

KIC 009838975

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})
009838975-01	OBS	0218.01	18.692860	143.833207	51422.4	3.907	1241.3	1205.6	0.66	5190	14.76	18.44
009838975-02	OBS	No	18.692809	133.853602	1488.2	4.800	37.4	40.6	0.66	5190	3.06	18.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009838975-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
009838975-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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.

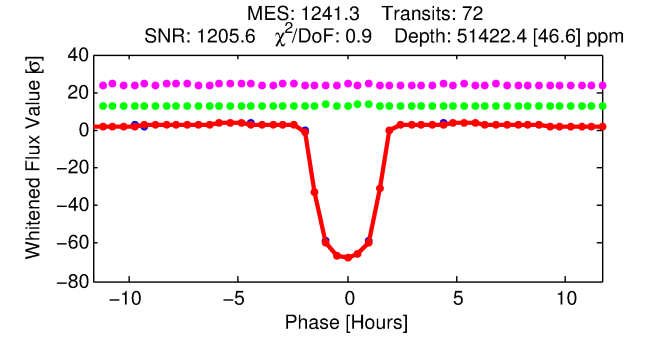
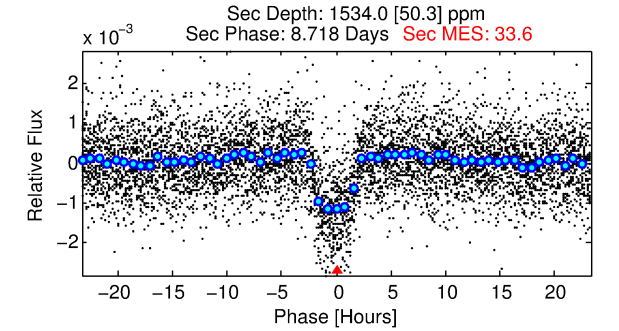
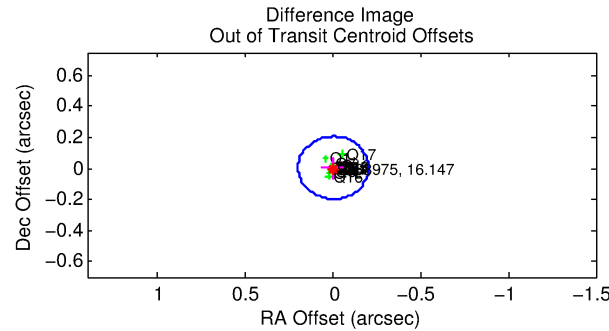
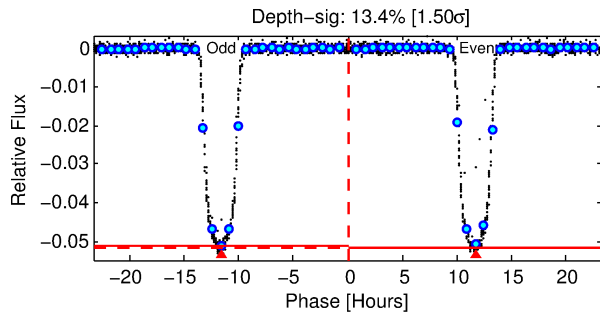
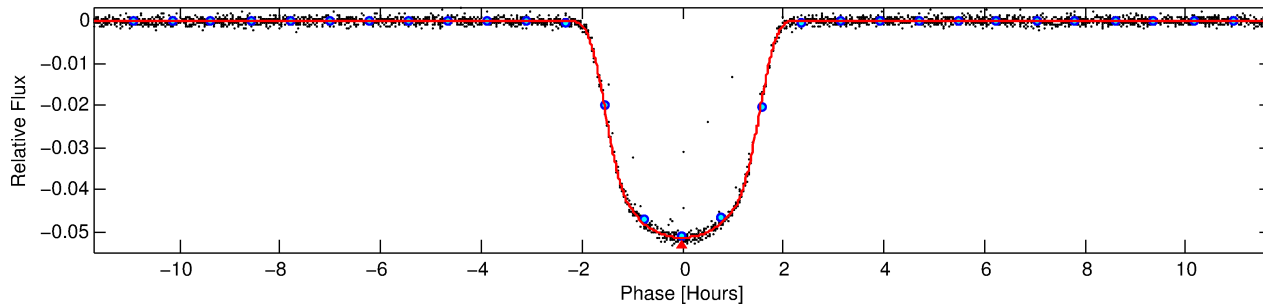
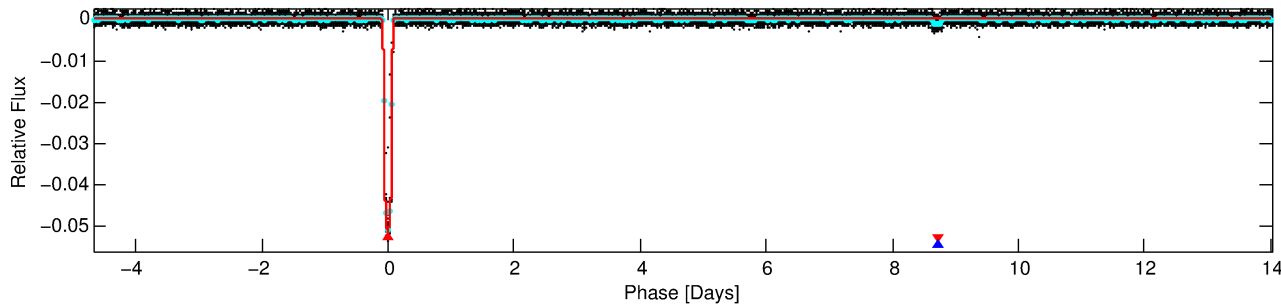
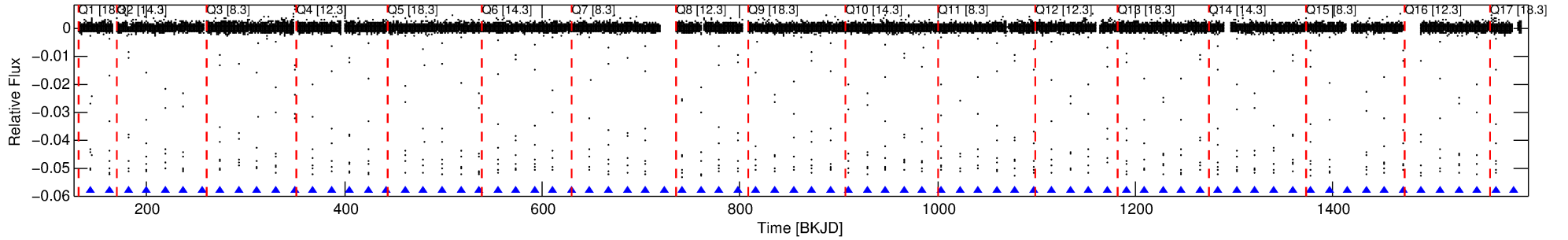
Ephemeris Match Information For 009838975-01

No Significant Match Found

DV One-Page Summary

KIC: 9838975 Candidate: 1 of 2 Period: 18.693 d
KOI: K00218.01 Corr: 0.971

Kp: 16.15 R*: 0.66 Rs Teff: 5190.0 K Logg: 4.66 Fe/H: -0.520



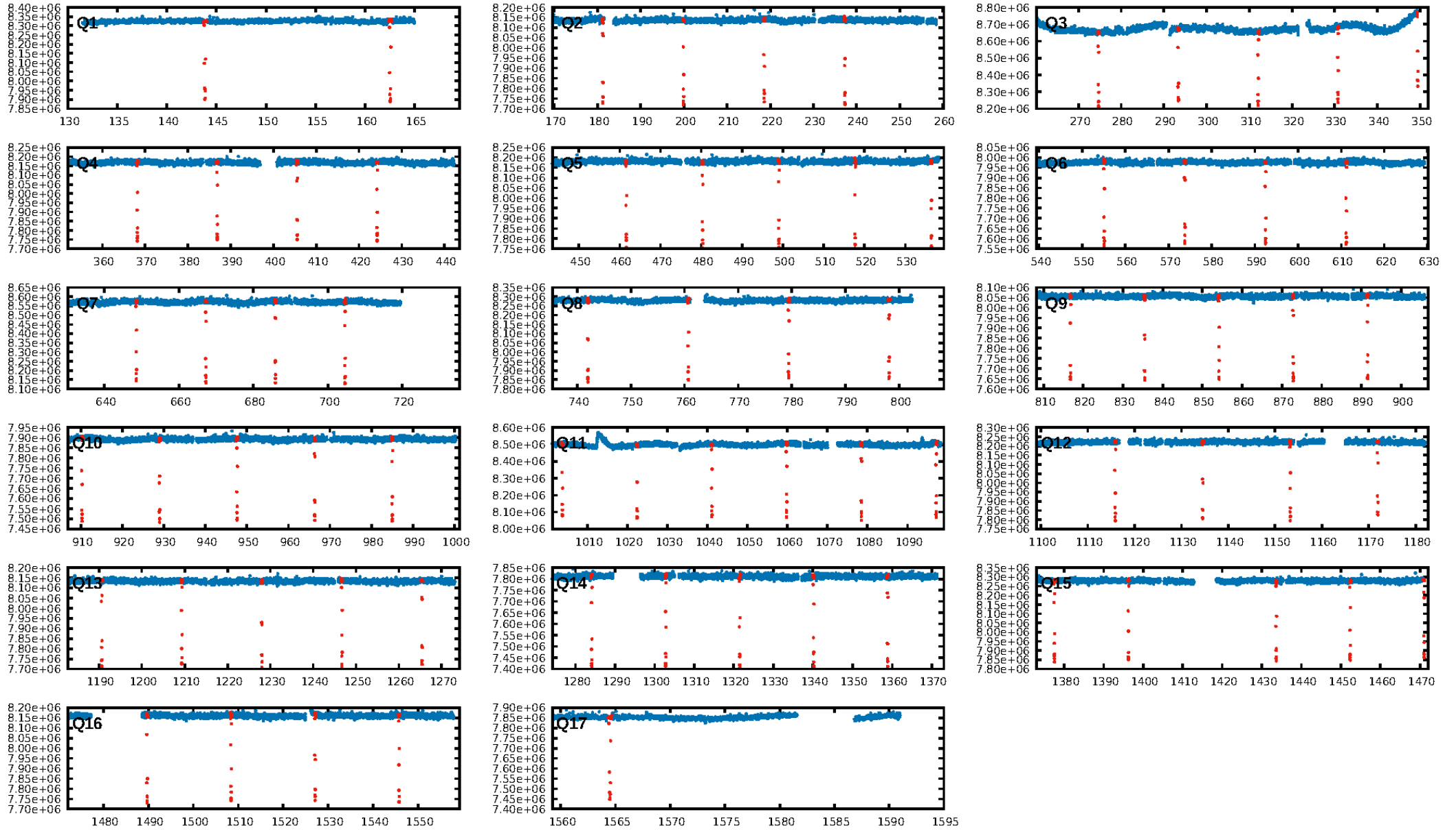
DV Fit Results:

Period = 18.69286 [0.00000] d
Epoch = 143.8332 [0.0001] BKJD
Rp/R* = 0.2049 [0.0003]
a/R* = 43.71 [0.22]
b = 0.15 [0.03]
Seff = 18.44 [3.63]
Teq = 528 [26] K
Rp = 14.76 [1.99] Re
a = 0.1239 [0.0137] AU
Ag = 59.53 [9.49] [6.17σ]
Teffp = 2269 [71] K [23.10σ]

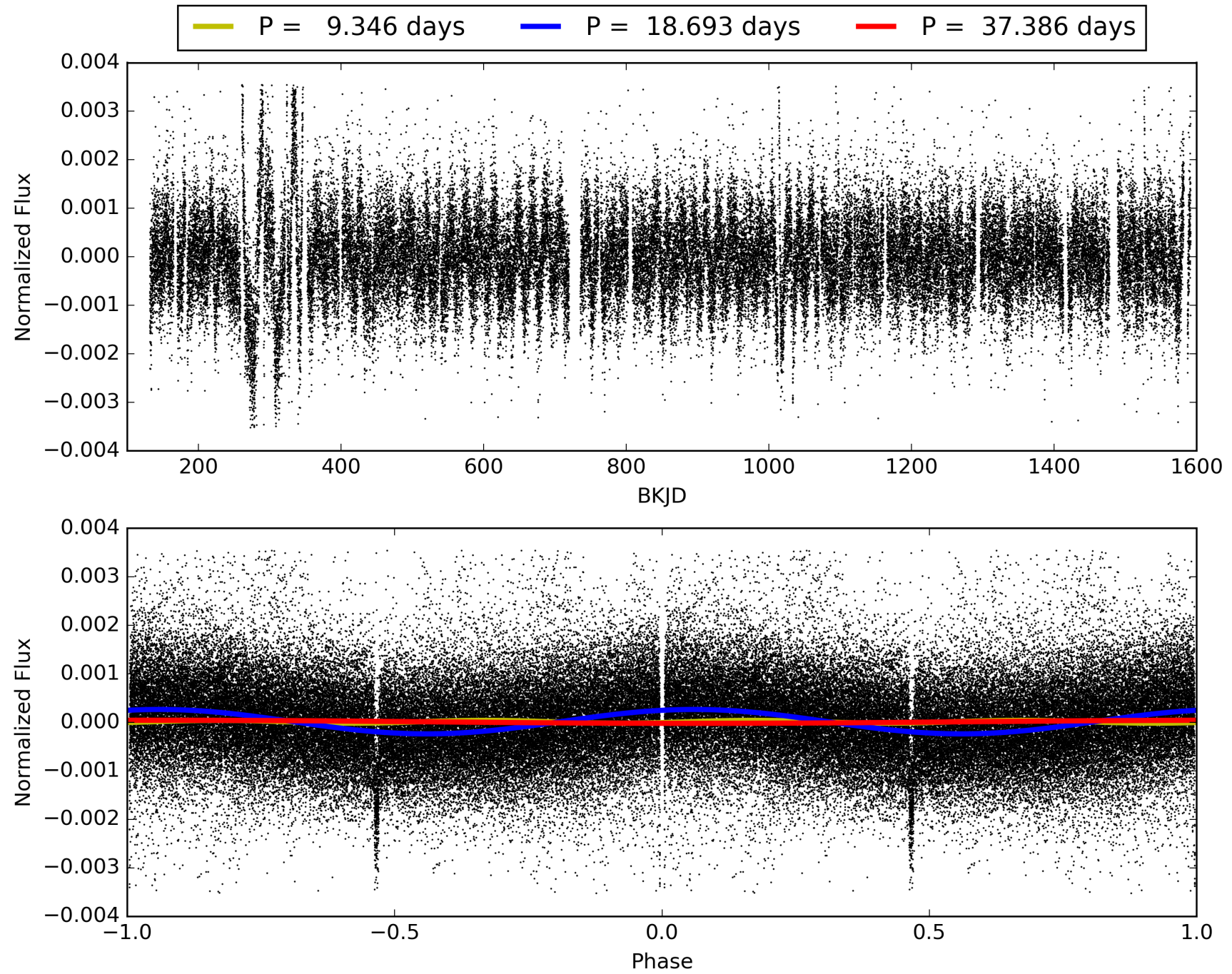
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [69/69]
GhostDiagnostic-chr: 5.569
Centroid-sig: 12.2%
Centroid-so: 0.372 arcsec [29.33σ]
OotOffset-rm: 0.006 arcsec [0.09σ]
KicOffset-rm: 0.367 arcsec [5.44σ]
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 009838975-01, PDC Light Curves

