

KIC 003973630

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})
003973630-01	OBS	No	145.867233	187.564846	1525.5	2.482	21.8	16.2	152.97	3287	562.31	0.00
003973630-02	OBS	No	90.677924	155.045225	509.4	3.058	10.5	5.3	152.97	3287	403.47	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003973630-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
003973630-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

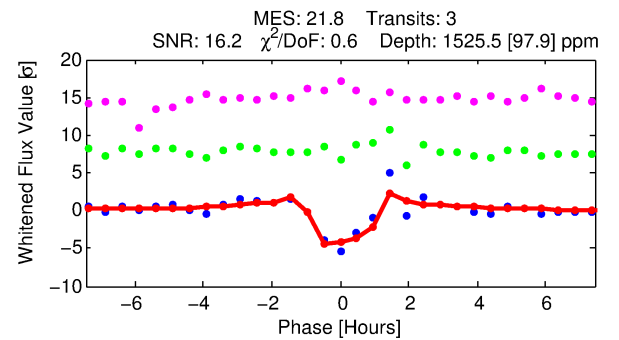
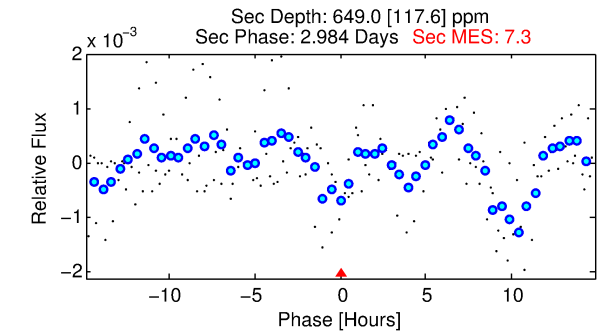
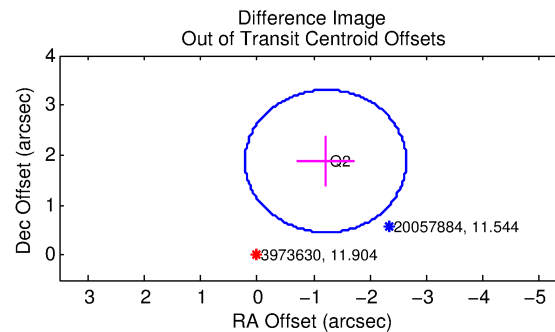
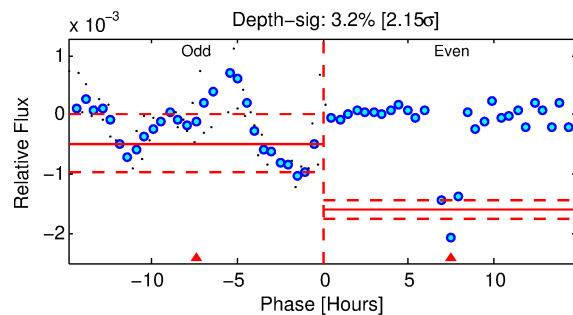
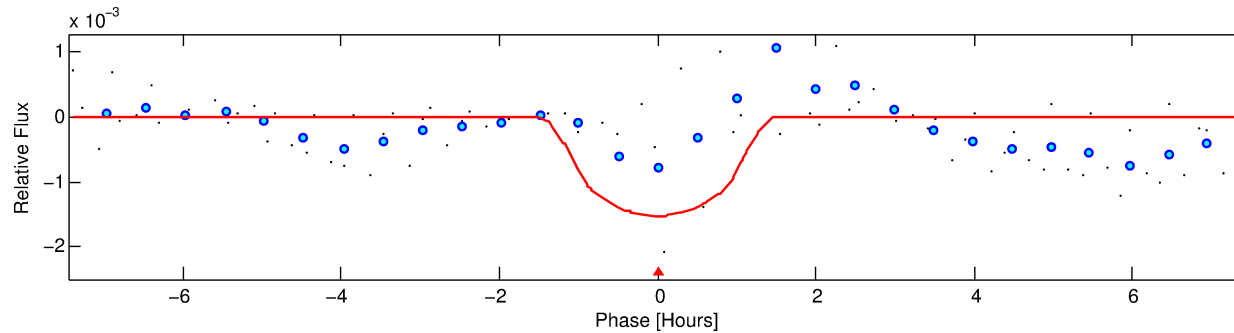
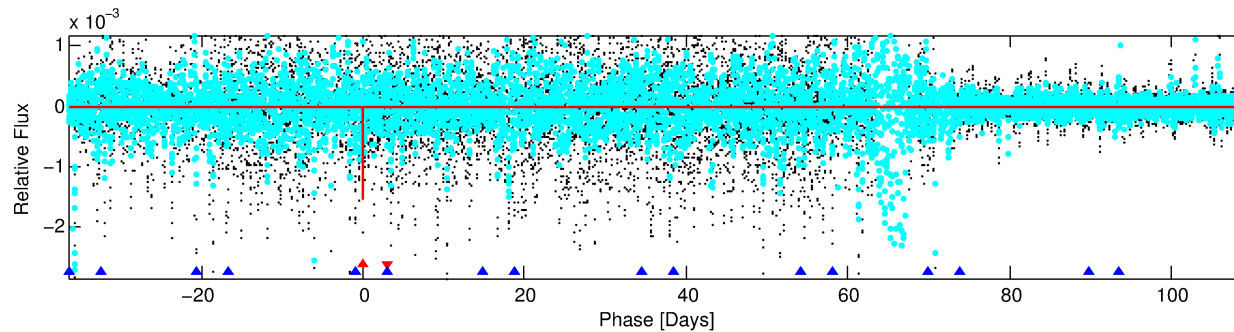
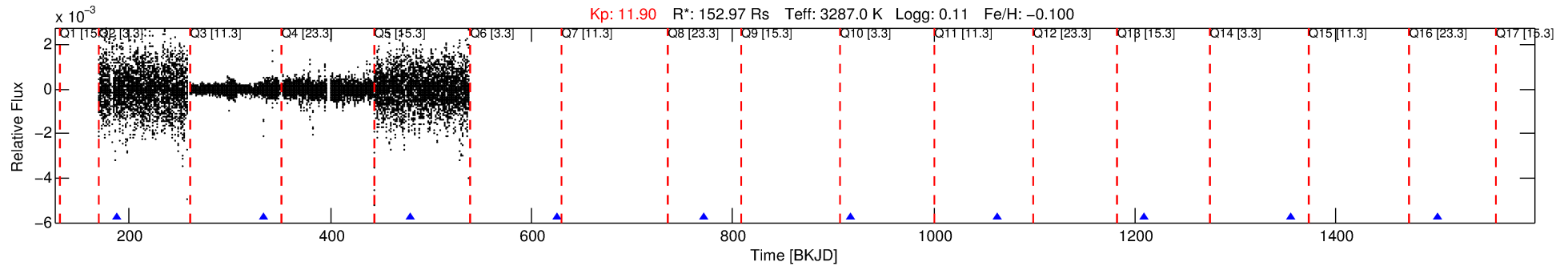
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003973630-01

No Significant Match Found

DV One-Page Summary

KIC: 3973630 Candidate: 1 of 2 Period: 145.867 d



DV Fit Results:

Period = 145.86723 [0.00230] d
Epoch = 187.5648 [0.0026] BKJD
Rp/R* = 0.0337 [0.0172]
a/R* = 443.30 [446.26]
b = 0.31 [3.18]
Seff = N/A
Teq = N/A
Rp = 562.31 [304.15] Re
a = N/A
Ag = N/A
Teffp = N/A

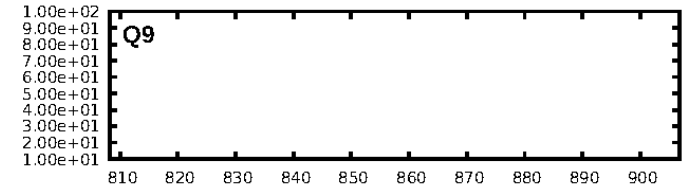
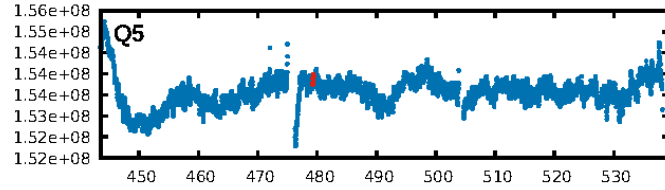
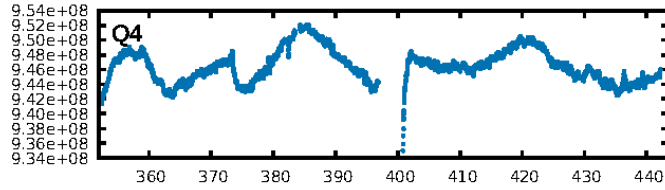
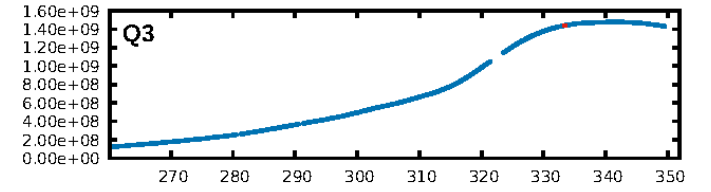
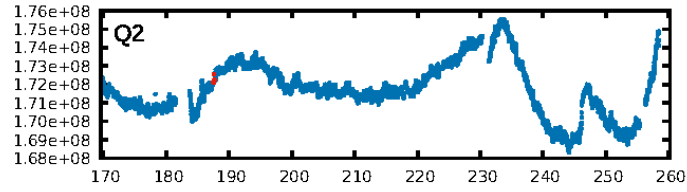
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [336.30 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.3%
ModelChiSquareGof-sig: 97.4%
Bootstrap-pfa: 1.43e-57
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.1499
Centroid-sig: N/A
Centroid-so: 0.601 arcsec [0.90 σ]
OotOffset-rm: 2.237 arcsec [4.70 σ]
KicOffset-rm: 1.901 arcsec [4.01 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

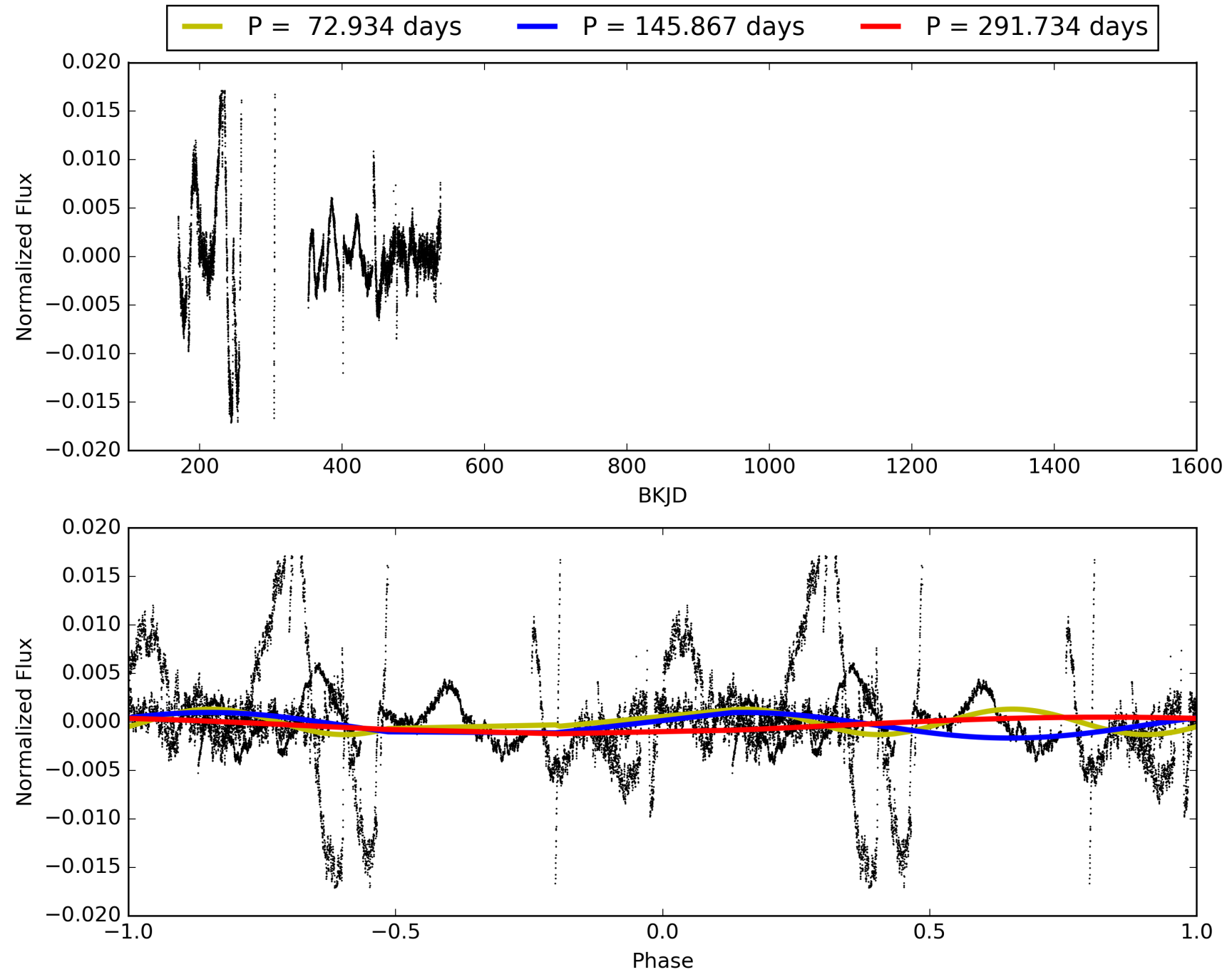
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:29:13 Z

