

KIC 010843431

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})
010843431-01	OBS	7378.01	8.739454	136.613860	1240.3	3.747	12.1	12.1	0.63	4406	3.55	26.21
010843431-02	OBS	7378.02	56.389927	167.610537	1537.1	4.876	8.3	8.0	0.63	4406	2.96	2.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010843431-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
010843431-02	OBS	PC	0.53	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.

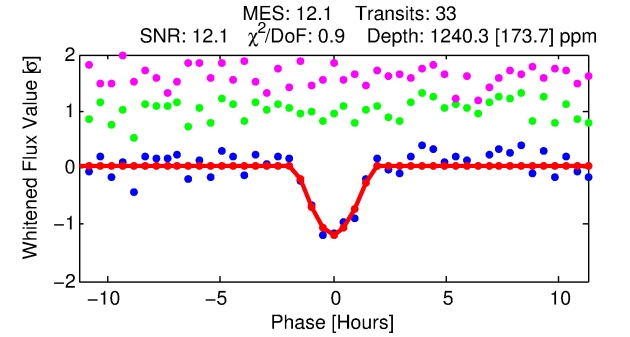
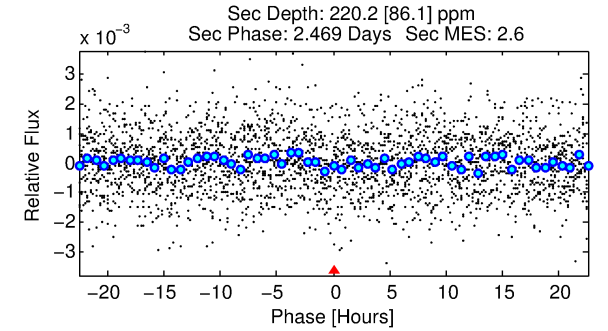
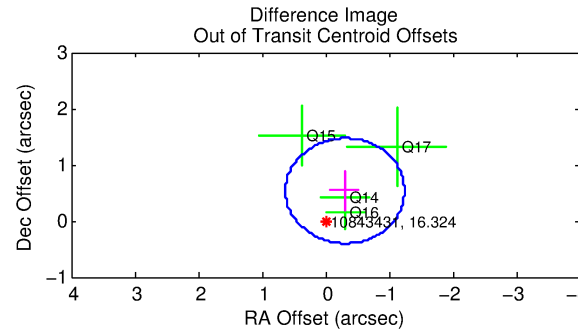
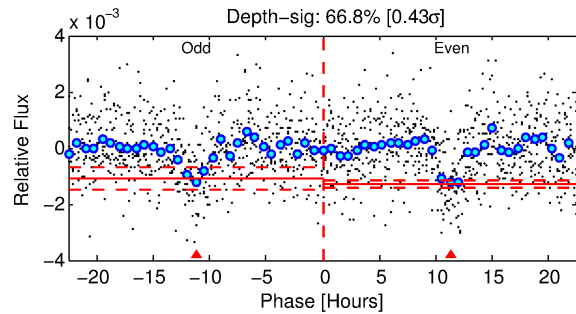
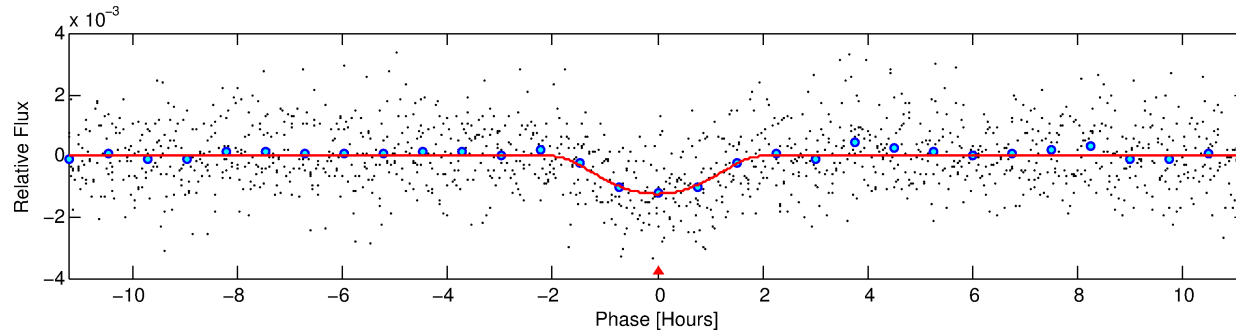
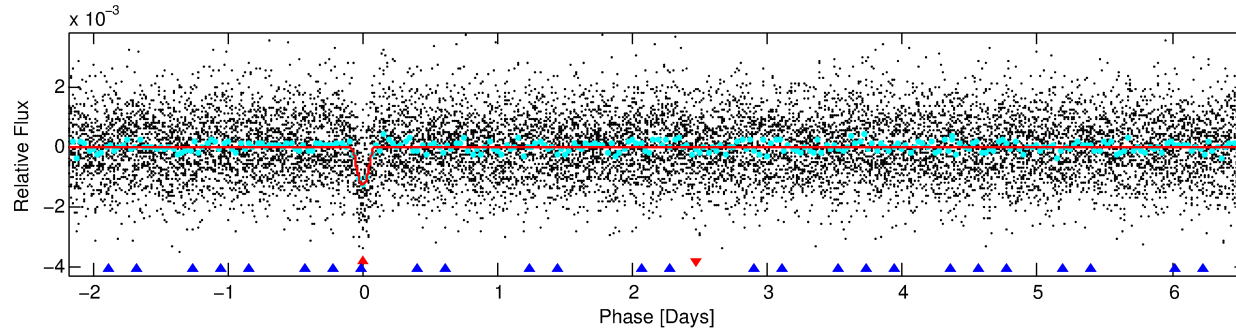
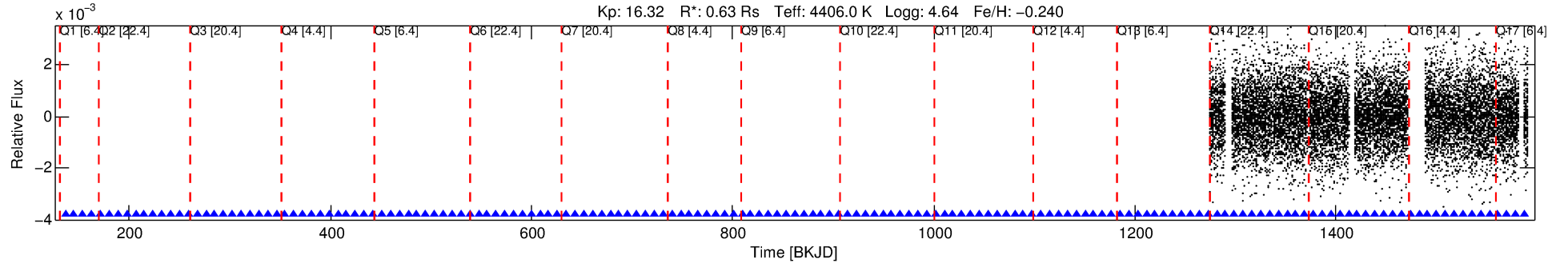
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010843431-01

No Significant Match Found

DV One-Page Summary

KIC: 10843431 Candidate: 1 of 2 Period: 8.739 d
KOI: K07378.01 Corr: 0.943



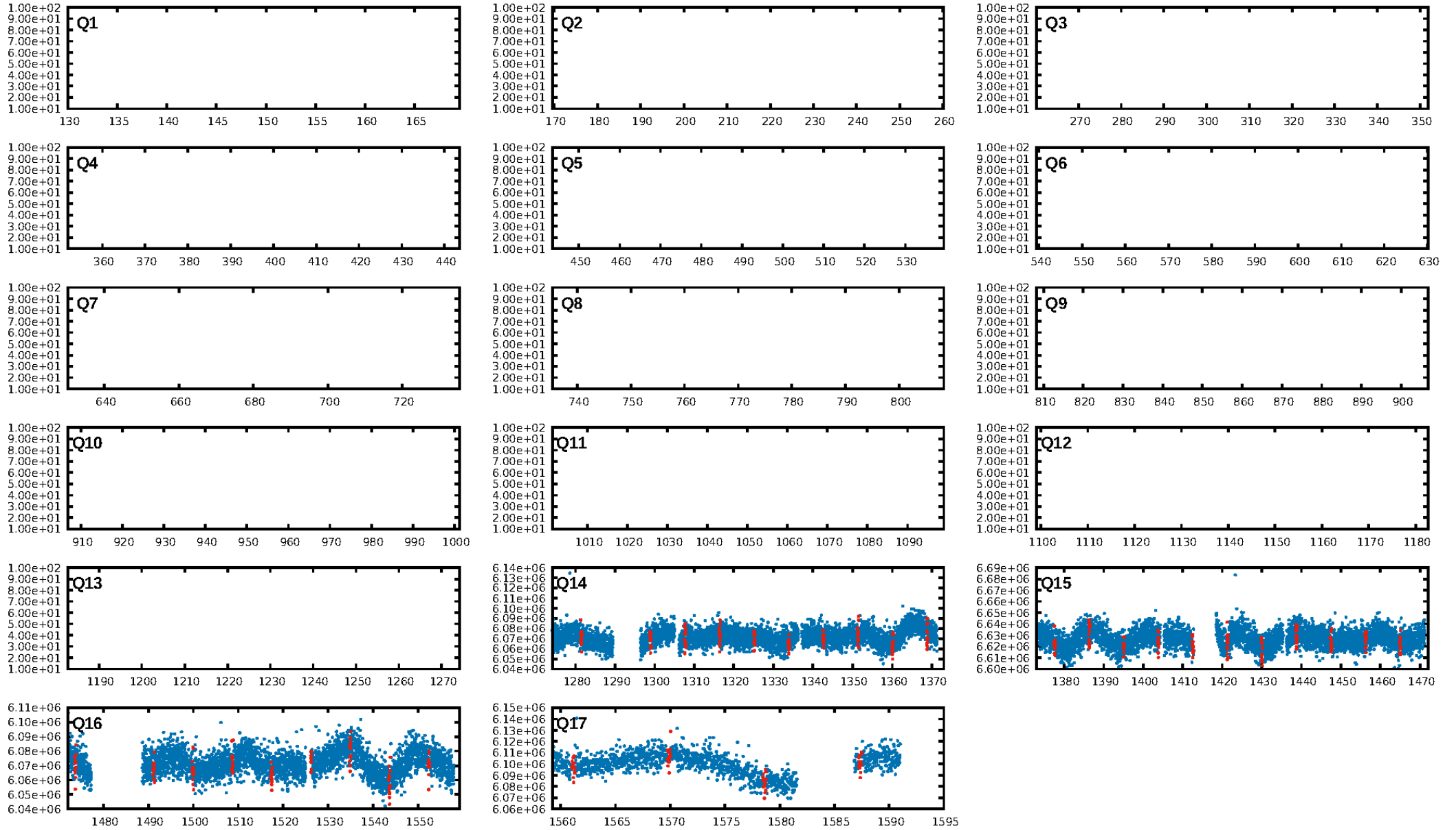
DV Fit Results:

Period = 8.73945 [0.00020] d
Epoch = 136.6139 [0.0291] BKJD
Rp/R* = 0.0518 [0.0872]
a/R* = 6.99 [4.67]
b = 0.98 [0.17]
Seff = 26.21 [4.68]
Teq = 577 [26] K
Rp = 3.55 [5.98] Re
a = 0.0713 [0.0049] AU
Ag = 48.78 [165.22] [0.29 σ]
Teff = 2357 [1997] K [0.89 σ]

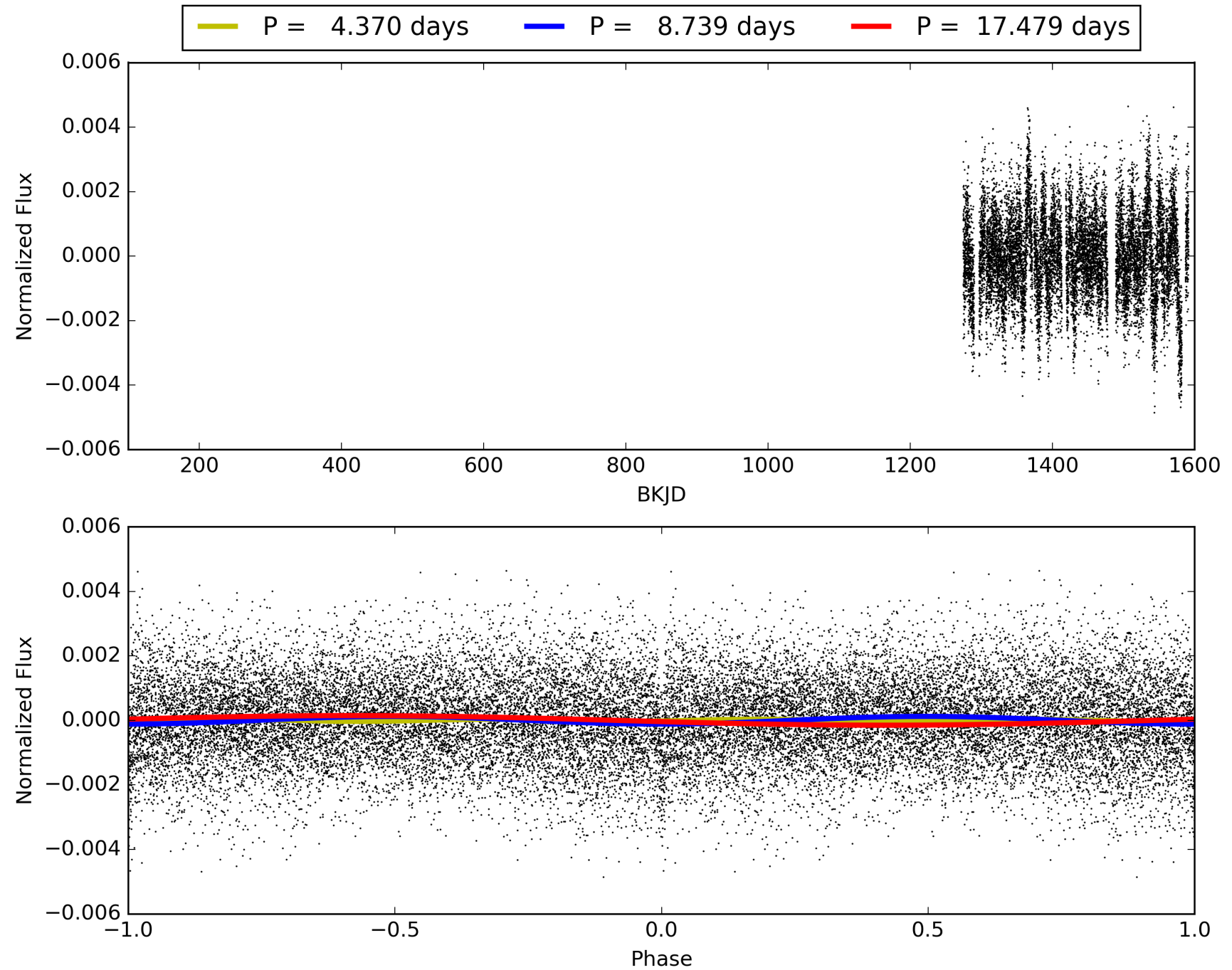
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [185.97 σ]
ModelChiSquare2-sig: 84.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.65e-33
RollingBand-fgt: 1.00 [29/29]
GhostDiagnostic-chr: 1.859
Centroid-sig: 68.7%
Centroid-so: 1.169 arcsec [0.93 σ]
OotOffset-rm: 0.615 arcsec [1.97 σ]
KicOffset-rm: 0.610 arcsec [1.59 σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 010843431-01, PDC Light Curves