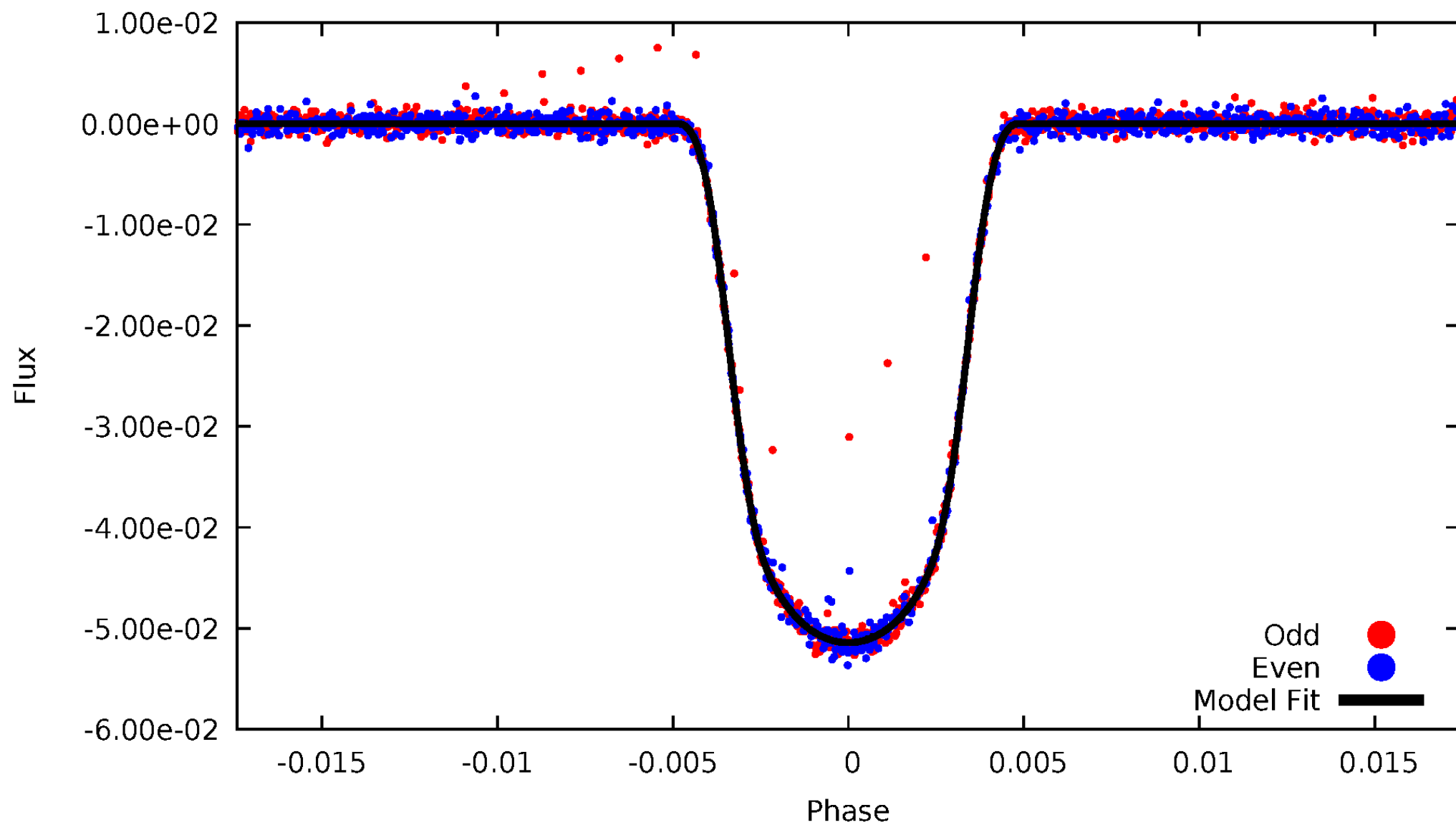


TCE 009838975-01



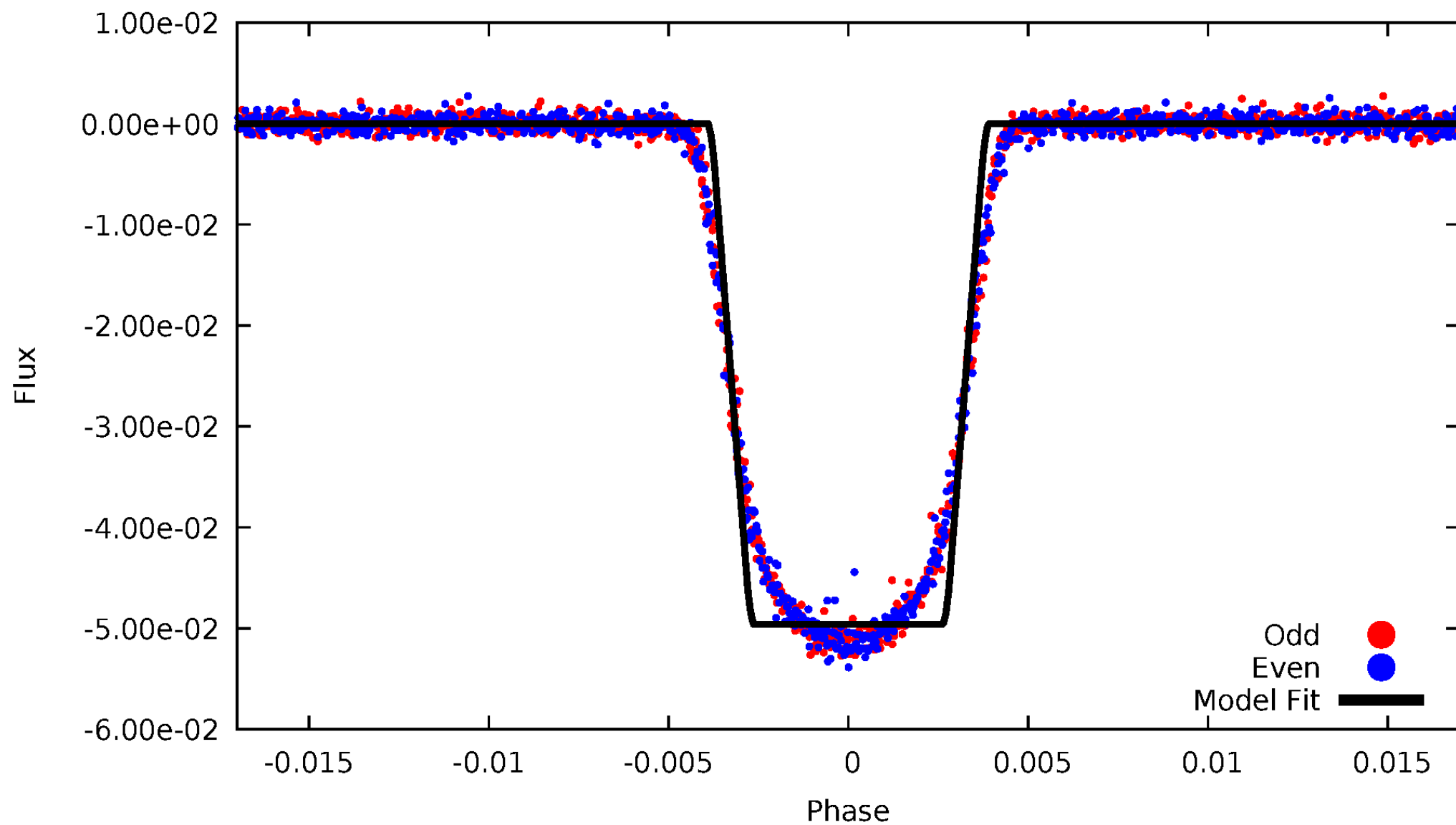
DV Odd/Even

TCE 009838975-01



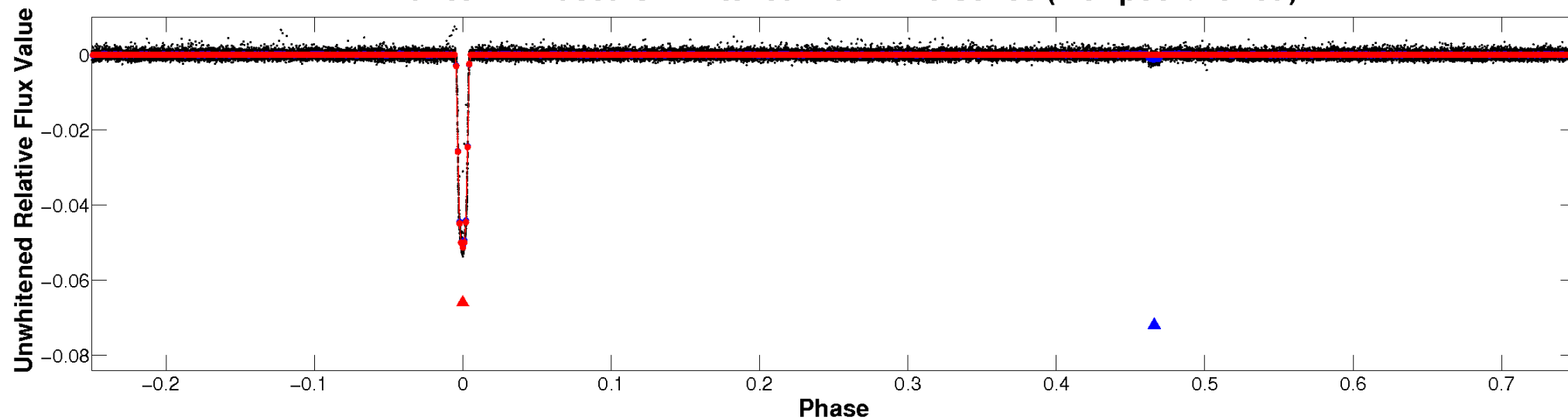
ALT Odd/Even

TCE 009838975-01

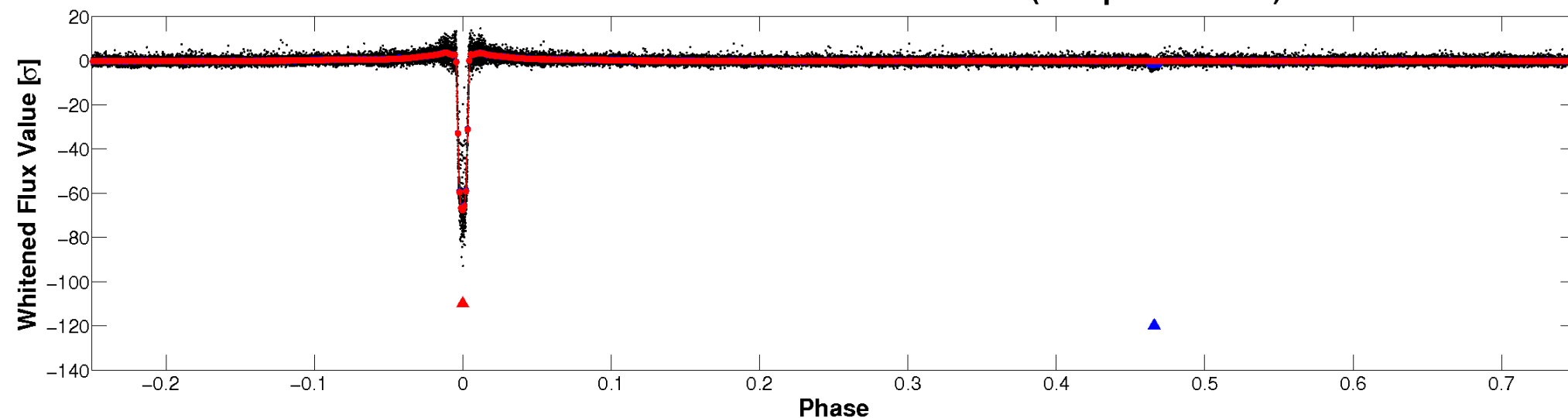


Non-Whitened Vs. Whitened Light Curve

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

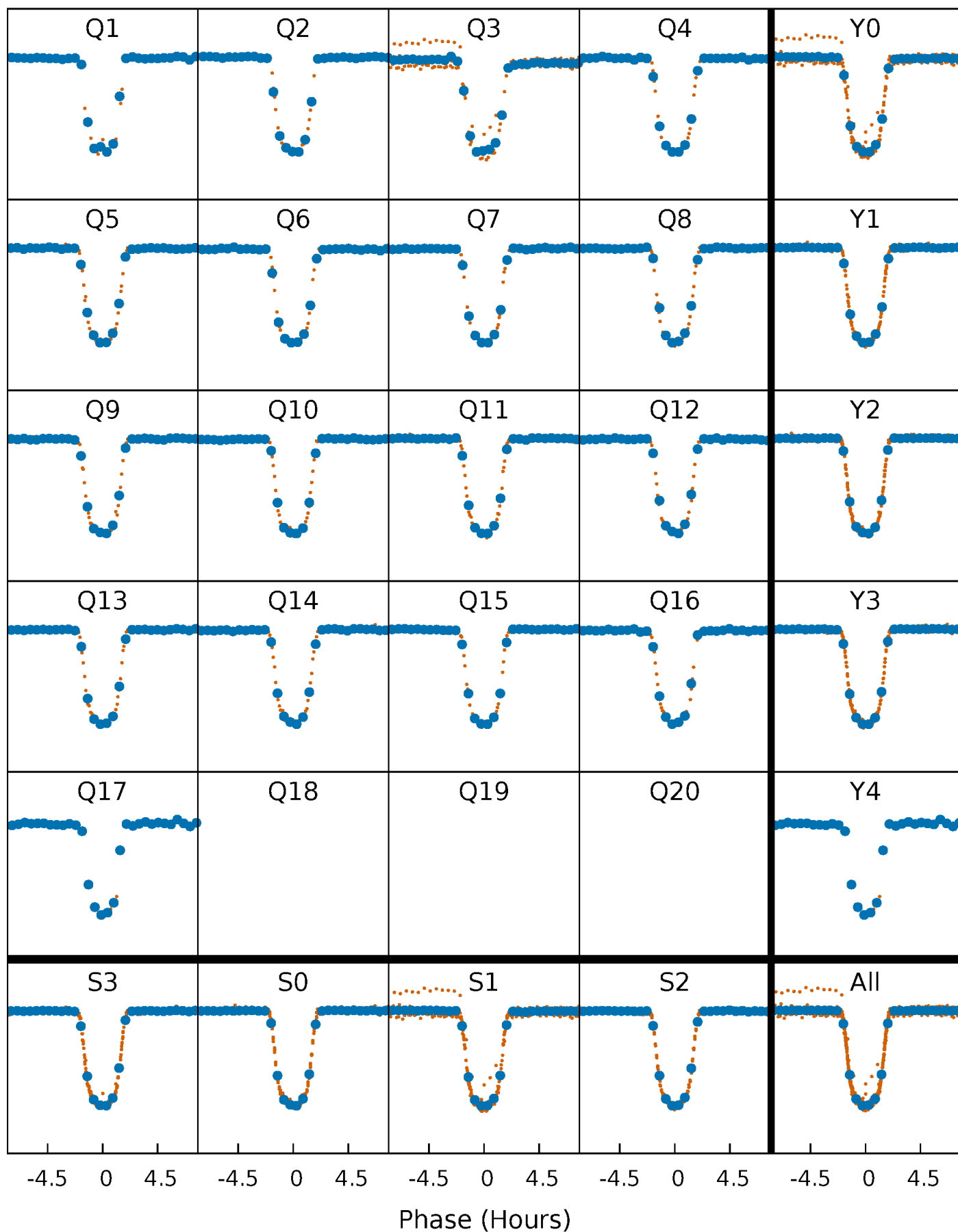


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



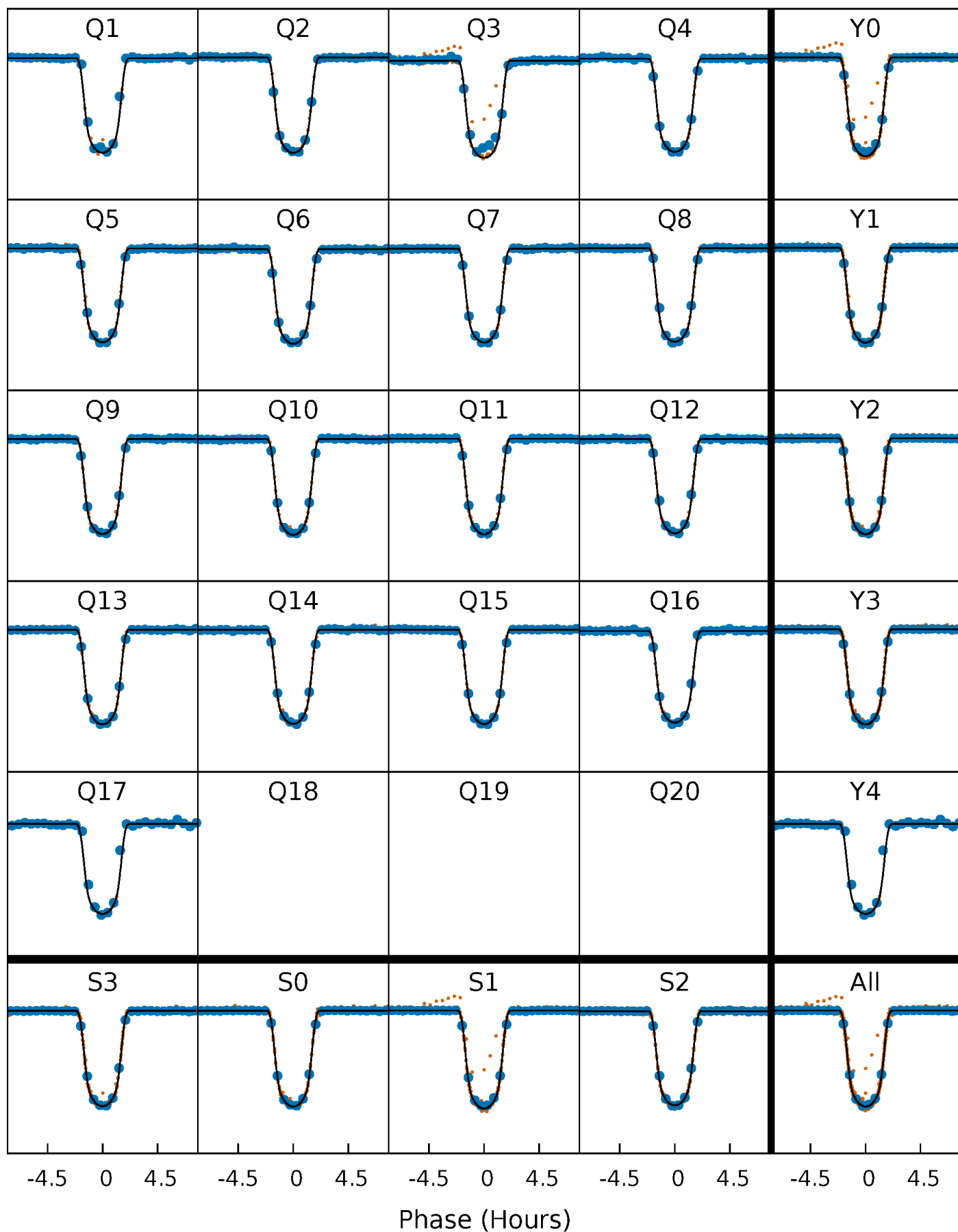
PDC Quarter-Phased Transit Curves

TCE 009838975-01 P= 18.692860 Days $T_0=143.833207$ (BKJD)



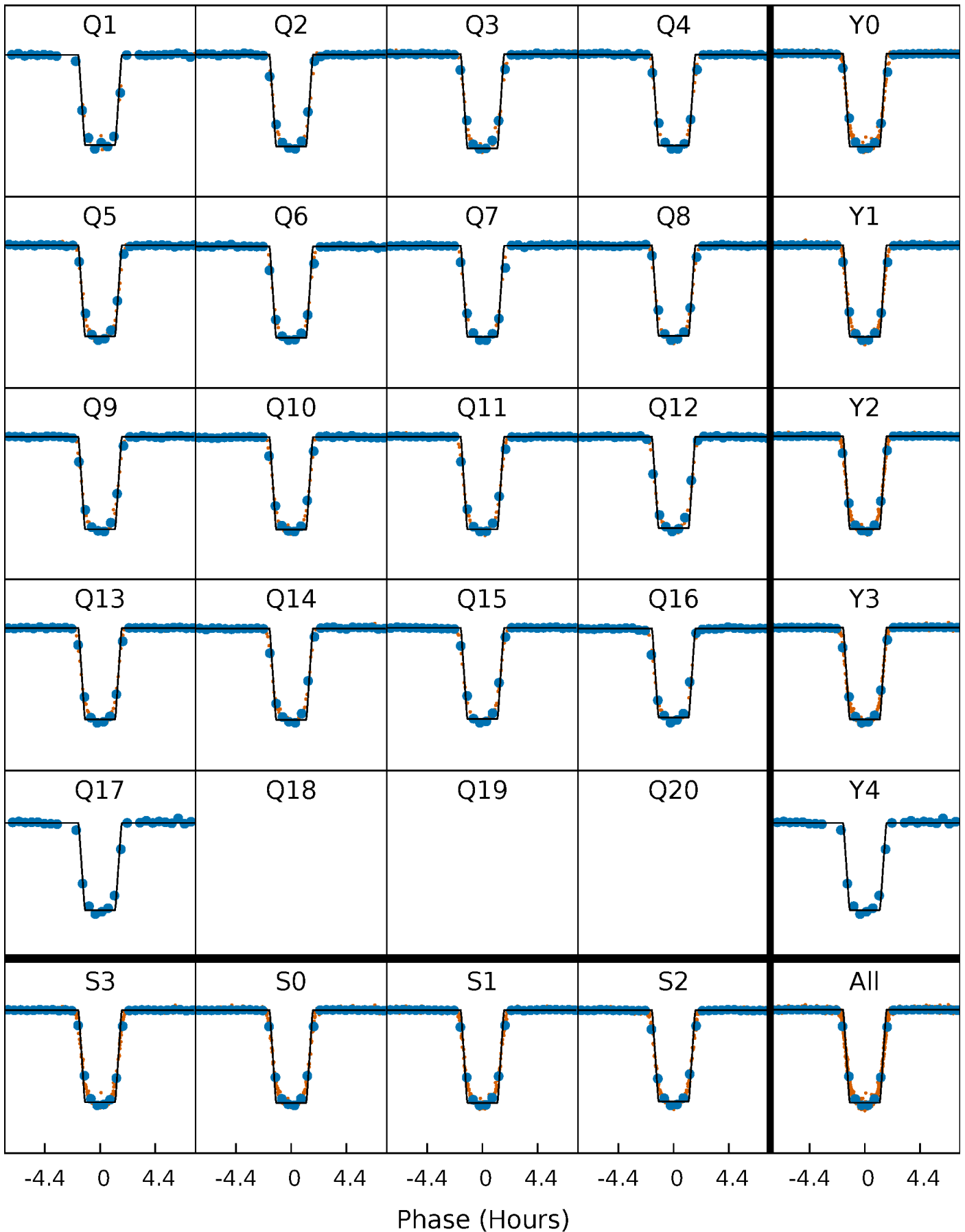
DV Quarter-Phased Transit Curves

TCE 009838975-01 P= 18.692860 Days $T_0=143.833207$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

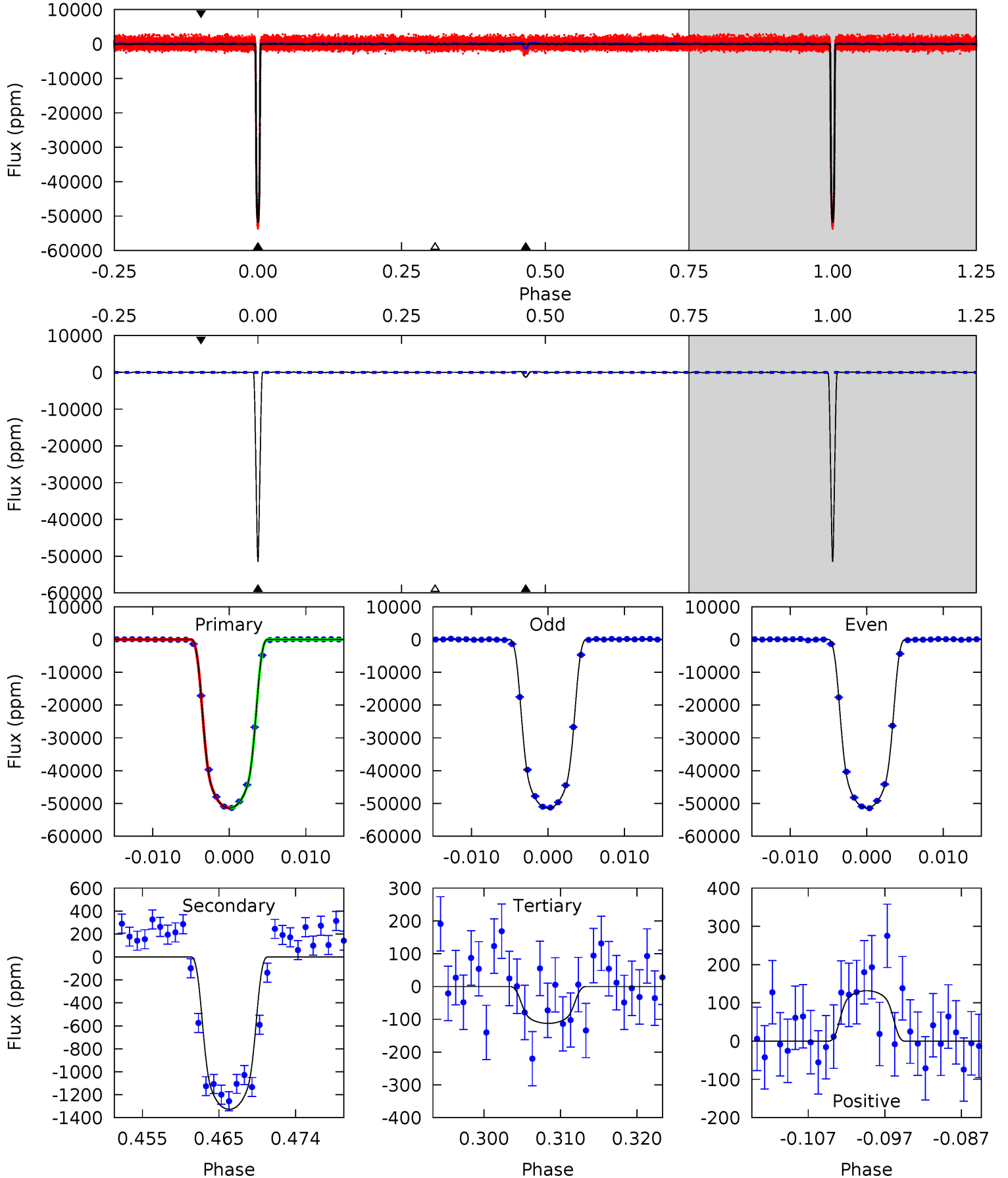
TCE 009838975-01 P= 18.692923 Days $T_0=143.830748$ (BKJD)



