

KIC 009591560

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})
009591560-01	OBS	No	58.360544	133.428795	3514.6	3.030	14.9	6.8	146.56	3457	811.97	0.00
009591560-02	OBS	No	98.674440	160.701864	2590.2	6.685	11.8	5.7	146.56	3457	773.93	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009591560-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009591560-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS

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

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

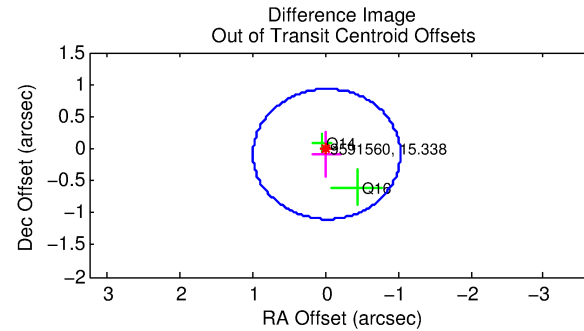
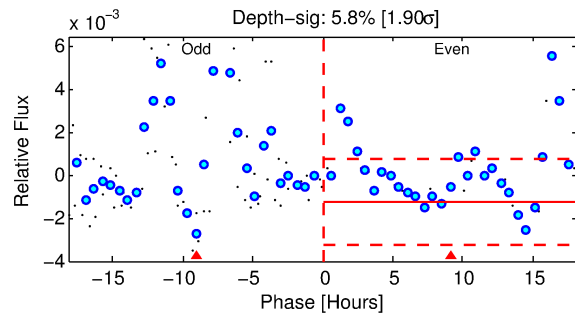
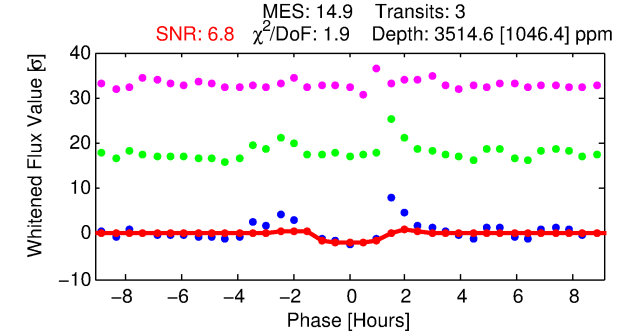
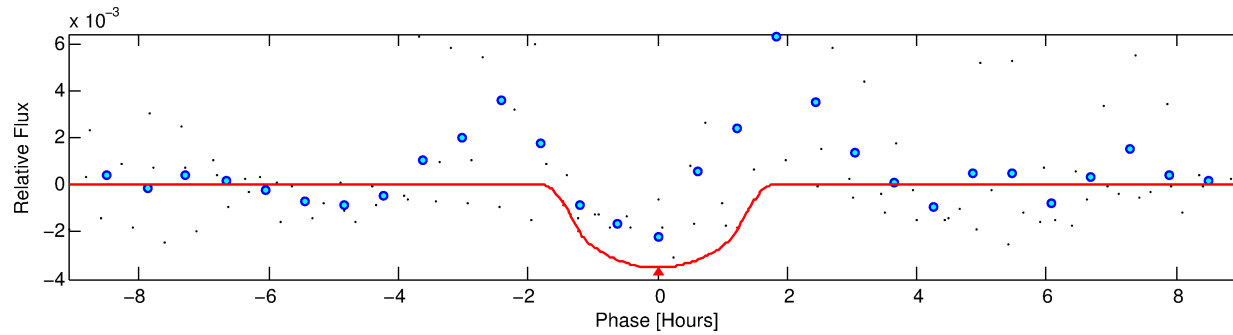
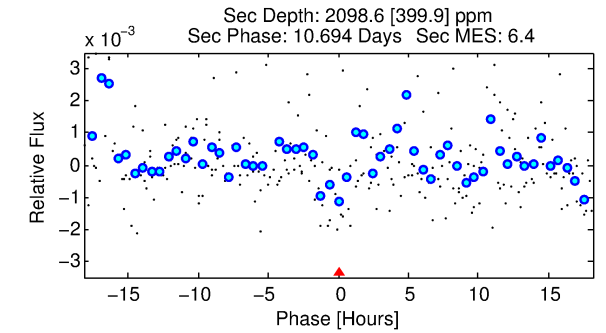
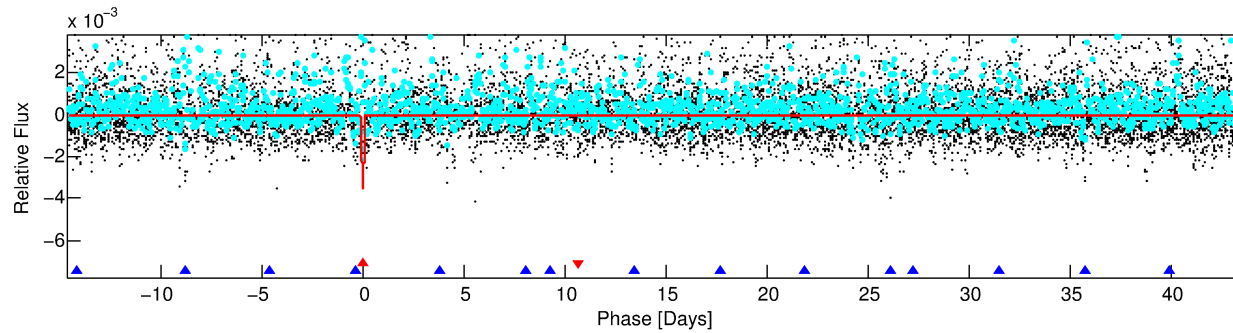
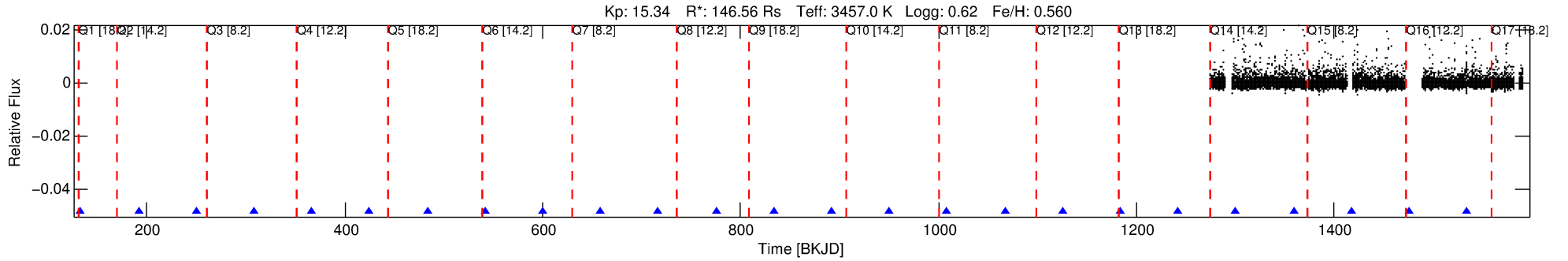
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009591560-01

No Significant Match Found

DV One-Page Summary

KIC: 9591560 Candidate: 1 of 2 Period: 58.361 d



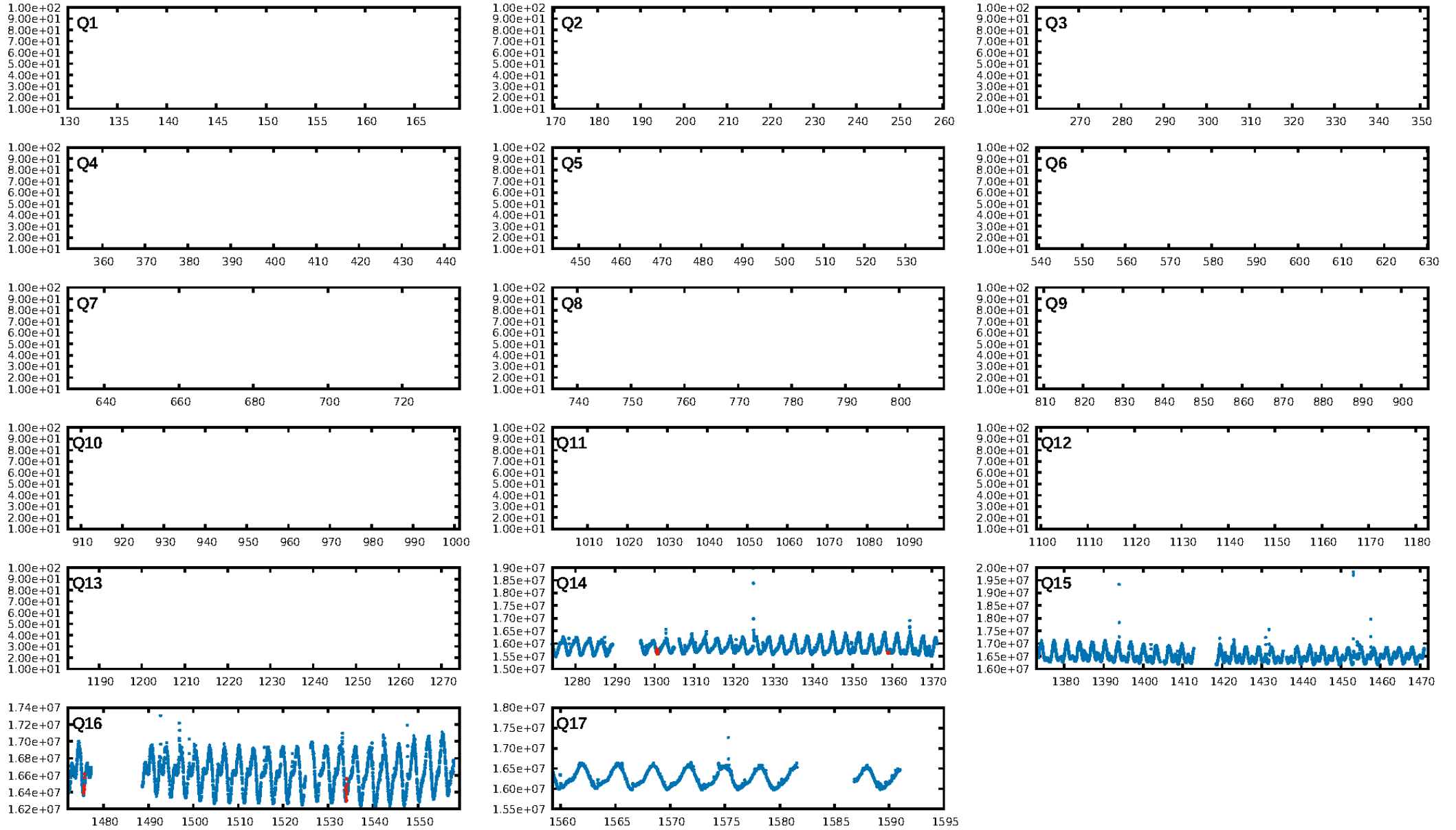
DV Fit Results:

Period = 58.36054 [0.00261] d
Epoch = 133.4288 [0.0583] BKJD
Rp/R* = 0.0508 [0.0675]
a/R* = 150.06 [392.64]
b = 0.25 [10.28]
Seff = N/A
Teq = N/A
Ag = N/A
Teffp = N/A
Rp = 811.97 [1161.05] Re
a = N/A

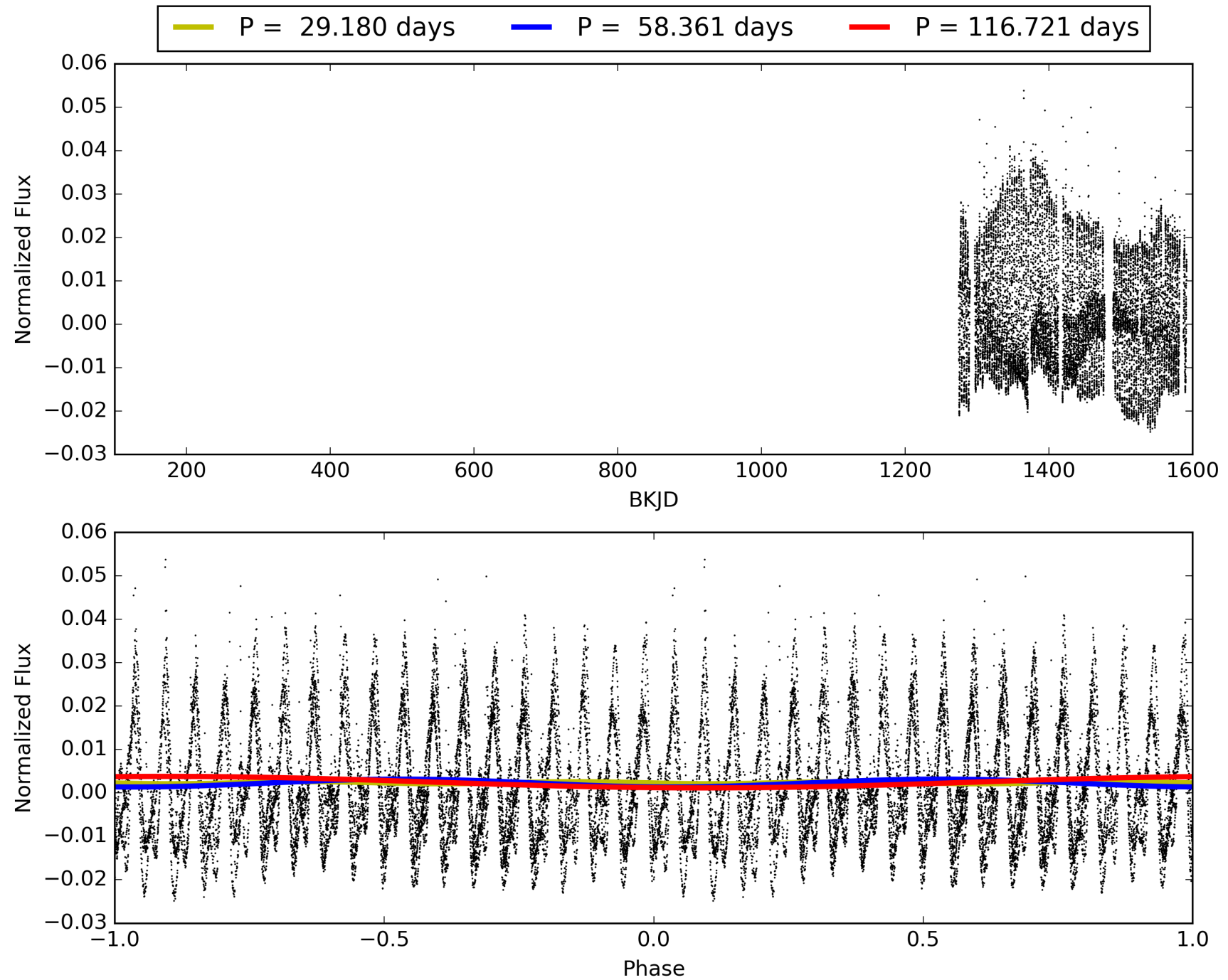
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [131.82σ]
ModelChiSquare2-sig: 2.5%
ModelChiSquareGof-sig: 71.5%
Bootstrap-pfa: 3.45e-23
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.4391
Centroid-sig: 26.5%
Centroid-so: 0.529 arcsec [0.99σ]
OotOffset-rm: 0.087 arcsec [0.26σ]
KicOffset-rm: 0.253 arcsec [0.71σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 009591560-01, PDC Light Curves

