

KIC 006778019

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})
006778019-01	OBS	2953.01	0.945827	131.621550	105.2	1.893	15.7	19.9	1.08	6116	1.30	3707.11
006778019-02	OBS	No	0.945817	132.101510	73.9	1.797	12.1	14.3	1.08	6116	1.11	3707.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006778019-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006778019-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—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 006778019-01

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
006778019-01	6778019	006778050-01	6778050	1:1	21.1	0	-5	14.51	14.76	2758.90	Direct-PRF	0	0.25	0.17

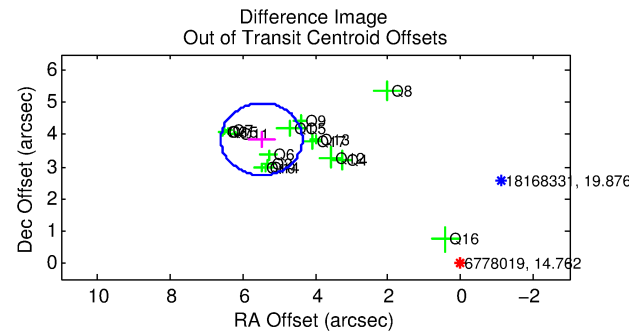
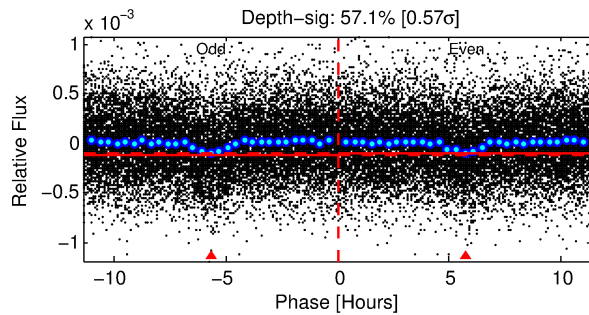
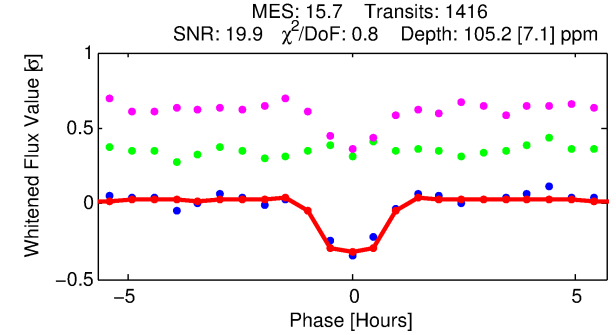
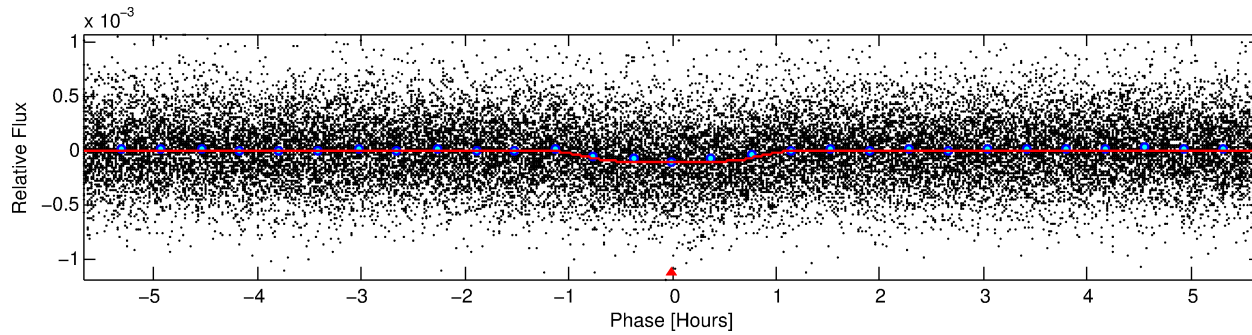
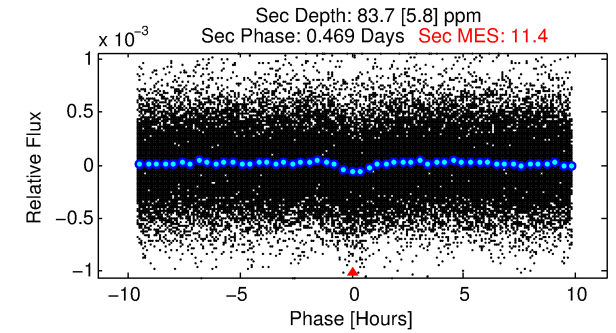
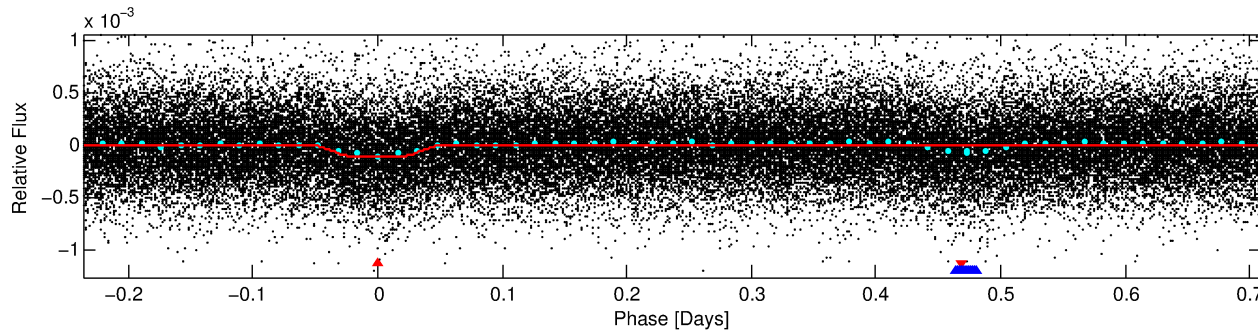
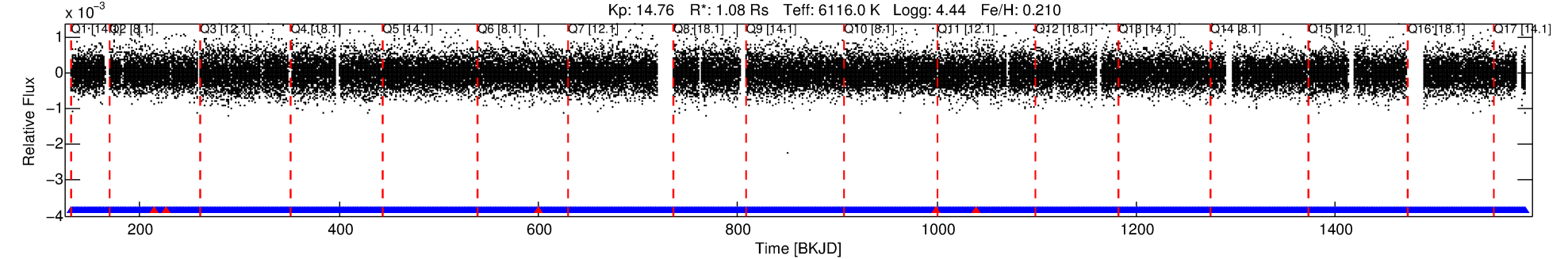
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 6778019 Candidate: 1 of 2 Period: 0.946 d

KOI: K02953 Corr: No Ephemeris Match

Kp: 14.76 R*: 1.08 Rs Teff: 6116.0 K Logg: 4.44 Fe/H: 0.210



DV Fit Results:

Period = 0.94583 [0.00000] d
Epoch = 131.6216 [0.0012] BKJD
Rp/R* = 0.0110 [0.0037]
a/R* = 2.06 [2.68]
b = 0.89 [0.41]
Seff = 3707.11 [1575.54]
Teff = 1990 [211] K
Rp = 1.30 [0.62] Re
a = 0.0199 [0.0055] AU
Ag = 10.76 [8.50] [1.15σ]
Teffp = 5572 [974] K [3.59σ]

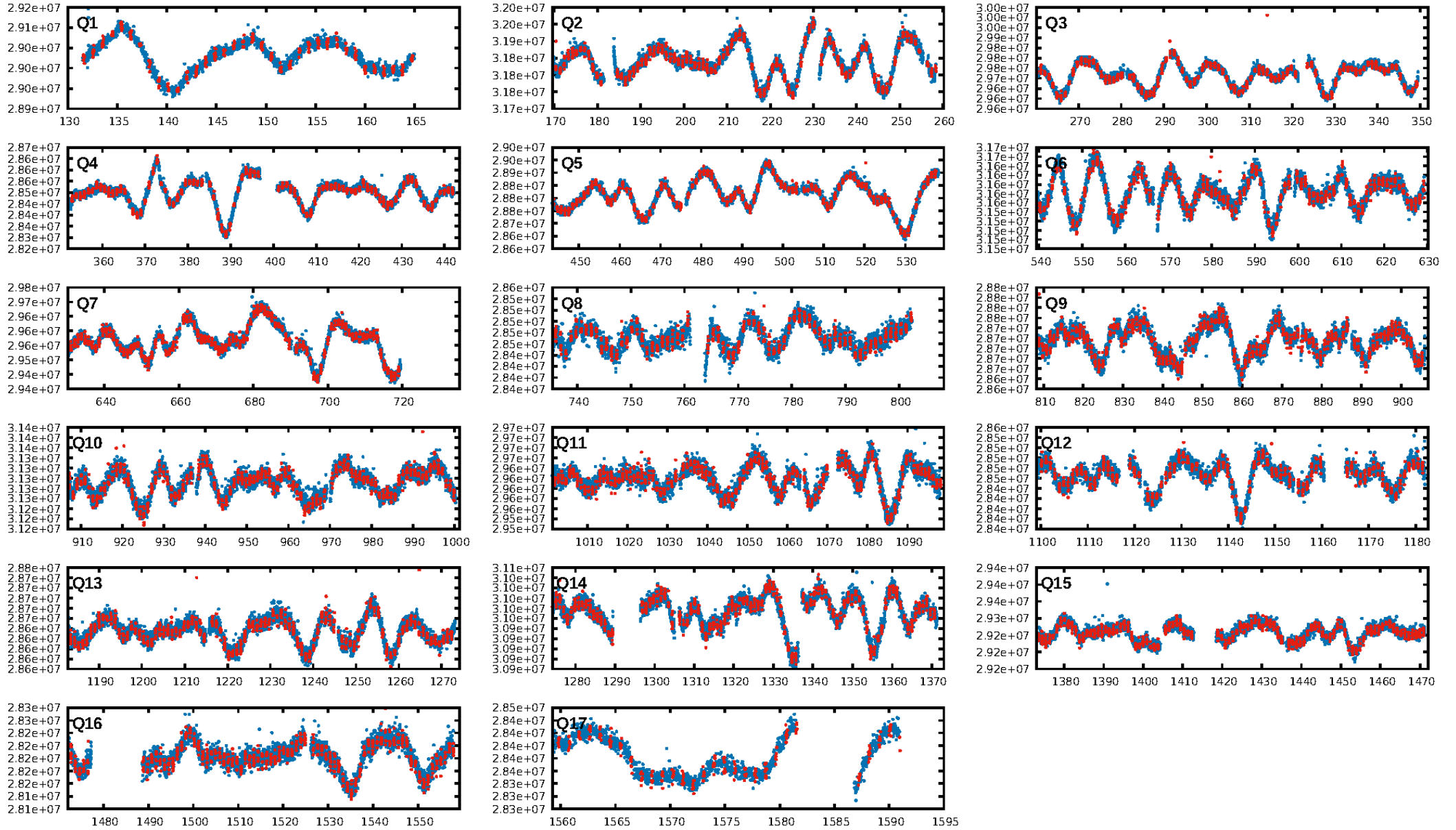
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.18e-57
RollingBand-fgt: 1.00 [1346/1351]
GhostDiagnostic-chr: -0.4574
Centroid-sig: 0.0%
Centroid-so: 4.713 arcsec [9.00σ]
OotOffset-rm: 6.698 arcsec [17.88σ]
KicOffset-rm: 6.644 arcsec [16.77σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.76 [13/17]
DiffImageOverlap-fno: 1.00 [17/17]

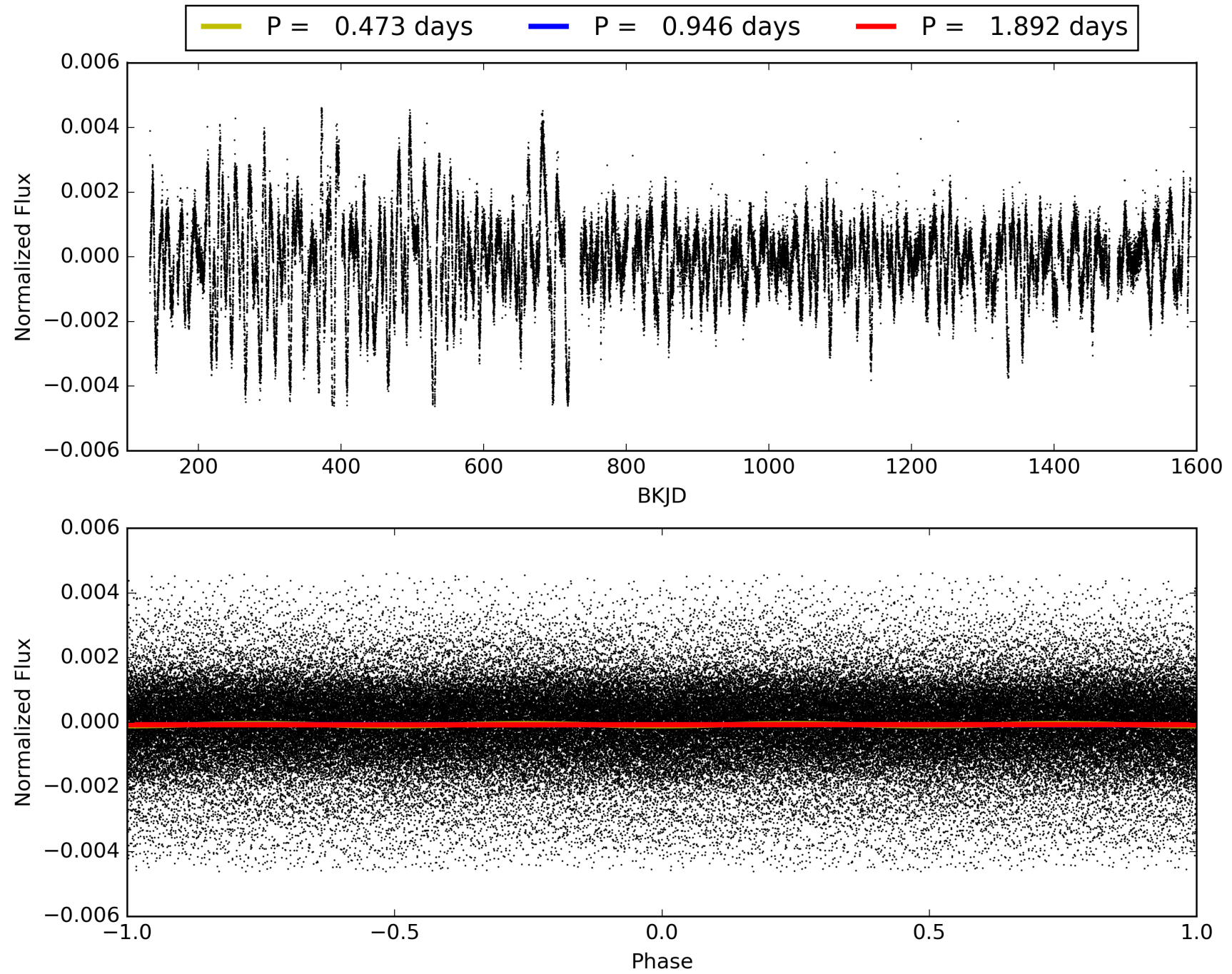
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006778019-01, PDC Light Curves