DV Model-Shift Uniqueness Test

009838975-01, P = 18.692860 Days, E = 125.140347 Days

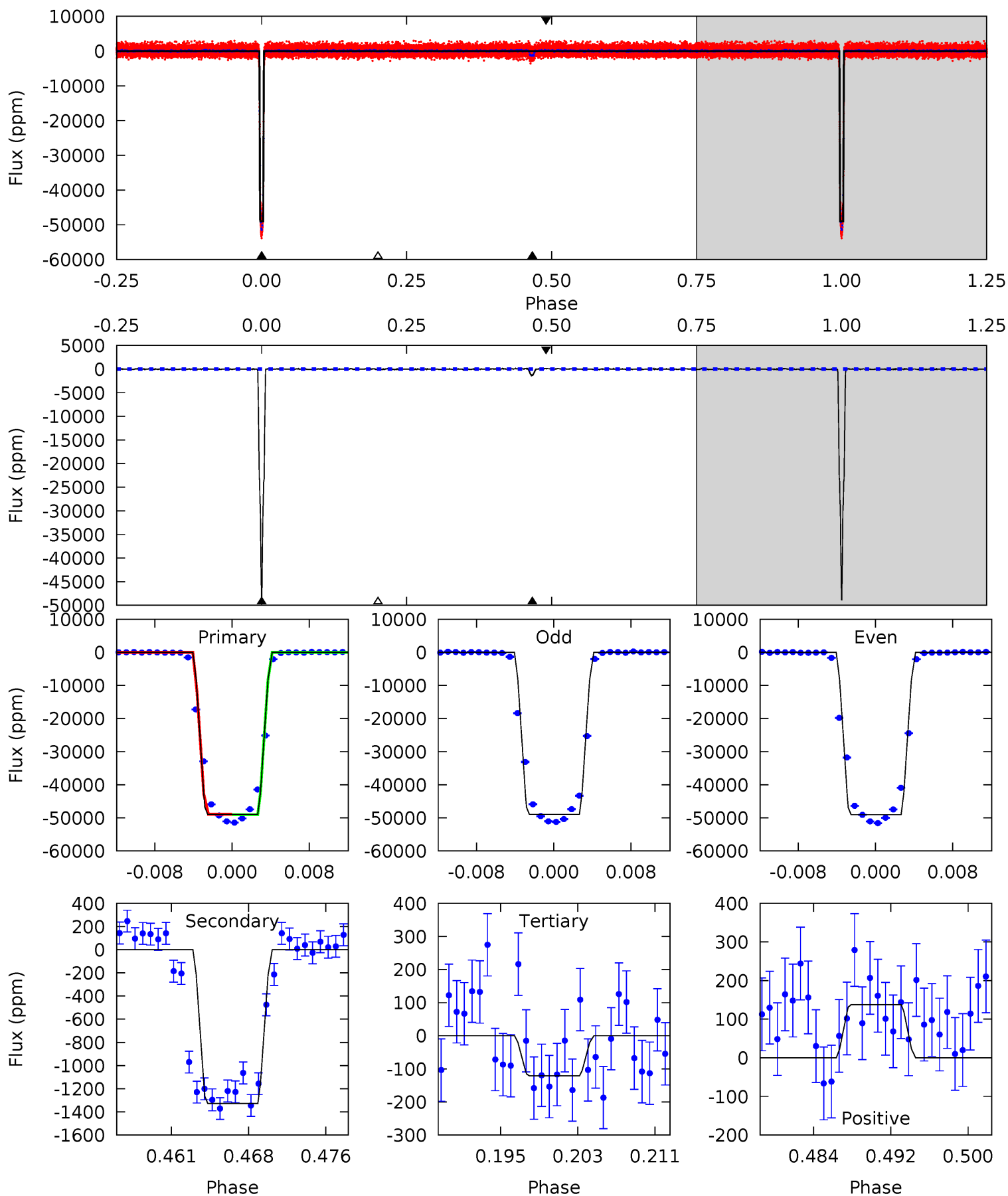
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1812	46.8	3.96	4.64	5.03	2.59	1.73	1808	1807	42.8	42.1	1.20	0.99	0.00	0.85



Alt Model-Shift Uniqueness Test

009838975-01, P = 18.692923 Days, E = 125.137825 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1337	36.2	3.31	3.76	5.07	2.66	1.19	1334	1333	32.9	32.5	1.50	1.00	0.00	1.66



Stellar Parameters For KIC 009838975

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5190^{+156}_{-140}	$4.660^{+0.028}_{-0.083}$	$-0.520^{+0.300}_{-0.300}$	$0.660^{+0.089}_{-0.041}$	$0.732^{+0.071}_{-0.071}$	$3.583^{+0.527}_{-0.979}$
	+3%/-3%	+1%/-2%	+58%/-58%	+13%/-6%	+10%/-10%	+15%/-27%
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 009838975-01 / KOI 0218.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1328 ± 28	$14.97^{+1.14}_{-0.74}$	747^{+30}_{-28}	2878^{+56}_{-50}	50^{+4}_{-6}
Alt.	-1327 ± 37	$16.33^{+1.15}_{-0.76}$	748^{+28}_{-26}	2816^{+50}_{-52}	42^{+3}_{-4}

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

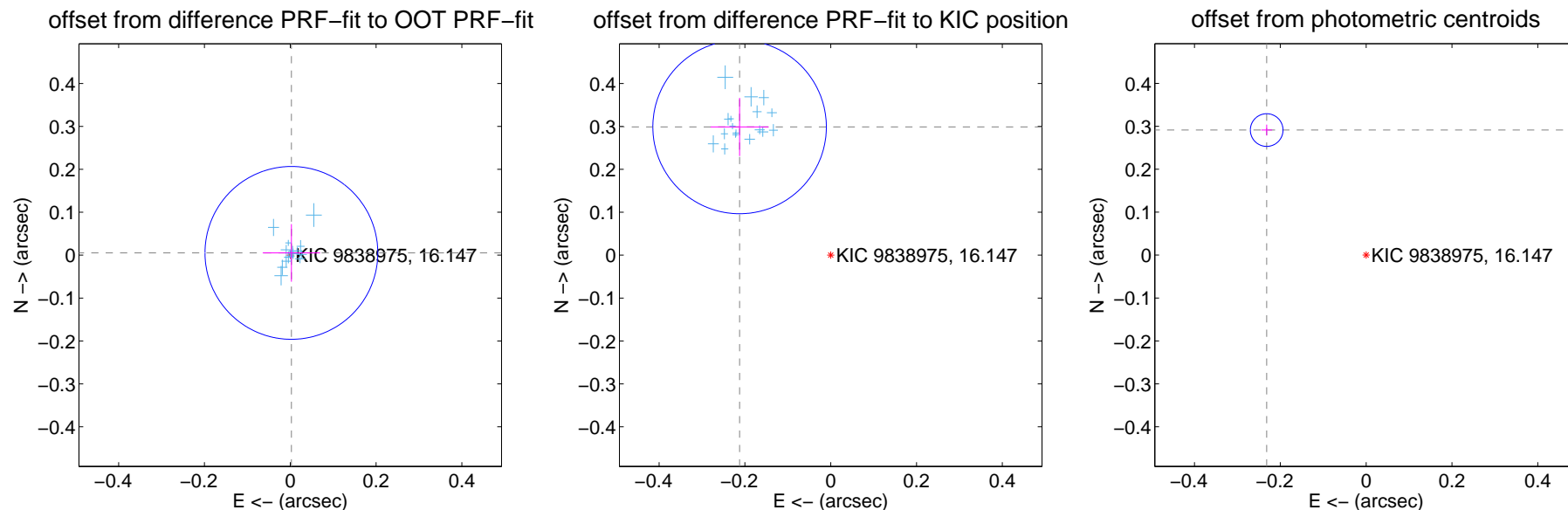
DV Centroid Data

Supplemental centroid analysis for 009838975-01. Kepler magnitude: 16.15. Transit SNR 1205.61

There are 17 quarters with good PRF difference image offsets

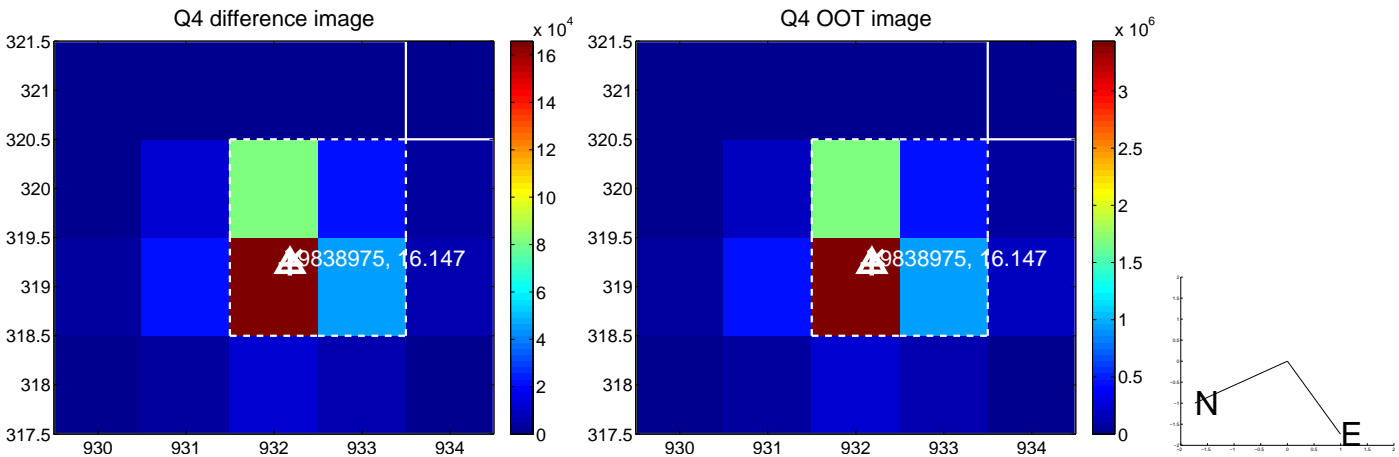
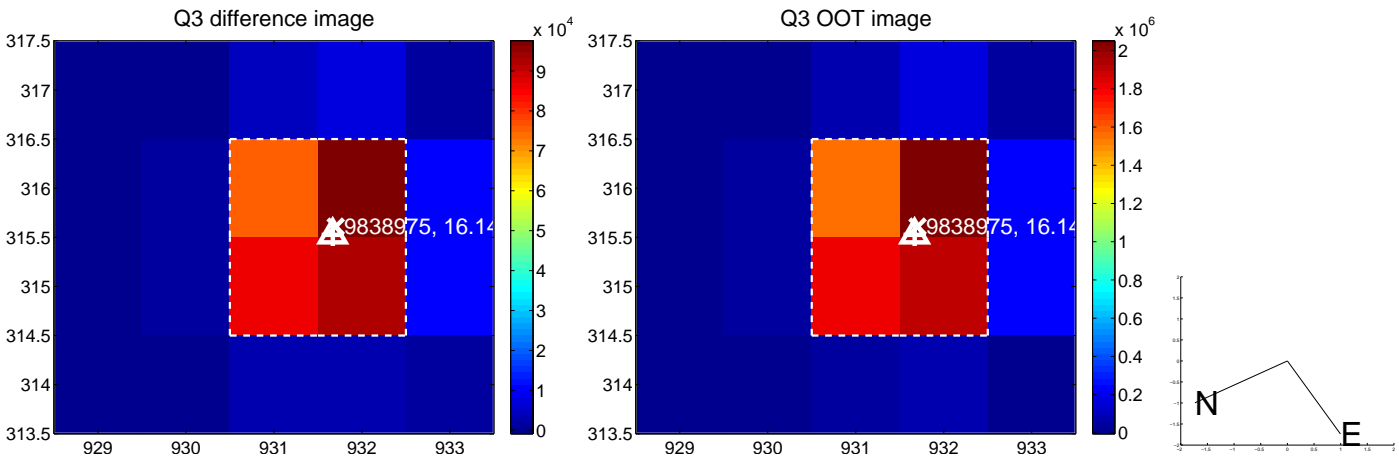
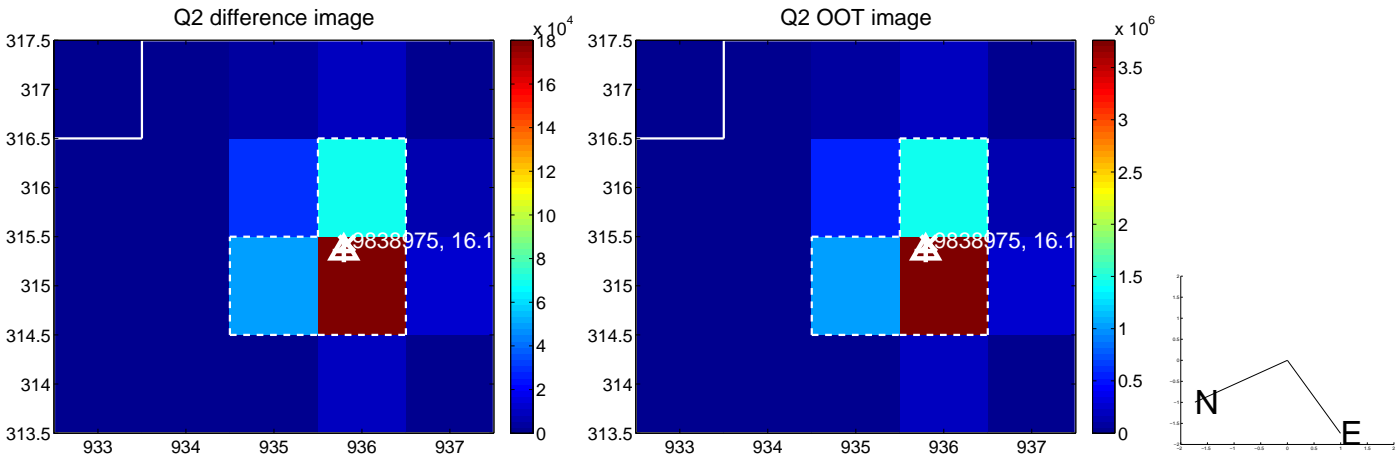
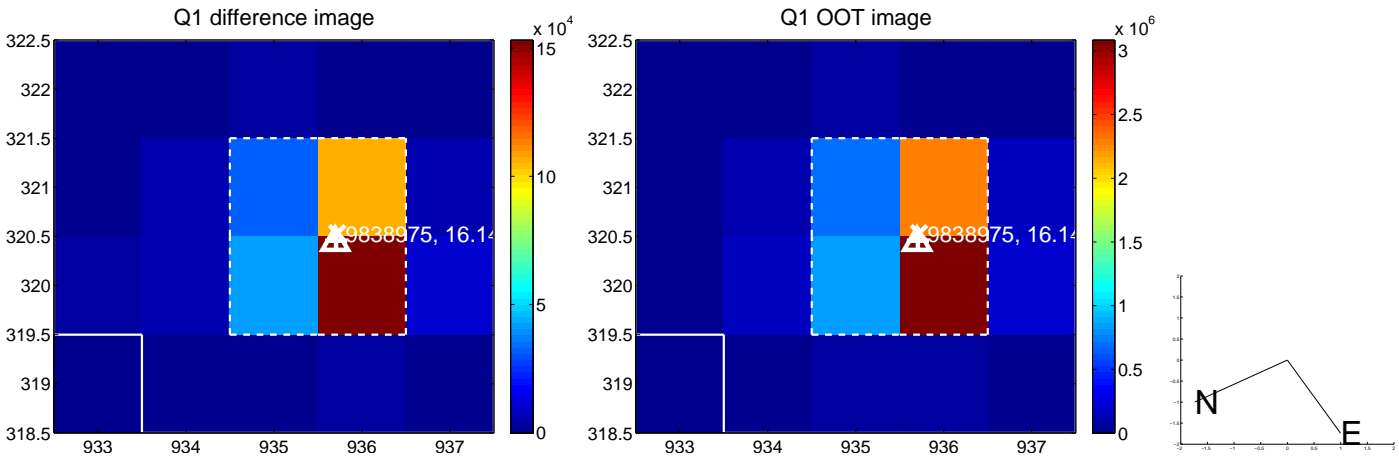
The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.006 ± 0.067	0.09	-0.003 ± 0.067	0.005 ± 0.067
PRF-fit source offset from KIC position	0.367 ± 0.067	5.44	0.212 ± 0.068	0.299 ± 0.068
photometric centroid source offset	0.37 ± 0.01	29.33	0.23 ± 0.01	0.29 ± 0.01

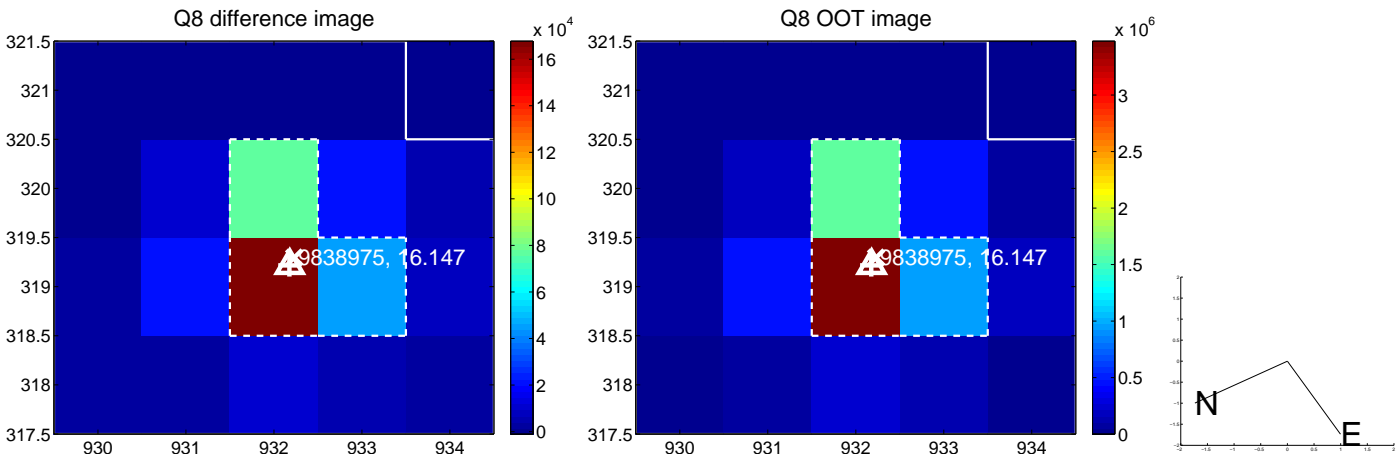
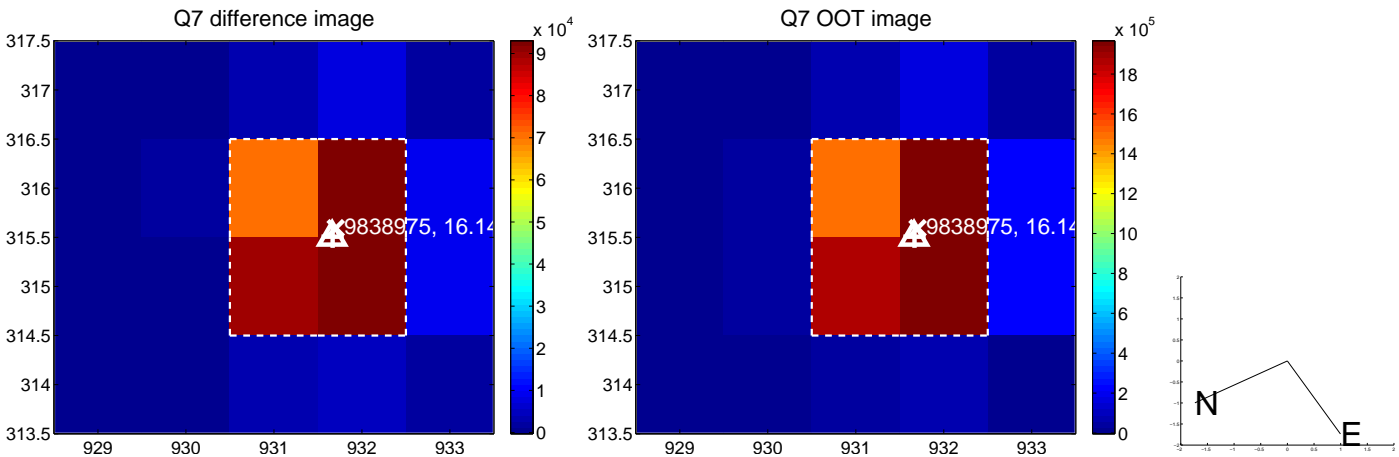
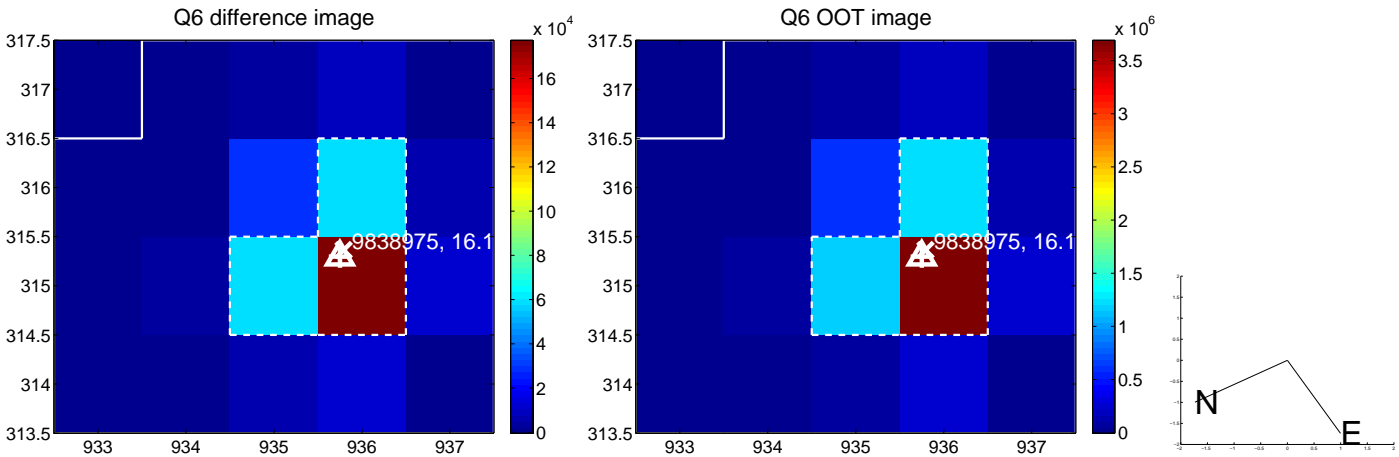
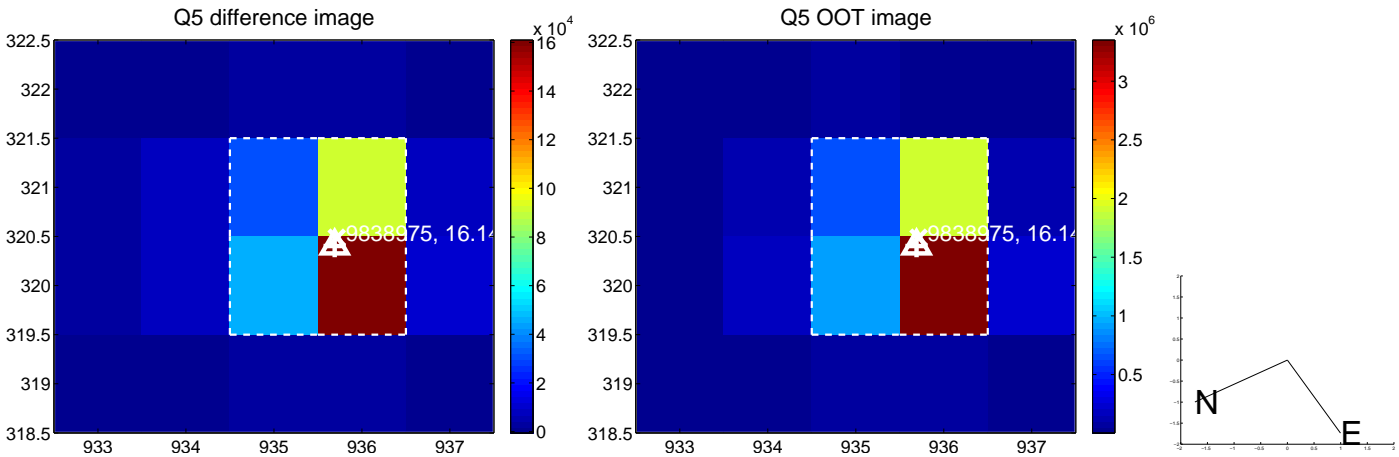


