

KIC 004059007

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})
004059007-01	OBS	No	302.273653	195.369274	2965.3	9.000	48.5	-1.0	5.58	4980	29.74	25.23
004059007-02	OBS	No	465.828578	303.165563	2643.1	9.440	16.3	7.8	5.58	4980	28.79	14.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004059007-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
004059007-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

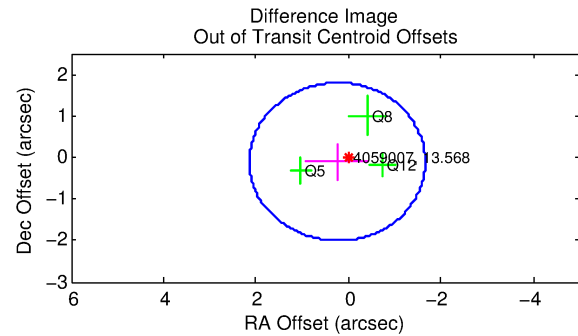
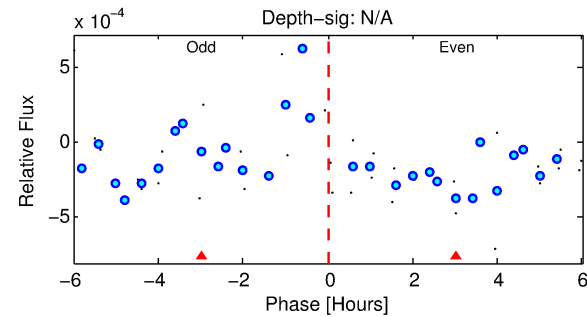
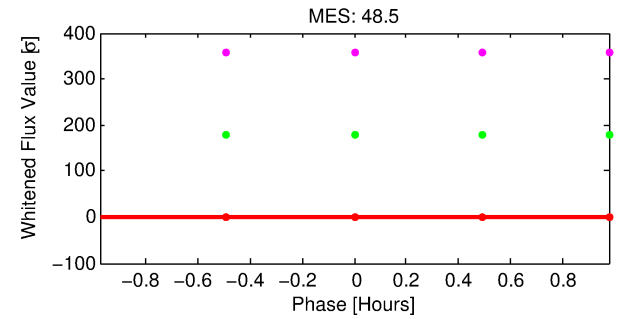
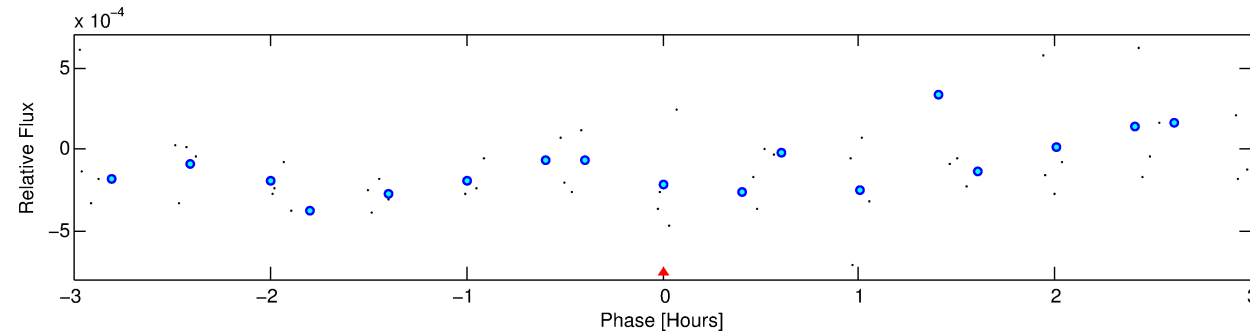
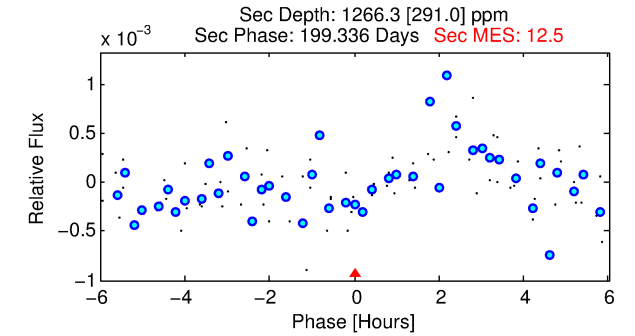
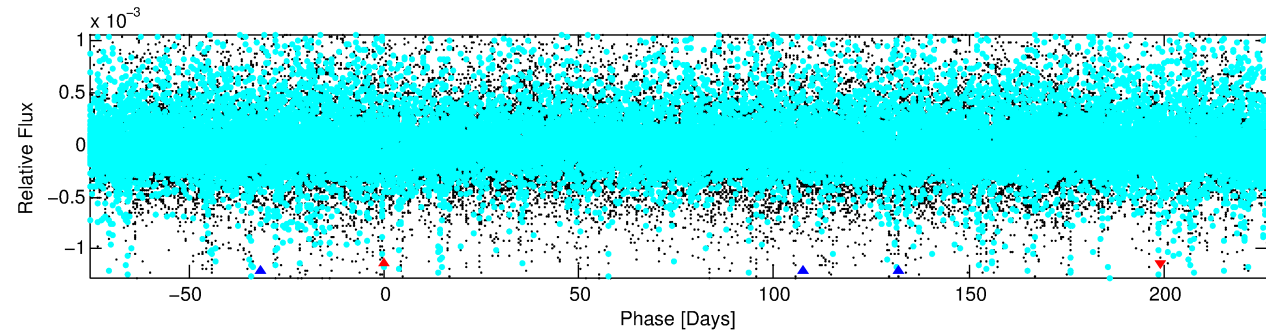
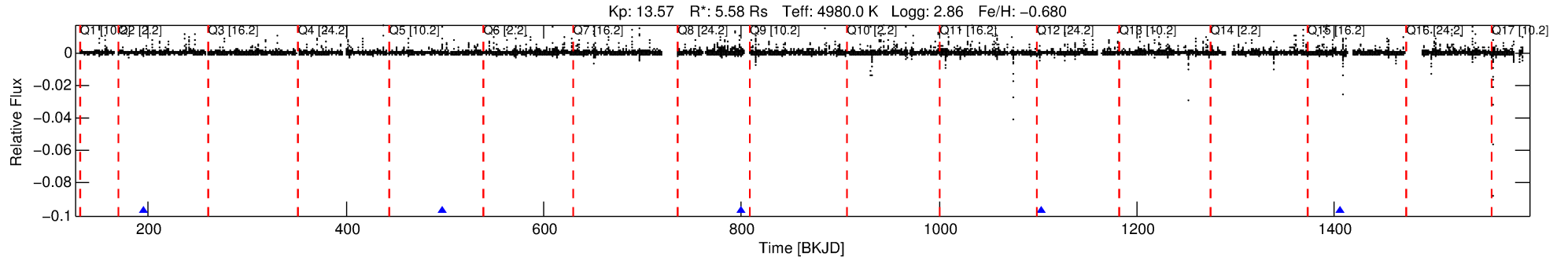
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004059007-01

No Significant Match Found

DV One-Page Summary

KIC: 4059007 Candidate: 1 of 2 Period: 302.274 d



TPS TCE Results:

Period = 302.27365 d
Epoch = 195.3693 BKJD

DV fit results are unavailable

DV Diagnostic Results:

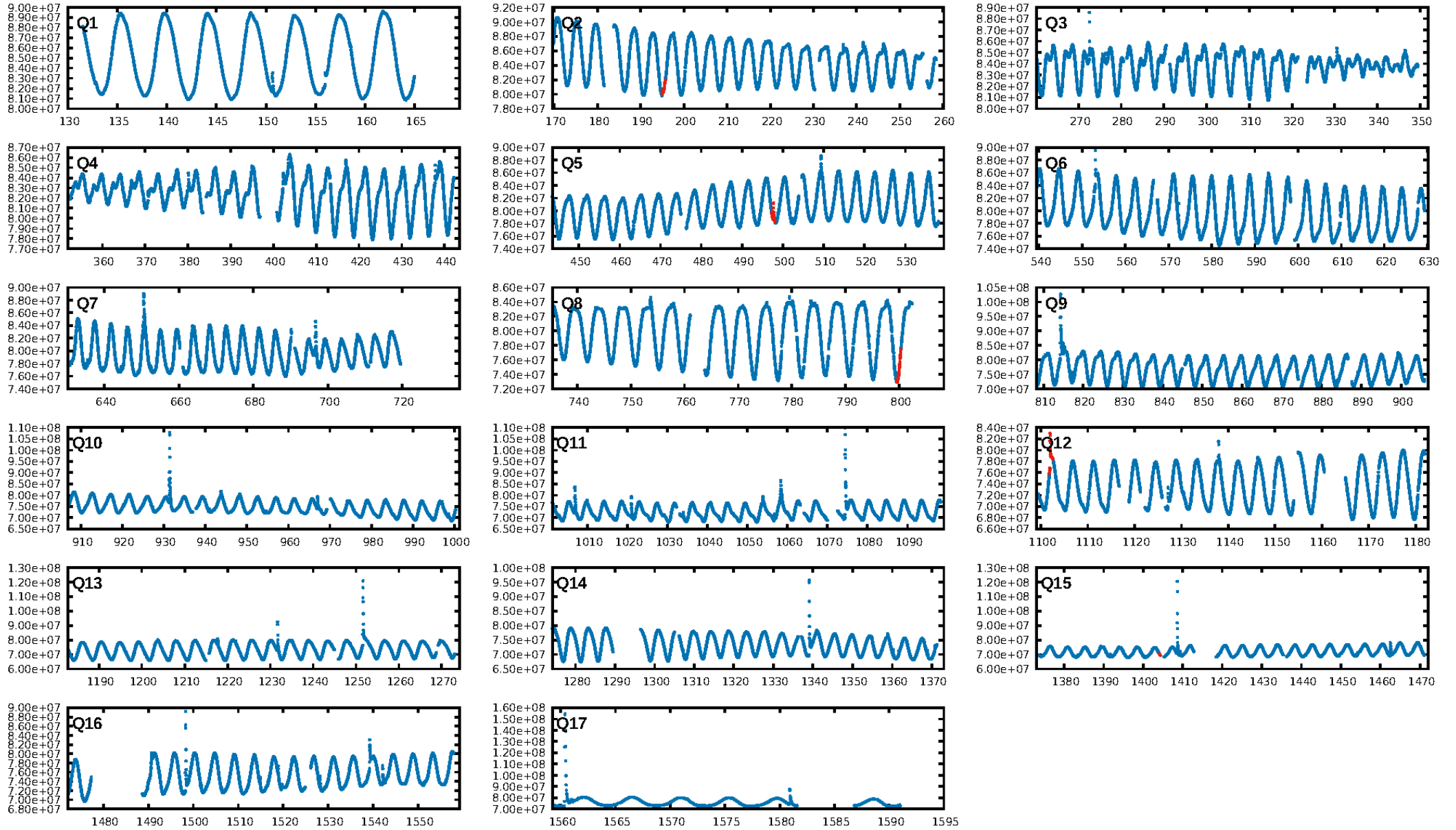
ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [300.95σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.87e-39
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.771

Centroid-sig: 13.6%
Centroid-so: 11.701 arcsec [1.10σ]
OotOffset-rm: 0.266 arcsec [0.42σ]
KicOffset-rm: 0.428 arcsec [0.89σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [4/4]

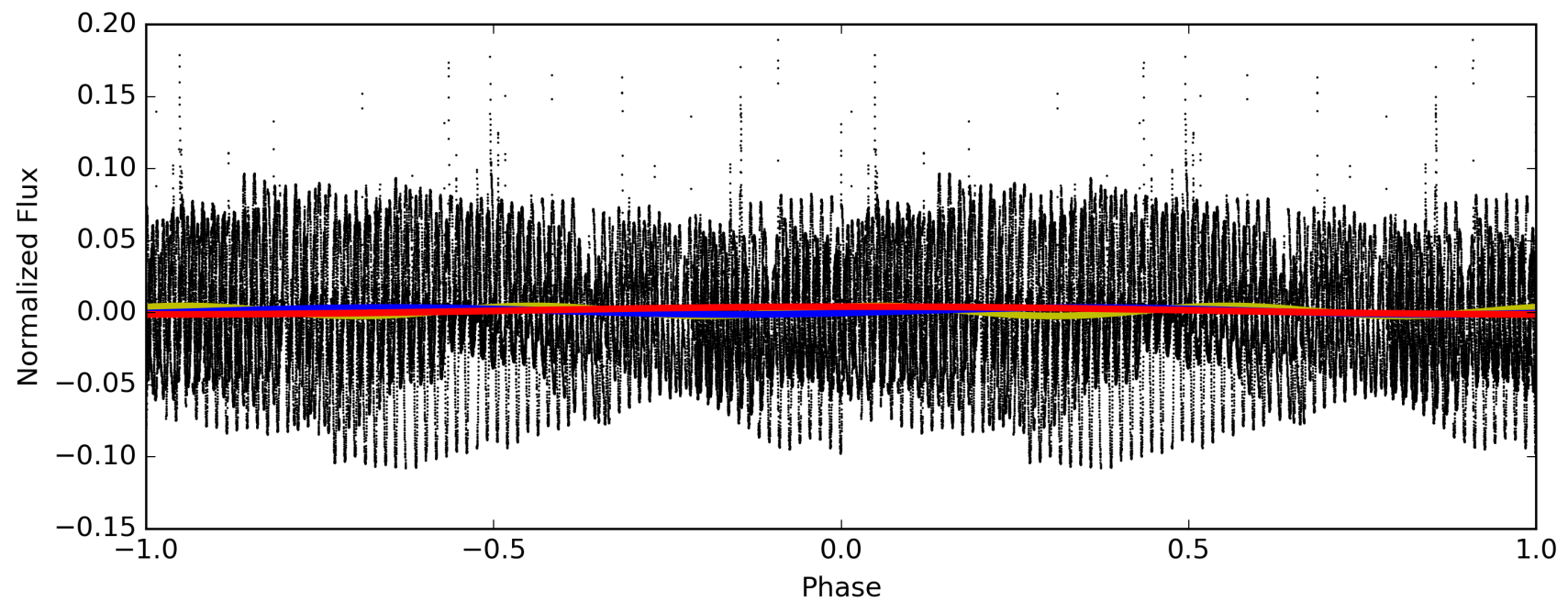
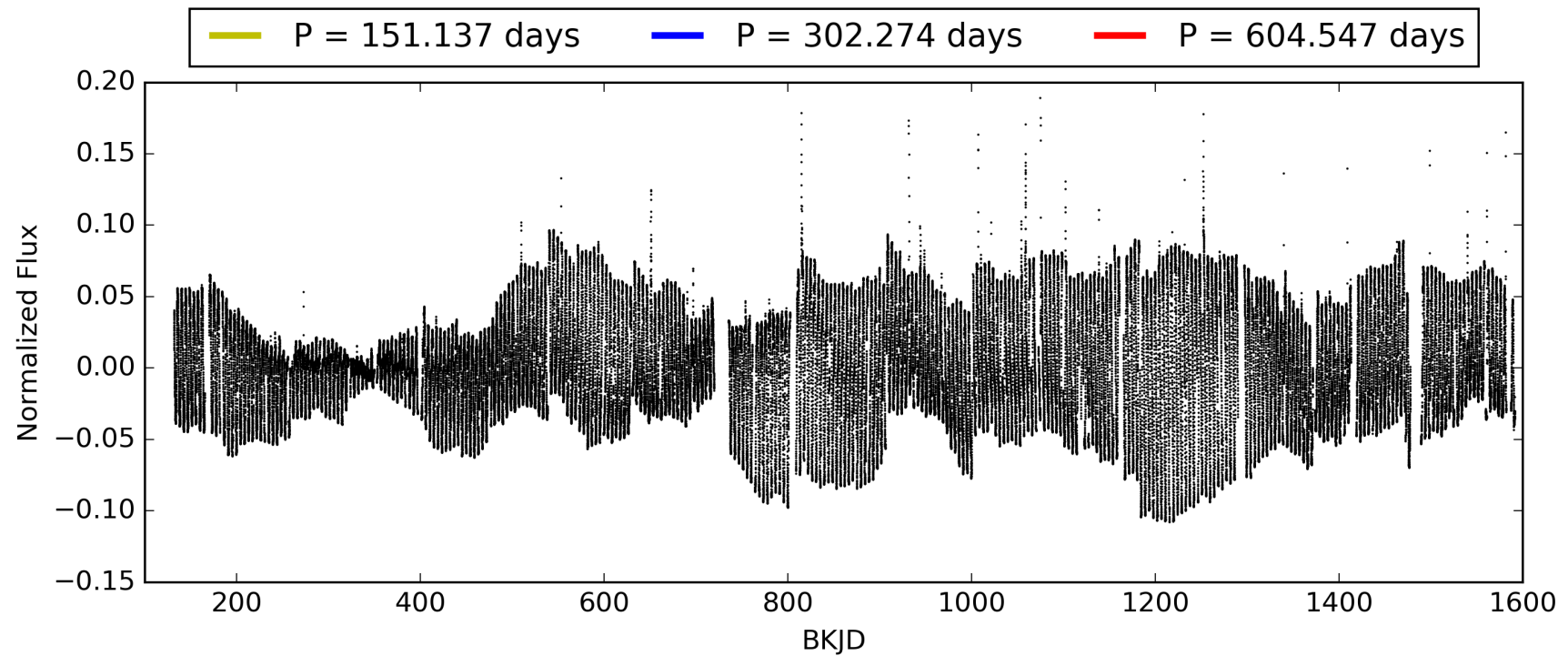
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:52:52 Z

