

KIC 010972981

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})
010972981-01	OBS	No	354.124079	394.396812	196.6	3.443	11.7	7.6	1.96	5102	3.15	2.54
010972981-02	OBS	No	597.287602	191.070580	260.5	4.418	8.2	8.8	1.96	5102	3.54	1.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010972981-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010972981-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—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.

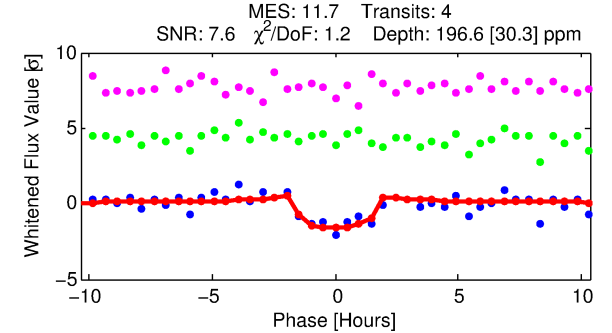
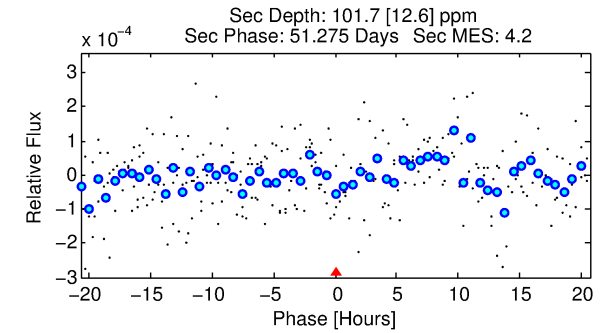
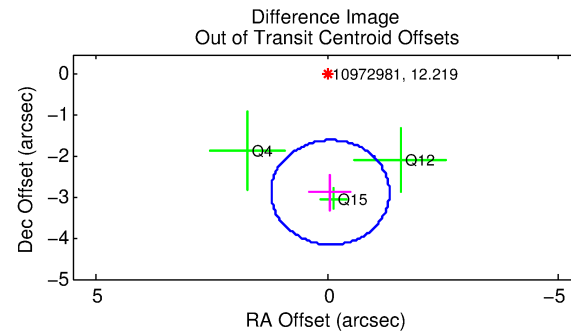
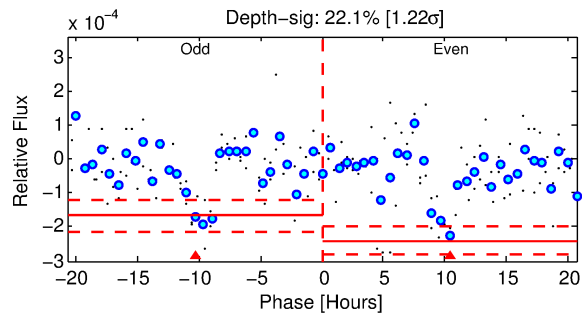
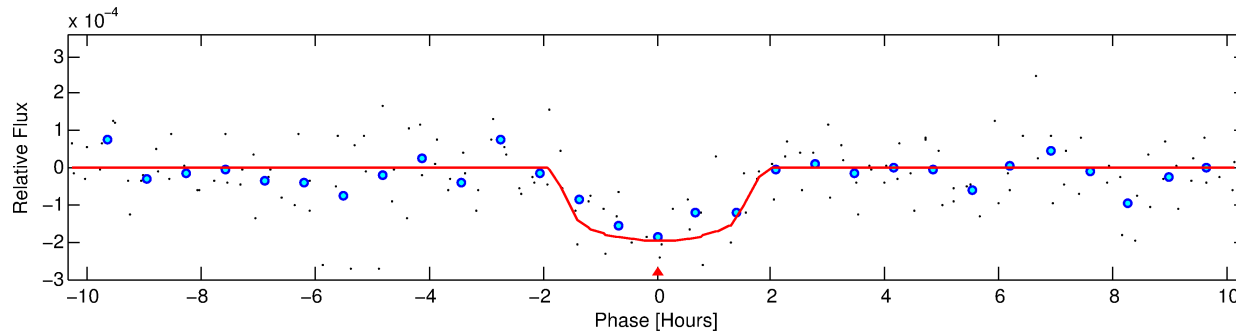
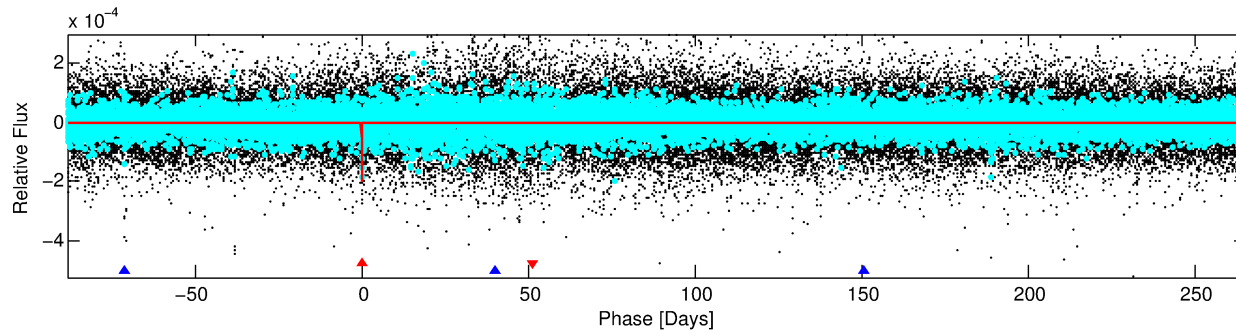
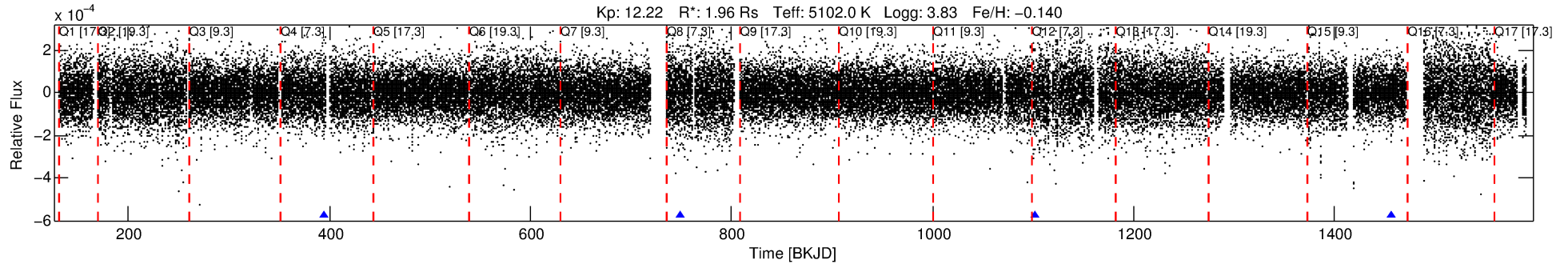
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010972981-01

No Significant Match Found

DV One-Page Summary

KIC: 10972981 Candidate: 1 of 2 Period: 354.124 d



DV Fit Results:

Period = 354.12408 [0.00401] d
Epoch = 394.3968 [0.0083] BKJD
Rp/R* = 0.0147 [0.0137]
a/R* = 448.10 [1632.03]
b = 0.84 [1.30]
Seff = 2.54 [3.19]
Teq = 322 [101] K
Rp = 3.15 [3.51] Re
a = 0.9589 [0.6890] AU
Ag = 5174.46 [11597.97] [0.45σ]
Teffp = 4221 [1966] K [1.98σ]

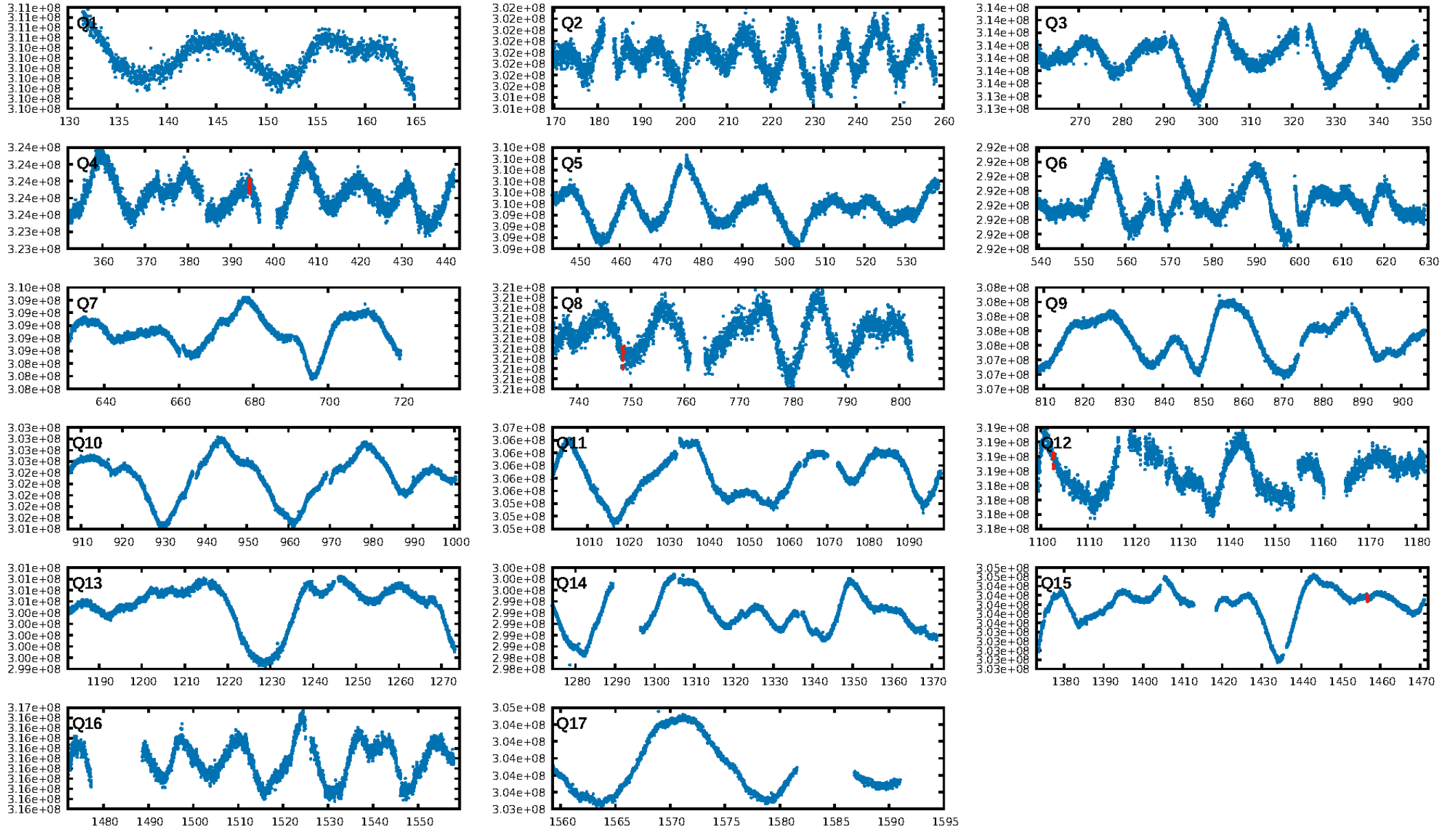
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1041.87σ]
ModelChiSquare2-sig: 4.0%
ModelChiSquareGof-sig: 89.8%
Bootstrap-pfa: 1.42e-27
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.5335
Centroid-sig: N/A
Centroid-so: 1.445 arcsec [1.51σ]
OotOffset-rm: 2.883 arcsec [6.76σ]
KicOffset-rm: 2.235 arcsec [5.24σ]
OotOffset-st: 0/1/2/0 [3]
KicOffset-st: 0/1/2/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [4/4]

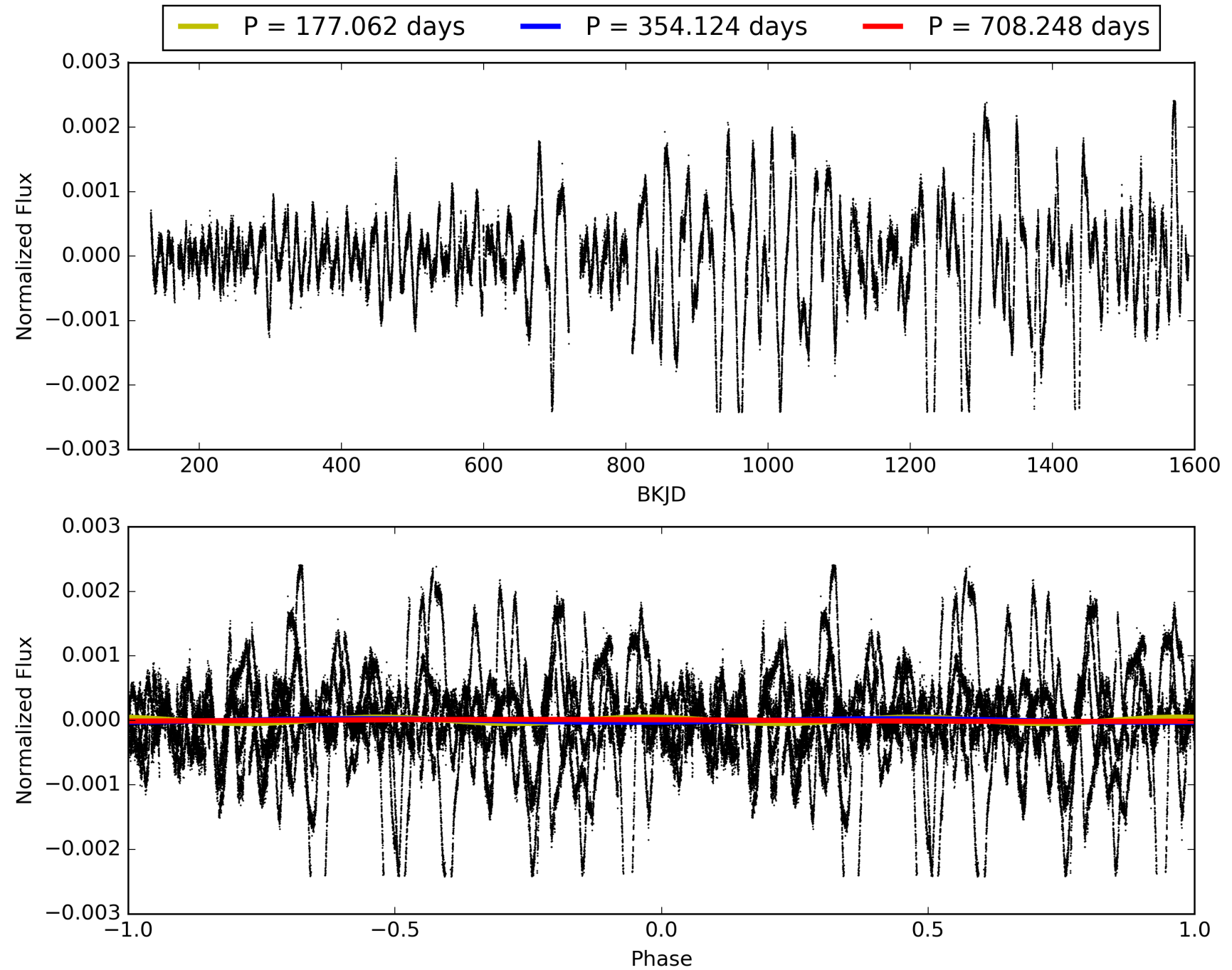
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:42:57 Z

