

KIC 008578766

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})
008578766-01	OBS	No	366.889888	174.882304	1302.8	20.265	9.4	9.6	0.94	5463	4.45	0.73
008578766-02	OBS	No	378.876376	171.493924	893.4	13.837	8.3	8.3	0.94	5463	2.94	0.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008578766-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008578766-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—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.

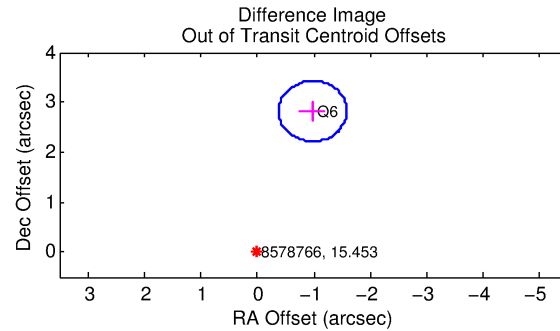
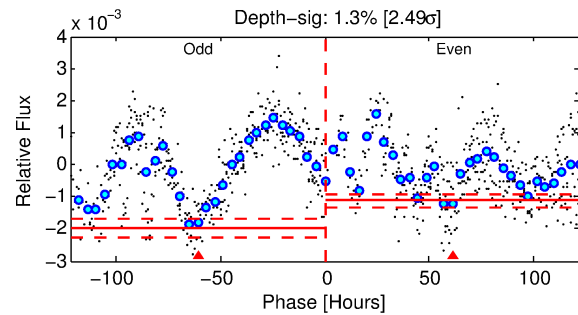
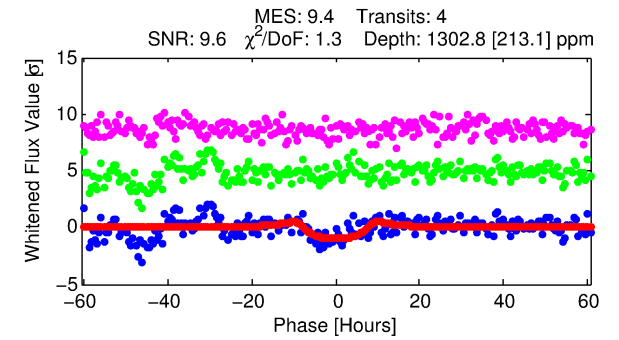
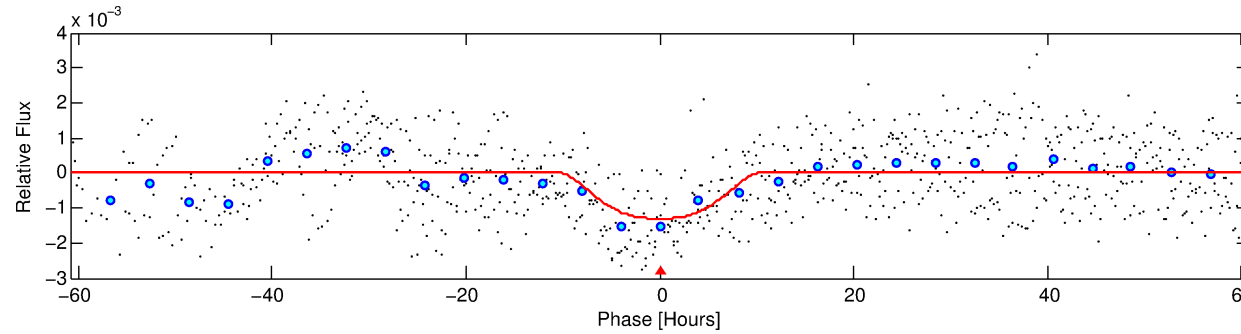
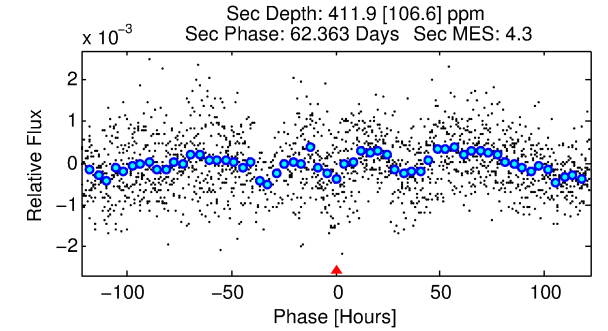
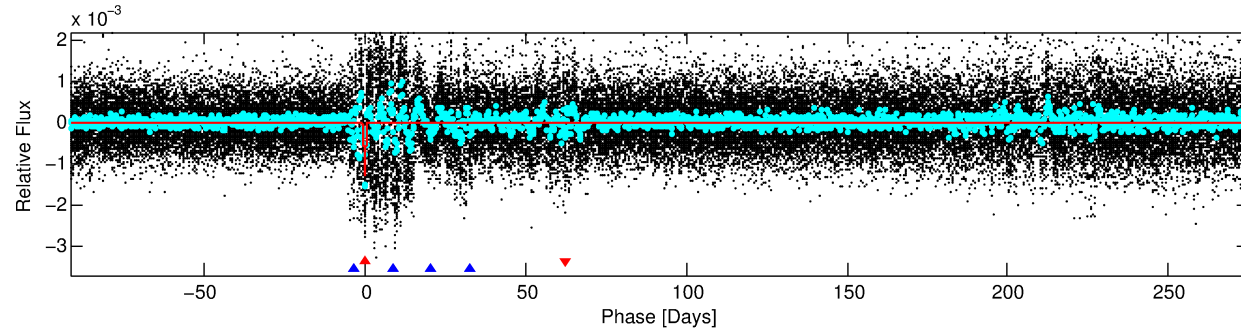
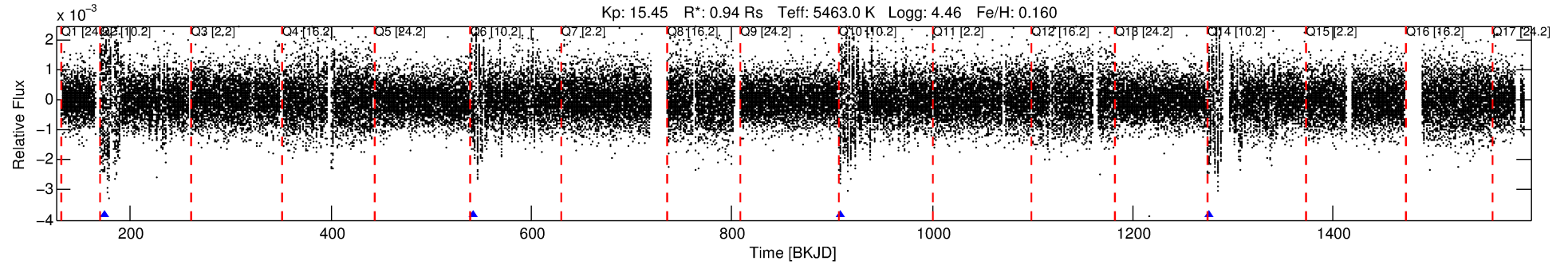
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008578766-01

No Significant Match Found

DV One-Page Summary

KIC: 8578766 Candidate: 1 of 2 Period: 366.890 d



DV Fit Results:

Period = 366.88989 [0.02059] d
Epoch = 174.8823 [0.0375] BKJD
Rp/R* = 0.0435 [0.0050]
a/R* = 58.26 [8.51]
b = 0.95 [0.02]
Seff = 0.73 [0.23]
Teq = 236 [19] K
Rp = 4.45 [1.17] Re
a = 0.9784 [0.1976] AU
Ag = 10946.88 [4980.96] [2.20σ]
Teff = 3732 [341] K [10.23σ]

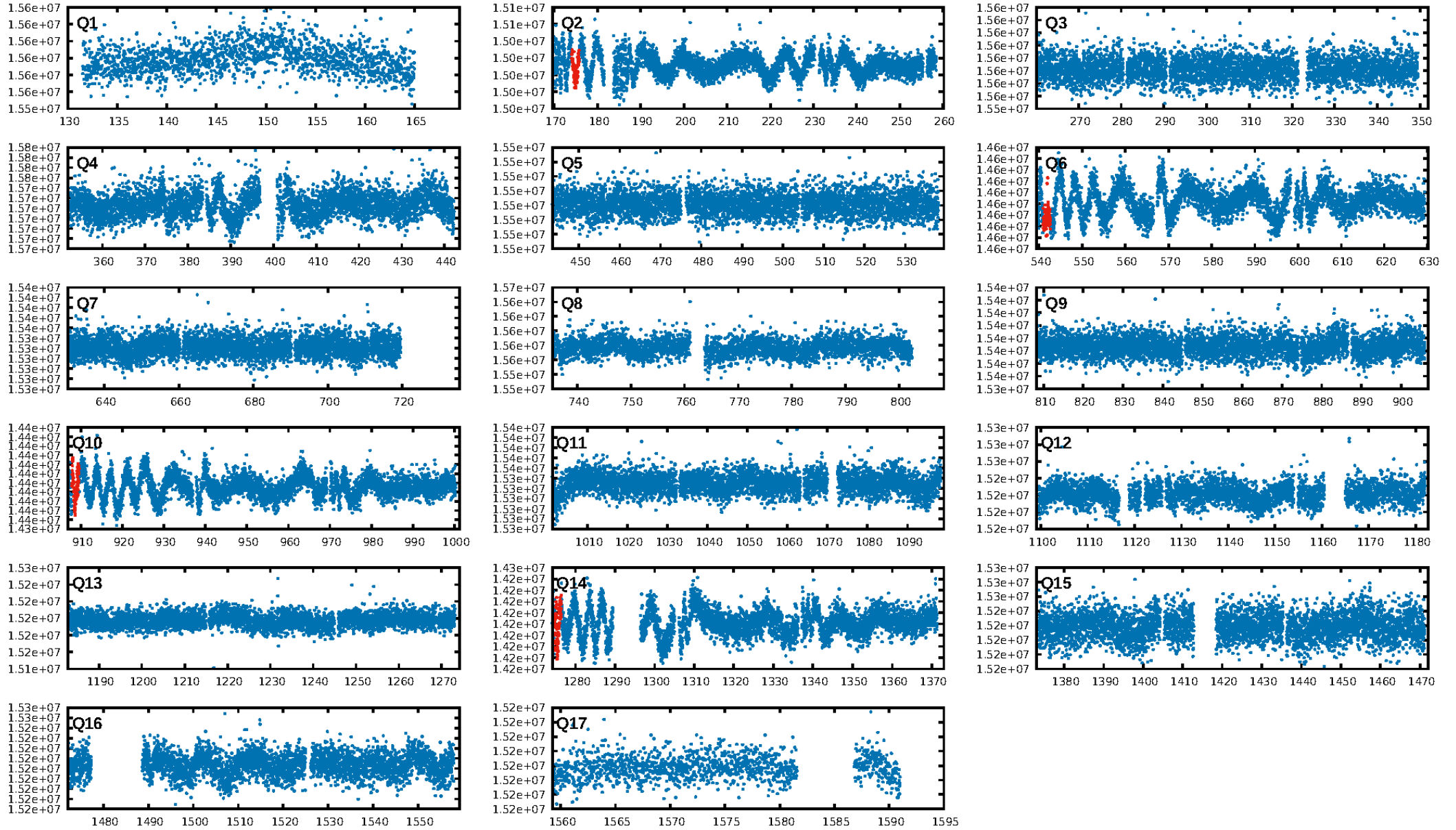
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [11.72σ]
ModelChiSquare2-sig: 3.8%
ModelChiSquareGoF-sig: 97.9%
Bootstrap-pfa: 1.48e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.9962
Centroid-sig: 65.0%
Centroid-so: 0.615 arcsec [0.55σ]
OotOffset-rm: 2.987 arcsec [14.83σ]
KicOffset-rm: 2.883 arcsec [14.28σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

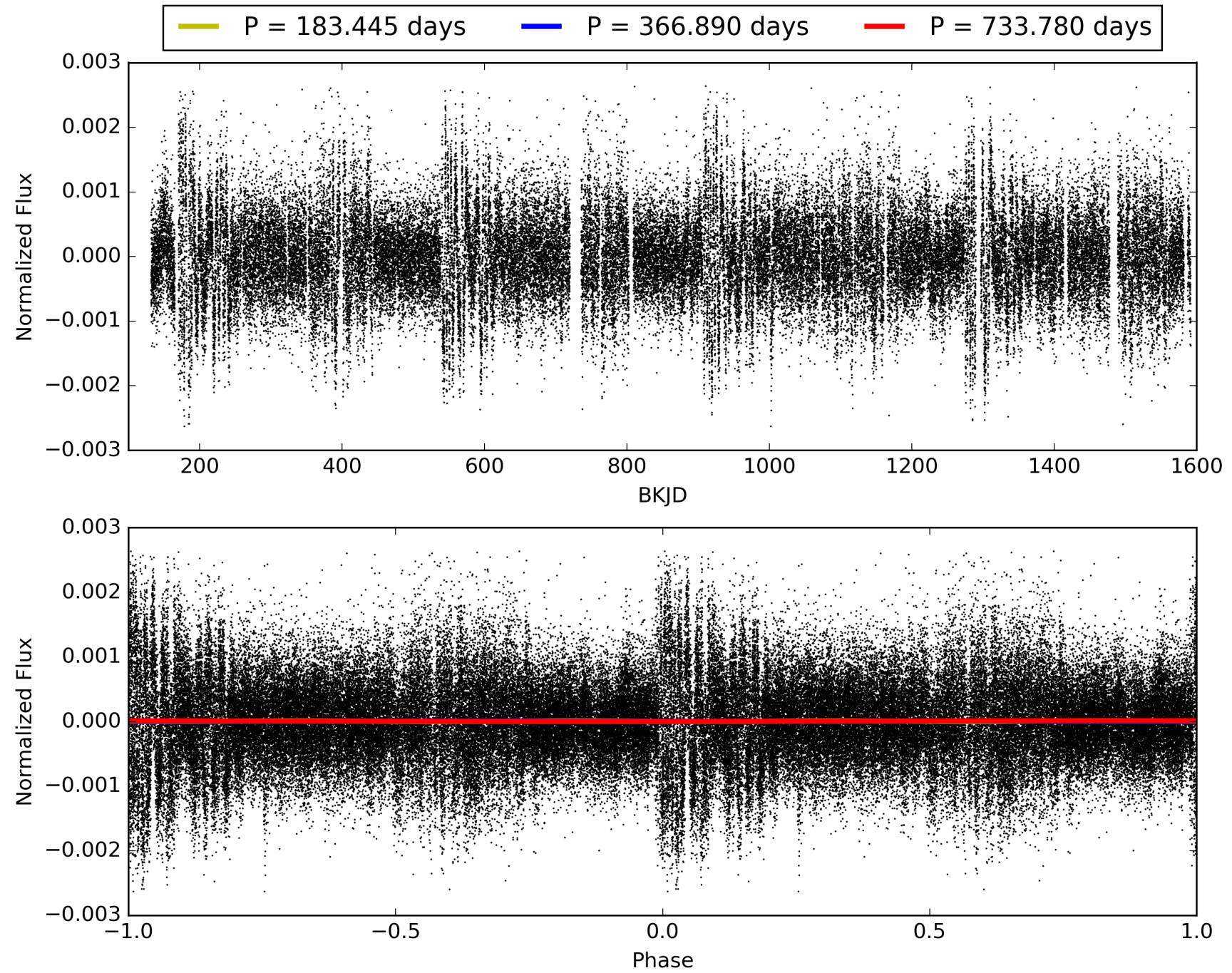
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:59:29 Z