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

TCE 003973630-01, PDC Light Curves

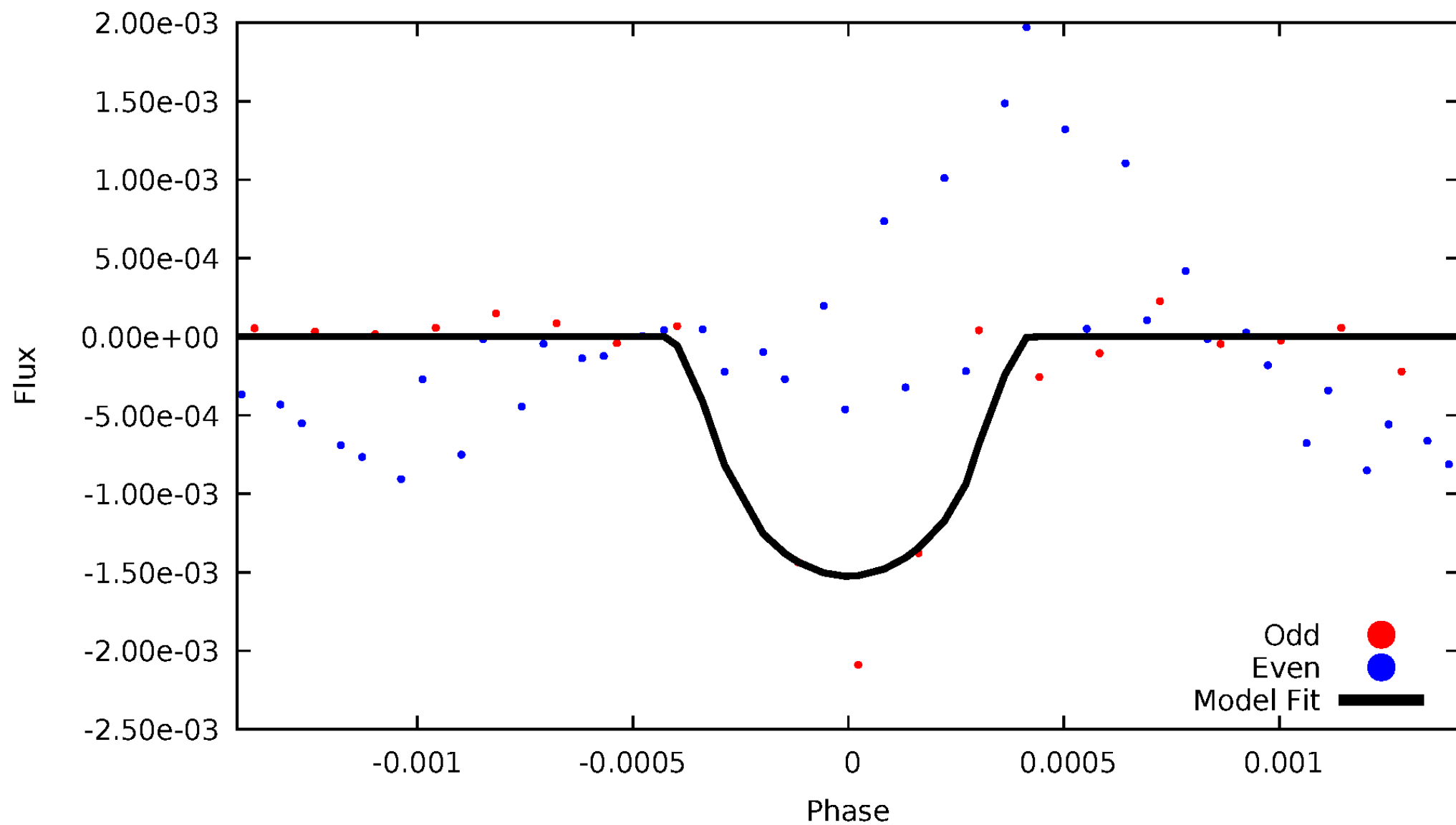


TCE 003973630-01



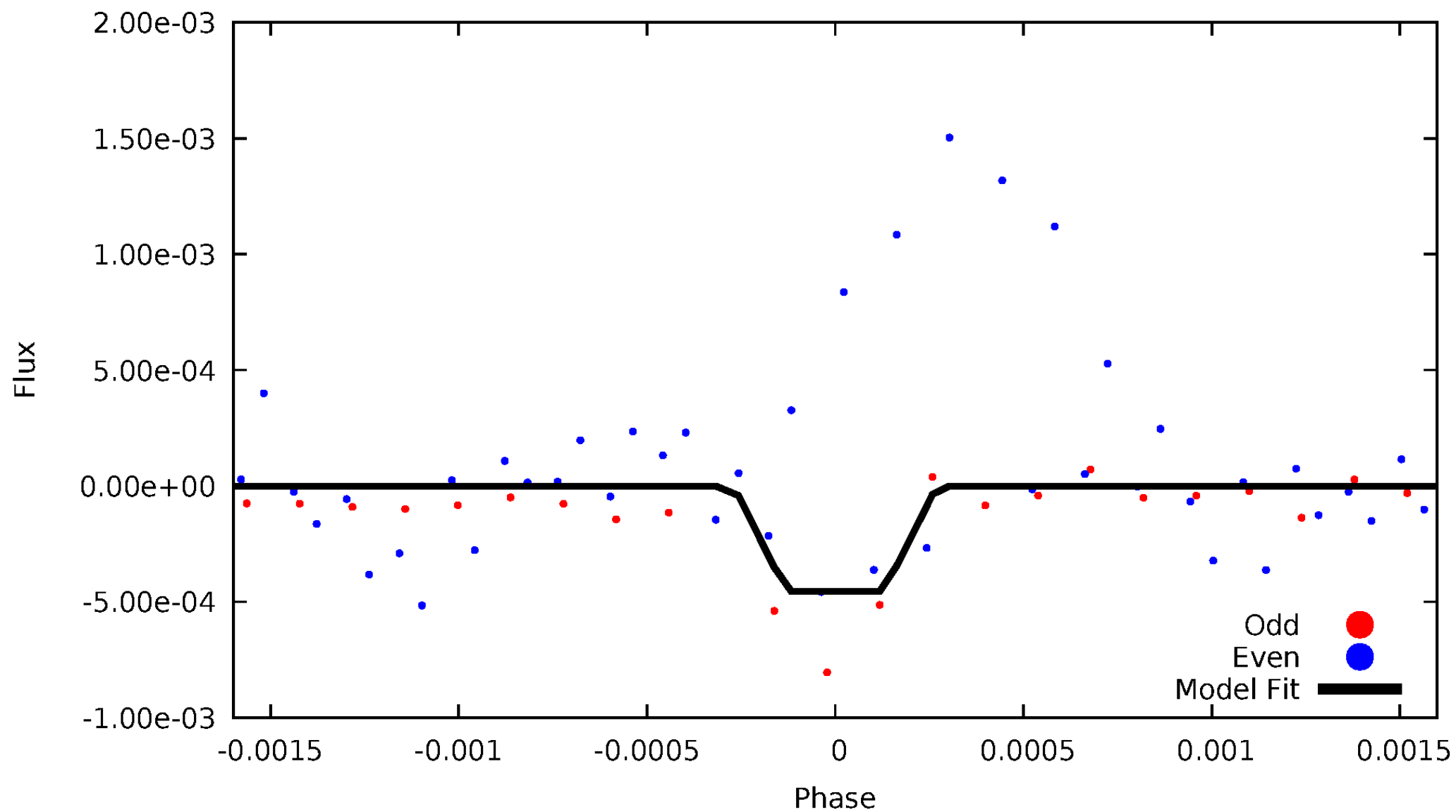
DV Odd/Even

TCE 003973630-01



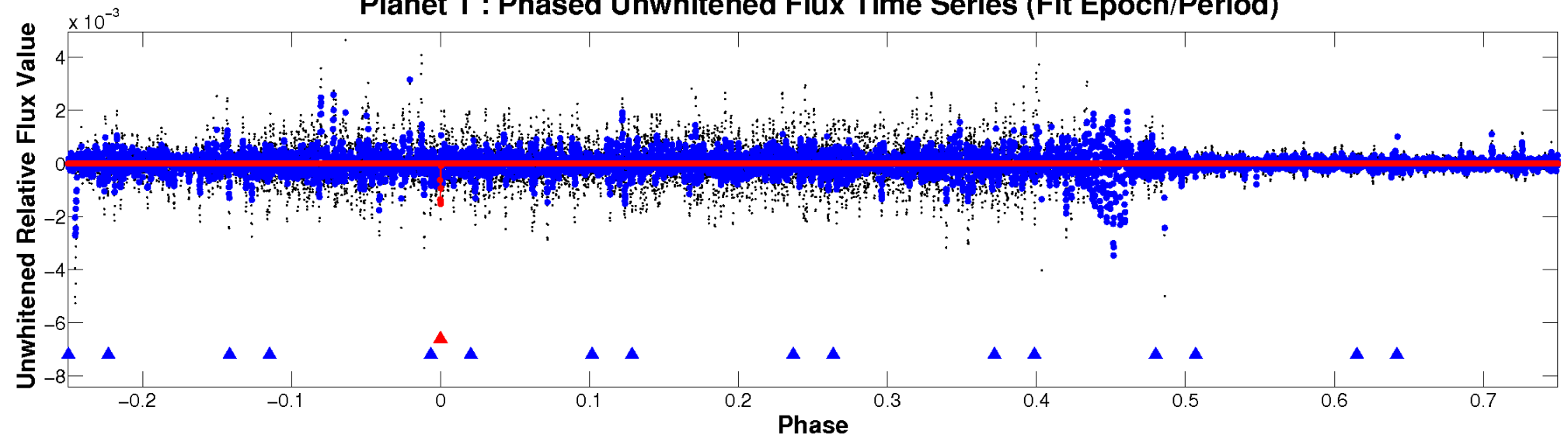
ALT Odd/Even

TCE 003973630-01

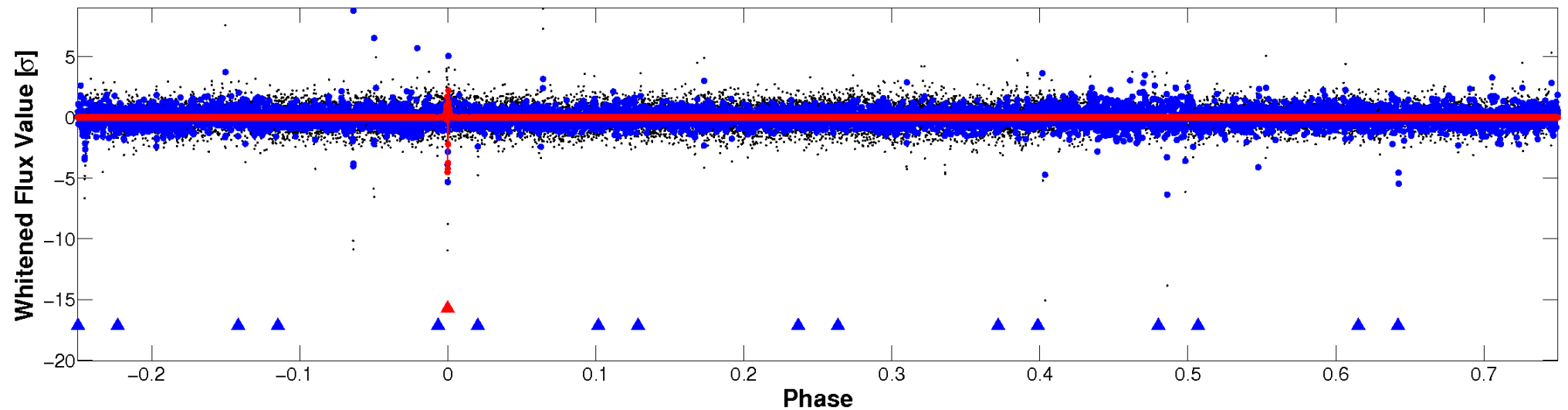


Non-Whitened Vs. Whitened Light Curve

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

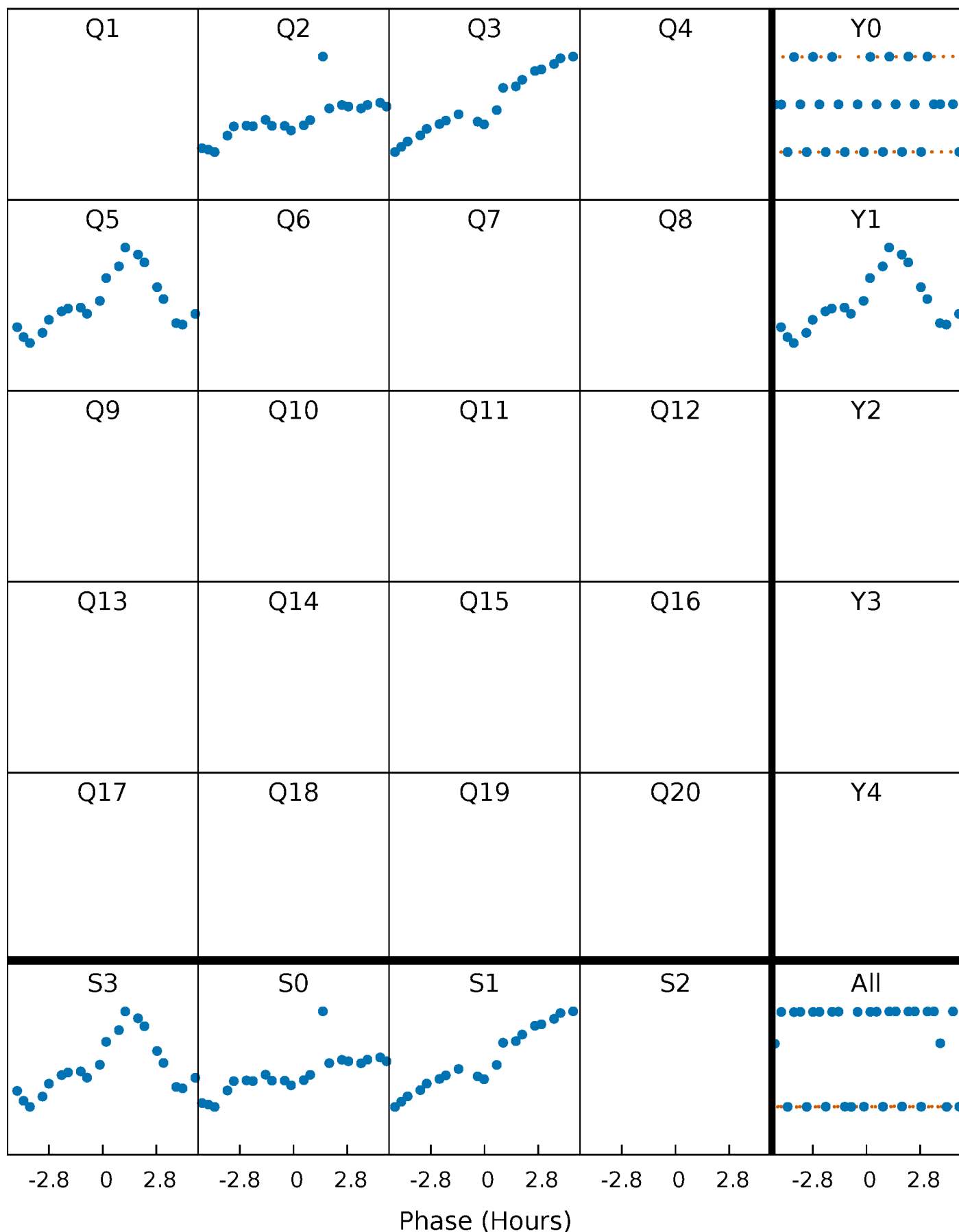


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



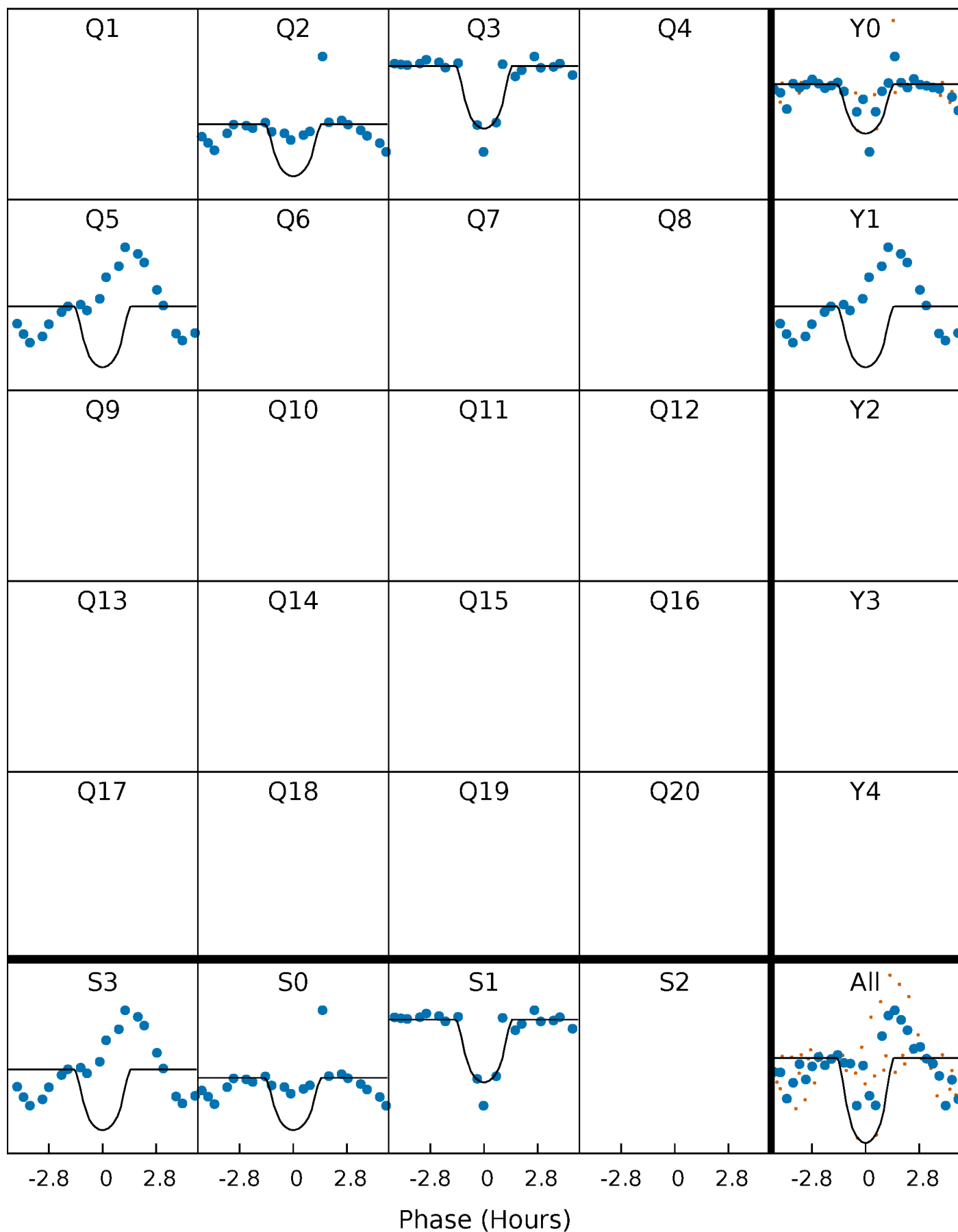
PDC Quarter-Phased Transit Curves

TCE 003973630-01 P=145.867233 Days $T_0=187.564845$ (BKJD)



