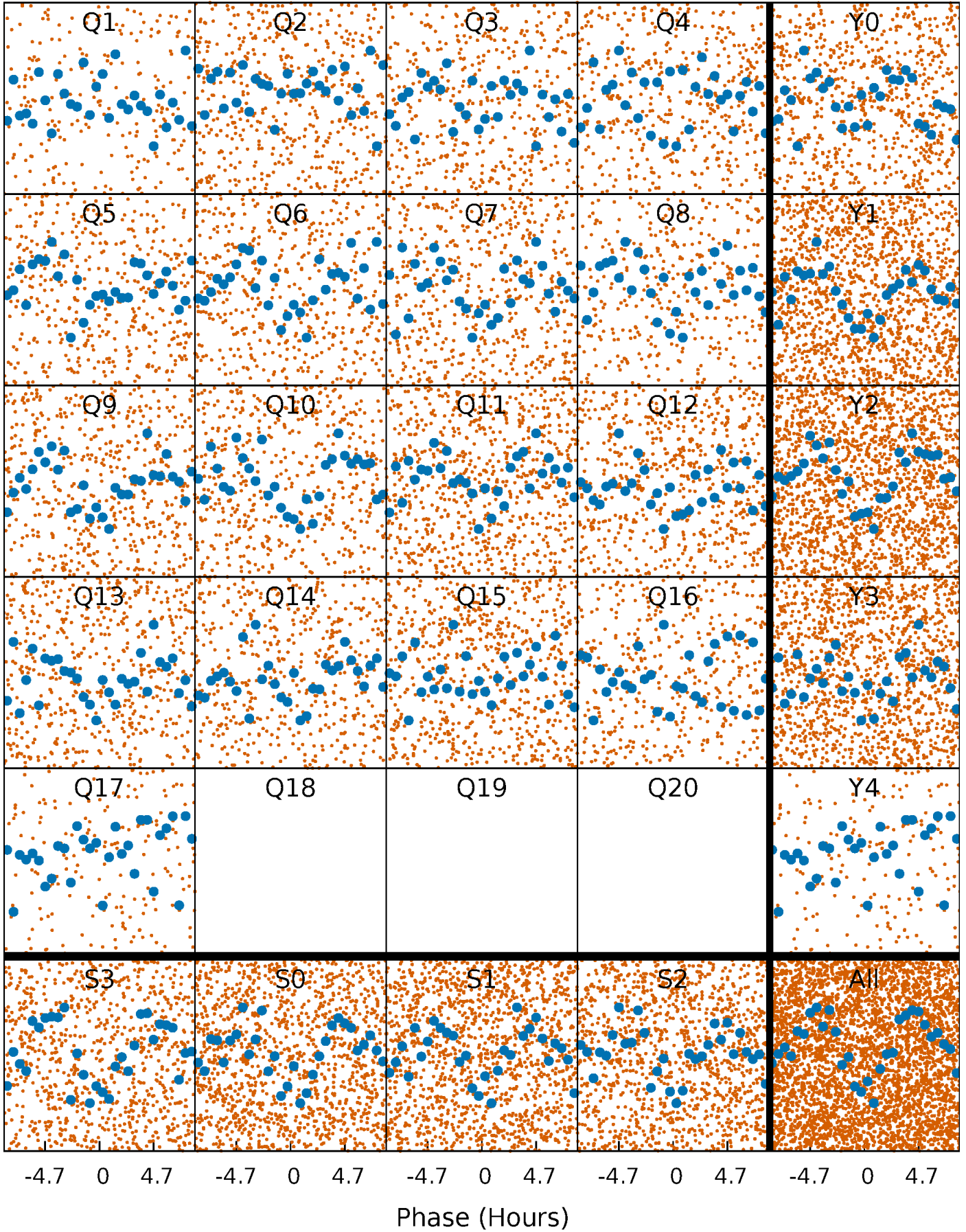


Non-Whitened Vs. Whitened Light Curve



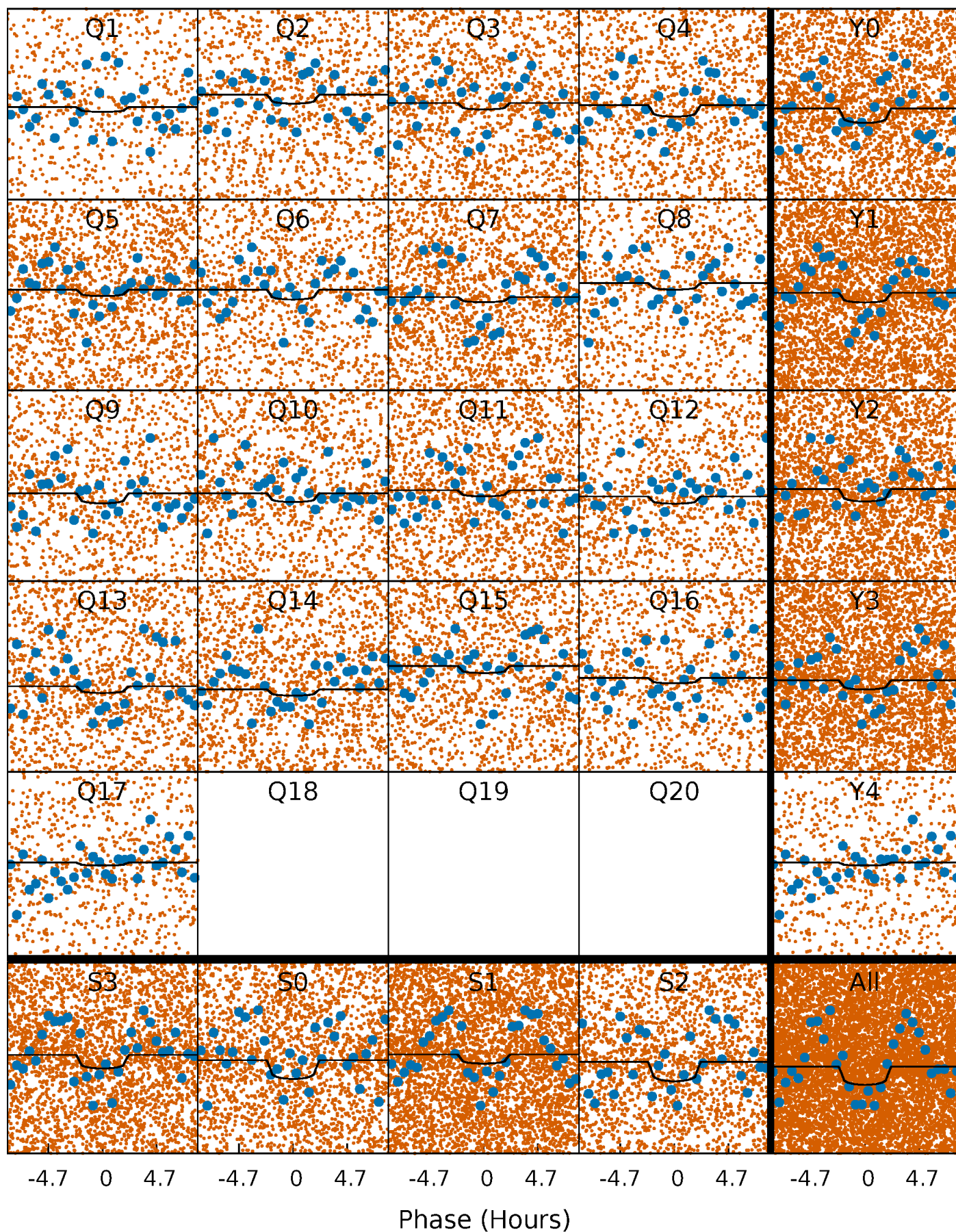
PDC Quarter-Phased Transit Curves

TCE 008439566-01 P= 0.858921 Days $T_0=131.979153$ (BKJD)



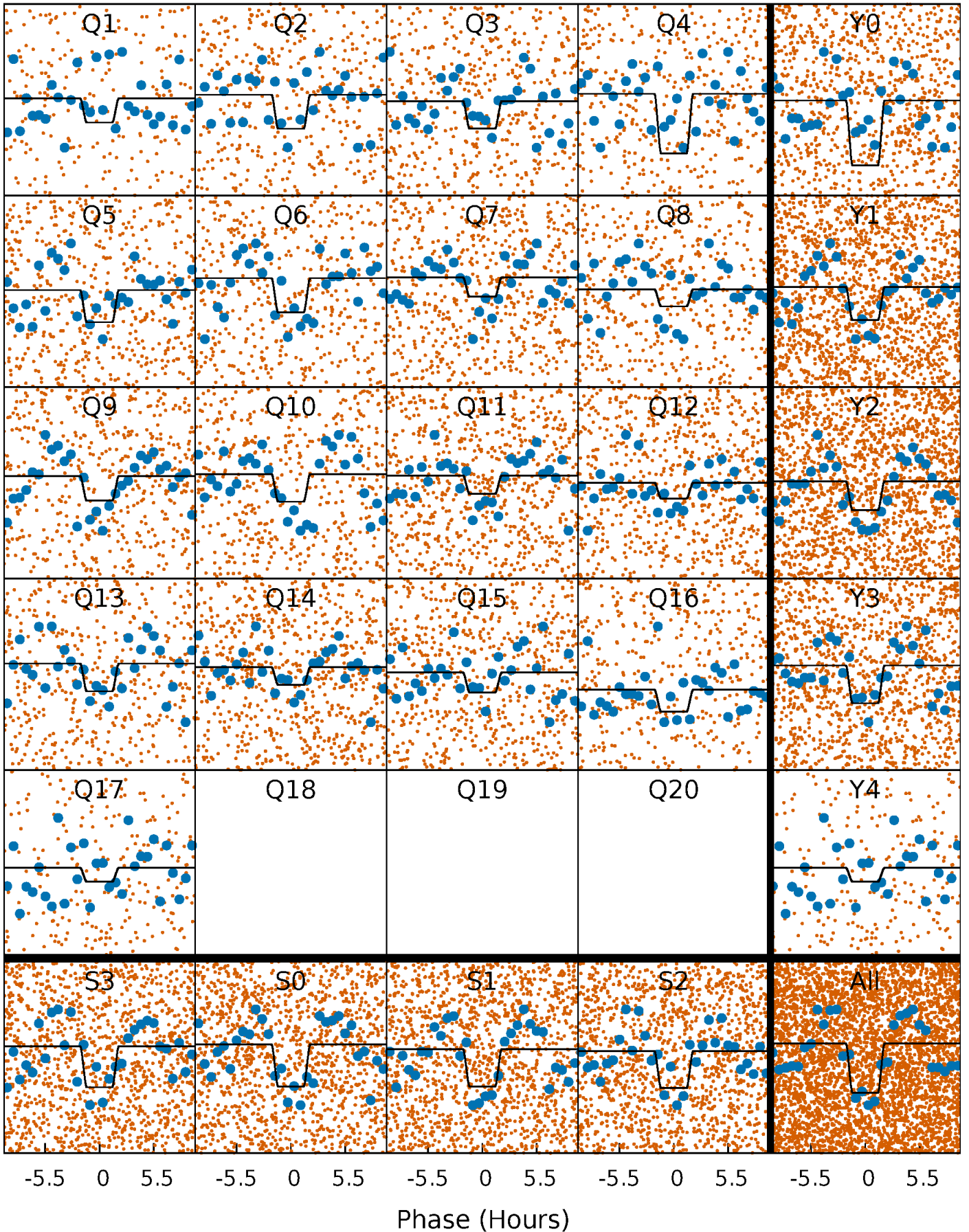
DV Quarter-Phased Transit Curves

TCE 008439566-01 P= 0.858921 Days $T_0=131.979153$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

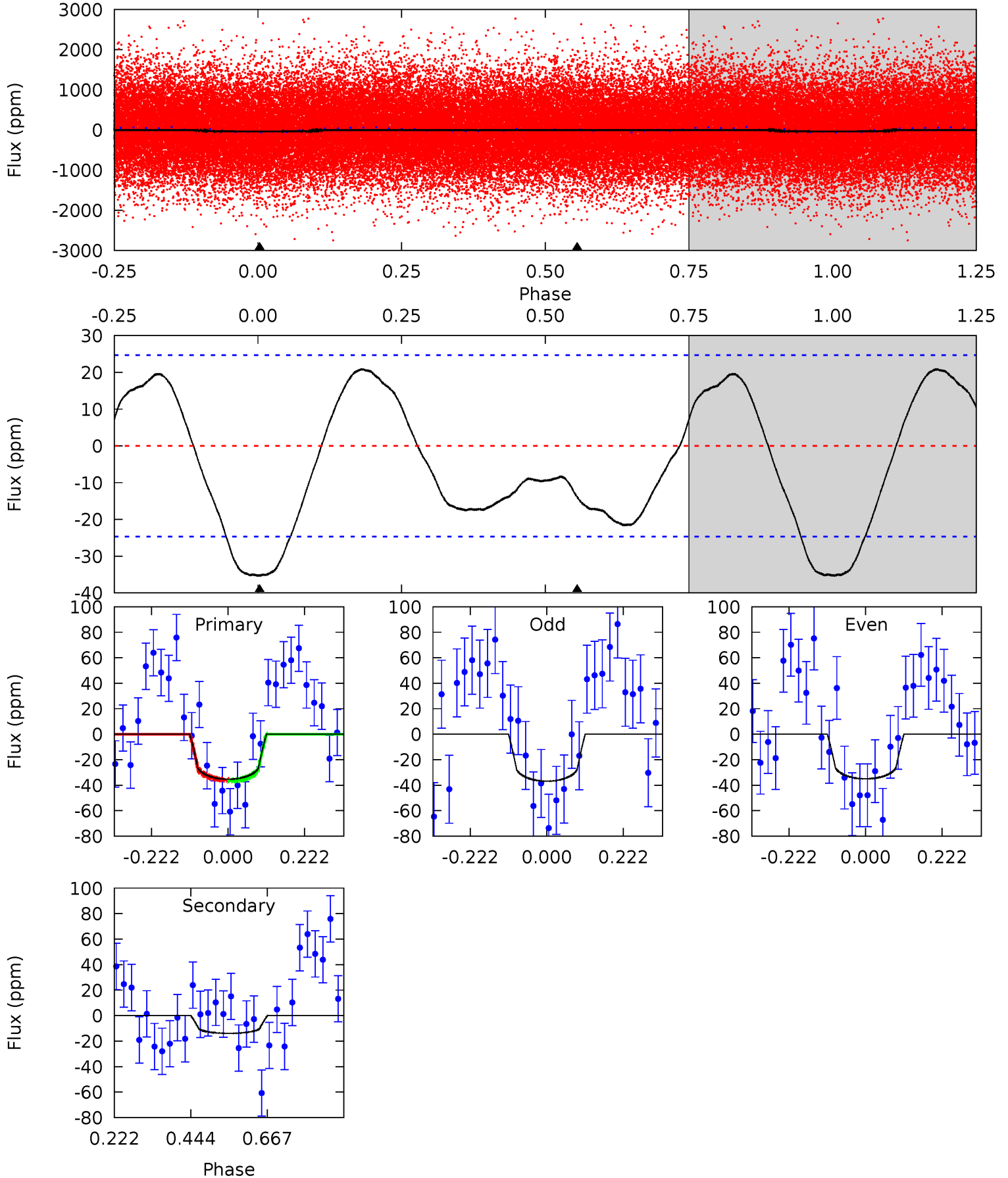
TCE 008439566-01 P= 0.858965 Days $T_0=131.939818$ (BKJD)



