

KIC 008753896

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})
008753896-01	OBS	2473.01	3.244117	132.956423	343.8	2.056	15.0	16.0	0.87	5094	1.96	284.89
008753896-02	OBS	2473.03	14.512118	143.836788	382.9	3.951	9.8	10.7	0.87	5094	1.98	38.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008753896-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008753896-02	OBS	PC	0.94	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.

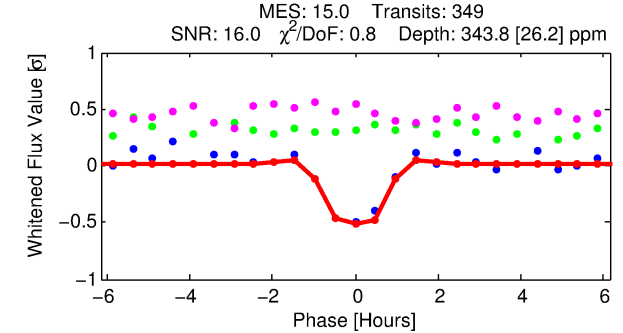
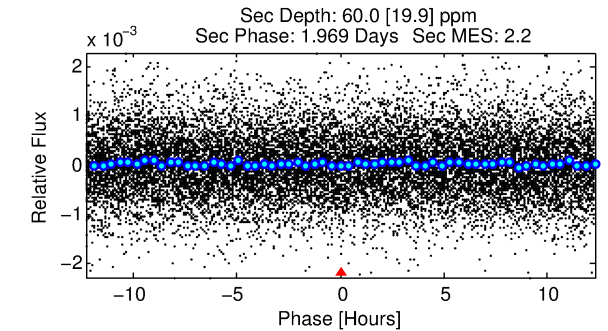
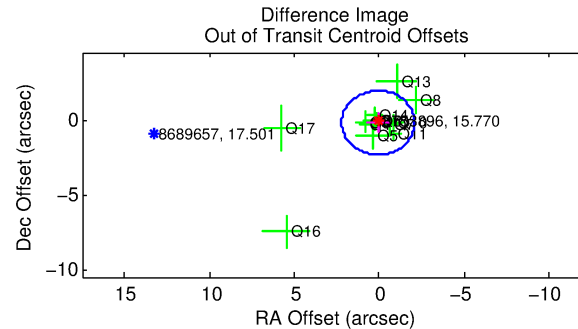
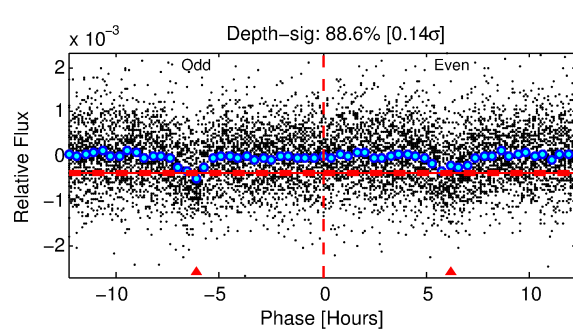
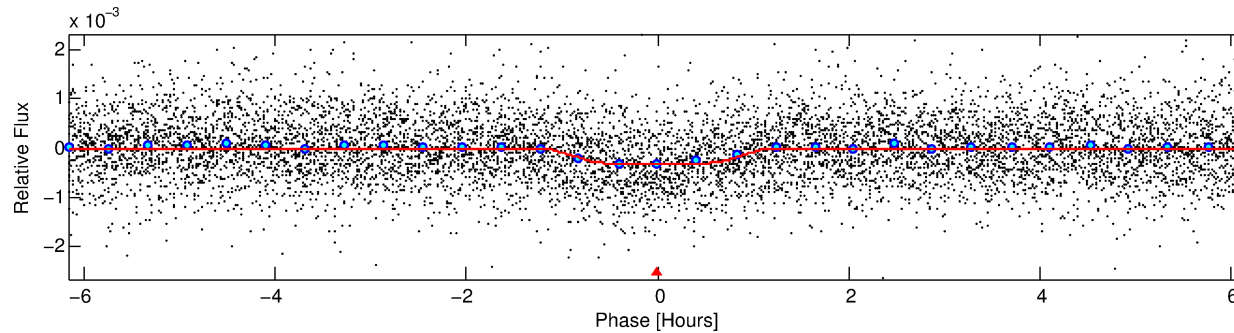
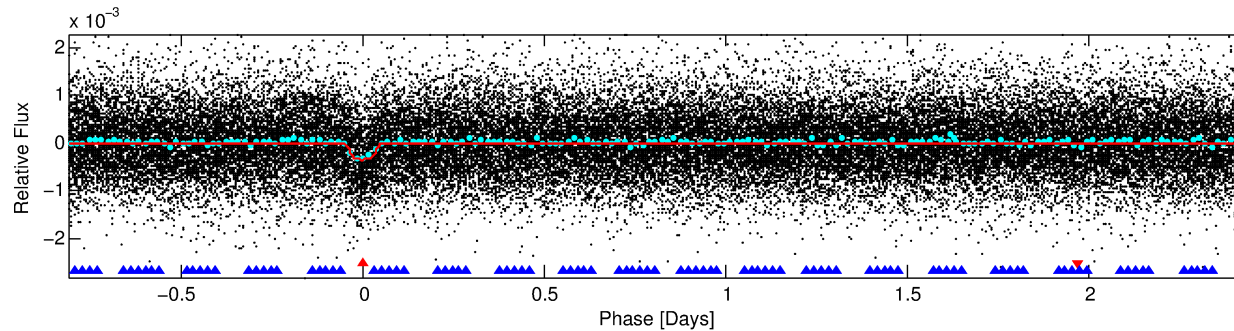
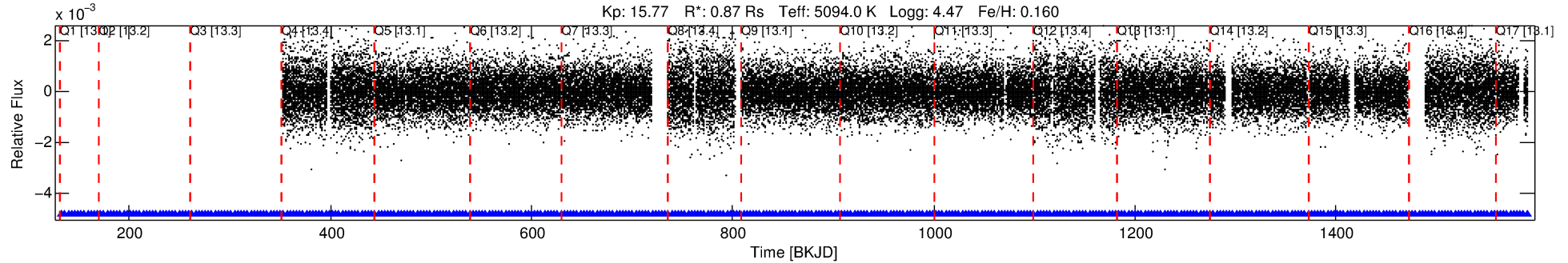
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008753896-01

No Significant Match Found

DV One-Page Summary

KIC: 8753896 Candidate: 1 of 2 Period: 3.244 d
KOI: K02473.01 Name: Kepler-389b Corr: 0.933



DV Fit Results:

Period = 3.24412 [0.00001] d
Epoch = 132.9564 [0.0022] BKJD
Rp/R* = 0.0206 [0.0095]
a/R* = 5.97 [10.52]
b = 0.90 [0.41]
Seff = 284.89 [48.57]
Teq = 1048 [45] K
Rp = 1.96 [0.91] Re
a = 0.0400 [0.0037] AU
Ag = 13.81 [13.66] [0.94 σ]
Teffp = 3122 [764] K [2.71 σ]

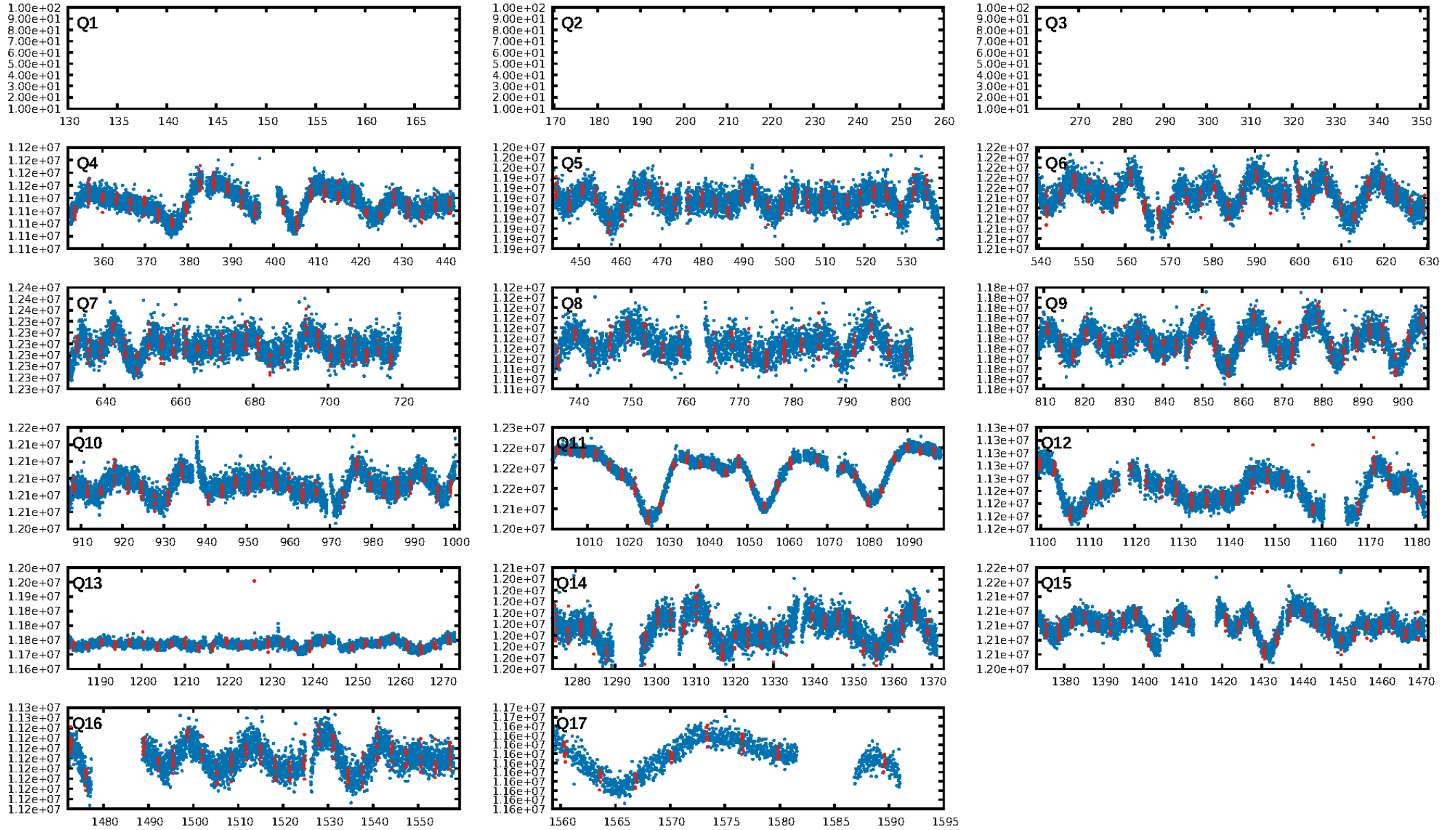
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [60.72 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.46e-50
RollingBand-fgt: 1.00 [341/341]
GhostDiagnostic-chr: 3.653
Centroid-sig: 2.0%
Centroid-so: 1.083 arcsec [1.39 σ]
OotOffset-rm: 0.211 arcsec [0.30 σ]
KicOffset-rm: 0.161 arcsec [0.20 σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 1.00 [14/14]

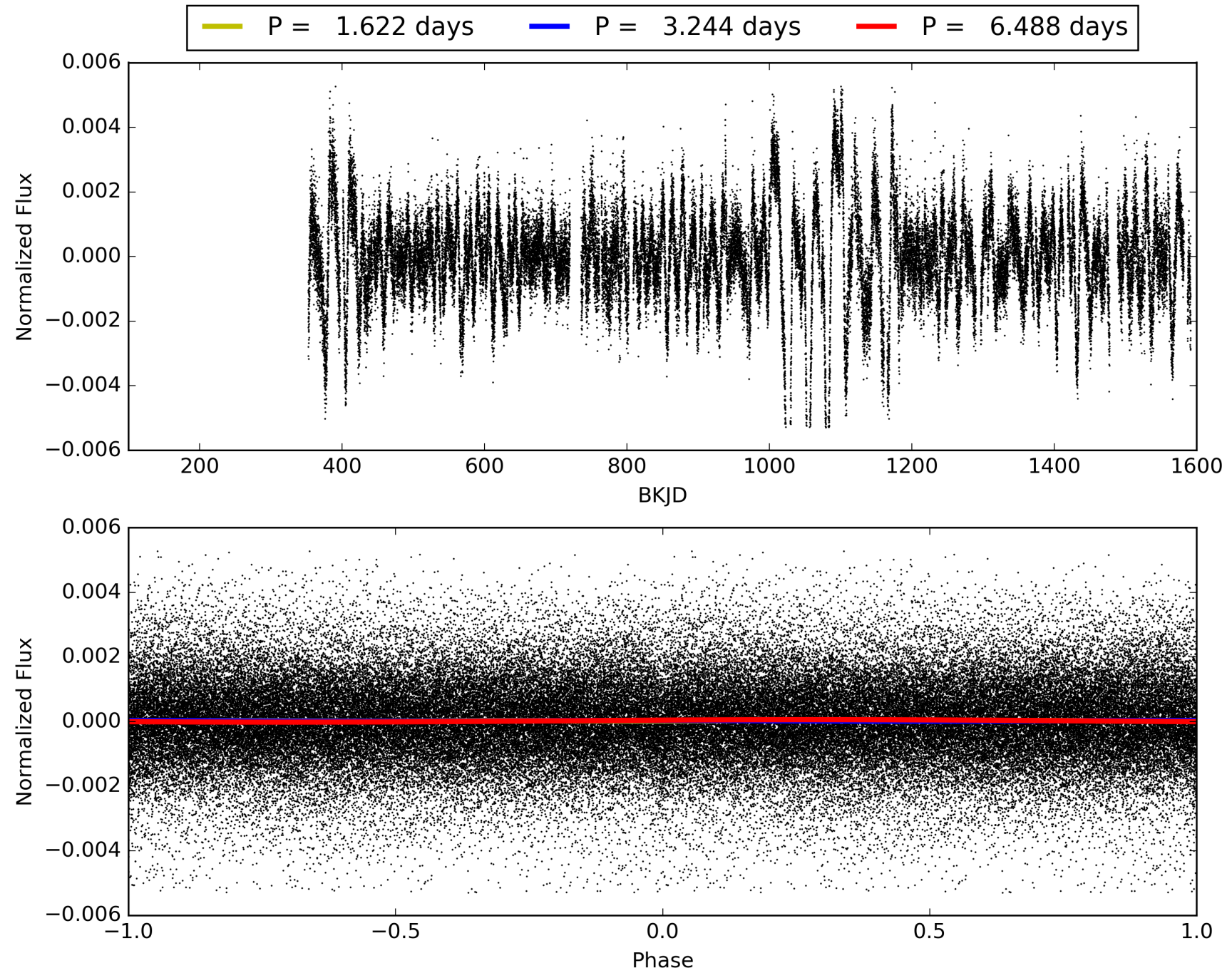
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:20:34 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008753896-01, PDC Light Curves

