

KIC 009597729

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})
009597729-01	OBS	4417.02	0.876297	131.959600	107.3	1.049	13.3	17.0	0.93	6032	1.15	3156.57
009597729-02	OBS	4417.01	0.876290	131.522899	89.3	1.093	13.6	14.7	0.93	6032	1.04	3156.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009597729-01	OBS	FP	0.13	0	0	1	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
009597729-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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.

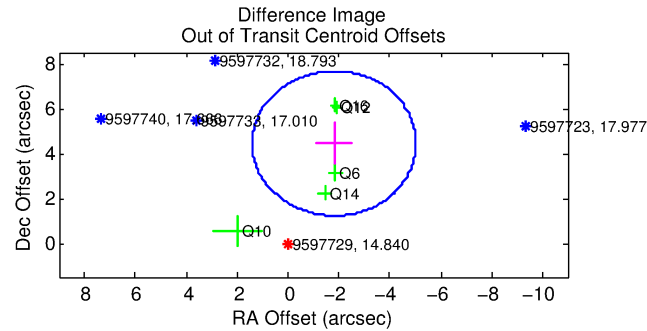
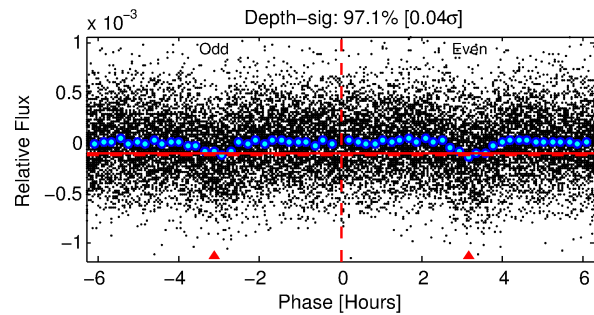
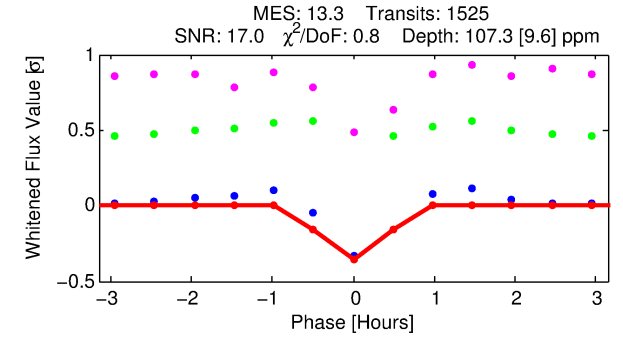
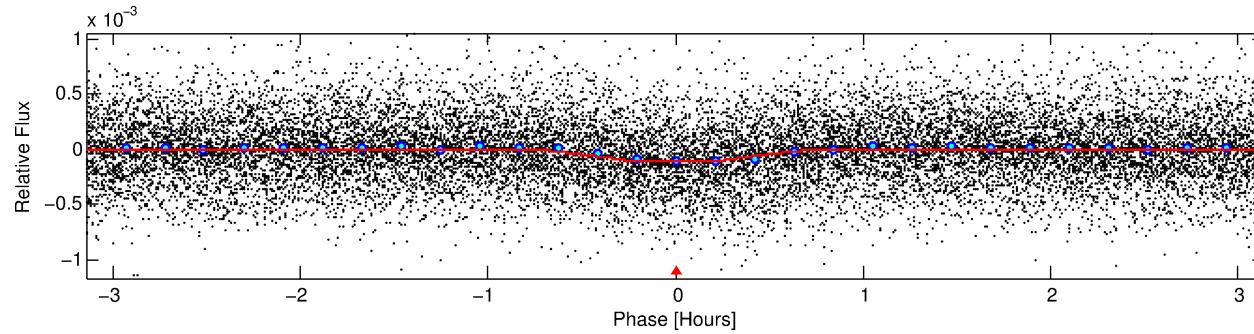
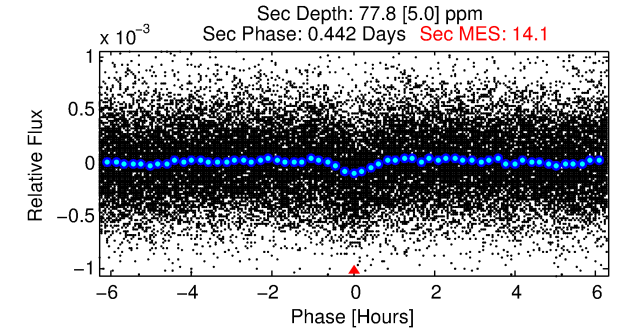
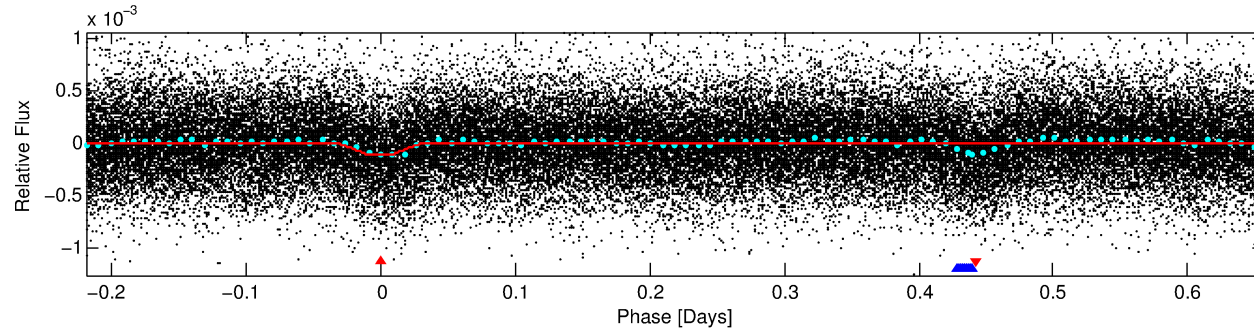
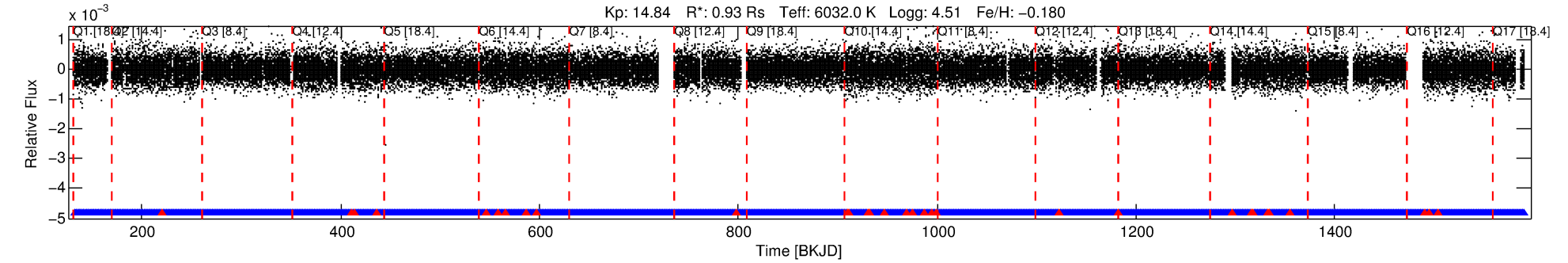
Ephemeris Match Information For 009597729-01

No Significant Match Found

DV One-Page Summary

KIC: 9597729 Candidate: 1 of 2 Period: 0.876 d

KOI: K04417.02 Corr: 0.905



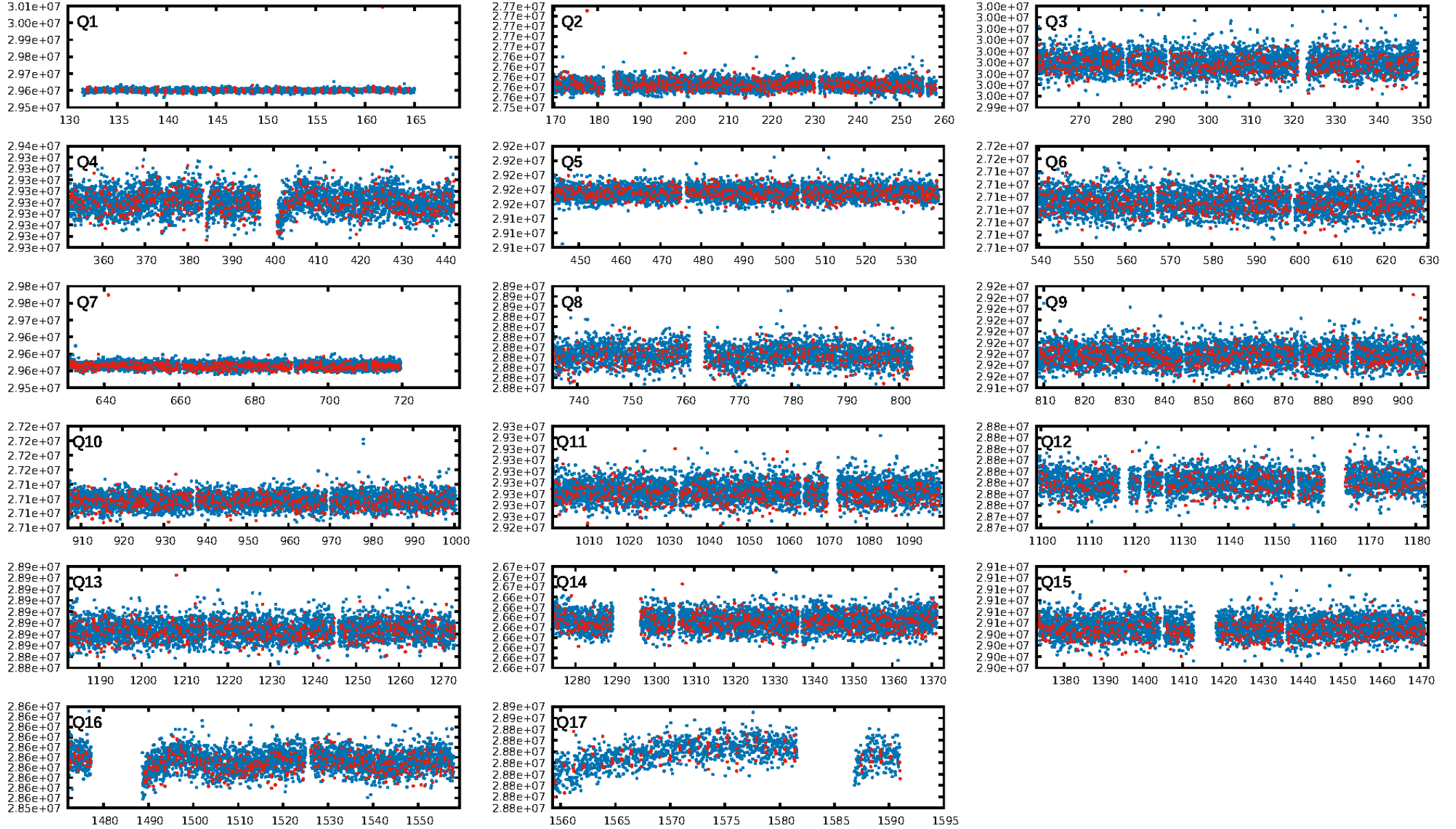
DV Fit Results:

Period = 0.87630 [0.00001] d
Epoch = 131.9596 [0.0011] BKJD
Rp/R* = 0.0113 [0.0048]
a/R* = 3.05 [6.03]
b = 0.90 [0.46]
Seff = 3156.57 [1258.62]
Teff = 1911 [191] K
Rp = 1.15 [0.60] Re
a = 0.0180 [0.0046] AU
Ag = 10.57 [9.84] [0.97σ]
Teffp = 5328 [1148] K [2.94σ]

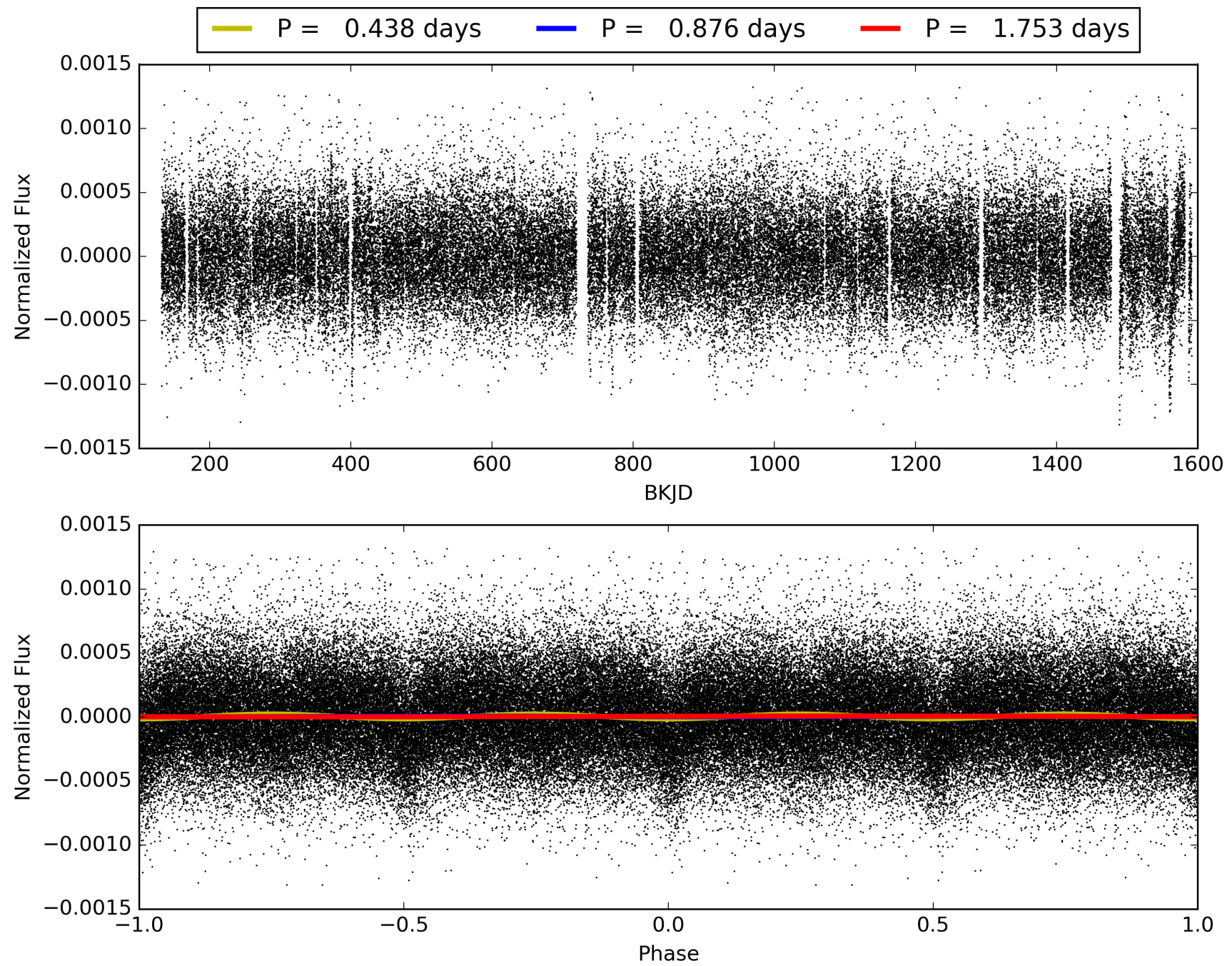
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.96e-43
RollingBand-fgt: 0.98 [1424/1456]
GhostDiagnostic-chr: -0.6766
Centroid-sig: 0.0%
Centroid-so: 9.422 arcsec [12.19σ]
OotOffset-rm: 4.799 arcsec [4.47σ]
KicOffset-rm: 4.738 arcsec [4.54σ]
OotOffset-st: 3/0/2/0 [5]
KicOffset-st: 3/0/2/0 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009597729-01, PDC Light Curves