DV Model-Shift Uniqueness Test

008439566-01, P = 0.858921 Days, E = 131.120232 Days

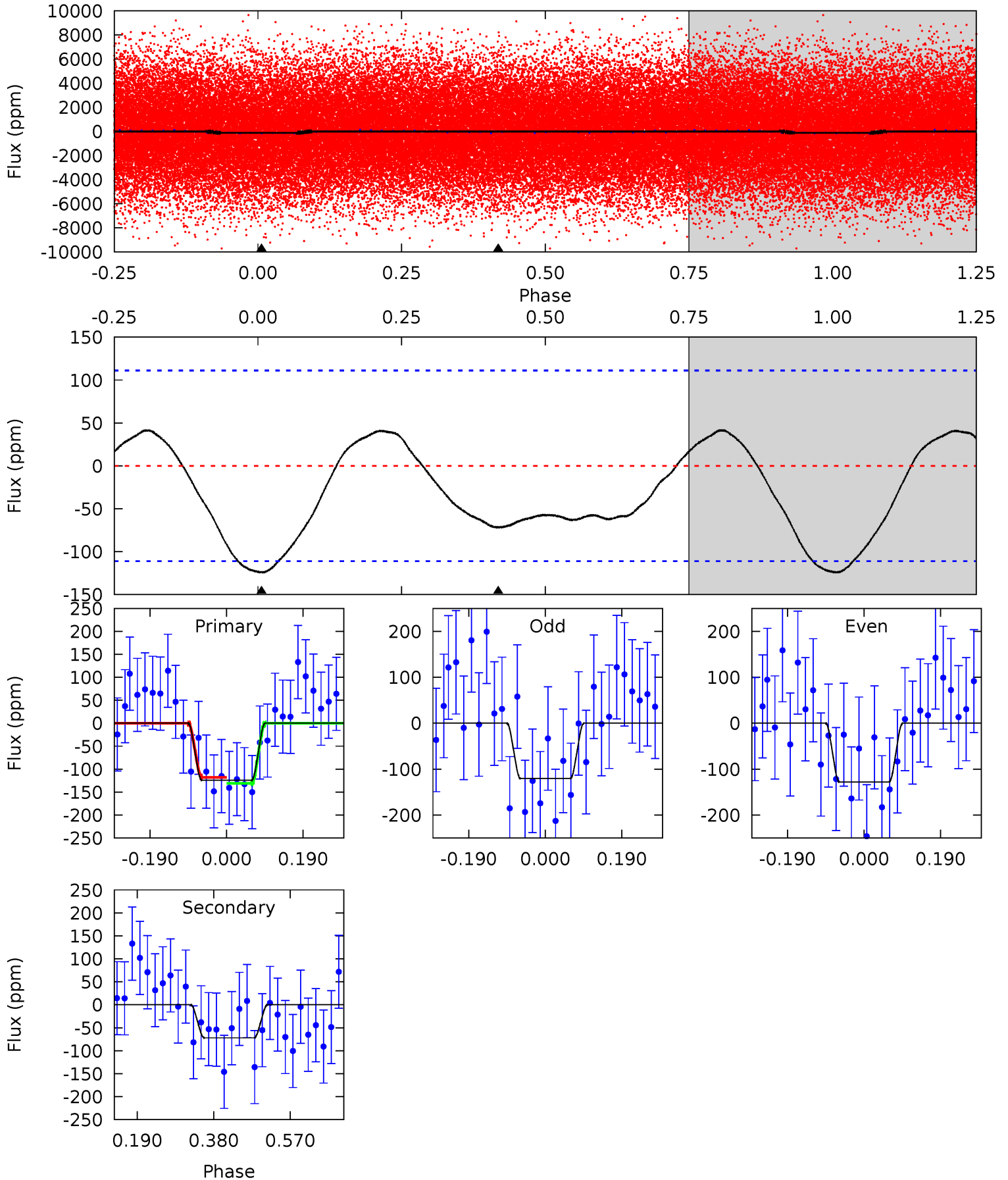
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.28	2.48	0	0	4.39	1.22	1.83	6.28	6.28	2.48	2.48	0.17	0.88	0.37	0.06



Alt Model-Shift Uniqueness Test

008439566-01, P = 0.858965 Days, E = 131.080853 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.96	2.87	0	0	4.43	1.31	1.54	4.96	4.96	2.87	2.87	0.15	1.02	0.25	0.26



Stellar Parameters For KIC 008439566

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8443^{+231}_{-397}	$3.757^{+0.378}_{-0.162}$	$0.070^{+0.250}_{-0.450}$	$3.388^{+1.020}_{-1.530}$	$2.393^{+0.319}_{-0.745}$	$0.087^{+0.317}_{-0.043}$
	+3%/-5%	+10%/-4%	+357%/-643%	+30%/-45%	+13%/-31%	+366%/-50%
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 008439566-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-14 ± 6	$2.18^{+2.06}_{-1.43}$	6072^{+557}_{-671}	5257^{+5819}_{-9232}	$0.822^{+5.298}_{-0.621}$
Alt.	-72 ± 25	$3.79^{+2.34}_{-2.00}$	6071^{+492}_{-626}	6685^{+4137}_{-2085}	$1.457^{+5.080}_{-0.939}$

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 $A_{obs} \gg 1.0$

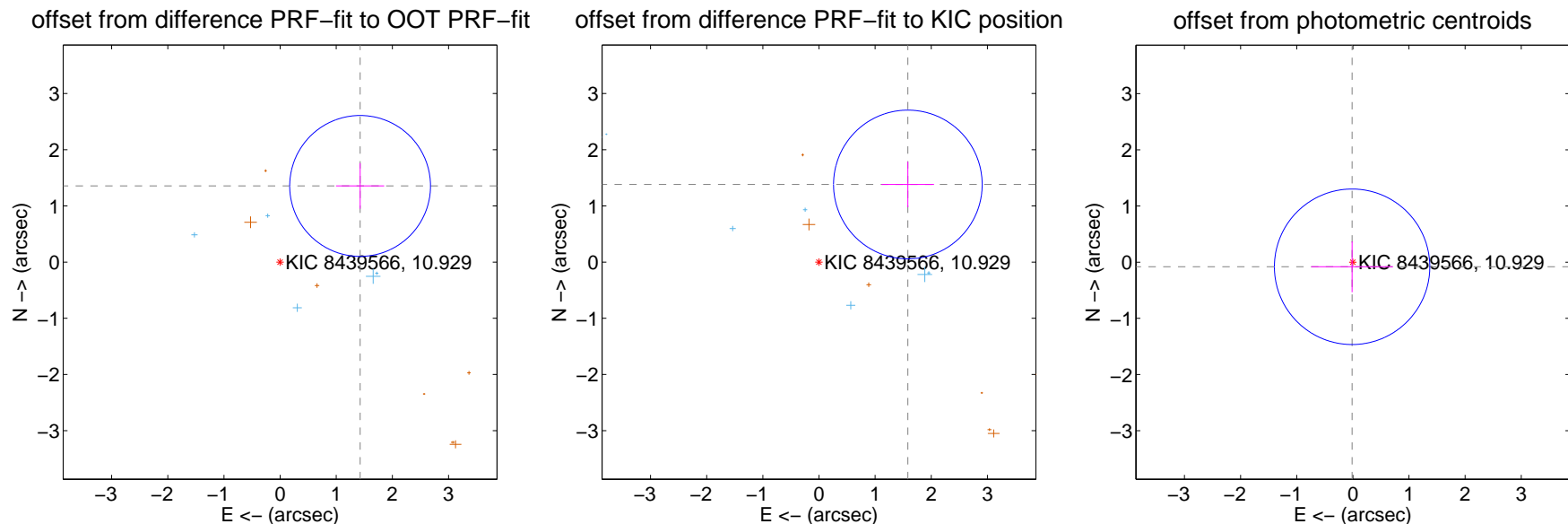
DV Centroid Data

Supplemental centroid analysis for 008439566-01. **Kepler magnitude: 10.93.** Transit SNR 3.63

There are 7 quarters with good PRF difference image offsets

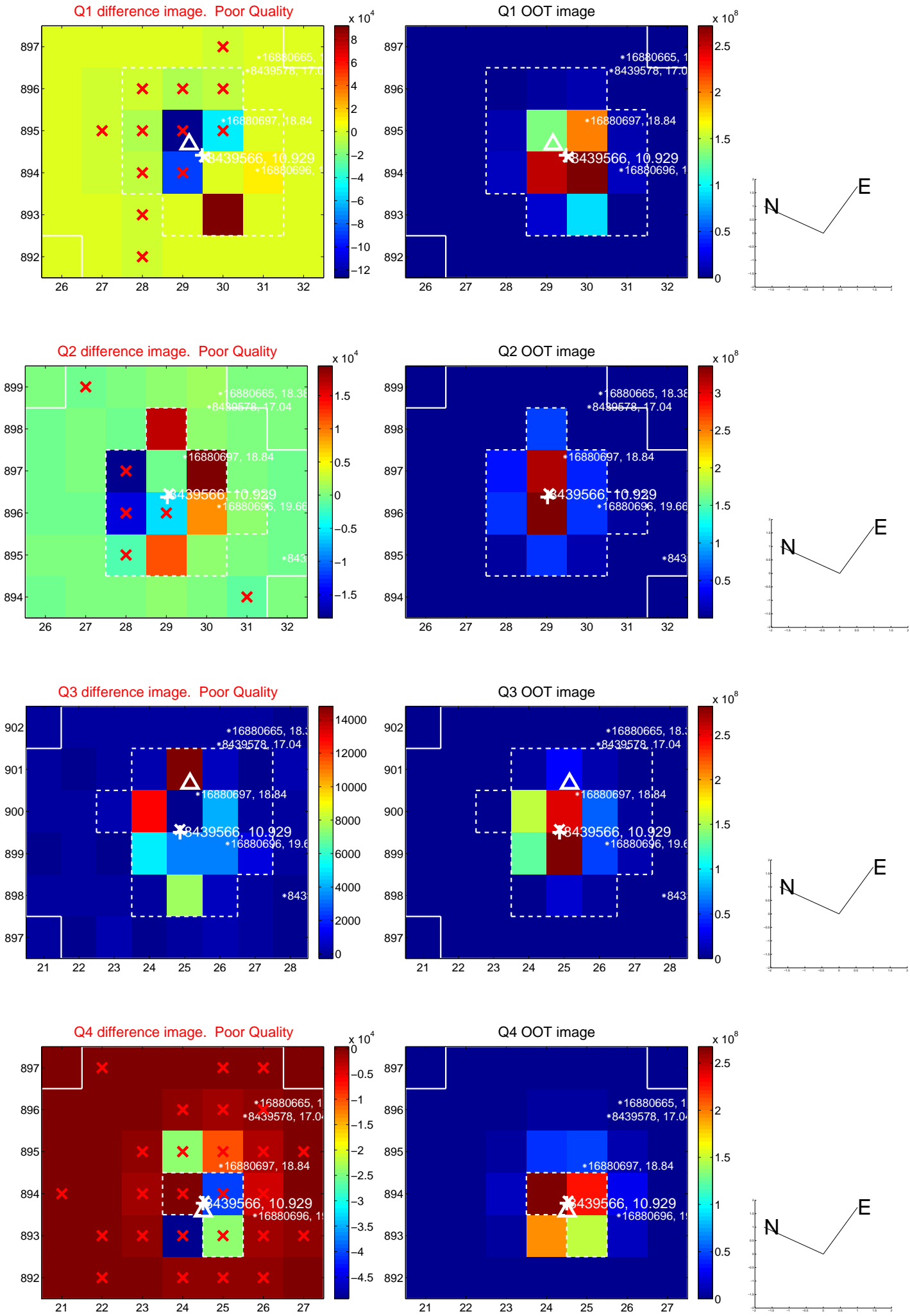
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.967 ± 0.418	4.70	-1.425 ± 0.429	1.355 ± 0.406
PRF-fit source offset from KIC position	2.101 ± 0.441	4.76	-1.583 ± 0.467	1.381 ± 0.405
photometric centroid source offset	0.08 ± 0.46	0.18	0.01 ± 0.73	-0.08 ± 0.45

