

KIC 002721835

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})
002721835-01	OBS	No	4.363270	132.038861	142.6	12.000	7.5	-1.0	3.19	8137	3.85	9119.75
002721835-02	OBS	No	4.363445	133.549026	21.2	19.443	7.9	9.0	3.19	8137	1.51	9119.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002721835-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS
002721835-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD

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

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

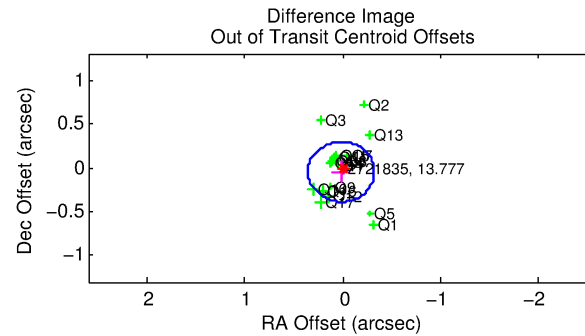
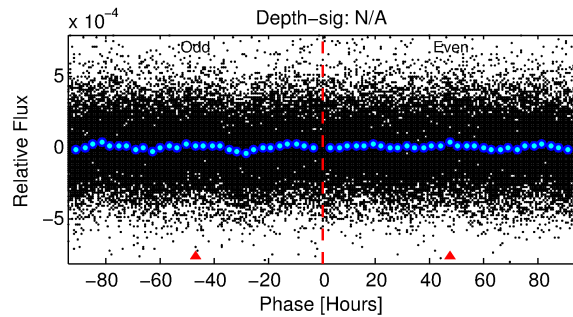
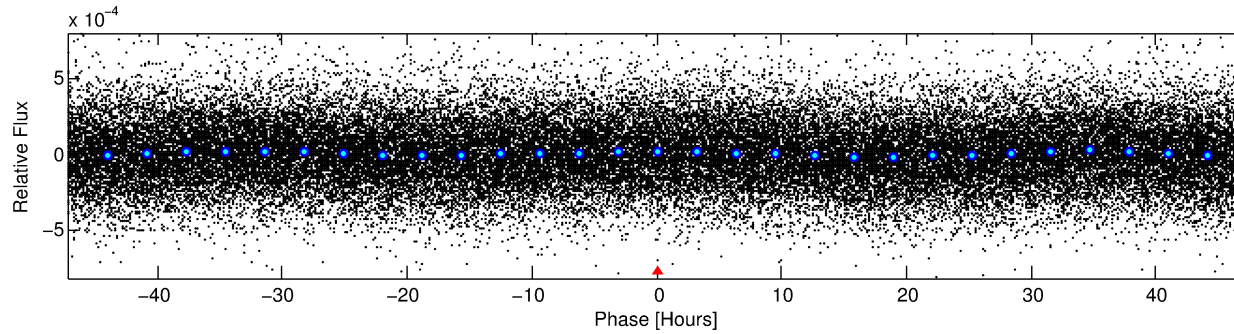
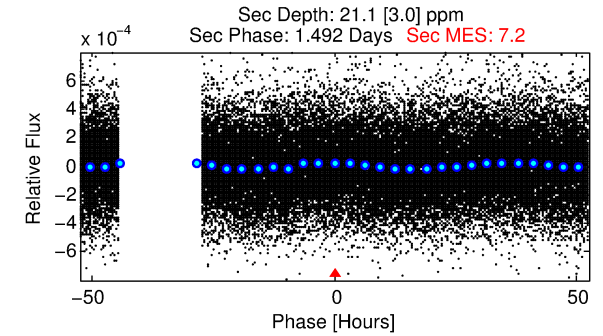
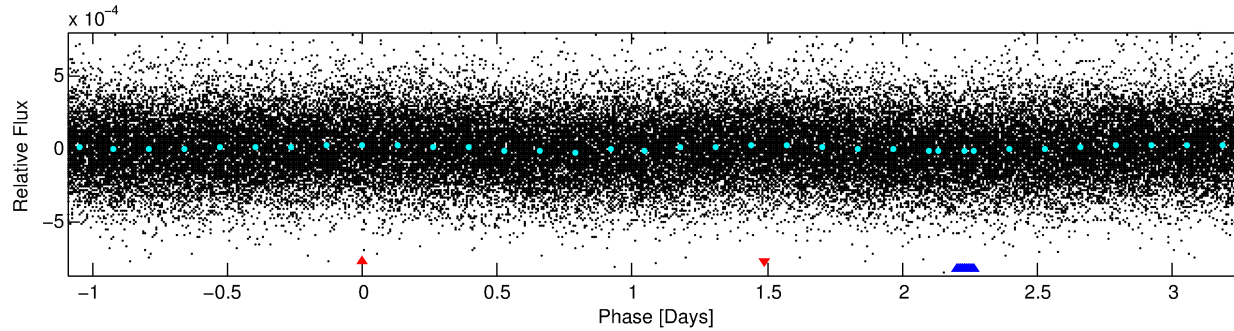
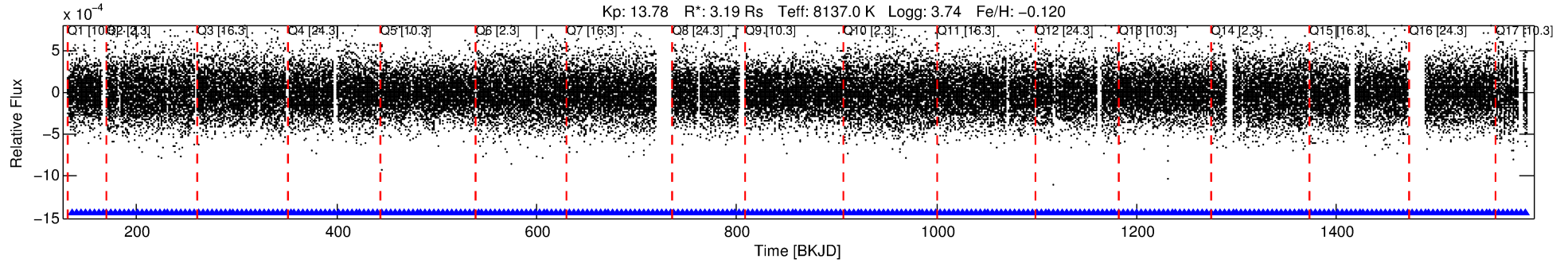
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002721835-01

No Significant Match Found

DV One-Page Summary

KIC: 2721835 Candidate: 1 of 2 Period: 4.363 d



TPS TCE Results:

Period = 4.36327 d
Epoch = 132.0389 BKJD

DV fit results are unavailable

DV Diagnostic Results:

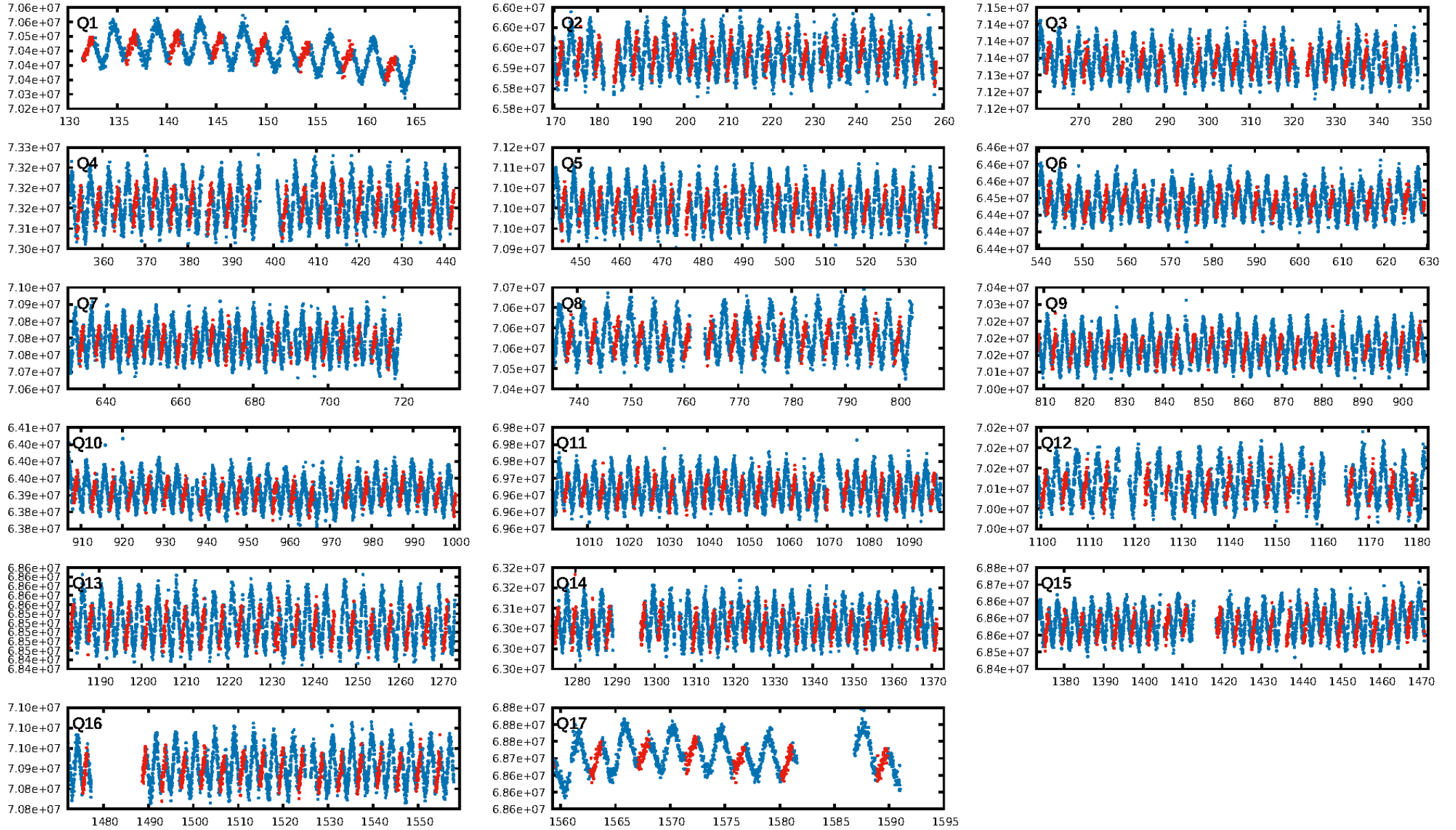
ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.66e-09
RollingBand-fgt: 1.00 [303/303]
GhostDiagnostic-chr: -5.834

Centroid-sig: 0.0%
Centroid-so: 10.748 arcsec [3.39 σ]
OotOffset-rm: 0.049 arcsec [0.43 σ]
KicOffset-rm: 0.008 arcsec [0.09 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

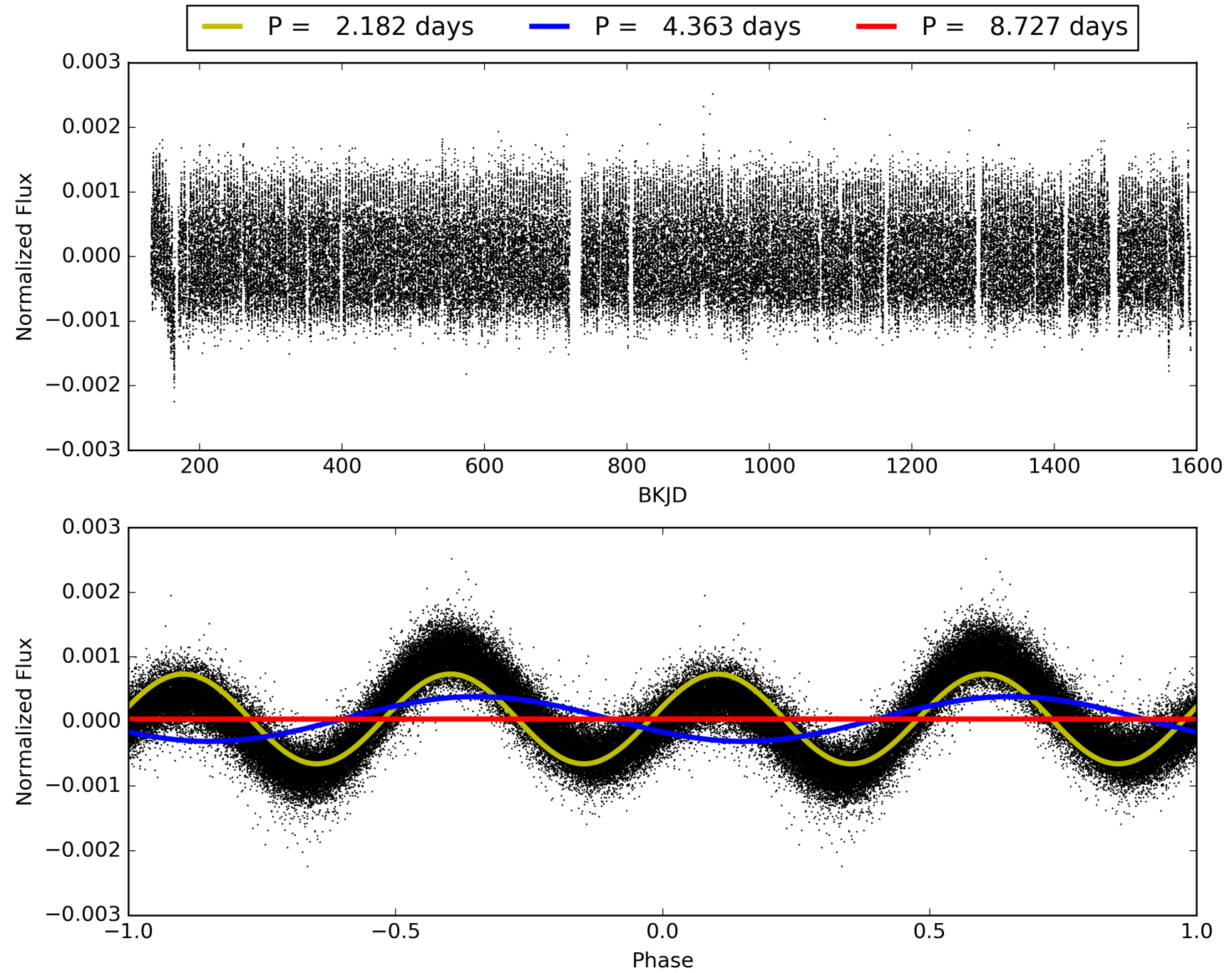
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:11:58 Z