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

TCE 010972981-01, PDC Light Curves

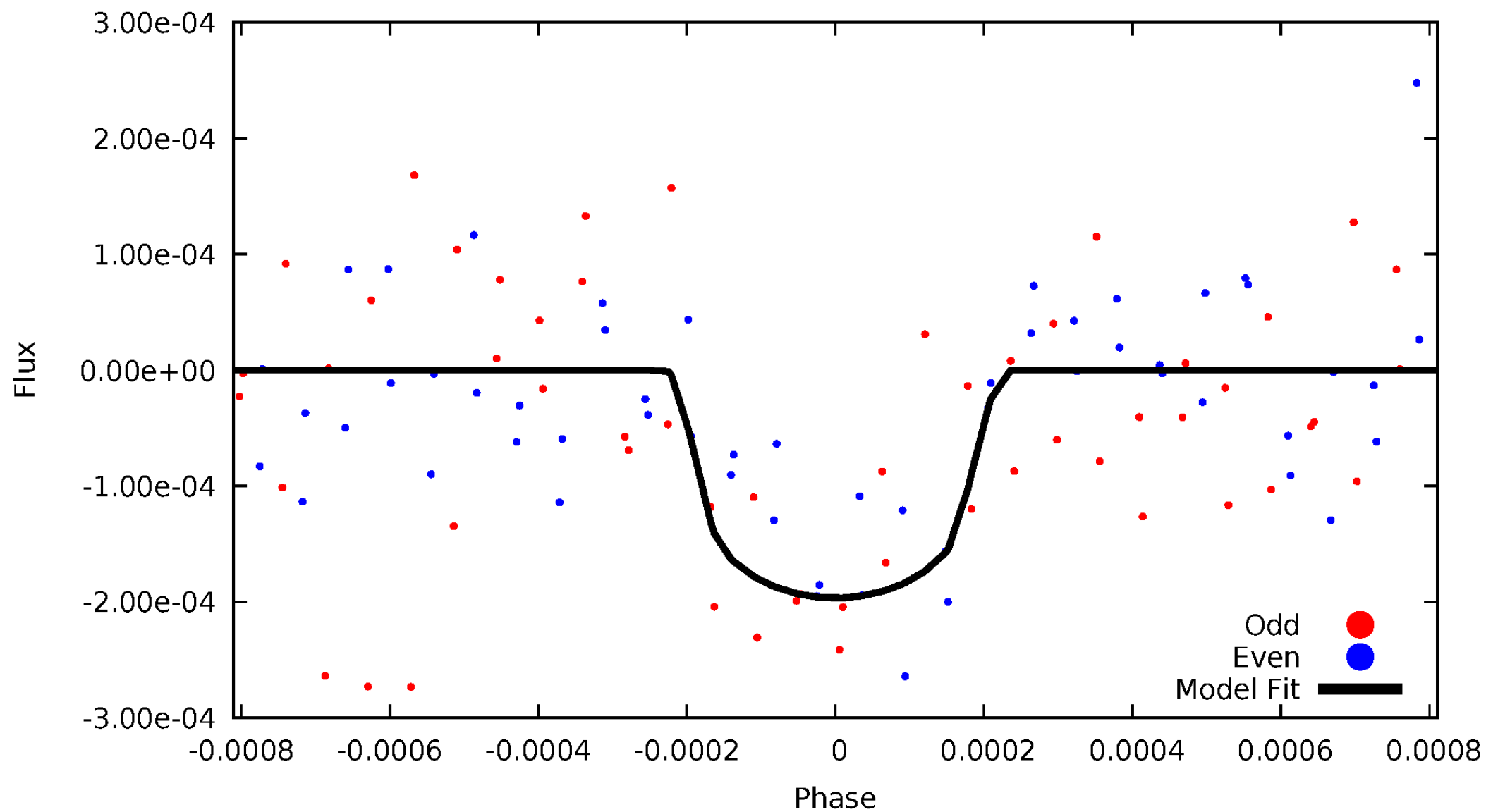


TCE 010972981-01



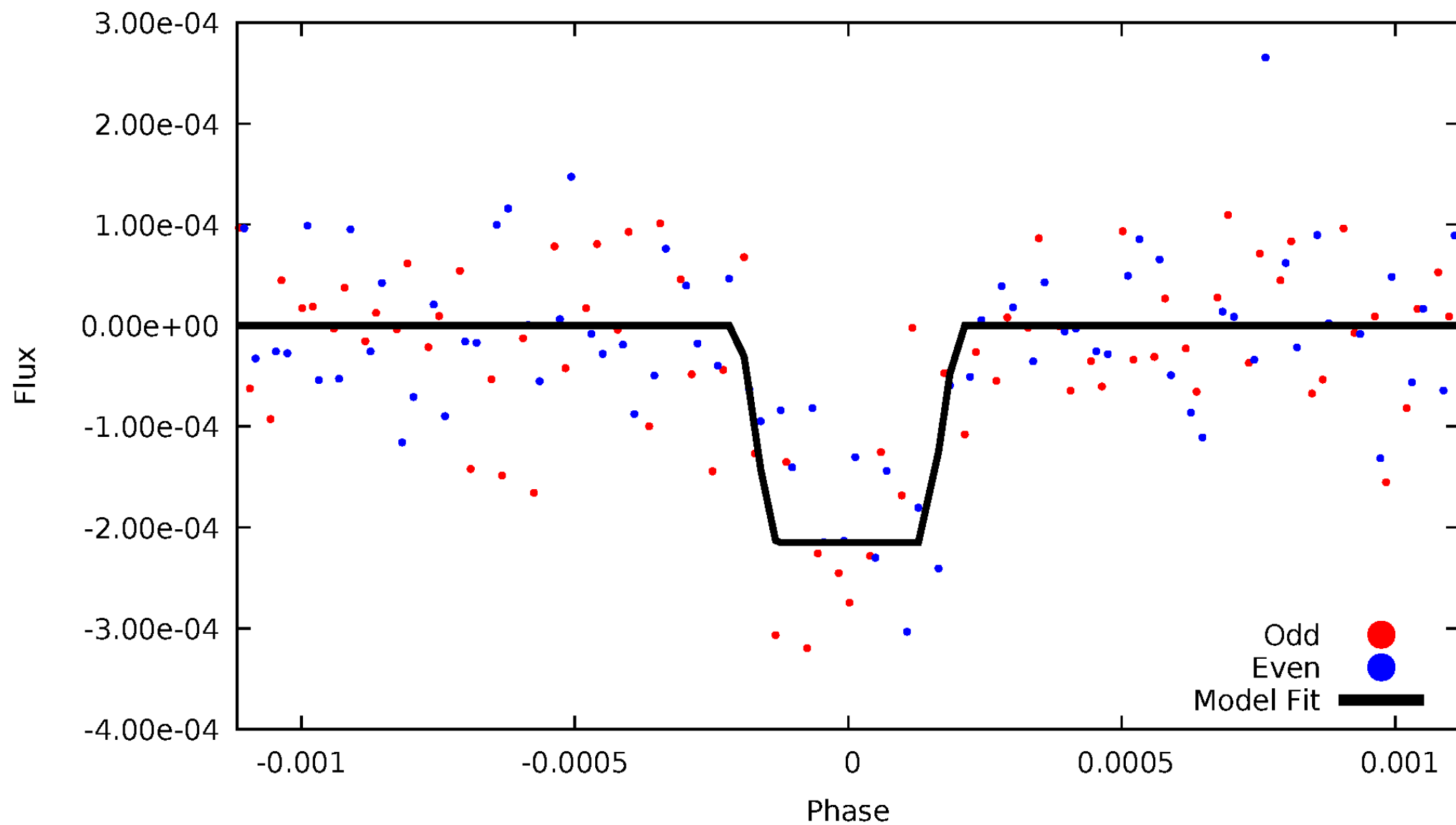
DV Odd/Even

TCE 010972981-01



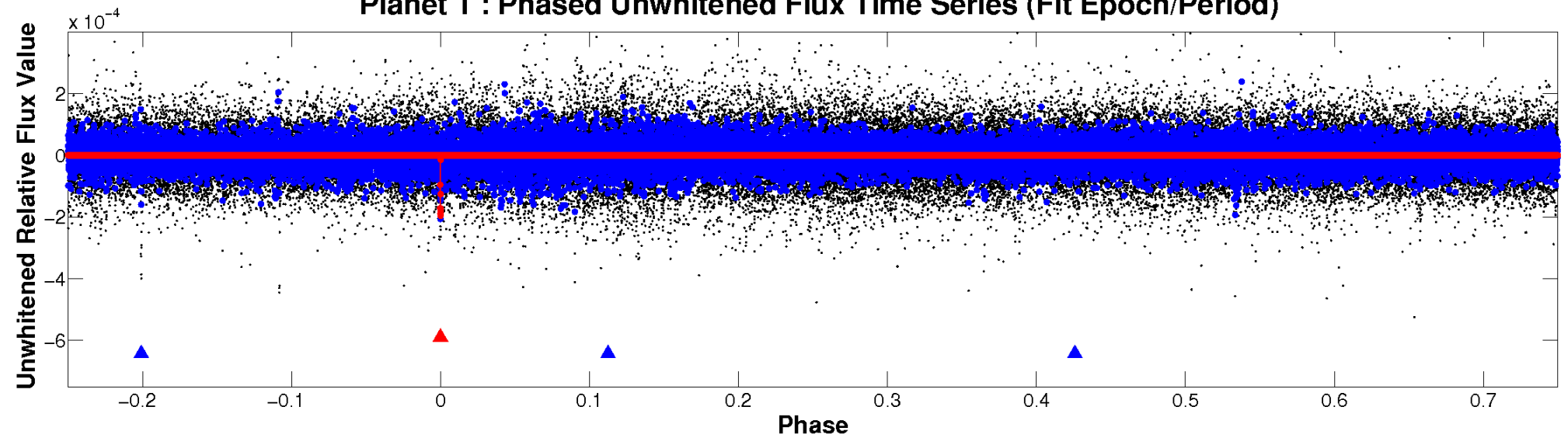
ALT Odd/Even

TCE 010972981-01

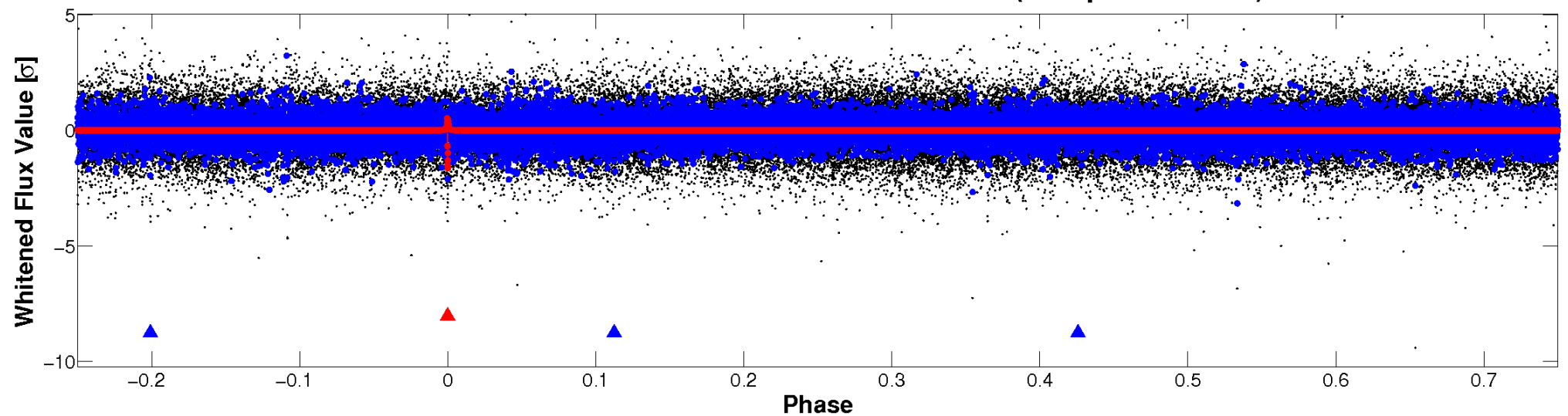


Non-Whitened Vs. Whitened Light Curve

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

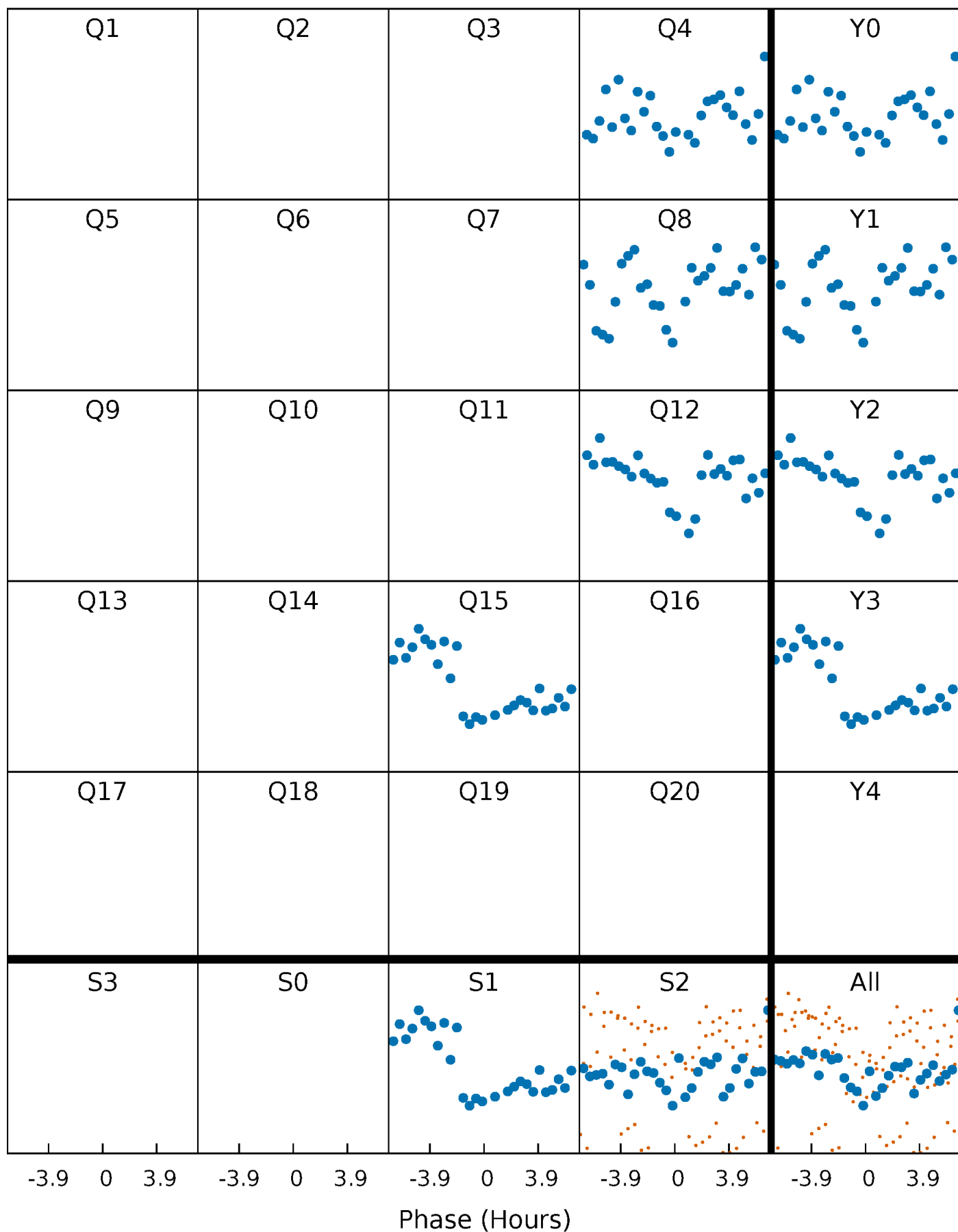


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



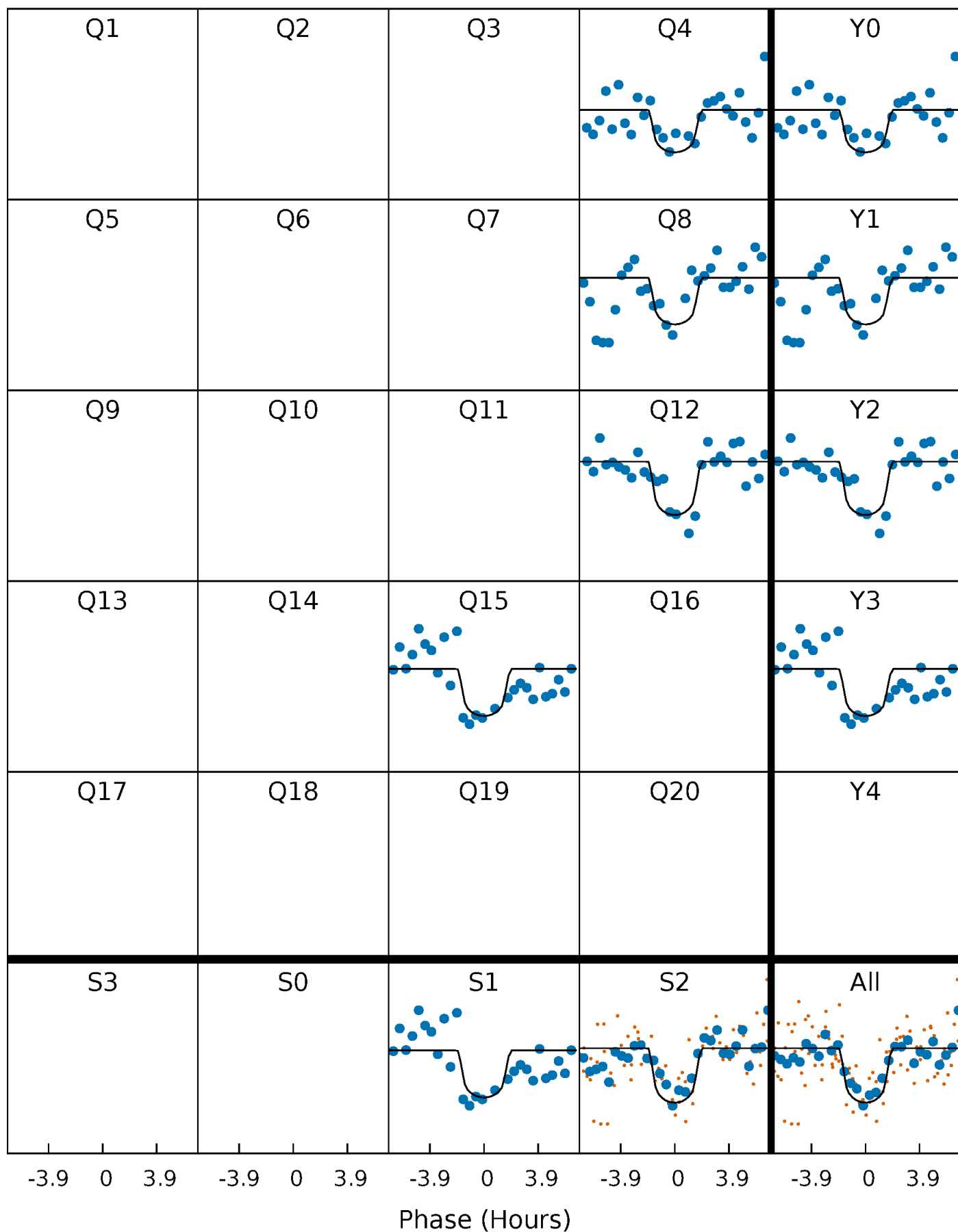
PDC Quarter-Phased Transit Curves

TCE 010972981-01 P=354.124079 Days $T_0=394.396812$ (BKJD)



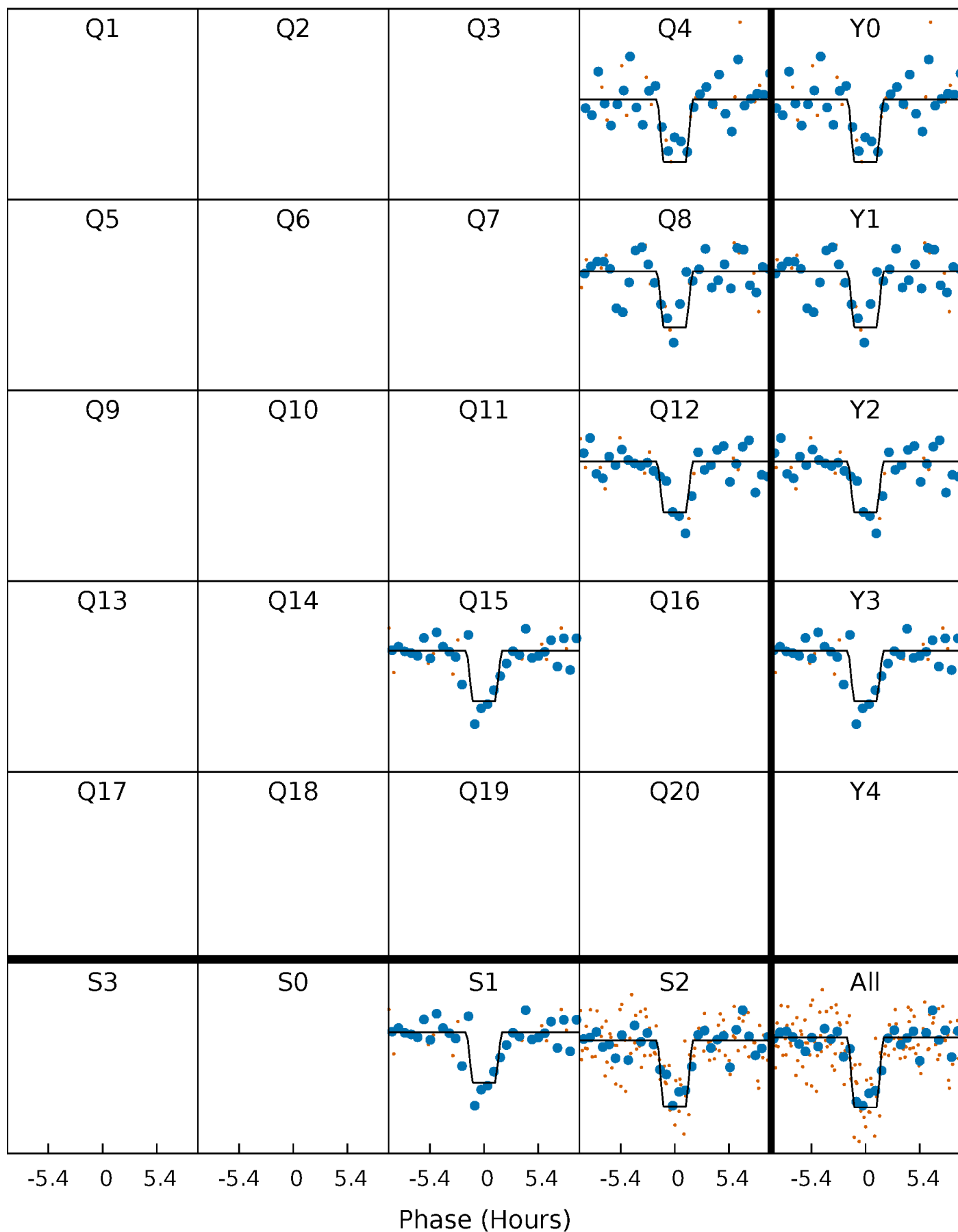
DV Quarter-Phased Transit Curves

TCE 010972981-01 P=354.124079 Days $T_0=394.396812$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