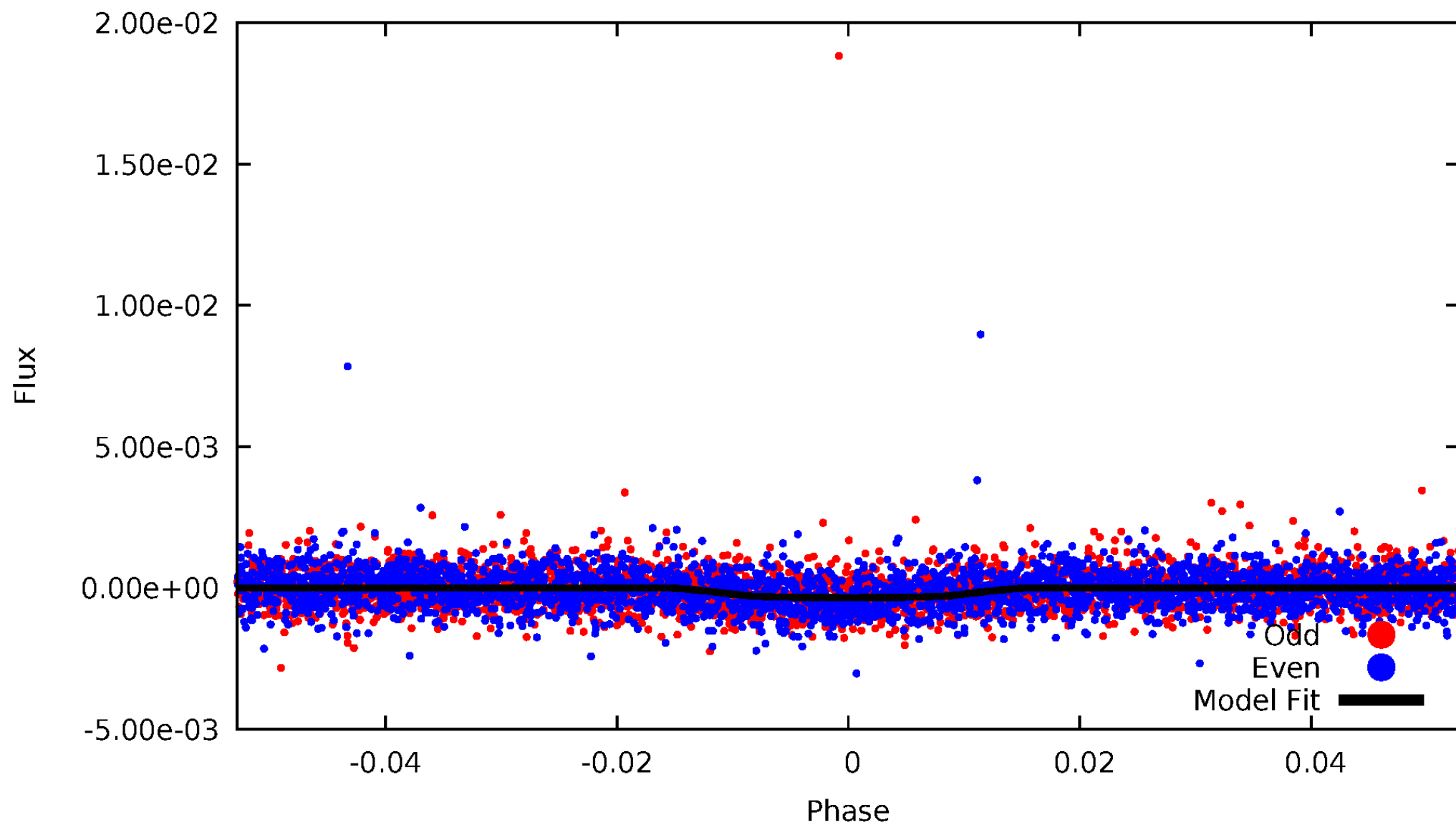


TCE 008753896-01



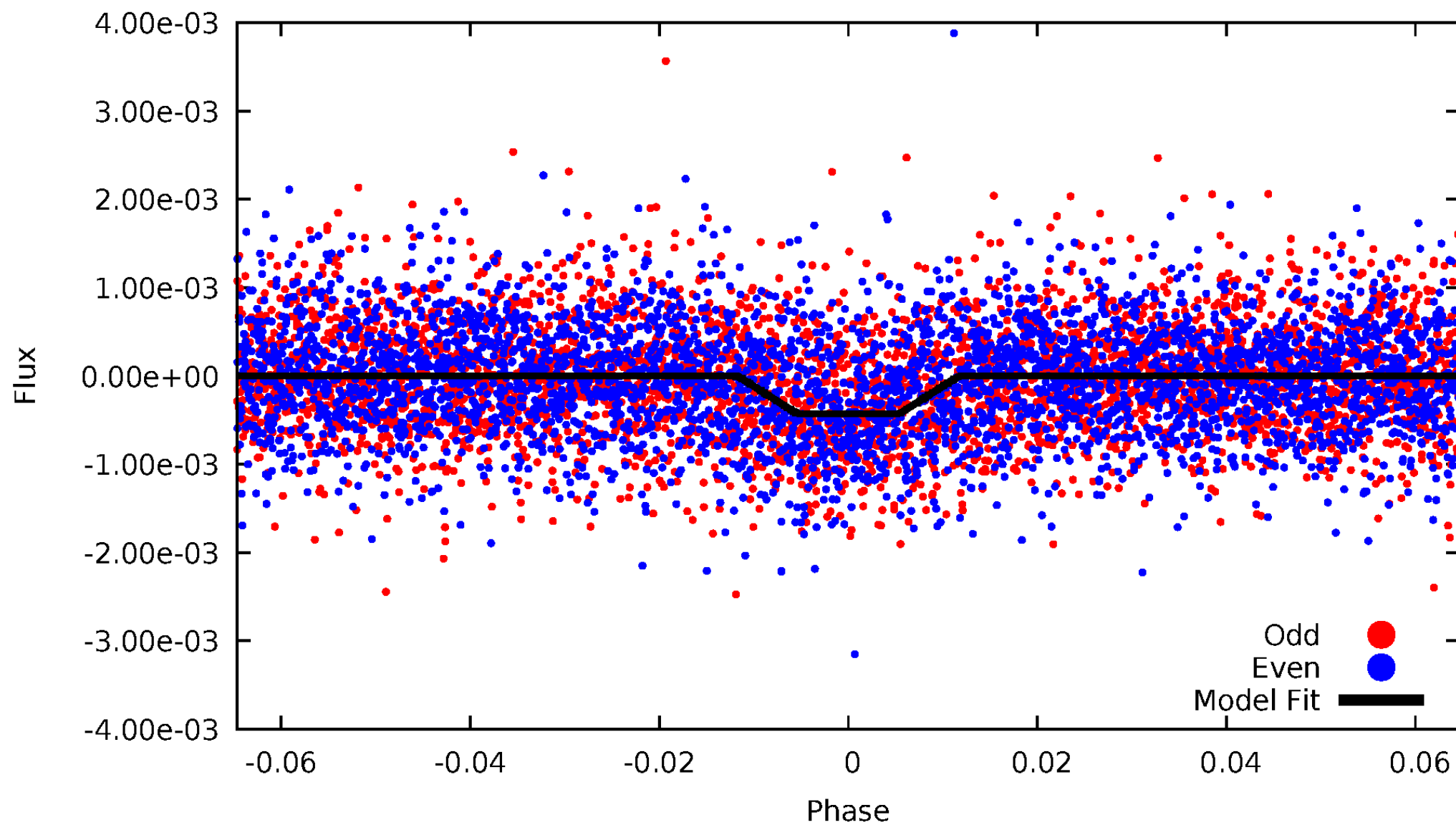
DV Odd/Even

TCE 008753896-01

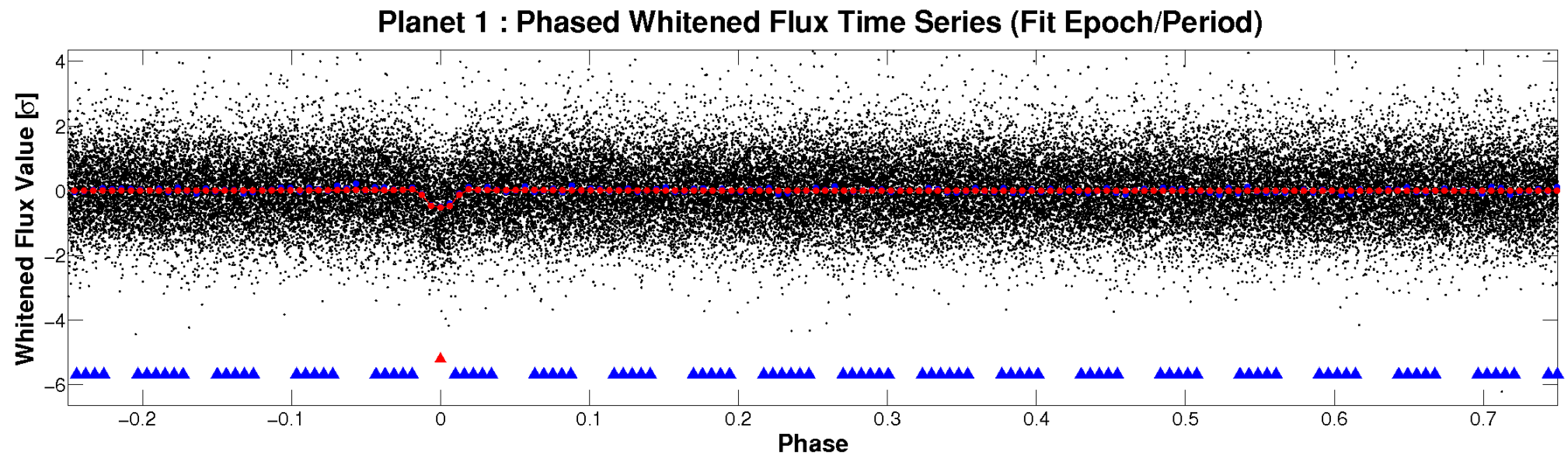
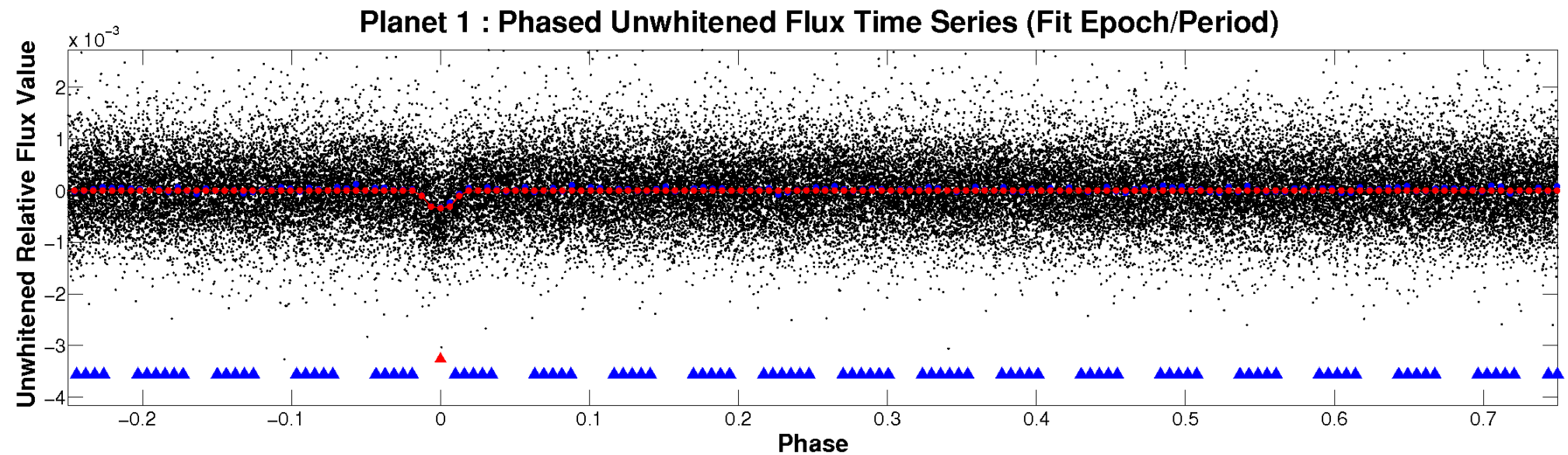


ALT Odd/Even

TCE 008753896-01

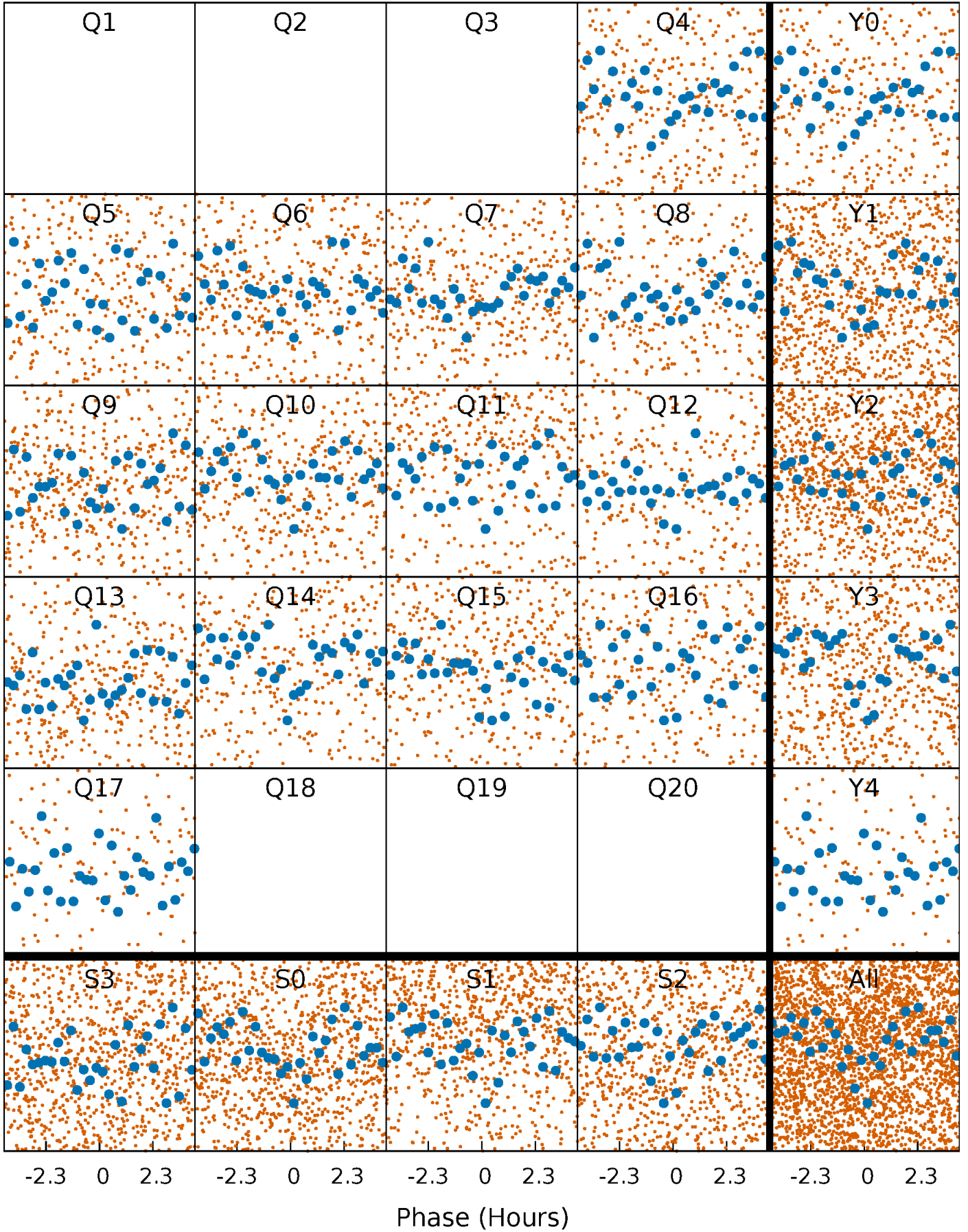


Non-Whitened Vs. Whitened Light Curve



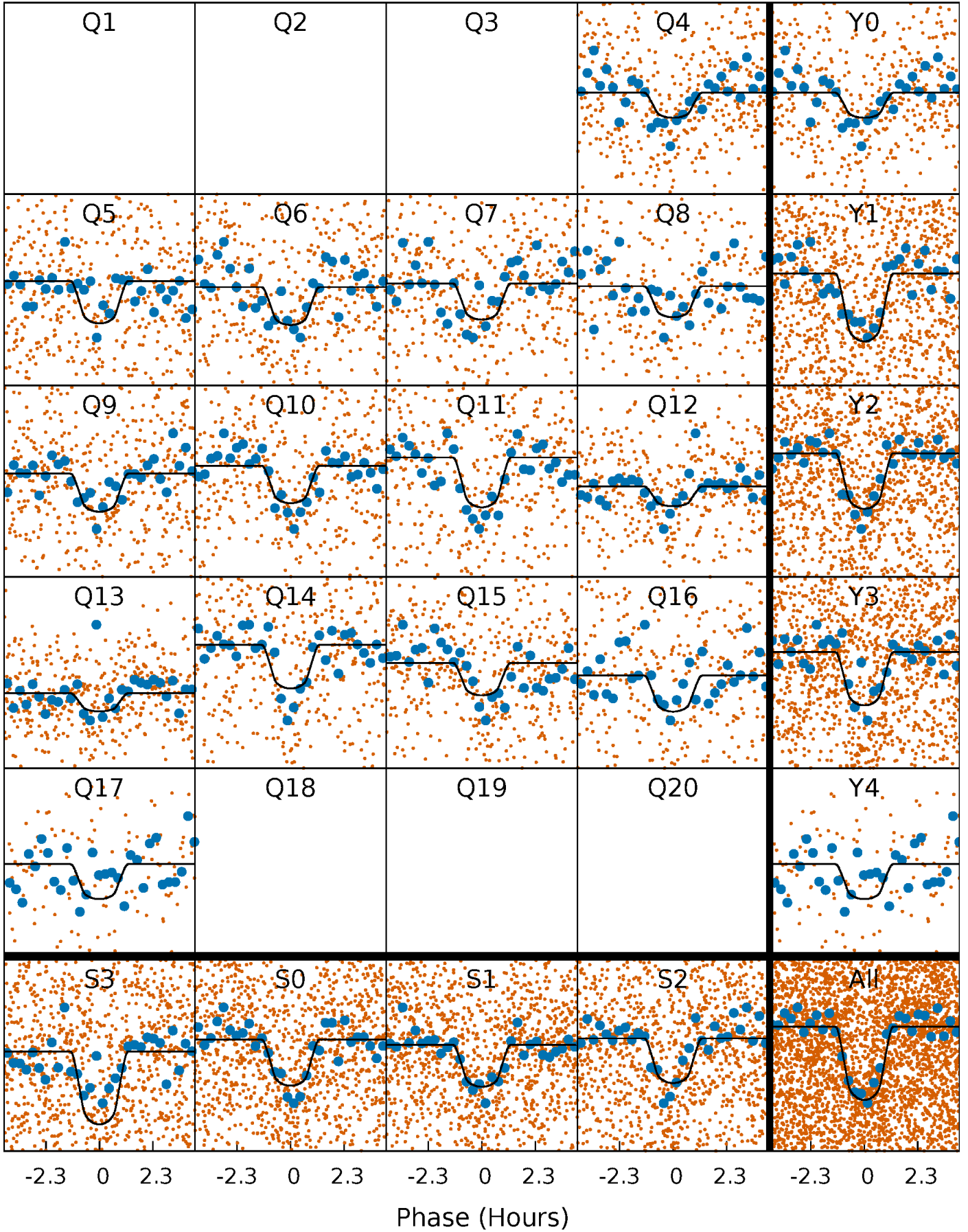
PDC Quarter-Phased Transit Curves

TCE 008753896-01 P= 3.244117 Days $T_0=132.956423$ (BKJD)



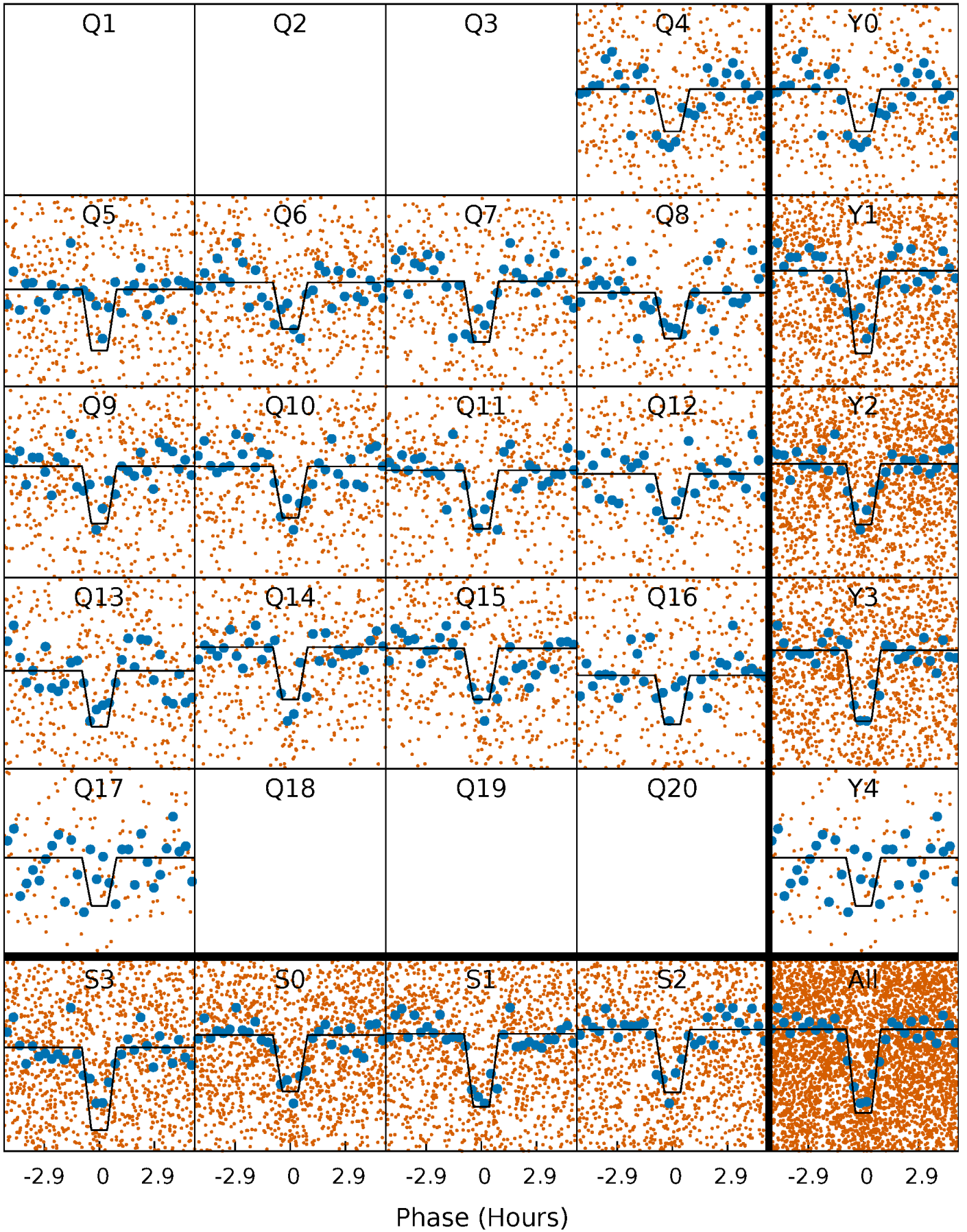
DV Quarter-Phased Transit Curves

TCE 008753896-01 P= 3.244117 Days $T_0=132.956423$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

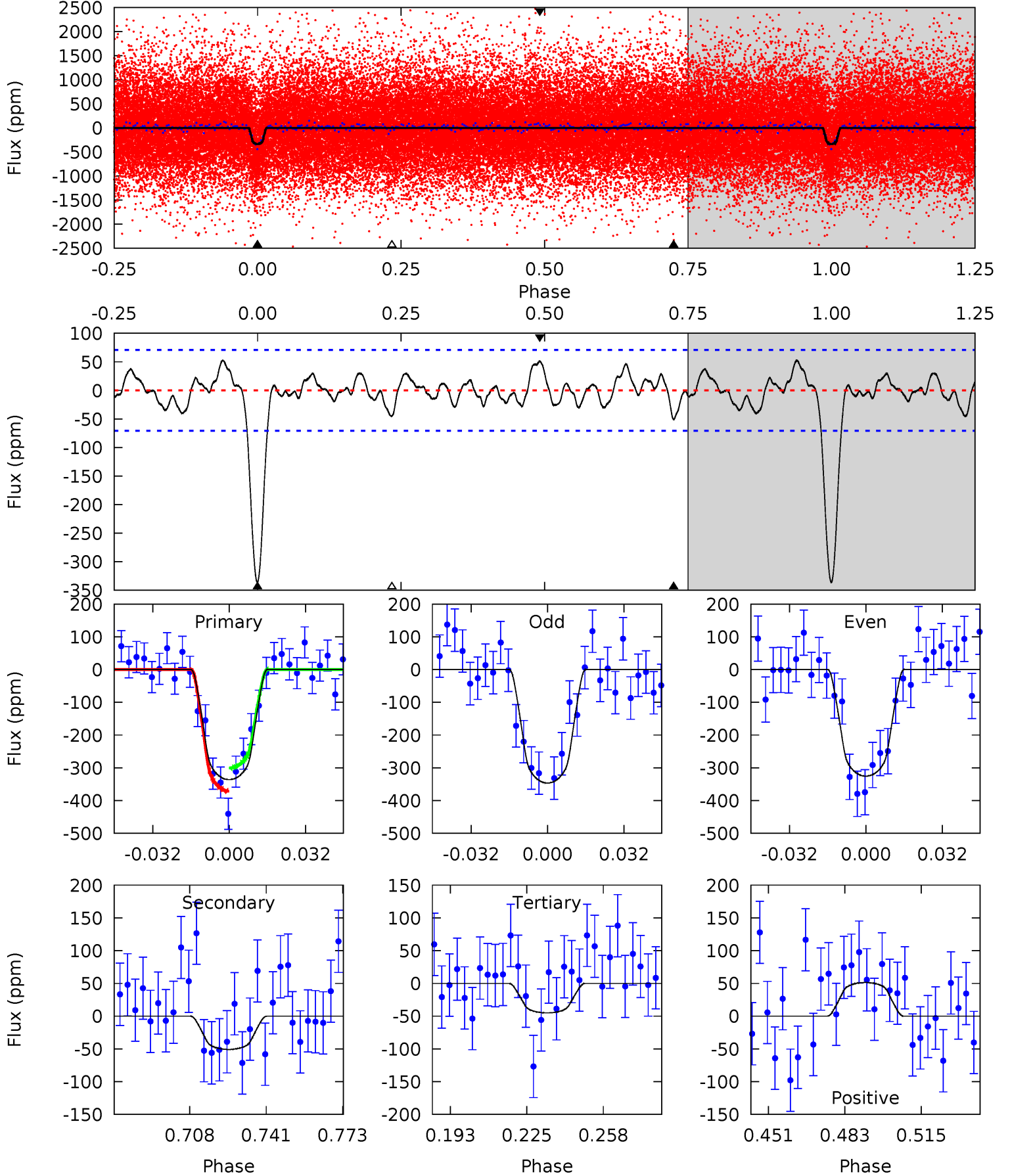
TCE 008753896-01 P= 3.244127 Days $T_0=132.952828$ (BKJD)