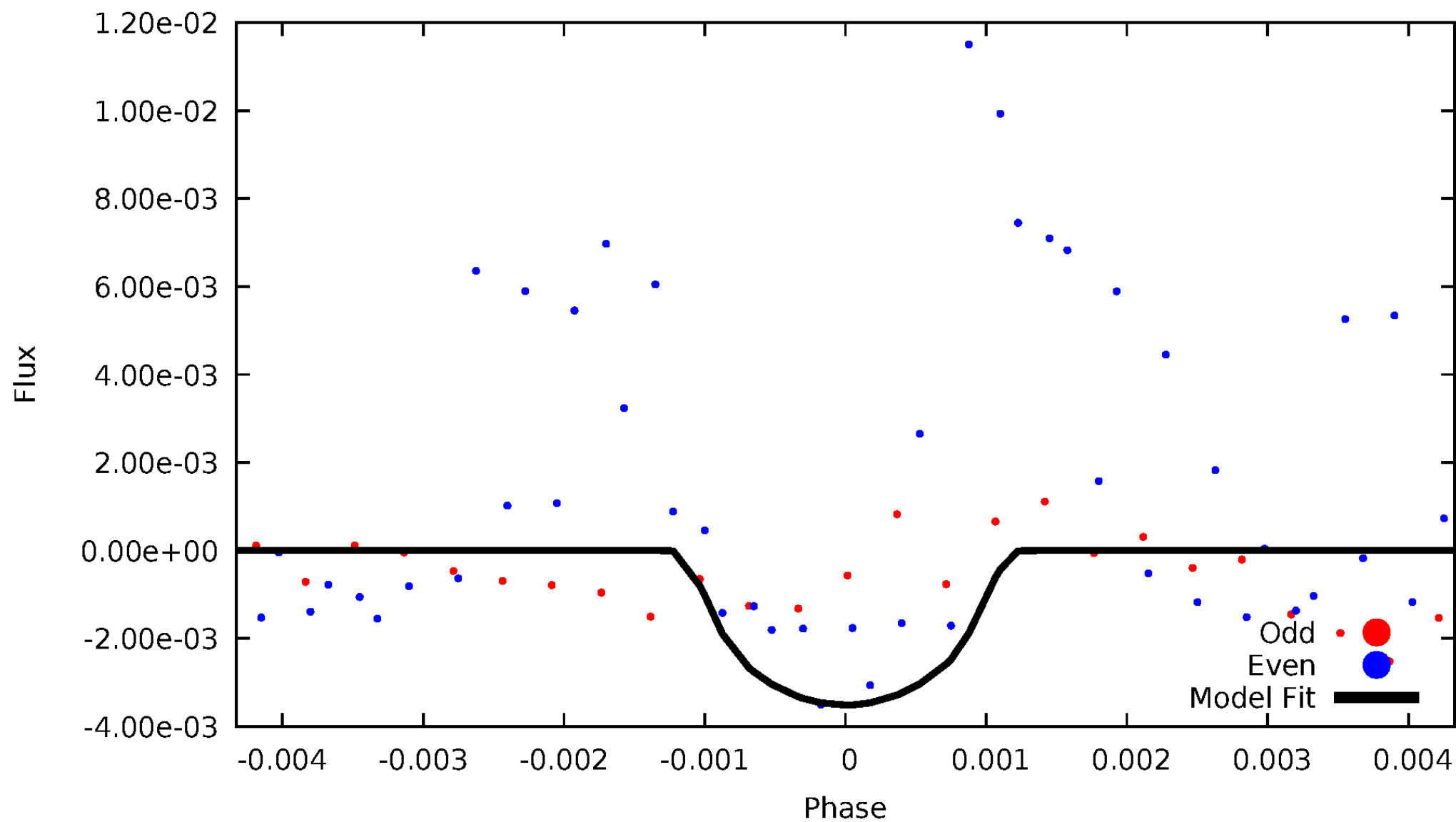


TCE 009591560-01



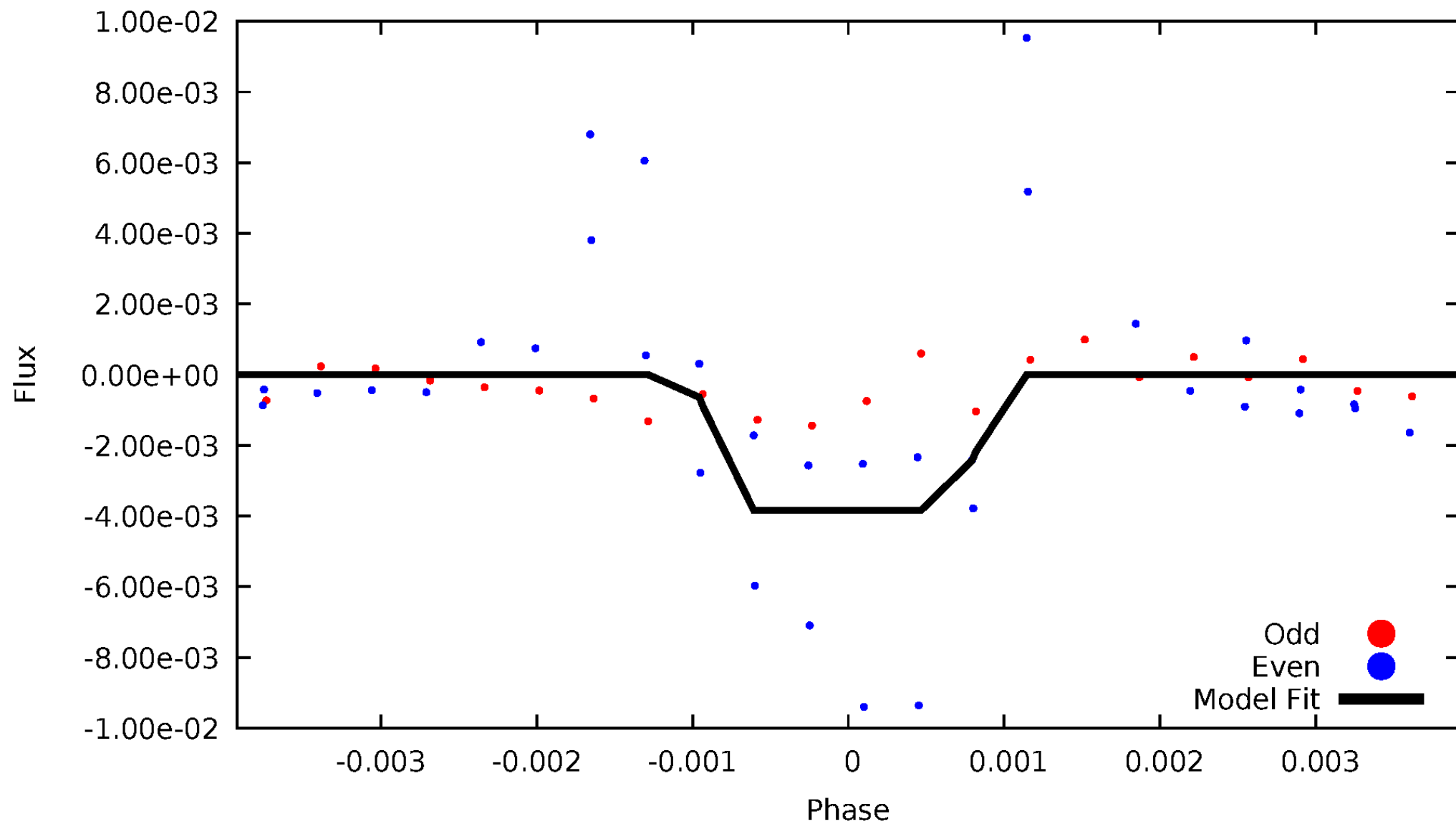
DV Odd/Even

TCE 009591560-01



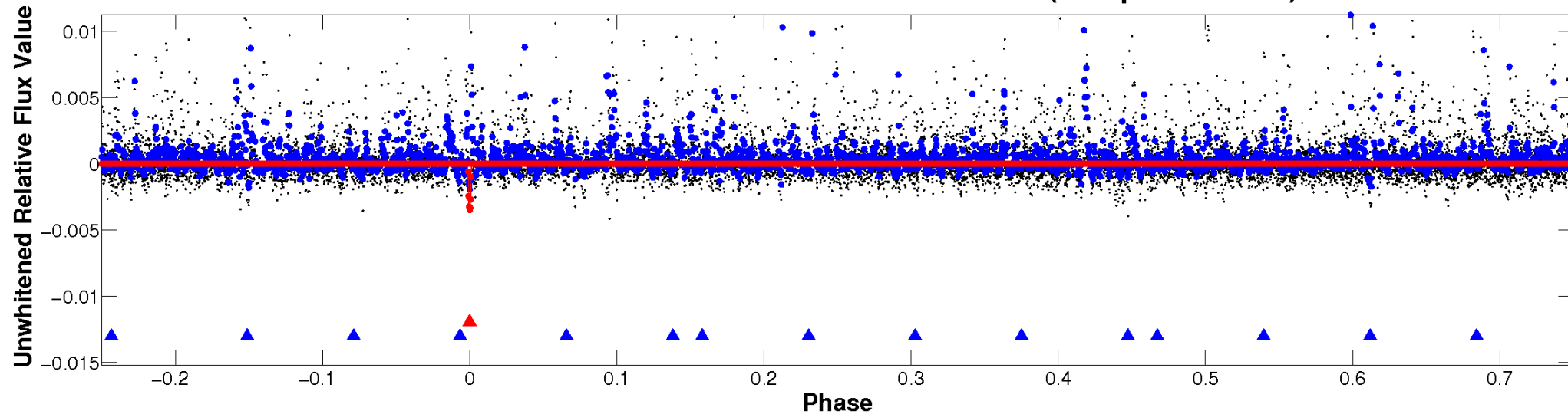
ALT Odd/Even

TCE 009591560-01

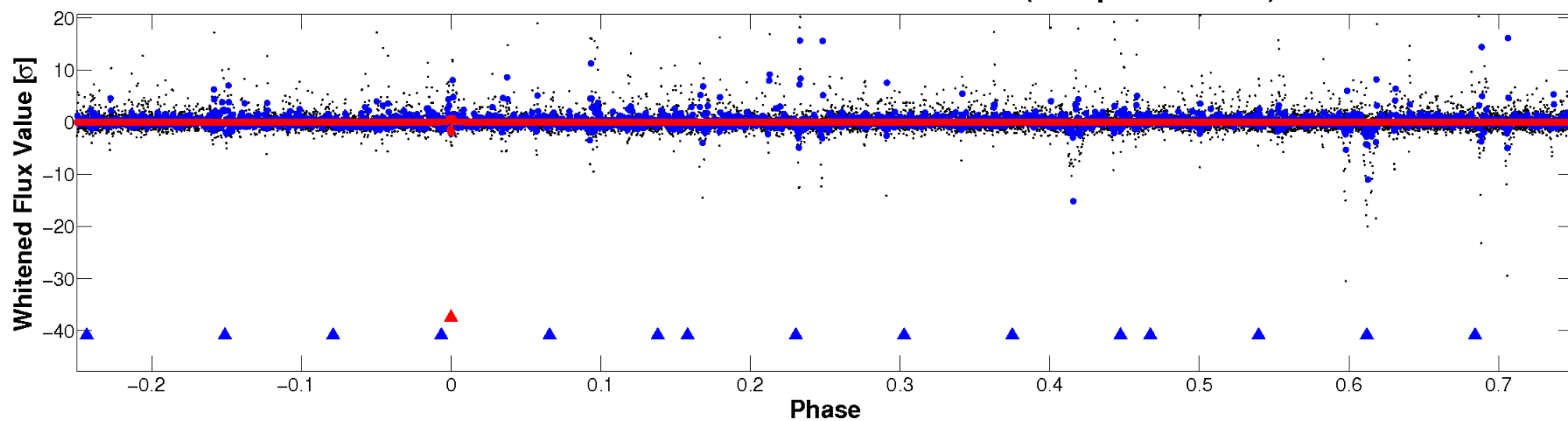


Non-Whitened Vs. Whitened Light Curve

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

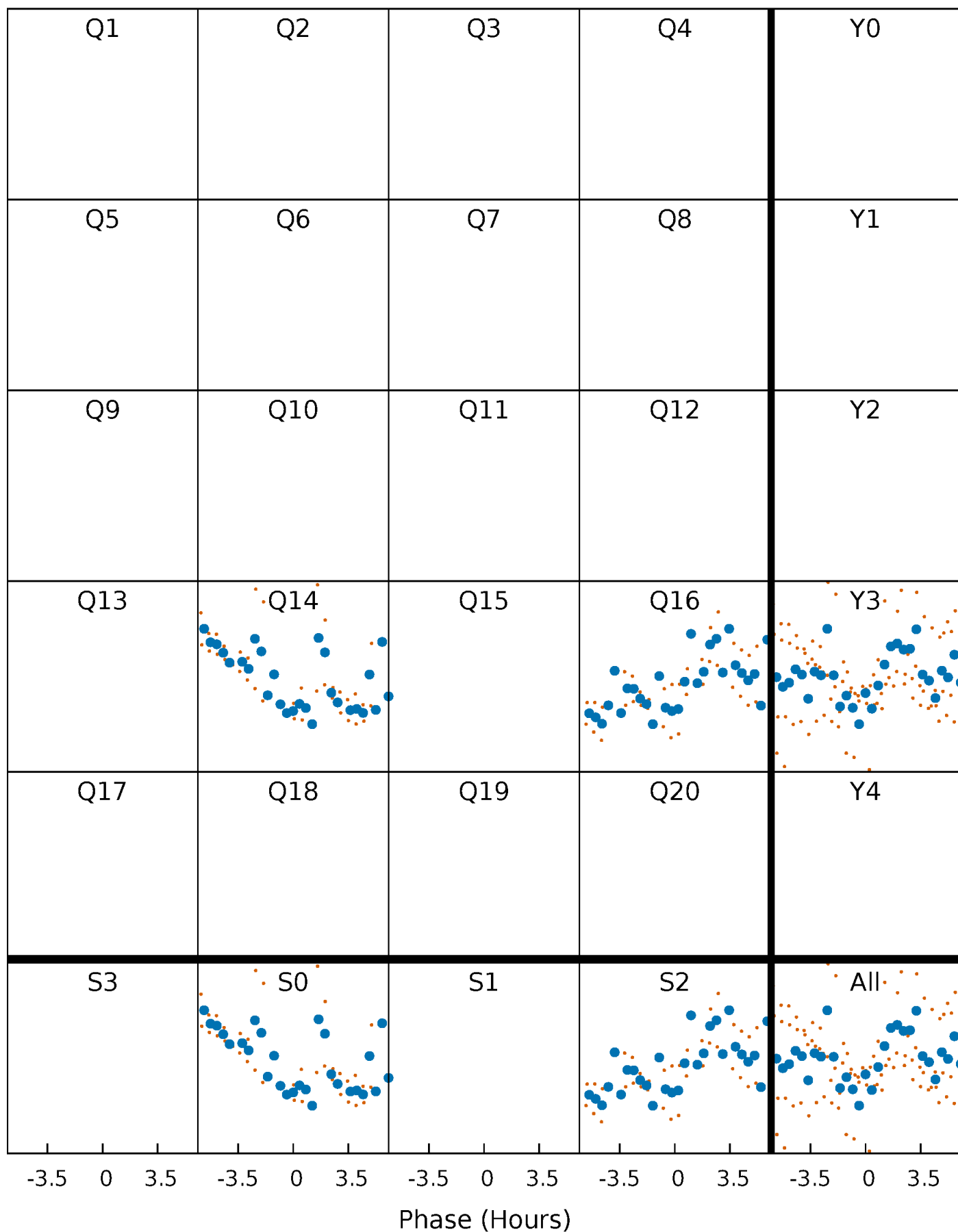


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



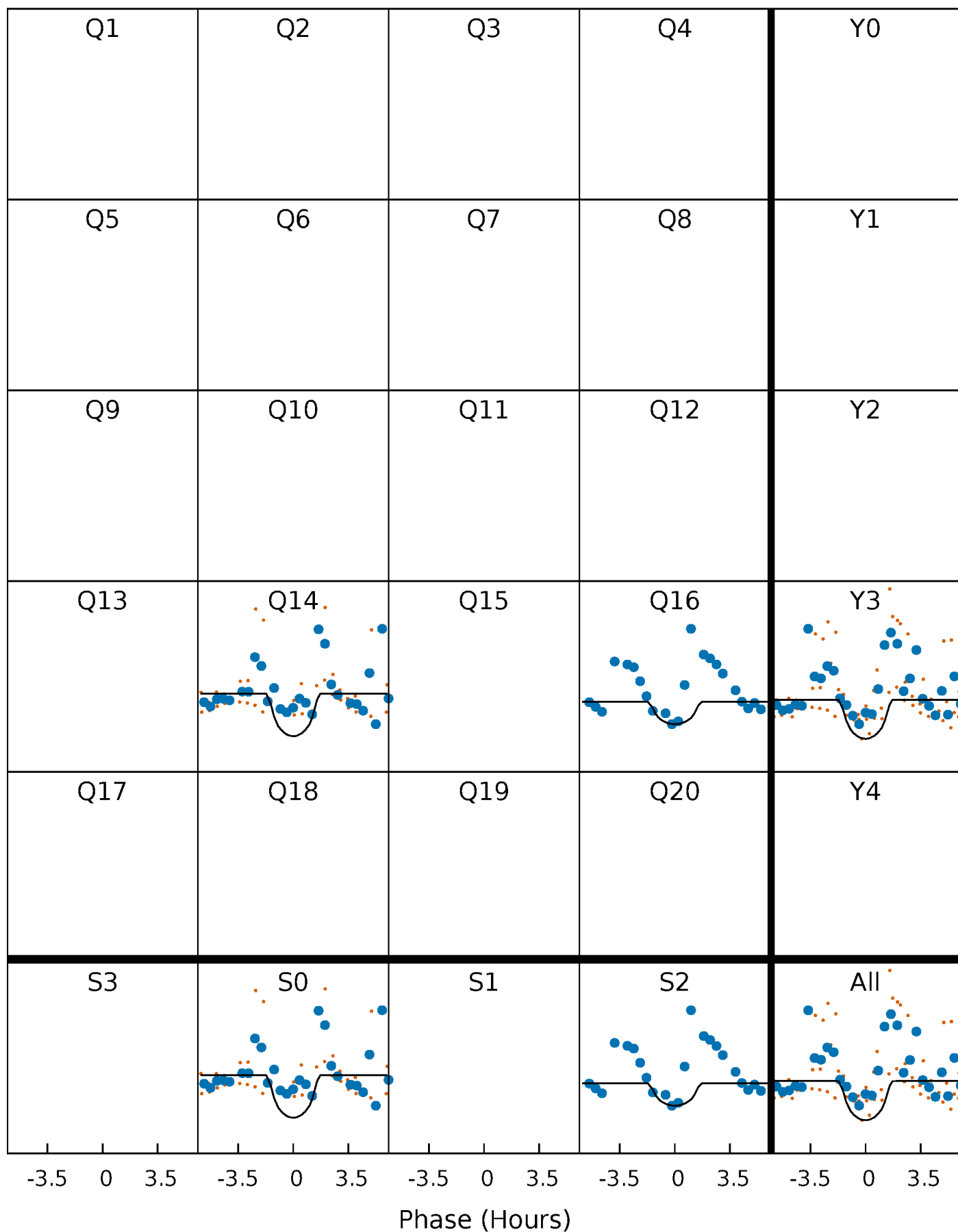
PDC Quarter-Phased Transit Curves

TCE 009591560-01 P= 58.360544 Days $T_0=133.428795$ (BKJD)