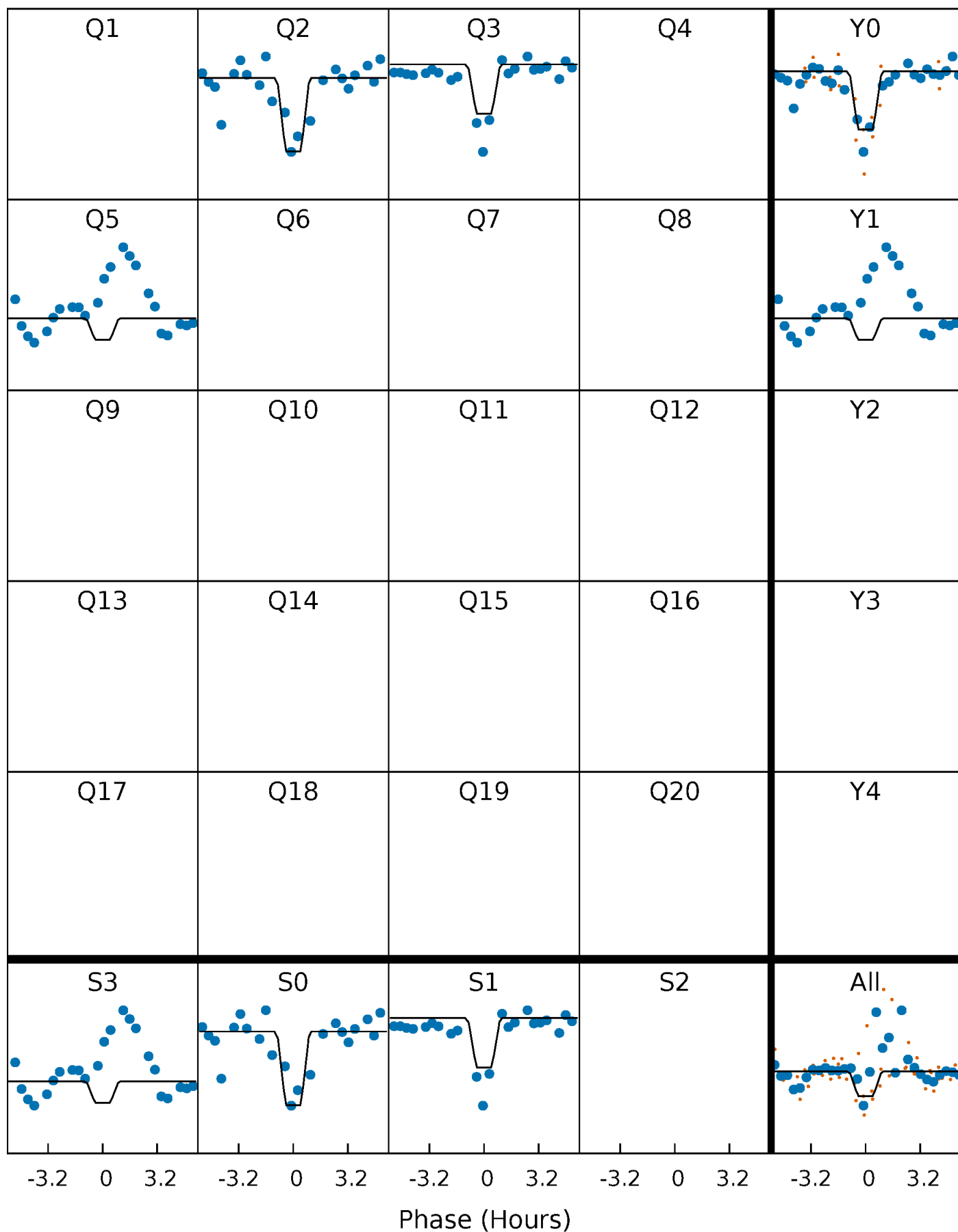
DV Quarter-Phased Transit Curves

TCE 003973630-01 P=145.867233 Days $T_0=187.564845$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

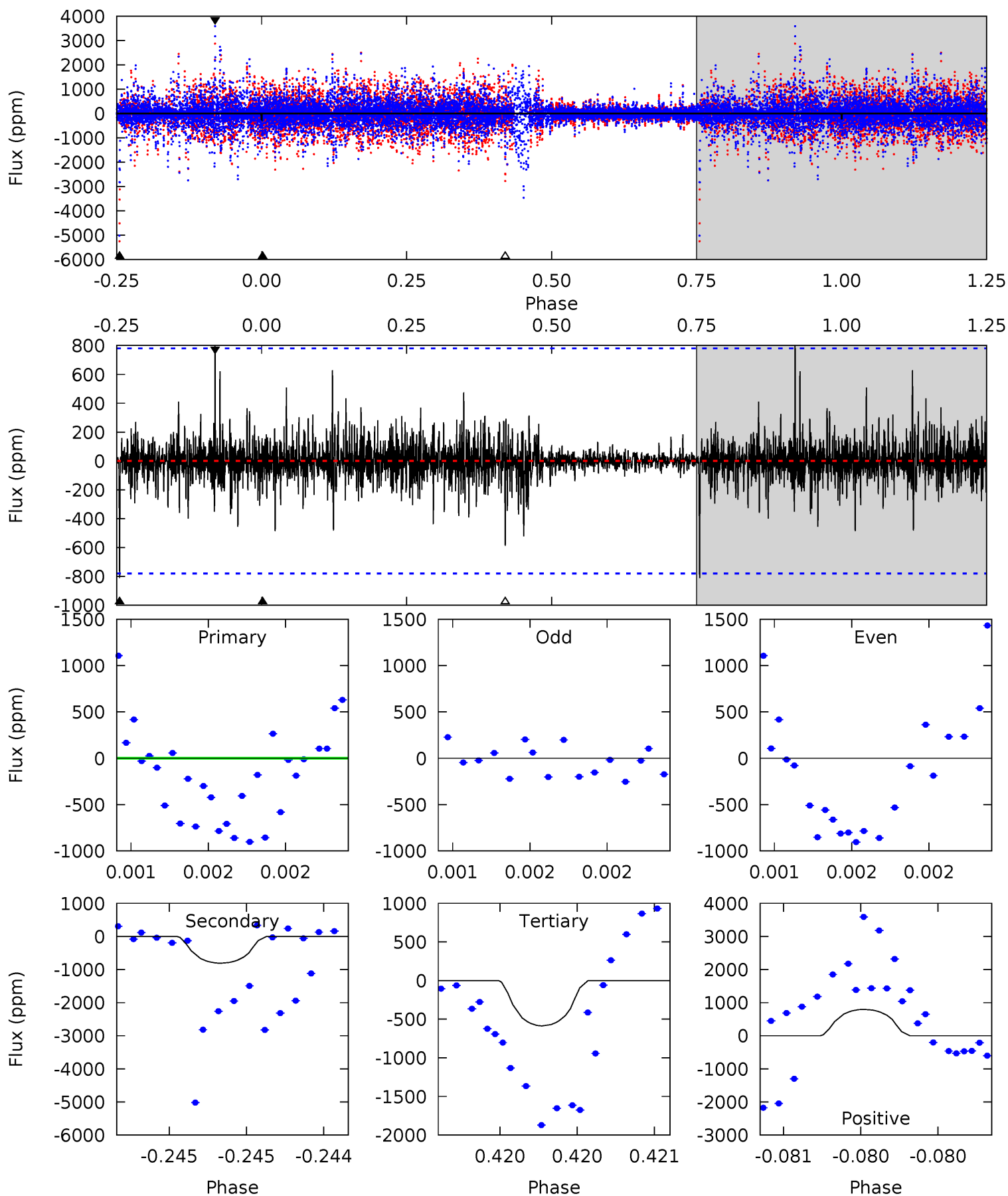
TCE 003973630-01 P=145.869393 Days $T_0=187.569195$ (BKJD)



DV Model-Shift Uniqueness Test

003973630-01, P = 145.867233 Days, E = 41.697612 Days

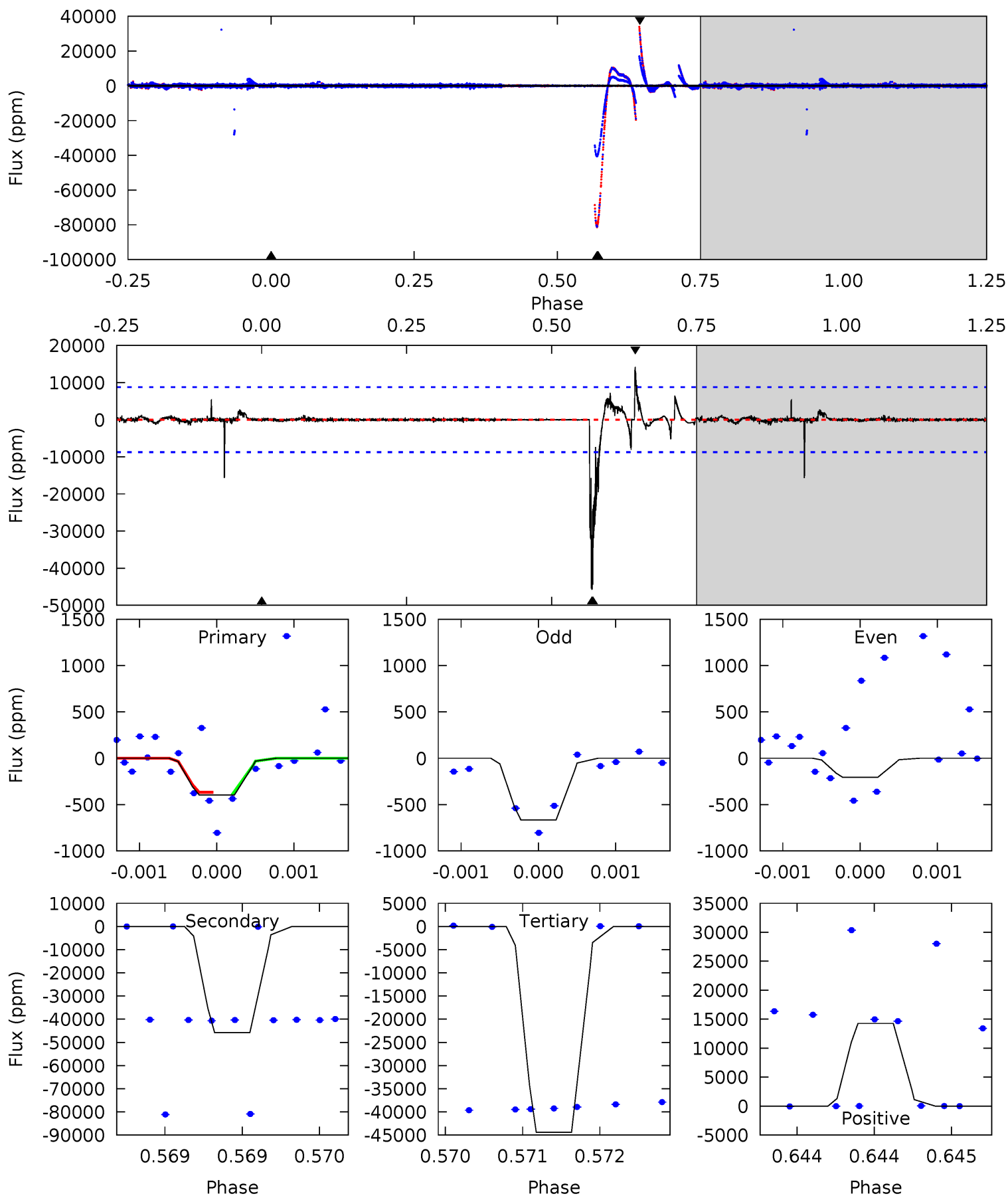
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.62	5.72	4.15	5.63	5.50	3.37	0.76	-2.52	-4.01	1.58	0.09	6.65	1.27	0.50	0.84



Alt Model-Shift Uniqueness Test

003973630-01, P = 145.869393 Days, E = 41.699802 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.25	29.1	28.2	9.07	5.57	3.47	1.79	-28.0	-8.82	0.87	20.0	0.01	0.25	0.24	0.01



Stellar Parameters For KIC 003973630

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3287^{+117}_{-88}	$0.114^{+0.200}_{-0.050}$	$-0.100^{+0.250}_{-0.100}$	$152.969^{+9.192}_{-27.576}$	$1.110^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-3%	+175%/-44%	+250%/-100%	+6%/-18%	+19%/-12%	+91%/-14%
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 003973630-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-811±142	$545.18^{+314.65}_{-244.39}$	3297^{+151}_{-159}	2724^{+983}_{-5274}	$0.482^{+1.166}_{-0.287}$
Alt.	-45772±1572	$385.35^{+267.48}_{-239.53}$	3290^{+157}_{-188}	8540^{+10471}_{-2126}	59^{+332}_{-39}

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 $A_{obs} \gg 1.0$

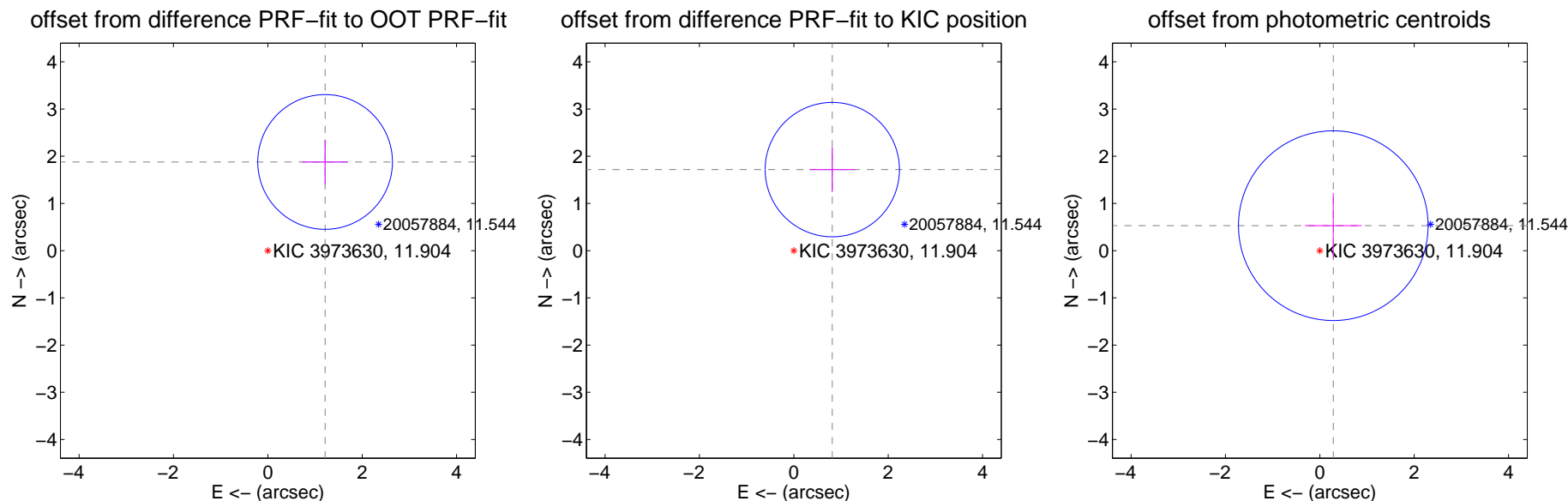
DV Centroid Data

Supplemental centroid analysis for 003973630-01. **Kepler magnitude: 11.90.** Transit SNR 16.23

