

KIC 008955709

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})
008955709-01	OBS	No	0.942989	131.771867	261.2	1.193	12.7	14.2	0.69	4499	1.40	642.45
008955709-02	OBS	4471.01	0.942998	132.242453	302.0	1.012	11.9	15.7	0.69	4499	1.51	642.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008955709-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
008955709-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_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.

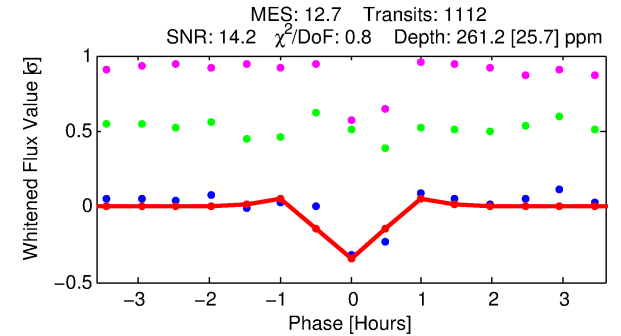
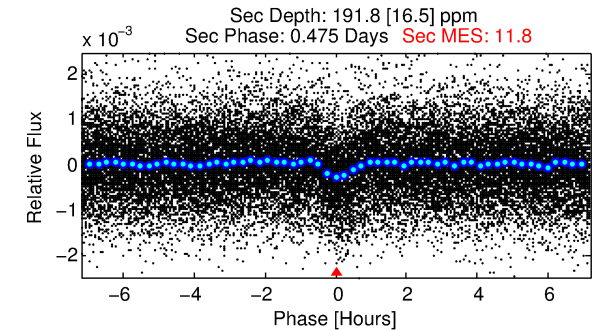
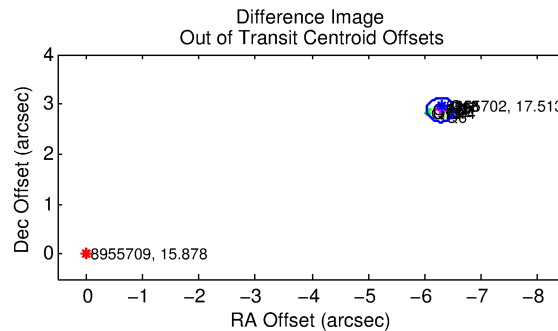
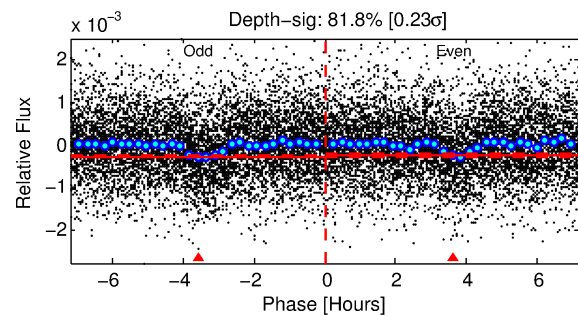
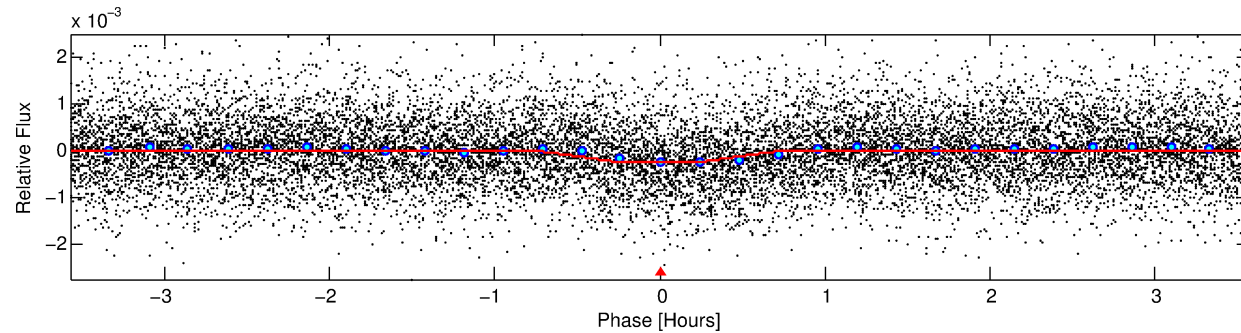
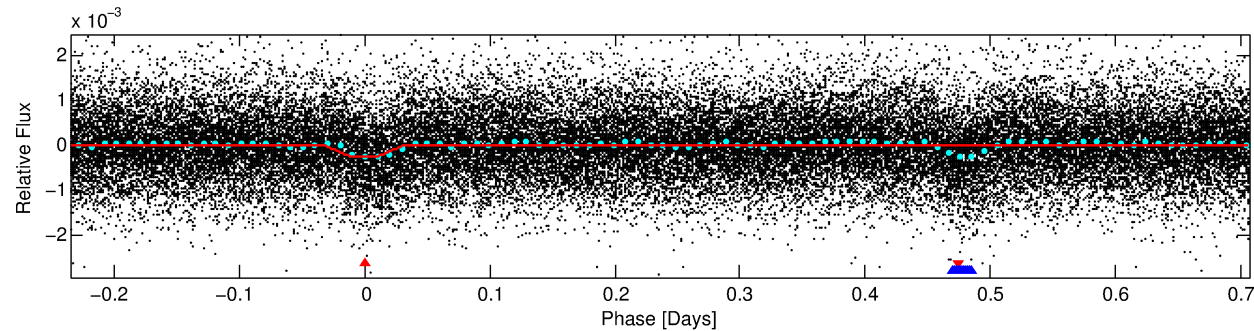
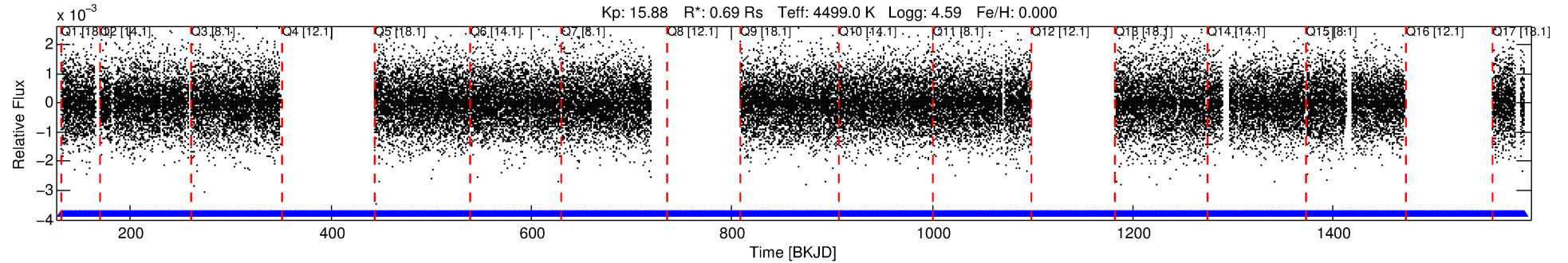
Ephemeris Match Information For 008955709-01

No Significant Match Found

DV One-Page Summary

KIC: 8955709 Candidate: 1 of 2 Period: 0.943 d
KOI: K04471 Corr: No Ephemeris Match

Kp: 15.88 R*: 0.69 Rs Teff: 4499.0 K Logg: 4.59 Fe/H: 0.000



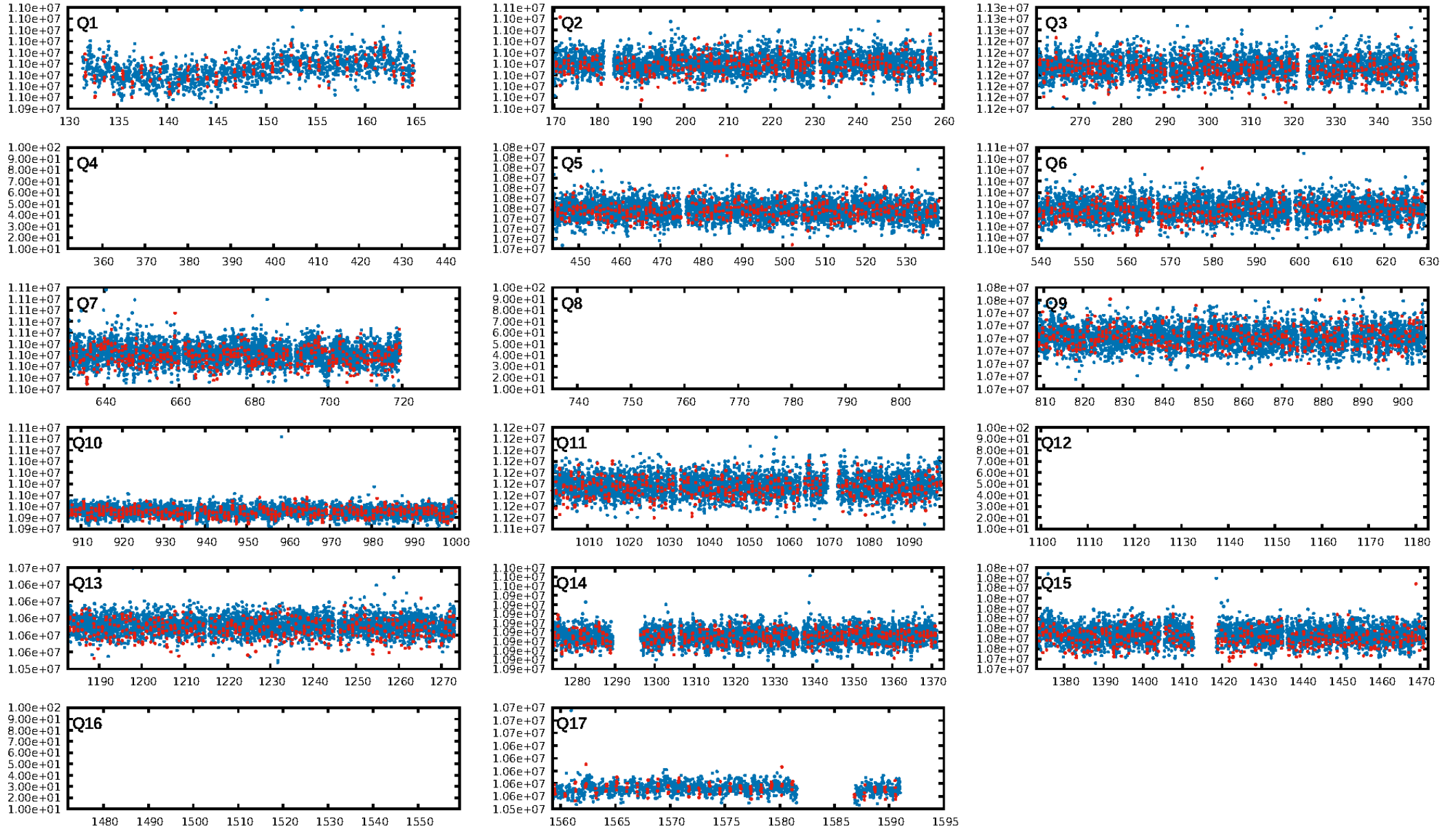
DV Fit Results:

Period = 0.94299 [0.00001] d
Epoch = 131.7719 [0.0011] BKJD
Rp/R* = 0.0185 [0.0128]
a/R* = 3.00 [6.71]
b = 0.90 [0.54]
Seff = 642.45 [101.41]
Teq = 1284 [51] K
Rp = 1.40 [0.97] Re
a = 0.0166 [0.0012] AU
Ag = 14.76 [20.47] [0.67σ]
Teff = 3890 [1350] K [1.93σ]

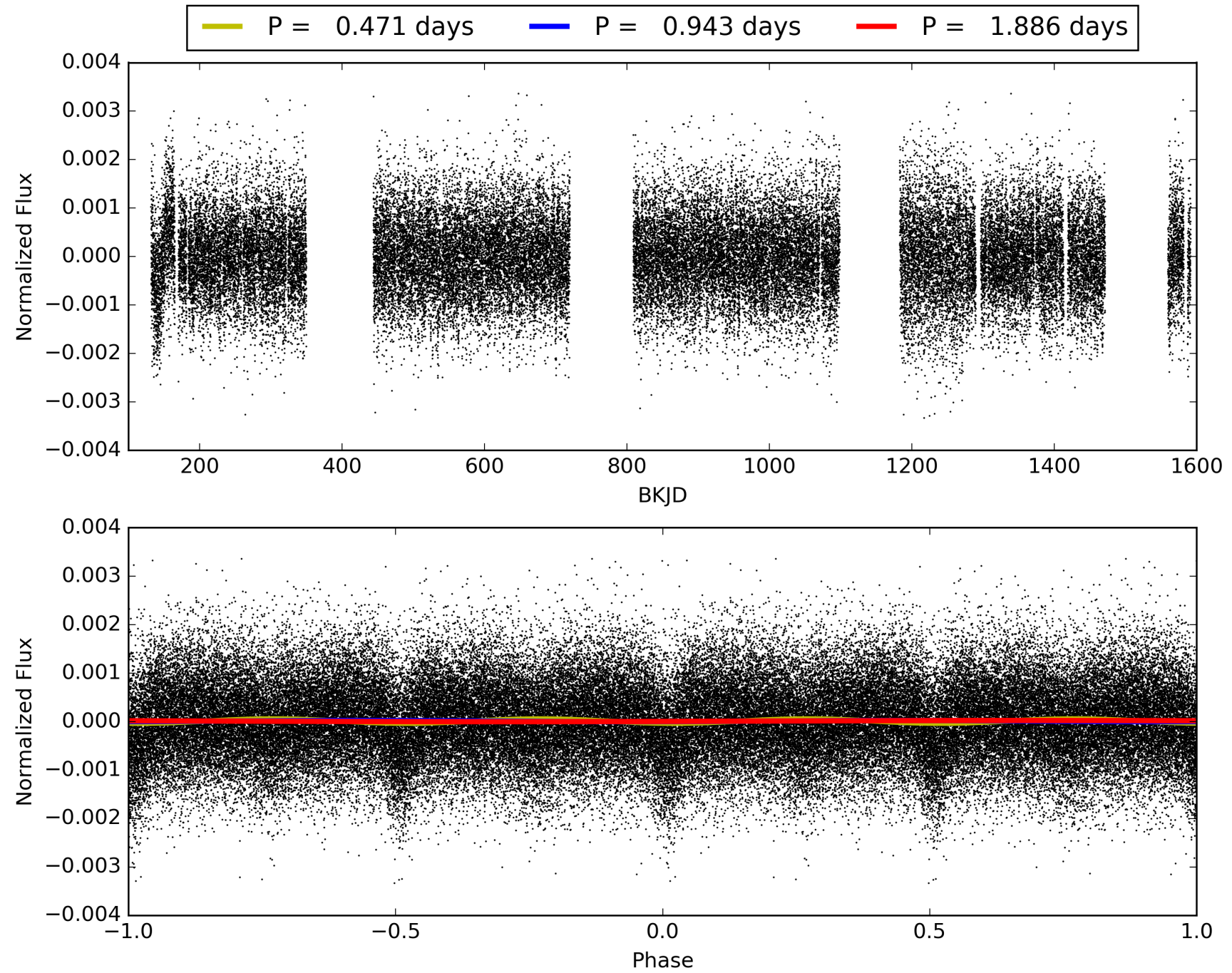
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 1.12e-32
RollingBand-fgt: 1.00 [1047/1047]
GhostDiagnostic-chr: -0.1347
Centroid-sig: 0.0%
Centroid-so: 19.674 arcsec [26.73σ]
OotOffset-rm: 6.903 arcsec [85.83σ]
KicOffset-rm: 6.844 arcsec [92.77σ]
OotOffset-st: 3/4/0/5 [12]
KicOffset-st: 3/4/0/5 [12]
DiffImageQuality-fgm: 1.00 [12/12]
DiffImageOverlap-fno: 1.00 [13/13]