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

TCE 004059007-01, PDC Light Curves

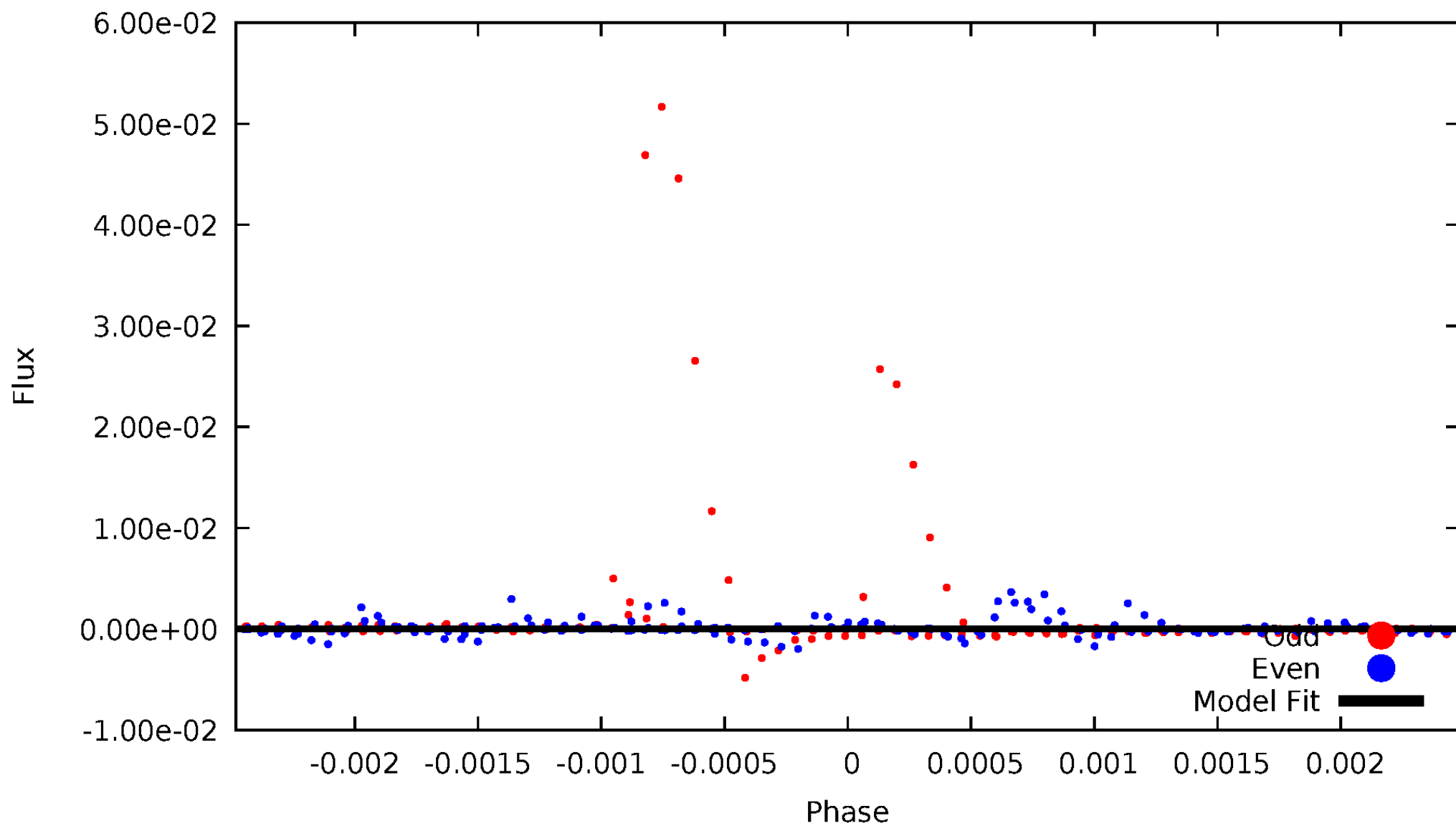


TCE 004059007-01



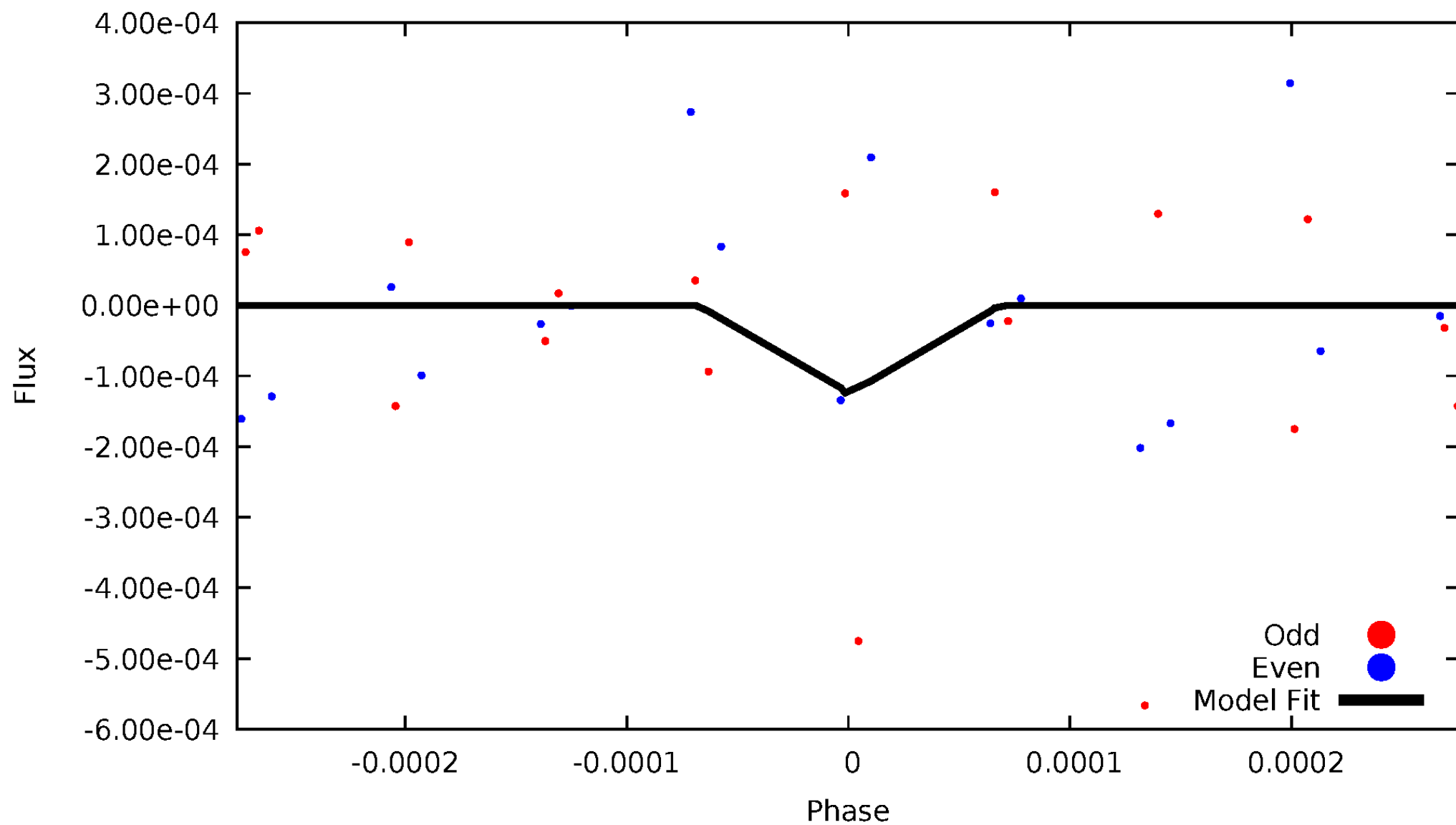
DV Odd/Even

TCE 004059007-01



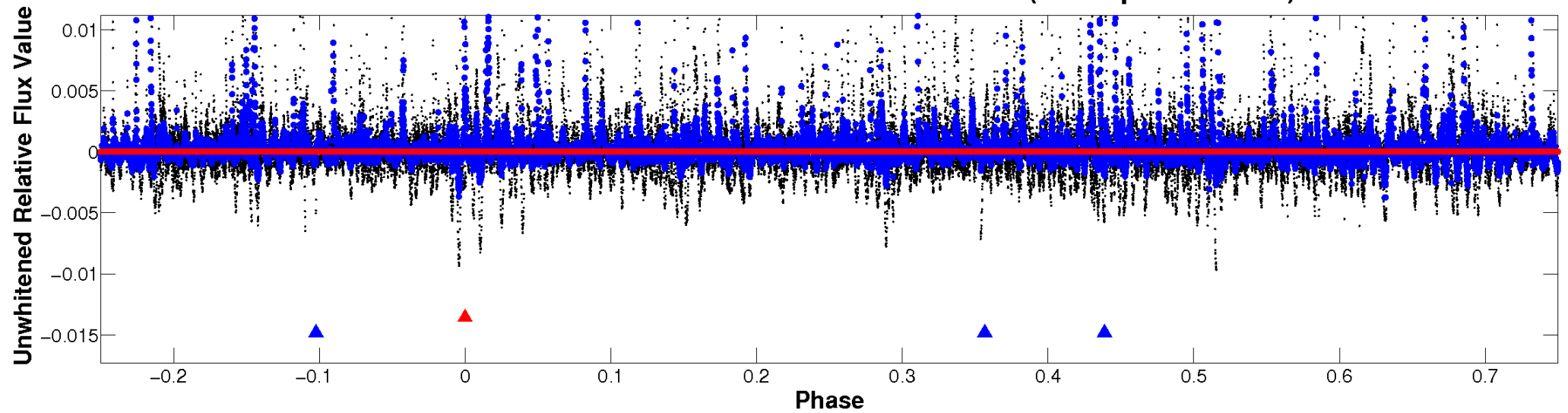
ALT Odd/Even

TCE 004059007-01

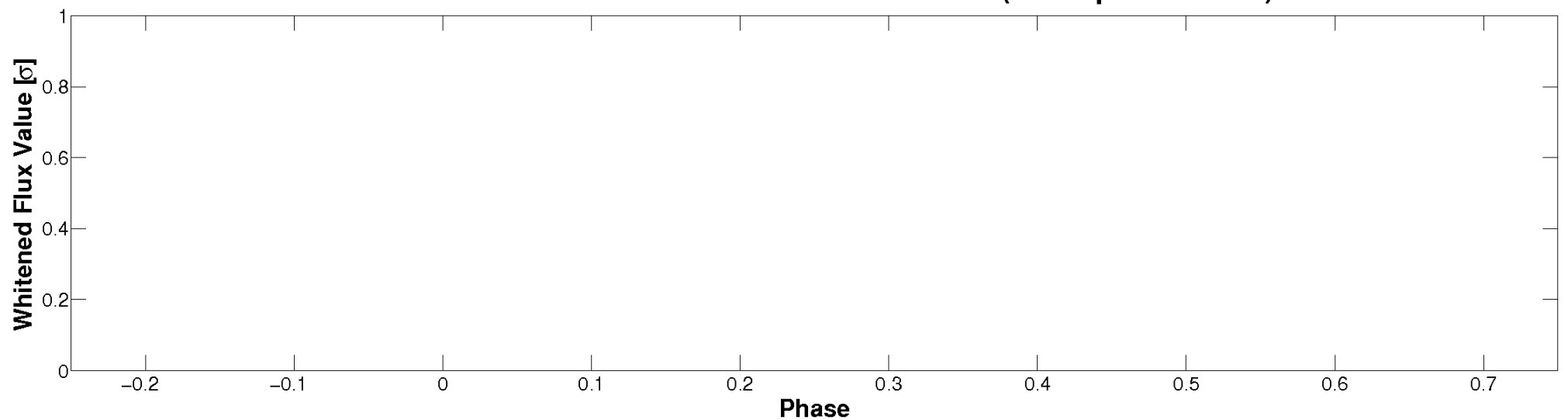


Non-Whitened Vs. Whitened Light Curve

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

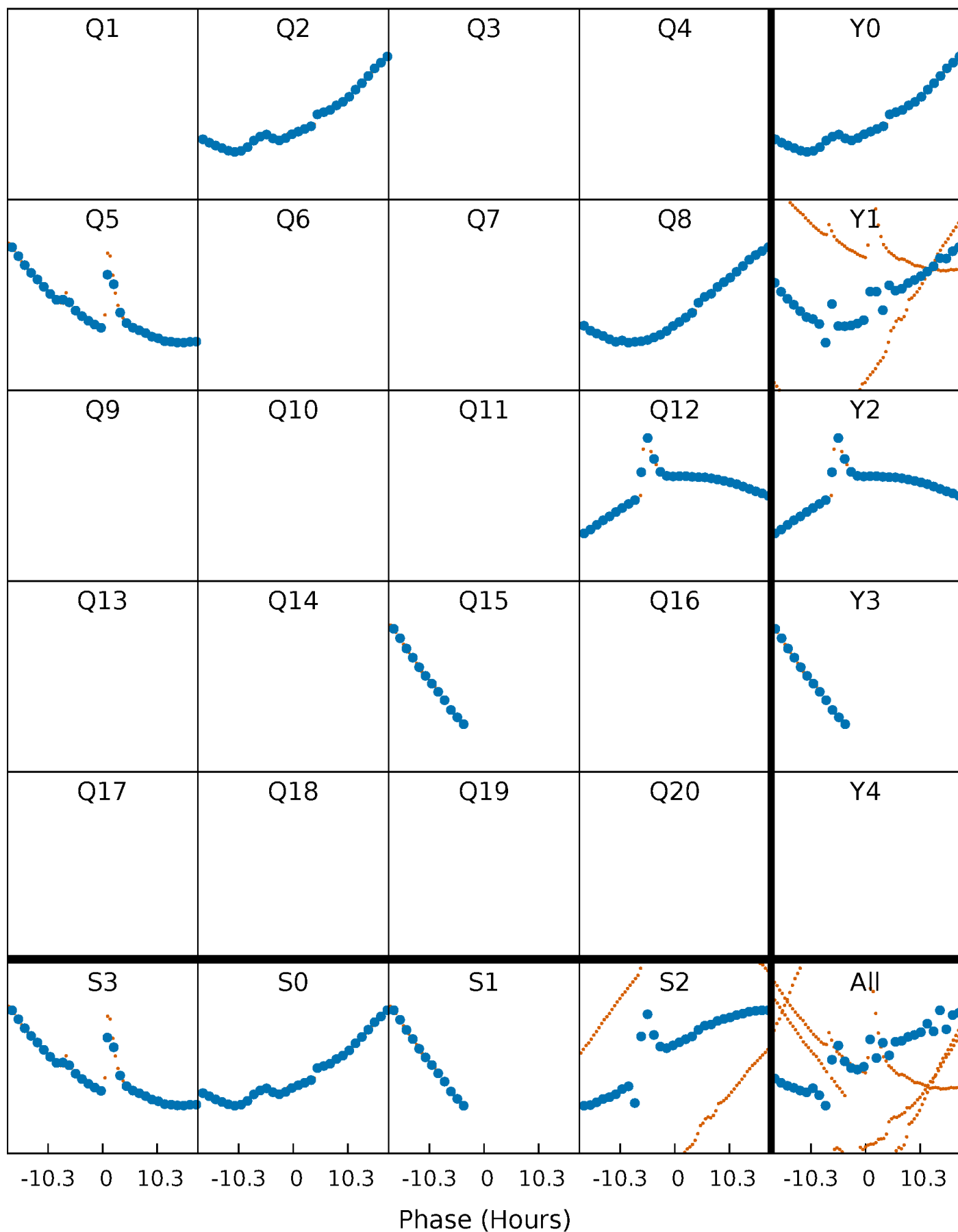


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



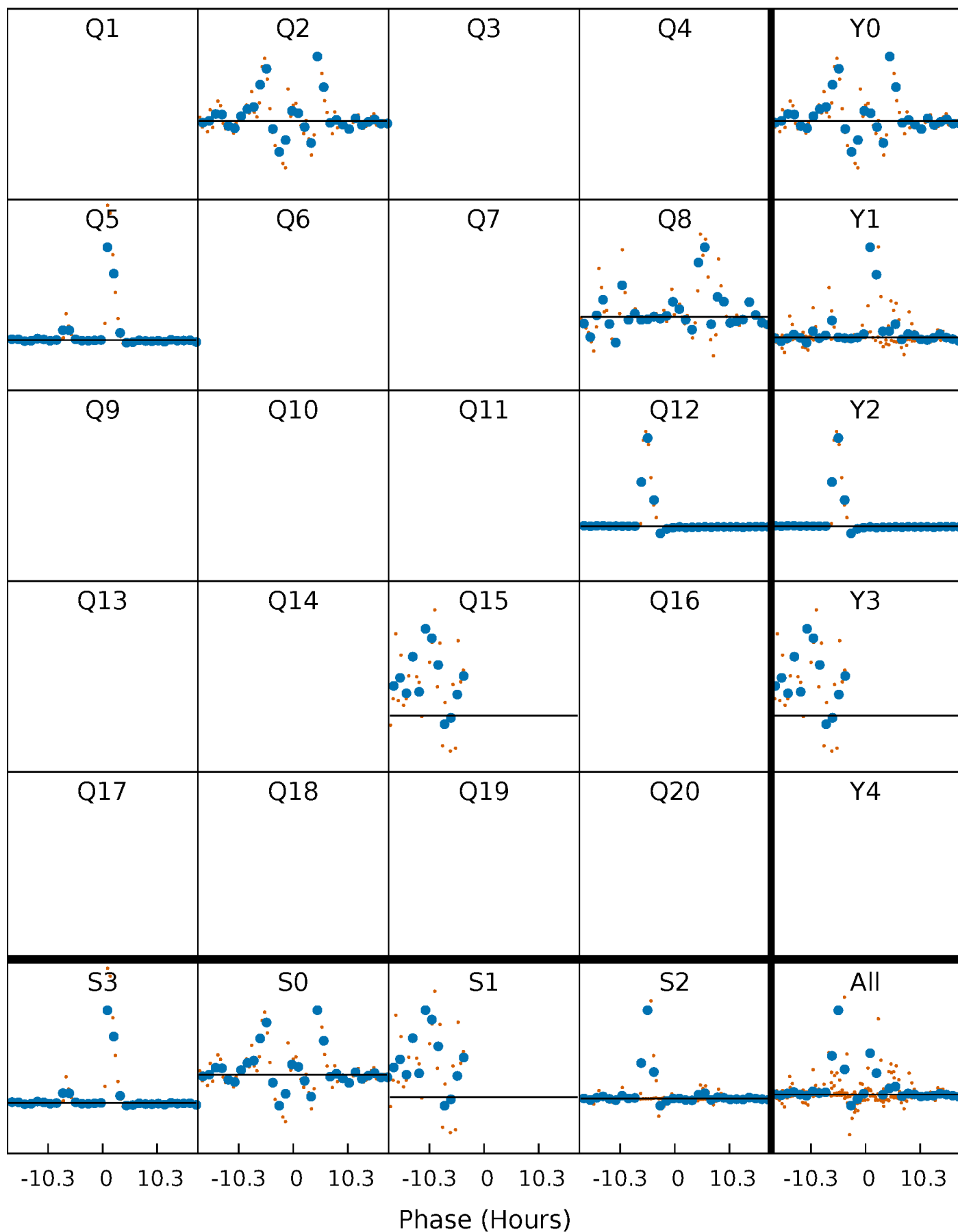
PDC Quarter-Phased Transit Curves

TCE 004059007-01 P=302.273653 Days $T_0=195.369274$ (BKJD)



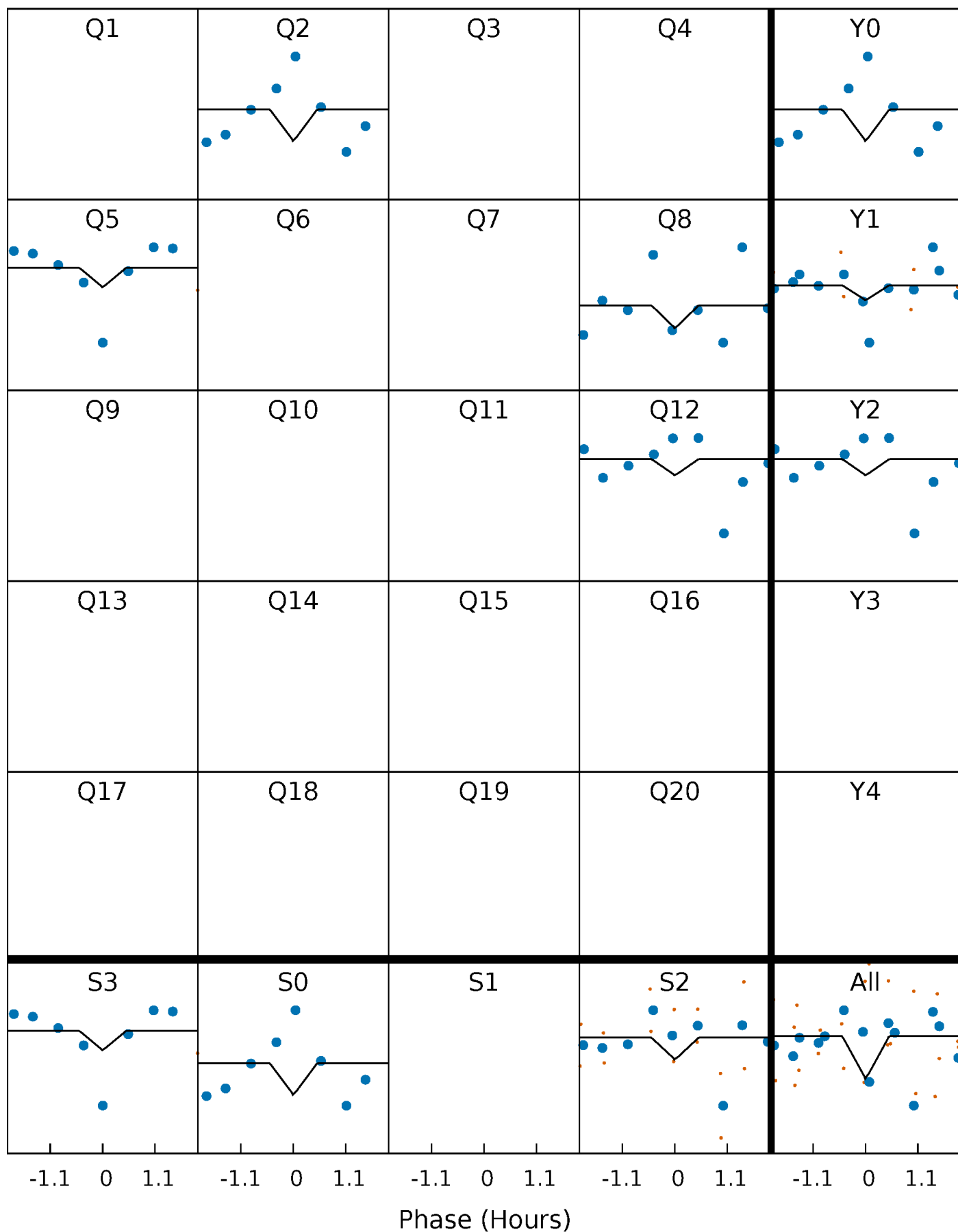
DV Quarter-Phased Transit Curves

TCE 004059007-01 $P=302.273653$ Days $T_0=195.369274$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

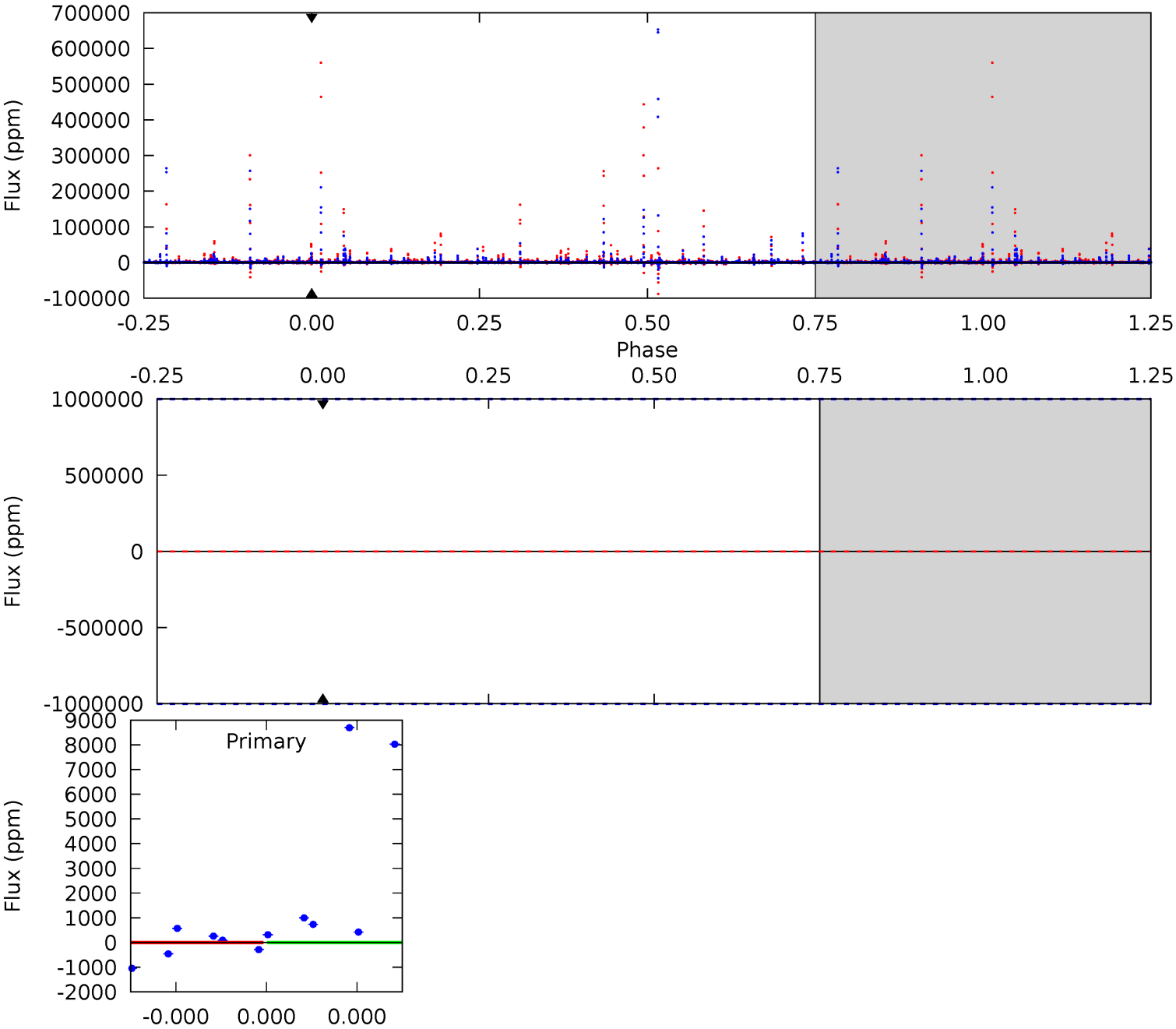
TCE 004059007-01 P=302.273653 Days $T_0=195.877377$ (BKJD)



DV Model-Shift Uniqueness Test