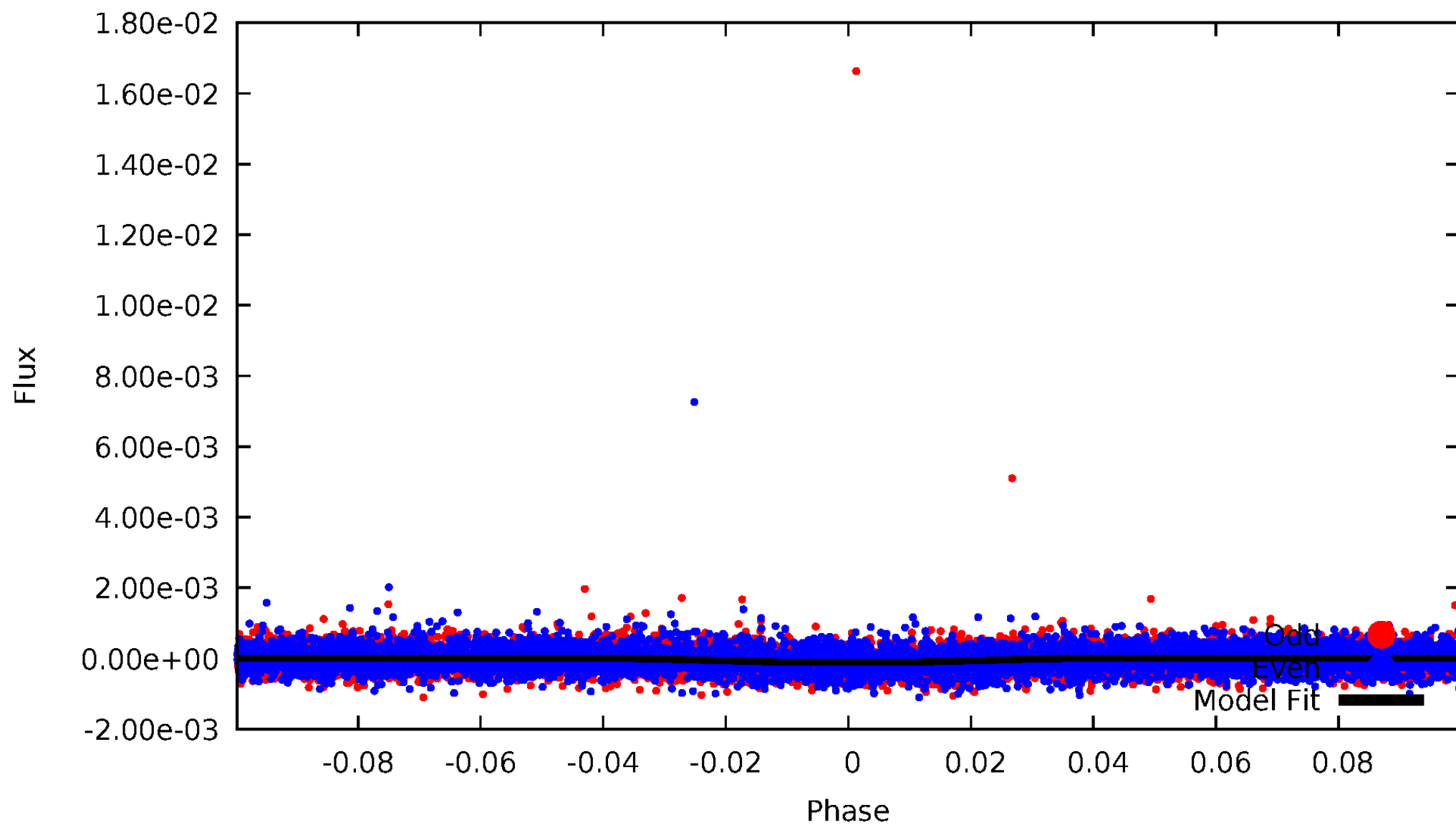


TCE 009597729-01



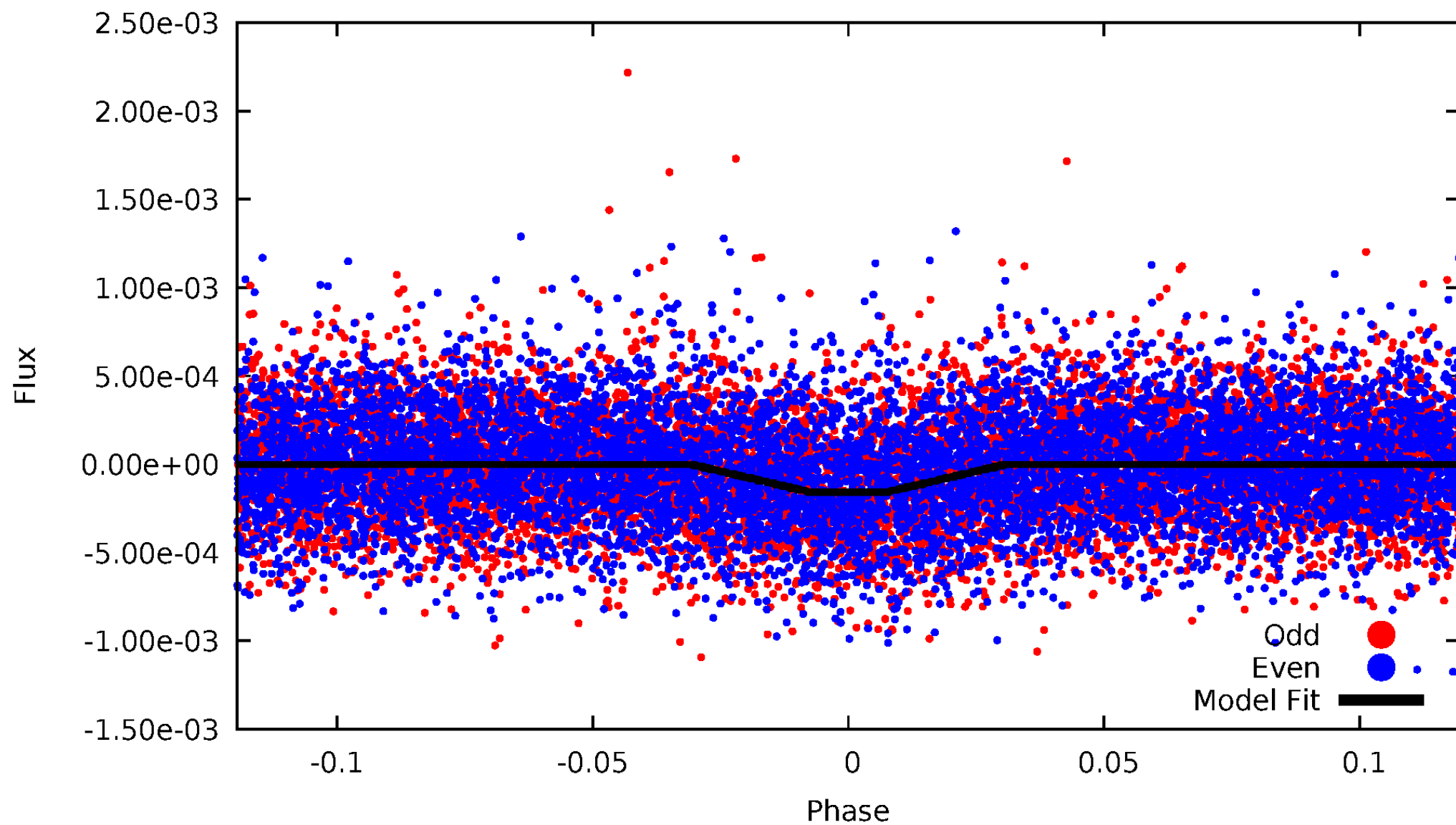
DV Odd/Even

TCE 009597729-01

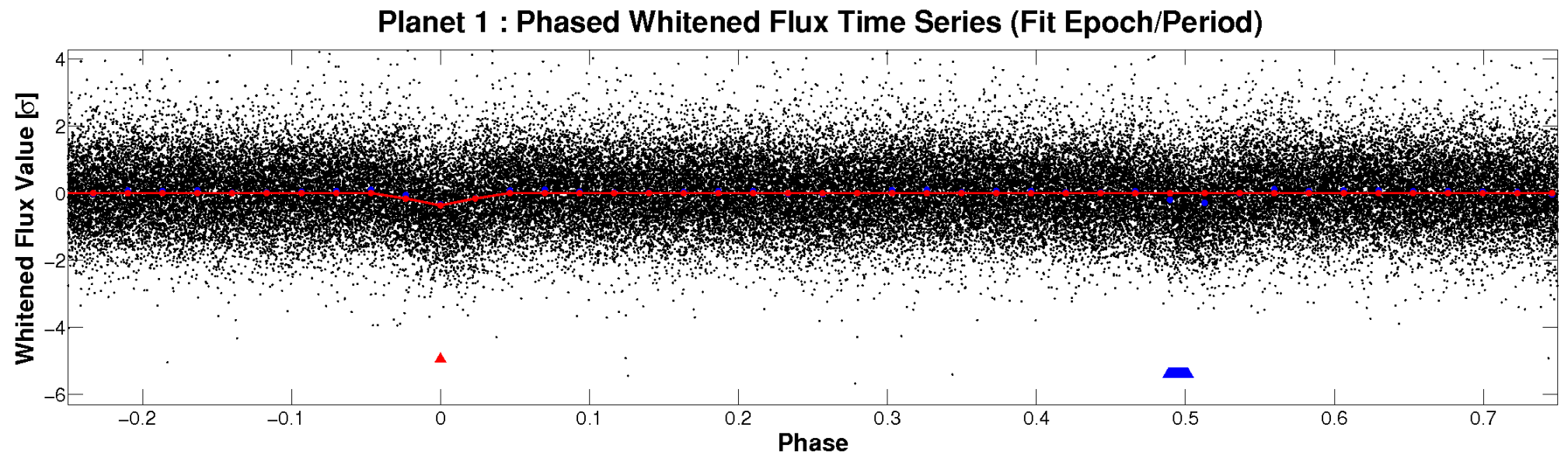
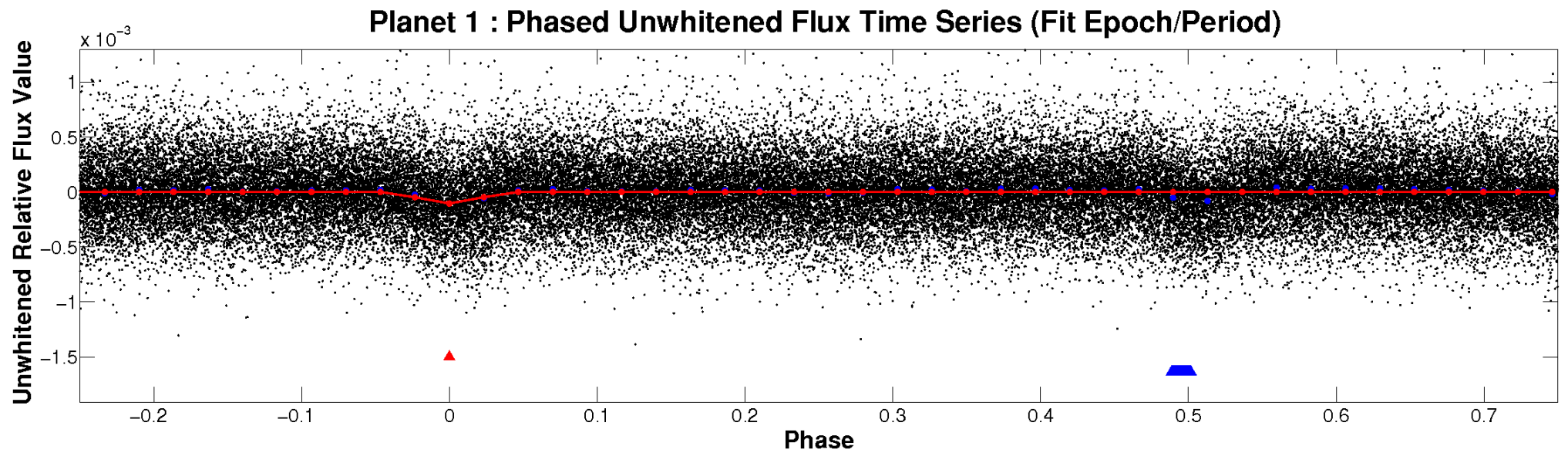


ALT Odd/Even

TCE 009597729-01

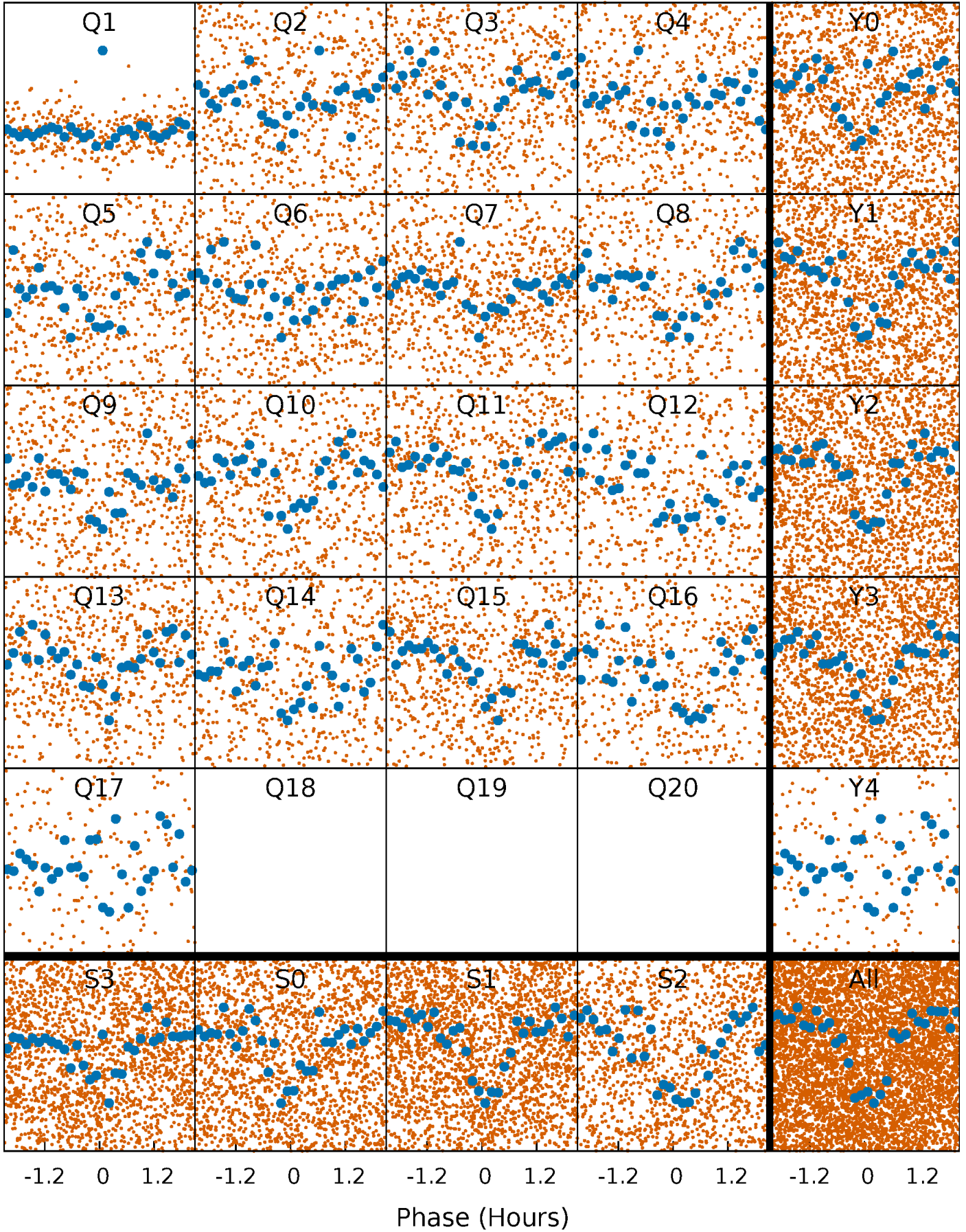


Non-Whitened Vs. Whitened Light Curve



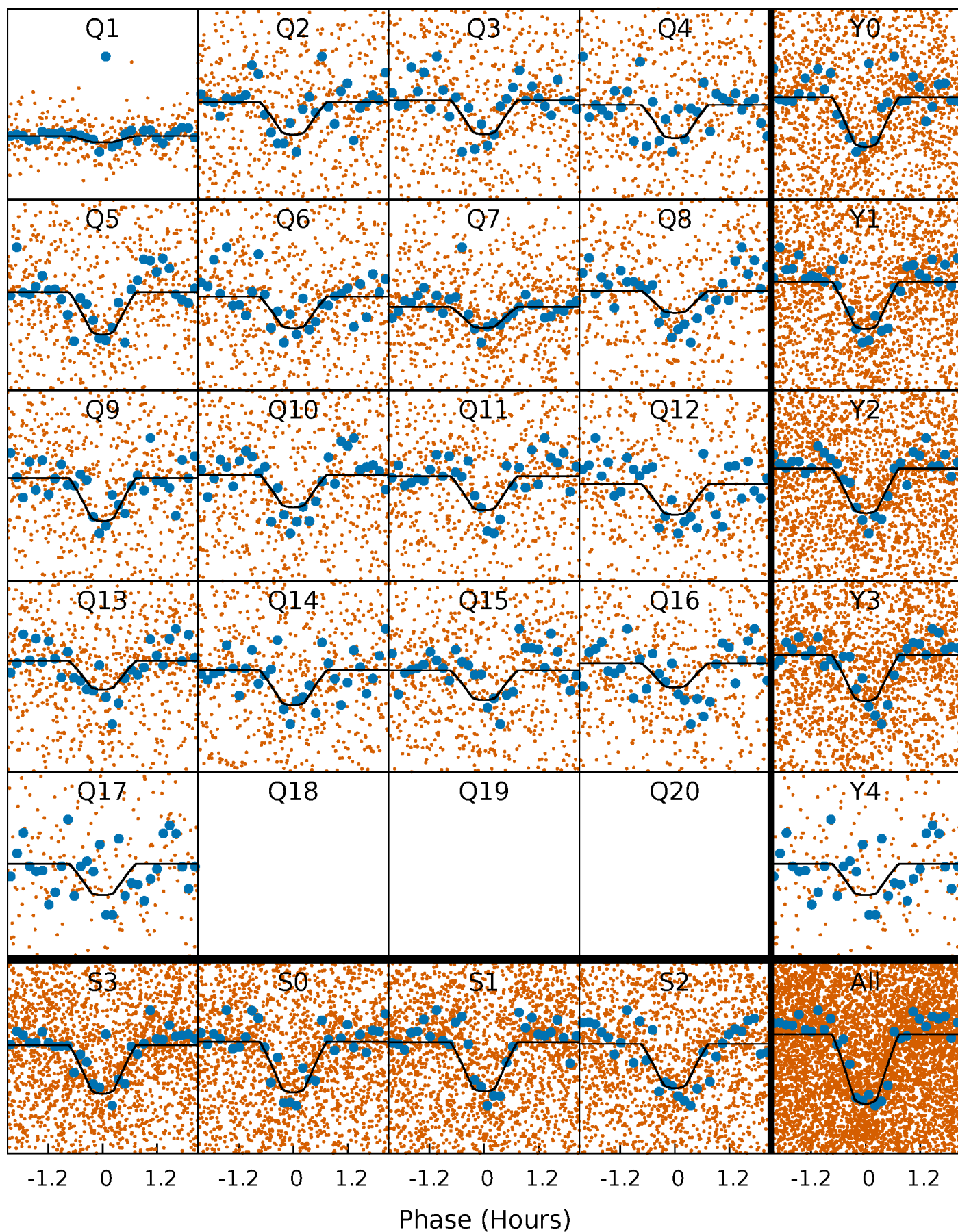
PDC Quarter-Phased Transit Curves

TCE 009597729-01 P= 0.876297 Days $T_0=131.959600$ (BKJD)



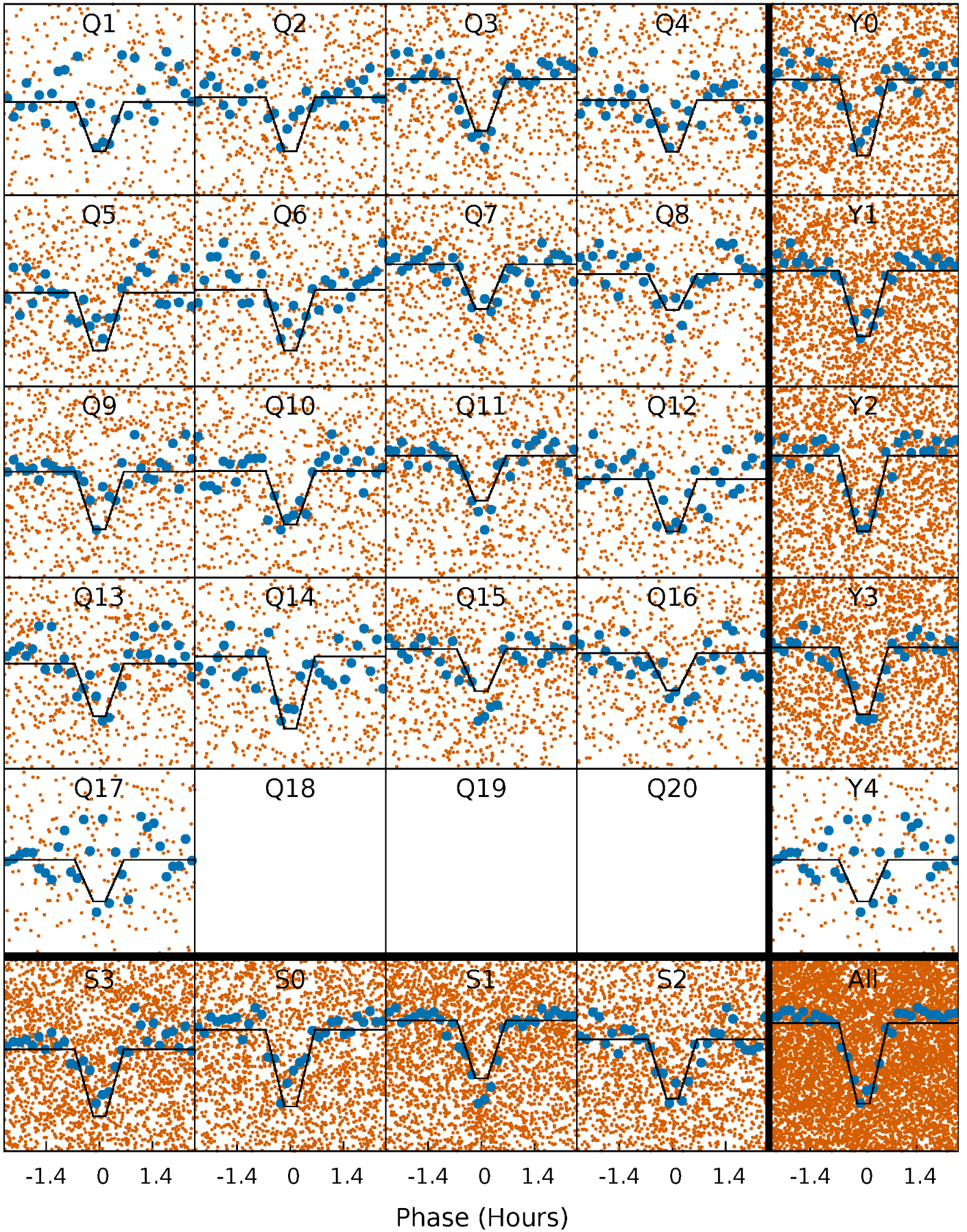
DV Quarter-Phased Transit Curves

TCE 009597729-01 P= 0.876297 Days $T_0=131.959600$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

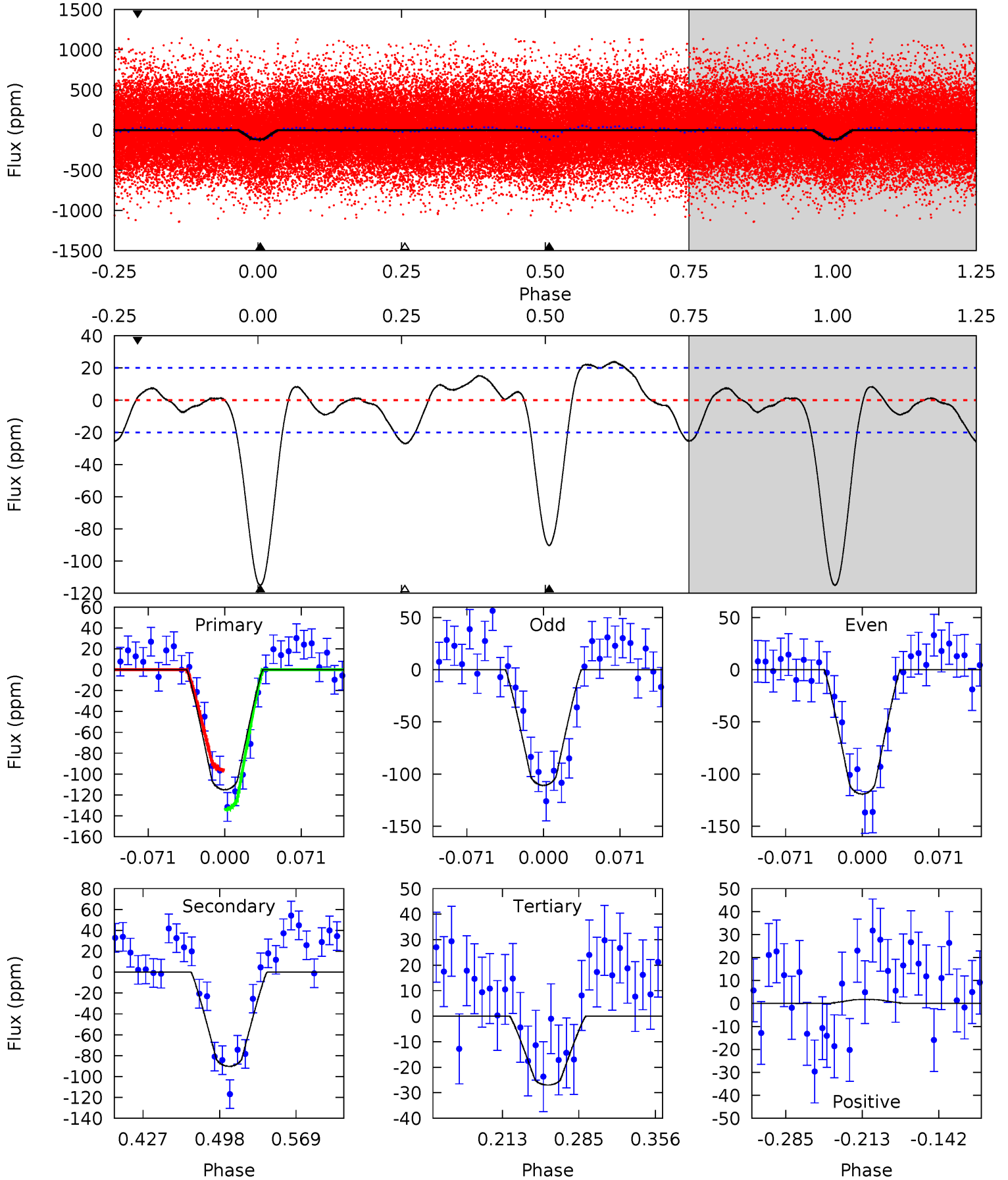
TCE 009597729-01 P= 0.876302 Days $T_0=131.959332$ (BKJD)



DV Model-Shift Uniqueness Test

009597729-01, P = 0.876297 Days, E = 131.083303 Days

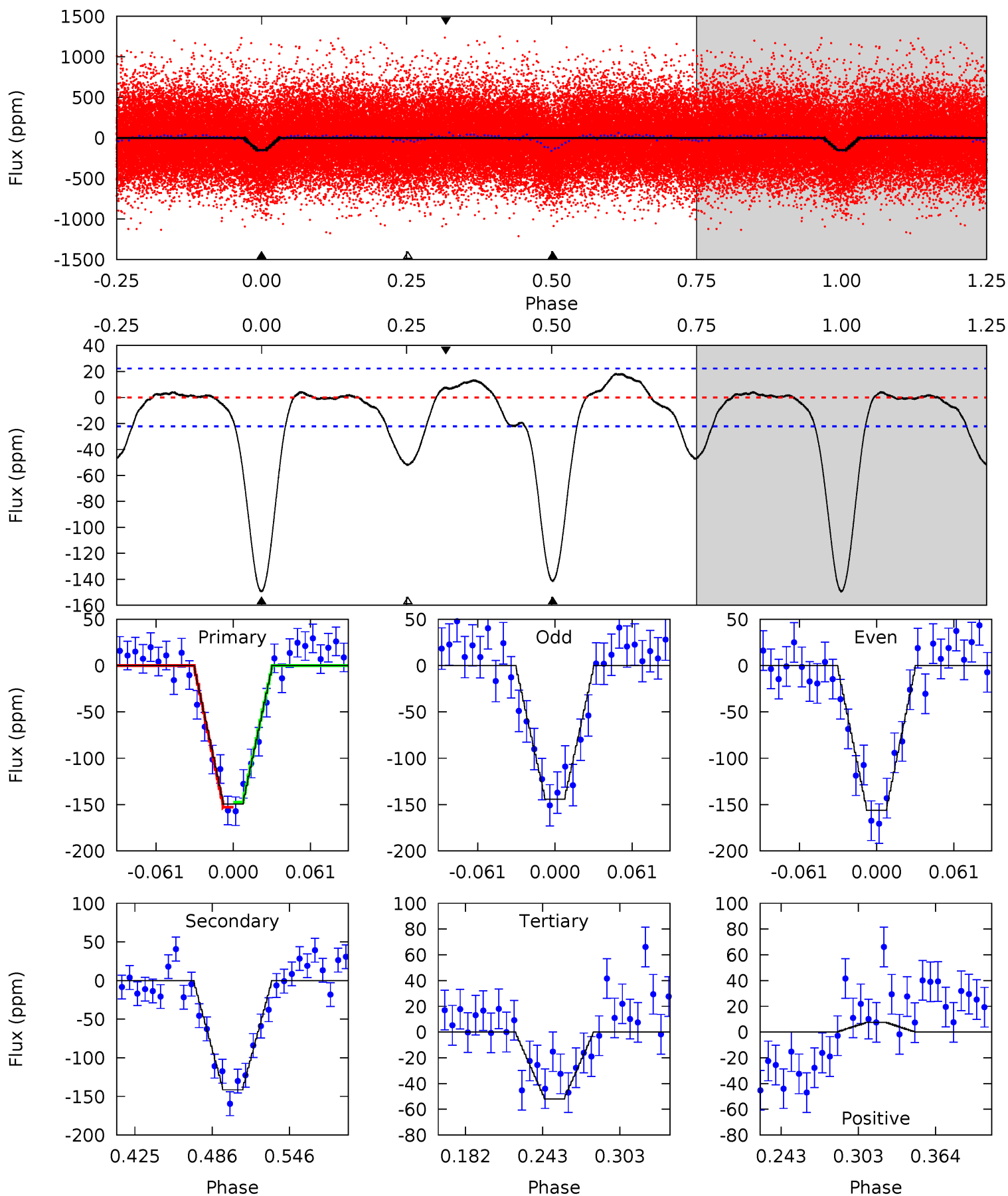
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.6	20.9	6.24	0.40	4.64	1.80	2.80	20.4	26.2	14.6	20.5	0.97	0.85	0.17	4.41



