

KIC 004073089

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})
004073089-01	OBS	7682.01	58.872312	153.931547	188858.2	17.450	1594.4	940.8	1.57	7078	99.10	50.45
004073089-02	OBS	No	1.186895	132.092776	119.4	10.879	9.1	11.9	1.57	7078	1.73	9194.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004073089-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—CENT_FEW_DIFFS
004073089-02	OBS	FP	0.00	1	0	0	0	LPP_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.

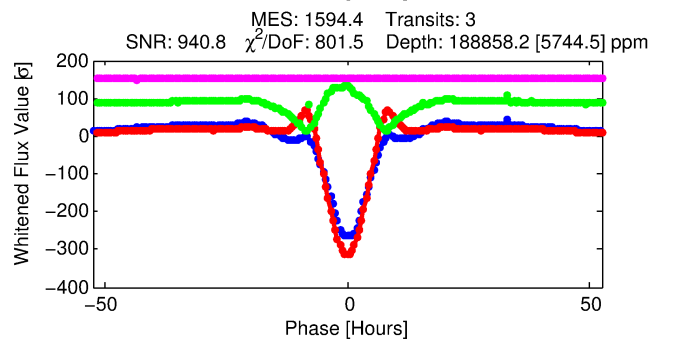
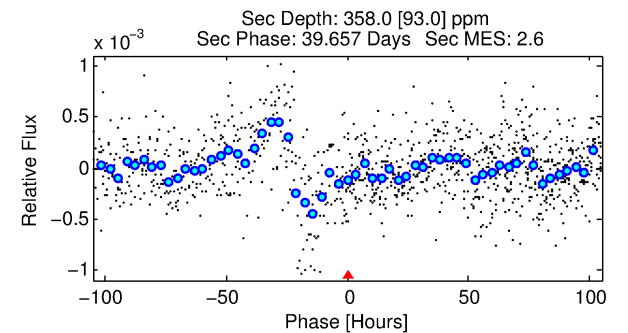
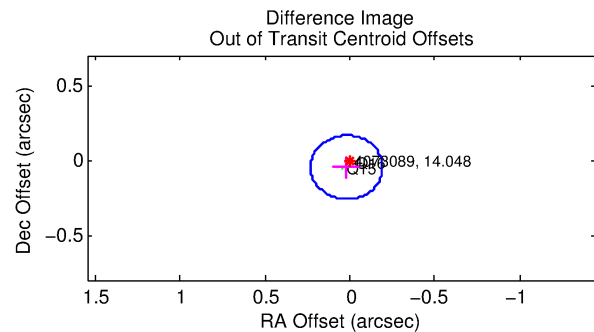
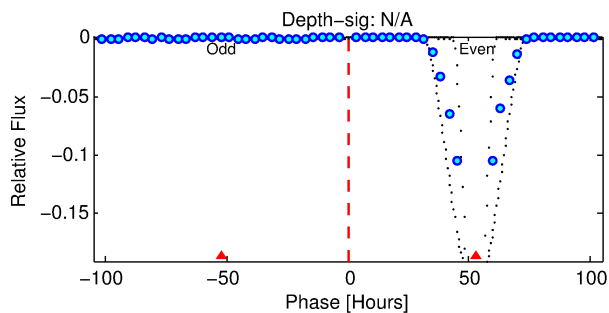
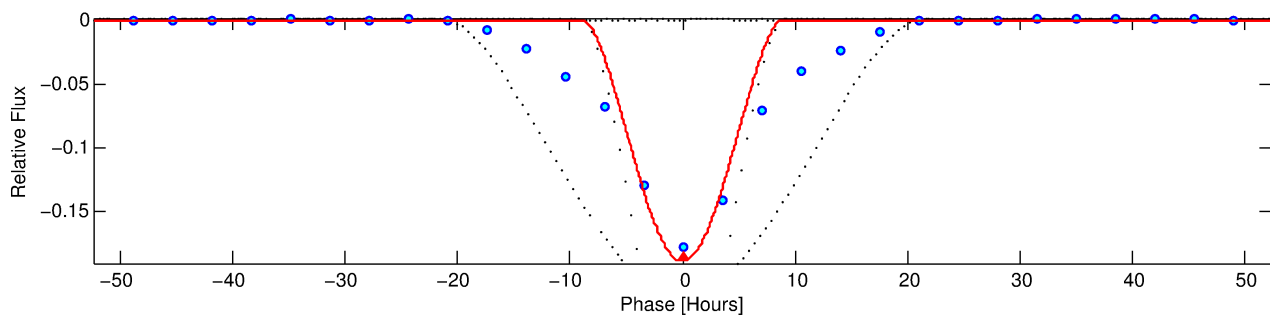
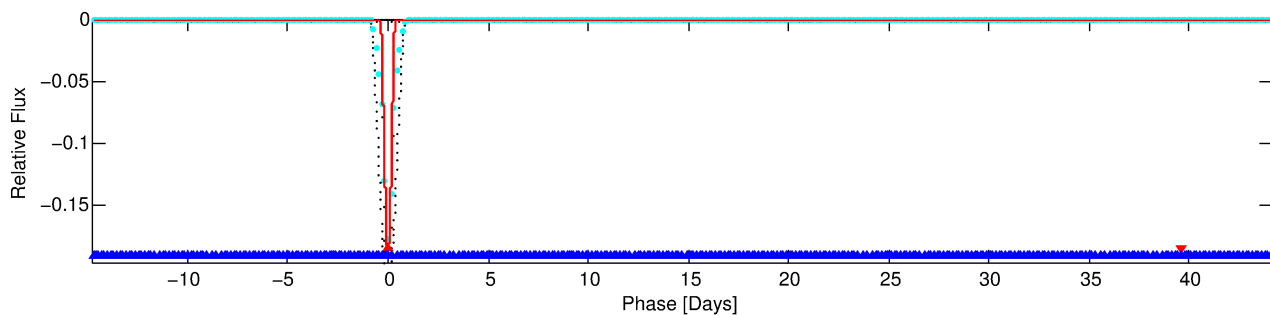
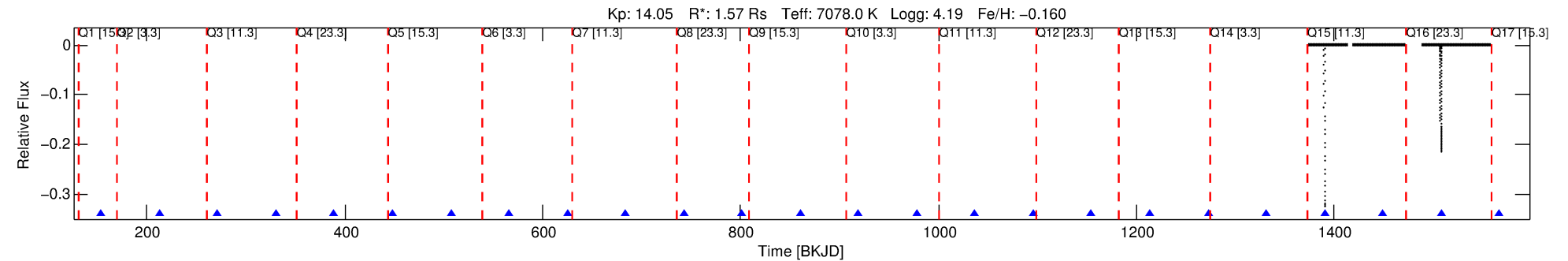
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004073089-01

No Significant Match Found

DV One-Page Summary

KIC: 4073089 Candidate: 1 of 2 Period: 58.872 d



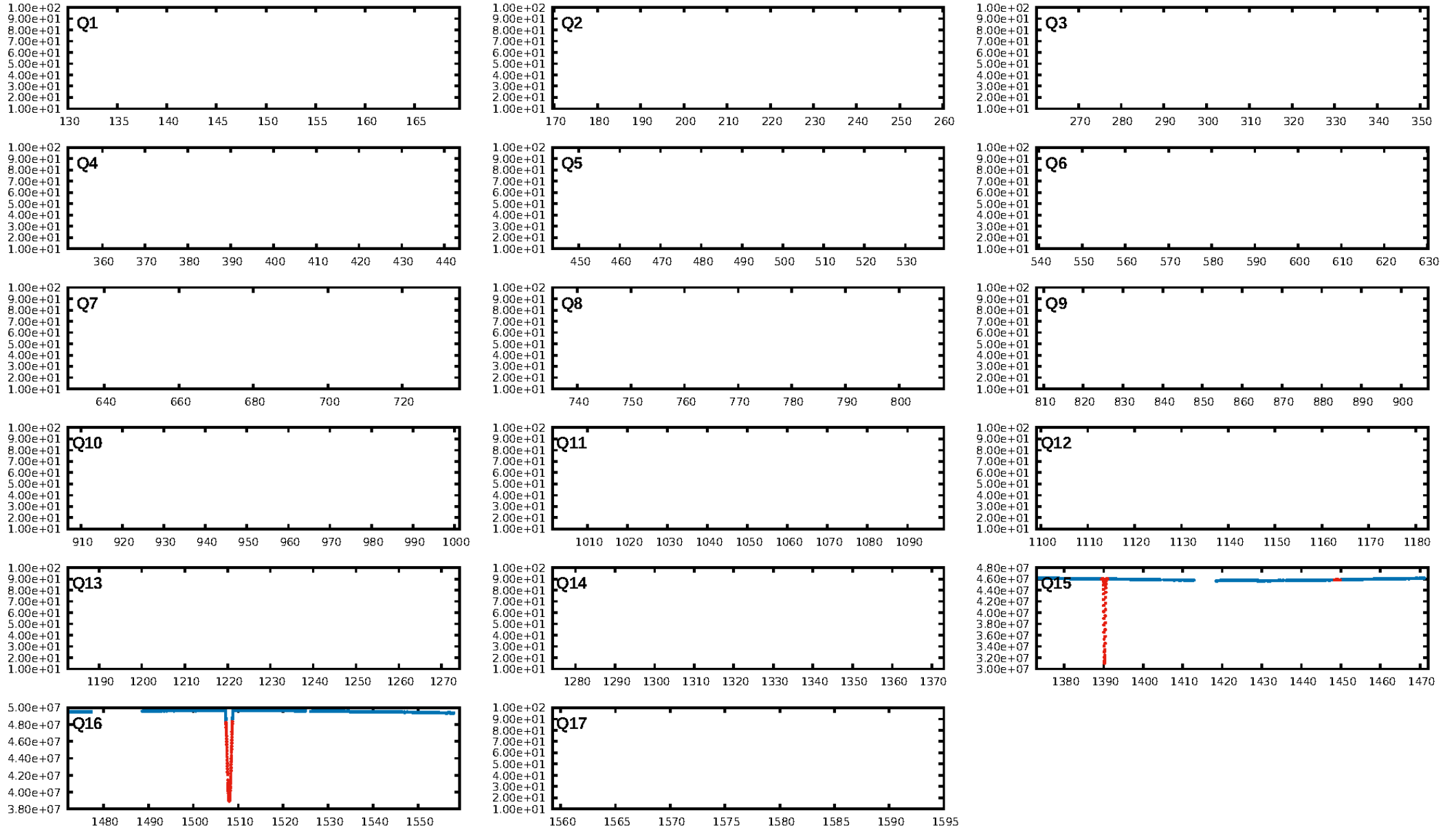
DV Fit Results:

Period = 58.87231 [0.00366] d
Epoch = 153.9315 [0.0802] BKJD
Rp/R* = 0.5792 [0.9695]
a/R* = 33.90 [7.40]
b = 0.87 [1.37]
Seff = 50.45 [20.68]
Teq = 680 [70] K
Rp = 99.10 [169.16] Re
a = 0.3310 [0.0884] AU
Ag = 2.20 [7.42] [0.16 σ]
Teffp = 1279 [1075] K [0.56 σ]

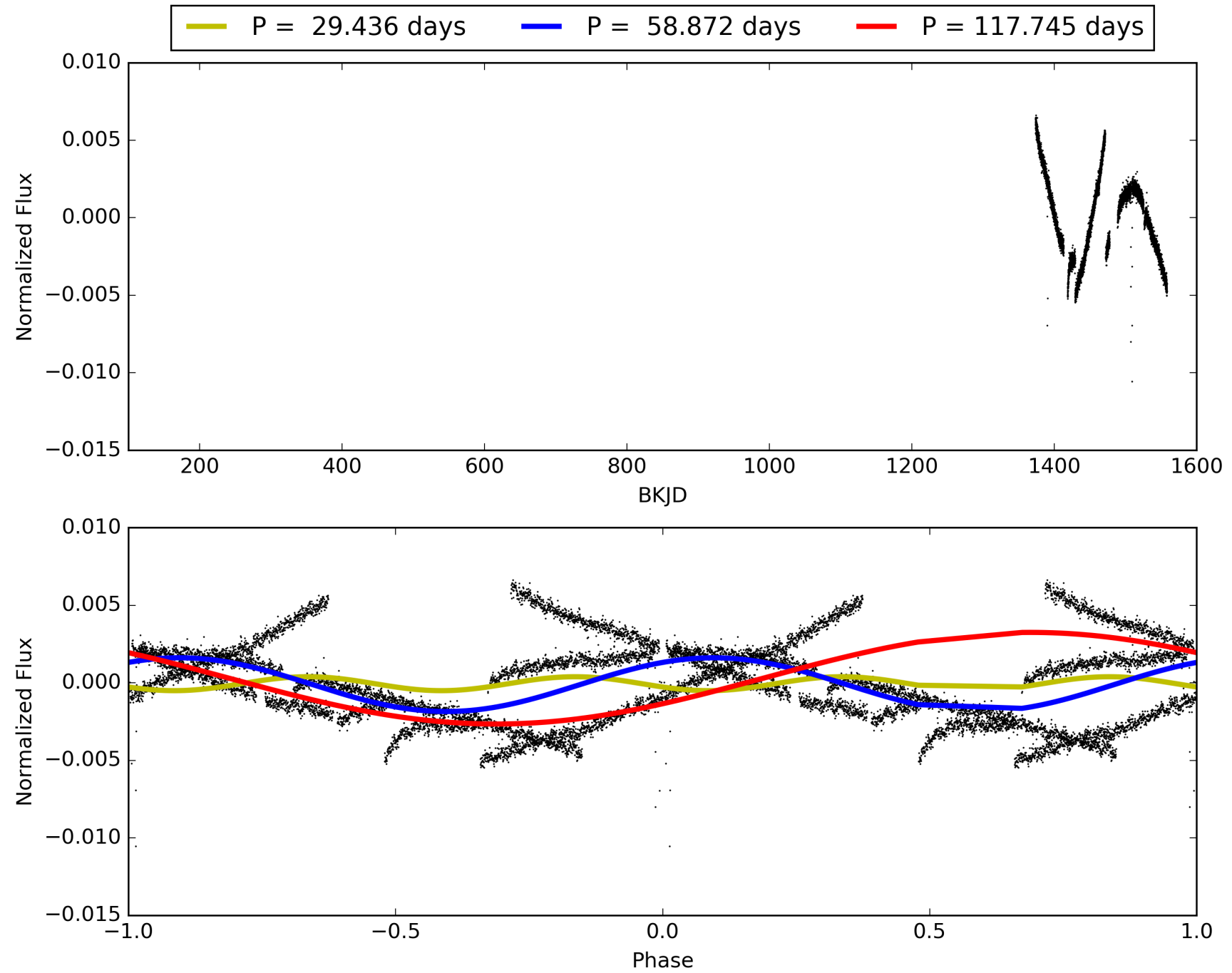
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.32 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 26.93
Centroid-sig: N/A
Centroid-so: 0.155 arcsec [31.62 σ]
OotOffset-rm: 0.053 arcsec [0.74 σ]
KicOffset-rm: 0.080 arcsec [1.13 σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