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

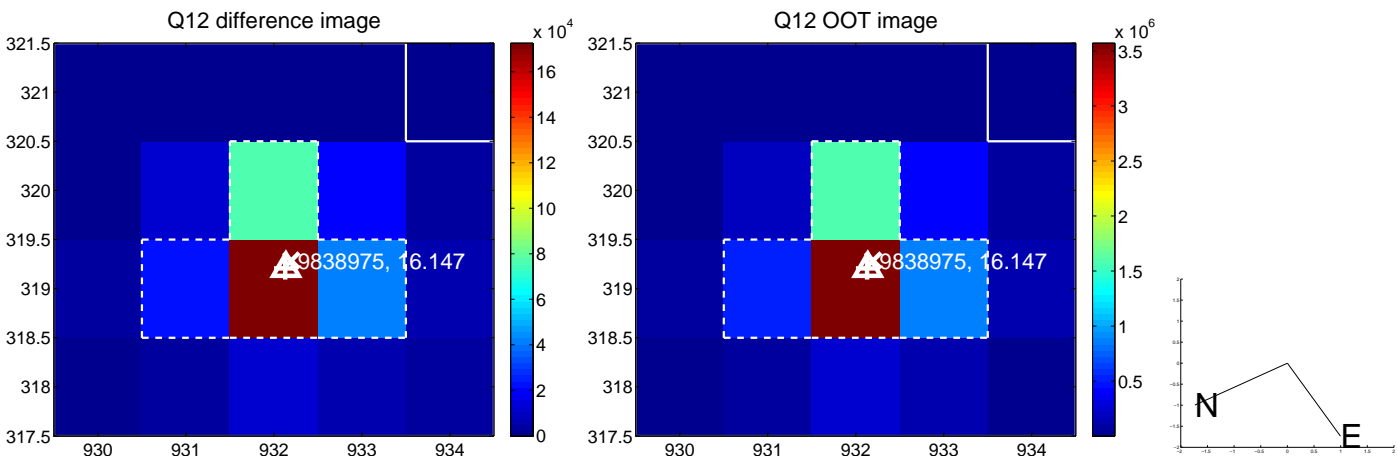
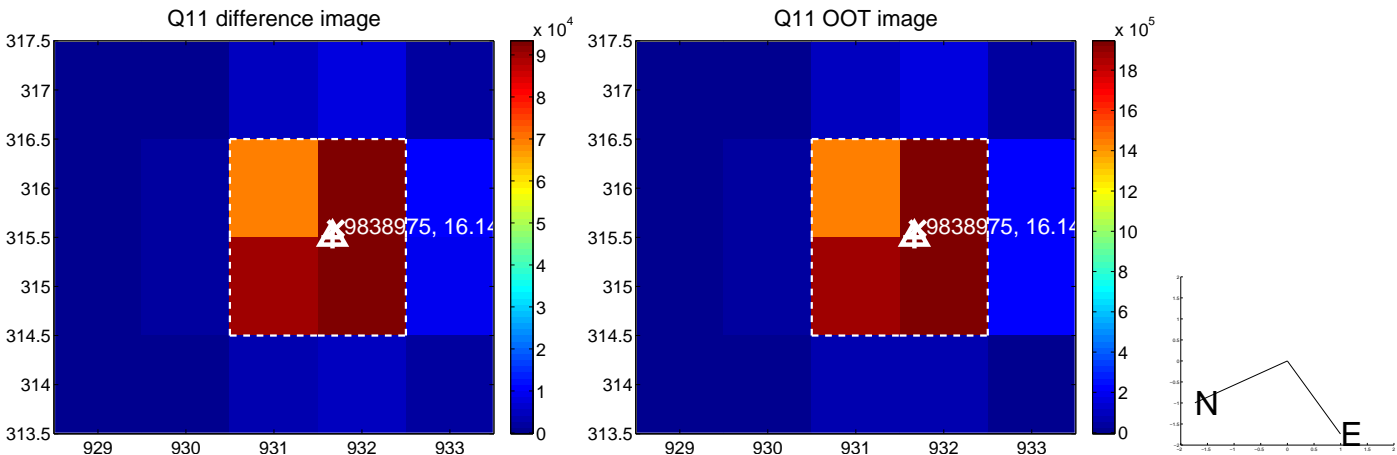
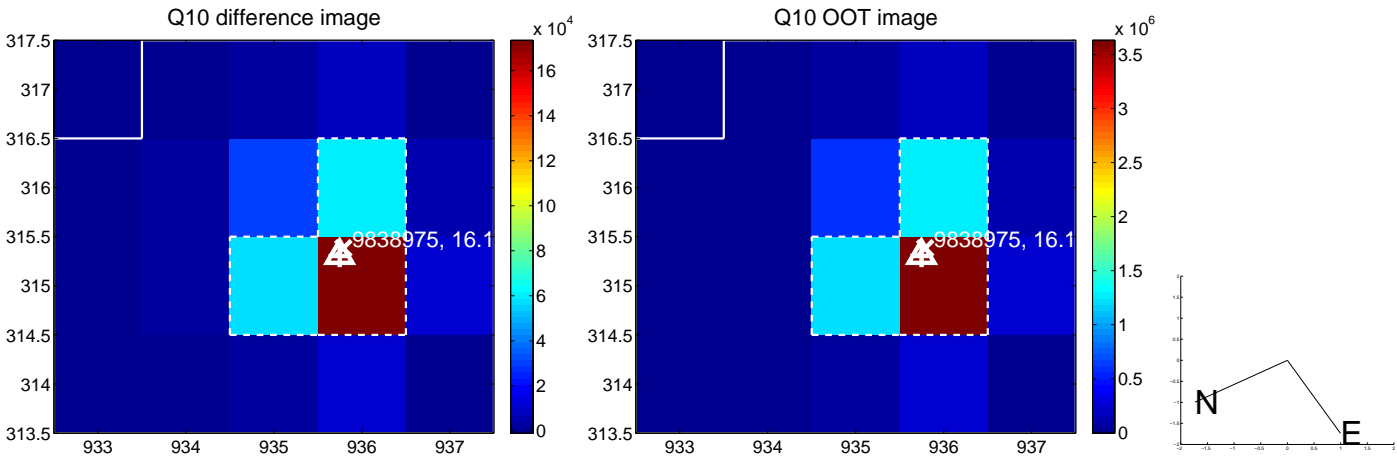
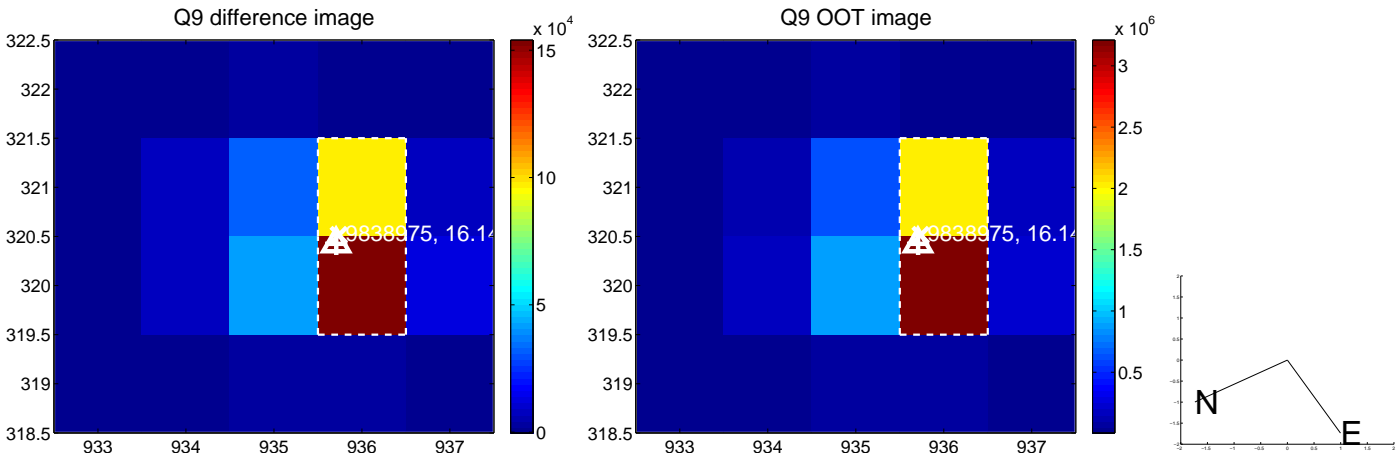
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



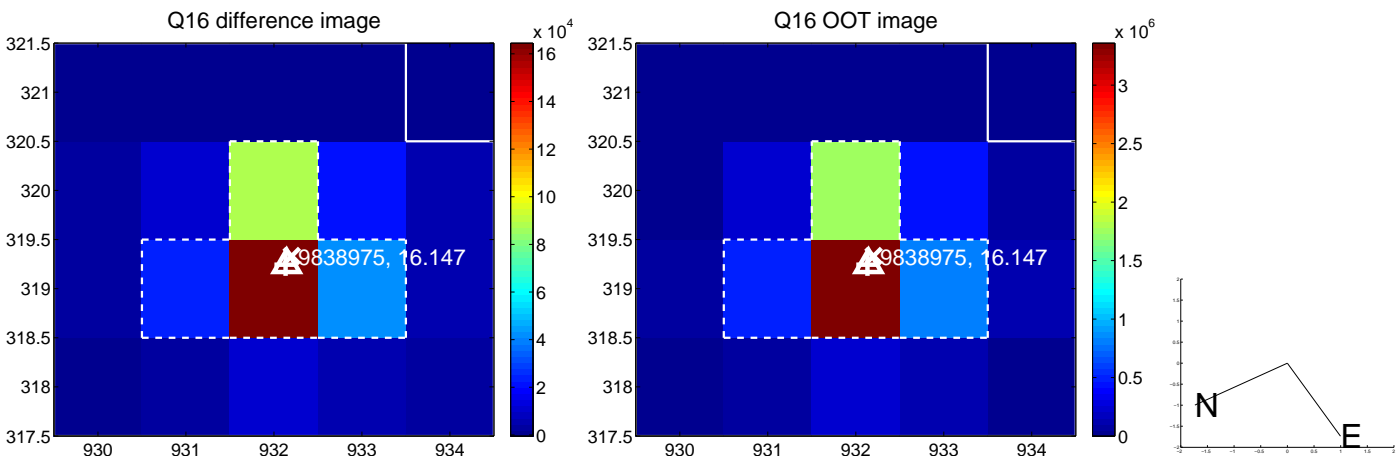
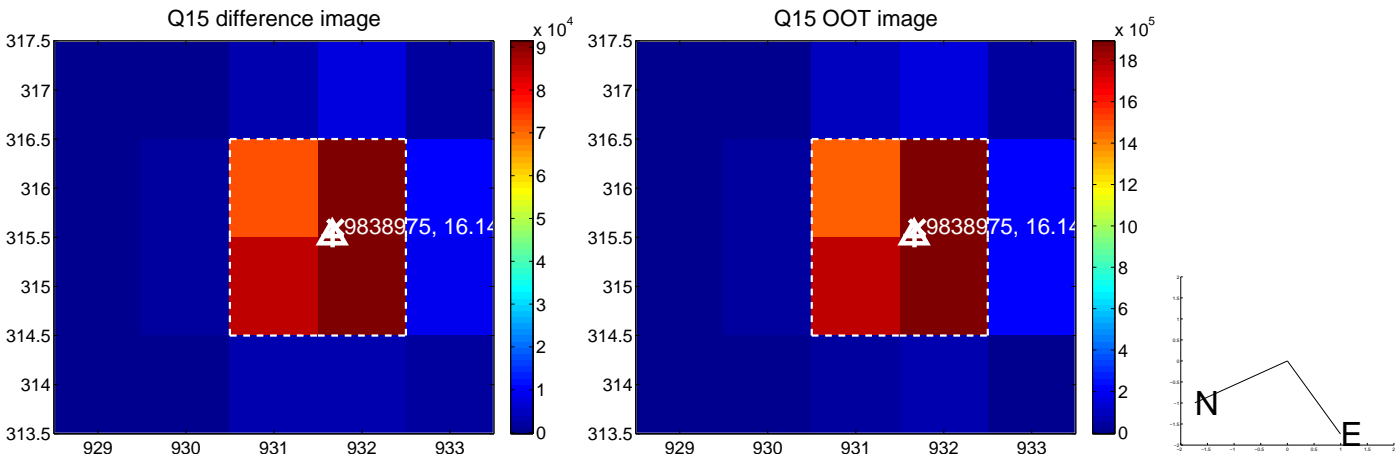
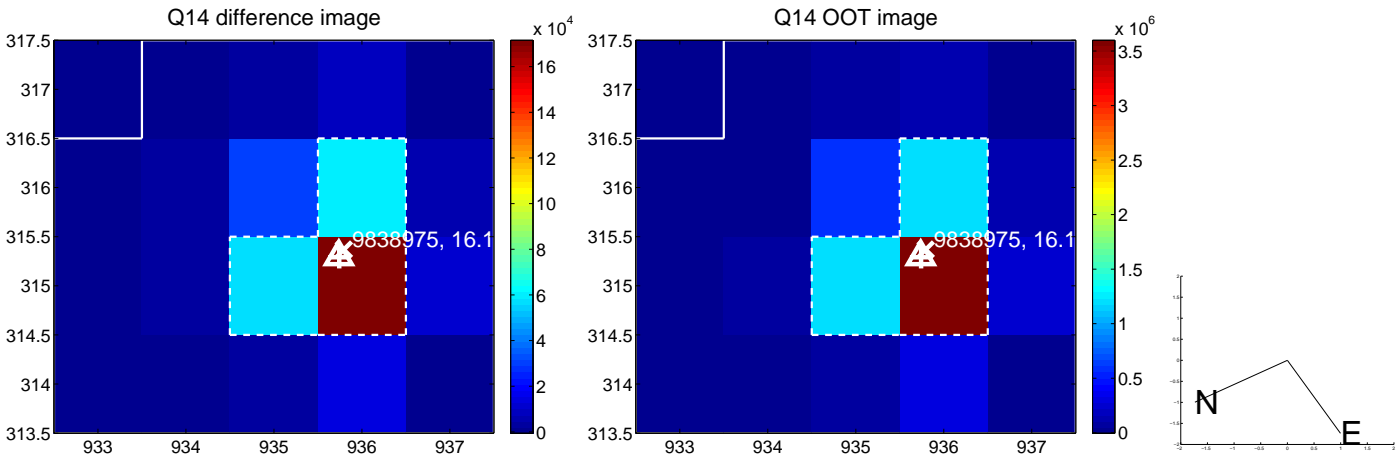
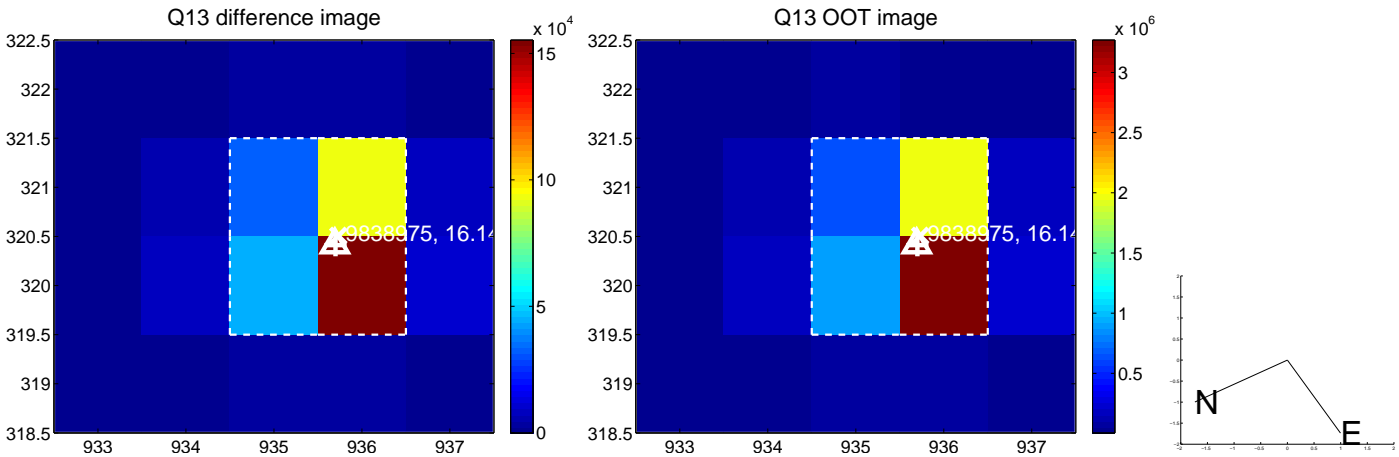
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



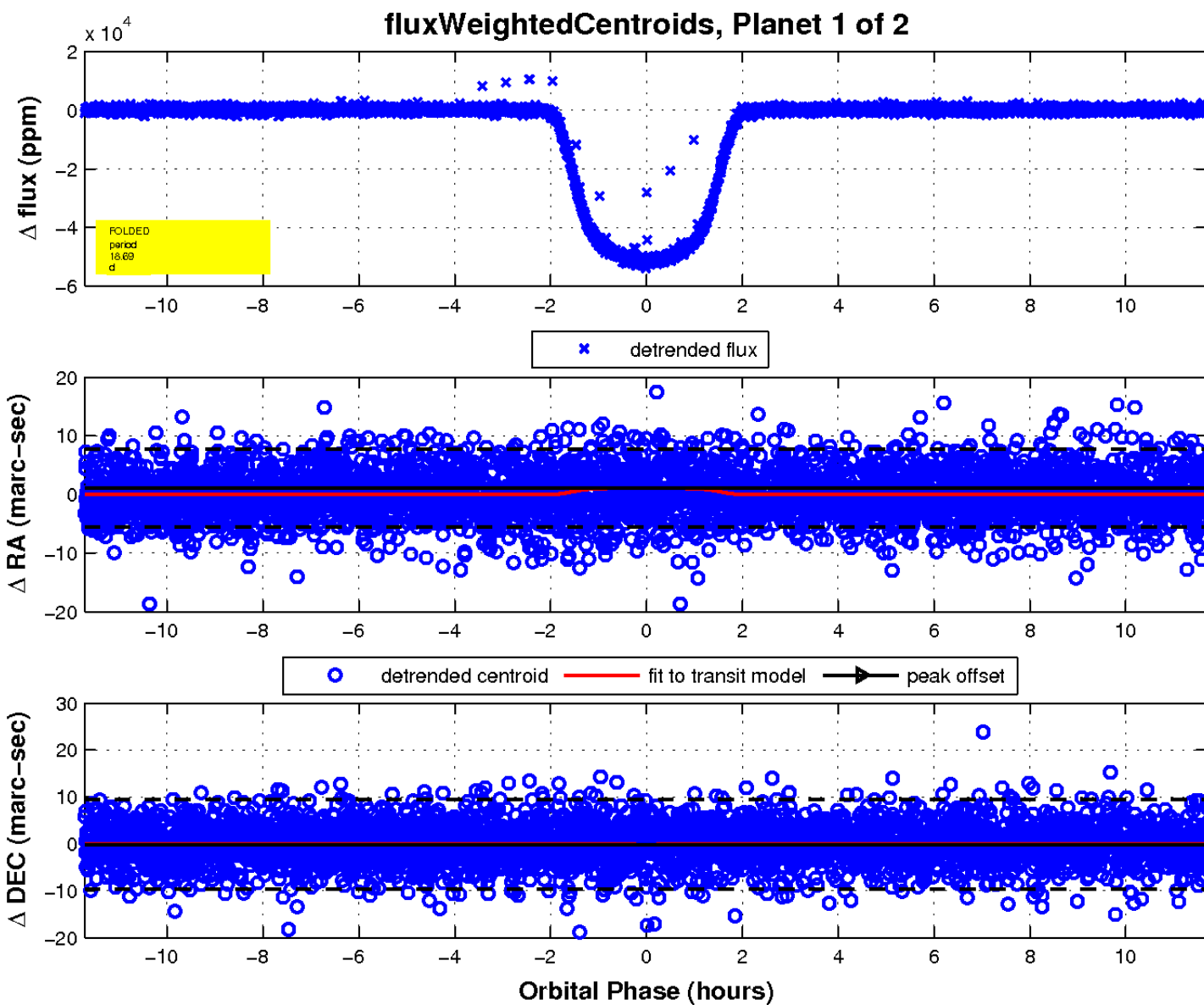
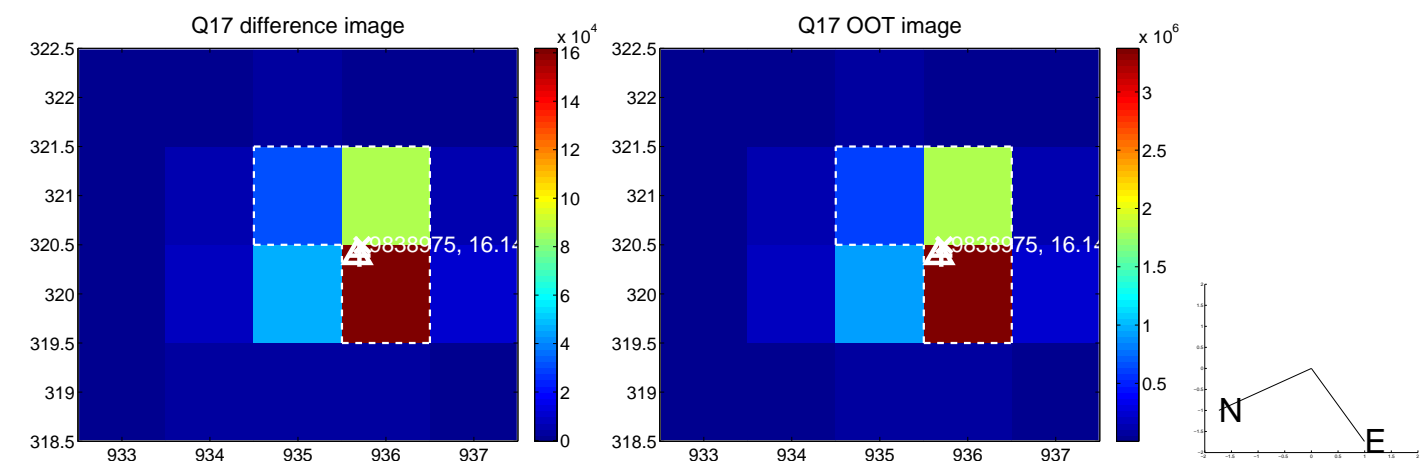
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