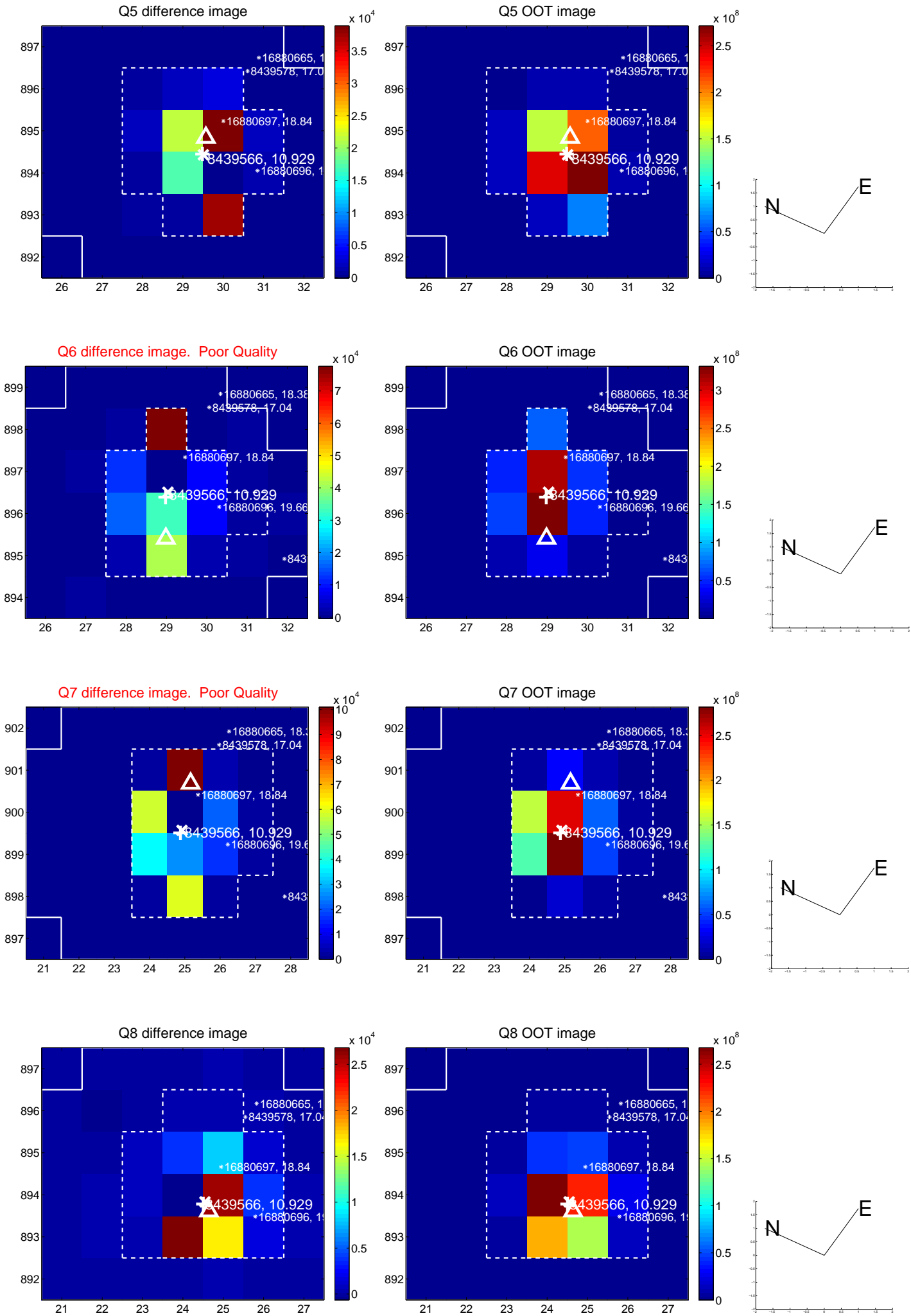


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

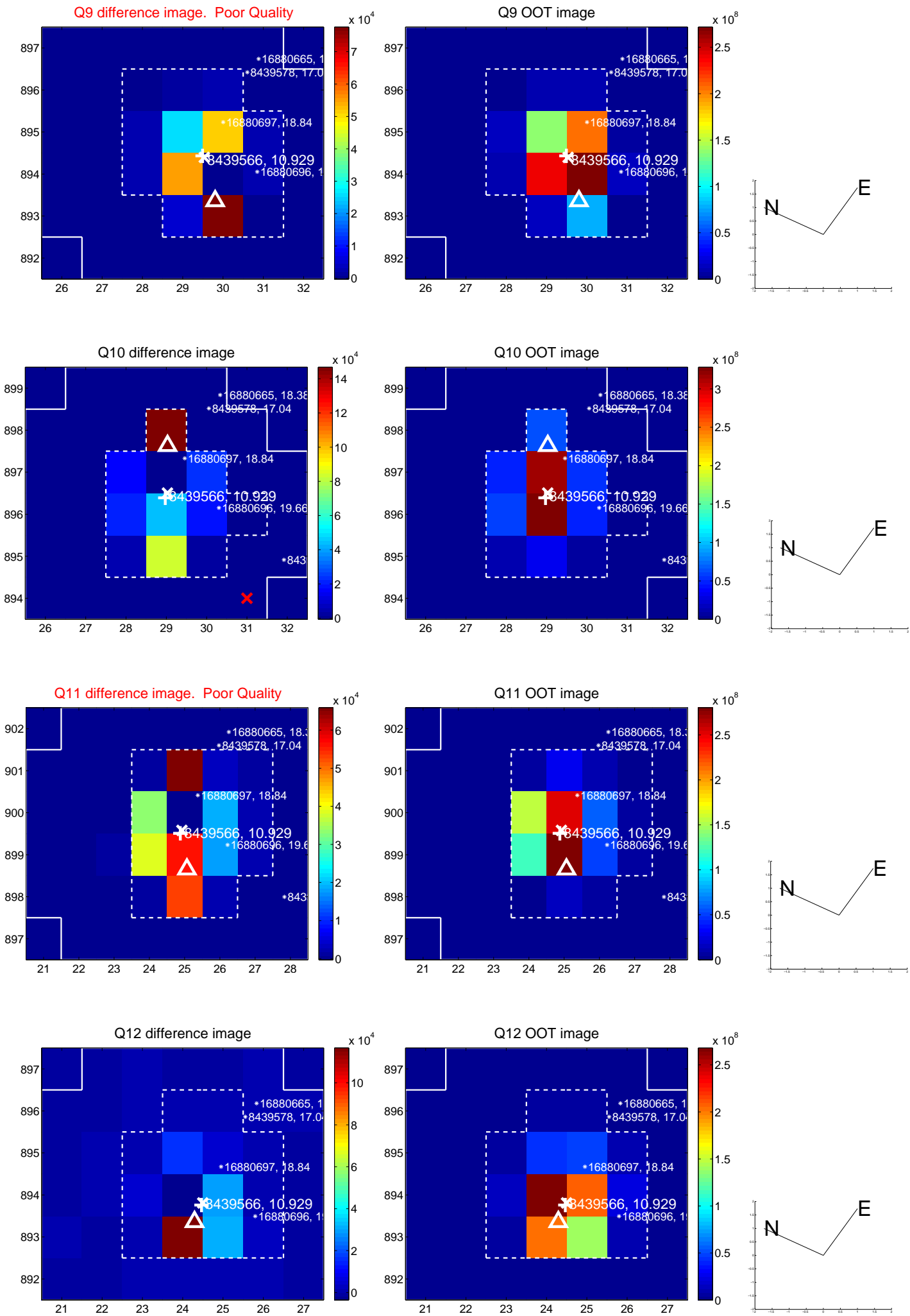
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



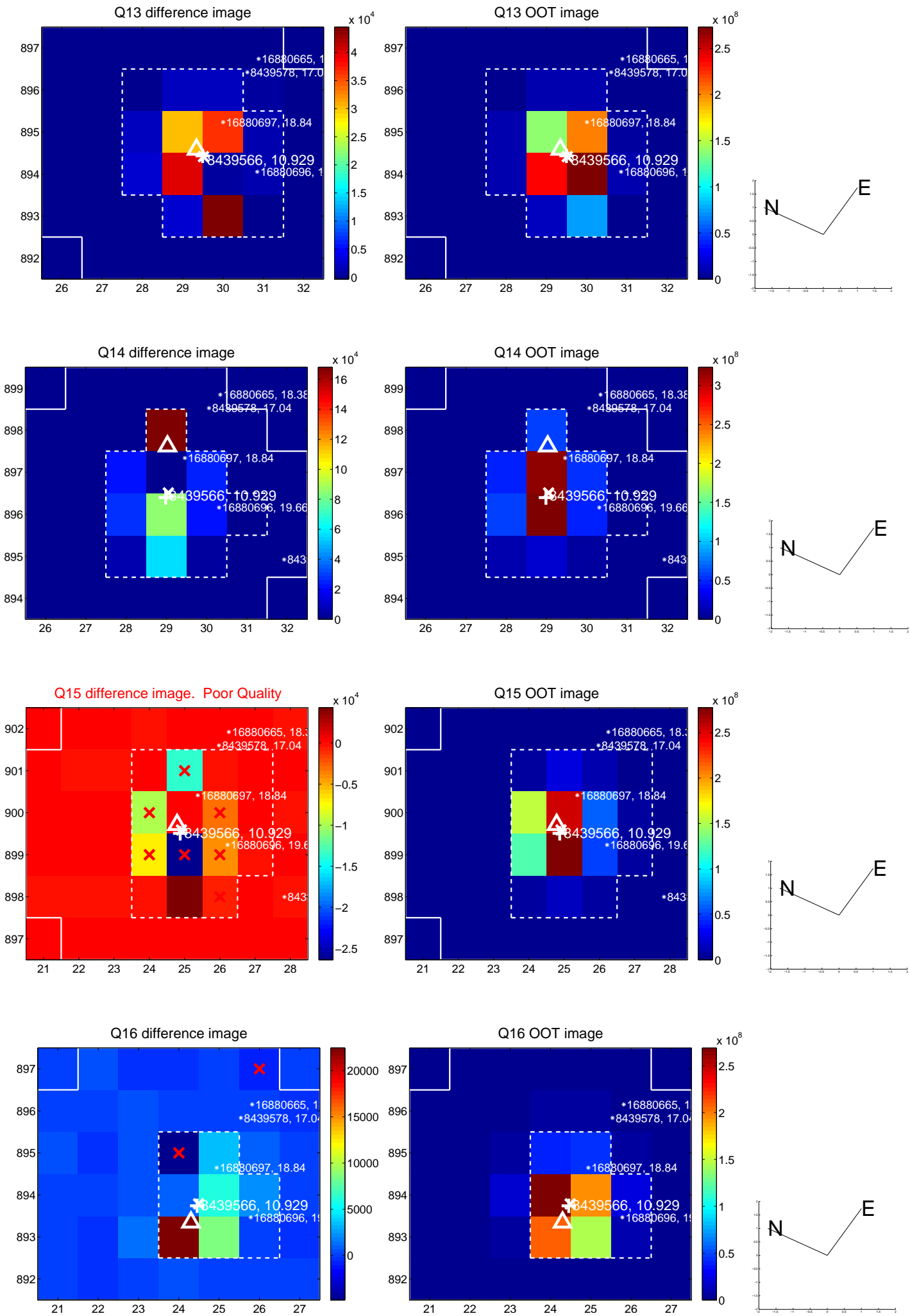
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



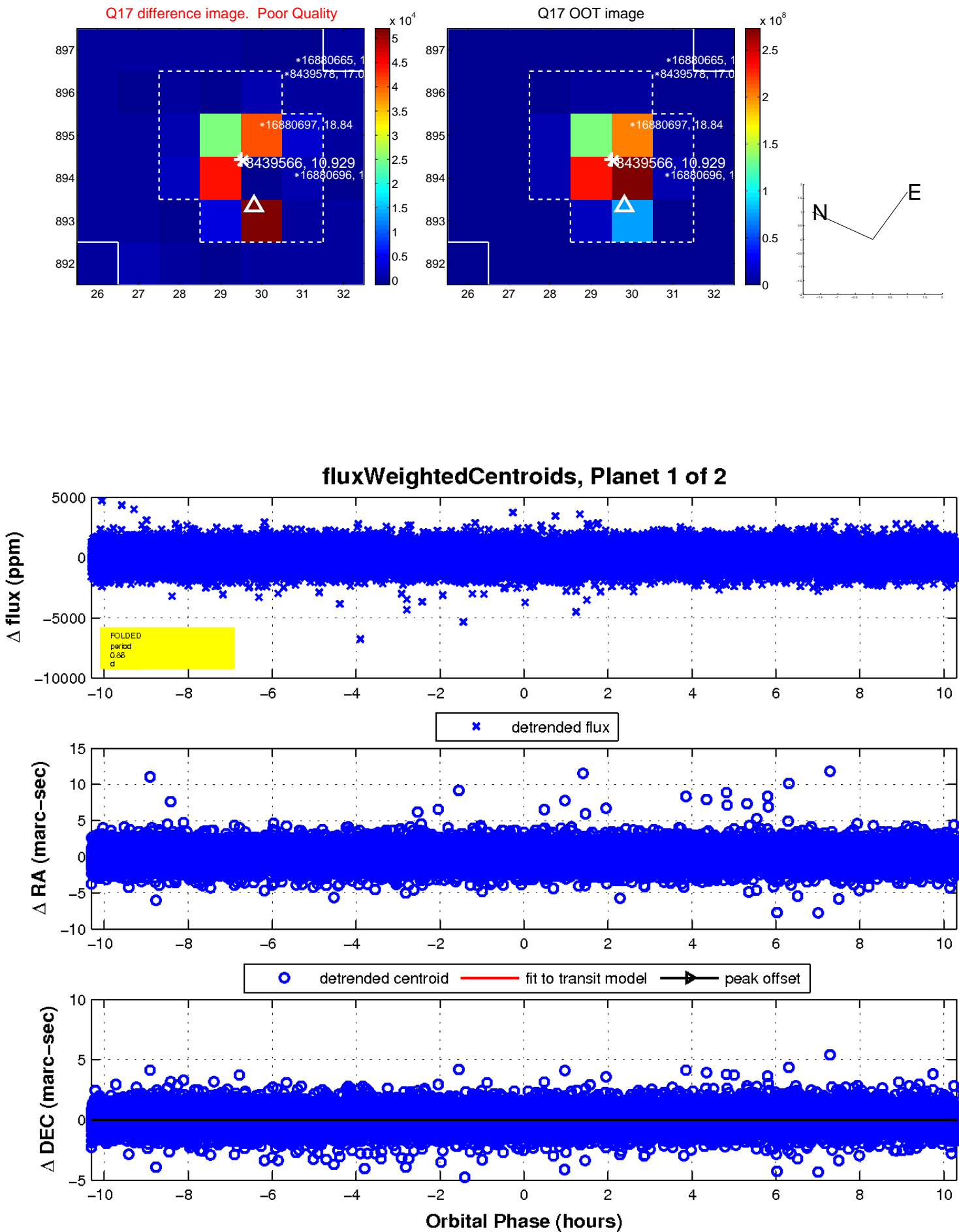
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

