

KIC 008230616

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})
008230616-01	OBS	1713.02	2.240483	133.344410	422.1	1.475	28.1	32.2	0.57	4198	1.43	116.38
008230616-02	OBS	1713.01	6.827735	131.793675	550.0	2.487	26.8	29.0	0.57	4198	1.62	26.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008230616-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
008230616-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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

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

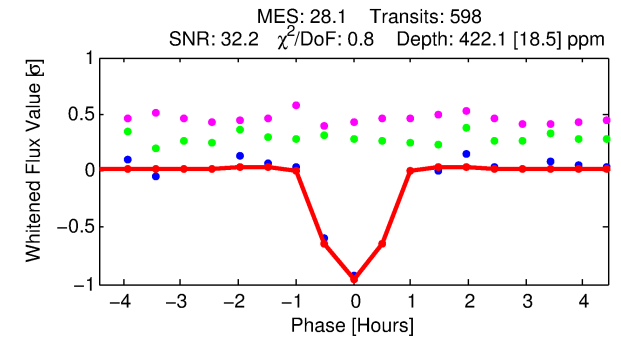
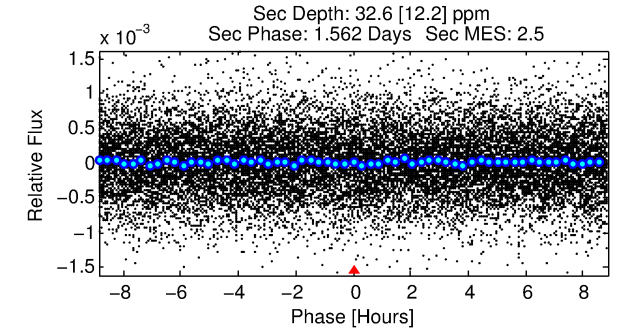
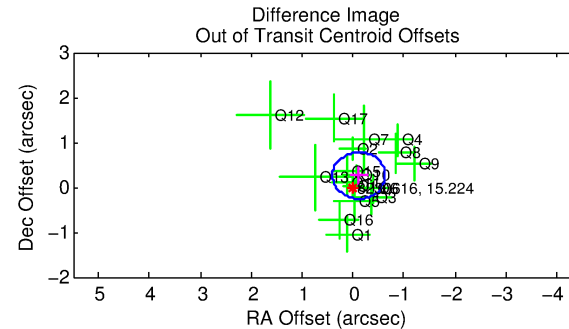
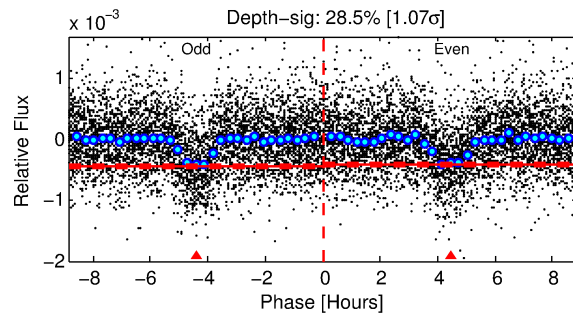
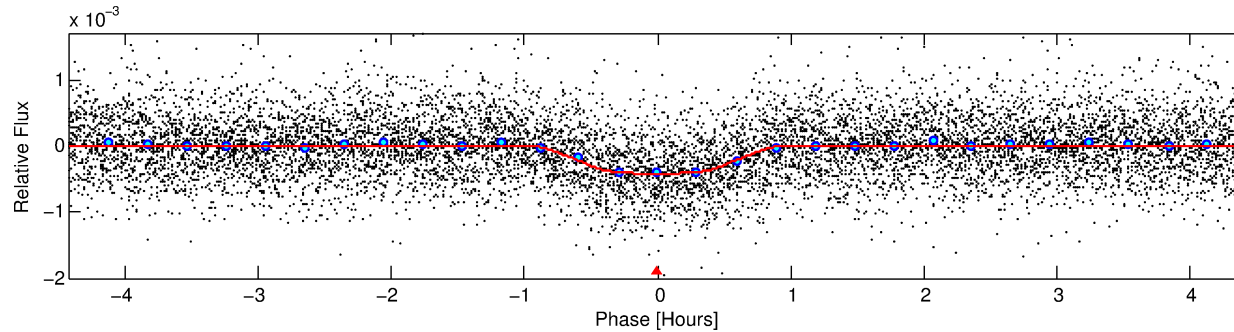
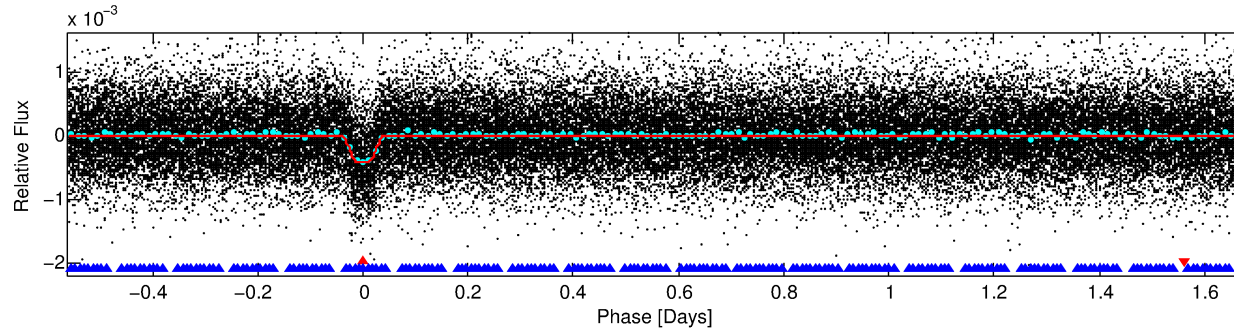
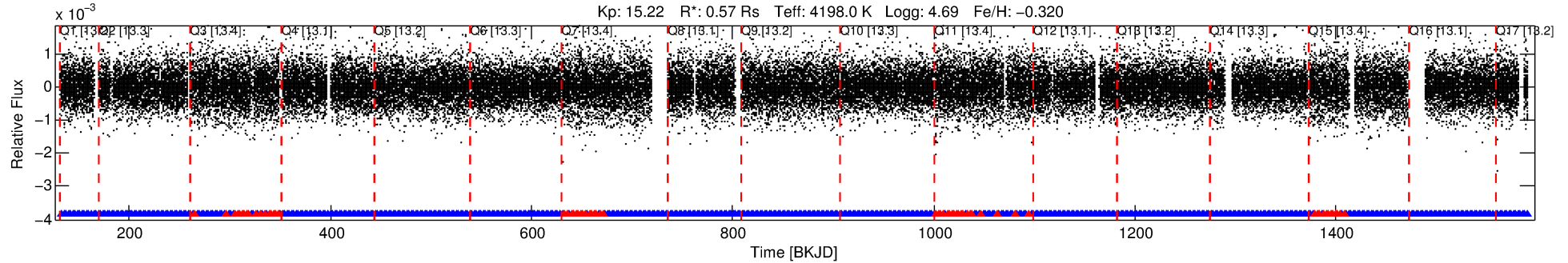
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008230616-01

No Significant Match Found

DV One-Page Summary

KIC: 8230616 Candidate: 1 of 2 Period: 2.240 d
KOI: K01713.02 Name: Kepler-316b Corr: 0.973



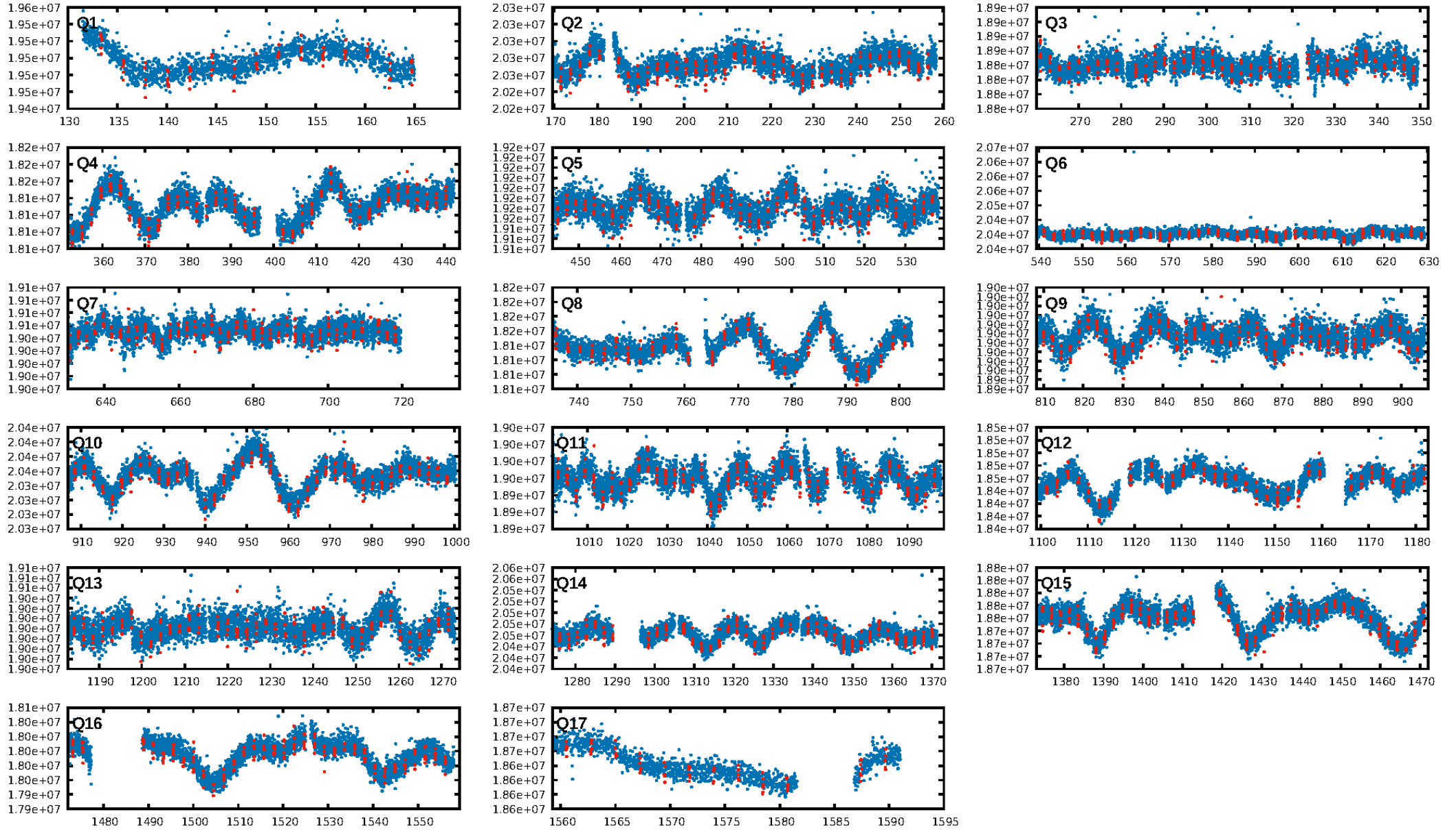
DV Fit Results:

Period = 2.24048 [0.00000] d
Epoch = 133.3444 [0.0007] BKJD
Rp/R* = 0.0228 [0.0056]
a/R* = 5.79 [5.80]
b = 0.90 [0.23]
Seff = 116.38 [11.33]
Teq = 838 [20] K
Rp = 1.43 [0.36] Re
a = 0.0281 [0.0012] AU
Ag = 6.95 [4.33] [1.37 σ]
Teffp = 2103 [329] K [3.84 σ]

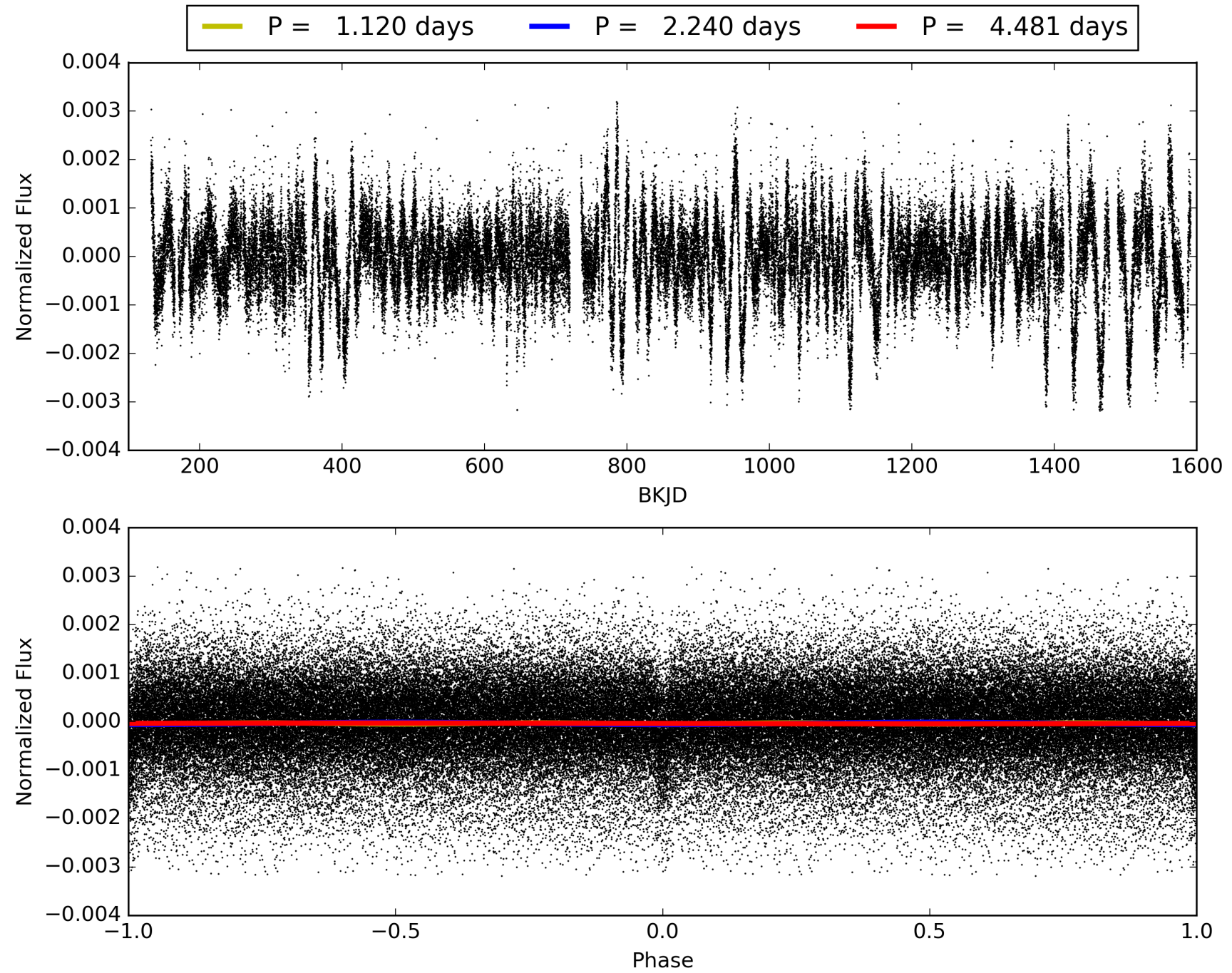
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [38.07 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.03e-164
RollingBand-fgt: 0.89 [508/571]
GhostDiagnostic-chr: 2.566
Centroid-sig: 0.3%
Centroid-so: 1.400 arcsec [3.11 σ]
OotOffset-rm: 0.279 arcsec [1.62 σ]
KicOffset-rm: 0.401 arcsec [2.36 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]

