

KIC 008591109

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})
008591109-01	OBS	No	2.768772	133.150800	17.1	9.667	8.0	5.2	1.49	6270	0.66	1991.36
008591109-02	OBS	No	8.307525	136.424995	16.1	59.336	8.6	3.9	1.49	6270	0.68	460.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008591109-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
008591109-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—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.

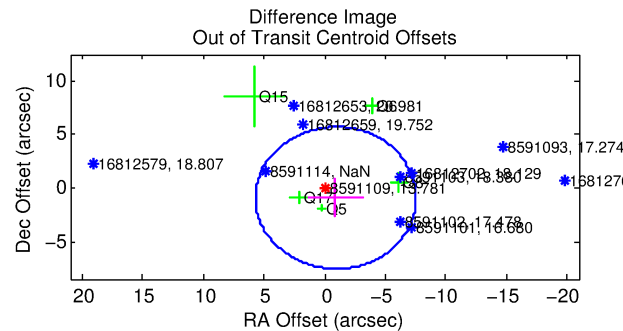
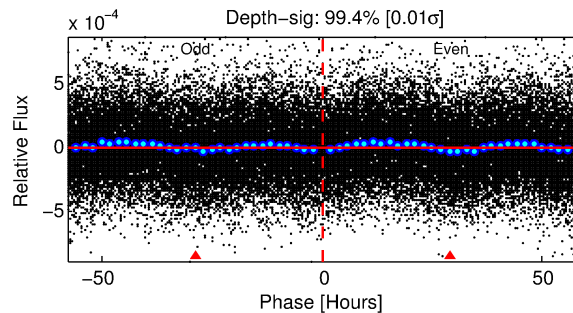
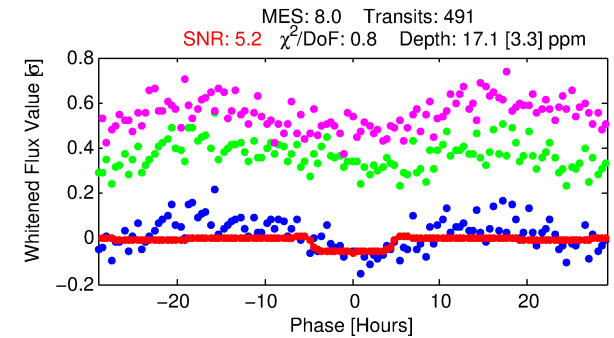
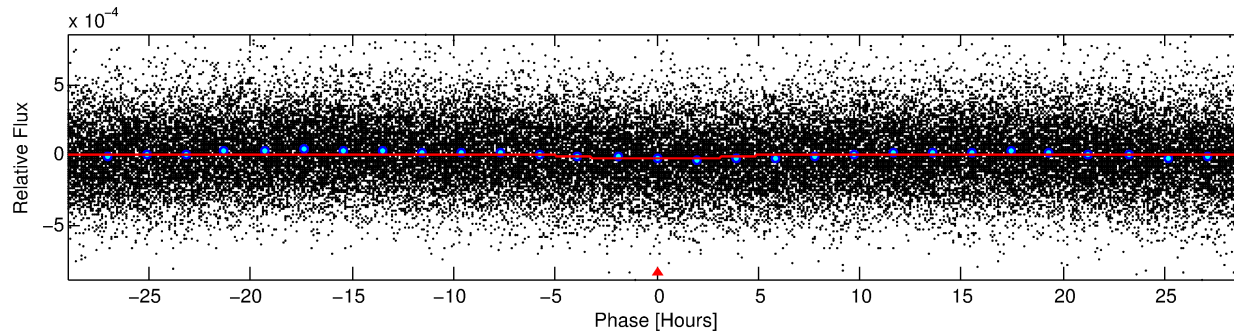
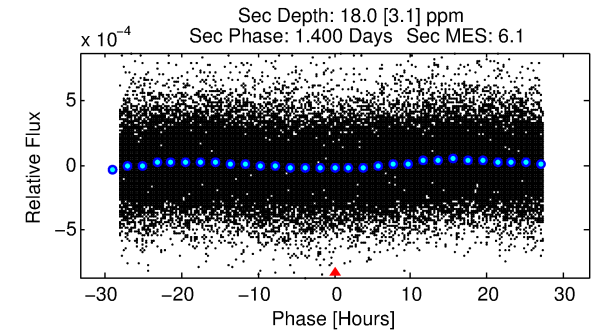
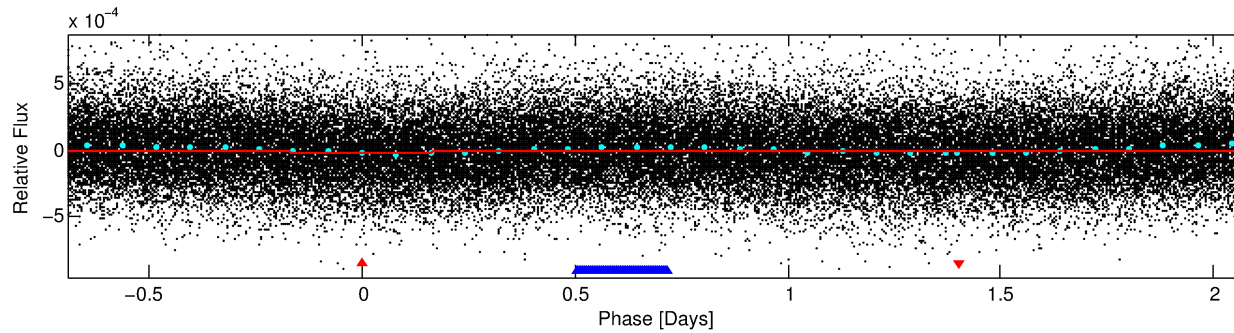
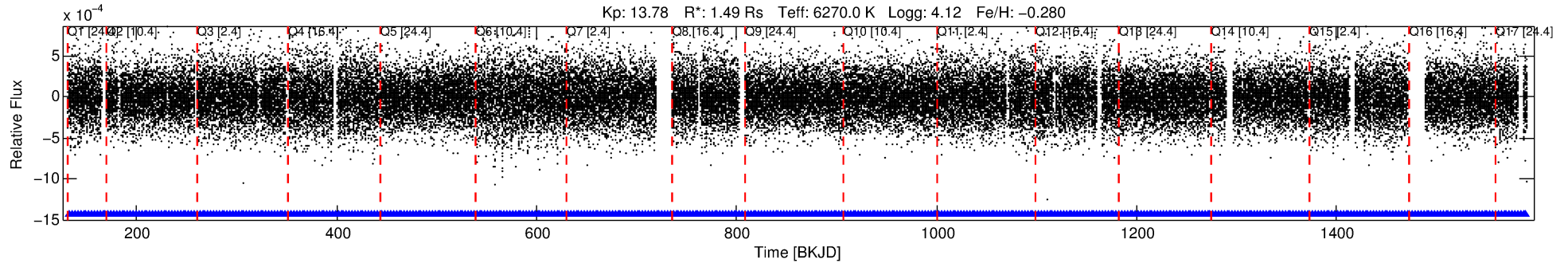
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008591109-01

No Significant Match Found

DV One-Page Summary

KIC: 8591109 Candidate: 1 of 2 Period: 2.769 d



DV Fit Results:

Period = 2.76877 [0.00007] d
Epoch = 133.1508 [0.0162] BKJD
Rp/R* = 0.0040 [0.0019]
a/R* = 1.79 [3.06]
b = 0.69 [1.90]
Seff = 1991.35 [1011.76]
Teff = 1703 [216] K
Rp = 0.66 [0.38] Re
a = 0.0394 [0.0121] AU
Ag = 35.50 [38.44] [0.90σ]
Teffp = 6429 [1569] K [2.98σ]

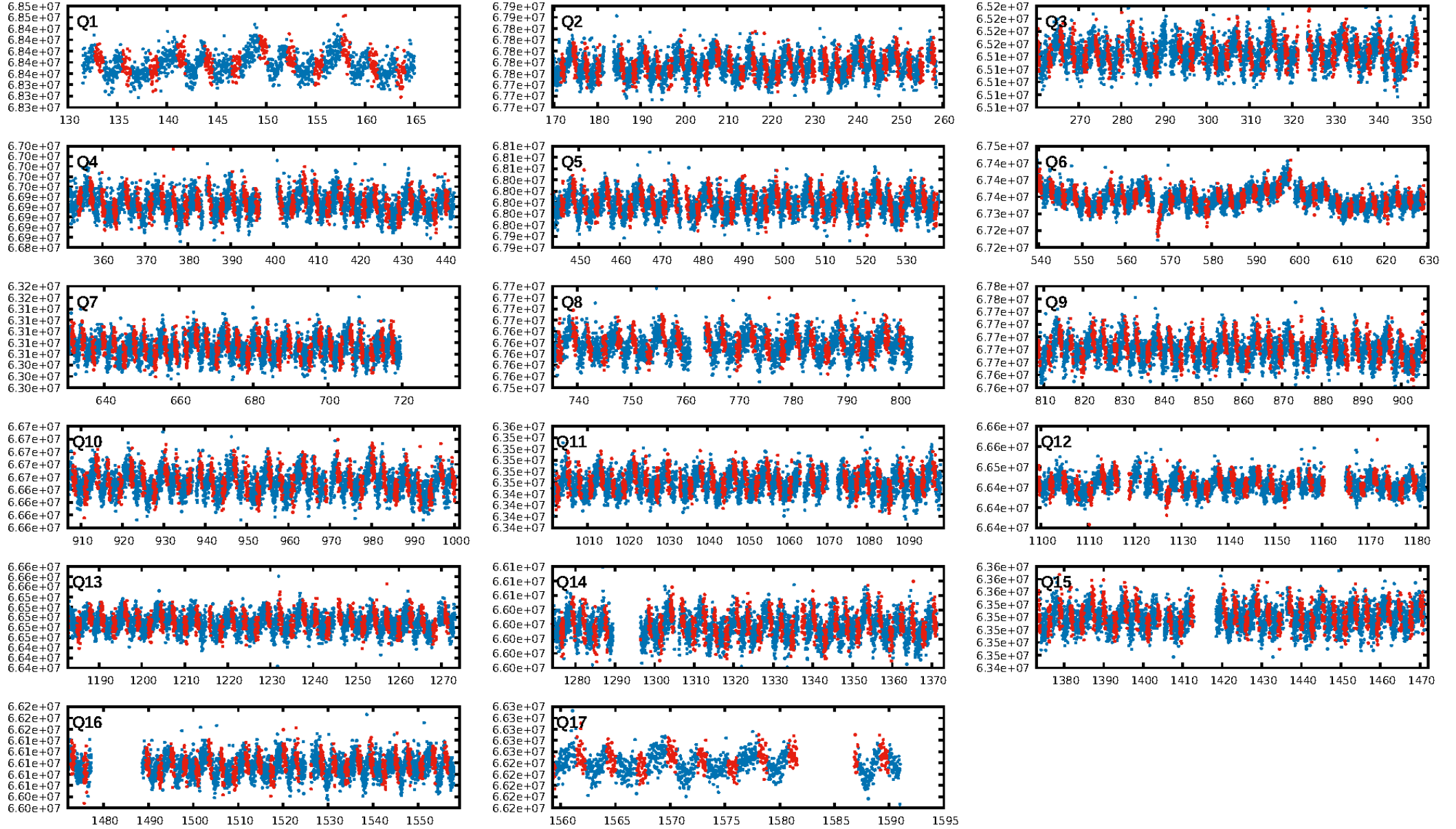
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 97.3% [2.21σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.69e-21
RollingBand-fgt: 1.00 [468/468]
GhostDiagnostic-chr: 0.3916
Centroid-sig: 9.3%
Centroid-so: 2.788 arcsec [1.13σ]
OotOffset-rm: 1.301 arcsec [0.59σ]
KicOffset-rm: 1.280 arcsec [0.57σ]
OotOffset-st: 1/1/1/2 [5]
KicOffset-st: 1/1/1/2 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 1.00 [17/17]

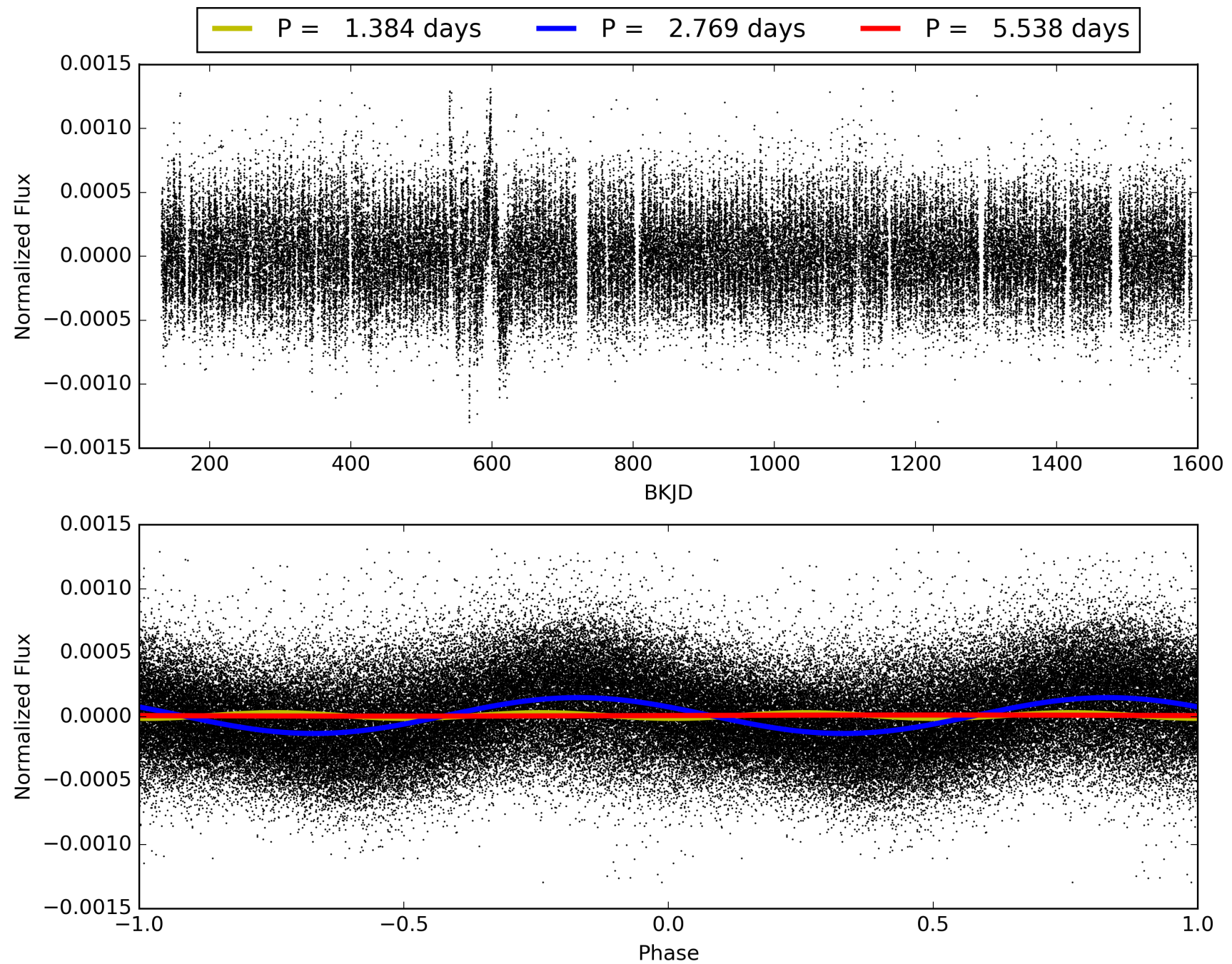
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 00:15:18 Z