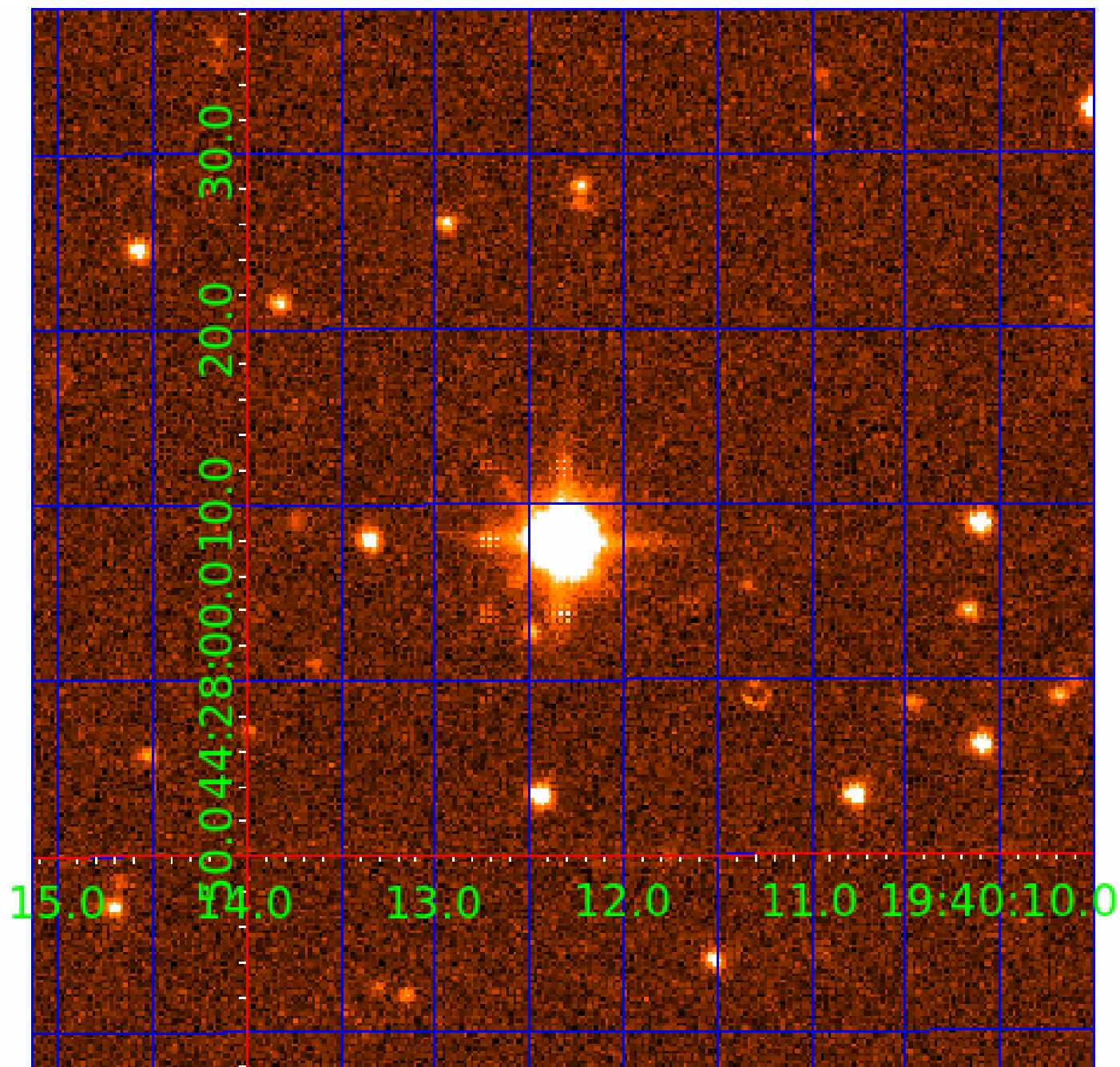


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008439566

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})
008439566-01	OBS	No	0.858921	131.979153	23.6	4.138	9.6	3.6	3.39	8443	1.69	93376.87
008439566-02	OBS	No	1.781099	132.585412	126.8	5.785	9.3	10.6	3.39	8443	4.42	35312.32

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008439566-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
008439566-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_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.

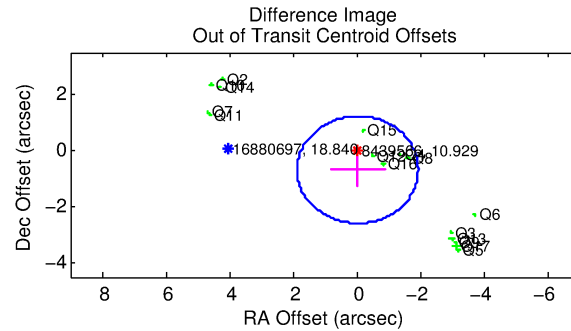
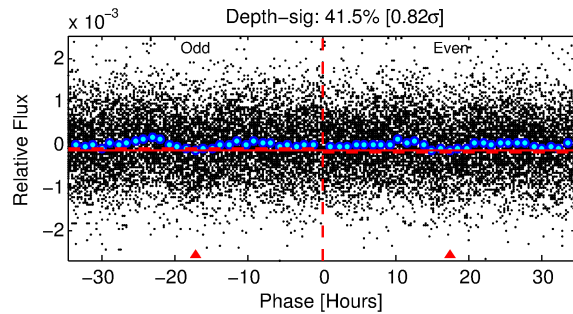
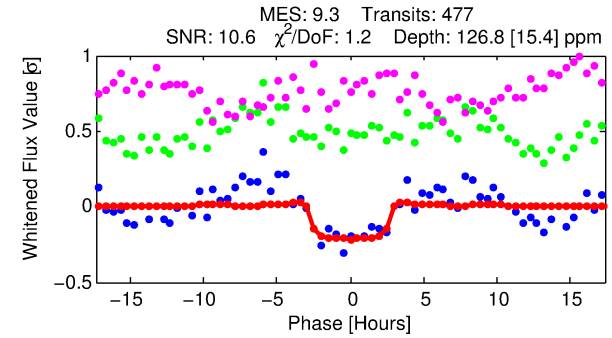
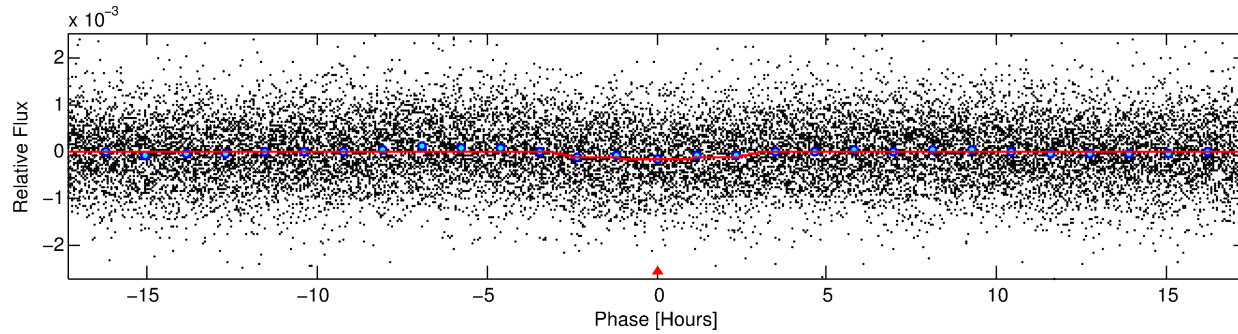
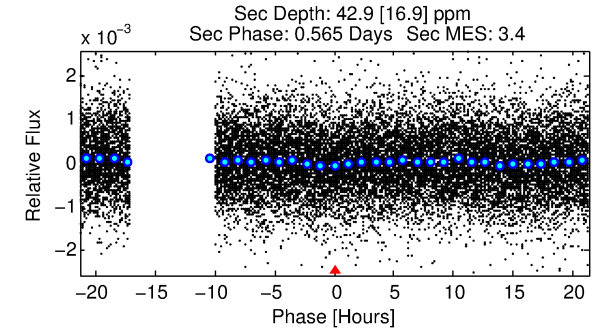
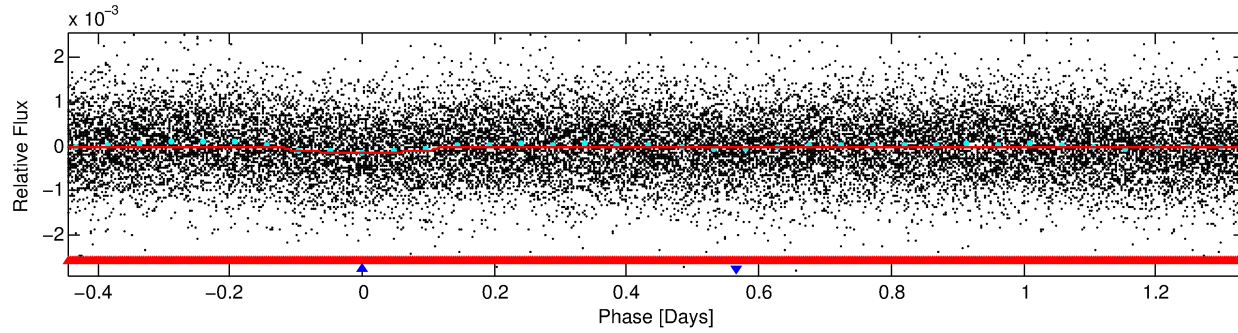
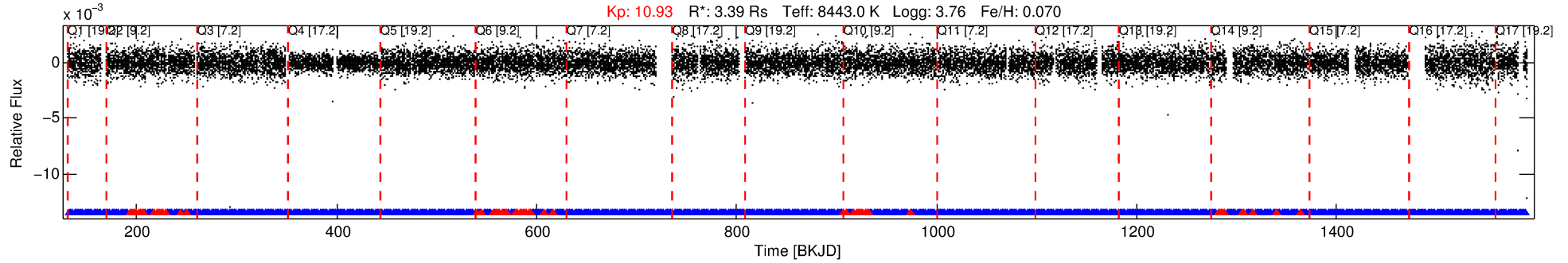
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008439566-02

No Significant Match Found

DV One-Page Summary

KIC: 8439566 Candidate: 2 of 2 Period: 1.781 d



DV Fit Results:

Period = 1.78110 [0.00002] d
Epoch = 132.5854 [0.0073] BKJD
Rp/R* = 0.0119 [0.0037]
a/R* = 1.45 [1.52]
b = 0.90 [0.44]
Seff = 35312.32 [24020.33]
Teq = 3495 [594] K
Rp = 4.42 [2.42] Re
a = 0.0385 [0.0161] AU
Ag = 1.79 [1.76] [0.45σ]
Teffp = 6253 [1189] K [2.07σ]

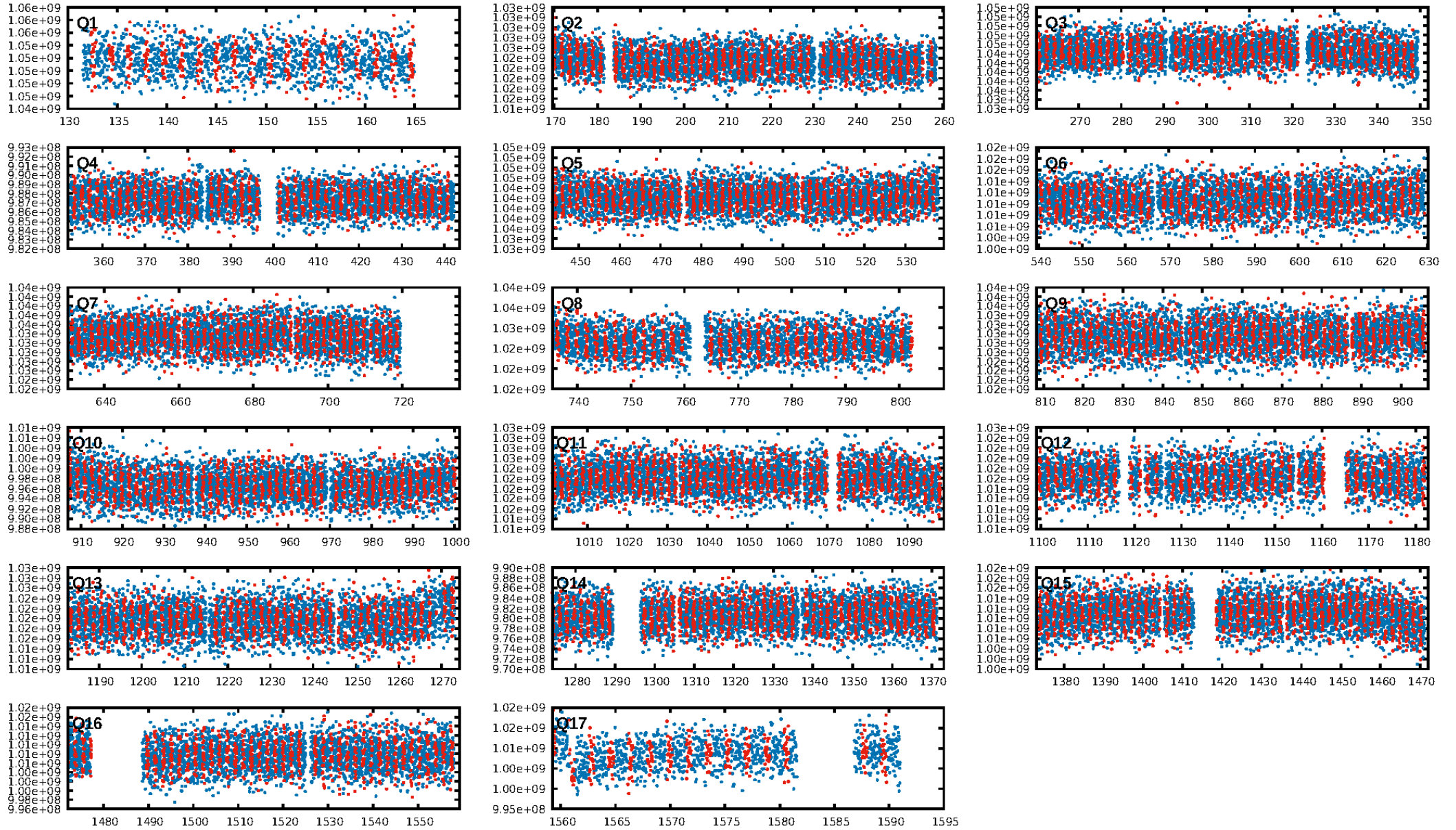
DV Diagnostic Results:

ShortPeriod-sig: 99.8% [3.11σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.34e-18
RollingBand-fgt: 0.87 [400/460]
GhostDiagnostic-chr: 1.746
Centroid-sig: N/A
Centroid-so: 0.555 arcsec [3.15σ]
OotOffset-rm: 0.682 arcsec [1.07σ]
KicOffset-rm: 0.705 arcsec [0.93σ]
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]

