

KIC 009344493

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})
009344493-01	OBS	No	0.836156	132.170962	58.5	3.505	12.1	11.3	2.00	7428	1.77	29438.64
009344493-02	OBS	No	0.836159	131.745775	64.4	3.494	12.7	12.1	2.00	7428	1.85	29438.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009344493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009344493-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

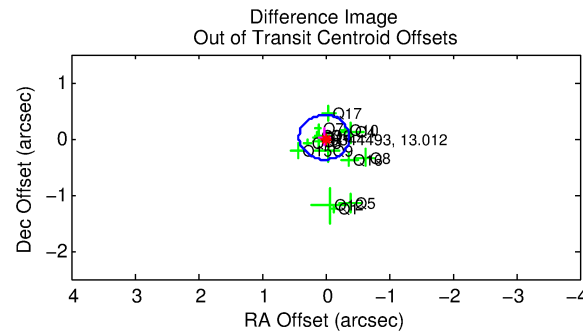
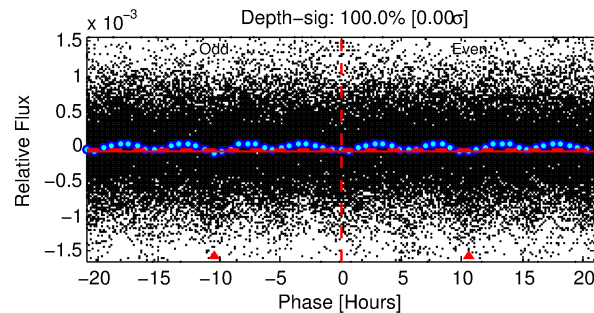
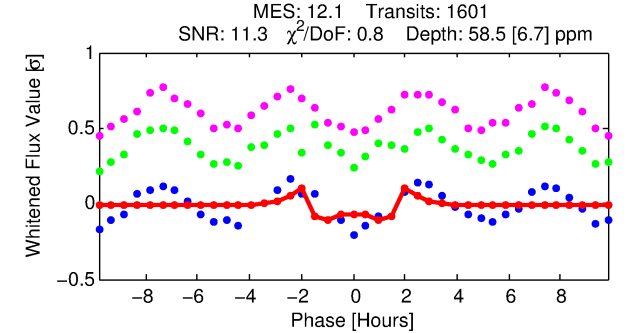
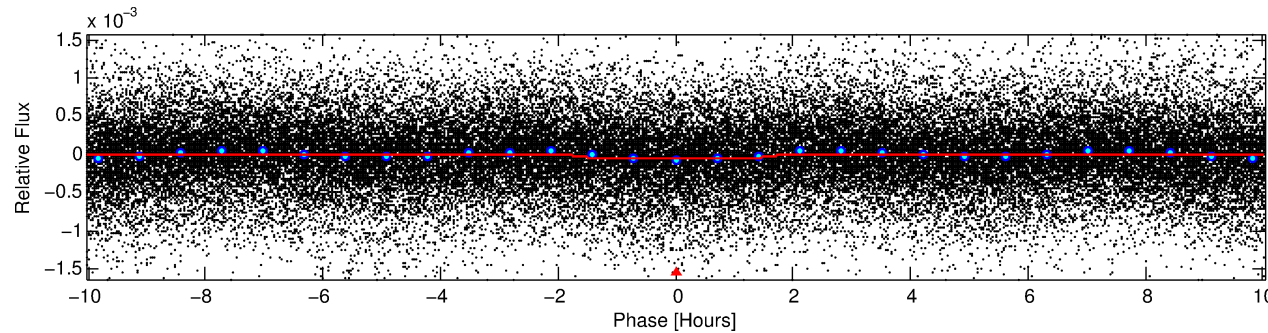
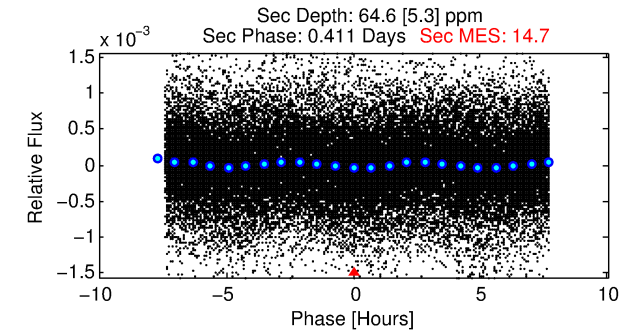
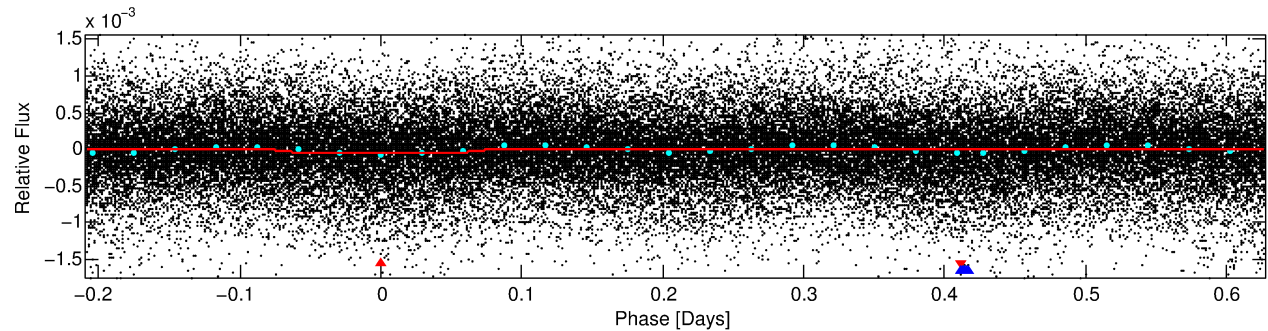
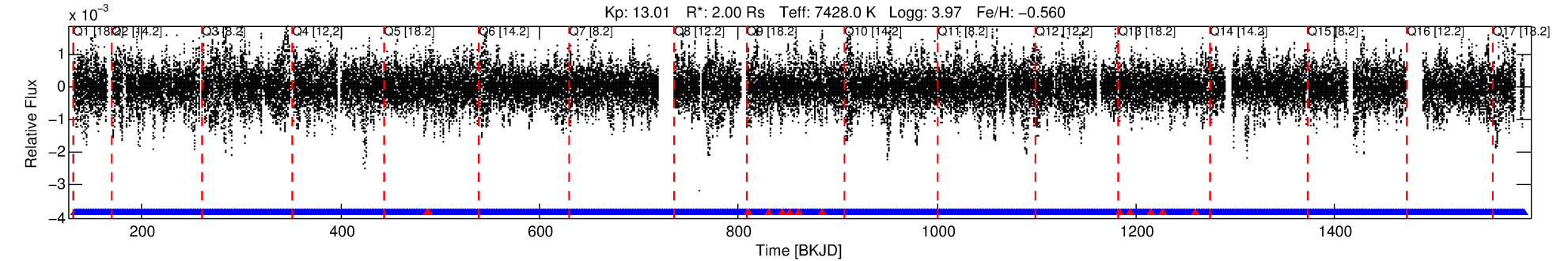
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009344493-01

No Significant Match Found

DV One-Page Summary

KIC: 9344493 Candidate: 1 of 2 Period: 0.836 d



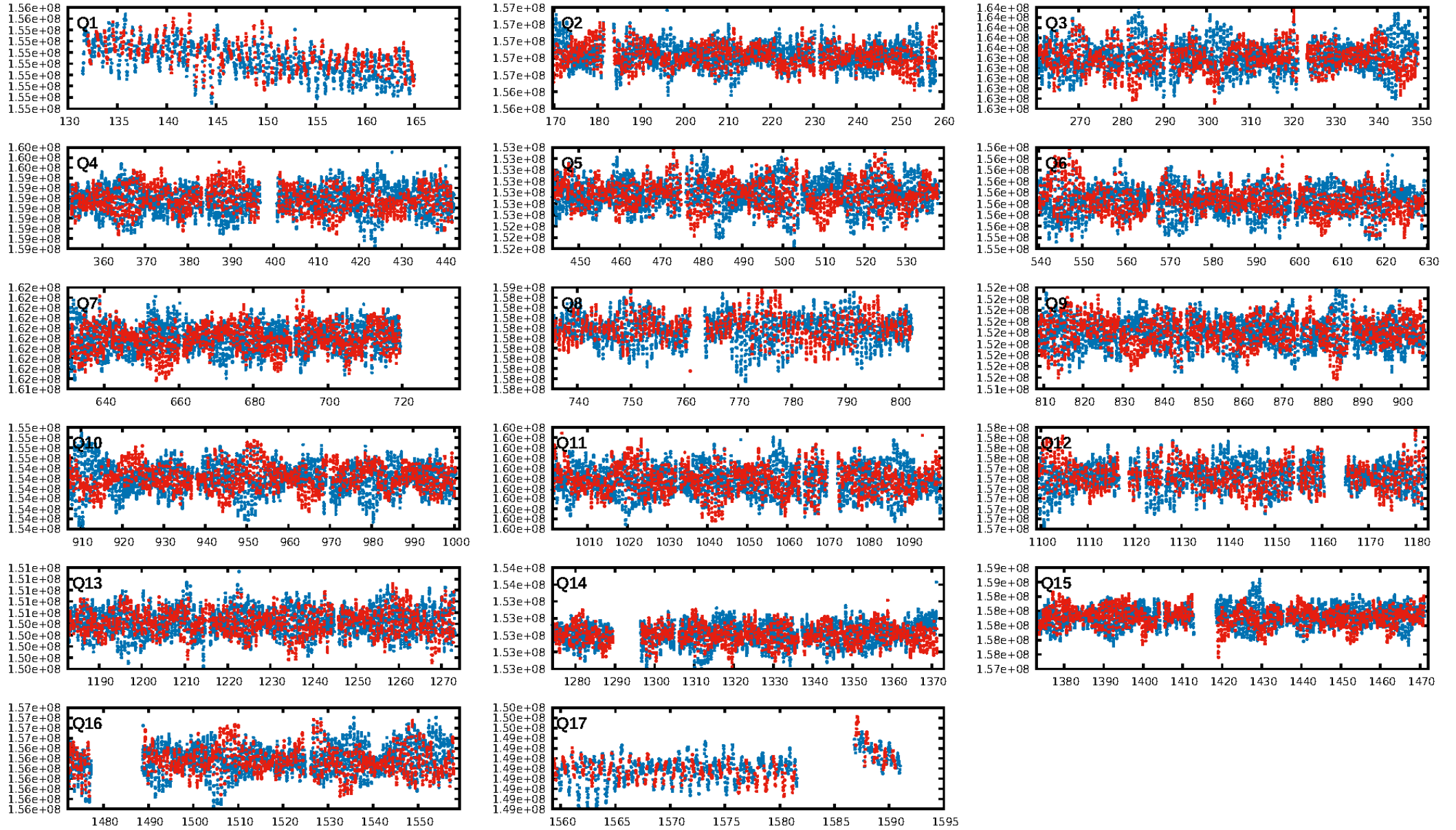
DV Fit Results:

Period = 0.83616 [0.00001] d
Epoch = 132.1710 [0.0013] BKJD
Rp/R* = 0.0081 [0.0013]
a/R* = 1.25 [0.42]
b = 0.90 [0.20]
Seff = 29438.64 [16614.37]
Teq = 3340 [471] K
Rp = 1.77 [0.69] Re
a = 0.0192 [0.0065] AU
Ag = 4.20 [2.65] [1.21σ]
Teffp = 7393 [682] K [4.89σ]

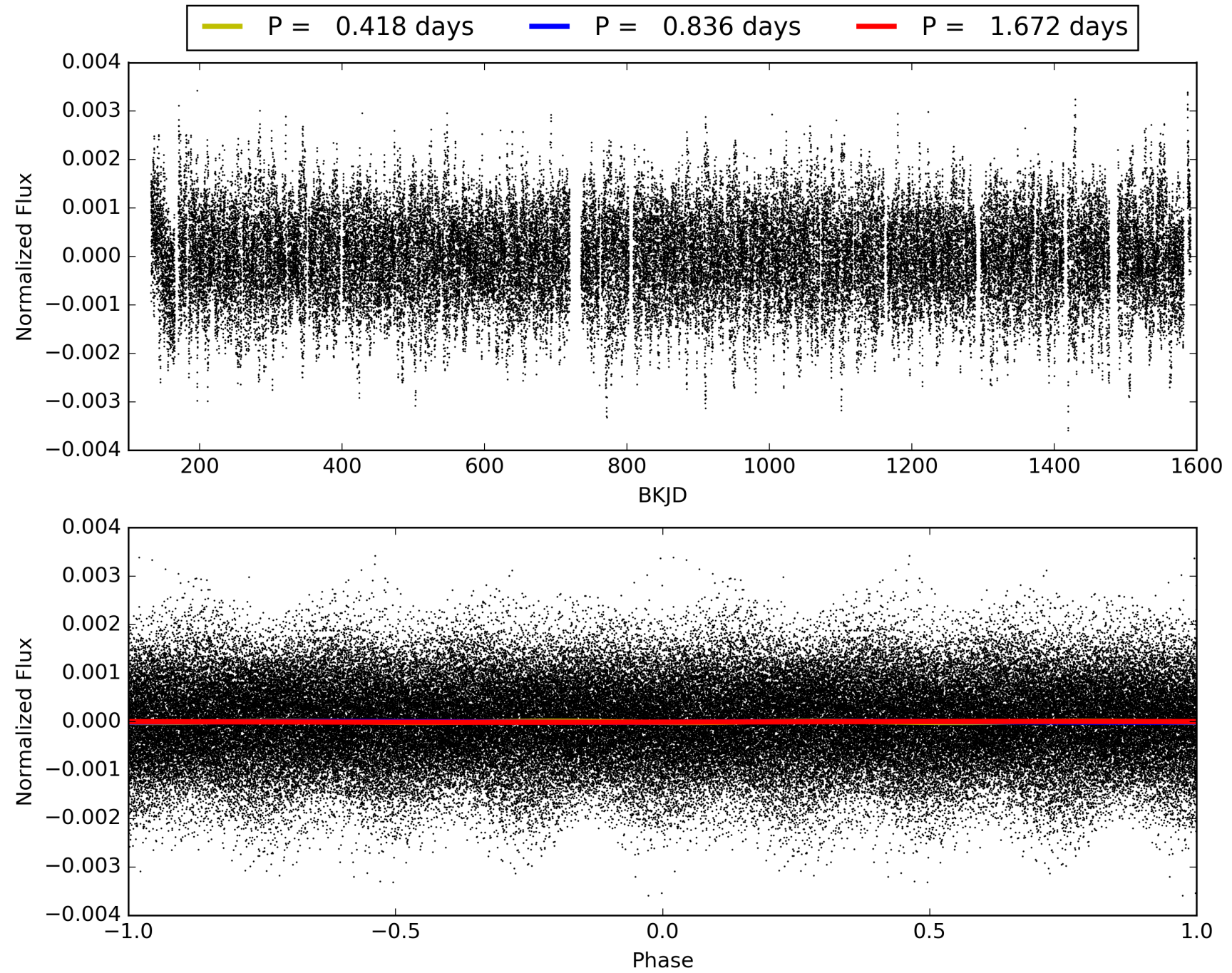
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1516/1529]
GhostDiagnostic-chr: 0.8264
Centroid-sig: 20.9%
Centroid-so: 0.256 arcsec [0.94σ]
OotOffset-rm: 0.030 arcsec [0.23σ]
KicOffset-rm: 0.159 arcsec [1.23σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.62 [10/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009344493-01, PDC Light Curves