TCE 008230616-01, PDC Light Curves

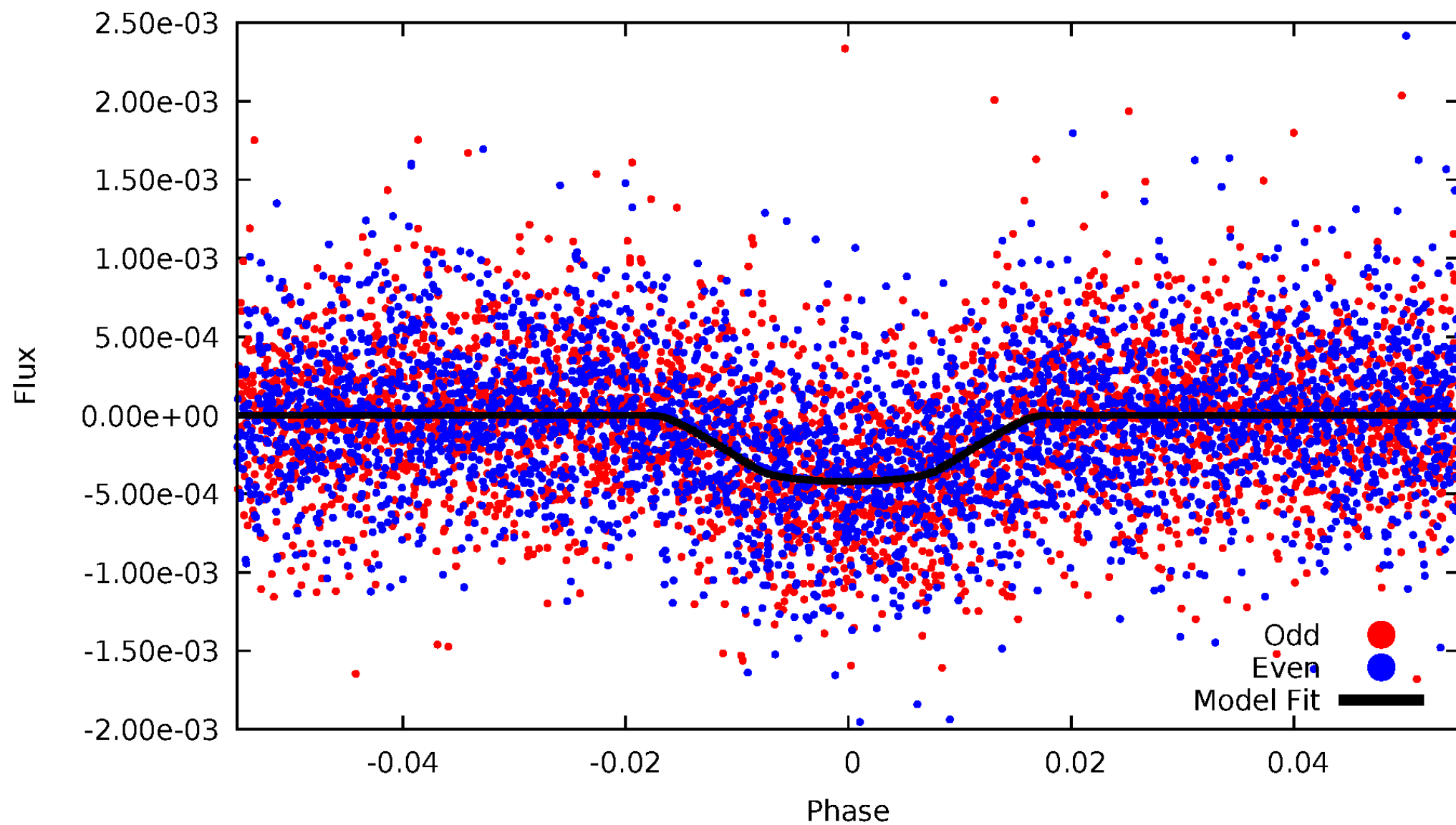


TCE 008230616-01



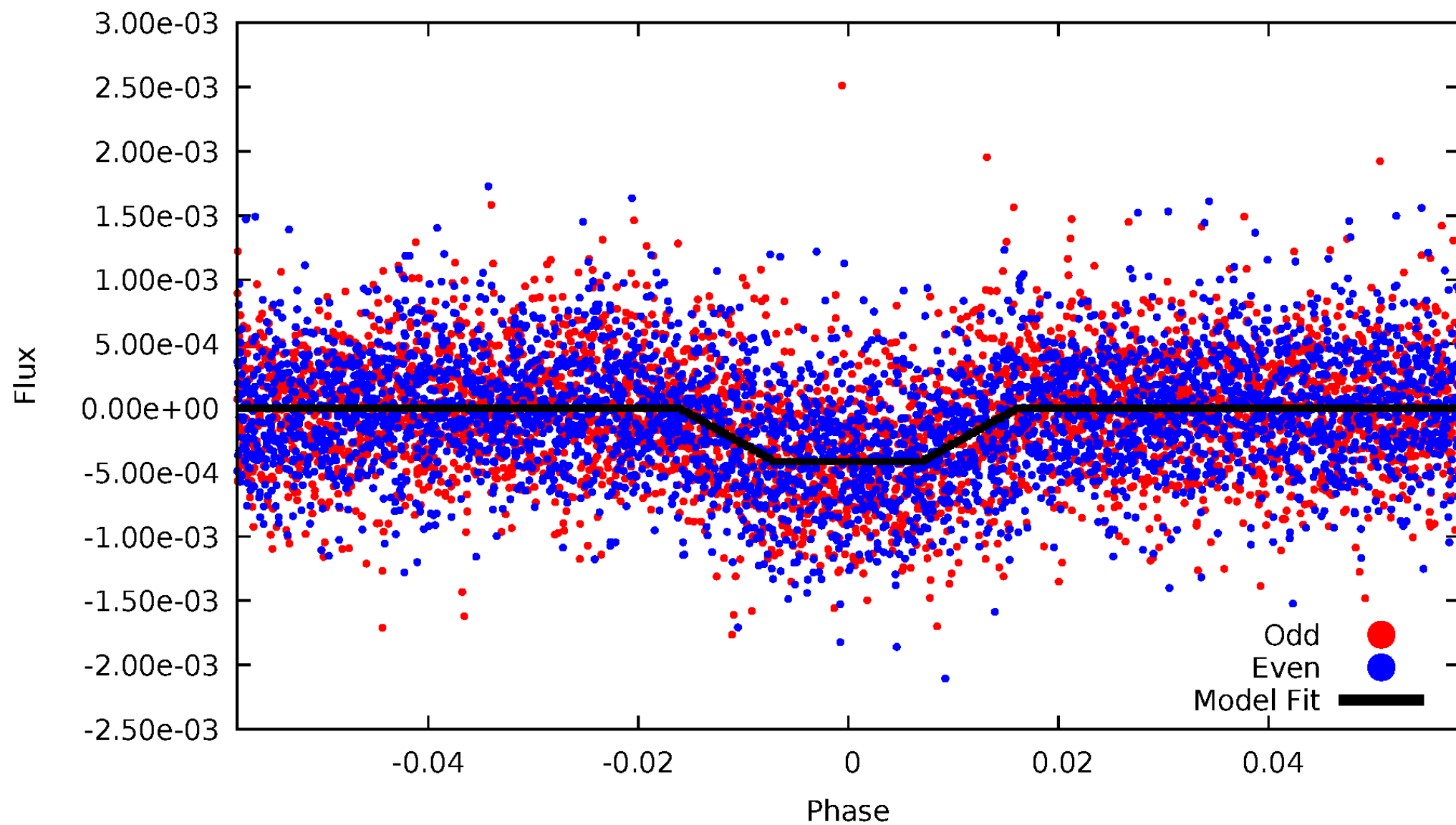
DV Odd/Even

TCE 008230616-01



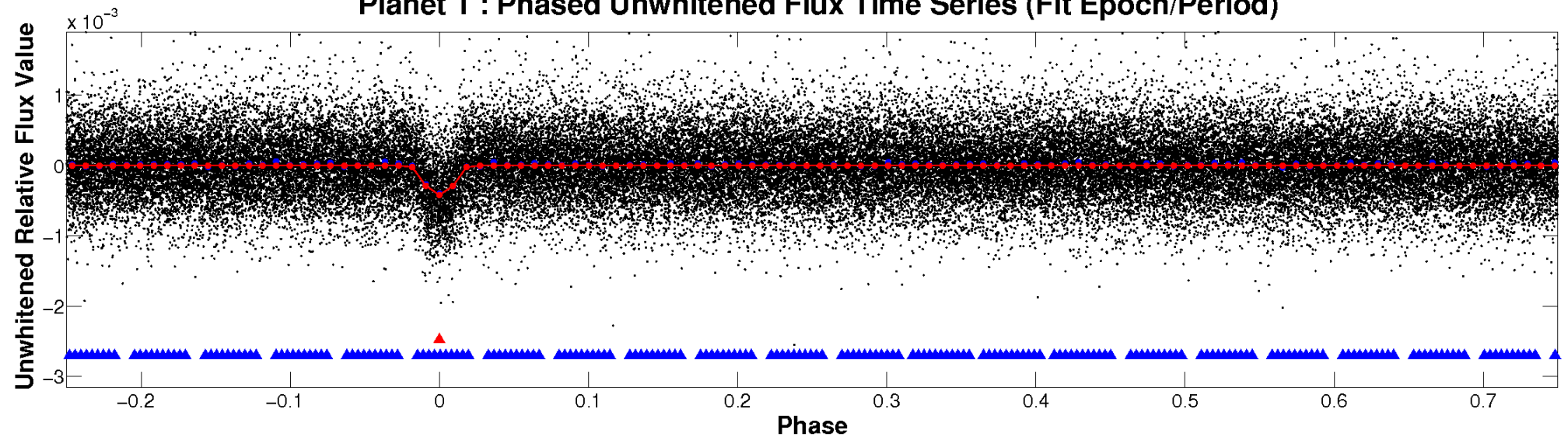
ALT Odd/Even

TCE 008230616-01

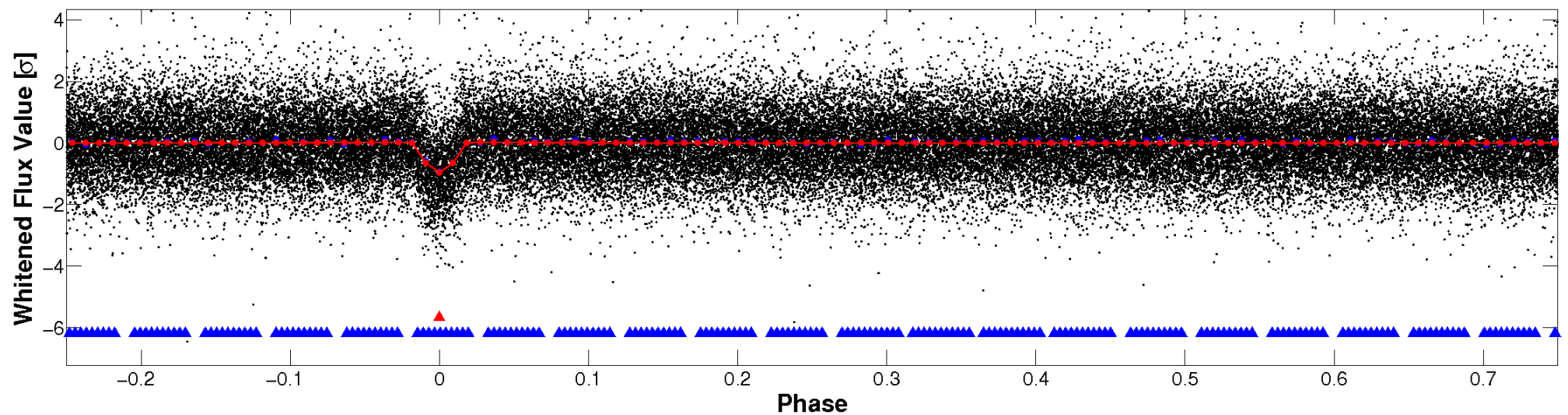


Non-Whitened Vs. Whitened Light Curve

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

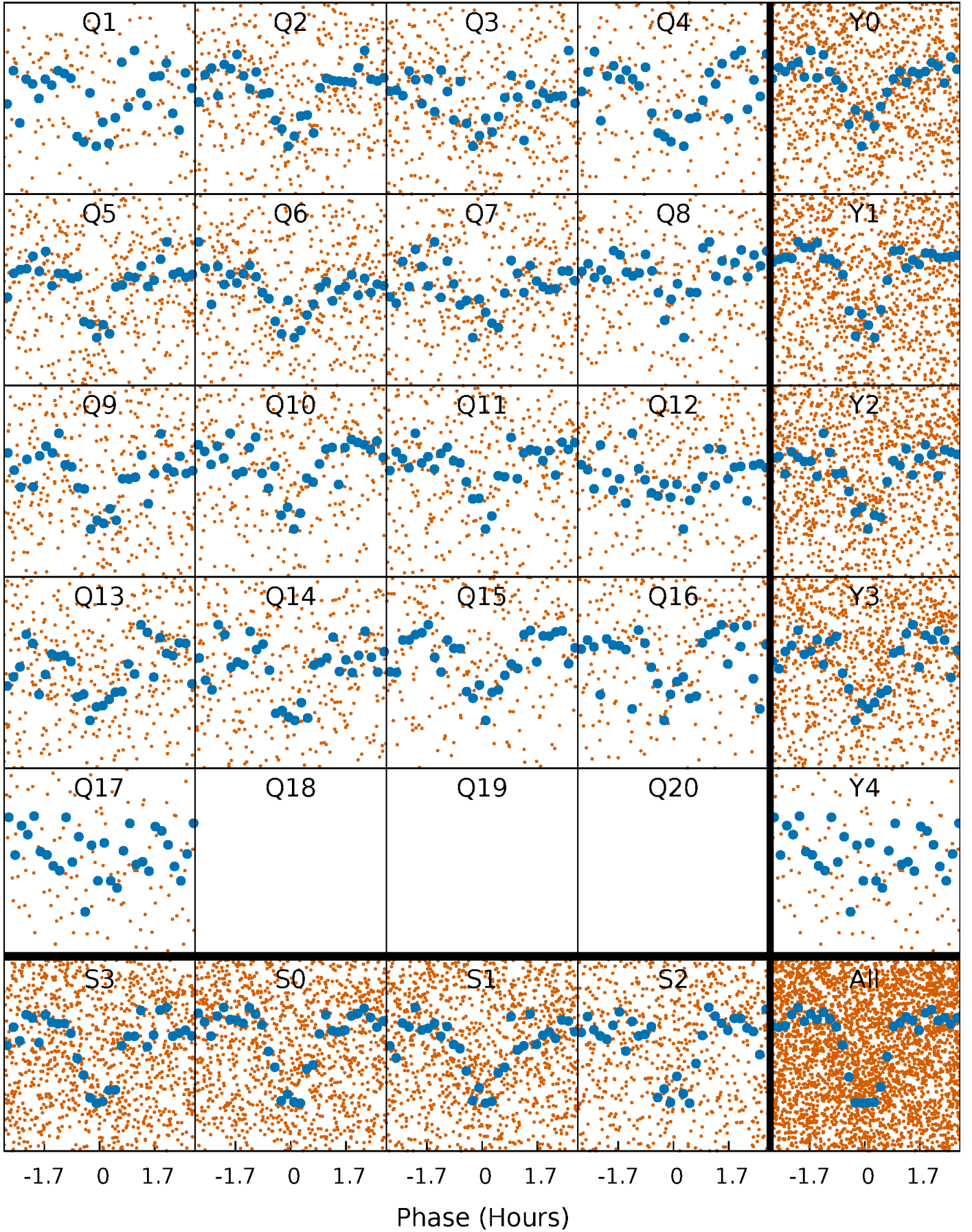


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



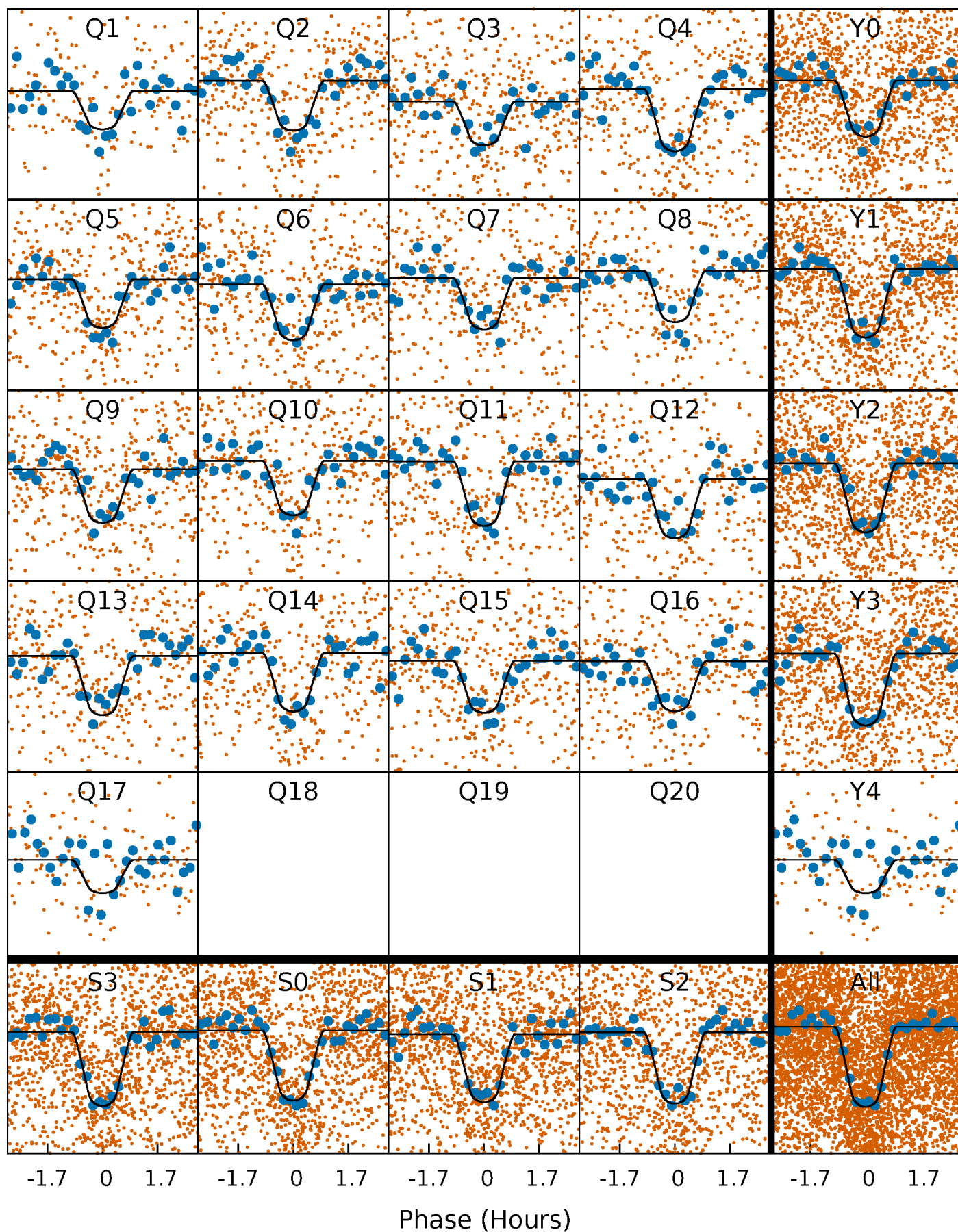
PDC Quarter-Phased Transit Curves

TCE 008230616-01 P= 2.240483 Days $T_0=133.344410$ (BKJD)



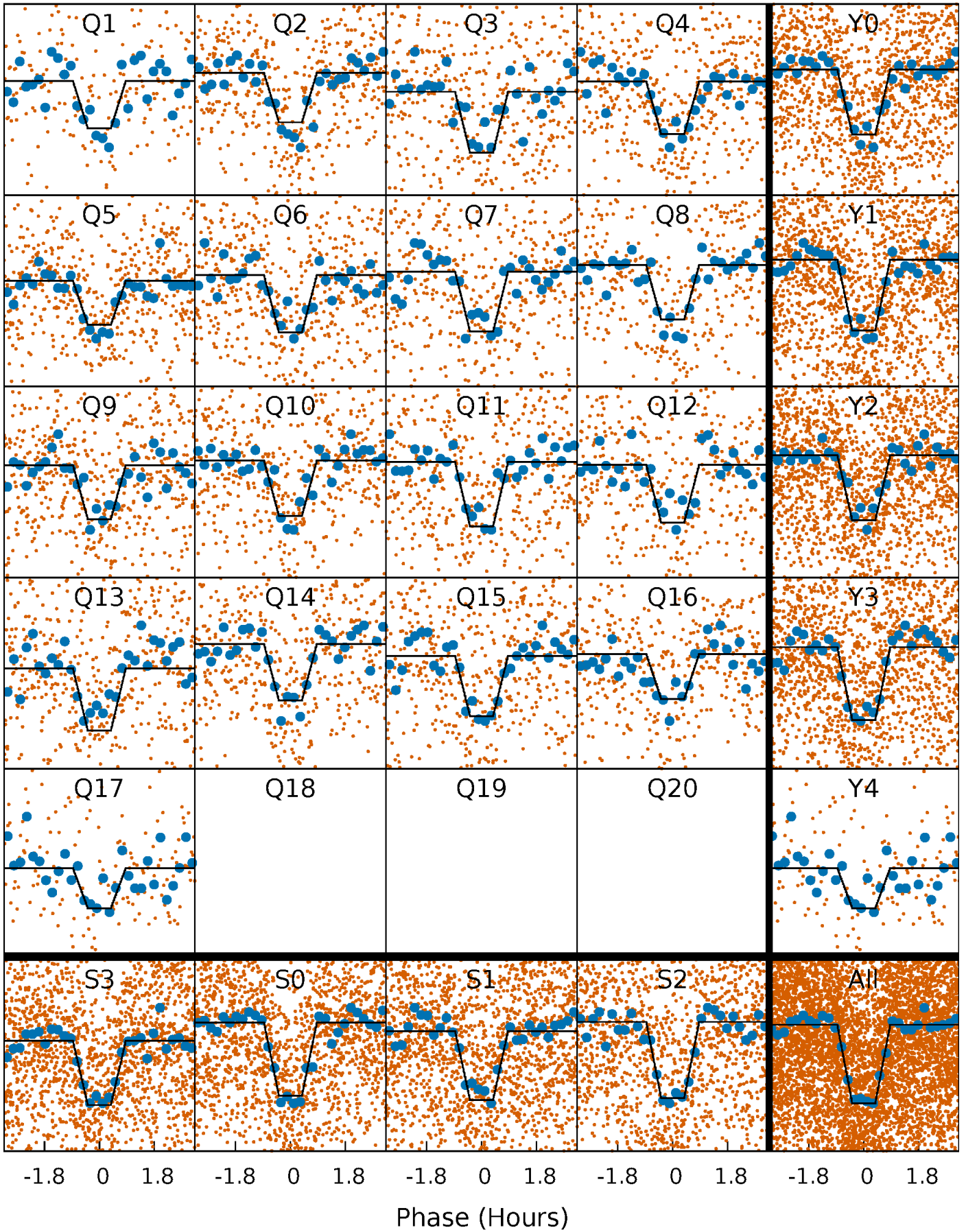
DV Quarter-Phased Transit Curves

TCE 008230616-01 P= 2.240483 Days $T_0=133.344410$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

