

KIC 008827407

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})
008827407-01	OBS	No	6.648022	133.590317	85.8	17.975	8.0	9.0	2.16	9677	2.28	4352.11
008827407-02	OBS	No	4.186230	132.429717	112.4	50.235	7.4	14.7	2.16	9677	2.80	8063.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008827407-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008827407-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

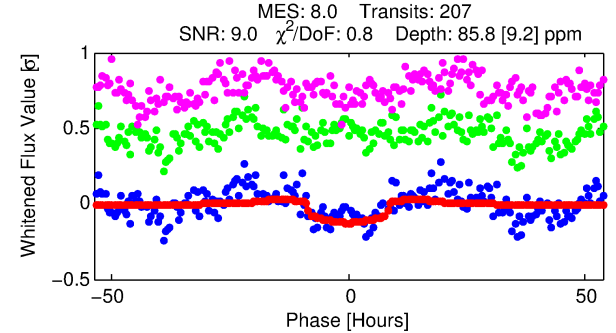
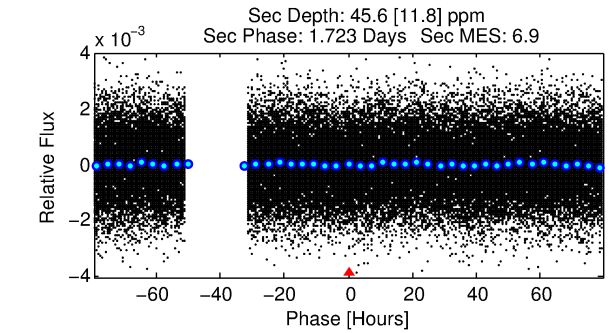
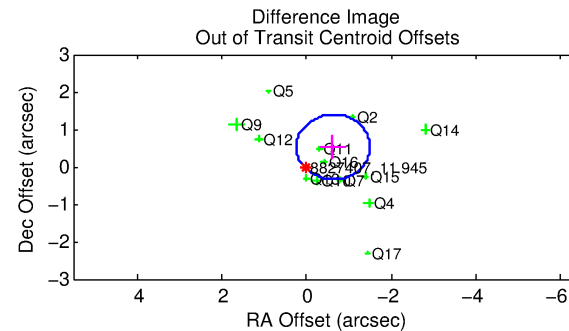
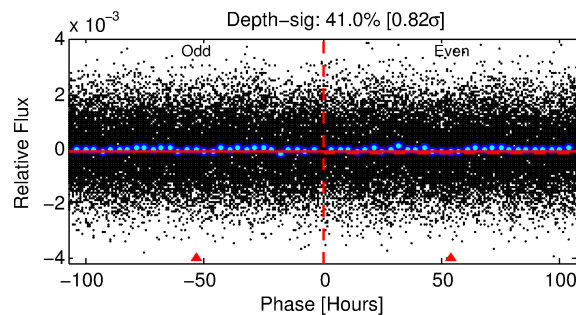
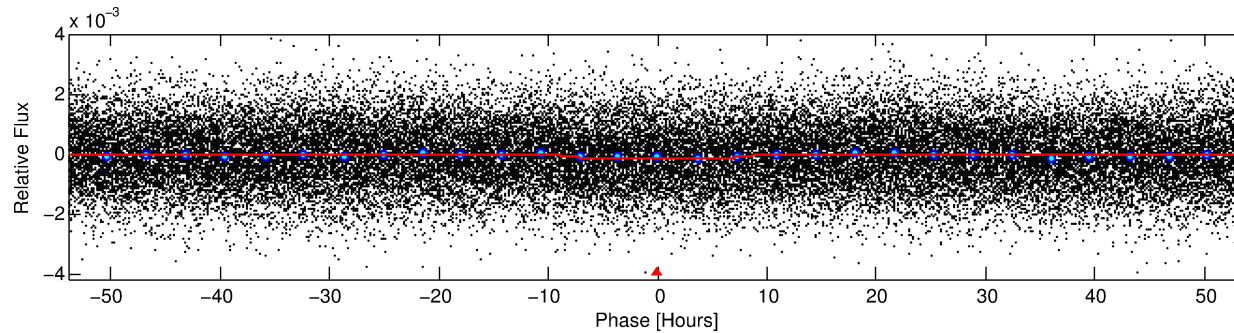
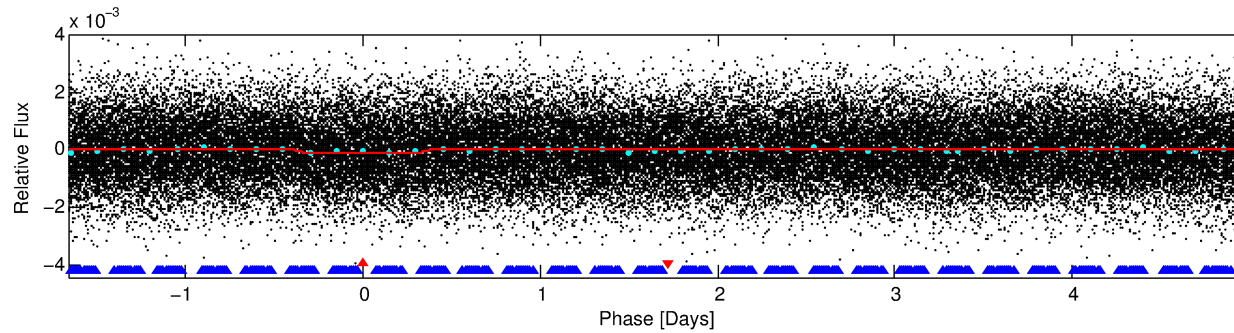
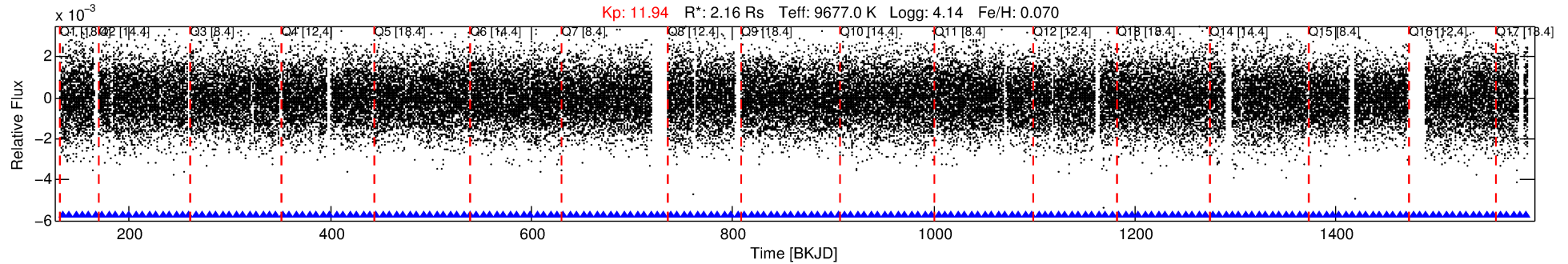
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008827407-01

No Significant Match Found

DV One-Page Summary

KIC: 8827407 Candidate: 1 of 2 Period: 6.648 d



DV Fit Results:

Period = 6.64802 [0.00024] d
Epoch = 133.5903 [0.0281] BKJD
 R_p/R^* = 0.0097 [0.0017]
 a/R^* = 1.65 [1.33]
 b = 0.89 [0.31]
 S_{eff} = 4352.11 [2101.73]
 T_{eq} = 2071 [250] K
 R_p = 2.28 [1.07] R_{e}
 a = 0.0916 [0.0309] AU
 A_g = 40.57 [25.54] [1.55 σ]
 T_{eff} = 8082 [945] K [6.15 σ]

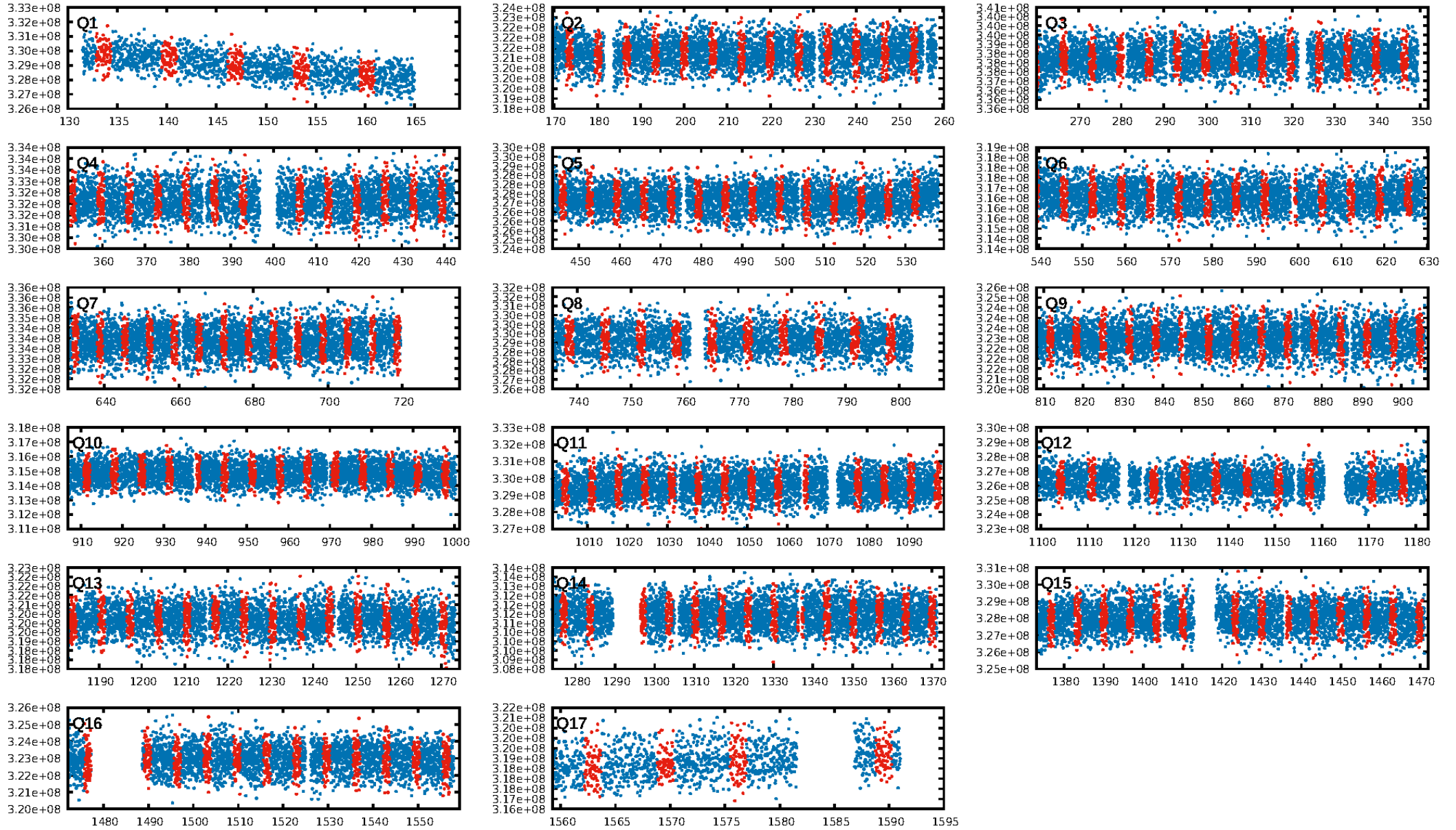
DV Diagnostic Results:

ShortPeriod-sig: 73.2% [1.11 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [198/198]
GhostDiagnostic-chr: 2.127
Centroid-sig: 0.0%
Centroid-so: 0.764 arcsec [2.28 σ]
OotOffset-rm: 0.821 arcsec [2.84 σ]
KicOffset-rm: 0.745 arcsec [2.55 σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.92 [12/13]
DiffImageOverlap-fno: 0.00 [0/17]

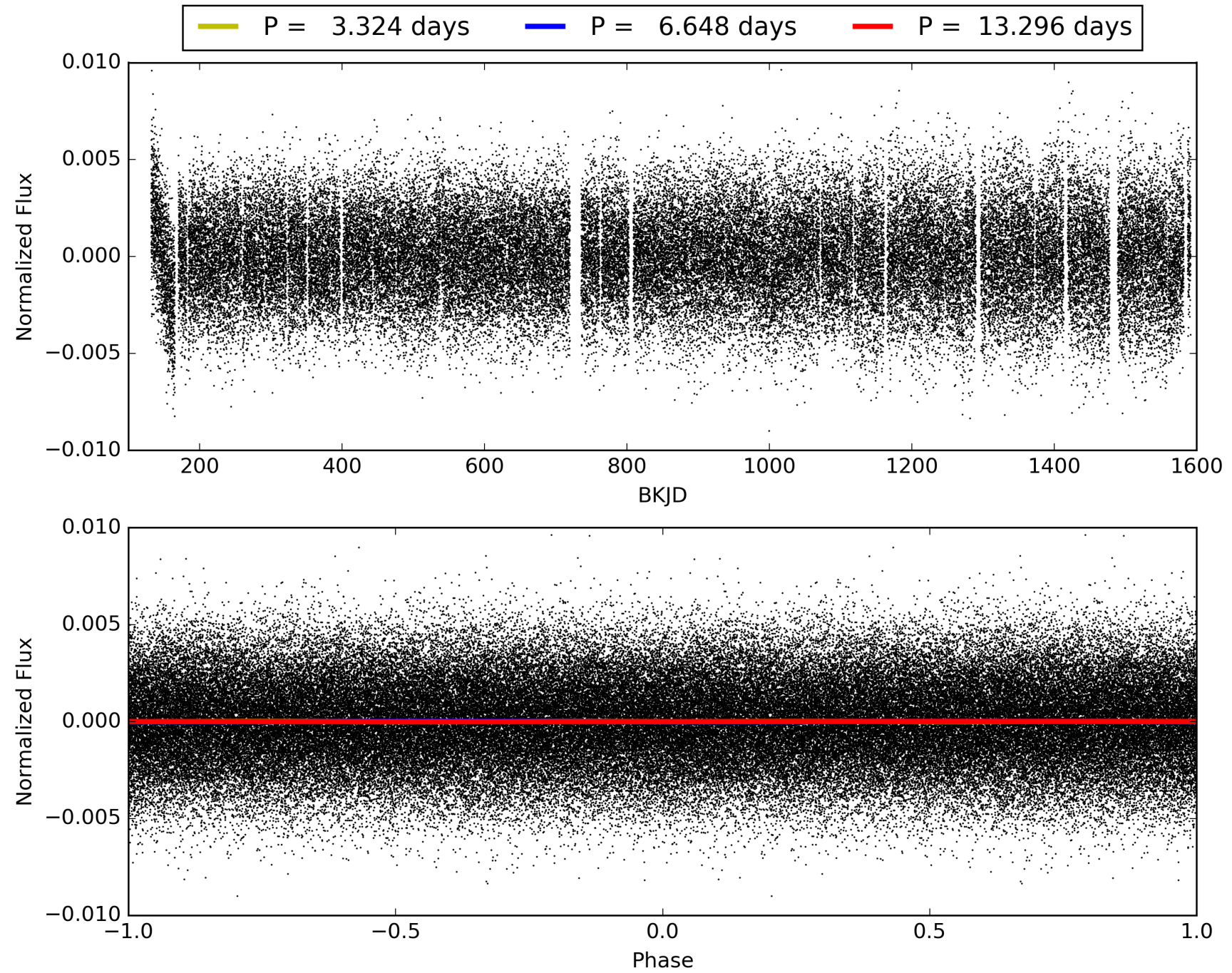
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 16:15:23 Z