Alt Model-Shift Uniqueness Test

009597729-01, P = 0.876302 Days, E = 131.083030 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.4	29.7	10.9	1.58	4.67	1.88	3.63	20.5	29.8	18.8	28.1	1.26	0.92	0.11	0.57



Stellar Parameters For KIC 009597729

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6032^{+162}_{-198}	$4.508^{+0.039}_{-0.208}$	$-0.180^{+0.250}_{-0.300}$	$0.929^{+0.278}_{-0.093}$	$1.014^{+0.131}_{-0.131}$	$1.783^{+0.372}_{-0.950}$
	+3%/-3%	+1%/-5%	+139%/-167%	+30%/-10%	+13%/-13%	+21%/-53%
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 009597729-01 / KOI 4417.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-90 ± 4	$1.20^{+0.52}_{-0.47}$	2739^{+204}_{-130}	5504^{+1743}_{-803}	11^{+19}_{-6}
Alt.	-141 ± 5	$1.31^{+0.56}_{-0.50}$	2737^{+200}_{-129}	5905^{+1841}_{-888}	14^{+24}_{-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 $A_{obs} \gg 1.0$

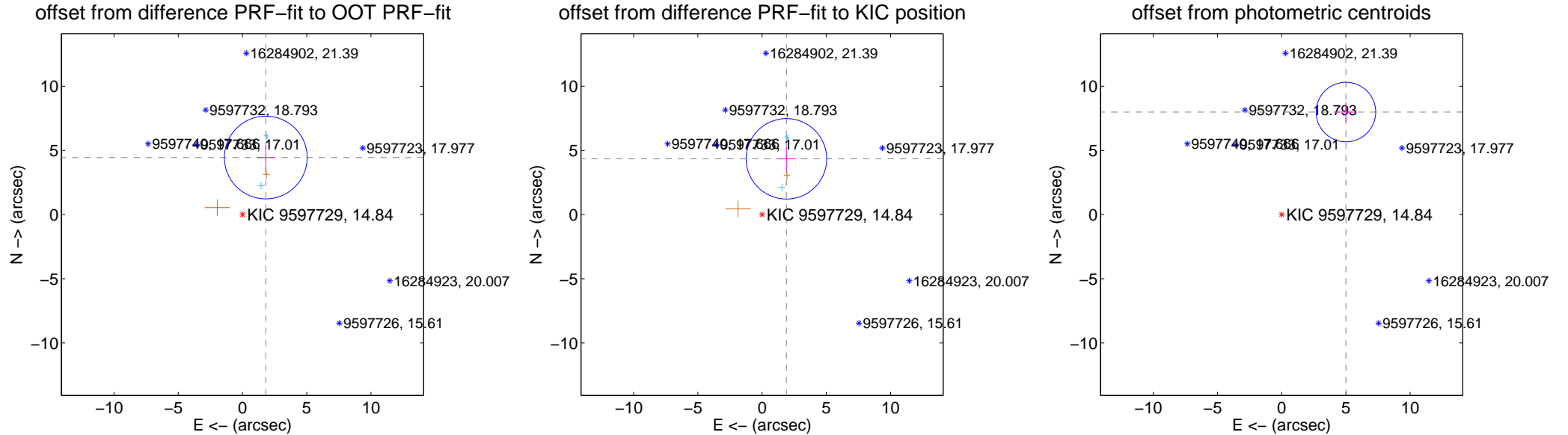
DV Centroid Data

Supplemental centroid analysis for 009597729-01. Kepler magnitude: 14.84. Transit SNR 17.05

There are 3 quarters with good PRF difference image offsets

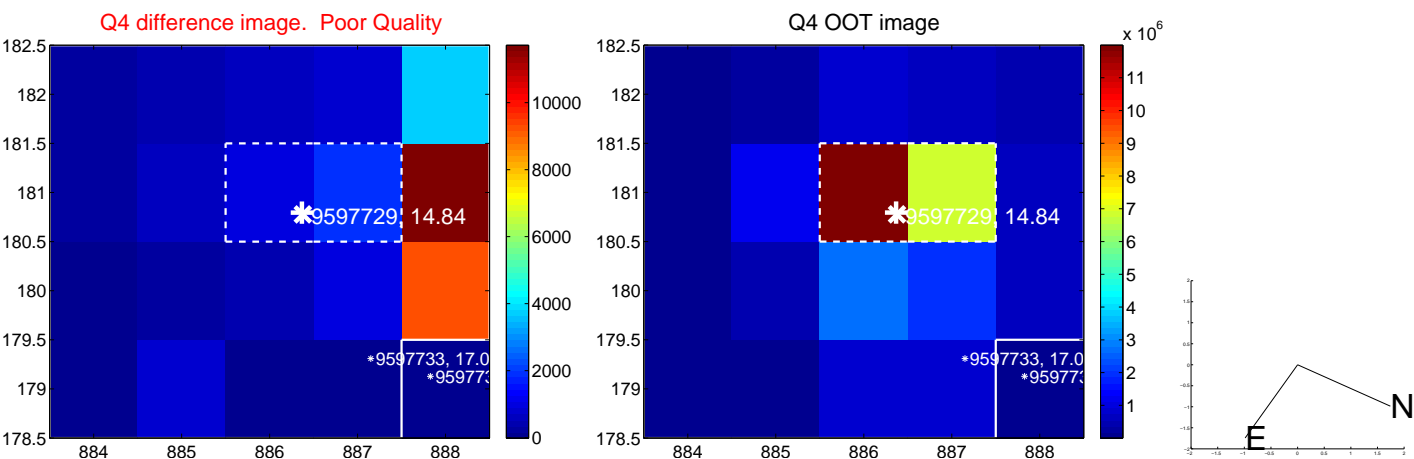
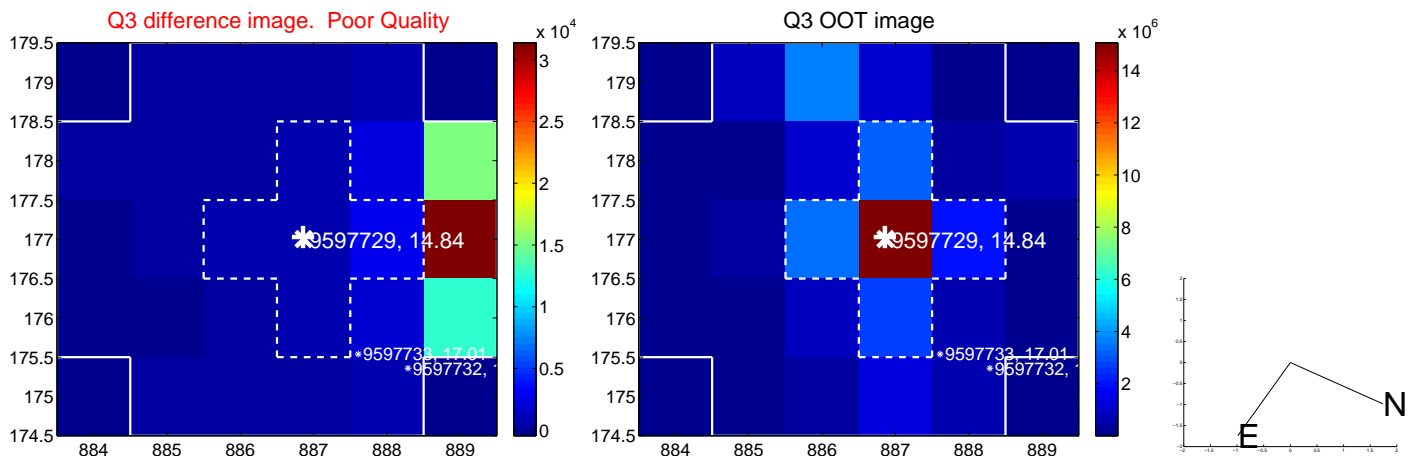
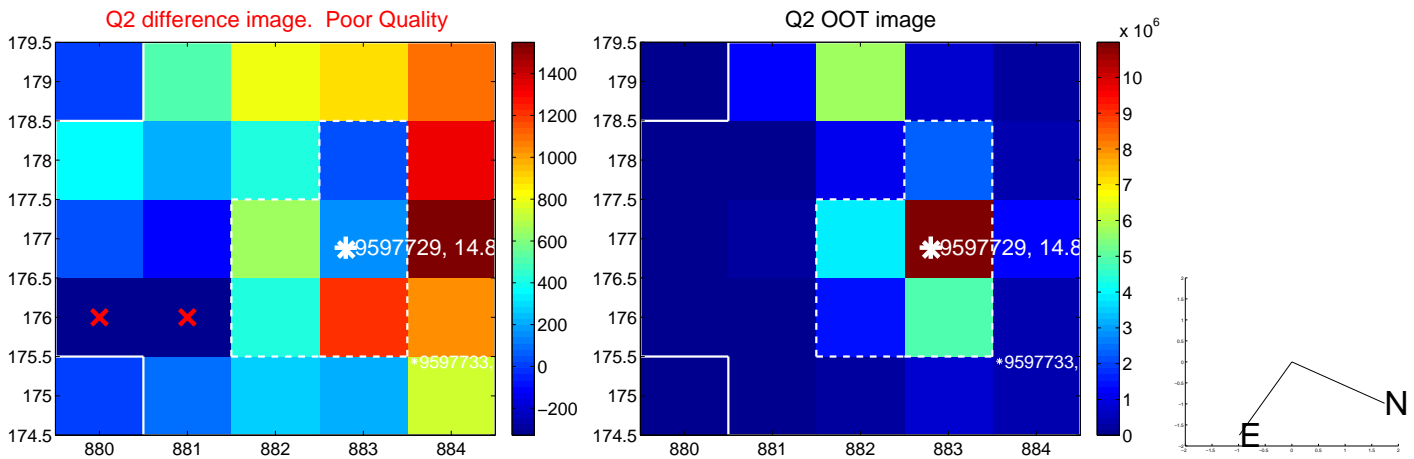
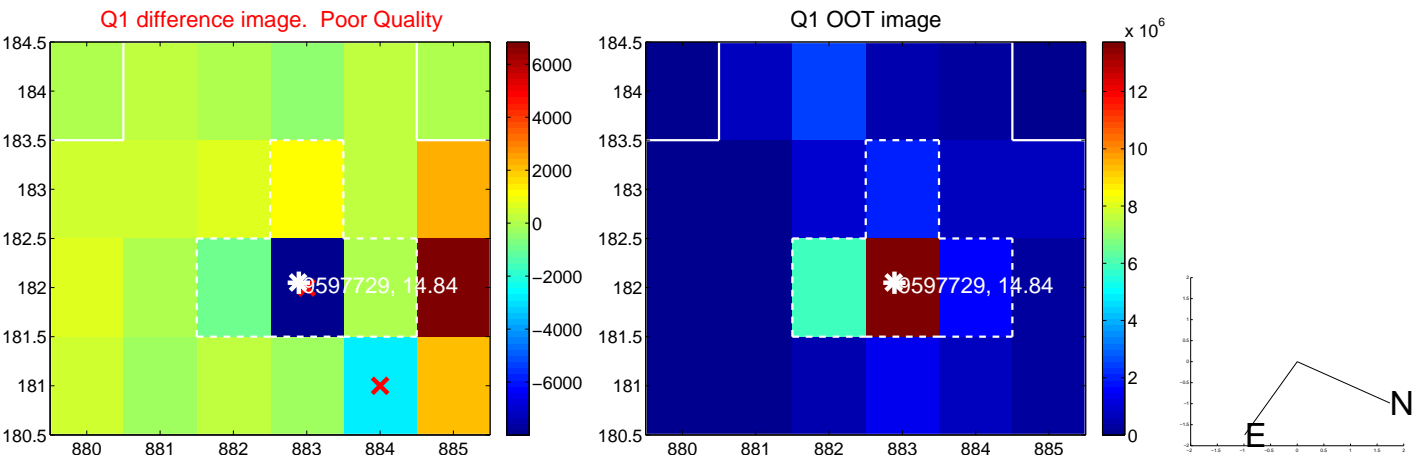
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.799 ± 1.073	4.47	-1.811 ± 0.701	4.444 ± 0.925
PRF-fit source offset from KIC position	4.738 ± 1.044	4.54	-1.892 ± 0.757	4.345 ± 0.885
photometric centroid source offset	9.42 ± 0.77	12.19	-5.00 ± 0.79	7.99 ± 0.77

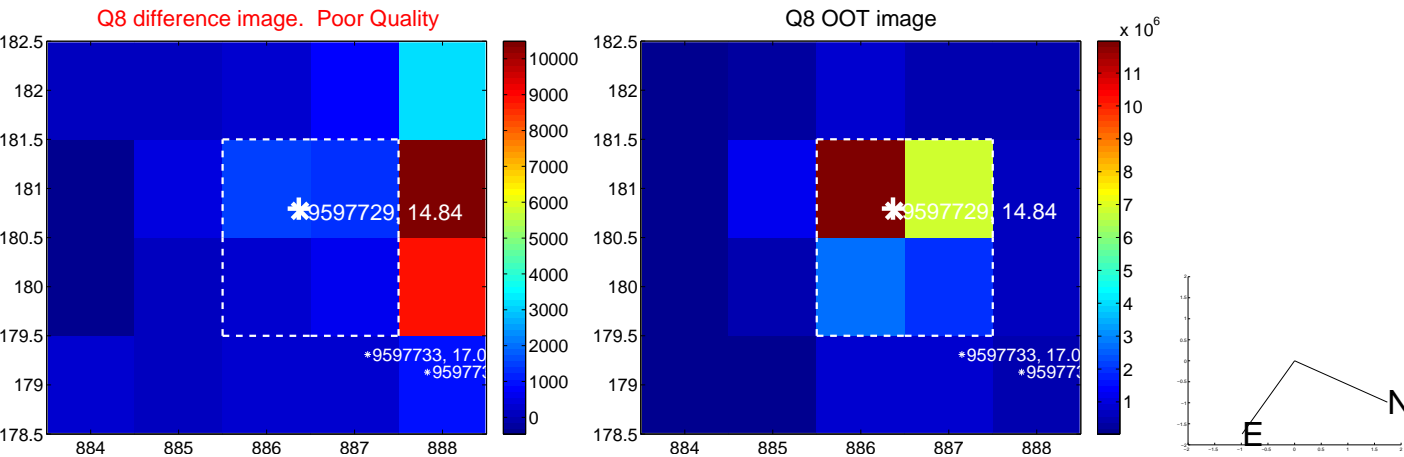
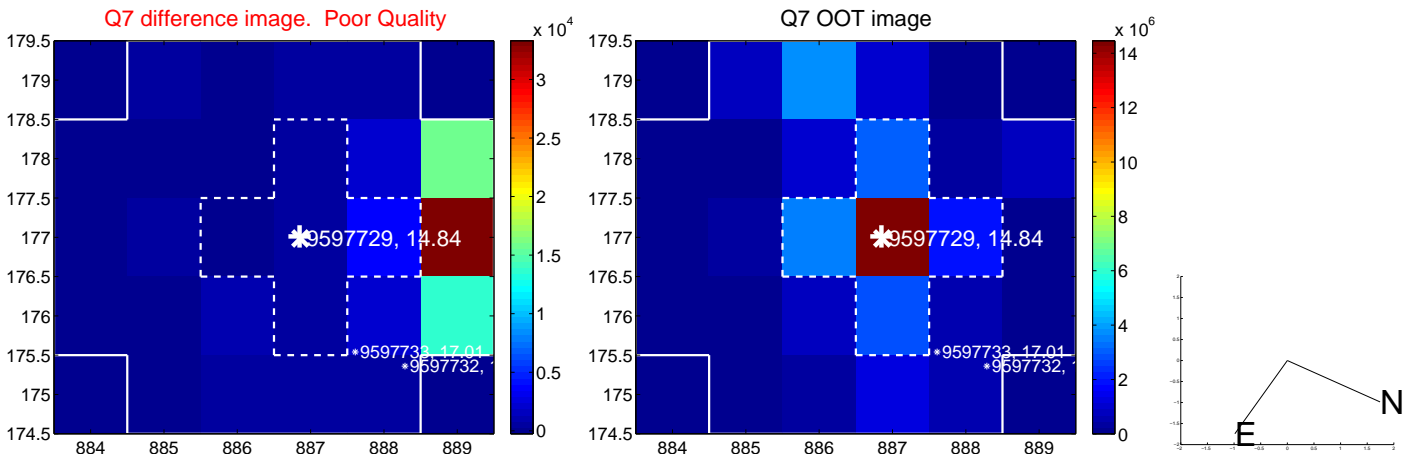
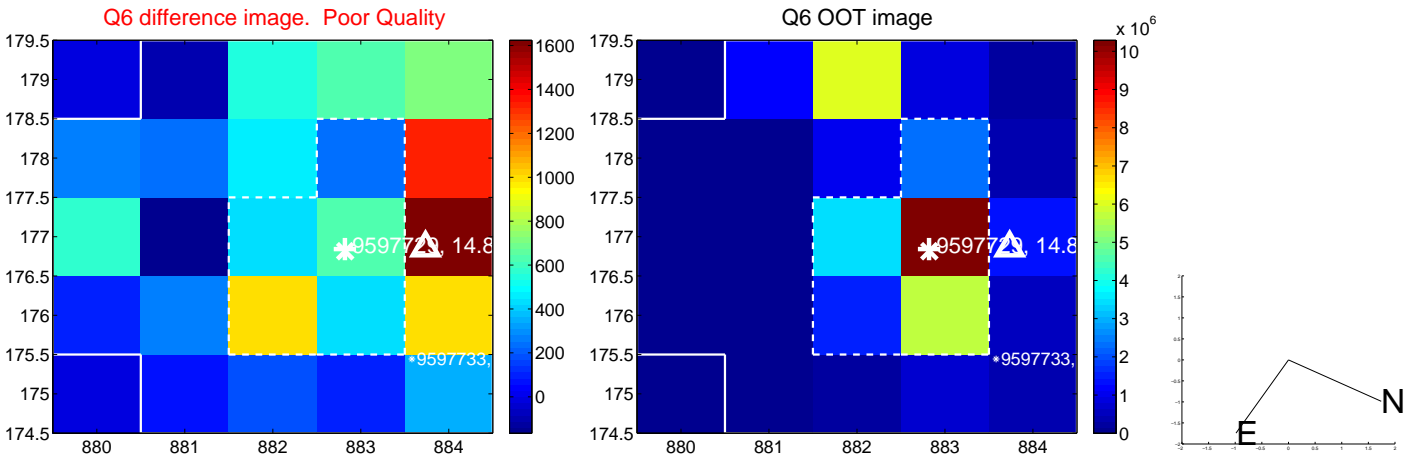
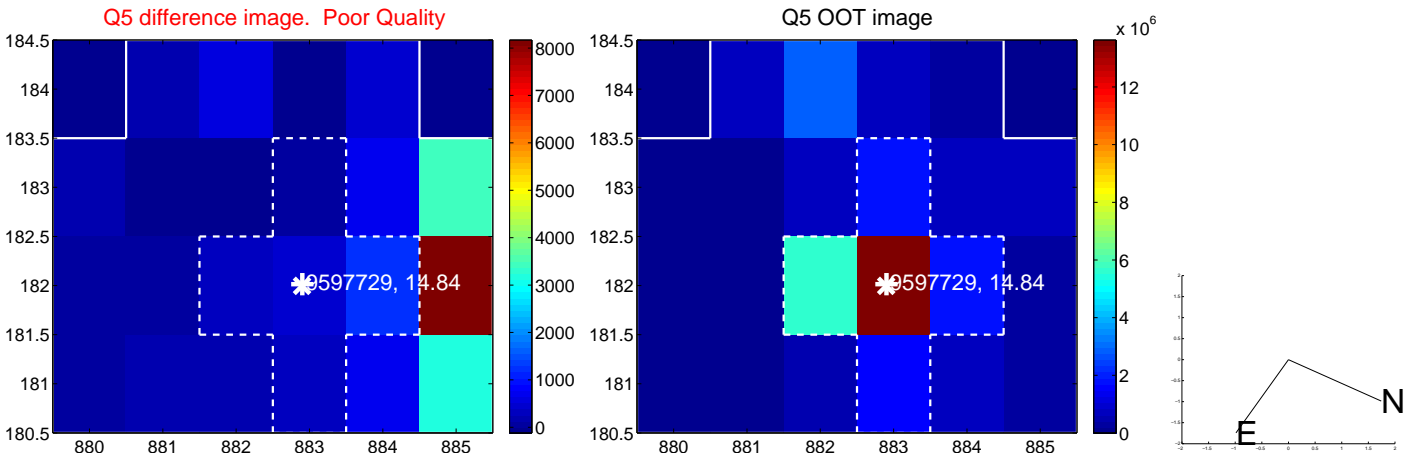


