

KIC 009967771

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})
009967771-01	OBS	1875.02	0.538354	131.649622	170.4	1.519	32.1	38.7	1.21	5539	1.90	7673.62
009967771-02	OBS	1875.01	9.917202	135.139572	440.4	3.339	22.8	27.4	1.21	5539	3.01	157.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009967771-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009967771-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

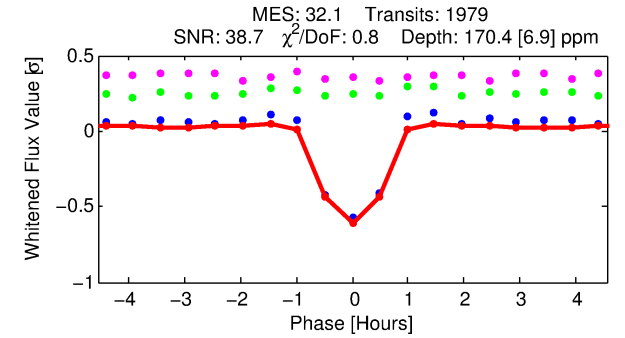
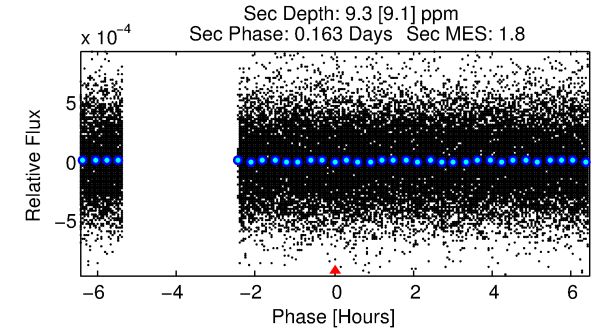
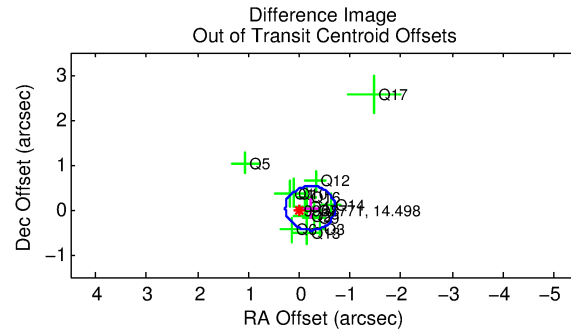
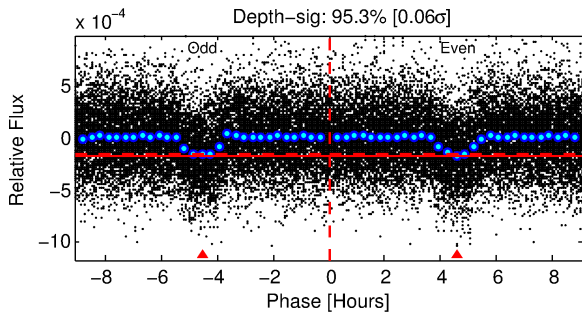
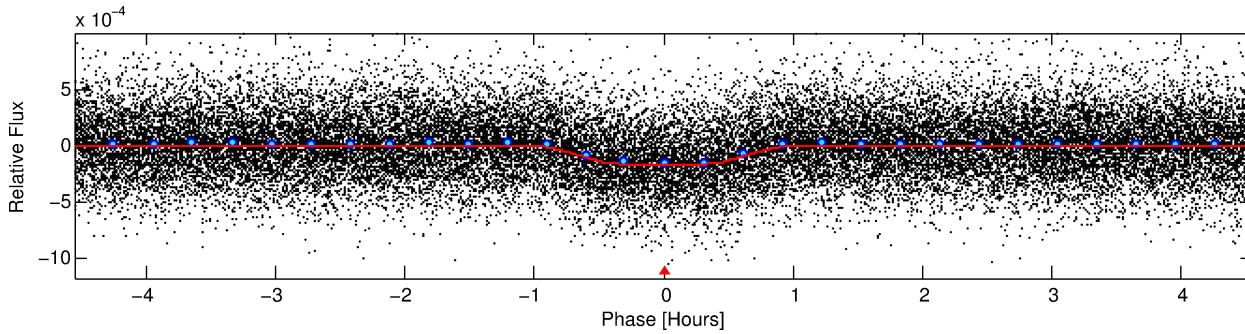
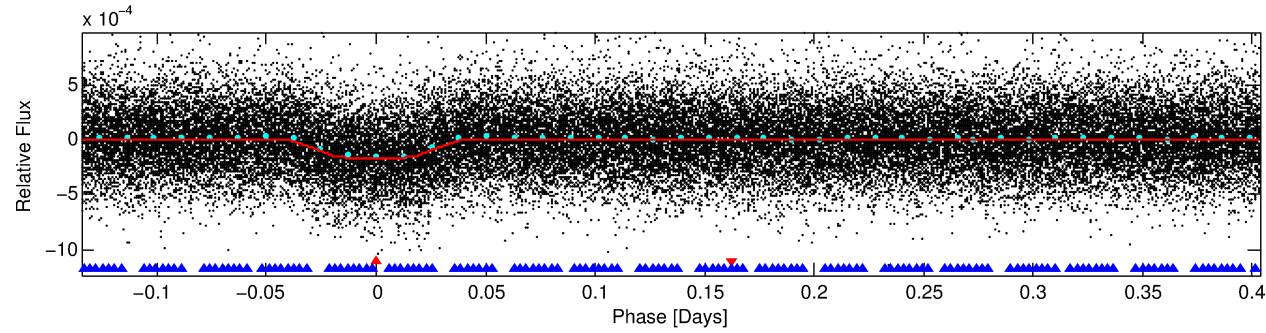
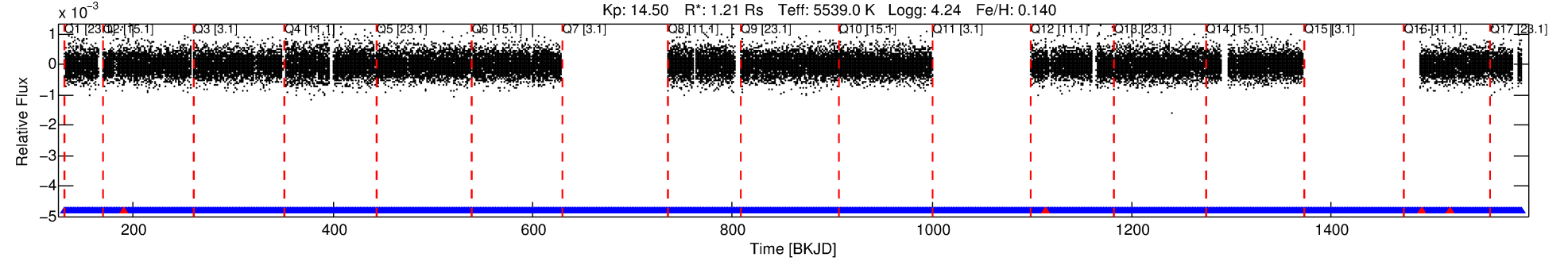
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009967771-01

No Significant Match Found

DV One-Page Summary

KIC: 9967771 Candidate: 1 of 2 Period: 0.538 d
KOI: K01875.02 Corr: 0.987



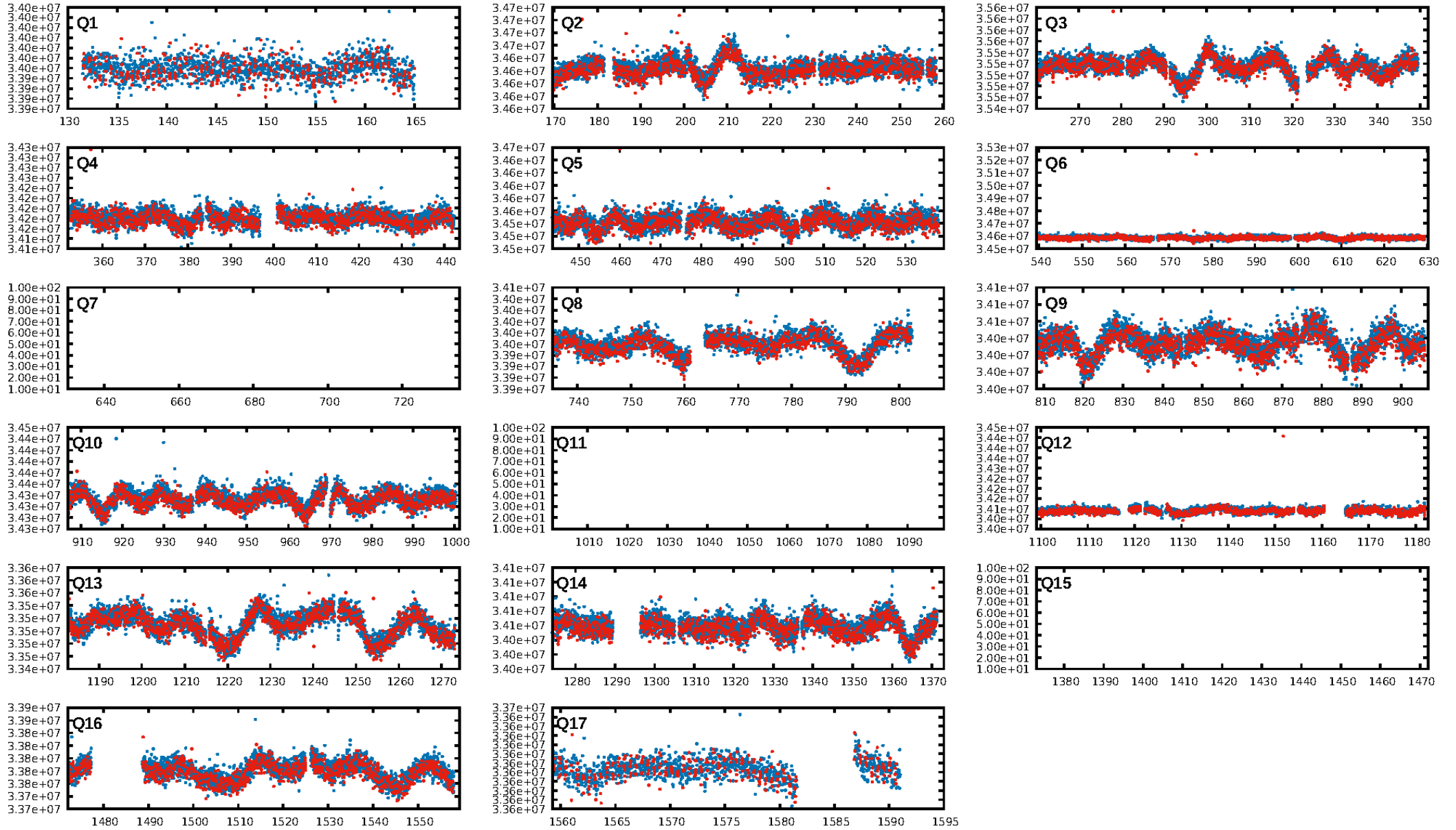
DV Fit Results:

Period = 0.53835 [0.00000] d
Epoch = 131.6496 [0.0006] BKJD
Rp/R* = 0.0144 [0.0037]
a/R* = 1.57 [1.08]
b = 0.90 [0.25]
Seff = 7673.62 [2321.15]
Teq = 2387 [180] K
Rp = 1.90 [0.61] Re
a = 0.0127 [0.0023] AU
Ag = 0.23 [0.26] [-2.98 σ]
Teffp = 2544 [708] K [0.22 σ]

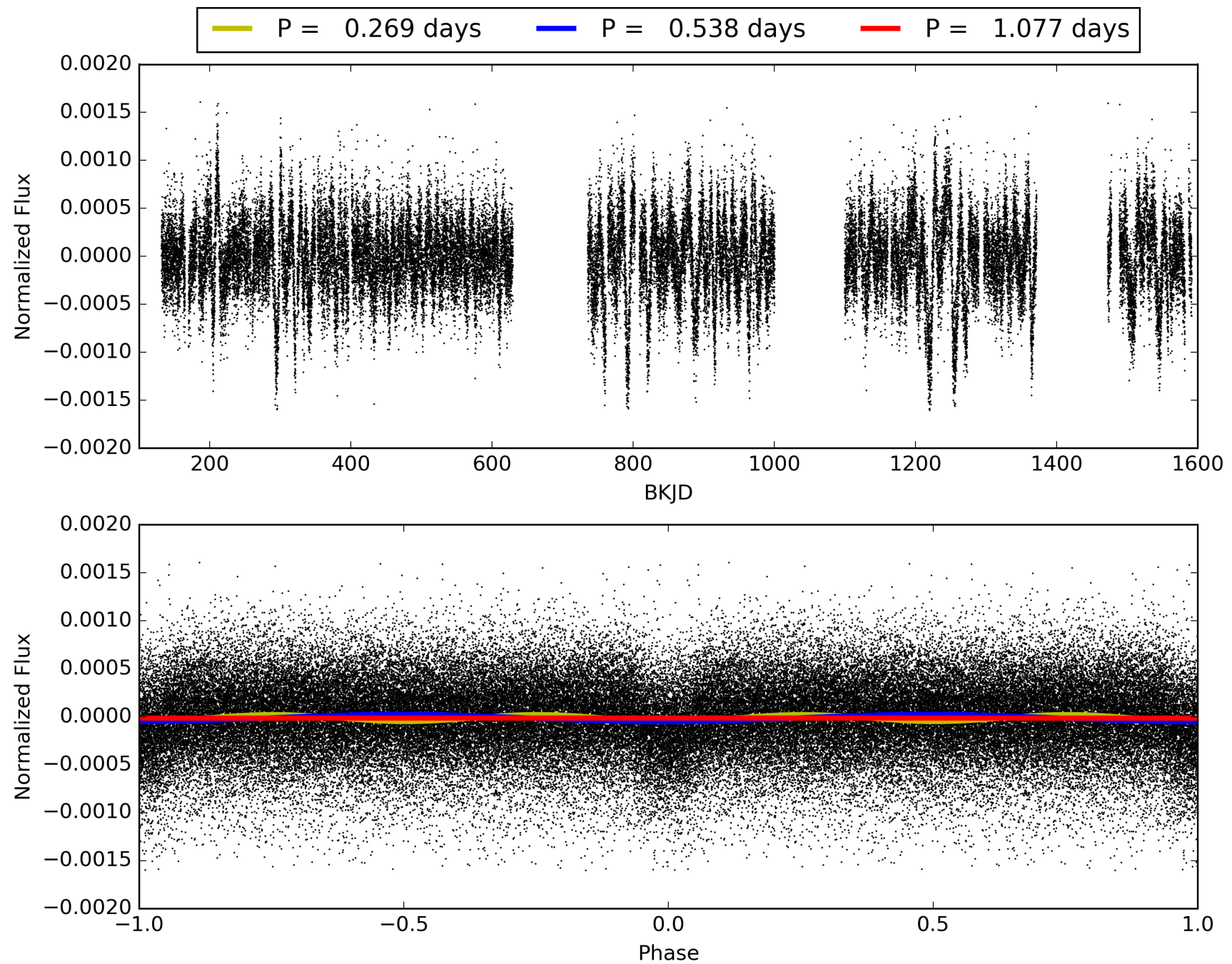
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [61.36 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.49e-207
RollingBand-fgt: 1.00 [1863/1867]
GhostDiagnostic-chr: 2.48
Centroid-sig: 0.6%
Centroid-so: 0.515 arcsec [1.52 σ]
OotOffset-rm: 0.219 arcsec [1.34 σ]
KicOffset-rm: 0.252 arcsec [1.64 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 009967771-01, PDC Light Curves