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

TCE 008827407-01, PDC Light Curves

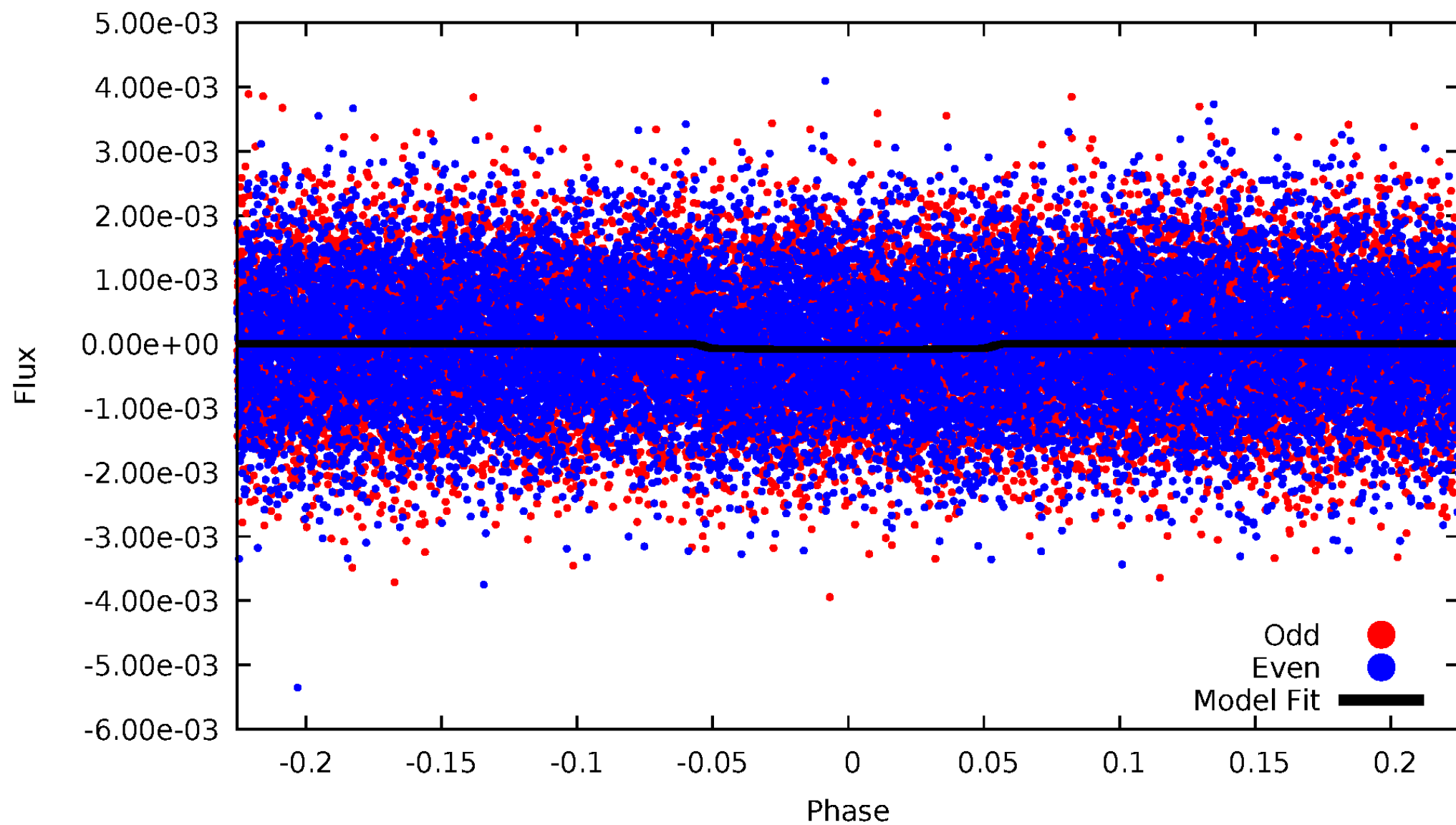


TCE 008827407-01



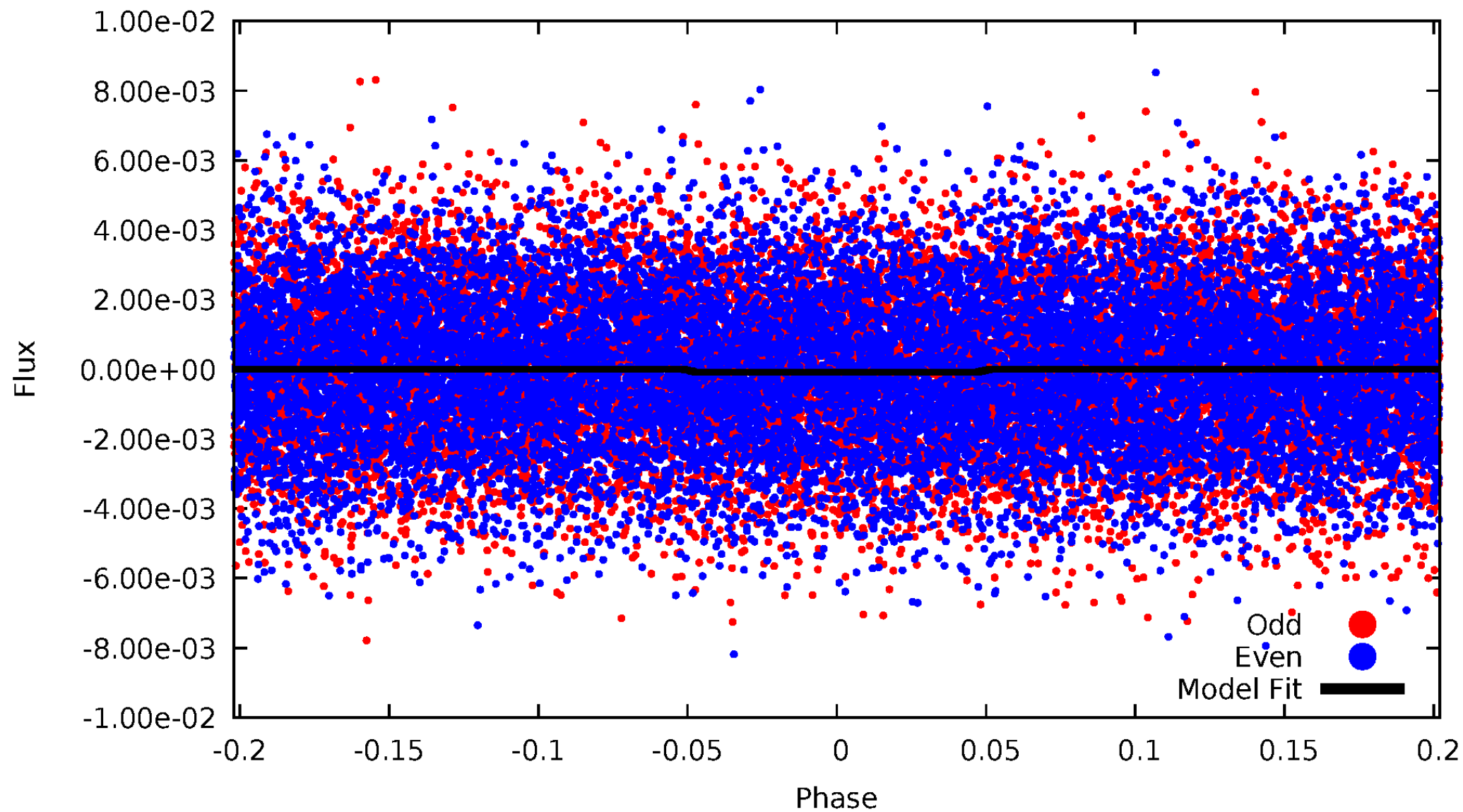
DV Odd/Even

TCE 008827407-01

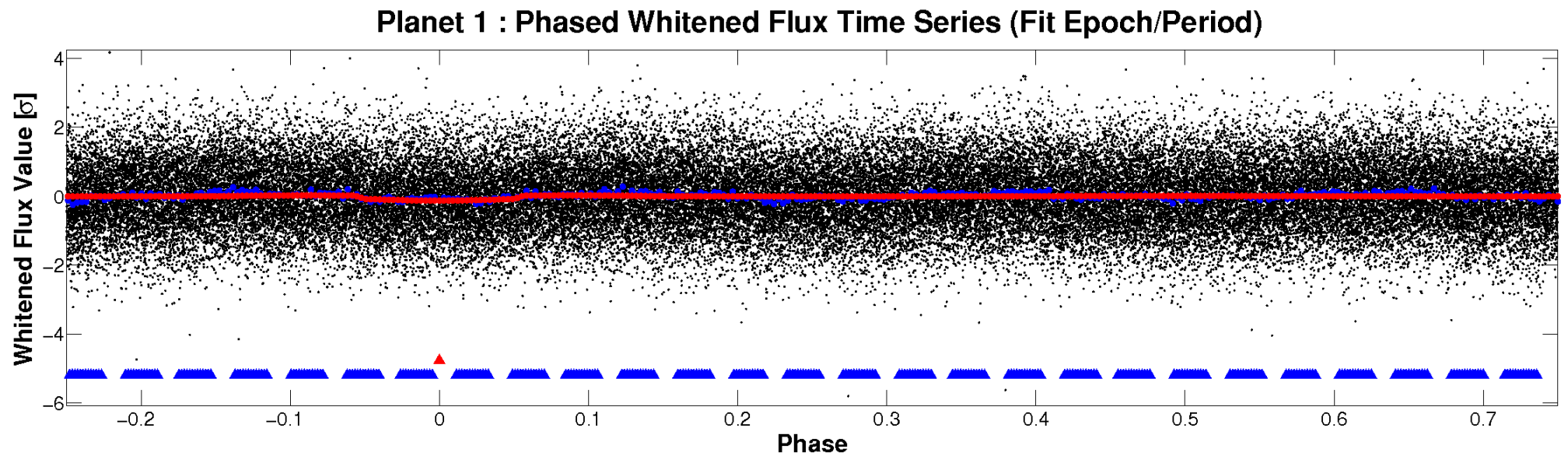
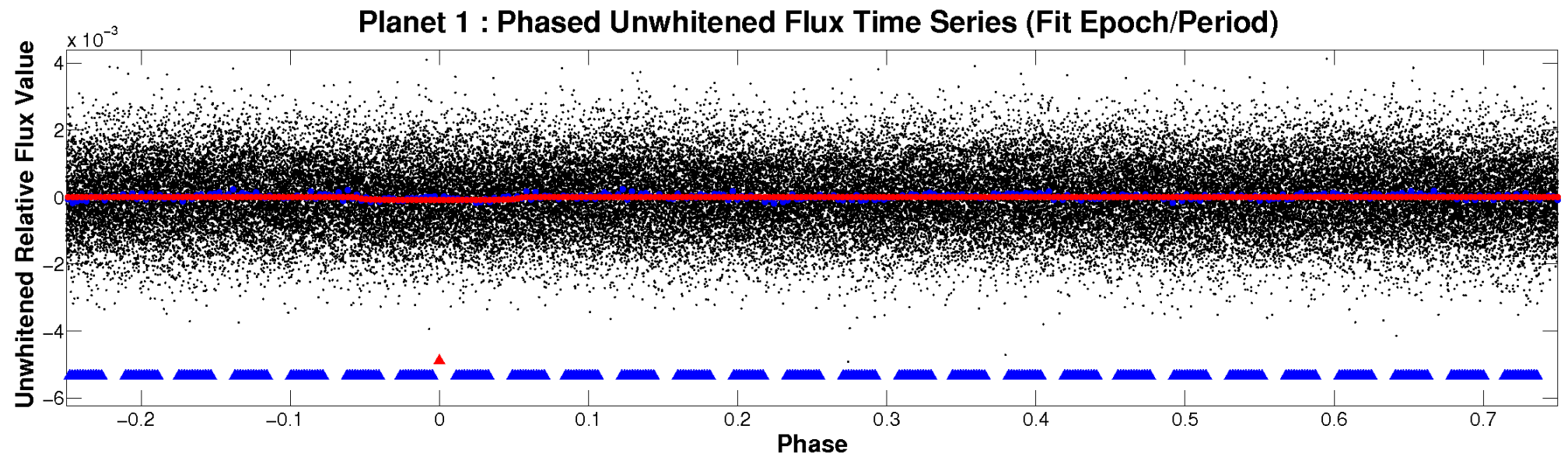


ALT Odd/Even

TCE 008827407-01

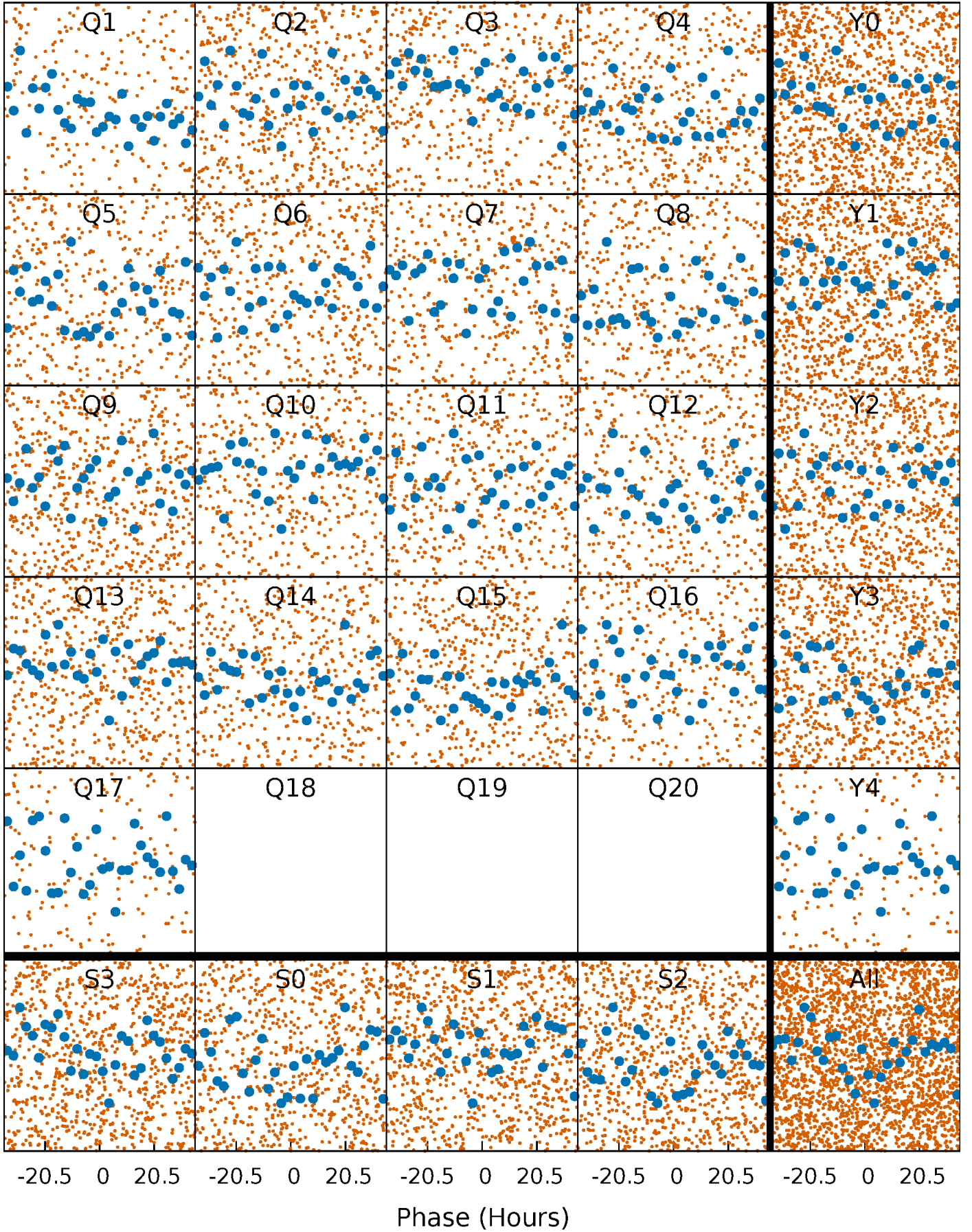


Non-Whitened Vs. Whitened Light Curve



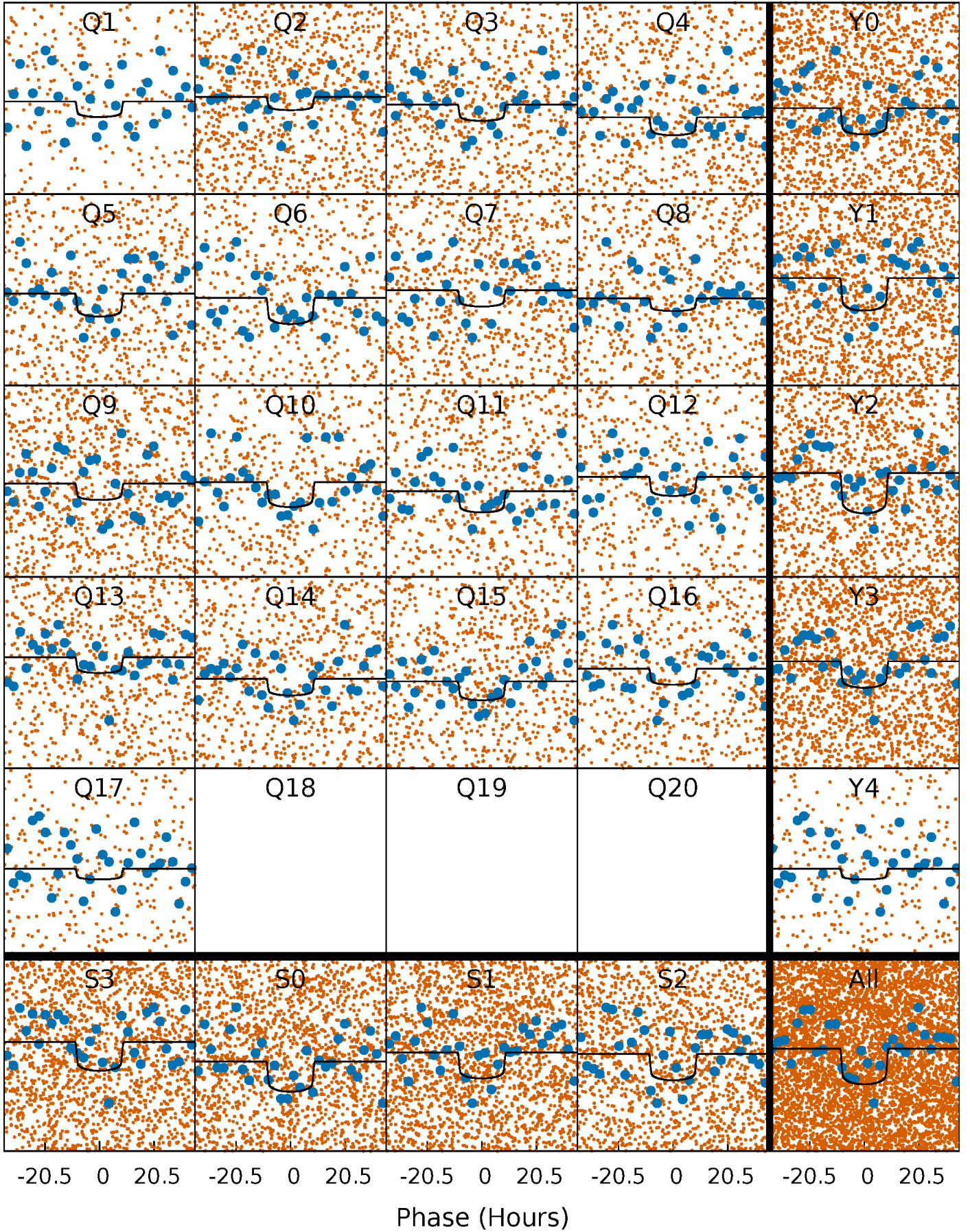
PDC Quarter-Phased Transit Curves

TCE 008827407-01 P= 6.648022 Days $T_0=133.590317$ (BKJD)



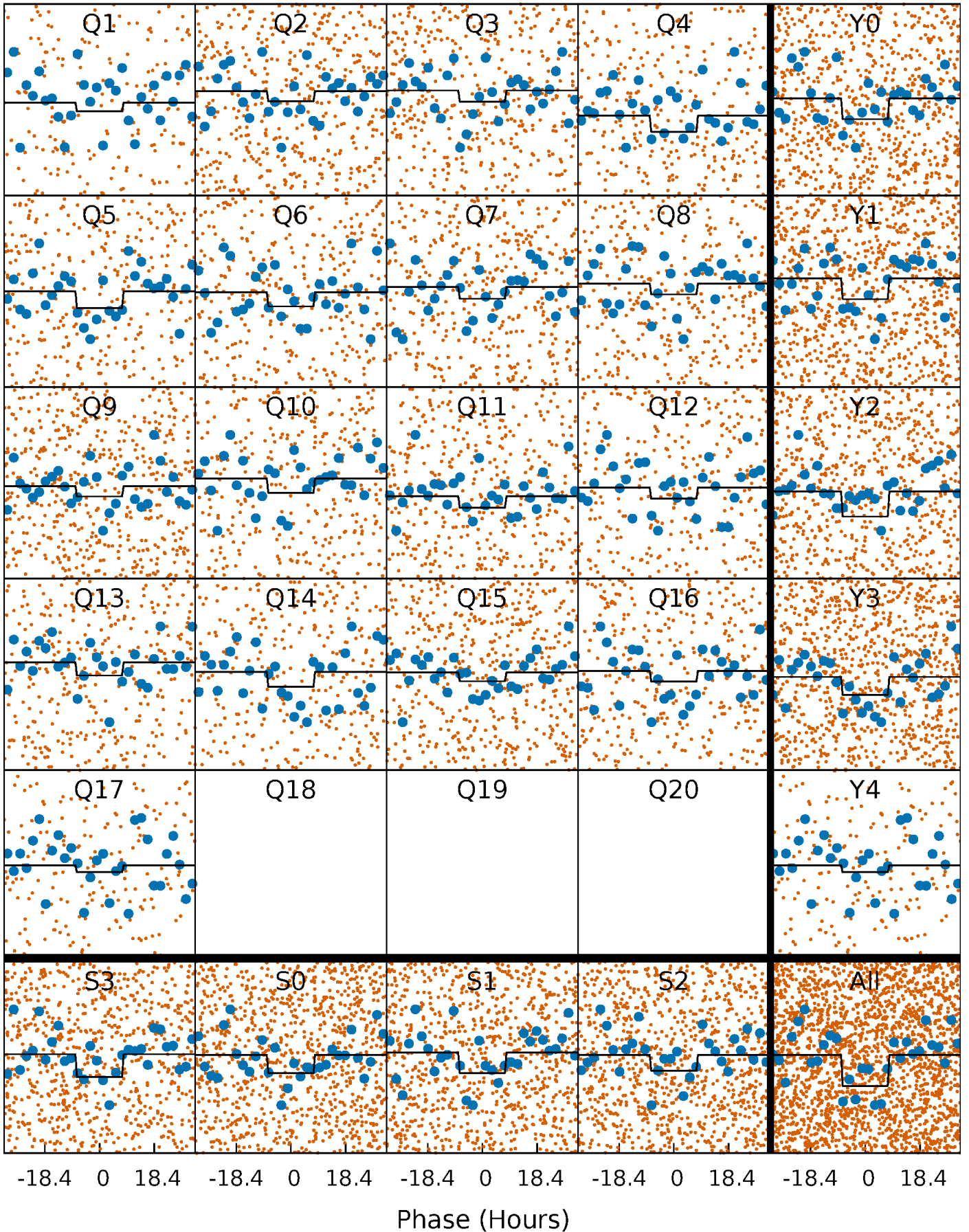
DV Quarter-Phased Transit Curves

TCE 008827407-01 P= 6.648022 Days $T_0=133.590317$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