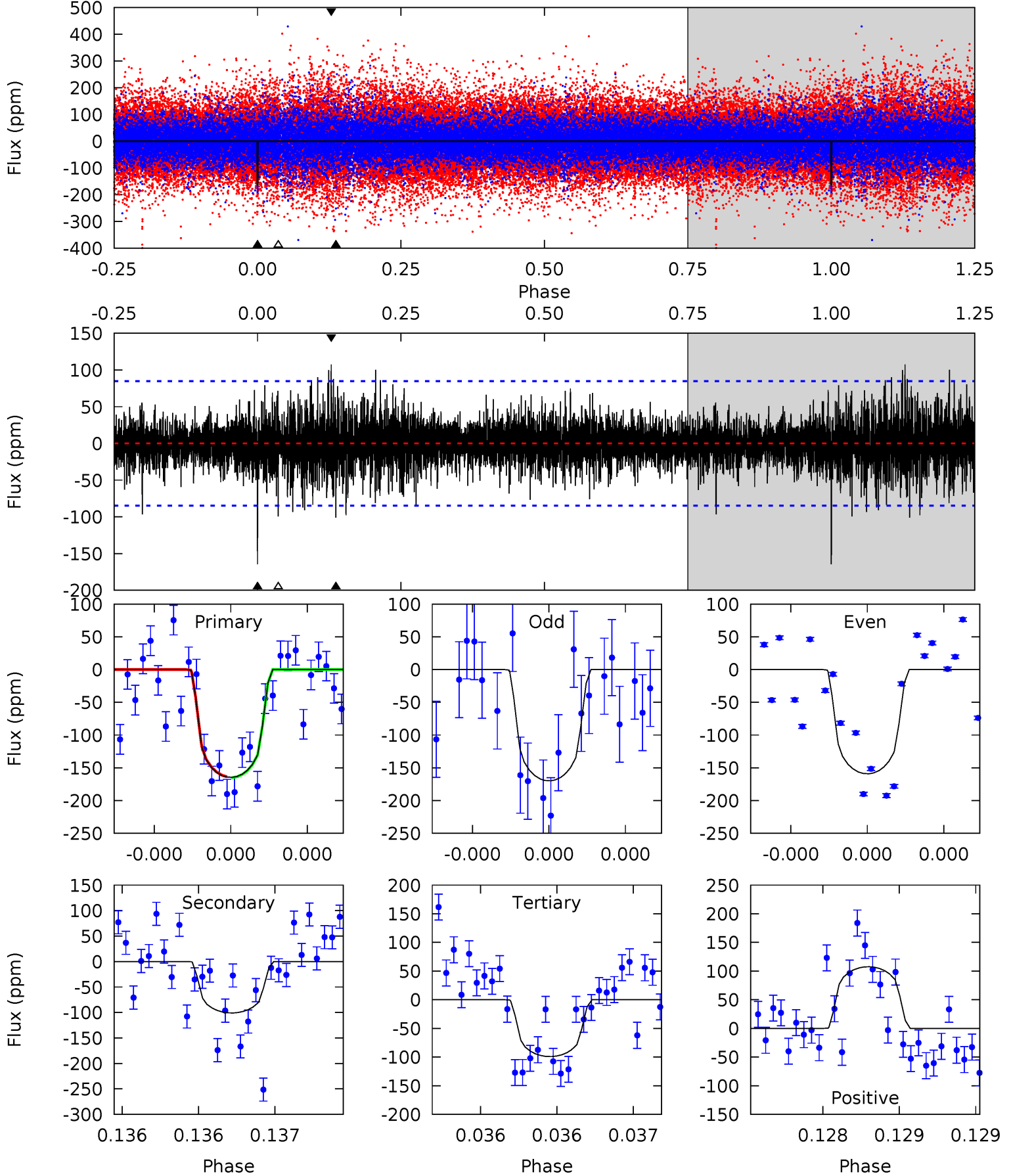
TCE 010972981-01 $P=354.118184$ Days $T_0=394.403881$ (BKJD)



DV Model-Shift Uniqueness Test

010972981-01, $P = 354.124079$ Days, $E = 40.272733$ Days

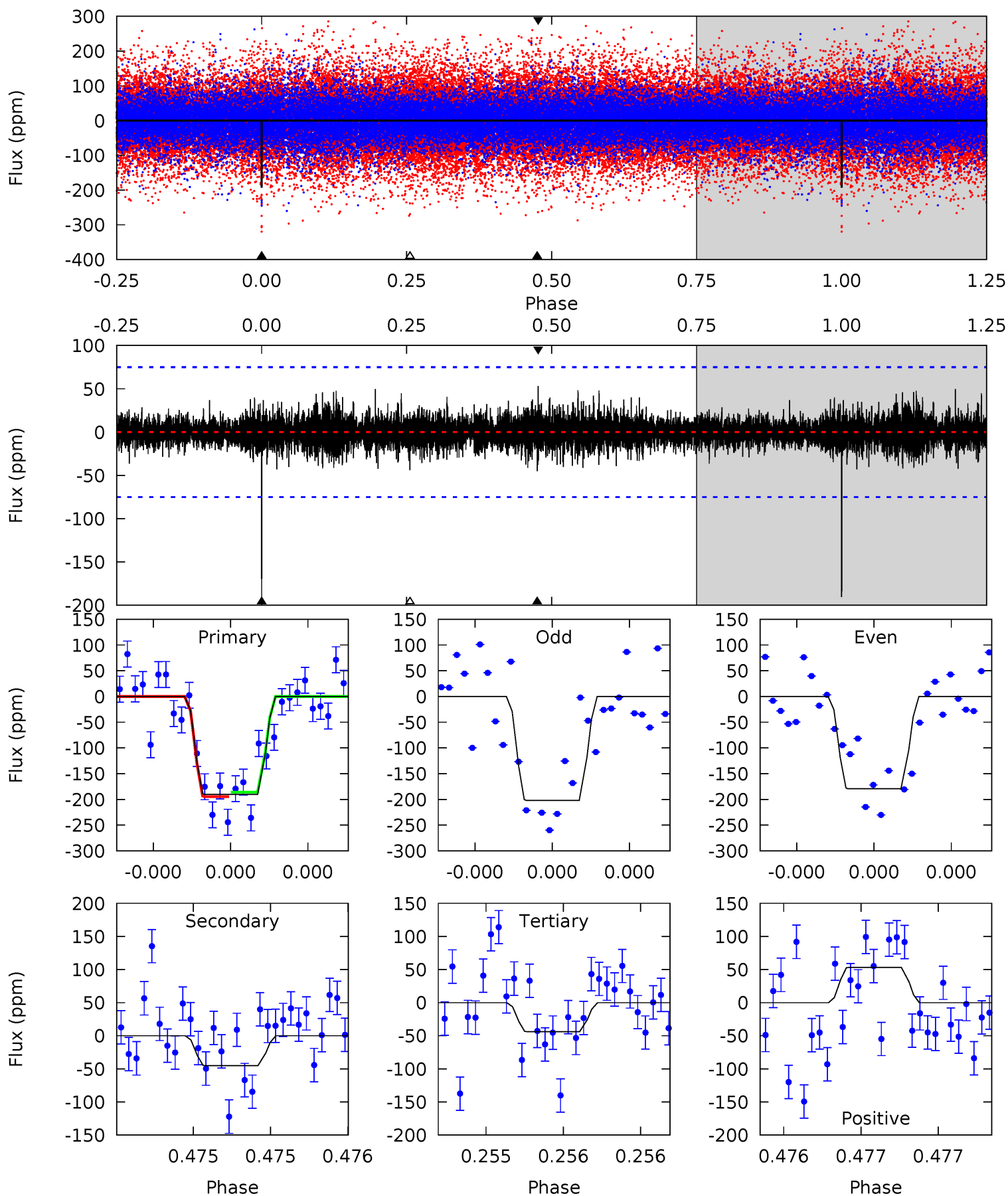
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	6.67	6.55	7.11	5.60	3.52	1.47	4.32	3.77	0.12	-0.44	0.36	1.04	0.40	0.05



Alt Model-Shift Uniqueness Test

010972981-01, P = 354.118184 Days, E = 40.285697 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	3.37	3.28	3.98	5.63	3.56	0.82	11.0	10.3	0.09	-0.60	0.85	1.07	0.22	0.35



Stellar Parameters For KIC 010972981

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5102^{+138}_{-138}	$3.825^{+0.770}_{-0.330}$	$-0.140^{+0.300}_{-0.250}$	$1.961^{+1.202}_{-1.202}$	$0.938^{+0.245}_{-0.183}$	$0.175^{+2.330}_{-0.144}$
	+3%/-3%	+20%/-9%	+214%/-179%	+61%/-61%	+26%/-20%	+1329%/-82%
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 010972981-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-101 ± 15	$3.47^{+3.25}_{-2.26}$	442^{+69}_{-79}	4097^{+2114}_{-725}	4492^{+27993}_{-3380}
Alt.	-45 ± 13	$3.18^{+3.42}_{-2.03}$	443^{+64}_{-80}	3570^{+1608}_{-576}	2146^{+16766}_{-1657}

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

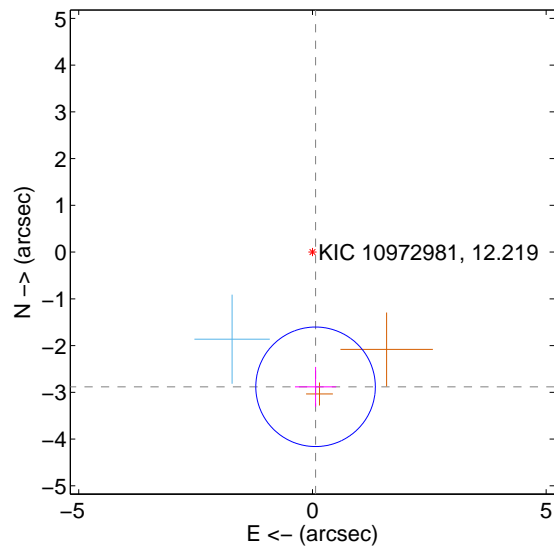
Supplemental centroid analysis for 010972981-01. Kepler magnitude: 12.22. Transit SNR 7.59

There are 1 quarters with good PRF difference image offsets

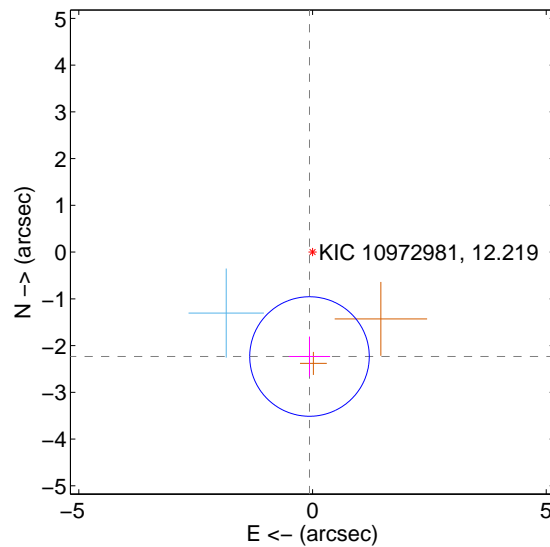
The direct PRF centroid is offset from the target star catalog position by about 0.67 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.883 ± 0.426	6.76	-0.067 ± 0.441	-2.882 ± 0.426
PRF-fit source offset from KIC position	2.235 ± 0.426	5.24	0.065 ± 0.441	-2.234 ± 0.426
photometric centroid source offset	1.45 ± 0.96	1.51	0.06 ± 0.99	1.44 ± 0.96

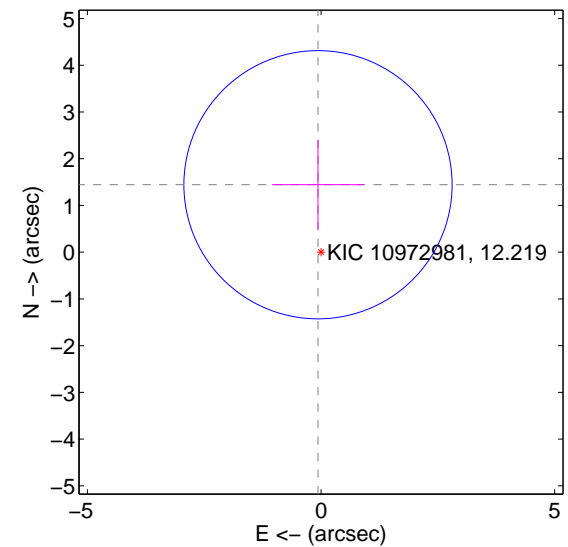
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