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

TCE 008578766-01, PDC Light Curves

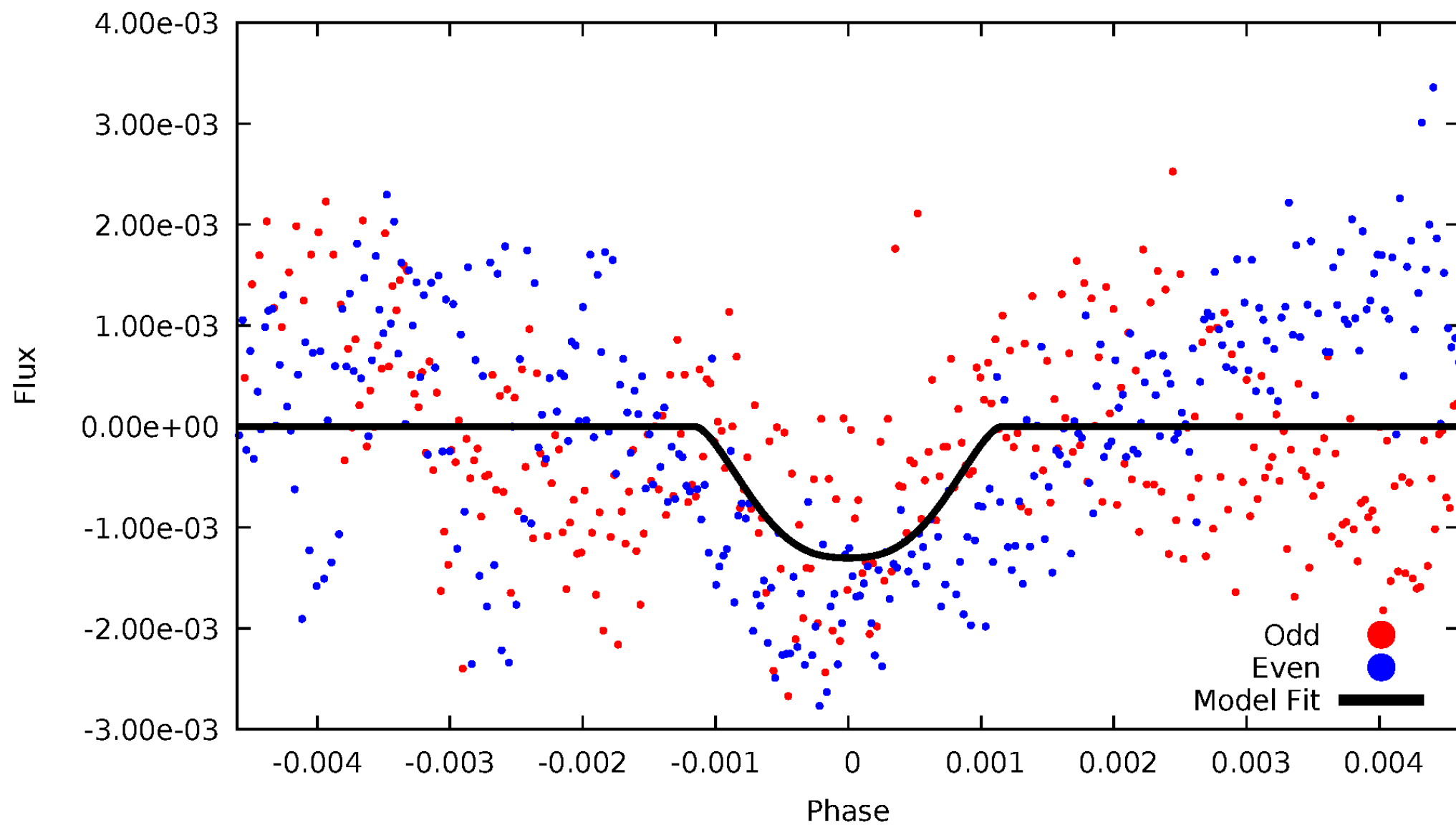


TCE 008578766-01



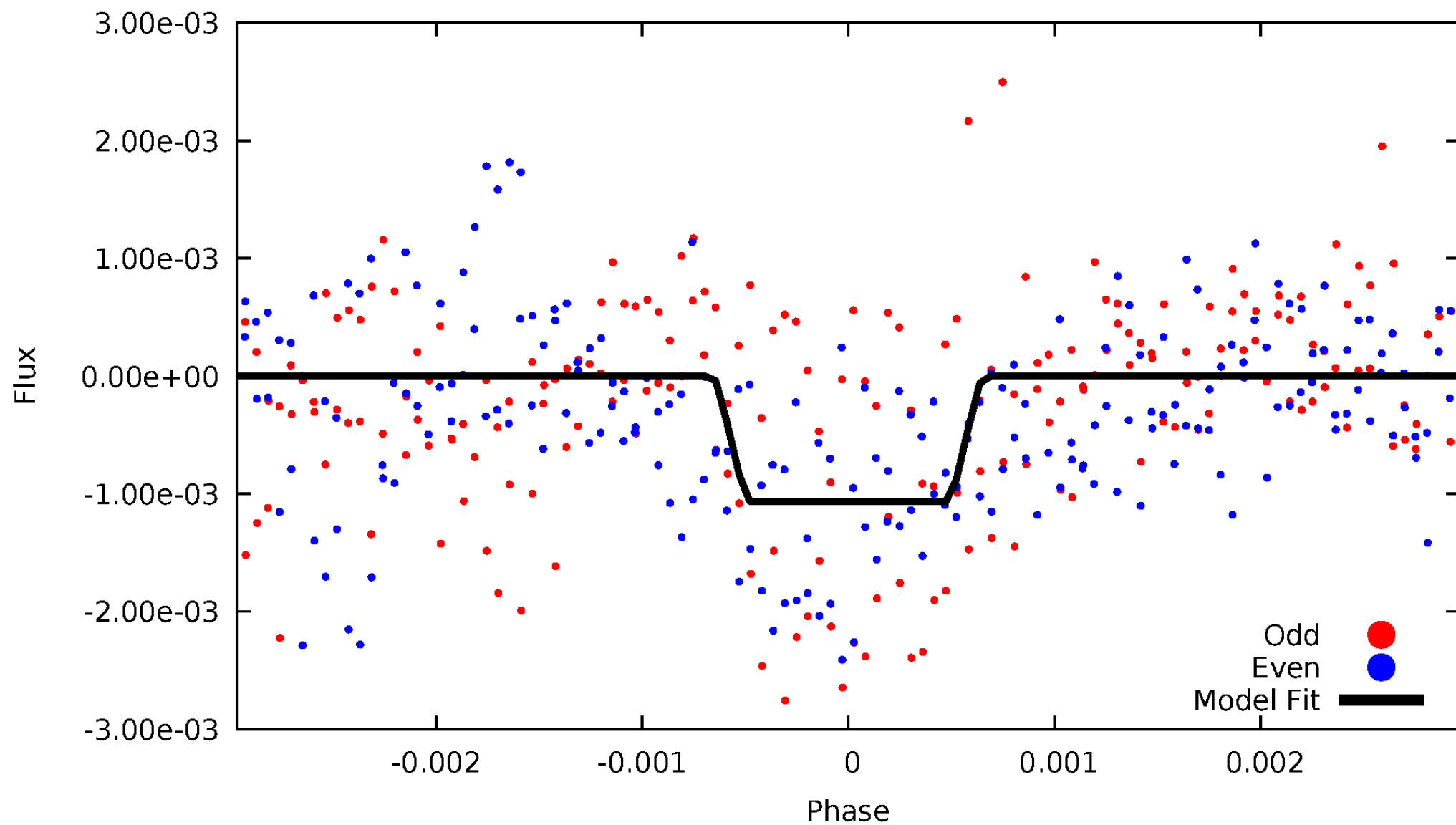
DV Odd/Even

TCE 008578766-01



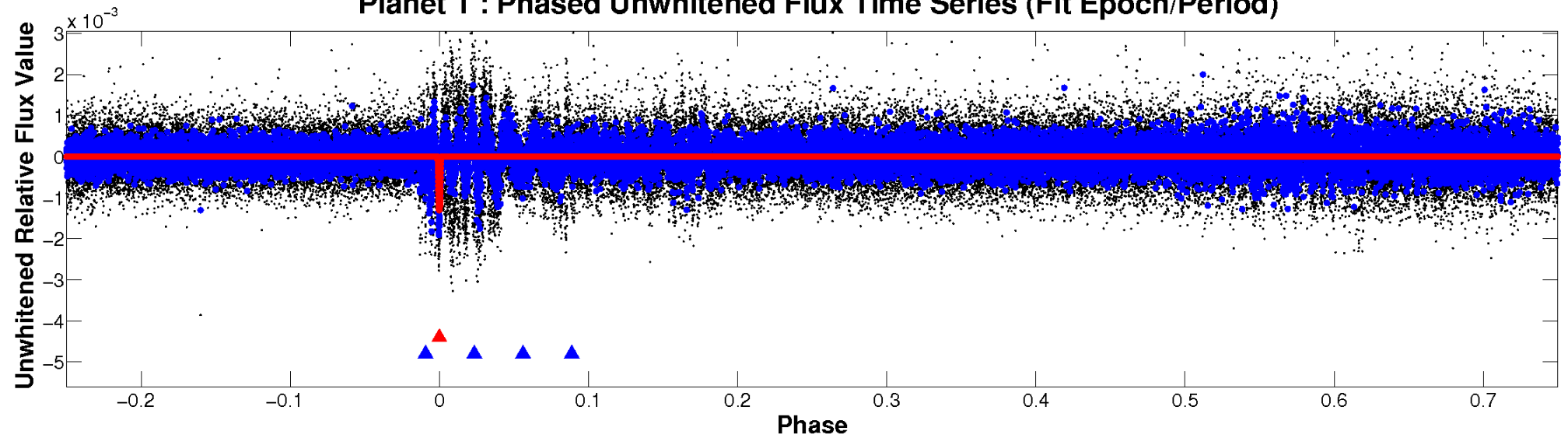
ALT Odd/Even

TCE 008578766-01

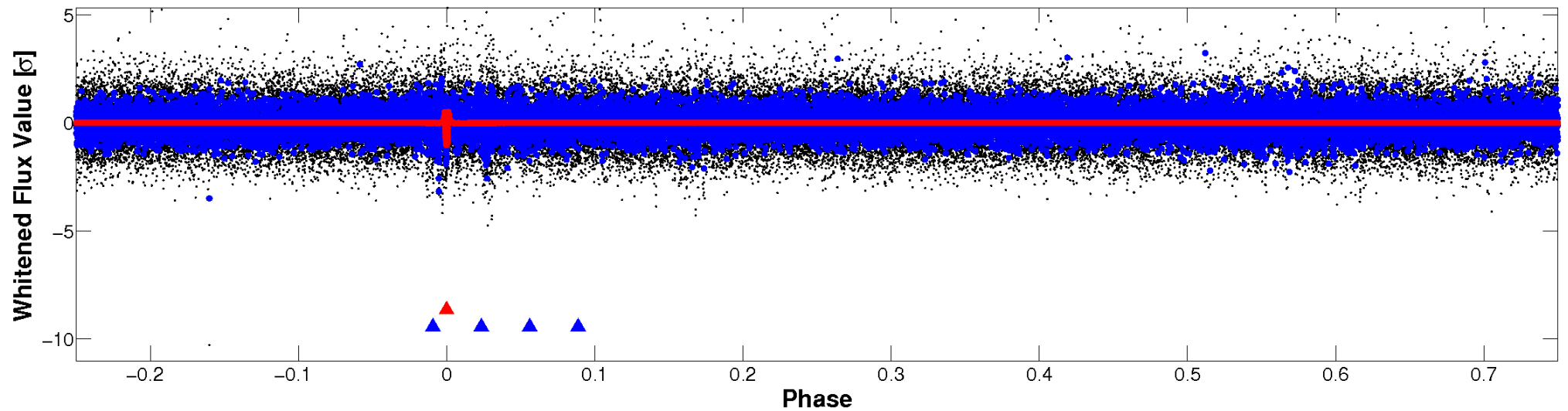


Non-Whitened Vs. Whitened Light Curve

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

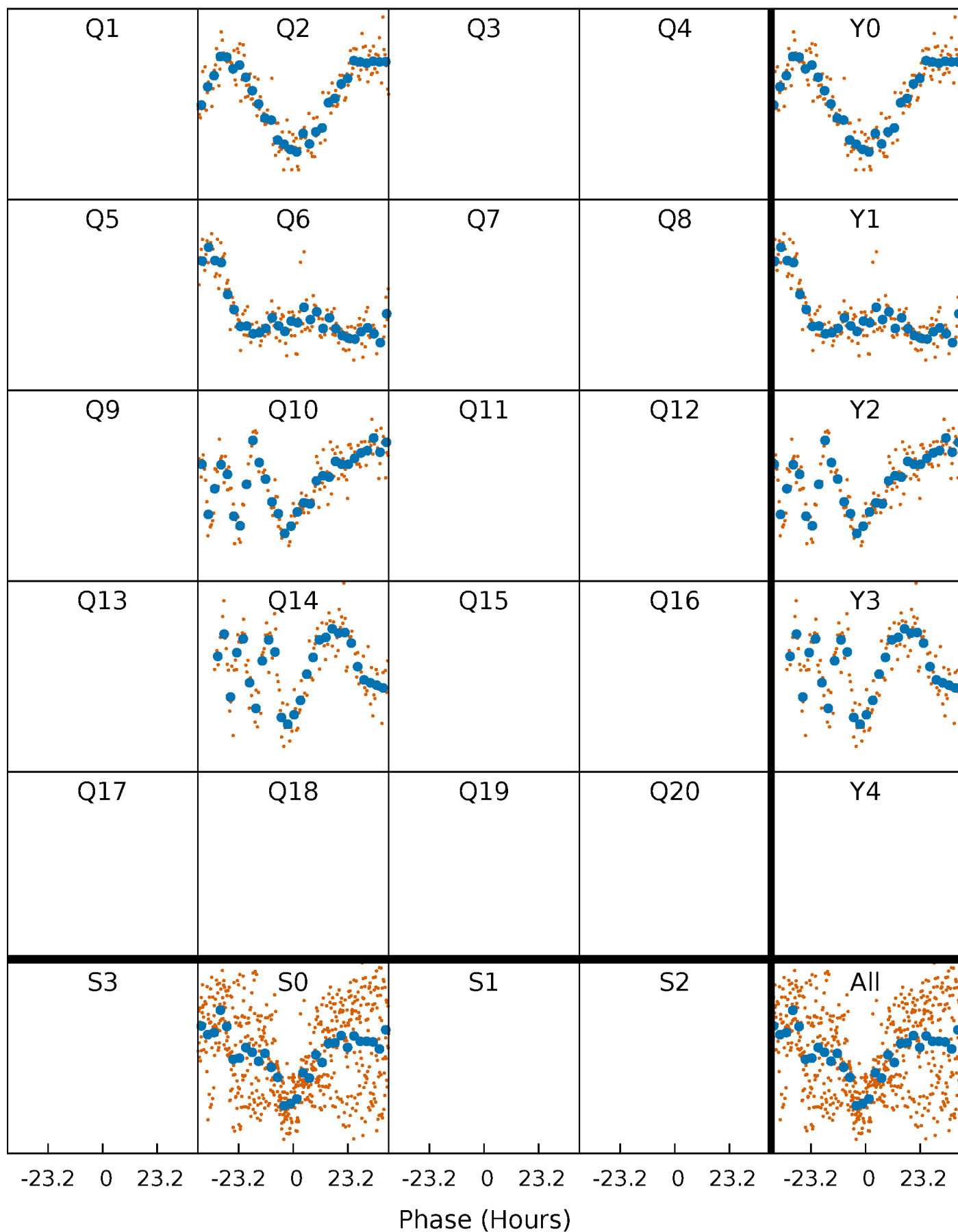


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



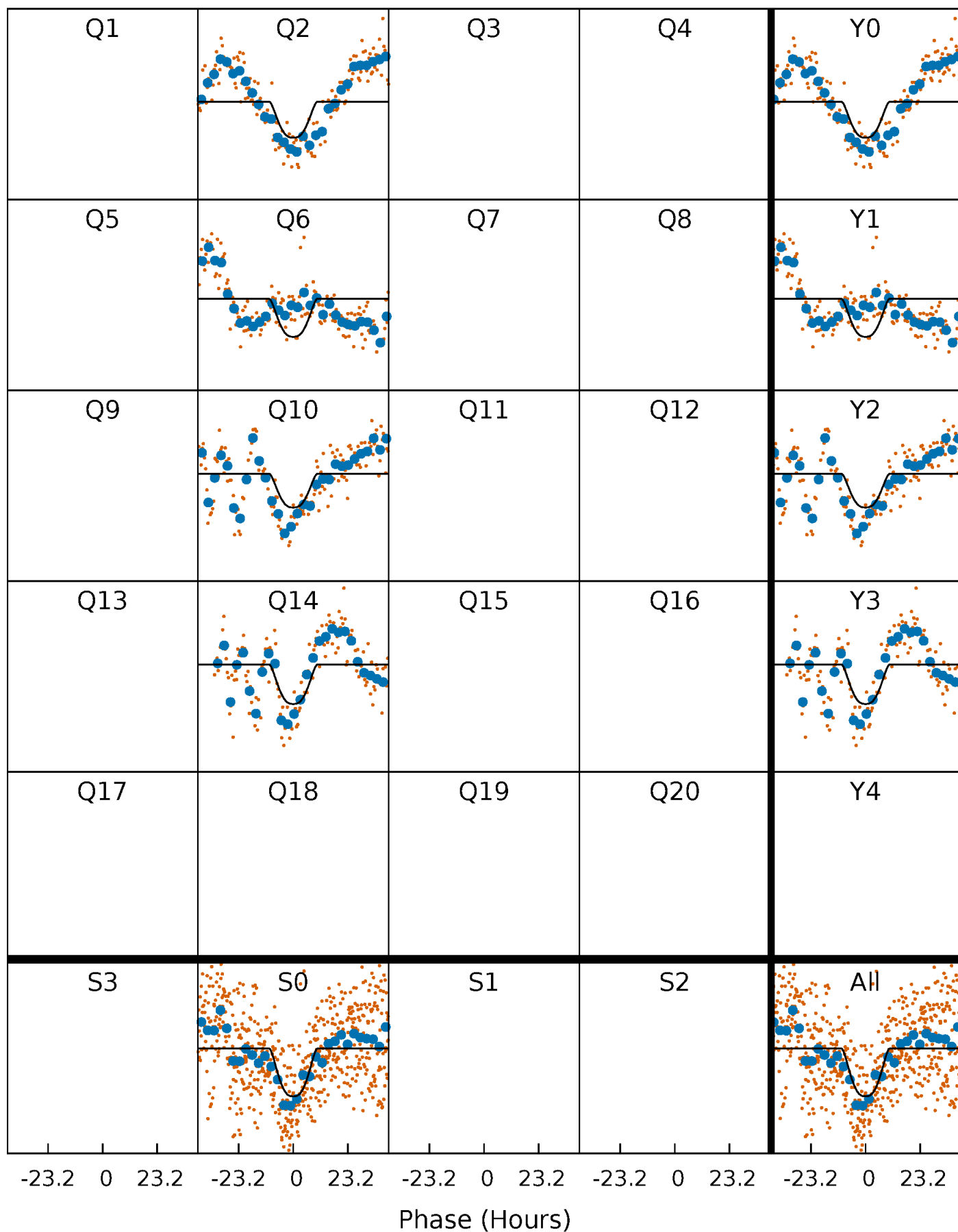
PDC Quarter-Phased Transit Curves

TCE 008578766-01 P=366.889888 Days $T_0=174.882304$ (BKJD)