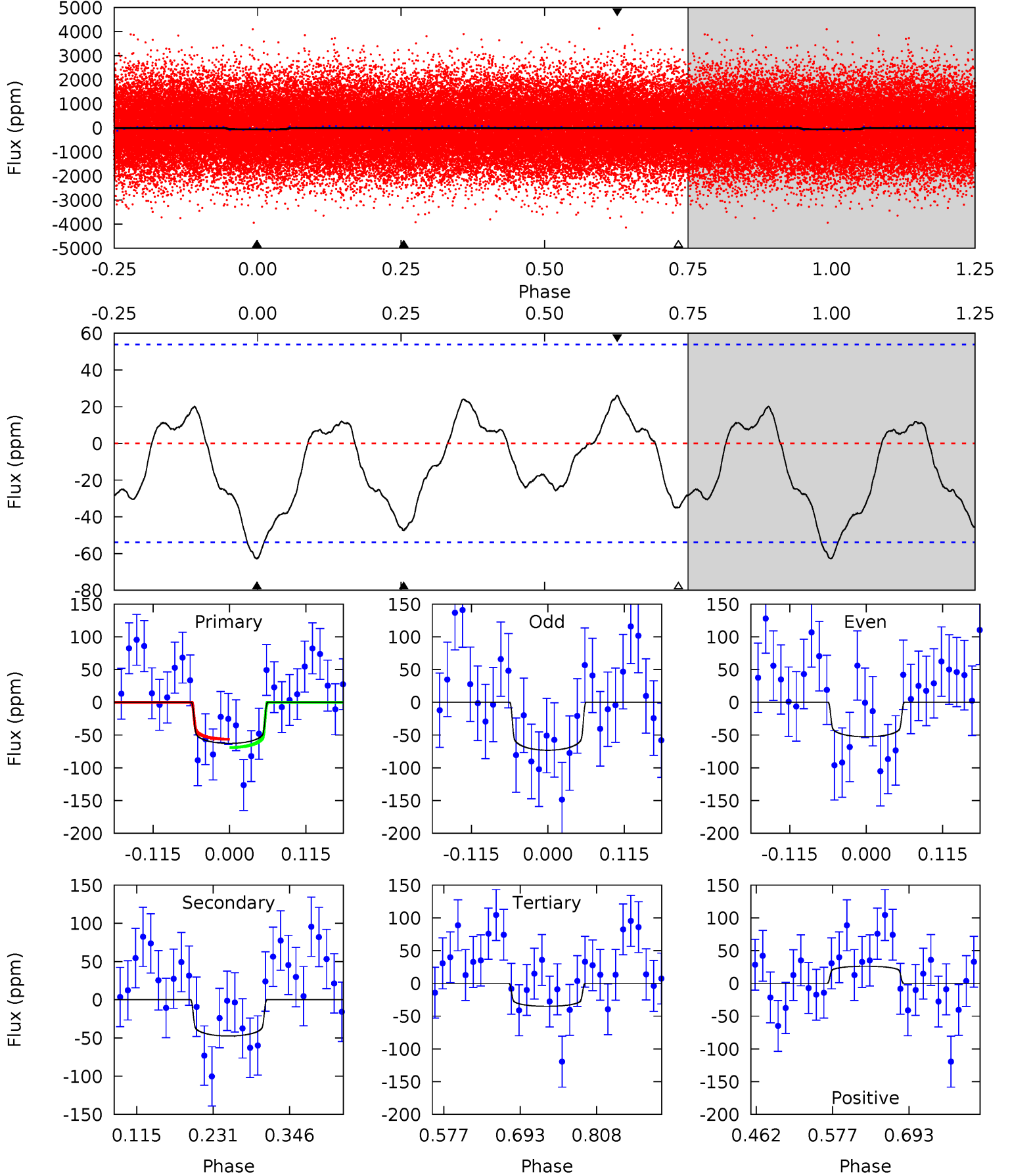
TCE 008827407-01 P= 6.648094 Days $T_0=133.578341$ (BKJD)



DV Model-Shift Uniqueness Test

008827407-01, P = 6.648022 Days, E = 126.942295 Days

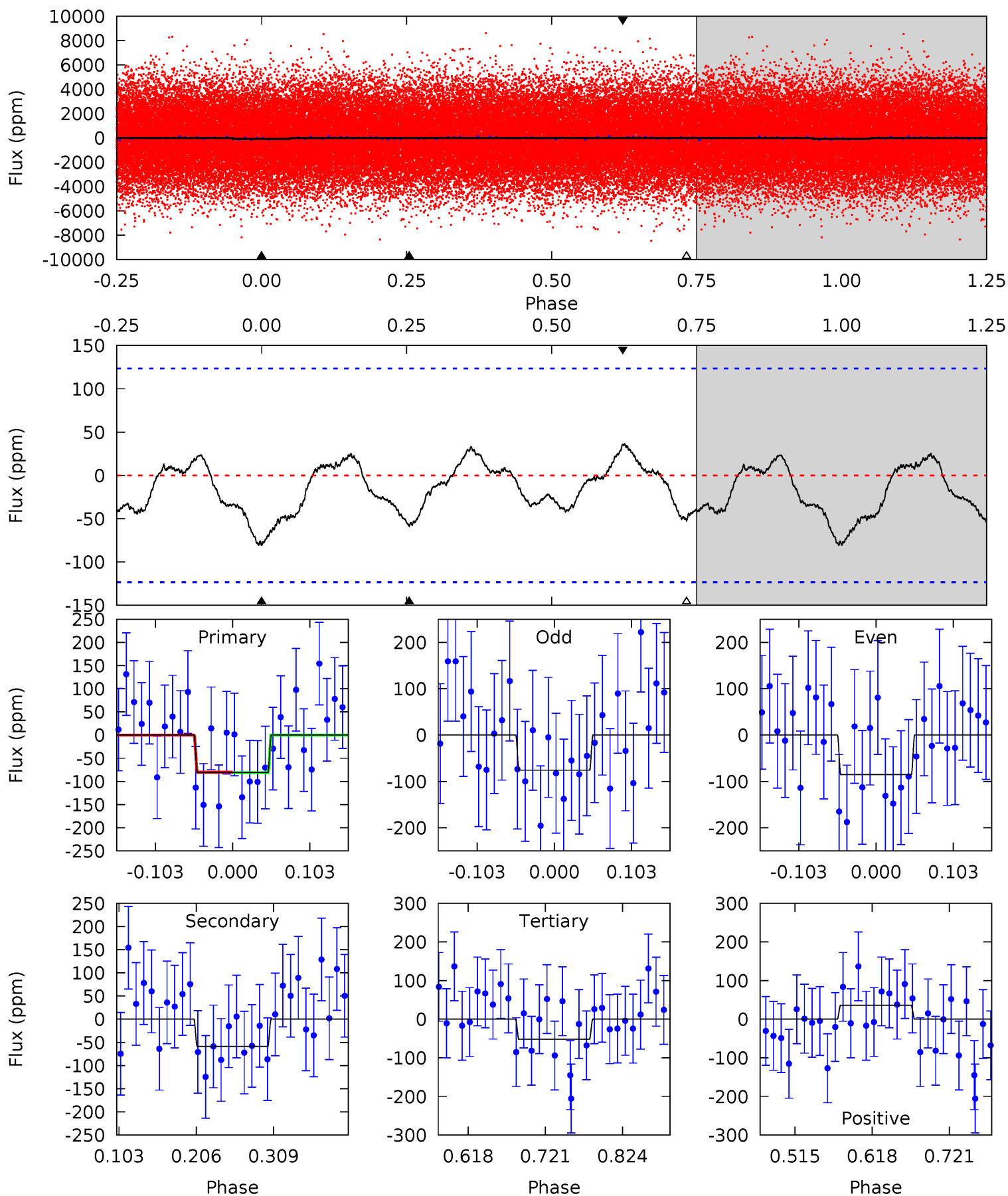
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.28	3.99	2.95	2.20	4.53	1.57	1.41	2.33	3.08	1.04	1.79	0.87	0.95	0.29	0.54



Alt Model-Shift Uniqueness Test

008827407-01, P = 6.648094 Days, E = 126.930247 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.98	2.16	1.93	1.33	4.56	1.63	0.86	1.05	1.65	0.24	0.83	0.17	0.87	0.31	0.01



Stellar Parameters For KIC 008827407

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	9677^{+270}_{-405}	$4.136^{+0.122}_{-0.227}$	$0.070^{+0.150}_{-0.550}$	$2.156^{+0.936}_{-0.504}$	$2.320^{+0.428}_{-0.571}$	$0.326^{+0.242}_{-0.181}$
	+3%/-4%	+3%/-5%	+214%/-786%	+43%/-23%	+18%/-25%	+74%/-56%
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 008827407-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-47 ± 12	$2.31^{+0.70}_{-0.56}$	2941^{+281}_{-208}	7745^{+1214}_{-1013}	39^{+30}_{-18}
Alt.	-59 ± 27	$2.10^{+0.64}_{-0.53}$	2926^{+257}_{-214}	8627^{+2017}_{-1626}	58^{+55}_{-33}

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 $A_{obs} \gg 1.0$

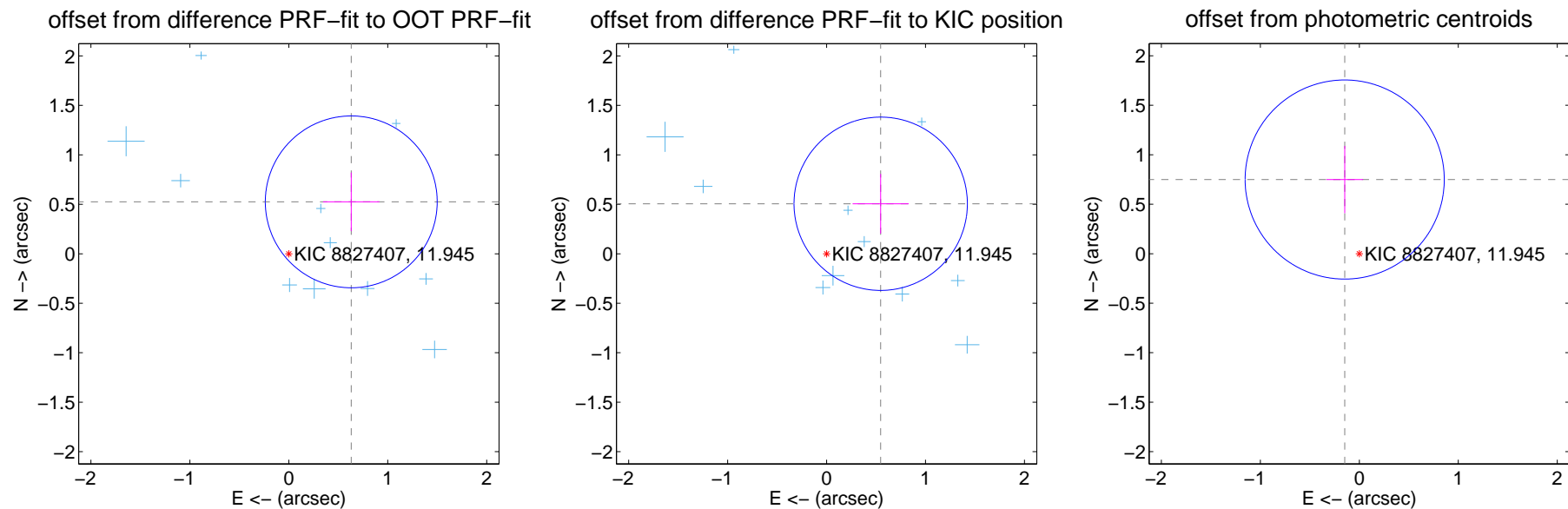
DV Centroid Data

Supplemental centroid analysis for 008827407-01. **Kepler magnitude: 11.95.** Transit SNR 8.99

There are 12 quarters with good PRF difference image offsets

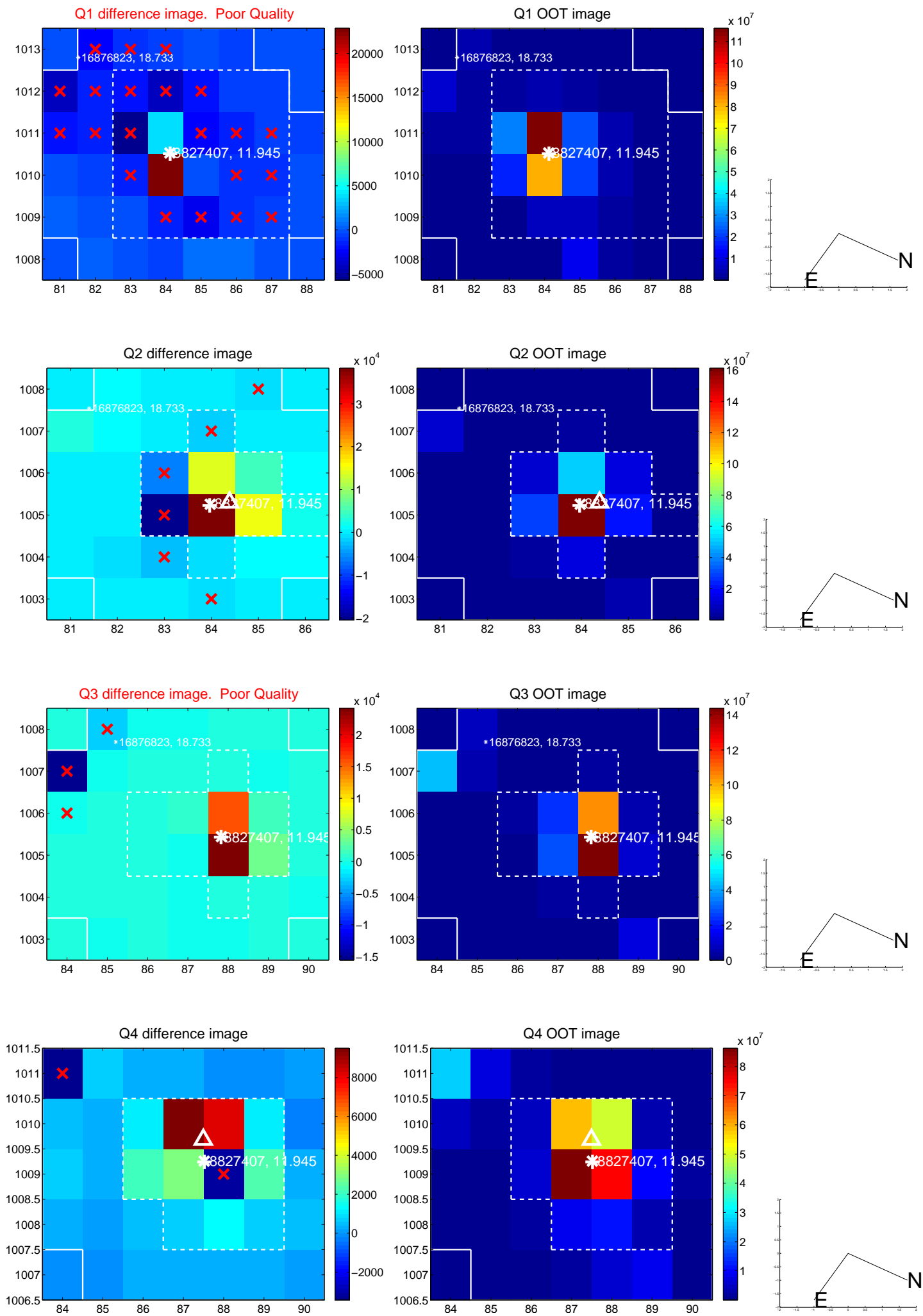
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.821 ± 0.289	2.84	-0.631 ± 0.285	0.525 ± 0.296
PRF-fit source offset from KIC position	0.745 ± 0.292	2.55	-0.547 ± 0.284	0.506 ± 0.301
photometric centroid source offset	0.76 ± 0.34	2.28	0.15 ± 0.18	0.75 ± 0.34