TCE 004073089-01, PDC Light Curves

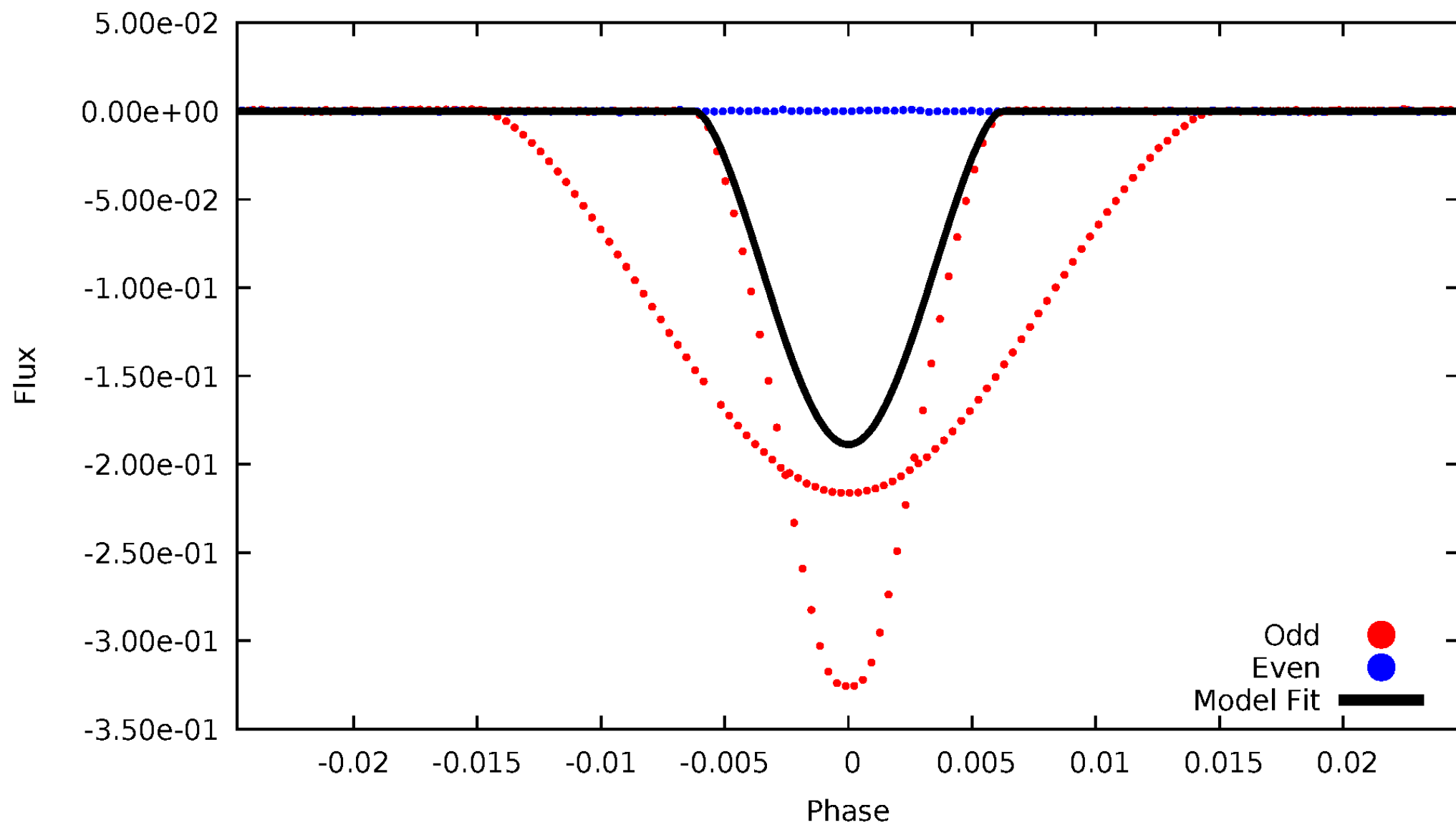


TCE 004073089-01



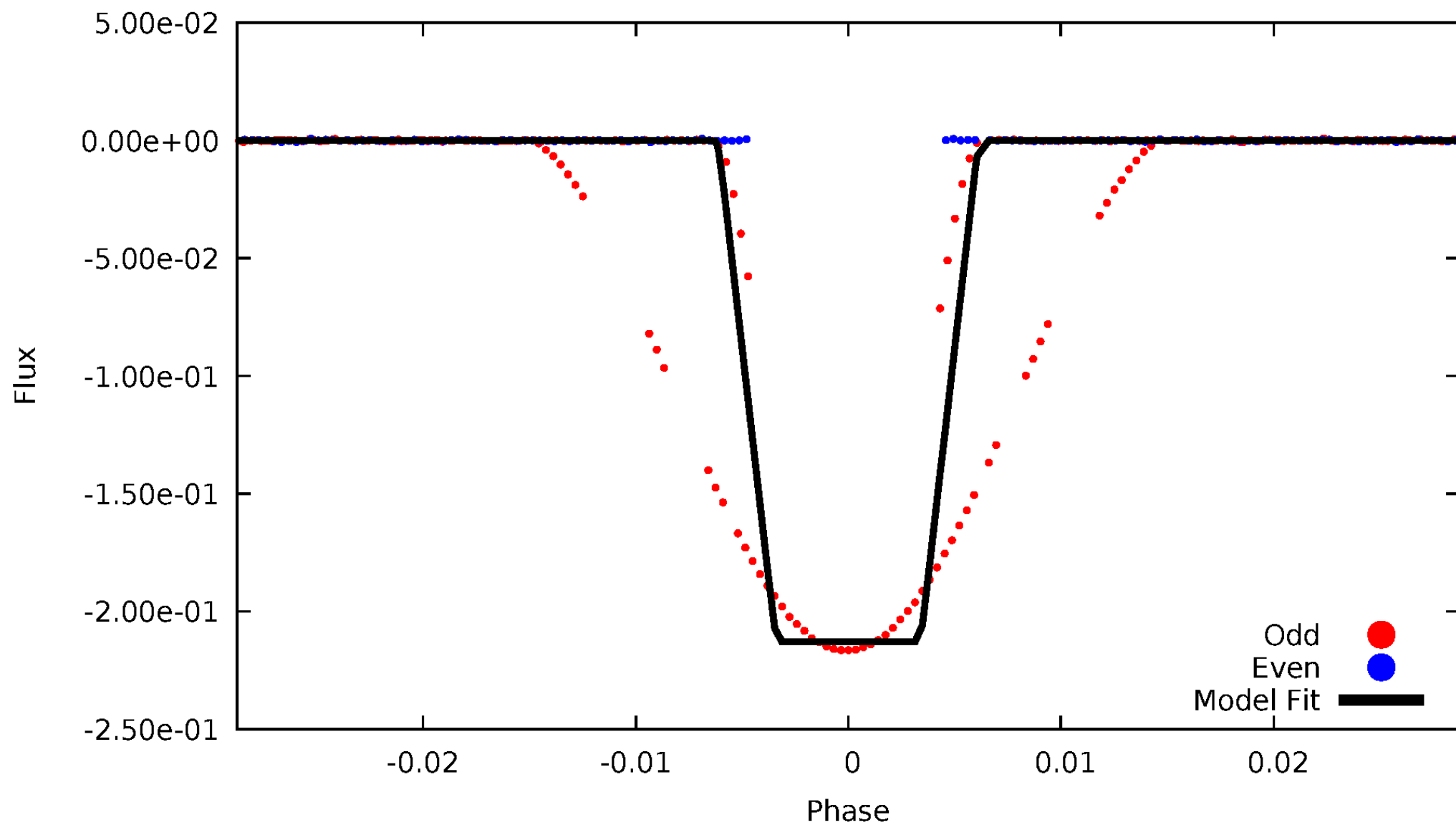
DV Odd/Even

TCE 004073089-01



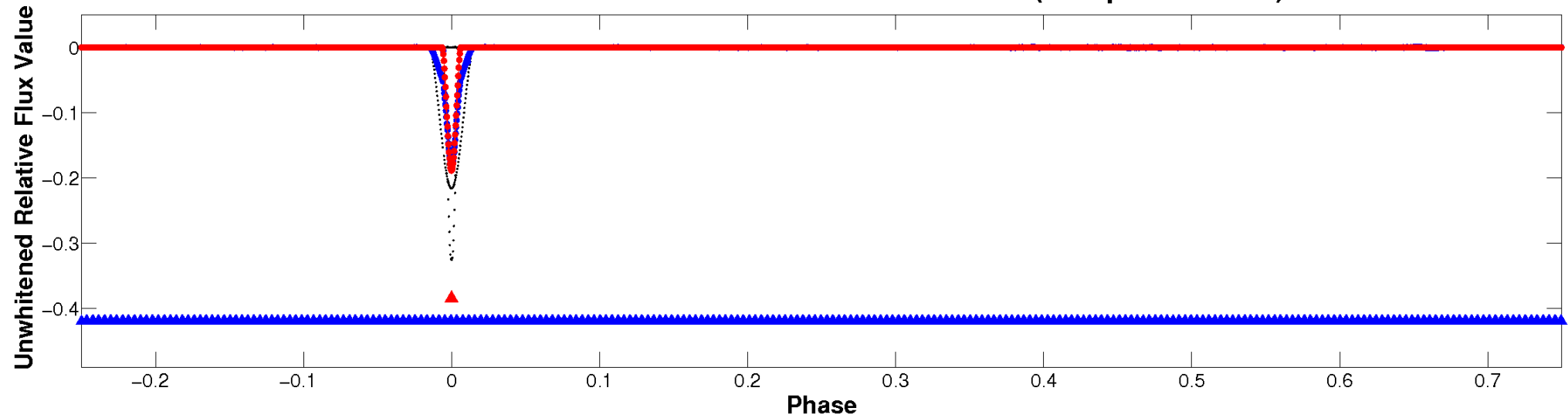
ALT Odd/Even

TCE 004073089-01

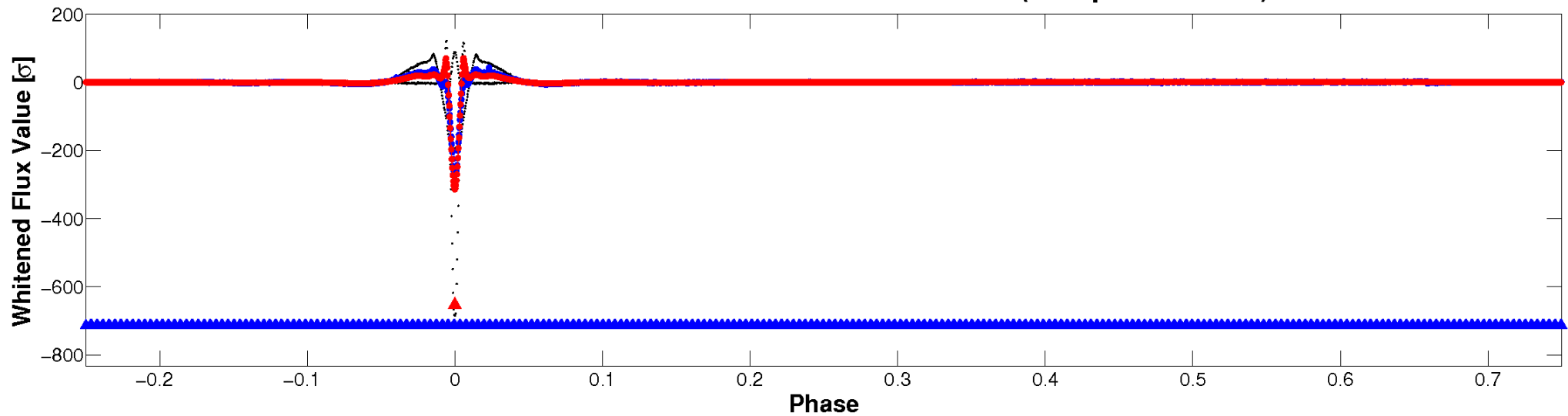


Non-Whitened Vs. Whitened Light Curve

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

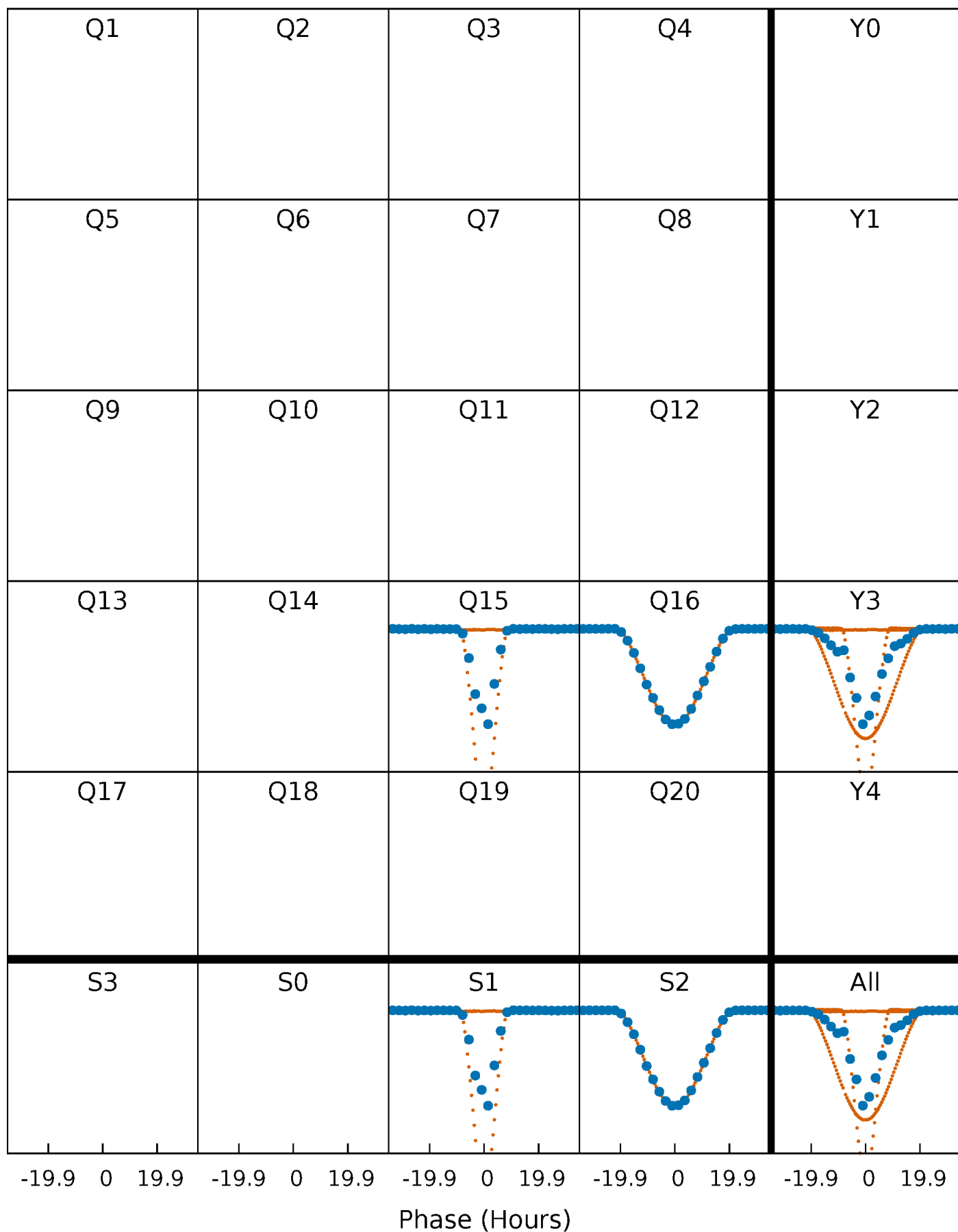


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



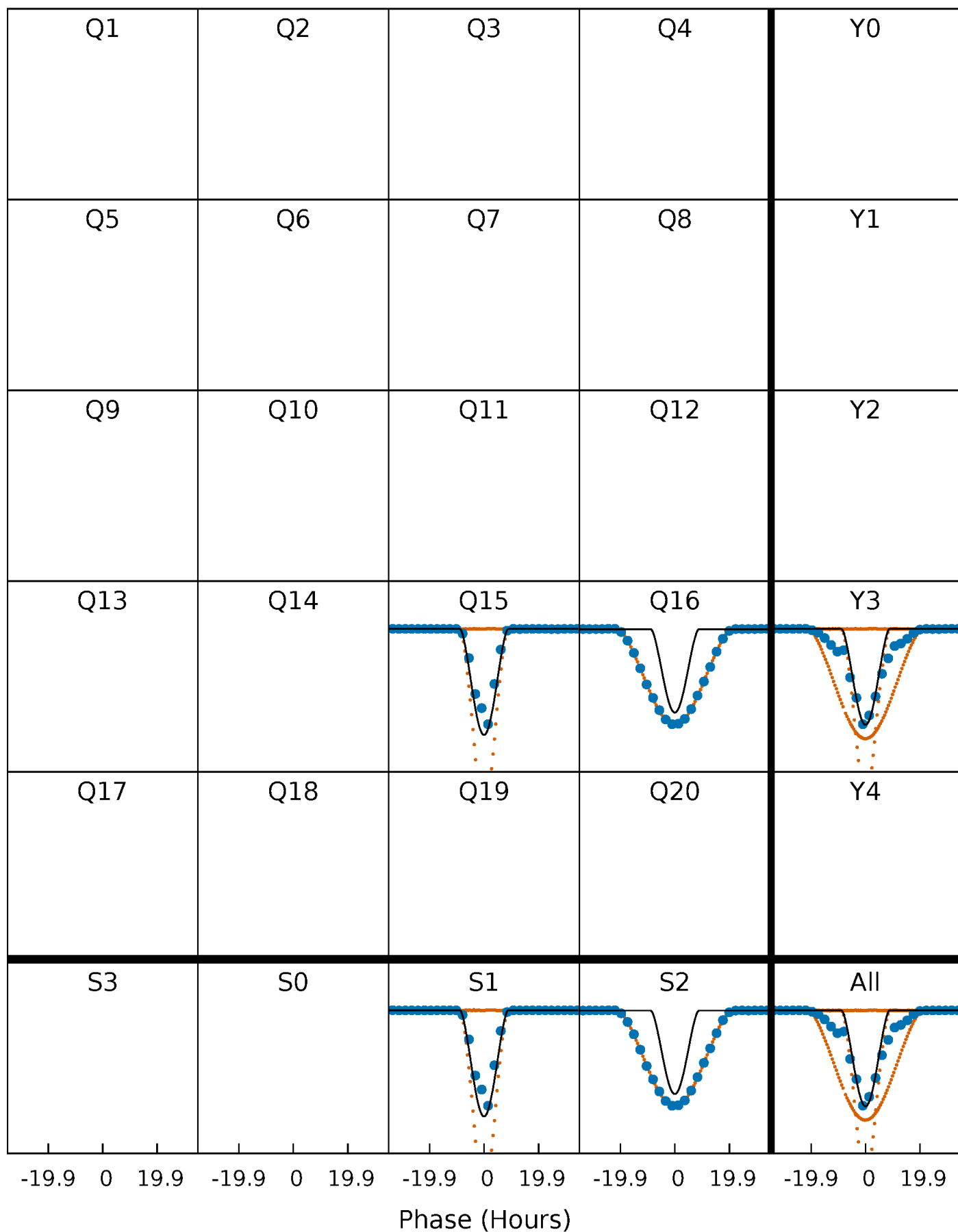
PDC Quarter-Phased Transit Curves

TCE 004073089-01 P= 58.872312 Days $T_0=153.931547$ (BKJD)



