

KIC 006150977

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})
006150977-01	OBS	6022.01	2.765619	133.680493	4558.1	2.778	267.3	164.6	0.83	5423	9.07	391.58
006150977-02	OBS	No	2.765609	132.300650	1627.2	2.565	74.9	74.2	0.83	5423	4.67	391.58

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006150977-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
006150977-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST

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.

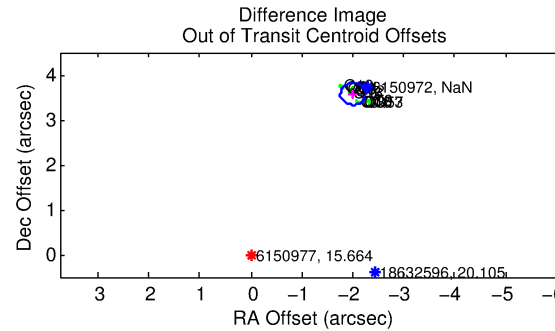
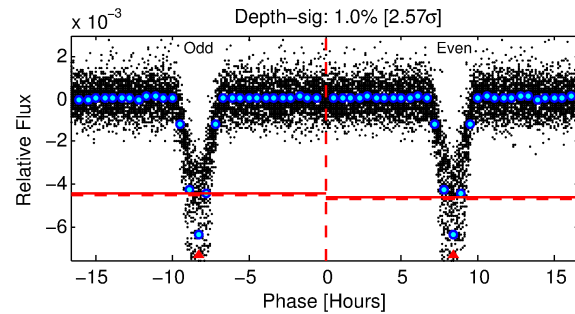
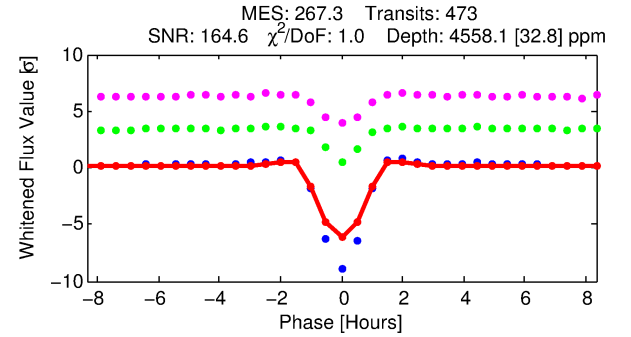
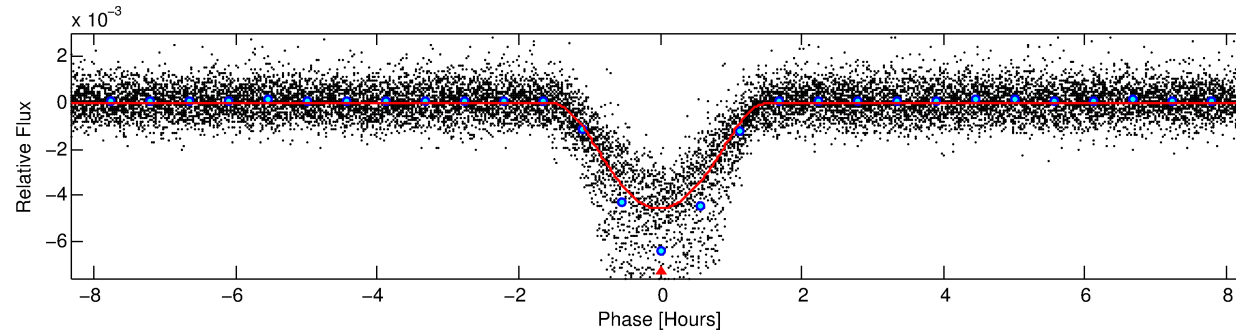
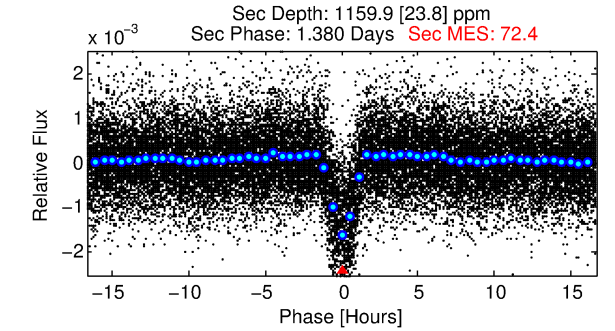
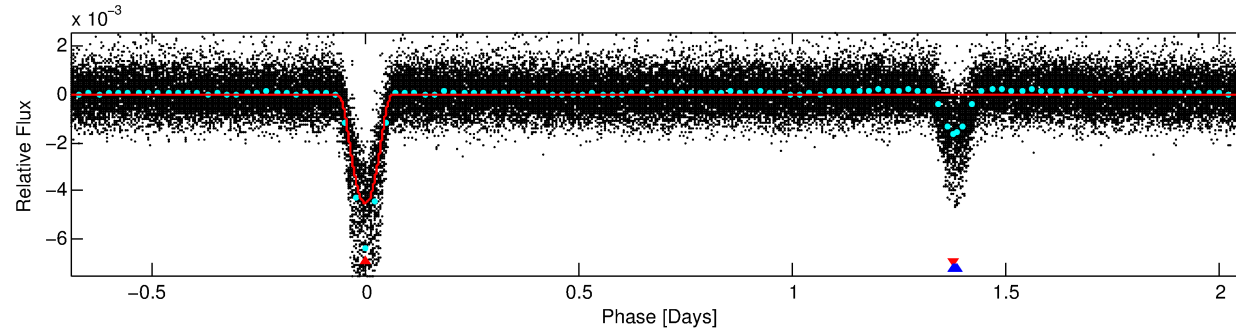
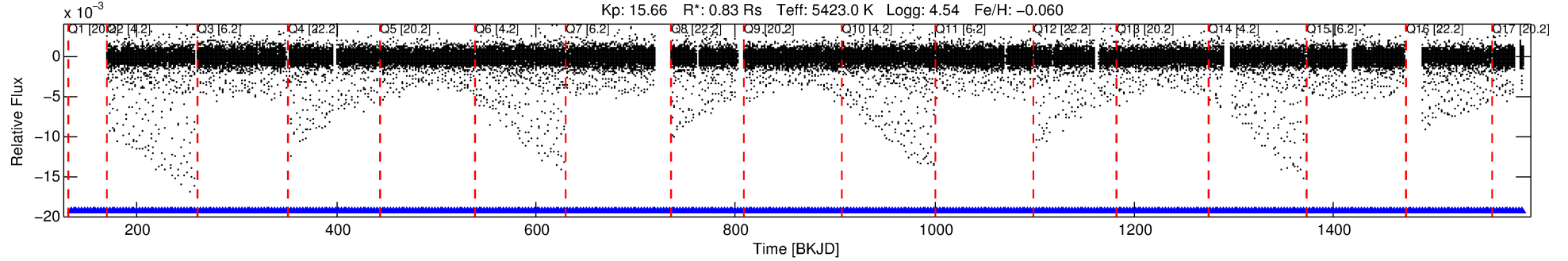
Ephemeris Match Information For 006150977-01

No Significant Match Found

DV One-Page Summary

KIC: 6150977 Candidate: 1 of 2 Period: 2.766 d
KOI: K06022.01 Corr: 0.982

Kp: 15.66 R*: 0.83 Rs Teff: 5423.0 K Logg: 4.54 Fe/H: -0.060



DV Fit Results:

Period = 2.76562 [0.00000] d
Epoch = 133.6805 [0.0003] BKJD
Rp/R* = 0.1004 [0.0164]
a/R* = 4.02 [0.15]
b = 0.97 [0.03]
Seff = 391.58 [109.71]
Teq = 1134 [79] K
Rp = 9.07 [2.37] Re
a = 0.0368 [0.0063] AU
Ag = 10.51 [4.31] [2.21σ]
Teffp = 3158 [278] K [7.01σ]

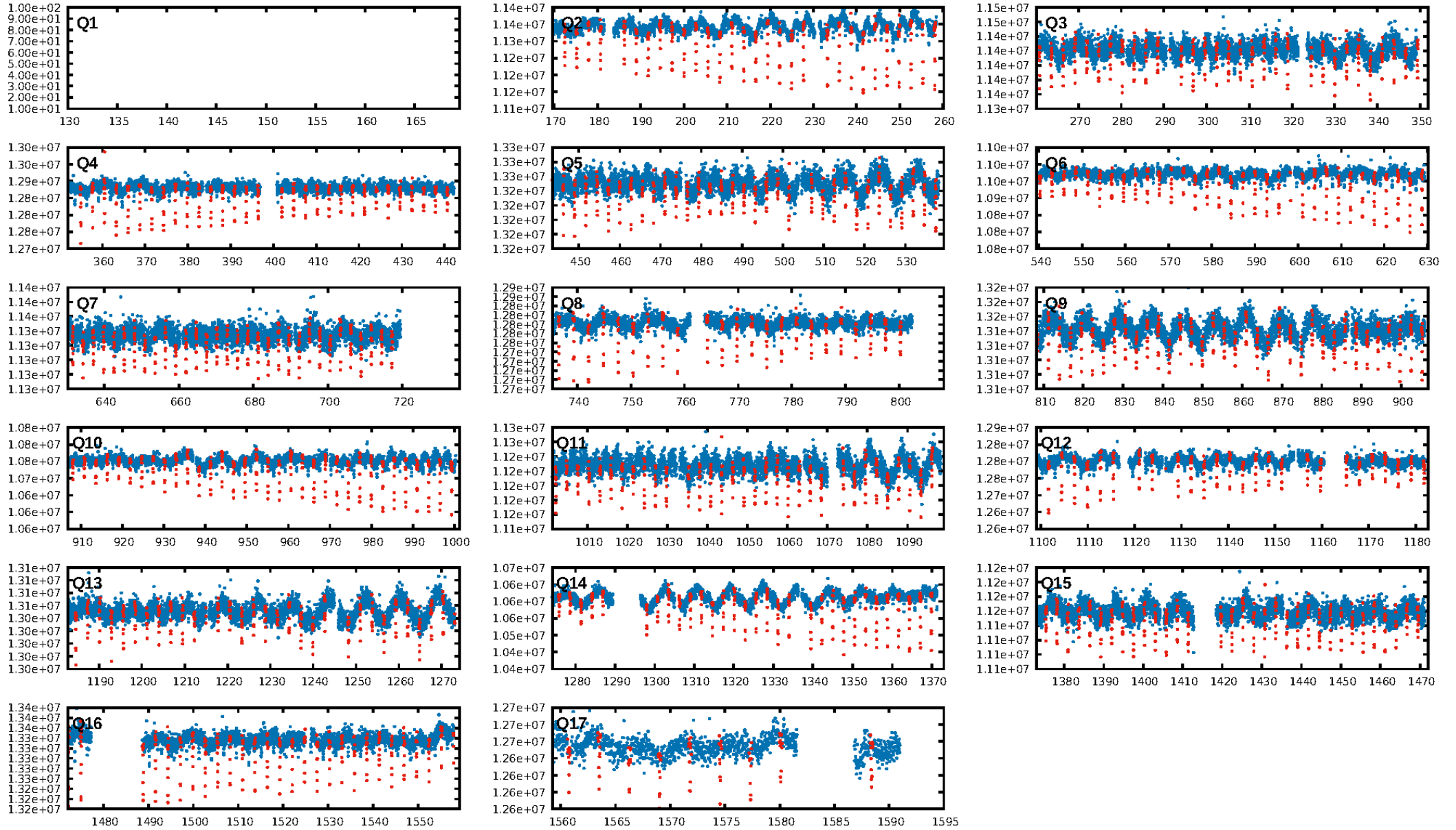
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [464/464]
GhostDiagnostic-chr: -0.1173
Centroid-sig: 0.0%
Centroid-so: 9.948 arcsec [181.42σ]
OotOffset-rm: 4.098 arcsec [50.26σ]
KicOffset-rm: 4.108 arcsec [60.27σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:23:08 Z

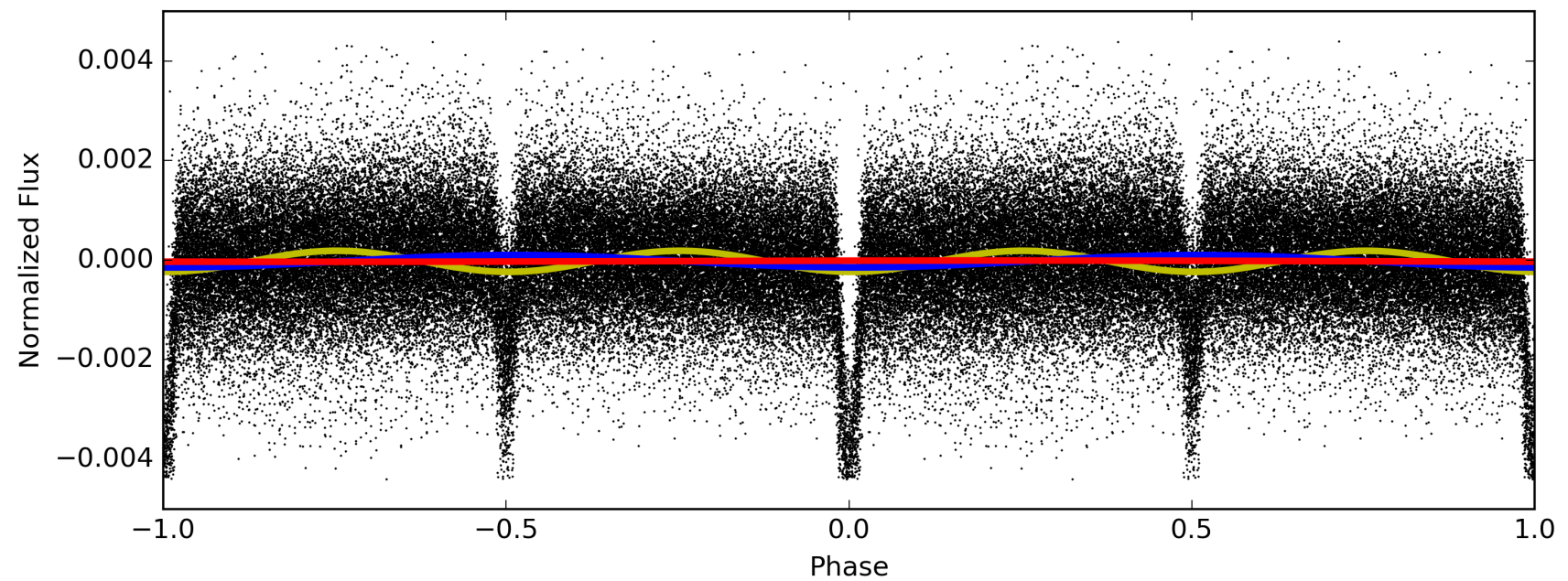
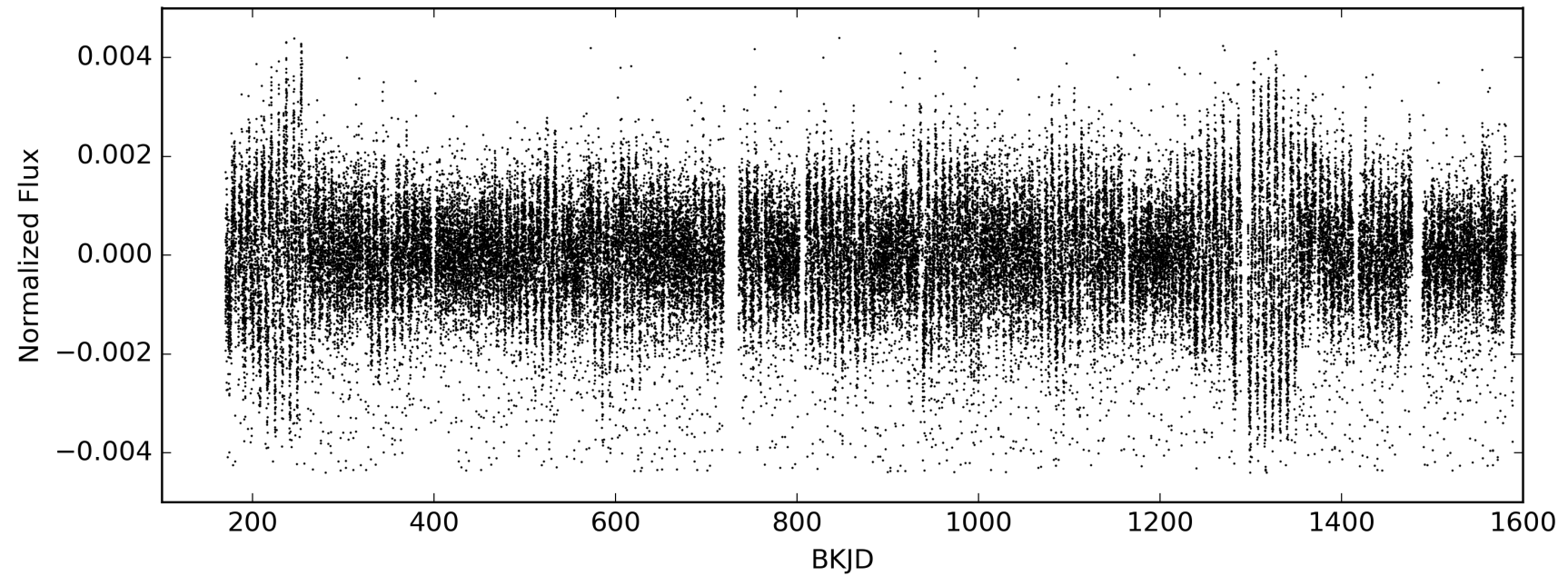
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006150977-01, PDC Light Curves