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

TCE 008591109-01, PDC Light Curves

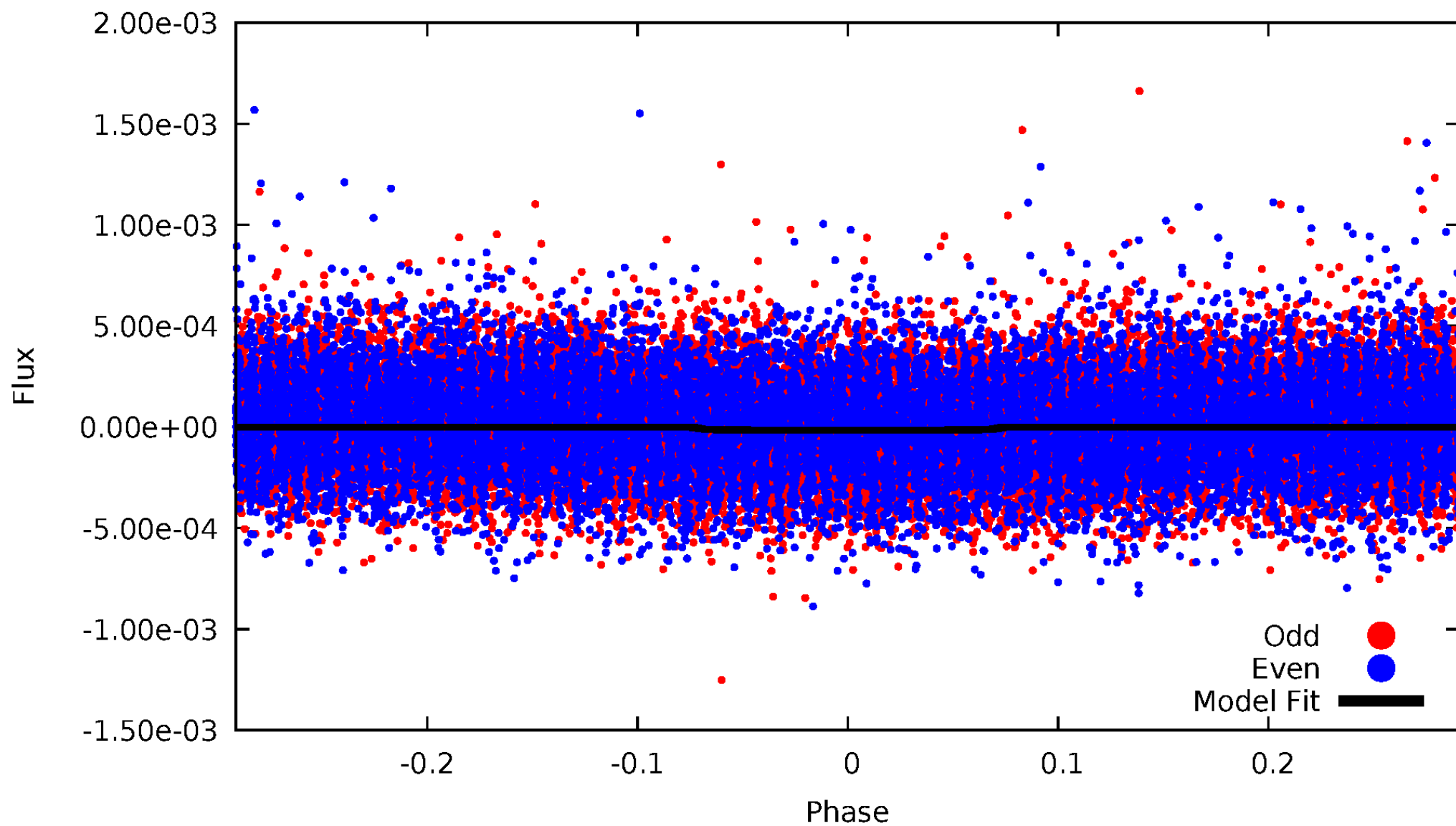


TCE 008591109-01



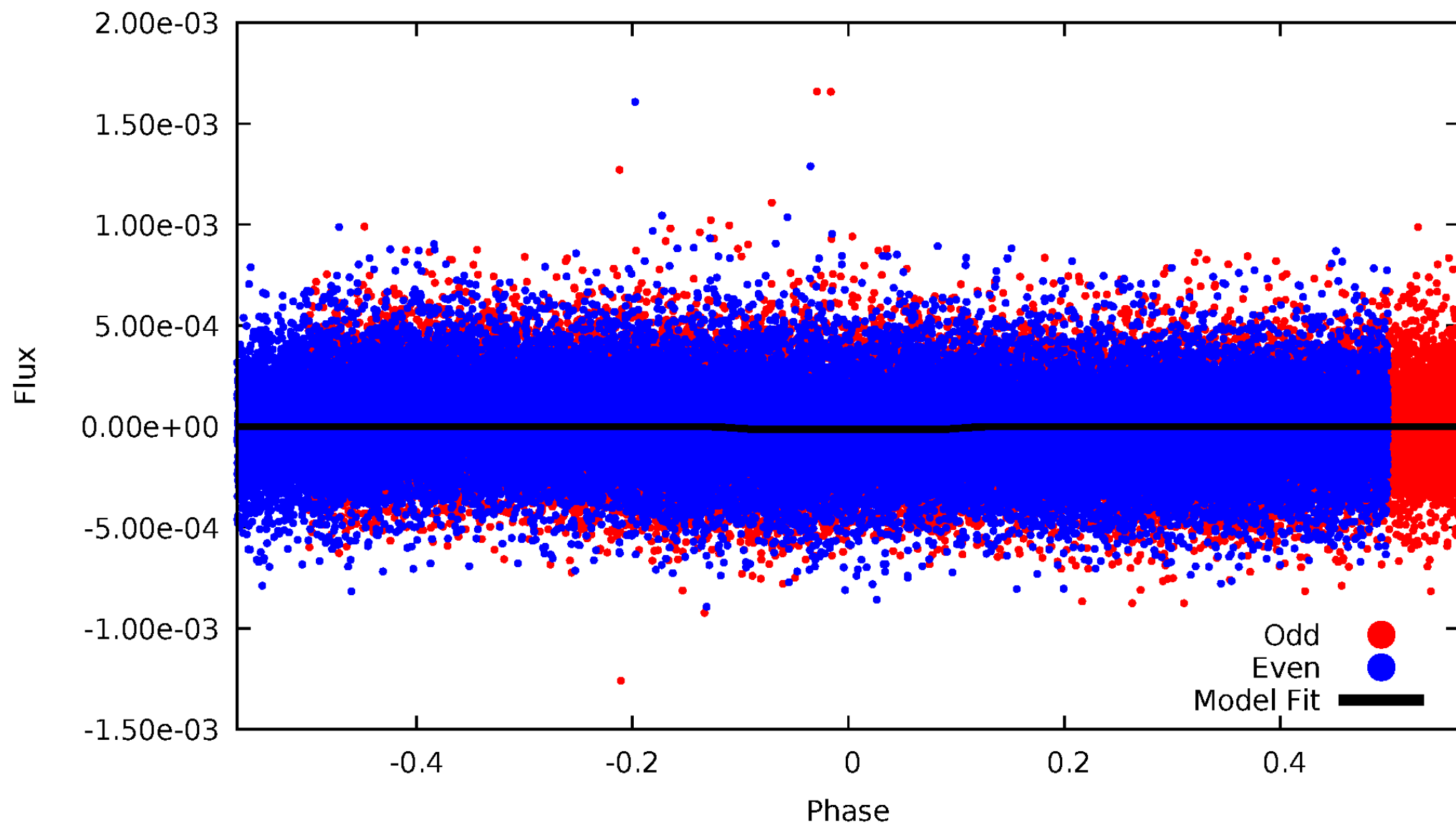
DV Odd/Even

TCE 008591109-01



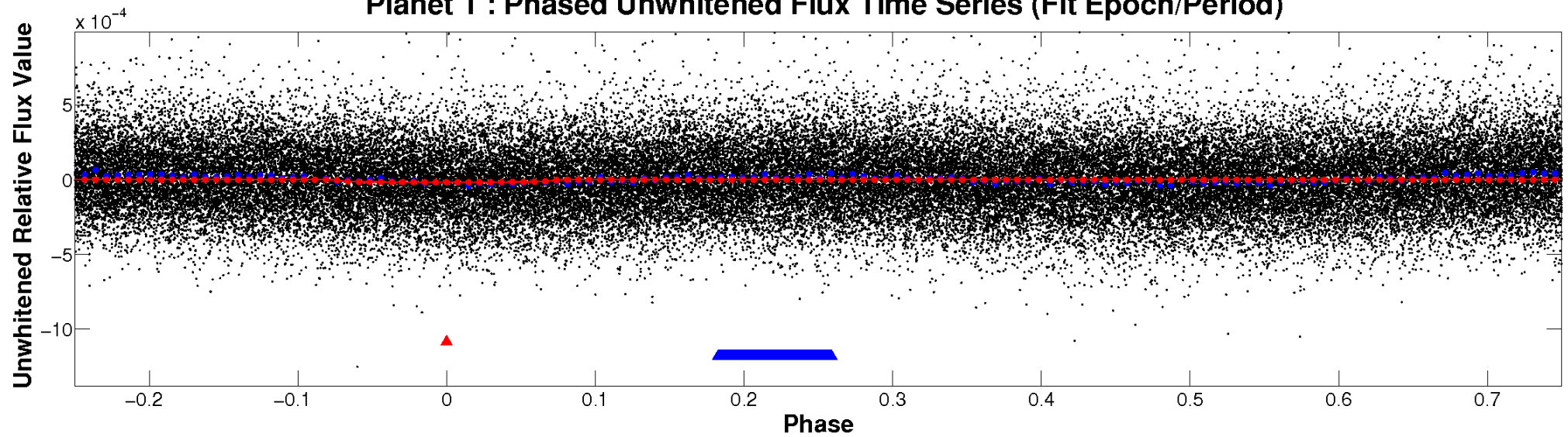
ALT Odd/Even

TCE 008591109-01

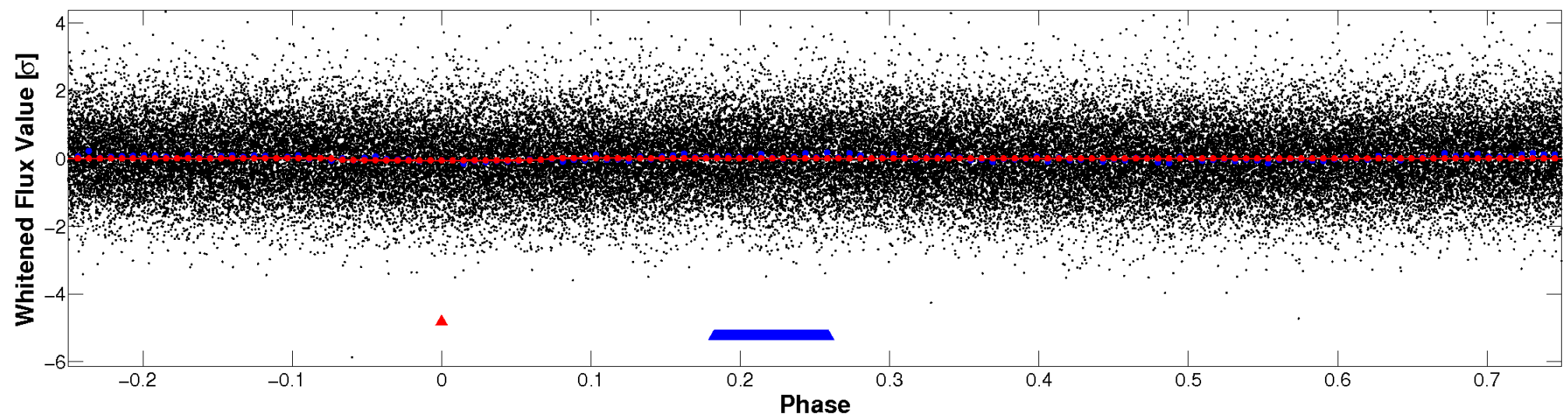


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

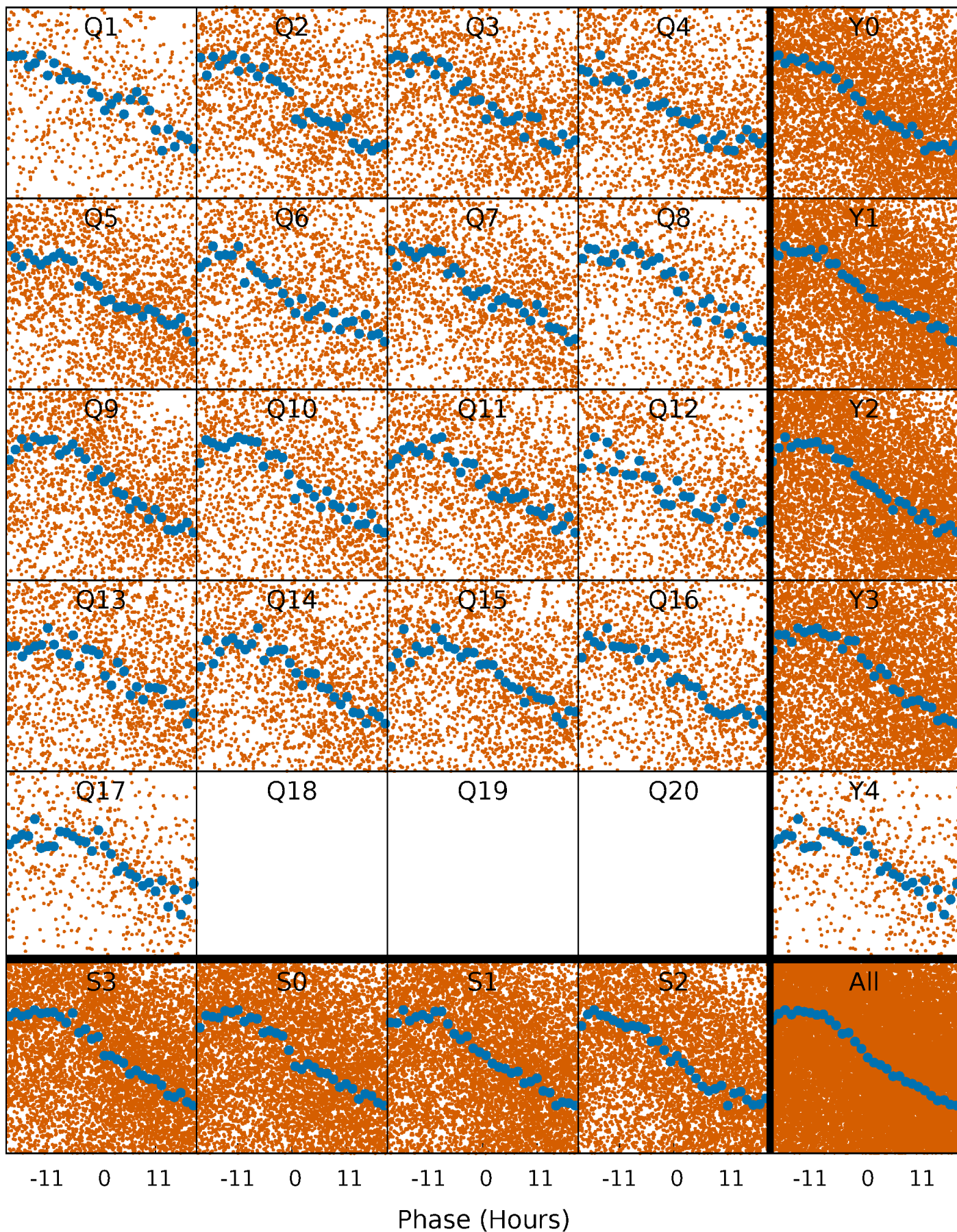


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



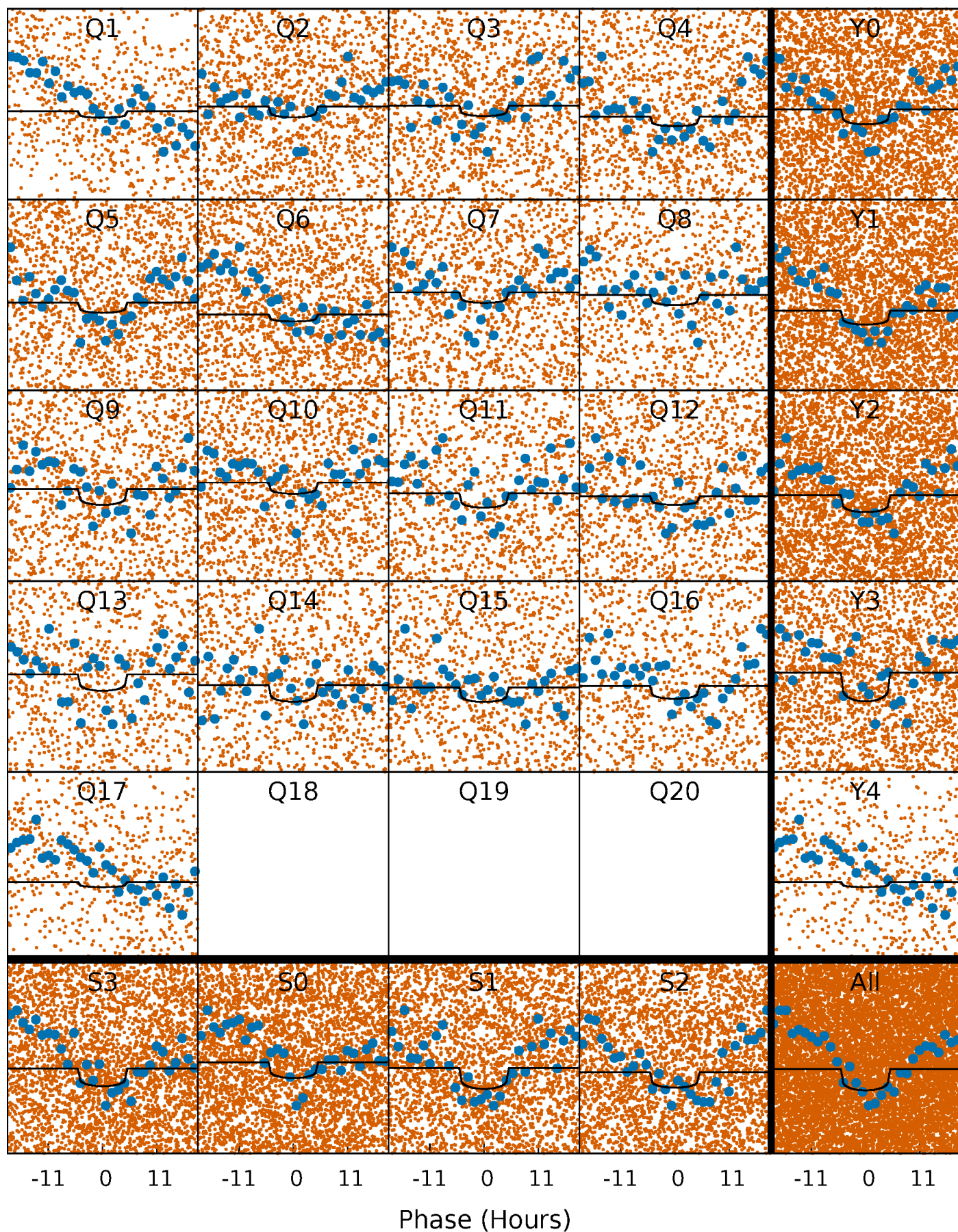
PDC Quarter-Phased Transit Curves

TCE 008591109-01 P= 2.768772 Days $T_0=133.150801$ (BKJD)