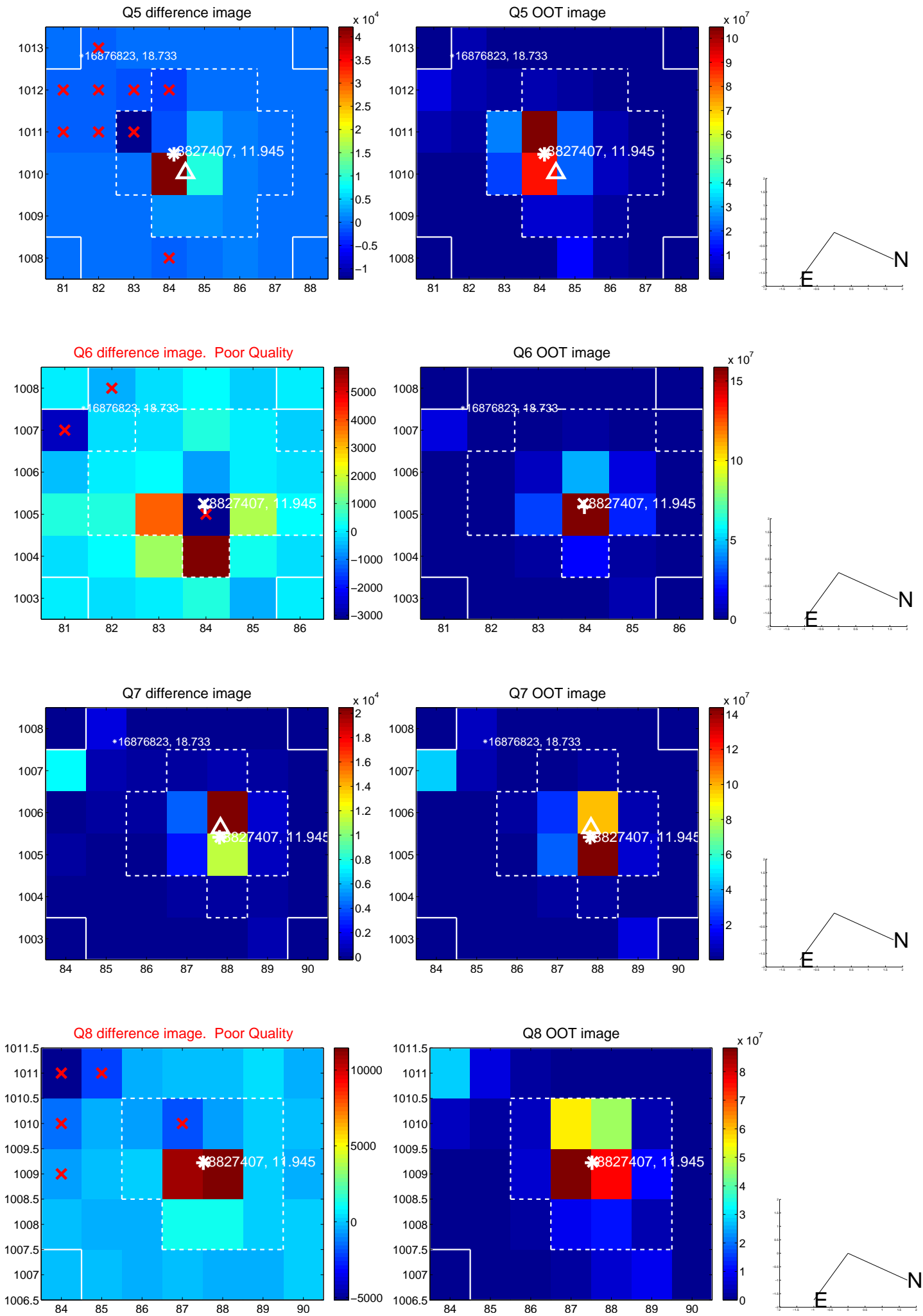


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

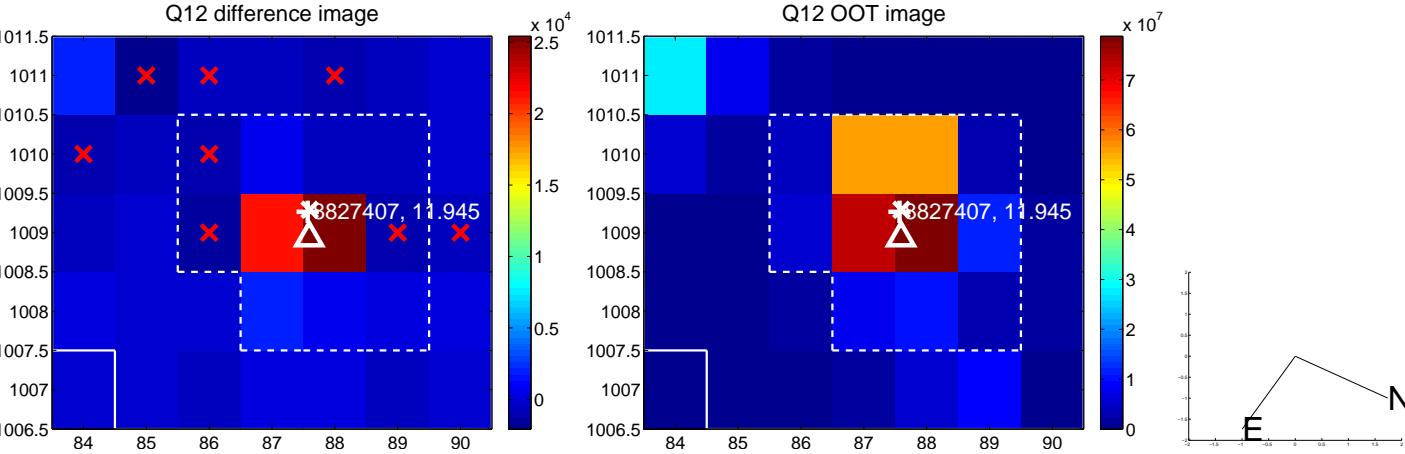
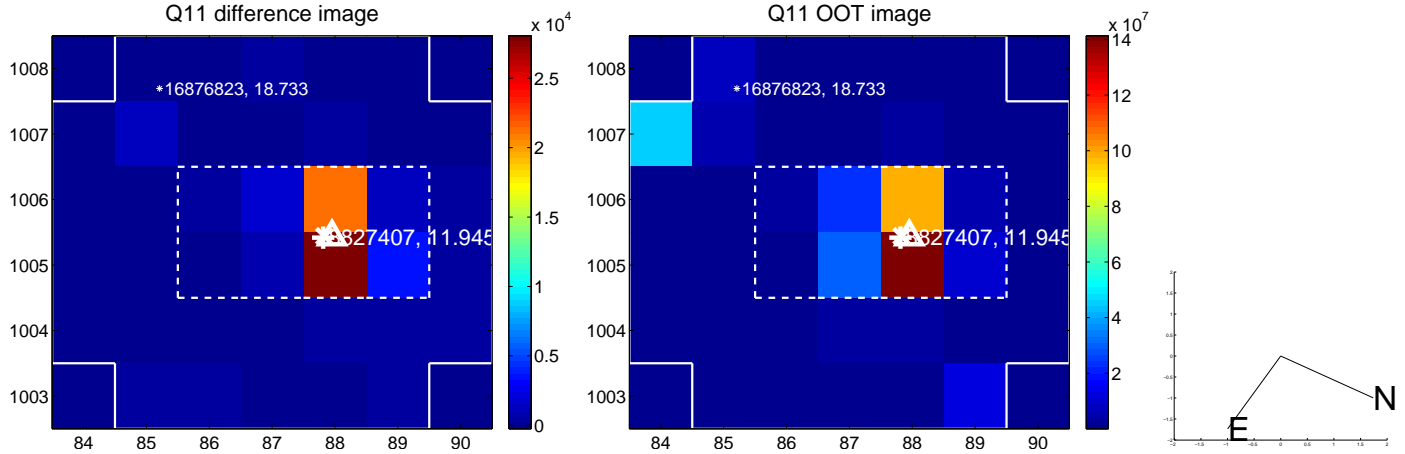
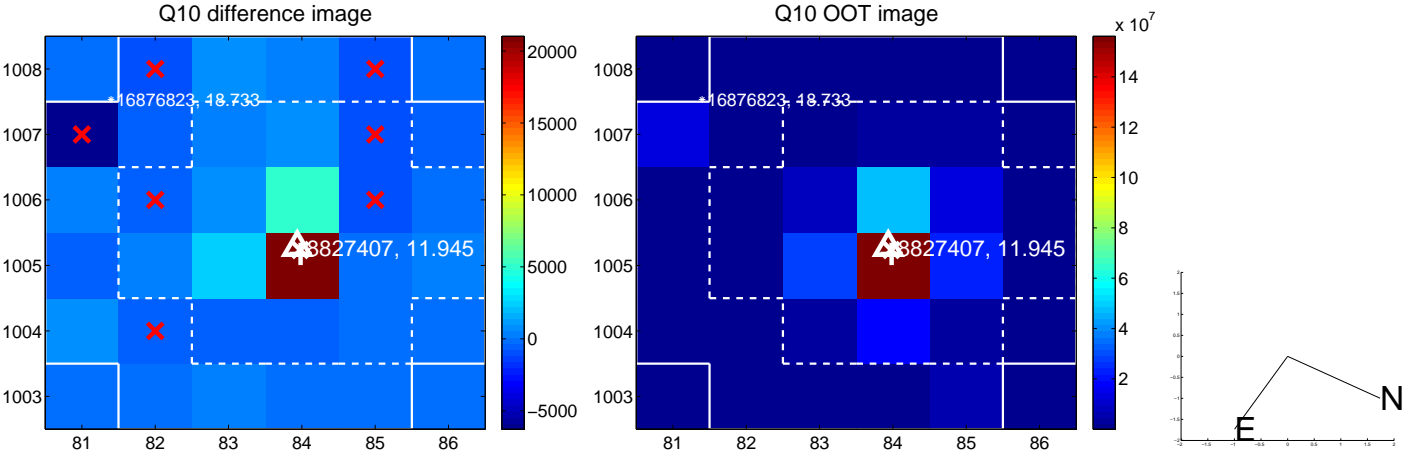
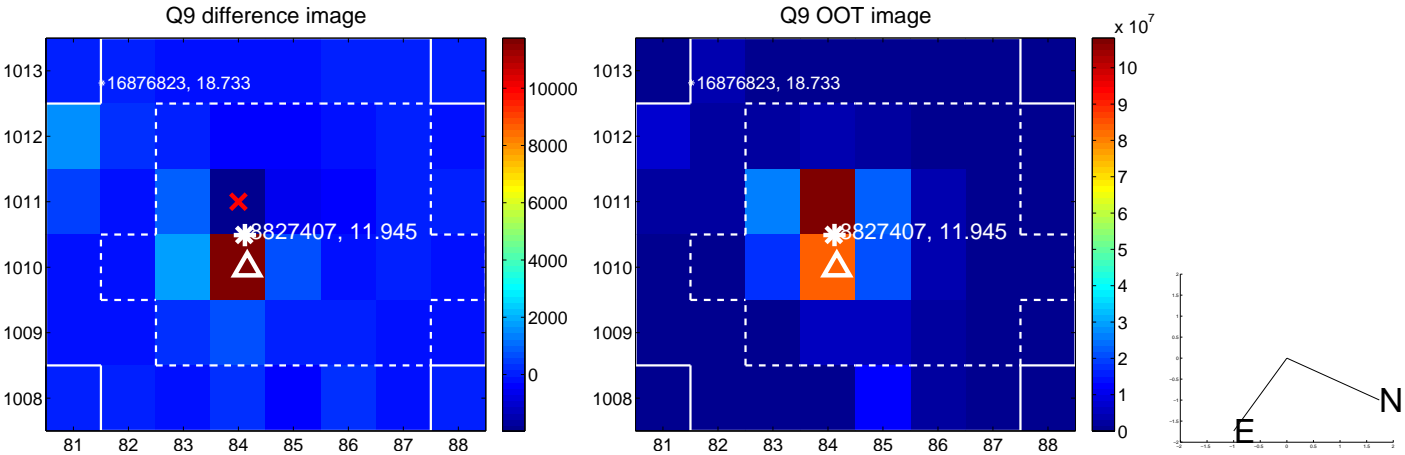
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



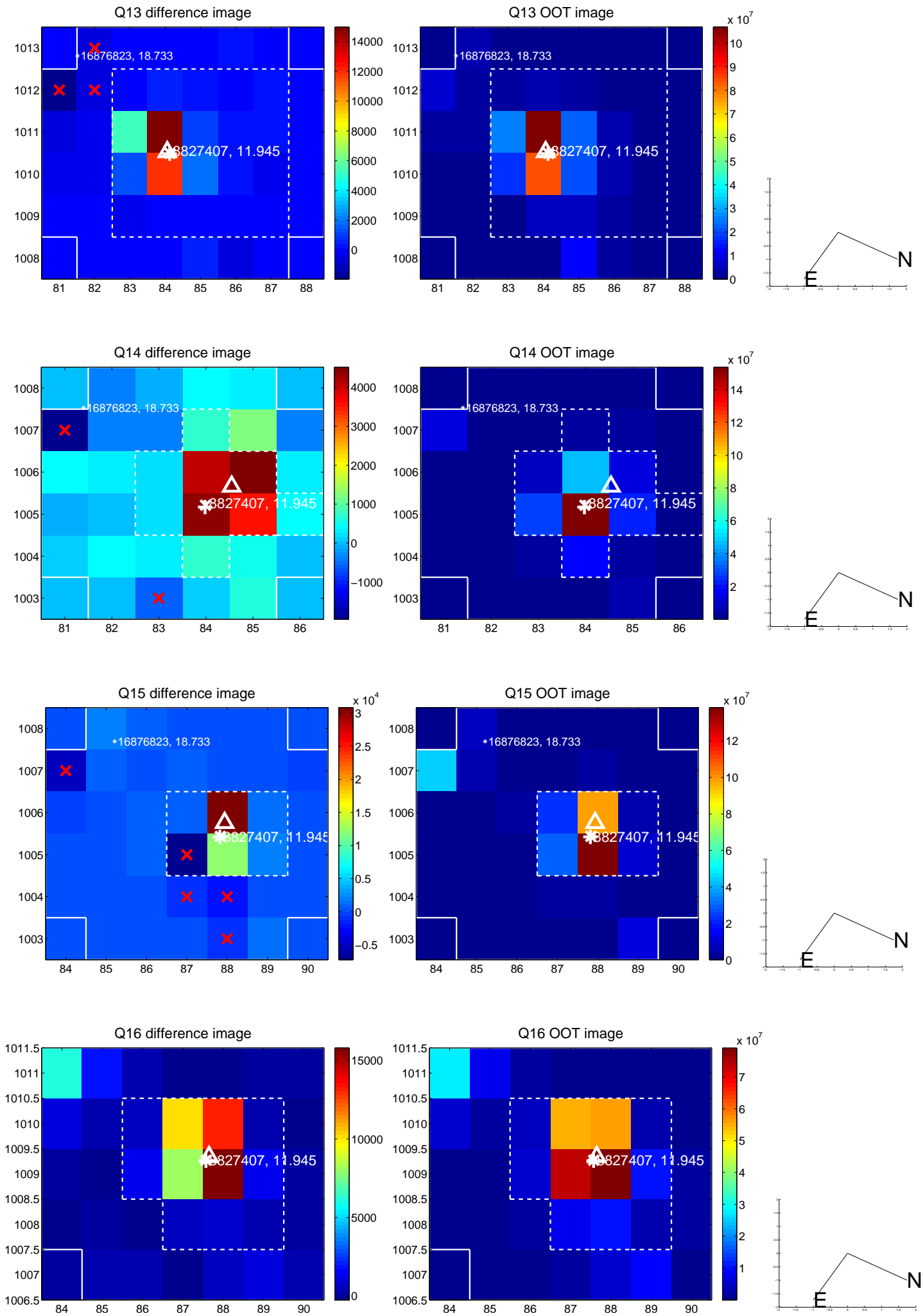
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



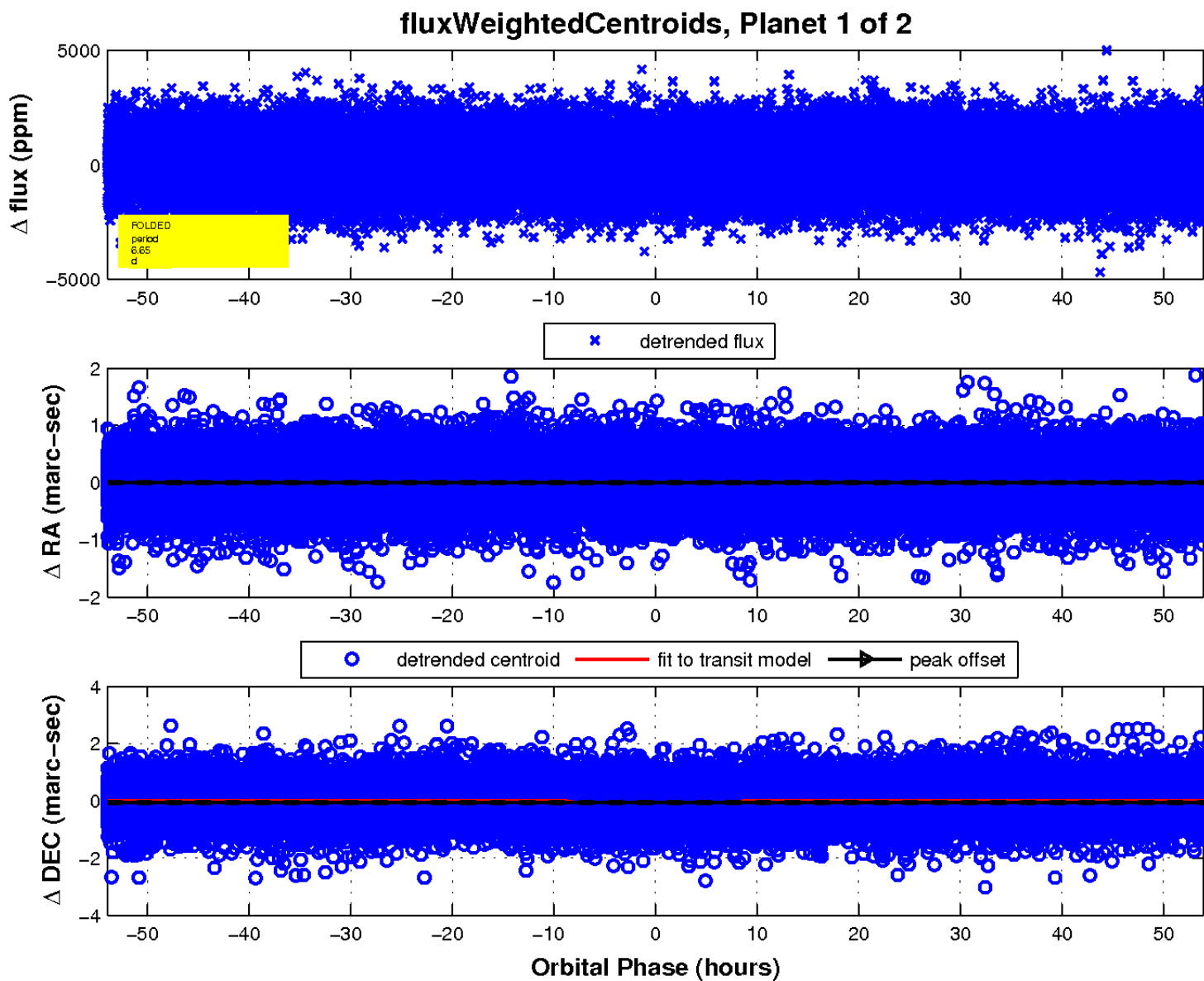
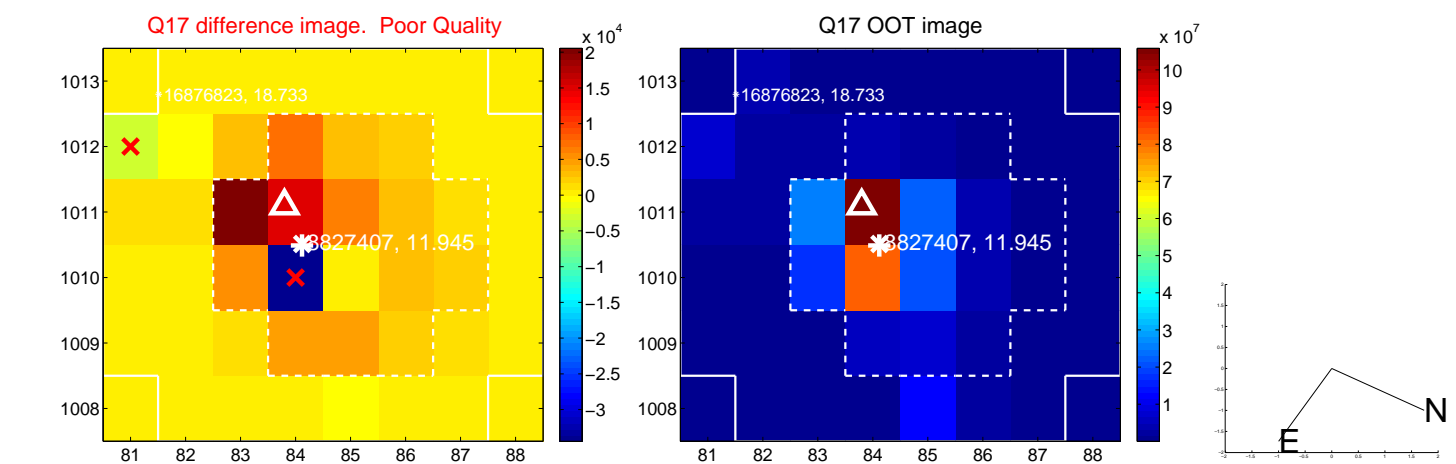
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