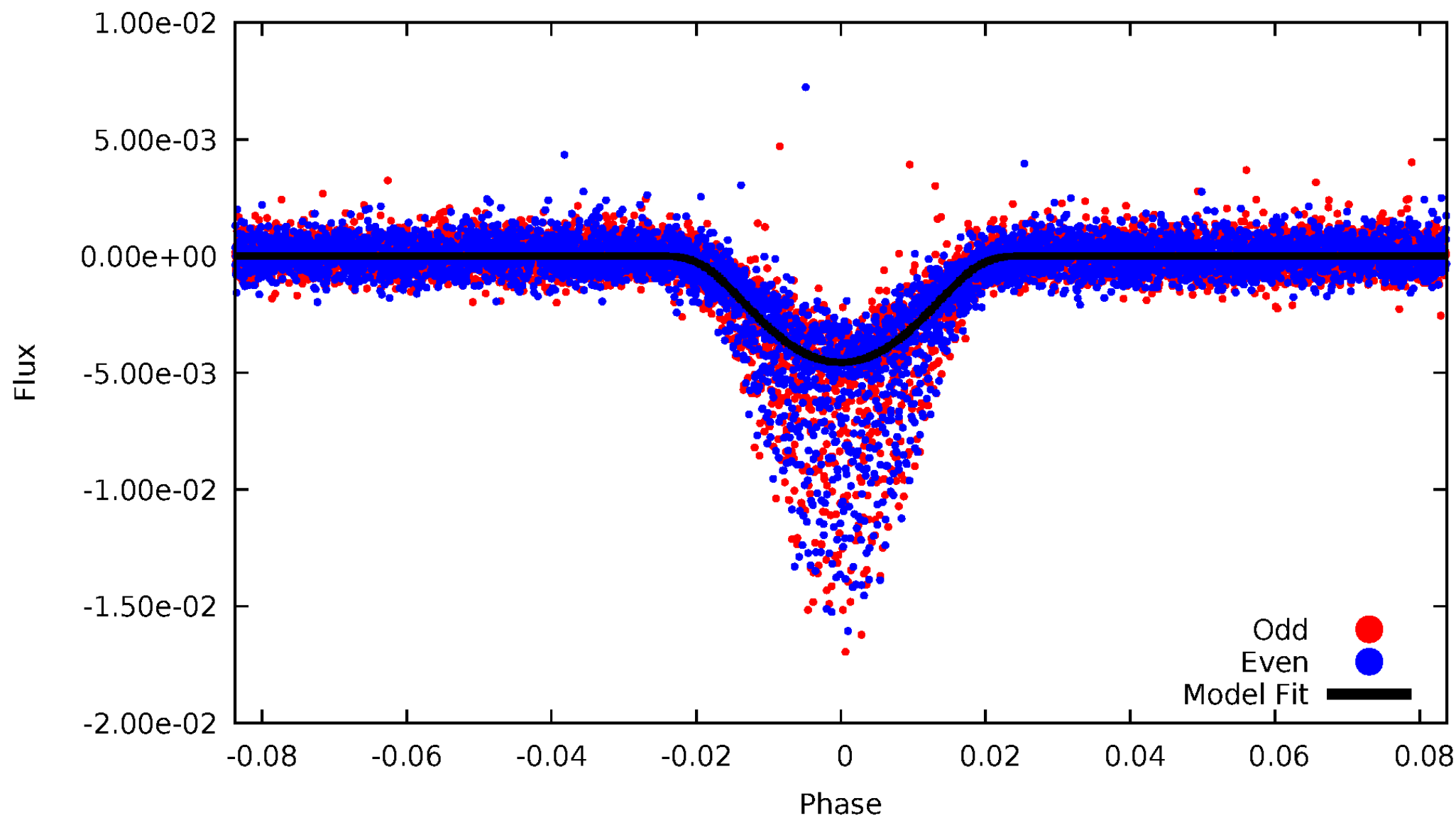
TCE 006150977-01

— P = 1.383 days — P = 2.766 days — P = 5.531 days



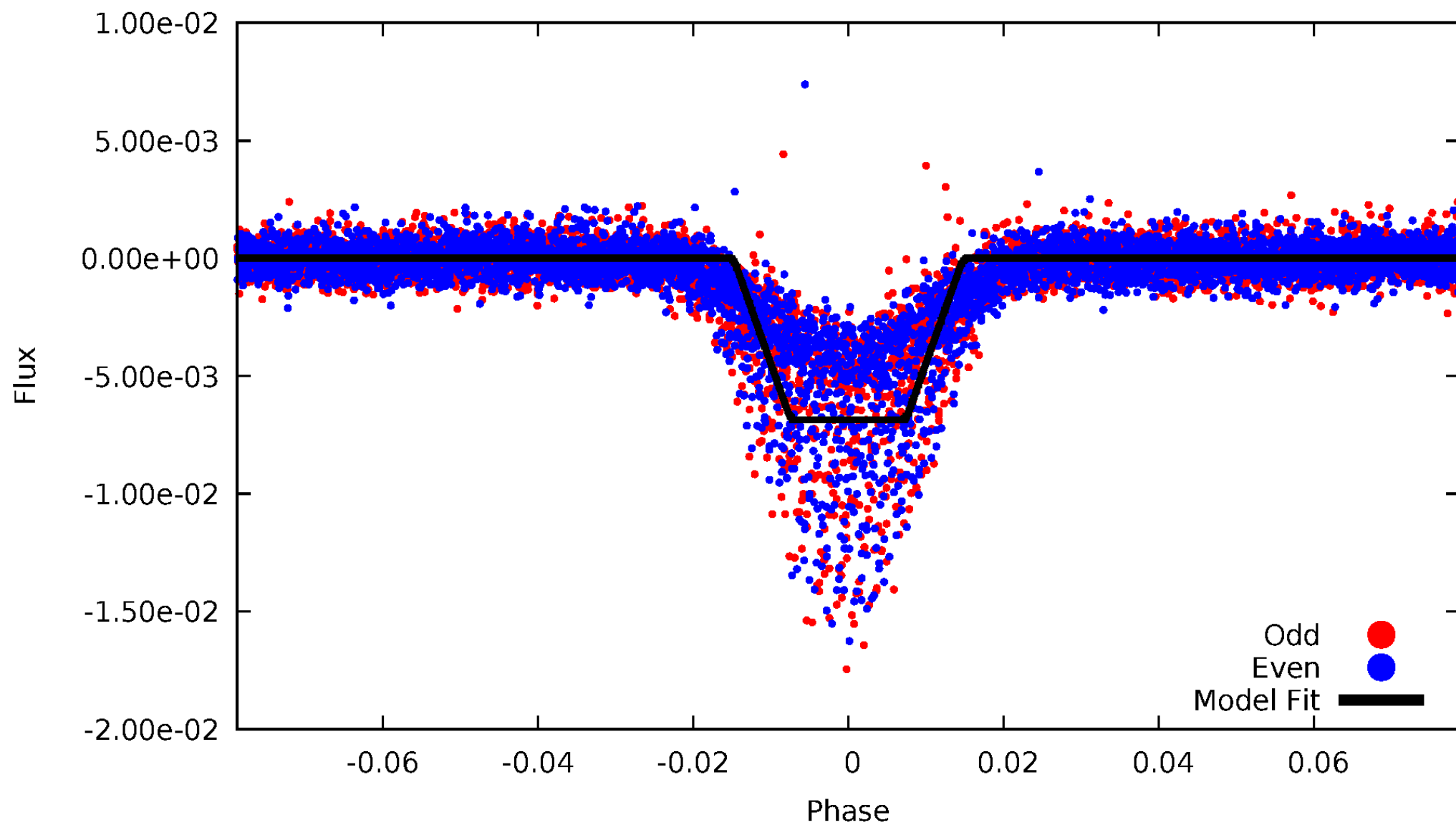
DV Odd/Even

TCE 006150977-01



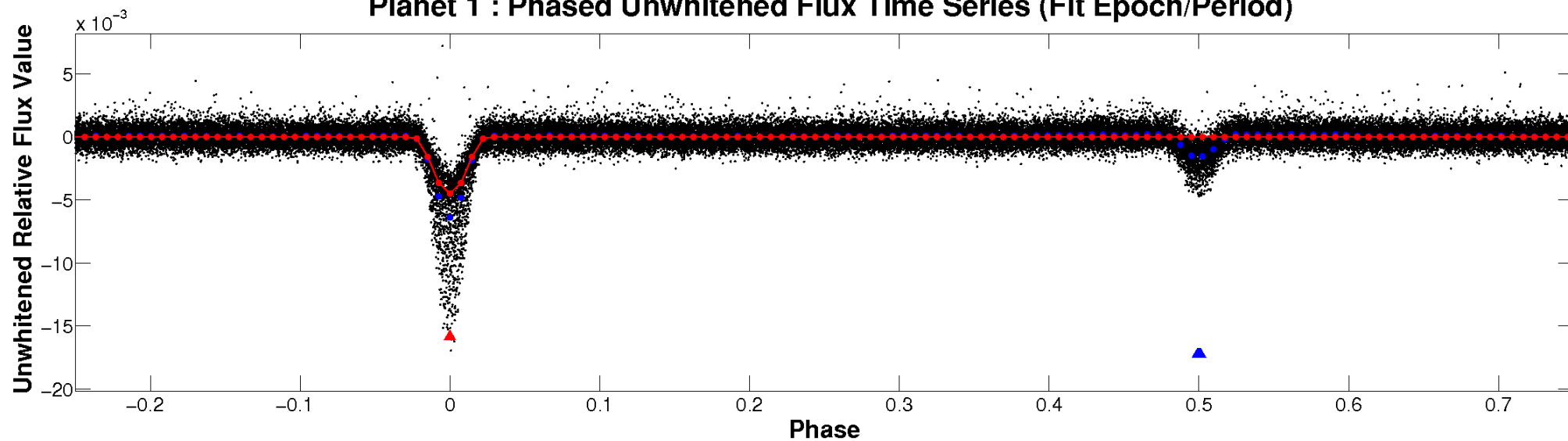
ALT Odd/Even

TCE 006150977-01

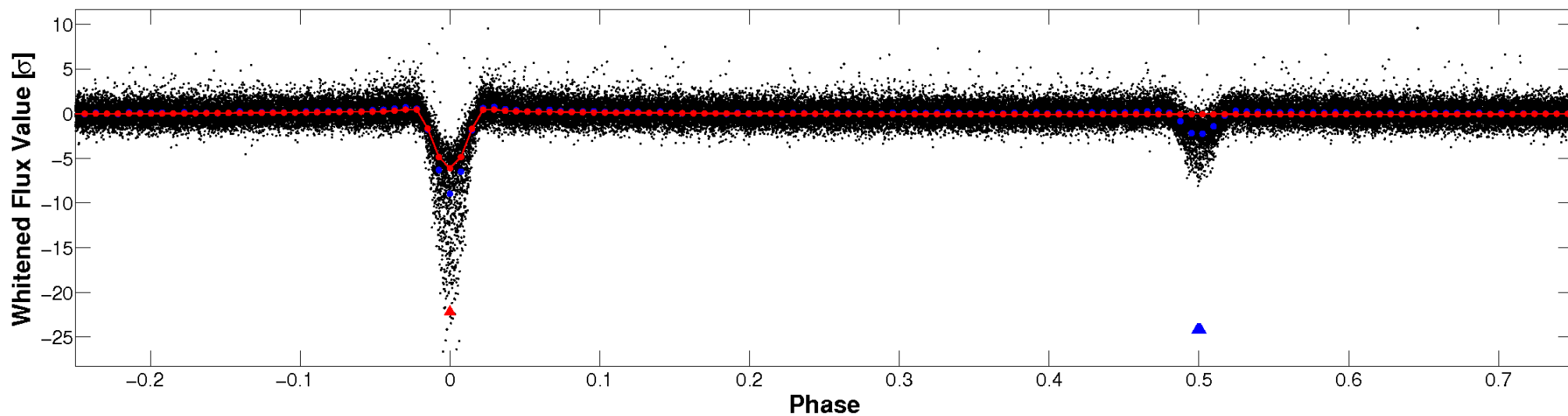


Non-Whitened Vs. Whitened Light Curve

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

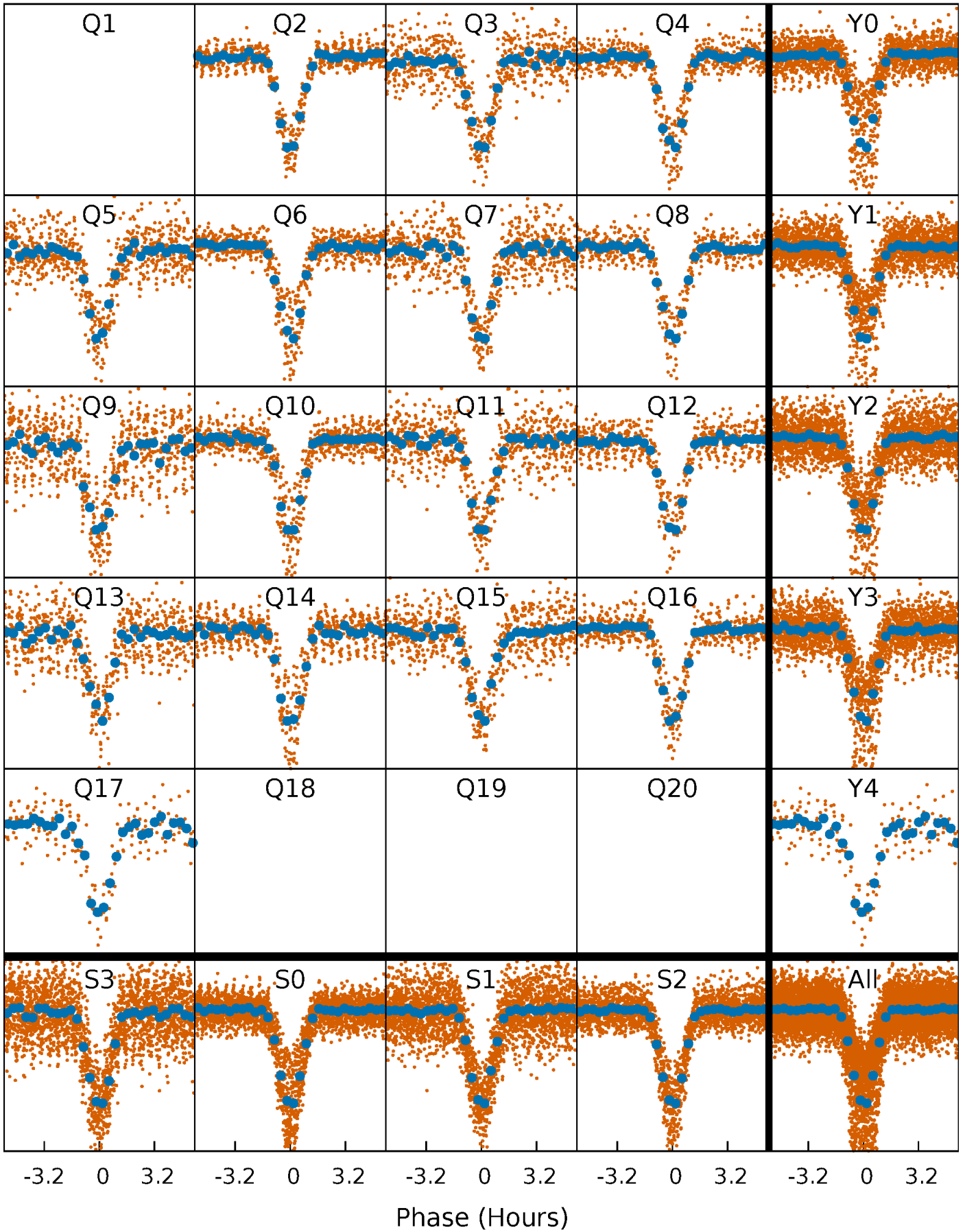


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



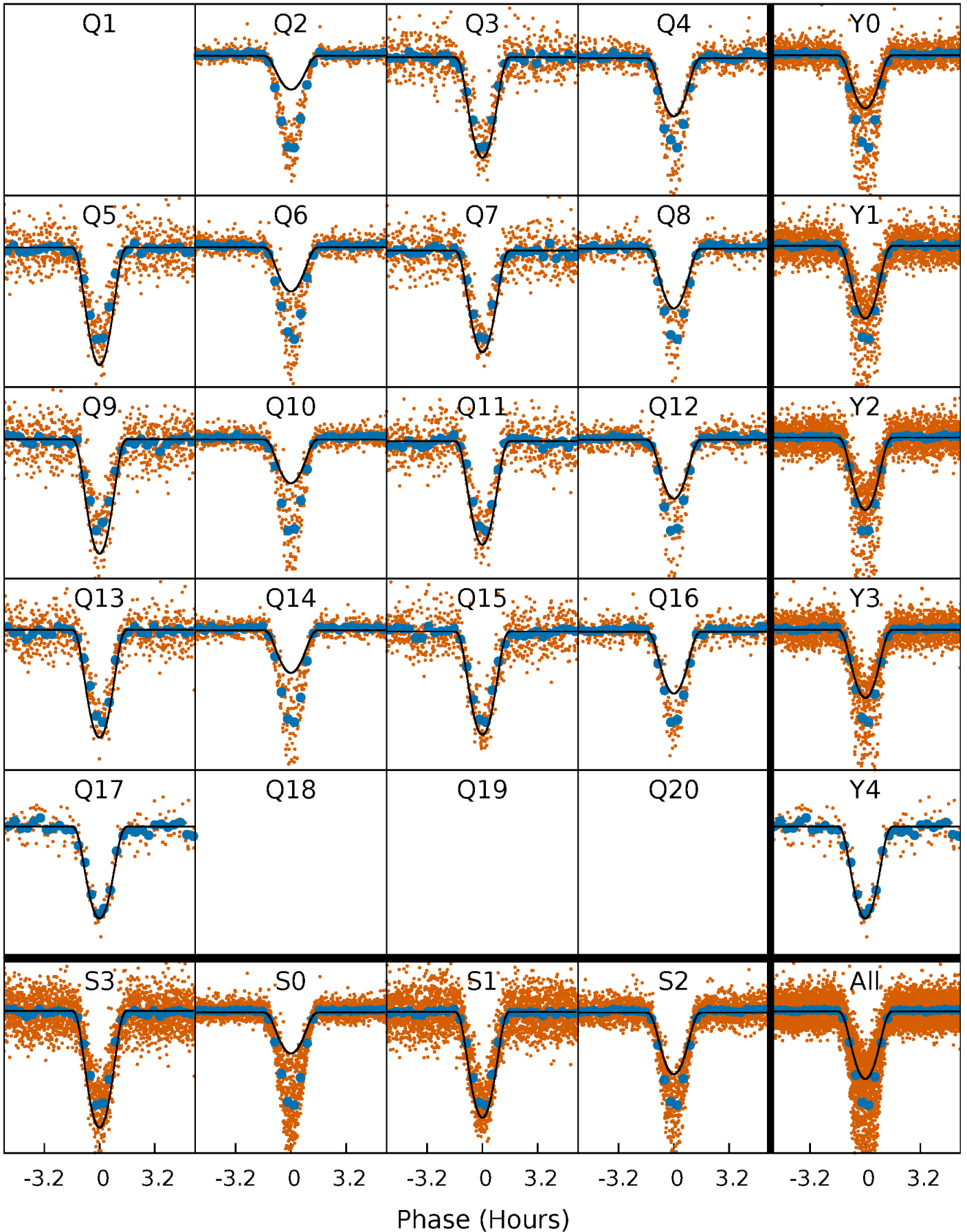
PDC Quarter-Phased Transit Curves

TCE 006150977-01 P= 2.765619 Days $T_0=133.680493$ (BKJD)