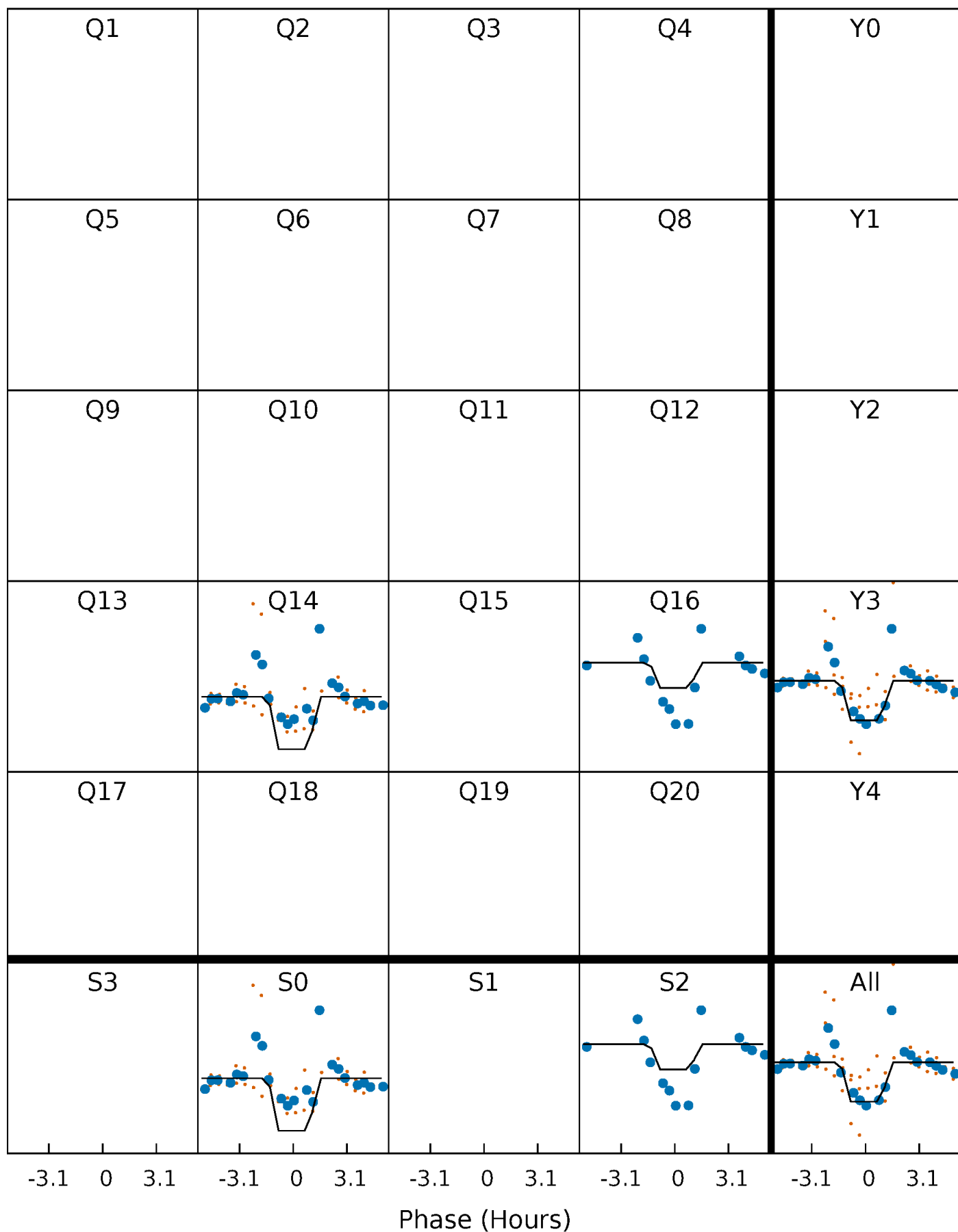
DV Quarter-Phased Transit Curves

TCE 009591560-01 P= 58.360544 Days $T_0=133.428795$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

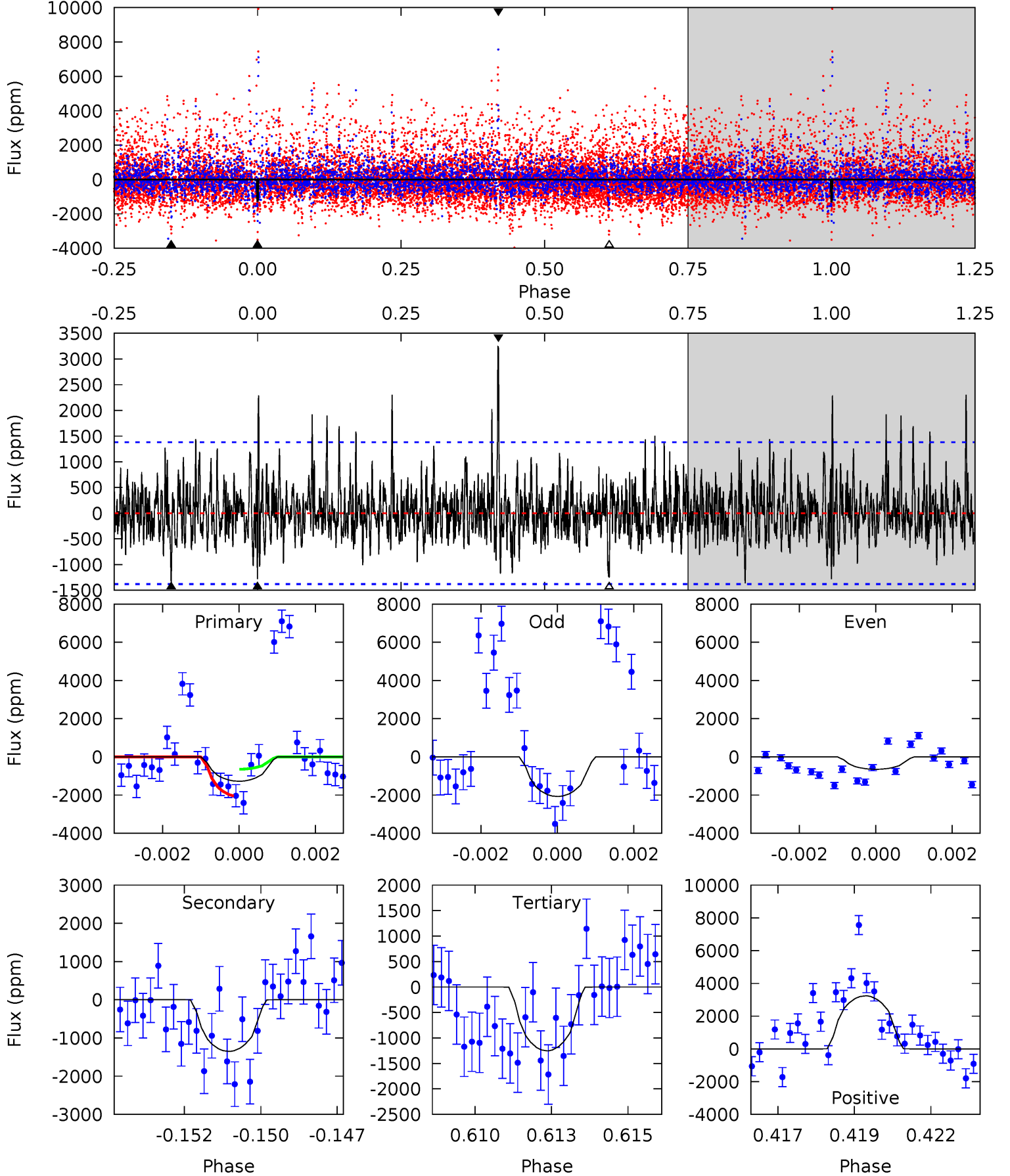
TCE 009591560-01 P= 58.357159 Days $T_0=133.493952$ (BKJD)



DV Model-Shift Uniqueness Test

009591560-01, $P = 58.360544$ Days, $E = 133.428795$ Days

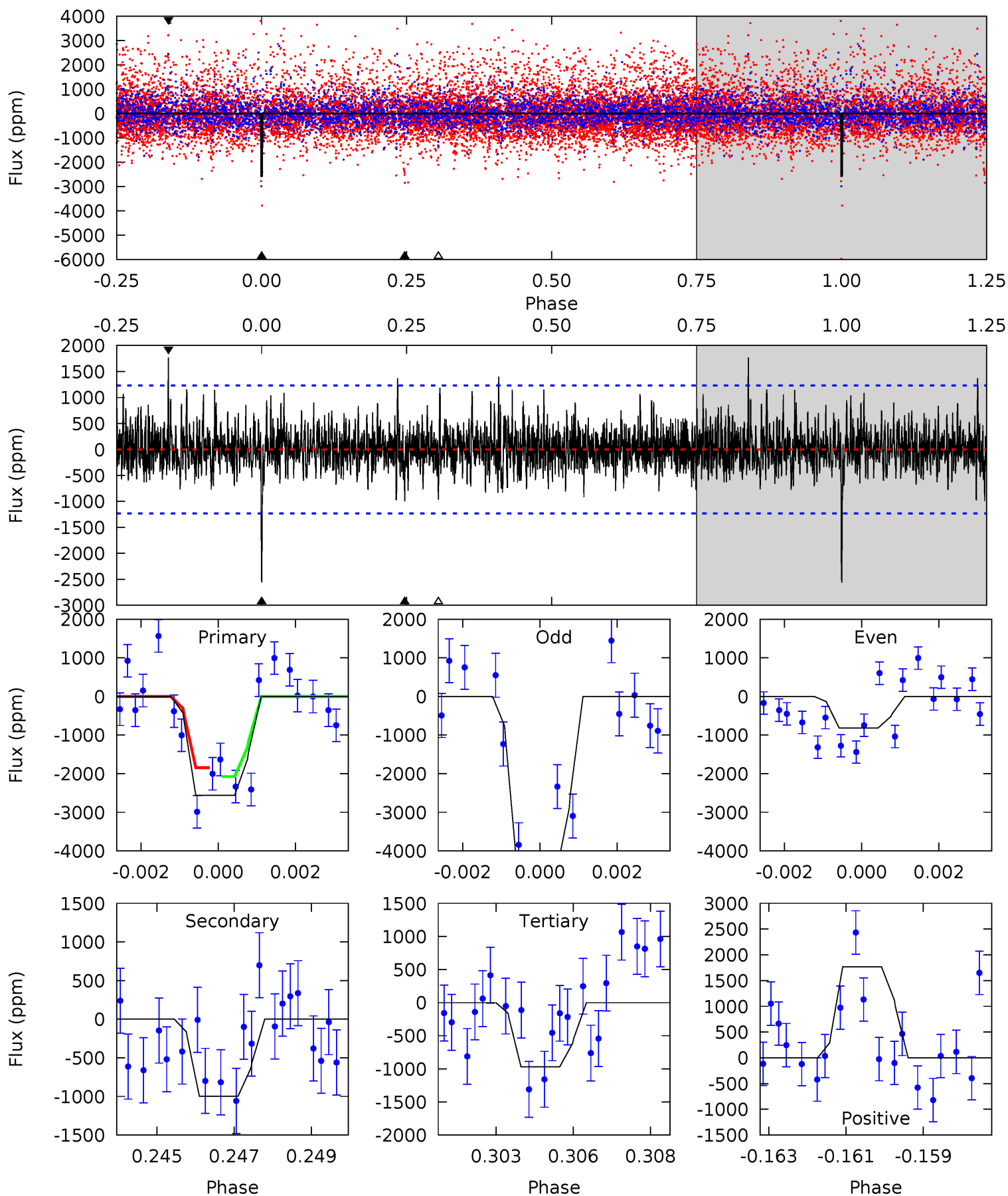
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.90	5.19	4.81	12.4	5.29	3.03	1.67	0.10	-7.53	0.38	-7.25	2.22	1.13	0.71	2.73



