

KIC 010603977

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})
010603977-01	OBS	No	283.728121	349.836040	806.7	3.829	15.8	6.8	3.38	4946	9.45	9.40
010603977-02	OBS	No	496.308890	500.081191	1129.7	10.117	17.2	9.4	3.38	4946	11.24	4.46
010603977-03	OBS	No	435.341489	518.994833	830.8	6.504	13.5	7.5	3.38	4946	10.15	5.31
010603977-04	OBS	No	588.391930	209.666961	704.9	7.593	12.0	6.5	3.38	4946	9.49	3.55
010603977-05	OBS	No	328.509606	306.369398	679.0	4.110	12.5	6.5	3.38	4946	9.36	7.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010603977-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010603977-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010603977-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—CENT_FEW_DIFFS
010603977-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010603977-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

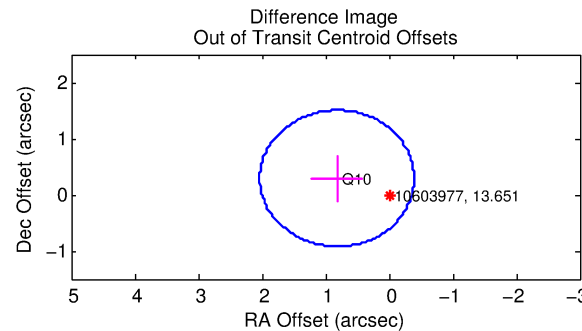
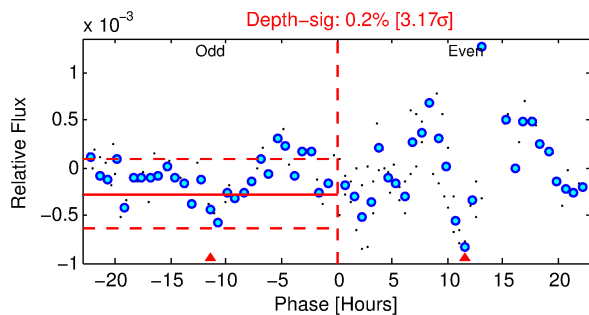
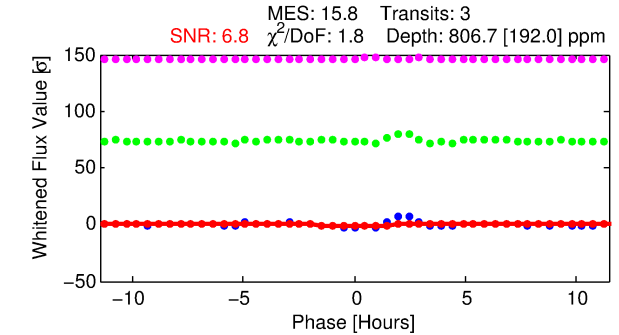
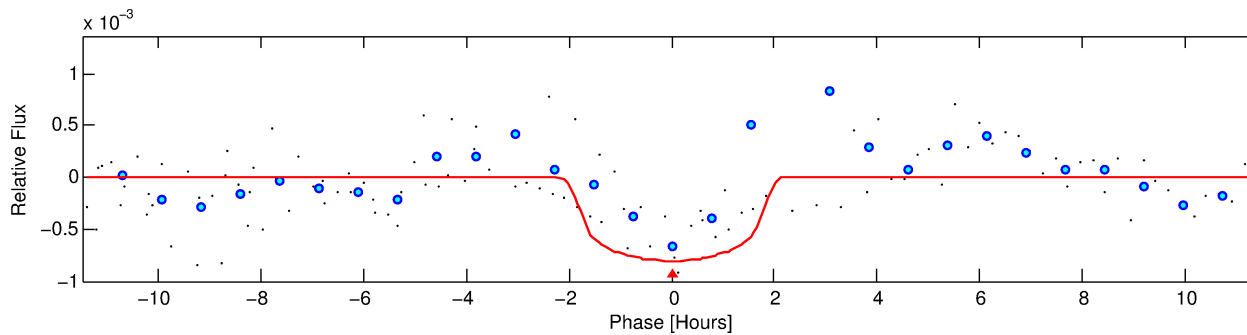
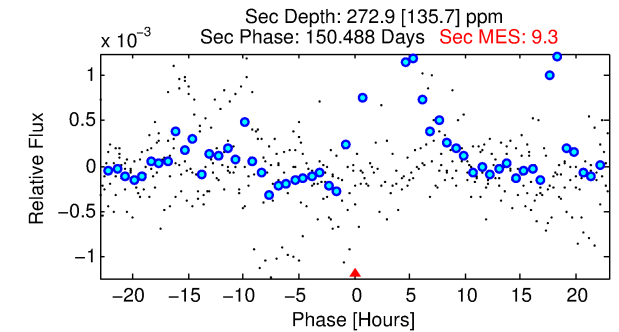
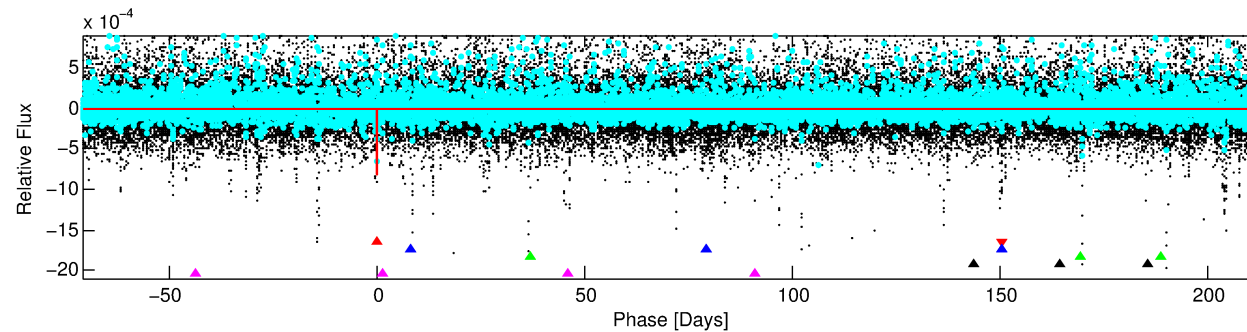
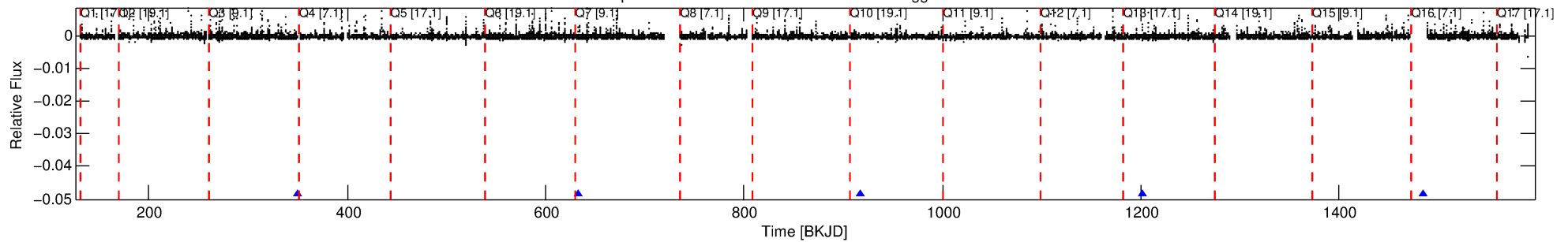
Ephemeris Match Information For 010603977-01

No Significant Match Found

DV One-Page Summary

KIC: 10603977 Candidate: 1 of 5 Period: 283.728 d

Kp: 13.65 R*: 3.38 Rs Teff: 4946.0 K Logg: 3.32 Fe/H: -0.320



DV Fit Results:

Period = 283.72812 [0.00653] d
Epoch = 349.8360 [0.0132] BKJD
Rp/R* = 0.0256 [0.1076]
a/R* = 552.50 [8063.80]
b = 0.32 [42.44]
Seff = 9.40 [5.80]
Teq = 446 [69] K
Rp = 9.45 [39.97] Re
a = 0.8064 [0.3546] AU
Ag = 1094.58 [9225.23] [0.12σ]
Teffp = 3970 [8345] K [0.42σ]

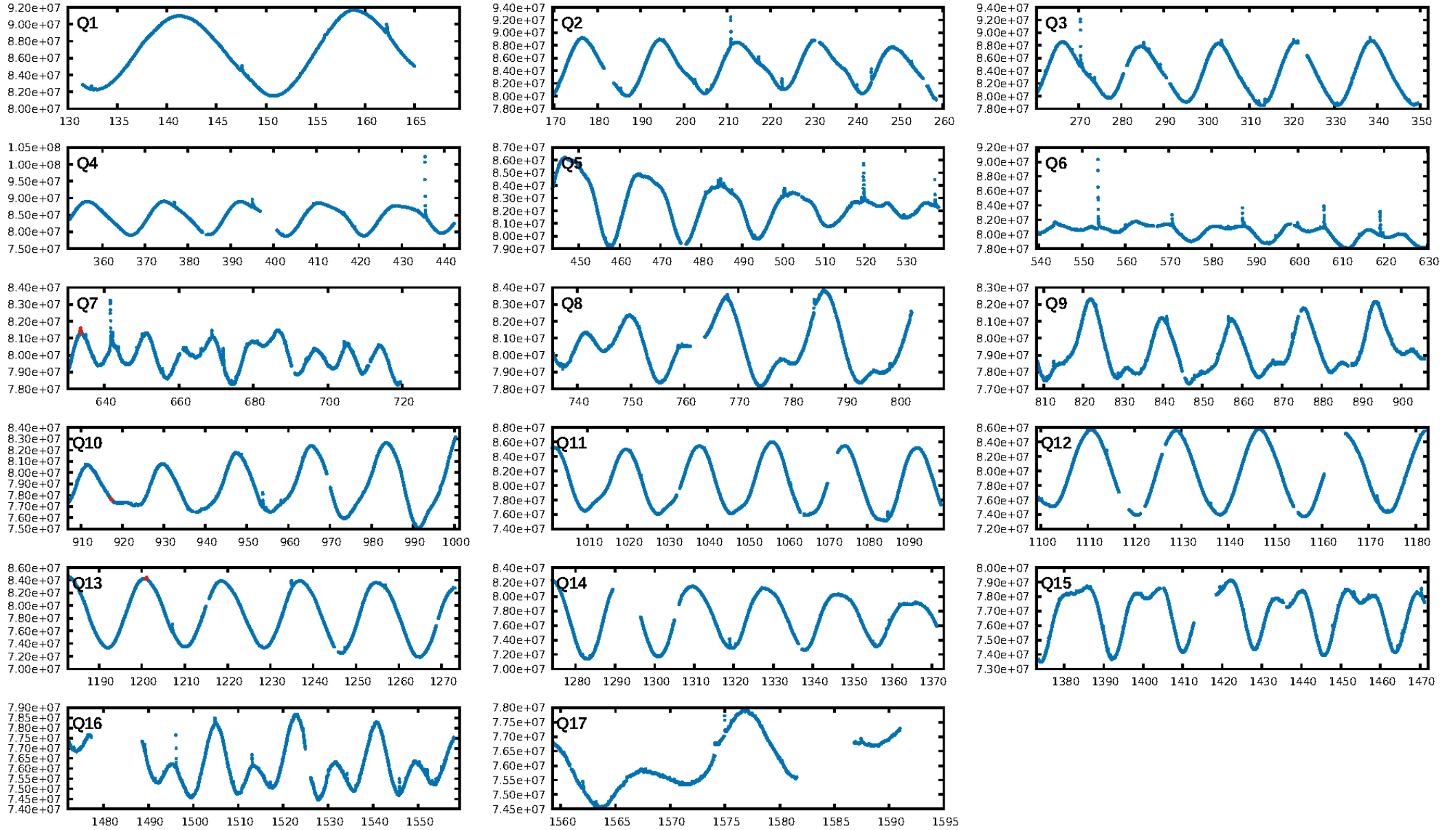
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [191.34σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 15.6%
Bootstrap-pfa: 4.55e-13
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.569
Centroid-sig: 77.2%
Centroid-so: 0.365 arcsec [0.55σ]
OotOffset-rm: 0.871 arcsec [2.15σ]
KicOffset-rm: 0.992 arcsec [2.45σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [1/1]

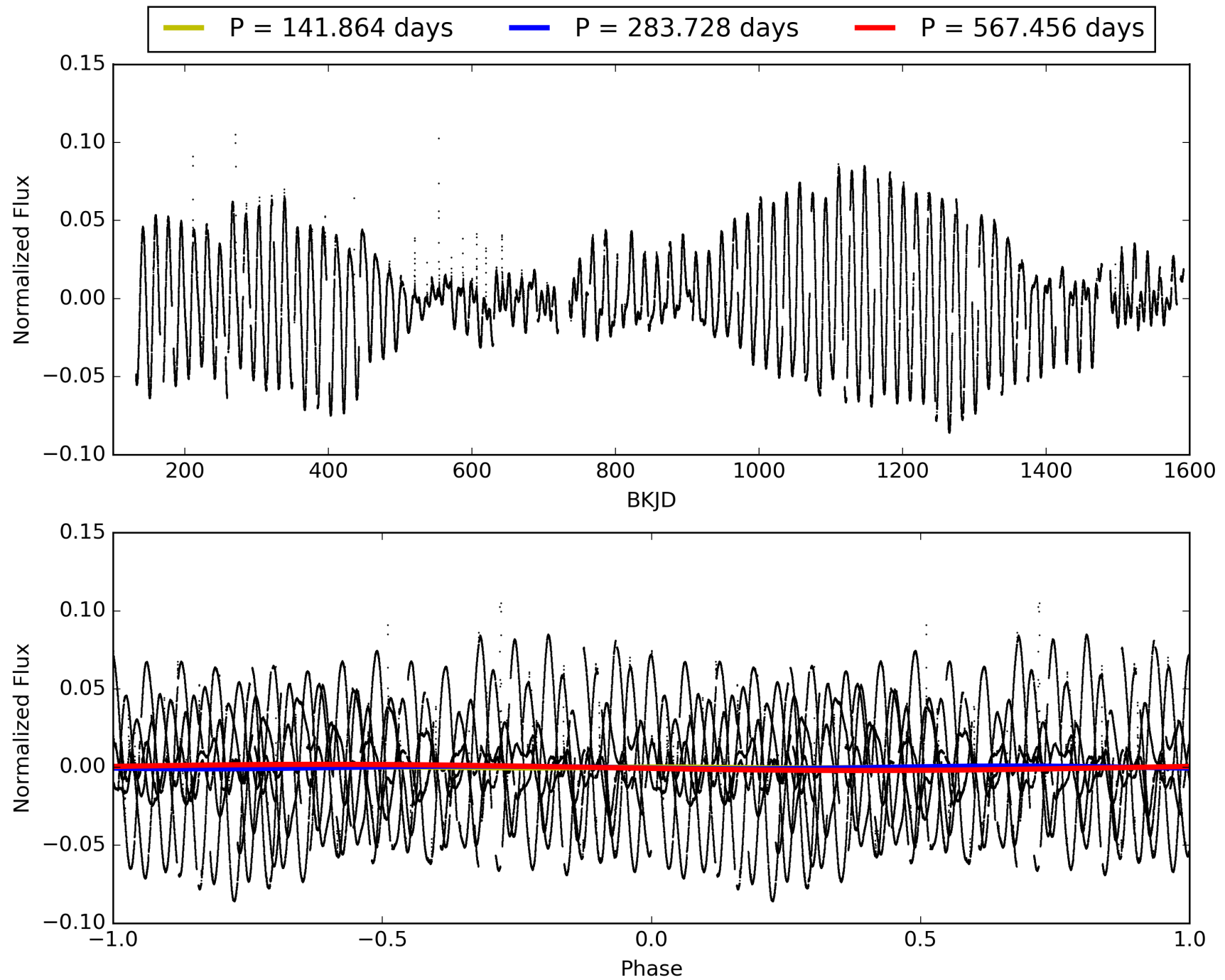
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010603977-01, PDC Light Curves