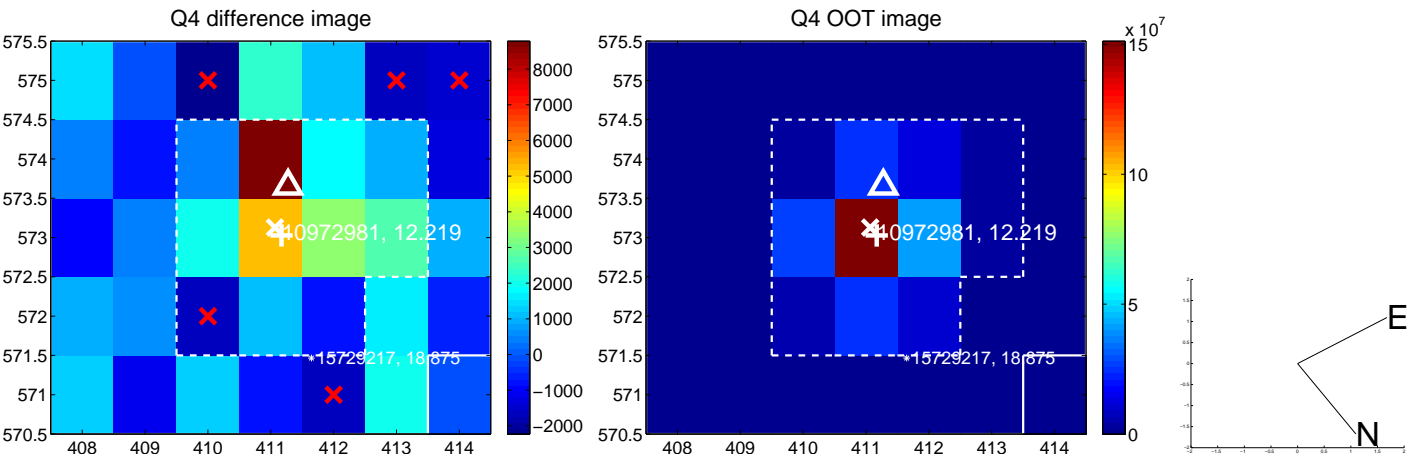


offset from photometric centroids

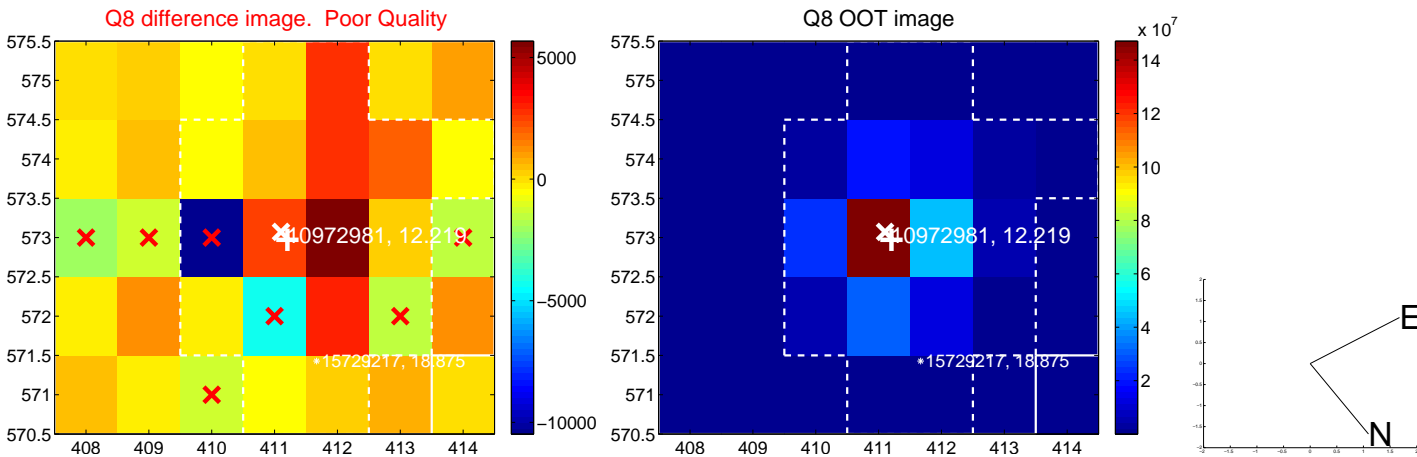


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

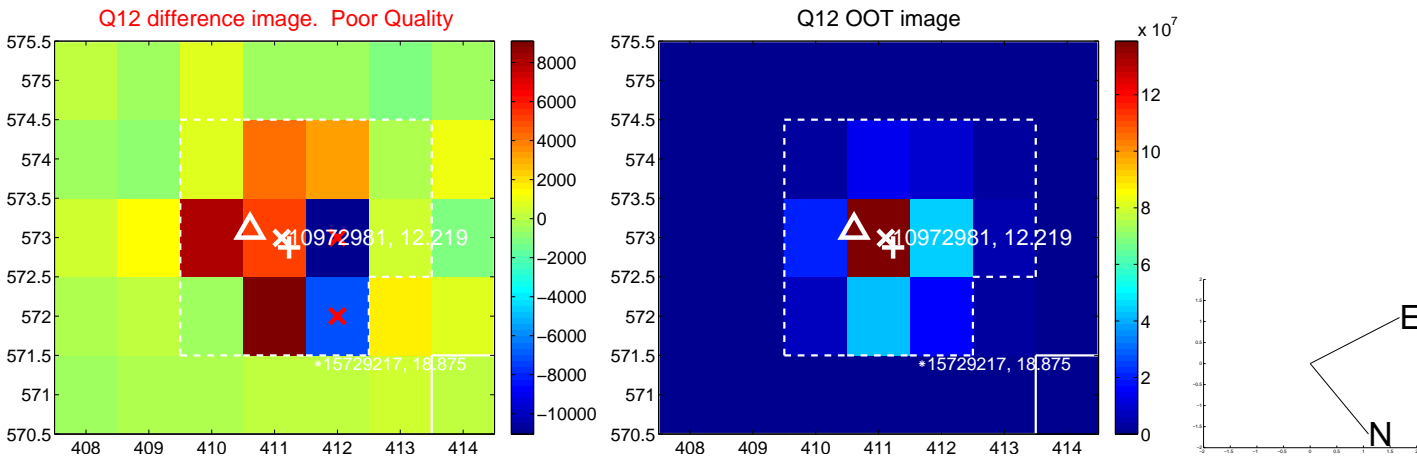
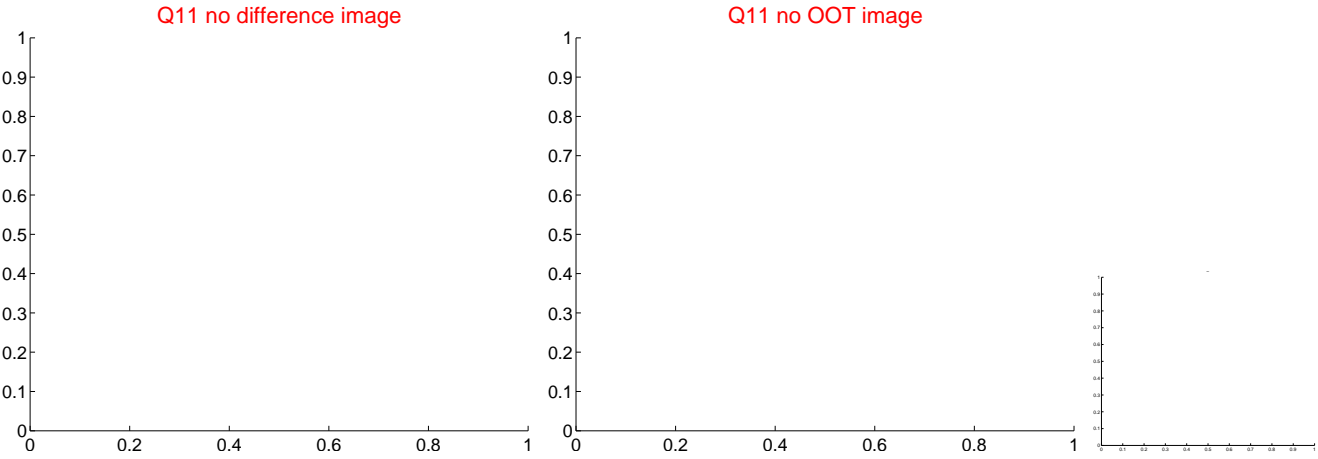
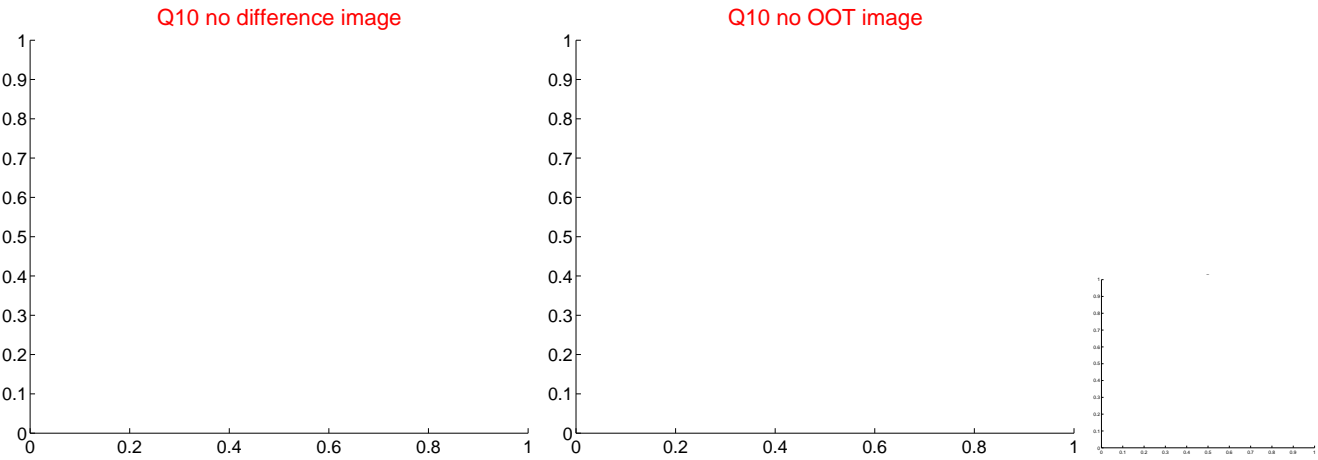
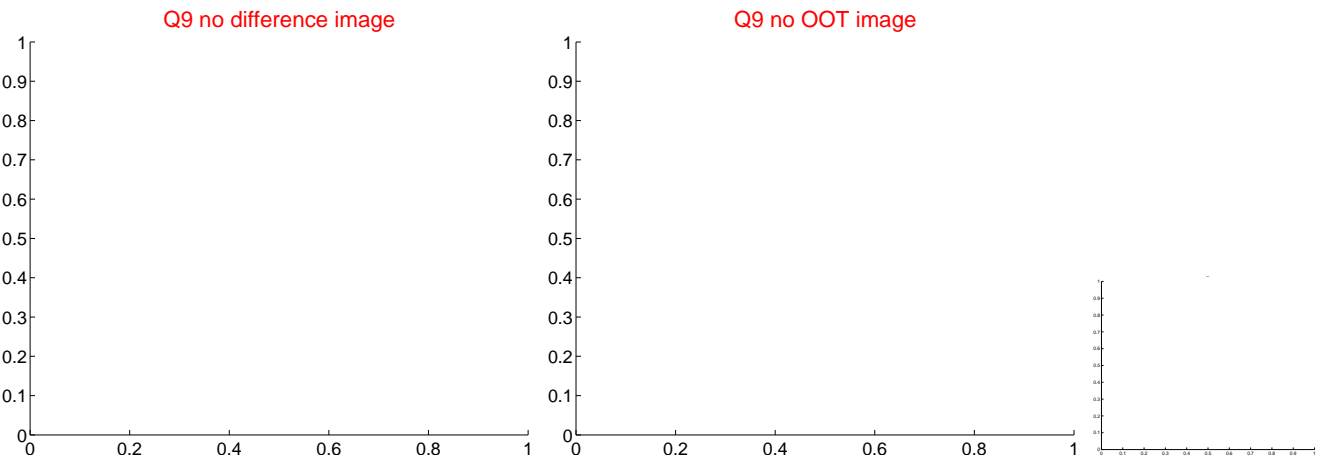
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



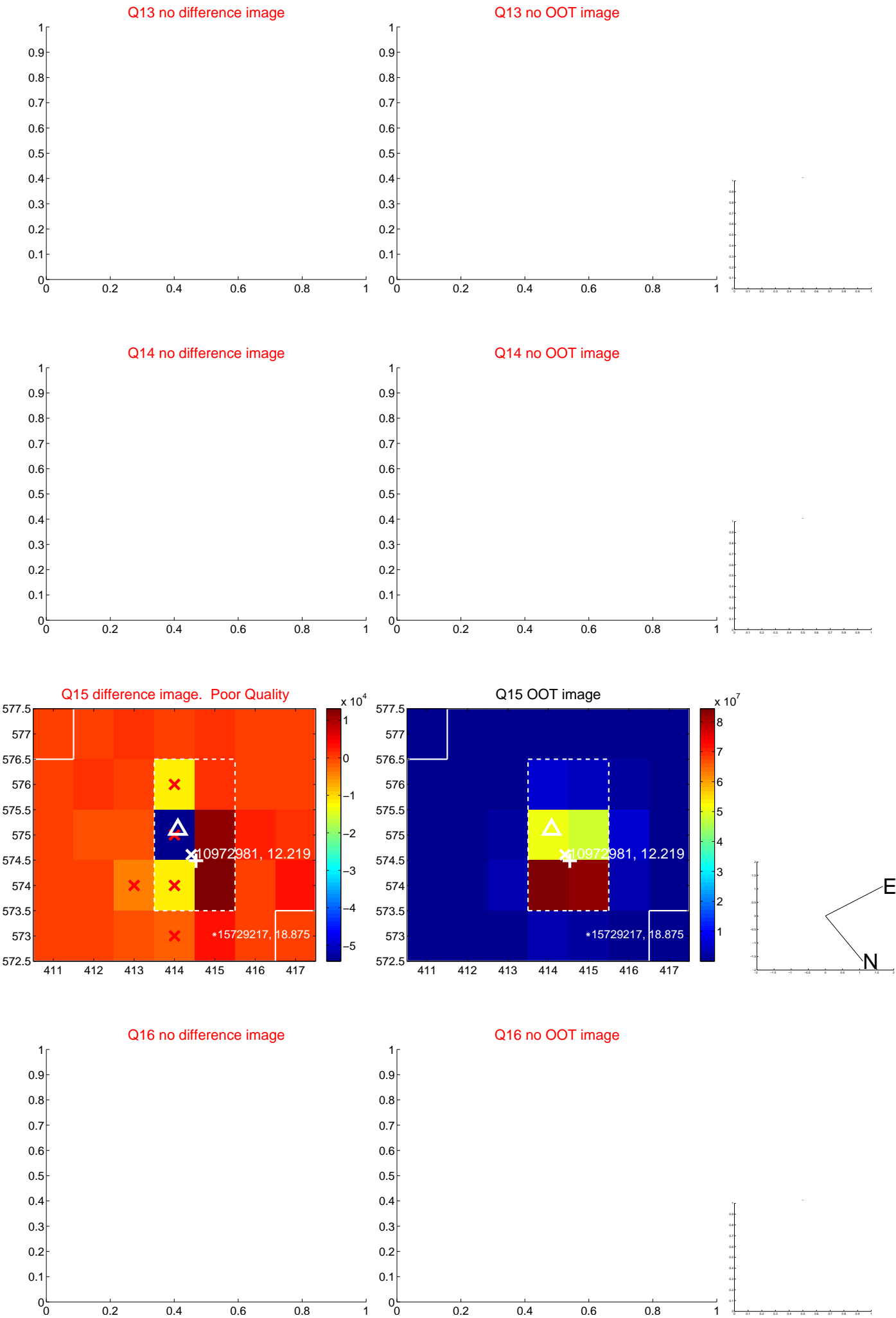
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



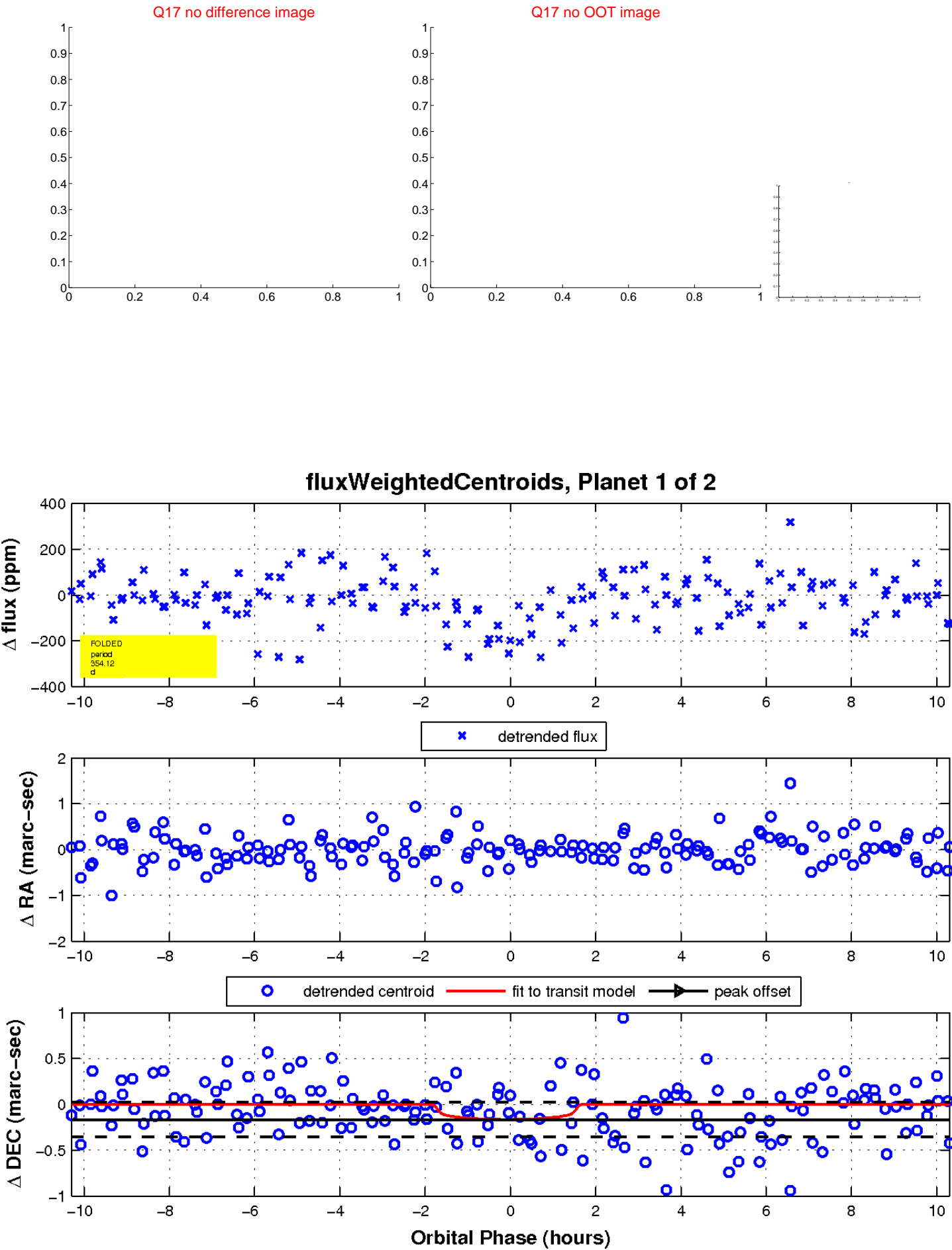
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

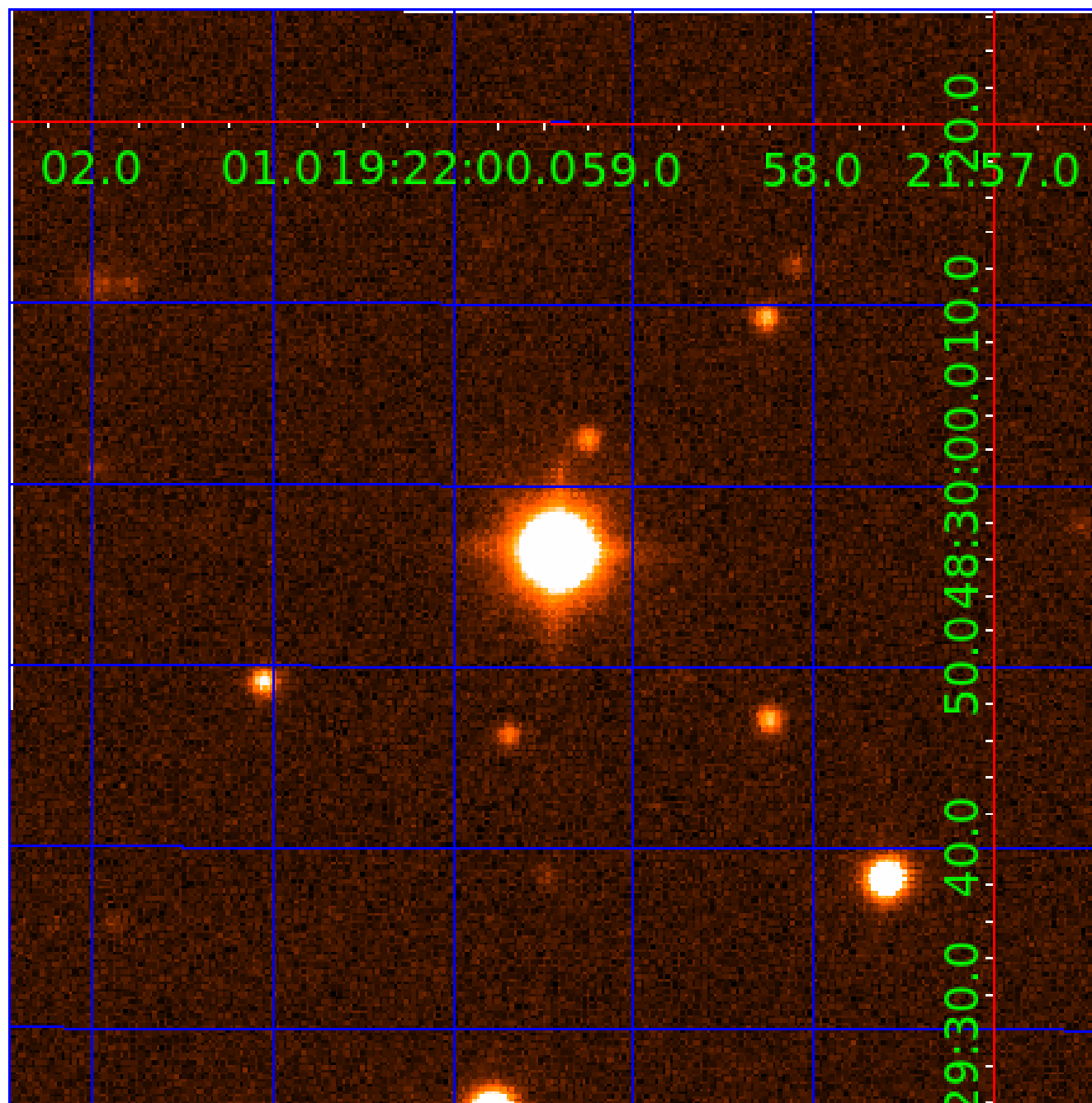


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010972981

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})
010972981-01	OBS	No	354.124079	394.396812	196.6	3.443	11.7	7.6	1.96	5102	3.15	2.54
010972981-02	OBS	No	597.287602	191.070580	260.5	4.418	8.2	8.8	1.96	5102	3.54	1.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010972981-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010972981-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—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.