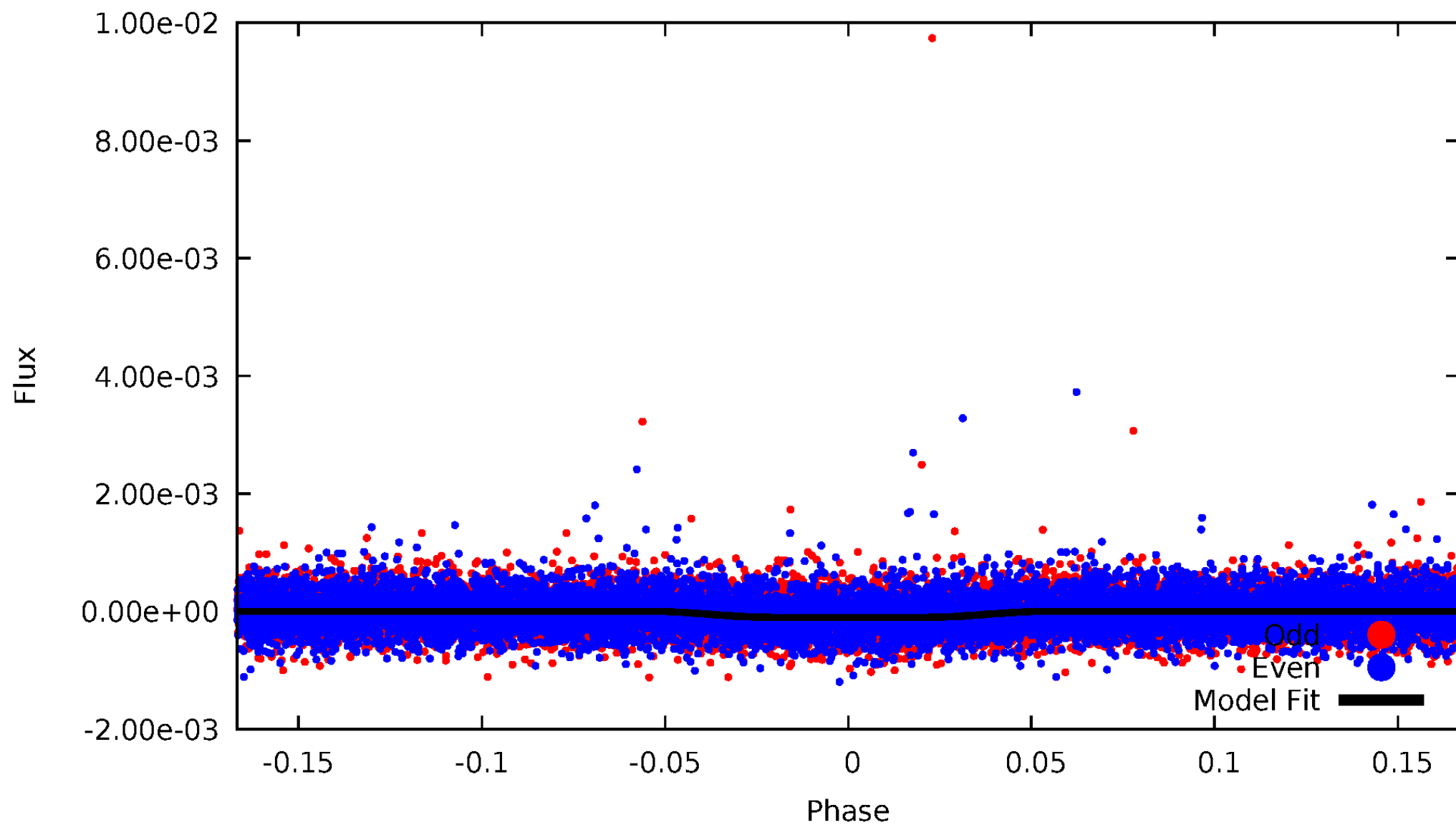


TCE 006778019-01



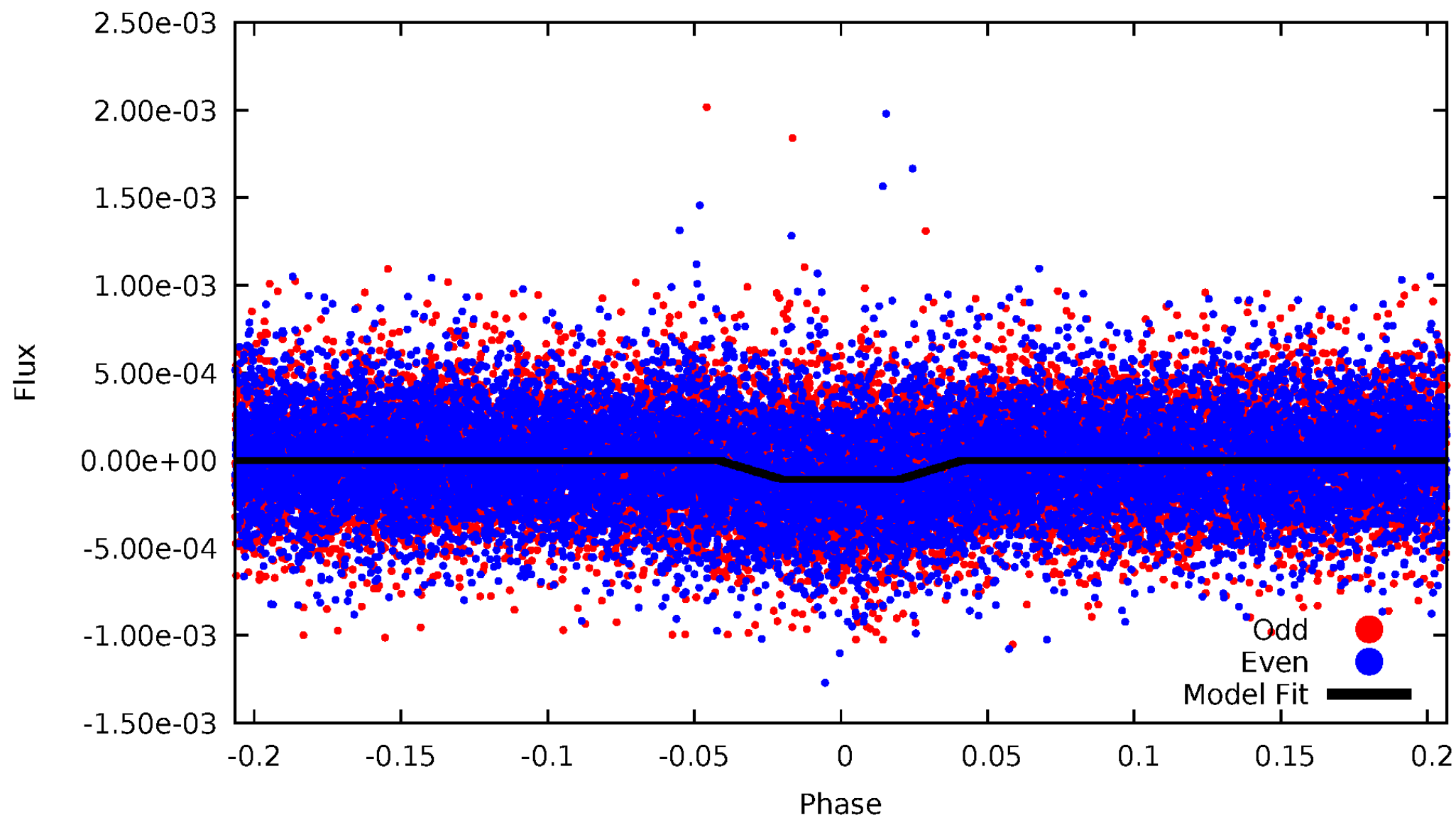
DV Odd/Even

TCE 006778019-01

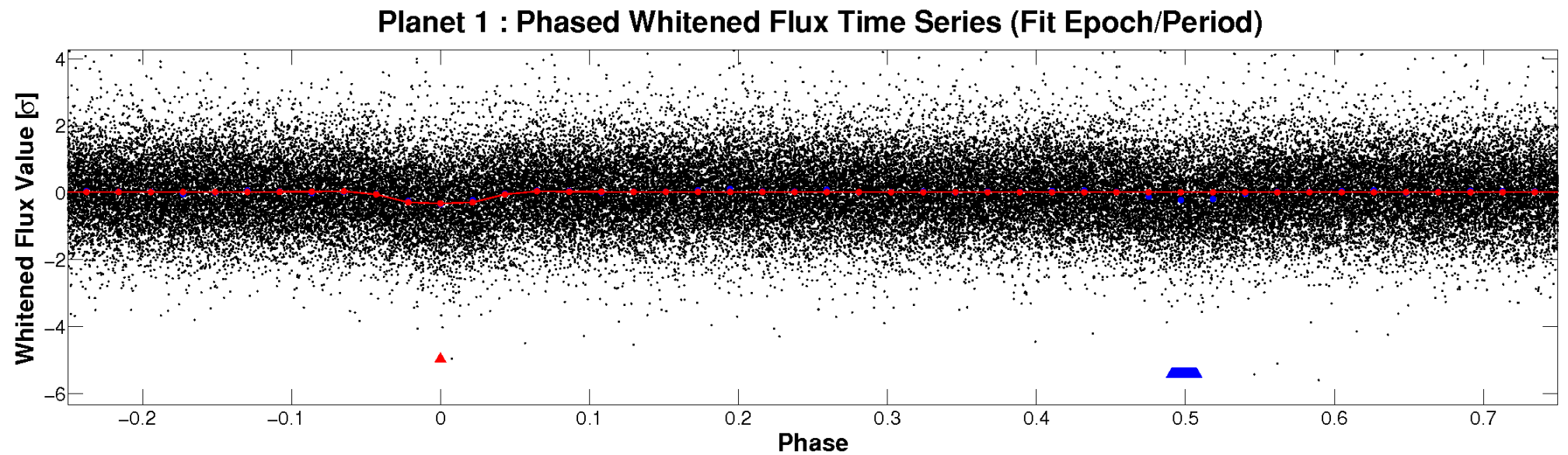
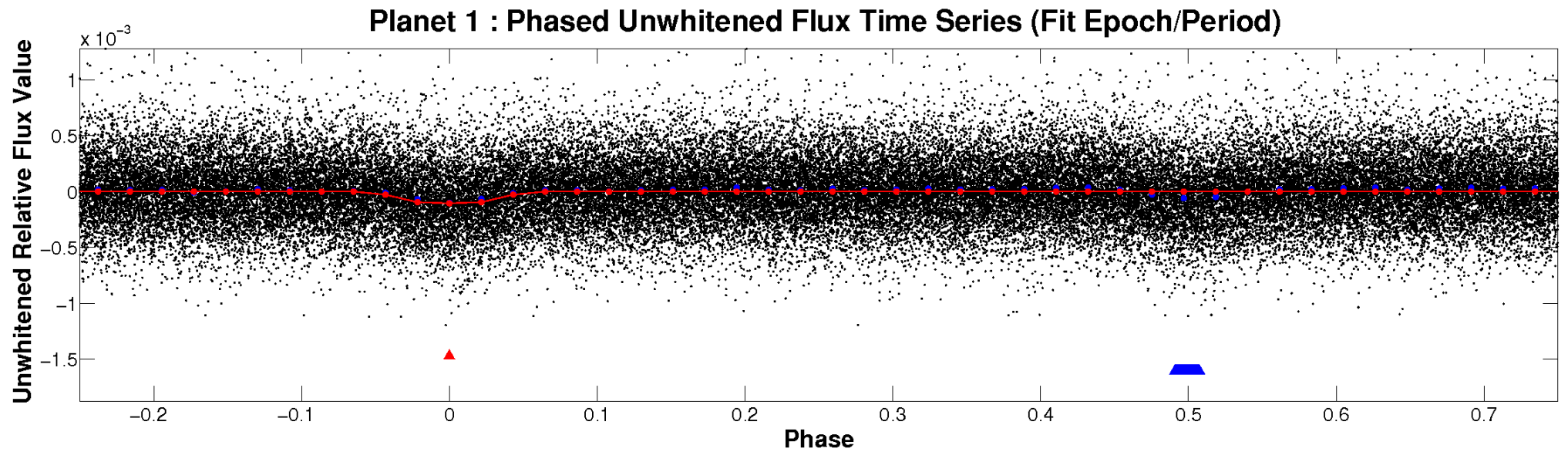


ALT Odd/Even

TCE 006778019-01

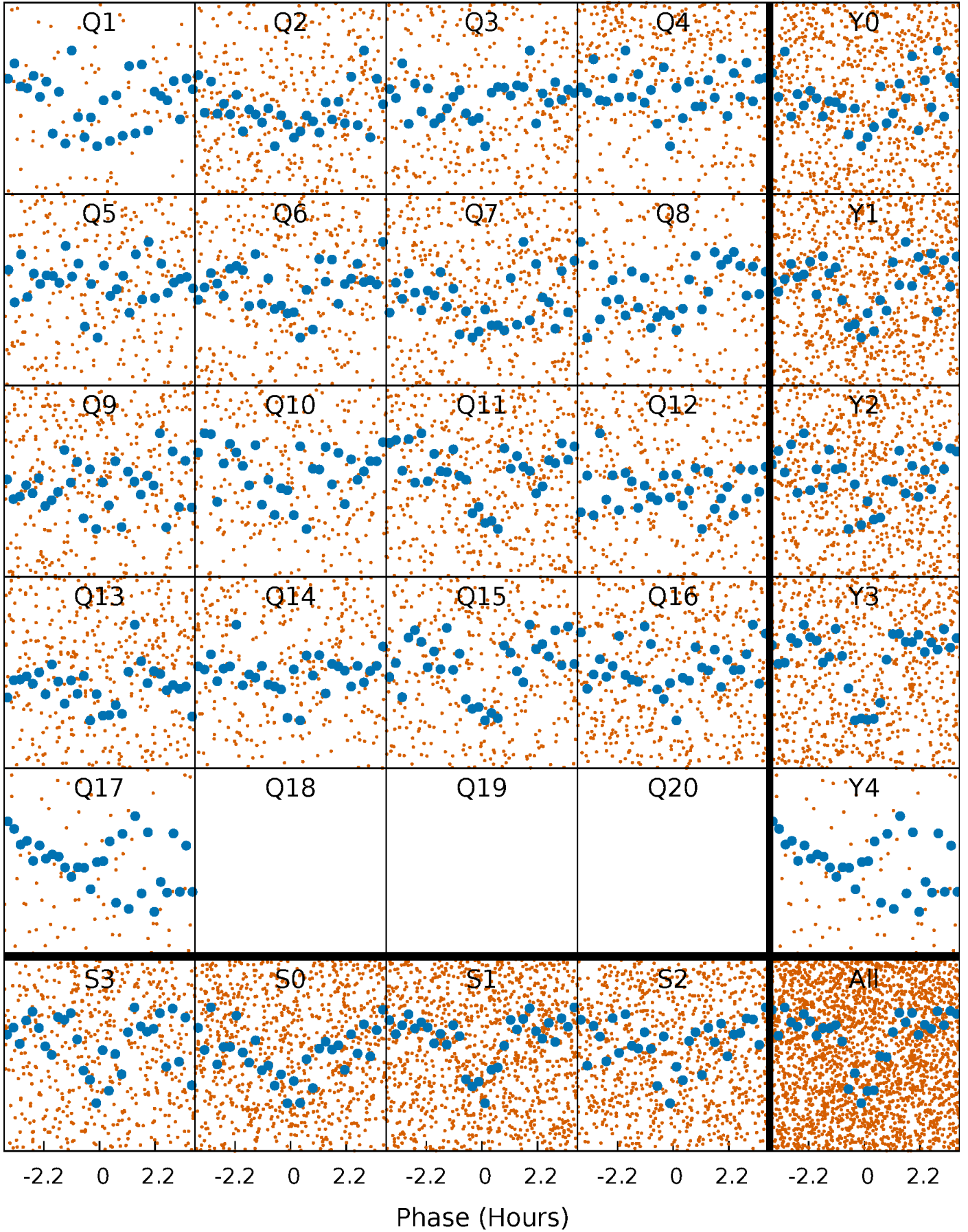


Non-Whitened Vs. Whitened Light Curve



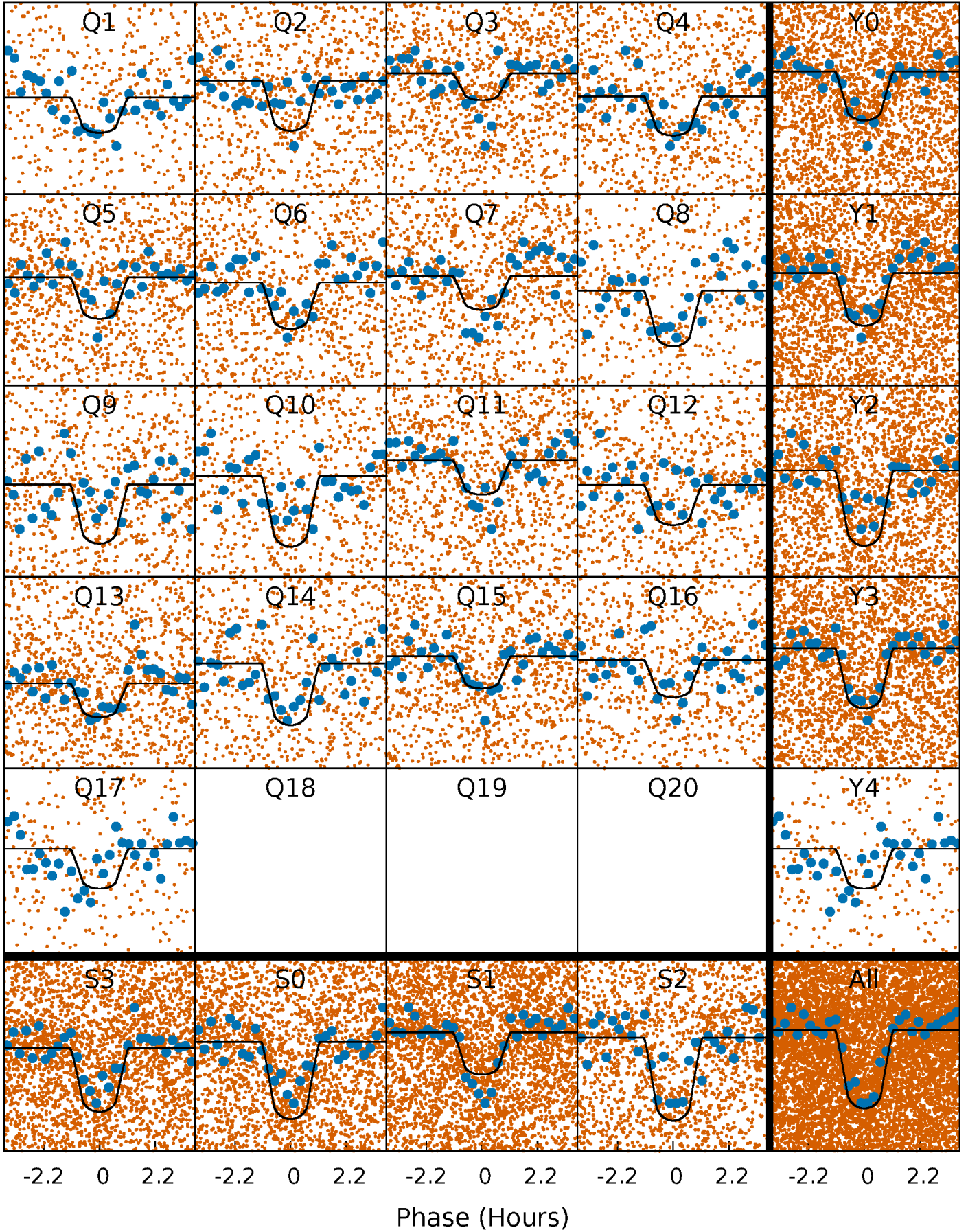
PDC Quarter-Phased Transit Curves

TCE 006778019-01 P= 0.945827 Days $T_0=131.621550$ (BKJD)



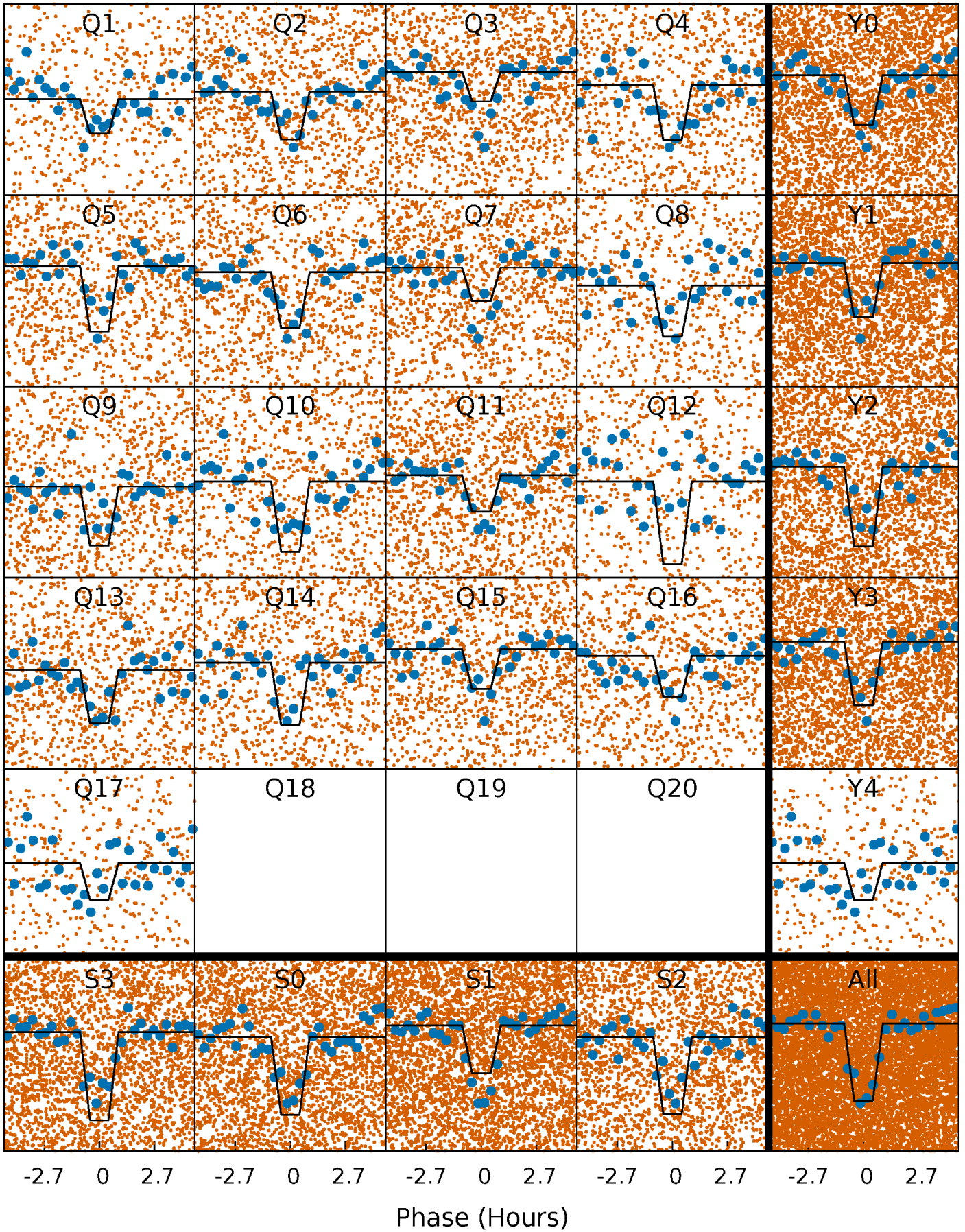
DV Quarter-Phased Transit Curves

TCE 006778019-01 P= 0.945827 Days $T_0=131.621550$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