TCE 008955709-01, PDC Light Curves

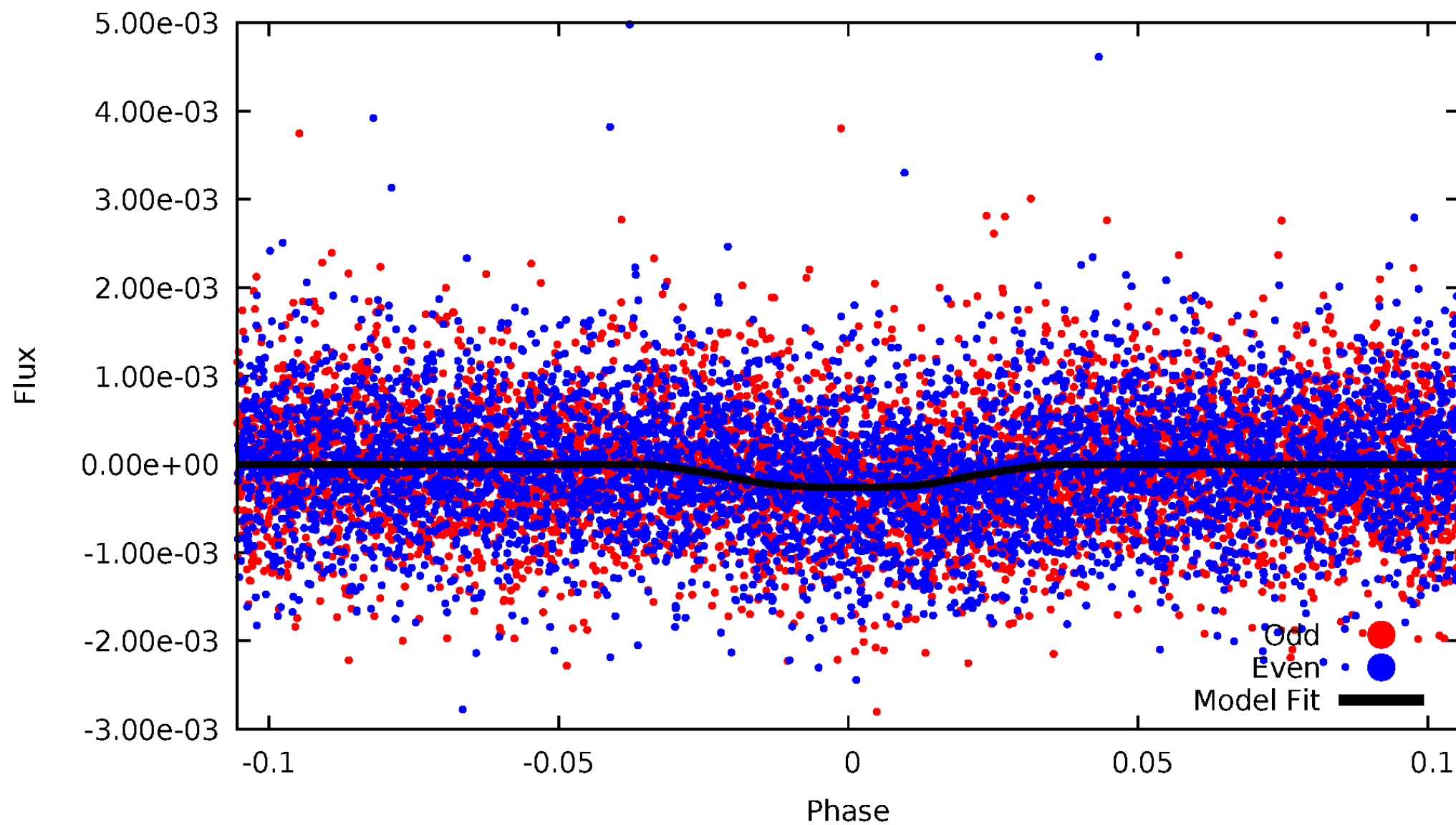


TCE 008955709-01



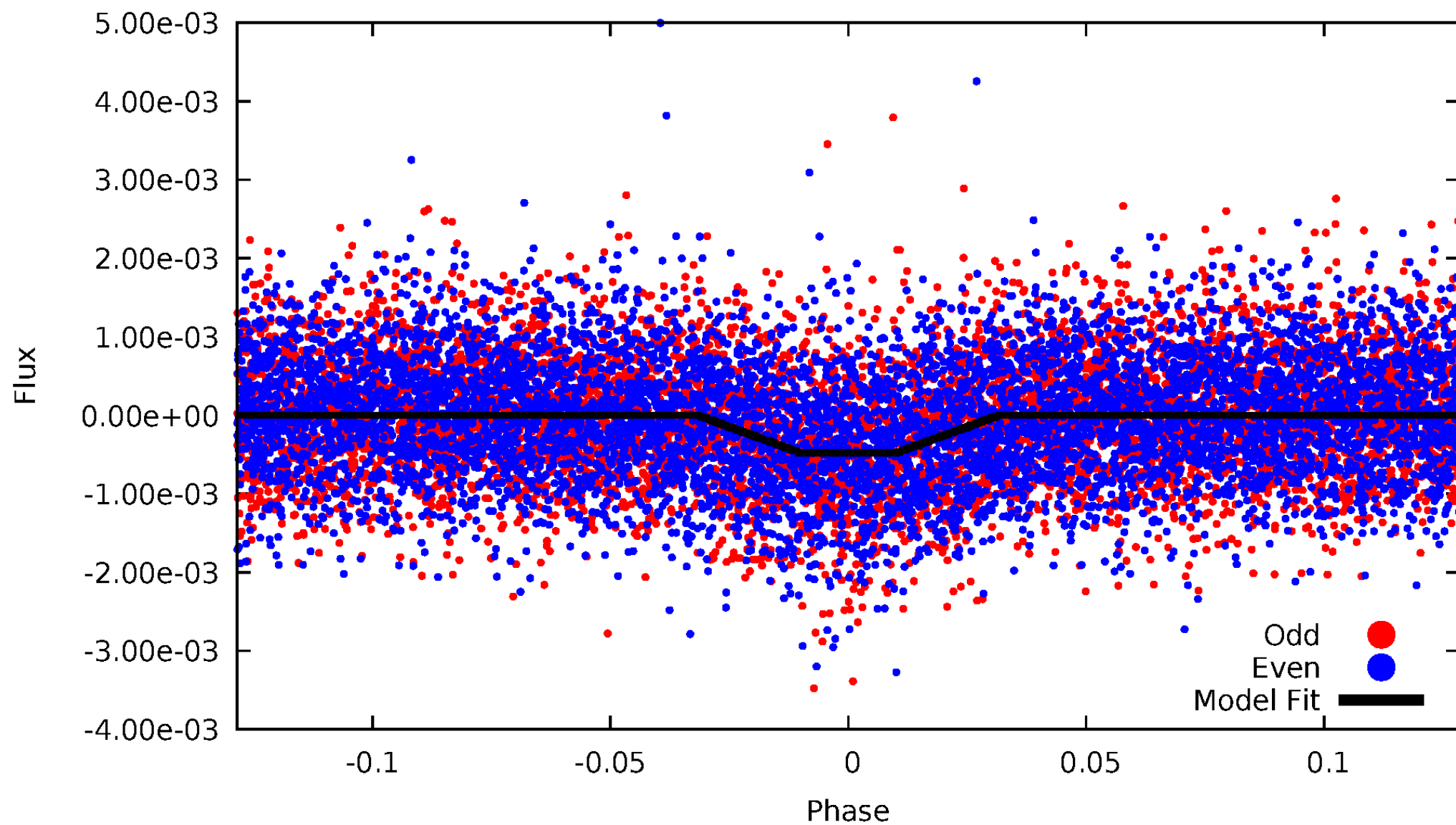
DV Odd/Even

TCE 008955709-01

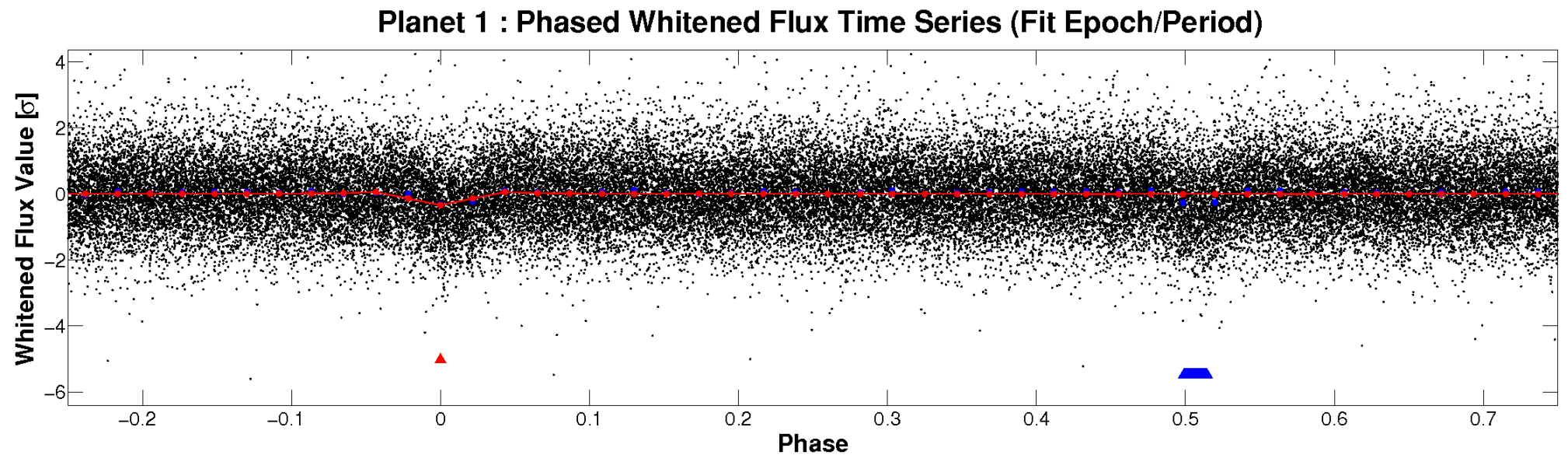
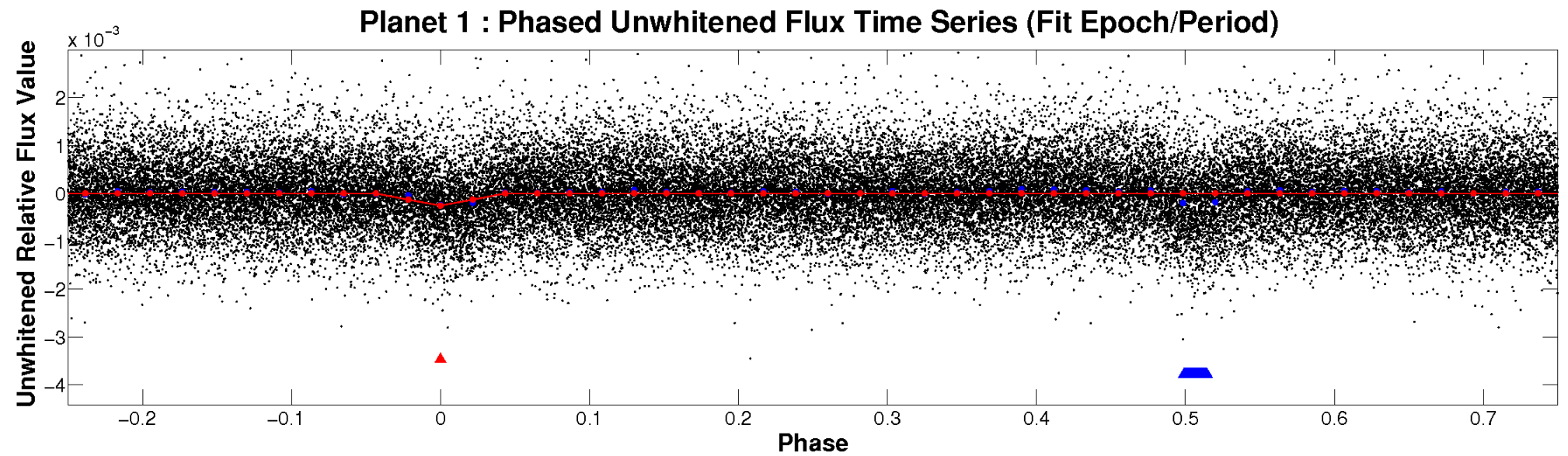


ALT Odd/Even

TCE 008955709-01

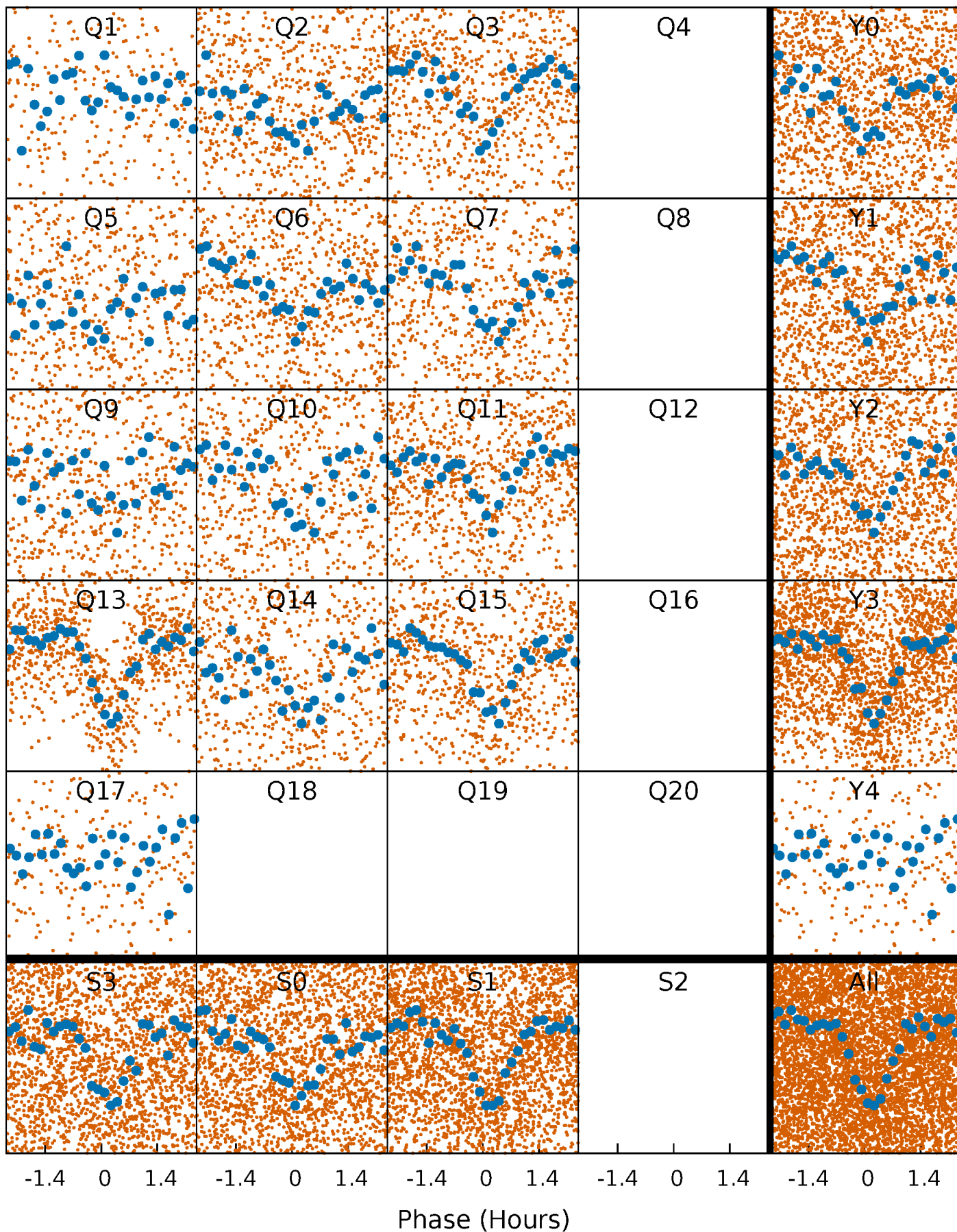


Non-Whitened Vs. Whitened Light Curve



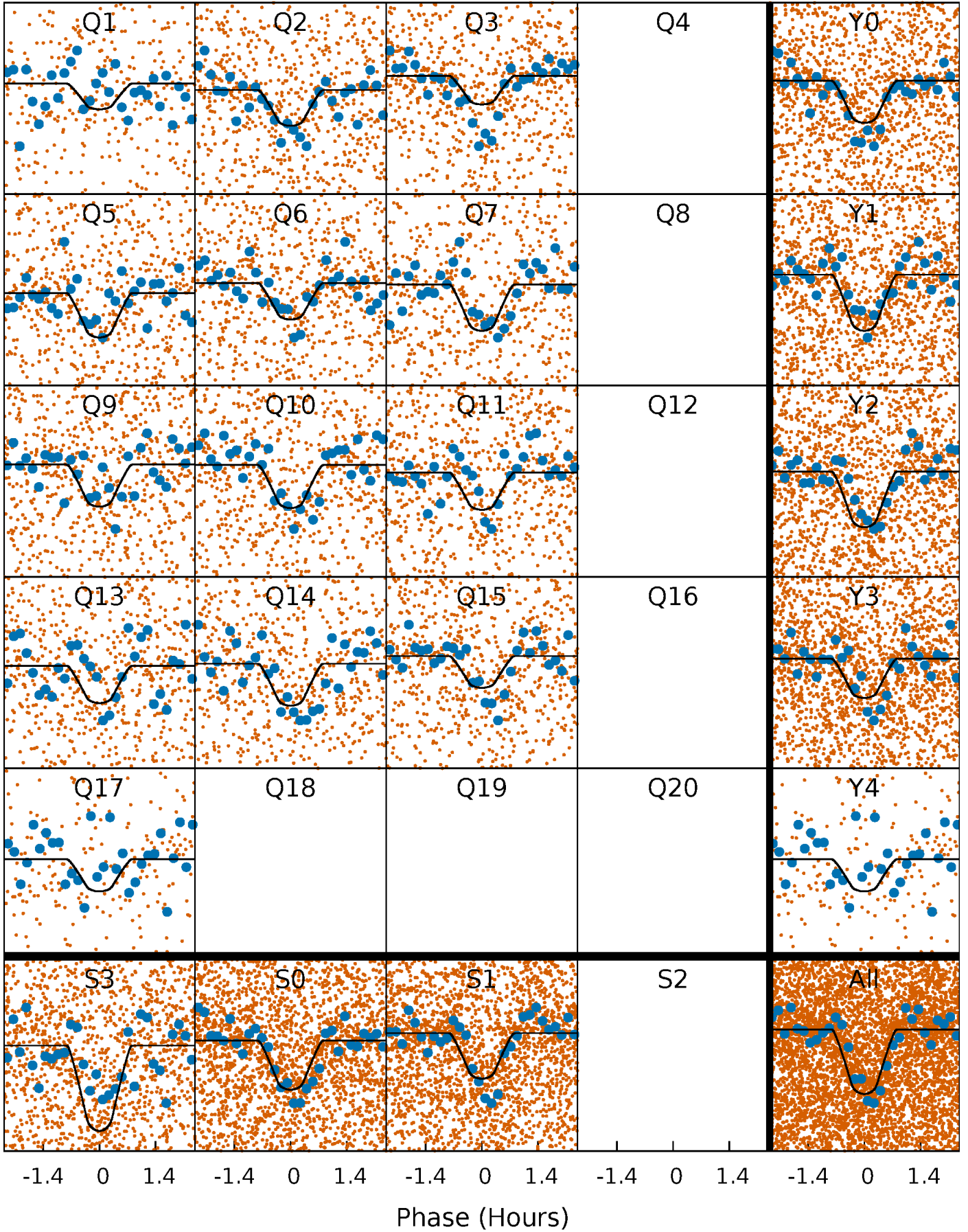
PDC Quarter-Phased Transit Curves

TCE 008955709-01 P= 0.942989 Days $T_0=131.771867$ (BKJD)



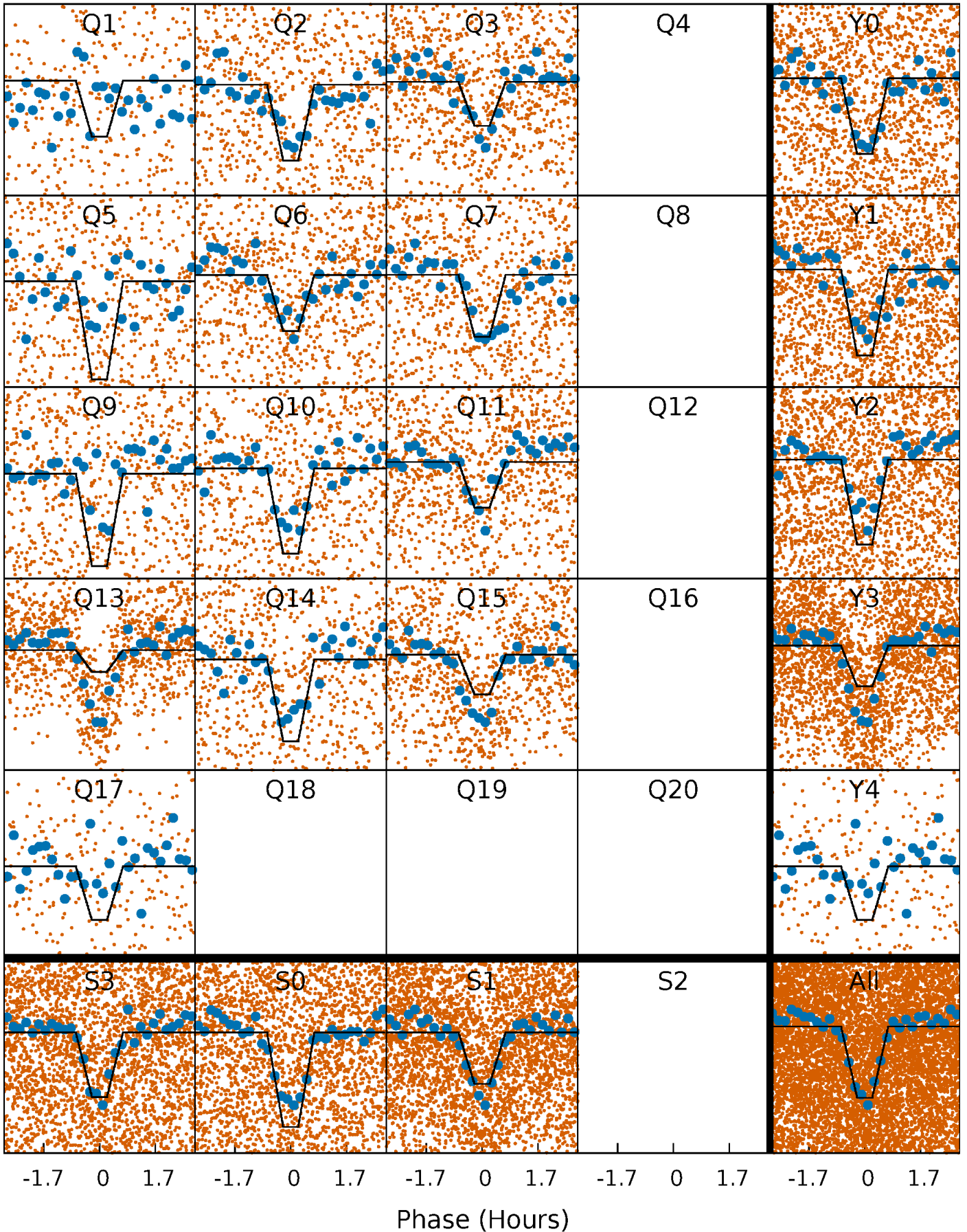
DV Quarter-Phased Transit Curves

TCE 008955709-01 P= 0.942989 Days $T_0=131.771867$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

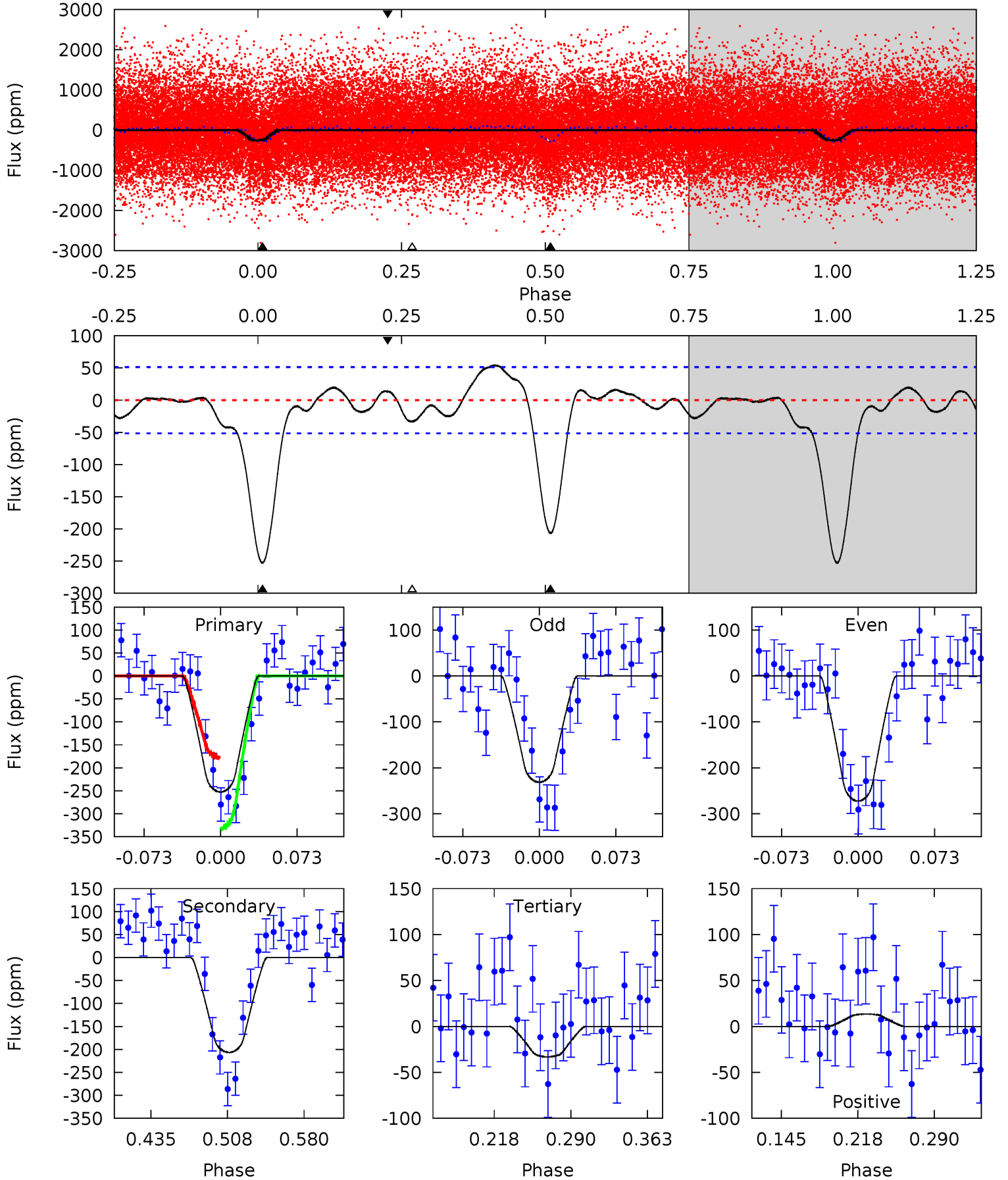
TCE 008955709-01 P= 0.943002 Days $T_0=131.768601$ (BKJD)