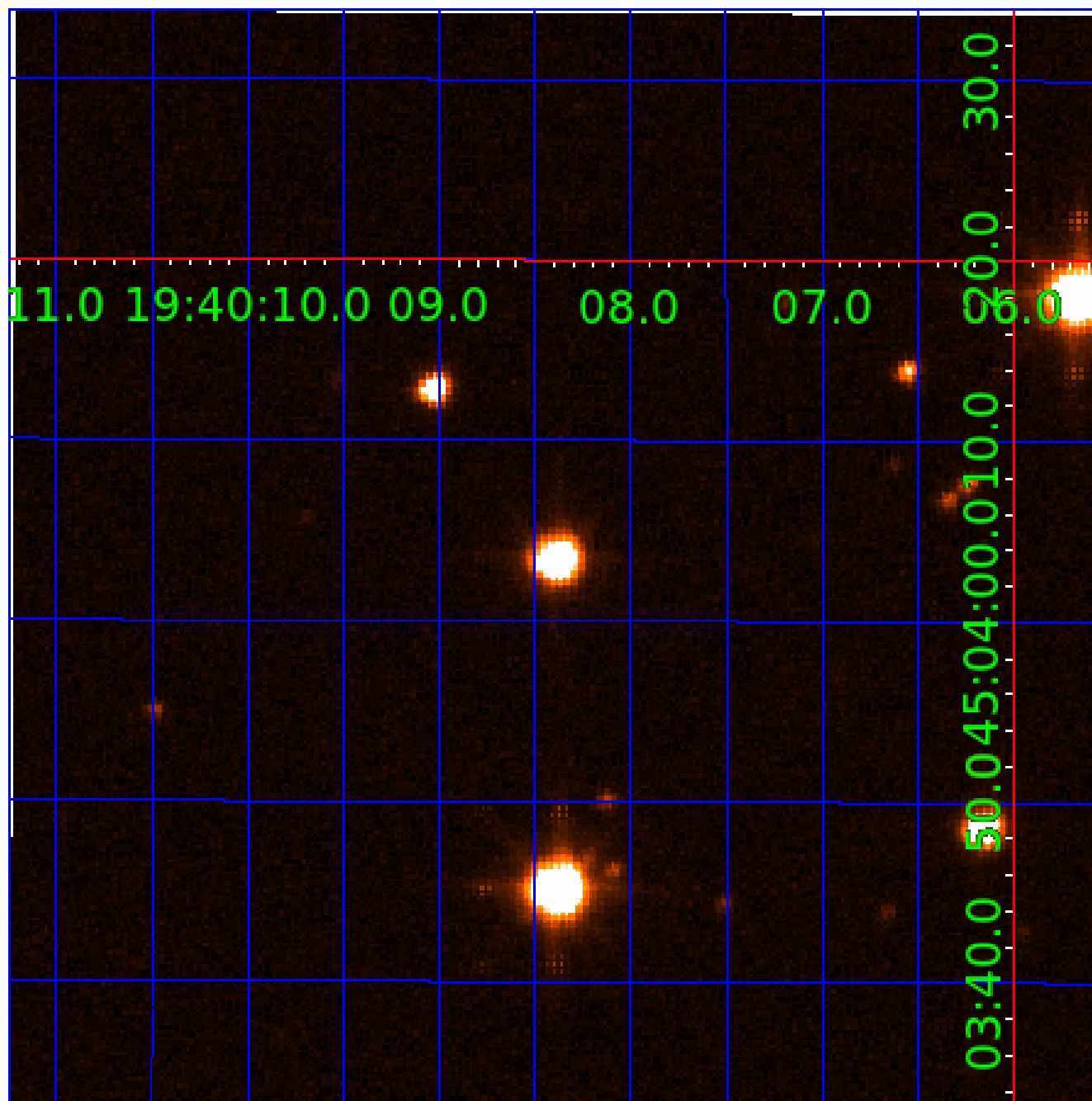


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008827407

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})
008827407-01	OBS	No	6.648022	133.590317	85.8	17.975	8.0	9.0	2.16	9677	2.28	4352.11
008827407-02	OBS	No	4.186230	132.429717	112.4	50.235	7.4	14.7	2.16	9677	2.80	8063.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008827407-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
008827407-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

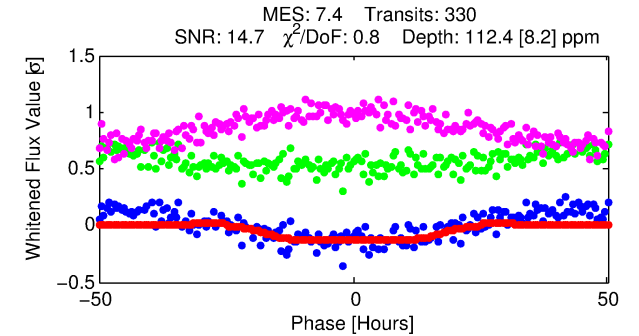
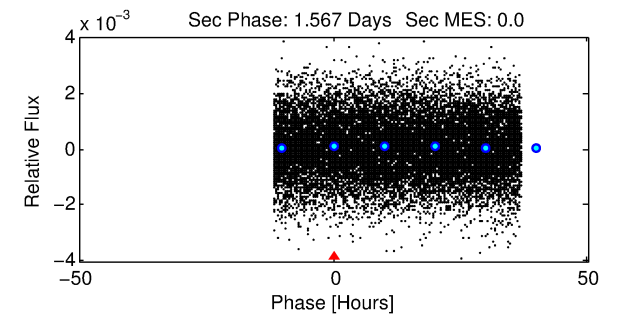
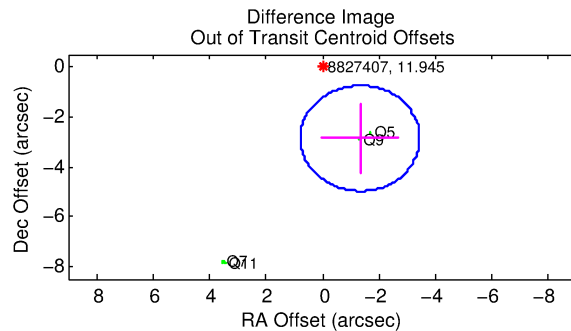
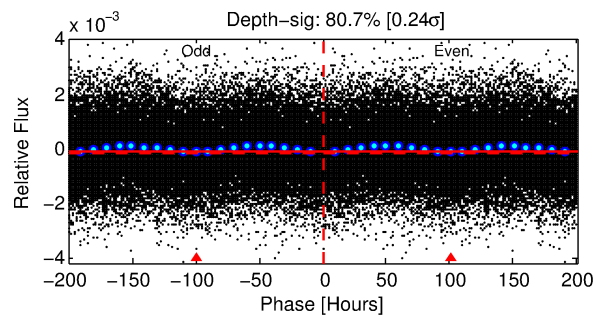
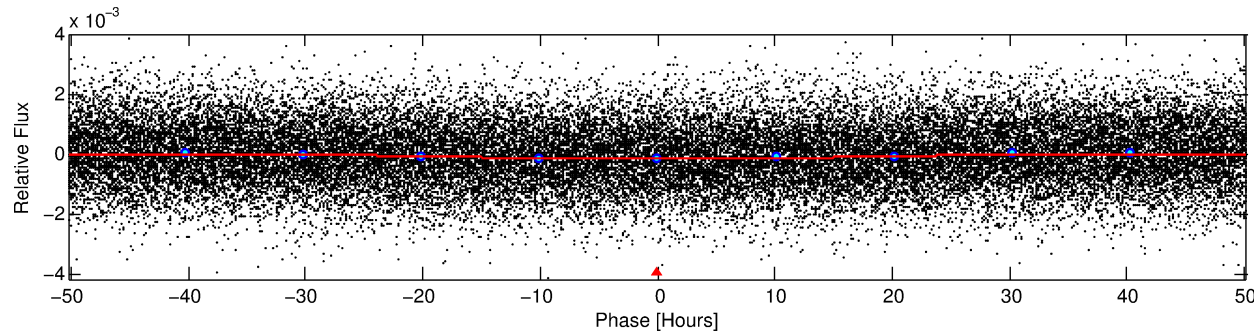
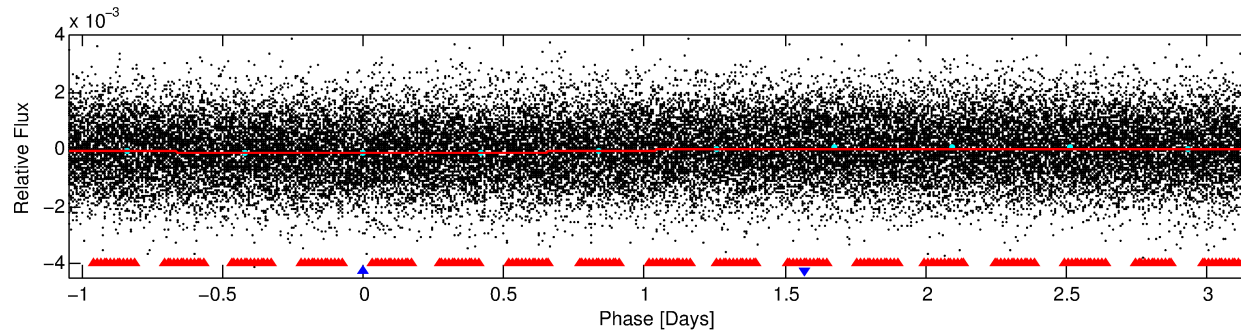
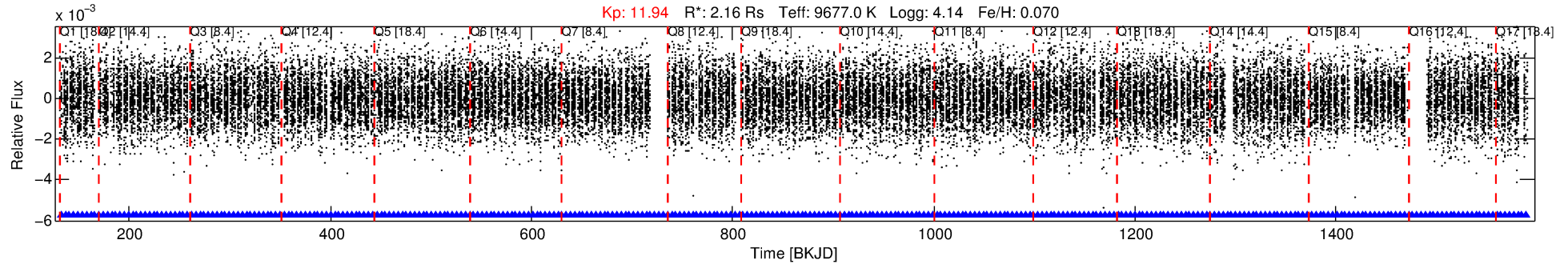
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008827407-02

No Significant Match Found

DV One-Page Summary

KIC: 8827407 Candidate: 2 of 2 Period: 4.186 d



DV Fit Results:

Period = 4.18623 [0.00025] d
Epoch = 132.4297 [0.0440] BKJD
 $R_p/R^* = 0.0119$ [0.0006]
 $a/R^* = 1.00$ [0.00]
 $b = 0.97$ [0.01]
 $\text{Seff} = 8063.54$ [3894.07]
 $T_{\text{eq}} = 2416$ [292] K
 $R_p = 2.80$ [1.22] R_e
 $a = 0.0673$ [0.0227] AU
 $\text{Ag} = \text{N/A}$
 $T_{\text{eff}} = \text{N/A}$

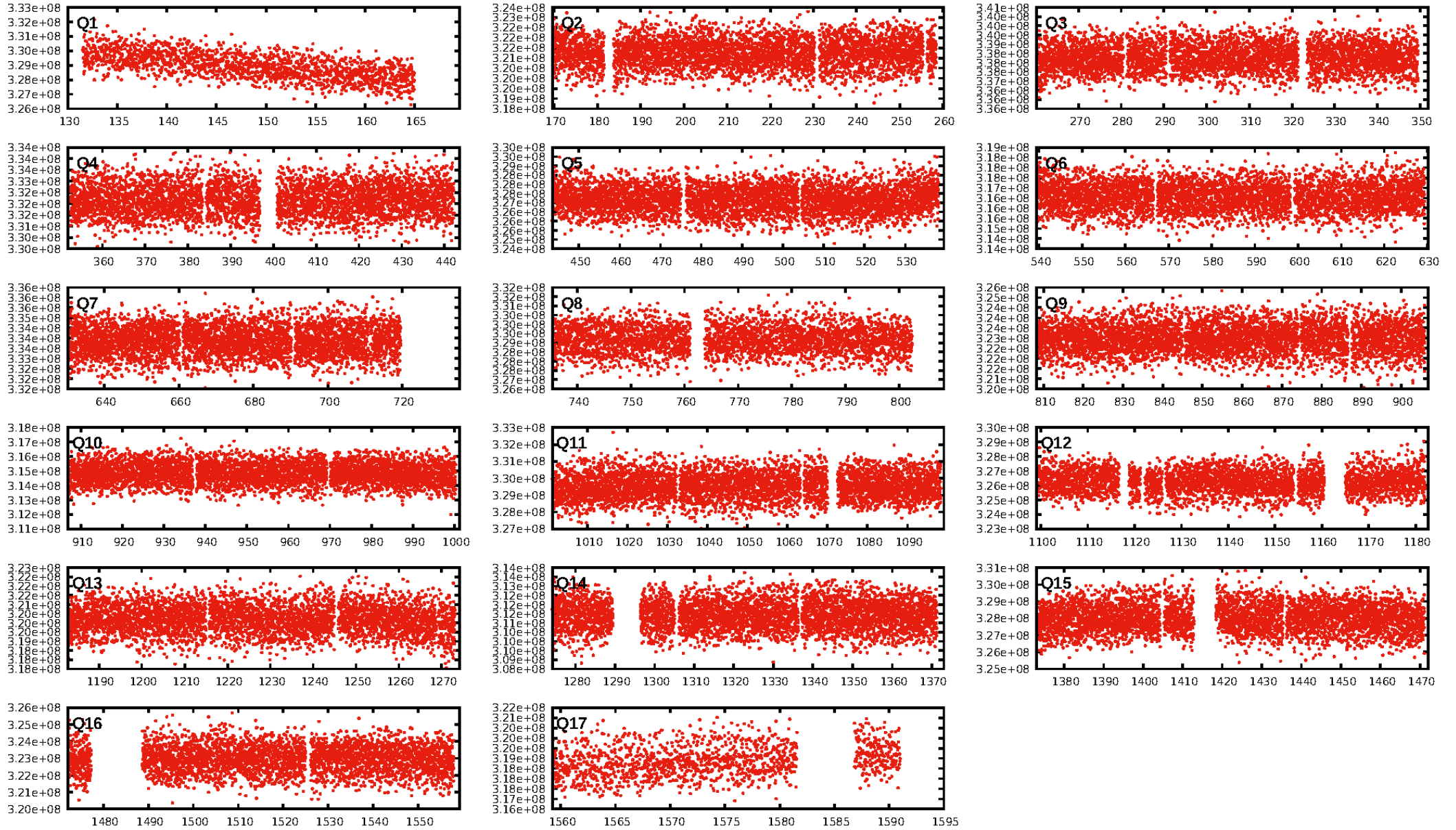
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 73.2% [1.11 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [314/314]
GhostDiagnostic-chr: 1.967
Centroid-sig: 0.0%
Centroid-so: 0.096 arcsec [0.99 σ]
OotOffset-rm: 3.157 arcsec [4.48 σ]
KicOffset-rm: 3.101 arcsec [4.95 σ]
OotOffset-st: 0/2/0/2 [4]
KicOffset-st: 0/2/0/2 [4]
DiffImageQuality-fgm: 0.00 [0/4]
DiffImageOverlap-fno: 0.94 [16/17]

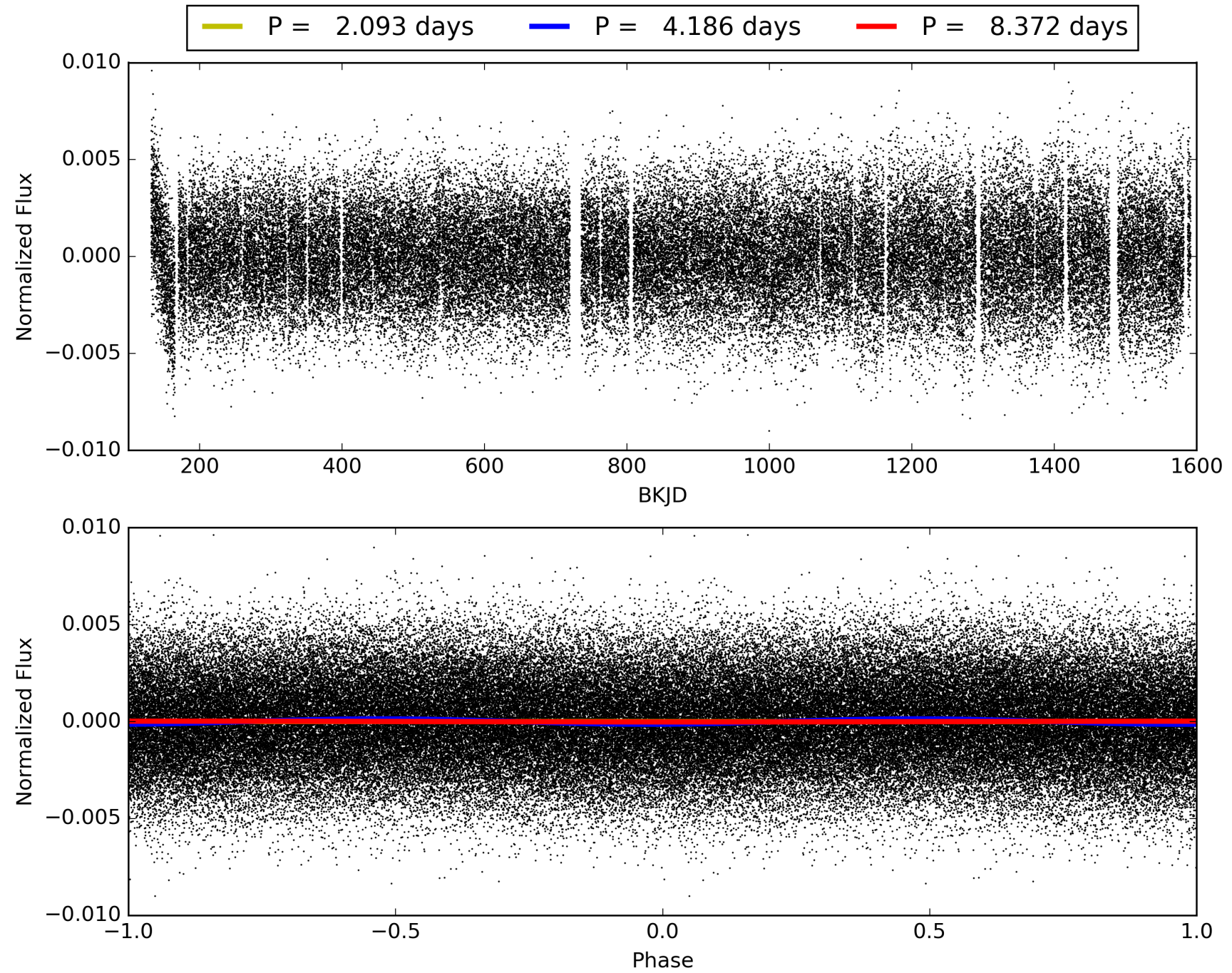
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 16:15:39 Z