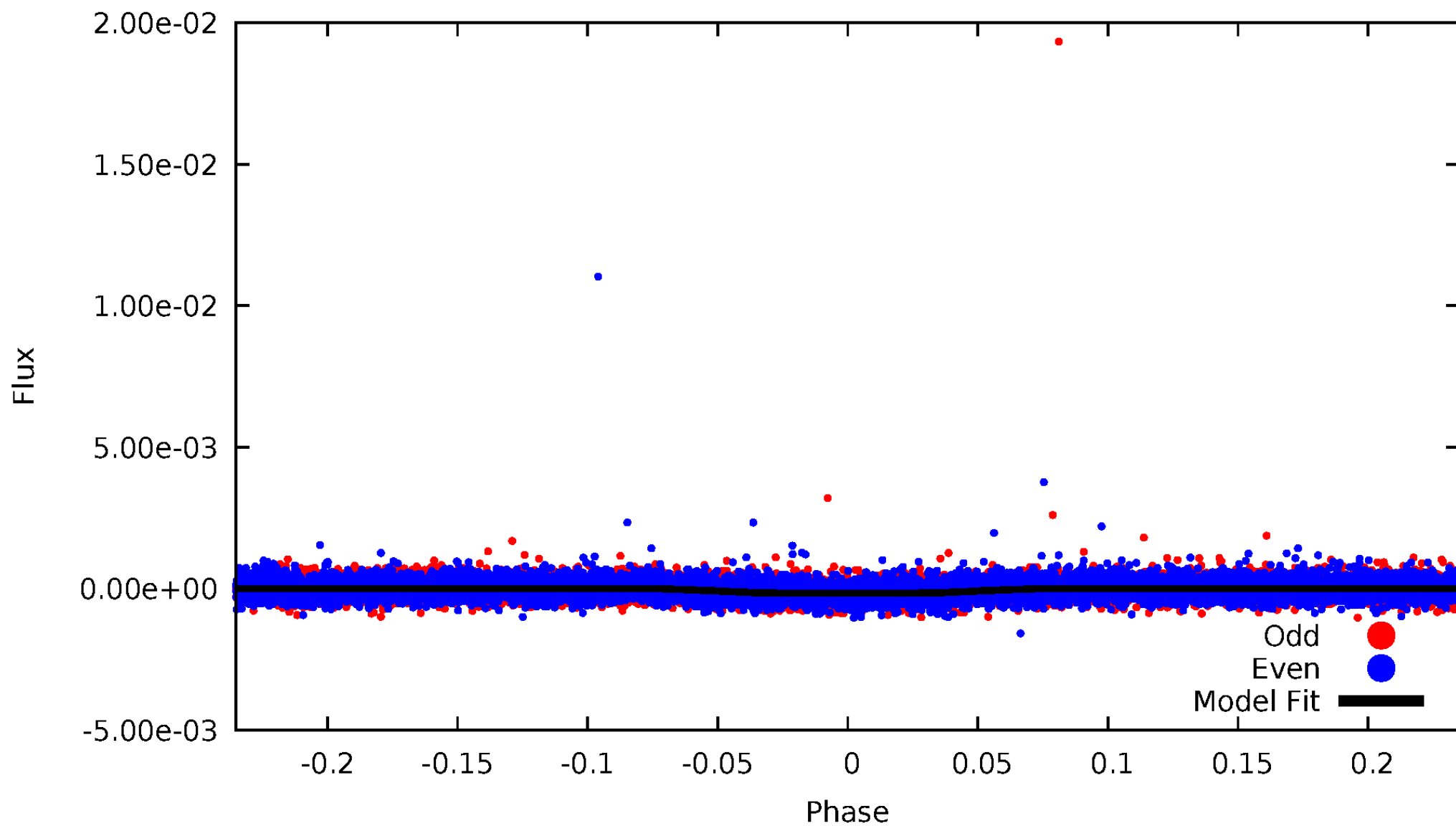


TCE 009967771-01



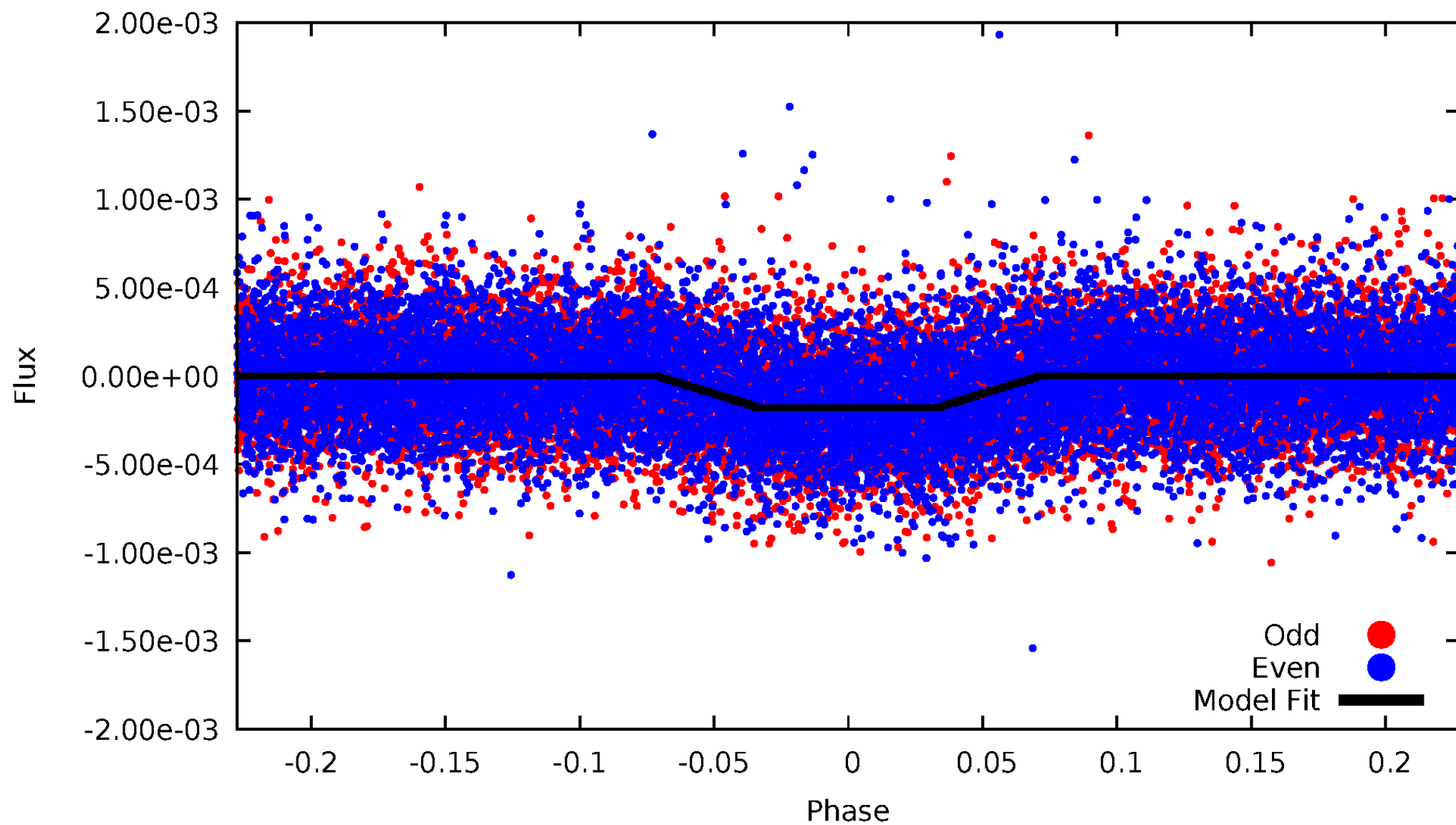
DV Odd/Even

TCE 009967771-01

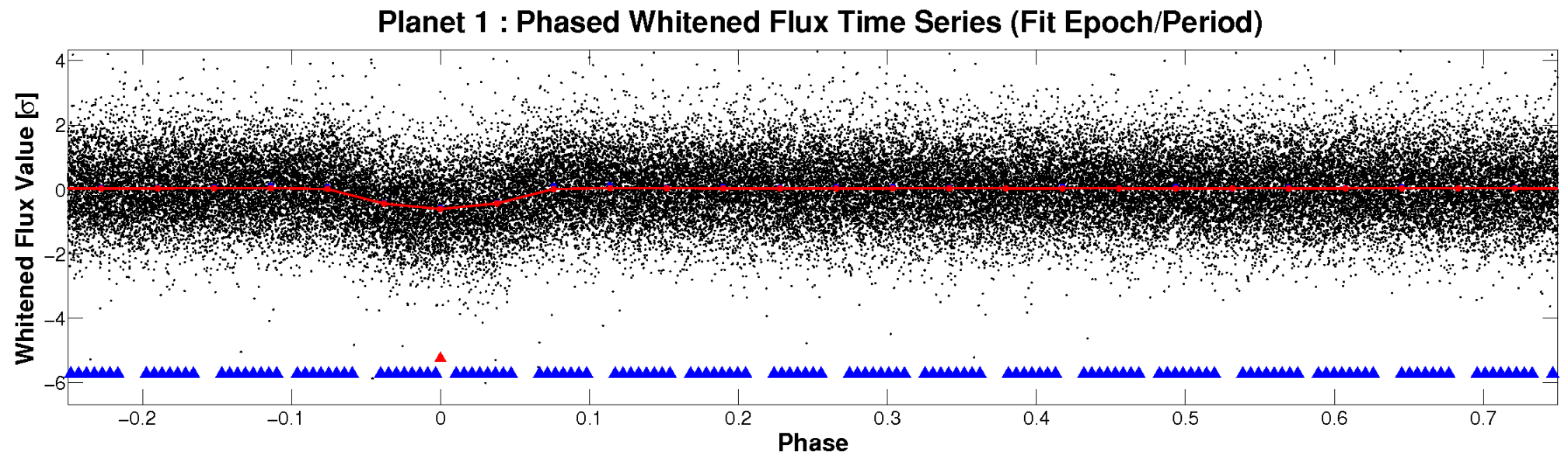
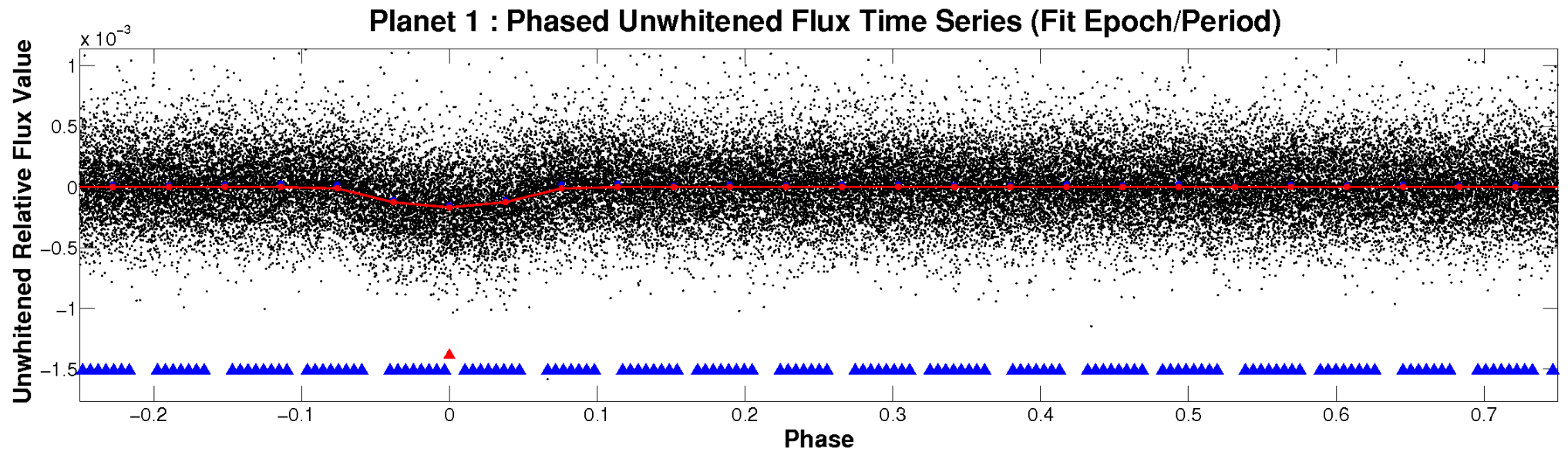


ALT Odd/Even

TCE 009967771-01

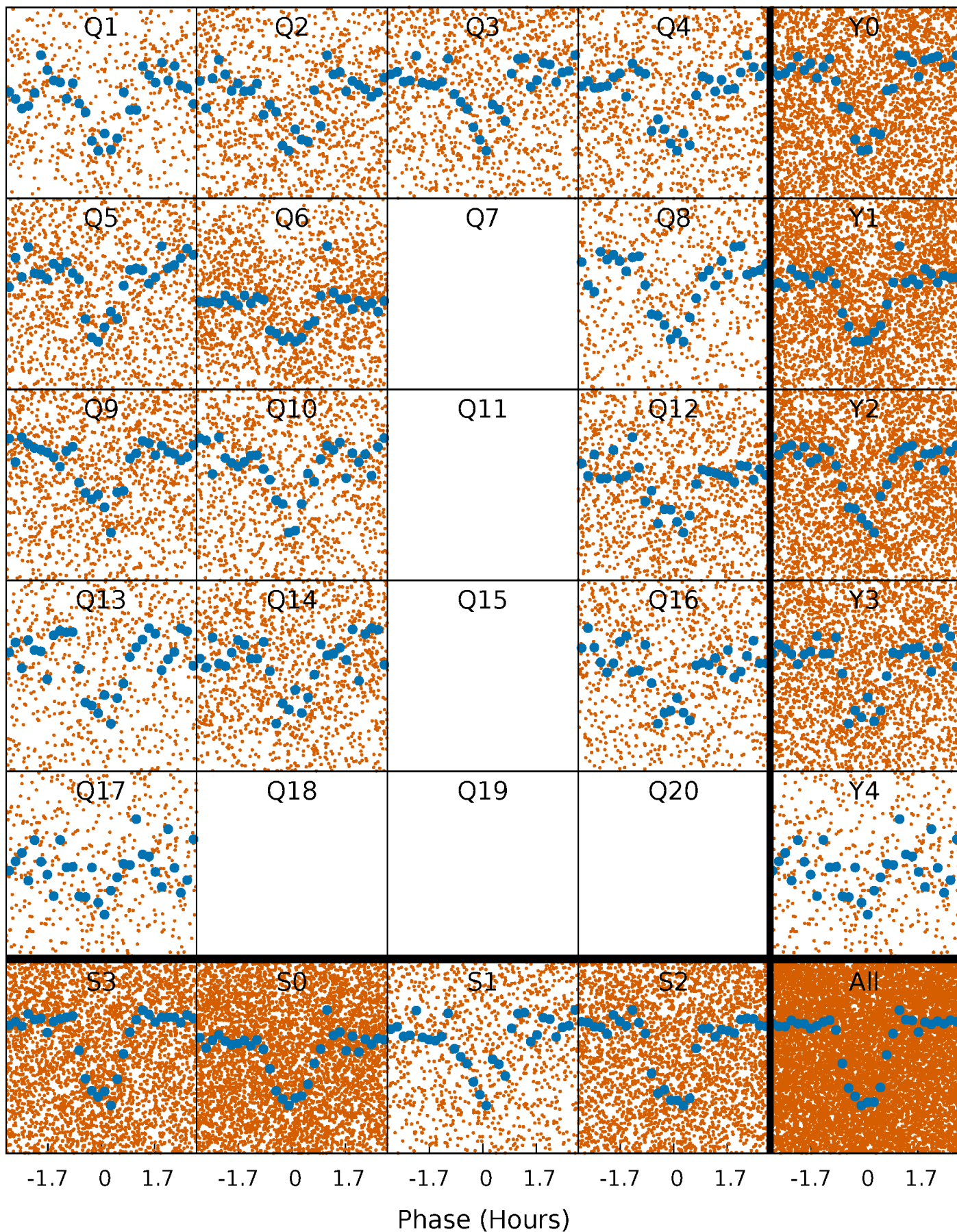


Non-Whitened Vs. Whitened Light Curve



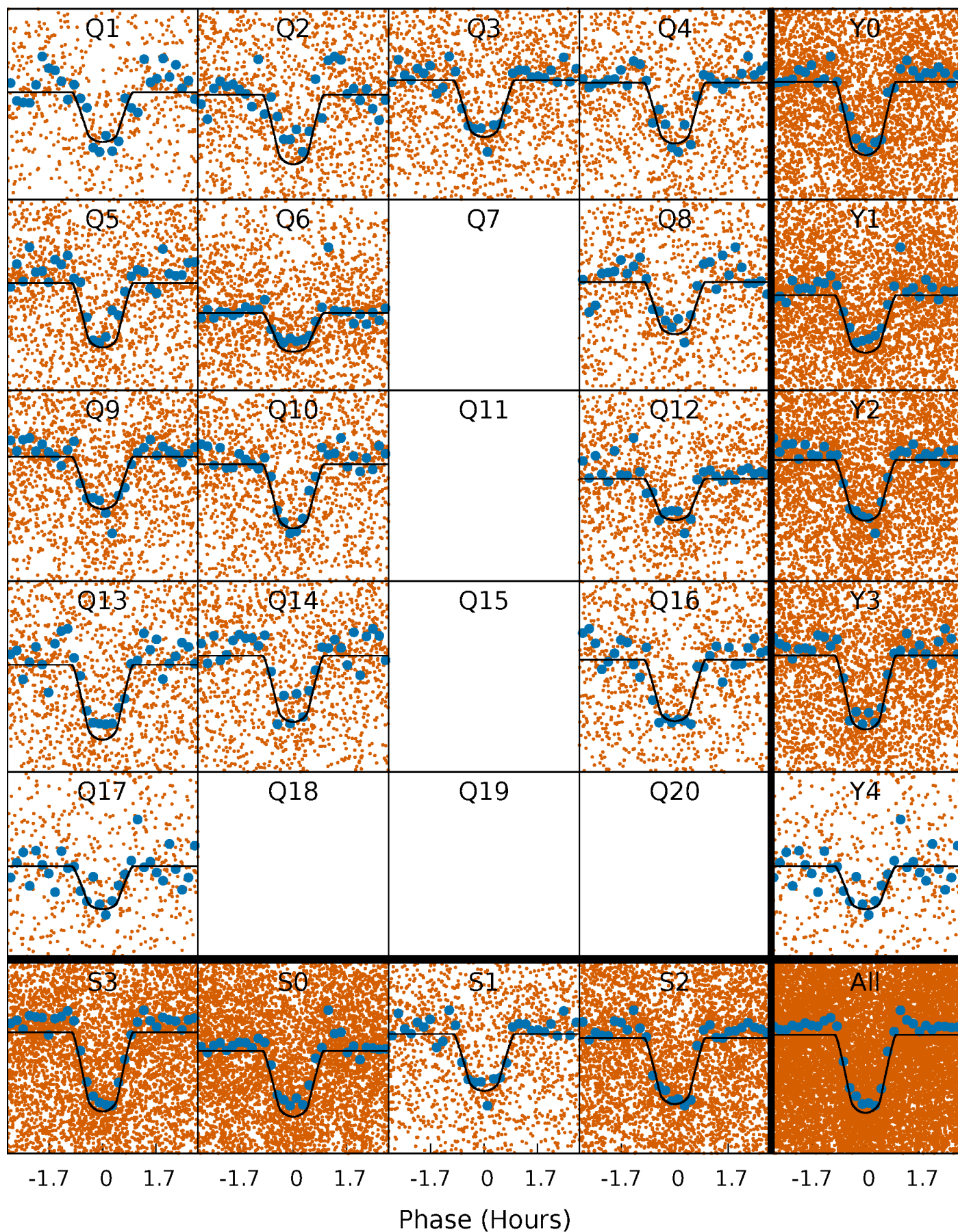
PDC Quarter-Phased Transit Curves

TCE 009967771-01 P= 0.538354 Days $T_0=131.649622$ (BKJD)



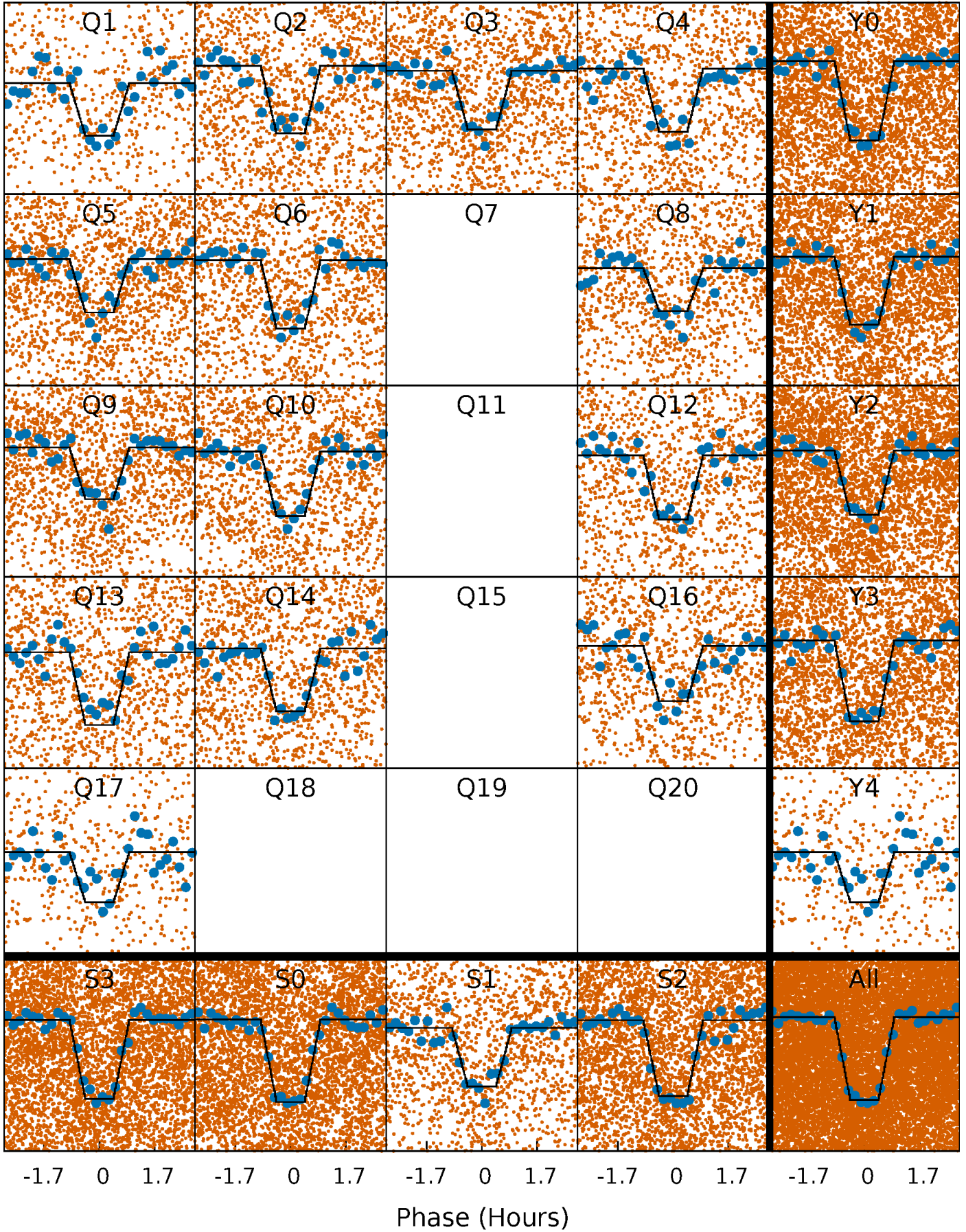
DV Quarter-Phased Transit Curves

TCE 009967771-01 P= 0.538354 Days $T_0=131.649622$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