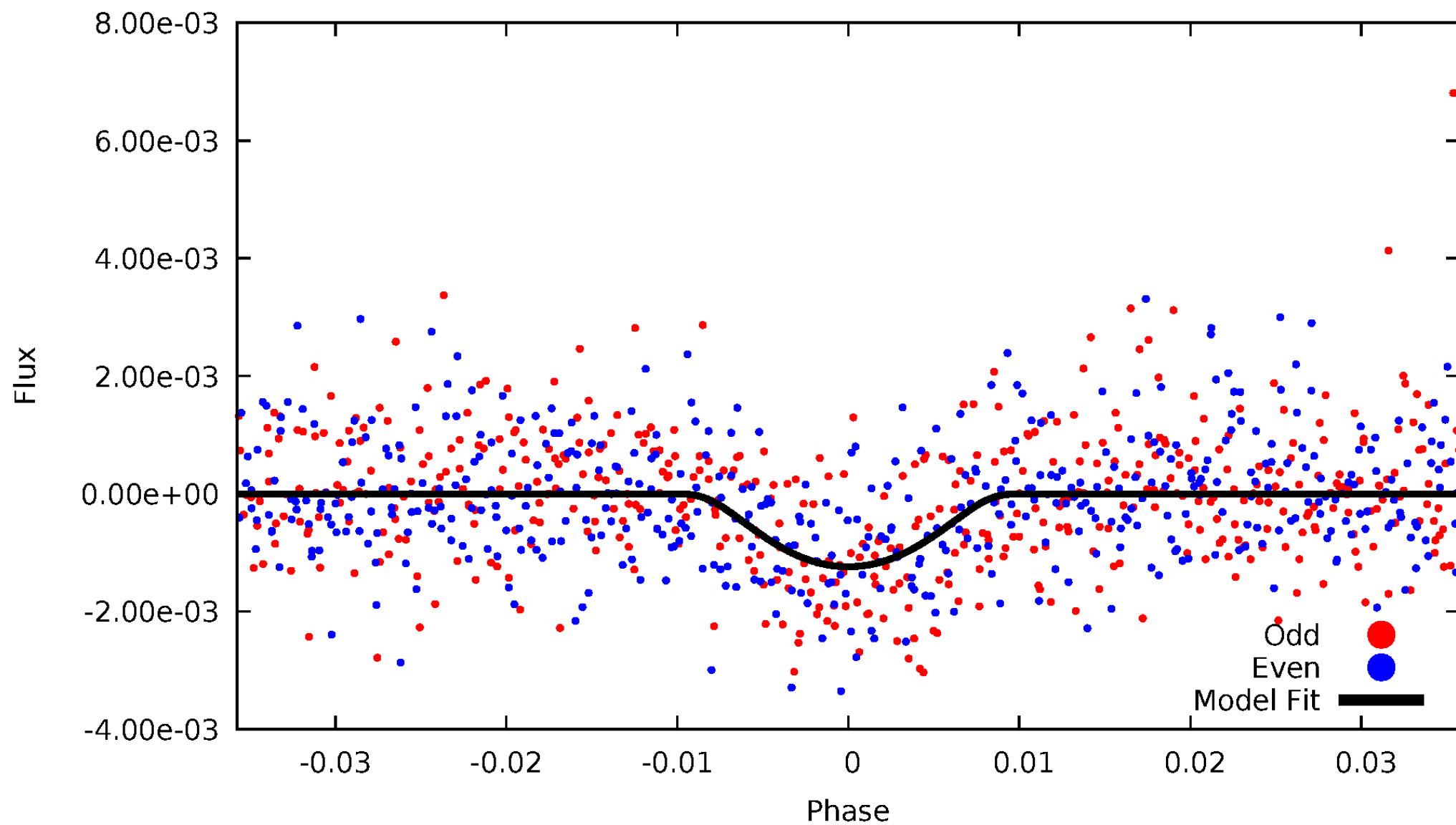


TCE 010843431-01



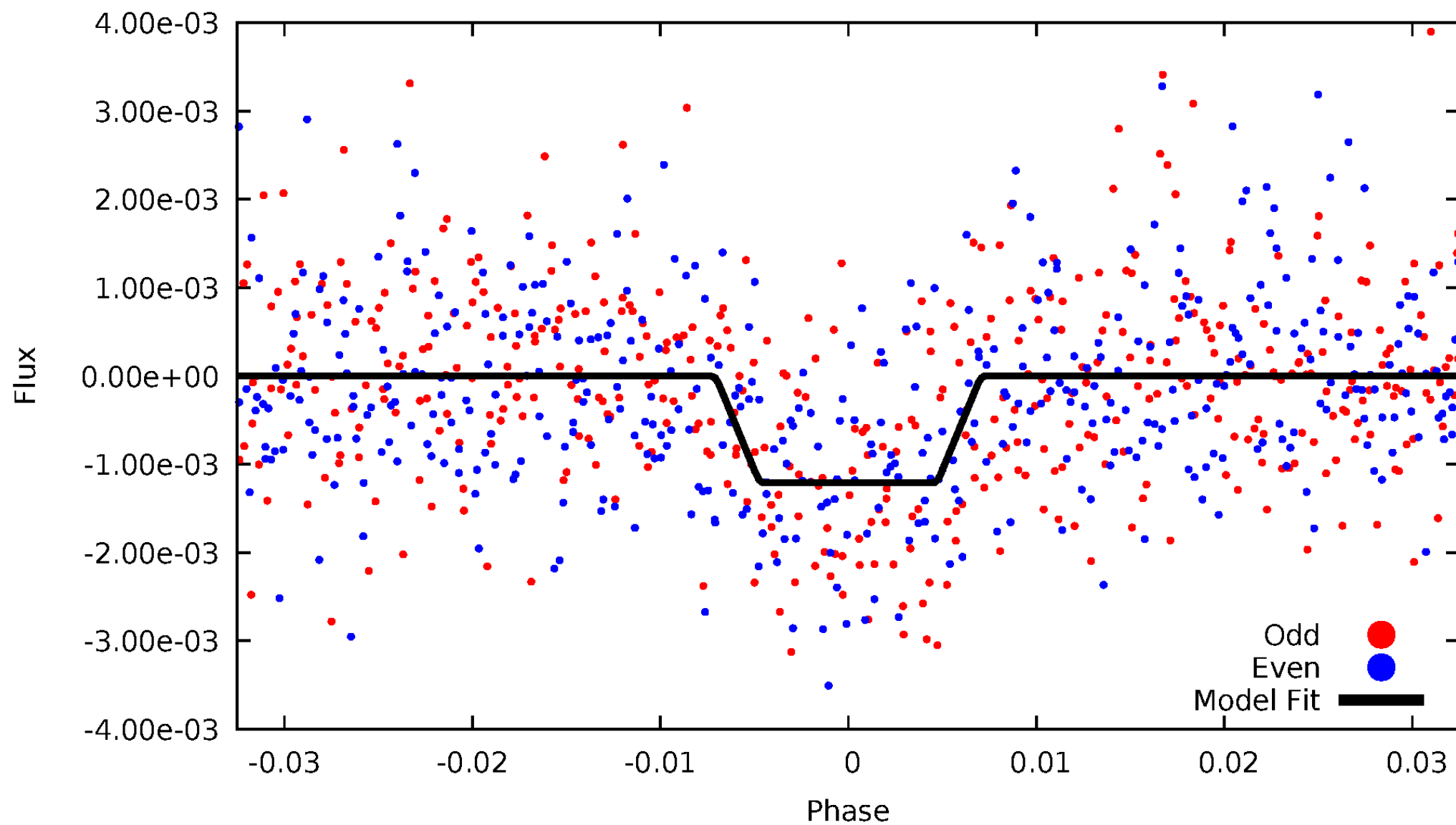
DV Odd/Even

TCE 010843431-01

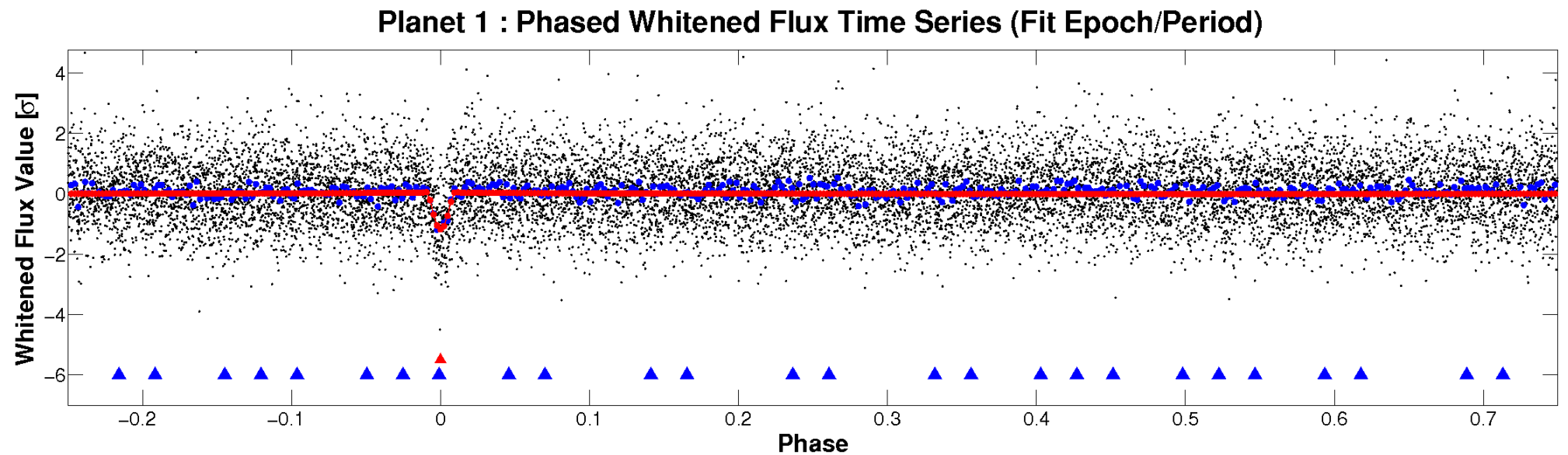
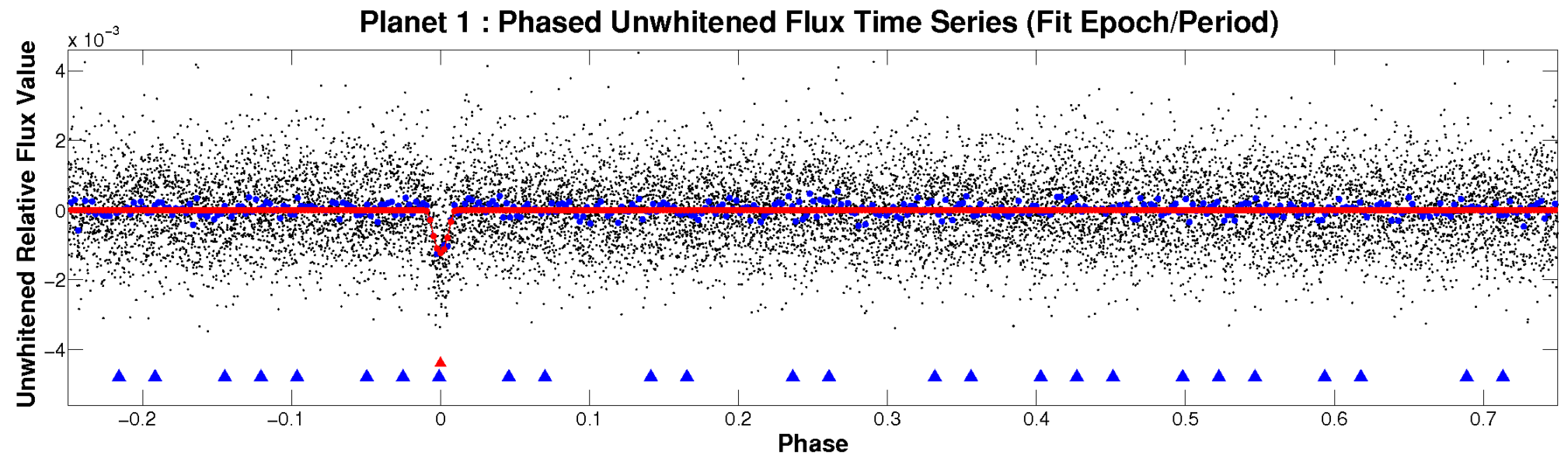