DV Model-Shift Uniqueness Test

008753896-01, P = 3.244117 Days, E = 132.956423 Days

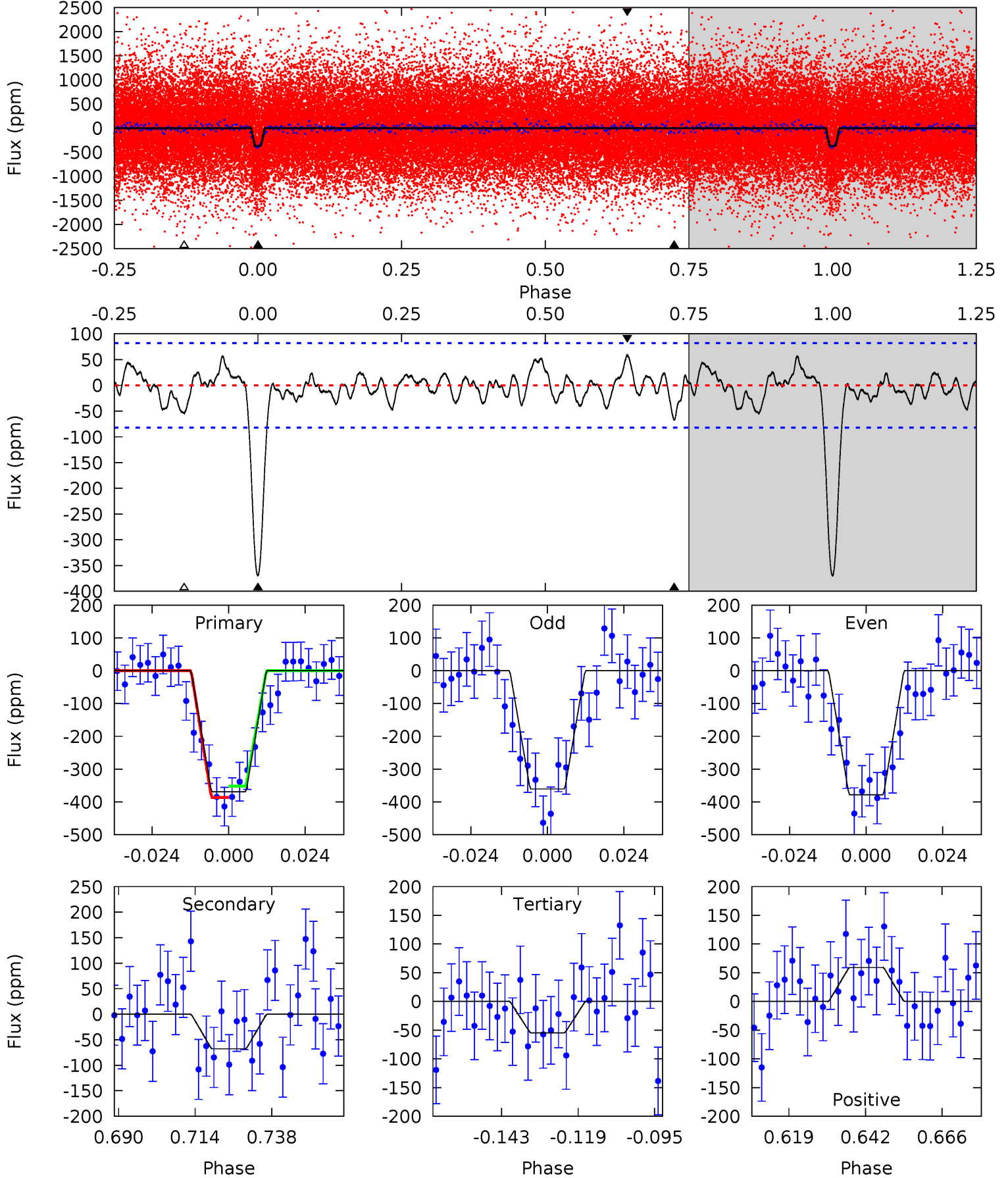
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.8	3.45	3.06	3.48	4.80	2.14	1.36	19.8	19.3	0.39	-0.03	0.71	0.92	0.14	2.40



Alt Model-Shift Uniqueness Test

008753896-01, P = 3.244127 Days, E = 132.952828 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	4.01	3.24	3.50	4.86	2.26	1.32	18.6	18.4	0.78	0.52	0.52	0.91	0.14	1.02



Stellar Parameters For KIC 008753896

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5094^{+81}_{-81}	$4.469^{+0.096}_{-0.030}$	$0.160^{+0.150}_{-0.150}$	$0.870^{+0.037}_{-0.075}$	$0.813^{+0.056}_{-0.030}$	$1.736^{+0.628}_{-0.170}$
	+2%/-2%	+2%/-1%	+94%/-94%	+4%/-9%	+7%/-4%	+36%/-10%
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 008753896-01 / KOI 2473.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-51 ± 15	$1.88^{+0.93}_{-0.80}$	1453^{+33}_{-42}	3455^{+719}_{-437}	13^{+25}_{-7}
Alt.	-68 ± 17	$1.93^{+0.93}_{-0.84}$	1452^{+36}_{-42}	3607^{+790}_{-440}	16^{+33}_{-9}

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

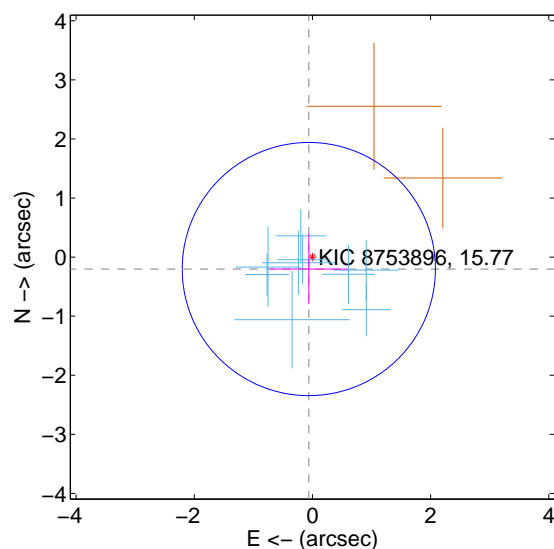
Supplemental centroid analysis for 008753896-01. Kepler magnitude: 15.77. Transit SNR 16.02

There are 10 quarters with good PRF difference image offsets

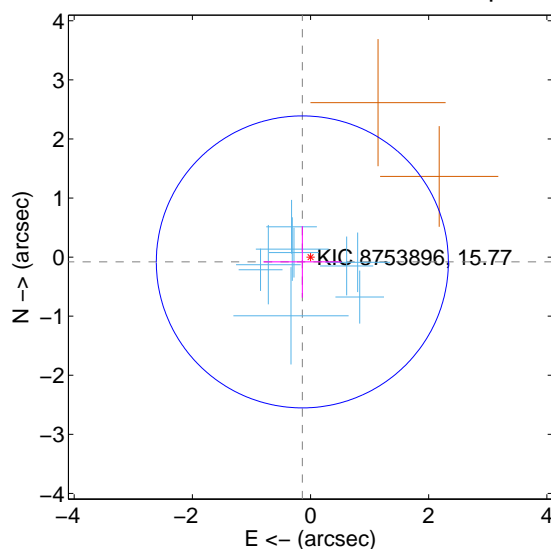
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.211 ± 0.714	0.30	0.061 ± 0.661	-0.202 ± 0.593
PRF-fit source offset from KIC position	0.161 ± 0.824	0.20	0.139 ± 0.658	-0.081 ± 0.606
photometric centroid source offset	1.08 ± 0.78	1.39	-0.02 ± 0.86	-1.08 ± 0.78

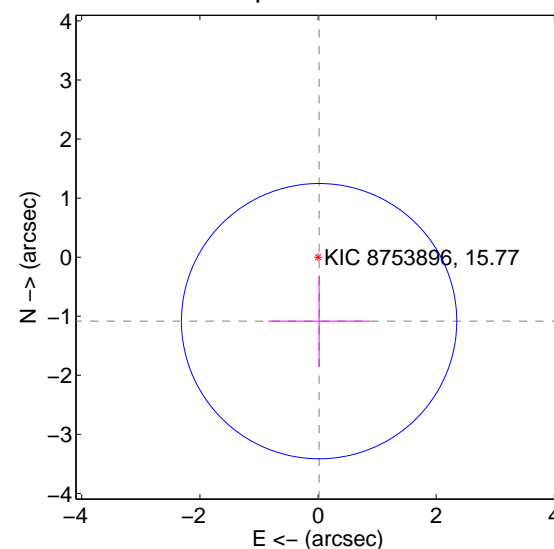
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

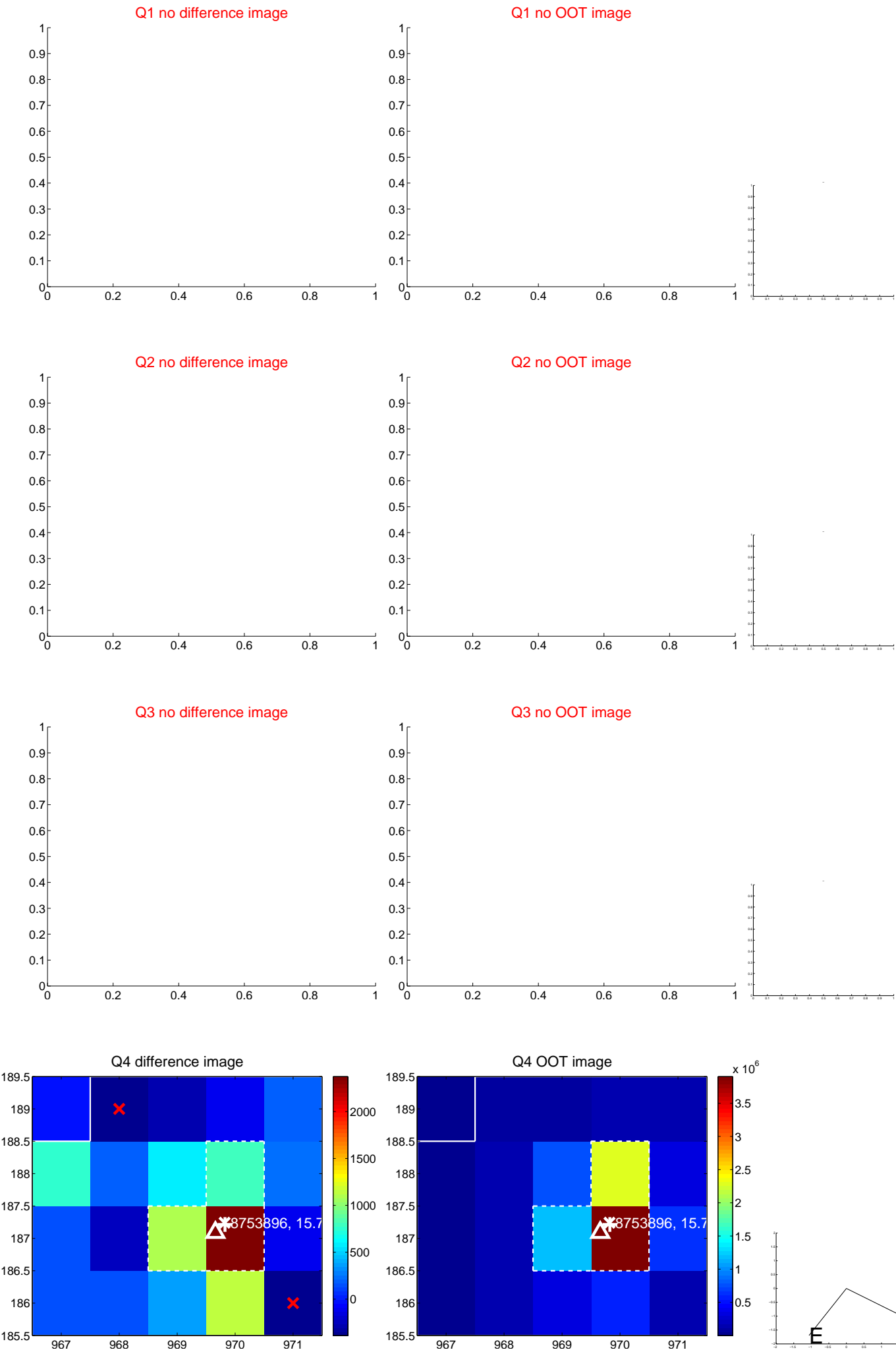


offset from photometric centroids

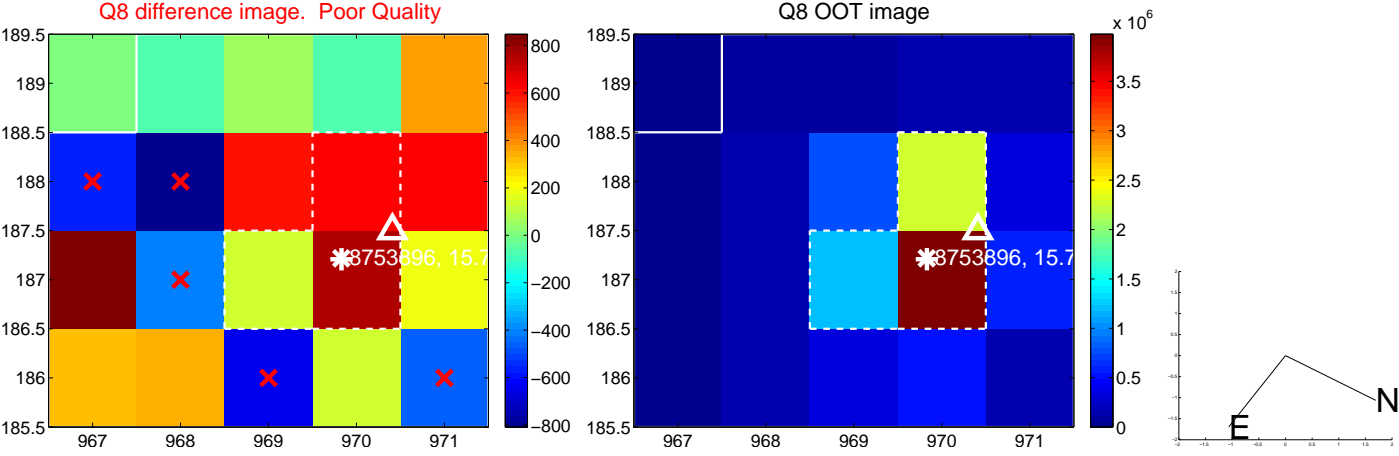
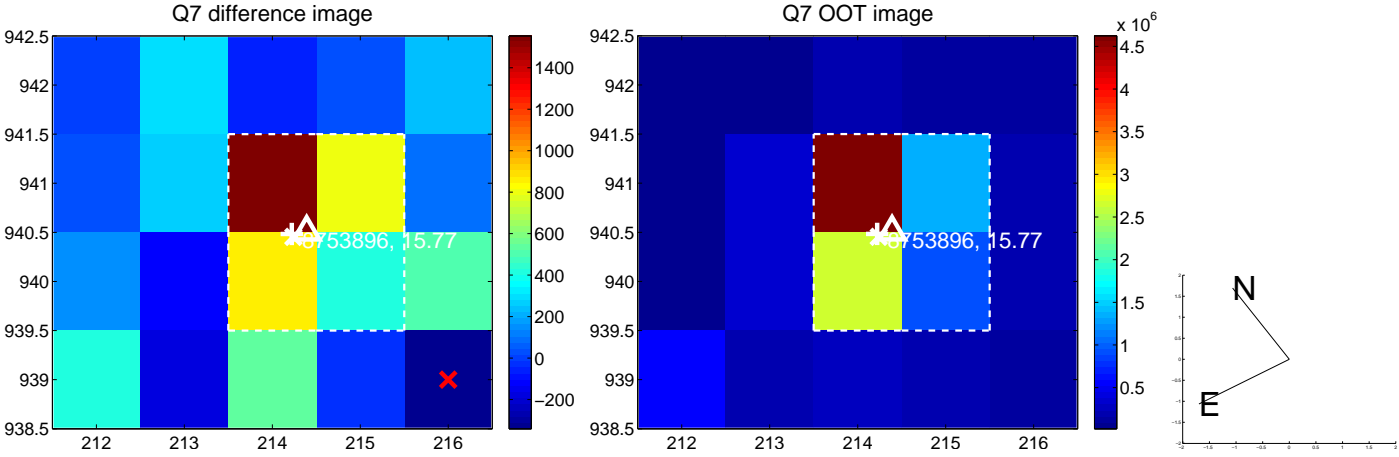
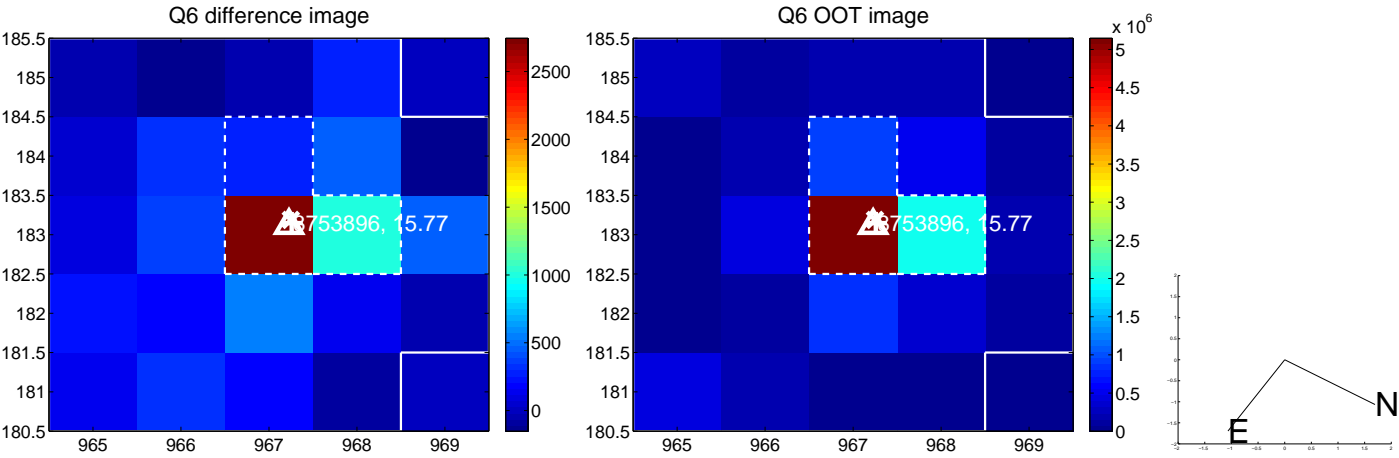
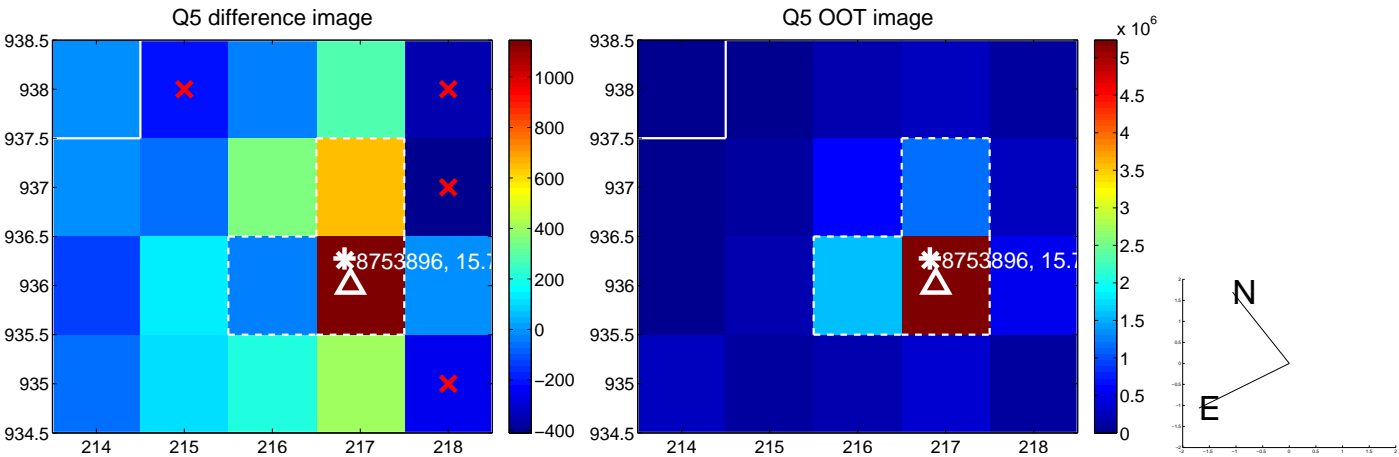