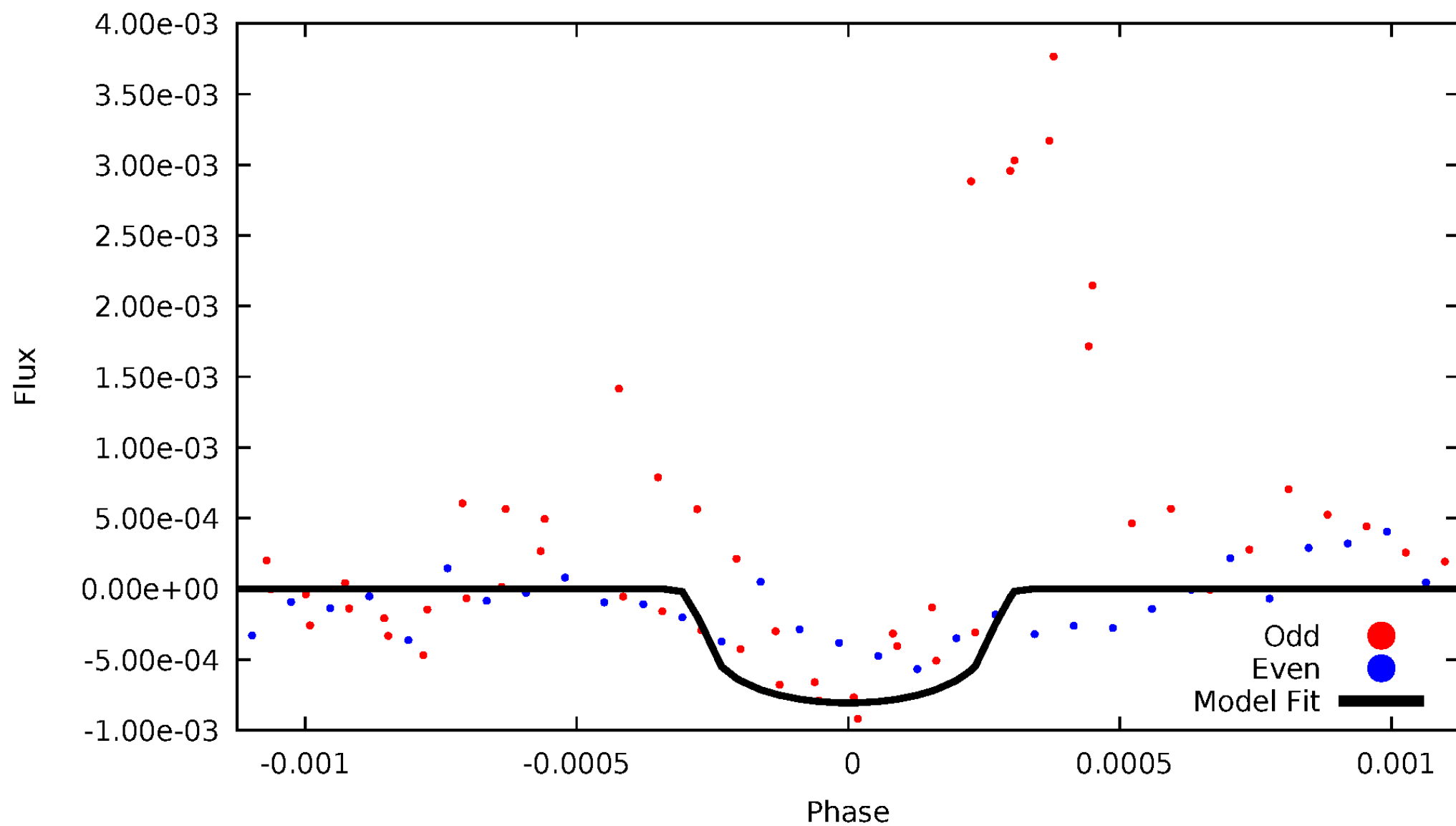


TCE 010603977-01



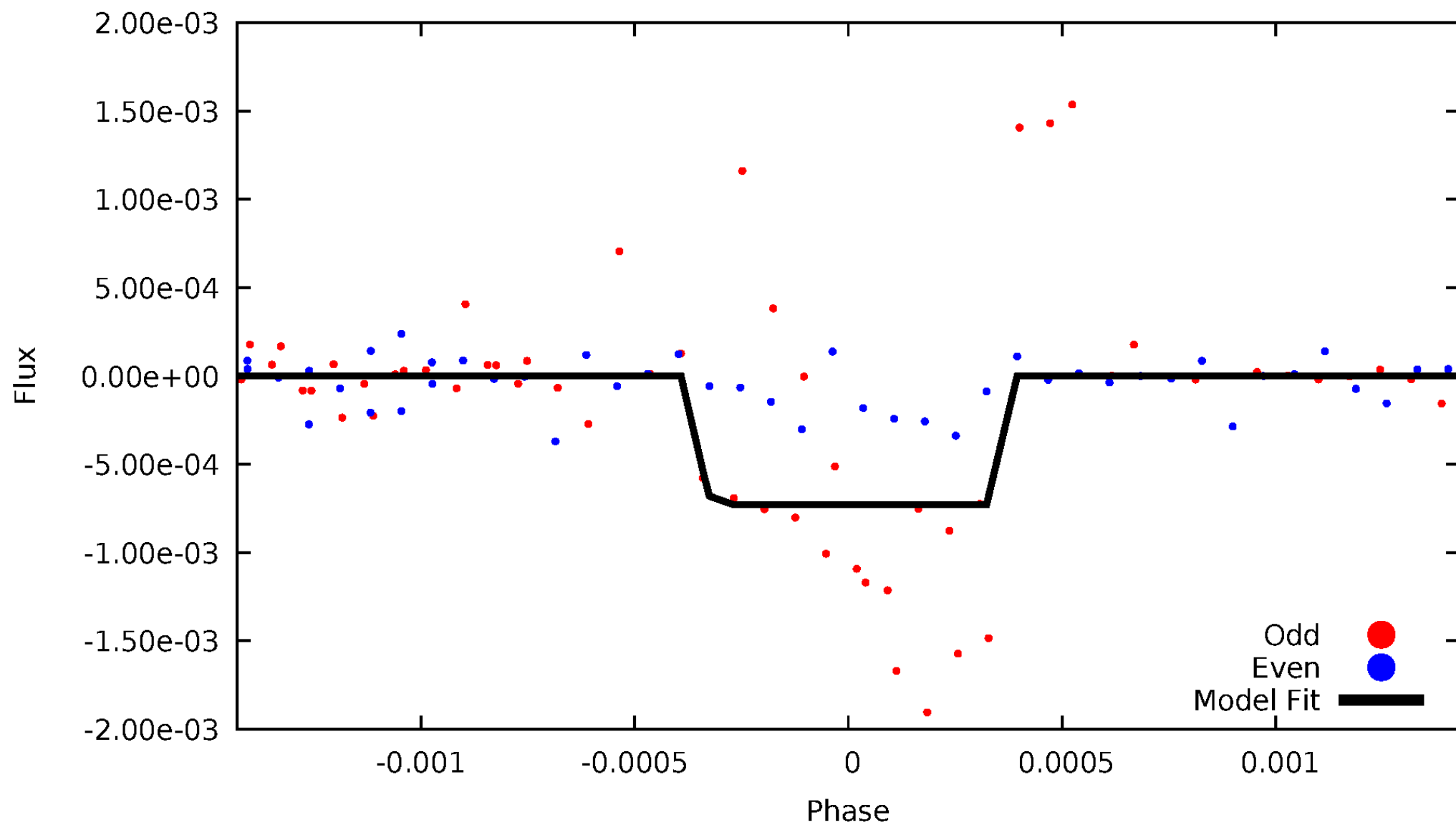
DV Odd/Even

TCE 010603977-01



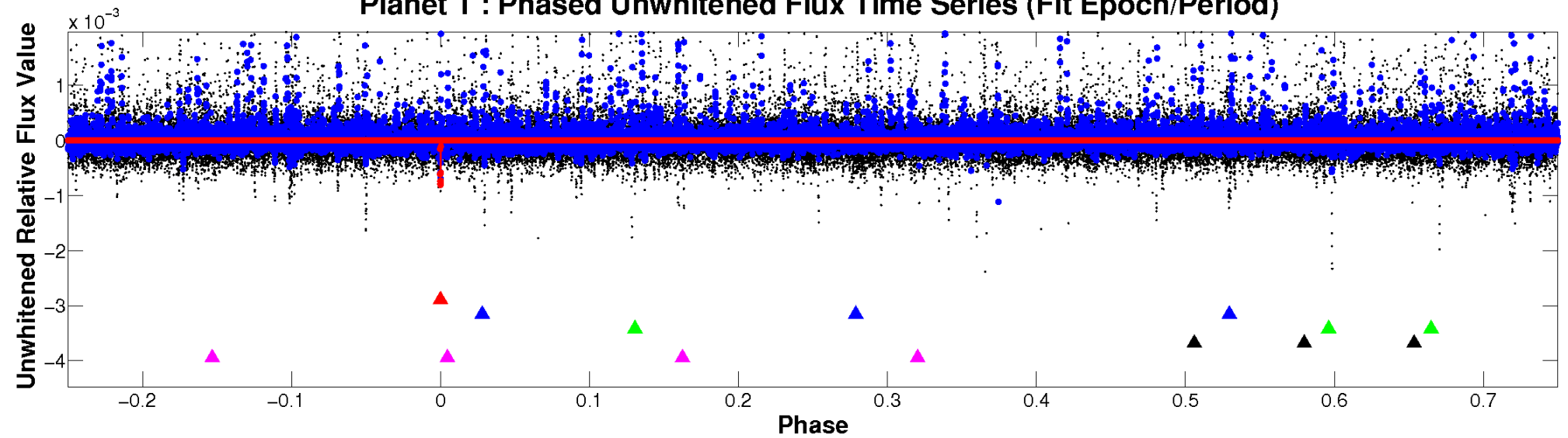
ALT Odd/Even

TCE 010603977-01

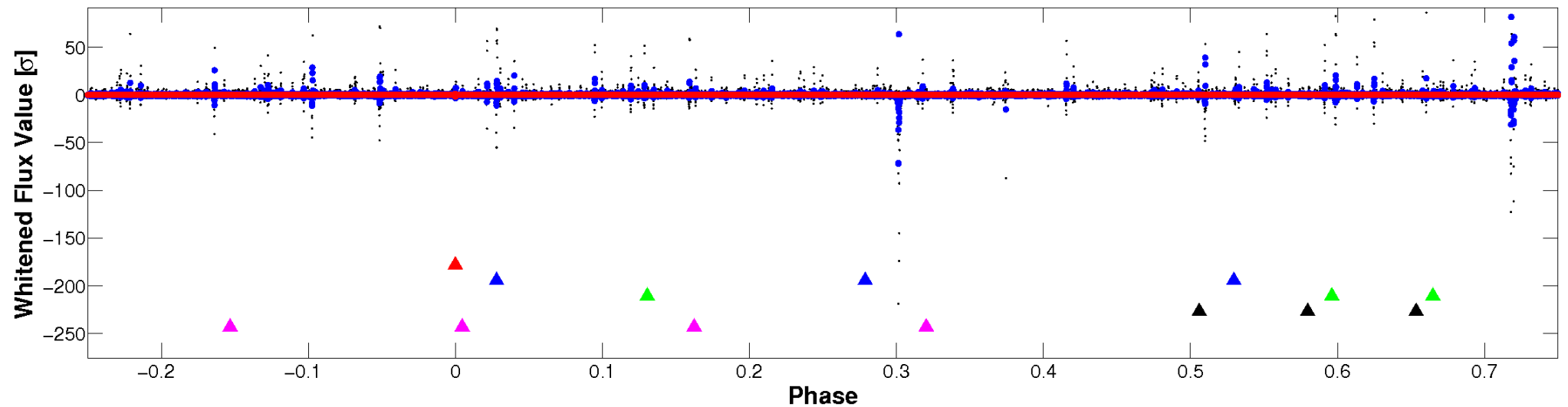


Non-Whitened Vs. Whitened Light Curve

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

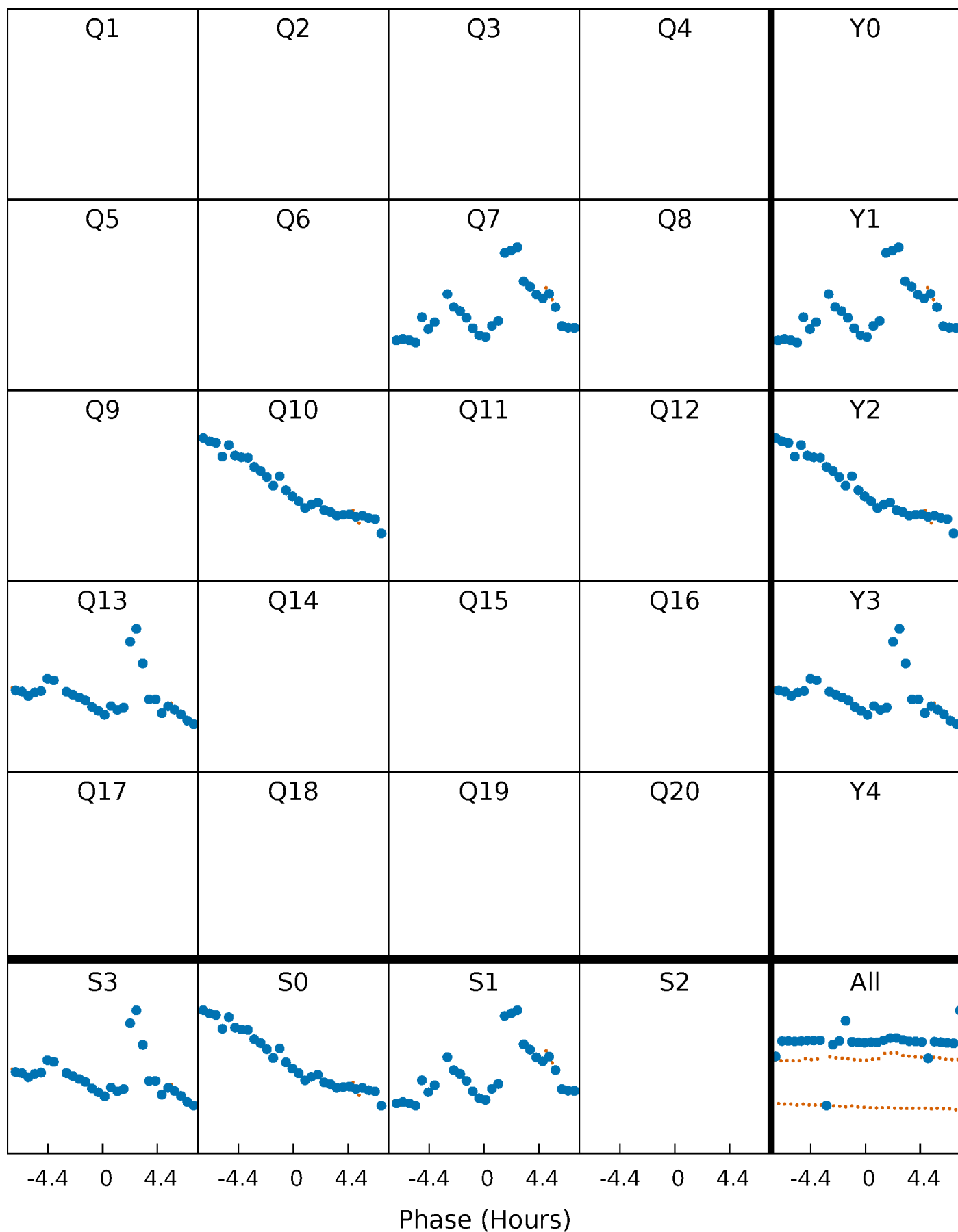


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



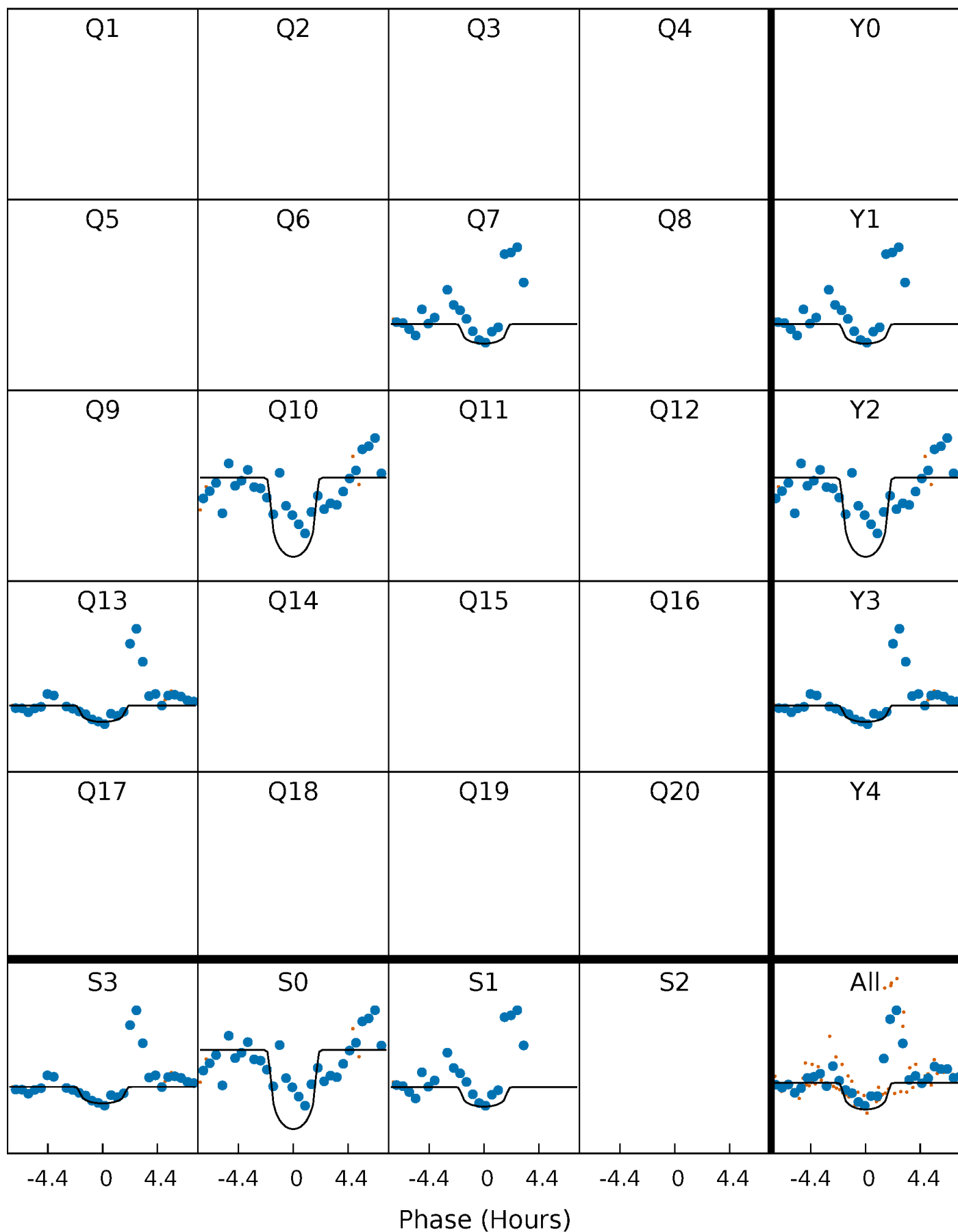
PDC Quarter-Phased Transit Curves

TCE 010603977-01 P=283.728120 Days $T_0=349.836040$ (BKJD)



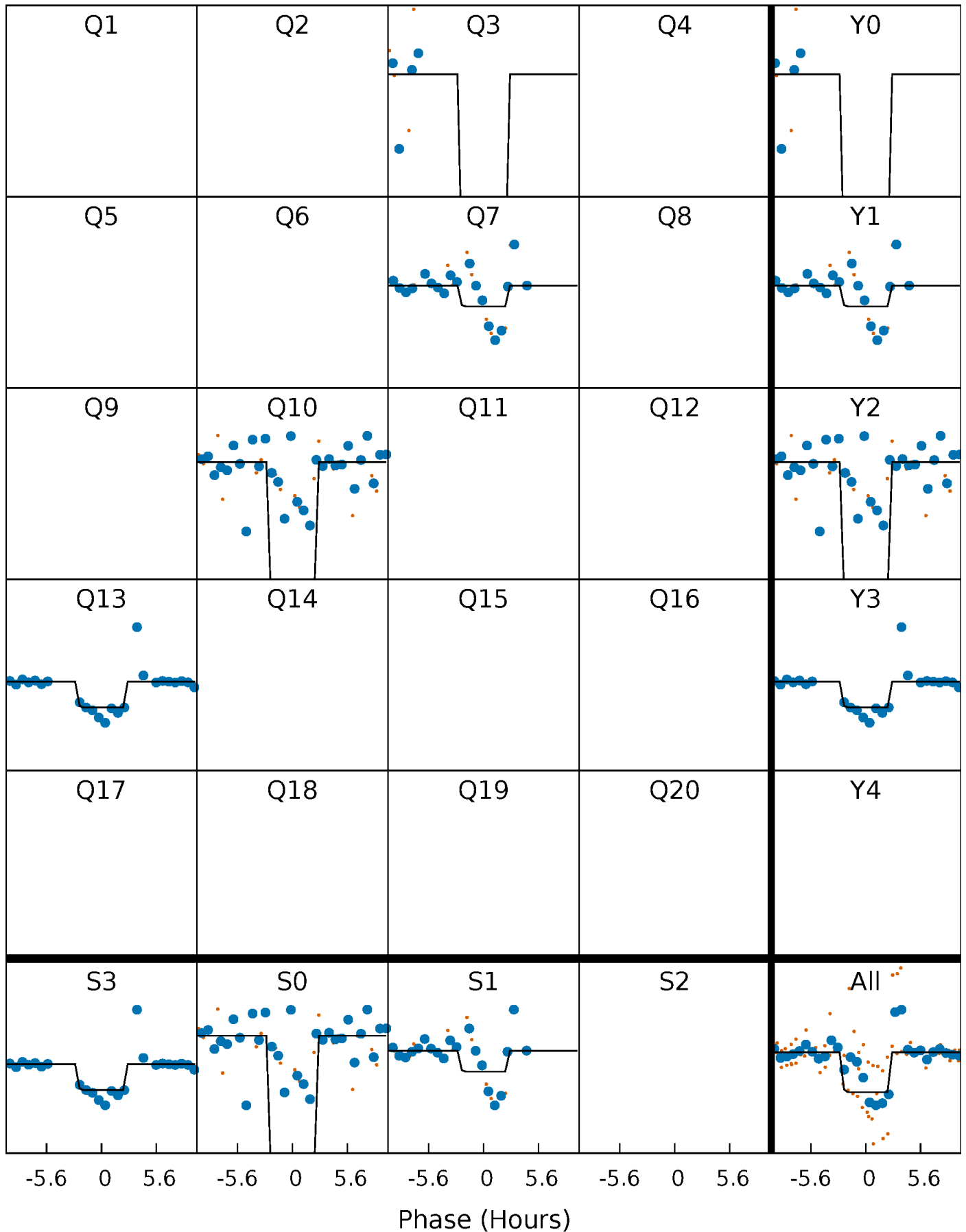
DV Quarter-Phased Transit Curves

TCE 010603977-01 P=283.728120 Days $T_0=349.836040$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

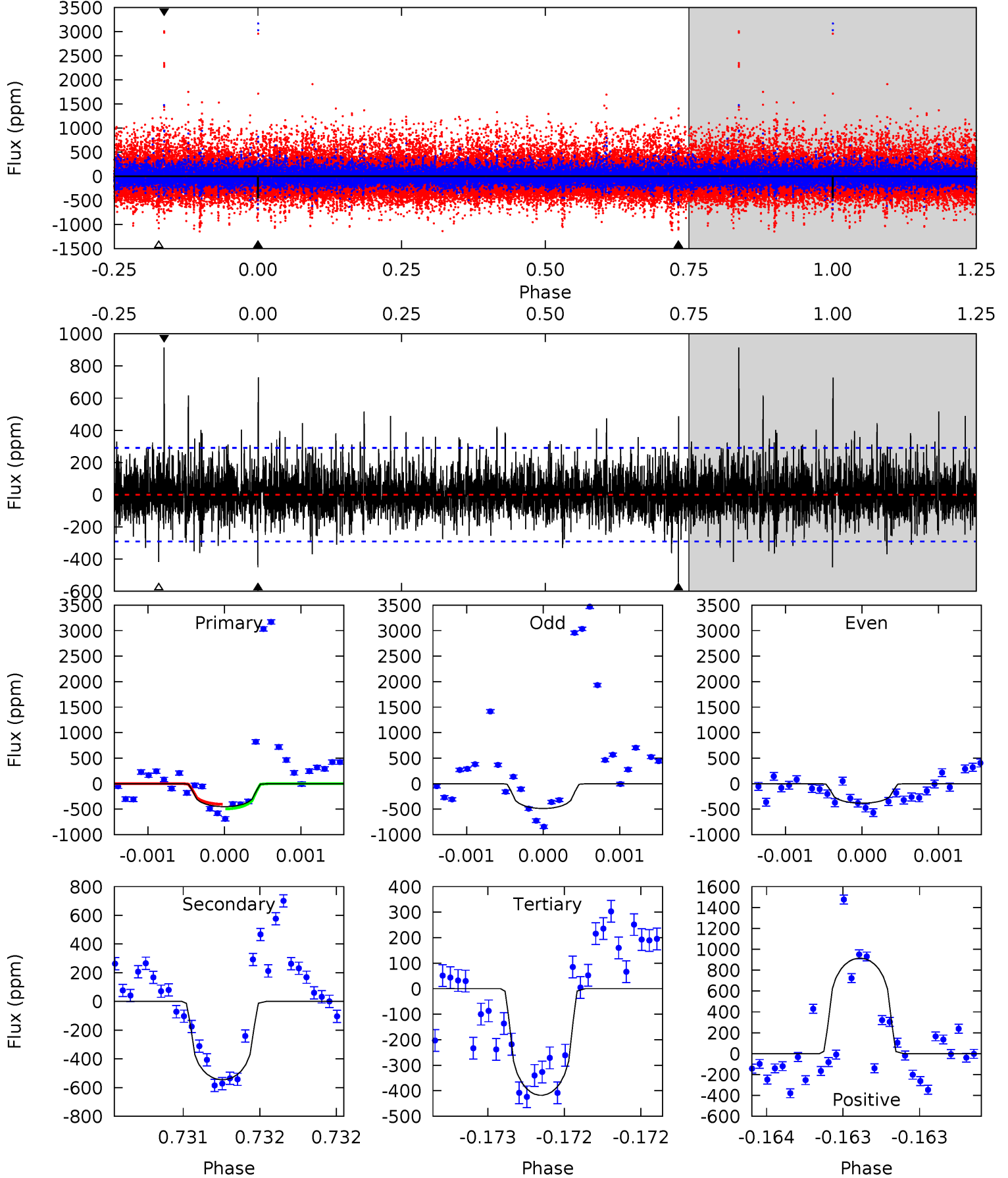
TCE 010603977-01 P=283.742303 Days $T_0=349.772399$ (BKJD)



DV Model-Shift Uniqueness Test

010603977-01, P = 283.728120 Days, E = 66.107920 Days

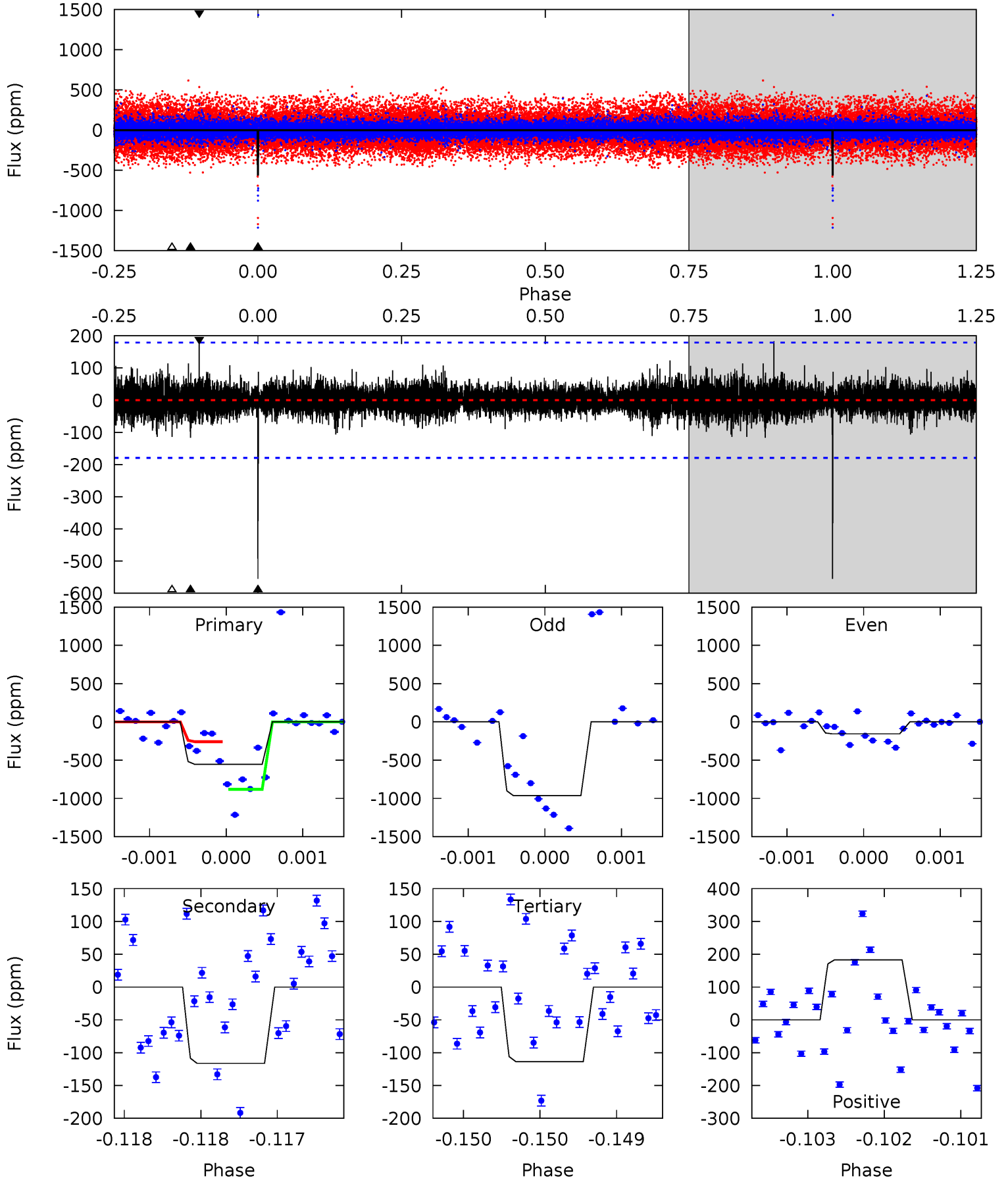
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.56	10.4	7.94	17.4	5.53	3.41	1.97	0.62	-8.82	2.42	-7.02	0.69	0.83	0.63	0.86



Alt Model-Shift Uniqueness Test