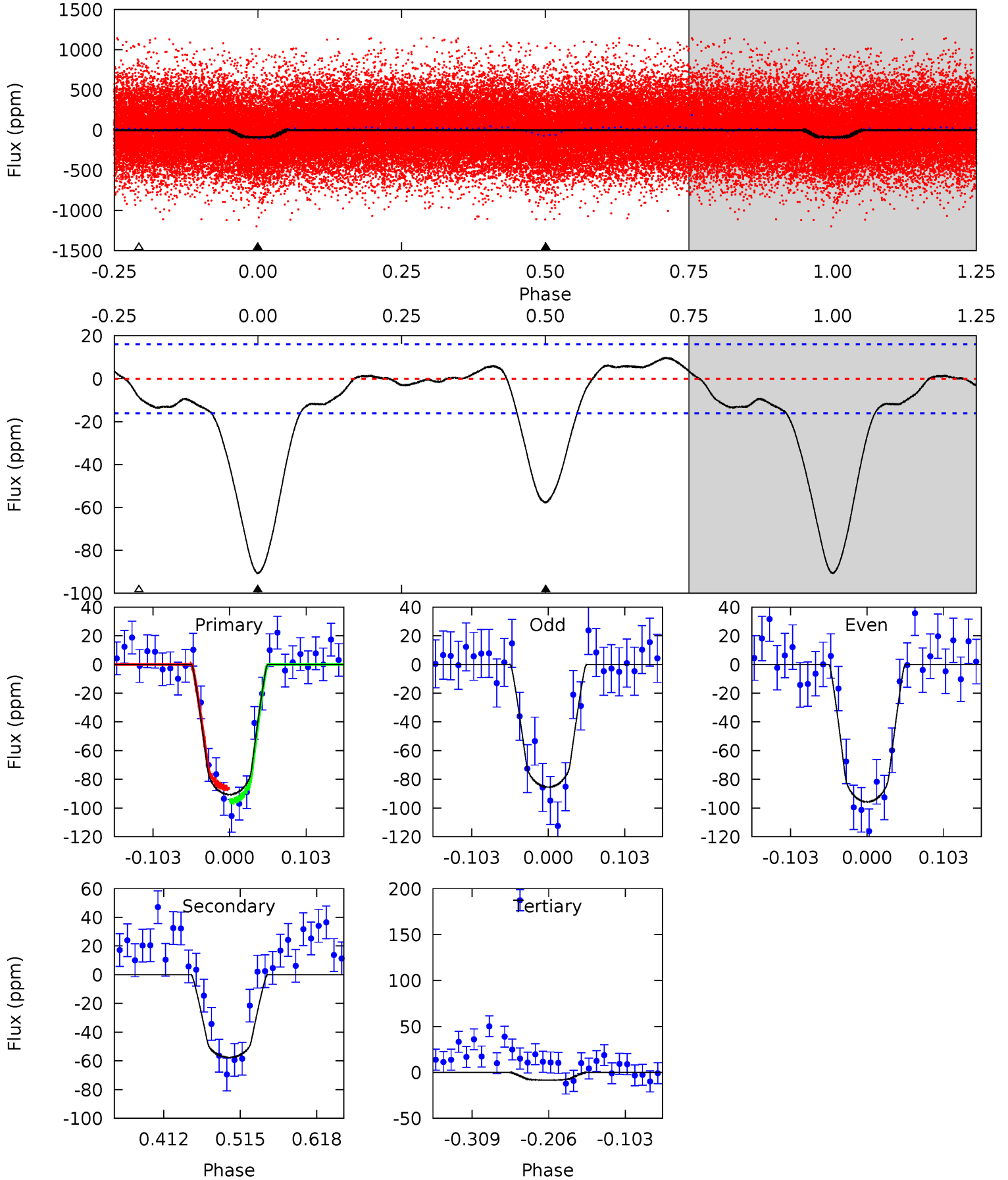
TCE 006778019-01 P= 0.945824 Days $T_0=131.624866$ (BKJD)



DV Model-Shift Uniqueness Test

006778019-01, P = 0.945827 Days, E = 130.675723 Days

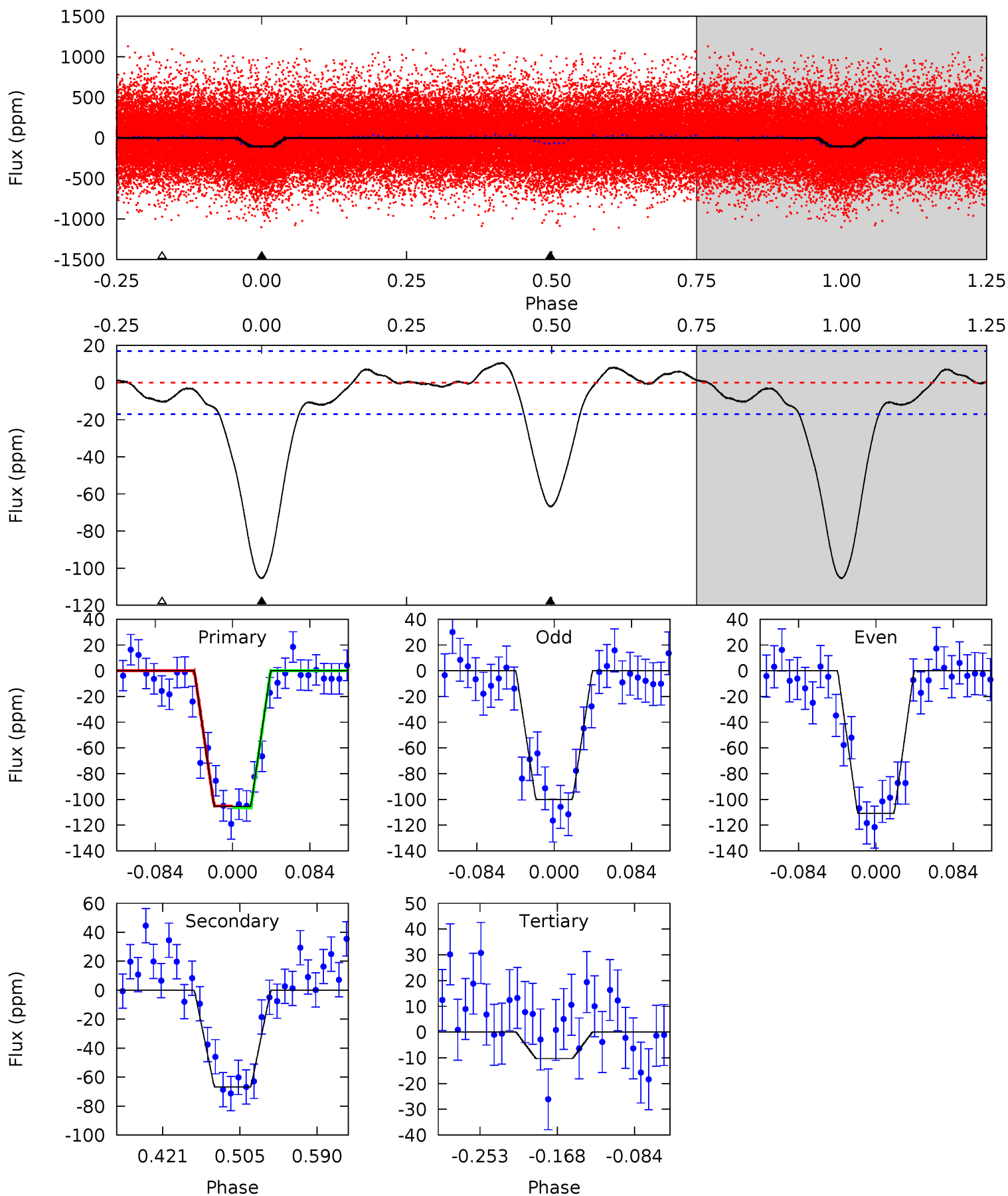
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.7	16.3	2.43	0	4.56	1.63	1.90	23.3	25.7	13.9	16.3	1.46	0.84	0.10	1.30



Alt Model-Shift Uniqueness Test

006778019-01, P = 0.945824 Days, E = 130.679042 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.5	18.1	2.78	0	4.60	1.73	1.58	25.7	28.5	15.3	18.1	1.45	0.95	0.09	0.16



Stellar Parameters For KIC 006778019

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6116^{+169}_{-232}	$4.440^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.084^{+0.355}_{-0.118}$	$1.181^{+0.136}_{-0.166}$	$1.307^{+0.377}_{-0.726}$
	+3%/-4%	+1%/-5%	+71%/-167%	+33%/-11%	+12%/-14%	+29%/-56%
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 006778019-01 / KOI 2953.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-58 ± 4	$1.33^{+0.50}_{-0.47}$	2835^{+217}_{-140}	5105^{+1285}_{-629}	$6.875^{+9.393}_{-3.247}$
Alt.	-67 ± 4	$1.29^{+0.47}_{-0.44}$	2834^{+195}_{-157}	5366^{+1301}_{-656}	$8.454^{+12.004}_{-3.920}$

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 $A_{obs} \gg 1.0$

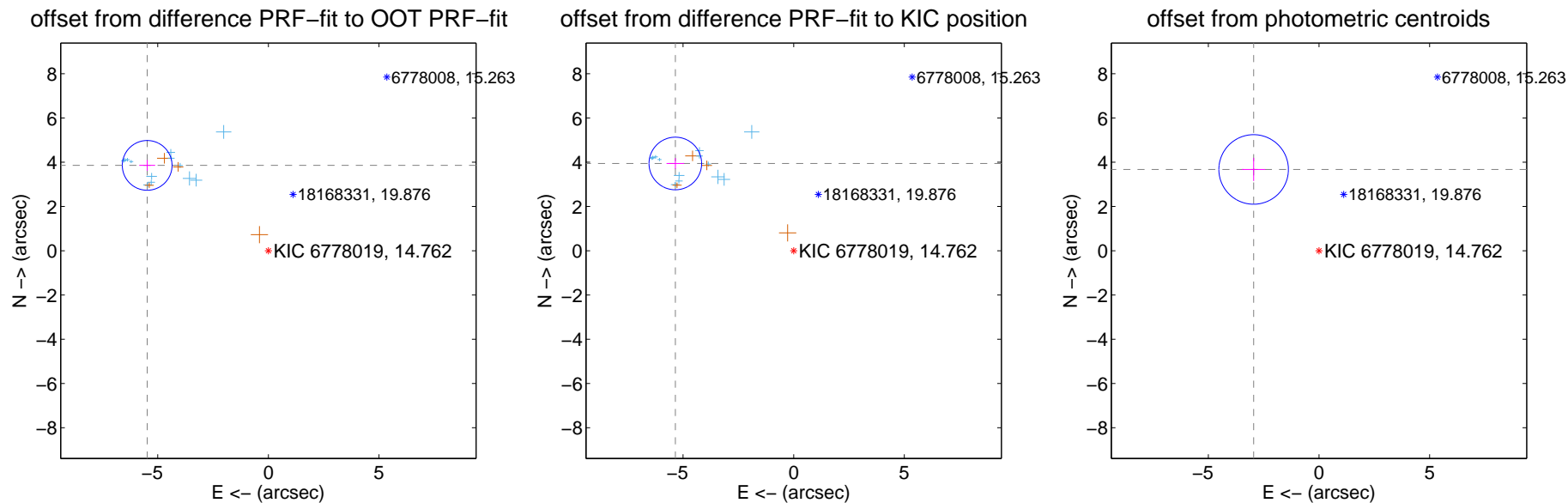
DV Centroid Data

Supplemental centroid analysis for 006778019-01. Kepler magnitude: 14.76. Transit SNR 19.93

There are 13 quarters with good PRF difference image offsets

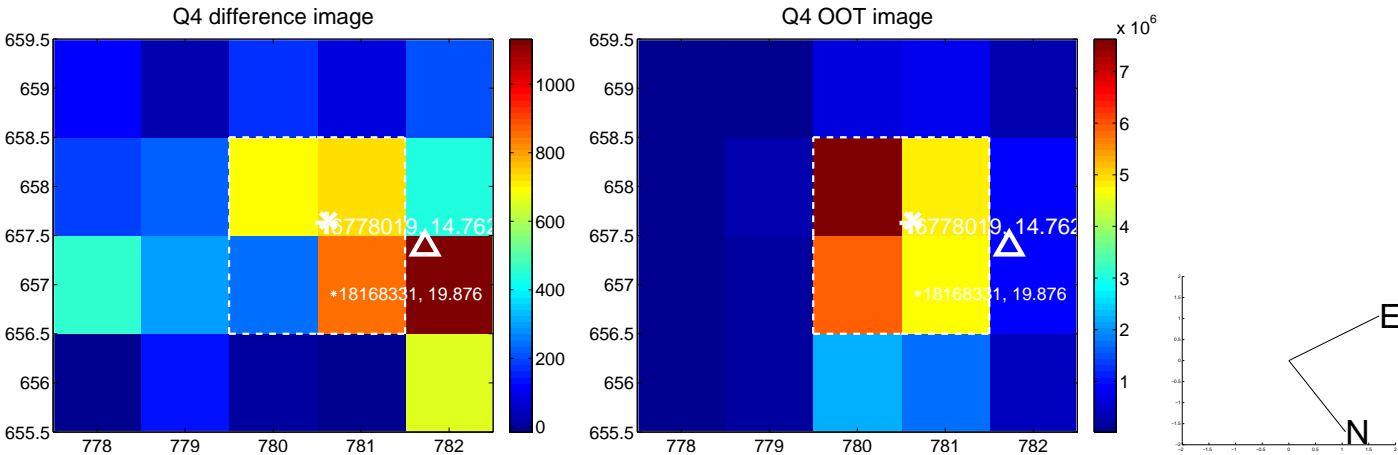
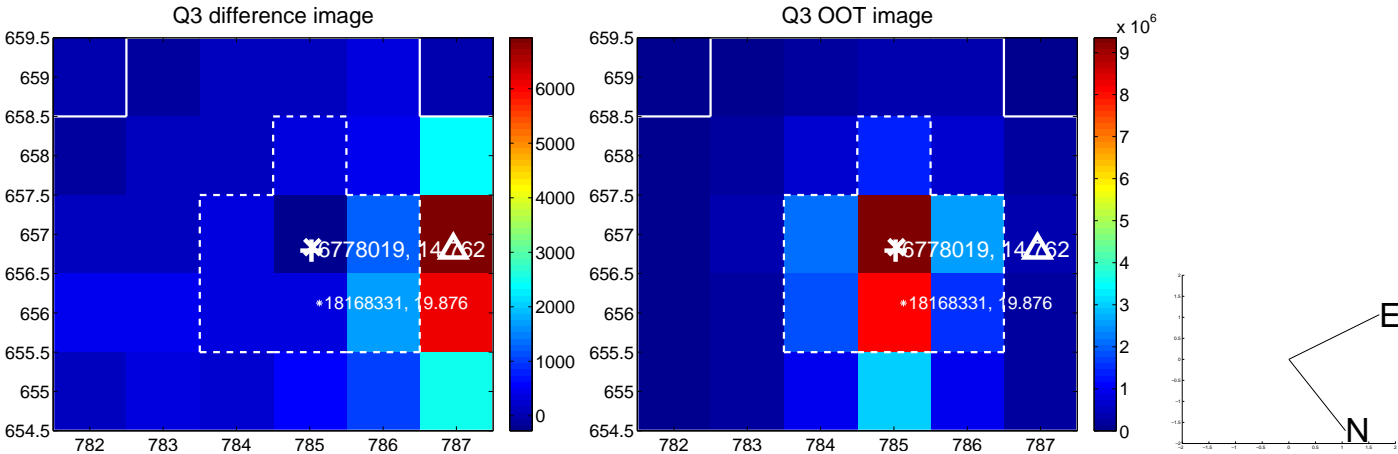
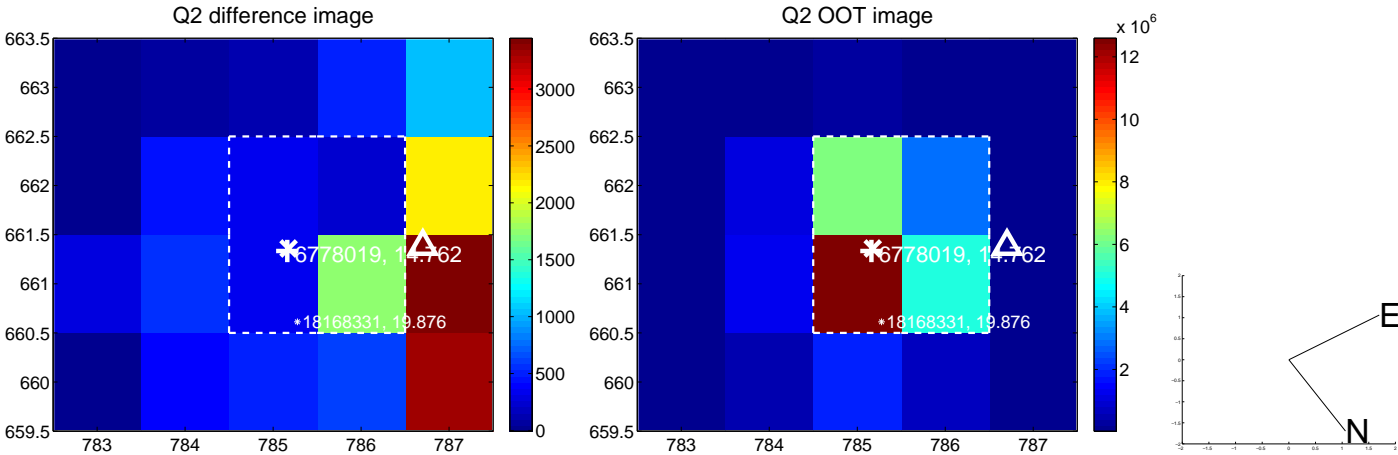
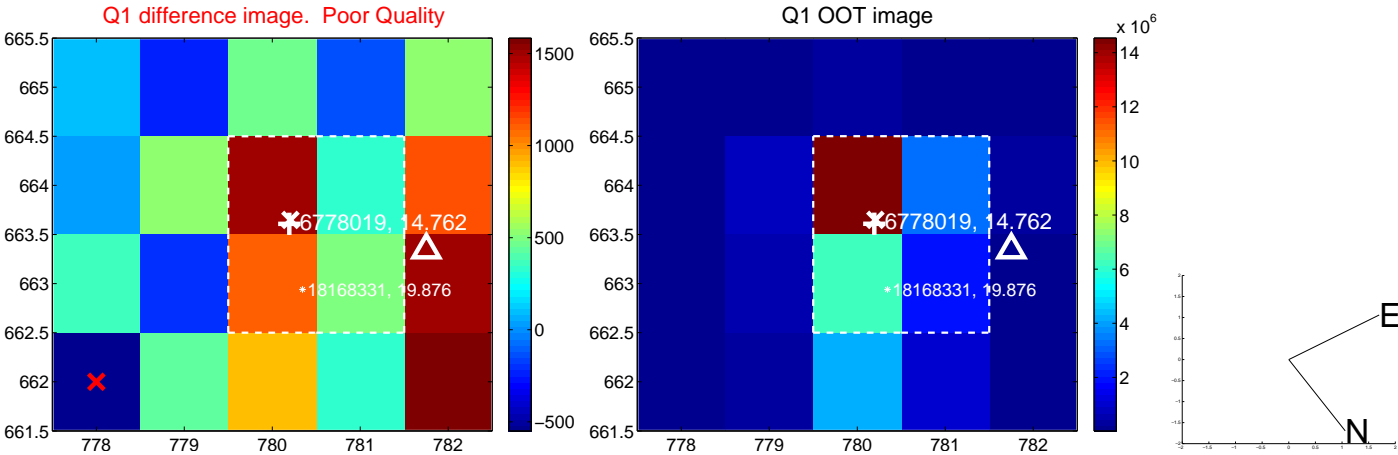
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.698 ± 0.375	17.88	5.476 ± 0.360	3.856 ± 0.242
PRF-fit source offset from KIC position	6.644 ± 0.396	16.77	5.348 ± 0.400	3.942 ± 0.244
photometric centroid source offset	4.71 ± 0.52	9.00	2.95 ± 0.53	3.67 ± 0.52