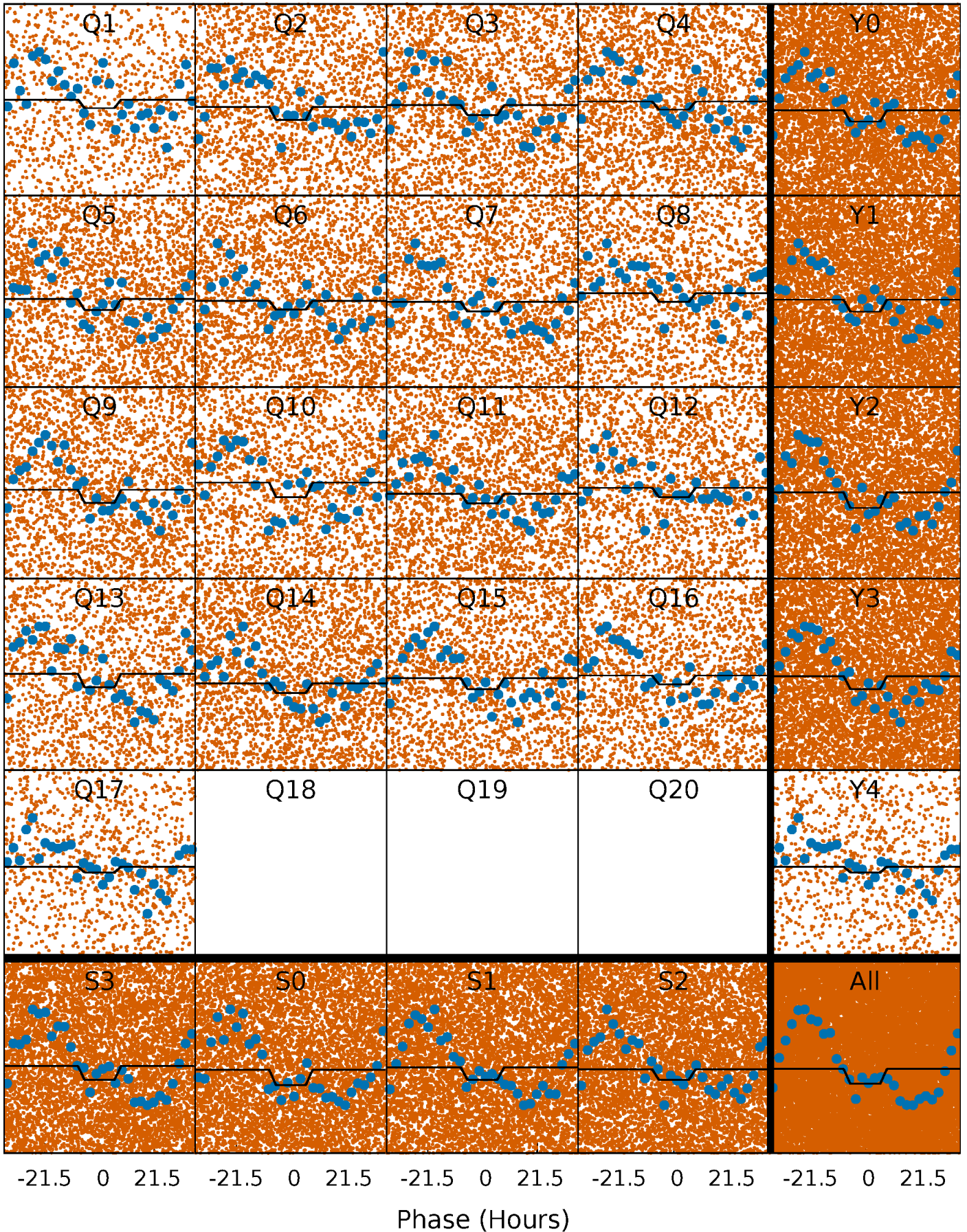
DV Quarter-Phased Transit Curves

TCE 008591109-01 P= 2.768772 Days $T_0=133.150801$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

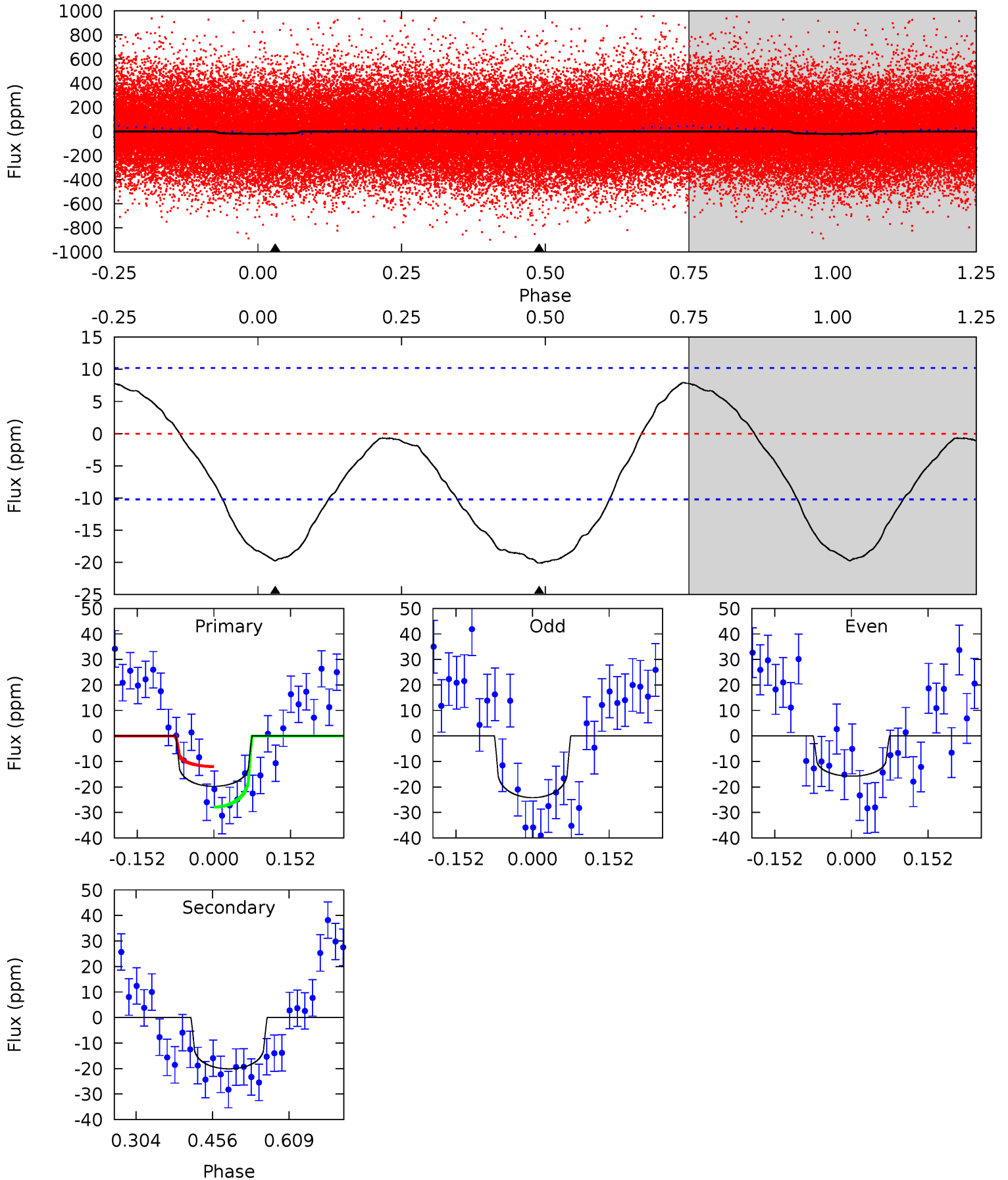
TCE 008591109-01 P= 2.769315 Days $T_0=133.376095$ (BKJD)



DV Model-Shift Uniqueness Test

008591109-01, P = 2.768772 Days, E = 130.382029 Days

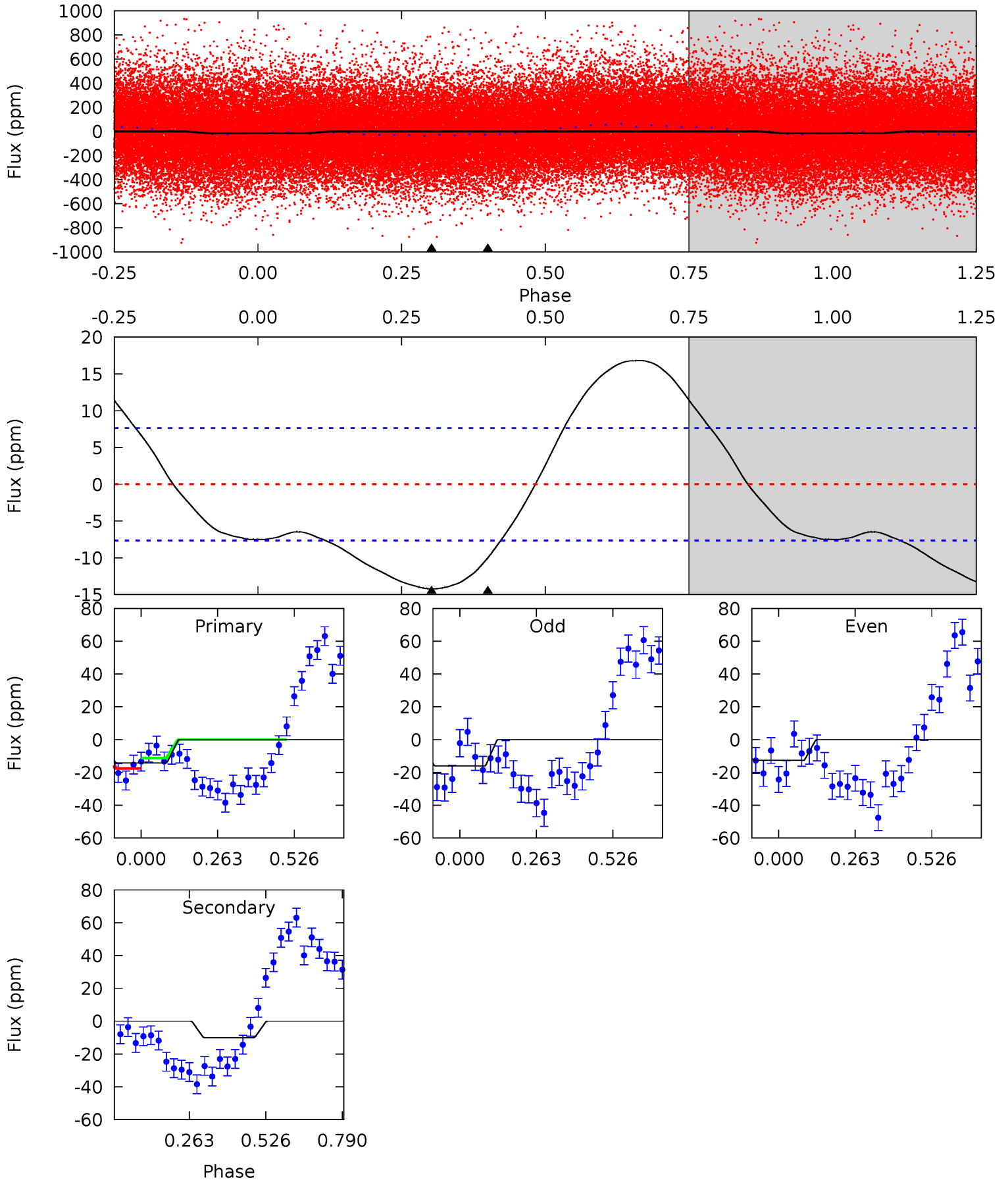
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.67	8.82	0	0	4.48	1.43	1.97	8.67	8.67	8.82	8.82	1.85	1.01	0.28	3.52



Alt Model-Shift Uniqueness Test

008591109-01, P = 2.769315 Days, E = 130.606780 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.12	5.71	0	0	4.36	1.12	5.04	8.12	8.12	5.71	5.71	0.97	0.71	0.54	1.90



Stellar Parameters For KIC 008591109

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6270^{+175}_{-219}	$4.116^{+0.286}_{-0.154}$	$-0.280^{+0.250}_{-0.300}$	$1.494^{+0.436}_{-0.480}$	$1.063^{+0.181}_{-0.148}$	$0.449^{+0.822}_{-0.211}$
	+3%/-3%	+7%/-4%	+89%/-107%	+29%/-32%	+17%/-14%	+183%/-47%
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 008591109-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-20 ± 2	$0.63^{+0.33}_{-0.29}$	2348^{+189}_{-215}	6585^{+3147}_{-1189}	44^{+108}_{-25}
Alt.	-10 ± 2	$0.60^{+0.35}_{-0.28}$	2341^{+205}_{-203}	5646^{+2290}_{-966}	23^{+64}_{-14}

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

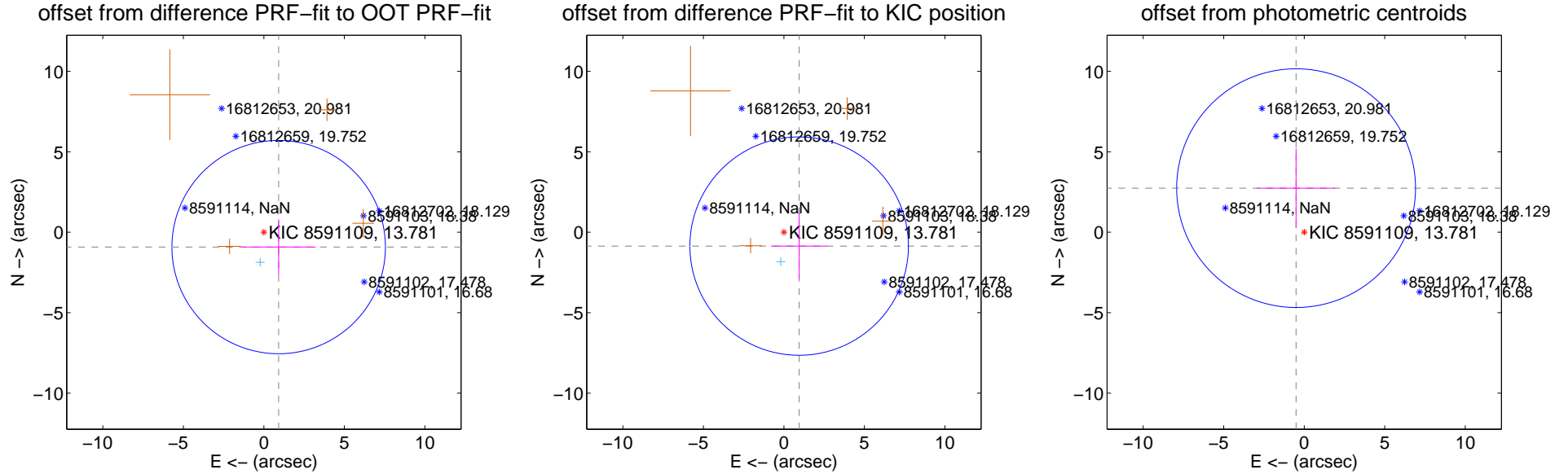
DV Centroid Data

Supplemental centroid analysis for 008591109-01. Kepler magnitude: 13.78. Transit SNR 5.21

There are 1 quarters with good PRF difference image offsets

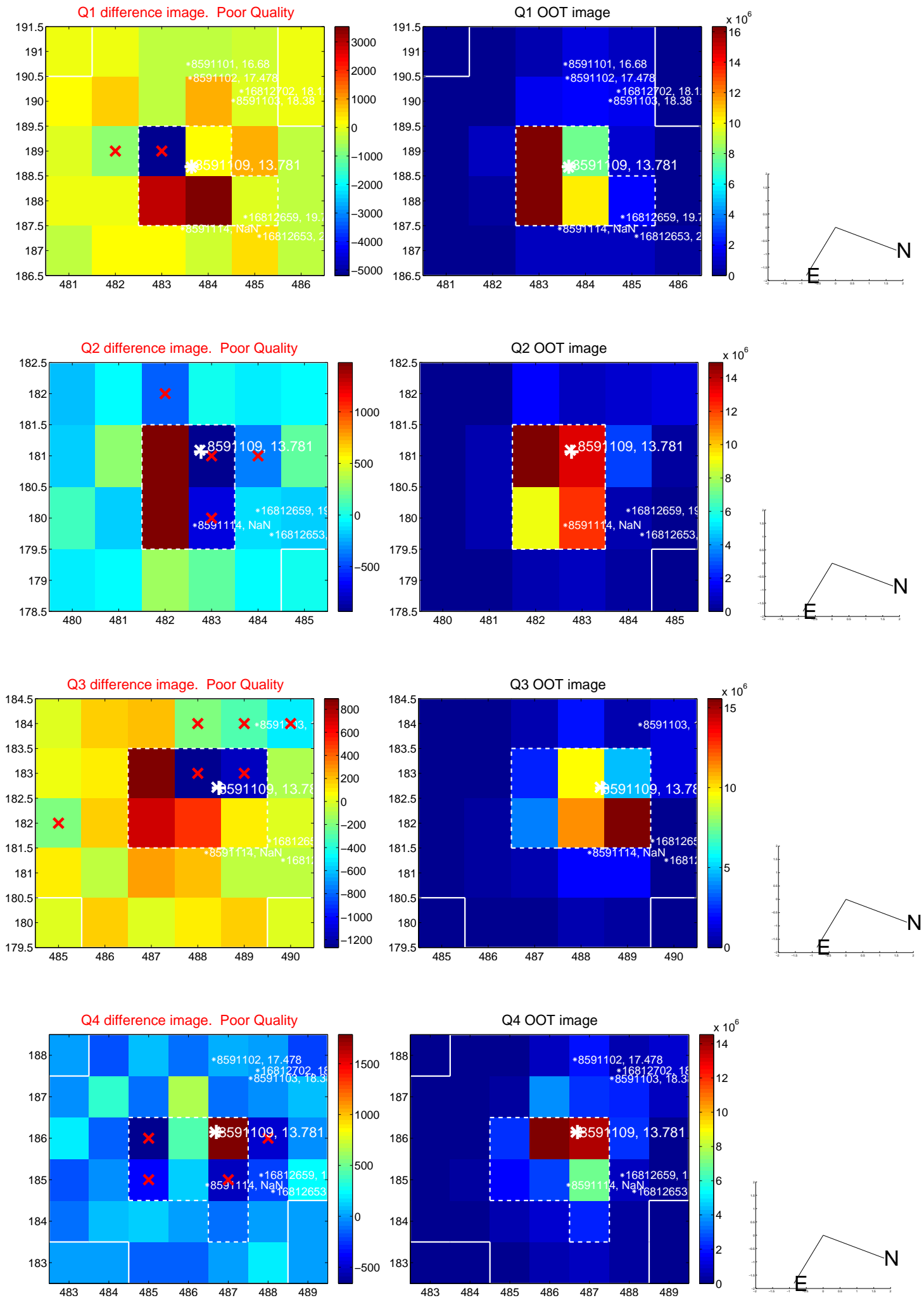
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.301 ± 2.210	0.59	-0.919 ± 2.307	-0.921 ± 1.723
PRF-fit source offset from KIC position	1.280 ± 2.262	0.57	-0.948 ± 1.746	-0.861 ± 2.058
photometric centroid source offset	2.79 ± 2.47	1.13	0.51 ± 2.43	2.74 ± 2.47