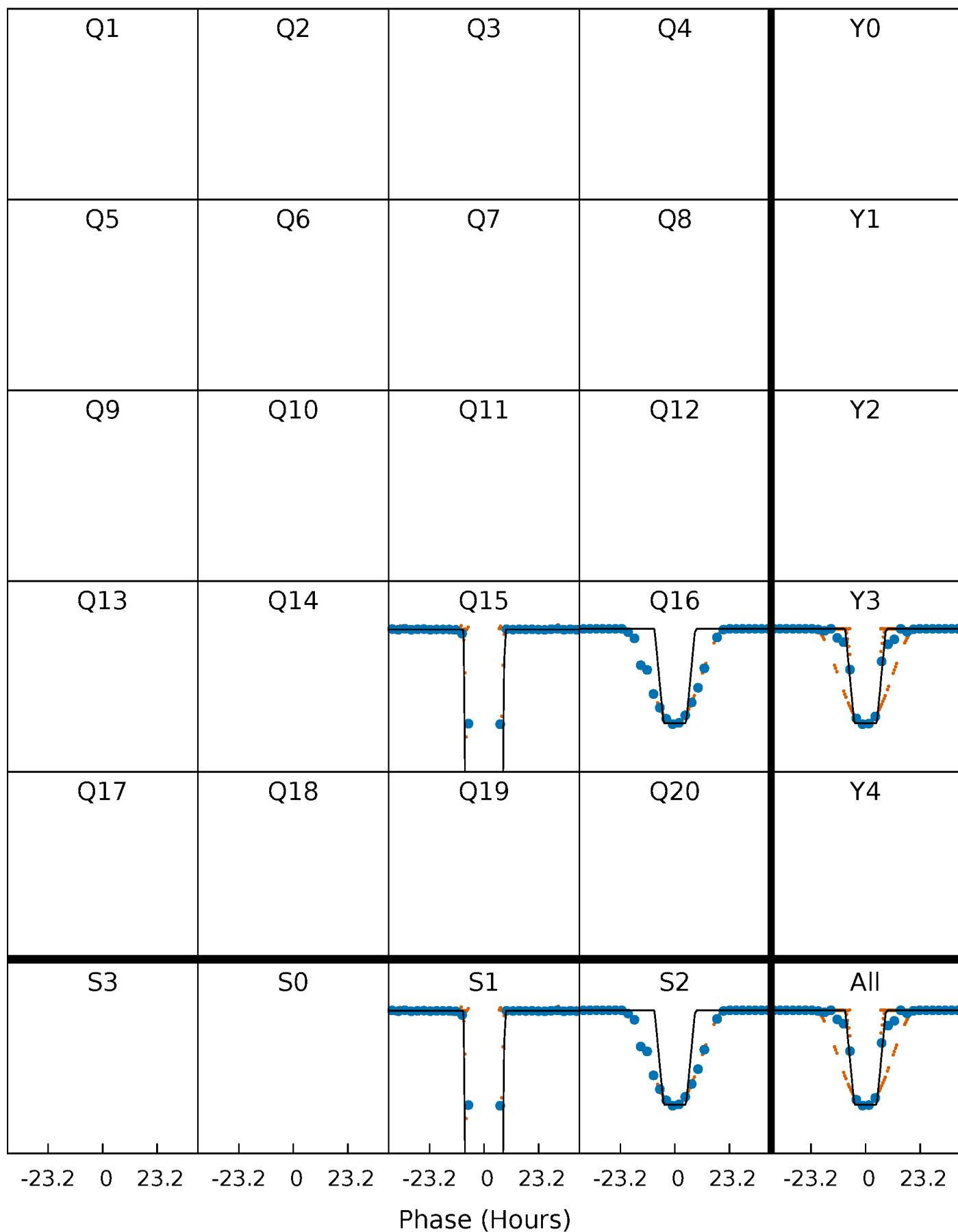
DV Quarter-Phased Transit Curves

TCE 004073089-01 P= 58.872312 Days $T_0=153.931547$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

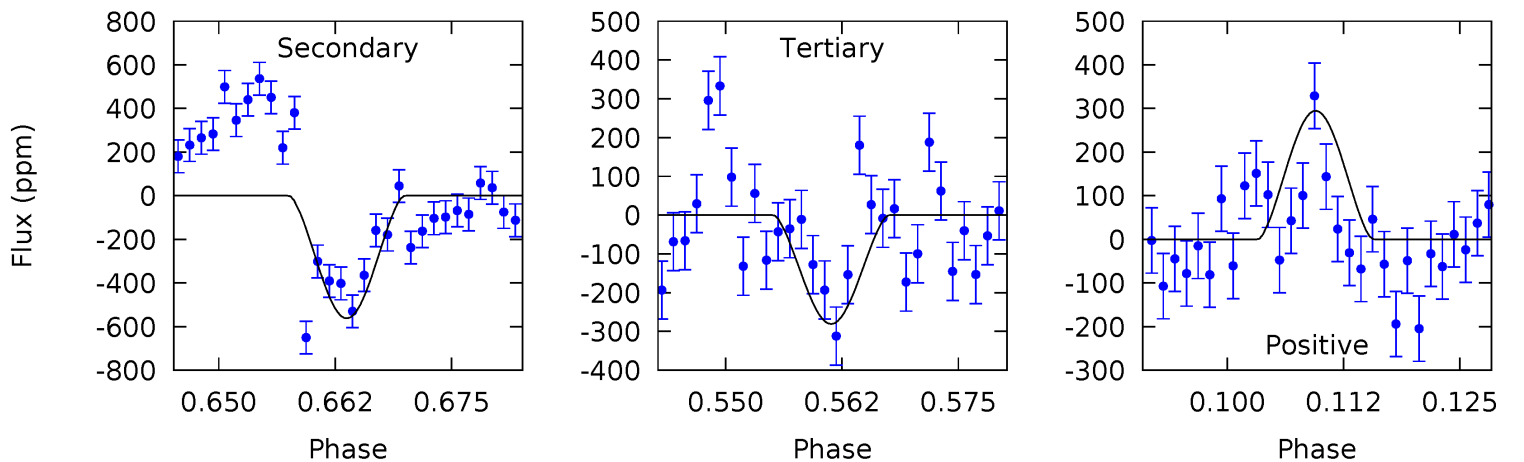
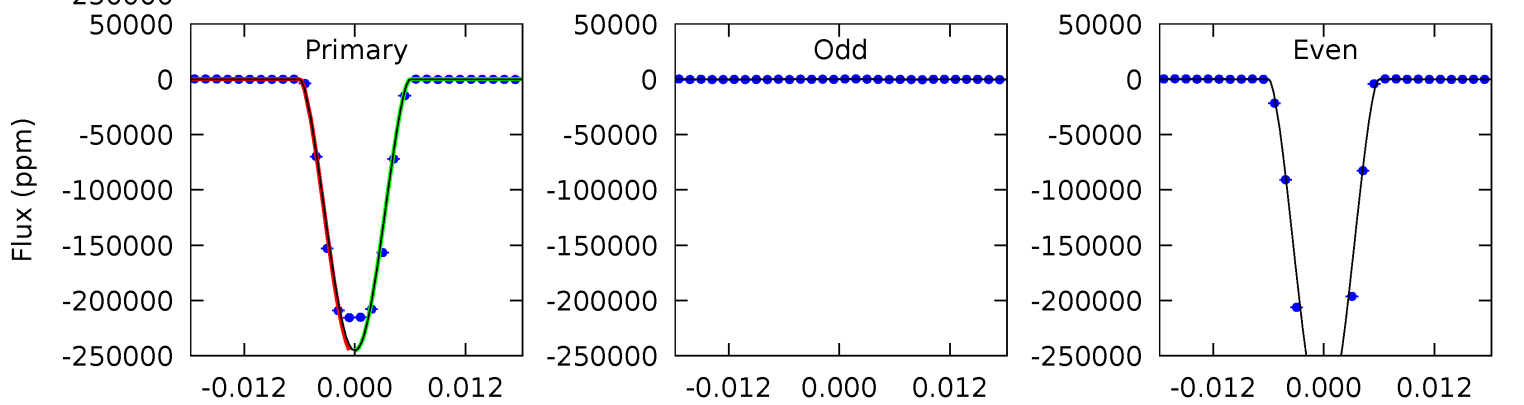
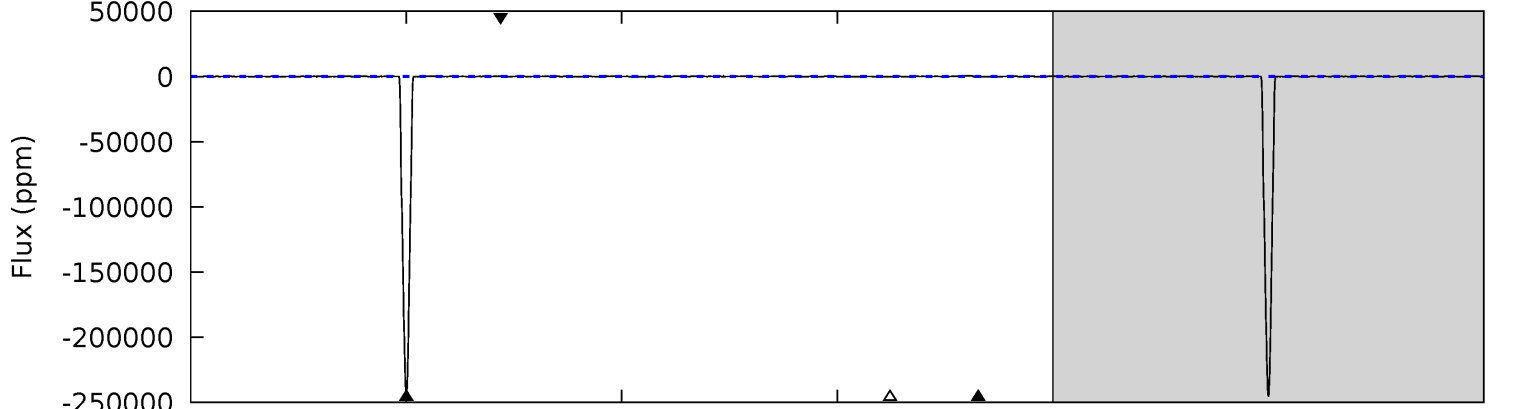
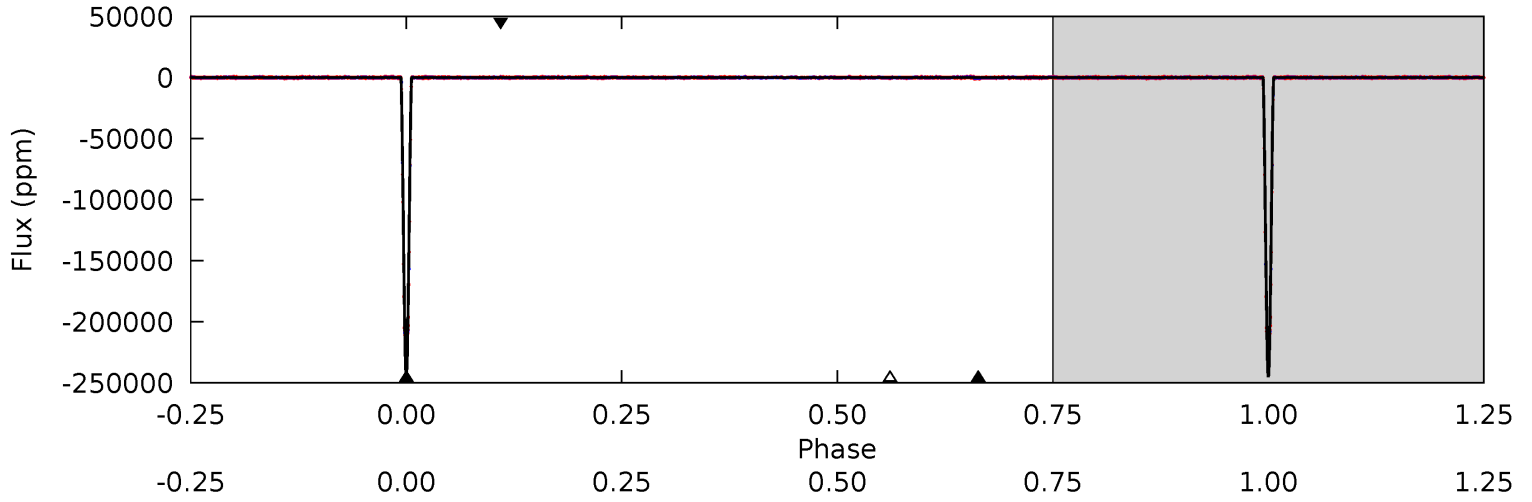
TCE 004073089-01 P= 58.870934 Days $T_0=153.965569$ (BKJD)



