

KIC 007877820

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})
007877820-01	OBS	6046.01	9.449436	136.026140	12183.5	5.988	1991.6	1188.0	1.43	6558	27.71	416.74
007877820-02	OBS	No	9.449436	132.451070	9677.1	6.164	1601.7	1019.5	1.43	6558	24.84	416.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007877820-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
007877820-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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 007877820-01

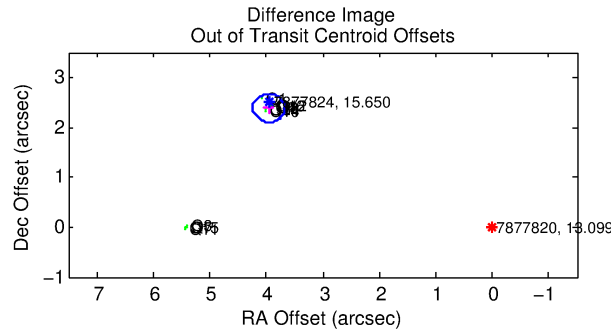
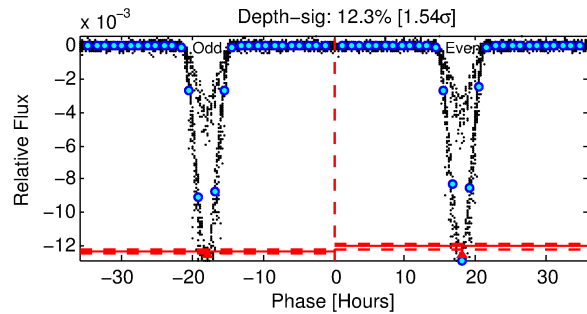
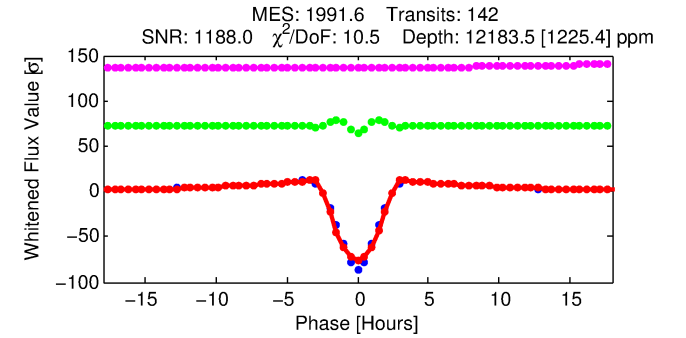
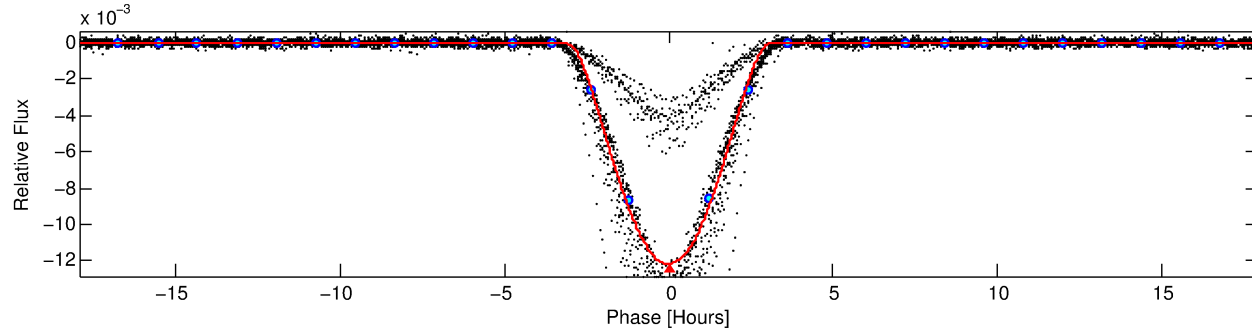
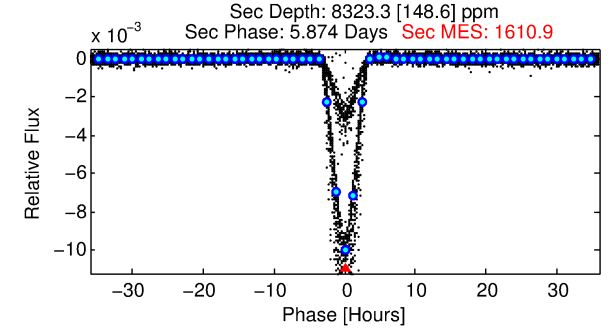
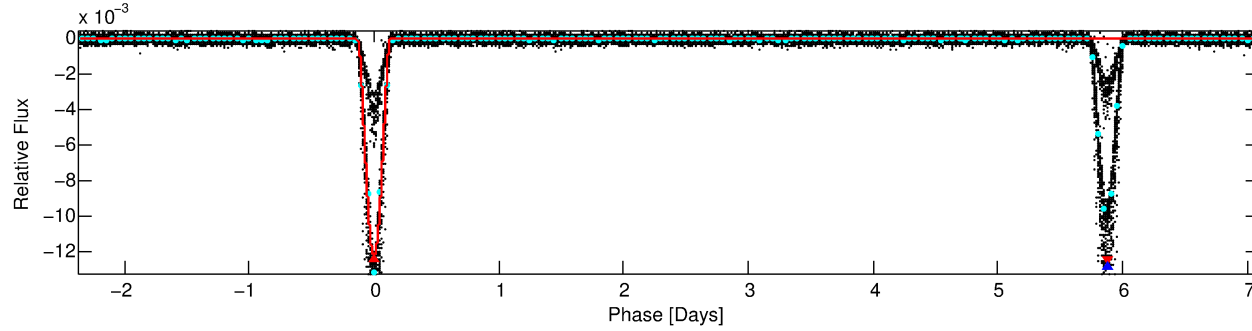
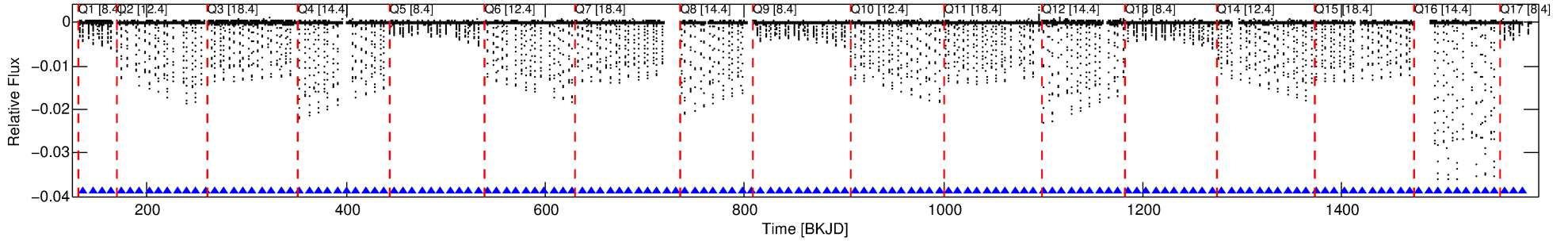
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
007877820-01	7877820	3530.01	7877824	1:1	4.7	-1	0	15.65	13.10	41.19	Direct-PRF	0	0.04	0.01

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 7877820 Candidate: 1 of 2 Period: 9.449 d
KOI: K06046.01 Corr: 0.984

Kp: 13.10 R*: 1.43 Rs Teff: 6558.0 K Logg: 4.17 Fe/H: -0.380



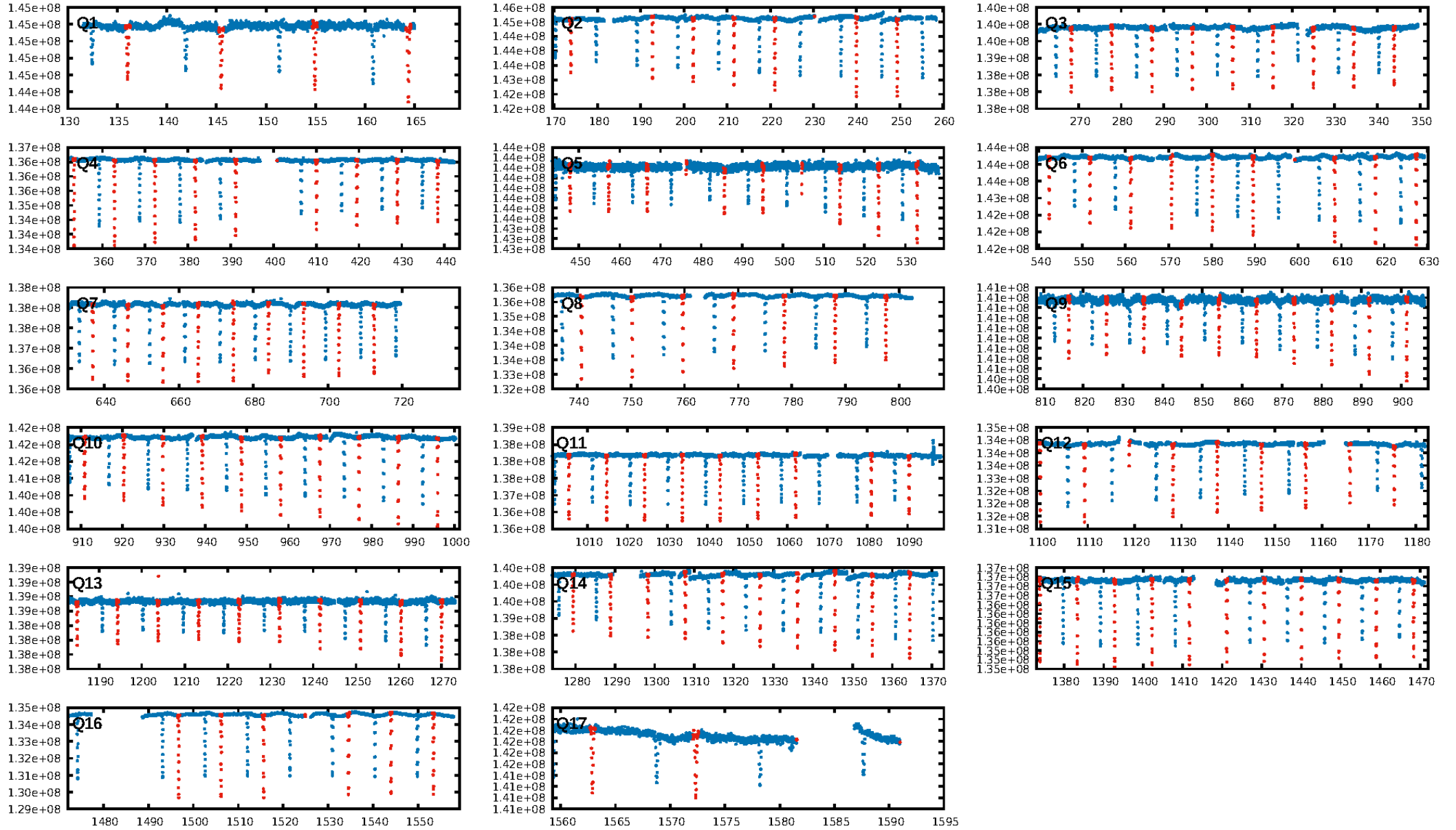
DV Fit Results:

Period = 9.44944 [0.00000] d
Epoch = 136.0261 [0.0003] BKJD
Rp/R* = 0.1775 [0.0152]
a/R* = 7.57 [0.09]
b = 1.00 [0.01]
Seff = 416.74 [160.83]
Teff = 1152 [111] K
Rp = 27.71 [7.81] Re
a = 0.0902 [0.0217] AU
Ag = 48.55 [19.70] [2.41σ]
Teffp = 4702 [246] K [13.16σ]

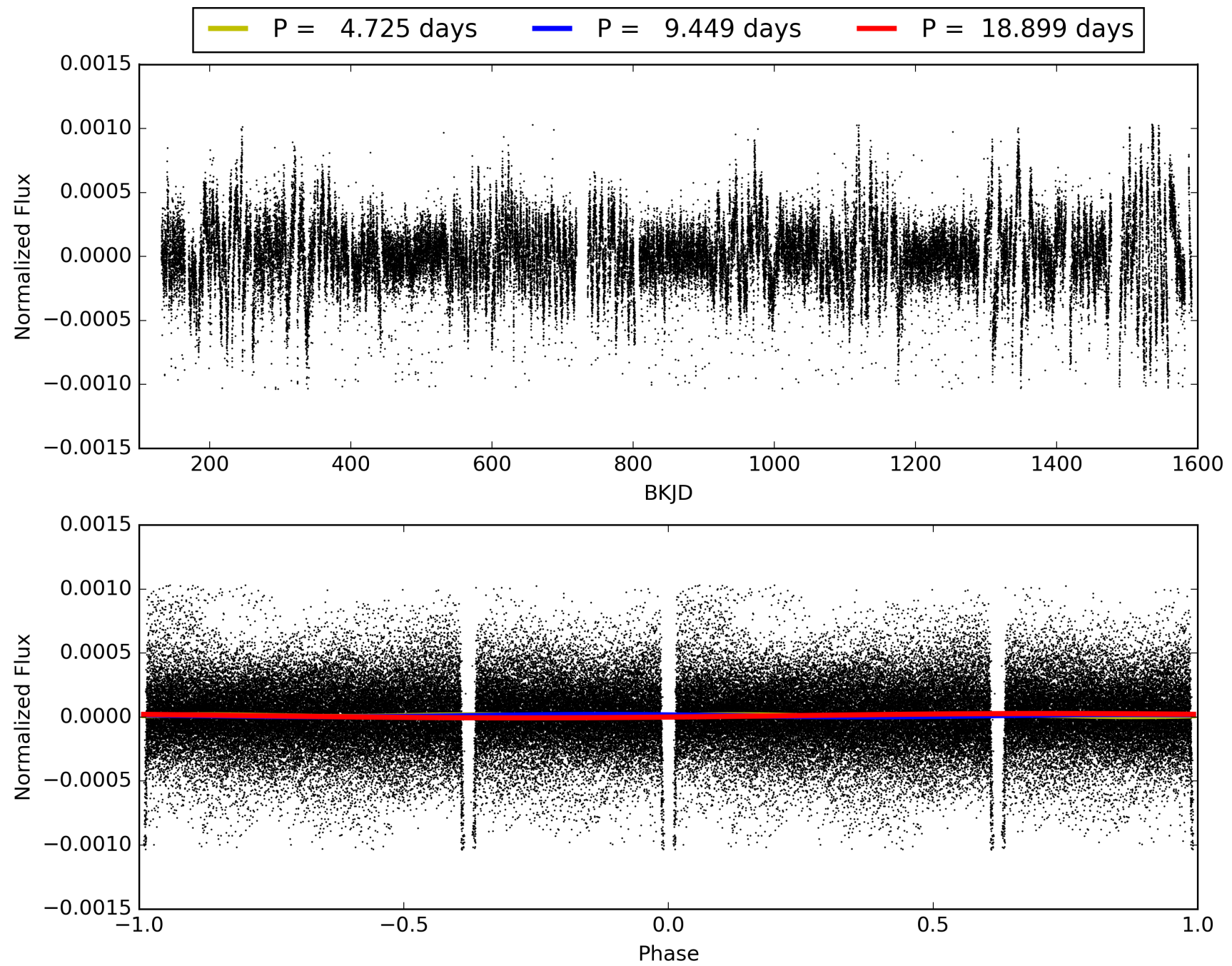
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [136/136]
GhostDiagnostic-chr: -0.07958
Centroid-sig: 0.0%
Centroid-so: 8.540 arcsec [1435.86σ]
OotOffset-rm: 4.620 arcsec [50.01σ]
KicOffset-rm: 4.763 arcsec [70.25σ]
OotOffset-st: 4/4/4/1 [13]
KicOffset-st: 4/4/4/1 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 007877820-01, PDC Light Curves