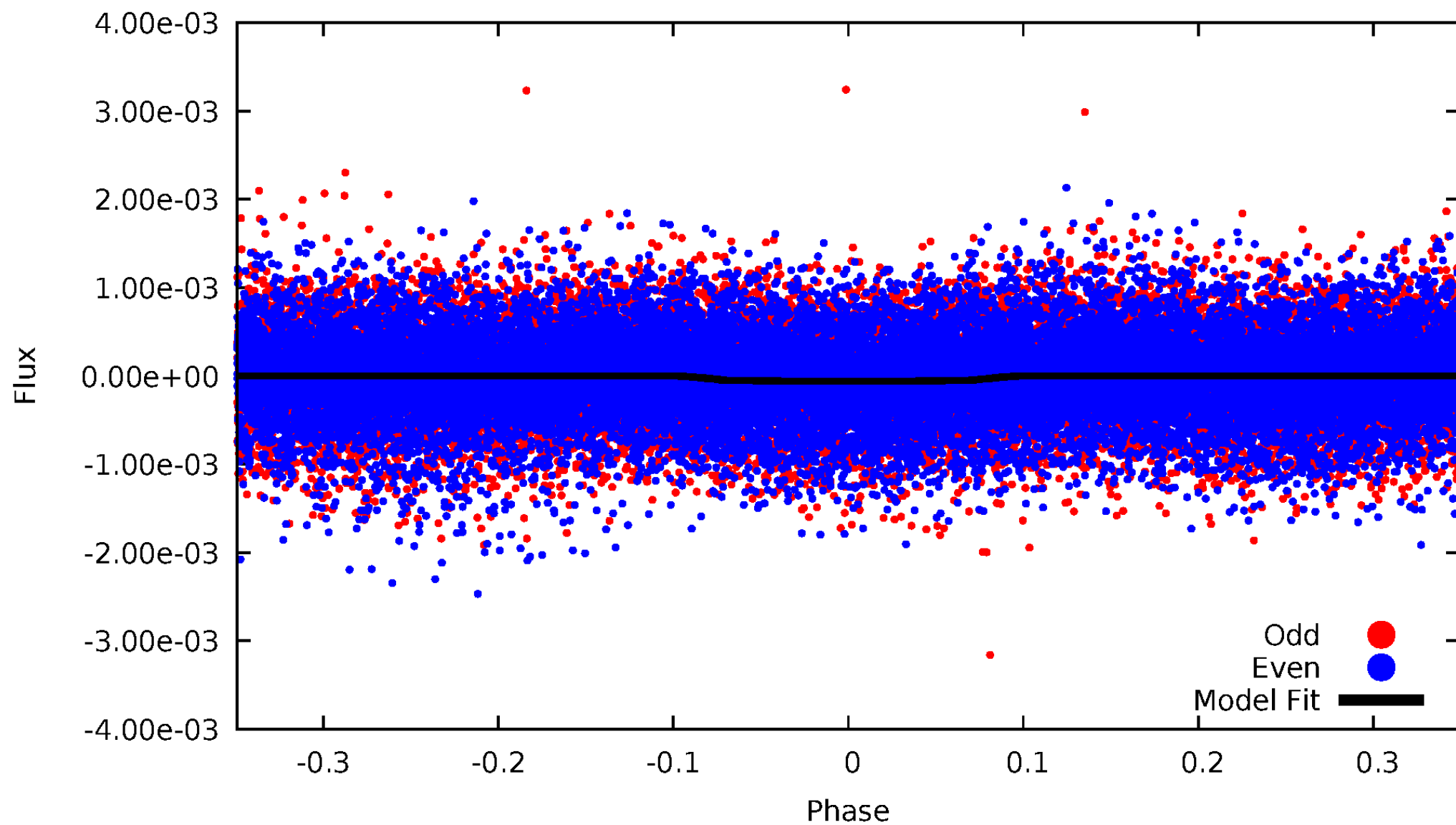


TCE 009344493-01



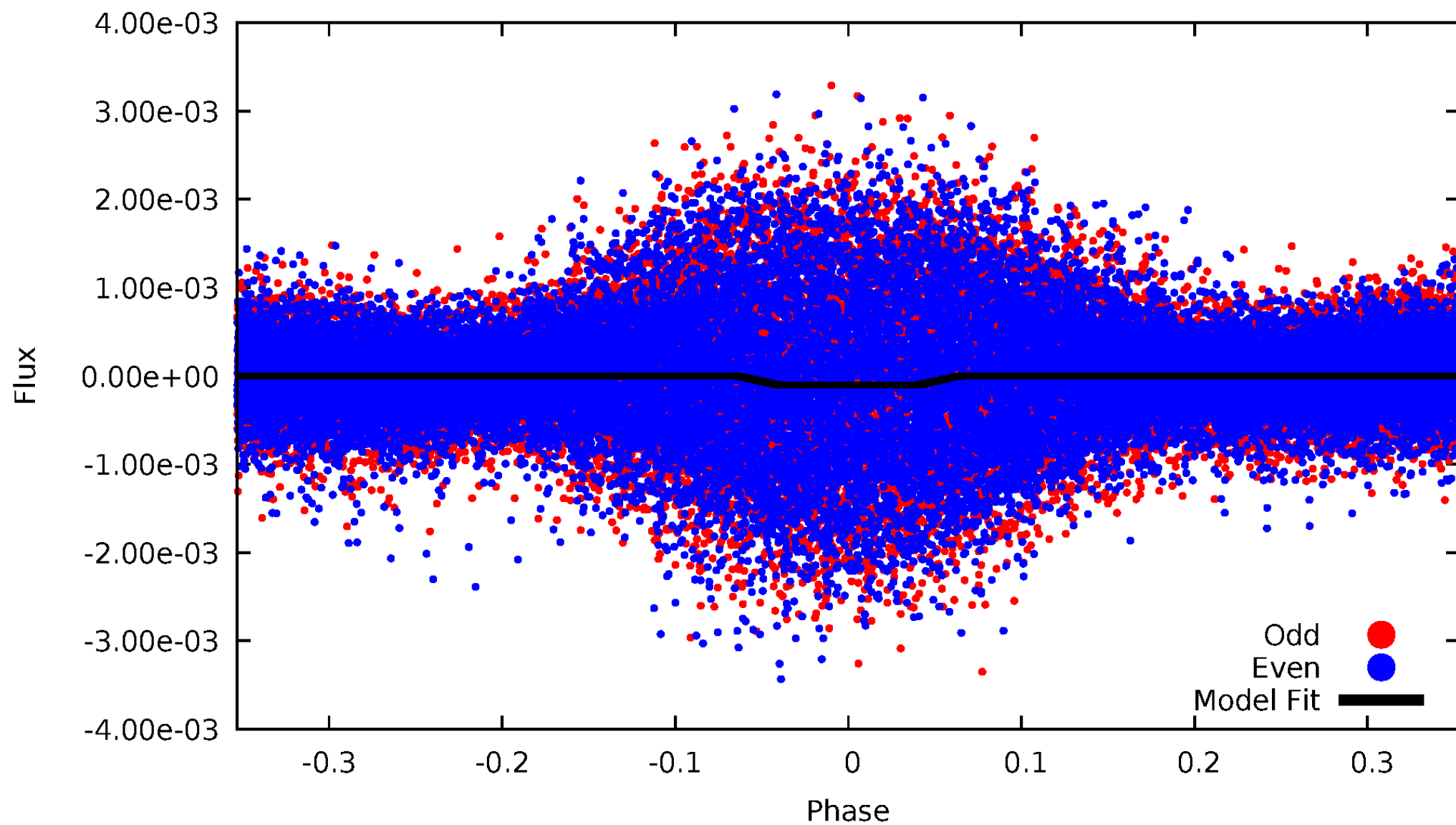
DV Odd/Even

TCE 009344493-01

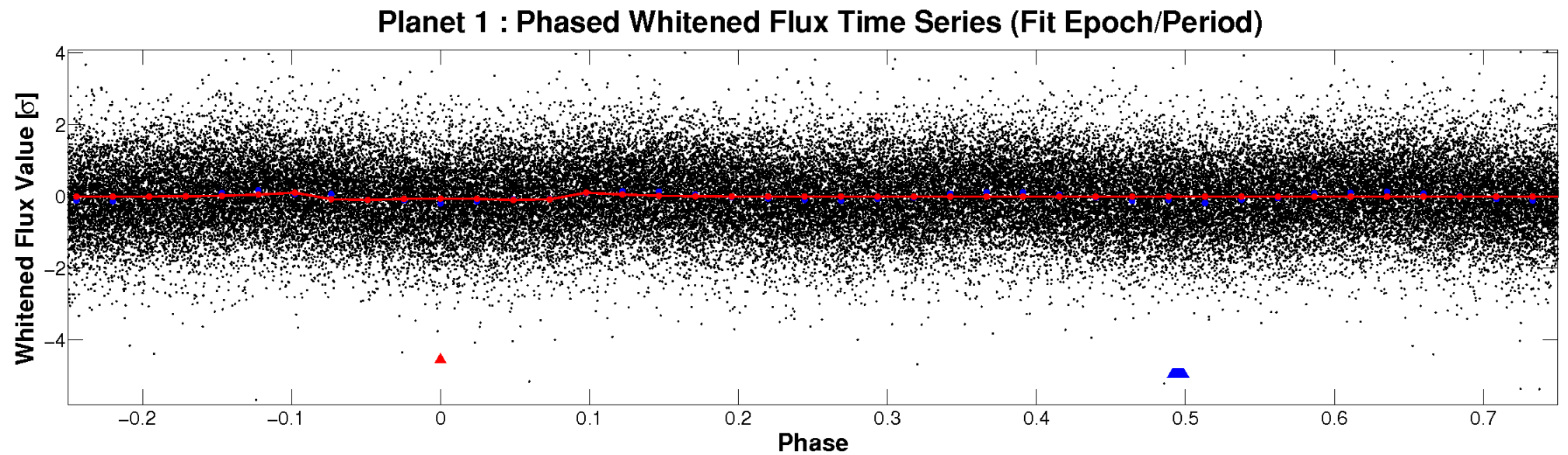
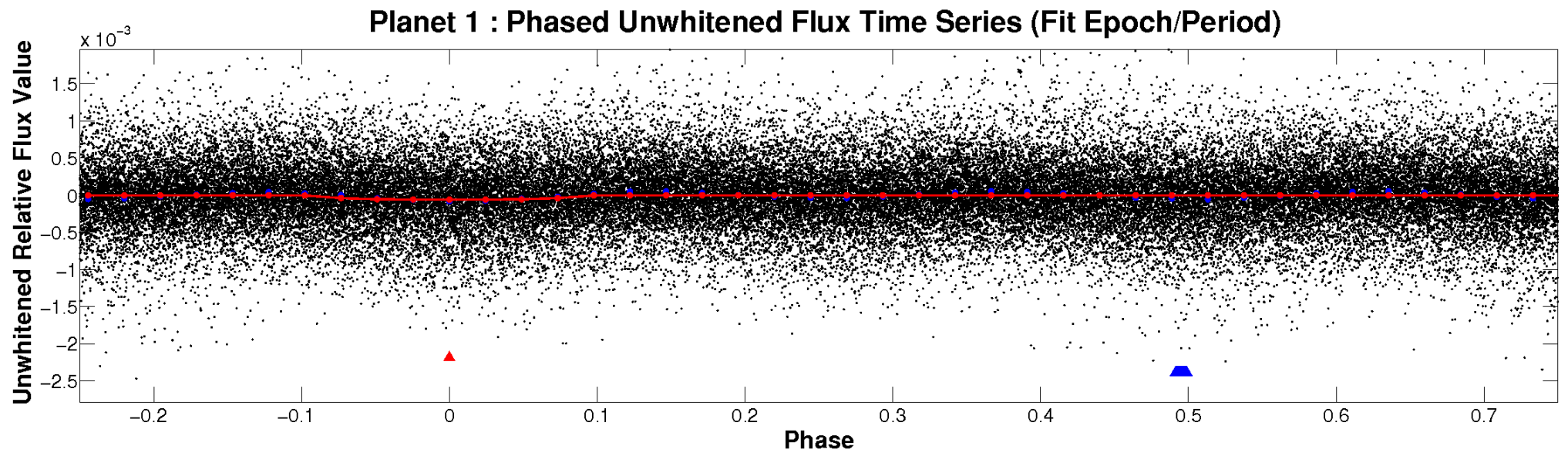


ALT Odd/Even

TCE 009344493-01

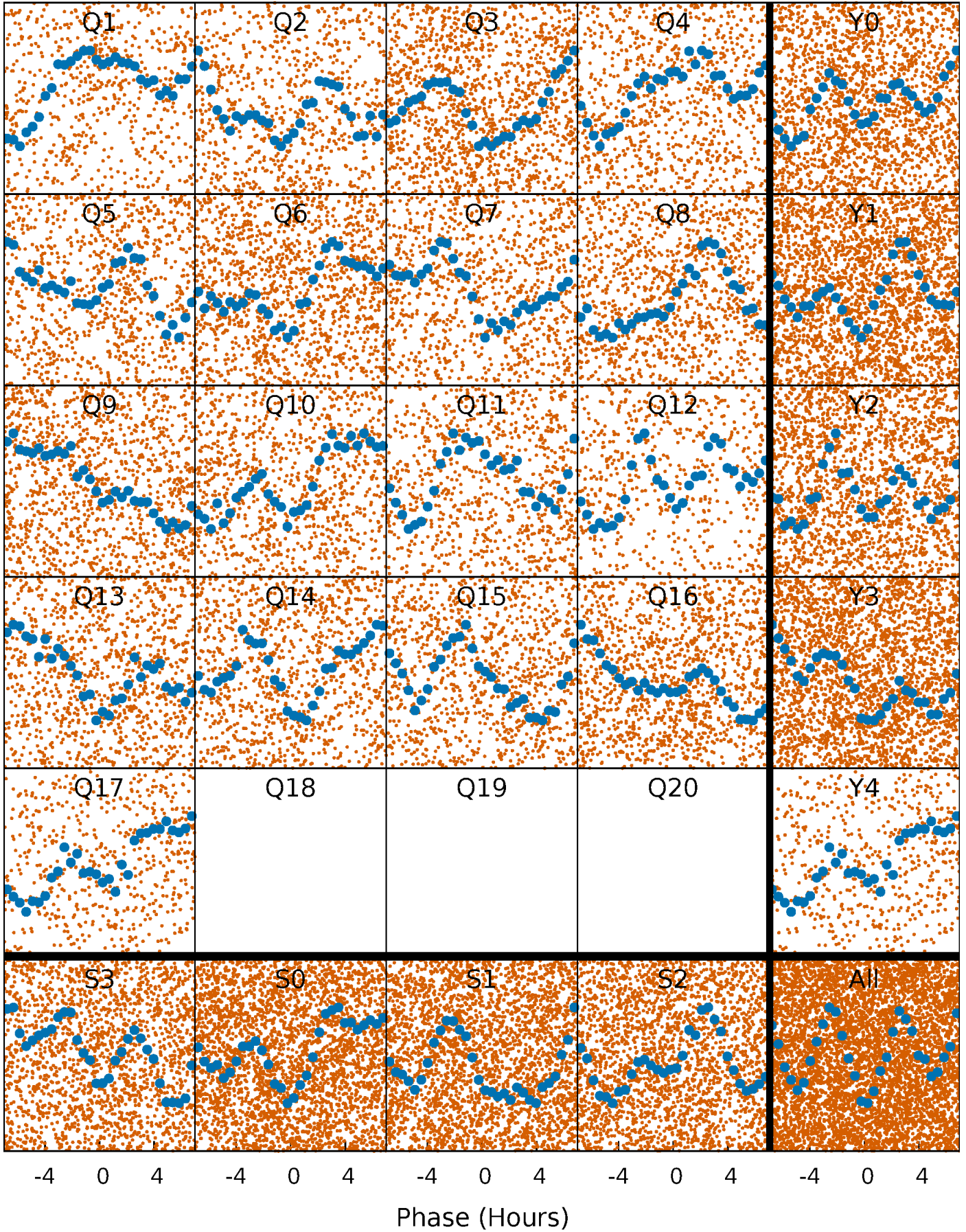


Non-Whitened Vs. Whitened Light Curve



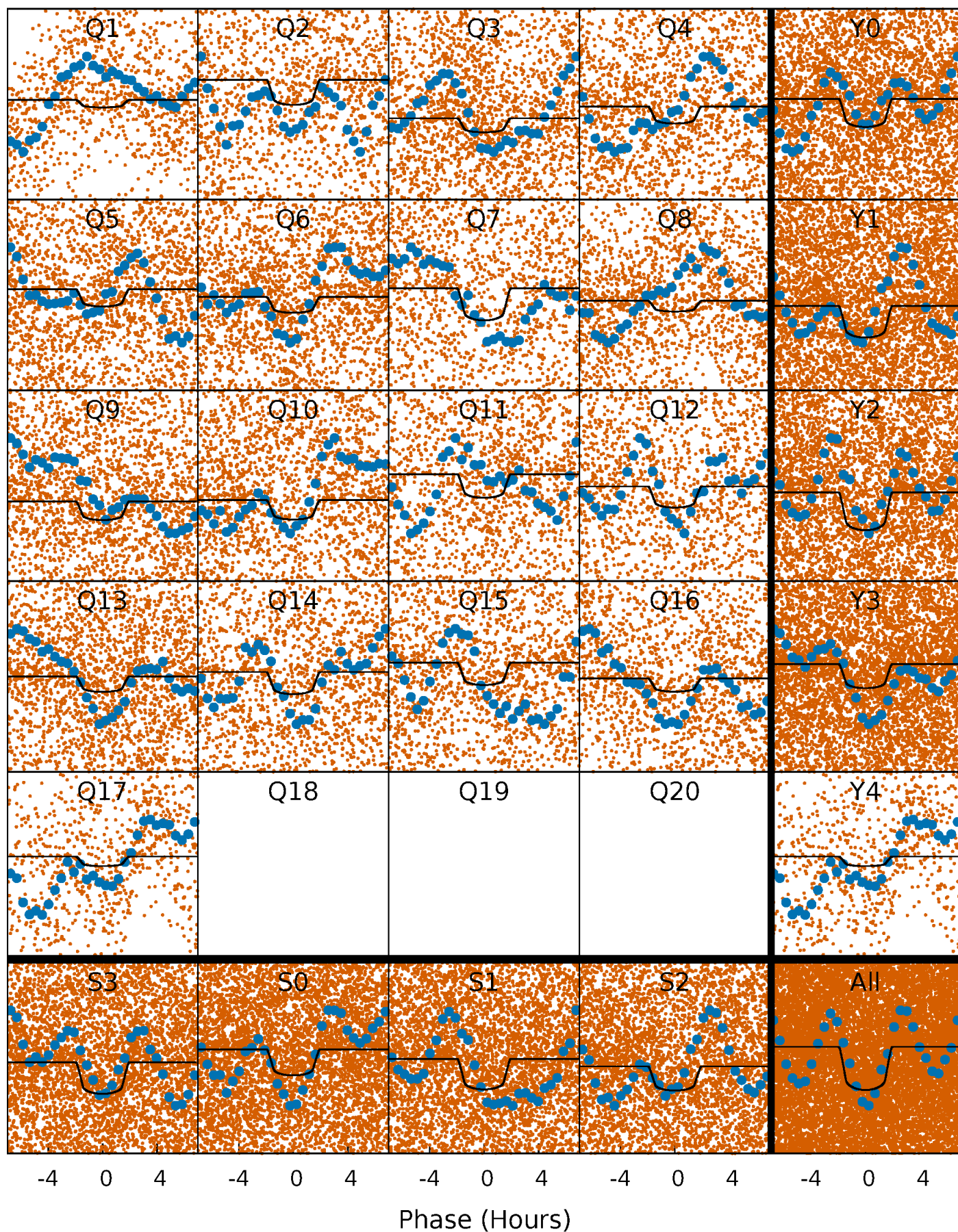
PDC Quarter-Phased Transit Curves

TCE 009344493-01 P= 0.836156 Days $T_0=132.170962$ (BKJD)



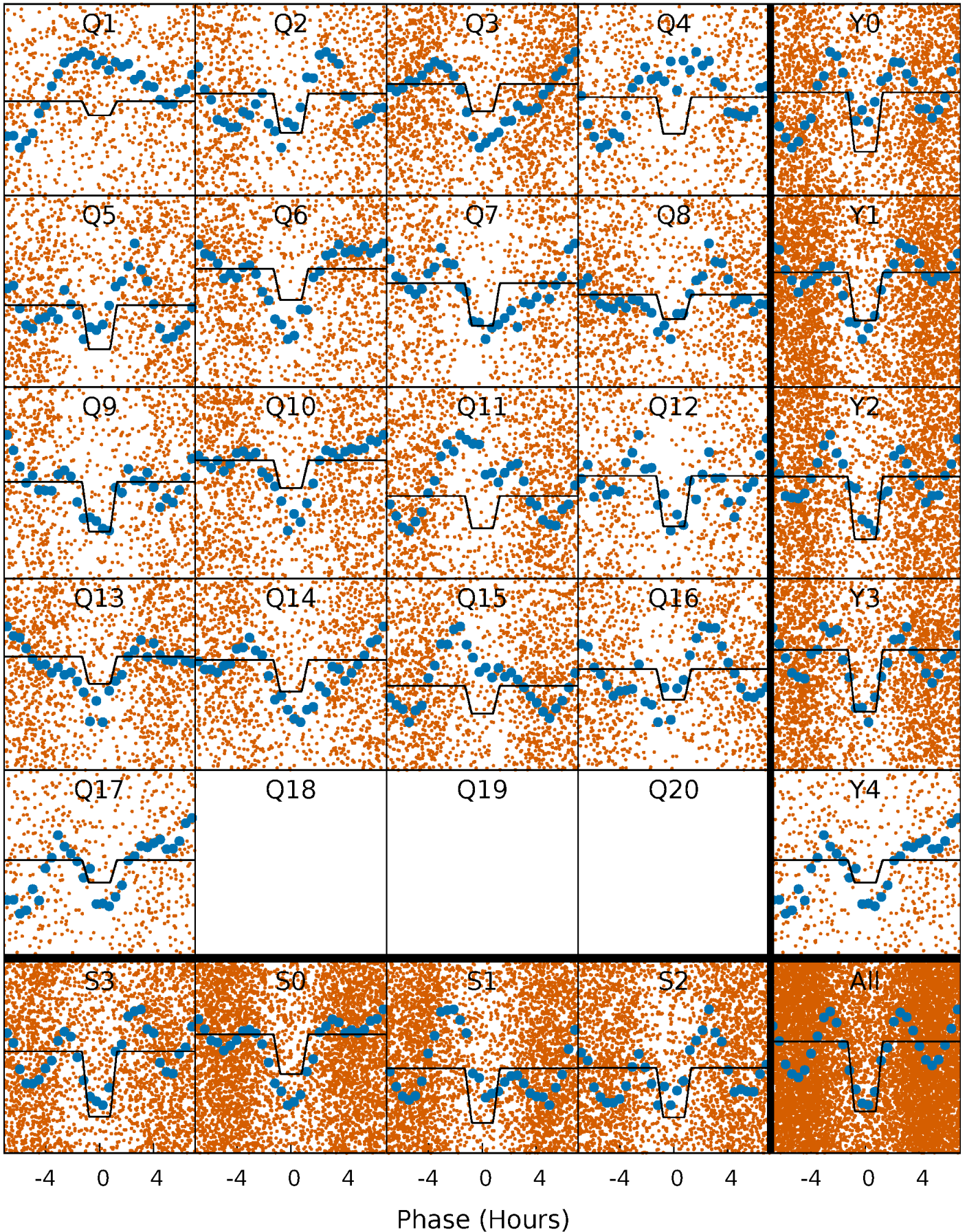
DV Quarter-Phased Transit Curves

TCE 009344493-01 P= 0.836156 Days $T_0=132.170962$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

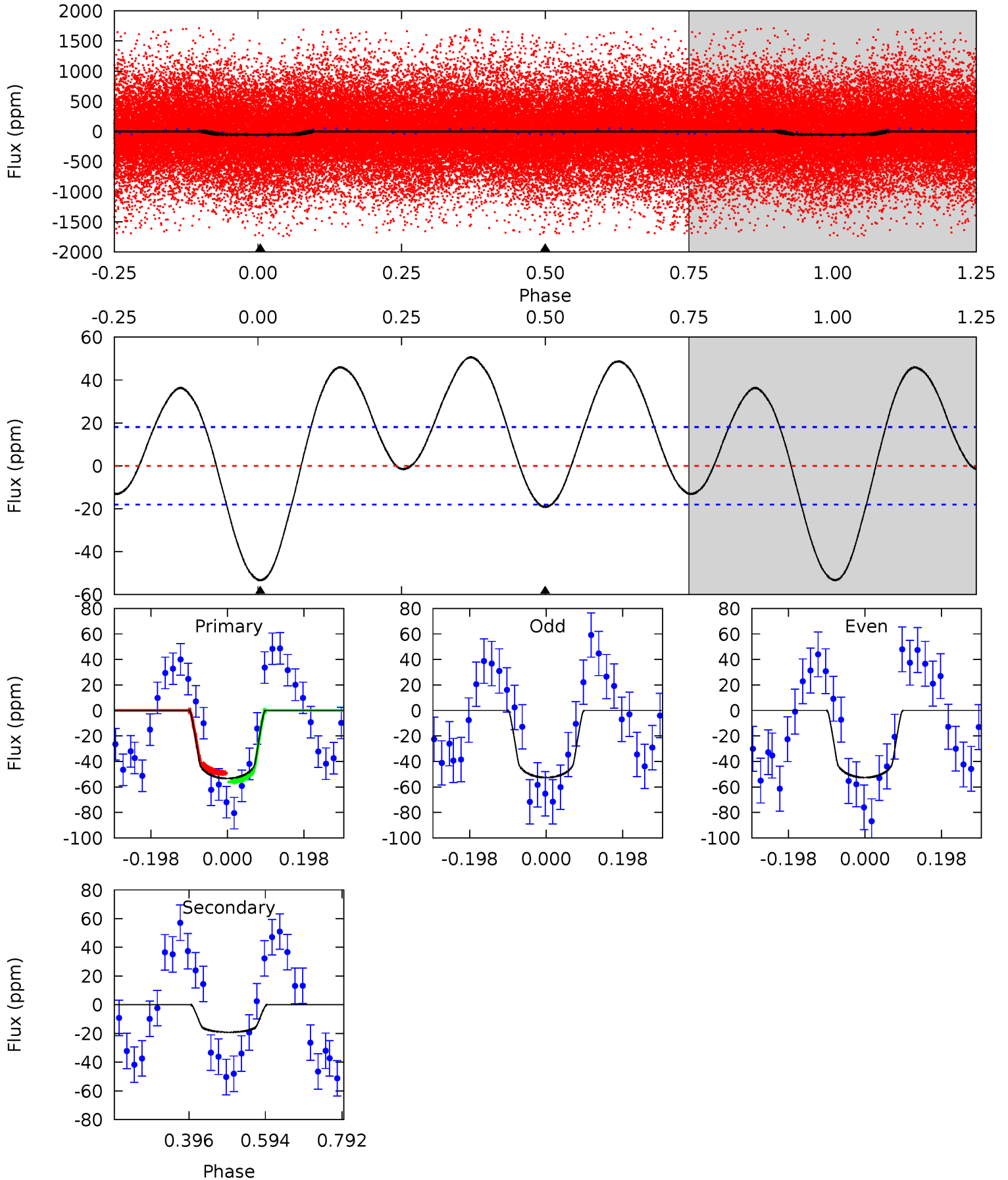
TCE 009344493-01 P= 0.836166 Days $T_0=132.166426$ (BKJD)