004059007-01, P = 302.273653 Days, E = 195.369274 Days

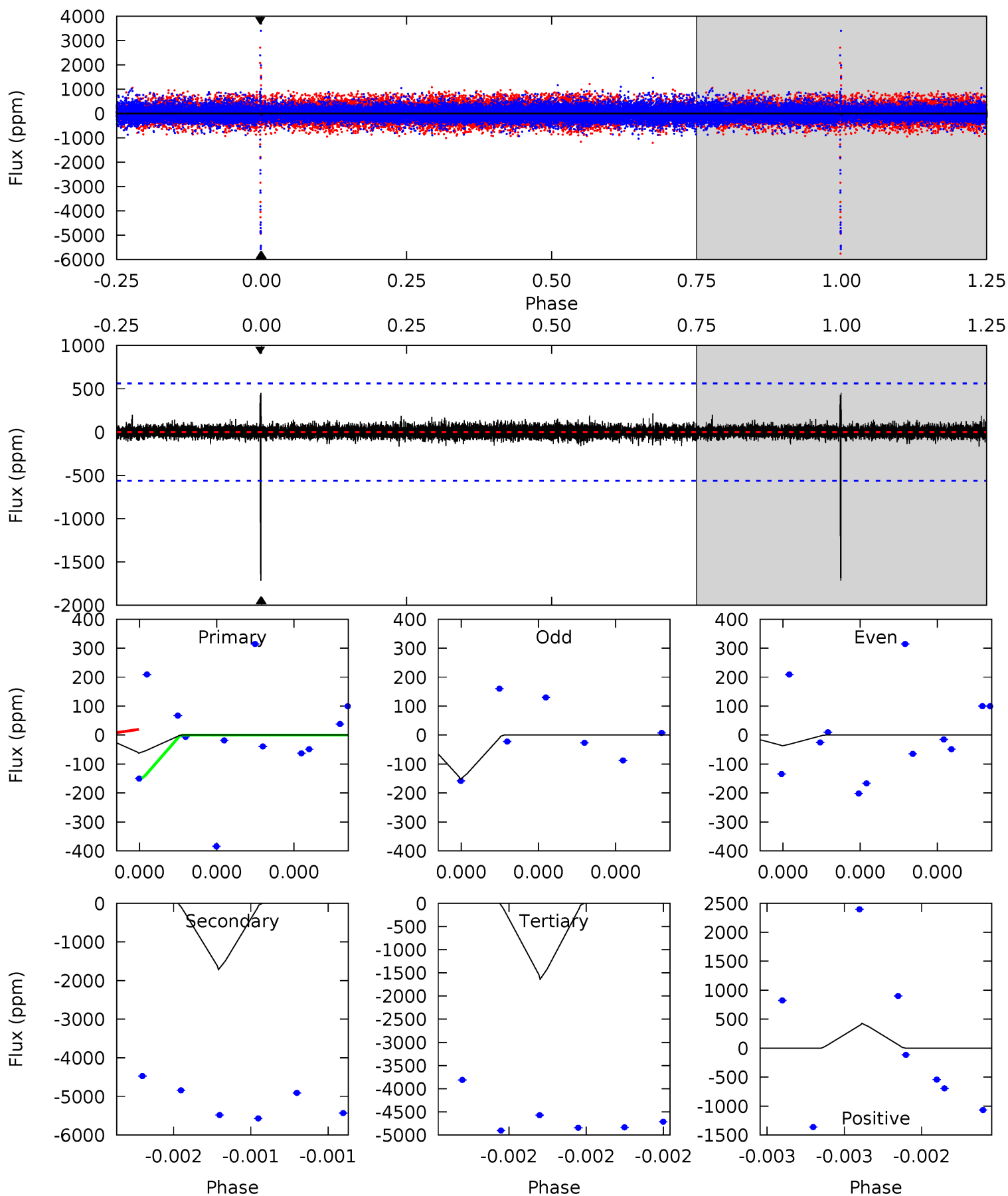
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

004059007-01, P = 302.273653 Days, E = 195.877377 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.64	17.7	16.9	4.41	5.80	3.83	0.44	-16.3	-3.77	0.81	13.3	0.47	-6.43	0.21	0.61



Stellar Parameters For KIC 004059007

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4980^{+162}_{-112}	$2.858^{+0.462}_{-0.308}$	$-0.680^{+0.300}_{-0.250}$	$5.583^{+3.478}_{-2.141}$	$0.820^{+0.321}_{-0.038}$	$0.007^{+0.025}_{-0.005}$
	+3%/-2%	+16%/-11%	+44%/-37%	+62%/-38%	+39%/-5%	+369%/-75%
Source	PHO1	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 004059007-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$53.52^{+55.31}_{-37.05}$	784^{+109}_{-102}	-4320^{+16323}_{-8022}	$-442.792^{+26621.062}_{-24842.228}$
Alt.	-1718 ± 97	$41.41^{+52.74}_{-29.48}$	786^{+113}_{-99}	4064^{+3061}_{-867}	407^{+4442}_{-328}