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

TCE 002721835-01, PDC Light Curves

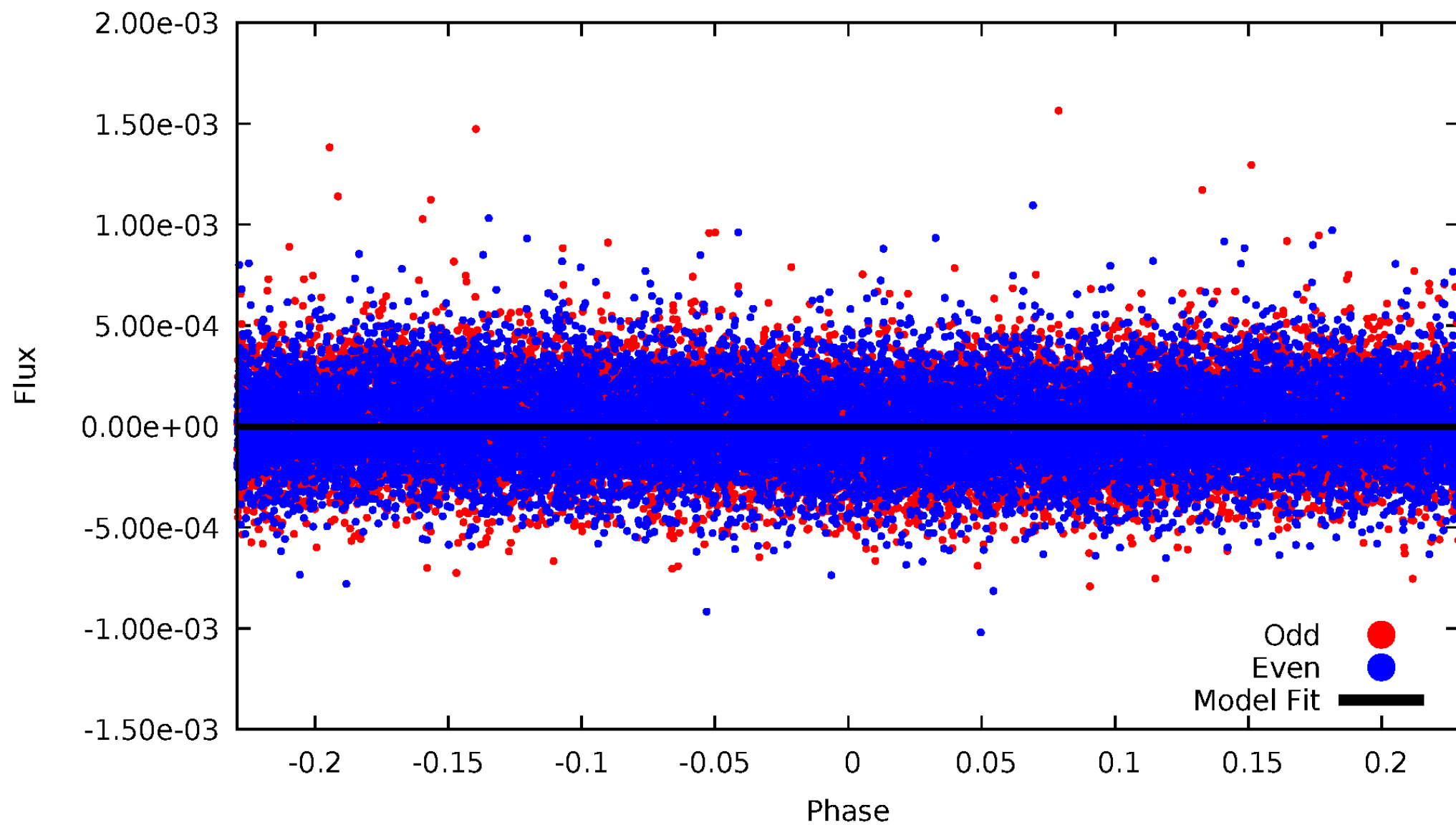


TCE 002721835-01



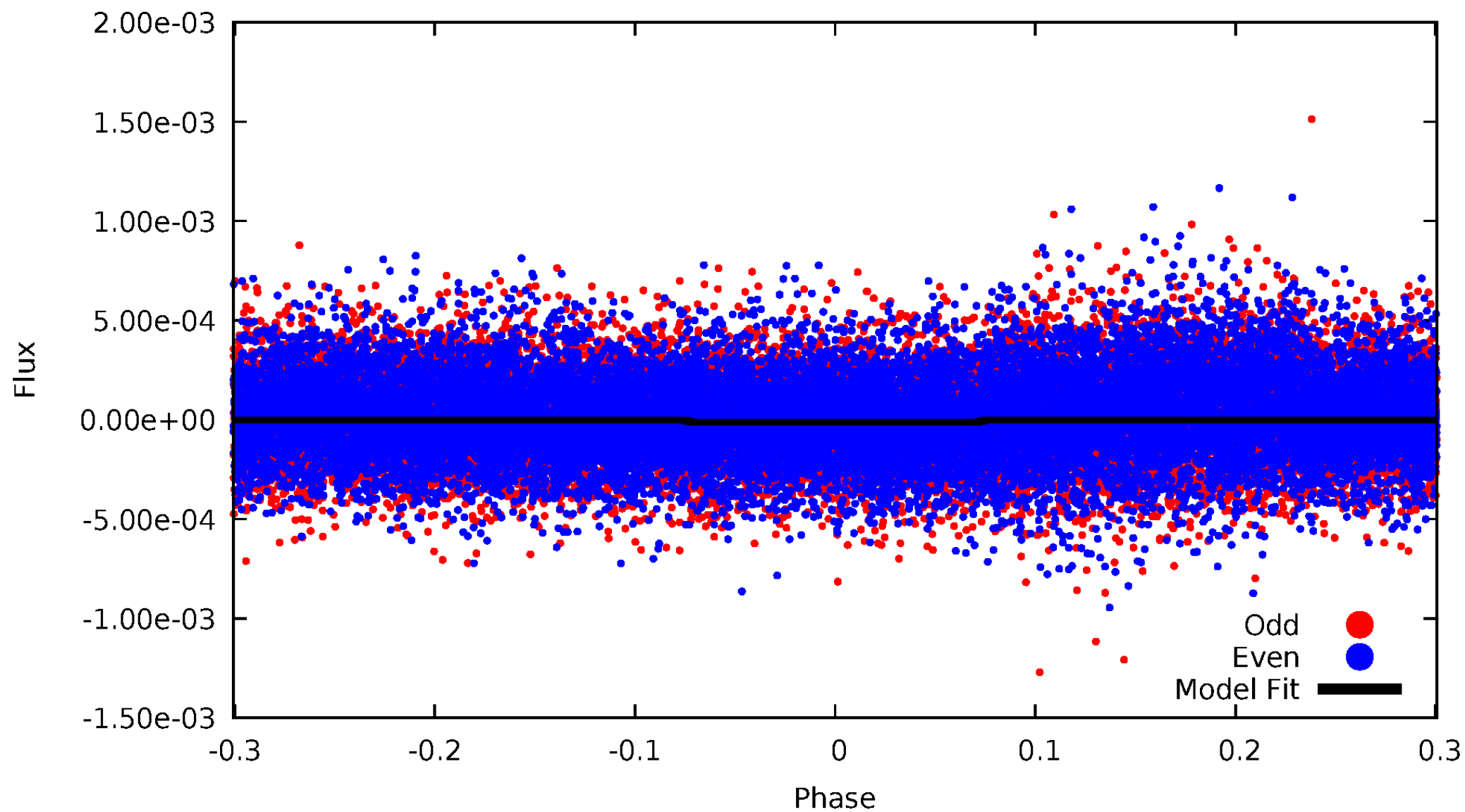
DV Odd/Even

TCE 002721835-01

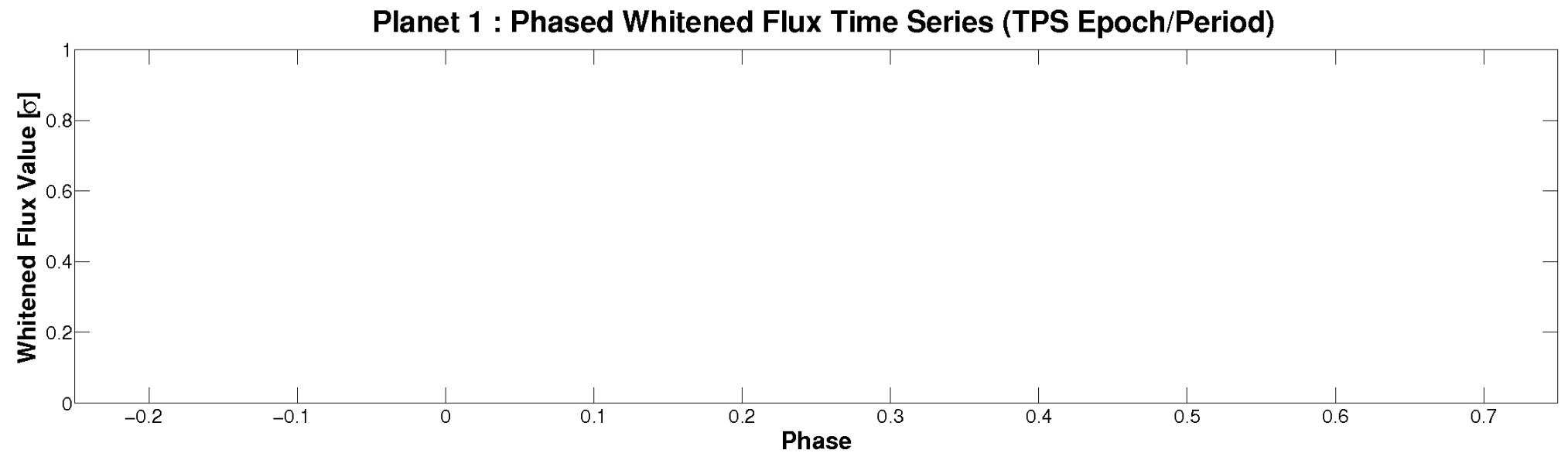
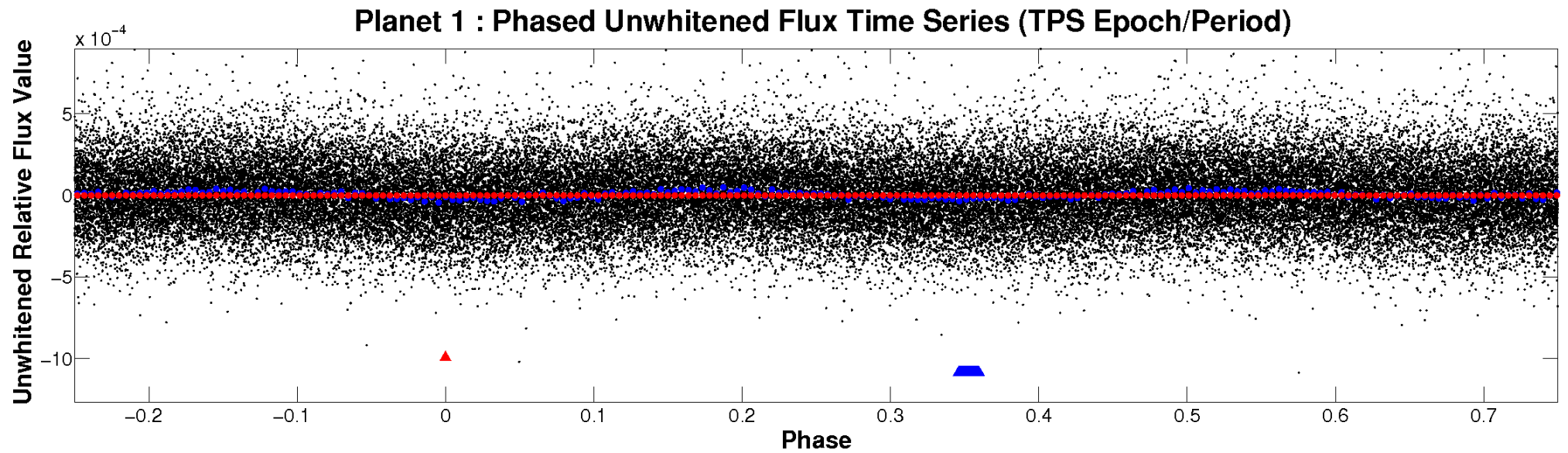


ALT Odd/Even

TCE 002721835-01

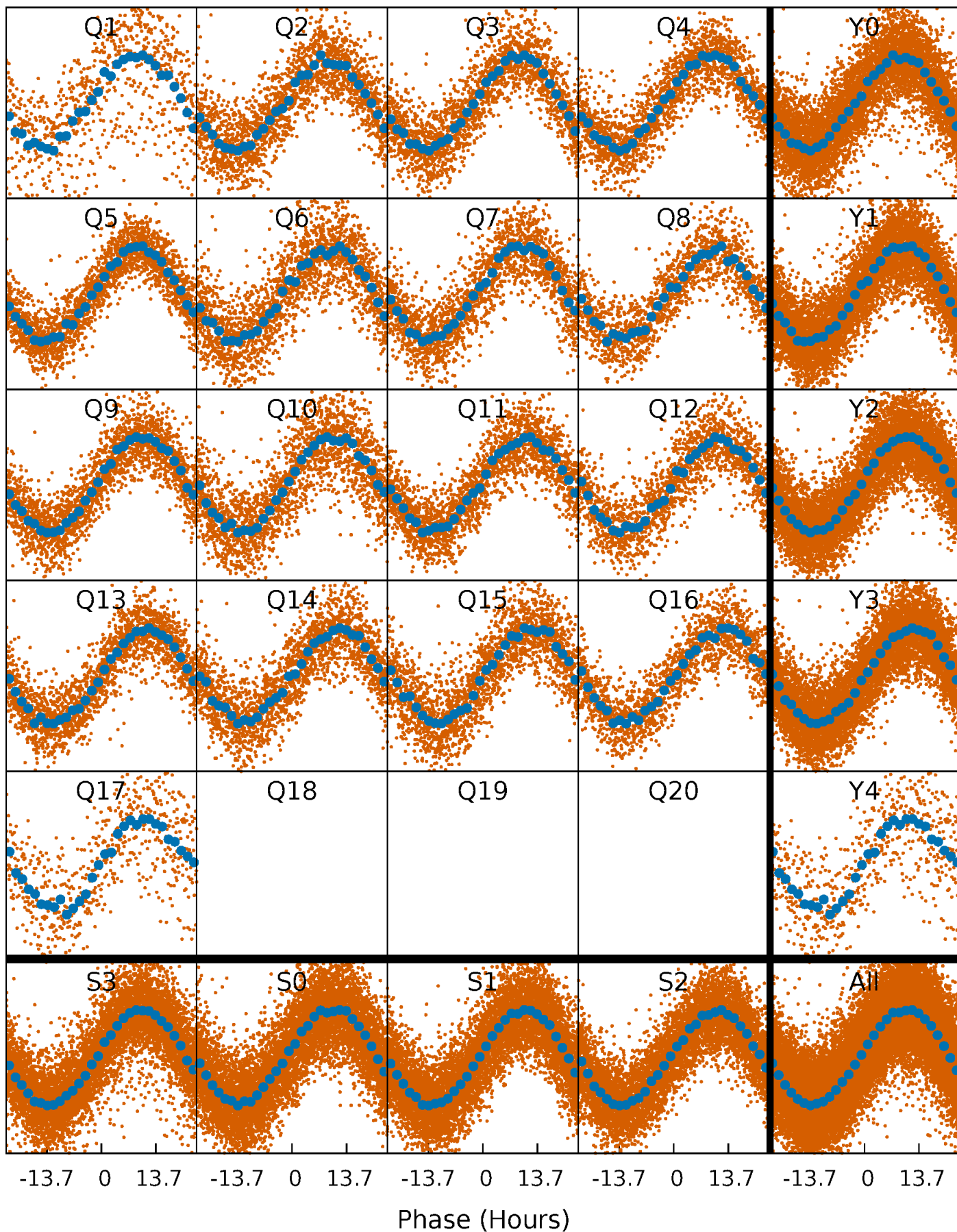


Non-Whitened Vs. Whitened Light Curve



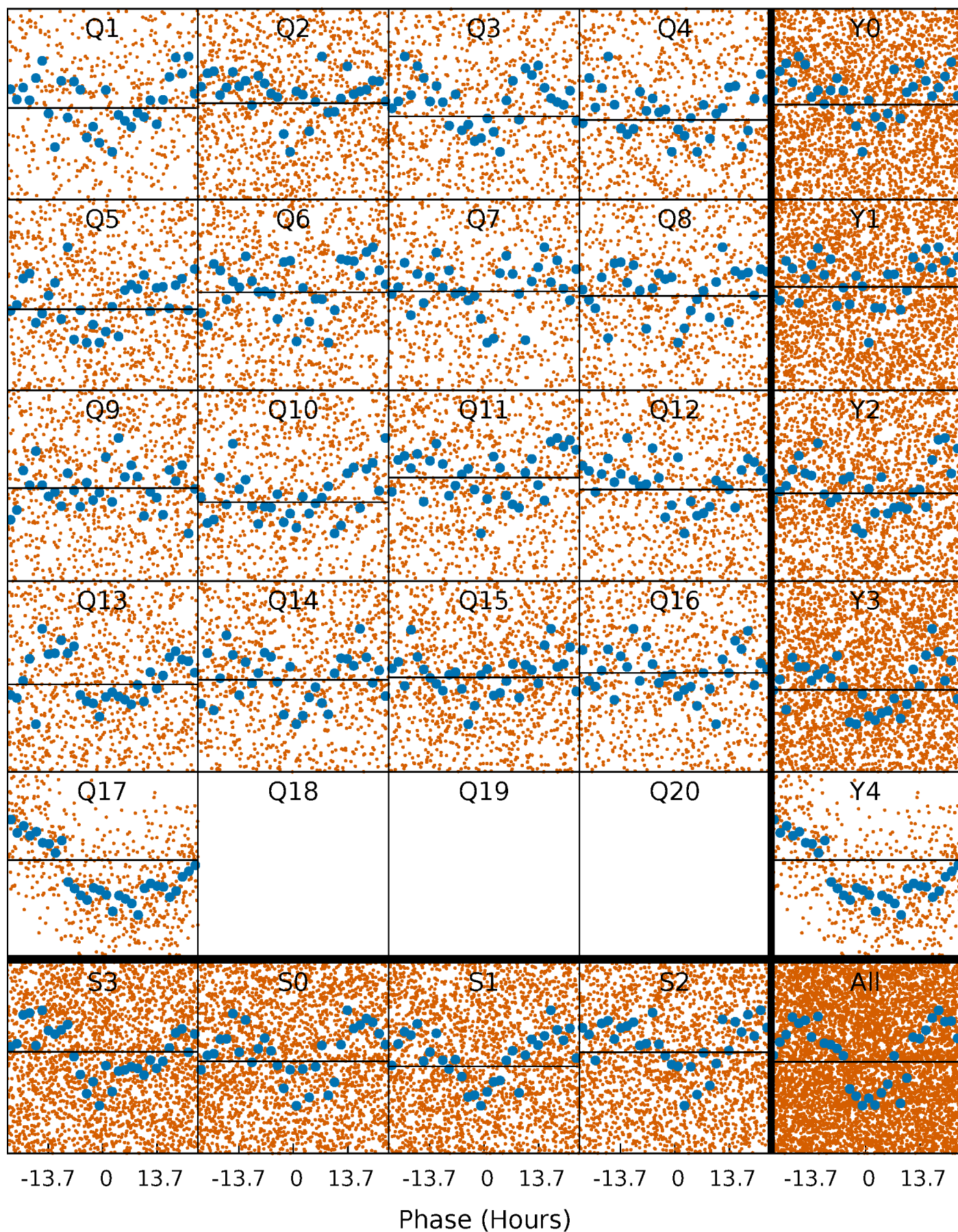
PDC Quarter-Phased Transit Curves

TCE 002721835-01 P= 4.363270 Days $T_0=132.038861$ (BKJD)



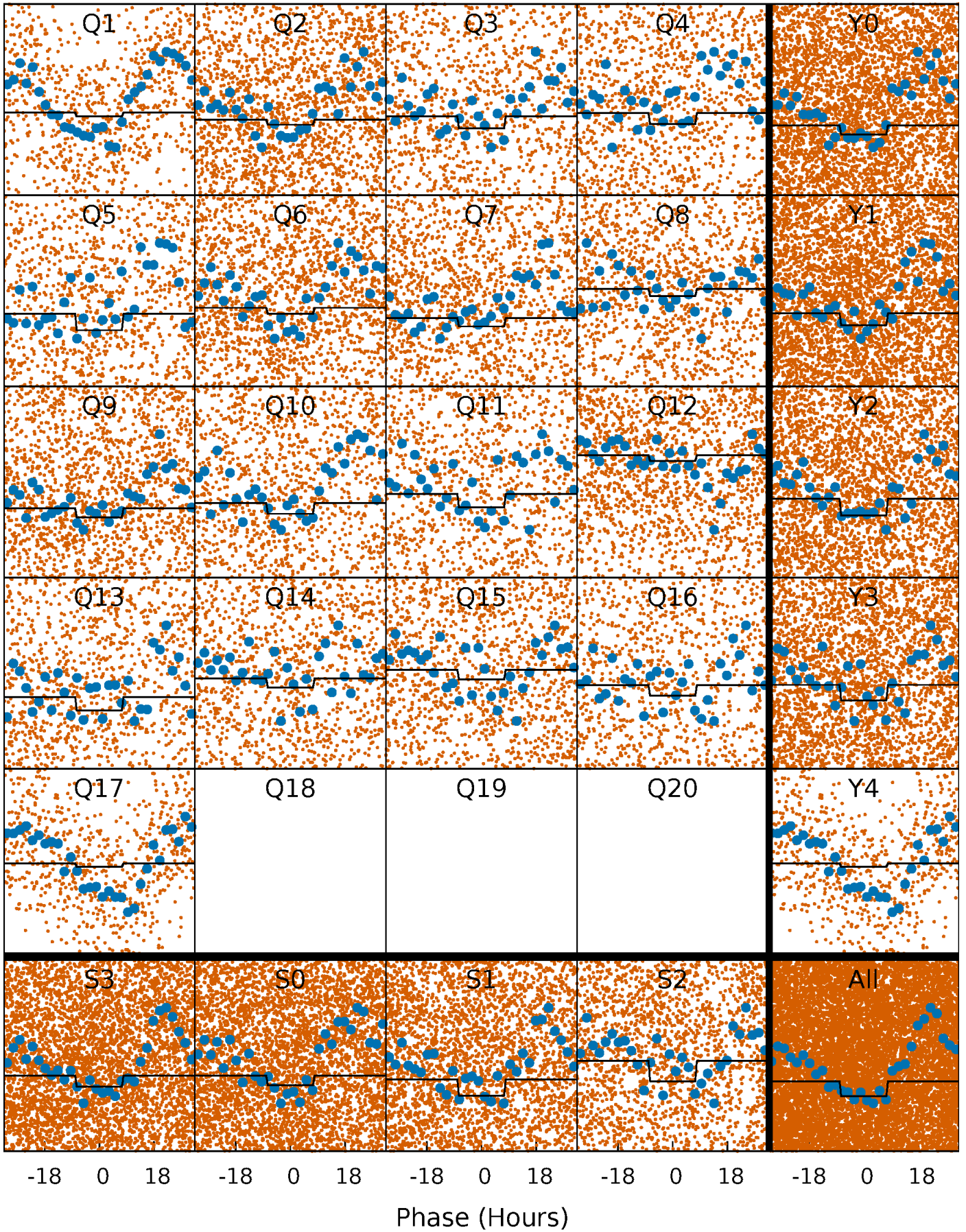
DV Quarter-Phased Transit Curves

TCE 002721835-01 P= 4.363270 Days $T_0=132.038861$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