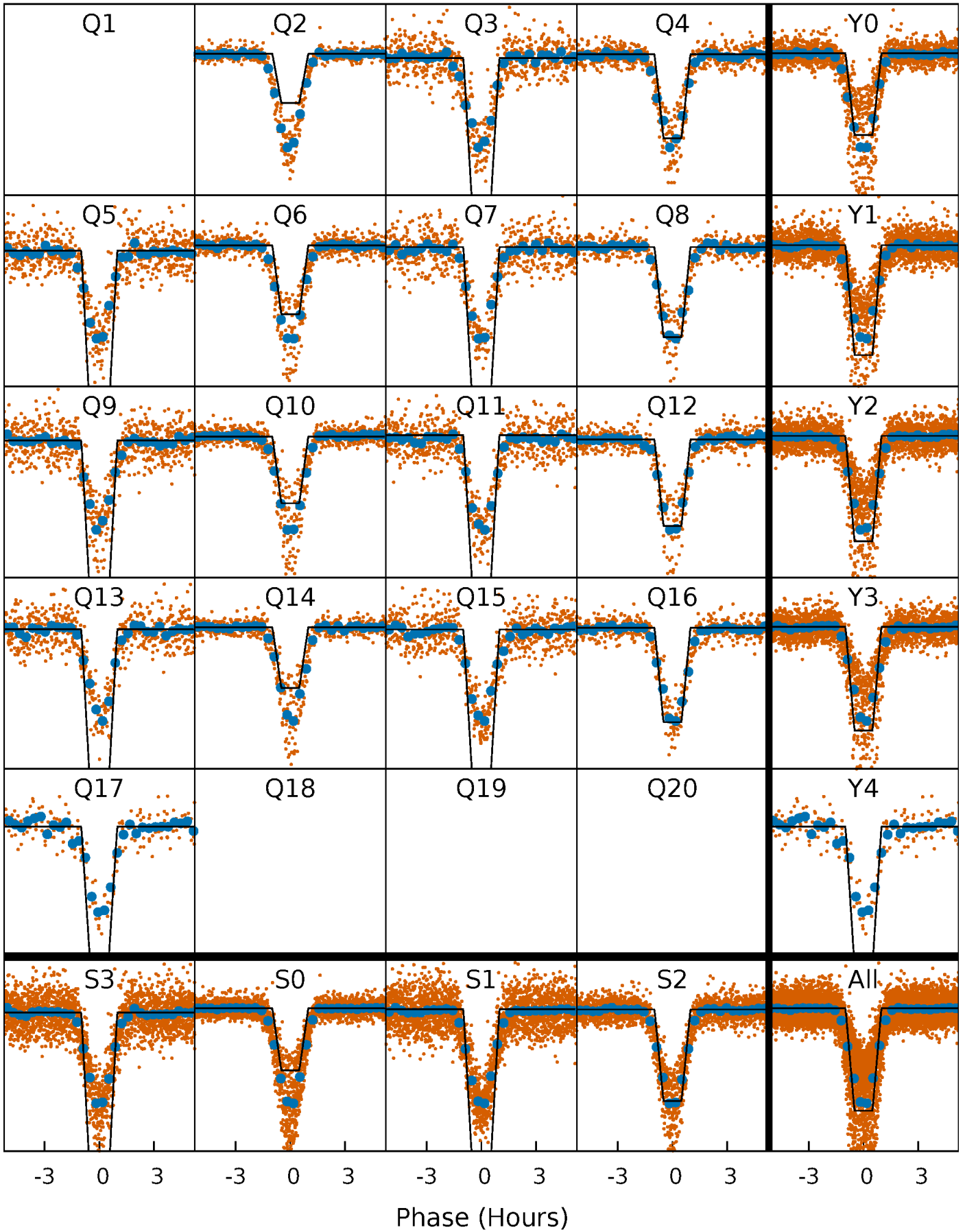
DV Quarter-Phased Transit Curves

TCE 006150977-01 P= 2.765619 Days $T_0=133.680493$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

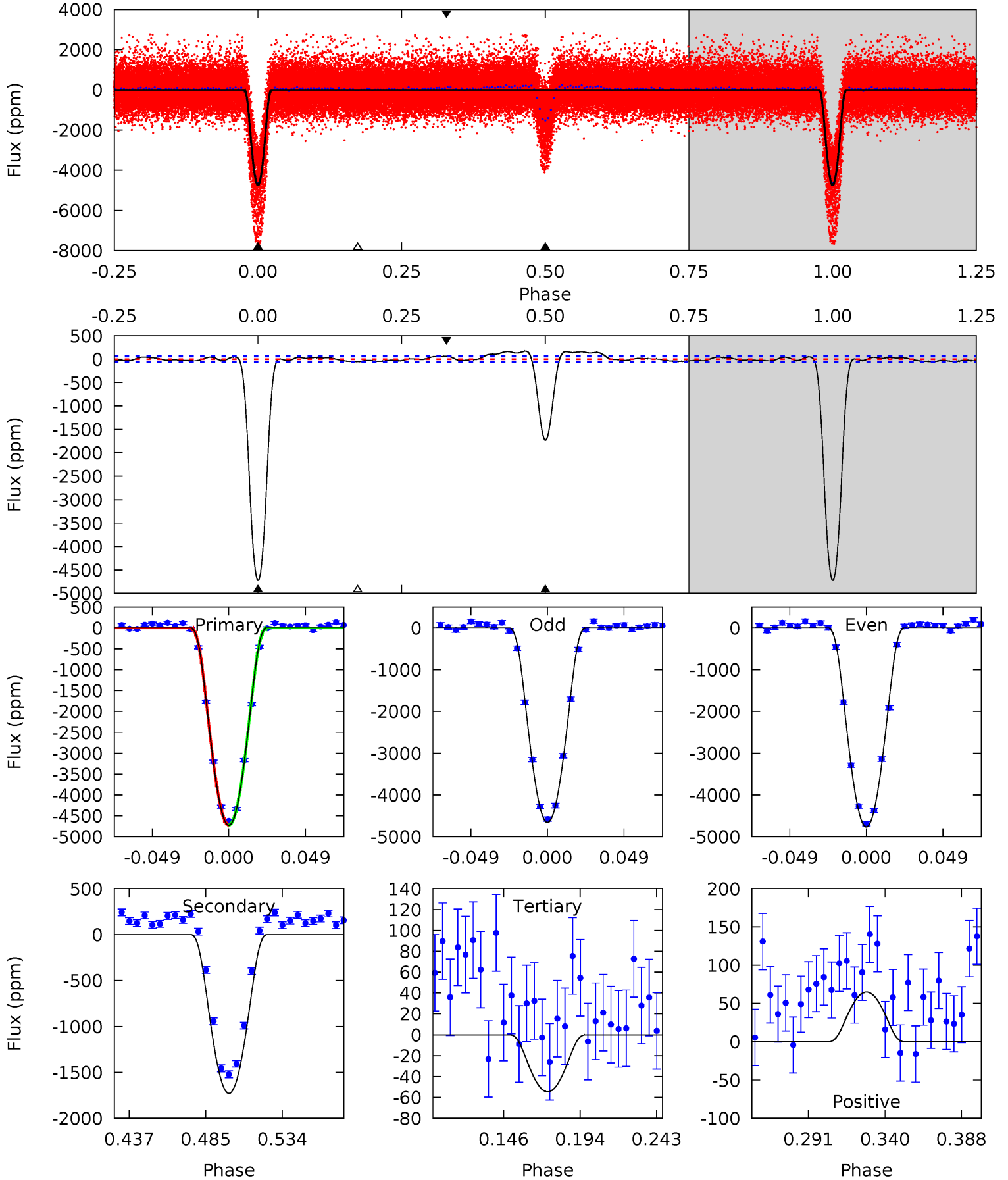
TCE 006150977-01 P= 2.765610 Days $T_0=133.683169$ (BKJD)



DV Model-Shift Uniqueness Test

006150977-01, P = 2.765619 Days, E = 133.680493 Days

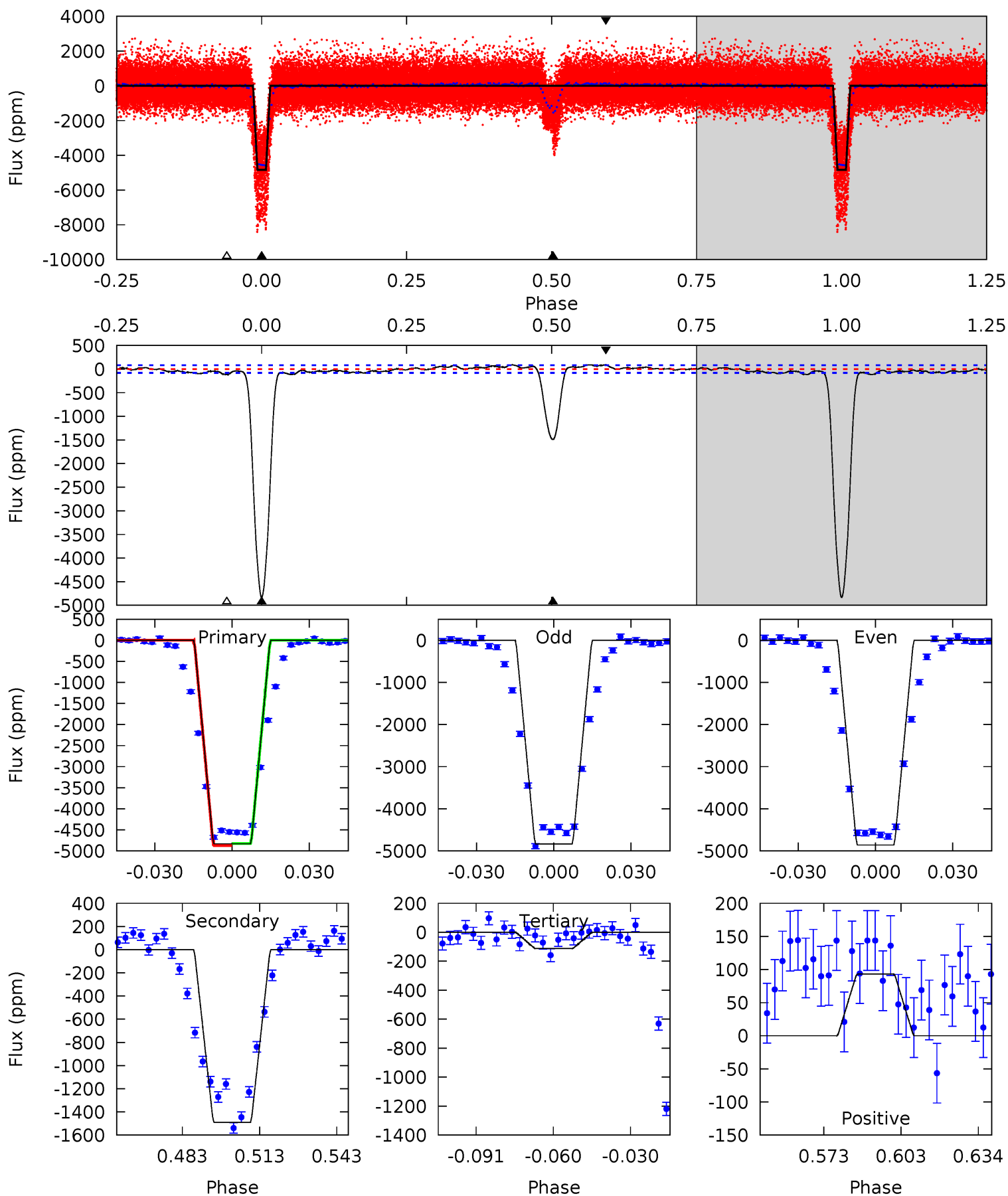
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
380.4	139.1	4.40	5.22	4.71	1.97	4.44	376.0	375.2	134.7	133.9	4.24	1.29	0.04	0.18



Alt Model-Shift Uniqueness Test

006150977-01, P = 2.765610 Days, E = 133.683169 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
288.5	89.0	6.75	5.56	4.81	2.17	2.95	281.7	282.9	82.2	83.4	0.63	1.28	0.02	1.46



Stellar Parameters For KIC 006150977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5423^{+177}_{-161}	$4.542^{+0.045}_{-0.135}$	$-0.060^{+0.300}_{-0.300}$	$0.828^{+0.169}_{-0.078}$	$0.872^{+0.090}_{-0.090}$	$2.161^{+0.497}_{-0.828}$
	+3%/-3%	+1%/-3%	+500%/-500%	+20%/-9%	+10%/-10%	+23%/-38%
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 006150977-01 / KOI 6022.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1729 ± 12	$9.31^{+1.94}_{-1.59}$	1614^{+80}_{-71}	3828^{+269}_{-196}	15^{+7}_{-4}
Alt.	-1490 ± 17	$7.65^{+1.65}_{-1.63}$	1609^{+84}_{-68}	4010^{+364}_{-287}	19^{+11}_{-6}

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 $A_{obs} \gg 1.0$

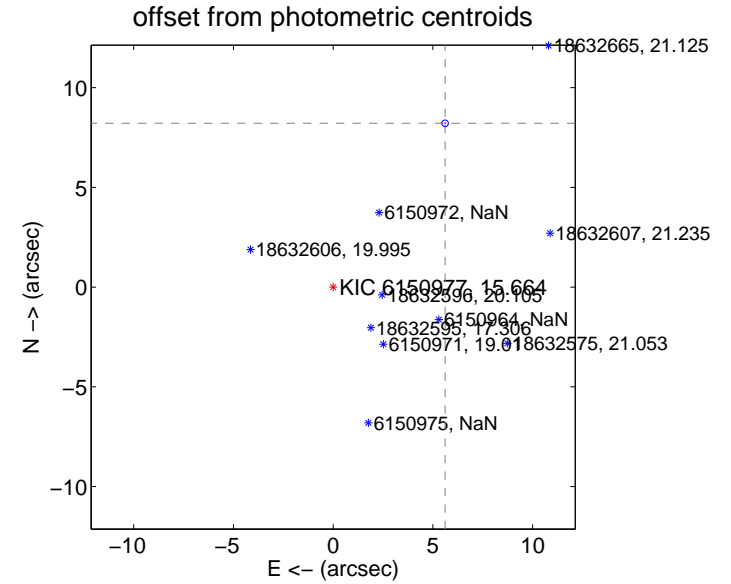
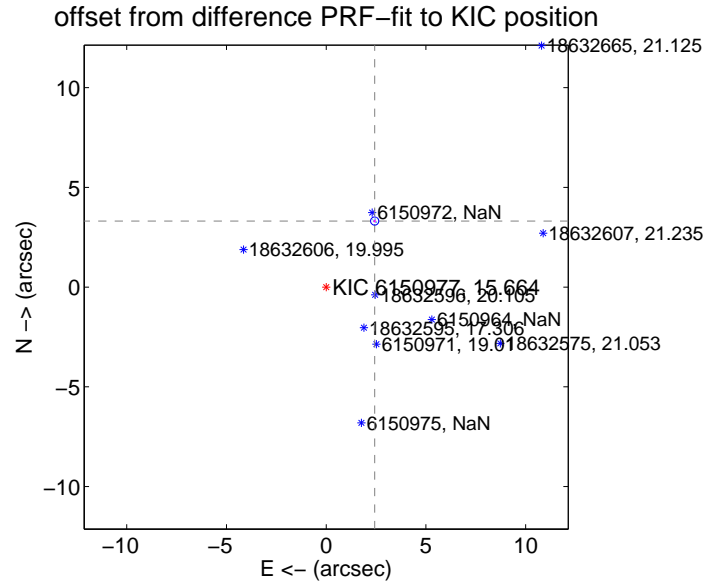
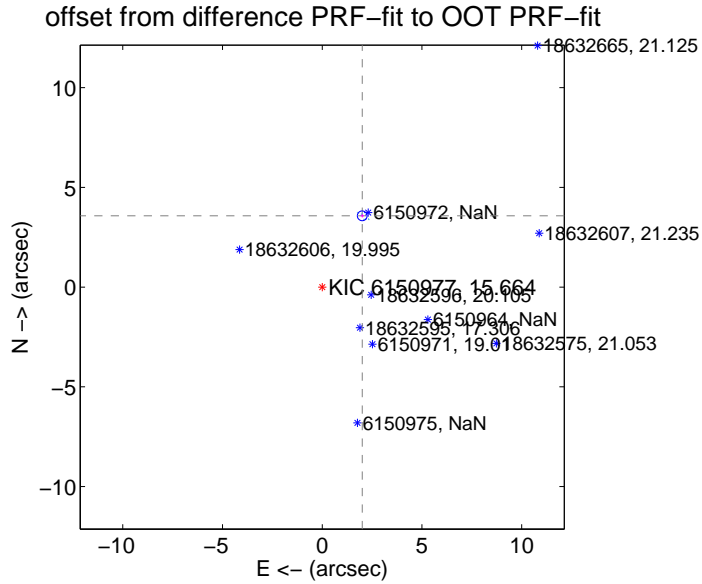
DV Centroid Data

Supplemental centroid analysis for 006150977-01. Kepler magnitude: 15.66. Transit SNR 164.58