There are 1 quarters with good PRF difference image offsets

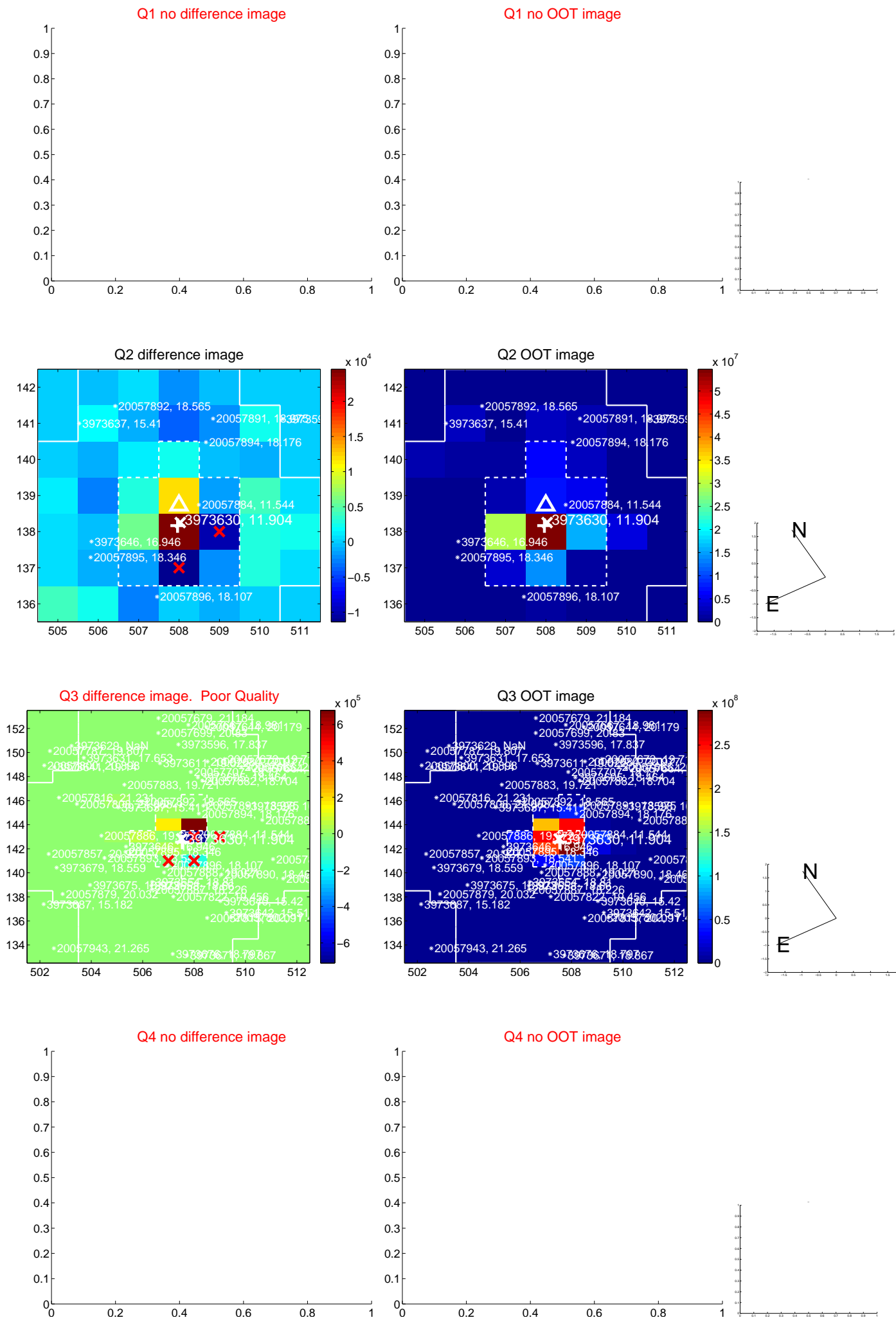
The direct PRF centroid is offset from the target star catalog position by about 0.43 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.237 ± 0.476	4.70	-1.214 ± 0.484	1.879 ± 0.472
PRF-fit source offset from KIC position	1.901 ± 0.475	4.01	-0.816 ± 0.484	1.717 ± 0.472
photometric centroid source offset	0.60 ± 0.67	0.90	-0.29 ± 0.60	0.53 ± 0.69



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.



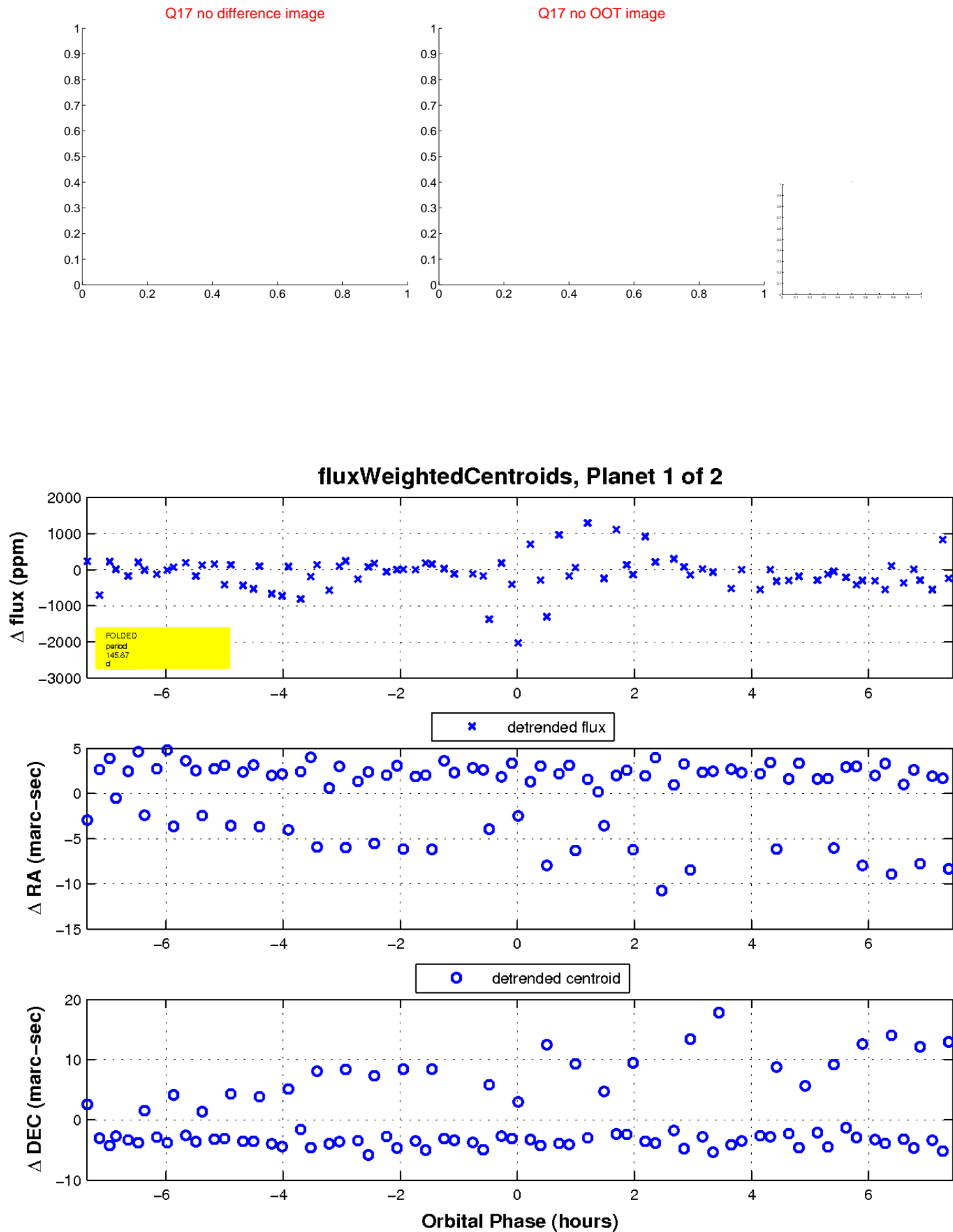
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



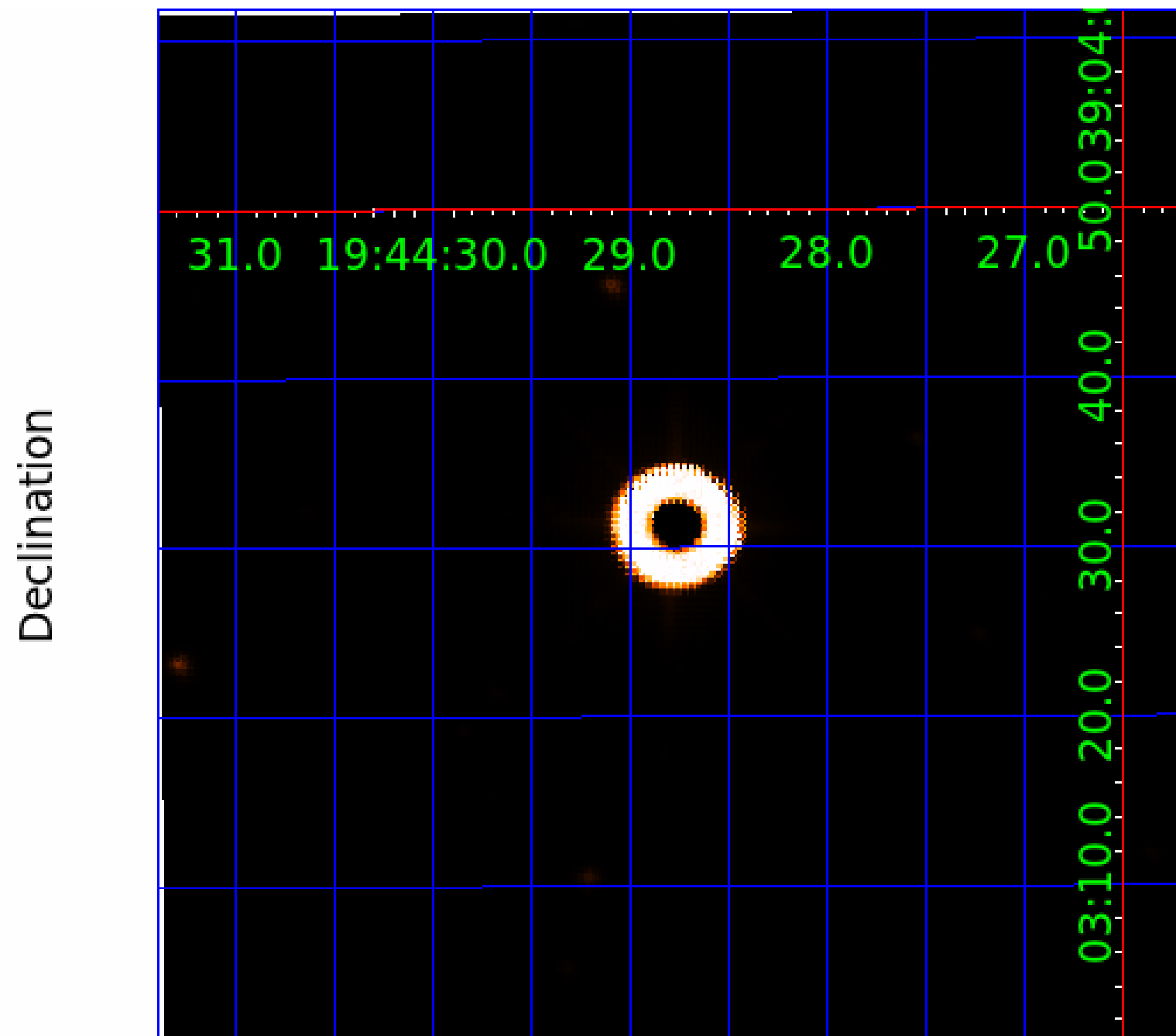
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 003973630

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})
003973630-01	OBS	No	145.867233	187.564846	1525.5	2.482	21.8	16.2	152.97	3287	562.31	0.00
003973630-02	OBS	No	90.677924	155.045225	509.4	3.058	10.5	5.3	152.97	3287	403.47	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003973630-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
003973630-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

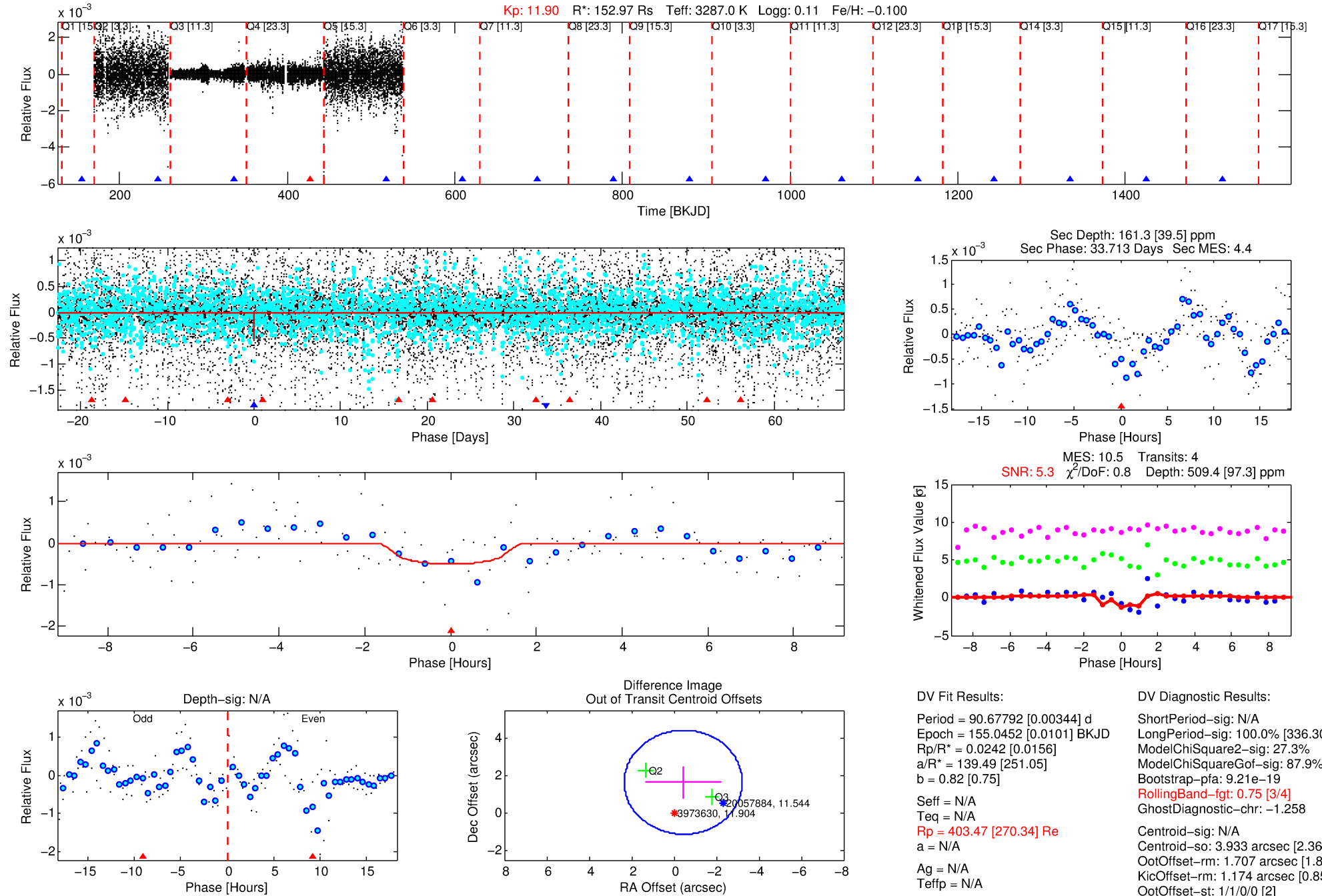
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003973630-02