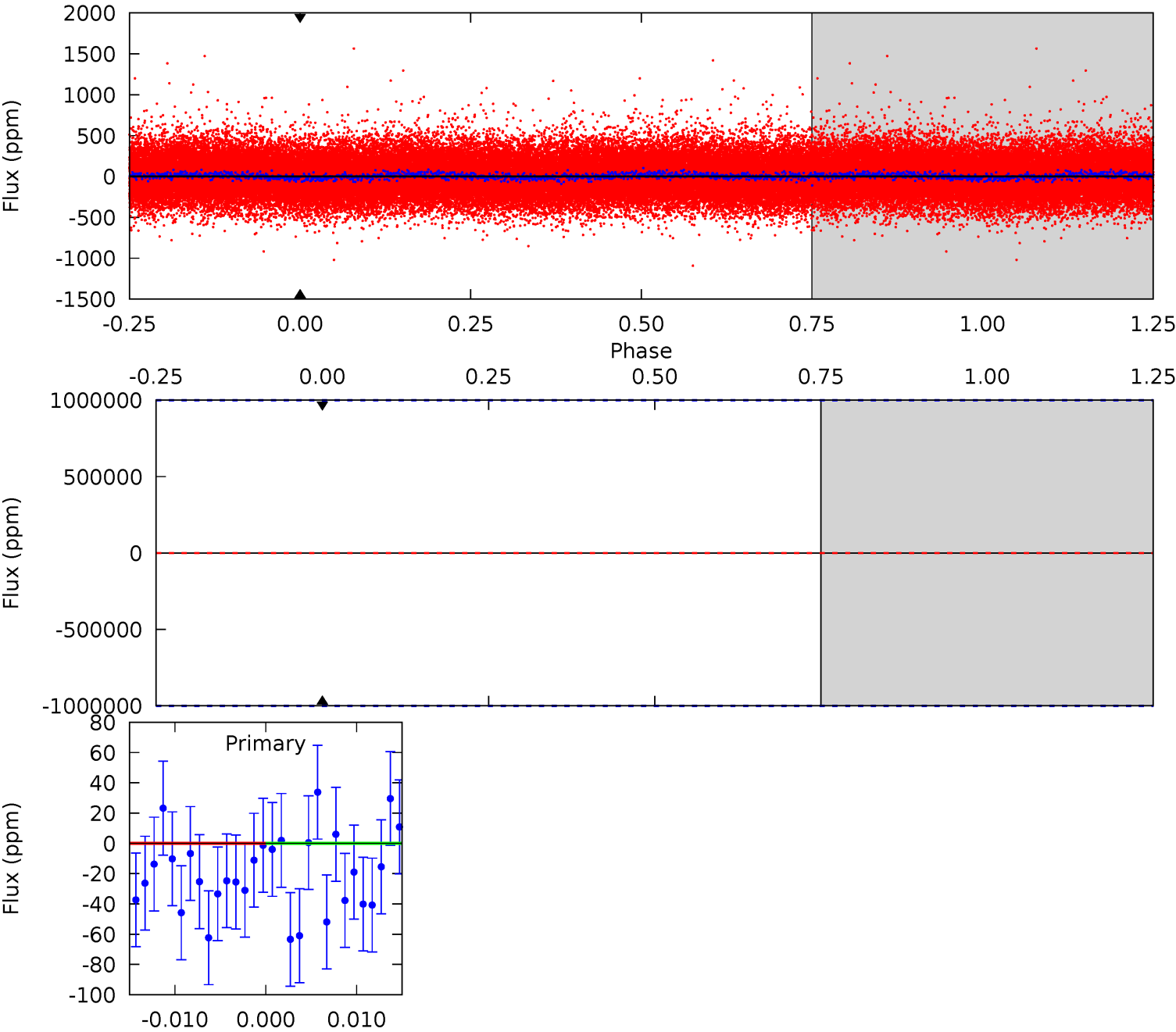
TCE 002721835-01 P= 4.363270 Days $T_0=135.707310$ (BKJD)



DV Model-Shift Uniqueness Test

002721835-01, P = 4.363270 Days, E = 127.675591 Days

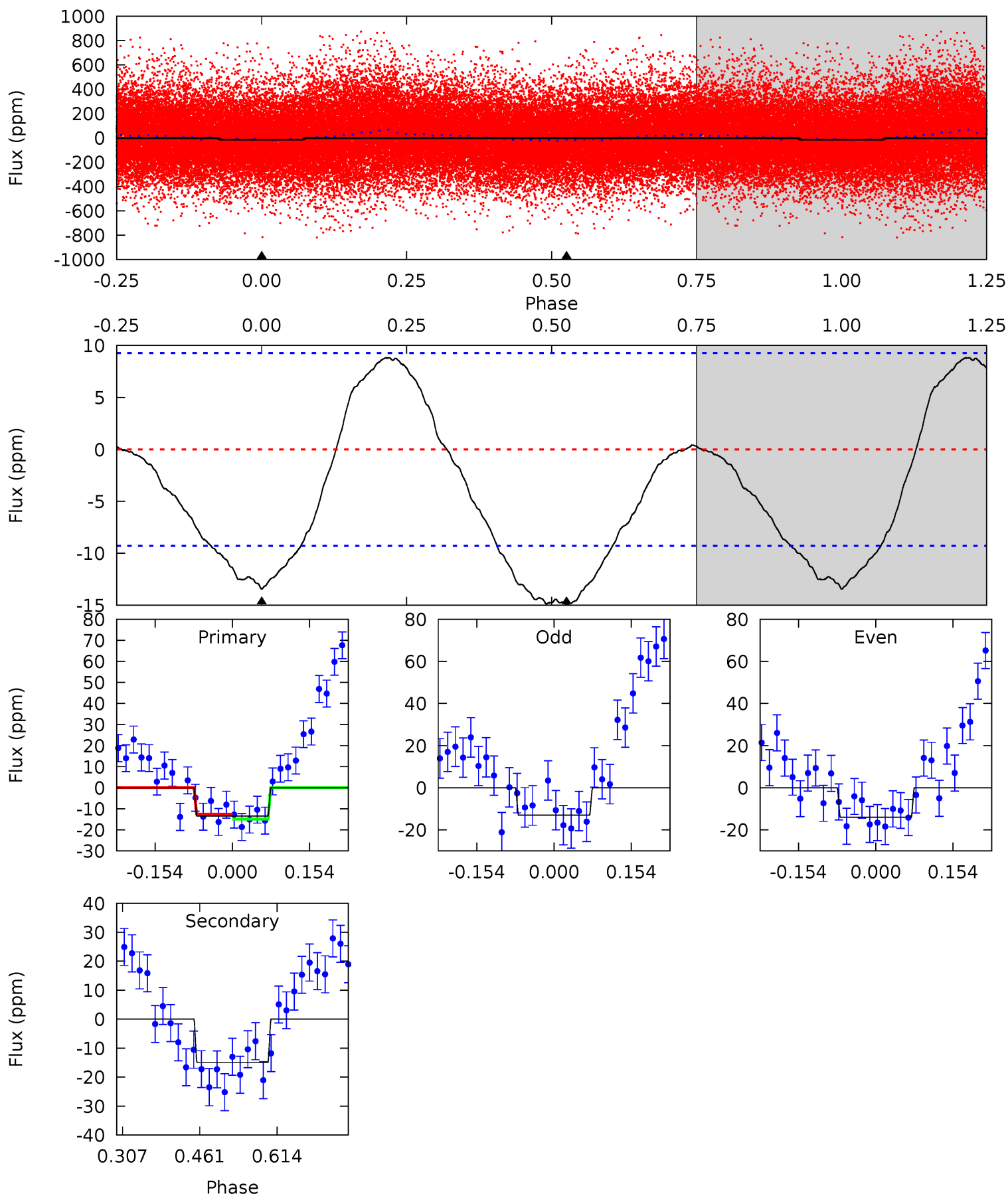
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

002721835-01, P = 4.363270 Days, E = 131.344040 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.48	7.21	0	0	4.47	1.43	2.08	6.48	6.48	7.21	7.21	0.24	1.52	0.37	0.55



Stellar Parameters For KIC 002721835

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8137^{+73}_{-89}	$3.739^{+0.280}_{-0.052}$	$-0.120^{+0.200}_{-0.150}$	$3.195^{+0.436}_{-1.090}$	$2.039^{+0.241}_{-0.241}$	$0.088^{+0.162}_{-0.020}$
	+1%/-1%	+7%/-1%	+167%/-125%	+14%/-34%	+12%/-12%	+184%/-23%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002721835-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$25.39^{+24.40}_{-17.85}$	3407^{+144}_{-282}	6447^{+45258}_{-43228}	12^{+754}_{-528}
Alt.	-15 ± 2	$22.96^{+24.46}_{-16.17}$	3407^{+130}_{-279}	-3080^{+6597}_{-191}	$0.072^{+0.762}_{-0.056}$

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

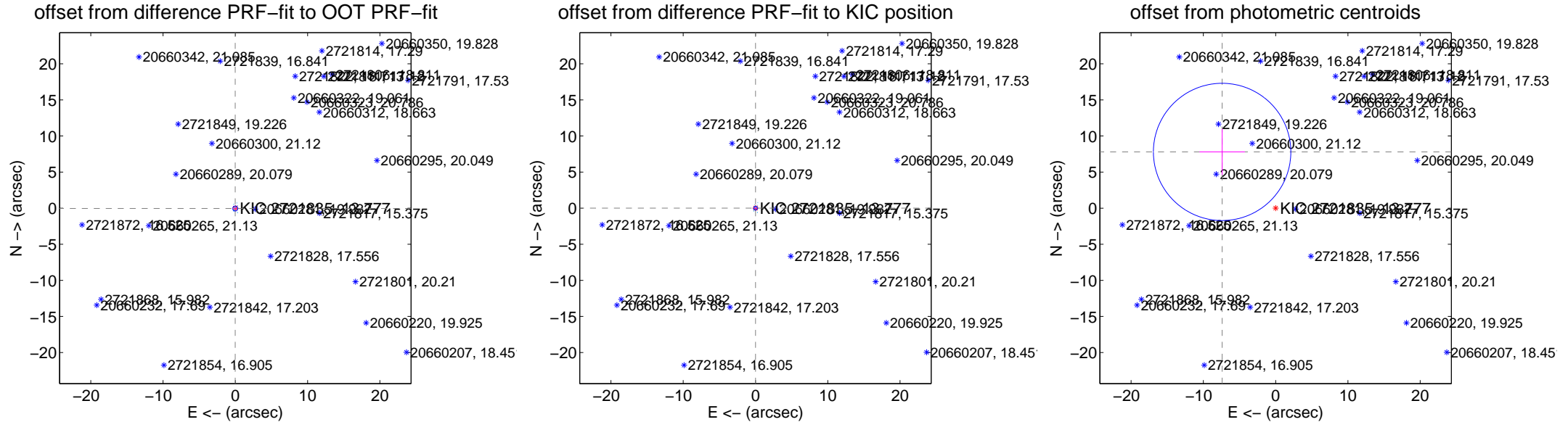
DV Centroid Data

Supplemental centroid analysis for 002721835-01. Kepler magnitude: 13.78. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

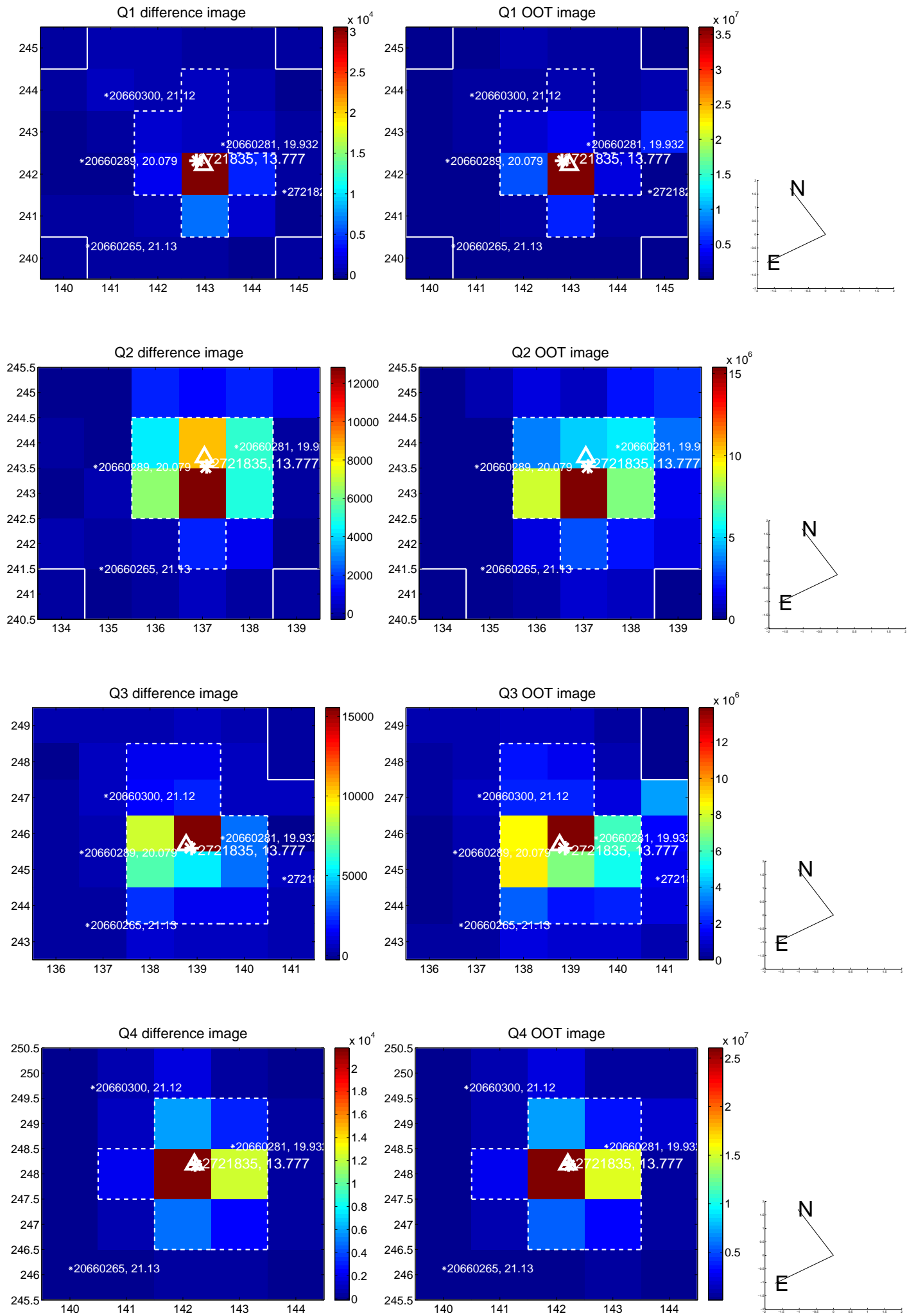
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.049 ± 0.113	0.43	0.016 ± 0.084	-0.046 ± 0.116
PRF-fit source offset from KIC position	0.008 ± 0.087	0.09	-0.007 ± 0.081	0.003 ± 0.106
photometric centroid source offset	10.75 ± 3.17	3.39	7.40 ± 3.14	7.79 ± 3.20