DV Model-Shift Uniqueness Test

004073089-01, P = 58.872312 Days, E = 153.931547 Days

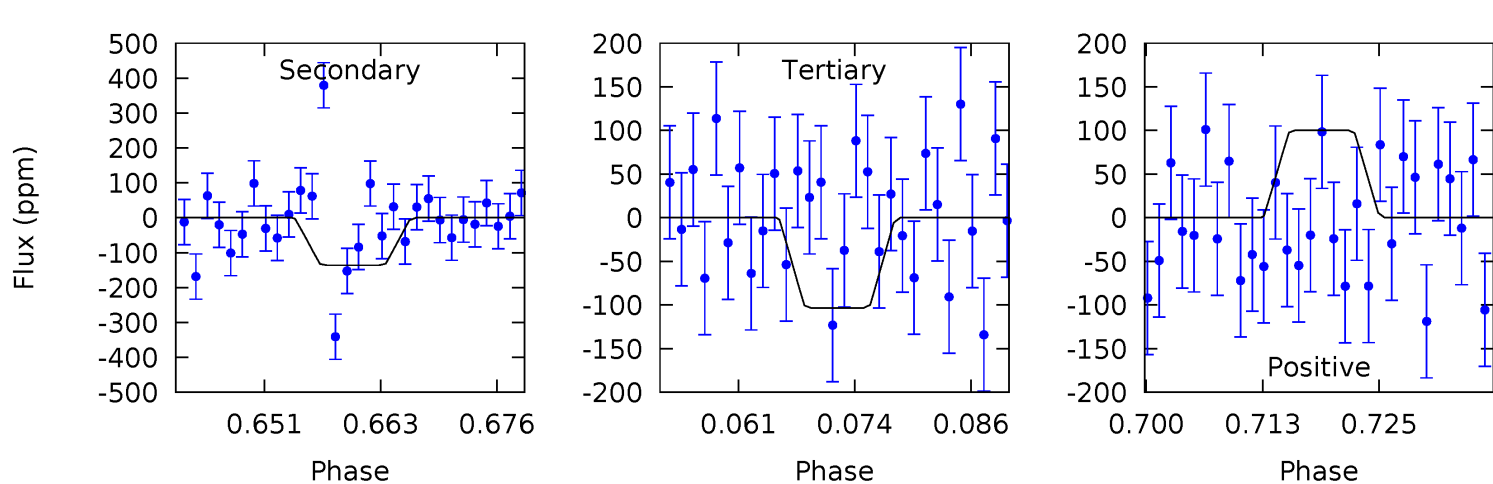
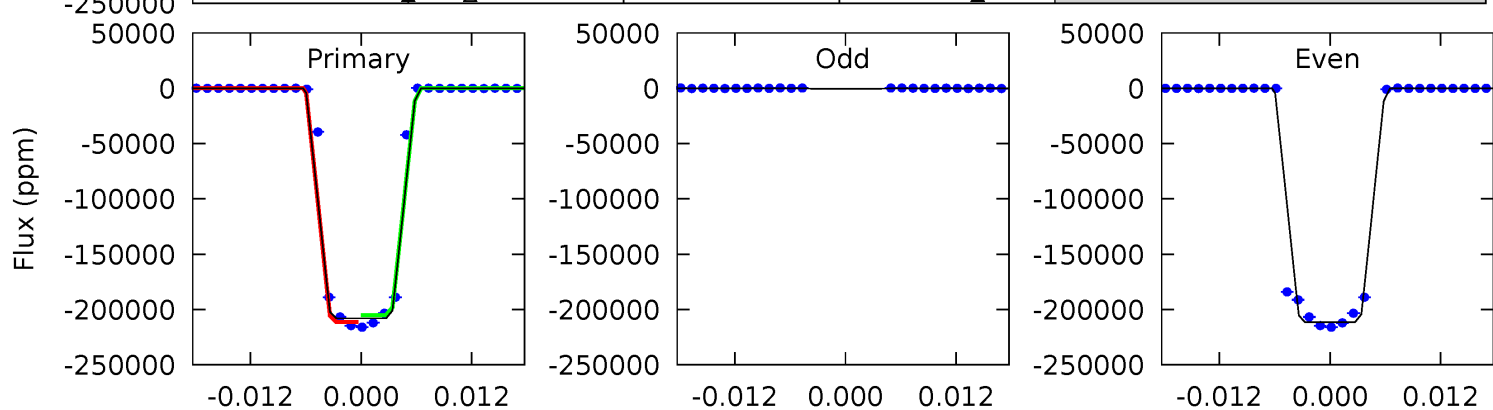
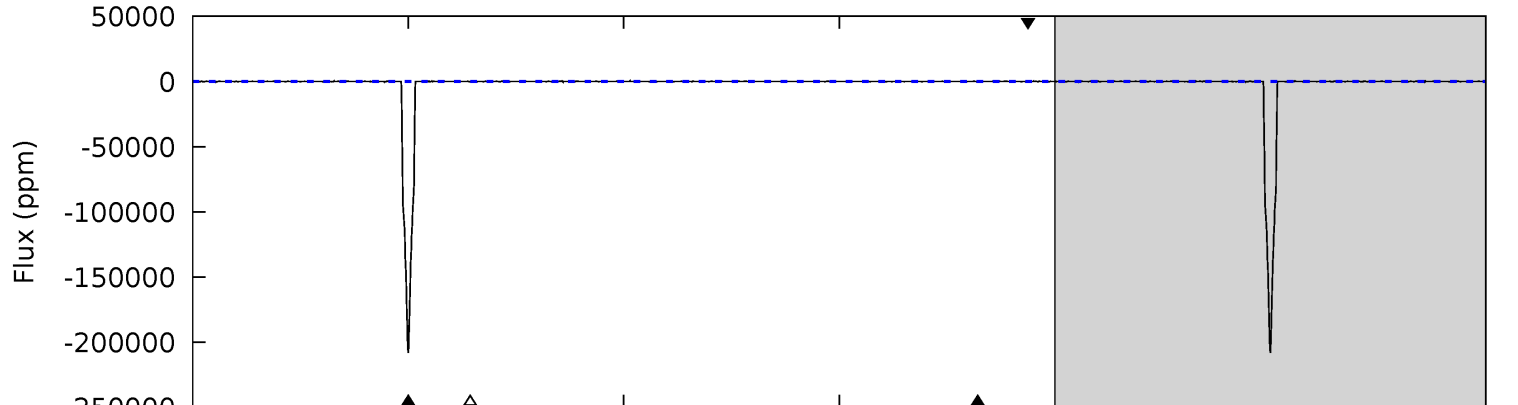
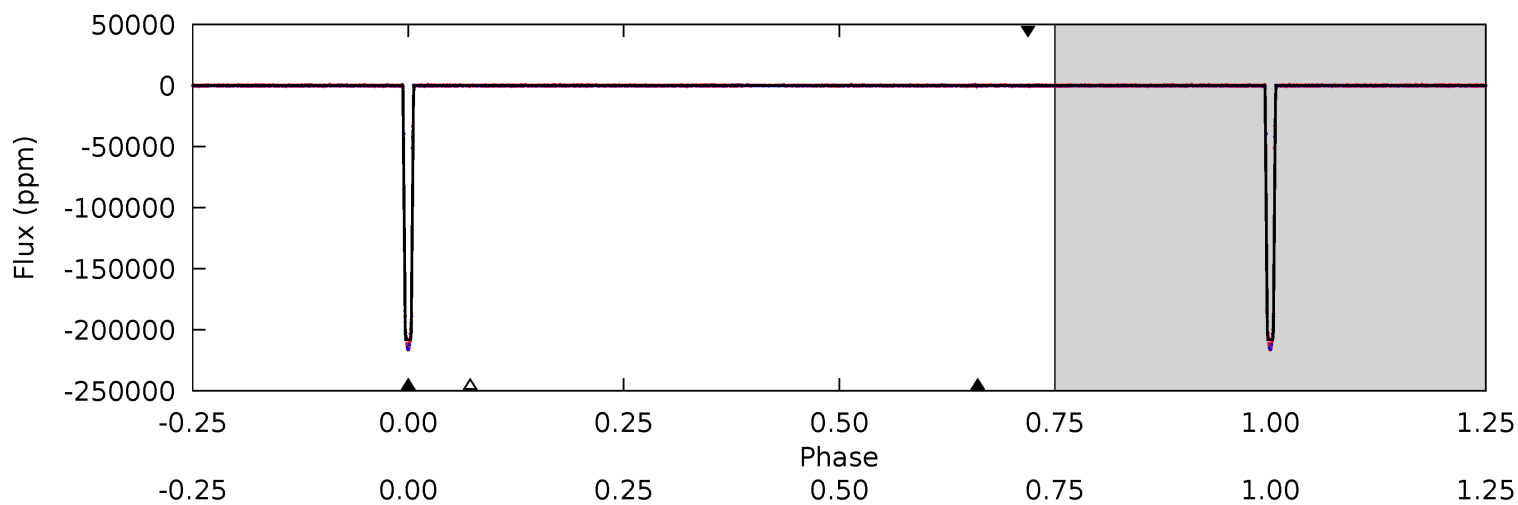
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5521	12.7	6.32	6.64	4.98	2.50	2.42	5515	5515	6.34	6.02	3621	0.72	0.00	0



Alt Model-Shift Uniqueness Test

004073089-01, P = 58.870934 Days, E = 153.965569 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4987	3.26	2.48	2.41	4.99	2.50	0.75	4985	4985	0.79	0.86	2565	1.09	0.00	72.3



Stellar Parameters For KIC 004073089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7078^{+228}_{-314}	$4.192^{+0.128}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.568^{+0.524}_{-0.322}$	$1.401^{+0.218}_{-0.239}$	$0.512^{+0.322}_{-0.263}$
	+3%/-4%	+3%/-5%	+156%/-219%	+33%/-21%	+16%/-17%	+63%/-51%
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 004073089-01 / KOI 7682.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-562 ± 44	$158.03^{+155.14}_{-106.43}$	954^{+72}_{-61}	2052^{+674}_{-504}	$1.341^{+10.826}_{-0.999}$
Alt.	-136 ± 42	$153.60^{+141.61}_{-99.74}$	956^{+70}_{-63}	1532^{+725}_{-3298}	$0.345^{+2.308}_{-0.259}$

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 $A_{obs} \gg 1.0$

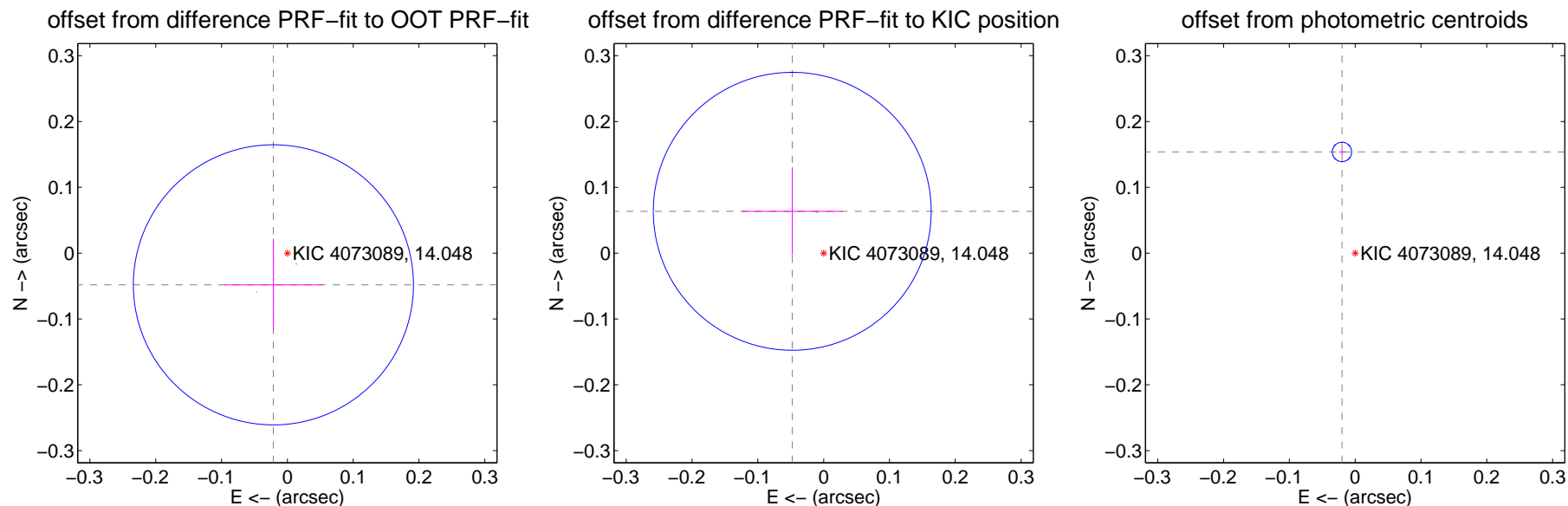
DV Centroid Data

Supplemental centroid analysis for 004073089-01. Kepler magnitude: 14.05. Transit SNR 940.82

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.053 ± 0.071	0.74	0.021 ± 0.075	-0.048 ± 0.070
PRF-fit source offset from KIC position	0.080 ± 0.070	1.13	0.048 ± 0.076	0.064 ± 0.067
photometric centroid source offset	0.16 ± 0.00	31.62	0.02 ± 0.00	0.15 ± 0.00



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.



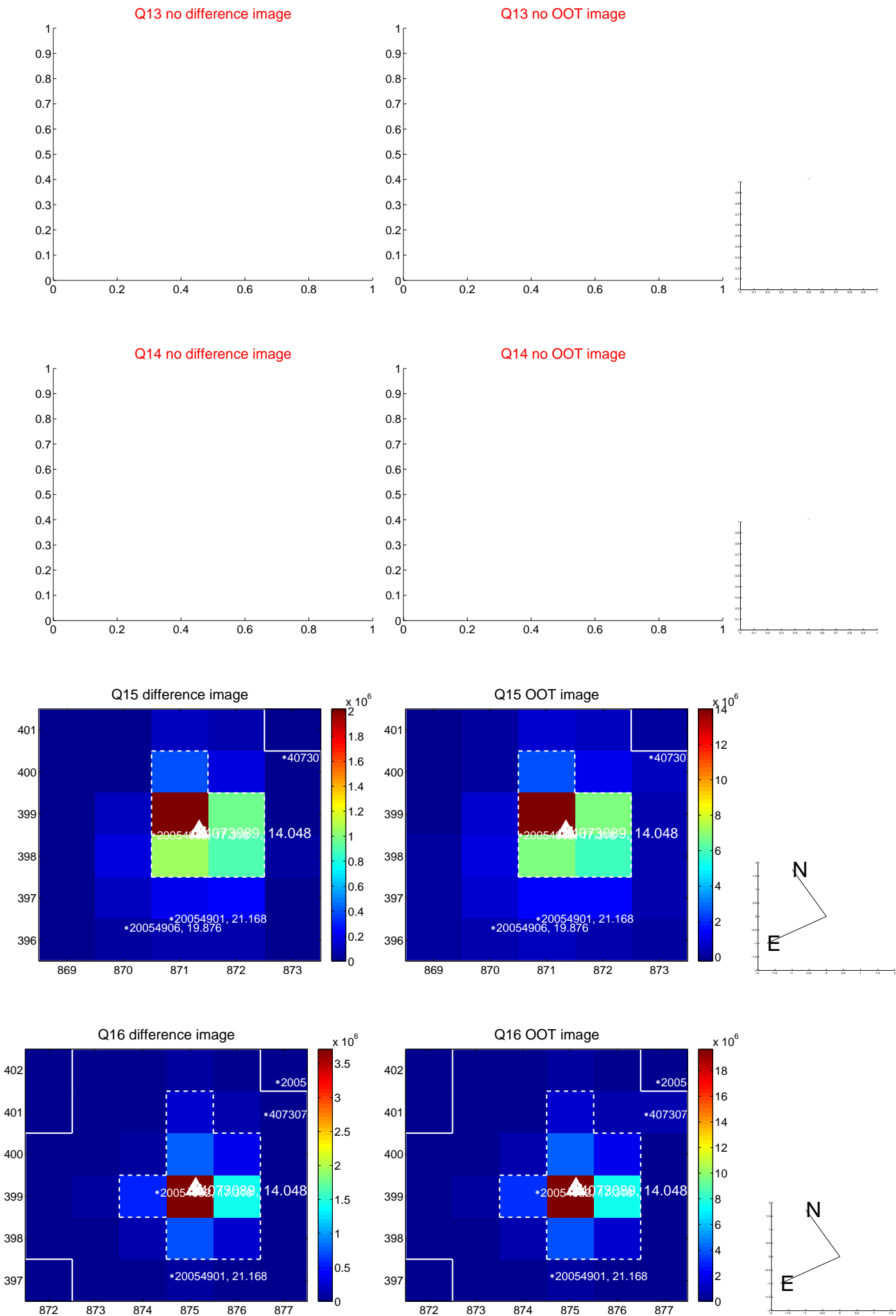
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