DV Model-Shift Uniqueness Test

008955709-01, P = 0.942989 Days, E = 130.828878 Days

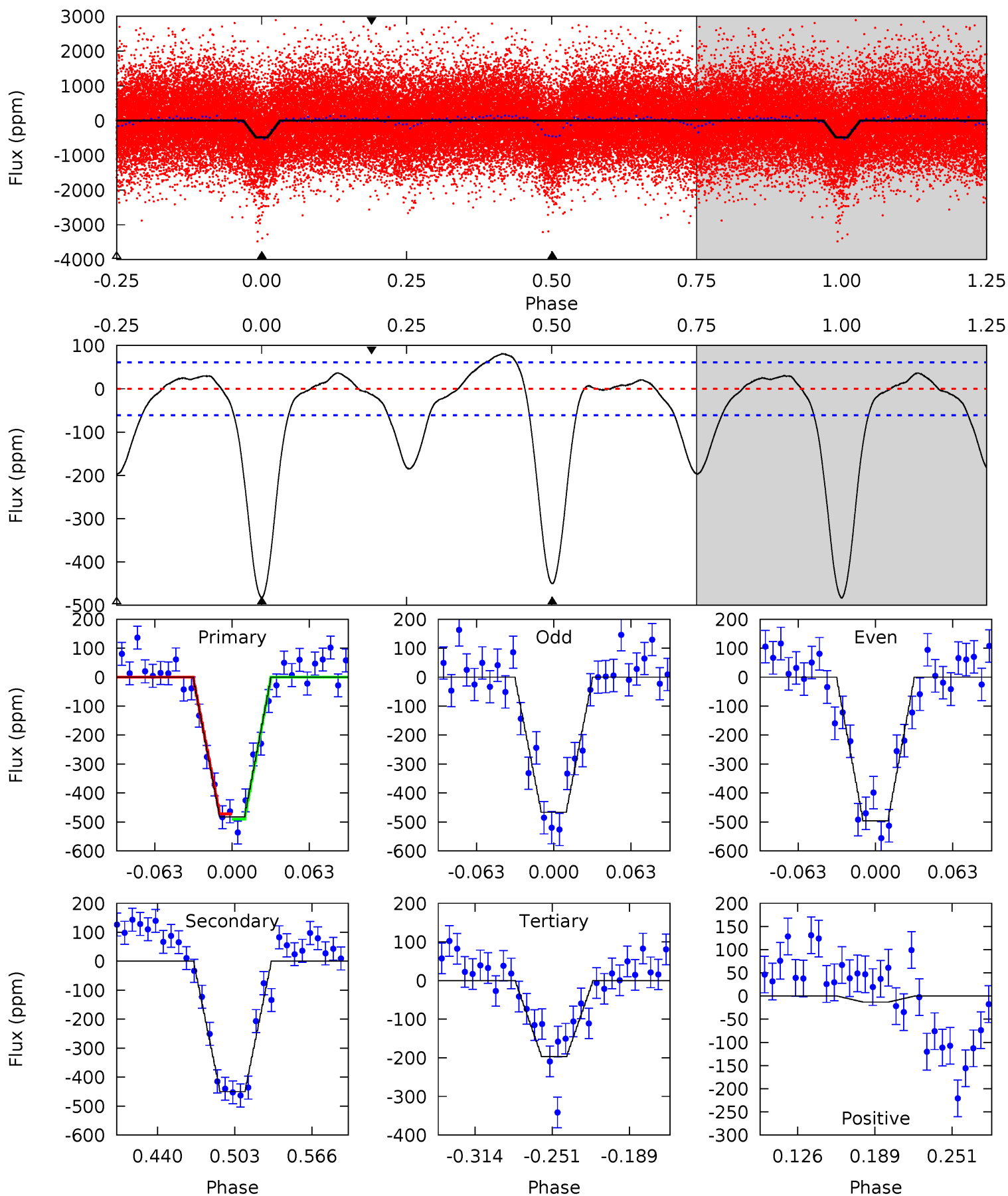
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.7	18.6	2.99	1.21	4.63	1.80	1.74	19.8	21.5	15.6	17.4	1.85	0.94	0.18	6.97



Alt Model-Shift Uniqueness Test

008955709-01, P = 0.943002 Days, E = 130.825599 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.9	34.4	15.0	-1.01	4.66	1.86	5.14	21.8	37.9	19.3	35.4	1.12	1.05	0.14	0.68



Stellar Parameters For KIC 008955709

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4499^{+121}_{-134}	$4.590^{+0.056}_{-0.020}$	$0.000^{+0.250}_{-0.300}$	$0.693^{+0.038}_{-0.060}$	$0.681^{+0.066}_{-0.054}$	$2.882^{+0.728}_{-0.265}$
	+3%/-3%	+1%/-0%	+inf%/-inf%	+5%/-9%	+10%/-8%	+25%/-9%
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 008955709-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-207 ± 11	$1.50^{+0.95}_{-0.83}$	1778^{+61}_{-61}	3959^{+1463}_{-592}	15^{+56}_{-9}
Alt.	-450 ± 13	$1.69^{+0.90}_{-0.88}$	1778^{+59}_{-60}	4368^{+1656}_{-611}	24^{+82}_{-14}

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

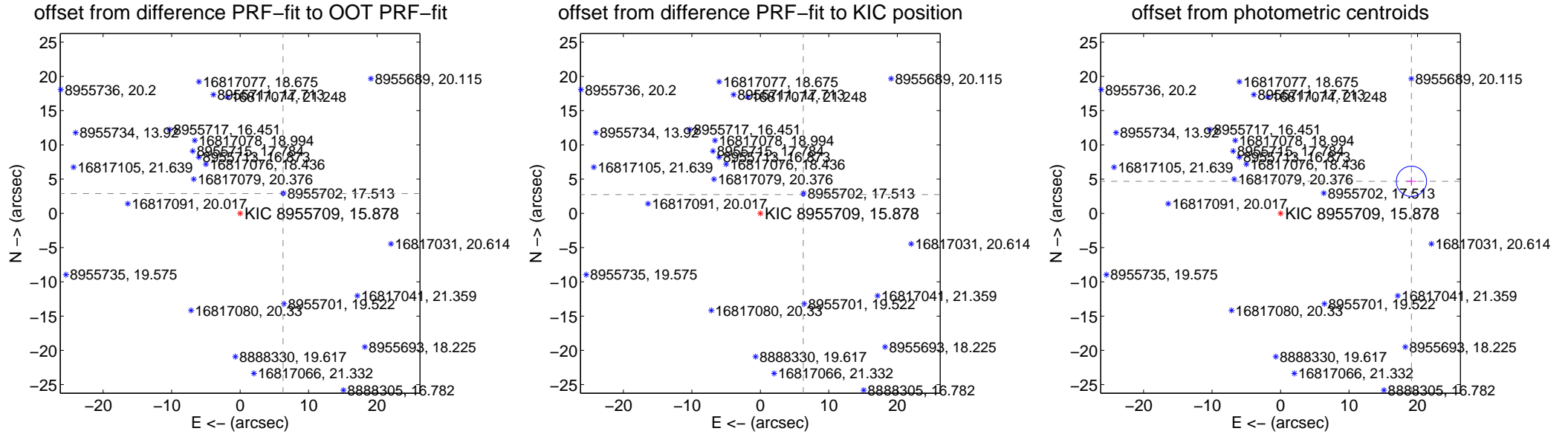
DV Centroid Data

Supplemental centroid analysis for 008955709-01. Kepler magnitude: 15.88. Transit SNR 14.16

There are 12 quarters with good PRF difference image offsets

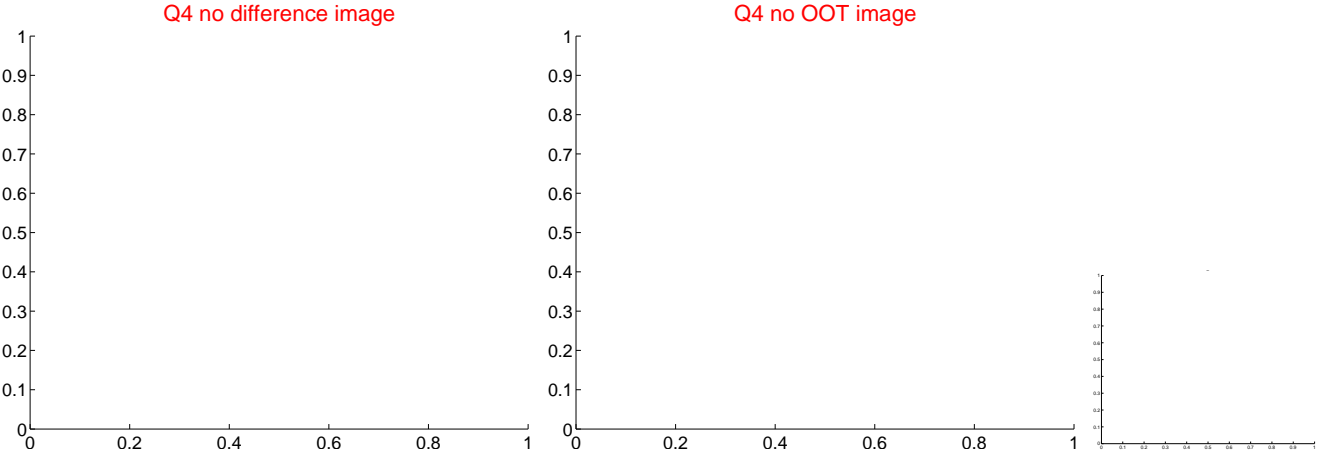
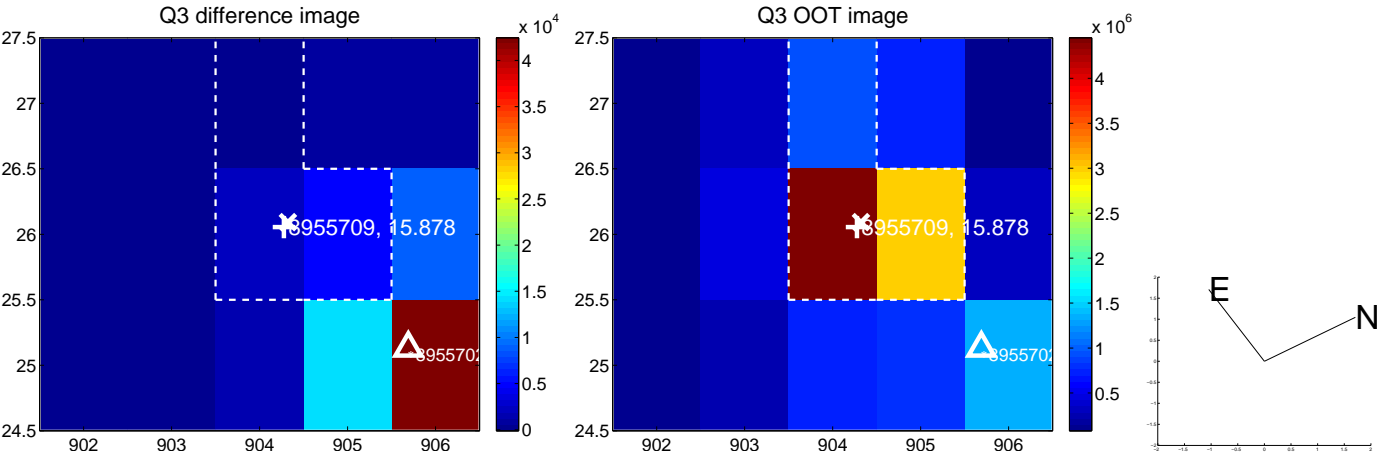
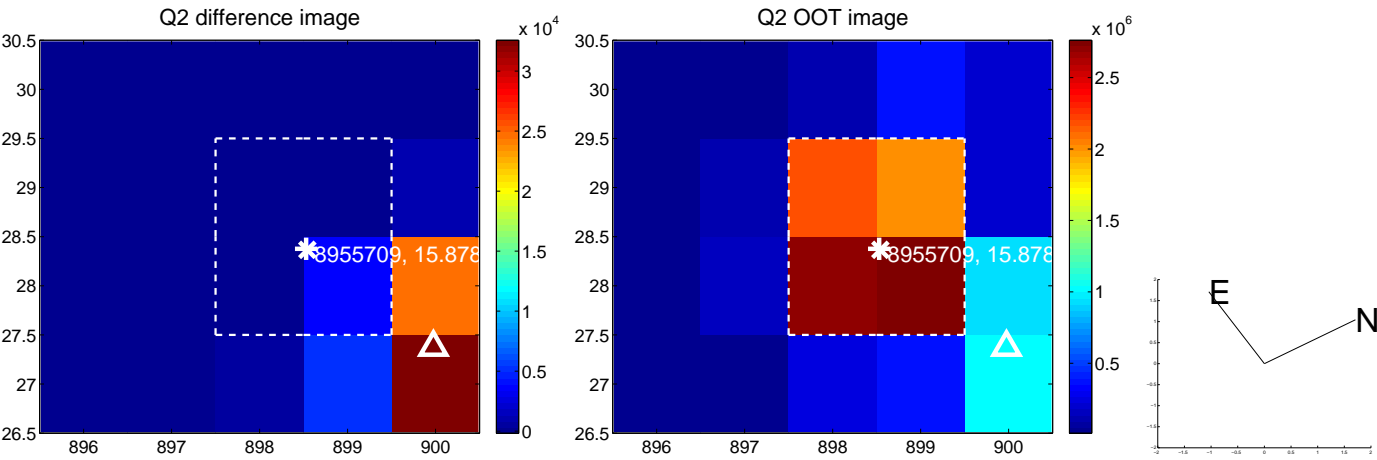
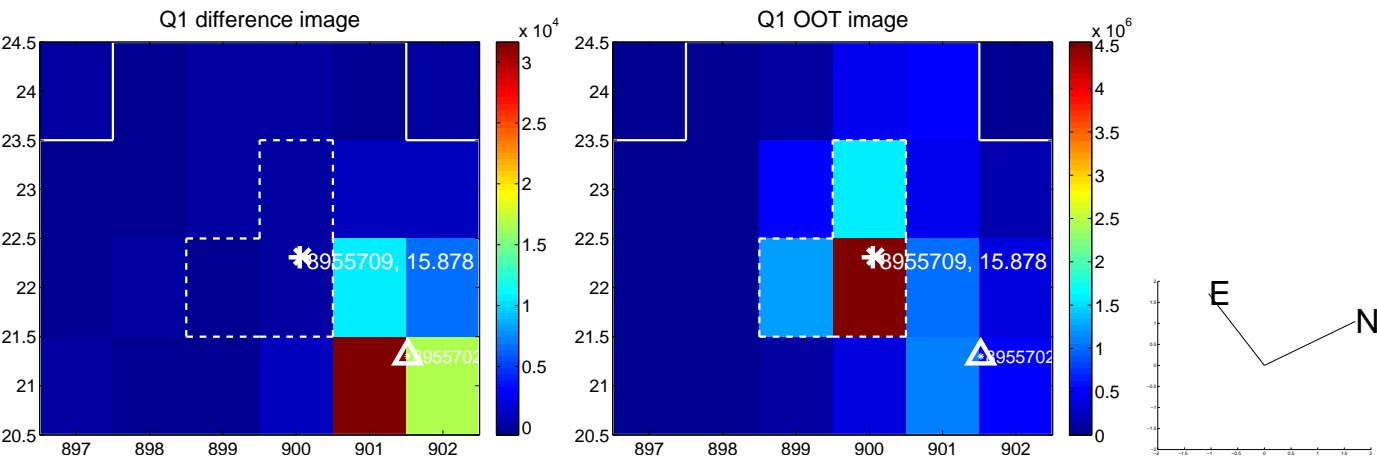
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.903 \pm 0.080	85.83	-6.270 \pm 0.083	2.888 \pm 0.070
PRF-fit source offset from KIC position	6.844 \pm 0.074	92.77	-6.271 \pm 0.074	2.740 \pm 0.070
photometric centroid source offset	19.67 \pm 0.74	26.73	-19.11 \pm 0.74	4.68 \pm 0.65

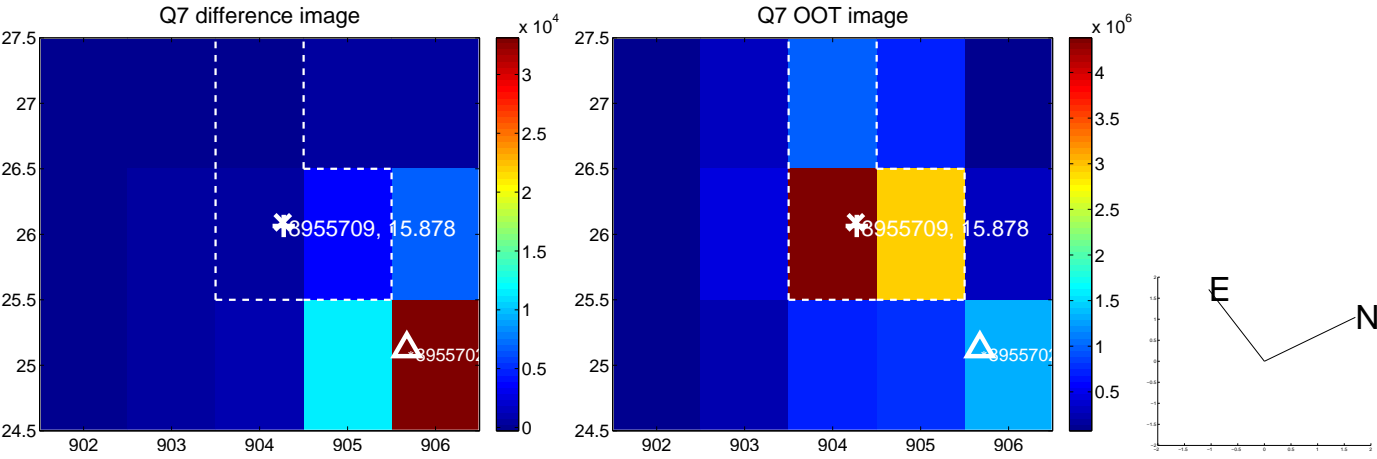
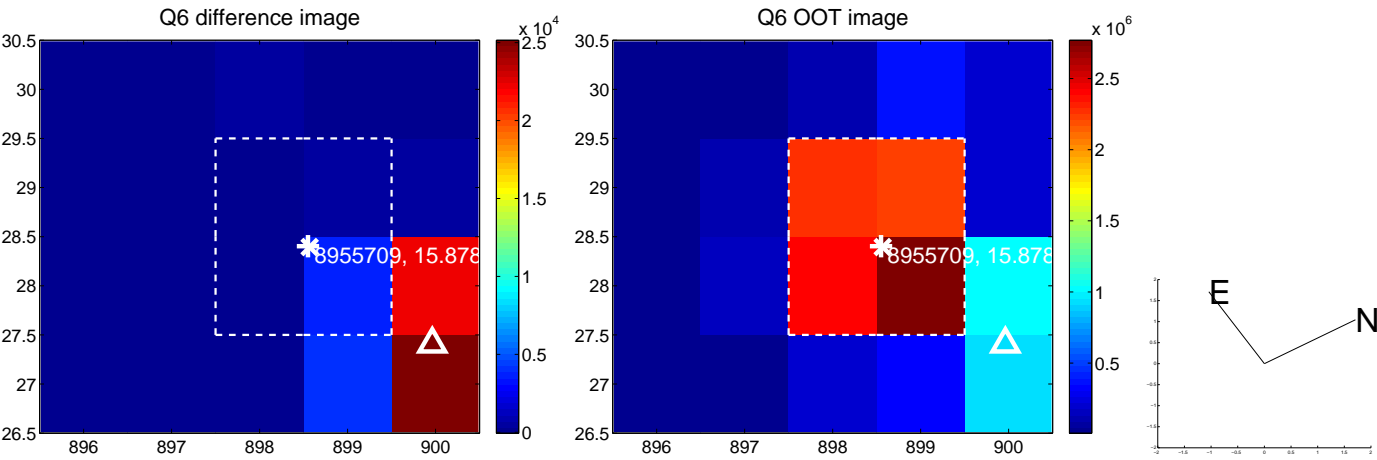
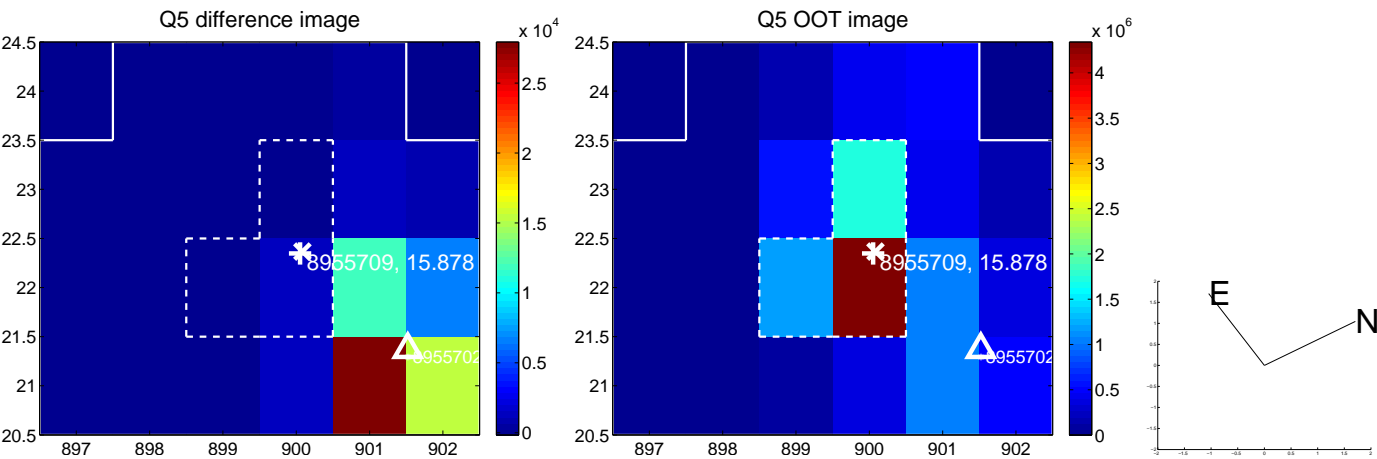