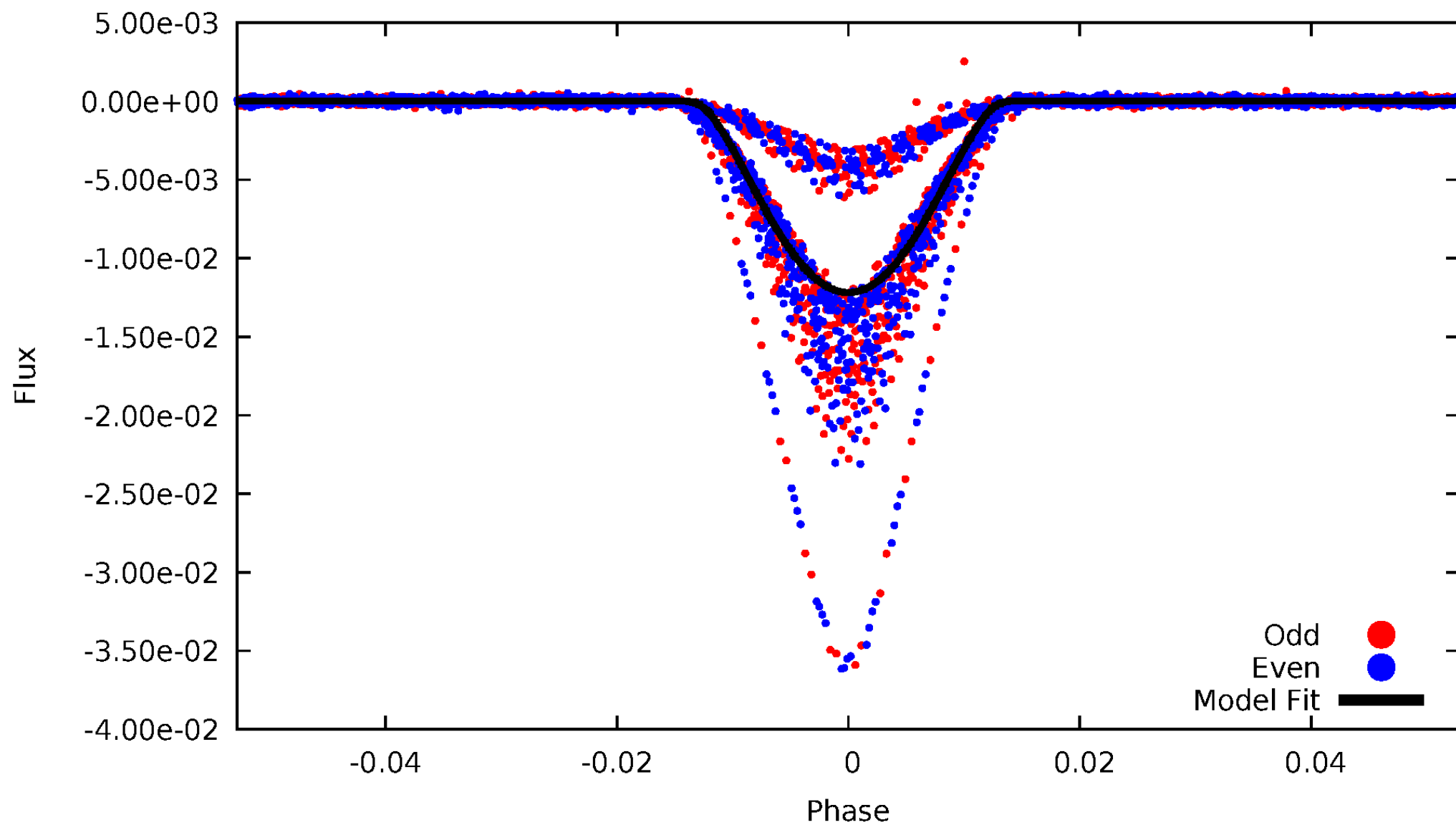


TCE 007877820-01



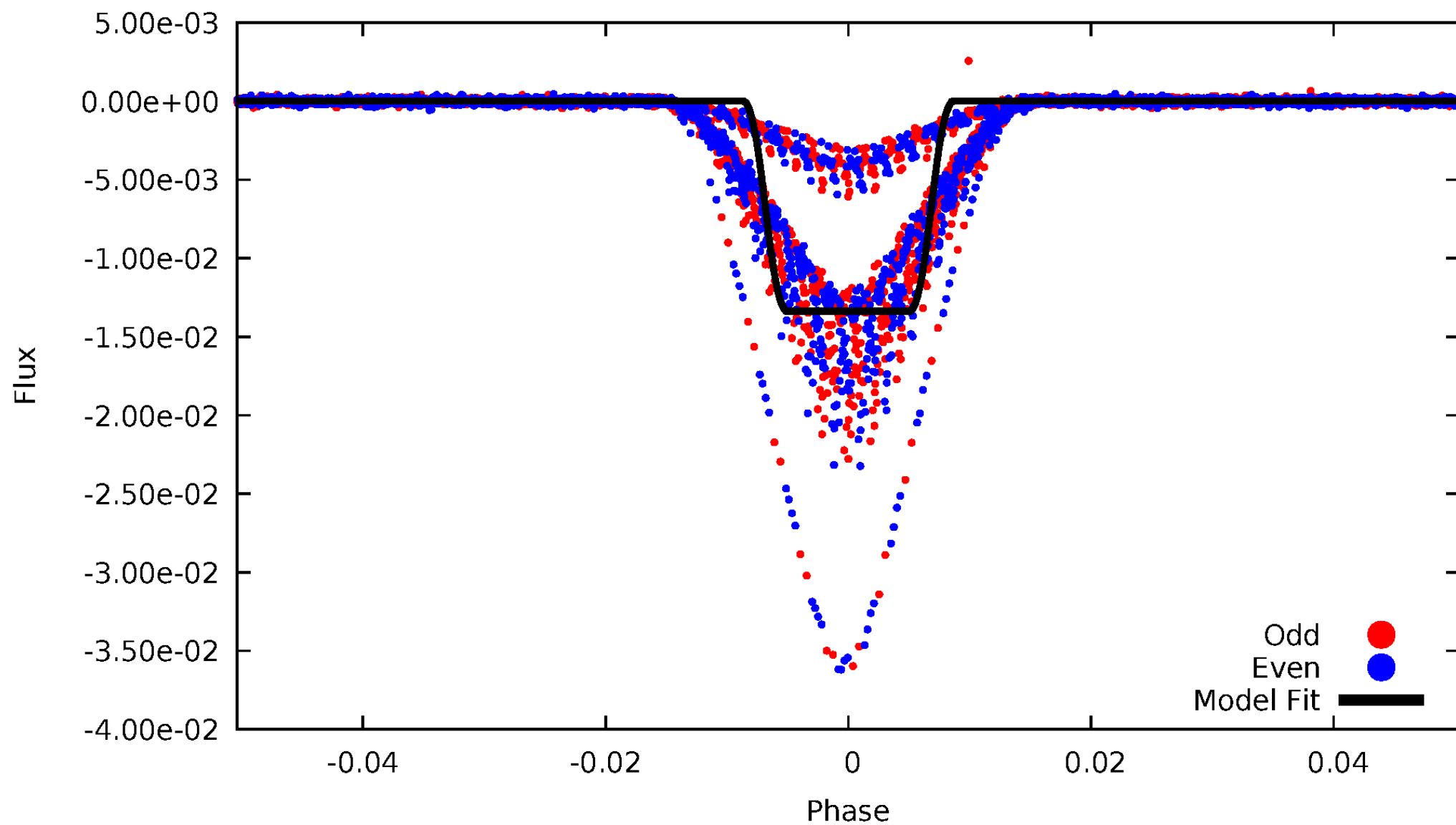
DV Odd/Even

TCE 007877820-01



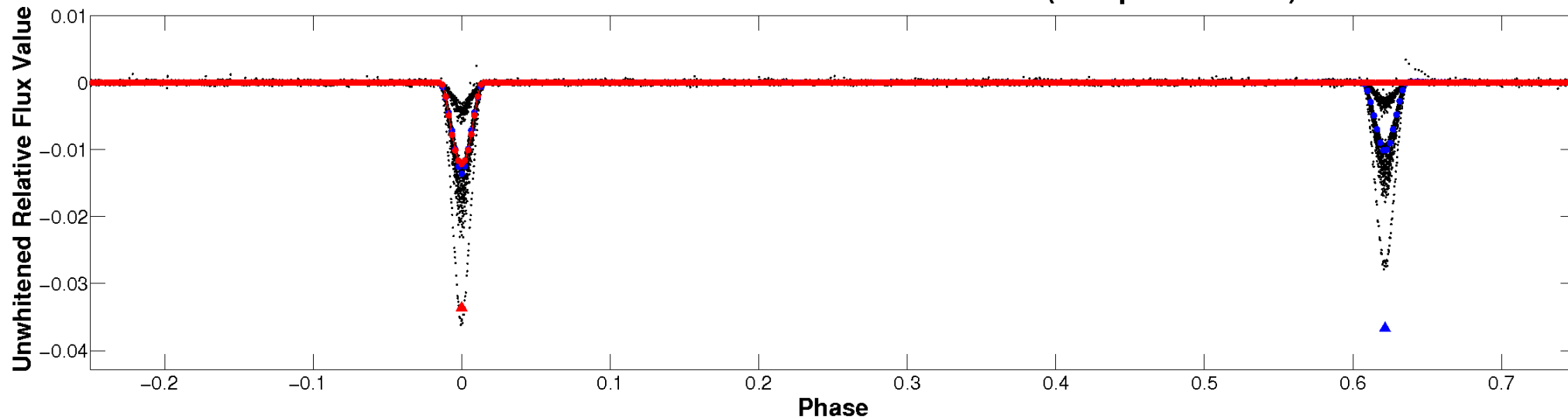
ALT Odd/Even

TCE 007877820-01

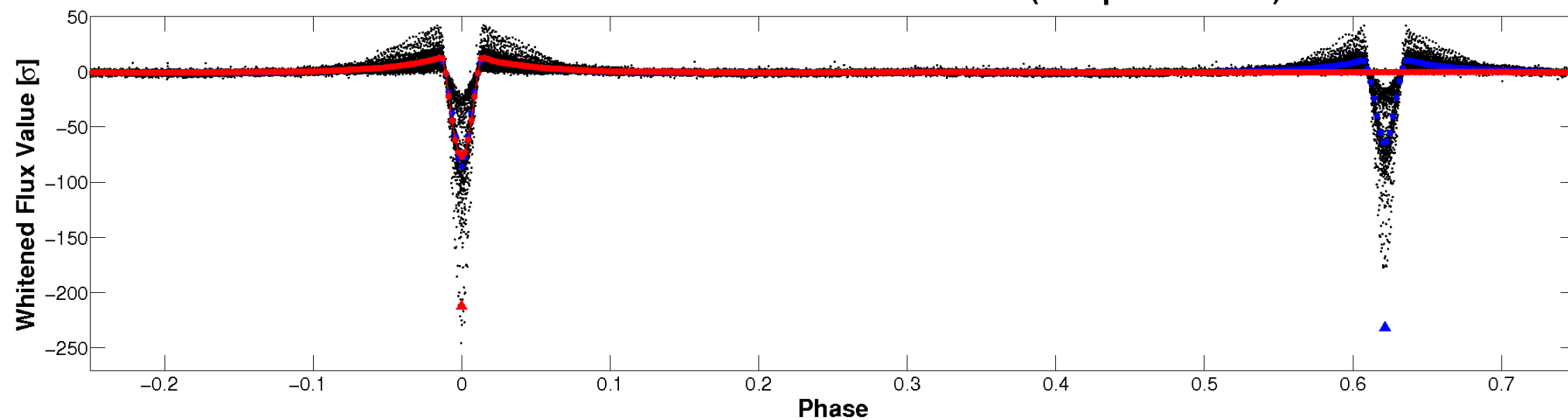


Non-Whitened Vs. Whitened Light Curve

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

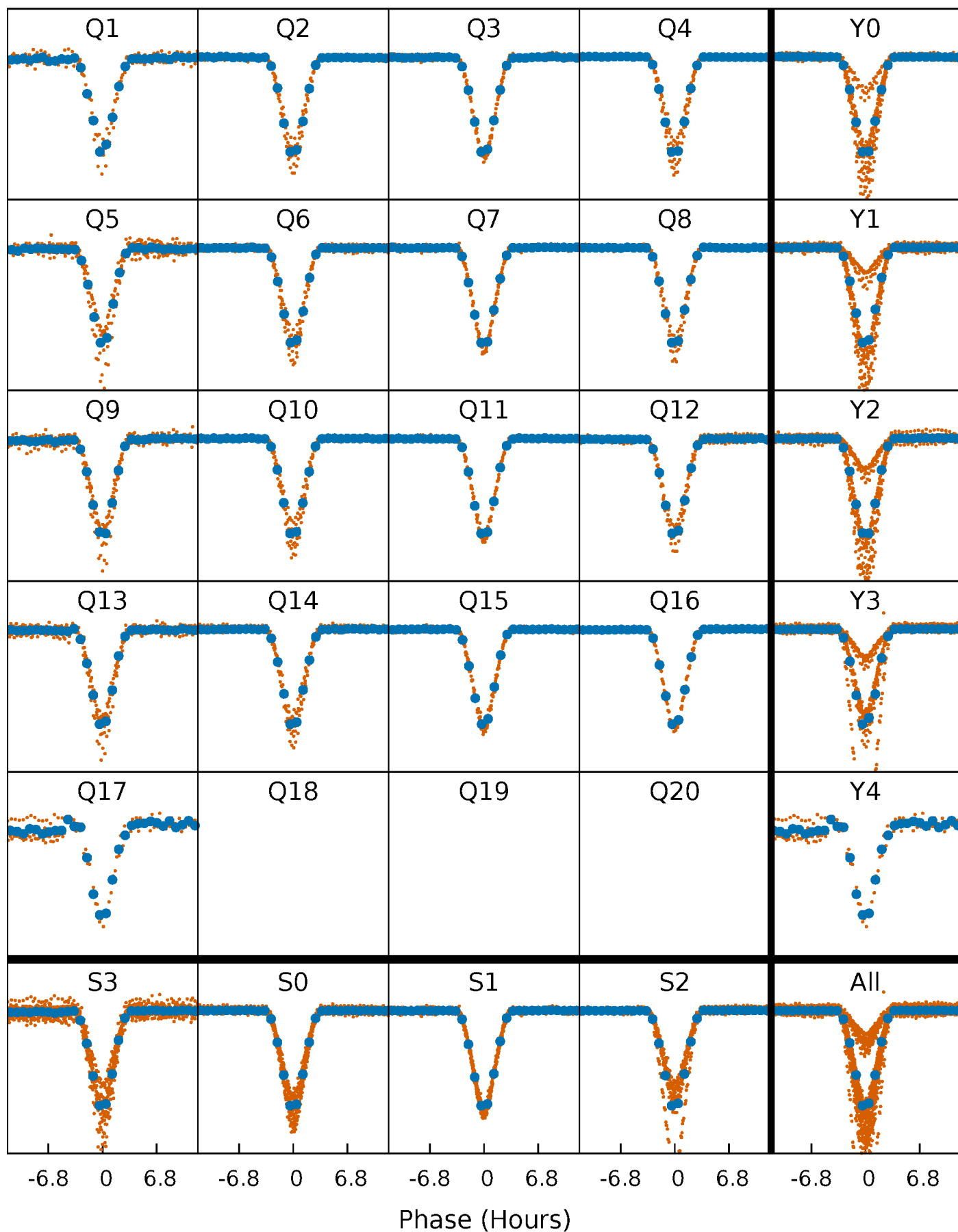


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



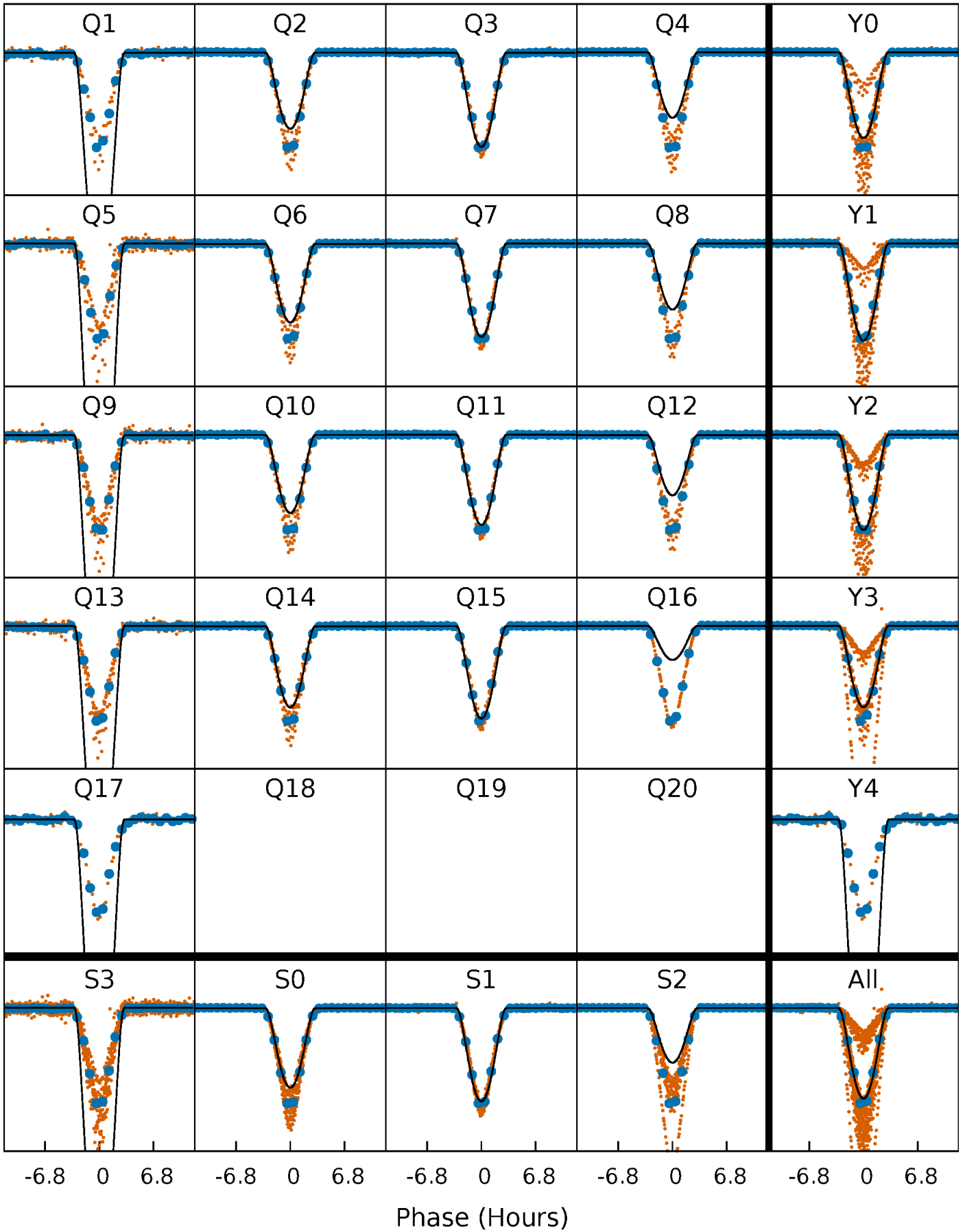
PDC Quarter-Phased Transit Curves

TCE 007877820-01 P= 9.449436 Days $T_0=136.026140$ (BKJD)