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

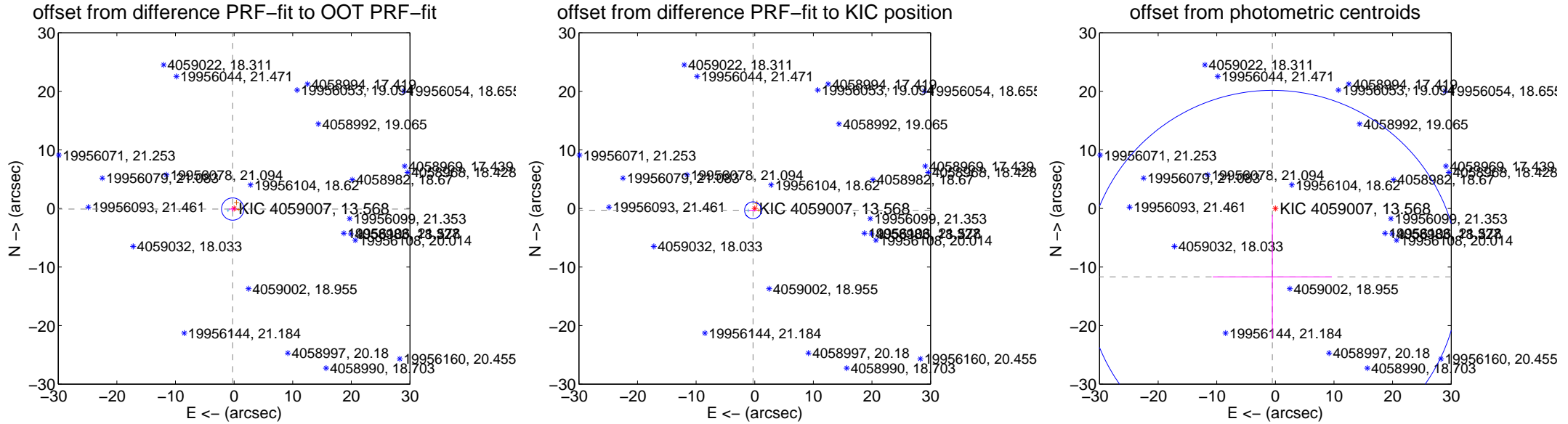
DV Centroid Data

Supplemental centroid analysis for 004059007-01. Kepler magnitude: 13.57. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

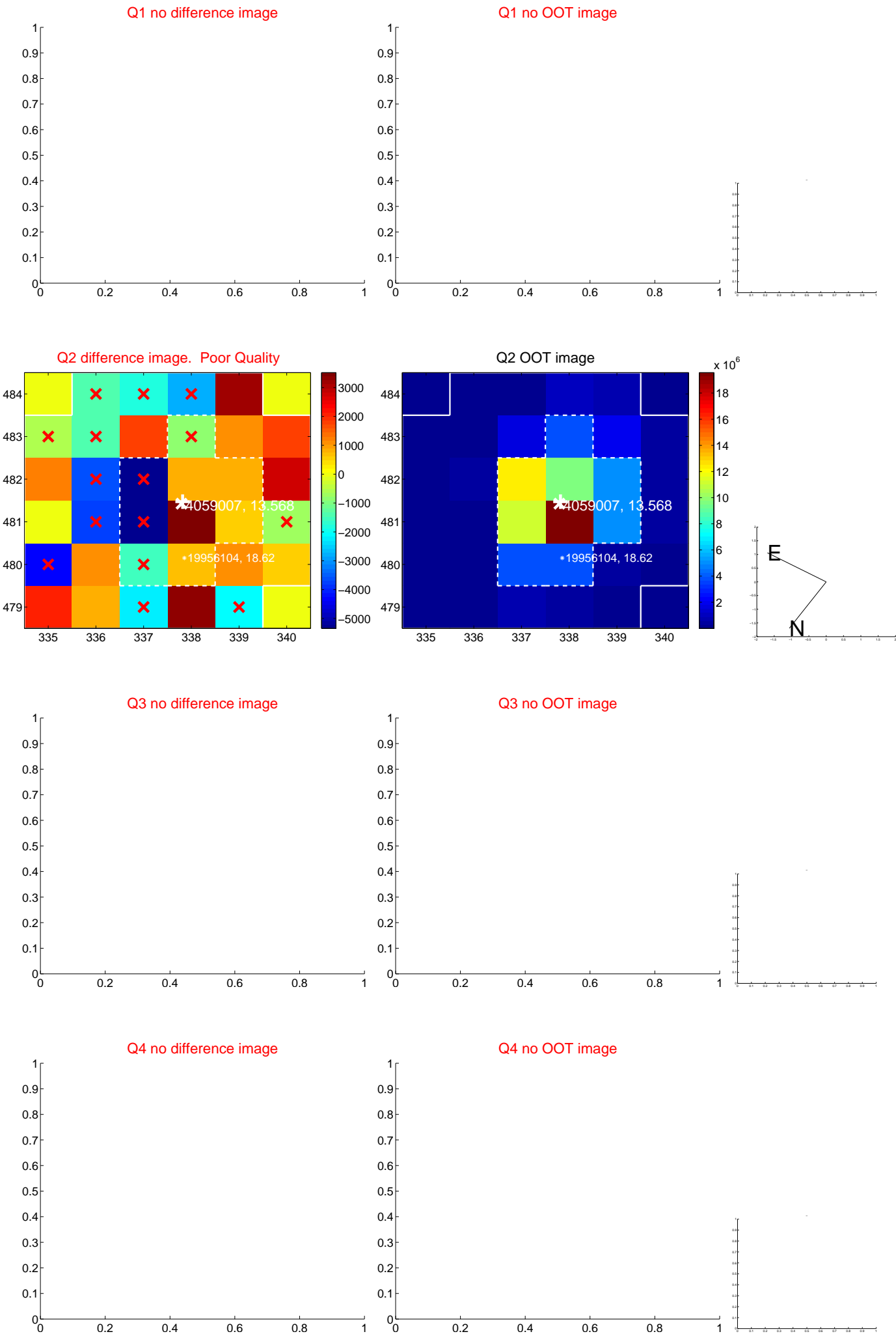
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.266 ± 0.634	0.42	0.245 ± 0.664	-0.104 ± 0.436
PRF-fit source offset from KIC position	0.428 ± 0.479	0.89	0.294 ± 0.674	-0.310 ± 0.167
photometric centroid source offset	11.70 ± 10.62	1.10	0.51 ± 10.15	-11.69 ± 10.62

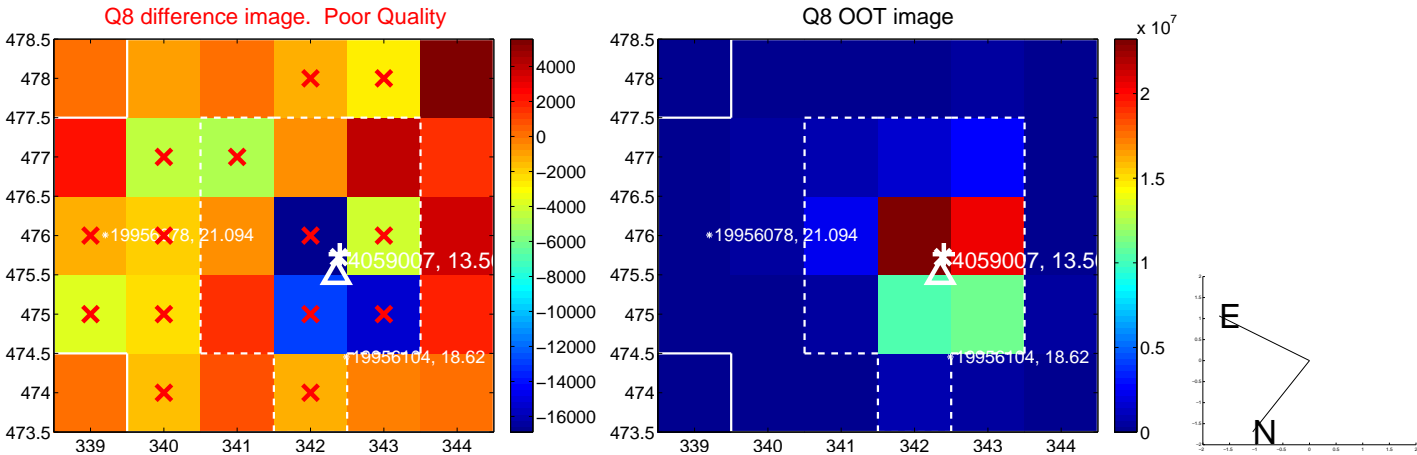
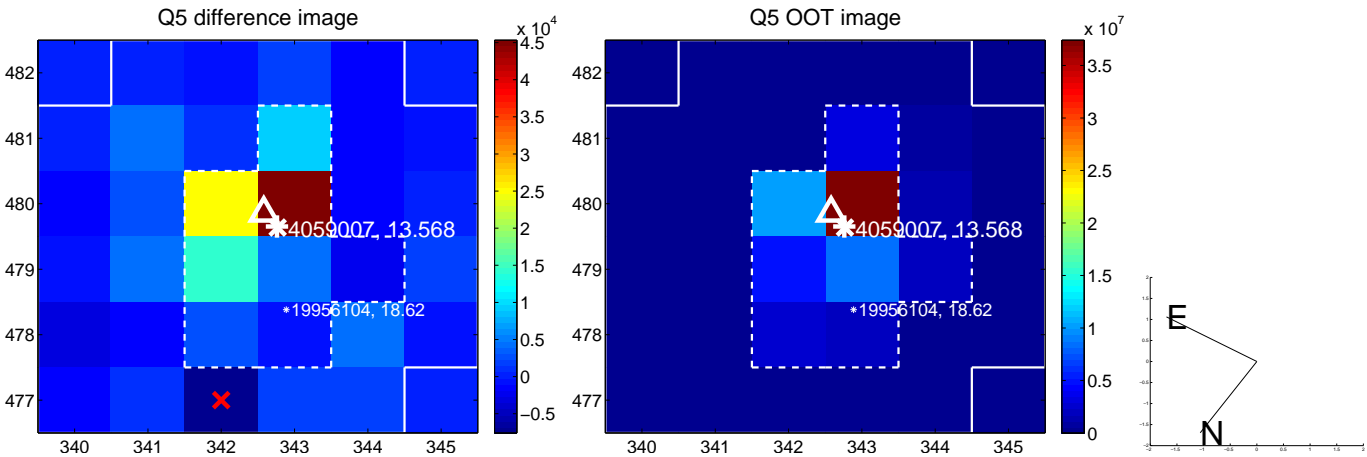


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

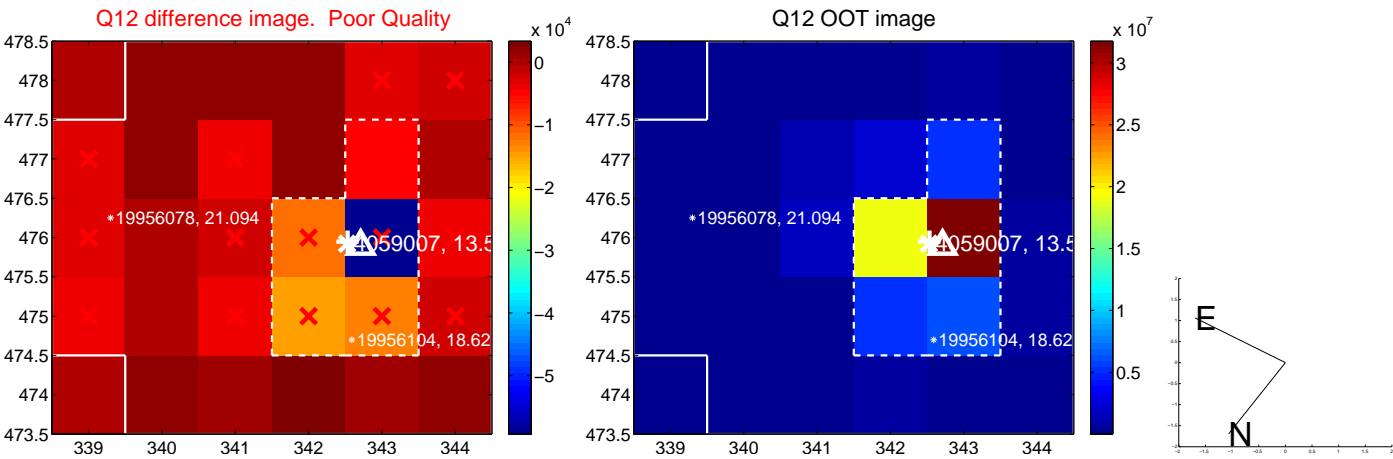
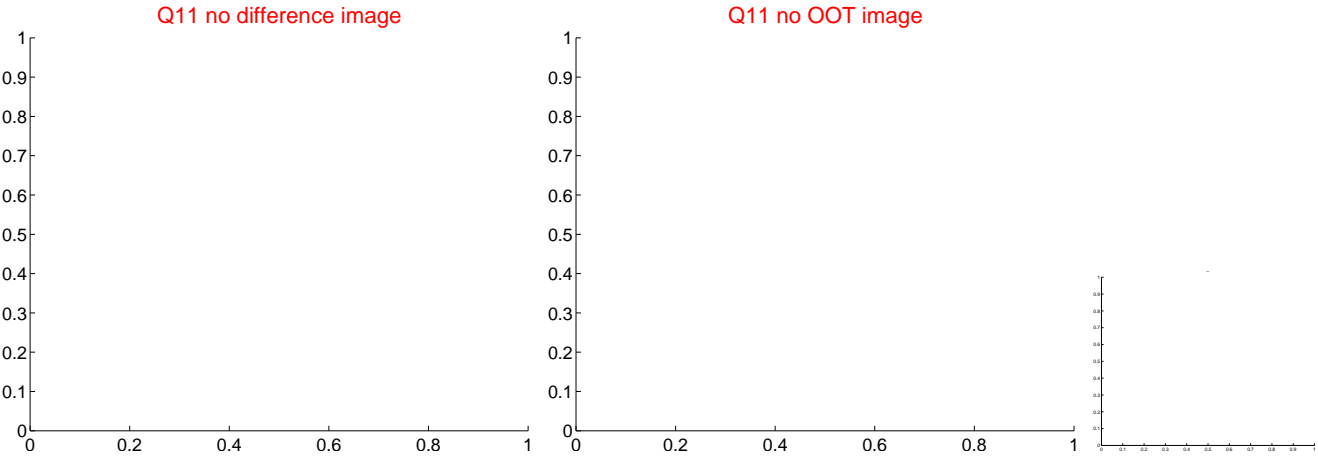
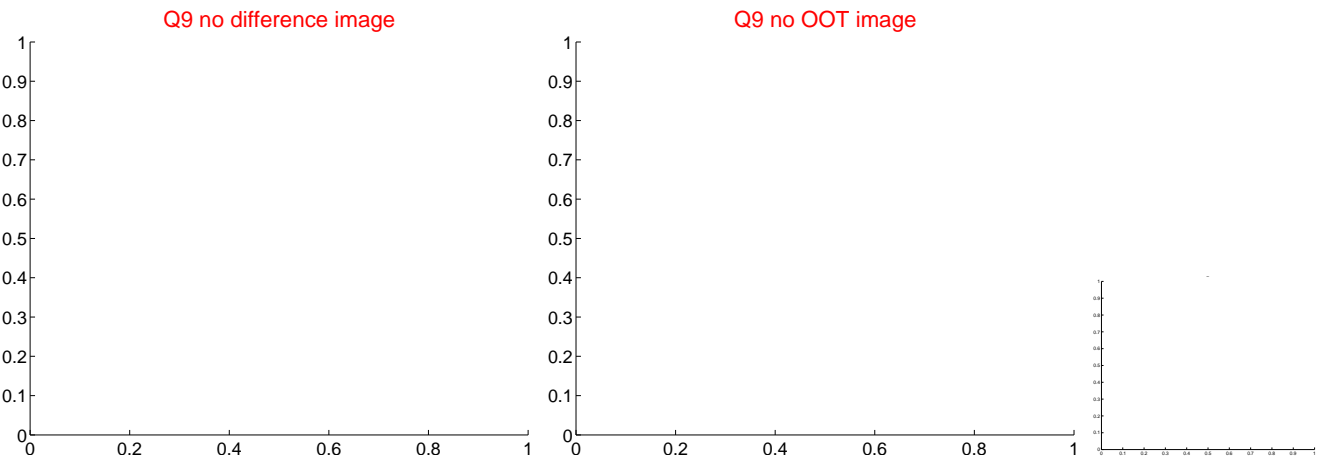
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