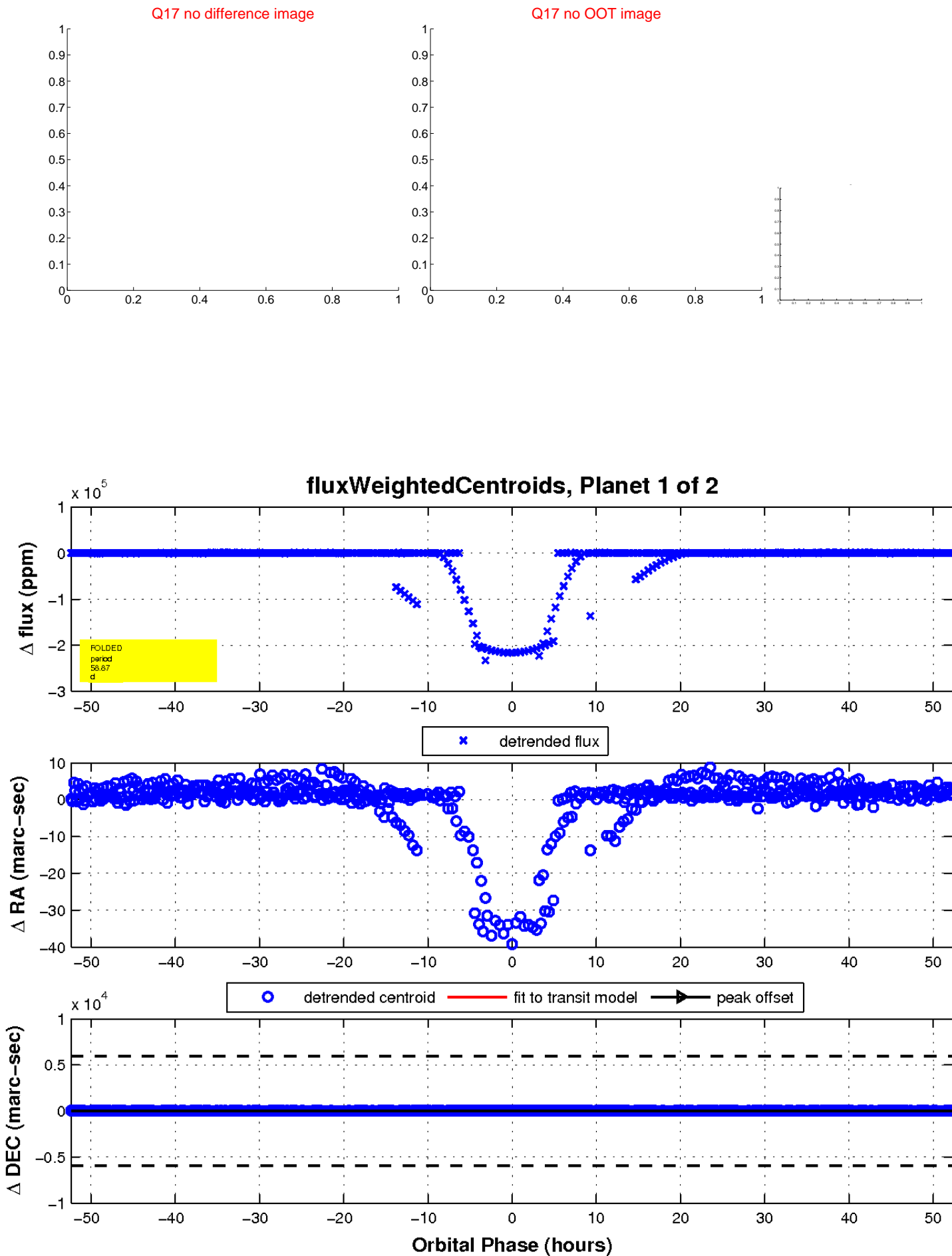
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

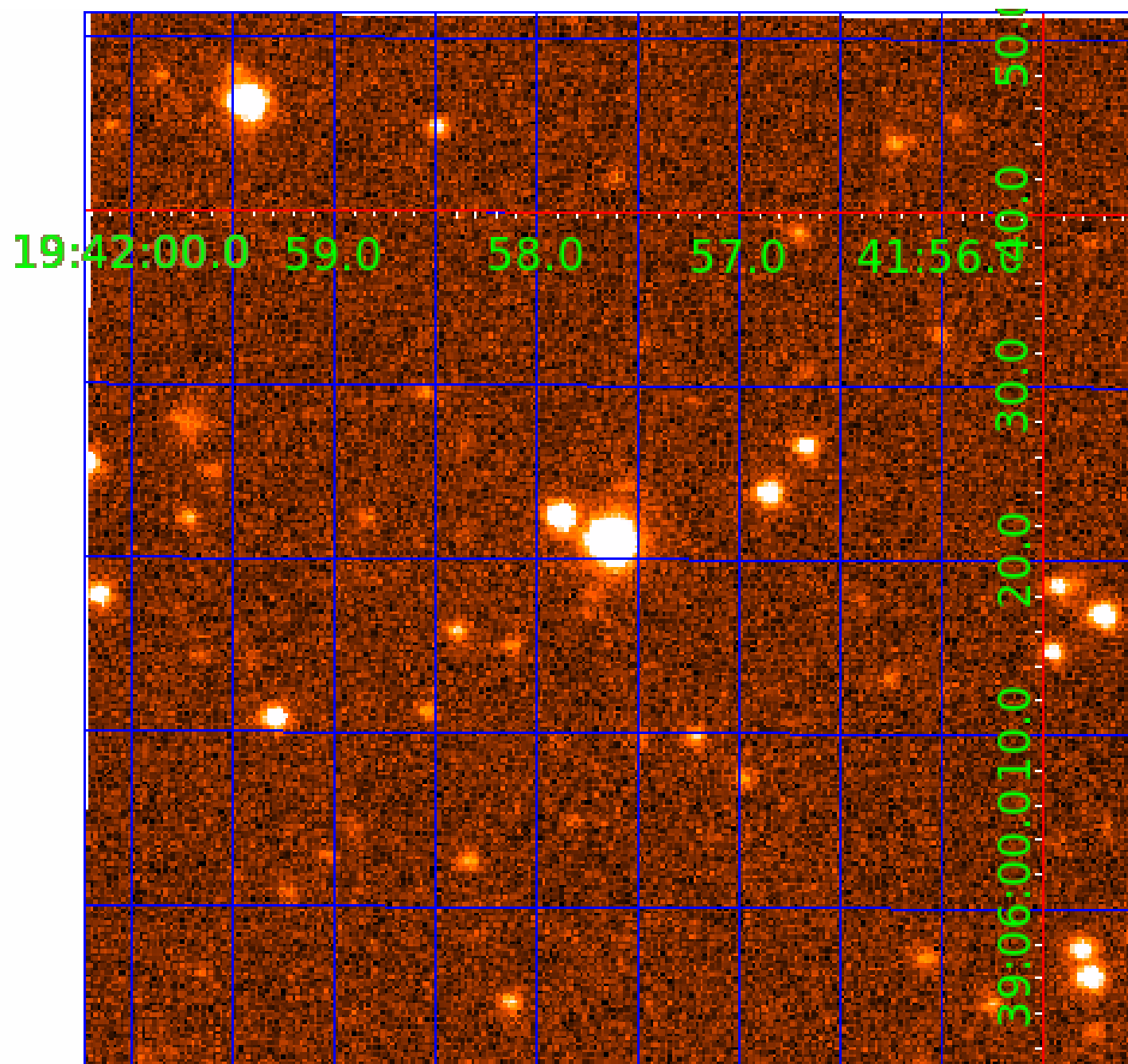


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004073089

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})
004073089-01	OBS	7682.01	58.872312	153.931547	188858.2	17.450	1594.4	940.8	1.57	7078	99.10	50.45
004073089-02	OBS	No	1.186895	132.092776	119.4	10.879	9.1	11.9	1.57	7078	1.73	9194.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004073089-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—CENT_FEW_DIFFS
004073089-02	OBS	FP	0.00	1	0	0	0	LPP_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.

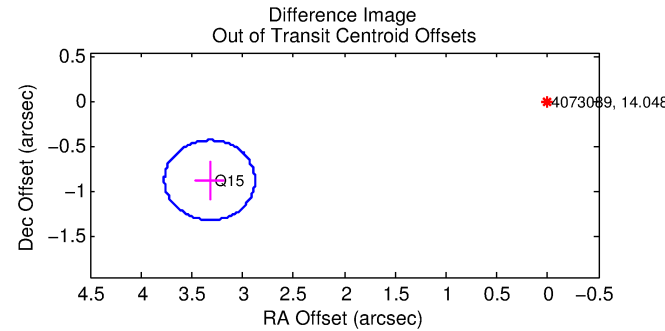
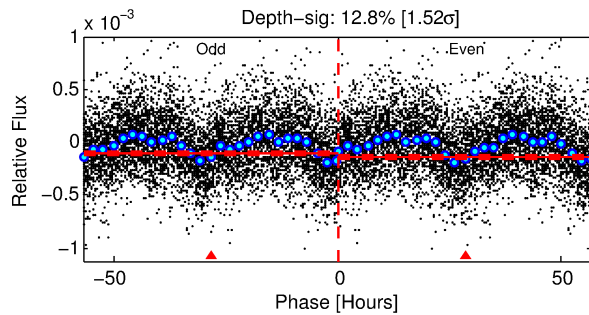
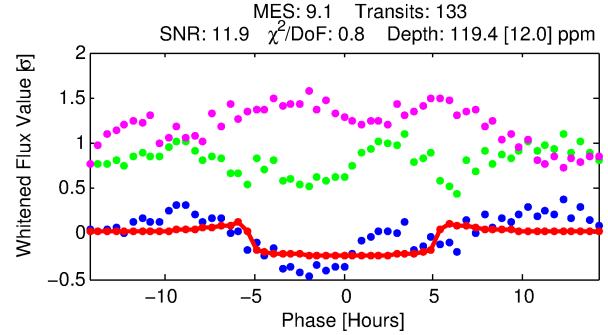
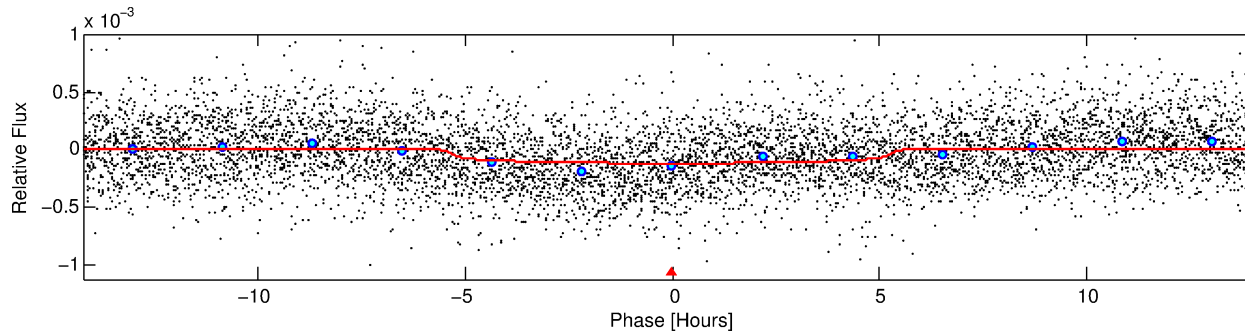
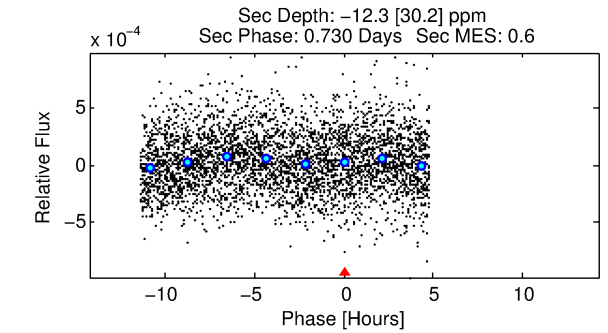
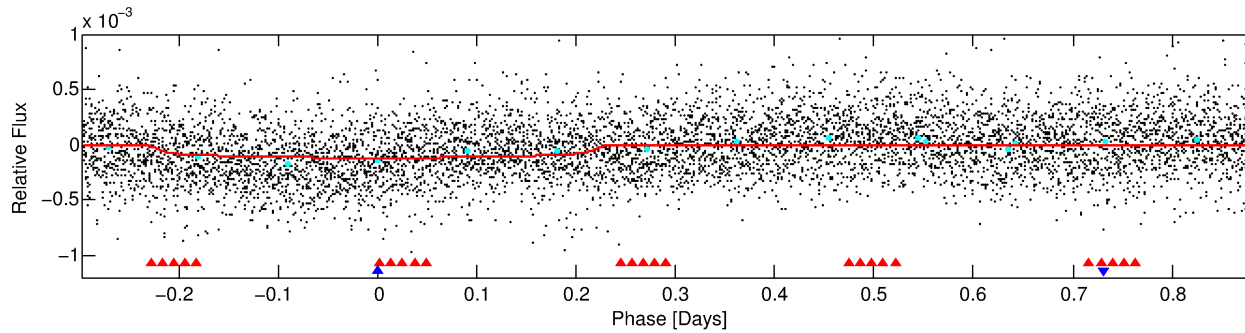
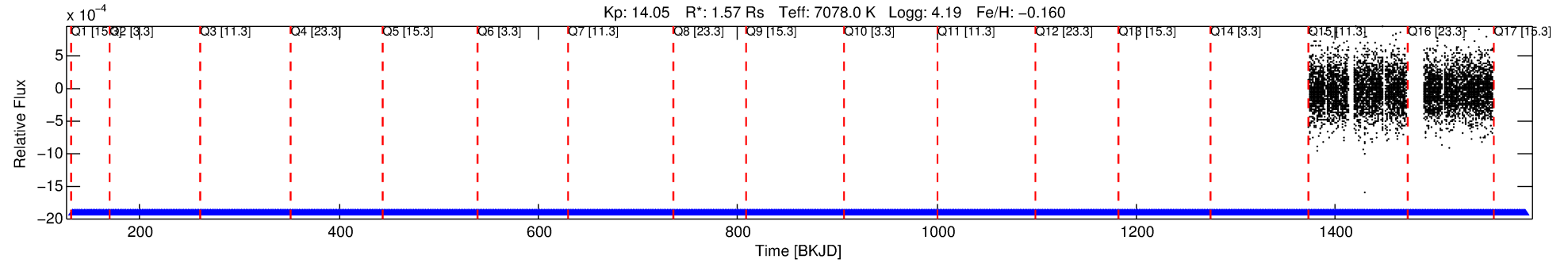
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004073089-02

No Significant Match Found

DV One-Page Summary

KIC: 4073089 Candidate: 2 of 2 Period: 1.187 d



DV Fit Results:

Period = 1.18690 [0.00001] d
Epoch = 132.0928 [0.0048] BKJD
Rp/R* = 0.0101 [0.0053]
a/R* = 1.08 [0.47]
b = 0.03 [113.59]
Seff = 9194.98 [3768.71]
Teff = 2497 [256] K
Rp = 1.73 [1.07] Re
a = 0.0245 [0.0065] AU
Ag = N/A
Teffp = N/A