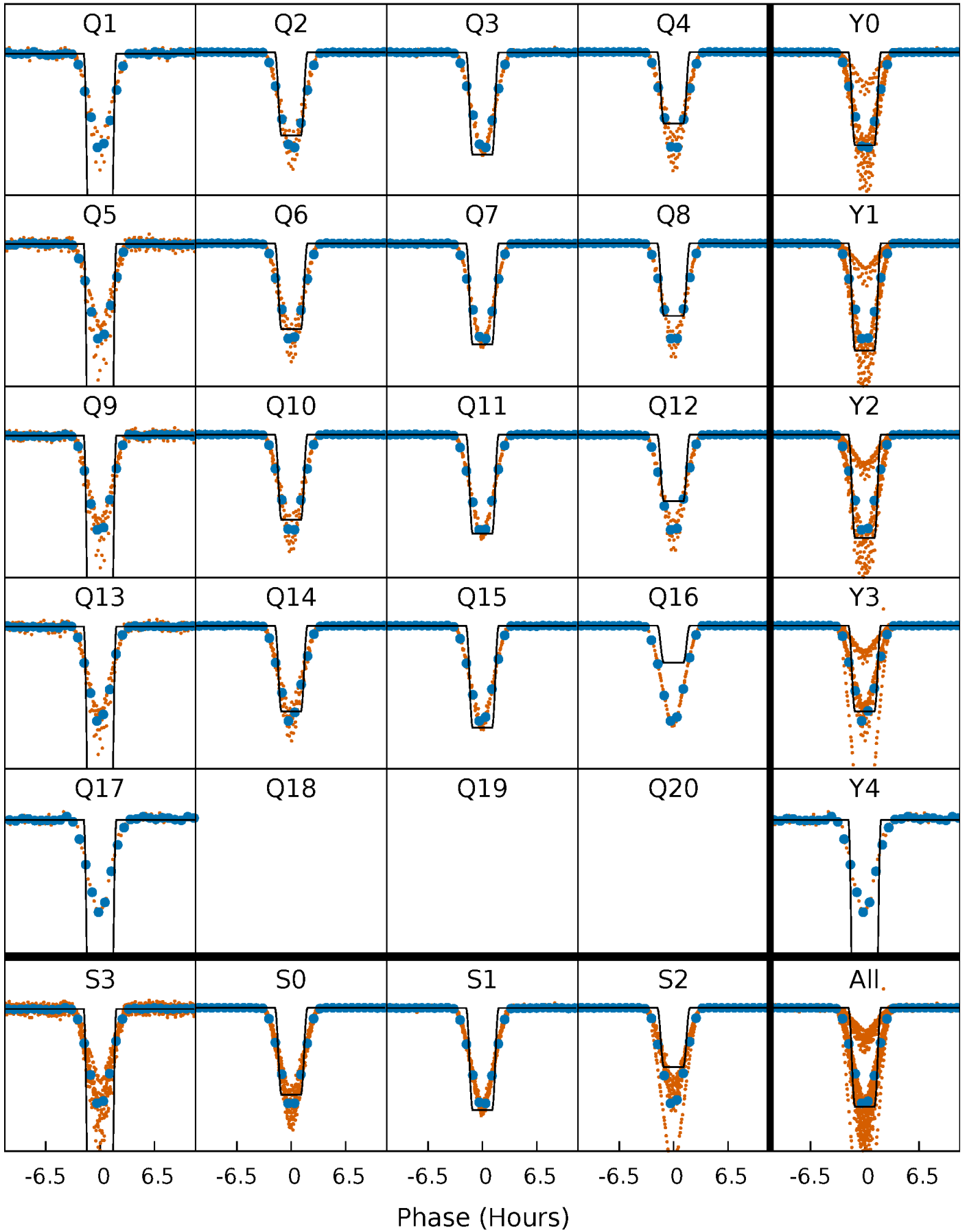
DV Quarter-Phased Transit Curves

TCE 007877820-01 P= 9.449436 Days $T_0=136.026140$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

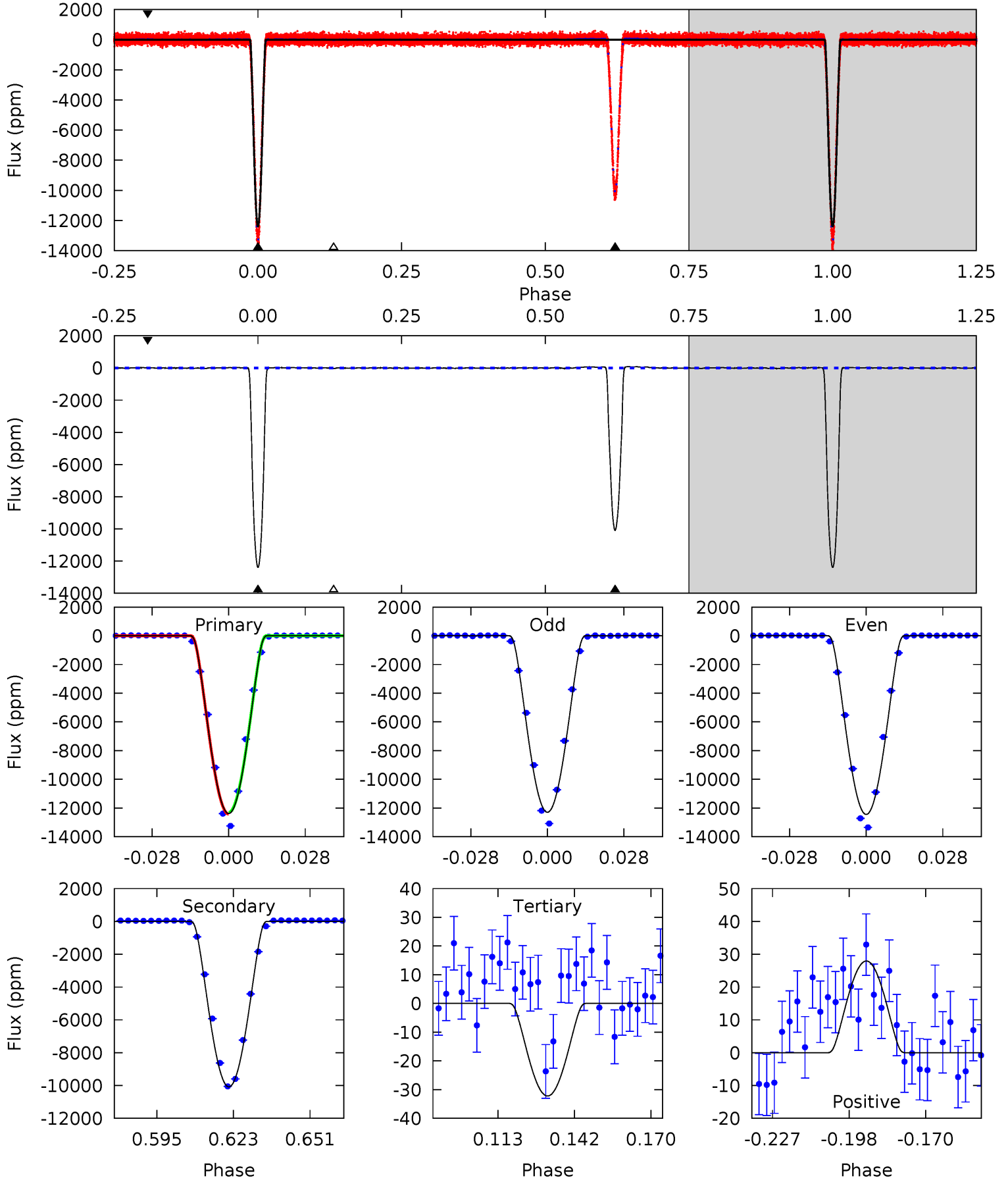
TCE 007877820-01 P= 9.449475 Days $T_0=136.022690$ (BKJD)



DV Model-Shift Uniqueness Test

007877820-01, P = 9.449436 Days, E = 126.576704 Days

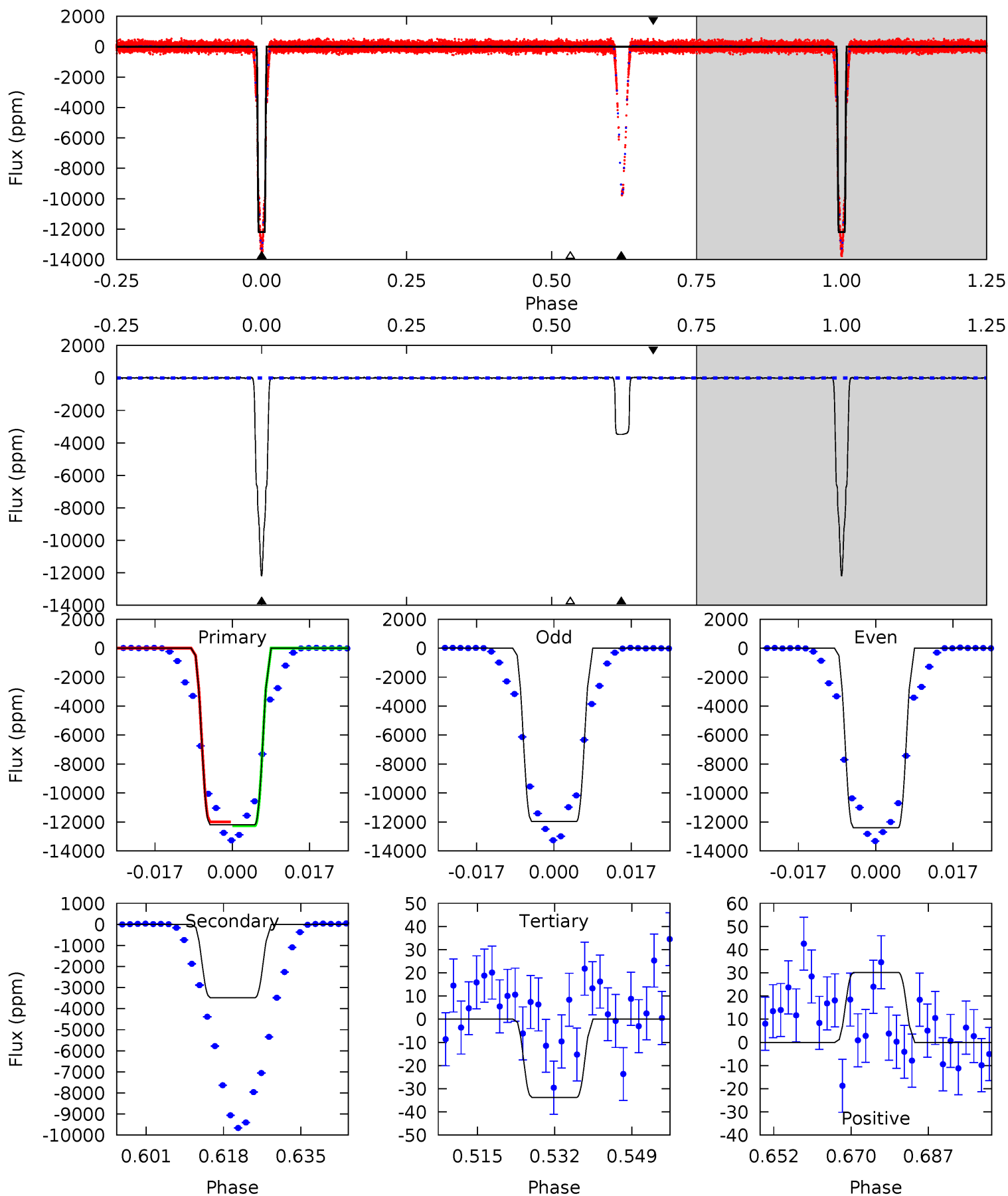
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2648	2155	6.89	5.97	4.82	2.19	4.17	2641	2642	2148	2149	16.1	0.99	0.01	0



Alt Model-Shift Uniqueness Test

007877820-01, P = 9.449475 Days, E = 126.573215 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1312	374.5	3.63	3.24	4.92	2.38	1.25	1308	1309	370.9	371.2	22.9	1.00	0.00	0



Stellar Parameters For KIC 007877820

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6558^{+162}_{-194}	$4.167^{+0.209}_{-0.171}$	$-0.380^{+0.250}_{-0.300}$	$1.431^{+0.384}_{-0.346}$	$1.096^{+0.177}_{-0.129}$	$0.527^{+0.594}_{-0.239}$
	+2%/-3%	+5%/-4%	+66%/-79%	+27%/-24%	+16%/-12%	+113%/-45%
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 007877820-01 / KOI 6046.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-10084 ± 5	$27.78^{+4.81}_{-4.38}$	1609^{+121}_{-118}	5016^{+222}_{-198}	59^{+23}_{-15}
Alt.	-3479 ± 9	$18.20^{+3.53}_{-3.32}$	1603^{+124}_{-111}	4776^{+328}_{-246}	48^{+22}_{-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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

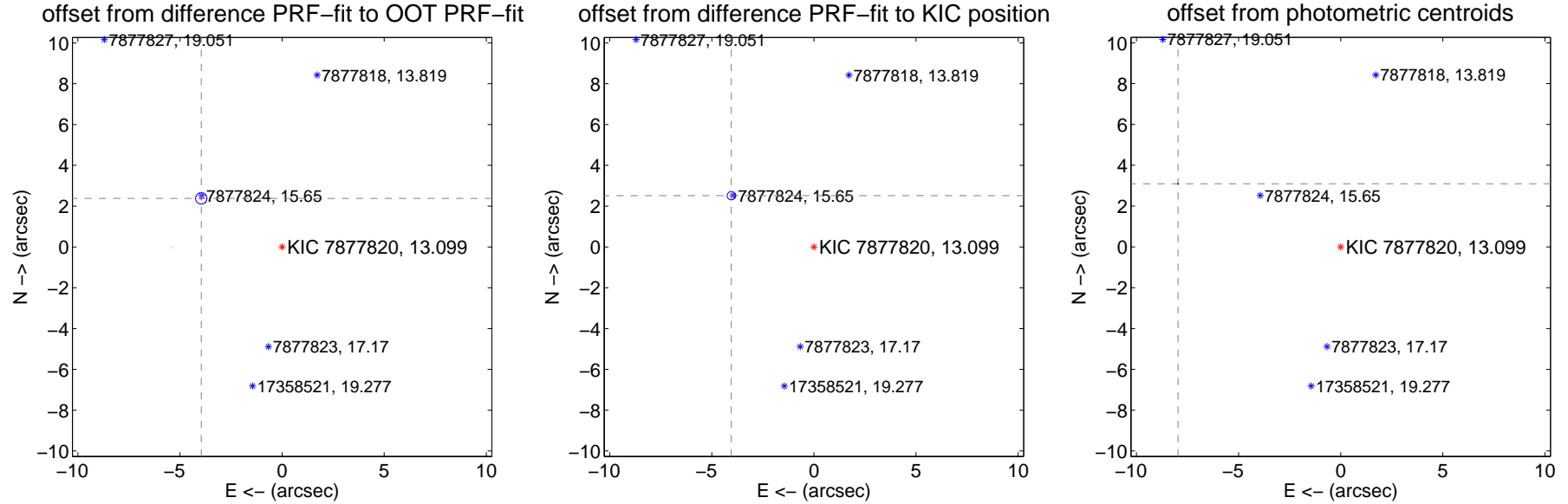
DV Centroid Data

Supplemental centroid analysis for 007877820-01. Kepler magnitude: 13.10. Transit SNR 1188.04