DV Model-Shift Uniqueness Test

009344493-01, P = 0.836156 Days, E = 131.334806 Days

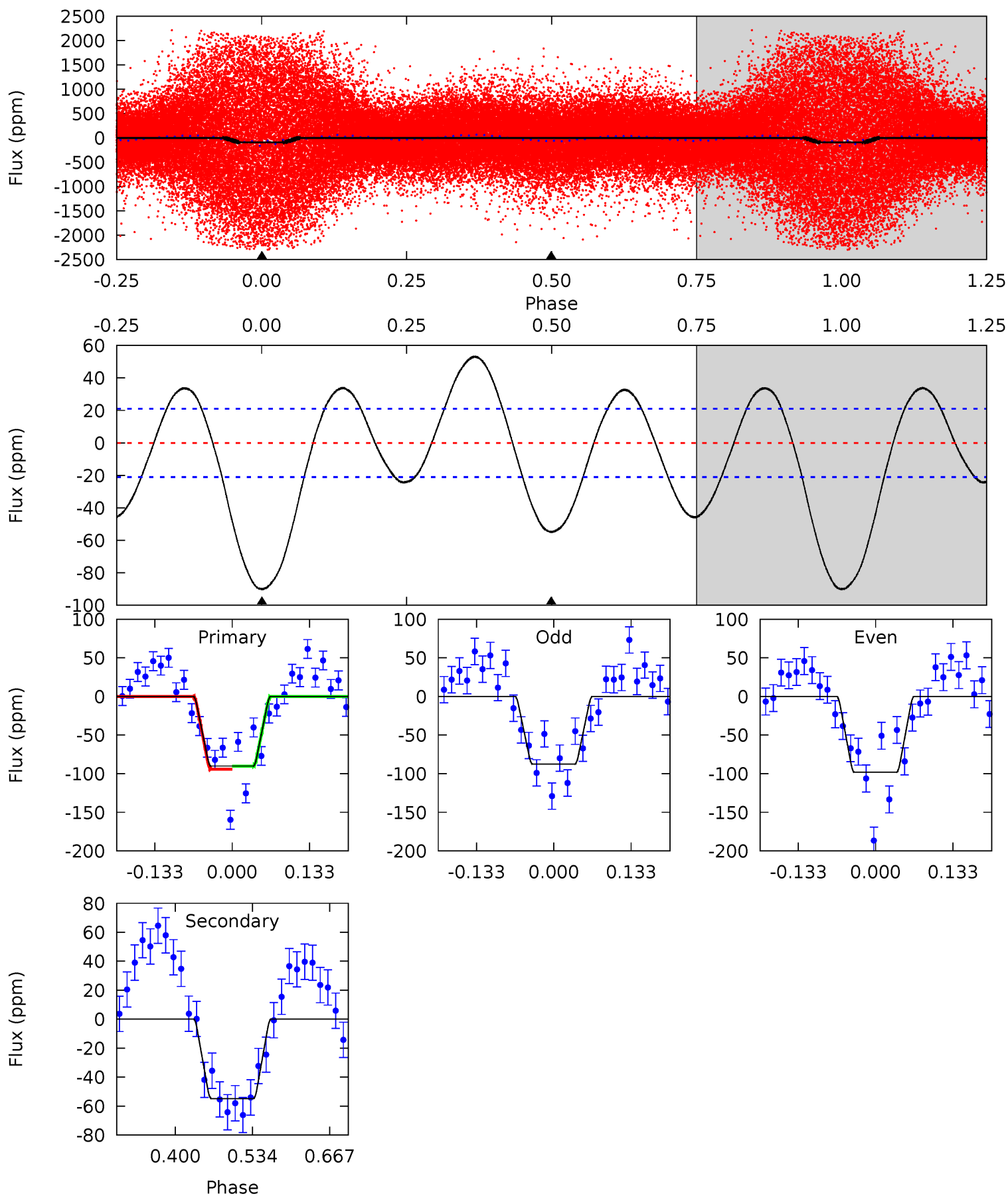
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	4.69	0	0	4.42	1.29	2.08	13.0	13.0	4.69	4.69	0.00	1.66	0.49	0.84



Alt Model-Shift Uniqueness Test

009344493-01, P = 0.836166 Days, E = 131.330260 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	11.7	0	0	4.50	1.50	5.85	19.3	19.3	11.7	11.7	1.10	0.91	0.37	0.42



Stellar Parameters For KIC 009344493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7428^{+233}_{-311}	$3.969^{+0.315}_{-0.135}$	$-0.560^{+0.300}_{-0.300}$	$1.997^{+0.475}_{-0.713}$	$1.354^{+0.206}_{-0.206}$	$0.239^{+0.534}_{-0.093}$
	+3%/-4%	+8%/-3%	+54%/-54%	+24%/-36%	+15%/-15%	+223%/-39%
Source	KIC0	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 009344493-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-19 ± 4	$1.67^{+0.40}_{-0.38}$	4586^{+338}_{-441}	5112^{+664}_{-538}	$1.417^{+0.970}_{-0.560}$
Alt.	-55 ± 5	$2.15^{+0.44}_{-0.43}$	4563^{+348}_{-415}	5989^{+546}_{-440}	$2.431^{+1.410}_{-0.746}$

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

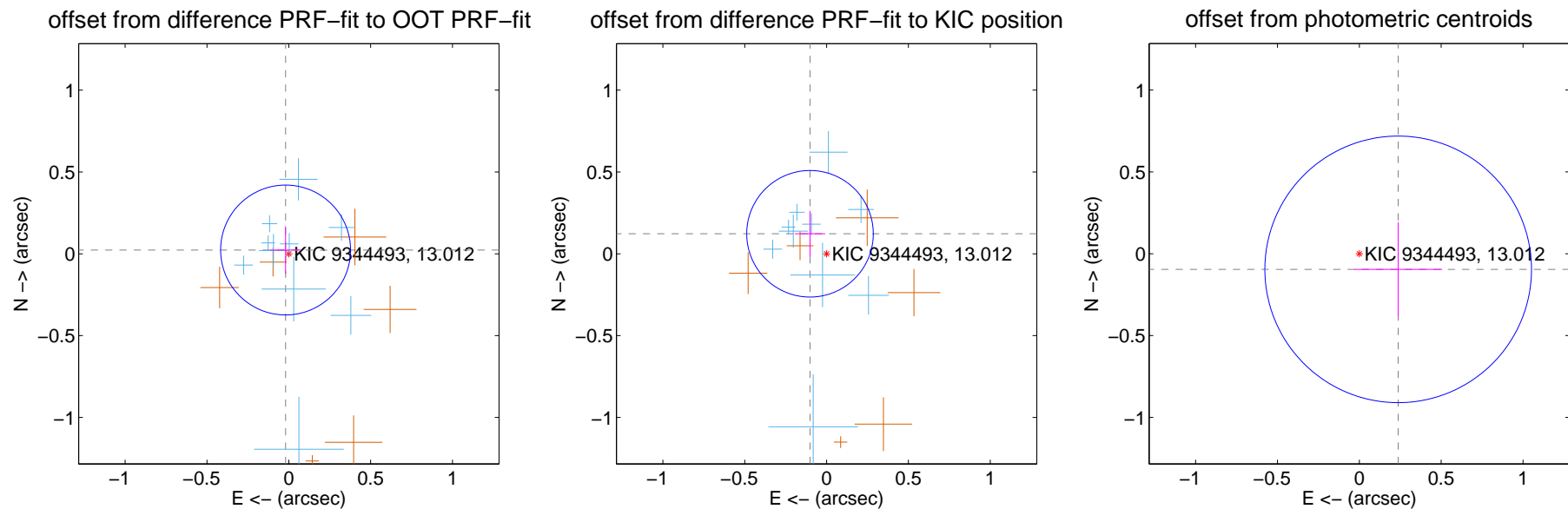
DV Centroid Data

Supplemental centroid analysis for 009344493-01. Kepler magnitude: 13.01. Transit SNR 11.32

There are 10 quarters with good PRF difference image offsets

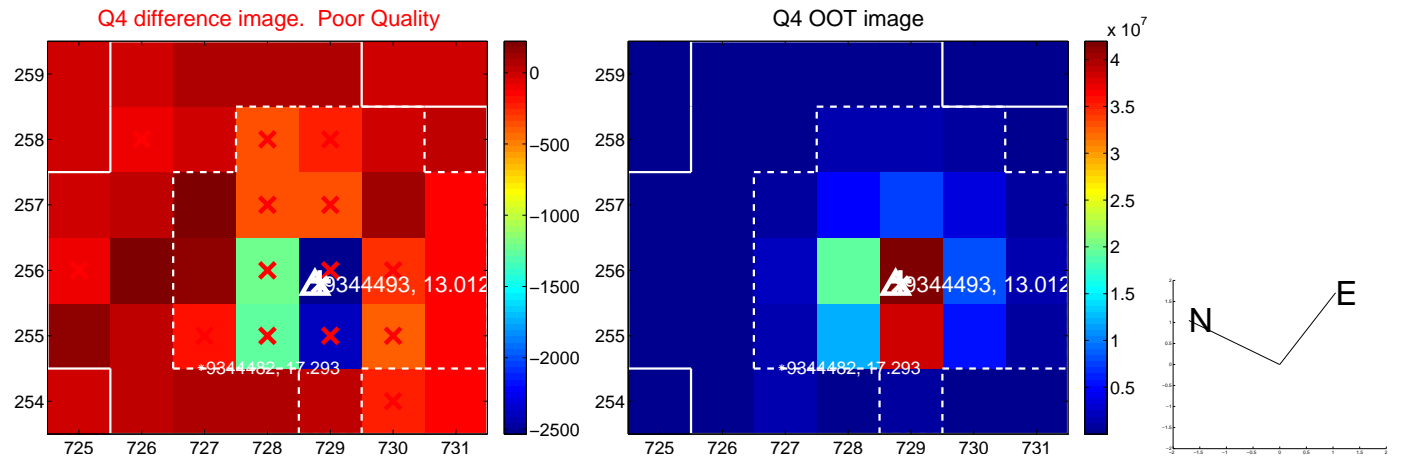
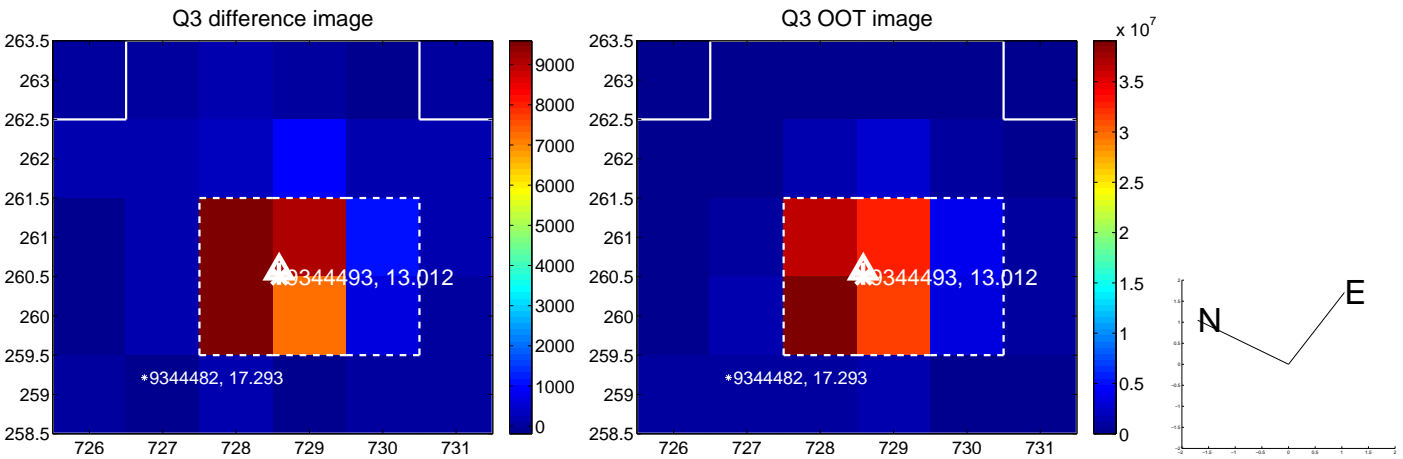
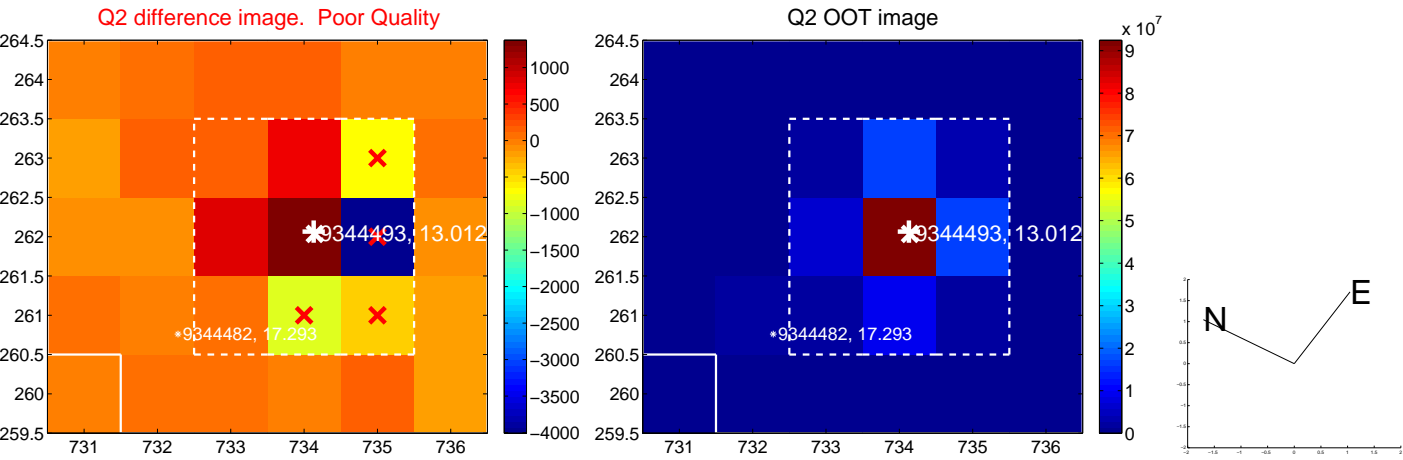
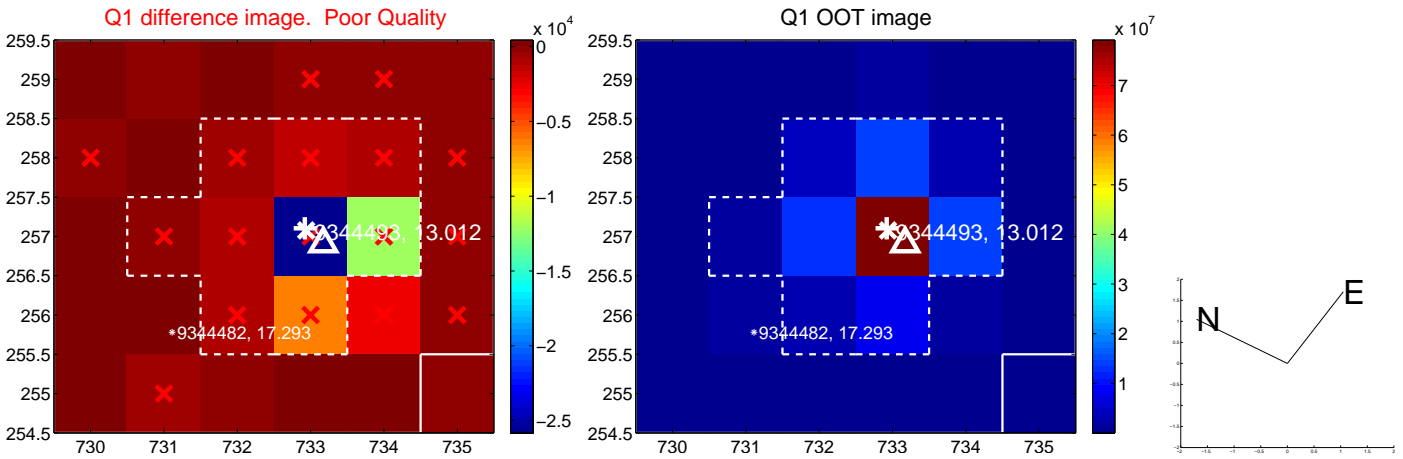
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.030 ± 0.132	0.23	0.020 ± 0.095	0.023 ± 0.145
PRF-fit source offset from KIC position	0.159 ± 0.129	1.23	0.101 ± 0.093	0.122 ± 0.139
photometric centroid source offset	0.26 ± 0.27	0.94	-0.24 ± 0.27	-0.10 ± 0.29

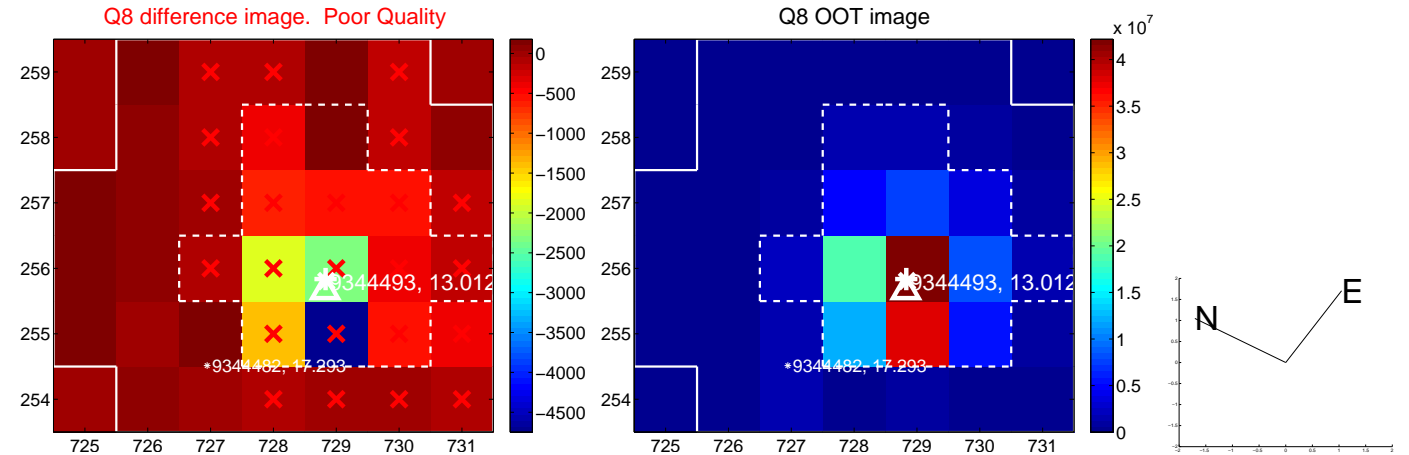
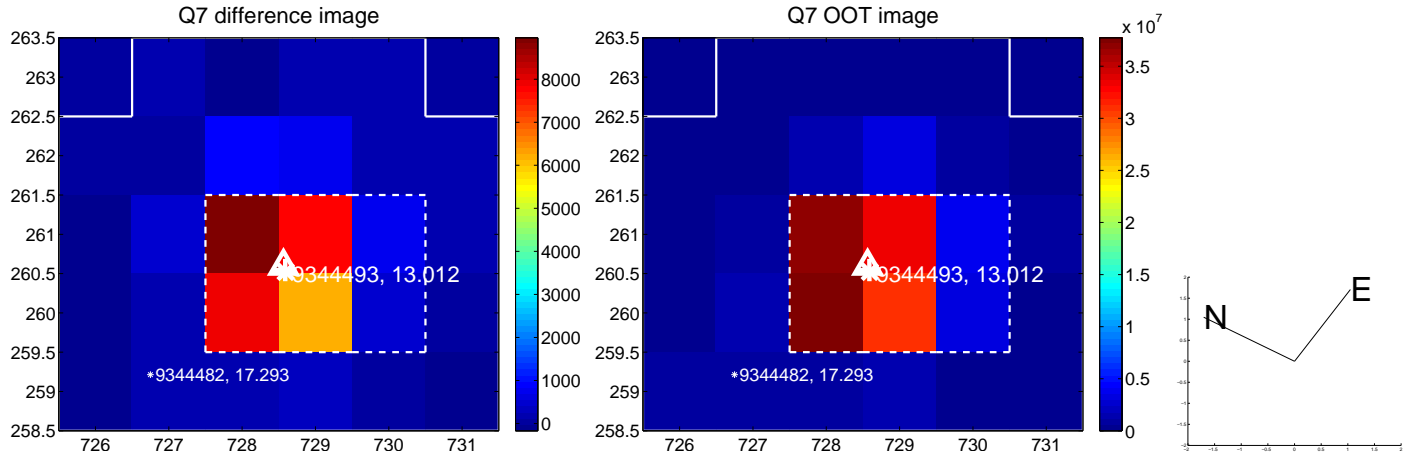
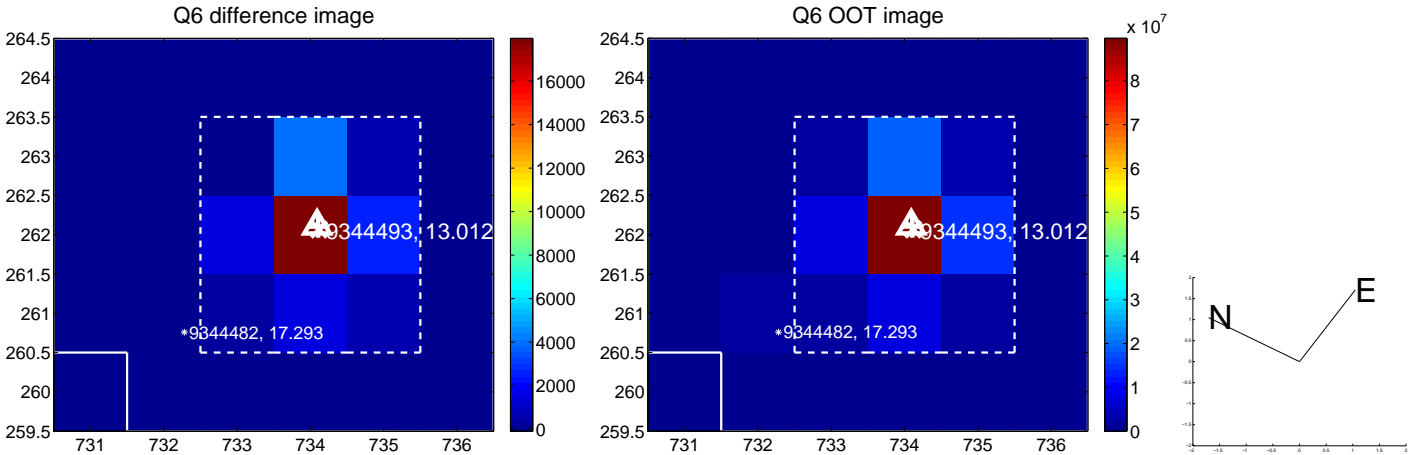
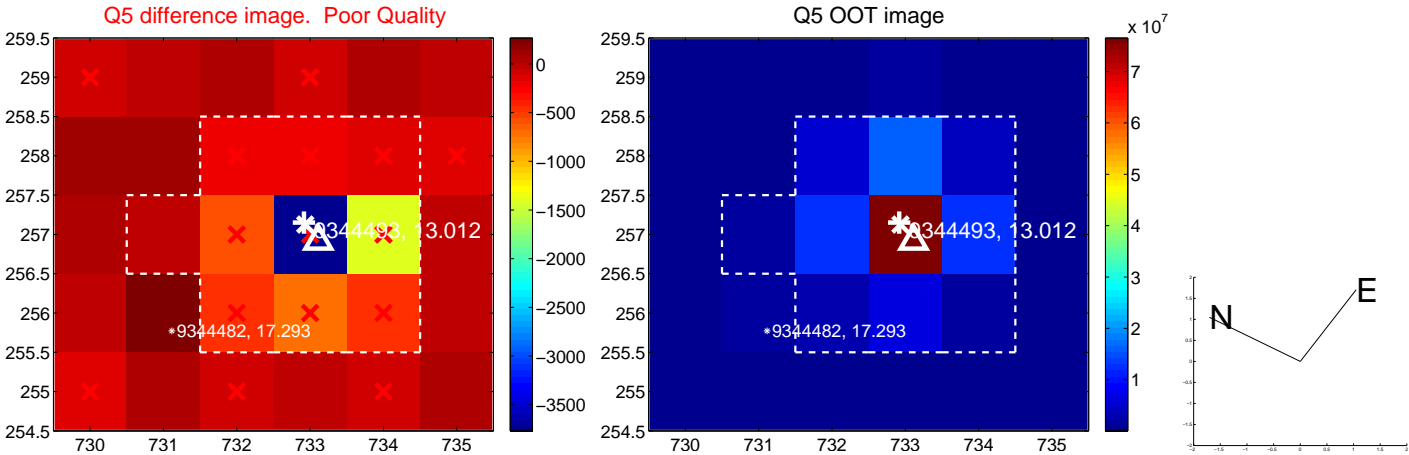