There are 16 quarters with good PRF difference image offsets

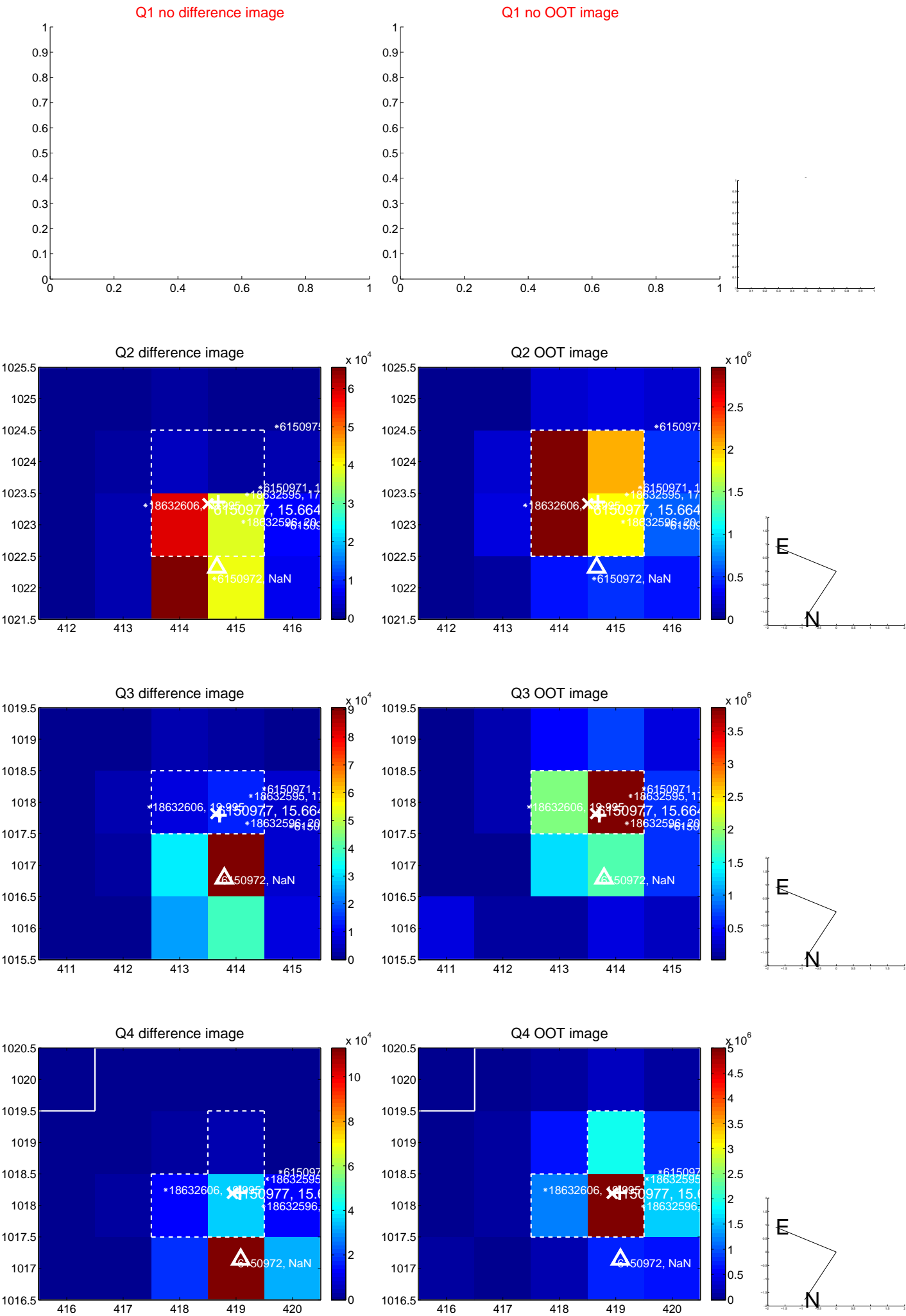
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.098 ± 0.082	50.26	-2.005 ± 0.085	3.574 ± 0.080
PRF-fit source offset from KIC position	4.108 ± 0.068	60.27	-2.430 ± 0.068	3.312 ± 0.068
photometric centroid source offset	9.95 ± 0.05	181.42	-5.61 ± 0.06	8.21 ± 0.05

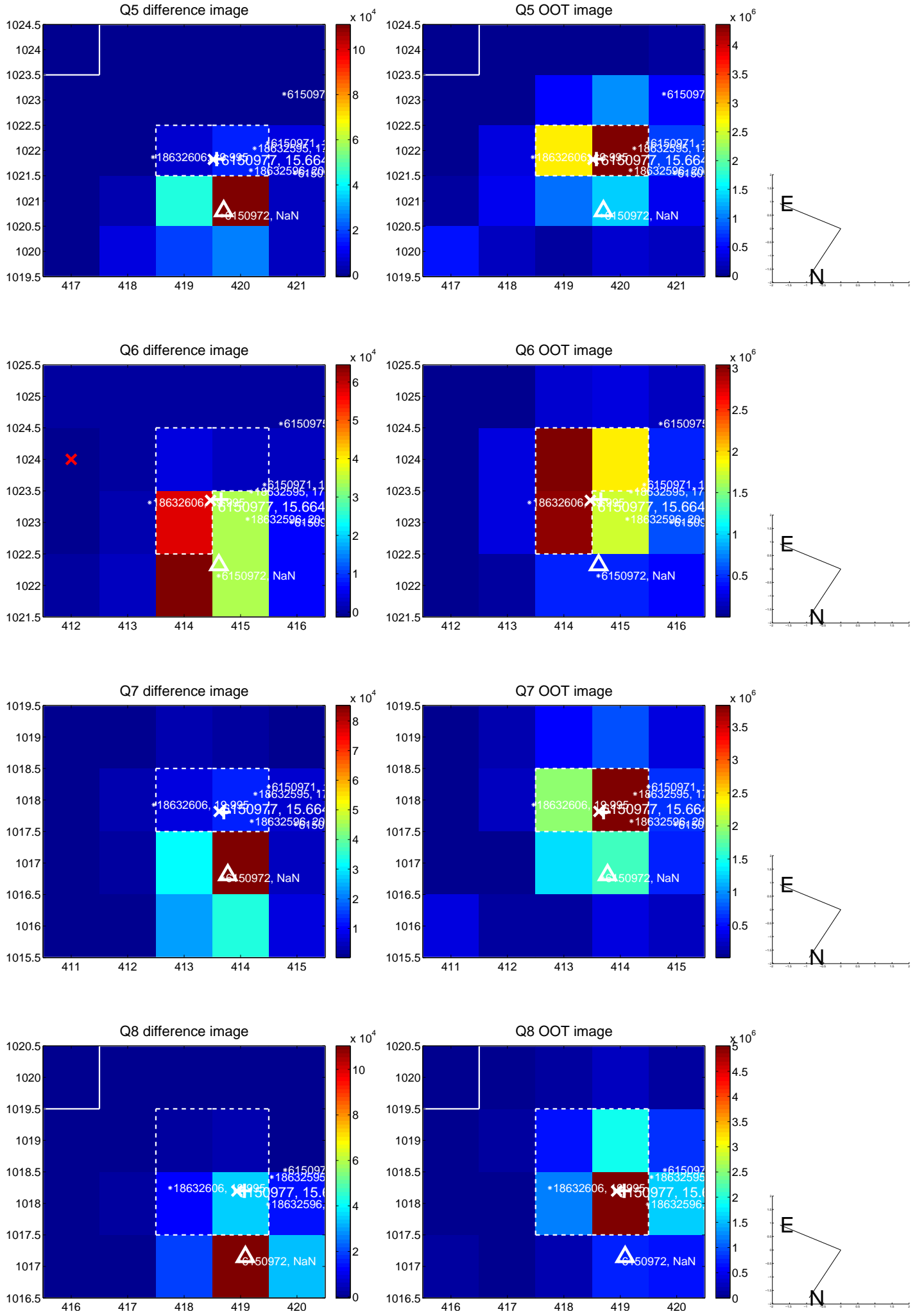


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

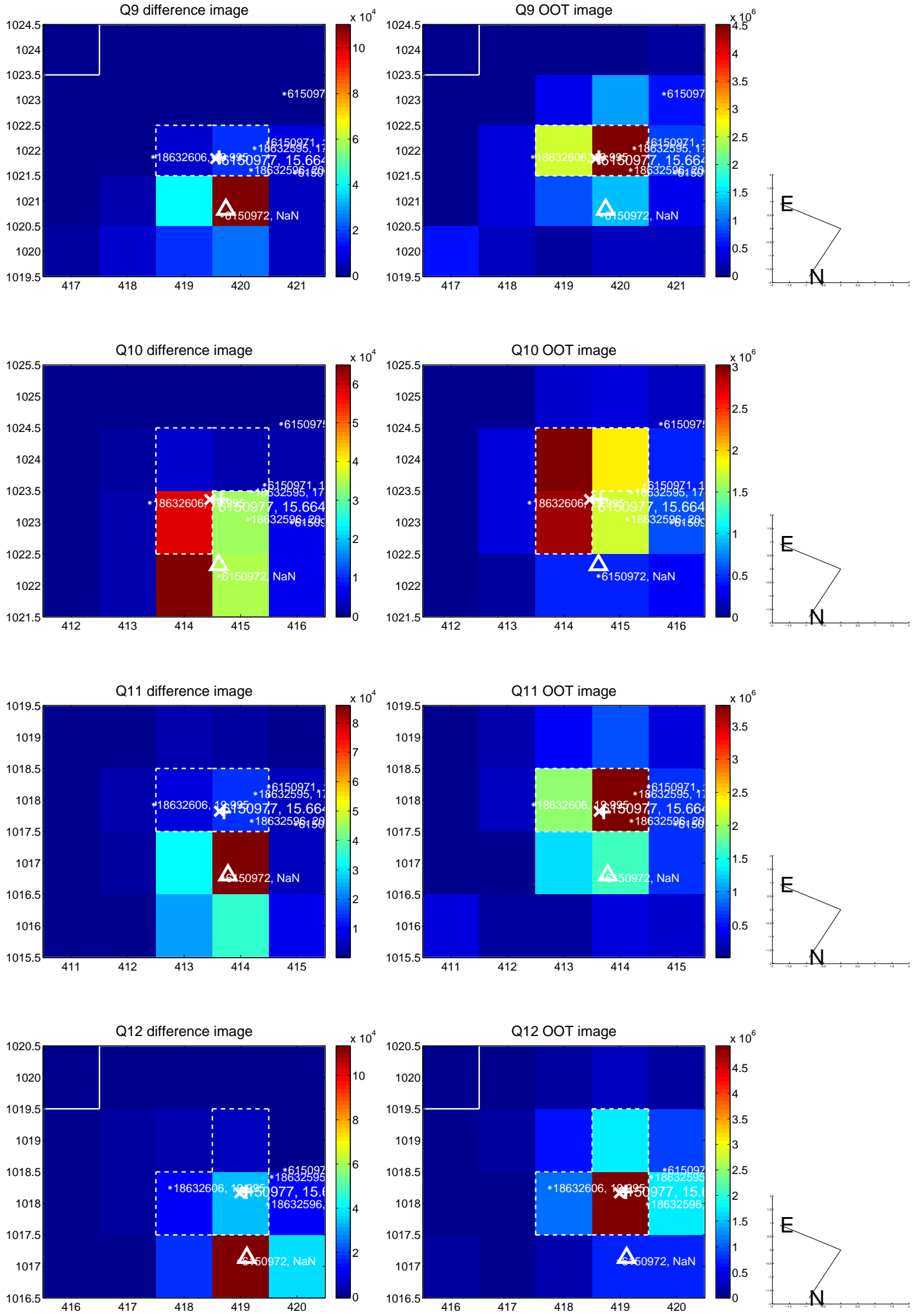
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



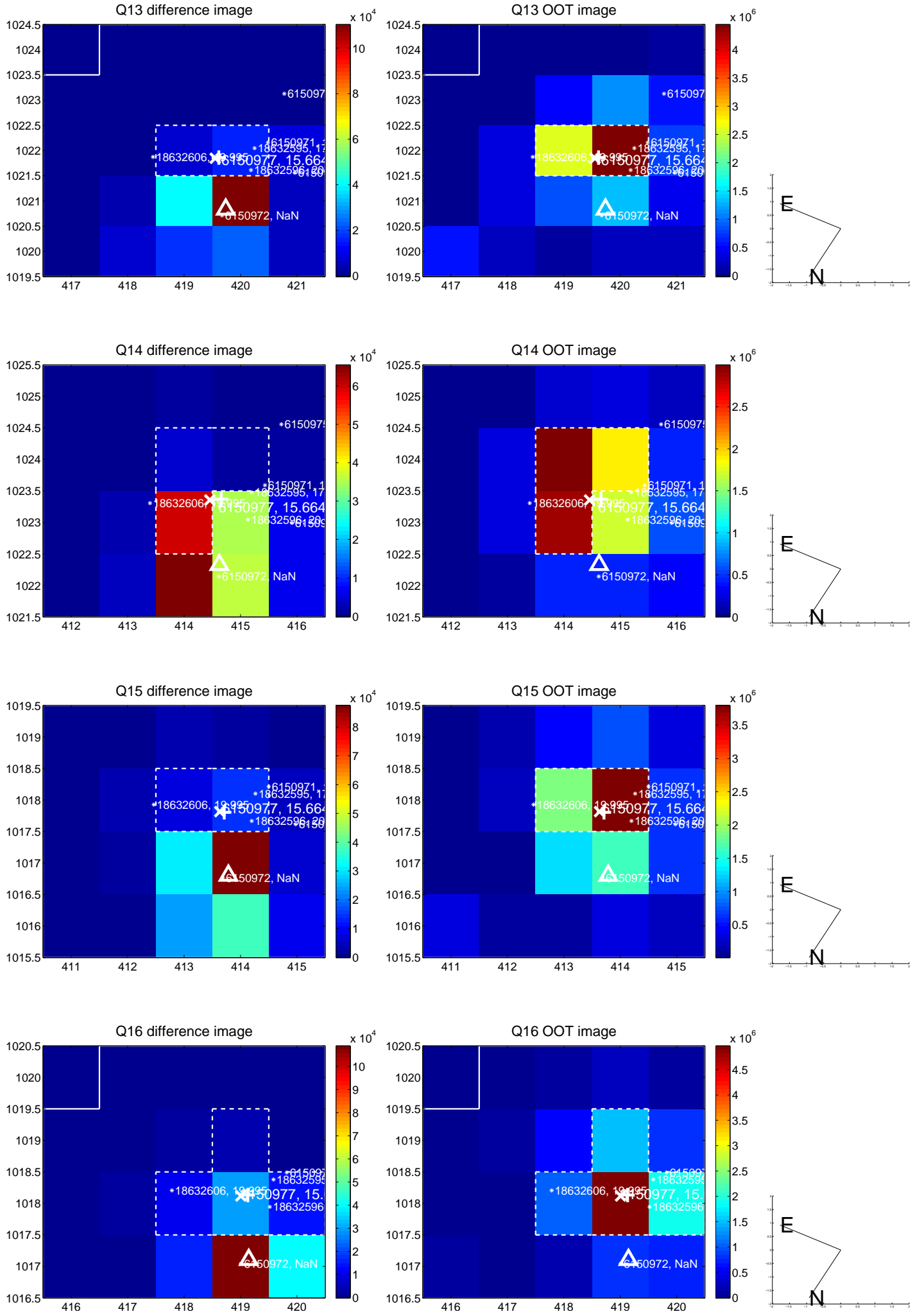
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



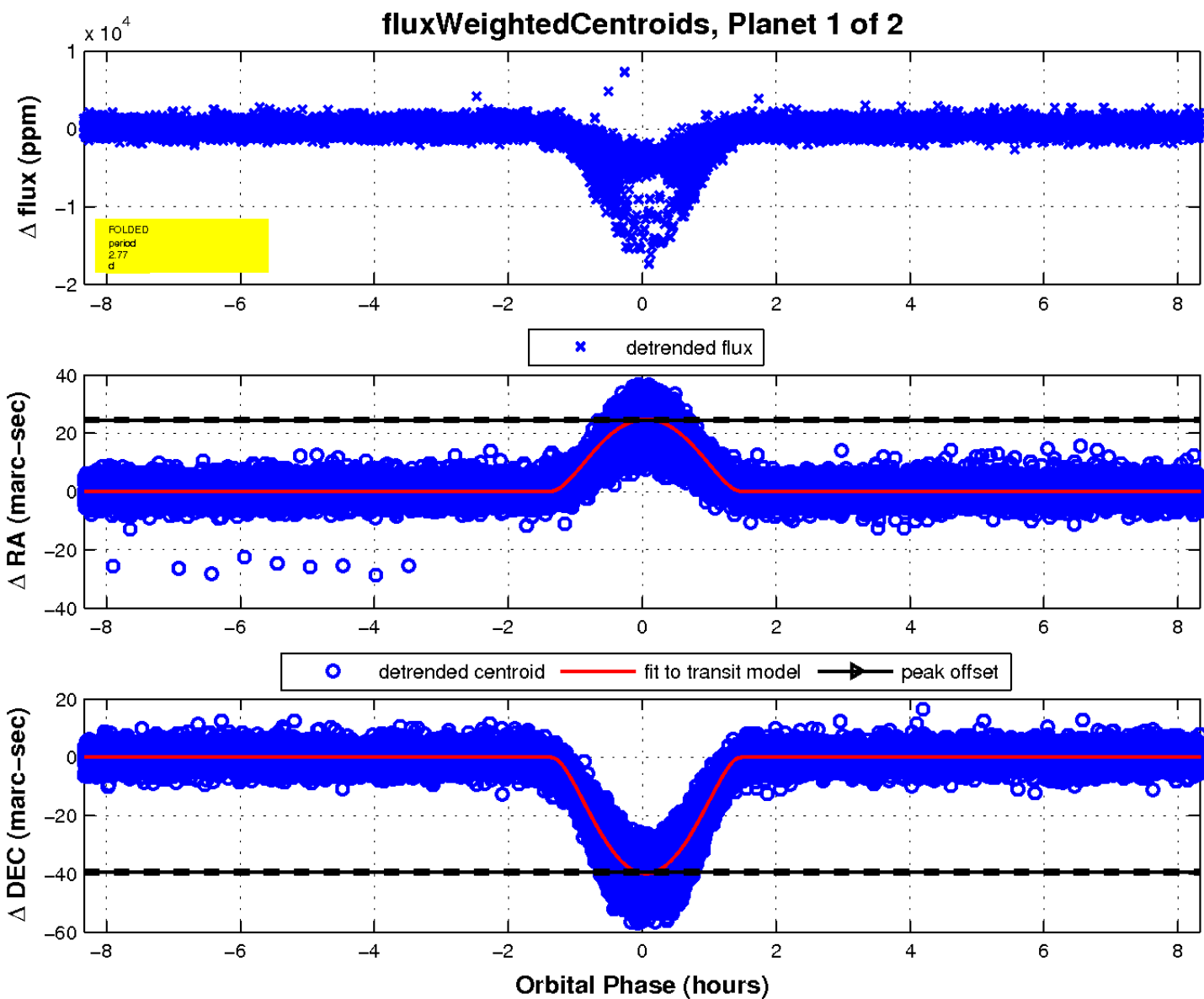
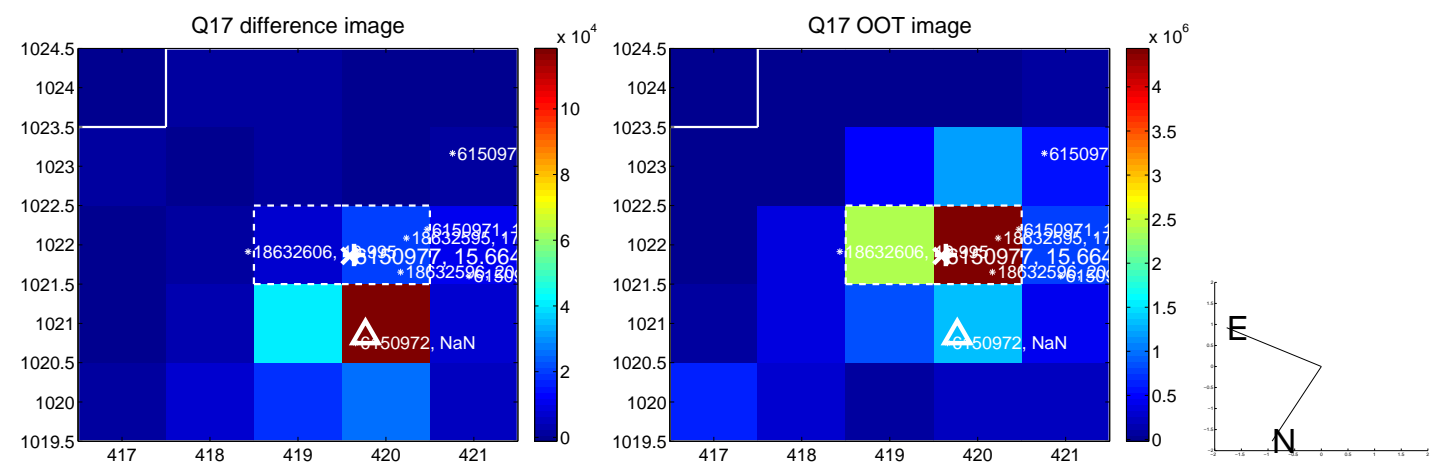
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

