

KIC 009813678

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})
009813678-01	OBS	7964.01	0.505083	131.922499	24938.8	1.261	564.1	463.6	1.84	5398	40.33	19099.67
009813678-02	OBS	No	0.505086	131.659577	16497.6	1.476	461.8	406.5	1.84	5398	31.12	19099.50

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009813678-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009813678-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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

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

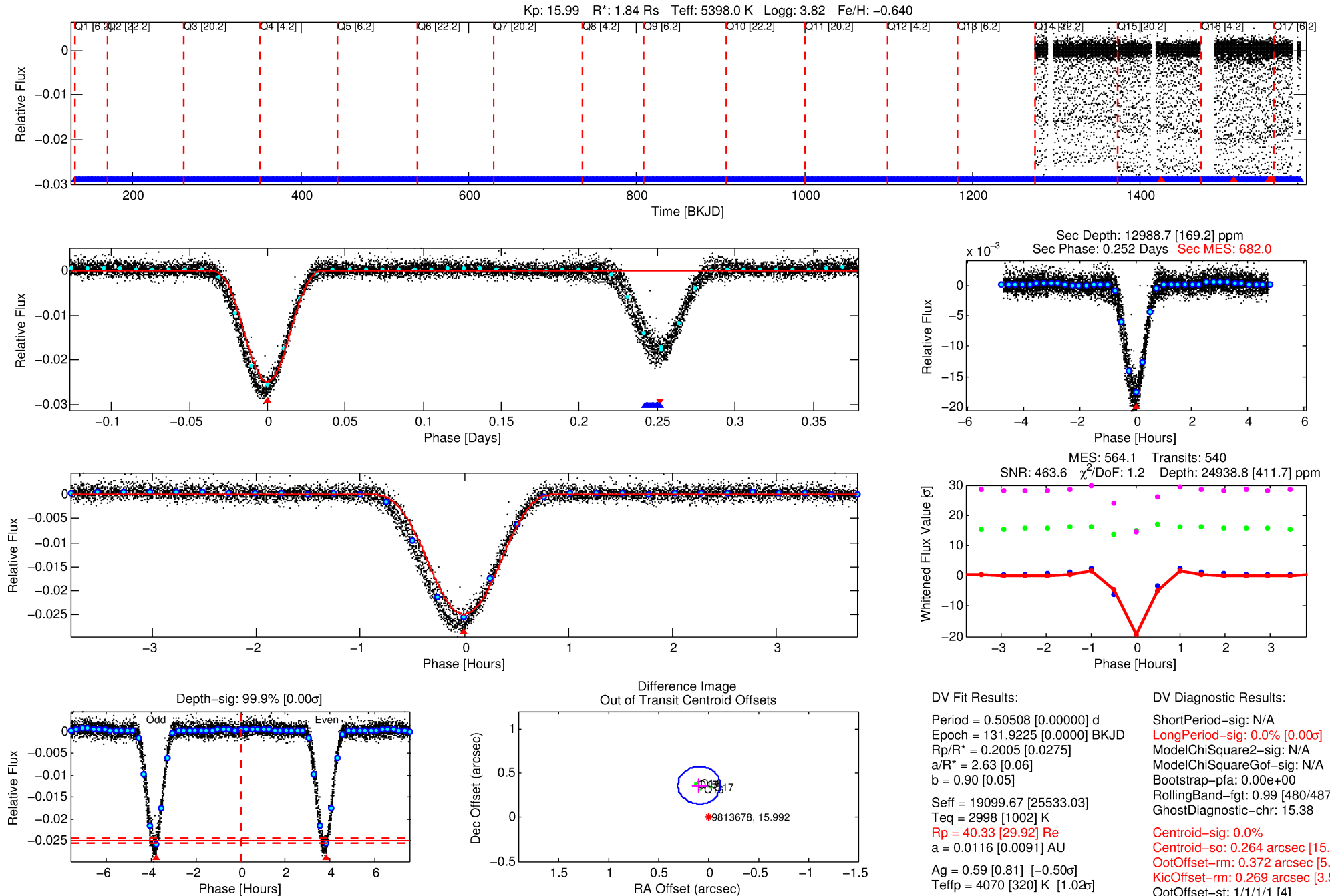
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009813678-01

No Significant Match Found

DV One-Page Summary

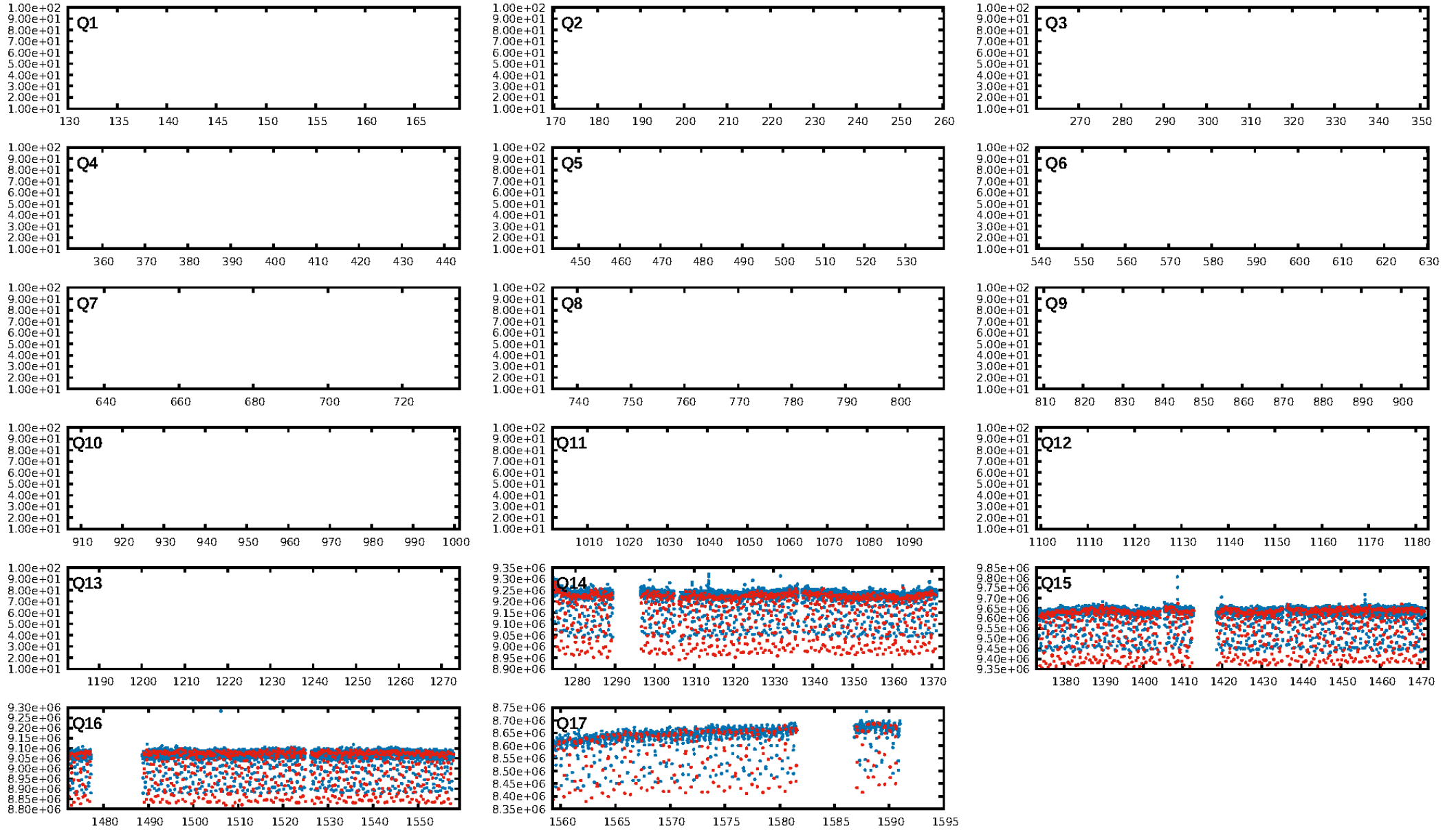
KIC: 9813678 Candidate: 1 of 2 Period: 0.505 d



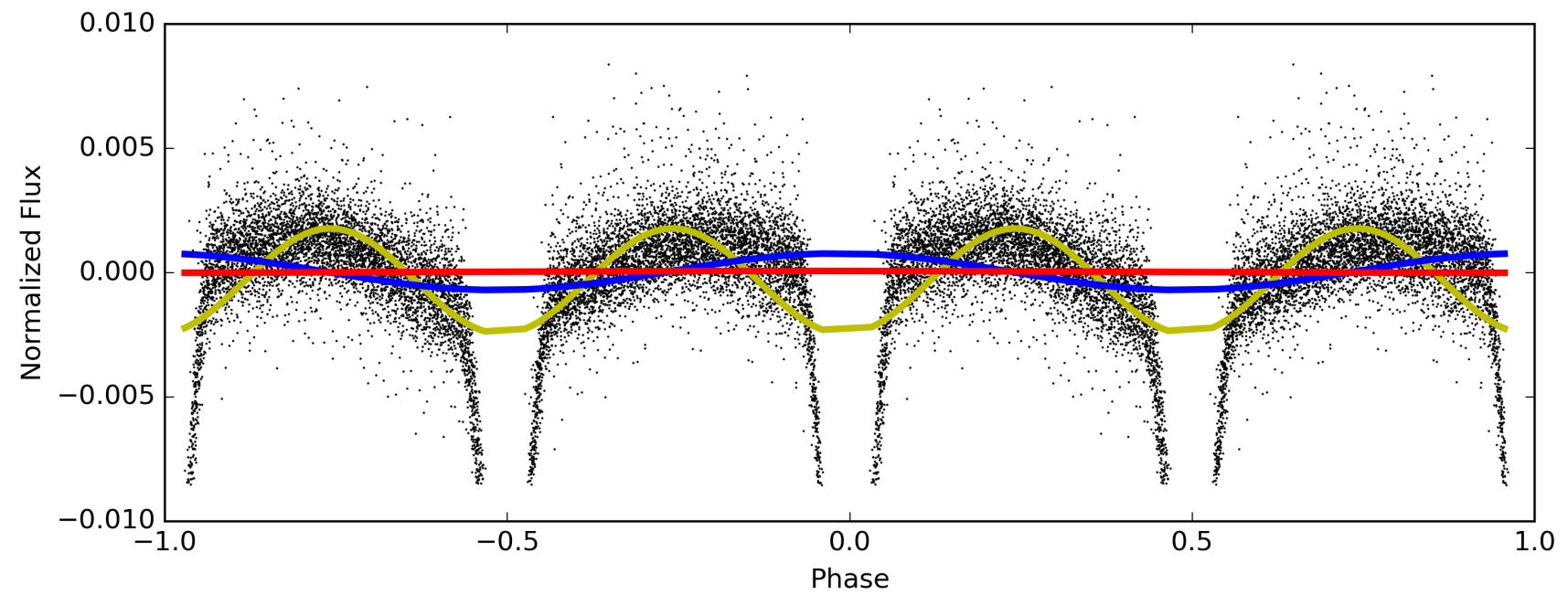
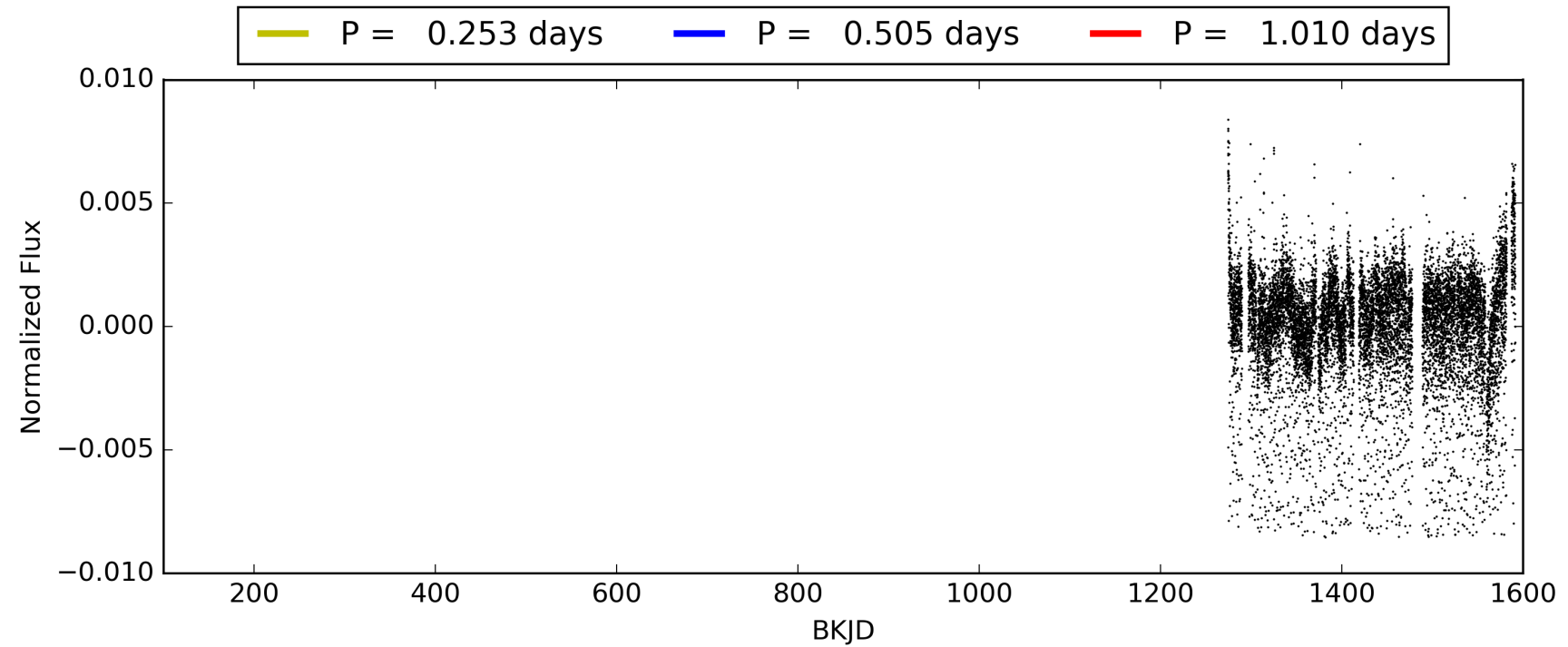
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:36:17 Z