Alt Model-Shift Uniqueness Test

009591560-01, P = 58.357159 Days, E = 133.493952 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	4.31	4.19	7.64	5.32	3.08	1.34	6.88	3.42	0.12	-3.33	8.65	1.54	0.41	0.45



Stellar Parameters For KIC 009591560

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3457^{+114}_{-104}	$0.622^{+0.270}_{-0.180}$	$0.560^{+0.050}_{-0.250}$	$146.556^{+13.623}_{-77.198}$	$3.281^{+0.231}_{-2.082}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+43%/-29%	+9%/-45%	+9%/-53%	+7%/-63%	+259%/-42%
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 009591560-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1353 ± 261	$1072.04^{+915.95}_{-656.29}$	3941^{+210}_{-291}	-3007^{+6510}_{-293}	$0.120^{+0.622}_{-0.086}$
Alt.	-996 ± 231	$1199.31^{+1021.90}_{-757.51}$	3908^{+232}_{-308}	-3097^{+6168}_{-240}	$0.066^{+0.430}_{-0.047}$

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

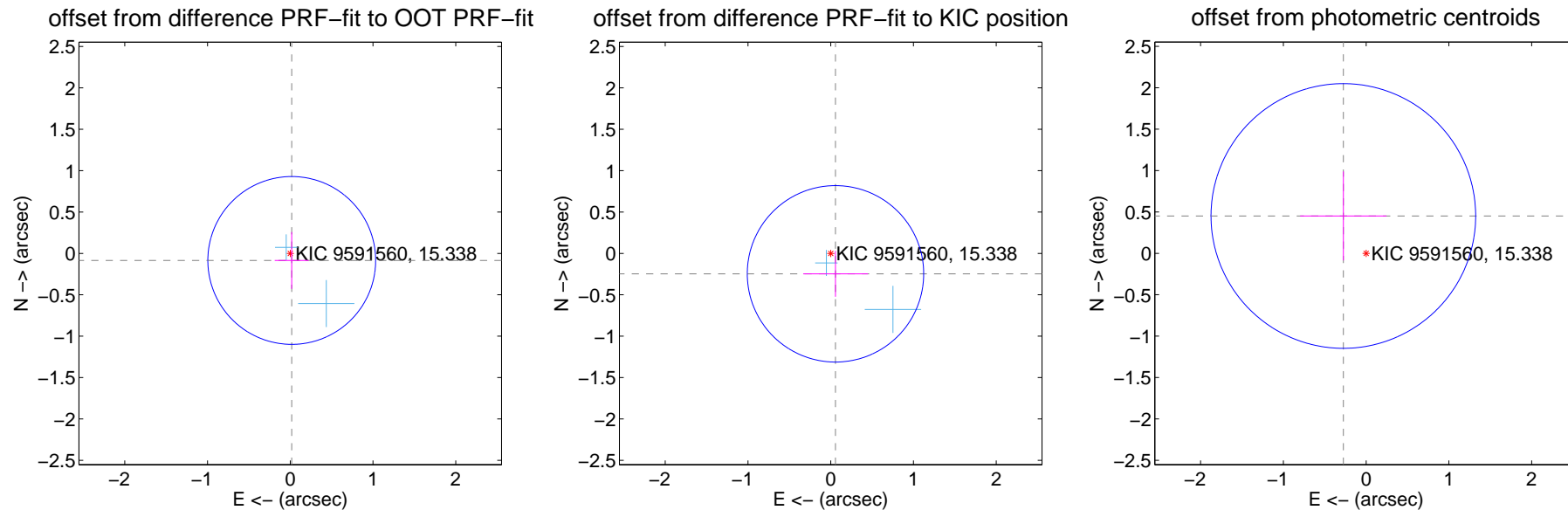
DV Centroid Data

Supplemental centroid analysis for 009591560-01. Kepler magnitude: 15.34. Transit SNR 6.80

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.087 ± 0.338	0.26	-0.018 ± 0.205	-0.085 ± 0.343
PRF-fit source offset from KIC position	0.253 ± 0.355	0.71	-0.058 ± 0.391	-0.247 ± 0.277
photometric centroid source offset	0.53 ± 0.53	0.99	0.28 ± 0.52	0.45 ± 0.54



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.



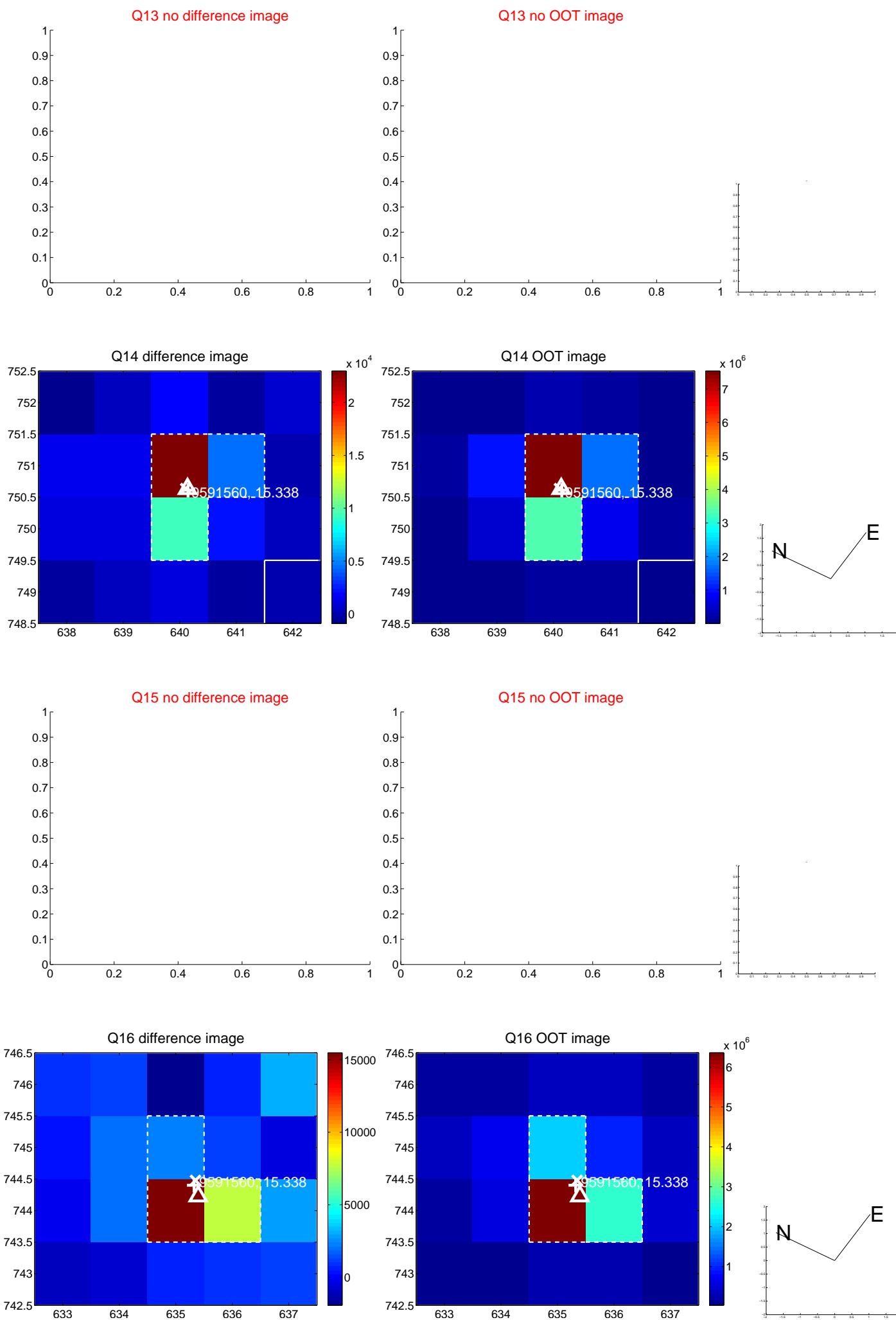
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



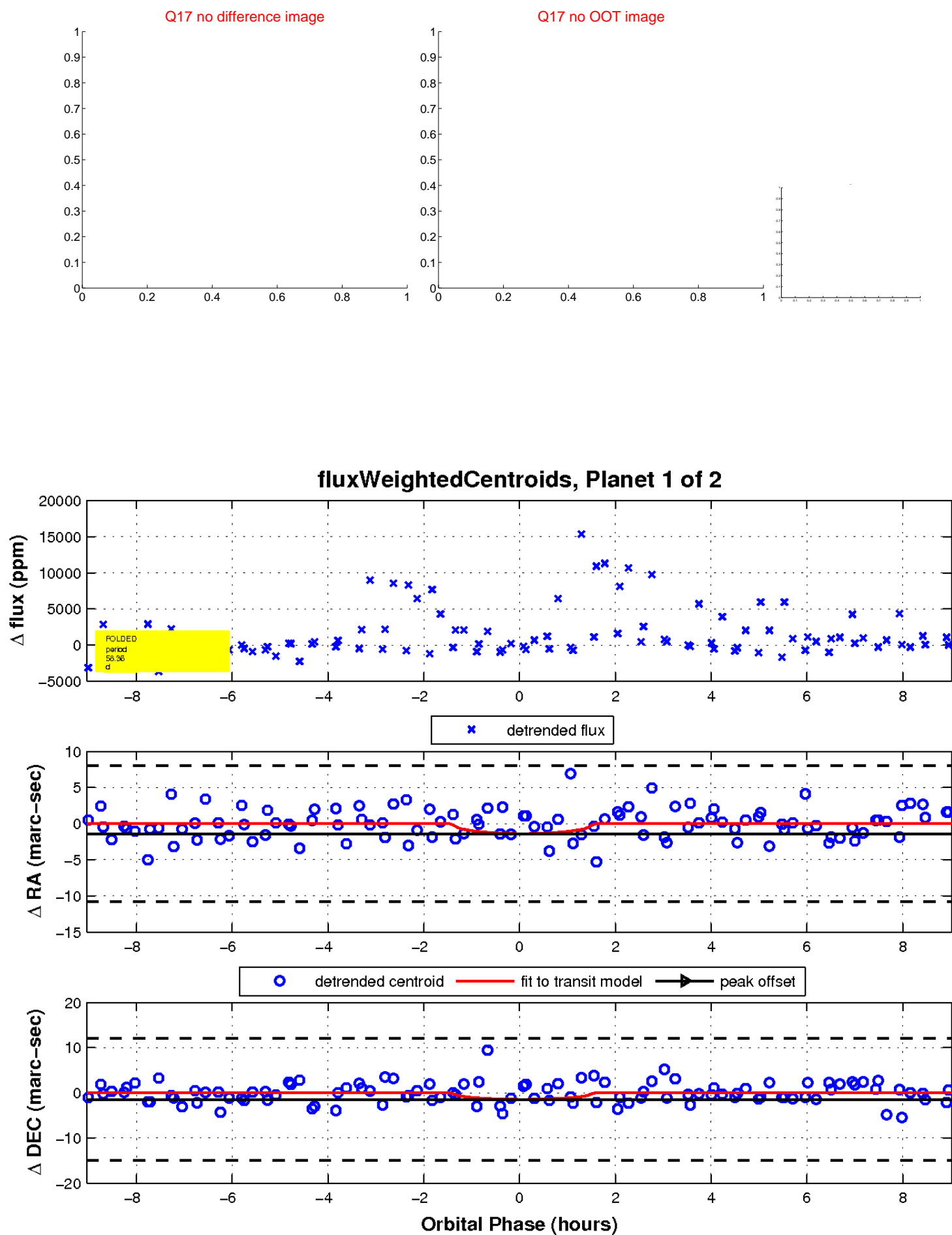
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