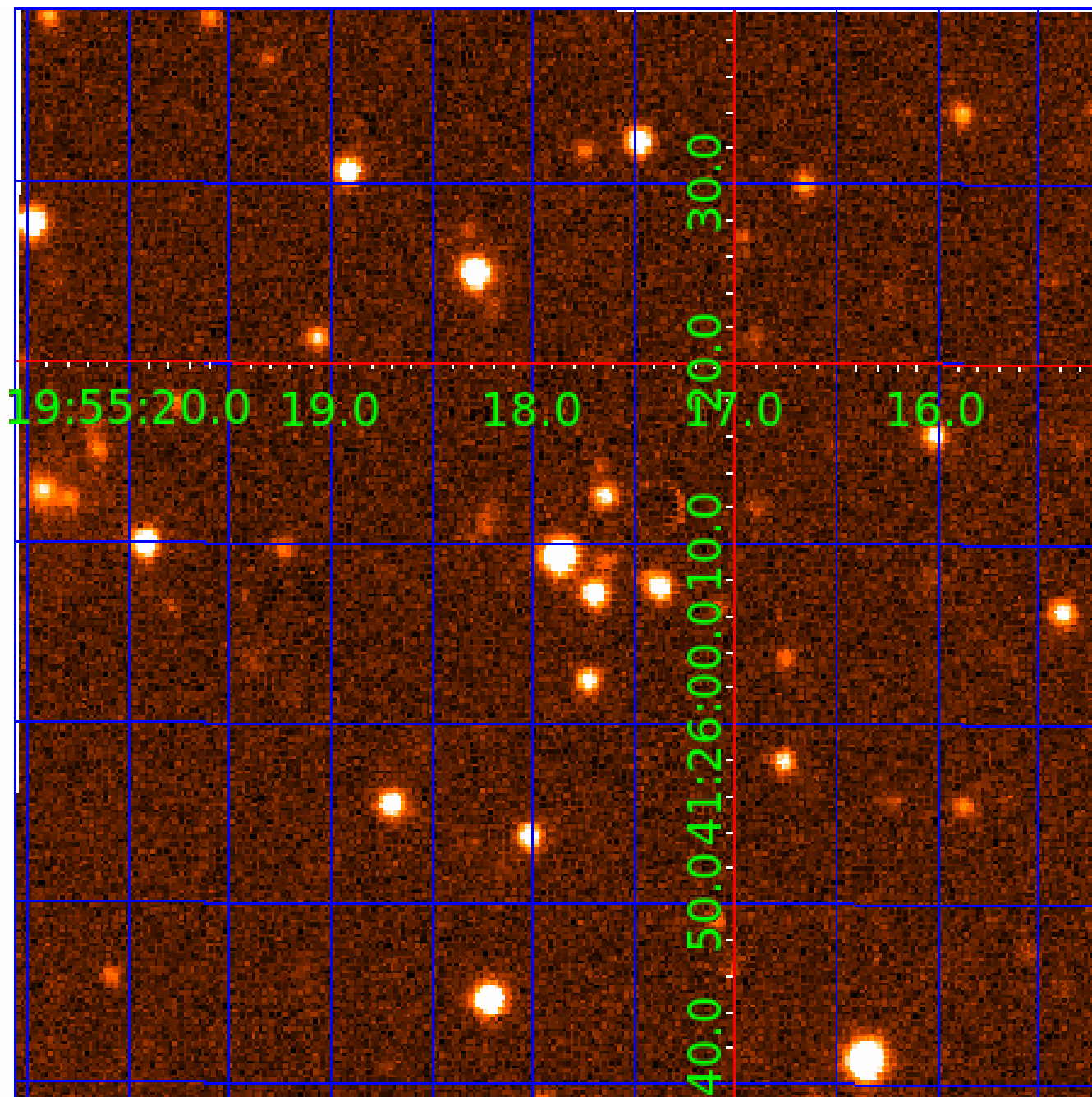


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006150977

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})
006150977-01	OBS	6022.01	2.765619	133.680493	4558.1	2.778	267.3	164.6	0.83	5423	9.07	391.58
006150977-02	OBS	No	2.765609	132.300650	1627.2	2.565	74.9	74.2	0.83	5423	4.67	391.58

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006150977-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
006150977-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST

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.

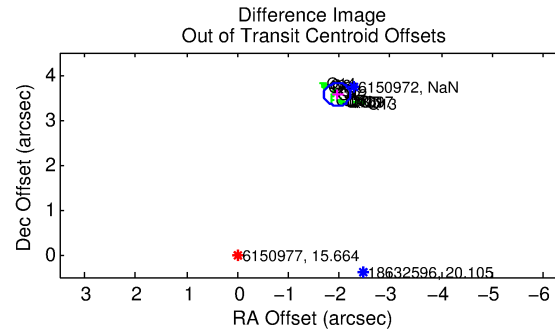
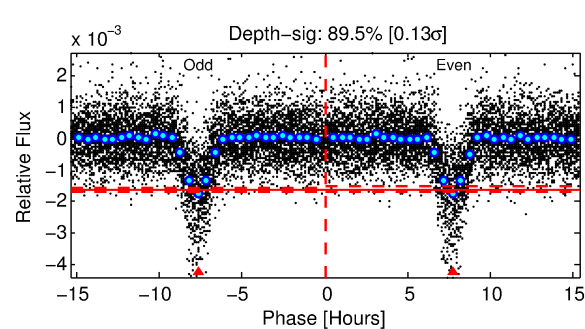
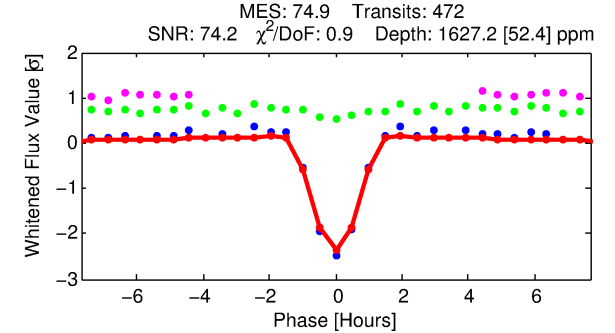
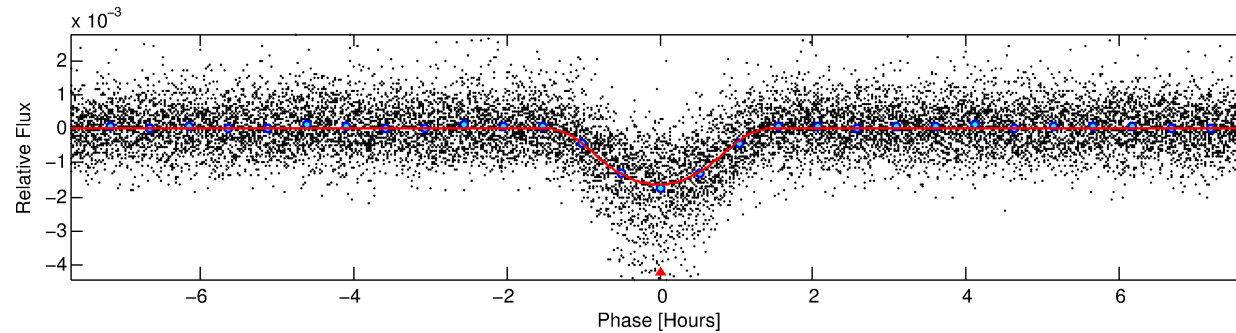
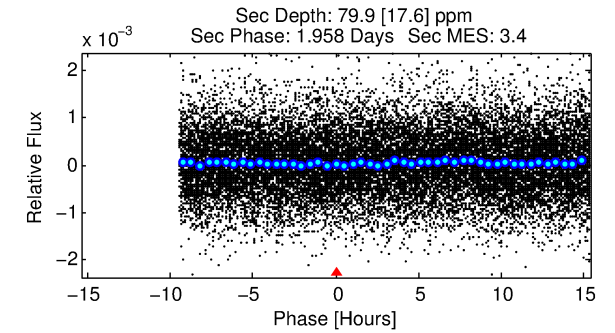
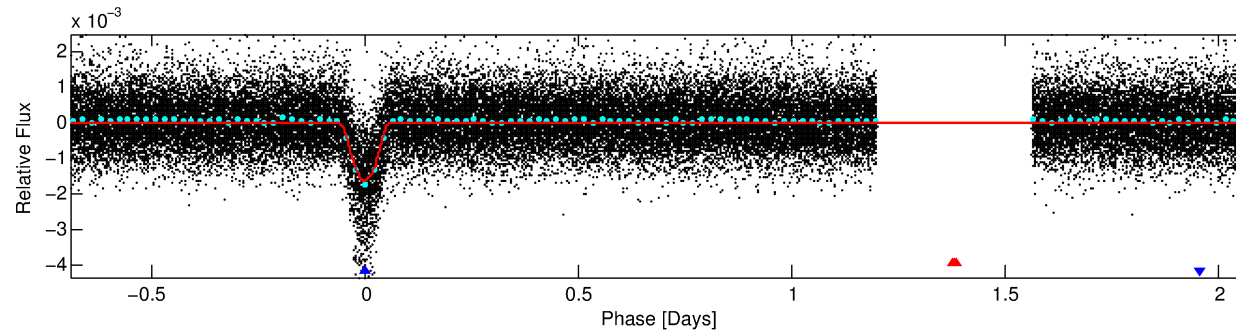
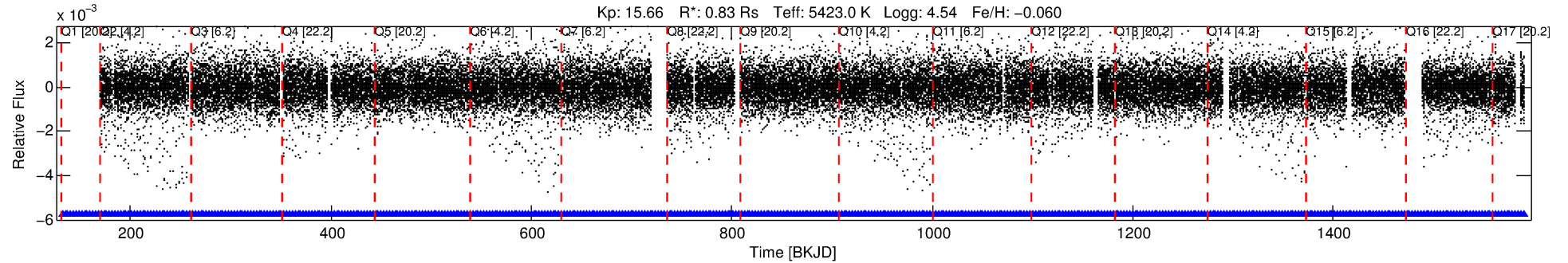
Ephemeris Match Information For 006150977-02

No Significant Match Found

DV One-Page Summary

KIC: 6150977 Candidate: 2 of 2 Period: 2.766 d
KOI: K06022 Corr: No Ephemeris Match

Kp: 15.66 R*: 0.83 Rs Teff: 5423.0 K Logg: 4.54 Fe/H: -0.060



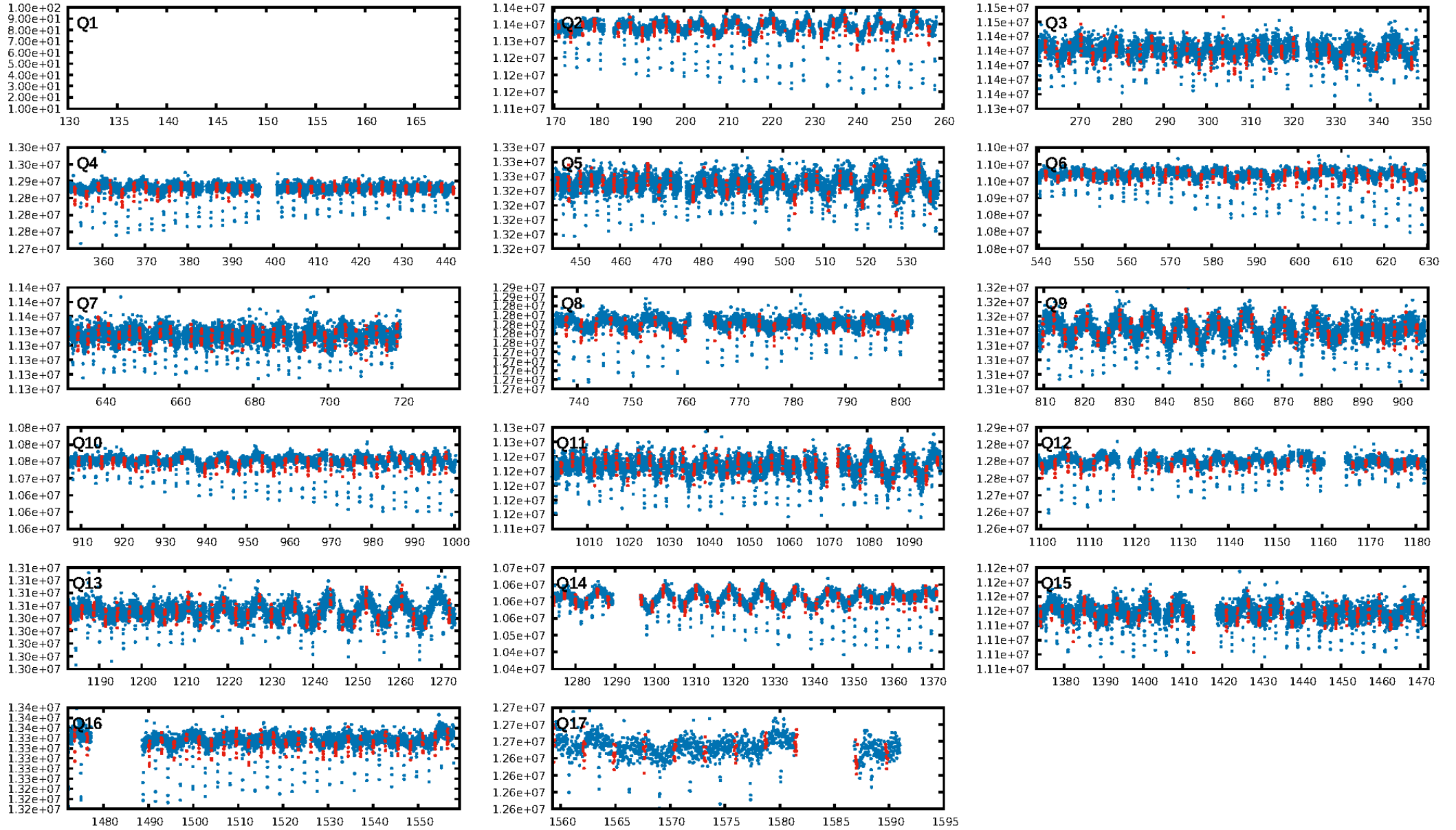
DV Fit Results:

Period = 2.76561 [0.00000] d
Epoch = 132.3006 [0.0006] BKJD
Rp/R* = 0.0517 [0.0059]
a/R* = 3.63 [0.22]
b = 0.96 [0.01]
Seff = 391.58 [109.72]
Teq = 1134 [79] K
Rp = 4.67 [1.09] Re
a = 0.0368 [0.0063] AU
Ag = 2.74 [1.10] [1.57σ]
Teff = 2256 [194] K [5.35σ]

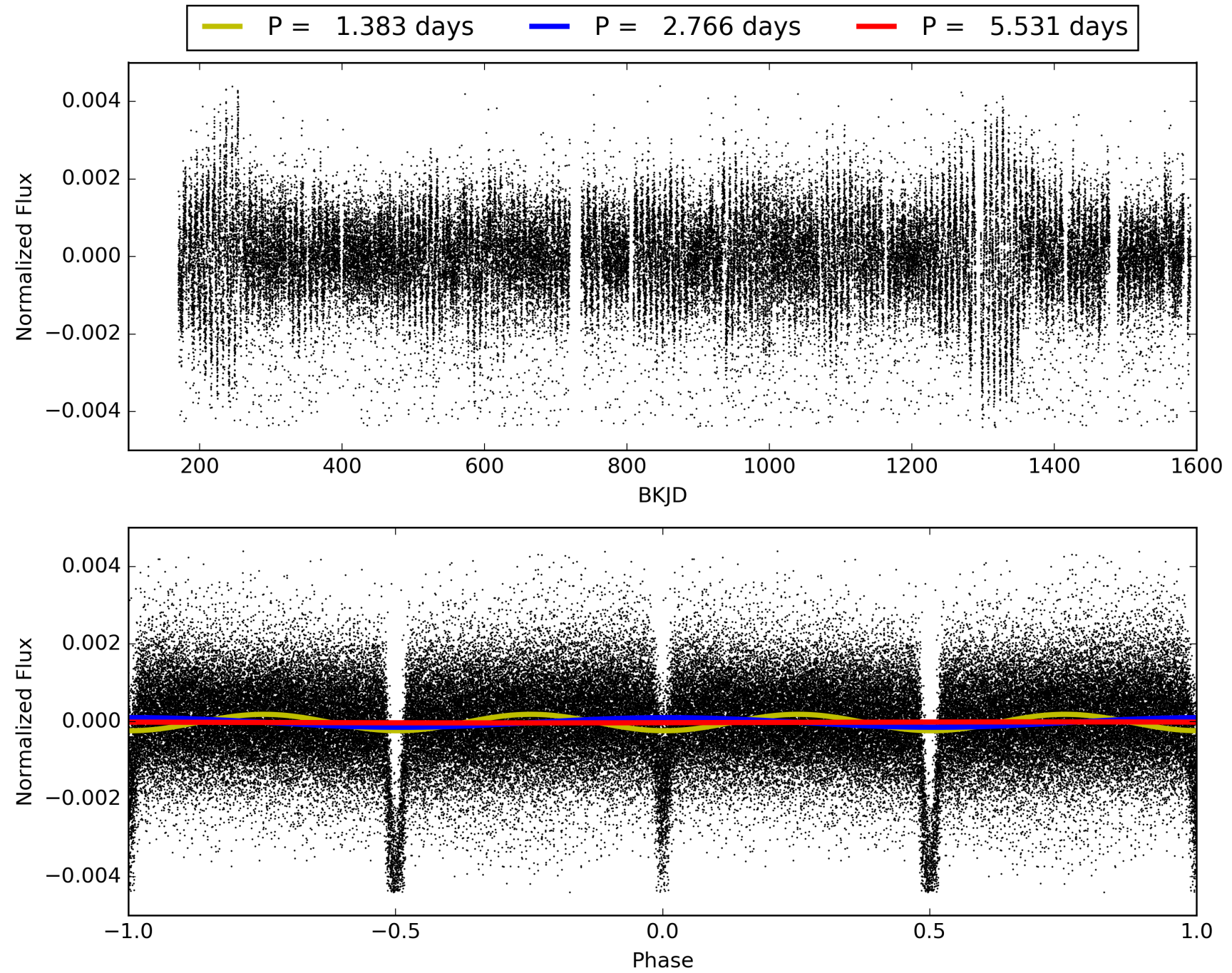
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [461/461]
GhostDiagnostic-chr: -0.004225
Centroid-sig: 0.0%
Centroid-so: 5.359 arcsec [34.60σ]
OotOffset-rm: 4.066 arcsec [47.90σ]
KicOffset-rm: 4.064 arcsec [58.88σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 006150977-02, PDC Light Curves