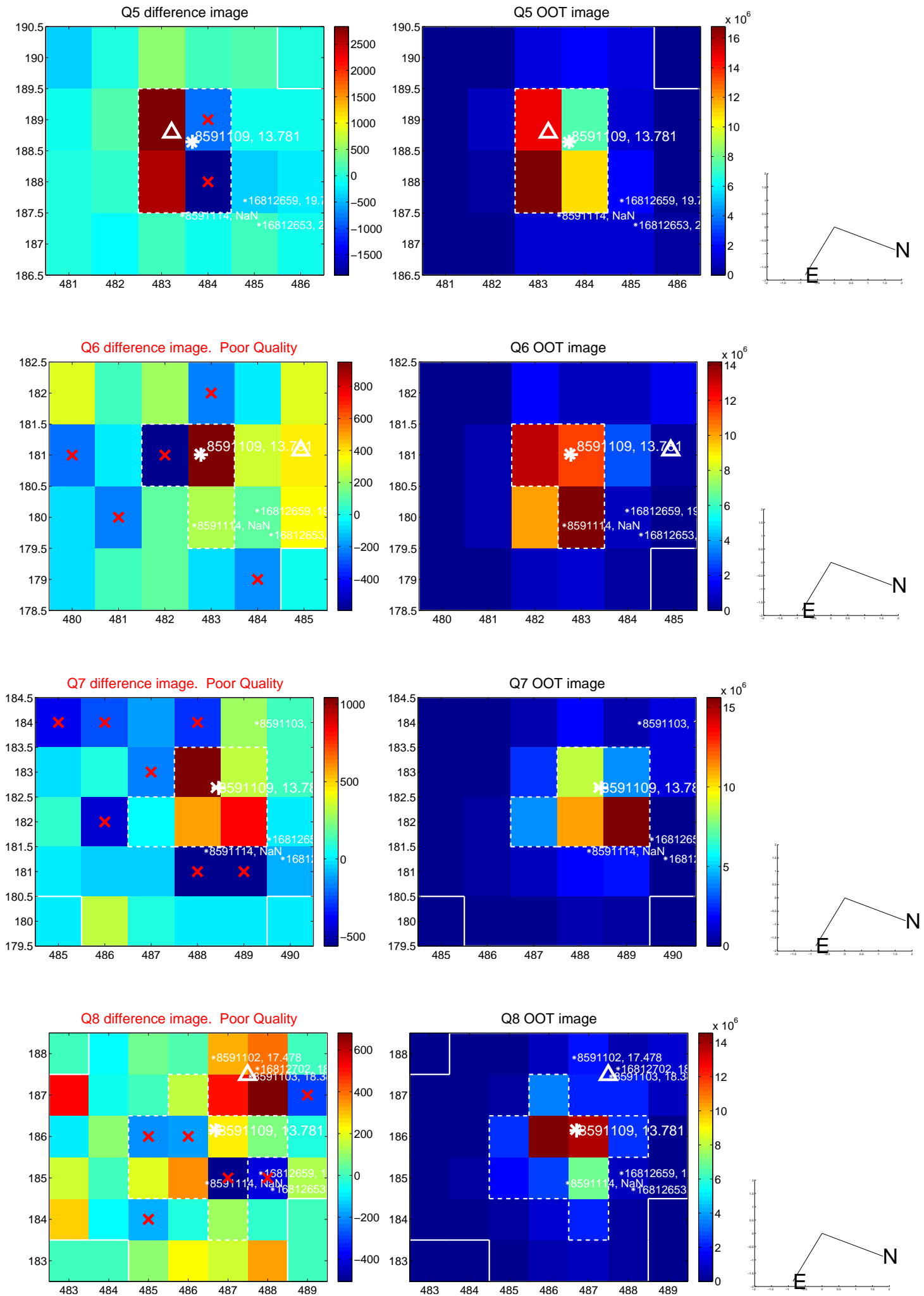


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

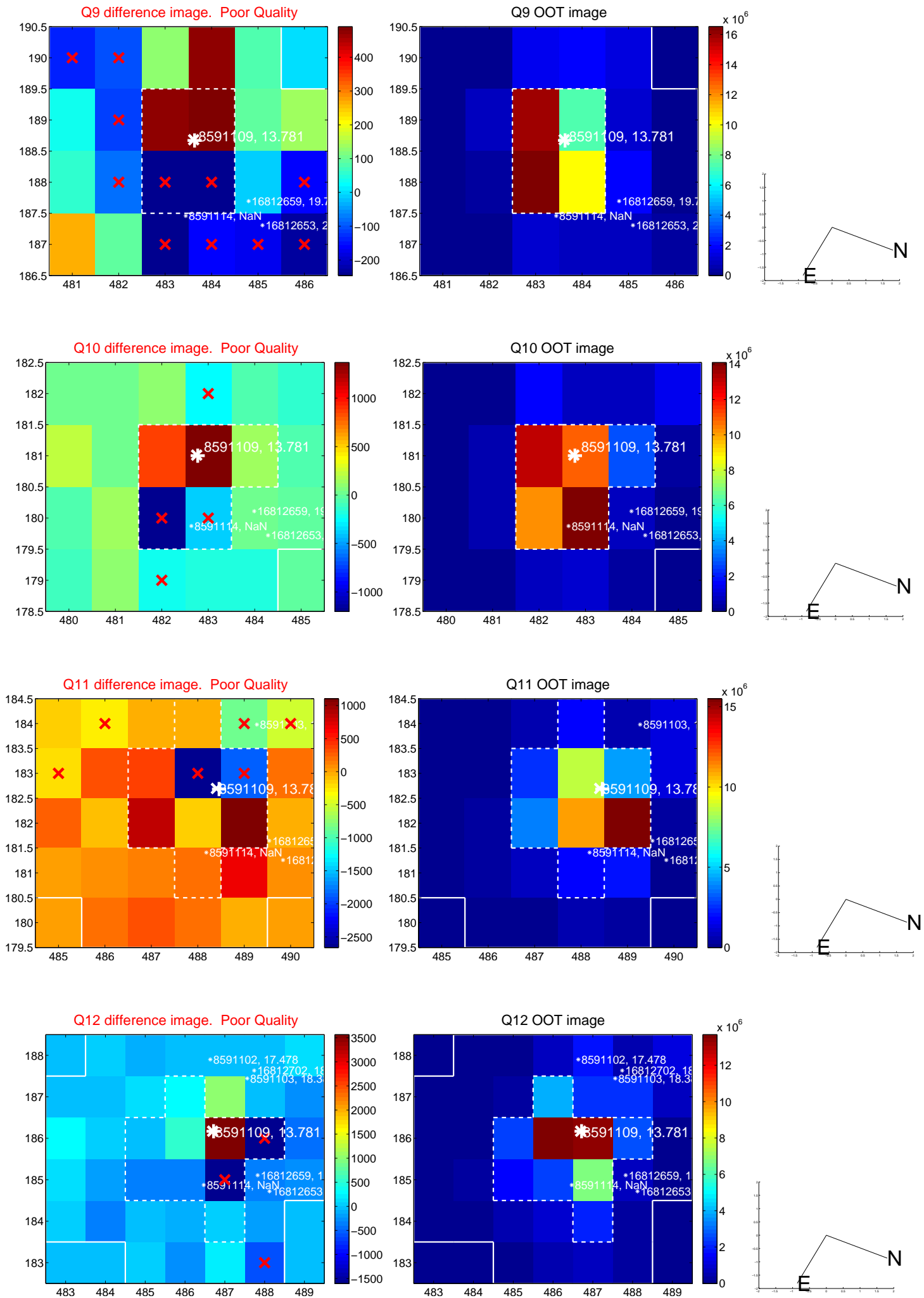
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



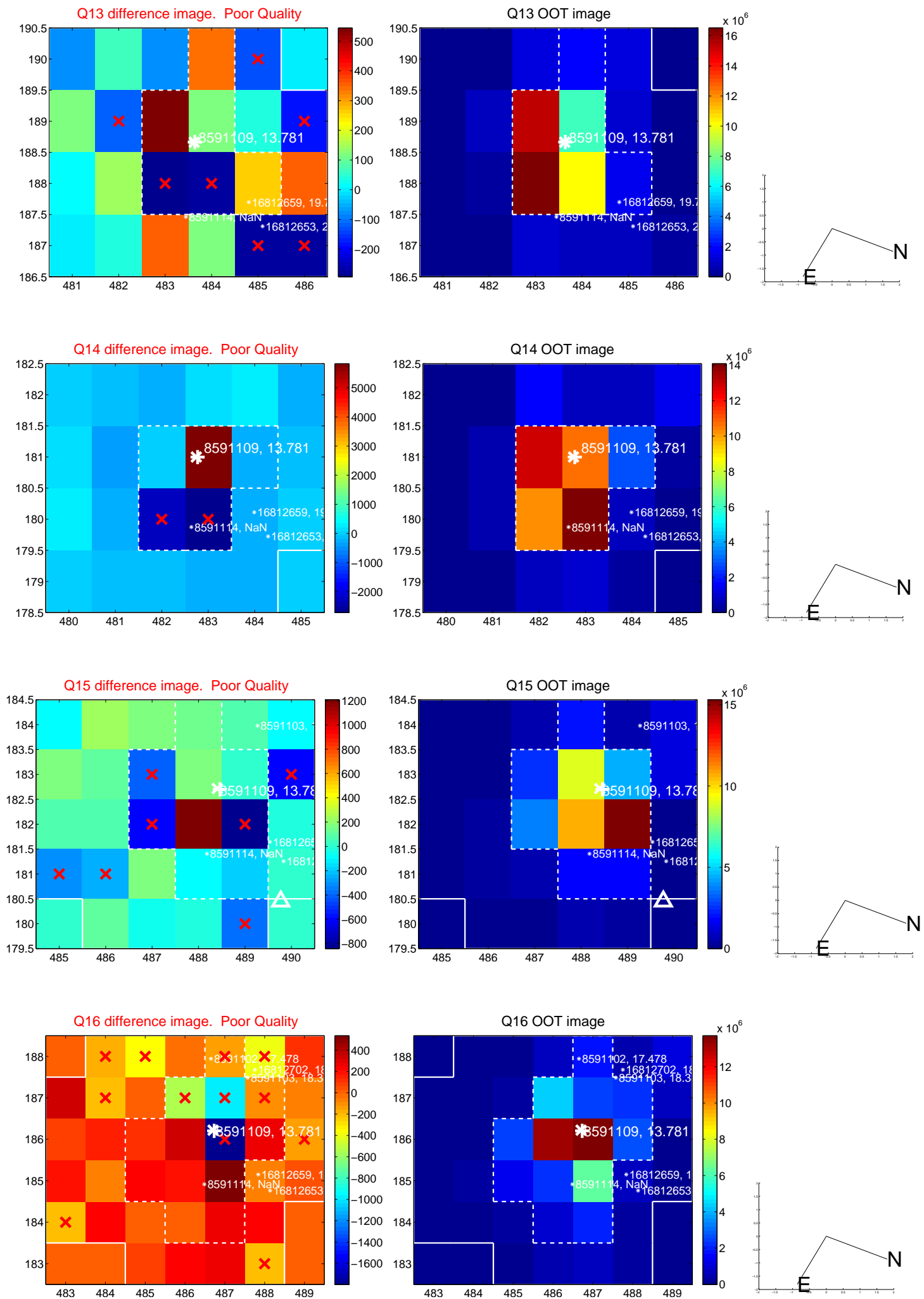
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

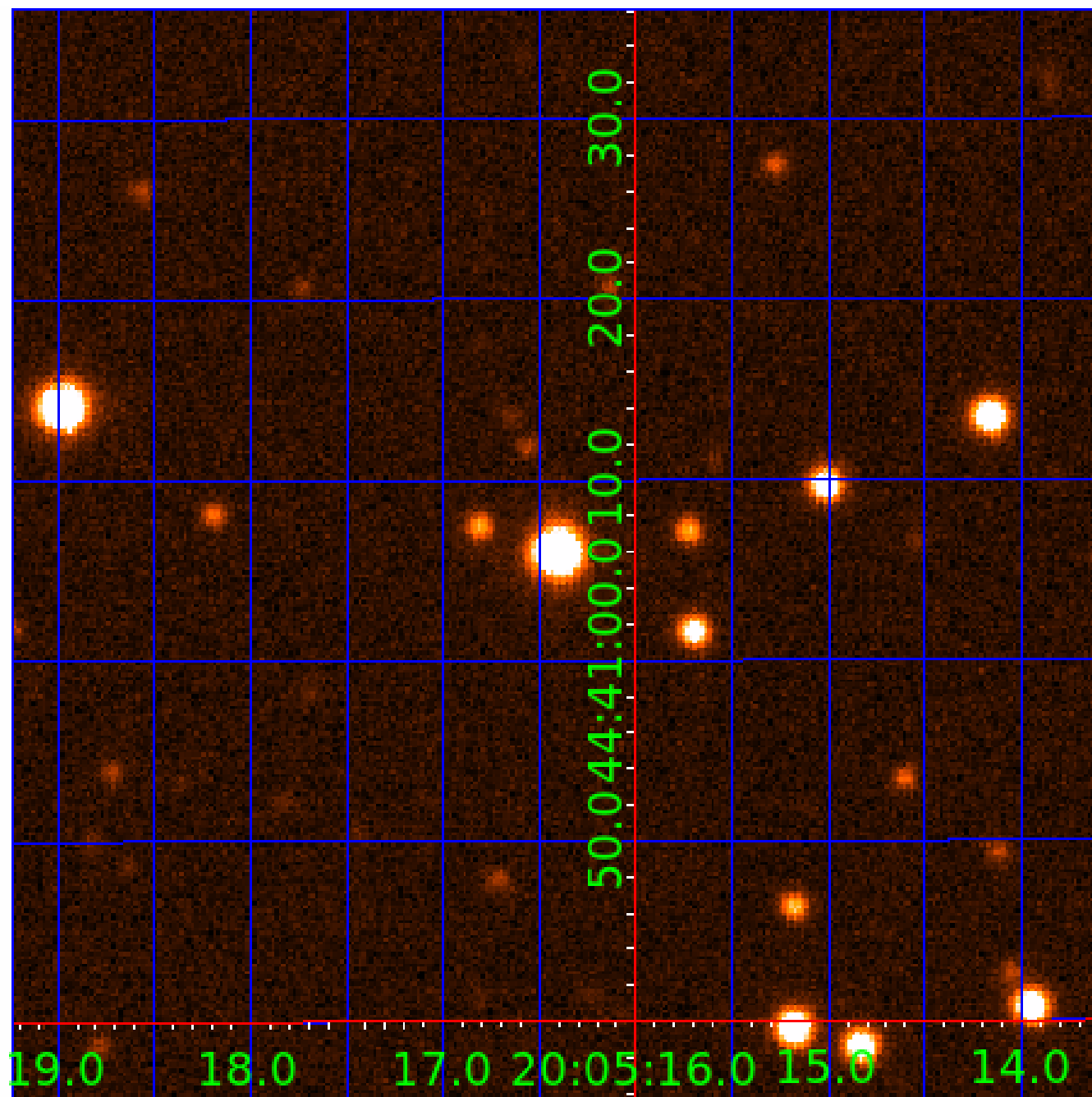


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008591109

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})
008591109-01	OBS	No	2.768772	133.150800	17.1	9.667	8.0	5.2	1.49	6270	0.66	1991.36
008591109-02	OBS	No	8.307525	136.424995	16.1	59.336	8.6	3.9	1.49	6270	0.68	460.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008591109-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_FEW_MEAS
008591109-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFS

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

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

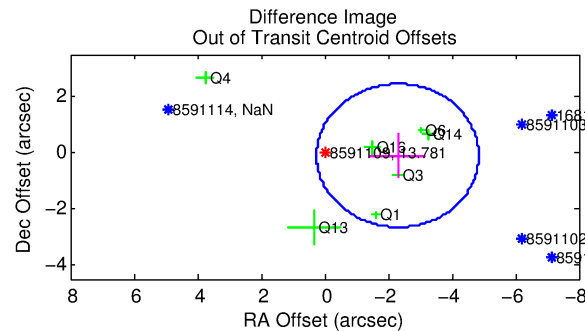
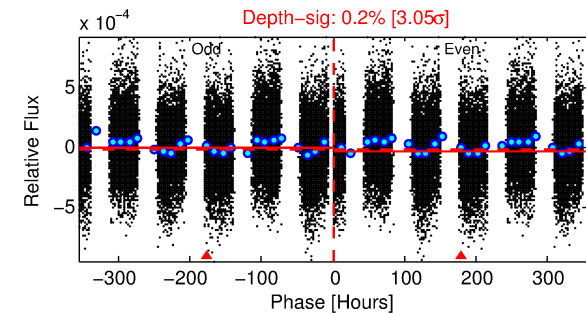
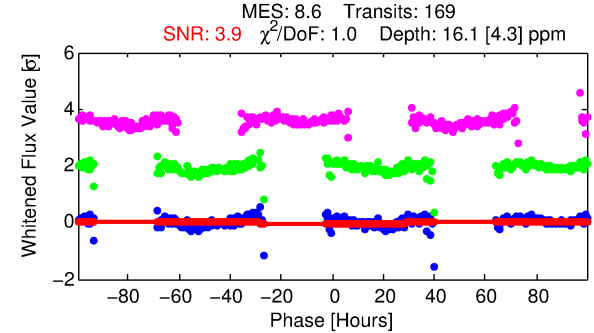
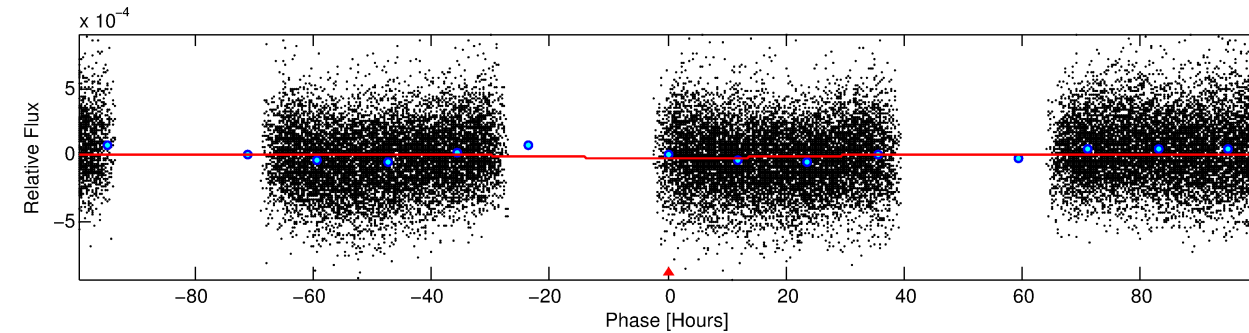
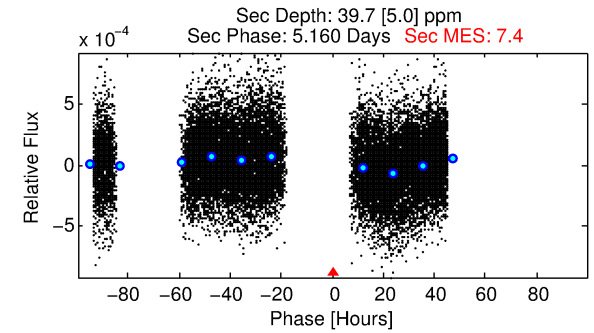
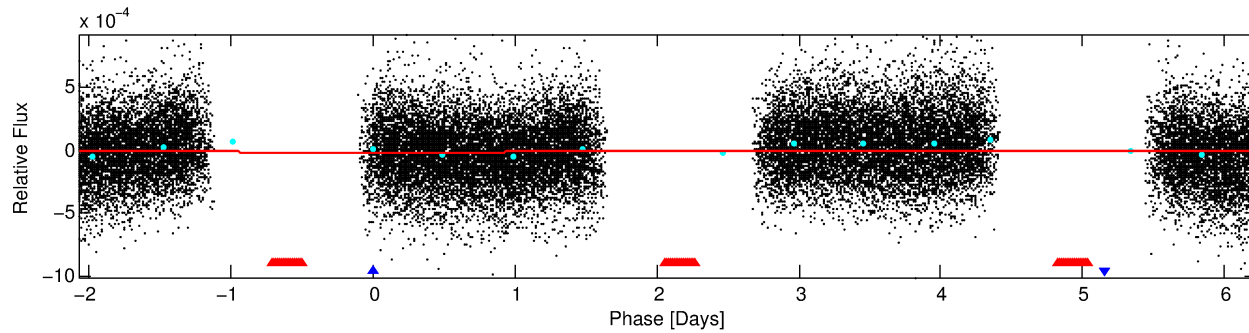
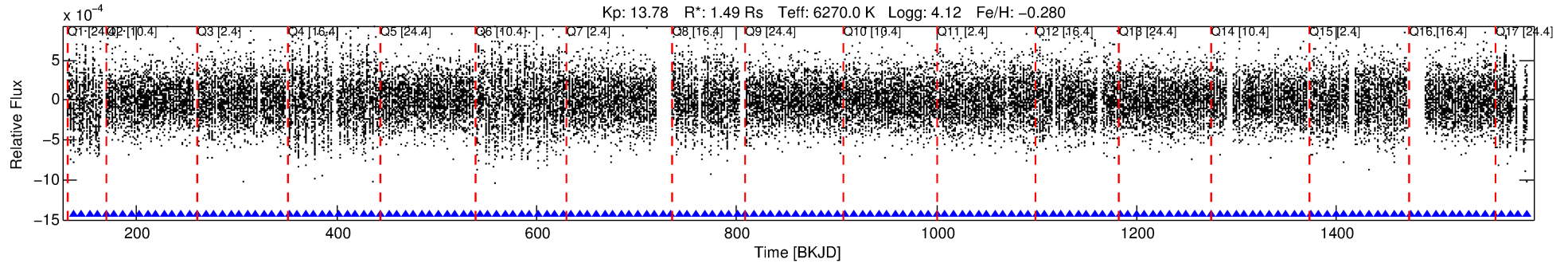
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008591109-02