ALT Odd/Even

TCE 010843431-01

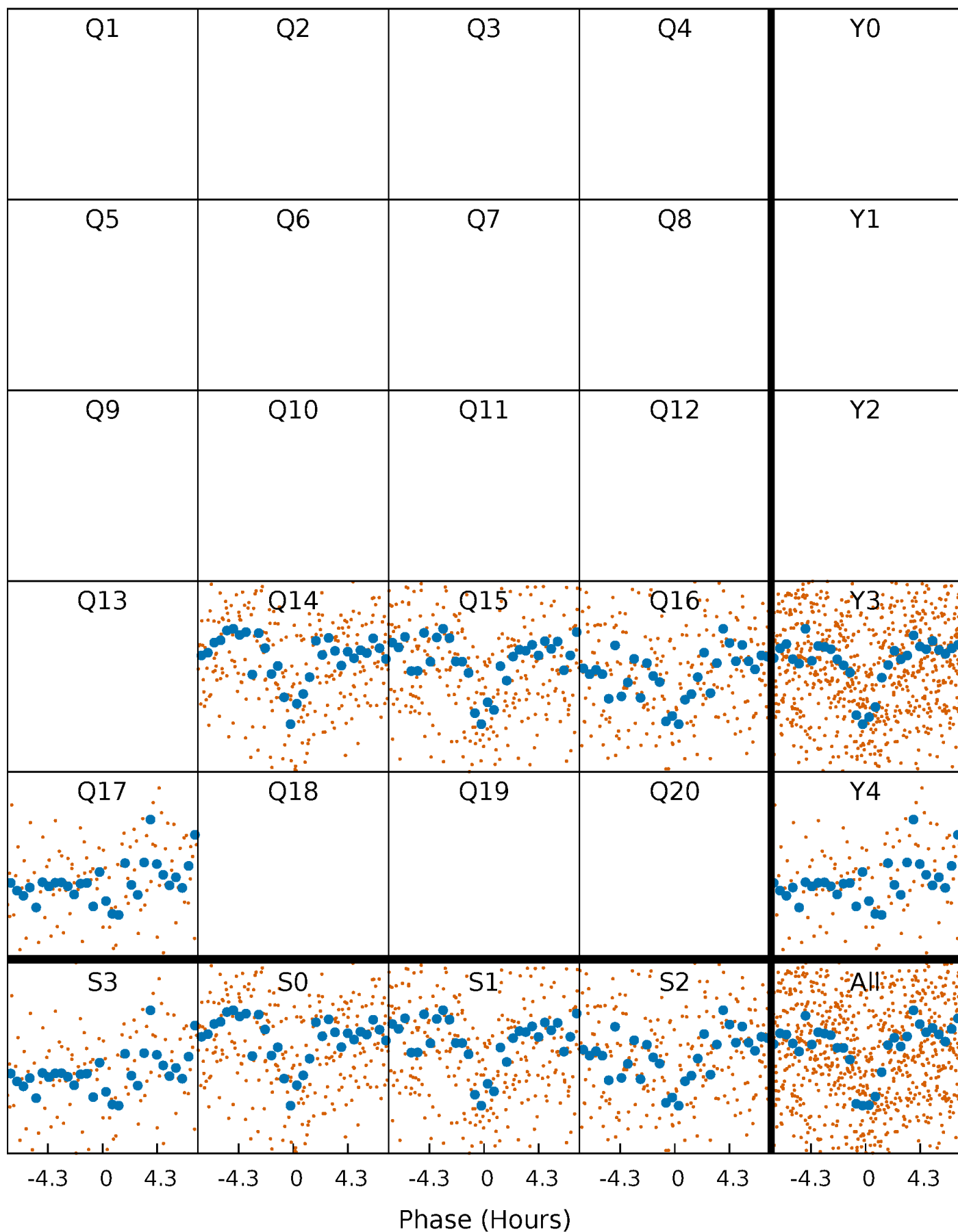


Non-Whitened Vs. Whitened Light Curve



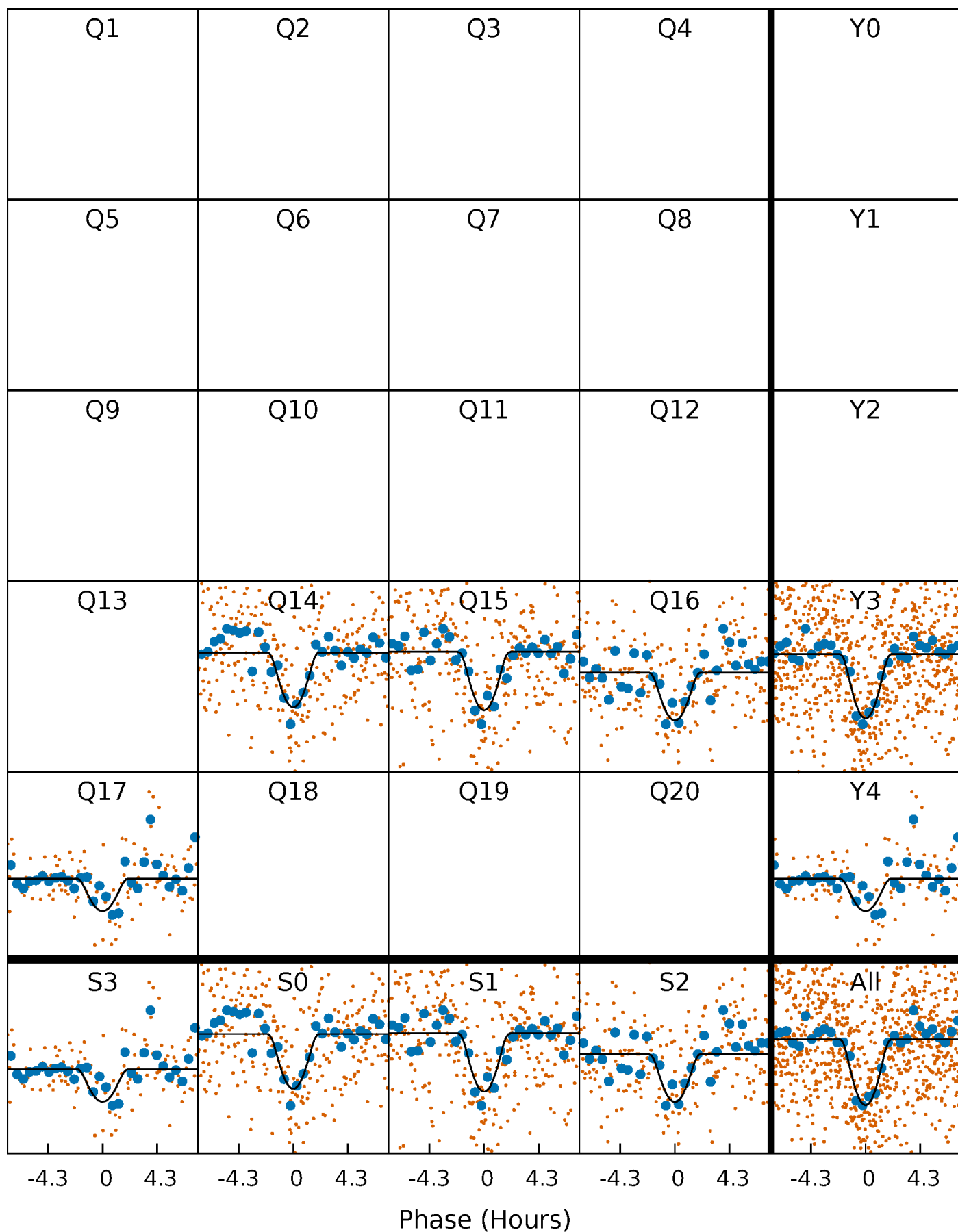
PDC Quarter-Phased Transit Curves

TCE 010843431-01 P= 8.739454 Days $T_0=136.613860$ (BKJD)



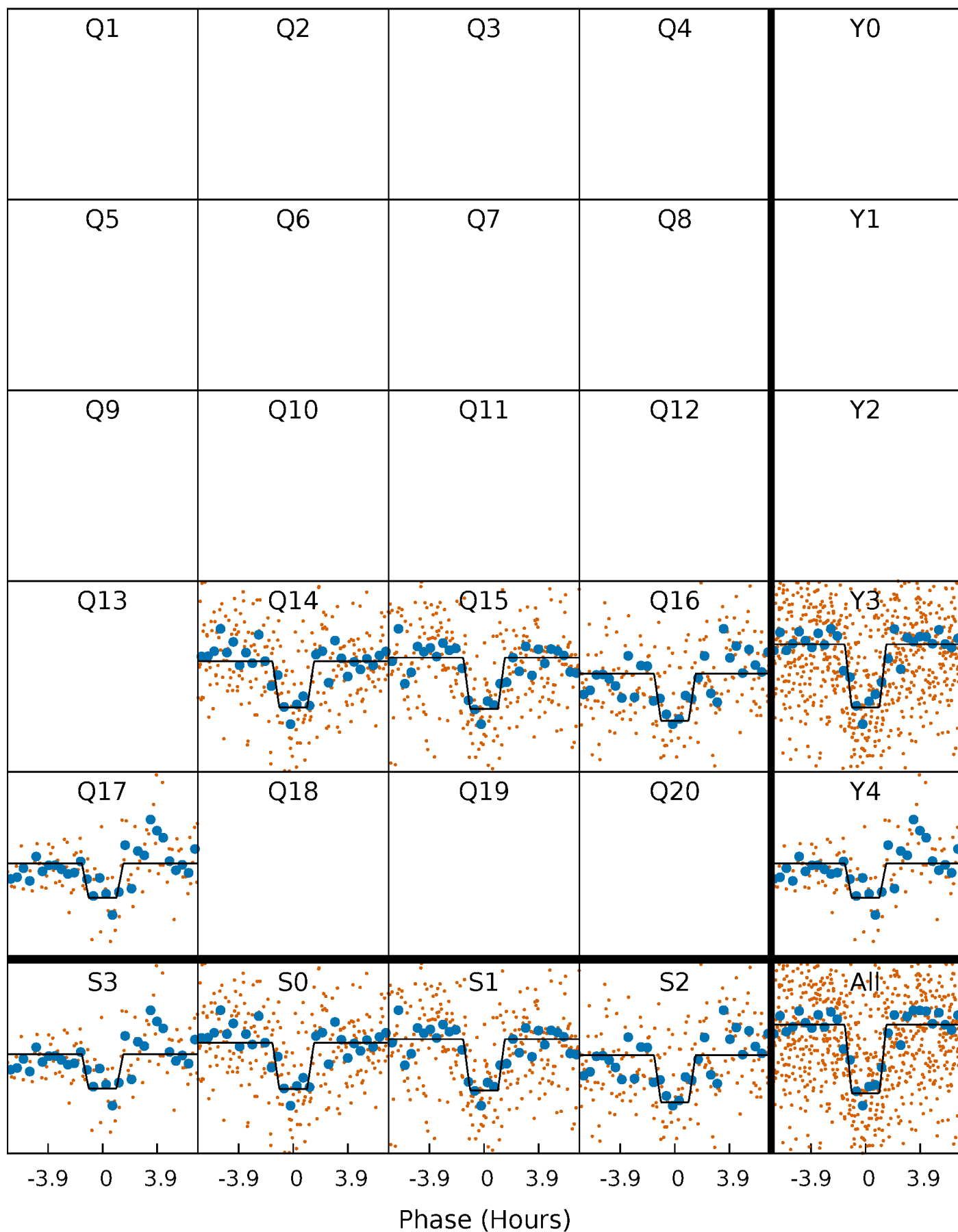
DV Quarter-Phased Transit Curves

TCE 010843431-01 P= 8.739454 Days $T_0=136.613860$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

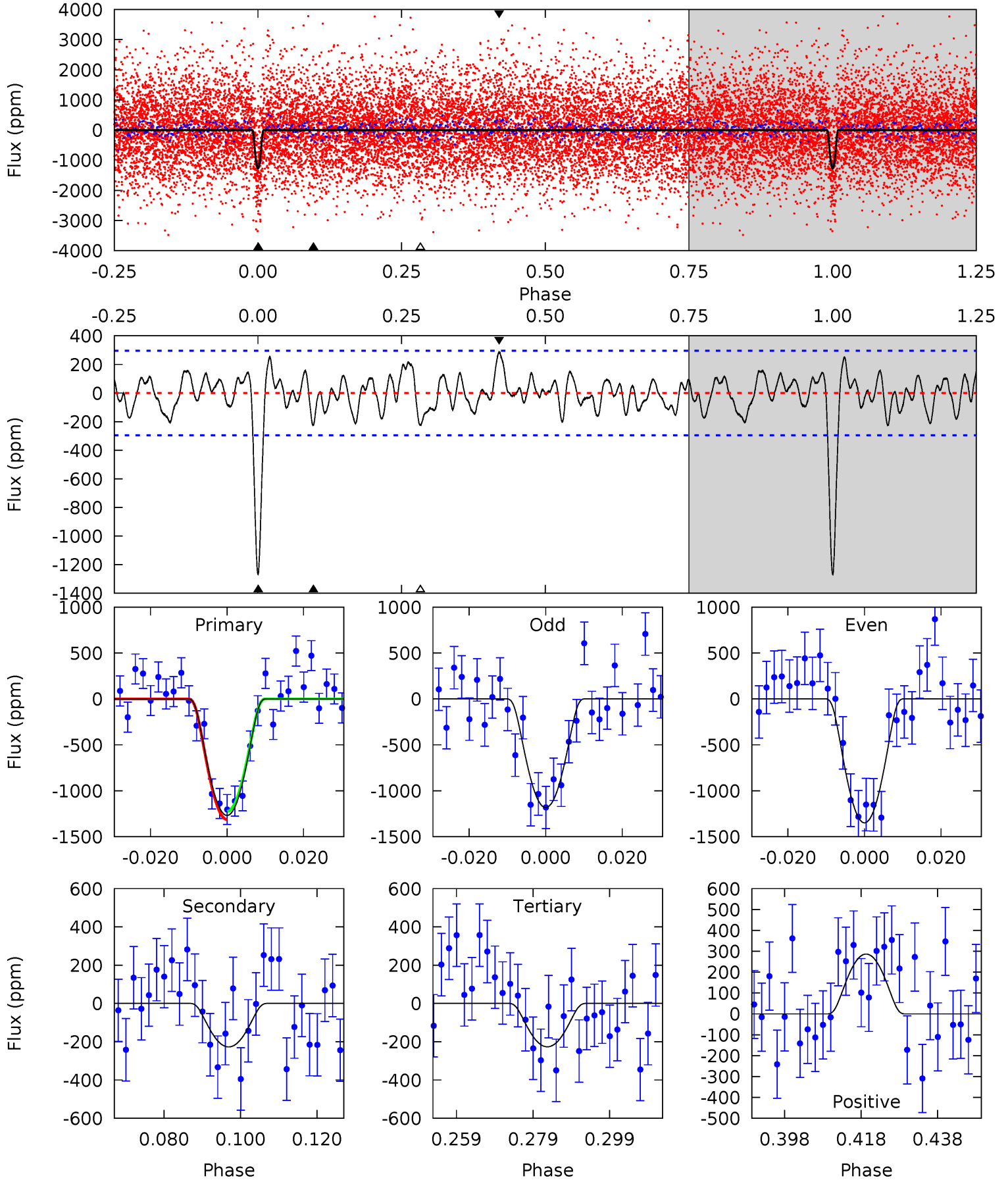
TCE 010843431-01 P= 8.739768 Days $T_0=136.568507$ (BKJD)



DV Model-Shift Uniqueness Test

010843431-01, P = 8.739454 Days, E = 136.613860 Days

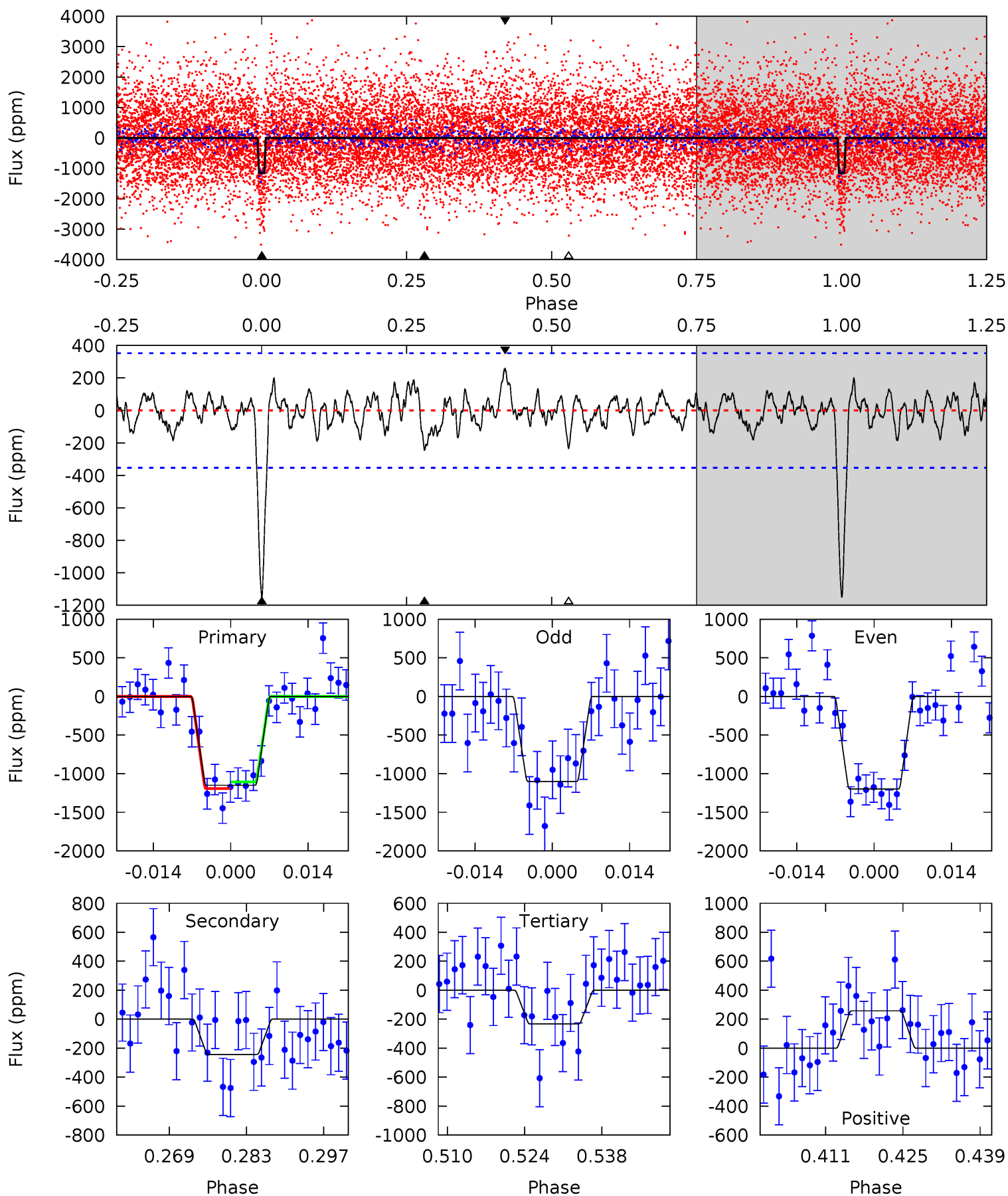
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	3.76	3.75	4.74	4.89	2.33	1.61	17.2	16.3	0.01	-0.98	1.38	1.05	0.18	0.73