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

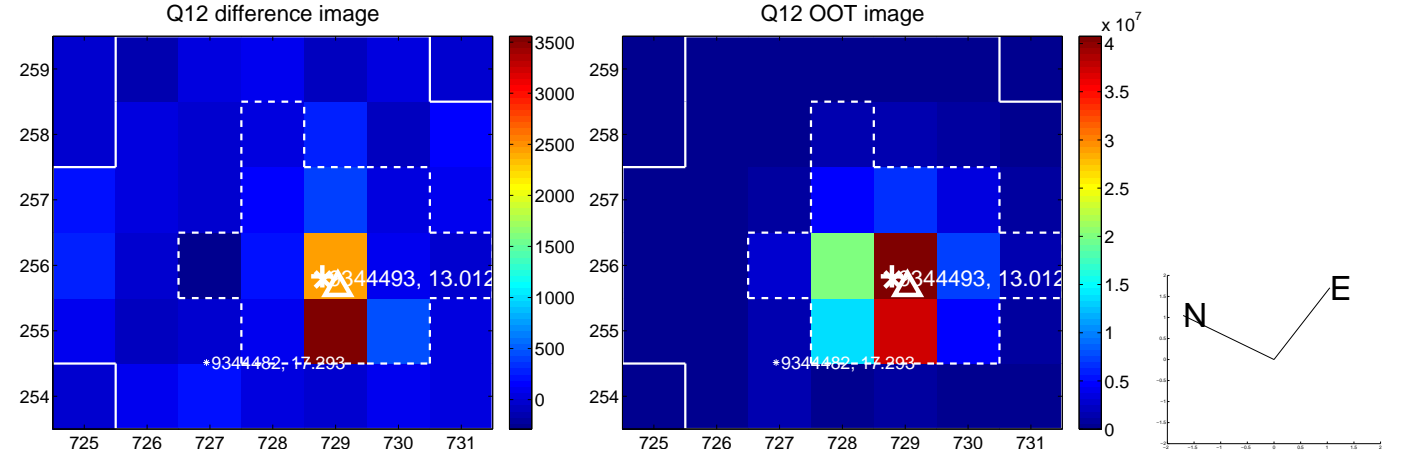
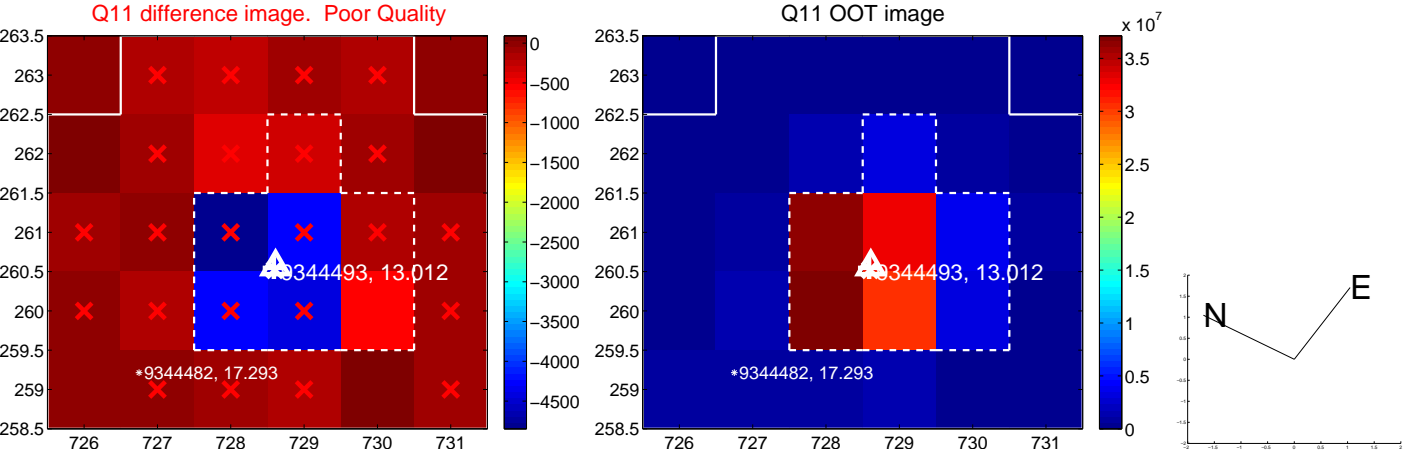
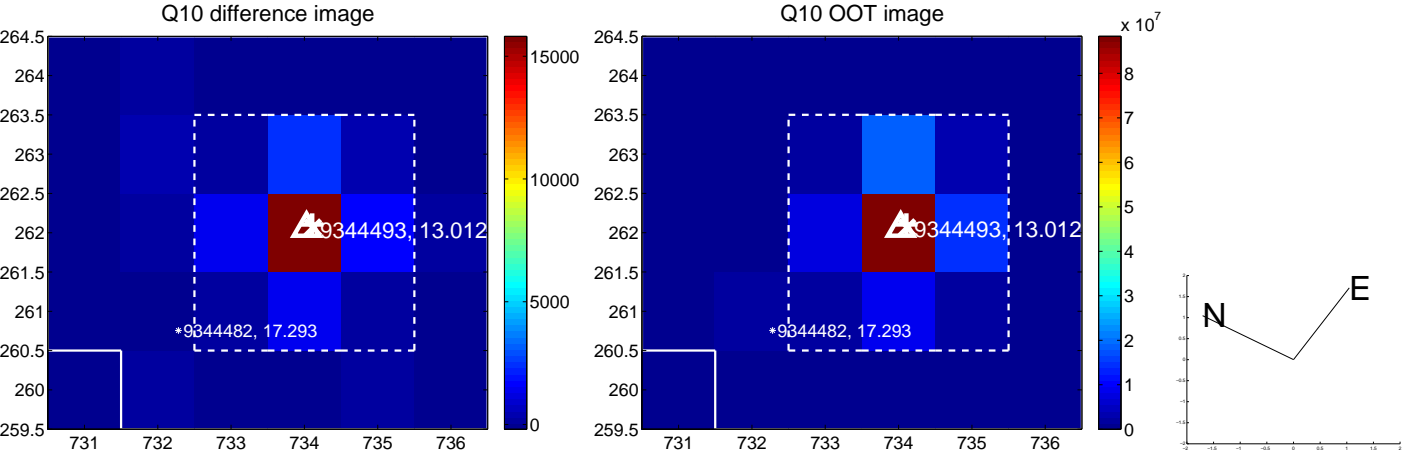
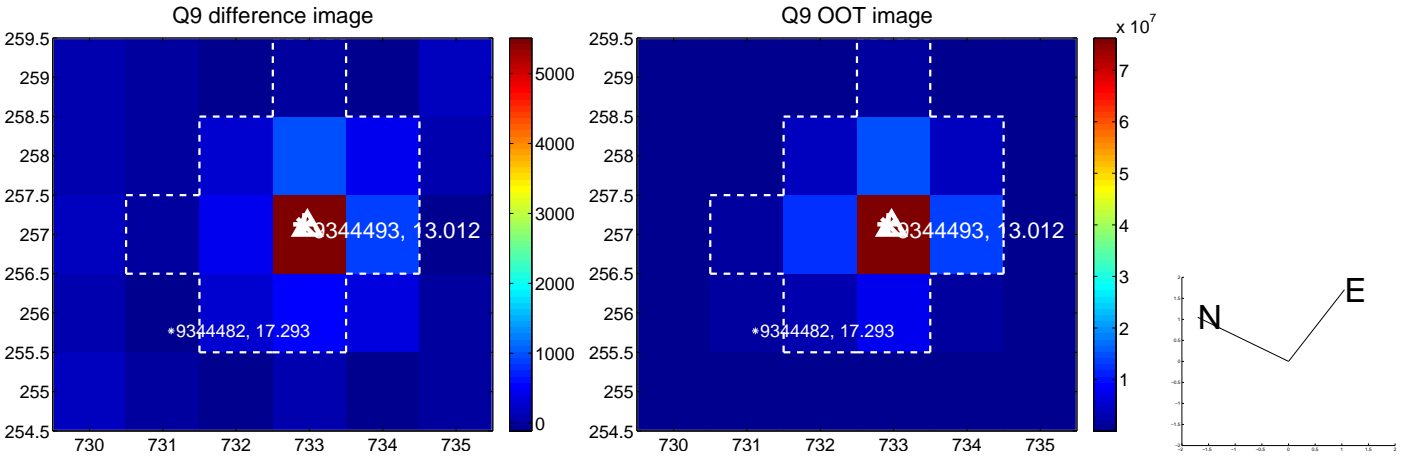
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



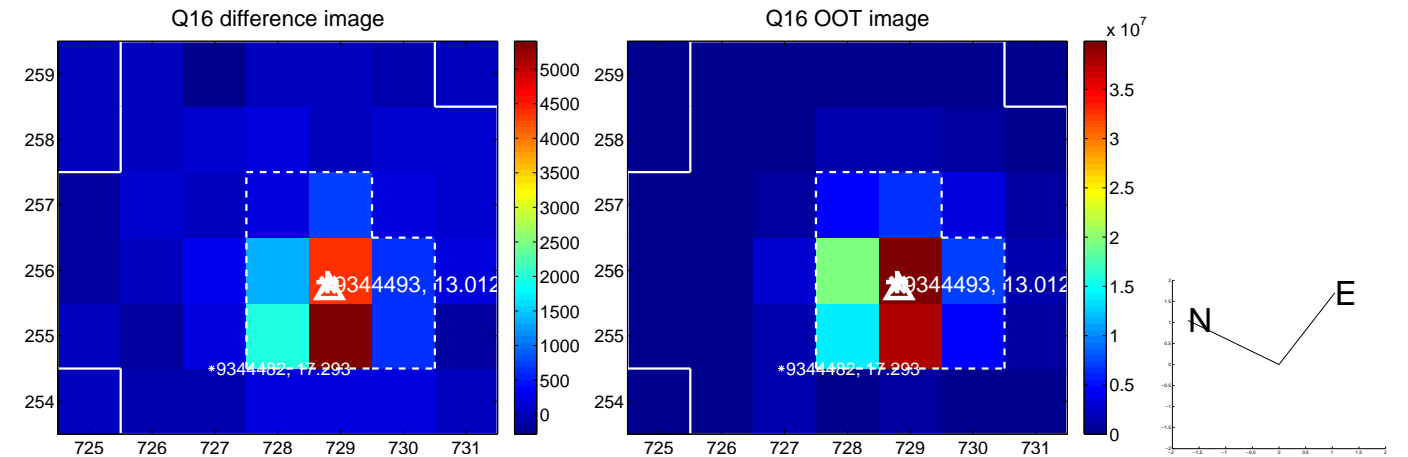
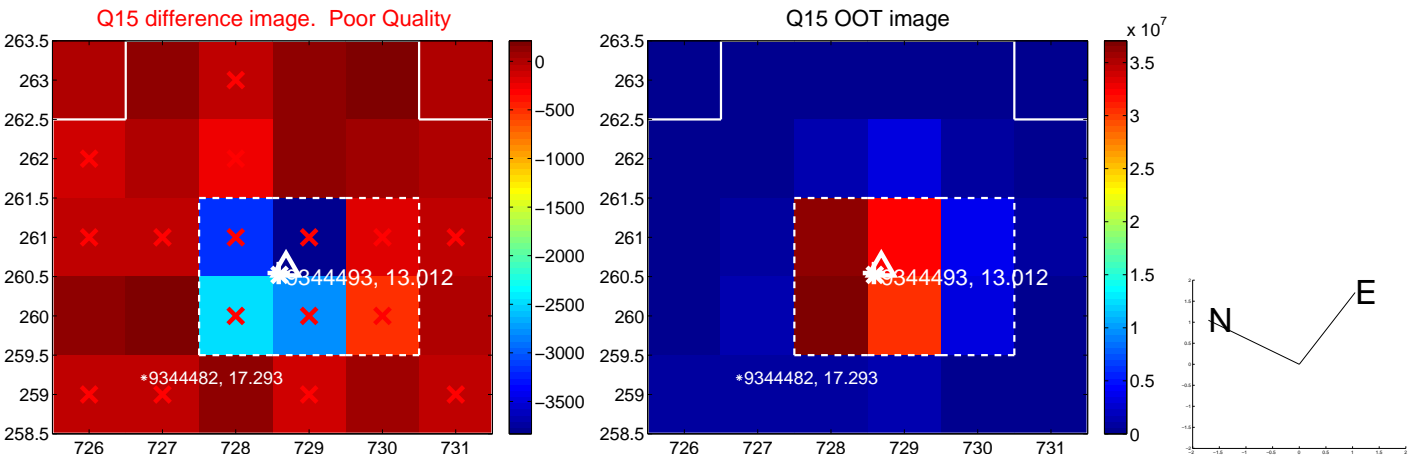
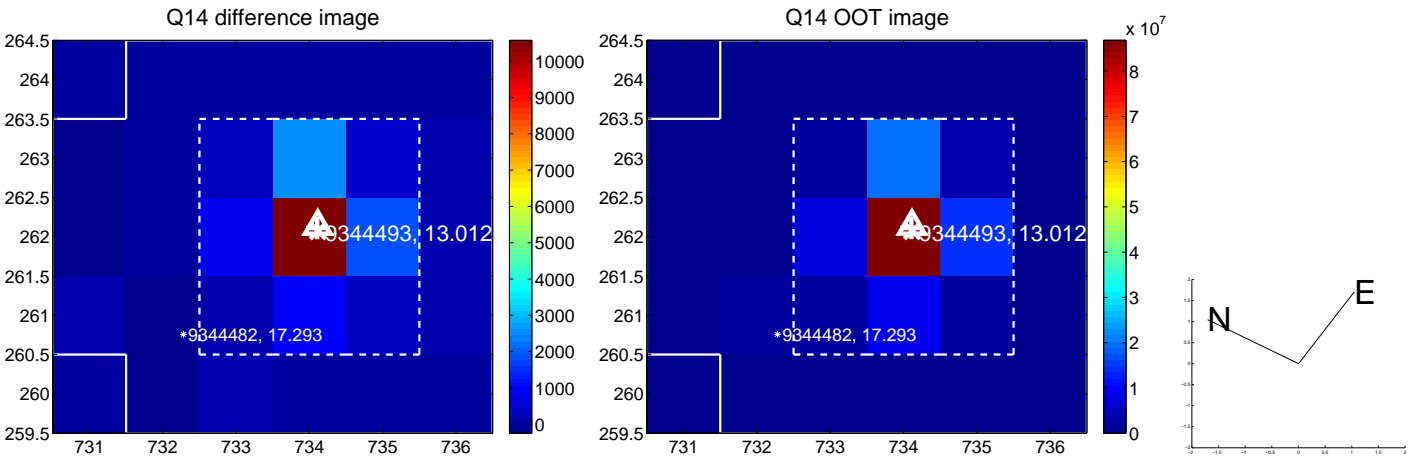
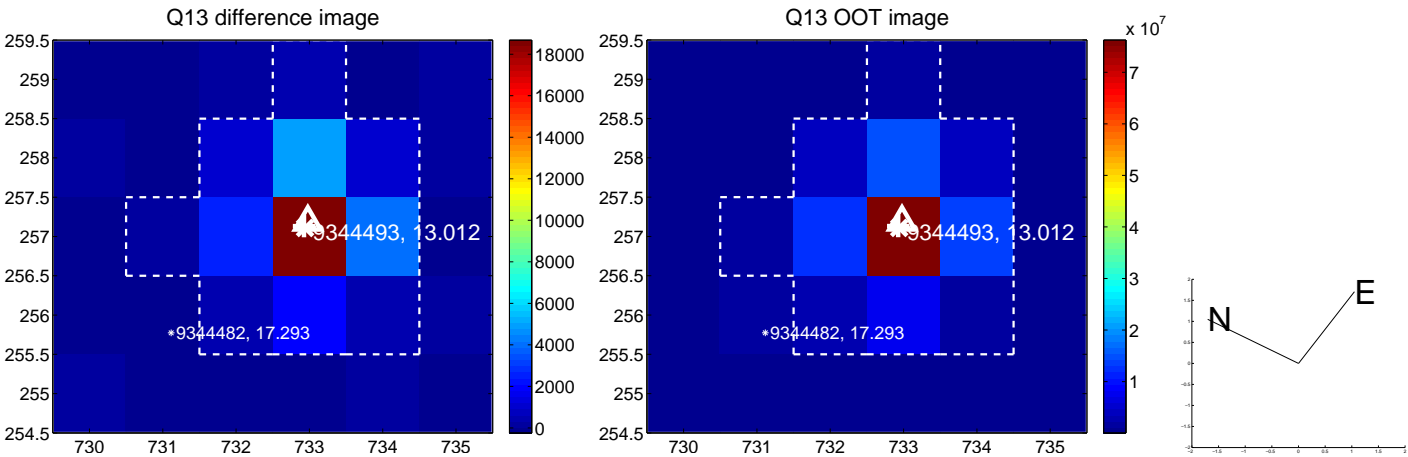
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



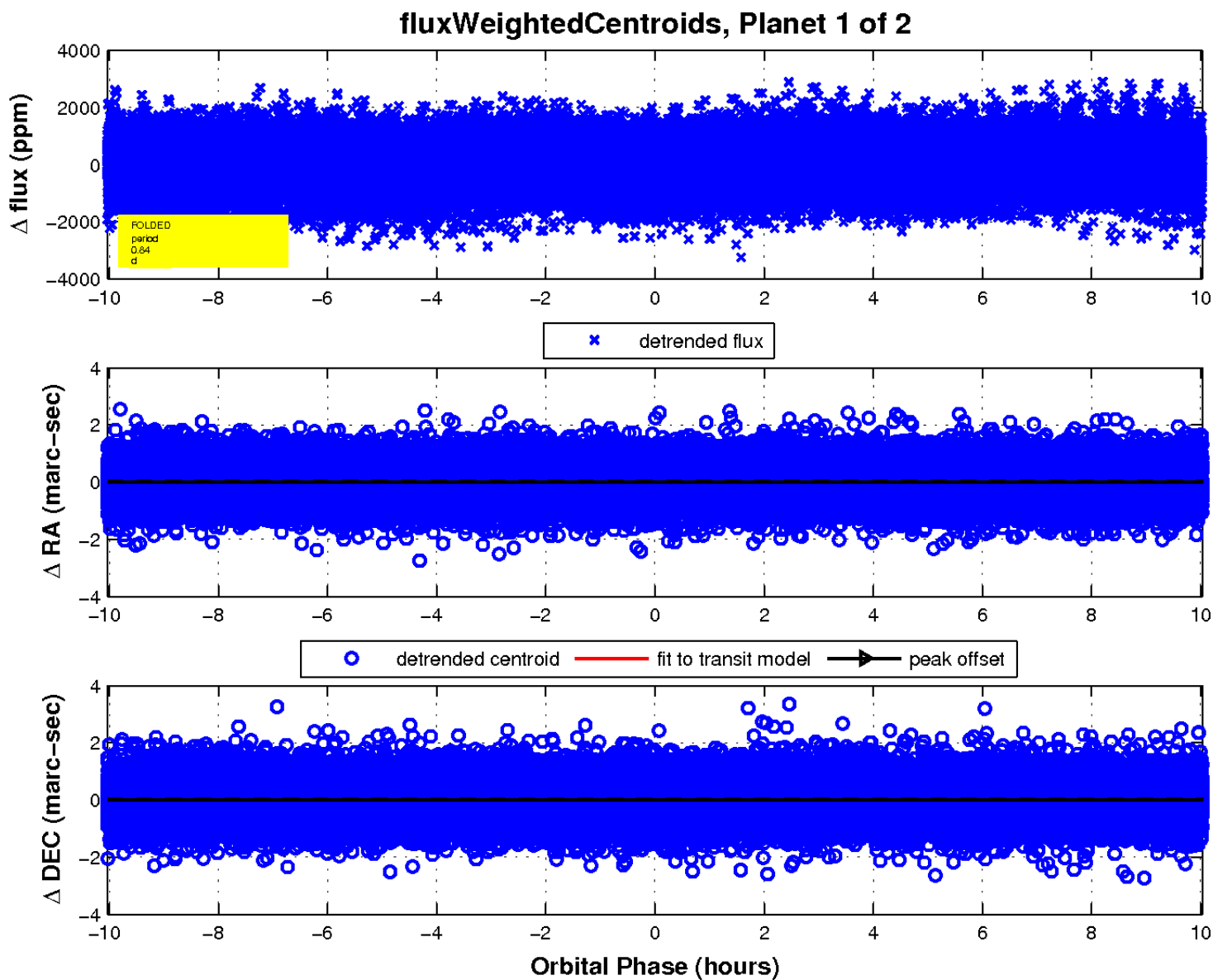
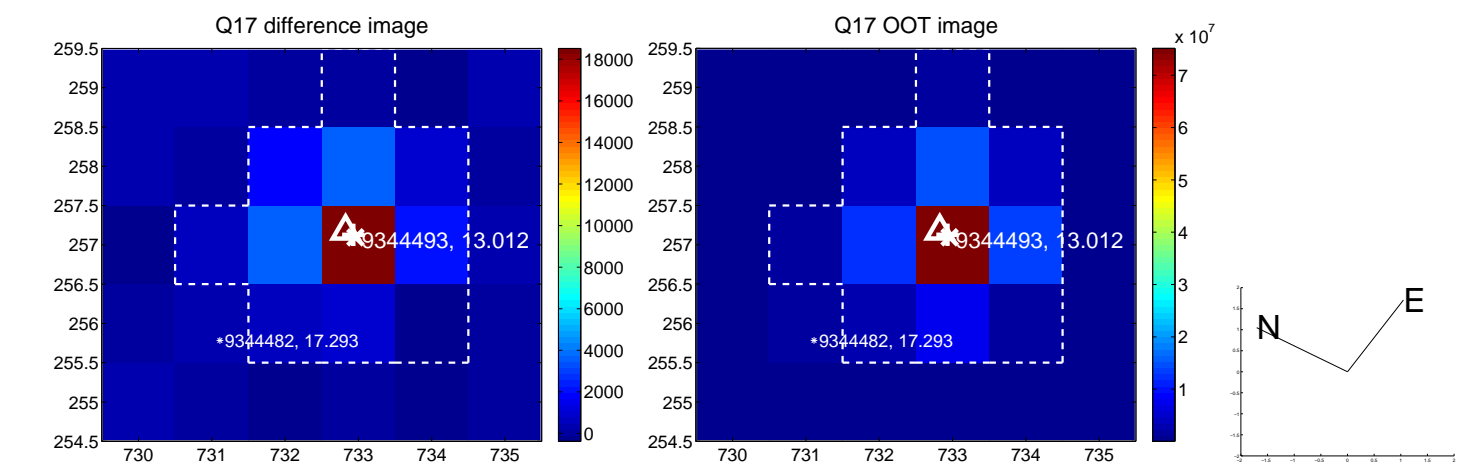
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