010603977-01, P = 283.742303 Days, E = 66.030096 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	3.59	3.51	5.65	5.53	3.41	0.77	13.6	11.5	0.08	-2.06	13.9	0.79	0.25	9.27



Stellar Parameters For KIC 010603977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4946^{+136}_{-1}	$3.320^{+0.315}_{-0.315}$	$-0.320^{+0.300}_{-0.200}$	$3.376^{+1.860}_{-1.002}$	$0.868^{+0.299}_{-0.161}$	$0.032^{+0.061}_{-0.020}$
	+3%/-0%	+9%/-9%	+94%/-62%	+55%/-30%	+34%/-19%	+192%/-64%
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 010603977-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-545 ± 53	$31.90^{+34.29}_{-22.27}$	621^{+84}_{-62}	3125^{+1523}_{-526}	196^{+1872}_{-150}
Alt.	-116 ± 32	$30.64^{+32.59}_{-21.78}$	621^{+84}_{-71}	2575^{+1033}_{-392}	42^{+495}_{-32}

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 $A_{obs} \gg 1.0$

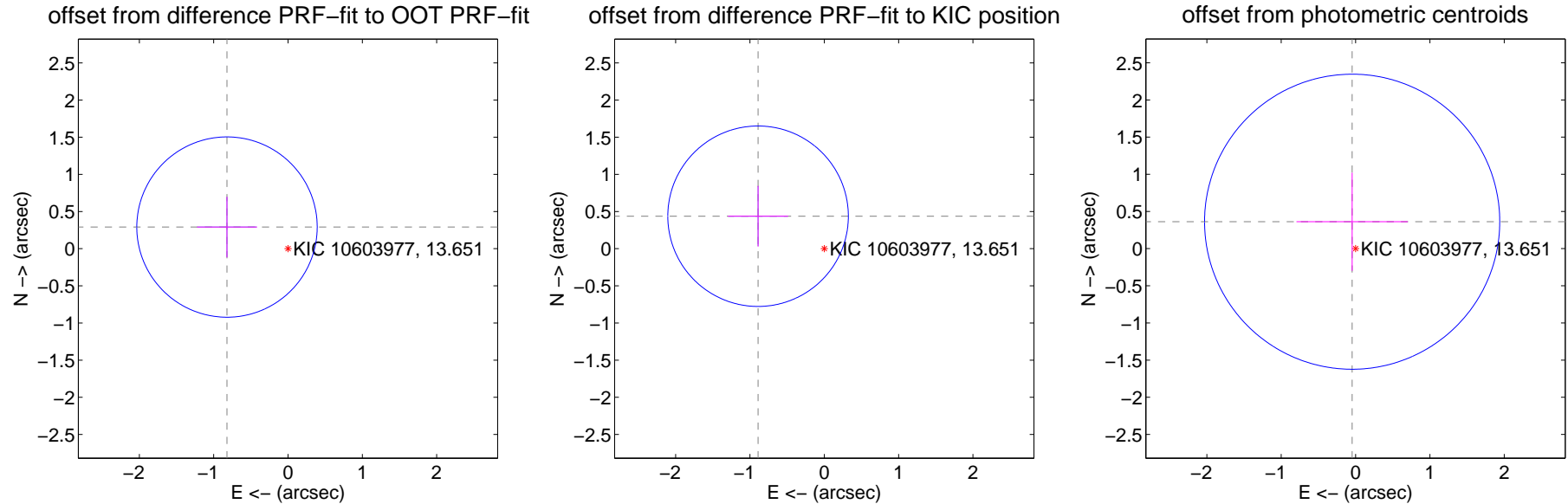
DV Centroid Data

Supplemental centroid analysis for 010603977-01. Kepler magnitude: 13.65. Transit SNR 6.84

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.871 ± 0.404	2.15	0.821 ± 0.404	0.291 ± 0.408
PRF-fit source offset from KIC position	0.992 ± 0.405	2.45	0.891 ± 0.404	0.437 ± 0.408
photometric centroid source offset	0.36 ± 0.66	0.55	0.05 ± 0.75	0.36 ± 0.66



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.