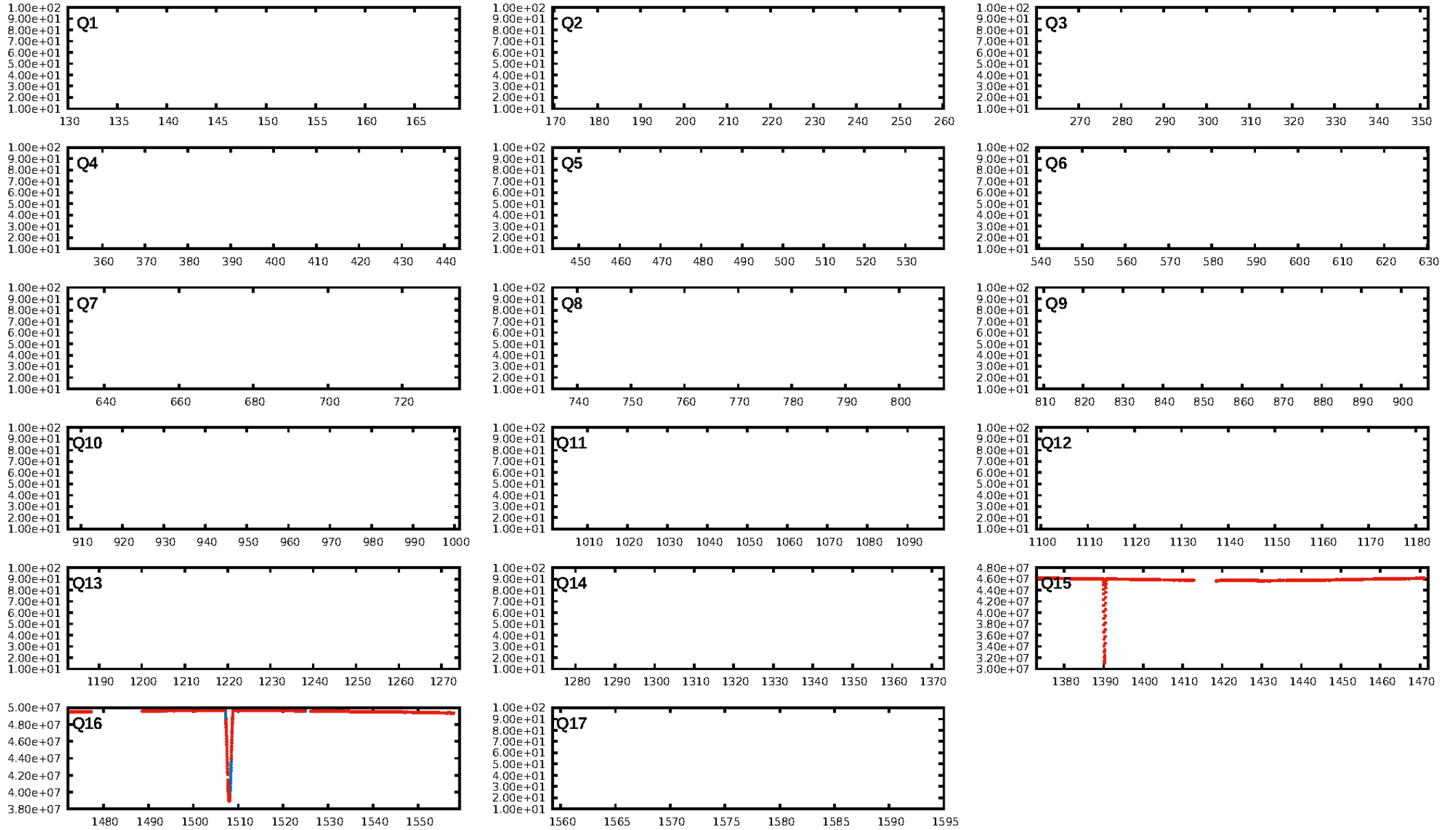
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [67.32σ]
ModelChiSquare2-sig: 61.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [133/133]
GhostDiagnostic-chr: 3.857
Centroid-sig: N/A
Centroid-so: 1.277 arcsec [1.52σ]
OotOffset-rm: 3.434 arcsec [23.19σ]
KicOffset-rm: 3.445 arcsec [23.48σ]
OotOffset-st: 0/1/0/0 [1]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

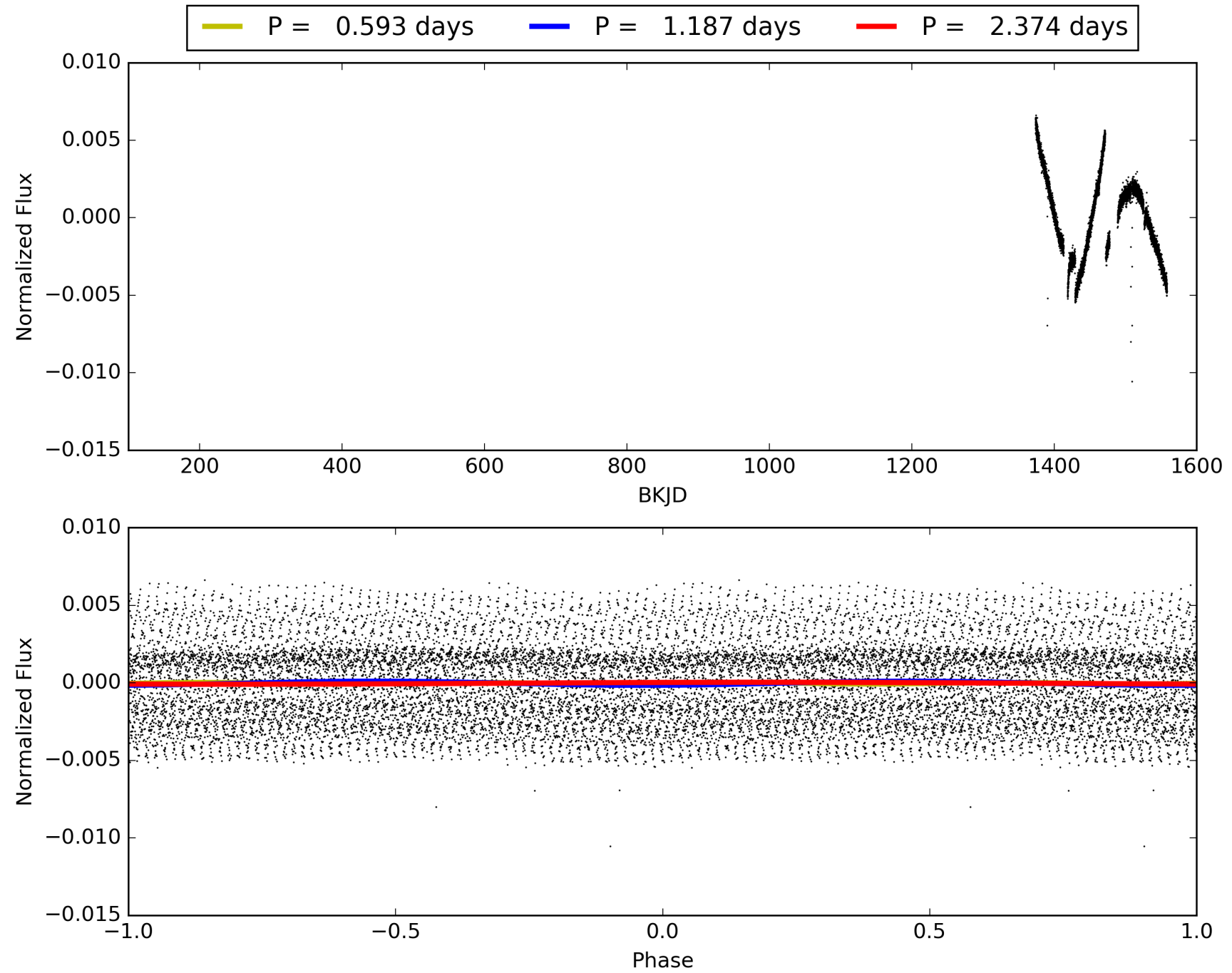
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 08:48:28 Z