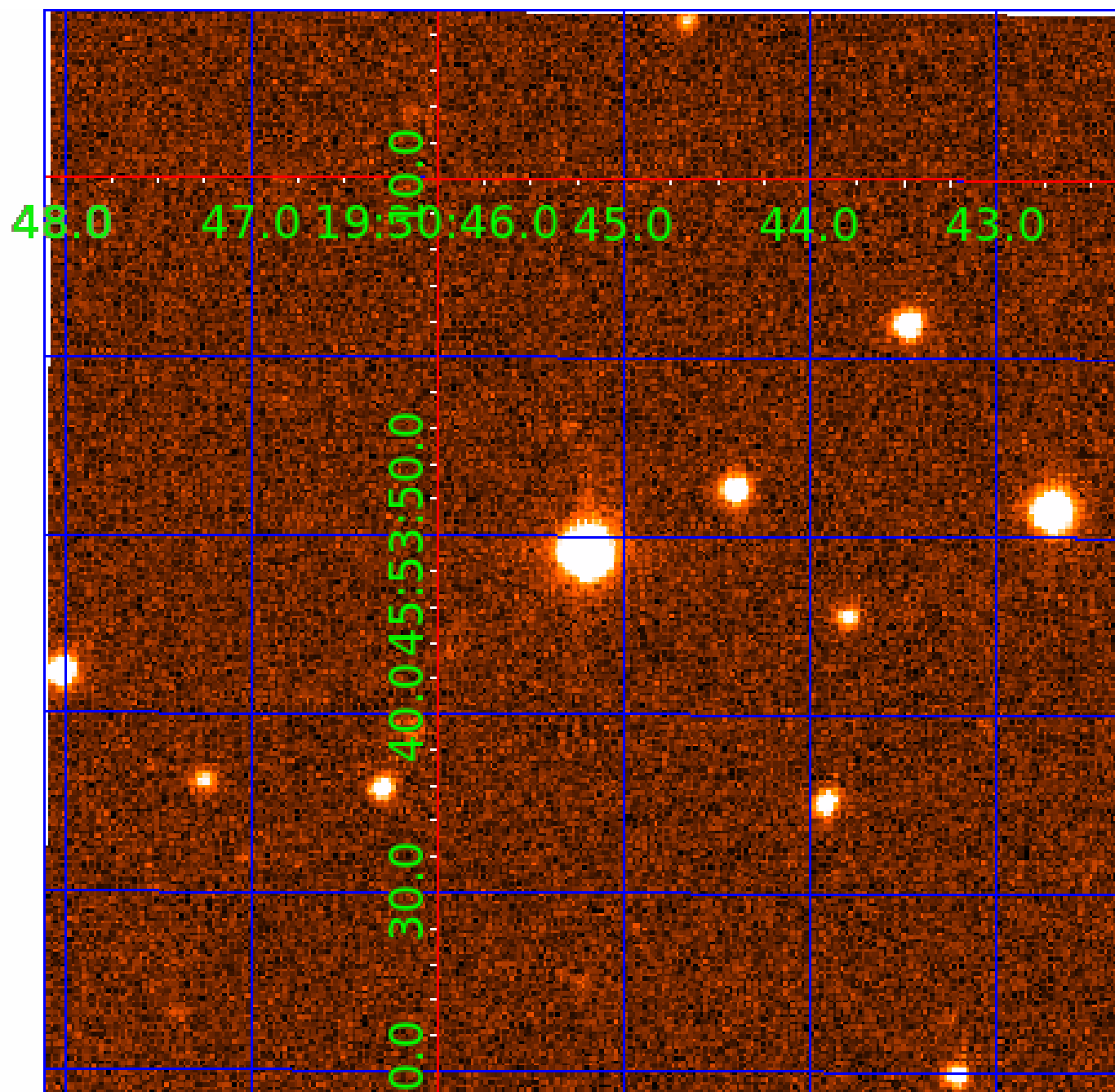


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009344493

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})
009344493-01	OBS	No	0.836156	132.170962	58.5	3.505	12.1	11.3	2.00	7428	1.77	29438.64
009344493-02	OBS	No	0.836159	131.745775	64.4	3.494	12.7	12.1	2.00	7428	1.85	29438.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009344493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009344493-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

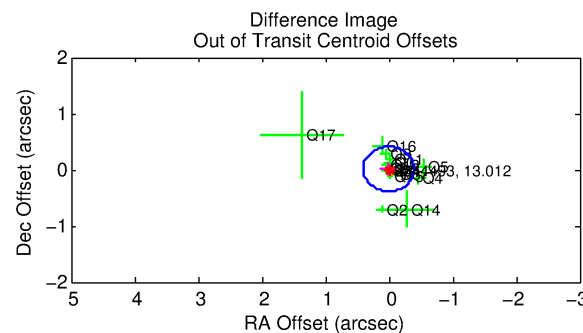
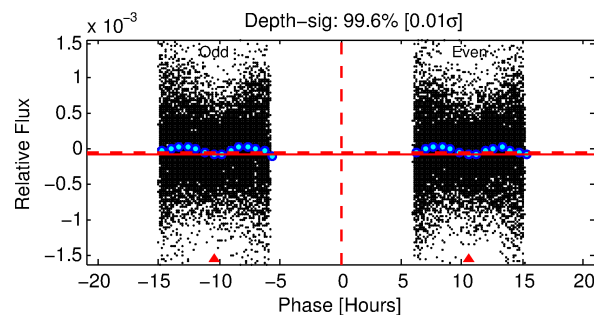
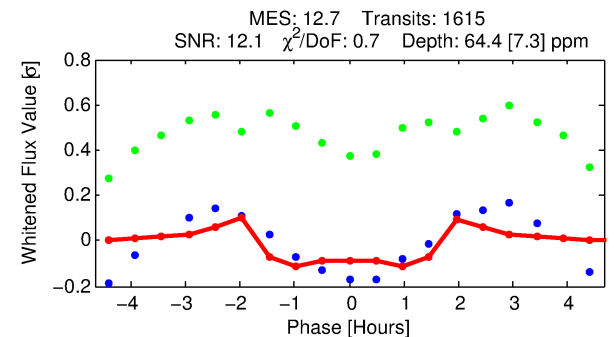
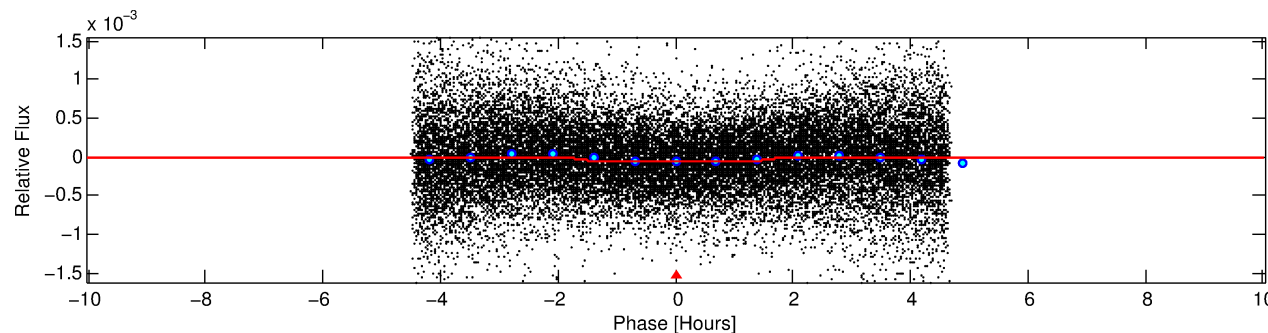
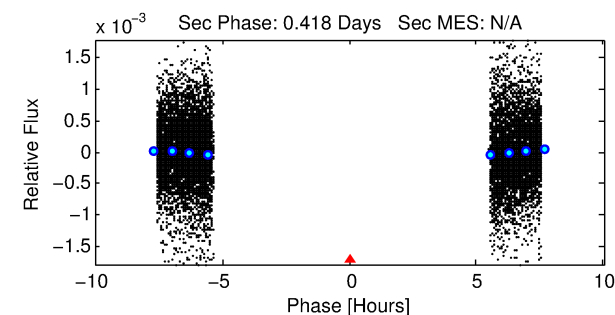
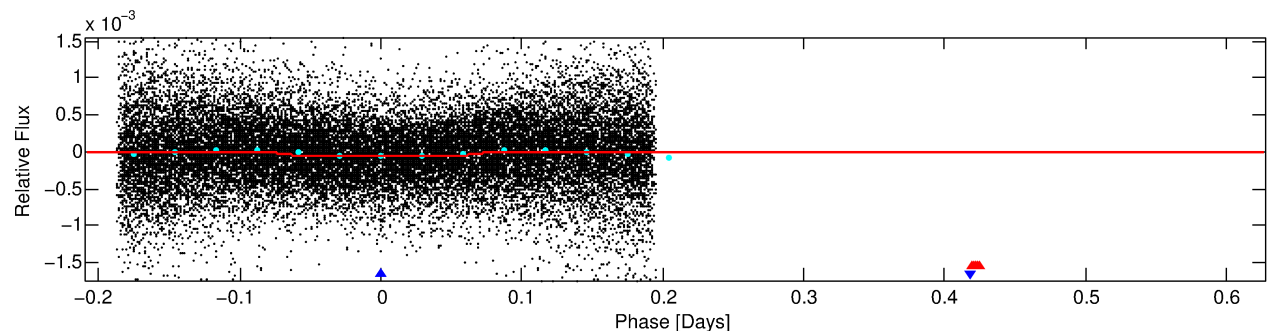
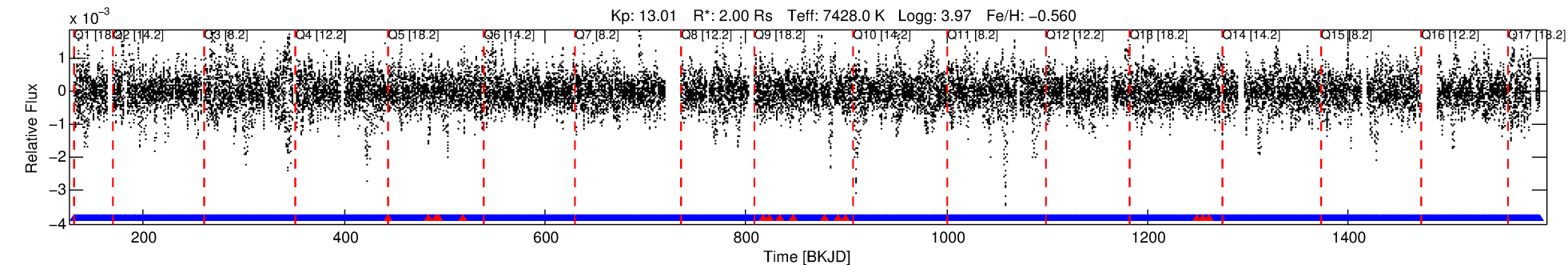
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009344493-02

No Significant Match Found

DV One-Page Summary

KIC: 9344493 Candidate: 2 of 2 Period: 0.836 d



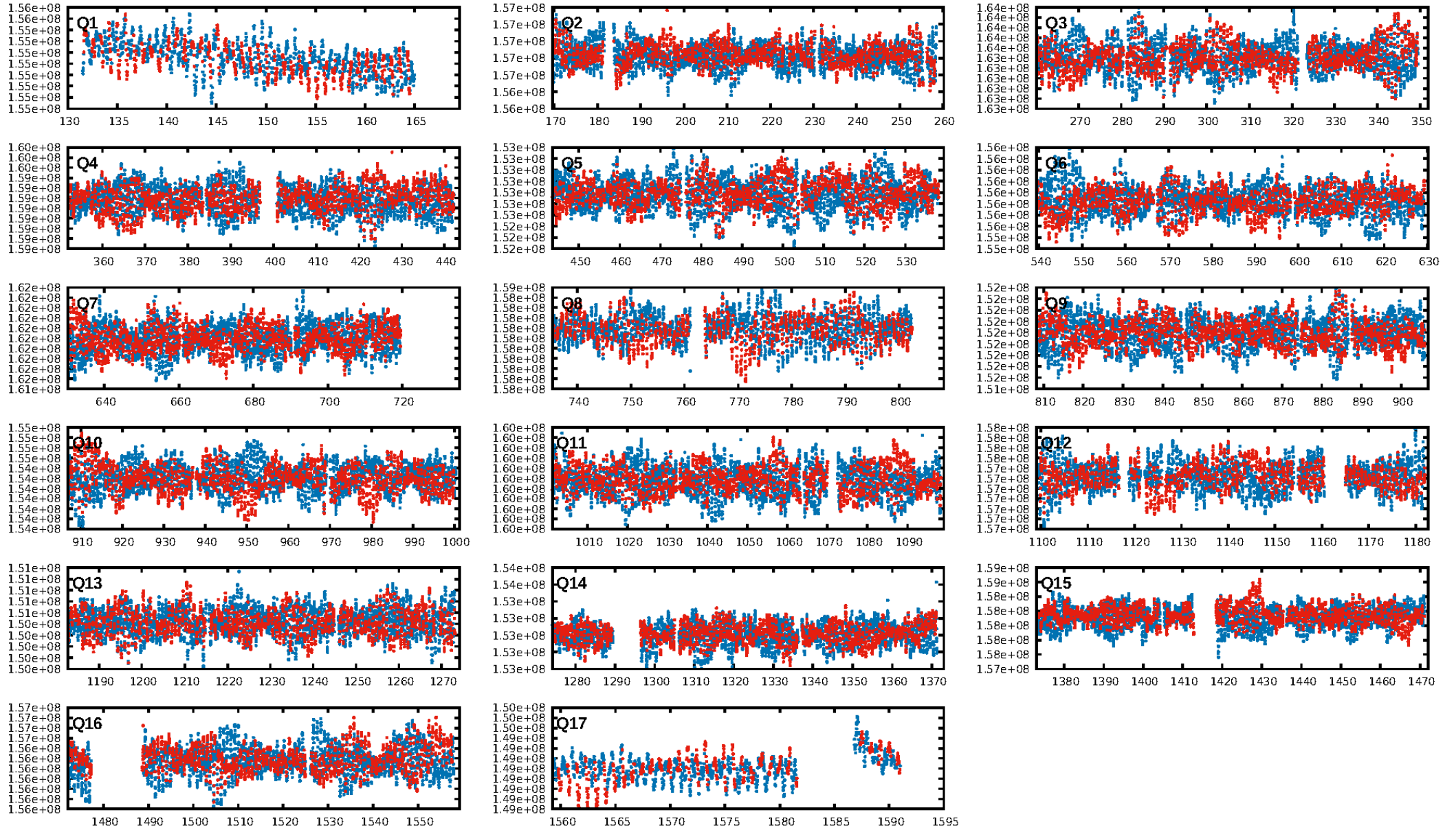
DV Fit Results:

Period = 0.83616 [0.00001] d
Epoch = 131.7458 [0.0014] BKJD
Rp/R* = 0.0085 [0.0014]
a/R* = 1.26 [0.45]
b = 0.90 [0.21]
Seff = 29438.48 [16614.28]
Teq = 3340 [471] K
Rp = 1.86 [0.73] Re
a = 0.0192 [0.0065] AU

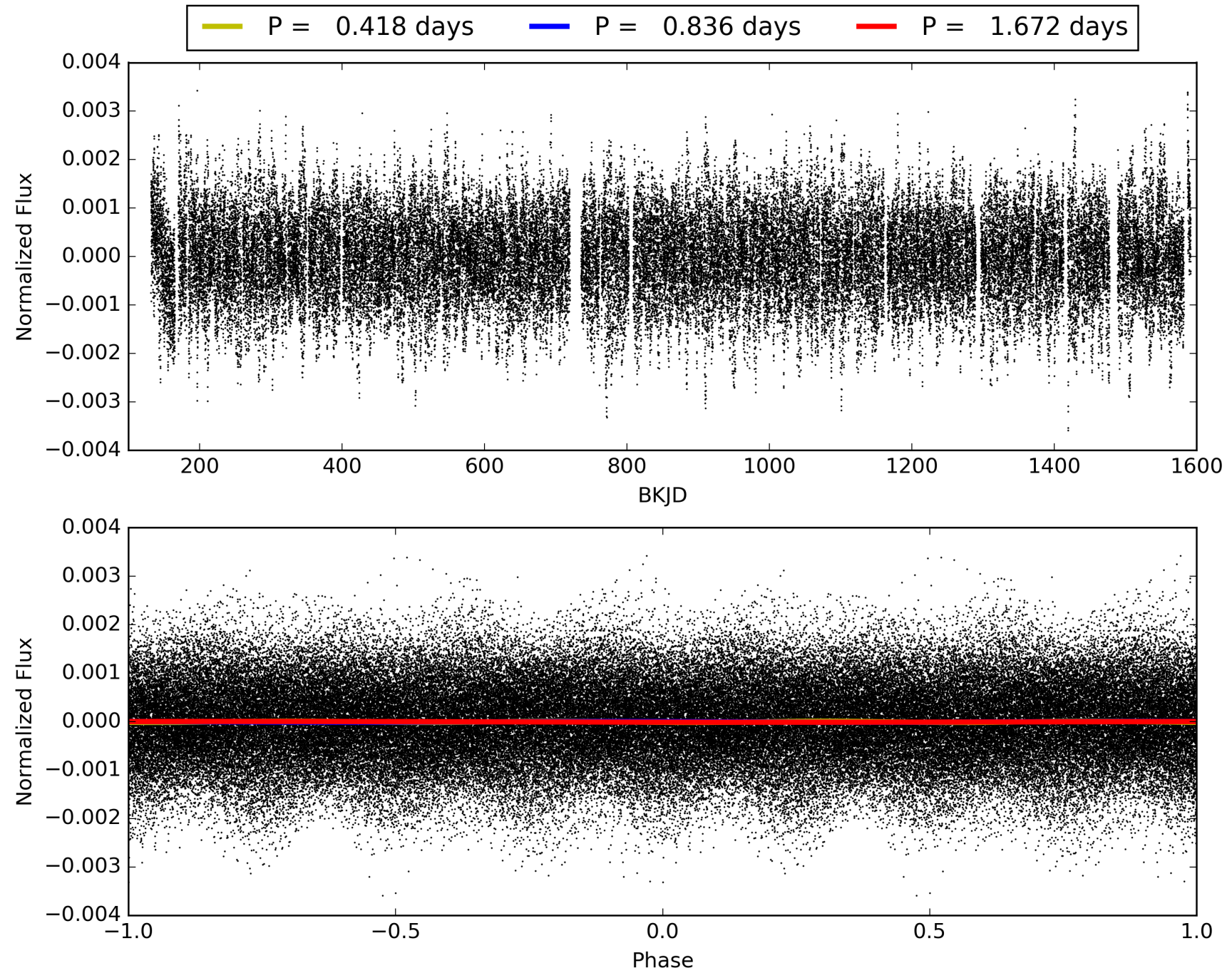
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1528/1543]
GhostDiagnostic-chr: 3.213
Centroid-sig: 17.1%
Centroid-so: 0.329 arcsec [1.29 σ]
OotOffset-rm: 0.015 arcsec [0.11 σ]
KicOffset-rm: 0.133 arcsec [0.90 σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.53 [8/15]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009344493-02, PDC Light Curves