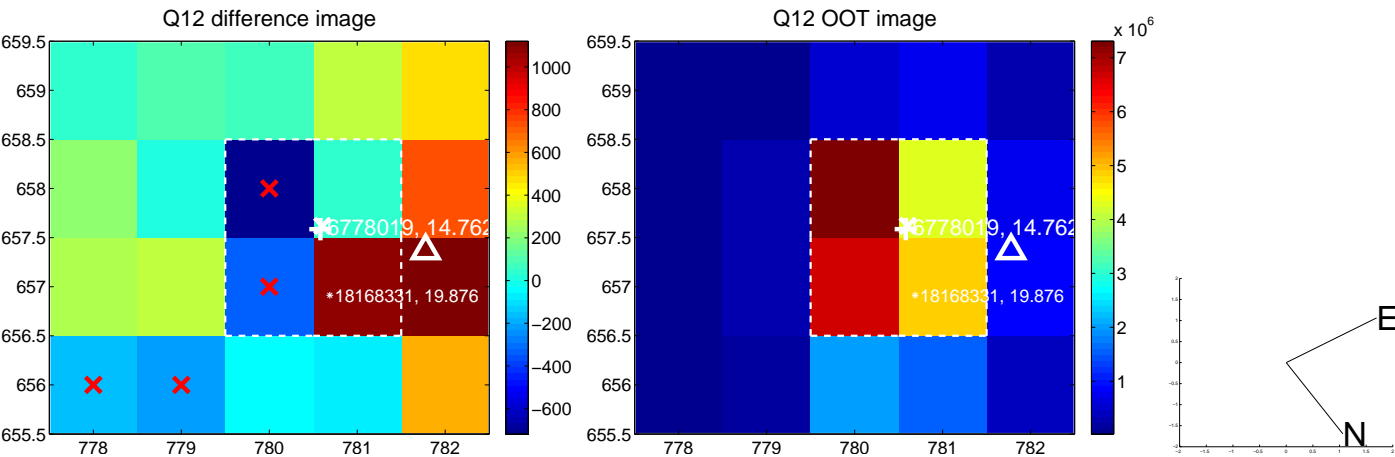
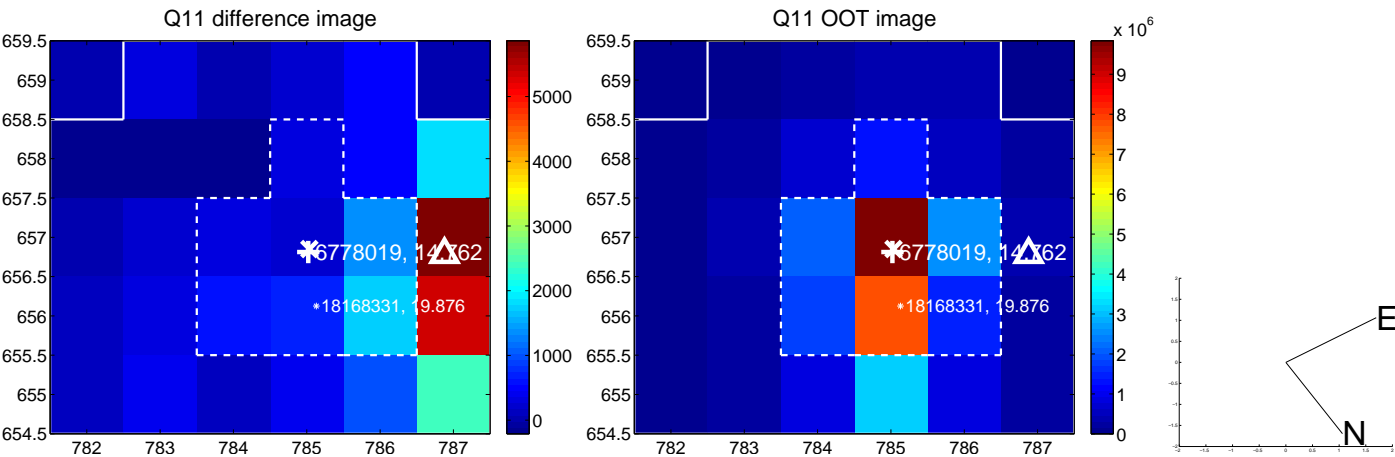
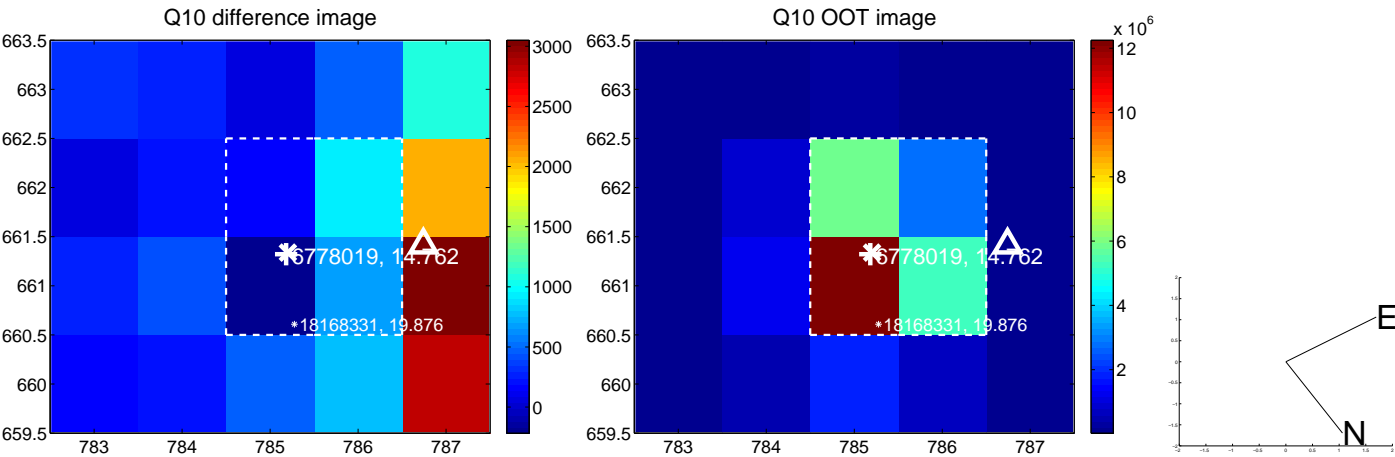
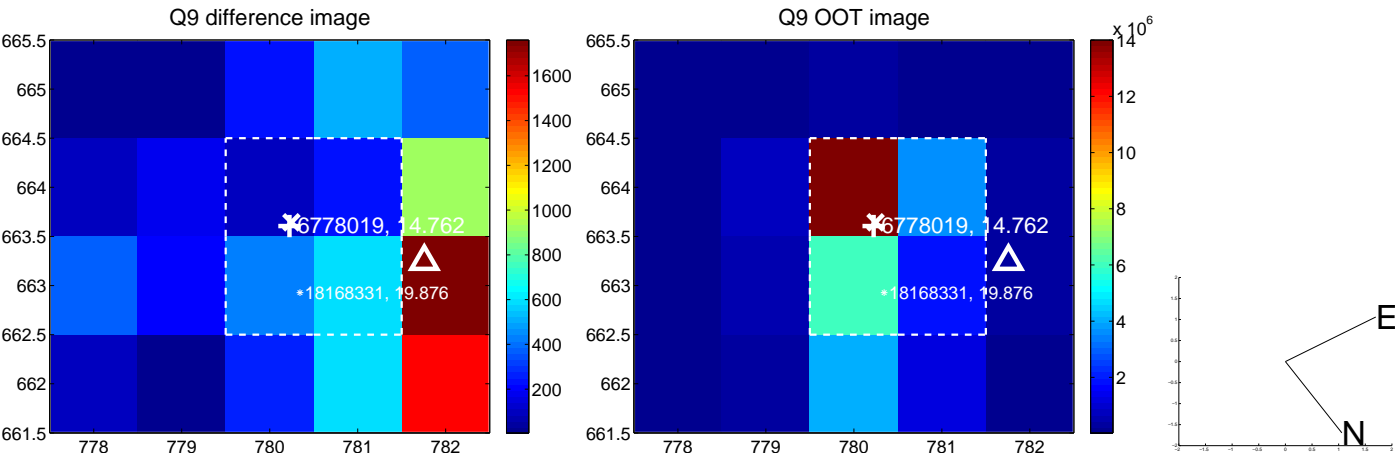


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

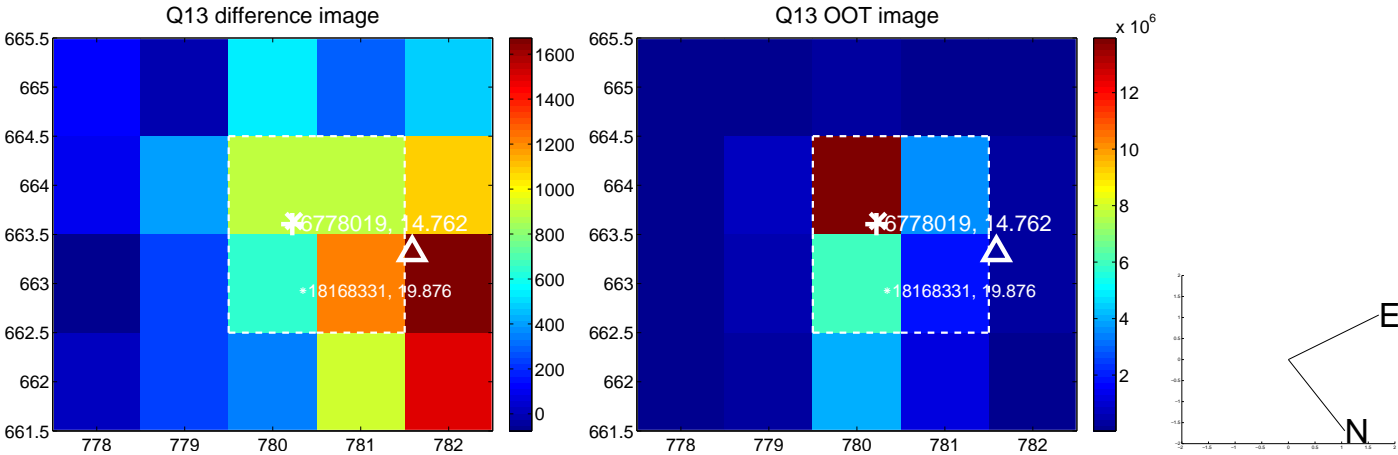
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



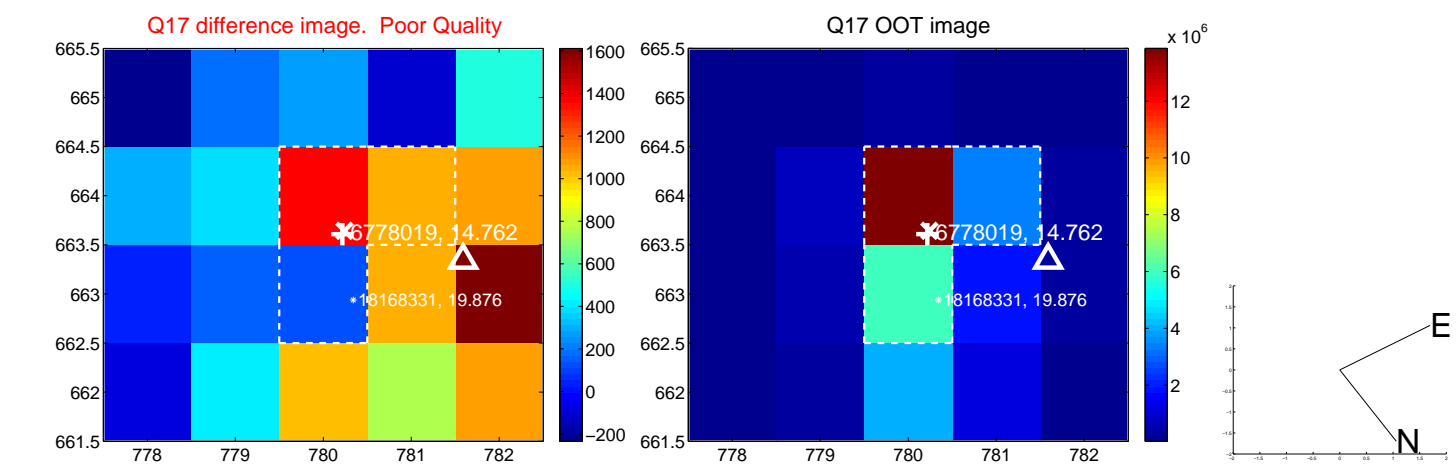
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



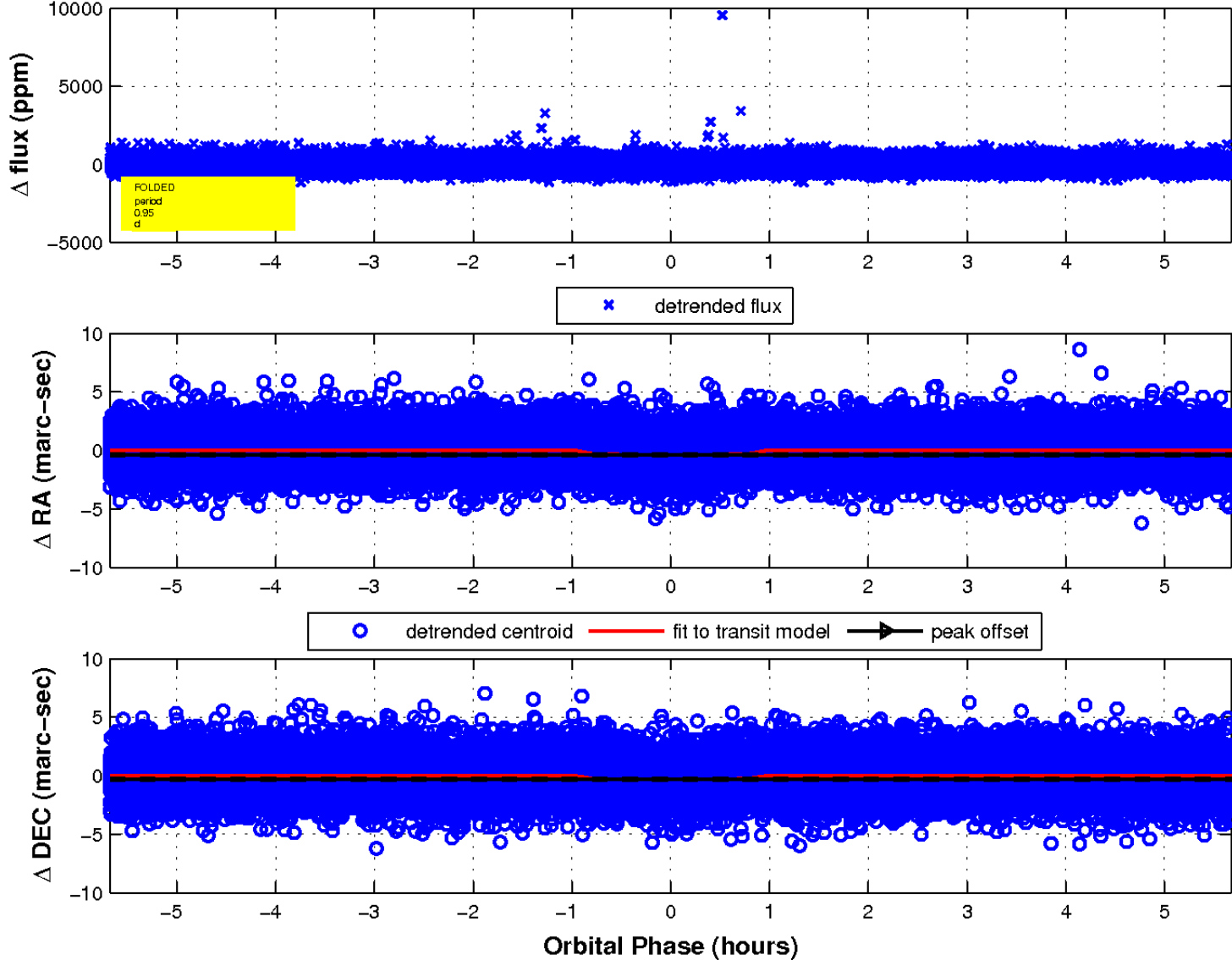
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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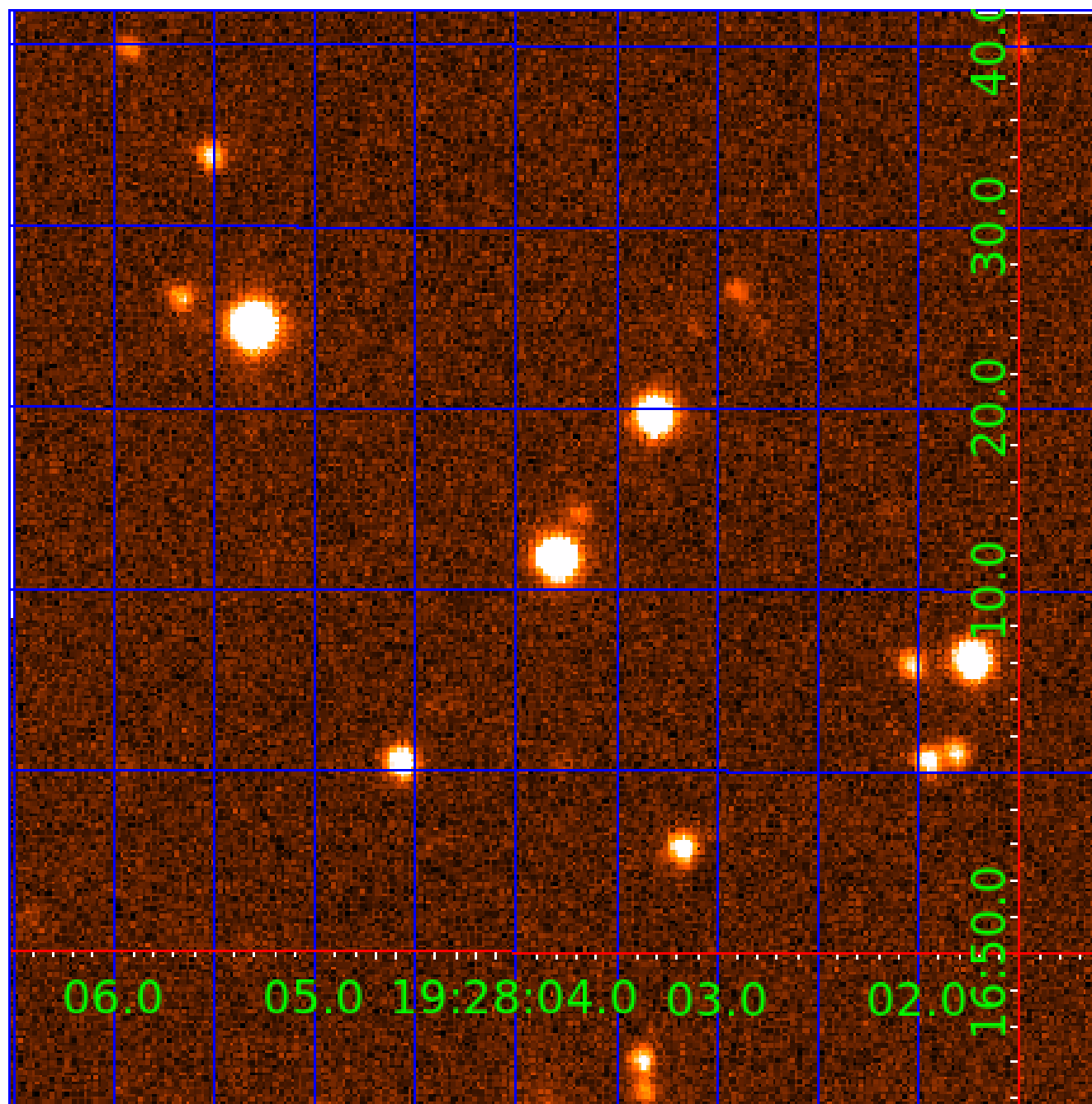


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 006778019

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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006778019-02	OBS	No	0.945817	132.101510	73.9	1.797	12.1	14.3	1.08	6116	1.11	3707.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006778019-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—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 006778019-02

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
006778019-02	6778019	006778050-sec	6778050	1:1	21.1	0	-5	14.51	14.76	3210.80	Direct-PRF	0	1.12	0.68