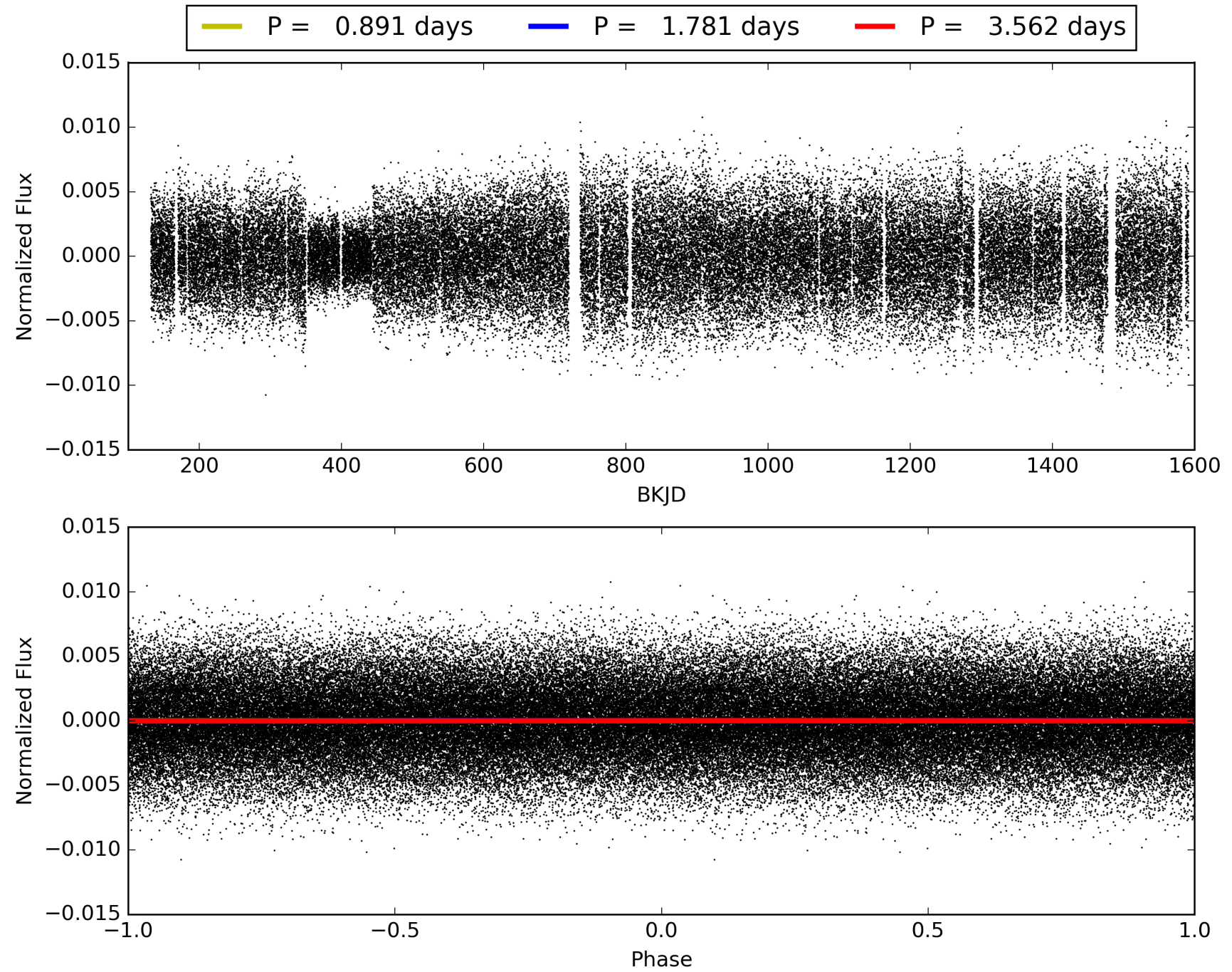
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:19:44 Z