There are 13 quarters with good PRF difference image offsets

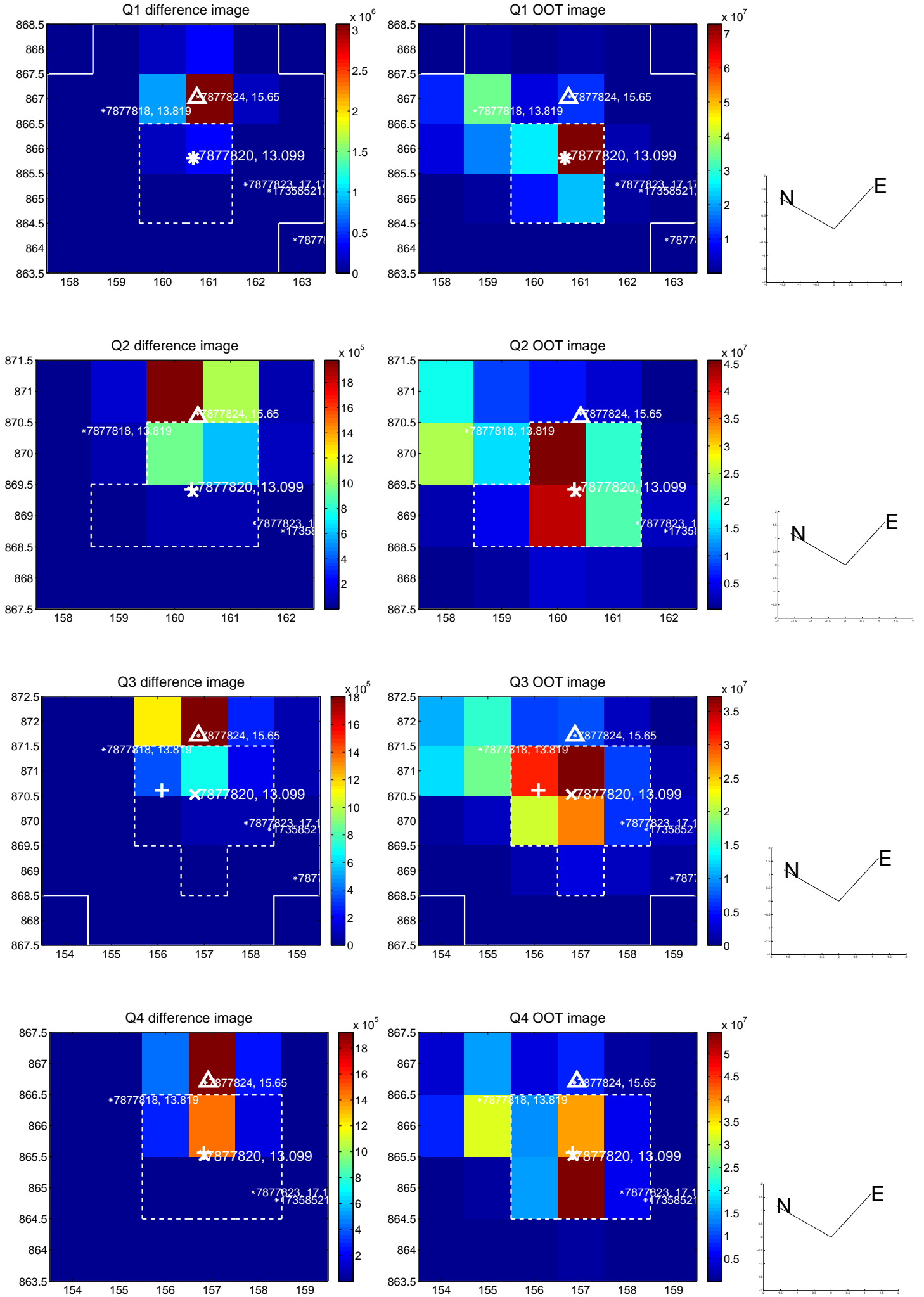
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.620 \pm 0.092	50.01	3.959 \pm 0.086	2.381 \pm 0.109
PRF-fit source offset from KIC position	4.763 \pm 0.068	70.25	4.046 \pm 0.067	2.513 \pm 0.068
photometric centroid source offset	8.54 \pm 0.01	1435.86	7.96 \pm 0.01	3.09 \pm 0.01

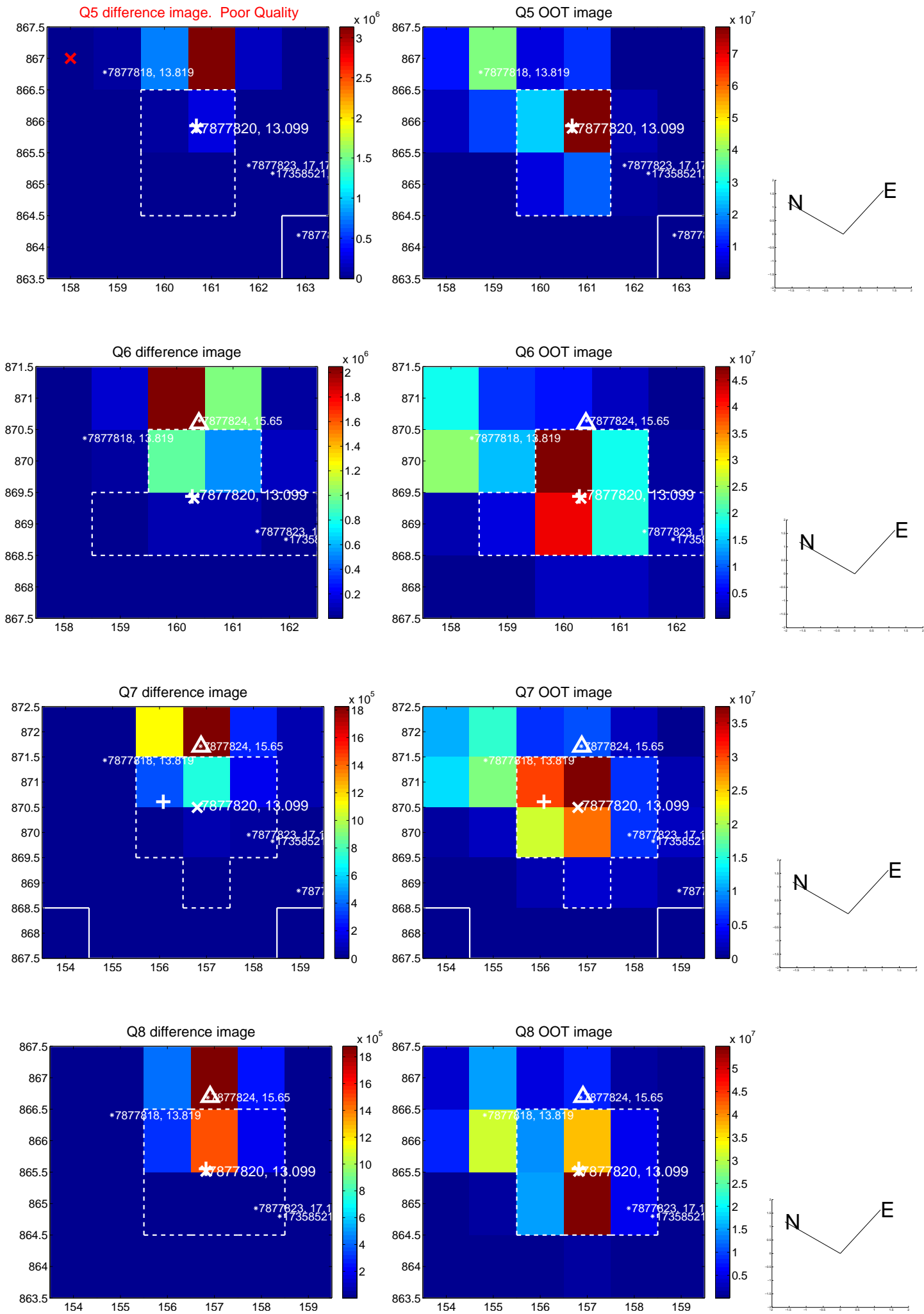


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

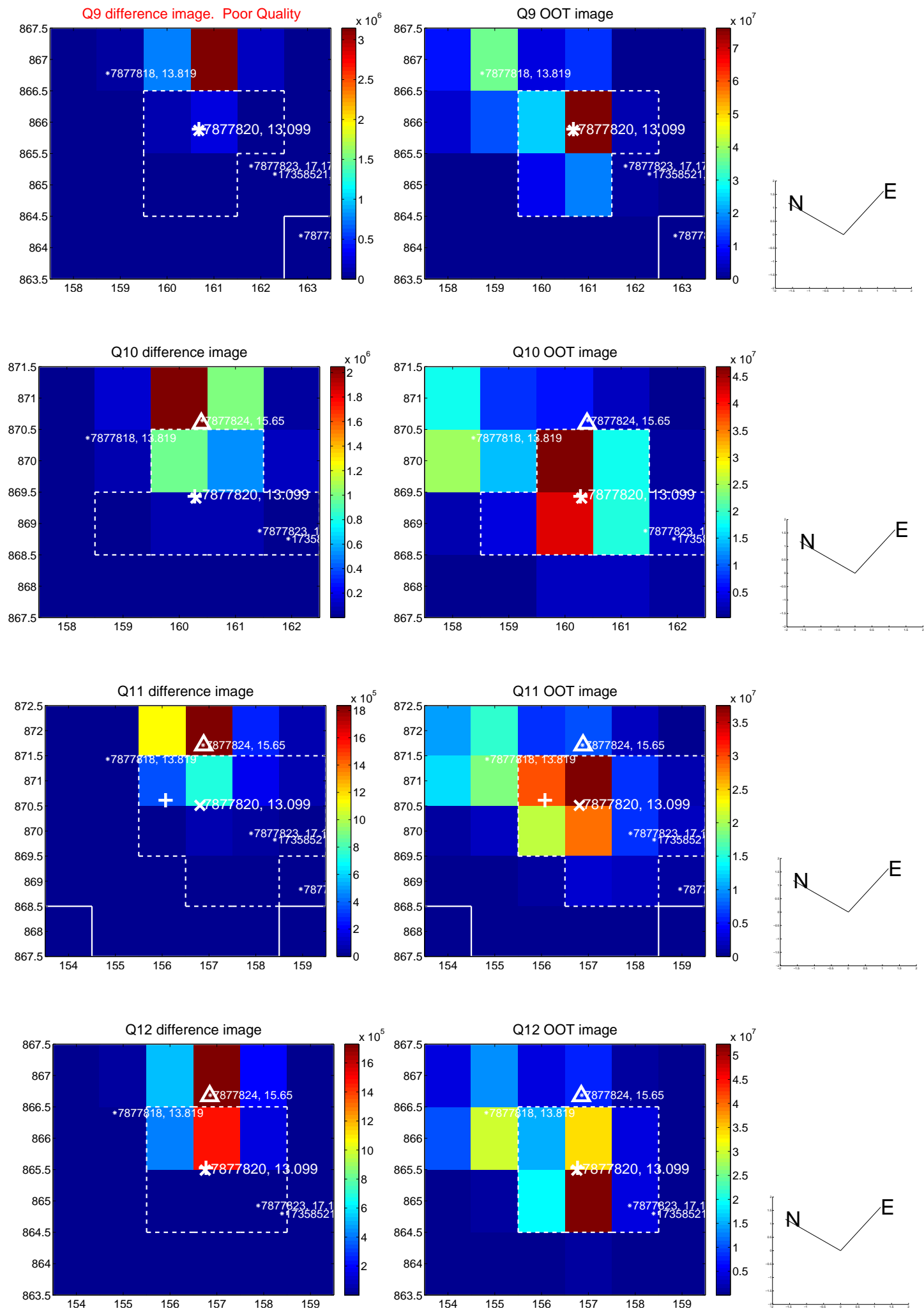
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



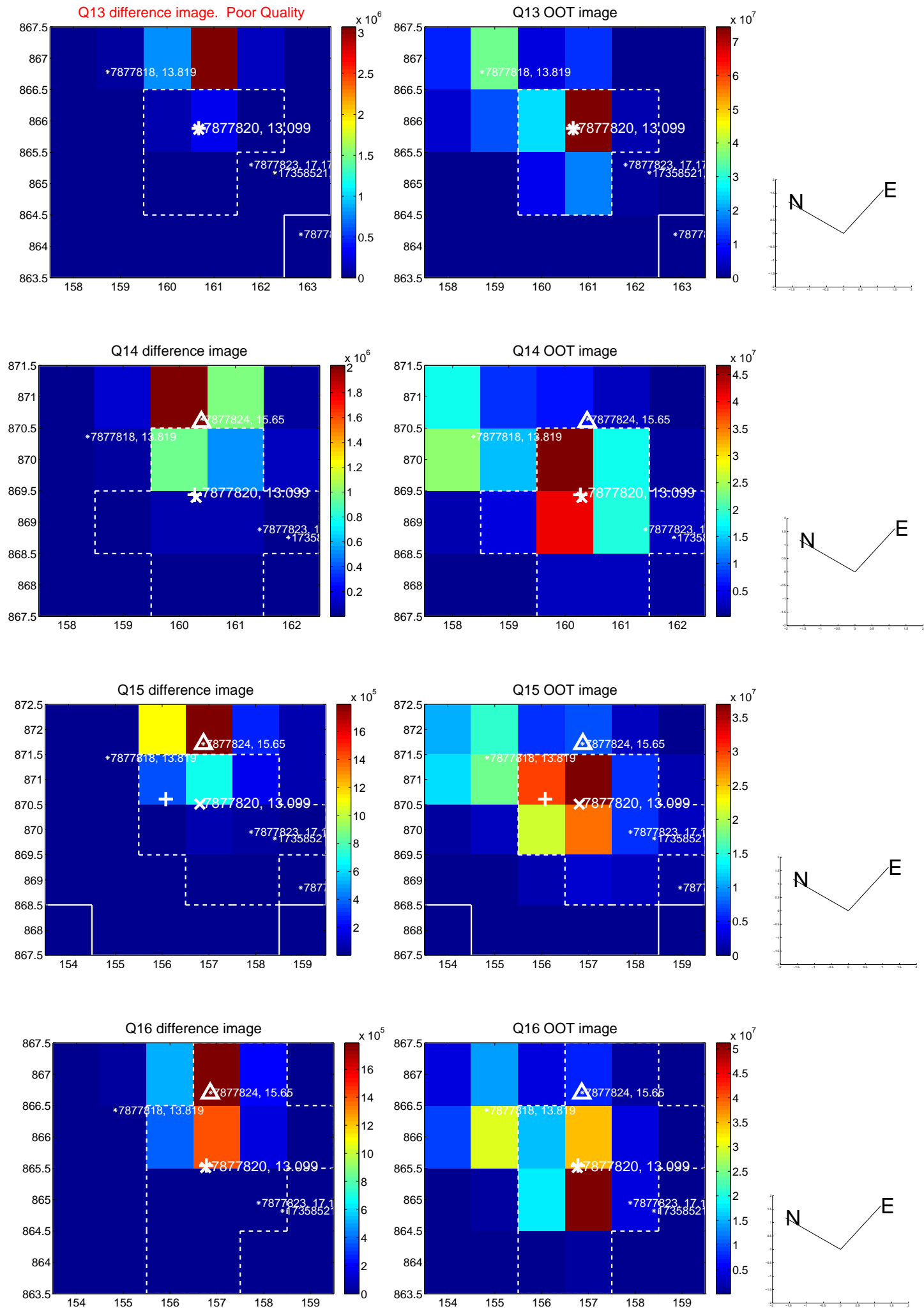
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



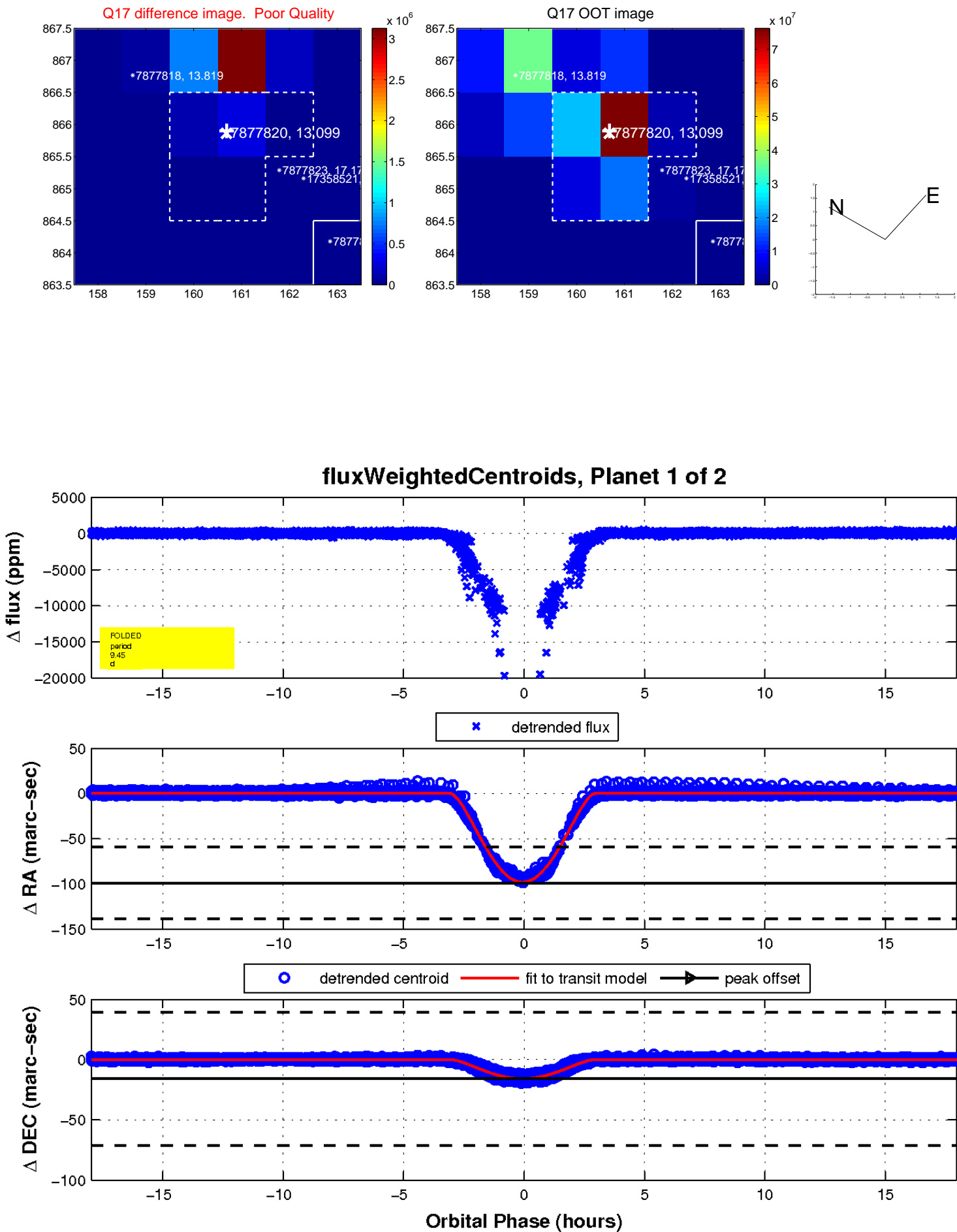
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