Alt Model-Shift Uniqueness Test

010843431-01, P = 8.739768 Days, E = 136.568507 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	3.41	3.27	3.62	4.96	2.45	1.12	12.9	12.5	0.14	-0.21	0.68	1.01	0.18	0.60



Stellar Parameters For KIC 010843431

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} \text{ (g}\cdot\text{cm}^{-3}\text{)}$
	4406^{+154}_{-170}	$4.643^{+0.044}_{-0.032}$	$-0.240^{+0.300}_{-0.300}$	$0.628^{+0.051}_{-0.056}$	$0.632^{+0.063}_{-0.057}$	$3.600^{+0.765}_{-0.484}$
	+3%/-4%	+1%/-1%	+125%/-125%	+8%/-9%	+10%/-9%	+21%/-13%
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 010843431-01 / KOI 7378.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} \text{ (K)}$	$T_{obs} \text{ (K)}$	A_{obs}
DV	-227 ± 60	$5.93^{+4.59}_{-3.96}$	803^{+32}_{-32}	2560^{+916}_{-342}	18^{+139}_{-12}
Alt.	-243 ± 71	$5.10^{+4.96}_{-3.32}$	803^{+30}_{-31}	2684^{+991}_{-430}	26^{+192}_{-20}

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 $A_{obs} \gg 1.0$

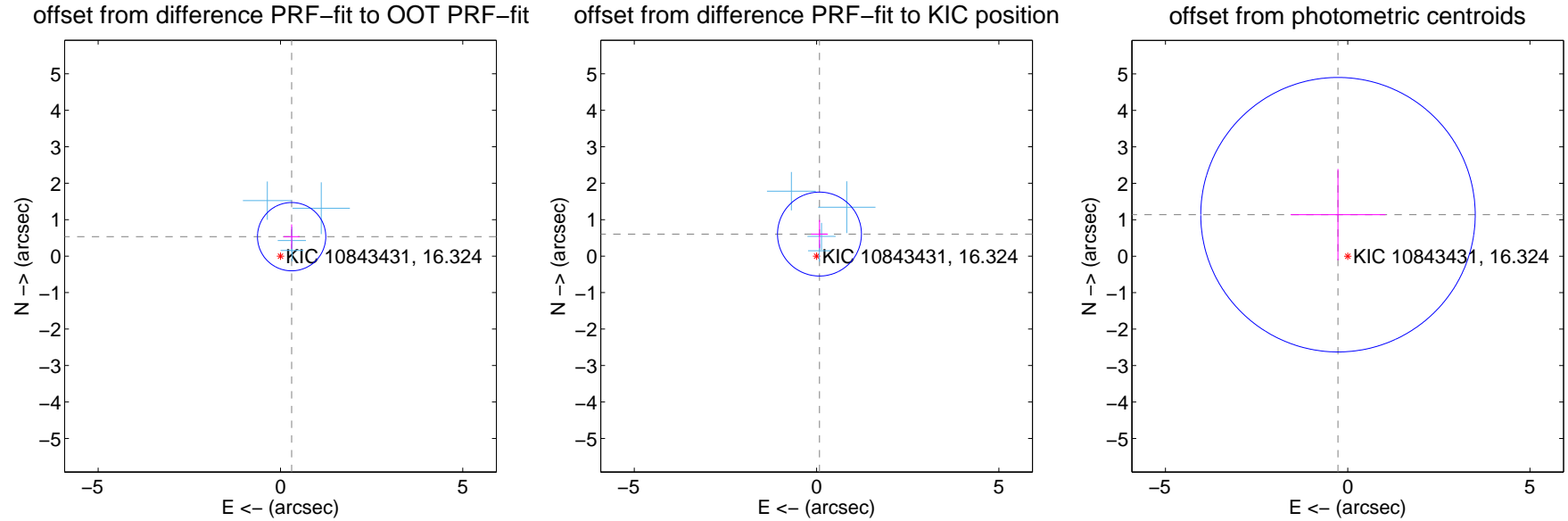
DV Centroid Data

Supplemental centroid analysis for 010843431-01. Kepler magnitude: 16.32. Transit SNR 12.10

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.615 ± 0.312	1.97	-0.306 ± 0.221	0.533 ± 0.337
PRF-fit source offset from KIC position	0.610 ± 0.384	1.59	-0.080 ± 0.230	0.605 ± 0.386
photometric centroid source offset	1.17 ± 1.25	0.93	0.27 ± 1.30	1.14 ± 1.25



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



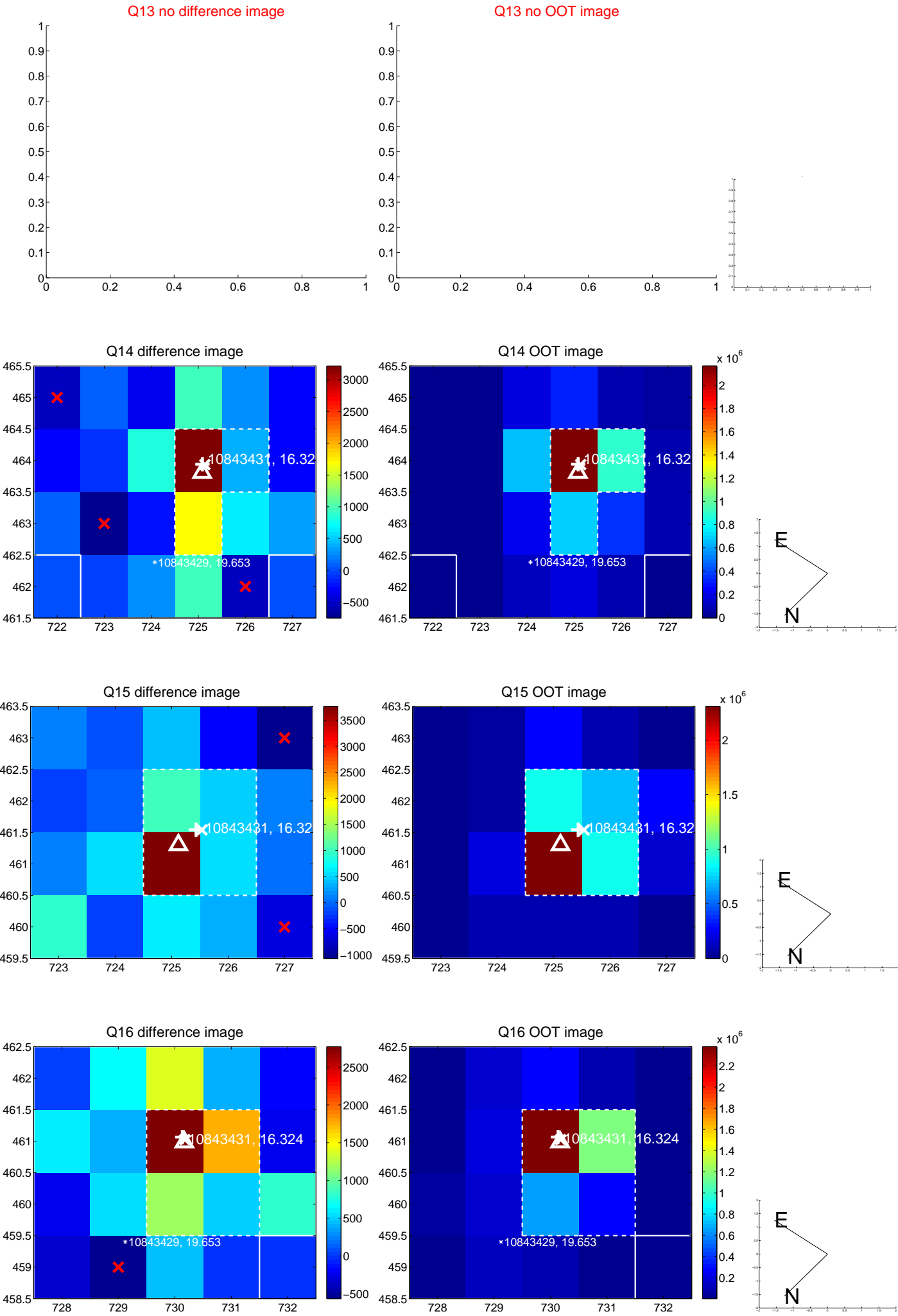
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



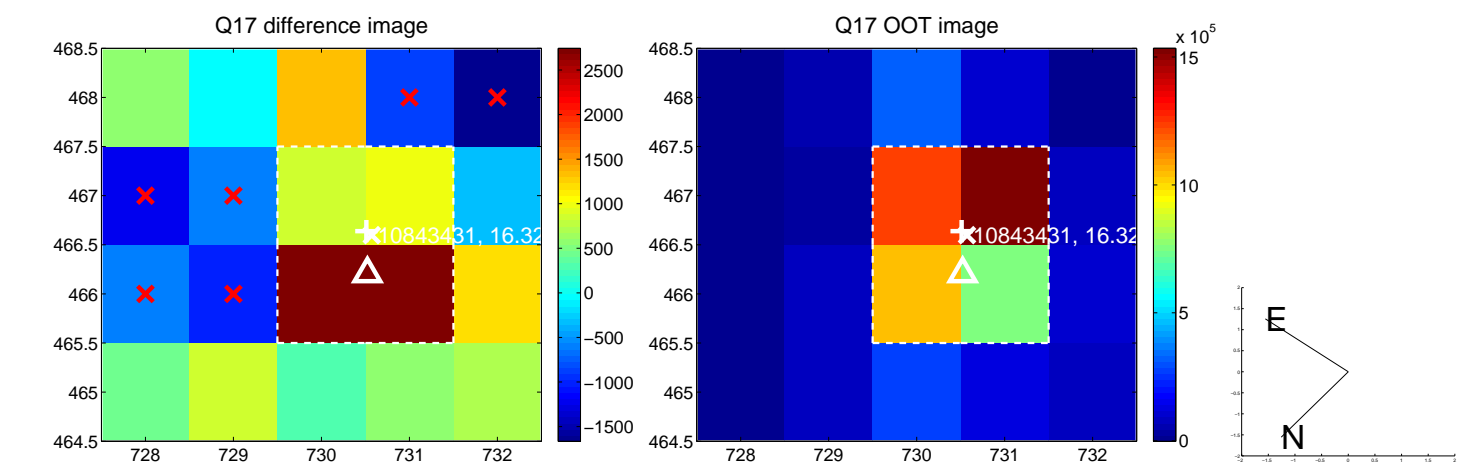
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



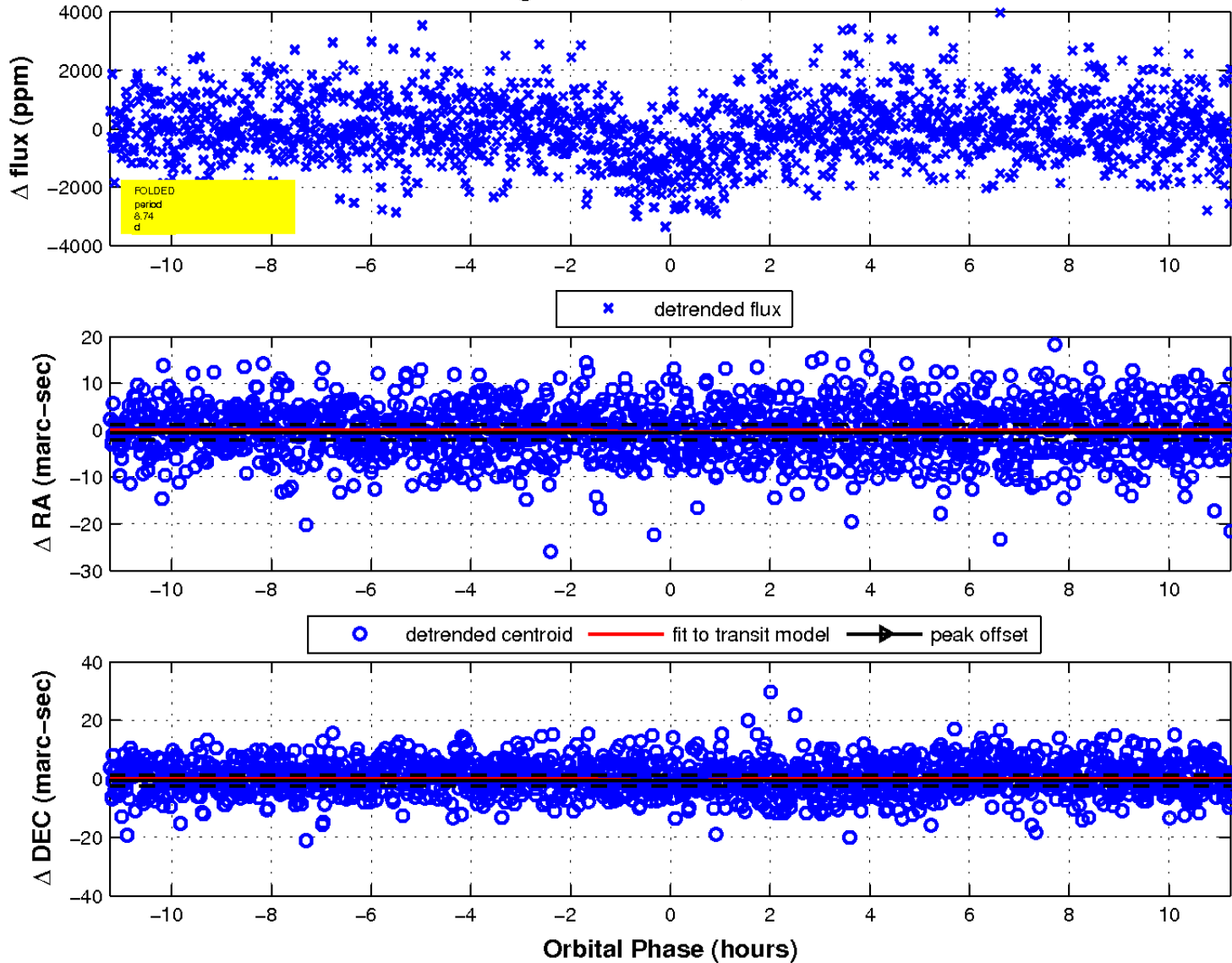
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