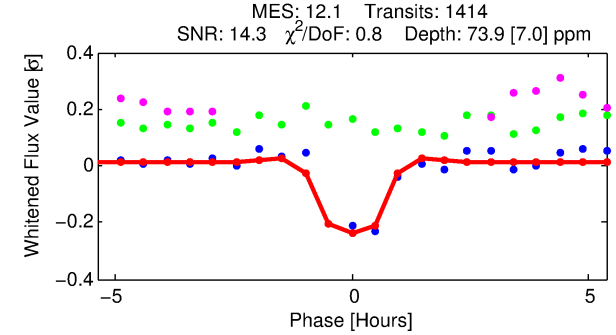
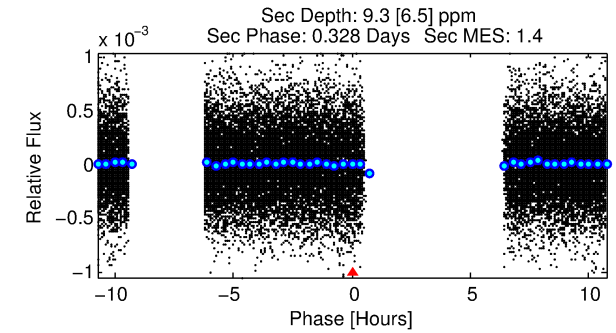
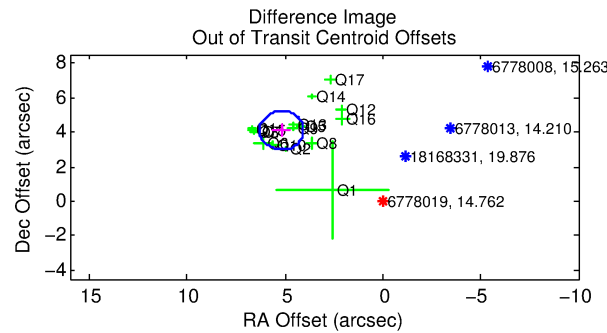
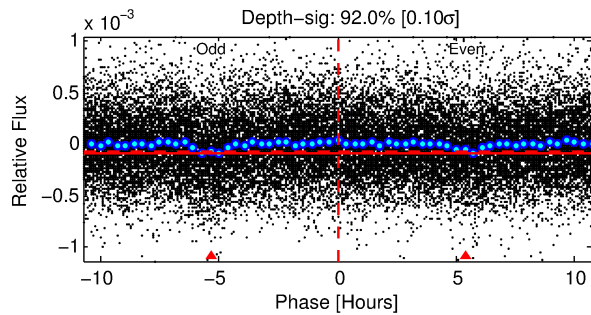
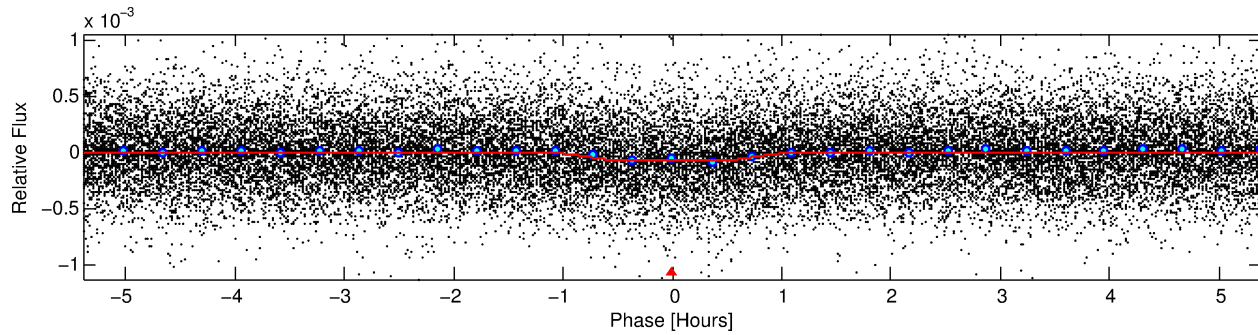
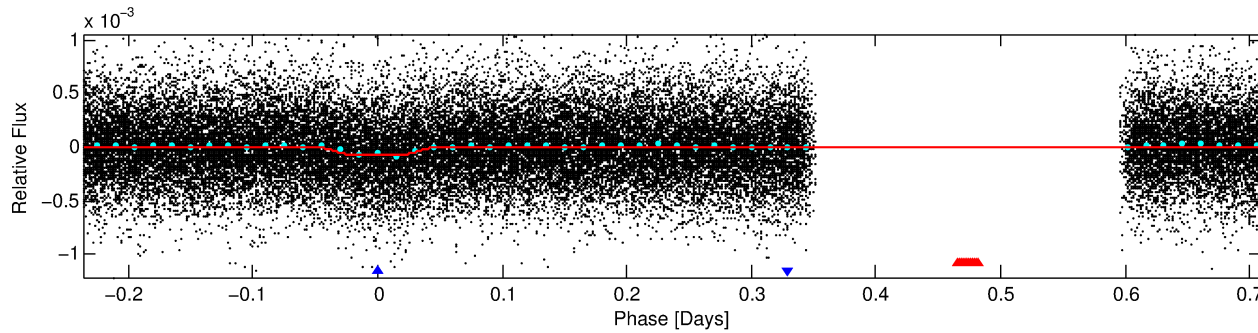
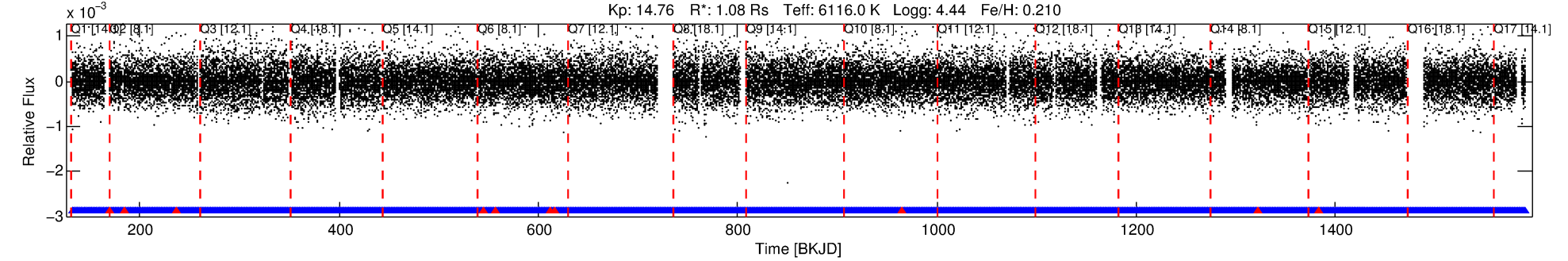
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 6778019 Candidate: 2 of 2 Period: 0.946 d

KOI: K02953 Corr: No Ephemeris Match

Kp: 14.76 R*: 1.08 Rs Teff: 6116.0 K Logg: 4.44 Fe/H: 0.210



DV Fit Results:

Period = 0.94582 [0.00001] d
Epoch = 132.1015 [0.0017] BKJD
Rp/R* = 0.0094 [0.0036]
a/R* = 2.05 [3.01]
b = 0.90 [0.41]
Seff = 3707.16 [1575.56]
Teq = 1990 [211] K
Rp = 1.11 [0.56] Re
a = 0.0199 [0.0055] AU
Ag = 1.66 [1.84] [0.36σ]
Teffp = 3494 [911] K [1.61σ]

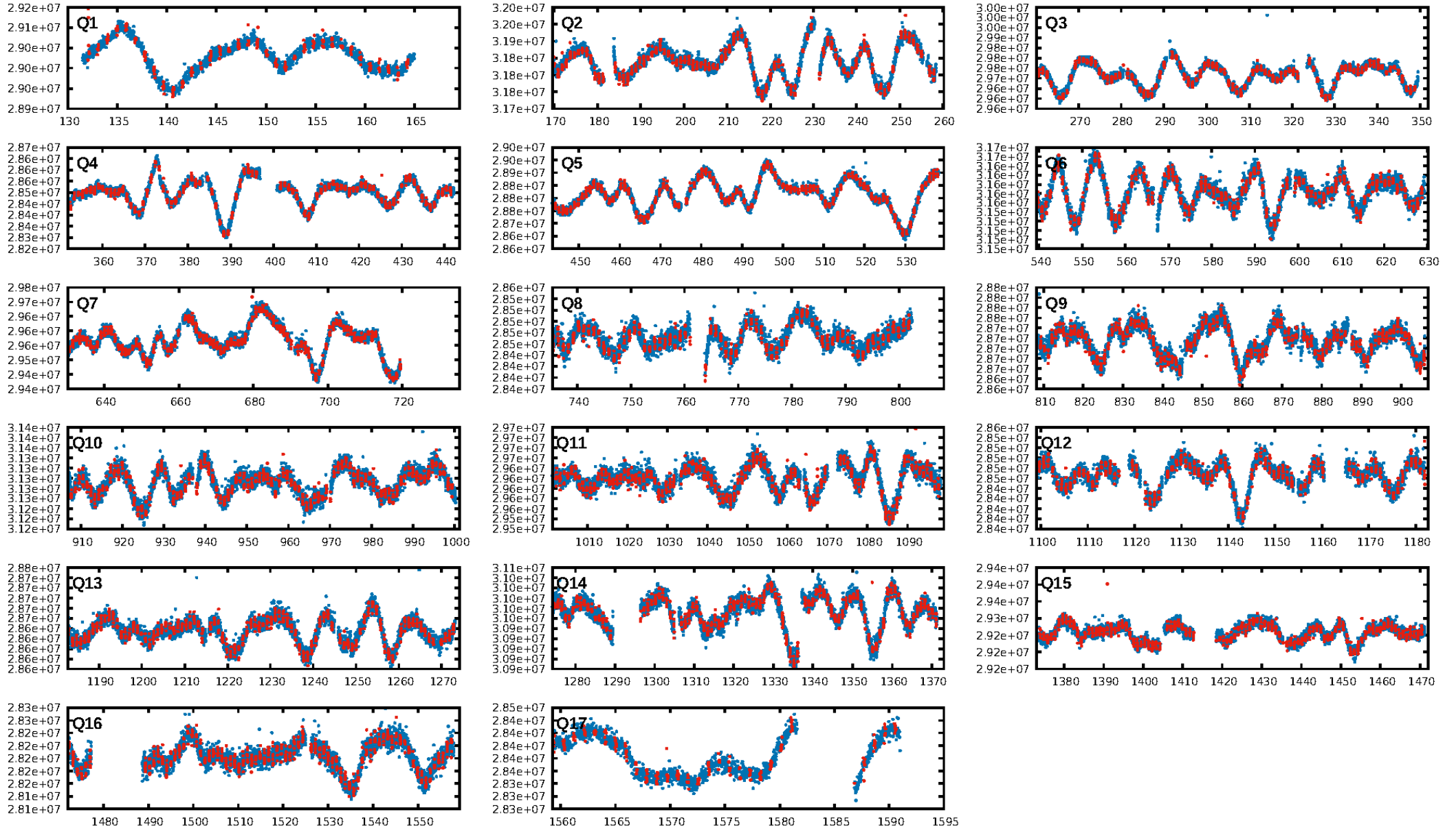
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.48e-36
RollingBand-fgt: 0.99 [1341/1351]
GhostDiagnostic-chr: -0.8726
Centroid-sig: 0.0%
Centroid-so: 3.028 arcsec [3.98σ]
OotOffset-rm: 6.614 arcsec [17.72σ]
KicOffset-rm: 6.597 arcsec [20.00σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.81 [13/16]
DiffImageOverlap-fno: 1.00 [17/17]

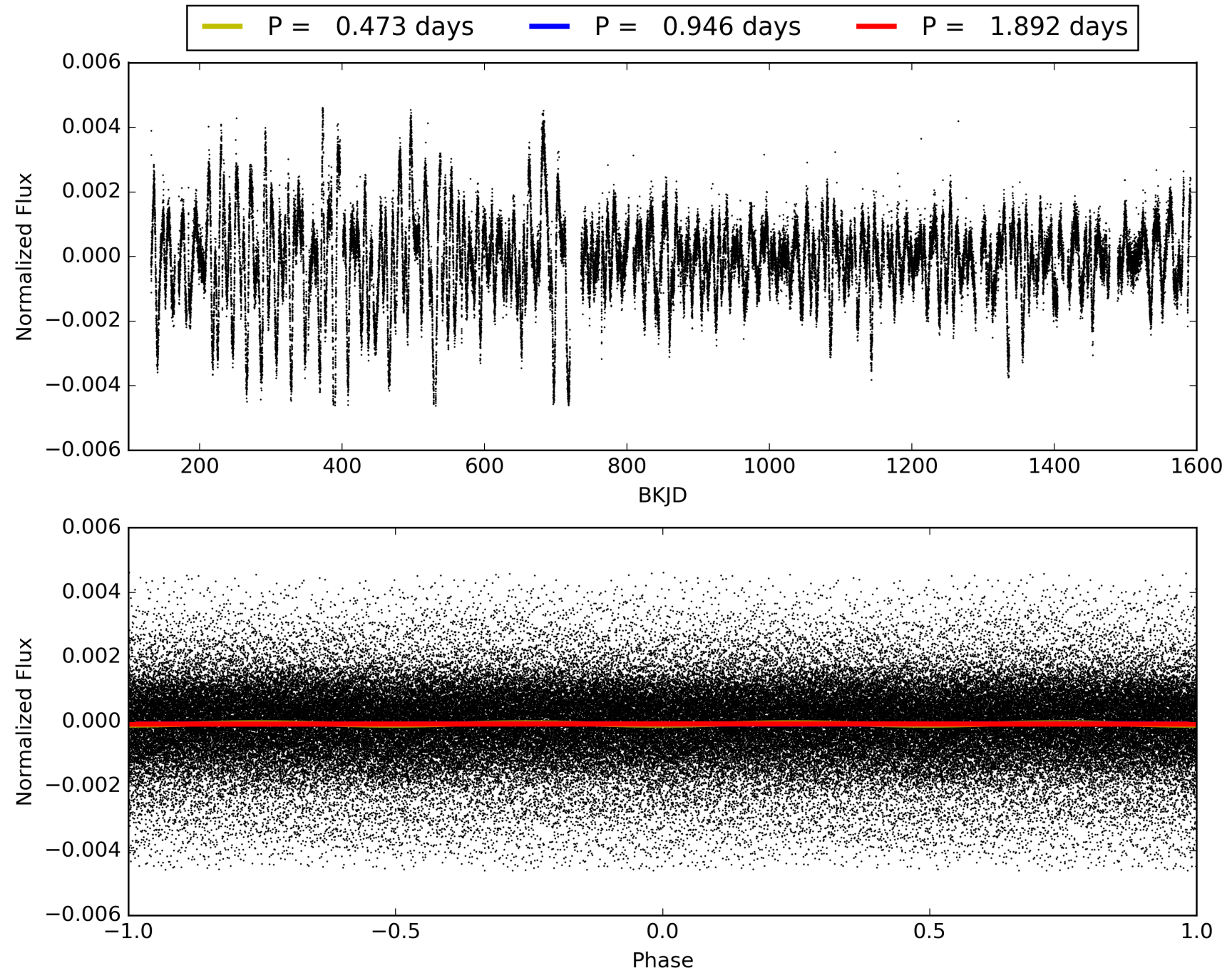
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 01:52:54 Z

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TCE 006778019-02, PDC Light Curves