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

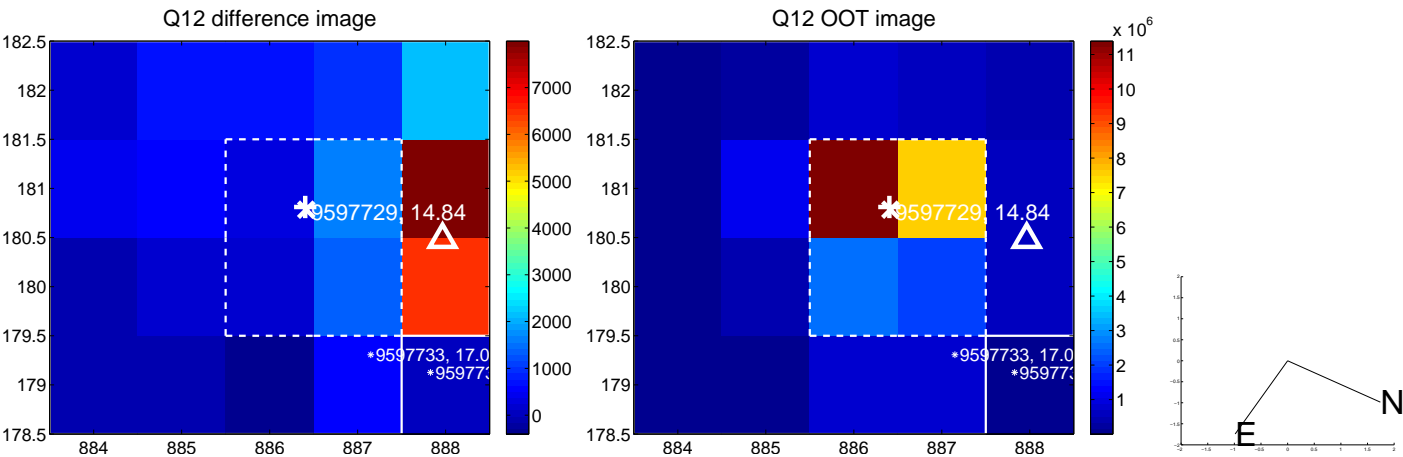
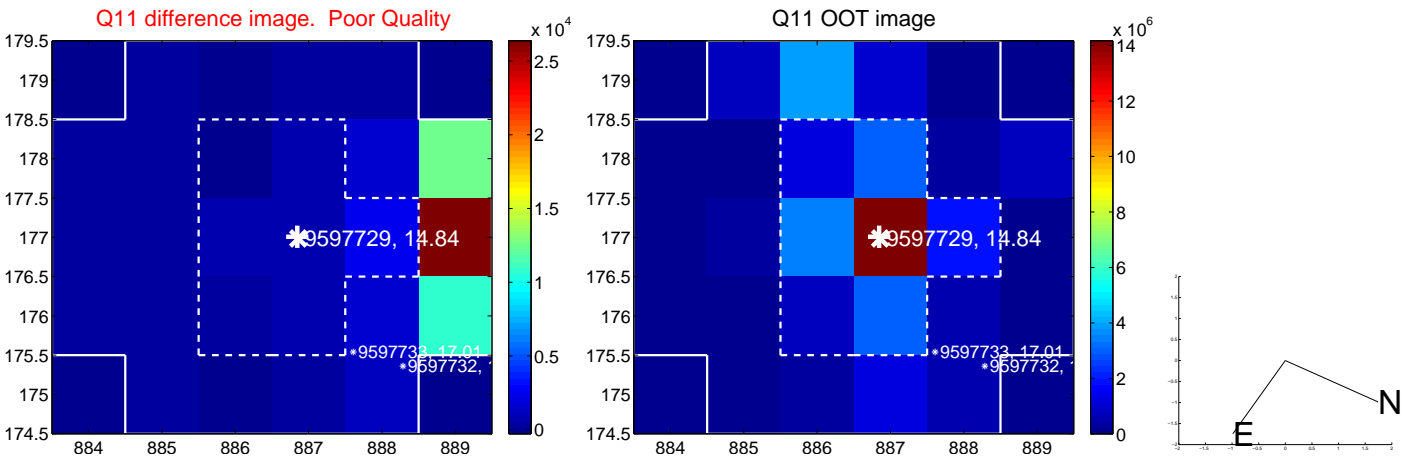
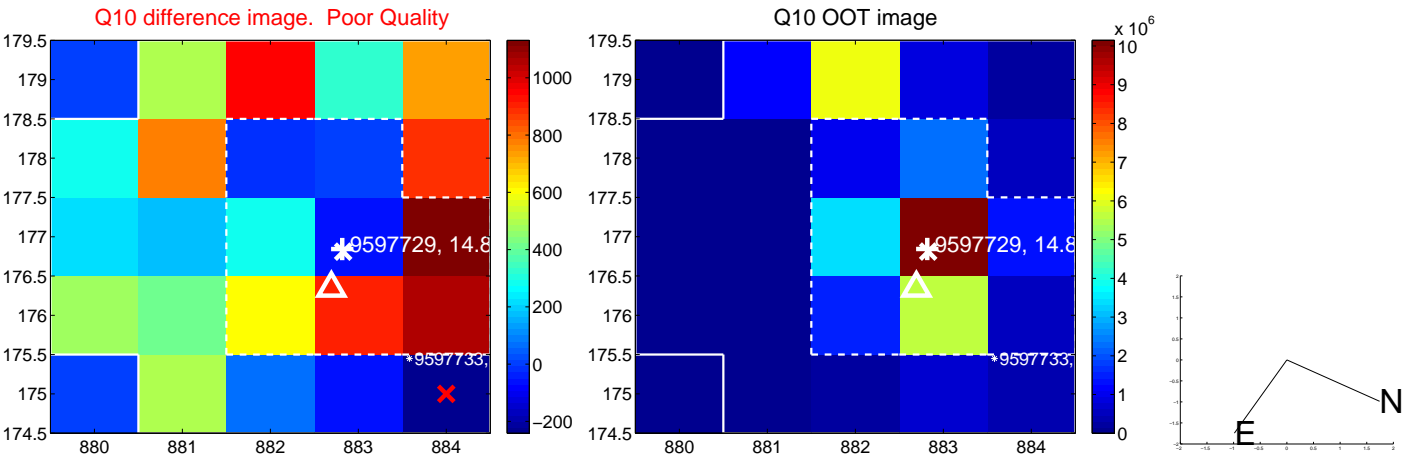
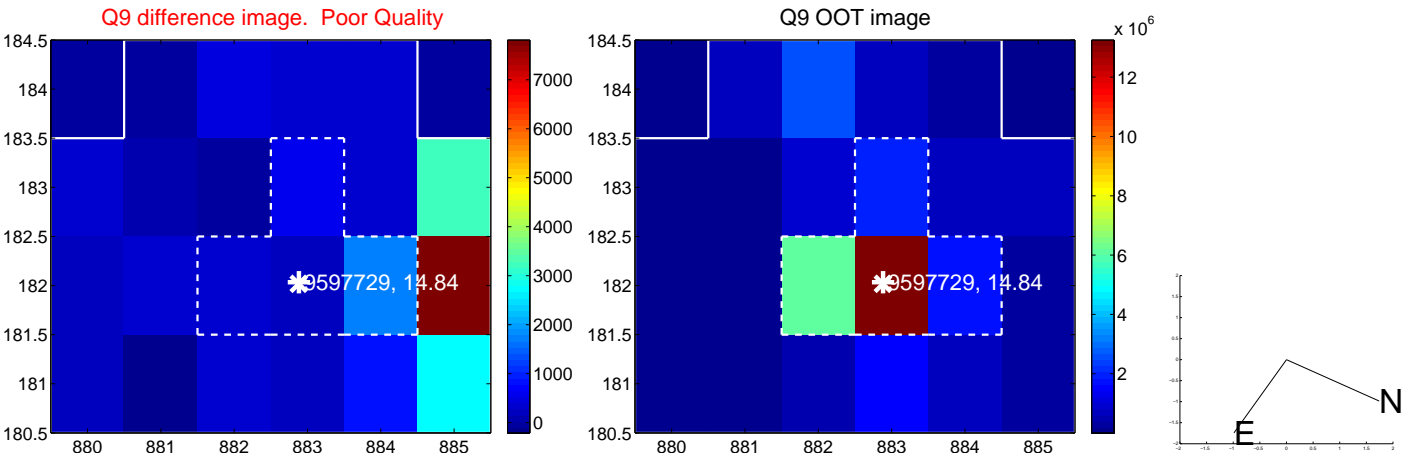
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



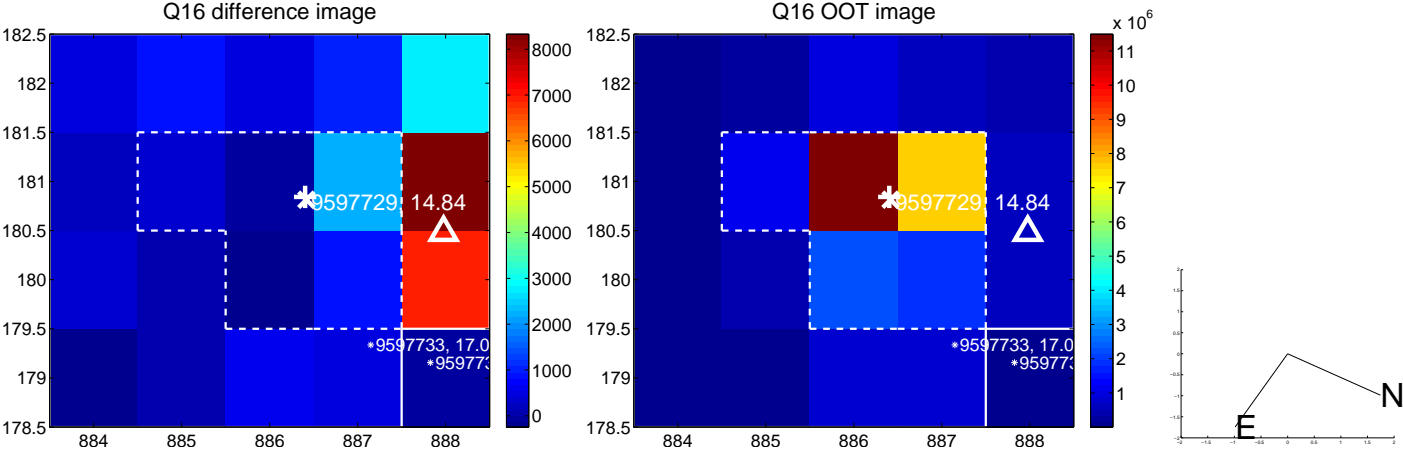
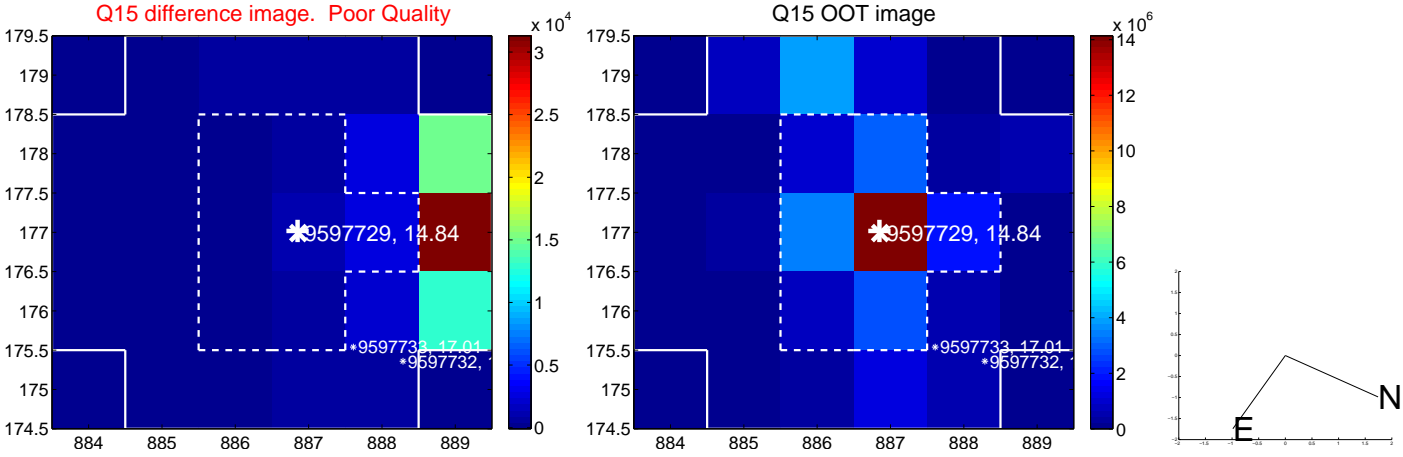
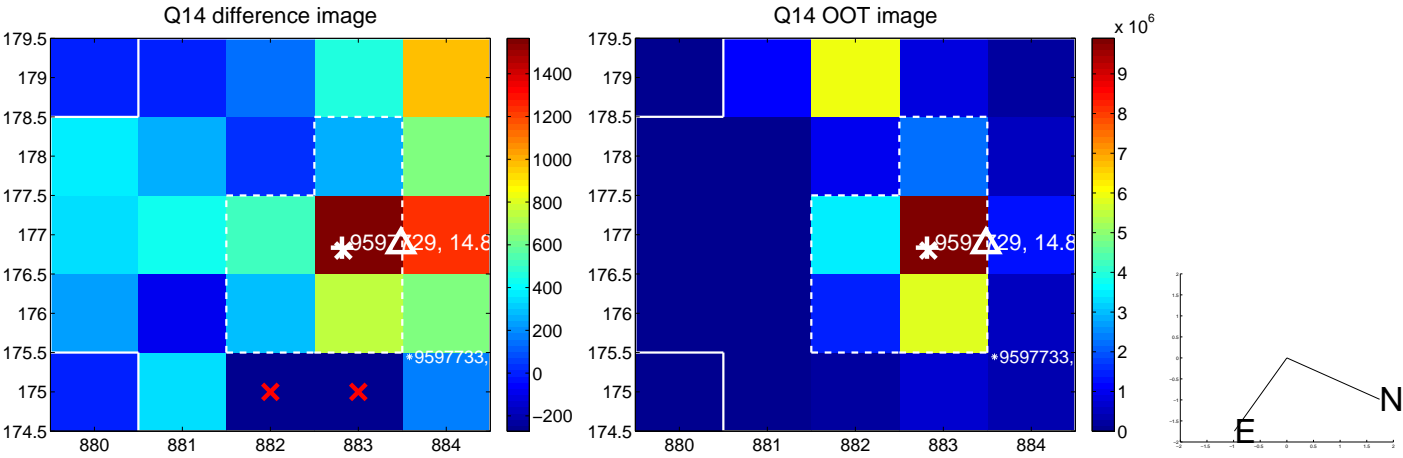
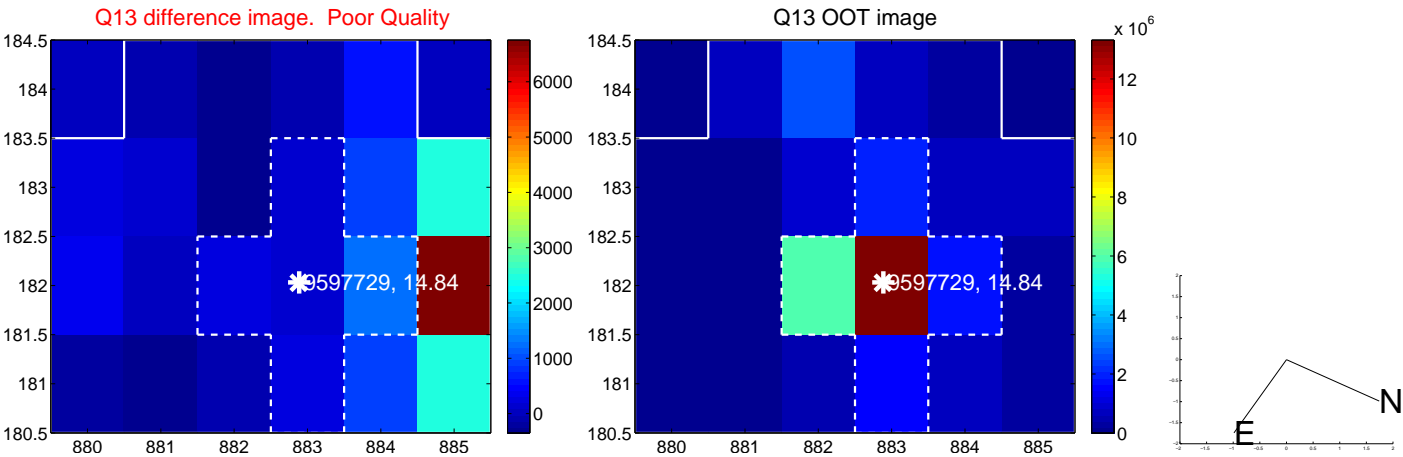
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



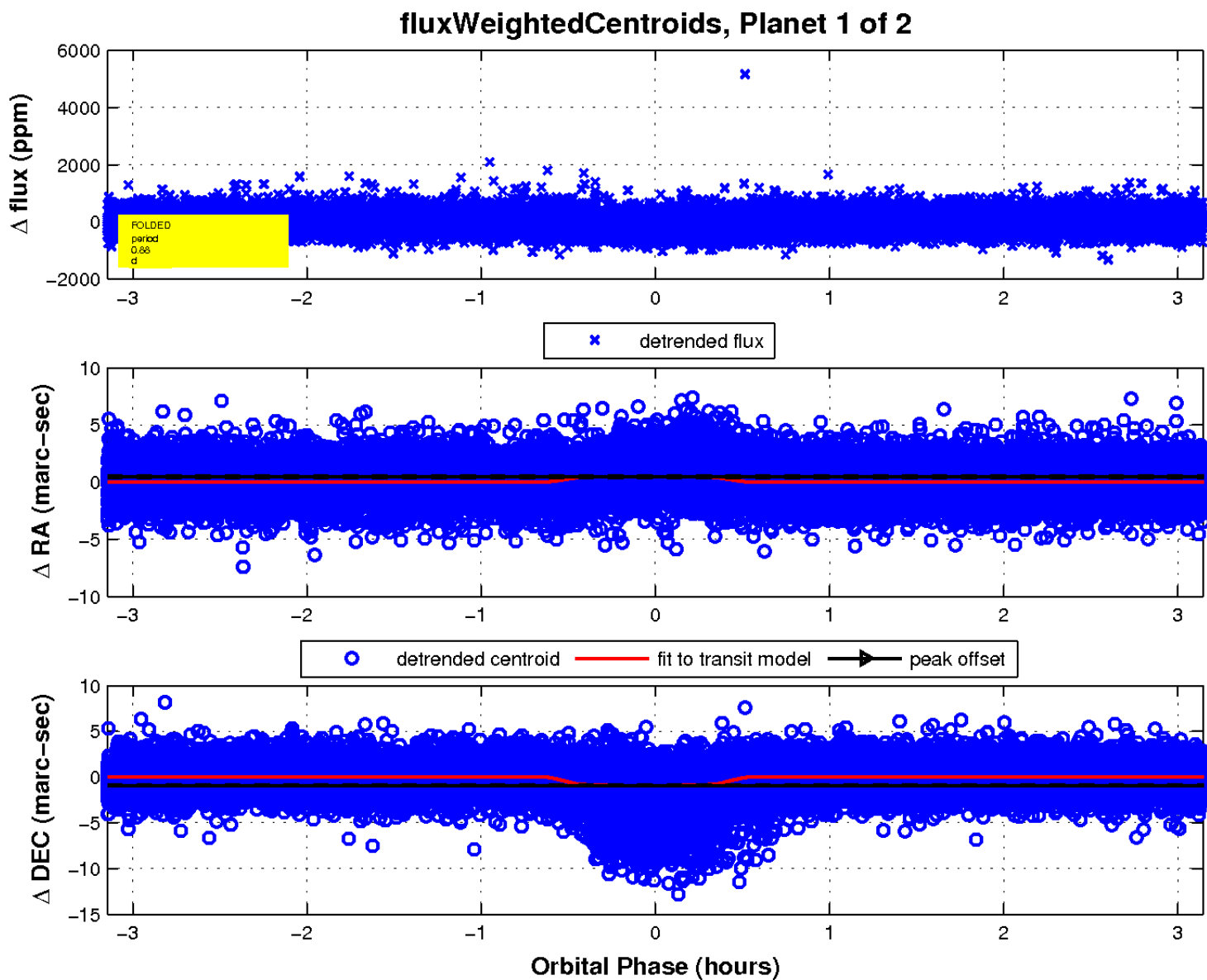
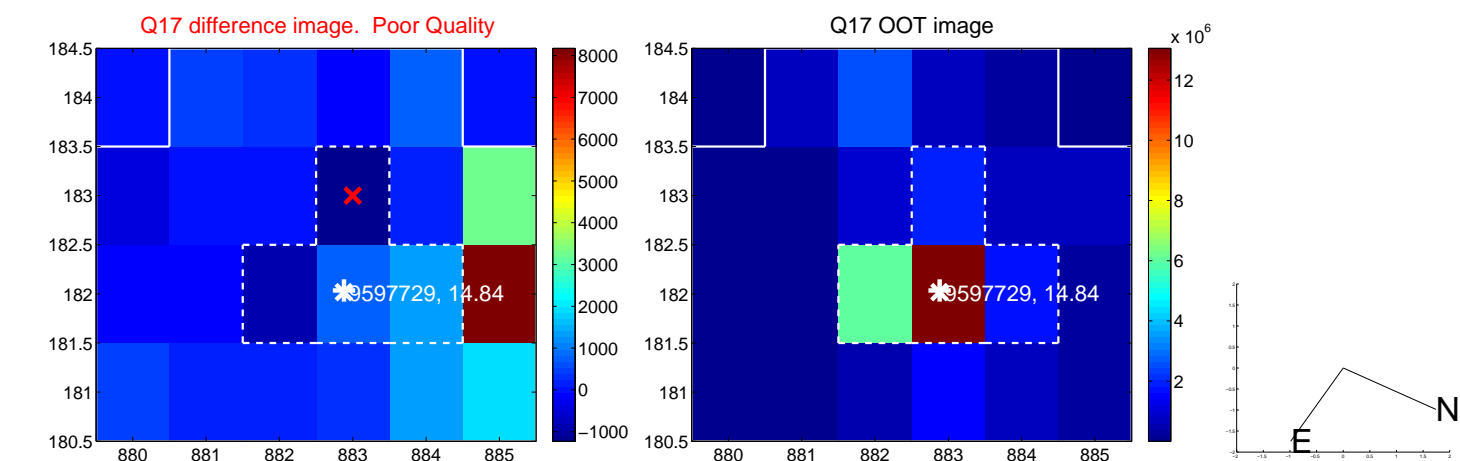
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