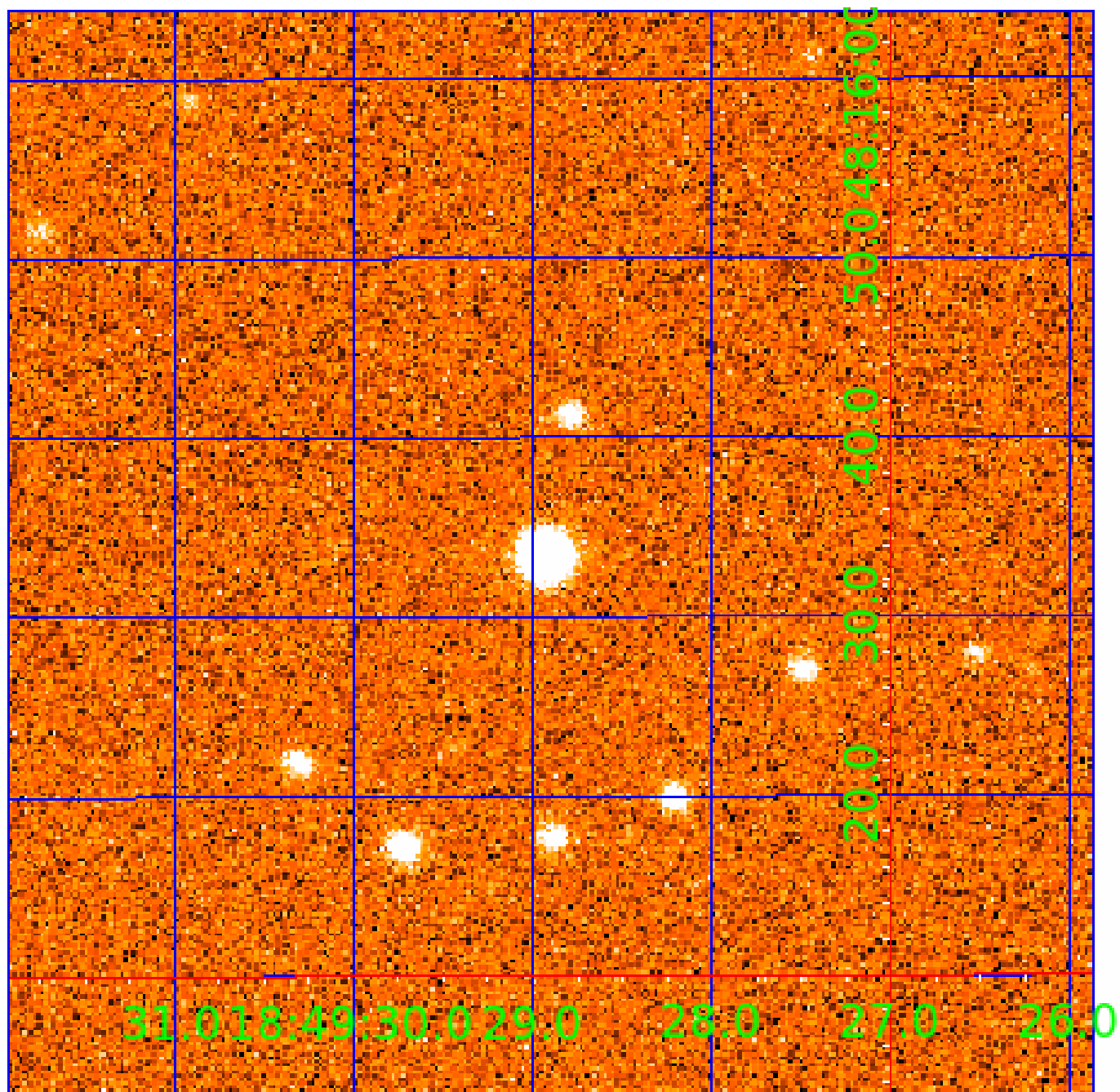


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010843431

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})
010843431-01	OBS	7378.01	8.739454	136.613860	1240.3	3.747	12.1	12.1	0.63	4406	3.55	26.21
010843431-02	OBS	7378.02	56.389927	167.610537	1537.1	4.876	8.3	8.0	0.63	4406	2.96	2.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010843431-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
010843431-02	OBS	PC	0.53	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.

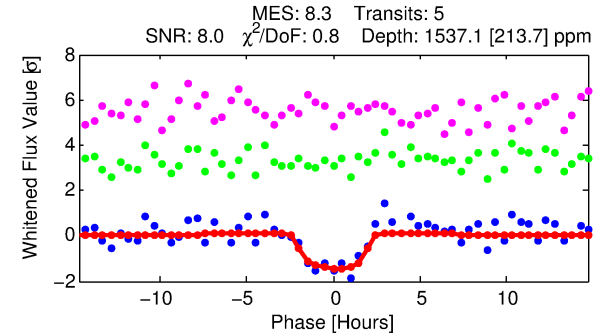
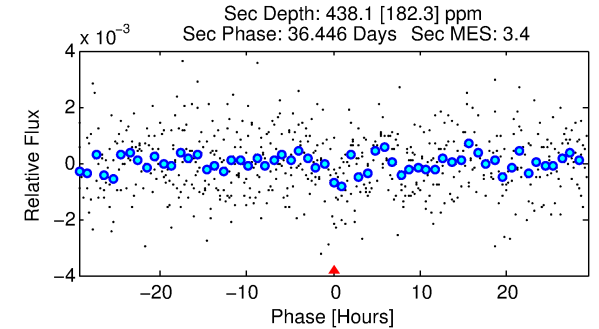
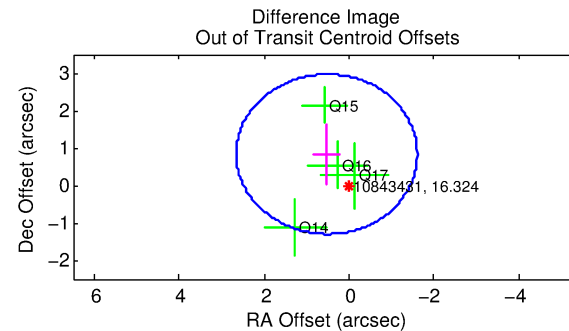
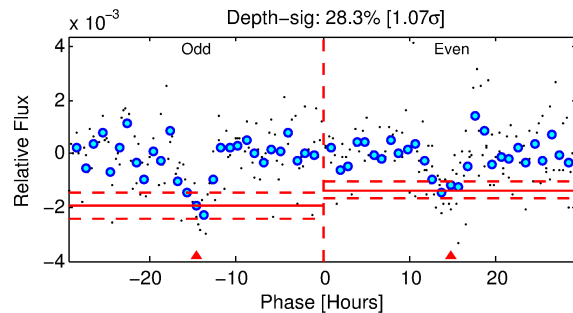
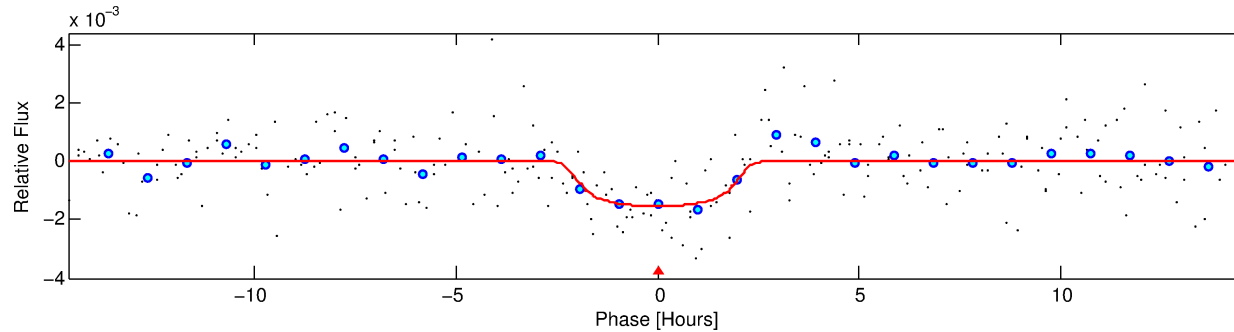
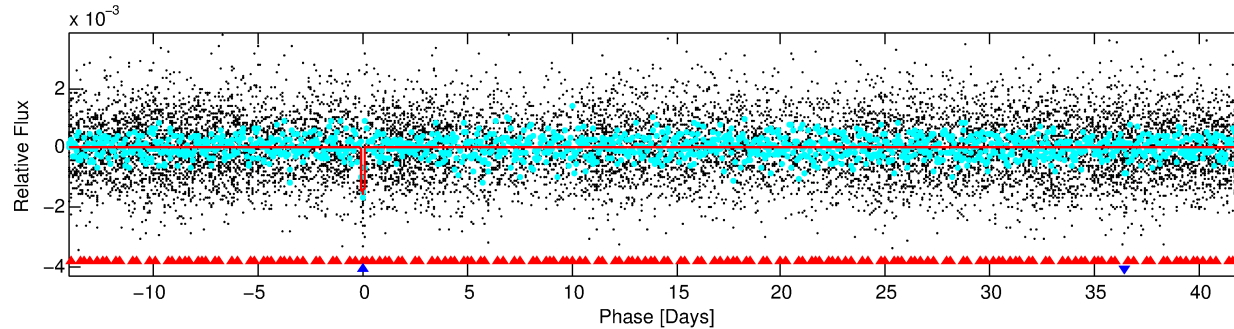
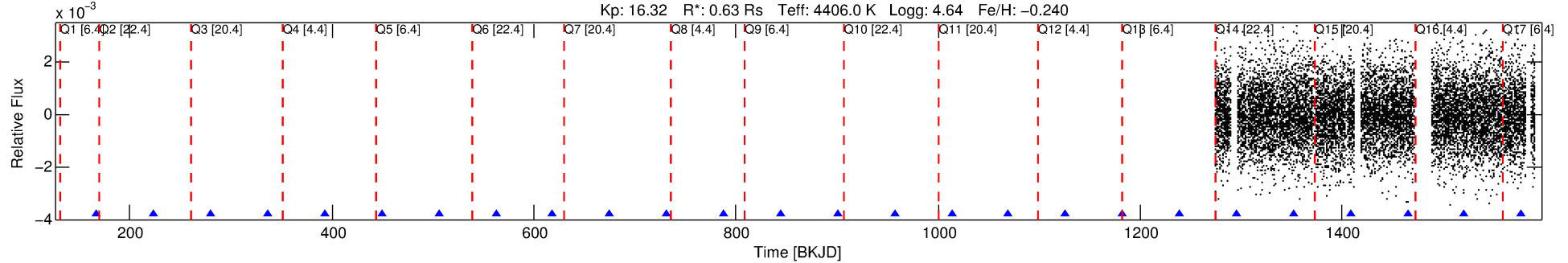
Ephemeris Match Information For 010843431-02

No Significant Match Found

DV One-Page Summary

KIC: 10843431 Candidate: 2 of 2 Period: 56.390 d
KOI: K07378 Corr: No Ephemeris Match

Kp: 16.32 R*: 0.63 Rs Teff: 4406.0 K Logg: 4.64 Fe/H: -0.240



DV Fit Results:

Period = 56.38993 [0.00510] d
Epoch = 167.6105 [0.1183] BKJD
Rp/R* = 0.0432 [0.0105]
a/R* = 48.84 [41.20]
b = 0.88 [0.21]
Seff = 2.18 [0.39]
Teq = 310 [14] K
Rp = 2.96 [0.77] Re
a = 0.2471 [0.0169] AU
Ag = 1677.28 [1084.91] [1.55σ]
Teffp = 3066 [505] K [5.45σ]

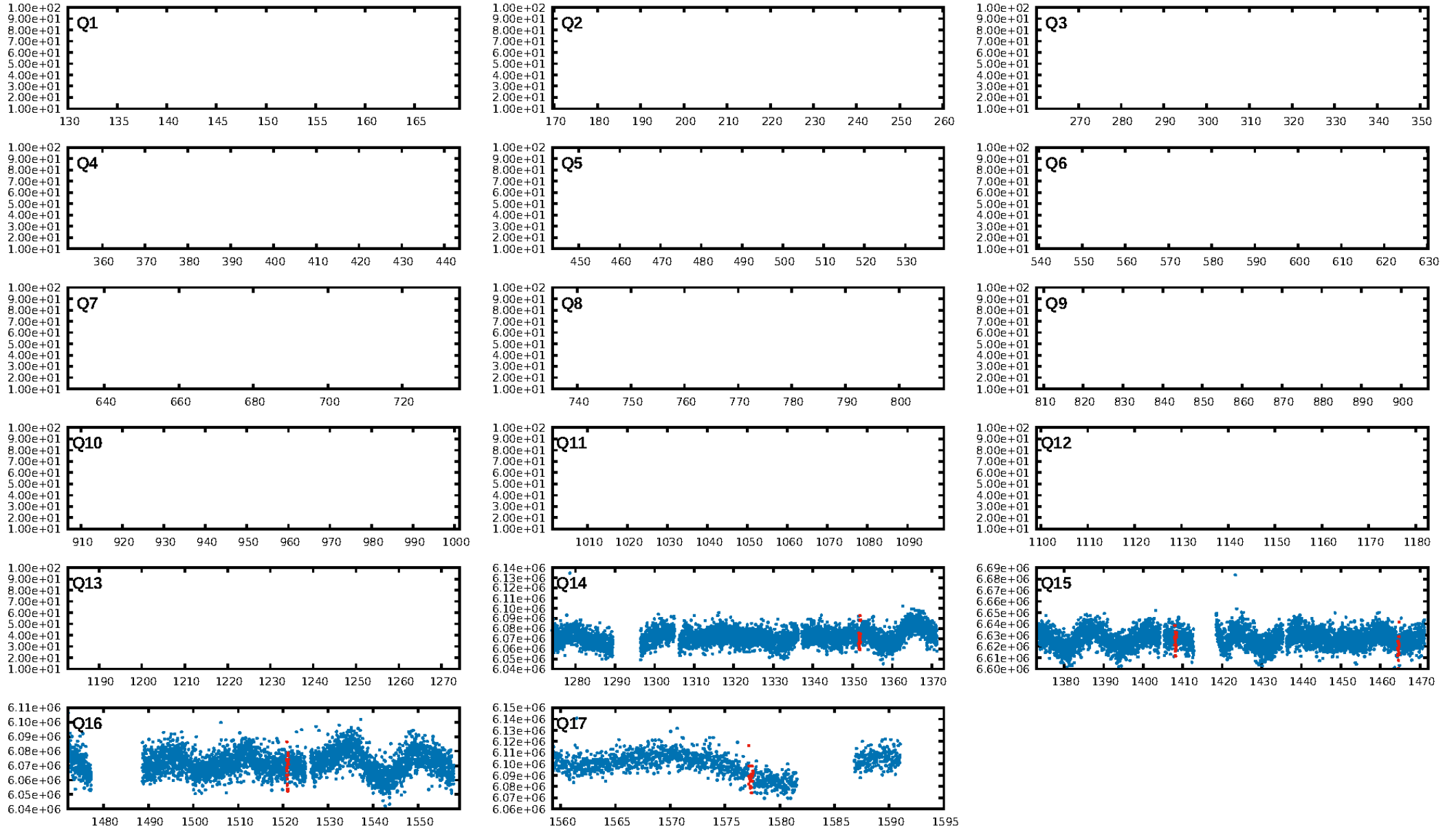
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [185.97σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 84.3%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 1.11e-17
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 7.304
Centroid-sig: 7.5%
Centroid-so: 2.393 arcsec [1.18σ]
OotOffset-rm: 0.980 arcsec [1.38σ]
KicOffset-rm: 1.211 arcsec [1.69σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 0.75 [3/4]