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

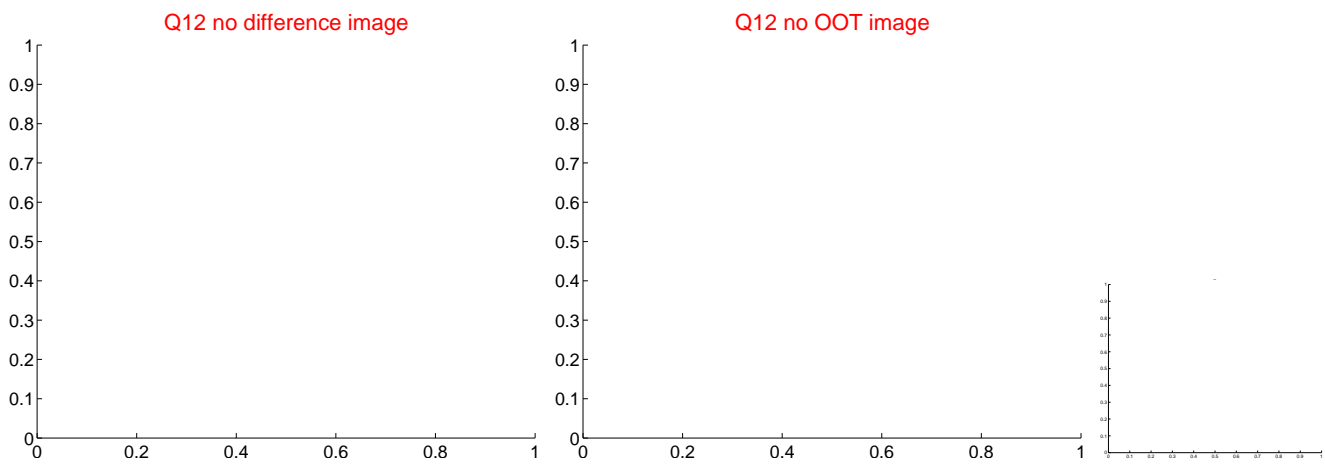
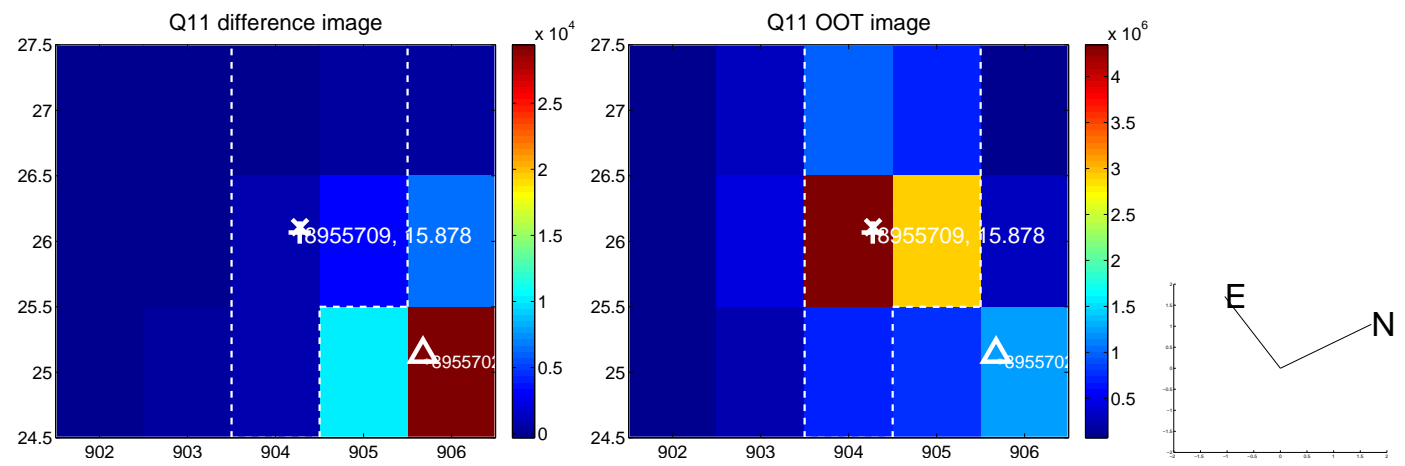
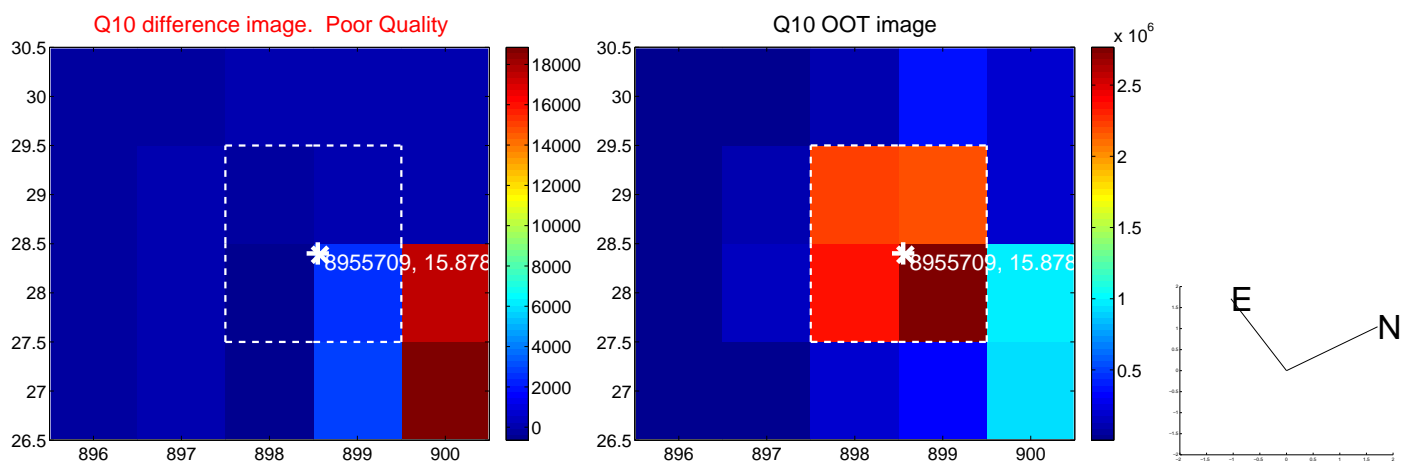
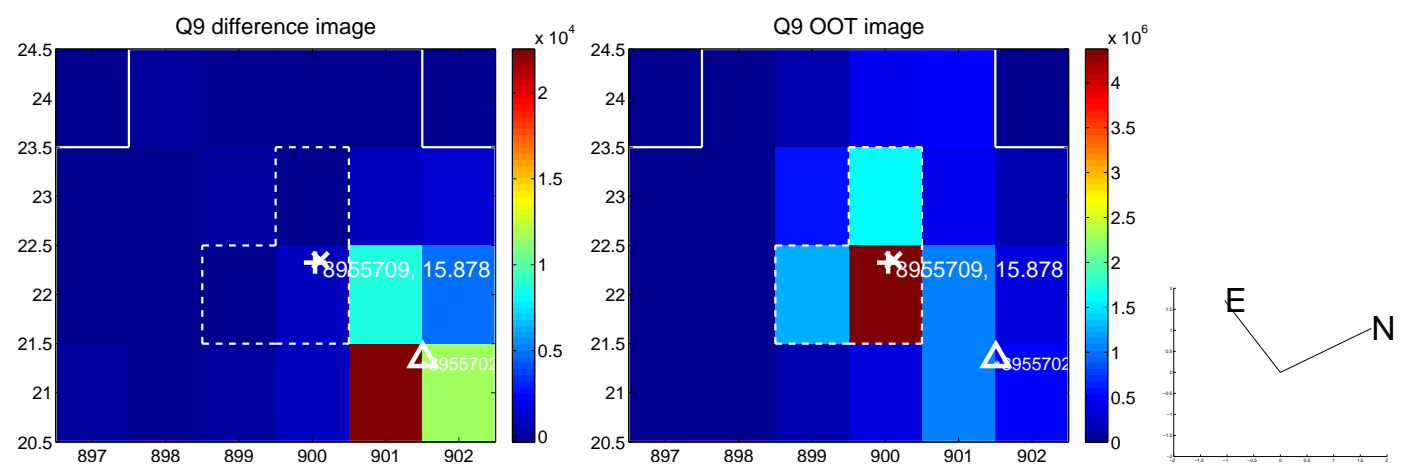
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



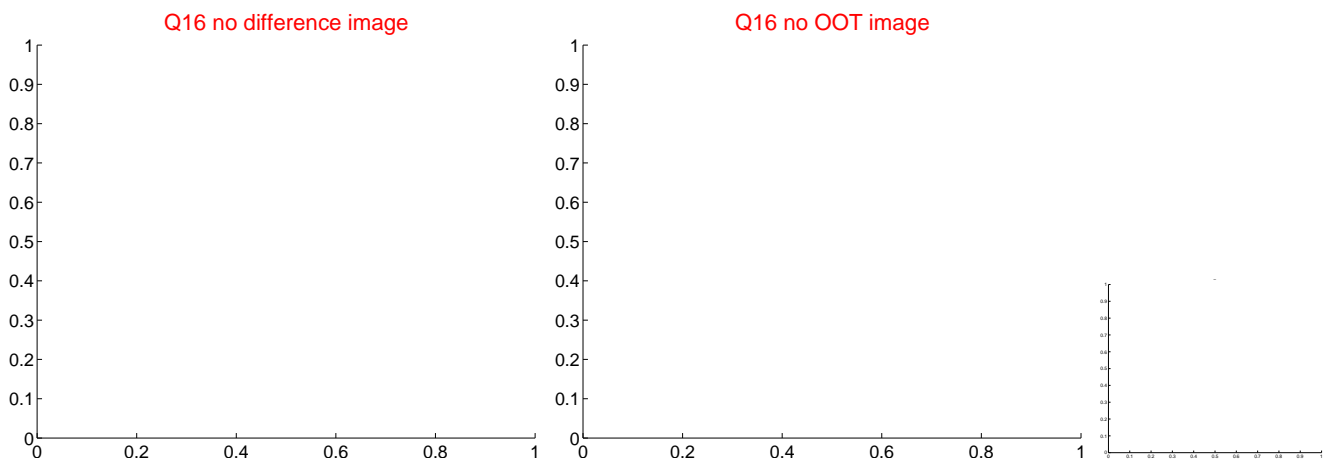
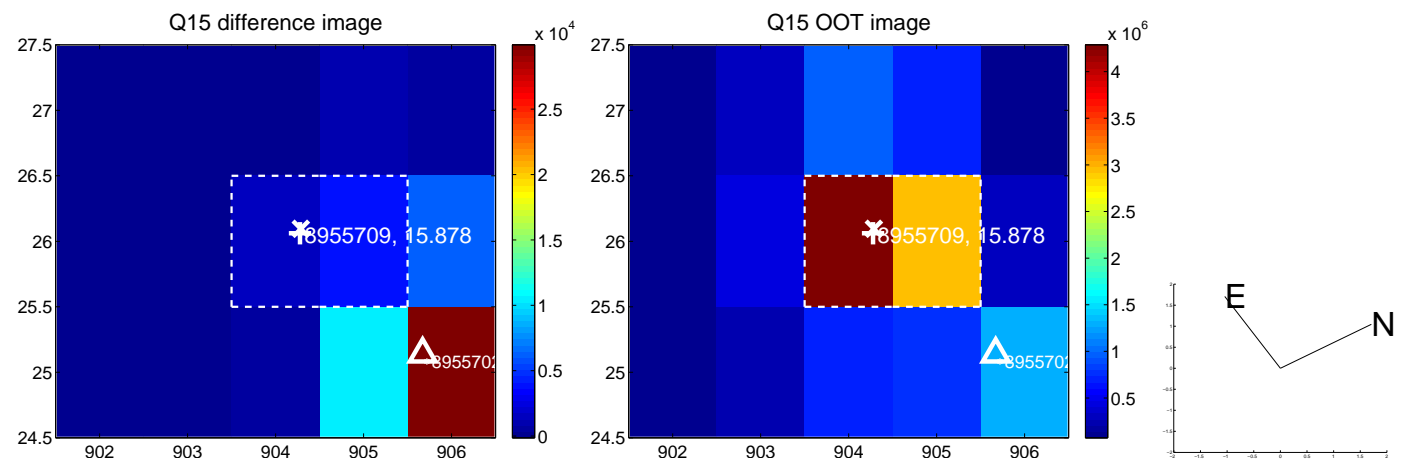
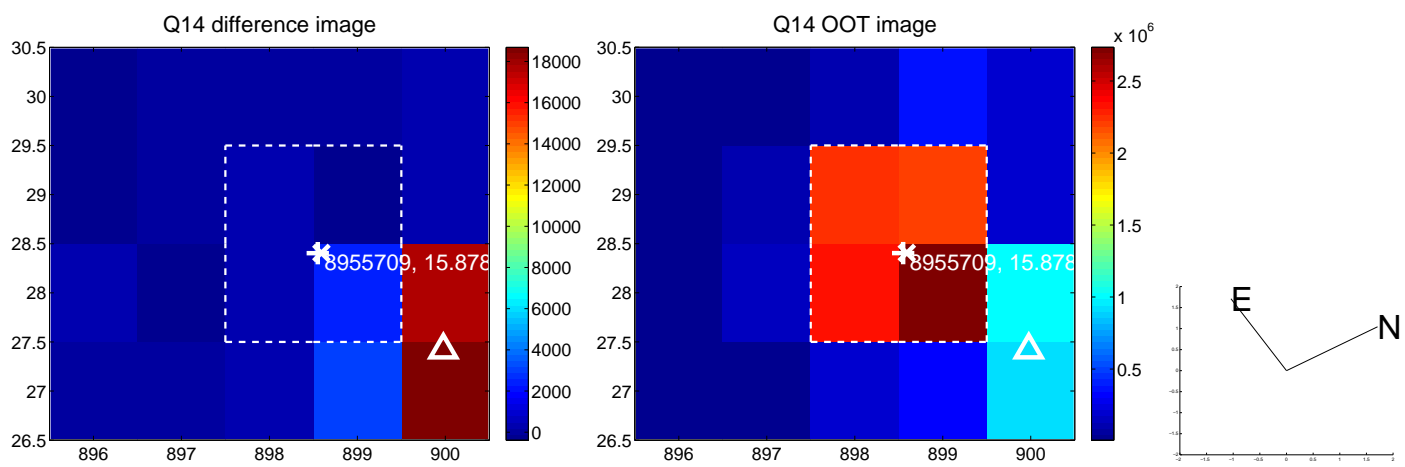
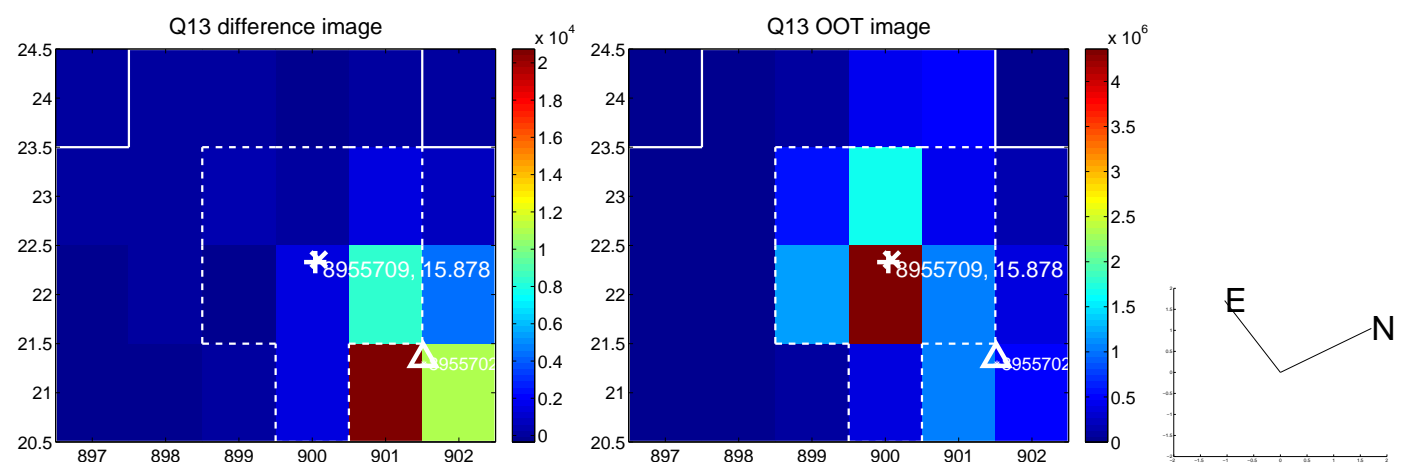
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



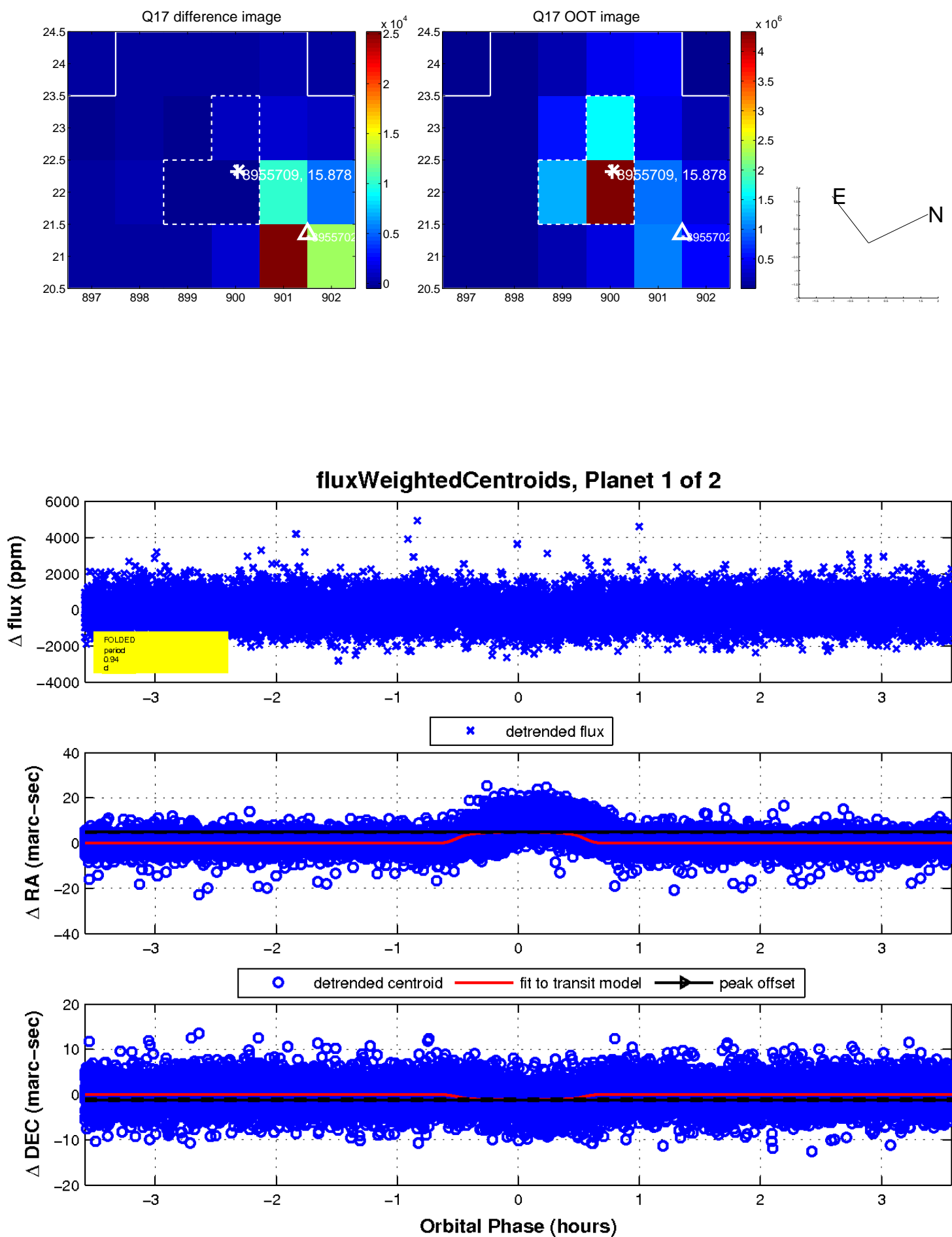
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

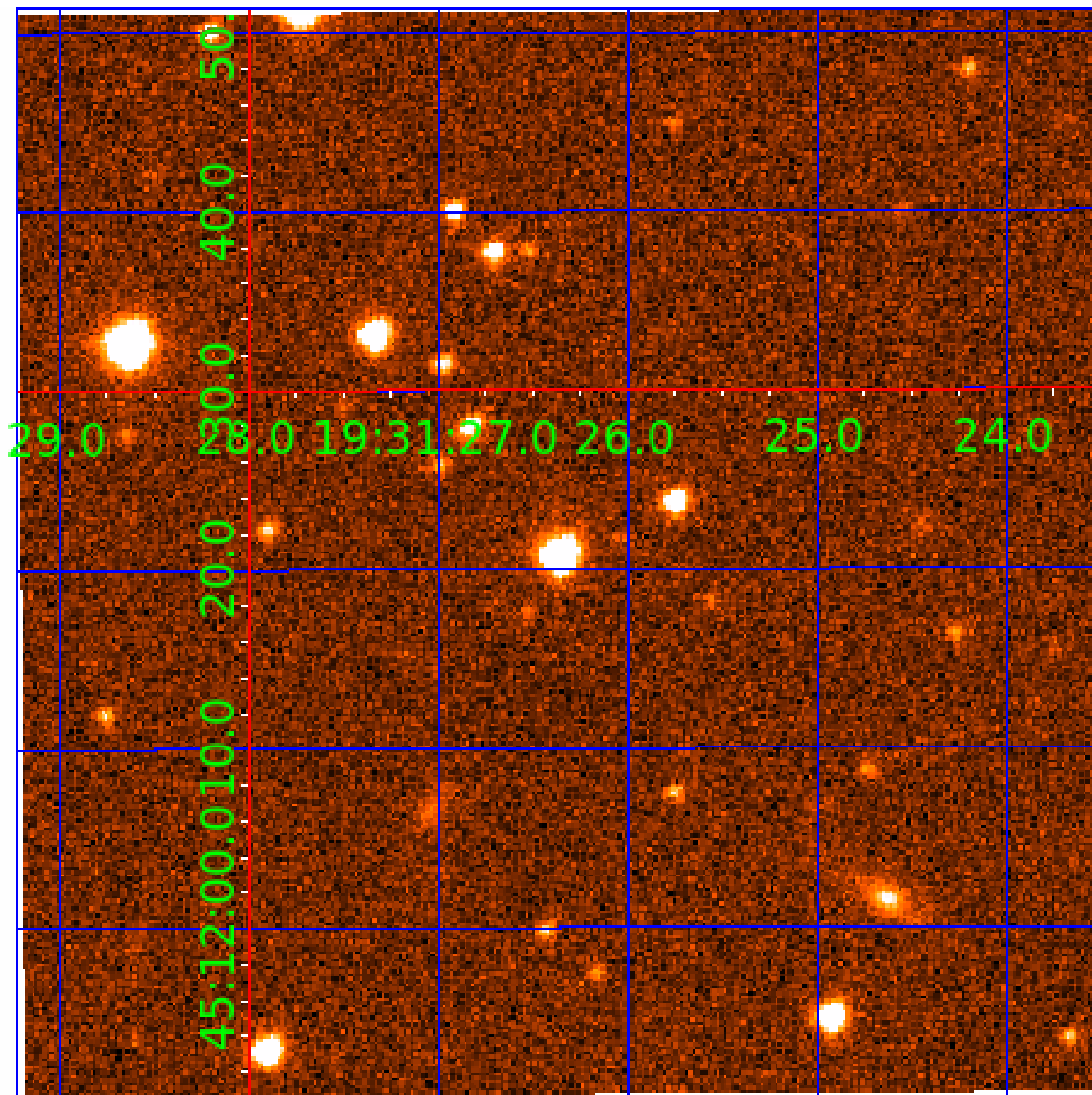


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008955709

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})
008955709-01	OBS	No	0.942989	131.771867	261.2	1.193	12.7	14.2	0.69	4499	1.40	642.45
008955709-02	OBS	4471.01	0.942998	132.242453	302.0	1.012	11.9	15.7	0.69	4499	1.51	642.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008955709-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
008955709-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_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.