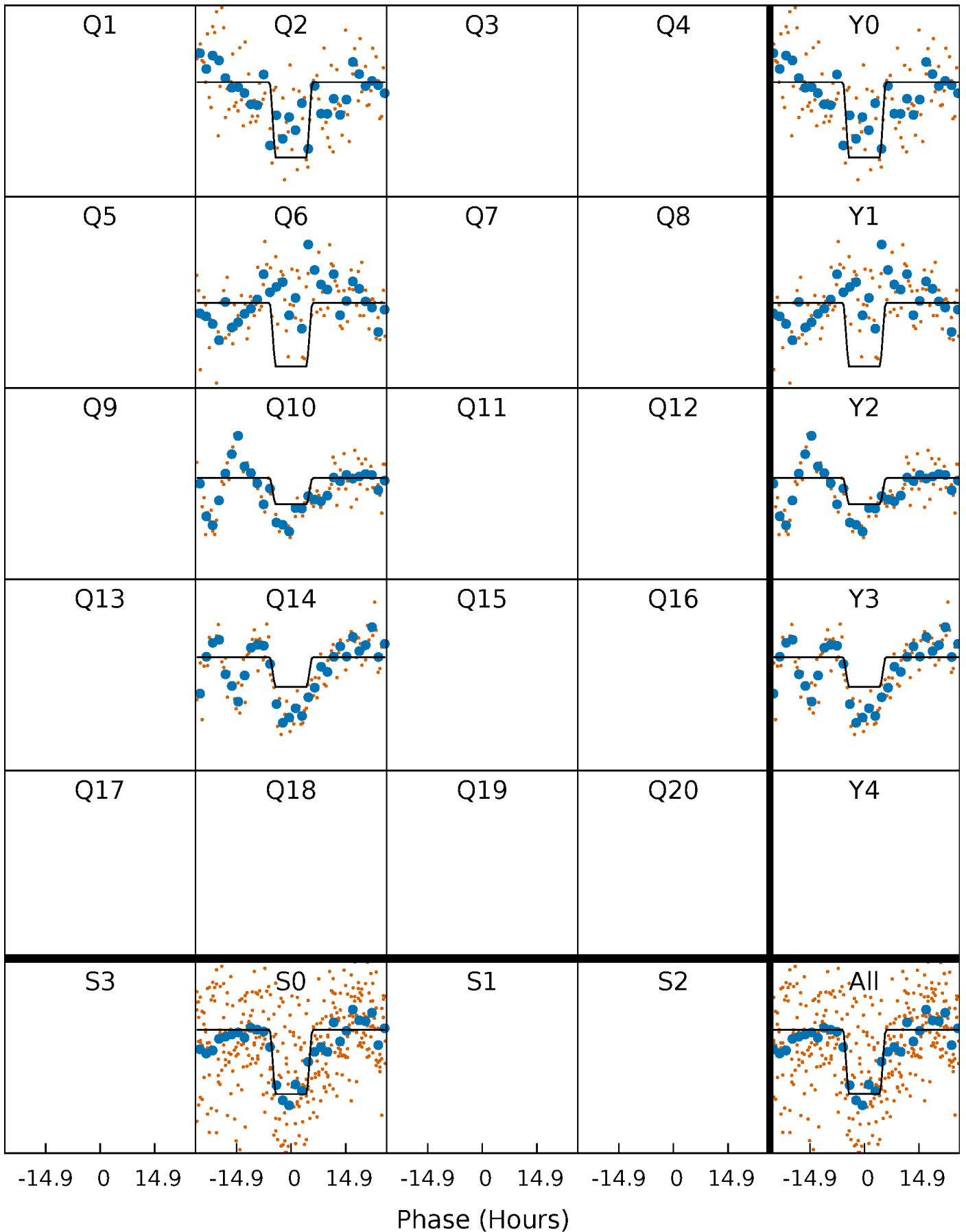
DV Quarter-Phased Transit Curves

TCE 008578766-01 P=366.889888 Days $T_0=174.882304$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

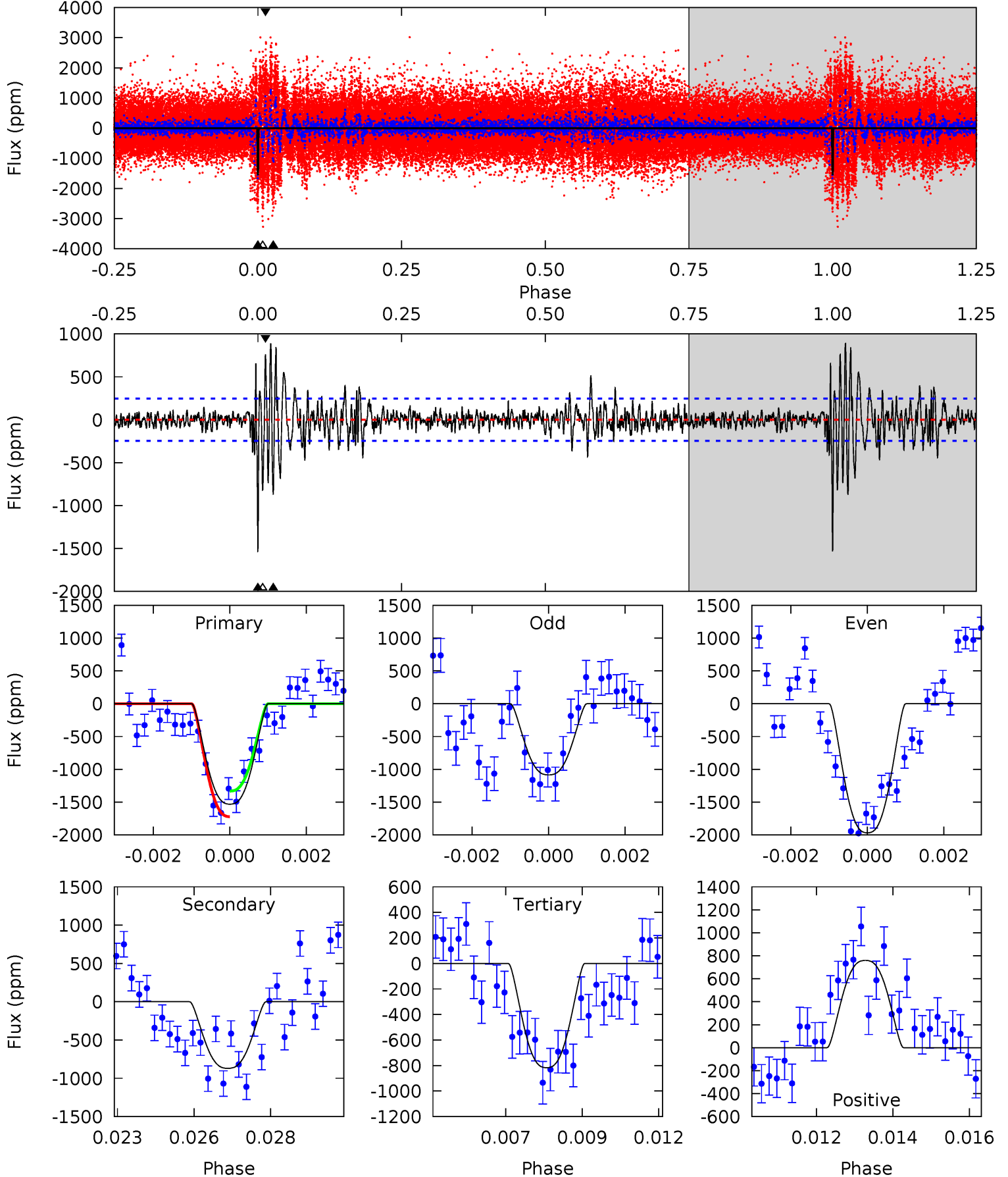
TCE 008578766-01 P=366.905003 Days $T_0=174.783428$ (BKJD)



DV Model-Shift Uniqueness Test

008578766-01, P = 366.889888 Days, E = 174.882304 Days

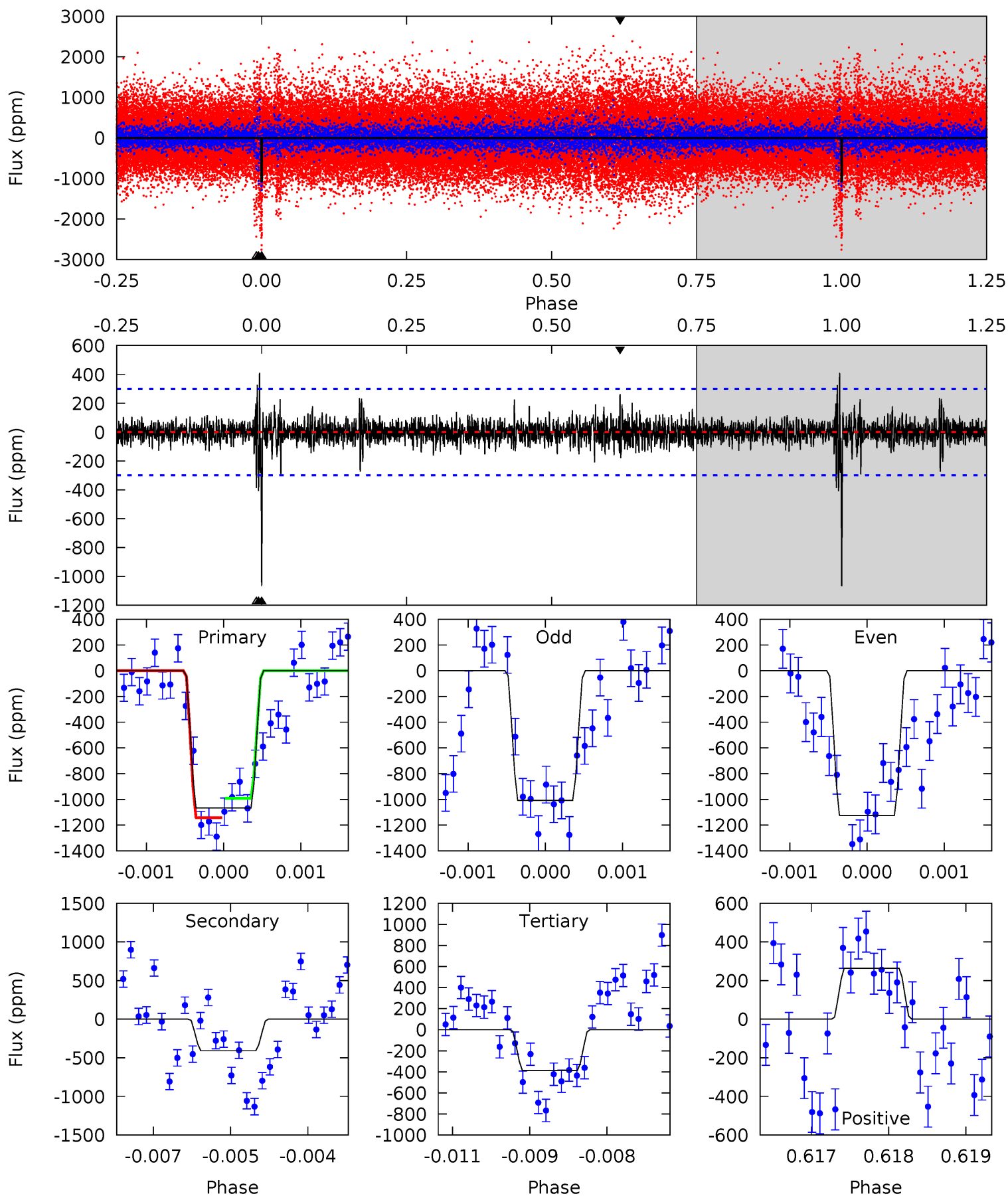
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.0	18.7	17.6	16.4	5.30	3.05	3.03	15.4	16.6	1.13	2.37	9.50	0.85	0.37	4.19



Alt Model-Shift Uniqueness Test

008578766-01, P = 366.905003 Days, E = 174.783428 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.2	7.36	6.98	4.75	5.40	3.21	1.02	12.3	14.5	0.38	2.61	1.05	0.94	0.28	1.35



Stellar Parameters For KIC 008578766

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5463^{+164}_{-164}	$4.461^{+0.075}_{-0.163}$	$0.160^{+0.200}_{-0.300}$	$0.938^{+0.223}_{-0.103}$	$0.926^{+0.090}_{-0.082}$	$1.582^{+0.592}_{-0.708}$
	+3%/-3%	+2%/-4%	+125%/-188%	+24%/-11%	+10%/-9%	+37%/-45%
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 008578766-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-870 ± 46	$4.55^{+0.71}_{-0.62}$	333^{+21}_{-15}	4655^{+243}_{-247}	22076^{+7426}_{-5524}
Alt.	-408 ± 55	$3.43^{+0.61}_{-0.66}$	335^{+19}_{-17}	4488^{+355}_{-305}	18516^{+9172}_{-6023}

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

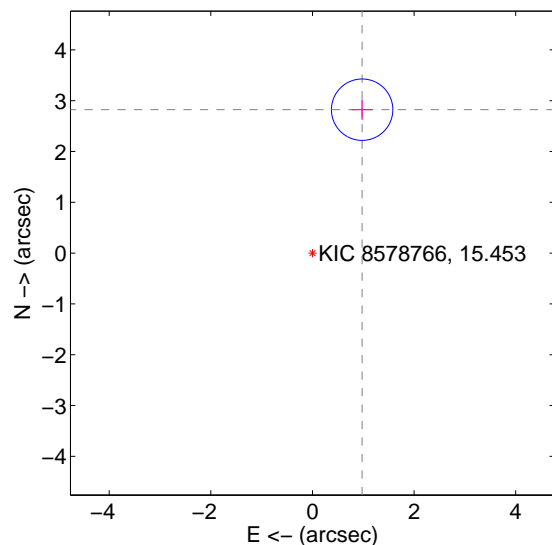
Supplemental centroid analysis for 008578766-01. Kepler magnitude: 15.45. Transit SNR 9.59

There are 0 quarters with good PRF difference image offsets

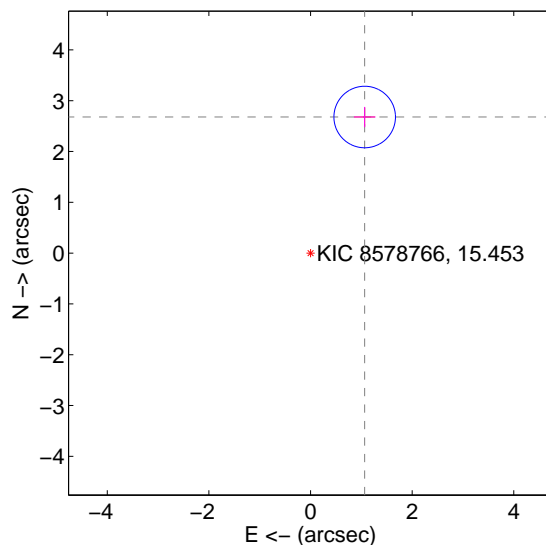
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.987 ± 0.201	14.83	-0.978 ± 0.214	2.822 ± 0.200
PRF-fit source offset from KIC position	2.883 ± 0.202	14.28	-1.066 ± 0.214	2.678 ± 0.200
photometric centroid source offset	0.62 ± 1.12	0.55	0.61 ± 1.12	0.06 ± 1.20