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

TCE 008439566-02, PDC Light Curves

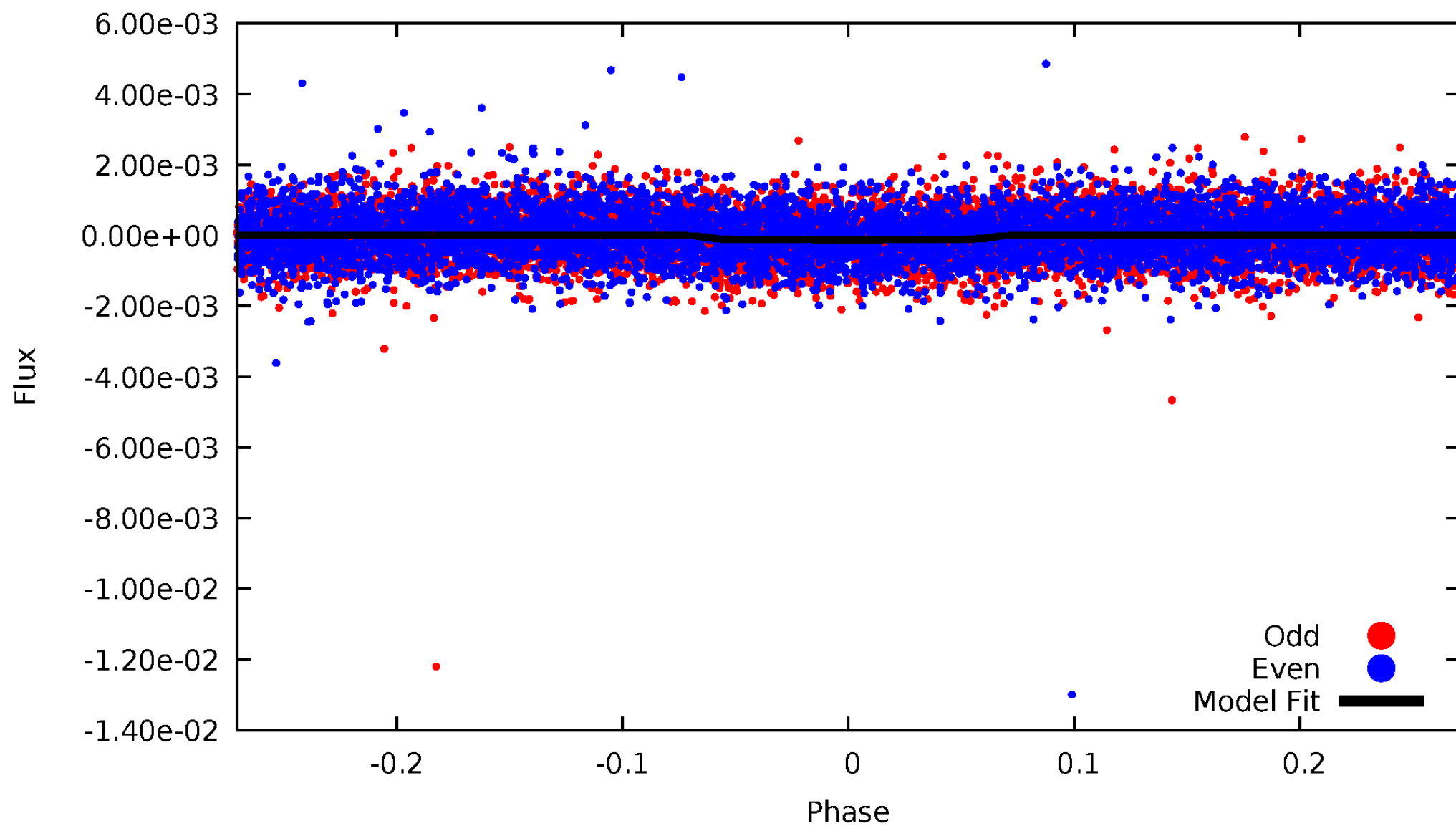


TCE 008439566-02



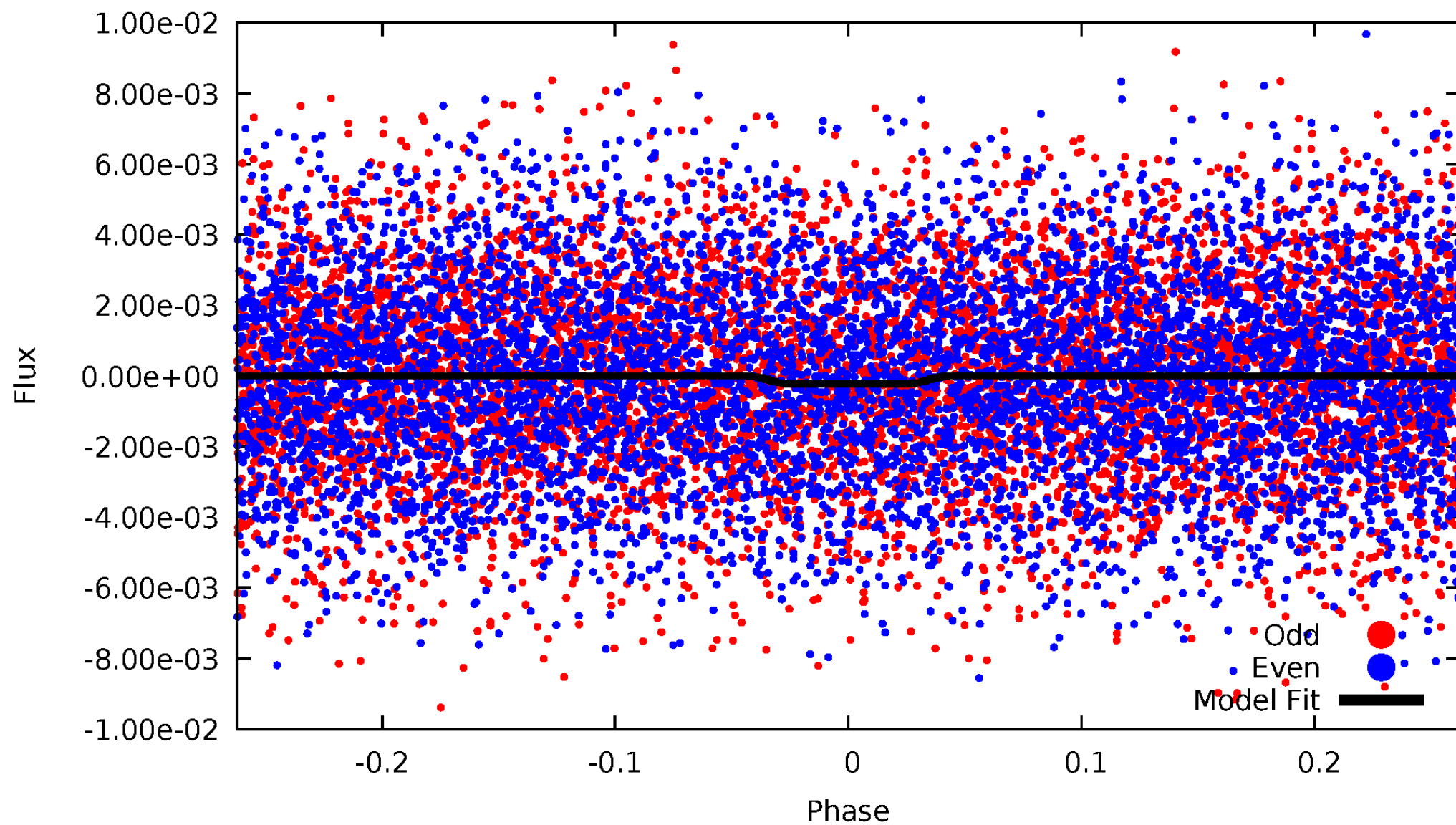
DV Odd/Even

TCE 008439566-02



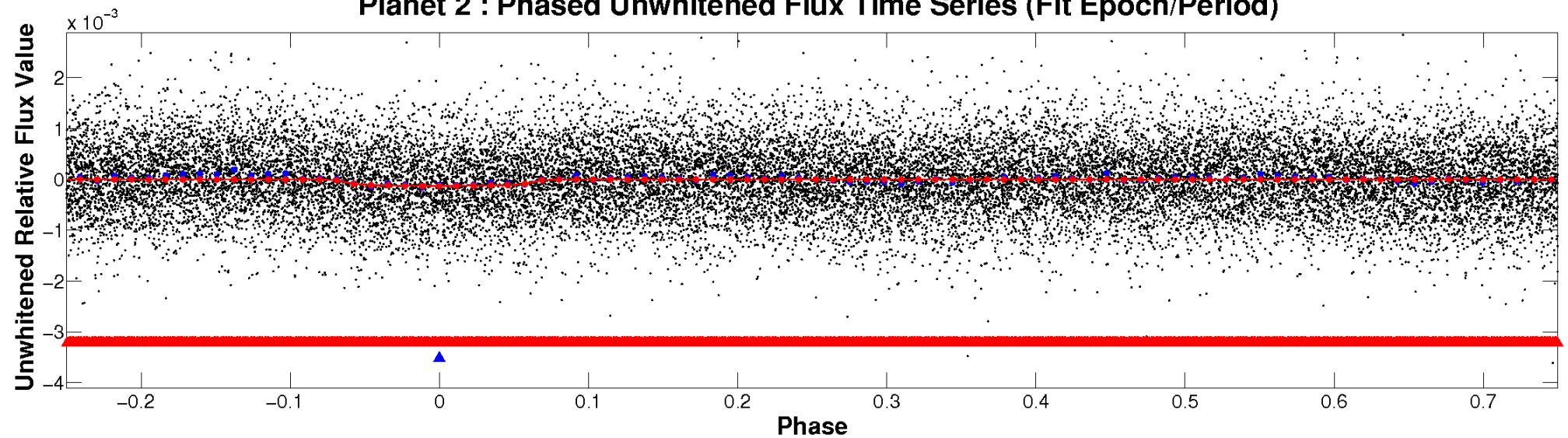
ALT Odd/Even

TCE 008439566-02

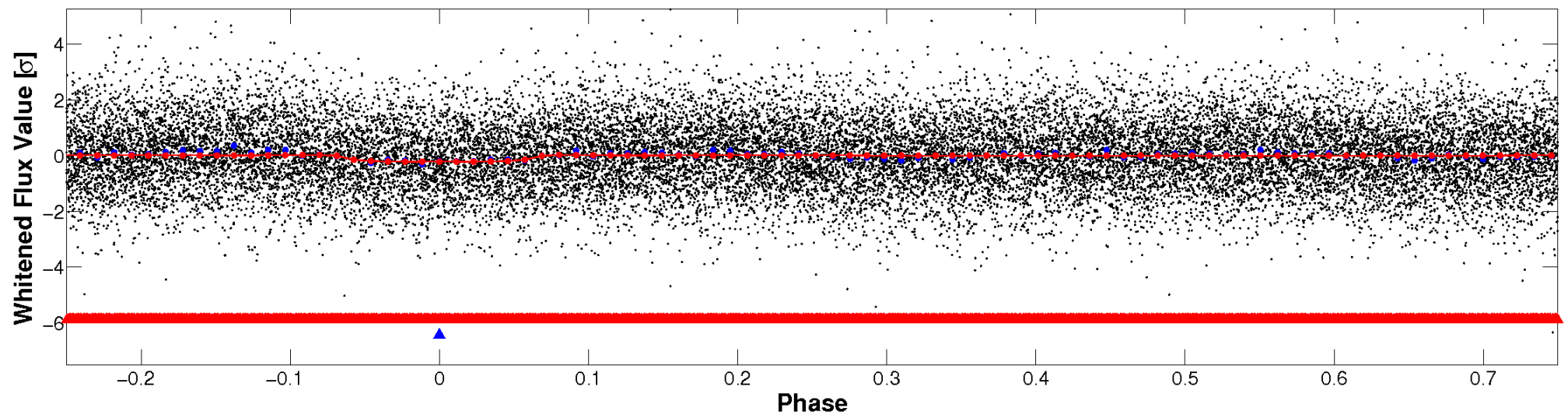


Non-Whitened Vs. Whitened Light Curve

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

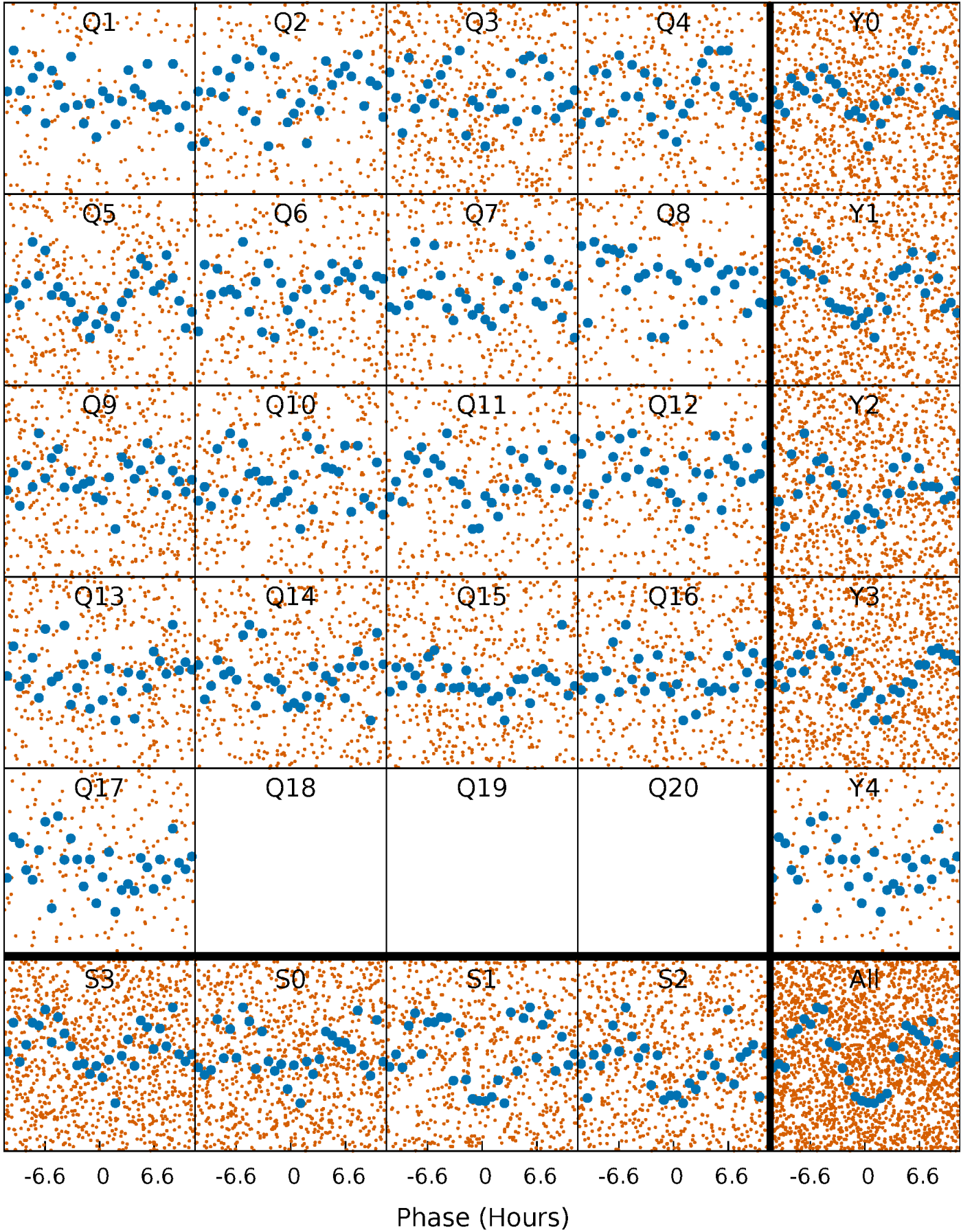


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



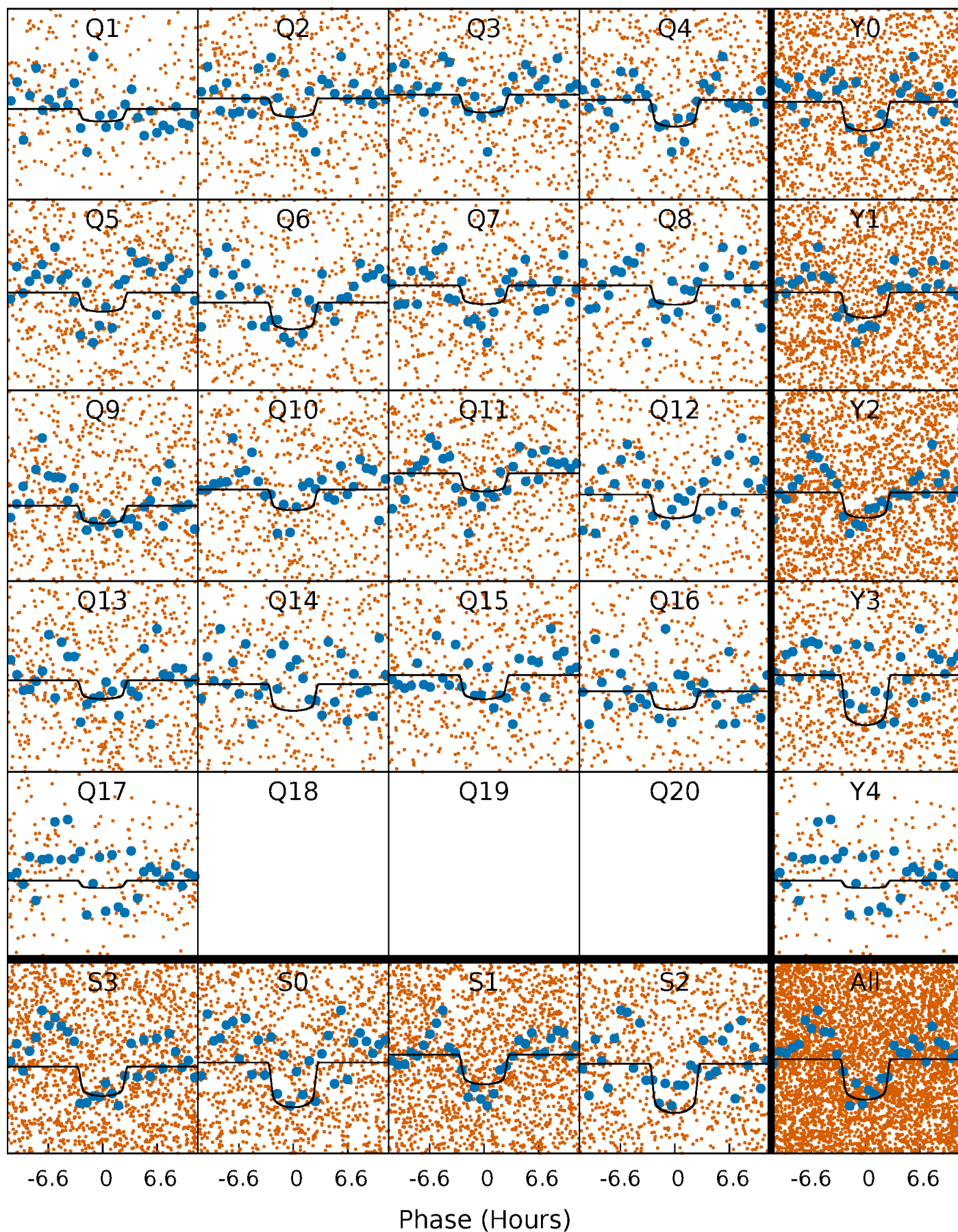
PDC Quarter-Phased Transit Curves

TCE 008439566-02 P= 1.781099 Days $T_0=132.585412$ (BKJD)



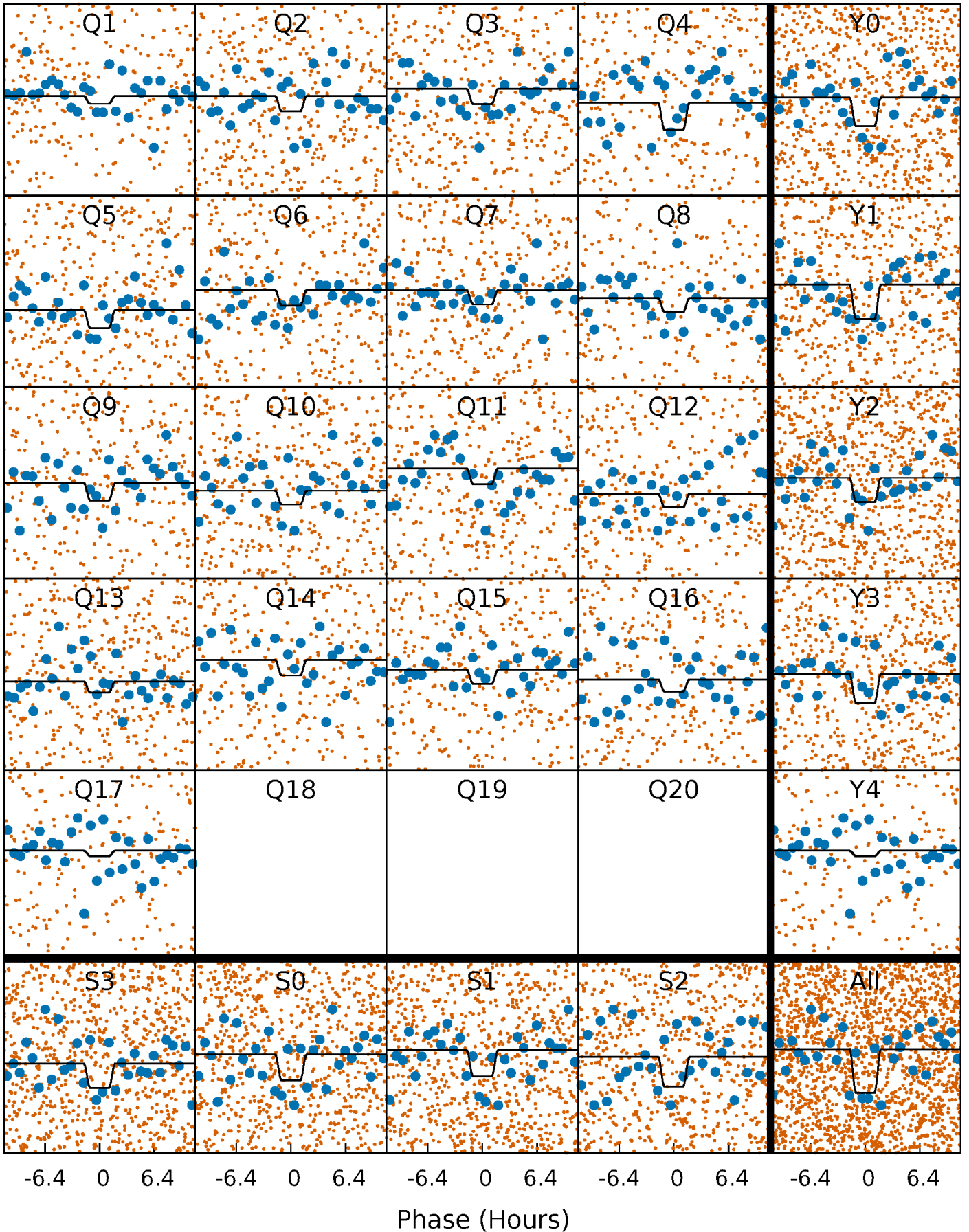
DV Quarter-Phased Transit Curves

TCE 008439566-02 P= 1.781099 Days $T_0=132.585412$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

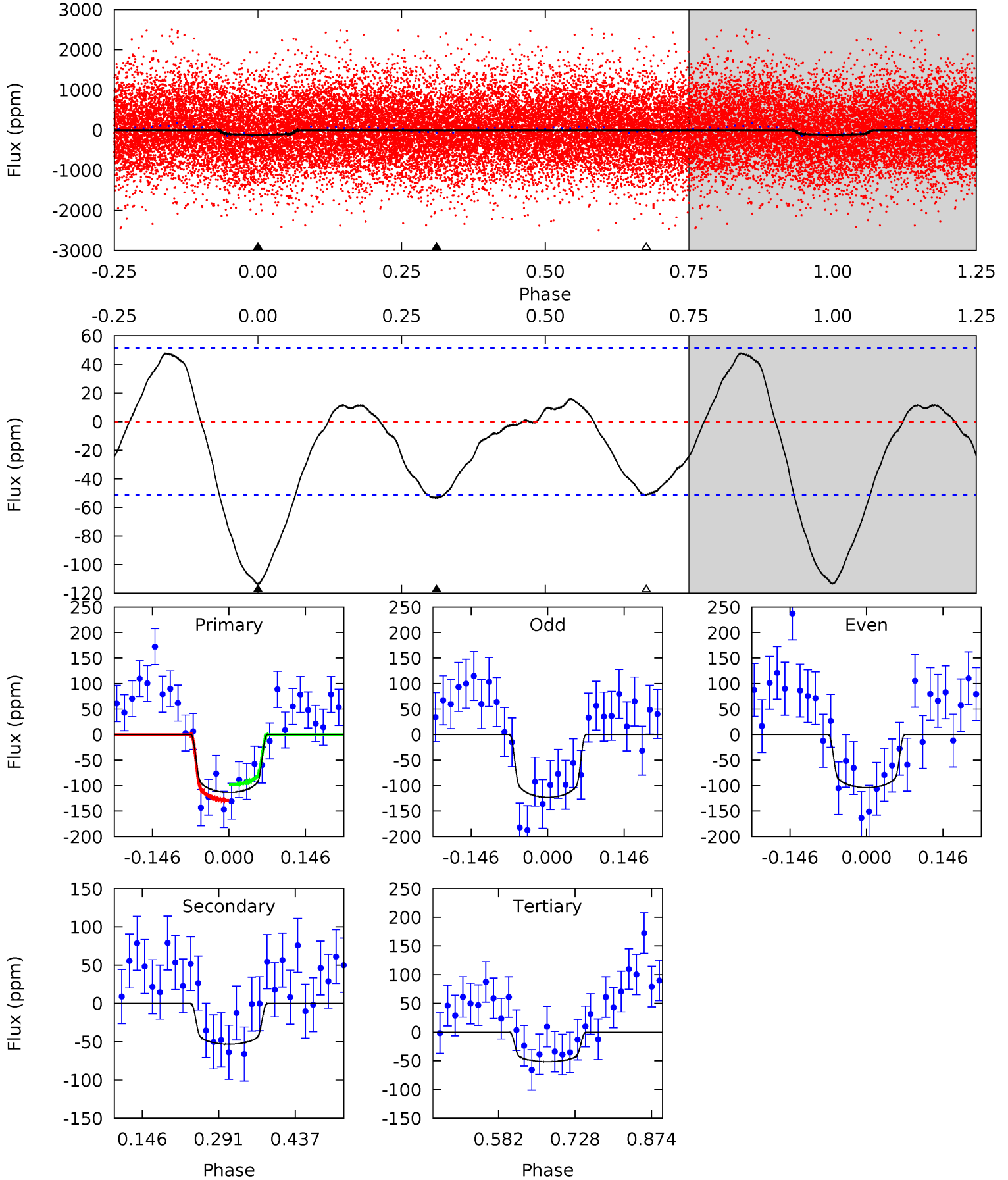
TCE 008439566-02 P= 1.780946 Days $T_0=132.615483$ (BKJD)