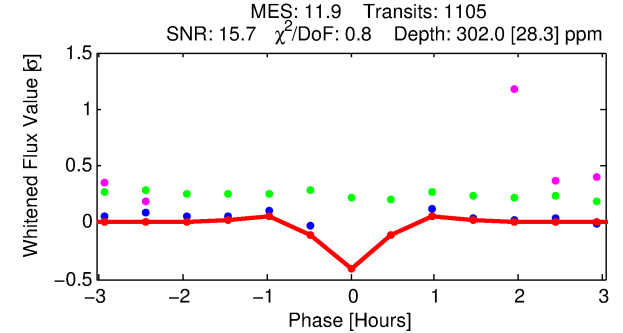
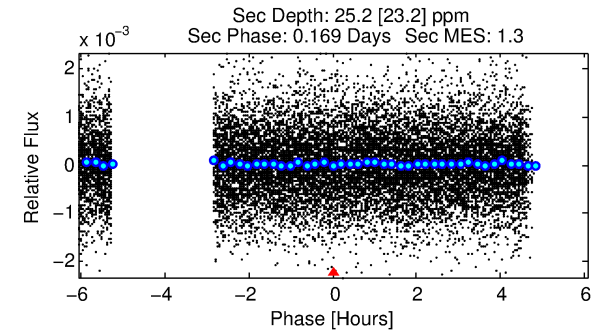
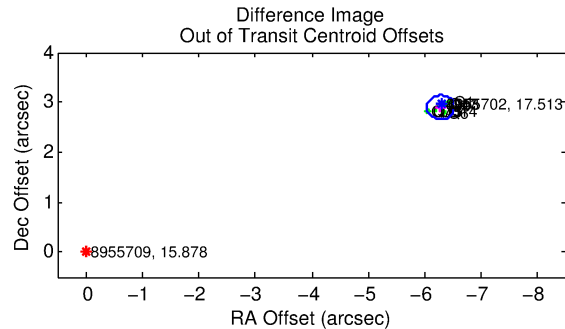
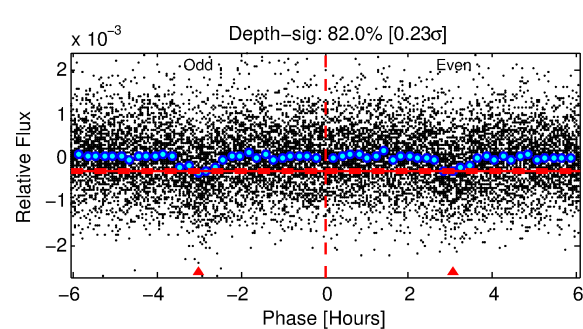
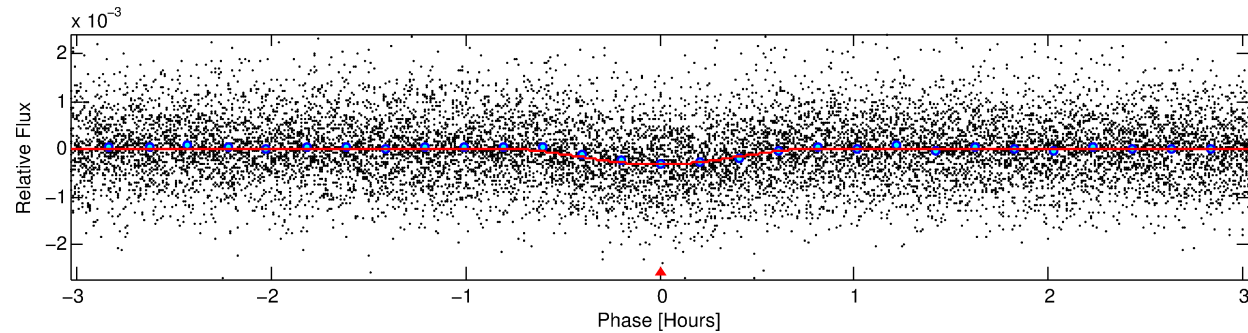
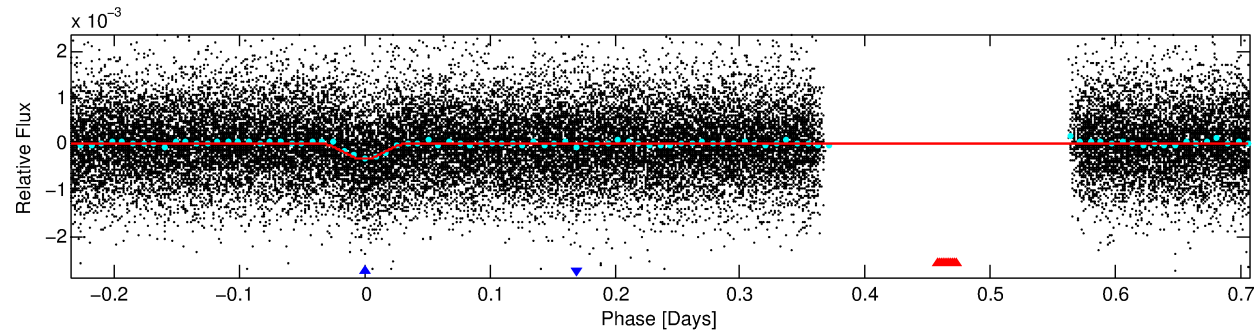
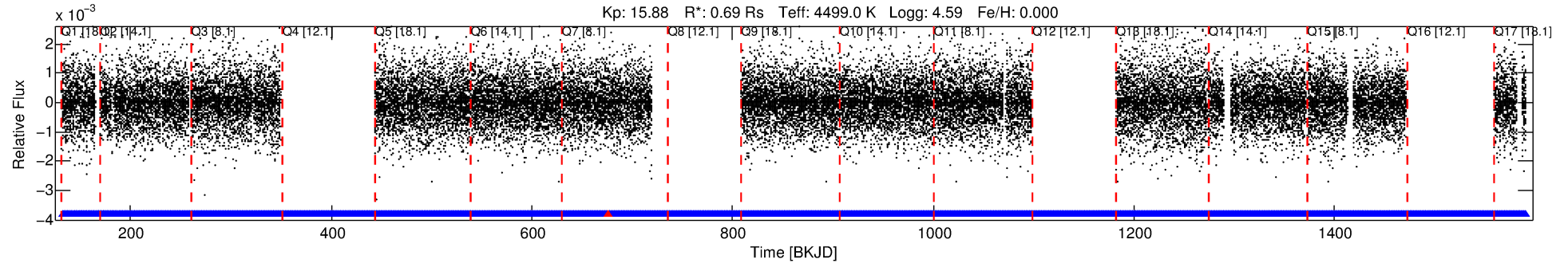
Ephemeris Match Information For 008955709-02

No Significant Match Found

DV One-Page Summary

KIC: 8955709 Candidate: 2 of 2 Period: 0.943 d
KOI: K04471.01 Corr: 0.911

Kp: 15.88 R*: 0.69 Rs Teff: 4499.0 K Logg: 4.59 Fe/H: 0.000



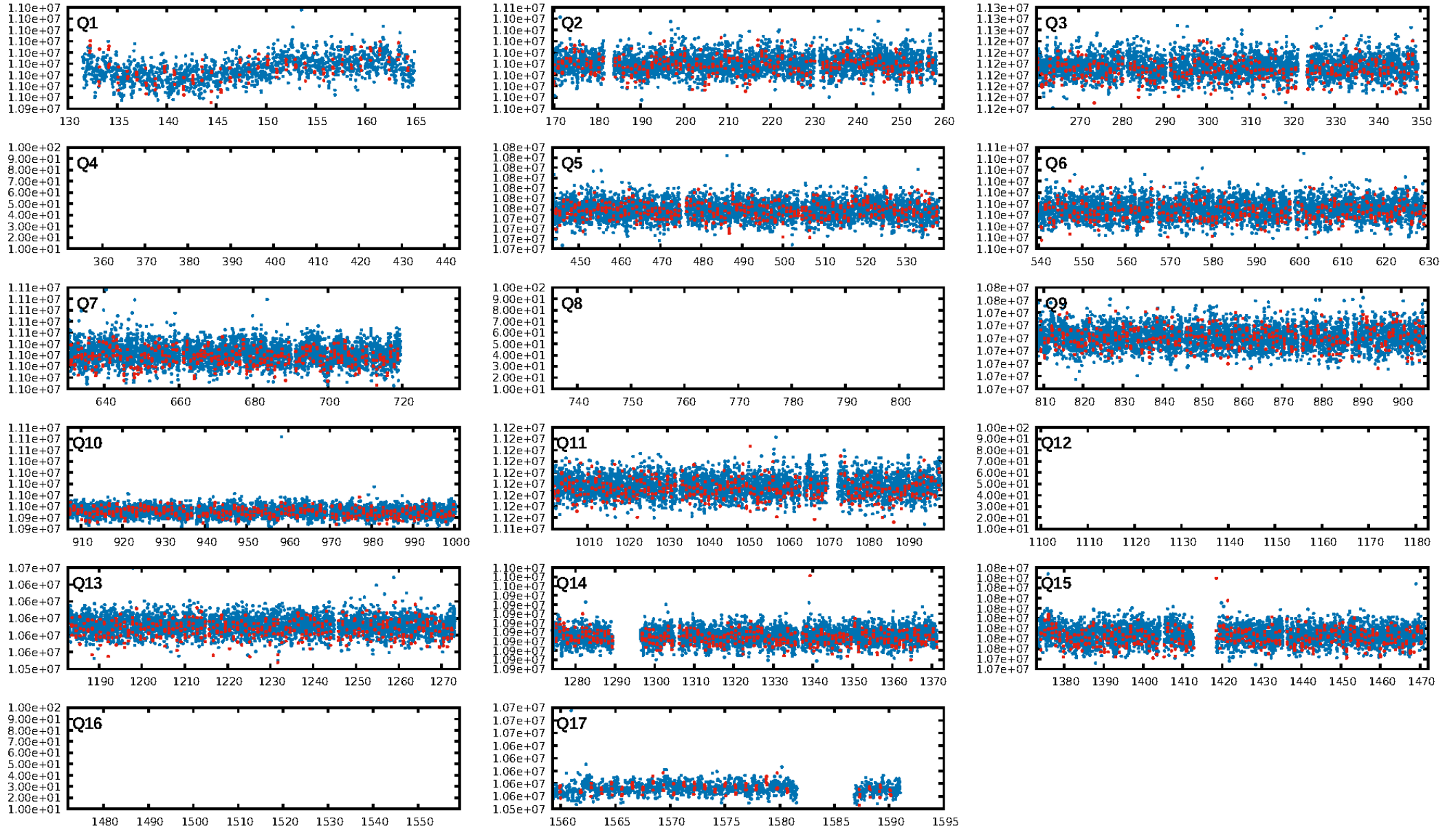
DV Fit Results:

Period = 0.94300 [0.00001] d
Epoch = 132.2425 [0.0009] BKJD
Rp/R* = 0.0199 [0.0117]
a/R* = 3.54 [6.93]
b = 0.90 [0.47]
Seff = 642.44 [101.41]
Teq = 1284 [51] K
Rp = 1.51 [0.90] Re
a = 0.0166 [0.0012] AU
Ag = 1.67 [2.50] [0.27σ]
Teffp = 2257 [846] K [1.15σ]

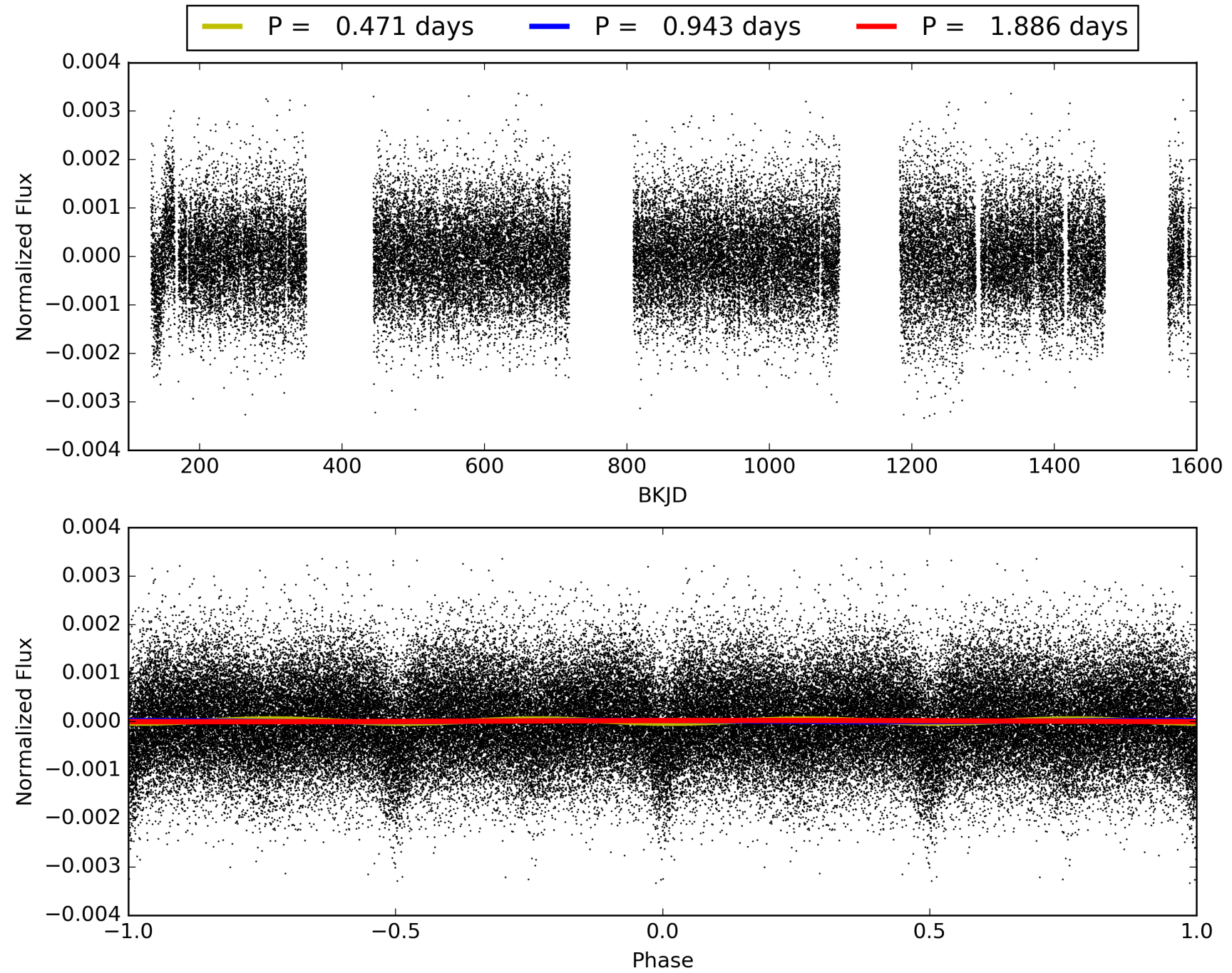
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 2.74e-29
RollingBand-fgt: 1.00 [1043/1044]
GhostDiagnostic-chr: -0.1265
Centroid-sig: 0.0%
Centroid-so: 25.430 arcsec [37.69σ]
OotOffset-rm: 6.913 arcsec [85.52σ]
KicOffset-rm: 6.852 arcsec [94.08σ]
OotOffset-st: 2/4/0/5 [11]
KicOffset-st: 2/4/0/5 [11]
DiffImageQuality-fgm: 1.00 [11/11]
DiffImageOverlap-fno: 1.00 [13/13]