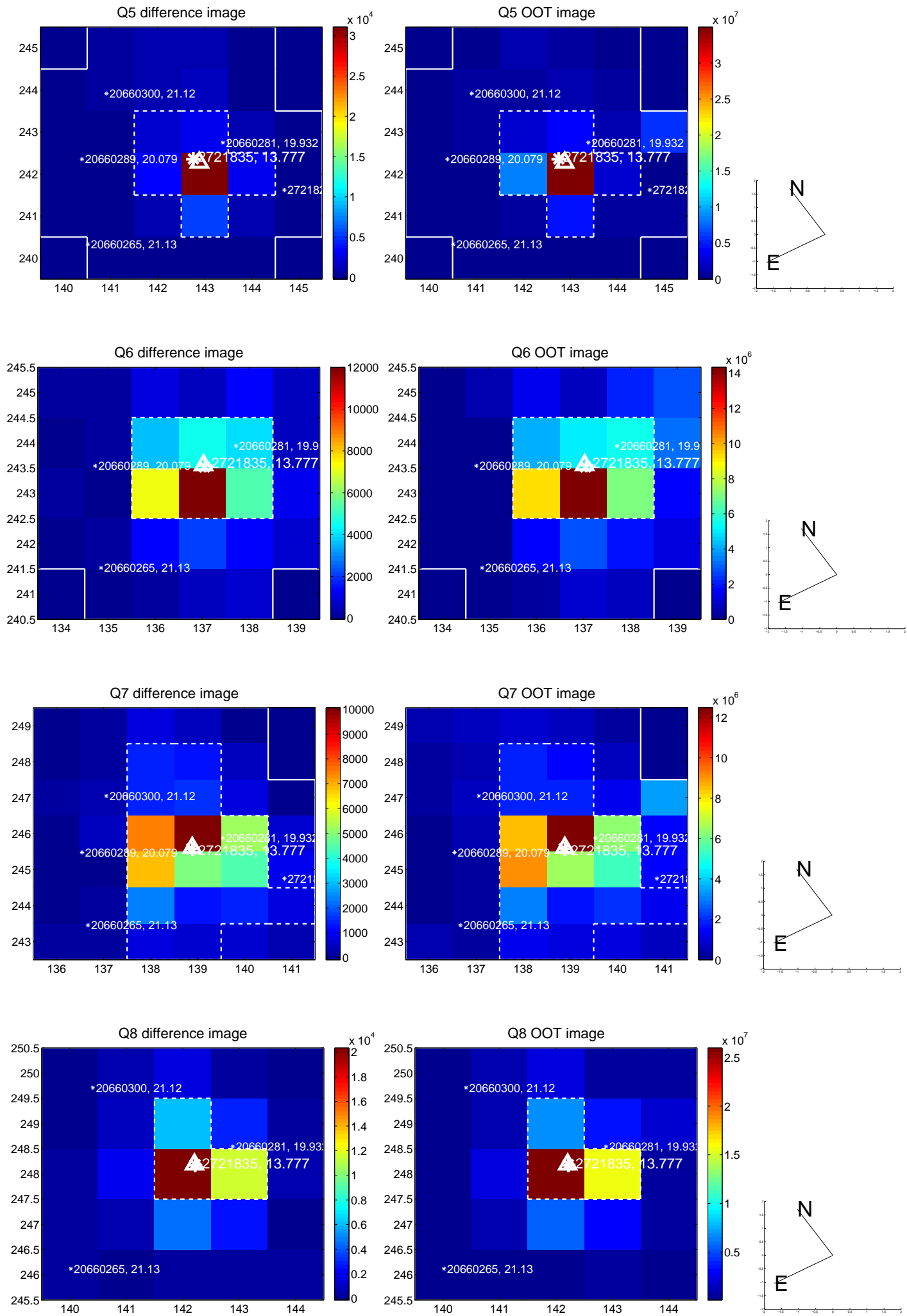


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

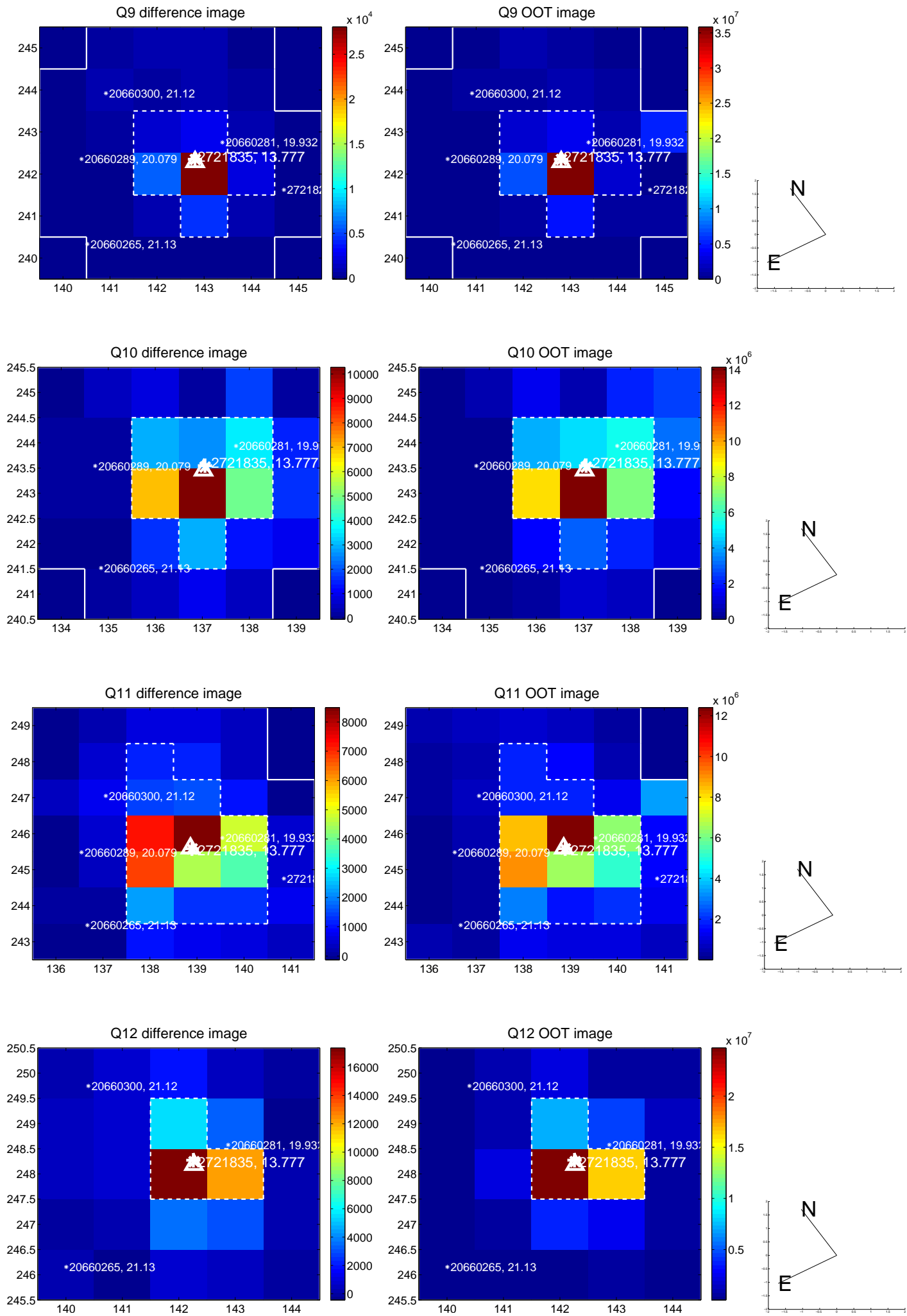
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



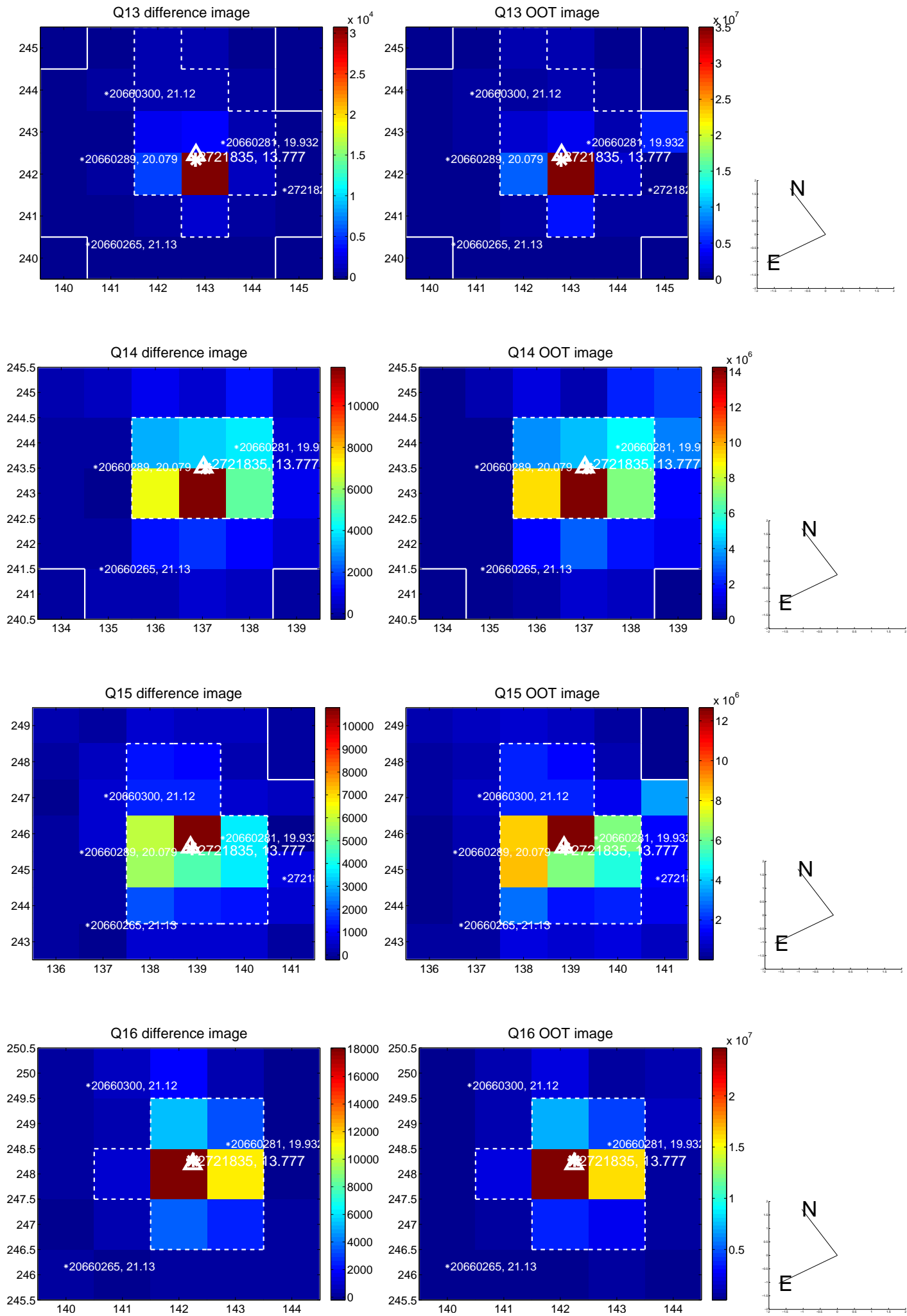
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



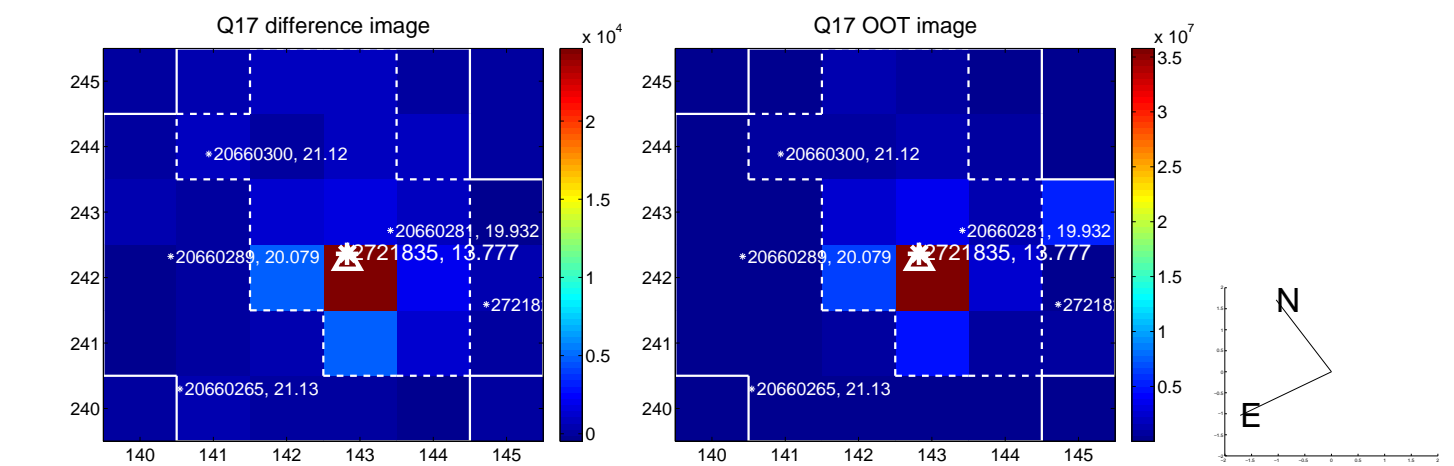
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



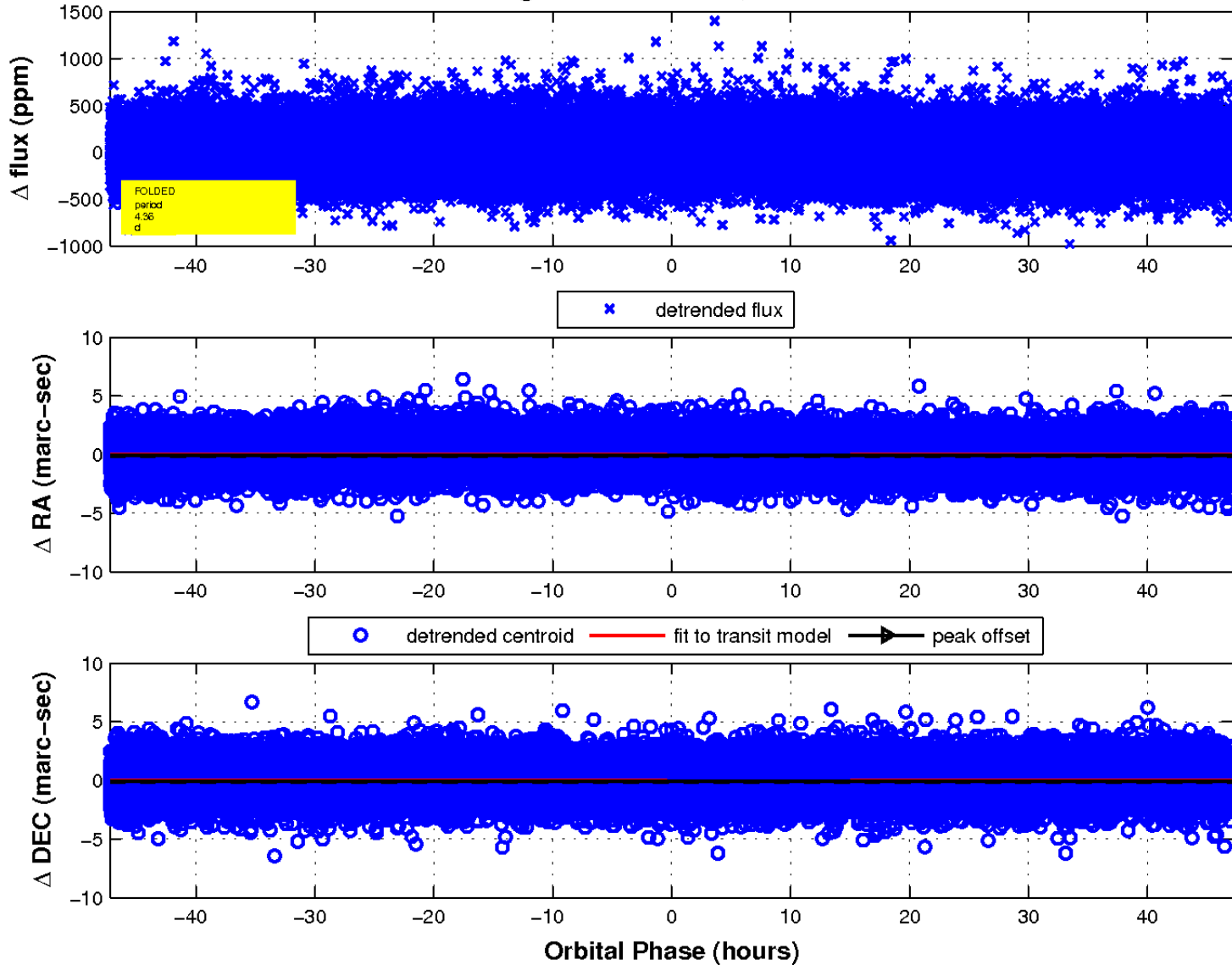
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

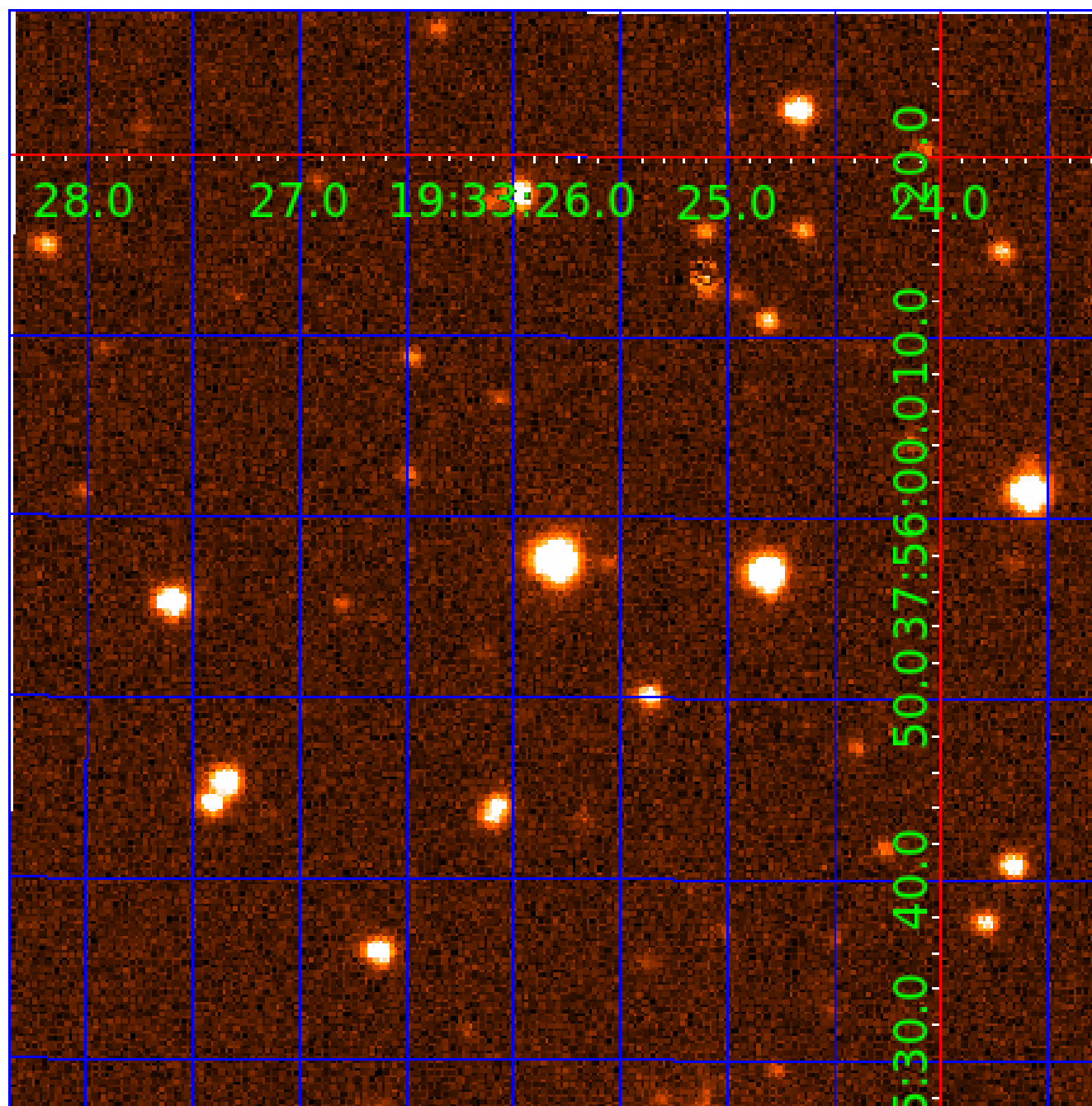


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 002721835

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})
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002721835-02	OBS	No	4.363445	133.549026	21.2	19.443	7.9	9.0	3.19	8137	1.51	9119.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002721835-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS
002721835-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—SAME_NTL_PERIOD