No Significant Match Found

DV One-Page Summary

KIC: 3973630 Candidate: 2 of 2 Period: 90.678 d



DV Fit Results:

Period = 90.67792 [0.00344] d
Epoch = 155.0452 [0.0101] BKJD
Rp/R* = 0.0242 [0.0156]
a/R* = 139.49 [251.05]
b = 0.82 [0.75]
Seff = N/A
Teq = N/A
Rp = 403.47 [270.34] Re
a = N/A
Ag = N/A
Teffp = N/A

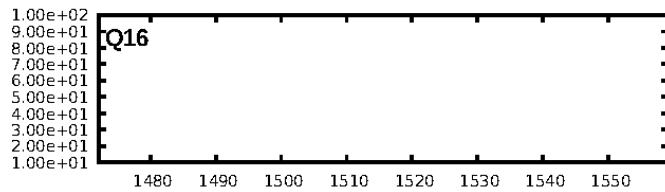
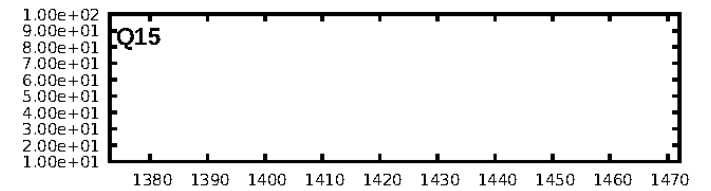
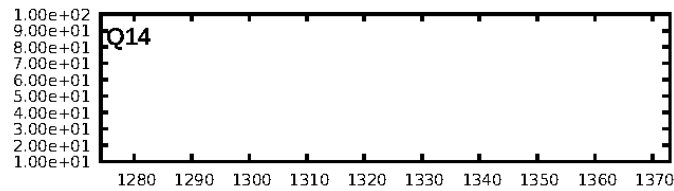
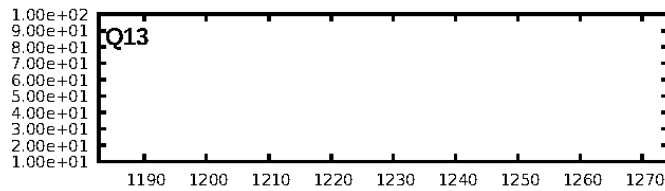
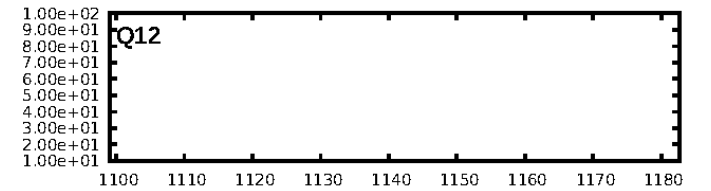
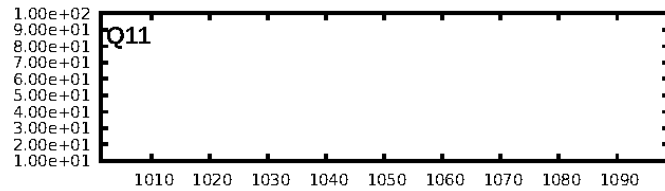
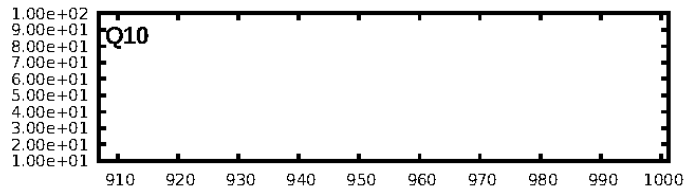
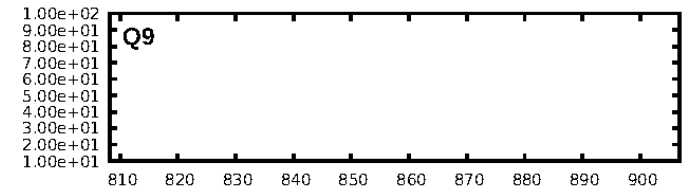
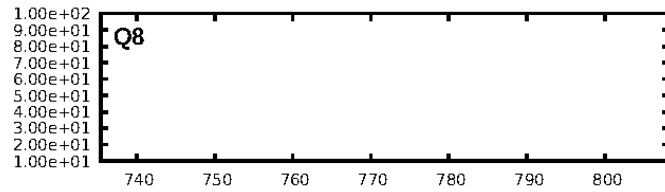
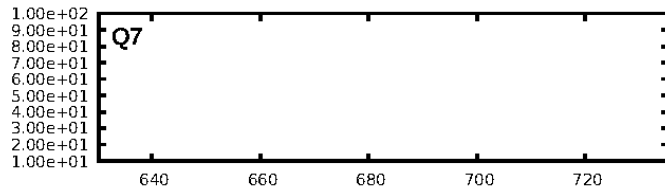
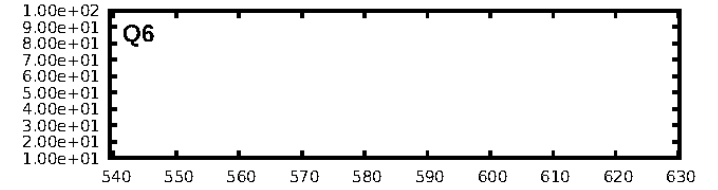
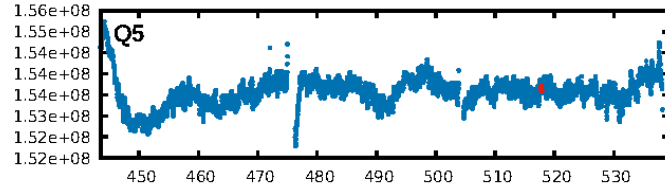
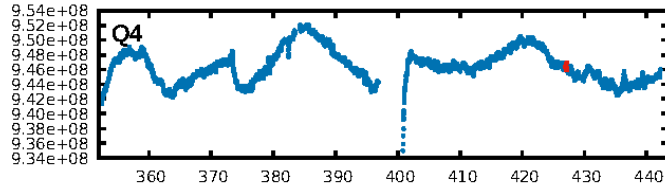
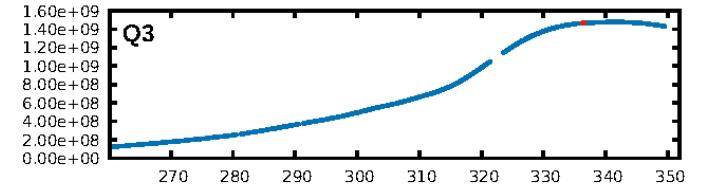
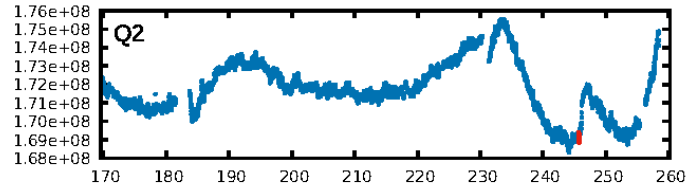
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [336.30 σ]
ModelChiSquare2-sig: 27.3%
ModelChiSquareGof-sig: 87.9%
Bootstrap-pfa: 9.21e-19
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: -1.258
Centroid-sig: N/A
Centroid-so: 3.933 arcsec [2.36 σ]
OotOffset-rm: 1.707 arcsec [1.84 σ]
KicOffset-rm: 1.174 arcsec [0.85 σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [4/4]

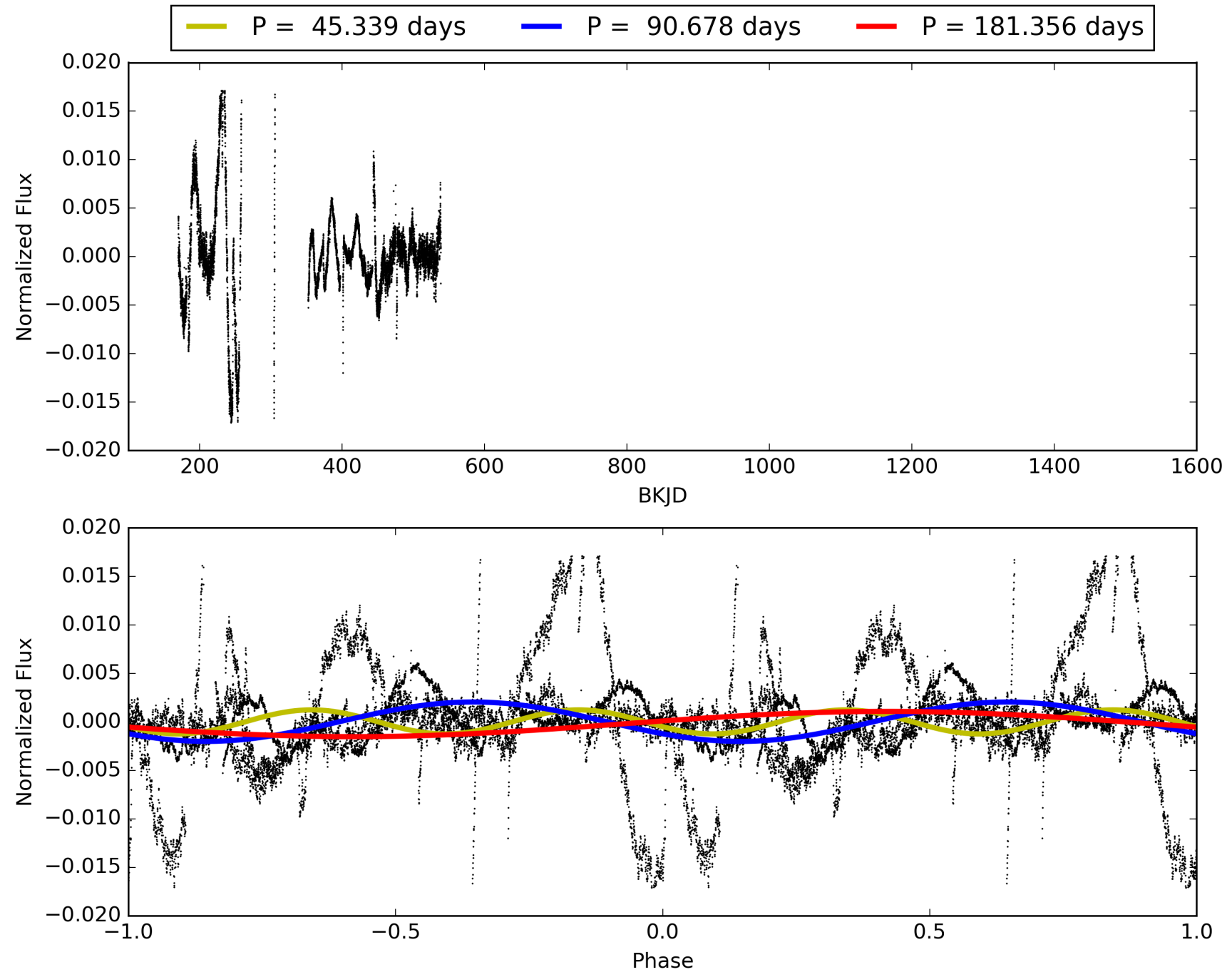
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:29:18 Z