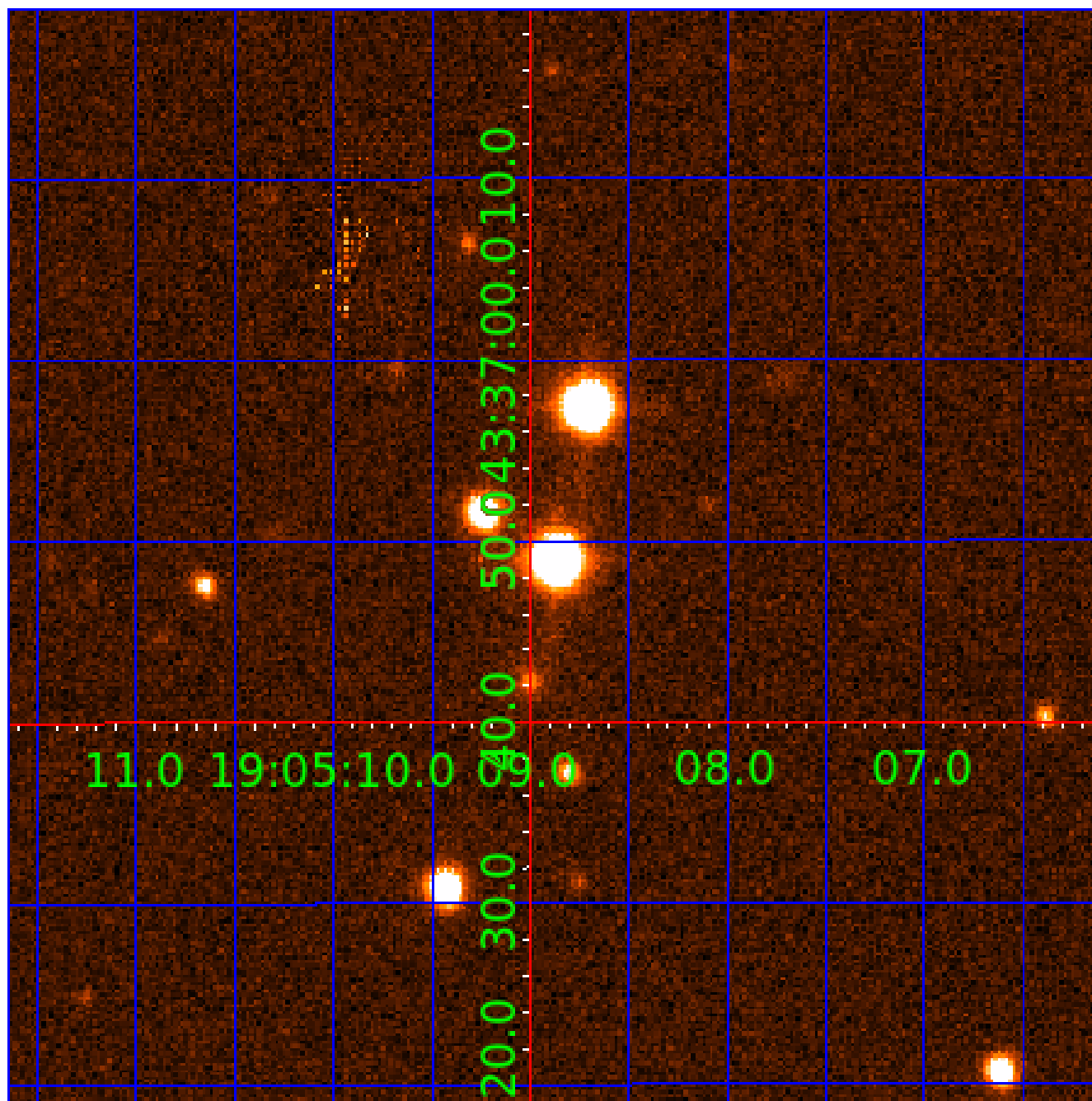


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007877820

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})
007877820-01	OBS	6046.01	9.449436	136.026140	12183.5	5.988	1991.6	1188.0	1.43	6558	27.71	416.74
007877820-02	OBS	No	9.449436	132.451070	9677.1	6.164	1601.7	1019.5	1.43	6558	24.84	416.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007877820-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
007877820-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH

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 007877820-02

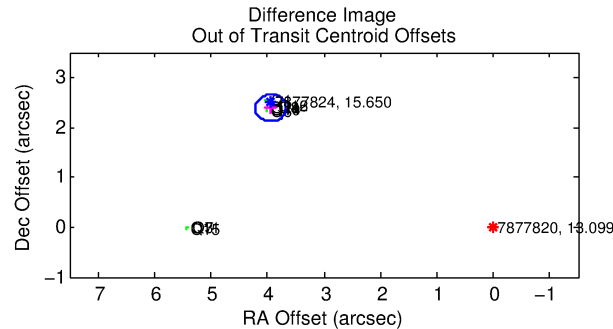
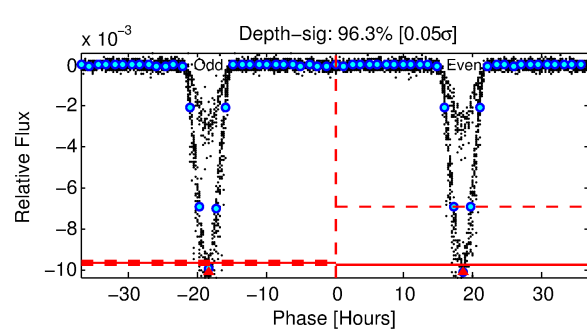
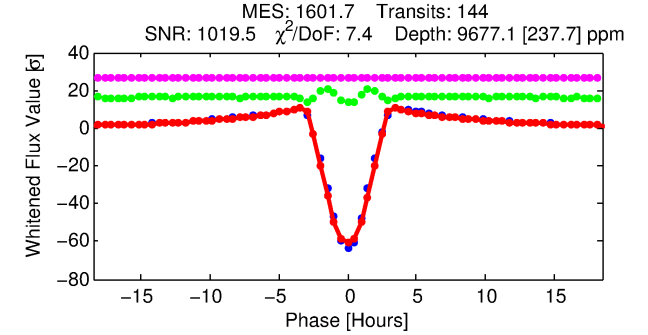
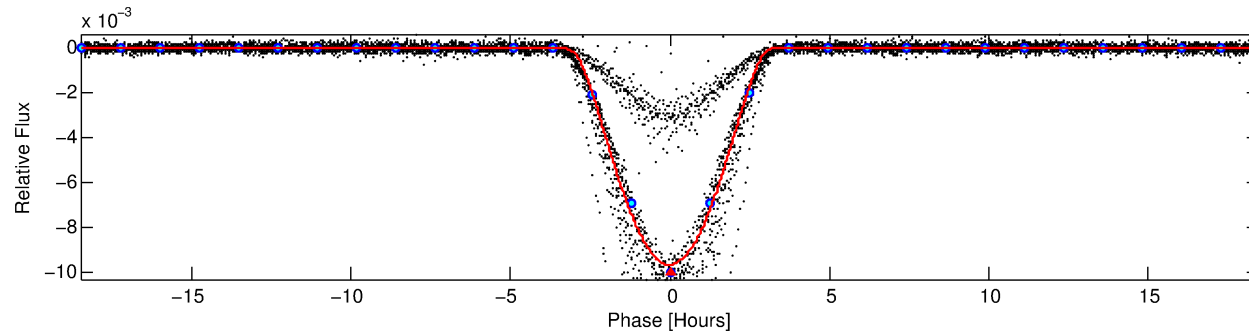
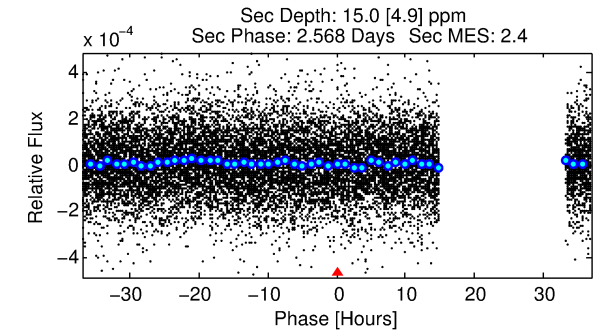
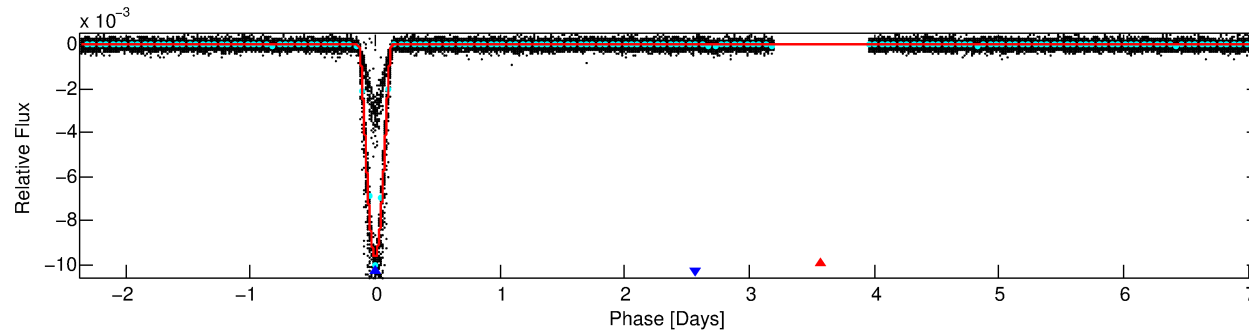
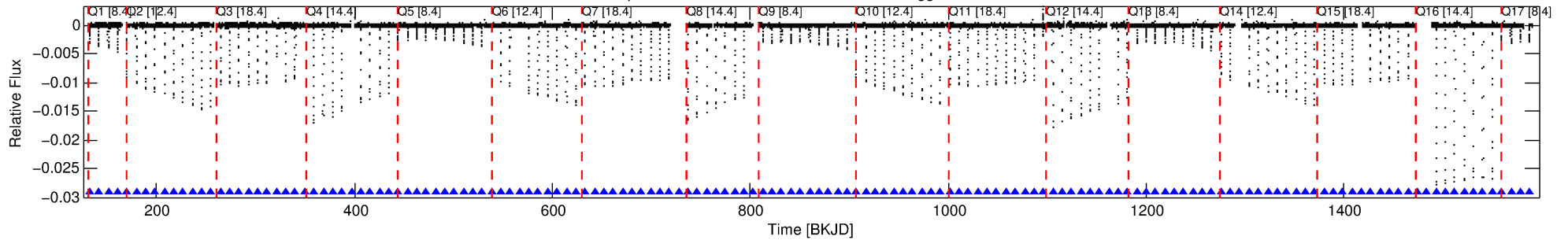
TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (")	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
007877820-02	7877820	007877824-02	7877824	1:1	4.7	-1	0	15.65	13.10	39.23	Direct-PRF	0	0.16	0.22

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 7877820 Candidate: 2 of 2 Period: 9.449 d
KOI: K06046 Corr: No Ephemeris Match

Kp: 13.10 R*: 1.43 Rs Teff: 6558.0 K Logg: 4.17 Fe/H: -0.380



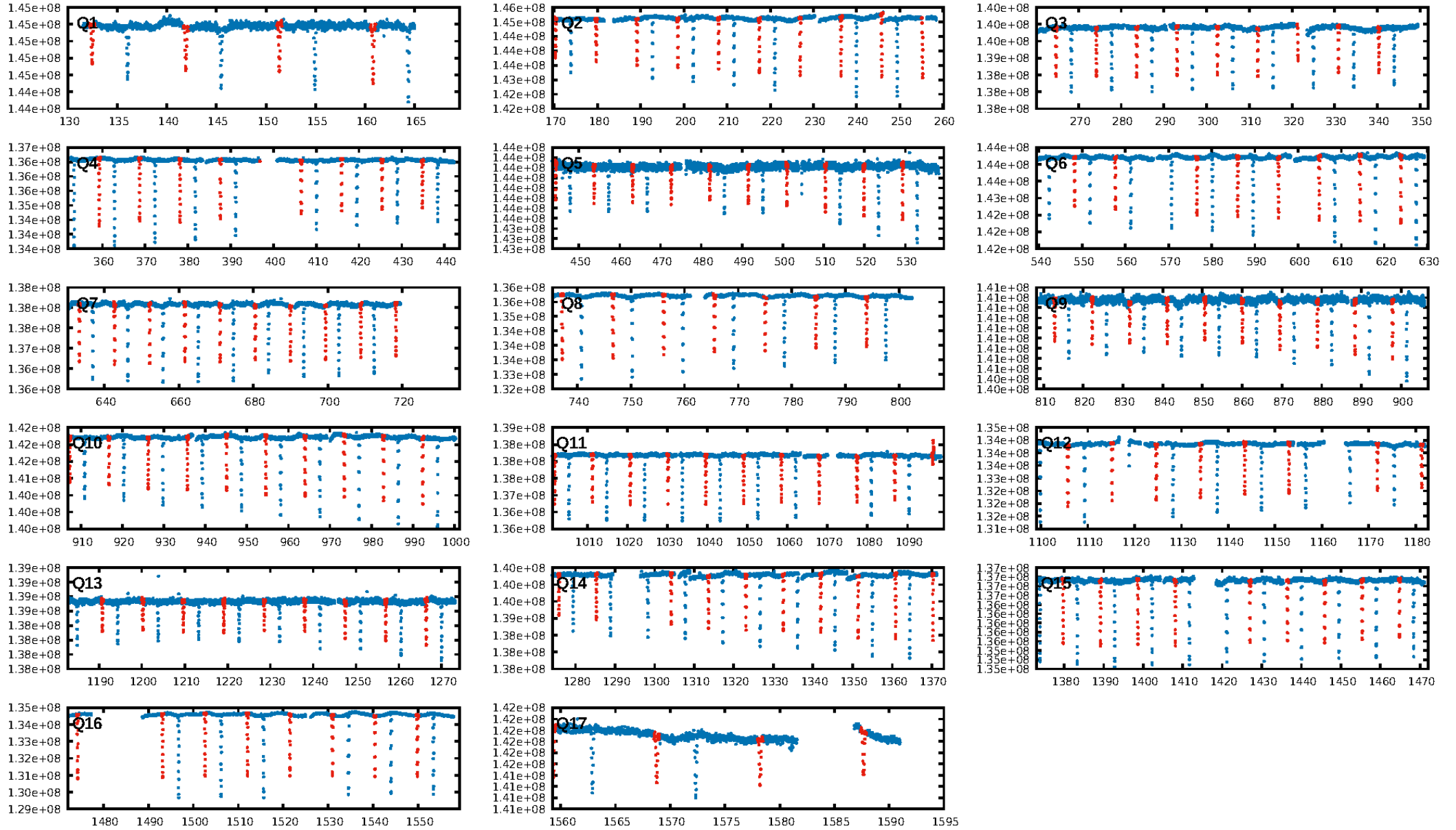
DV Fit Results:

Period = 9.44944 [0.00000] d
Epoch = 132.4511 [0.0003] BKJD
Rp/R* = 0.1591 [0.0132]
a/R* = 6.94 [0.09]
b = 1.00 [0.02]
Seff = 416.74 [160.83]
Teq = 1152 [111] K
Rp = 24.84 [6.98] Re
a = 0.0902 [0.0217] AU
Ag = 0.11 [0.06] [-15.75σ]
Teffp = 1023 [99] K [-0.87σ]

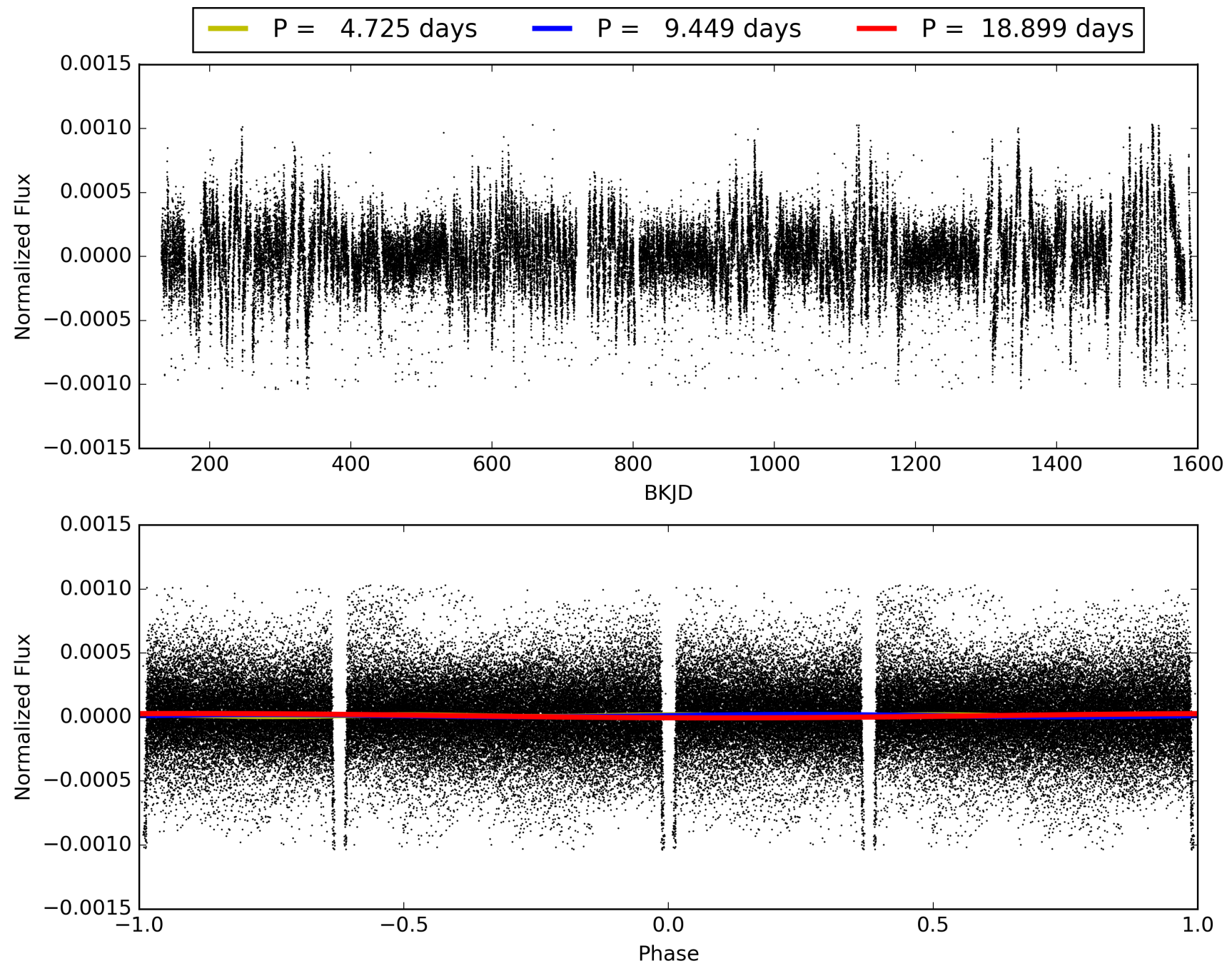
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [136/136]
GhostDiagnostic-chr: -0.05961
Centroid-sig: 0.0%
Centroid-so: 8.396 arcsec [1137.71σ]
OotOffset-rm: 4.609 arcsec [50.84σ]
KicOffset-rm: 4.758 arcsec [70.58σ]
OotOffset-st: 4/4/4/1 [13]
KicOffset-st: 4/4/4/1 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 007877820-02, PDC Light Curves