No Significant Match Found

DV One-Page Summary

KIC: 8591109 Candidate: 2 of 2 Period: 8.308 d



DV Fit Results:

Period = 8.30753 [0.00123] d
Epoch = 136.4250 [0.0951] BKJD
Rp/R* = 0.0042 [0.0014]
a/R* = 1.07 [0.23]
b = 0.86 [0.49]
Seff = 460.15 [233.79]
Teq = 1181 [150] K
Rp = 0.68 [0.31] Re
a = 0.0820 [0.0251] AU
Ag = 314.18 [257.37] [1.22σ]
Teffp = 7688 [1292] K [5.00σ]

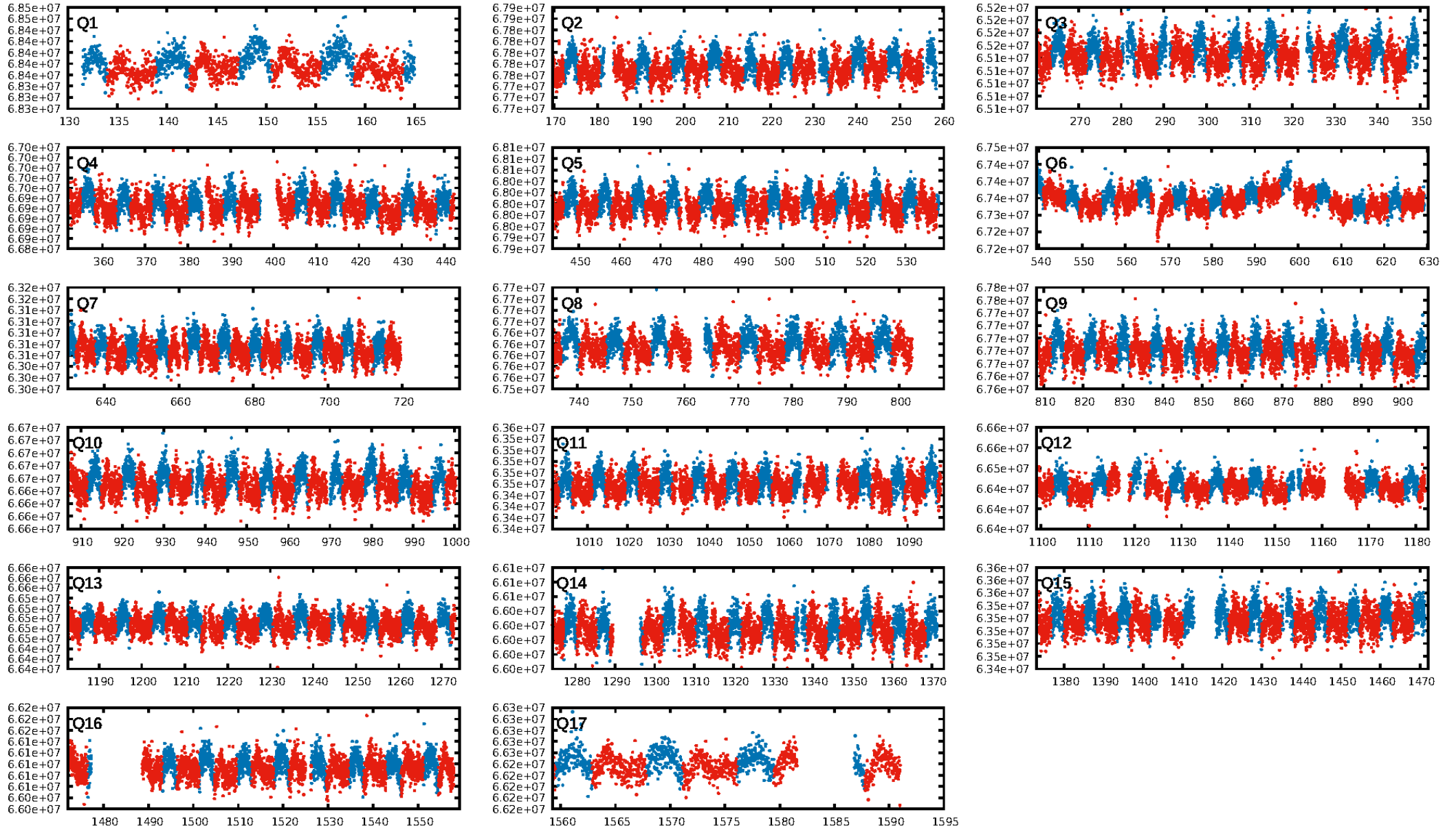
DV Diagnostic Results:

ShortPeriod-sig: 97.3% [2.21σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 98.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.98e-22
RollingBand-fgt: 1.00 [162/162]
GhostDiagnostic-chr: 3.38
Centroid-sig: 68.6%
Centroid-so: 2.576 arcsec [1.22σ]
OotOffset-rm: 2.303 arcsec [2.71σ]
KicOffset-rm: 2.326 arcsec [2.58σ]
OotOffset-st: 2/1/2/2 [7]
KicOffset-st: 2/1/2/2 [7]
DiffImageQuality-fgm: 0.43 [3/7]
DiffImageOverlap-fno: 0.00 [0/17]

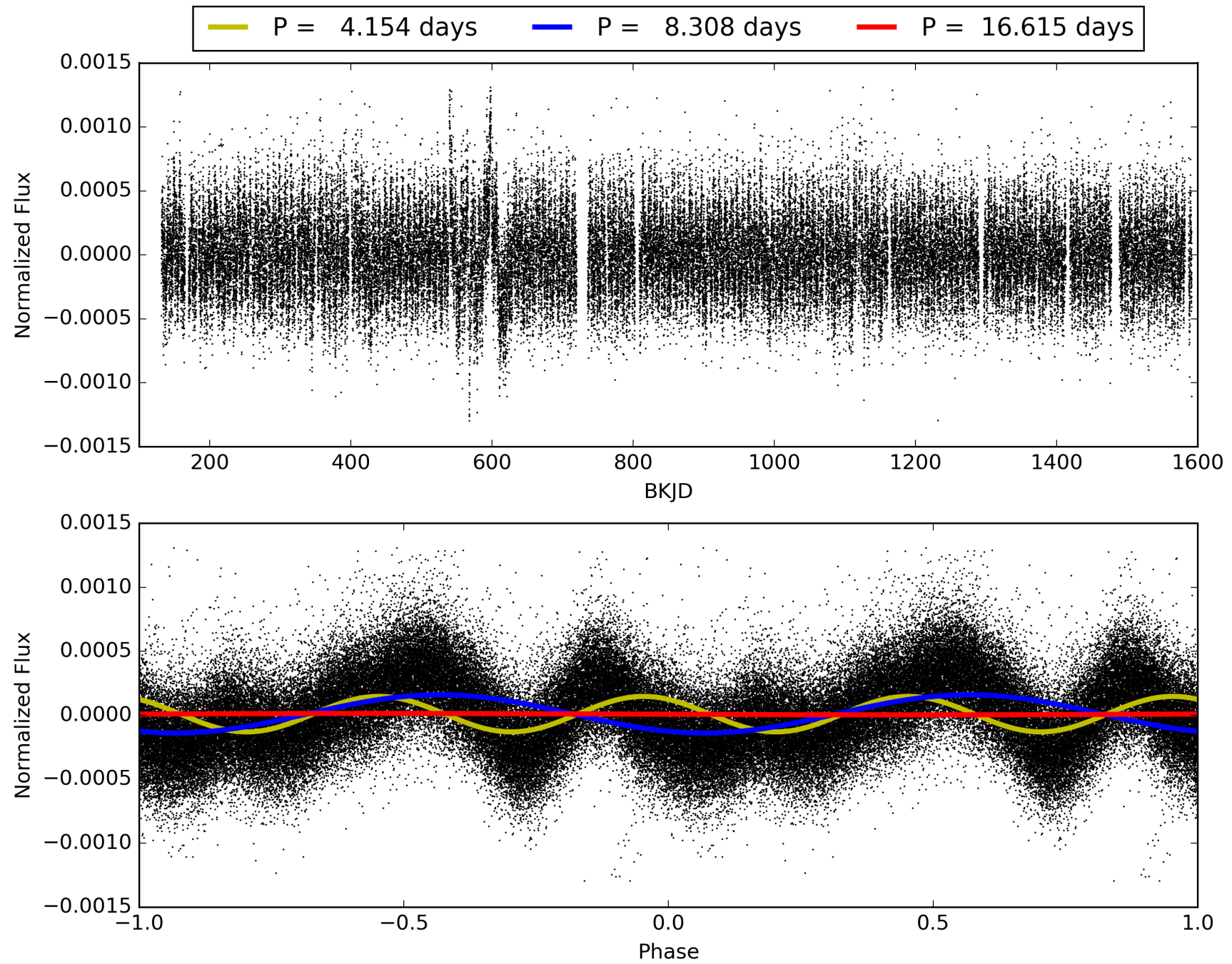
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 00:15:34 Z

