

KIC 008410727

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})
008410727-01	OBS	1148.01	11.476084	135.396858	184.3	5.104	23.0	24.1	1.41	6071	2.20	221.66
008410727-02	OBS	1148.02	25.265164	134.129326	109.2	7.914	10.7	10.8	1.41	6071	1.72	77.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008410727-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008410727-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

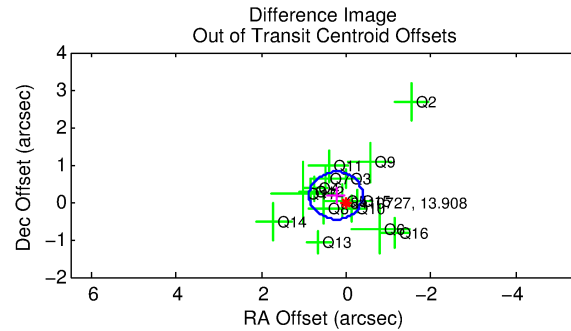
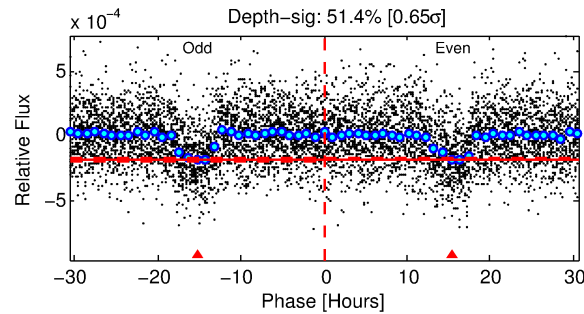
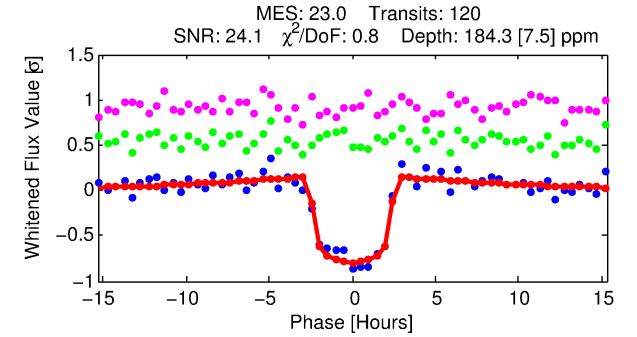
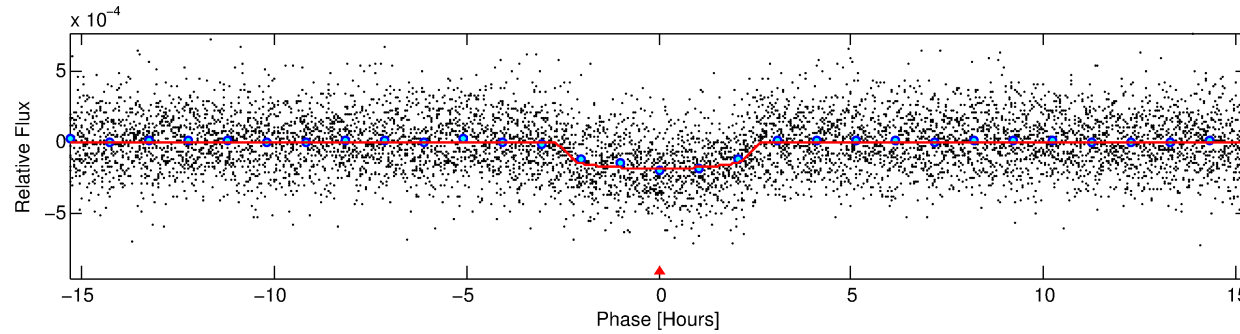
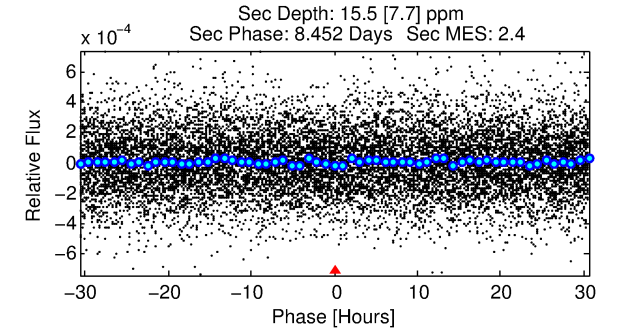
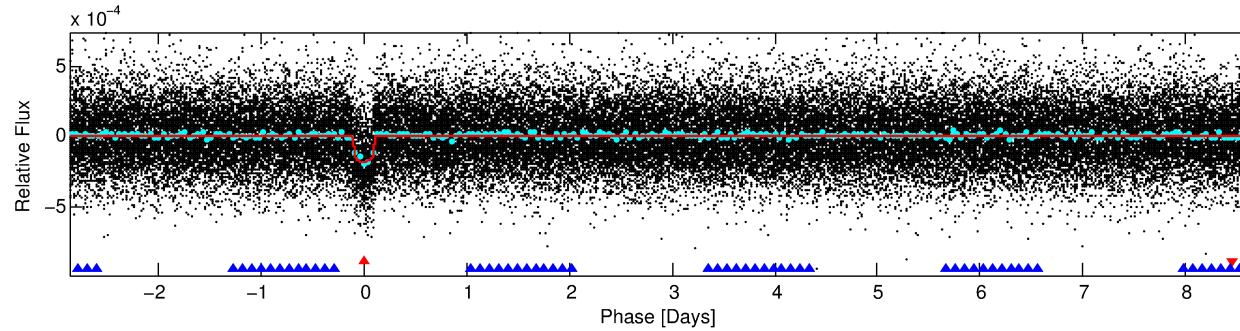
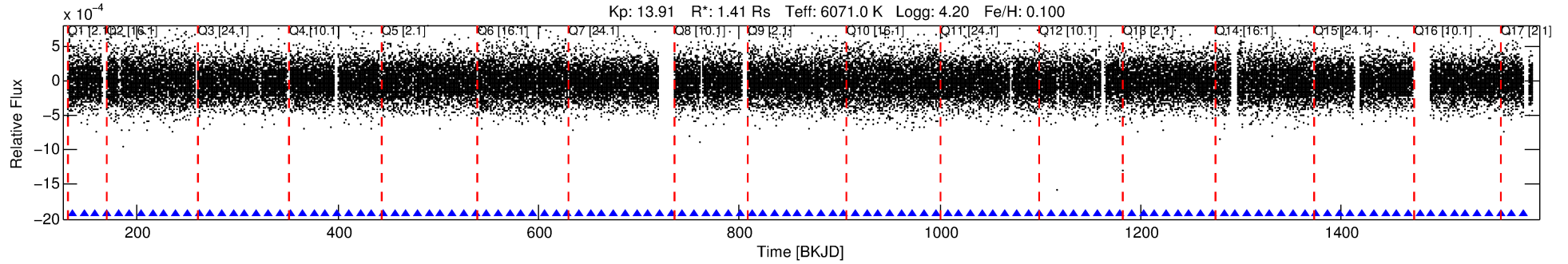
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008410727-01

No Significant Match Found

DV One-Page Summary

KIC: 8410727 Candidate: 1 of 2 Period: 11.476 d
KOI: K01148.01 Name: Kepler-270b Corr: 0.986



DV Fit Results:

Period = 11.47608 [0.00005] d
Epoch = 135.3969 [0.0037] BKJD
Rp/R* = 0.0143 [0.0025]
a/R* = 9.17 [7.78]
b = 0.86 [0.26]
Seff = 221.66 [60.38]
Teq = 984 [67] K
Rp = 2.20 [0.55] Re
a = 0.1045 [0.0173] AU
Ag = 19.34 [12.66] [1.45σ]
Teffp = 3190 [485] K [4.51σ]

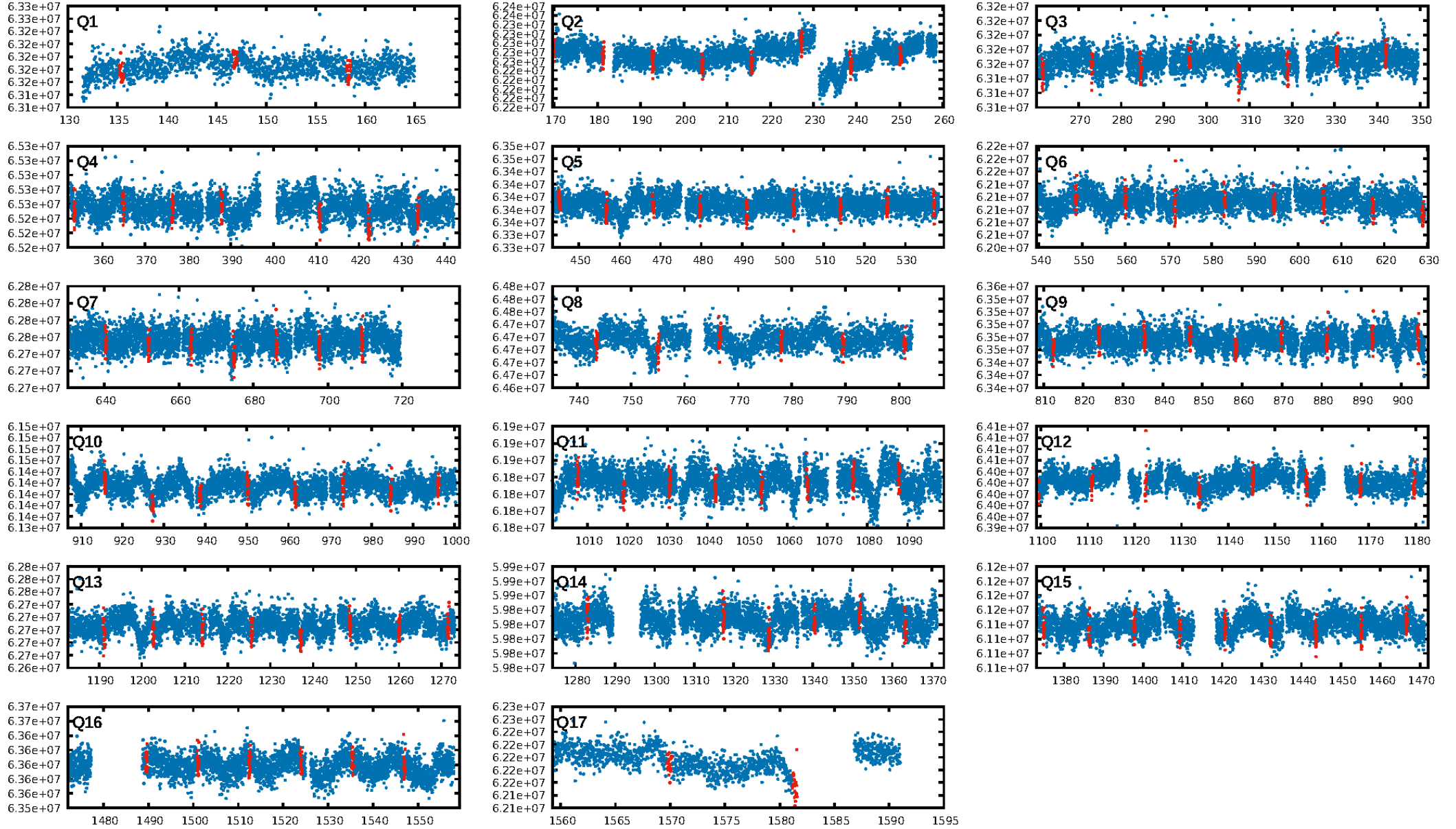
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [35.14σ]
ModelChiSquare2-sig: 99.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.58e-114
RollingBand-fgt: 1.00 [115/115]
GhostDiagnostic-chr: 2.482
Centroid-sig: 100.0%
Centroid-so: 0.270 arcsec [0.54σ]
OotOffset-rm: 0.293 arcsec [1.39σ]
KicOffset-rm: 0.325 arcsec [1.55σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [17/17]

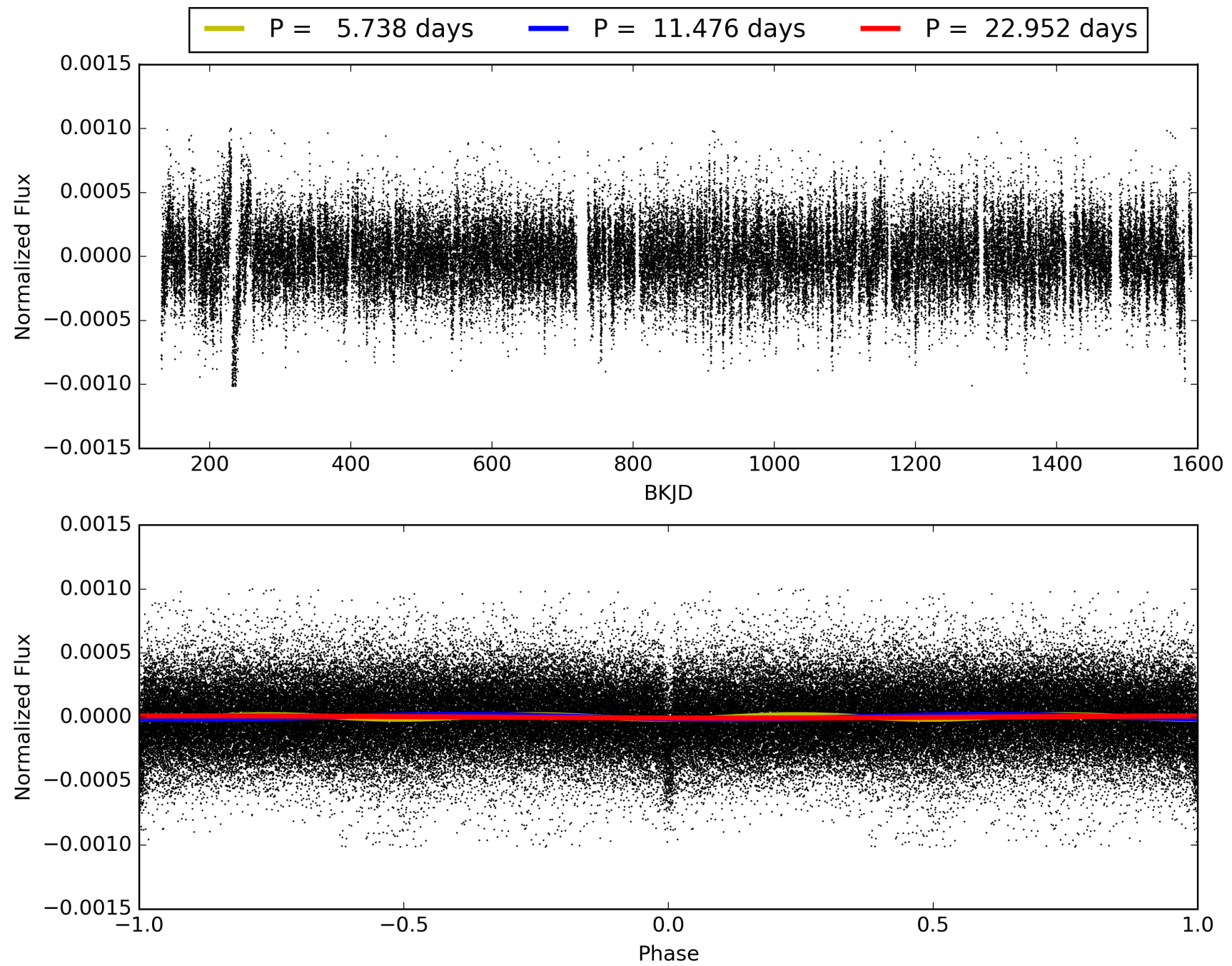
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:15:48 Z