TCE 008955709-02, PDC Light Curves

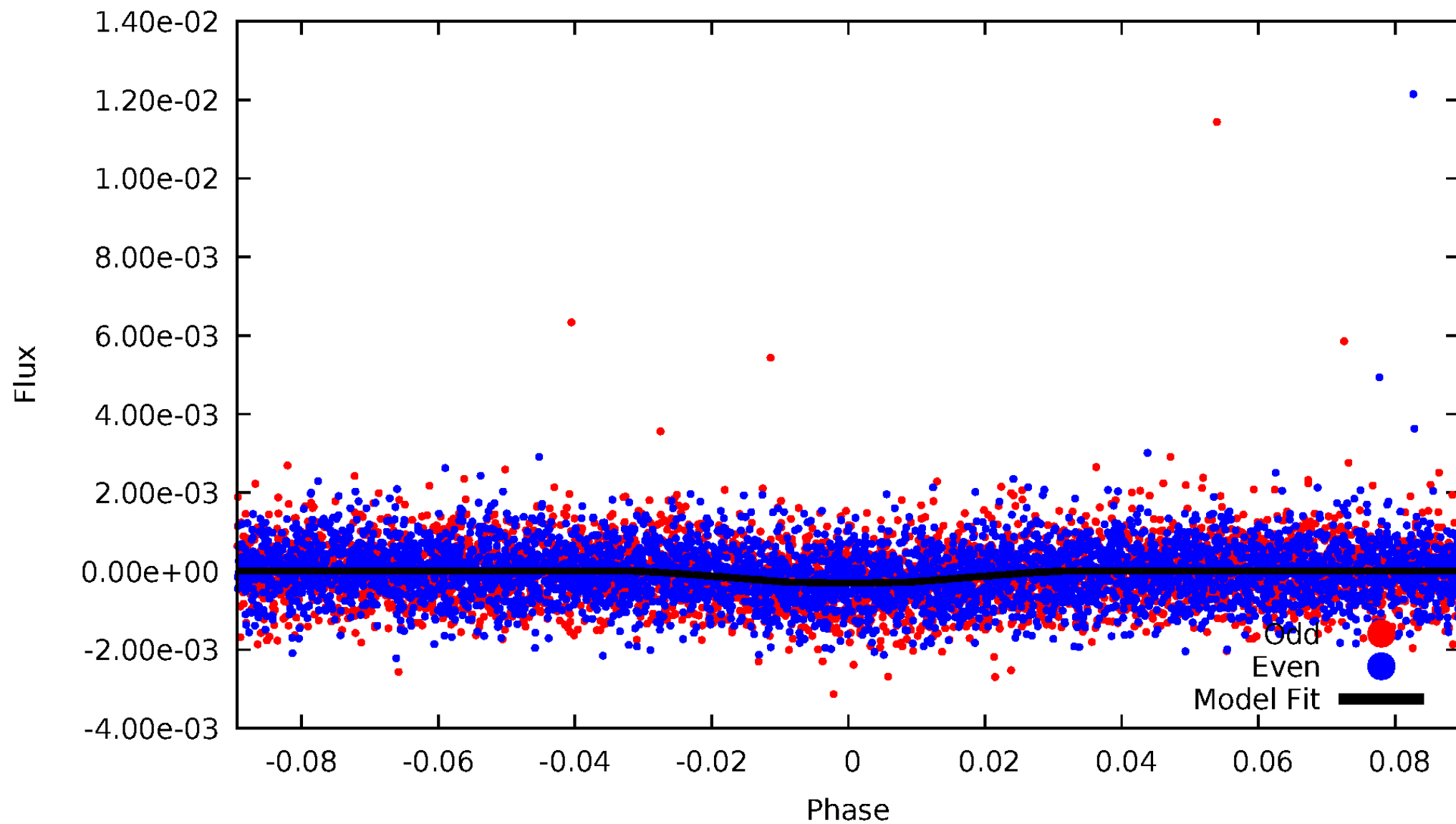


TCE 008955709-02



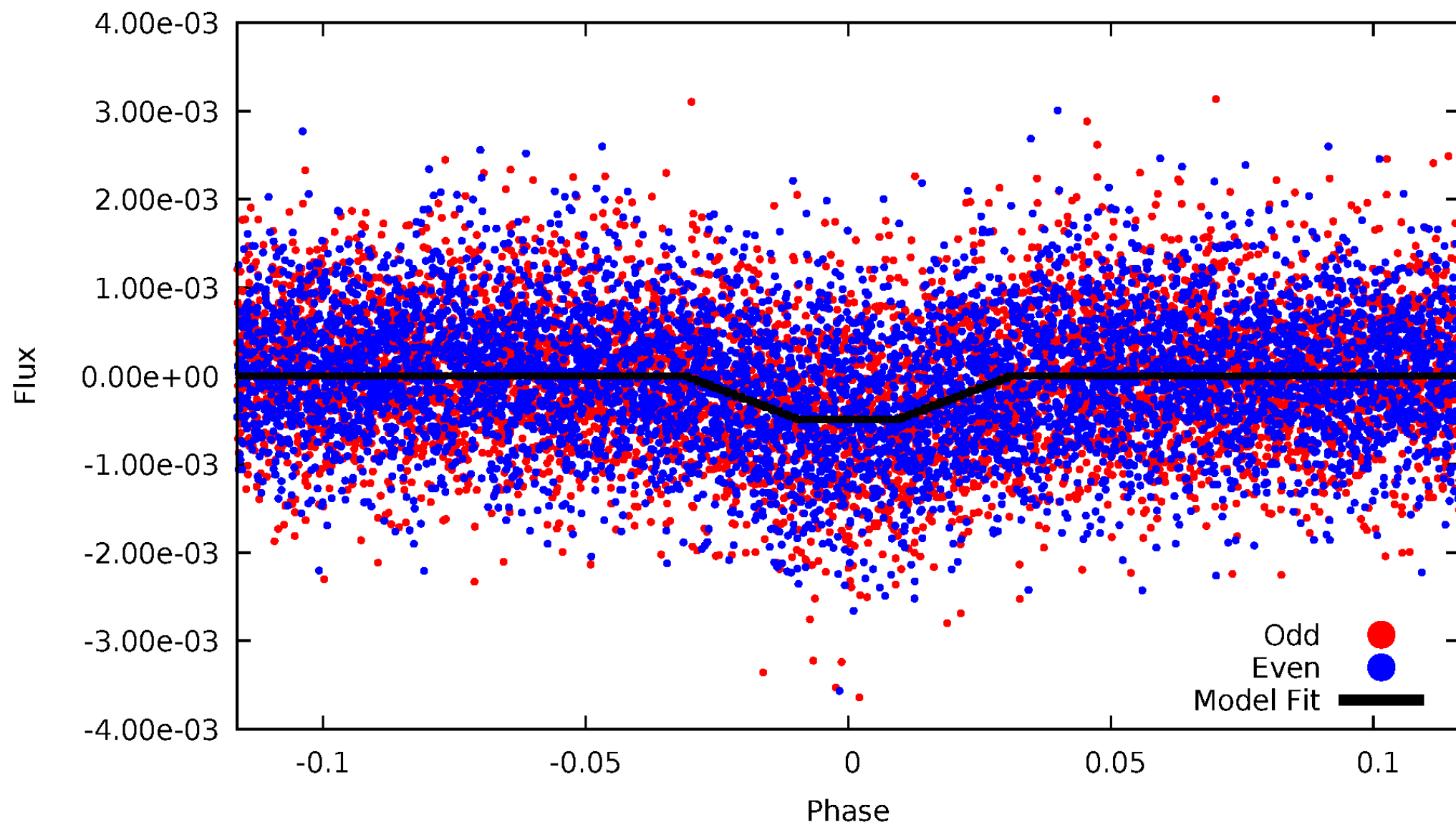
DV Odd/Even

TCE 008955709-02



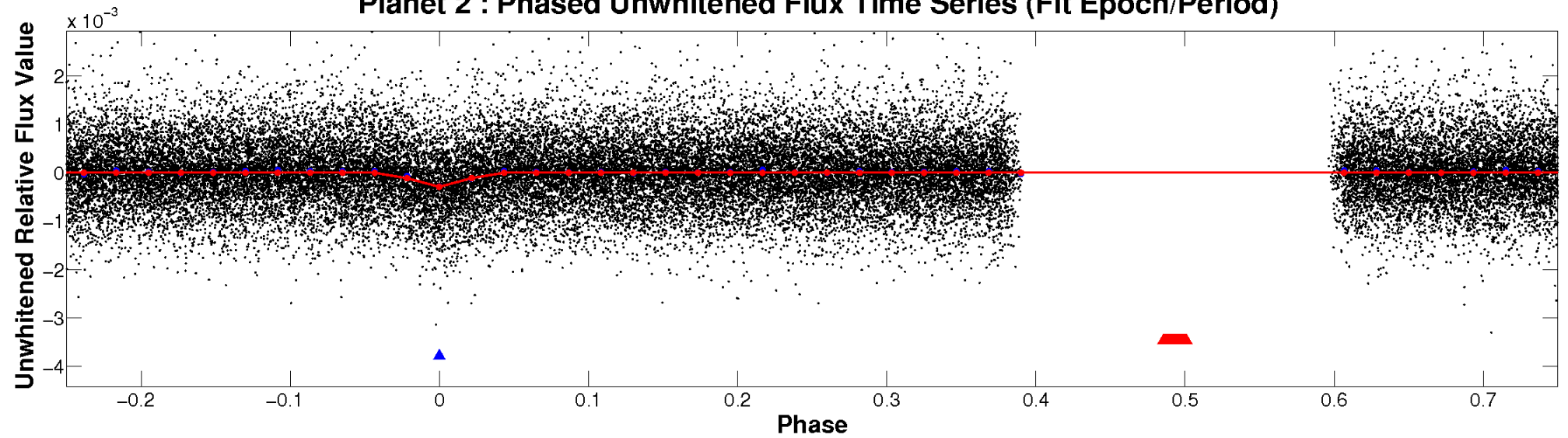
ALT Odd/Even

TCE 008955709-02

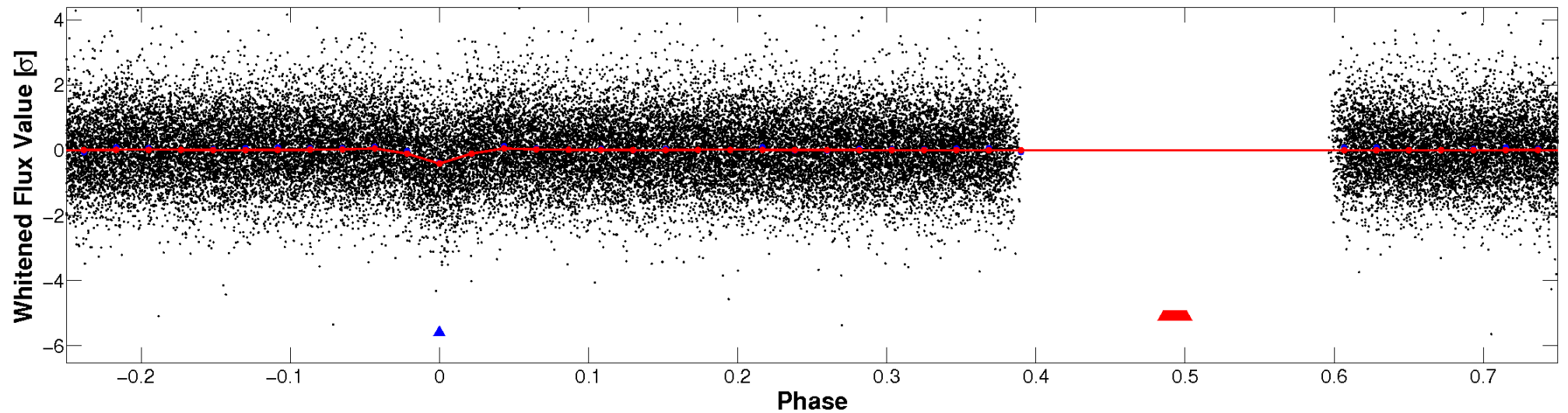


Non-Whitened Vs. Whitened Light Curve

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

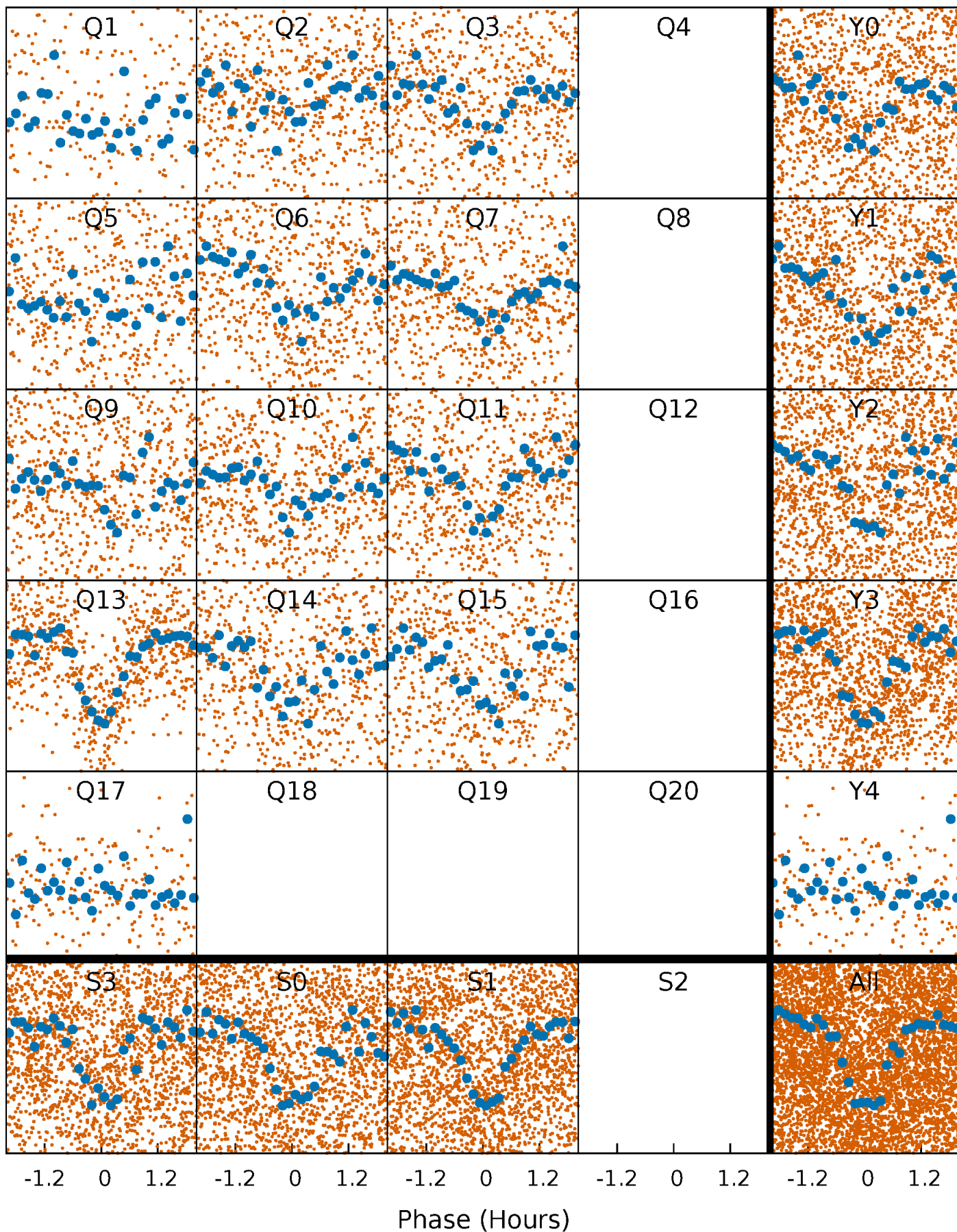


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



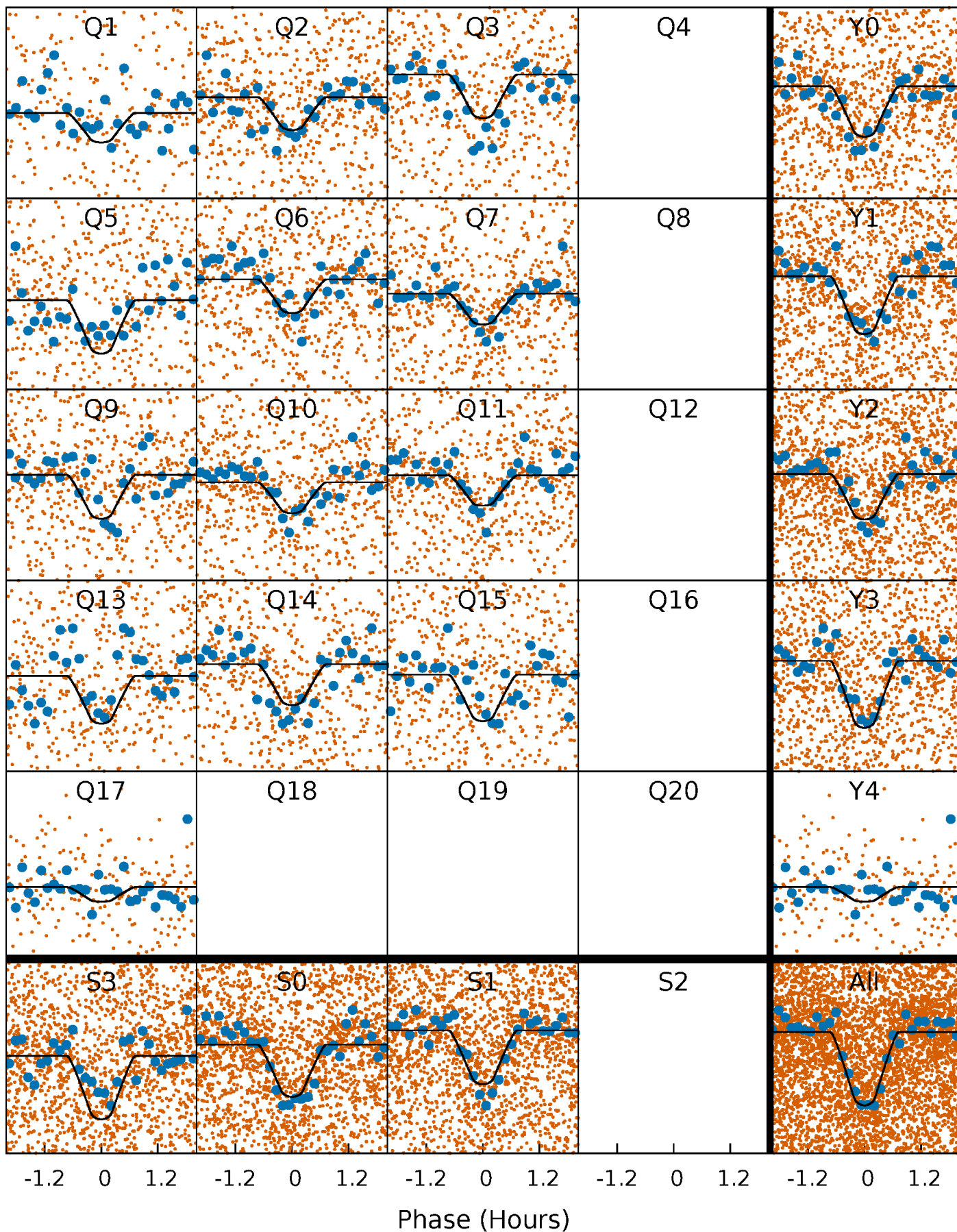
PDC Quarter-Phased Transit Curves

TCE 008955709-02 P= 0.942998 Days $T_0=132.242453$ (BKJD)



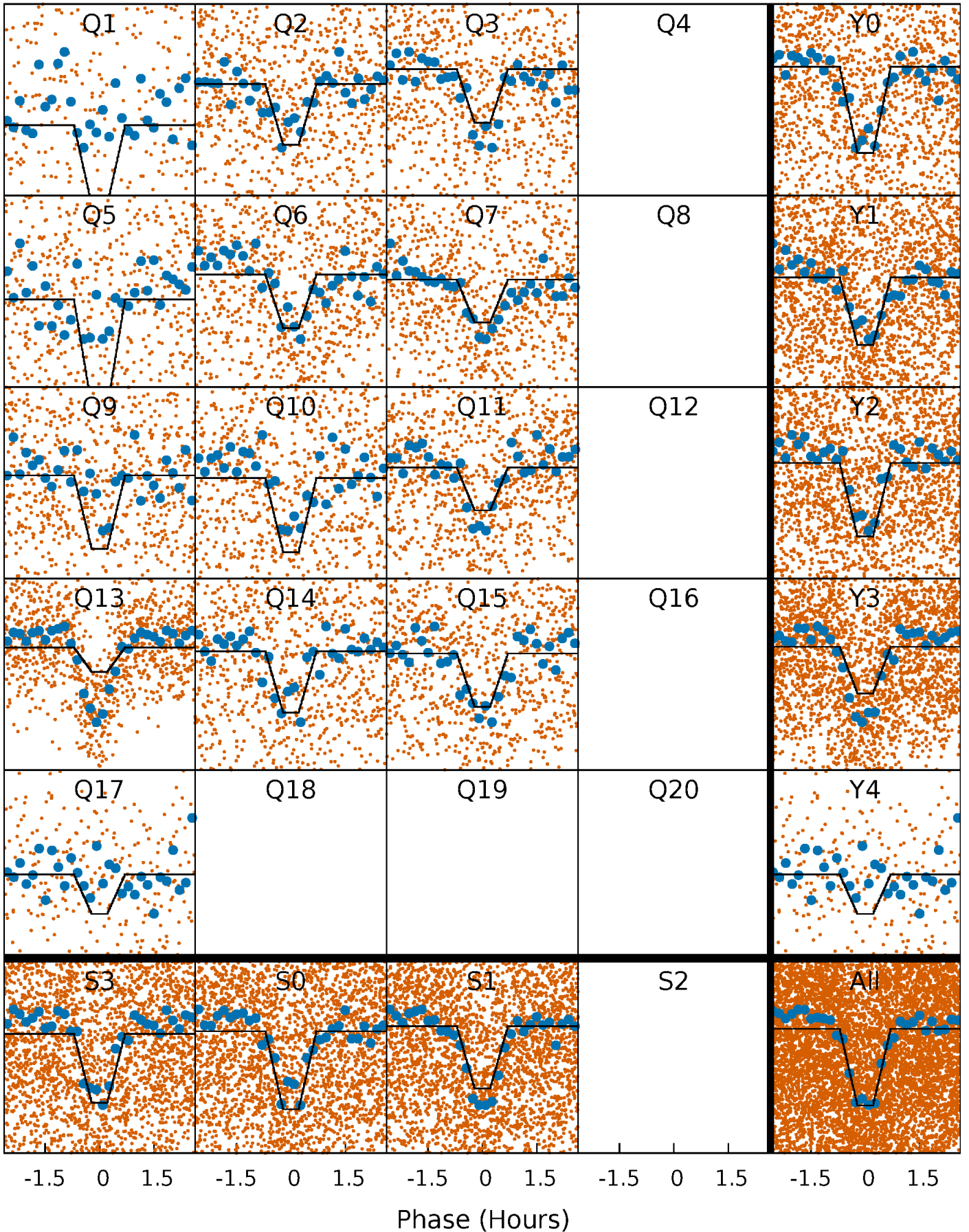
DV Quarter-Phased Transit Curves

TCE 008955709-02 $P = 0.942998$ Days $T_0 = 132.242453$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

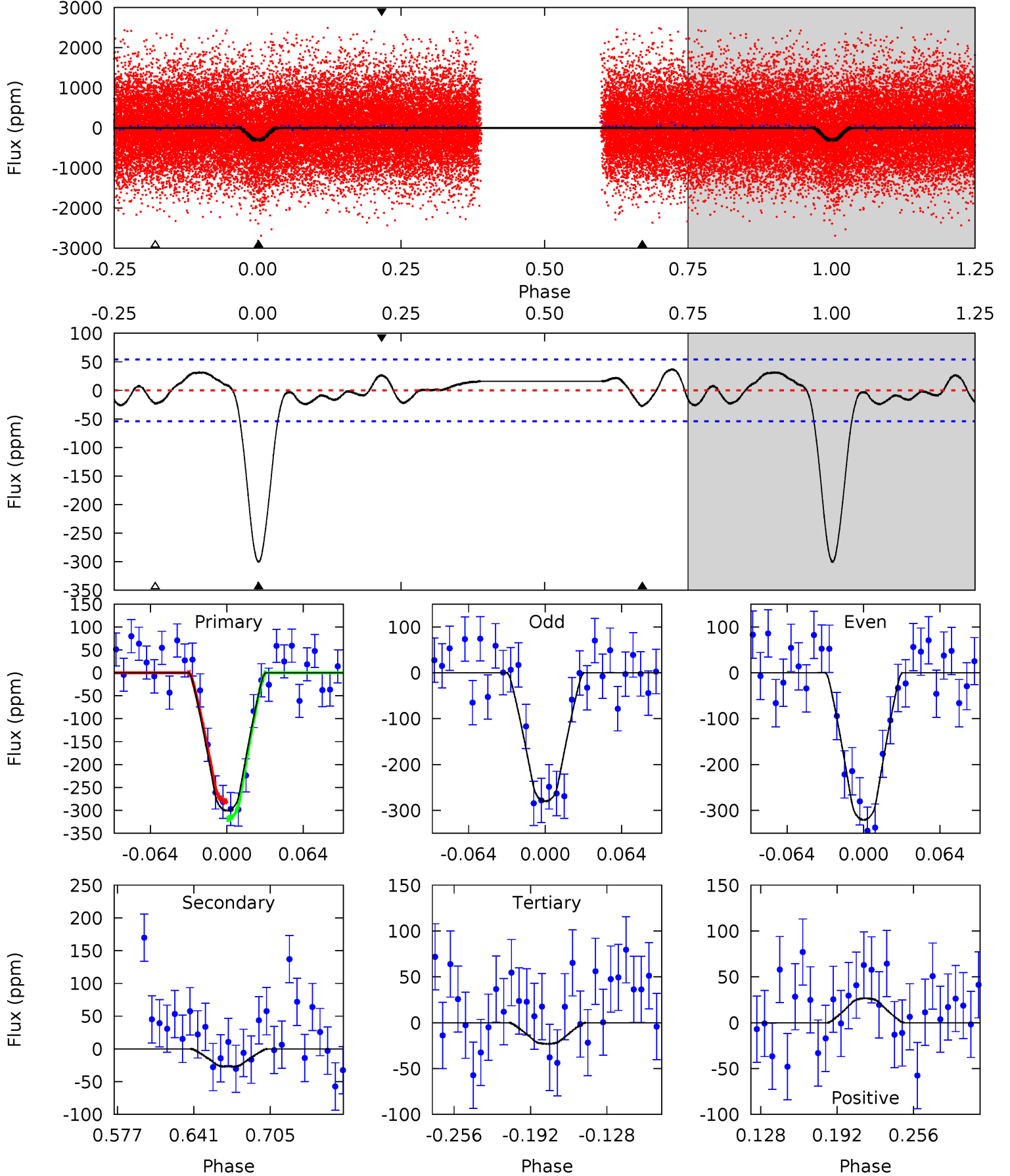
TCE 008955709-02 P= 0.943002 Days $T_0=132.241103$ (BKJD)