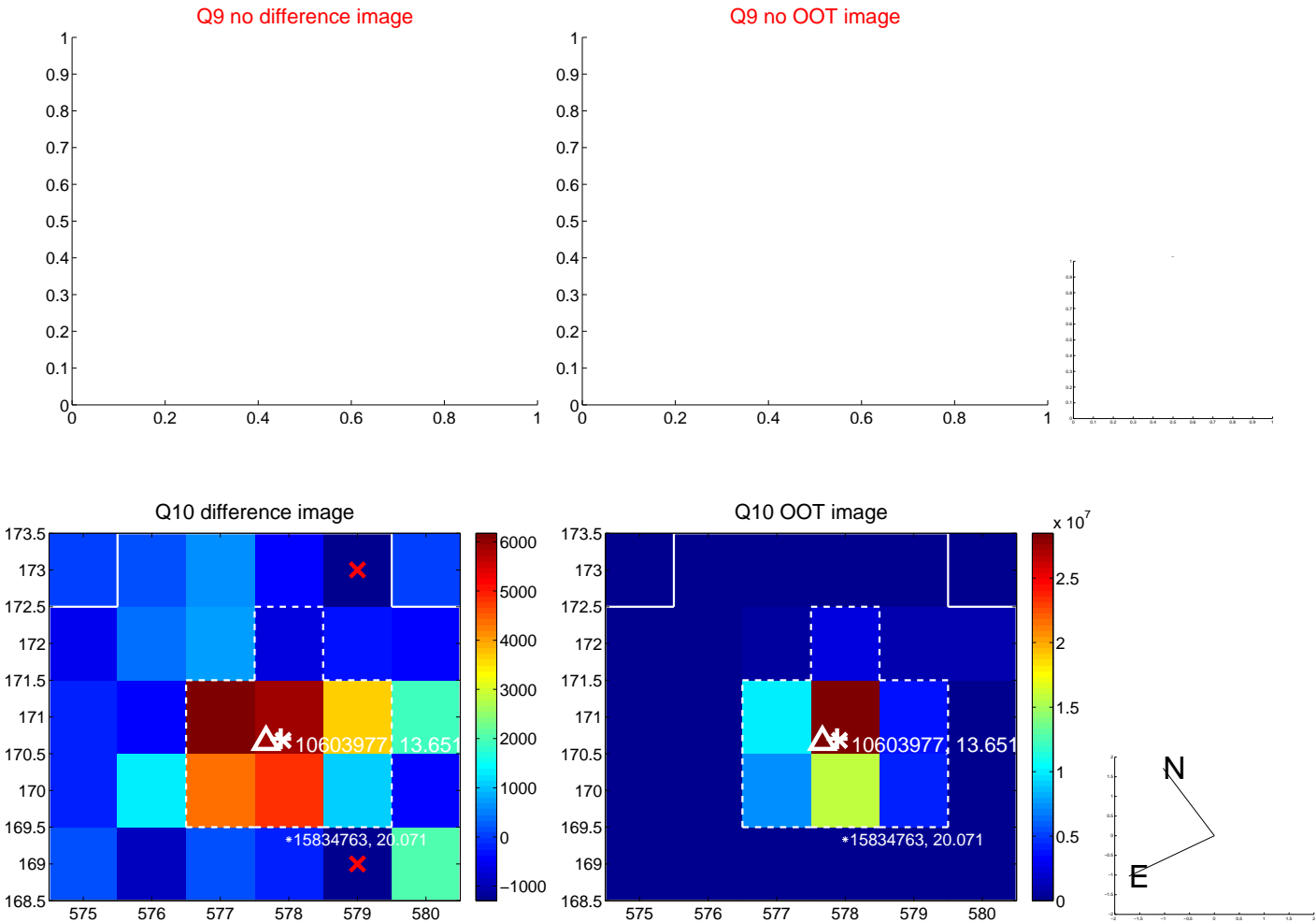
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



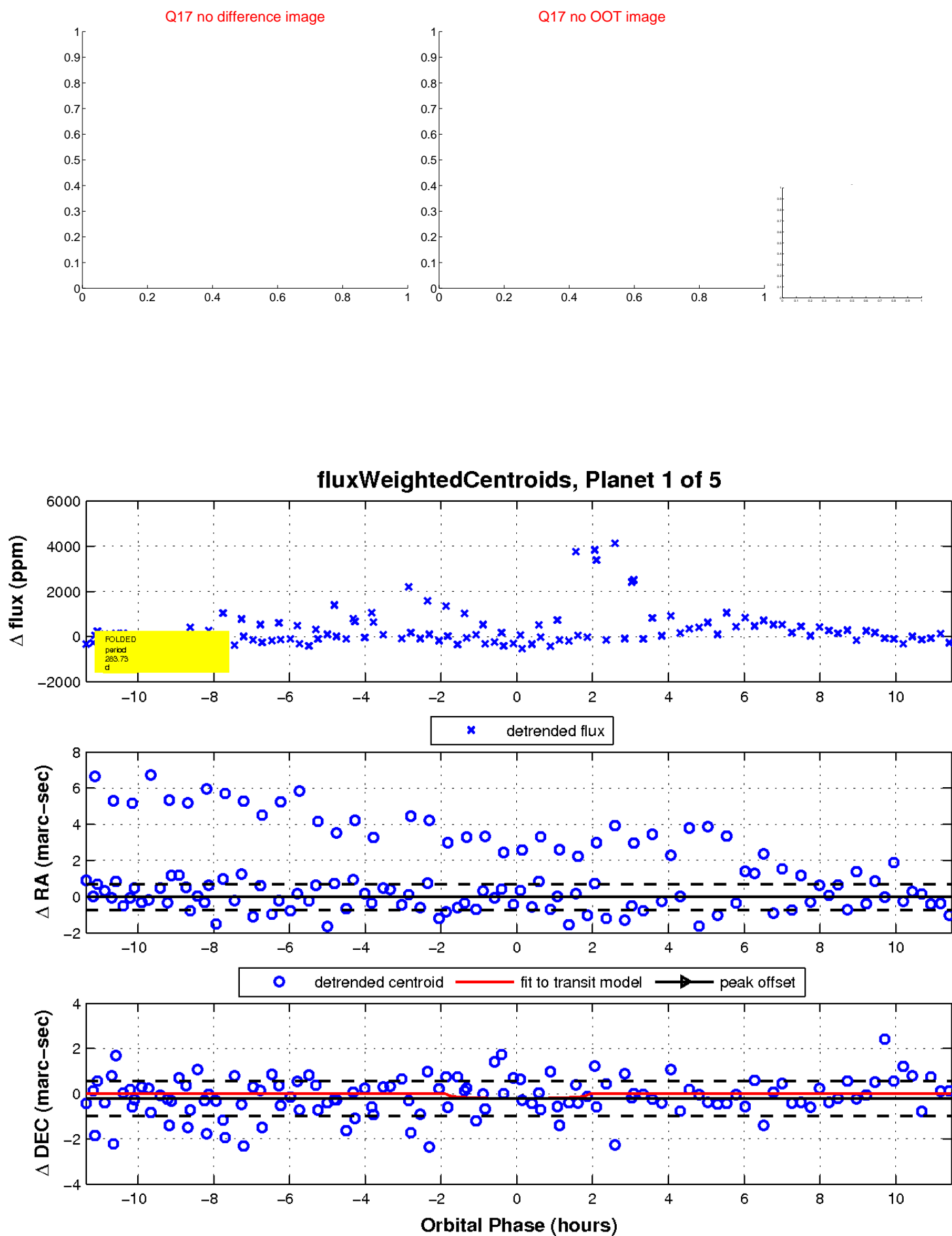
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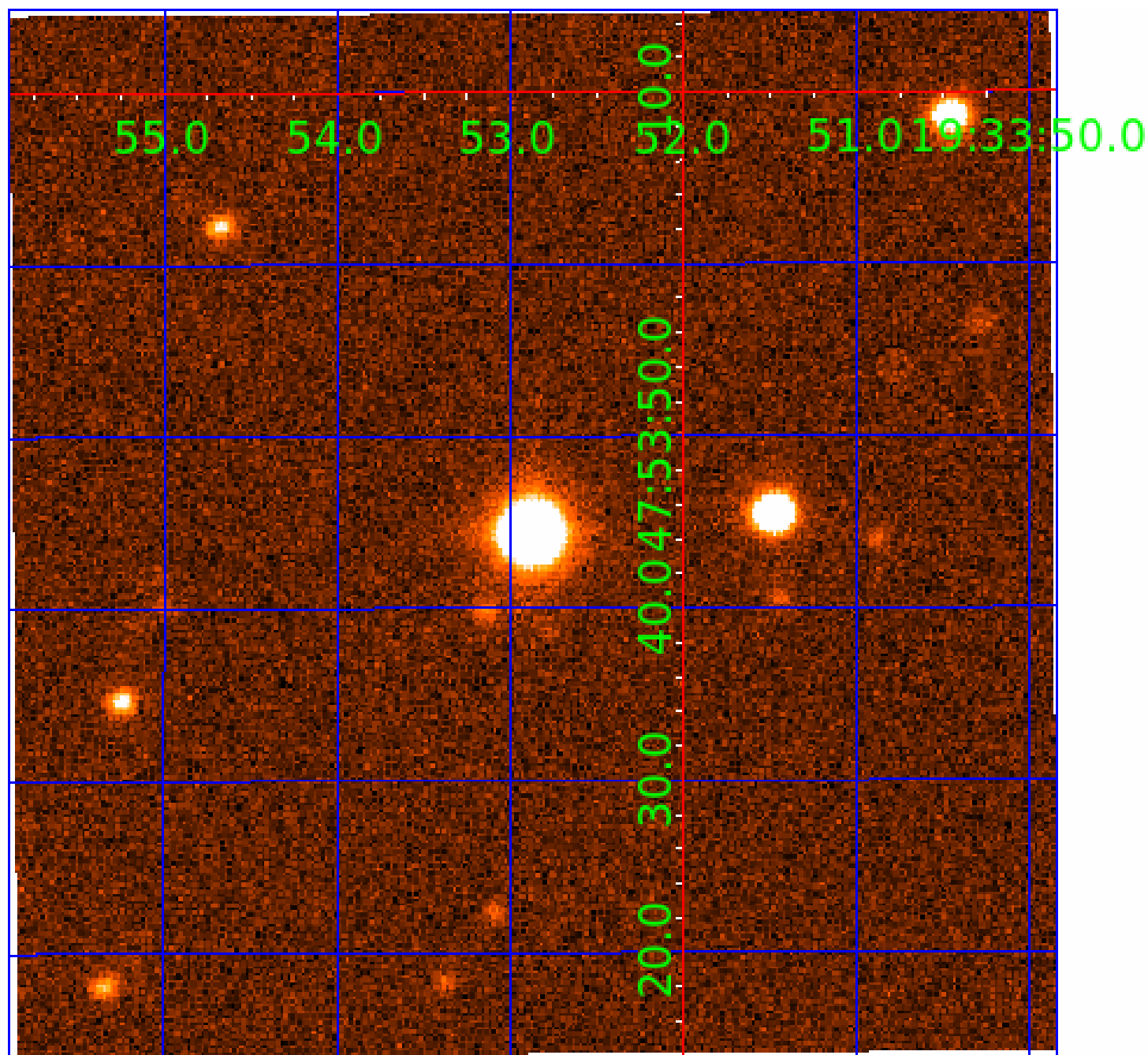


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010603977

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})
010603977-01	OBS	No	283.728121	349.836040	806.7	3.829	15.8	6.8	3.38	4946	9.45	9.40
010603977-02	OBS	No	496.308890	500.081191	1129.7	10.117	17.2	9.4	3.38	4946	11.24	4.46
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010603977-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010603977-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010603977-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—CENT_FEW_DIFFS
010603977-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010603977-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