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

TCE 003973630-02, PDC Light Curves

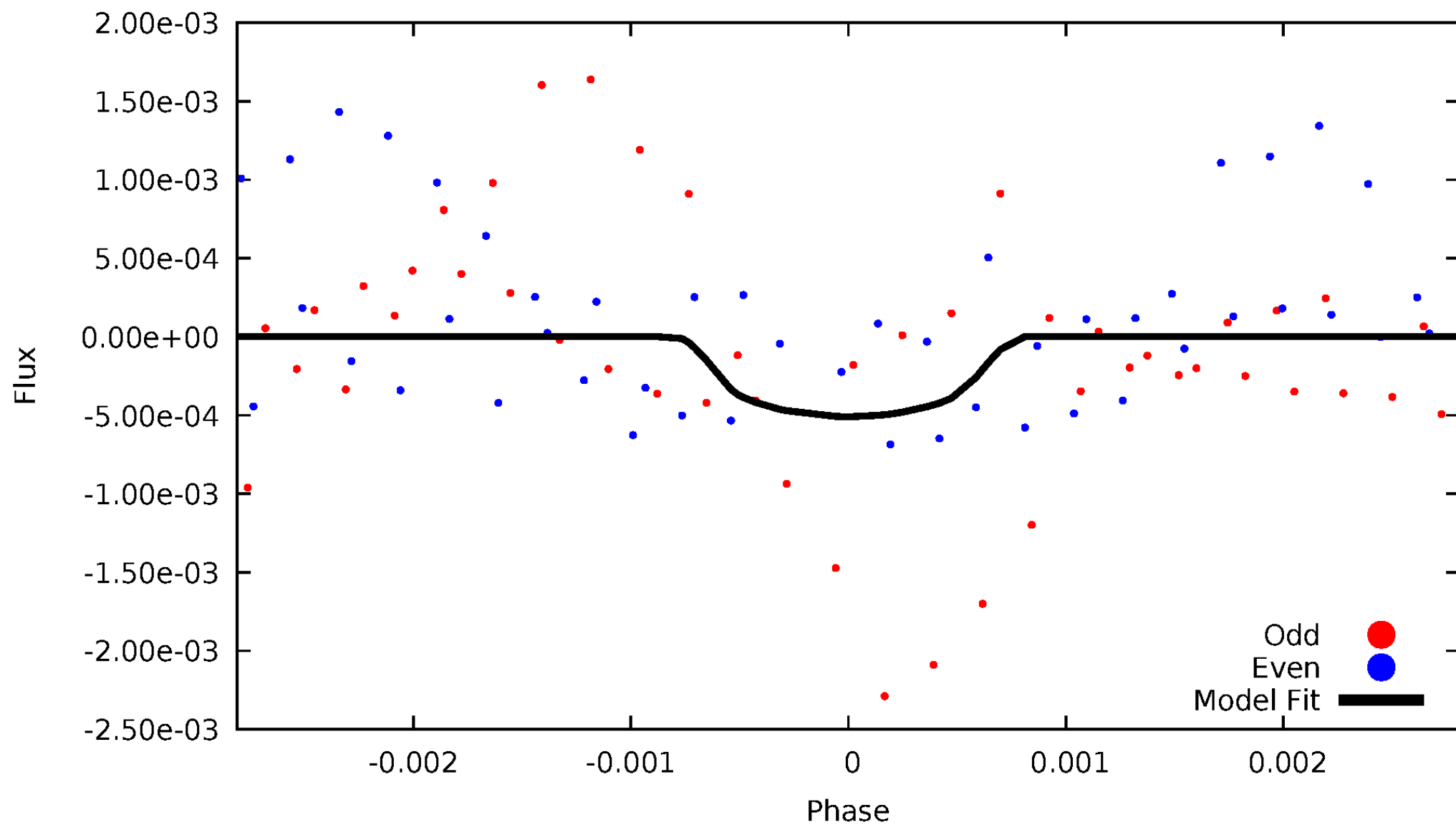


TCE 003973630-02



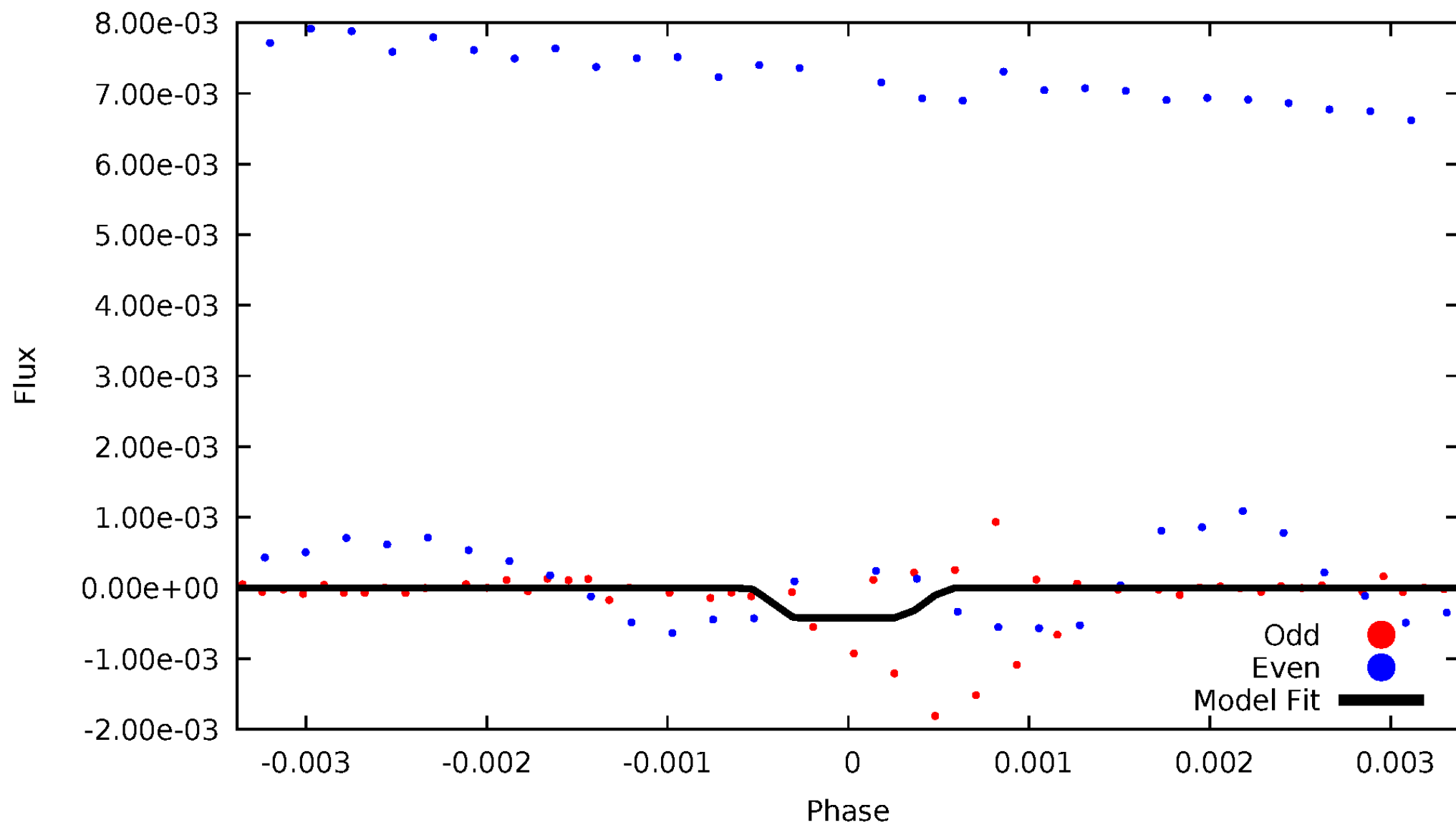
DV Odd/Even

TCE 003973630-02



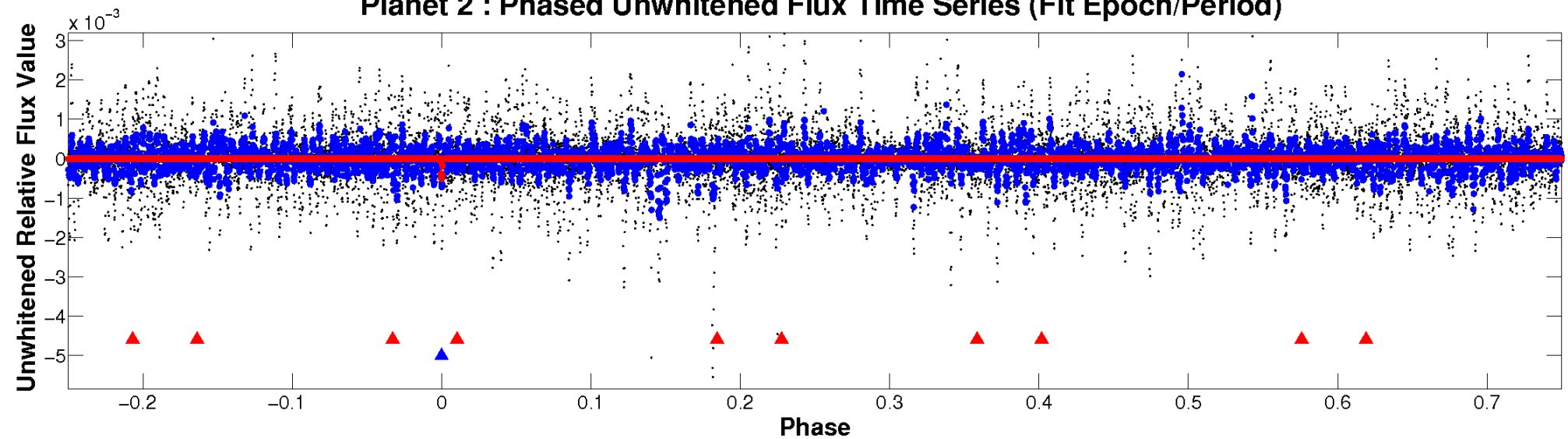
ALT Odd/Even

TCE 003973630-02

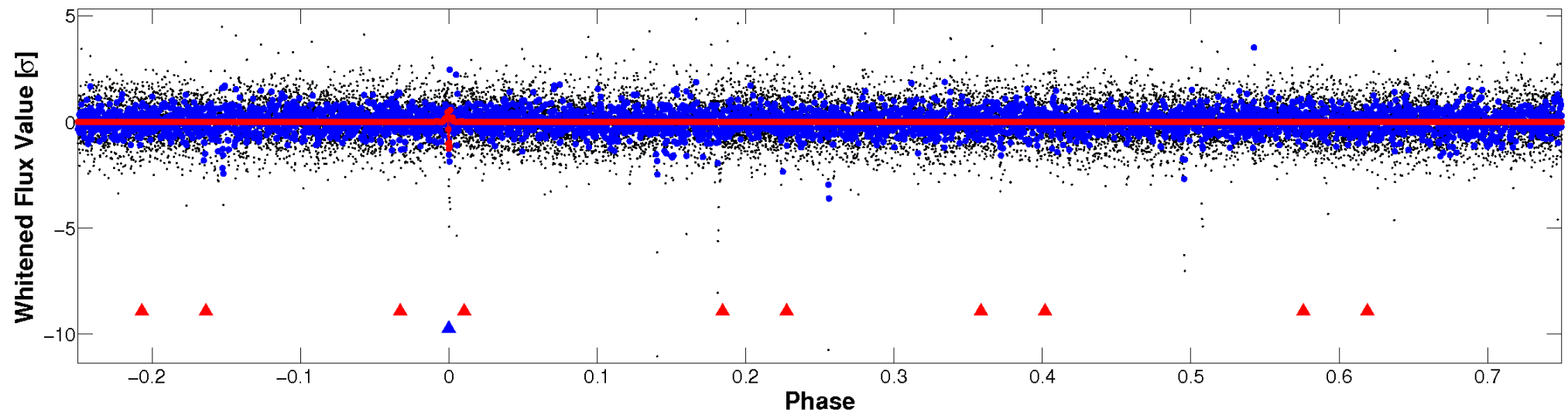


Non-Whitened Vs. Whitened Light Curve

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

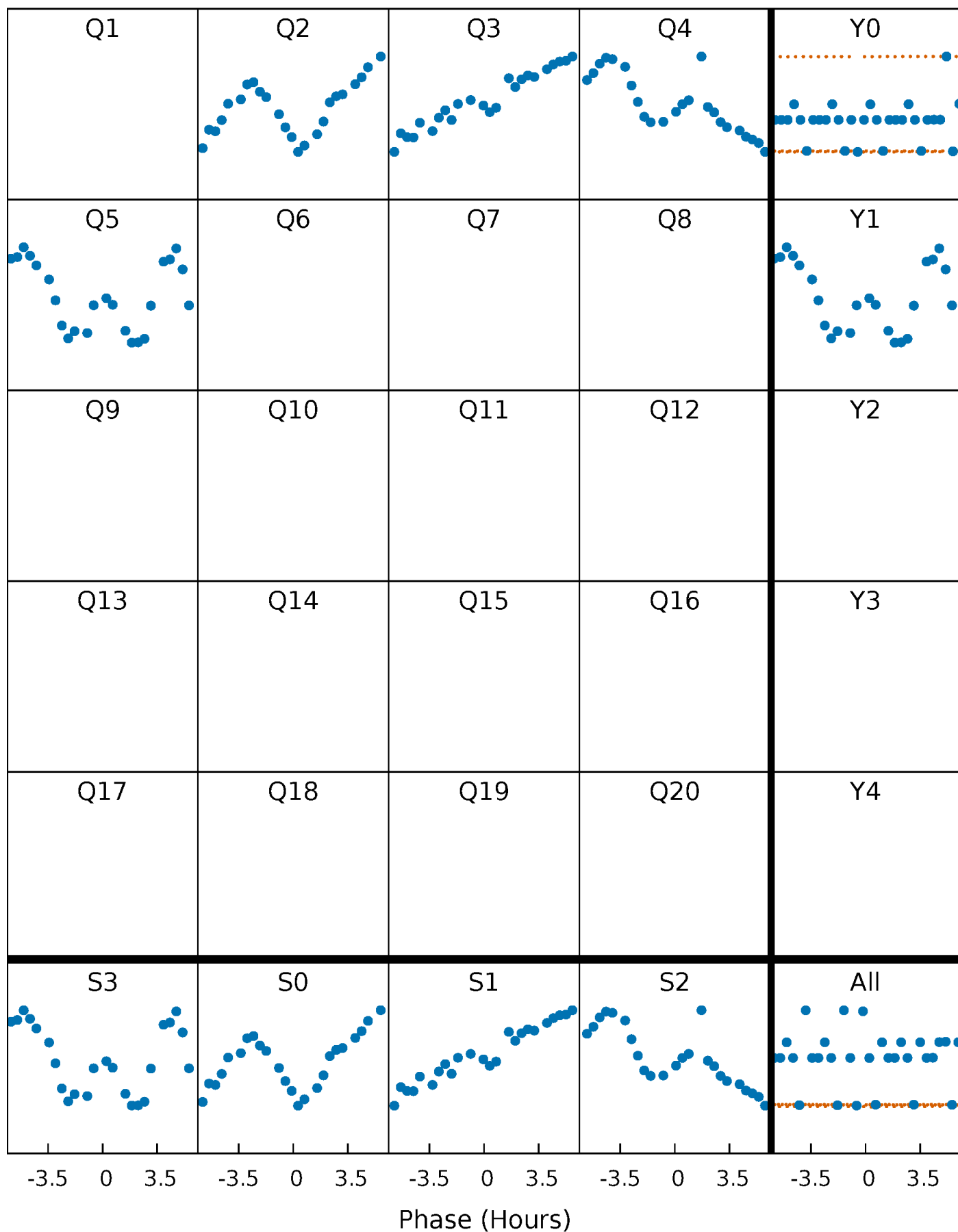


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



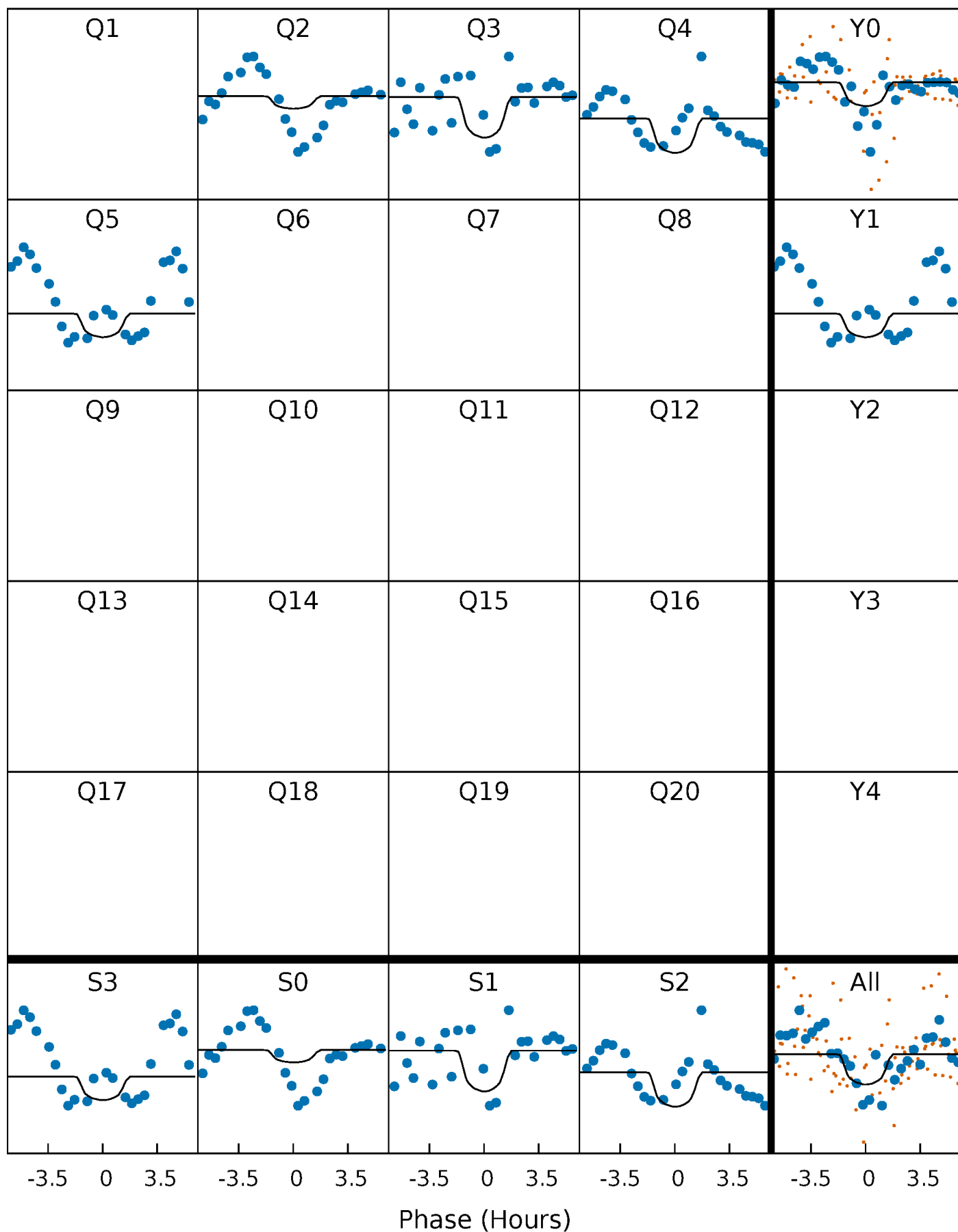
PDC Quarter-Phased Transit Curves

TCE 003973630-02 $P = 90.677924$ Days $T_0 = 155.045225$ (BKJD)