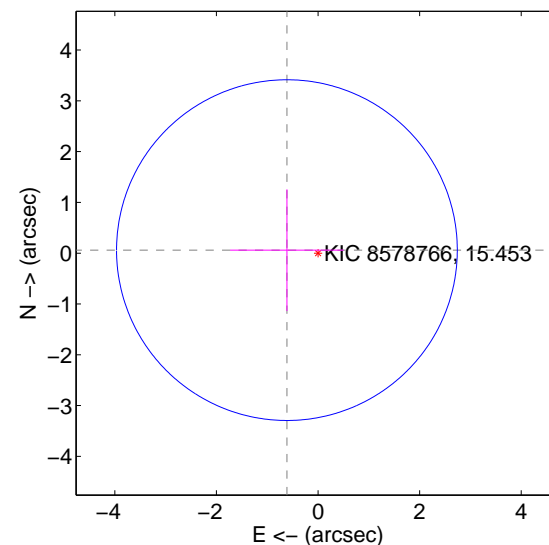
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

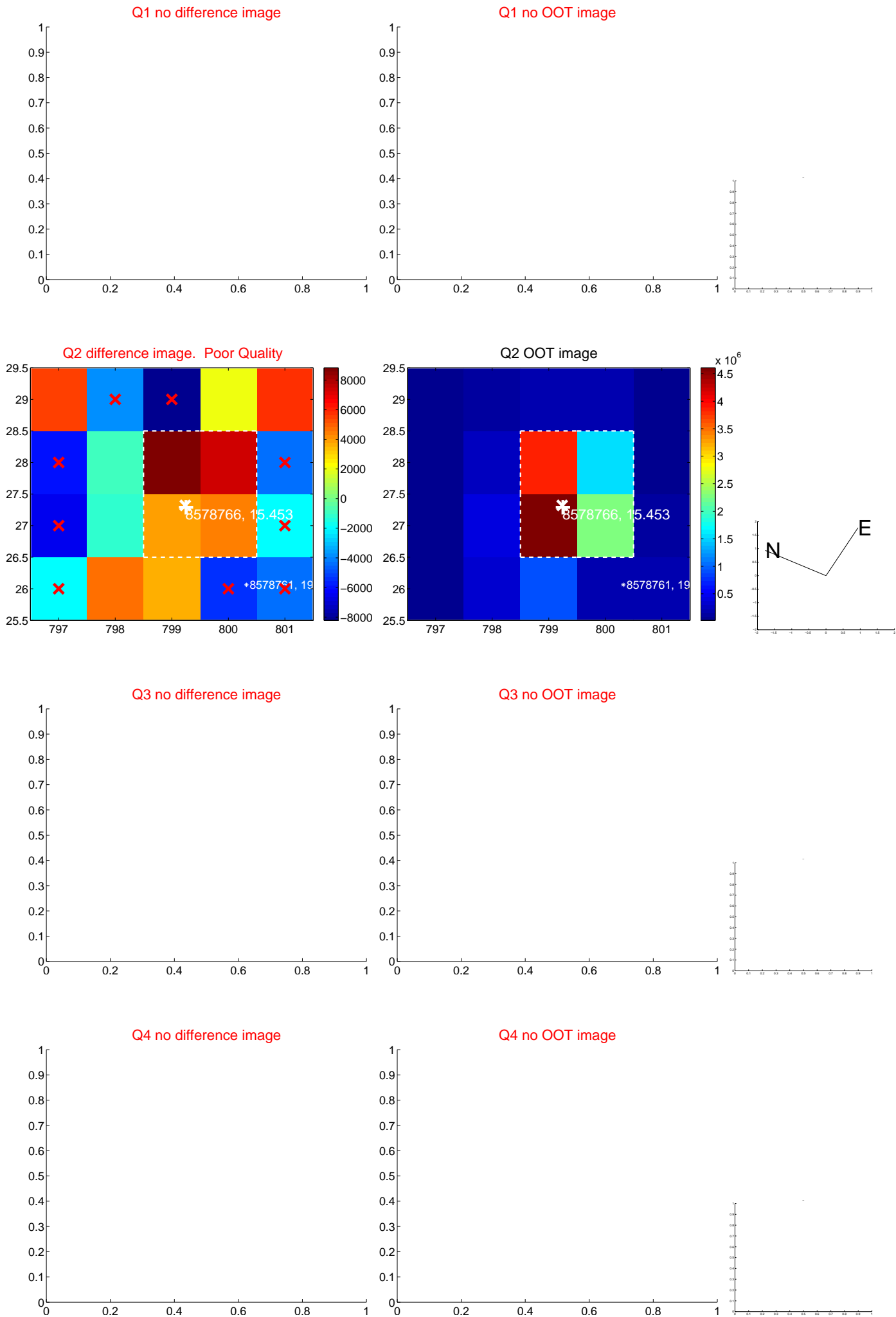


offset from photometric centroids



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 ×: 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.

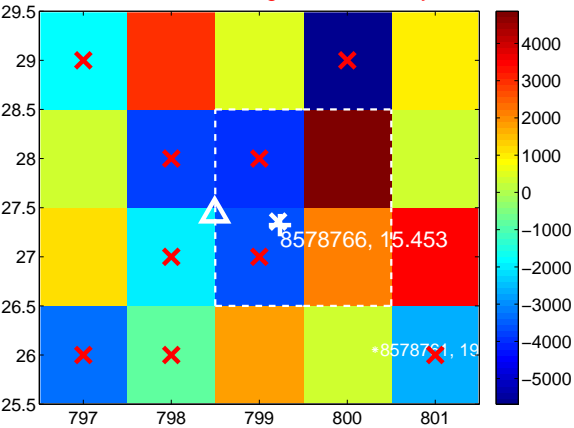
Q5 no difference image



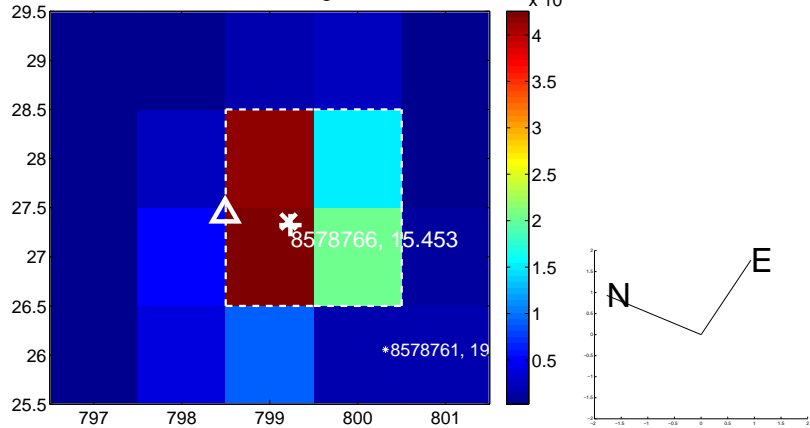
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



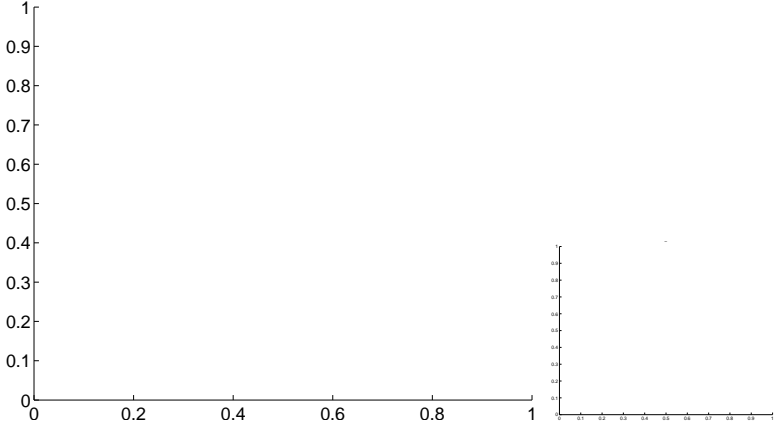
Q7 no OOT image



Q8 no difference image



Q8 no OOT image



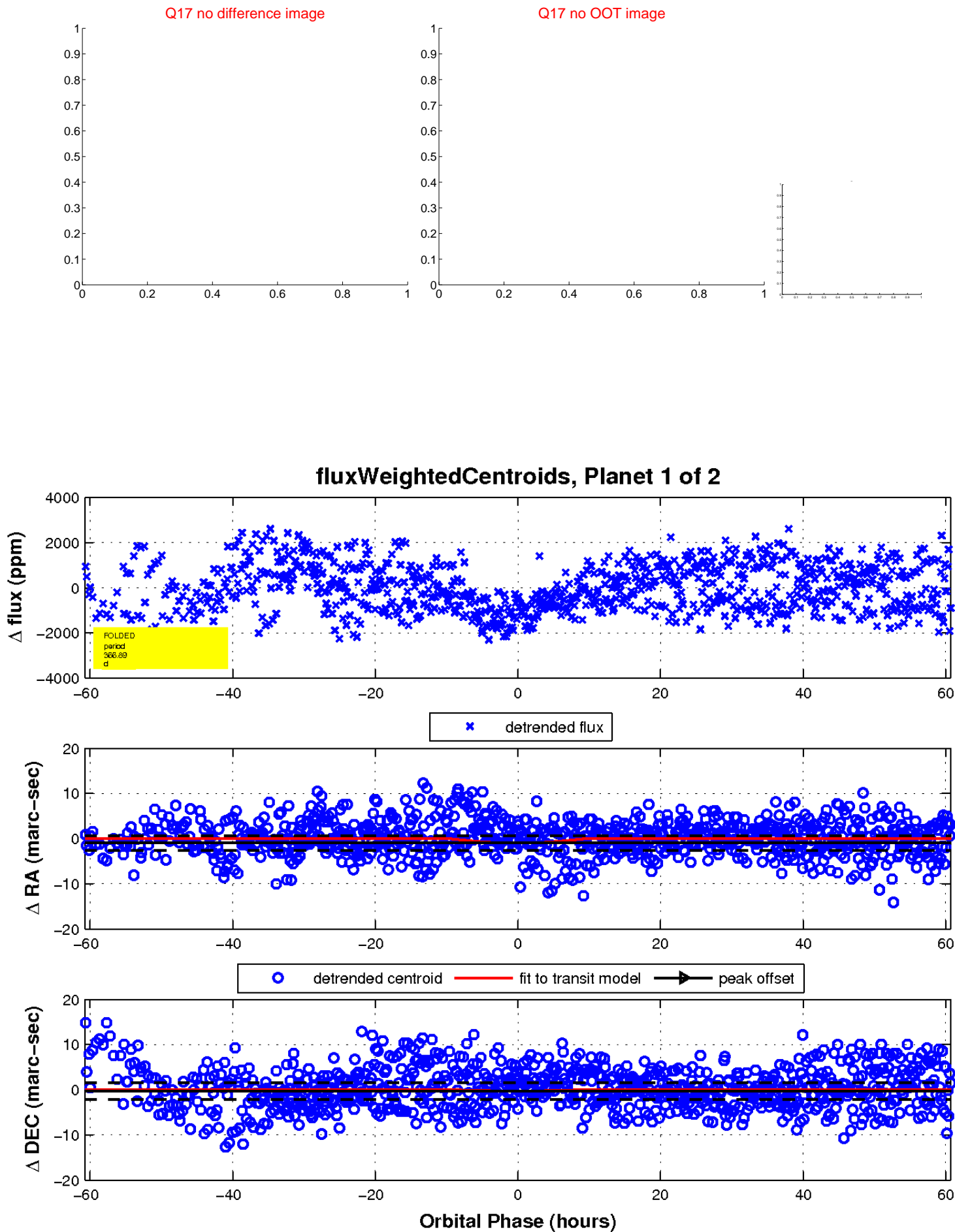
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

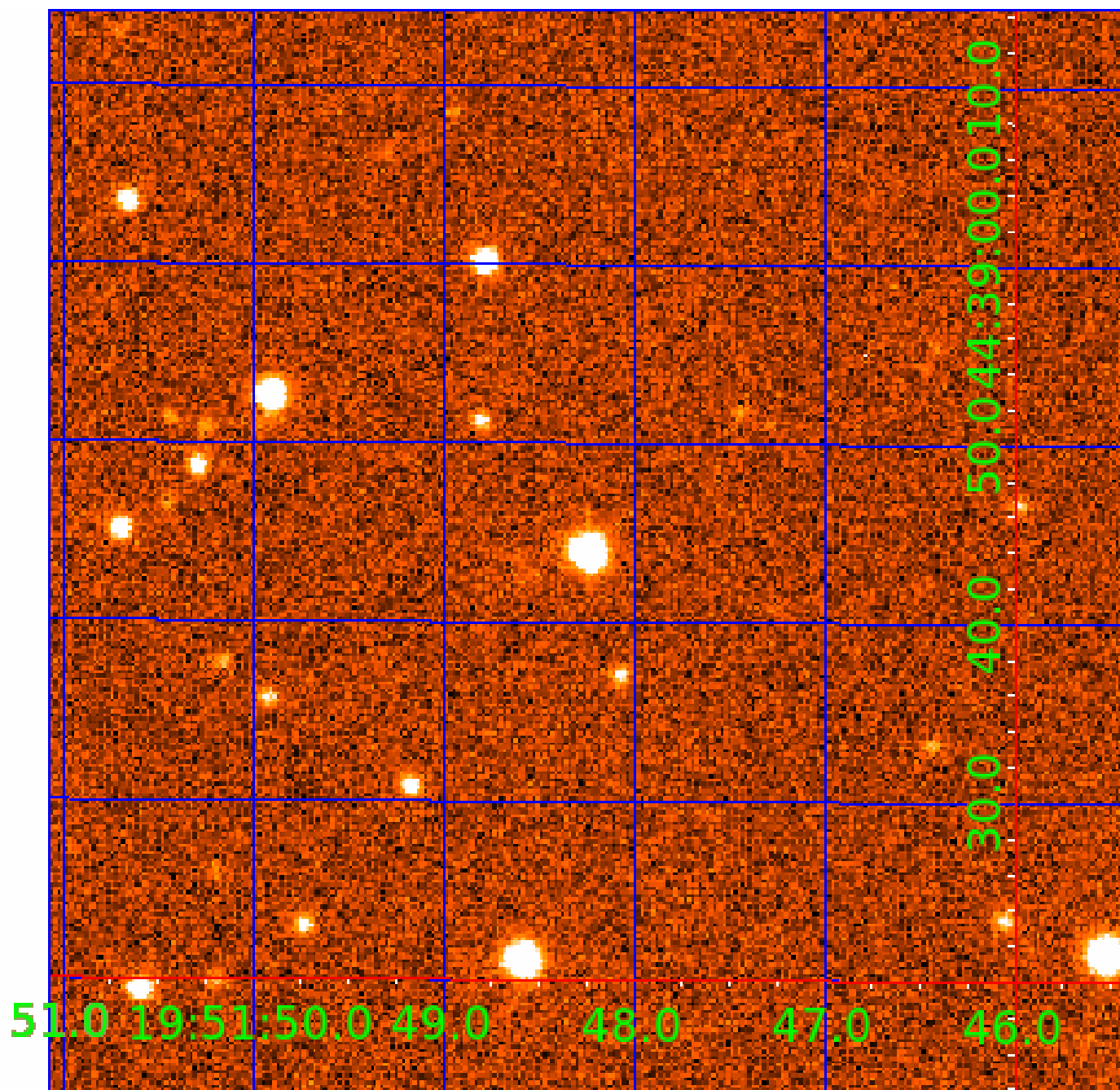


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008578766

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})
008578766-01	OBS	No	366.889888	174.882304	1302.8	20.265	9.4	9.6	0.94	5463	4.45	0.73
008578766-02	OBS	No	378.876376	171.493924	893.4	13.837	8.3	8.3	0.94	5463	2.94	0.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008578766-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008578766-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—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.