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

TCE 008591109-02, PDC Light Curves

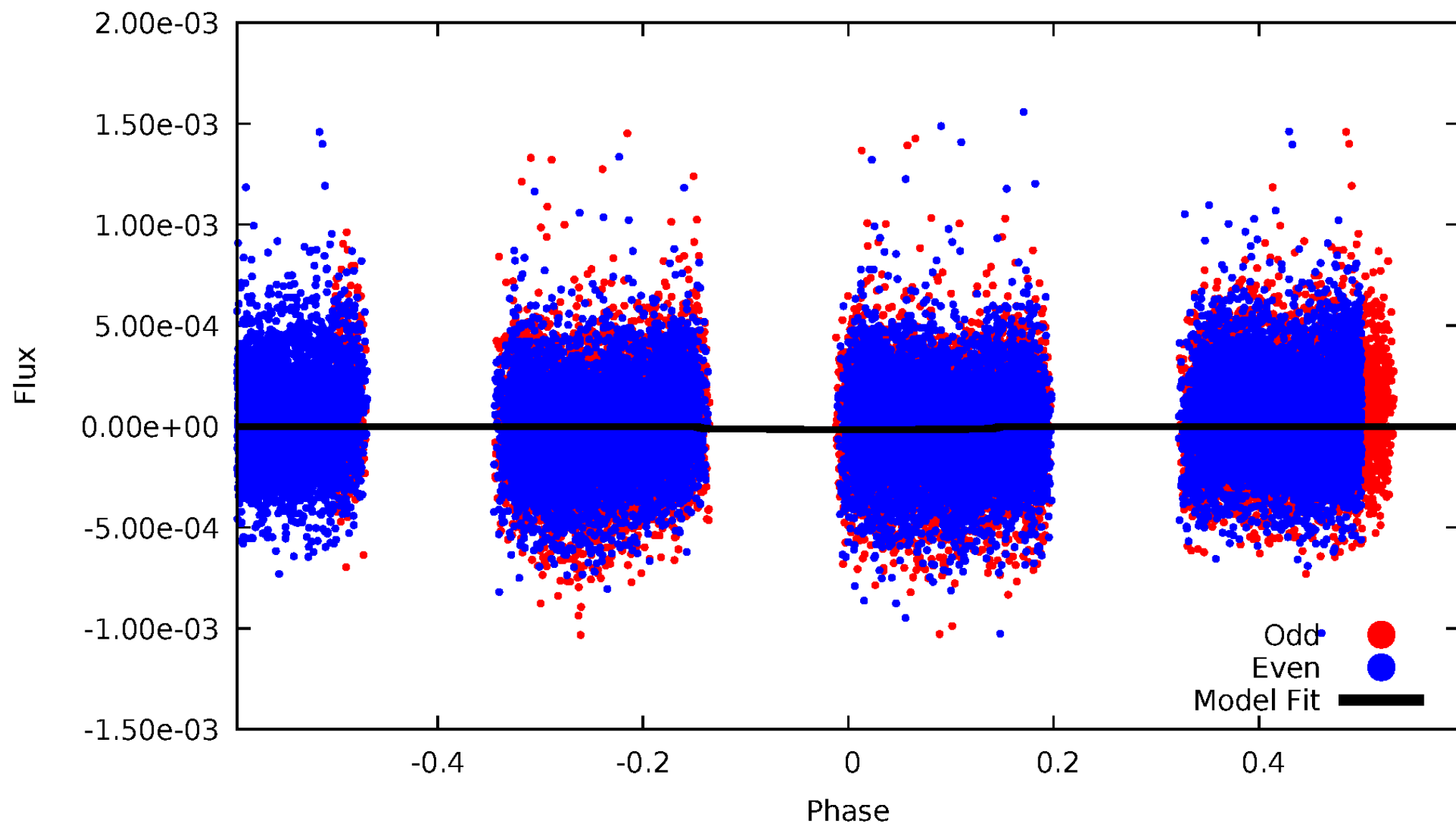


TCE 008591109-02



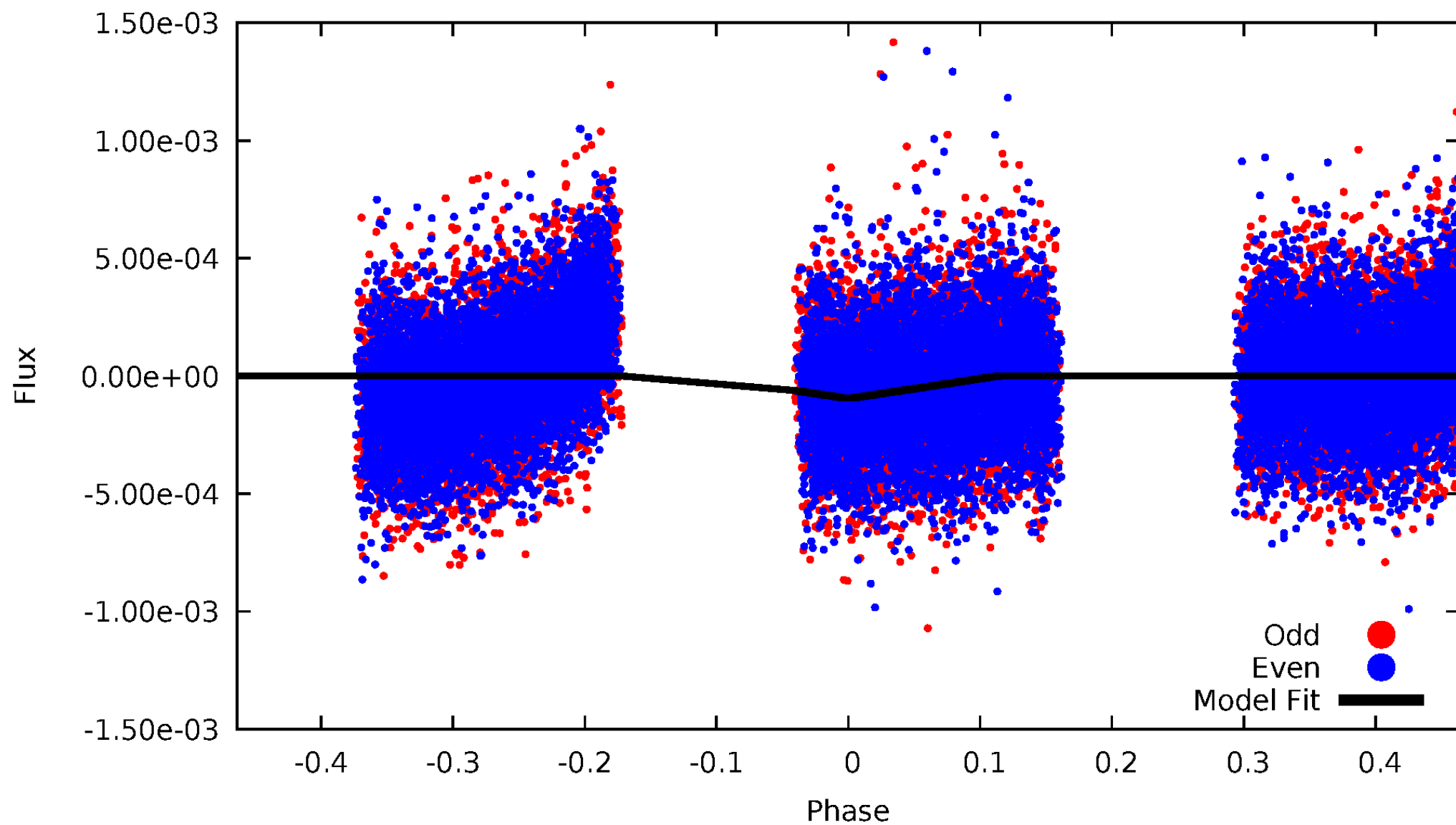
DV Odd/Even

TCE 008591109-02



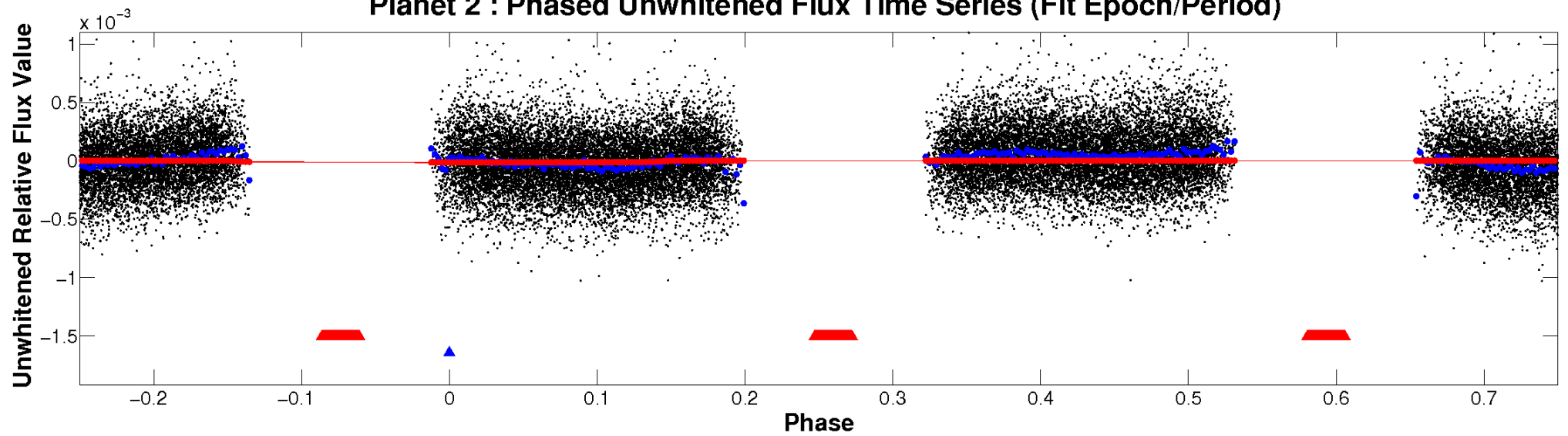
ALT Odd/Even

TCE 008591109-02

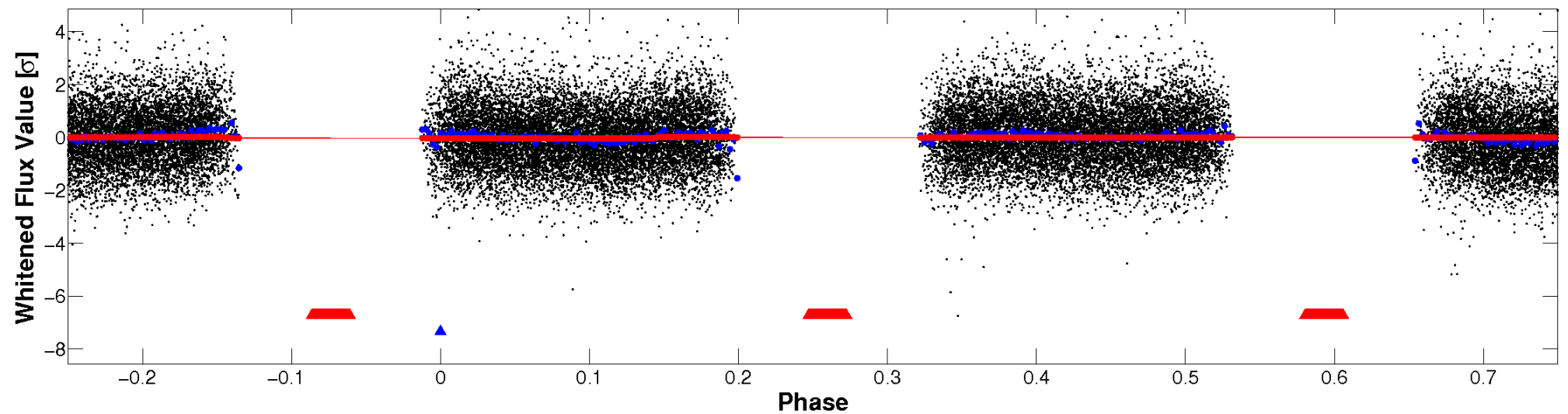


Non-Whitened Vs. Whitened Light Curve

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

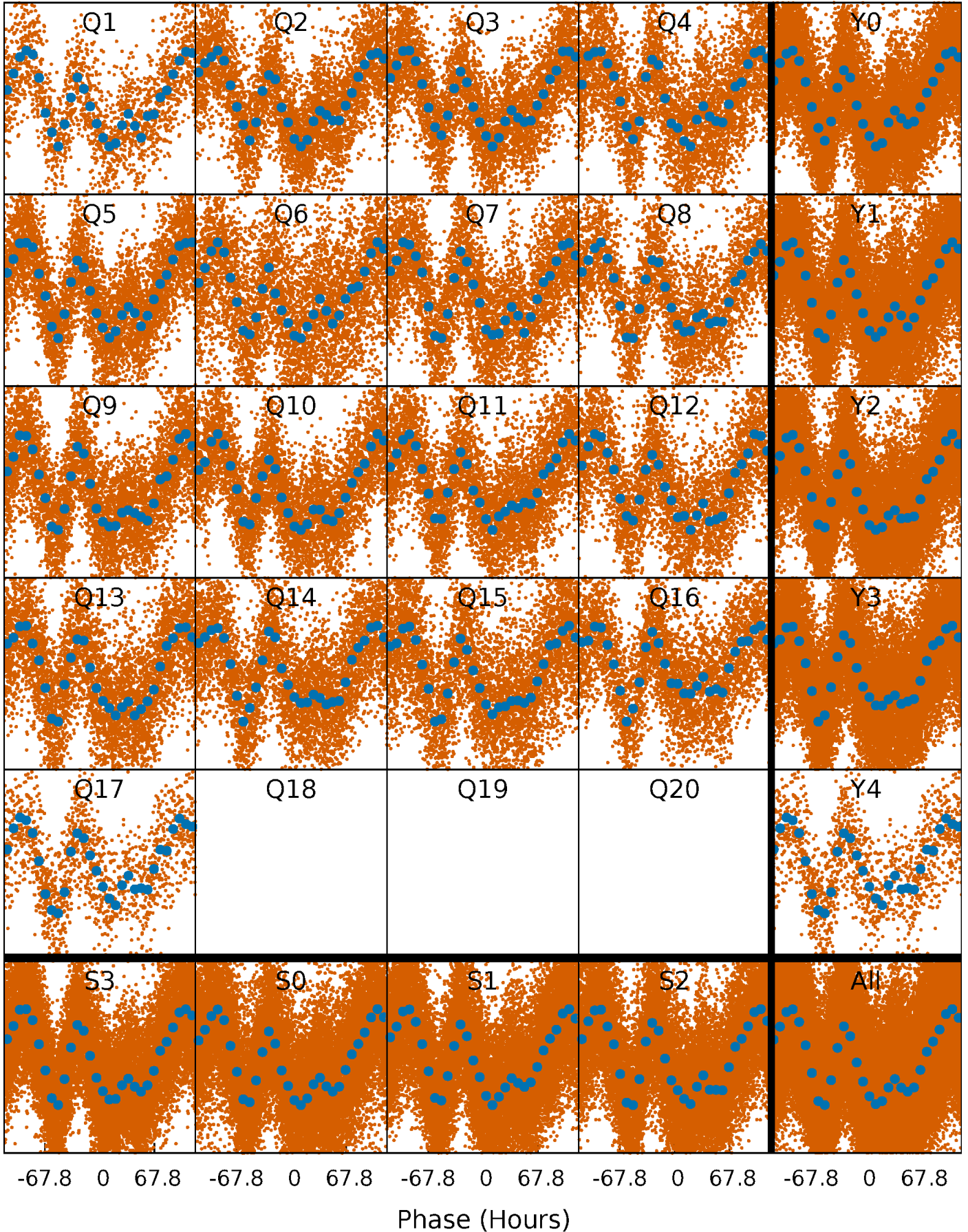


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



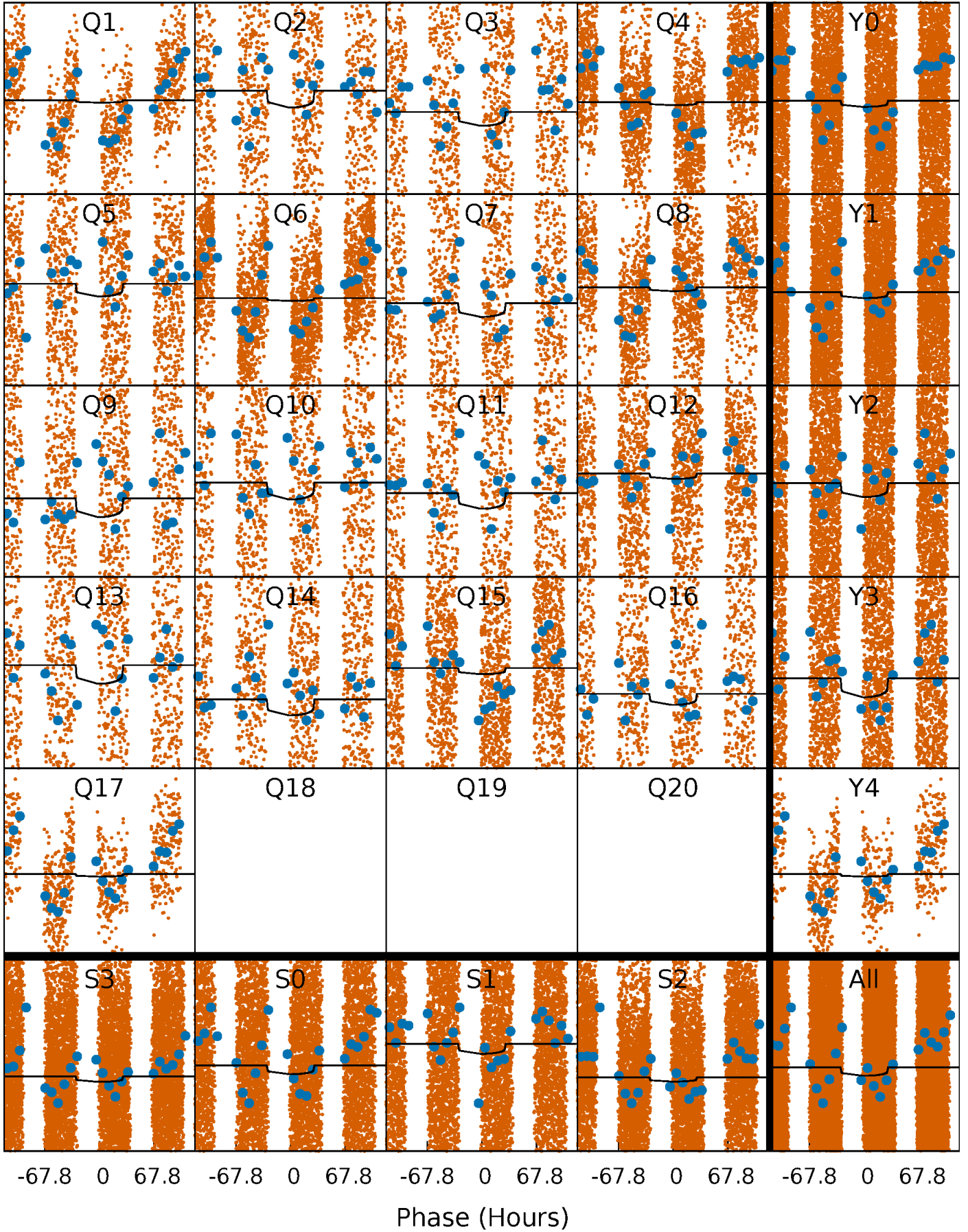
PDC Quarter-Phased Transit Curves

TCE 008591109-02 P= 8.307525 Days $T_0=136.424995$ (BKJD)



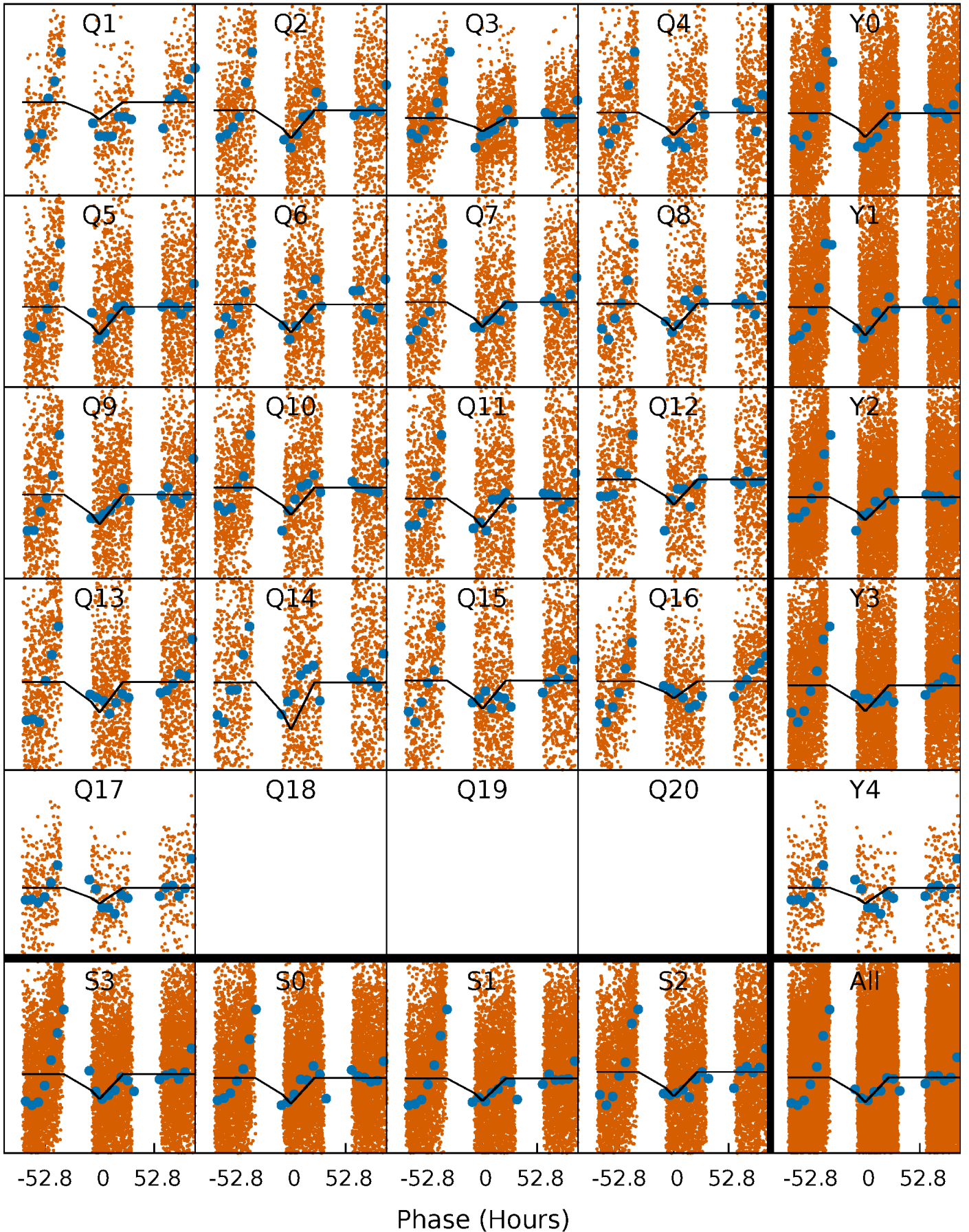
DV Quarter-Phased Transit Curves

TCE 008591109-02 P= 8.307525 Days $T_0=136.424995$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