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

TCE 004073089-02, PDC Light Curves

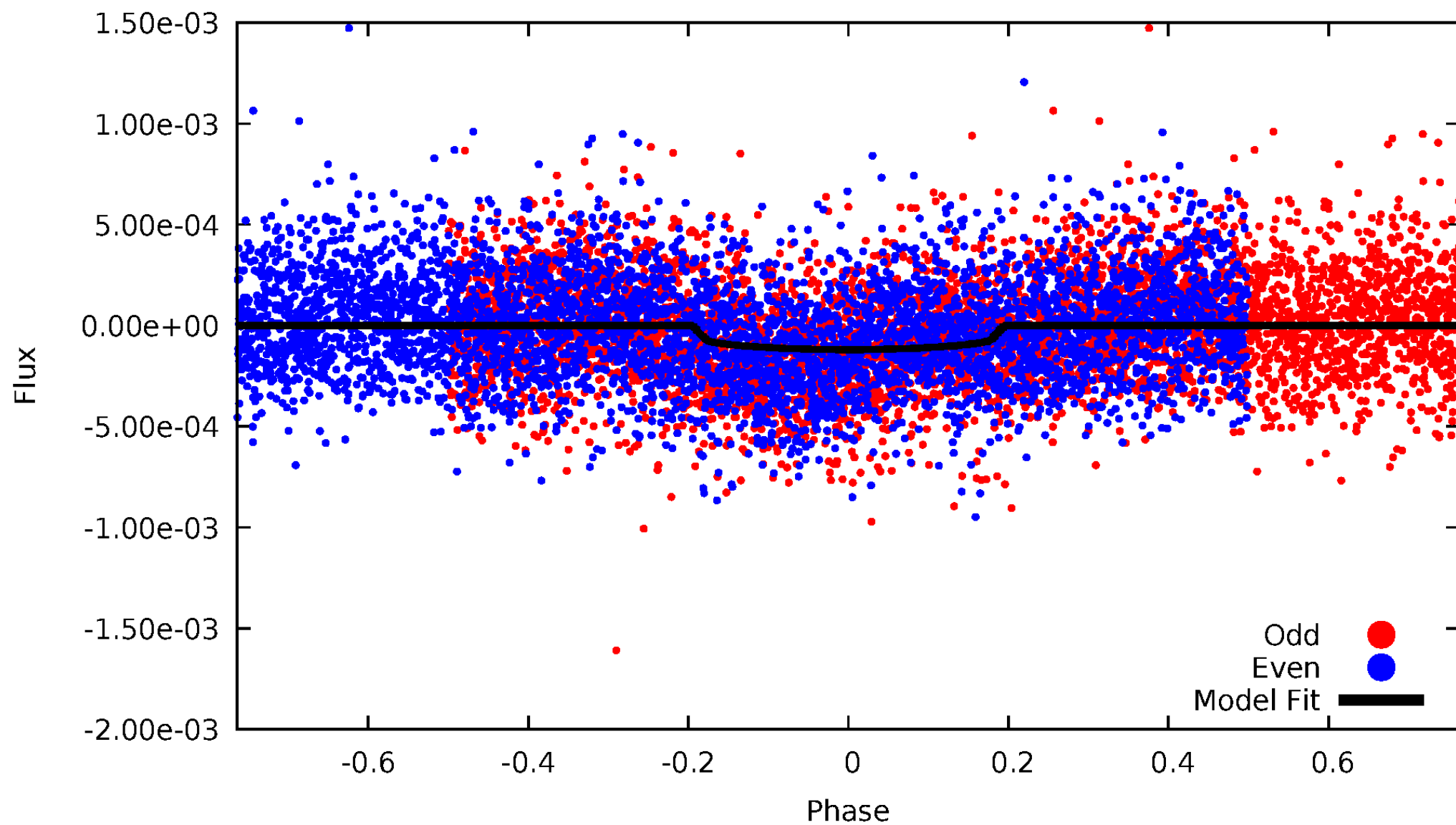


TCE 004073089-02



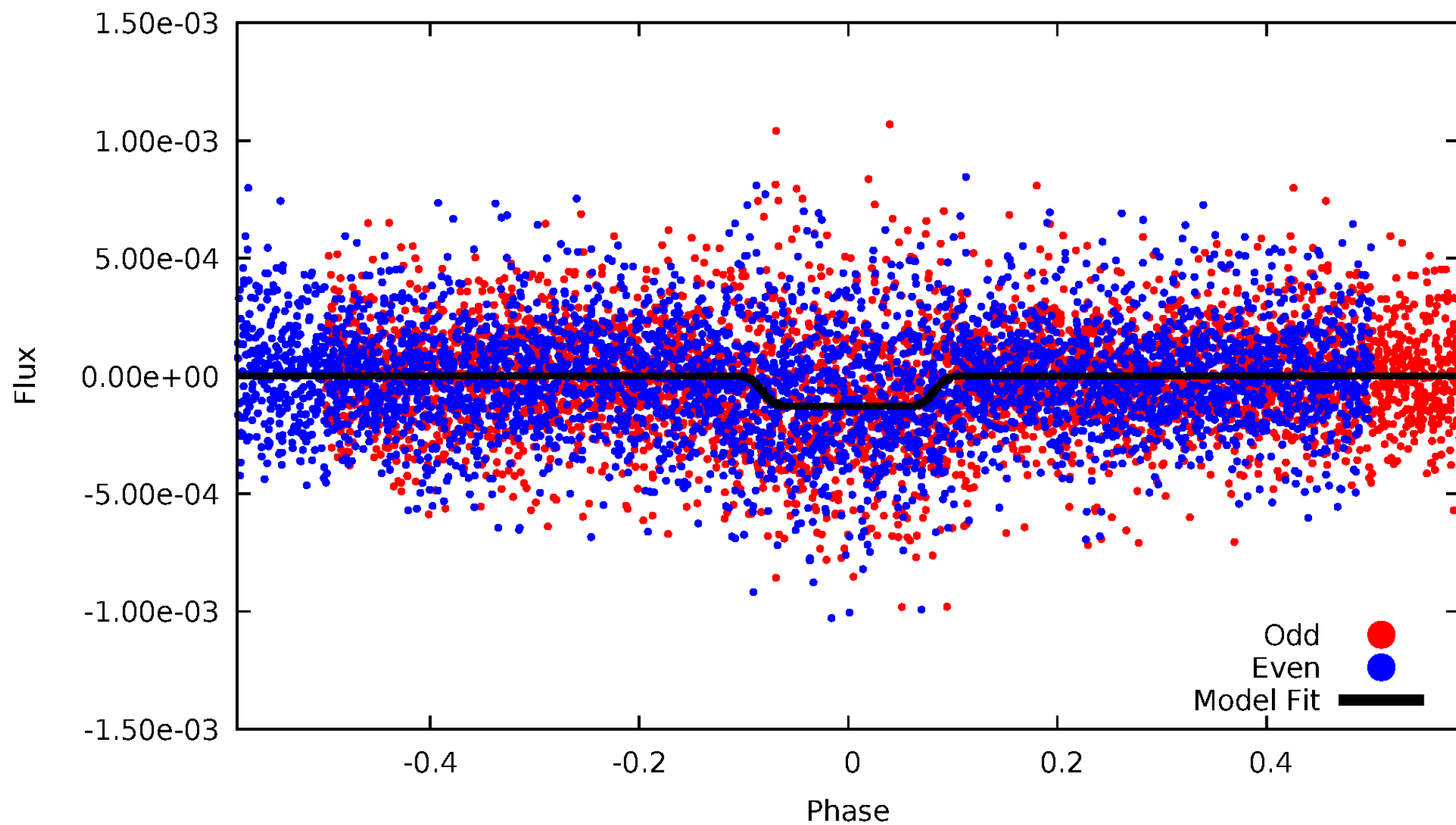
DV Odd/Even

TCE 004073089-02



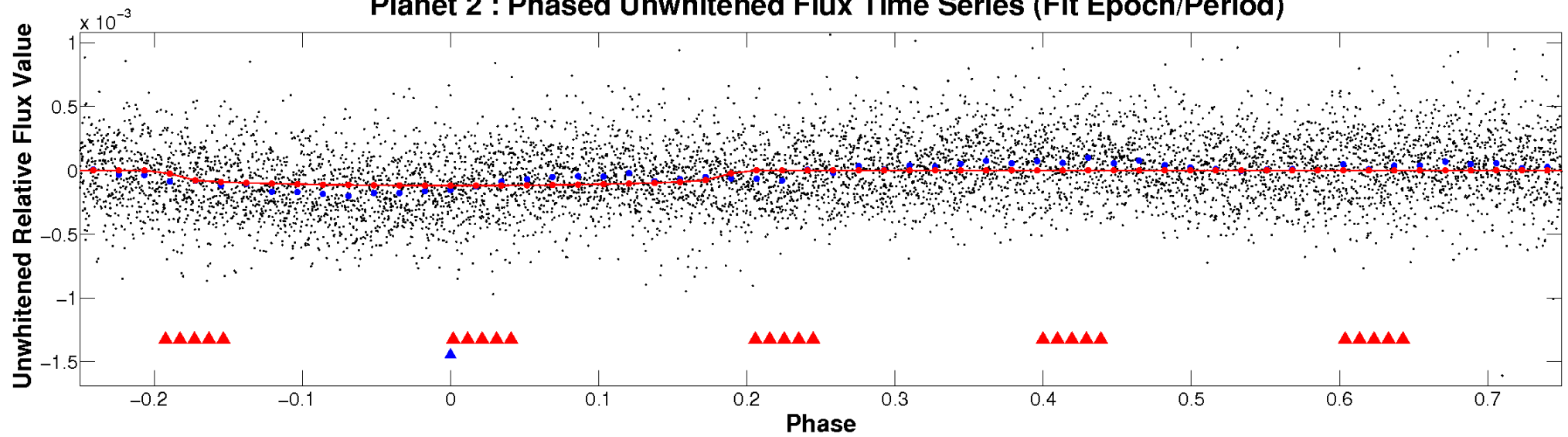
ALT Odd/Even

TCE 004073089-02

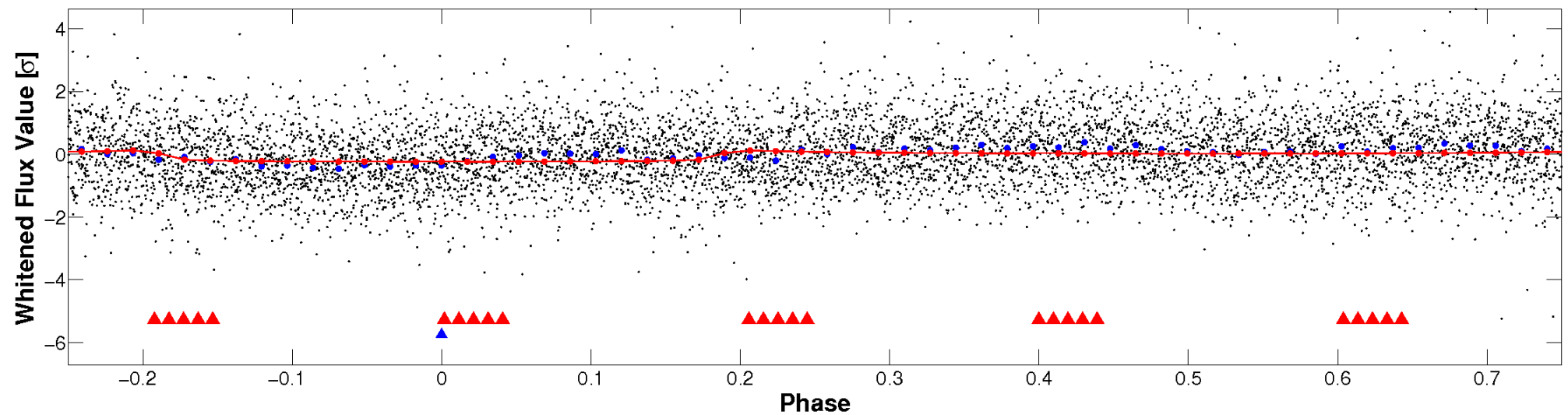


Non-Whitened Vs. Whitened Light Curve

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

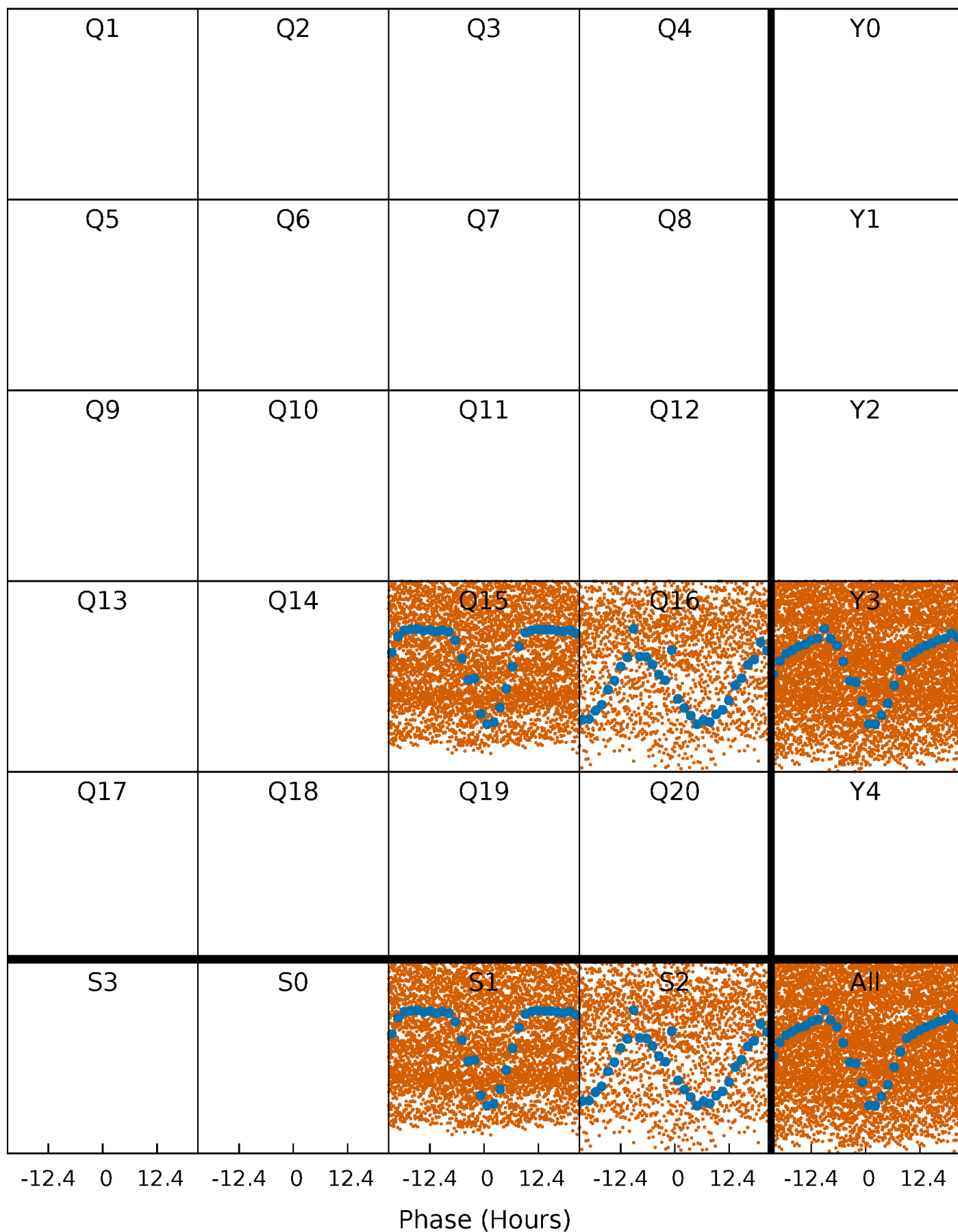


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



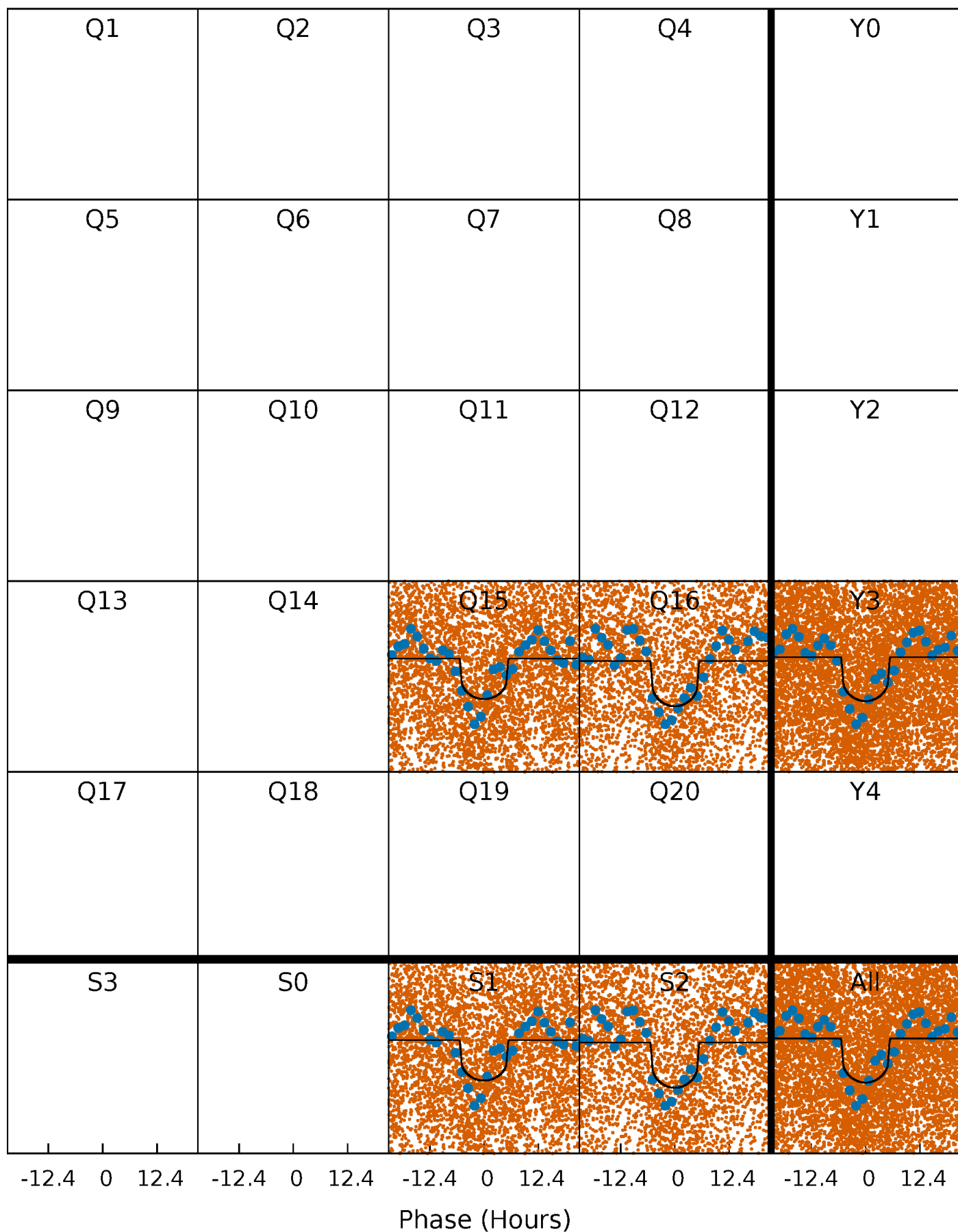
PDC Quarter-Phased Transit Curves

TCE 004073089-02 P= 1.186895 Days $T_0=132.092776$ (BKJD)



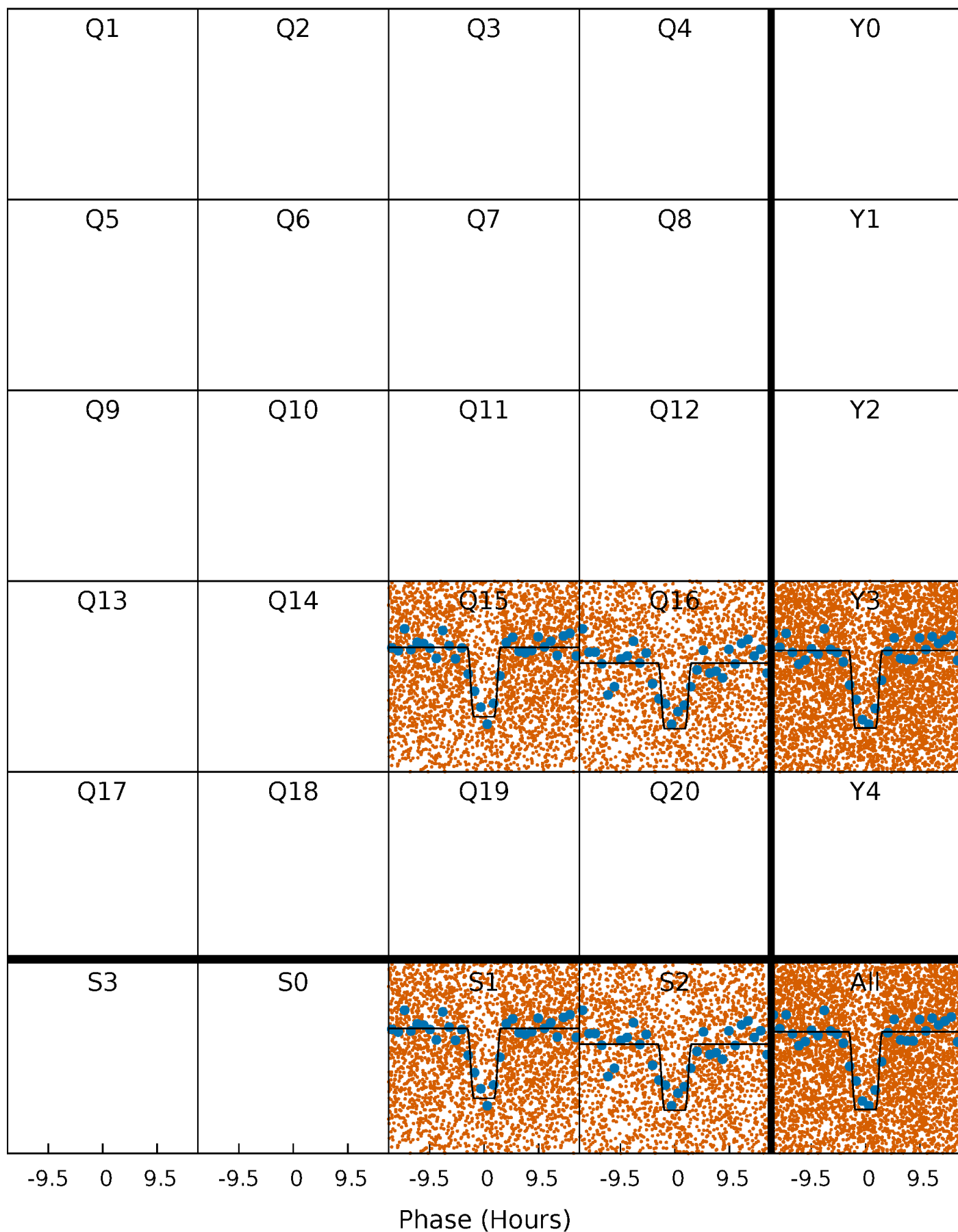
DV Quarter-Phased Transit Curves

TCE 004073089-02 P= 1.186895 Days $T_0=132.092776$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

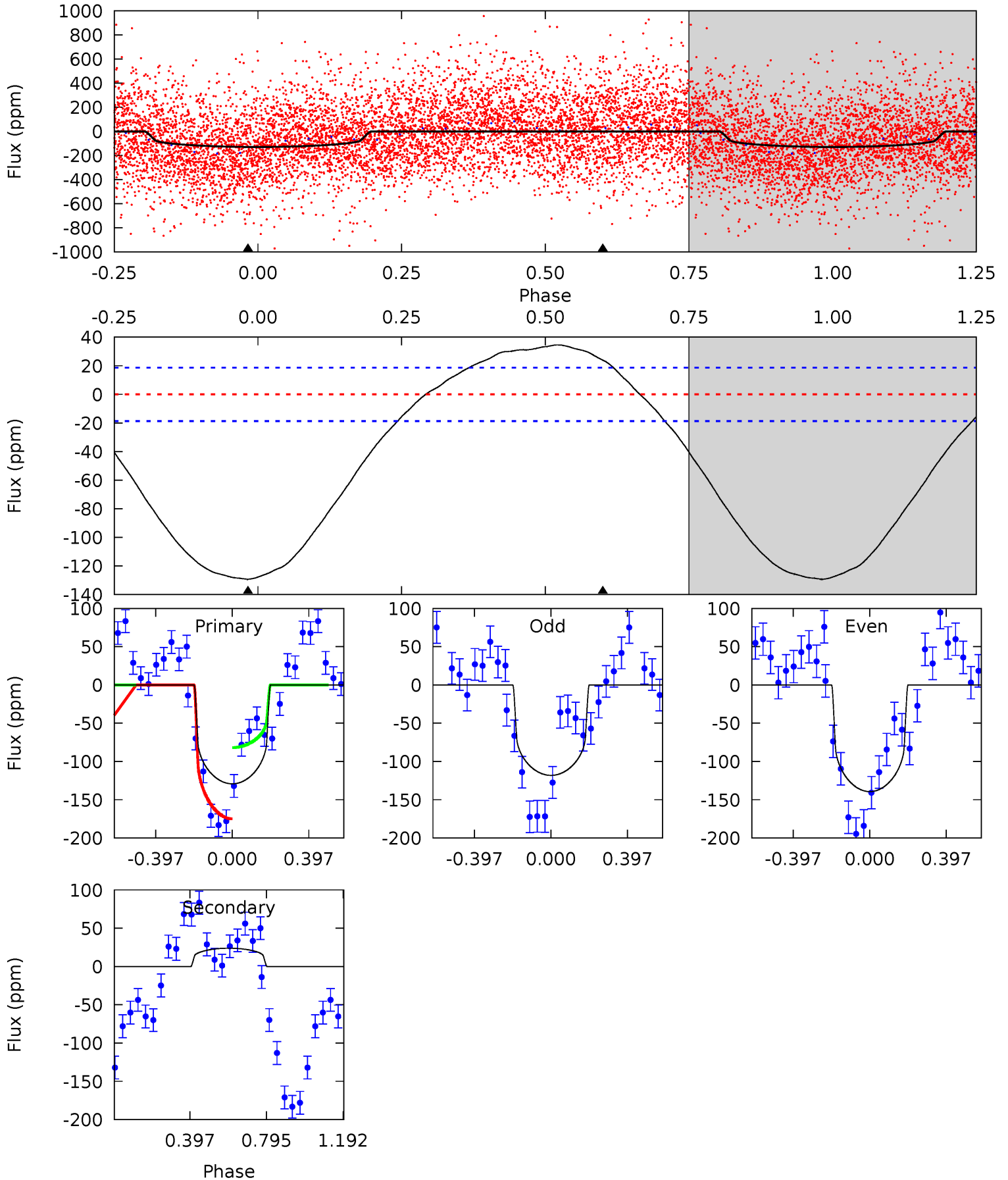
TCE 004073089-02 P= 1.186807 Days $T_0=132.107447$ (BKJD)