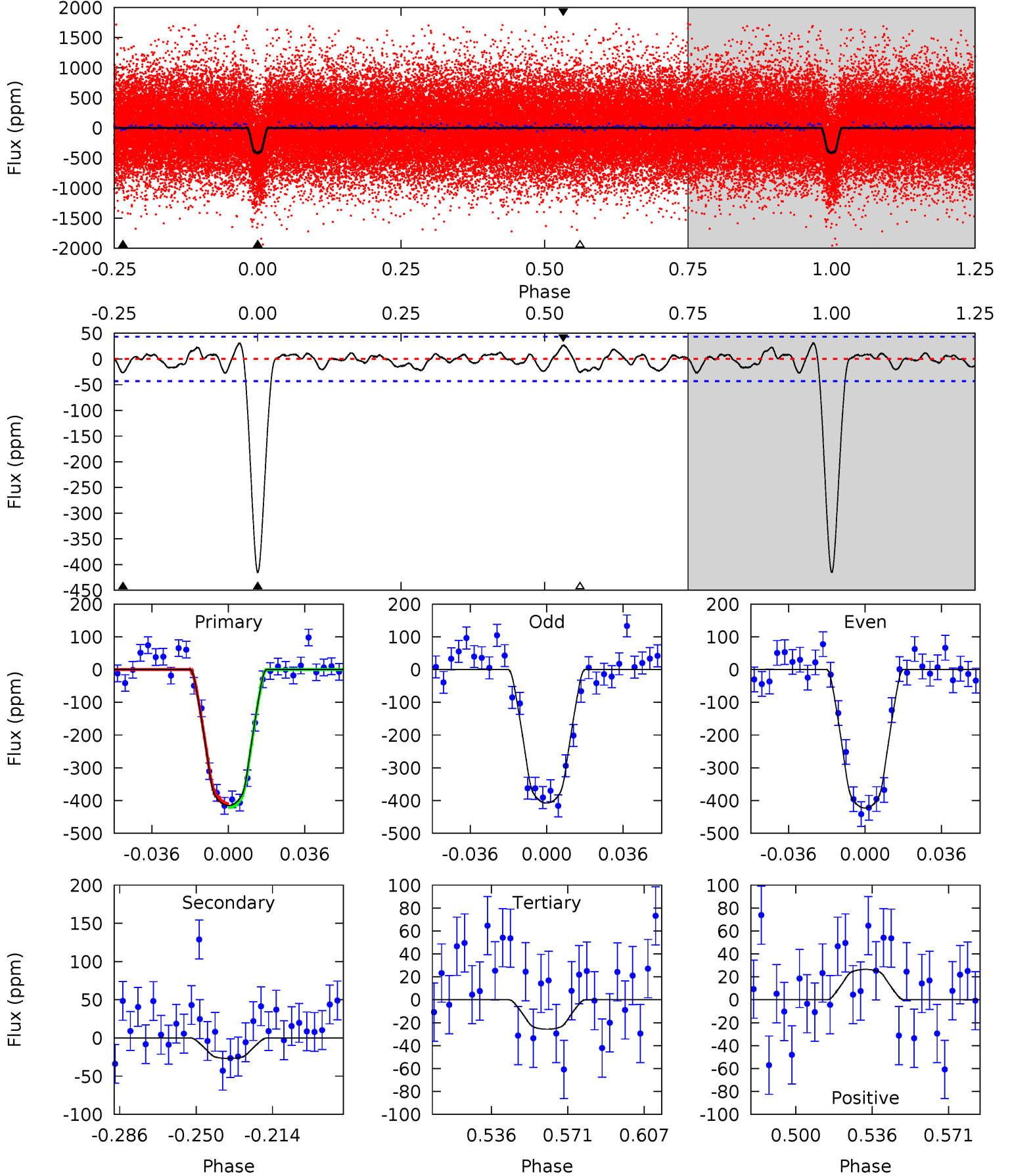
TCE 008230616-01 P= 2.240494 Days $T_0=133.341536$ (BKJD)



DV Model-Shift Uniqueness Test

008230616-01, P = 2.240483 Days, E = 131.103927 Days

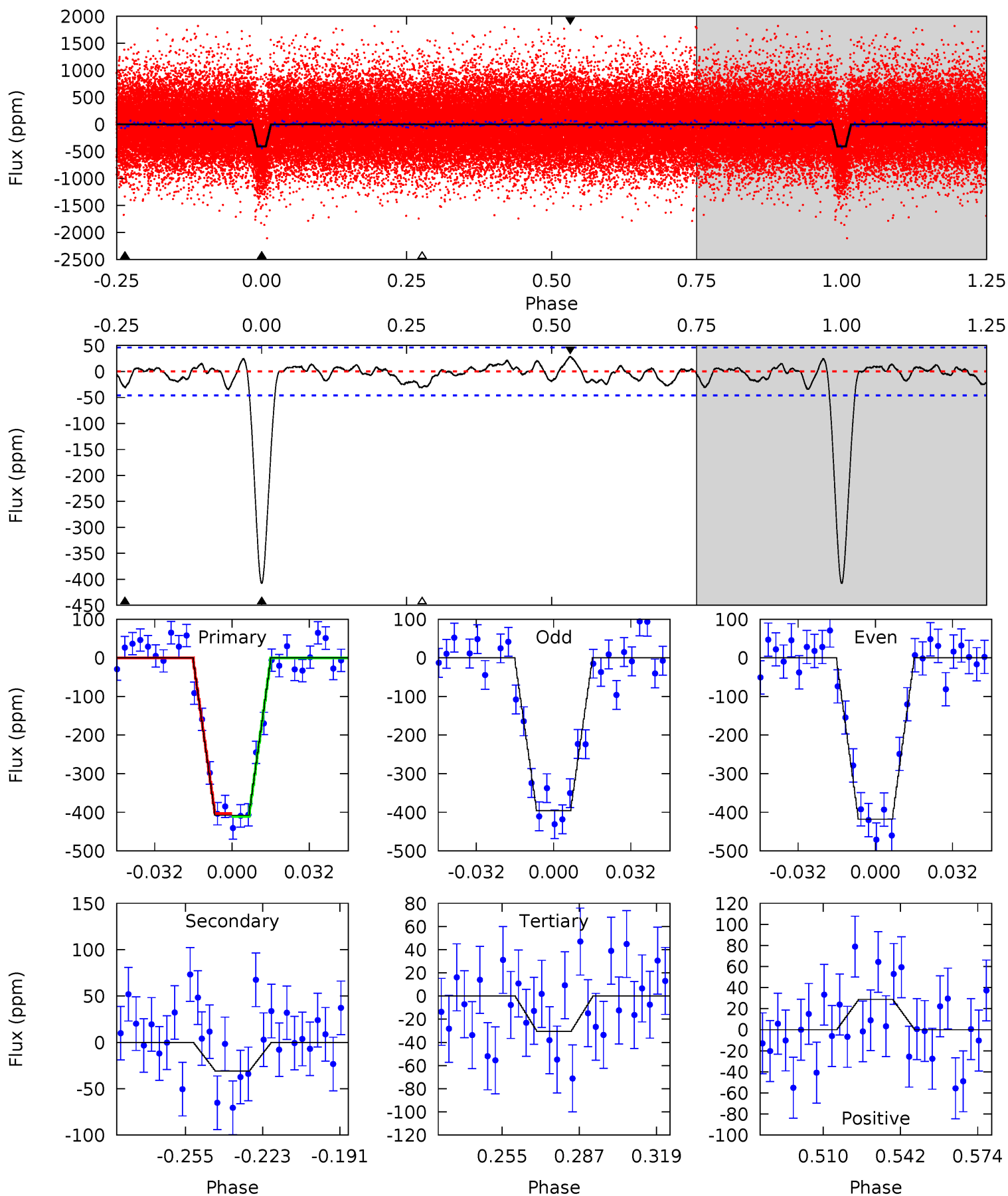
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.9	2.97	2.84	2.93	4.78	2.10	1.25	43.1	43.0	0.13	0.04	0.83	0.98	0.07	0.68



Alt Model-Shift Uniqueness Test

008230616-01, P = 2.240494 Days, E = 131.101042 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.4	3.22	3.18	2.99	4.80	2.15	1.28	39.2	39.4	0.04	0.23	1.16	0.98	0.07	0.39



Stellar Parameters For KIC 008230616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4198^{+83}_{-83}	$4.689^{+0.023}_{-0.028}$	$-0.320^{+0.150}_{-0.150}$	$0.574^{+0.032}_{-0.028}$	$0.587^{+0.028}_{-0.035}$	$4.376^{+0.478}_{-0.431}$
	+2%/-2%	+0%/-1%	+47%/-47%	+6%/-5%	+5%/-6%	+11%/-10%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 008230616-01 / KOI 1713.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-27 ± 9	$1.43^{+0.35}_{-0.37}$	1172^{+28}_{-26}	2648^{+255}_{-186}	$5.591^{+5.301}_{-2.460}$
Alt.	-31 ± 10	$1.32^{+0.34}_{-0.34}$	1172^{+24}_{-28}	2758^{+263}_{-203}	$7.497^{+7.083}_{-3.157}$

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 $A_{obs} \gg 1.0$

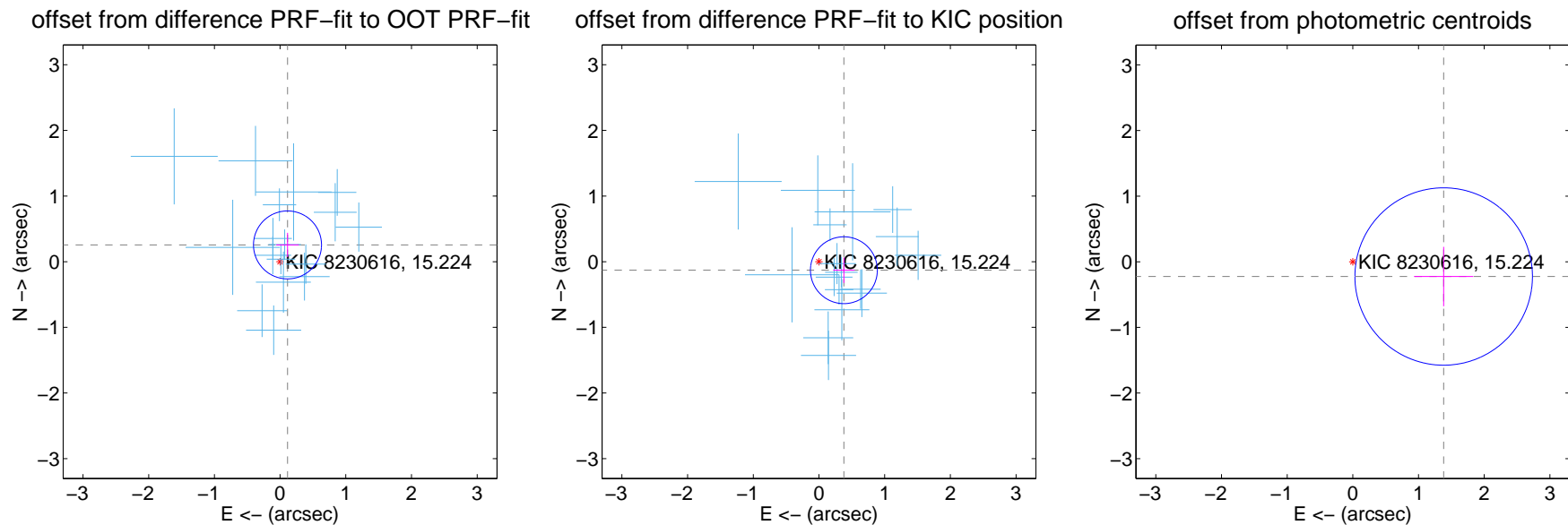
DV Centroid Data

Supplemental centroid analysis for 008230616-01. Kepler magnitude: 15.22. Transit SNR 32.18

There are 17 quarters with good PRF difference image offsets

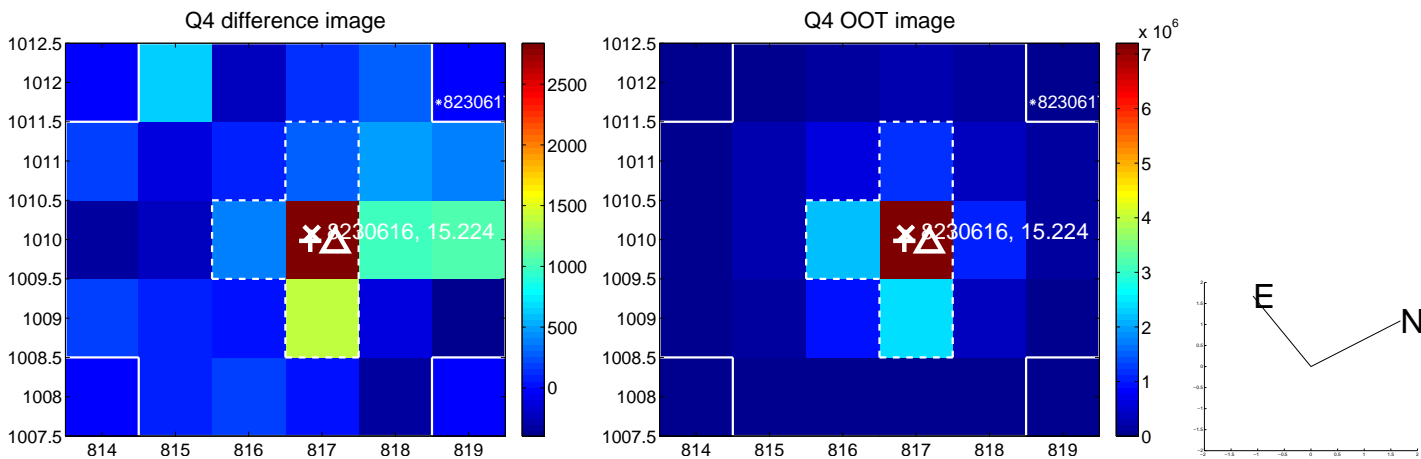
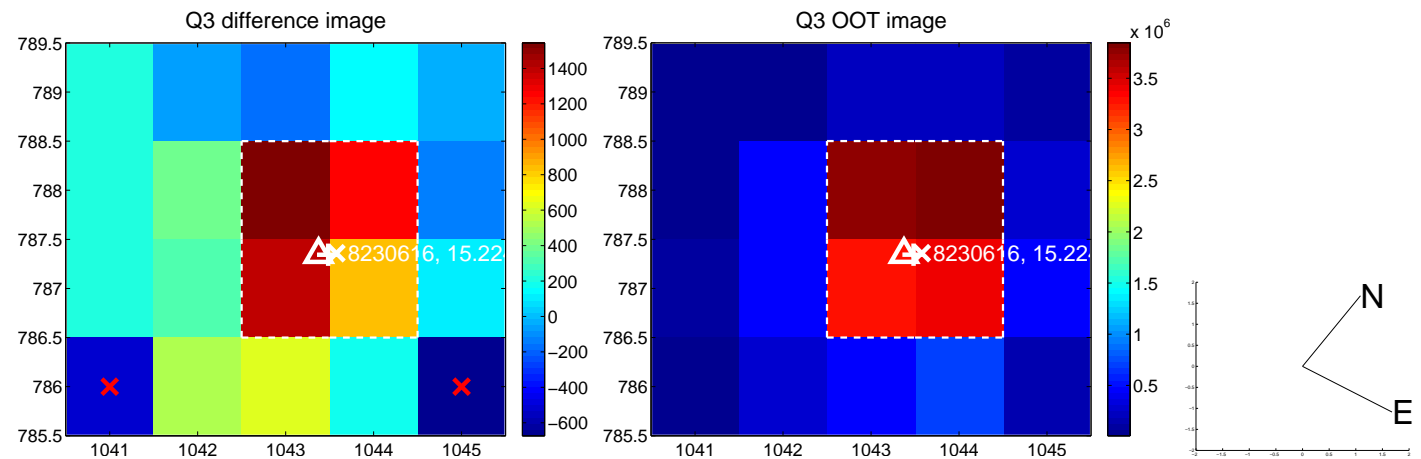
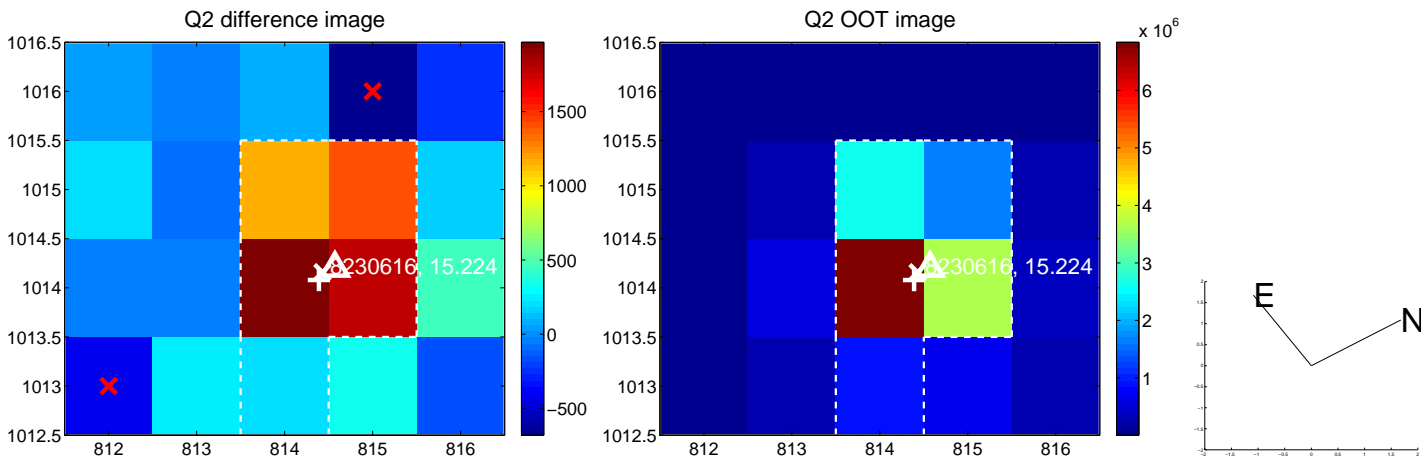
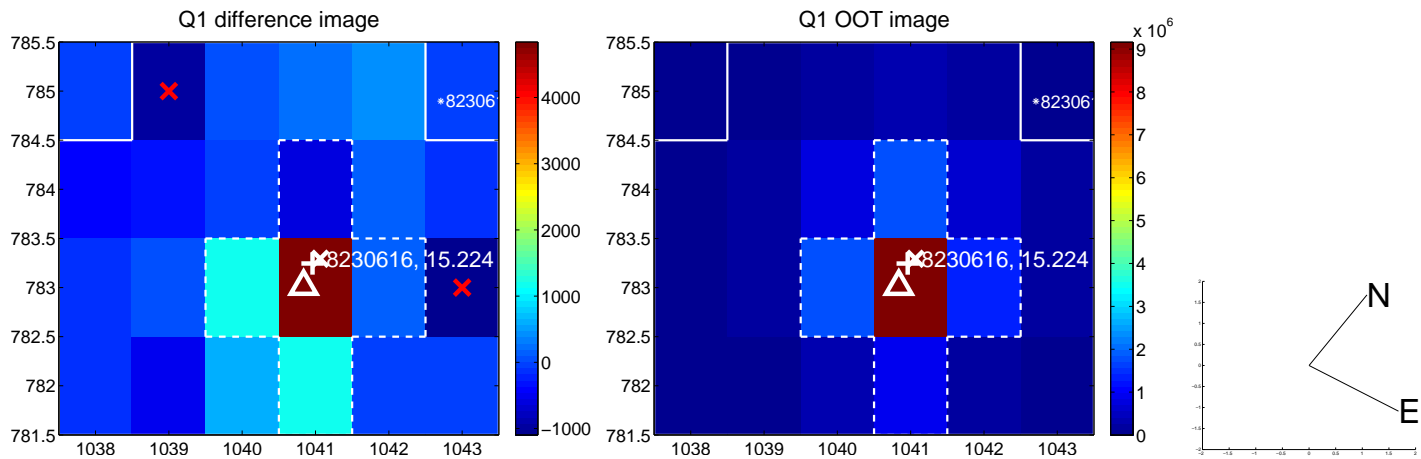
The direct PRF centroid is offset from the target star catalog position by about 0.57 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.279 ± 0.172	1.62	-0.113 ± 0.170	0.256 ± 0.184
PRF-fit source offset from KIC position	0.401 ± 0.170	2.36	-0.379 ± 0.162	-0.130 ± 0.193
photometric centroid source offset	1.40 ± 0.45	3.11	-1.38 ± 0.45	-0.22 ± 0.45