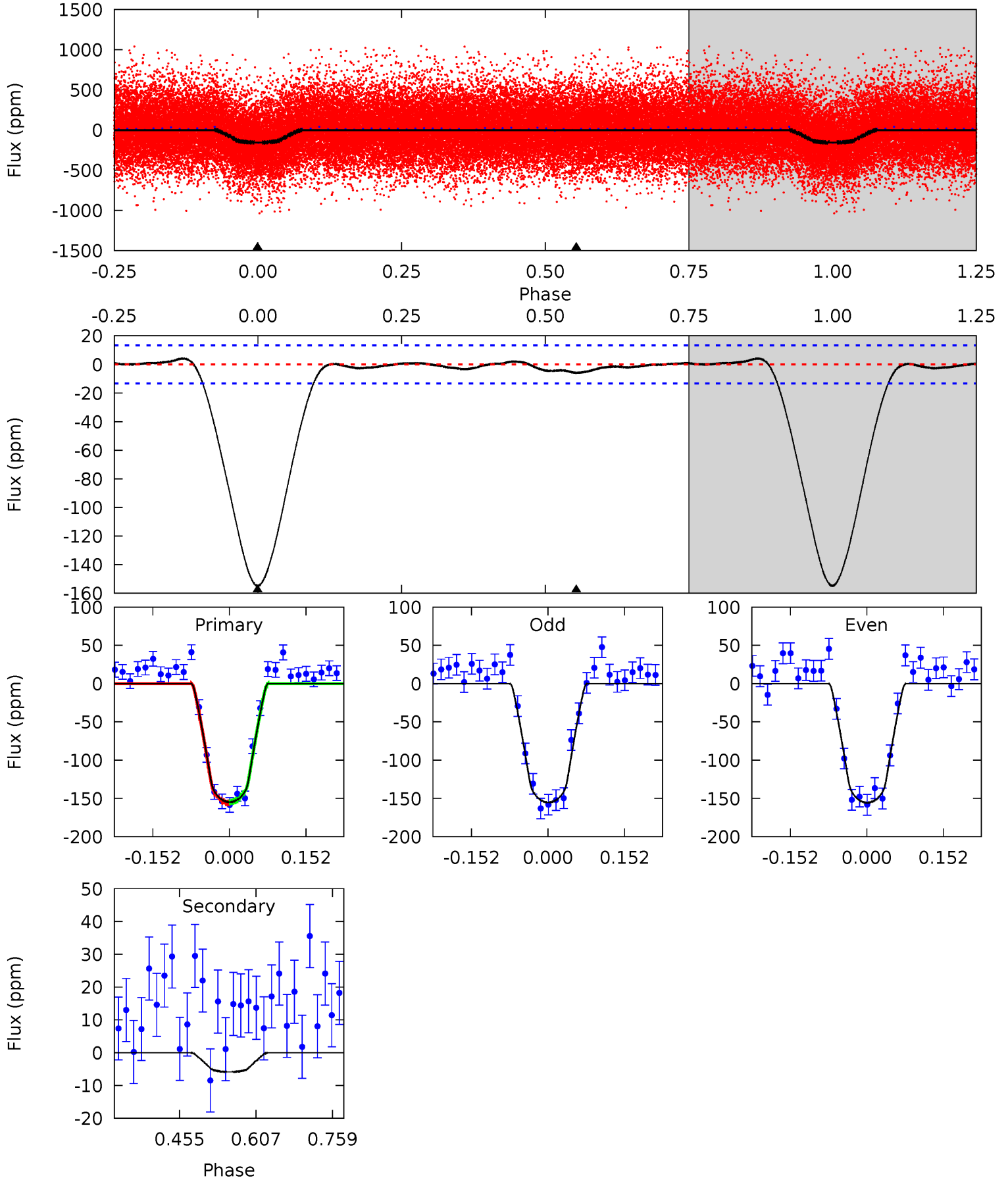
TCE 009967771-01 P= 0.538353 Days $T_0=131.650395$ (BKJD)



DV Model-Shift Uniqueness Test

009967771-01, P = 0.538354 Days, E = 131.111268 Days

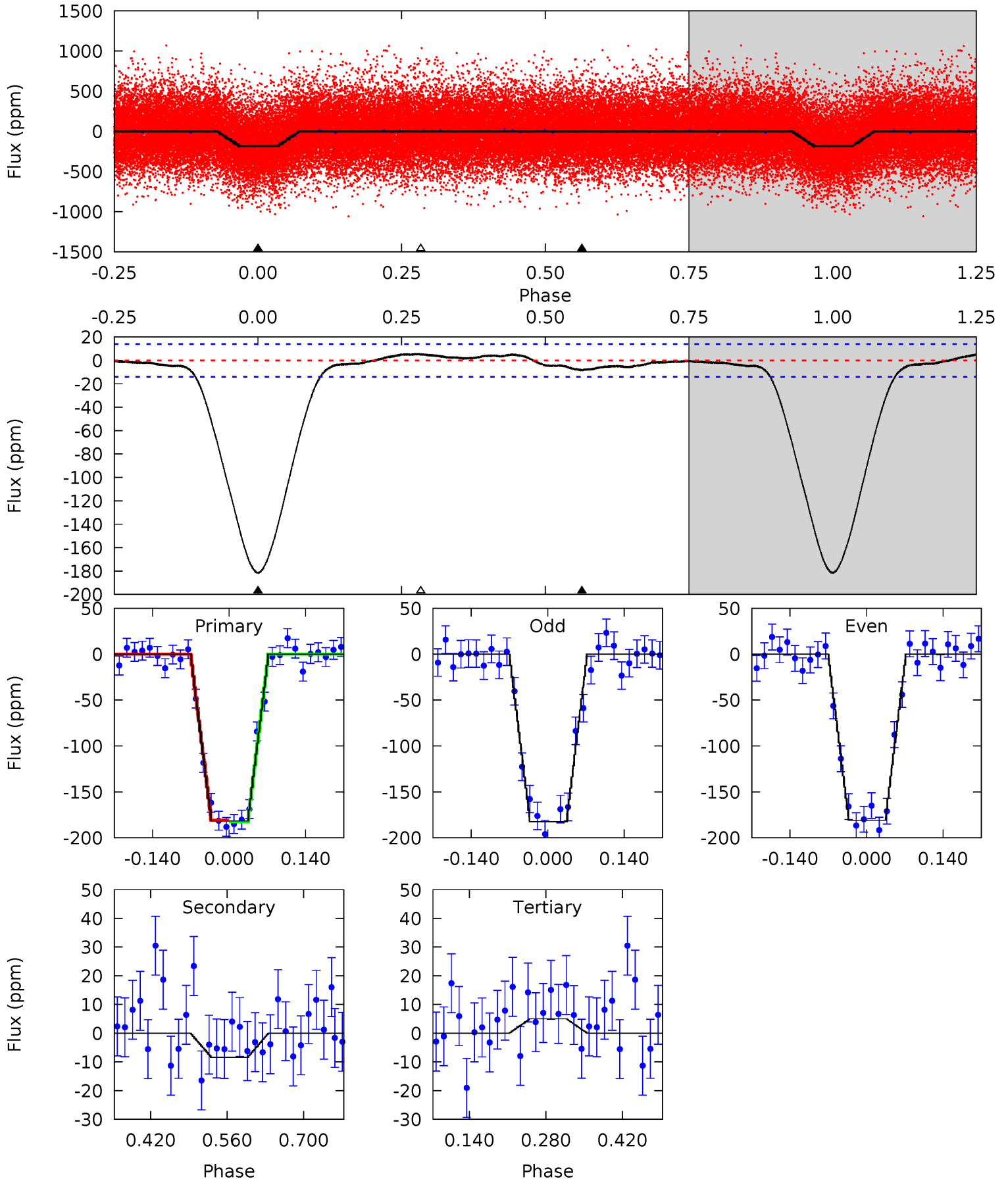
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.0	1.97	0	0	4.48	1.43	0.47	52.0	52.0	1.97	1.97	0.06	0.96	0.03	0.24



Alt Model-Shift Uniqueness Test

009967771-01, P = 0.538353 Days, E = 131.112042 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
58.2	2.69	-1.60	0	4.49	1.48	0.98	59.8	58.2	4.29	2.69	0.23	0.96	0.03	0.27



Stellar Parameters For KIC 009967771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5539^{+83}_{-74}	$4.244^{+0.174}_{-0.101}$	$0.140^{+0.150}_{-0.150}$	$1.207^{+0.175}_{-0.233}$	$0.932^{+0.067}_{-0.039}$	$0.746^{+0.628}_{-0.250}$
	+1%/-1%	+4%/-2%	+107%/-107%	+14%/-19%	+7%/-4%	+84%/-34%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009967771-01 / KOI 1875.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-6 ± 3	$1.84^{+0.53}_{-0.49}$	3326^{+140}_{-164}	-2962^{+5138}_{-245}	$0.144^{+0.169}_{-0.086}$
Alt.	-8 ± 3	$1.72^{+0.53}_{-0.52}$	3321^{+143}_{-178}	-2576^{+5700}_{-470}	$0.247^{+0.287}_{-0.125}$

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 $A_{obs} \gg 1.0$

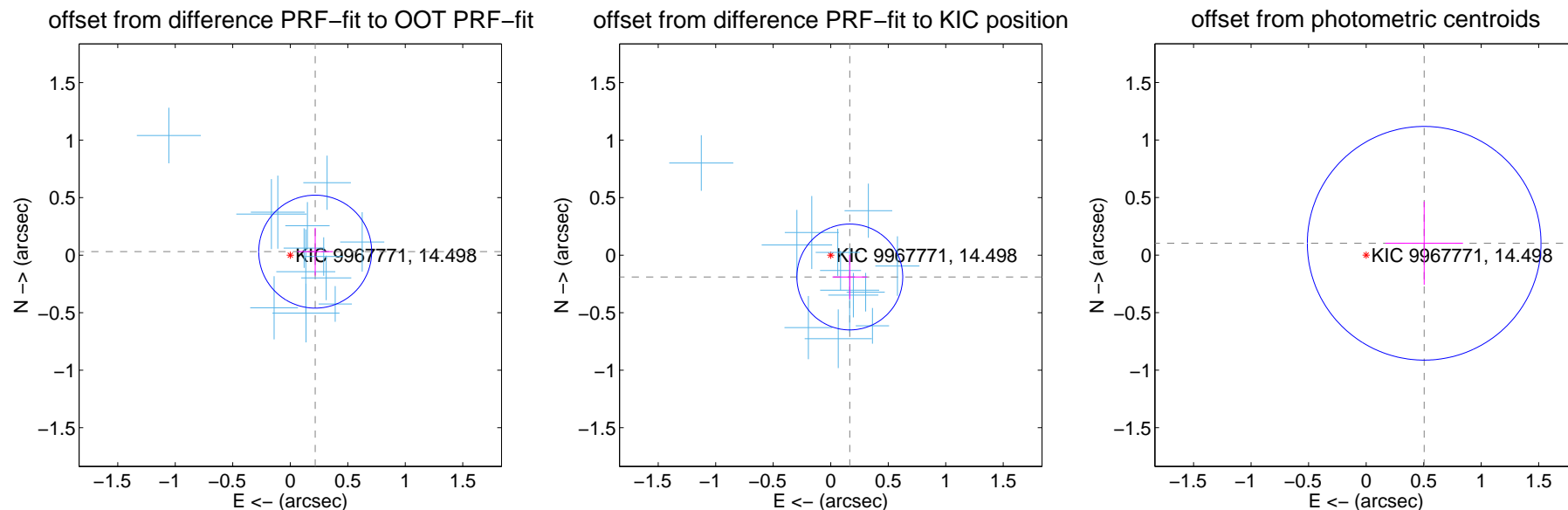
DV Centroid Data

Supplemental centroid analysis for 009967771-01. Kepler magnitude: 14.50. Transit SNR 38.69

There are 14 quarters with good PRF difference image offsets

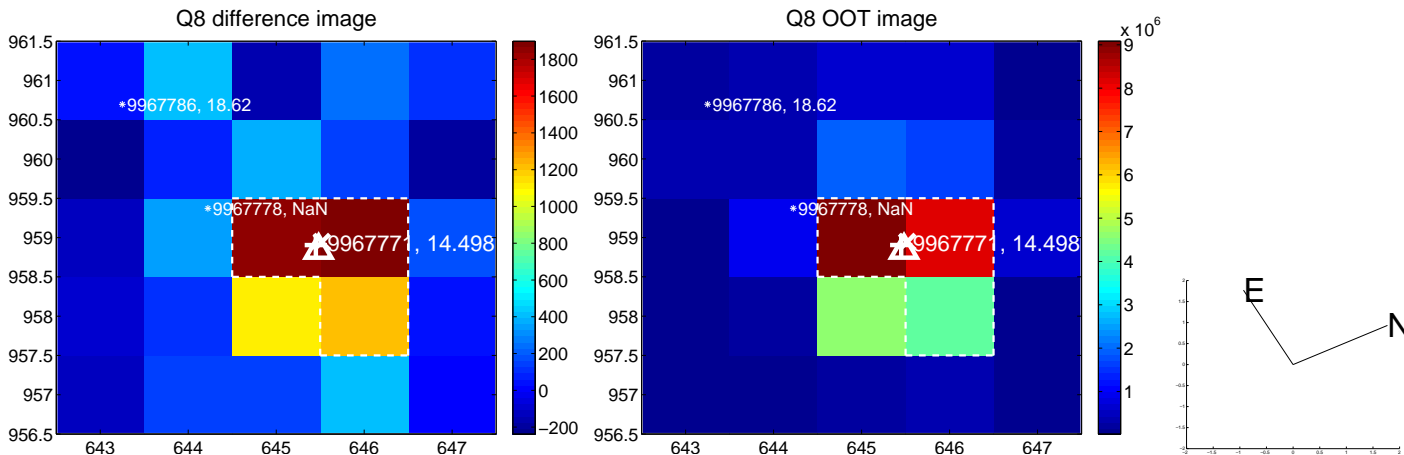
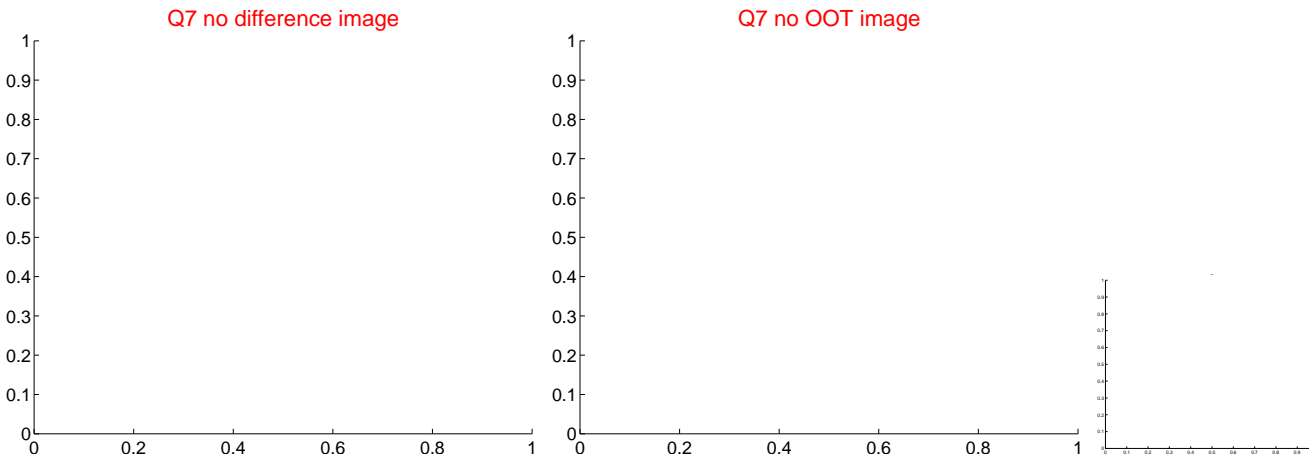
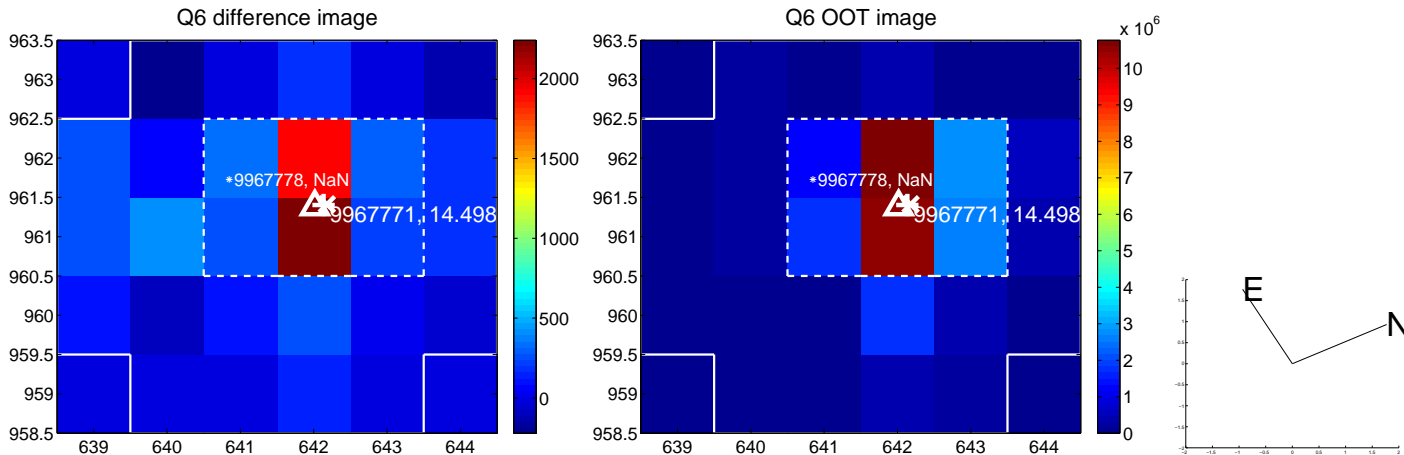
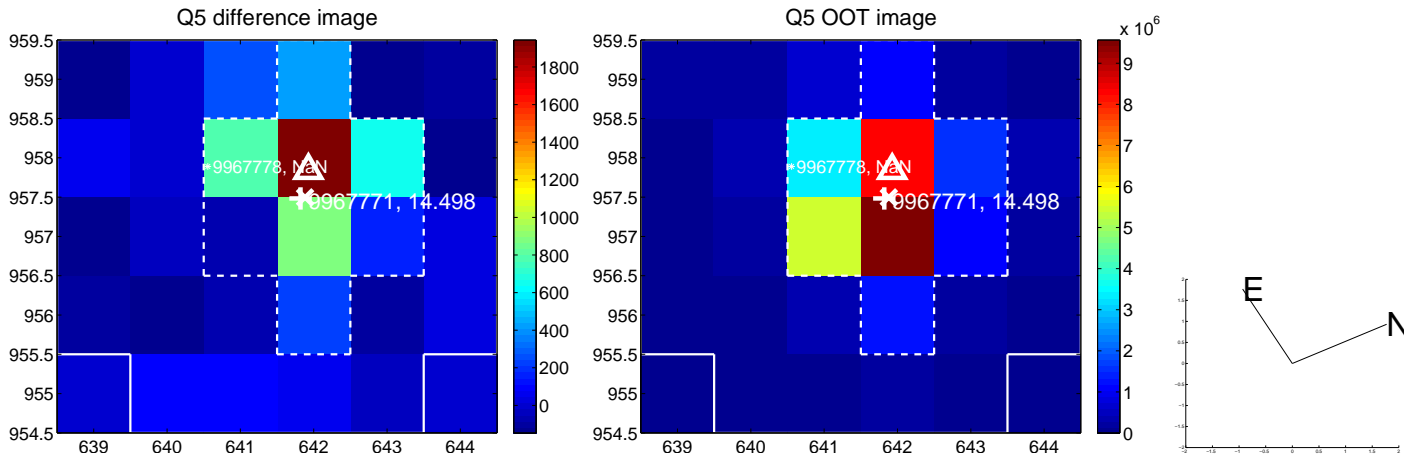
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.219 ± 0.164	1.34	-0.217 ± 0.154	0.030 ± 0.207
PRF-fit source offset from KIC position	0.252 ± 0.153	1.64	-0.166 ± 0.151	-0.190 ± 0.193
photometric centroid source offset	0.52 ± 0.34	1.52	-0.50 ± 0.34	0.10 ± 0.36