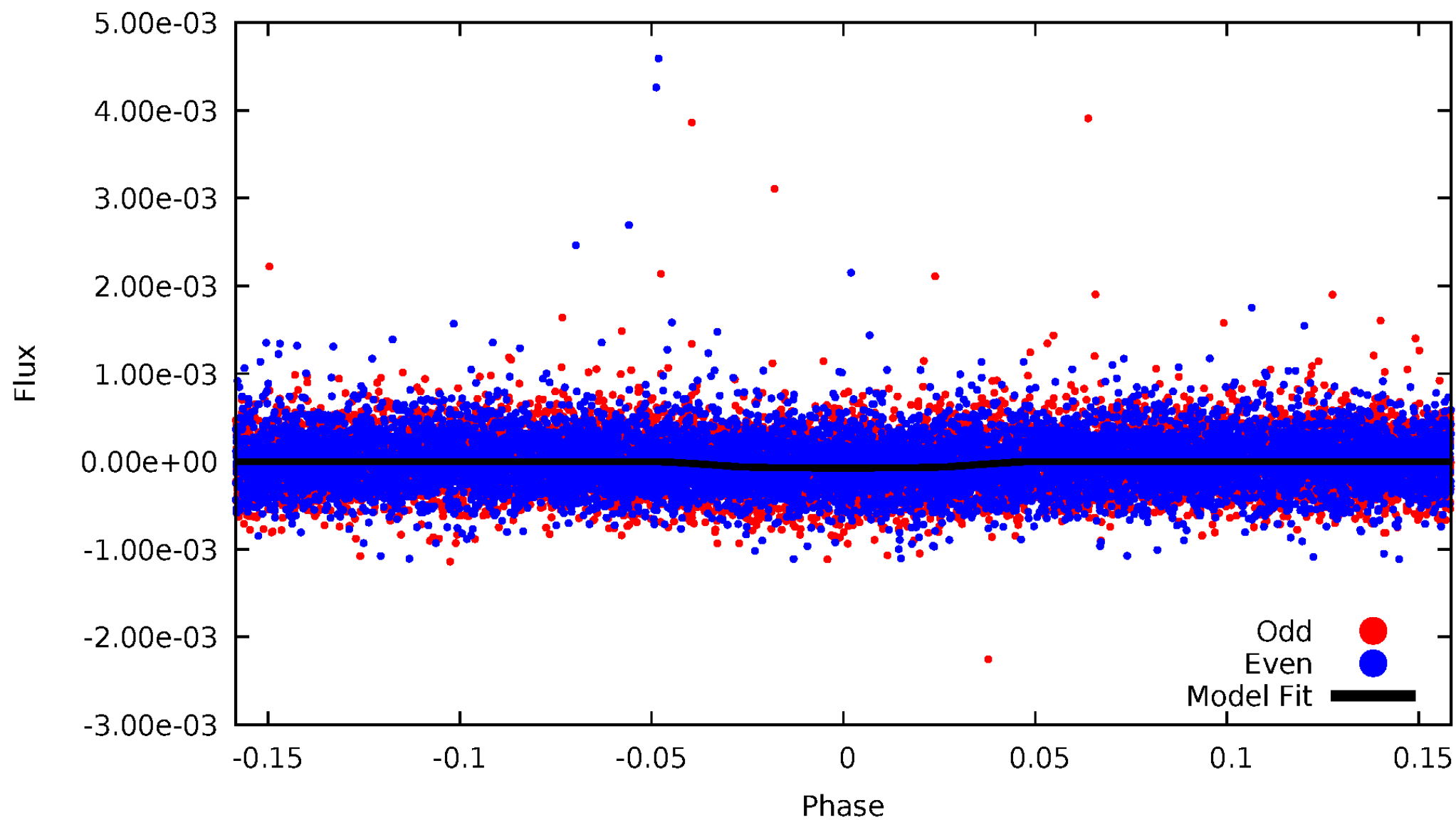


TCE 006778019-02



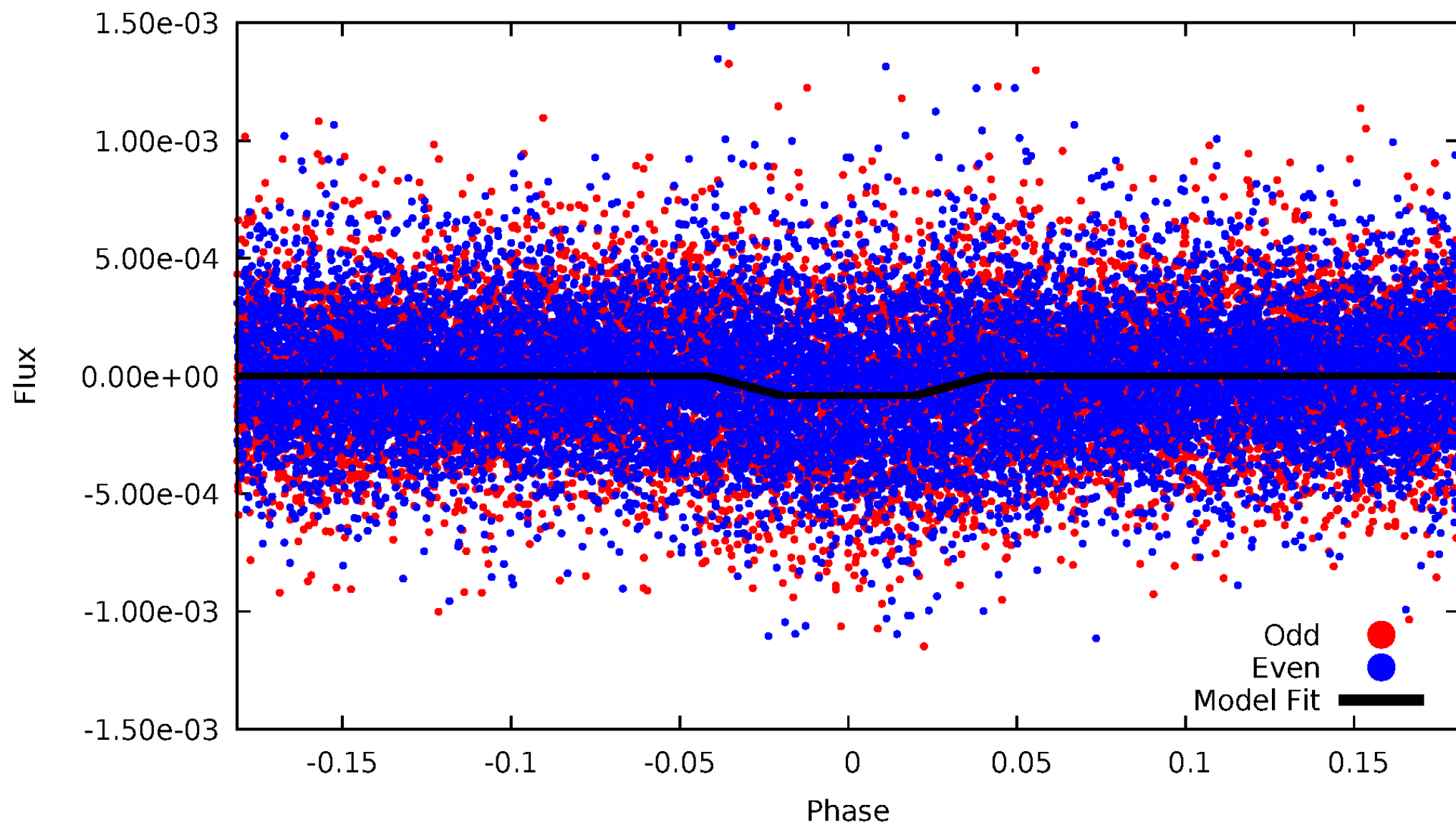
DV Odd/Even

TCE 006778019-02



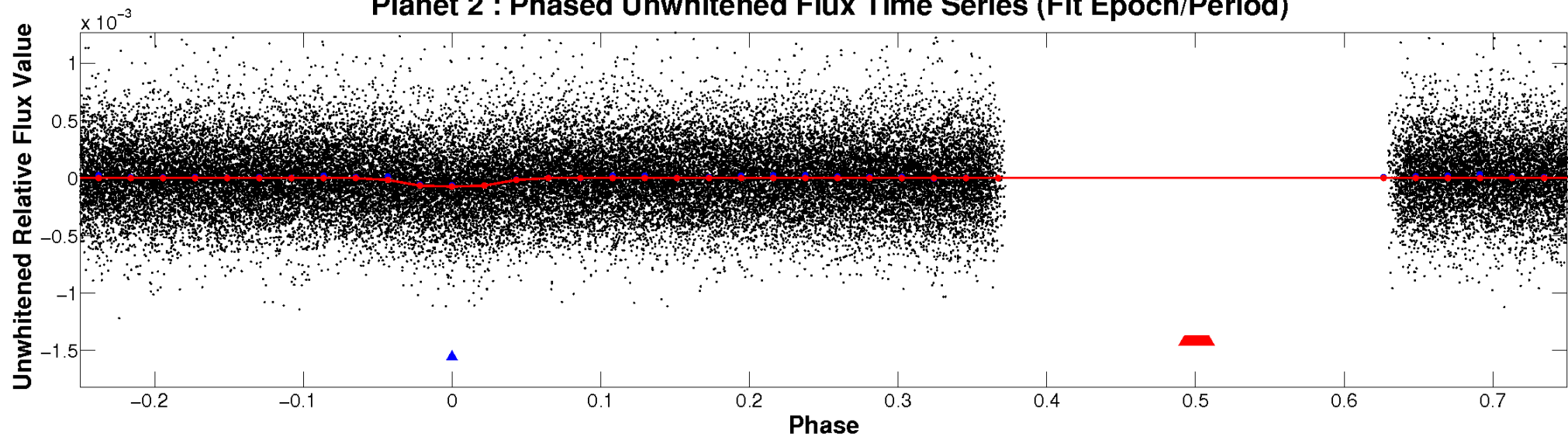
ALT Odd/Even

TCE 006778019-02

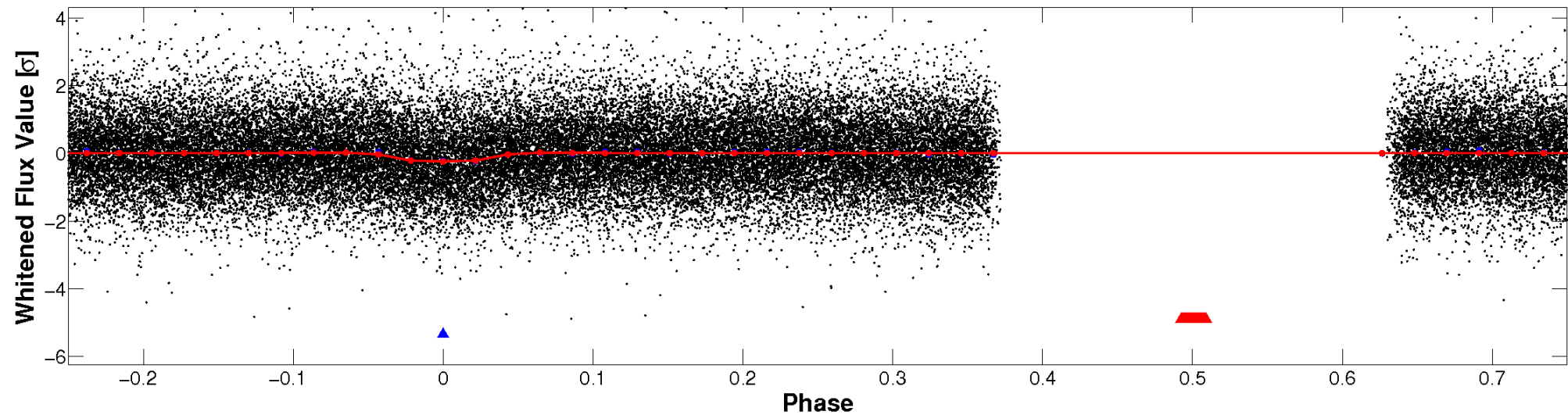


Non-Whitened Vs. Whitened Light Curve

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

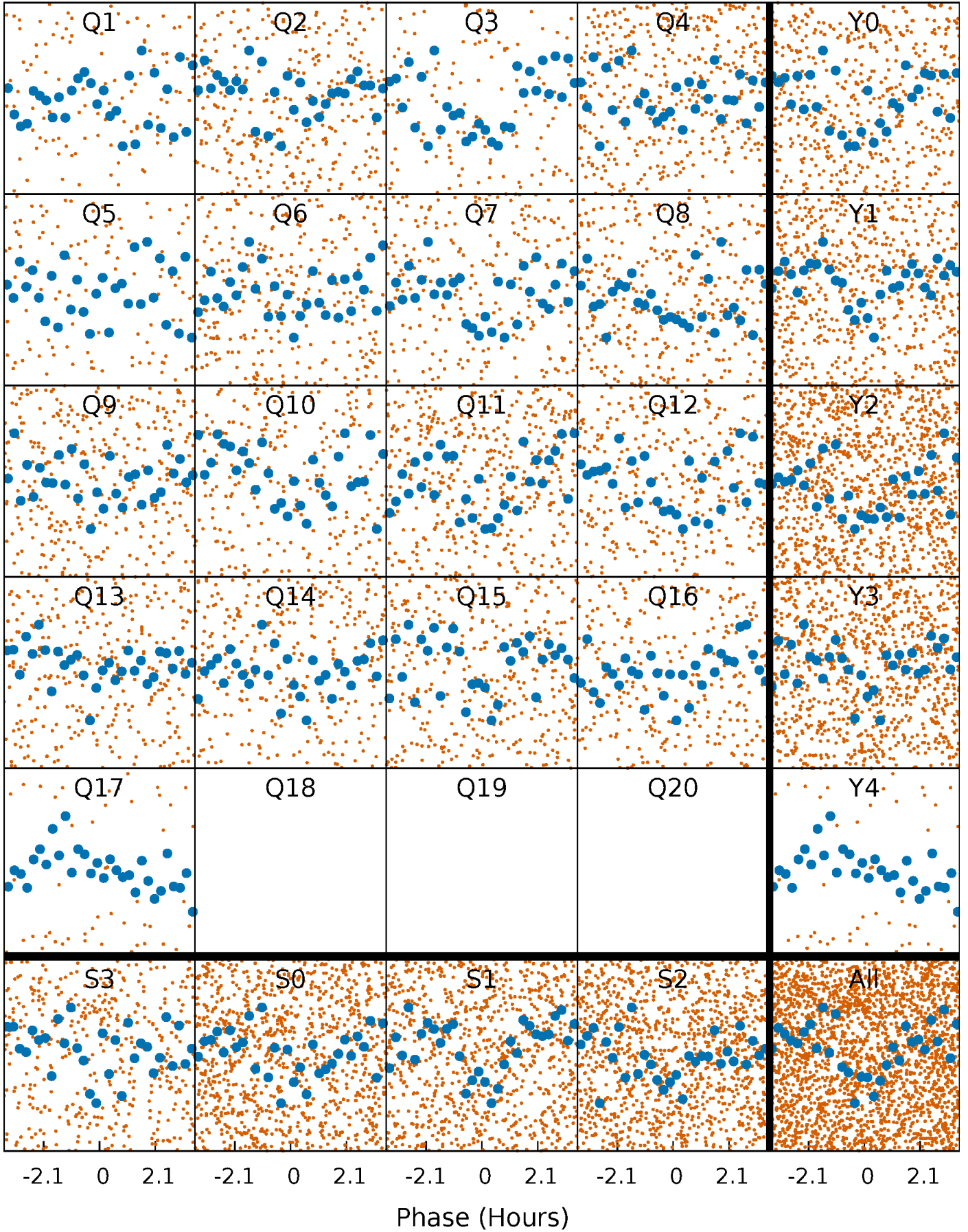


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



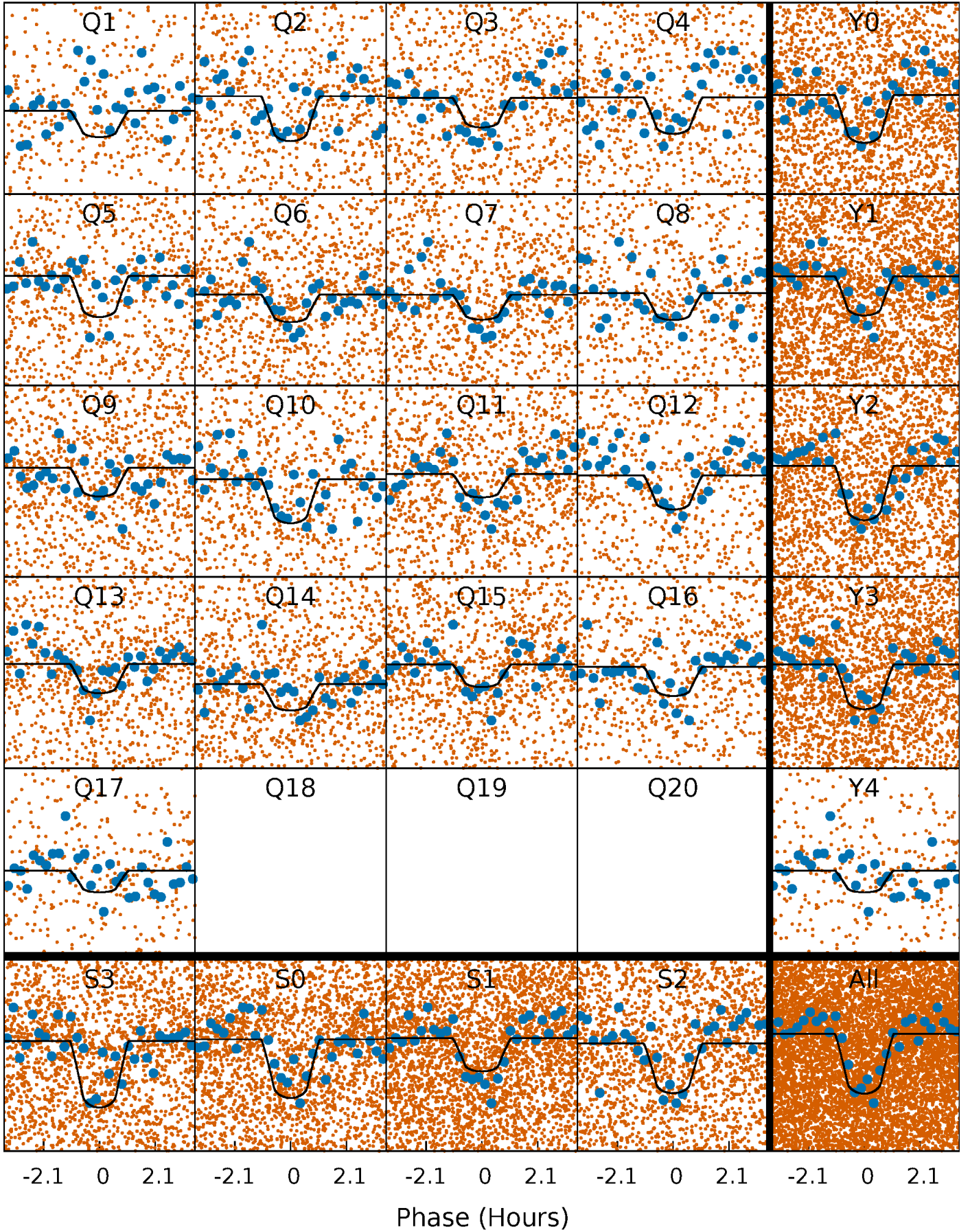
PDC Quarter-Phased Transit Curves

TCE 006778019-02 P= 0.945817 Days $T_0=132.101510$ (BKJD)



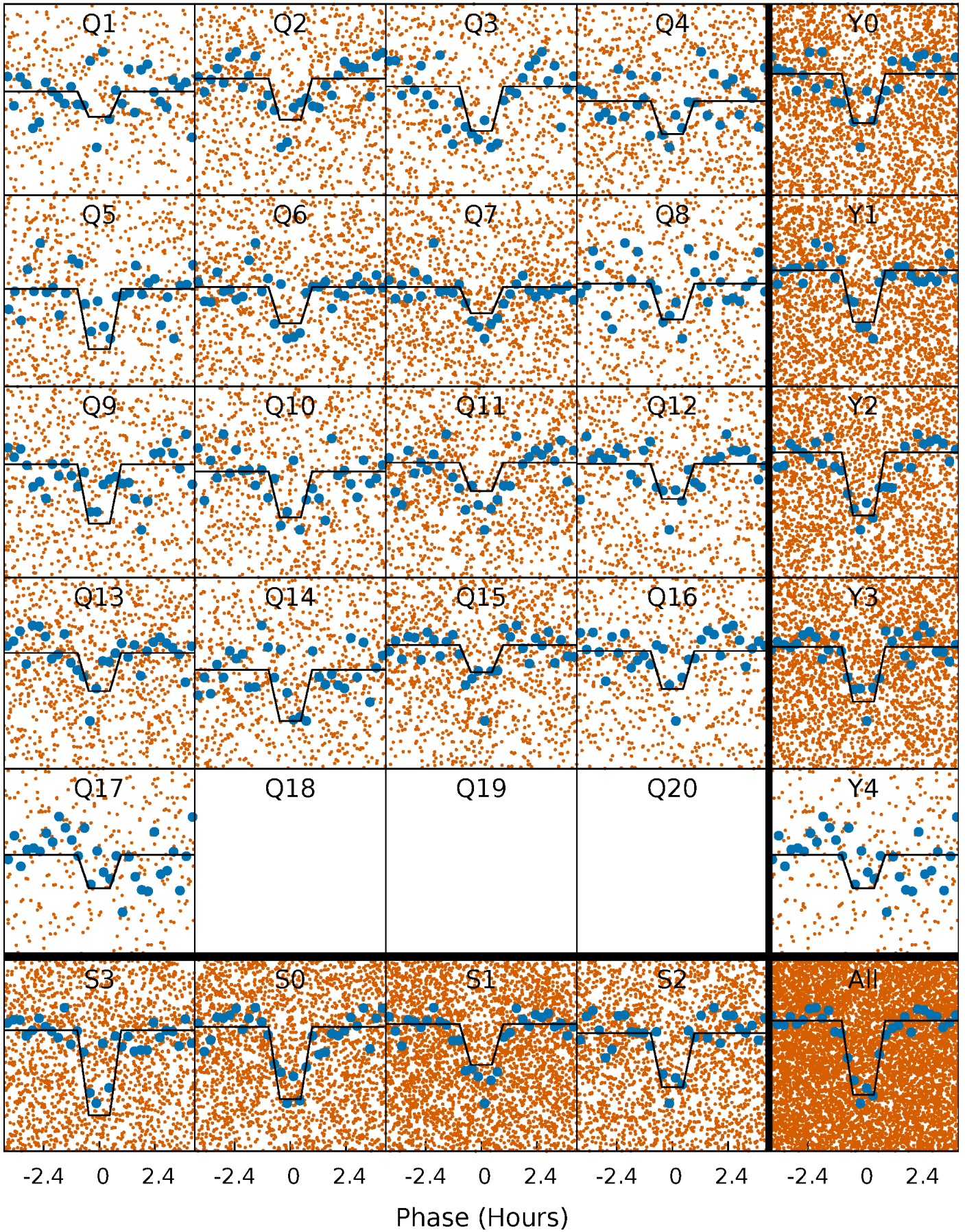
DV Quarter-Phased Transit Curves

TCE 006778019-02 P= 0.945817 Days $T_0=132.101510$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

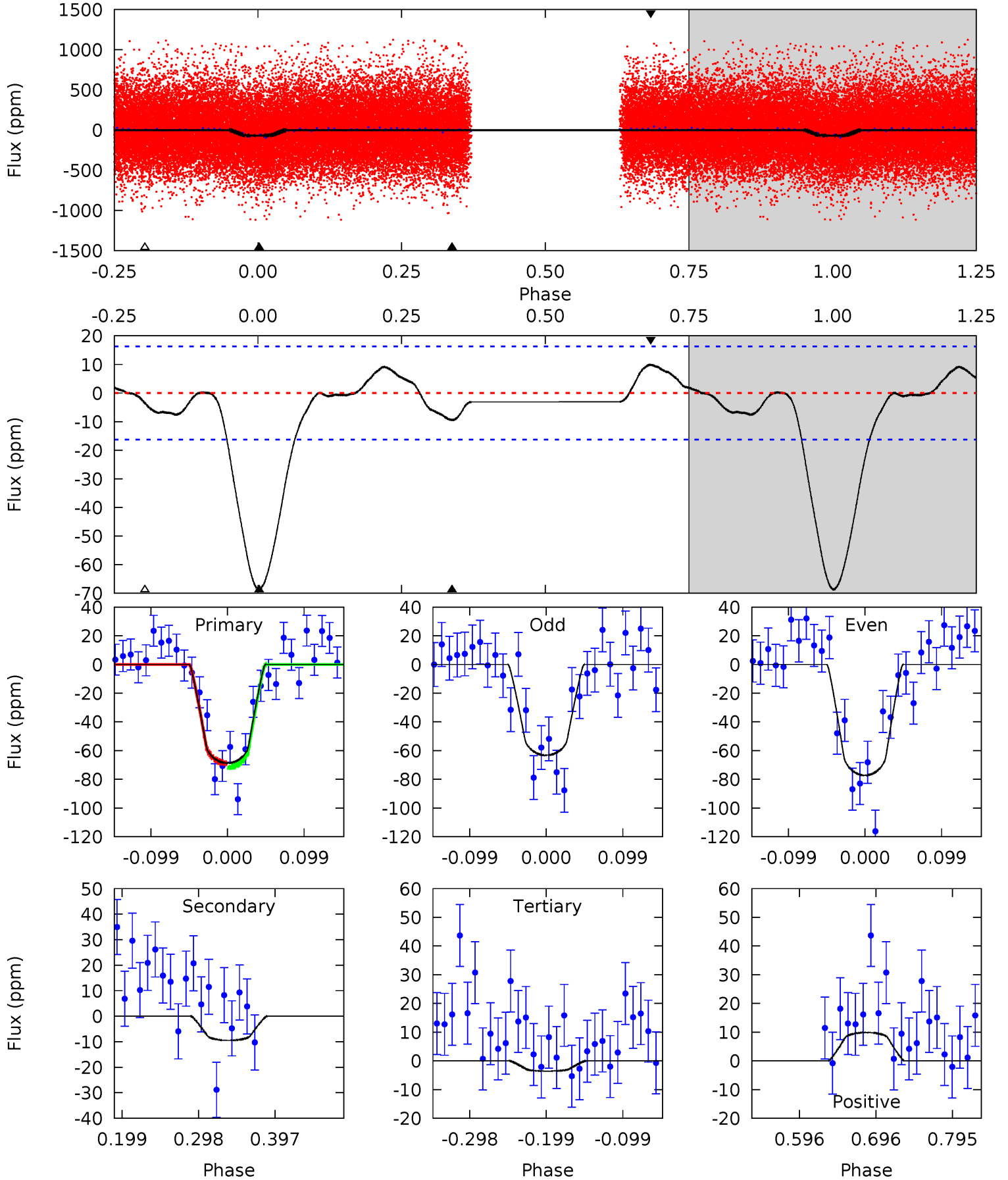
TCE 006778019-02 P= 0.945824 Days $T_0=132.097366$ (BKJD)