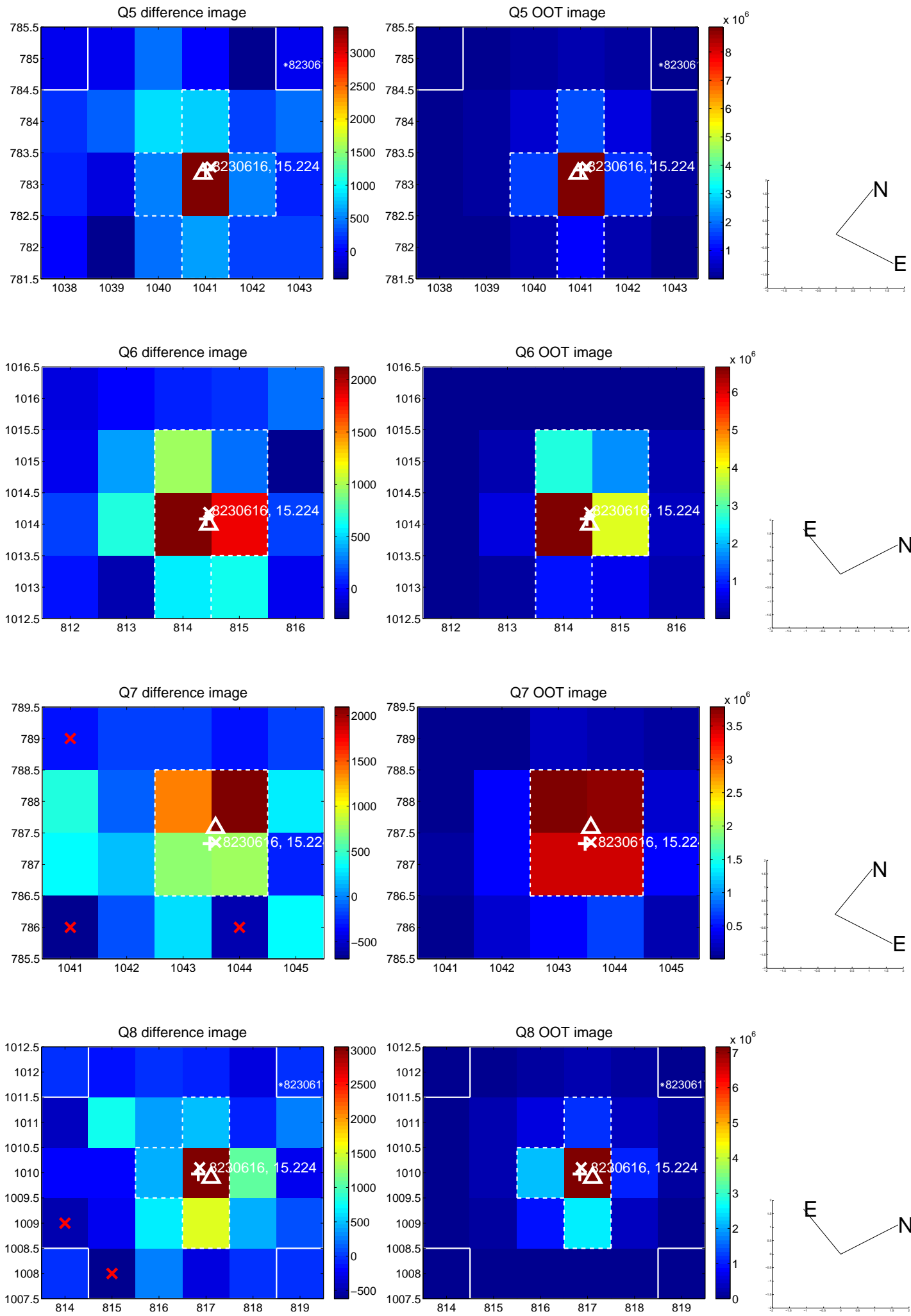


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

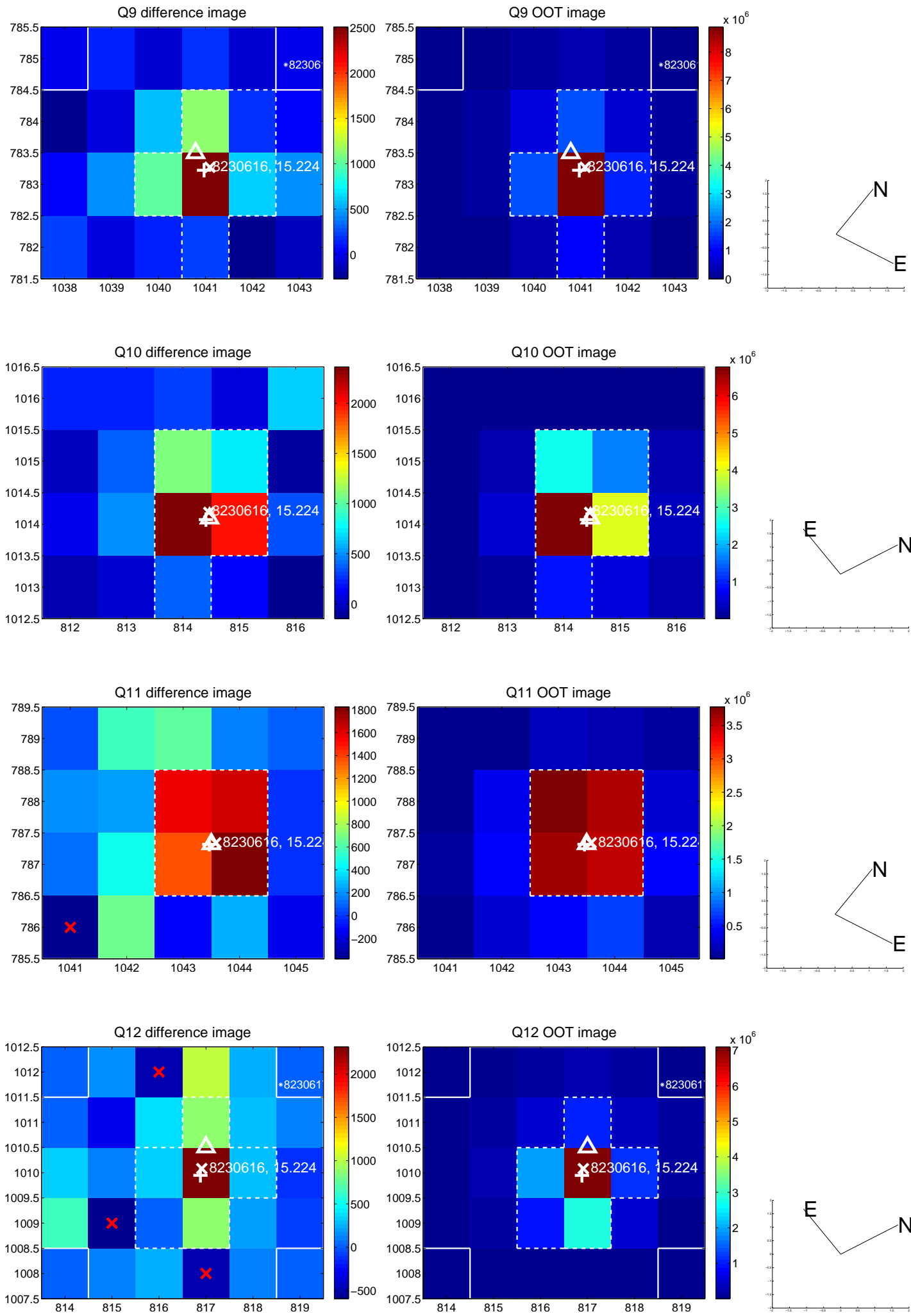
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



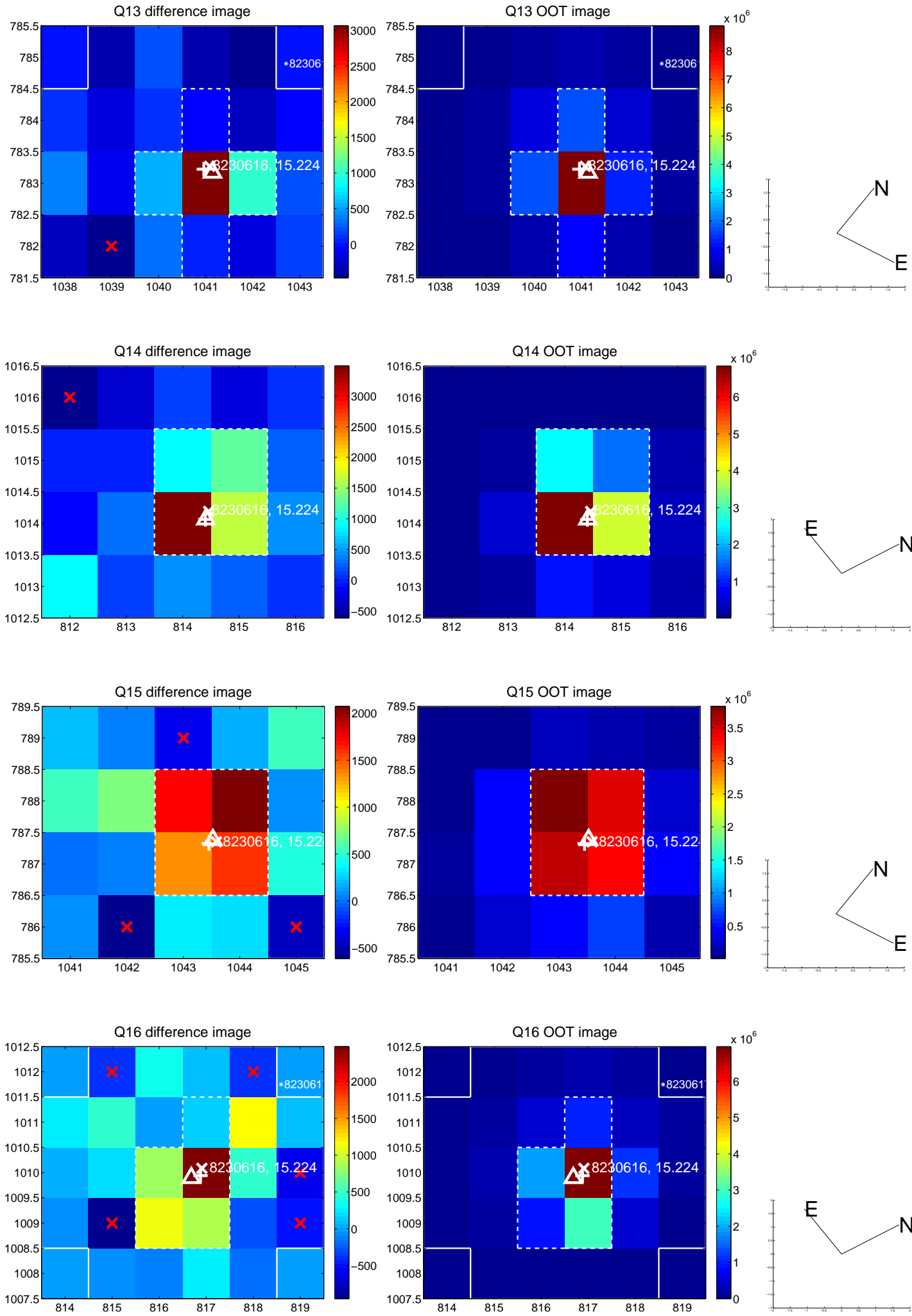
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



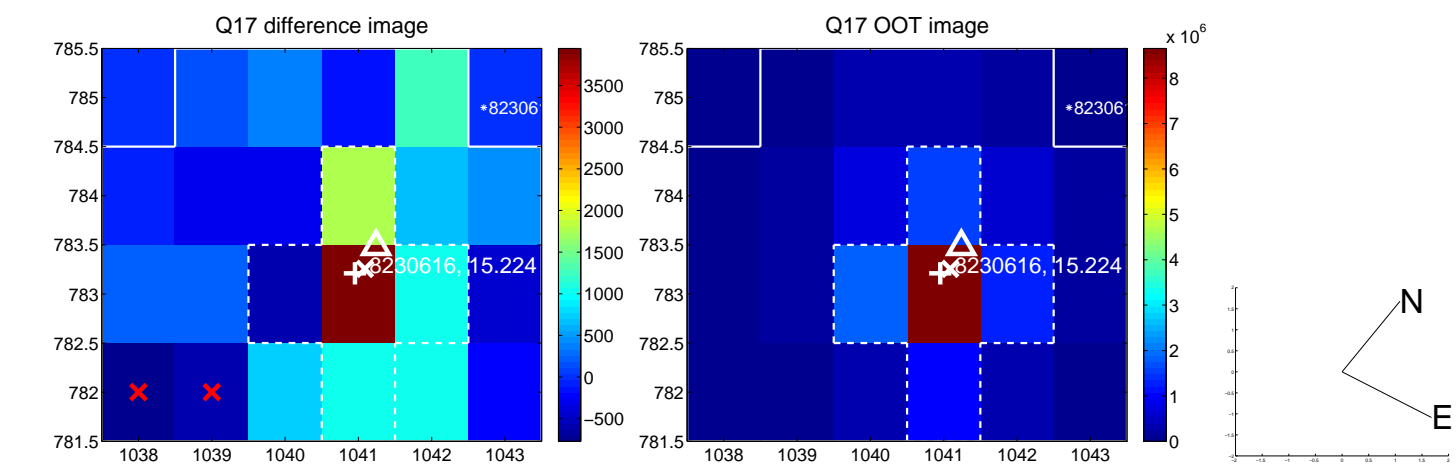
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



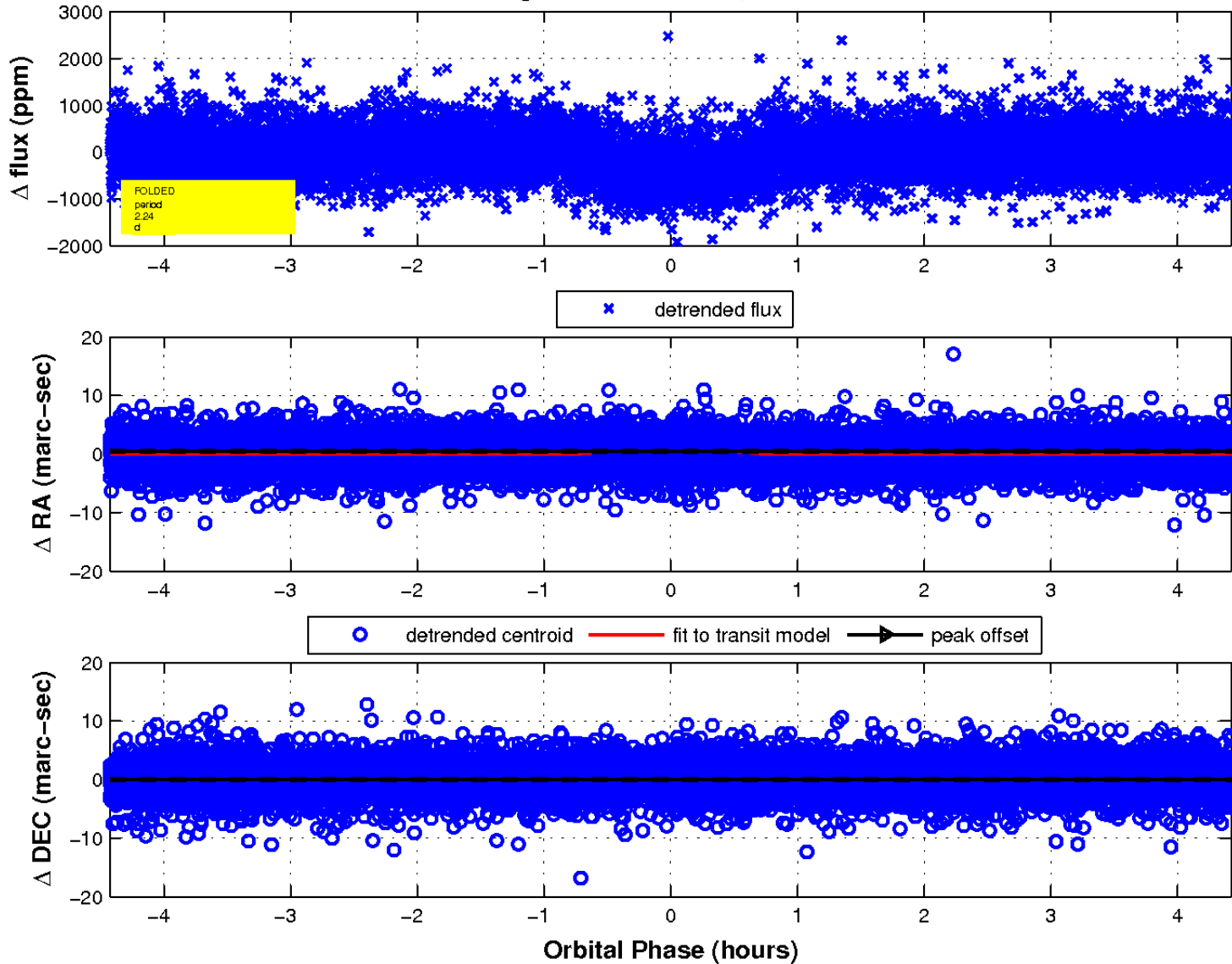
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