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

TCE 009813678-01, PDC Light Curves

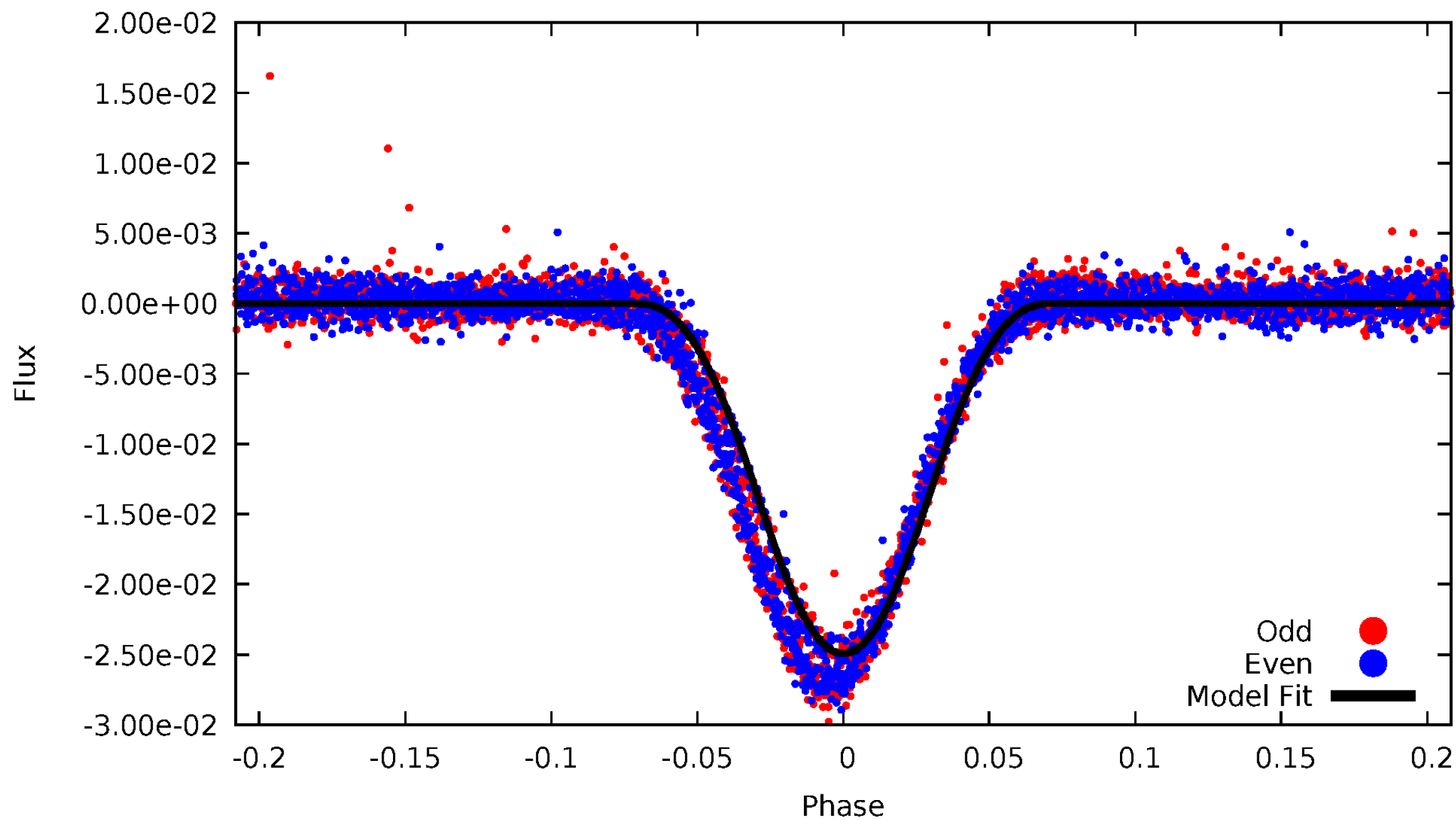


TCE 009813678-01



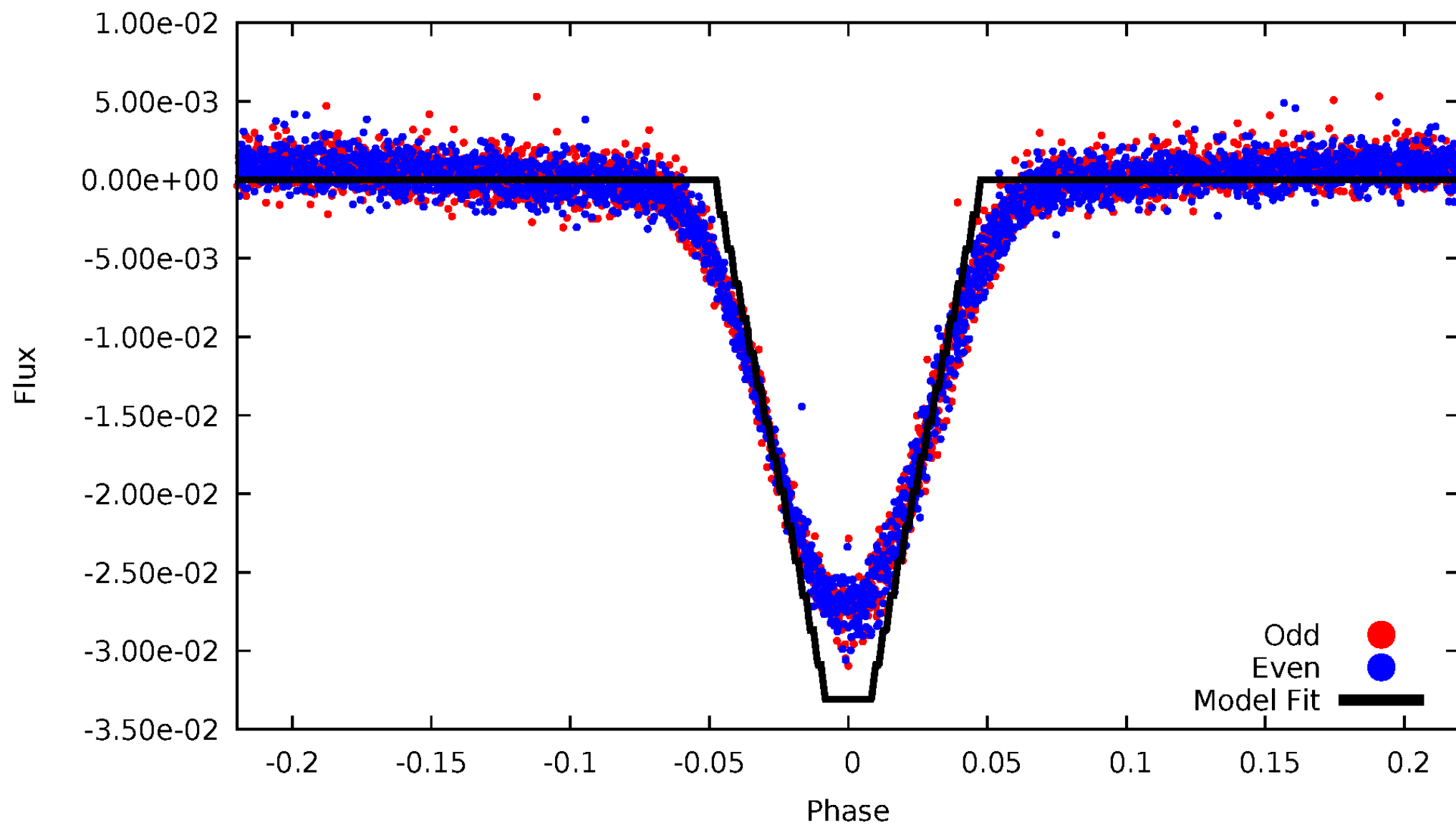
DV Odd/Even

TCE 009813678-01



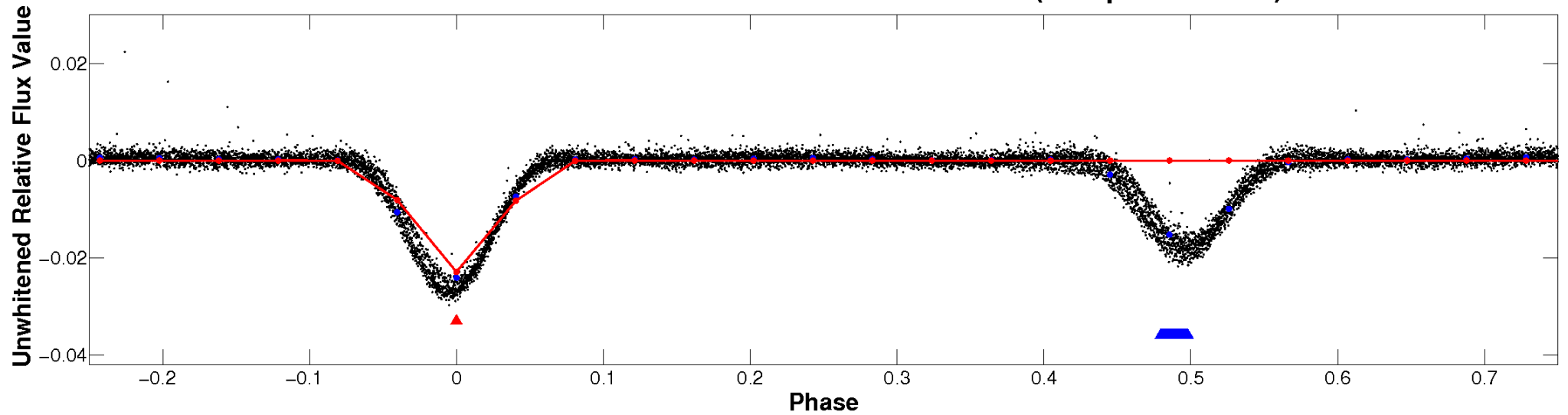
ALT Odd/Even

TCE 009813678-01

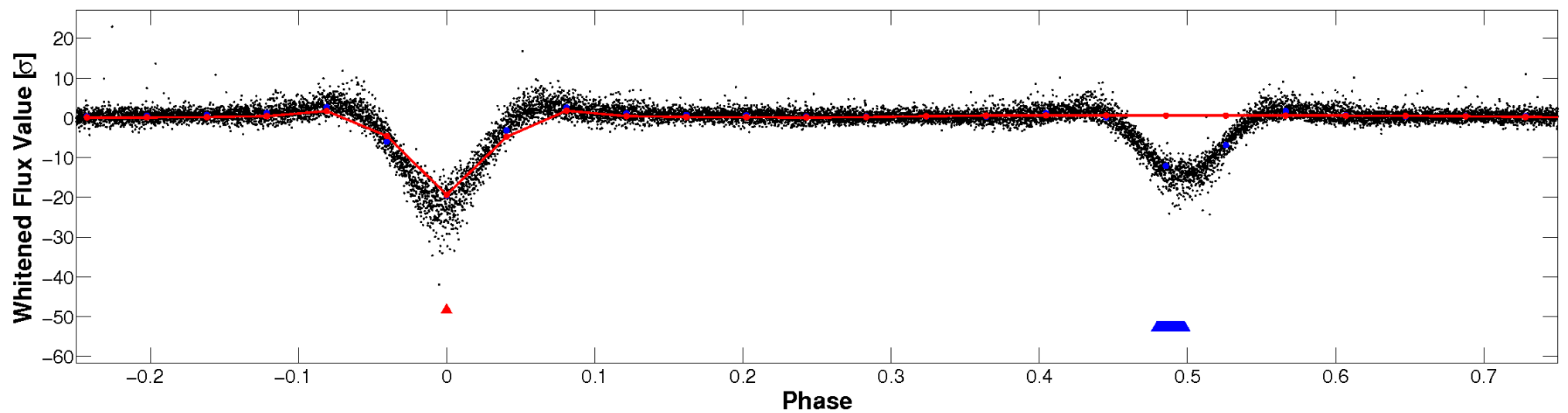


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

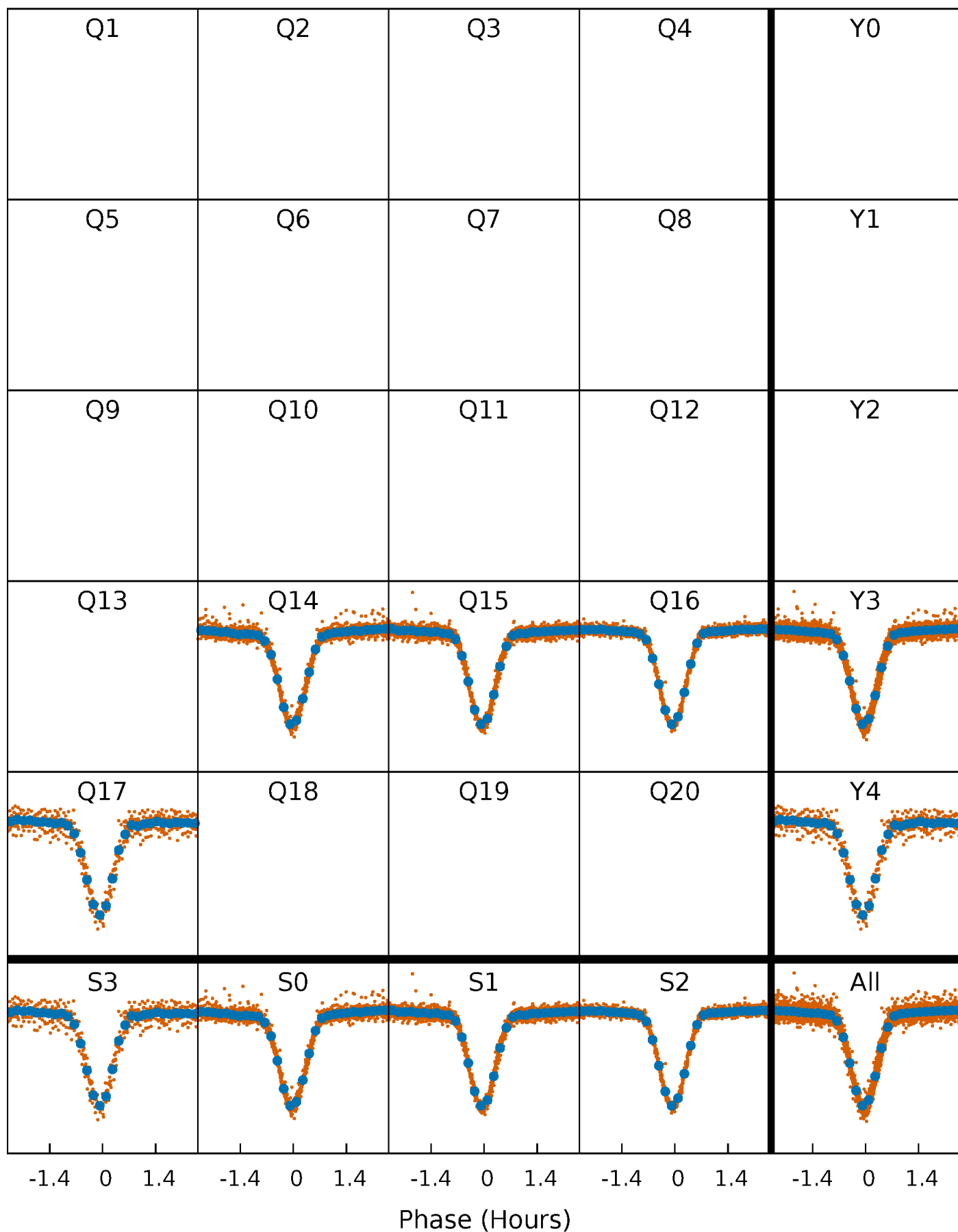


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



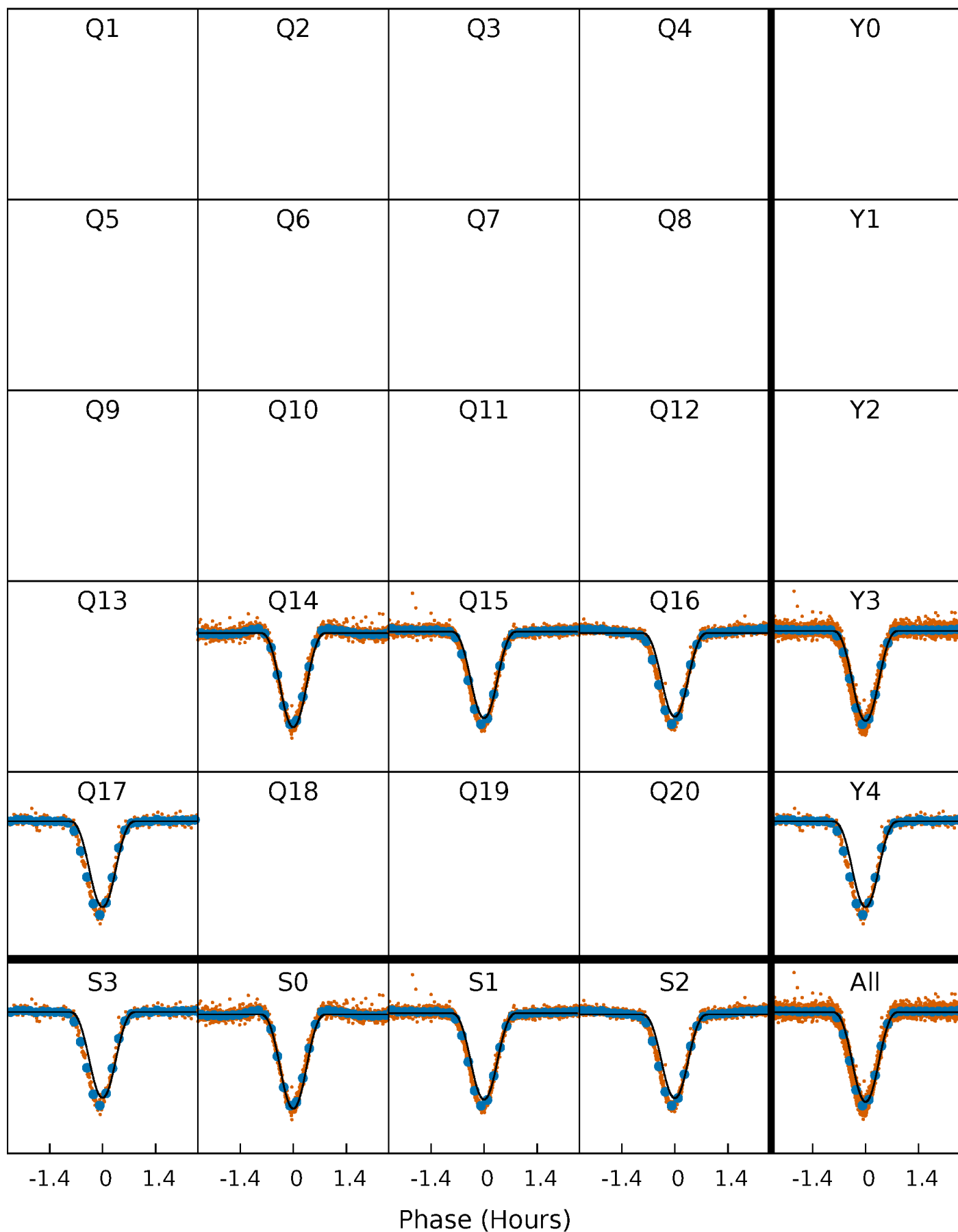
PDC Quarter-Phased Transit Curves

TCE 009813678-01 P= 0.505083 Days $T_0=131.922499$ (BKJD)