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

TCE 008827407-02, PDC Light Curves

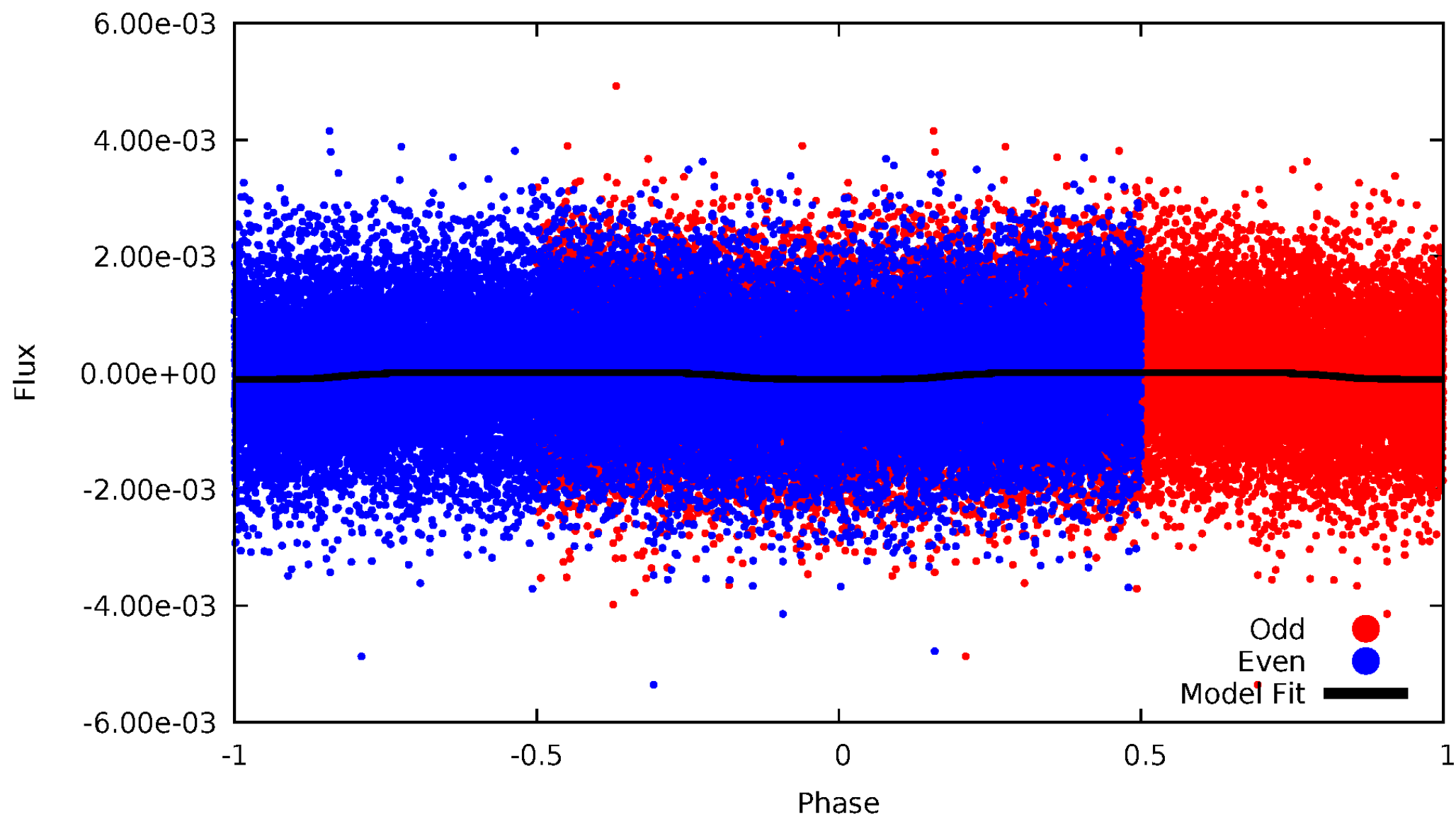


TCE 008827407-02



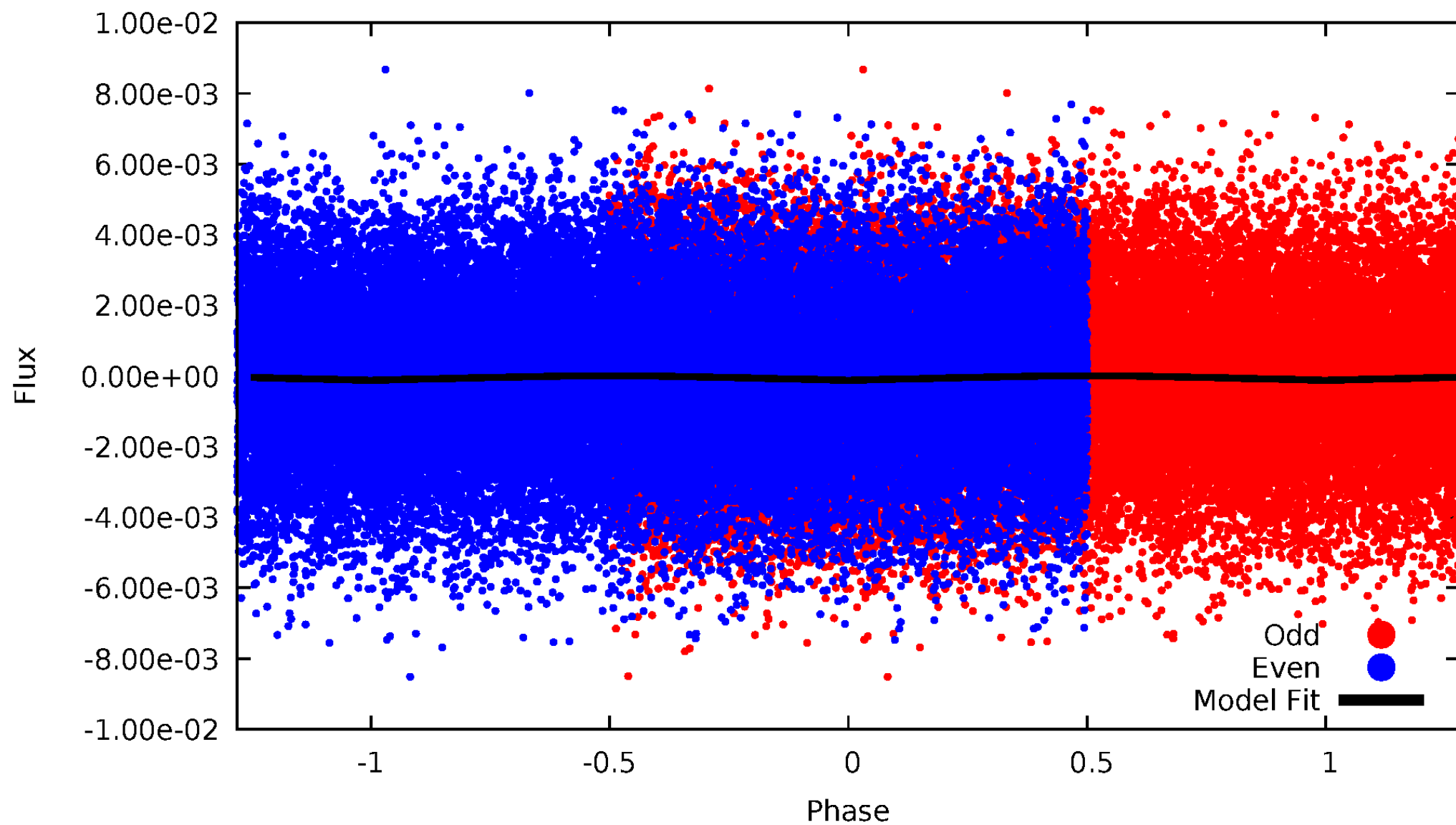
DV Odd/Even

TCE 008827407-02



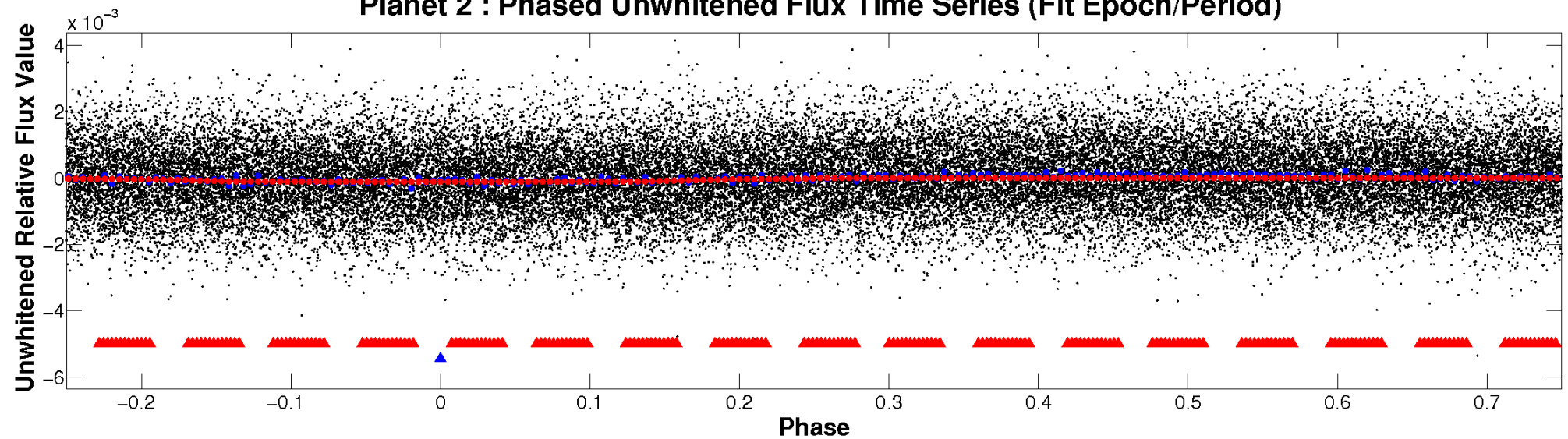
ALT Odd/Even

TCE 008827407-02

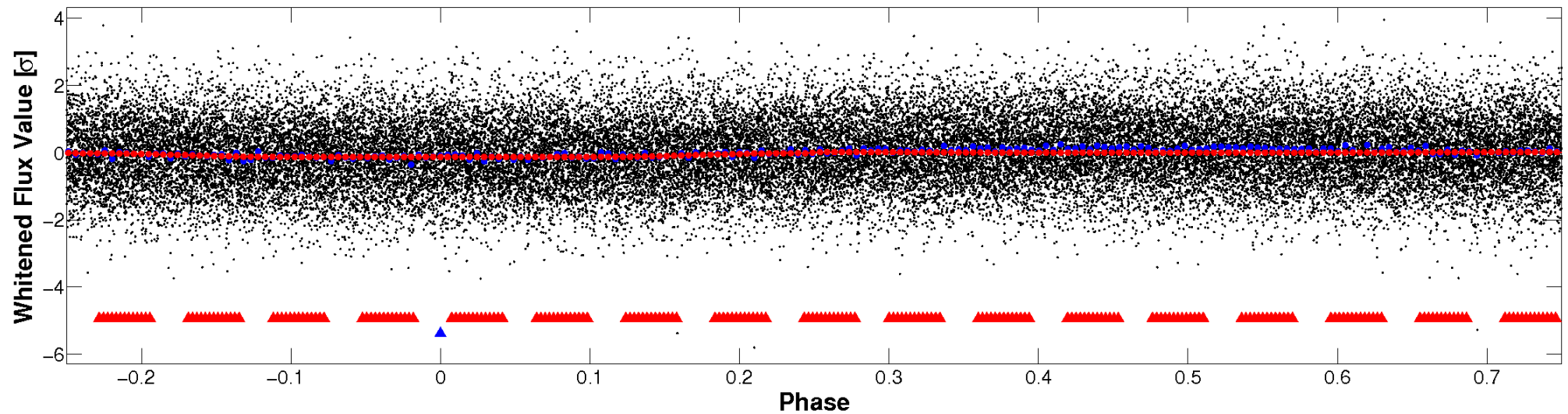


Non-Whitened Vs. Whitened Light Curve

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

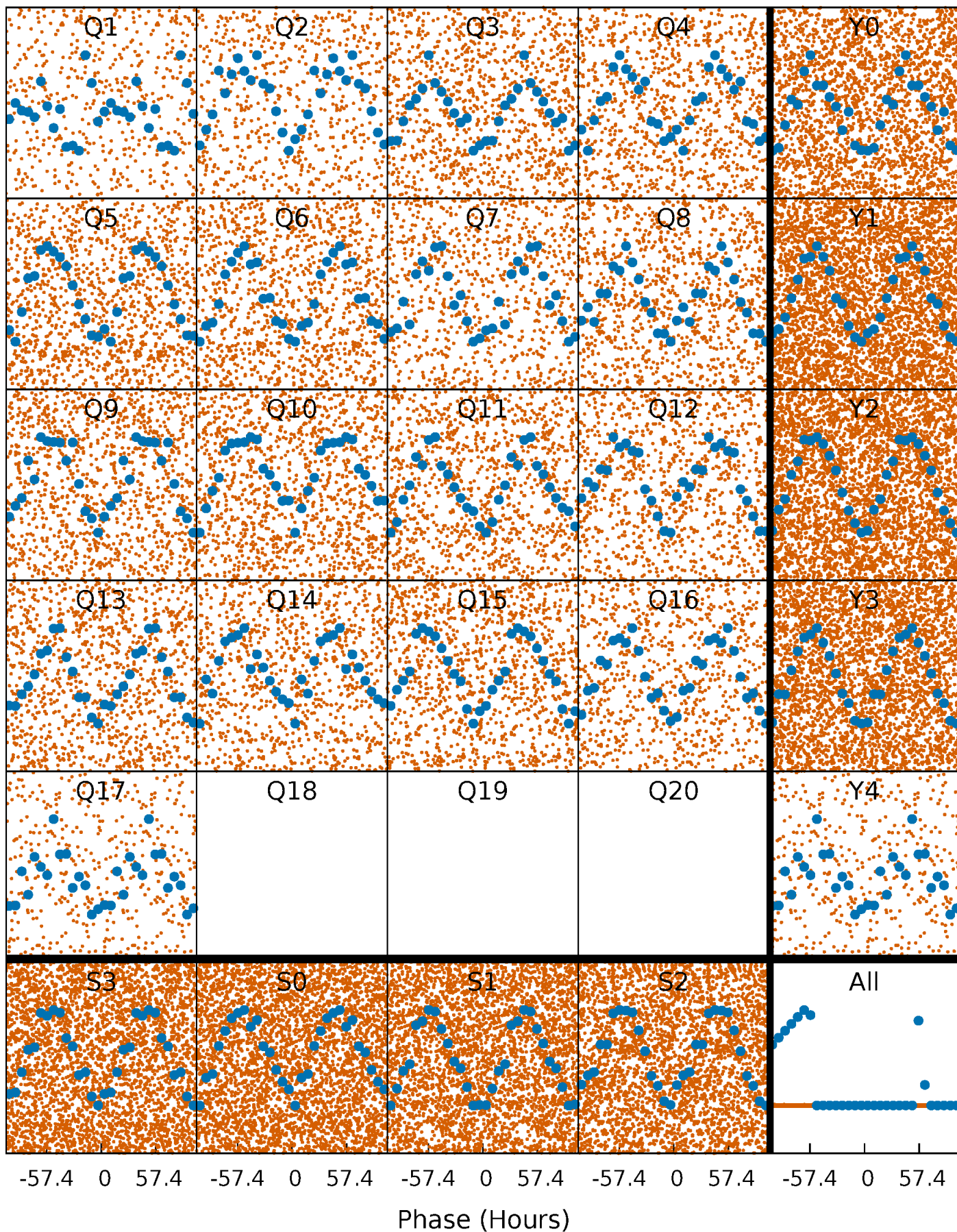


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



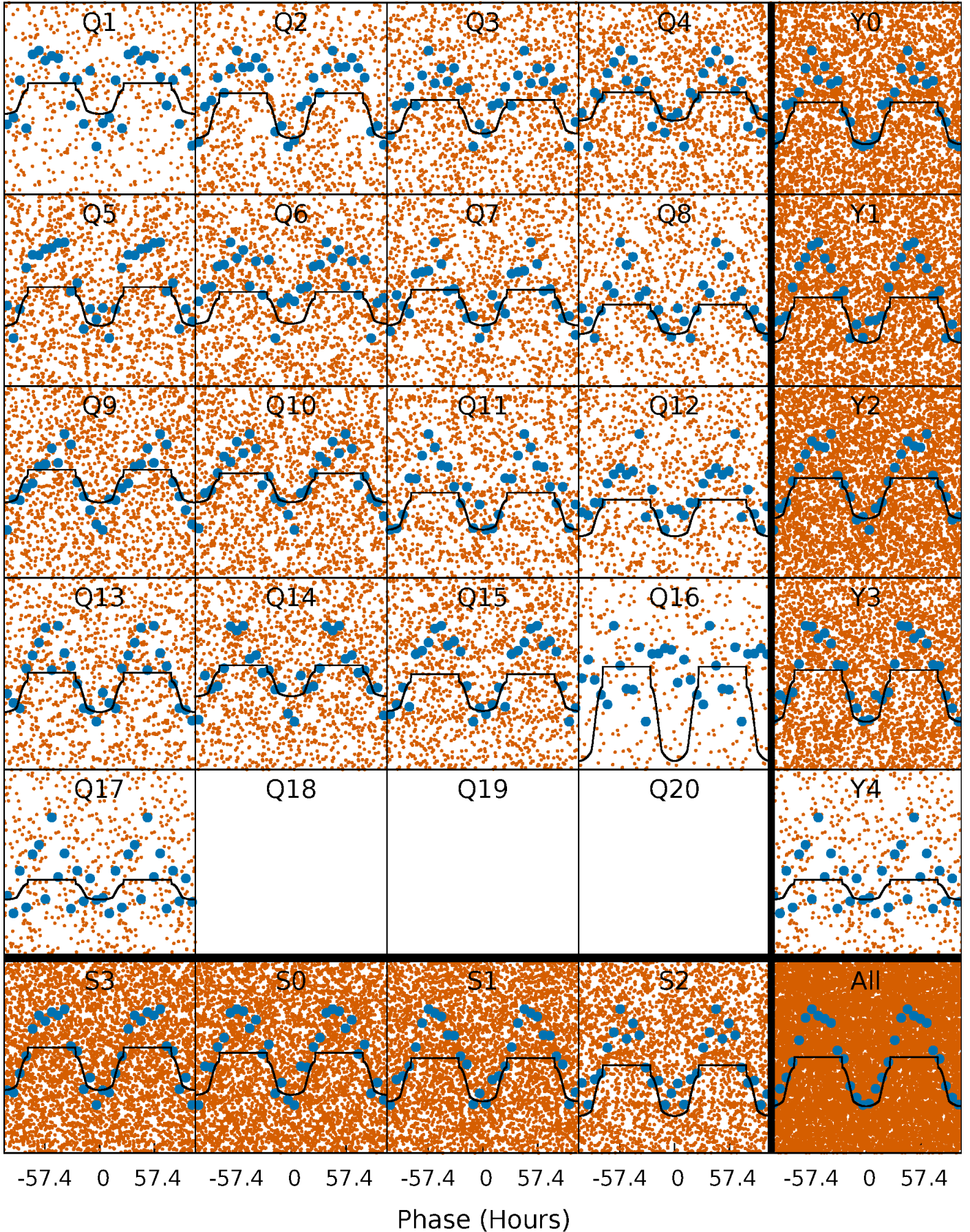
PDC Quarter-Phased Transit Curves

TCE 008827407-02 P= 4.186230 Days $T_0=132.429717$ (BKJD)