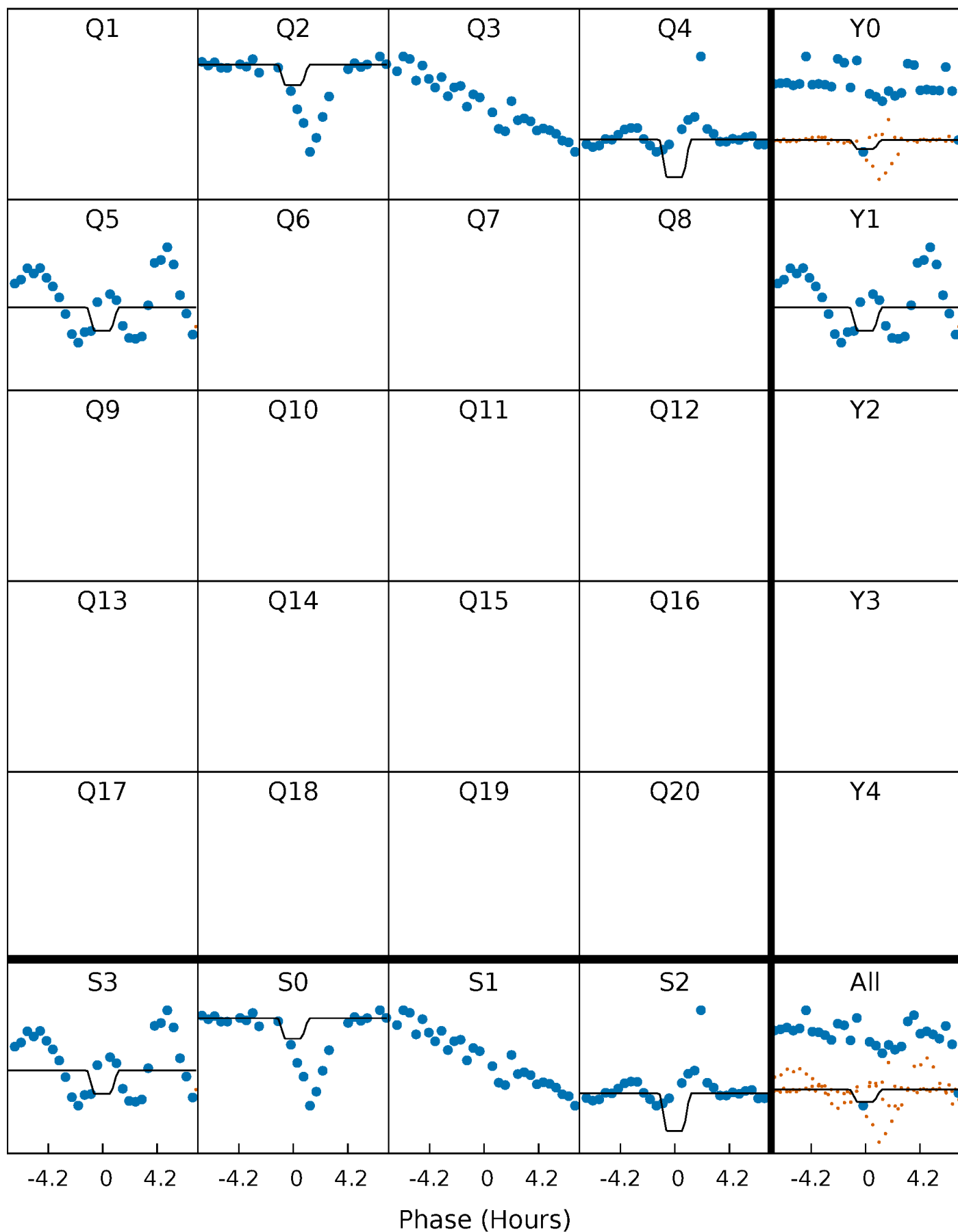
DV Quarter-Phased Transit Curves

TCE 003973630-02 P= 90.677924 Days $T_0=155.045225$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

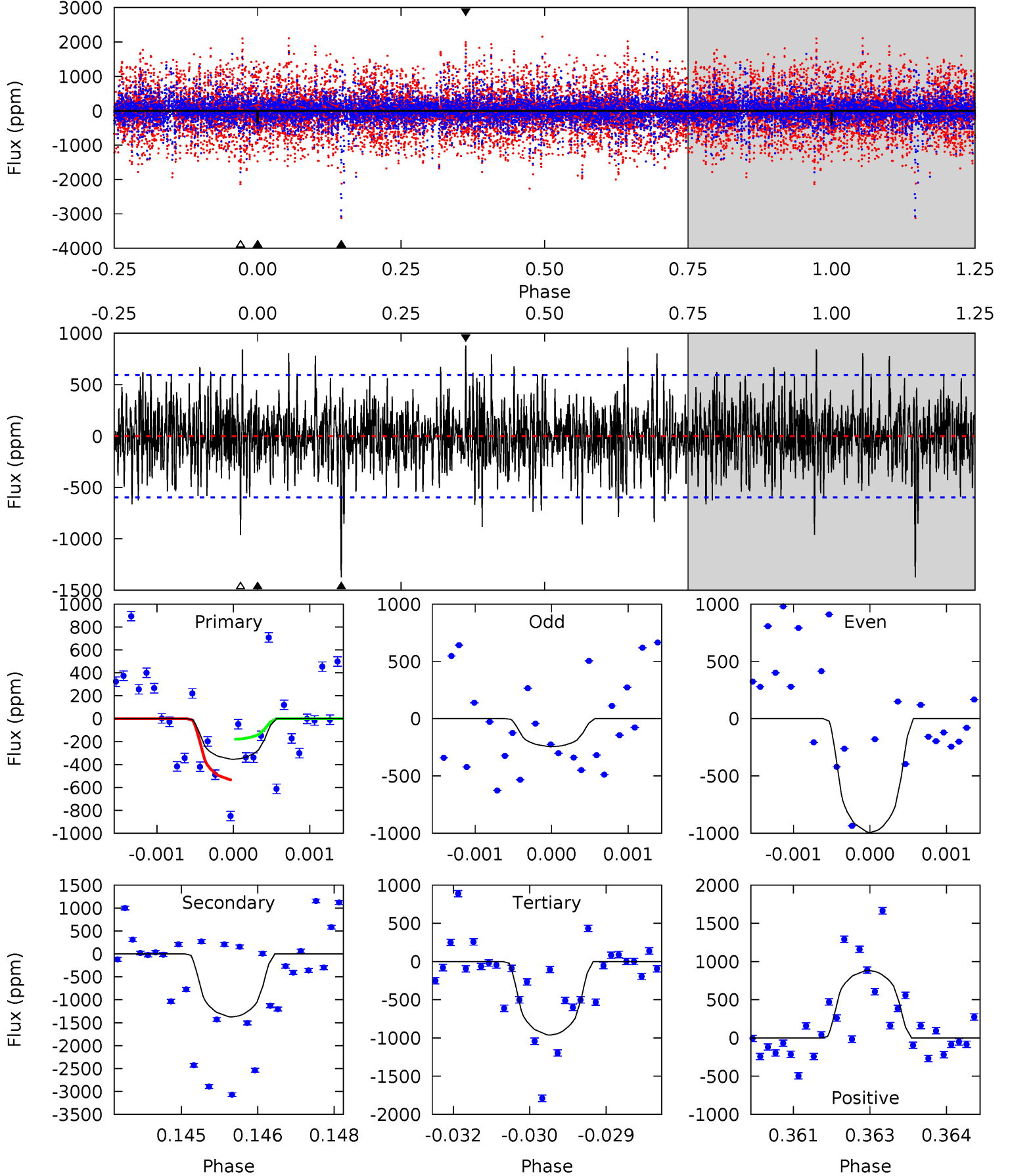
TCE 003973630-02 P= 90.686885 Days $T_0=155.007847$ (BKJD)



DV Model-Shift Uniqueness Test

003973630-02, $P = 90.677924$ Days, $E = 155.045225$ Days

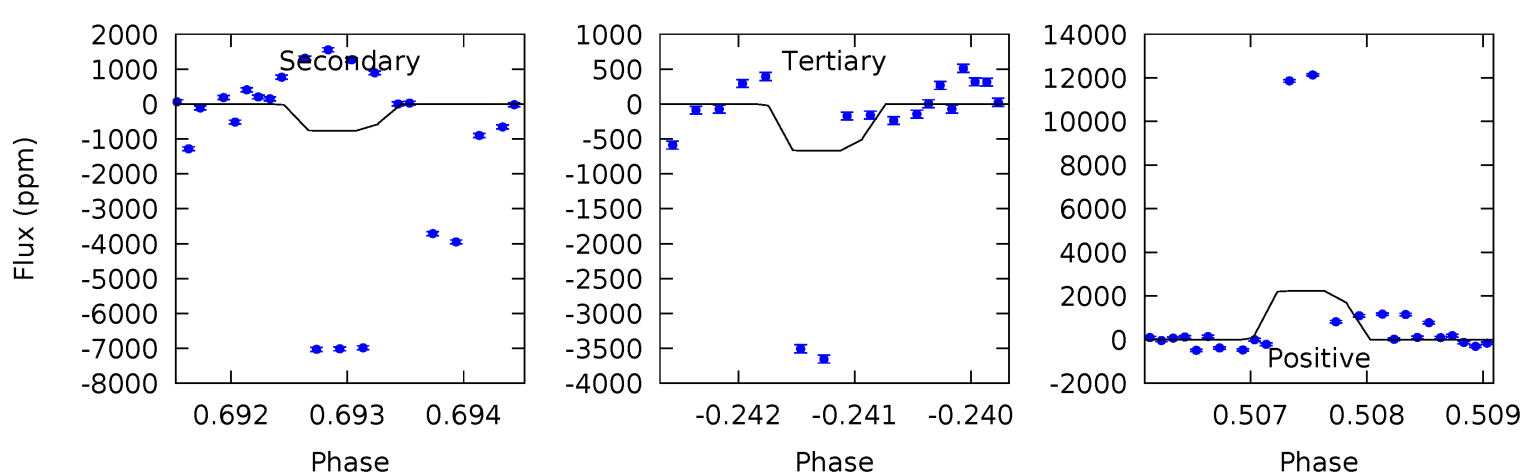
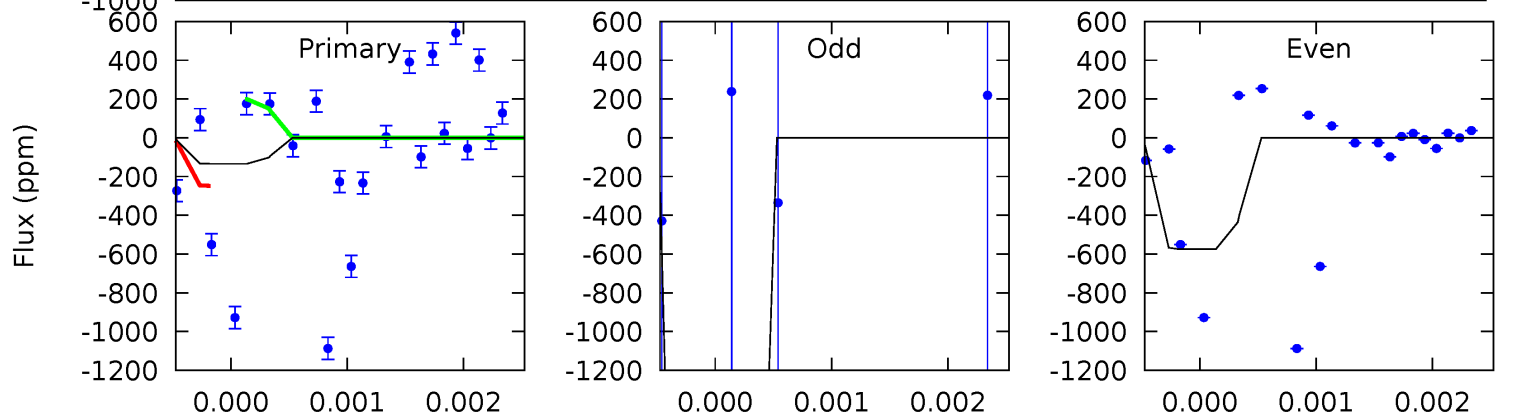
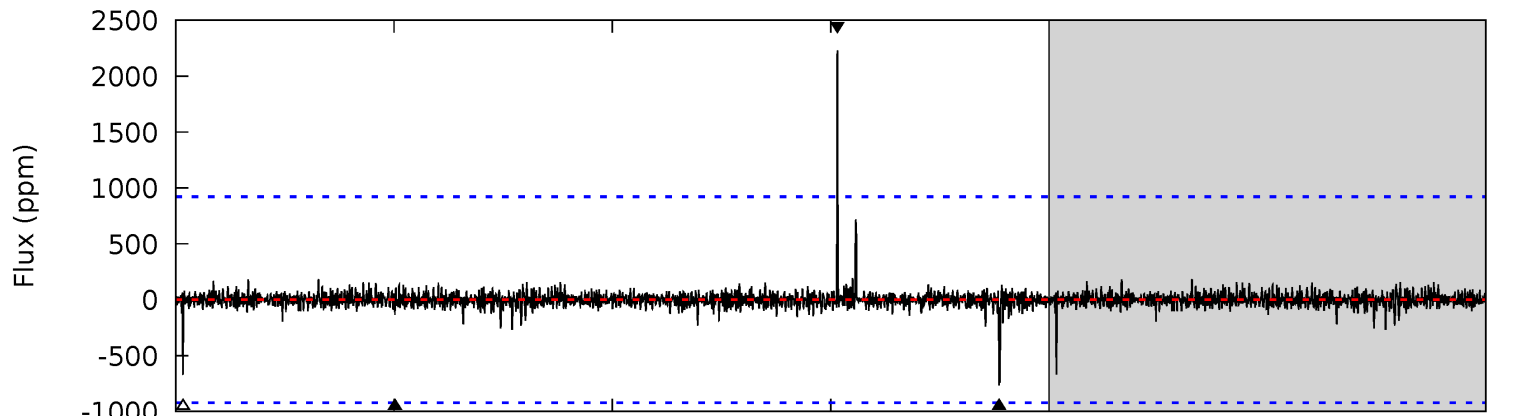
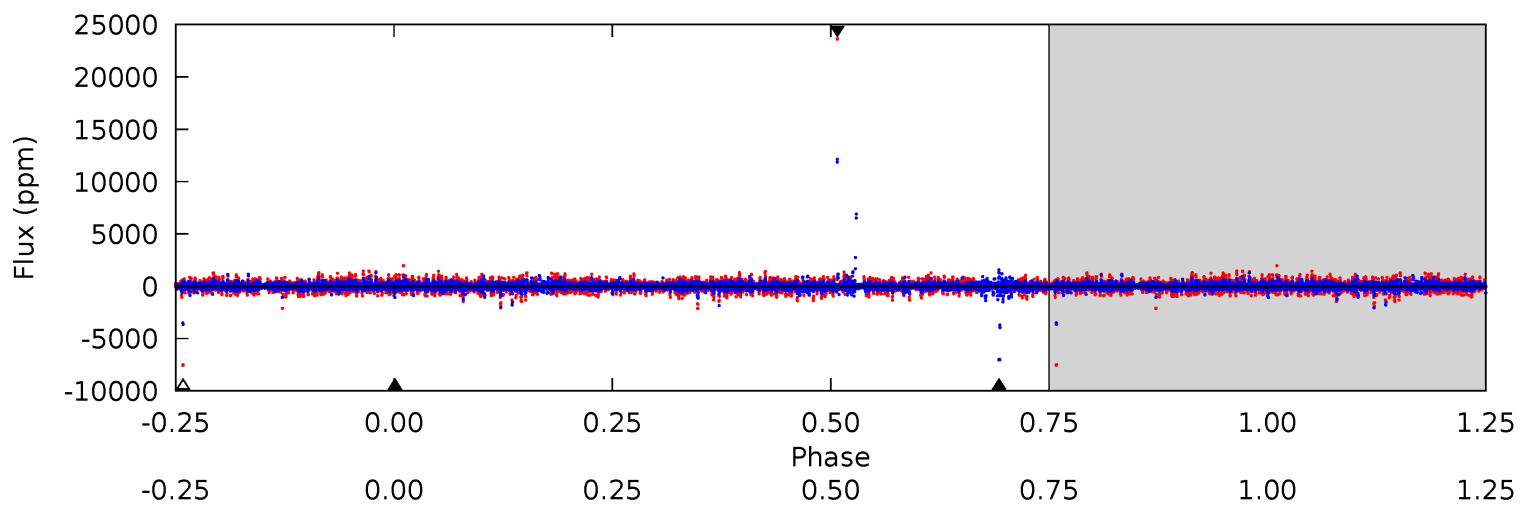
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.20	12.4	8.69	7.98	5.39	3.19	2.15	-5.49	-4.78	3.72	4.44	3.01	2.33	0.39	1.63