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

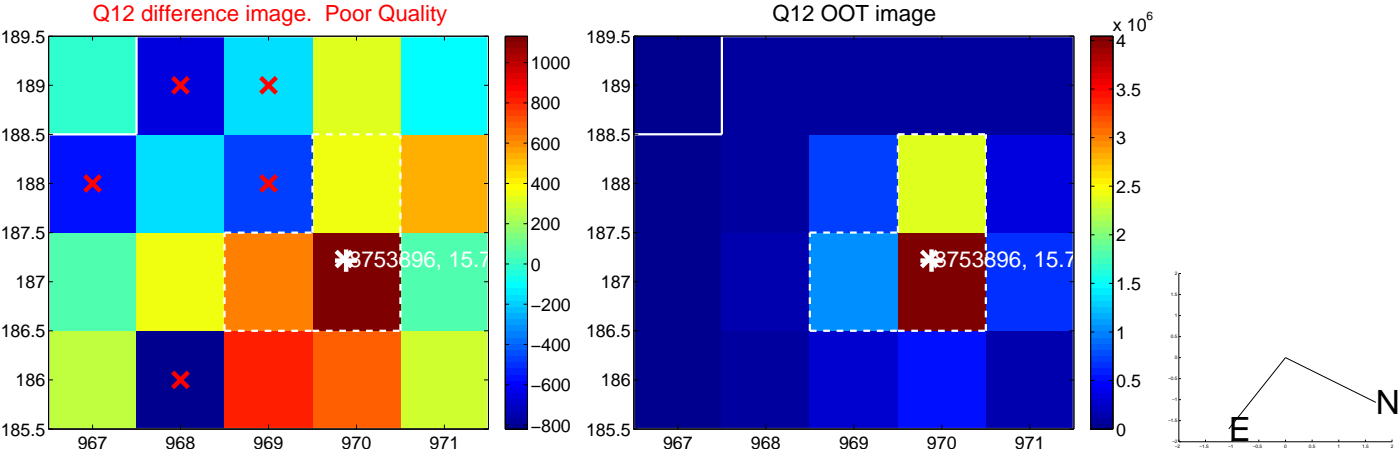
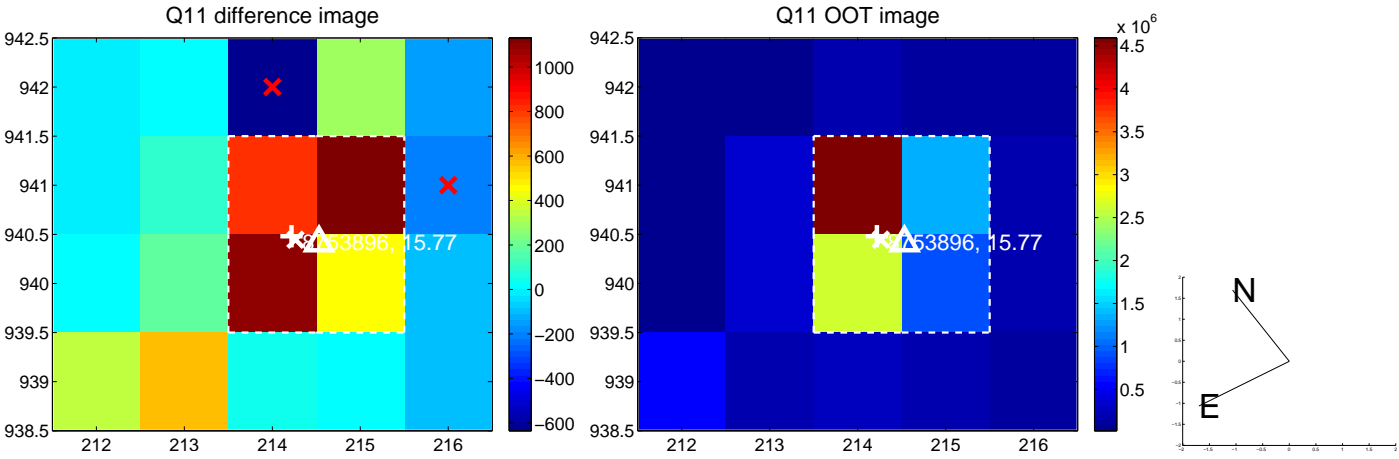
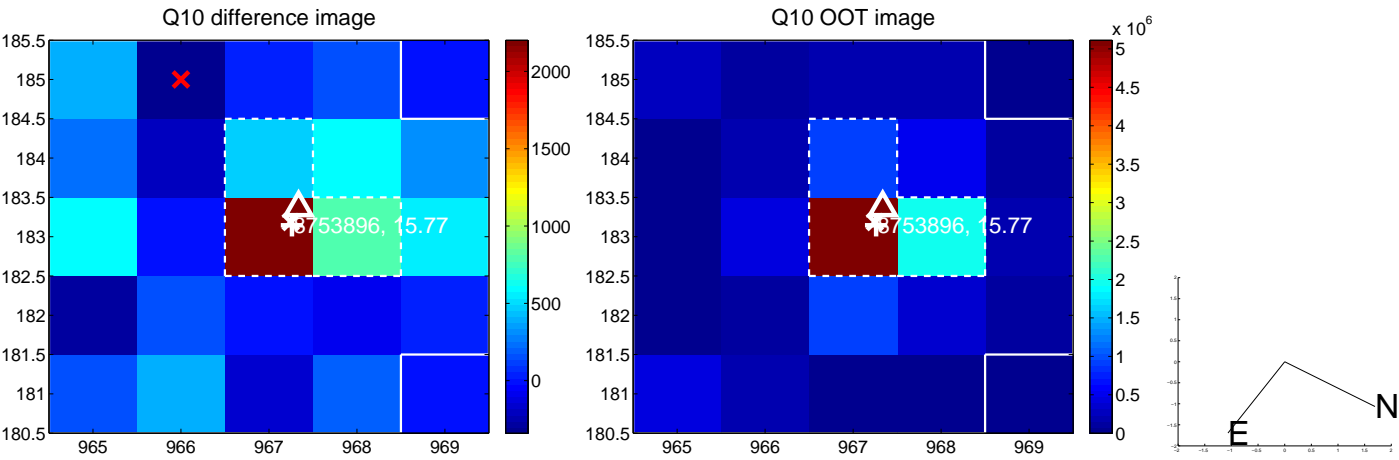
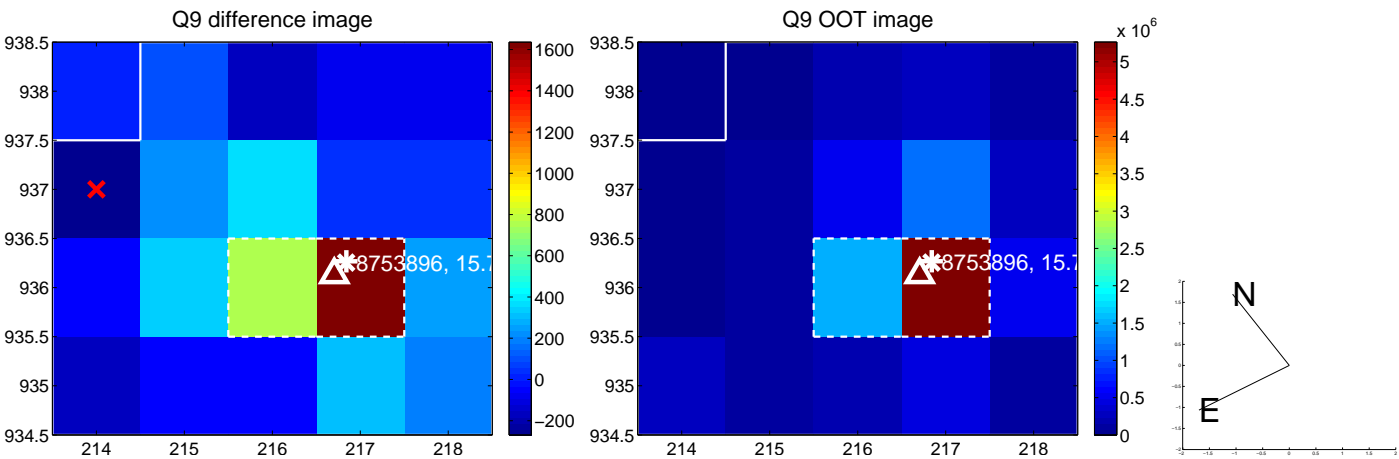
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



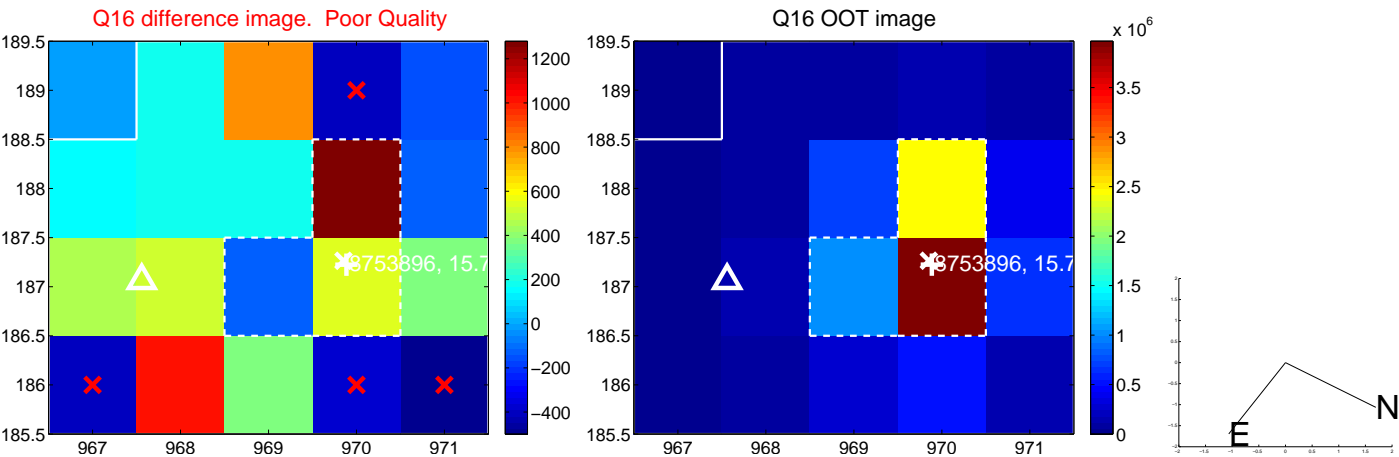
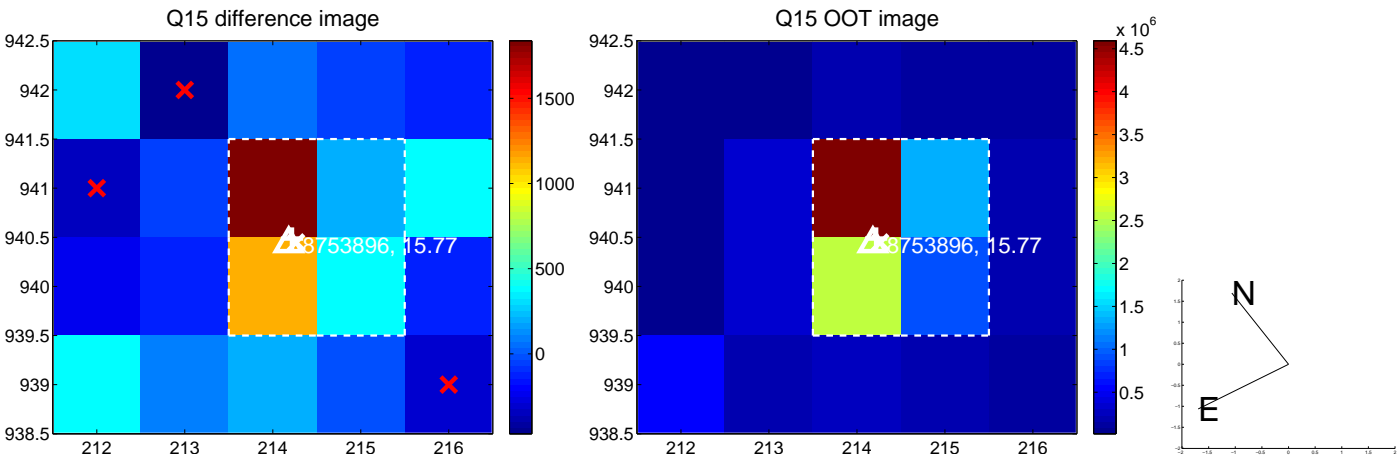
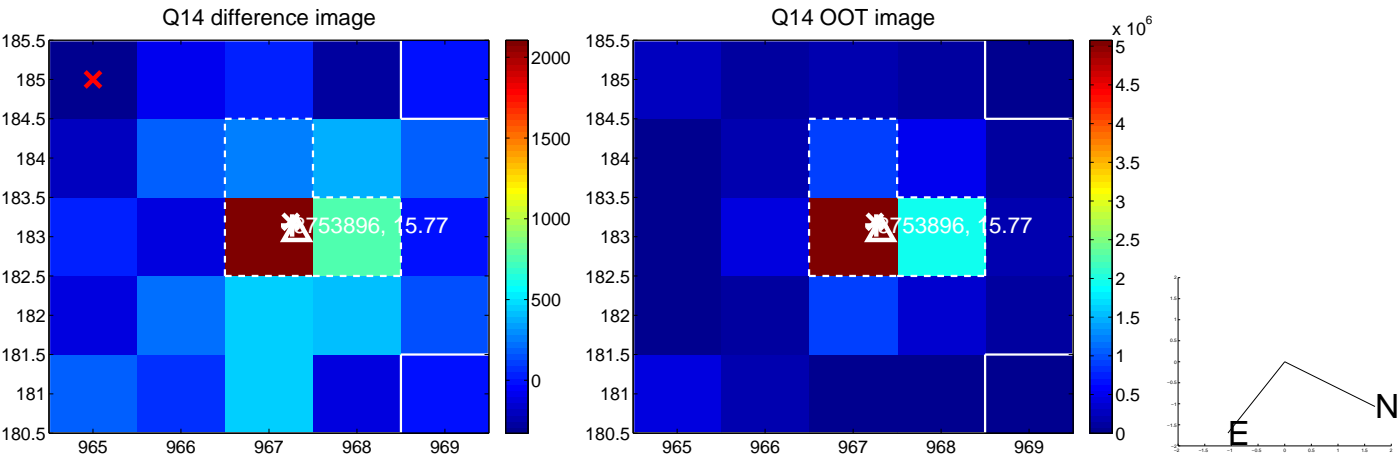
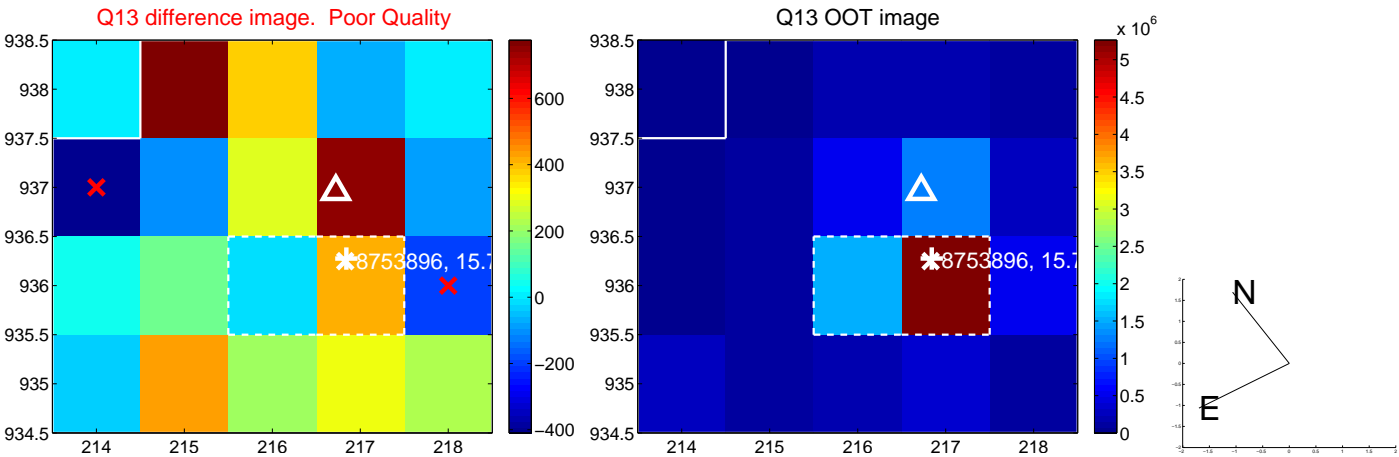
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



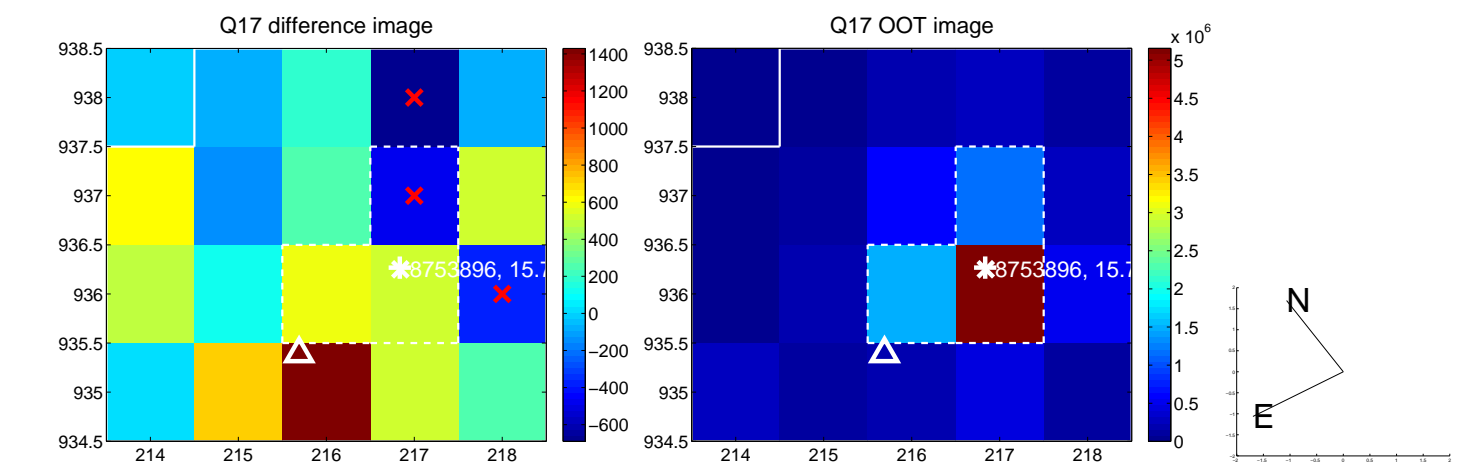
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



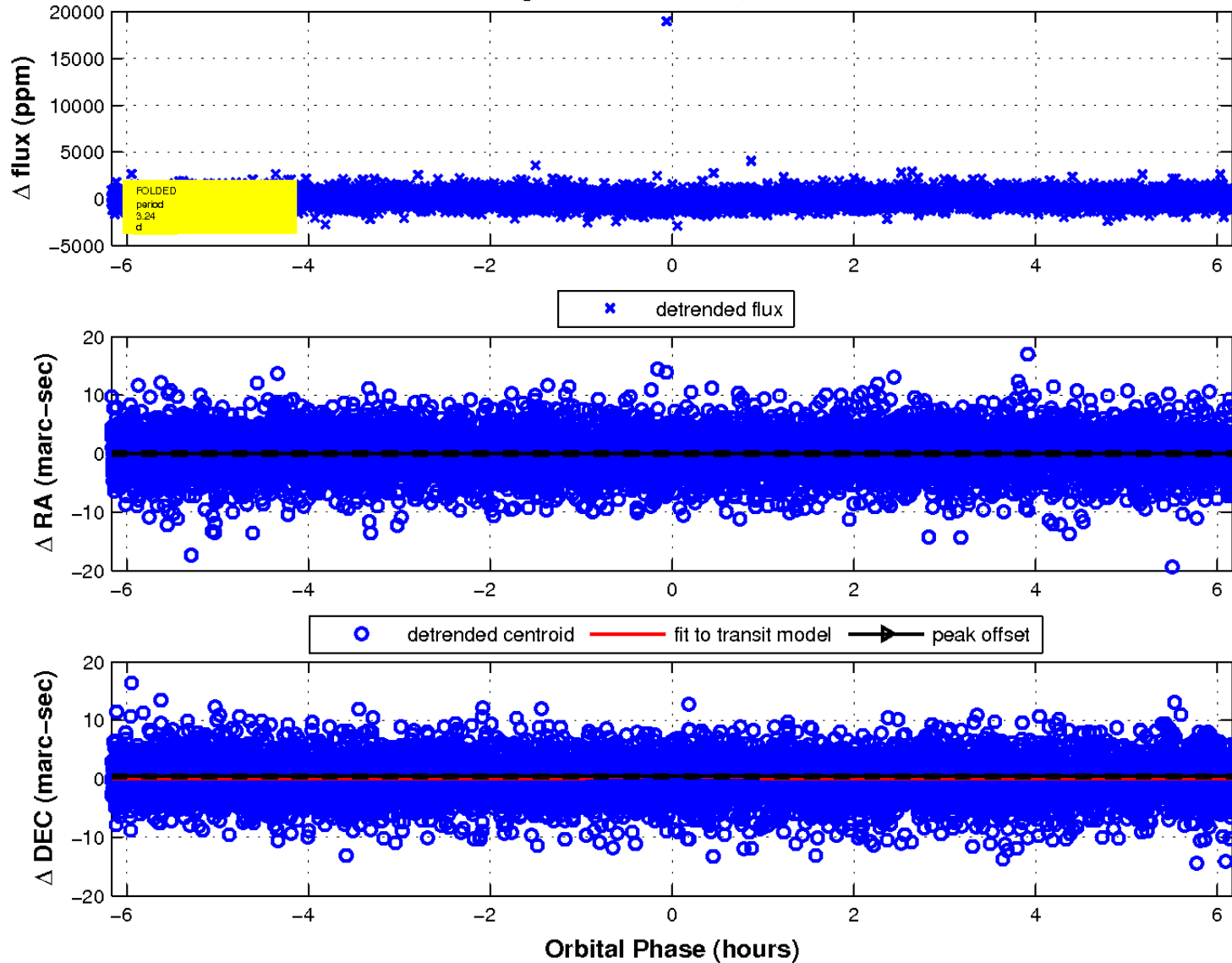
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

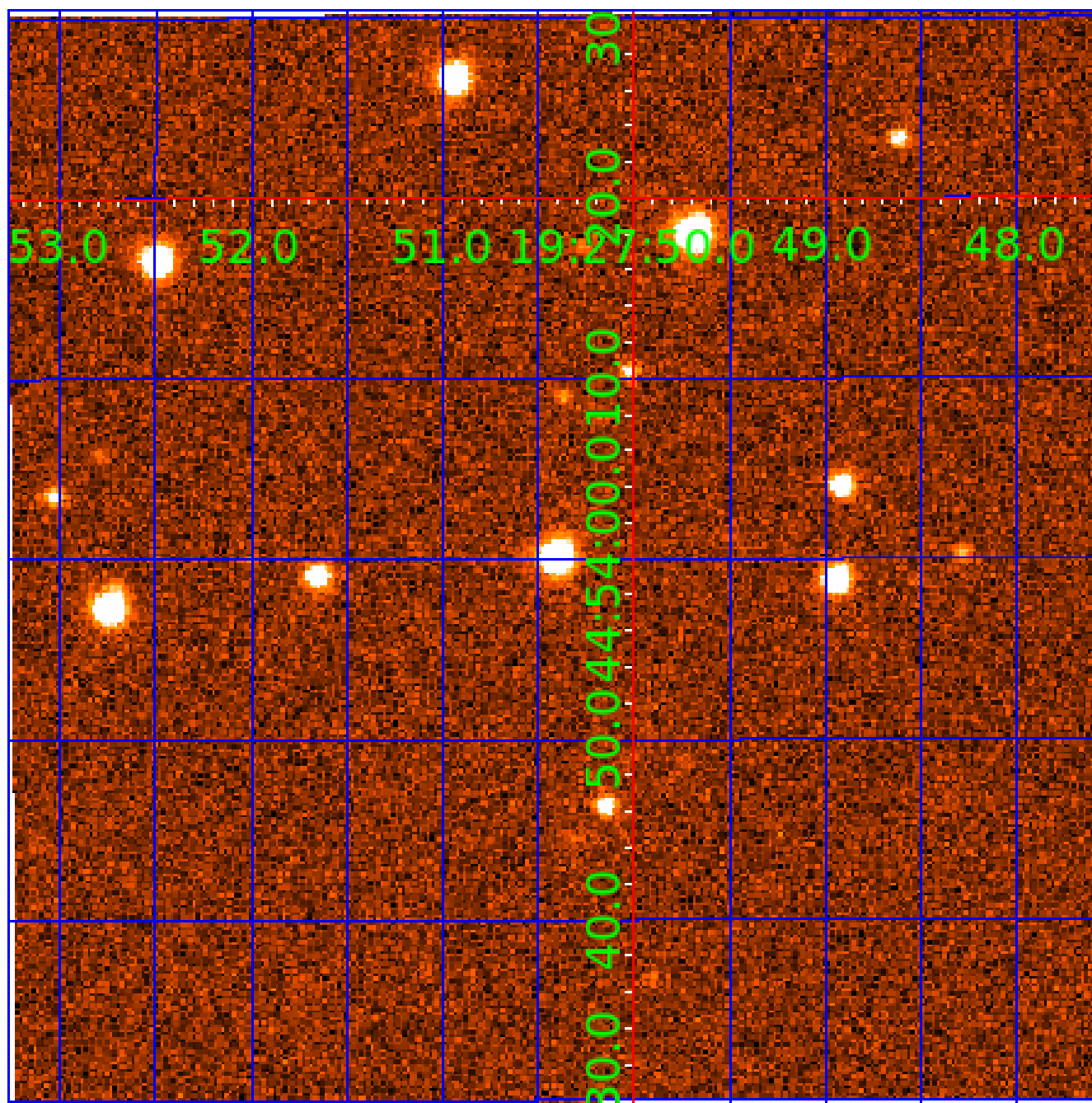


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 008753896

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})
008753896-01	OBS	2473.01	3.244117	132.956423	343.8	2.056	15.0	16.0	0.87	5094	1.96	284.89
008753896-02	OBS	2473.03	14.512118	143.836788	382.9	3.951	9.8	10.7	0.87	5094	1.98	38.65

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008753896-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
008753896-02	OBS	PC	0.94	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.