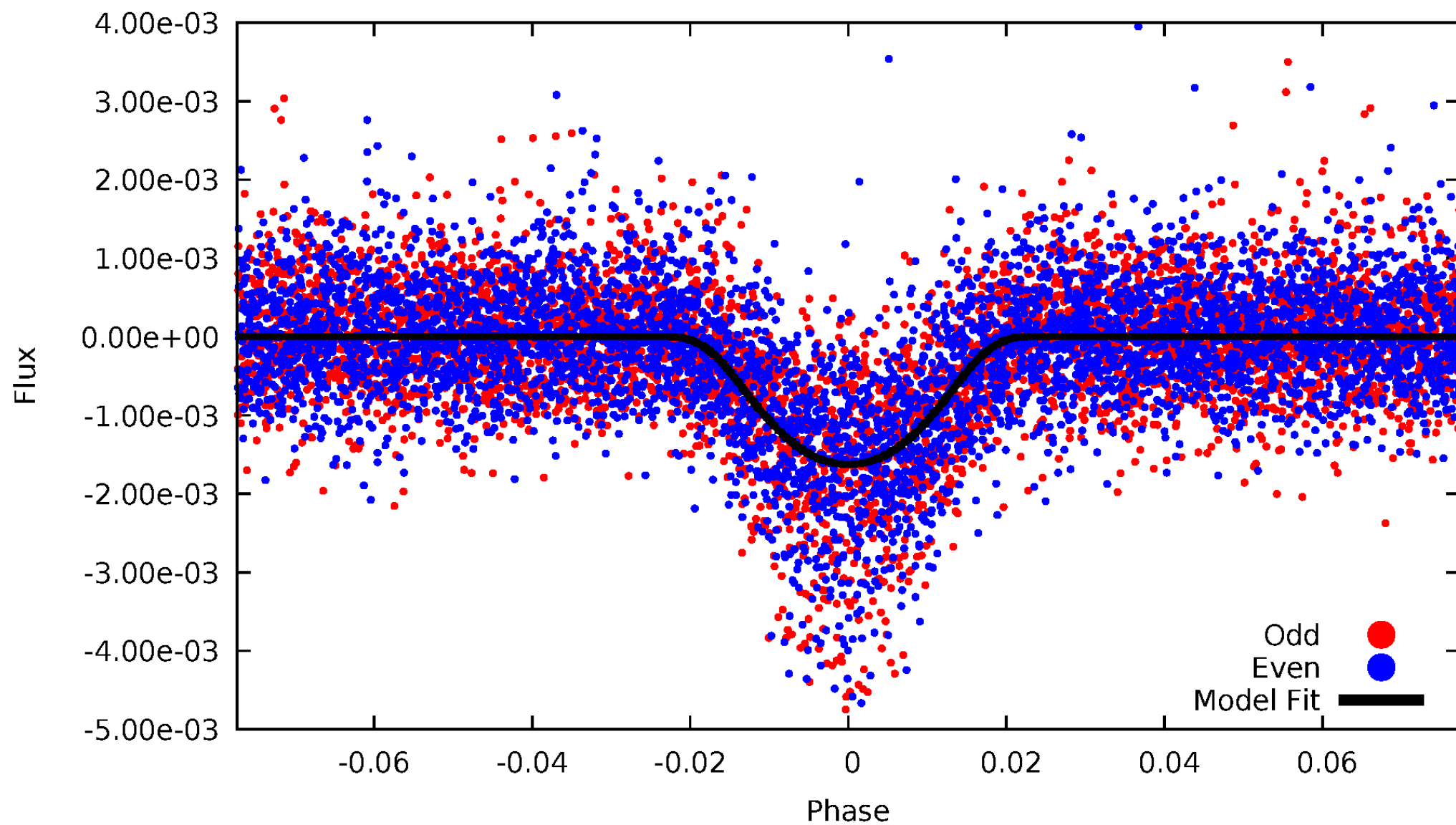


TCE 006150977-02



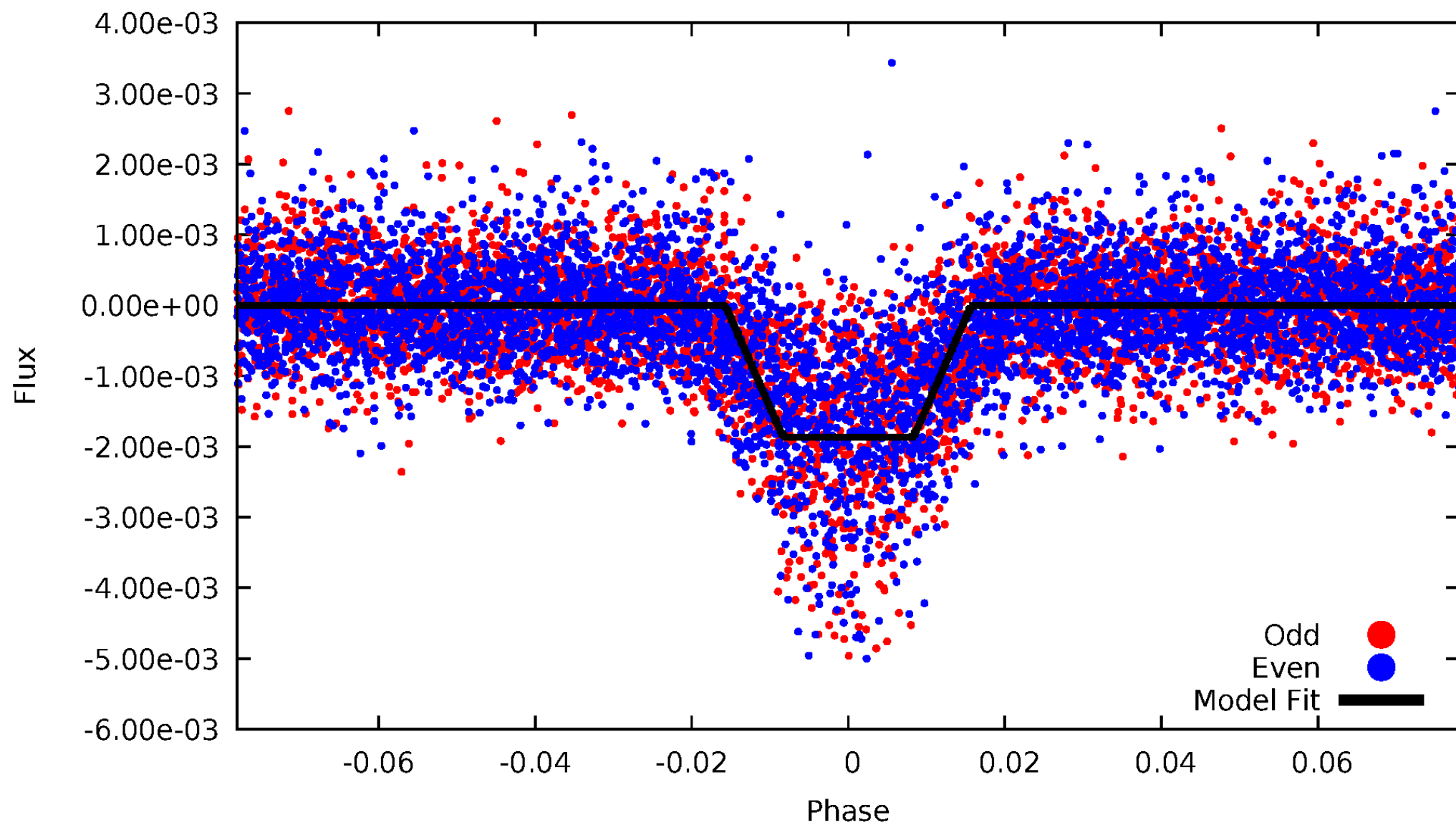
DV Odd/Even

TCE 006150977-02



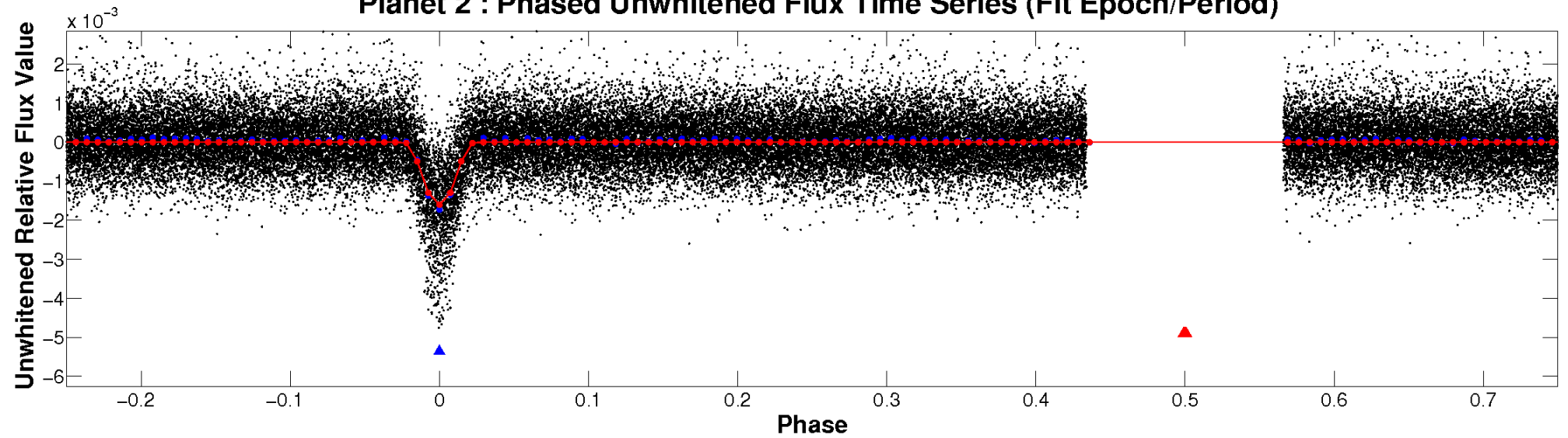
ALT Odd/Even

TCE 006150977-02

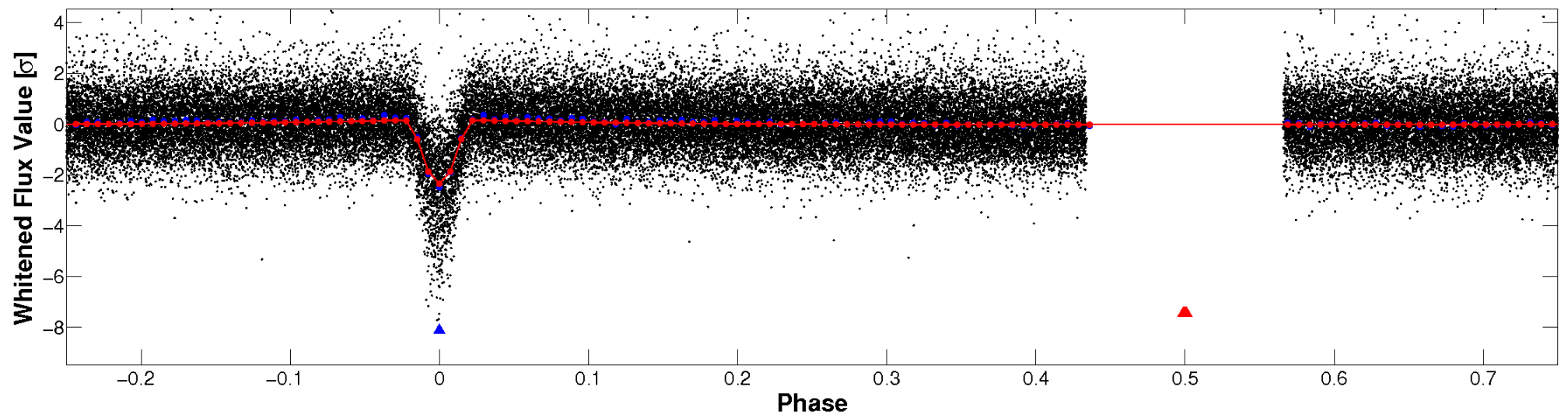


Non-Whitened Vs. Whitened Light Curve

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

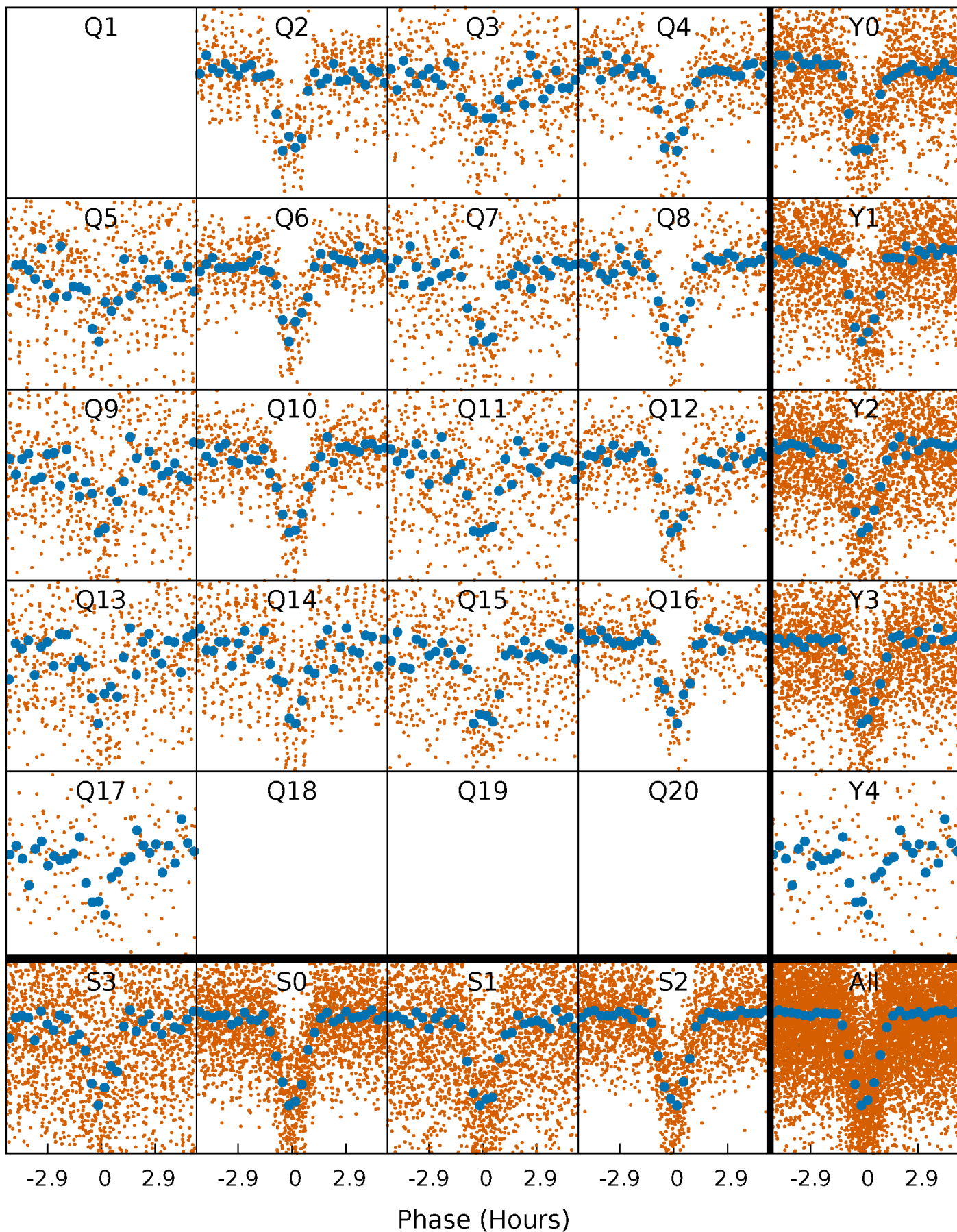


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



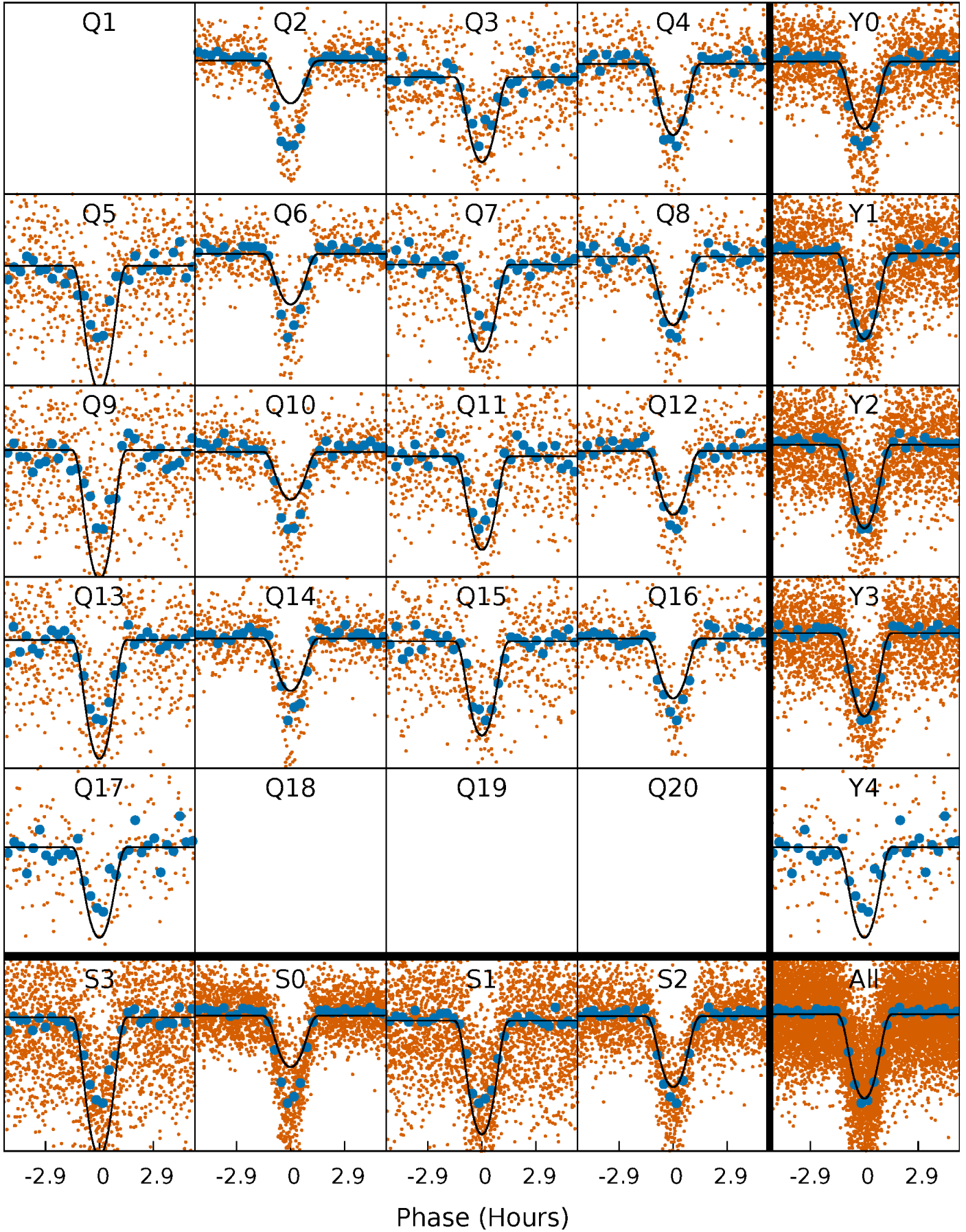
PDC Quarter-Phased Transit Curves

TCE 006150977-02 P= 2.765609 Days $T_0=132.300650$ (BKJD)