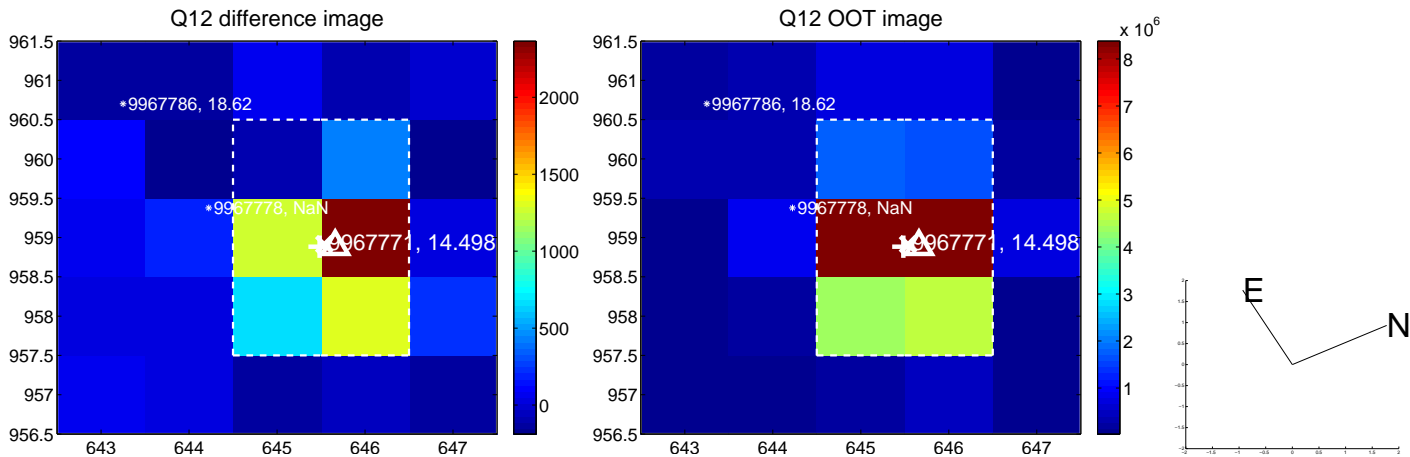
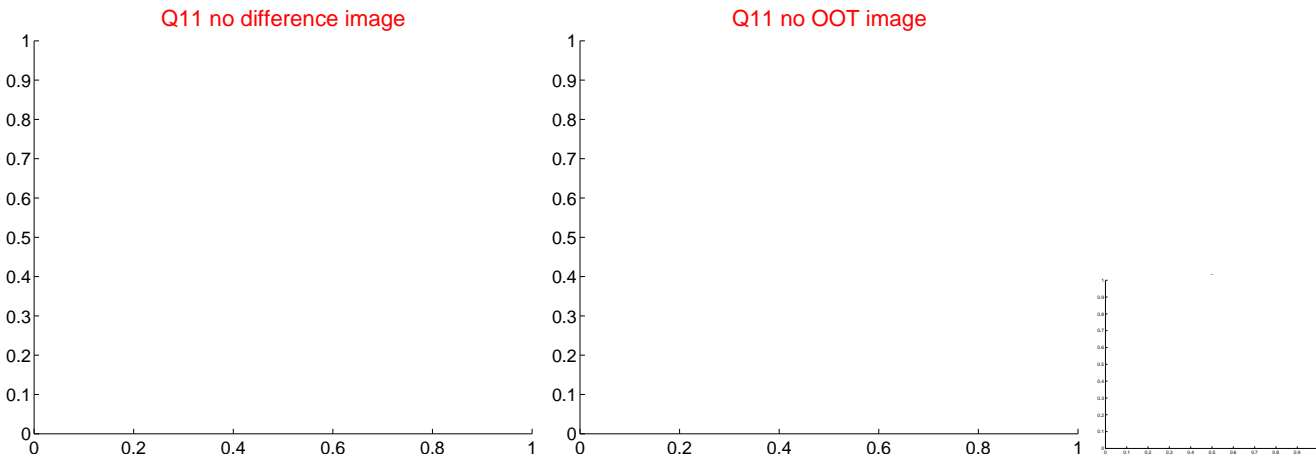
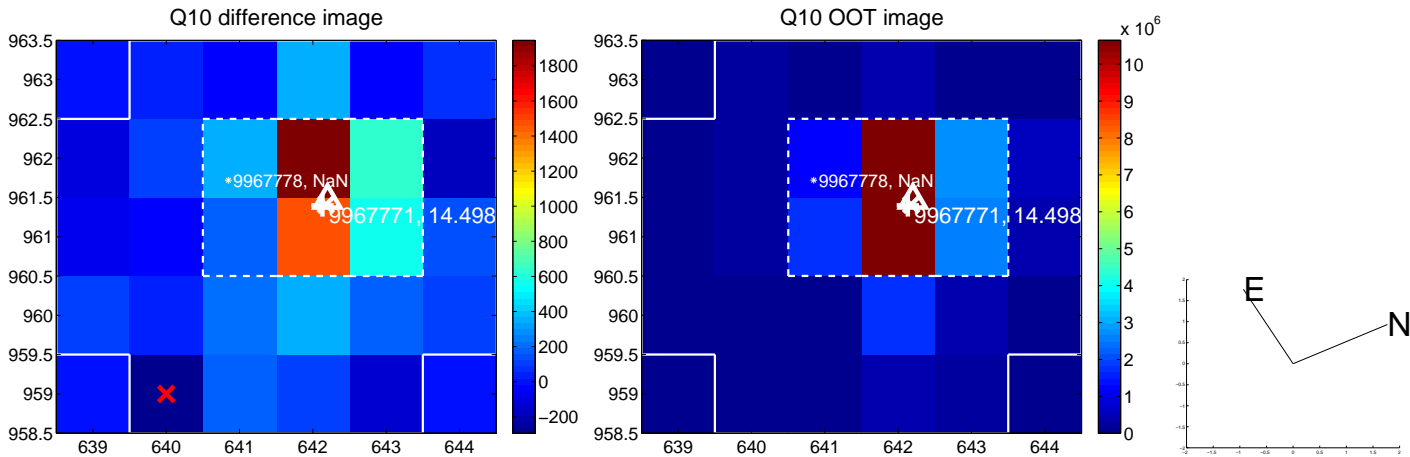
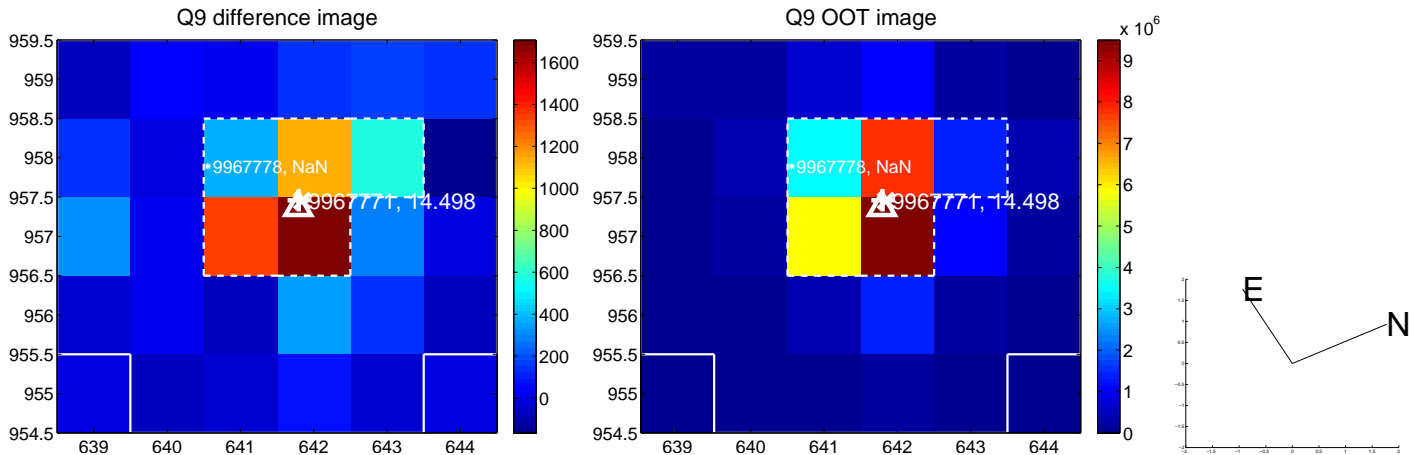


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

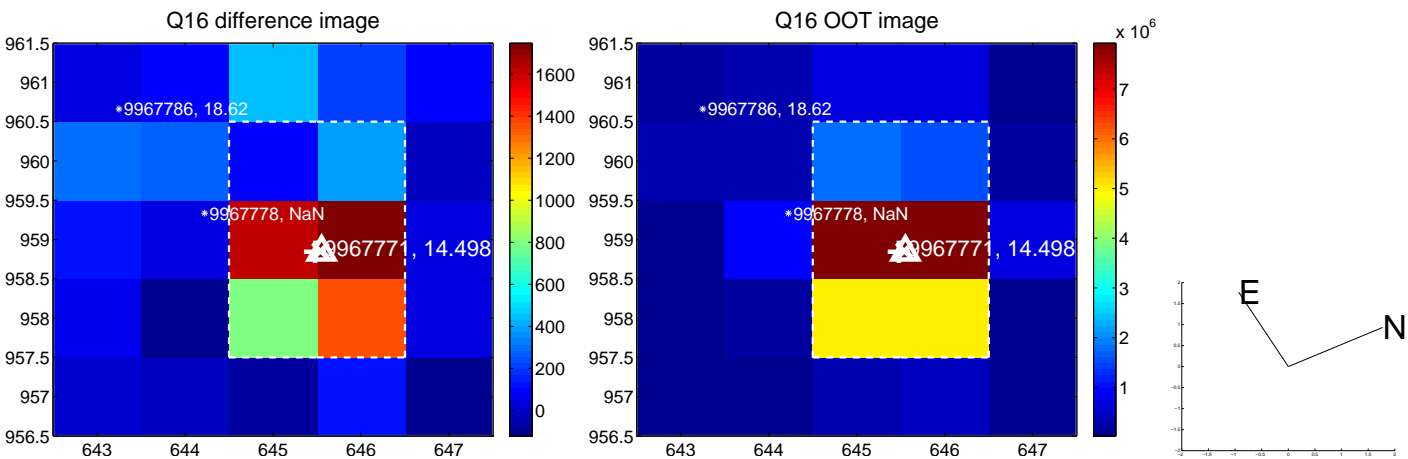
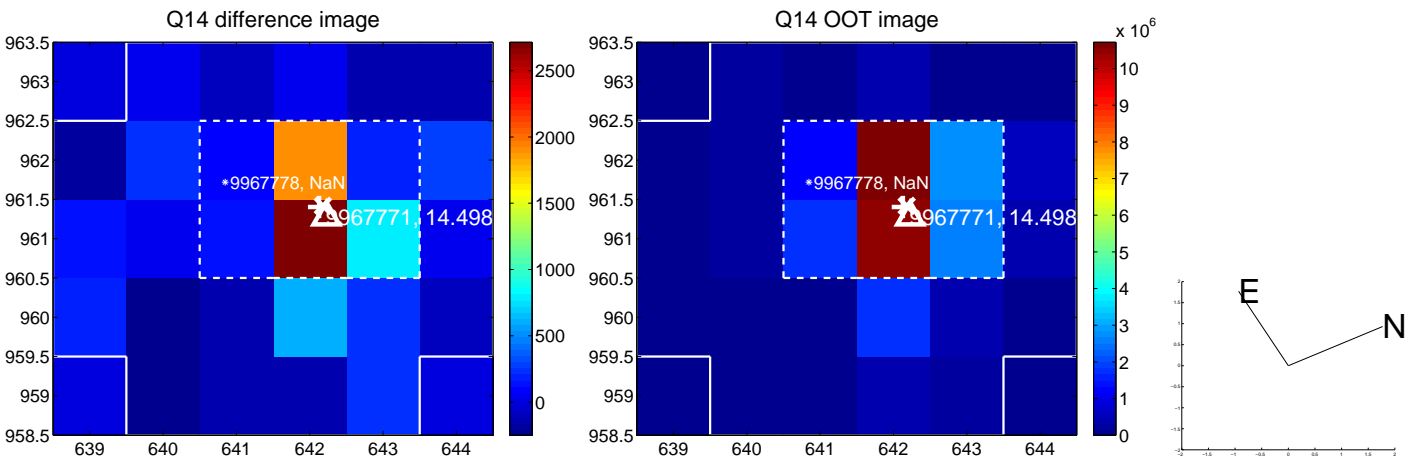
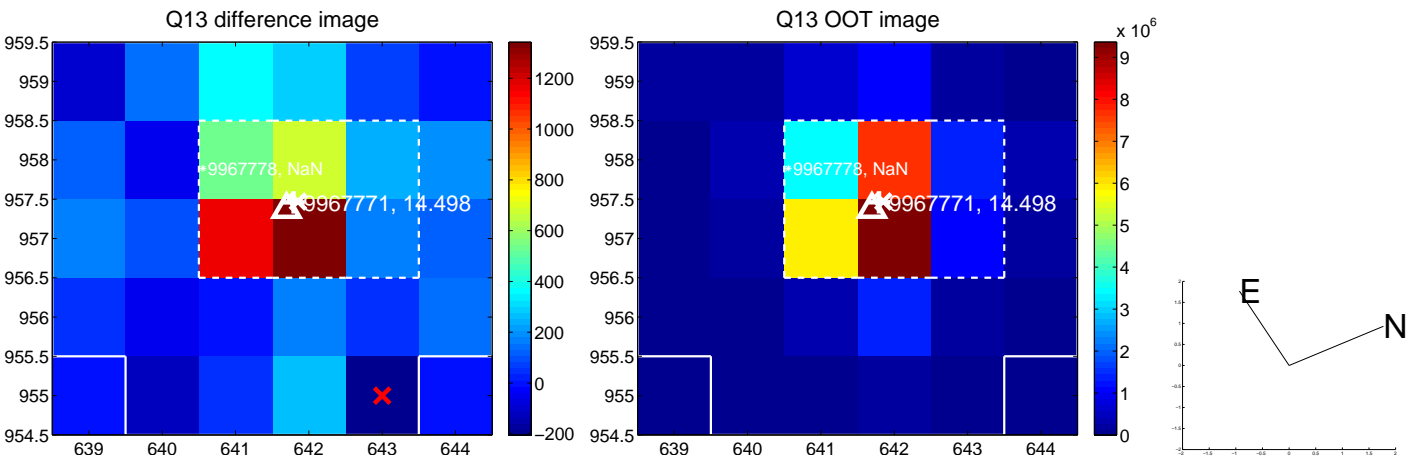
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

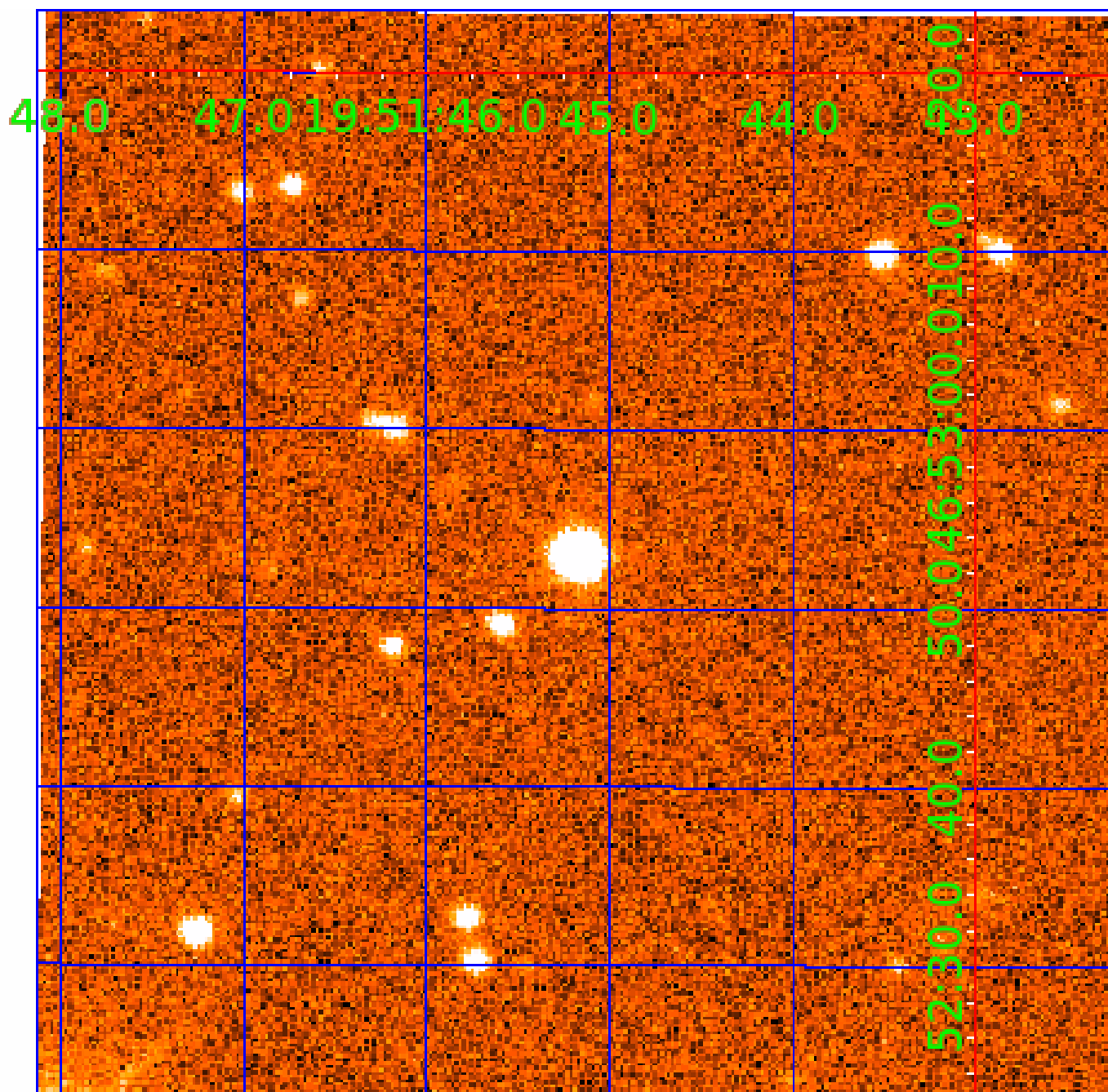


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009967771

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})
009967771-01	OBS	1875.02	0.538354	131.649622	170.4	1.519	32.1	38.7	1.21	5539	1.90	7673.62
009967771-02	OBS	1875.01	9.917202	135.139572	440.4	3.339	22.8	27.4	1.21	5539	3.01	157.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009967771-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009967771-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT

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

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

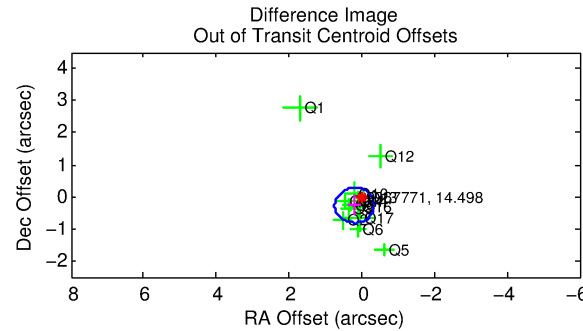
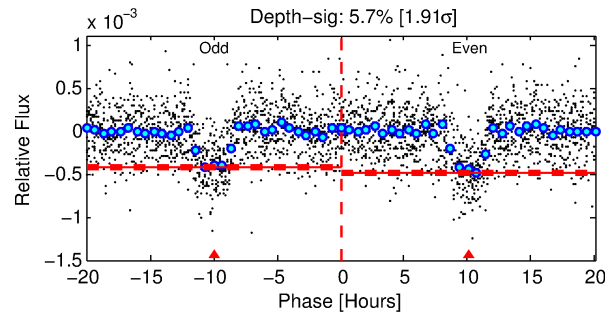
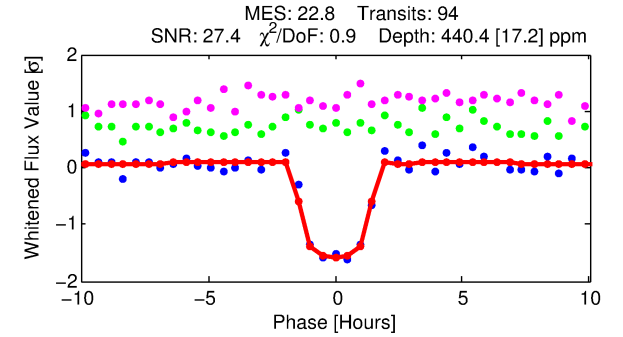
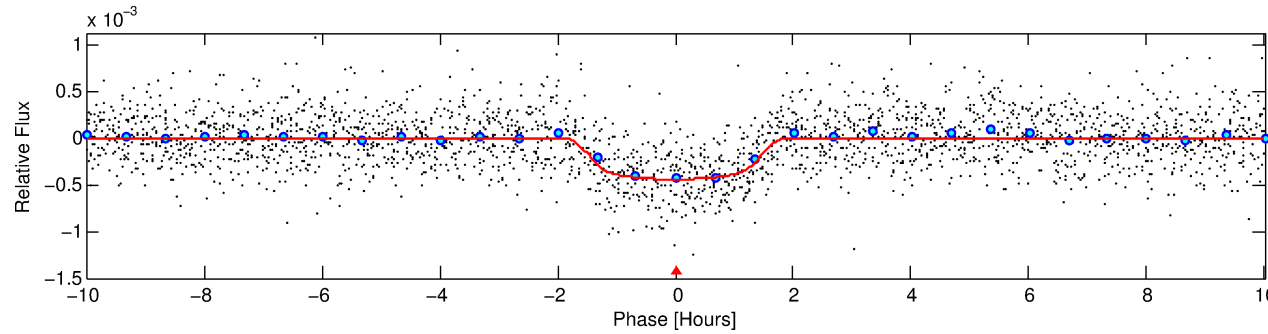
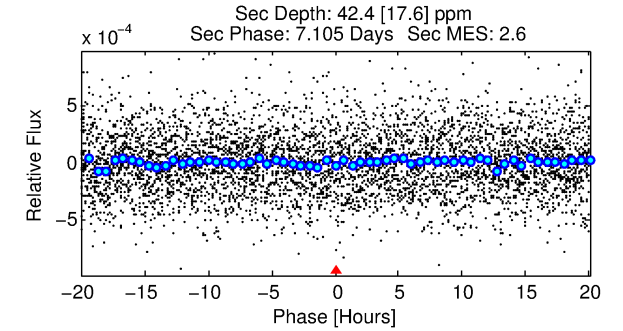
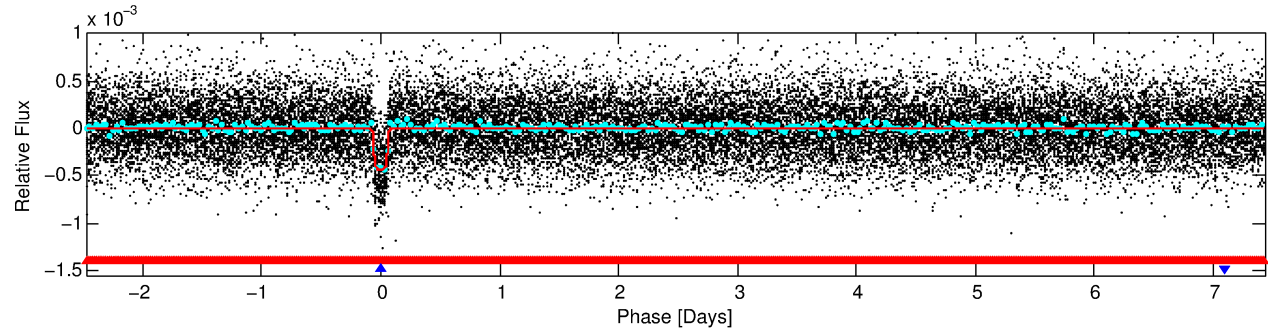
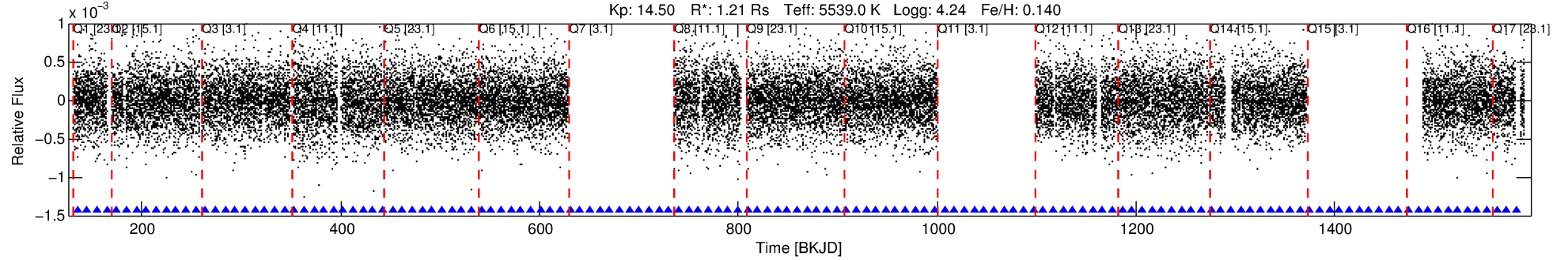
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009967771-02