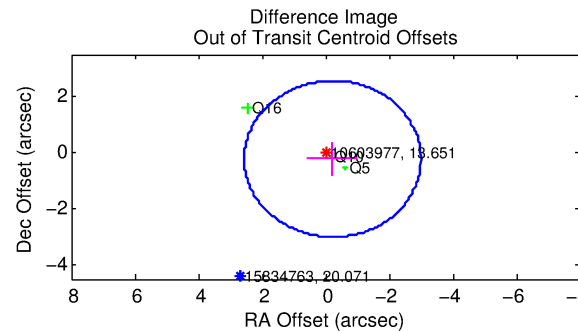
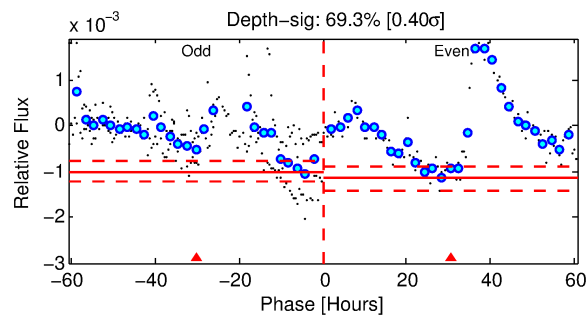
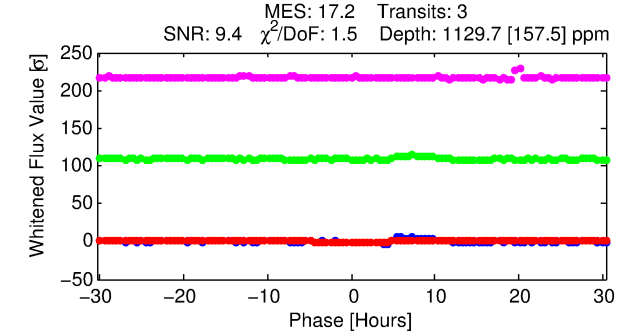
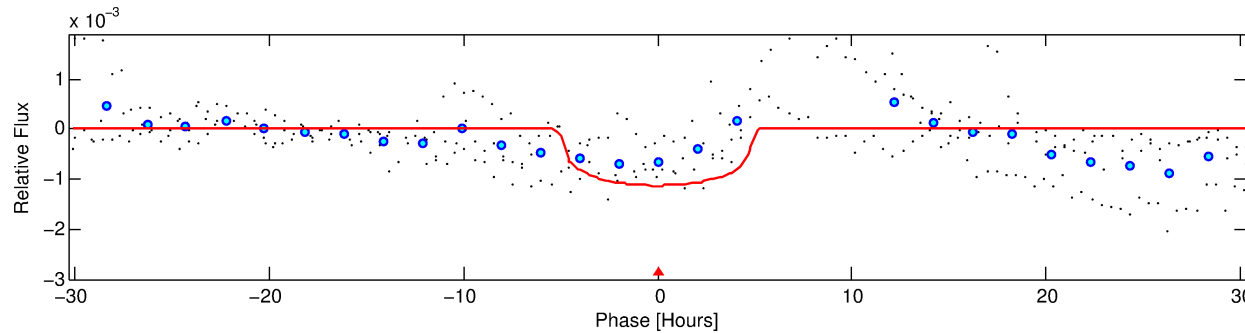
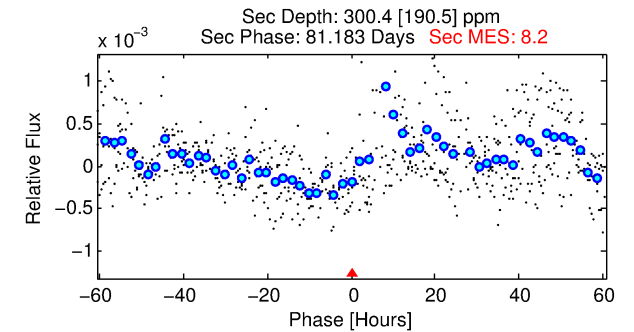
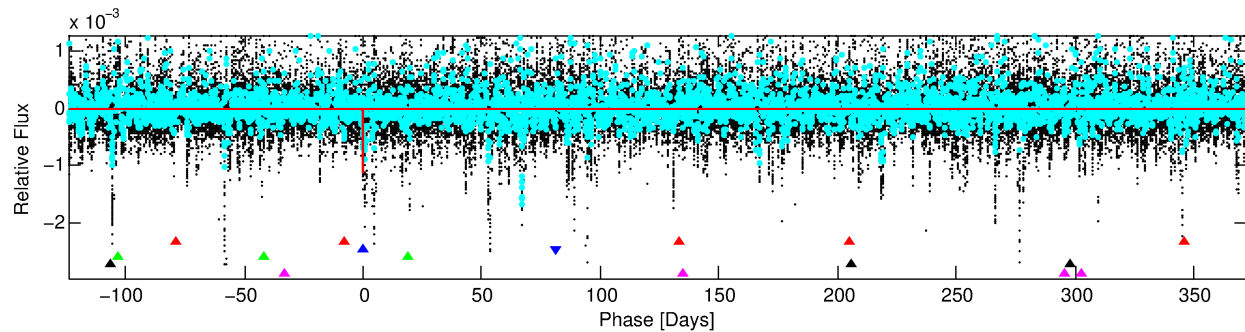
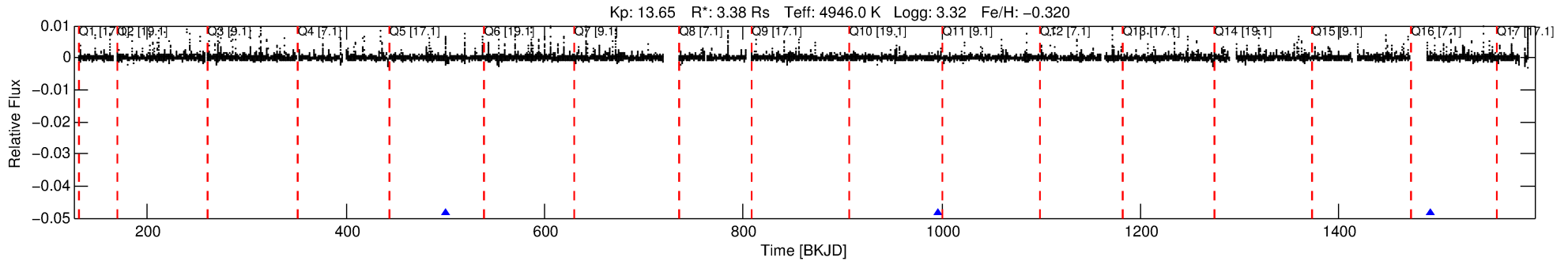
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010603977-02

No Significant Match Found

DV One-Page Summary

KIC: 10603977 Candidate: 2 of 5 Period: 496.309 d



DV Fit Results:

Period = 496.30889 [0.00528] d
Epoch = 500.0812 [0.0077] BKJD
Rp/R* = 0.0305 [0.0155]
a/R* = 359.89 [626.62]
b = 0.37 [4.05]
Seff = 4.46 [2.75]
Teq = 371 [57] K
Rp = 11.24 [8.42] Re
a = 1.1708 [0.5148] AU
Ag = 1792.56 [2405.18] [0.74σ]
Teffp = 3728 [1120] K [2.99σ]

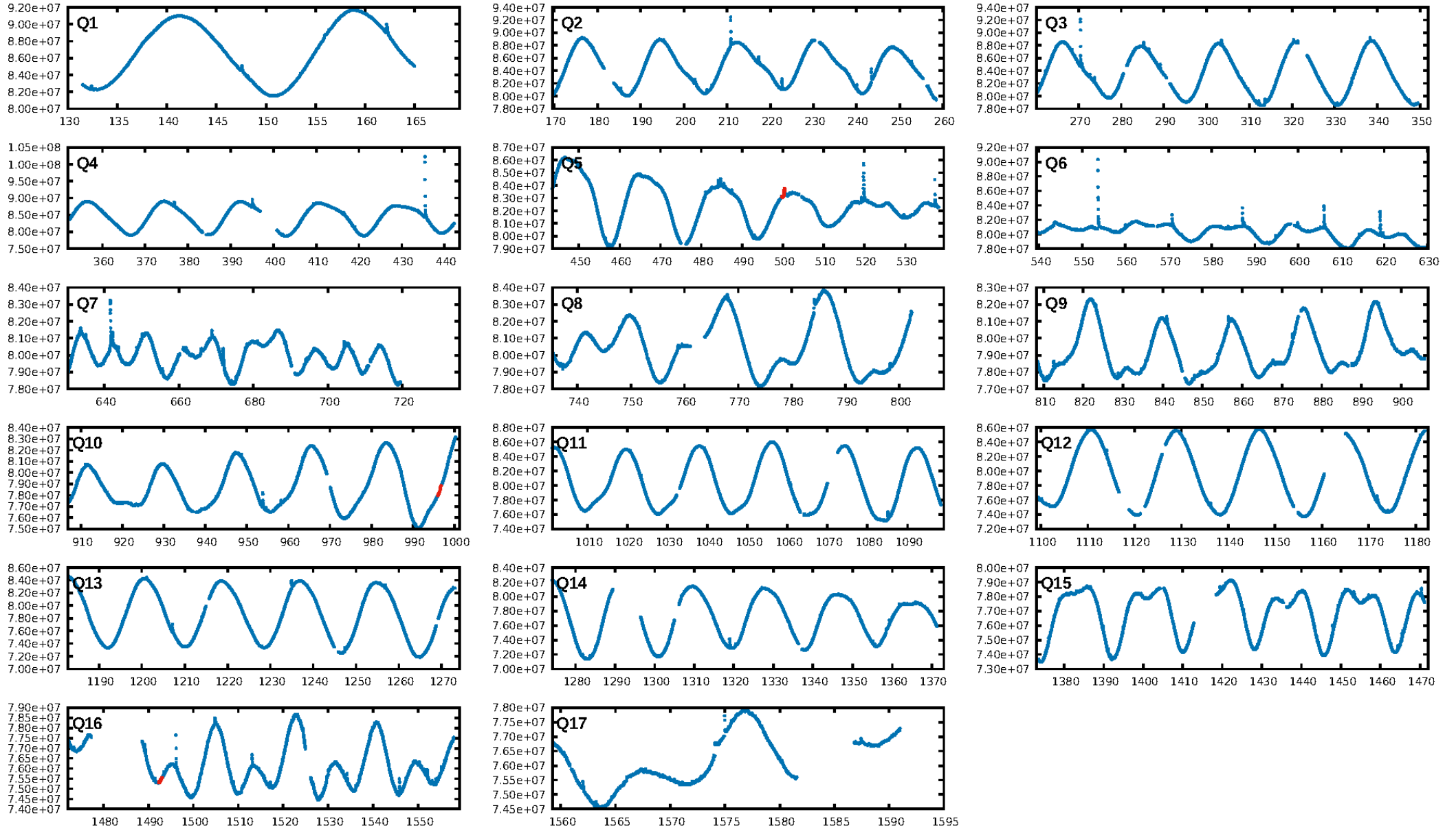
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [121.66σ]
LongPeriod-sig: 100.0% [174.71σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 26.4%
Bootstrap-pfa: 3.18e-14
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.417
Centroid-sig: 1.1%
Centroid-so: 0.763 arcsec [2.04σ]
OotOffset-rm: 0.317 arcsec [0.34σ]
KicOffset-rm: 0.204 arcsec [0.21σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

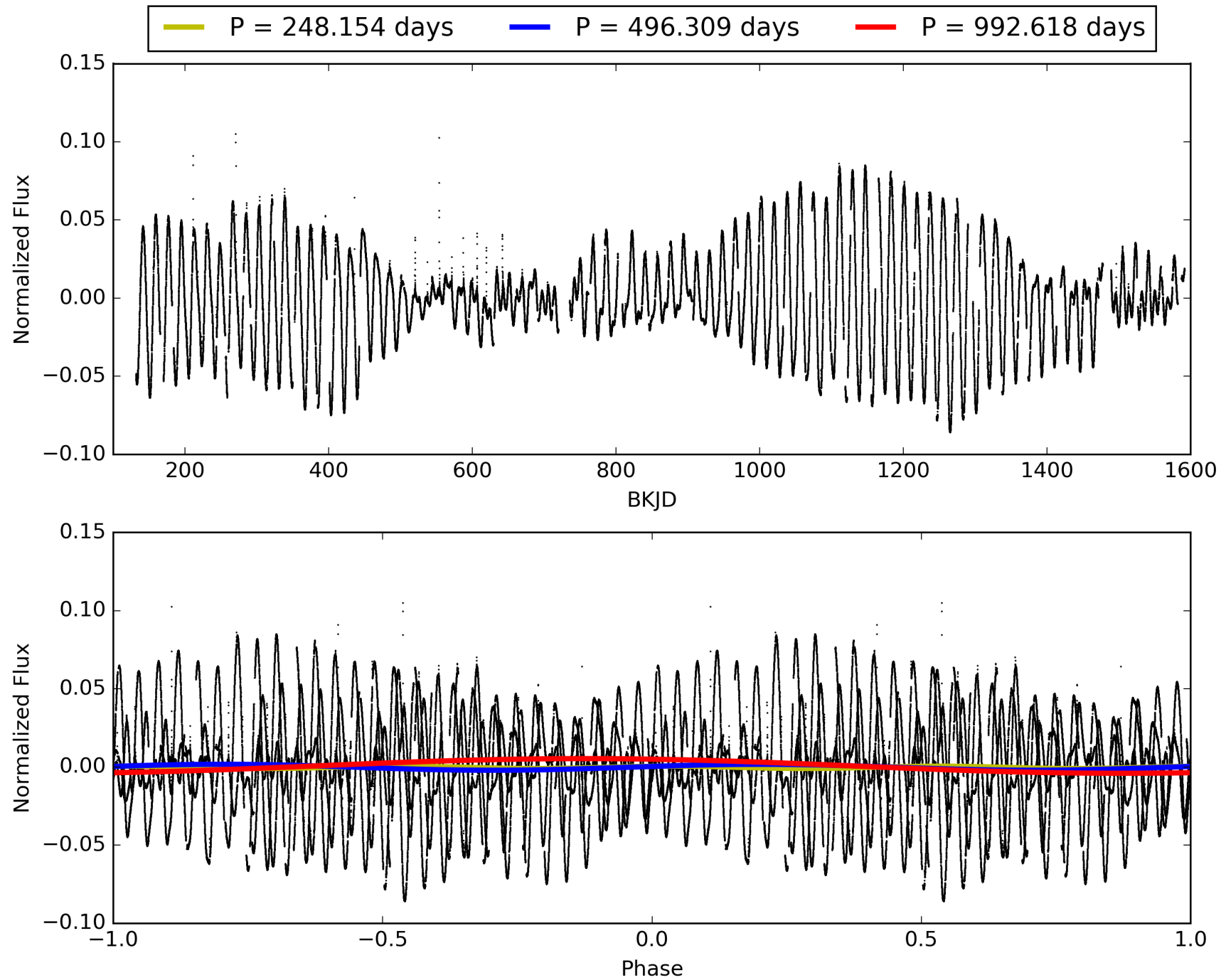
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010603977-02, PDC Light Curves