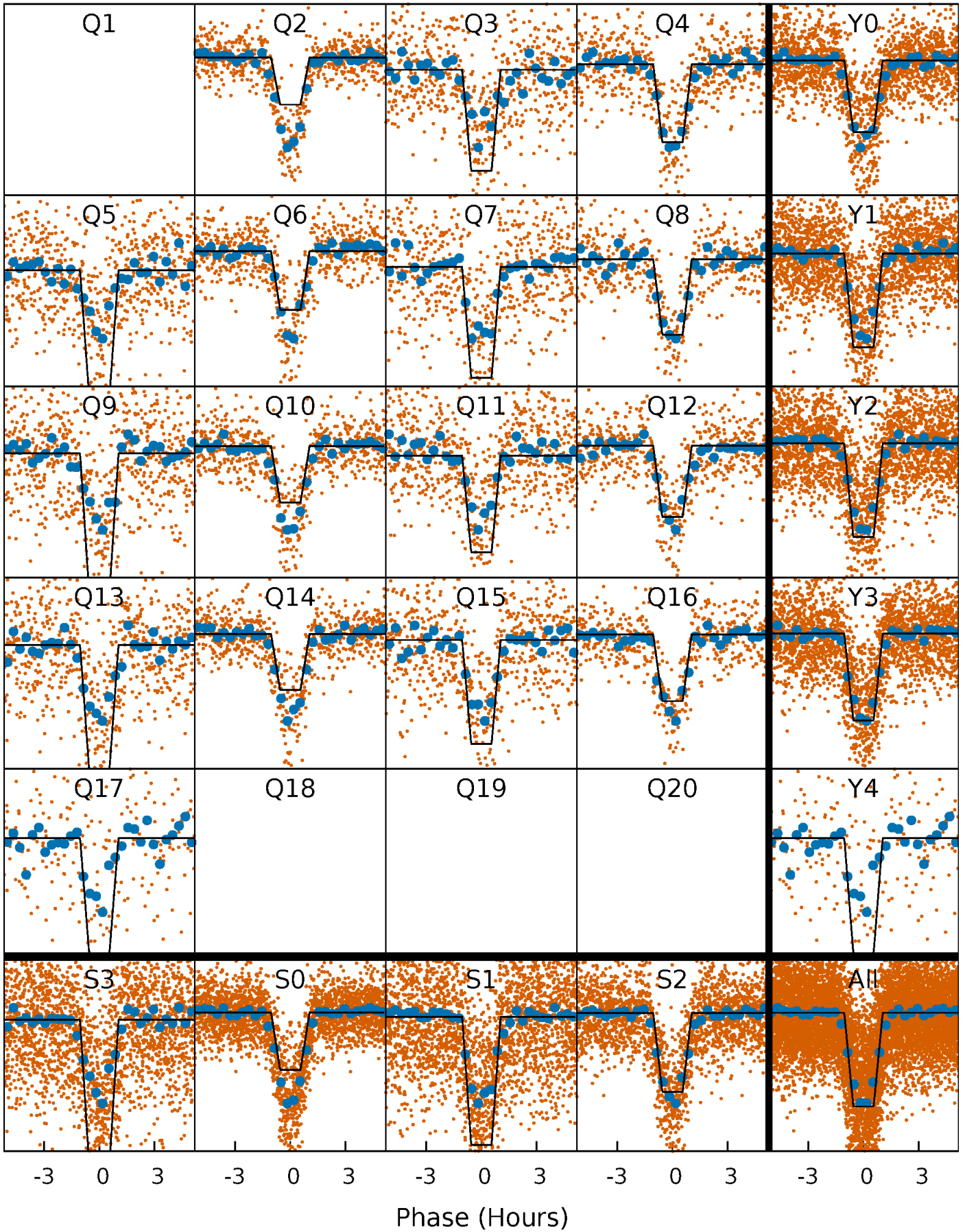
DV Quarter-Phased Transit Curves

TCE 006150977-02 P= 2.765609 Days $T_0=132.300650$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

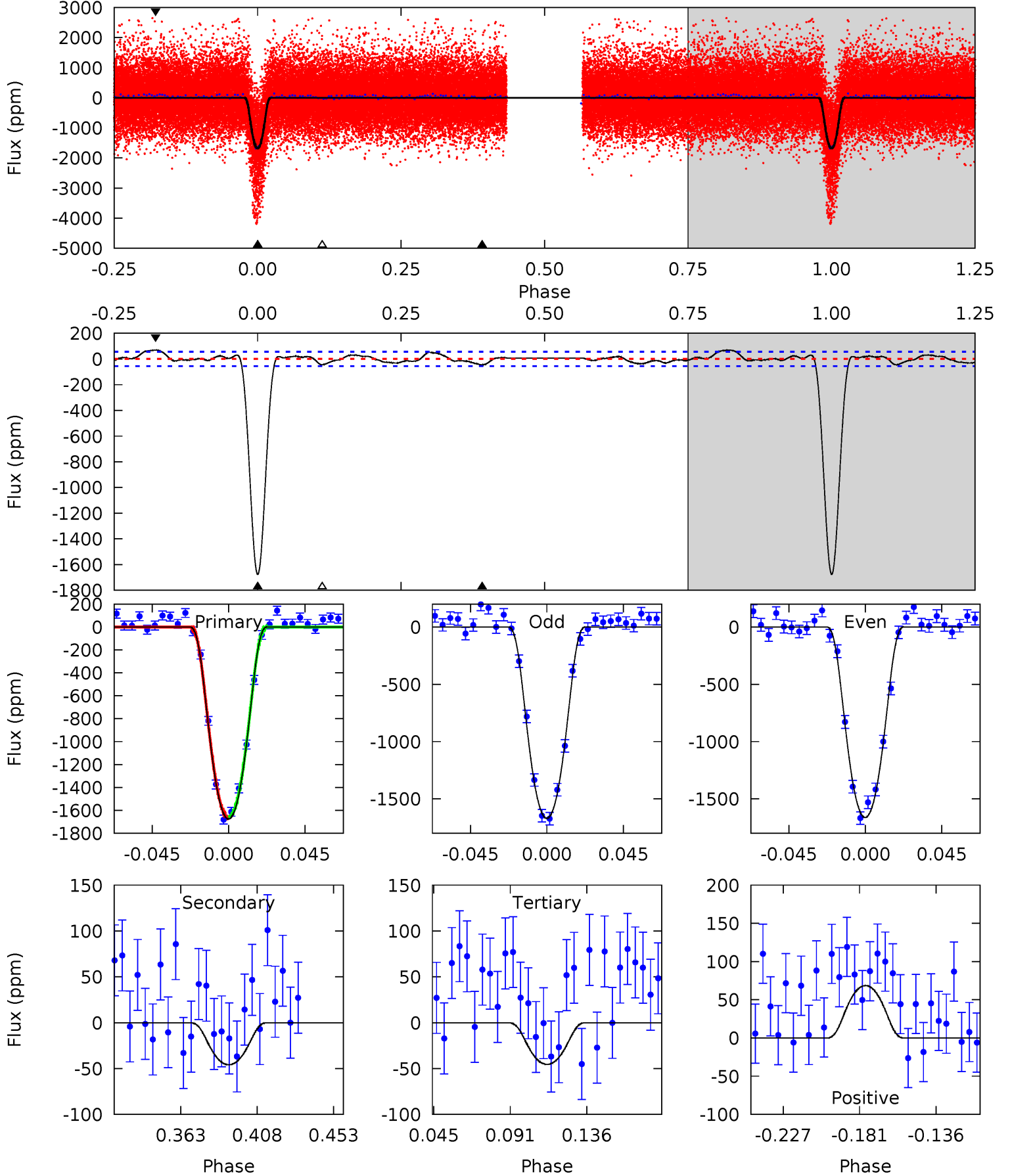
TCE 006150977-02 P= 2.765623 Days $T_0=132.297032$ (BKJD)



DV Model-Shift Uniqueness Test

006150977-02, P = 2.765609 Days, E = 132.300650 Days

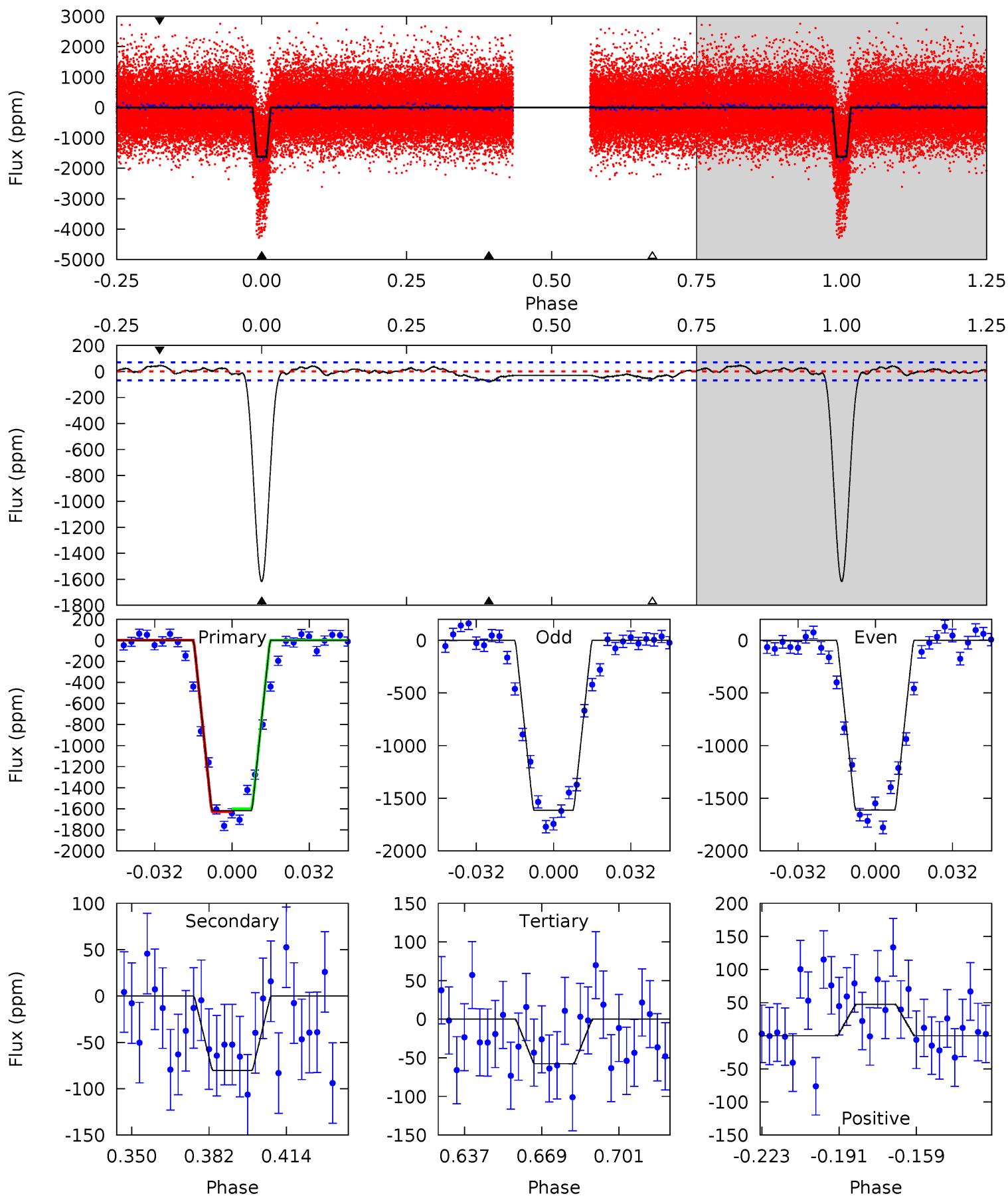
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
140.2	3.84	3.80	5.73	4.73	2.00	2.07	136.4	134.5	0.03	-1.90	0.28	1.15	0.04	0.16



Alt Model-Shift Uniqueness Test

006150977-02, P = 2.765623 Days, E = 132.297032 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
111.9	5.55	3.99	3.28	4.80	2.15	1.72	107.9	108.6	1.57	2.27	0.09	1.14	0.03	0.98



Stellar Parameters For KIC 006150977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5423^{+177}_{-161}	$4.542^{+0.045}_{-0.135}$	$-0.060^{+0.300}_{-0.300}$	$0.828^{+0.169}_{-0.078}$	$0.872^{+0.090}_{-0.090}$	$2.161^{+0.497}_{-0.828}$
	+3%/-3%	+1%/-3%	+500%/-500%	+20%/-9%	+10%/-10%	+23%/-38%
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 006150977-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-46 ± 12	$4.80^{+0.77}_{-0.65}$	1608^{+83}_{-66}	2633^{+157}_{-186}	$1.413^{+0.688}_{-0.509}$
Alt.	-80 ± 14	$4.01^{+0.71}_{-0.61}$	1611^{+84}_{-70}	3054^{+169}_{-163}	$3.617^{+1.583}_{-1.145}$

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

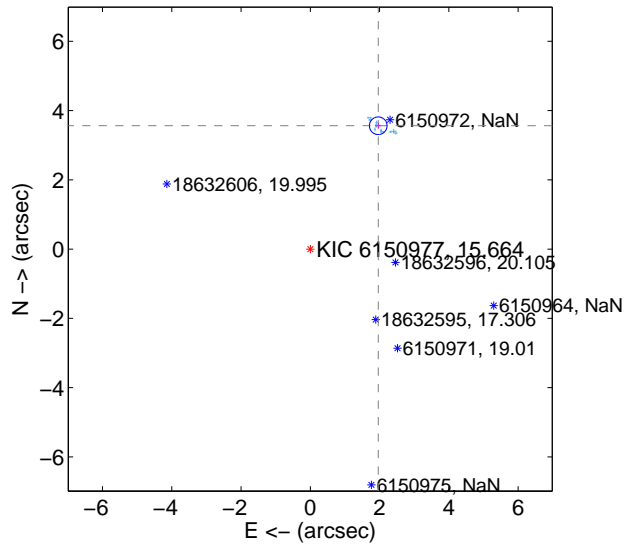
Supplemental centroid analysis for 006150977-02. Kepler magnitude: 15.66. Transit SNR 74.23

There are 16 quarters with good PRF difference image offsets

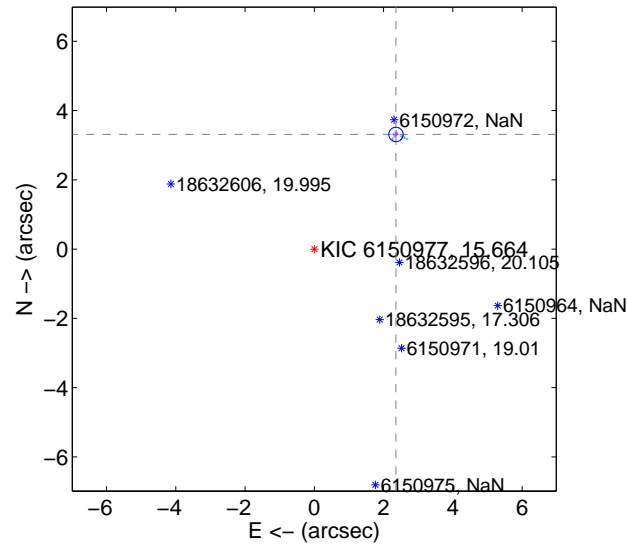
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.066 ± 0.085	47.90	-1.961 ± 0.091	3.562 ± 0.083
PRF-fit source offset from KIC position	4.064 ± 0.069	58.88	-2.357 ± 0.069	3.311 ± 0.069
photometric centroid source offset	5.36 ± 0.15	34.60	-4.12 ± 0.16	3.43 ± 0.15

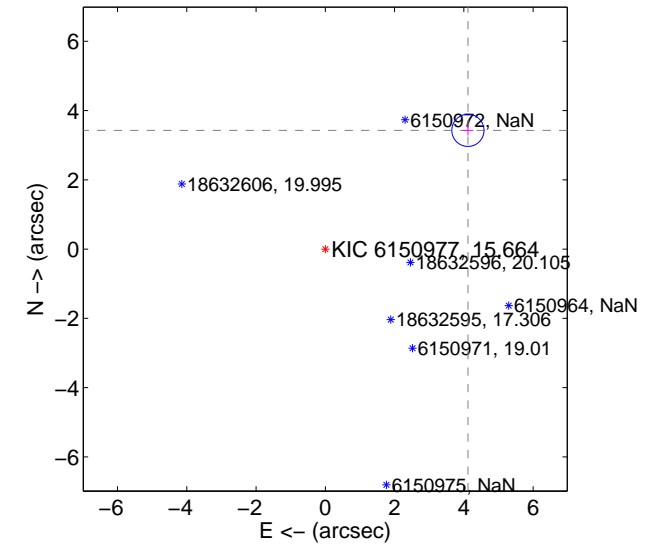
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