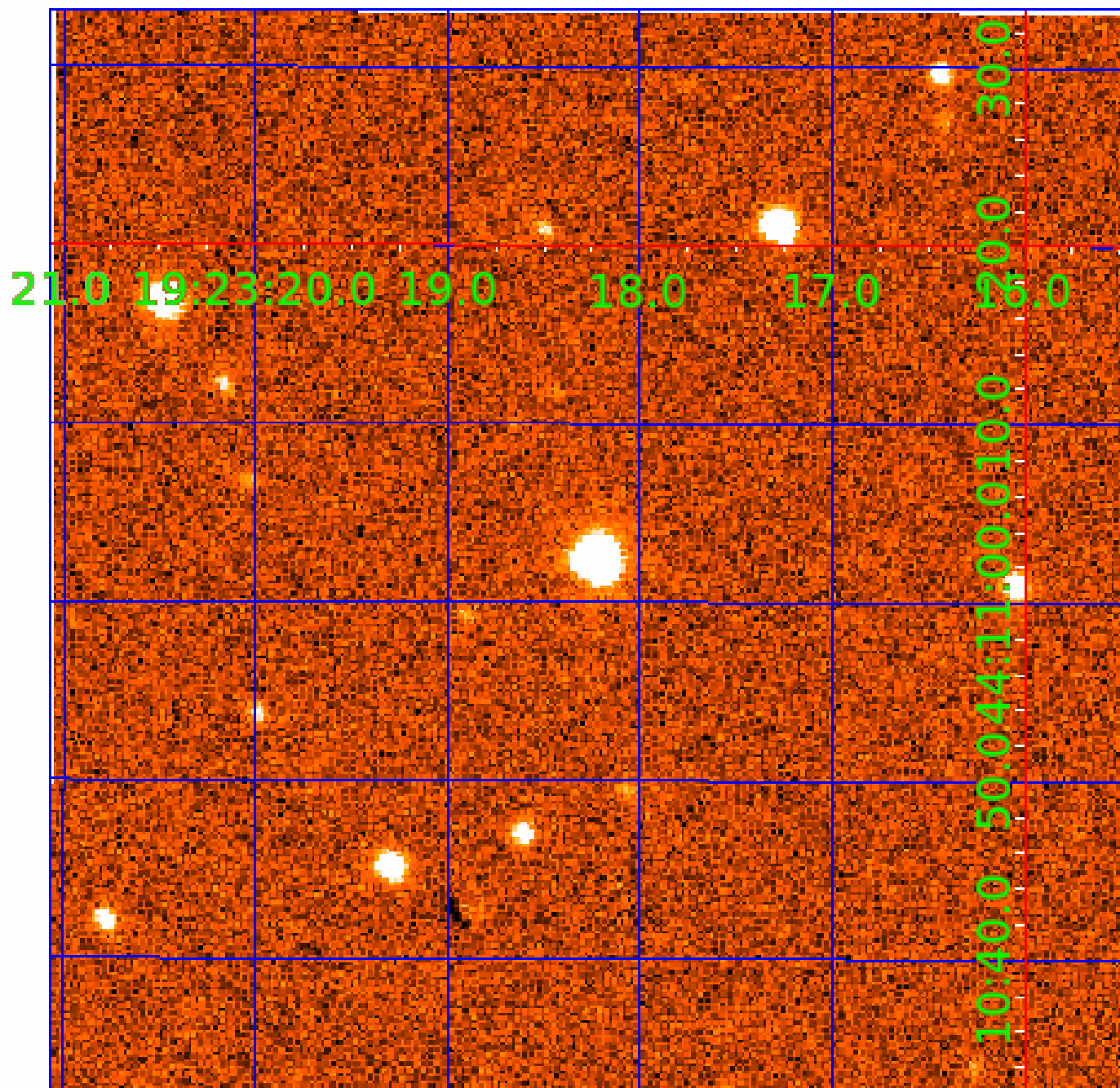


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008230616

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})
008230616-01	OBS	1713.02	2.240483	133.344410	422.1	1.475	28.1	32.2	0.57	4198	1.43	116.38
008230616-02	OBS	1713.01	6.827735	131.793675	550.0	2.487	26.8	29.0	0.57	4198	1.62	26.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008230616-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
008230616-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

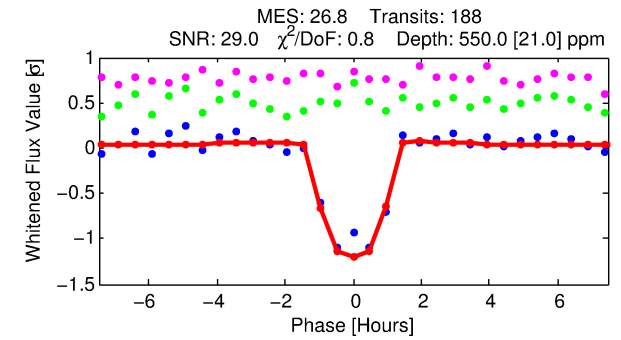
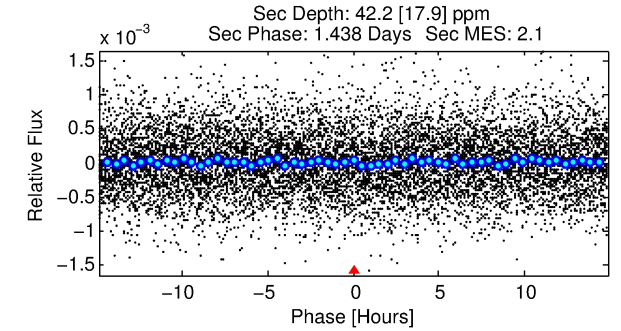
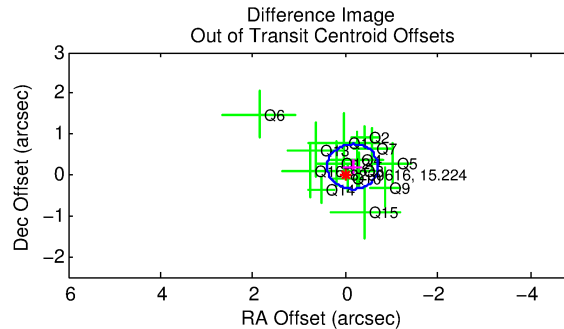
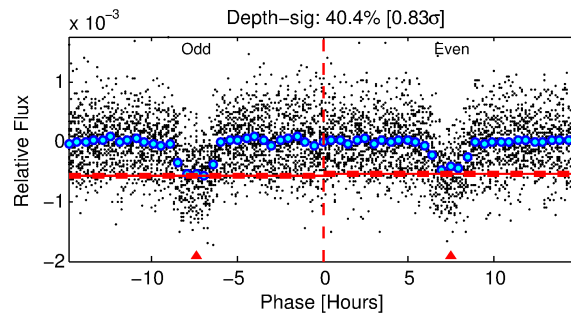
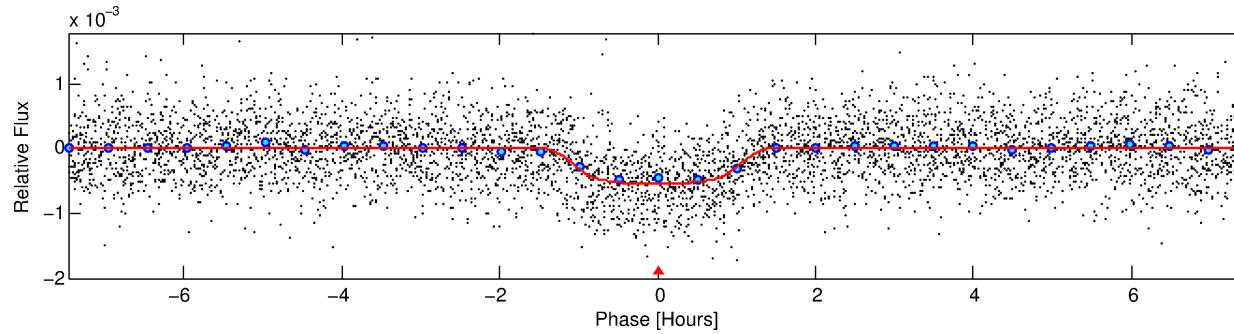
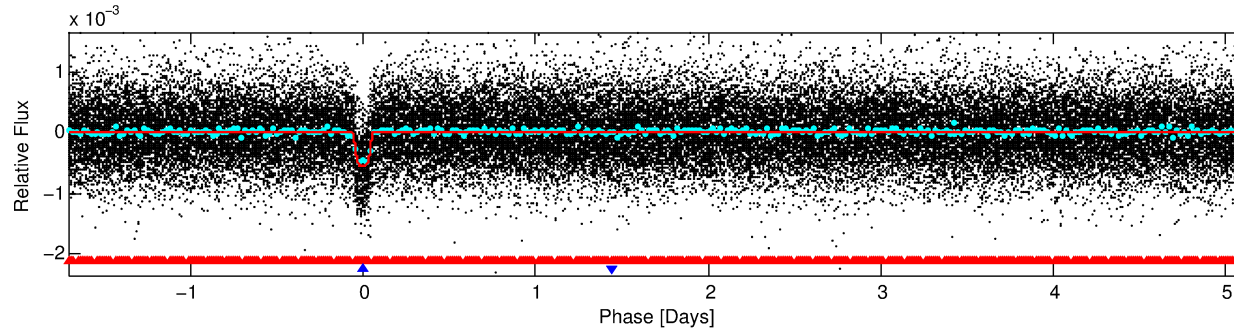
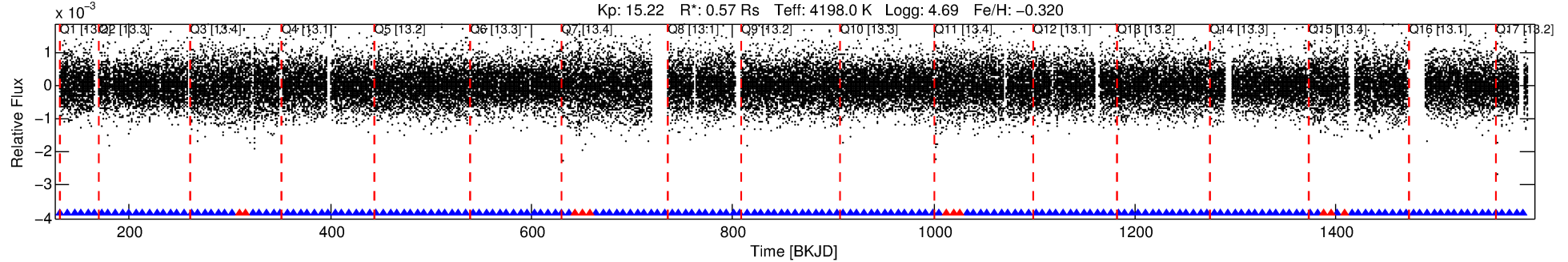
Ephemeris Match Information For 008230616-02

No Significant Match Found

DV One-Page Summary

KIC: 8230616 Candidate: 2 of 2 Period: 6.828 d
KOI: K01713.01 Name: Kepler-316c Corr: 0.972

Kp: 15.22 R*: 0.57 Rs Teff: 4198.0 K Logg: 4.69 Fe/H: -0.320



DV Fit Results:

Period = 6.82773 [0.00002] d
Epoch = 131.7937 [0.0018] BKJD
Rp/R* = 0.0259 [0.0040]
a/R* = 10.53 [6.68]
b = 0.90 [0.14]
Seff = 26.34 [2.57]
Teq = 578 [14] K
Rp = 1.62 [0.27] Re
a = 0.0590 [0.0025] AU
Ag = 30.80 [16.27] [1.83σ]
Teffp = 2104 [279] K [5.46σ]

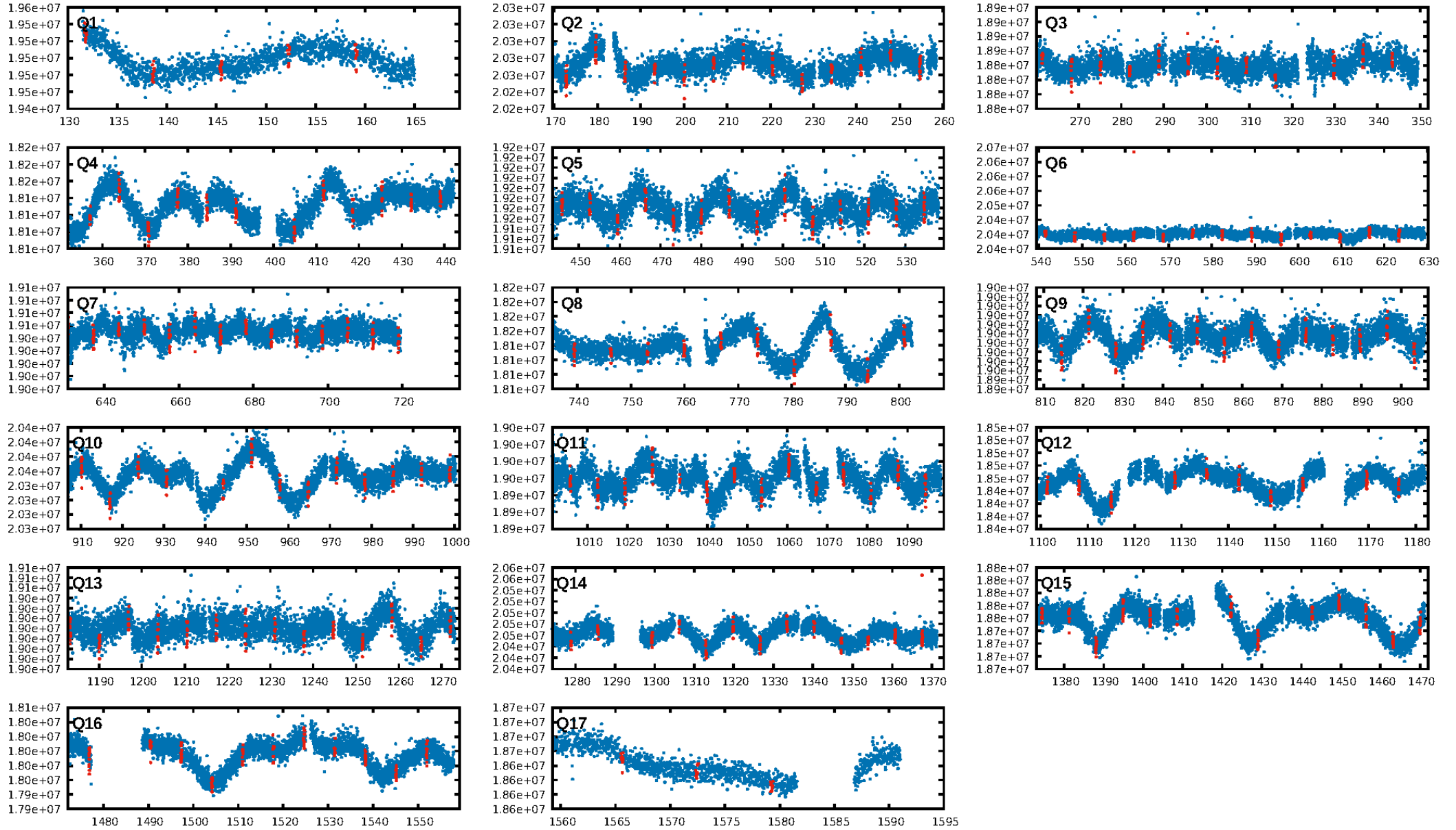
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.73e-150
RollingBand-fgt: 0.94 [169/180]
GhostDiagnostic-chr: 1.735
Centroid-sig: 0.5%
Centroid-so: 1.400 arcsec [3.01σ]
OotOffset-rm: 0.253 arcsec [1.37σ]
KicOffset-rm: 0.483 arcsec [2.13σ]
OotOffset-st: 4/2/4/4 [14]
KicOffset-st: 4/2/4/4 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 1.00 [17/17]

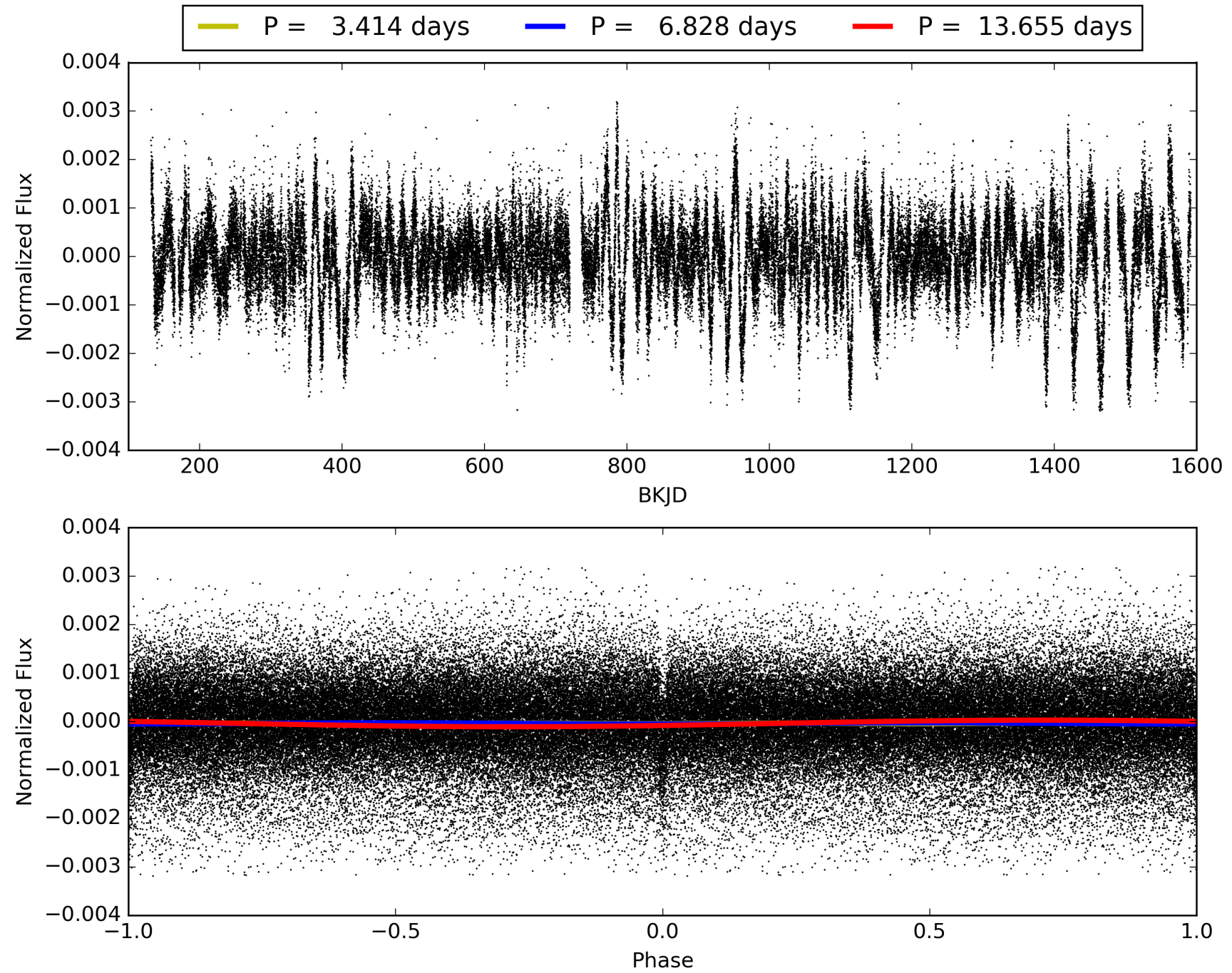
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:03:38 Z