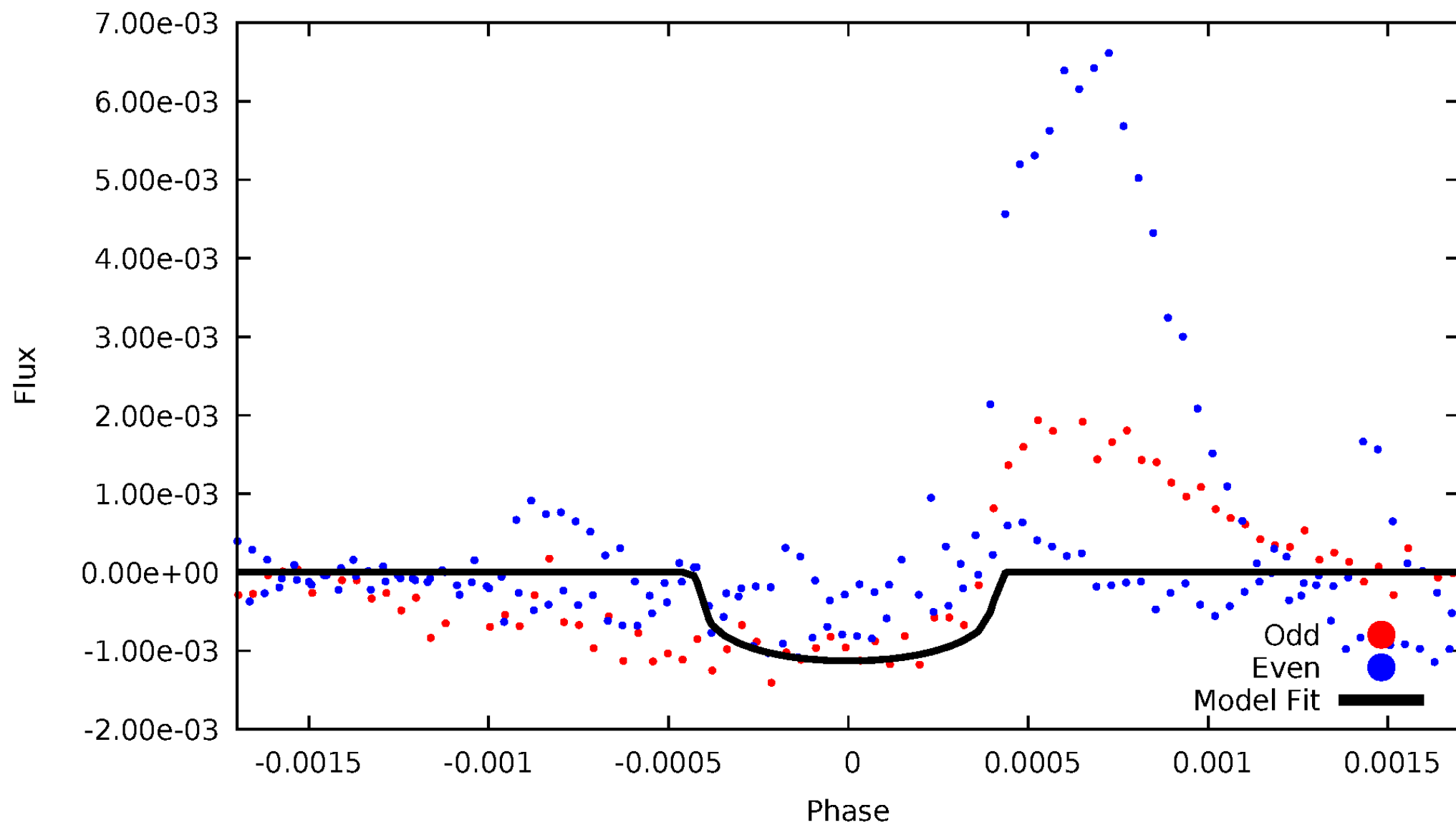


TCE 010603977-02



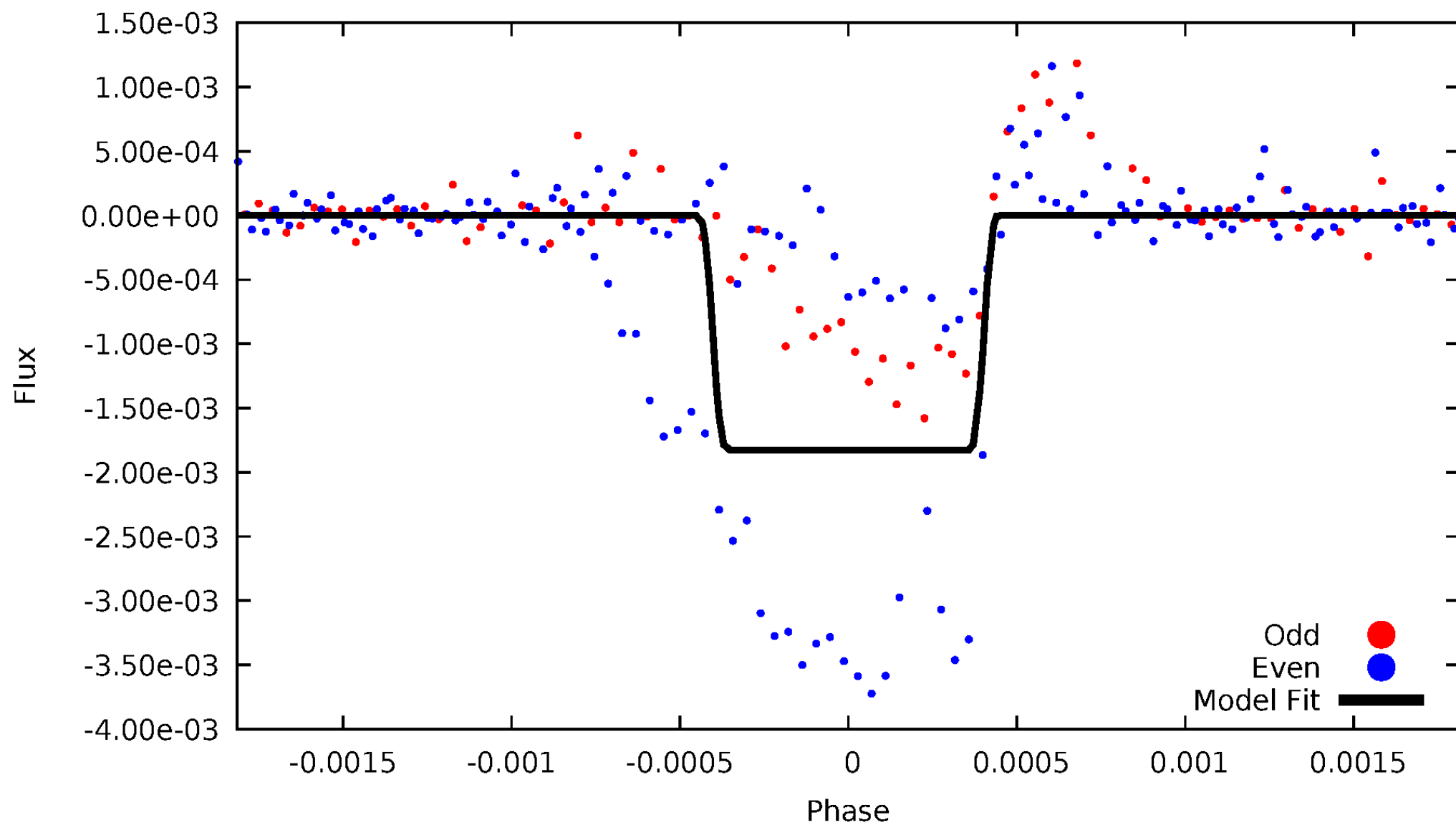
DV Odd/Even

TCE 010603977-02



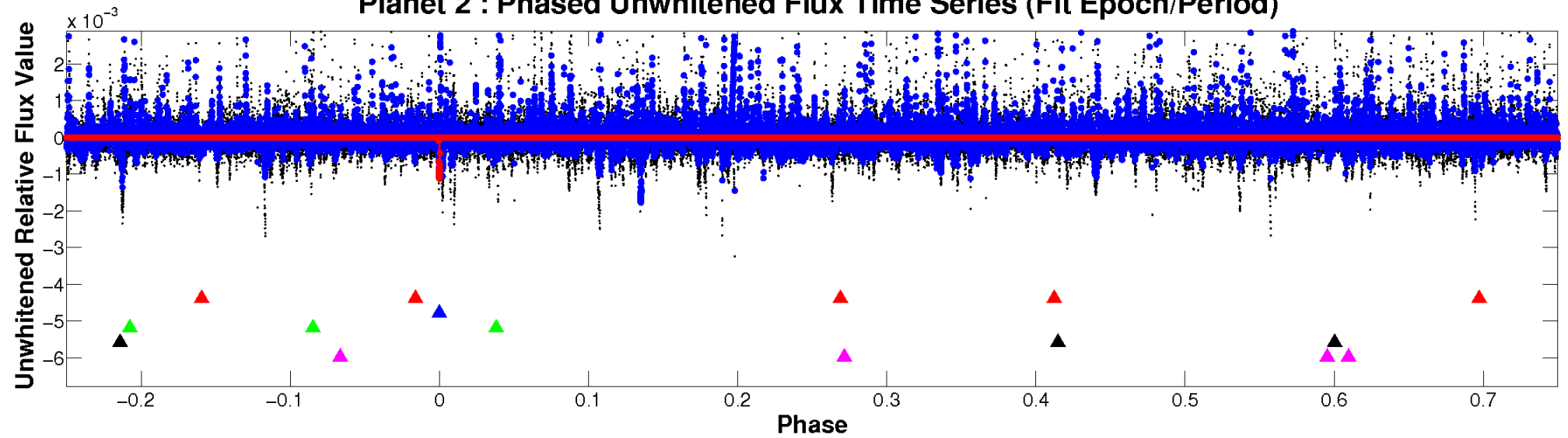
ALT Odd/Even

TCE 010603977-02

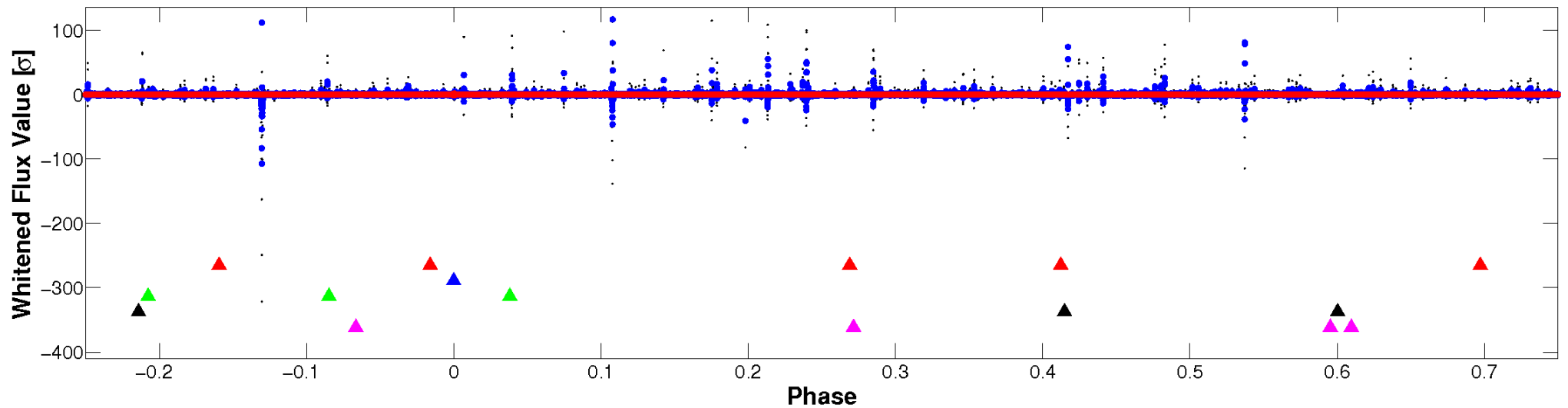


Non-Whitened Vs. Whitened Light Curve

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

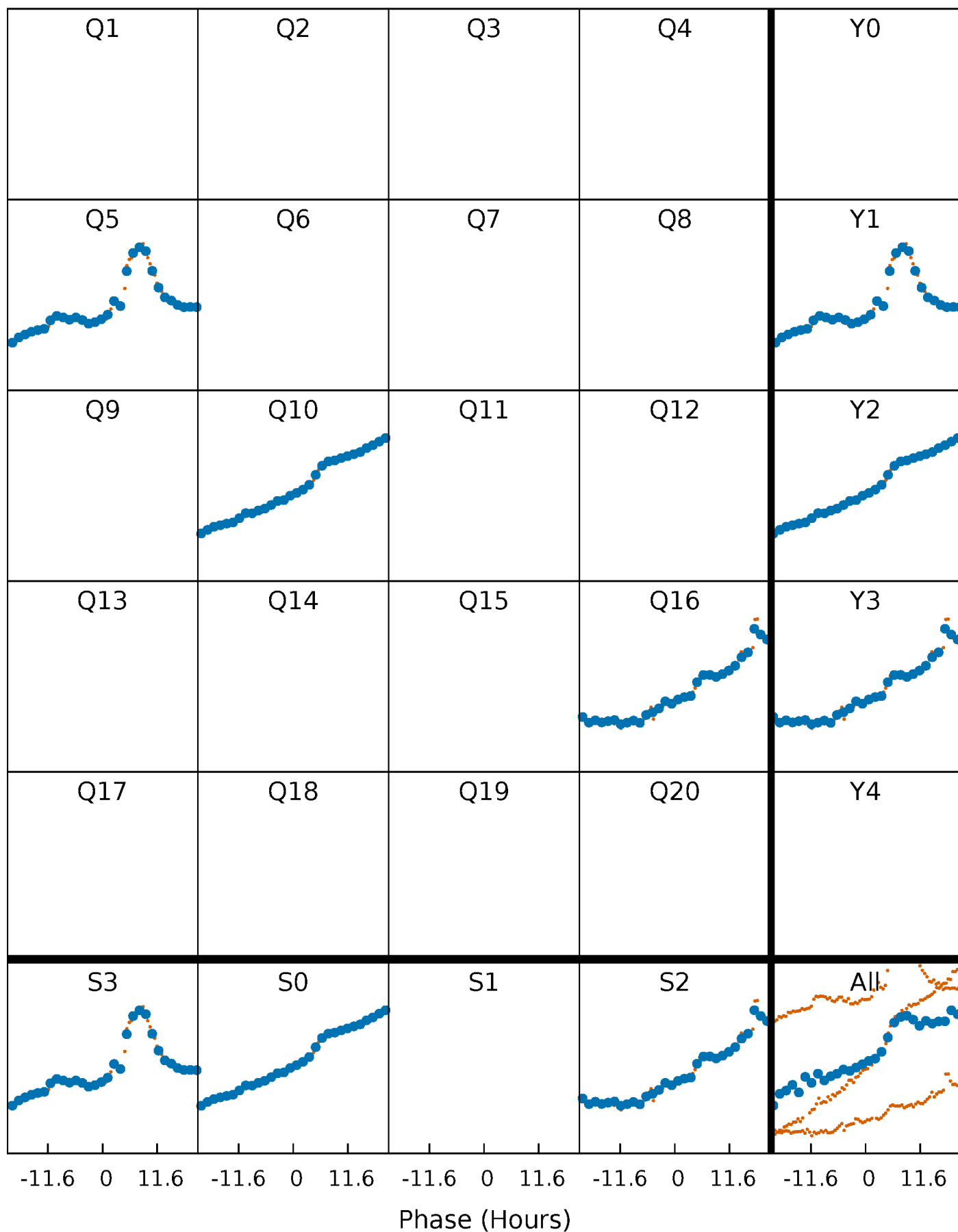


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



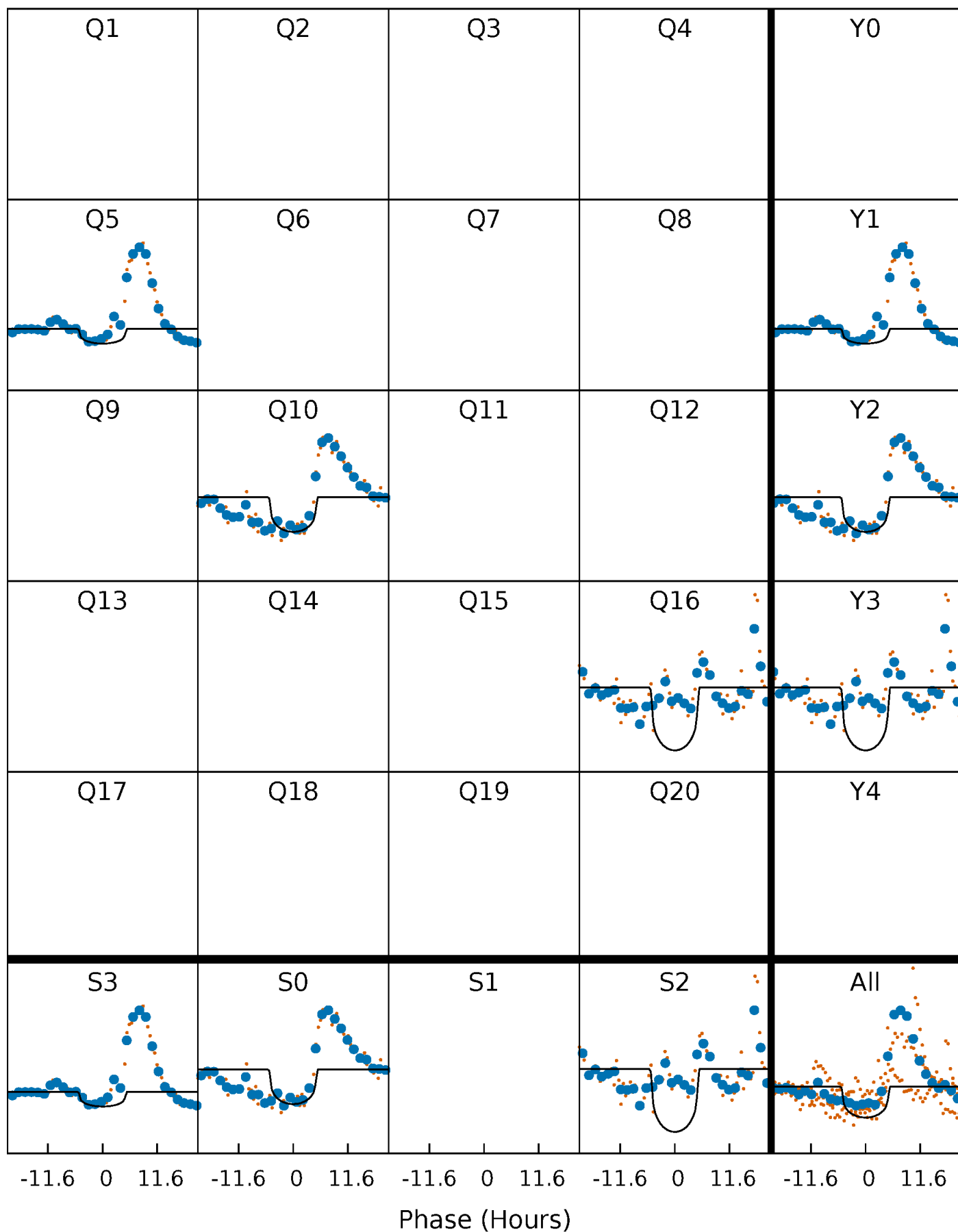
PDC Quarter-Phased Transit Curves

TCE 010603977-02 $P=496.308890$ Days $T_0=500.081191$ (BKJD)