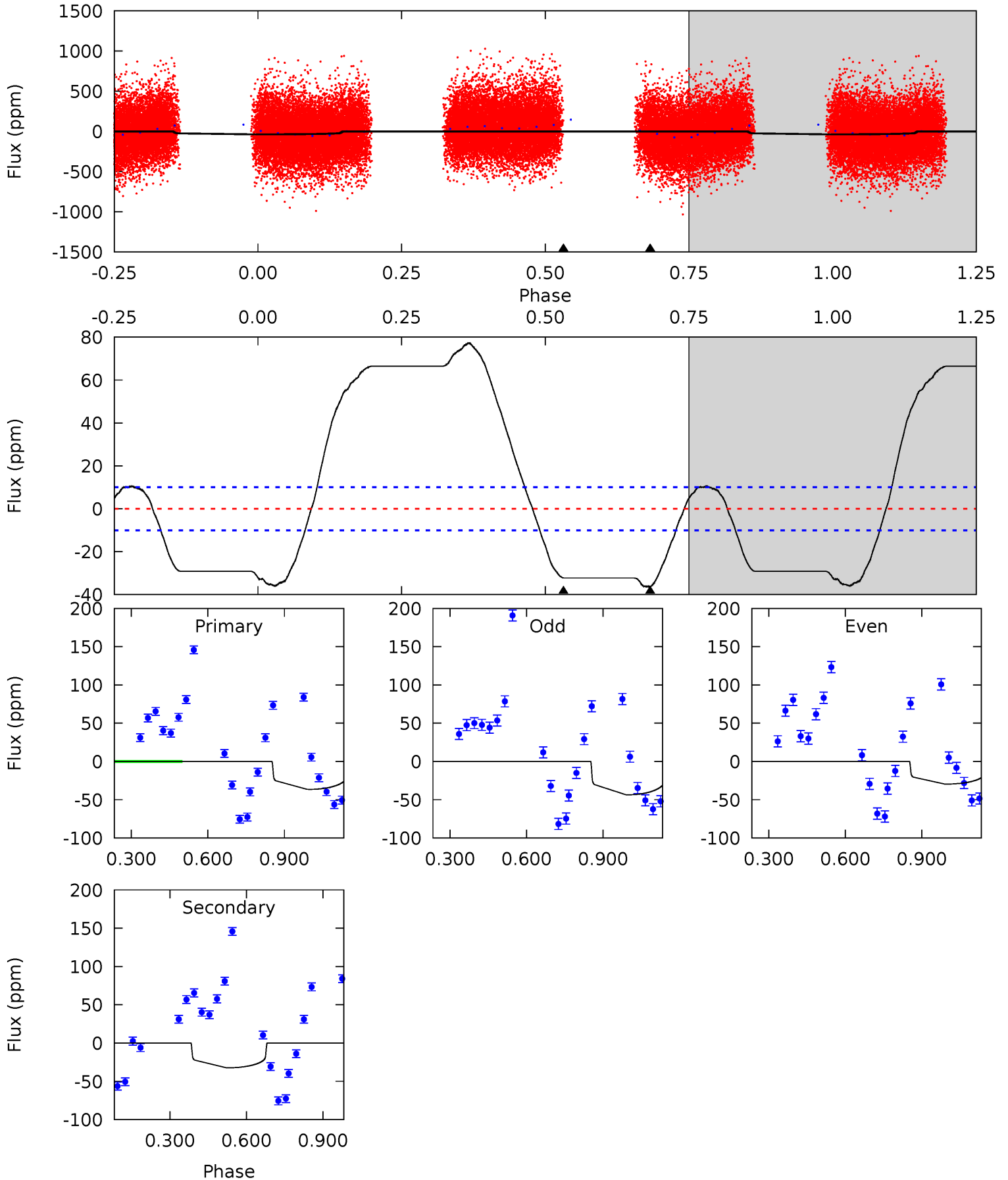
TCE 008591109-02 P= 8.307144 Days $T_0=136.728840$ (BKJD)



DV Model-Shift Uniqueness Test

008591109-02, P = 8.307525 Days, E = 128.117470 Days

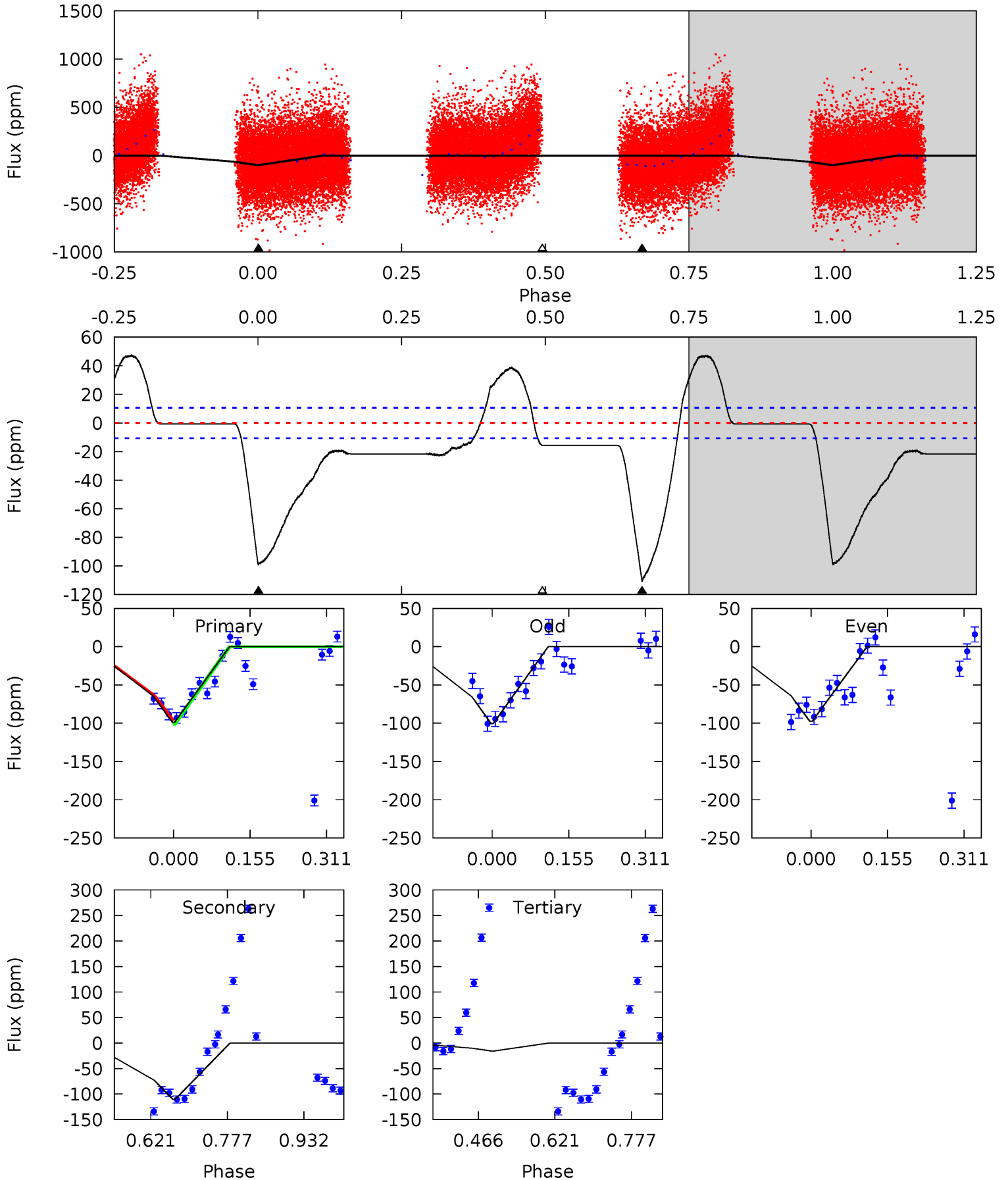
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.7	13.9	0	0	4.33	1.04	16.2	15.7	15.7	13.9	13.9	2.99	2.12	0.68	3.29



Alt Model-Shift Uniqueness Test

008591109-02, P = 8.307144 Days, E = 128.421696 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.3	46.1	6.54	0	4.47	1.42	9.55	34.8	41.3	39.6	46.1	0.59	1.05	0.30	0.87



Stellar Parameters For KIC 008591109

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6270^{+175}_{-219}	$4.116^{+0.286}_{-0.154}$	$-0.280^{+0.250}_{-0.300}$	$1.494^{+0.436}_{-0.480}$	$1.063^{+0.181}_{-0.148}$	$0.449^{+0.822}_{-0.211}$
	+3%/-3%	+7%/-4%	+89%/-107%	+29%/-32%	+17%/-14%	+183%/-47%
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 008591109-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-32 ± 2	$0.64^{+0.28}_{-0.22}$	1614^{+145}_{-146}	7424^{+2200}_{-1174}	292^{+412}_{-147}
Alt.	-110 ± 2	$1.52^{+0.37}_{-0.31}$	1625^{+126}_{-156}	6513^{+582}_{-481}	177^{+103}_{-61}

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

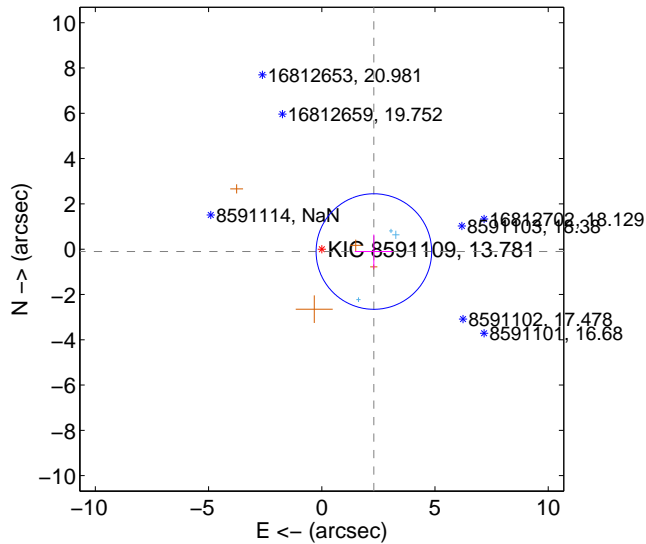
Supplemental centroid analysis for 008591109-02. Kepler magnitude: 13.78. Transit SNR 3.94

There are 3 quarters with good PRF difference image offsets

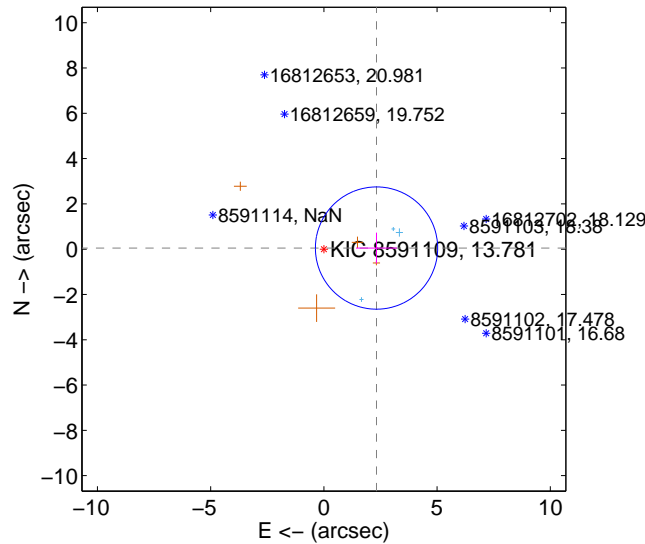
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.303 ± 0.850	2.71	-2.301 ± 0.840	-0.104 ± 0.750
PRF-fit source offset from KIC position	2.326 ± 0.900	2.58	-2.325 ± 0.906	0.049 ± 0.681
photometric centroid source offset	2.58 ± 2.11	1.22	2.56 ± 2.11	0.32 ± 2.25

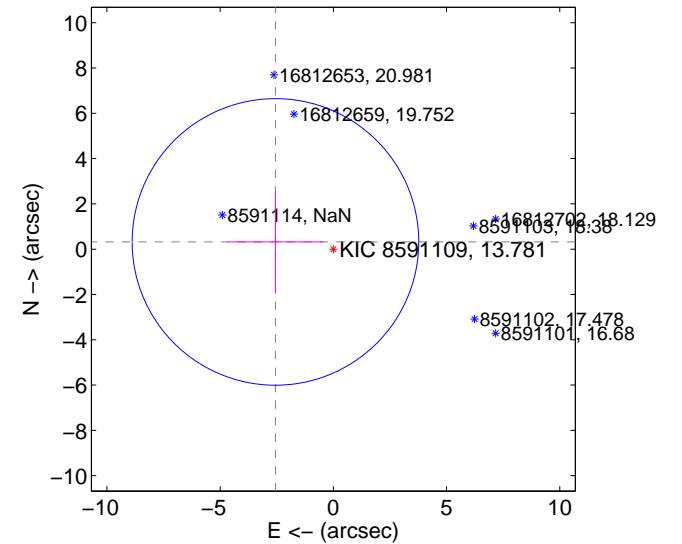
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