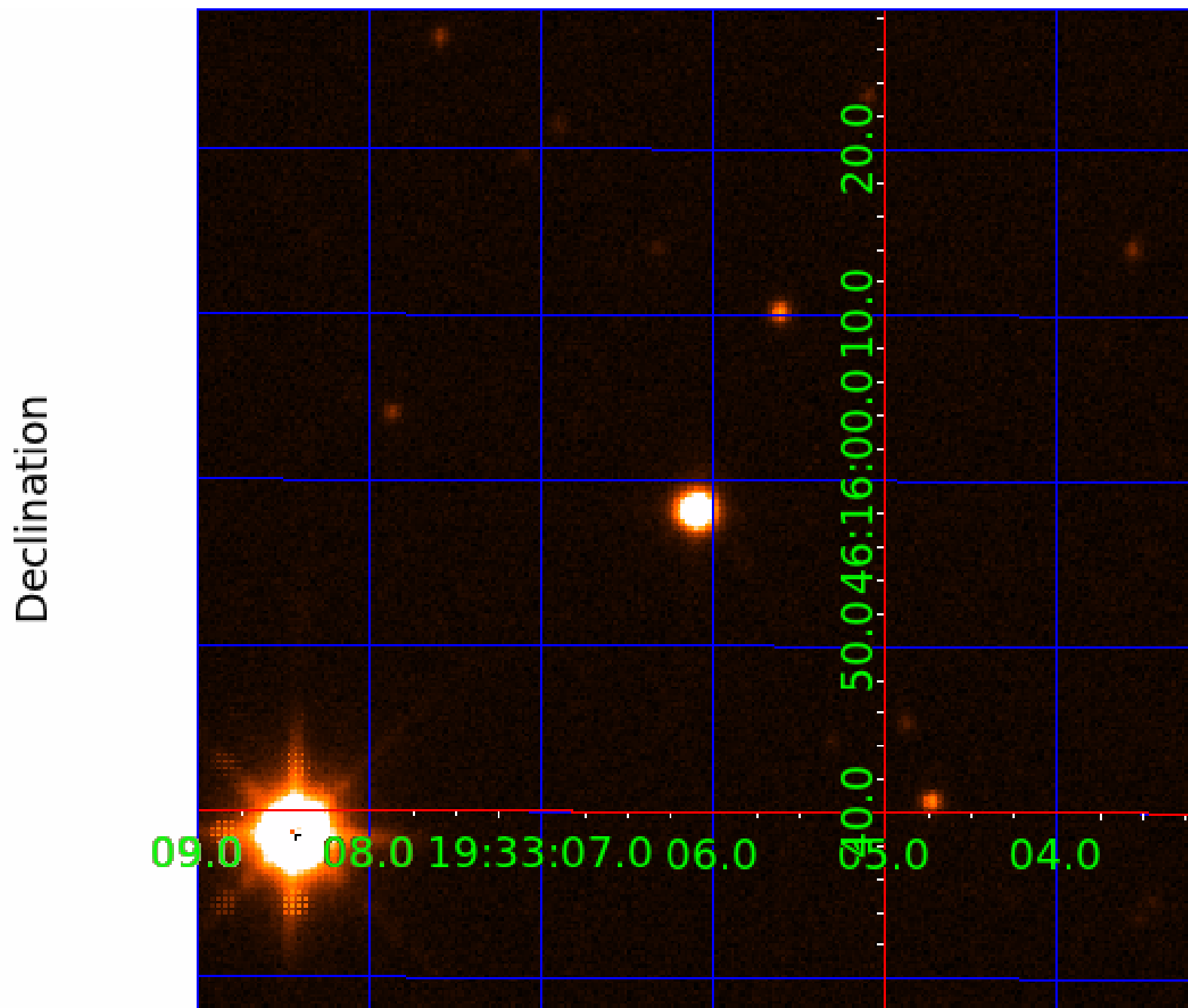
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009591560

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})
009591560-01	OBS	No	58.360544	133.428795	3514.6	3.030	14.9	6.8	146.56	3457	811.97	0.00
009591560-02	OBS	No	98.674440	160.701864	2590.2	6.685	11.8	5.7	146.56	3457	773.93	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009591560-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009591560-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS

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

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

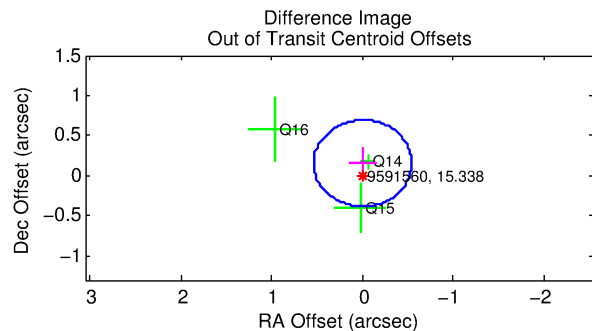
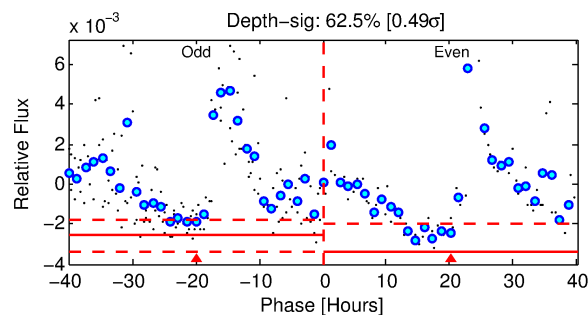
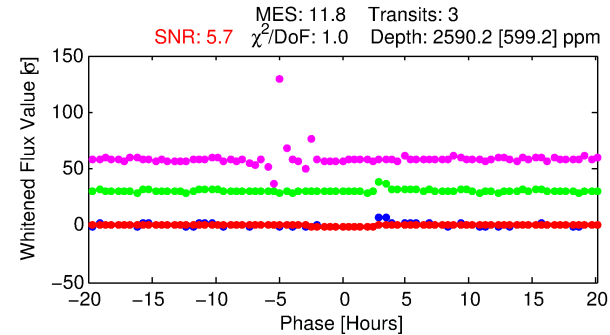
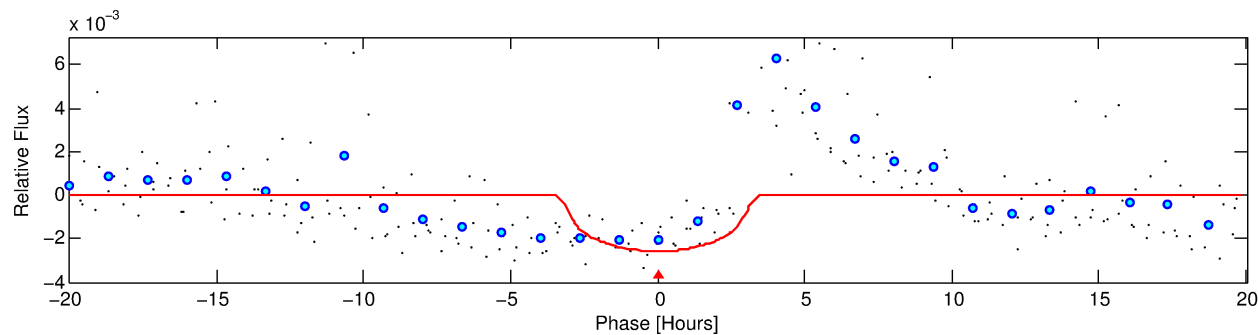
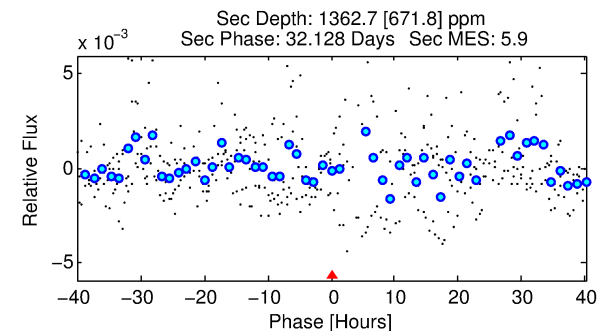
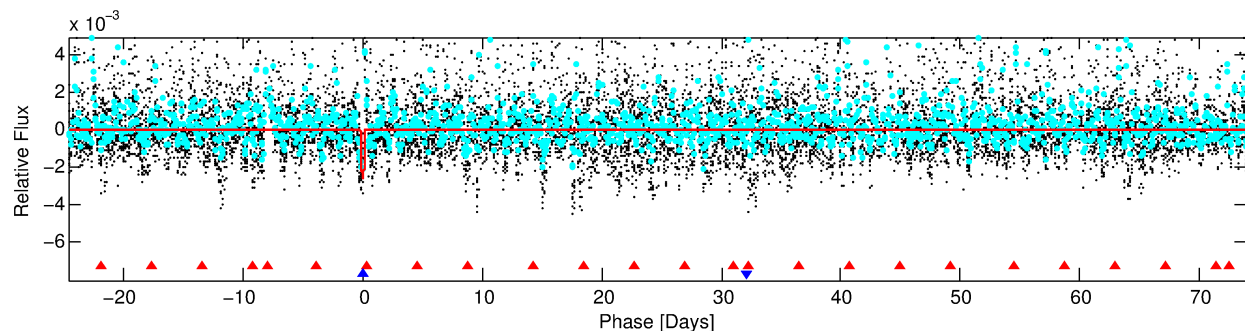
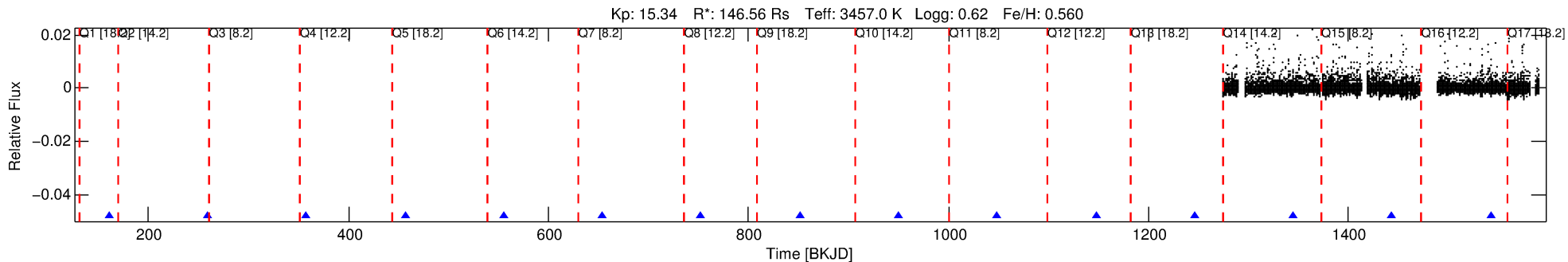
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009591560-02

No Significant Match Found

DV One-Page Summary

KIC: 9591560 Candidate: 2 of 2 Period: 98.674 d



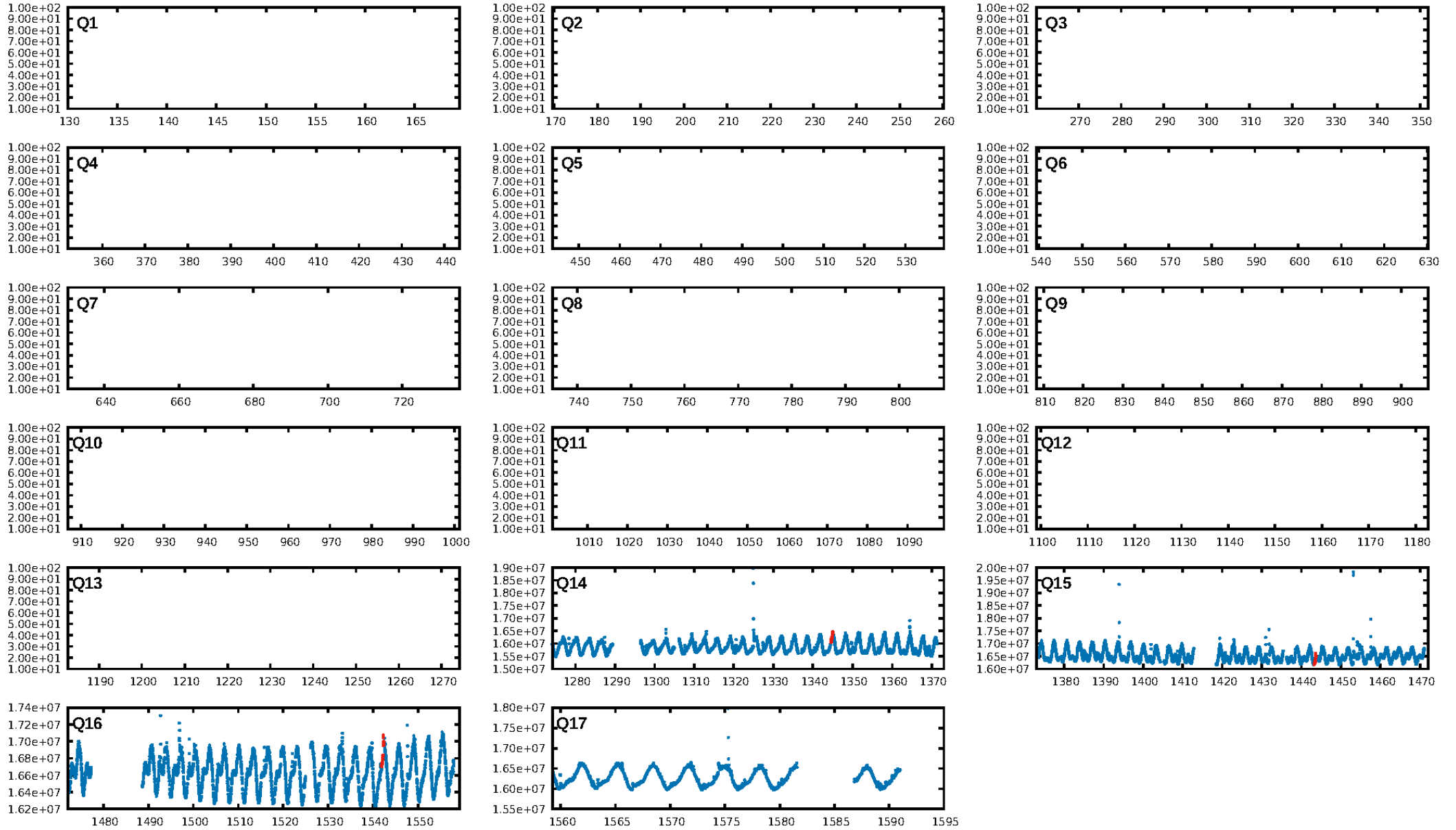
DV Fit Results:

Period = 98.67444 [0.00635] d
Epoch = 160.7019 [0.0831] BKJD
Rp/R* = 0.0484 [0.0327]
a/R* = 93.80 [149.66]
b = 0.64 [1.52]
Seff = N/A
Teq = N/A
Rp = 773.93 [663.61] Re
a = N/A
Ag = N/A
Teffp = N/A