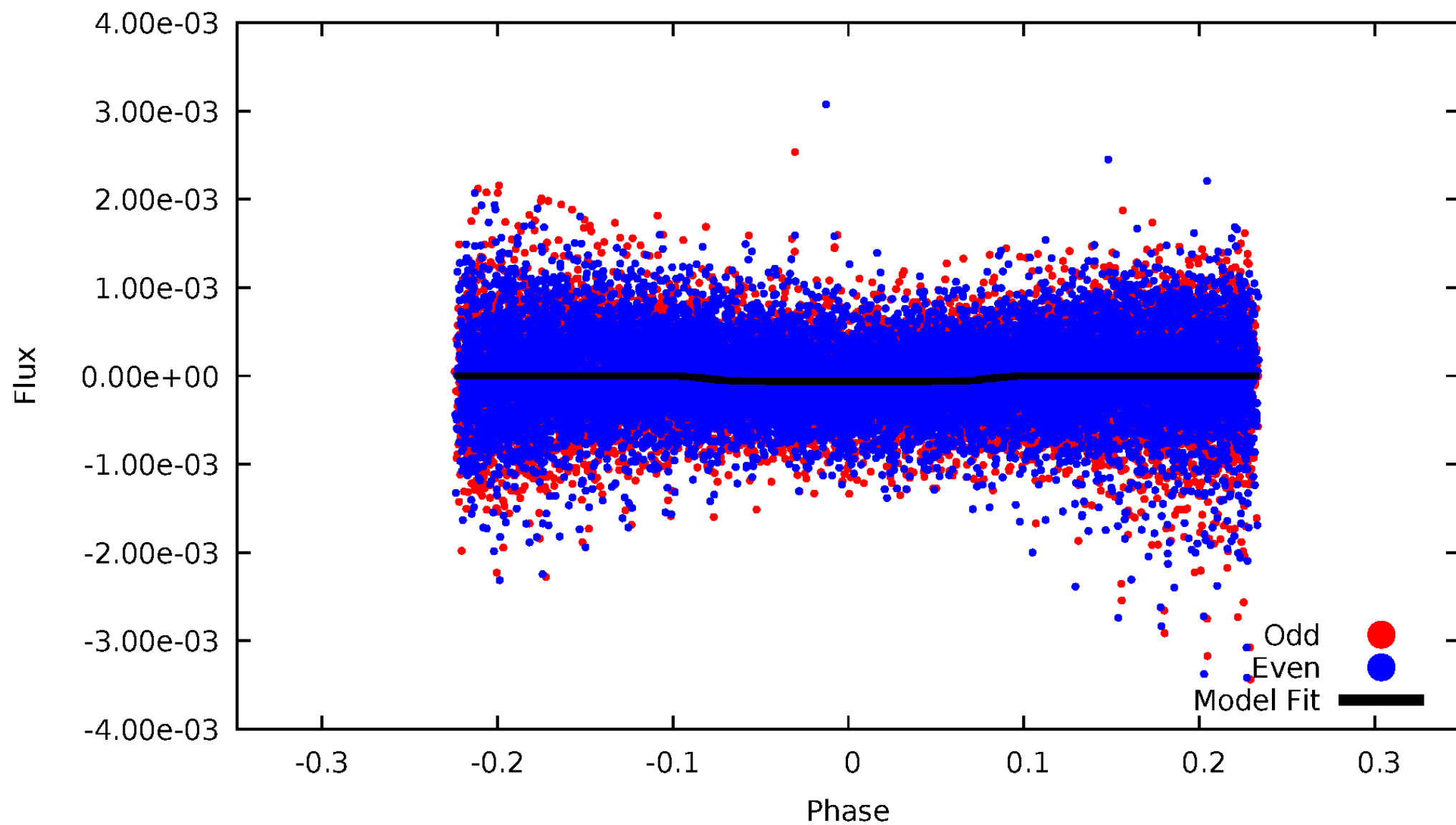


TCE 009344493-02



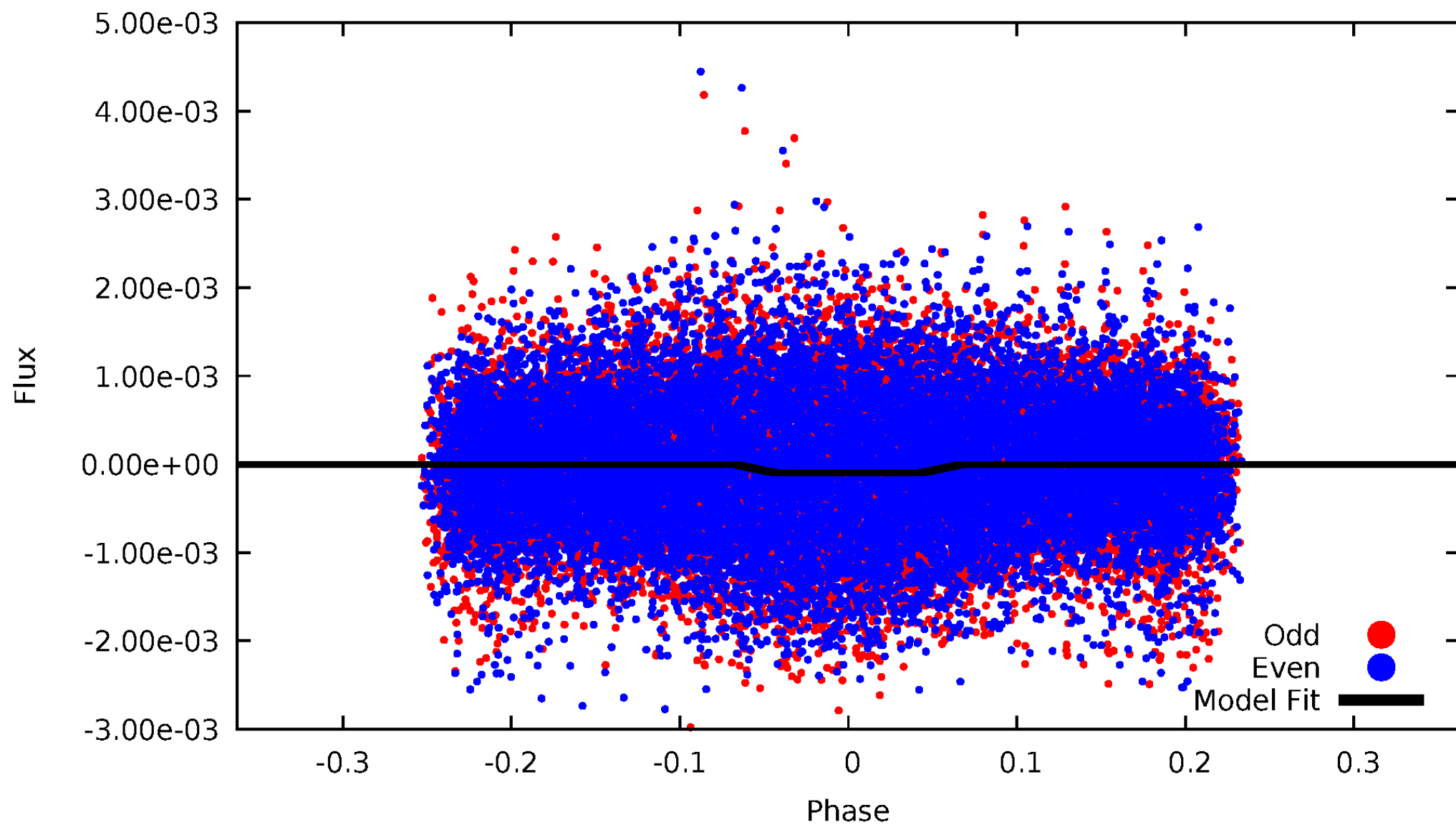
DV Odd/Even

TCE 009344493-02



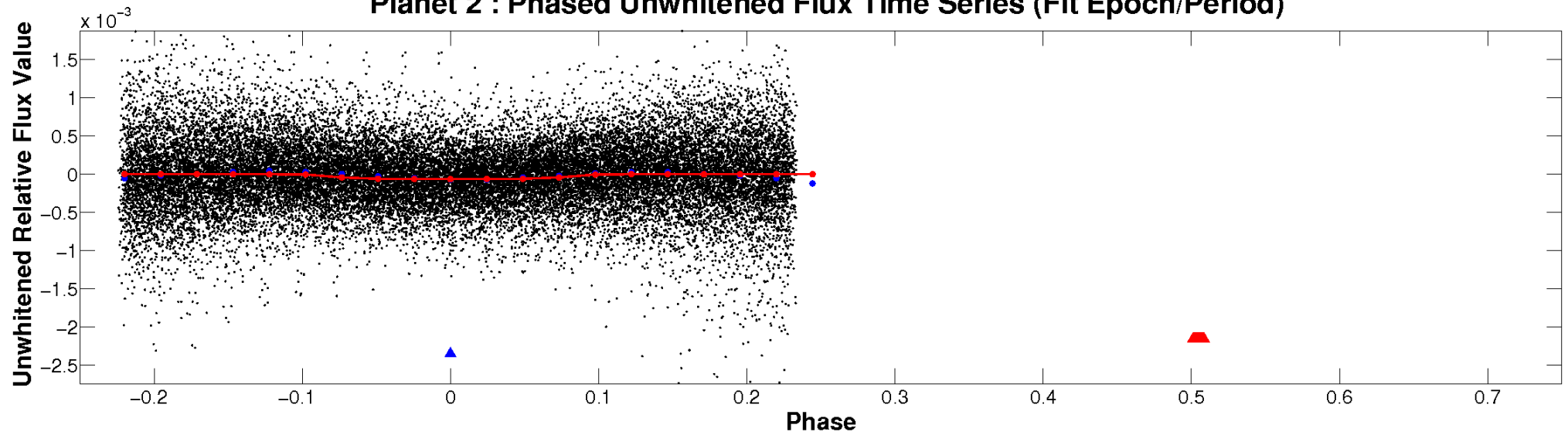
ALT Odd/Even

TCE 009344493-02

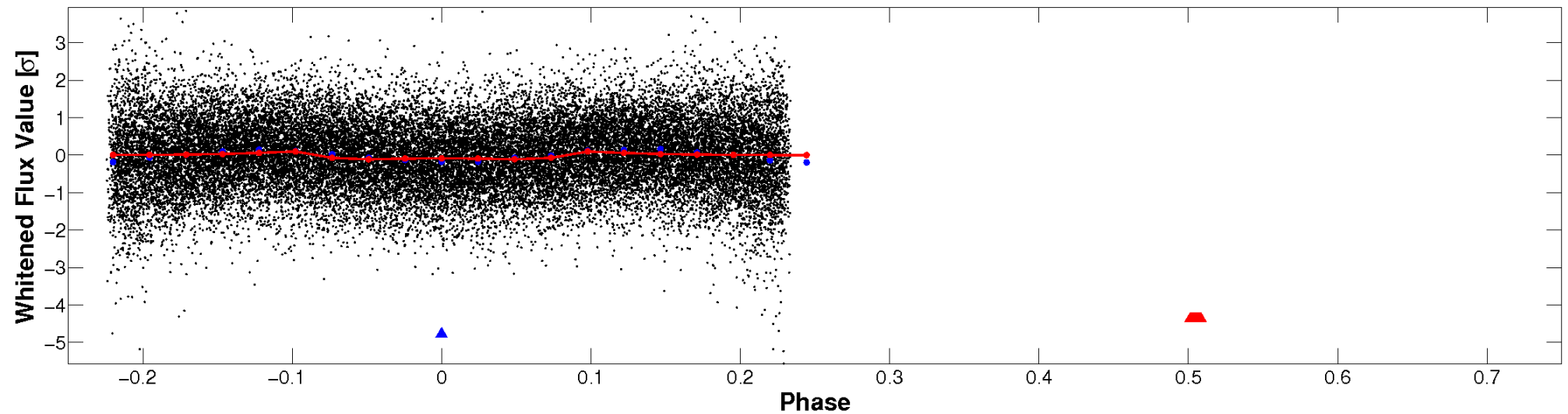


Non-Whitened Vs. Whitened Light Curve

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

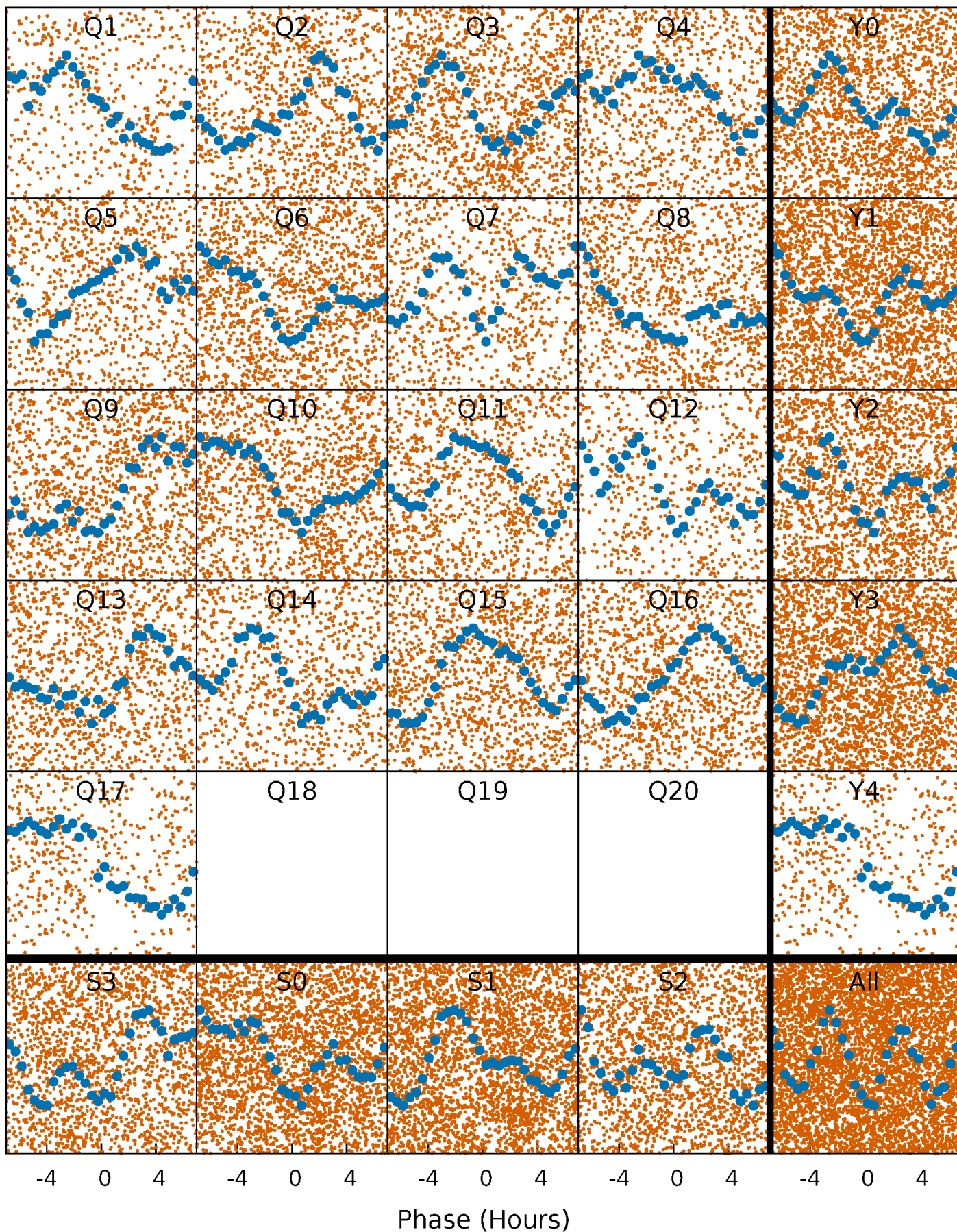


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



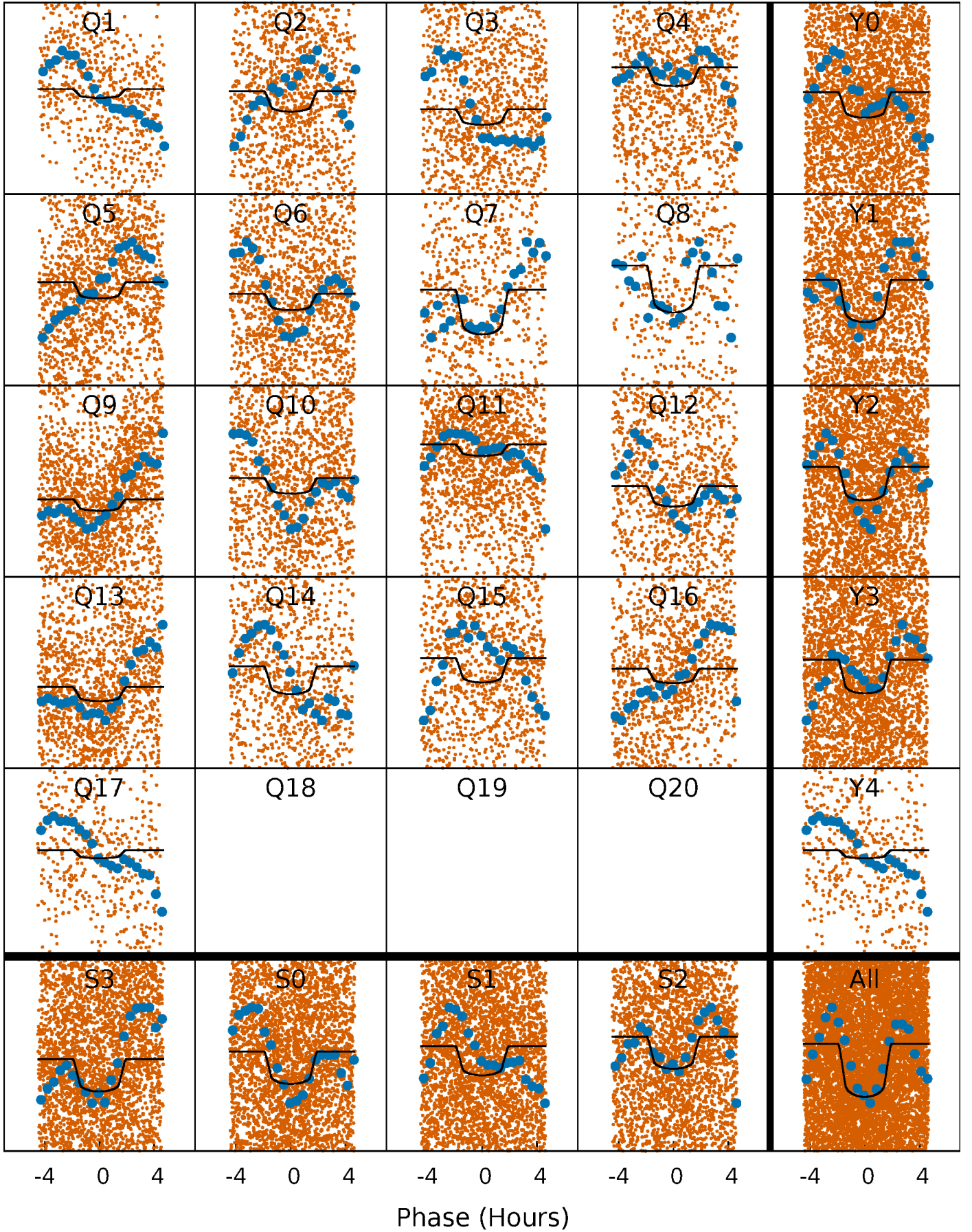
PDC Quarter-Phased Transit Curves

TCE 009344493-02 P= 0.836159 Days $T_0=131.745775$ (BKJD)



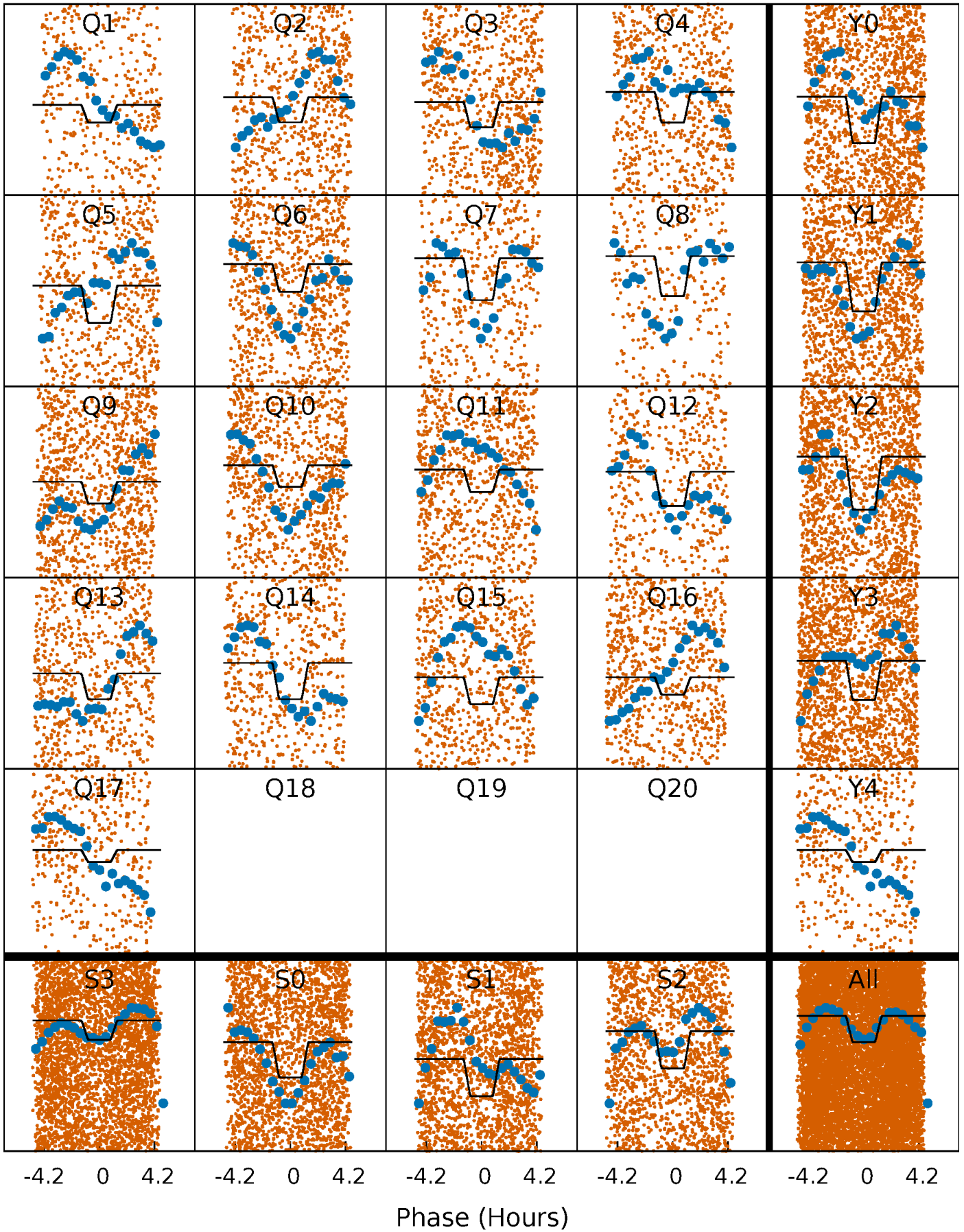
DV Quarter-Phased Transit Curves

TCE 009344493-02 P= 0.836159 Days $T_0=131.745775$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