No Significant Match Found

DV One-Page Summary

KIC: 9967771 Candidate: 2 of 2 Period: 9.917 d
KOI: K01875.01 Corr: 0.981



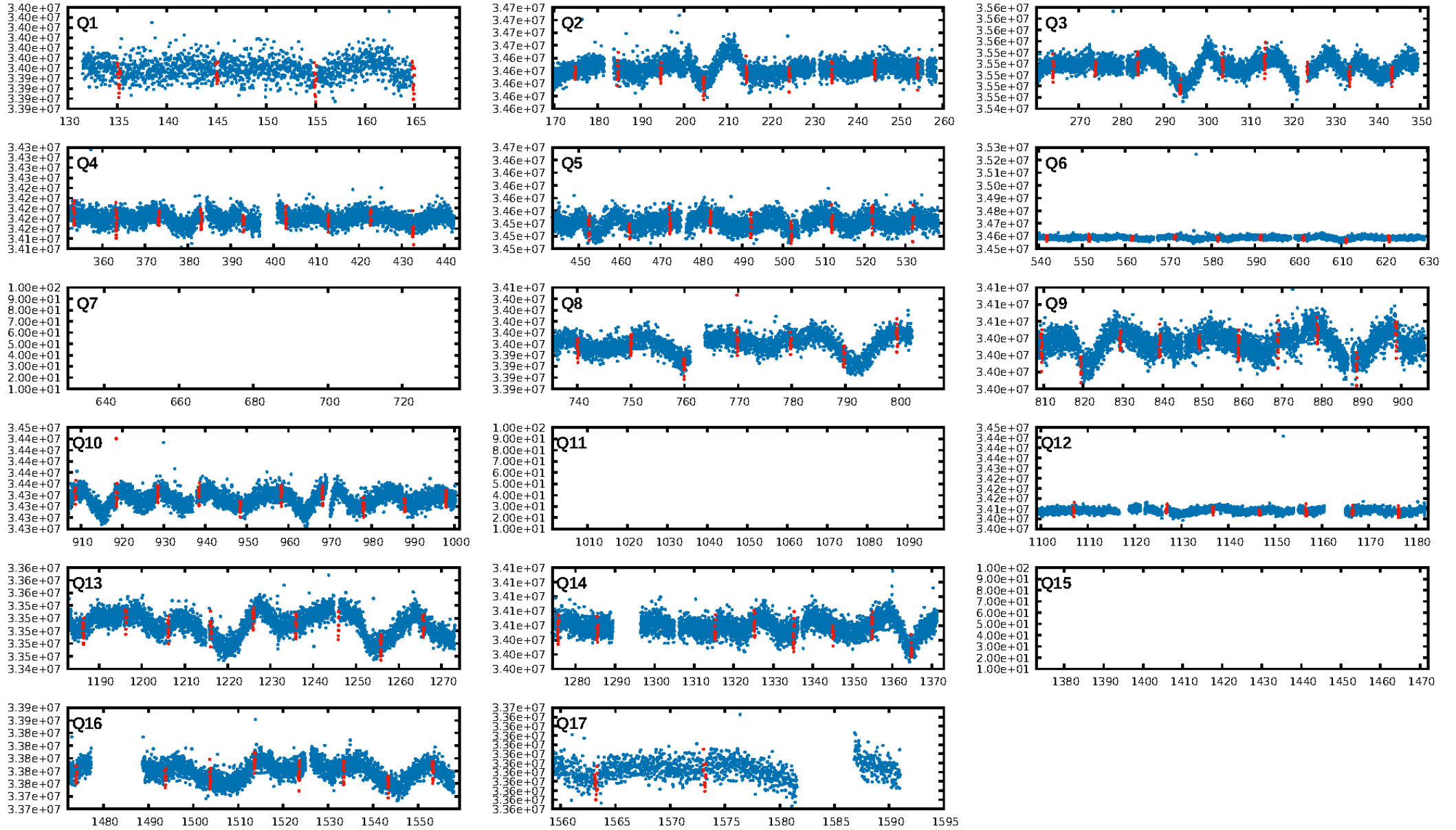
DV Fit Results:

Period = 9.91720 [0.00003] d
Epoch = 135.1396 [0.0025] BKJD
Rp/R* = 0.0229 [0.0035]
a/R* = 11.45 [7.43]
b = 0.89 [0.16]
Seff = 157.73 [47.71]
Teff = 904 [68] K
Rp = 3.01 [0.74] Re
a = 0.0883 [0.0164] AU
Ag = 20.05 [11.91] [1.60 σ]
Teffp = 2956 [383] K [5.28 σ]

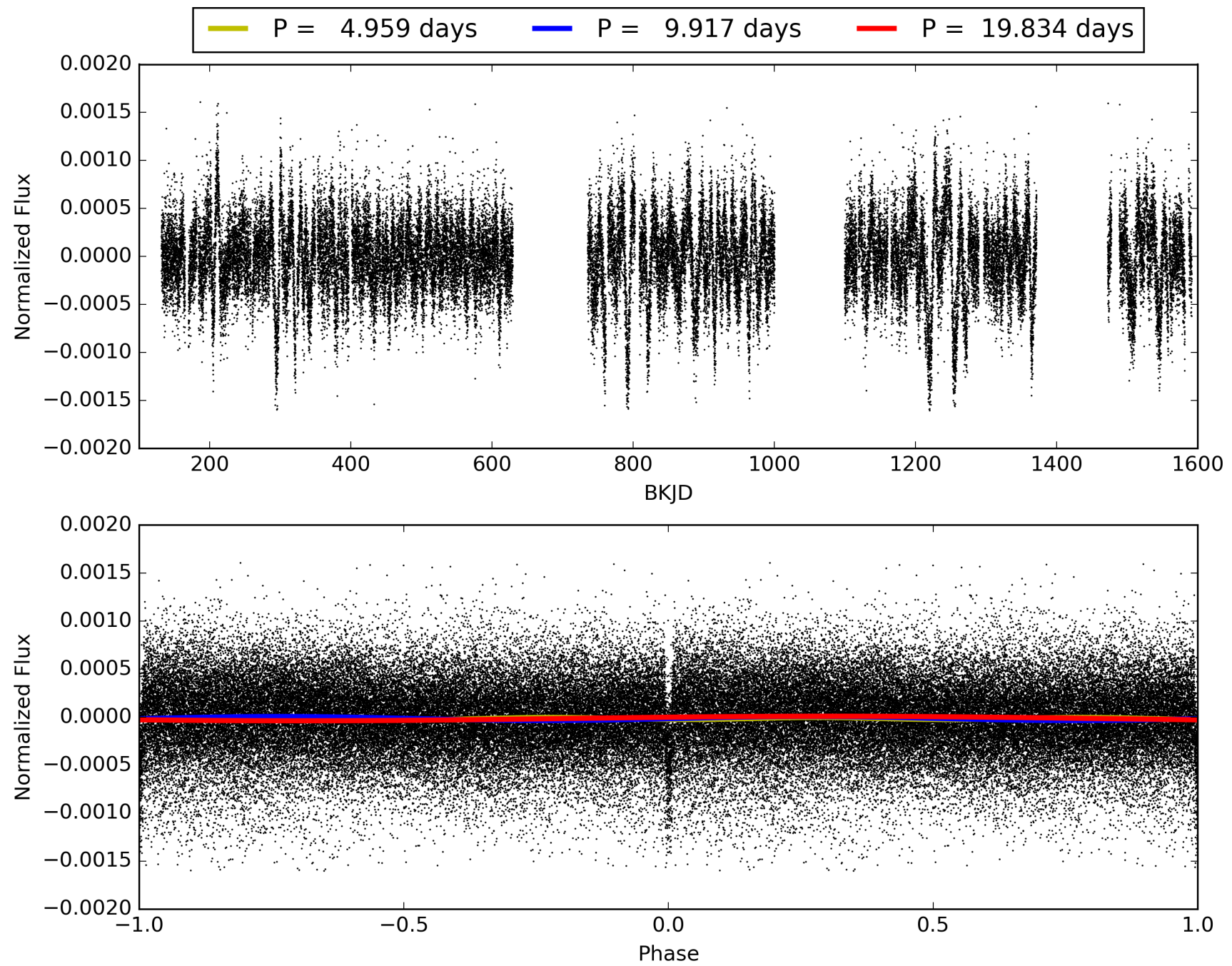
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [61.36 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 85.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.02e-105
RollingBand-fgt: 1.00 [88/88]
GhostDiagnostic-chr: 3.134
Centroid-sig: 50.4%
Centroid-so: 0.534 arcsec [1.39 σ]
OotOffset-rm: 0.337 arcsec [1.86 σ]
KicOffset-rm: 0.540 arcsec [2.50 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 0.00 [0/14]