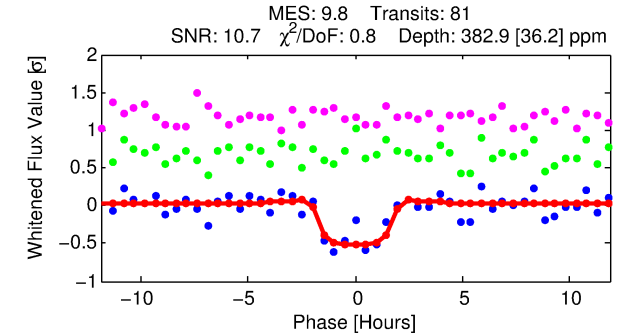
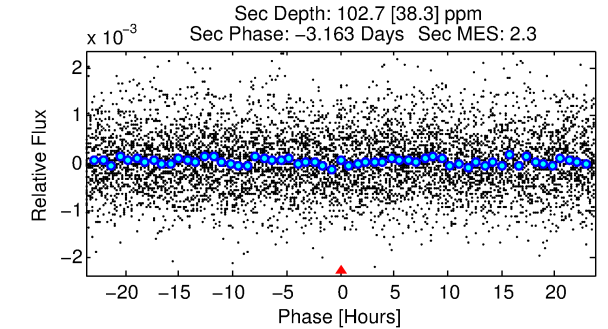
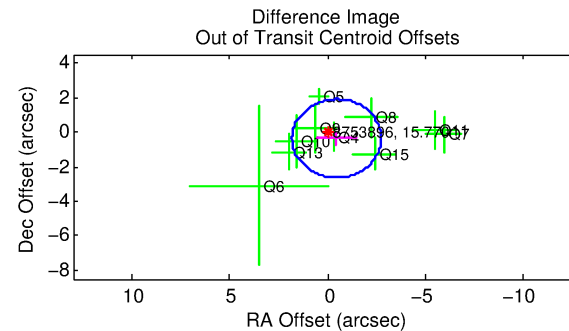
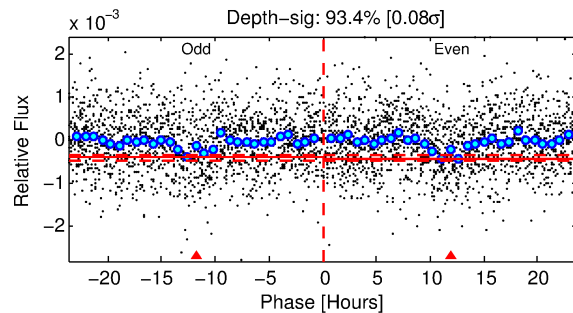
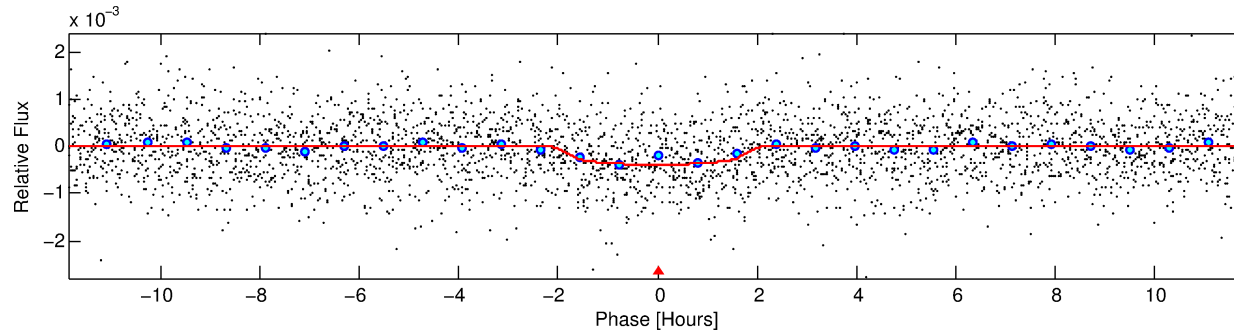
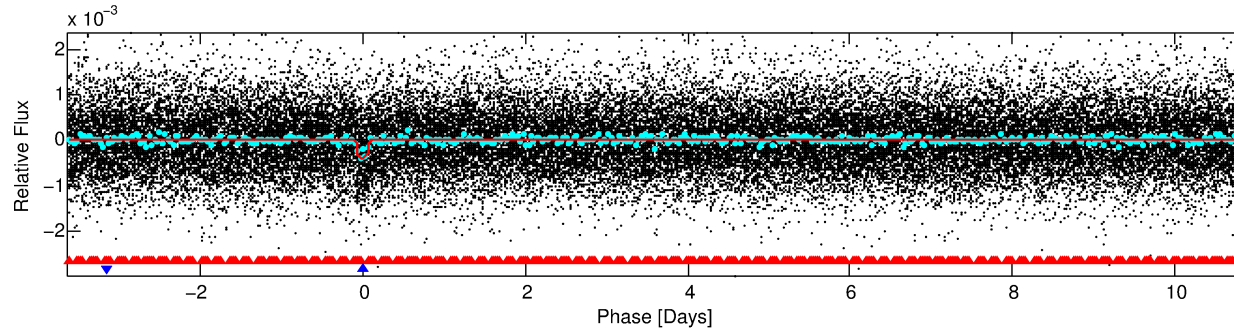
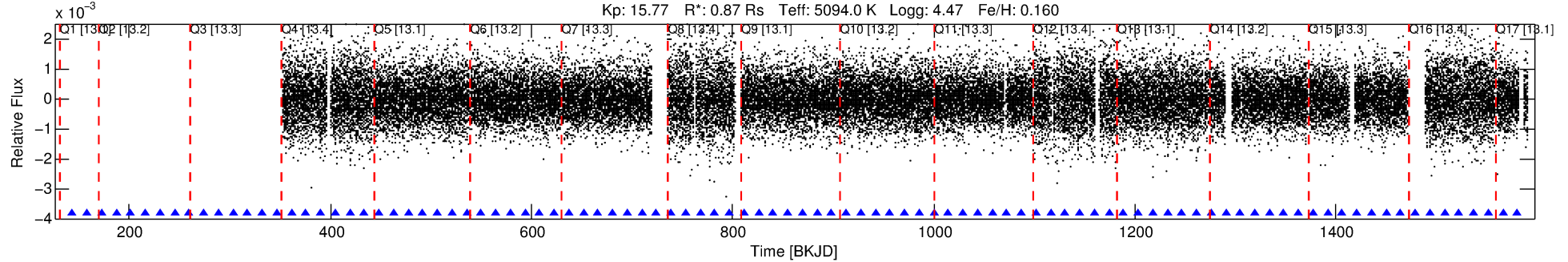
Ephemeris Match Information For 008753896-02

No Significant Match Found

DV One-Page Summary

KIC: 8753896 Candidate: 2 of 2 Period: 14.512 d
KOI: K02473.03 Name: Kepler-389c Corr: 0.936

Kp: 15.77 R*: 0.87 Rs Teff: 5094.0 K Logg: 4.47 Fe/H: 0.160



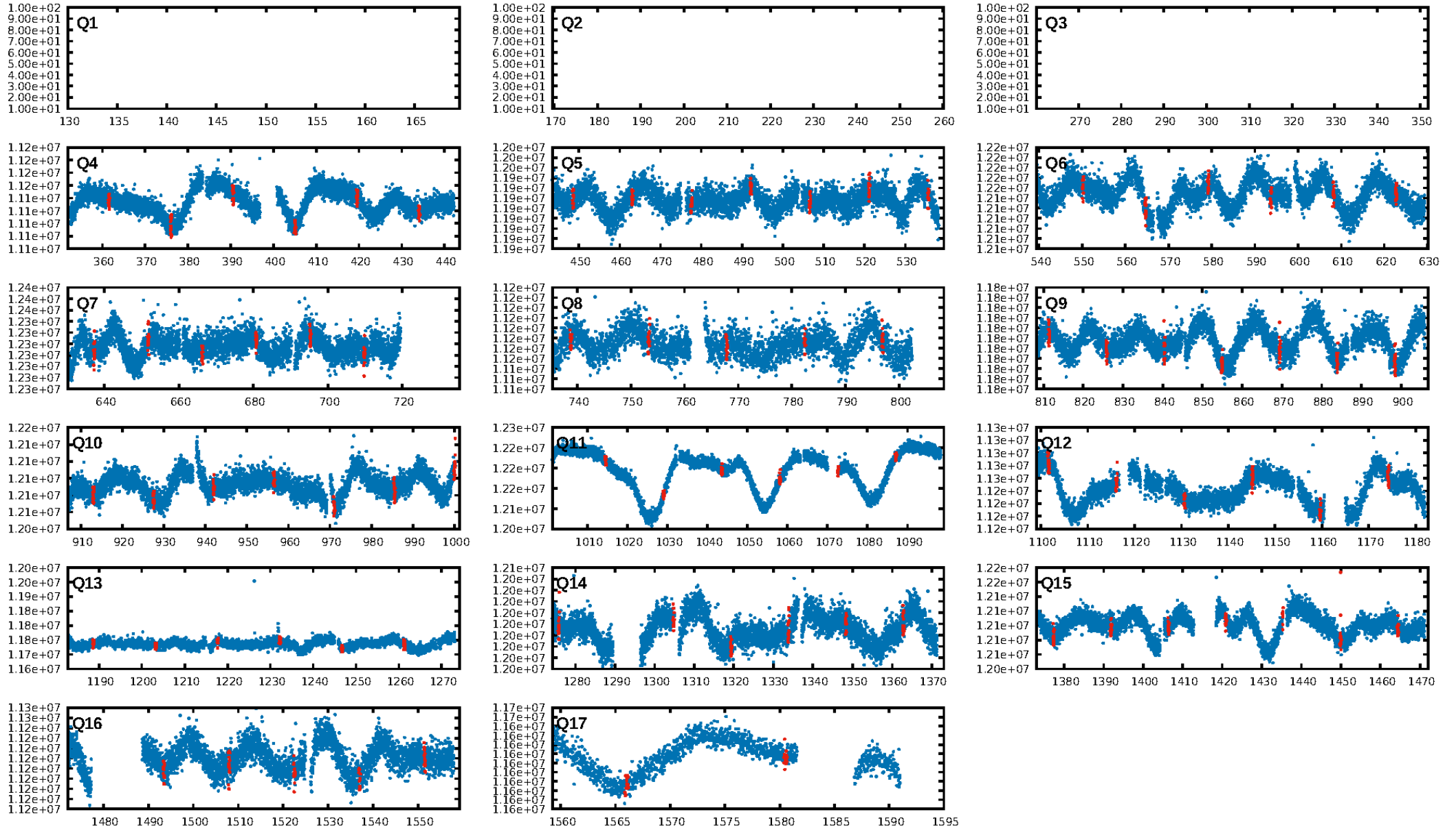
DV Fit Results:

Period = 14.51212 [0.00016] d
Epoch = 143.8368 [0.0093] BKJD
Rp/R* = 0.0209 [0.0112]
a/R* = 15.65 [31.87]
b = 0.86 [0.66]
Seff = 38.65 [6.59]
Teq = 636 [27] K
Rp = 1.98 [1.08] Re
a = 0.1087 [0.0102] AU
Ag = 169.69 [194.92] [0.87σ]
Teffp = 3548 [1011] K [2.88σ]

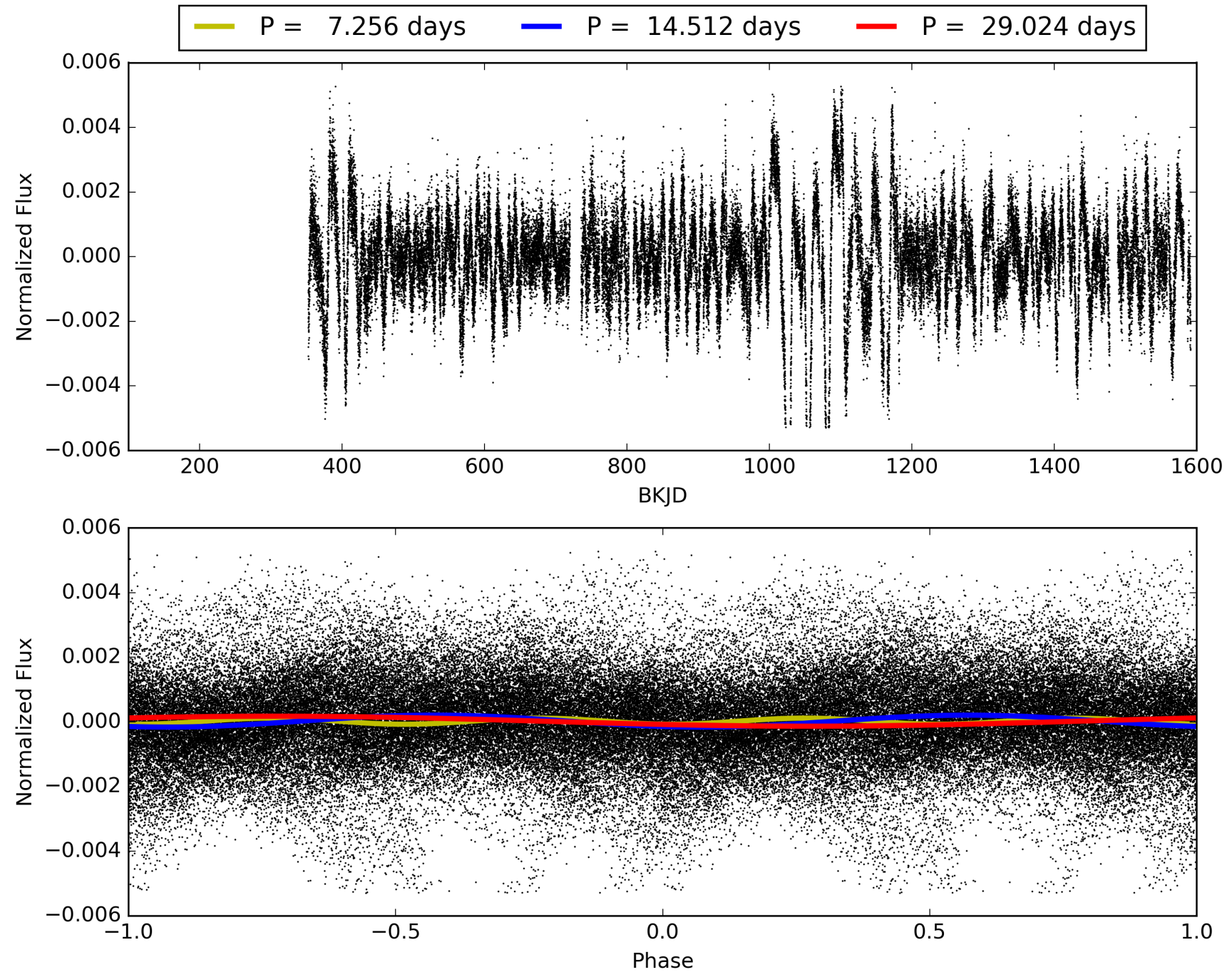
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [60.72σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 84.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.25e-22
RollingBand-fgt: 1.00 [79/79]
GhostDiagnostic-chr: 4.042
Centroid-sig: 54.0%
Centroid-so: 0.933 arcsec [0.83σ]
OotOffset-rm: 0.585 arcsec [0.77σ]
OotOffset-st: 2/3/2/3 [10]
KicOffset-rm: 0.506 arcsec [0.68σ]
KicOffset-st: 2/3/2/3 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 008753896-02, PDC Light Curves