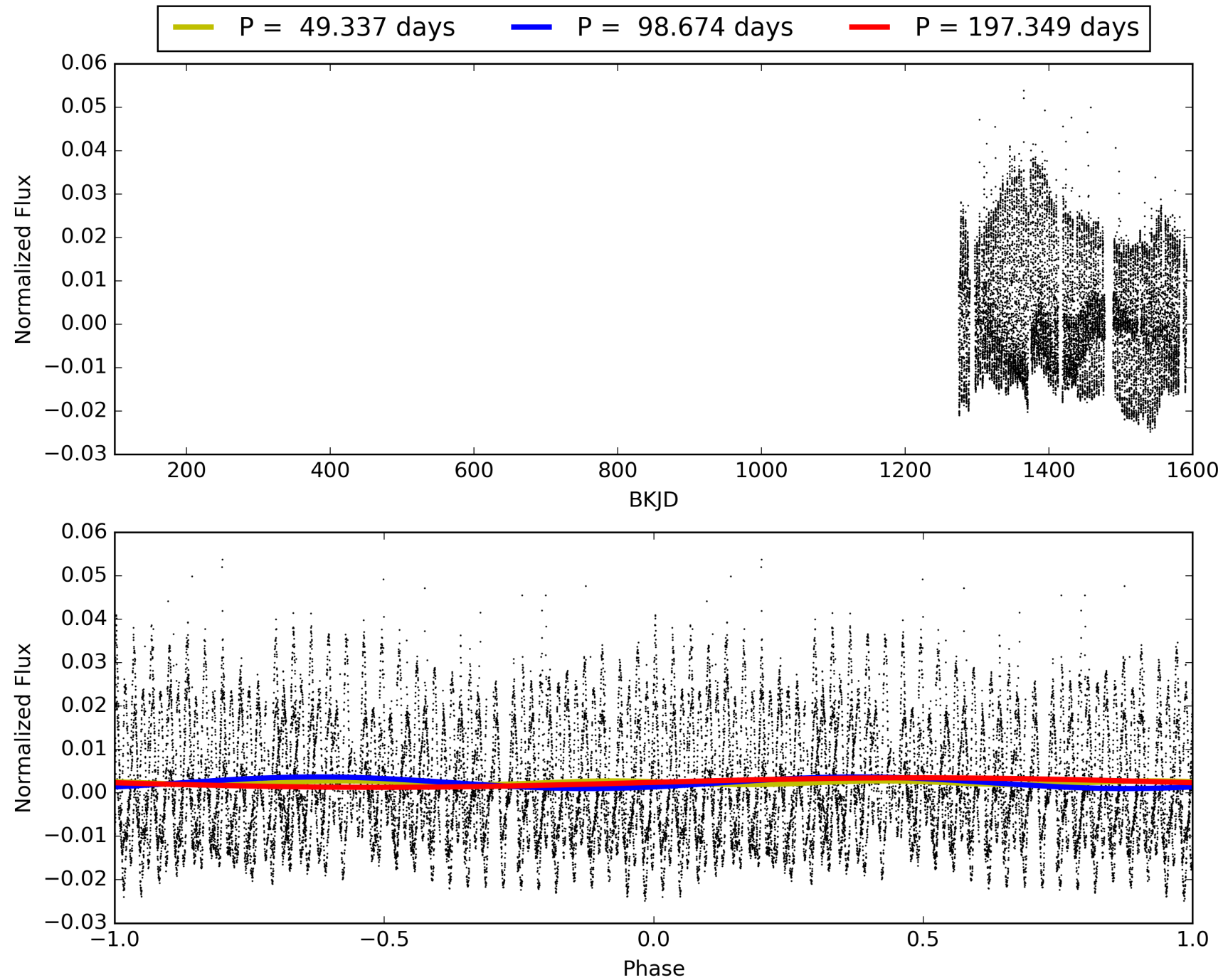
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [131.82σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 89.5%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 1.16e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -7.191
Centroid-sig: 35.3%
Centroid-so: 0.512 arcsec [0.98σ]
OotOffset-rm: 0.155 arcsec [0.86σ]
KicOffset-rm: 0.036 arcsec [0.12σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009591560-02, PDC Light Curves