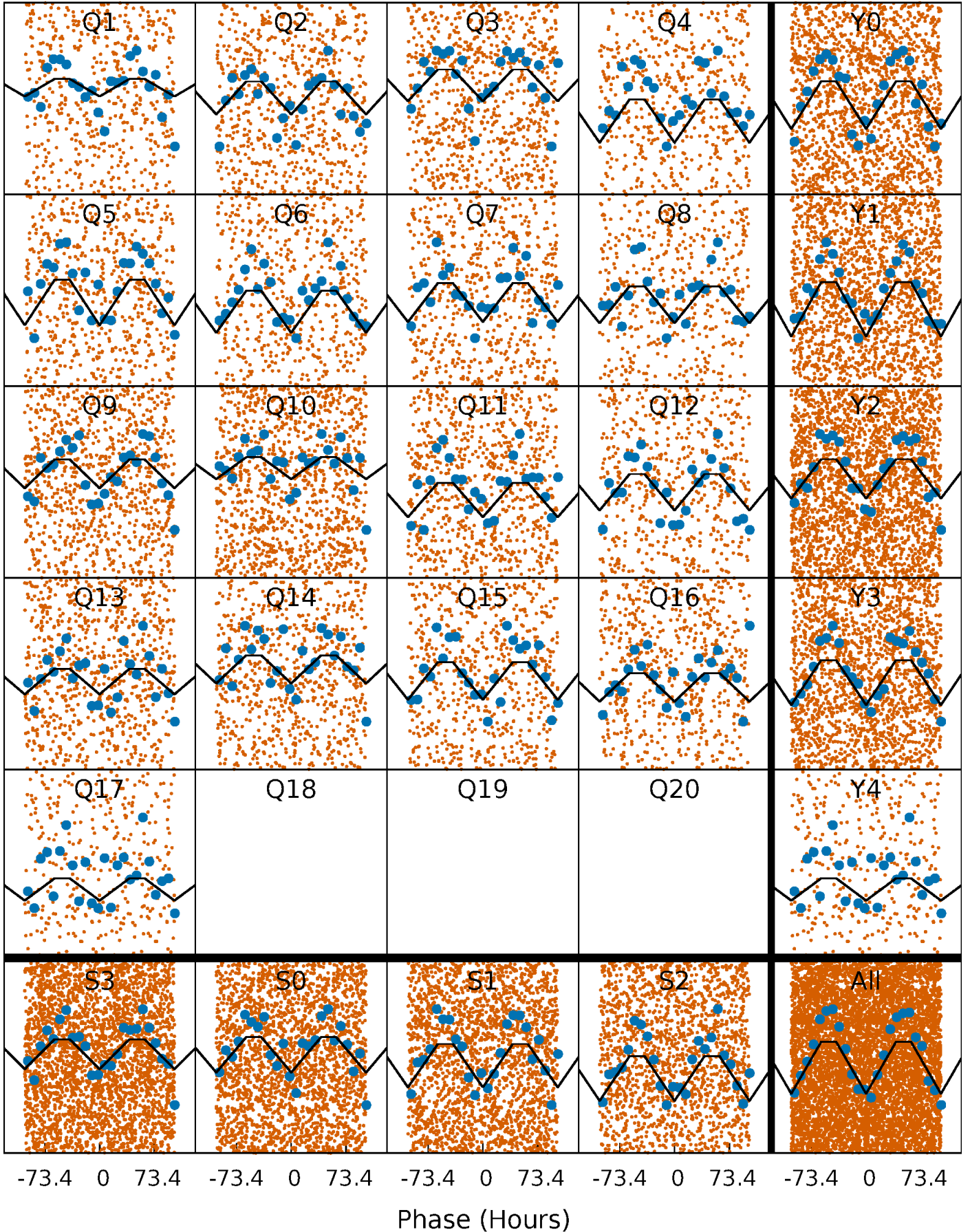
DV Quarter-Phased Transit Curves

TCE 008827407-02 P= 4.186230 Days $T_0=132.429717$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

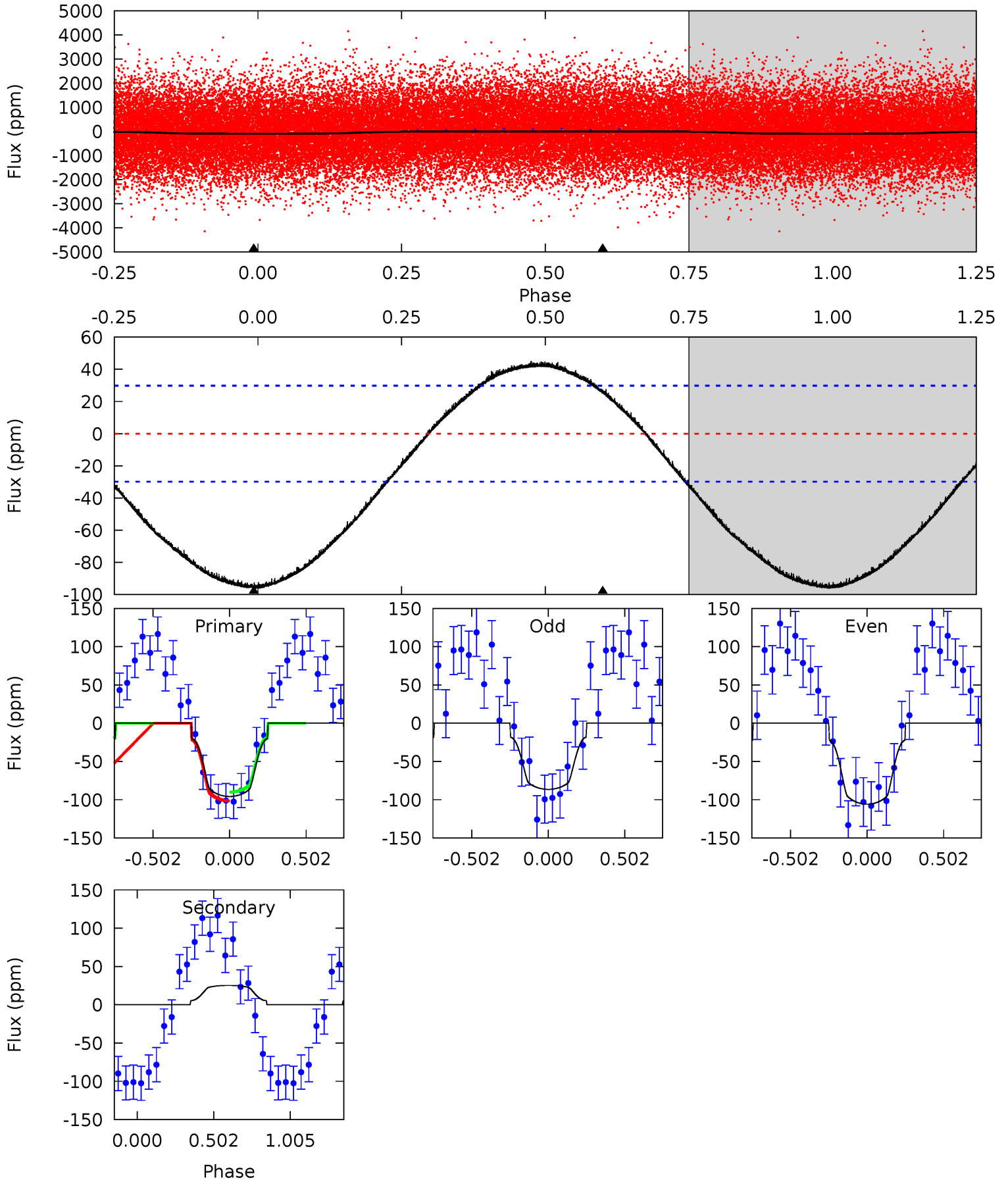
TCE 008827407-02 P= 4.185369 Days $T_0=132.469165$ (BKJD)



DV Model-Shift Uniqueness Test

008827407-02, P = 4.186230 Days, E = 128.243487 Days

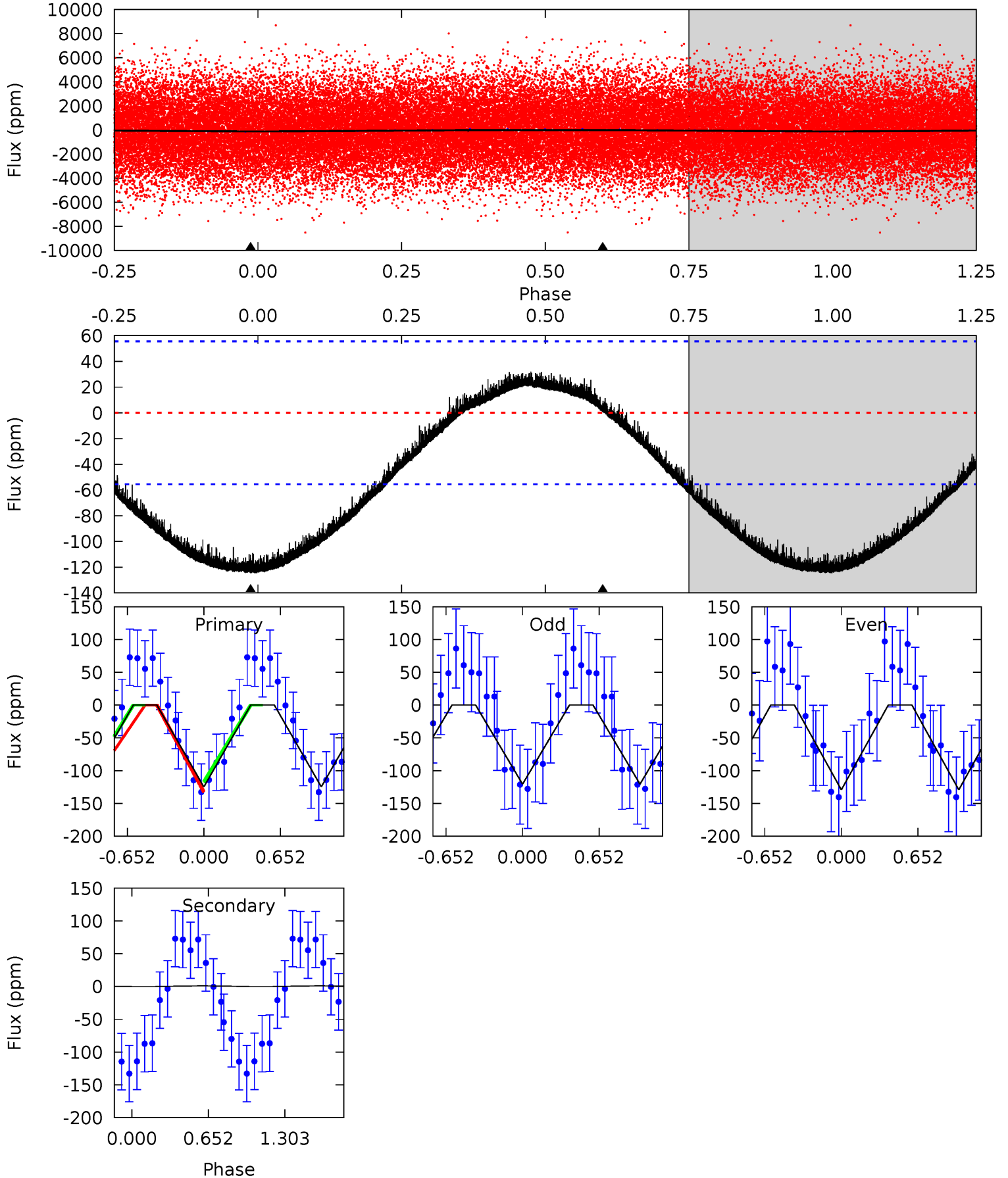
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.5	-3.58	0	0	4.21	0.67	1.68	13.5	13.5	-3.58	-3.58	1.37	1.70	0.32	0.82



Alt Model-Shift Uniqueness Test

008827407-02, P = 4.185369 Days, E = 128.283796 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.31	-0.07	0	0	4.15	0.45	0.73	9.31	9.31	-0.07	-0.07	0.32	0.94	0.20	0.54



Stellar Parameters For KIC 008827407

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	9677^{+270}_{-405}	$4.136^{+0.122}_{-0.227}$	$0.070^{+0.150}_{-0.550}$	$2.156^{+0.936}_{-0.504}$	$2.320^{+0.428}_{-0.571}$	$0.326^{+0.242}_{-0.181}$
	+3%/-4%	+3%/-5%	+214%/-786%	+43%/-23%	+18%/-25%	+74%/-56%
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 008827407-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	25 ± 7	$2.84^{+0.65}_{-0.42}$	3406^{+325}_{-231}	-5882^{+411}_{-399}	$-7.315^{+2.677}_{-3.430}$
Alt.	1 ± 13	$2.61^{+0.58}_{-0.36}$	3402^{+320}_{-253}	-3590^{+8688}_{-1837}	$-0.296^{+4.644}_{-4.685}$

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 $A_{obs} \gg 1.0$

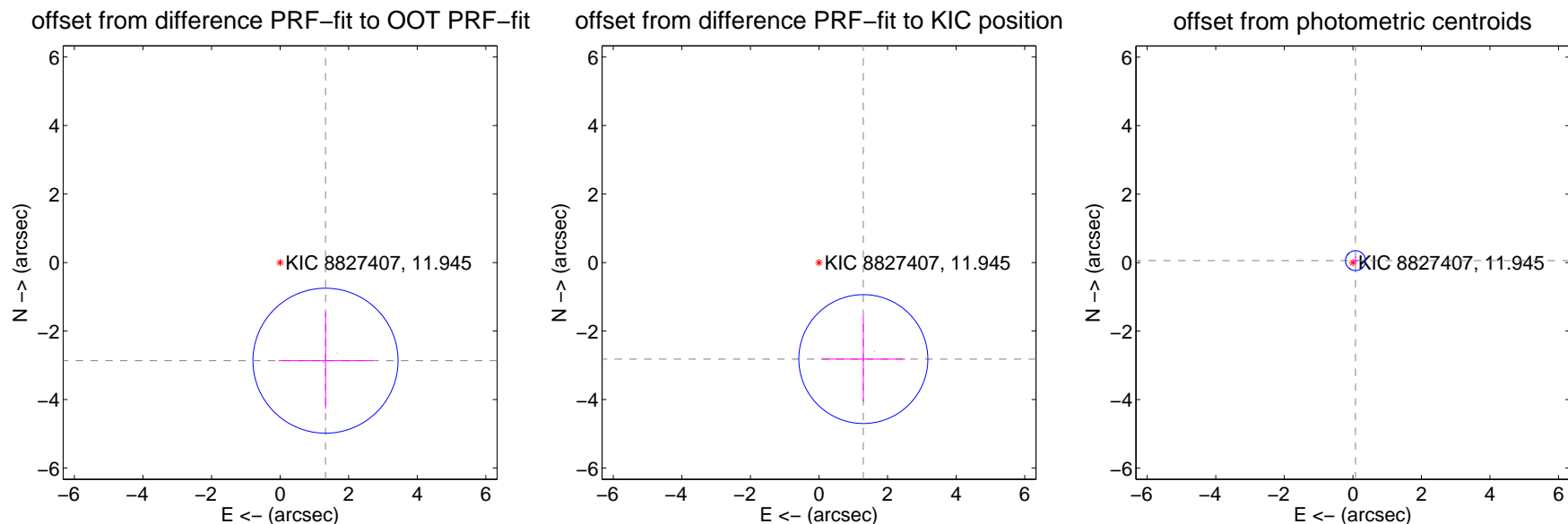
DV Centroid Data

Supplemental centroid analysis for 008827407-02. **Kepler magnitude: 11.95.** Transit SNR 14.71

There are 0 quarters with good PRF difference image offsets

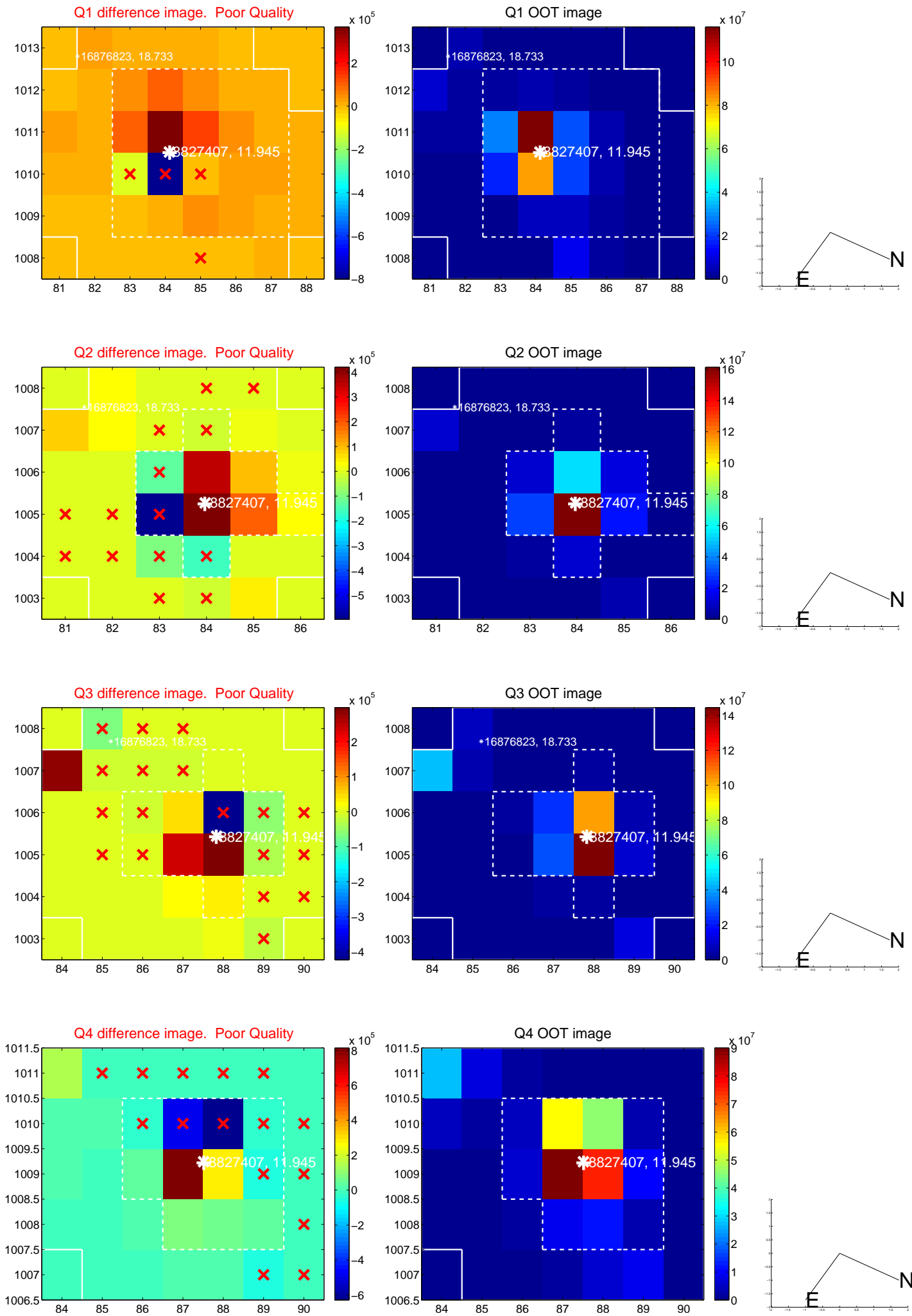
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.157 ± 0.705	4.48	-1.324 ± 1.371	-2.866 ± 1.408
PRF-fit source offset from KIC position	3.101 ± 0.627	4.95	-1.293 ± 1.220	-2.818 ± 1.247
photometric centroid source offset	0.10 ± 0.10	0.99	-0.08 ± 0.08	0.06 ± 0.12