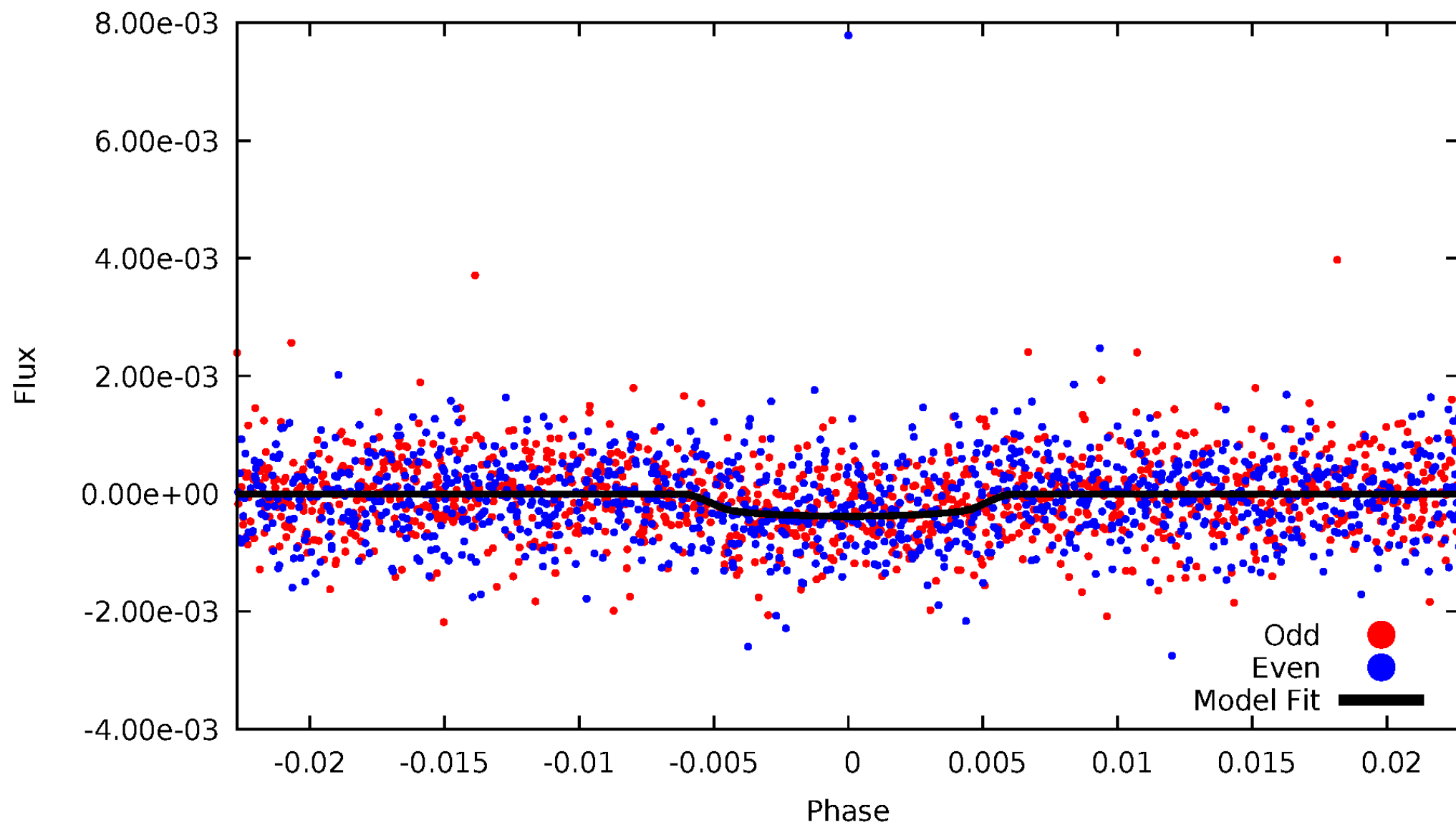


TCE 008753896-02



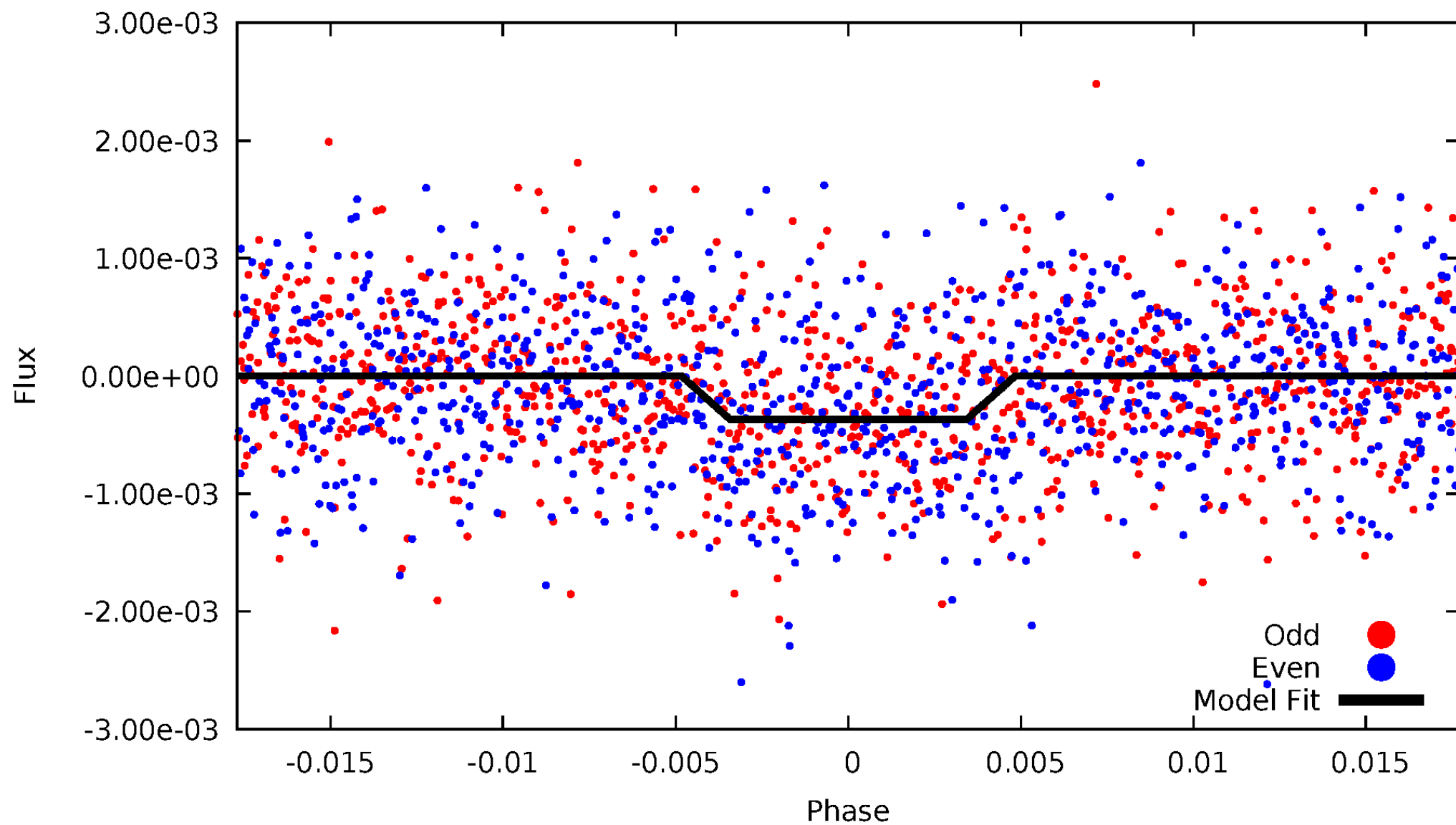
DV Odd/Even

TCE 008753896-02



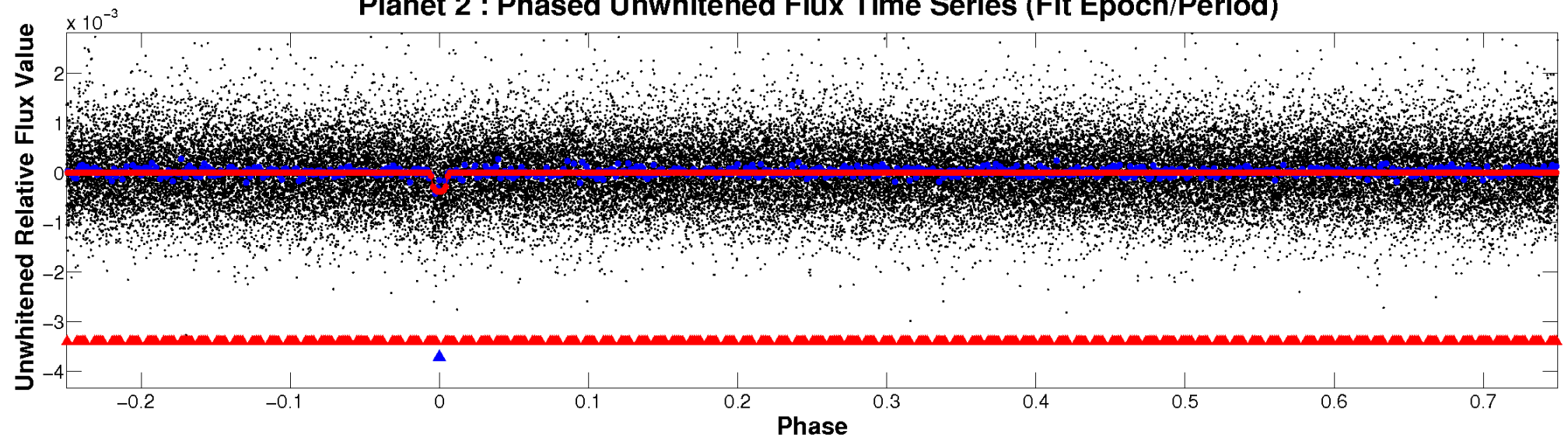
ALT Odd/Even

TCE 008753896-02

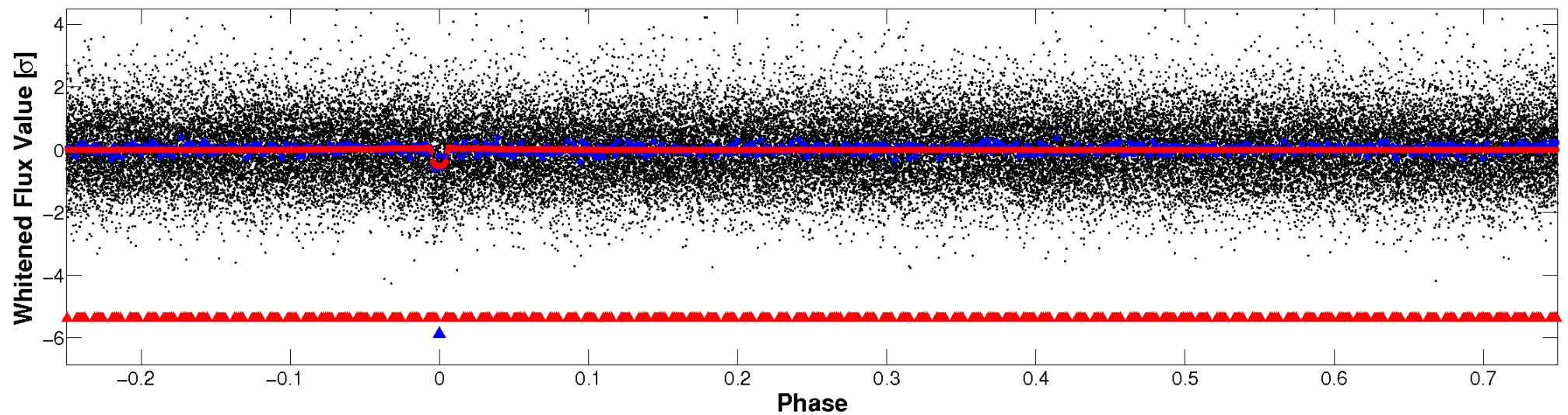


Non-Whitened Vs. Whitened Light Curve

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

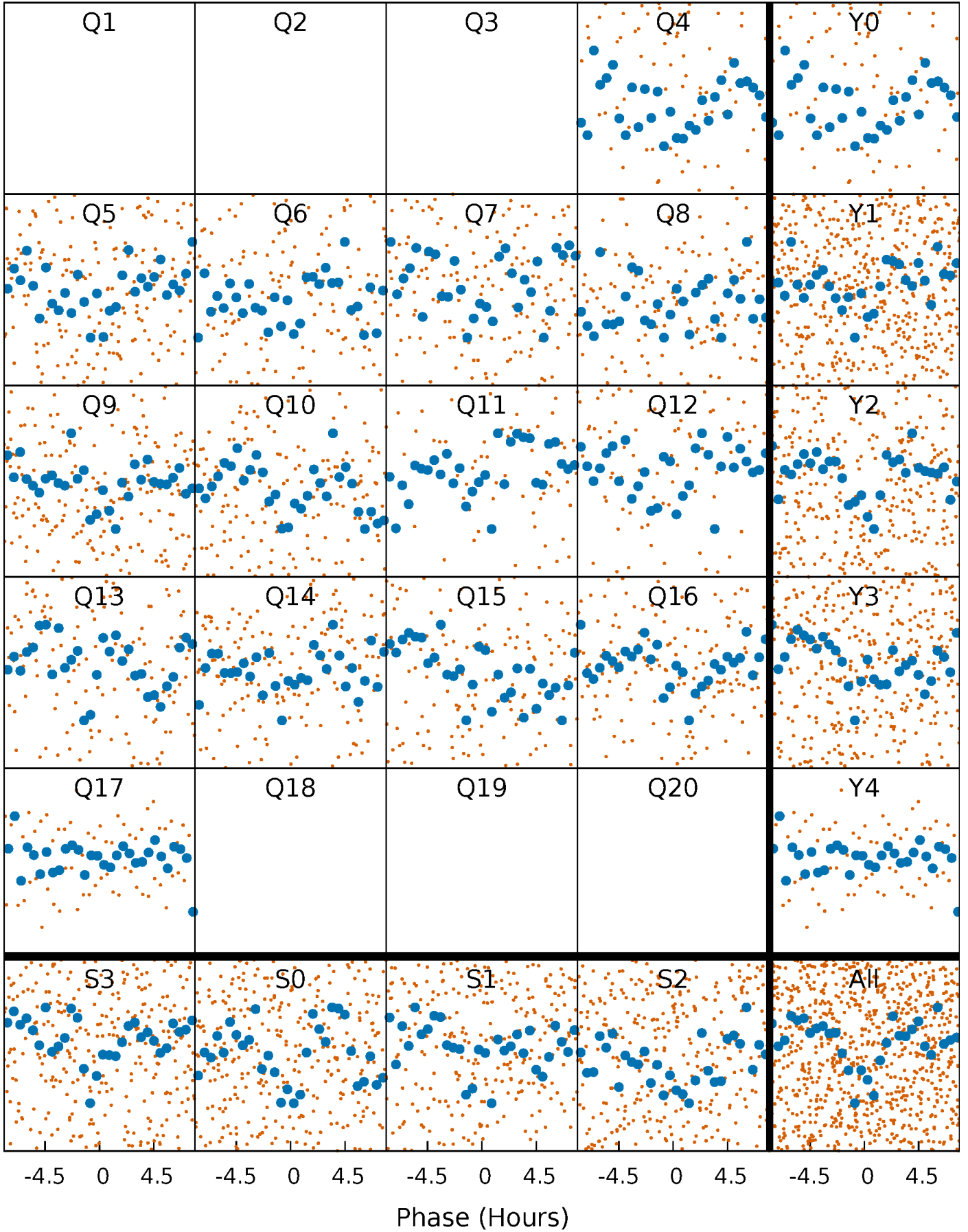


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



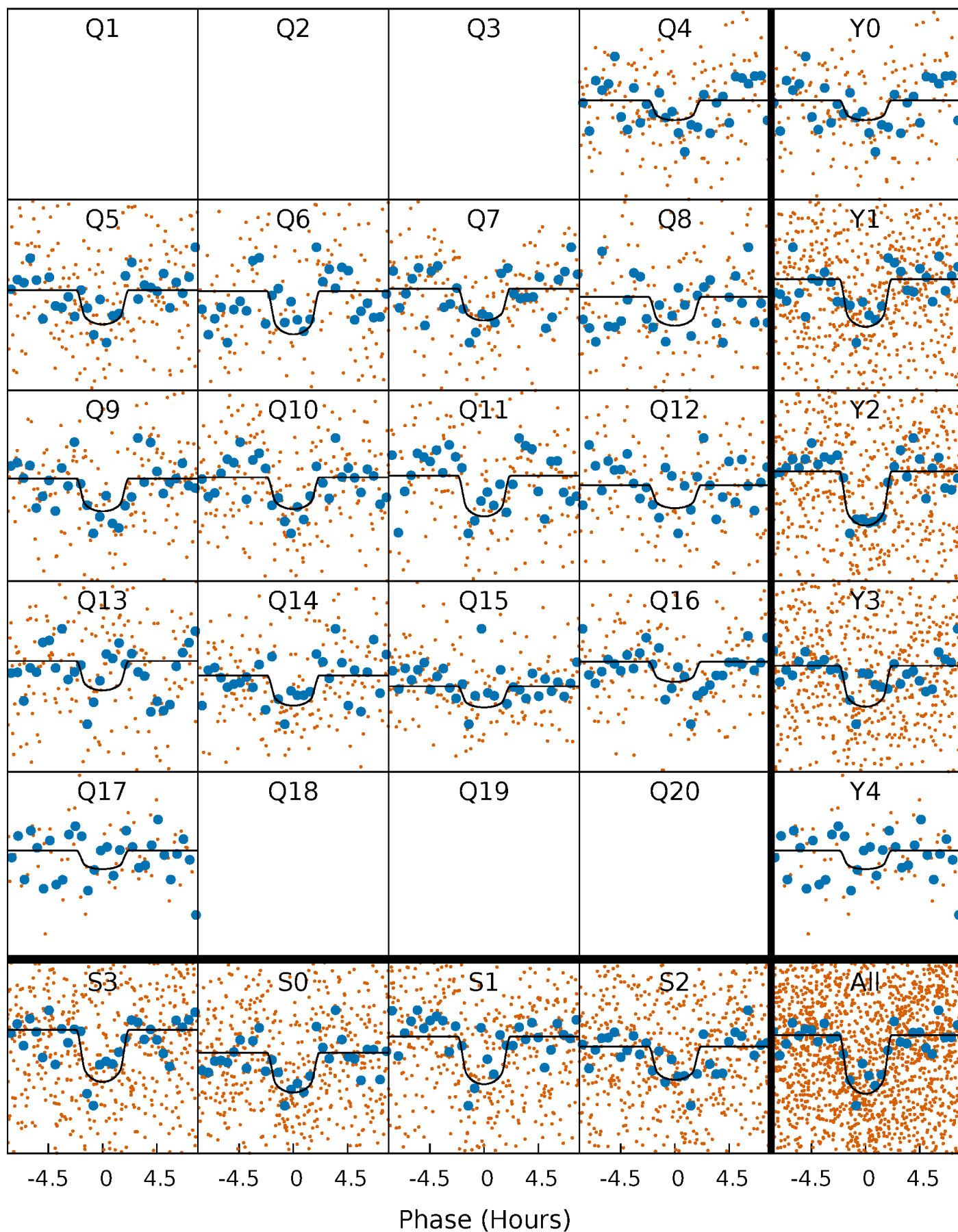
PDC Quarter-Phased Transit Curves

TCE 008753896-02 P= 14.512118 Days $T_0=143.836788$ (BKJD)



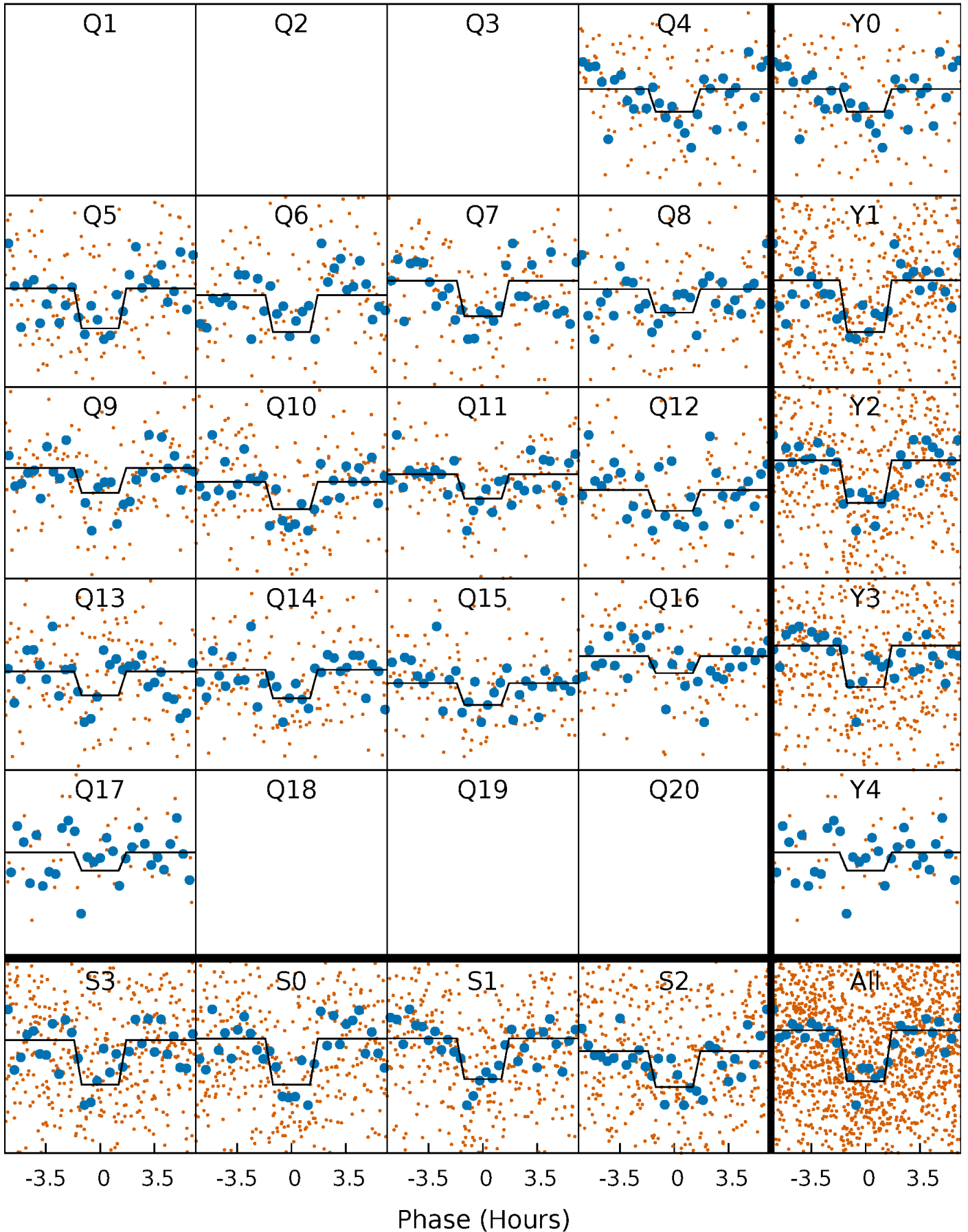
DV Quarter-Phased Transit Curves

TCE 008753896-02 P= 14.512118 Days $T_0=143.836788$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

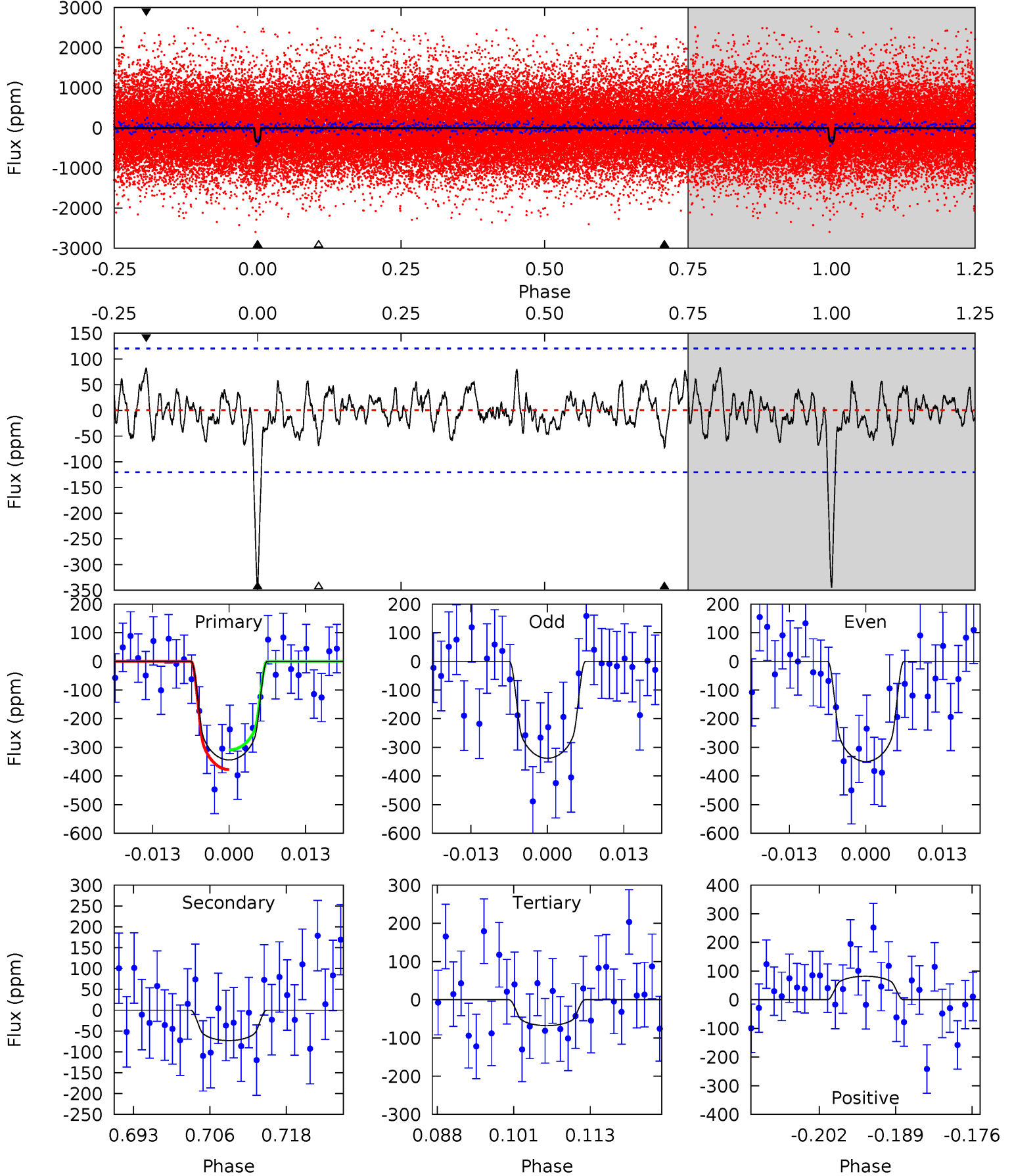
TCE 008753896-02 $P = 14.511877$ Days $T_0 = 143.845553$ (BKJD)