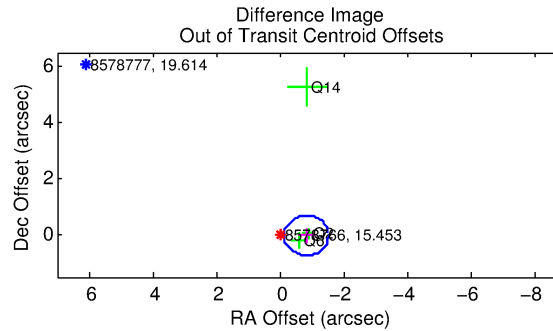
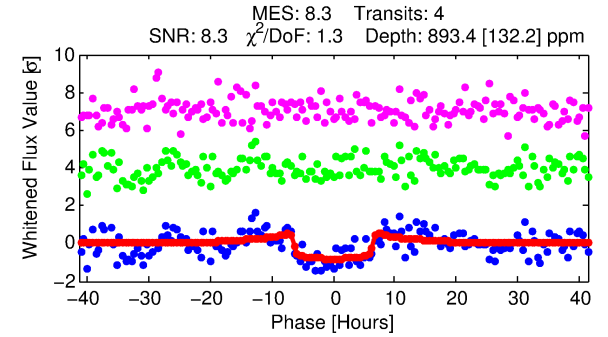
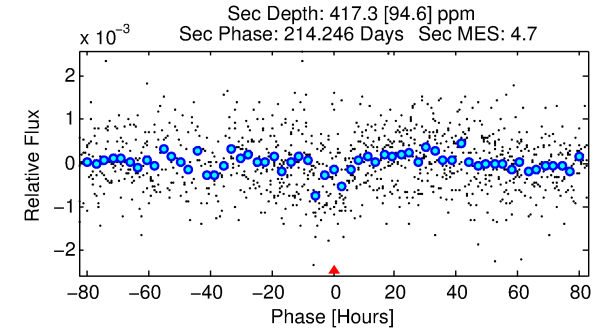
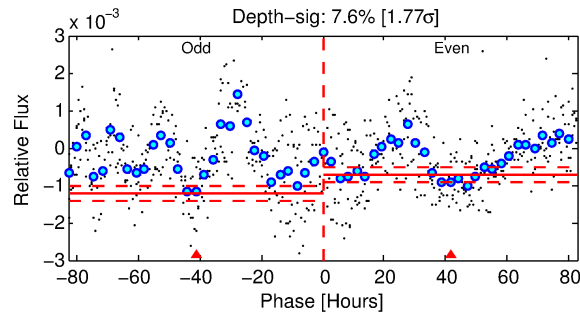
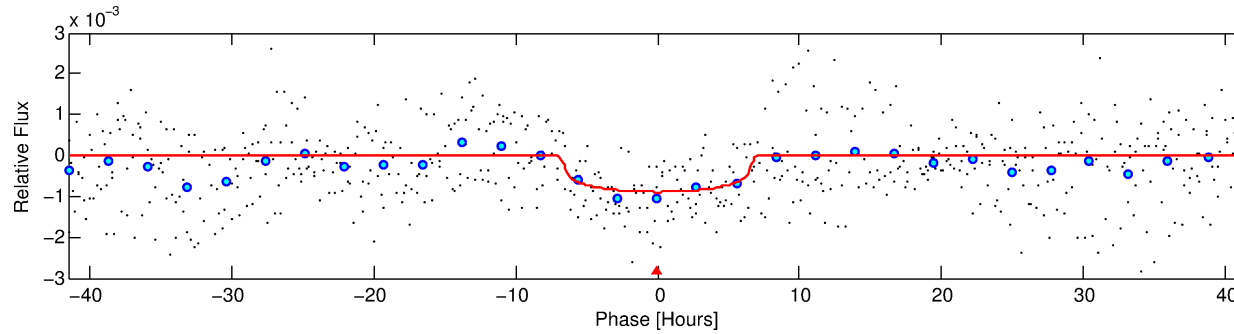
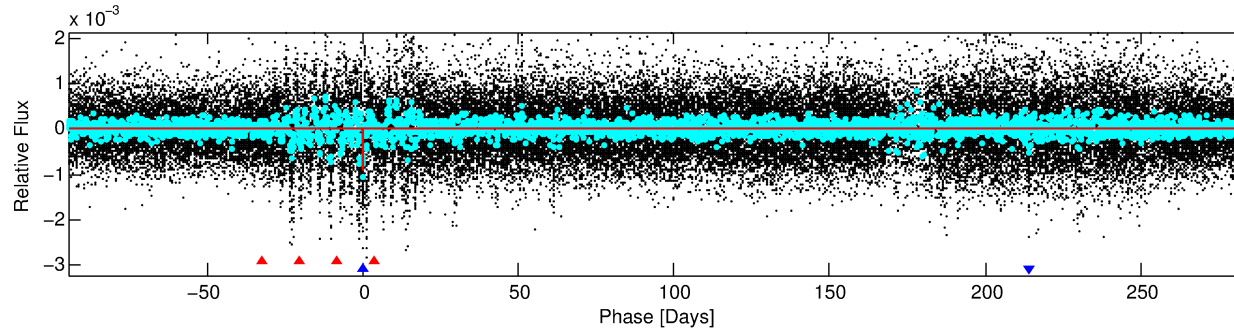
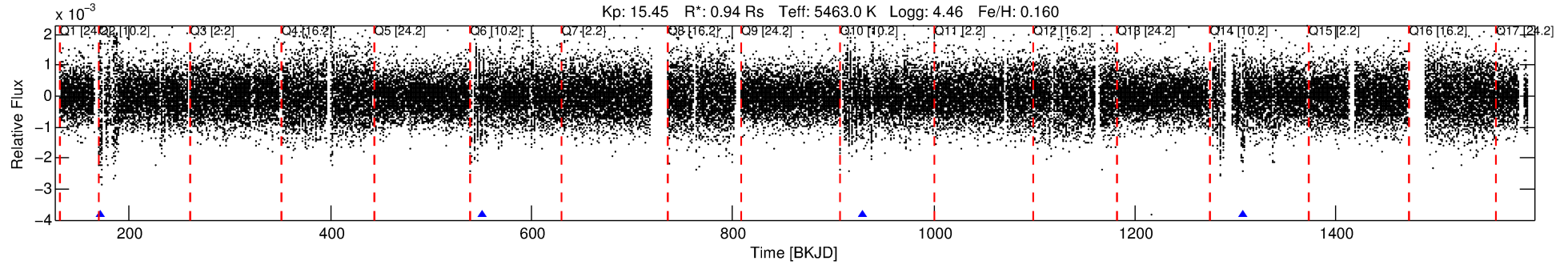
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008578766-02

No Significant Match Found

DV One-Page Summary

KIC: 8578766 Candidate: 2 of 2 Period: 378.876 d



DV Fit Results:

Period = 378.87638 [0.01048] d
Epoch = 171.4939 [0.0192] BKJD
Rp/R* = 0.0287 [0.0116]
a/R* = 168.20 [256.10]
b = 0.64 [1.41]
Seff = 0.70 [0.22]
Teq = 233 [19] K
Rp = 2.94 [1.38] Re
a = 0.9996 [0.2018] AU
Ag = 26612.43 [23659.01] [1.12σ]
Teffp = 4610 [976] K [4.48σ]

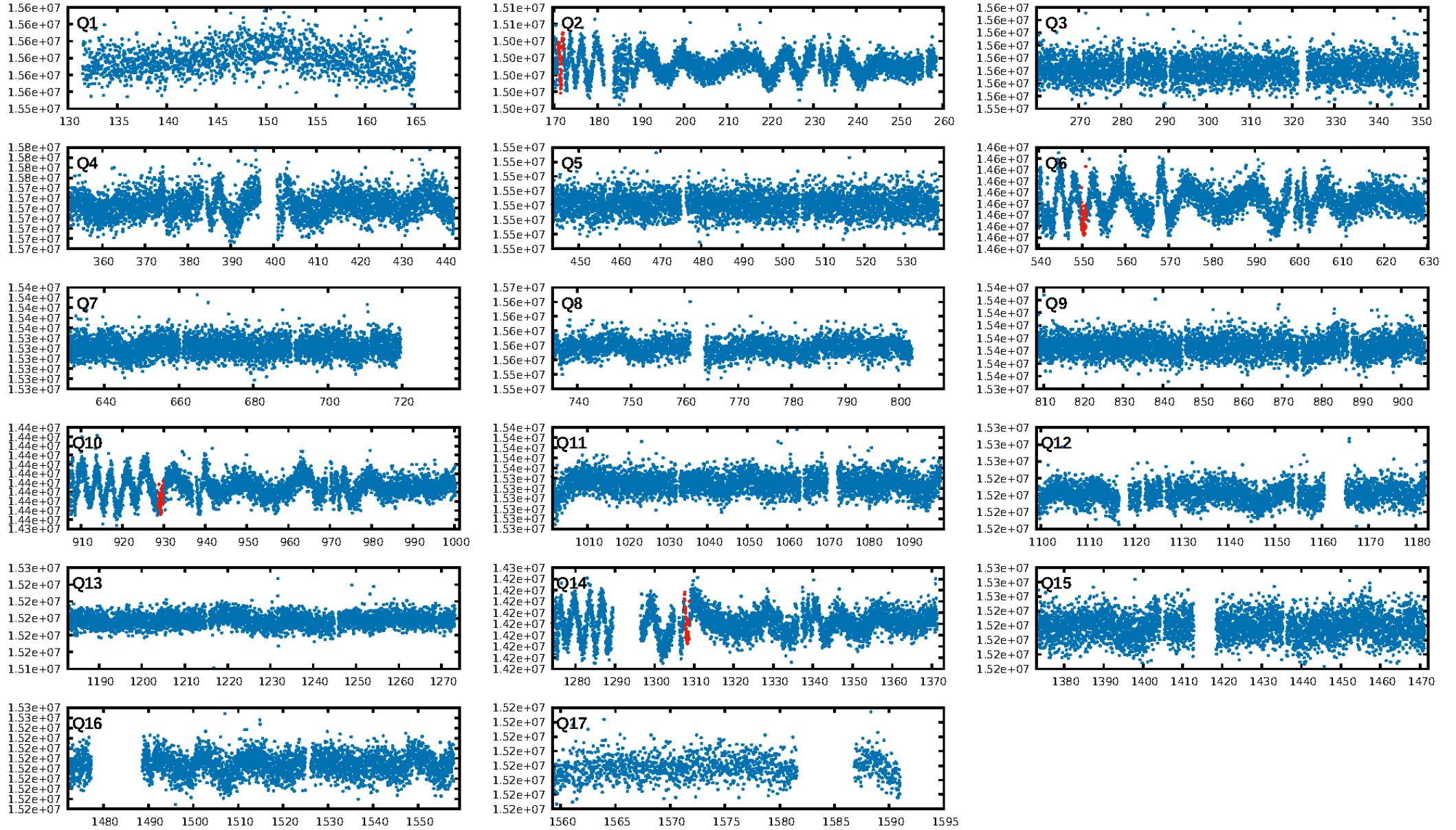
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [11.72σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.3%
ModelChiSquareGof-sig: 97.2%
Bootstrap-pfa: 3.99e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 17.38
Centroid-sig: 81.6%
Centroid-so: 0.730 arcsec [0.46σ]
OotOffset-rm: 0.831 arcsec [3.54σ]
KicOffset-rm: 0.922 arcsec [3.91σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

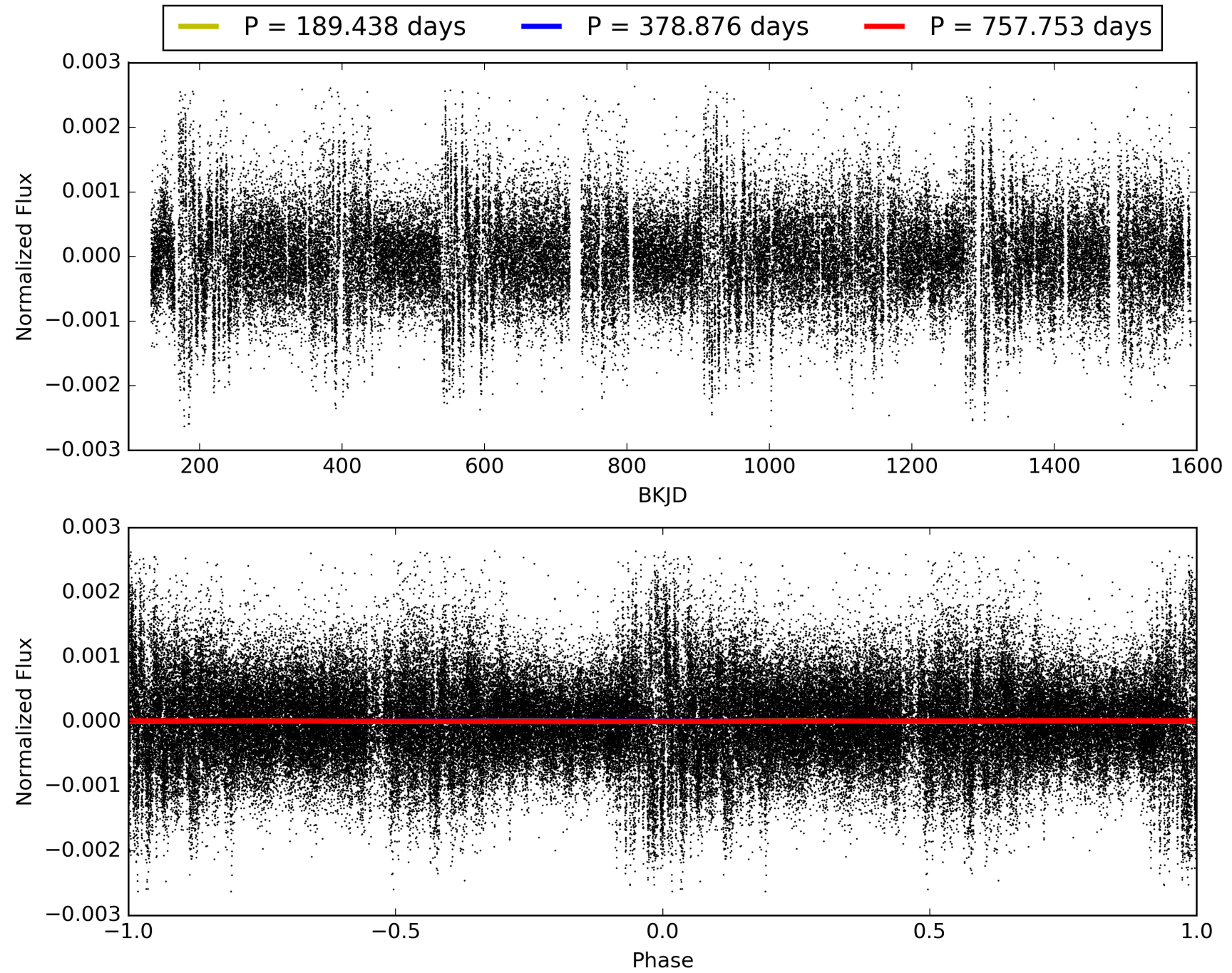
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:59:38 Z