DV Model-Shift Uniqueness Test

008439566-02, P = 1.781099 Days, E = 130.804313 Days

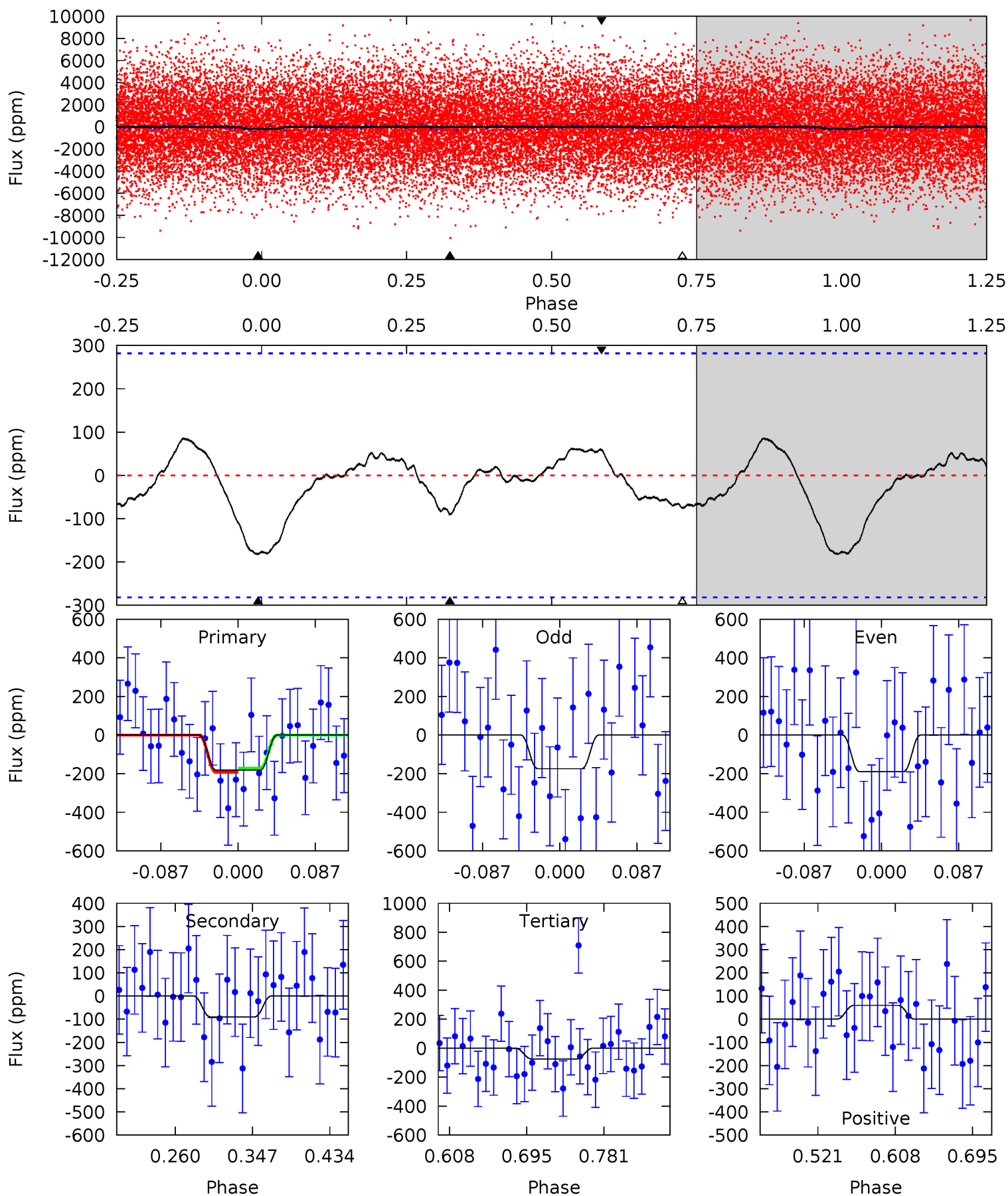
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.93	4.66	4.49	0	4.49	1.46	2.42	5.44	9.93	0.17	4.66	0.84	0.88	0.30	1.35



Alt Model-Shift Uniqueness Test

008439566-02, P = 1.780946 Days, E = 130.834537 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.96	1.47	1.22	0.97	4.59	1.71	0.72	1.74	1.99	0.25	0.50	0.12	1.07	0.32	0.17



Stellar Parameters For KIC 008439566

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8443^{+231}_{-397}	$3.757^{+0.378}_{-0.162}$	$0.070^{+0.250}_{-0.450}$	$3.388^{+1.020}_{-1.530}$	$2.393^{+0.319}_{-0.745}$	$0.087^{+0.317}_{-0.043}$
	+3%/-5%	+10%/-4%	+357%/-643%	+30%/-45%	+13%/-31%	+366%/-50%
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 008439566-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-53 ± 11	$4.00^{+1.71}_{-1.43}$	4730^{+438}_{-509}	6084^{+1514}_{-921}	$2.539^{+3.509}_{-1.288}$
Alt.	-90 ± 61	$5.10^{+1.91}_{-1.56}$	4751^{+446}_{-532}	6148^{+1553}_{-1977}	$2.410^{+3.668}_{-1.772}$

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

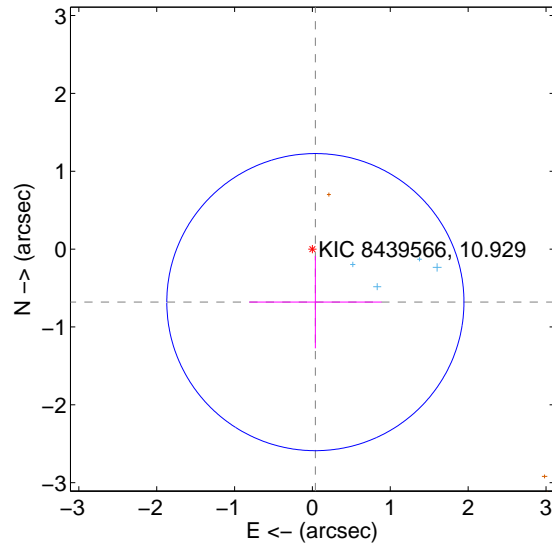
Supplemental centroid analysis for 008439566-02. **Kepler magnitude: 10.93.** Transit SNR 10.57

There are 9 quarters with good PRF difference image offsets

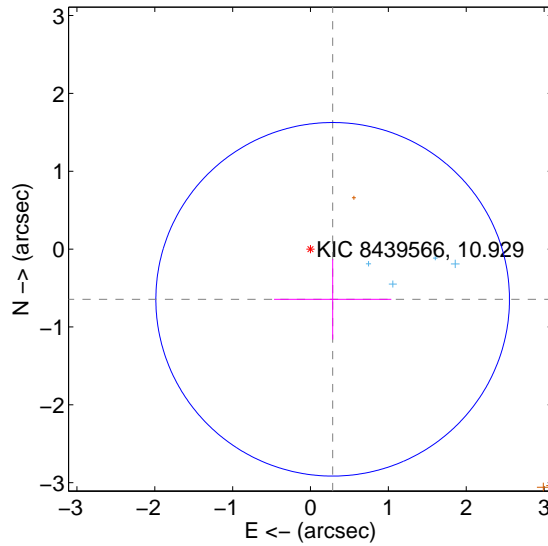
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.682 ± 0.636	1.07	-0.038 ± 0.849	-0.681 ± 0.593
PRF-fit source offset from KIC position	0.705 ± 0.757	0.93	-0.284 ± 0.753	-0.645 ± 0.516
photometric centroid source offset	0.55 ± 0.18	3.15	-0.54 ± 0.18	-0.14 ± 0.11

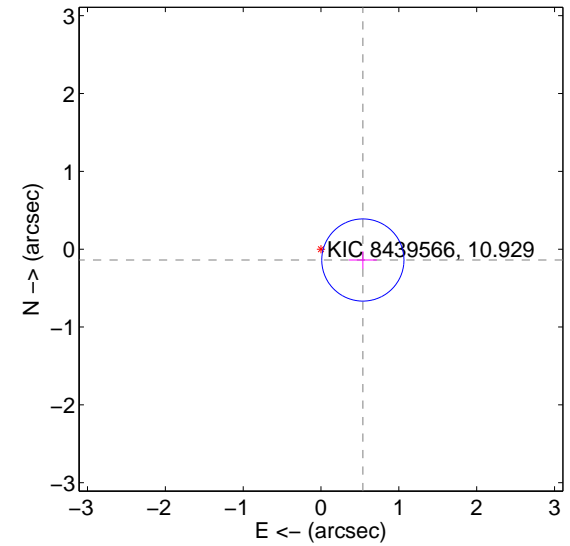
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