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

TCE 008230616-02, PDC Light Curves

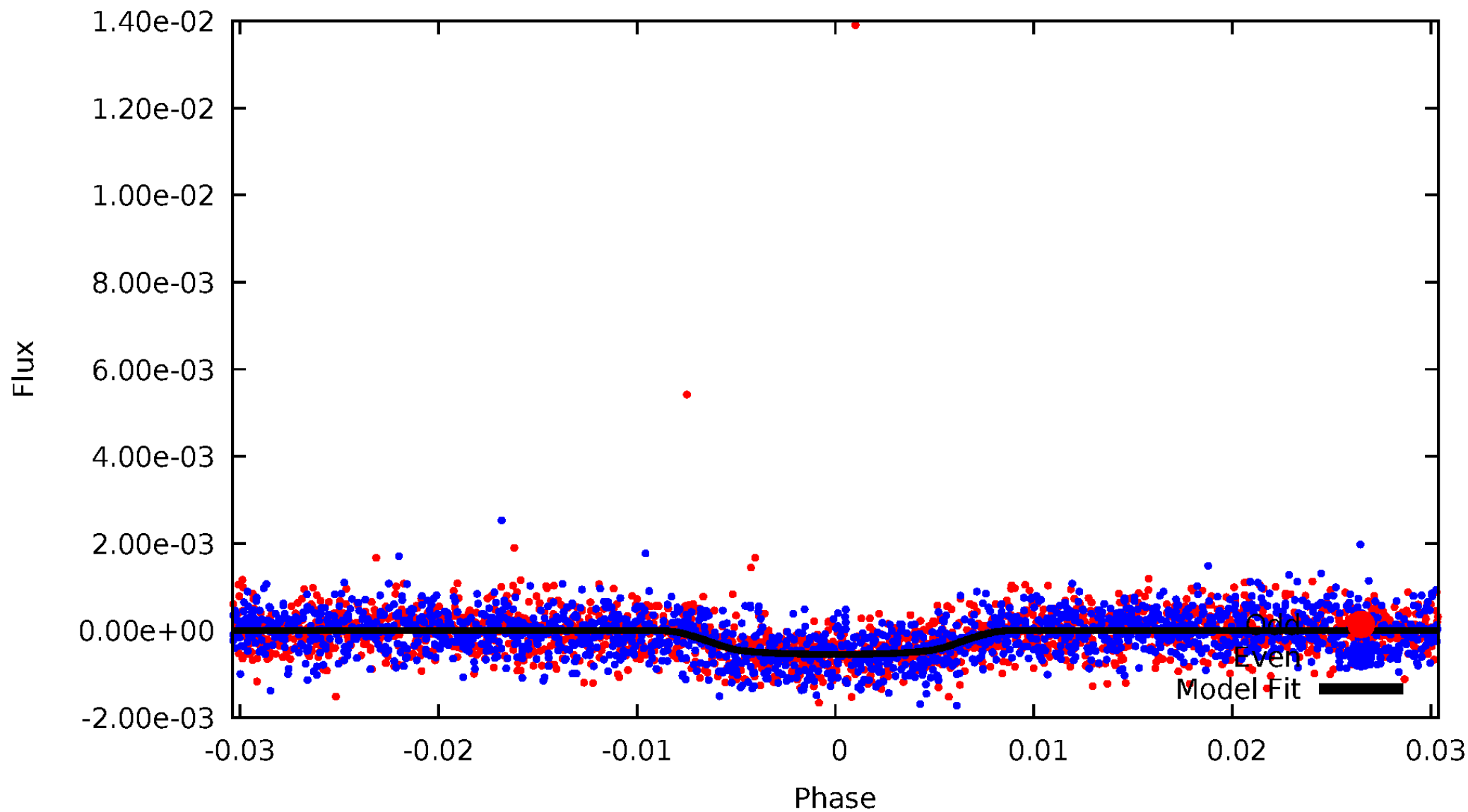


TCE 008230616-02



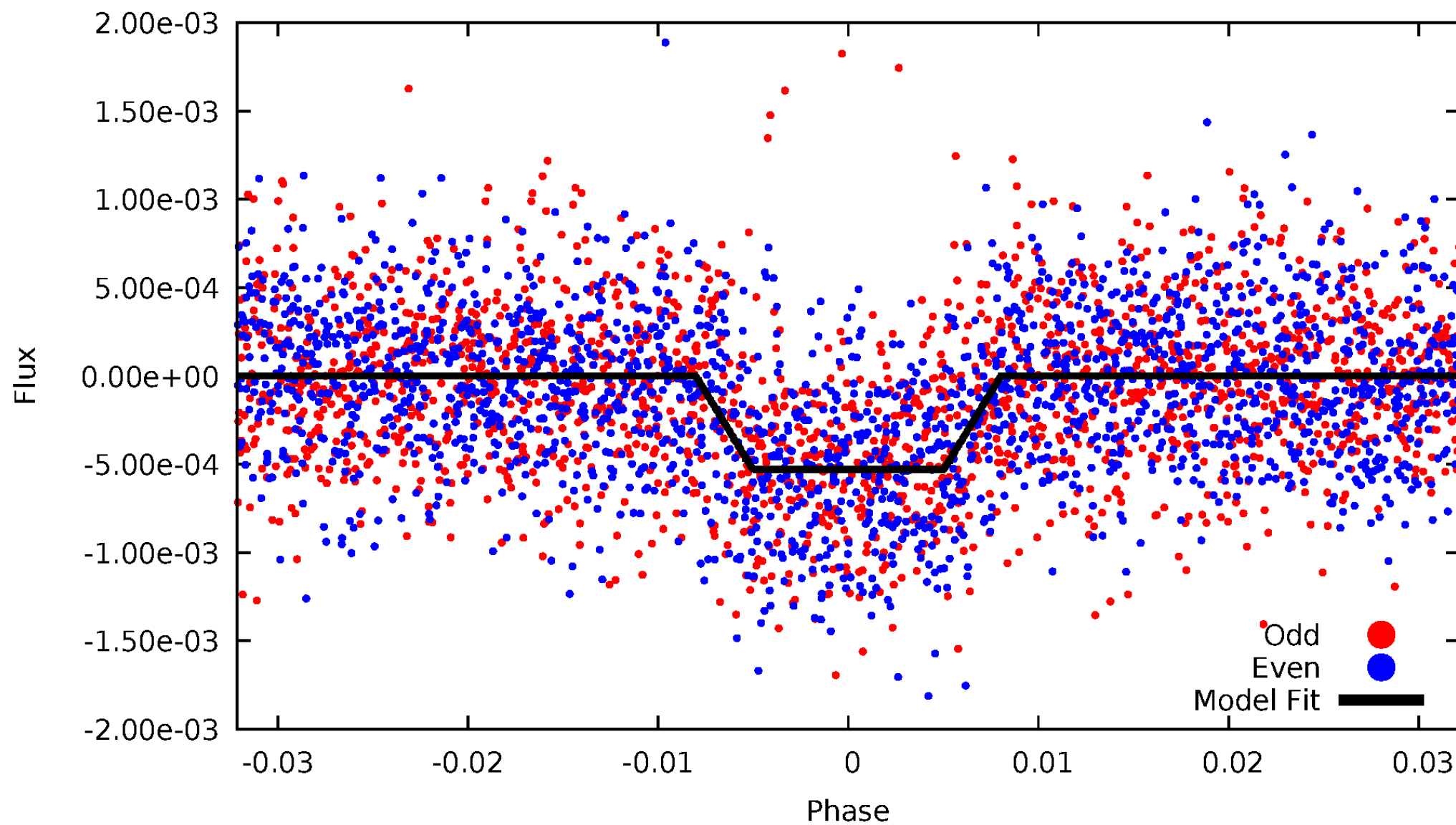
DV Odd/Even

TCE 008230616-02



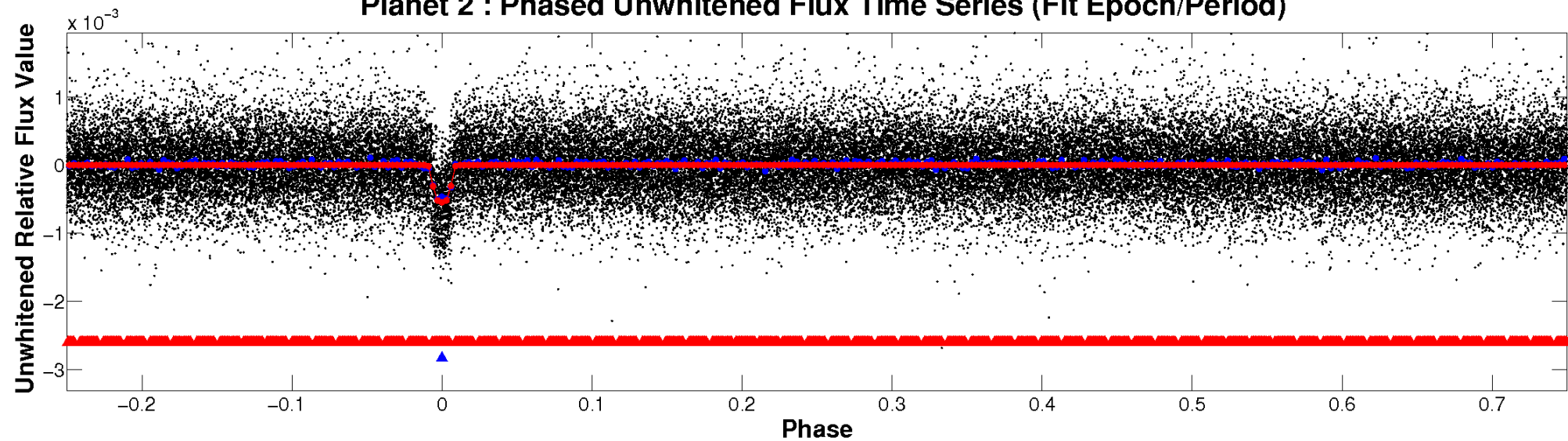
ALT Odd/Even

TCE 008230616-02

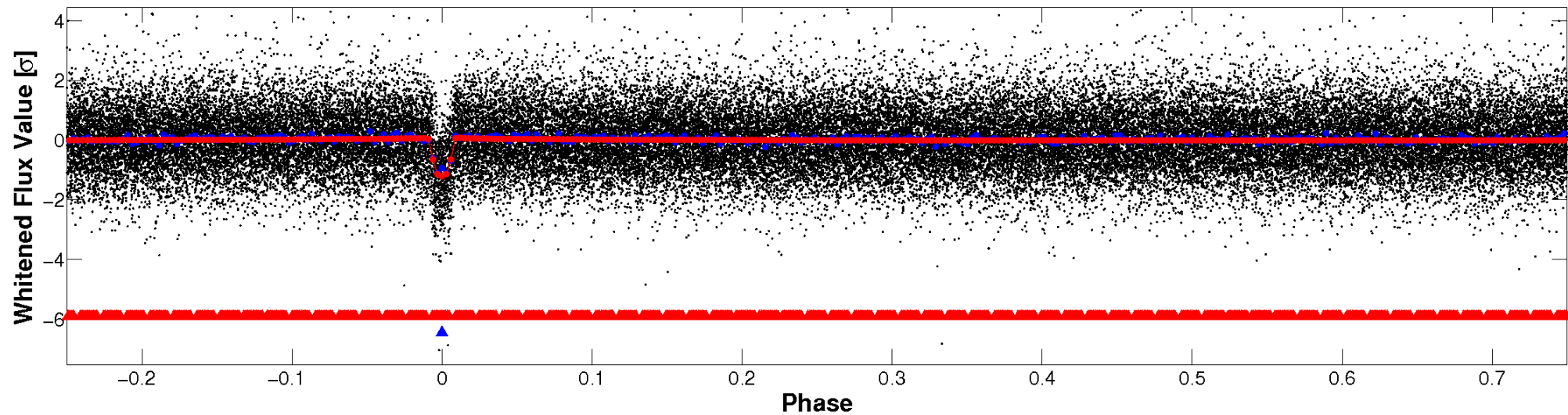


Non-Whitened Vs. Whitened Light Curve

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

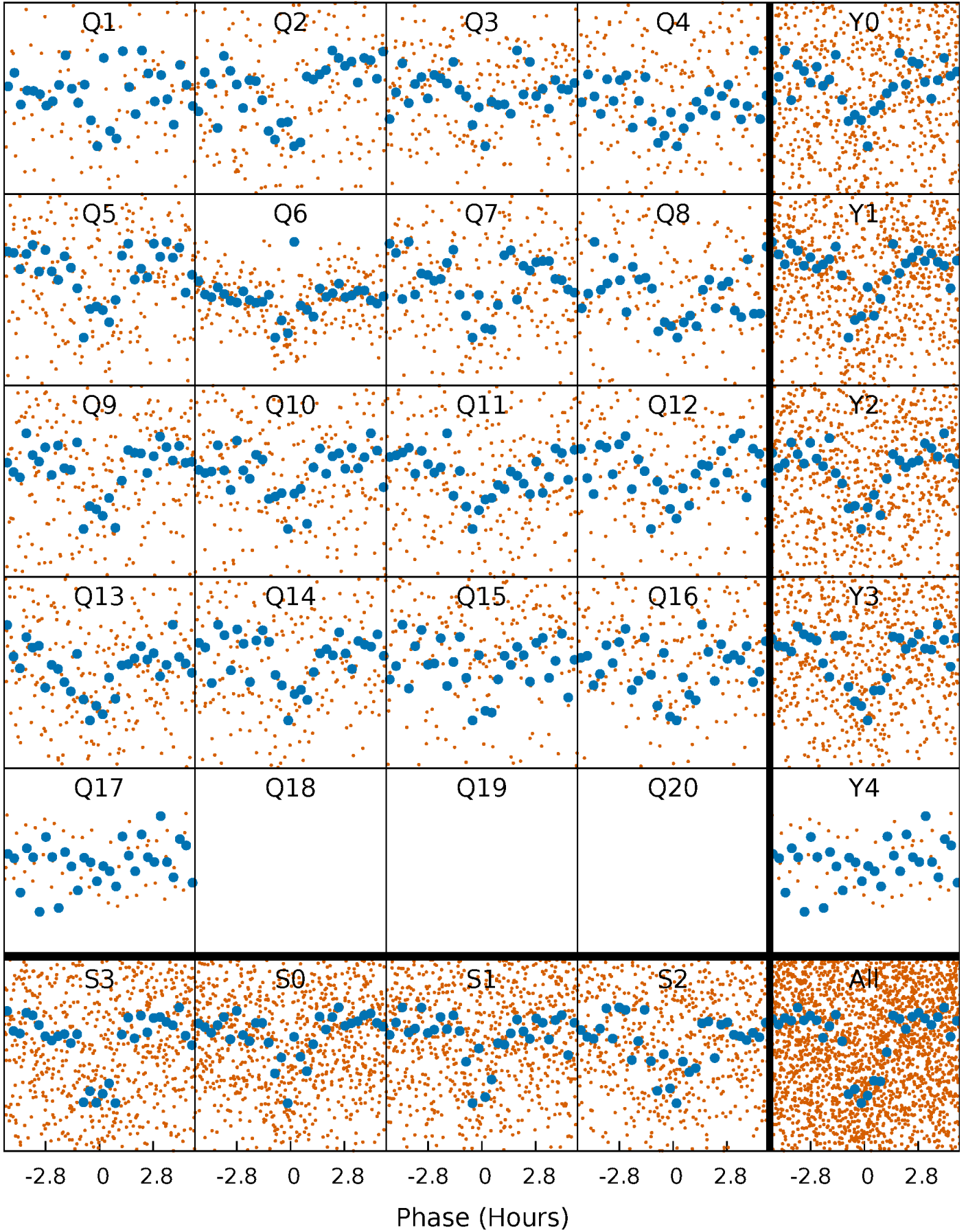


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



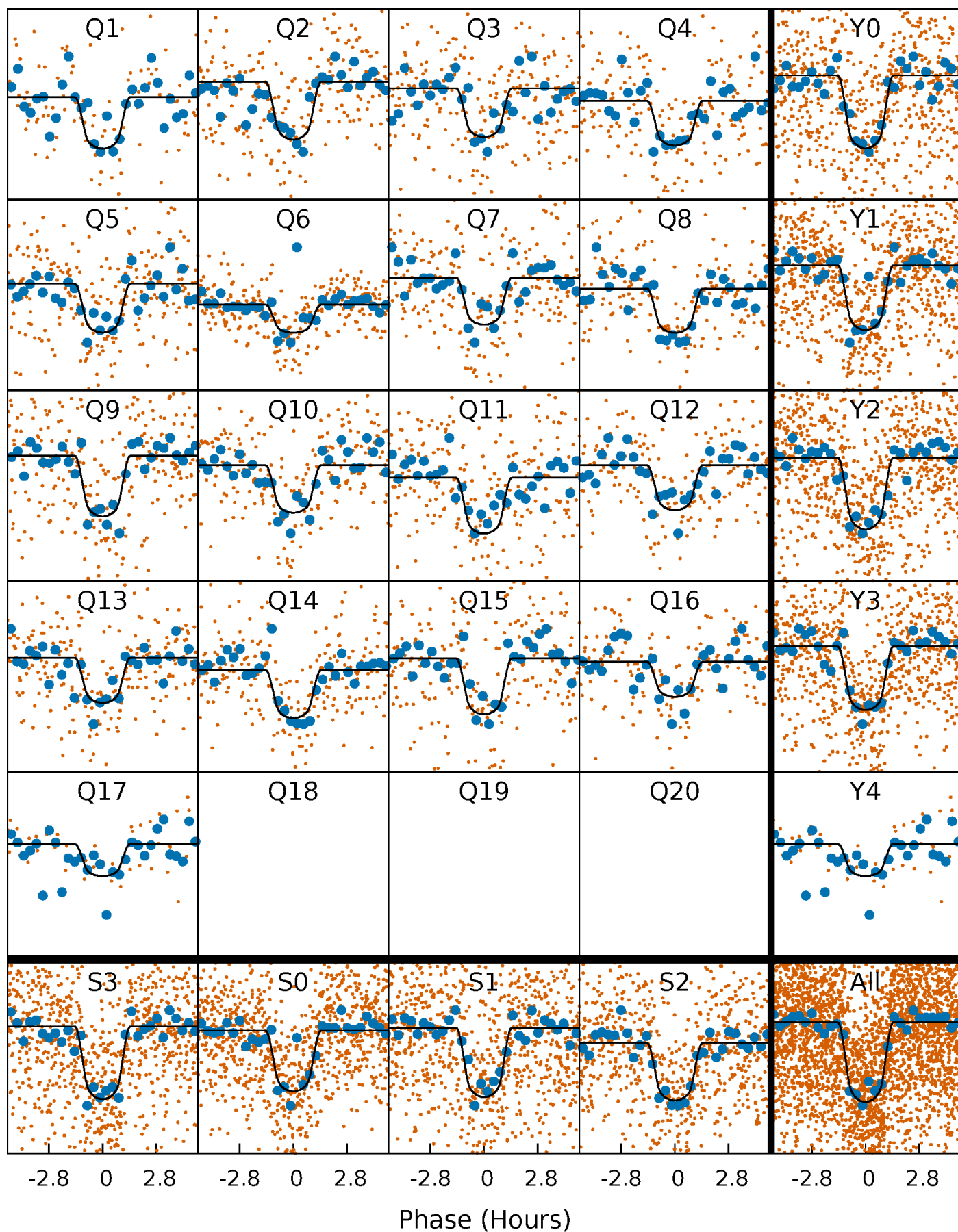
PDC Quarter-Phased Transit Curves

TCE 008230616-02 P= 6.827735 Days $T_0=131.793675$ (BKJD)