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

TCE 008410727-01, PDC Light Curves

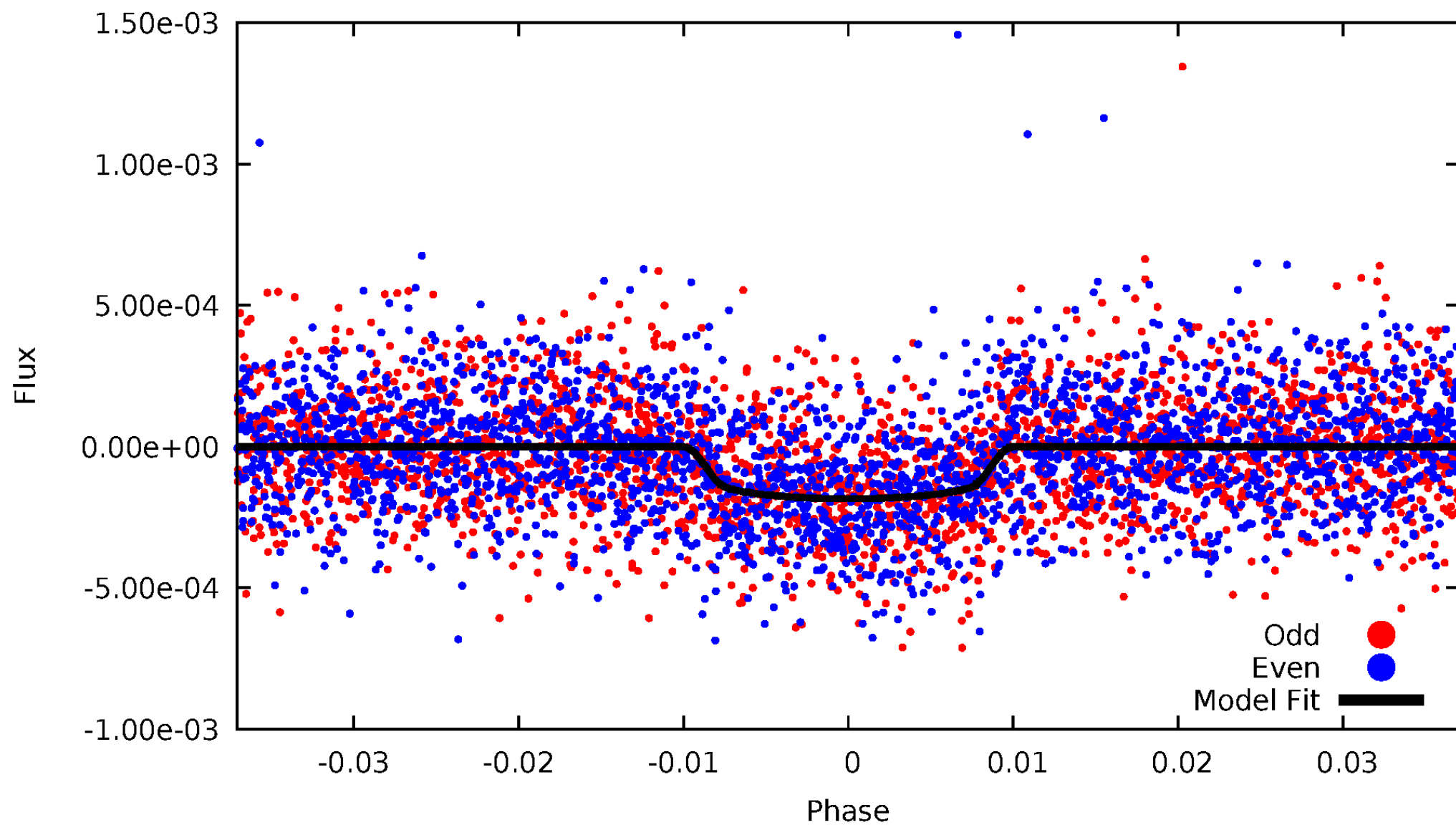


TCE 008410727-01



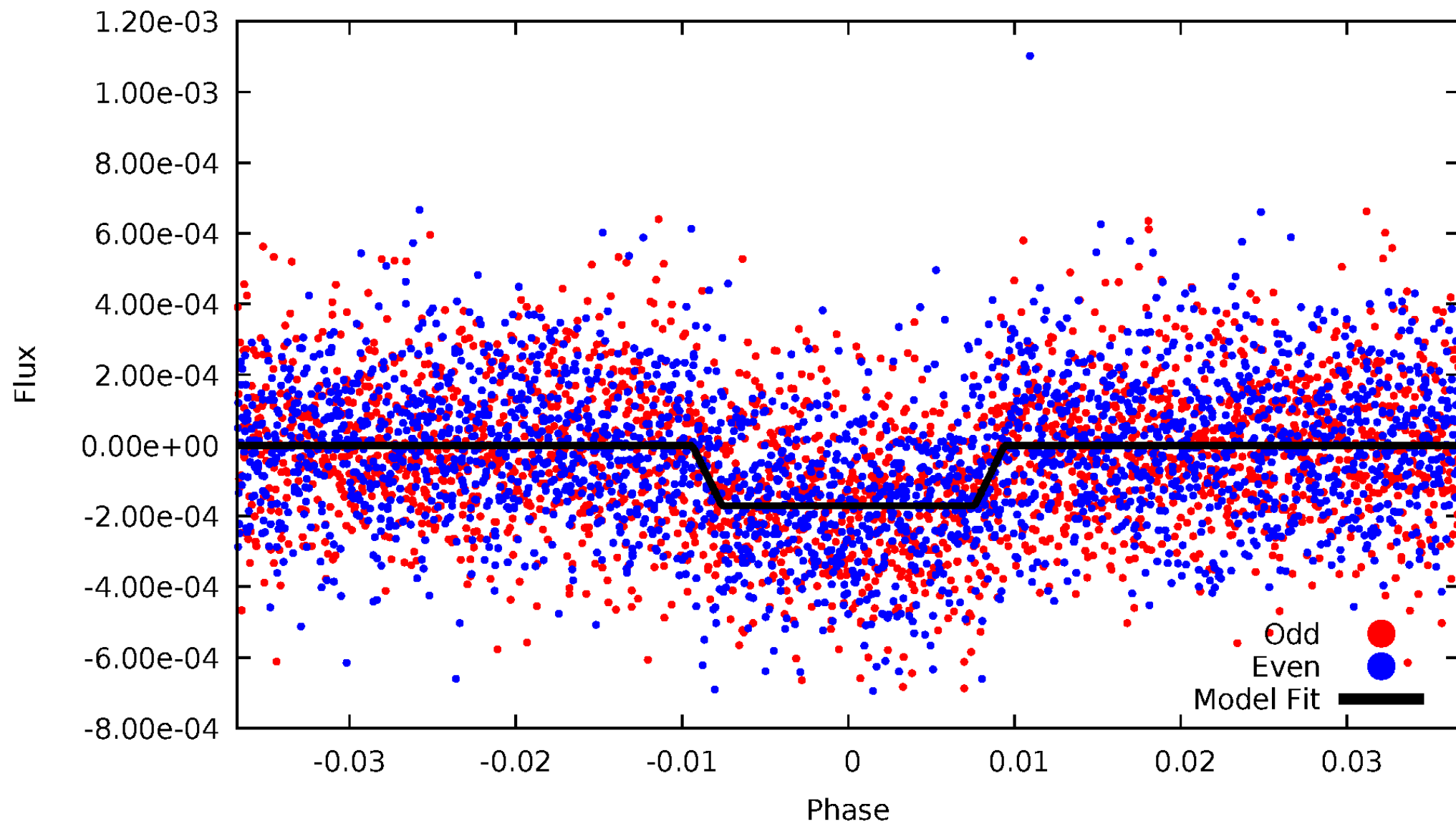
DV Odd/Even

TCE 008410727-01

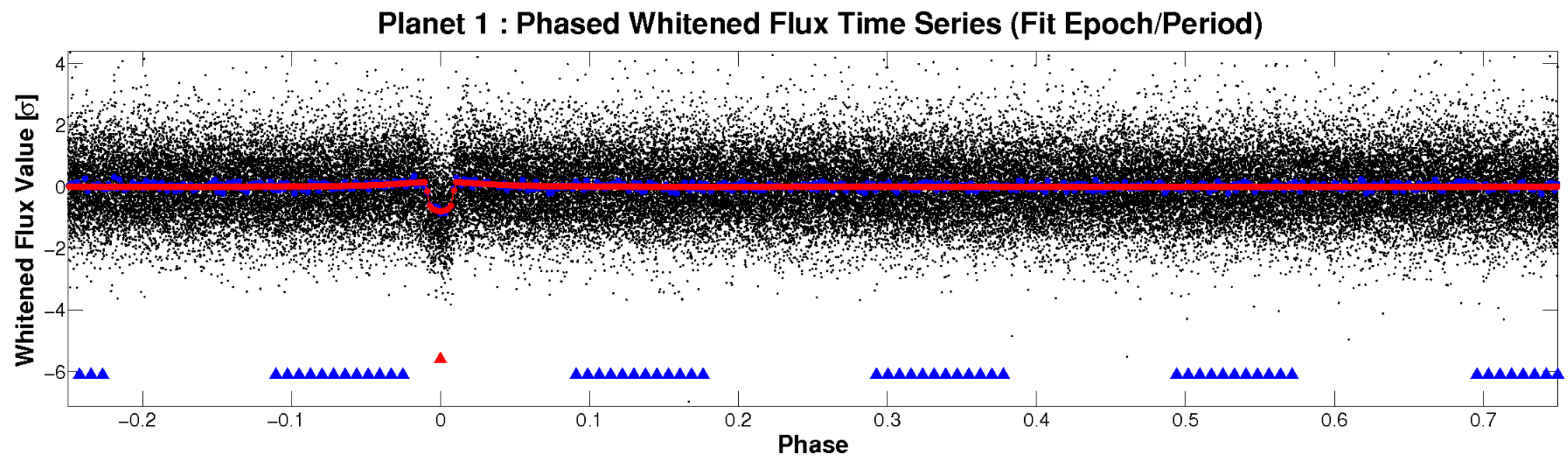
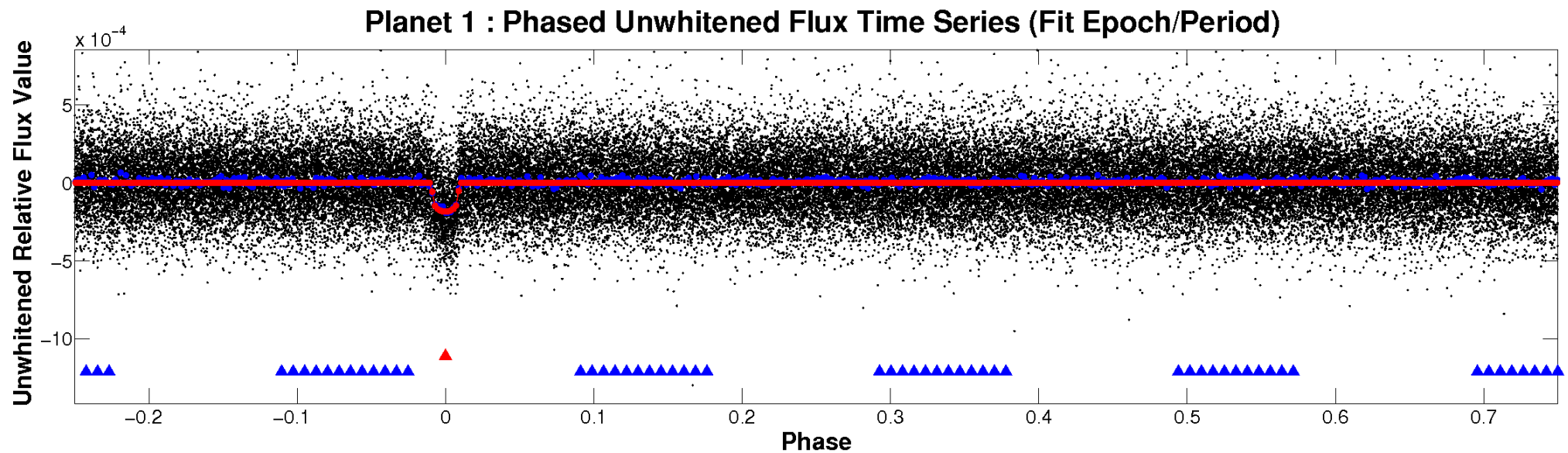


ALT Odd/Even

TCE 008410727-01

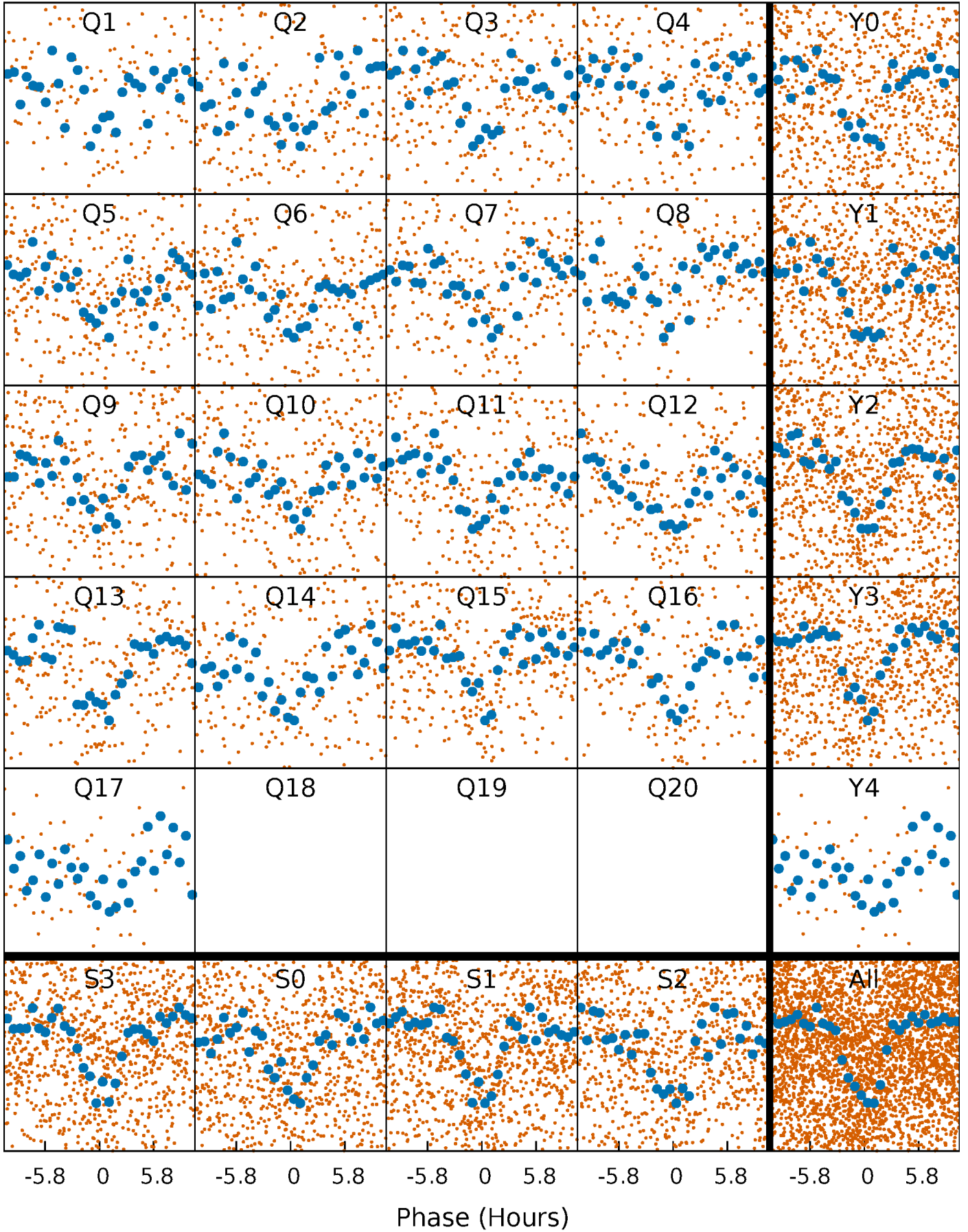


Non-Whitened Vs. Whitened Light Curve



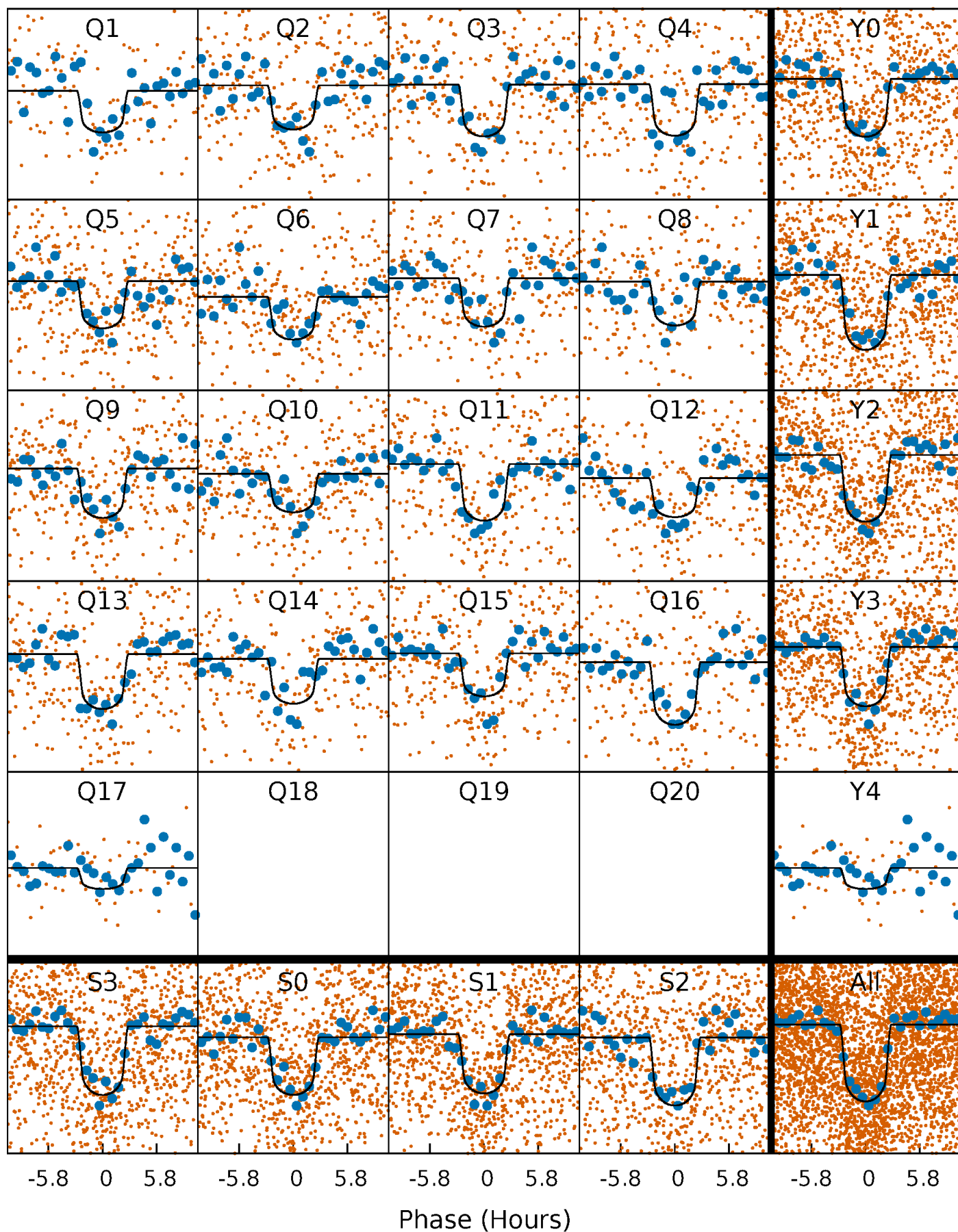
PDC Quarter-Phased Transit Curves

TCE 008410727-01 P= 11.476084 Days $T_0=135.396858$ (BKJD)