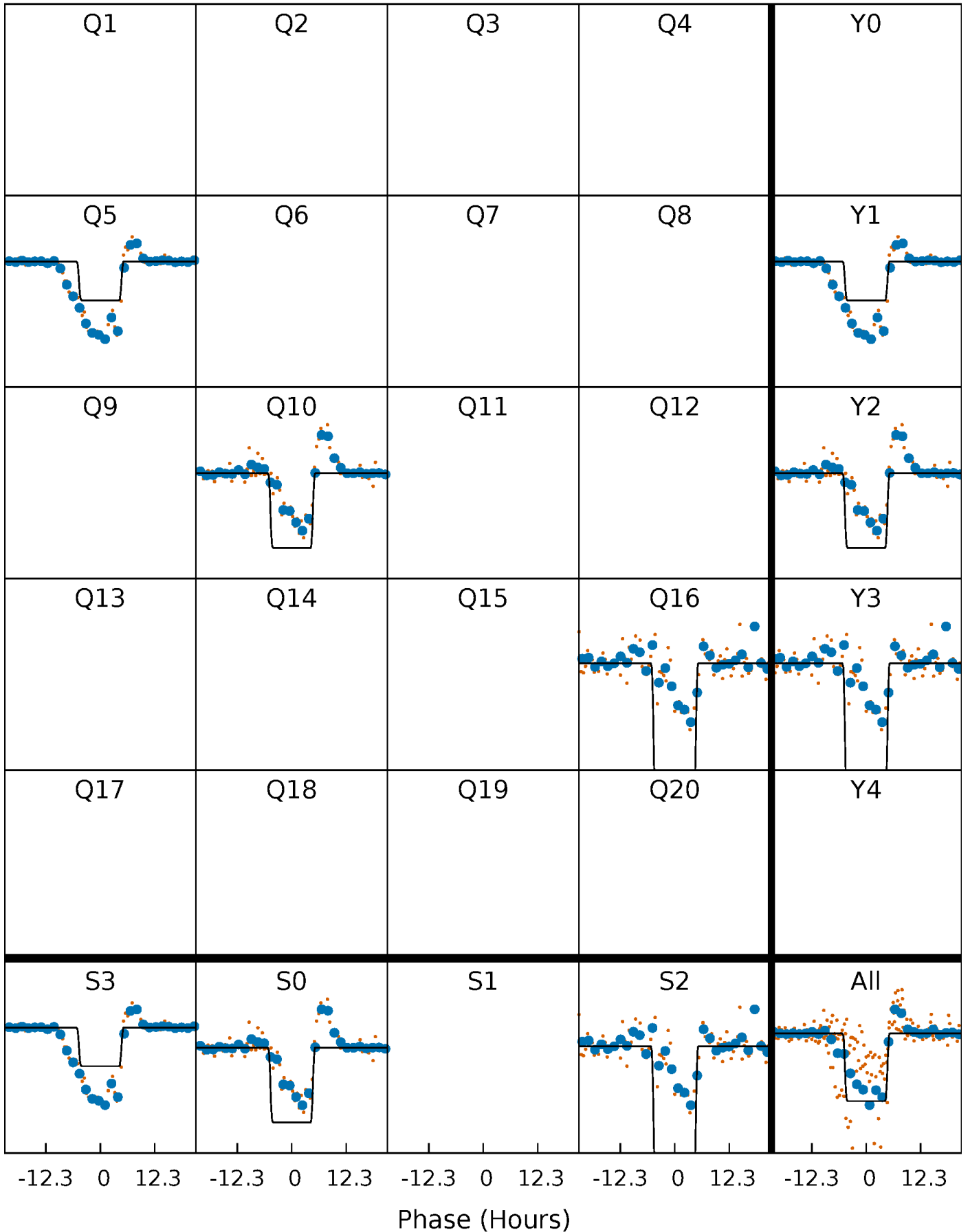
DV Quarter-Phased Transit Curves

TCE 010603977-02 $P=496.308890$ Days $T_0=500.081191$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

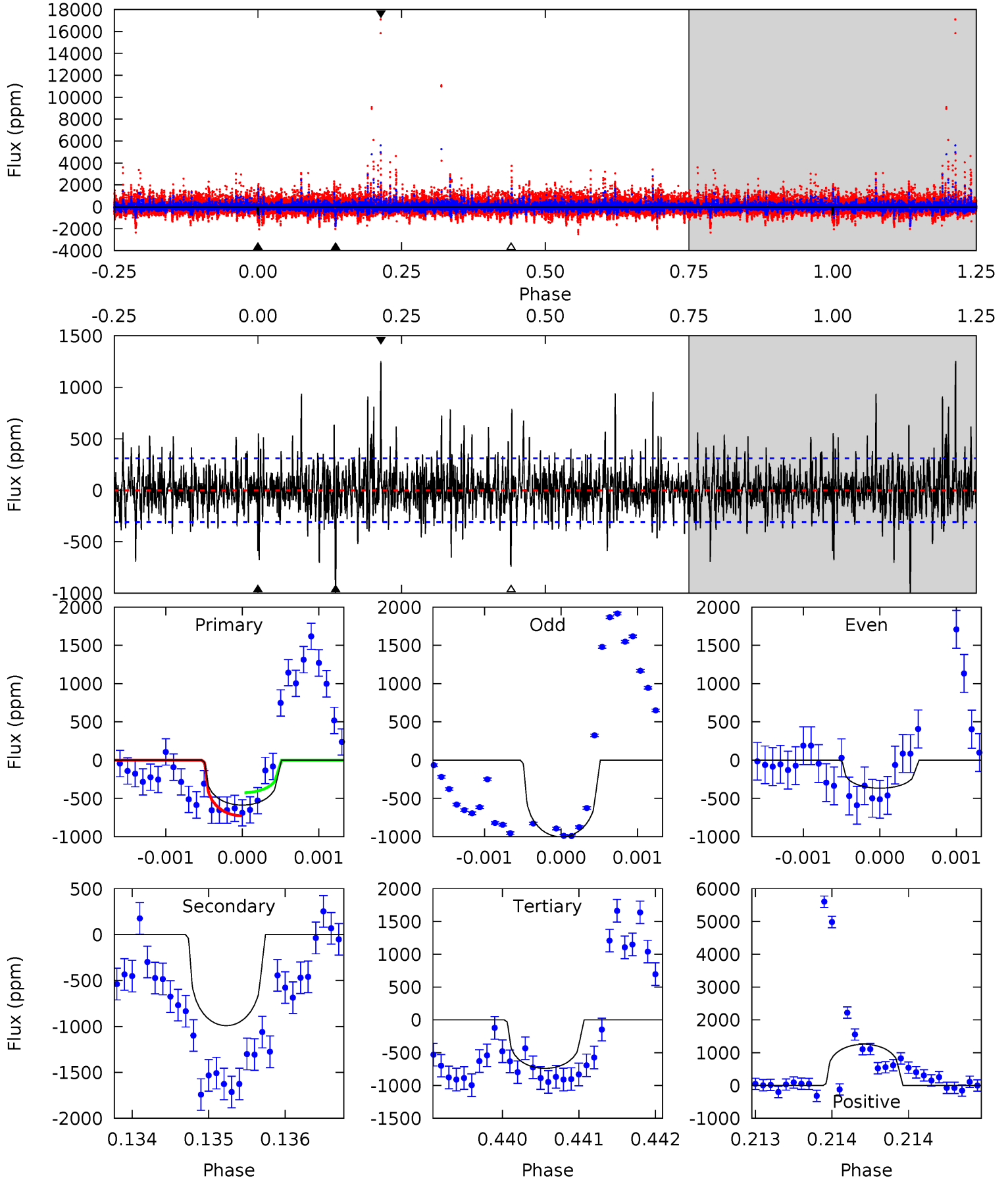
TCE 010603977-02 $P=496.297116$ Days $T_0=500.079222$ (BKJD)



DV Model-Shift Uniqueness Test

010603977-02, P = 496.308890 Days, E = 3.772301 Days

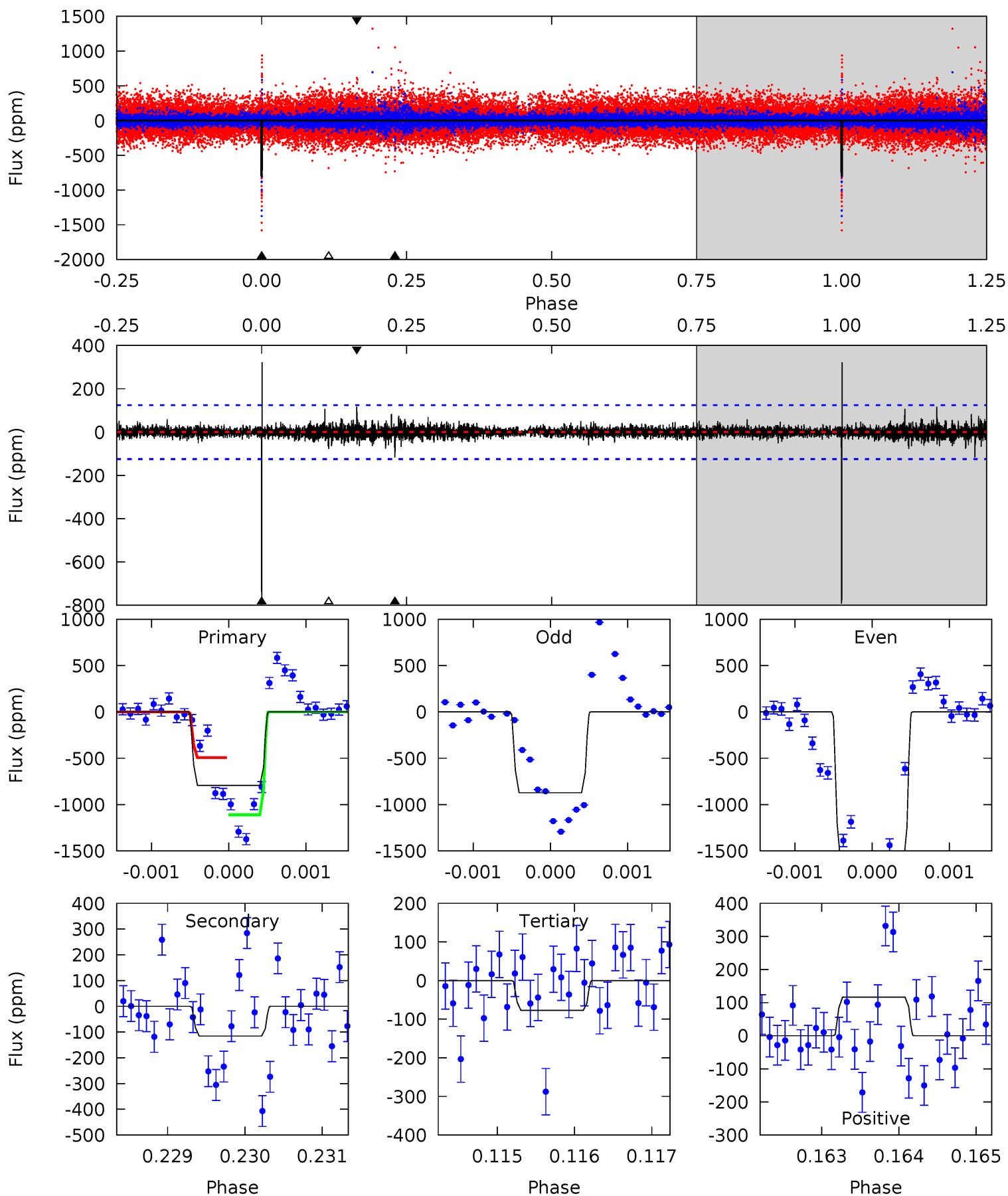
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	17.5	13.1	22.1	5.48	3.33	3.17	-2.68	-11.8	4.45	-4.65	3.41	1.26	0.56	2.67



Alt Model-Shift Uniqueness Test

010603977-02, P = 496.297116 Days, E = 3.782106 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.9	5.09	3.39	5.13	5.48	3.33	0.60	31.5	29.8	1.70	-0.05	21.5	1.63	0.29	0



Stellar Parameters For KIC 010603977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4946^{+136}_{-1}	$3.320^{+0.315}_{-0.315}$	$-0.320^{+0.300}_{-0.200}$	$3.376^{+1.860}_{-1.002}$	$0.868^{+0.299}_{-0.161}$	$0.032^{+0.061}_{-0.020}$
	+3%/-0%	+9%/-9%	+94%/-62%	+55%/-30%	+34%/-19%	+192%/-64%
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 010603977-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-992 ± 57	$11.37^{+6.89}_{-5.65}$	514^{+67}_{-51}	4972^{+1700}_{-765}	6114^{+15993}_{-3852}
Alt.	-115 ± 23	$16.00^{+7.55}_{-6.54}$	516^{+60}_{-52}	3072^{+467}_{-282}	353^{+658}_{-201}

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

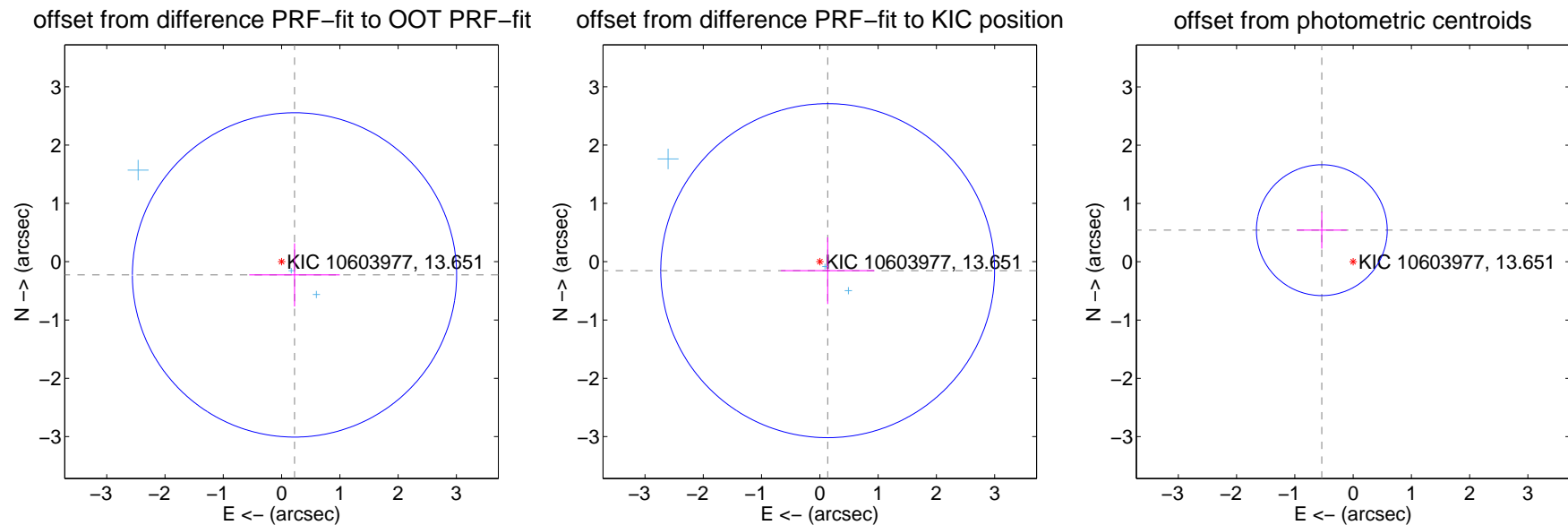
DV Centroid Data

Supplemental centroid analysis for 010603977-02. Kepler magnitude: 13.65. Transit SNR 9.41

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.317 ± 0.927	0.34	-0.222 ± 0.777	-0.227 ± 0.541
PRF-fit source offset from KIC position	0.204 ± 0.955	0.21	-0.134 ± 0.802	-0.154 ± 0.572
photometric centroid source offset	0.76 ± 0.37	2.04	0.54 ± 0.43	0.54 ± 0.32