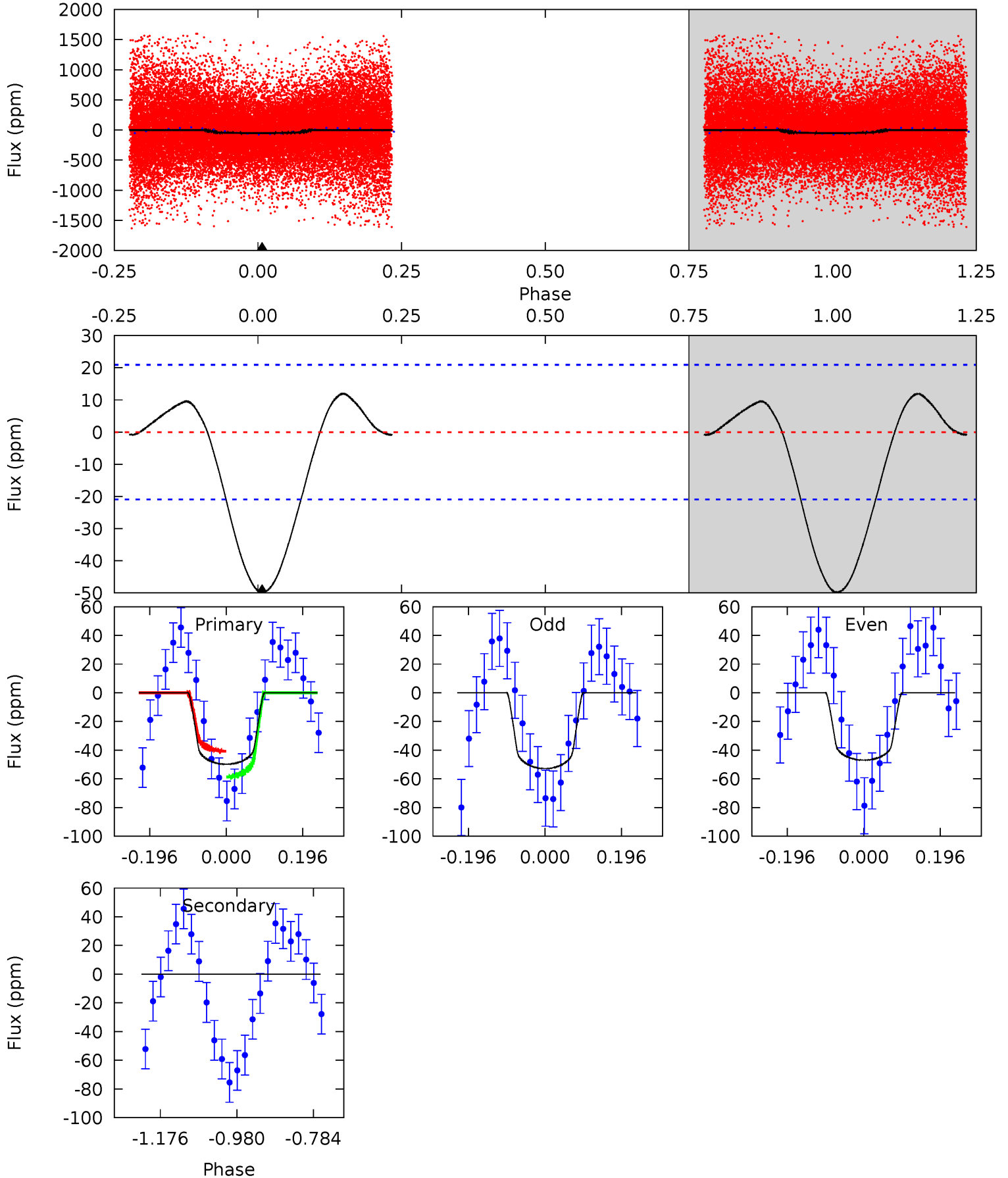
TCE 009344493-02 P= 0.836173 Days $T_0=131.746083$ (BKJD)



DV Model-Shift Uniqueness Test

009344493-02, P = 0.836159 Days, E = 130.909616 Days

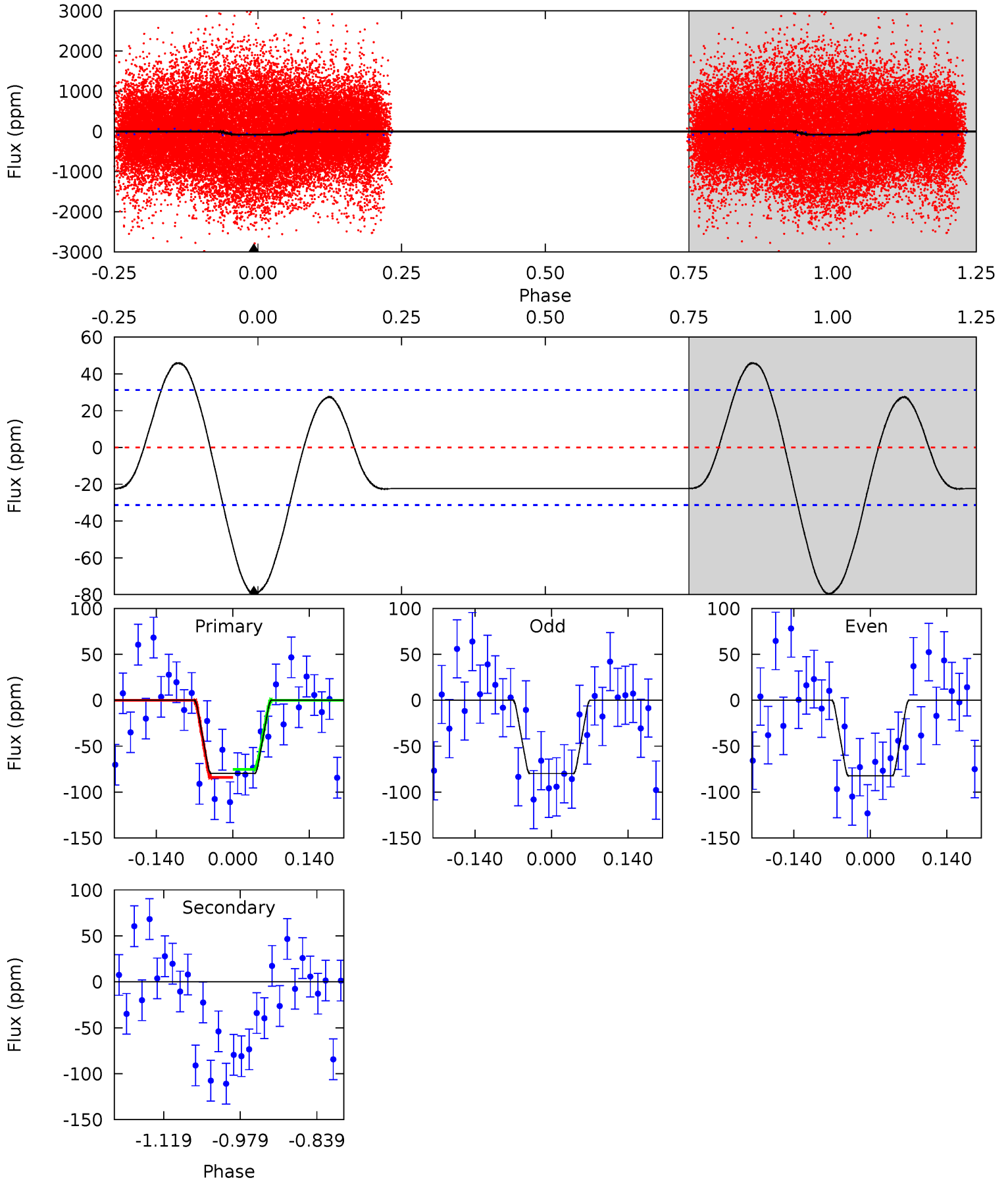
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	0	0	0	4.42	1.29	0.18	10.5	10.5	0	0	0.63	1.06	0.19	2.77



Alt Model-Shift Uniqueness Test

009344493-02, P = 0.836173 Days, E = 130.909910 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	0	0	0	4.49	1.48	2.96	11.4	11.4	0	0	0.18	1.10	0.37	0.48



Stellar Parameters For KIC 009344493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7428^{+233}_{-311}	$3.969^{+0.315}_{-0.135}$	$-0.560^{+0.300}_{-0.300}$	$1.997^{+0.475}_{-0.713}$	$1.354^{+0.206}_{-0.206}$	$0.239^{+0.534}_{-0.093}$
	+3%/-4%	+8%/-3%	+54%/-54%	+24%/-36%	+15%/-15%	+223%/-39%
Source	KIC0	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 009344493-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 5	$1.79^{+0.45}_{-0.42}$	4586^{+356}_{-425}	-3986^{+6988}_{-584}	$0.019^{+0.332}_{-0.317}$
Alt.	0 ± 7	$2.11^{+0.45}_{-0.46}$	4607^{+348}_{-418}	-4022^{+7007}_{-640}	$0.013^{+0.333}_{-0.347}$

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 $A_{obs} \gg 1.0$

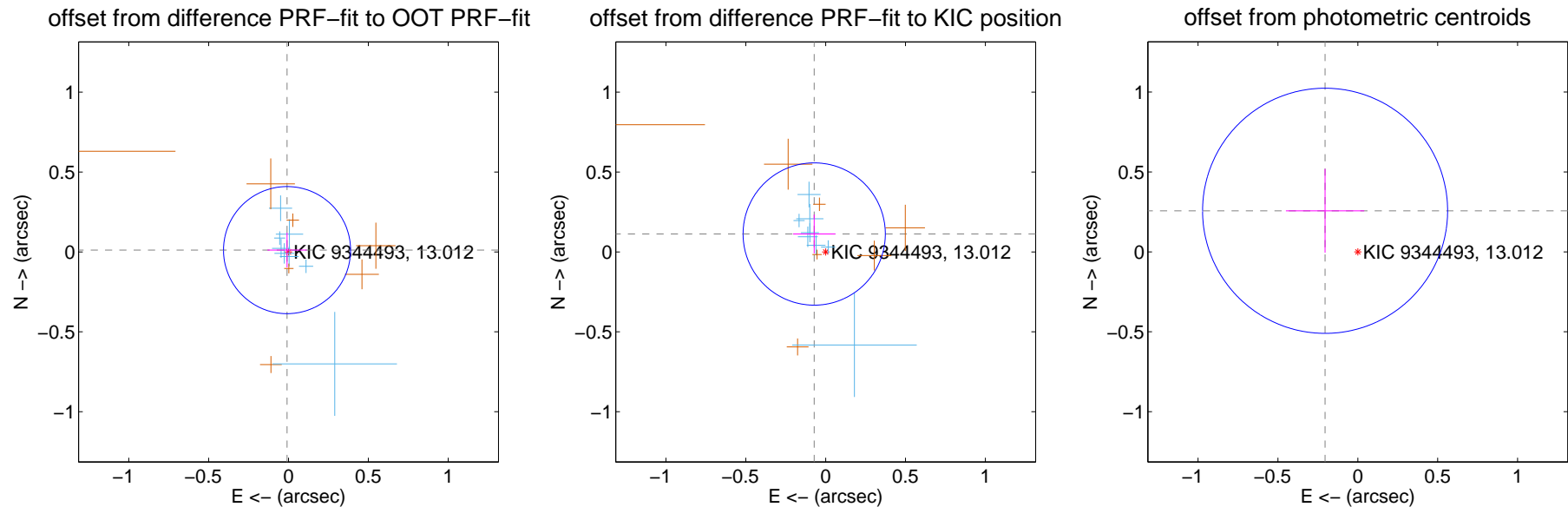
DV Centroid Data

Supplemental centroid analysis for 009344493-02. Kepler magnitude: 13.01. Transit SNR 12.06

There are 8 quarters with good PRF difference image offsets

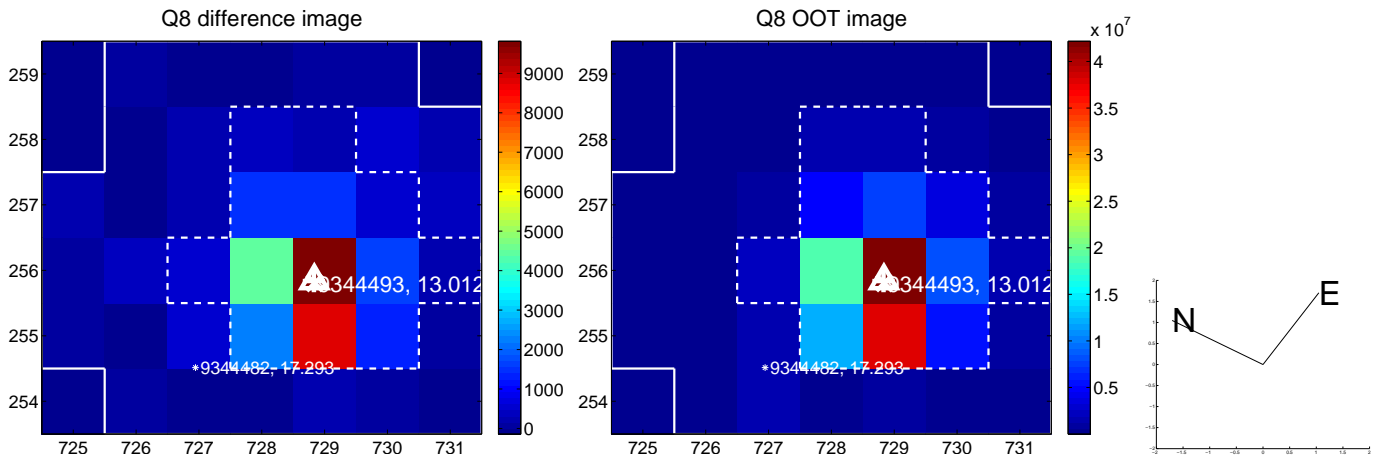
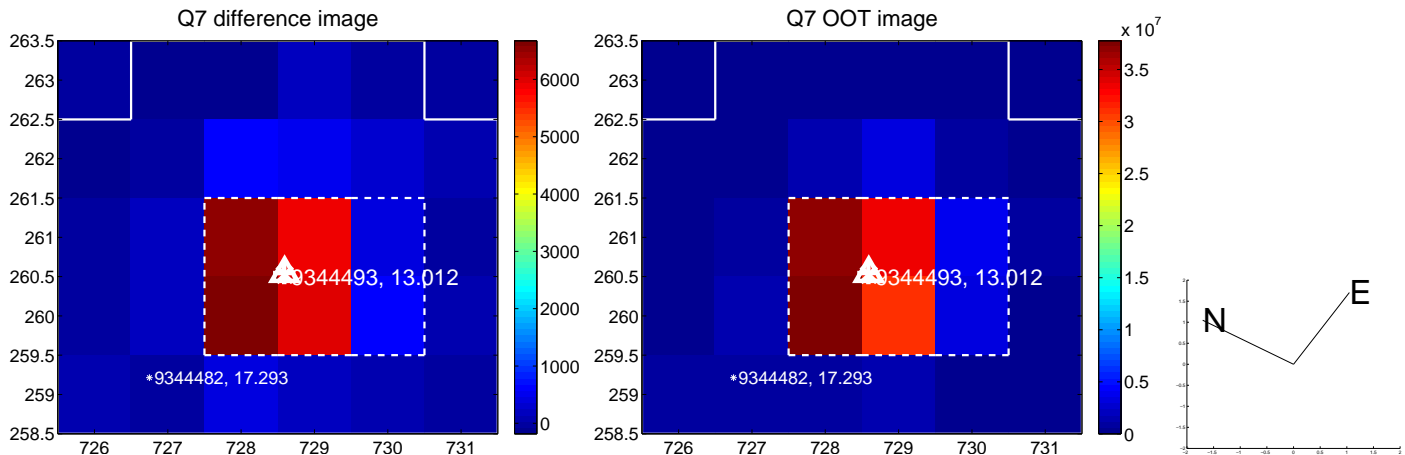
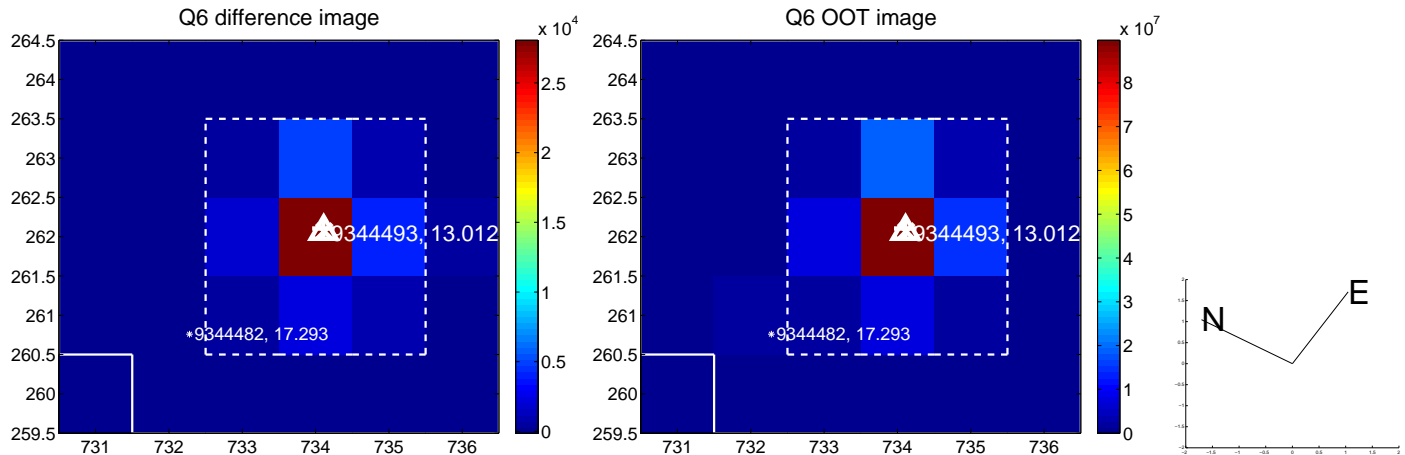
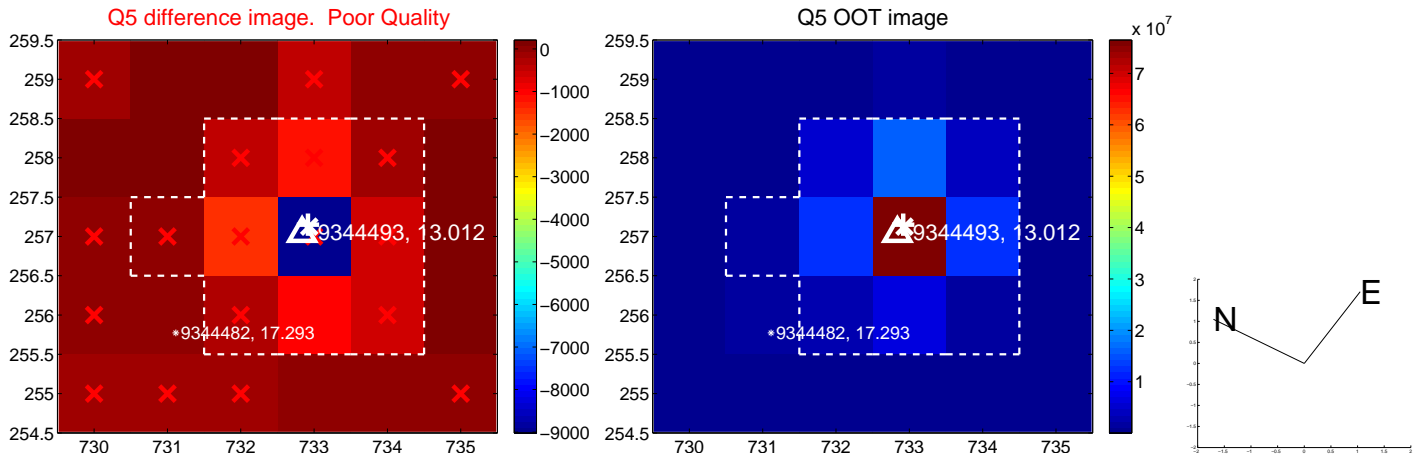
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.015 ± 0.133	0.11	0.009 ± 0.123	0.011 ± 0.109
PRF-fit source offset from KIC position	0.133 ± 0.148	0.90	0.072 ± 0.132	0.112 ± 0.121
photometric centroid source offset	0.33 ± 0.26	1.29	0.20 ± 0.25	0.26 ± 0.26