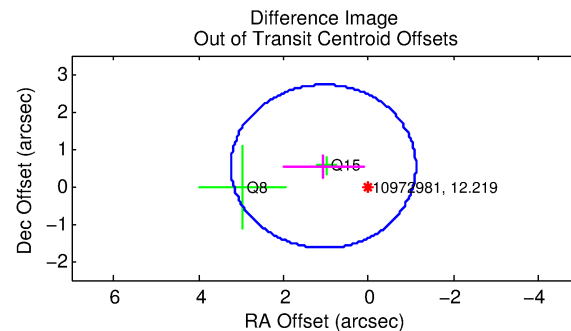
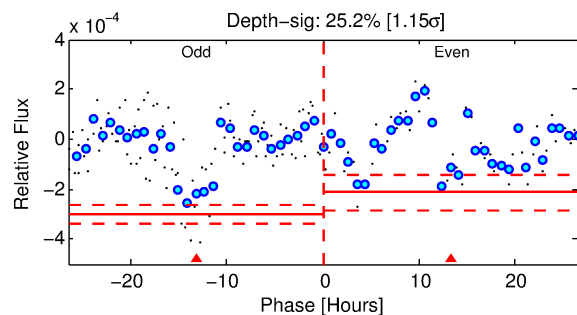
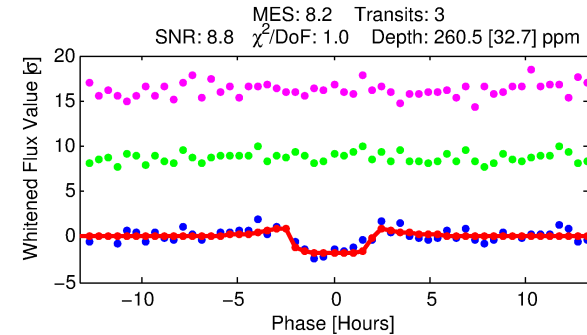
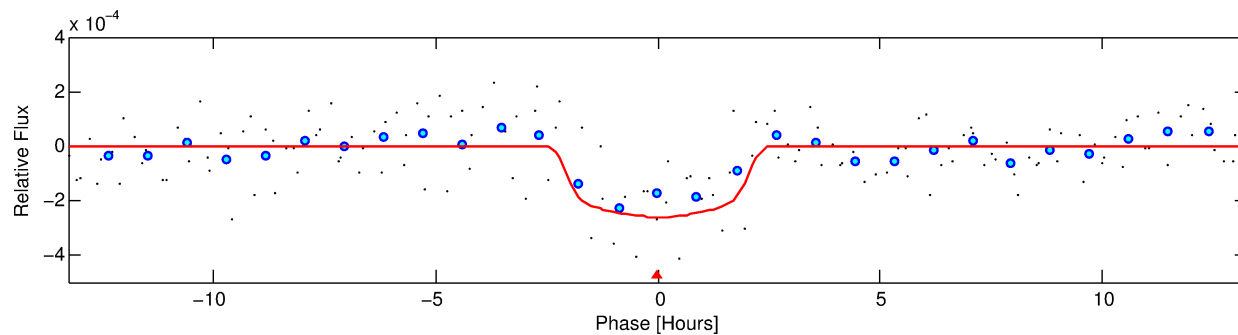
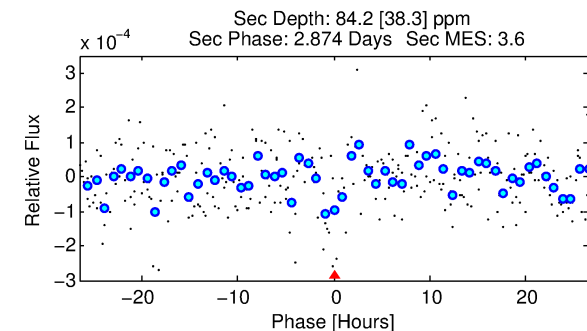
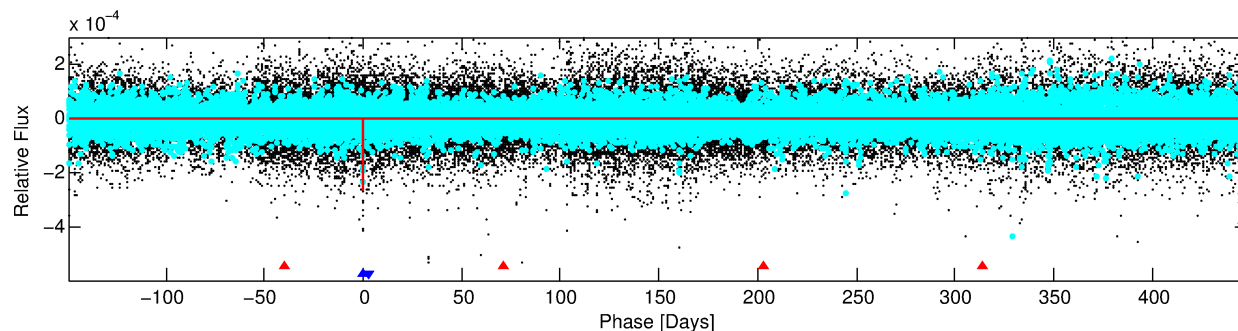
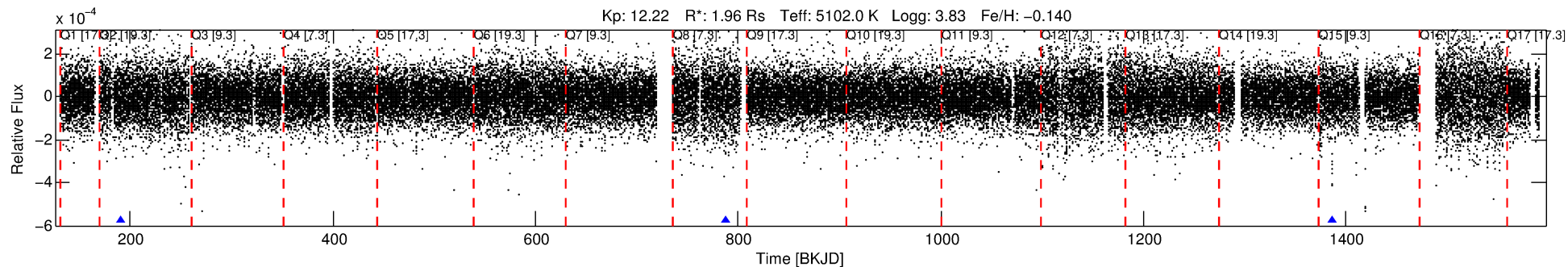
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010972981-02

No Significant Match Found

DV One-Page Summary

KIC: 10972981 Candidate: 2 of 2 Period: 597.288 d



DV Fit Results:

Period = 597.28760 [0.00439] d
Epoch = 191.0706 [0.0064] BKJD
Rp/R* = 0.0166 [0.0160]
a/R* = 642.80 [2385.37]
b = 0.80 [1.67]
Seff = 1.26 [1.59]
Teq = 270 [85] K
Rp = 3.54 [4.06] Re
a = 1.3587 [0.9763] AU
Ag = 6809.52 [15999.58] [0.43σ]
Teff = 3798 [1891] K [1.86σ]

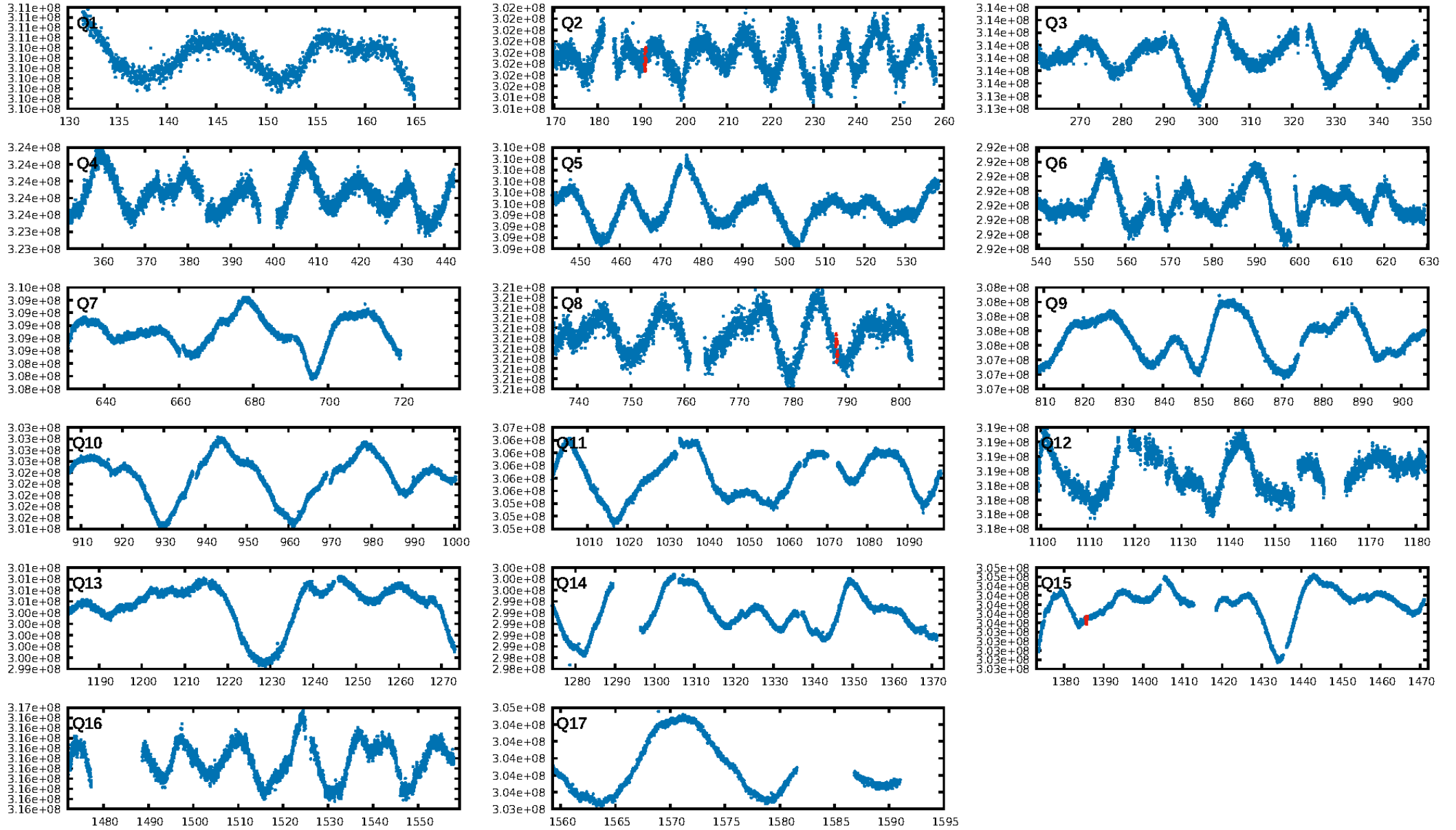
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1041.87σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 7.4%
ModelChiSquareGof-sig: 91.2%
Bootstrap-pfa: 2.55e-15
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -6.969
Centroid-sig: N/A
Centroid-so: 1.731 arcsec [2.10σ]
OotOffset-rm: 1.183 arcsec [1.63σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-rm: 1.670 arcsec [3.10σ]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

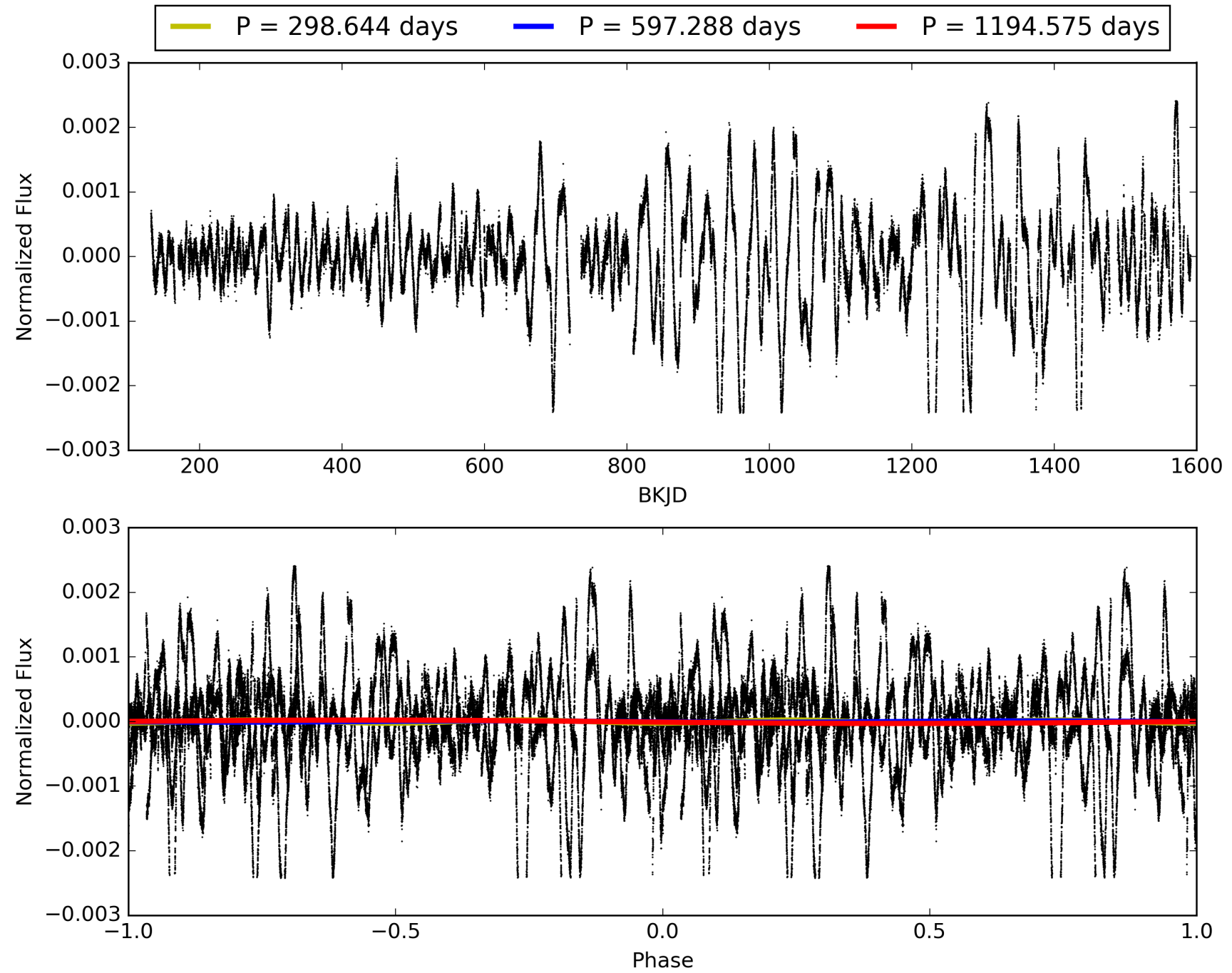
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:43:21 Z