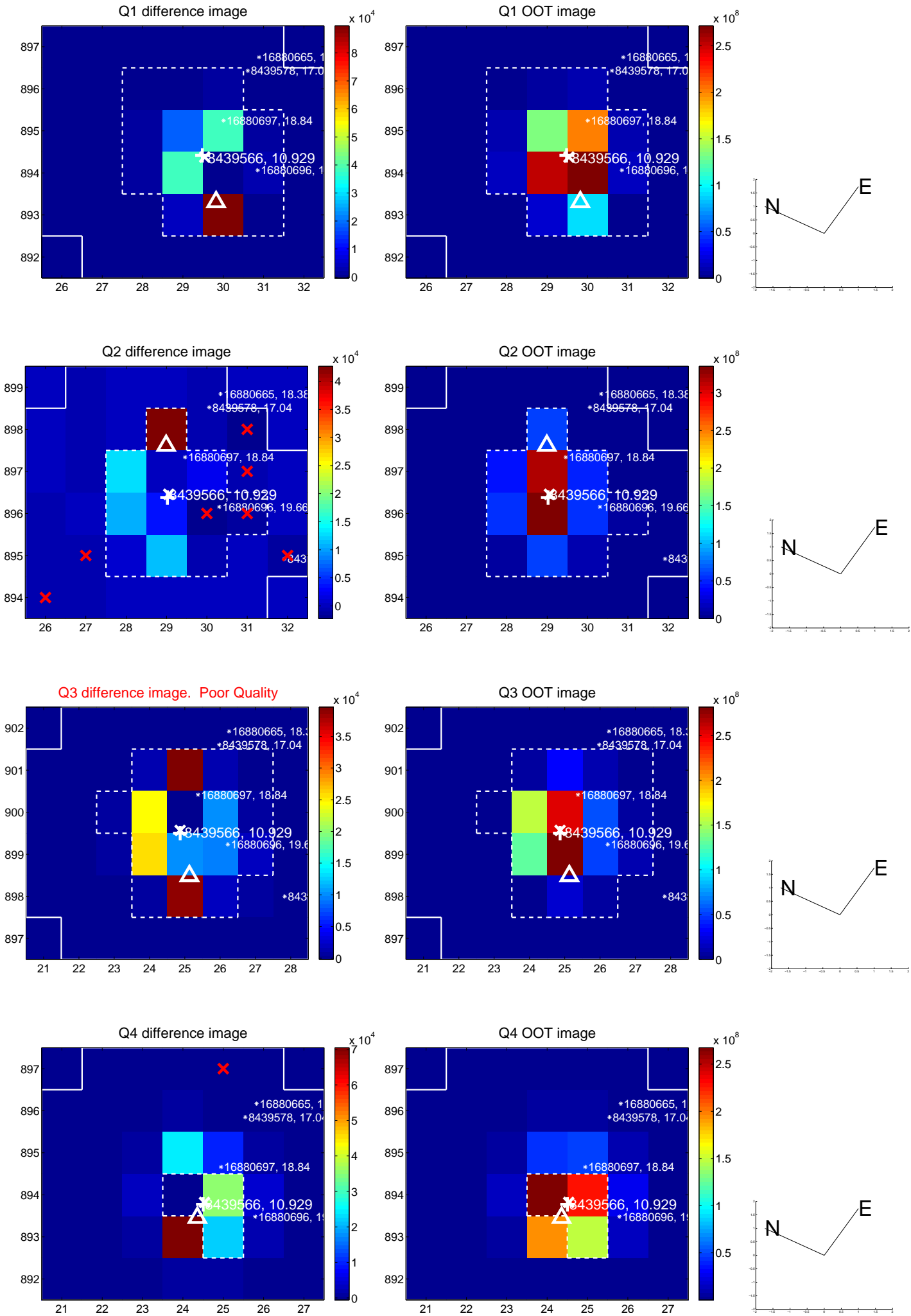


offset from photometric centroids

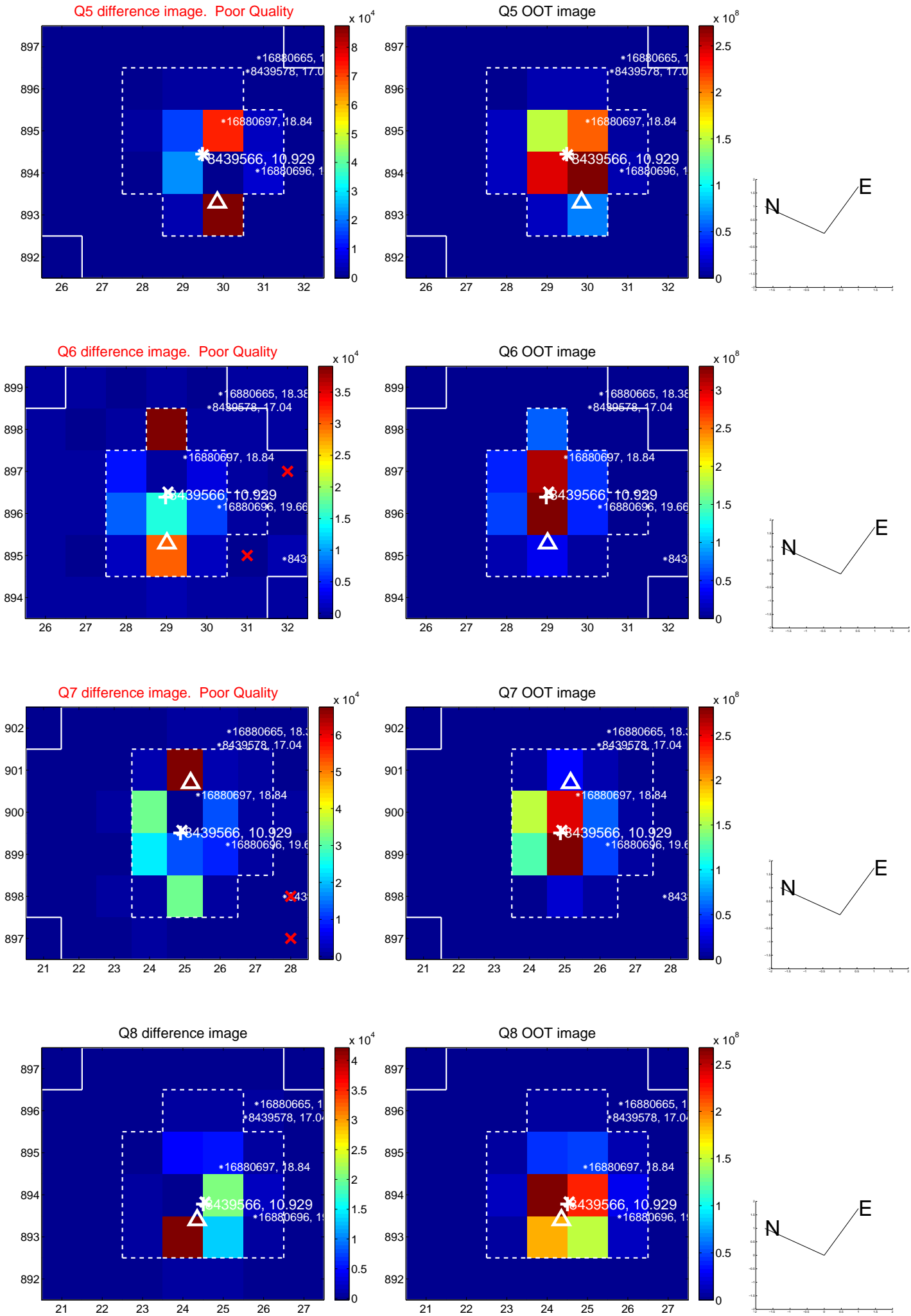


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

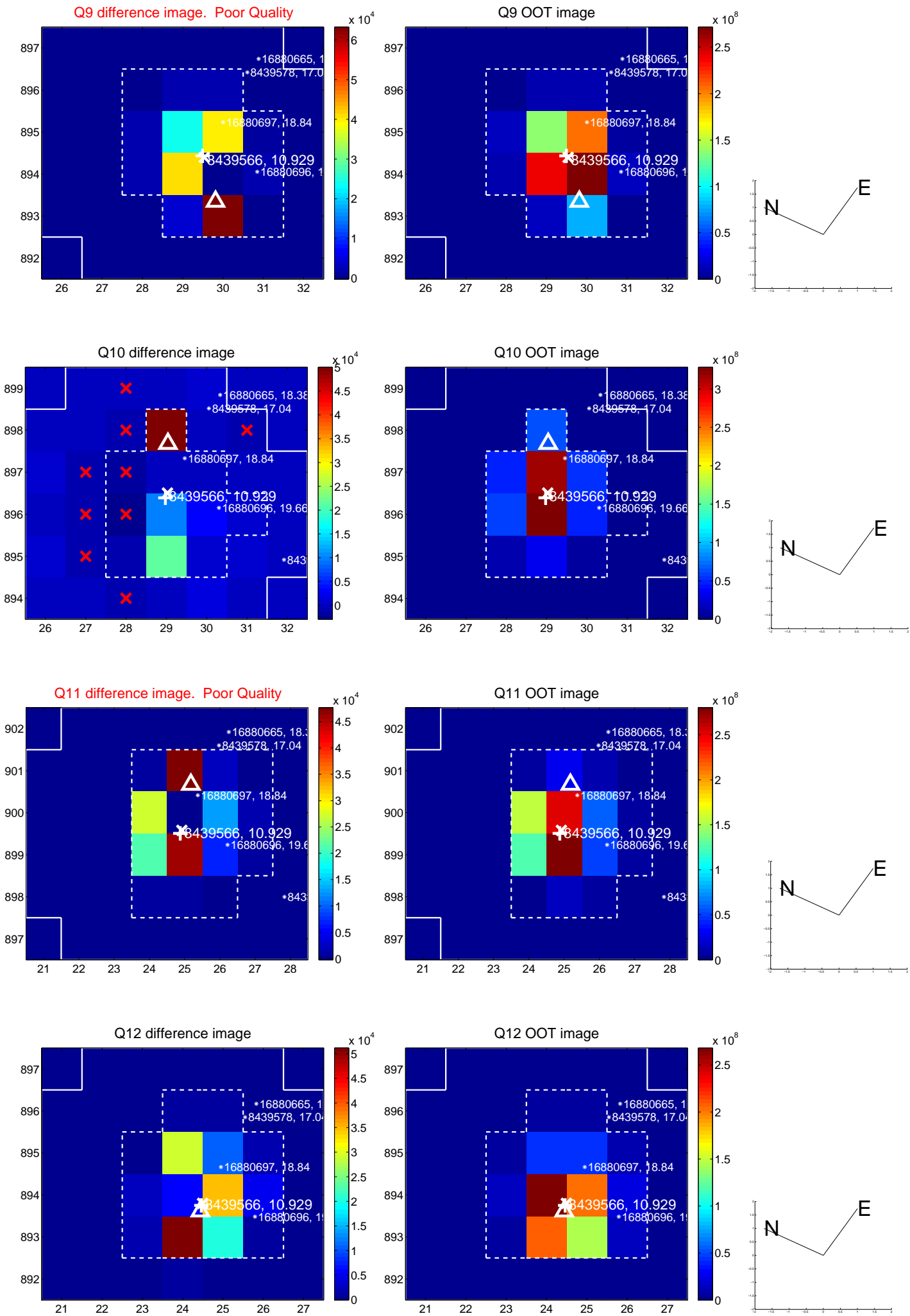
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



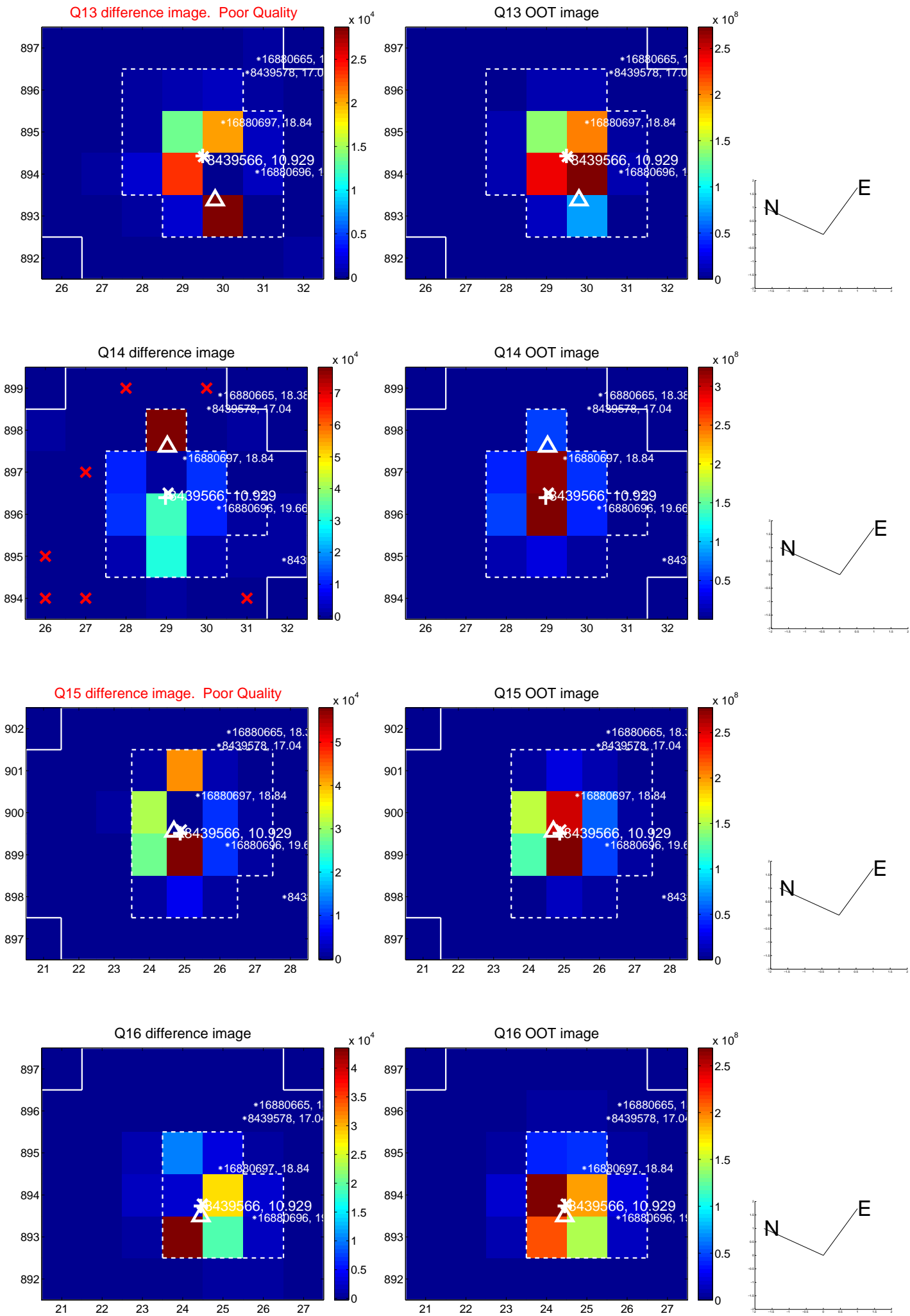
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



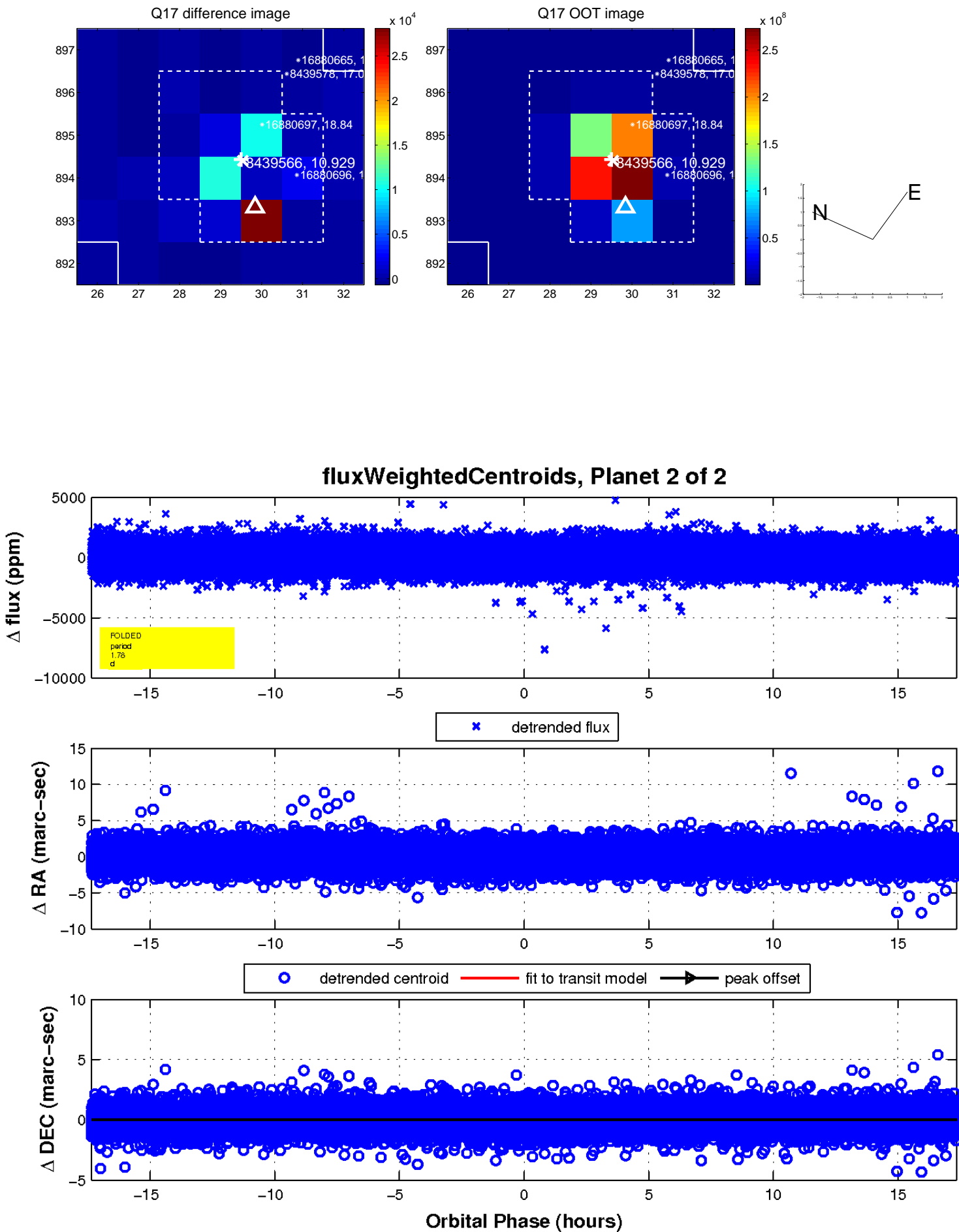
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