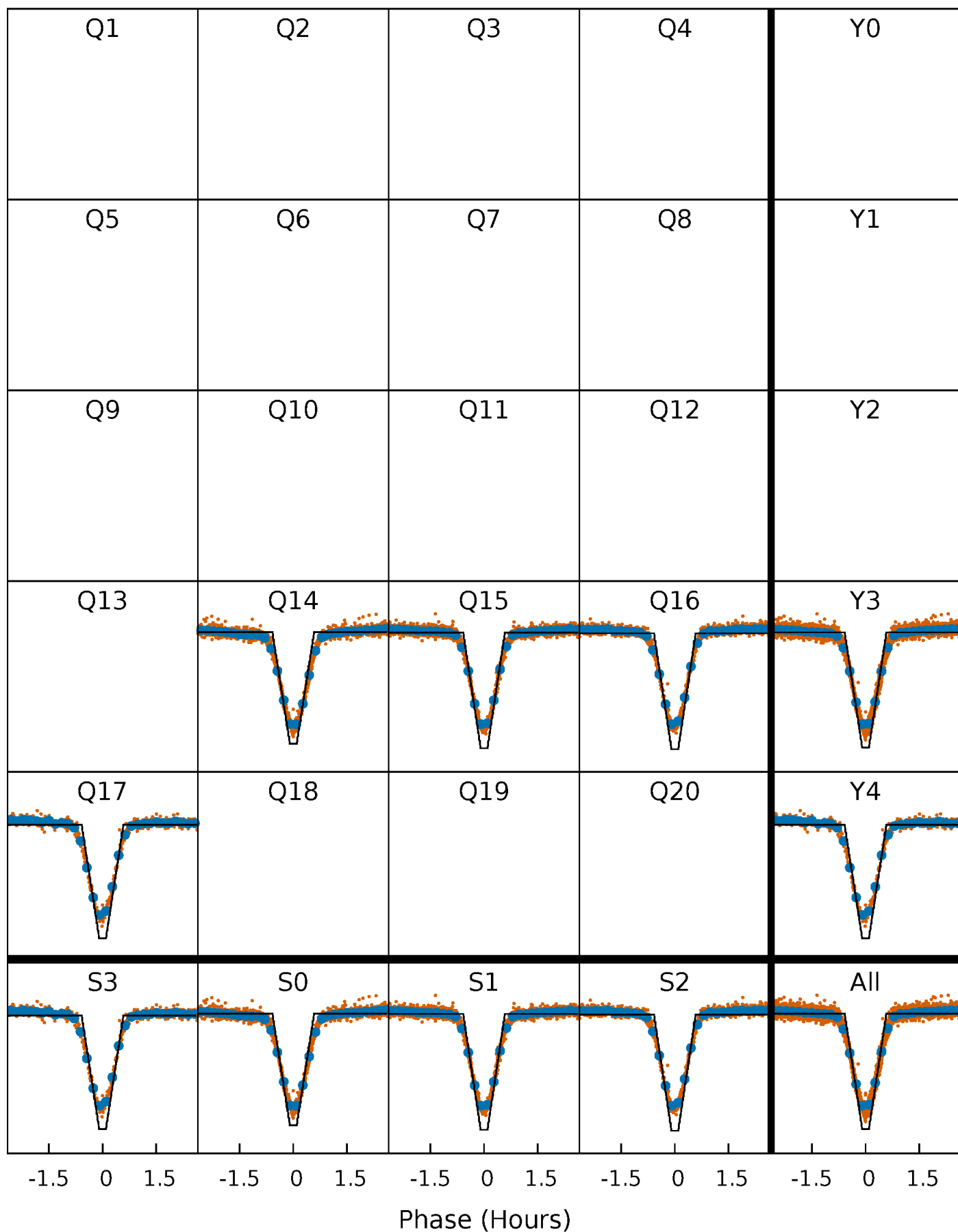
DV Quarter-Phased Transit Curves

TCE 009813678-01 P= 0.505083 Days $T_0=131.922499$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

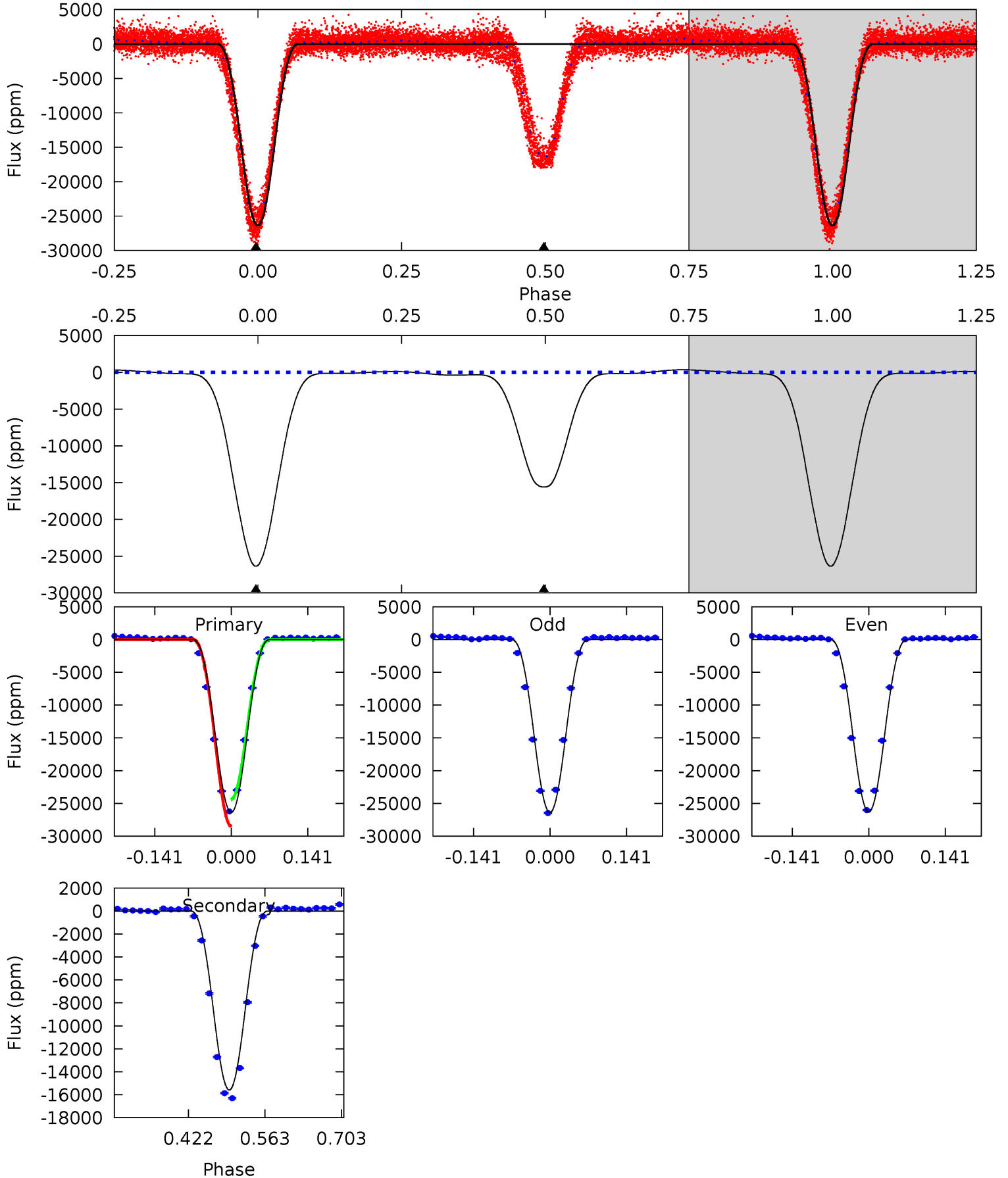
TCE 009813678-01 P= 0.505082 Days $T_0=131.922886$ (BKJD)



DV Model-Shift Uniqueness Test

009813678-01, P = 0.505083 Days, E = 131.922499 Days

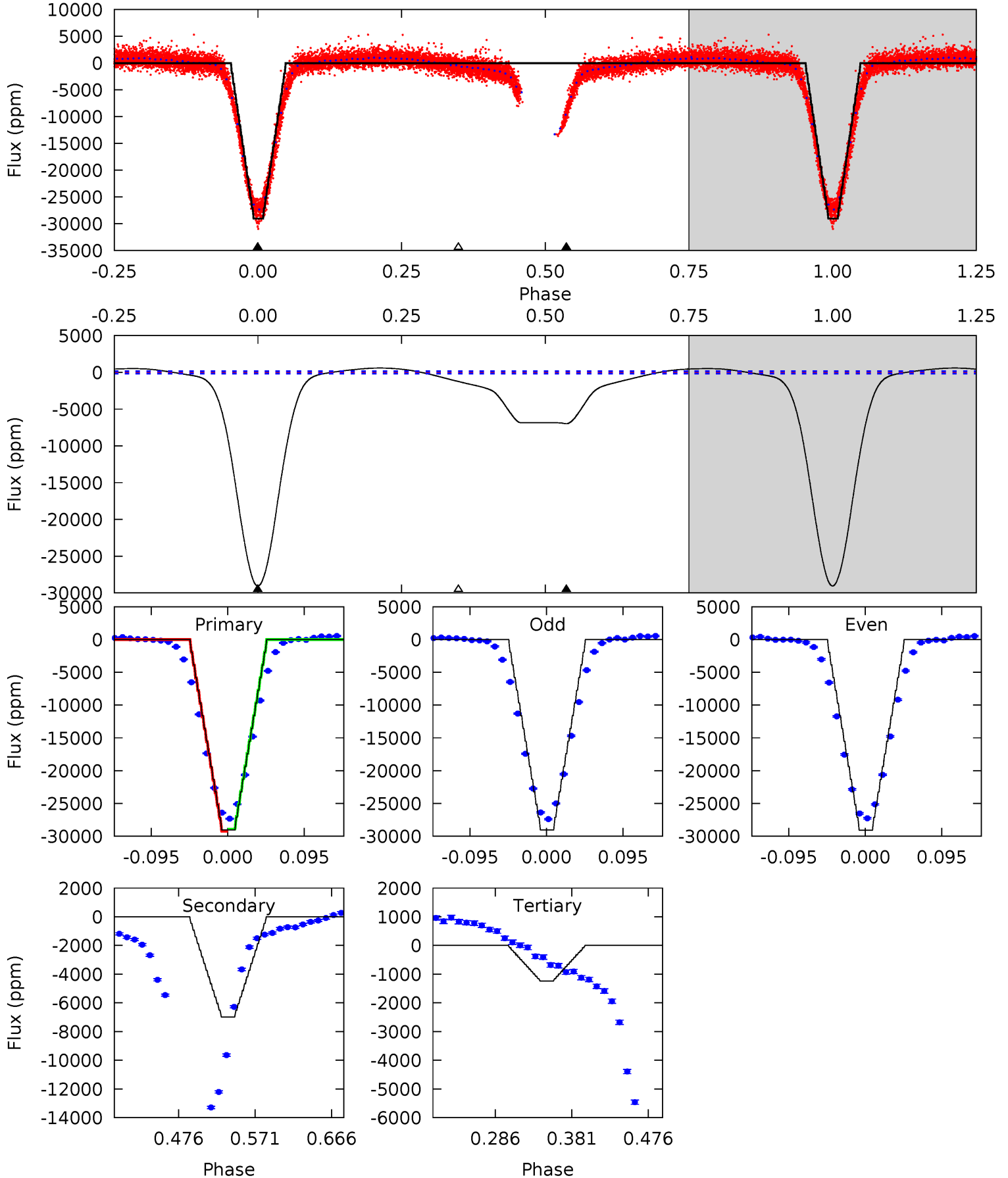
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1150	680.1	0	0	4.49	1.47	8.69	1150	1150	680.1	680.1	1.41	0.98	0.01	89.3



Alt Model-Shift Uniqueness Test

009813678-01, P = 0.505082 Days, E = 131.922886 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
853.3	205.2	36.4	0	4.58	1.67	34.2	817.0	853.3	168.9	205.2	0.46	1.00	0.02	5.25



Stellar Parameters For KIC 009813678

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5398^{+208}_{-170}	$3.822^{+0.805}_{-0.345}$	$-0.640^{+0.350}_{-0.250}$	$1.843^{+1.344}_{-1.100}$	$0.821^{+0.204}_{-0.110}$	$0.185^{+2.858}_{-0.118}$
	+4%/-3%	+21%/-9%	+55%/-39%	+73%/-60%	+25%/-13%	+1547%/-64%
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 009813678-01 / KOI 7964.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-15594 ± 23	$38.25^{+16.04}_{-13.65}$	4098^{+705}_{-752}	4077^{+422}_{-636}	$0.824^{+1.134}_{-0.409}$
Alt.	-6984 ± 34	$34.96^{+14.08}_{-11.46}$	4084^{+689}_{-761}	3297^{+549}_{-6533}	$0.440^{+0.568}_{-0.211}$