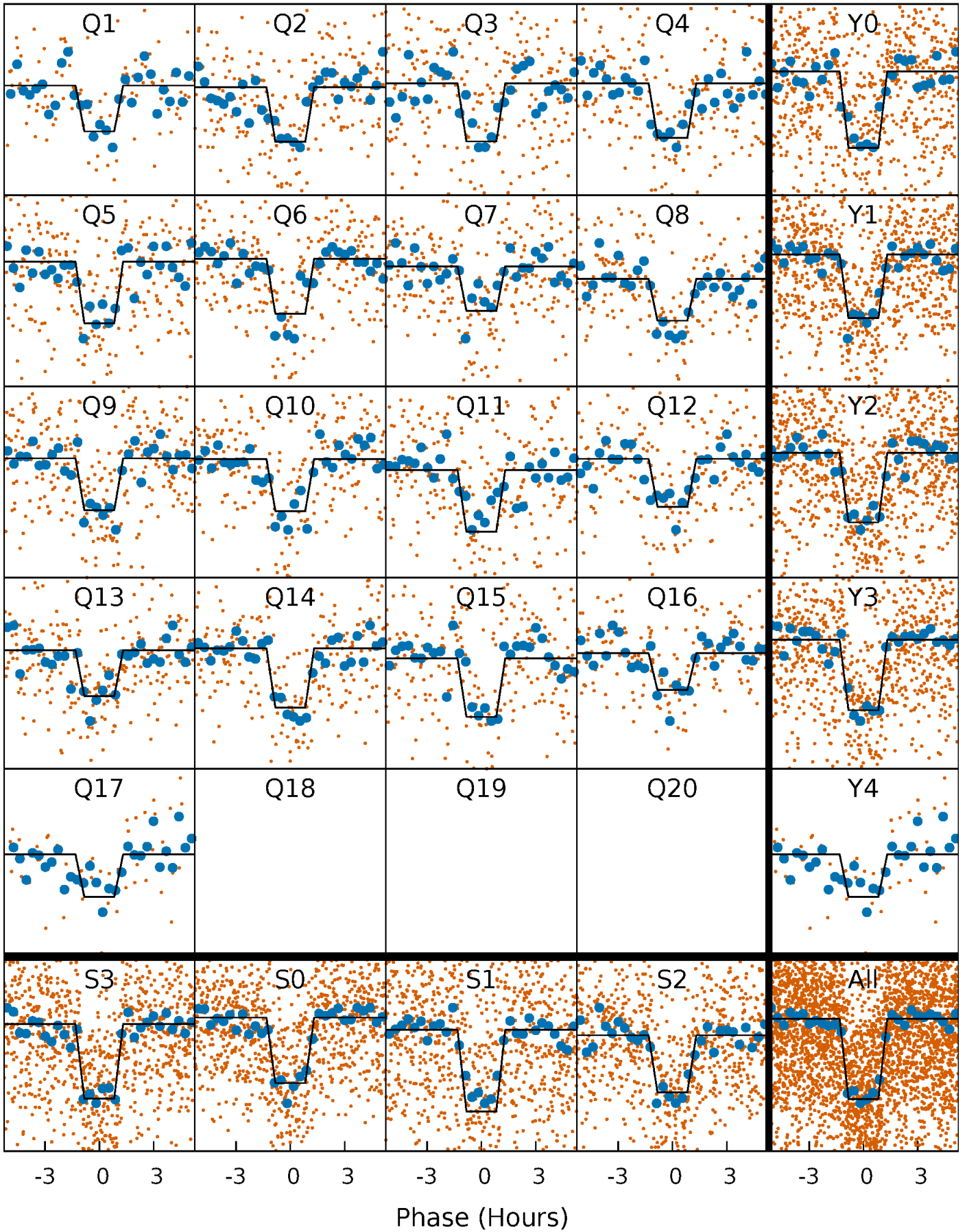
DV Quarter-Phased Transit Curves

TCE 008230616-02 P= 6.827735 Days $T_0=131.793675$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

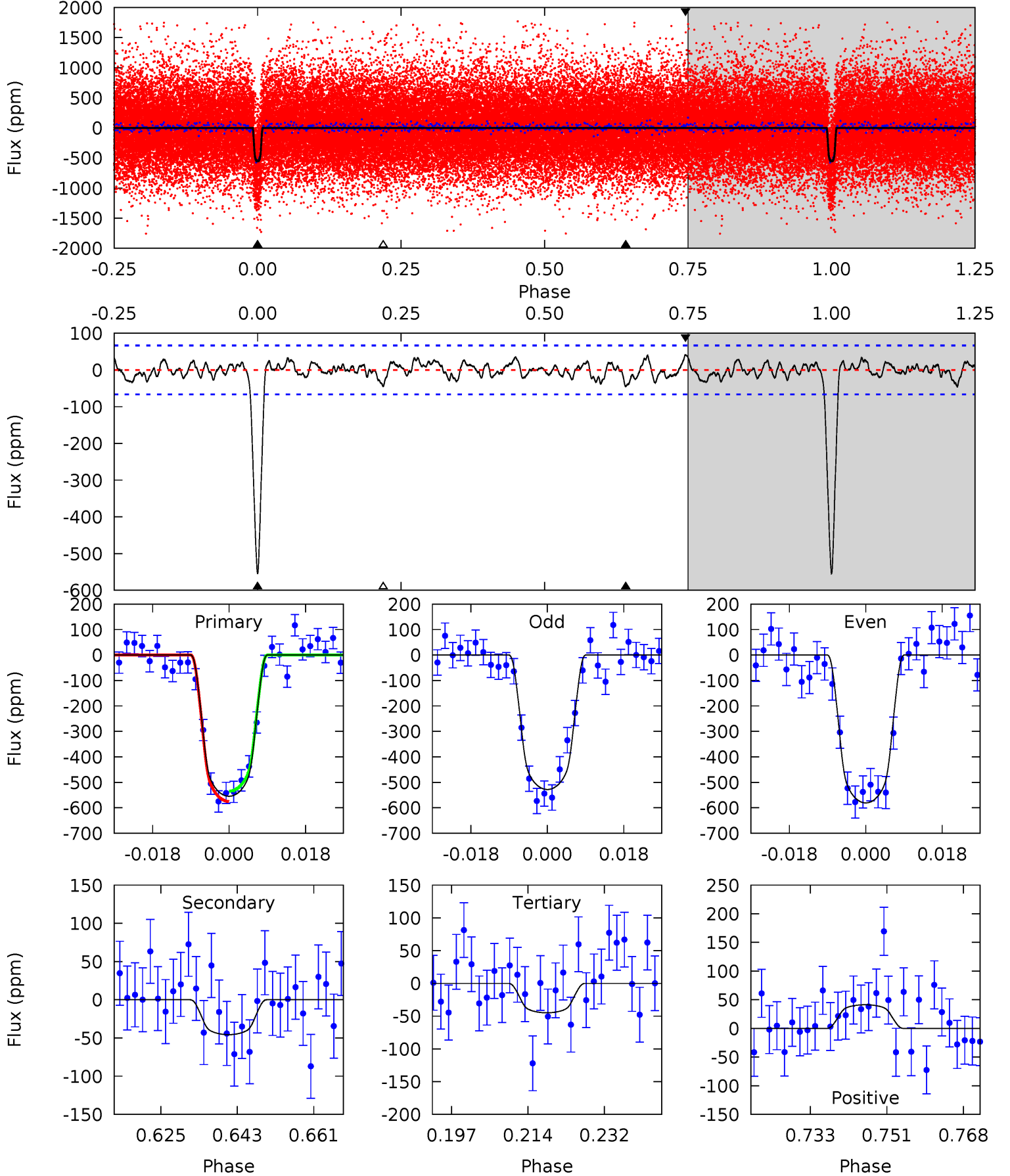
TCE 008230616-02 P= 6.827726 Days $T_0=131.794244$ (BKJD)



DV Model-Shift Uniqueness Test

008230616-02, P = 6.827735 Days, E = 124.965940 Days

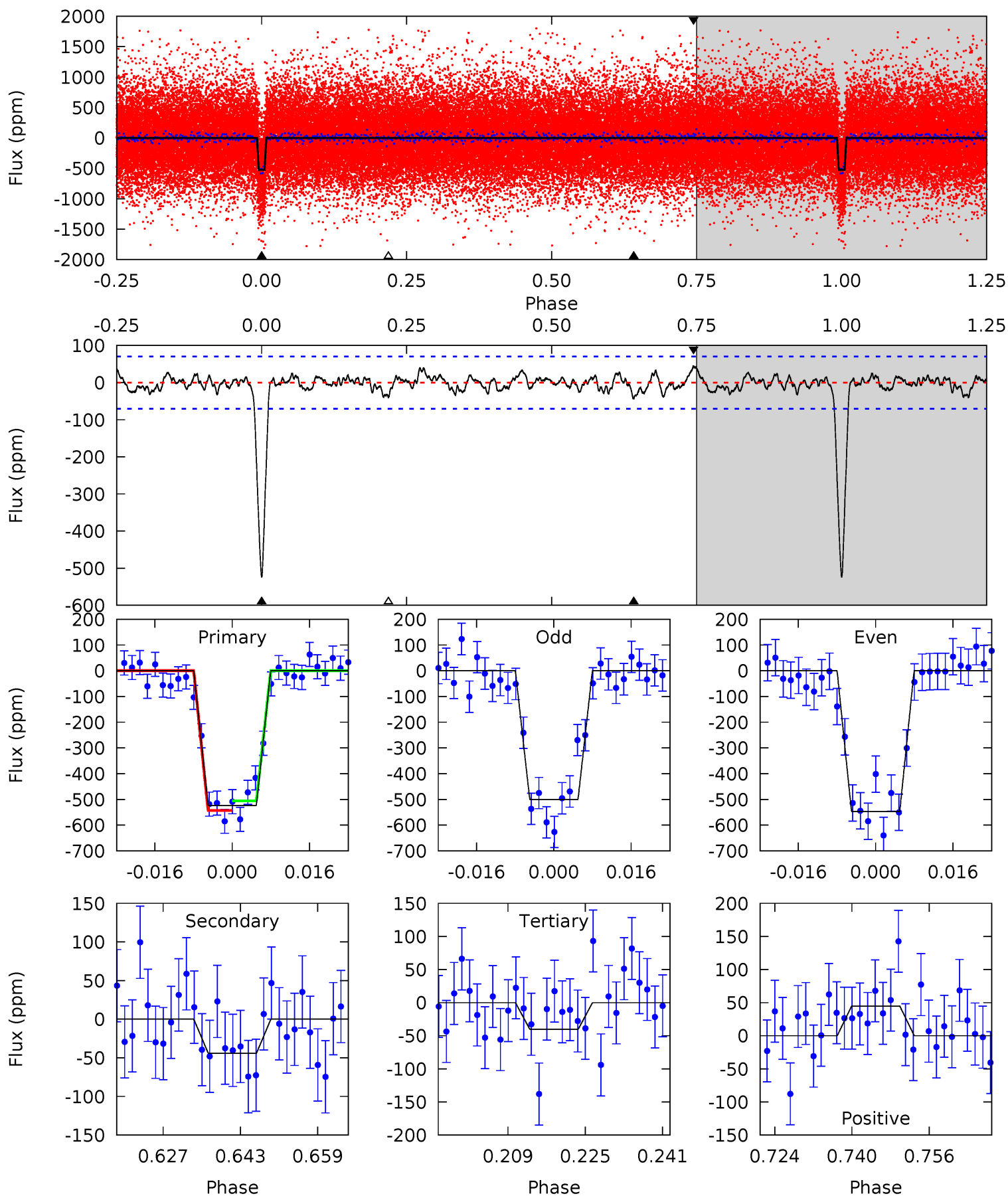
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.0	3.37	3.32	3.05	4.91	2.37	1.20	37.7	37.9	0.06	0.33	1.96	0.94	0.07	1.51



Alt Model-Shift Uniqueness Test

008230616-02, P = 6.827726 Days, E = 124.966518 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.8	3.09	2.83	3.13	4.93	2.41	1.08	33.9	33.6	0.26	-0.04	1.63	0.99	0.08	1.33



Stellar Parameters For KIC 008230616

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4198^{+83}_{-83}	$4.689^{+0.023}_{-0.028}$	$-0.320^{+0.150}_{-0.150}$	$0.574^{+0.032}_{-0.028}$	$0.587^{+0.028}_{-0.035}$	$4.376^{+0.478}_{-0.431}$
	+2%/-2%	+0%/-1%	+47%/-47%	+6%/-5%	+5%/-6%	+11%/-10%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 008230616-02 / KOI 1713.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-46 ± 14	$1.62^{+0.24}_{-0.24}$	807^{+20}_{-17}	2761^{+159}_{-158}	33^{+16}_{-12}
Alt.	-44 ± 14	$1.45^{+0.24}_{-0.27}$	807^{+18}_{-18}	2829^{+210}_{-179}	40^{+26}_{-15}

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 $A_{obs} \gg 1.0$

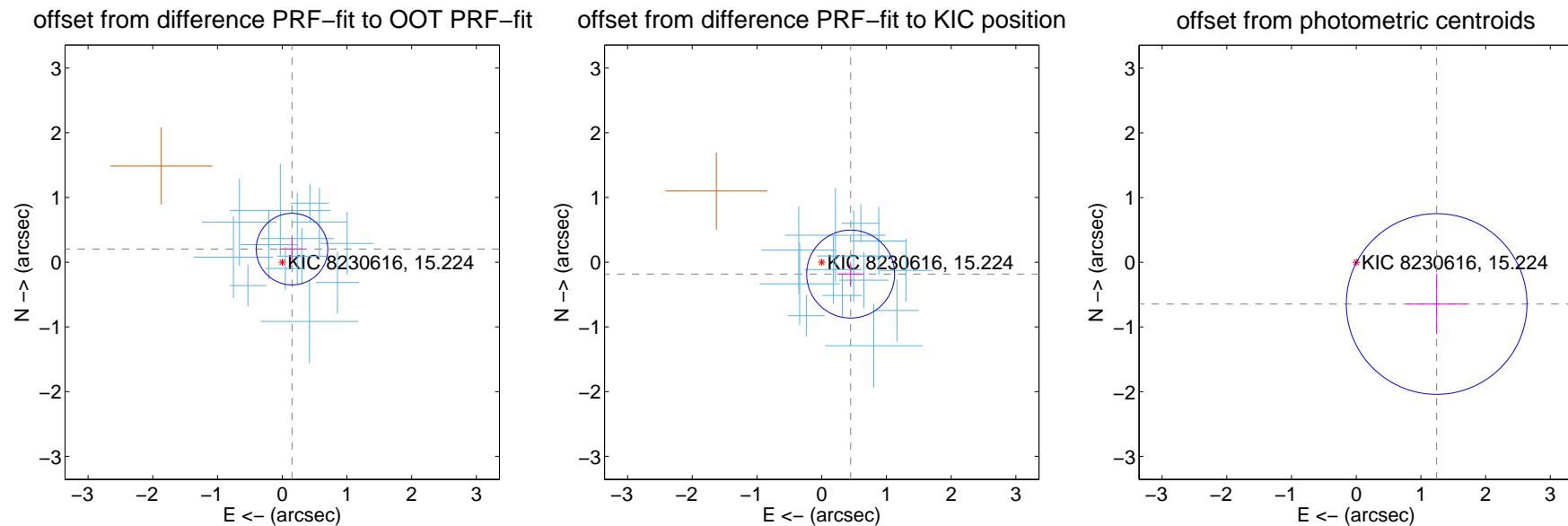
DV Centroid Data

Supplemental centroid analysis for 008230616-02. Kepler magnitude: 15.22. Transit SNR 29.03

There are 13 quarters with good PRF difference image offsets

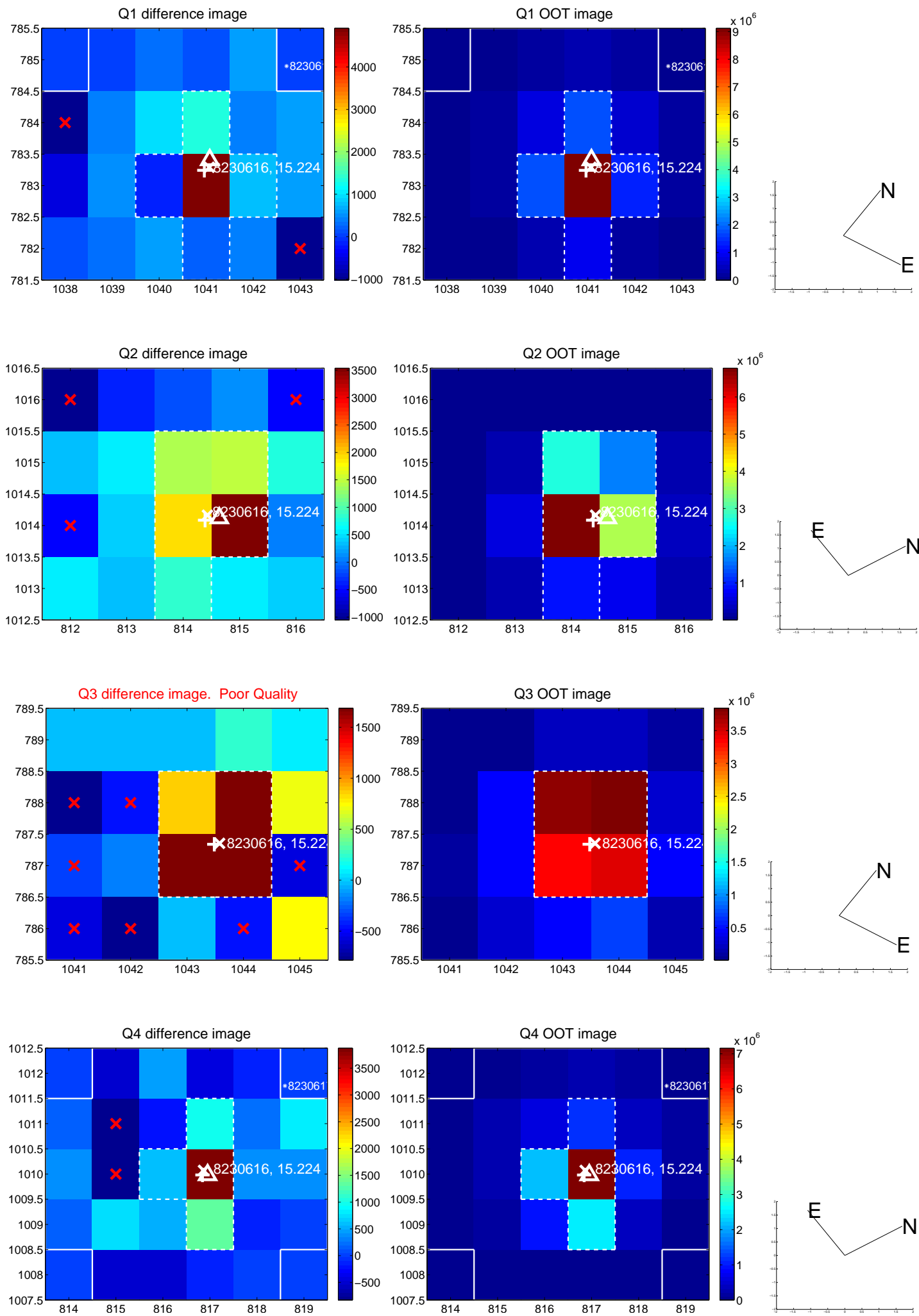
The direct PRF centroid is offset from the target star catalog position by about 0.58 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.253 ± 0.184	1.37	-0.151 ± 0.193	0.202 ± 0.179
PRF-fit source offset from KIC position	0.483 ± 0.226	2.13	-0.447 ± 0.207	-0.183 ± 0.181
photometric centroid source offset	1.40 ± 0.47	3.01	-1.24 ± 0.47	-0.64 ± 0.47