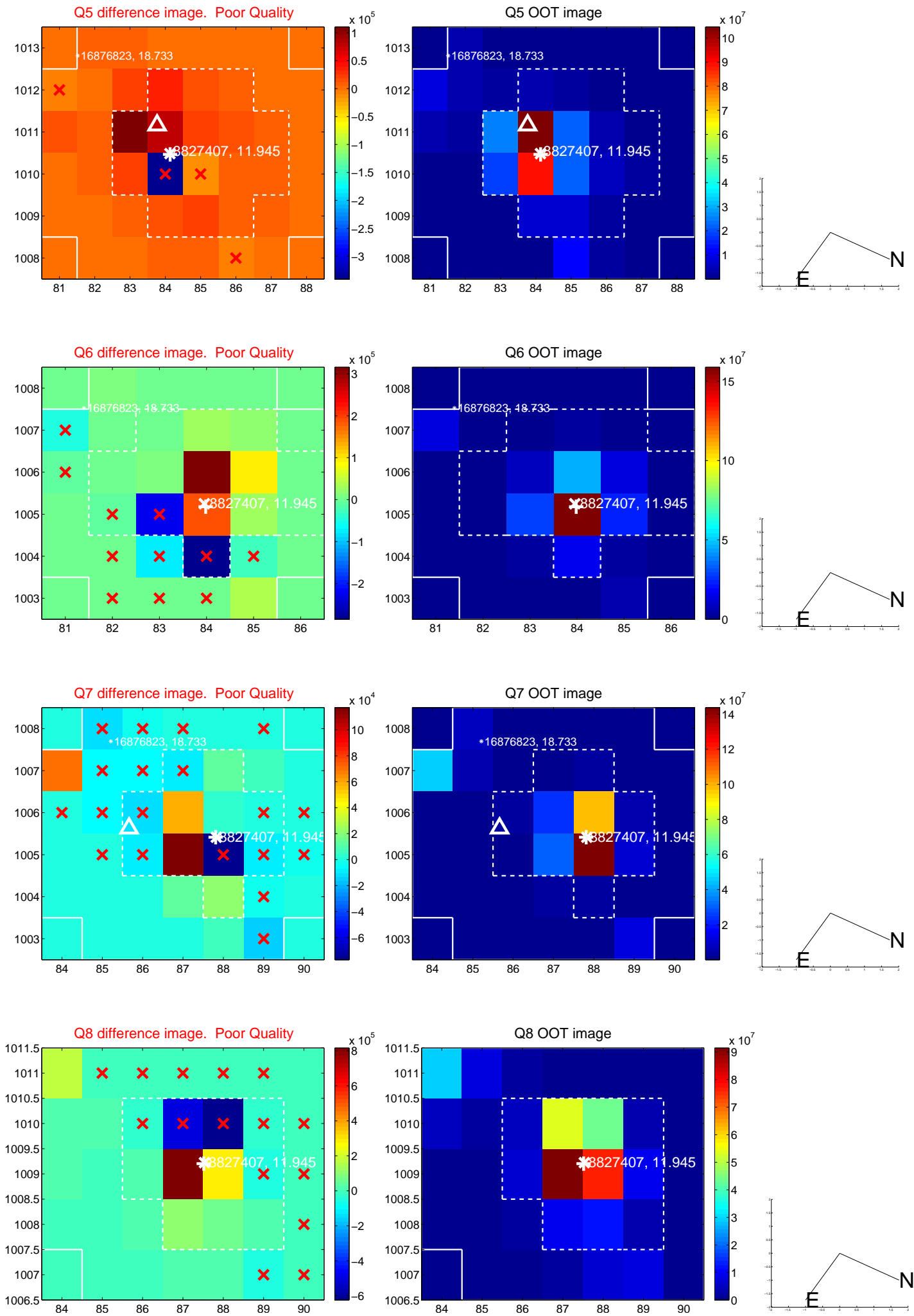


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

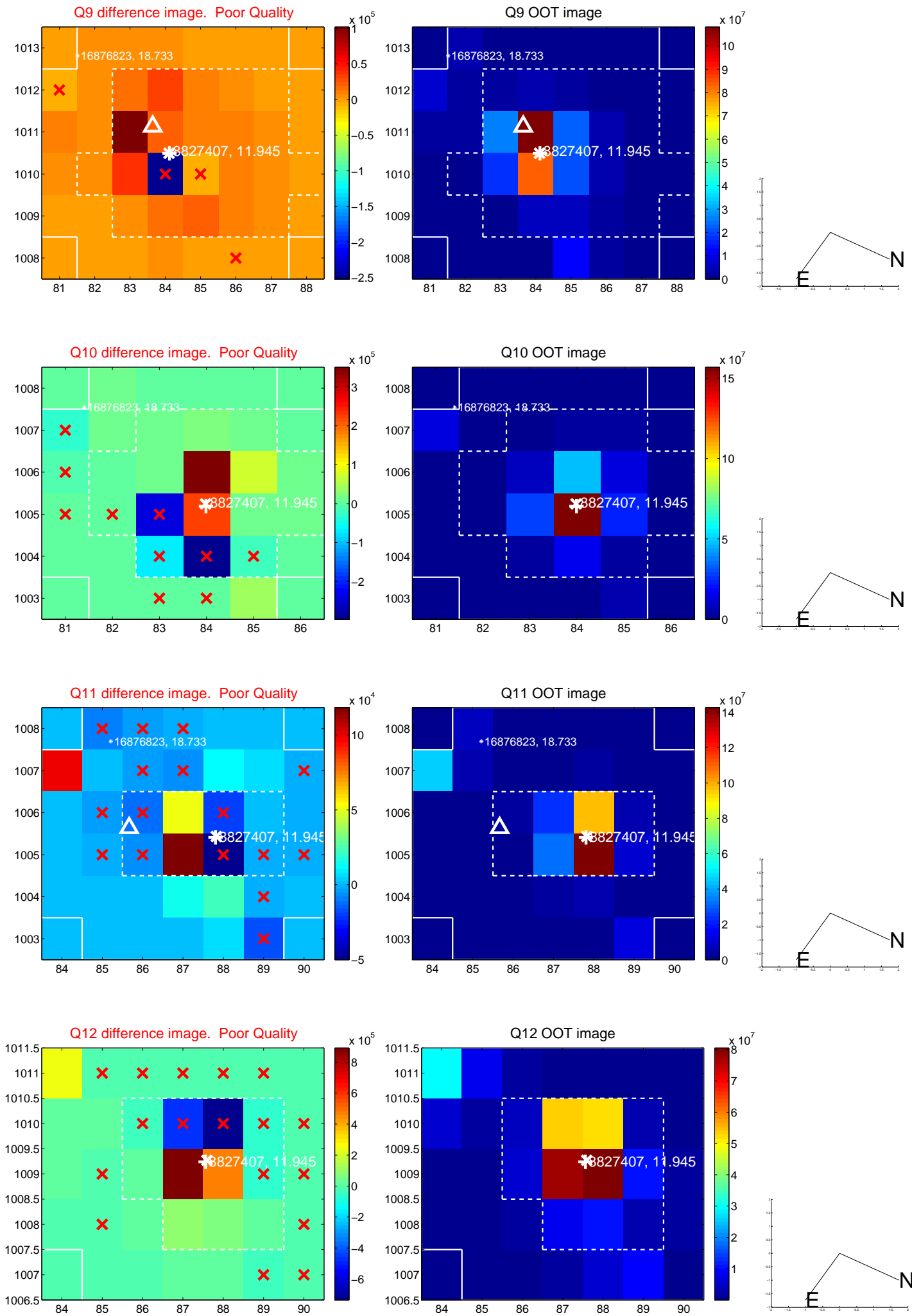
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



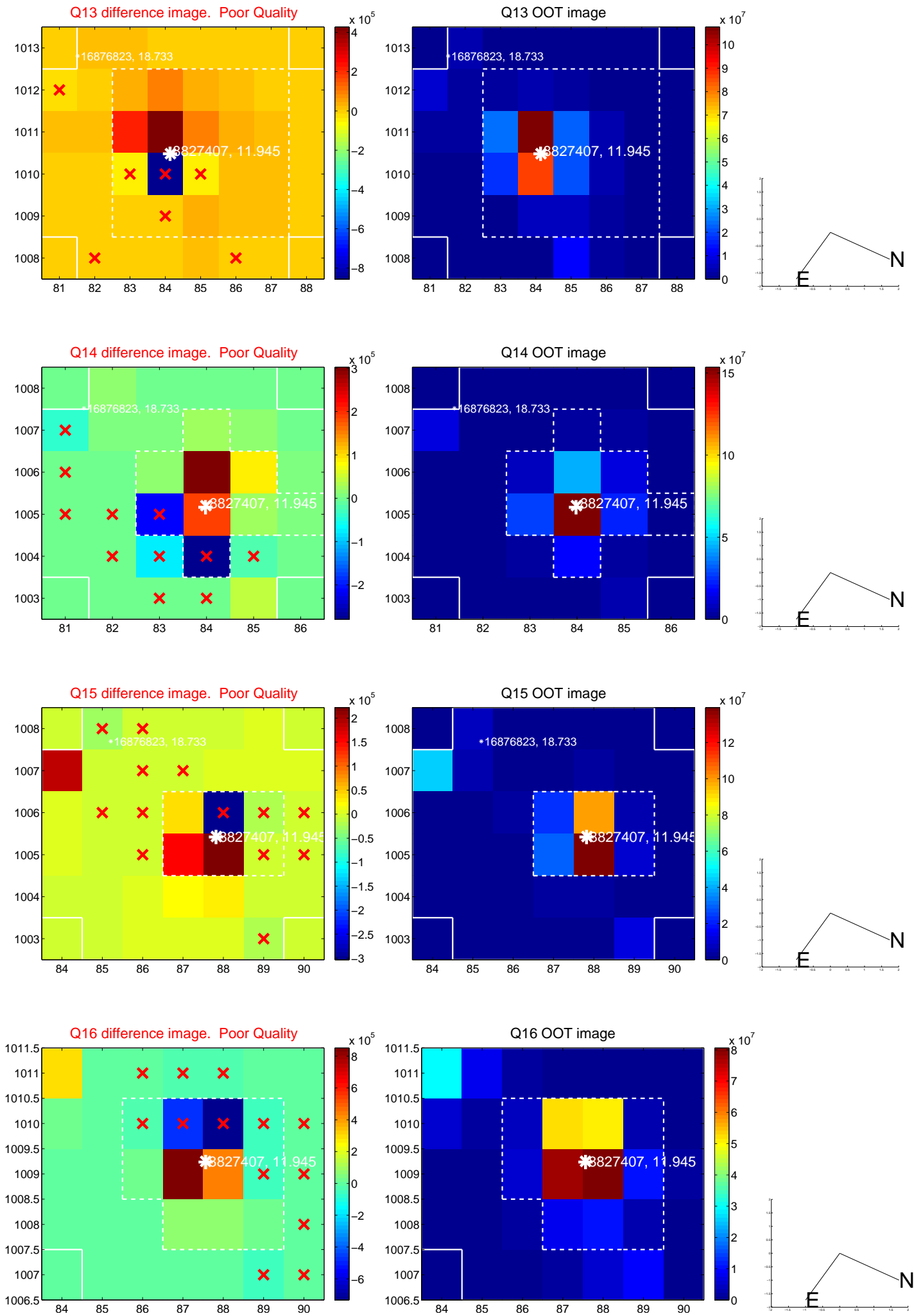
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



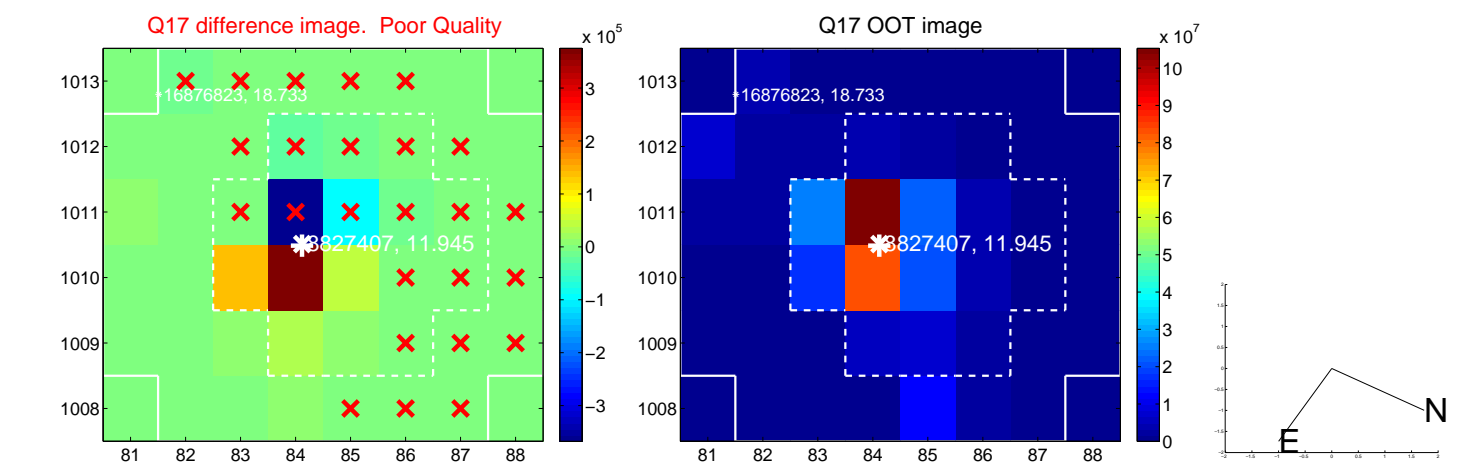
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



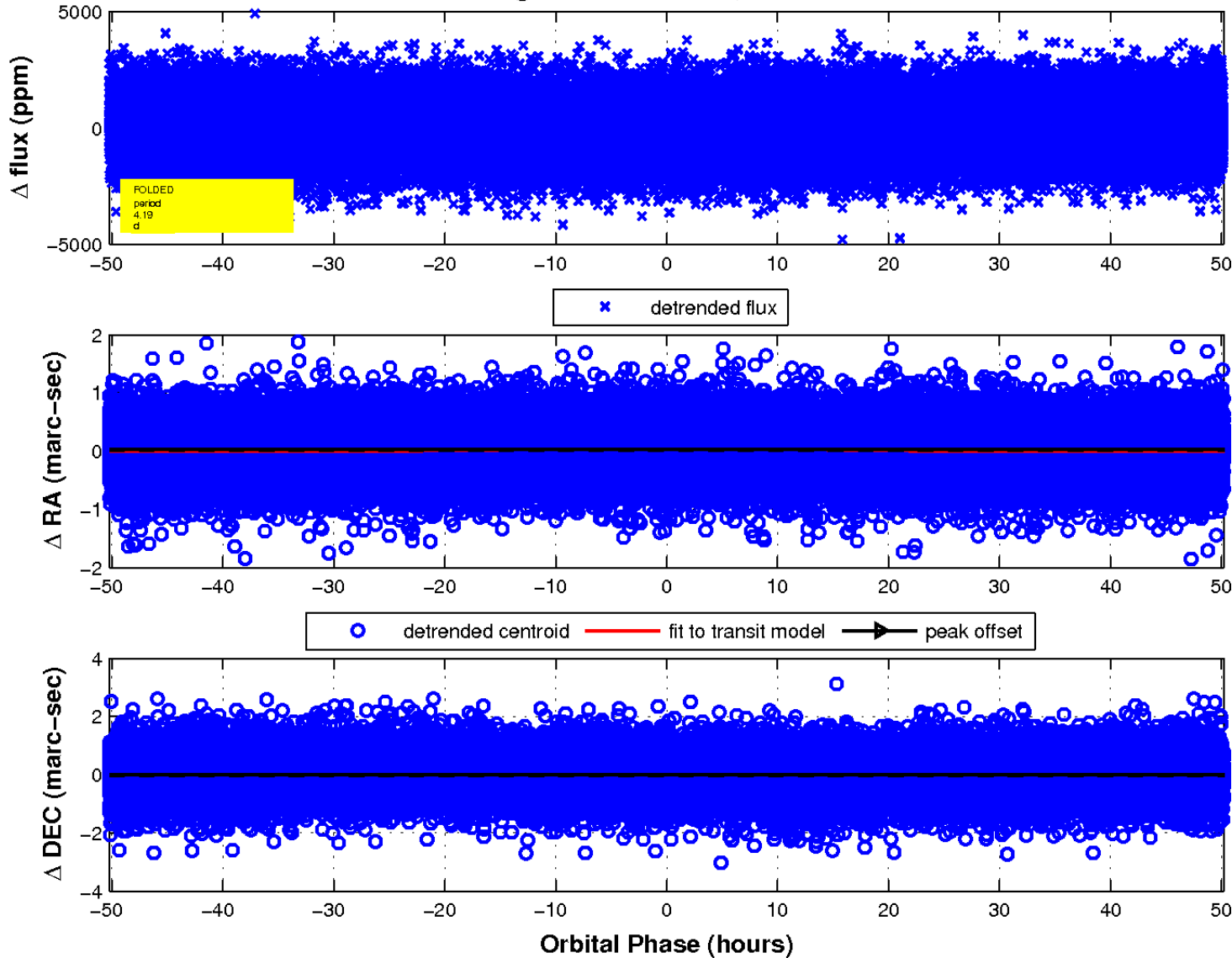
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



This astronomical image displays a field of stars against a black background. A blue grid is overlaid on the image, with green text labels indicating Right Ascension (RA) and Declination (Dec). The RA labels at the top are 11.0, 10.0, 9.0, 8.0, 7.0, and 6.0. The Dec labels on the right side are 03:40.0, 45:00.0, 50.0, 55.0, 00.0, 05.0, 10.0, 15.0, 20.0, 25.0, and 30.0. A bright star is visible near the center of the grid, and several other stars of varying brightness are scattered throughout the field.

Declination