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 $A_{obs} \gg 1.0$

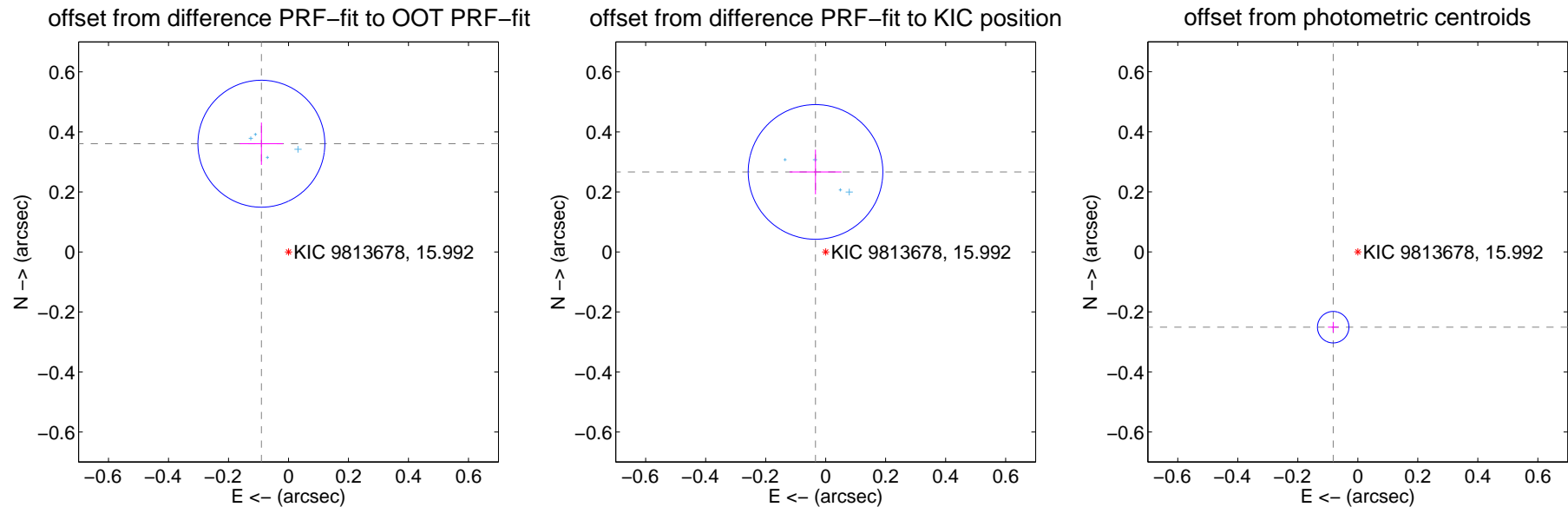
DV Centroid Data

Supplemental centroid analysis for 009813678-01. Kepler magnitude: 15.99. Transit SNR 463.57

There are 4 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.372 ± 0.071	5.27	0.090 ± 0.072	0.361 ± 0.070
PRF-fit source offset from KIC position	0.269 ± 0.075	3.59	0.034 ± 0.087	0.267 ± 0.075
photometric centroid source offset	0.26 ± 0.02	15.10	0.08 ± 0.02	-0.25 ± 0.02



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.



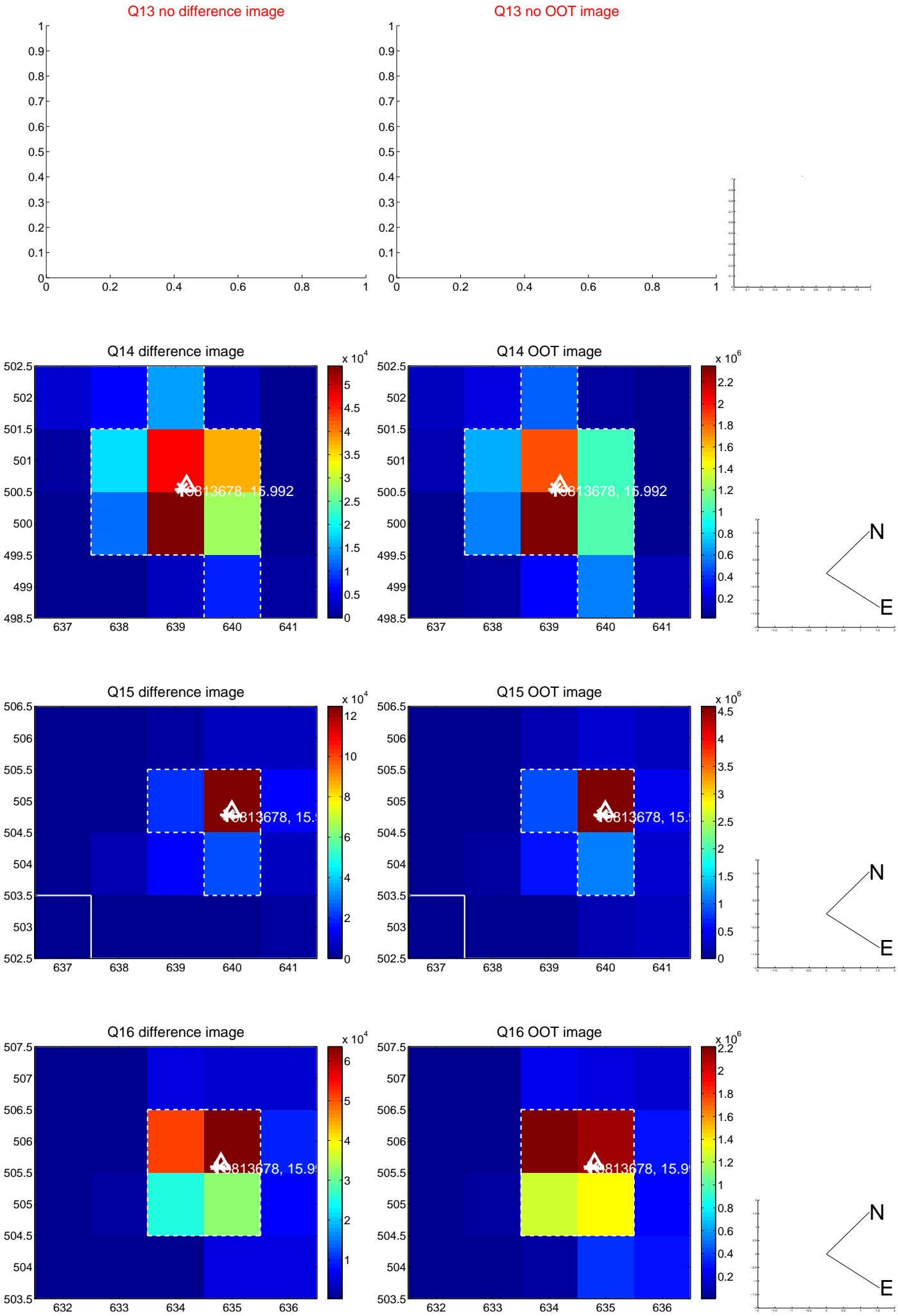
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



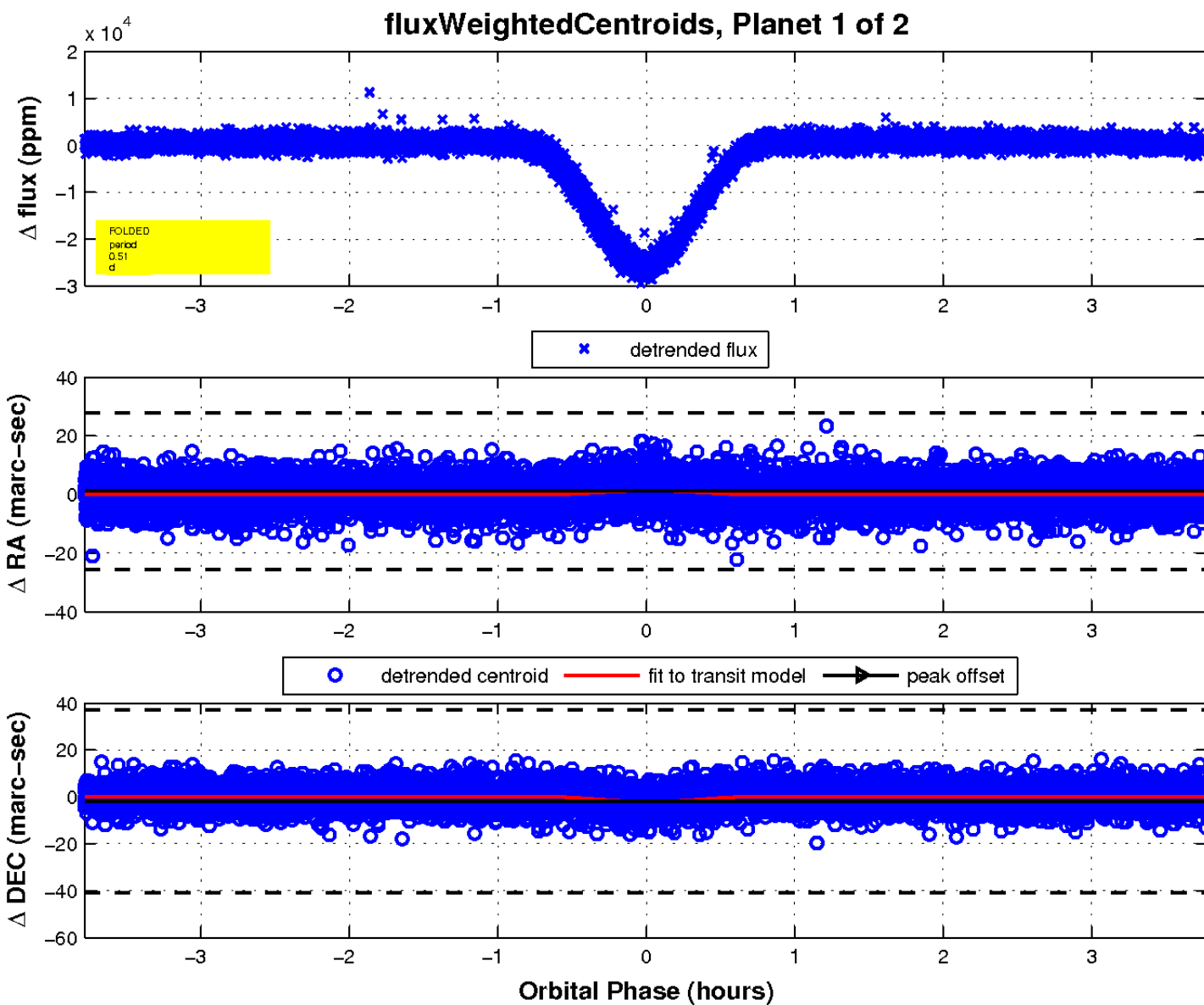
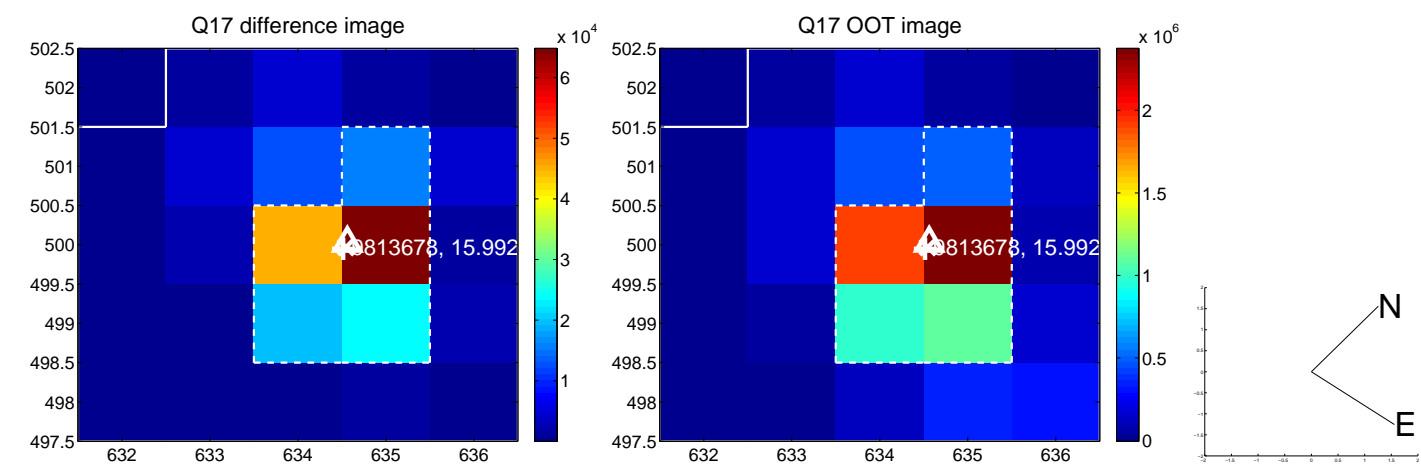
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

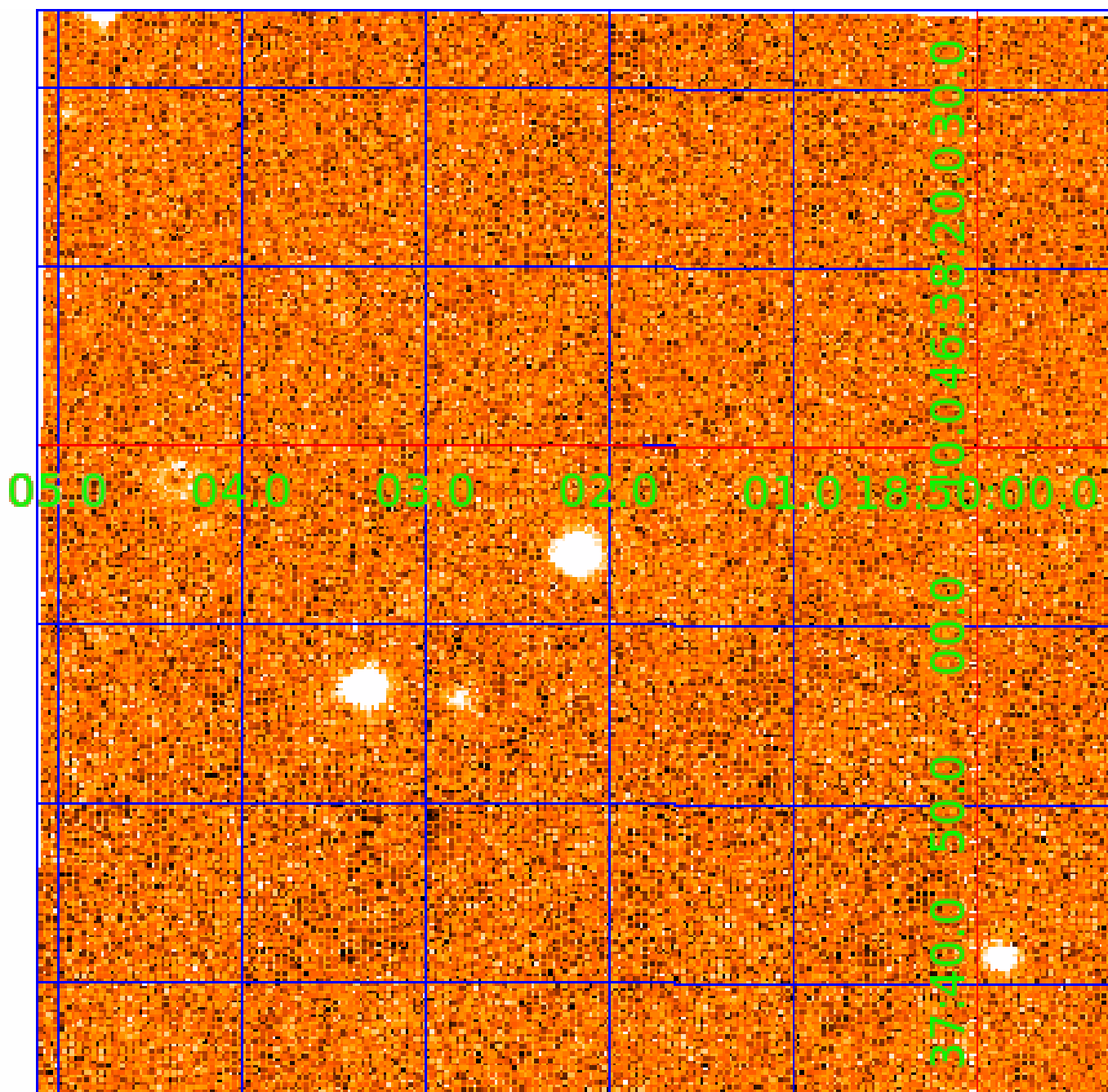


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009813678

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})
009813678-01	OBS	7964.01	0.505083	131.922499	24938.8	1.261	564.1	463.6	1.84	5398	40.33	19099.67
009813678-02	OBS	No	0.505086	131.659577	16497.6	1.476	461.8	406.5	1.84	5398	31.12	19099.50