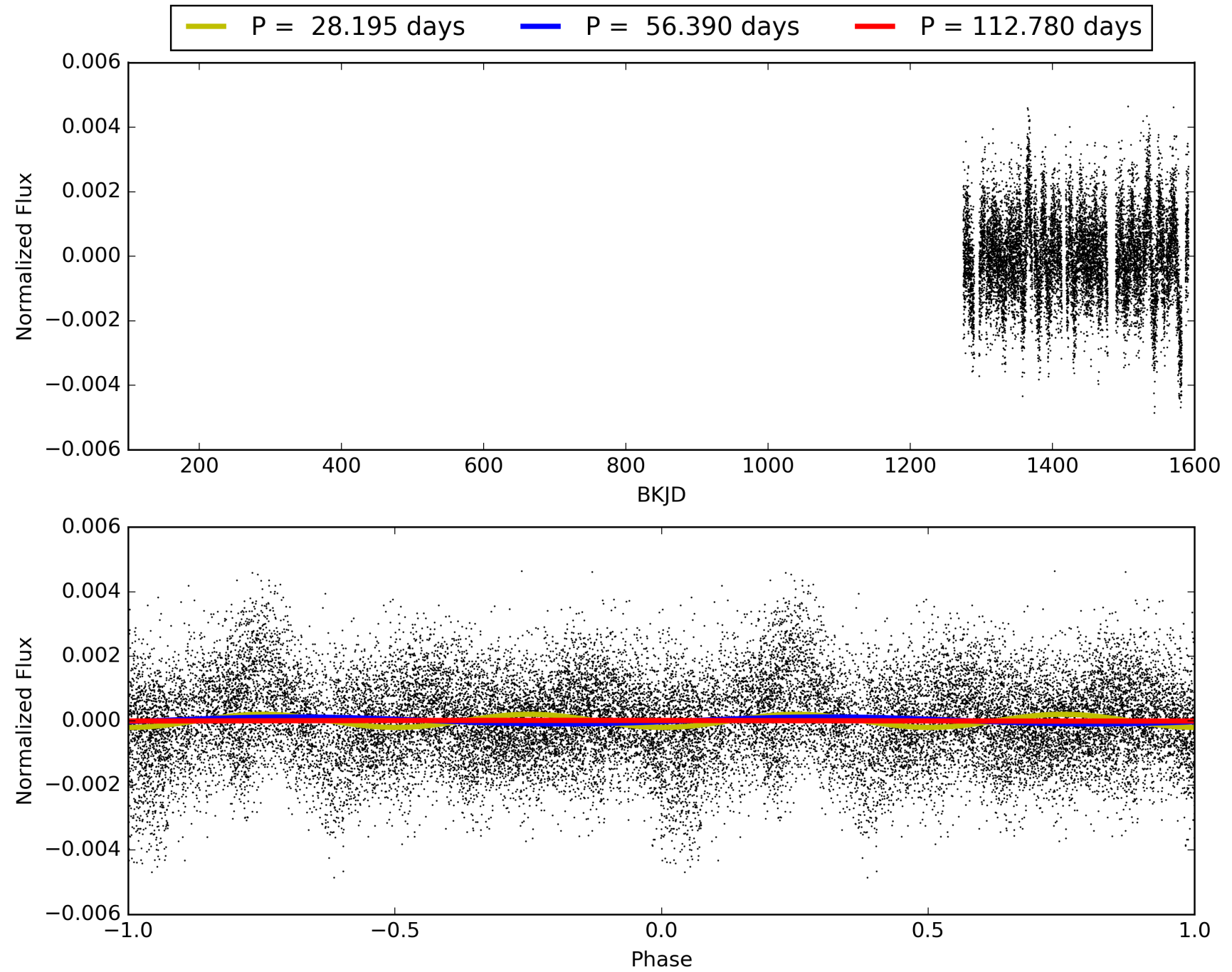
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 01:19:11 Z