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

TCE 010972981-02, PDC Light Curves

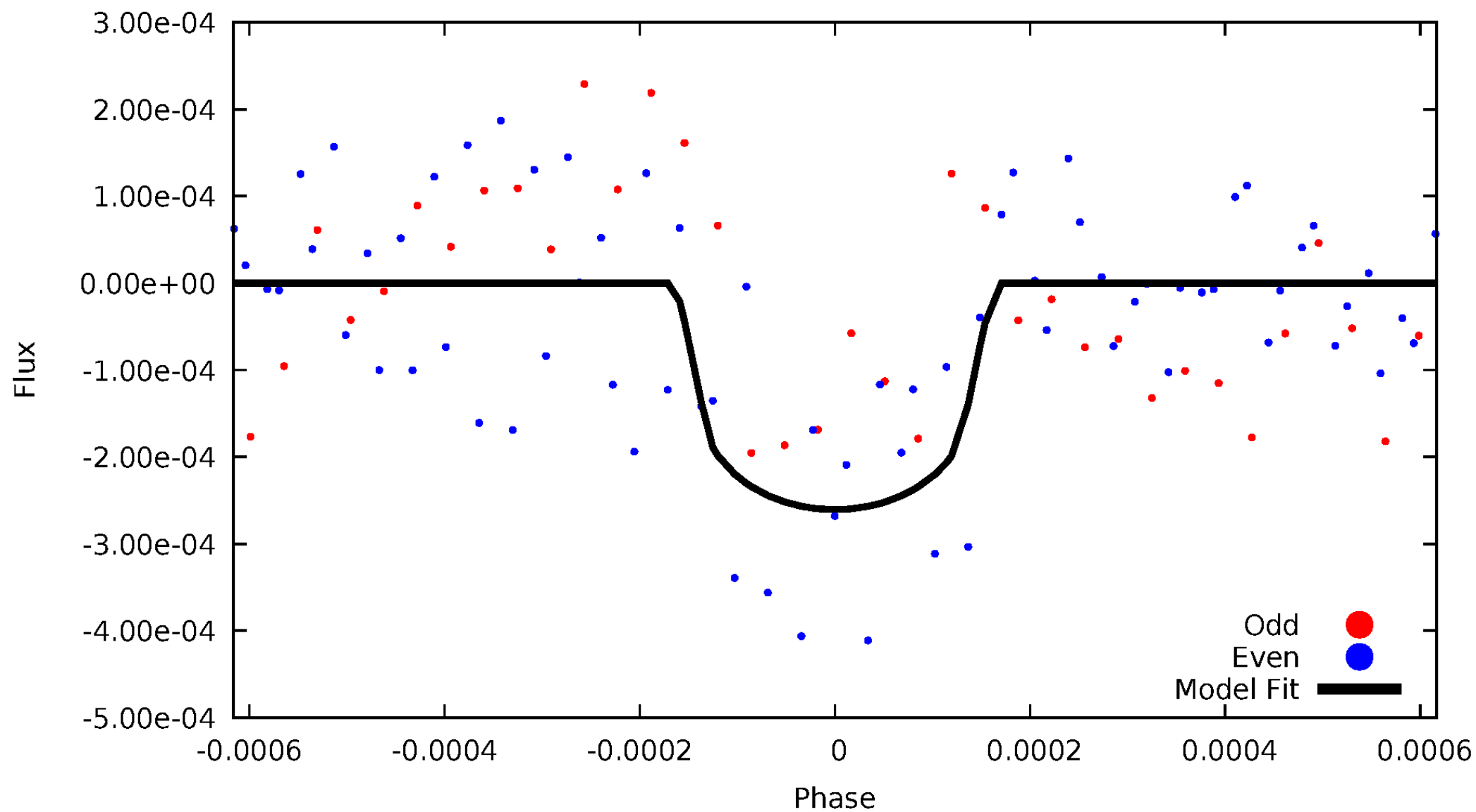


TCE 010972981-02



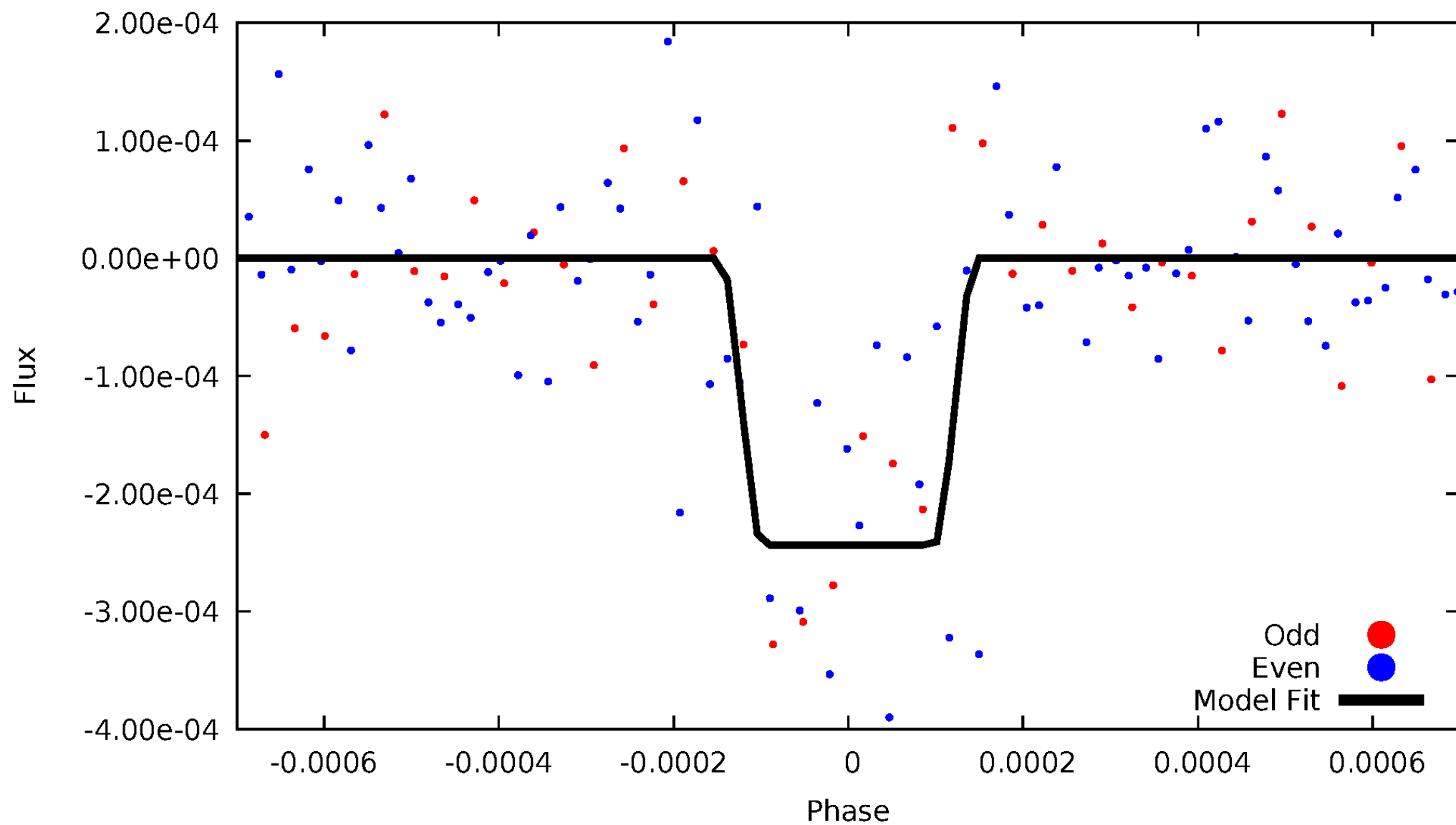
DV Odd/Even

TCE 010972981-02



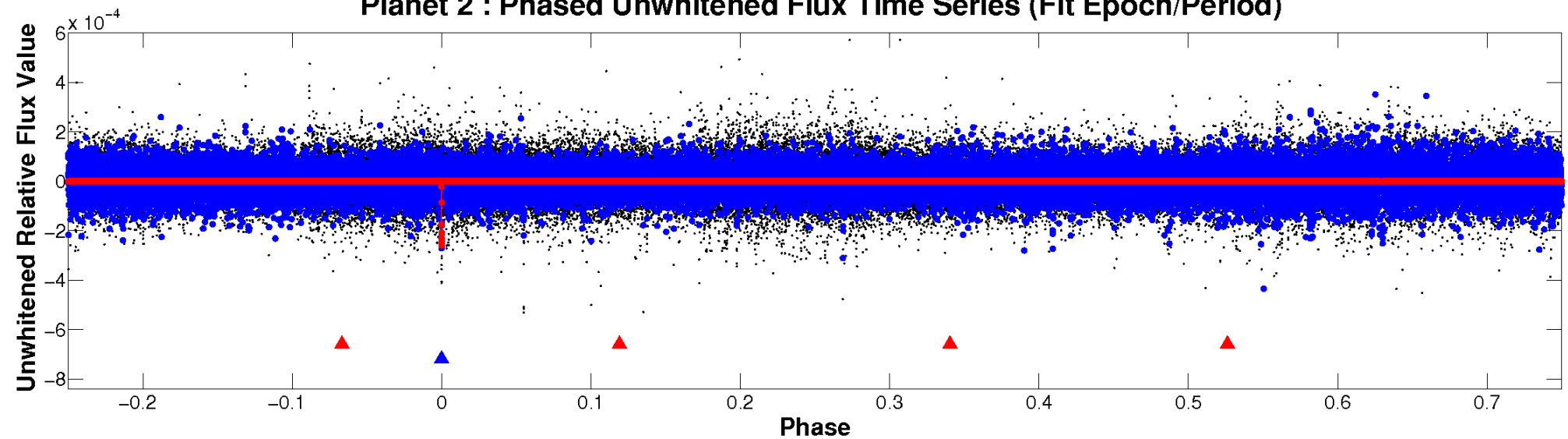
ALT Odd/Even

TCE 010972981-02

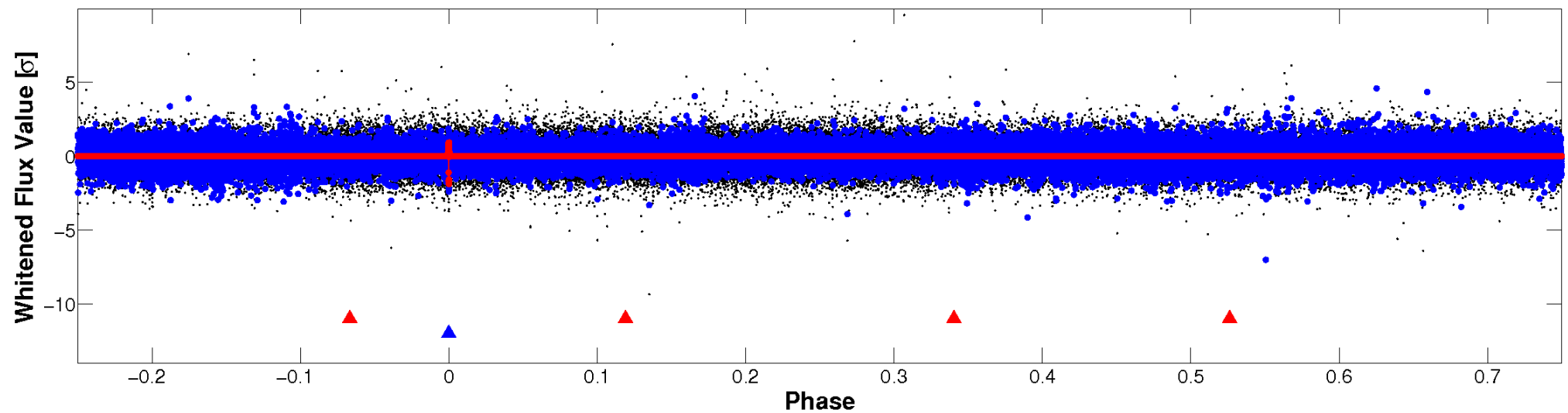


Non-Whitened Vs. Whitened Light Curve

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

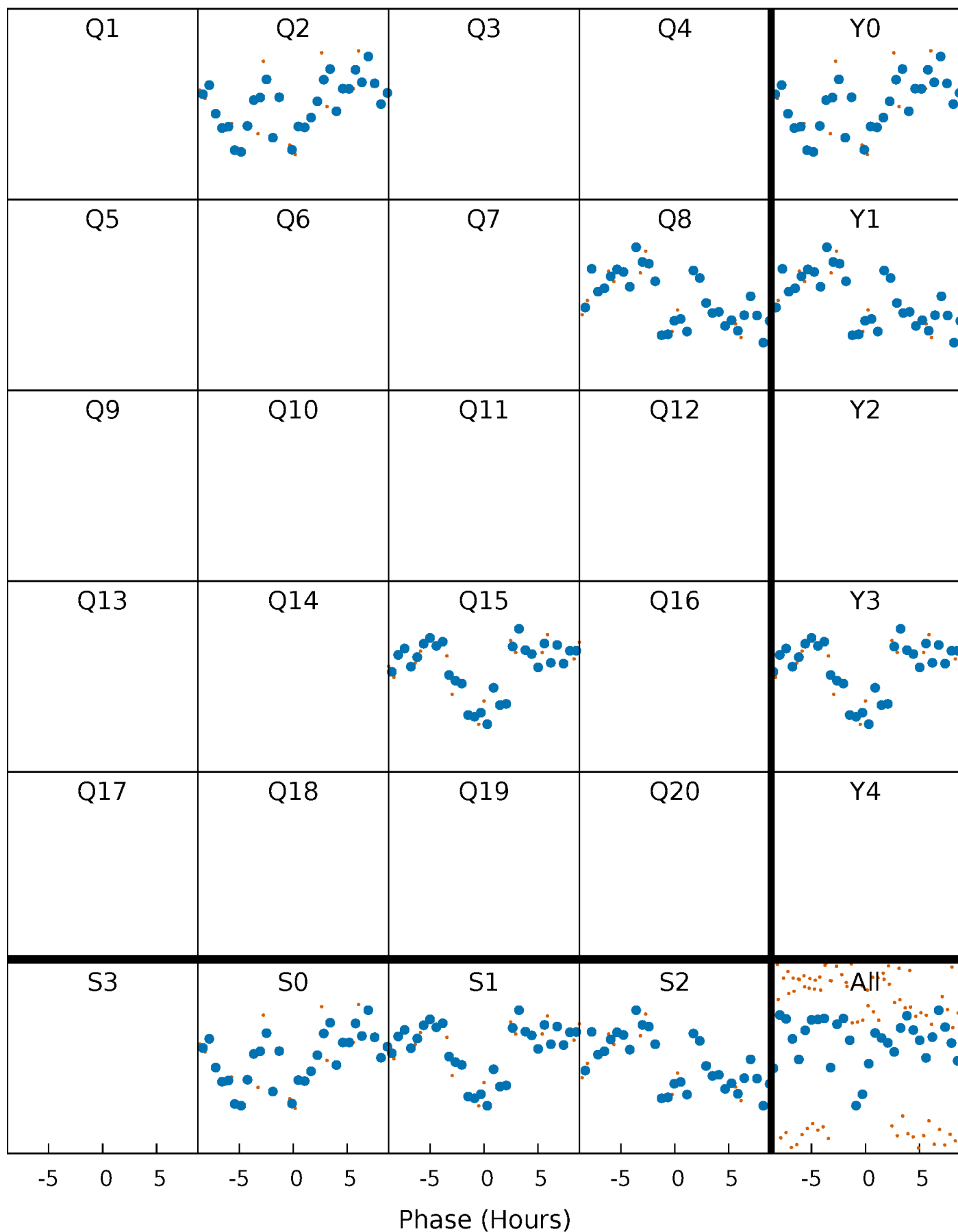


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



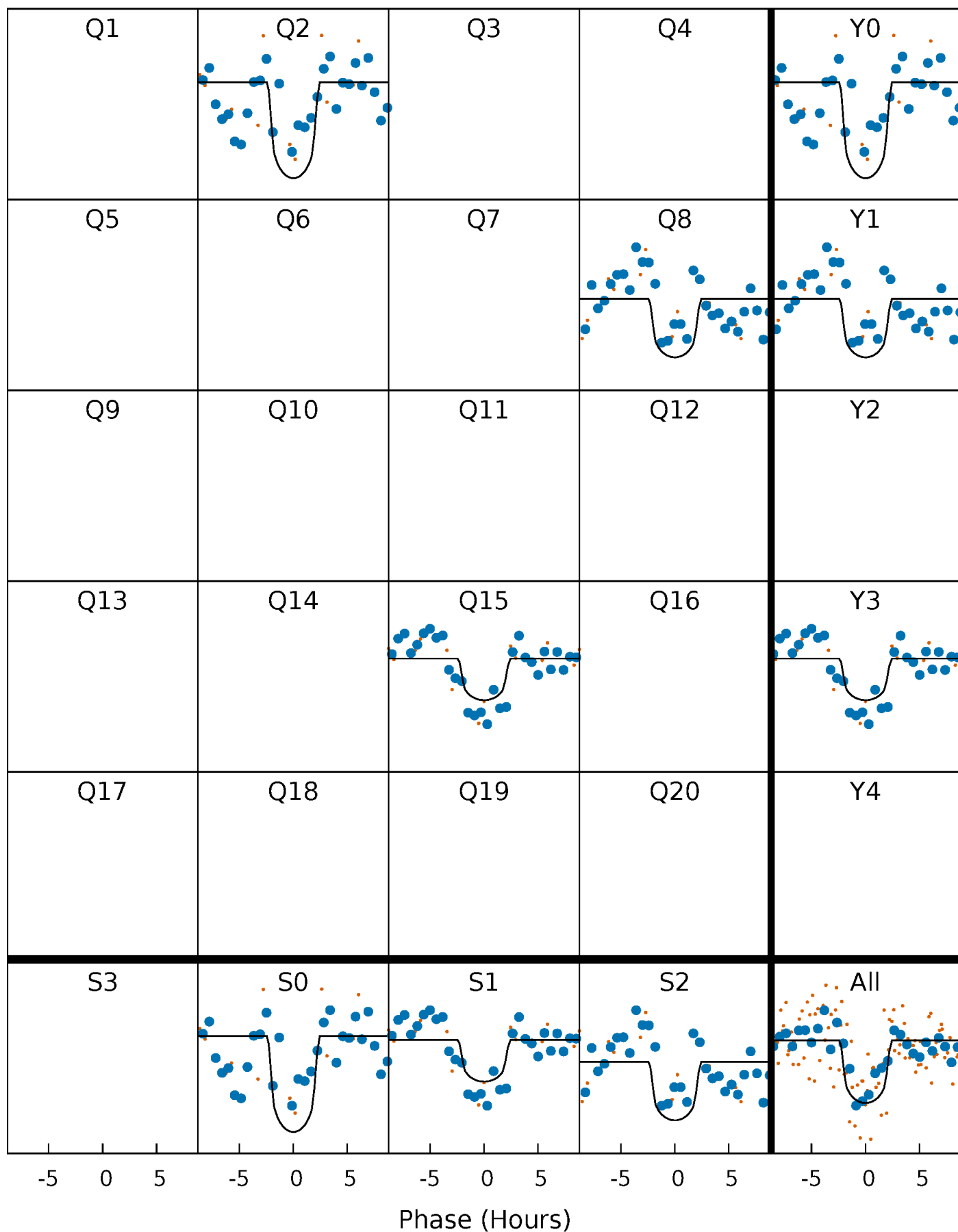
PDC Quarter-Phased Transit Curves

TCE 010972981-02 $P=597.287602$ Days $T_0=191.070580$ (BKJD)



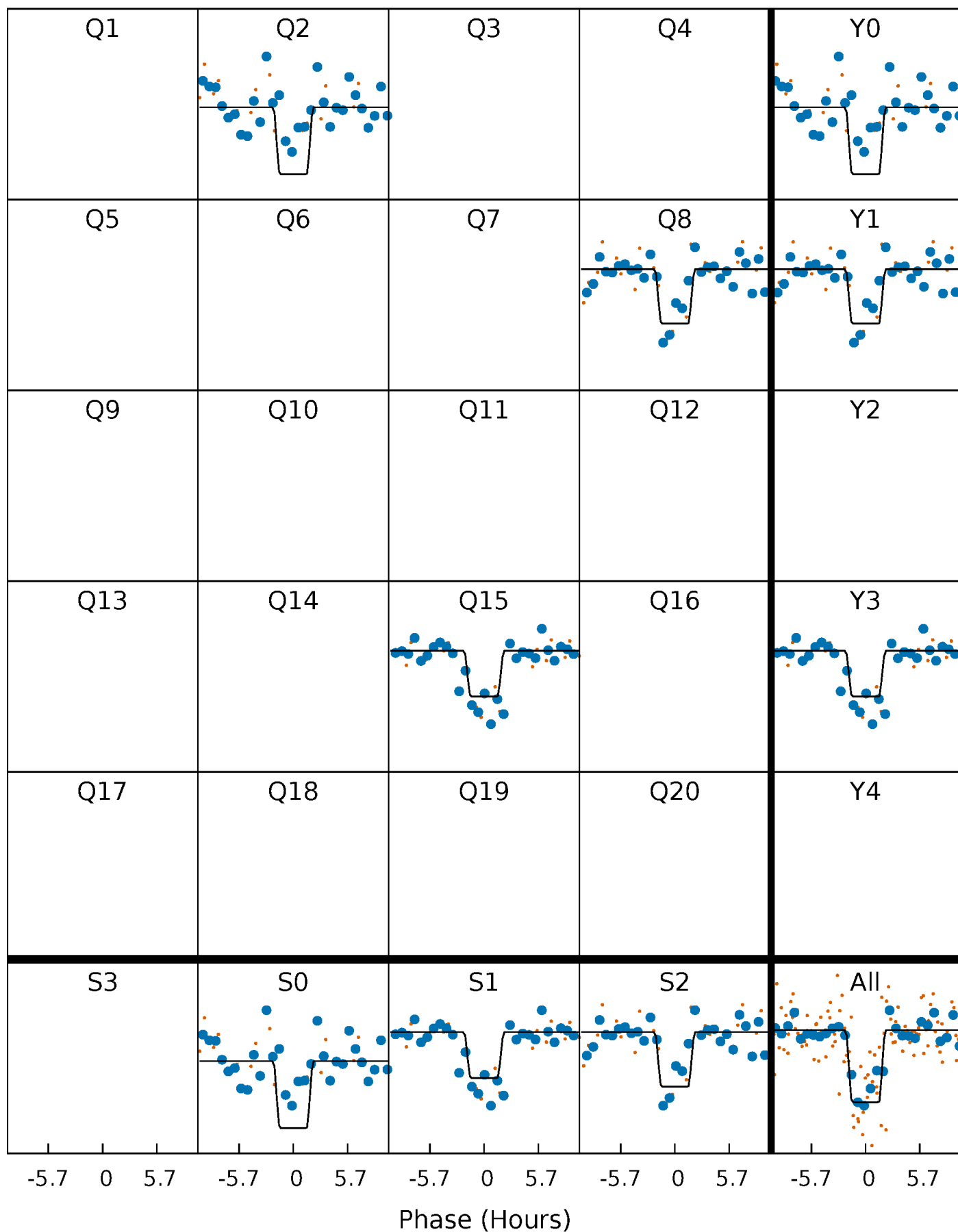
DV Quarter-Phased Transit Curves

TCE 010972981-02 $P=597.287602$ Days $T_0=191.070580$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