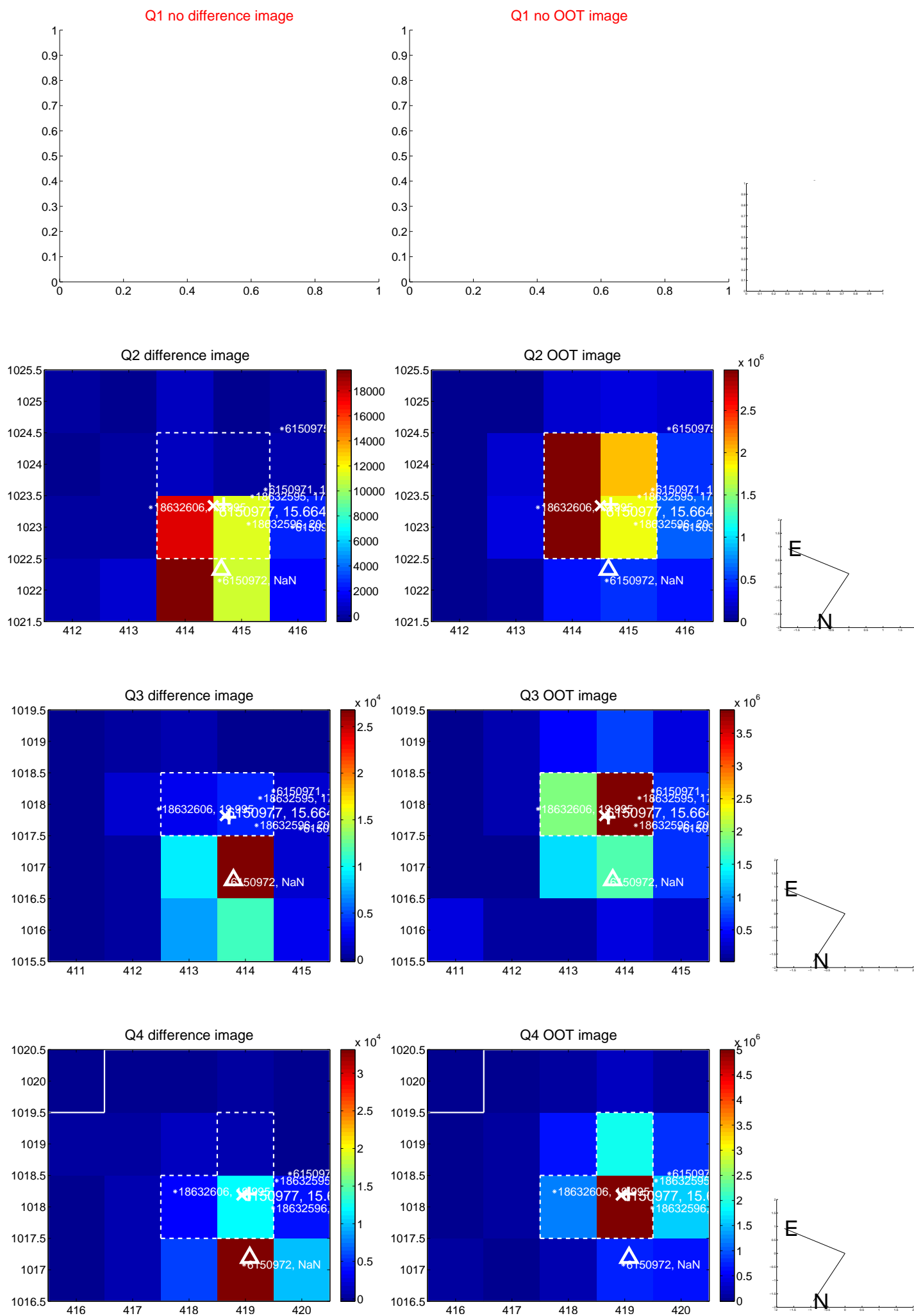


offset from photometric centroids

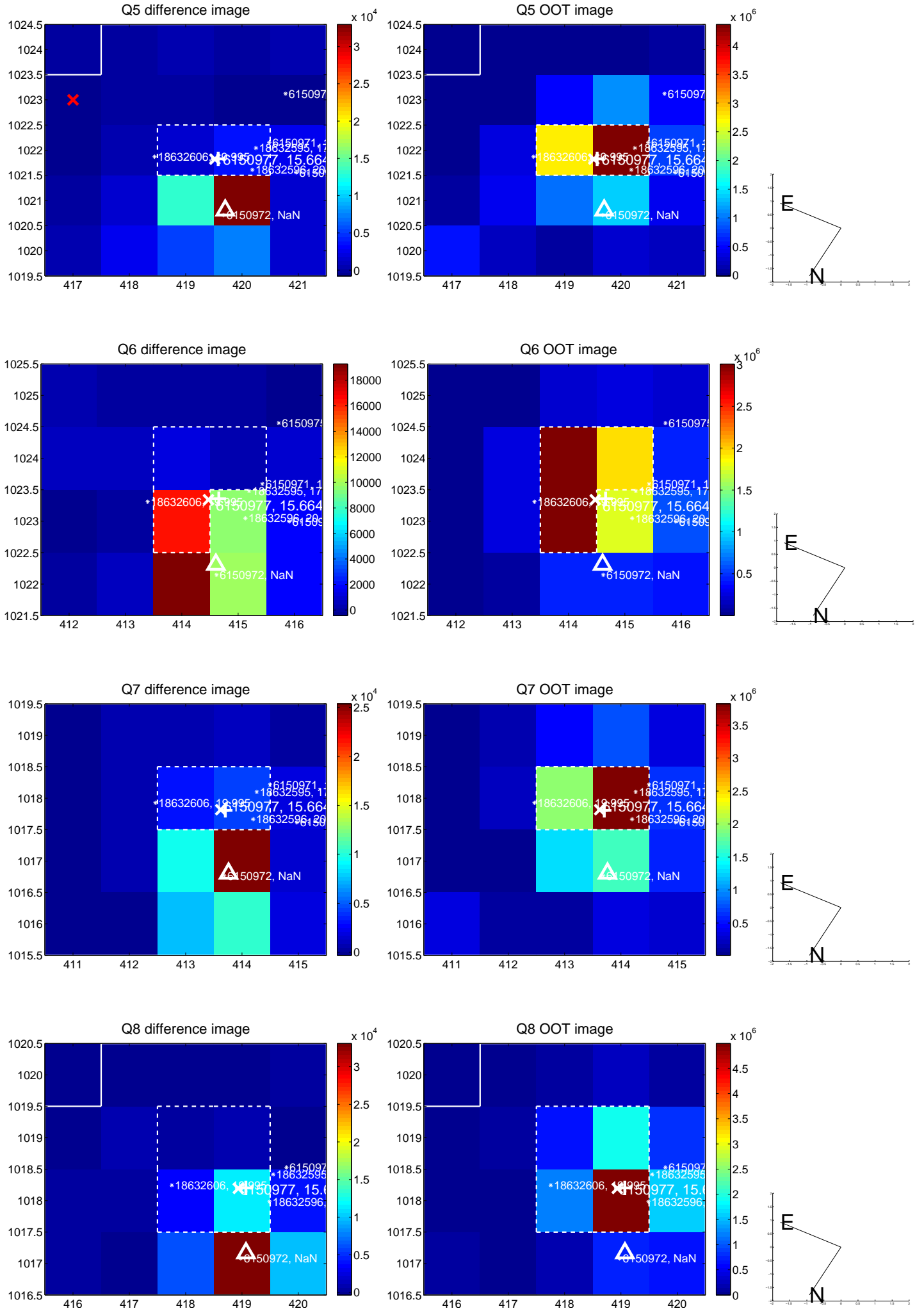


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

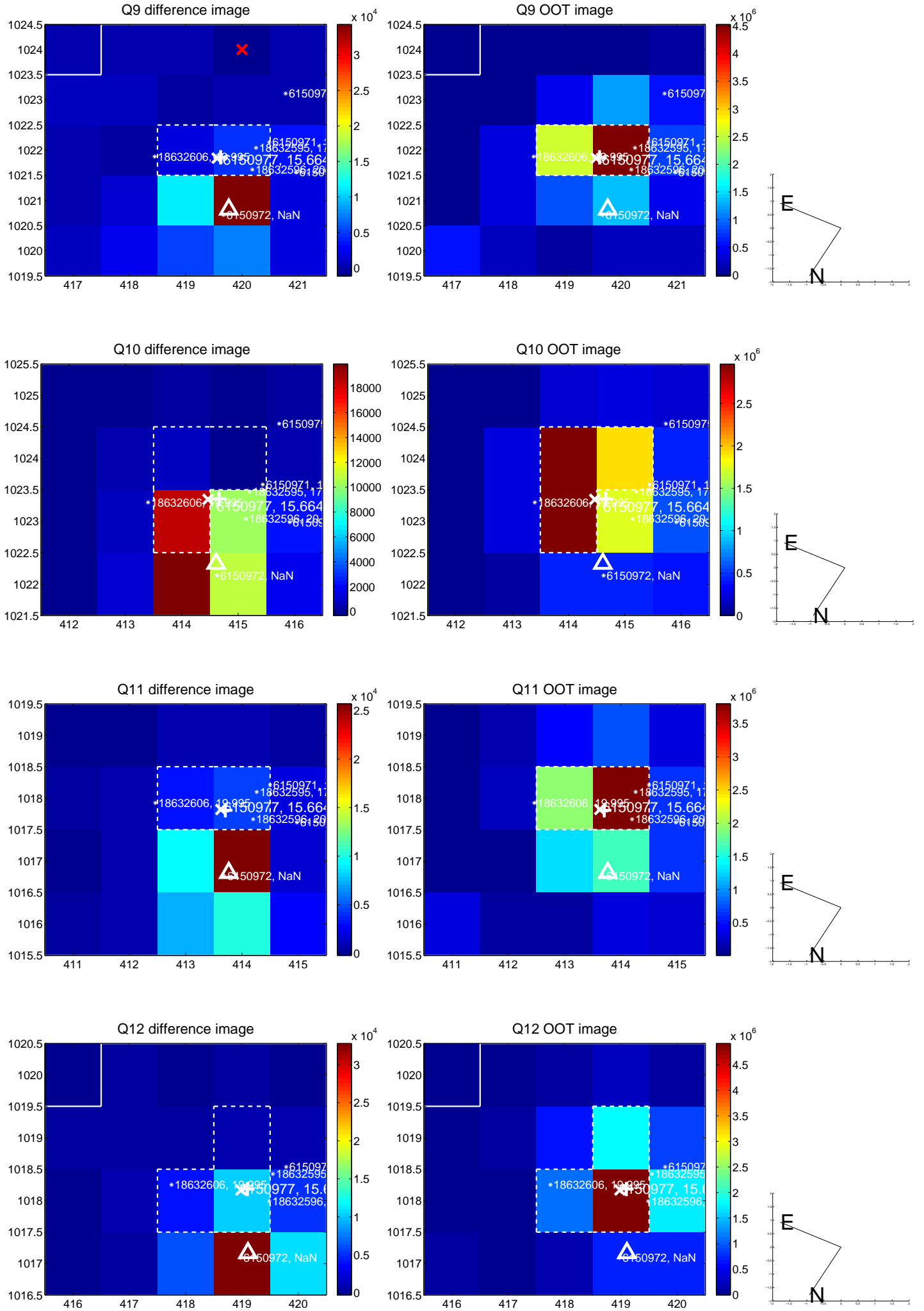
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



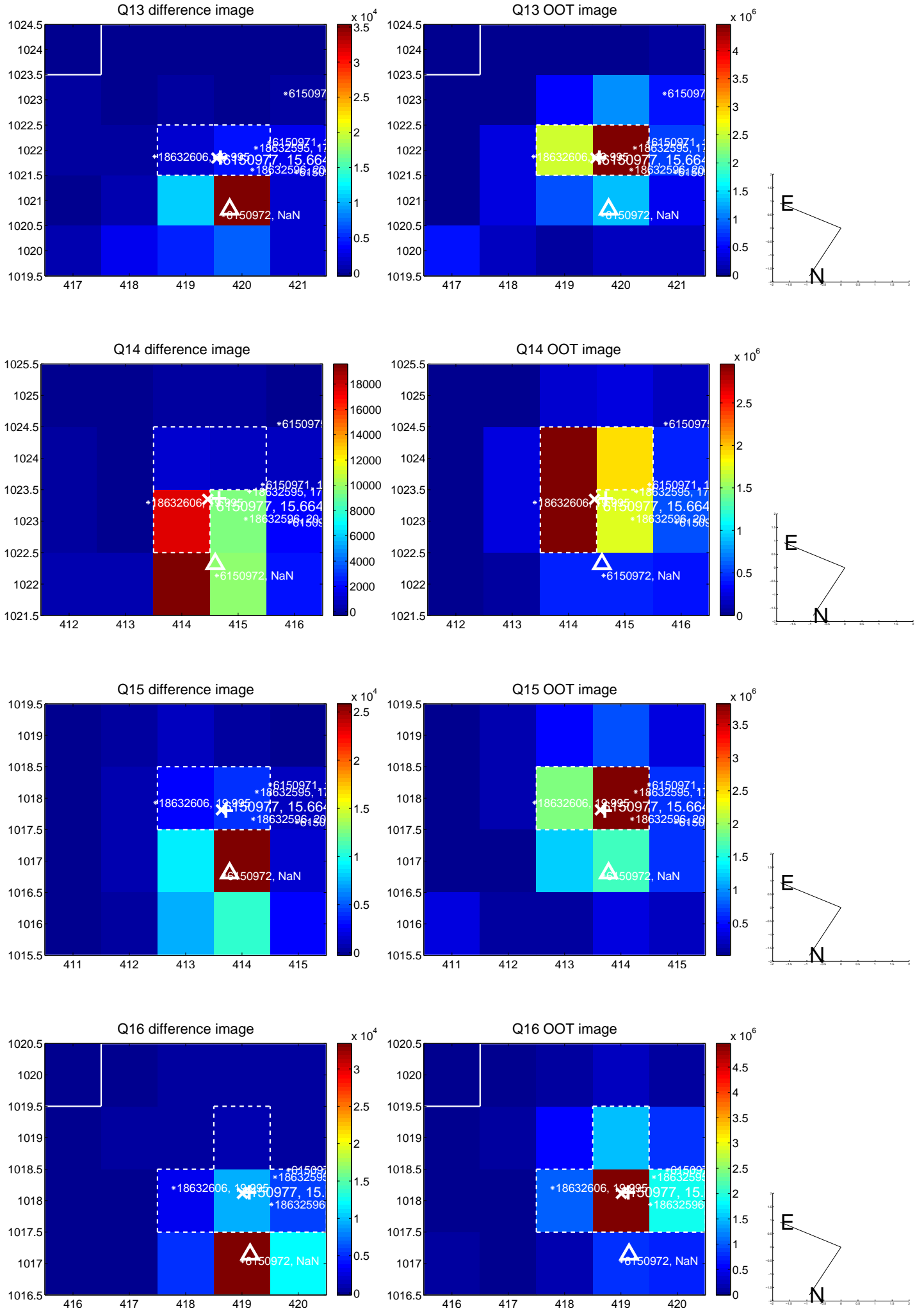
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



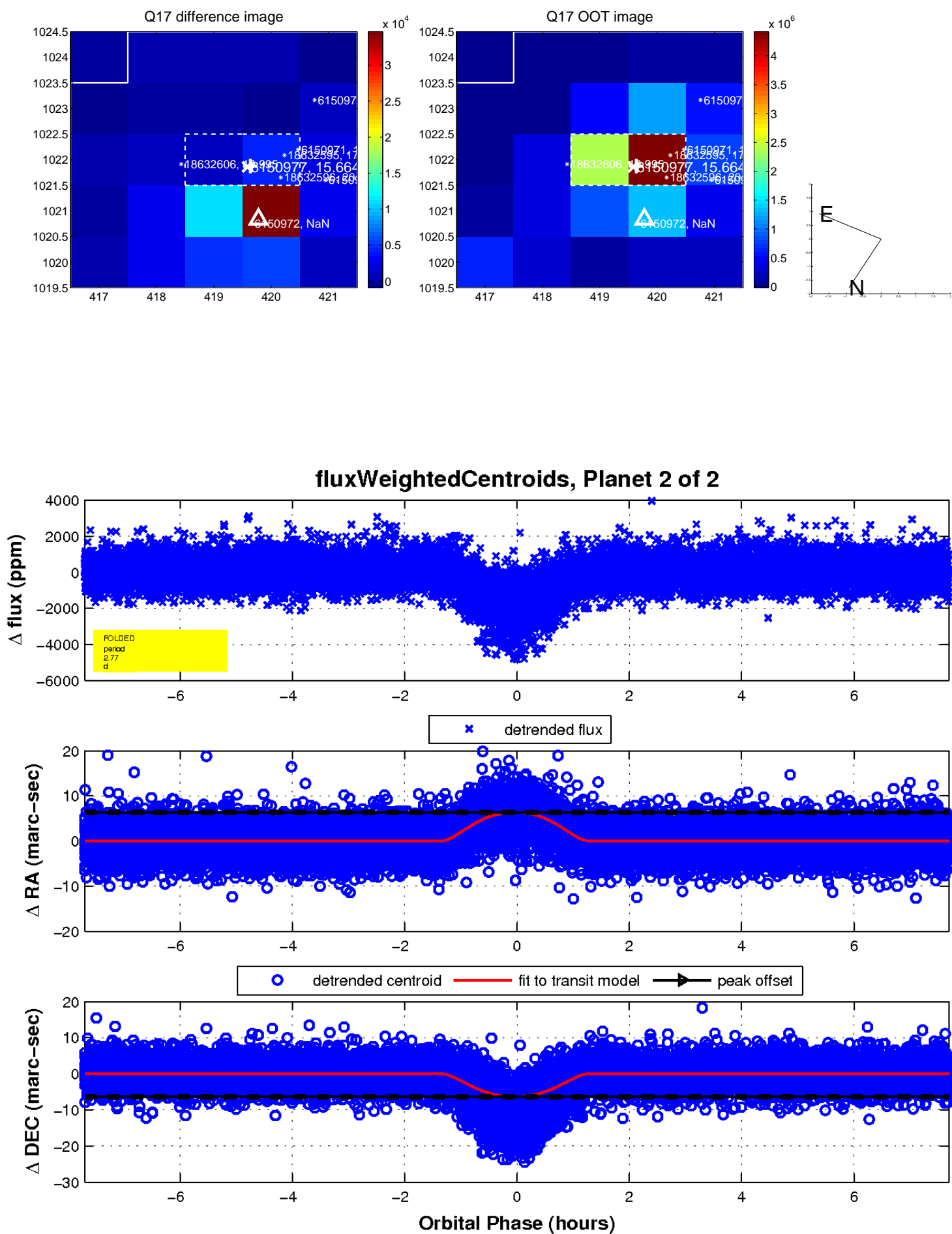
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