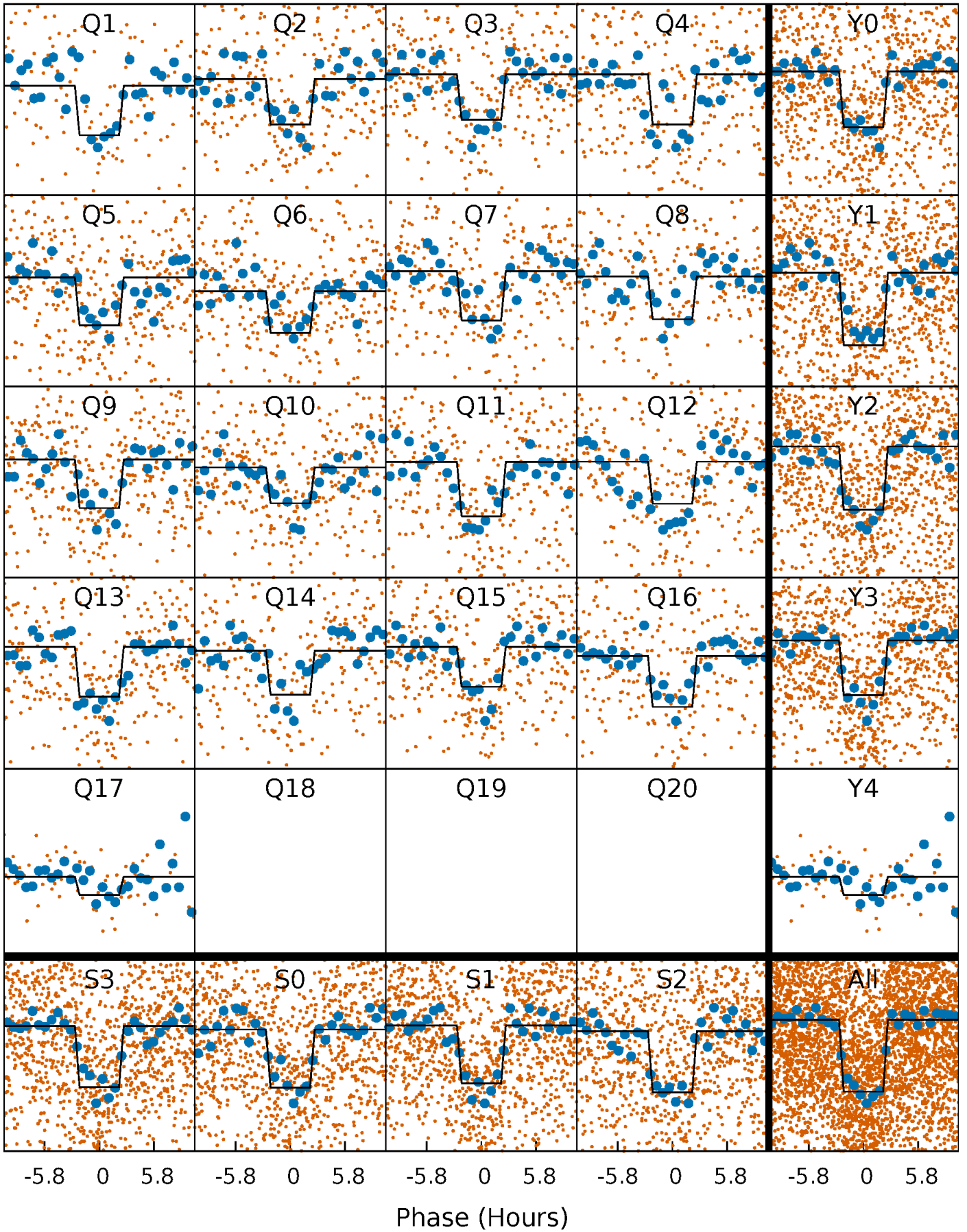
DV Quarter-Phased Transit Curves

TCE 008410727-01 P= 11.476084 Days $T_0=135.396858$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

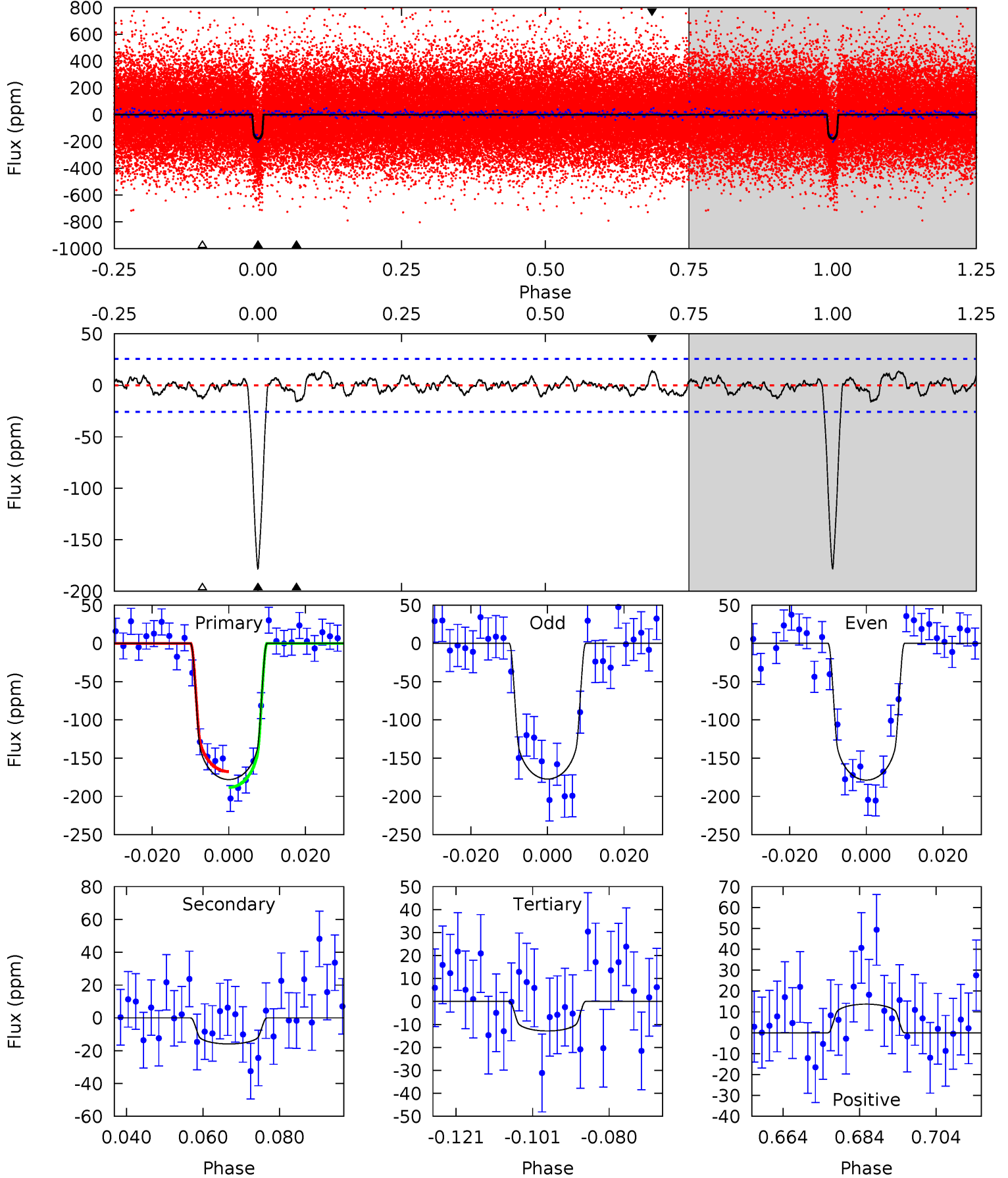
TCE 008410727-01 P= 11.476076 Days $T_0=135.396723$ (BKJD)



DV Model-Shift Uniqueness Test

008410727-01, P = 11.476084 Days, E = 123.920774 Days

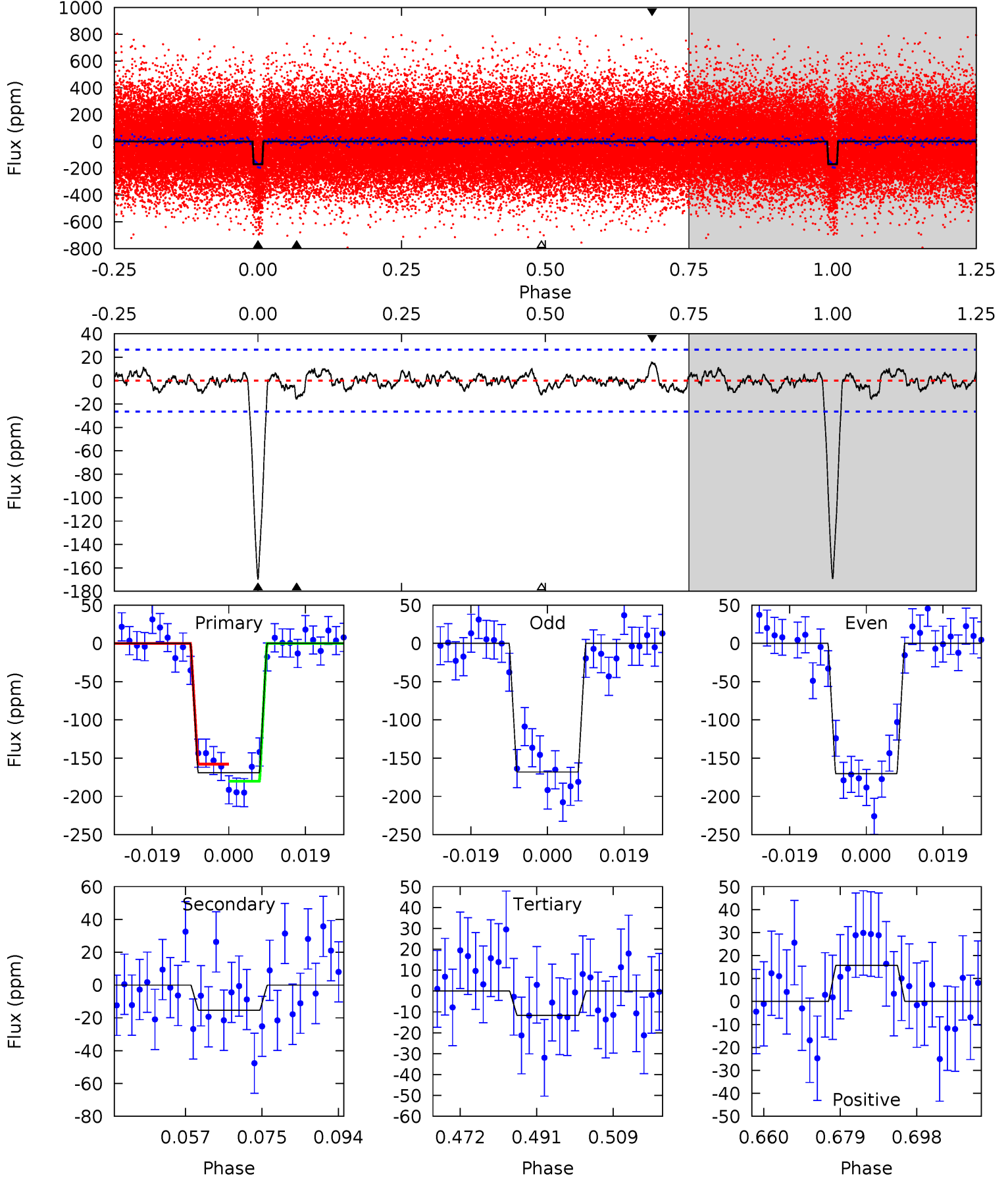
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.8	3.02	2.44	2.60	4.89	2.32	0.99	31.4	31.2	0.58	0.41	0.13	0.98	0.07	1.97



Alt Model-Shift Uniqueness Test

008410727-01, $P = 11.476076$ Days, $E = 123.920647$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.3	2.85	2.17	2.92	4.90	2.35	0.89	29.2	28.4	0.68	-0.07	0.19	1.00	0.09	2.07



Stellar Parameters For KIC 008410727

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6071^{+121}_{-133}	$4.202^{+0.149}_{-0.122}$	$0.100^{+0.150}_{-0.150}$	$1.410^{+0.252}_{-0.252}$	$1.156^{+0.104}_{-0.093}$	$0.581^{+0.408}_{-0.205}$
	+2%/-2%	+4%/-3%	+150%/-150%	+18%/-18%	+9%/-8%	+70%/-35%
Source	SPE58	SPE58	SPE58	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008410727-01 / KOI 1148.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-16 ± 5	$2.19^{+0.43}_{-0.45}$	1373^{+72}_{-74}	3621^{+335}_{-282}	19^{+14}_{-8}
Alt.	-15 ± 5	$1.99^{+0.40}_{-0.43}$	1371^{+73}_{-71}	3736^{+349}_{-360}	23^{+18}_{-11}

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 $A_{obs} \gg 1.0$

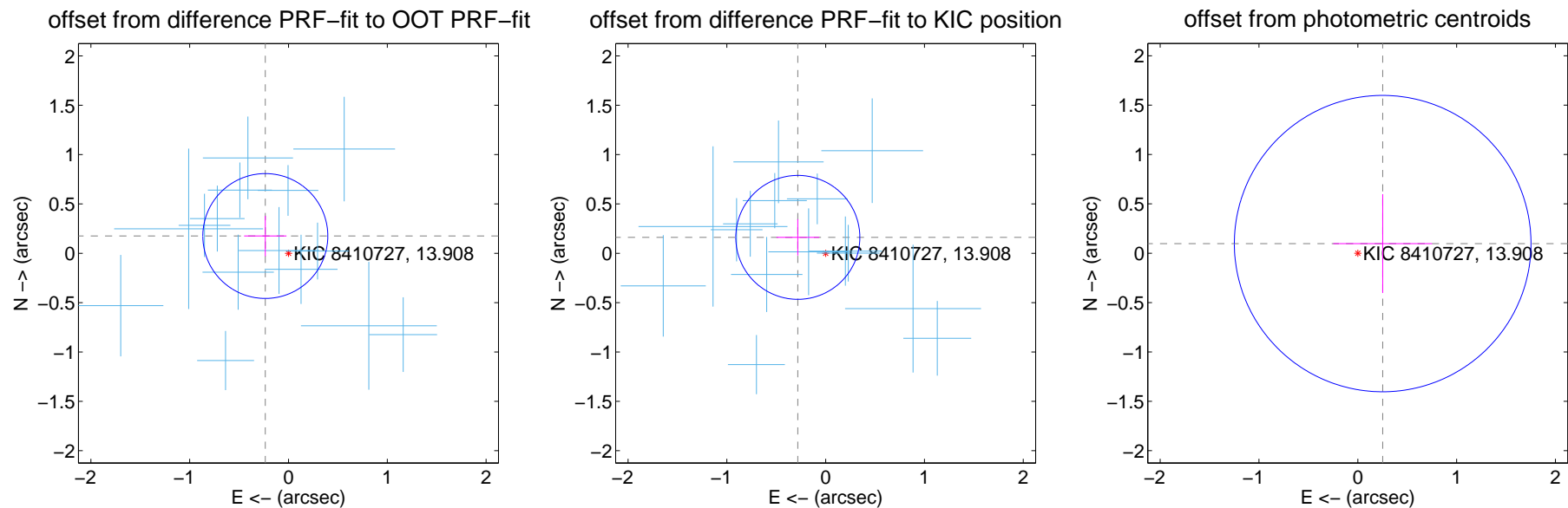
DV Centroid Data

Supplemental centroid analysis for 008410727-01. Kepler magnitude: 13.91. Transit SNR 24.14

There are 16 quarters with good PRF difference image offsets

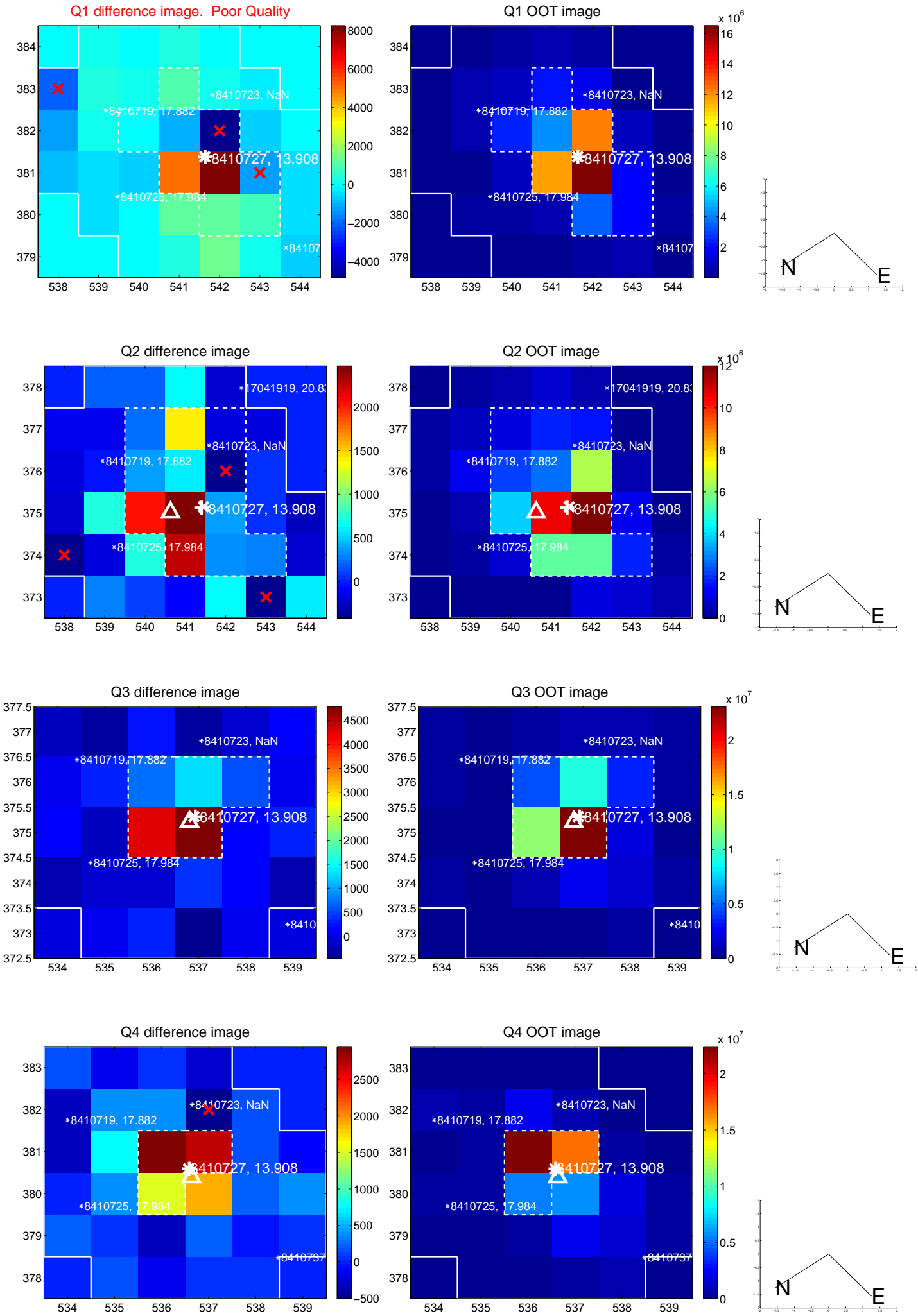
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.293 ± 0.211	1.39	0.235 ± 0.214	0.175 ± 0.205
PRF-fit source offset from KIC position	0.325 ± 0.209	1.55	0.282 ± 0.217	0.161 ± 0.184
photometric centroid source offset	0.27 ± 0.50	0.54	-0.25 ± 0.50	0.10 ± 0.50