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

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

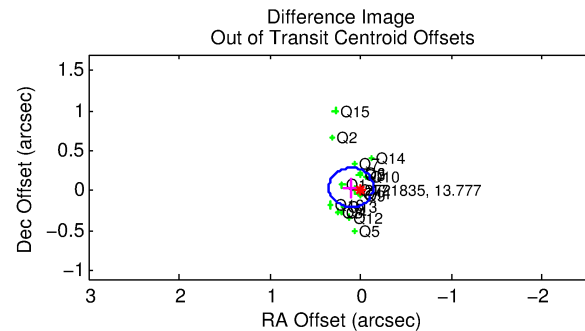
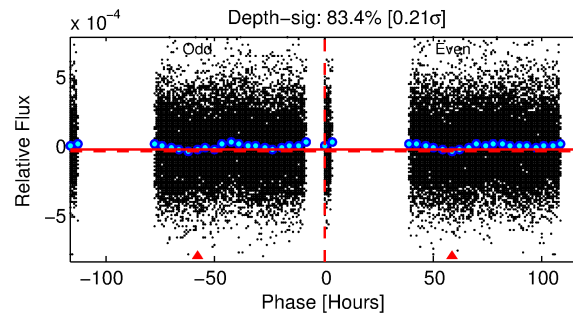
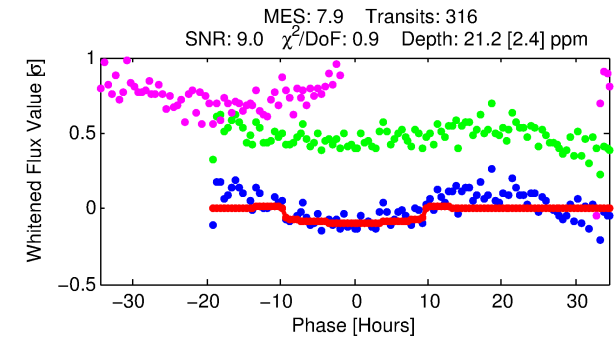
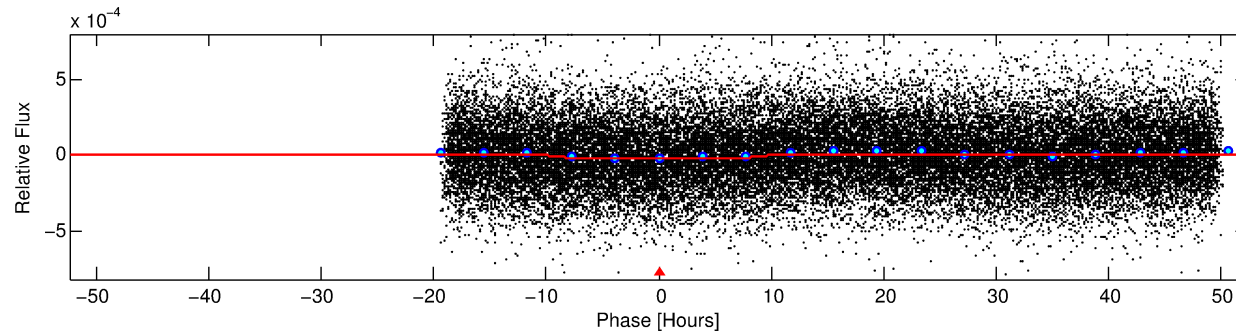
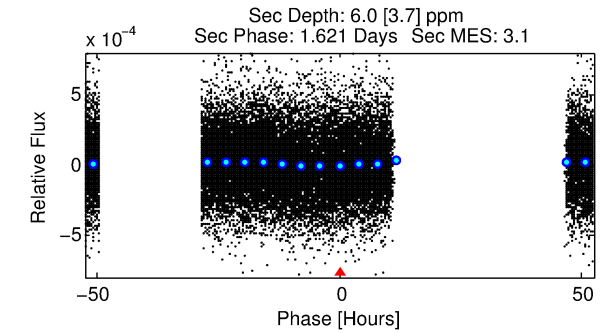
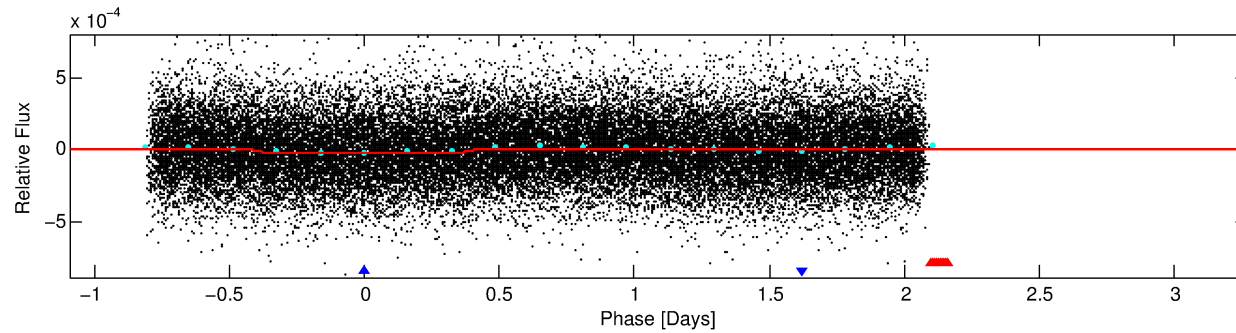
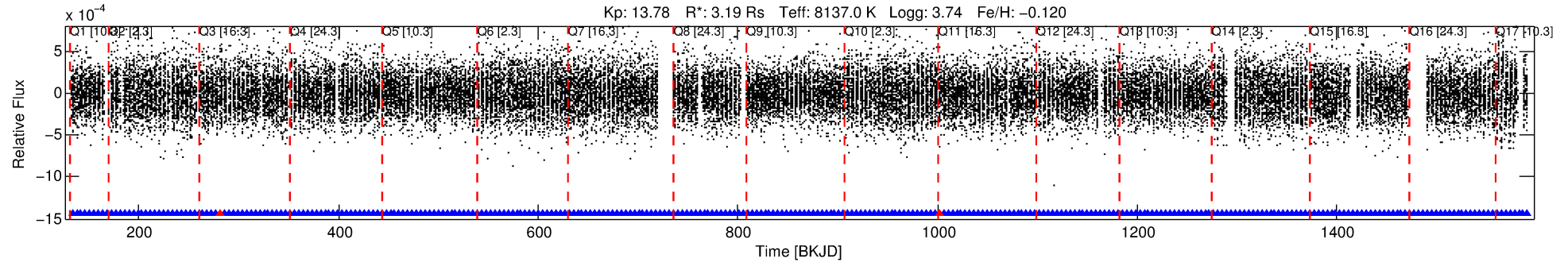
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002721835-02

No Significant Match Found

DV One-Page Summary

KIC: 2721835 Candidate: 2 of 2 Period: 4.363 d



DV Fit Results:

Period = 4.36345 [0.00012] d
Epoch = 133.5490 [0.0185] BKJD
Rp/R* = 0.0043 [0.0026]
a/R* = 1.70 [3.85]
b = 0.43 [6.51]
Seff = 9119.26 [4452.44]
Teq = 2492 [304] K
Rp = 1.51 [1.05] Re
a = 0.0663 [0.0207] AU
Ag = 6.32 [9.15] [0.58σ]
Teffp = 6108 [2084] K [1.72σ]

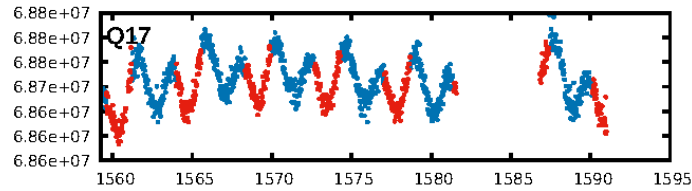
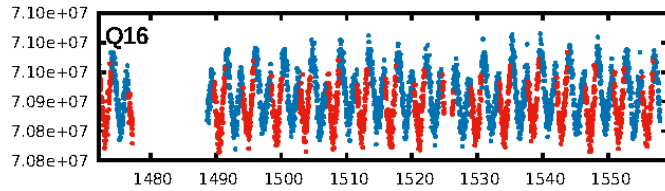
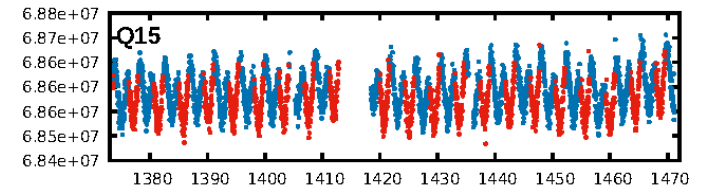
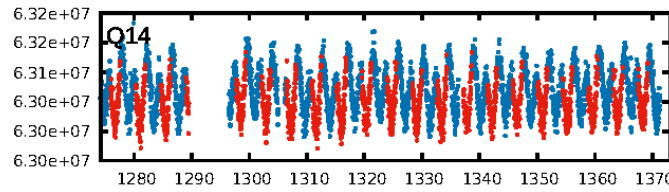
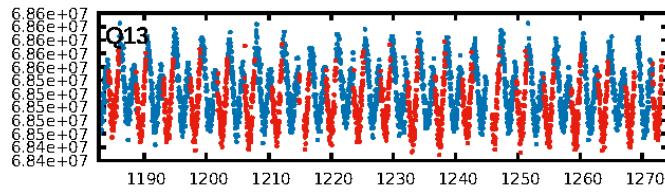
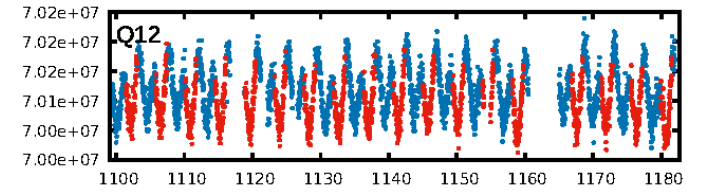
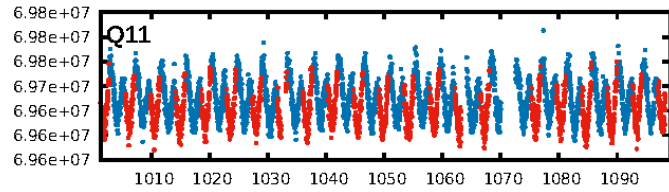
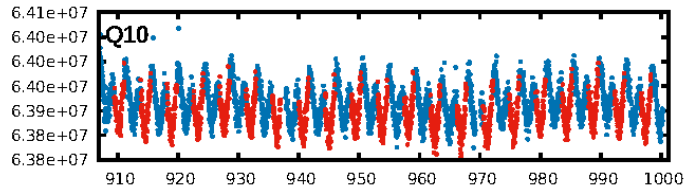
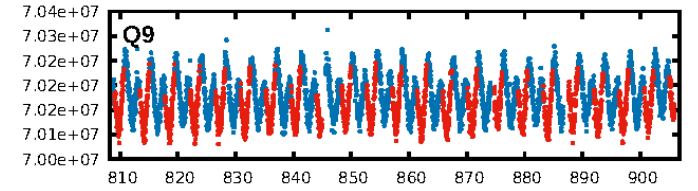
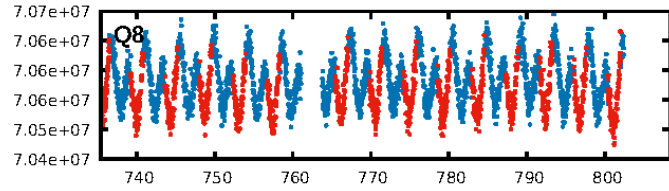
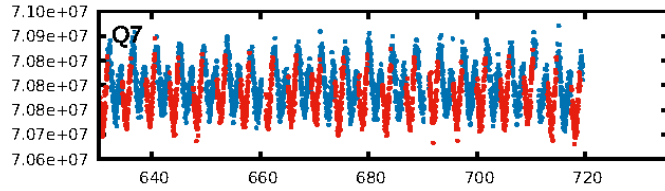
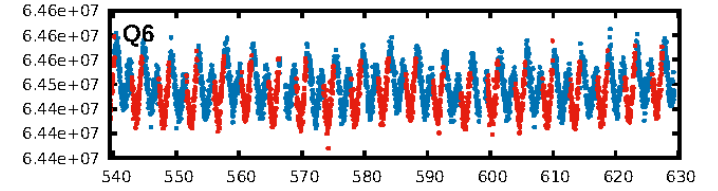
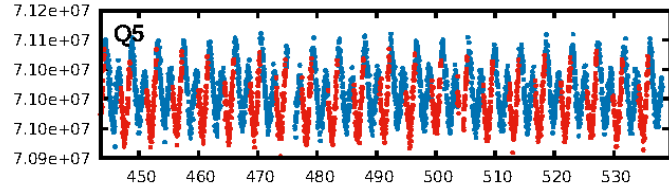
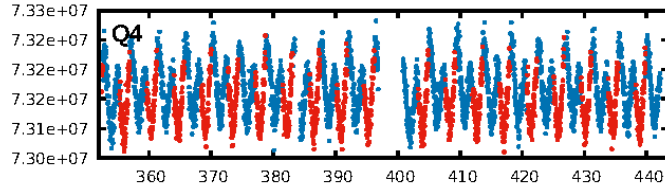
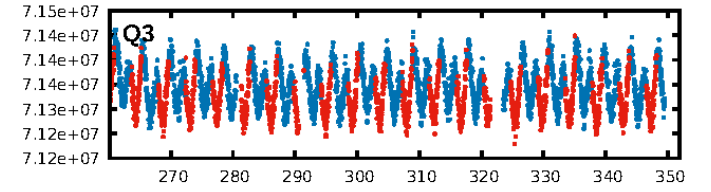
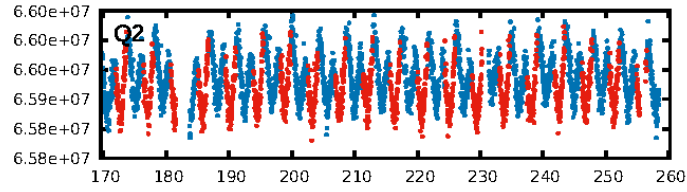
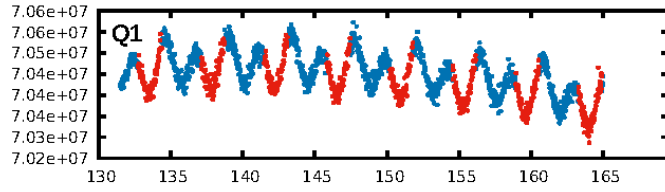
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.83e-10
RollingBand-fgt: 0.99 [299/301]
GhostDiagnostic-chr: 1.742
Centroid-sig: 0.0%
Centroid-so: 6.758 arcsec [3.82σ]
OotOffset-rm: 0.117 arcsec [1.43σ]
KicOffset-rm: 0.122 arcsec [1.25σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

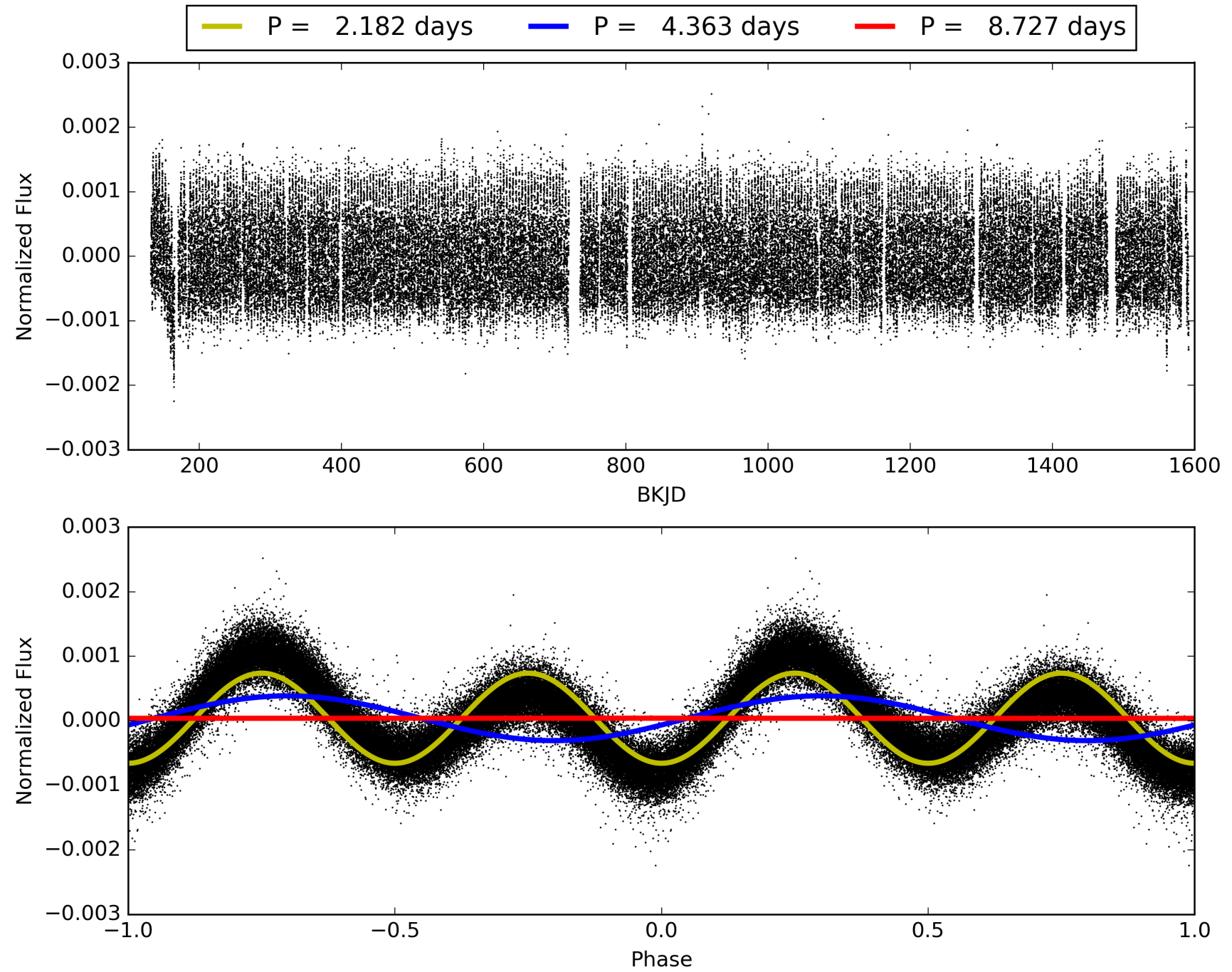
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:12:11 Z