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

TCE 008578766-02, PDC Light Curves

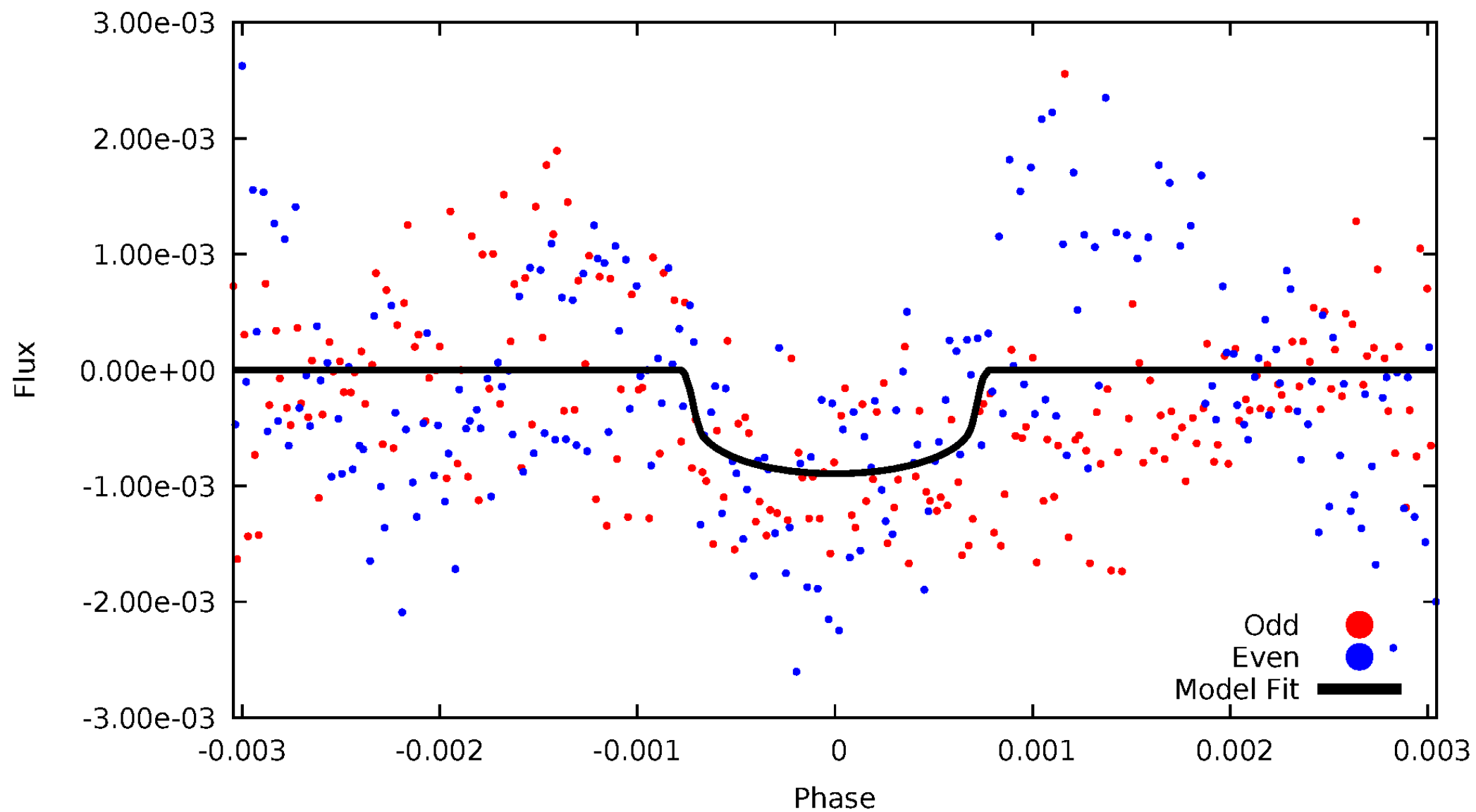


TCE 008578766-02



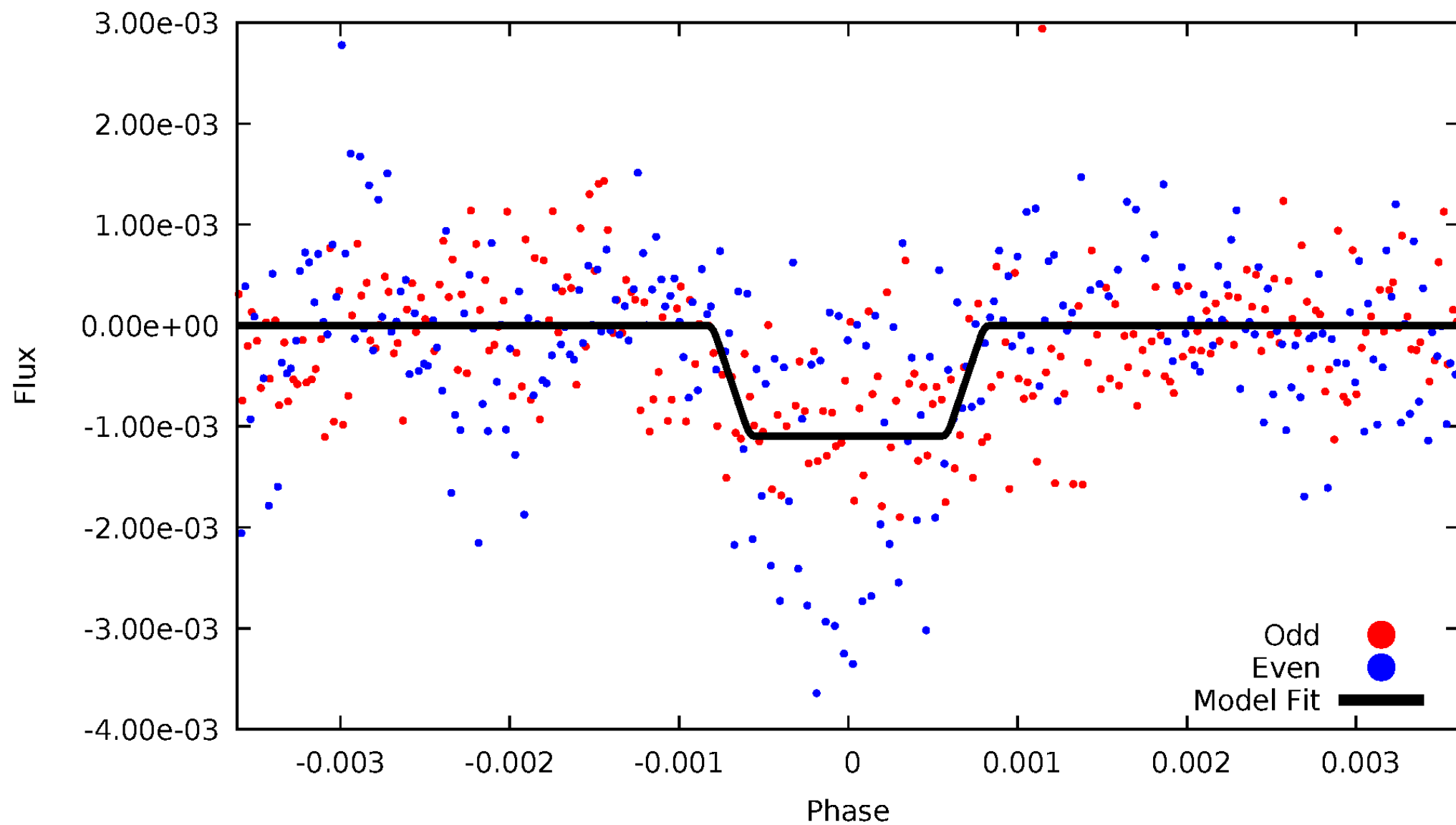
DV Odd/Even

TCE 008578766-02



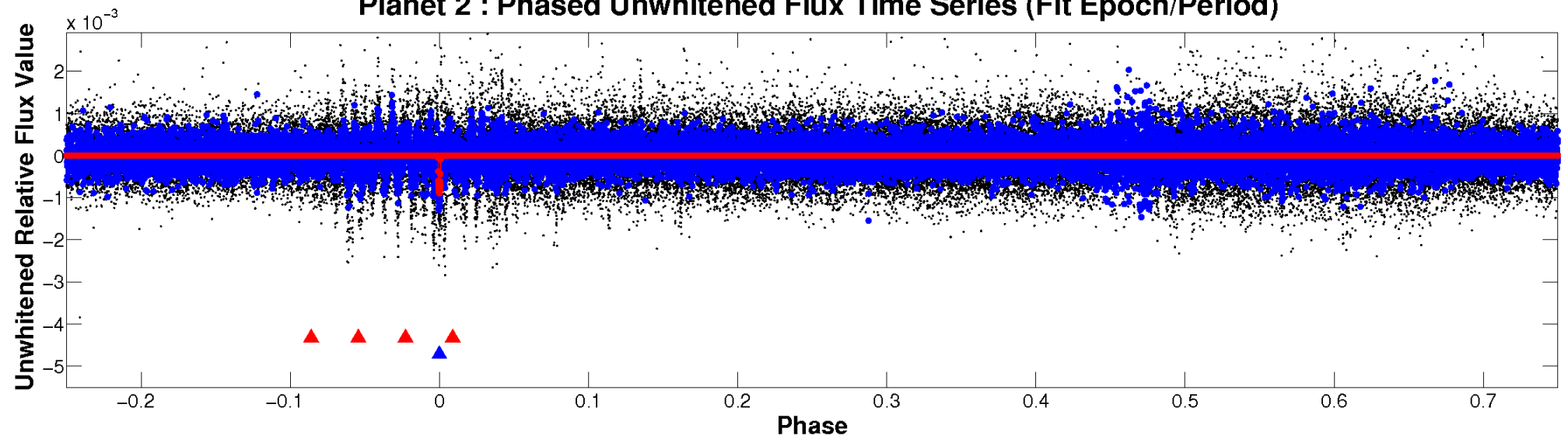
ALT Odd/Even

TCE 008578766-02

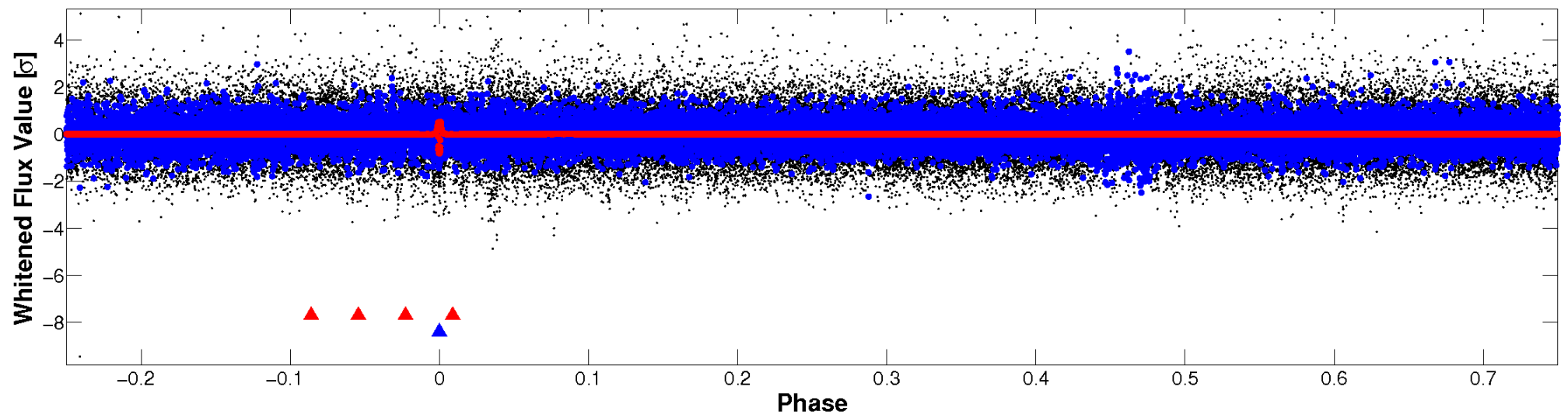


Non-Whitened Vs. Whitened Light Curve

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

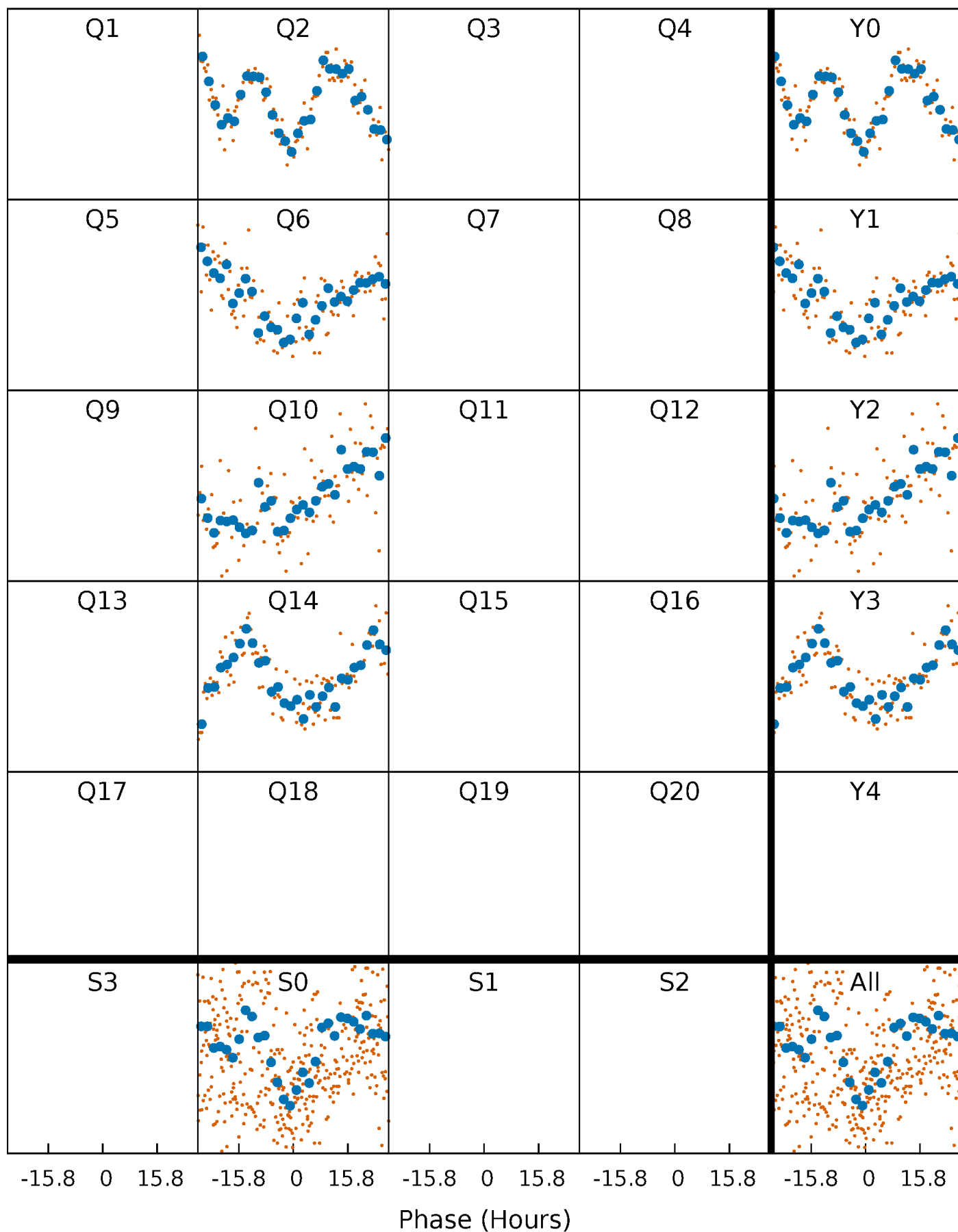


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



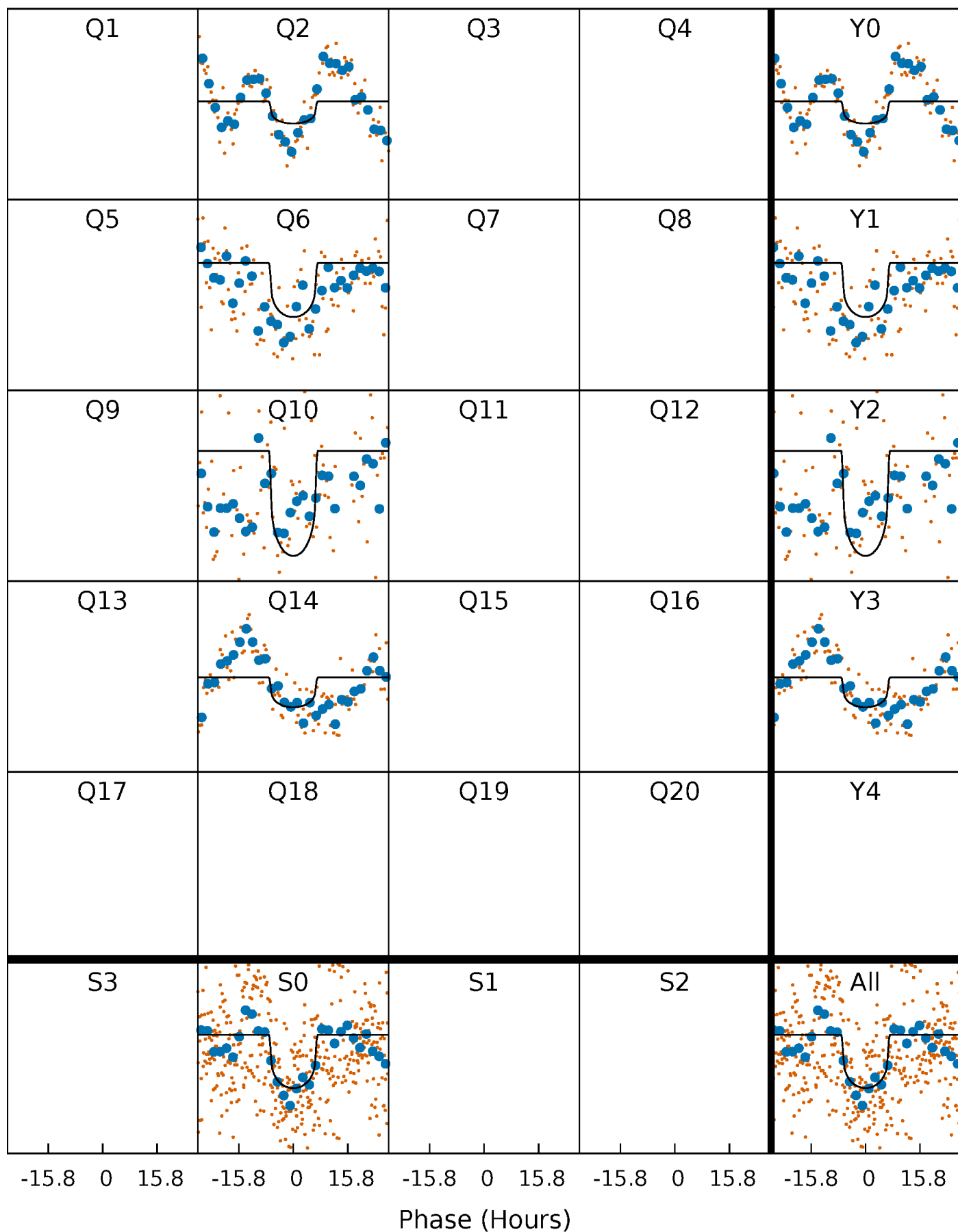
PDC Quarter-Phased Transit Curves

TCE 008578766-02 $P=378.876376$ Days $T_0=171.493924$ (BKJD)