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009813678-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
009813678-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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

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

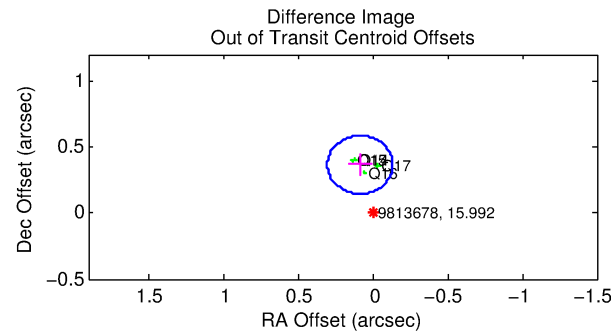
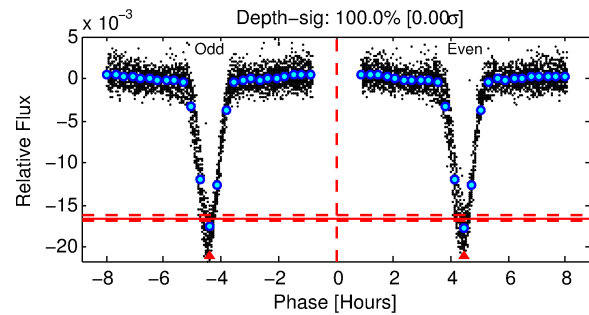
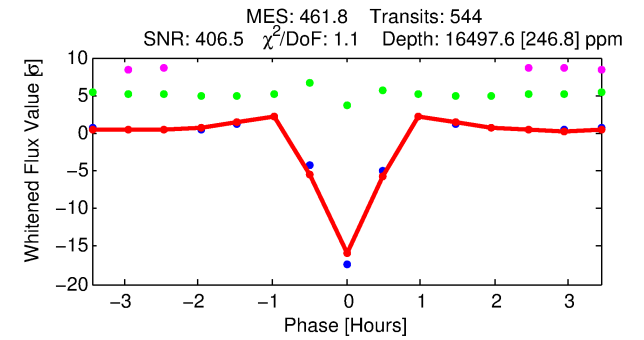
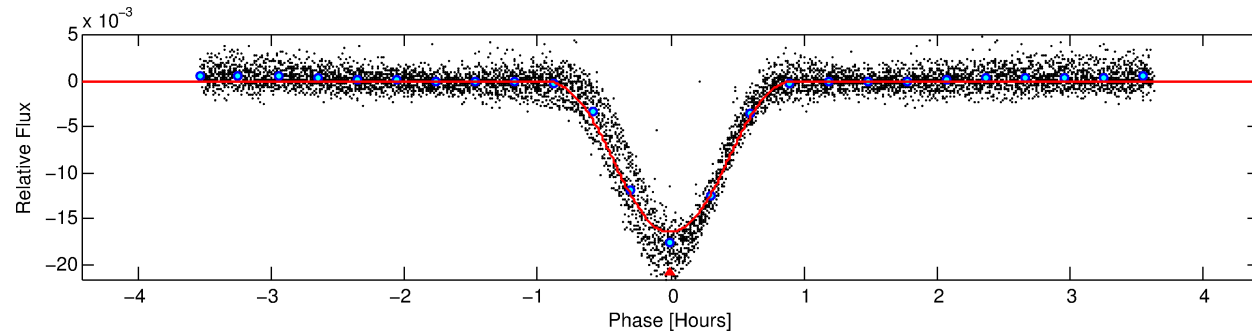
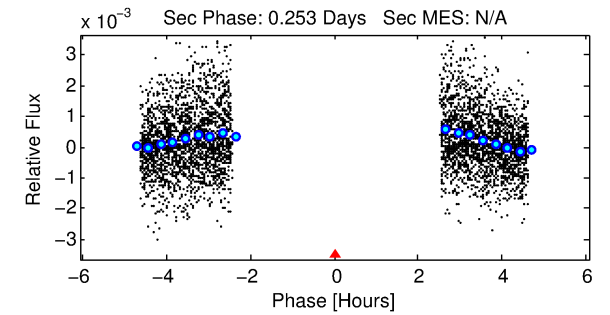
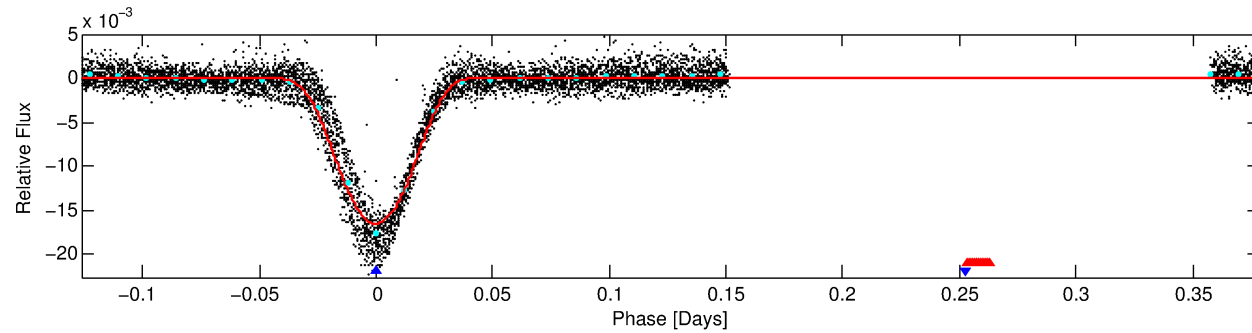
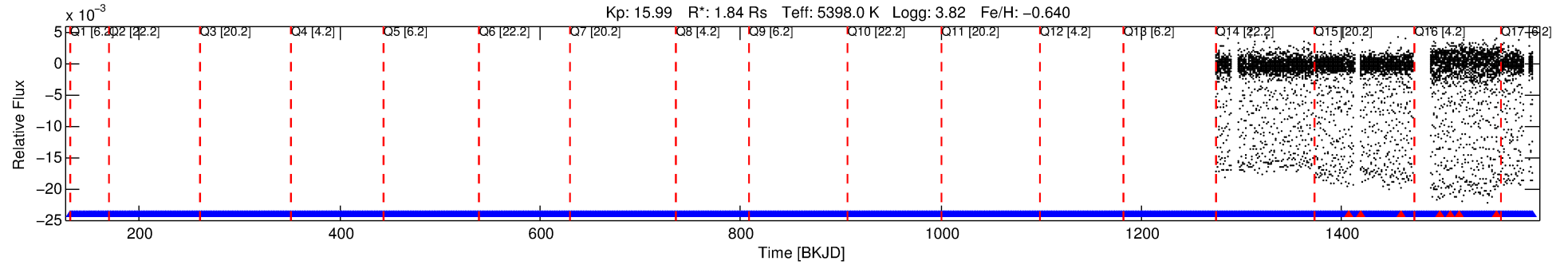
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009813678-02

No Significant Match Found

DV One-Page Summary

KIC: 9813678 Candidate: 2 of 2 Period: 0.505 d



DV Fit Results:

Period = 0.50509 [0.00000] d
Epoch = 131.6596 [0.0000] BKJD
Rp/R* = 0.1547 [0.0090]
a/R* = 2.14 [0.03]
b = 0.90 [0.02]
Seff = 19099.50 [25532.81]
Teq = 2998 [1002] K
Rp = 31.12 [22.77] Re
a = 0.0116 [0.0091] AU

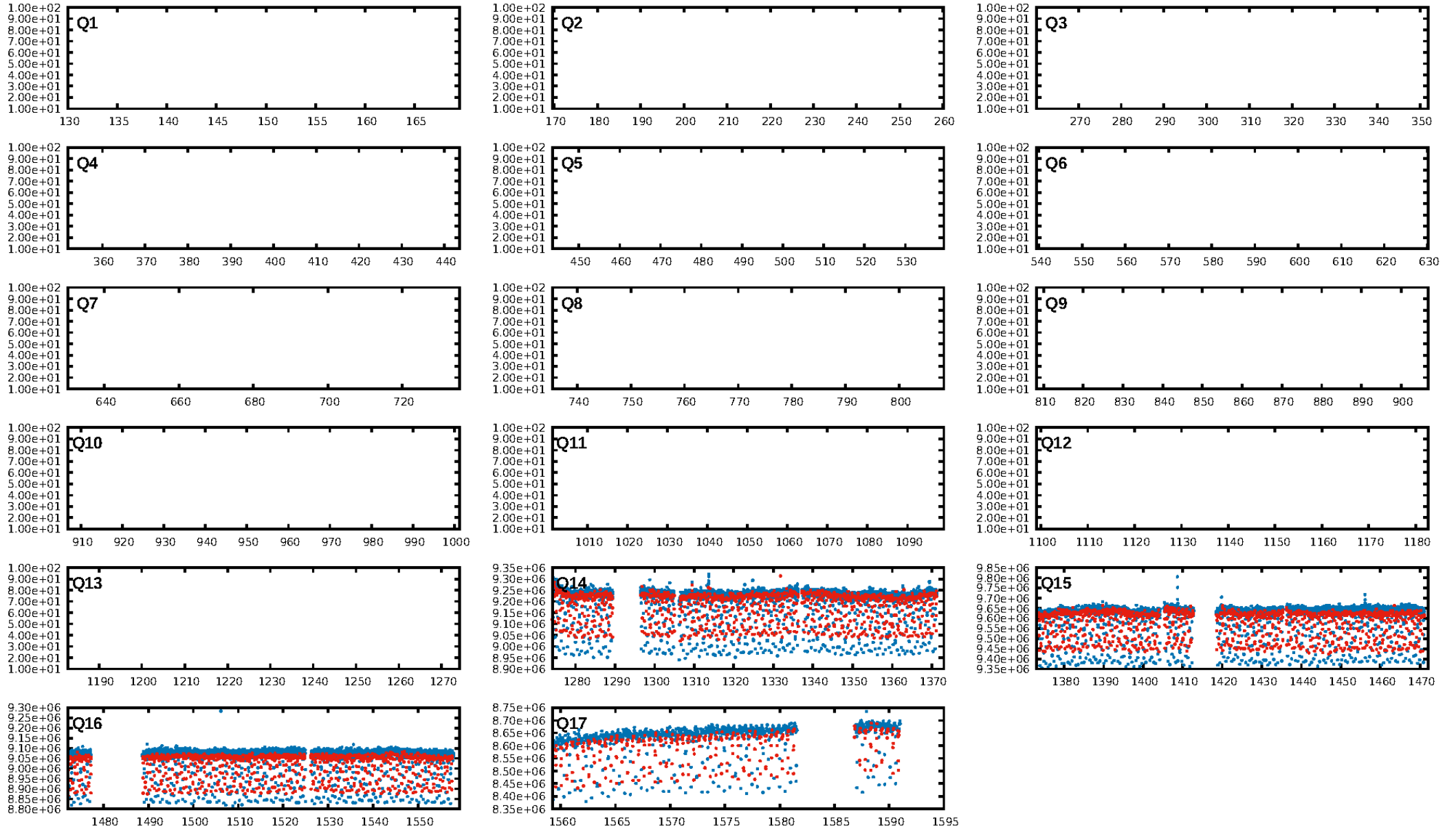
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.98 [482/491]
GhostDiagnostic-chr: 176.1
Centroid-sig: 0.0%
Centroid-so: 0.369 arcsec [15.12 σ]
OotOffset-rm: 0.374 arcsec [5.10 σ]
KicOffset-rm: 0.268 arcsec [3.44 σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 0.00 [0/4]

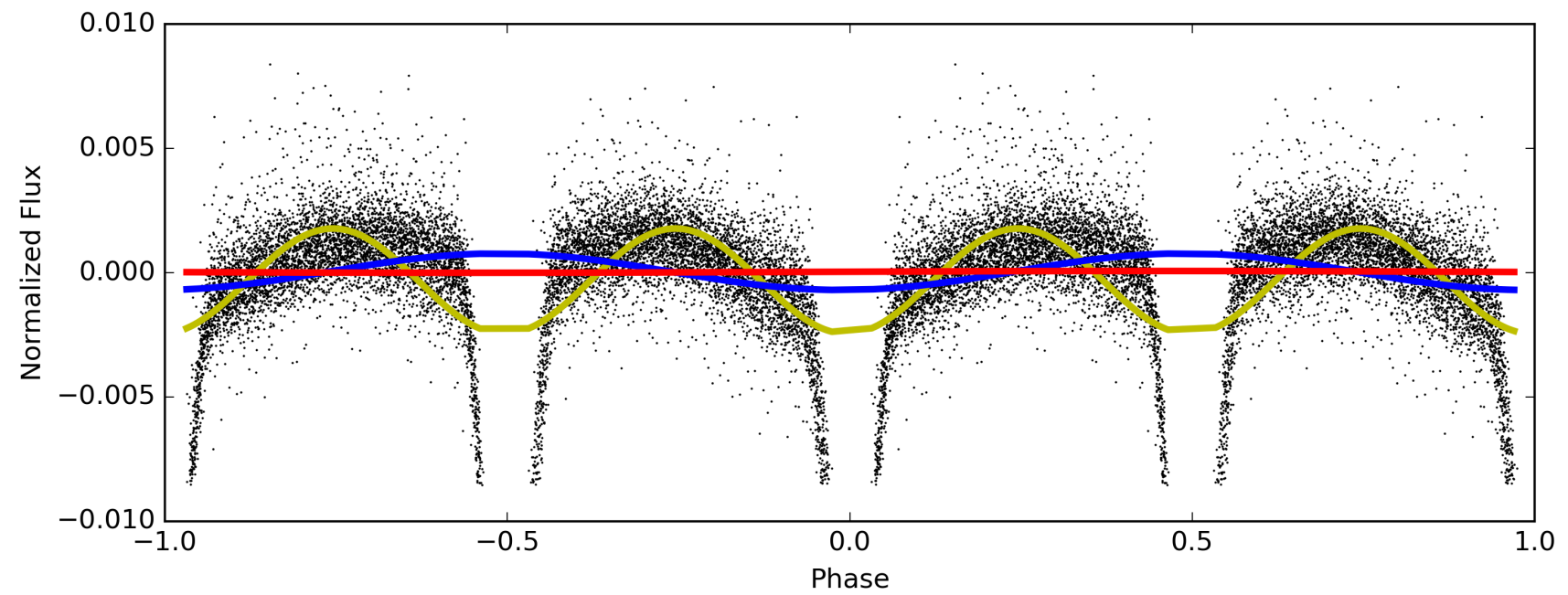
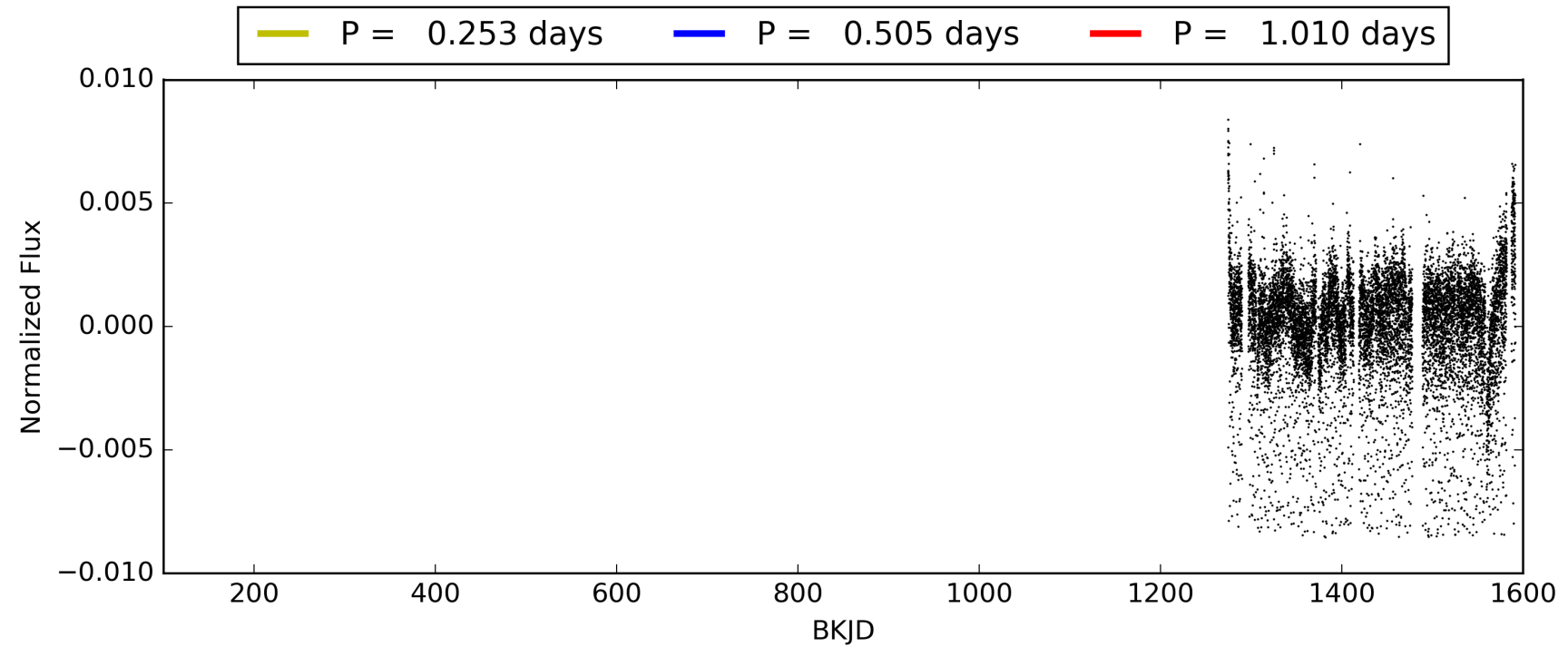
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:36:23 Z