TCE 009967771-02, PDC Light Curves

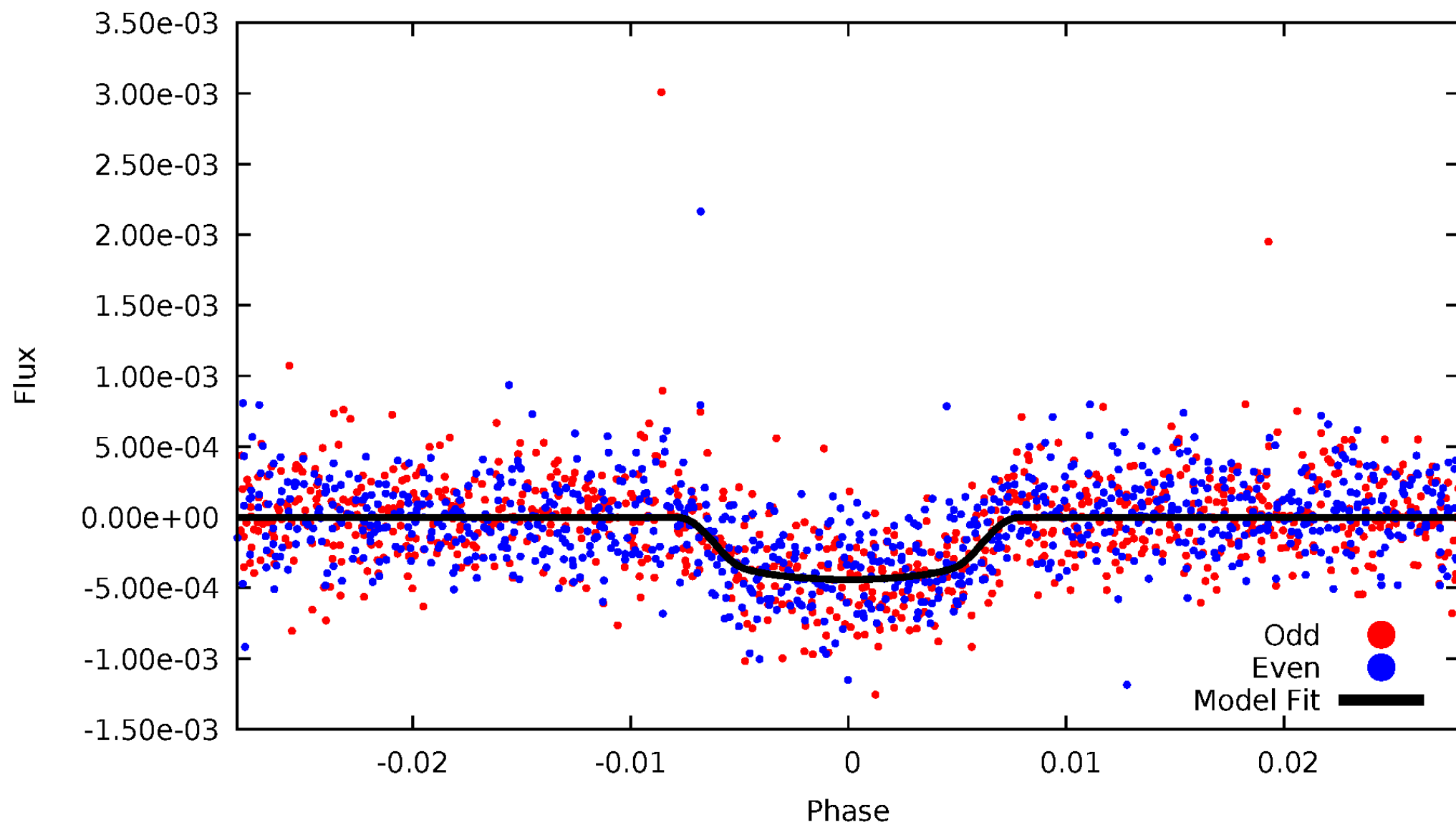


TCE 009967771-02



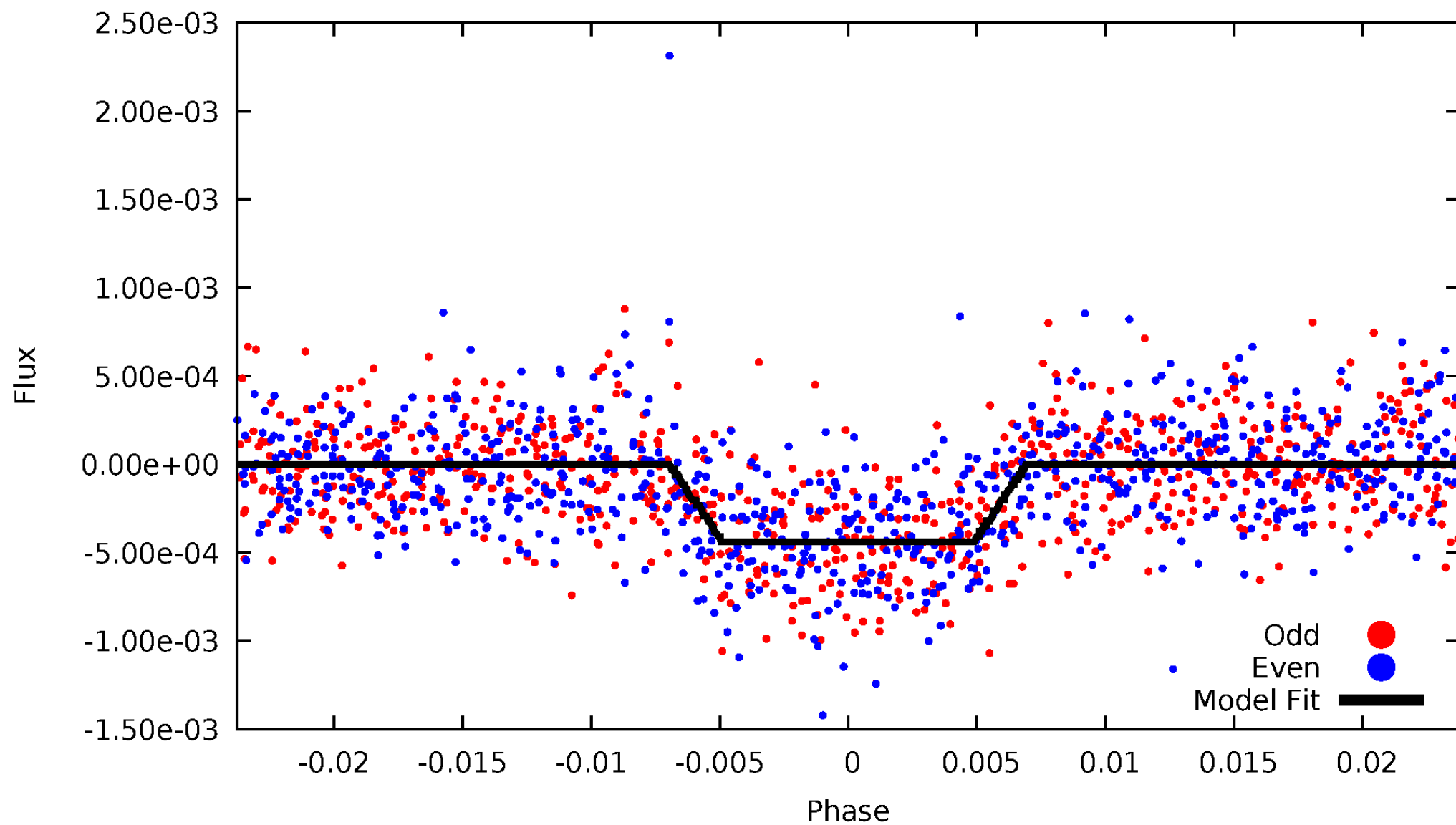
DV Odd/Even

TCE 009967771-02



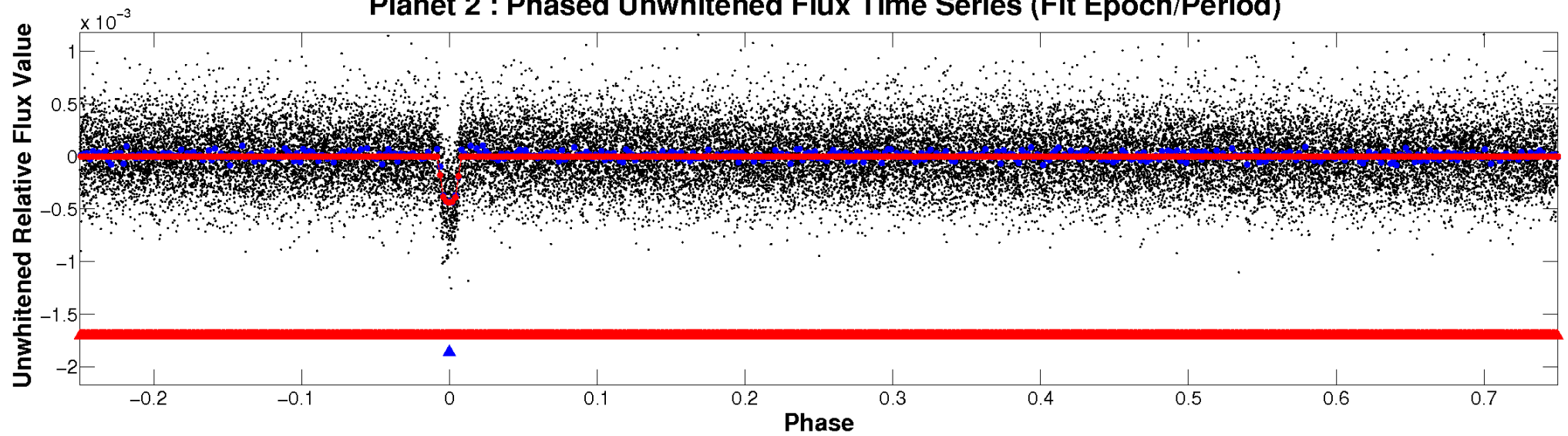
ALT Odd/Even

TCE 009967771-02

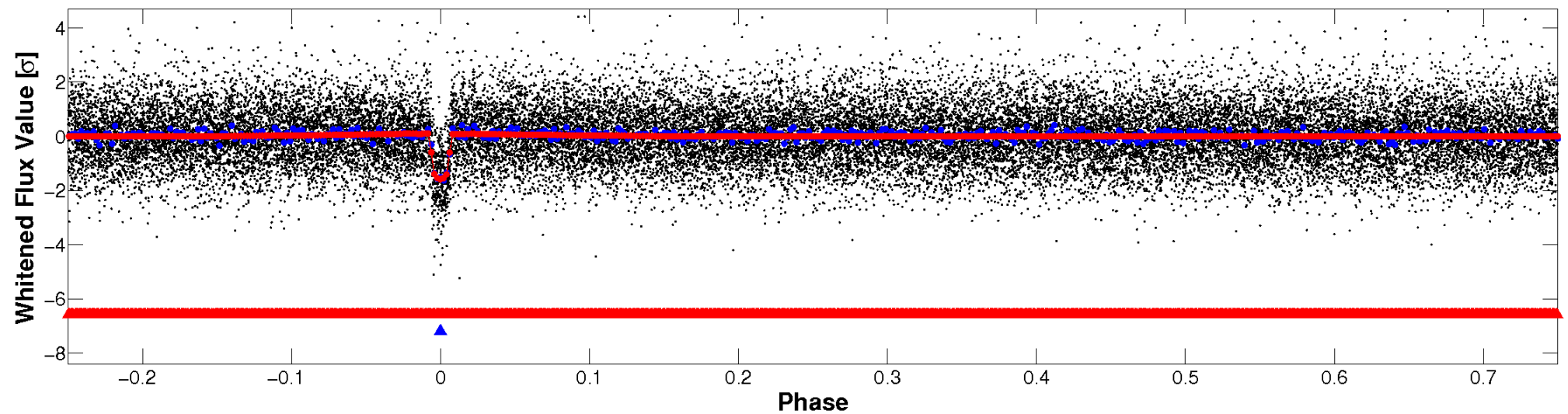


Non-Whitened Vs. Whitened Light Curve

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

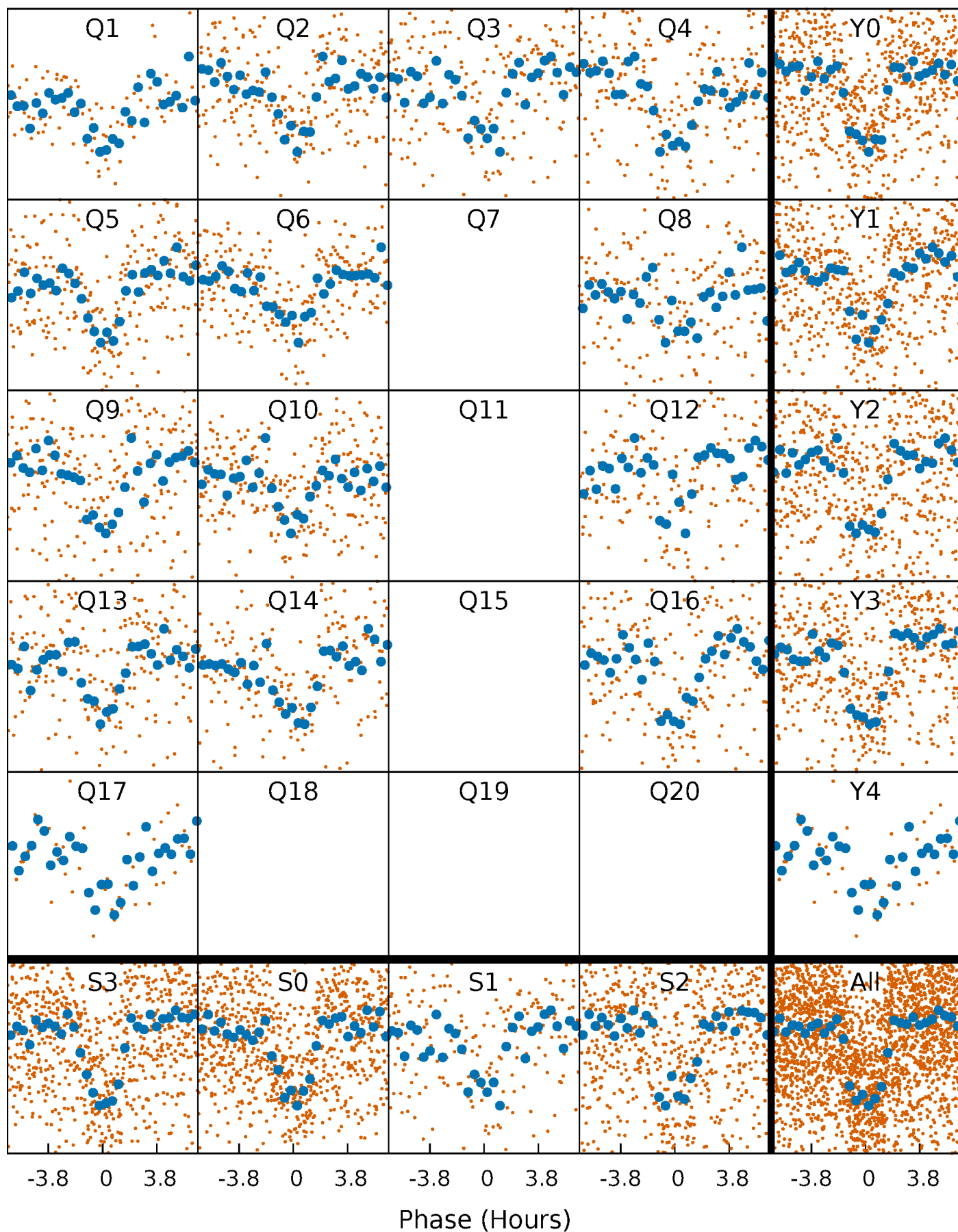


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



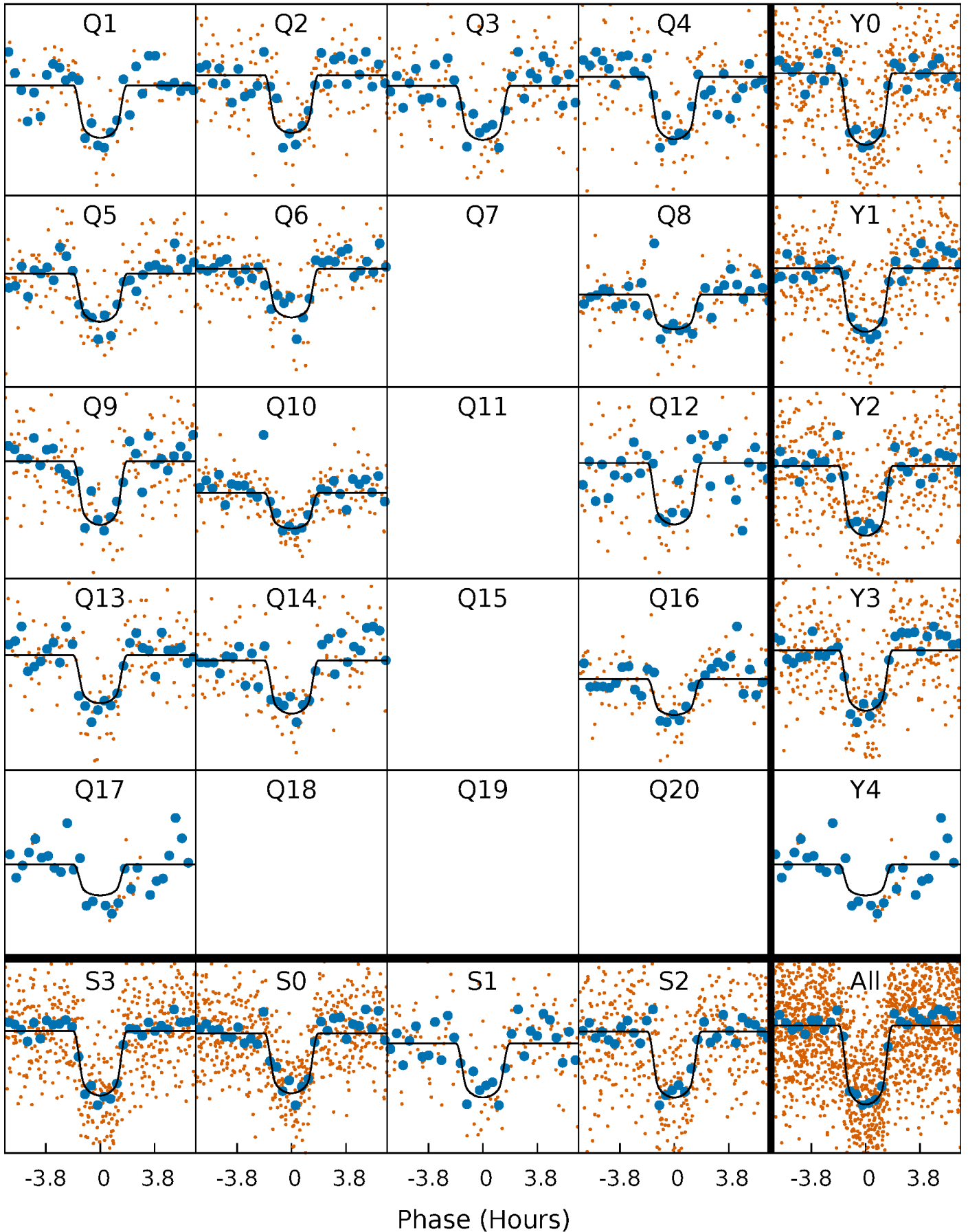
PDC Quarter-Phased Transit Curves

TCE 009967771-02 P= 9.917202 Days $T_0=135.139572$ (BKJD)



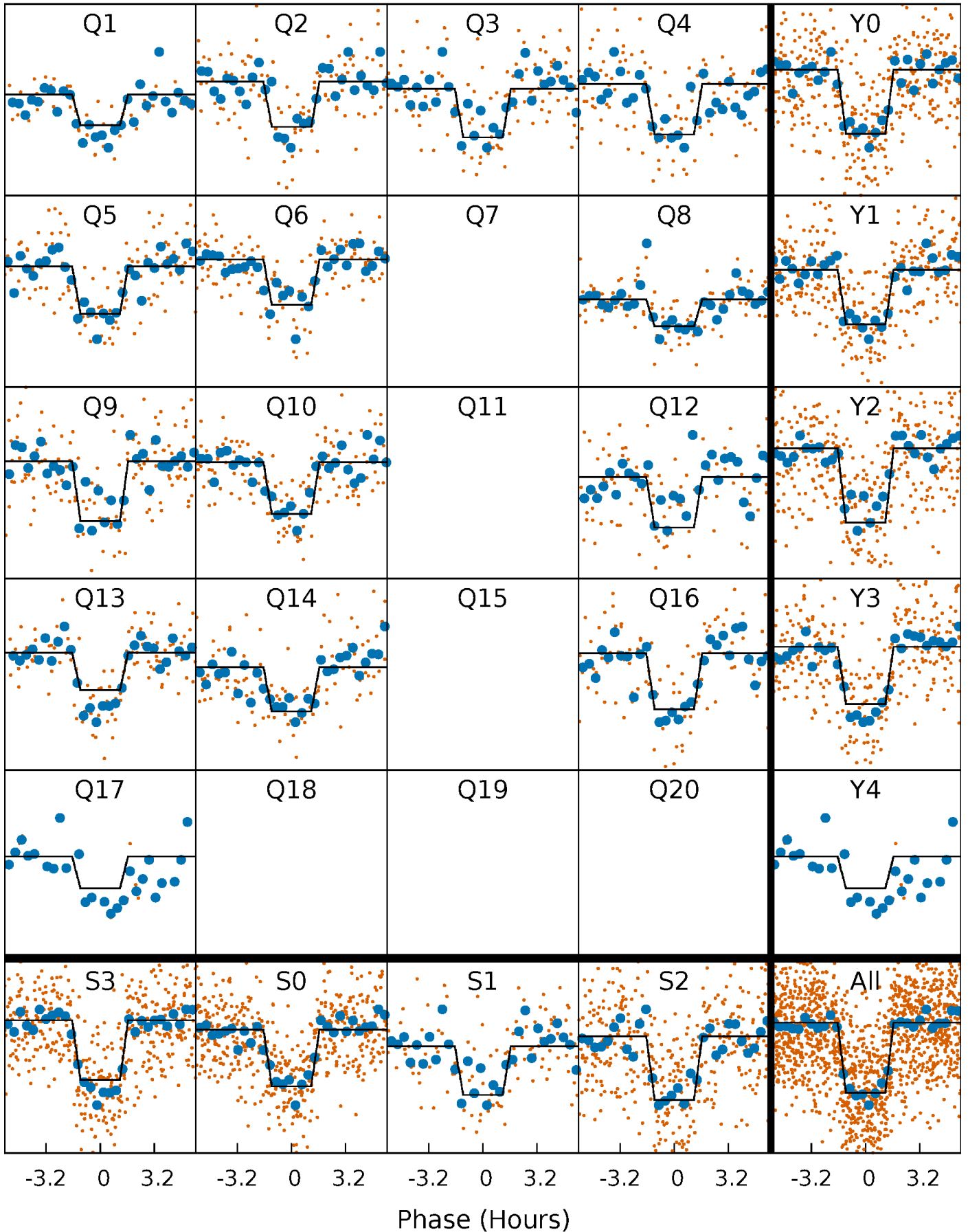
DV Quarter-Phased Transit Curves

TCE 009967771-02 $P = 9.917202$ Days $T_0 = 135.139572$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

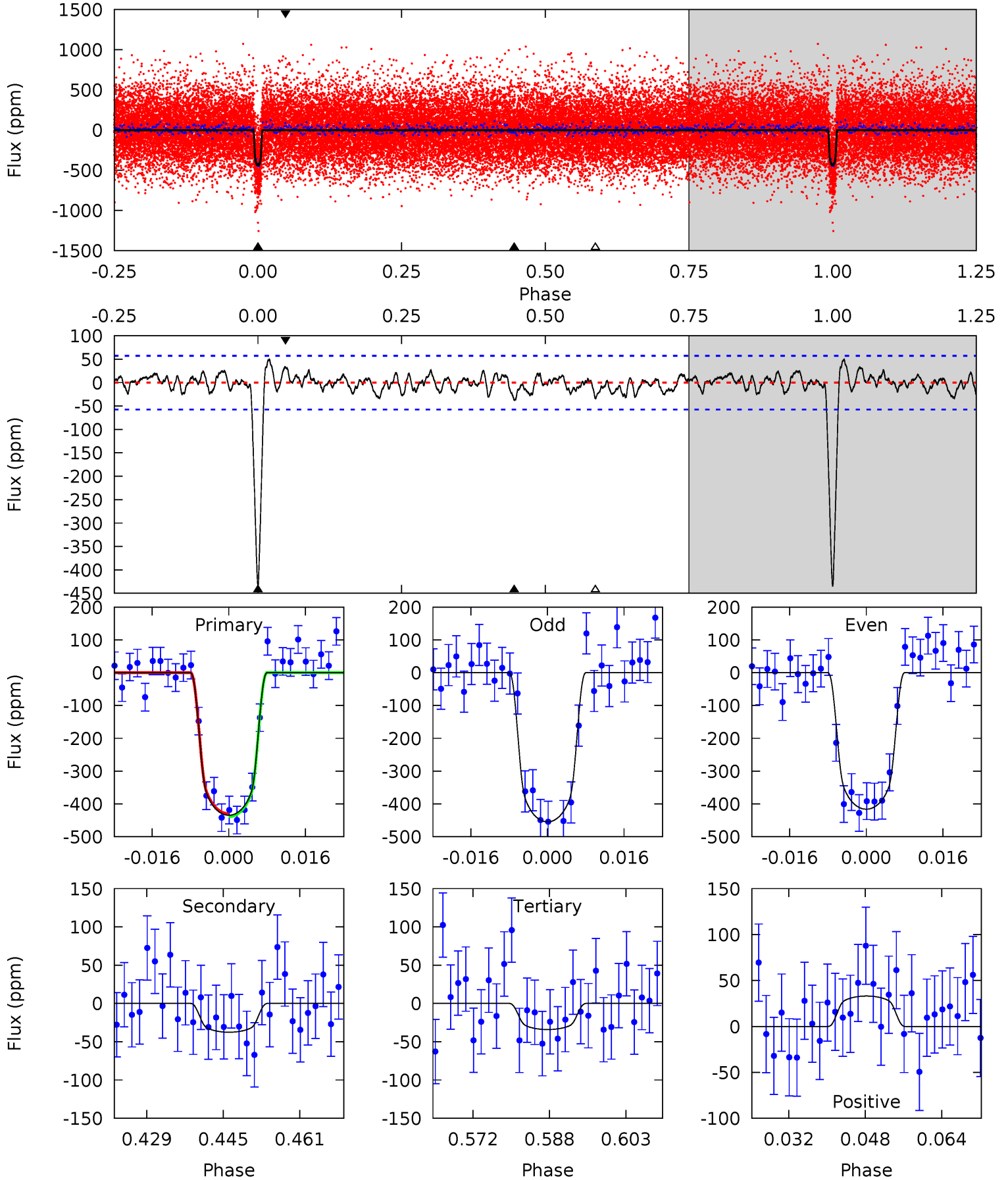
TCE 009967771-02 P= 9.917202 Days $T_0=135.141281$ (BKJD)