DV Model-Shift Uniqueness Test

008753896-02, P = 14.512118 Days, E = 143.836788 Days

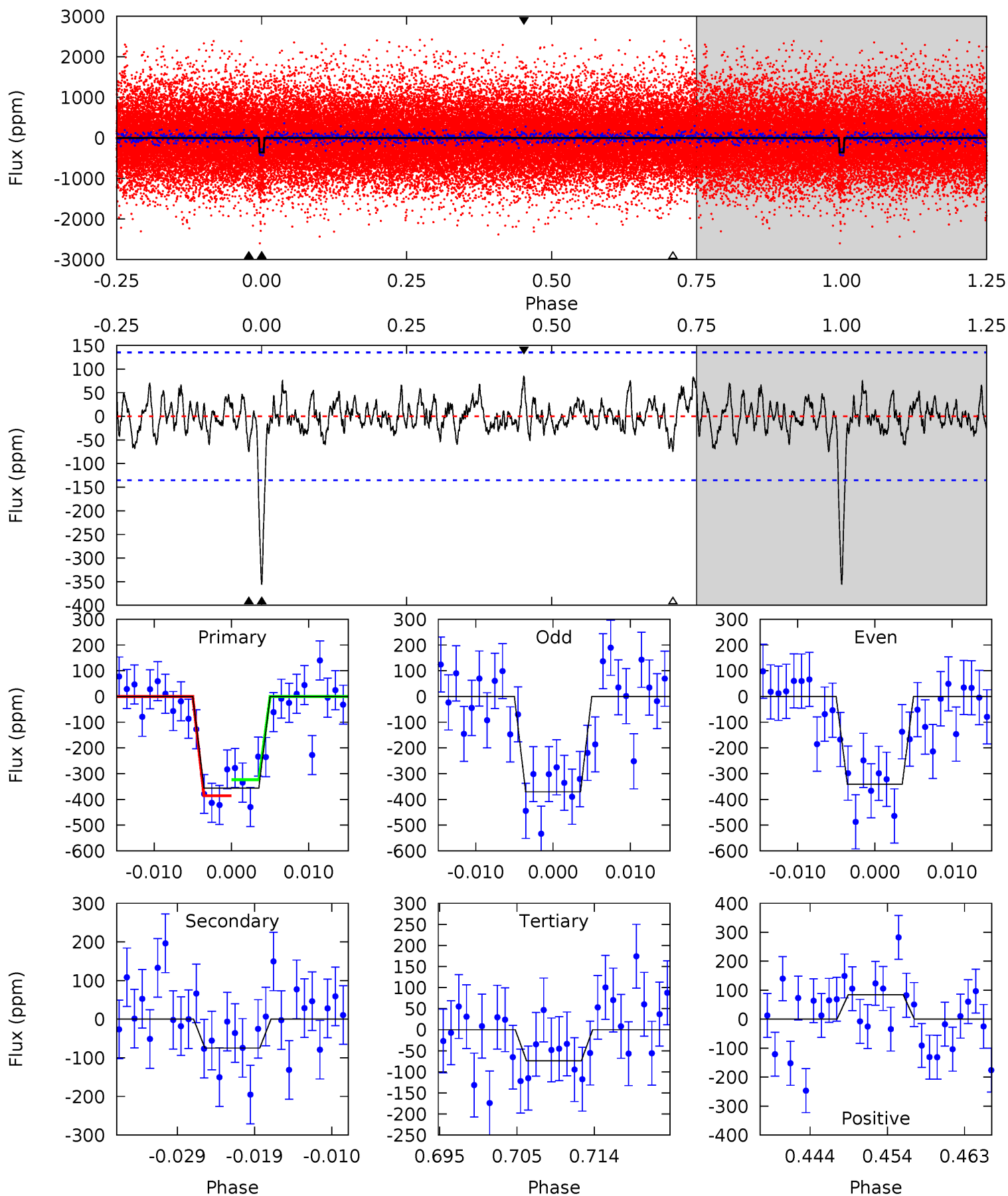
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	3.02	2.80	3.39	4.98	2.49	1.18	11.4	10.8	0.22	-0.37	0.24	0.80	0.19	0



Alt Model-Shift Uniqueness Test

008753896-02, $P = 14.511877$ Days, $E = 143.845553$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	2.78	2.74	3.15	5.03	2.59	1.02	10.5	10.1	0.04	-0.37	0.55	0.78	0.19	1.17



Stellar Parameters For KIC 008753896

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5094^{+81}_{-81}	$4.469^{+0.096}_{-0.030}$	$0.160^{+0.150}_{-0.150}$	$0.870^{+0.037}_{-0.075}$	$0.813^{+0.056}_{-0.030}$	$1.736^{+0.628}_{-0.170}$
	+2%/-2%	+2%/-1%	+94%/-94%	+4%/-9%	+7%/-4%	+36%/-10%
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 008753896-02 / KOI 2473.03

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-73 ± 24	$2.06^{+1.01}_{-0.97}$	882^{+21}_{-26}	3581^{+912}_{-471}	115^{+291}_{-71}
Alt.	-75 ± 27	$1.86^{+1.10}_{-0.97}$	880^{+21}_{-24}	3697^{+1174}_{-508}	138^{+495}_{-83}

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

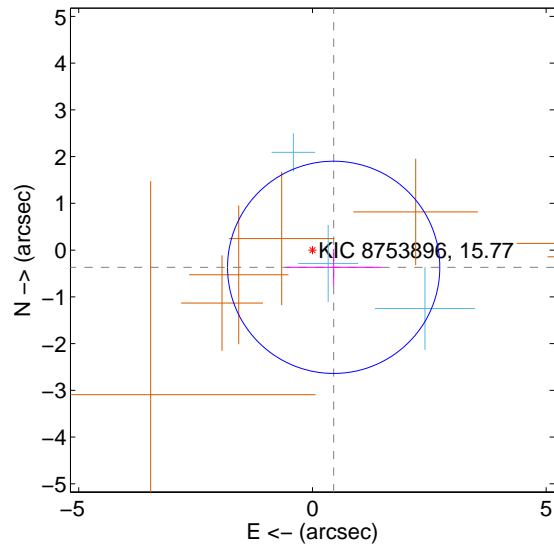
Supplemental centroid analysis for 008753896-02. Kepler magnitude: 15.77. Transit SNR 10.74

There are 3 quarters with good PRF difference image offsets

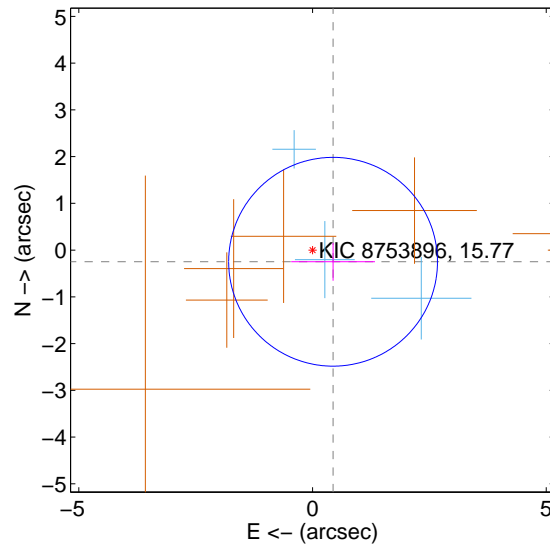
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.585 ± 0.757	0.77	-0.454 ± 1.026	-0.369 ± 0.397
PRF-fit source offset from KIC position	0.506 ± 0.745	0.68	-0.440 ± 0.897	-0.250 ± 0.406
photometric centroid source offset	0.93 ± 1.13	0.83	0.93 ± 1.13	0.09 ± 1.02

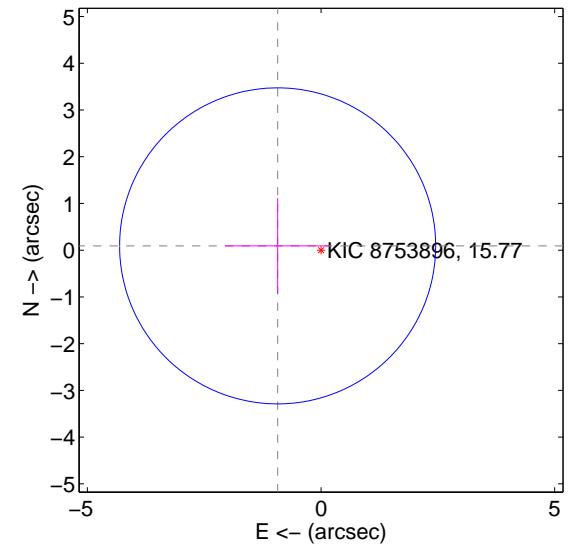
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

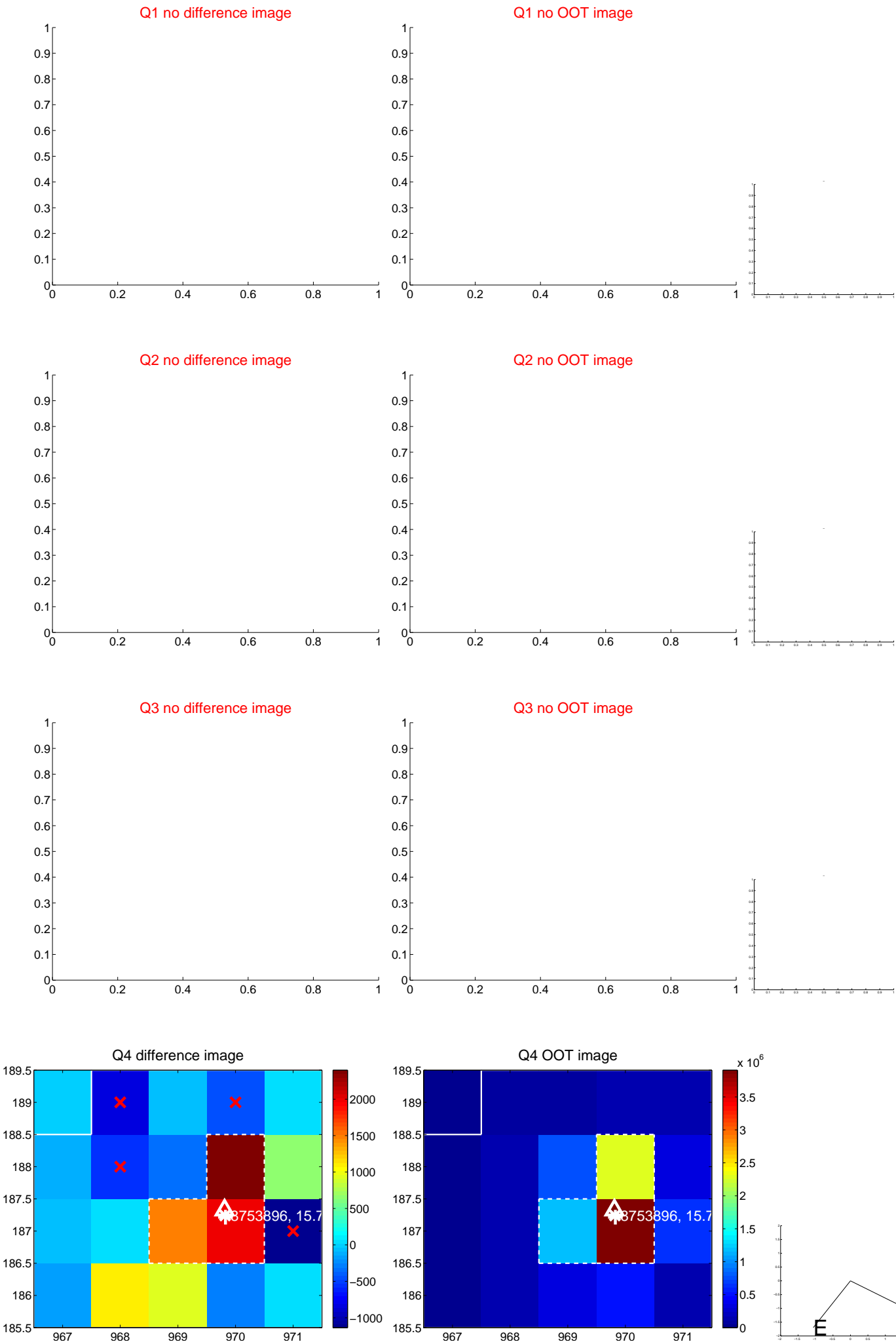


offset from photometric centroids

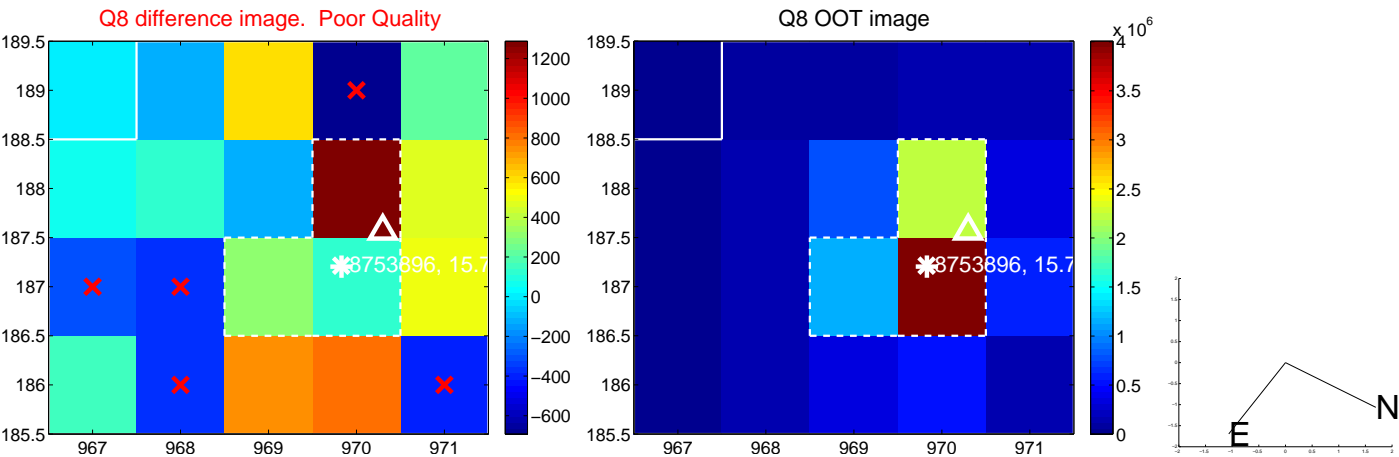
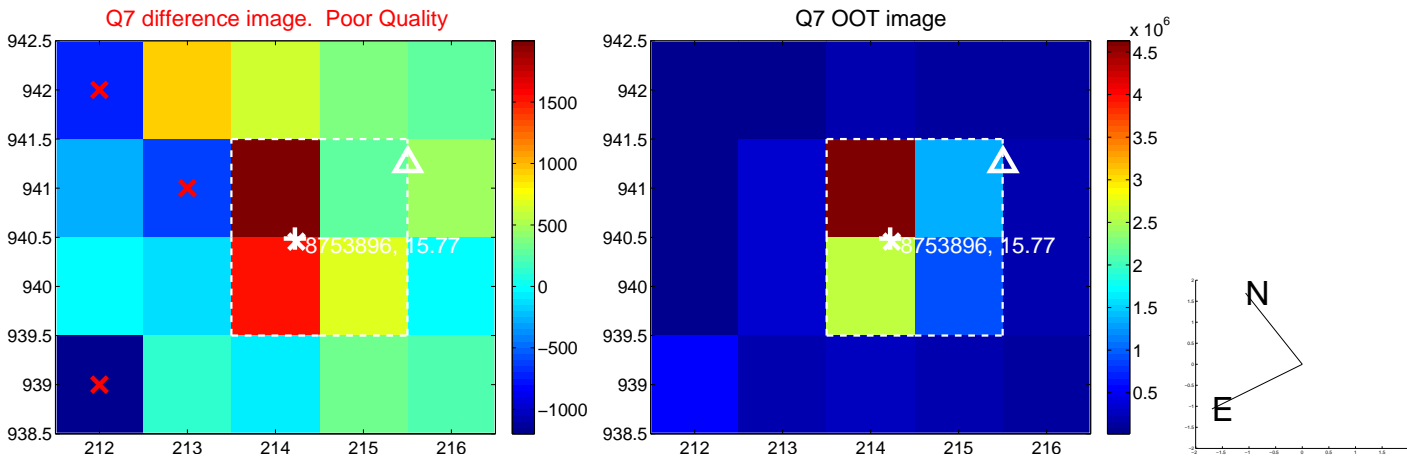
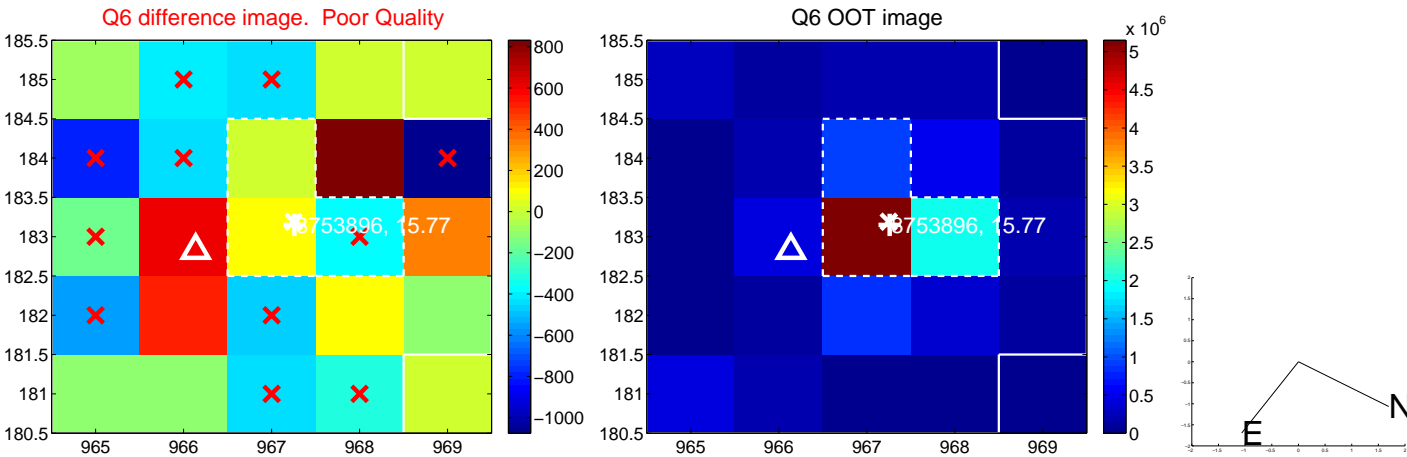
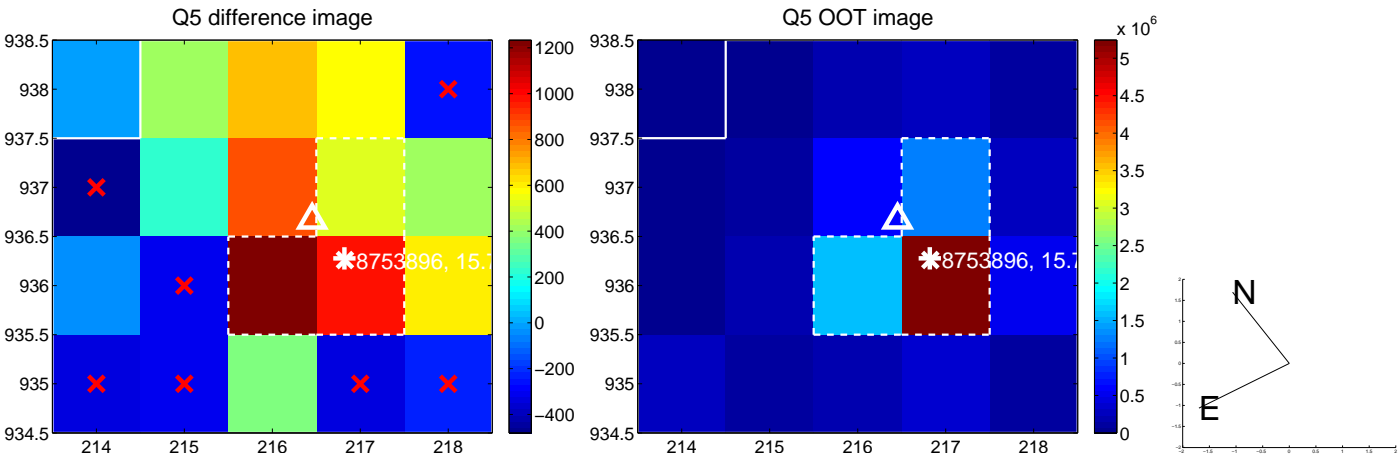