DV Model-Shift Uniqueness Test

006778019-02, P = 0.945817 Days, E = 131.155693 Days

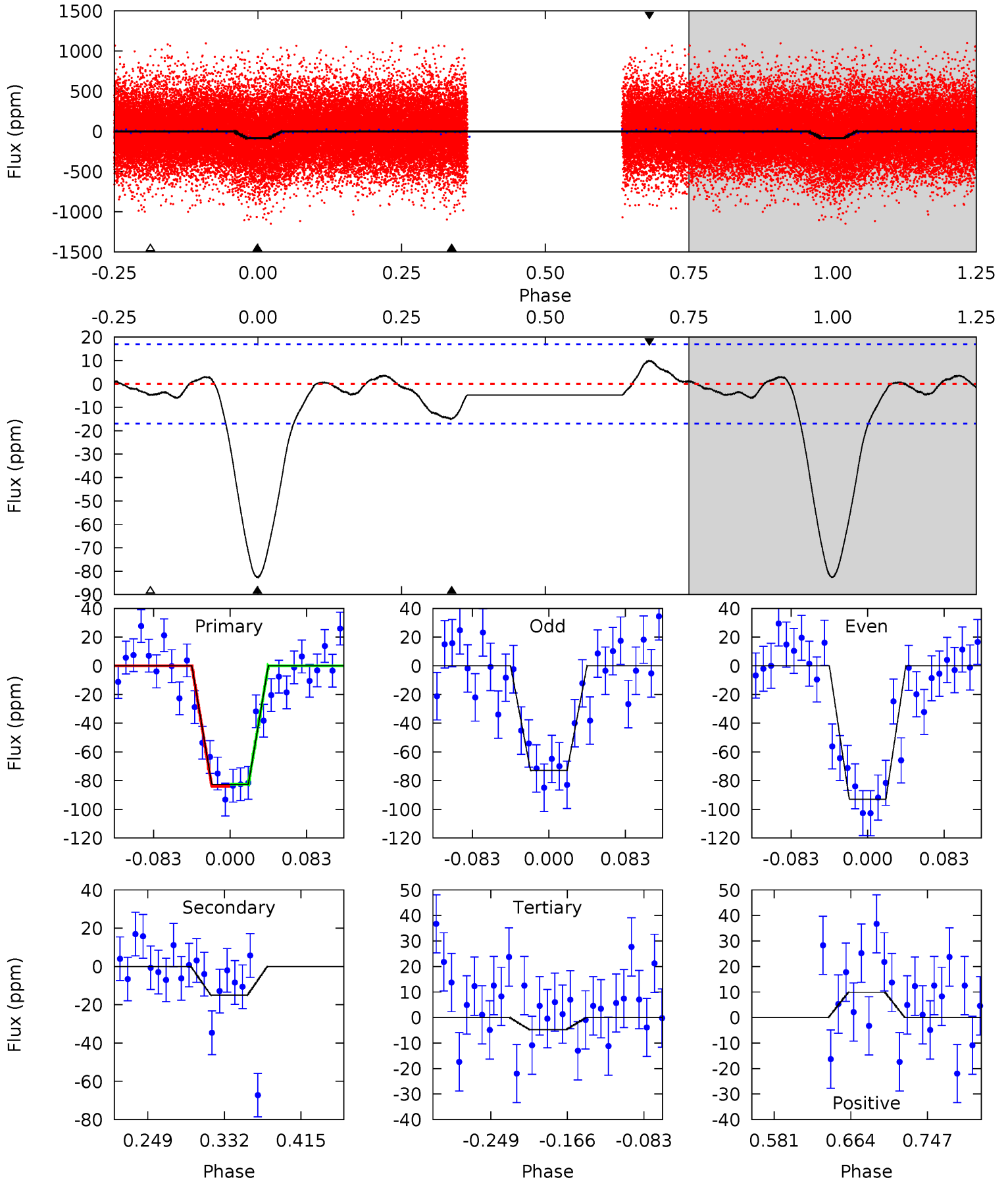
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	2.66	1.00	2.78	4.57	1.65	1.44	18.3	16.5	1.66	-0.11	1.97	0.92	0.13	0.39



Alt Model-Shift Uniqueness Test

006778019-02, P = 0.945824 Days, E = 131.151542 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.4	4.07	1.29	2.68	4.60	1.73	1.02	21.1	19.7	2.77	1.38	2.73	1.03	0.11	0.20



Stellar Parameters For KIC 006778019

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6116^{+169}_{-232}	$4.440^{+0.054}_{-0.216}$	$0.210^{+0.150}_{-0.350}$	$1.084^{+0.355}_{-0.118}$	$1.181^{+0.136}_{-0.166}$	$1.307^{+0.377}_{-0.726}$
	+3%/-4%	+1%/-5%	+71%/-167%	+33%/-11%	+12%/-14%	+29%/-56%
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 006778019-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-9 ± 4	$1.14^{+0.48}_{-0.40}$	2841^{+215}_{-146}	3718^{+794}_{-659}	$1.490^{+2.487}_{-0.863}$
Alt.	-15 ± 4	$1.14^{+0.45}_{-0.42}$	2838^{+216}_{-139}	4121^{+845}_{-575}	$2.385^{+3.740}_{-1.185}$

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 $A_{obs} \gg 1.0$

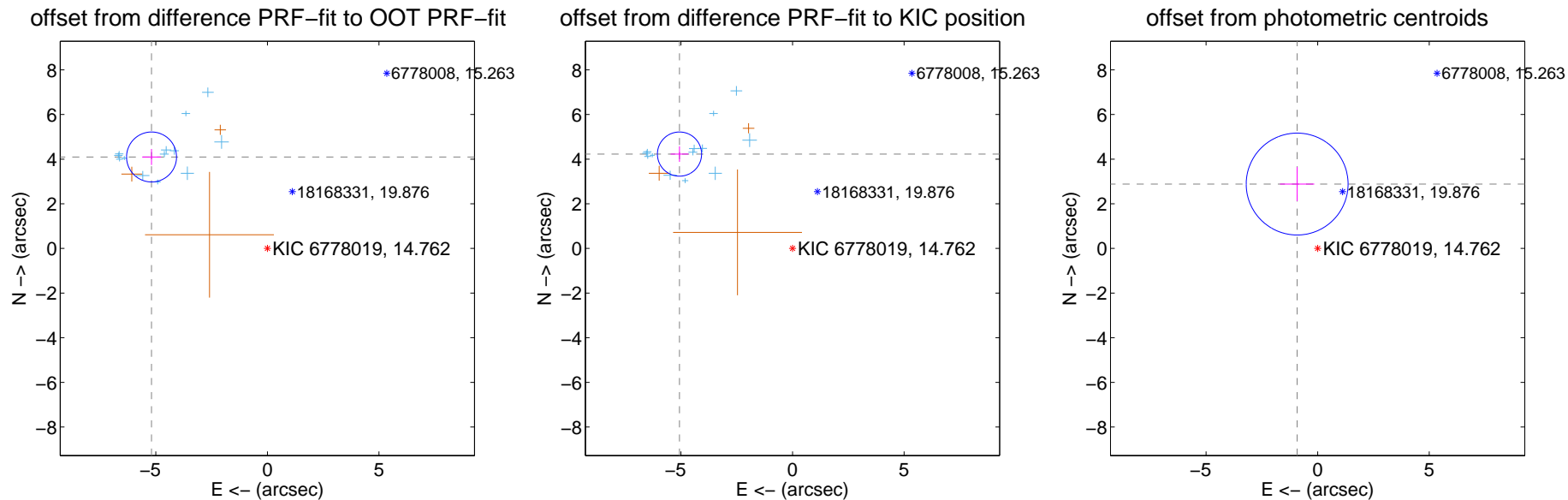
DV Centroid Data

Supplemental centroid analysis for 006778019-02. Kepler magnitude: 14.76. Transit SNR 14.27

There are 13 quarters with good PRF difference image offsets

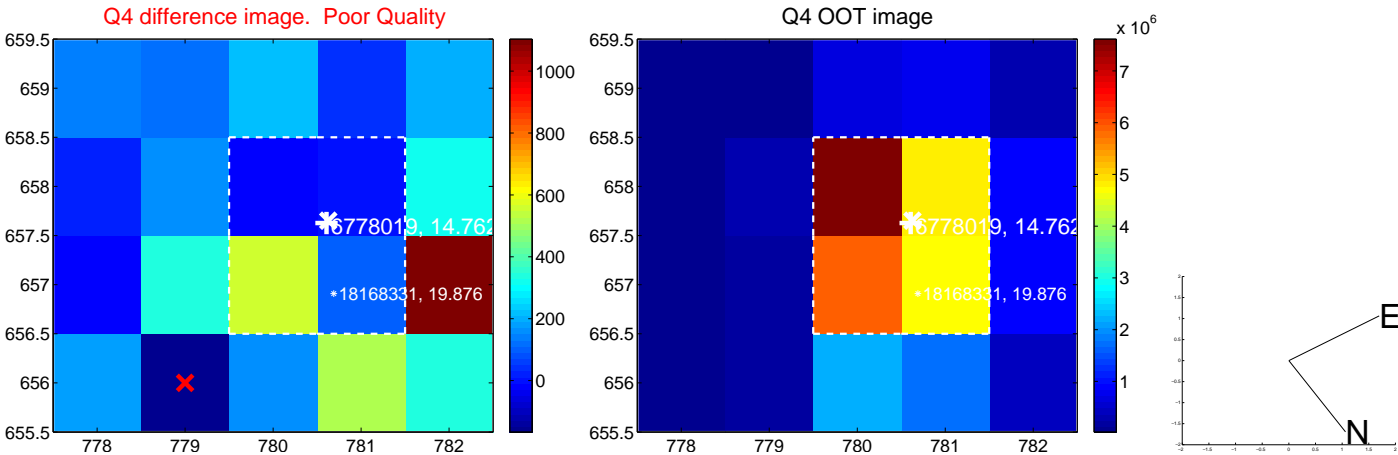
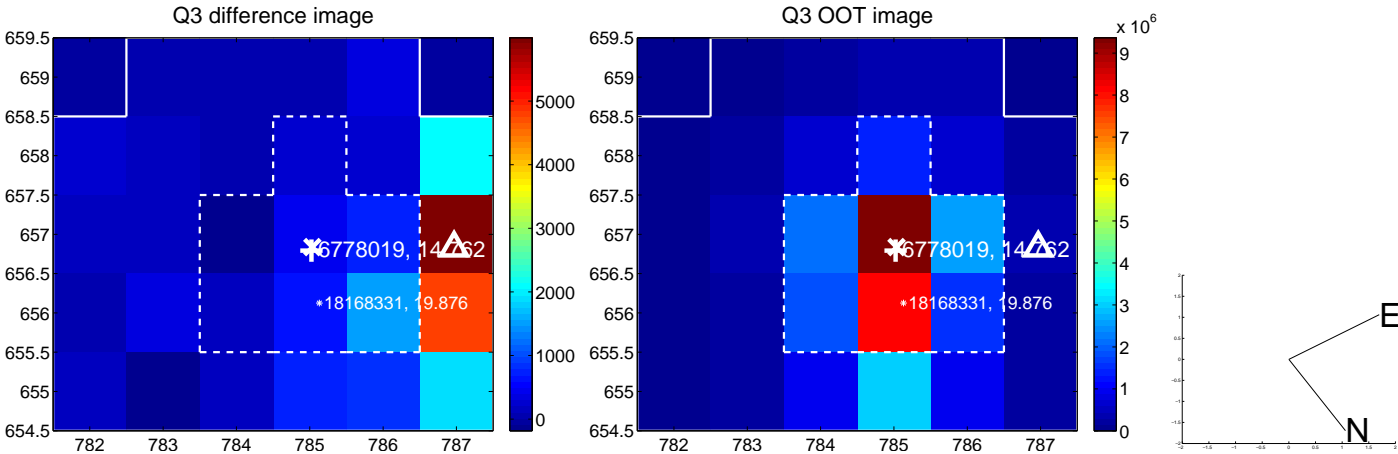
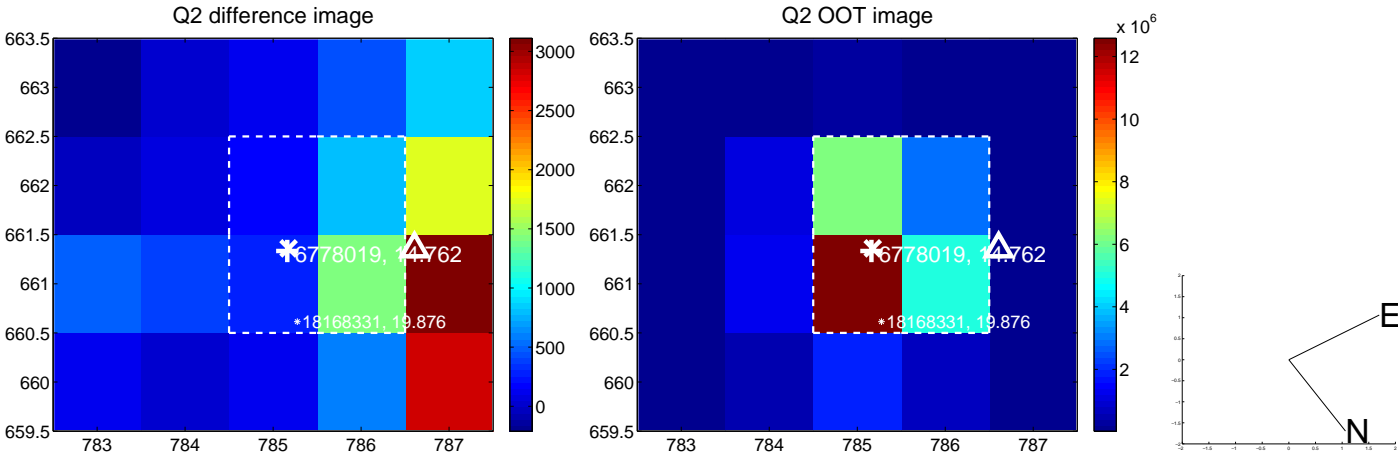
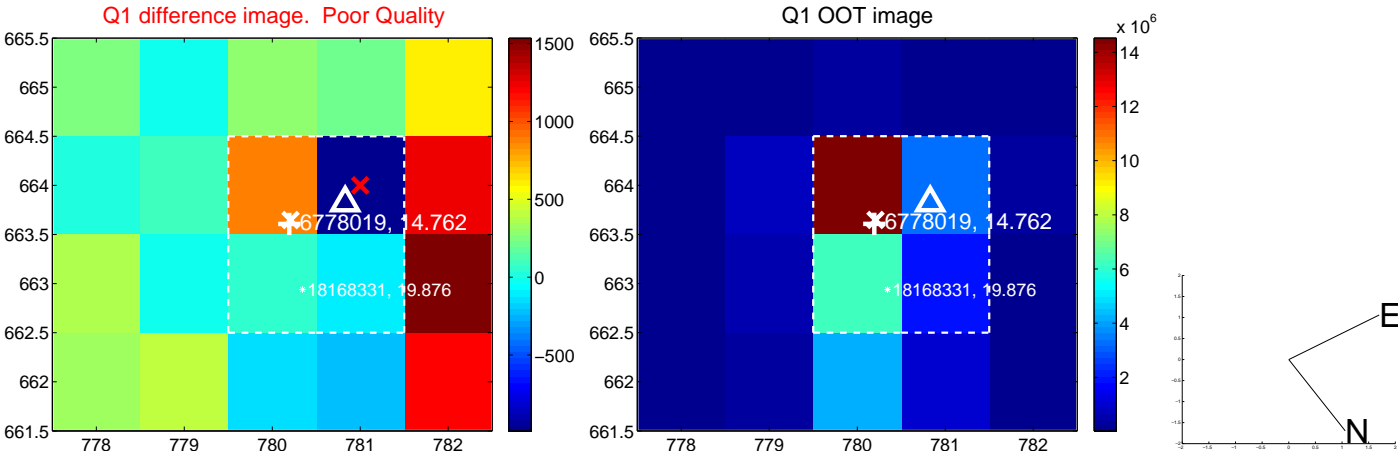
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.614 ± 0.373	17.72	5.192 ± 0.421	4.097 ± 0.360
PRF-fit source offset from KIC position	6.597 ± 0.330	20.00	5.065 ± 0.399	4.227 ± 0.347
photometric centroid source offset	3.03 ± 0.76	3.98	0.92 ± 0.77	2.88 ± 0.76