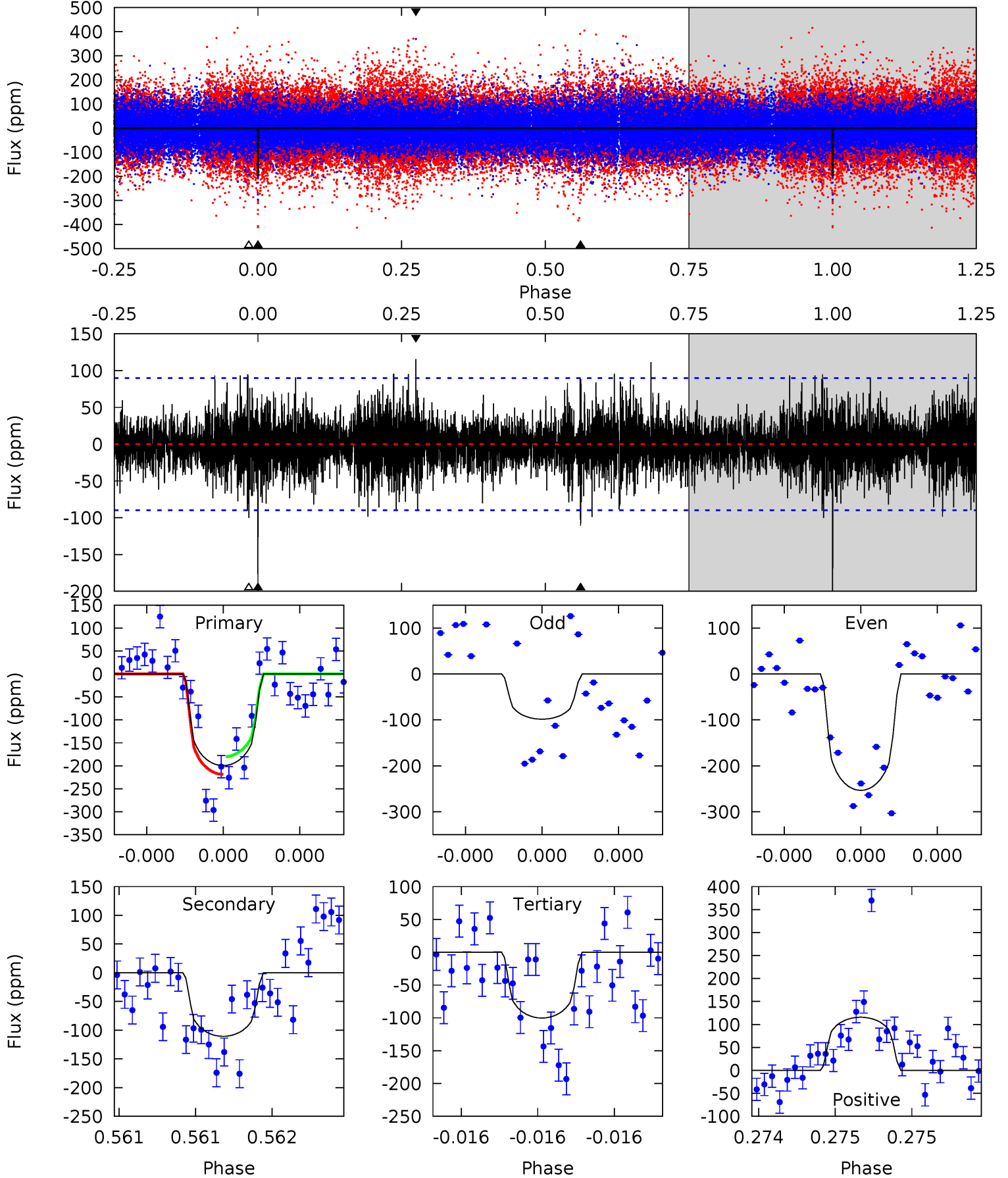
TCE 010972981-02 P=597.279770 Days $T_0=191.078450$ (BKJD)



DV Model-Shift Uniqueness Test

010972981-02, P = 597.287602 Days, E = 191.070580 Days

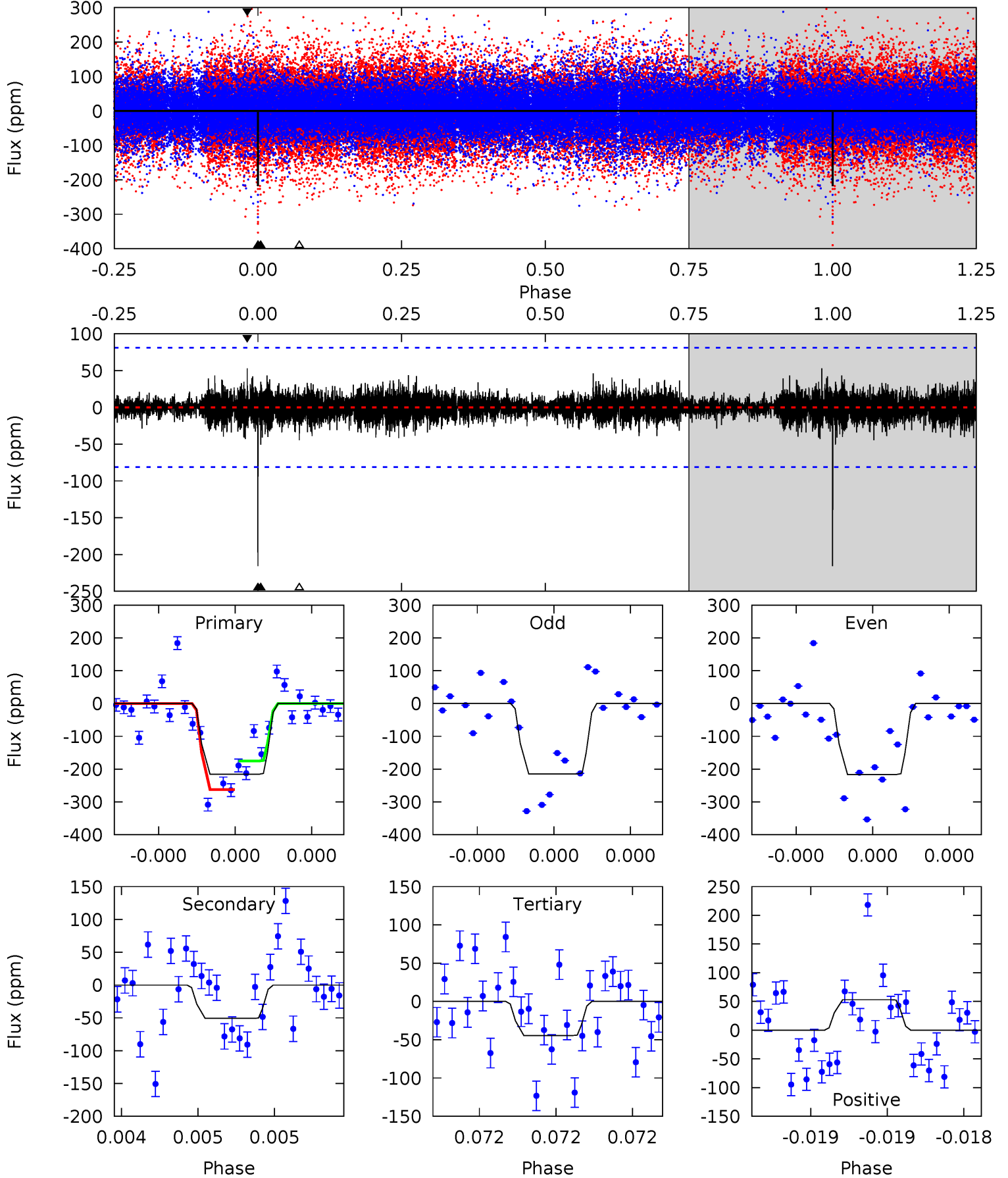
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	6.97	6.31	7.28	5.65	3.59	1.54	6.24	5.27	0.66	-0.31	4.74	1.45	0.37	1.20



Alt Model-Shift Uniqueness Test

010972981-02, $P = 597.279770$ Days, $E = 191.078450$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.1	3.55	3.11	3.71	5.68	3.64	0.70	12.0	11.4	0.44	-0.16	0.07	0.93	0.20	3.03



Stellar Parameters For KIC 010972981

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5102^{+138}_{-138}	$3.825^{+0.770}_{-0.330}$	$-0.140^{+0.300}_{-0.250}$	$1.961^{+1.202}_{-1.202}$	$0.938^{+0.245}_{-0.183}$	$0.175^{+2.330}_{-0.144}$
	+3%/-3%	+20%/-9%	+214%/-179%	+61%/-61%	+26%/-20%	+1329%/-82%
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 010972981-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-111 ± 16	$3.57^{+3.80}_{-2.17}$	371^{+53}_{-66}	4014^{+1992}_{-659}	8646^{+53966}_{-6578}
Alt.	-51 ± 14	$3.54^{+3.69}_{-2.25}$	370^{+61}_{-65}	3597^{+1473}_{-623}	3826^{+27418}_{-2860}

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

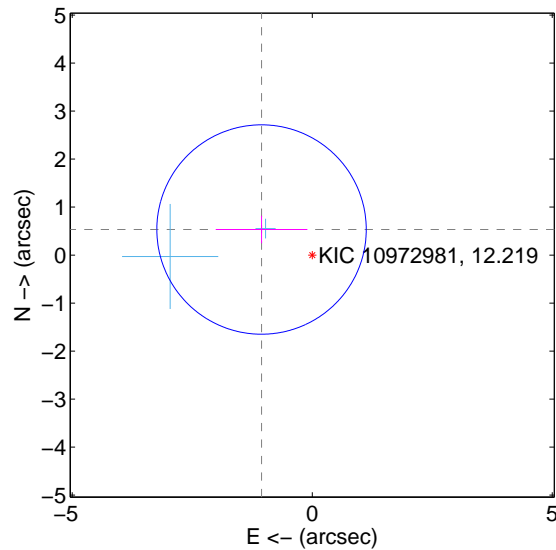
Supplemental centroid analysis for 010972981-02. Kepler magnitude: 12.22. Transit SNR 8.77

There are 2 quarters with good PRF difference image offsets

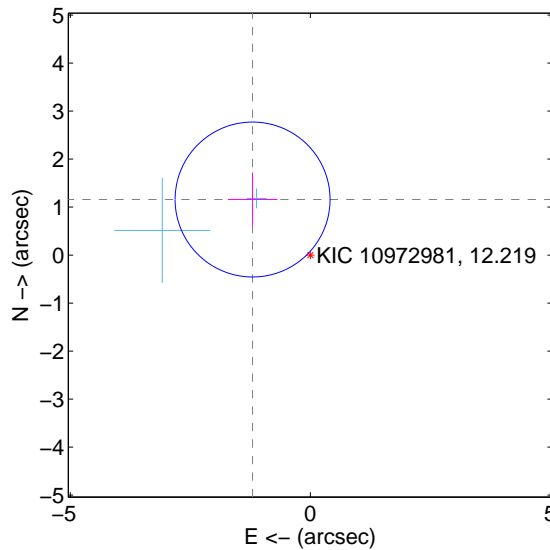
The direct PRF centroid is offset from the target star catalog position by about 0.64 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.183 ± 0.727	1.63	1.056 ± 0.954	0.533 ± 0.287
PRF-fit source offset from KIC position	1.670 ± 0.538	3.10	1.203 ± 0.516	1.158 ± 0.560
photometric centroid source offset	1.73 ± 0.82	2.10	-0.19 ± 0.68	1.72 ± 0.82

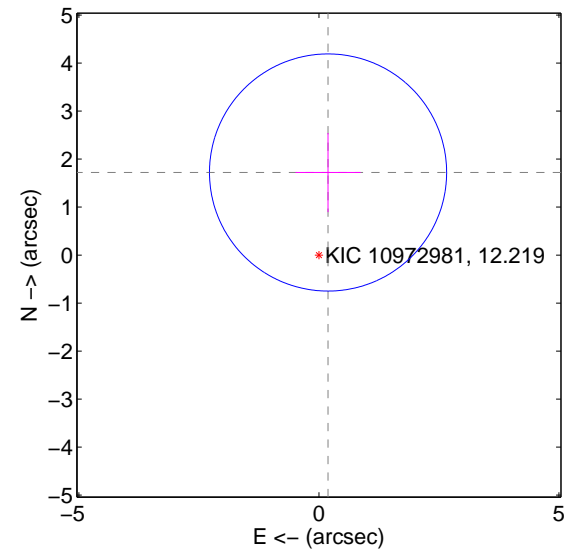
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

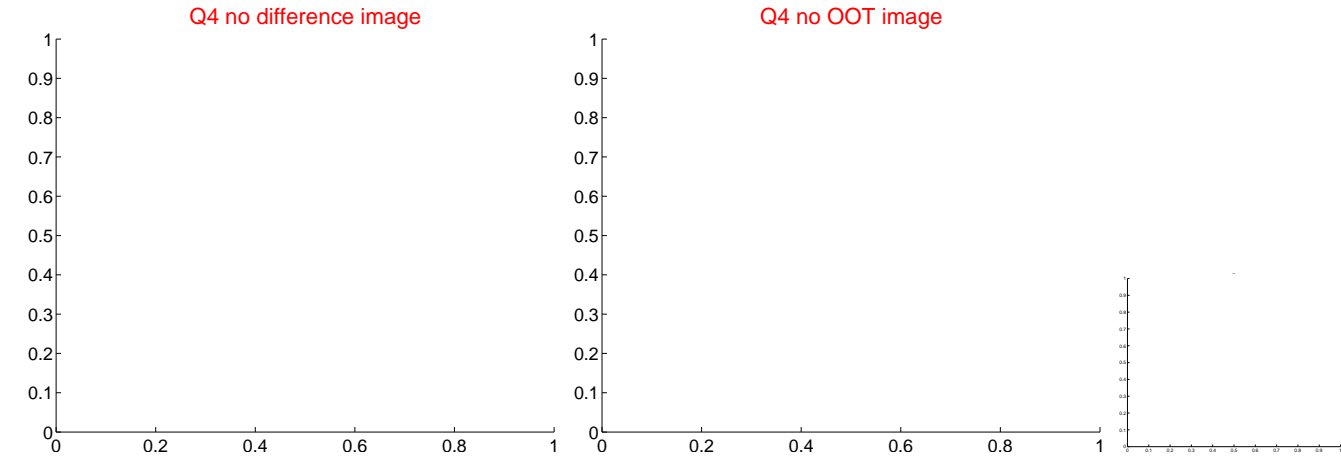
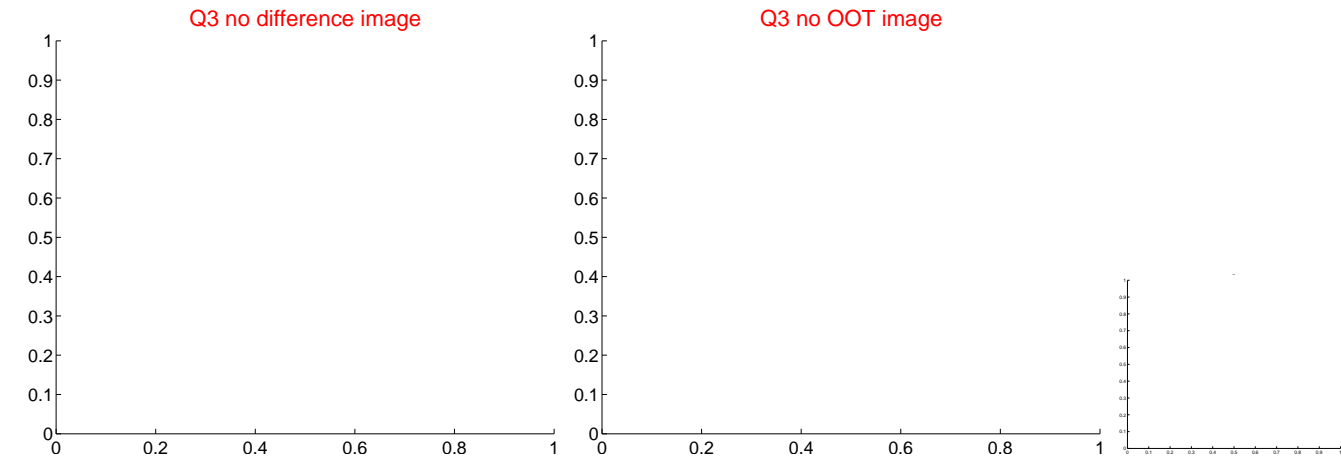
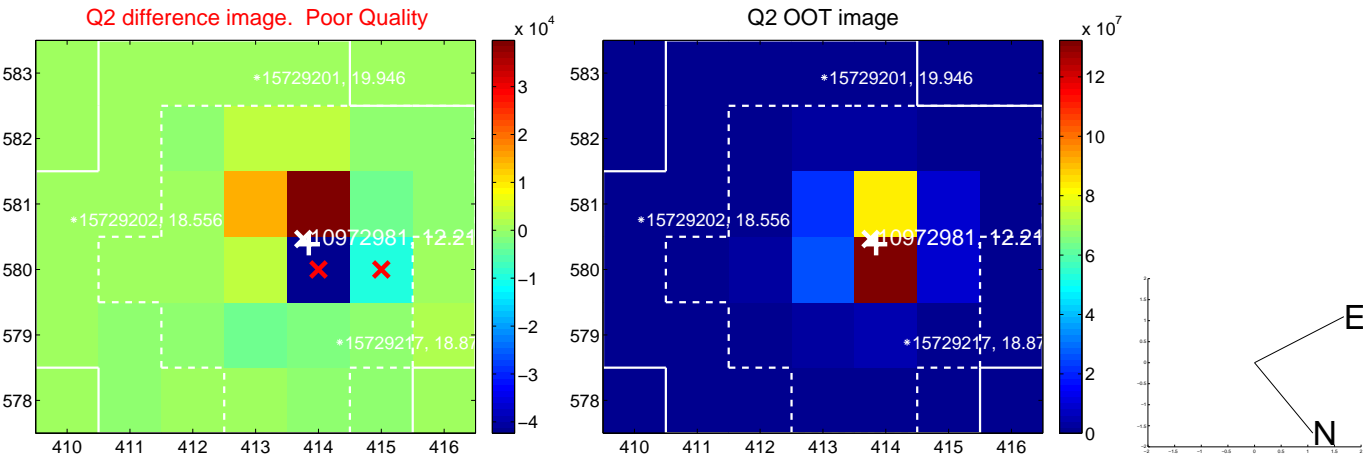
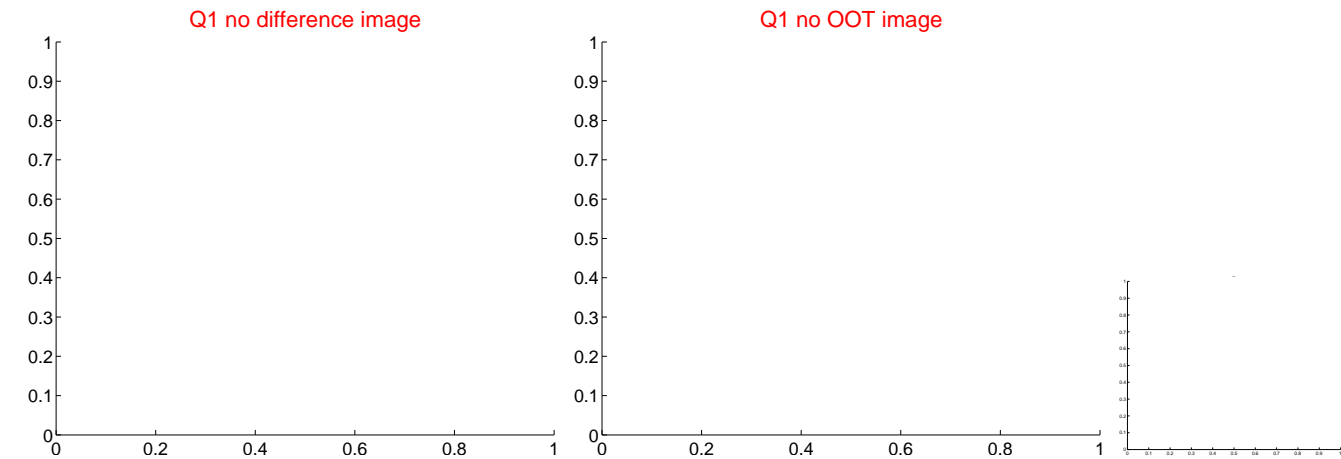


offset from photometric centroids



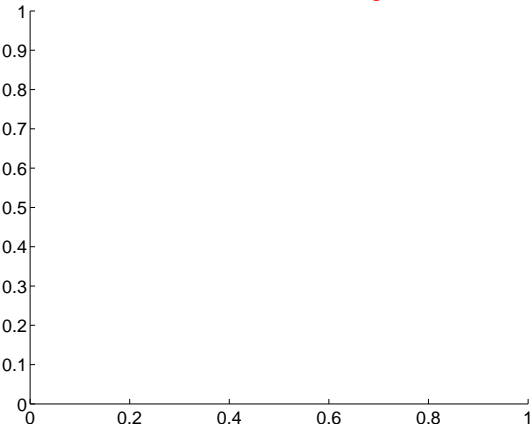
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . 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 \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