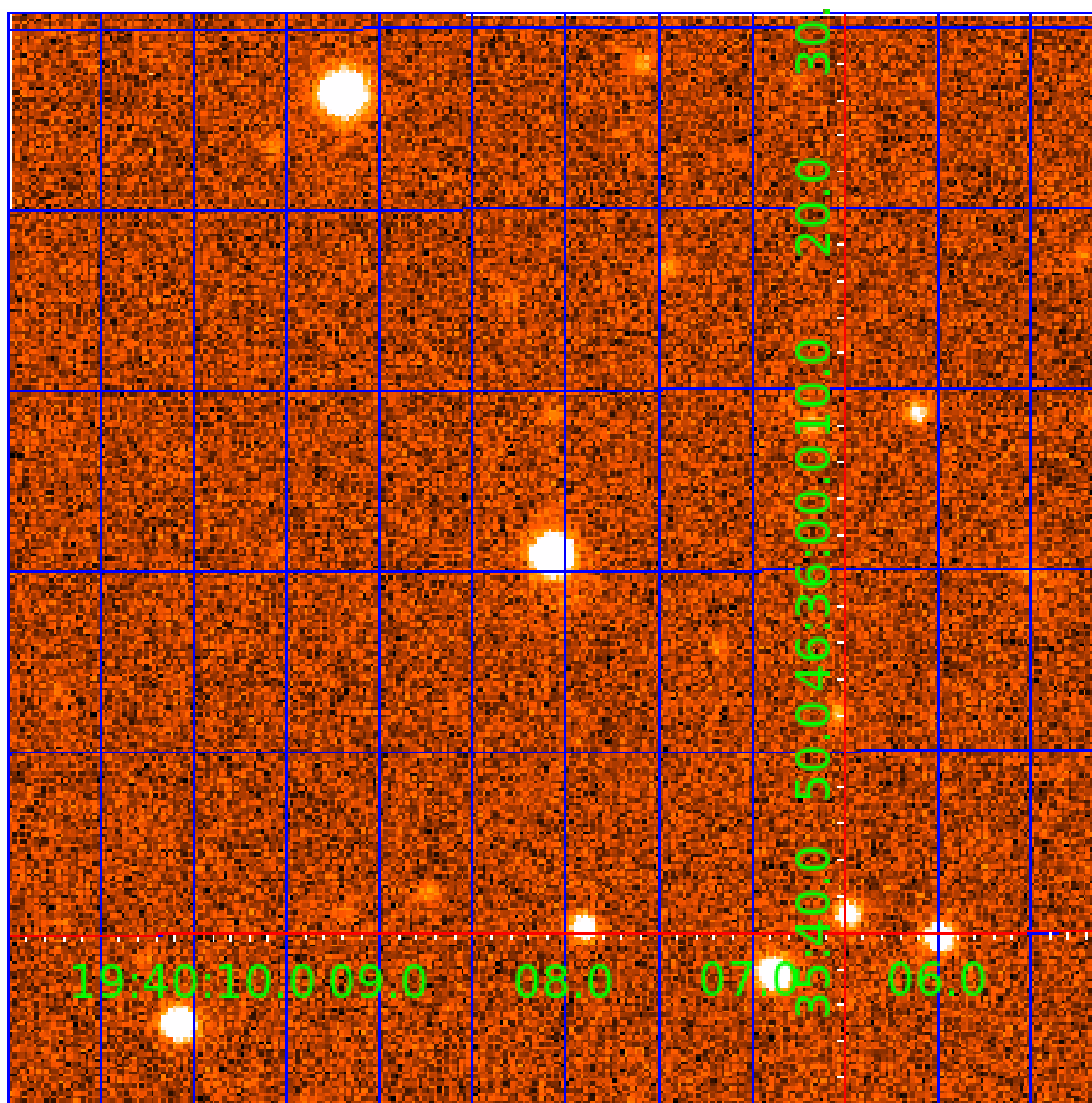


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009838975

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})
009838975-01	OBS	0218.01	18.692860	143.833207	51422.4	3.907	1241.3	1205.6	0.66	5190	14.76	18.44
009838975-02	OBS	No	18.692809	133.853602	1488.2	4.800	37.4	40.6	0.66	5190	3.06	18.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009838975-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_KIC_POS
009838975-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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.

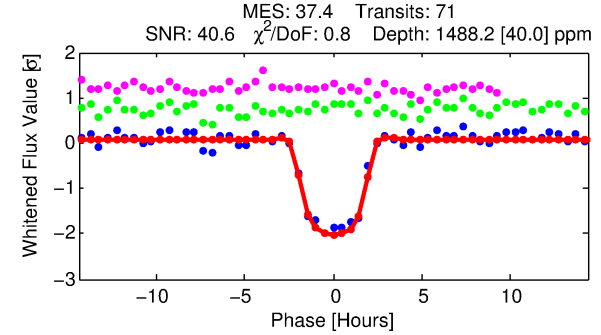
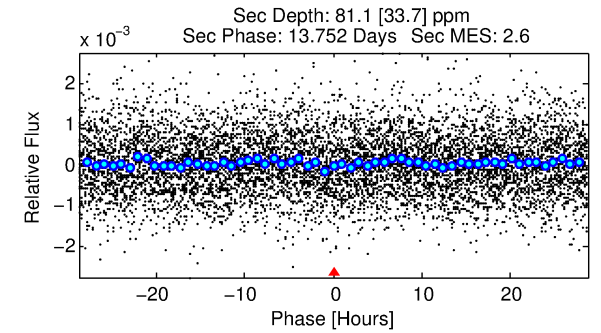
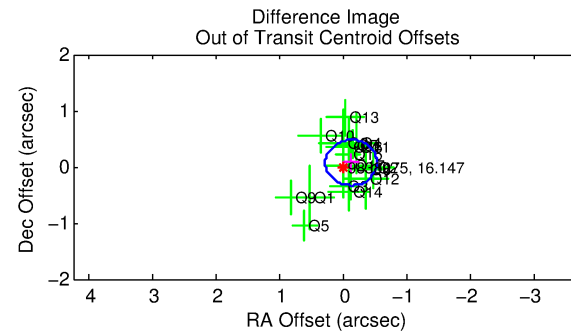
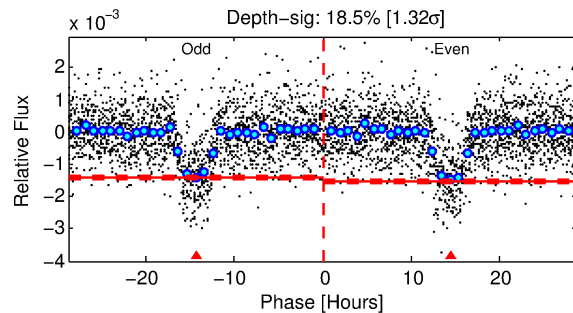
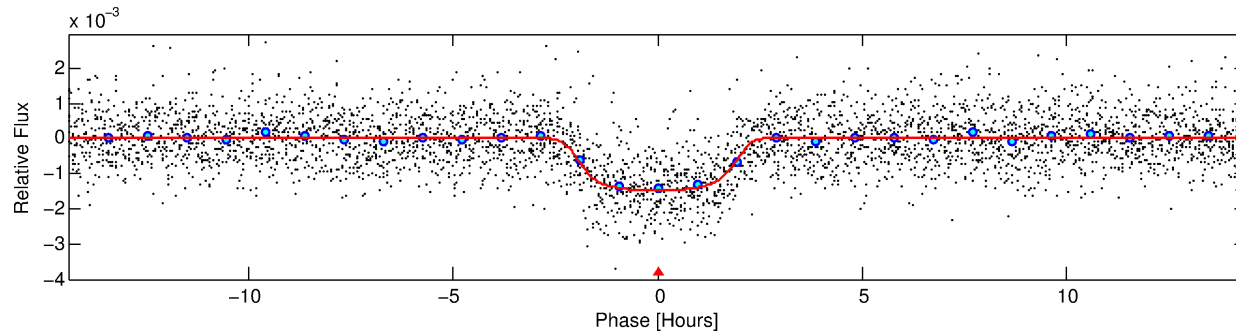
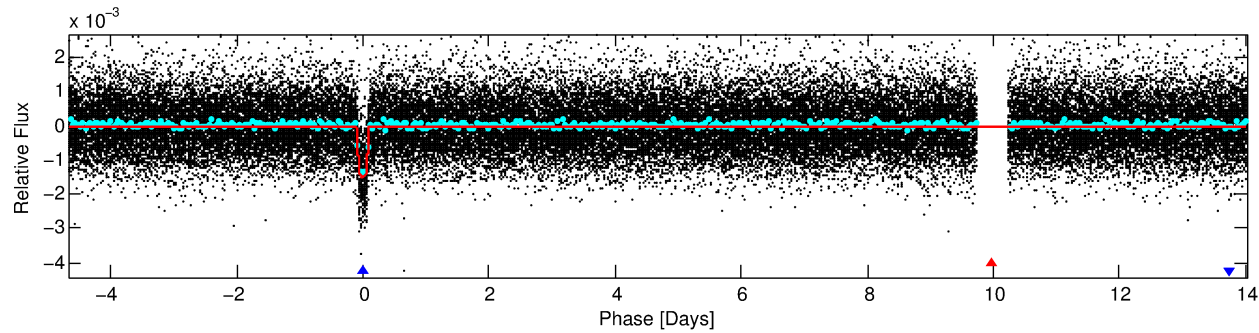
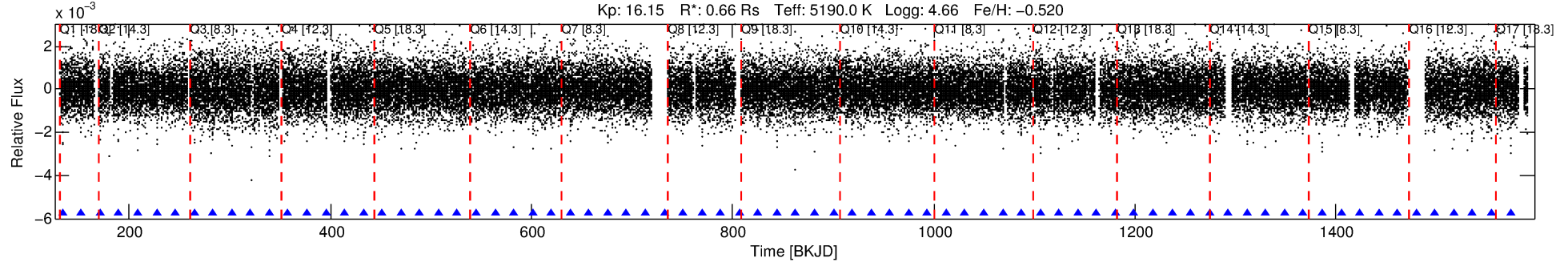
Ephemeris Match Information For 009838975-02

No Significant Match Found

DV One-Page Summary

KIC: 9838975 Candidate: 2 of 2 Period: 18.693 d
KOI: K00218 Corr: No Ephemeris Match

Kp: 16.15 R*: 0.66 Rs Teff: 5190.0 K Logg: 4.66 Fe/H: -0.520



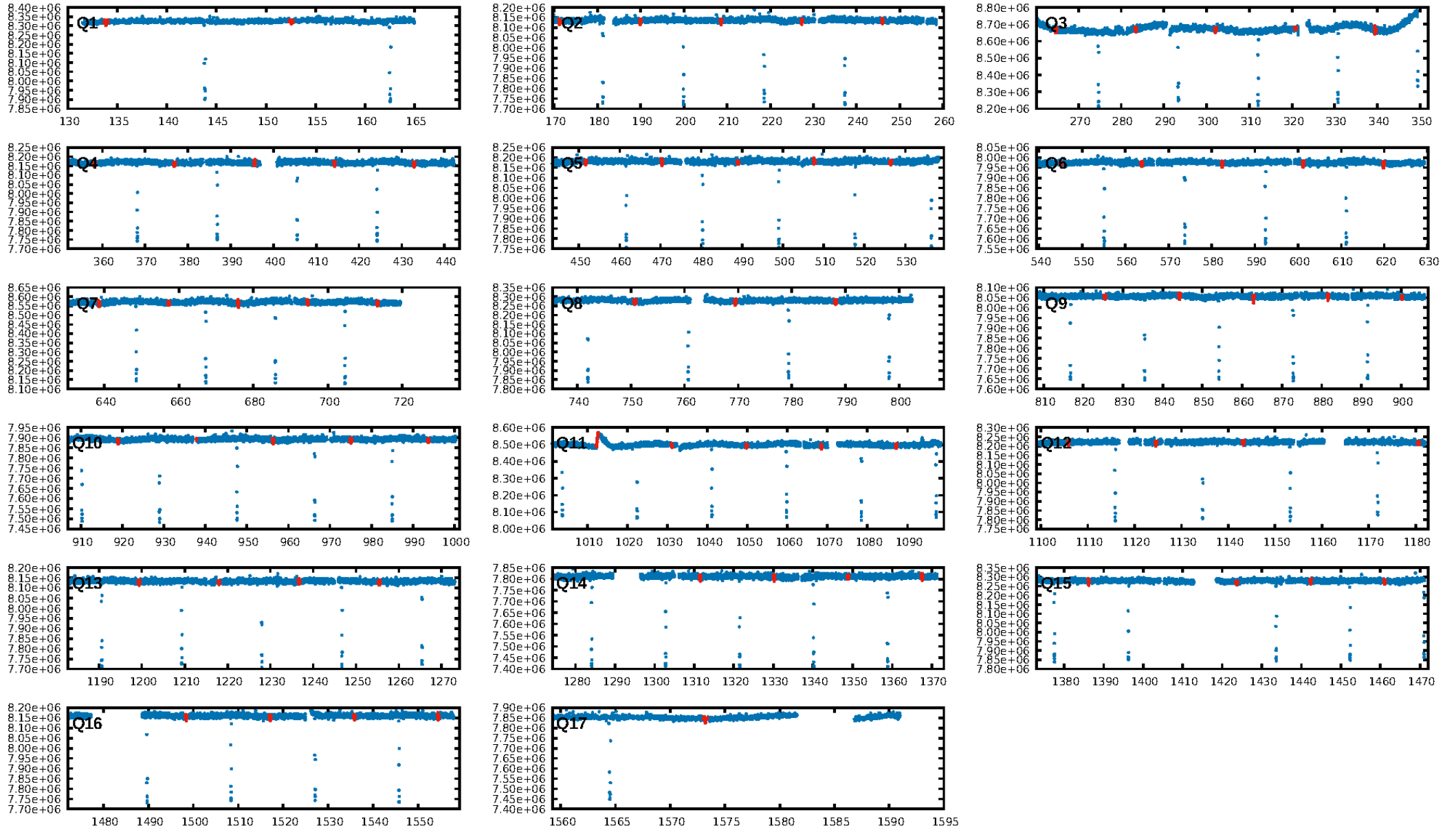
DV Fit Results:

Period = 18.69281 [0.00006] d
Epoch = 133.8536 [0.0027] BKJD
Rp/R* = 0.0424 [0.0015]
a/R* = 15.79 [1.91]
b = 0.90 [0.03]
Seff = 18.44 [3.63]
Teq = 528 [26] K
Rp = 3.06 [0.43] Re
a = 0.1239 [0.0137] AU
Ag = 73.29 [32.91] [2.20σ]
Teffp = 2390 [262] K [7.08σ]

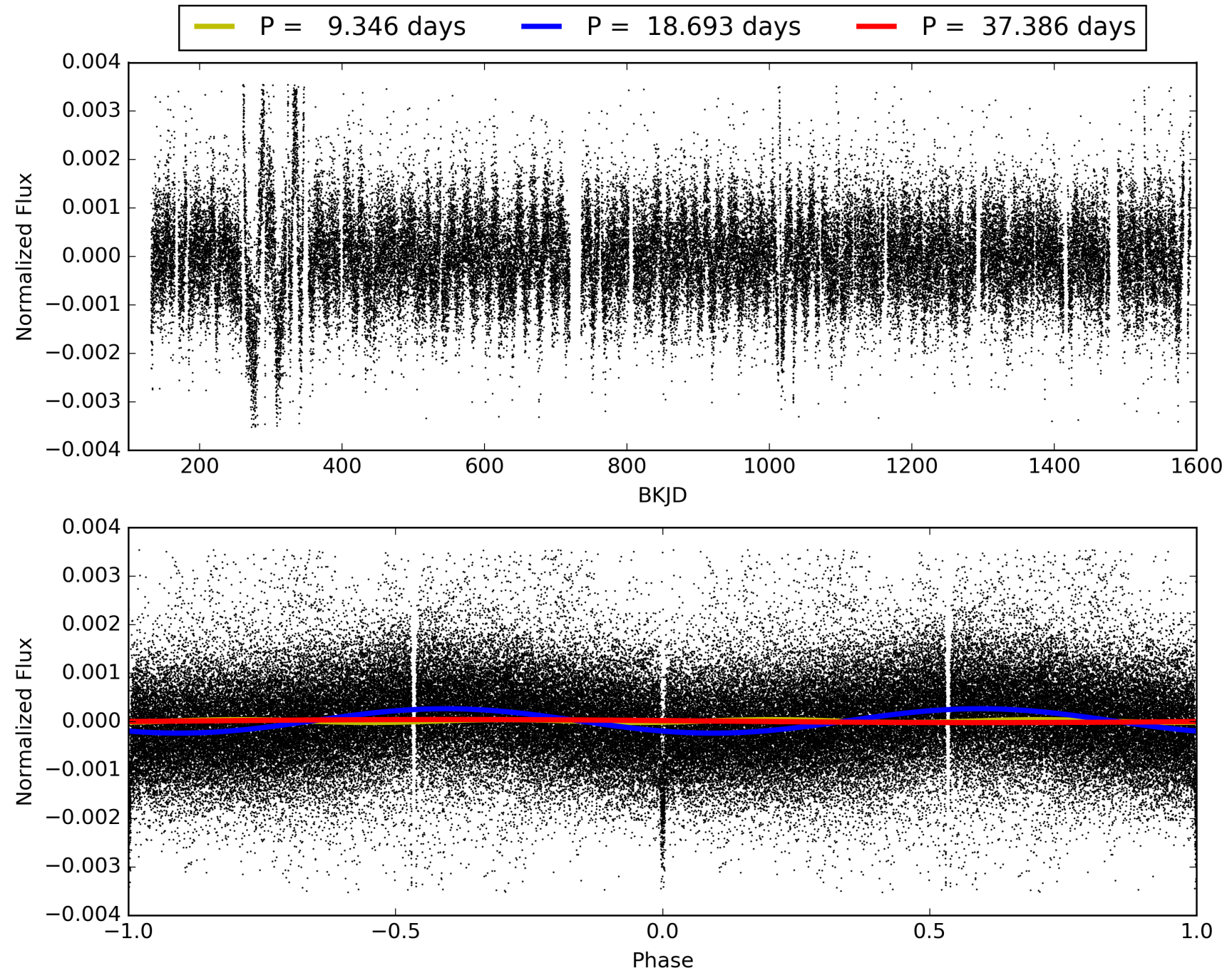
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 53.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.77e-291
RollingBand-fgt: 1.00 [68/68]
GhostDiagnostic-chr: 2.9
Centroid-sig: 56.1%
Centroid-so: 0.350 arcsec [0.90σ]
OotOffset-rm: 0.138 arcsec [1.02σ]
KicOffset-rm: 0.367 arcsec [2.65σ]
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 009838975-02, PDC Light Curves