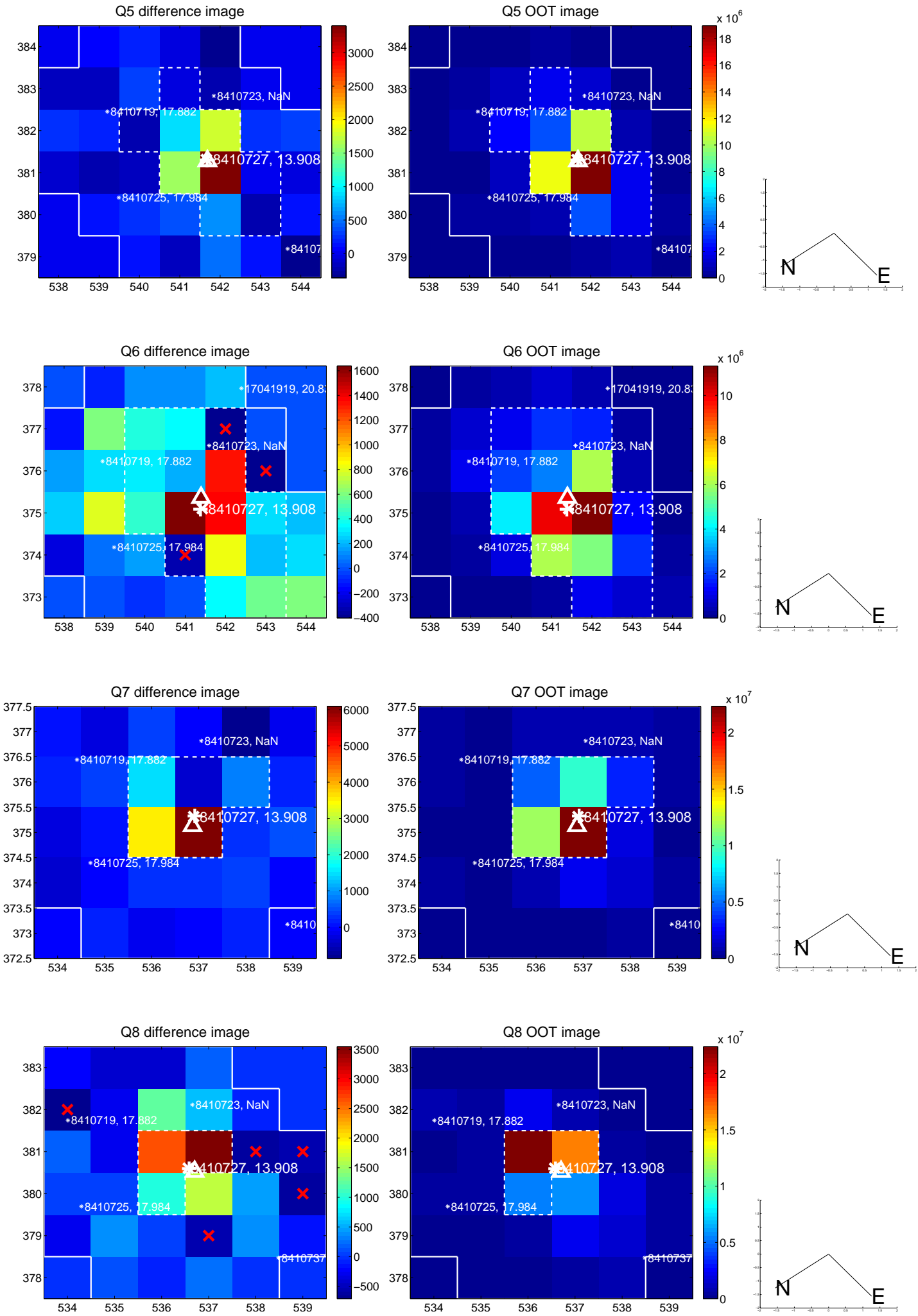


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

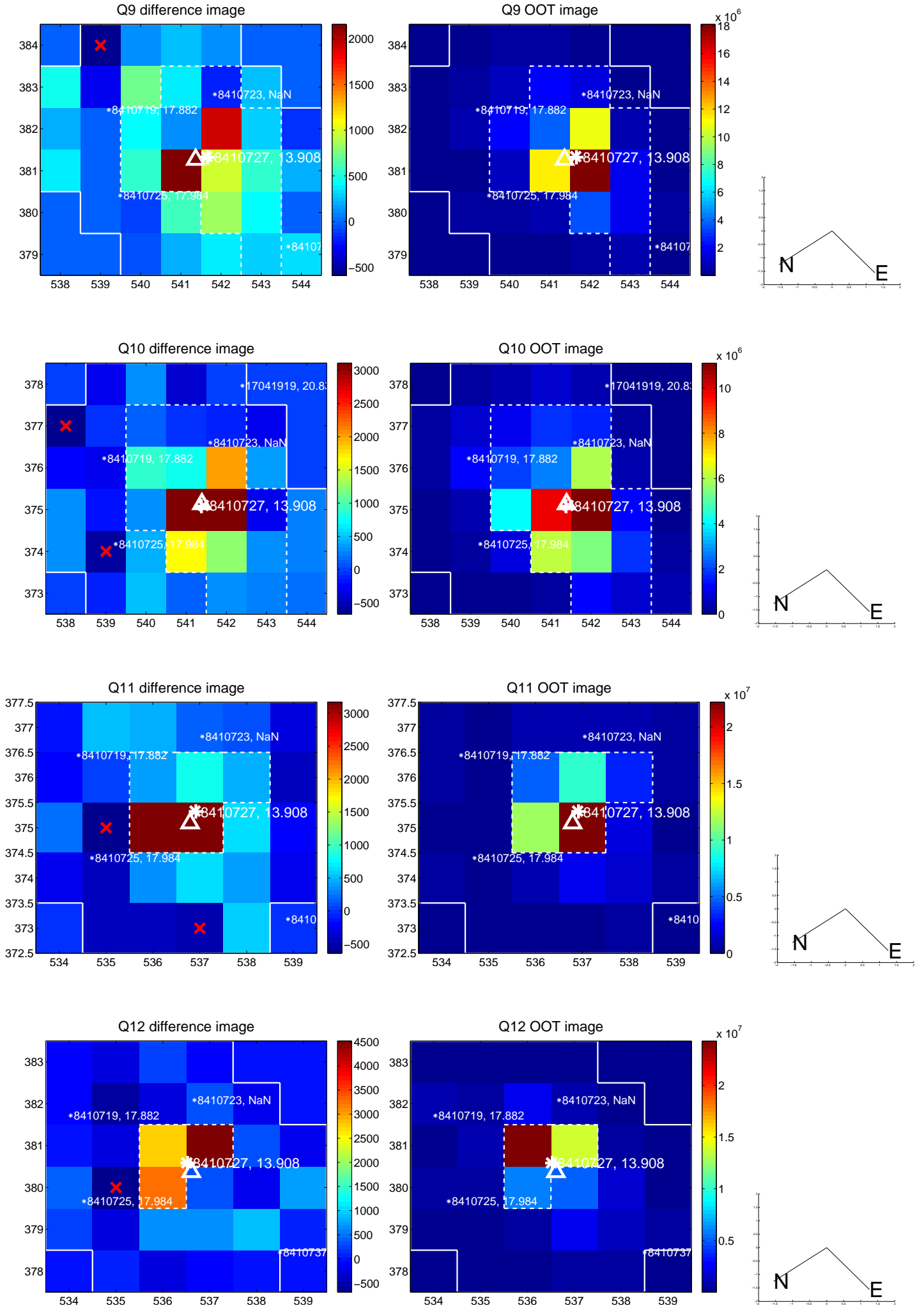
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



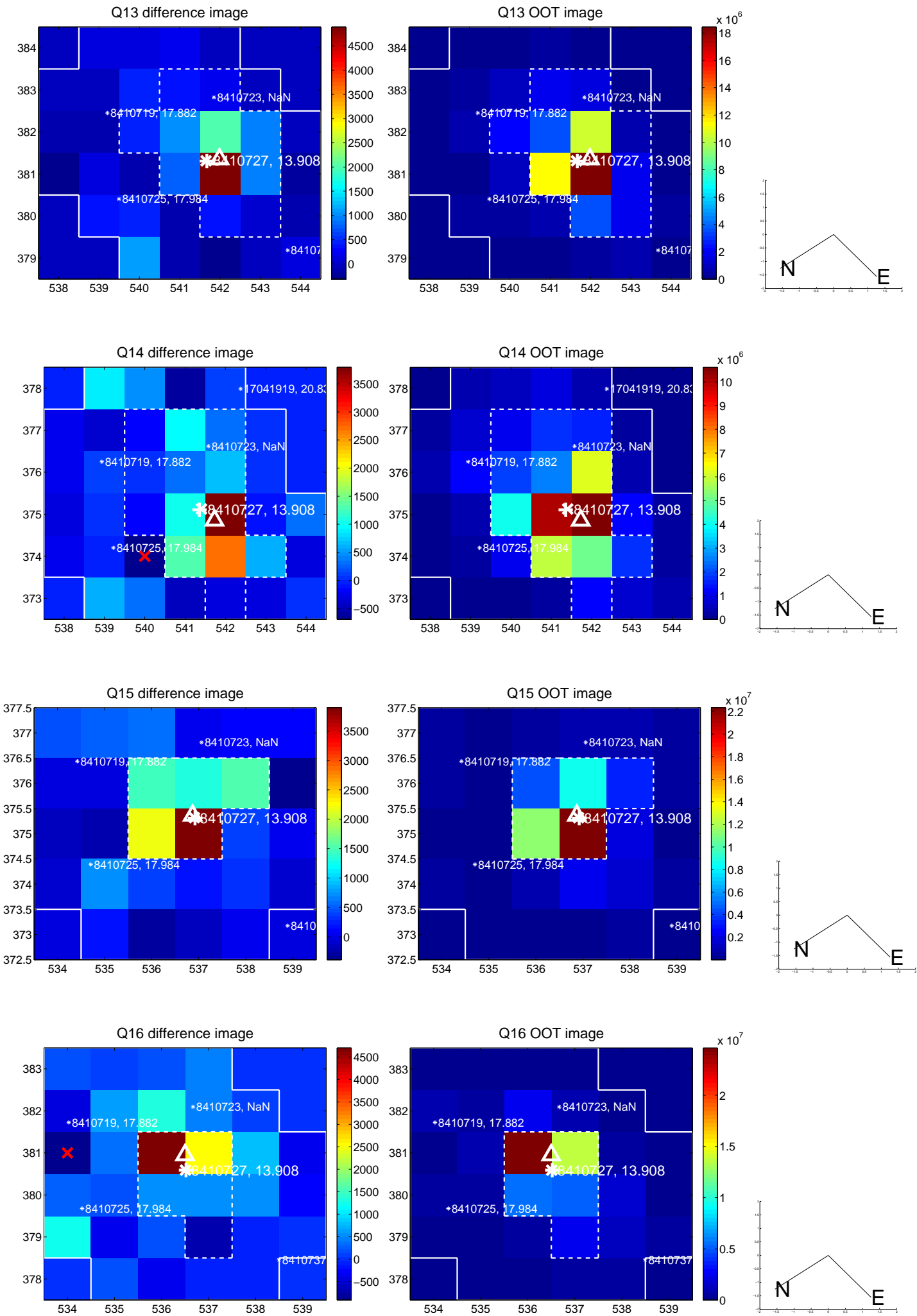
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



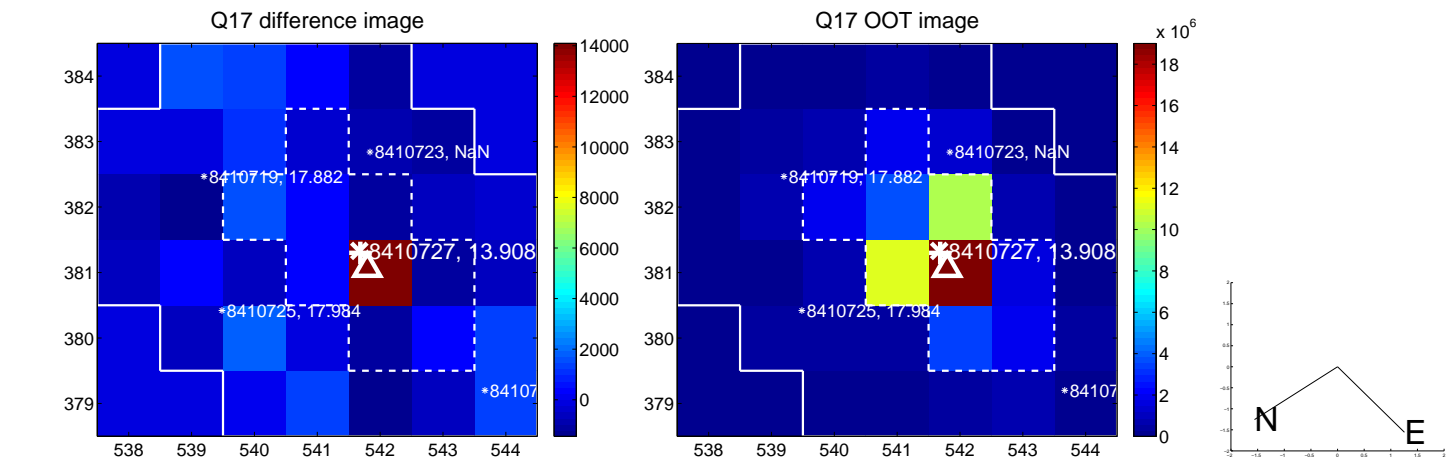
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



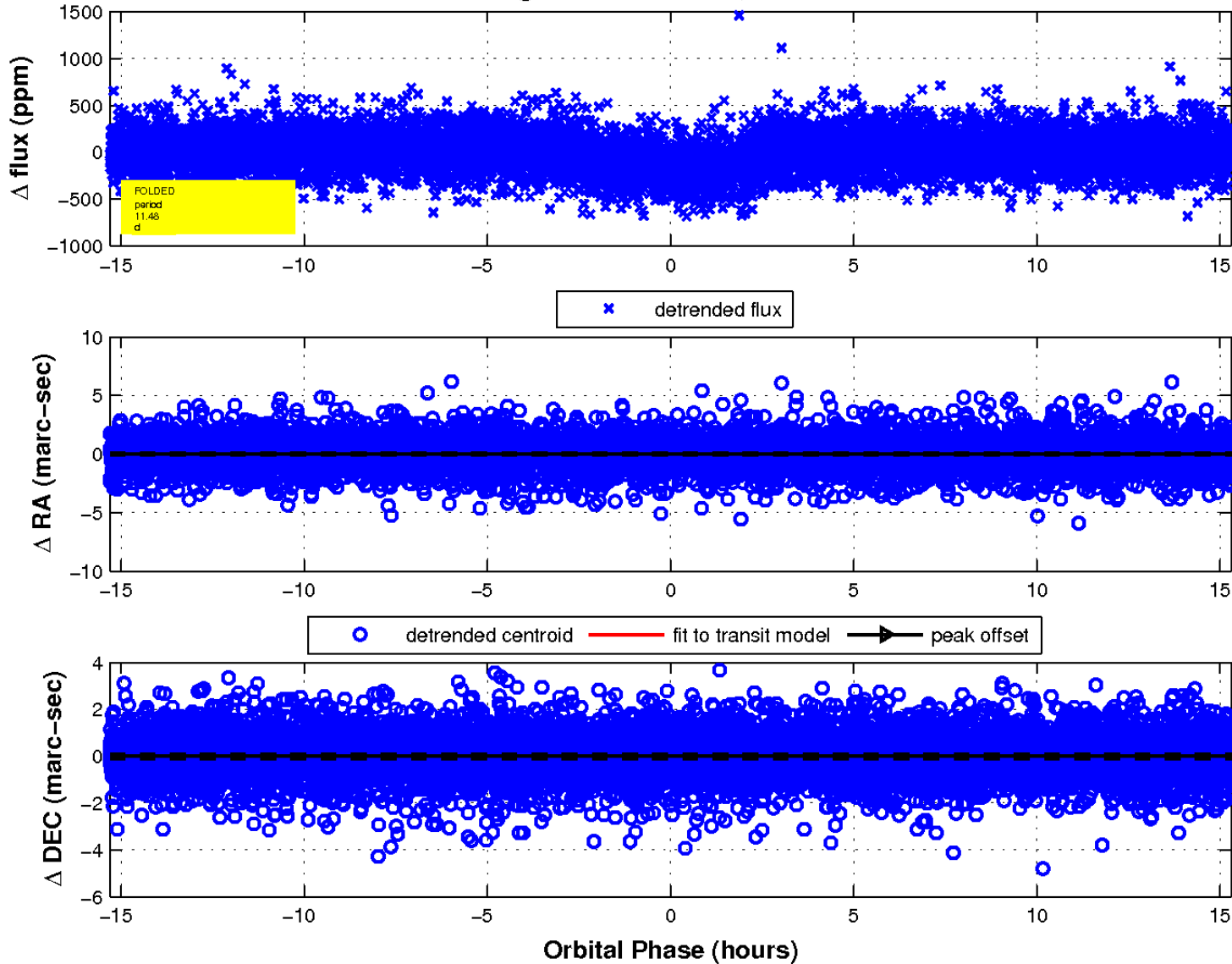
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