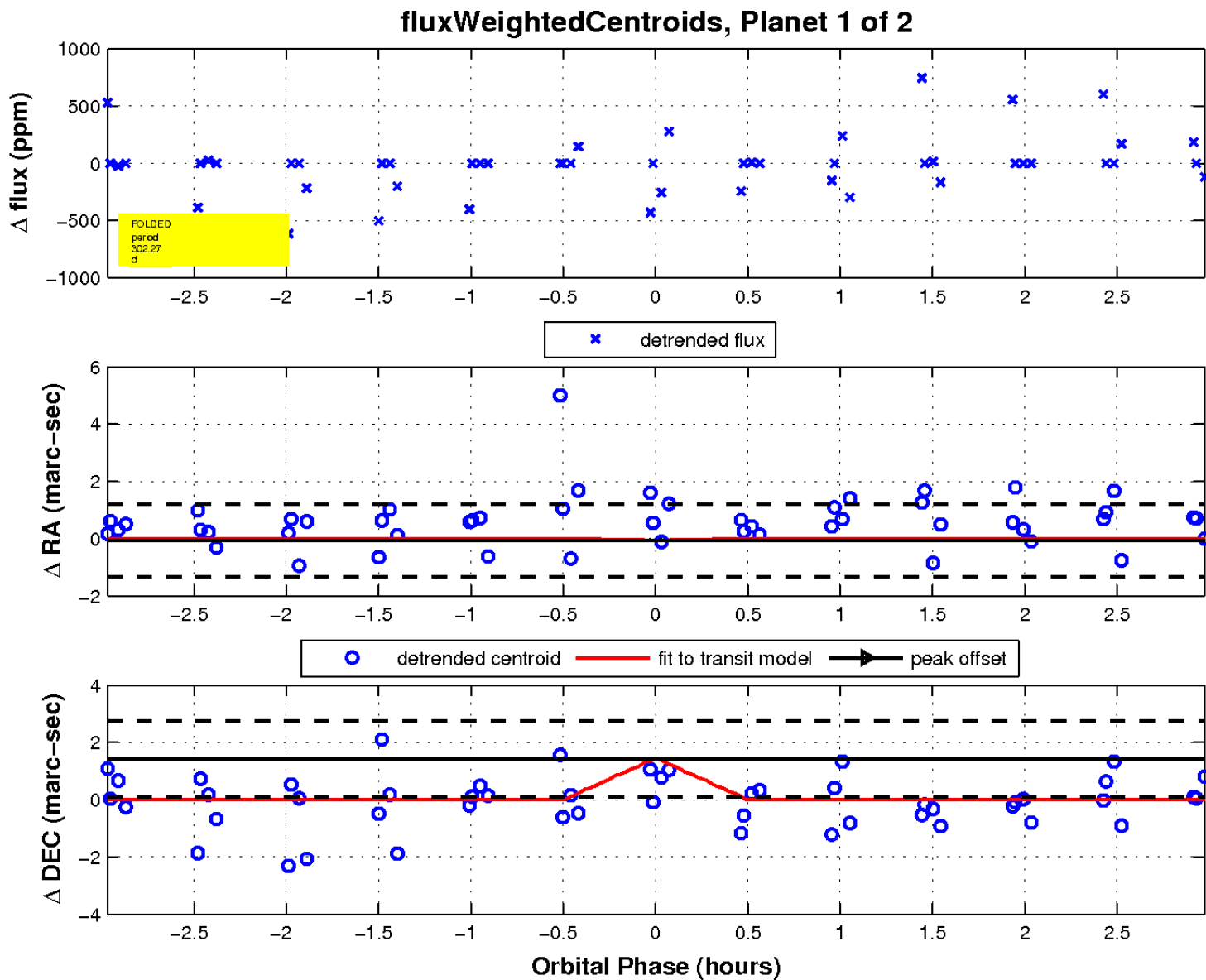
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

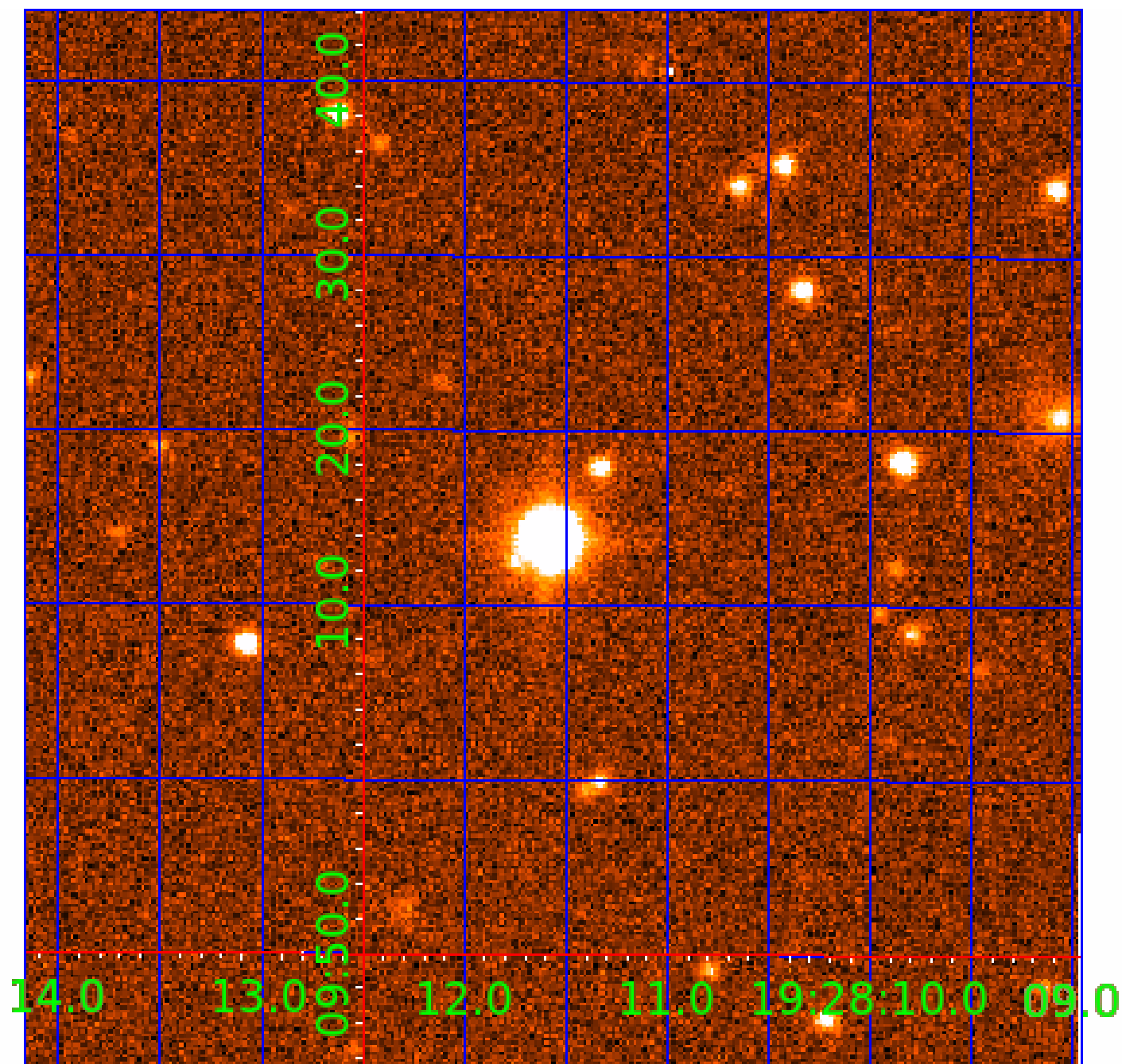


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004059007

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})
004059007-01	OBS	No	302.273653	195.369274	2965.3	9.000	48.5	-1.0	5.58	4980	29.74	25.23
004059007-02	OBS	No	465.828578	303.165563	2643.1	9.440	16.3	7.8	5.58	4980	28.79	14.17

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004059007-01	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
004059007-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—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.

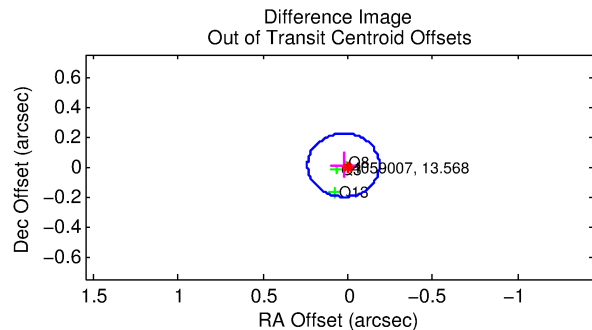
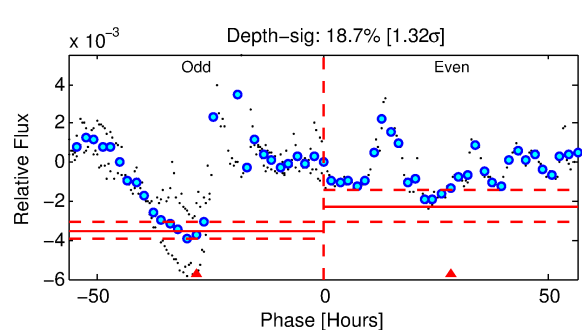
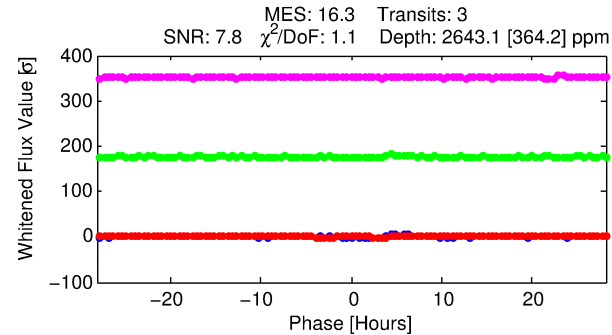
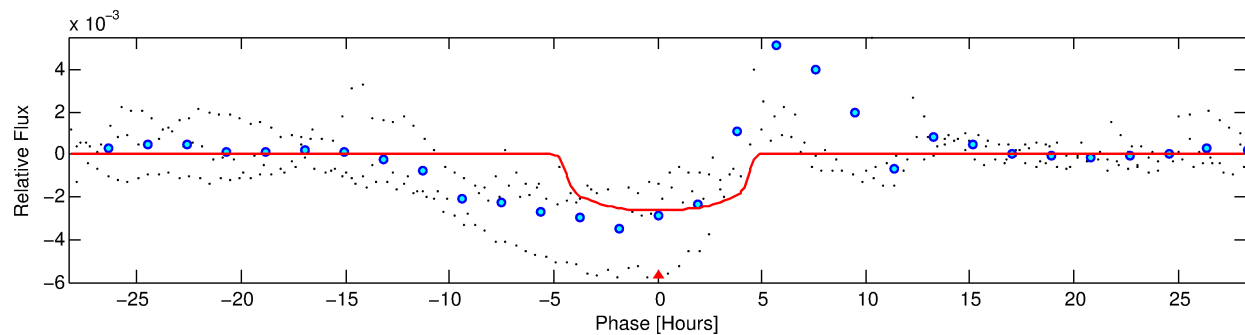
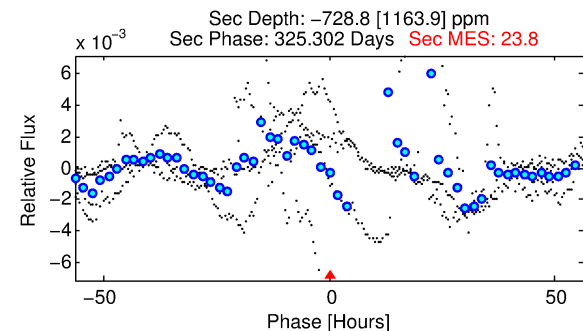
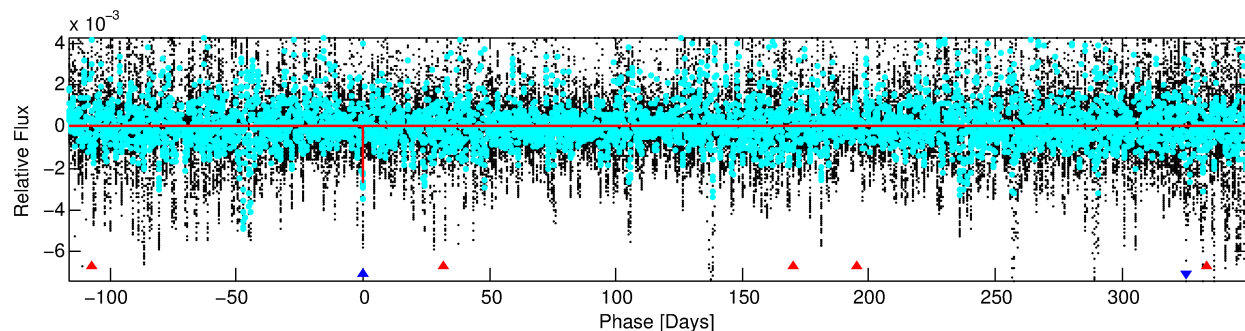
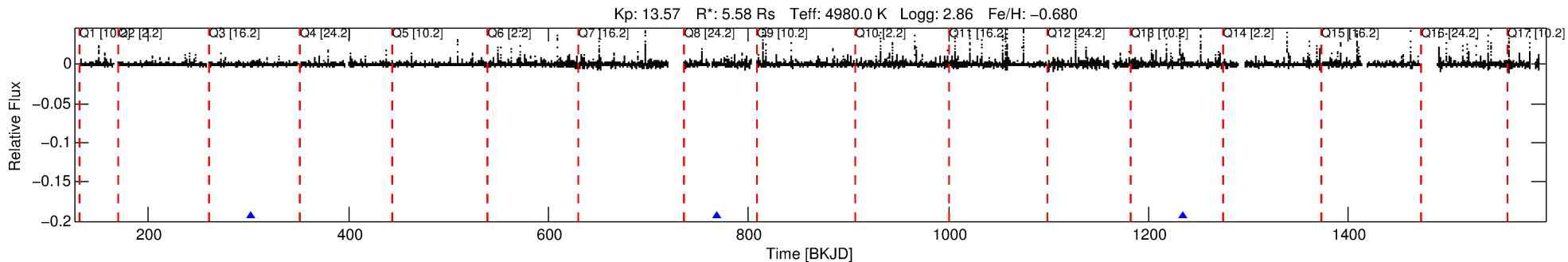
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004059007-02

No Significant Match Found

DV One-Page Summary

KIC: 4059007 Candidate: 2 of 2 Period: 465.829 d



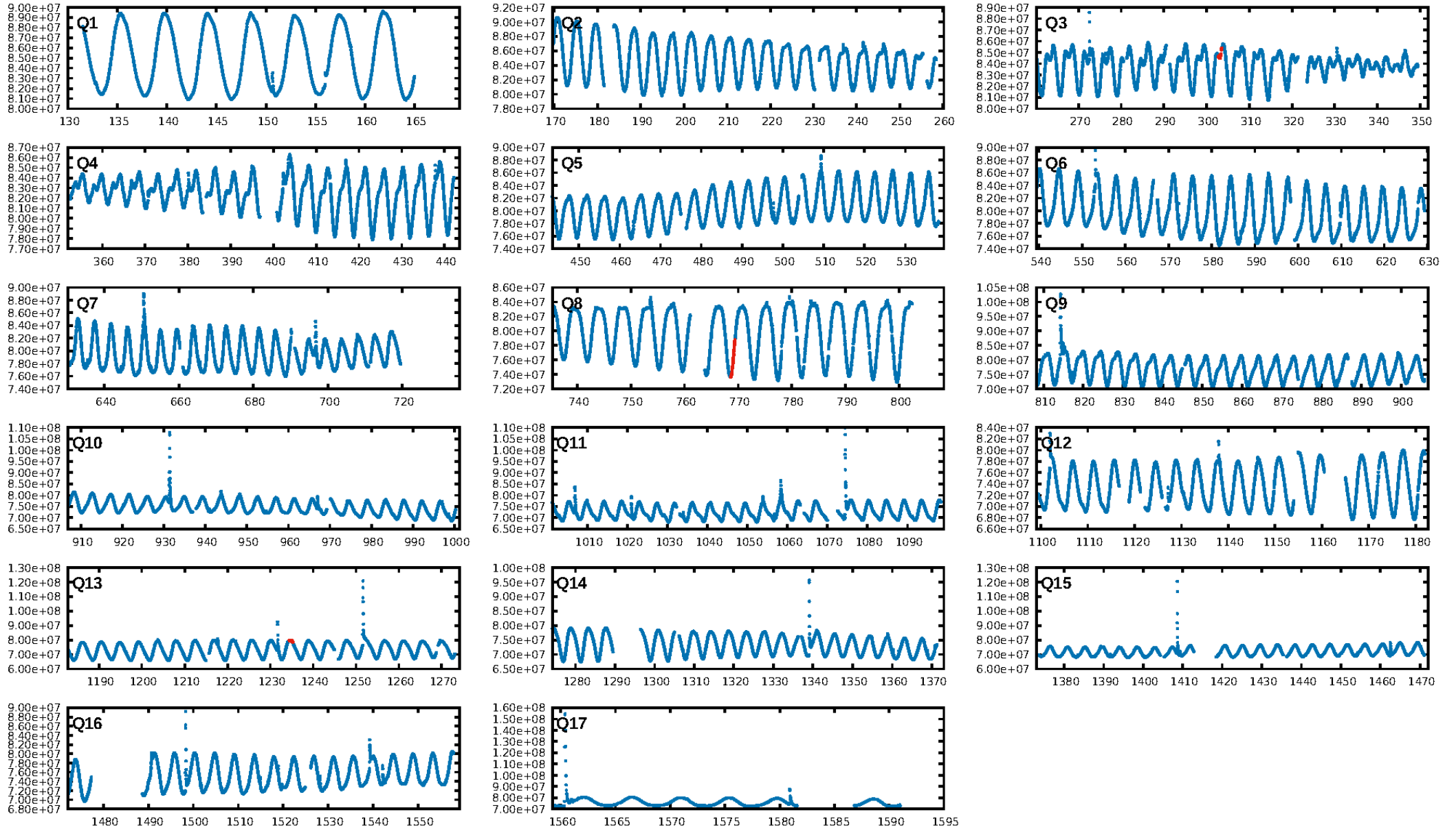
DV Fit Results:

Period = 465.82858 [0.00398] d
Epoch = 303.1656 [0.0063] BKJD
Rp/R* = 0.0473 [0.0119]
a/R* = 360.39 [310.89]
b = 0.43 [1.66]
Seff = 14.17 [11.79]
Teff = 495 [103] K
Rp = 28.79 [19.33] Re
a = 1.1009 [0.6012] AU
Ag = N/A
Teffp = N/A

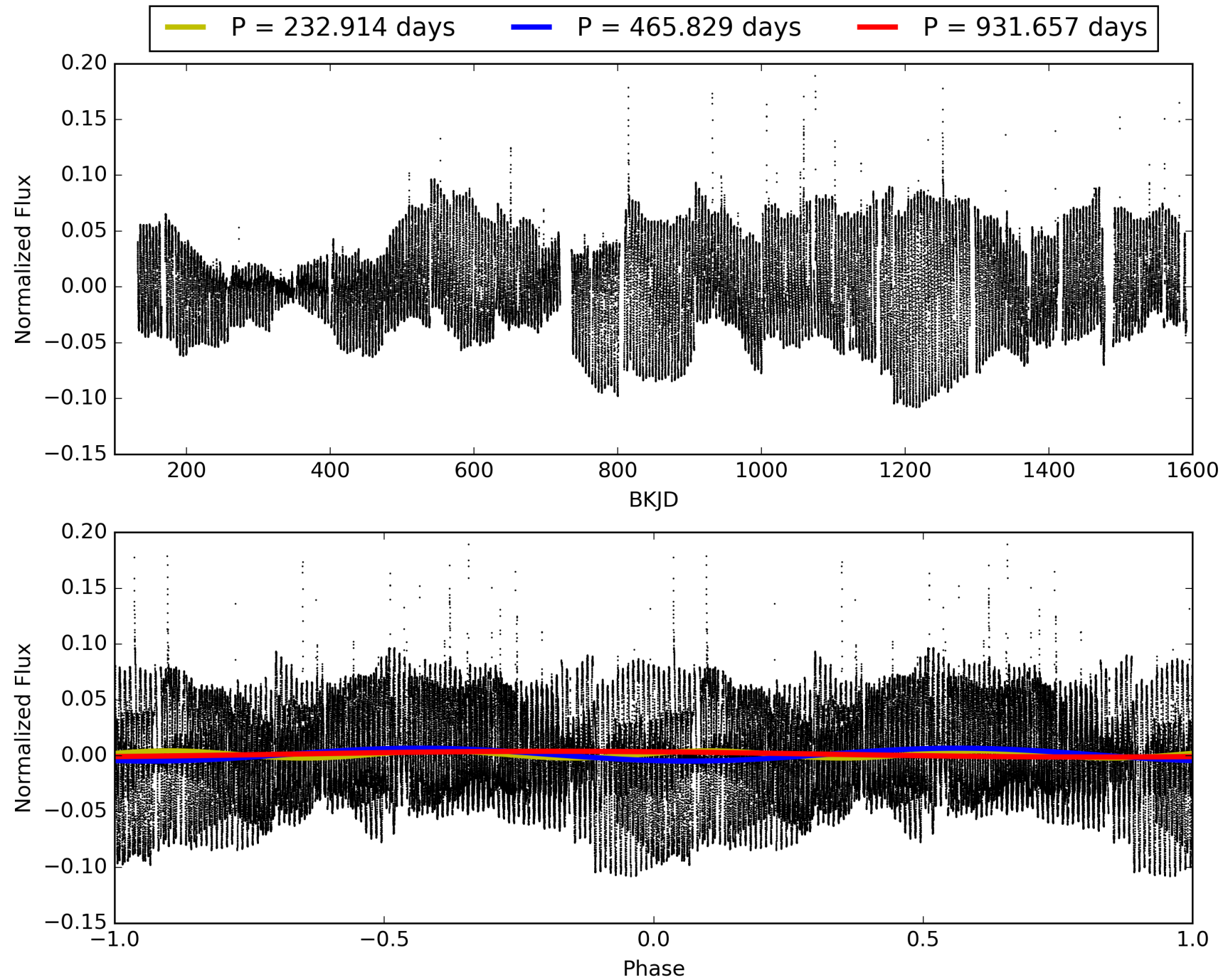
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [300.95 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 43.1%
ModelChiSquareGof-sig: 97.5%
Bootstrap-pfa: 2.40e-07
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.9949
Centroid-sig: 35.4%
Centroid-so: 0.290 arcsec [1.29 σ]
OotOffset-rm: 0.029 arcsec [0.41 σ]
KicOffset-rm: 0.139 arcsec [1.81 σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 004059007-02, PDC Light Curves