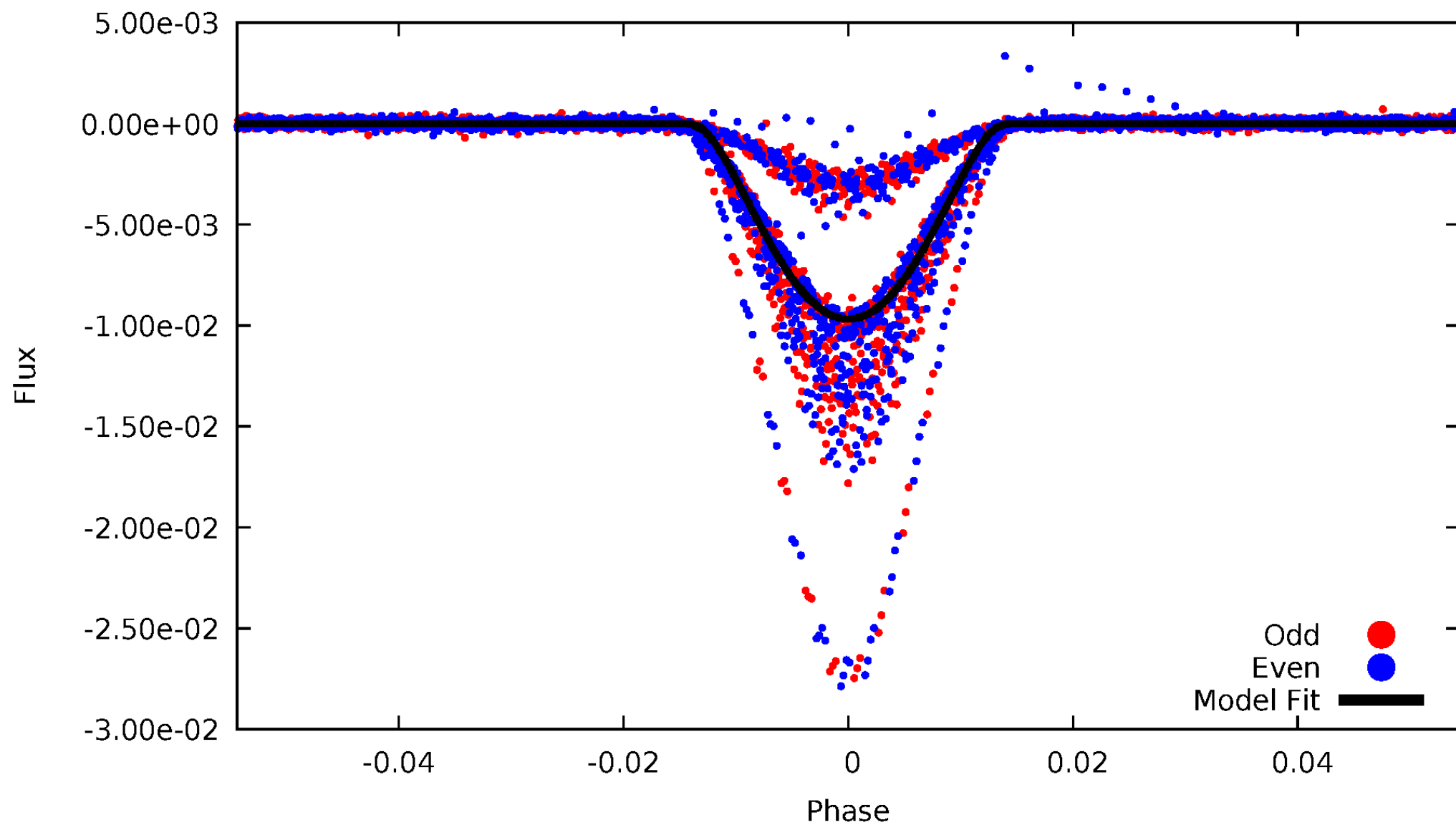


TCE 007877820-02



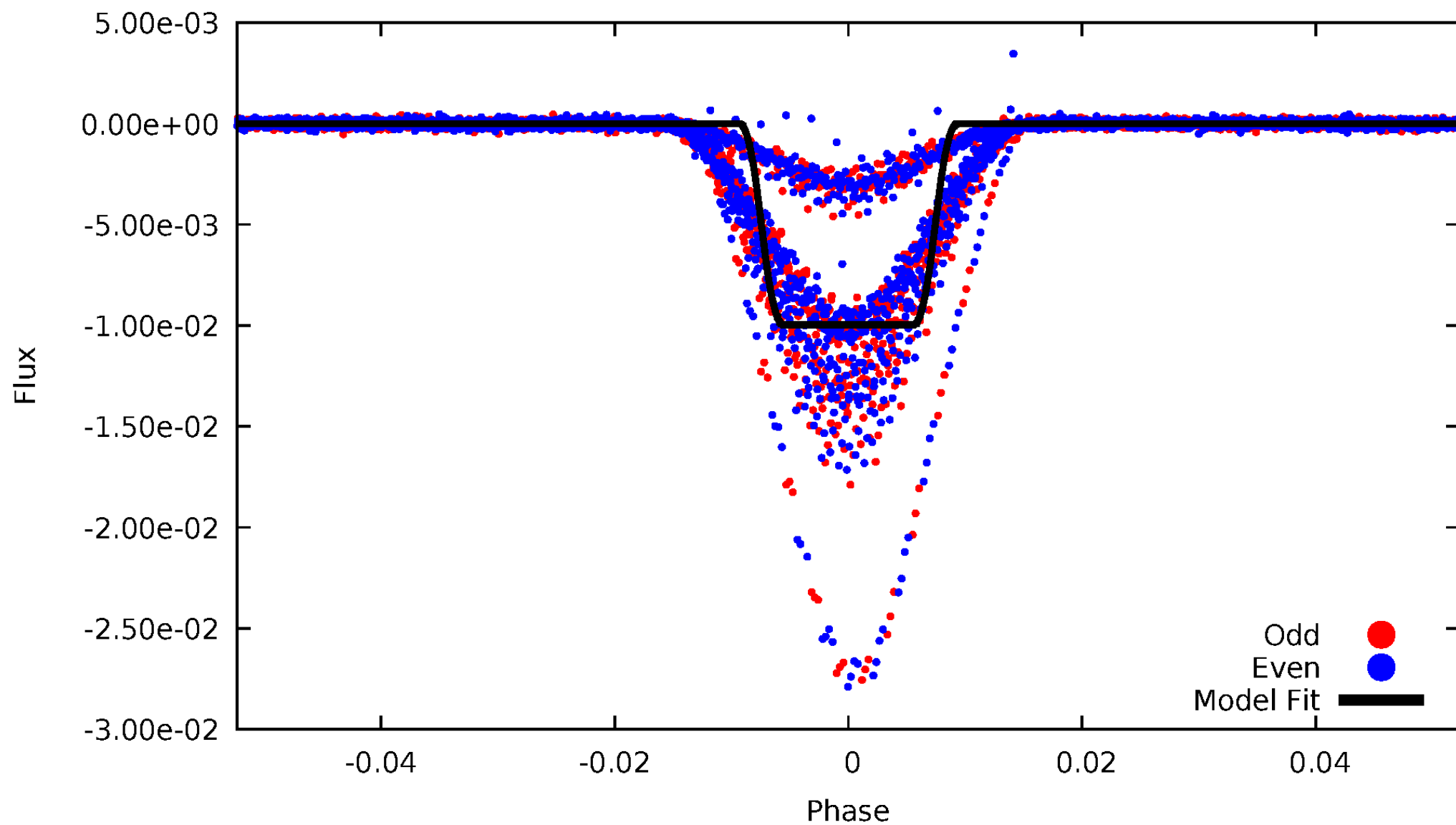
DV Odd/Even

TCE 007877820-02



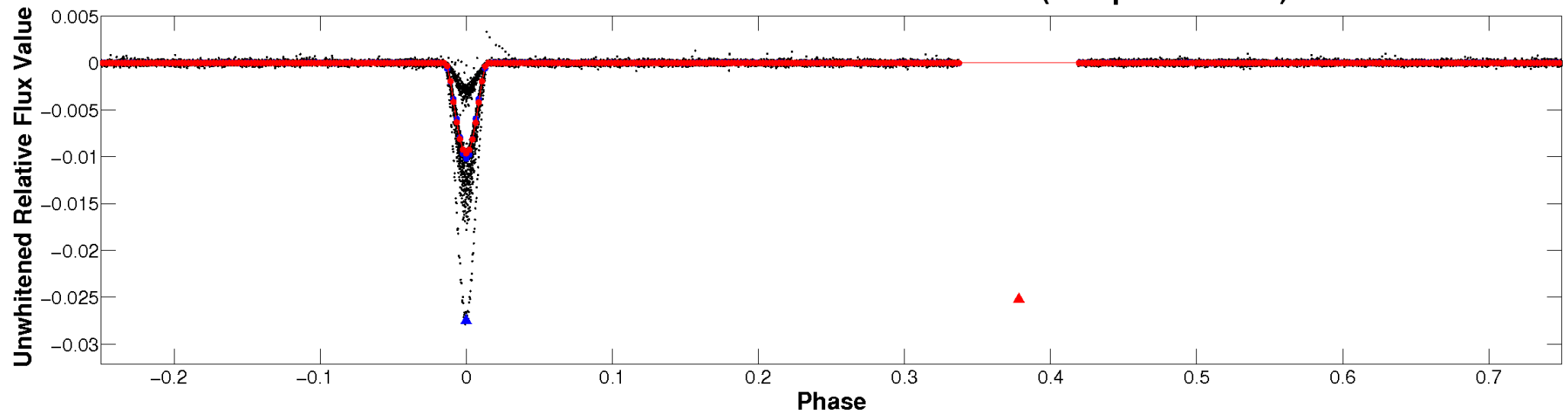
ALT Odd/Even

TCE 007877820-02

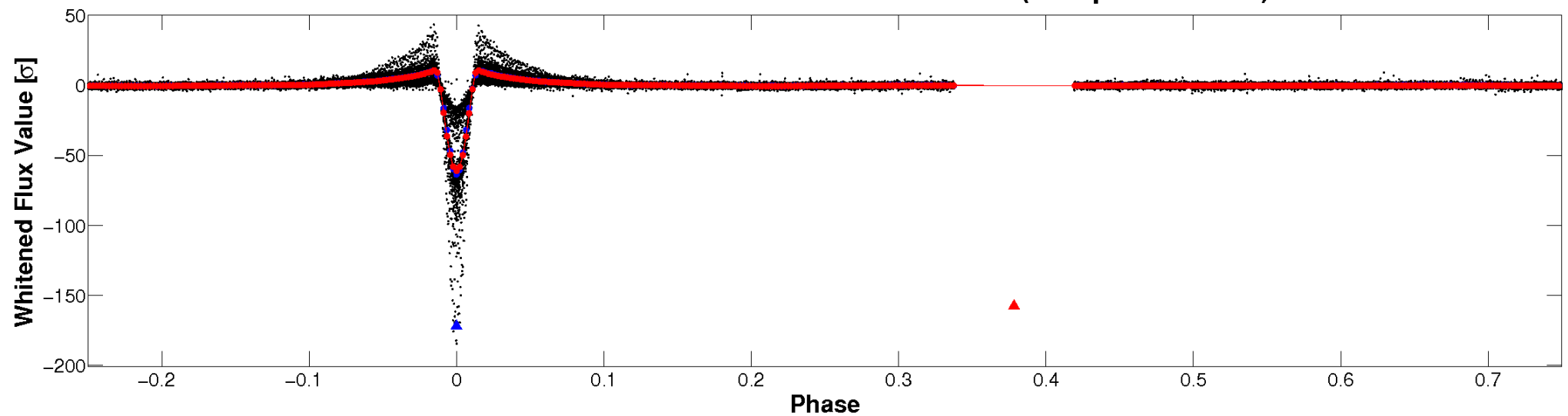


Non-Whitened Vs. Whitened Light Curve

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

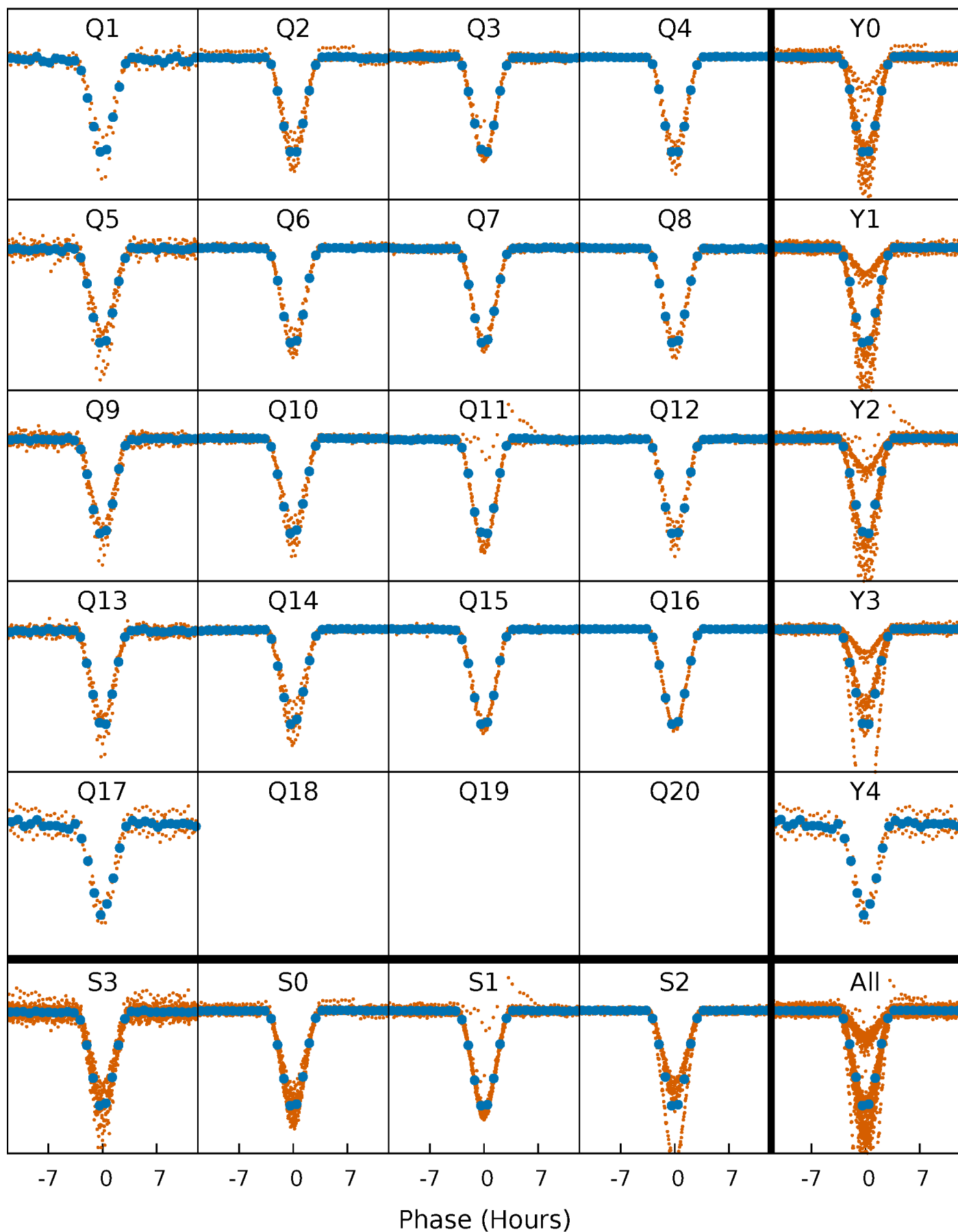


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



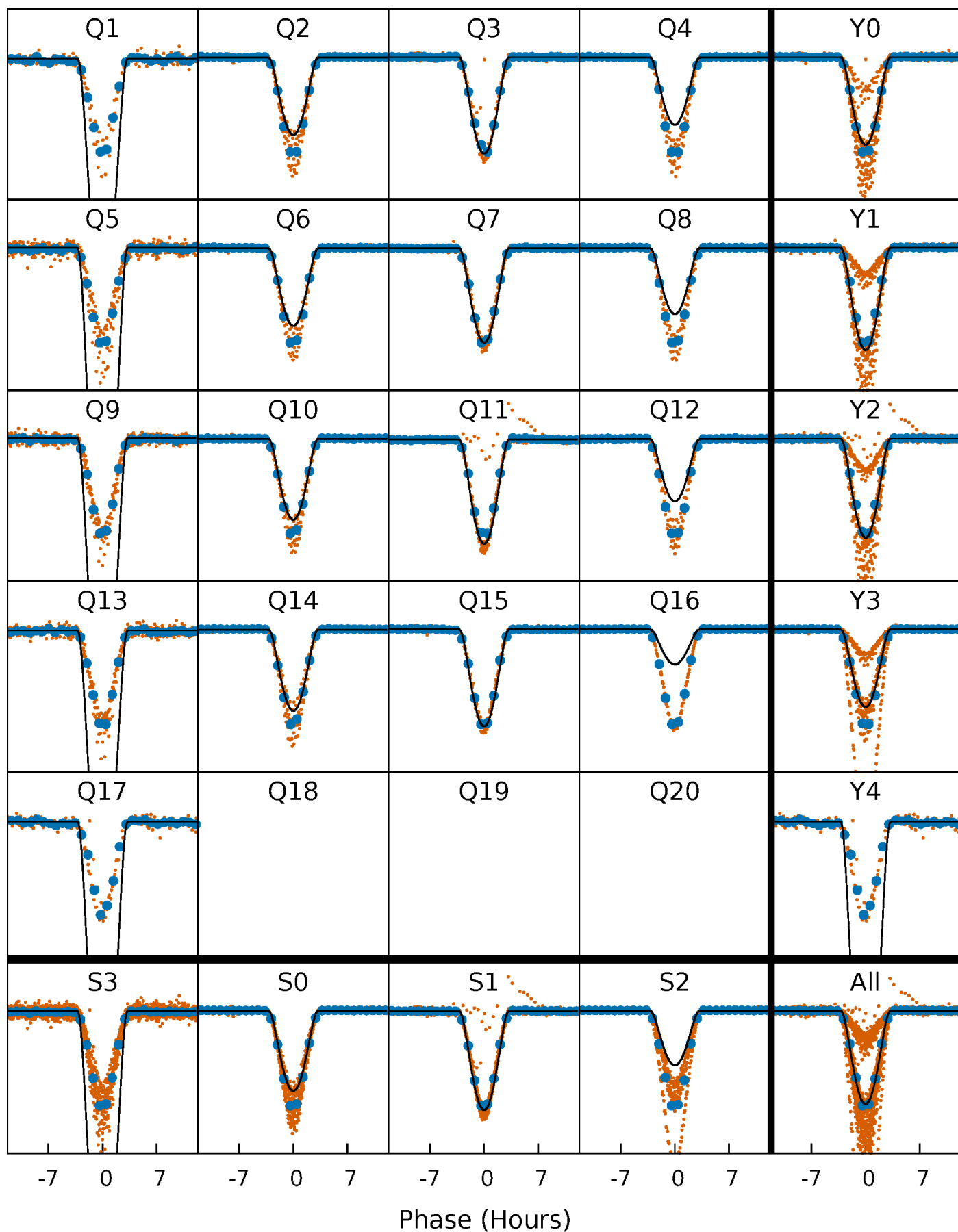
PDC Quarter-Phased Transit Curves

TCE 007877820-02 P= 9.449436 Days $T_0=132.451070$ (BKJD)



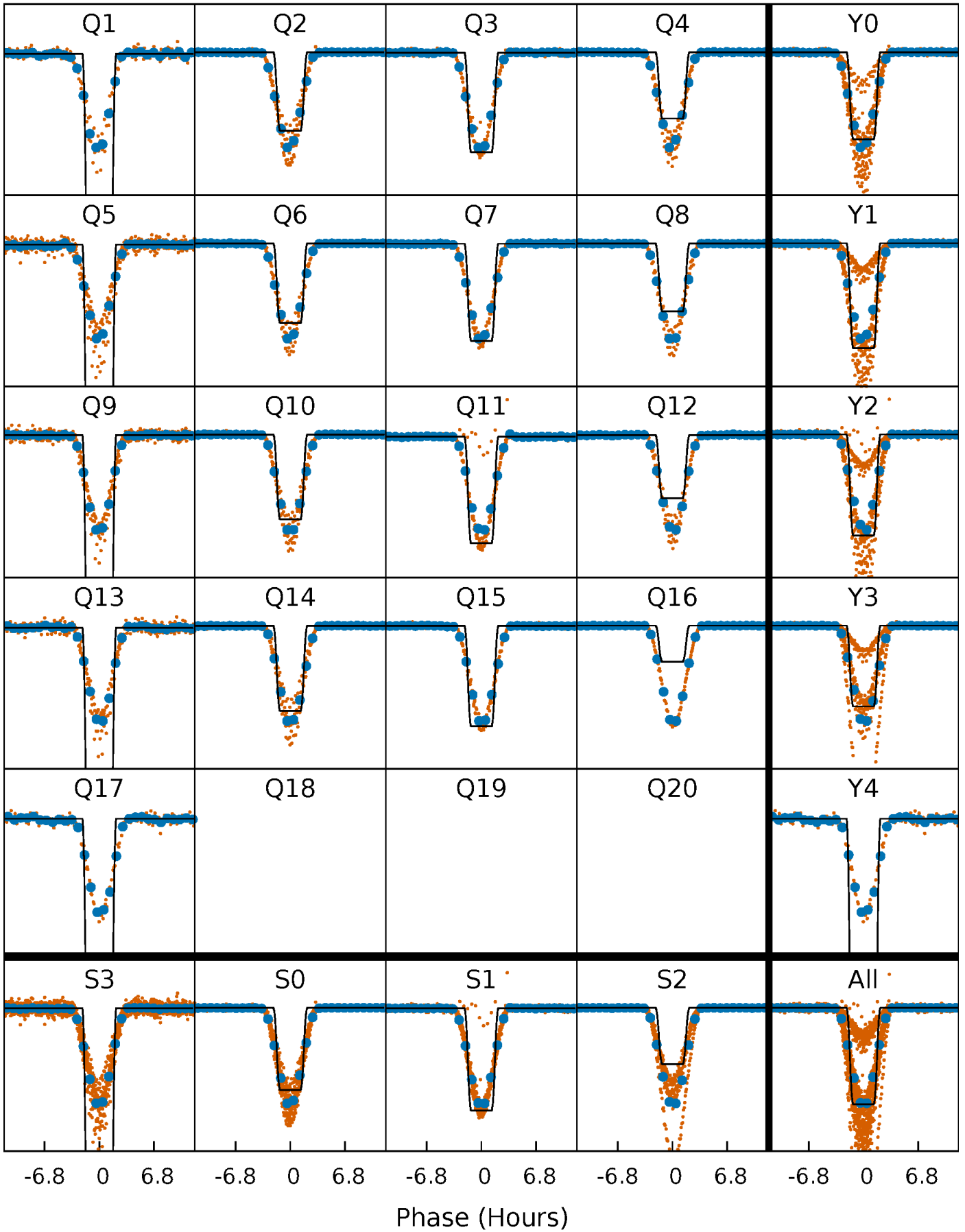
DV Quarter-Phased Transit Curves

TCE 007877820-02 P= 9.449436 Days $T_0=132.451070$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

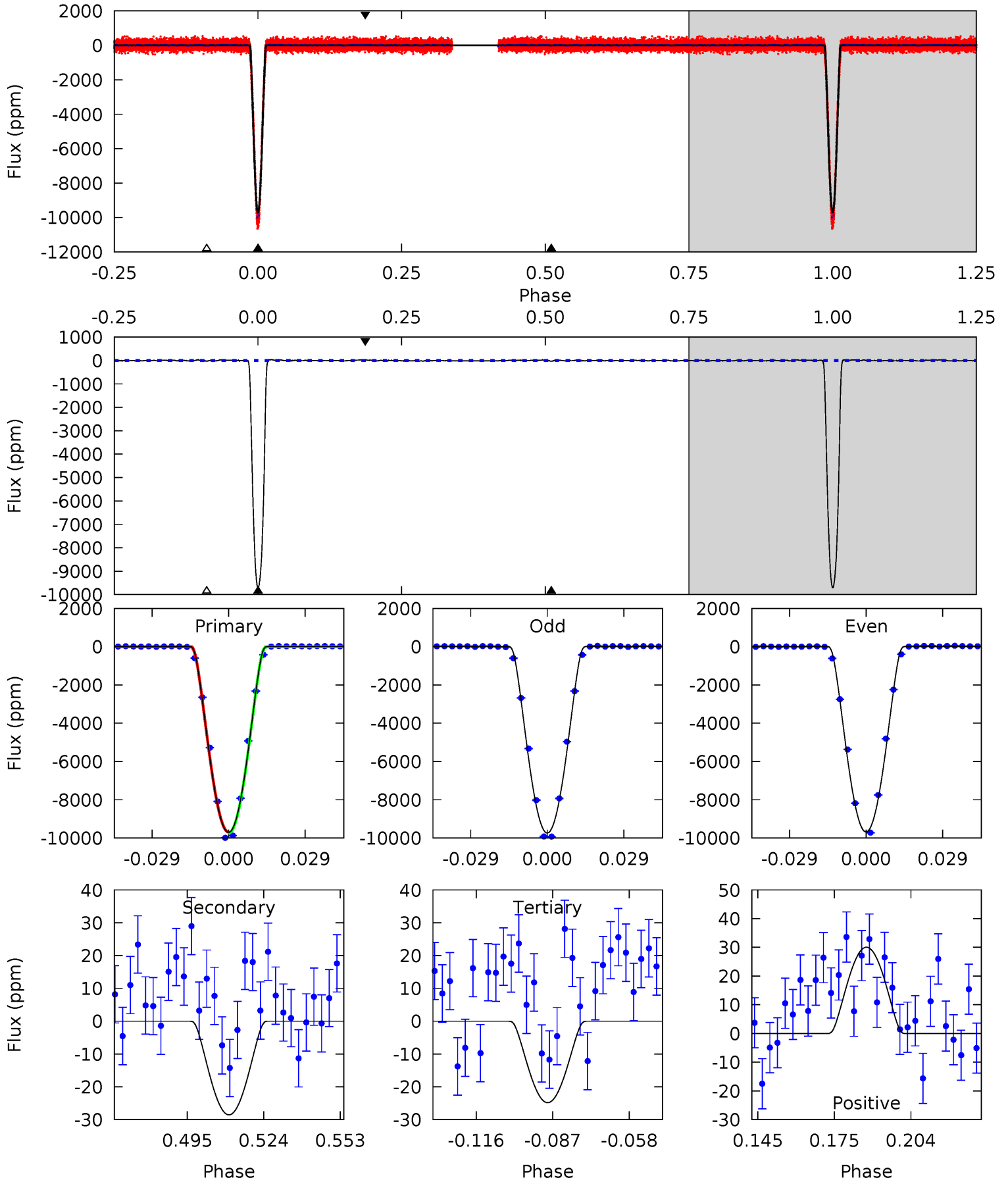
TCE 007877820-02 P= 9.449337 Days $T_0=132.459258$ (BKJD)



DV Model-Shift Uniqueness Test

007877820-02, P = 9.449436 Days, E = 123.001634 Days

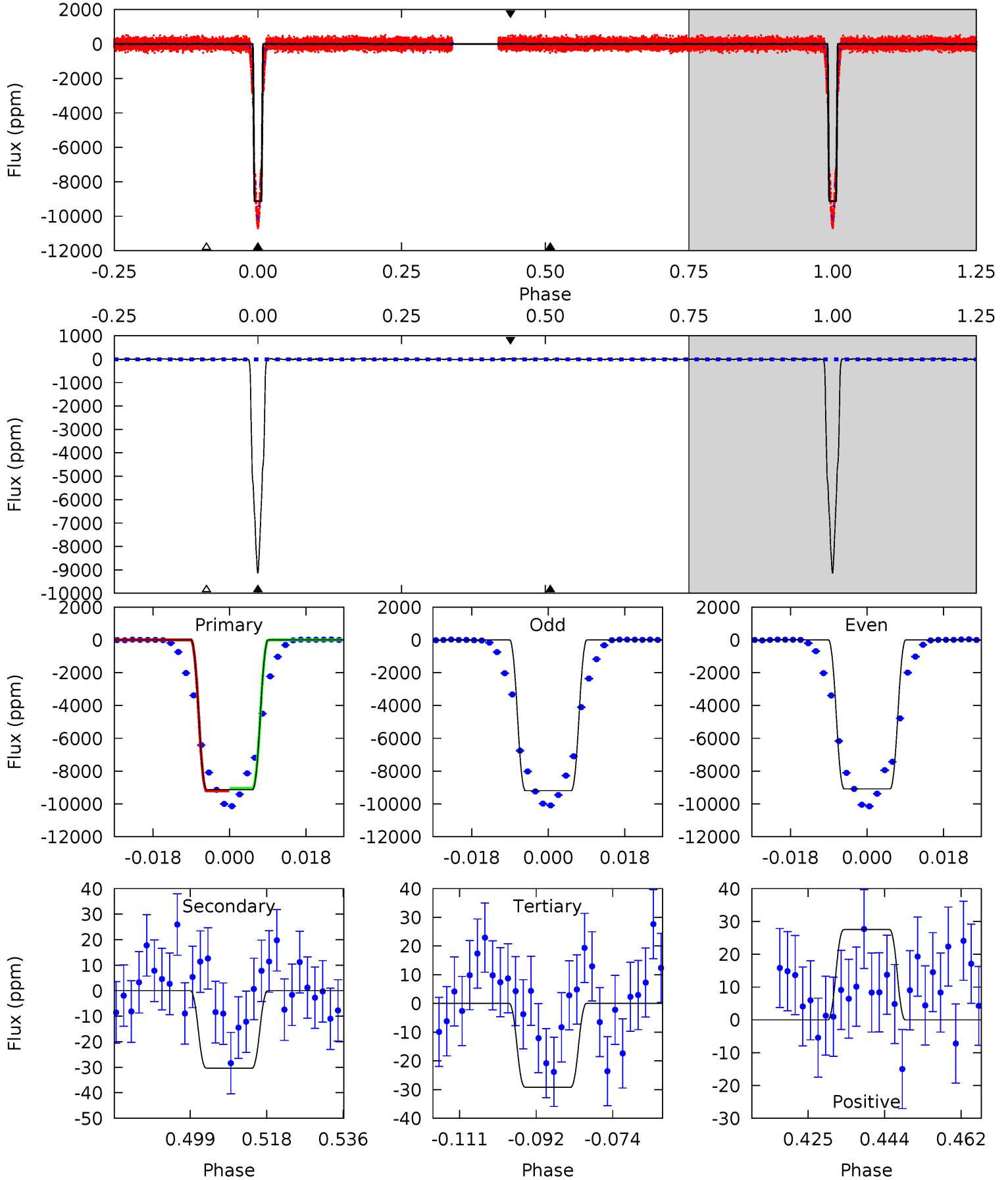
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2188	6.44	5.60	6.77	4.82	2.18	2.35	2183	2181	0.84	-0.34	6.26	0.99	0.00	7.37



Alt Model-Shift Uniqueness Test

007877820-02, P = 9.449337 Days, E = 123.009921 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1109	3.69	3.54	3.34	4.91	2.36	1.16	1105	1106	0.14	0.35	6.30	0.99	0.00	0



Stellar Parameters For KIC 007877820

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6558^{+162}_{-194}	$4.167^{+0.209}_{-0.171}$	$-0.380^{+0.250}_{-0.300}$	$1.431^{+0.384}_{-0.346}$	$1.096^{+0.177}_{-0.129}$	$0.527^{+0.594}_{-0.239}$
	+2%/-3%	+5%/-4%	+66%/-79%	+27%/-24%	+16%/-12%	+113%/-45%
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 007877820-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-29 ± 4	$24.48^{+4.20}_{-3.69}$	1603^{+118}_{-122}	-1975^{+516}_{-165}	$0.211^{+0.086}_{-0.063}$
Alt.	-30 ± 8	$15.63^{+2.96}_{-2.85}$	1603^{+110}_{-106}	2201^{+210}_{-358}	$0.540^{+0.355}_{-0.201}$