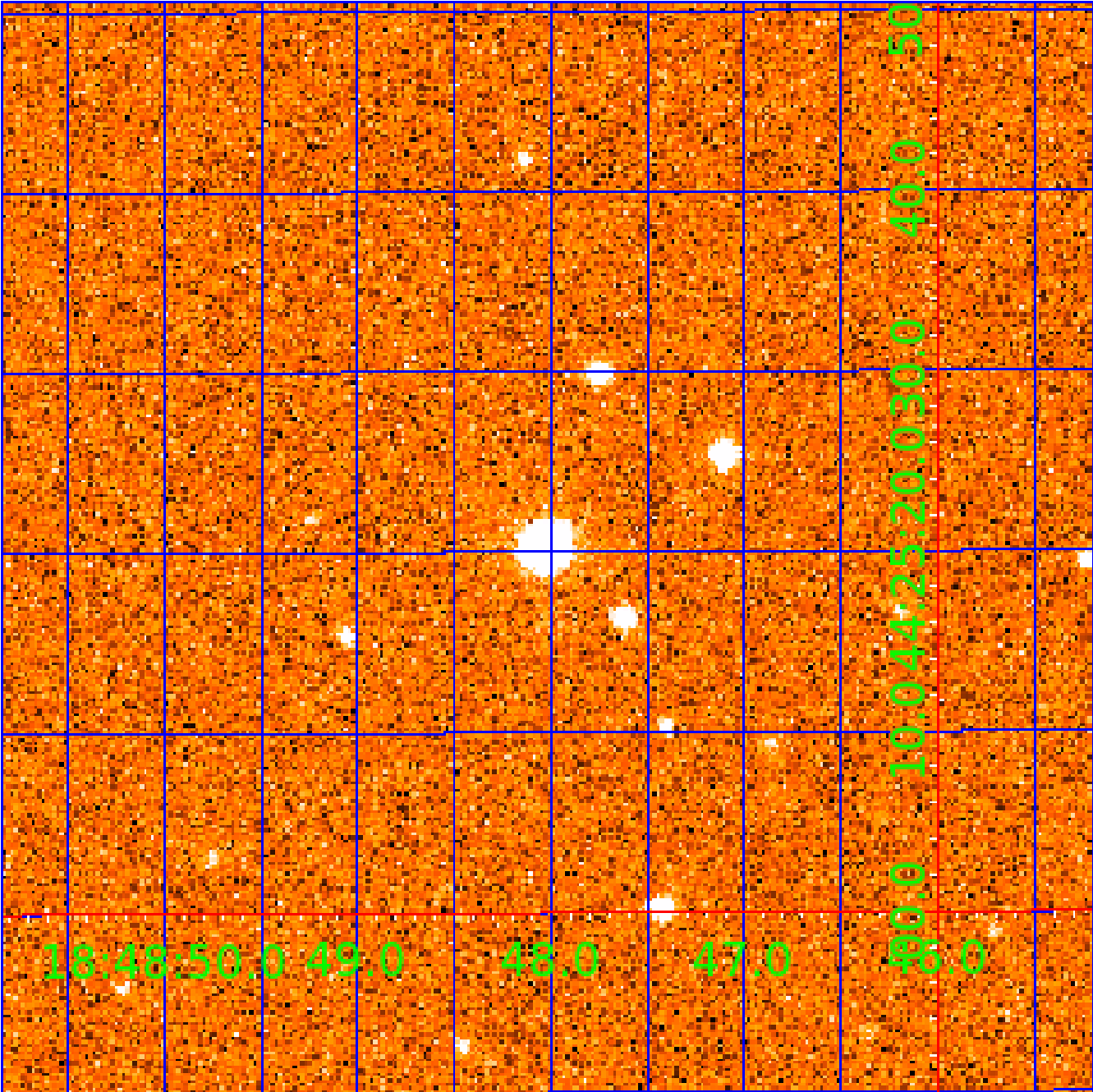


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008410727

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})
008410727-01	OBS	1148.01	11.476084	135.396858	184.3	5.104	23.0	24.1	1.41	6071	2.20	221.66
008410727-02	OBS	1148.02	25.265164	134.129326	109.2	7.914	10.7	10.8	1.41	6071	1.72	77.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008410727-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008410727-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

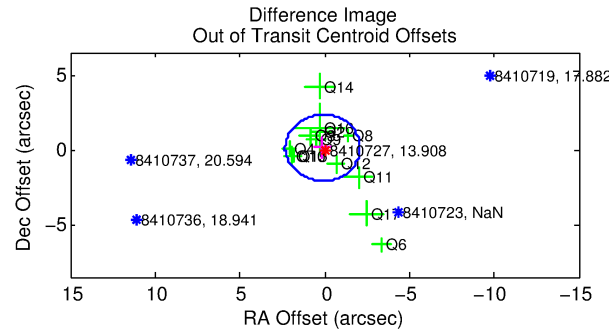
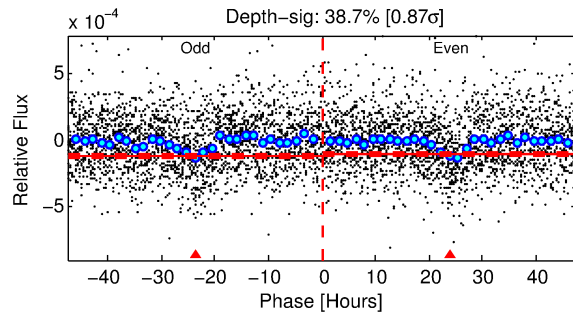
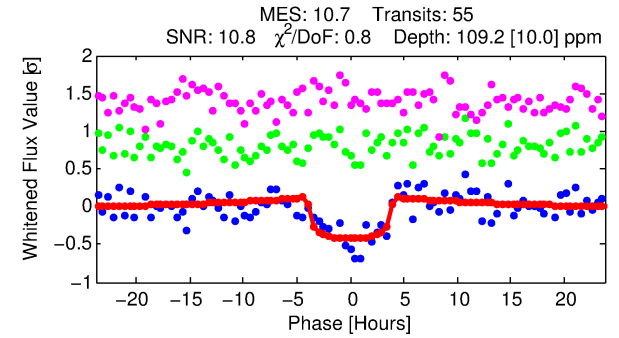
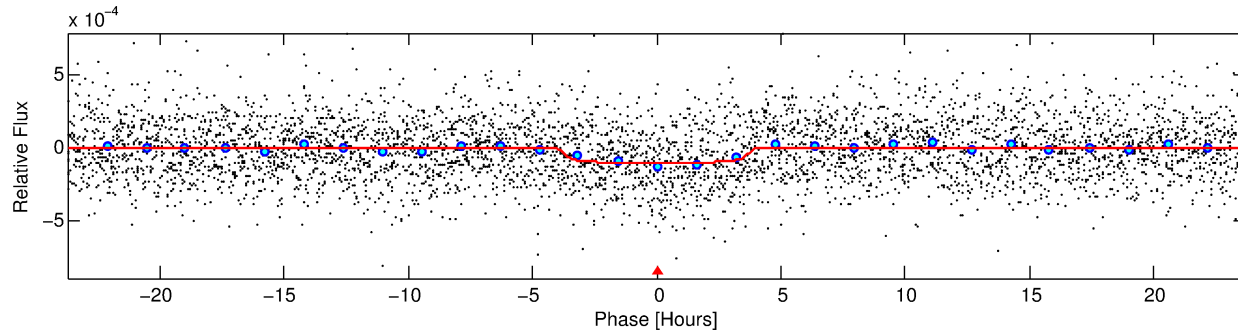
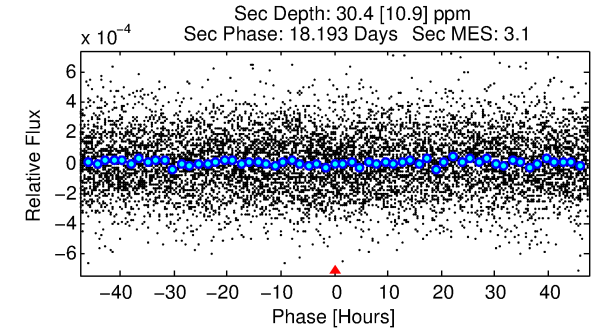
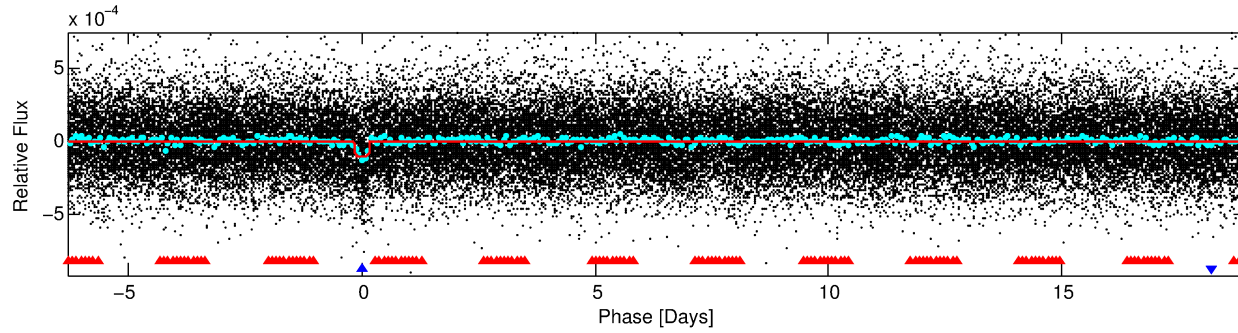
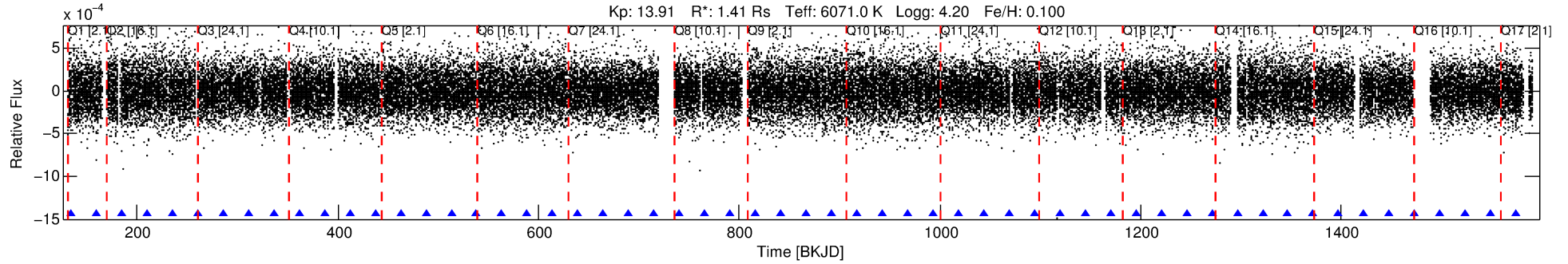
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008410727-02

No Significant Match Found

DV One-Page Summary

KIC: 8410727 Candidate: 2 of 2 Period: 25.265 d
KOI: K01148.02 Name: Kepler-270c Corr: 0.881



DV Fit Results:

Period = 25.26516 [0.00035] d
Epoch = 134.1293 [0.0112] BKJD
Rp/R* = 0.0112 [0.0027]
a/R* = 11.82 [13.87]
b = 0.89 [0.28]
Seff = 77.40 [21.08]
Teq = 756 [52] K
Rp = 1.72 [0.51] Re
a = 0.1768 [0.0292] AU
Ag = 176.46 [114.45] [1.53σ]
Teffp = 4262 [641] K [5.45σ]

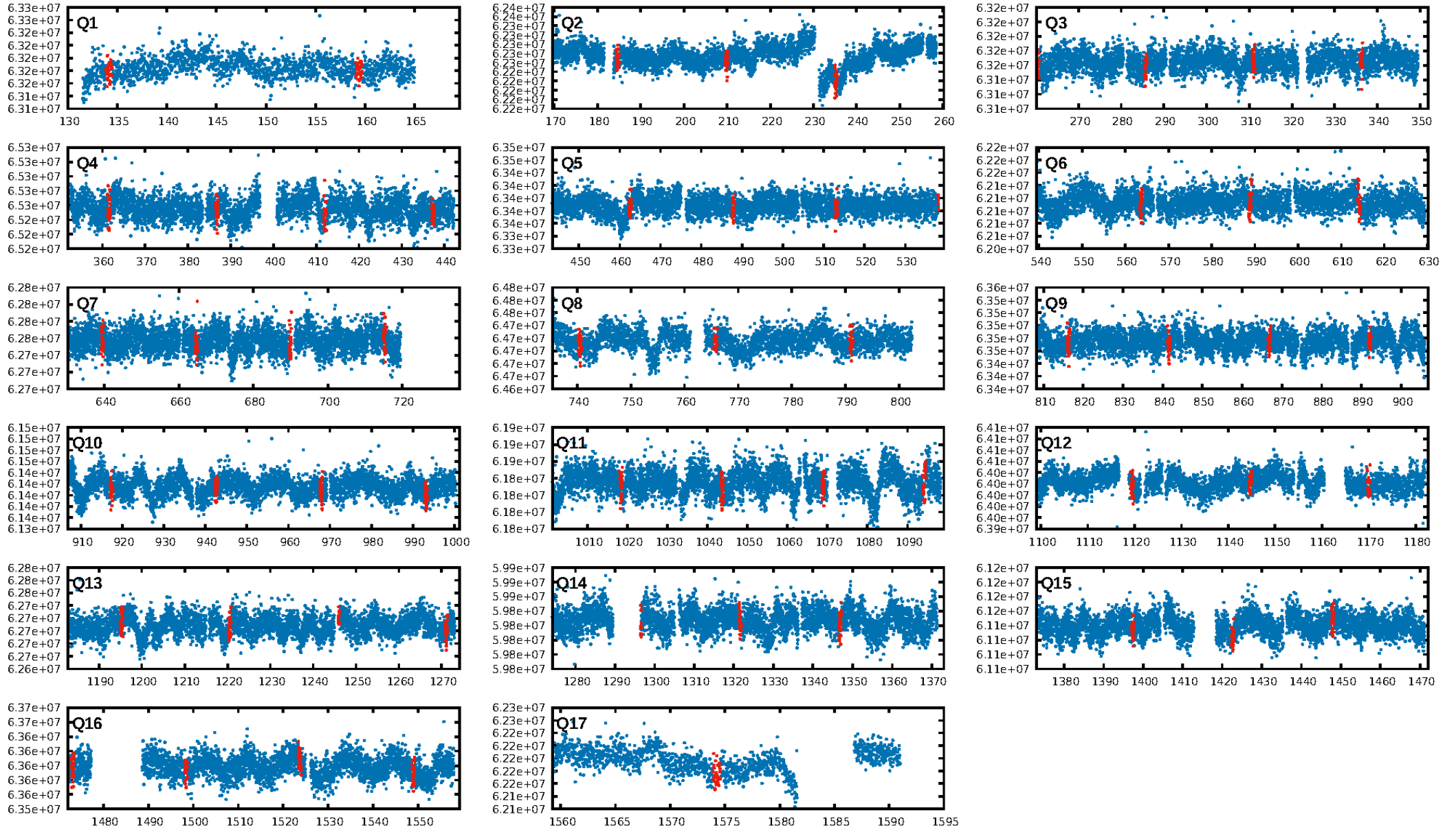
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.14σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 98.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.37e-26
RollingBand-fgt: 1.00 [52/52]
GhostDiagnostic-chr: 2.223
Centroid-sig: 4.0%
Centroid-so: 1.407 arcsec [1.38σ]
OotOffset-rm: 0.172 arcsec [0.23σ]
KicOffset-rm: 0.210 arcsec [0.27σ]
OotOffset-st: 4/3/4/2 [13]
KicOffset-st: 4/3/4/2 [13]
DiffImageQuality-fgm: 0.69 [9/13]
DiffImageOverlap-fno: 0.94 [16/17]

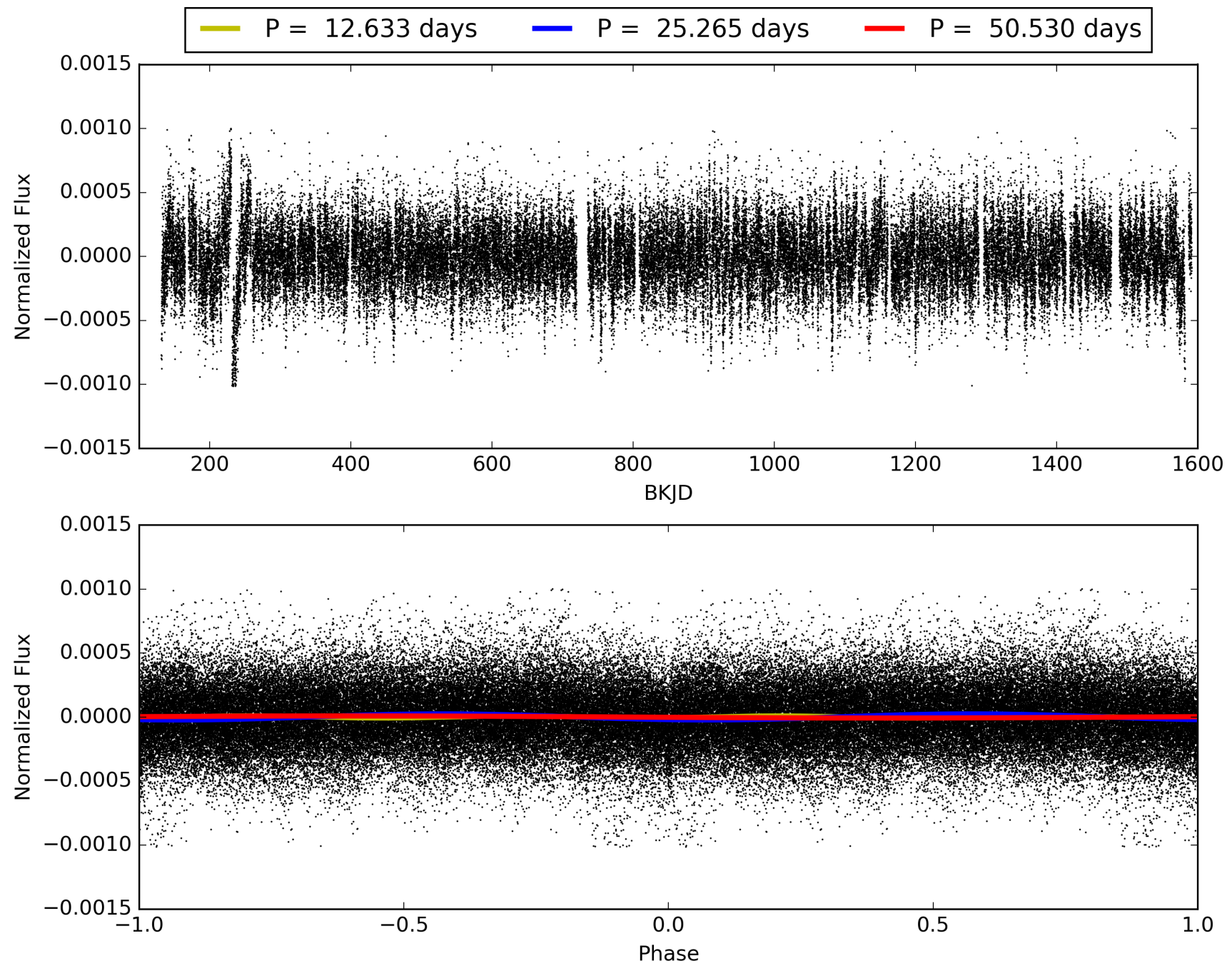
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:15:55 Z