DV Model-Shift Uniqueness Test

008955709-02, P = 0.942998 Days, E = 131.299455 Days

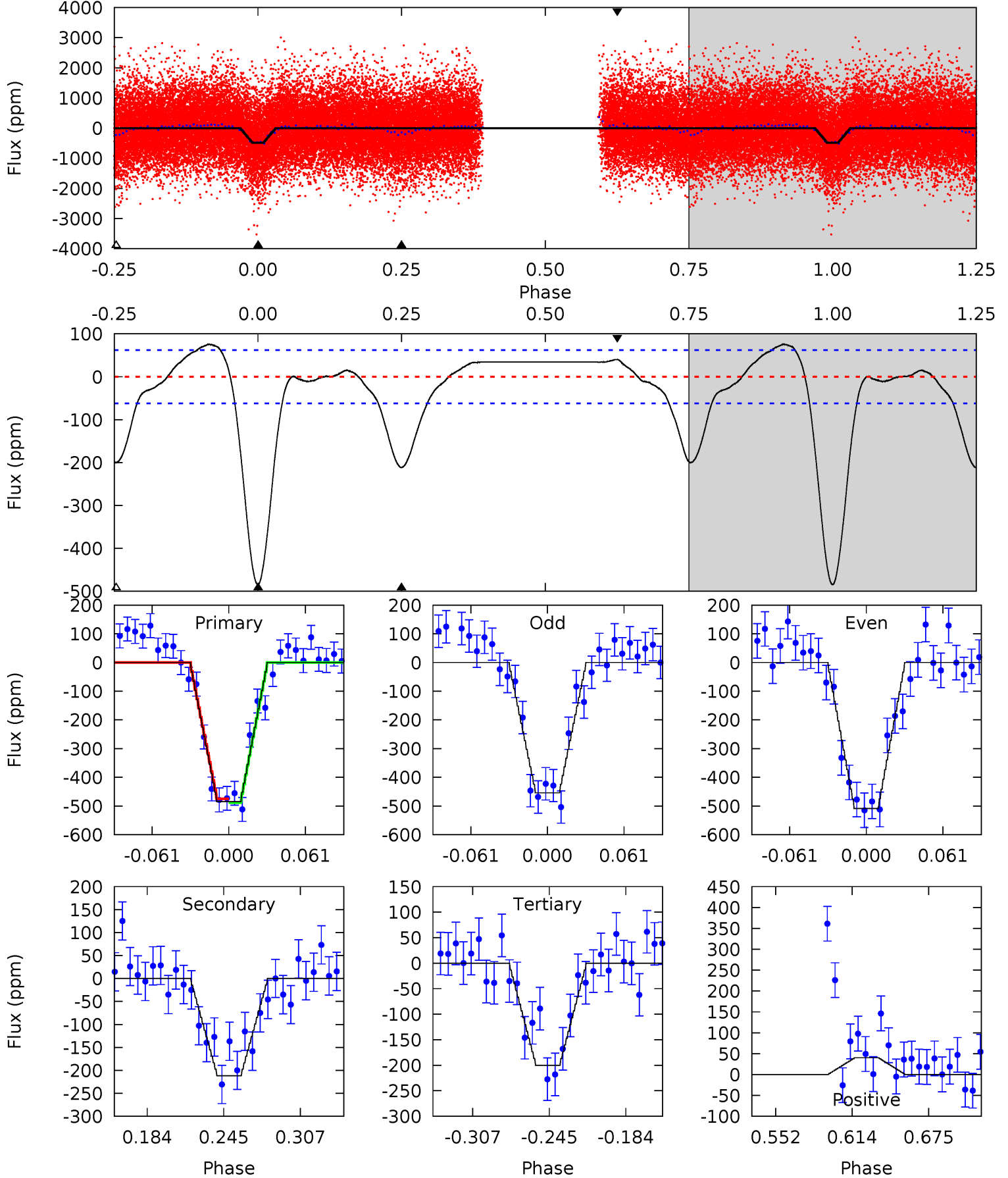
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.9	2.37	1.99	2.28	4.66	1.85	1.37	23.9	23.6	0.38	0.08	1.75	1.05	0.11	1.64



Alt Model-Shift Uniqueness Test

008955709-02, P = 0.943002 Days, E = 131.298101 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.4	15.9	15.0	3.02	4.67	1.87	4.66	21.4	33.4	0.86	12.9	2.05	0.97	0.14	0.52



Stellar Parameters For KIC 008955709

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4499^{+121}_{-134}	$4.590^{+0.056}_{-0.020}$	$0.000^{+0.250}_{-0.300}$	$0.693^{+0.038}_{-0.060}$	$0.681^{+0.066}_{-0.054}$	$2.882^{+0.728}_{-0.265}$
	+3%/-3%	+1%/-0%	+inf%/-inf%	+5%/-9%	+10%/-8%	+25%/-9%
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 008955709-02 / KOI 4471.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-27 ± 12	$1.53^{+0.93}_{-0.77}$	1777^{+62}_{-61}	2791^{+751}_{-491}	$1.710^{+5.465}_{-1.122}$
Alt.	-212 ± 13	$1.68^{+0.97}_{-0.82}$	1778^{+55}_{-57}	3831^{+1157}_{-539}	12^{+32}_{-7}

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 $A_{obs} \gg 1.0$

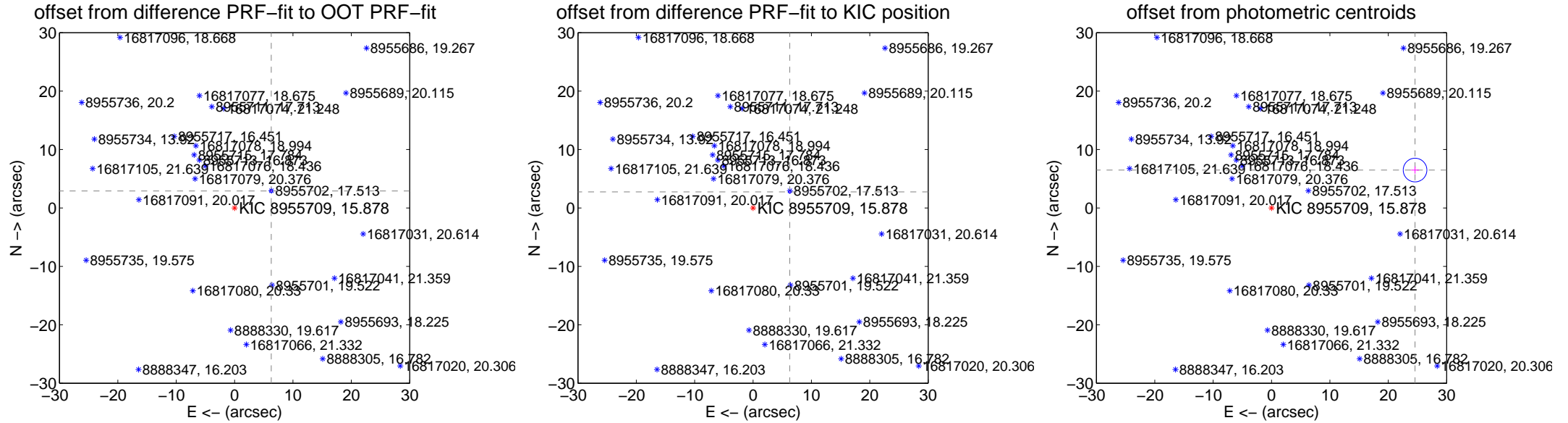
DV Centroid Data

Supplemental centroid analysis for 008955709-02. Kepler magnitude: 15.88. Transit SNR 15.68

There are 11 quarters with good PRF difference image offsets

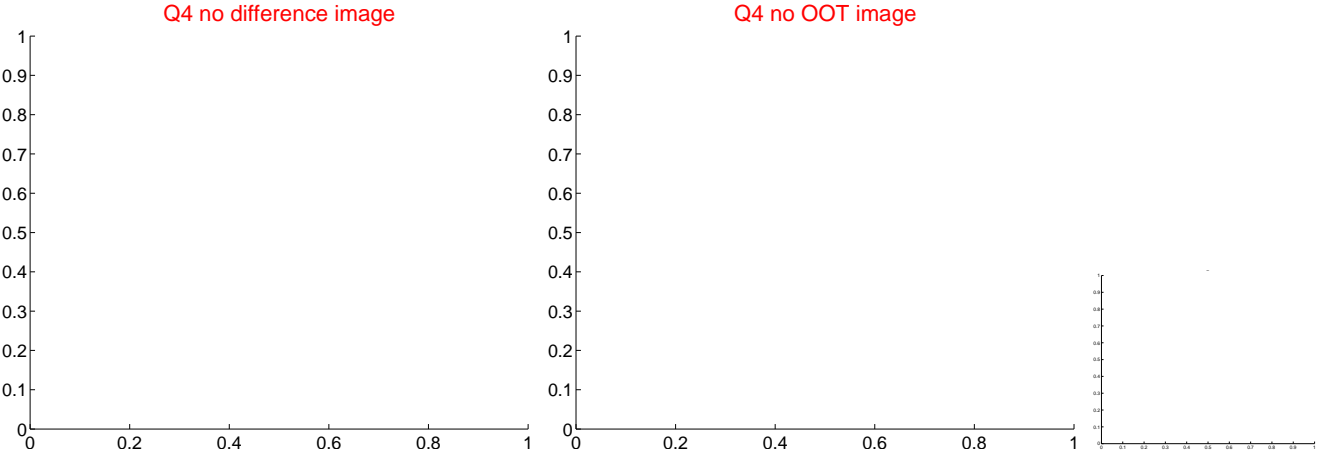
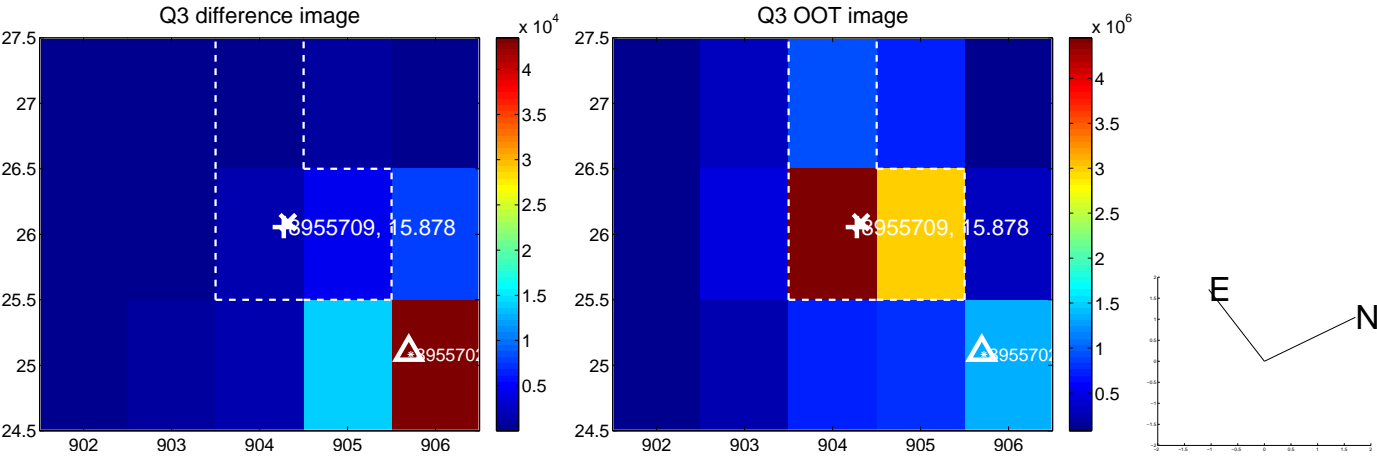
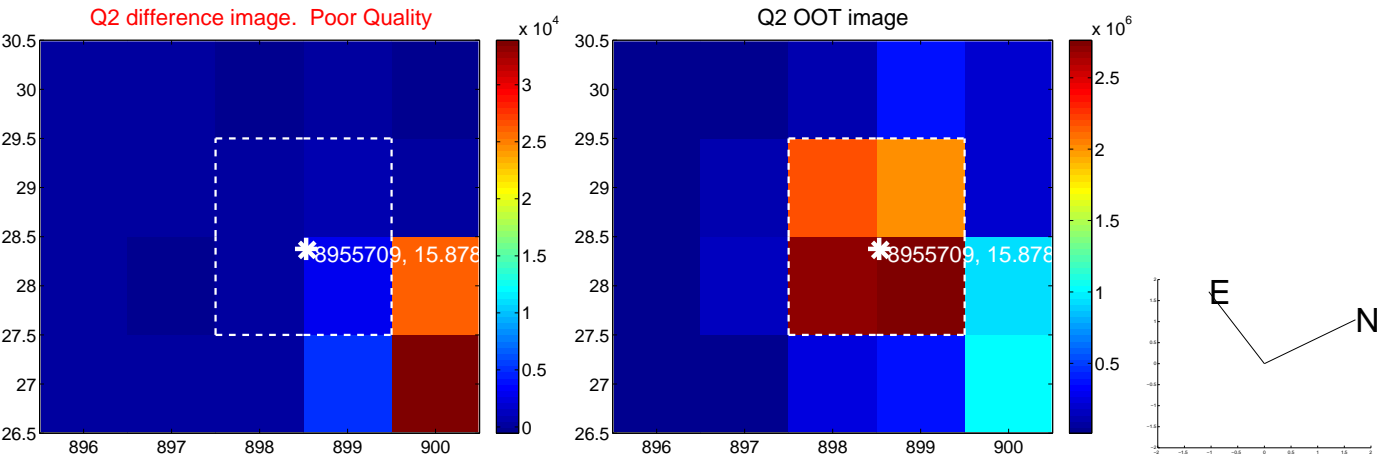
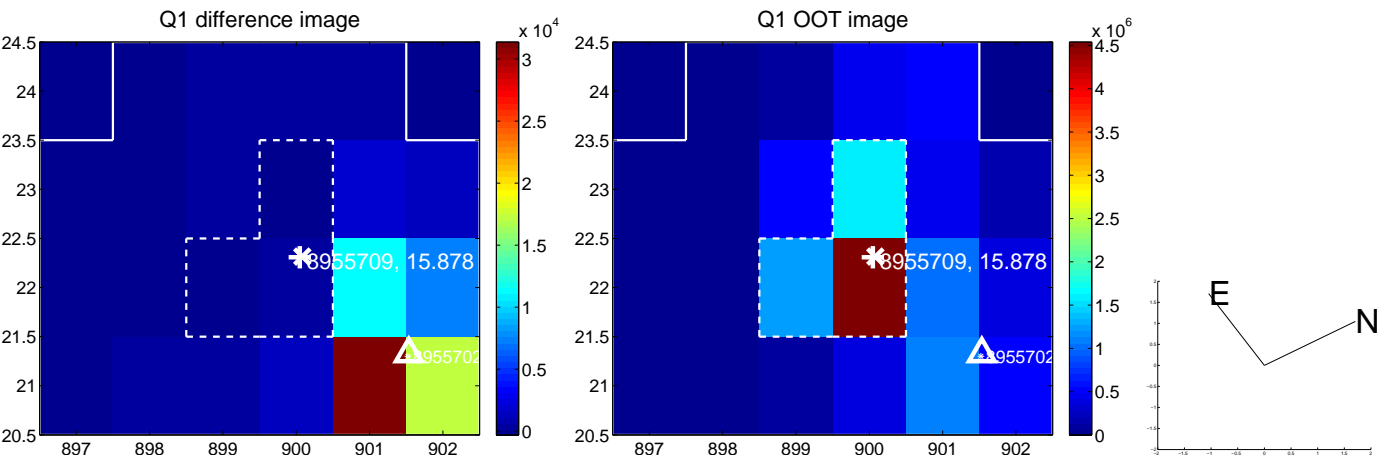
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	6.913 \pm 0.081	85.52	-6.277 \pm 0.083	2.897 \pm 0.071
PRF-fit source offset from KIC position	6.852 \pm 0.073	94.08	-6.278 \pm 0.072	2.747 \pm 0.070
photometric centroid source offset	25.43 \pm 0.67	37.69	-24.59 \pm 0.68	6.49 \pm 0.62

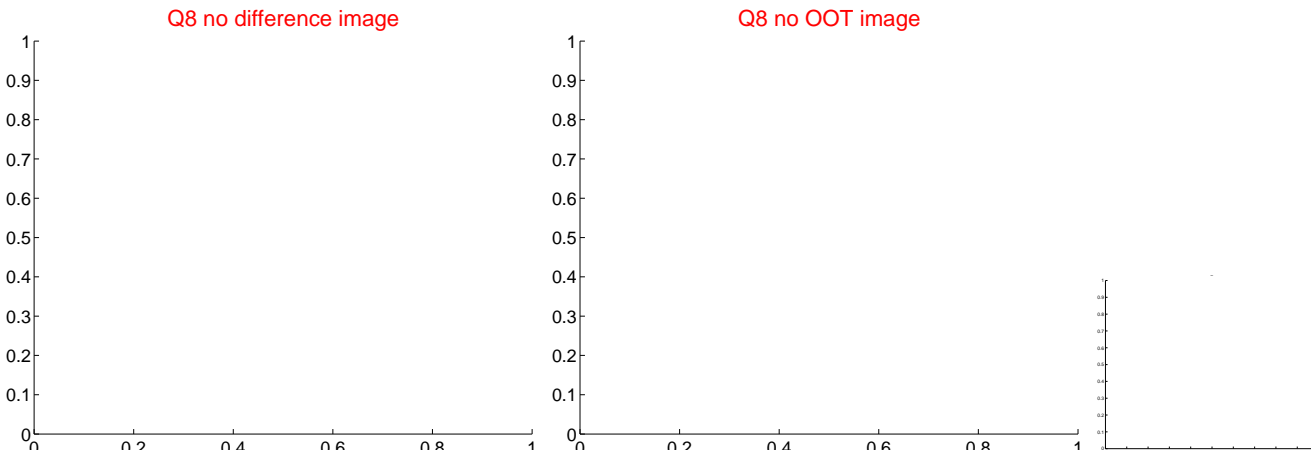
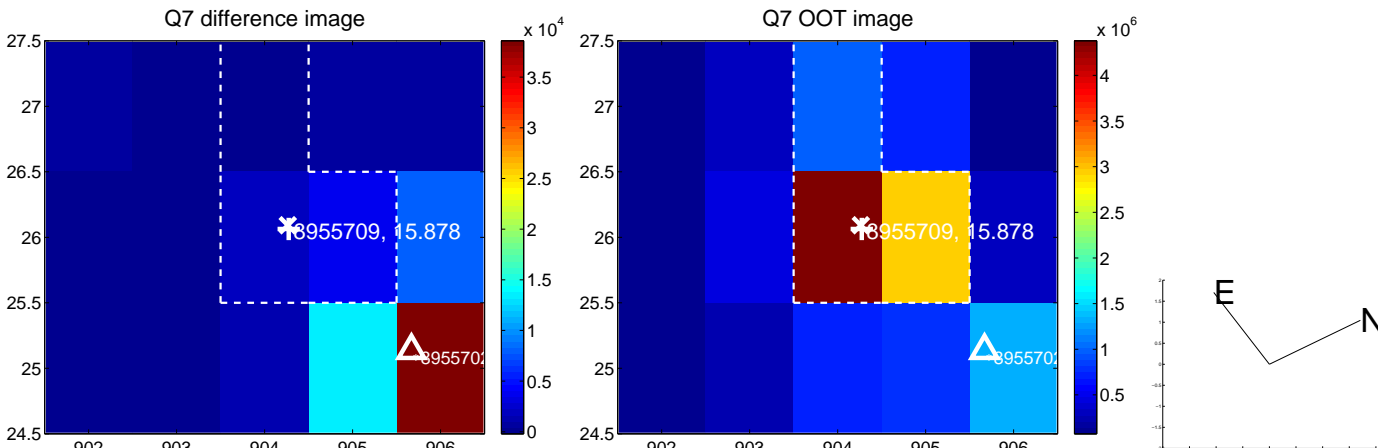
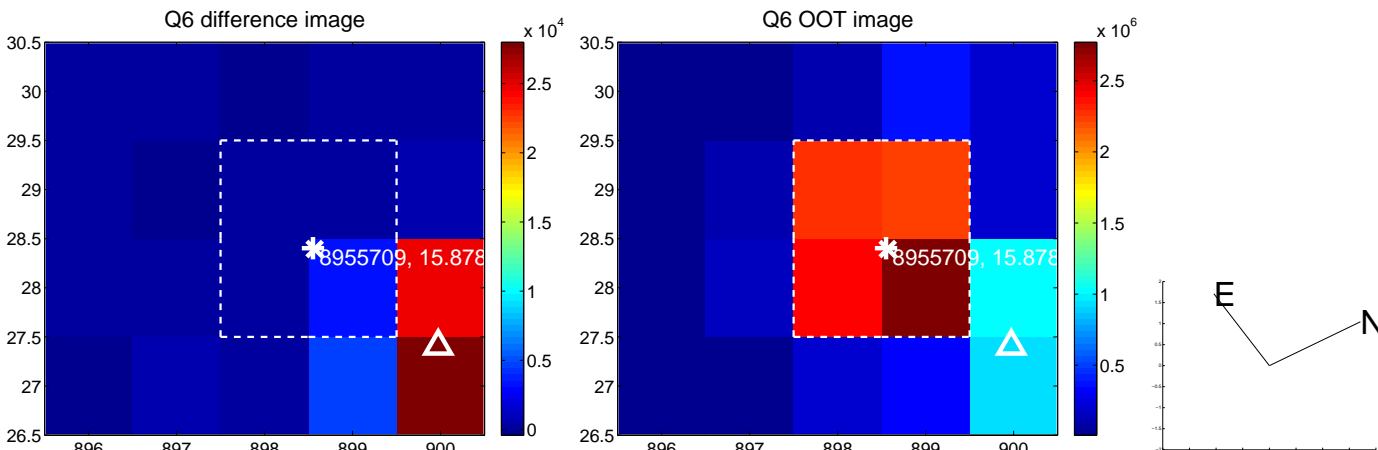
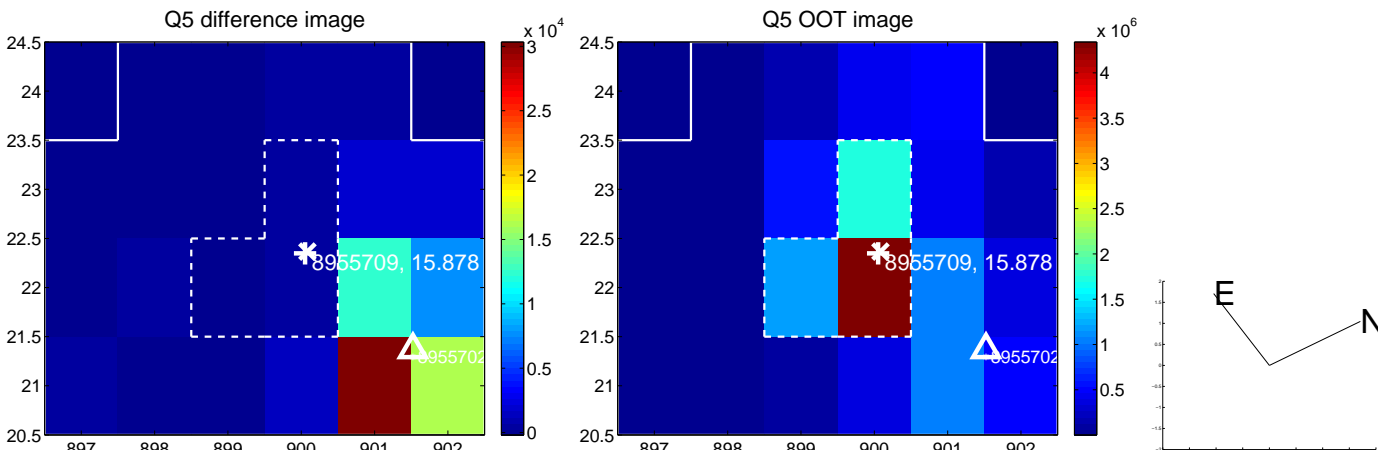