Alt Model-Shift Uniqueness Test

003973630-02, P = 90.686885 Days, E = 155.007847 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.79	4.52	3.95	13.1	5.43	3.26	0.41	-3.16	-12.3	0.57	-8.61	0.04	15.4	0.74	0.11



Stellar Parameters For KIC 003973630

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3287^{+117}_{-88}	$0.114^{+0.200}_{-0.050}$	$-0.100^{+0.250}_{-0.100}$	$152.969^{+9.192}_{-27.576}$	$1.110^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-3%	+175%/-44%	+250%/-100%	+6%/-18%	+19%/-12%	+91%/-14%
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 003973630-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1372 ± 111	$411.41^{+251.88}_{-237.45}$	3848^{+180}_{-192}	3456^{+1603}_{-5475}	$0.773^{+3.509}_{-0.479}$
Alt.	-767 ± 170	$359.35^{+255.35}_{-210.63}$	3850^{+186}_{-194}	3130^{+1597}_{-5912}	$0.562^{+2.861}_{-0.371}$

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

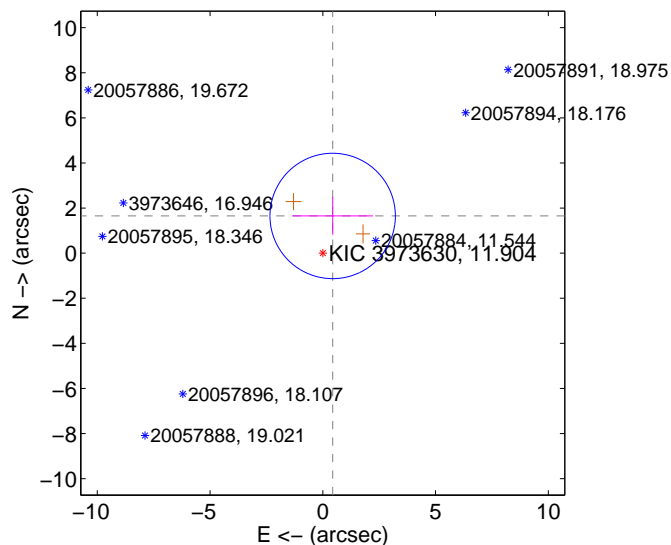
Supplemental centroid analysis for 003973630-02. **Kepler magnitude: 11.90.** Transit SNR 5.32

There are 0 quarters with good PRF difference image offsets

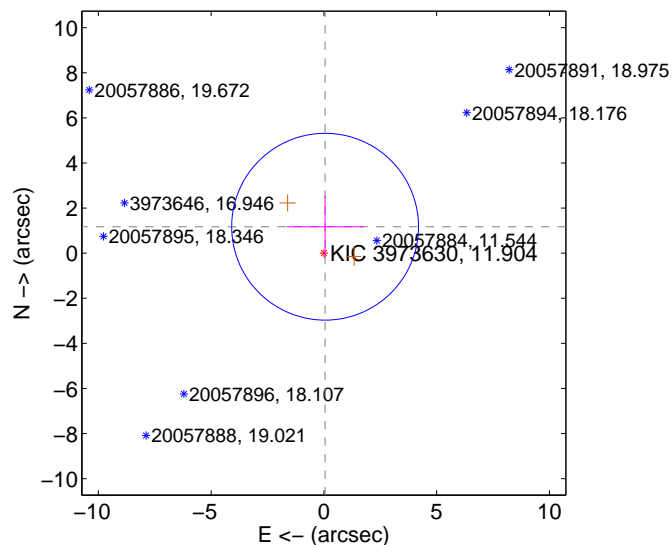
The direct PRF centroid is offset from the target star catalog position by about 1.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.707 ± 0.927	1.84	-0.438 ± 1.788	1.650 ± 0.833
PRF-fit source offset from KIC position	1.174 ± 1.381	0.85	-0.054 ± 1.710	1.173 ± 1.380
photometric centroid source offset	3.93 ± 1.67	2.36	-2.10 ± 1.33	3.33 ± 1.79

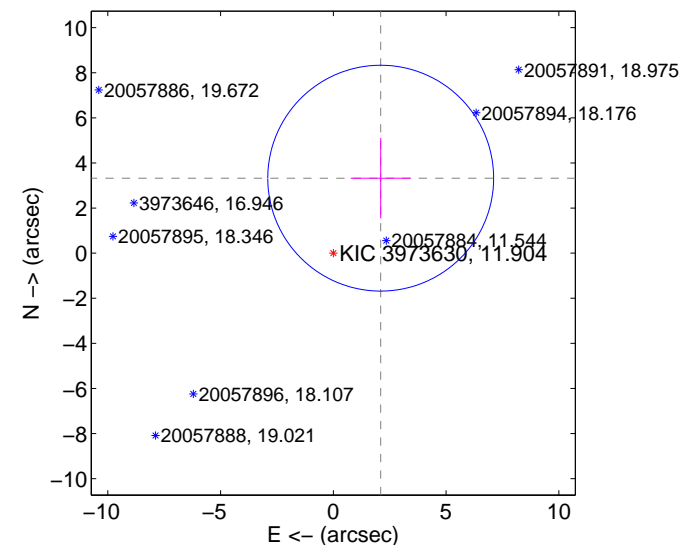
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

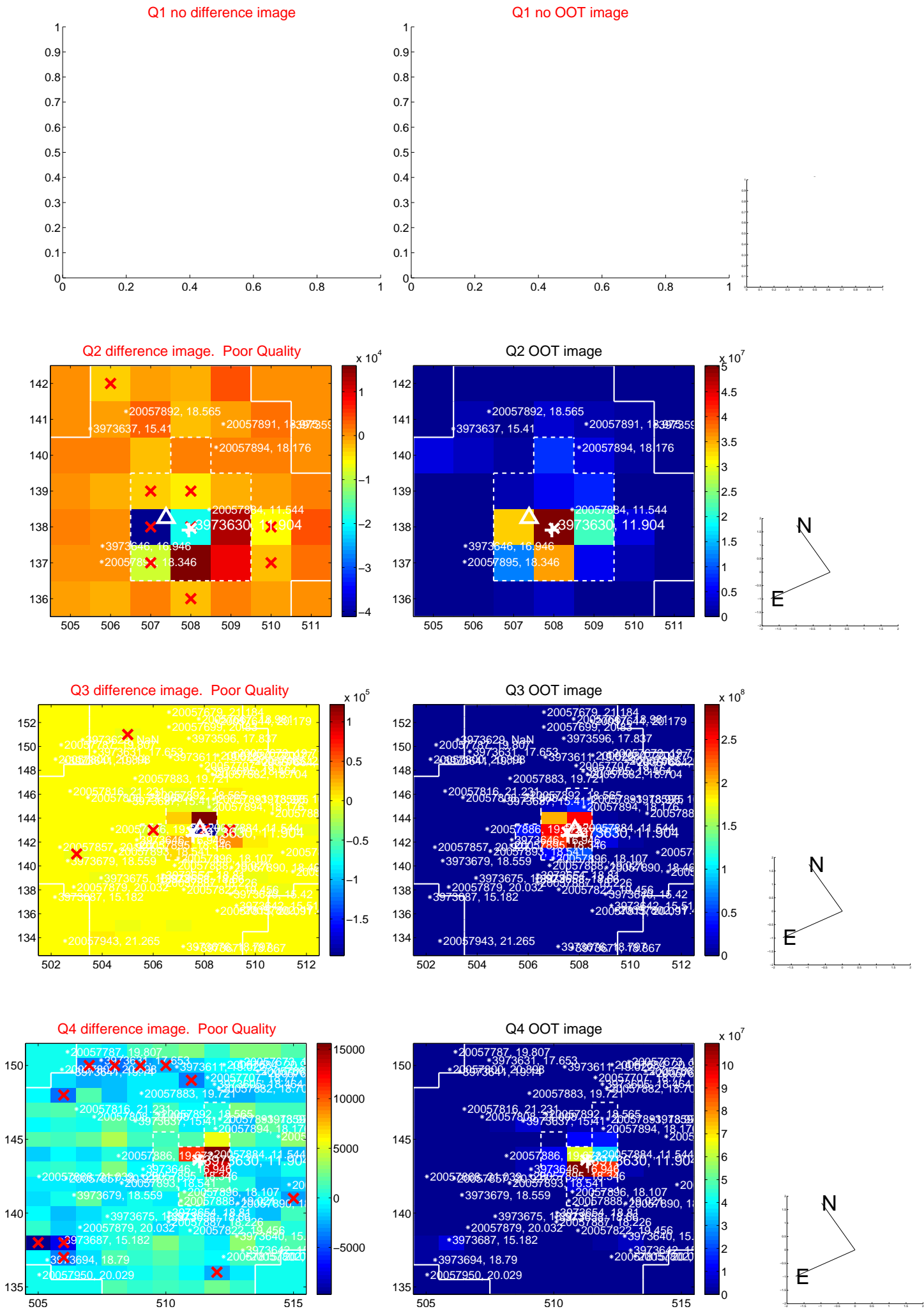


offset from photometric centroids

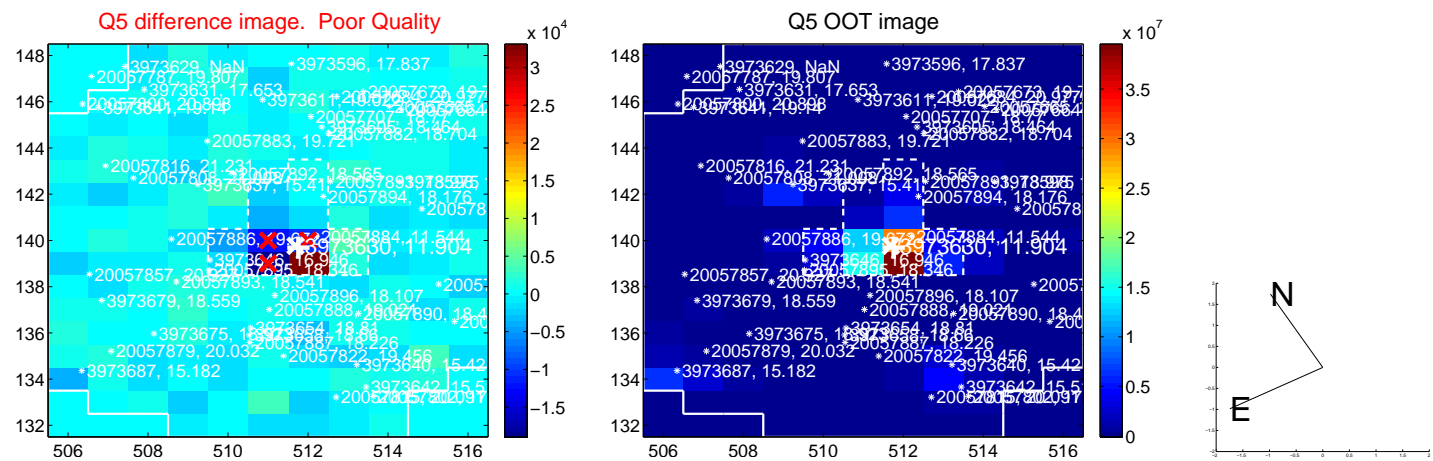


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



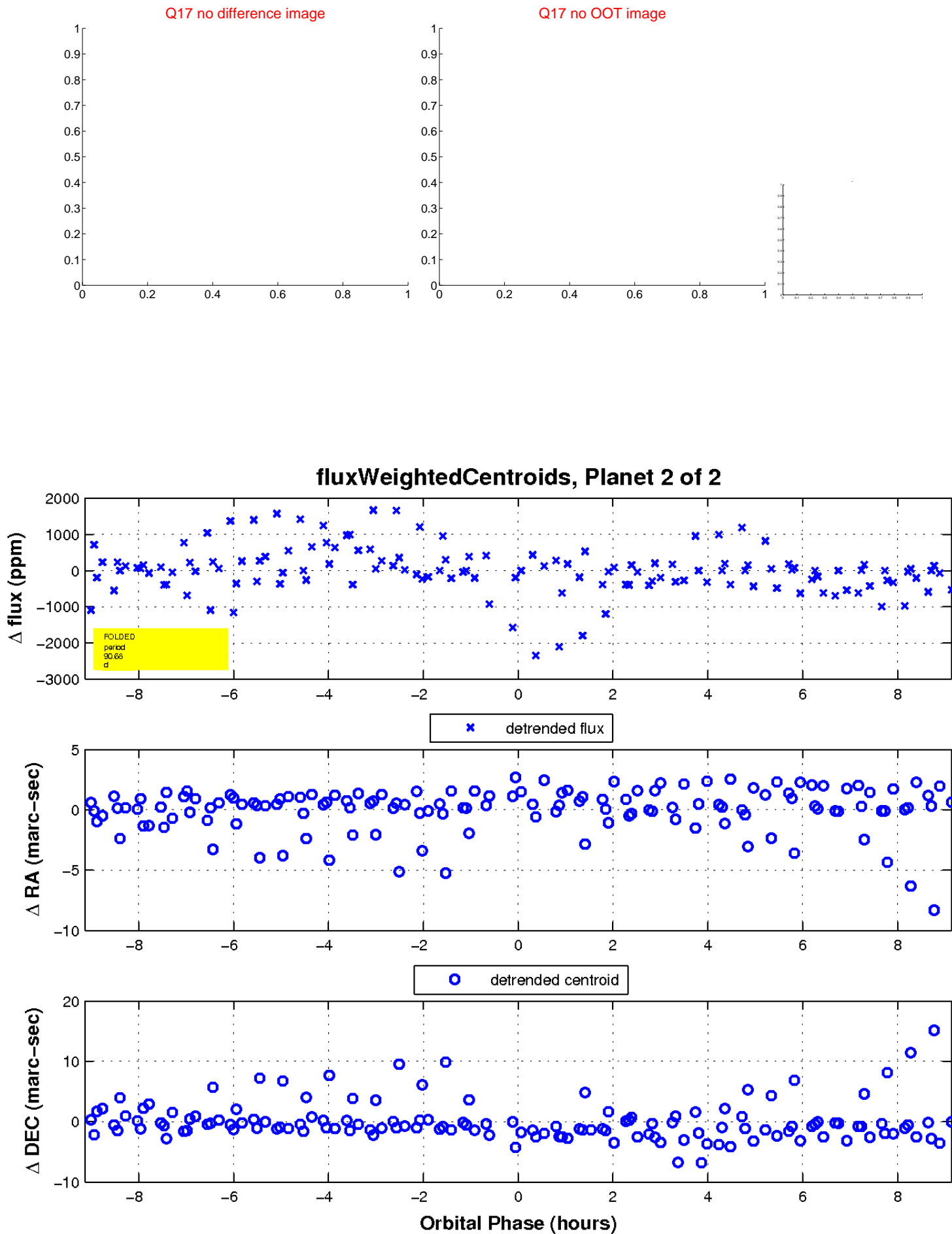
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