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

TCE 008410727-02, PDC Light Curves

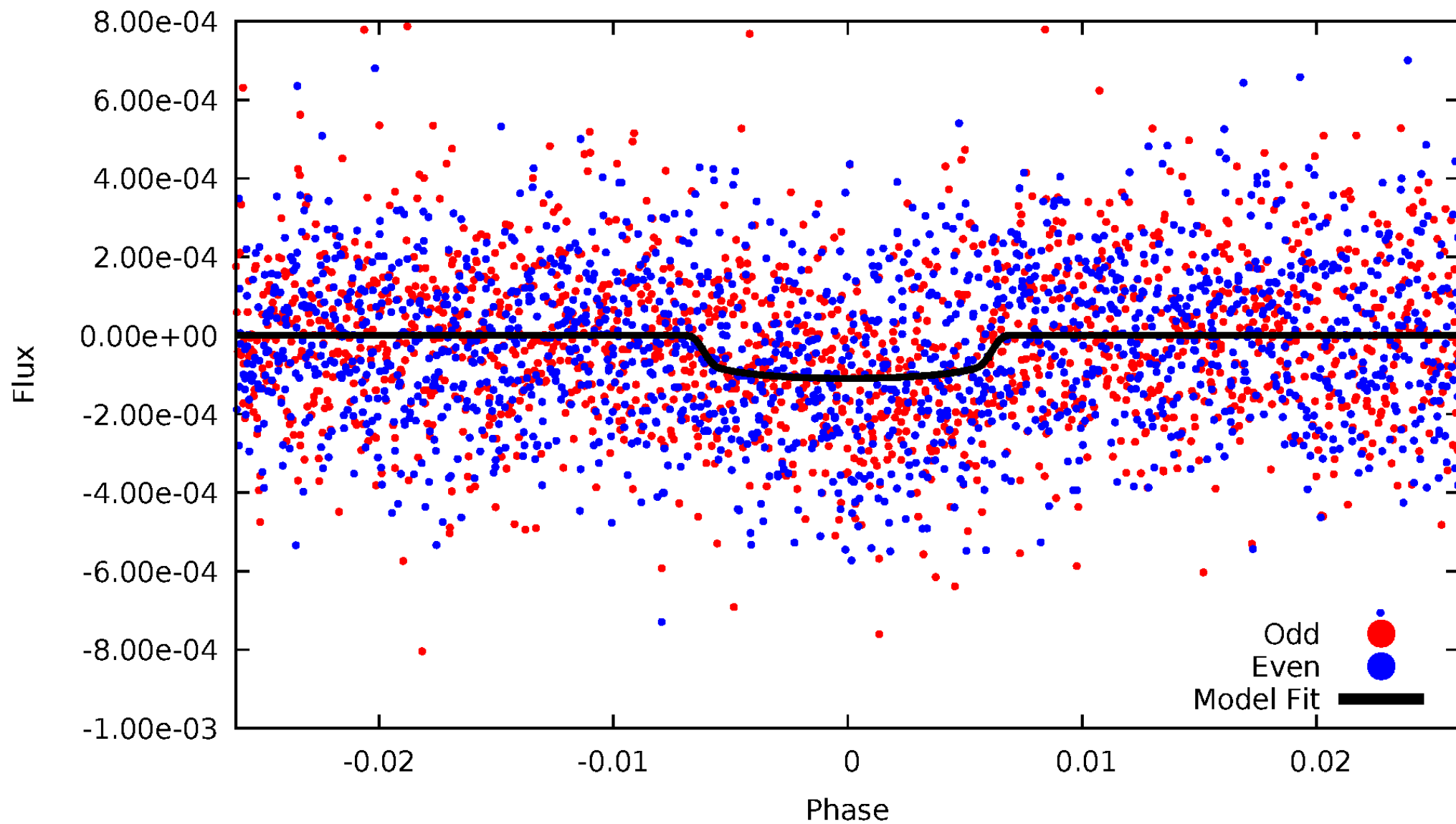


TCE 008410727-02



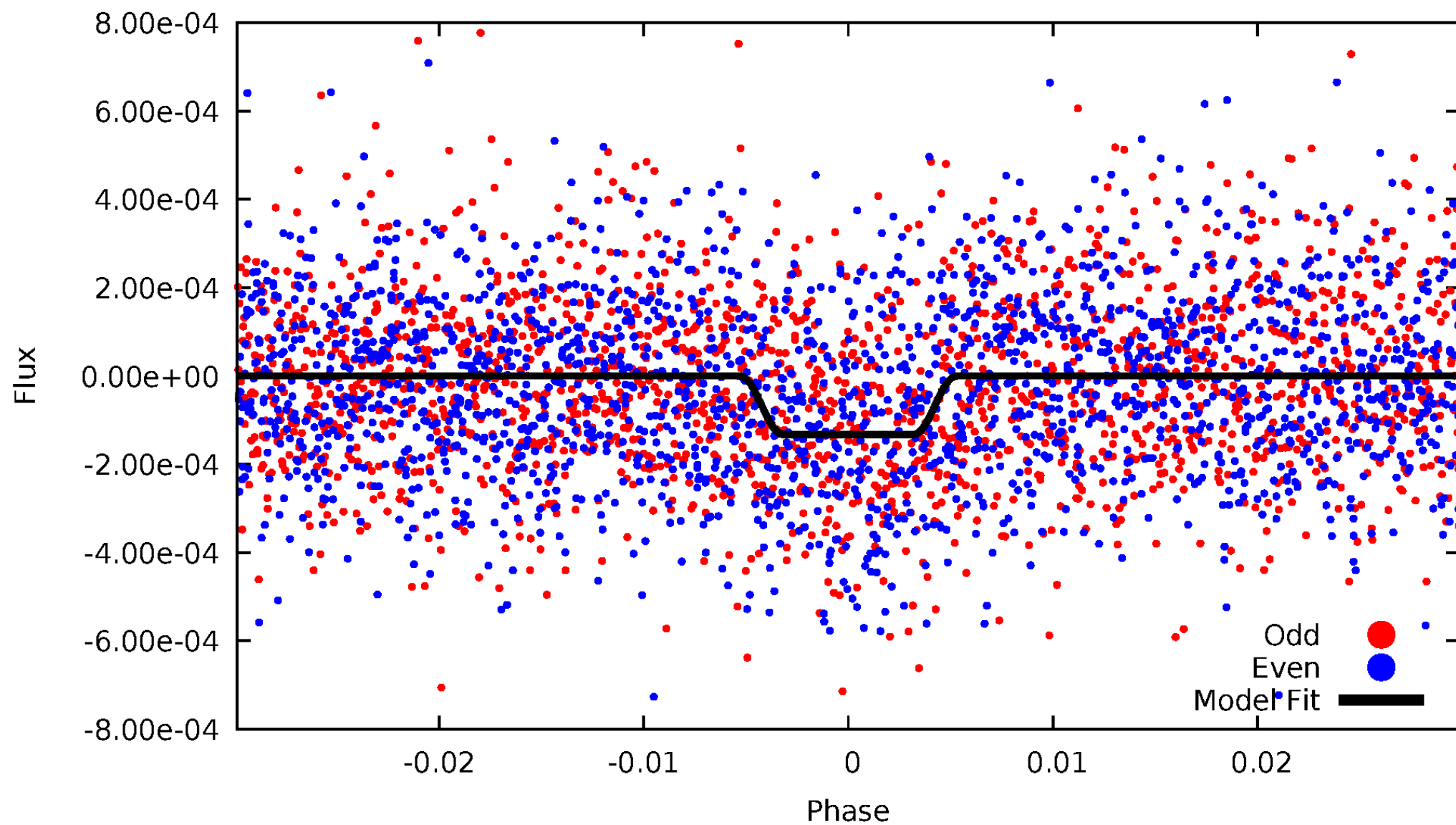
DV Odd/Even

TCE 008410727-02



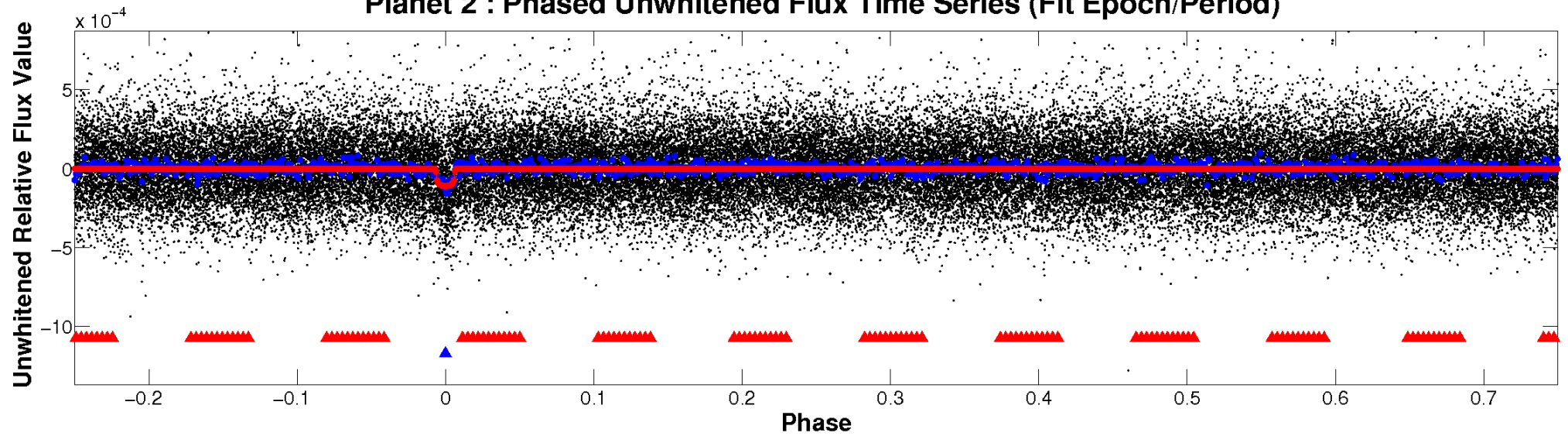
ALT Odd/Even

TCE 008410727-02

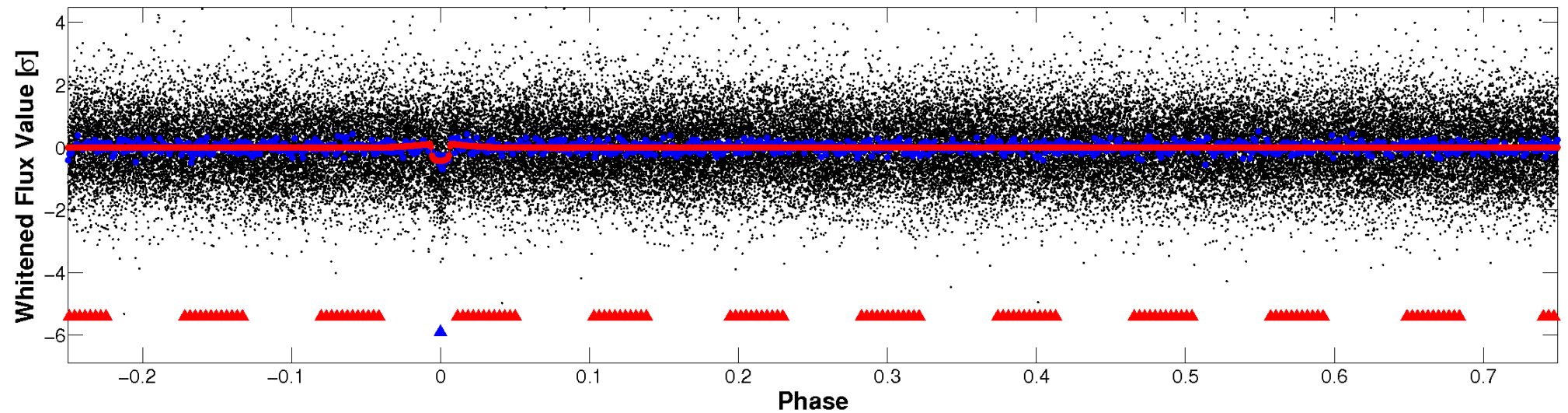


Non-Whitened Vs. Whitened Light Curve

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

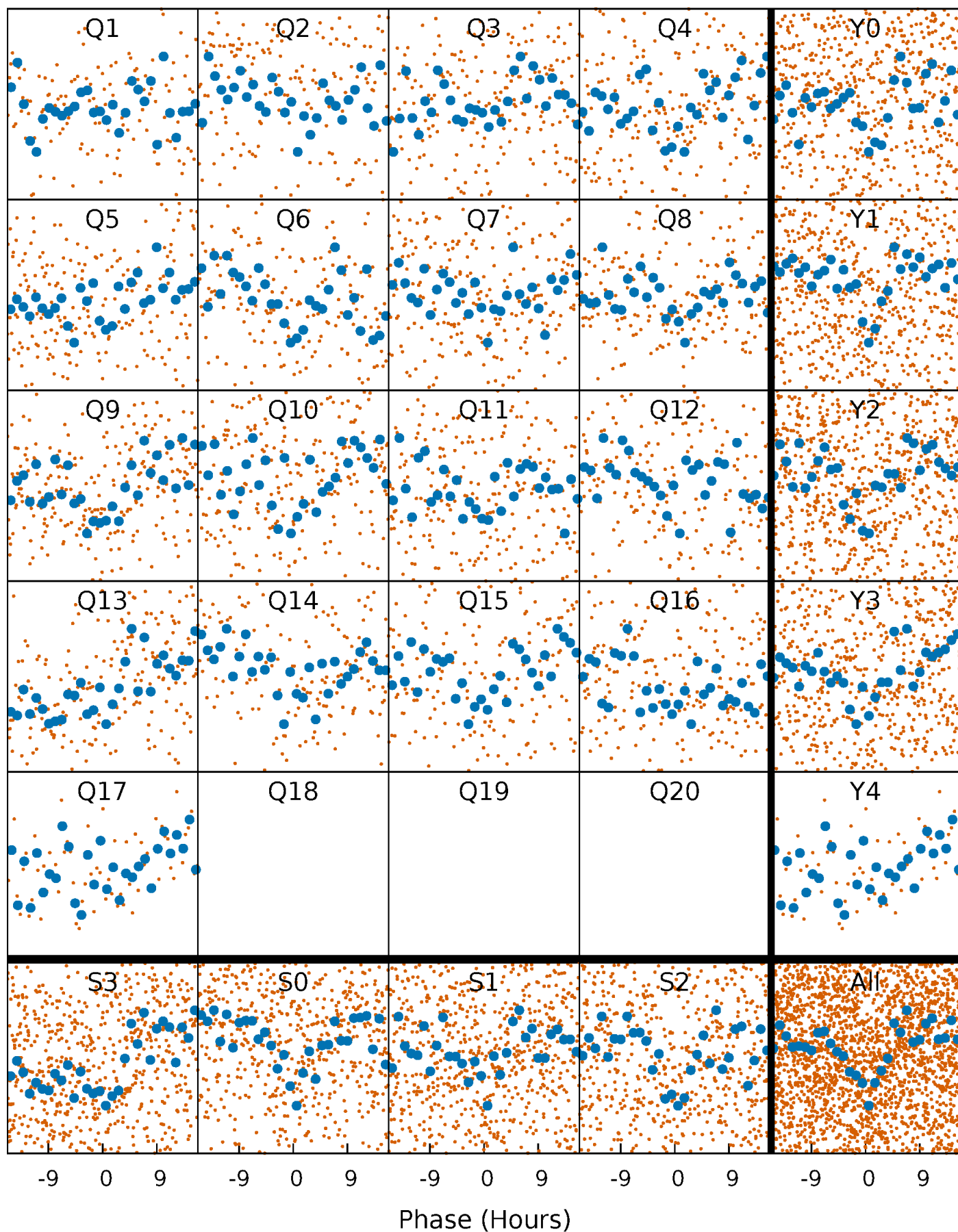


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



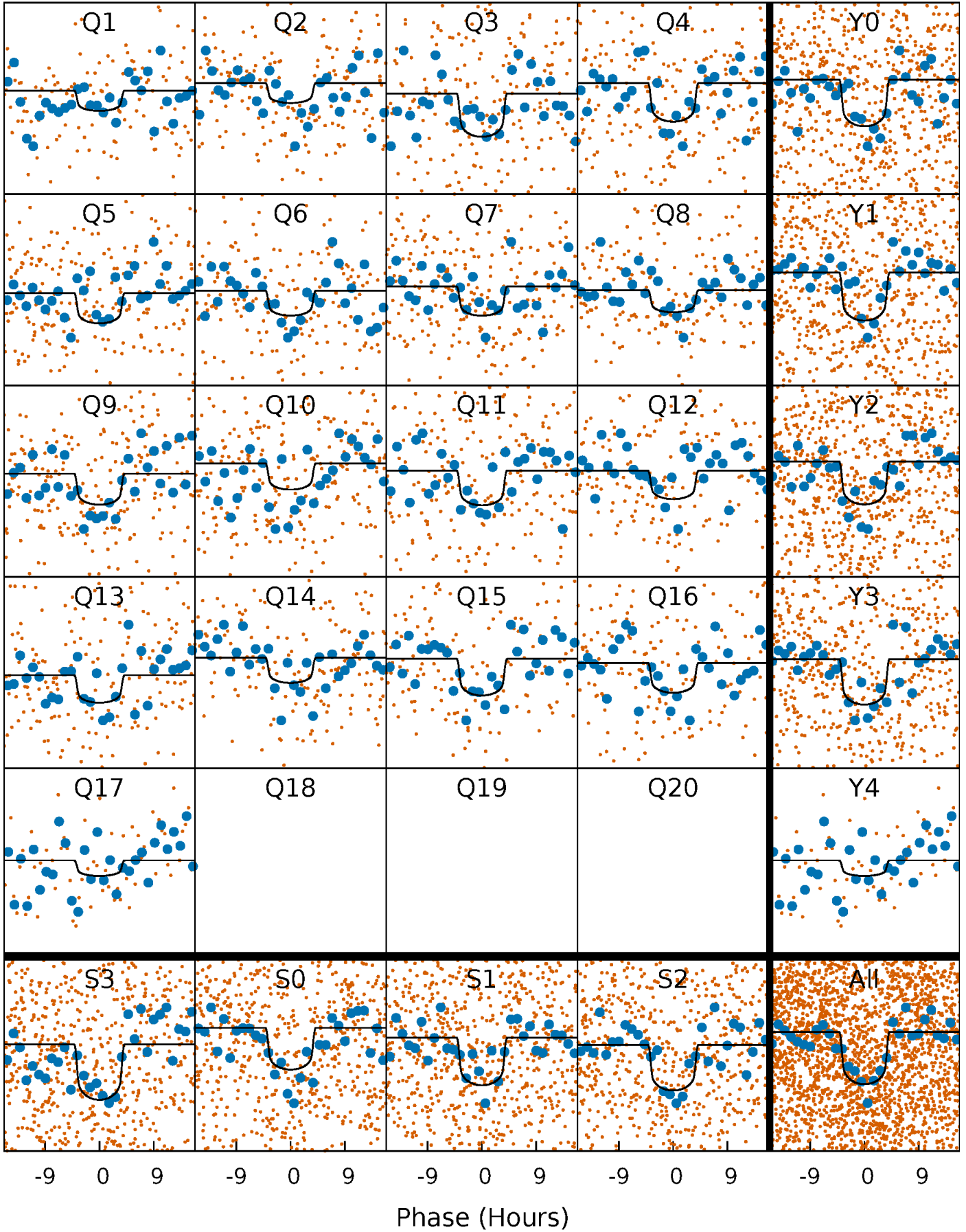
PDC Quarter-Phased Transit Curves

TCE 008410727-02 P= 25.265164 Days $T_0=134.129326$ (BKJD)