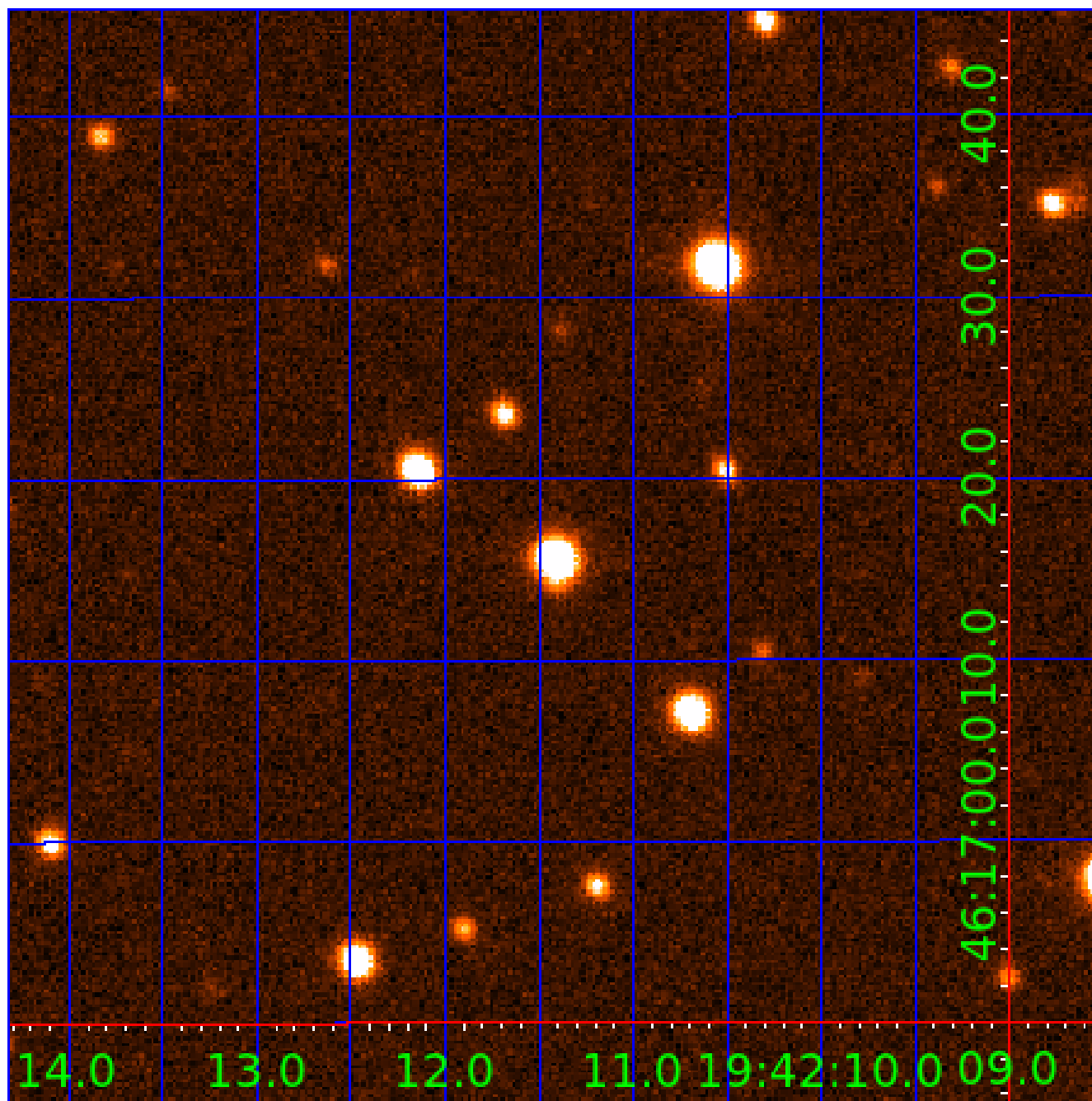


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



UKIRT Image

Declination



KIC 009597729

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})
009597729-01	OBS	4417.02	0.876297	131.959600	107.3	1.049	13.3	17.0	0.93	6032	1.15	3156.57
009597729-02	OBS	4417.01	0.876290	131.522899	89.3	1.093	13.6	14.7	0.93	6032	1.04	3156.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009597729-01	OBS	FP	0.13	0	0	1	0	MOD_SEC_DV—MOD_SEC_ALT—PLANET_PERIOD_IS_HALF_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
009597729-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_OFFSET

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

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

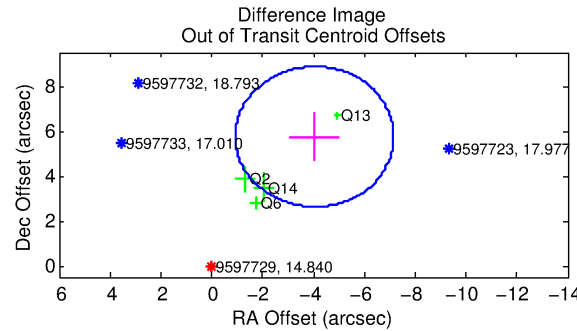
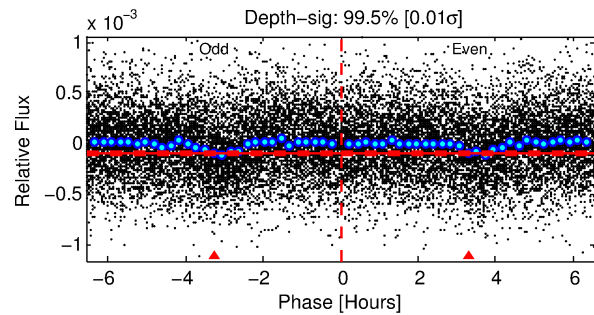
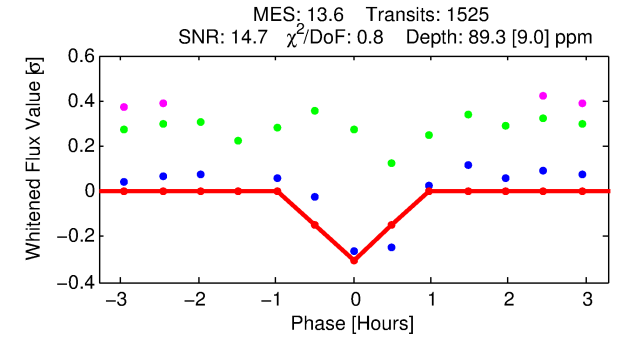
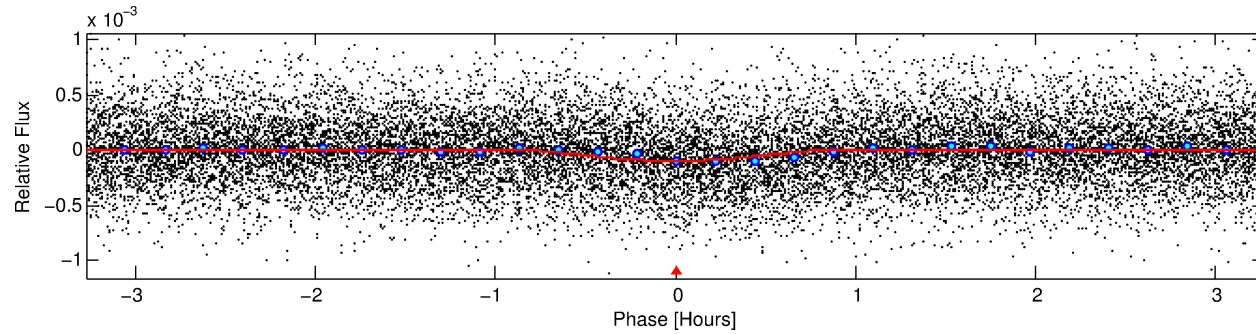
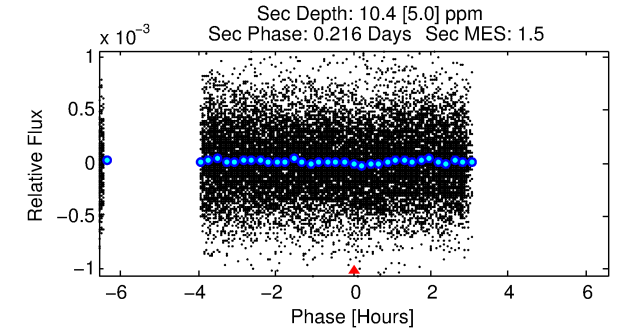
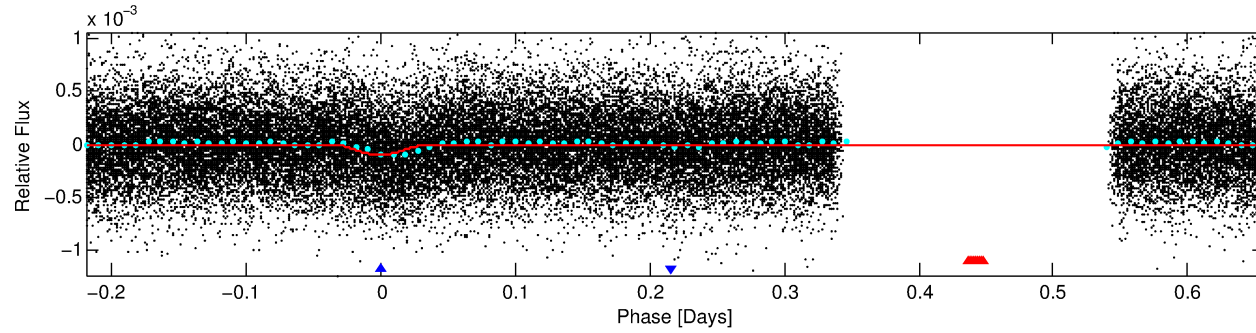
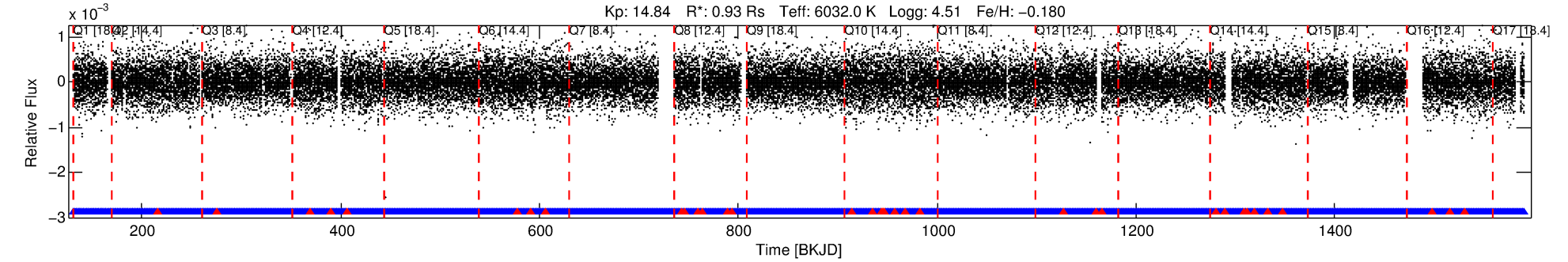
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009597729-02

No Significant Match Found

DV One-Page Summary

KIC: 9597729 Candidate: 2 of 2 Period: 0.876 d
KOI: K04417.01 Corr: 0.764



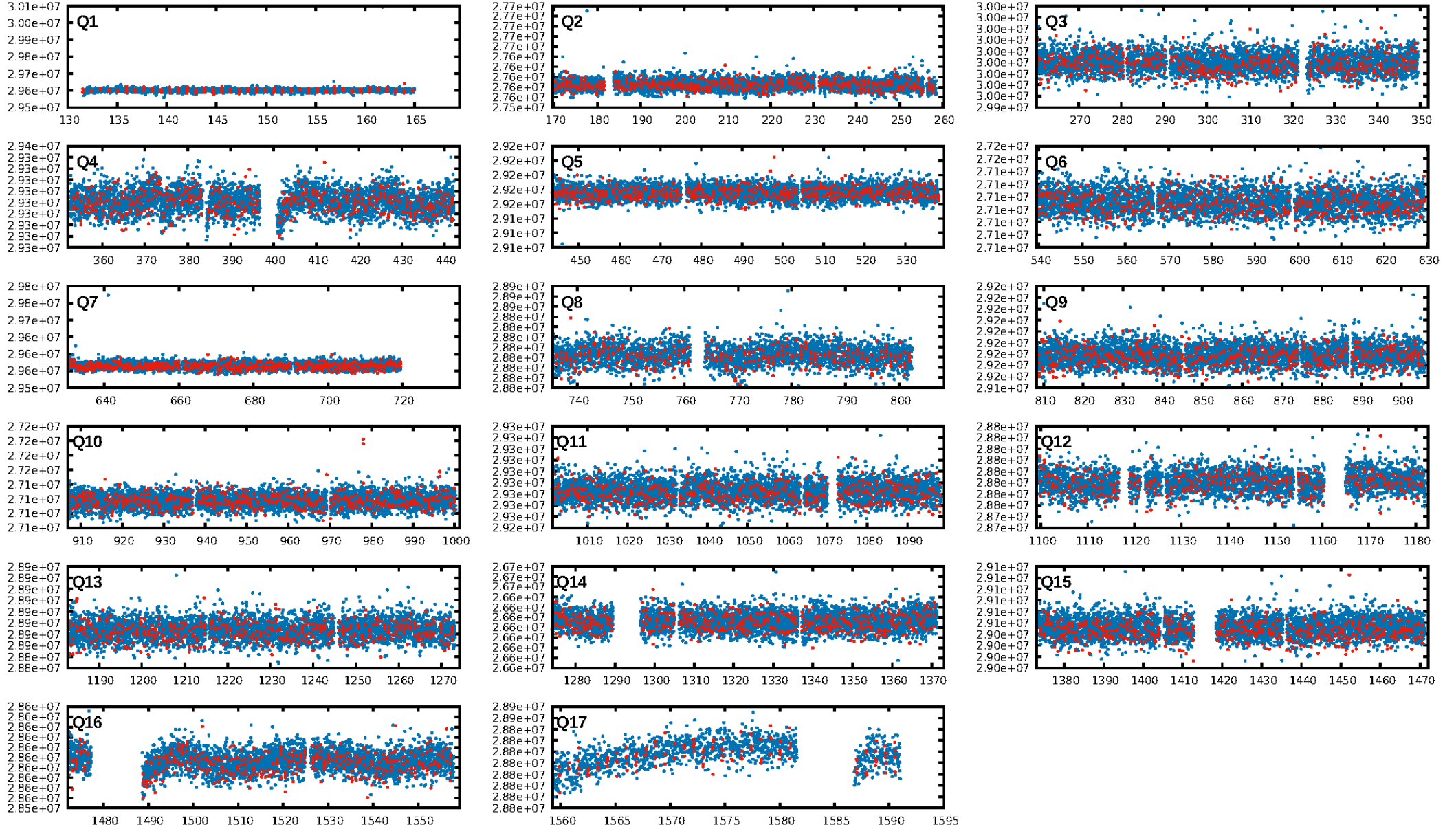
DV Fit Results:

Period = 0.87629 [0.00001] d
Epoch = 131.5229 [0.0013] BKJD
Rp/R* = 0.0103 [0.0043]
a/R* = 2.98 [5.75]
b = 0.90 [0.47]
Seff = 3156.60 [1258.63]
Teq = 1911 [191] K
Rp = 1.04 [0.53] Re
a = 0.0180 [0.0046] AU
Ag = 1.71 [1.77] [0.40σ]
Teffp = 3380 [823] K [1.74σ]

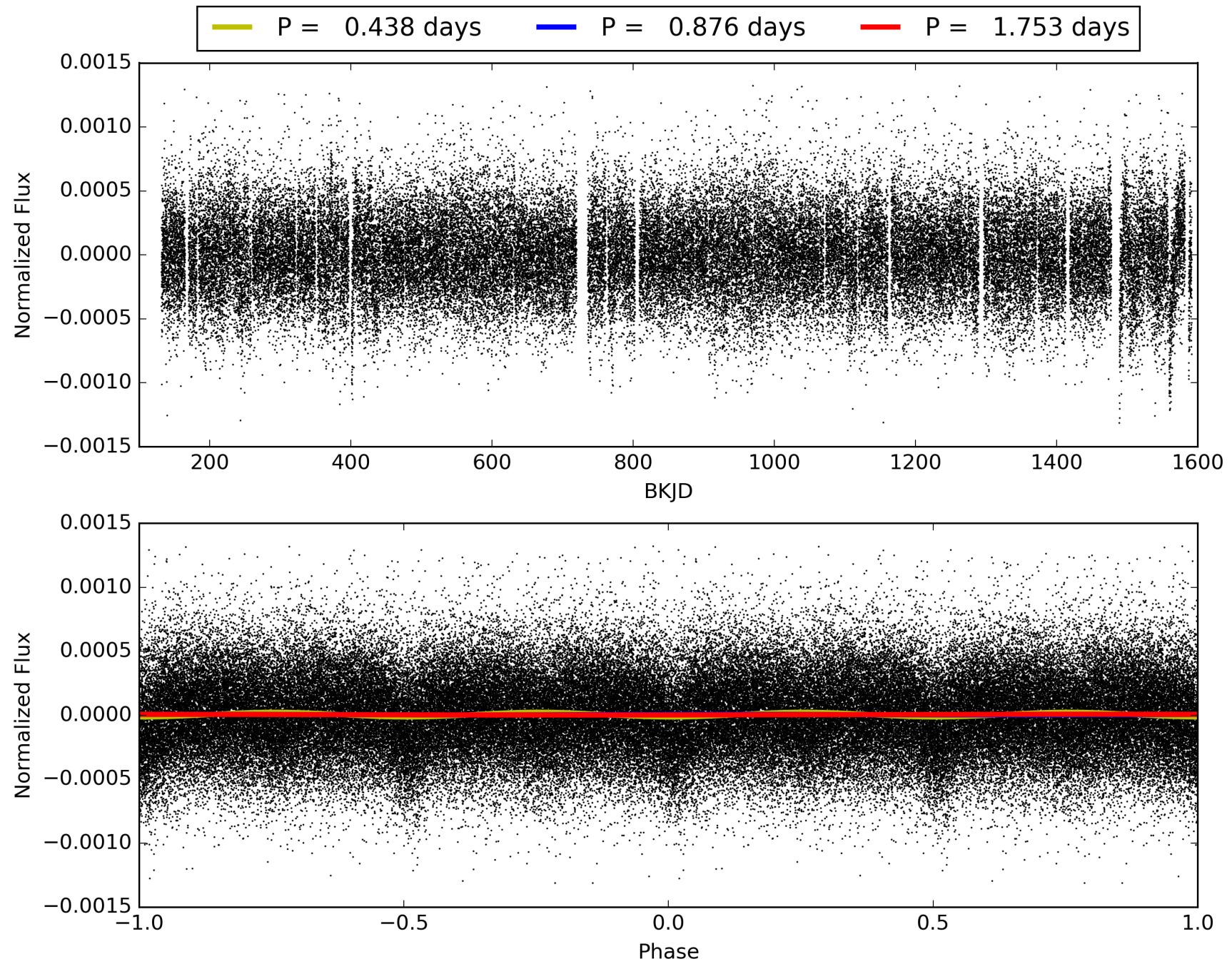
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.09e-44
RollingBand-fgt: 0.98 [1421/1456]
GhostDiagnostic-chr: -0.981
Centroid-sig: 0.0%
Centroid-so: 8.646 arcsec [9.44σ]
OotOffset-rm: 7.024 arcsec [6.75σ]
KicOffset-rm: 7.038 arcsec [6.61σ]
OotOffset-st: 3/0/0/1 [4]
KicOffset-st: 3/0/0/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009597729-02, PDC Light Curves