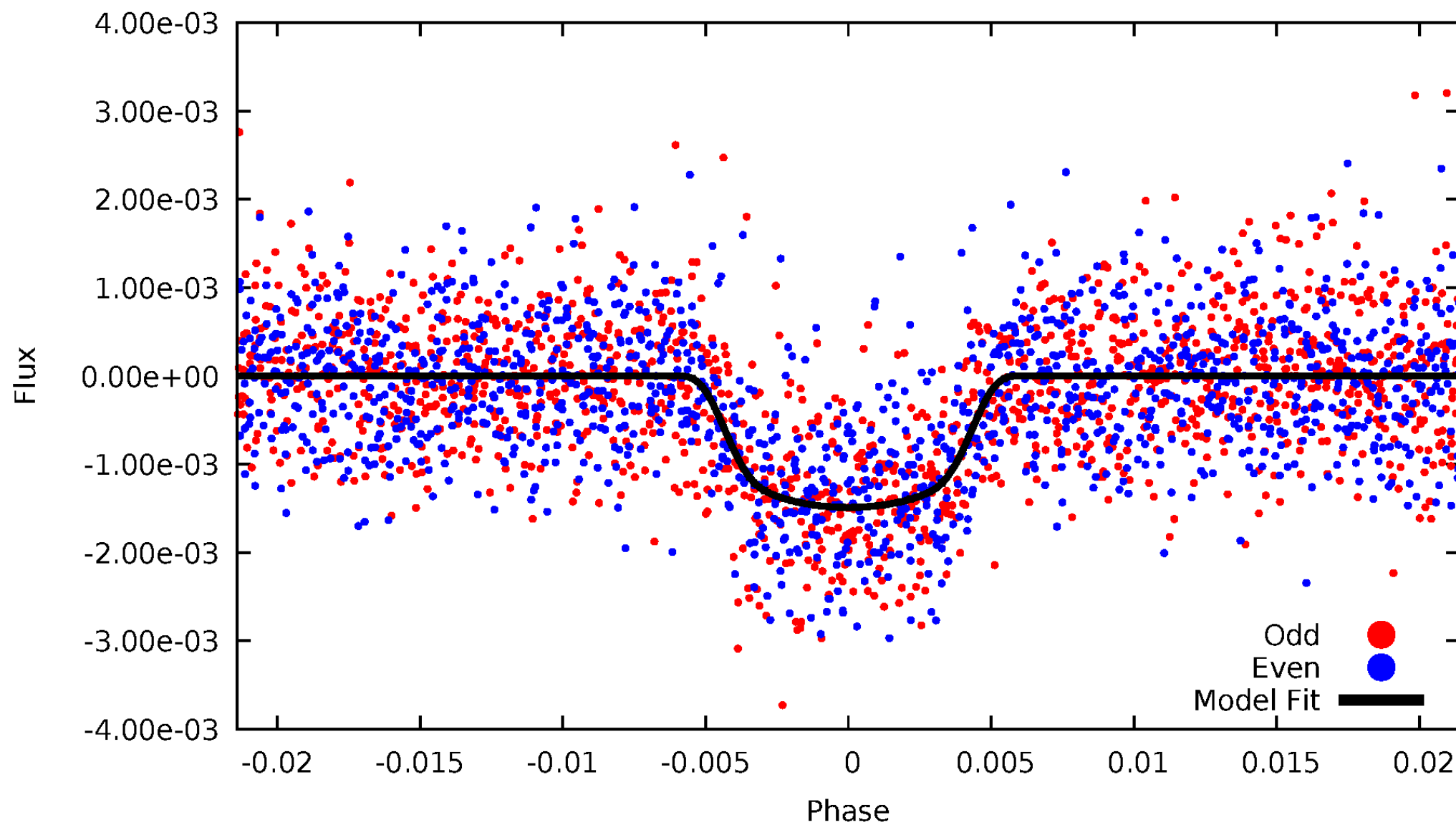


TCE 009838975-02



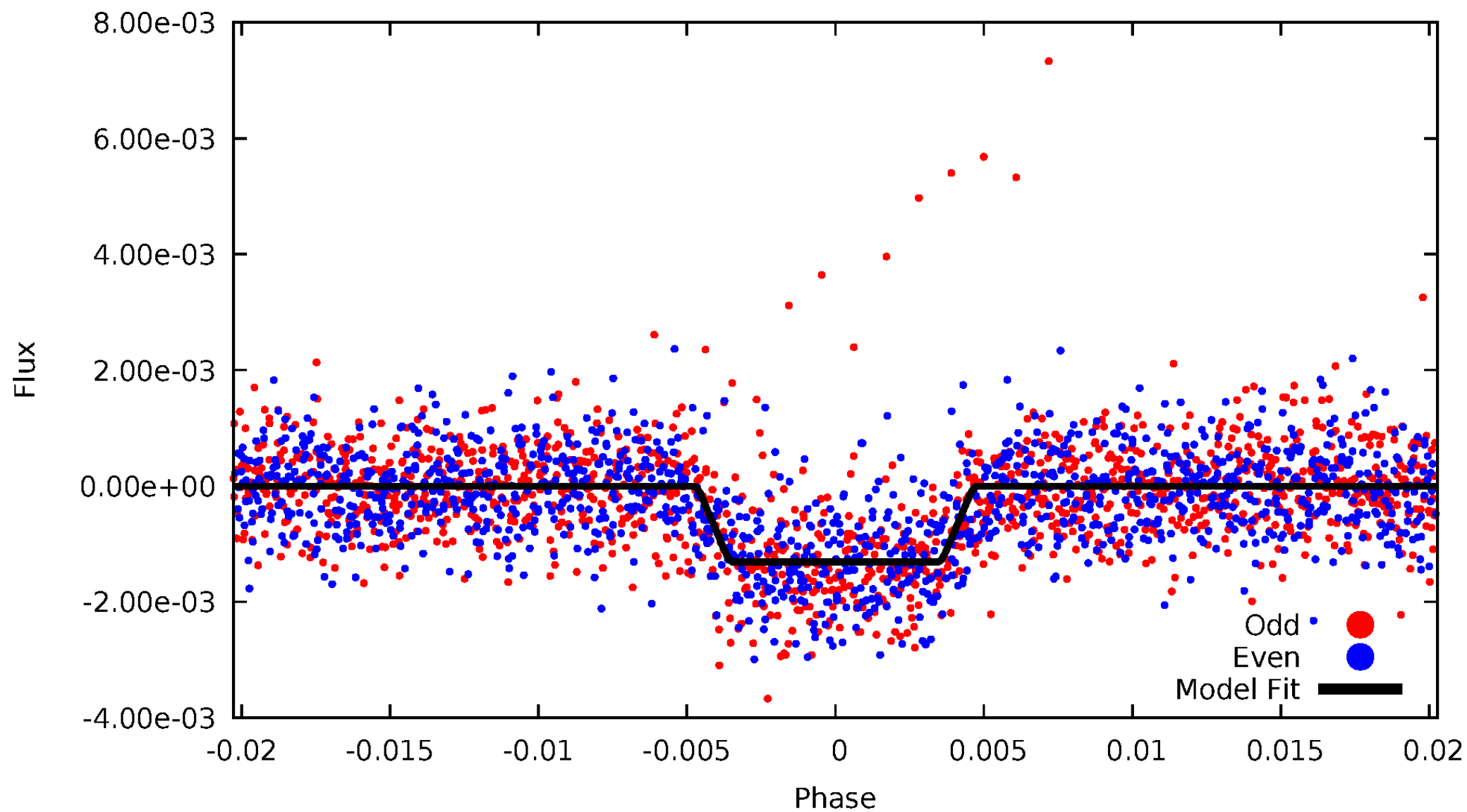
DV Odd/Even

TCE 009838975-02



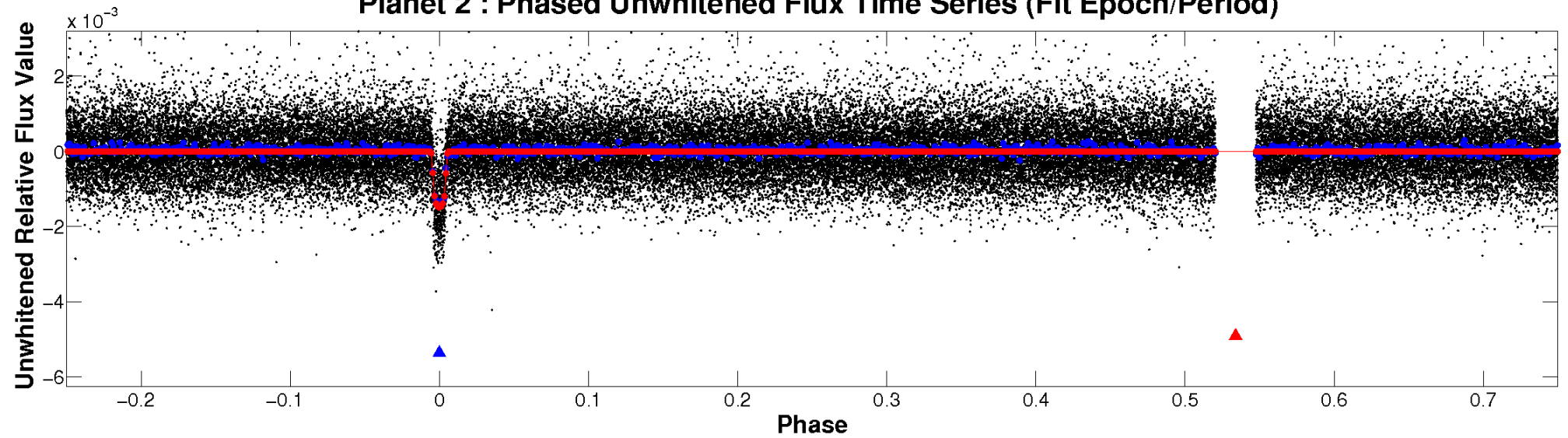
ALT Odd/Even

TCE 009838975-02

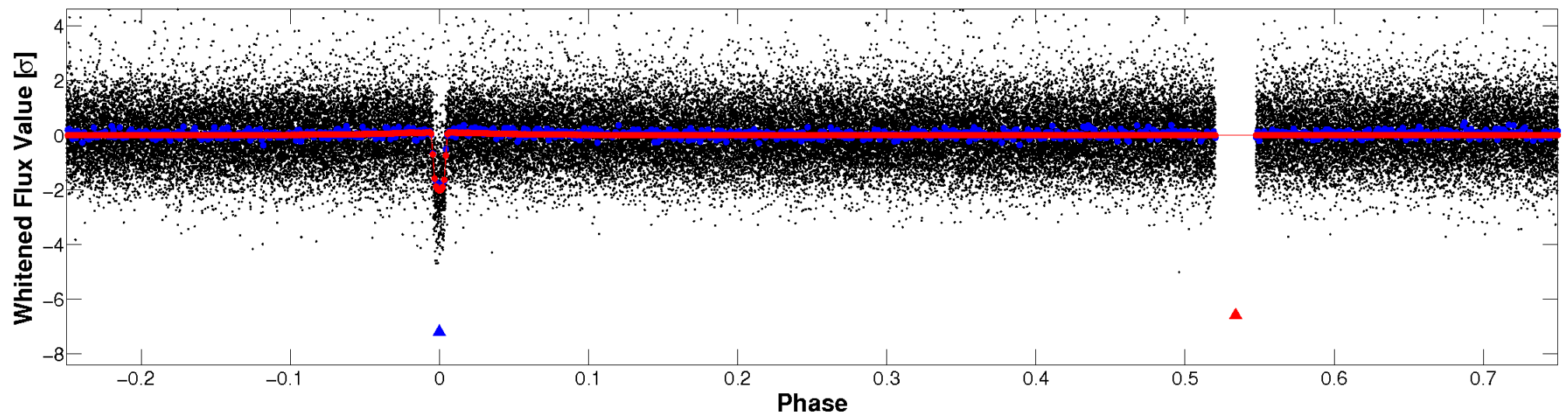


Non-Whitened Vs. Whitened Light Curve

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

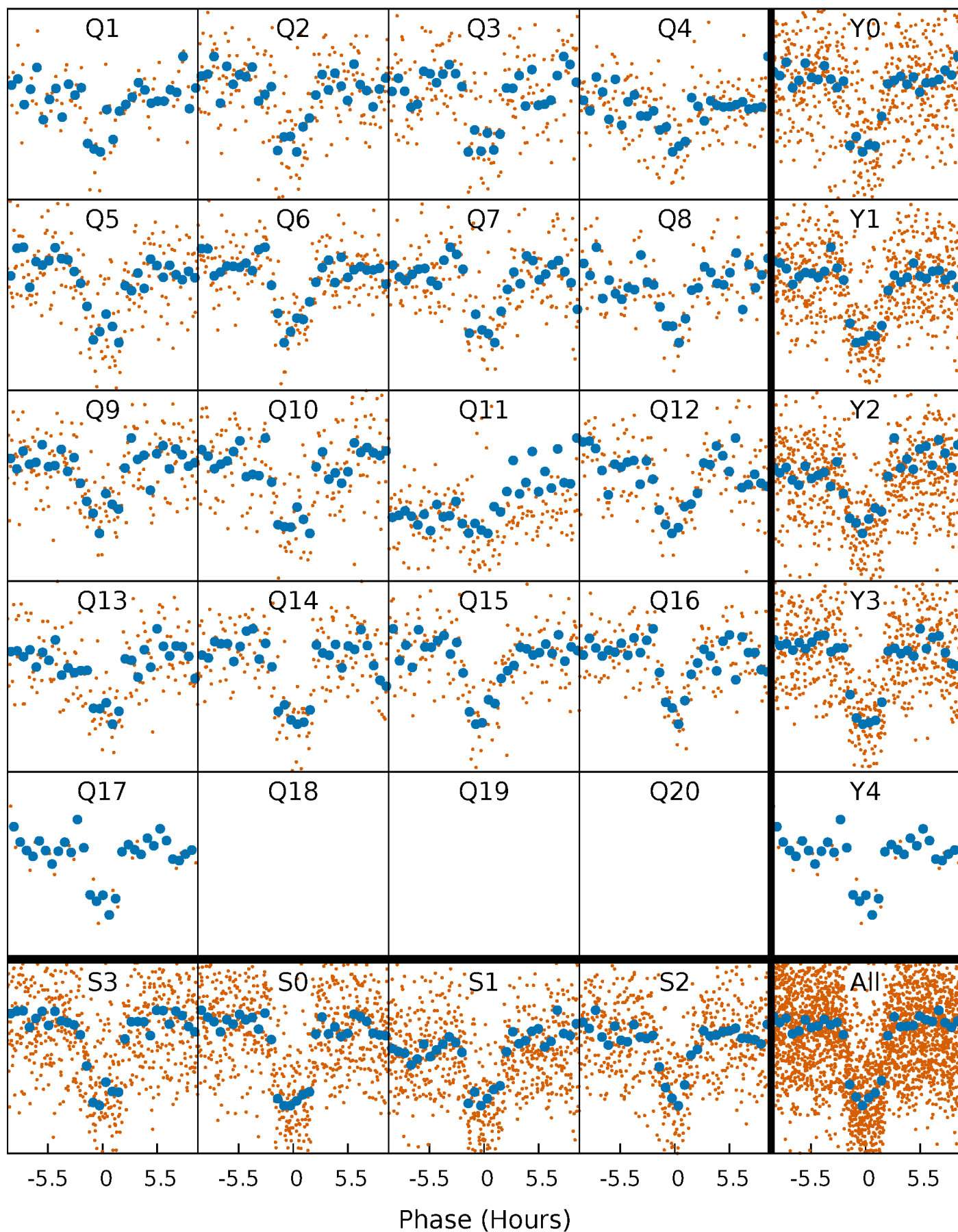


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



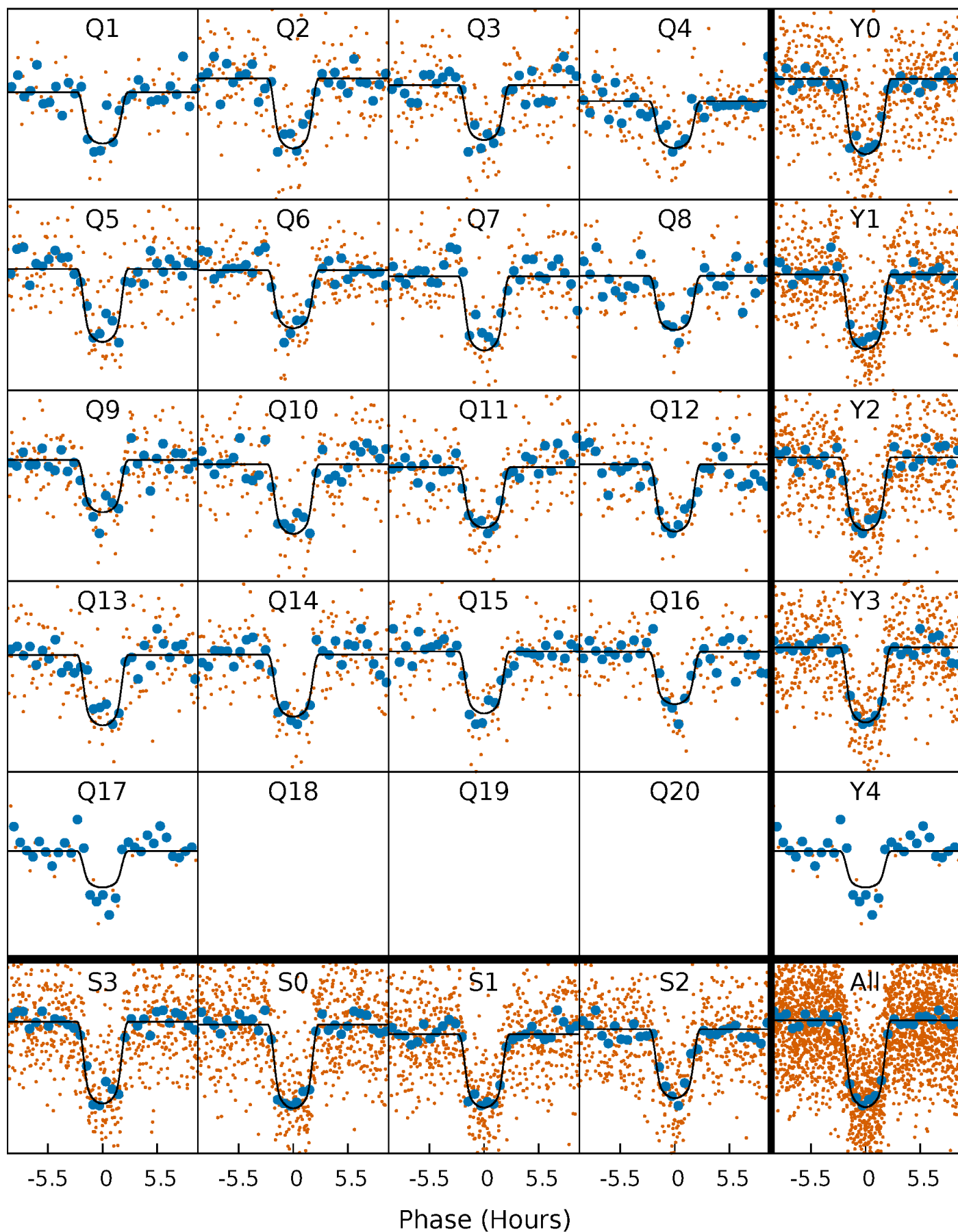
PDC Quarter-Phased Transit Curves

TCE 009838975-02 P= 18.692809 Days $T_0=133.853602$ (BKJD)



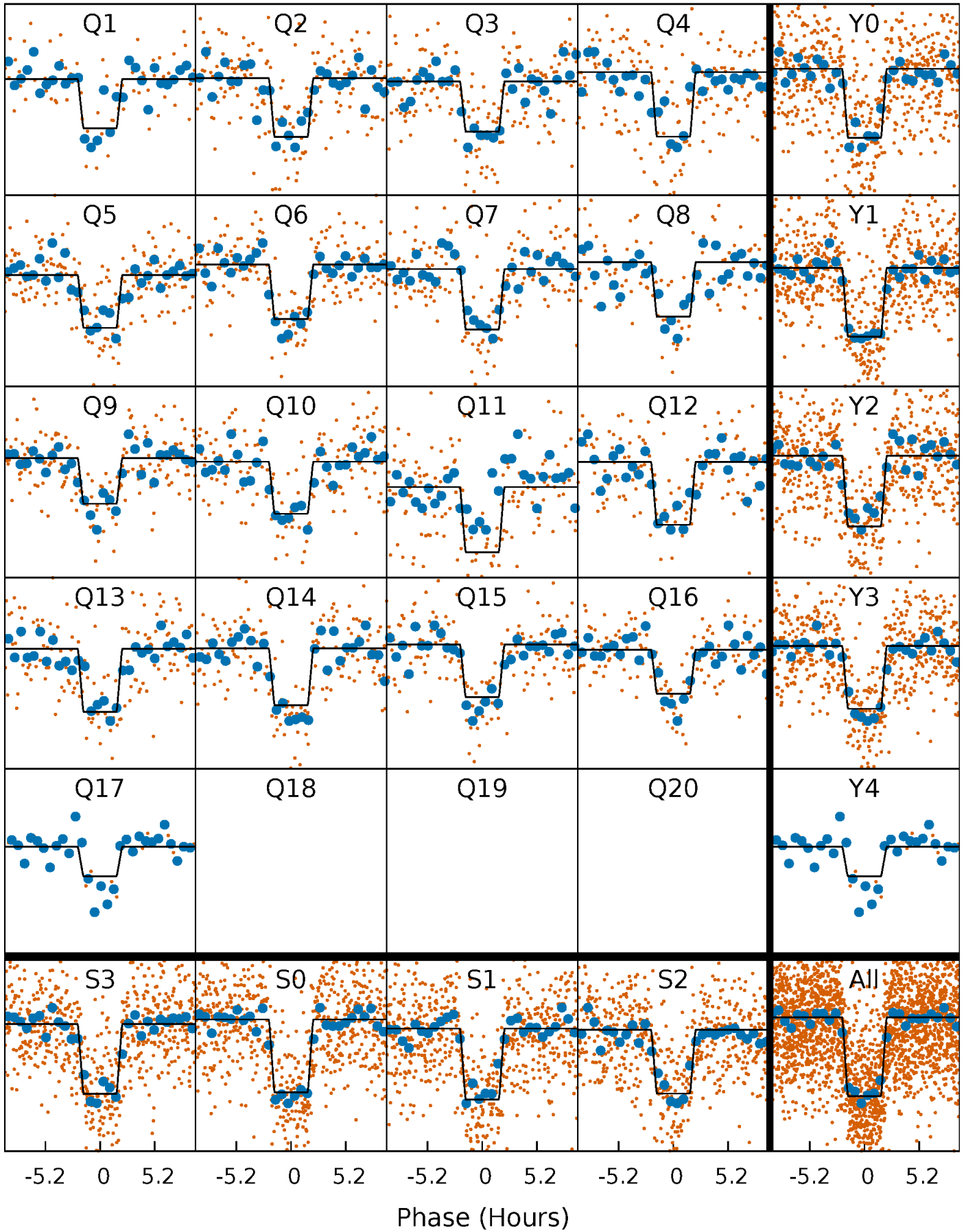
DV Quarter-Phased Transit Curves

TCE 009838975-02 P= 18.692809 Days $T_0=133.853602$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