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

TCE 010843431-02, PDC Light Curves

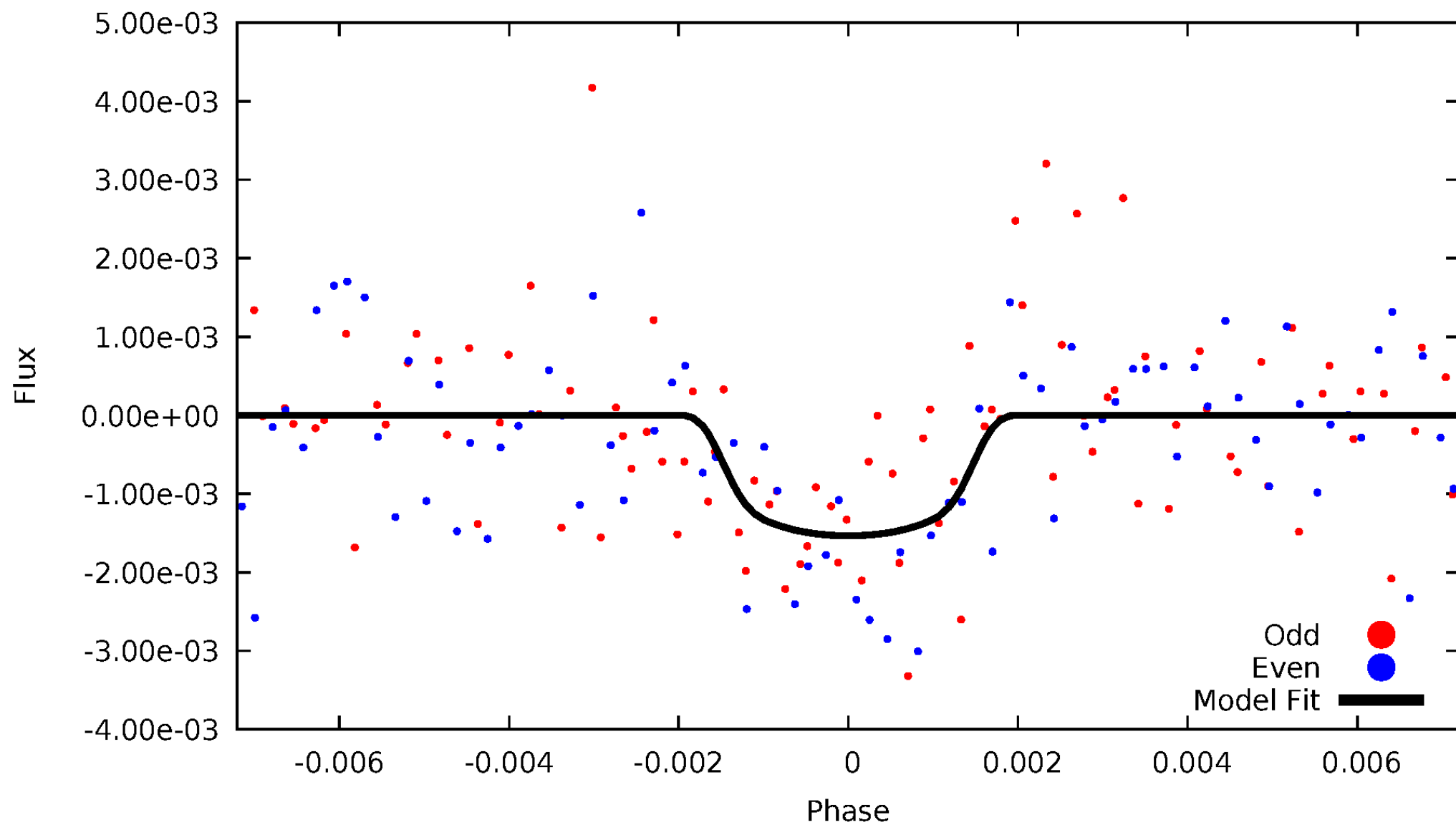


TCE 010843431-02



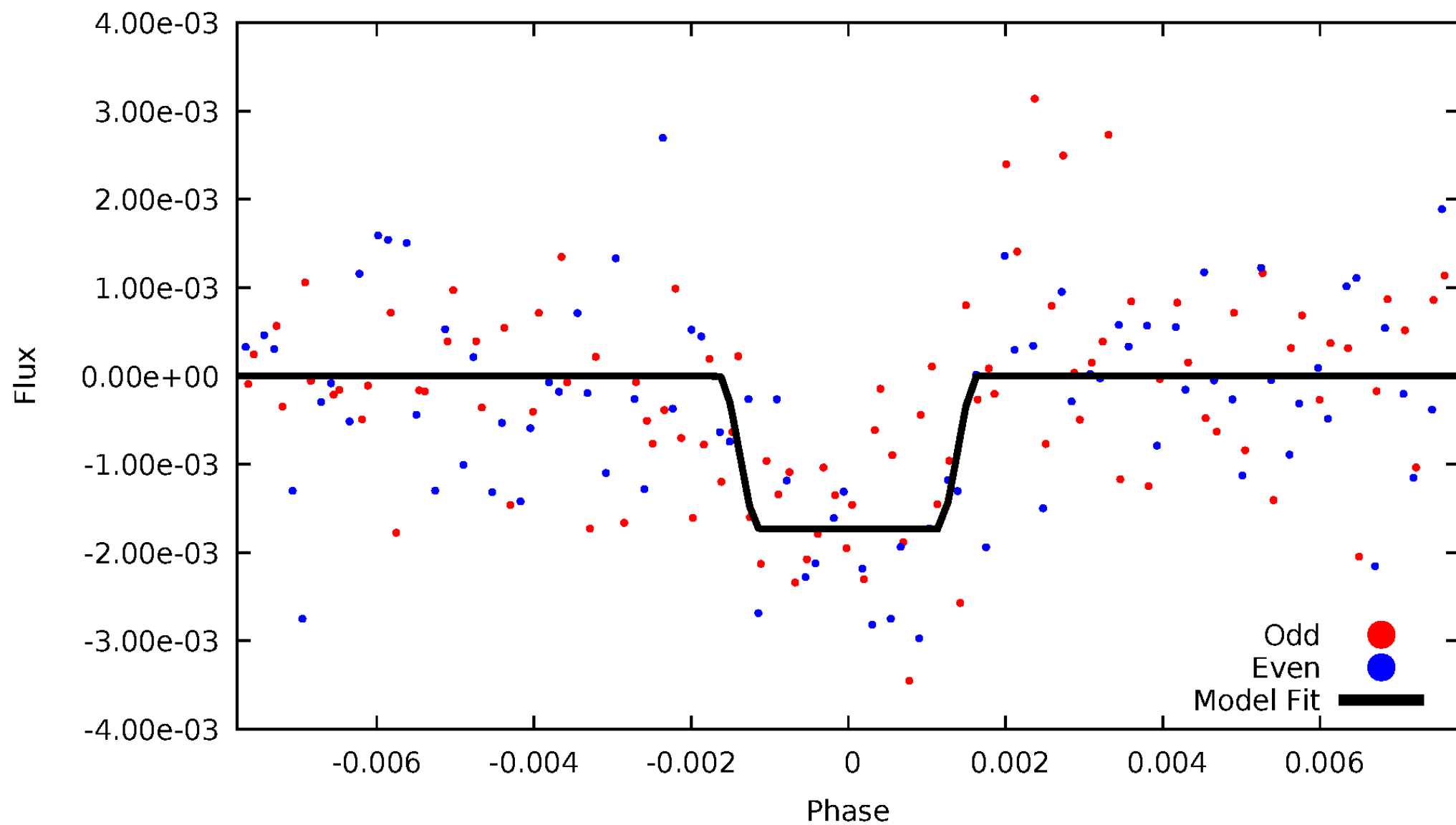
DV Odd/Even

TCE 010843431-02



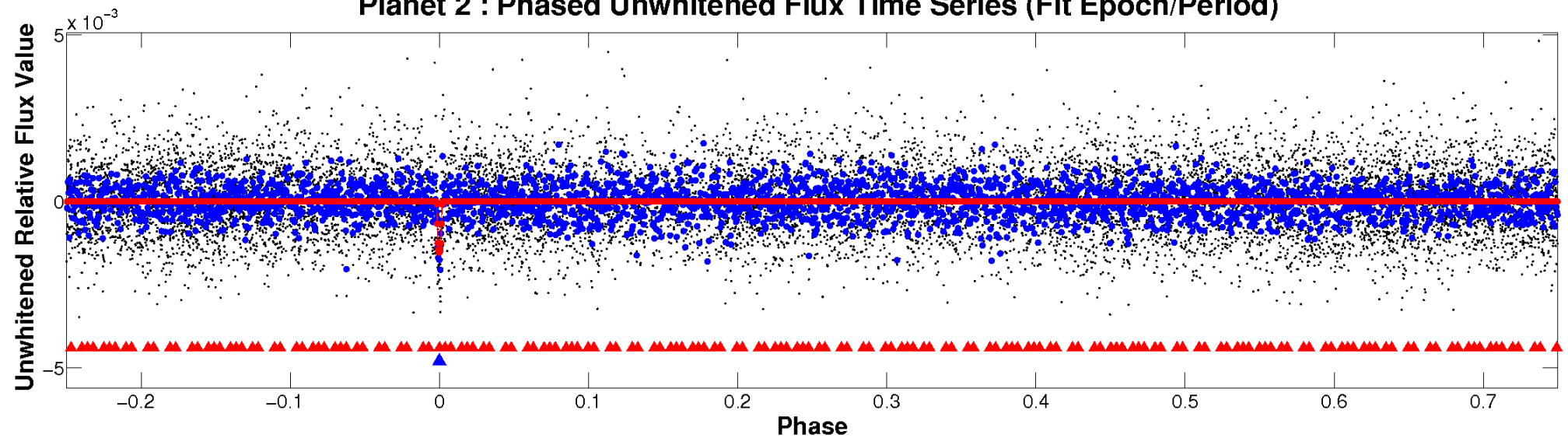
ALT Odd/Even

TCE 010843431-02

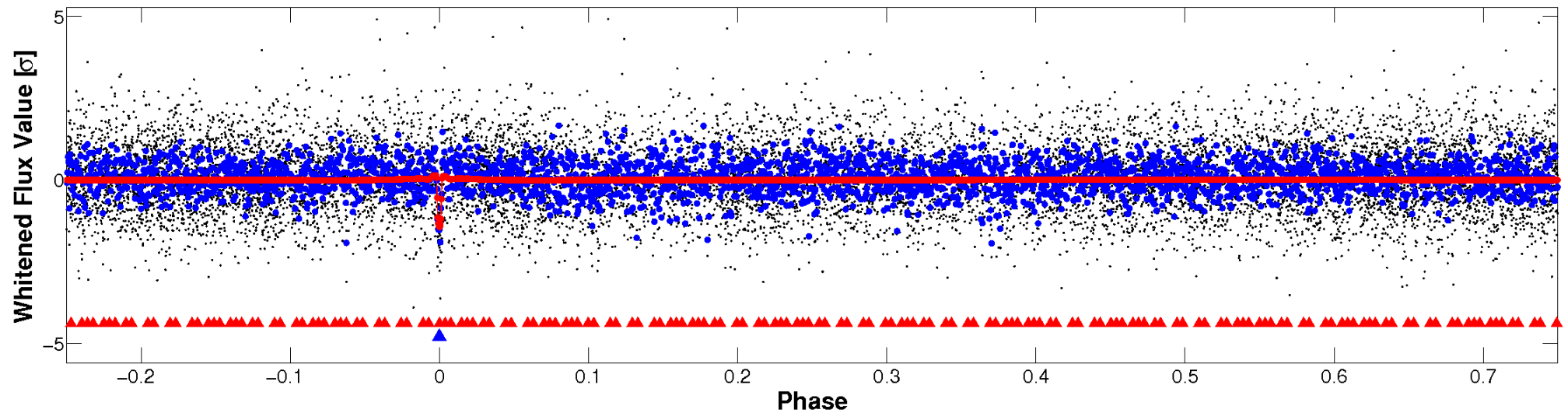


Non-Whitened Vs. Whitened Light Curve

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

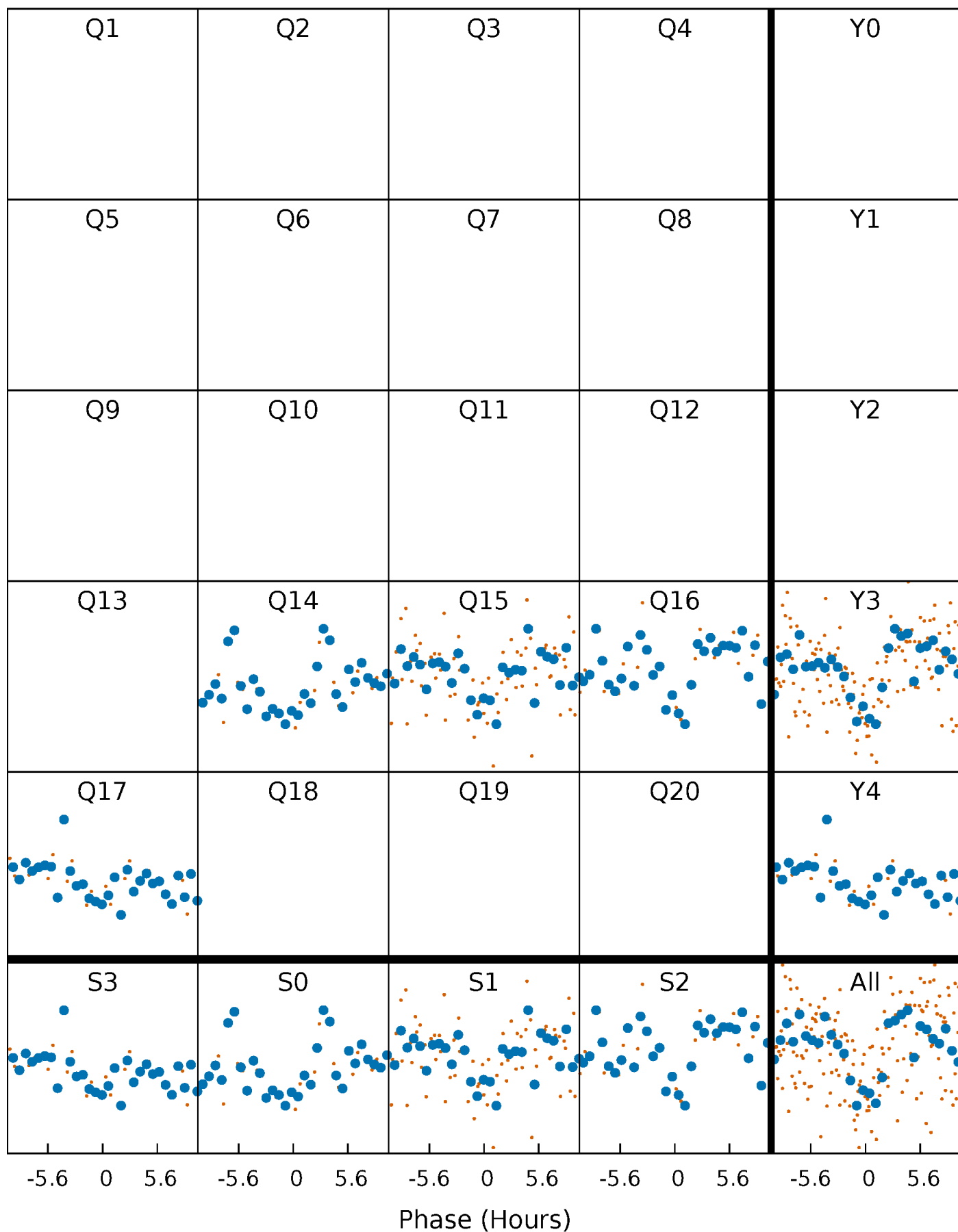


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



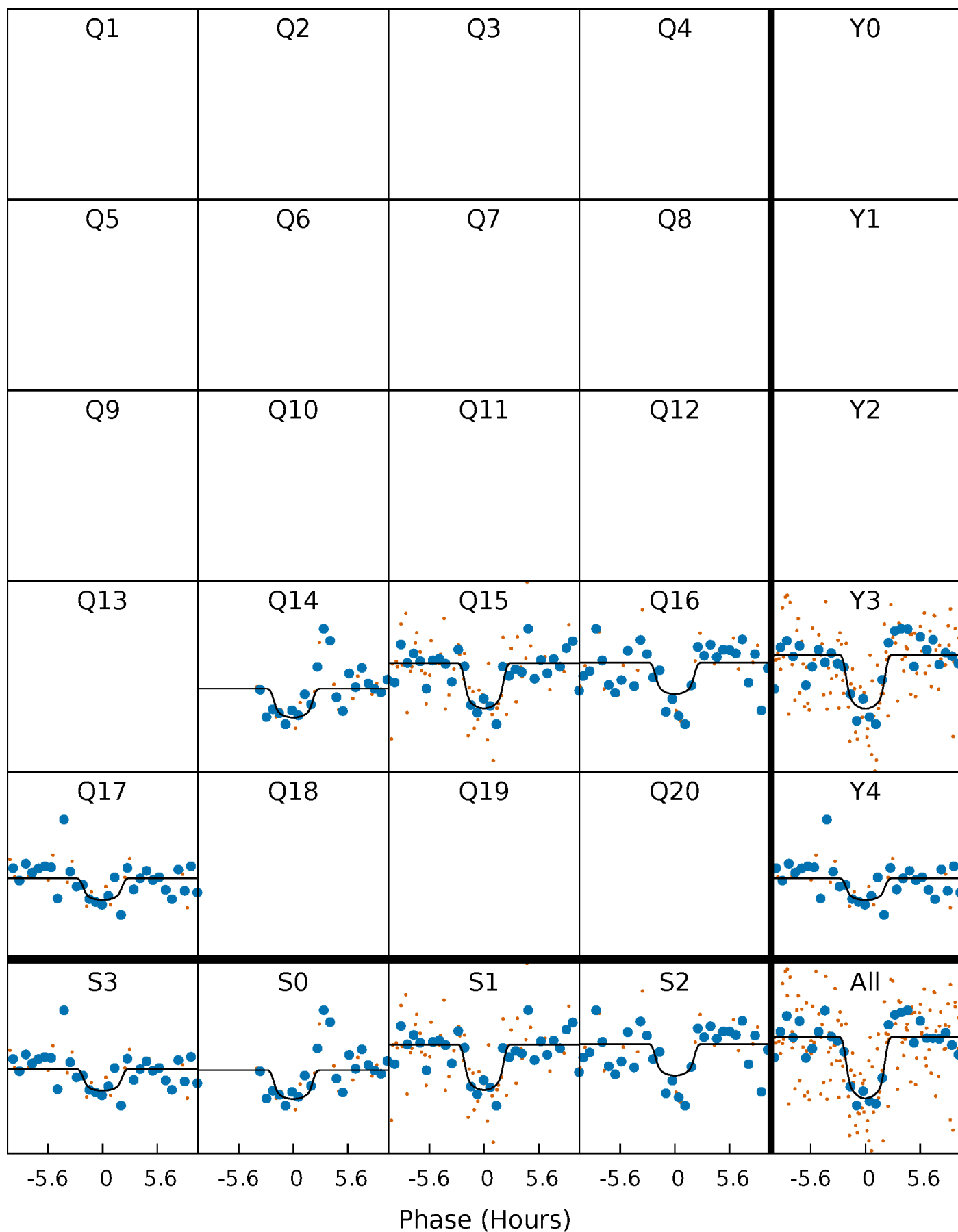
PDC Quarter-Phased Transit Curves

TCE 010843431-02 P= 56.389927 Days $T_0=167.610537$ (BKJD)



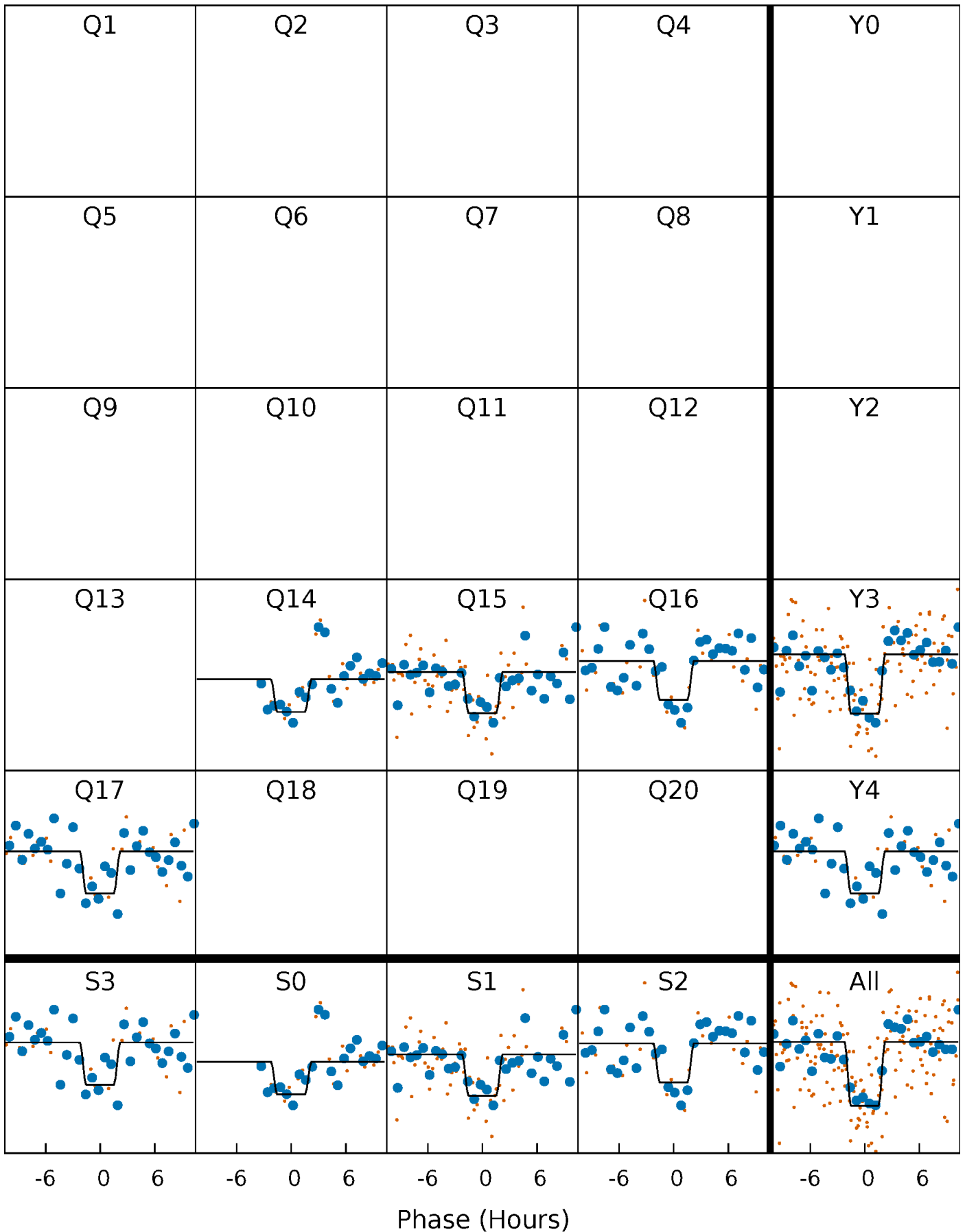
DV Quarter-Phased Transit Curves

TCE 010843431-02 P= 56.389927 Days $T_0=167.610537$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

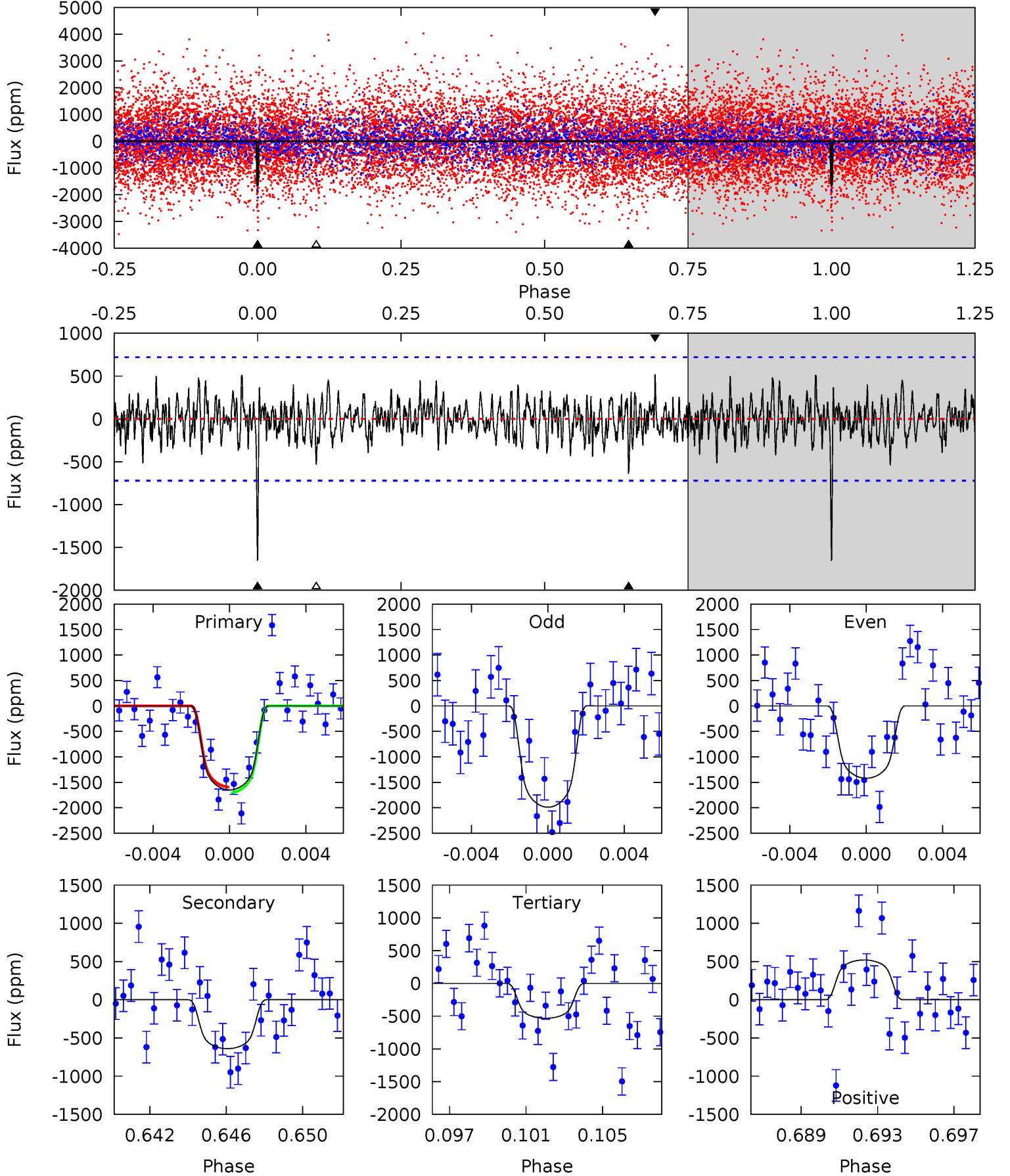
TCE 010843431-02 P= 56.389108 Days $T_0=167.625572$ (BKJD)



DV Model-Shift Uniqueness Test

010843431-02, $P = 56.389927$ Days, $E = 167.610537$ Days

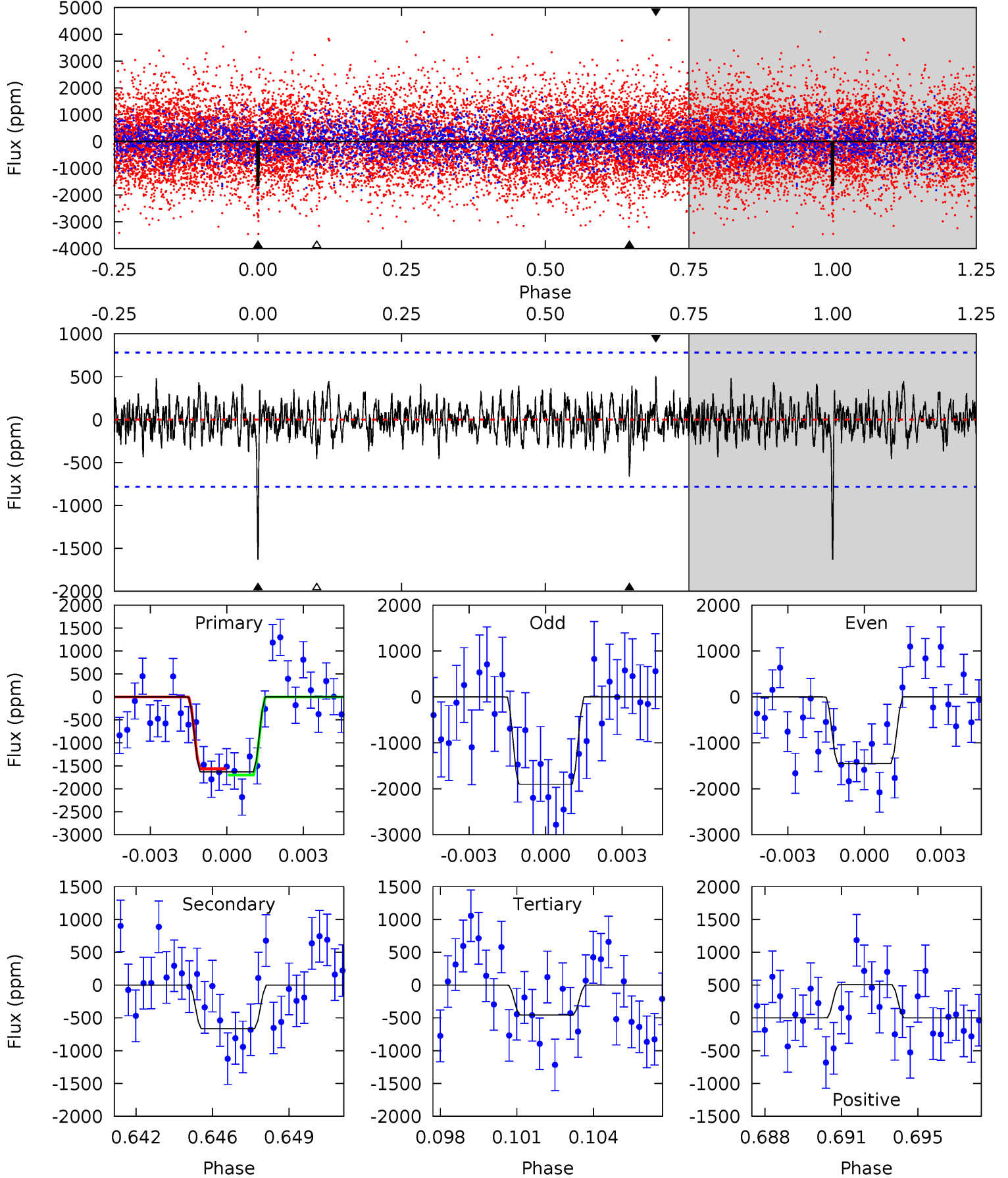
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	4.62	3.85	3.76	5.20	2.89	1.21	8.05	8.14	0.78	0.86	2.02	1.07	0.24	0.41