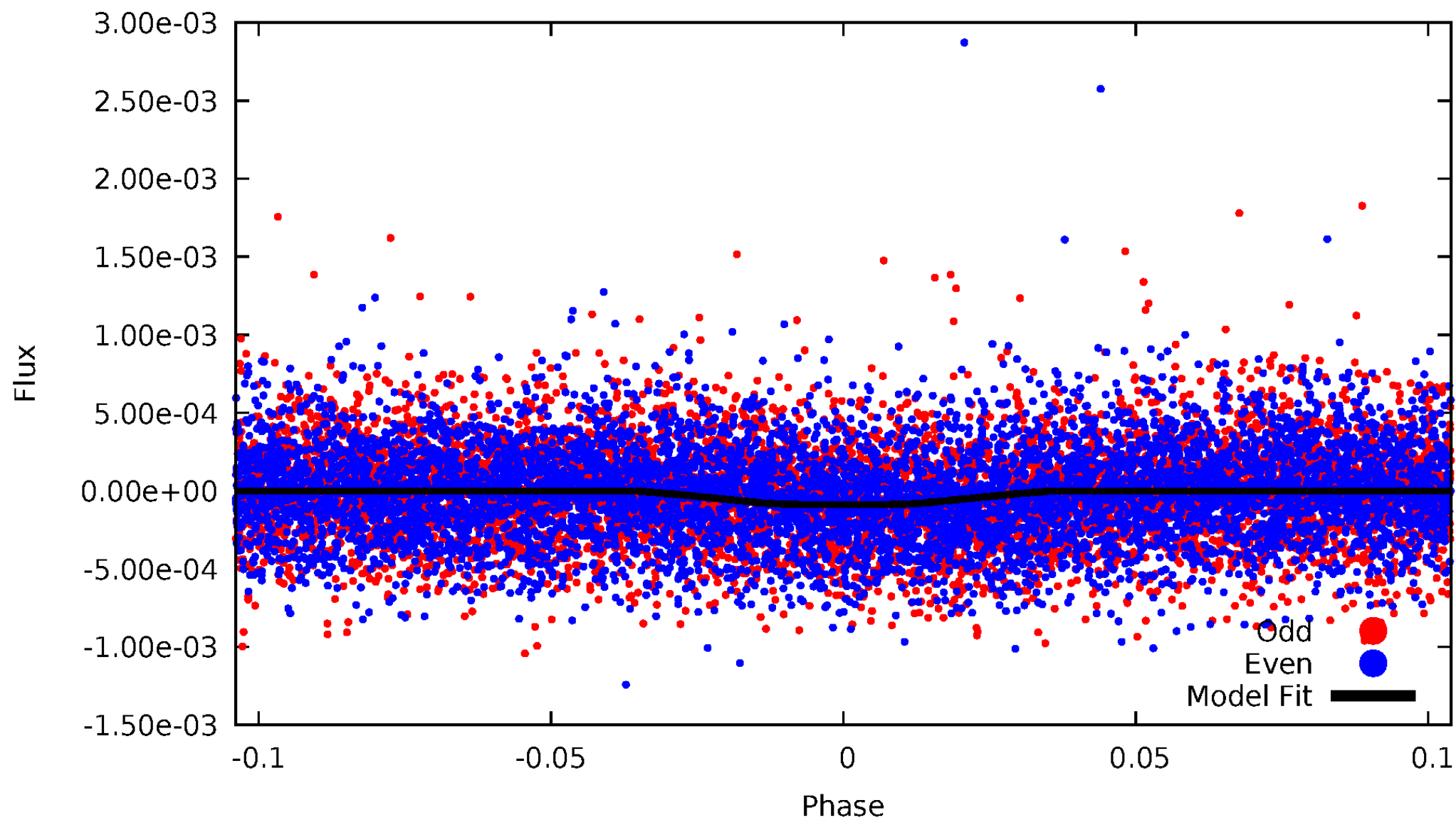


TCE 009597729-02



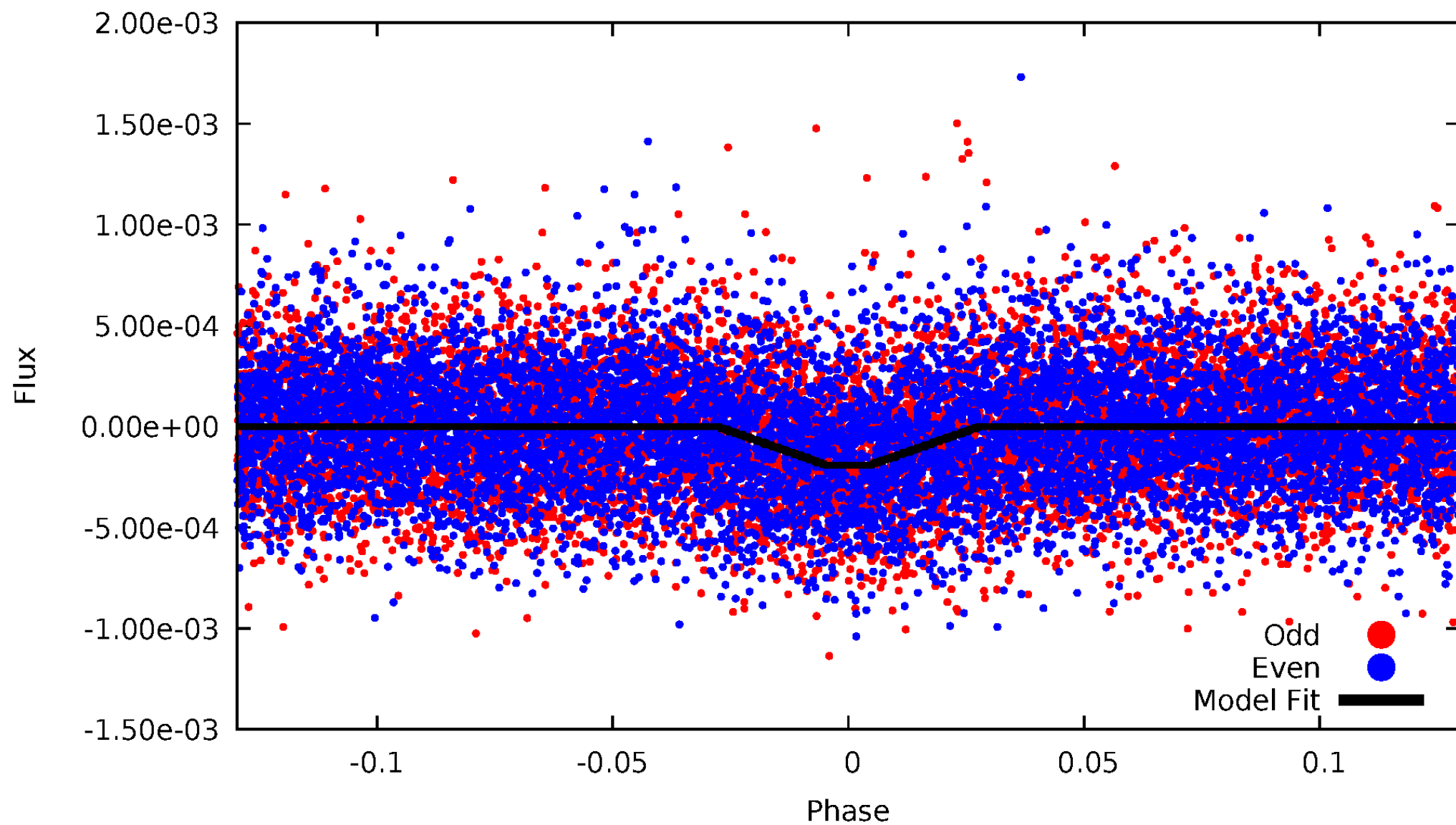
DV Odd/Even

TCE 009597729-02



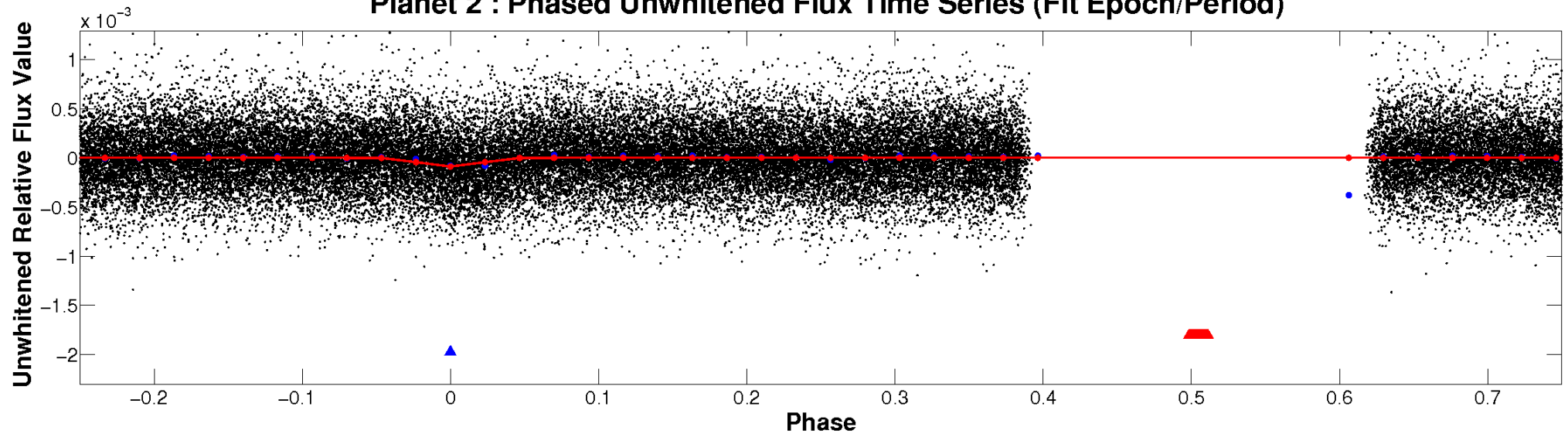
ALT Odd/Even

TCE 009597729-02

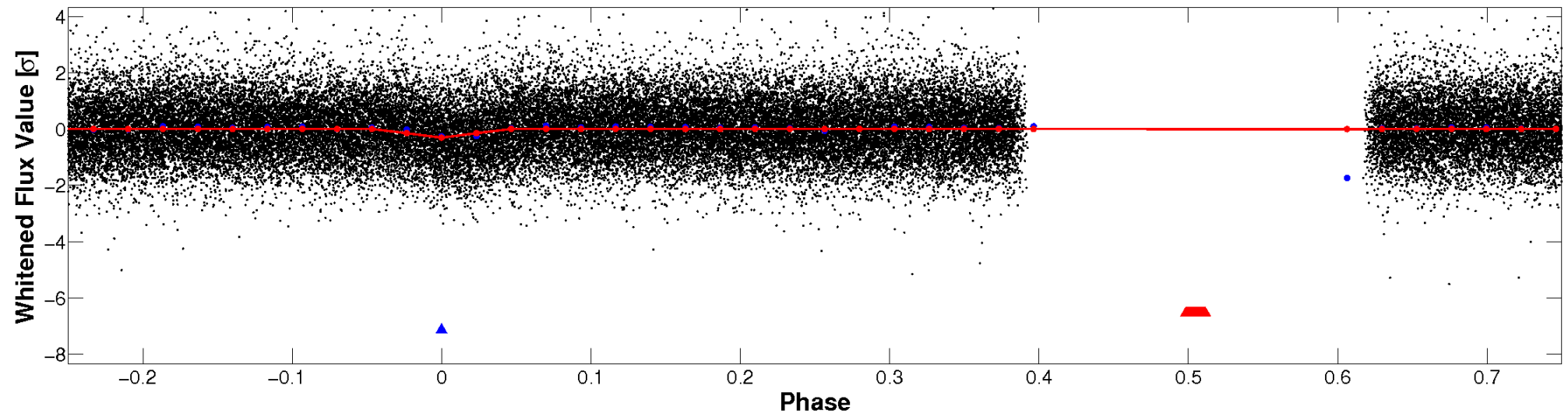


Non-Whitened Vs. Whitened Light Curve

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

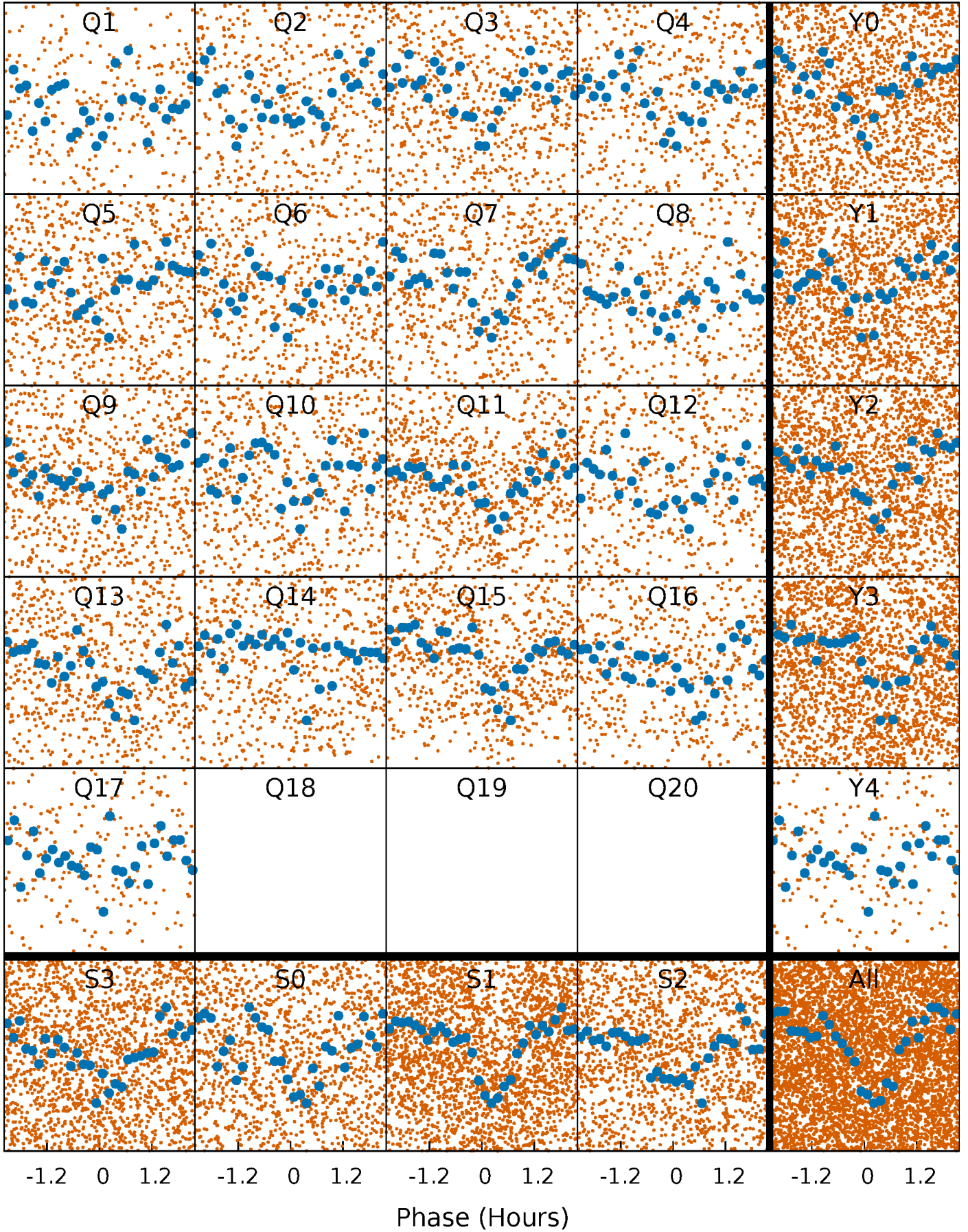


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



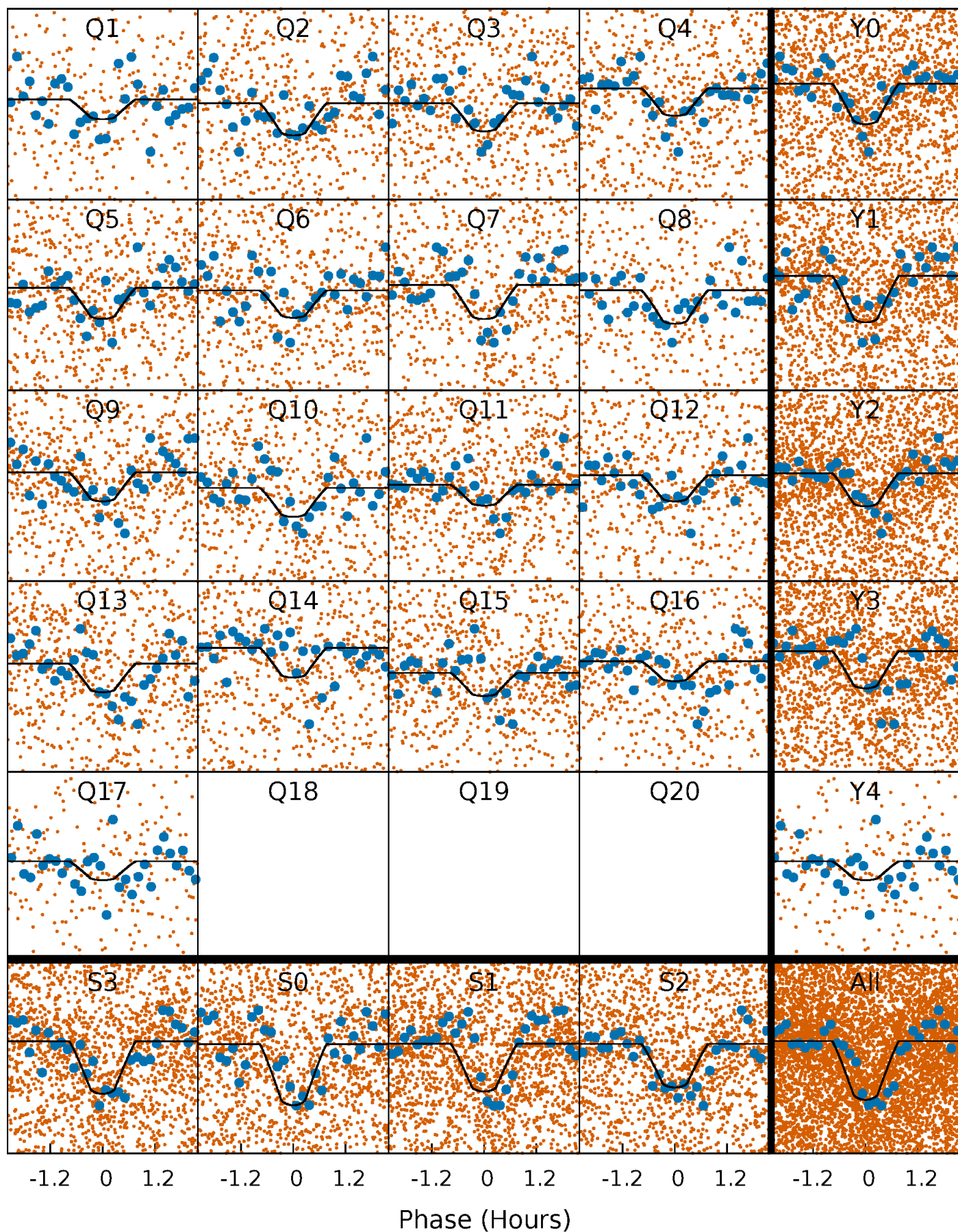
PDC Quarter-Phased Transit Curves

TCE 009597729-02 P= 0.876290 Days $T_0=131.522899$ (BKJD)



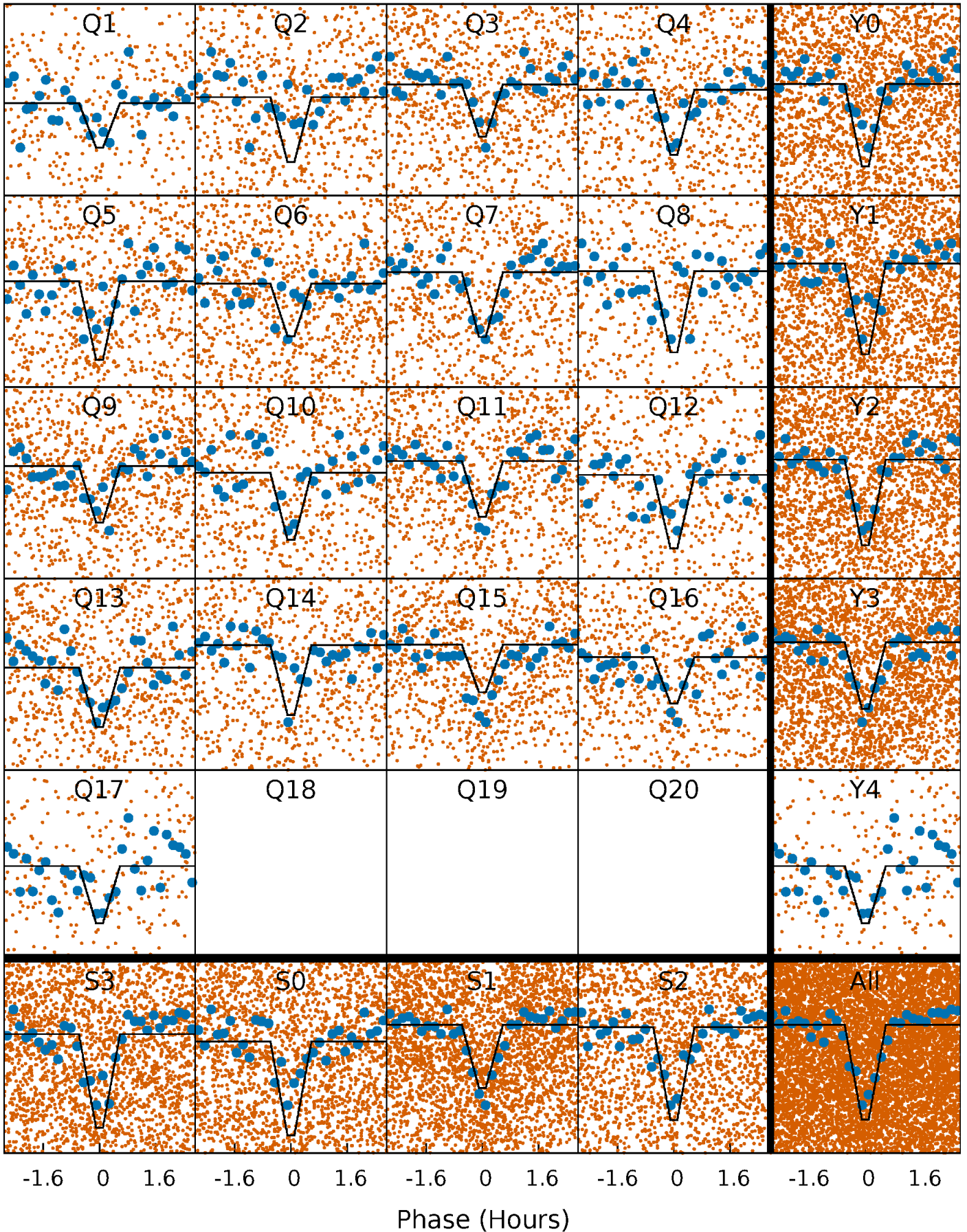
DV Quarter-Phased Transit Curves

TCE 009597729-02 P= 0.876290 Days $T_0=131.522899$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

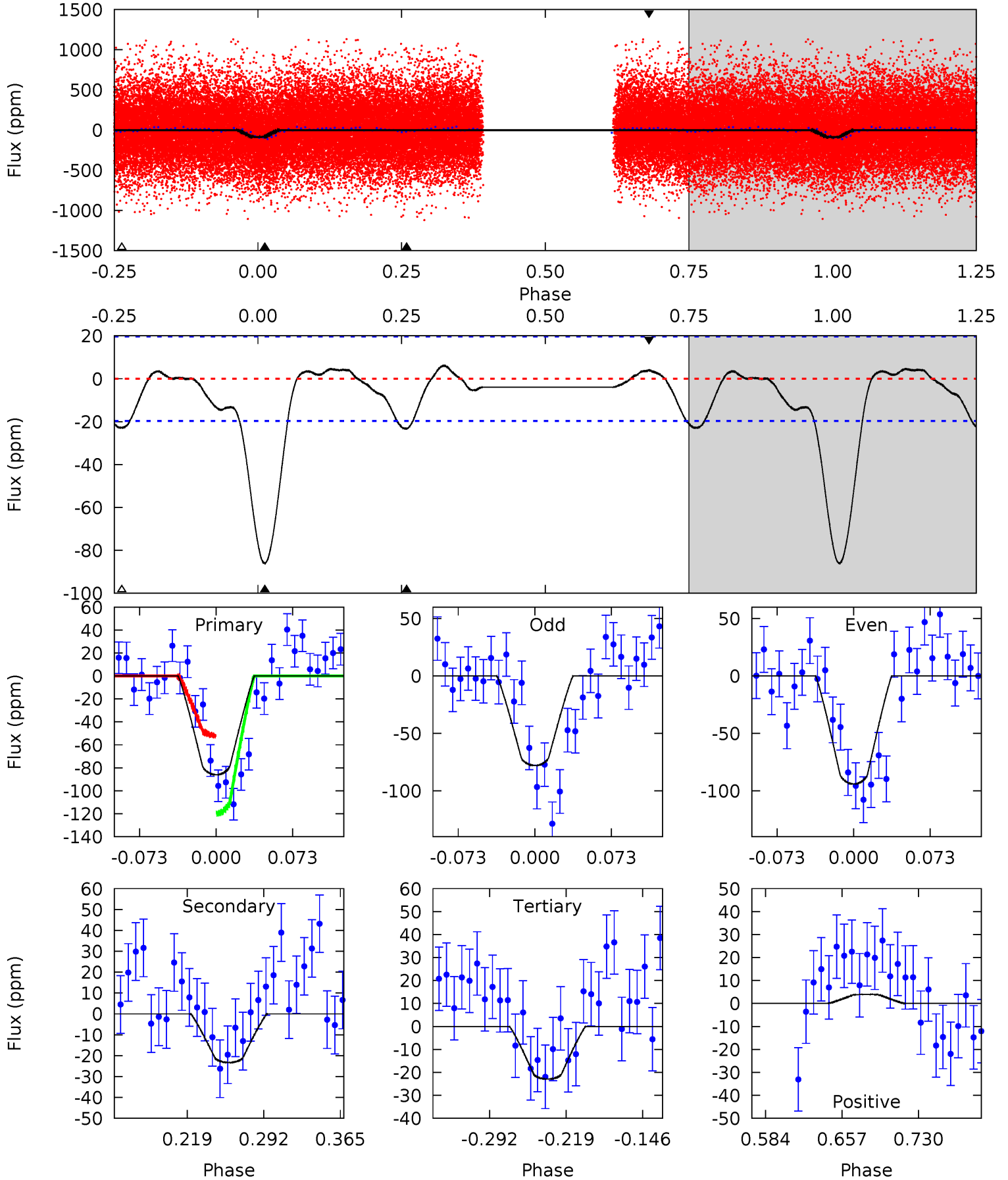
TCE 009597729-02 P= 0.876309 Days $T_0=131.515898$ (BKJD)