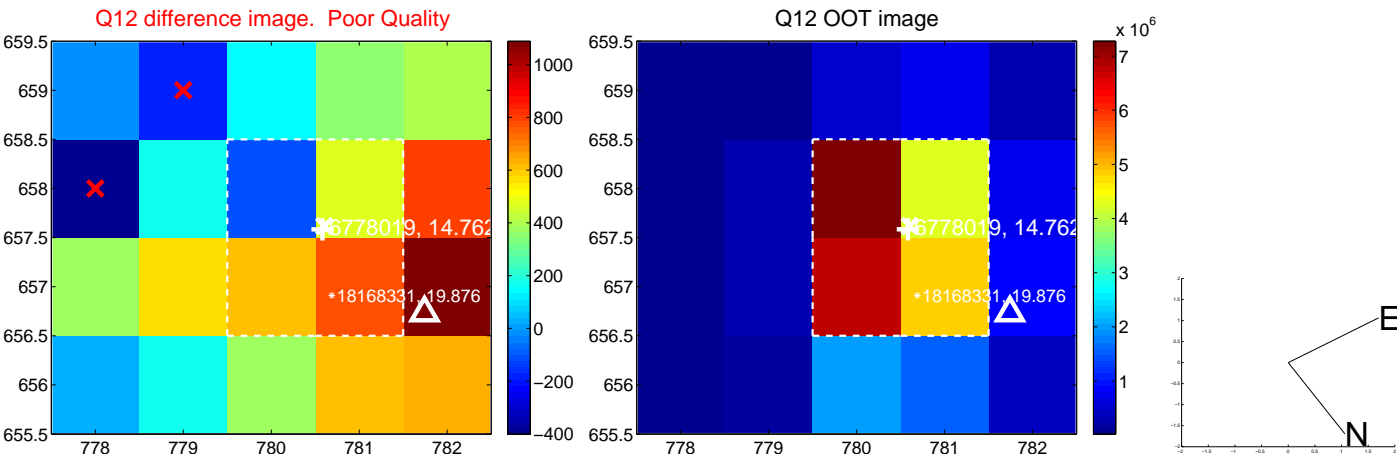
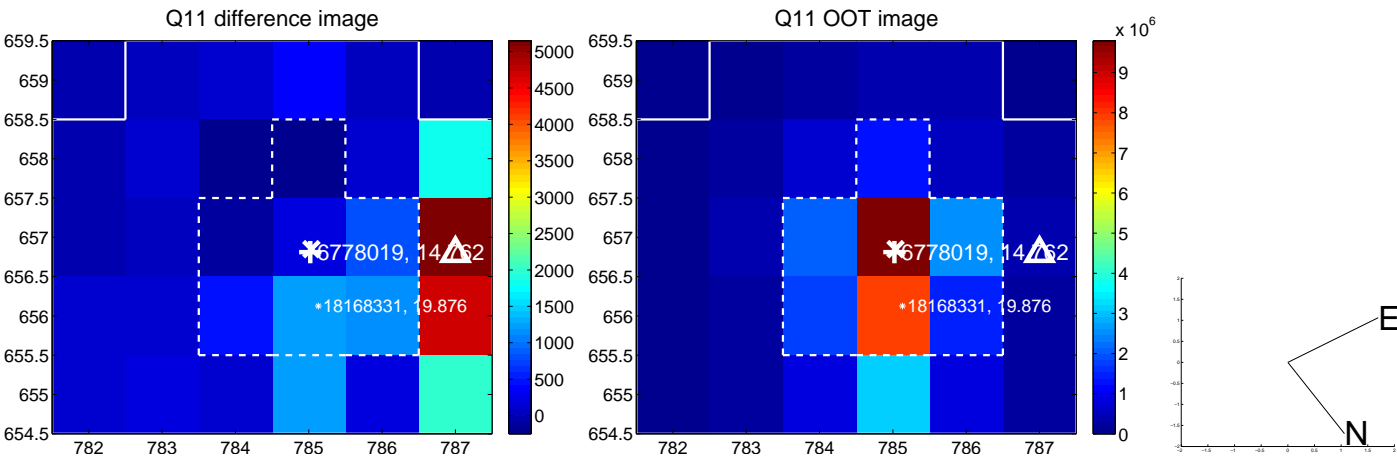
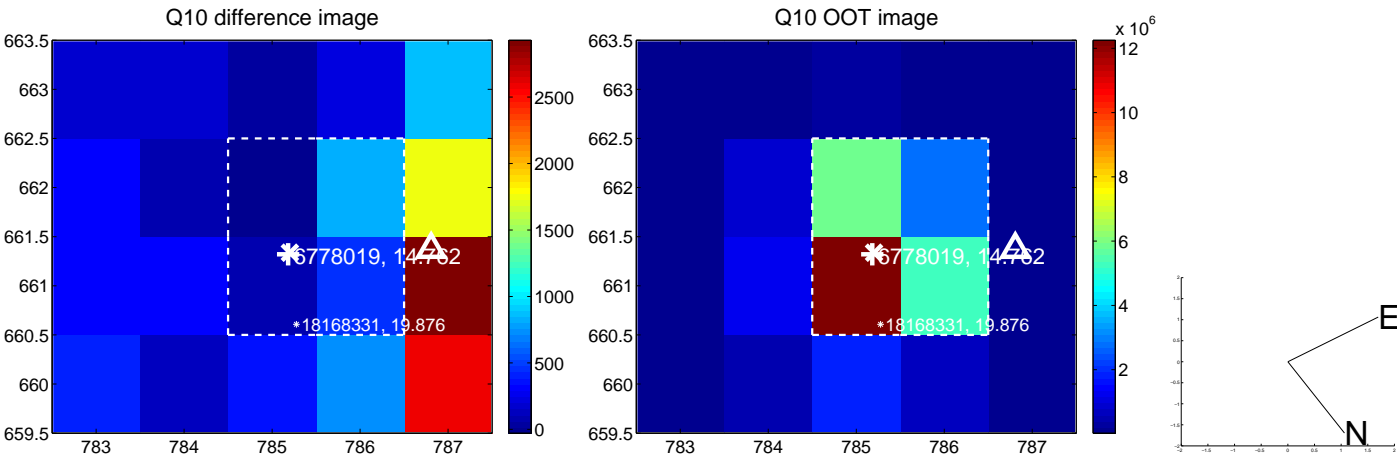
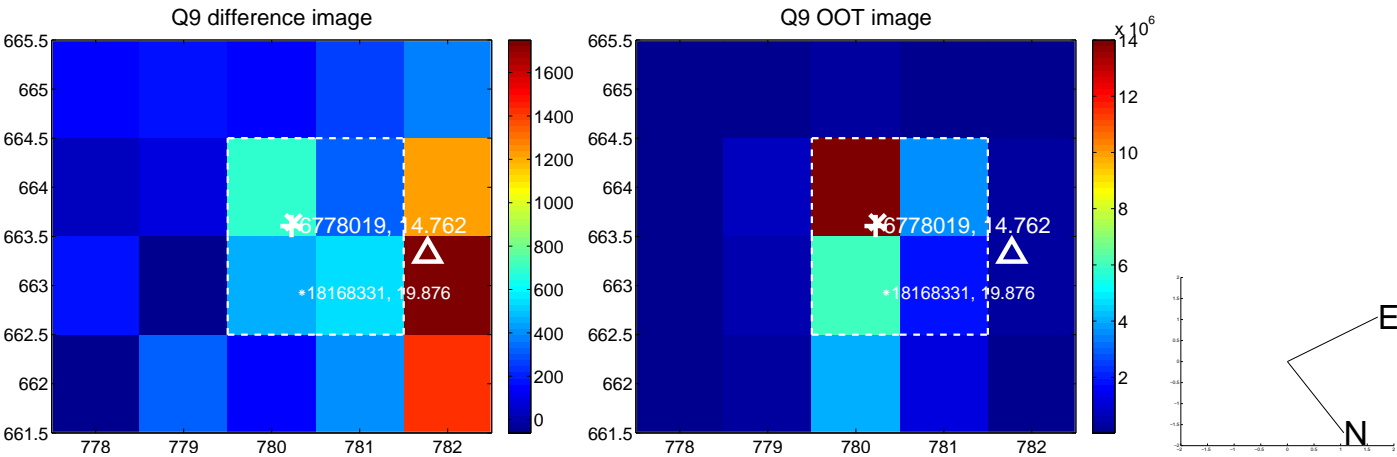


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

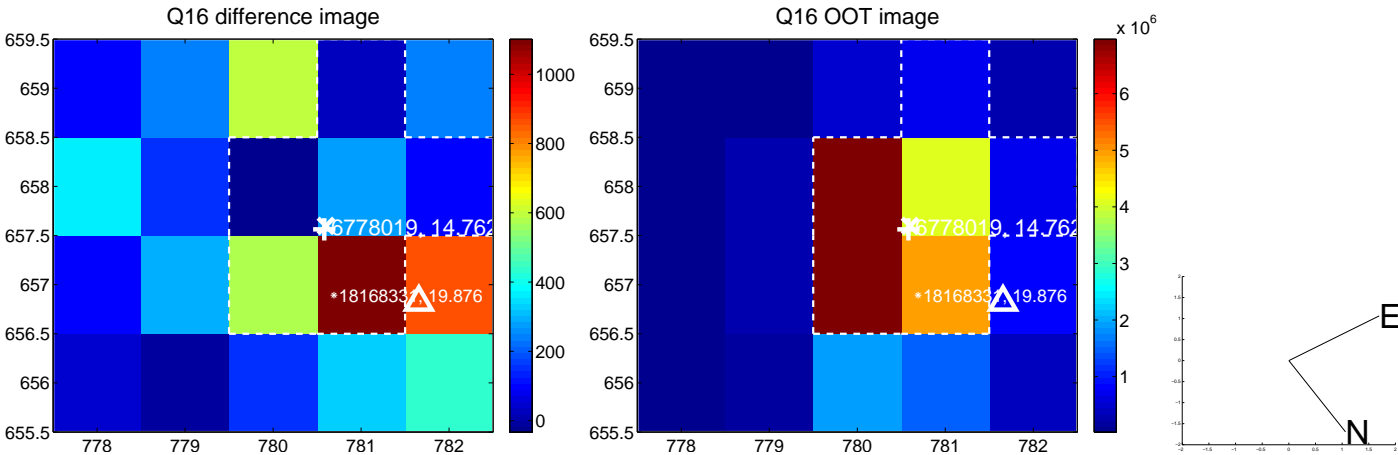
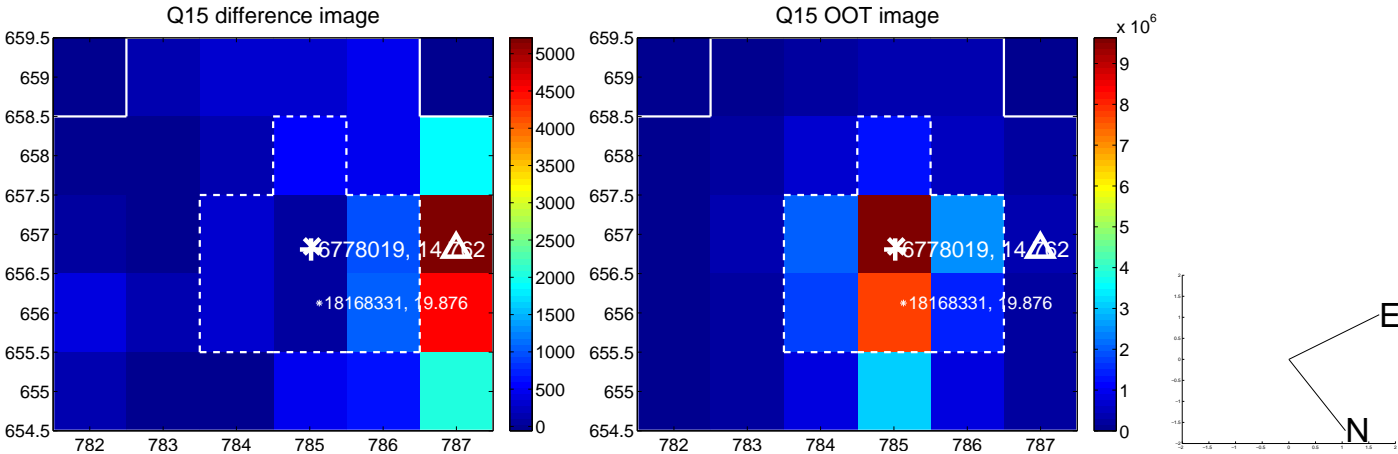
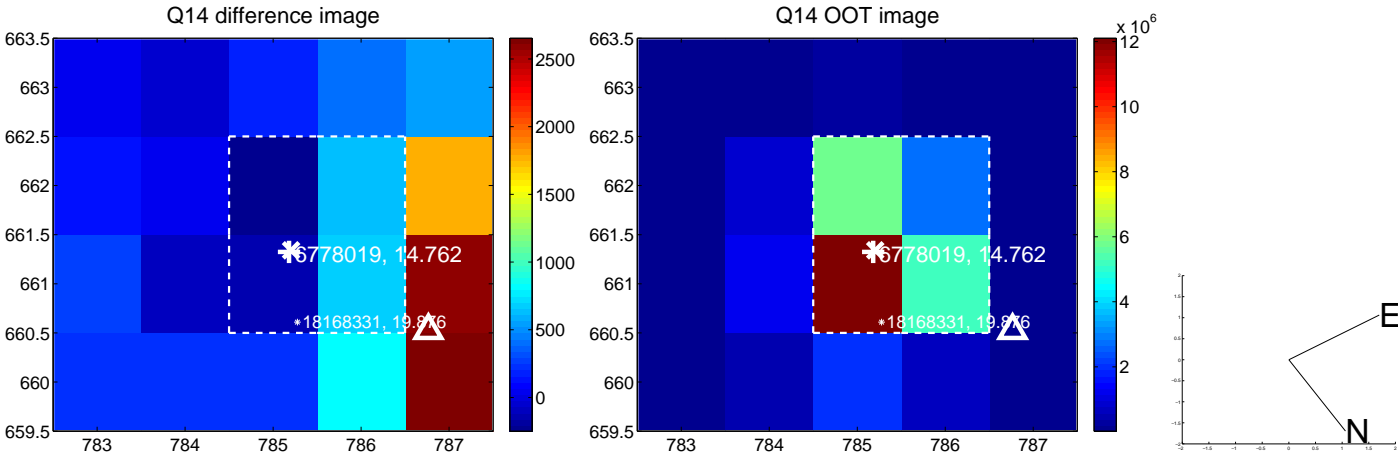
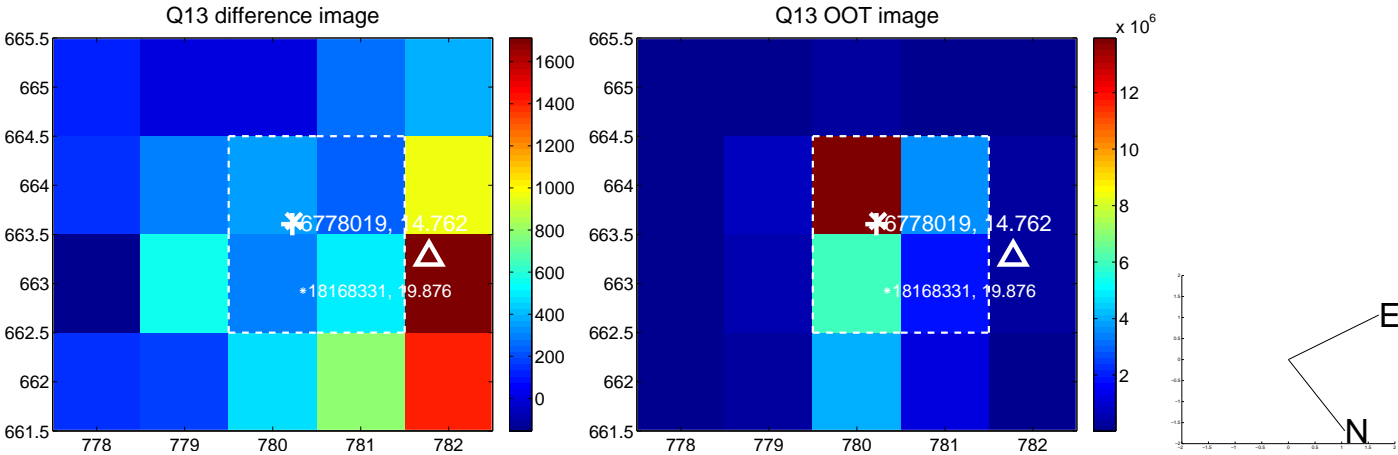
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



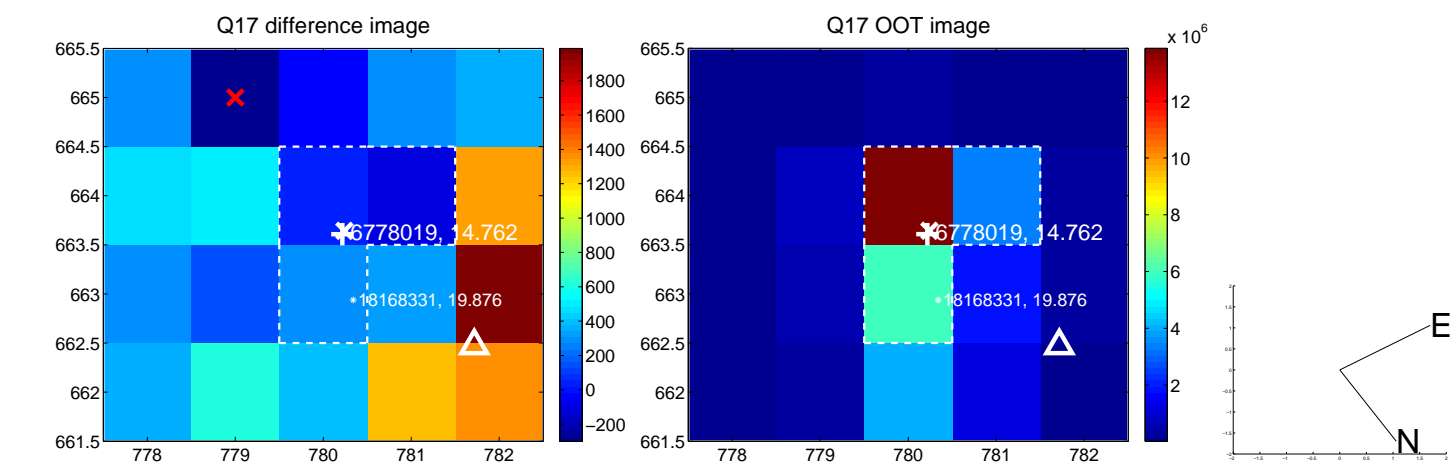
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



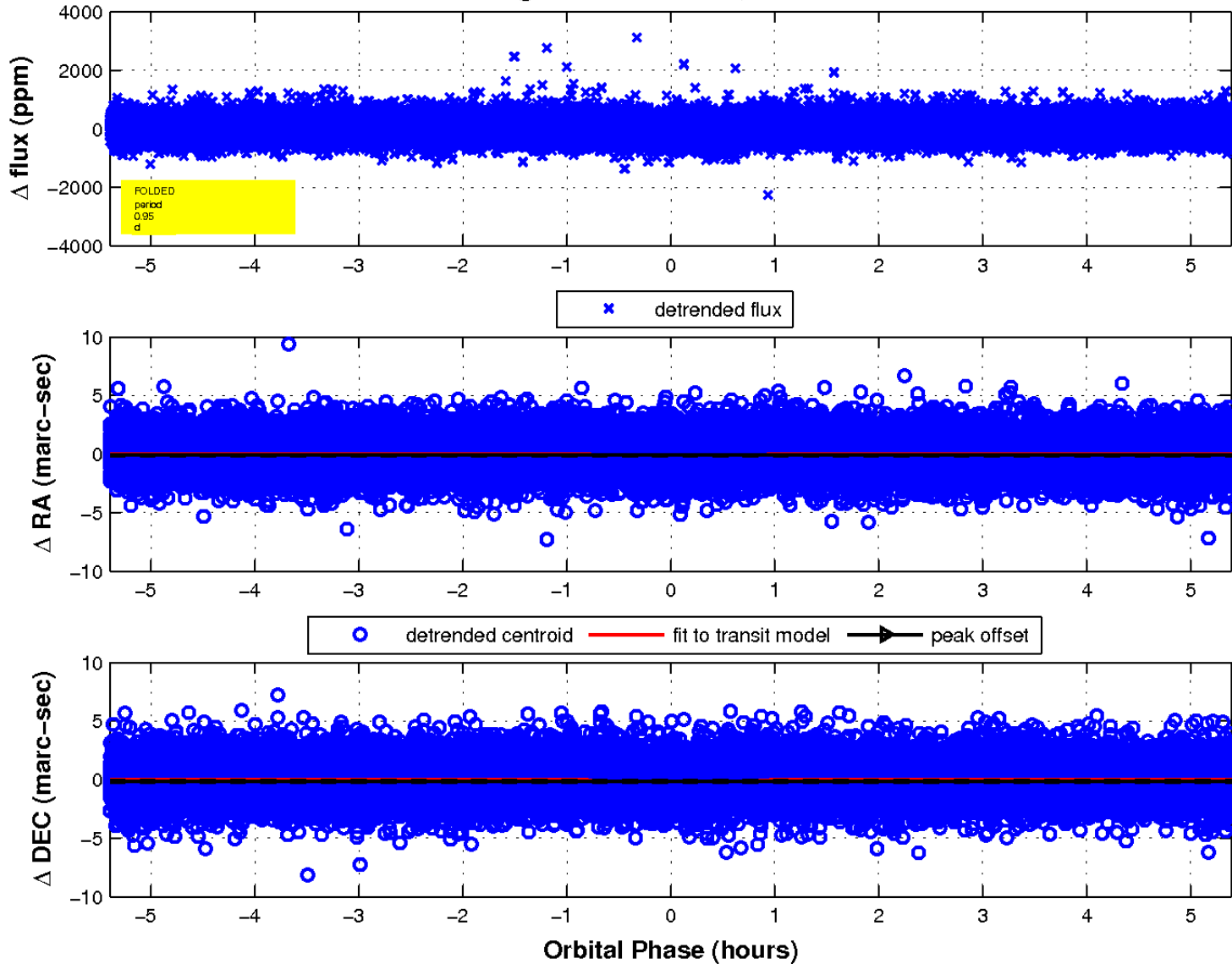
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