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

TCE 002721835-02, PDC Light Curves

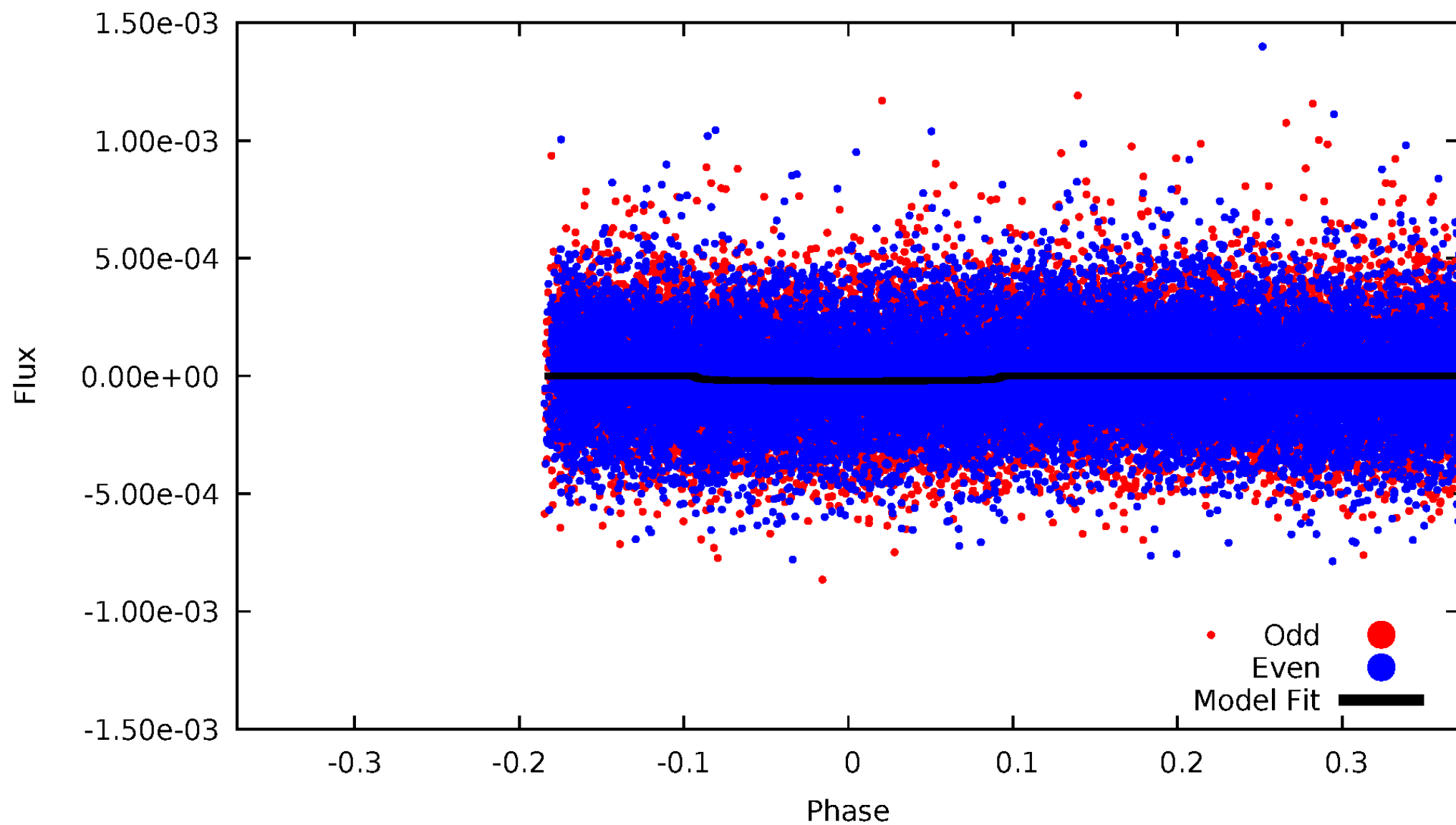


TCE 002721835-02



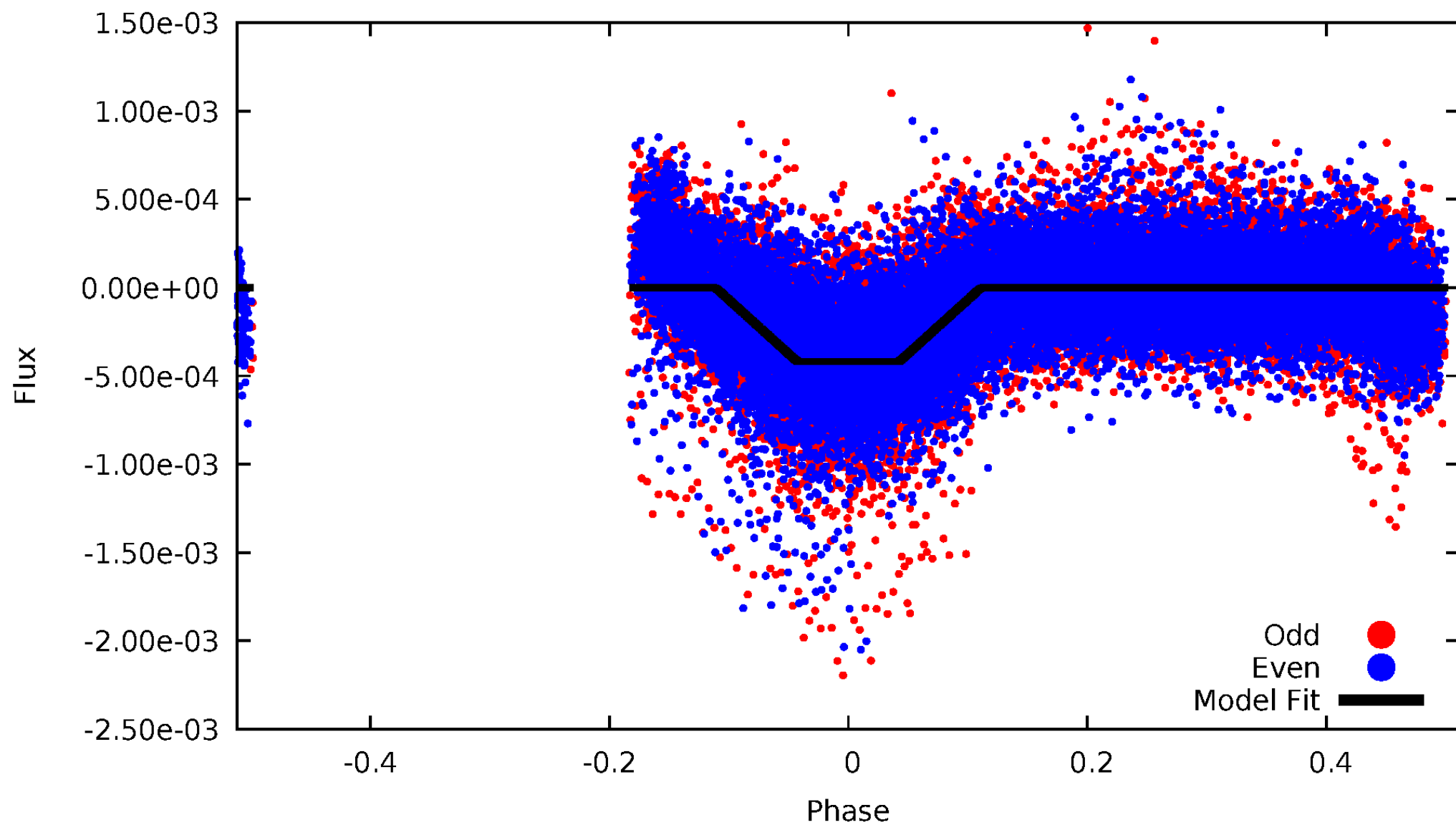
DV Odd/Even

TCE 002721835-02



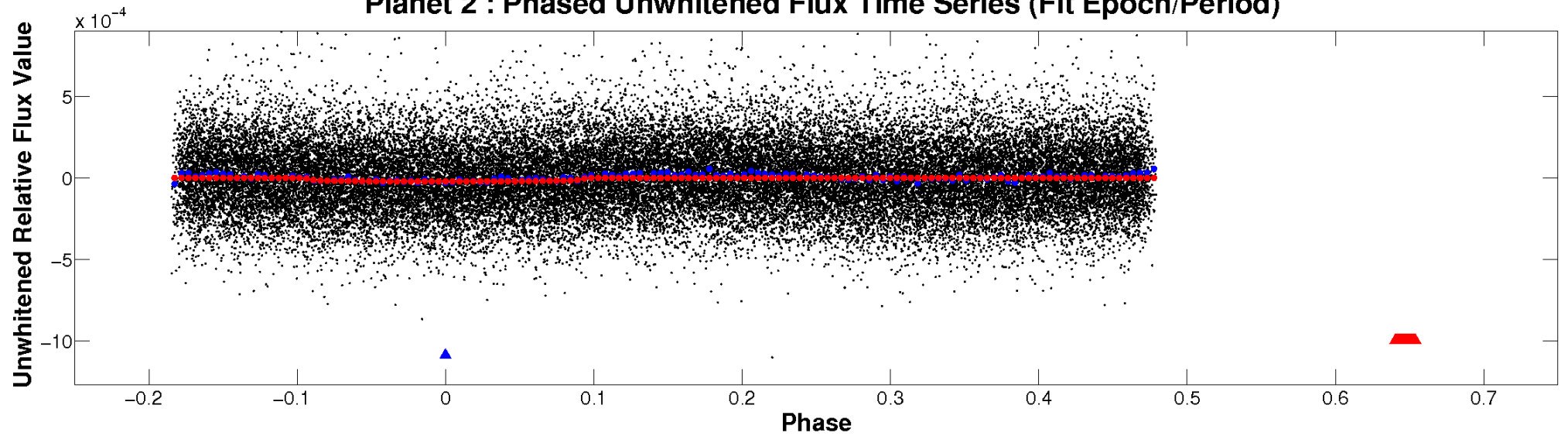
ALT Odd/Even

TCE 002721835-02

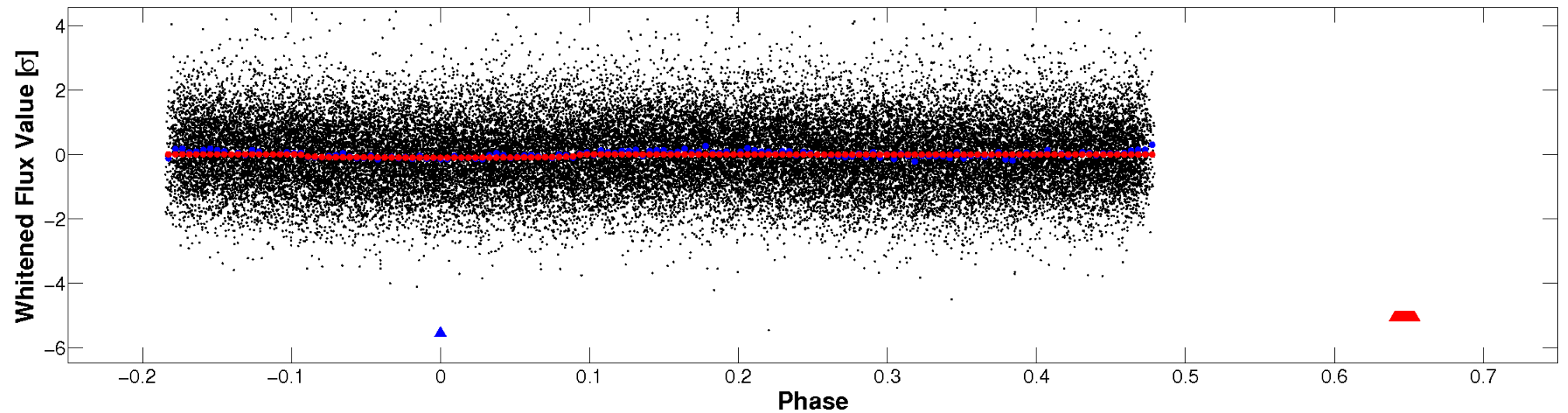


Non-Whitened Vs. Whitened Light Curve

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

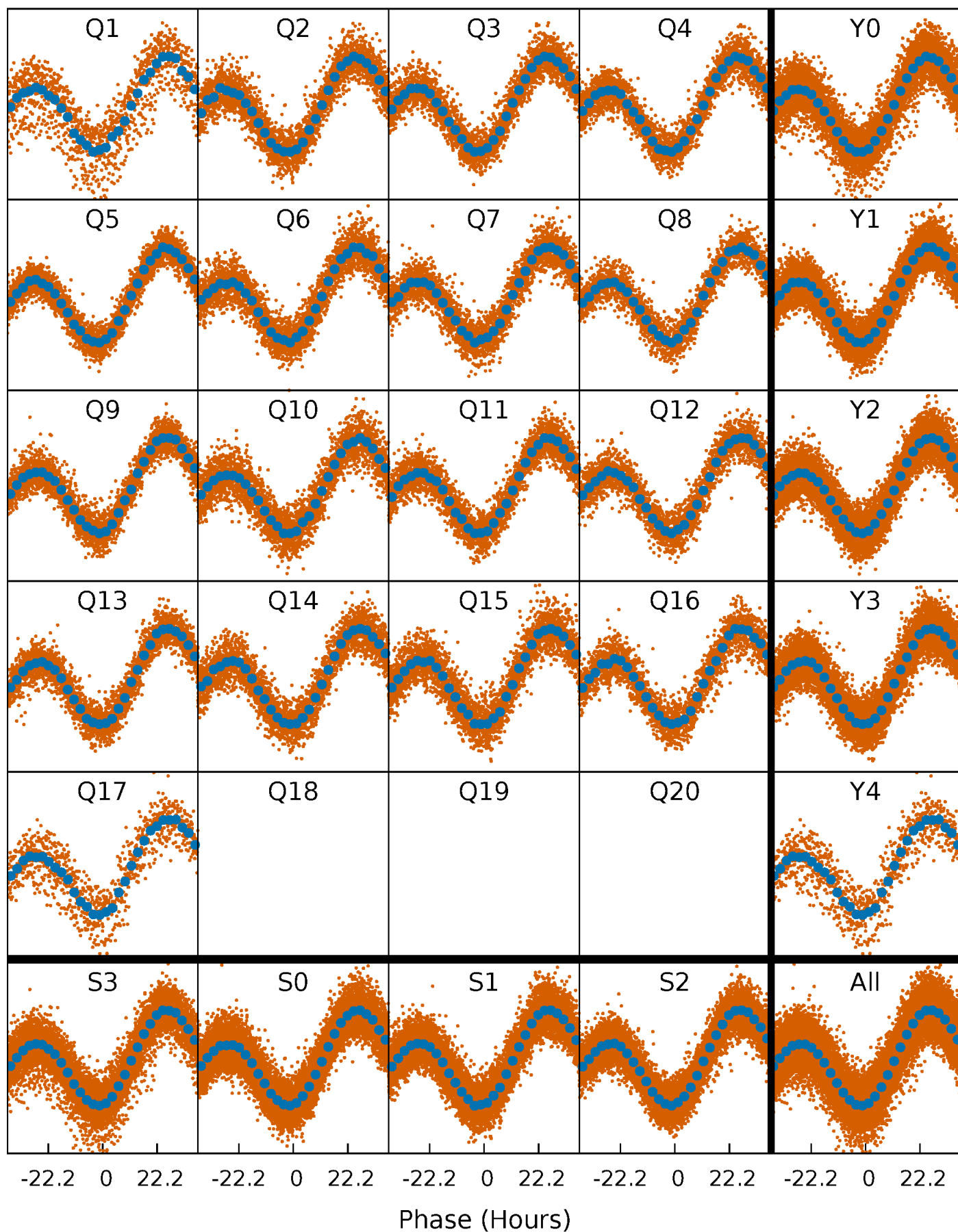


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



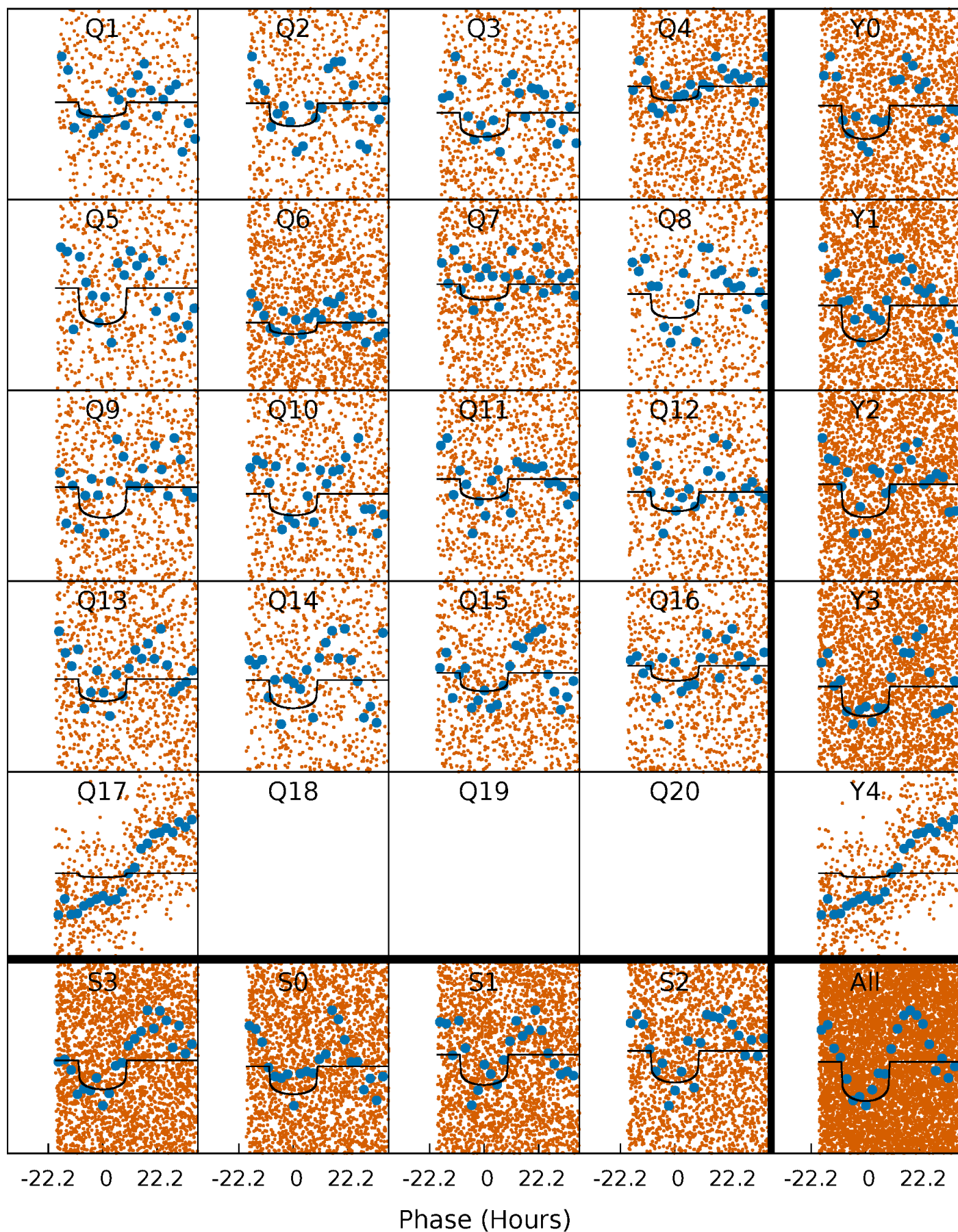
PDC Quarter-Phased Transit Curves

TCE 002721835-02 P= 4.363445 Days $T_0=133.549026$ (BKJD)