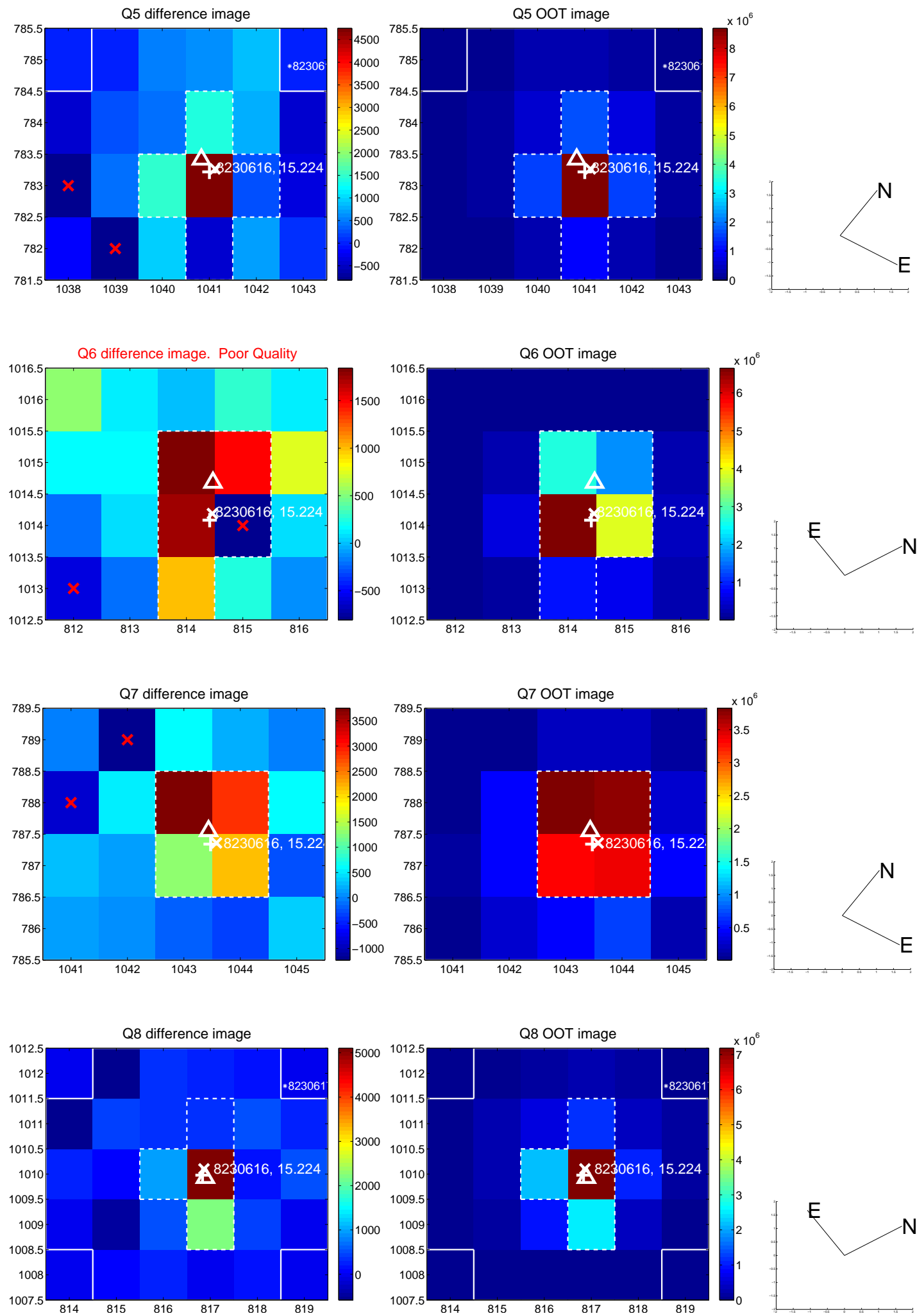


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

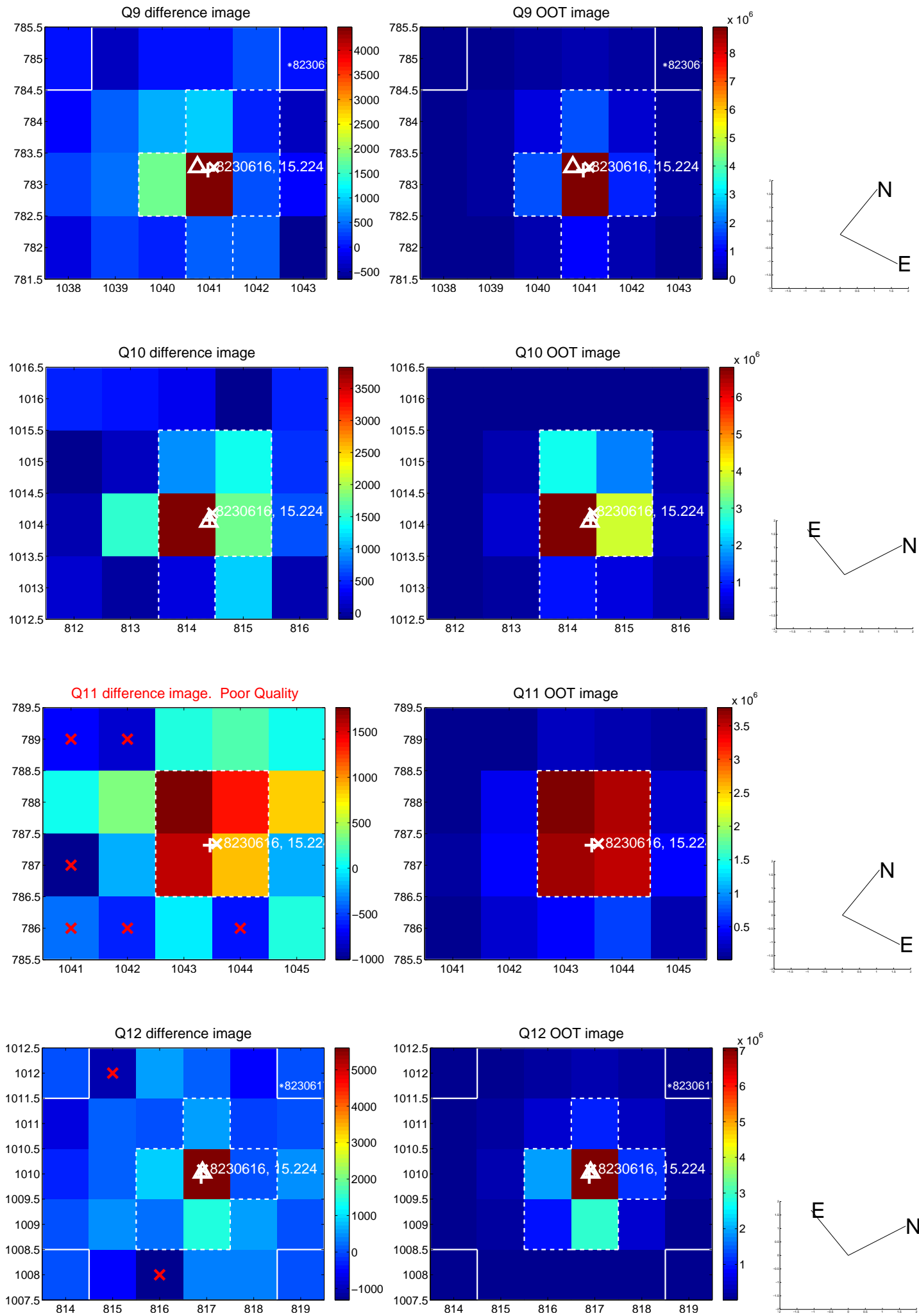
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



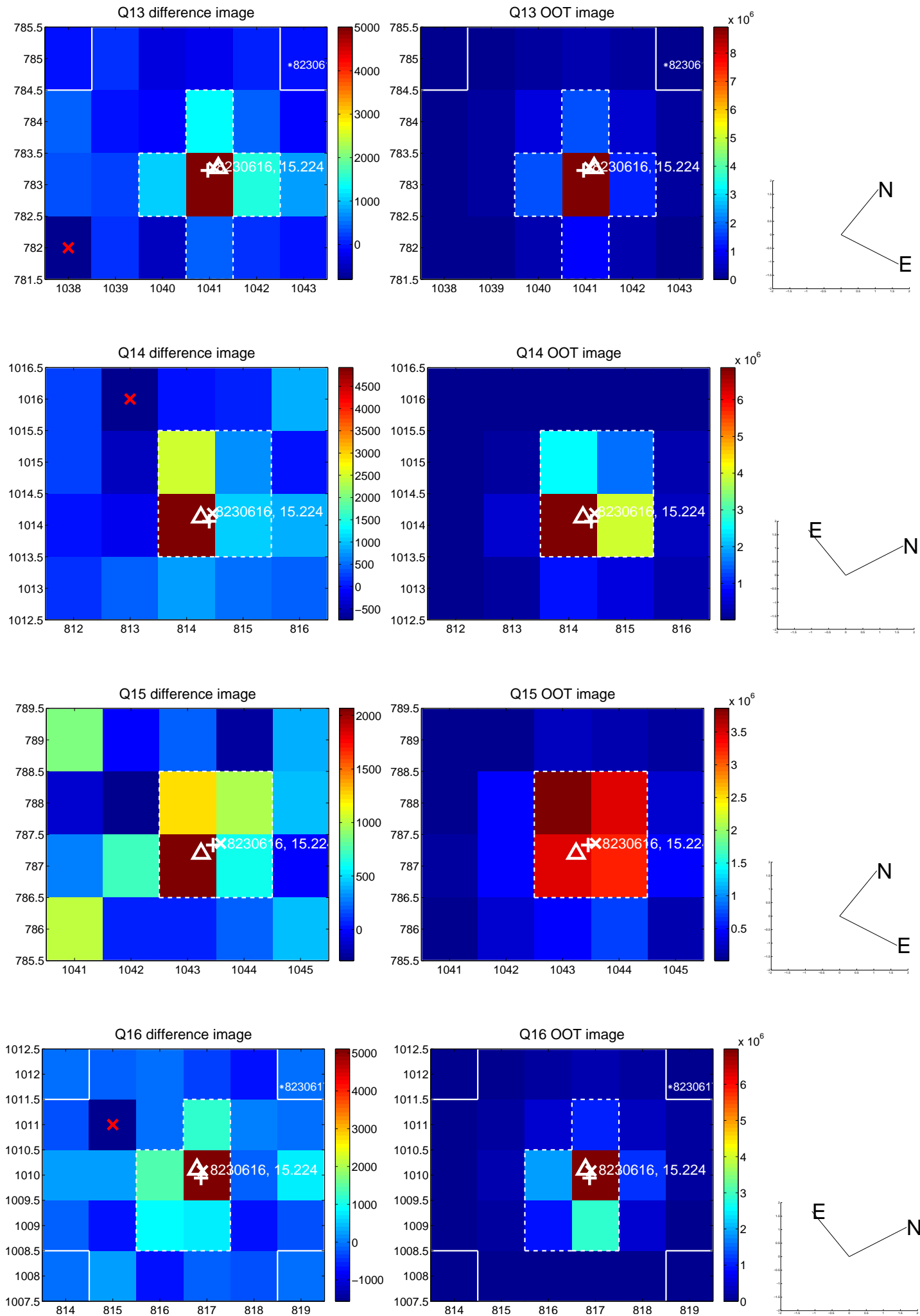
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



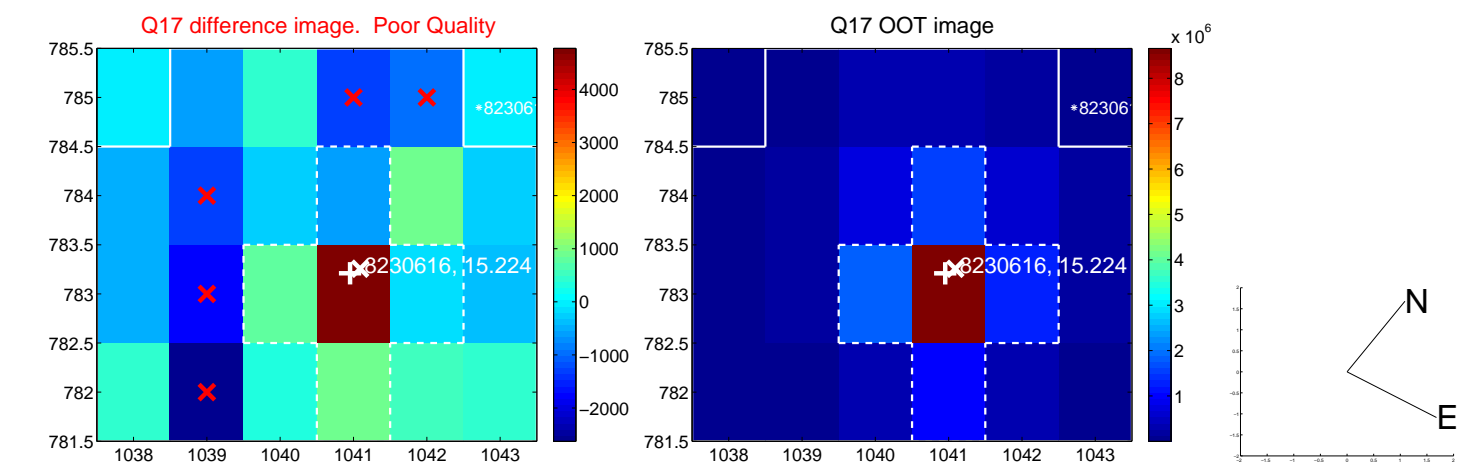
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



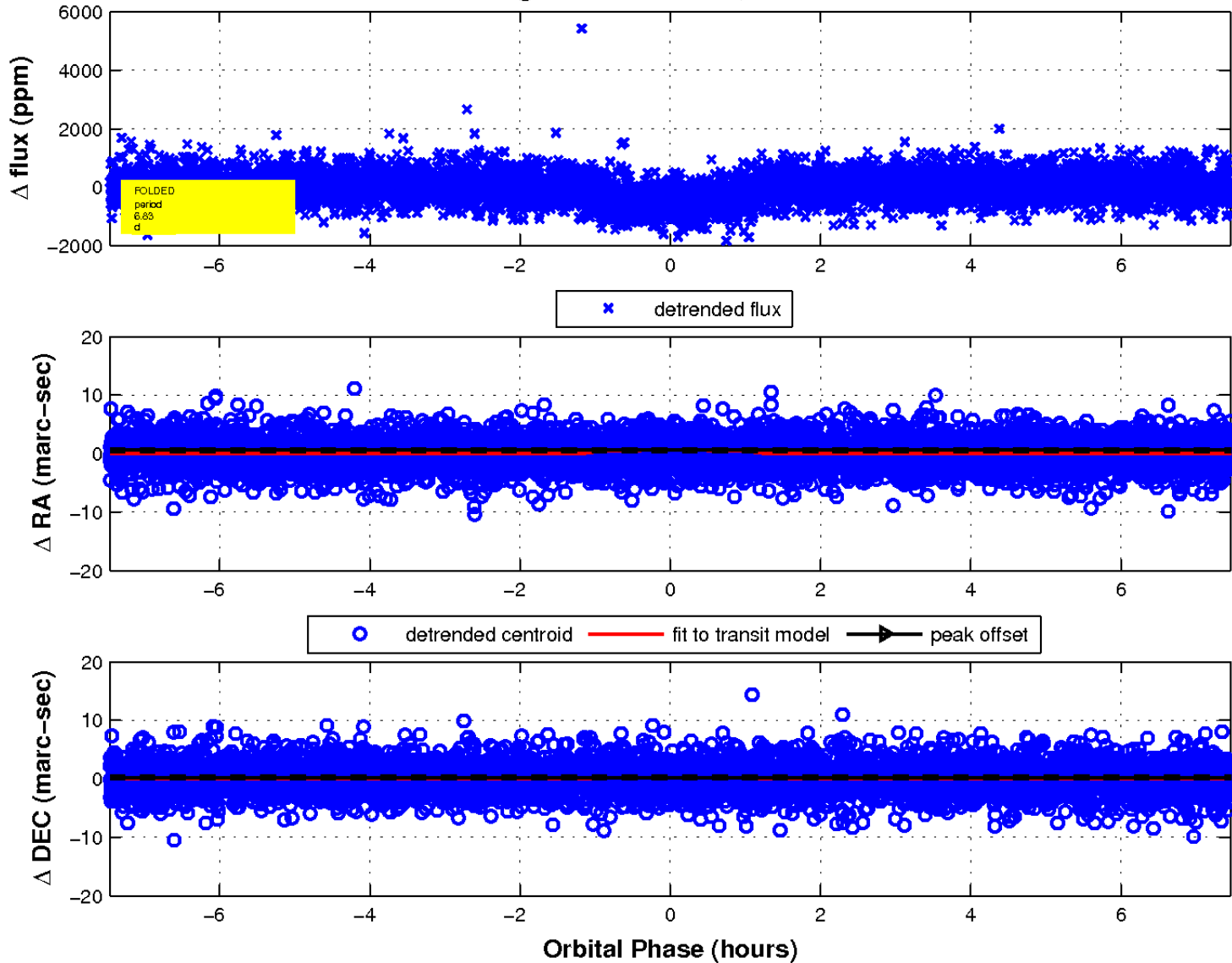
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