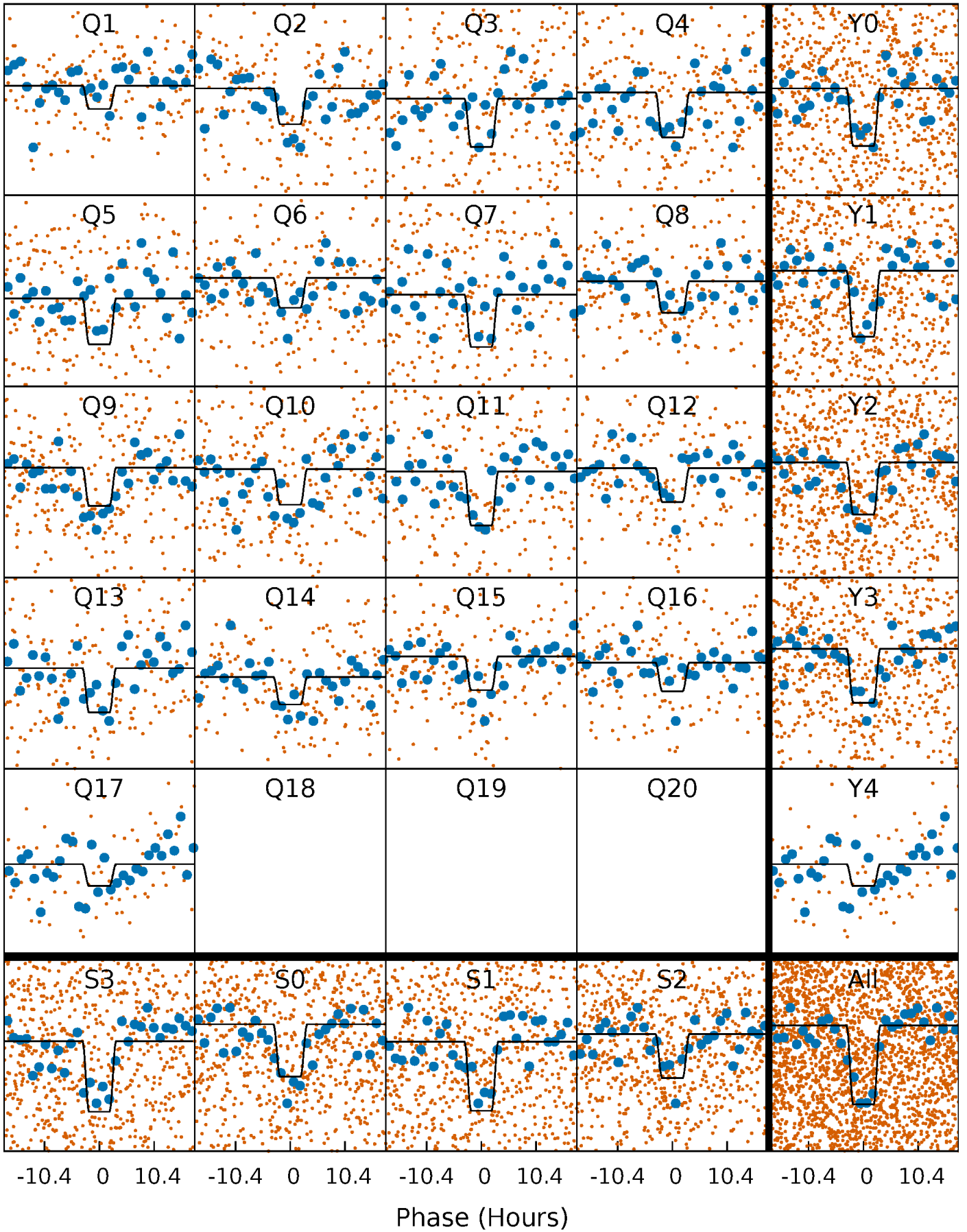
DV Quarter-Phased Transit Curves

TCE 008410727-02 P= 25.265164 Days $T_0=134.129326$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

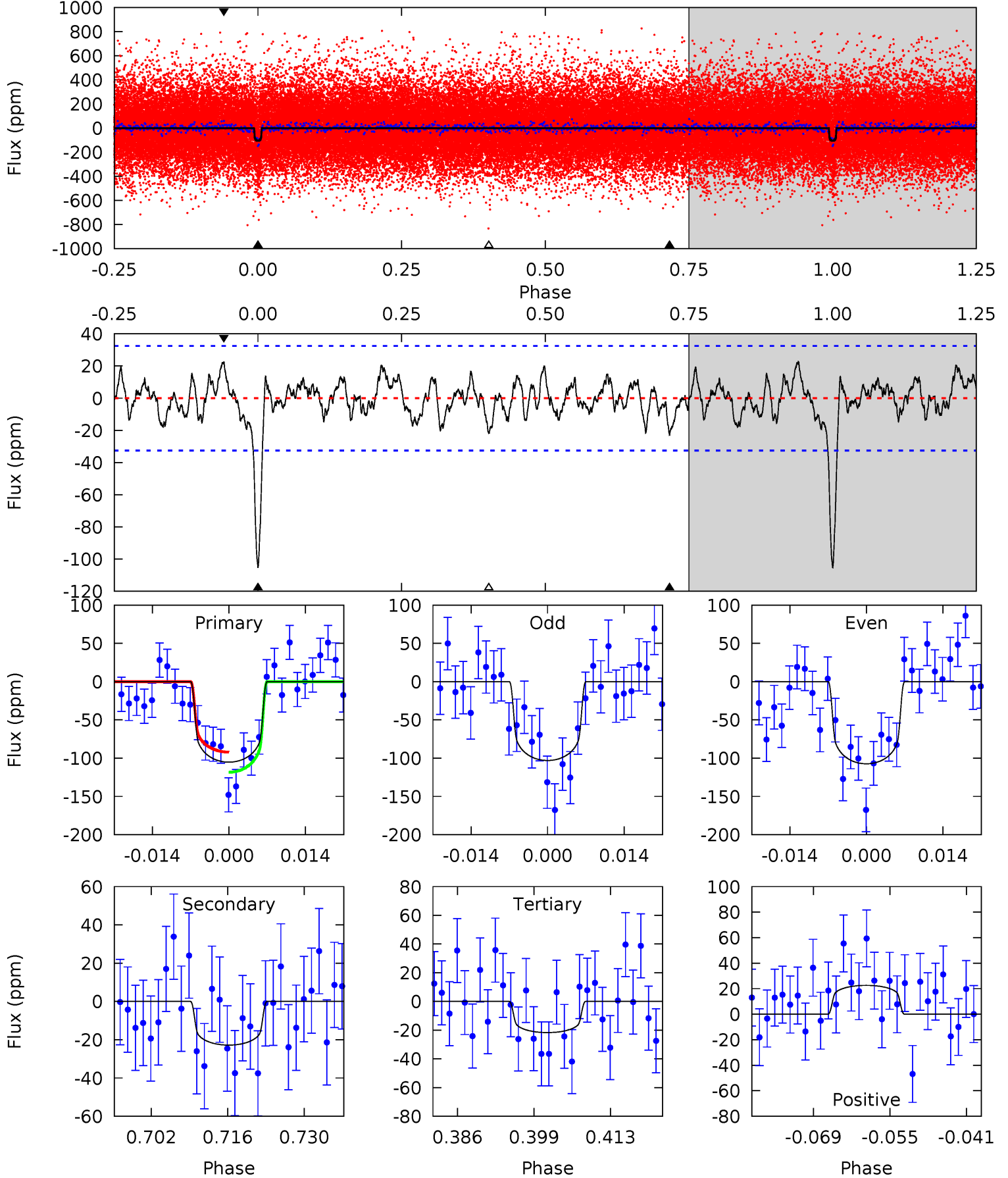
TCE 008410727-02 P= 25.263761 Days $T_0=134.174707$ (BKJD)



DV Model-Shift Uniqueness Test

008410727-02, $P = 25.265164$ Days, $E = 108.864162$ Days

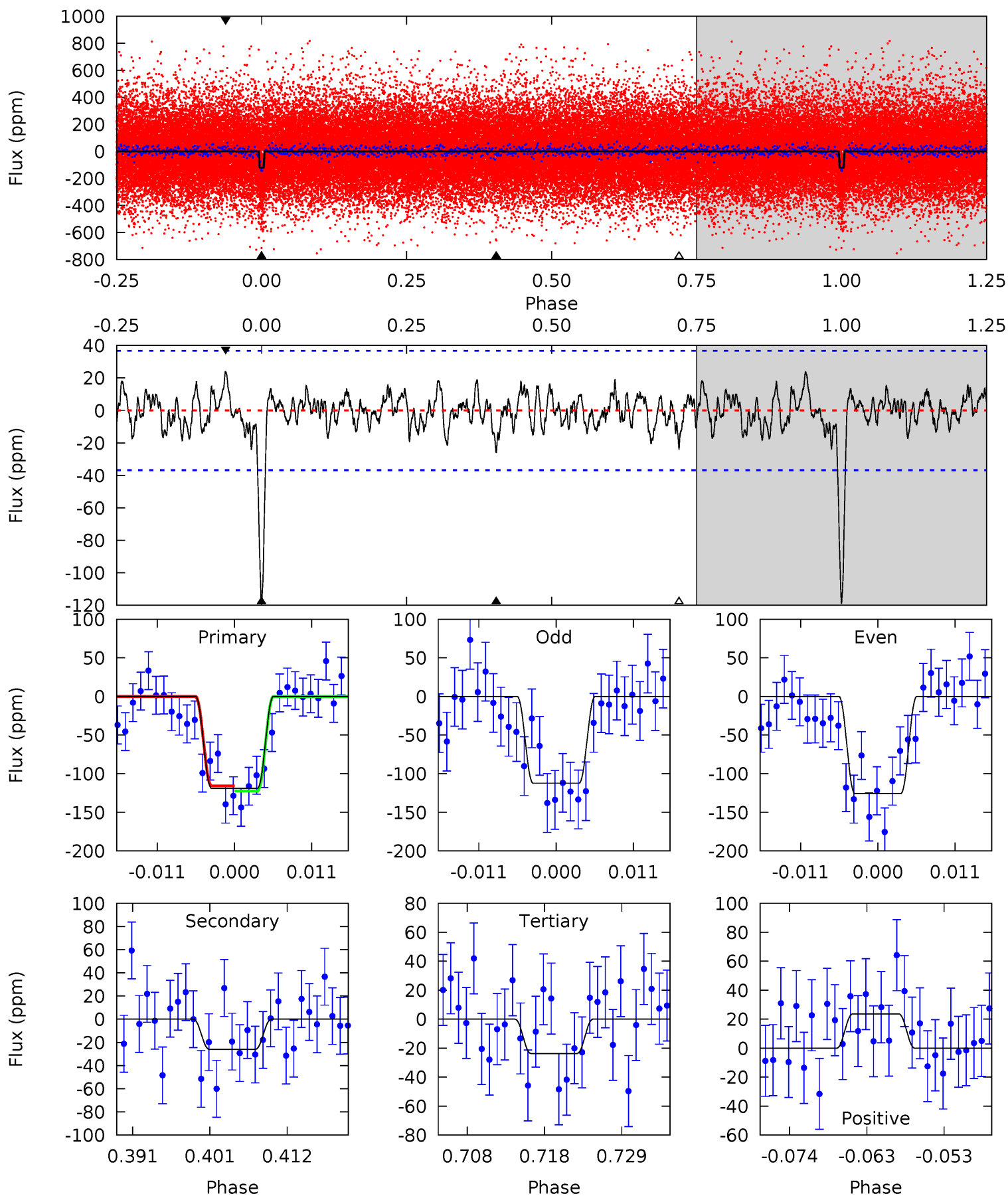
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	3.48	3.31	3.45	4.96	2.46	1.32	12.8	12.6	0.17	0.03	0.33	0.98	0.18	2.01



Alt Model-Shift Uniqueness Test

008410727-02, P = 25.263761 Days, E = 108.910946 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	3.56	3.24	3.22	5.02	2.56	1.14	13.0	13.0	0.32	0.33	0.92	1.17	0.17	0.45



Stellar Parameters For KIC 008410727

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6071^{+121}_{-133}	$4.202^{+0.149}_{-0.122}$	$0.100^{+0.150}_{-0.150}$	$1.410^{+0.252}_{-0.252}$	$1.156^{+0.104}_{-0.093}$	$0.581^{+0.408}_{-0.205}$
	+2%/-2%	+4%/-3%	+150%/-150%	+18%/-18%	+9%/-8%	+70%/-35%
Source	SPE58	SPE58	SPE58	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008410727-02 / KOI 1148.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-23 ± 7	$1.72^{+0.46}_{-0.46}$	1058^{+51}_{-57}	4215^{+577}_{-409}	130^{+130}_{-58}
Alt.	-26 ± 7	$1.79^{+0.44}_{-0.44}$	1055^{+54}_{-56}	4248^{+507}_{-375}	138^{+120}_{-59}

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

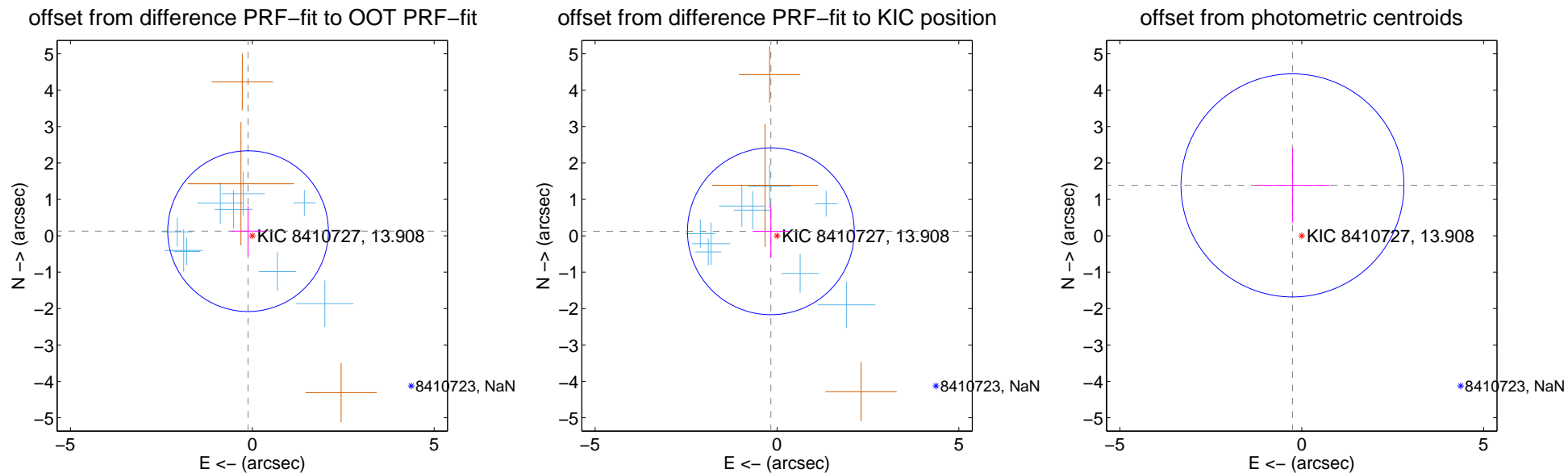
DV Centroid Data

Supplemental centroid analysis for 008410727-02. Kepler magnitude: 13.91. Transit SNR 10.84

There are 9 quarters with good PRF difference image offsets

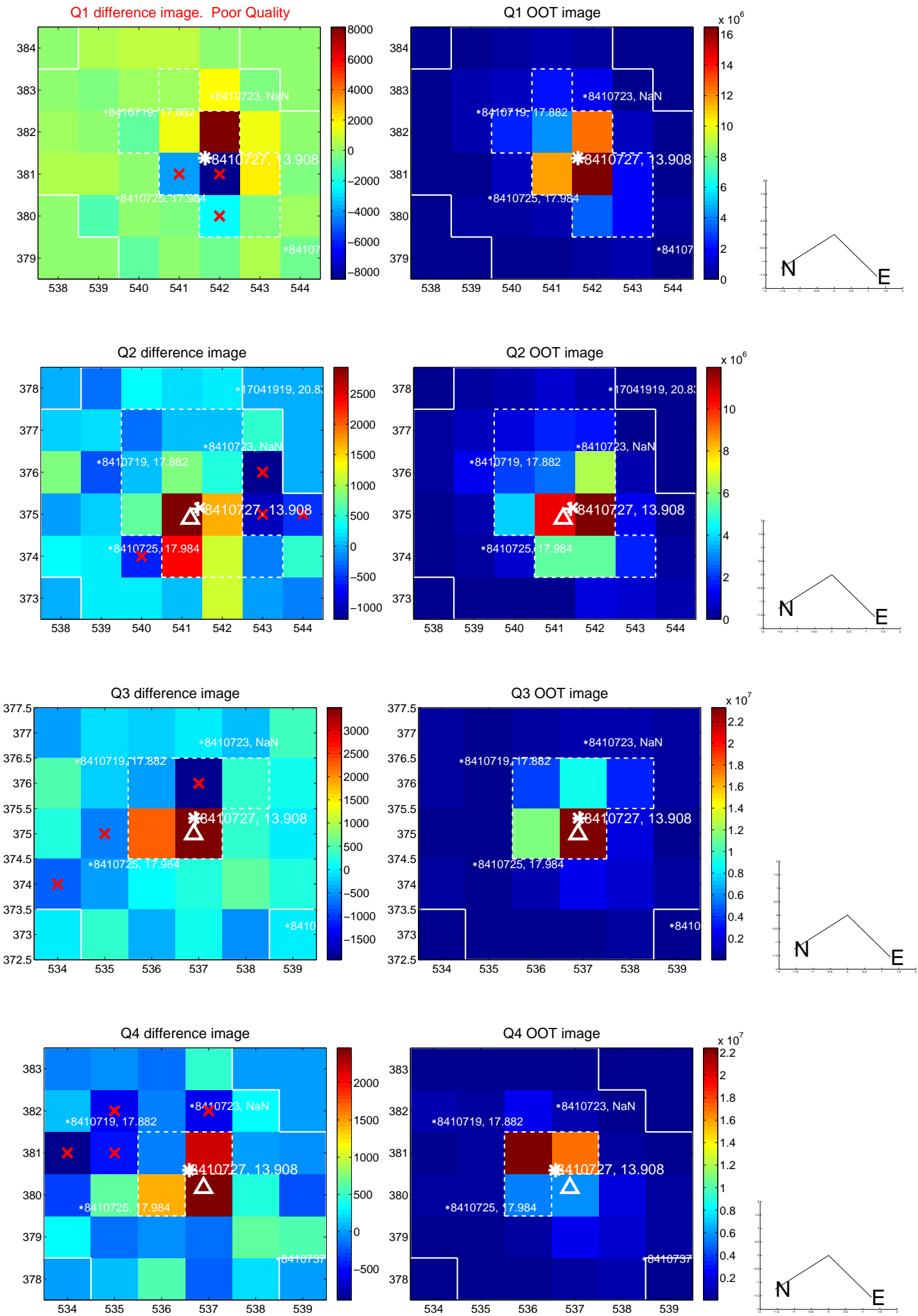
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.172 ± 0.736	0.23	0.116 ± 0.462	0.127 ± 0.687
PRF-fit source offset from KIC position	0.210 ± 0.764	0.27	0.169 ± 0.498	0.124 ± 0.723
photometric centroid source offset	1.41 ± 1.02	1.38	0.26 ± 1.02	1.38 ± 1.02