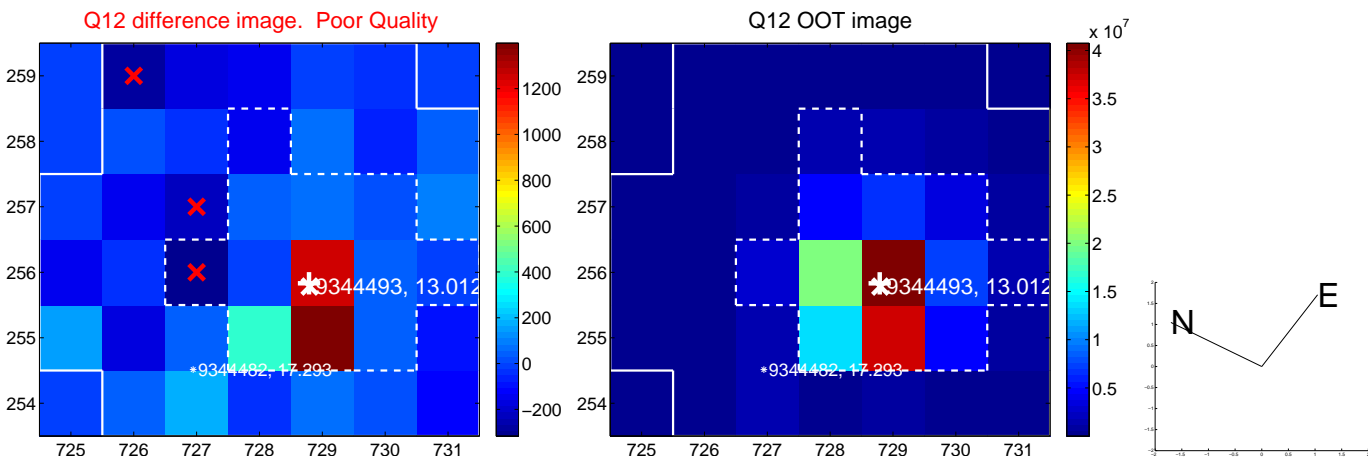
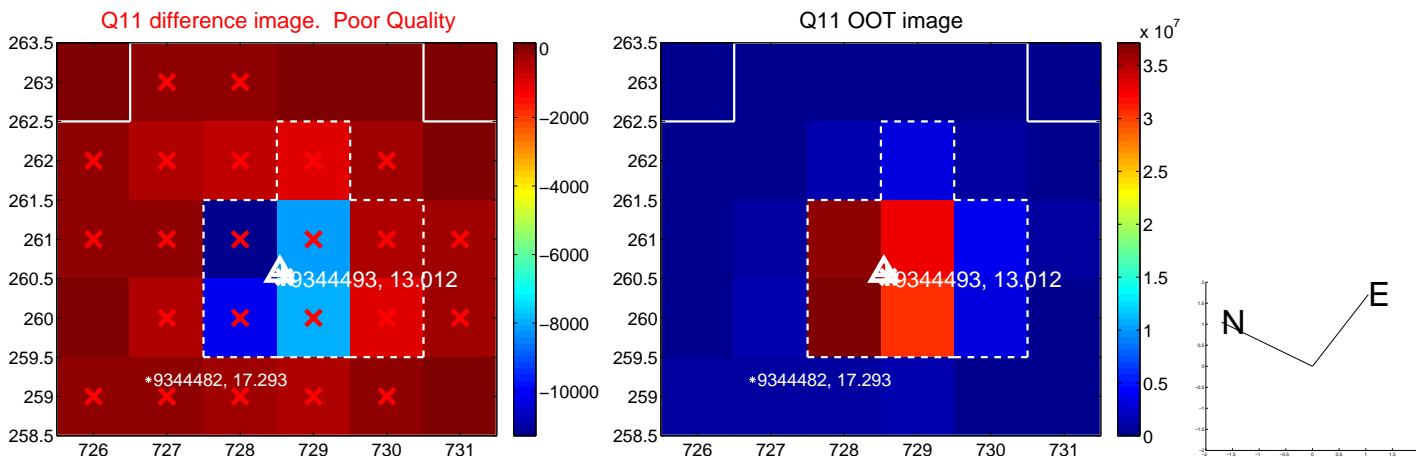
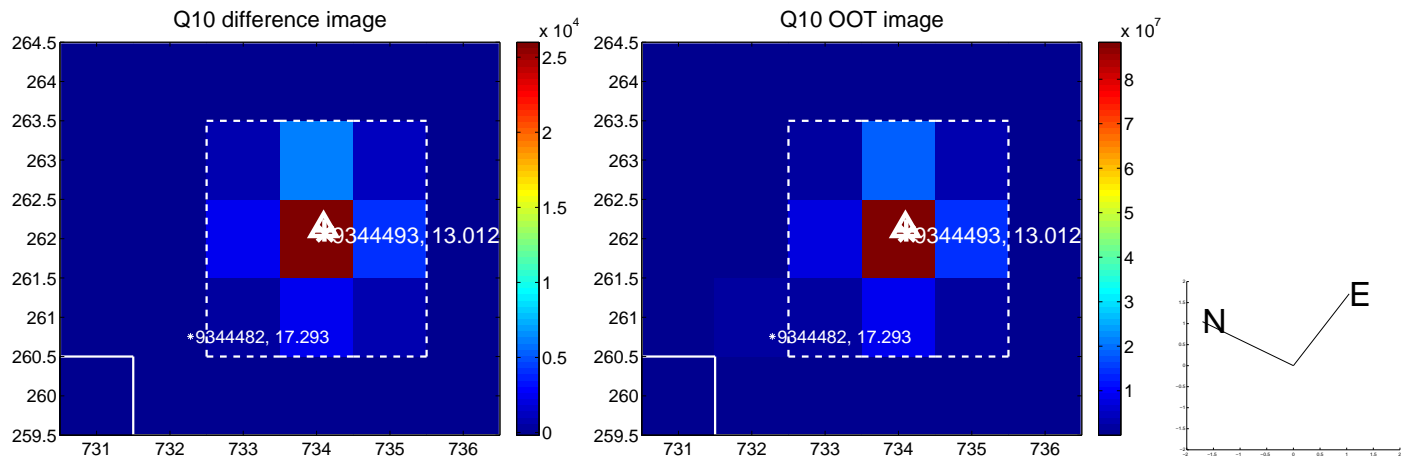
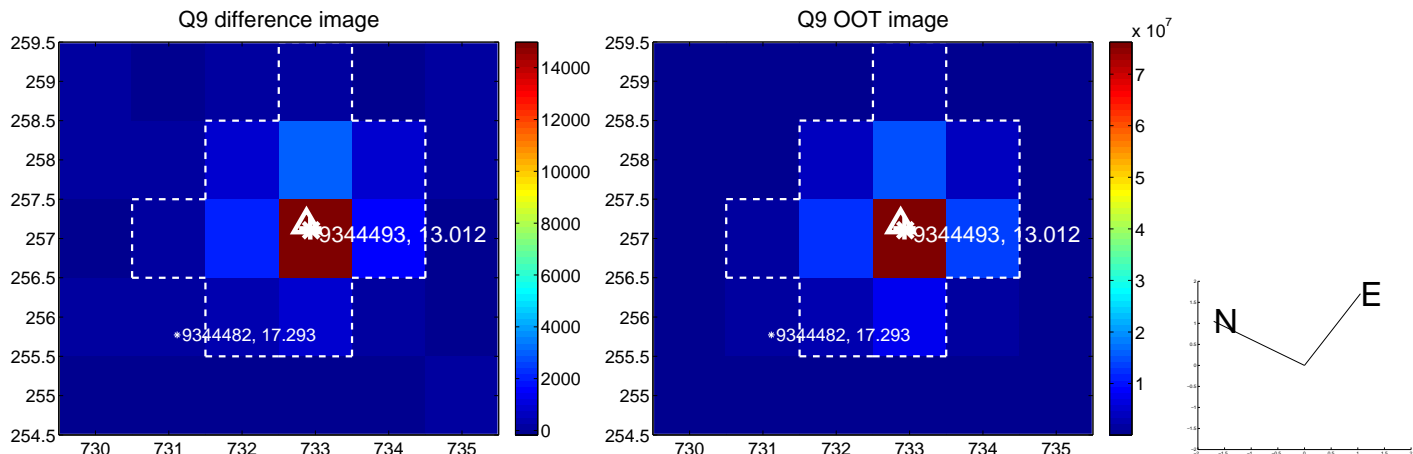


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

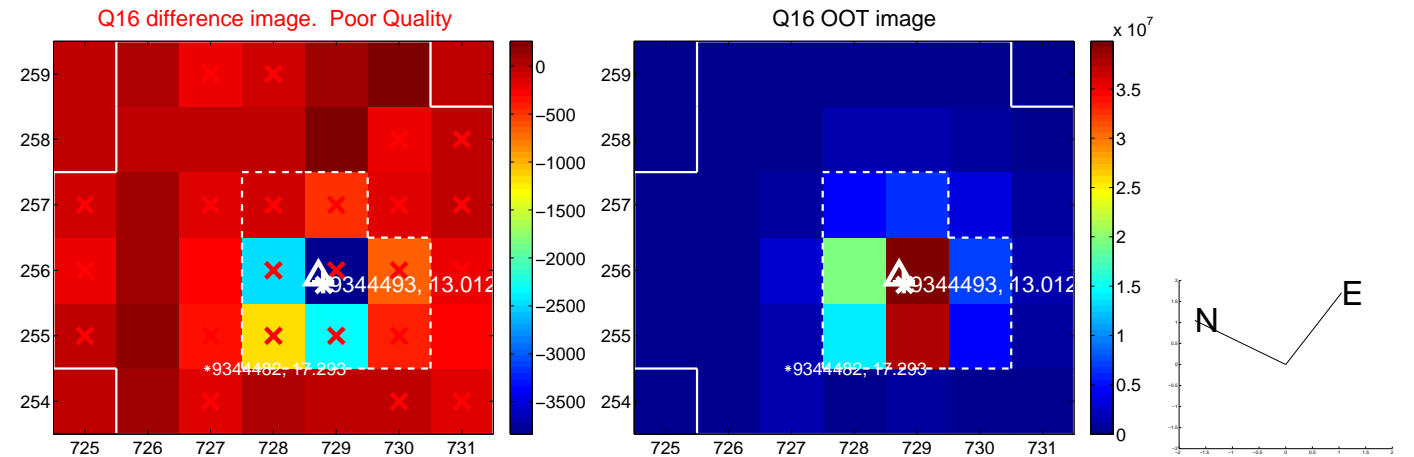
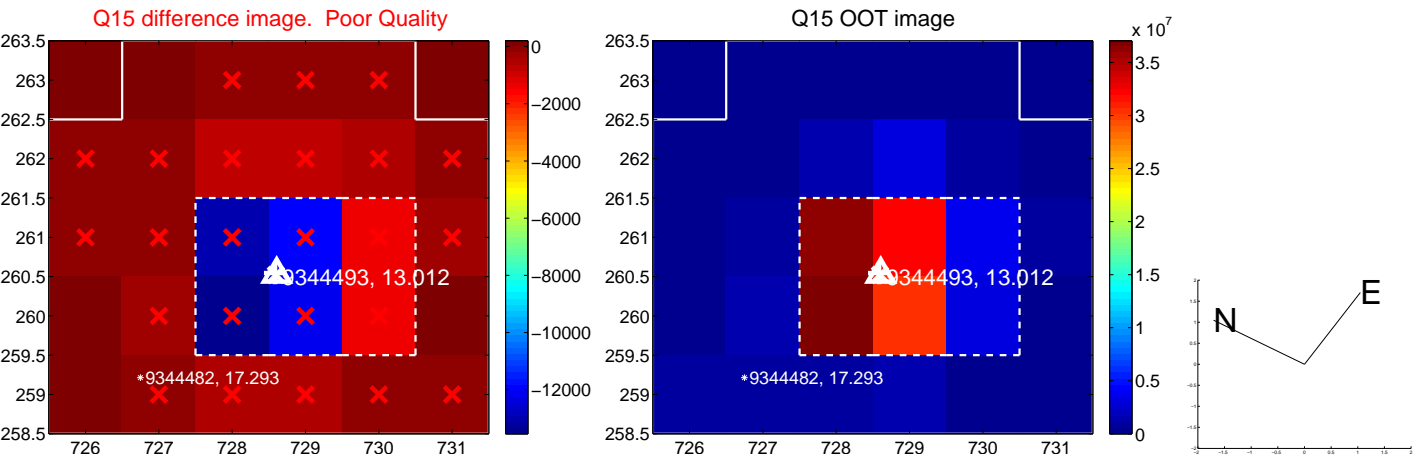
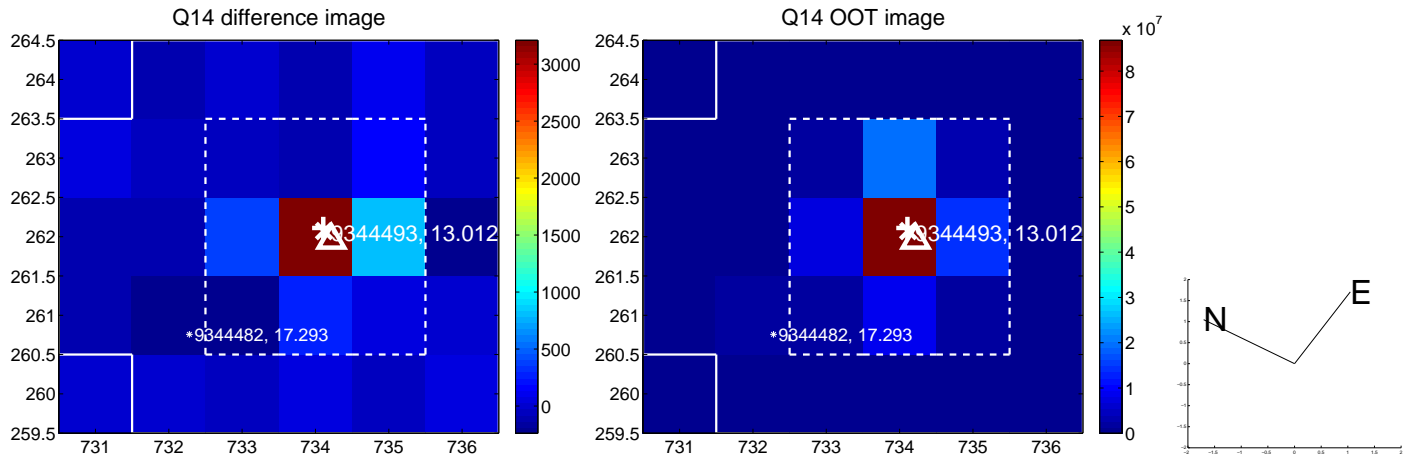
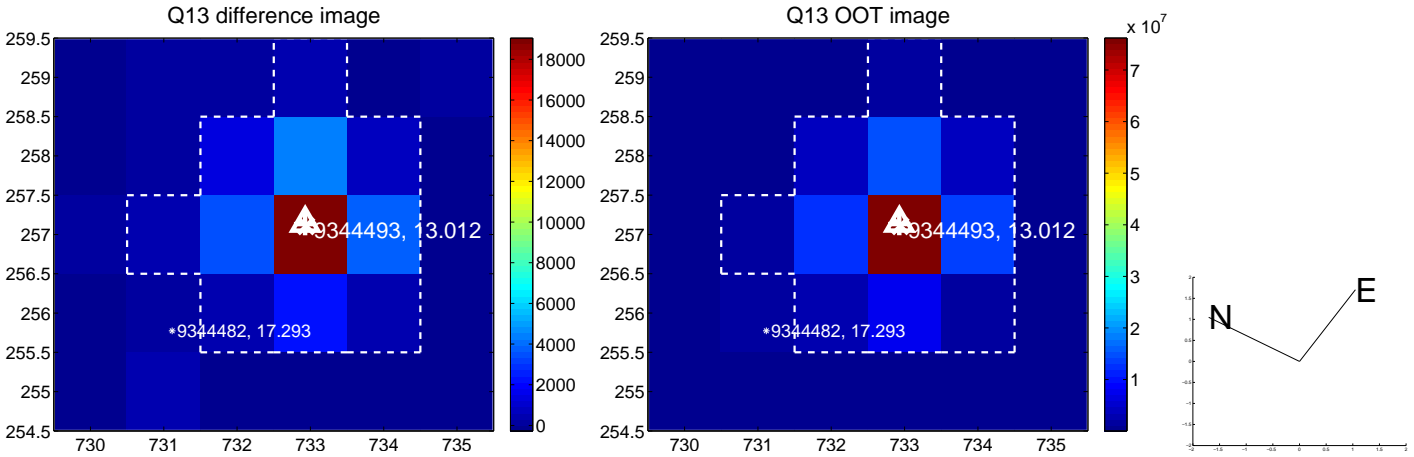
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



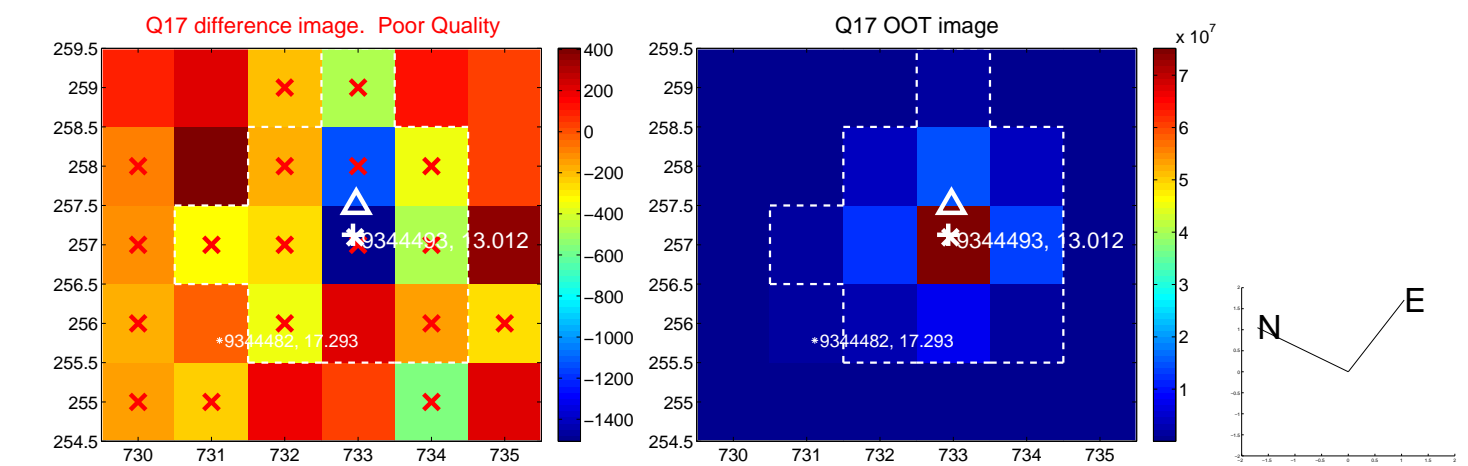
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



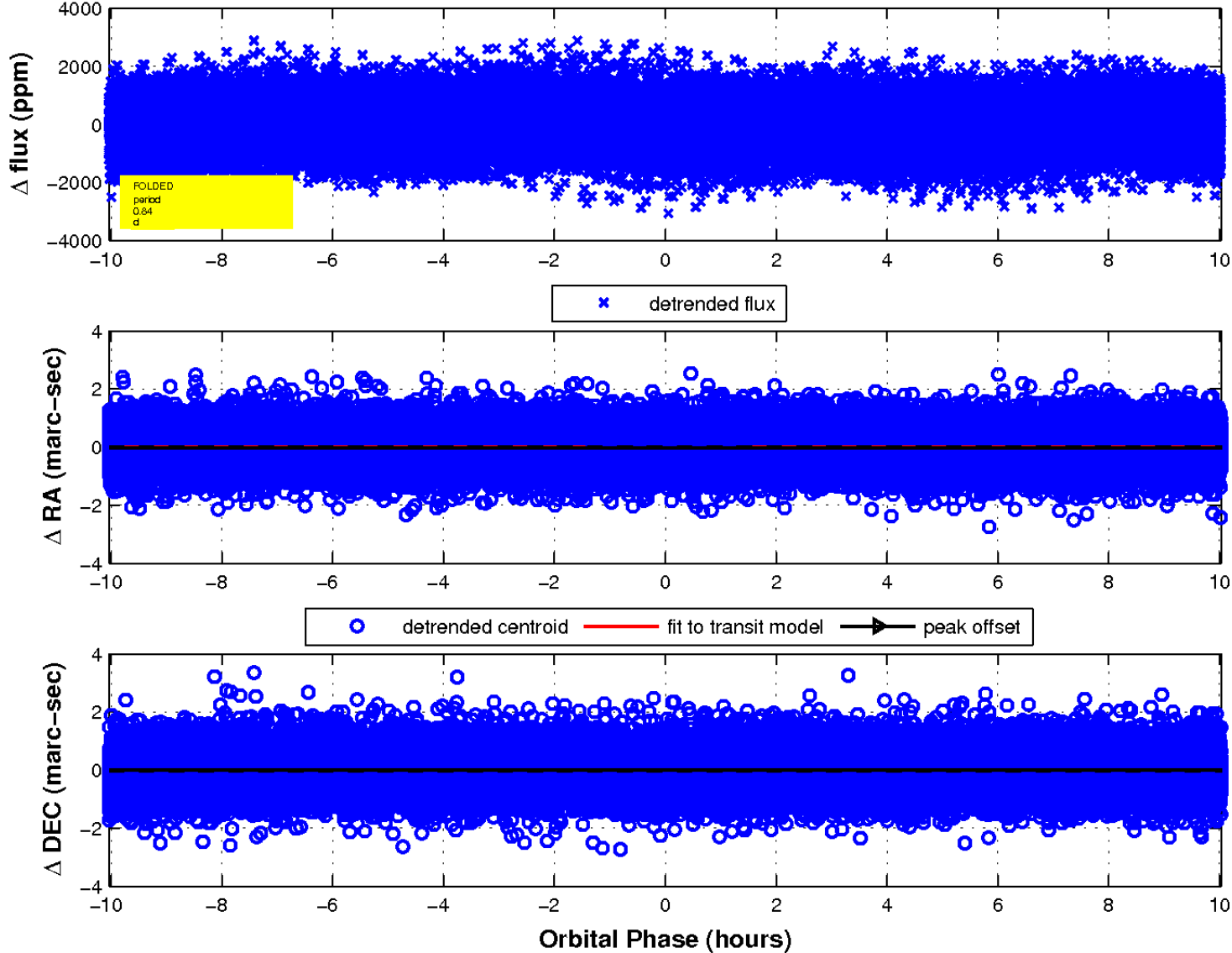
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