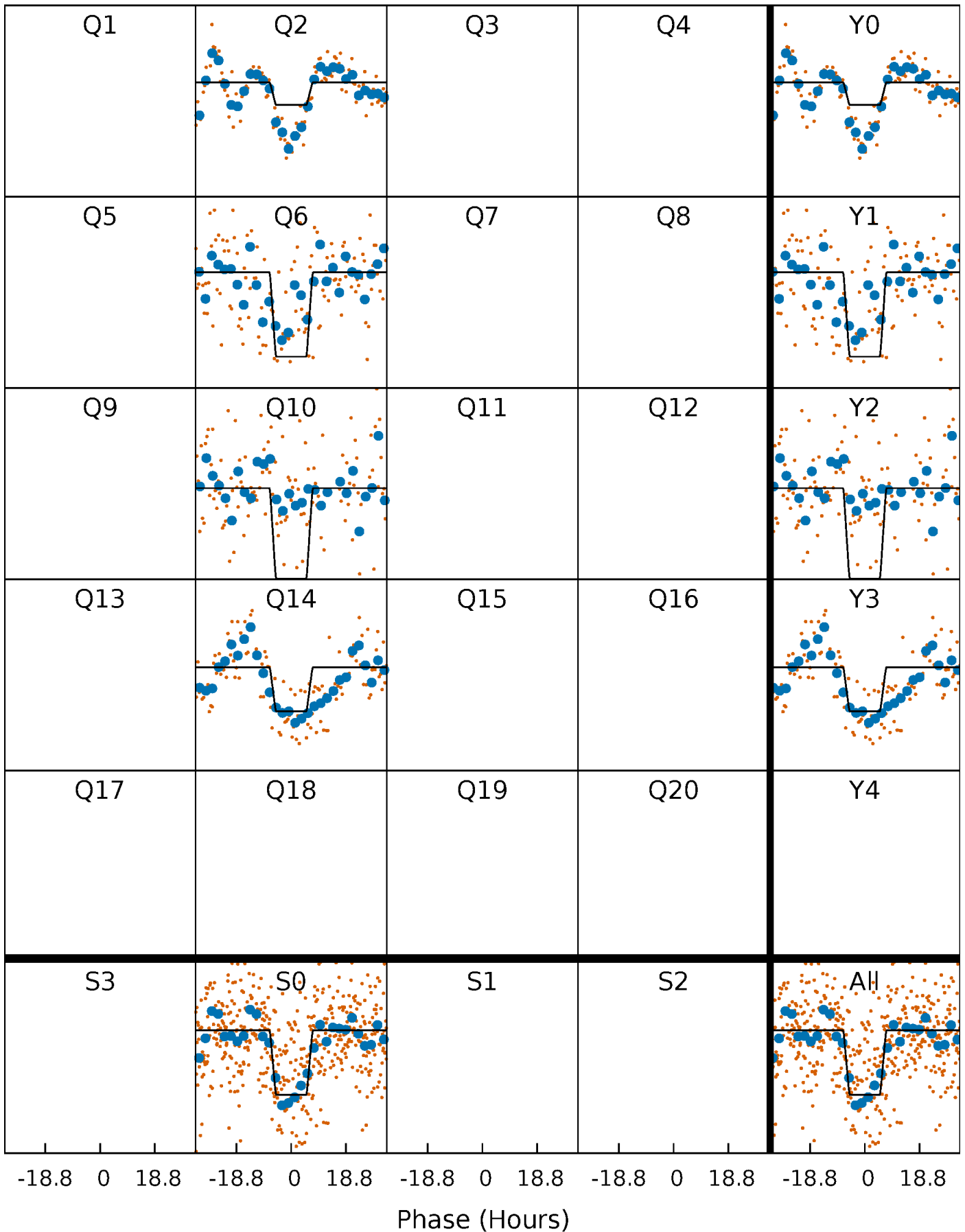
DV Quarter-Phased Transit Curves

TCE 008578766-02 P=378.876376 Days $T_0=171.493924$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

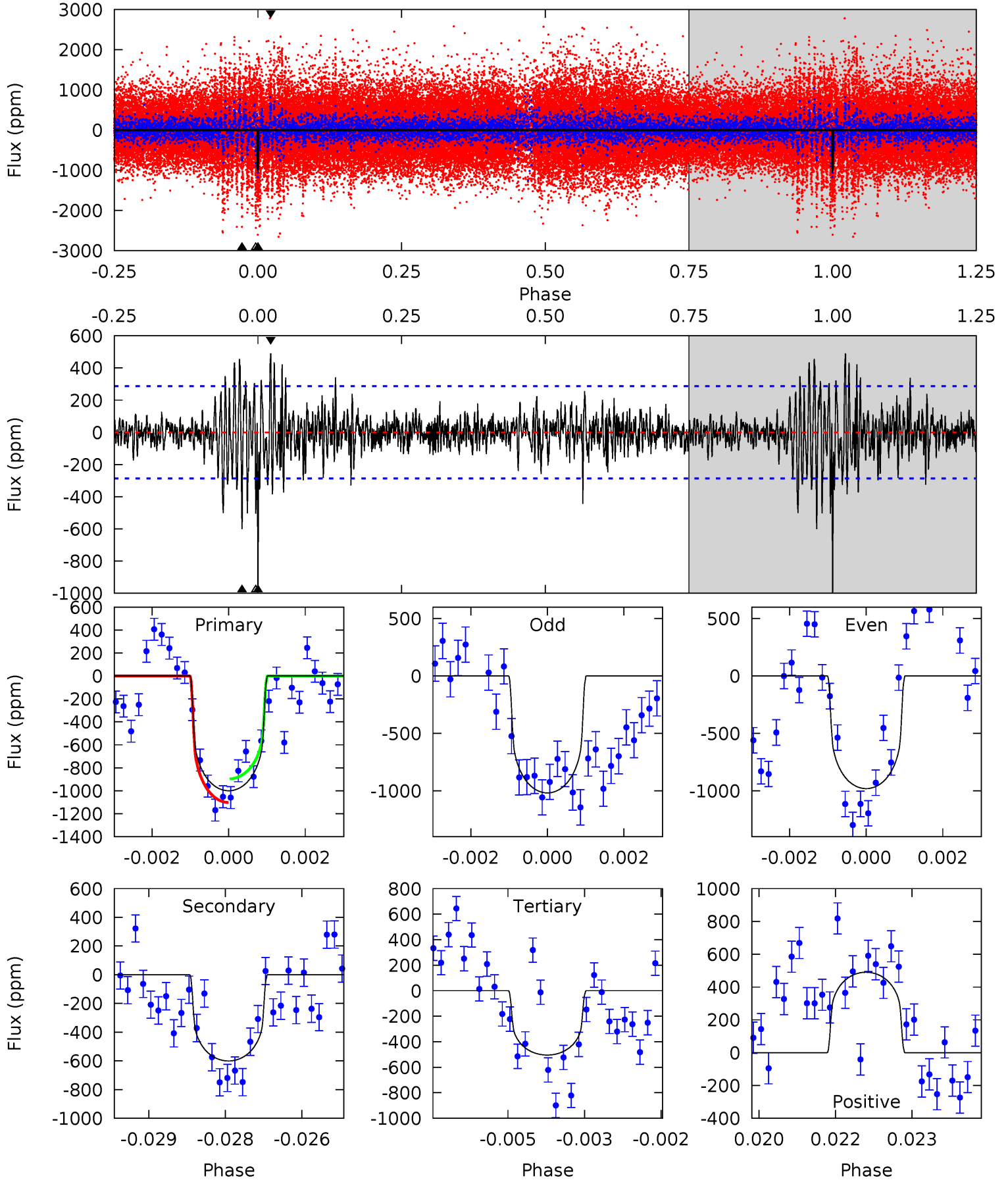
TCE 008578766-02 P=378.885881 Days $T_0=171.491429$ (BKJD)



DV Model-Shift Uniqueness Test

008578766-02, $P = 378.876376$ Days, $E = 171.493924$ Days

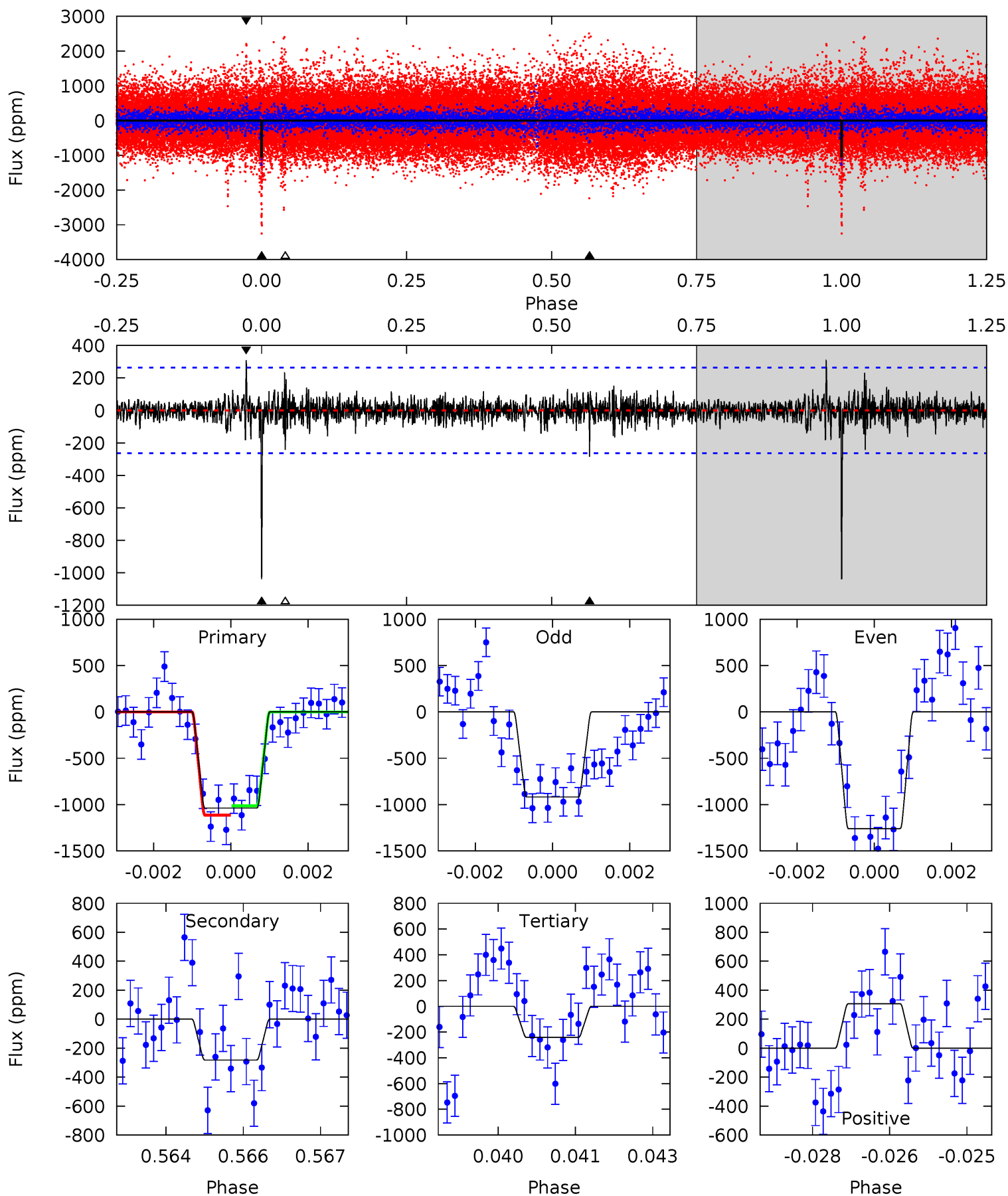
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.7	11.3	9.46	9.19	5.37	3.17	1.95	9.29	9.56	1.80	2.07	0.35	0.98	0.33	1.93



Alt Model-Shift Uniqueness Test

008578766-02, P = 378.885881 Days, E = 171.491429 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.2	5.74	4.92	6.25	5.36	3.15	0.94	16.2	14.9	0.82	-0.50	3.51	1.18	0.23	1.03



Stellar Parameters For KIC 008578766

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5463^{+164}_{-164}	$4.461^{+0.075}_{-0.163}$	$0.160^{+0.200}_{-0.300}$	$0.938^{+0.223}_{-0.103}$	$0.926^{+0.090}_{-0.082}$	$1.582^{+0.592}_{-0.708}$
	+3%/-3%	+2%/-4%	+125%/-188%	+24%/-11%	+10%/-9%	+37%/-45%
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 008578766-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-601 ± 53	$2.99^{+1.26}_{-1.15}$	330^{+19}_{-16}	5062^{+1319}_{-664}	35851^{+59870}_{-17785}
Alt.	-282 ± 49	$3.51^{+1.25}_{-1.26}$	329^{+21}_{-16}	4118^{+803}_{-418}	12446^{+17983}_{-5843}

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

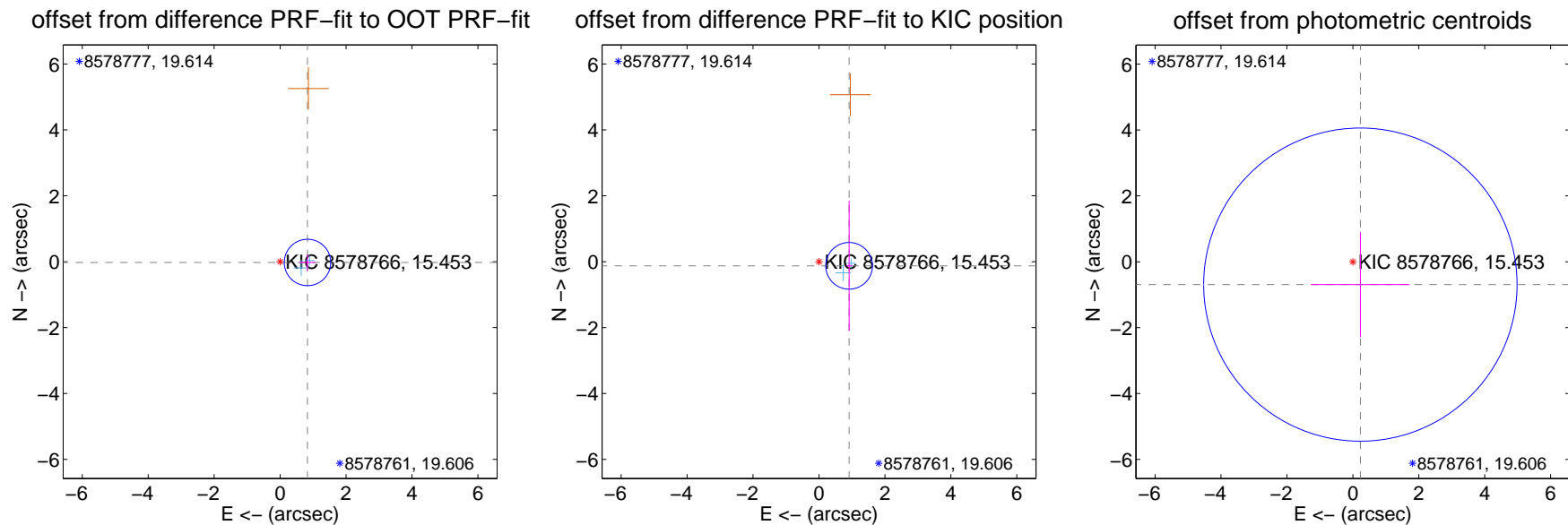
DV Centroid Data

Supplemental centroid analysis for 008578766-02. Kepler magnitude: 15.45. Transit SNR 8.28

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.831 ± 0.235	3.54	-0.831 ± 0.235	-0.023 ± 0.246
PRF-fit source offset from KIC position	0.922 ± 0.236	3.91	-0.913 ± 0.091	-0.125 ± 1.973
photometric centroid source offset	0.73 ± 1.58	0.46	-0.23 ± 1.50	-0.69 ± 1.59



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.