DV Model-Shift Uniqueness Test

009597729-02, P = 0.876290 Days, E = 130.646609 Days

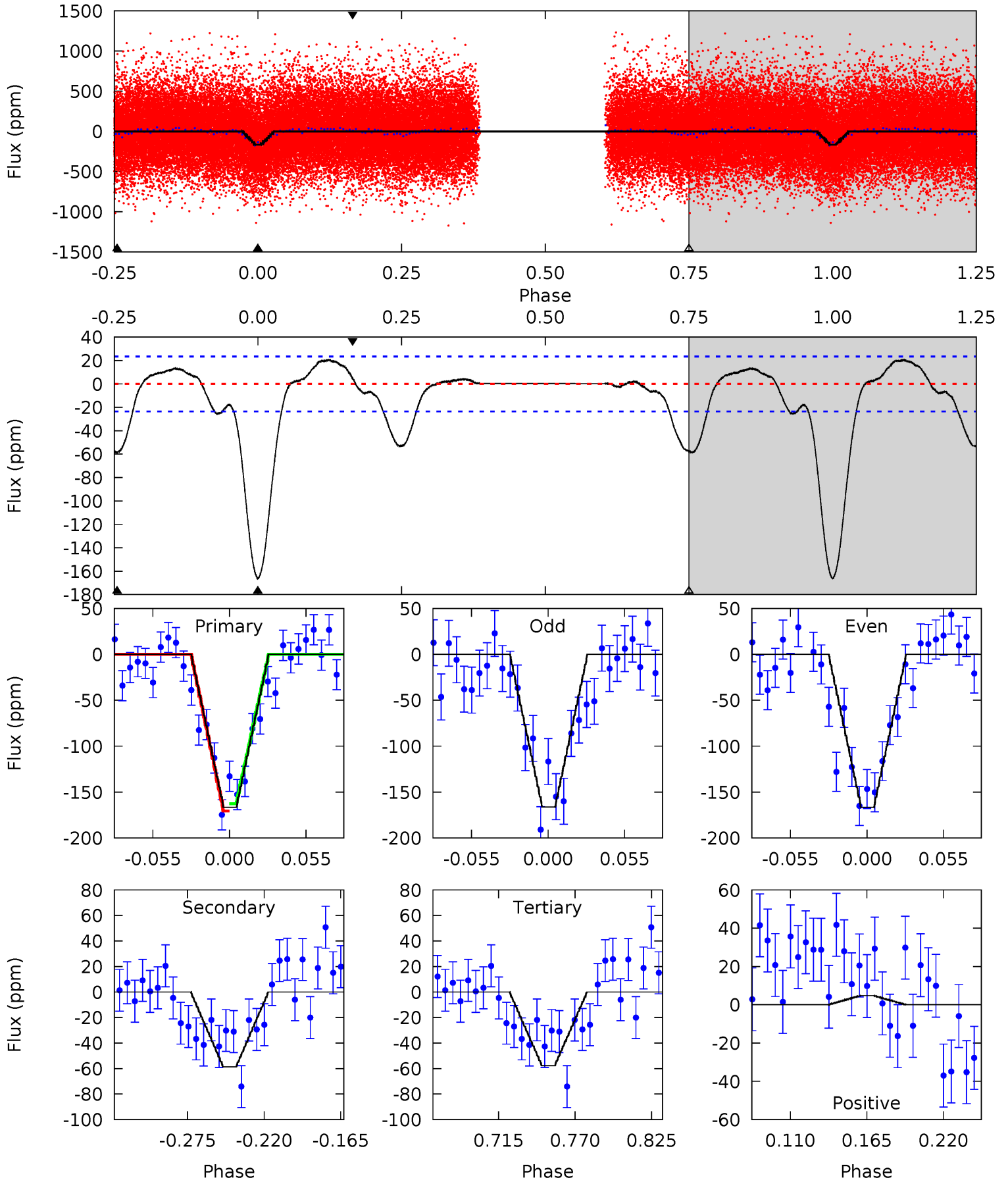
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	5.48	5.40	0.93	4.63	1.79	1.78	14.9	19.3	0.08	4.55	1.89	0.91	0.07	7.96



Alt Model-Shift Uniqueness Test

009597729-02, P = 0.876309 Days, E = 130.639589 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.3	11.7	11.5	0.96	4.69	1.92	3.86	21.7	32.3	0.20	10.8	0.05	1.00	0.11	0.79



Stellar Parameters For KIC 009597729

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6032^{+162}_{-198}	$4.508^{+0.039}_{-0.208}$	$-0.180^{+0.250}_{-0.300}$	$0.929^{+0.278}_{-0.093}$	$1.014^{+0.131}_{-0.131}$	$1.783^{+0.372}_{-0.950}$
	+3%/-3%	+1%/-5%	+139%/-167%	+30%/-10%	+13%/-13%	+21%/-53%
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 009597729-02 / KOI 4417.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-23 ± 4	$1.12^{+0.53}_{-0.47}$	2742^{+179}_{-129}	4213^{+1192}_{-579}	$3.190^{+6.638}_{-1.718}$
Alt.	-59 ± 5	$1.46^{+0.54}_{-0.43}$	2744^{+178}_{-132}	4569^{+784}_{-500}	$4.737^{+4.962}_{-2.174}$

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 $A_{obs} \gg 1.0$

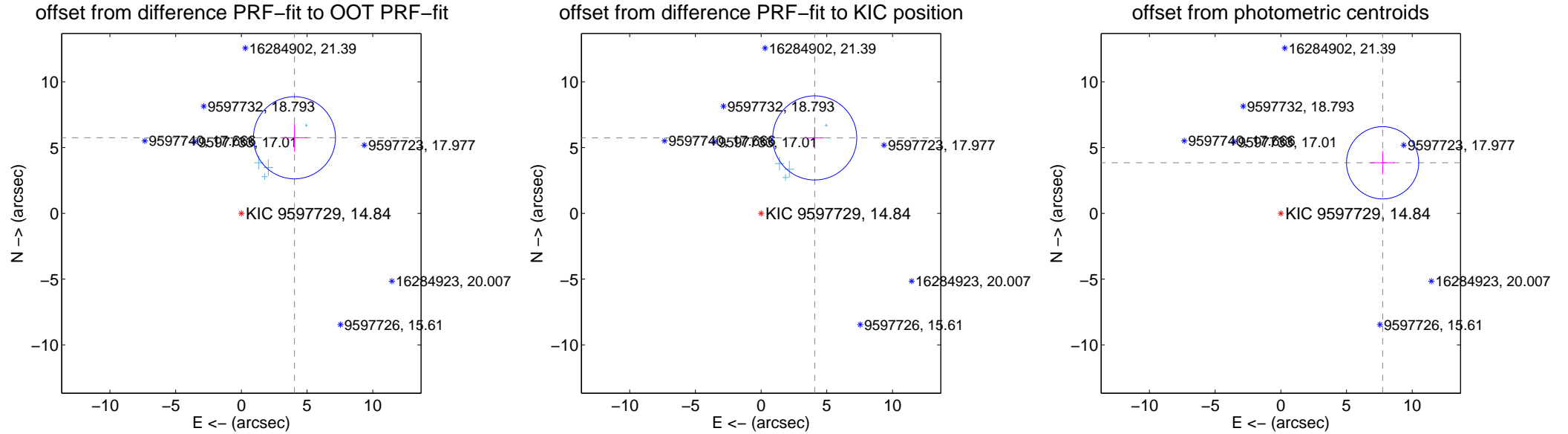
DV Centroid Data

Supplemental centroid analysis for 009597729-02. Kepler magnitude: 14.84. Transit SNR 14.69

There are 4 quarters with good PRF difference image offsets

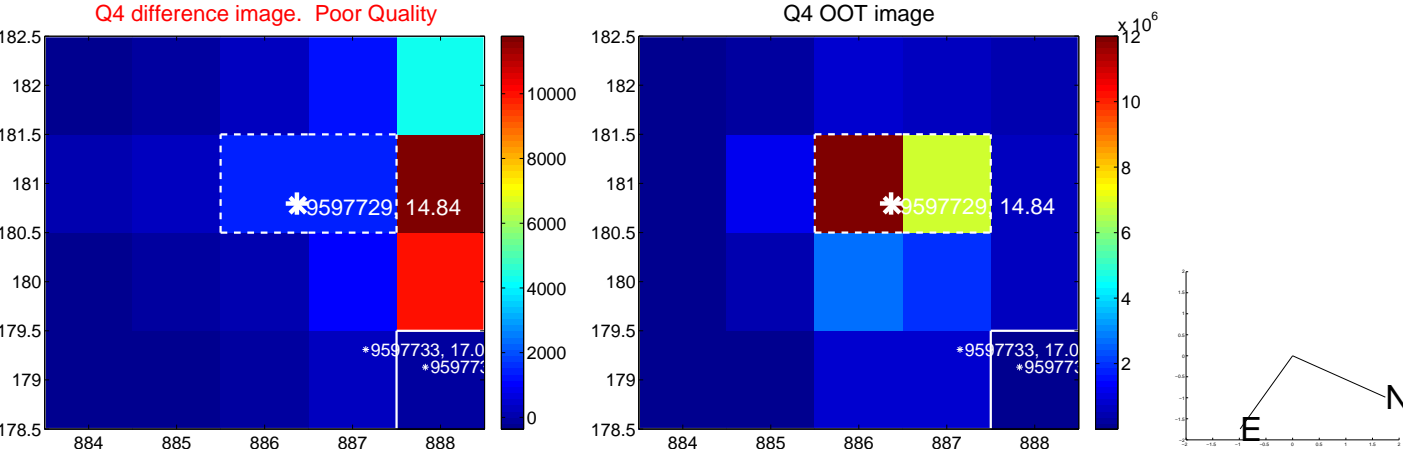
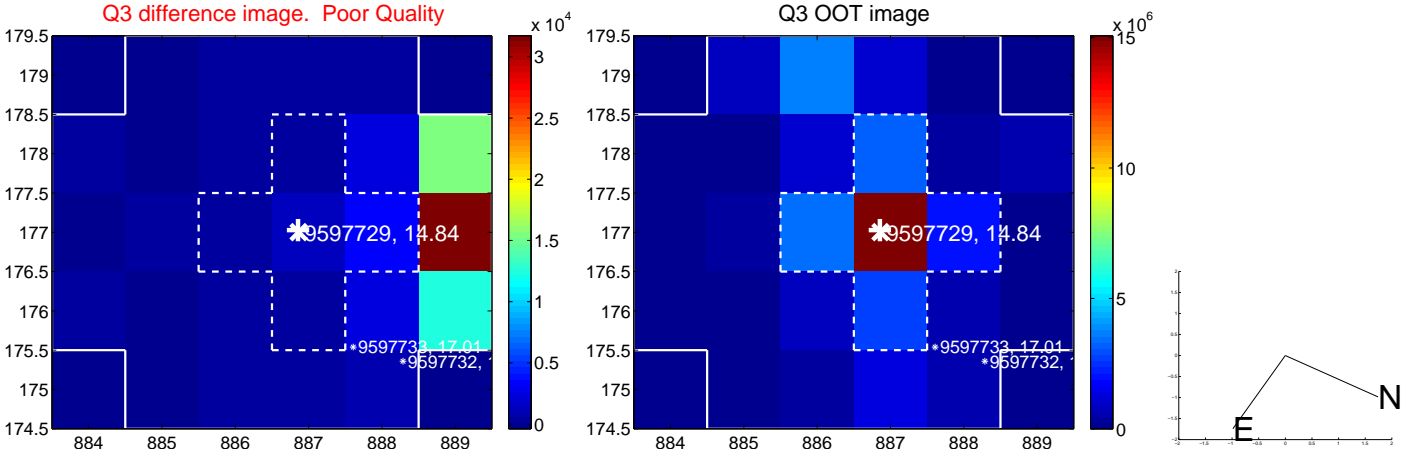
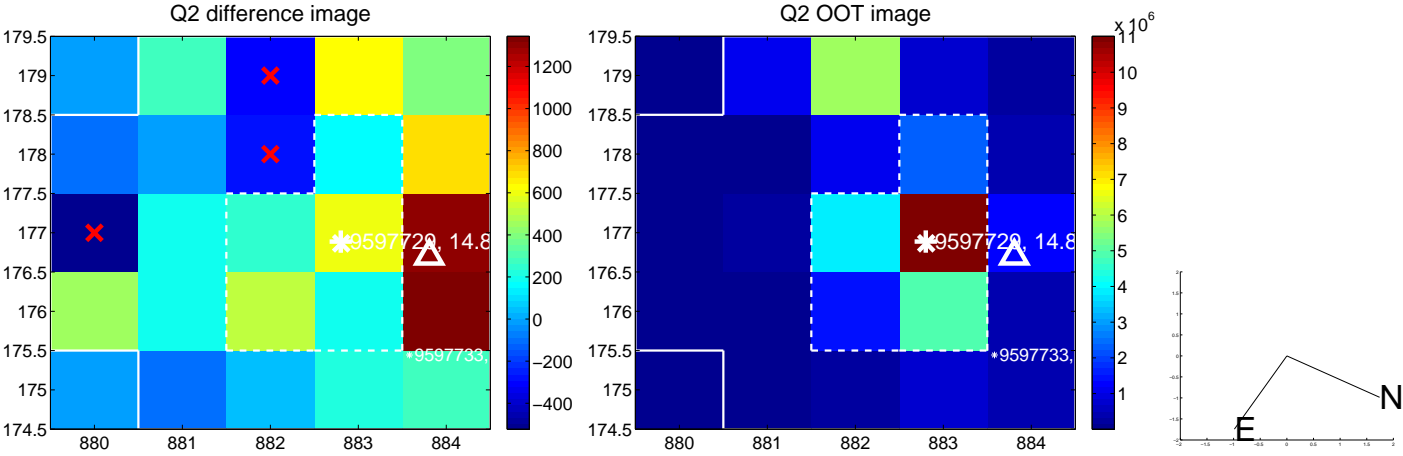
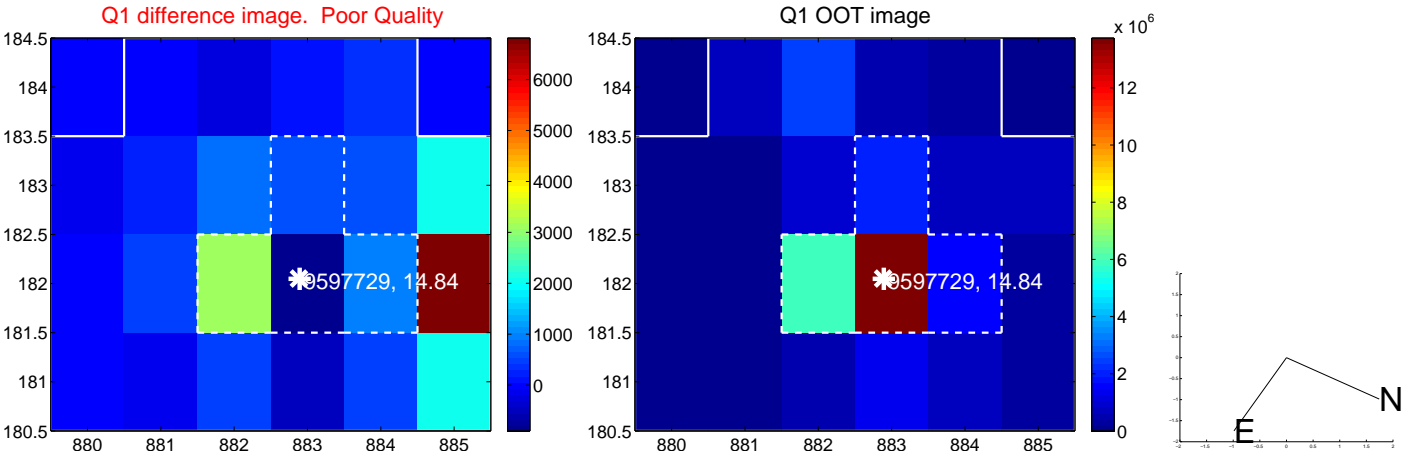
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.024 ± 1.041	6.75	-4.040 ± 0.975	5.746 ± 1.071
PRF-fit source offset from KIC position	7.038 ± 1.066	6.61	-4.081 ± 0.700	5.735 ± 0.829
photometric centroid source offset	8.65 ± 0.92	9.44	-7.74 ± 0.92	3.84 ± 0.90

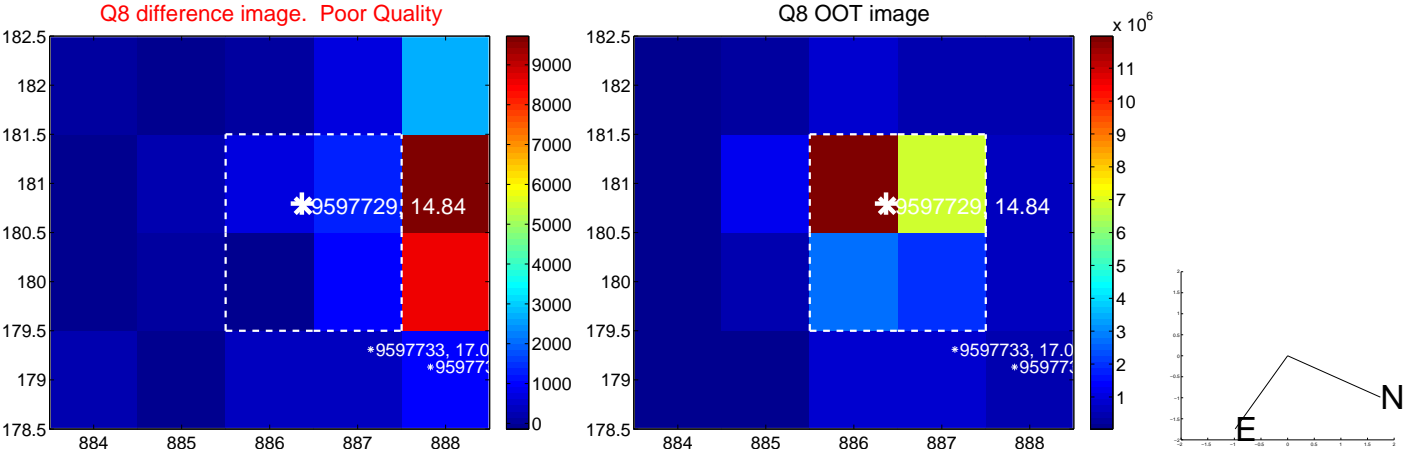
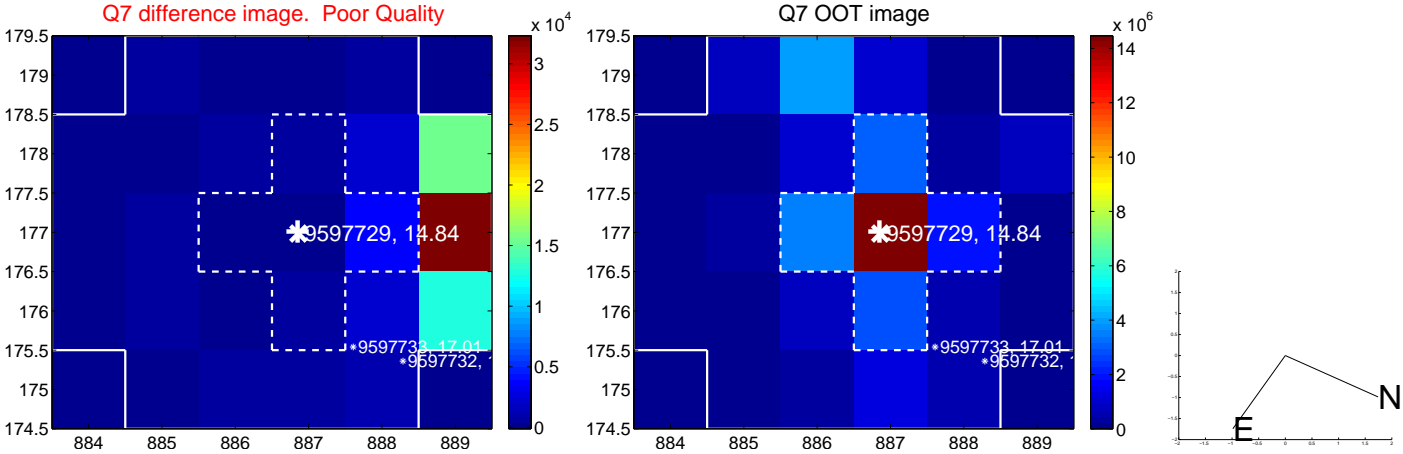
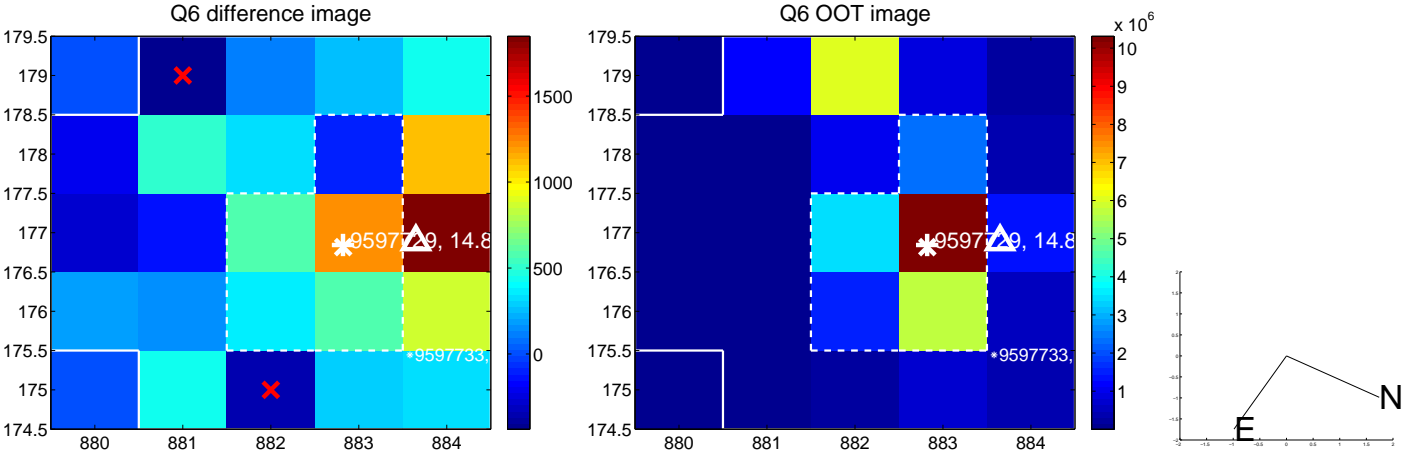
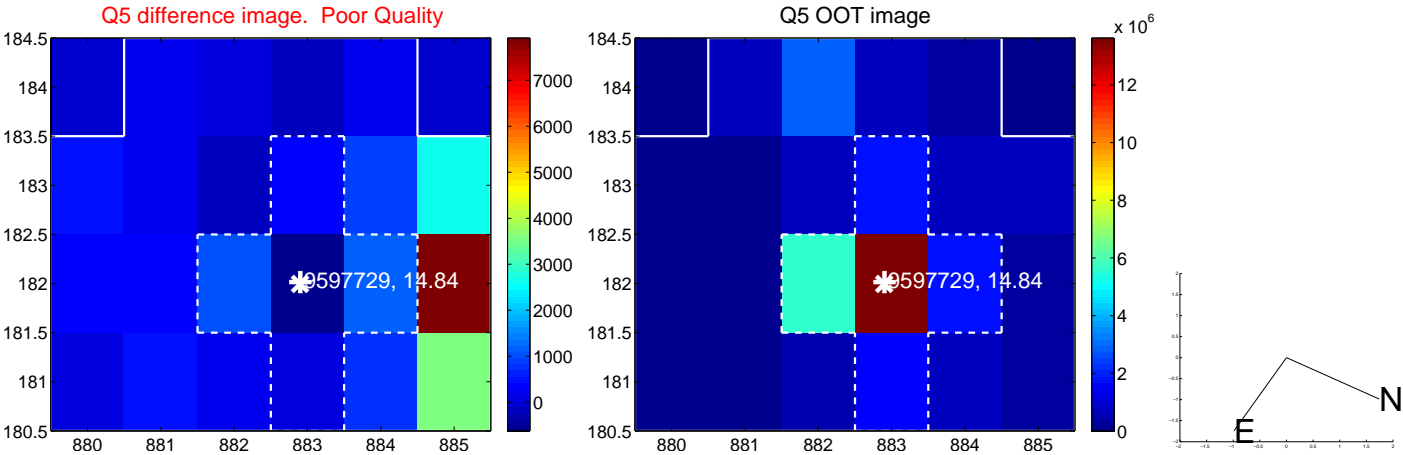