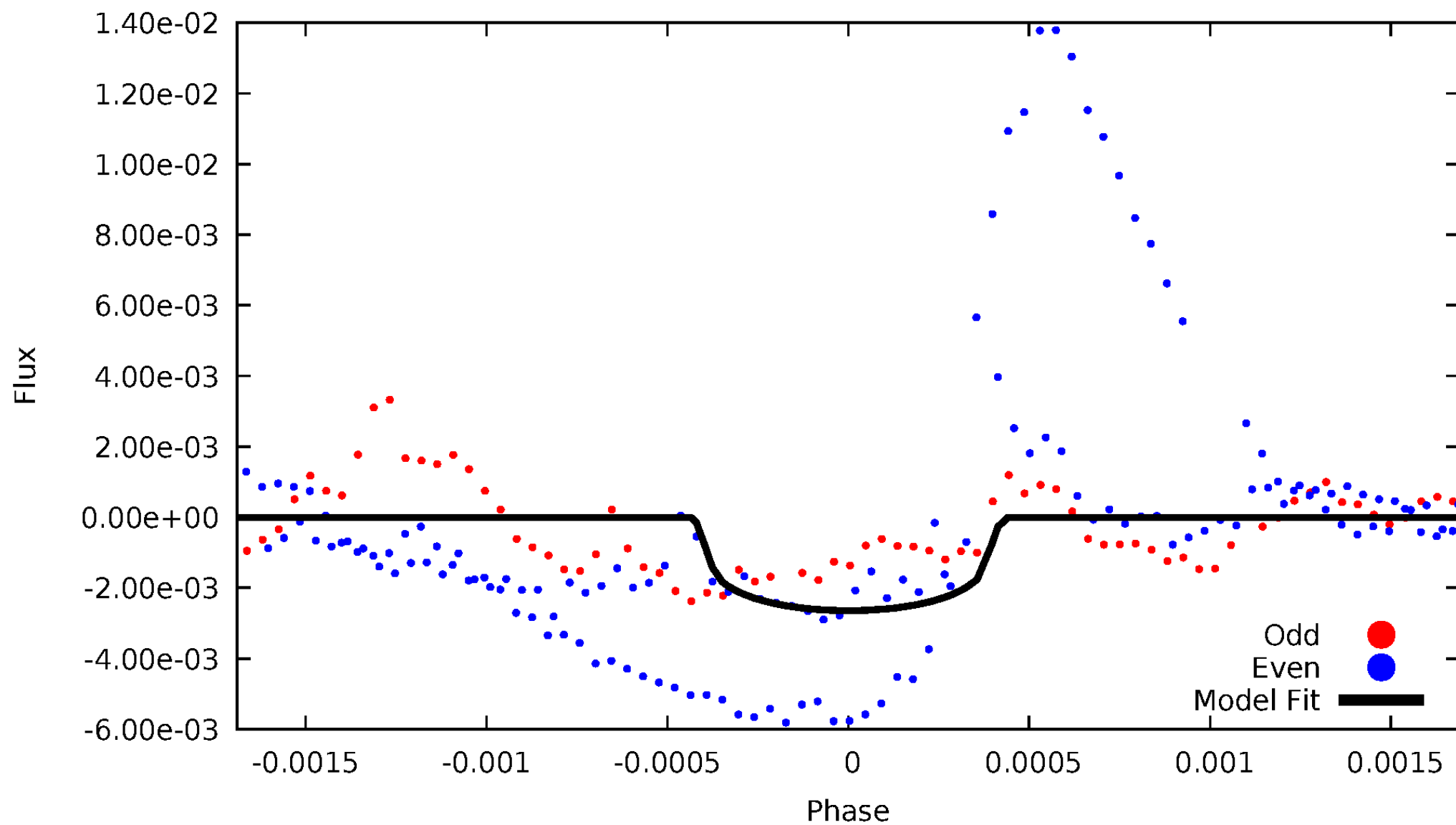


TCE 004059007-02



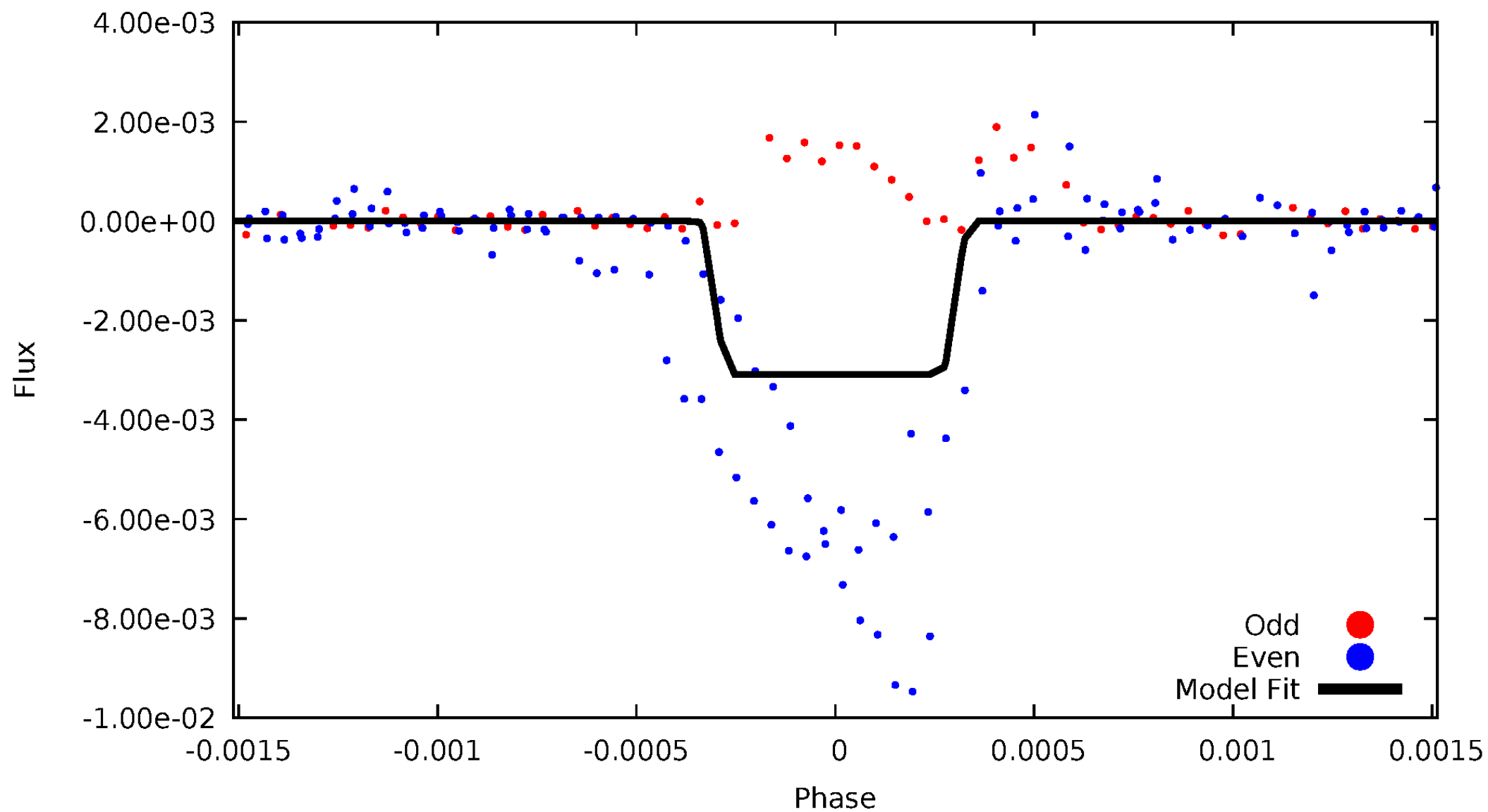
DV Odd/Even

TCE 004059007-02



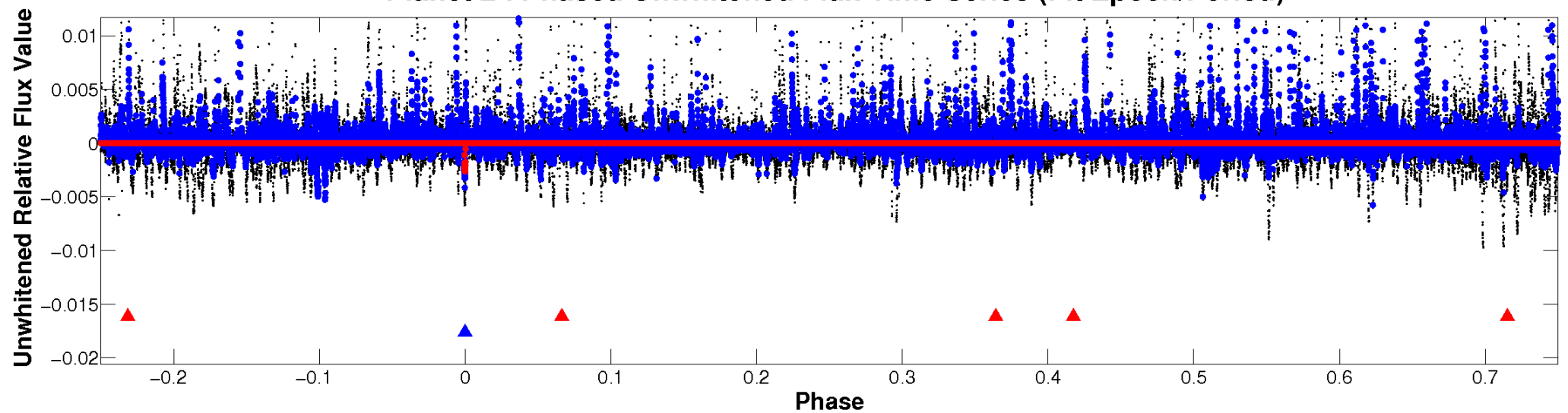
ALT Odd/Even

TCE 004059007-02

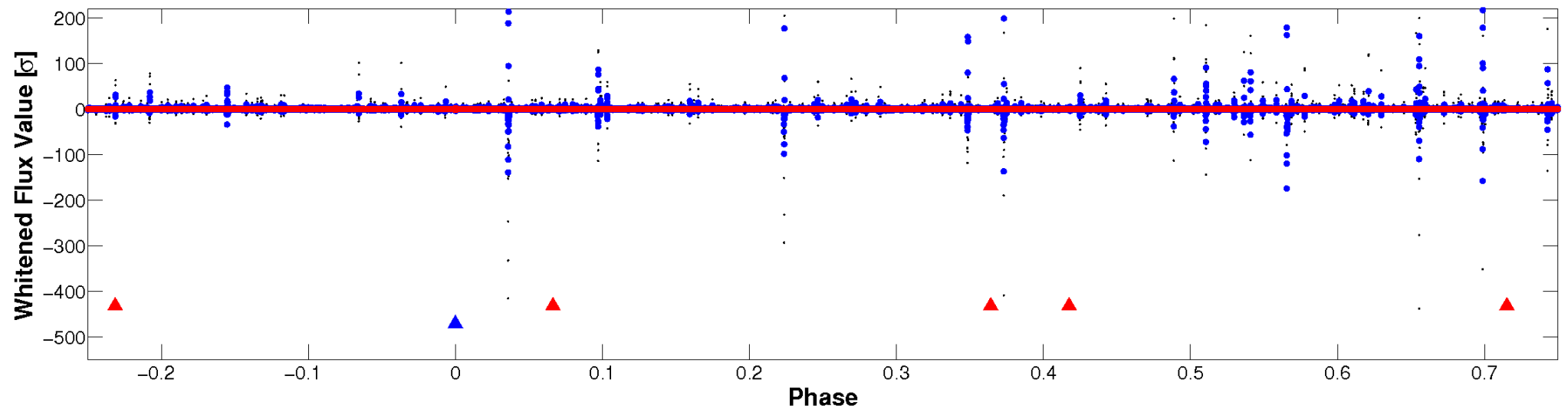


Non-Whitened Vs. Whitened Light Curve

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

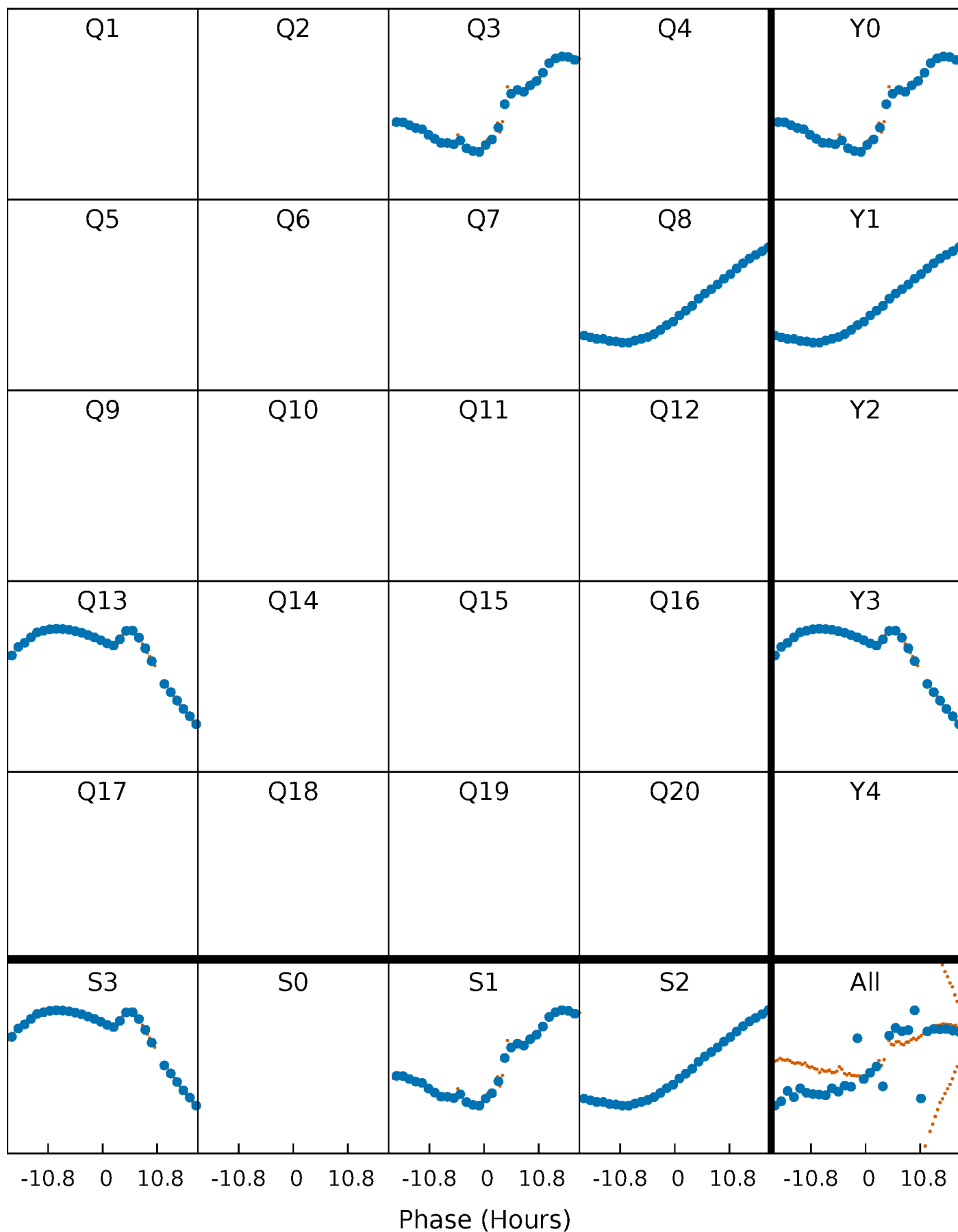


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



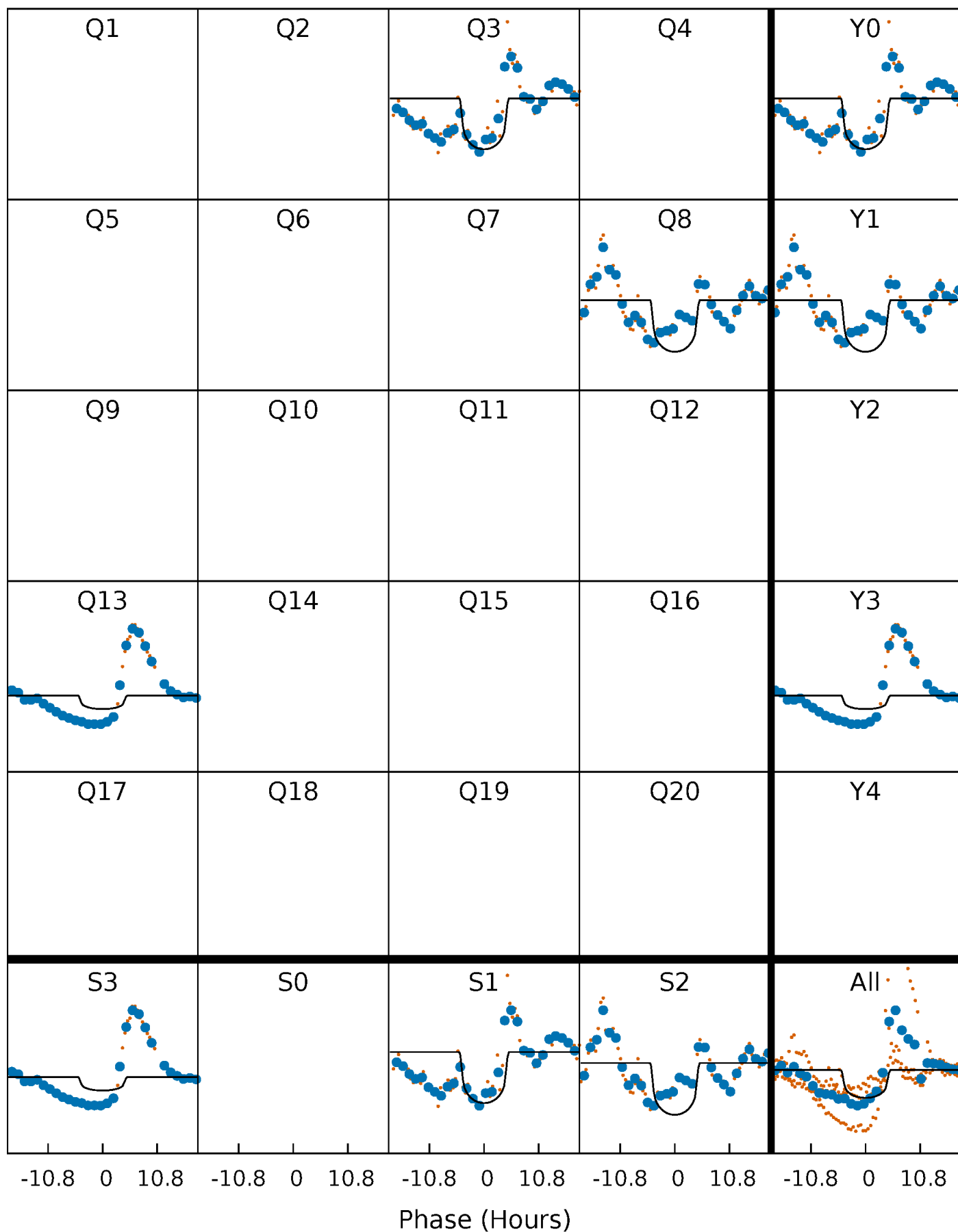
PDC Quarter-Phased Transit Curves

TCE 004059007-02 $P=465.828578$ Days $T_0=303.165563$ (BKJD)



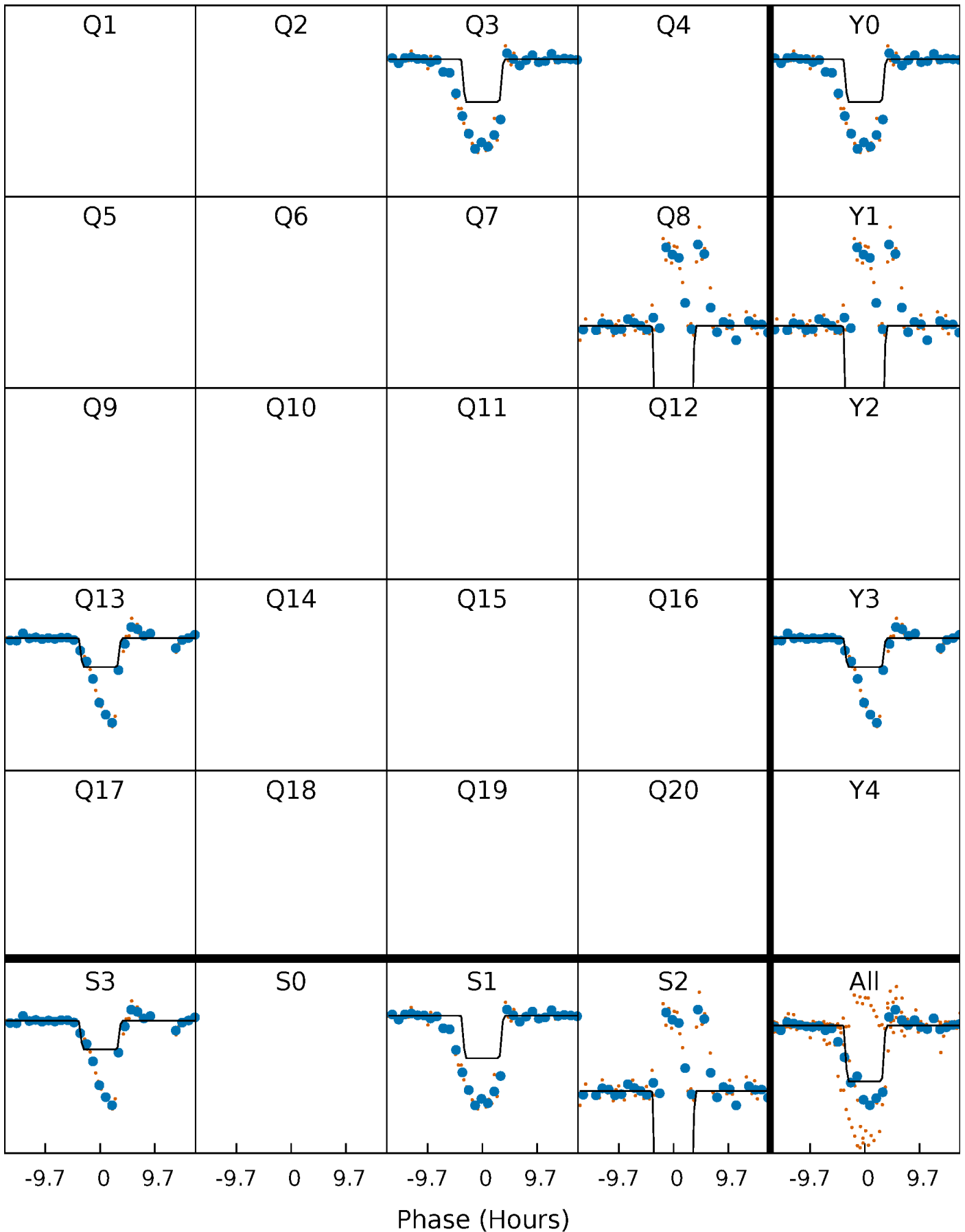
DV Quarter-Phased Transit Curves

TCE 004059007-02 $P=465.828578$ Days $T_0=303.165563$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

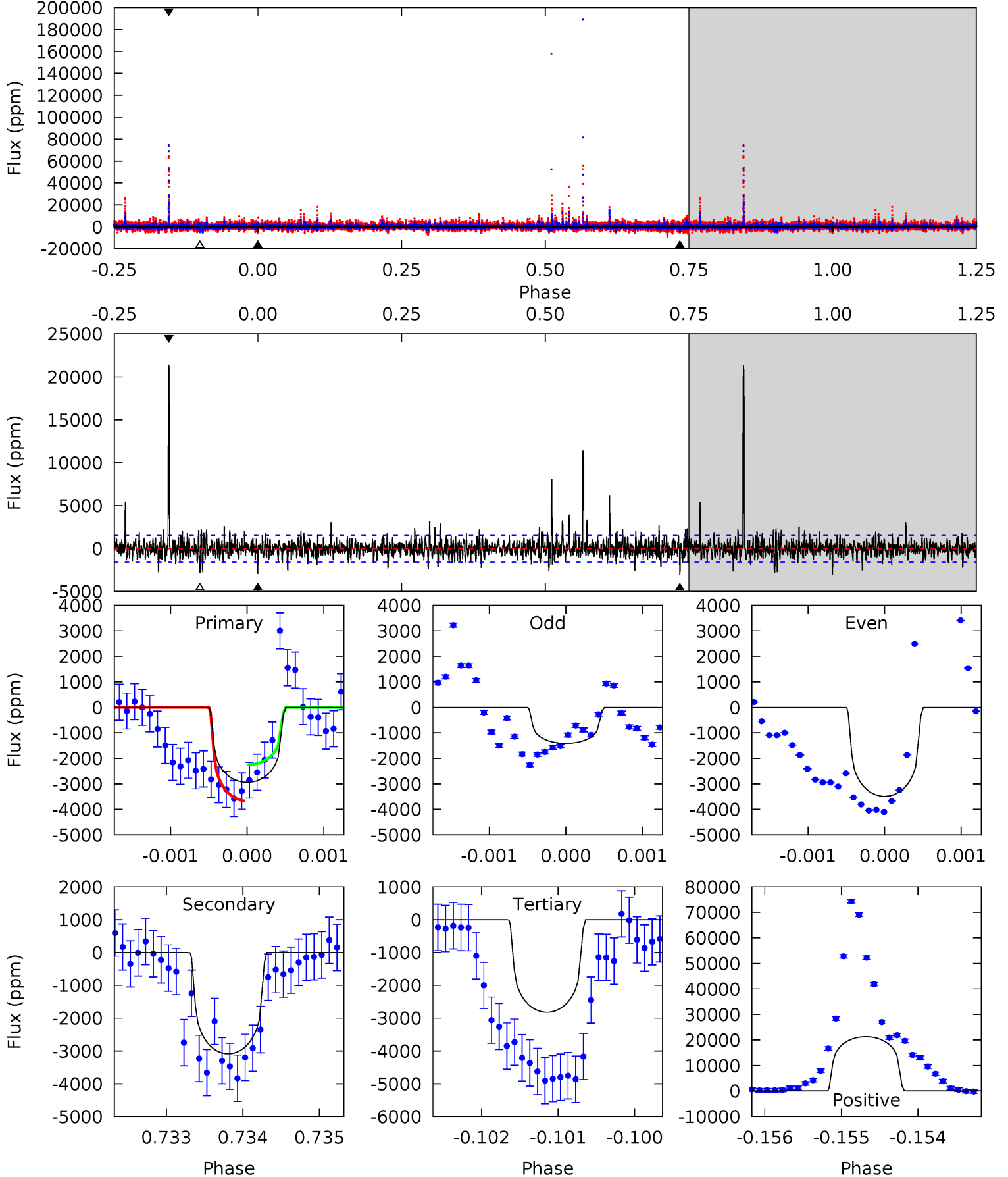
TCE 004059007-02 $P=465.823867$ Days $T_0=303.188172$ (BKJD)