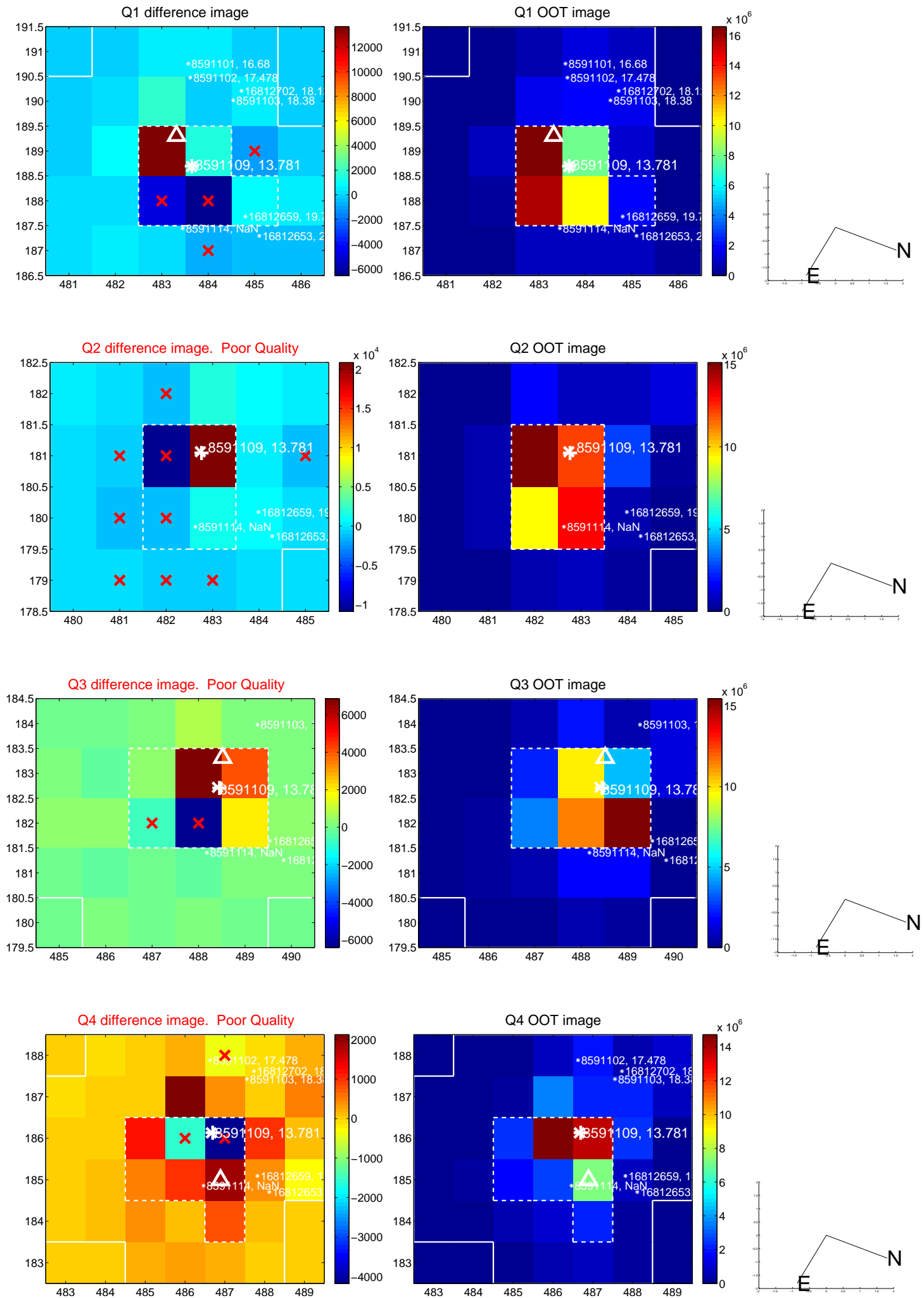


offset from photometric centroids

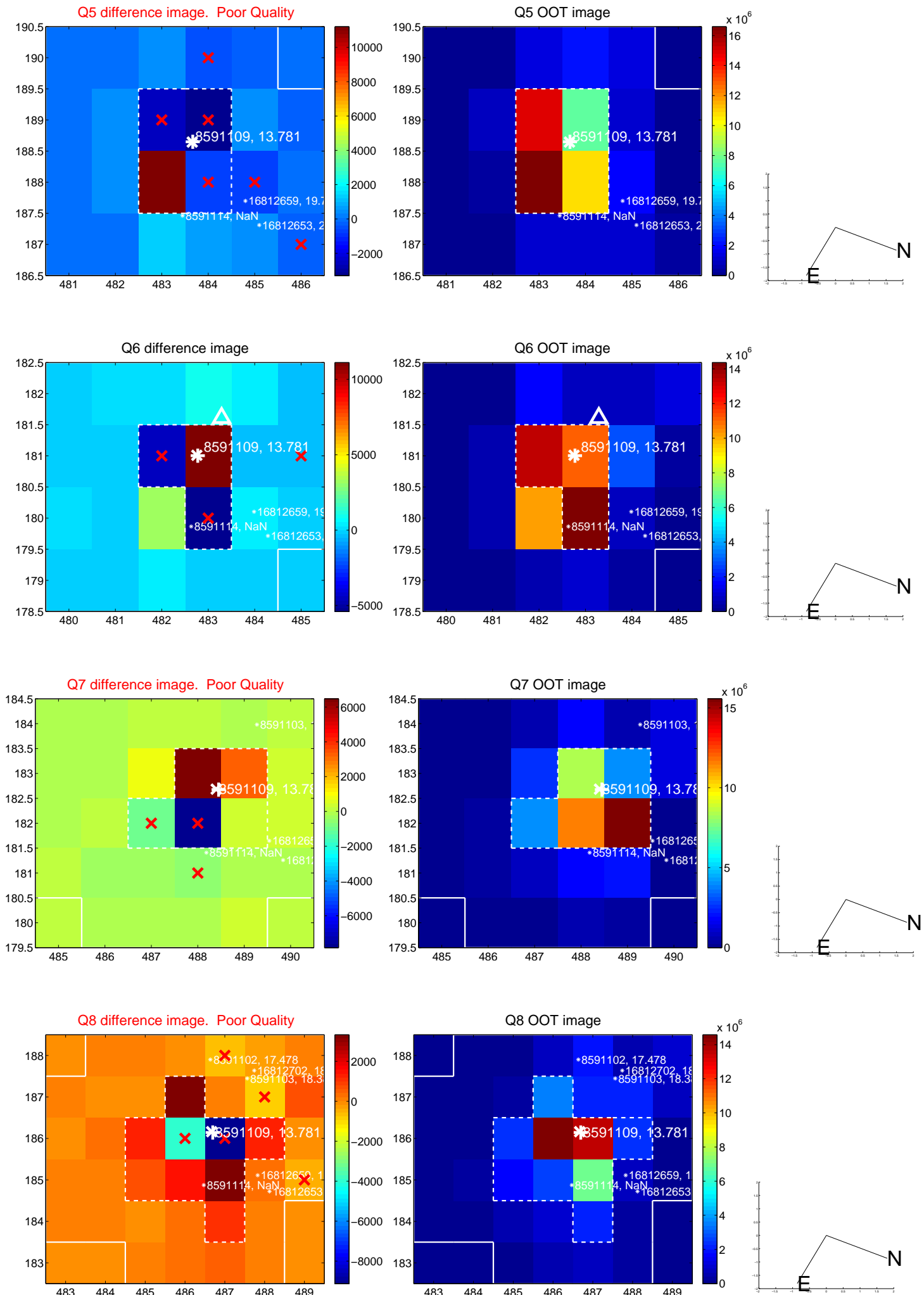


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

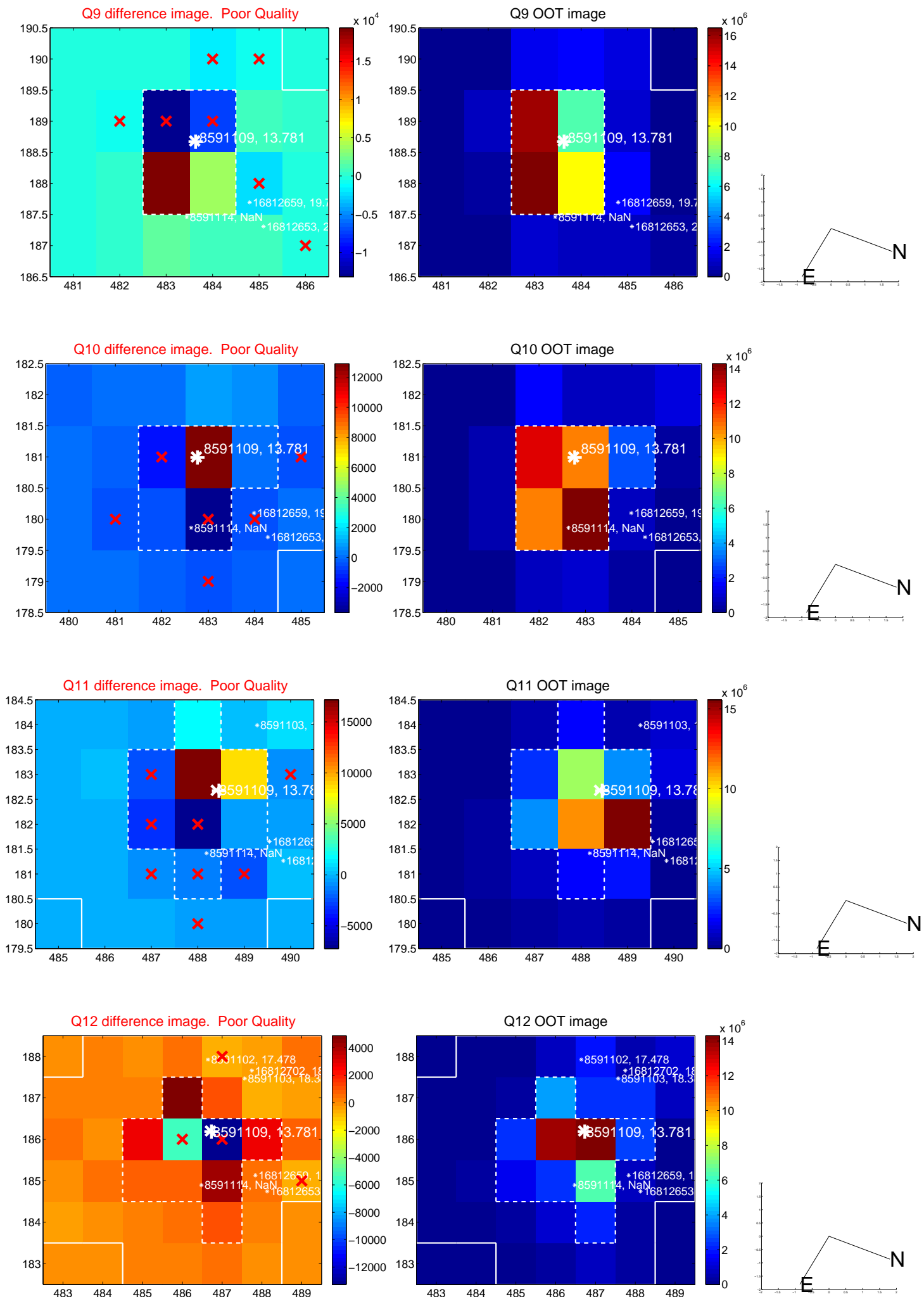
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



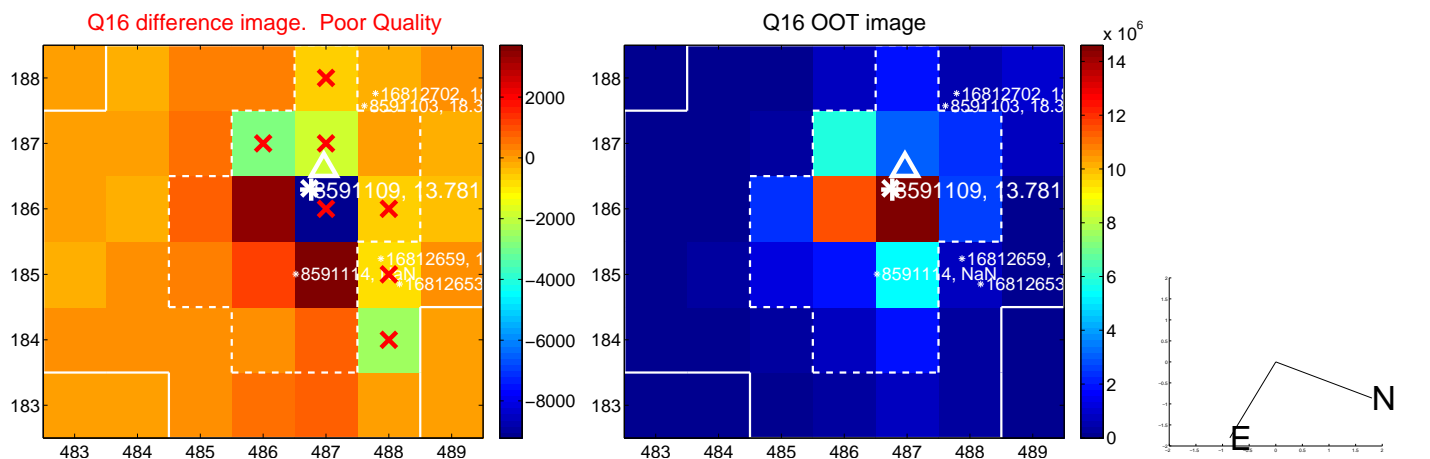
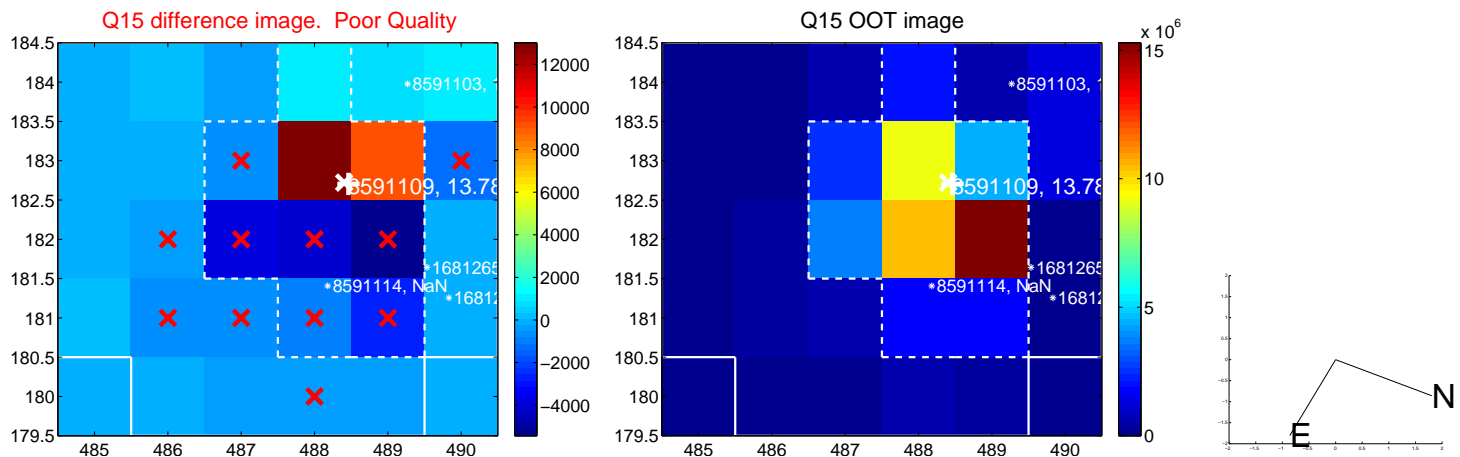
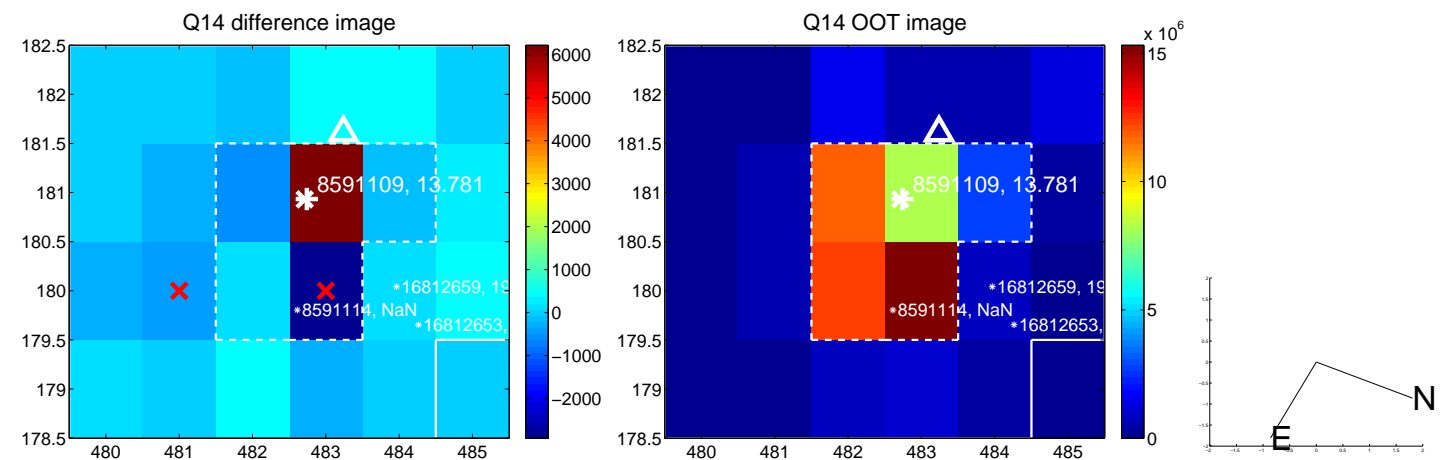
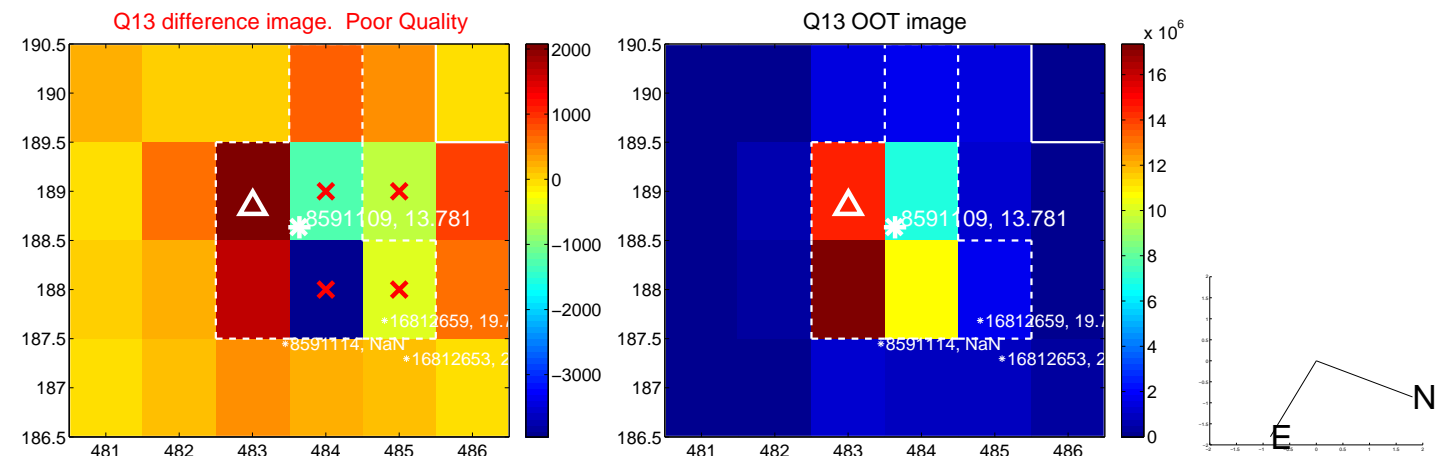
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



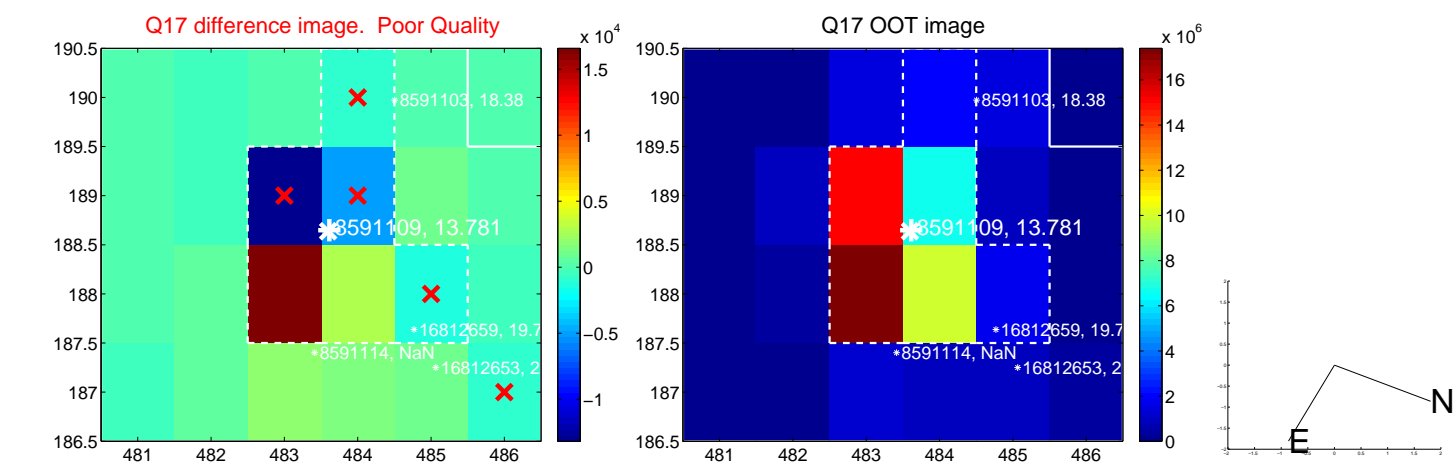
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



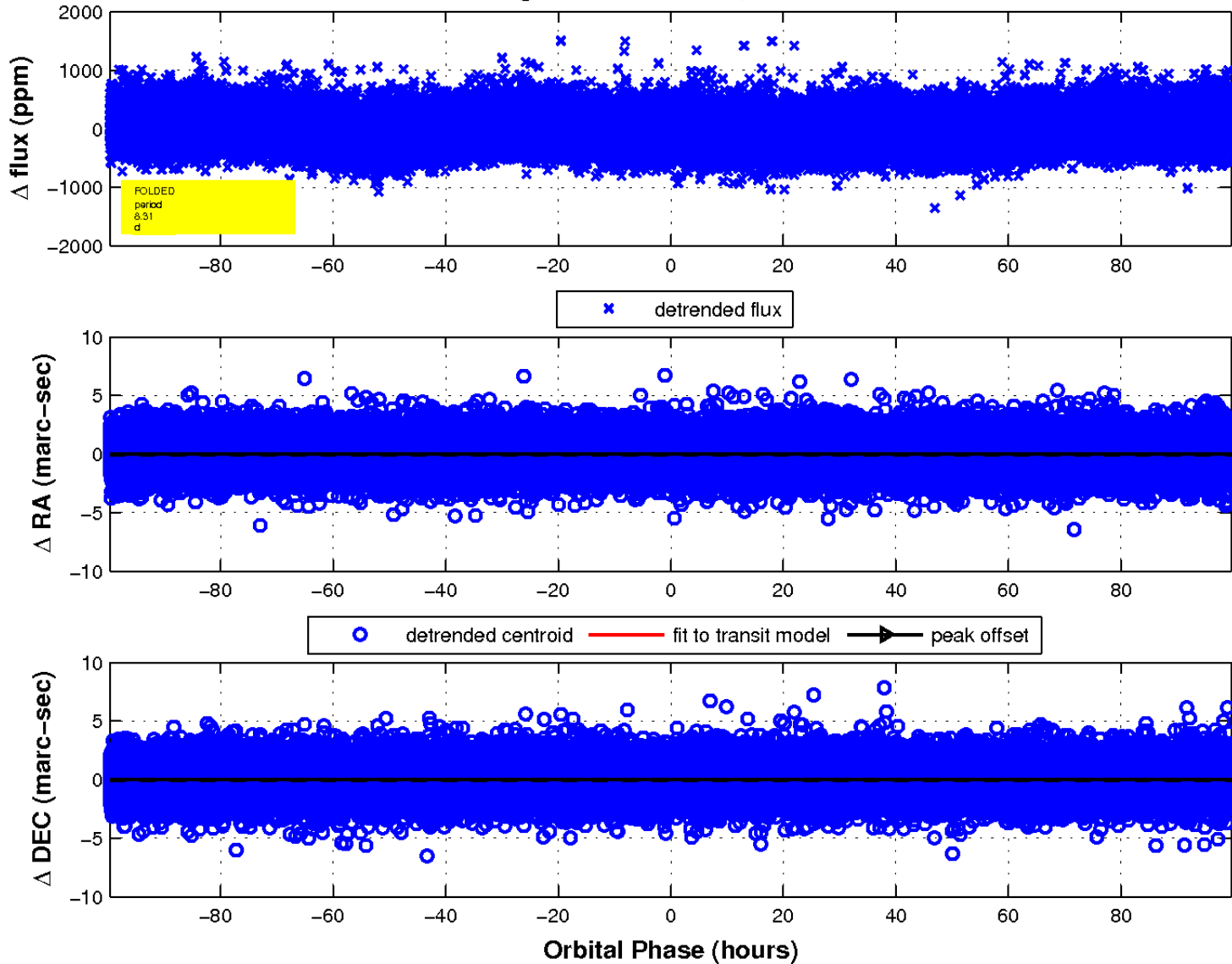
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