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

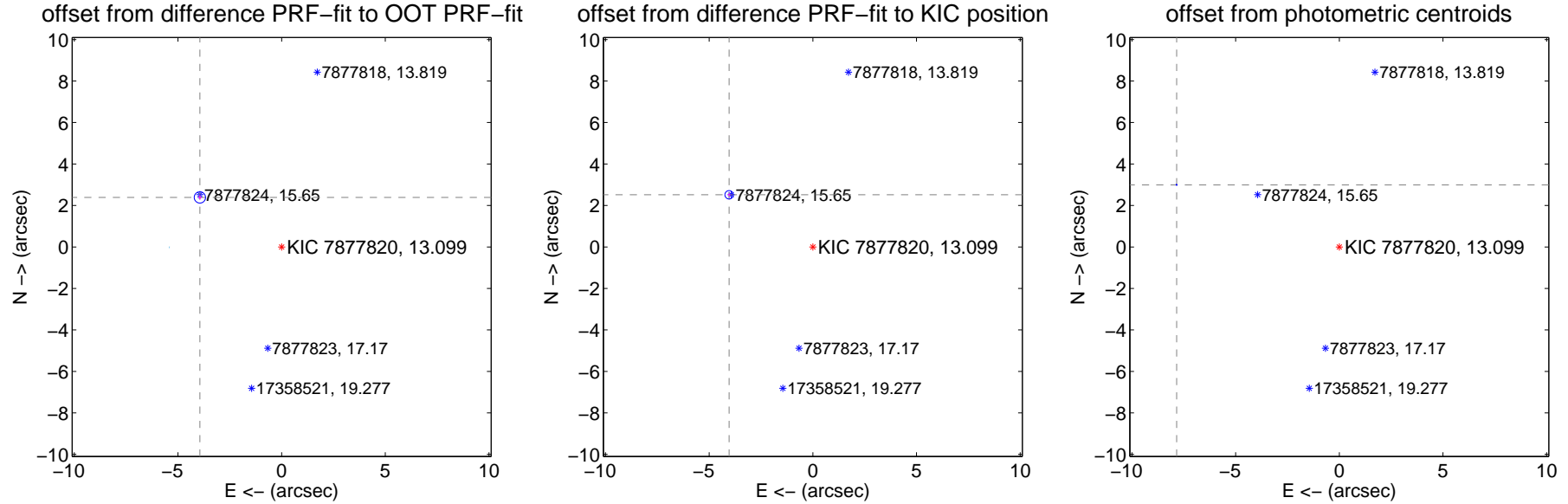
DV Centroid Data

Supplemental centroid analysis for 007877820-02. Kepler magnitude: 13.10. Transit SNR 1019.51

There are 13 quarters with good PRF difference image offsets

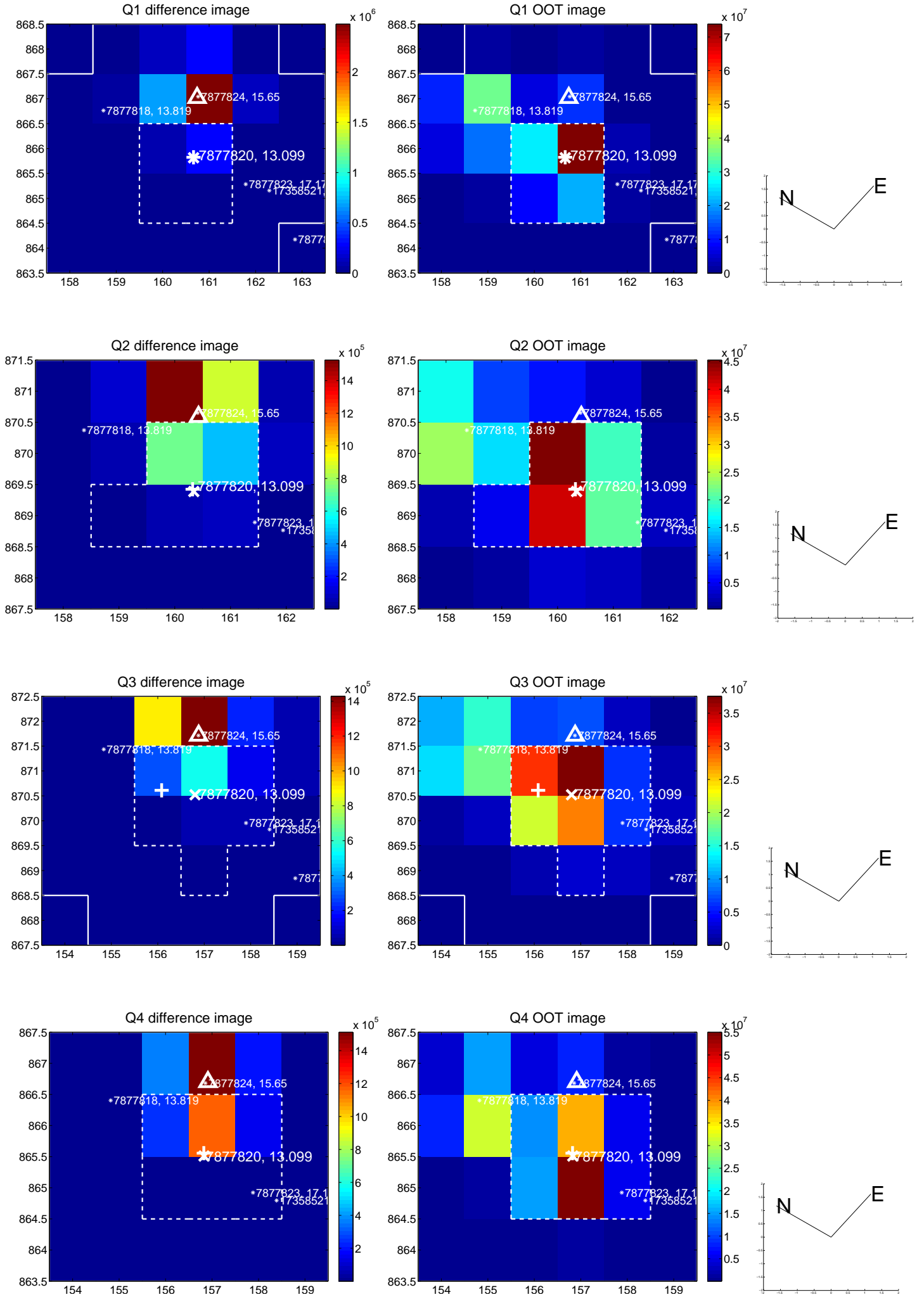
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.609 ± 0.091	50.84	3.942 ± 0.084	2.388 ± 0.106
PRF-fit source offset from KIC position	4.758 ± 0.067	70.58	4.039 ± 0.067	2.515 ± 0.068
photometric centroid source offset	8.40 ± 0.01	1137.71	7.85 ± 0.01	2.99 ± 0.01

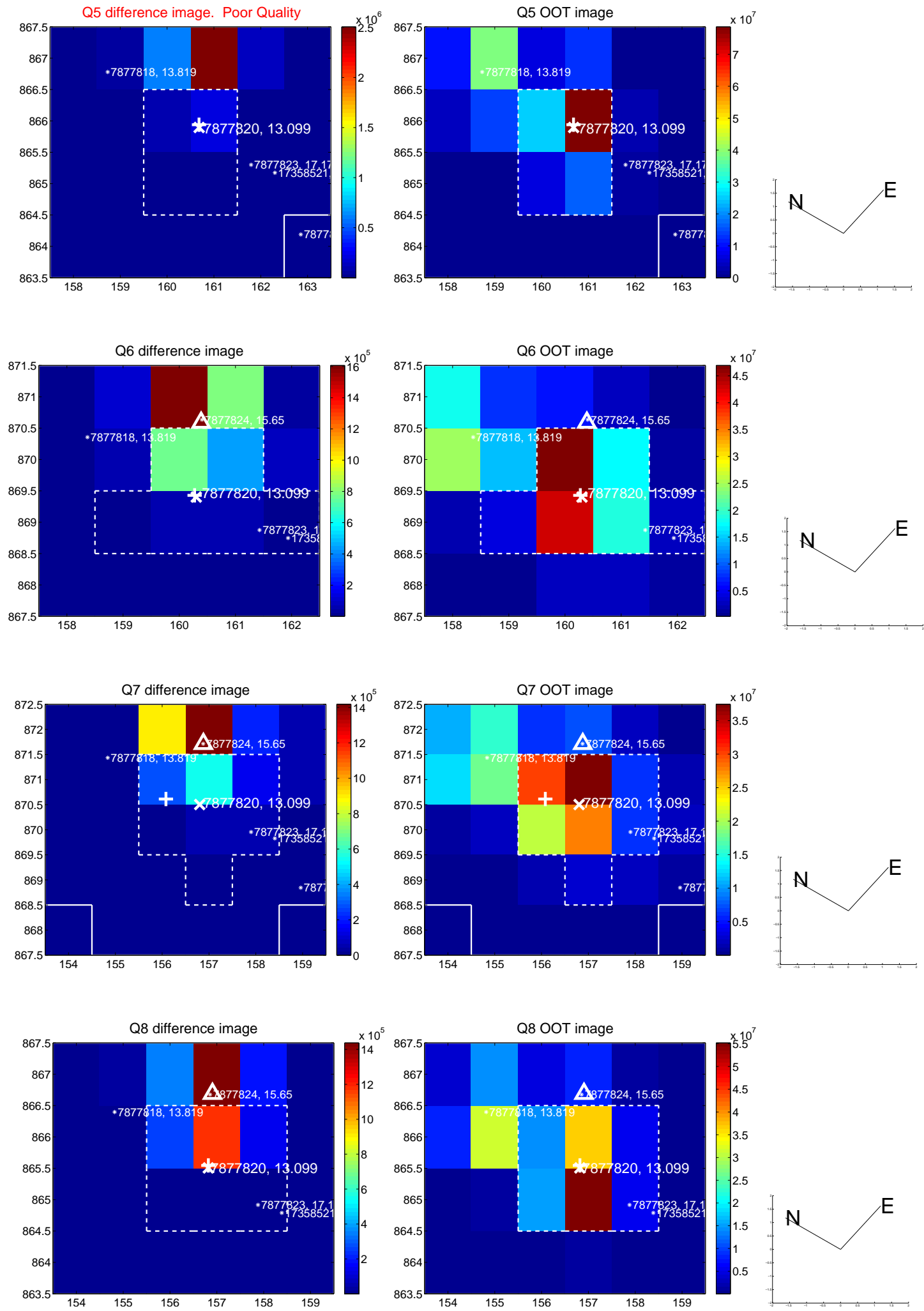


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

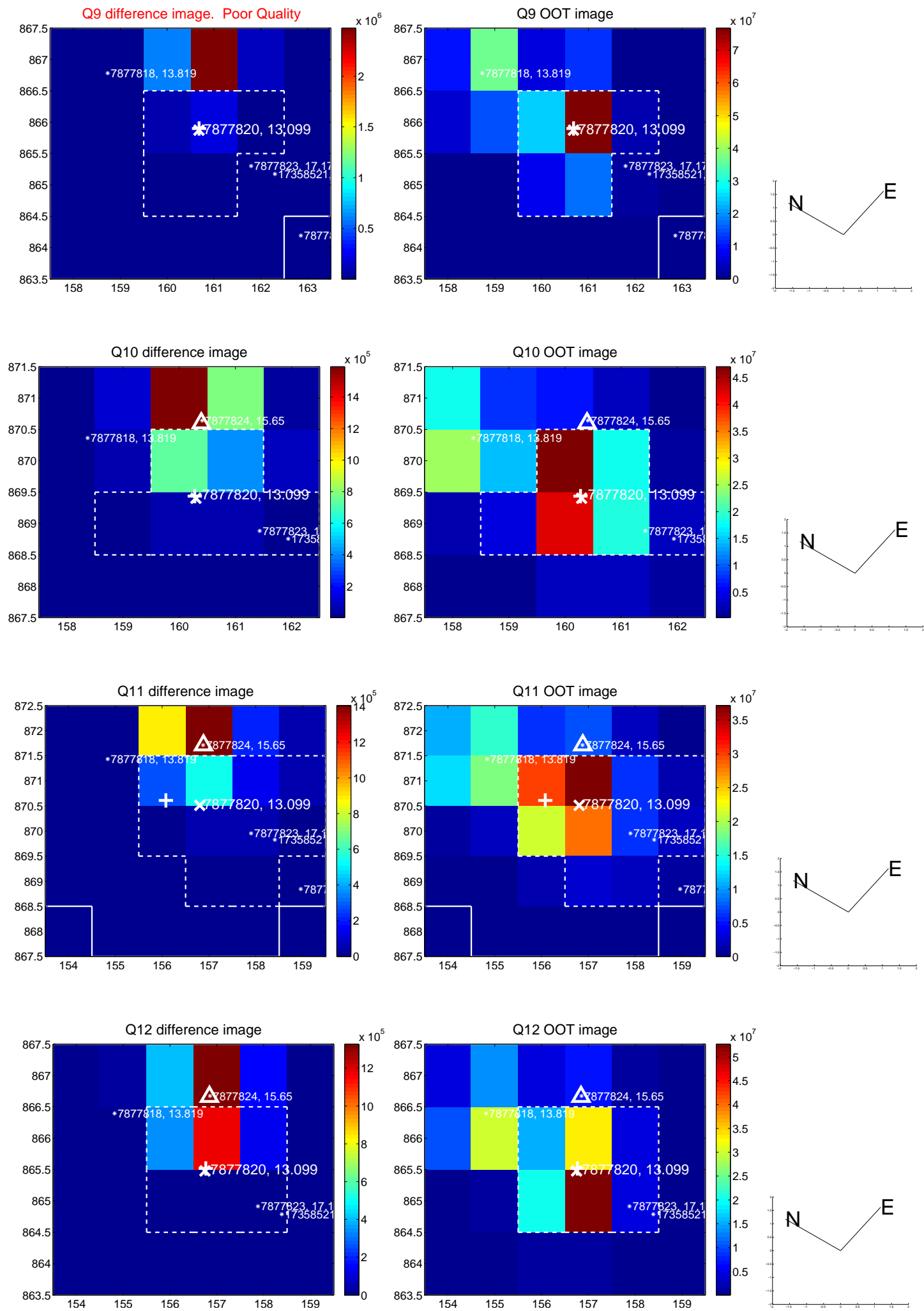
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



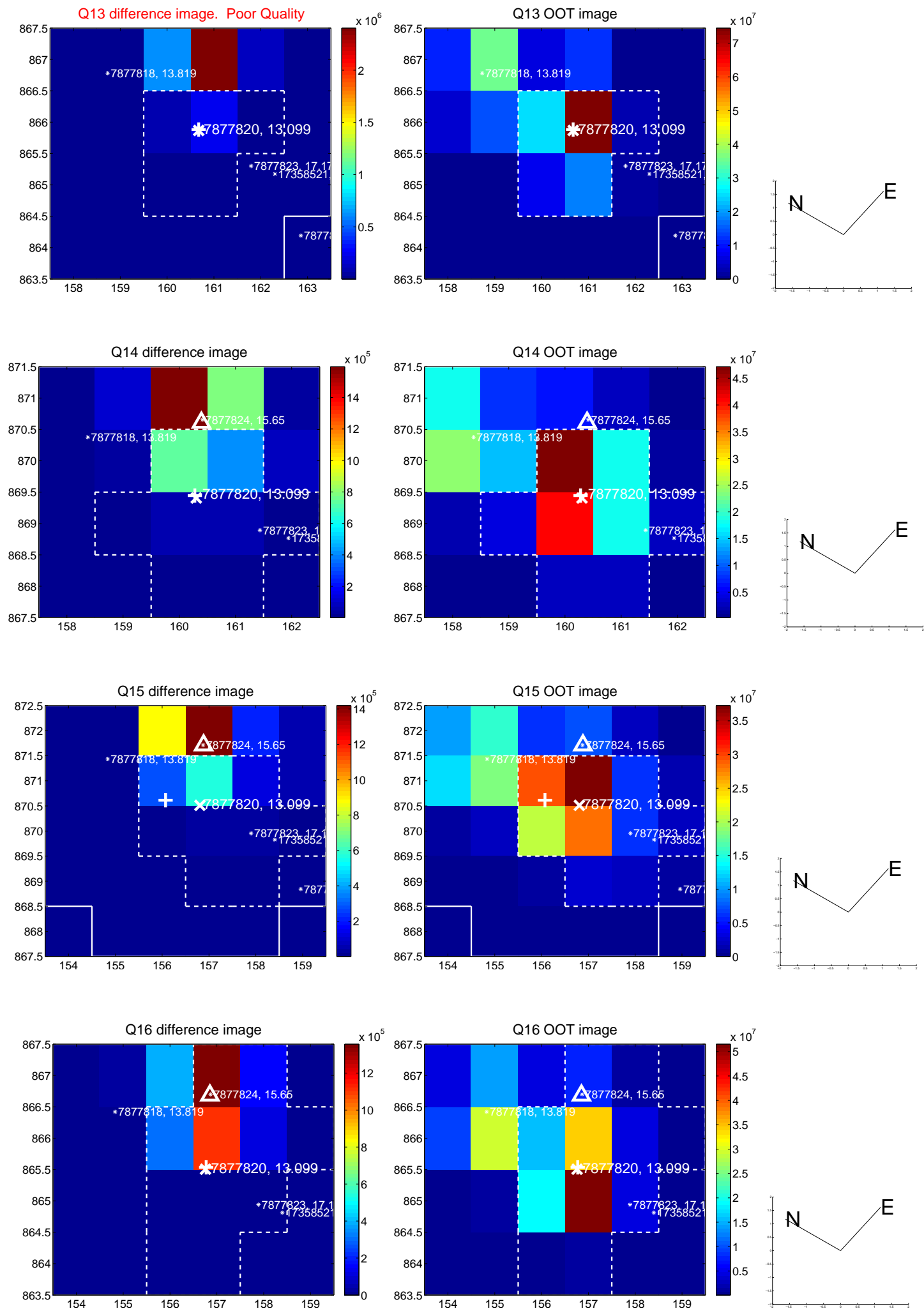
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