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

TCE 009813678-02, PDC Light Curves

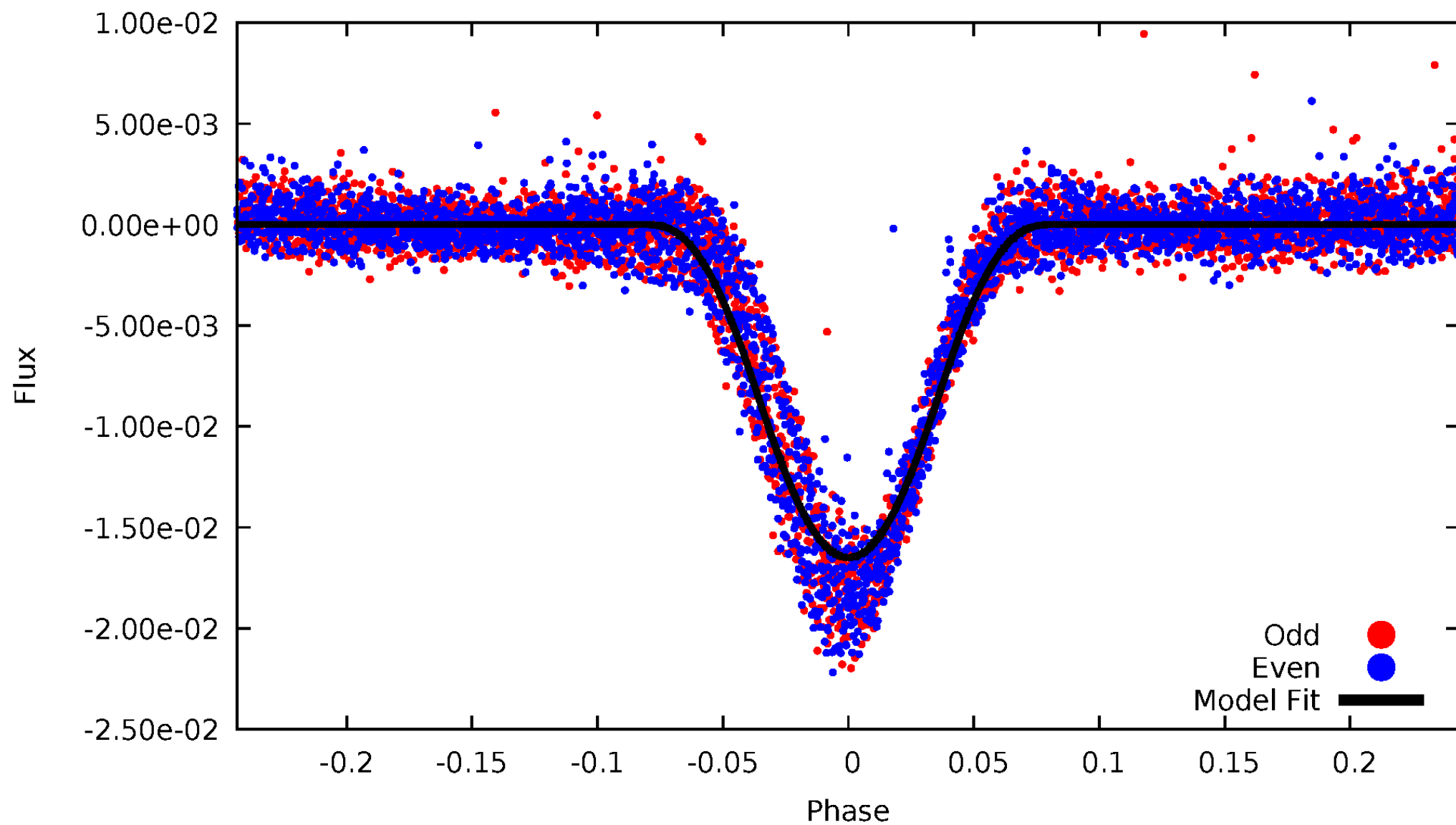


TCE 009813678-02



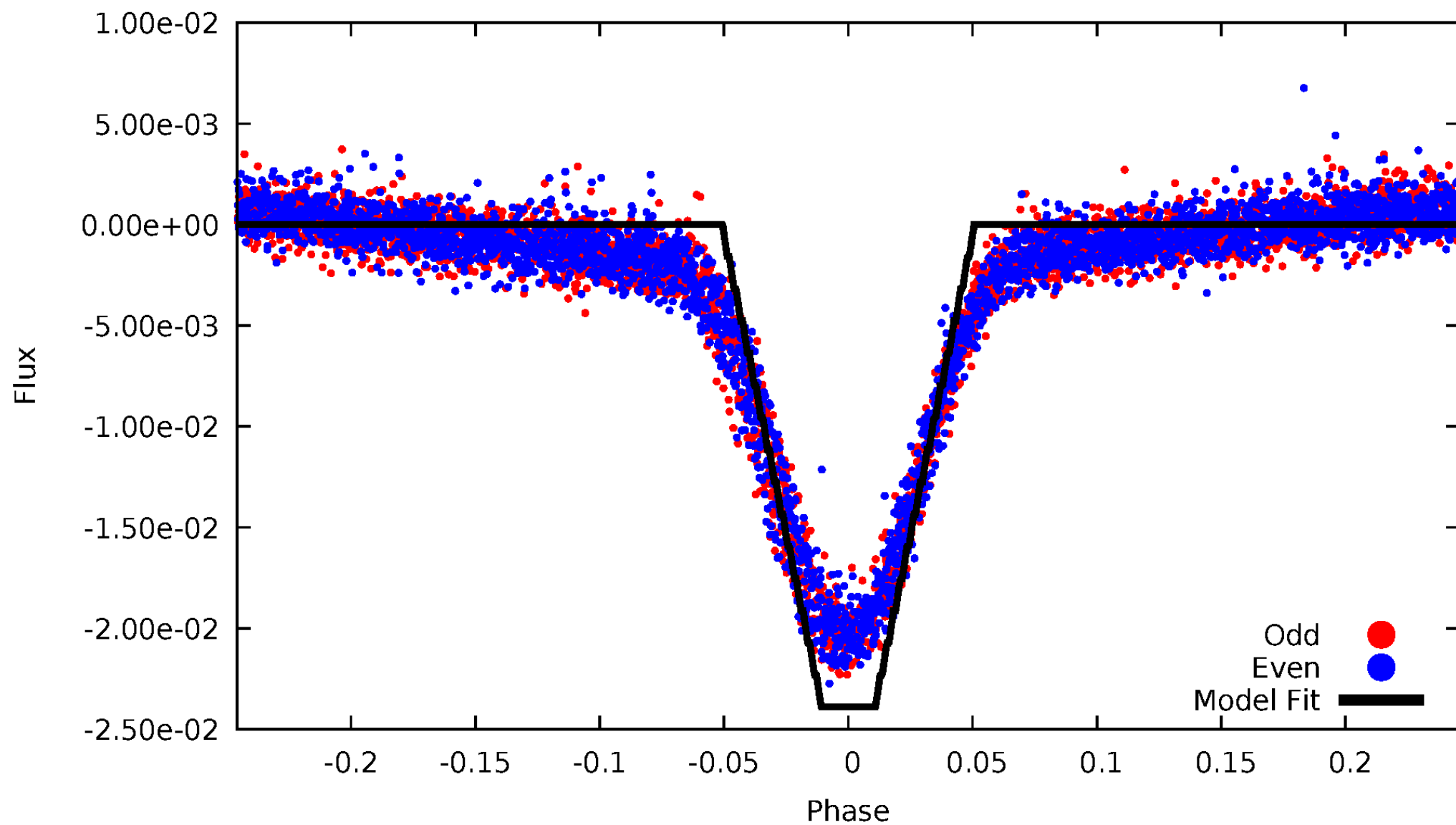
DV Odd/Even

TCE 009813678-02



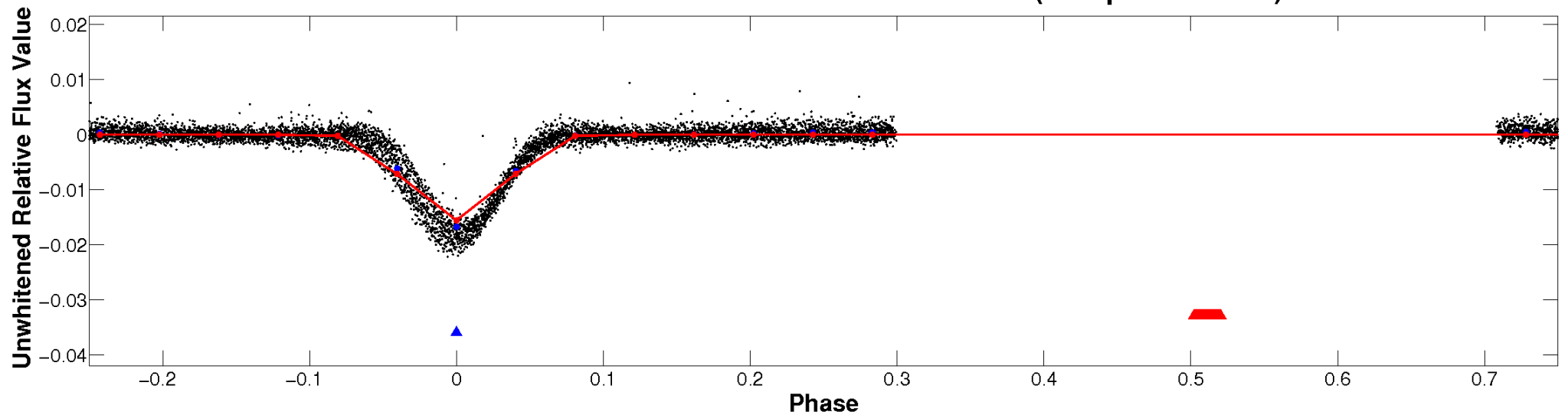
ALT Odd/Even

TCE 009813678-02

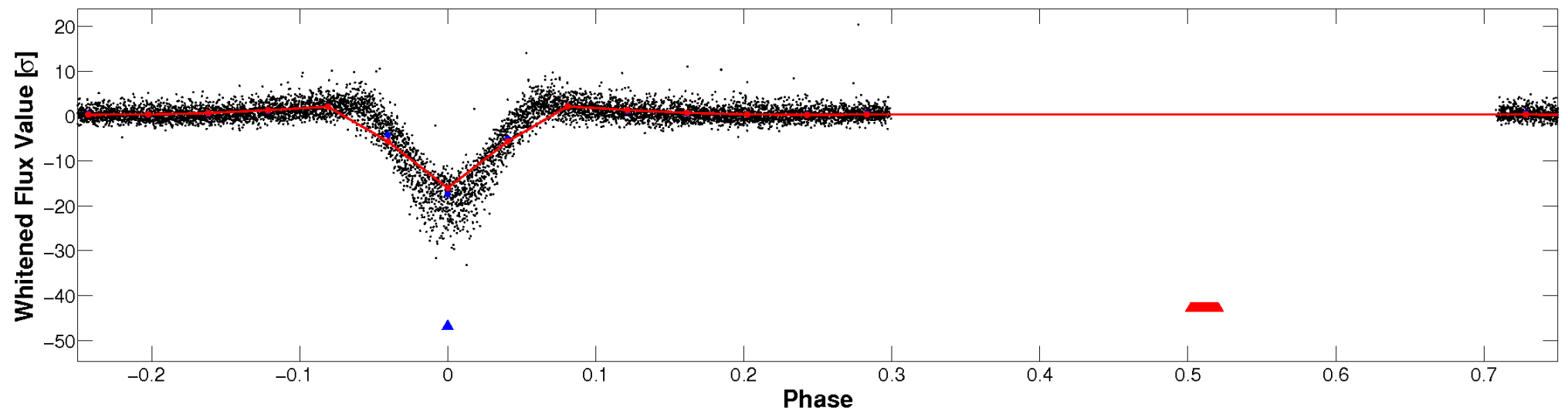


Non-Whitened Vs. Whitened Light Curve

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

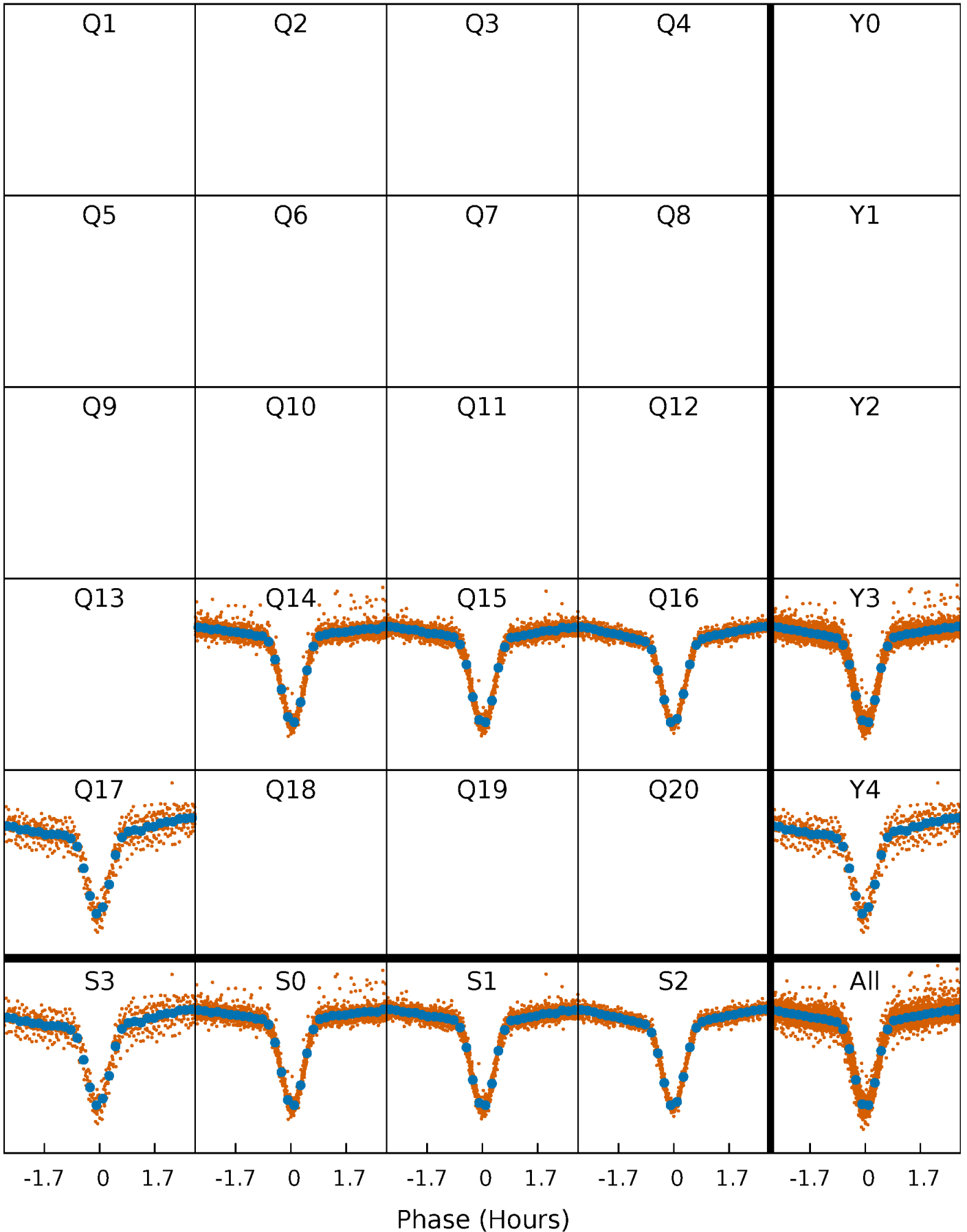


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



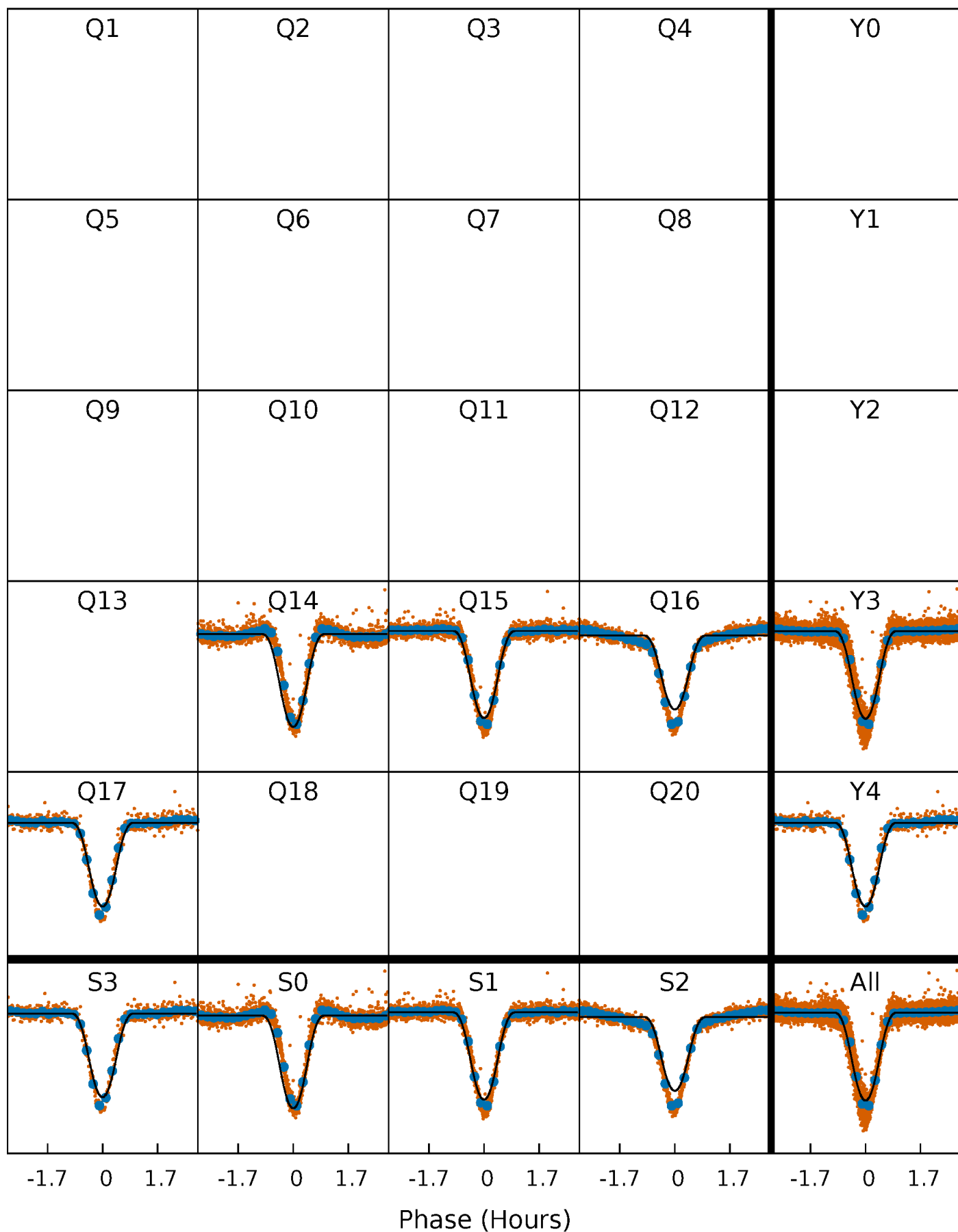
PDC Quarter-Phased Transit Curves