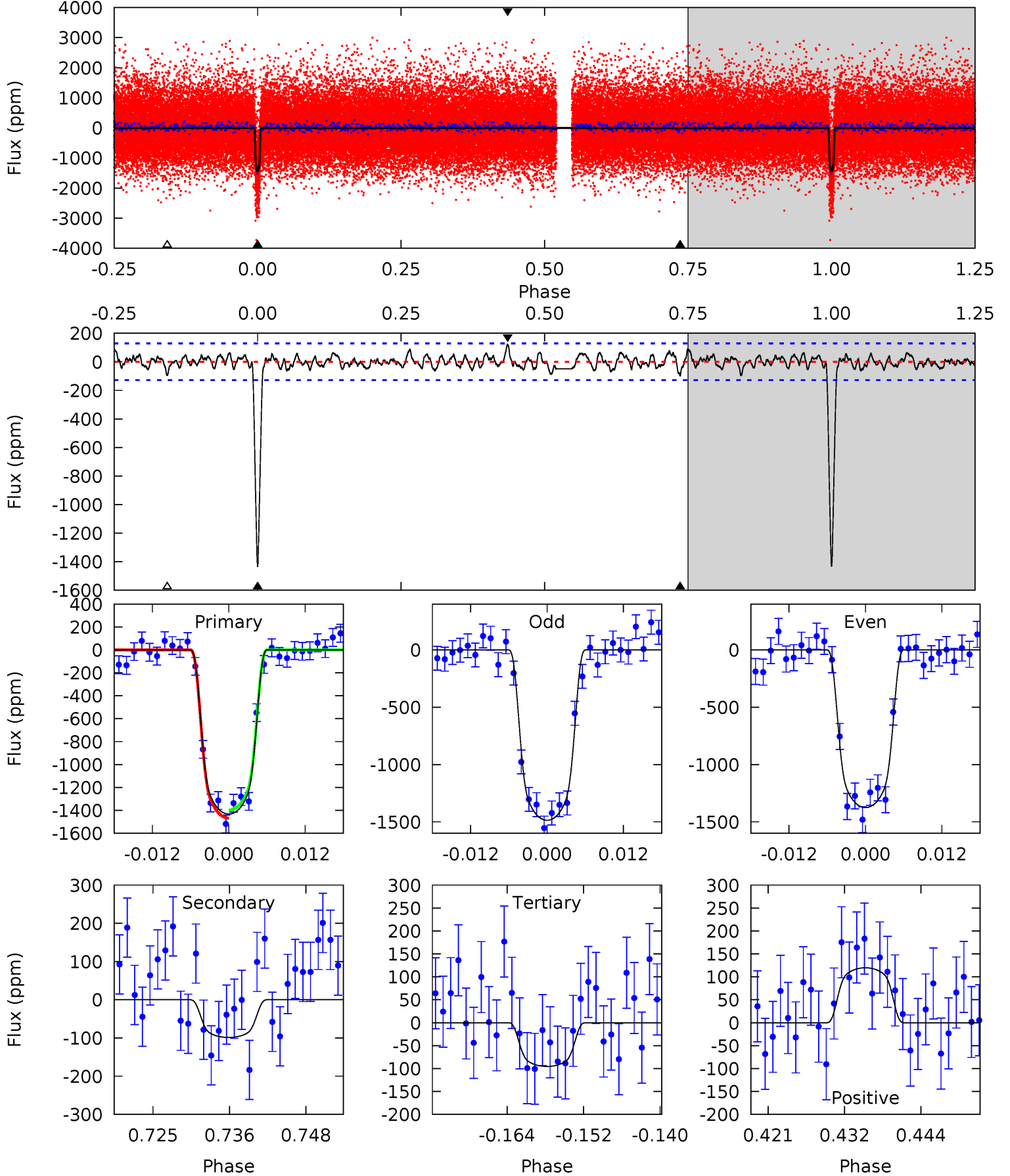
TCE 009838975-02 P= 18.692758 Days $T_0=133.855070$ (BKJD)



DV Model-Shift Uniqueness Test

009838975-02, $P = 18.692809$ Days, $E = 115.160793$ Days

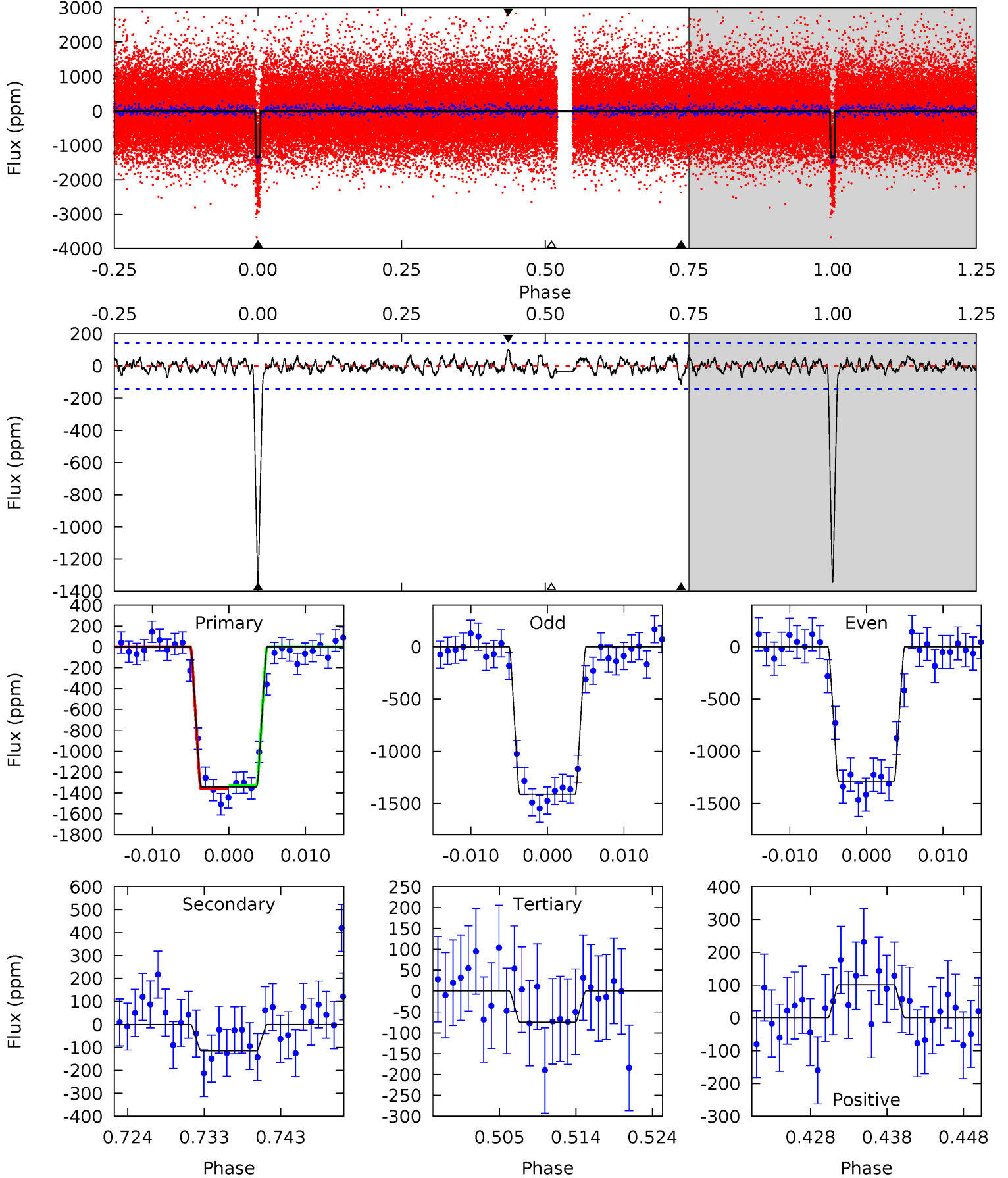
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.7	3.84	3.72	4.66	5.00	2.52	1.33	52.0	51.1	0.13	-0.82	2.16	0.98	0.08	1.38



Alt Model-Shift Uniqueness Test

009838975-02, P = 18.692758 Days, E = 115.162312 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.4	4.05	2.64	3.57	5.04	2.59	1.04	44.8	43.8	1.41	0.47	2.19	0.97	0.07	0.66



Stellar Parameters For KIC 009838975

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5190^{+156}_{-140}	$4.660^{+0.028}_{-0.083}$	$-0.520^{+0.300}_{-0.300}$	$0.660^{+0.089}_{-0.041}$	$0.732^{+0.071}_{-0.071}$	$3.583^{+0.527}_{-0.979}$
	+3%/-3%	+1%/-2%	+58%/-58%	+13%/-6%	+10%/-10%	+15%/-27%
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 009838975-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-99±26	$3.11^{+0.23}_{-0.19}$	748^{+30}_{-27}	3118^{+129}_{-143}	86^{+25}_{-24}
Alt.	-115±28	$2.64^{+0.22}_{-0.17}$	748^{+27}_{-24}	3334^{+144}_{-147}	136^{+37}_{-37}

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

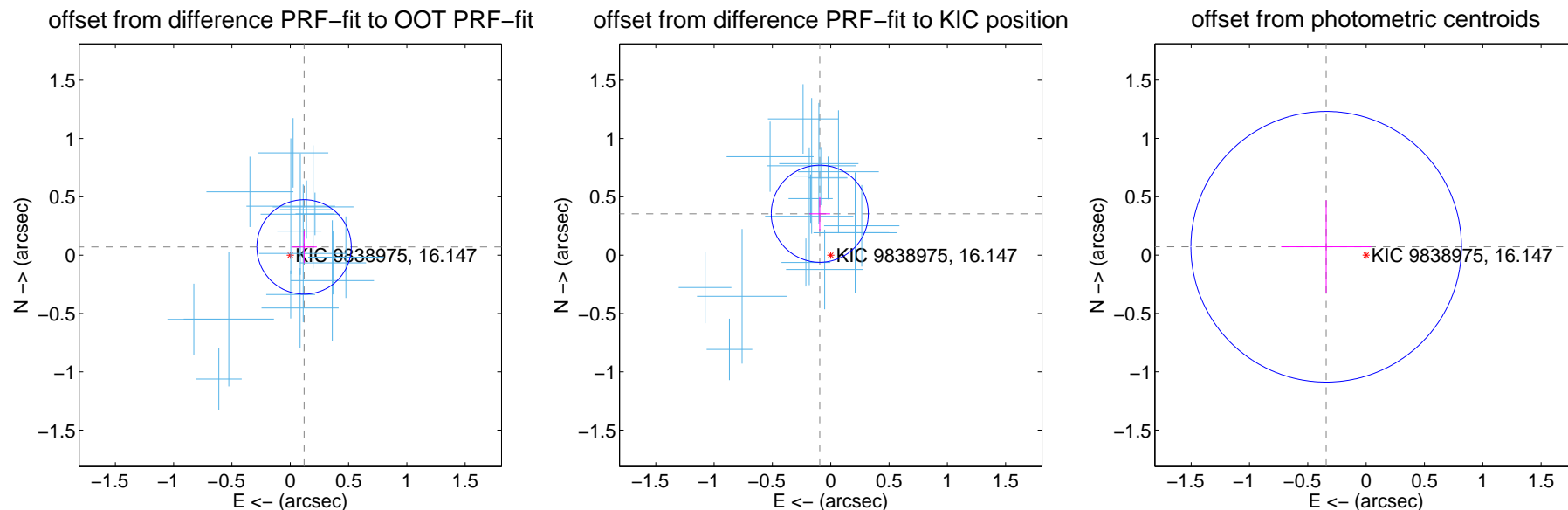
DV Centroid Data

Supplemental centroid analysis for 009838975-02. Kepler magnitude: 16.15. Transit SNR 40.65

There are 17 quarters with good PRF difference image offsets

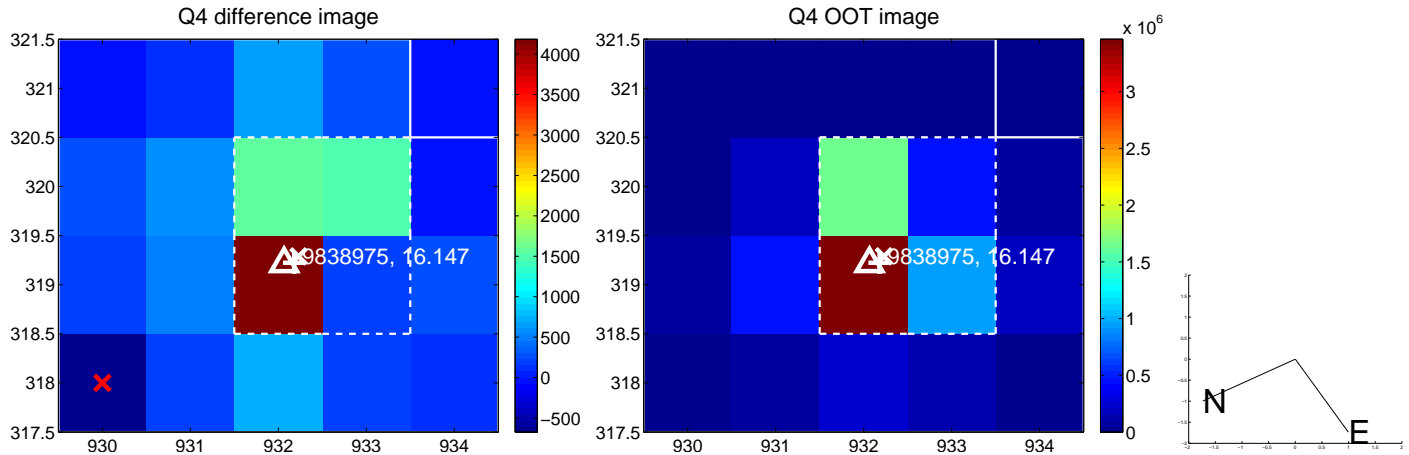
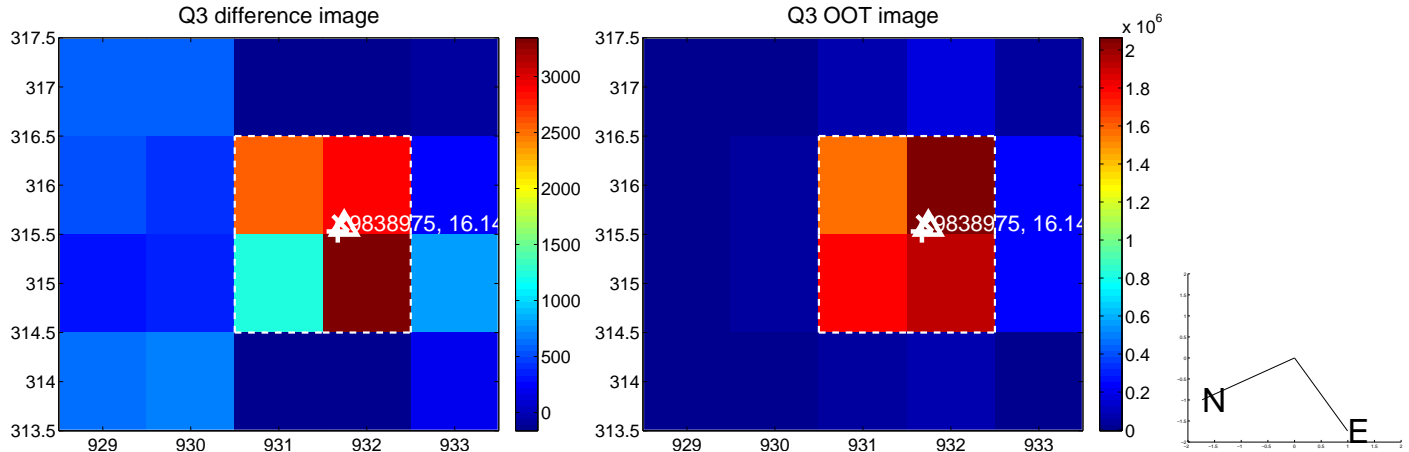
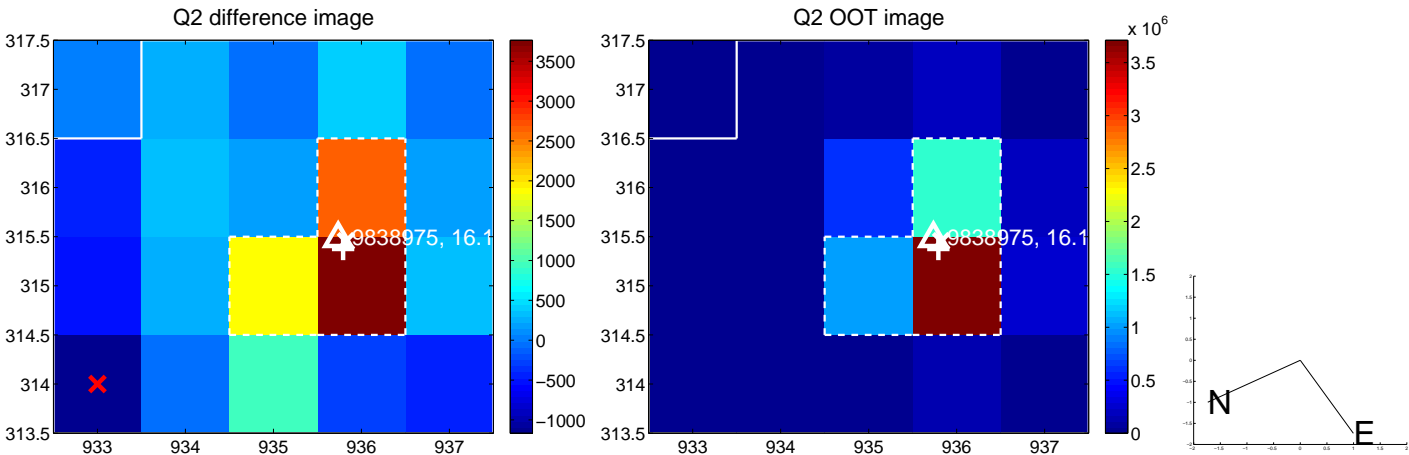
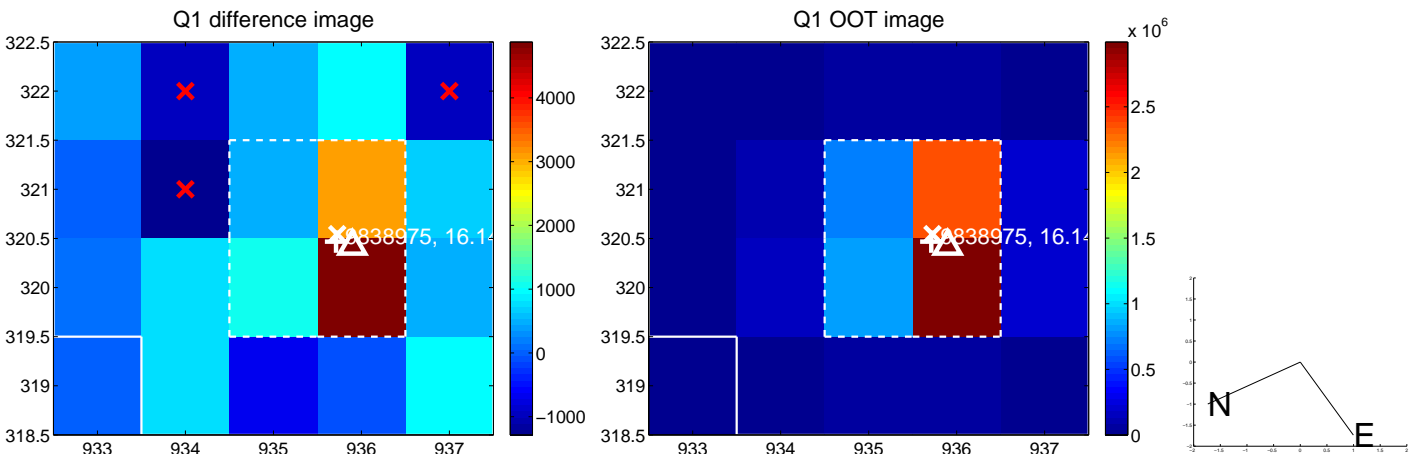
The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.138 ± 0.135	1.02	-0.118 ± 0.109	0.070 ± 0.139
PRF-fit source offset from KIC position	0.367 ± 0.139	2.65	0.094 ± 0.089	0.355 ± 0.142
photometric centroid source offset	0.35 ± 0.39	0.90	0.34 ± 0.39	0.07 ± 0.40