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

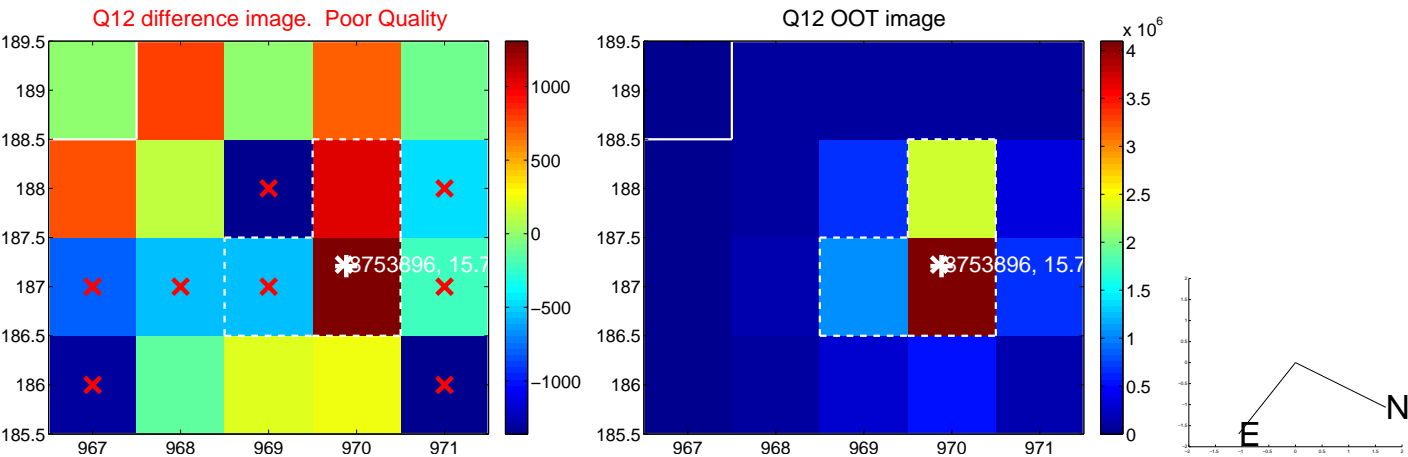
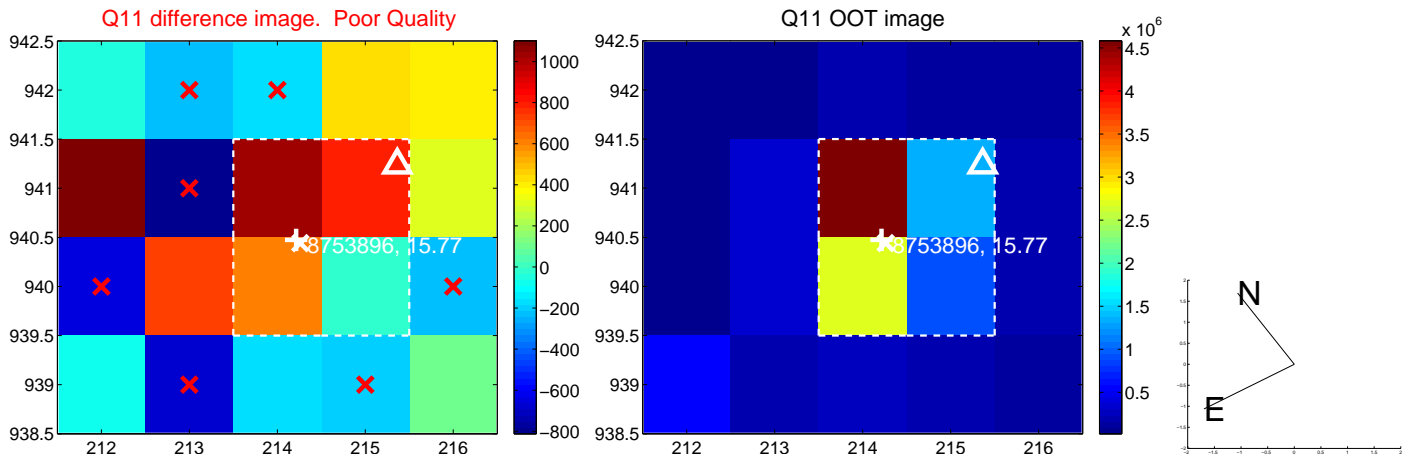
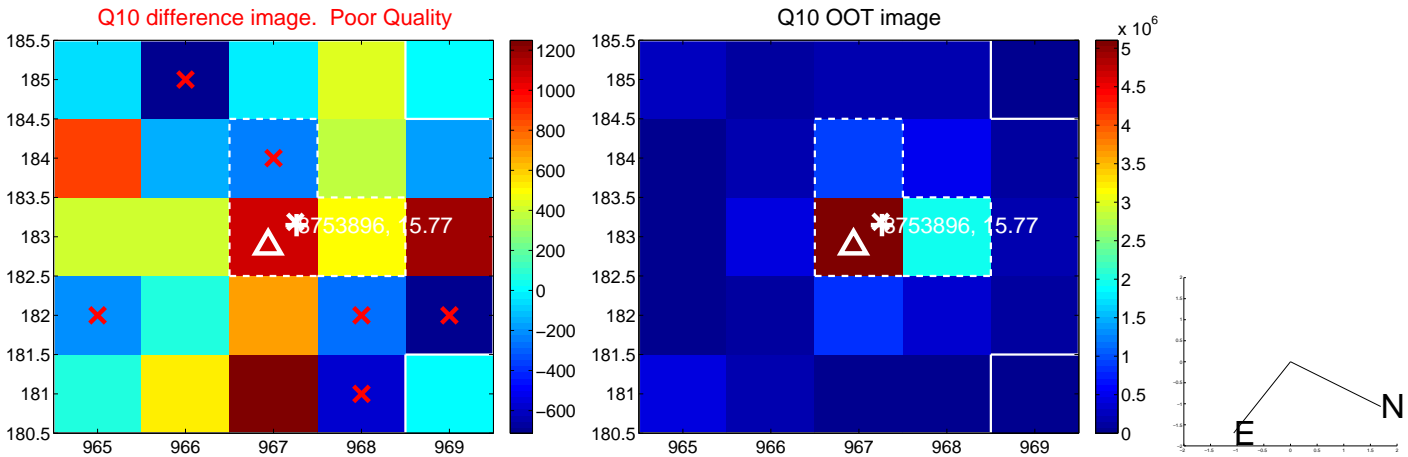
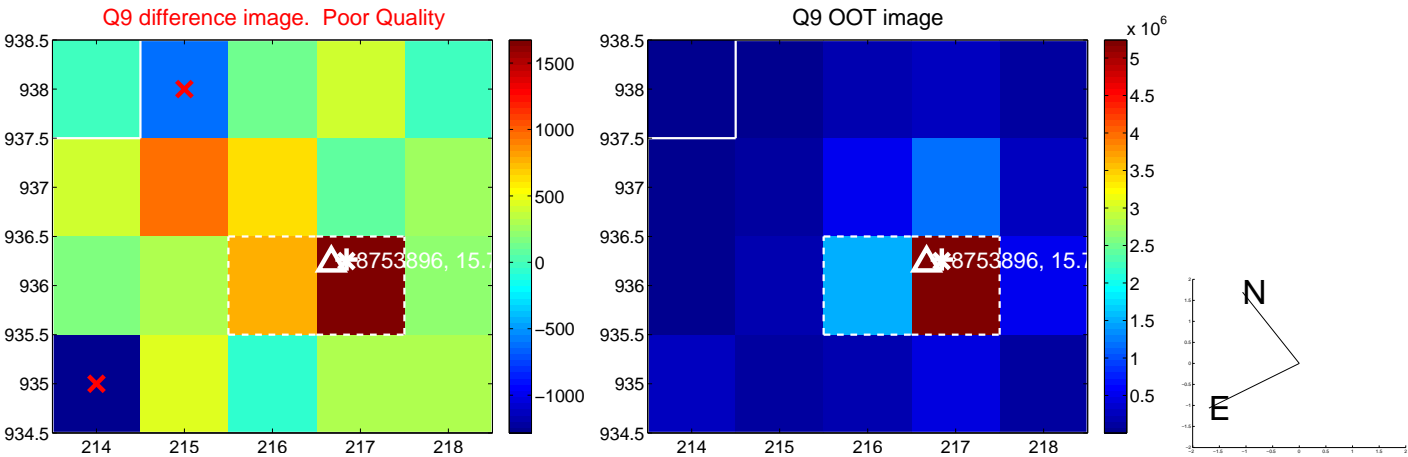
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



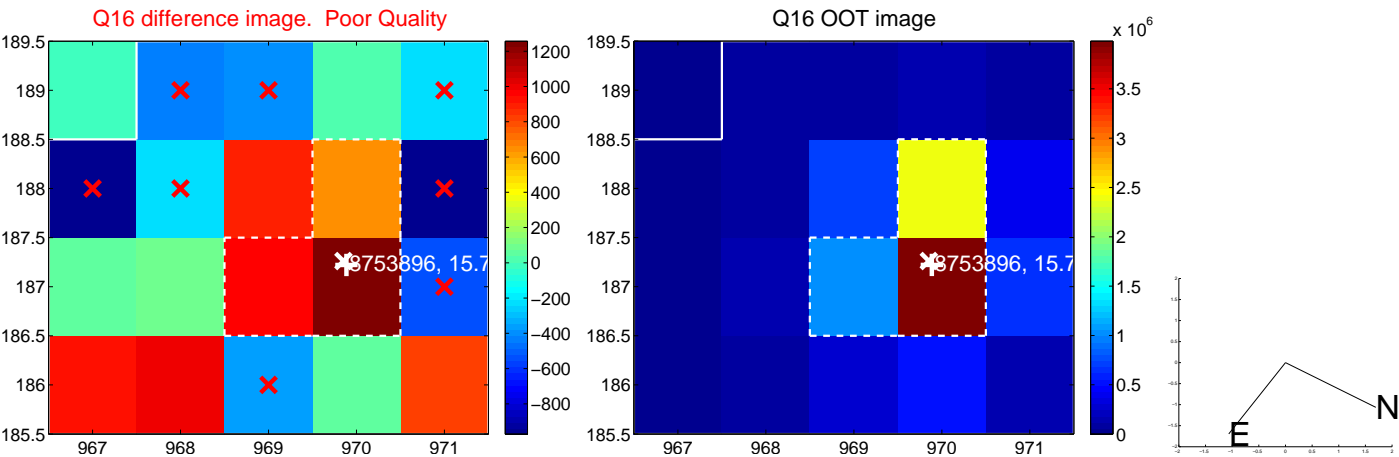
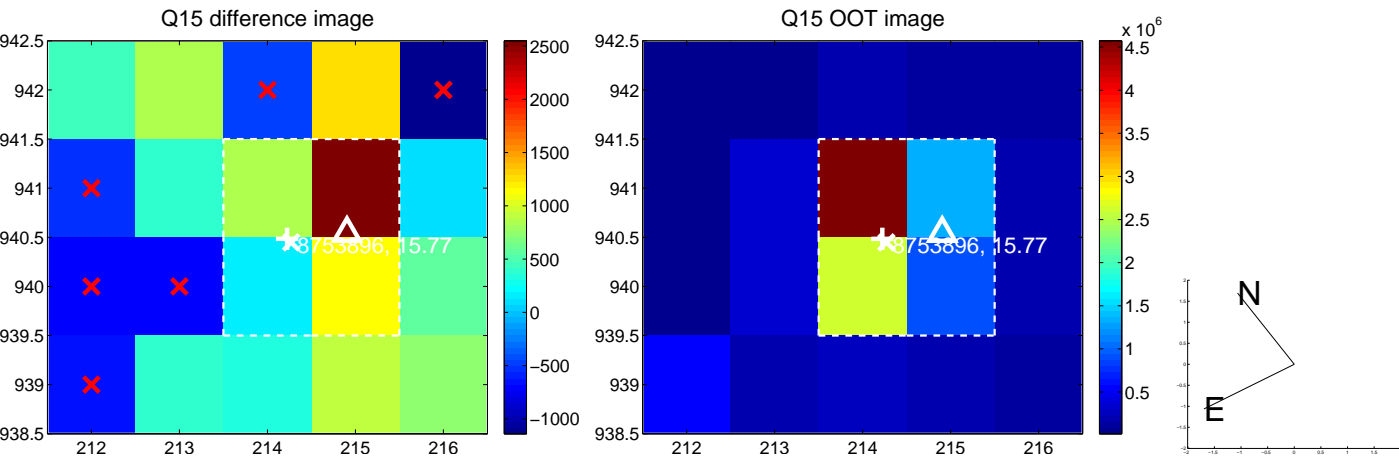
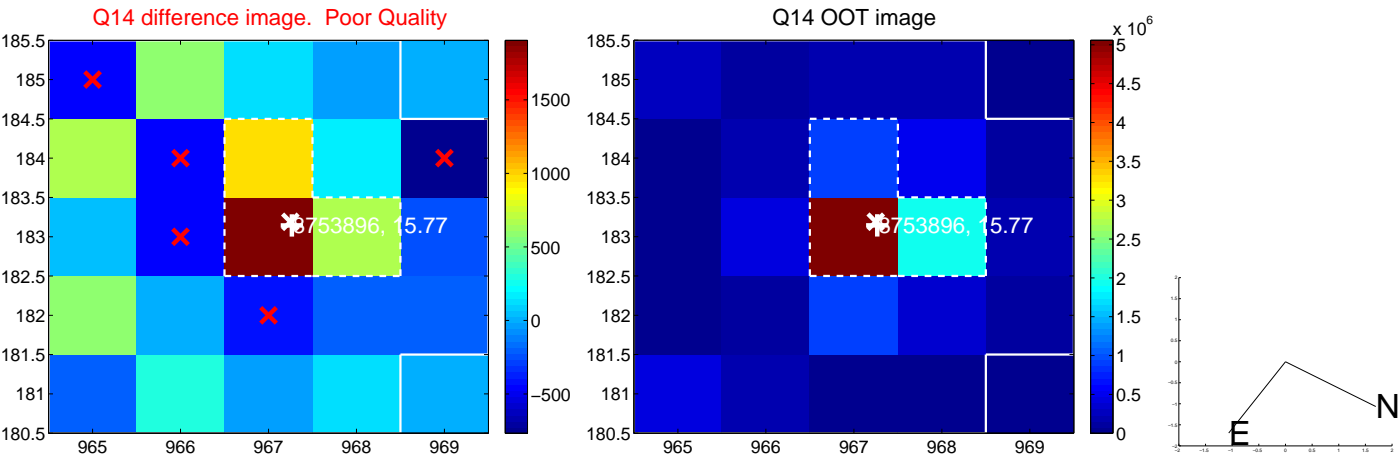
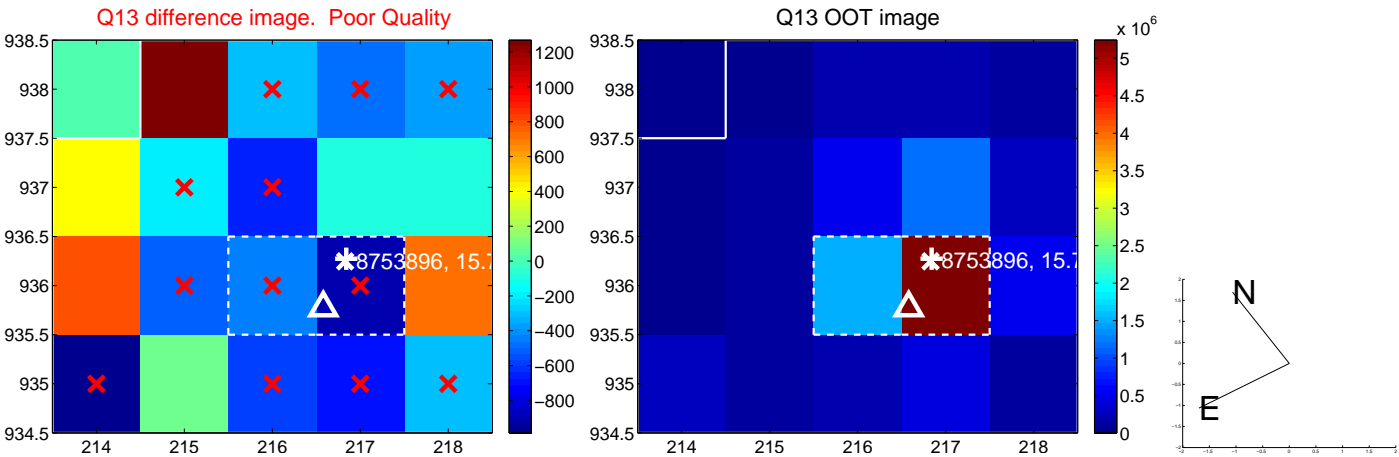
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



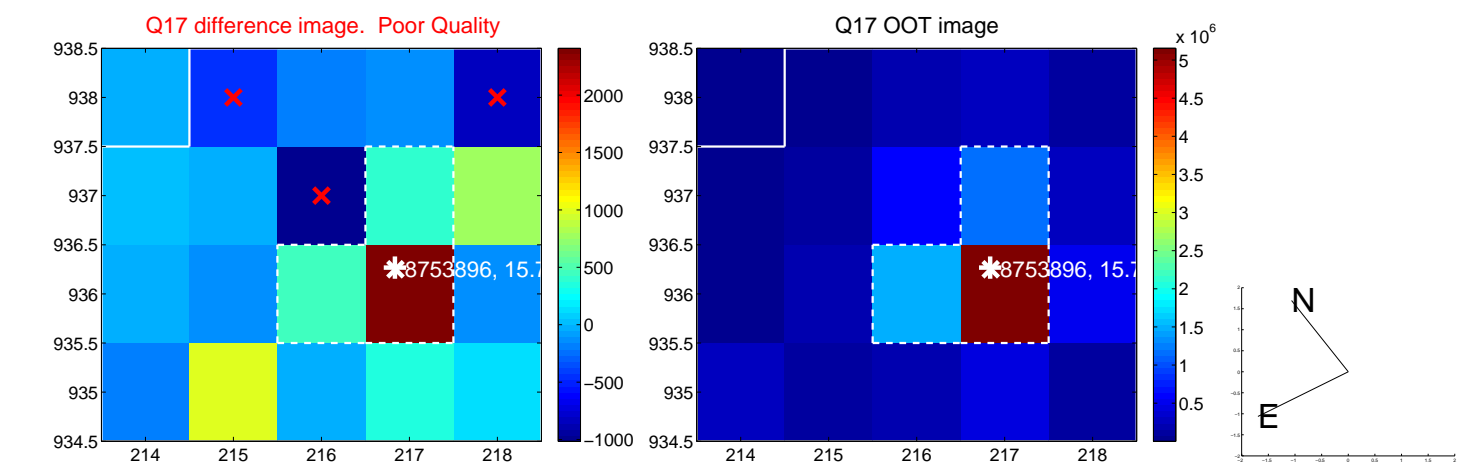
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



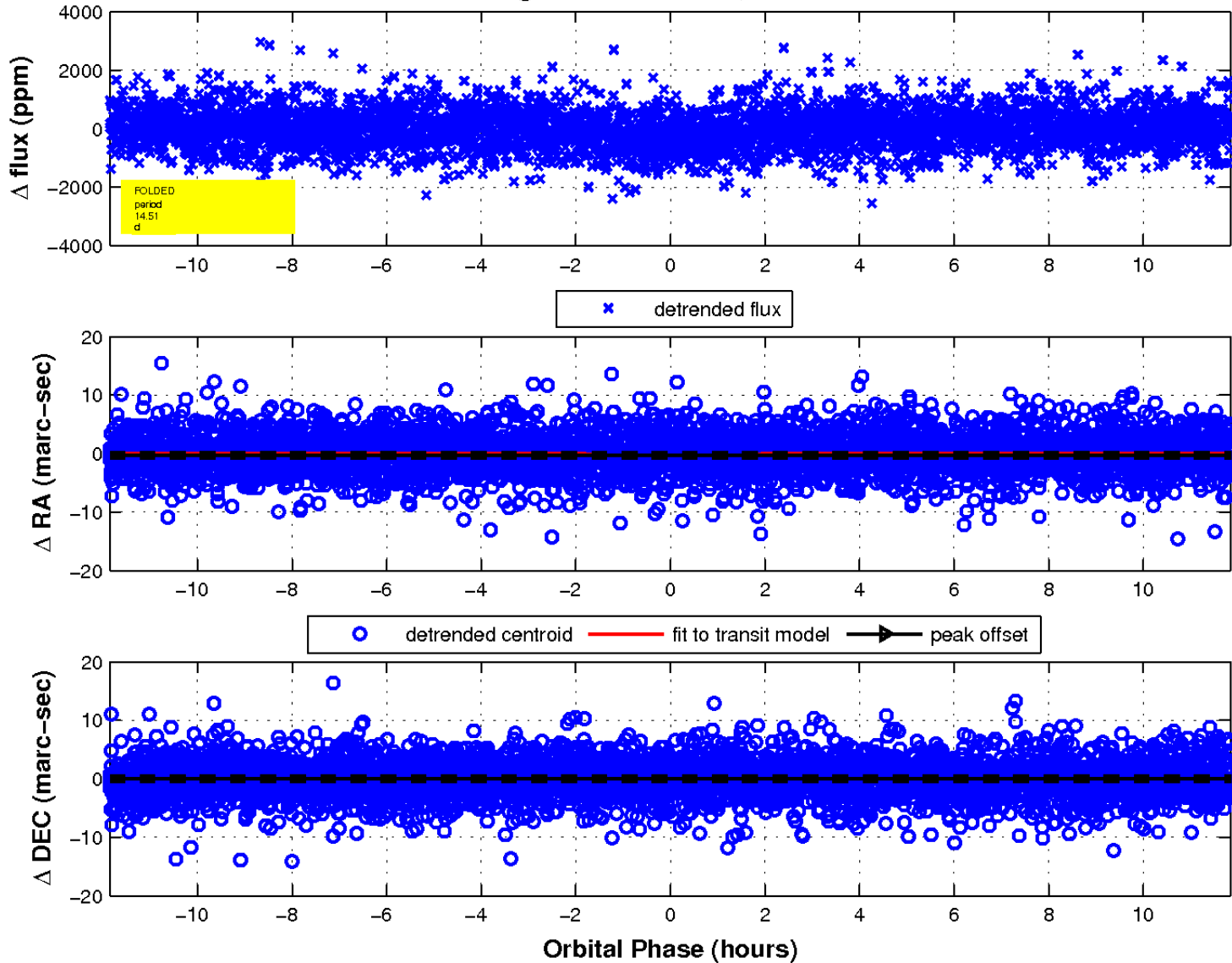
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