DV Model-Shift Uniqueness Test

004073089-02, P = 1.186895 Days, E = 132.092776 Days

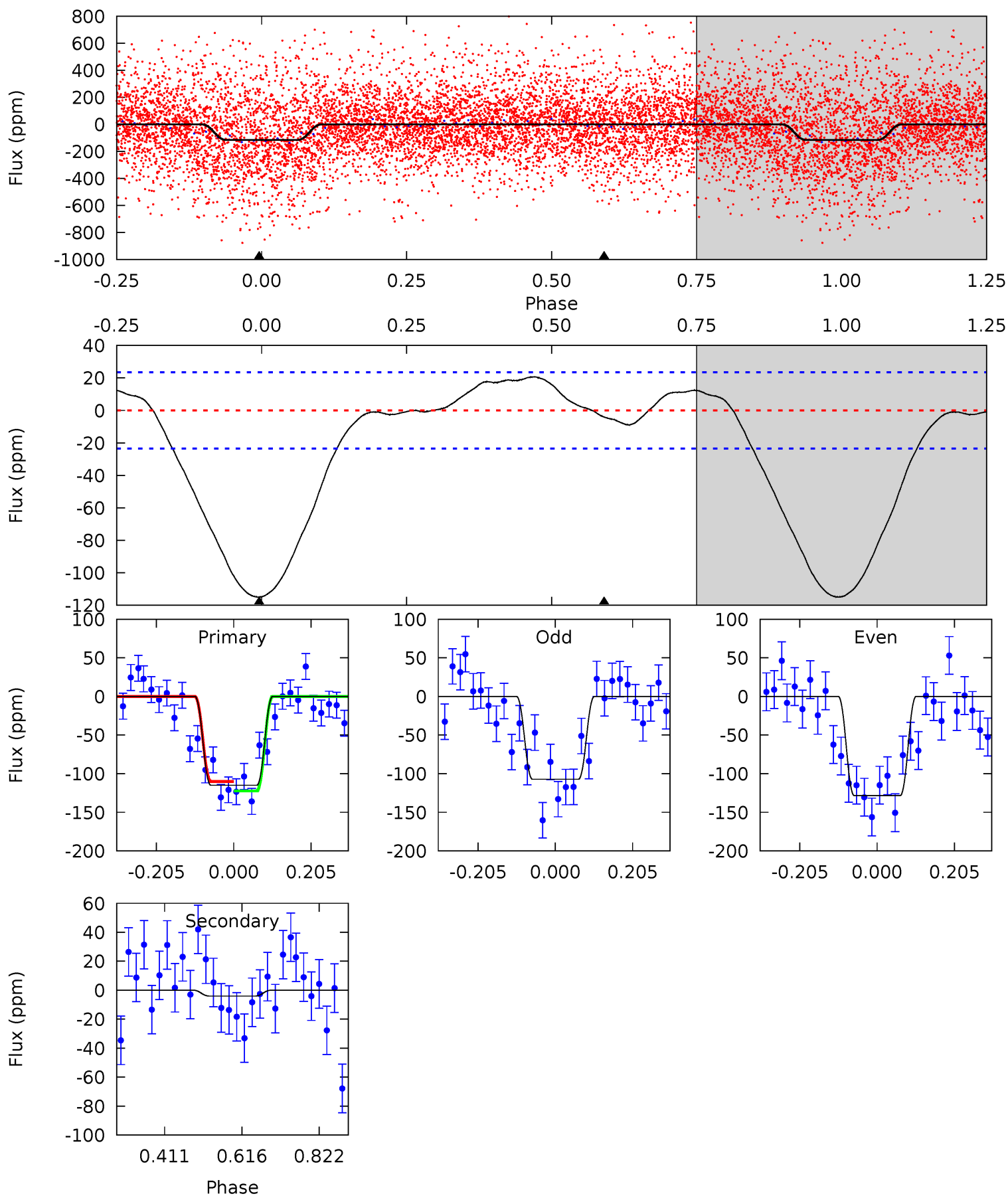
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.5	-5.46	0	0	4.27	0.85	2.10	29.5	29.5	-5.46	-5.46	2.35	0.97	0.21	10.1



Alt Model-Shift Uniqueness Test

004073089-02, P = 1.186807 Days, E = 132.107447 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.6	0.76	0	0	4.41	1.27	1.13	21.6	21.6	0.76	0.76	1.99	0.88	0.15	1.14



Stellar Parameters For KIC 004073089

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7078^{+228}_{-314}	$4.192^{+0.128}_{-0.192}$	$-0.160^{+0.250}_{-0.350}$	$1.568^{+0.524}_{-0.322}$	$1.401^{+0.218}_{-0.239}$	$0.512^{+0.322}_{-0.263}$
	+3%/-4%	+3%/-5%	+156%/-219%	+33%/-21%	+16%/-17%	+63%/-51%
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 004073089-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	24 ± 4	$1.73^{+0.99}_{-0.75}$	3523^{+259}_{-241}	-5056^{+670}_{-1570}	$-2.474^{+1.454}_{-5.913}$
Alt.	-4 ± 5	$1.99^{+0.98}_{-0.87}$	3525^{+295}_{-241}	-2641^{+6641}_{-995}	$0.250^{+0.954}_{-0.360}$

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 $A_{obs} \gg 1.0$

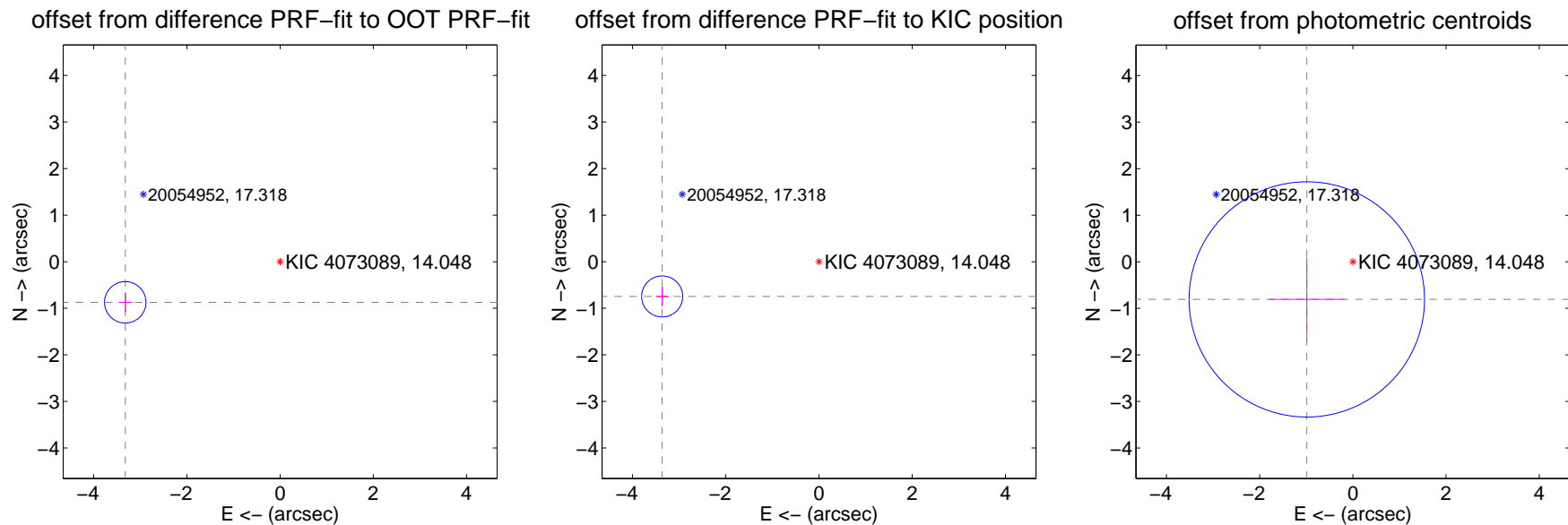
DV Centroid Data

Supplemental centroid analysis for 004073089-02. Kepler magnitude: 14.05. Transit SNR 11.88

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.434 ± 0.148	23.19	3.322 ± 0.143	-0.872 ± 0.209
PRF-fit source offset from KIC position	3.445 ± 0.147	23.48	3.364 ± 0.143	-0.746 ± 0.209
photometric centroid source offset	1.28 ± 0.84	1.52	0.99 ± 0.80	-0.81 ± 0.90



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.



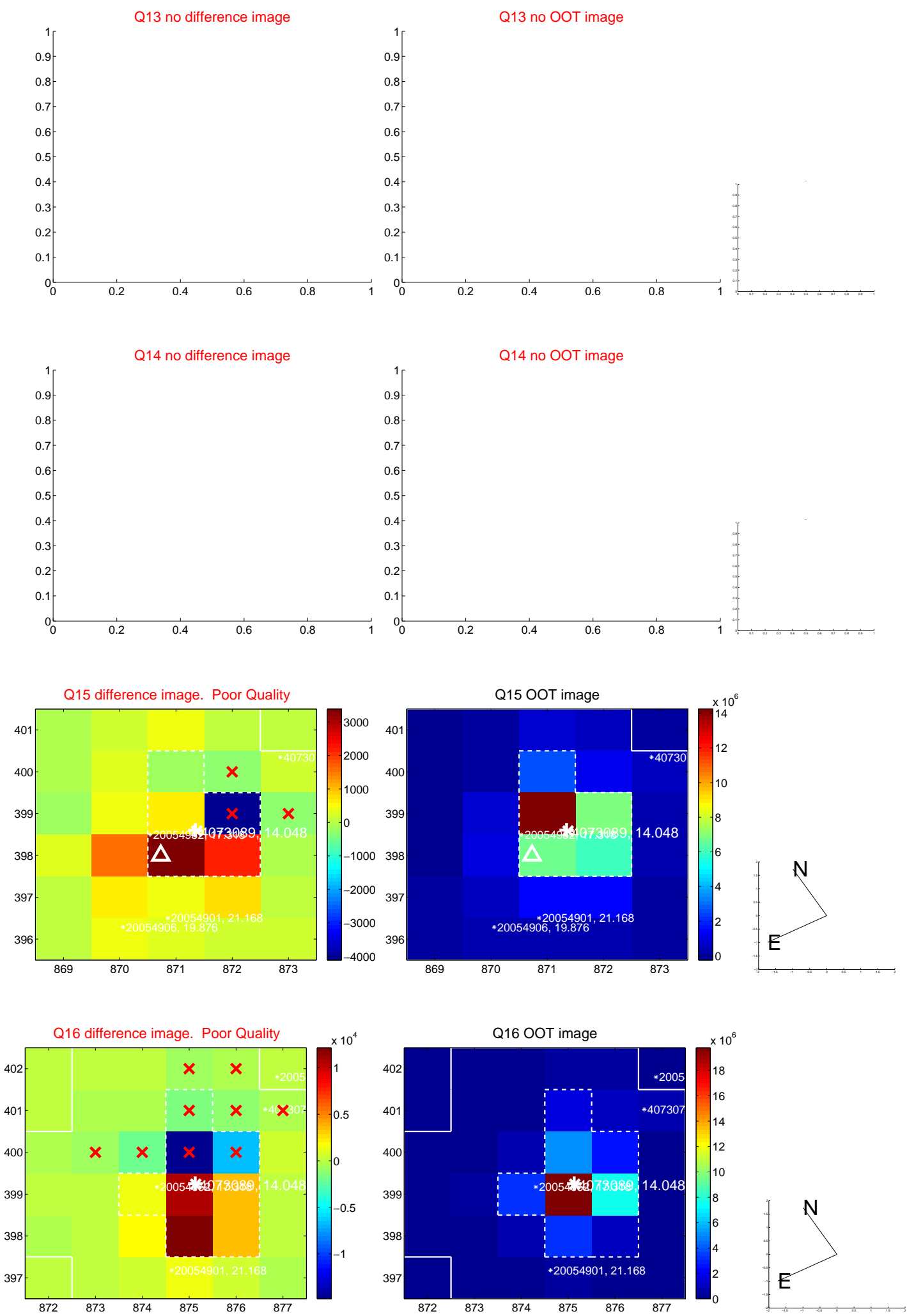
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



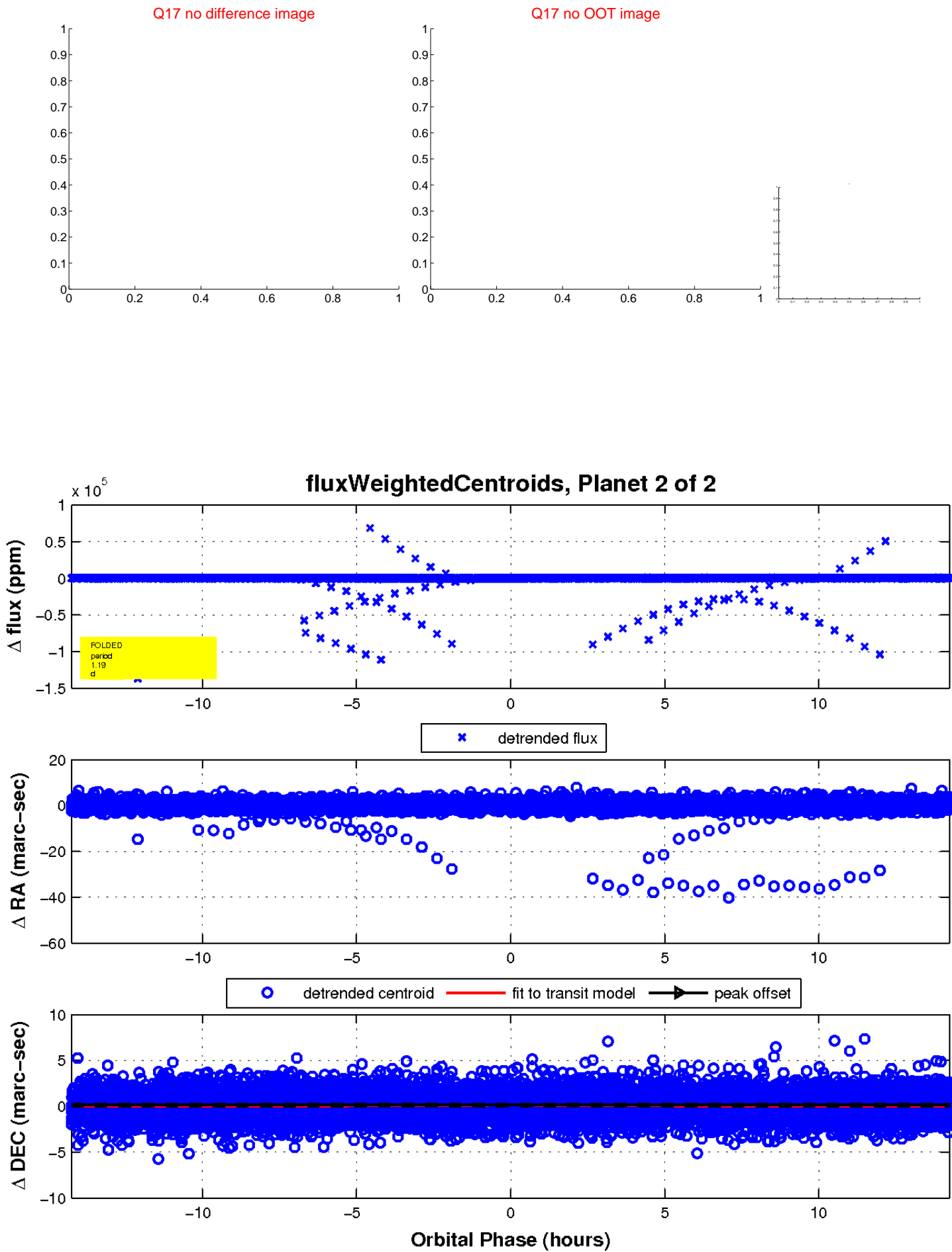
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