TCE 009813678-02 P= 0.505086 Days $T_0=131.659577$ (BKJD)



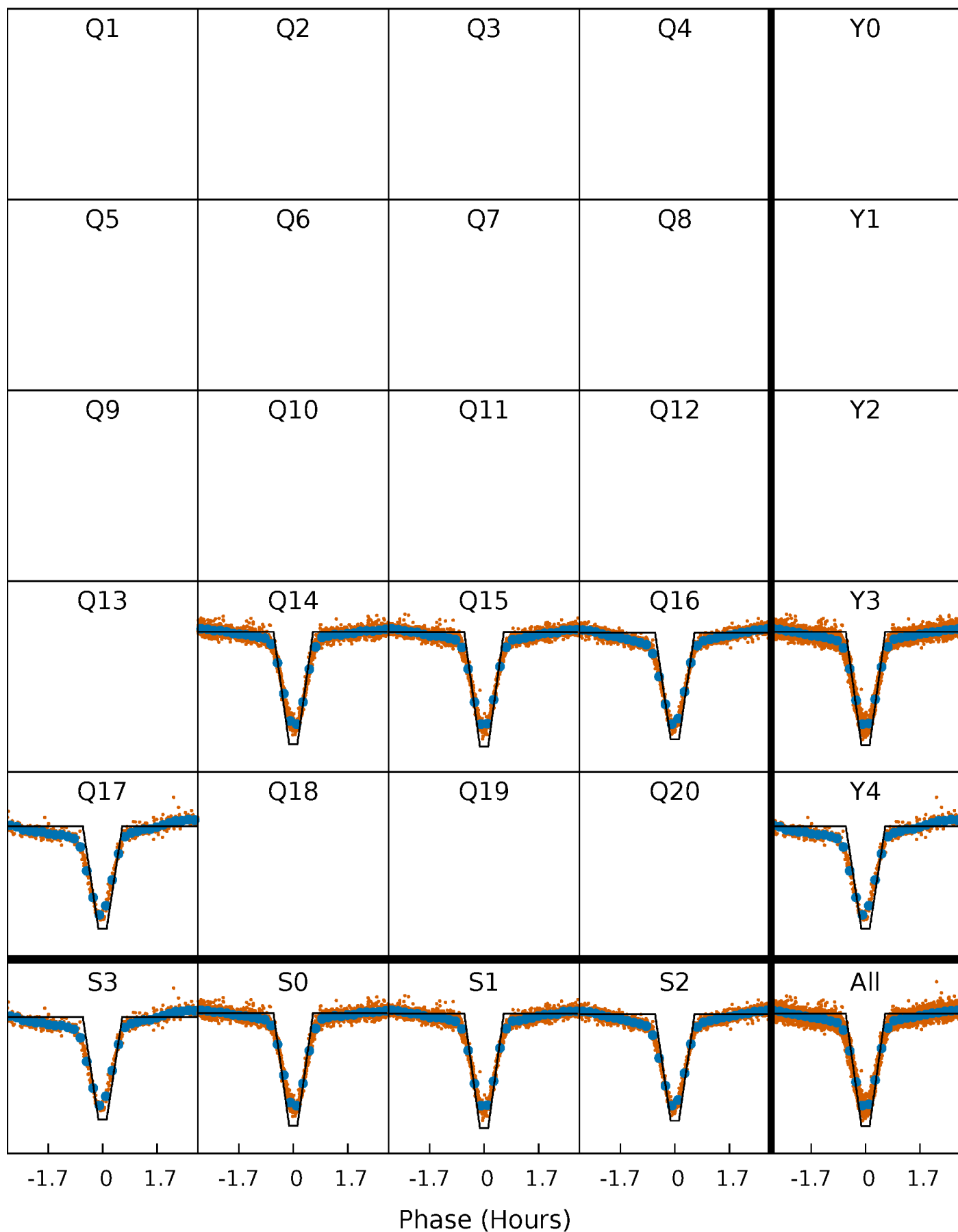
DV Quarter-Phased Transit Curves

TCE 009813678-02 P= 0.505086 Days $T_0=131.659577$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

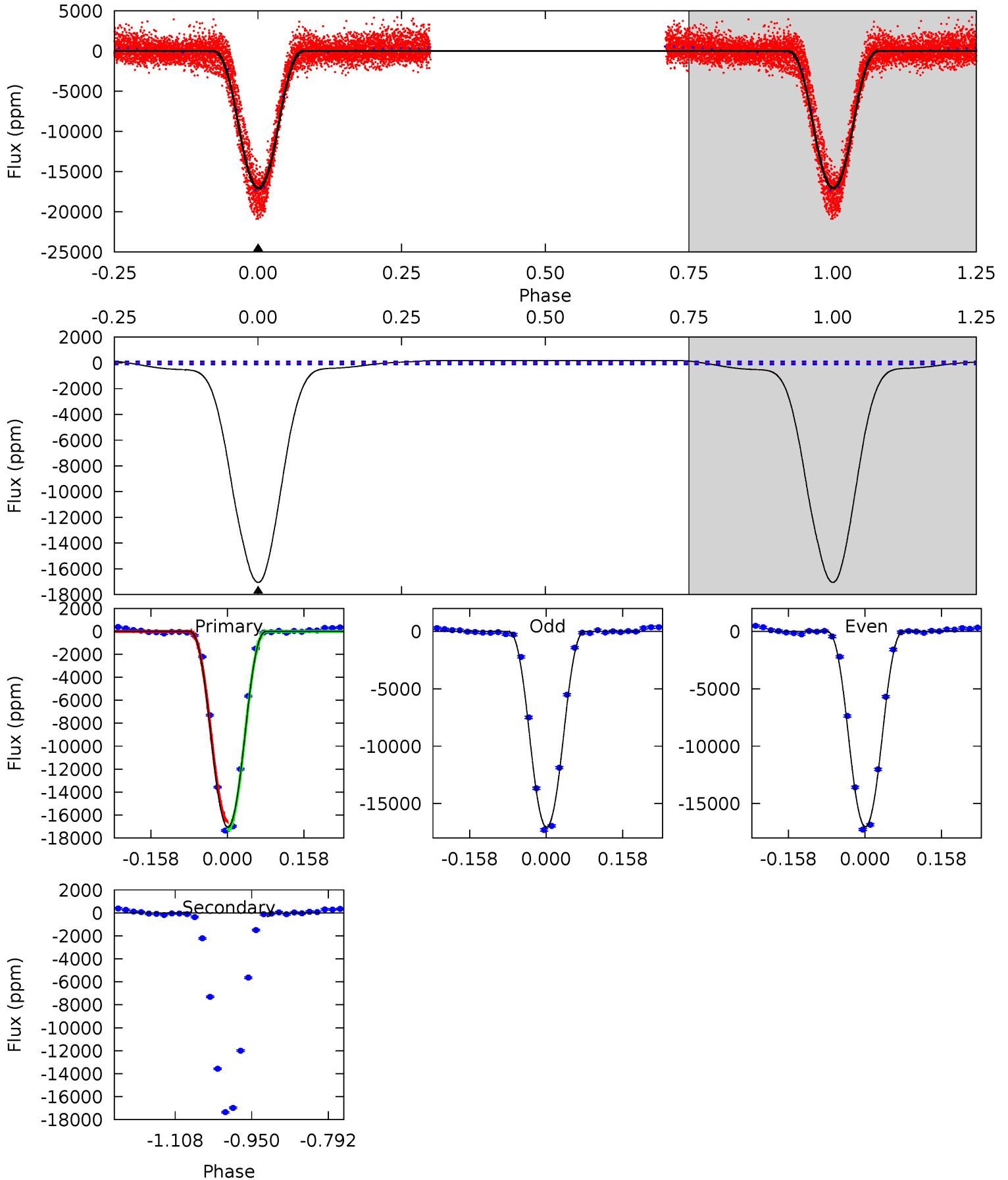
TCE 009813678-02 P= 0.505086 Days $T_0=131.659607$ (BKJD)



DV Model-Shift Uniqueness Test

009813678-02, P = 0.505086 Days, E = 131.659577 Days

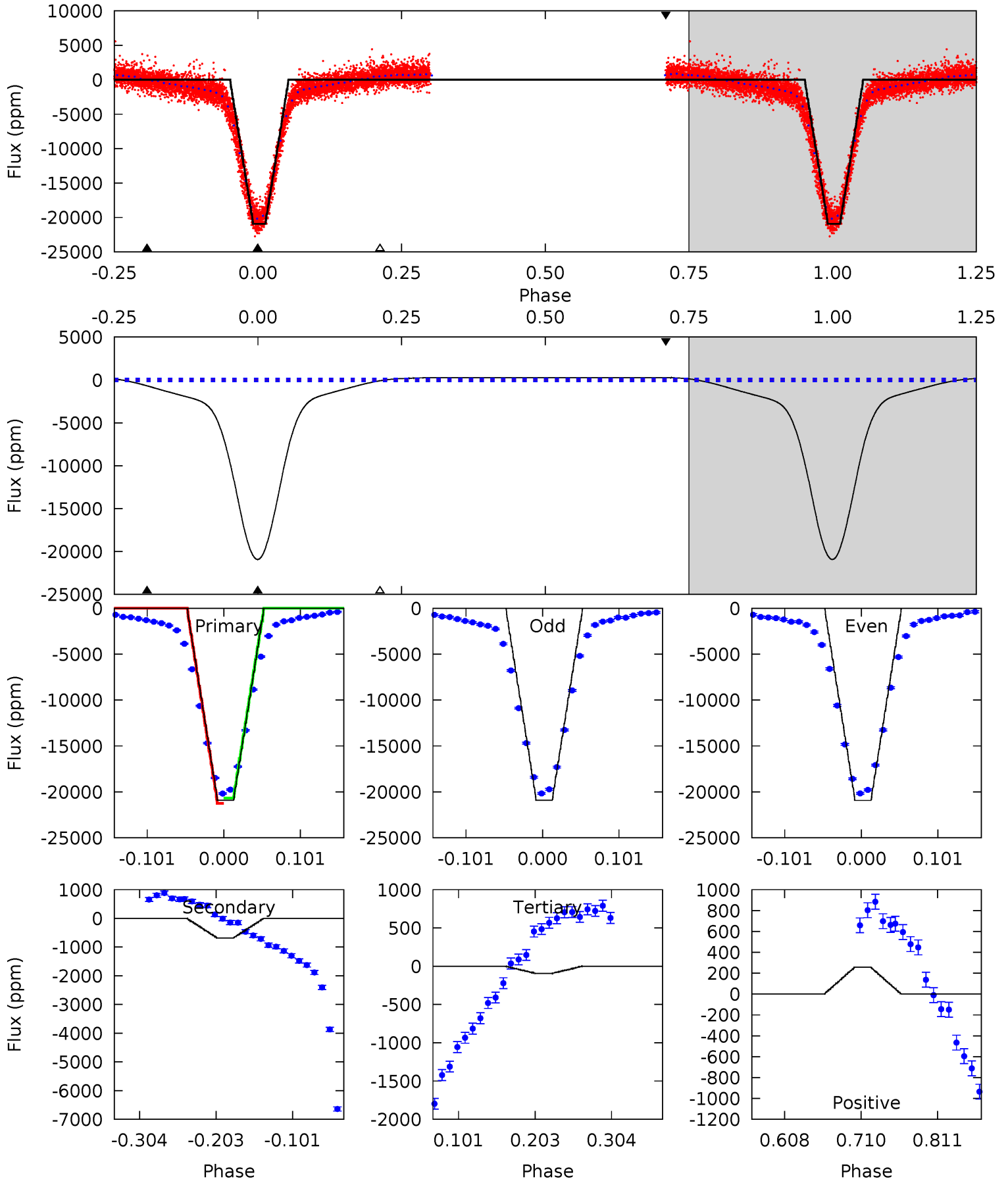
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
709.8	0	0	0	4.47	1.41	7.86	709.8	709.8	0	0	0.88	0.99	0.01	14.1