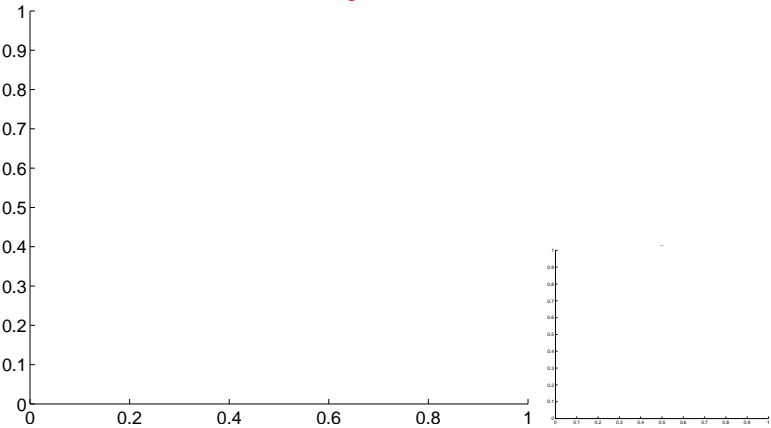


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

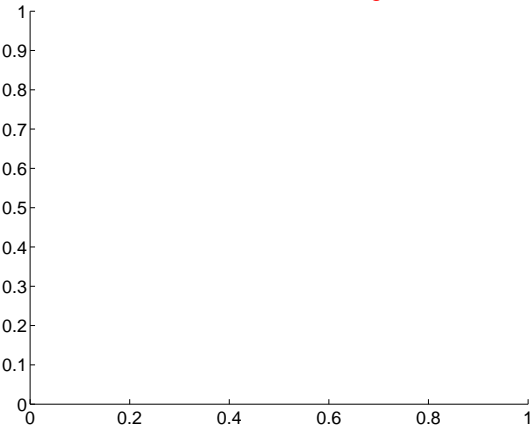
Q5 no difference image



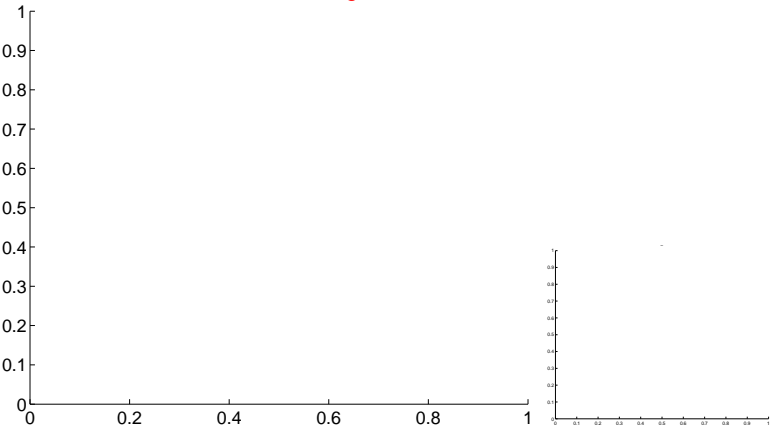
Q5 no OOT image



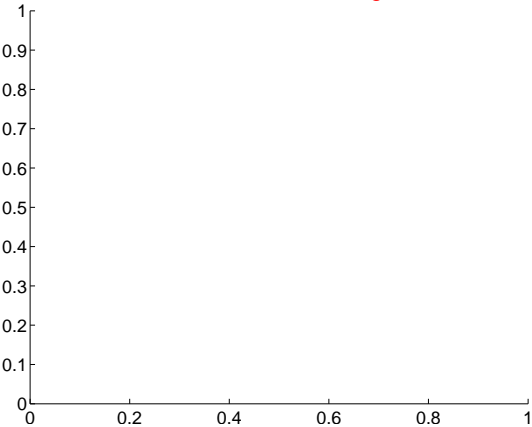
Q6 no difference image



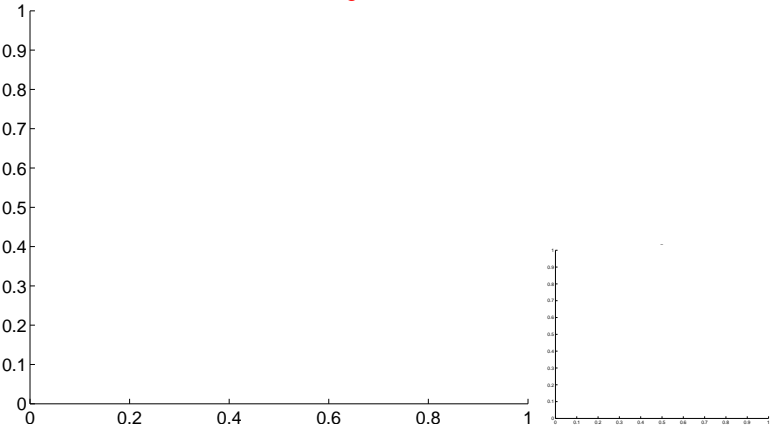
Q6 no OOT image



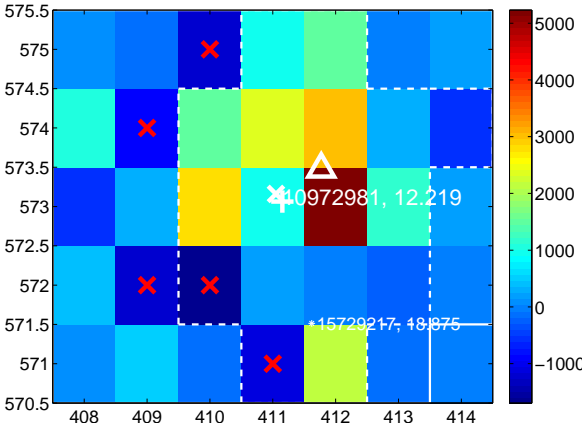
Q7 no difference image



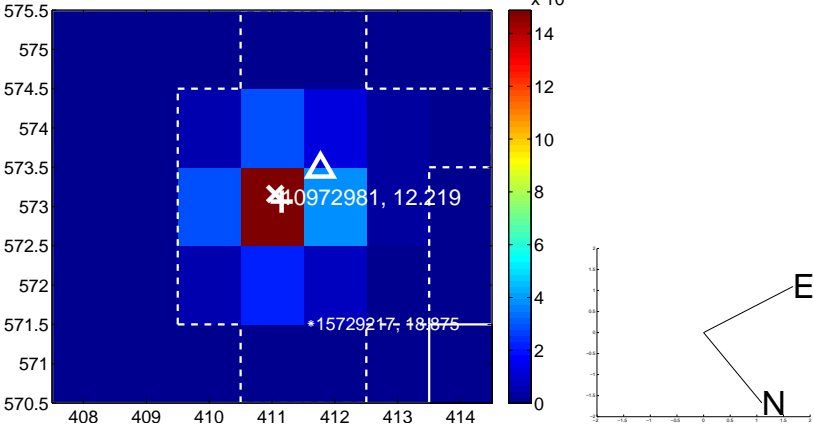
Q7 no OOT image



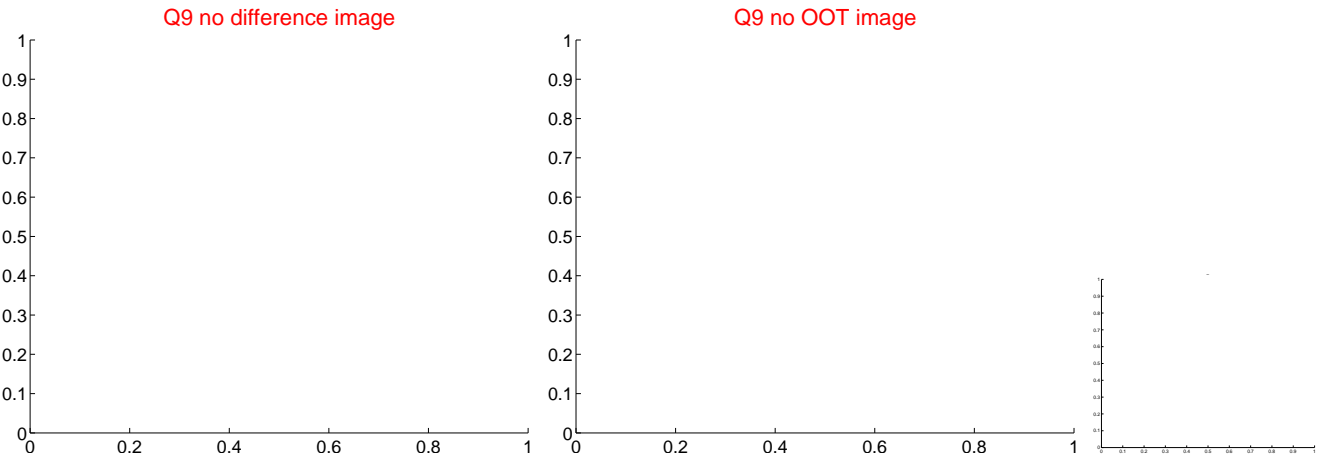
Q8 difference image



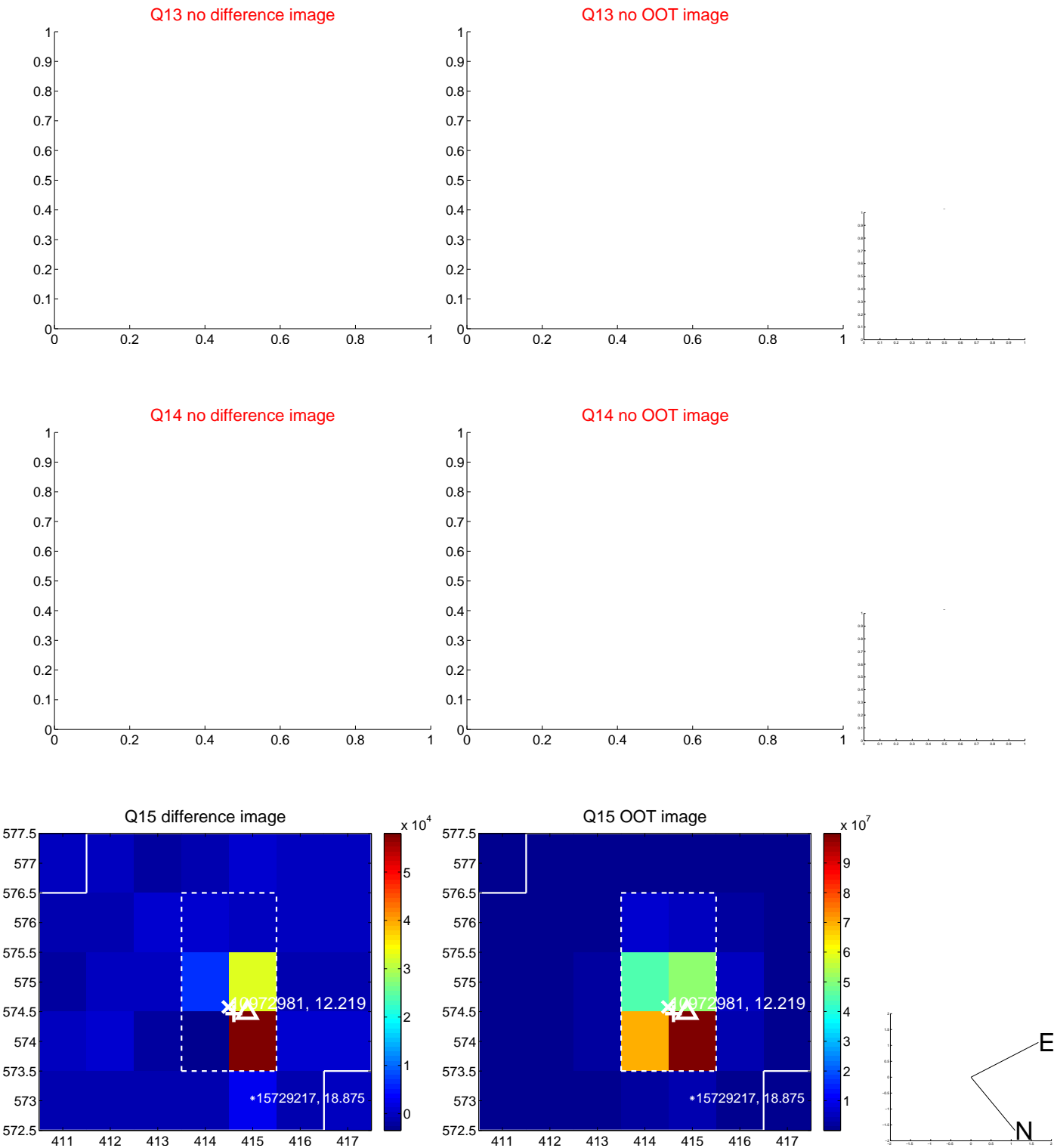
Q8 OOT image



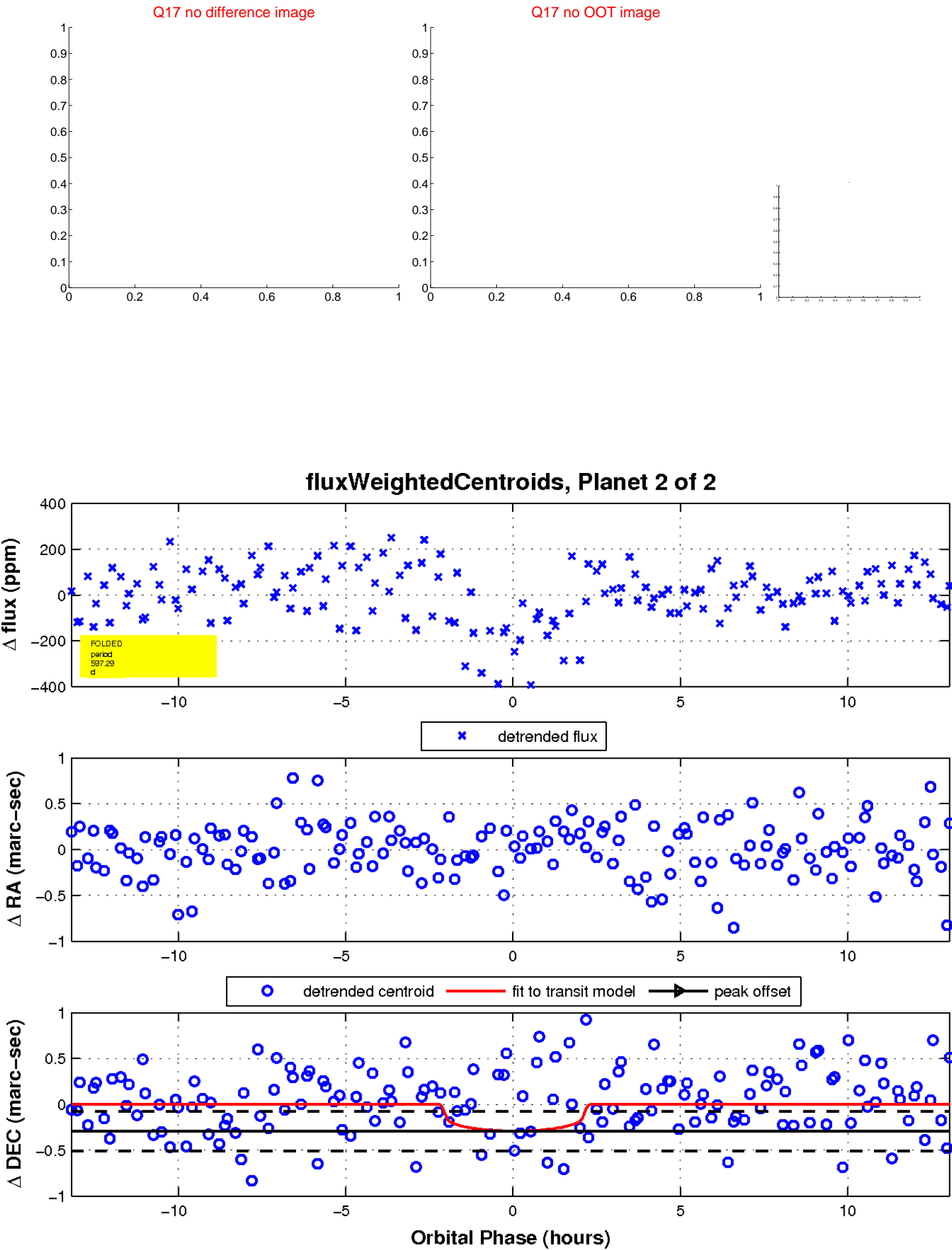
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