DV Model-Shift Uniqueness Test

009967771-02, P = 9.917202 Days, E = 125.222370 Days

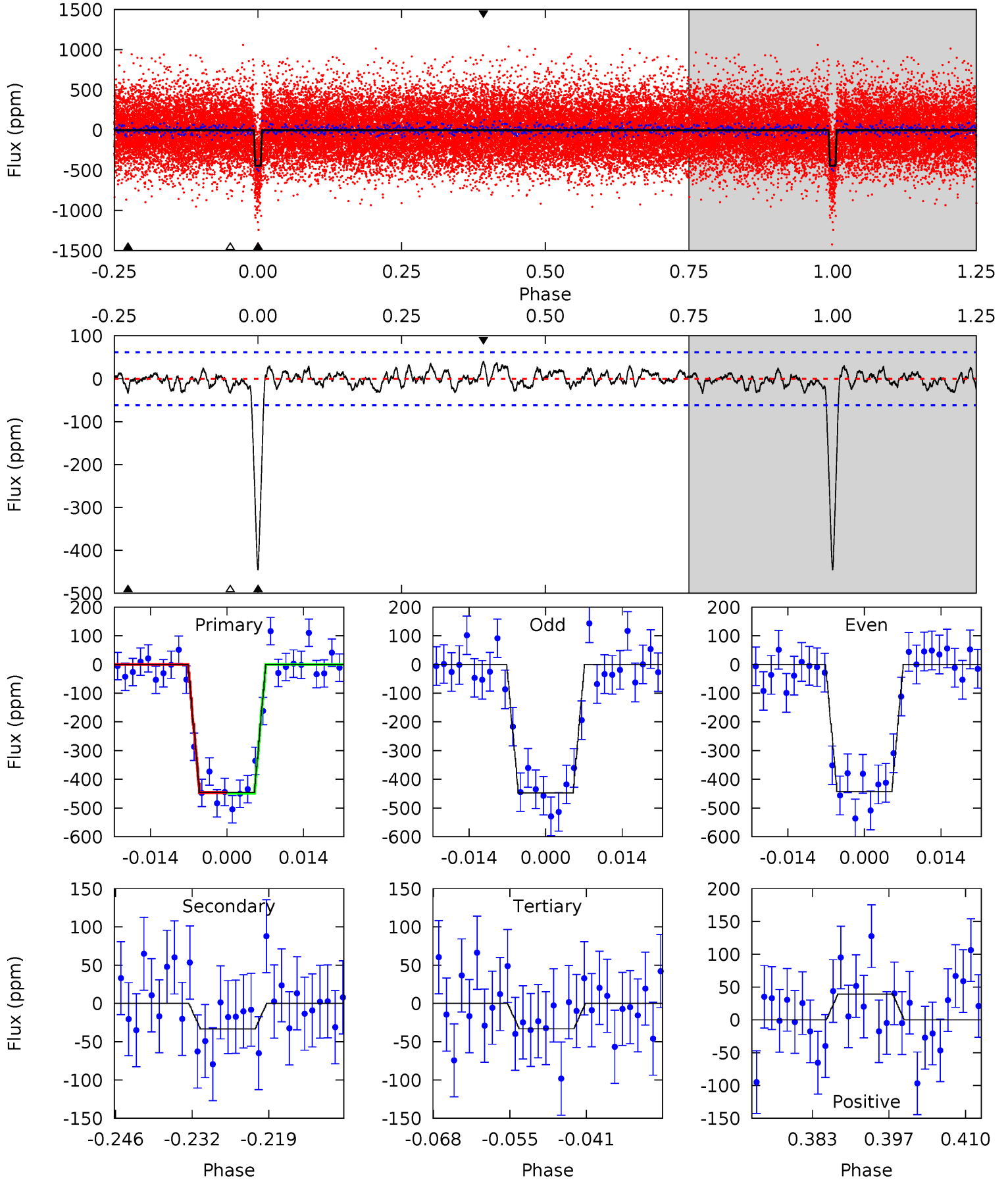
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.3	3.23	2.92	2.84	4.94	2.41	1.19	34.4	34.5	0.30	0.39	1.66	1.02	0.10	0.37



Alt Model-Shift Uniqueness Test

009967771-02, P = 9.917202 Days, E = 125.224079 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.8	2.69	2.66	3.17	4.97	2.47	1.13	33.1	32.6	0.03	-0.48	0.19	0.95	0.08	0.11



Stellar Parameters For KIC 009967771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5539^{+83}_{-74}	$4.244^{+0.174}_{-0.101}$	$0.140^{+0.150}_{-0.150}$	$1.207^{+0.175}_{-0.233}$	$0.932^{+0.067}_{-0.039}$	$0.746^{+0.628}_{-0.250}$
	+1%/-1%	+4%/-2%	+107%/-107%	+14%/-19%	+7%/-4%	+84%/-34%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009967771-02 / KOI 1875.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-38 ± 12	$2.97^{+0.52}_{-0.54}$	1259^{+53}_{-67}	3379^{+255}_{-256}	18^{+12}_{-7}
Alt.	-33 ± 12	$2.75^{+0.51}_{-0.53}$	1261^{+52}_{-73}	3401^{+263}_{-262}	19^{+13}_{-8}

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 $A_{obs} \gg 1.0$

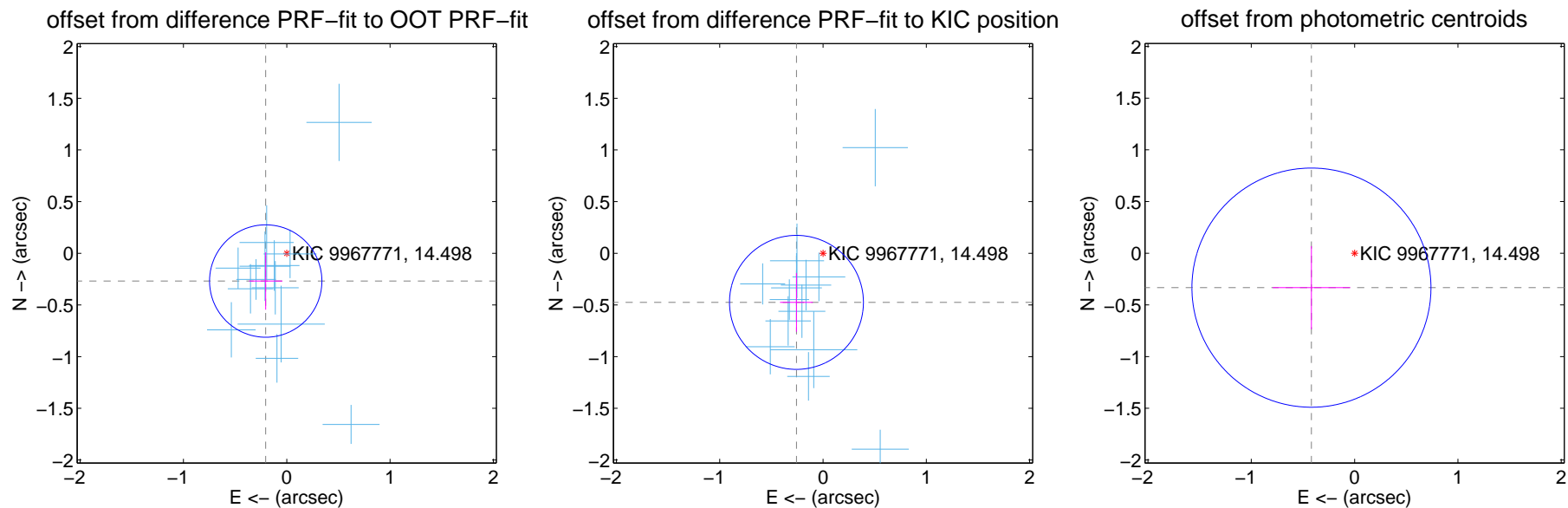
DV Centroid Data

Supplemental centroid analysis for 009967771-02. Kepler magnitude: 14.50. Transit SNR 27.35

There are 14 quarters with good PRF difference image offsets

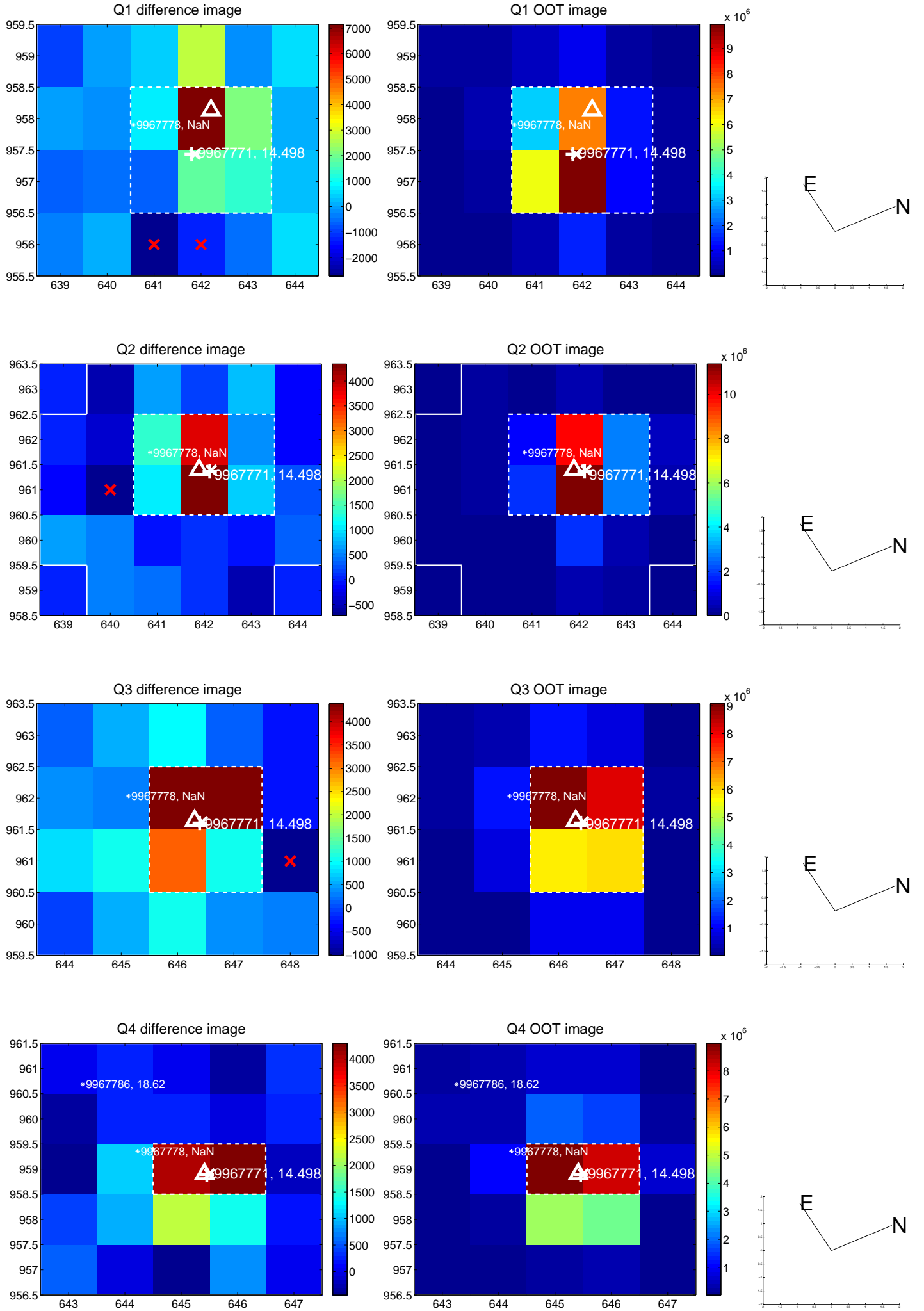
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.337 ± 0.181	1.86	0.204 ± 0.161	-0.269 ± 0.277
PRF-fit source offset from KIC position	0.540 ± 0.216	2.50	0.257 ± 0.159	-0.475 ± 0.284
photometric centroid source offset	0.53 ± 0.39	1.39	0.42 ± 0.37	-0.33 ± 0.40

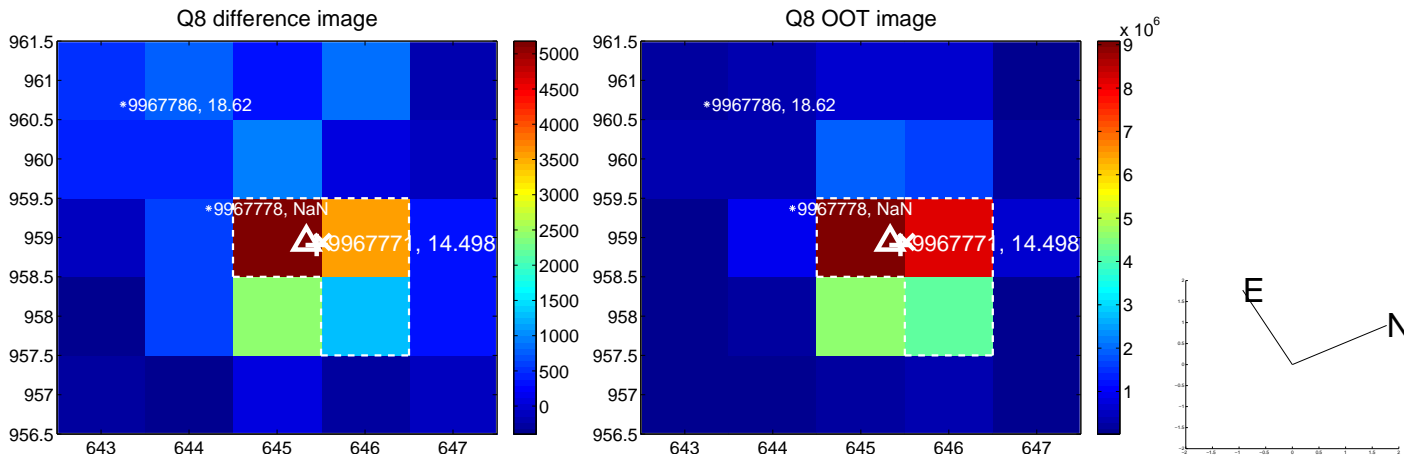
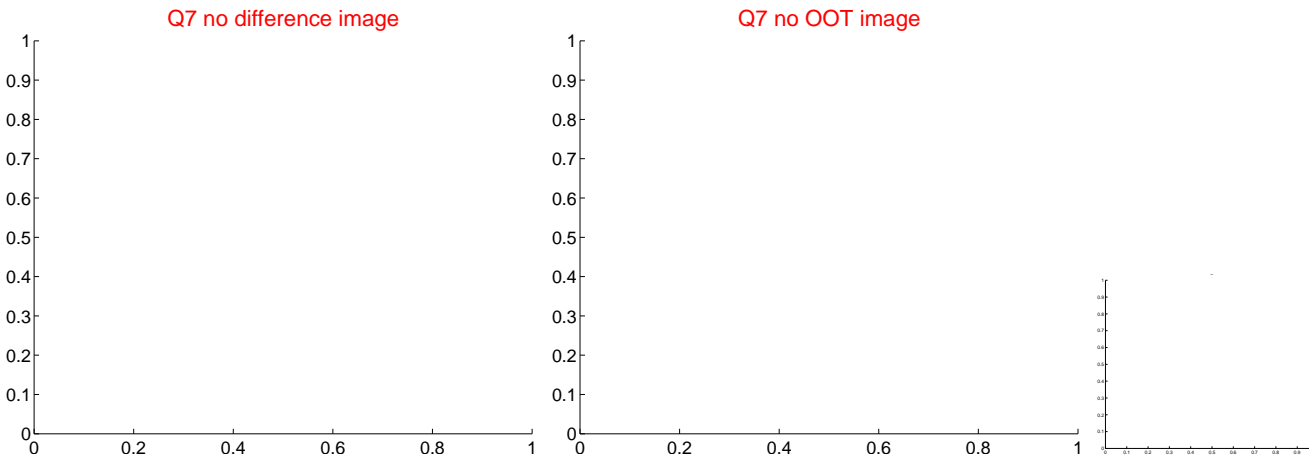
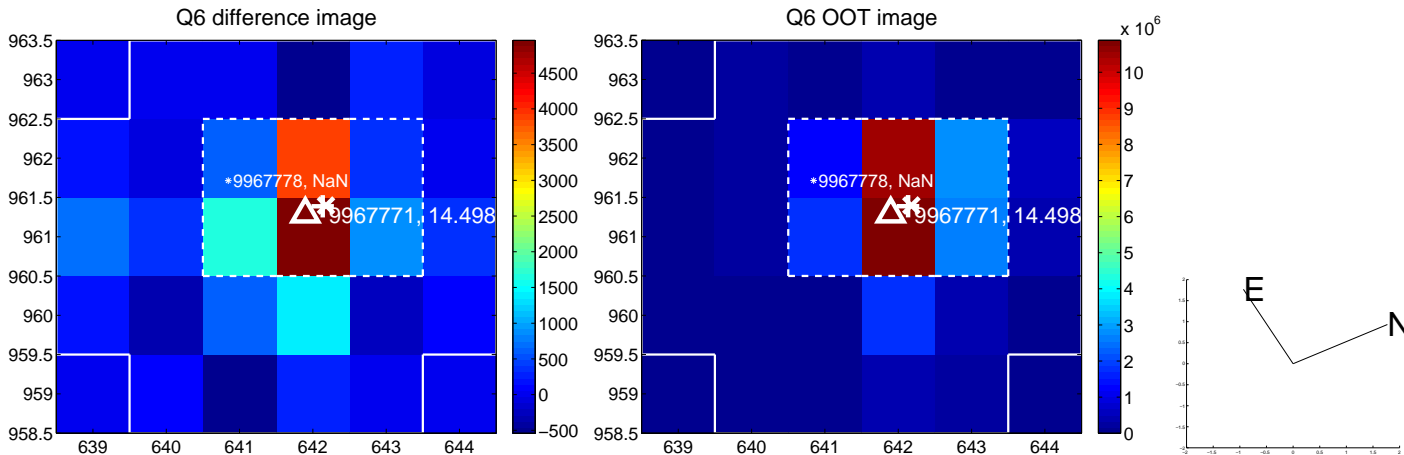
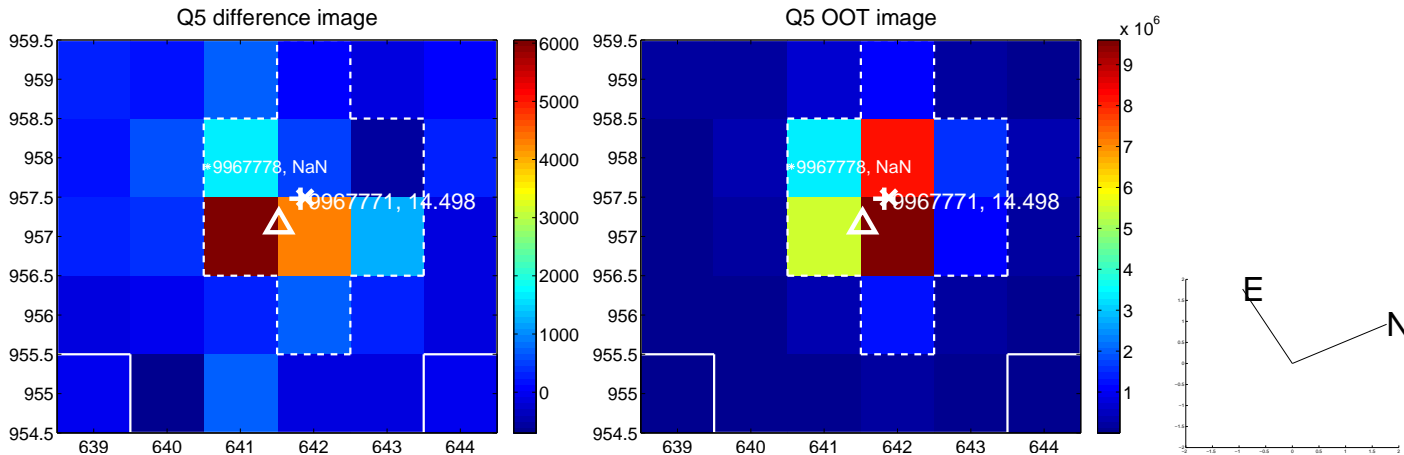