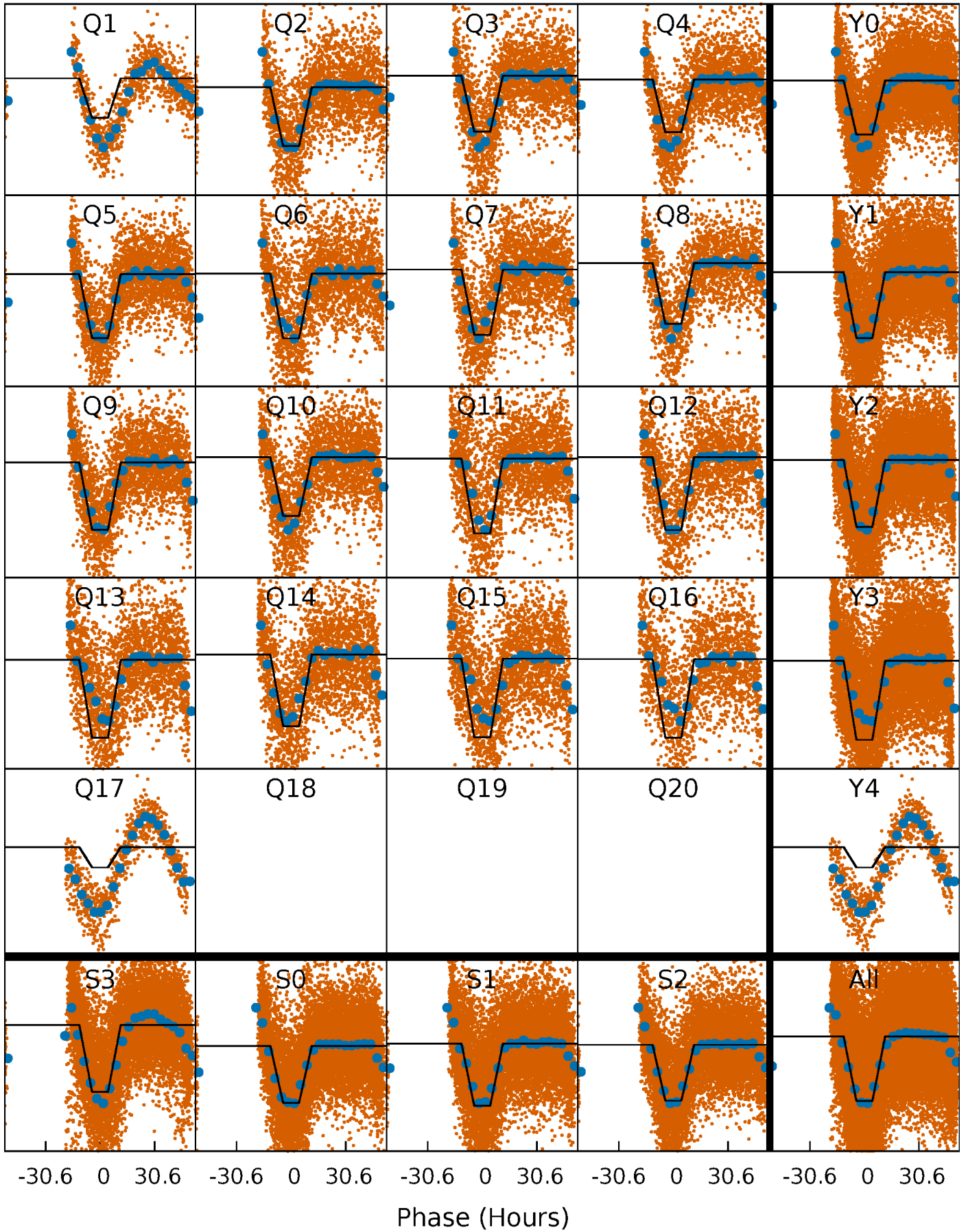
DV Quarter-Phased Transit Curves

TCE 002721835-02 P= 4.363445 Days $T_0=133.549026$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

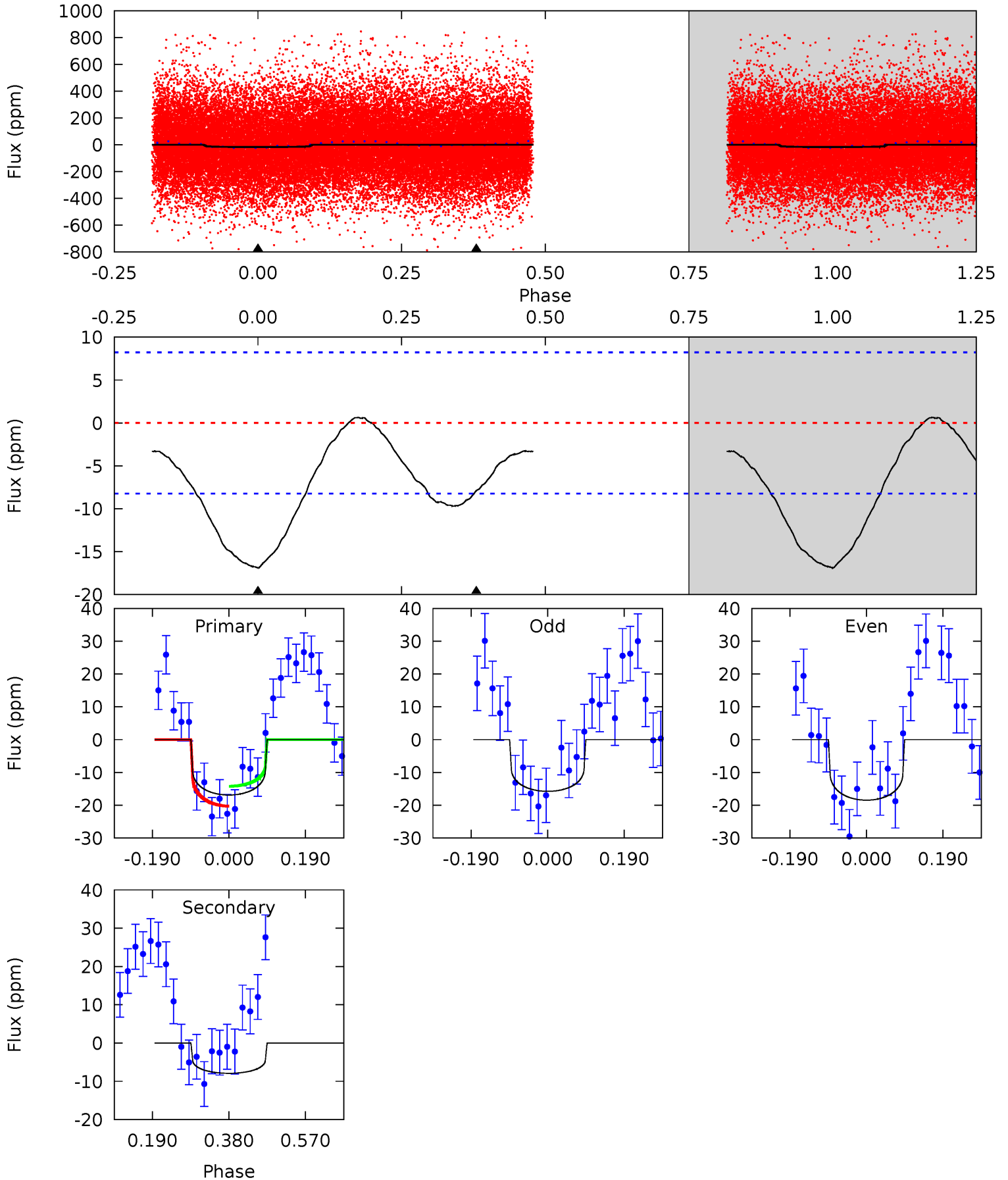
TCE 002721835-02 P= 4.363727 Days $T_0=133.450633$ (BKJD)



DV Model-Shift Uniqueness Test

002721835-02, P = 4.363445 Days, E = 129.185581 Days

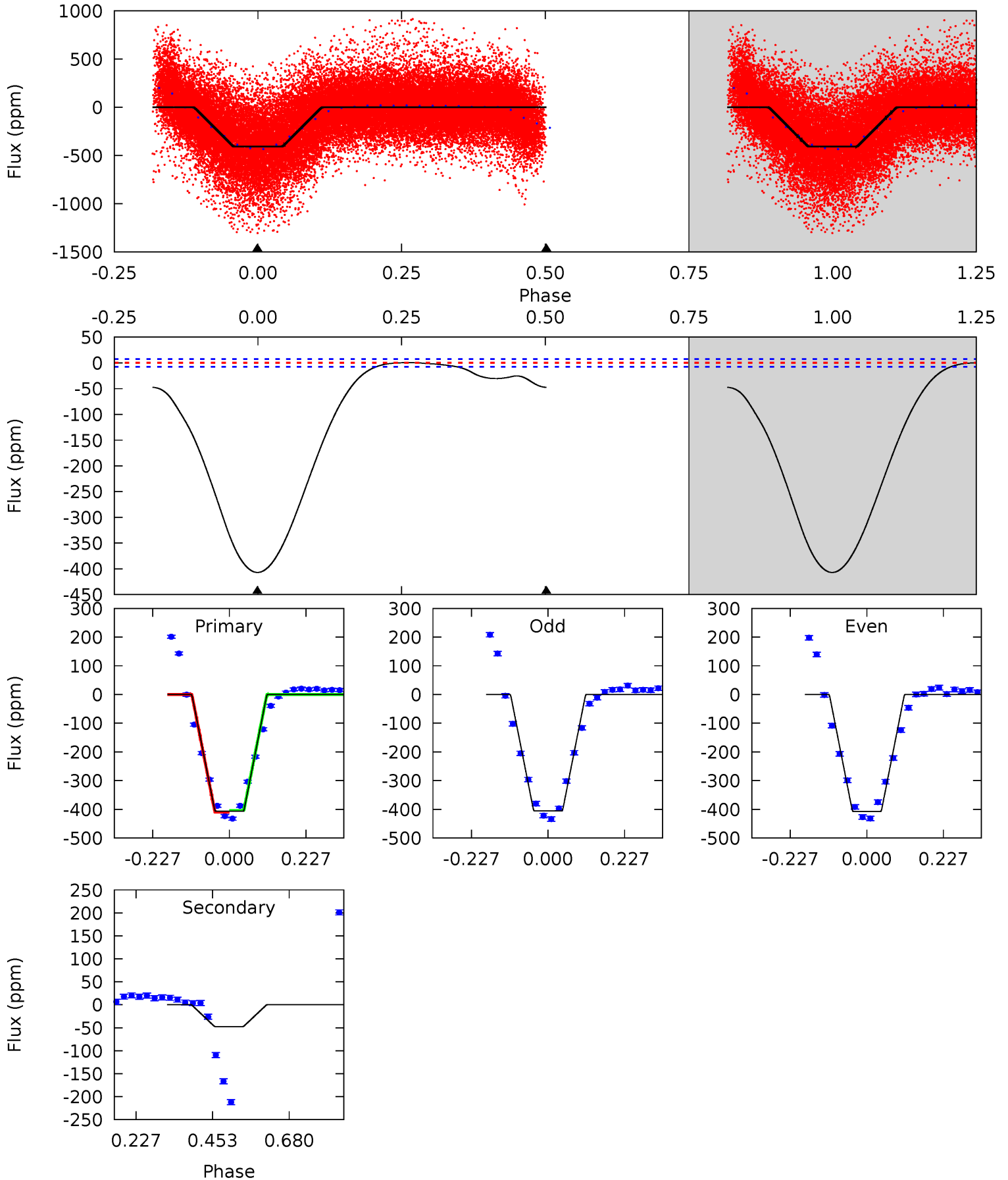
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.09	4.25	0	0	4.43	1.31	0.82	9.09	9.09	4.25	4.25	0.73	1.25	0.04	1.62



Alt Model-Shift Uniqueness Test

002721835-02, P = 4.363727 Days, E = 129.086906 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
238.0	27.8	0	0	4.39	1.21	0.59	238.0	238.0	27.8	27.8	0.48	1.07	0.00	1.53



Stellar Parameters For KIC 002721835

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	8137^{+73}_{-89}	$3.739^{+0.280}_{-0.052}$	$-0.120^{+0.200}_{-0.150}$	$3.195^{+0.436}_{-1.090}$	$2.039^{+0.241}_{-0.241}$	$0.088^{+0.162}_{-0.020}$
	+1%/-1%	+7%/-1%	+167%/-125%	+14%/-34%	+12%/-12%	+184%/-23%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002721835-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-8 ± 2	$1.44^{+0.85}_{-0.79}$	3402^{+140}_{-258}	6167^{+3687}_{-1229}	$9.154^{+35.949}_{-5.750}$
Alt.	-47 ± 2	$6.71^{+1.21}_{-1.18}$	3410^{+134}_{-261}	4617^{+272}_{-260}	$2.601^{+1.089}_{-0.728}$

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

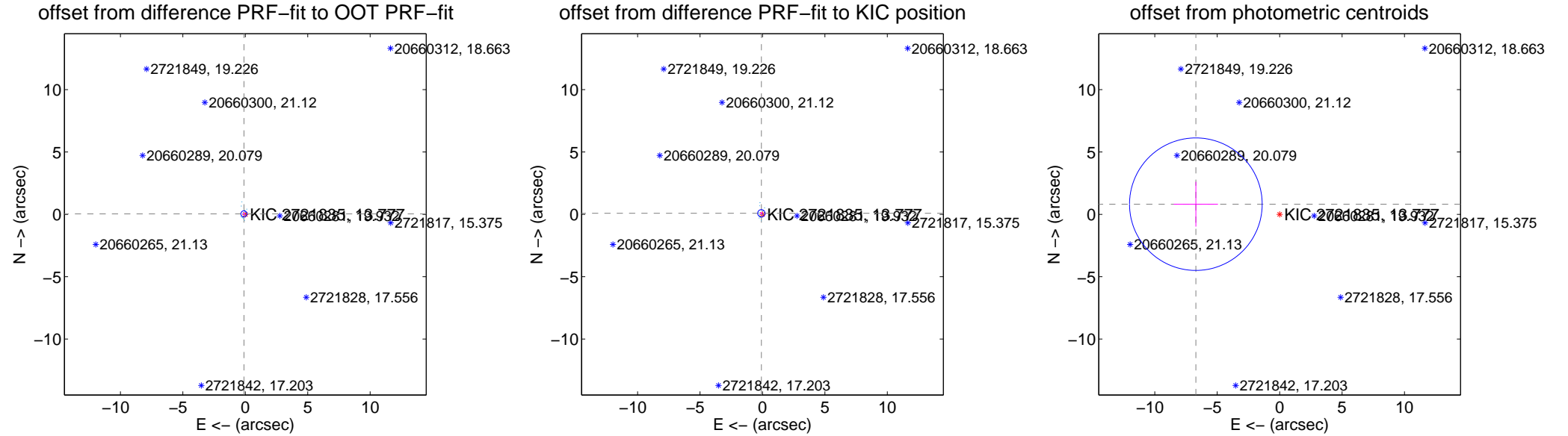
DV Centroid Data

Supplemental centroid analysis for 002721835-02. Kepler magnitude: 13.78. Transit SNR 9.02

There are 17 quarters with good PRF difference image offsets

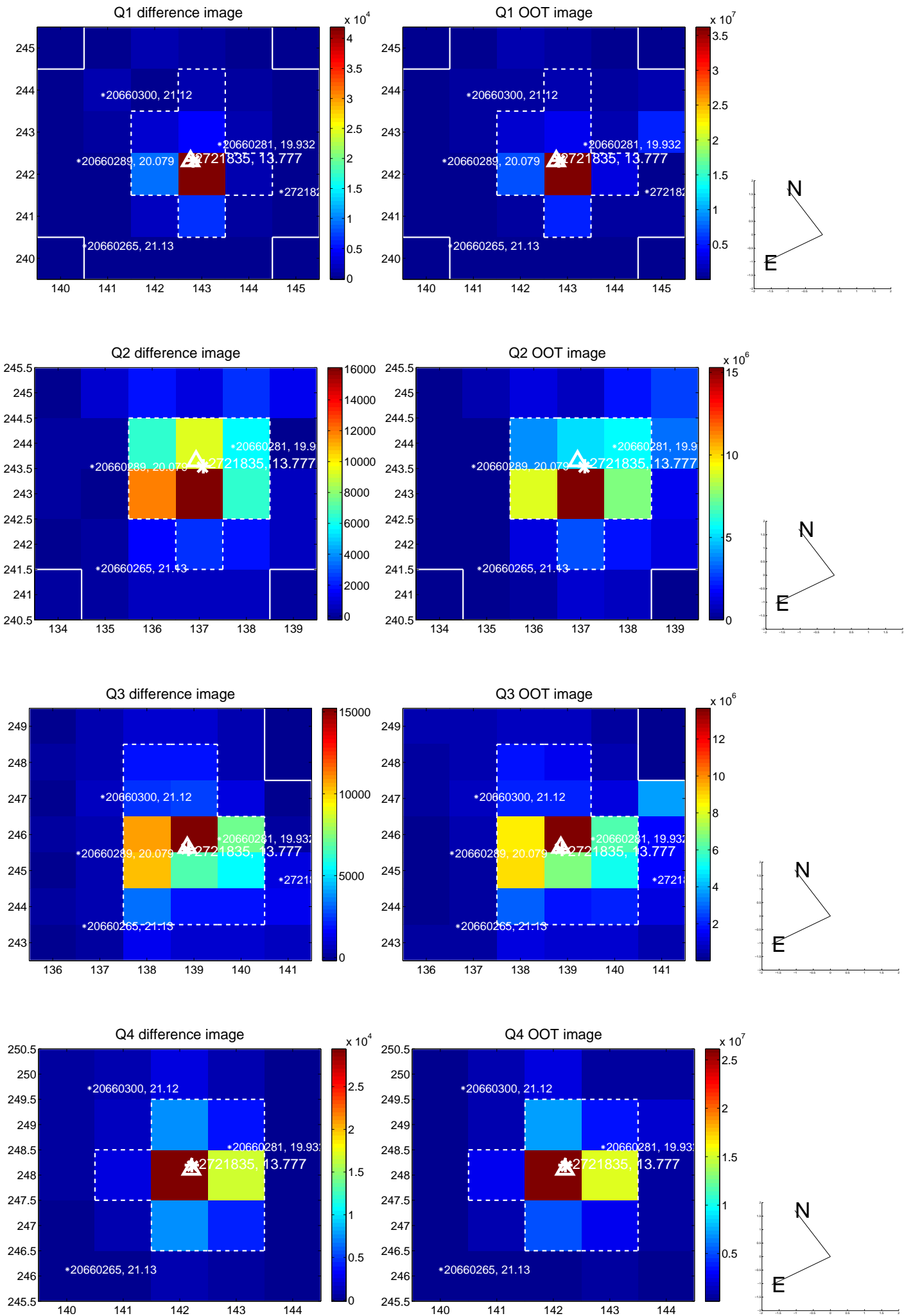
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.117 ± 0.081	1.43	0.109 ± 0.075	0.041 ± 0.116
PRF-fit source offset from KIC position	0.122 ± 0.098	1.25	0.089 ± 0.077	0.084 ± 0.117
photometric centroid source offset	6.76 ± 1.77	3.82	6.71 ± 1.77	0.82 ± 1.80