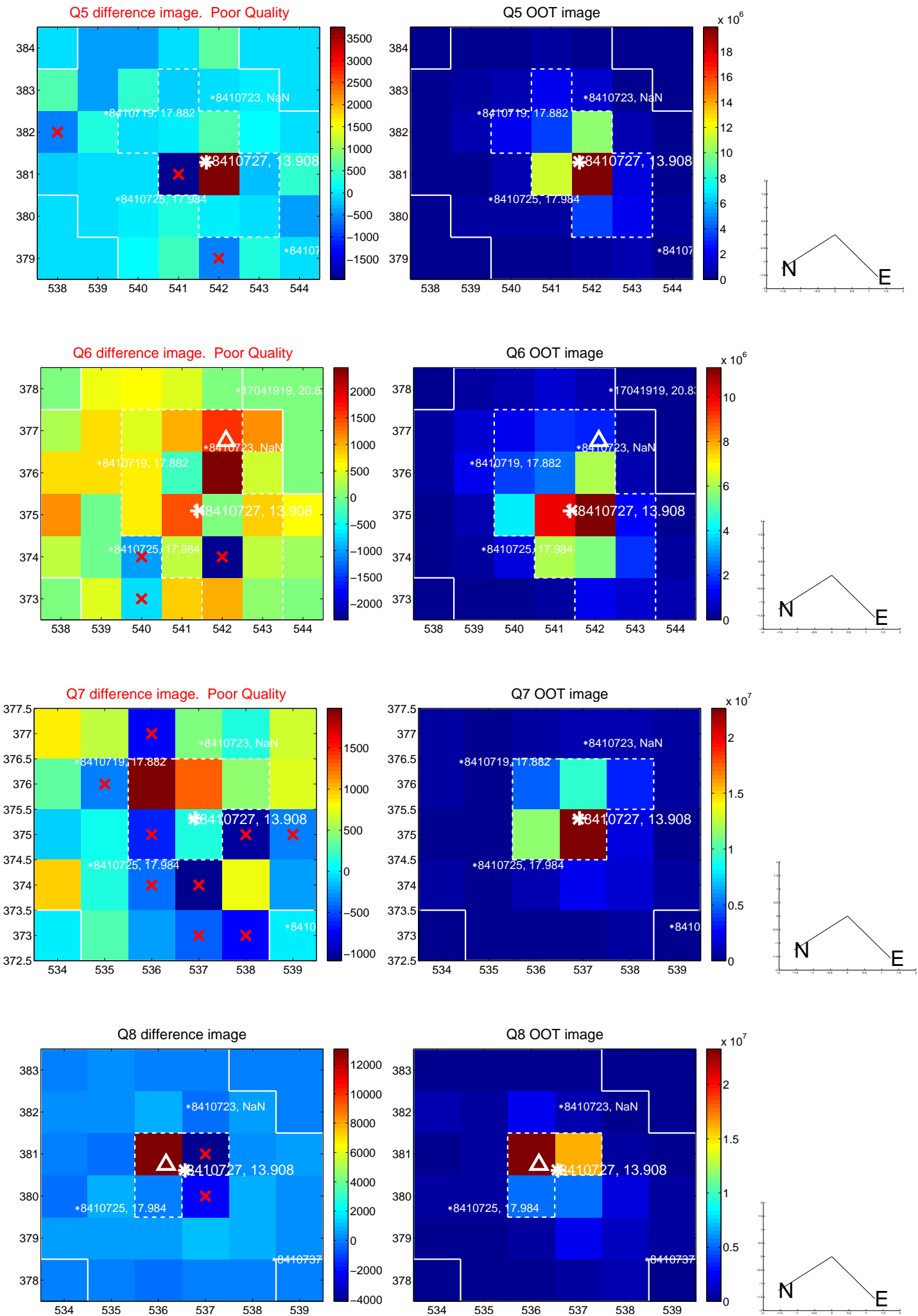


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

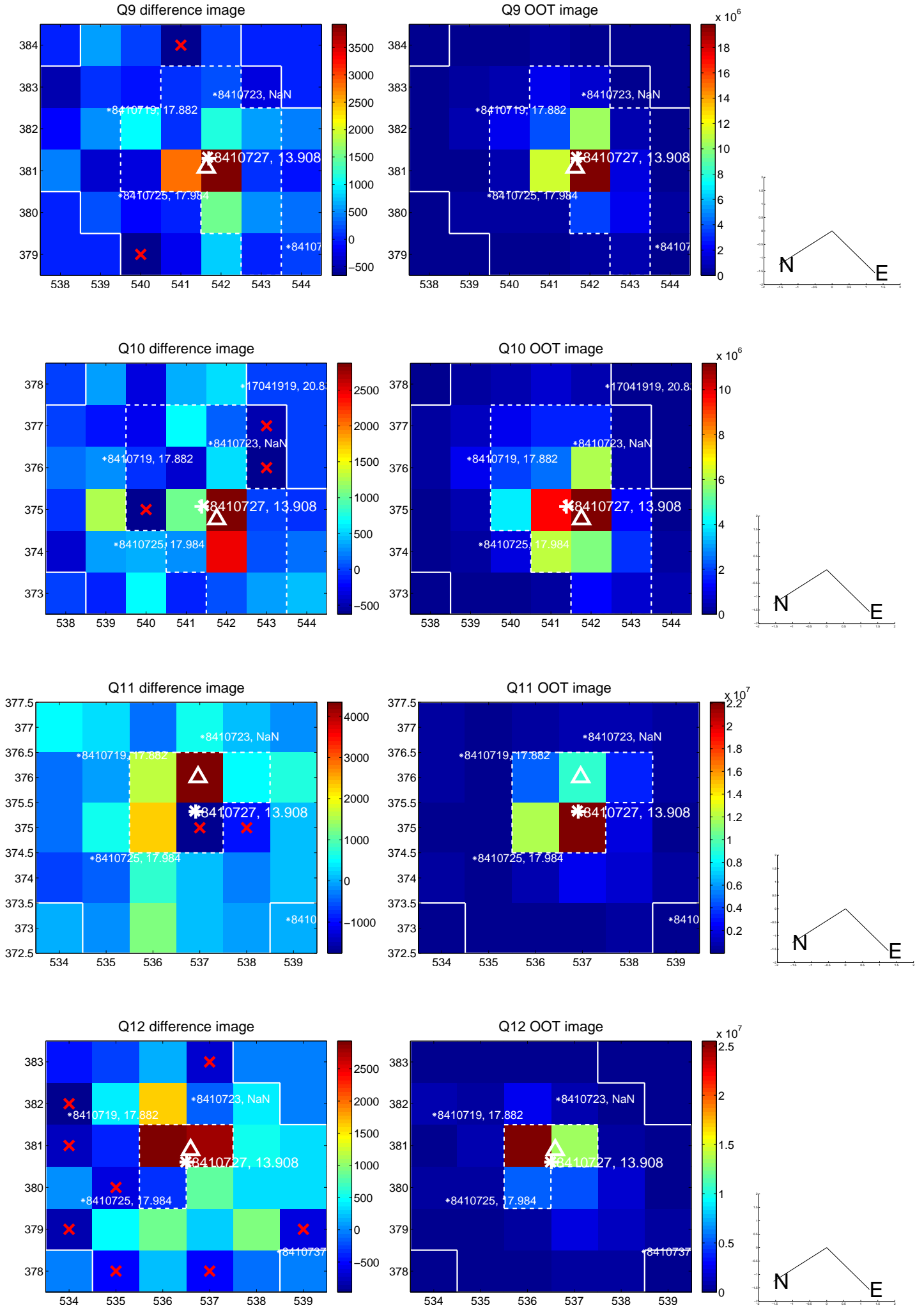
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



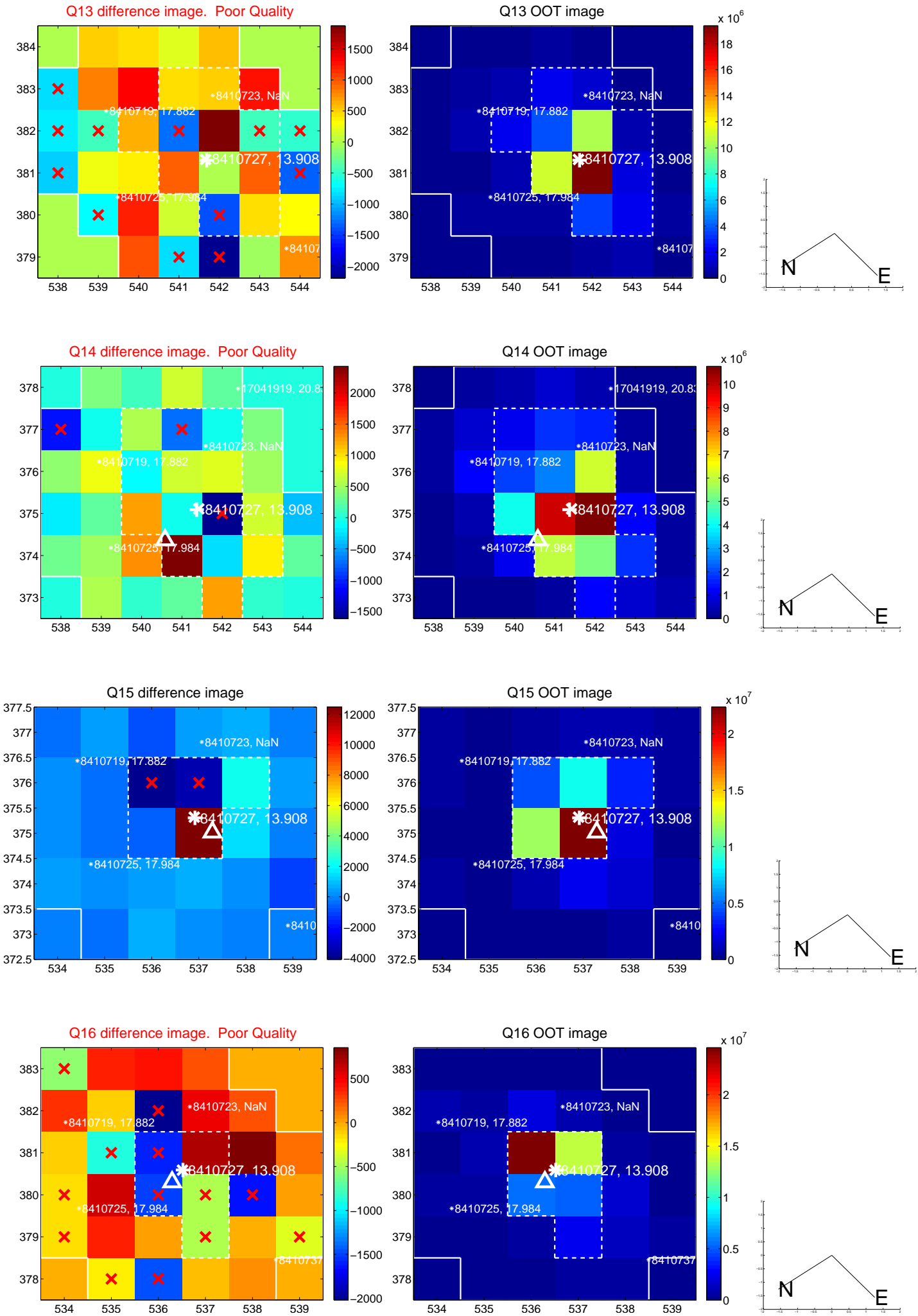
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



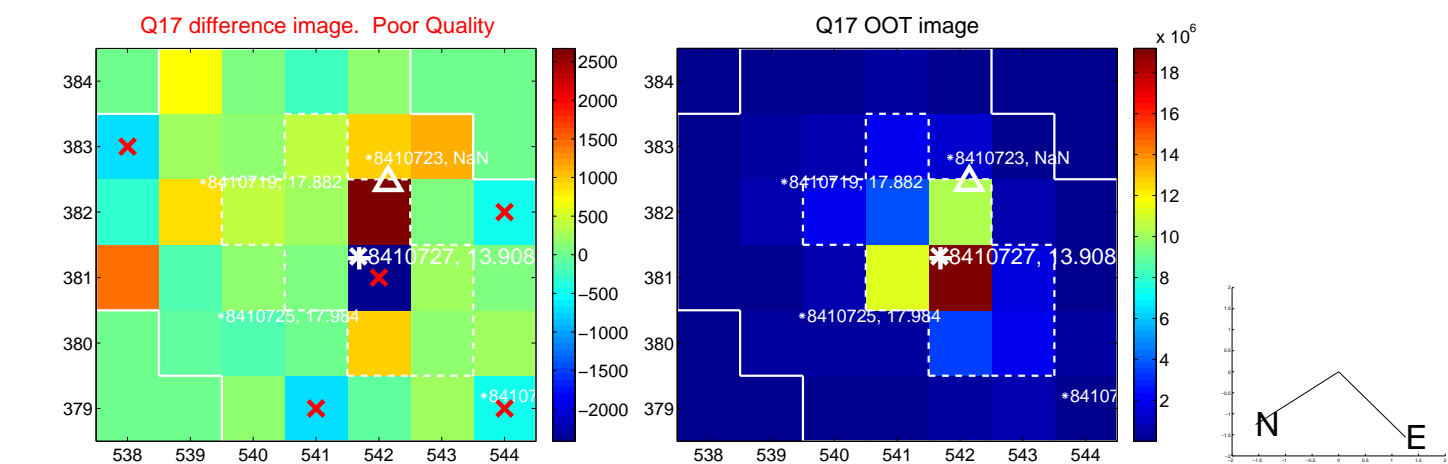
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



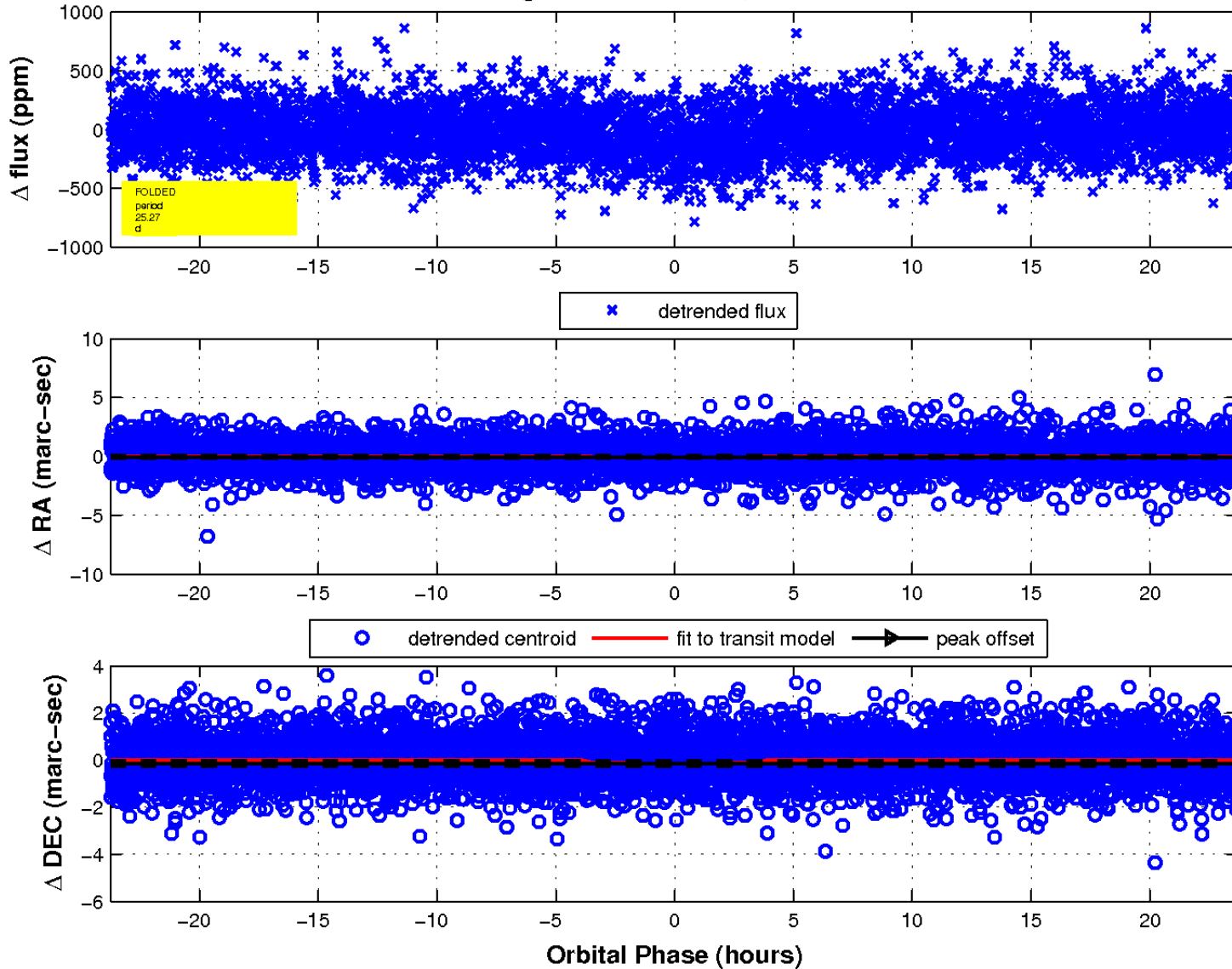
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