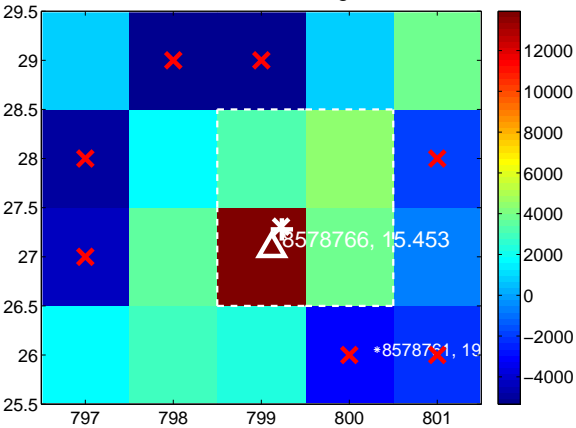
Q1 no difference image



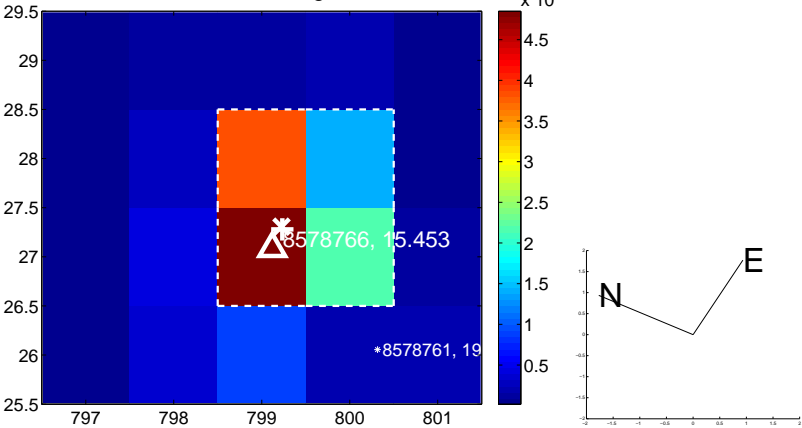
Q1 no OOT image



Q2 difference image



Q2 OOT image



Q3 no difference image



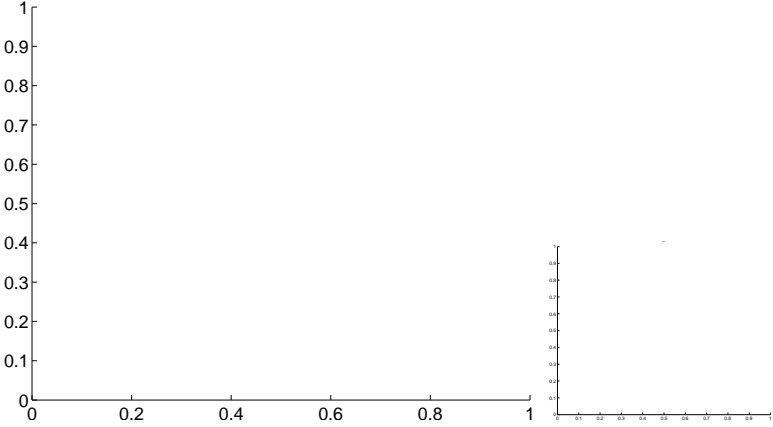
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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

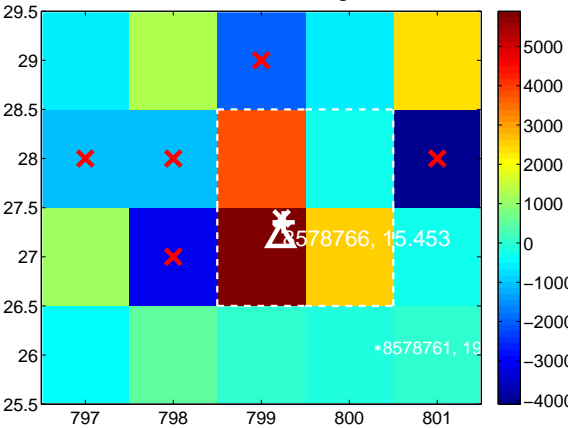
Q5 no difference image



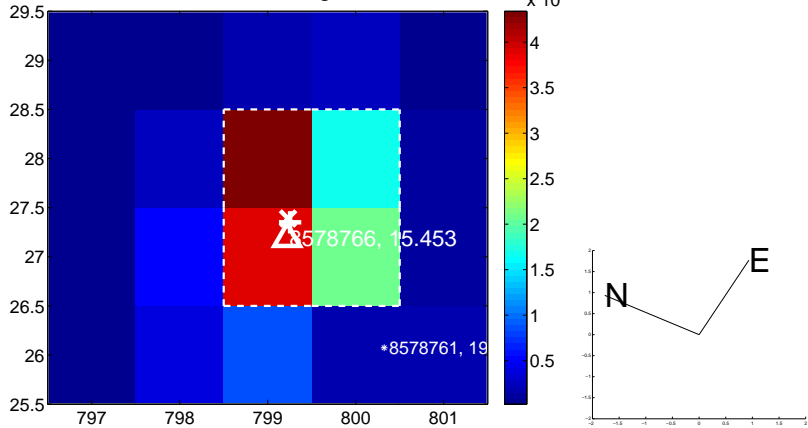
Q5 no OOT image



Q6 difference image



Q6 OOT image



Q7 no difference image



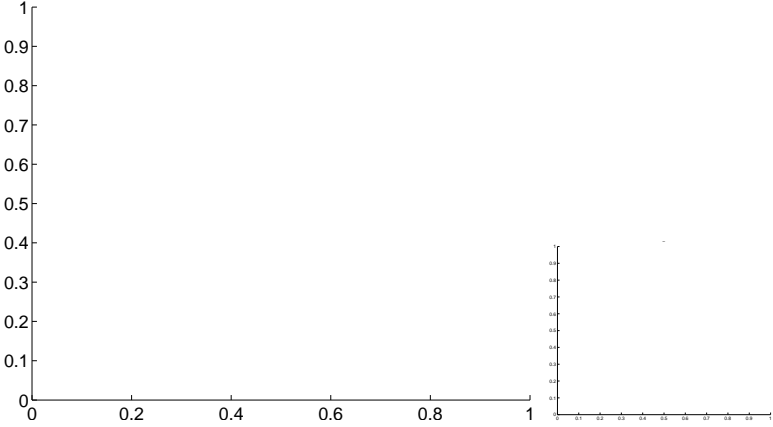
Q7 no OOT image



Q8 no difference image



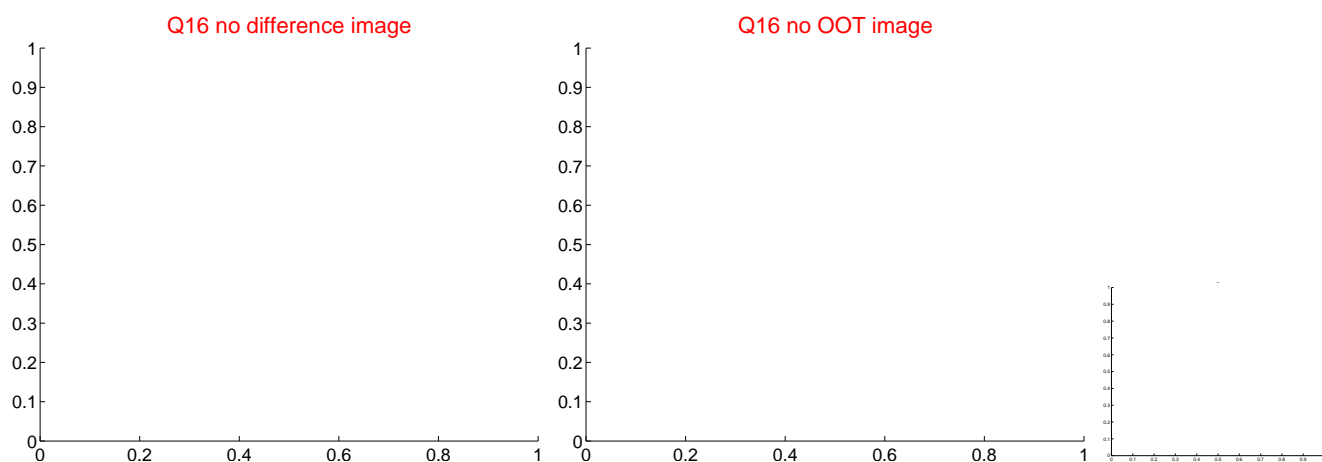
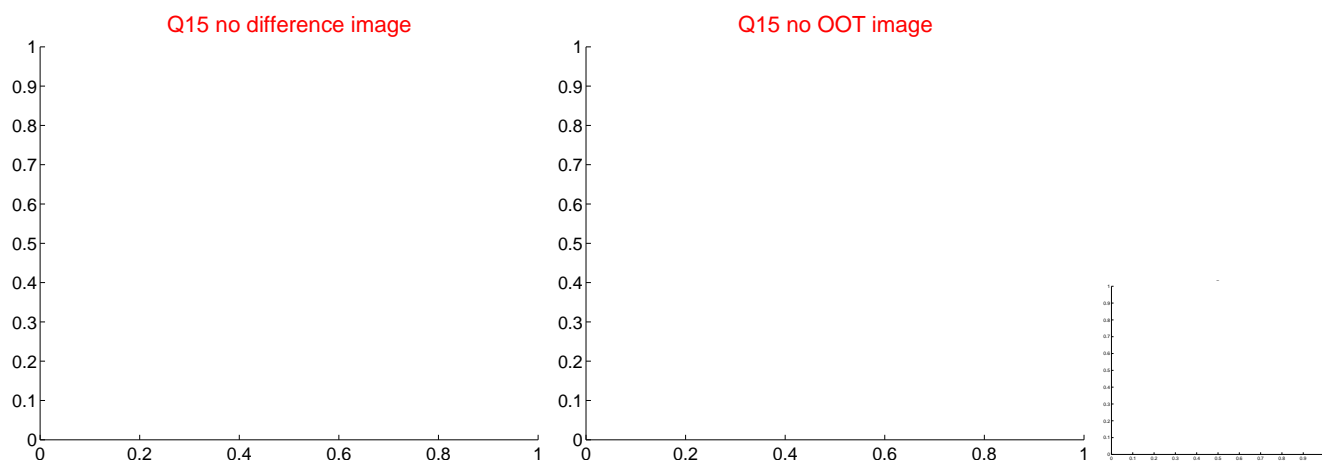
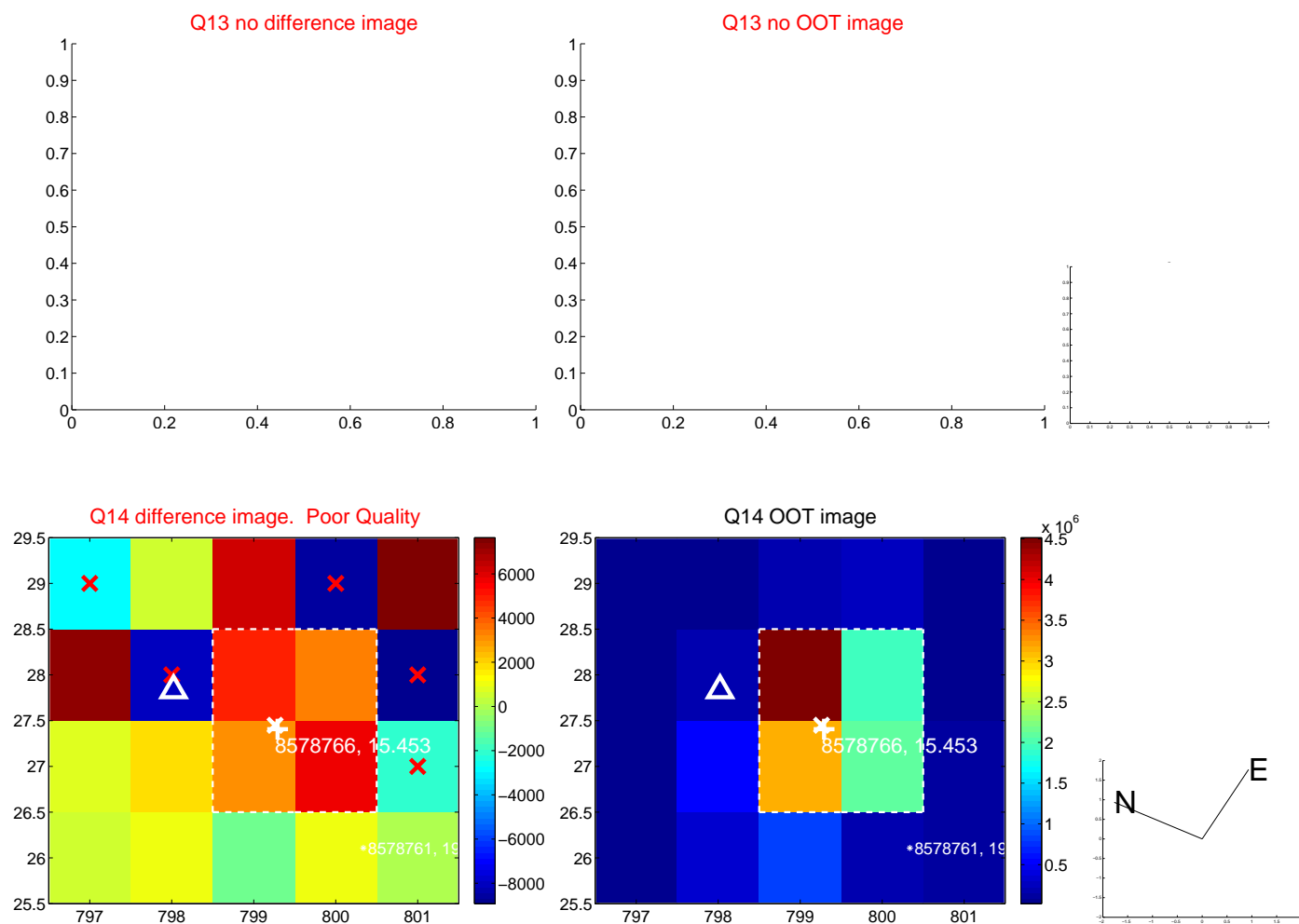
Q8 no OOT image



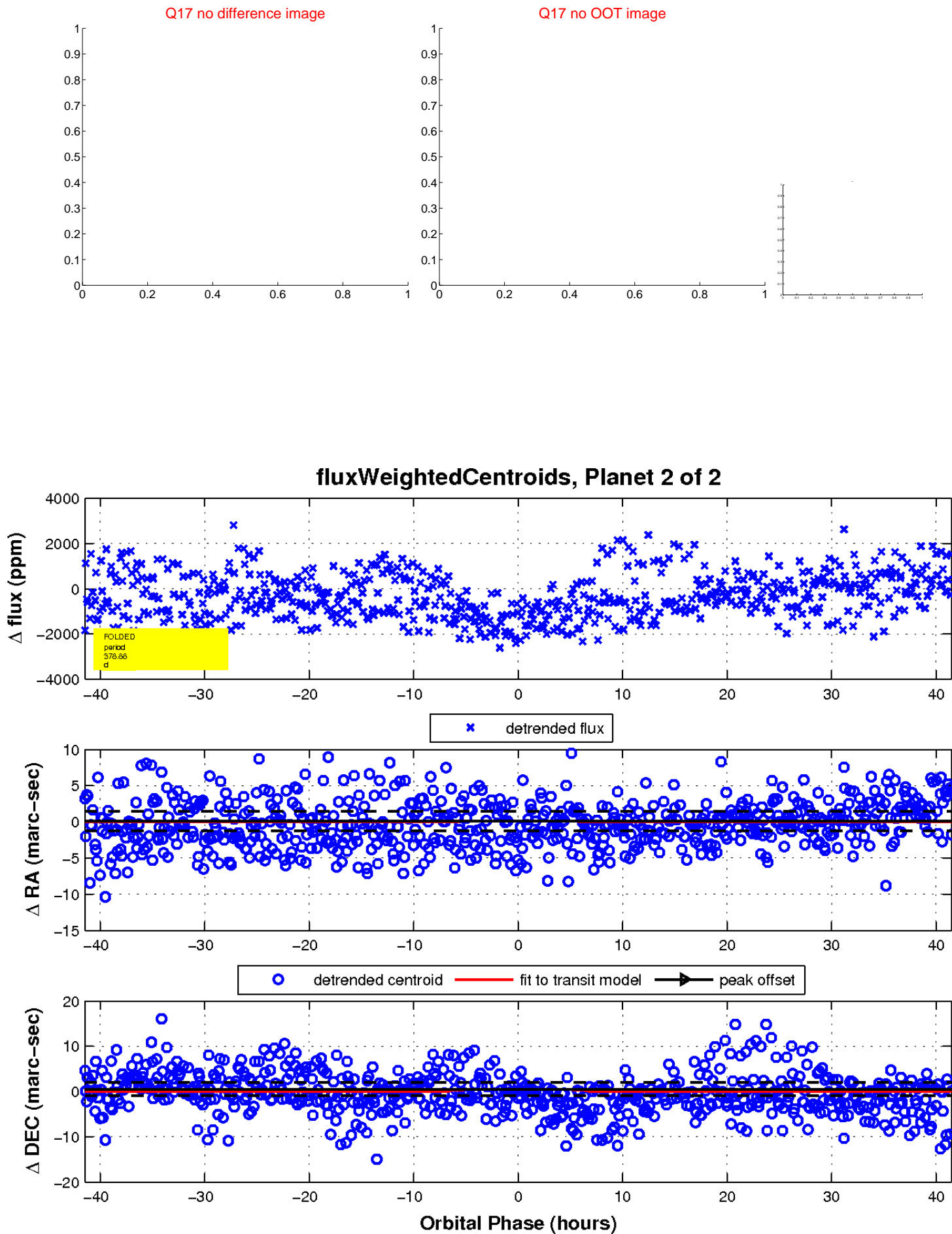
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