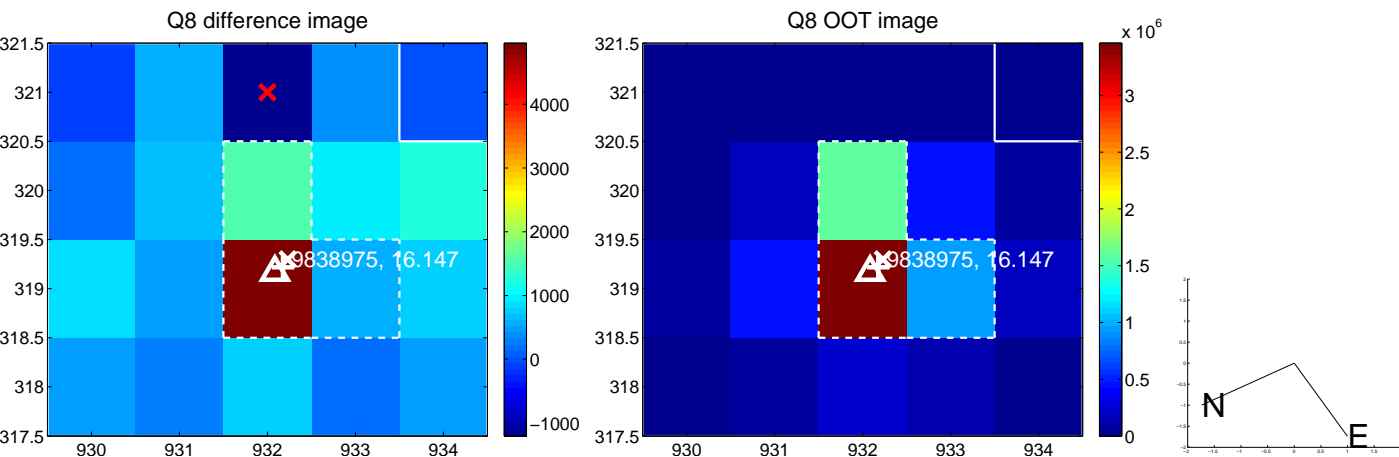
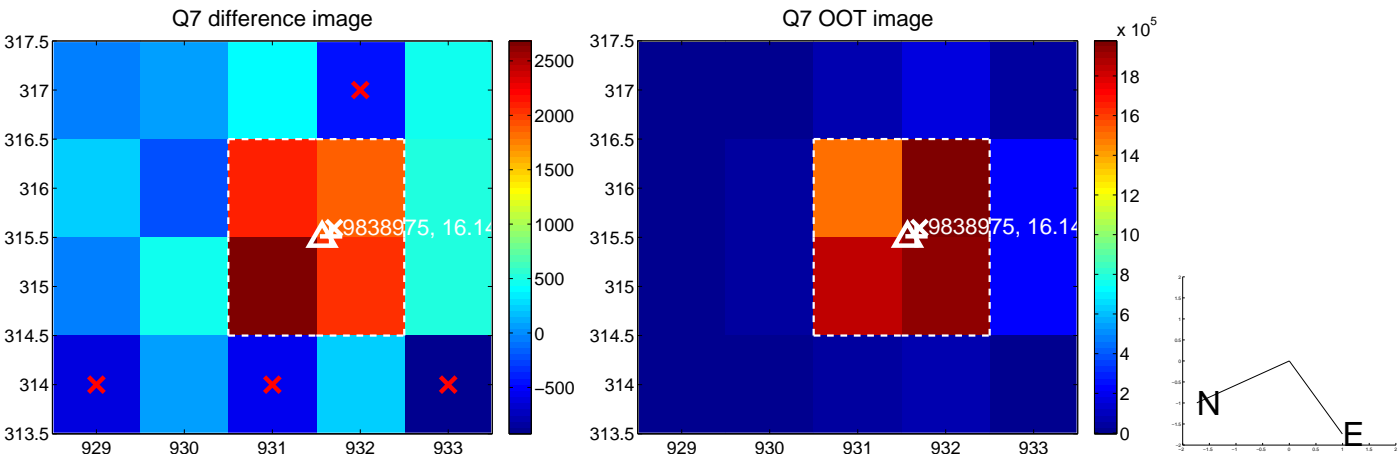
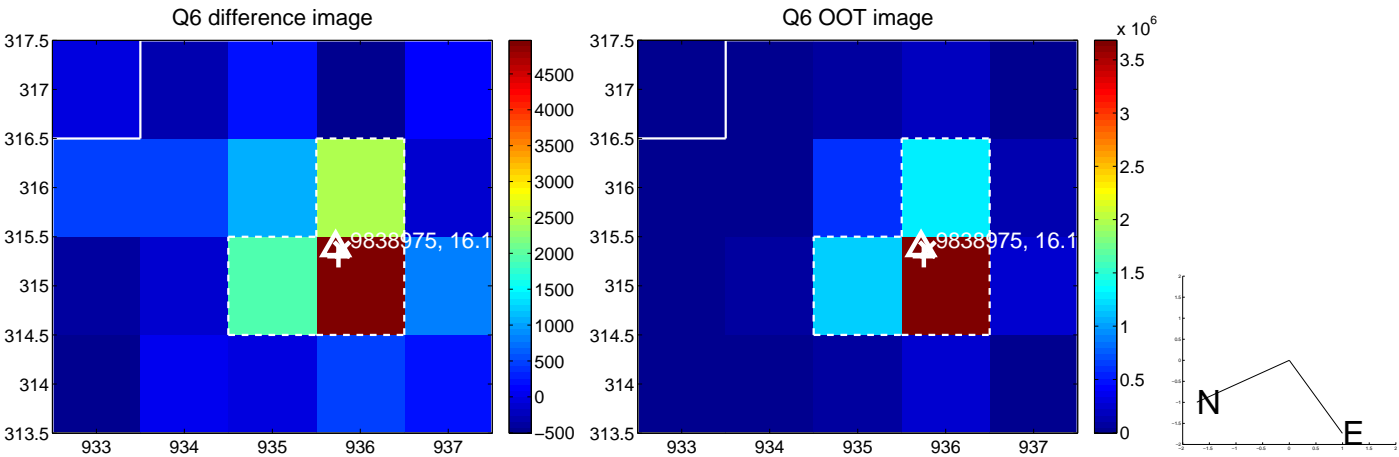
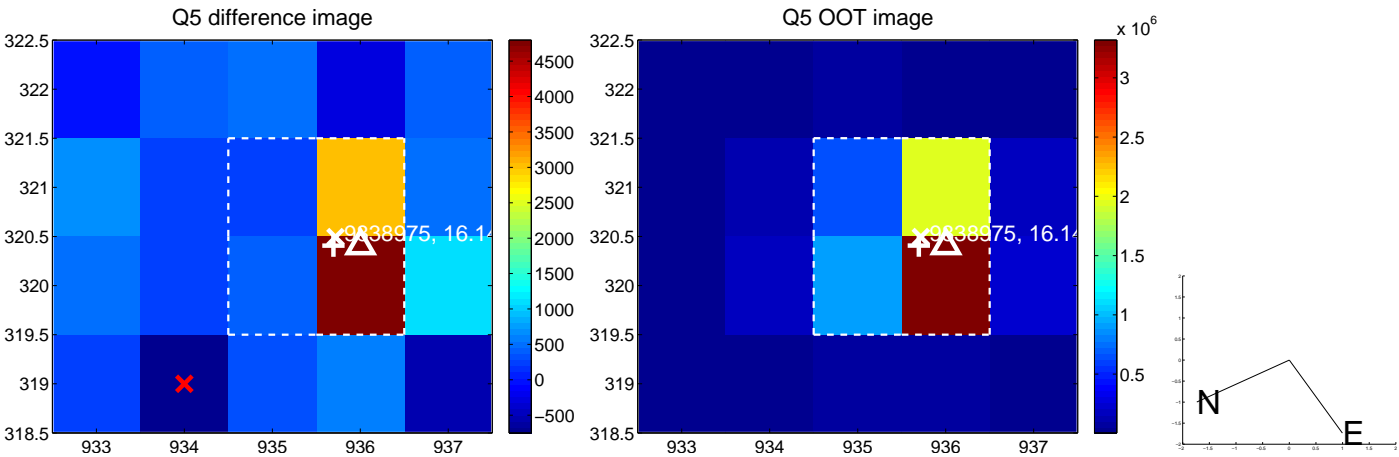


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

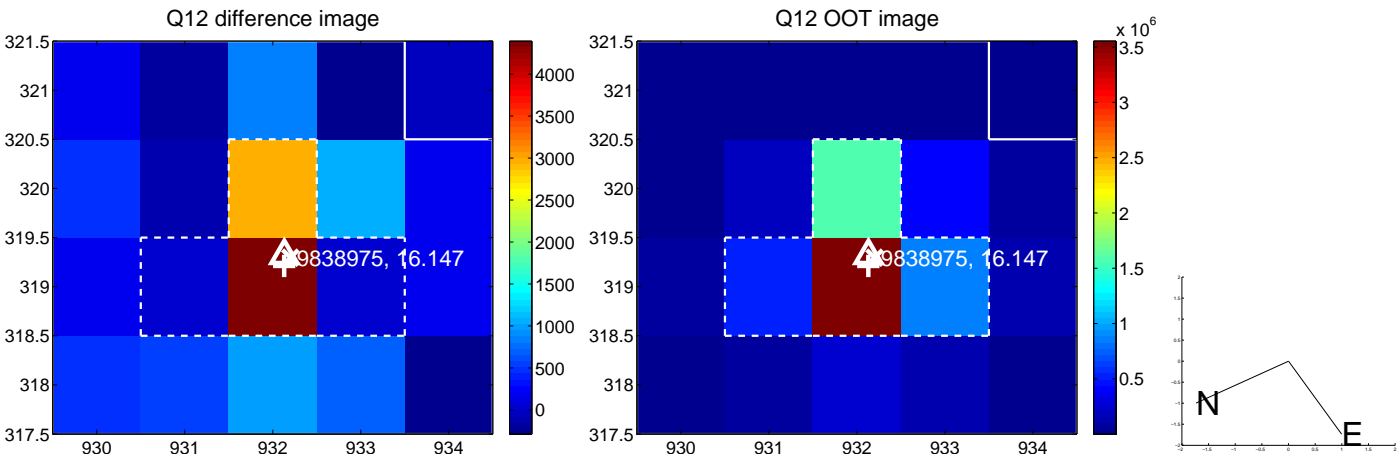
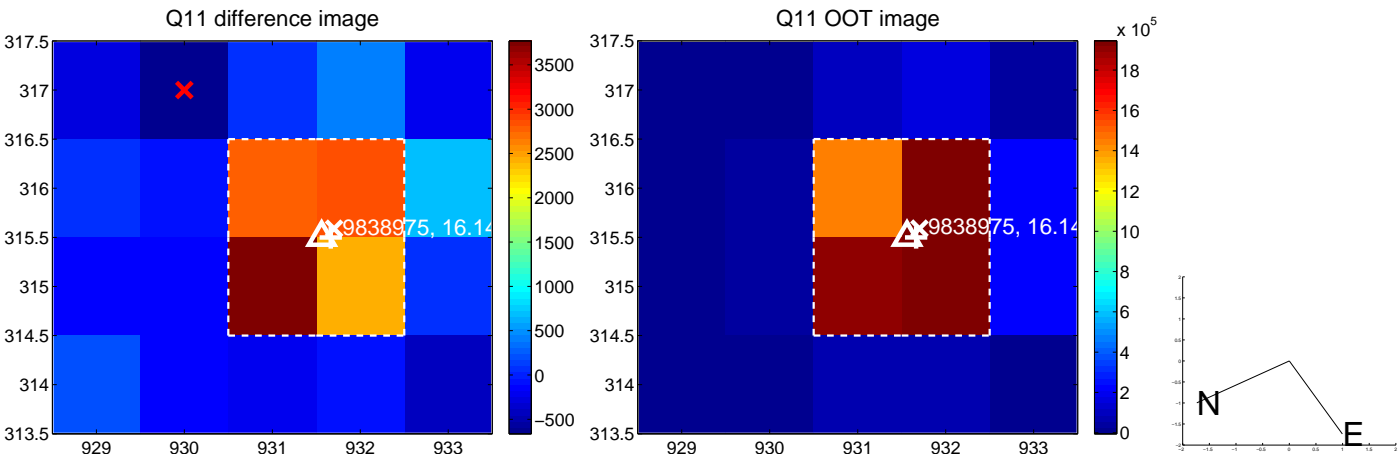
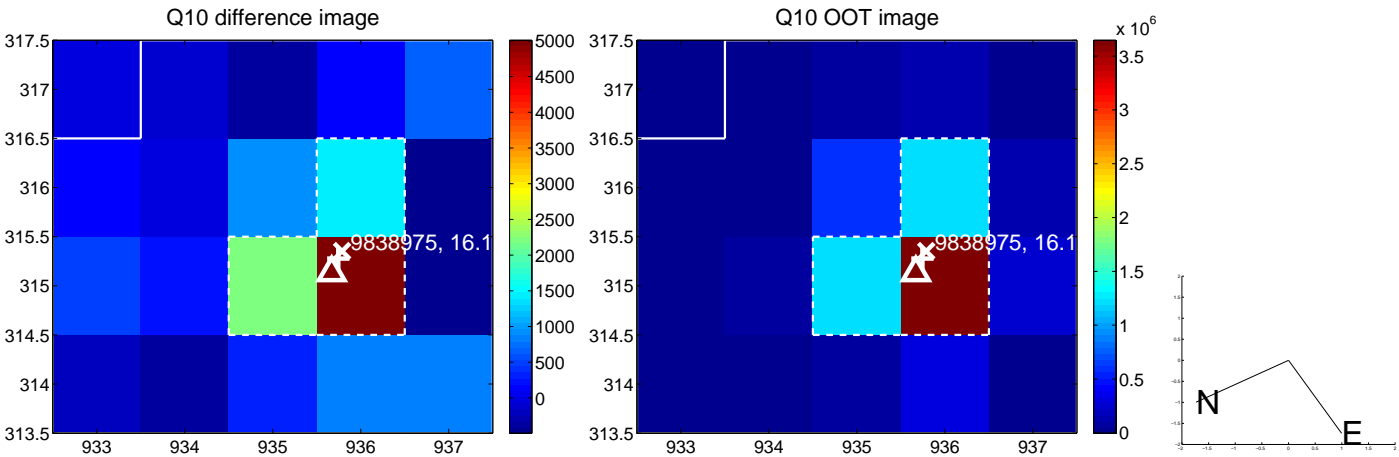
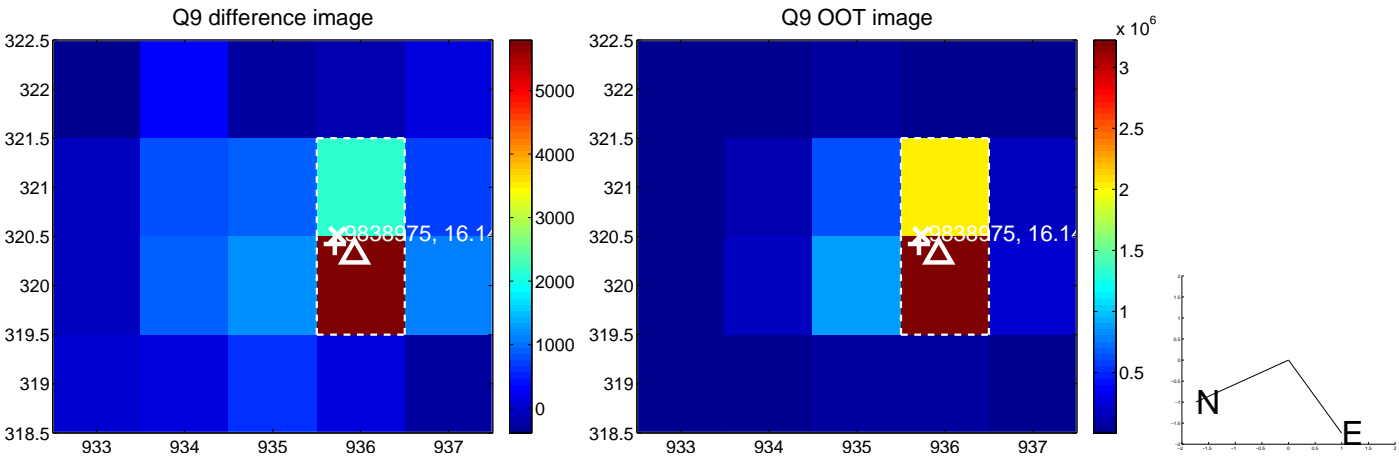
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



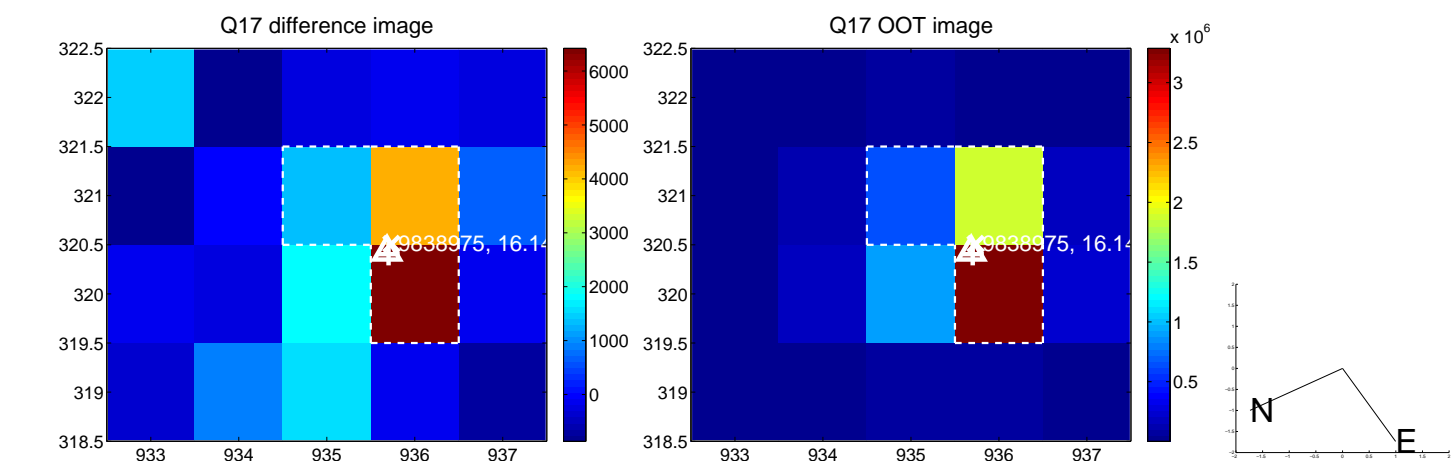
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



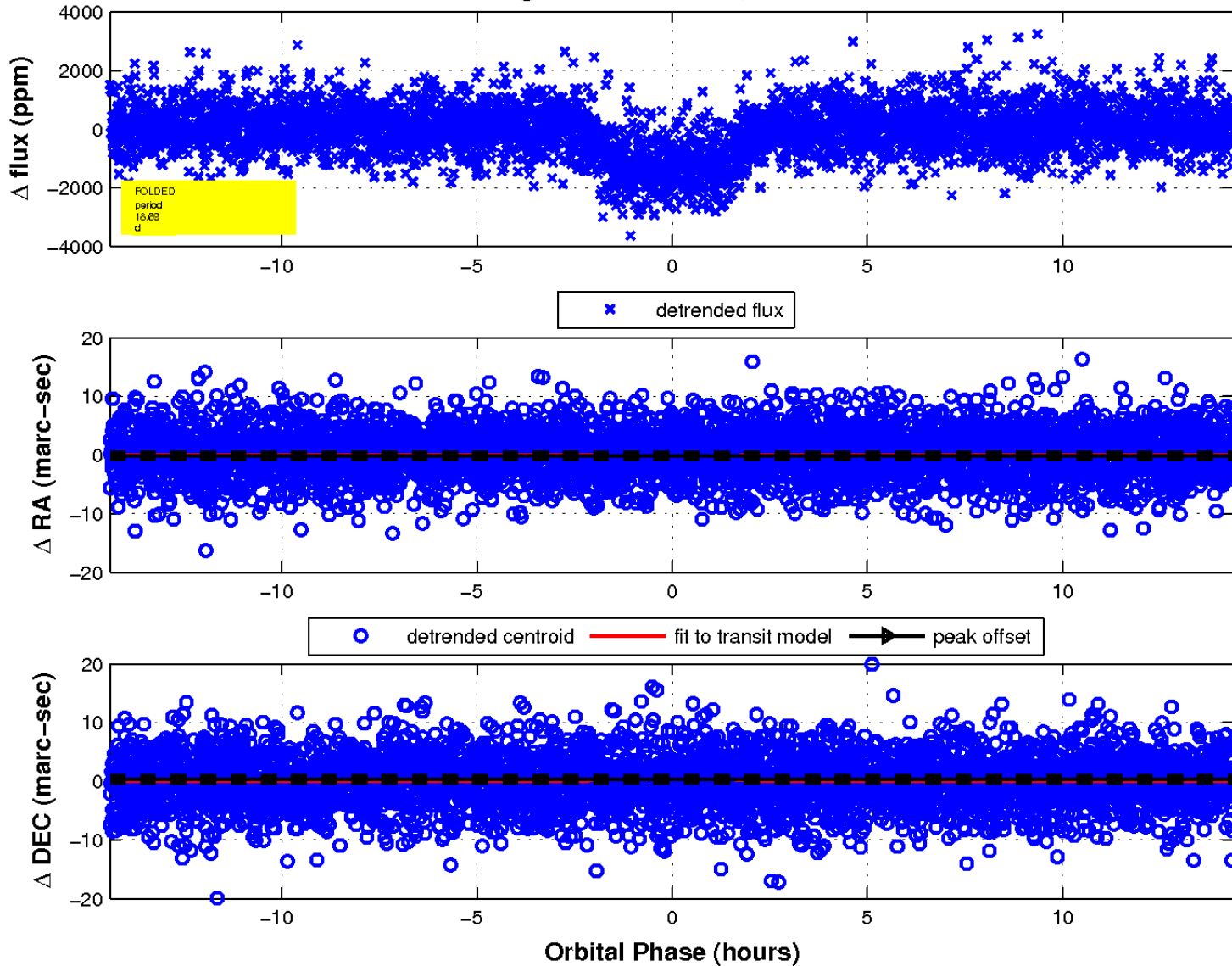
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