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

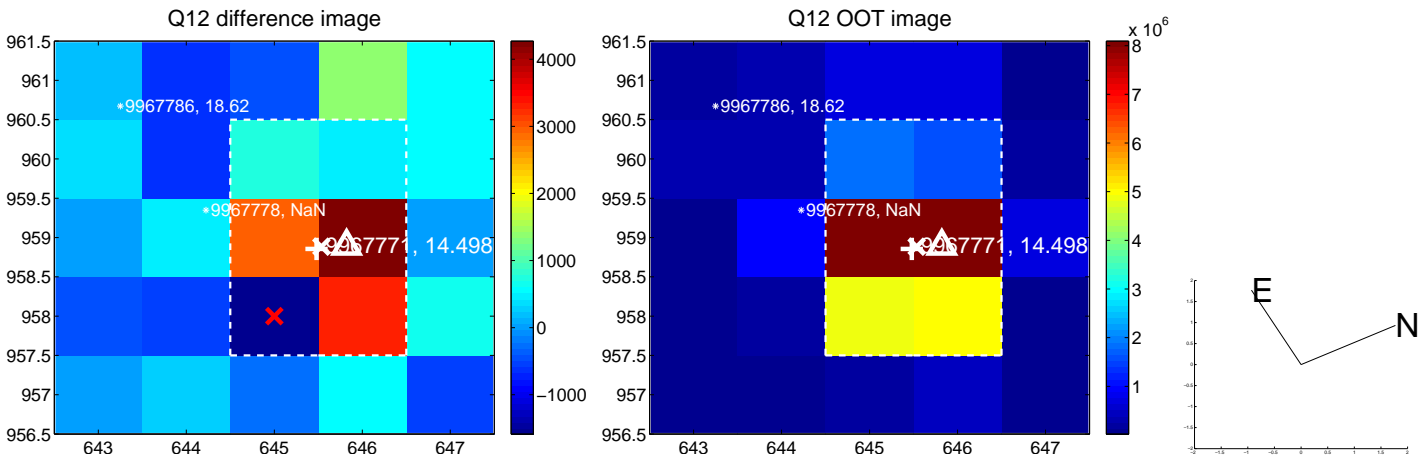
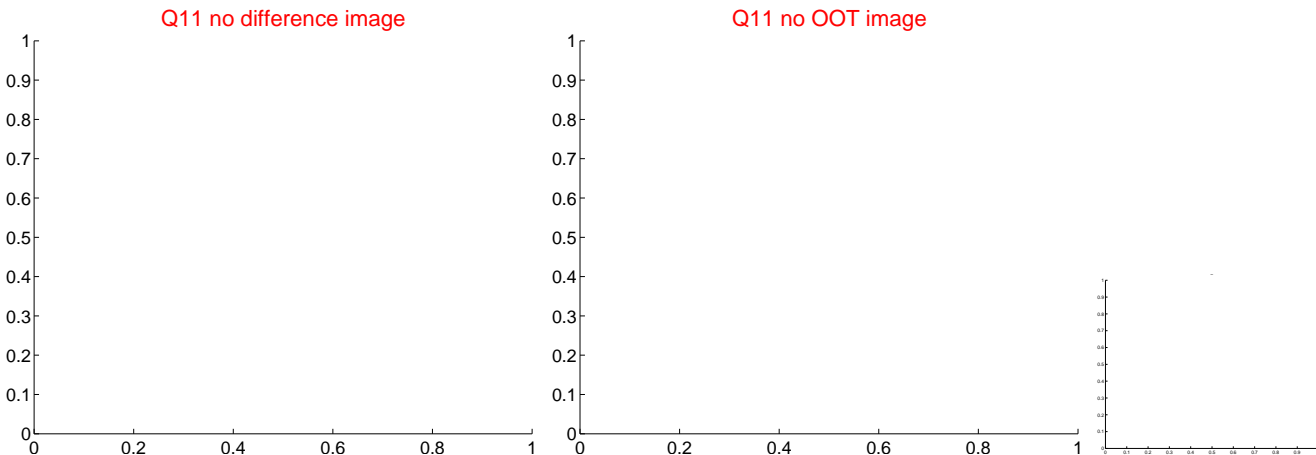
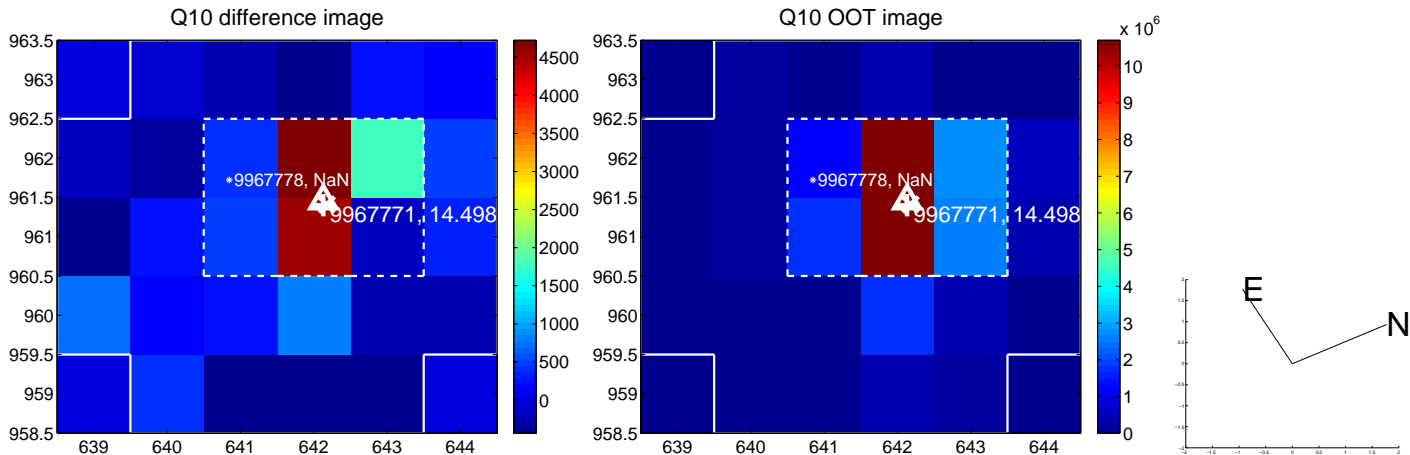
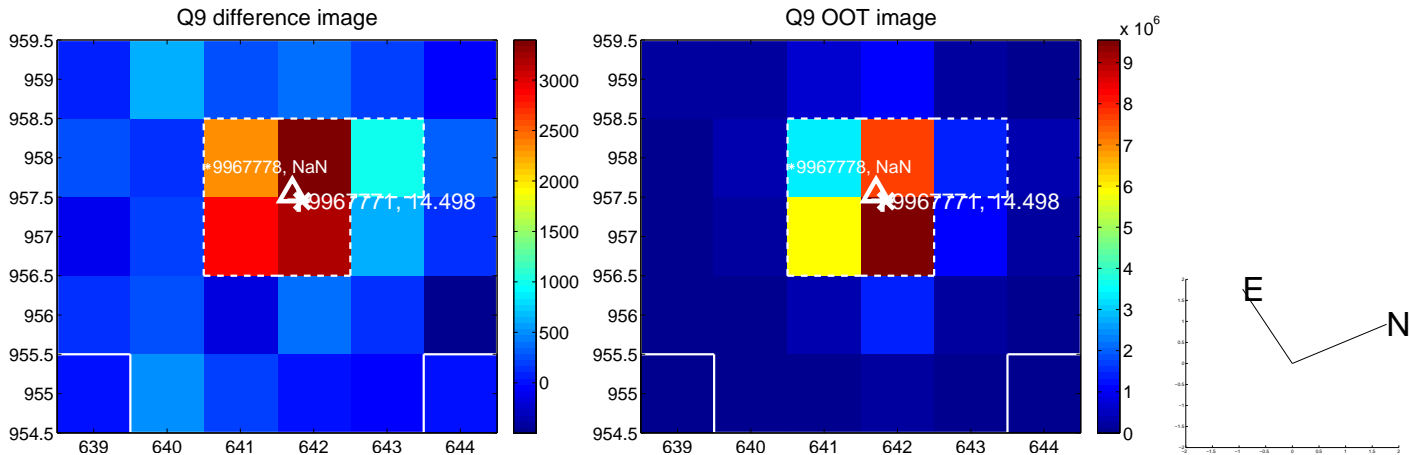
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



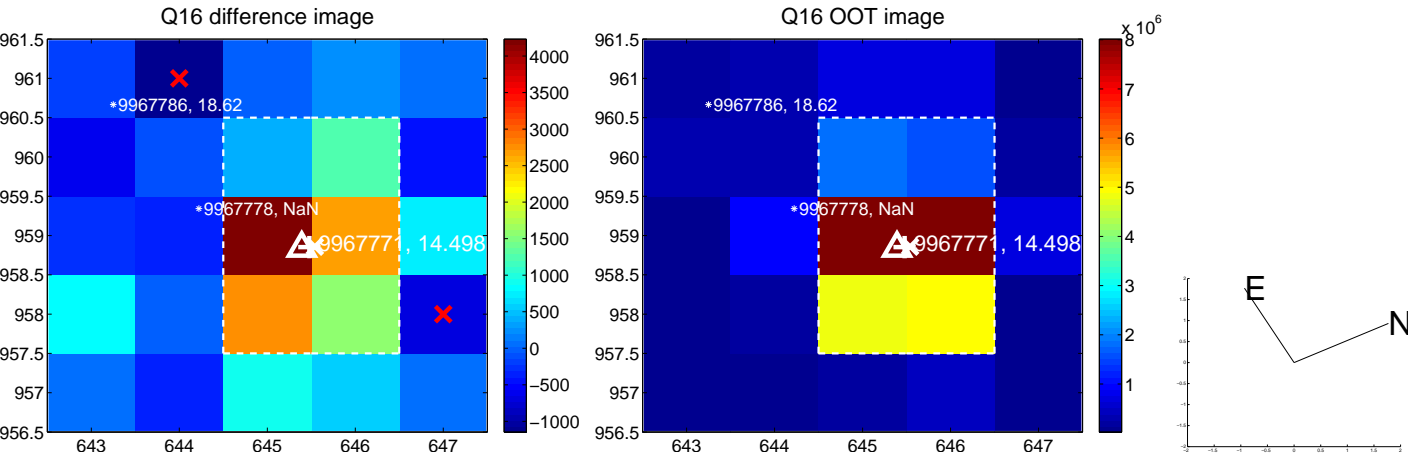
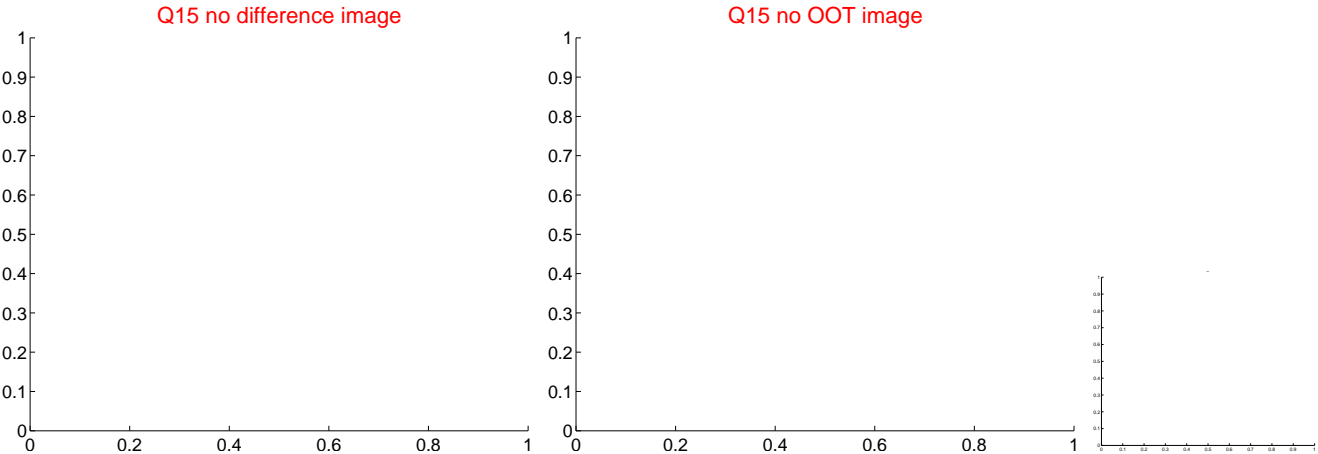
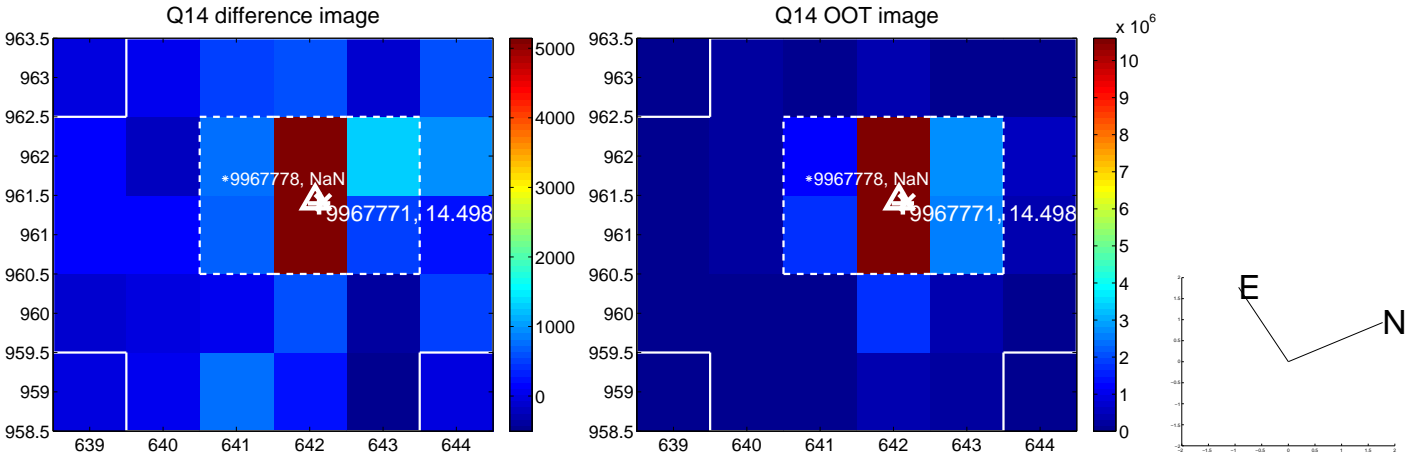
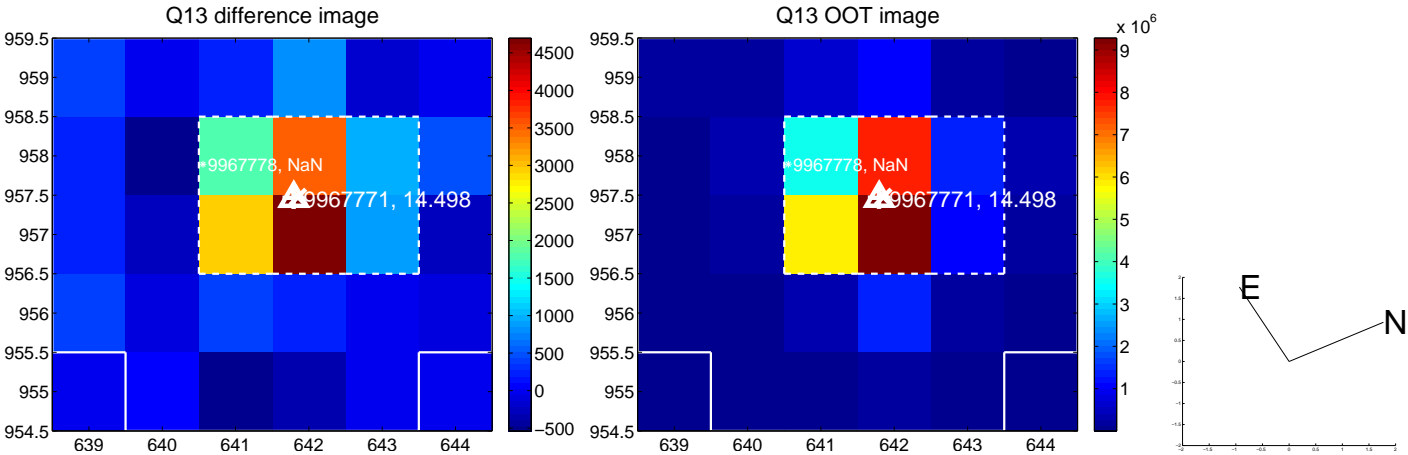
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



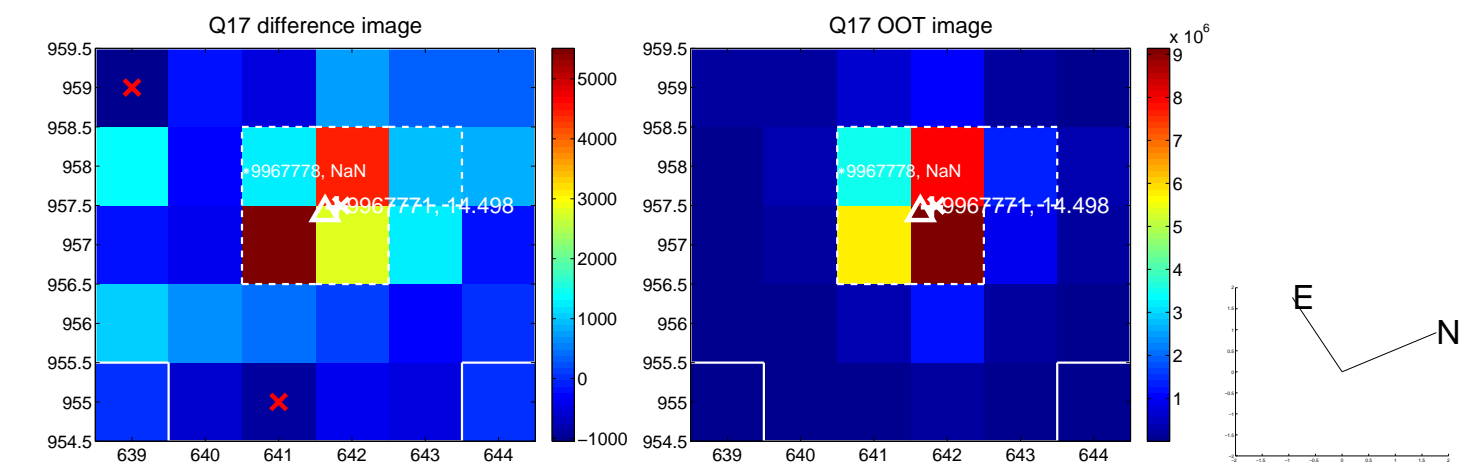
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



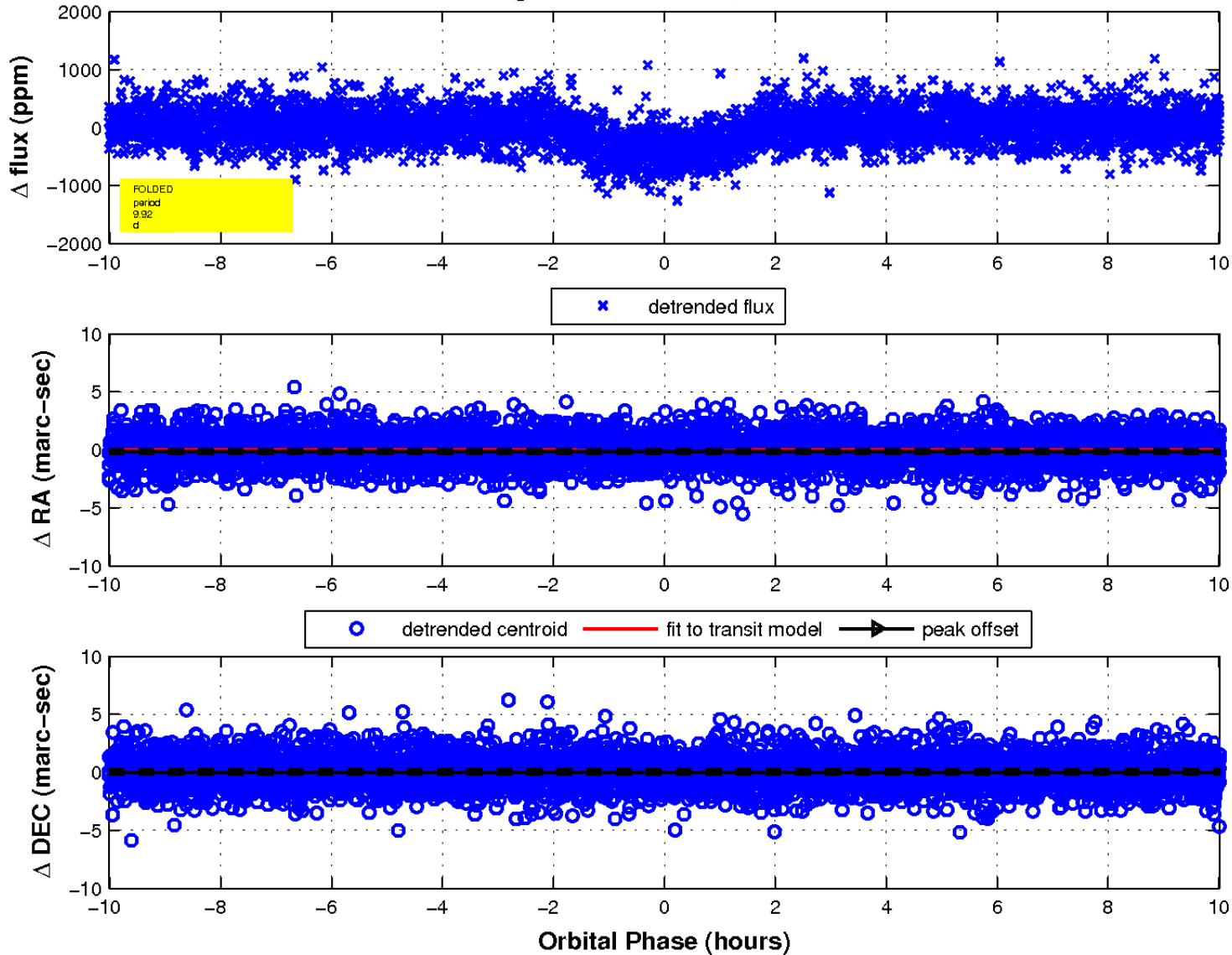
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