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

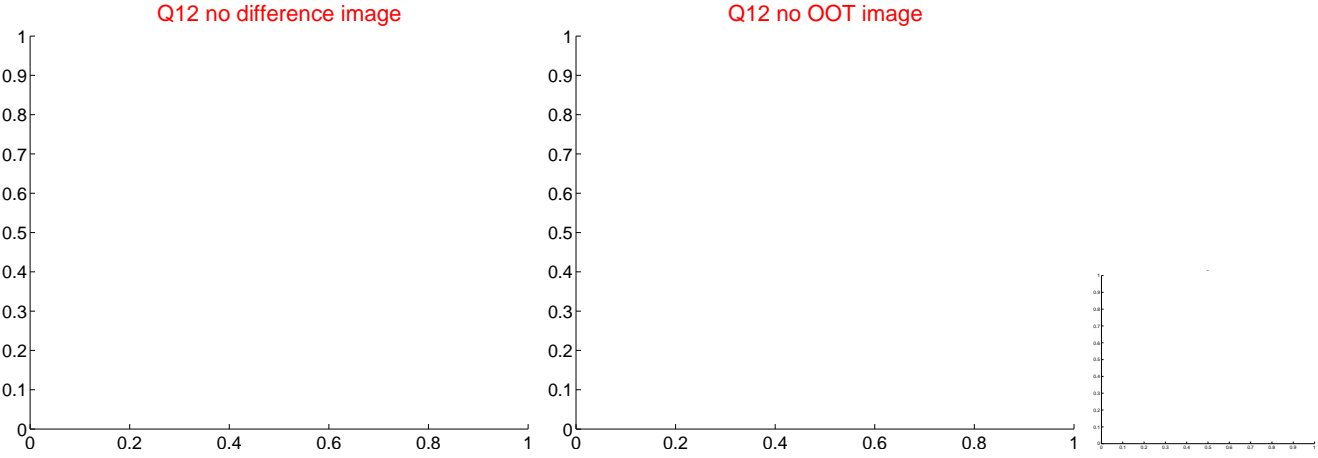
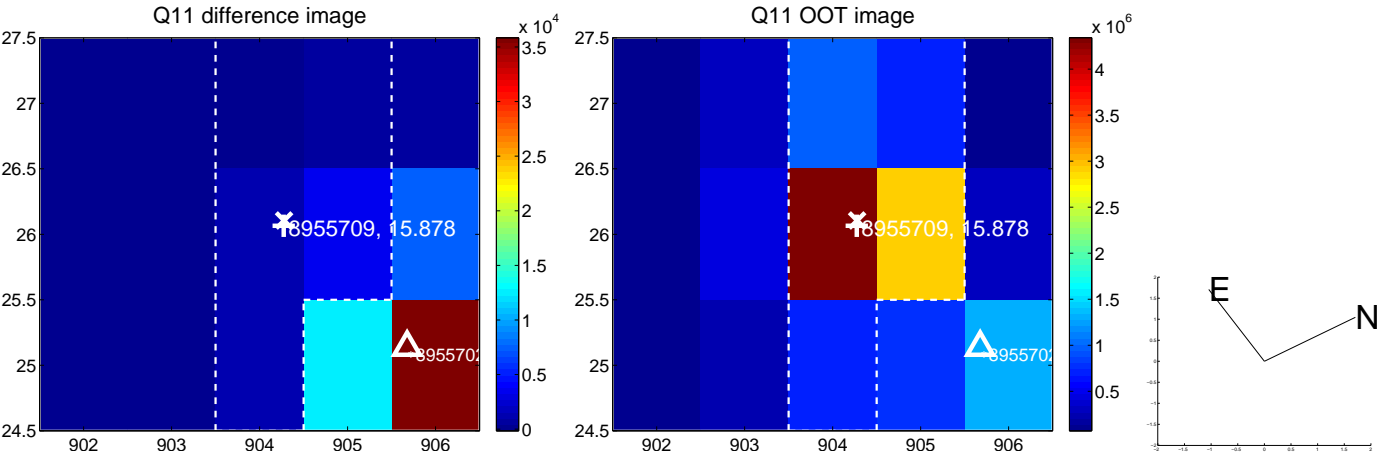
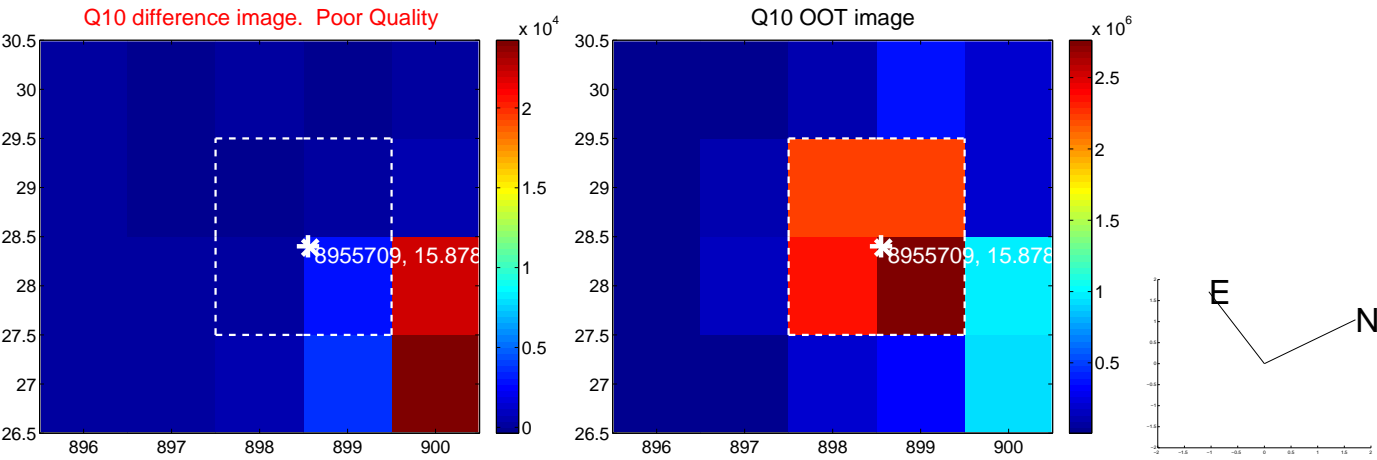
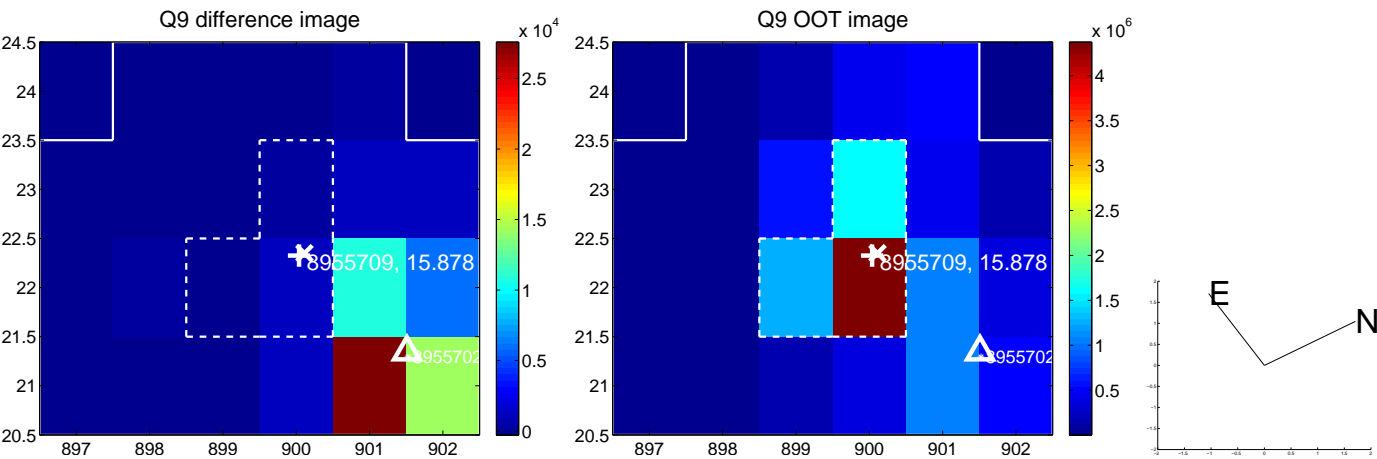
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



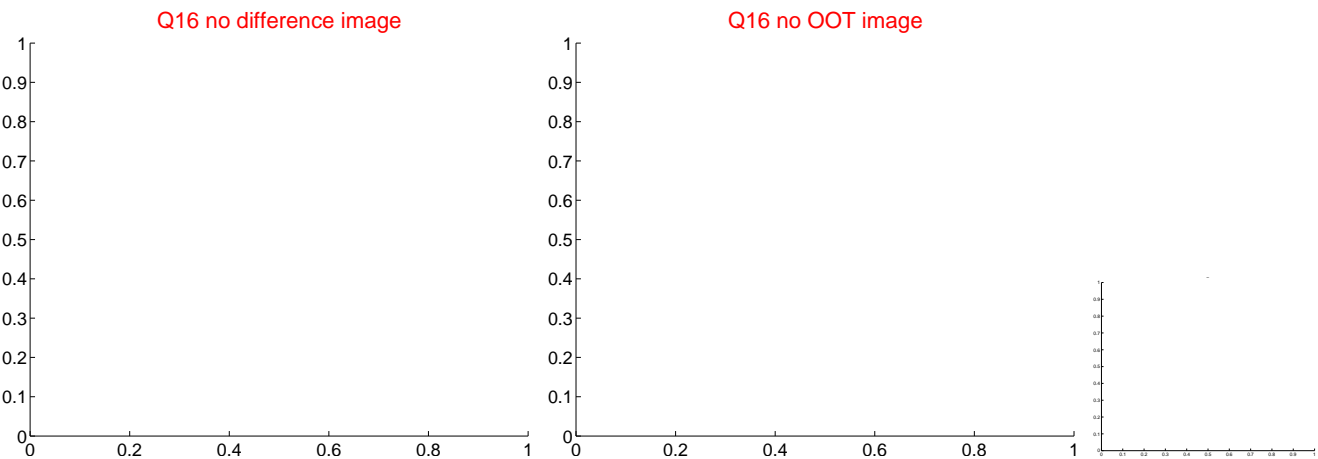
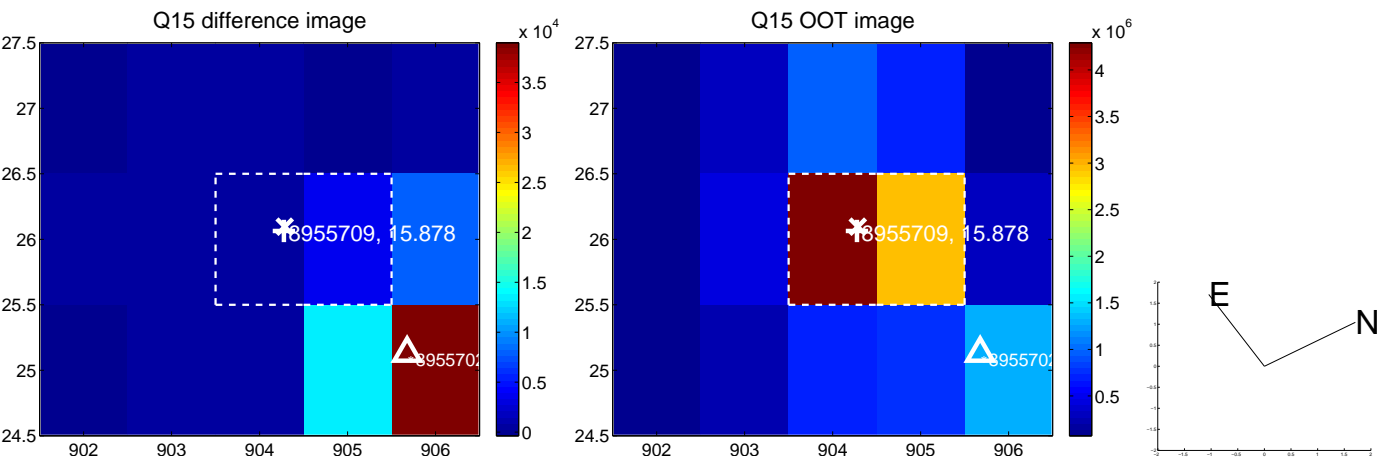
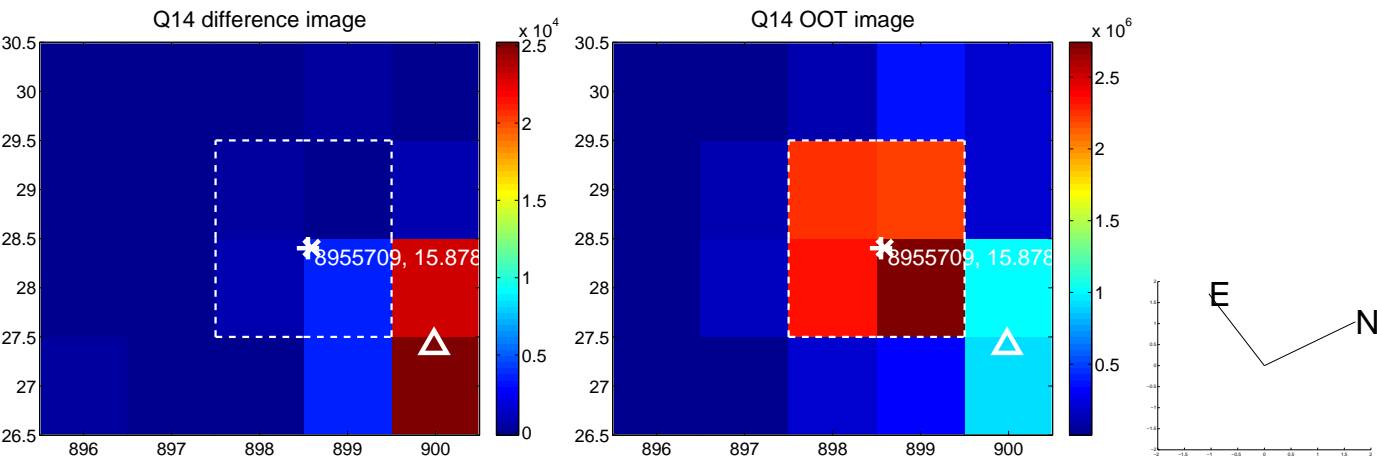
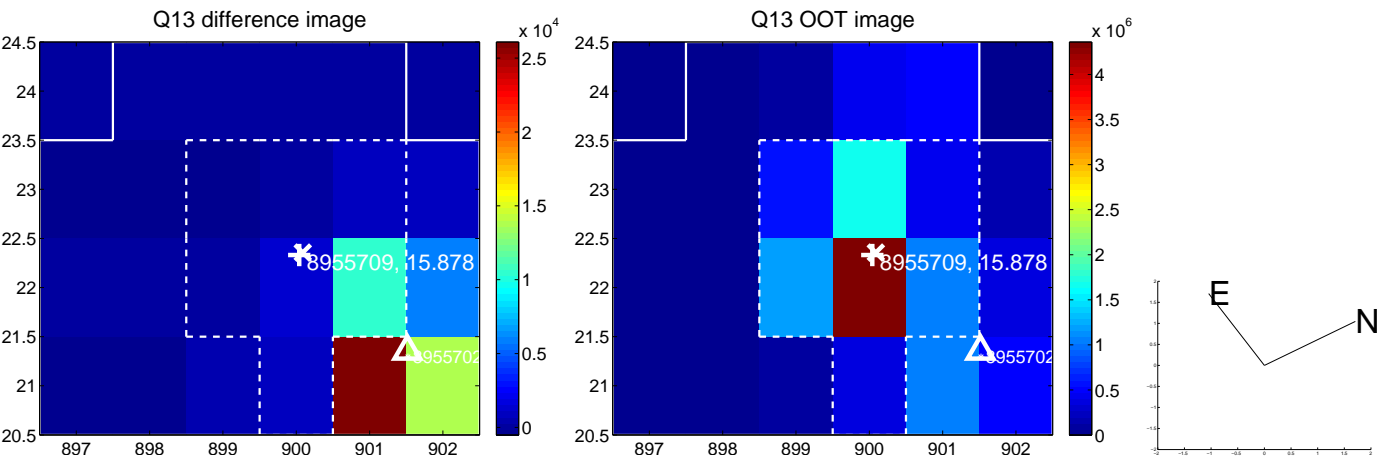
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



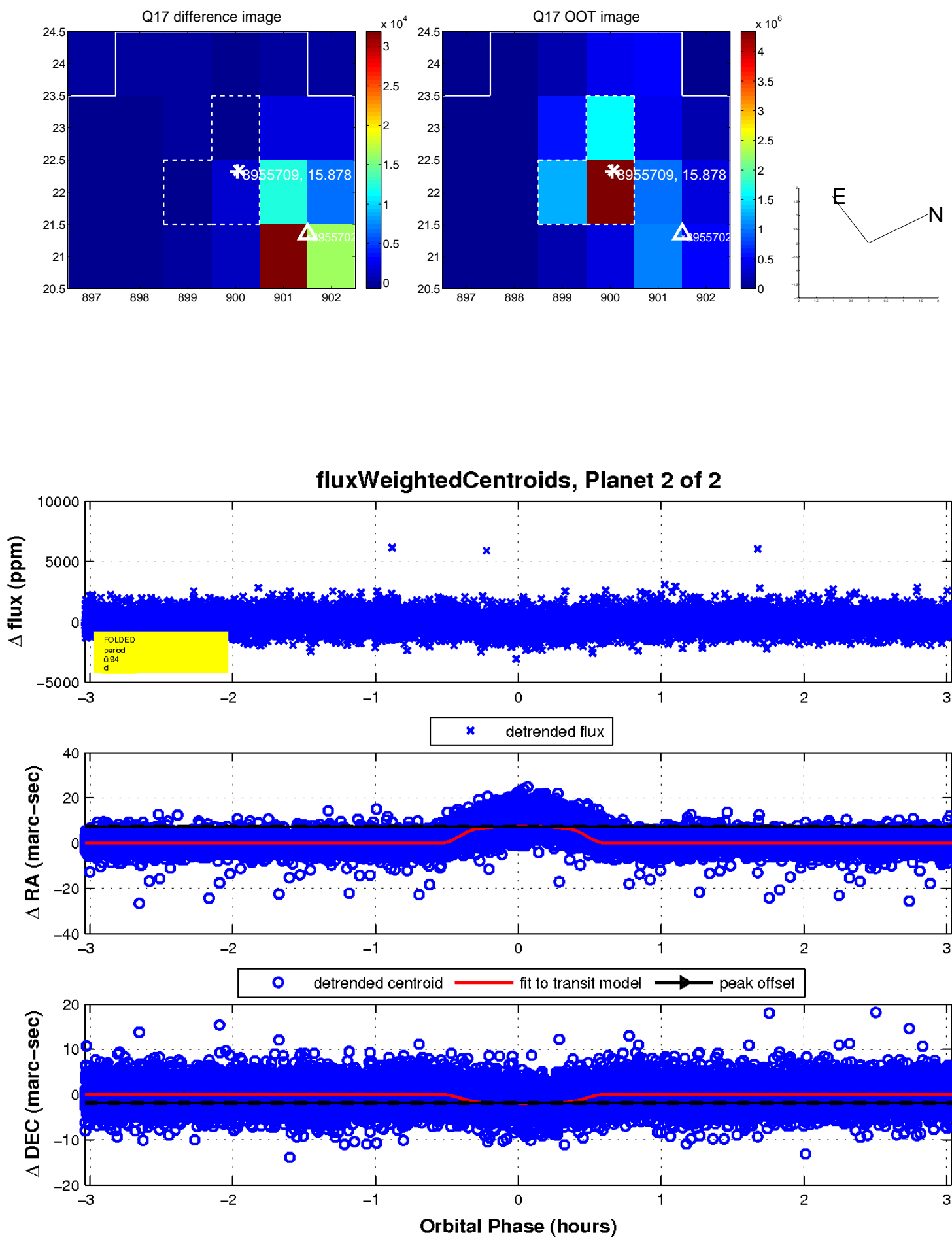
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



UKIRT Image

Declination