DV Model-Shift Uniqueness Test

004059007-02, P = 465.828578 Days, E = 303.165563 Days

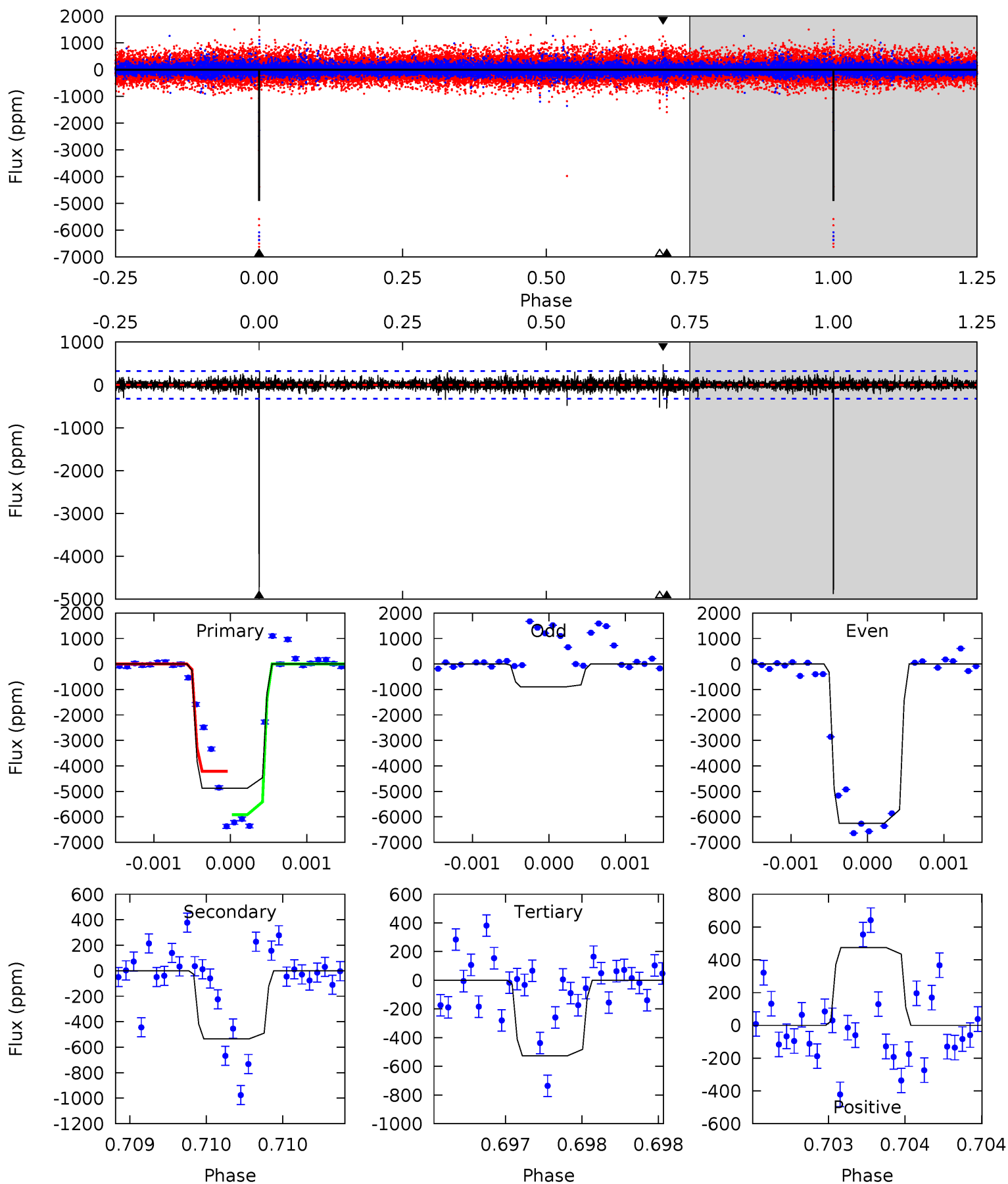
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	10.8	9.87	74.5	5.47	3.33	3.43	0.42	-64.3	0.94	-63.7	1.27	1.28	0.87	2.50



Alt Model-Shift Uniqueness Test

004059007-02, P = 465.823867 Days, E = 303.188172 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
83.4	9.16	9.01	8.13	5.52	3.40	1.00	74.4	75.3	0.15	1.03	49.2	0.63	0.09	14.4



Stellar Parameters For KIC 004059007

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4980^{+162}_{-112}	$2.858^{+0.462}_{-0.308}$	$-0.680^{+0.300}_{-0.250}$	$5.583^{+3.478}_{-2.141}$	$0.820^{+0.321}_{-0.038}$	$0.007^{+0.025}_{-0.005}$
	+3%/-2%	+16%/-11%	+44%/-37%	+62%/-38%	+39%/-5%	+369%/-75%
Source	PHO1	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 004059007-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3087 ± 286	$29.17^{+11.83}_{-9.83}$	686^{+97}_{-84}	5383^{+838}_{-539}	2671^{+3280}_{-1367}
Alt.	-535 ± 58	$33.53^{+13.98}_{-9.74}$	685^{+92}_{-85}	3611^{+327}_{-240}	343^{+324}_{-174}

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 $A_{obs} \gg 1.0$

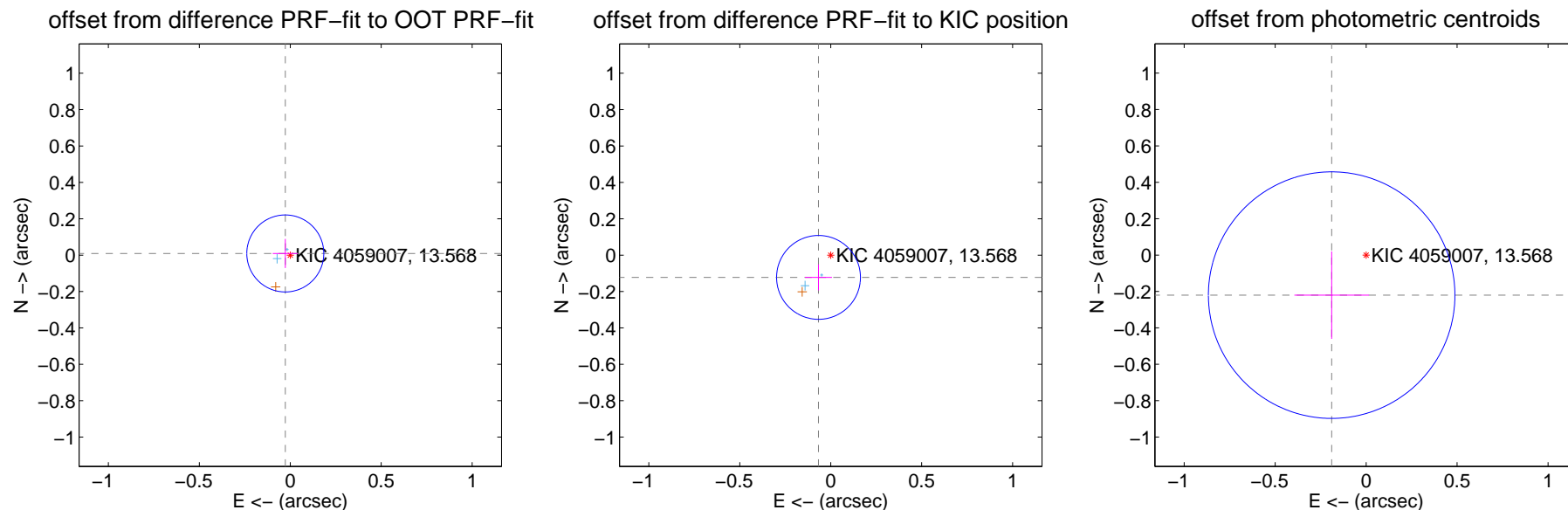
DV Centroid Data

Supplemental centroid analysis for 004059007-02. Kepler magnitude: 13.57. Transit SNR 7.78

There are 2 quarters with good PRF difference image offsets

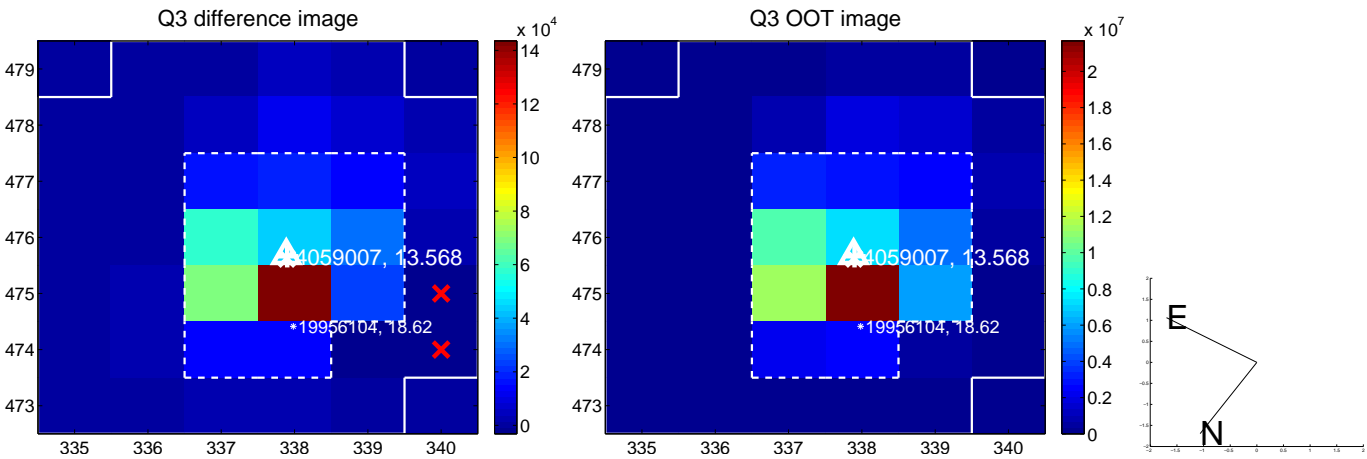
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.029 ± 0.071	0.41	0.027 ± 0.069	0.009 ± 0.080
PRF-fit source offset from KIC position	0.139 ± 0.077	1.81	0.067 ± 0.074	-0.122 ± 0.071
photometric centroid source offset	0.29 ± 0.23	1.29	0.19 ± 0.20	-0.22 ± 0.24

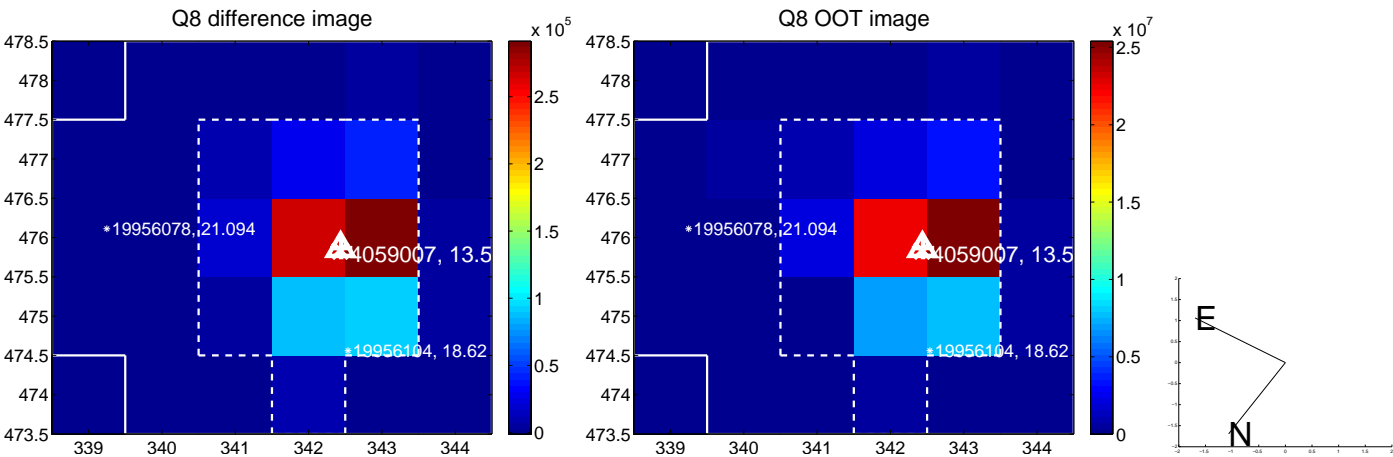


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



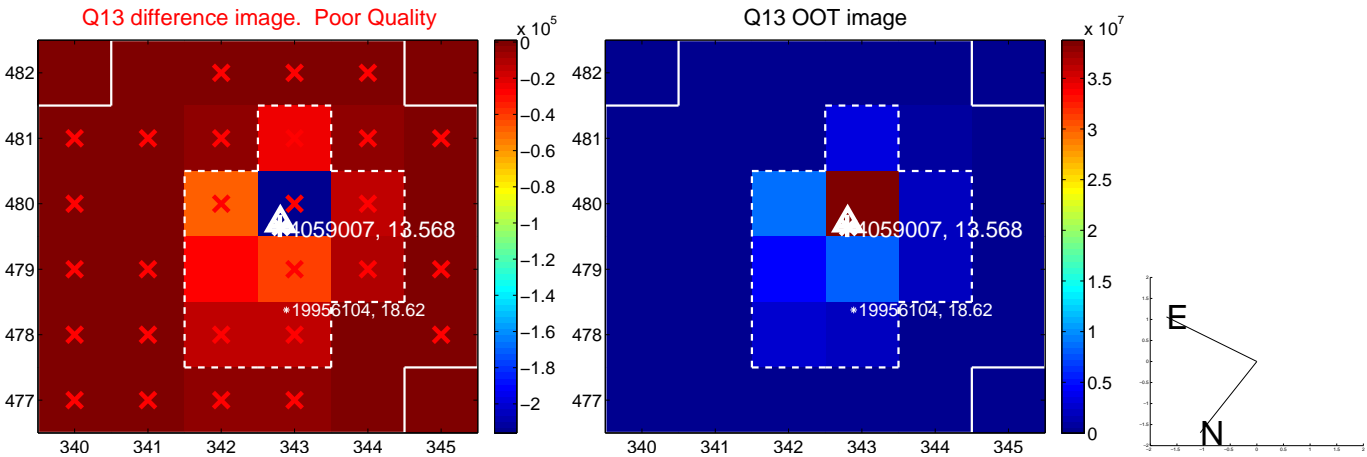
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



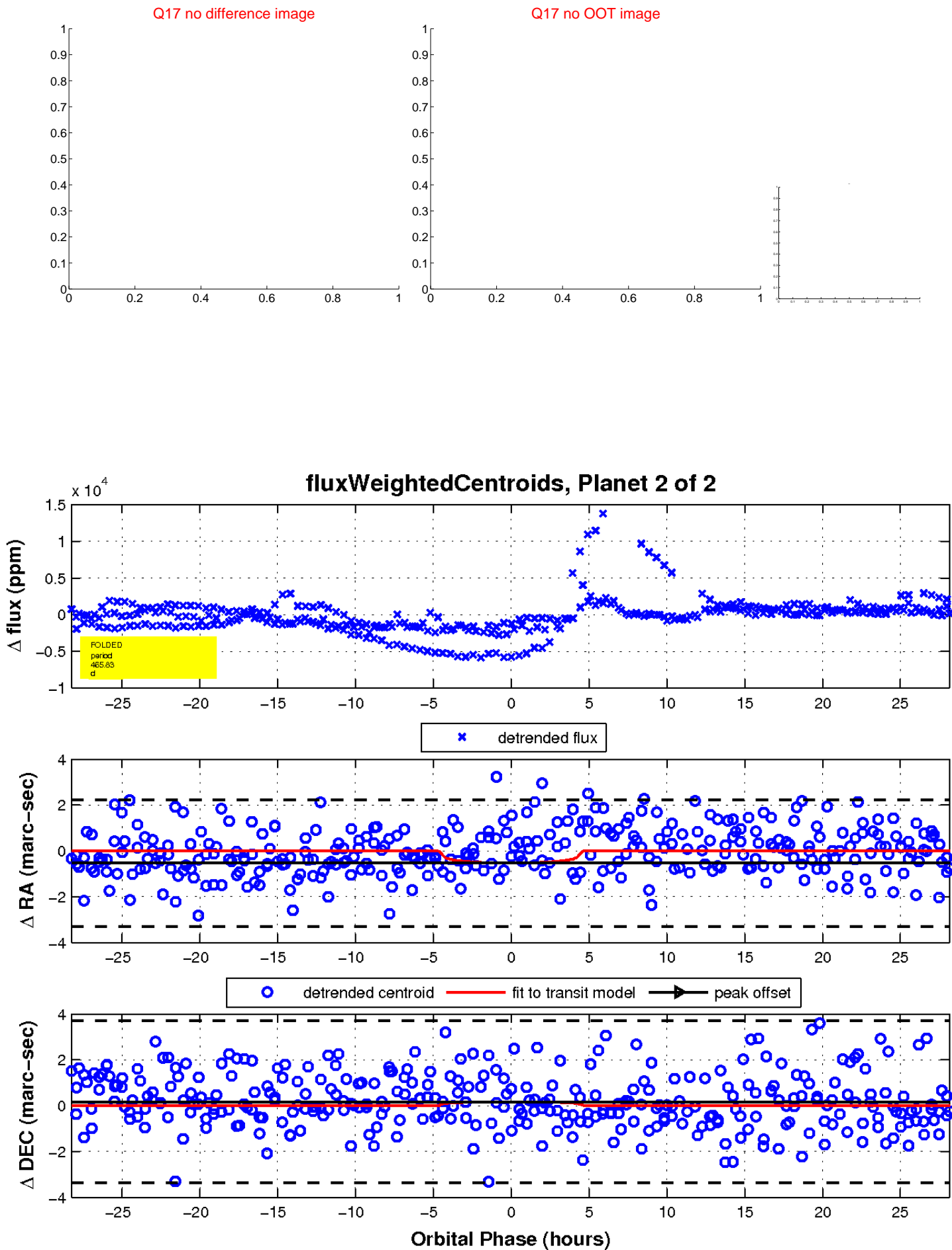
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