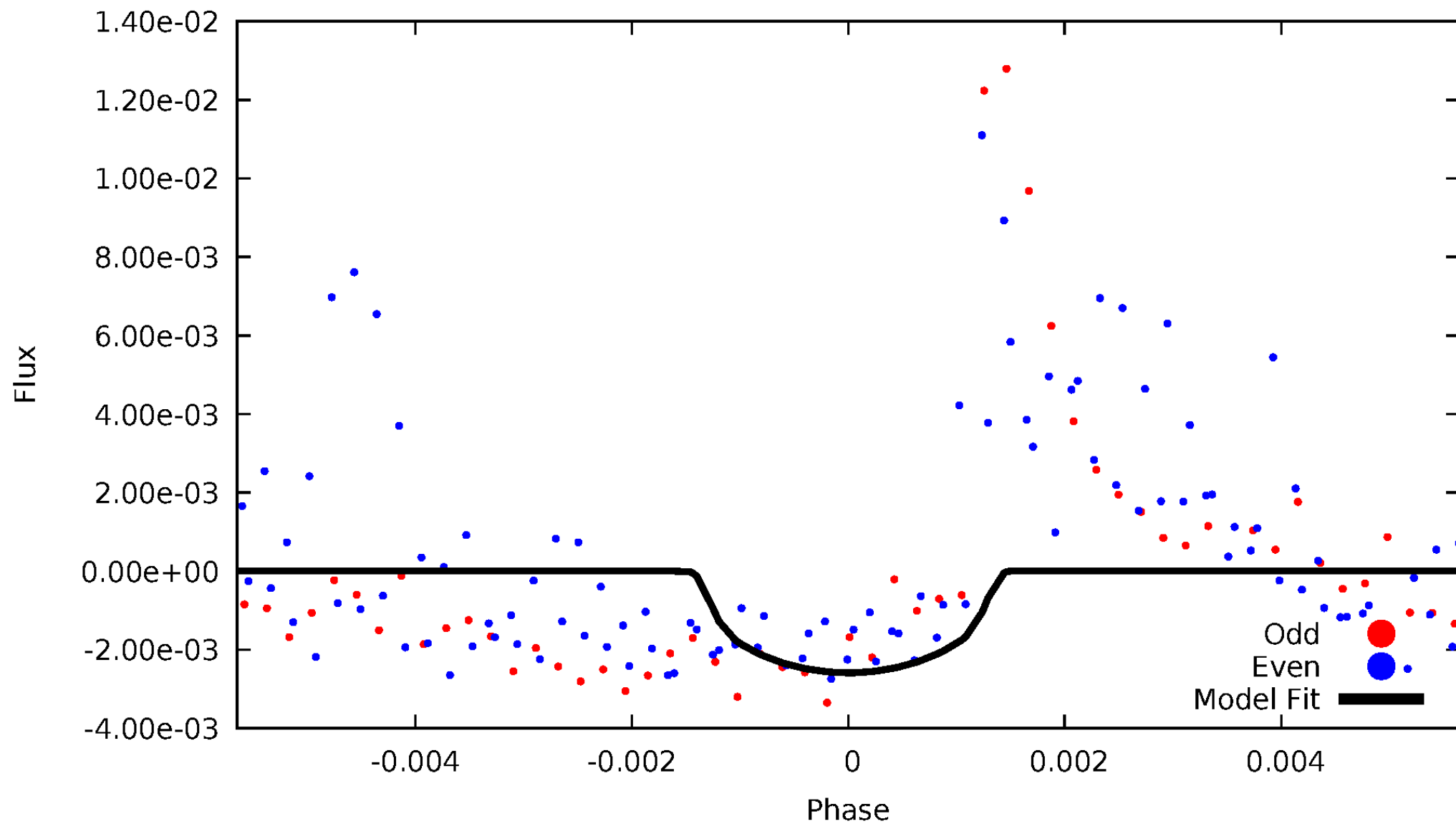


TCE 009591560-02



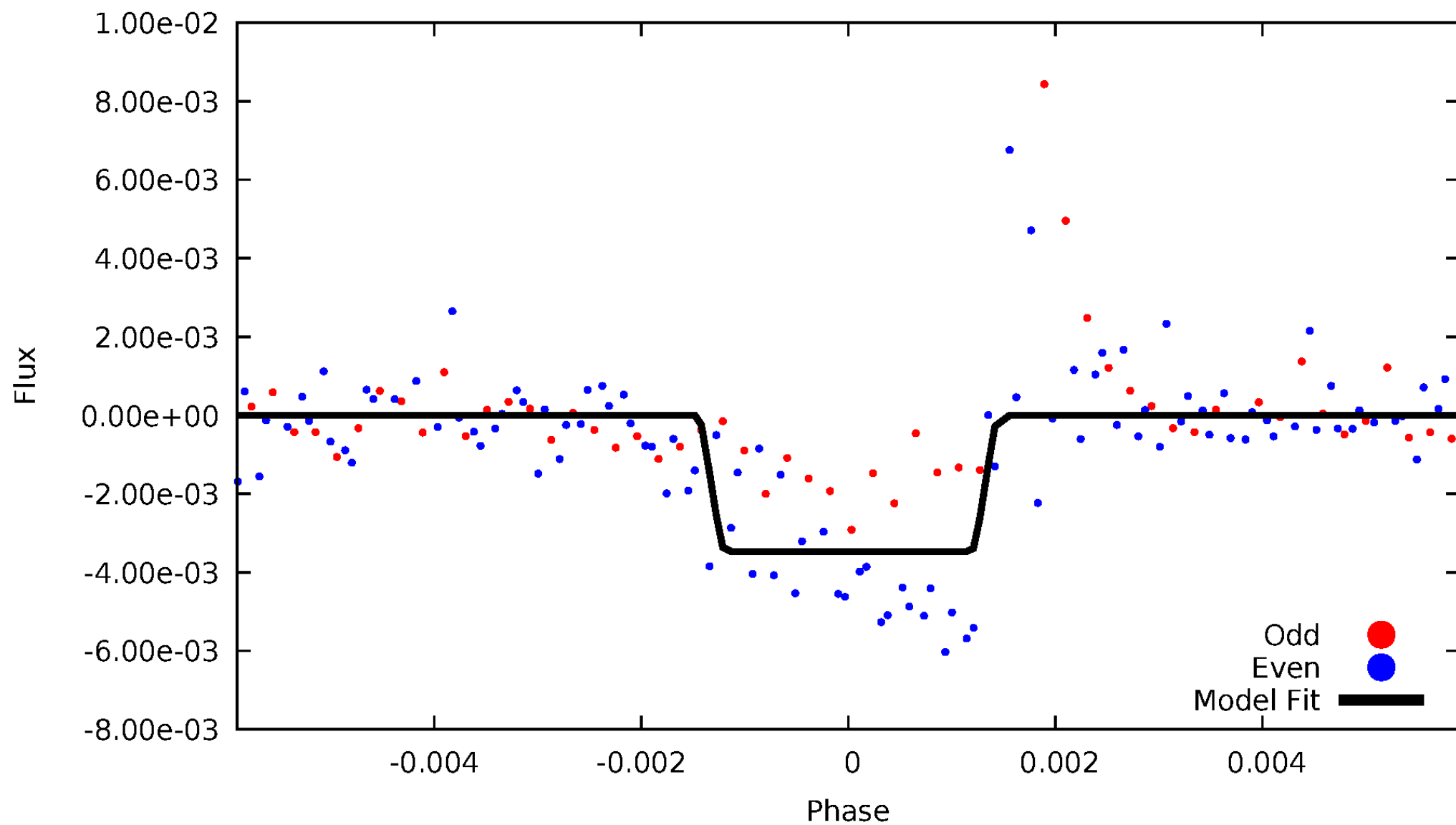
DV Odd/Even

TCE 009591560-02



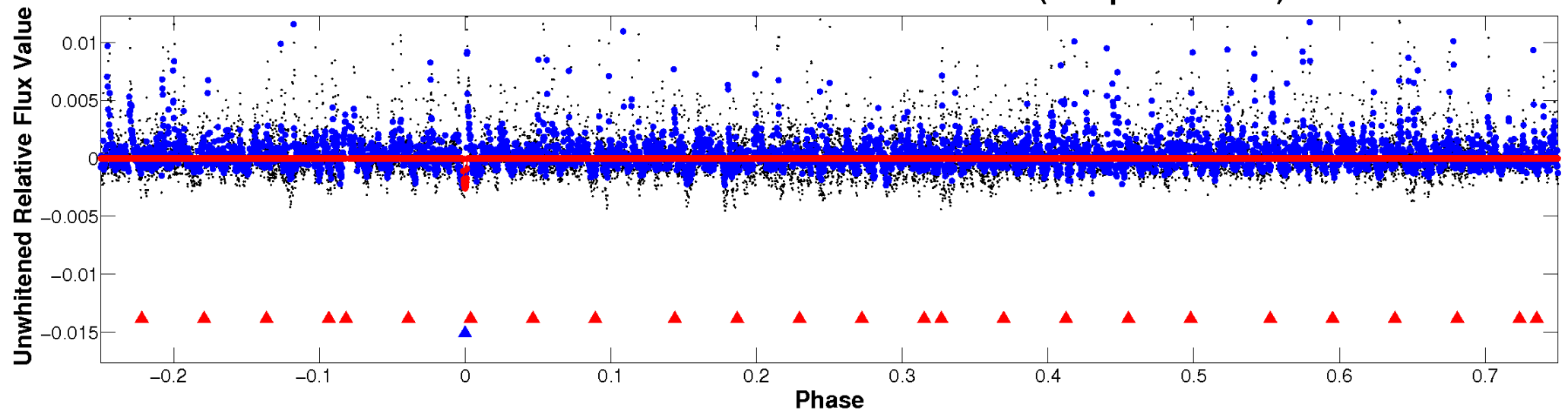
ALT Odd/Even

TCE 009591560-02

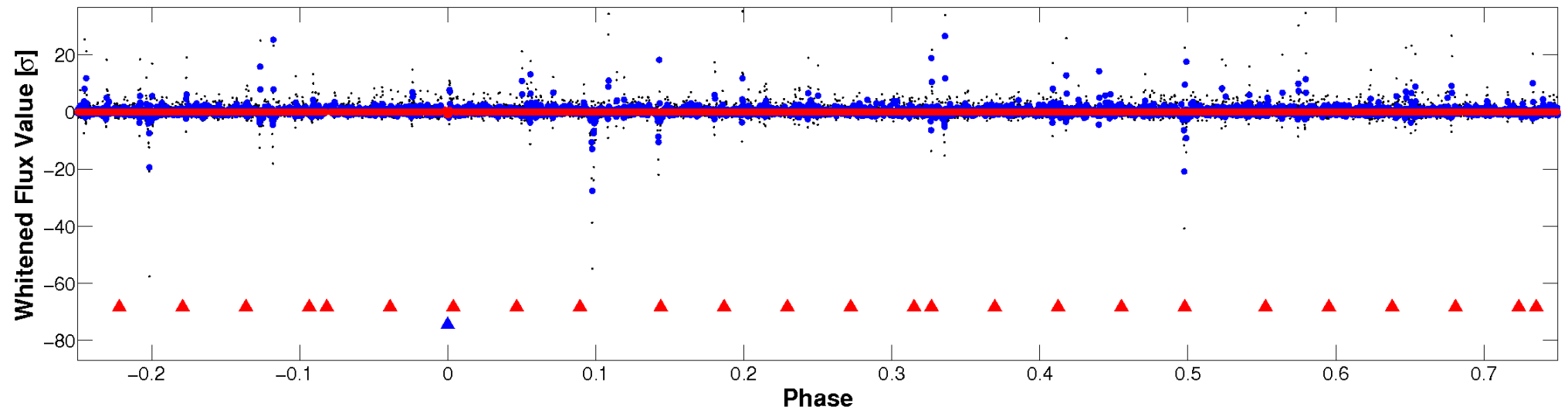


Non-Whitened Vs. Whitened Light Curve

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

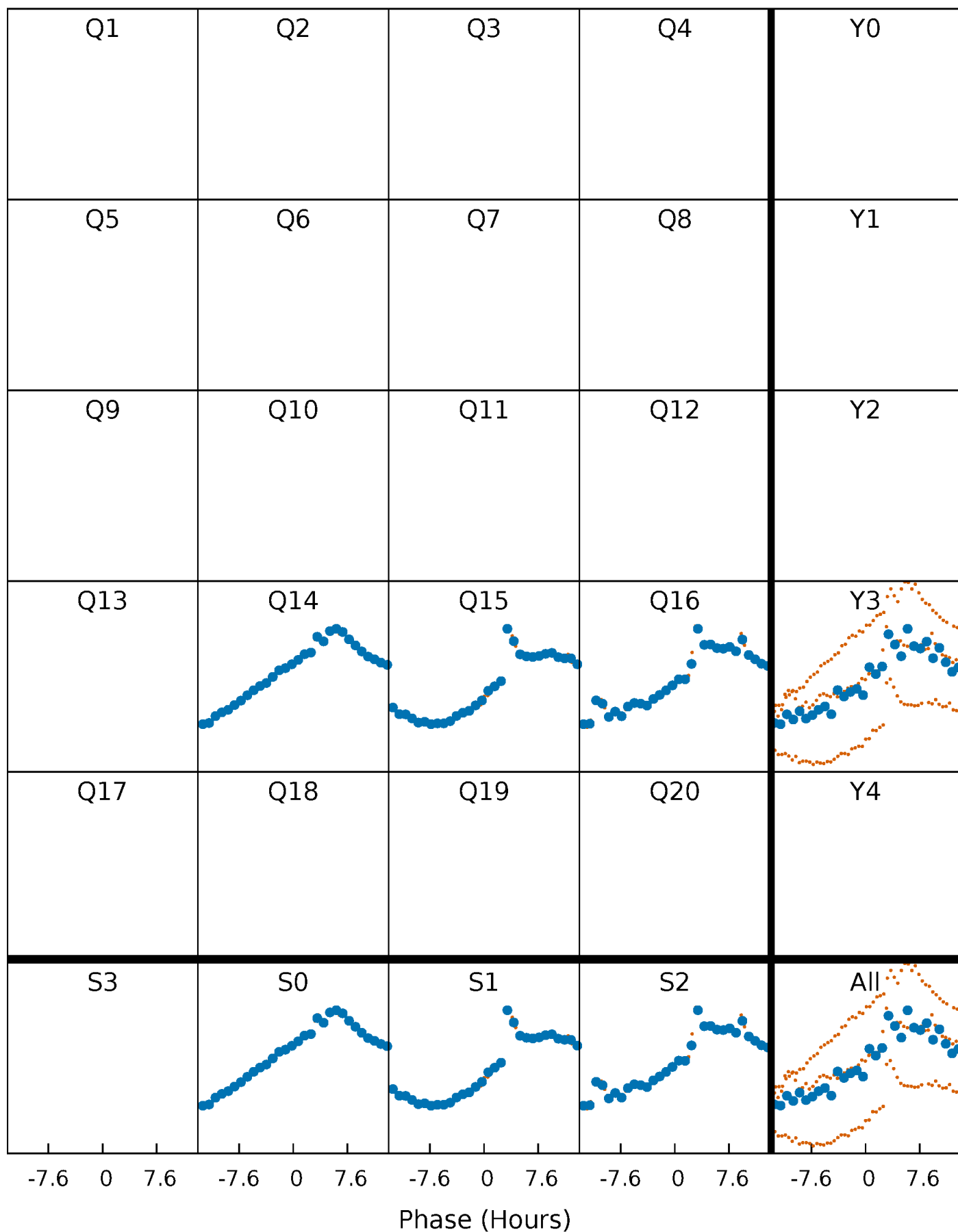


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



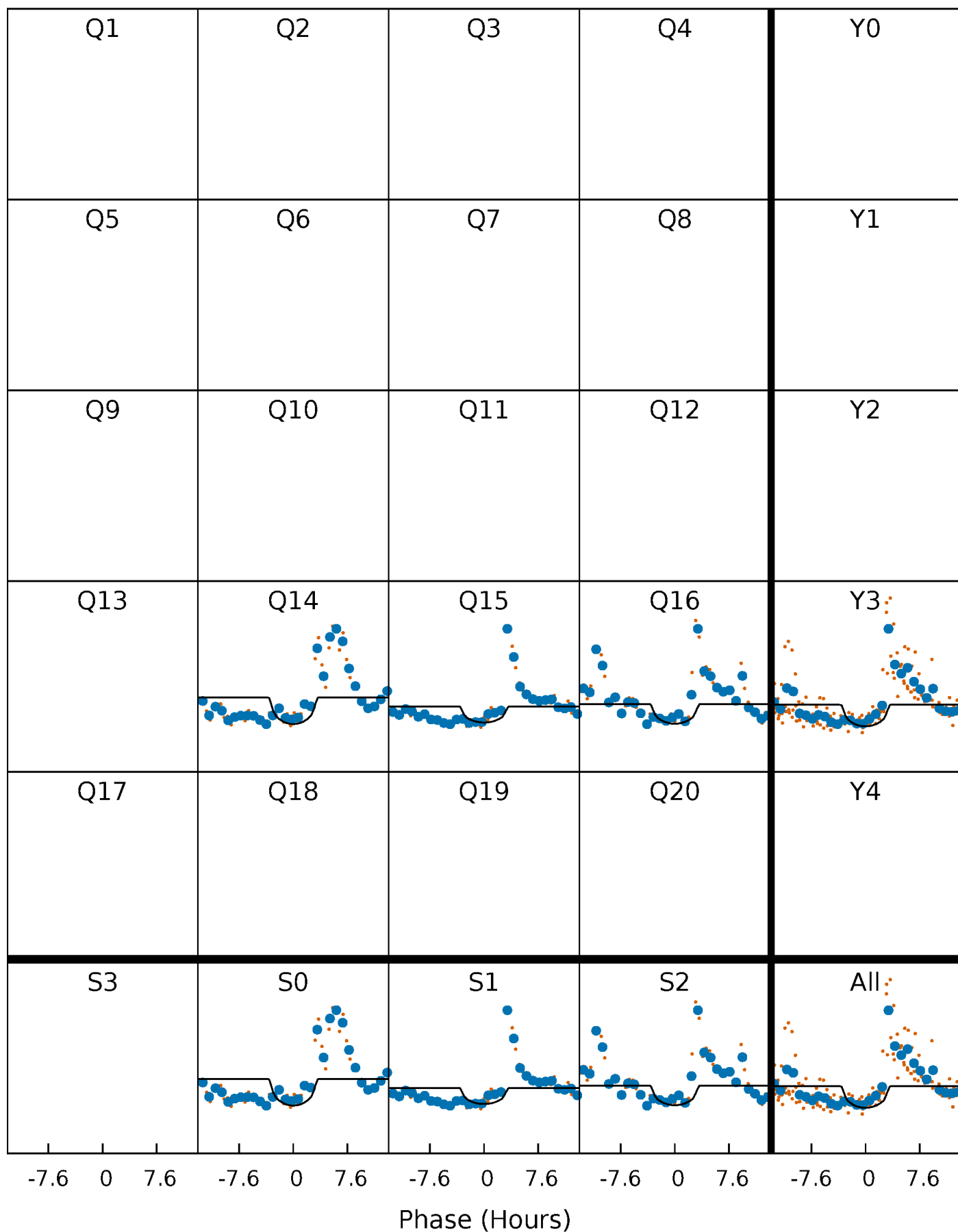
PDC Quarter-Phased Transit Curves

TCE 009591560-02 P= 98.674440 Days $T_0=160.701864$ (BKJD)



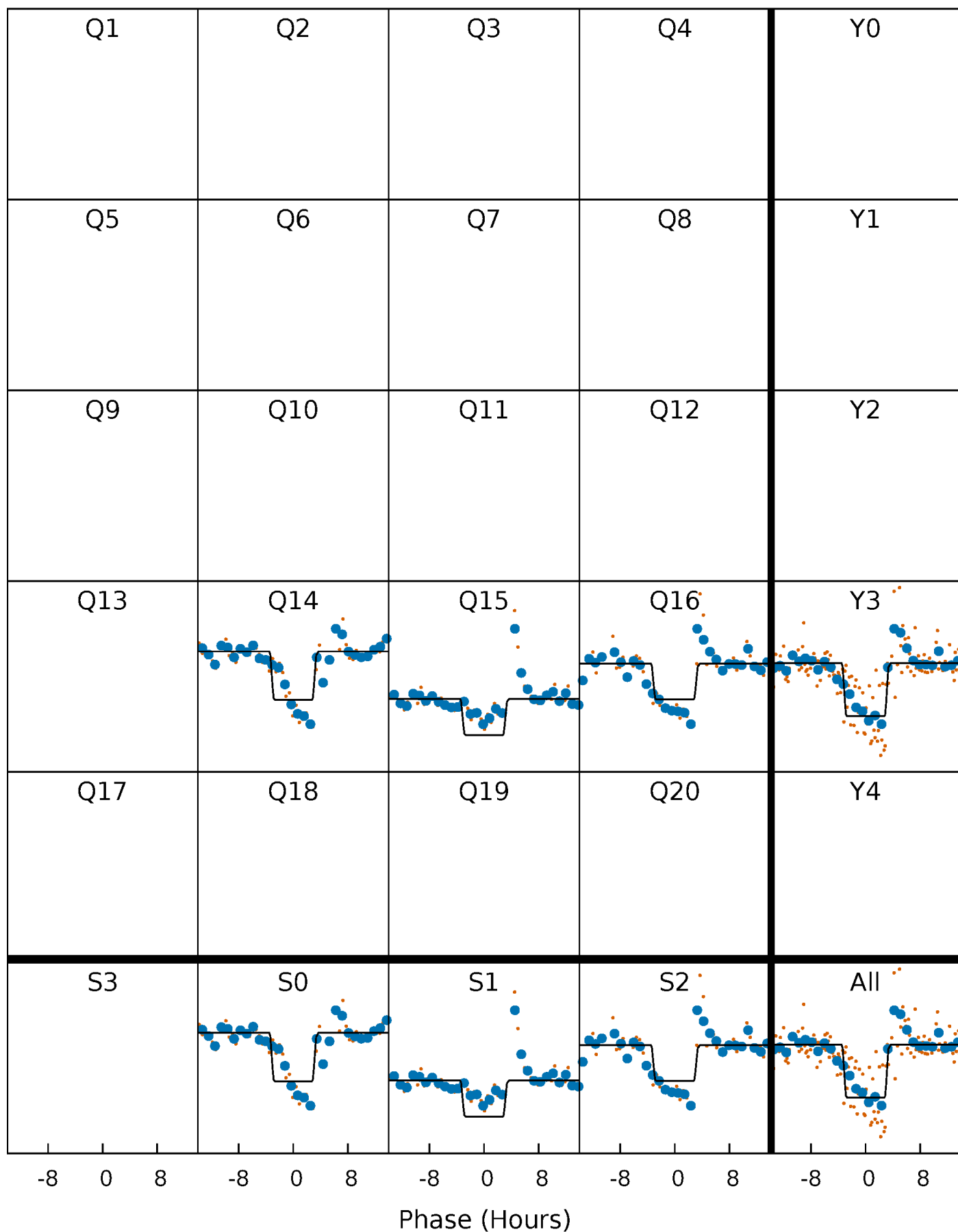
DV Quarter-Phased Transit Curves

TCE 009591560-02 P= 98.674440 Days $T_0=160.701864$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

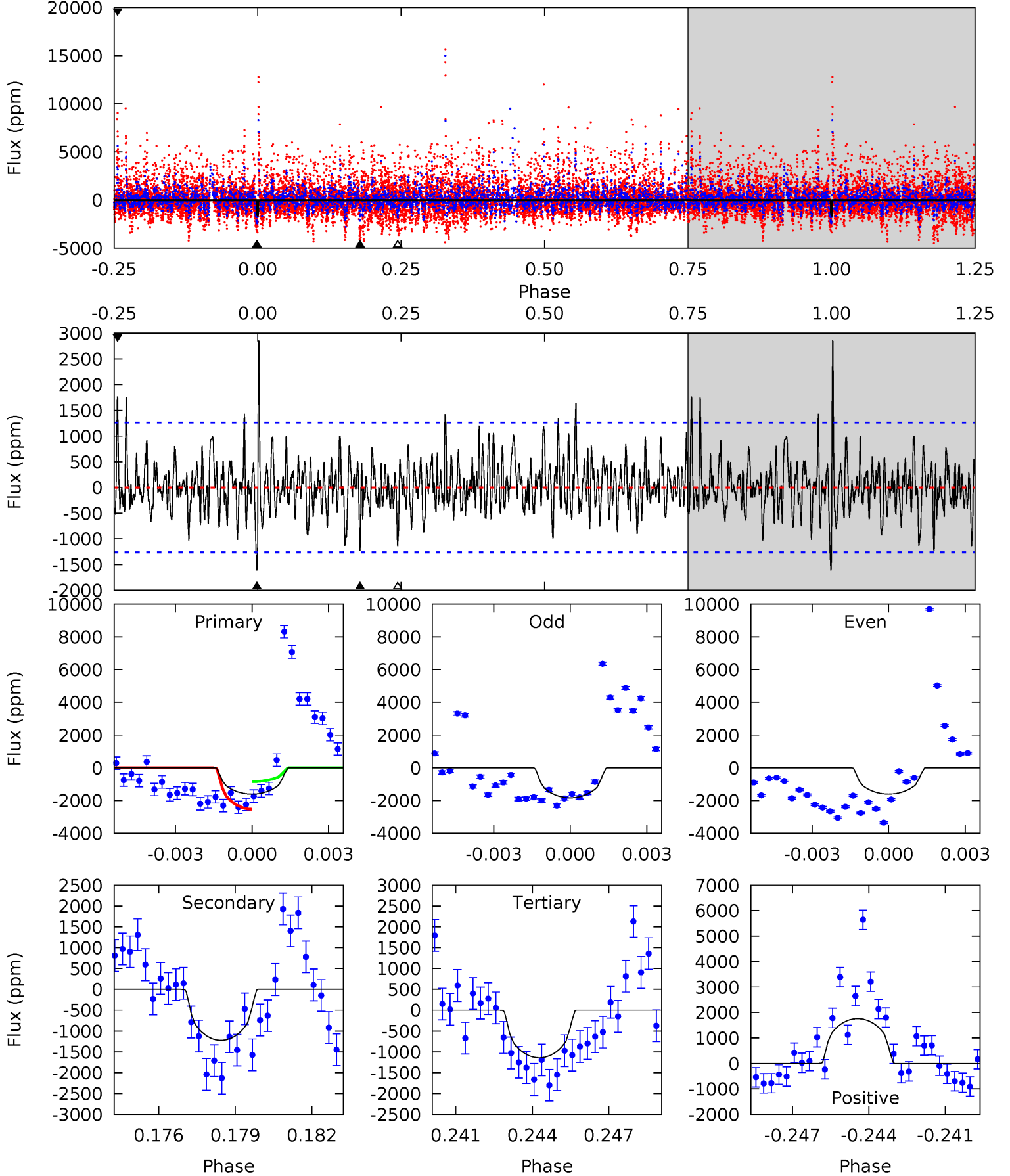
TCE 009591560-02 P= 98.664558 Days $T_0=160.808085$ (BKJD)