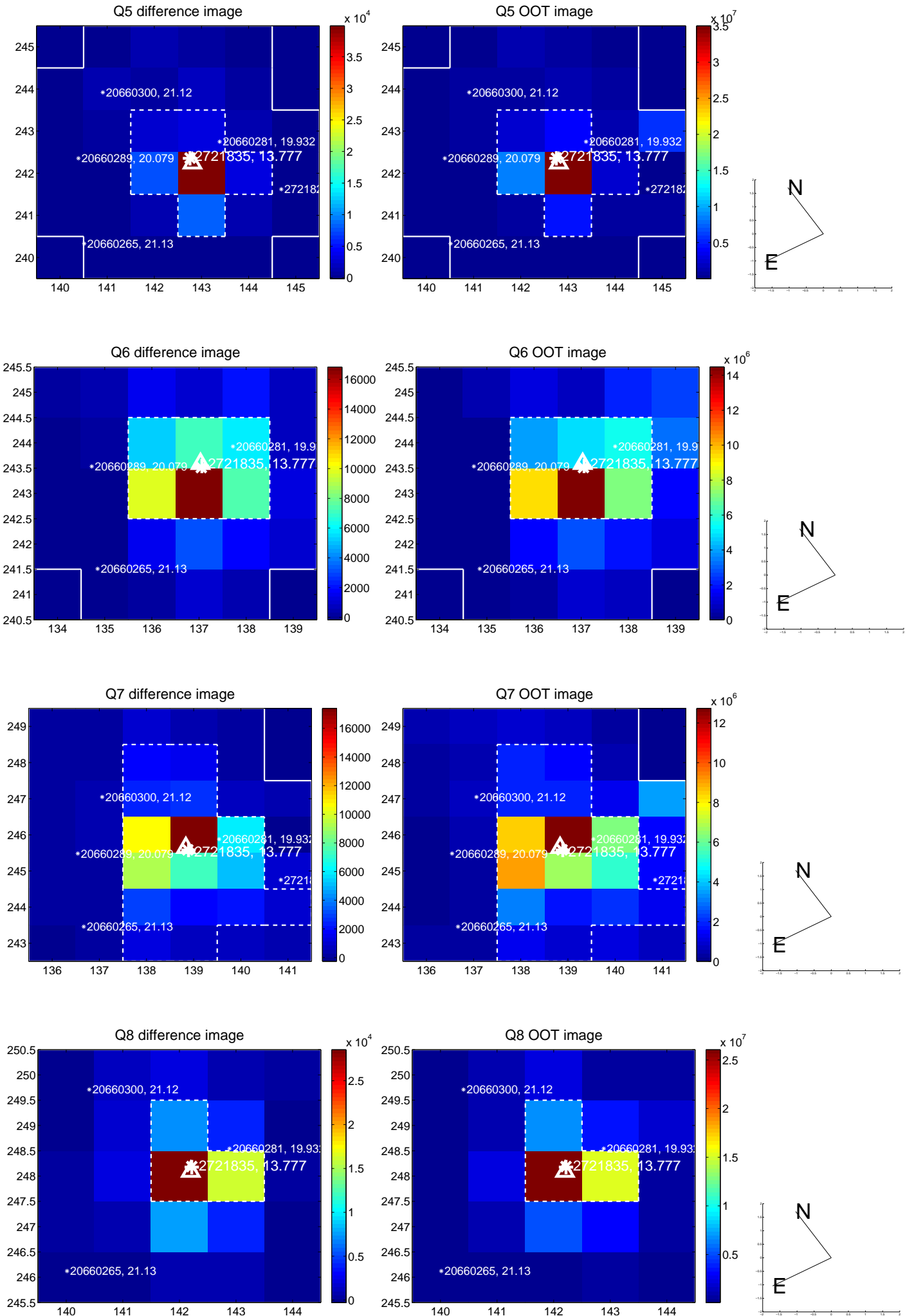


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

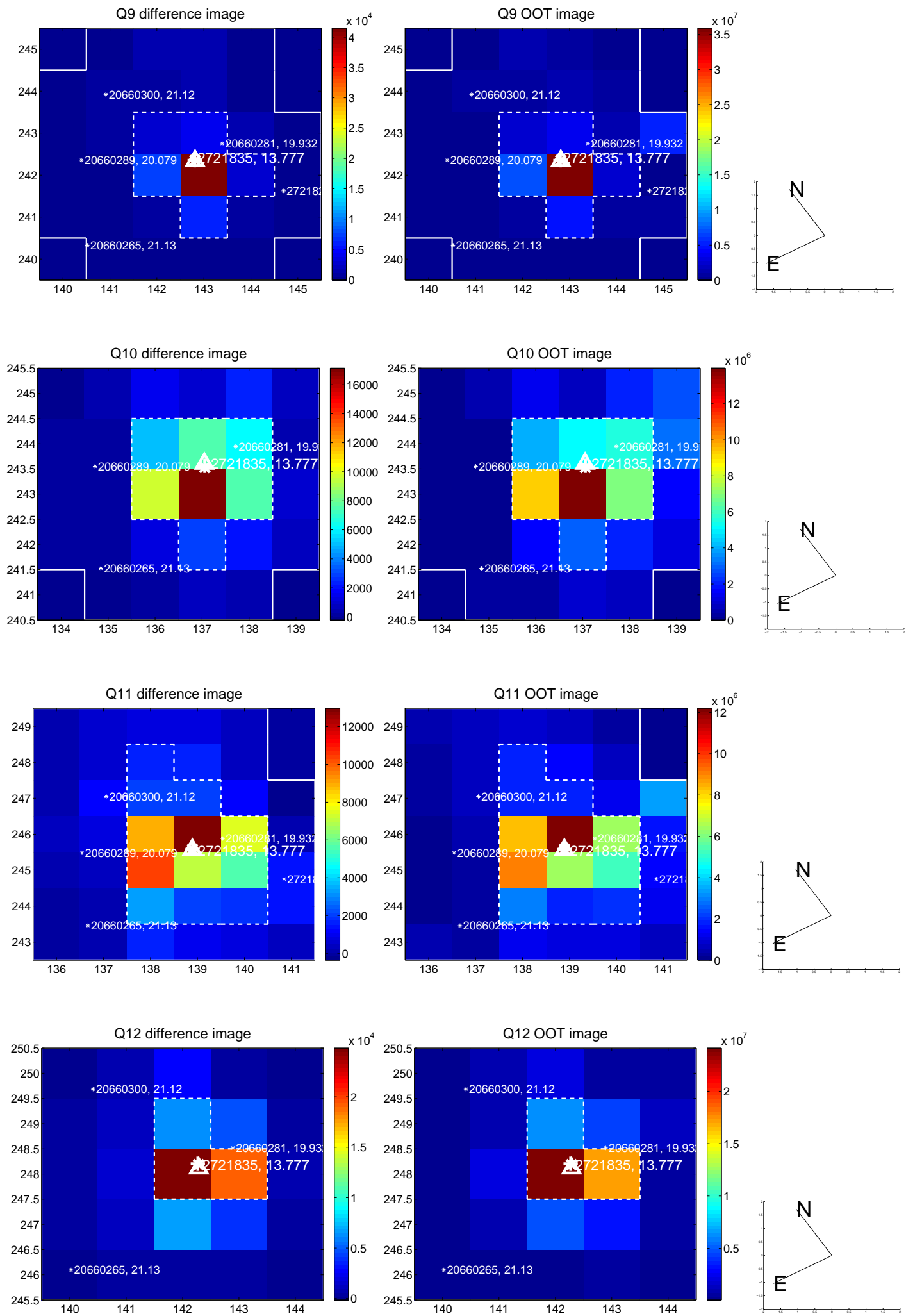
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



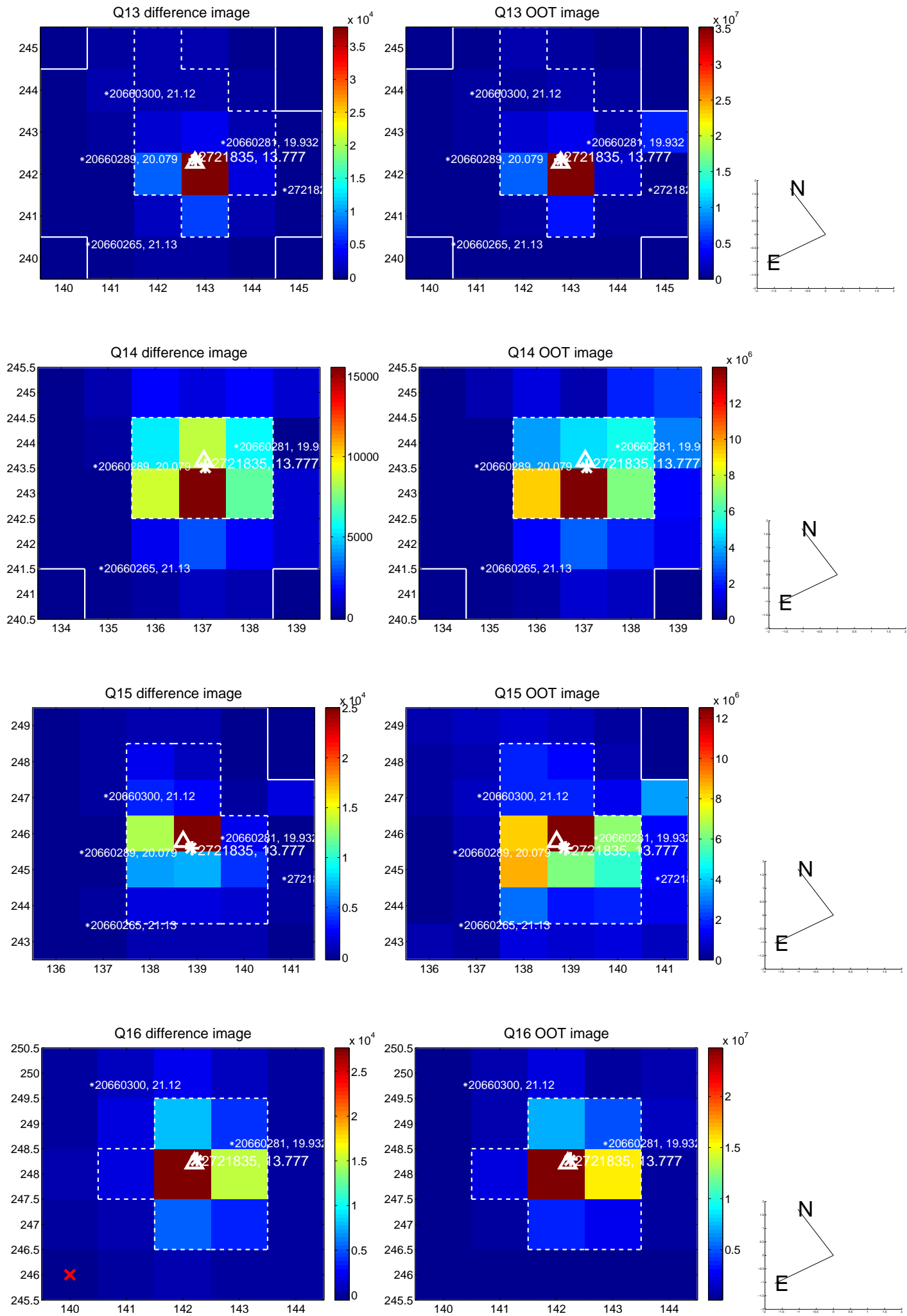
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



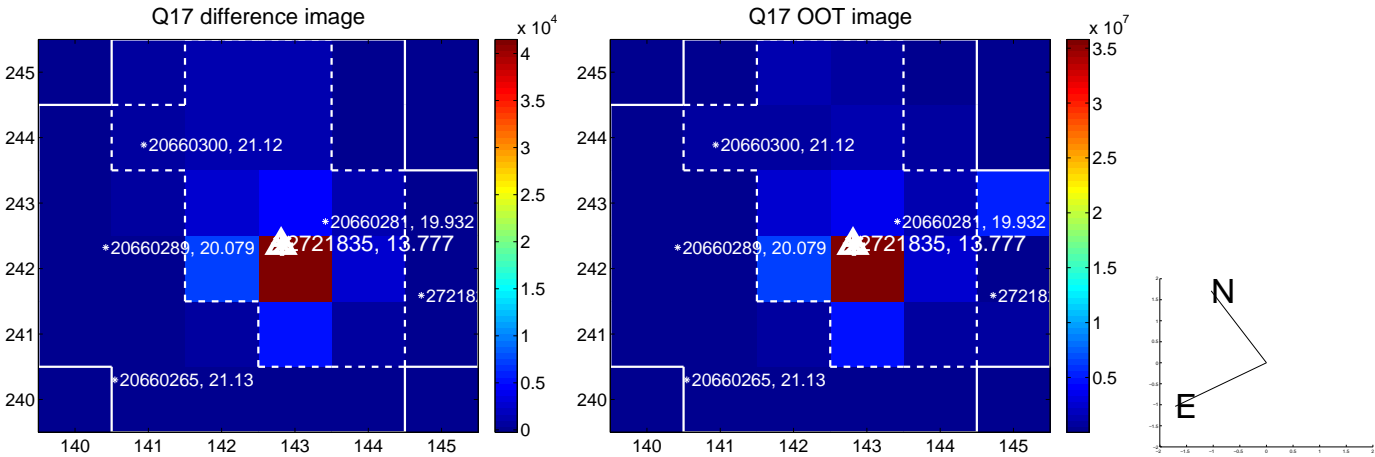
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



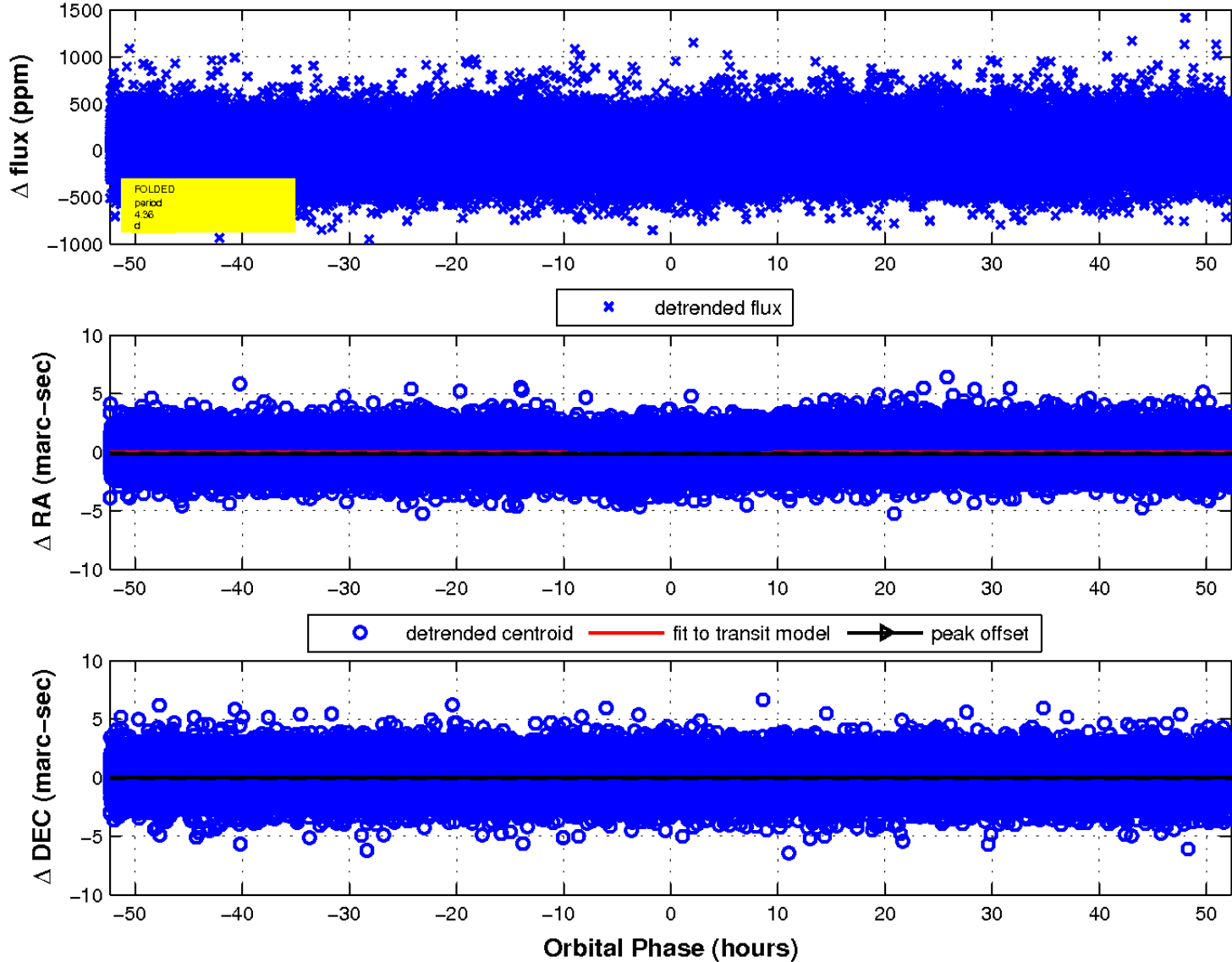
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