Alt Model-Shift Uniqueness Test

010843431-02, P = 56.389108 Days, E = 167.625572 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	4.46	3.06	3.39	5.24	2.94	1.01	7.88	7.55	1.41	1.07	1.50	1.12	0.24	0.44



Stellar Parameters For KIC 010843431

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4406^{+154}_{-170}	$4.643^{+0.044}_{-0.032}$	$-0.240^{+0.300}_{-0.300}$	$0.628^{+0.051}_{-0.056}$	$0.632^{+0.063}_{-0.057}$	$3.600^{+0.765}_{-0.484}$
	+3%/-4%	+1%/-1%	+125%/-125%	+8%/-9%	+10%/-9%	+21%/-13%
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 010843431-02 / KOI 7378.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-640 ± 138	$2.93^{+0.81}_{-0.68}$	432^{+18}_{-18}	3622^{+449}_{-278}	2396^{+2187}_{-949}
Alt.	-666 ± 149	$2.84^{+0.74}_{-0.78}$	432^{+17}_{-17}	3714^{+447}_{-311}	2764^{+2516}_{-1133}

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 $A_{obs} \gg 1.0$

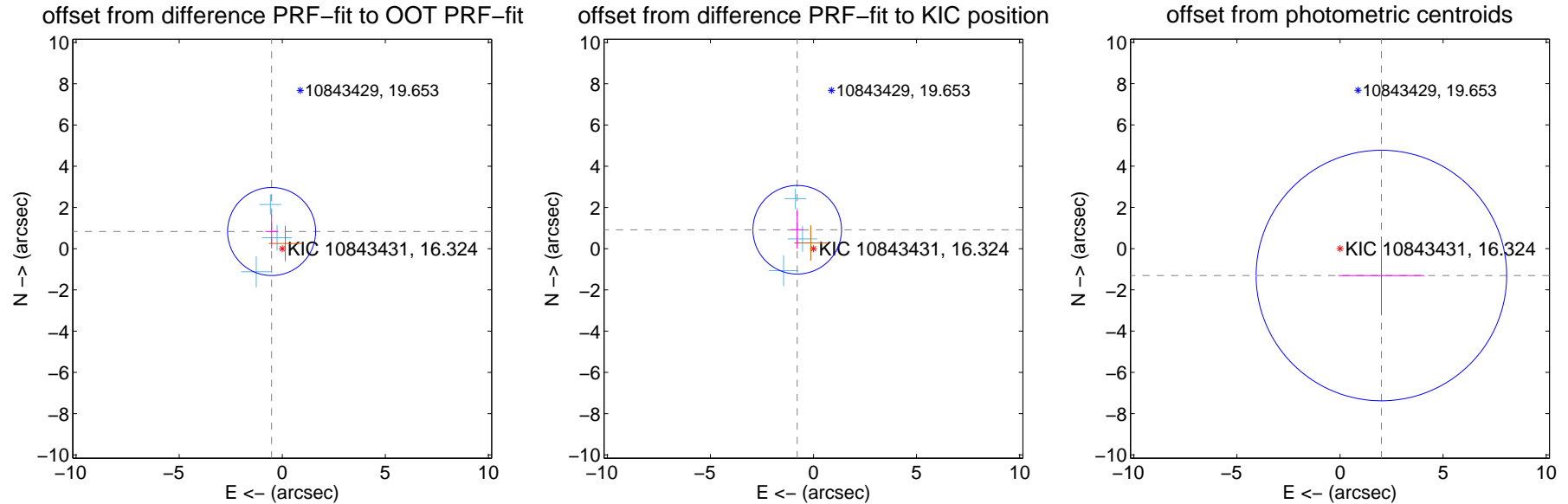
DV Centroid Data

Supplemental centroid analysis for 010843431-02. Kepler magnitude: 16.32. Transit SNR 7.99

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.980 ± 0.712	1.38	0.516 ± 0.308	0.833 ± 0.815
PRF-fit source offset from KIC position	1.211 ± 0.716	1.69	0.789 ± 0.287	0.918 ± 0.912
photometric centroid source offset	2.39 ± 2.02	1.18	-2.01 ± 2.08	-1.30 ± 1.88



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



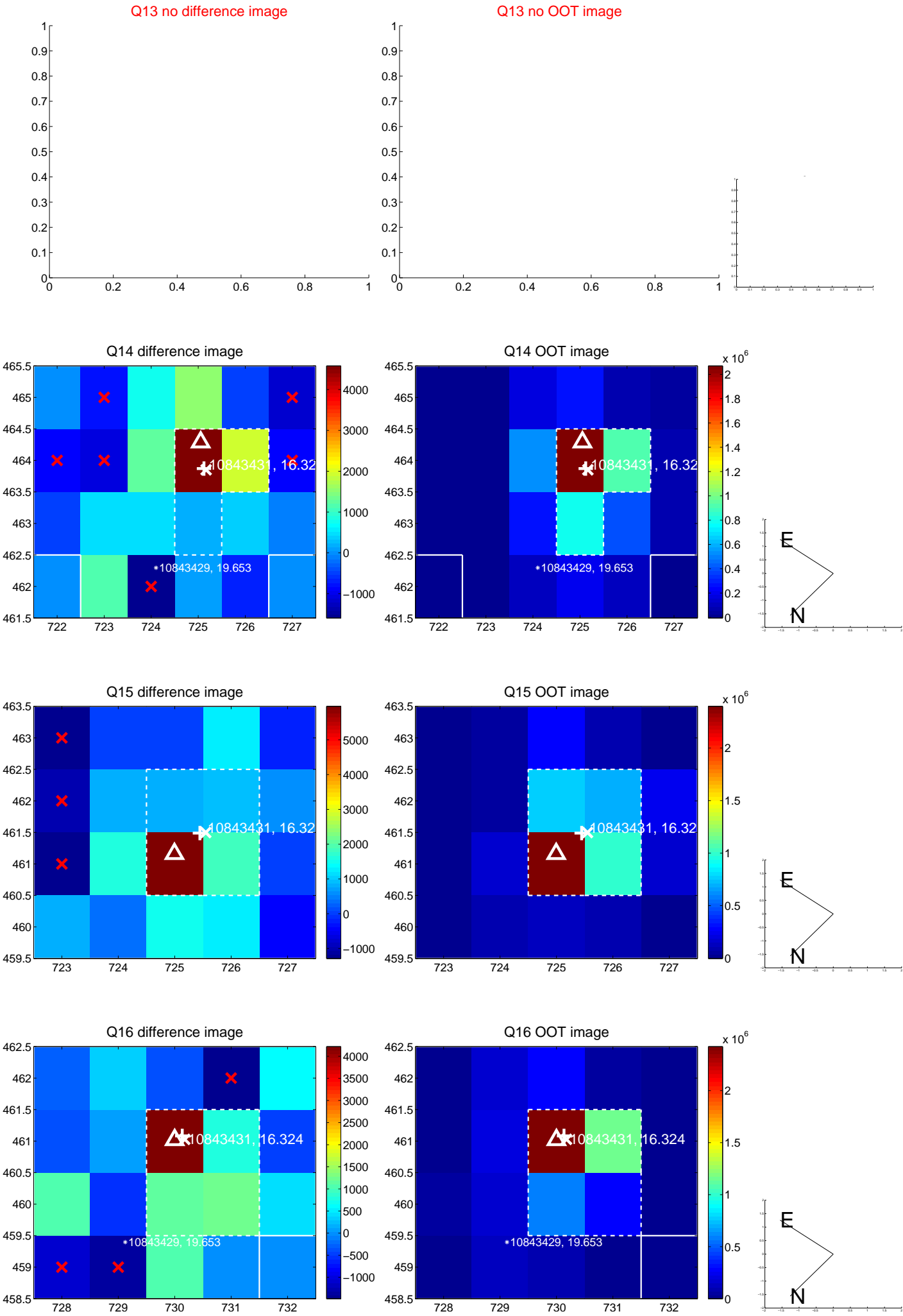
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



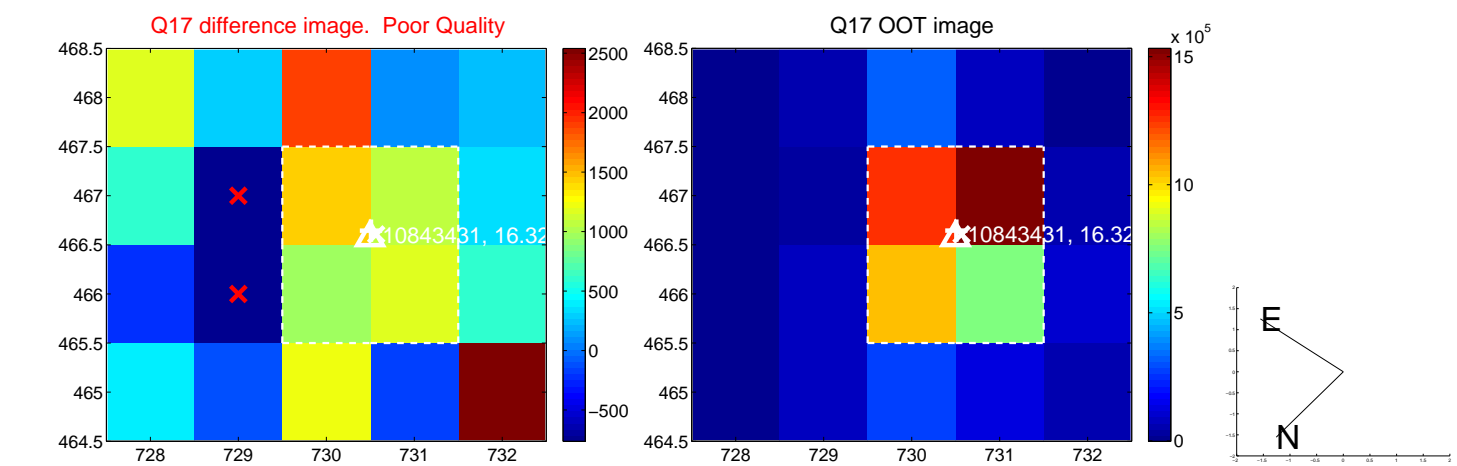
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



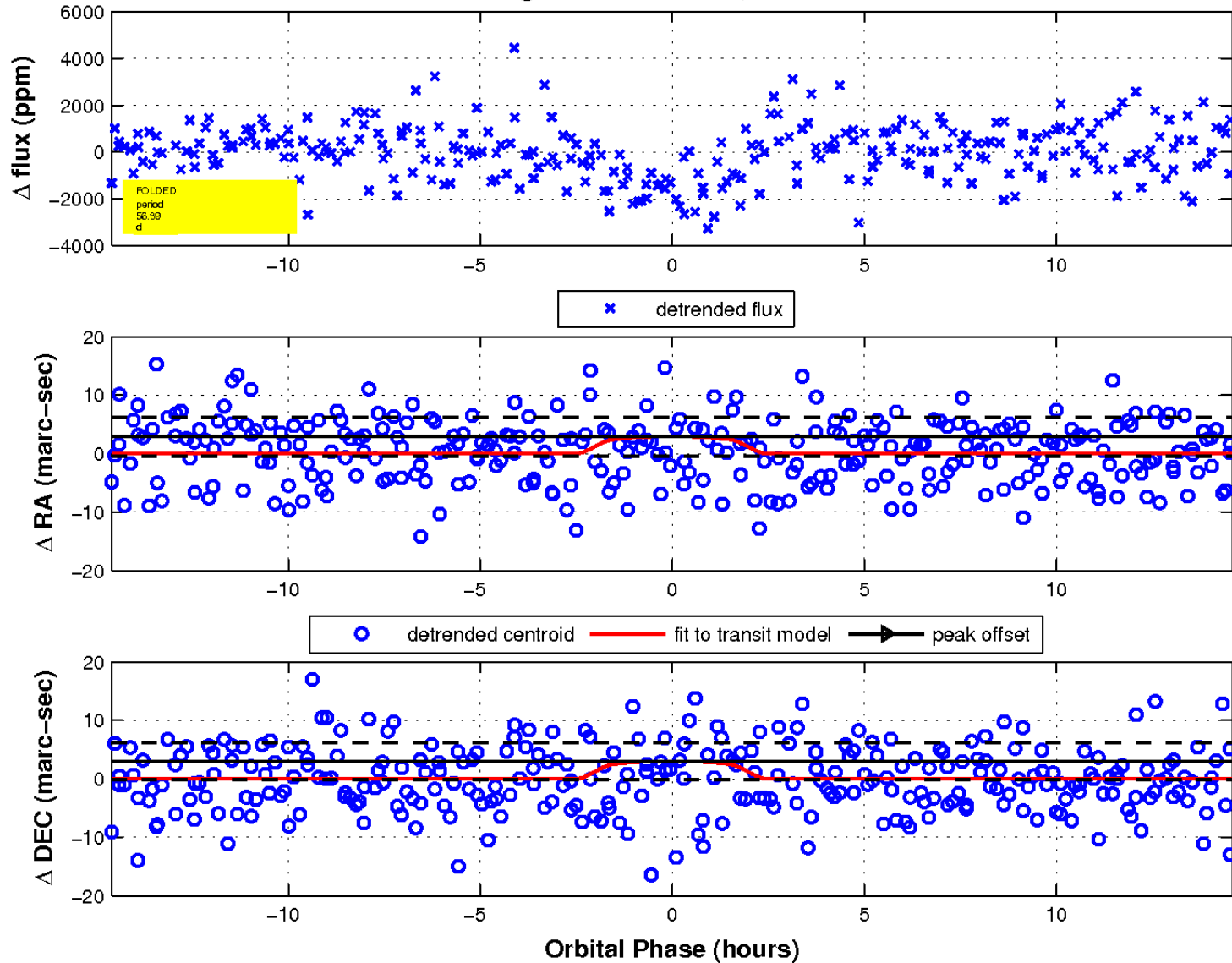
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