DV Model-Shift Uniqueness Test

009591560-02, P = 98.674440 Days, E = 160.701864 Days

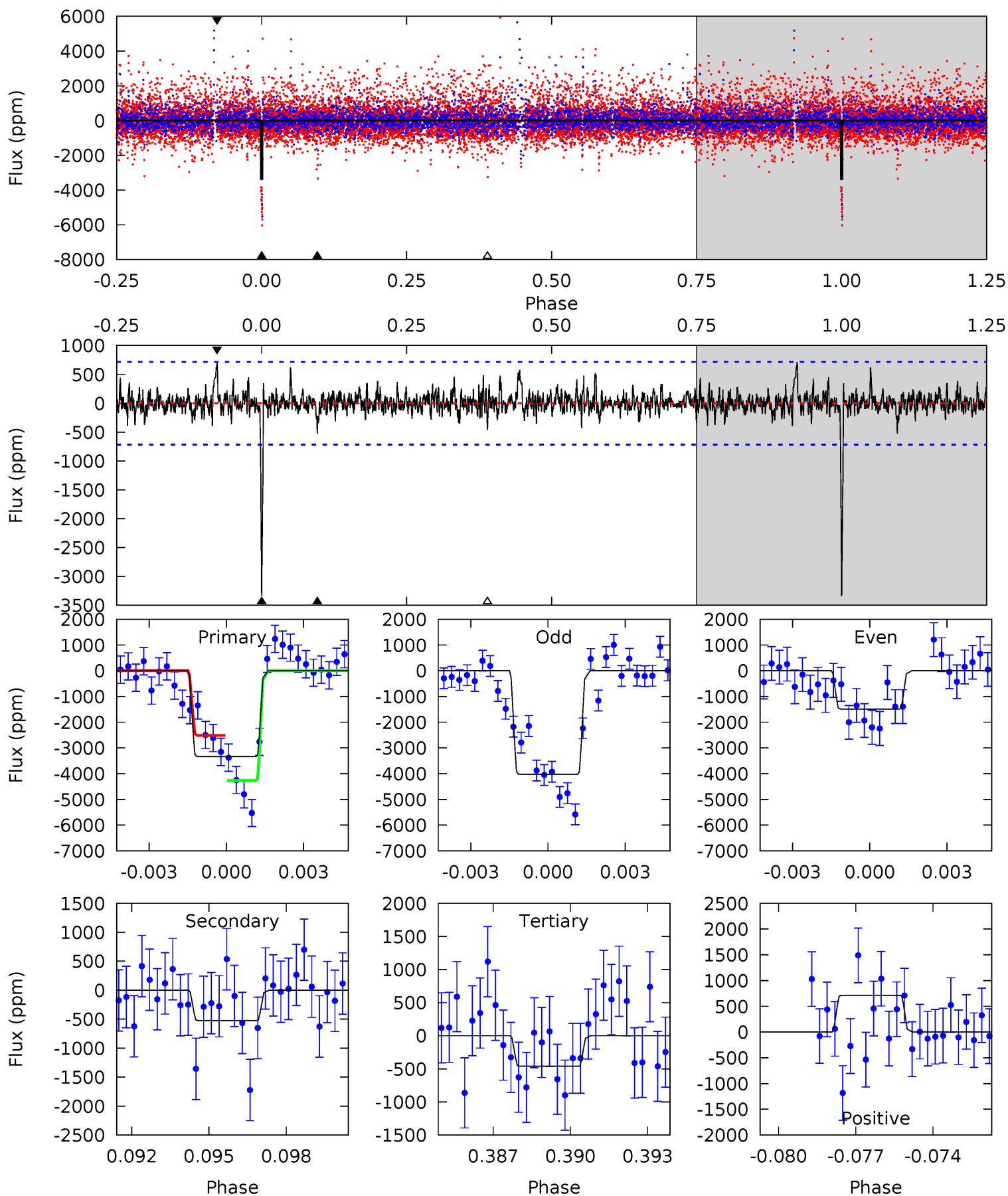
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.71	5.09	4.75	7.32	5.25	2.96	1.76	1.96	-0.62	0.35	-2.23	0.20	0.88	0.64	3.49



Alt Model-Shift Uniqueness Test

009591560-02, P = 98.664558 Days, E = 160.808085 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	3.84	3.38	5.24	5.25	2.97	0.96	21.1	19.2	0.46	-1.40	7.99	0.92	0.18	6.47



Stellar Parameters For KIC 009591560

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3457^{+114}_{-104}	$0.622^{+0.270}_{-0.180}$	$0.560^{+0.050}_{-0.250}$	$146.556^{+13.623}_{-77.198}$	$3.281^{+0.231}_{-2.082}$	$0.000^{+0.000}_{-0.000}$
	+3%/-3%	+43%/-29%	+9%/-45%	+9%/-53%	+7%/-63%	+259%/-42%
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 009591560-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1224 ± 240	$760.37^{+560.47}_{-424.20}$	3292^{+180}_{-226}	2624^{+1277}_{-5357}	$0.426^{+1.675}_{-0.282}$
Alt.	-523 ± 136	$922.83^{+586.42}_{-480.76}$	3299^{+184}_{-273}	-2717^{+5528}_{-244}	$0.120^{+0.399}_{-0.076}$

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 $A_{obs} \gg 1.0$

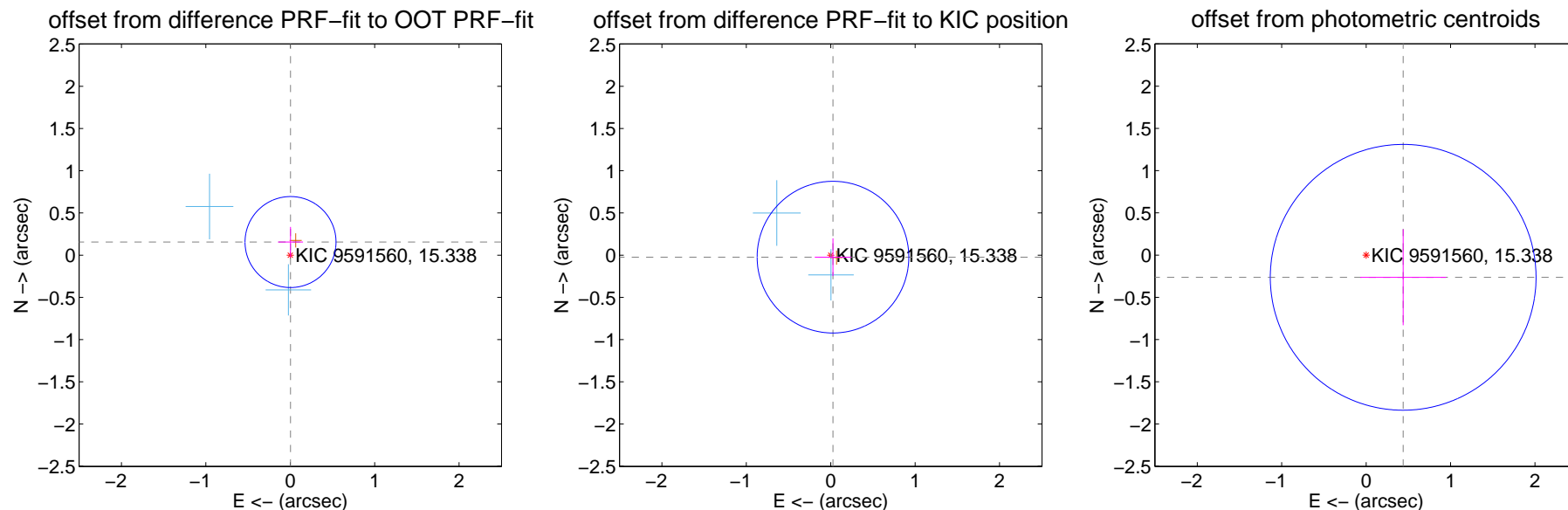
DV Centroid Data

Supplemental centroid analysis for 009591560-02. Kepler magnitude: 15.34. Transit SNR 5.67

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.155 ± 0.180	0.86	-0.003 ± 0.148	0.155 ± 0.180
PRF-fit source offset from KIC position	0.036 ± 0.299	0.12	-0.027 ± 0.216	-0.024 ± 0.223
photometric centroid source offset	0.51 ± 0.52	0.98	-0.44 ± 0.51	-0.26 ± 0.57



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.



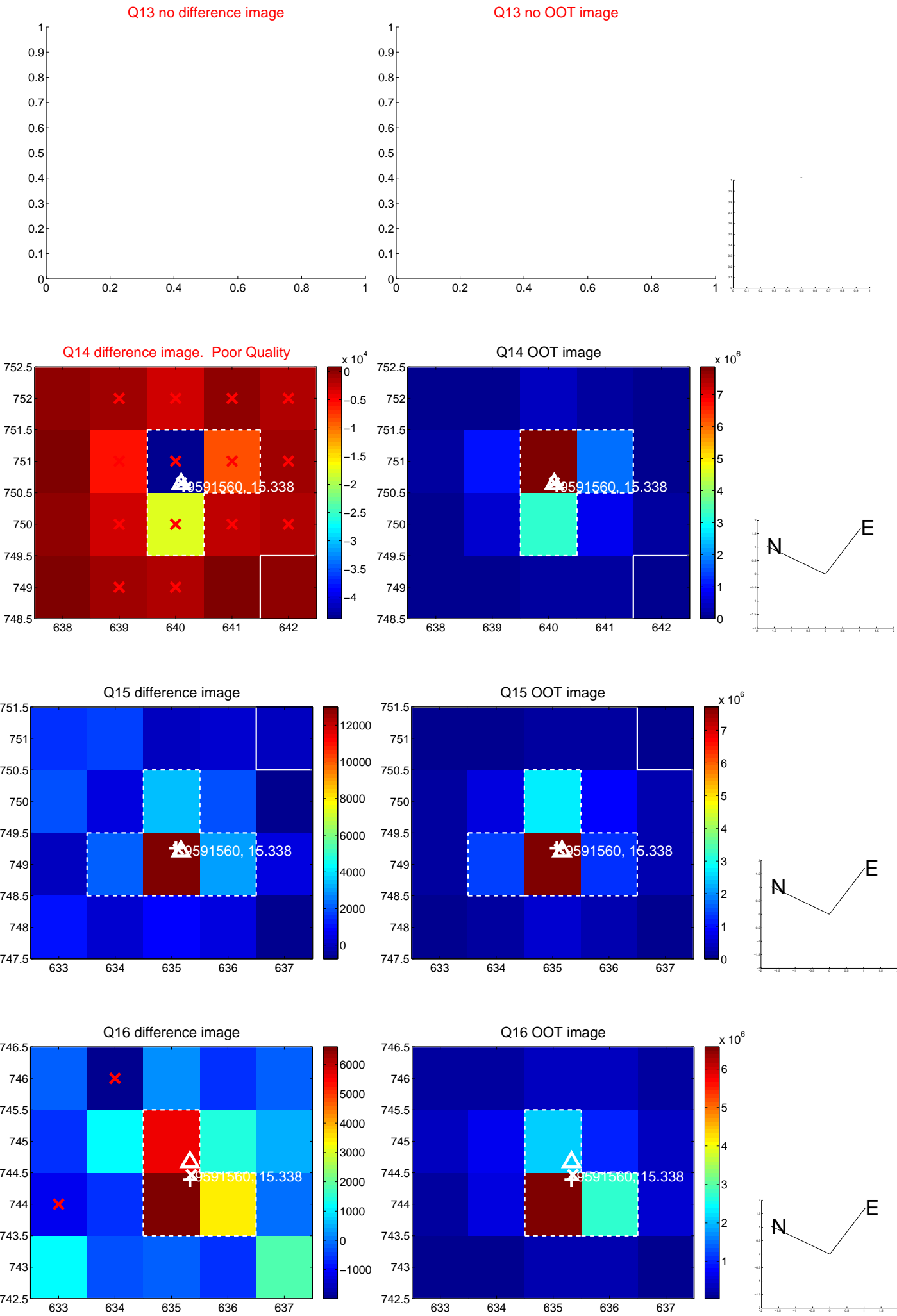
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



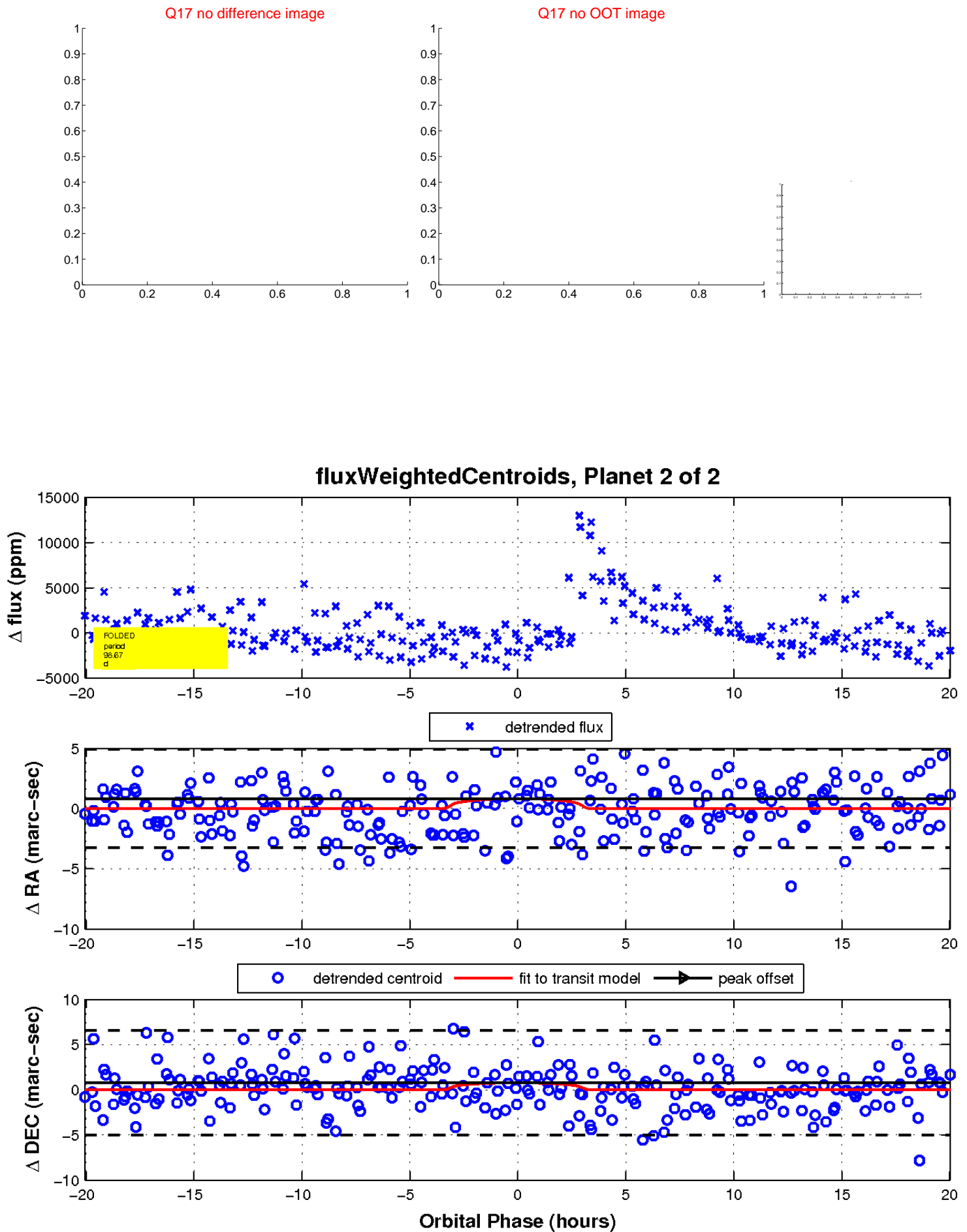
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