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

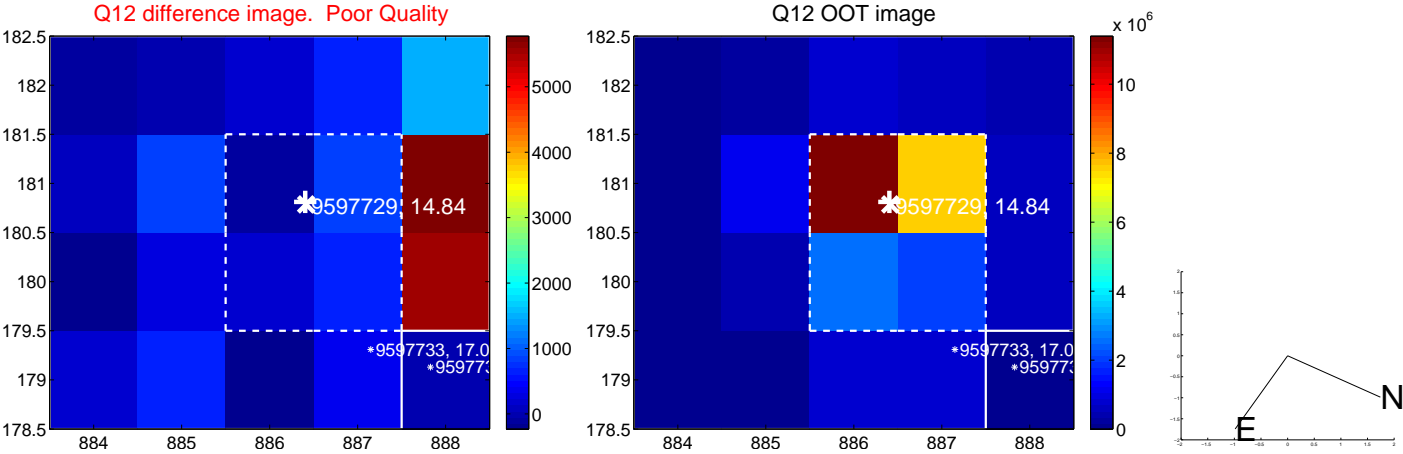
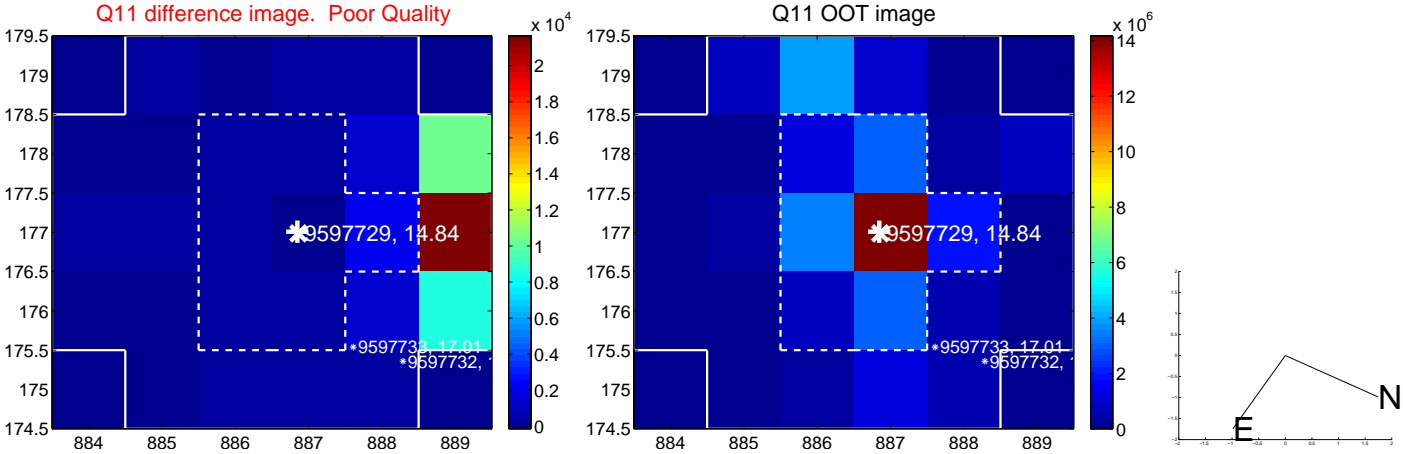
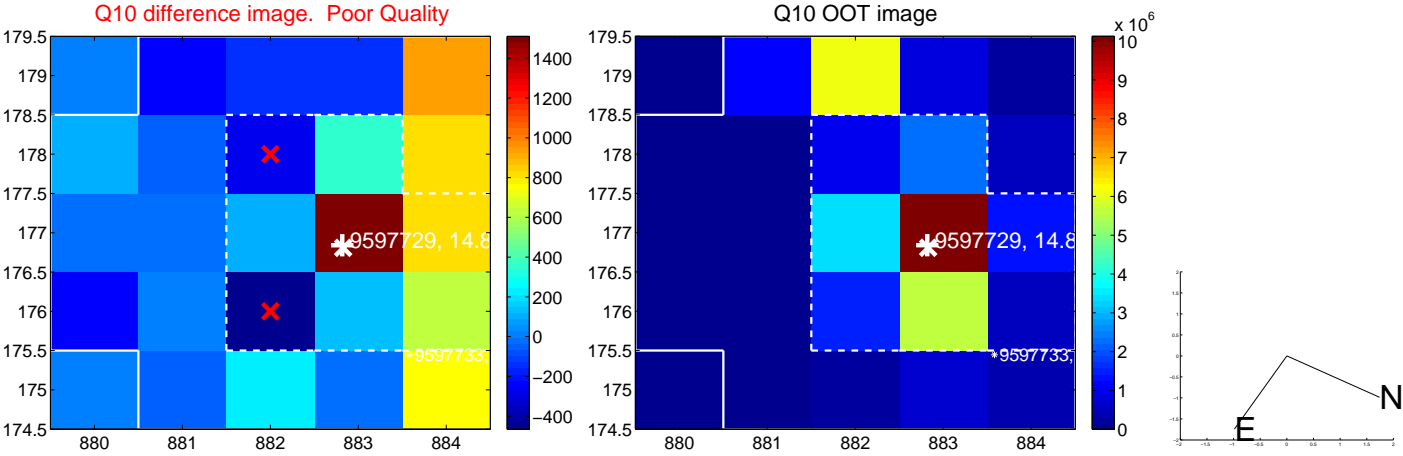
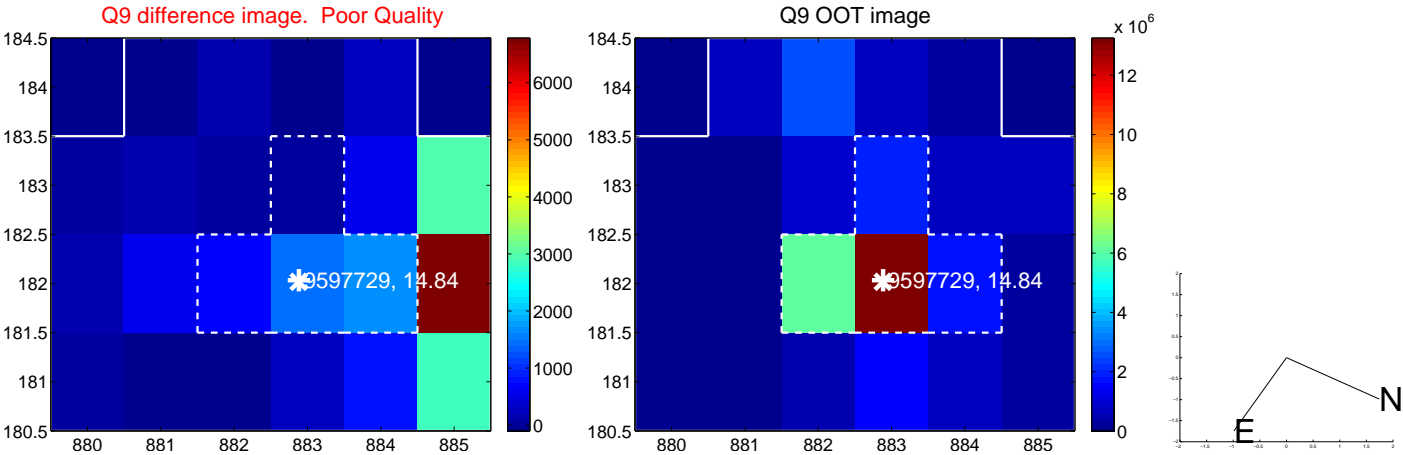
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



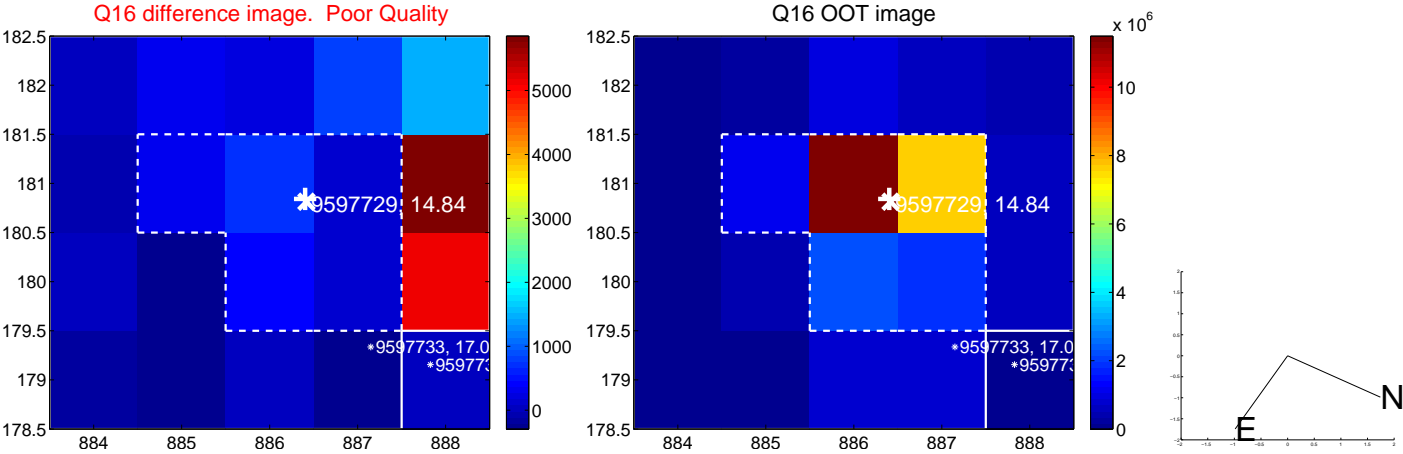
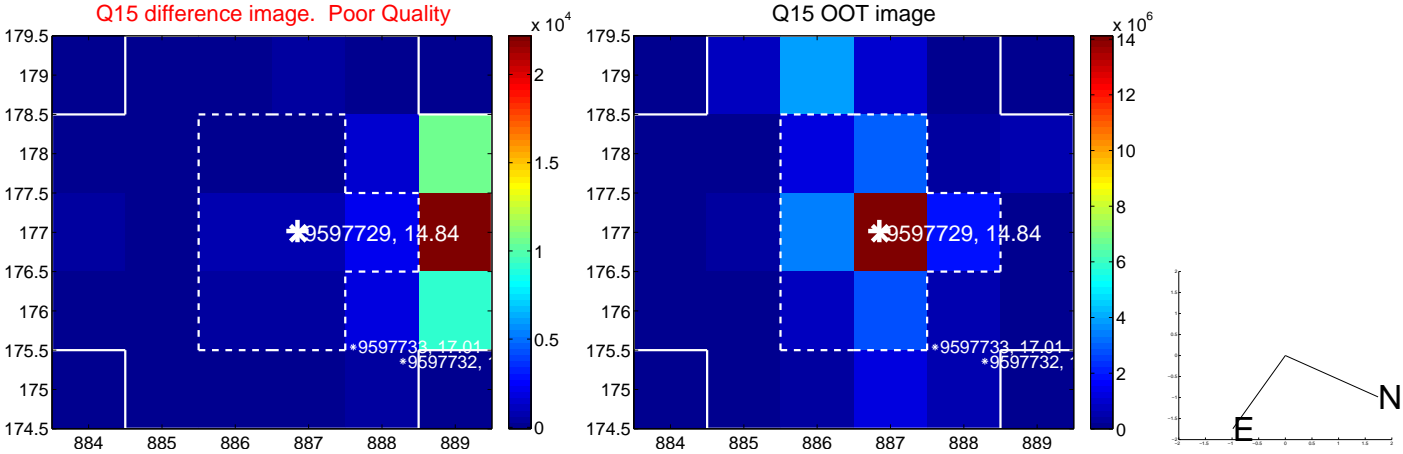
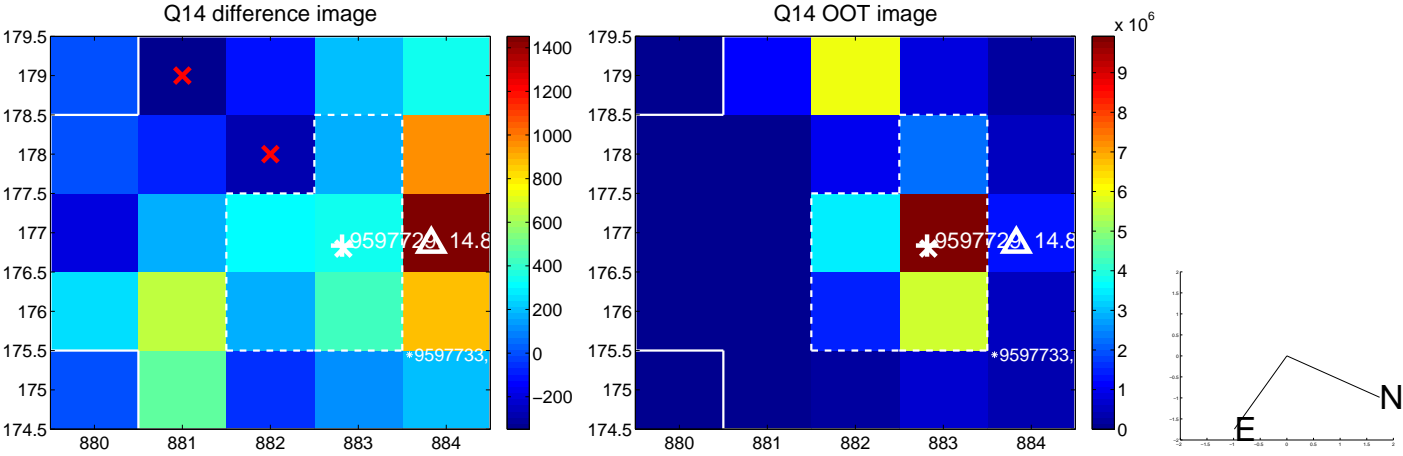
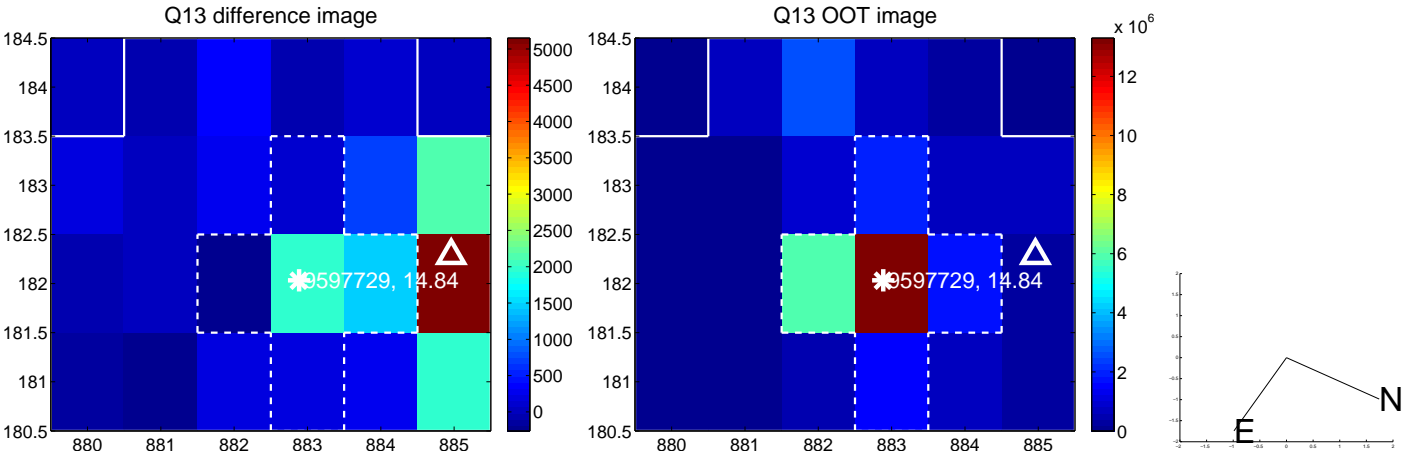
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



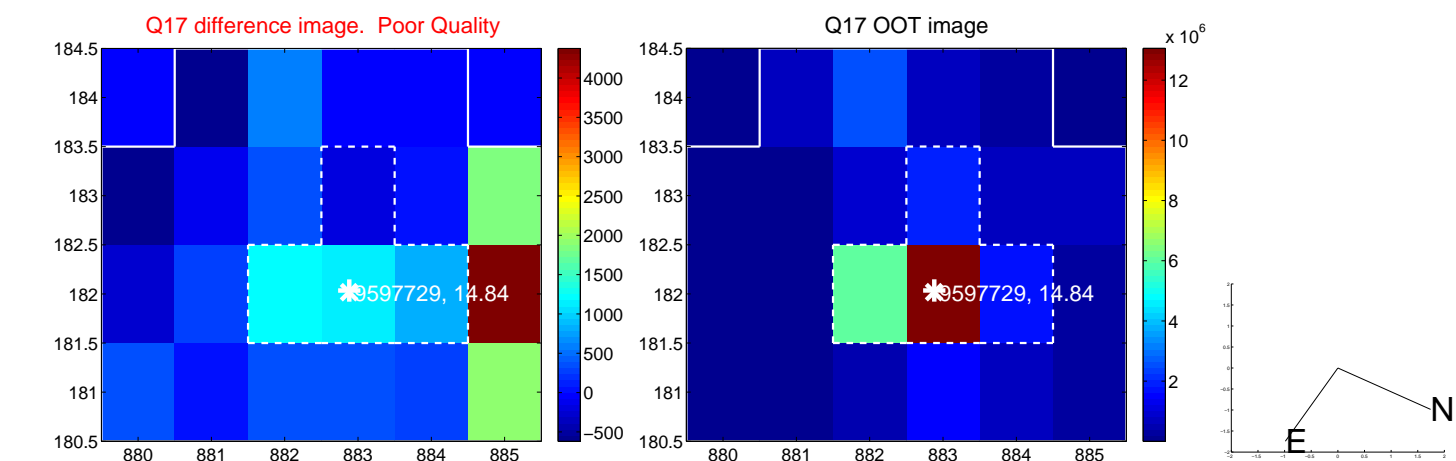
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



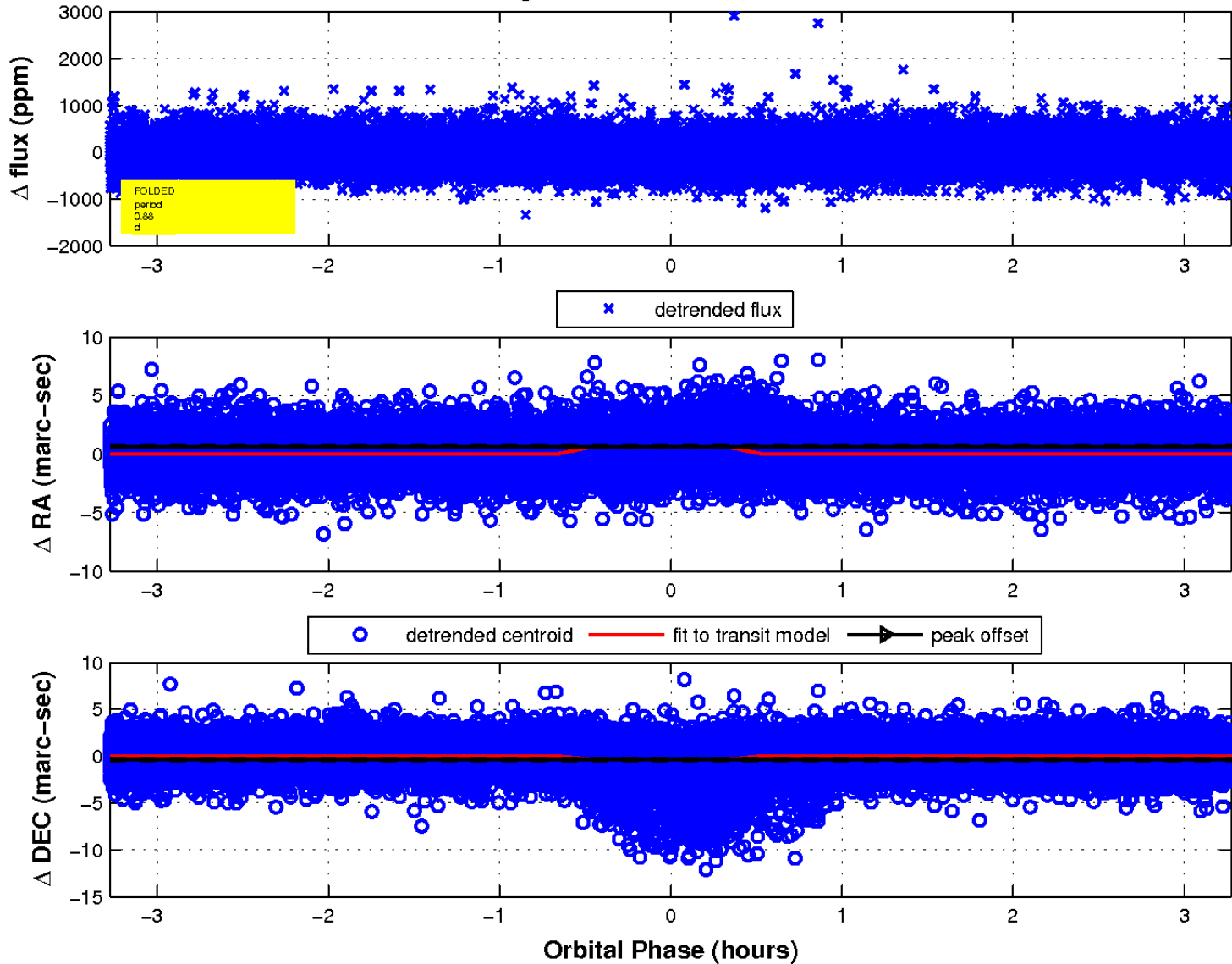
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