Alt Model-Shift Uniqueness Test

009813678-02, P = 0.505086 Days, E = 131.659607 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
721.8	23.6	3.25	8.89	4.56	1.64	23.0	718.6	712.9	20.3	14.7	0.18	1.00	0.01	9.25



Stellar Parameters For KIC 009813678

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5398^{+208}_{-170}	$3.822^{+0.805}_{-0.345}$	$-0.640^{+0.350}_{-0.250}$	$1.843^{+1.344}_{-1.100}$	$0.821^{+0.204}_{-0.110}$	$0.185^{+2.858}_{-0.118}$
	+4%/-3%	+21%/-9%	+55%/-39%	+73%/-60%	+25%/-13%	+1547%/-64%
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 009813678-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 24	$29.01^{+12.15}_{-9.20}$	4061^{+758}_{-752}	-3715^{+450}_{-469}	$0.000^{+0.002}_{-0.002}$
Alt.	-683 ± 29	$29.20^{+11.42}_{-8.97}$	4052^{+736}_{-717}	-3575^{+549}_{-510}	$0.061^{+0.066}_{-0.029}$

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 $A_{obs} \gg 1.0$

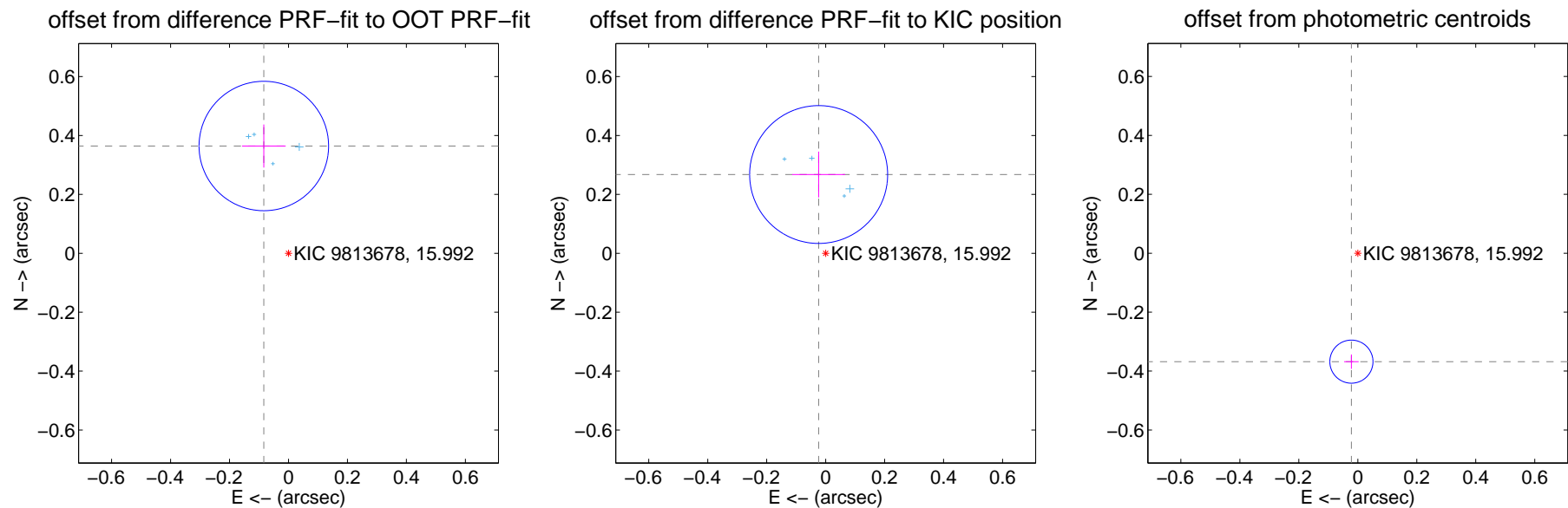
DV Centroid Data

Supplemental centroid analysis for 009813678-02. Kepler magnitude: 15.99. Transit SNR 406.48

There are 4 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.374 ± 0.073	5.10	0.084 ± 0.074	0.364 ± 0.073
PRF-fit source offset from KIC position	0.268 ± 0.078	3.44	0.024 ± 0.090	0.267 ± 0.078
photometric centroid source offset	0.37 ± 0.02	15.12	0.02 ± 0.02	-0.37 ± 0.02



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.



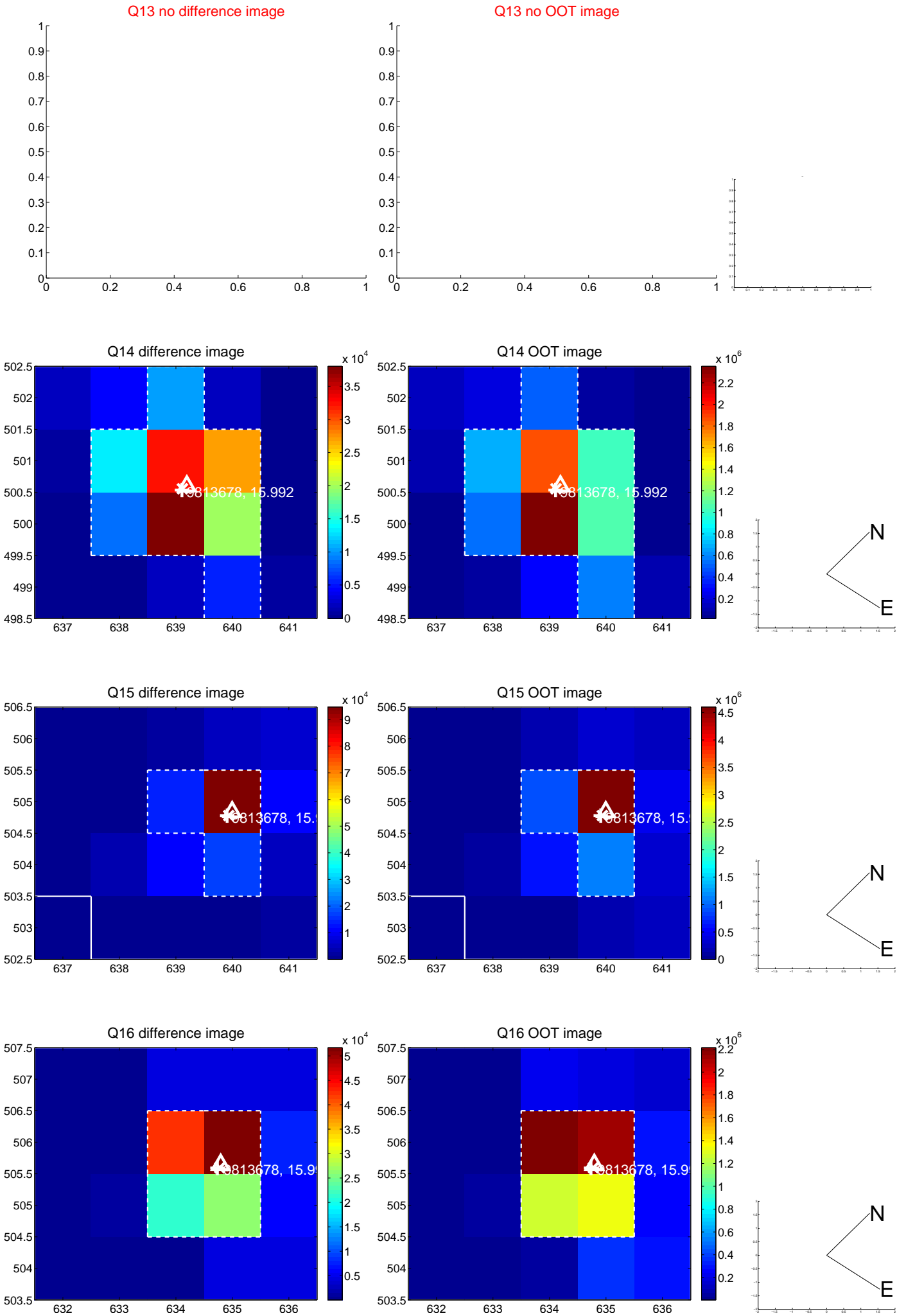
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



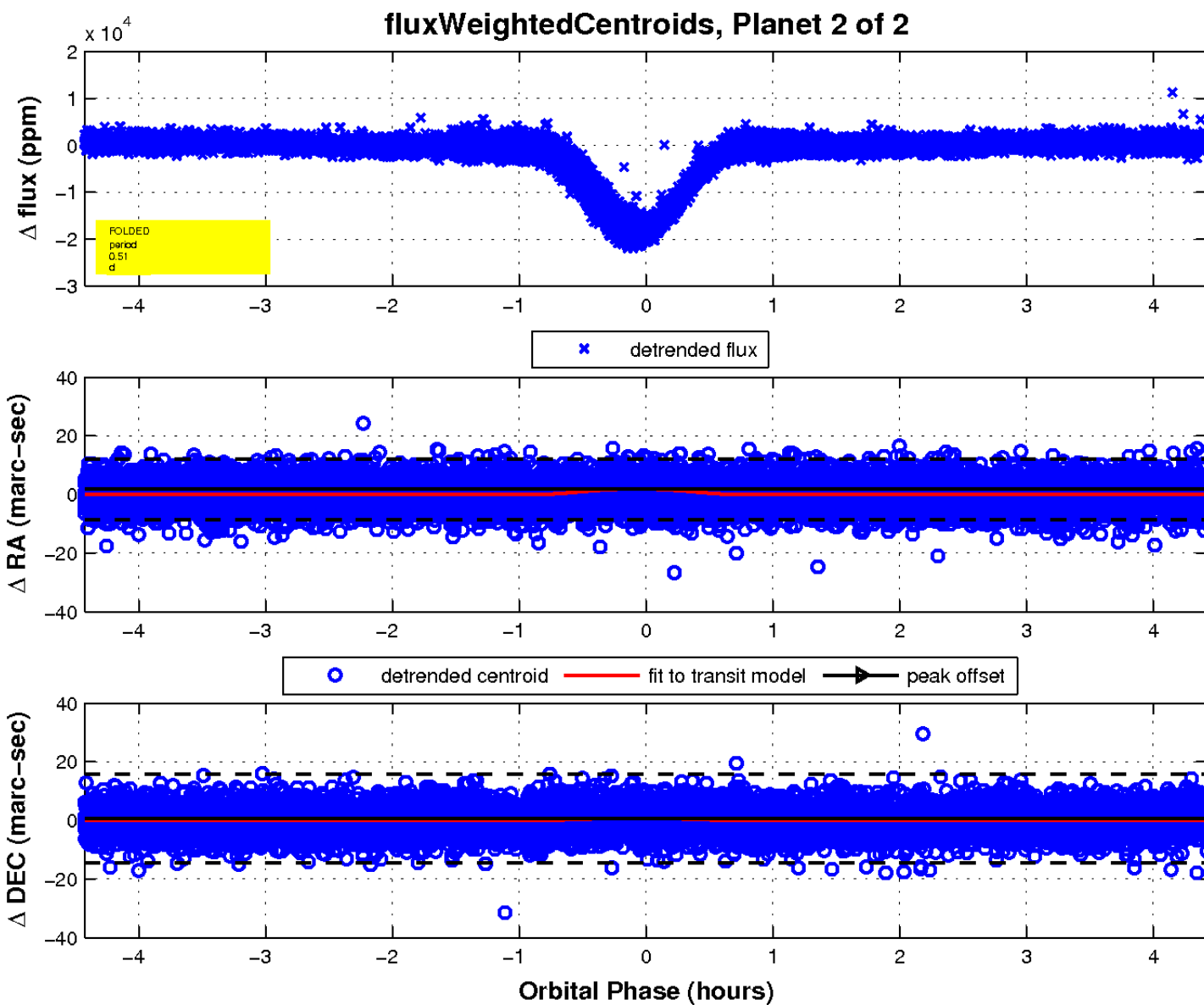
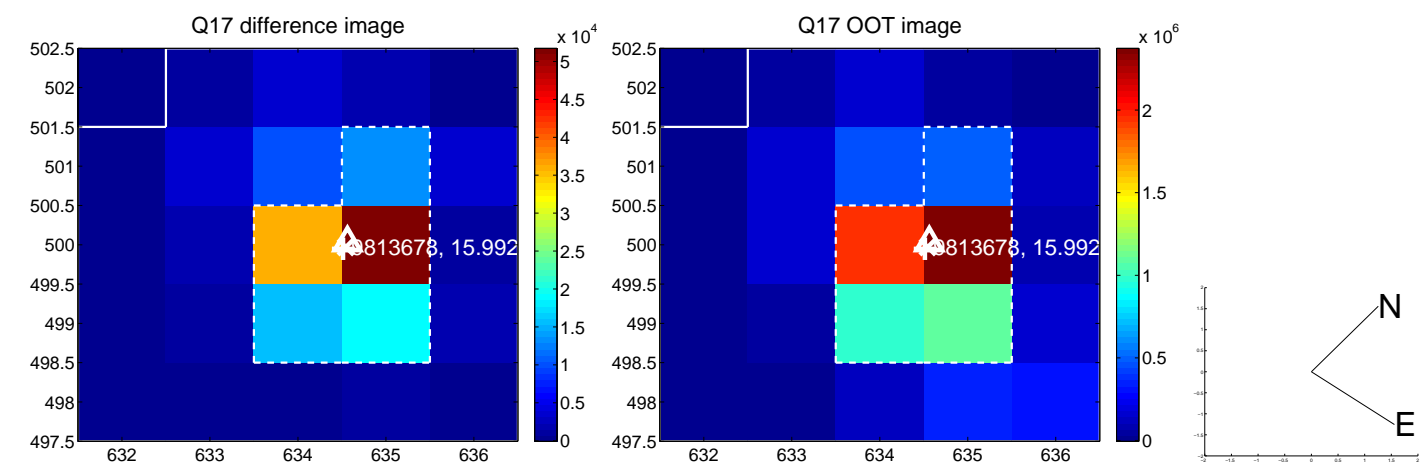
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