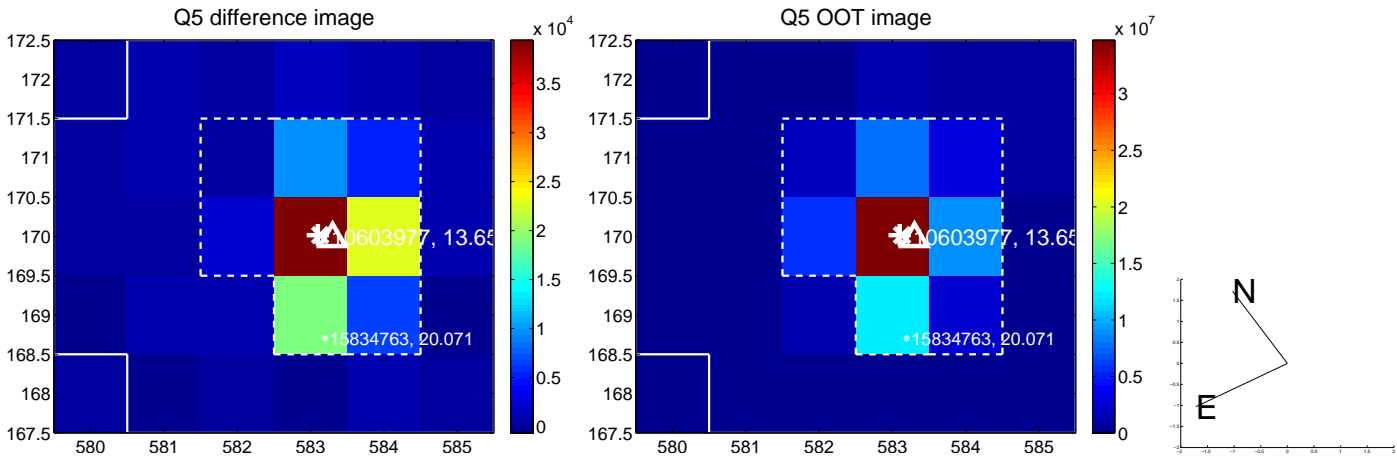


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

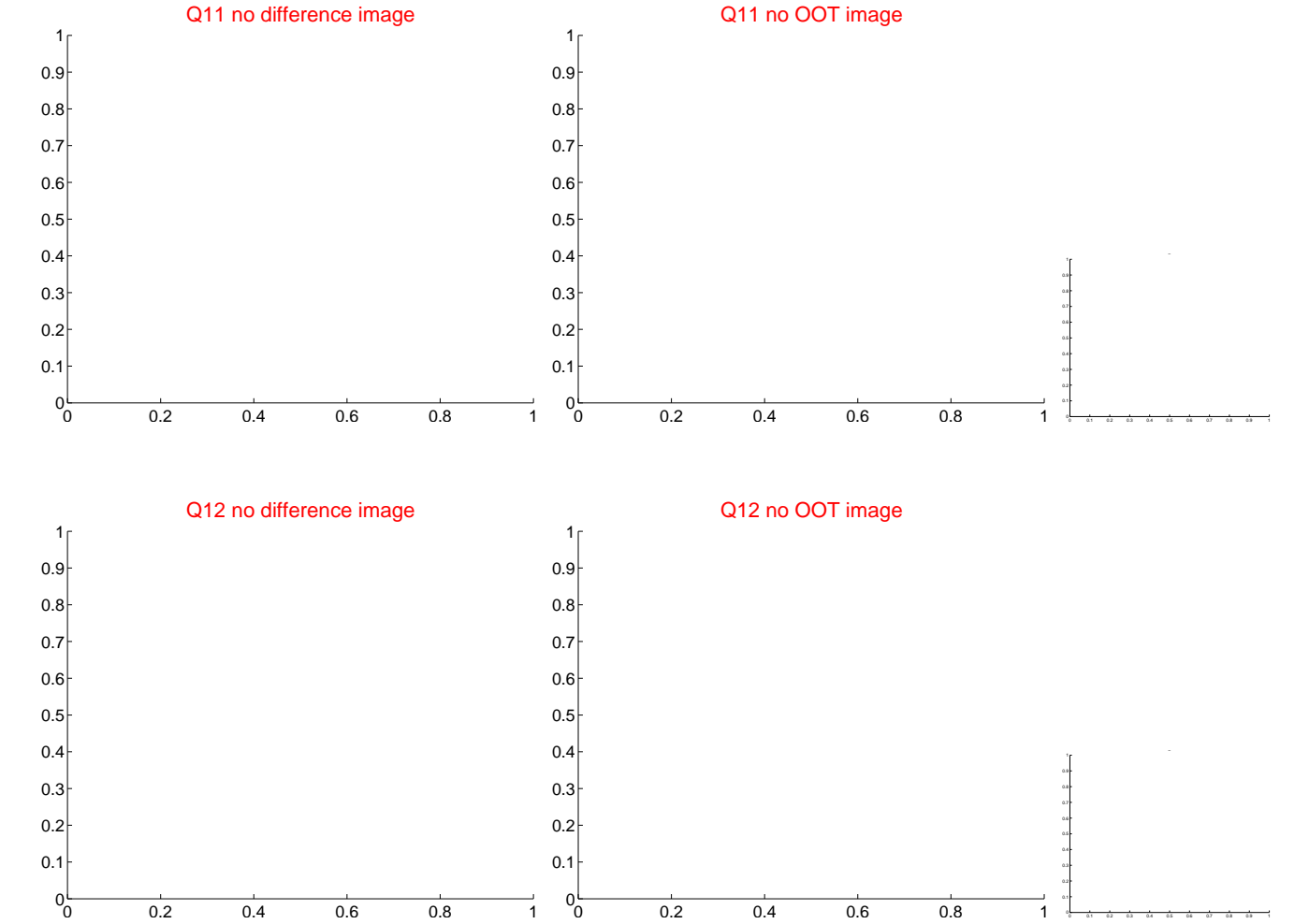
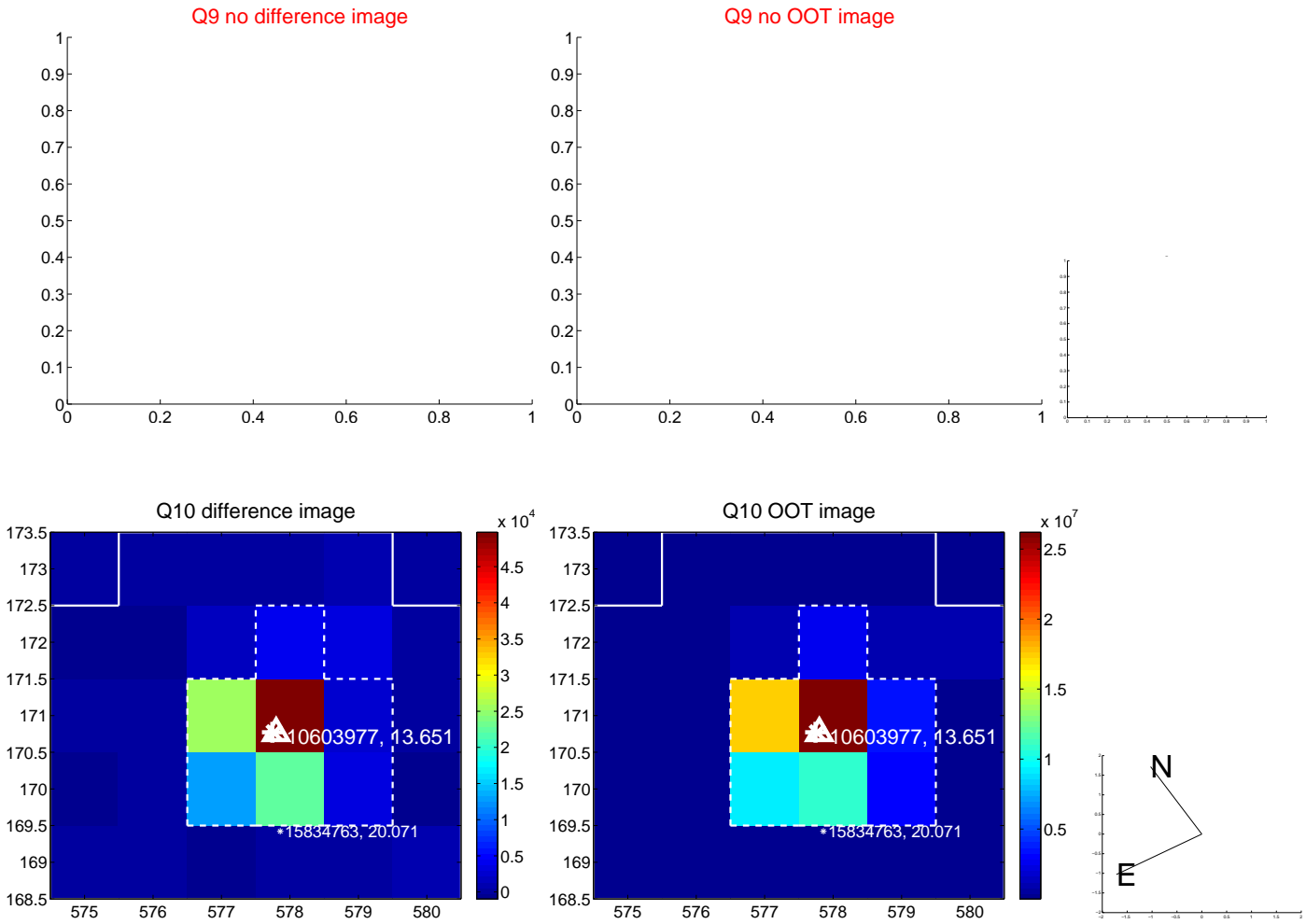
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



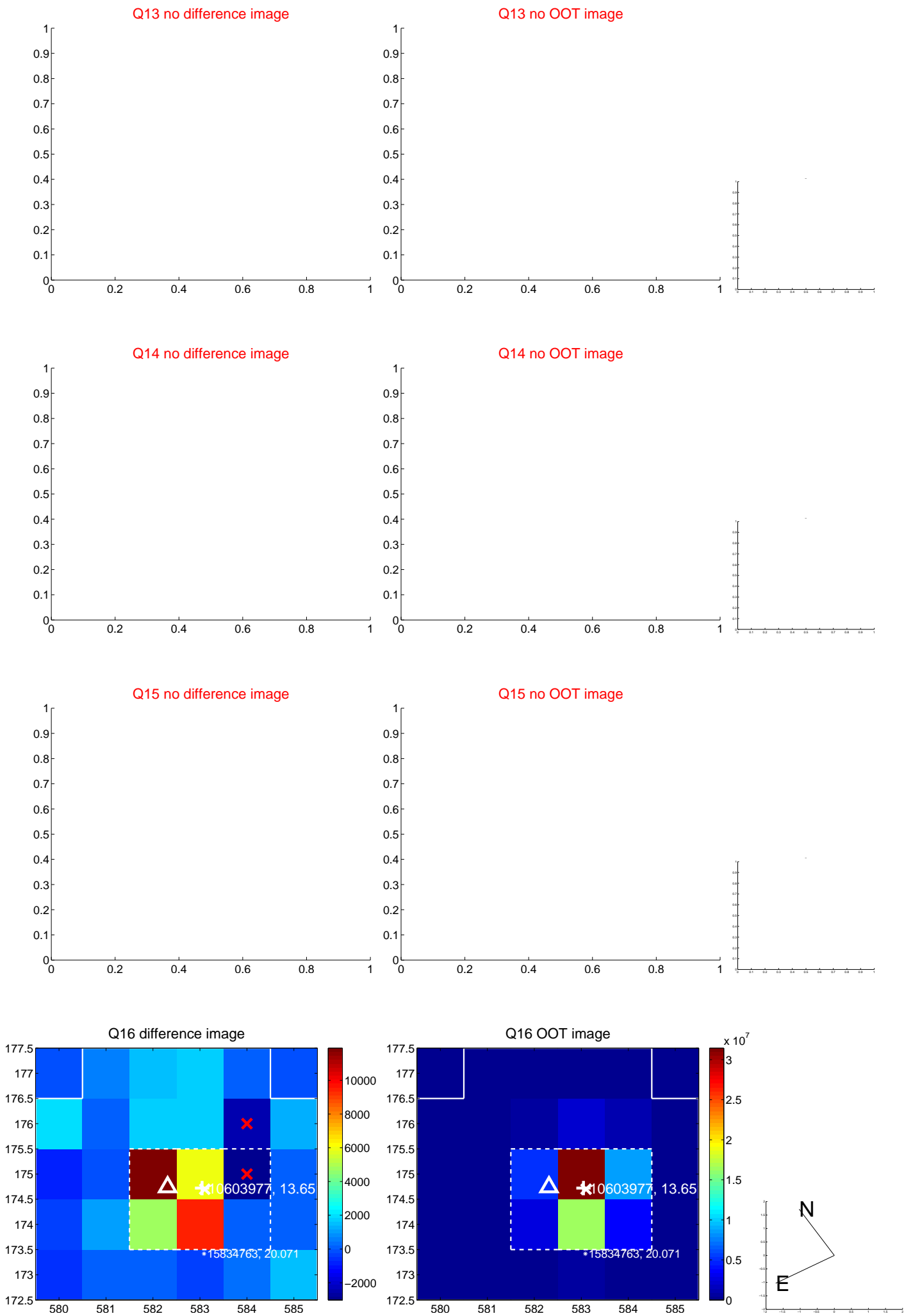
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



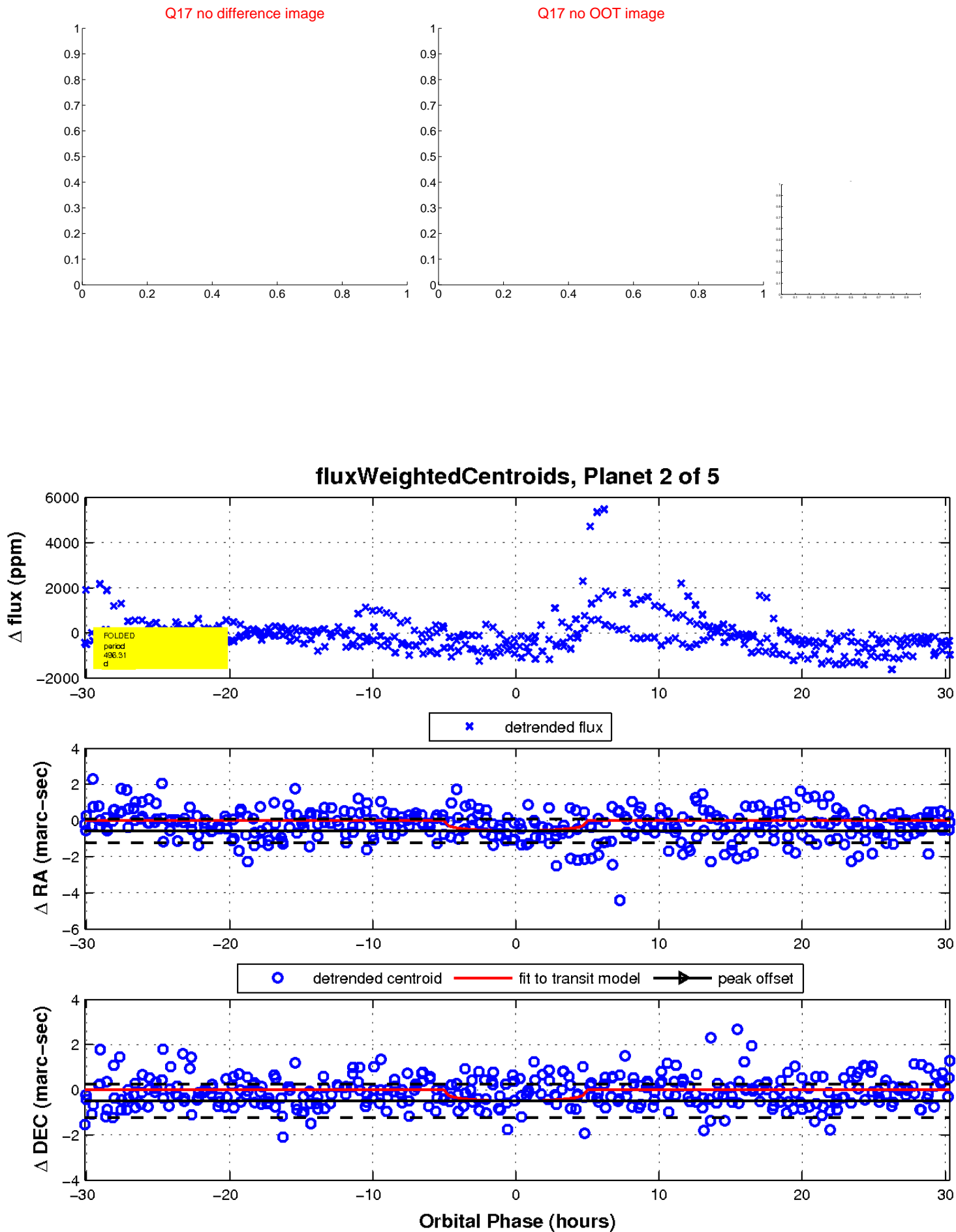
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

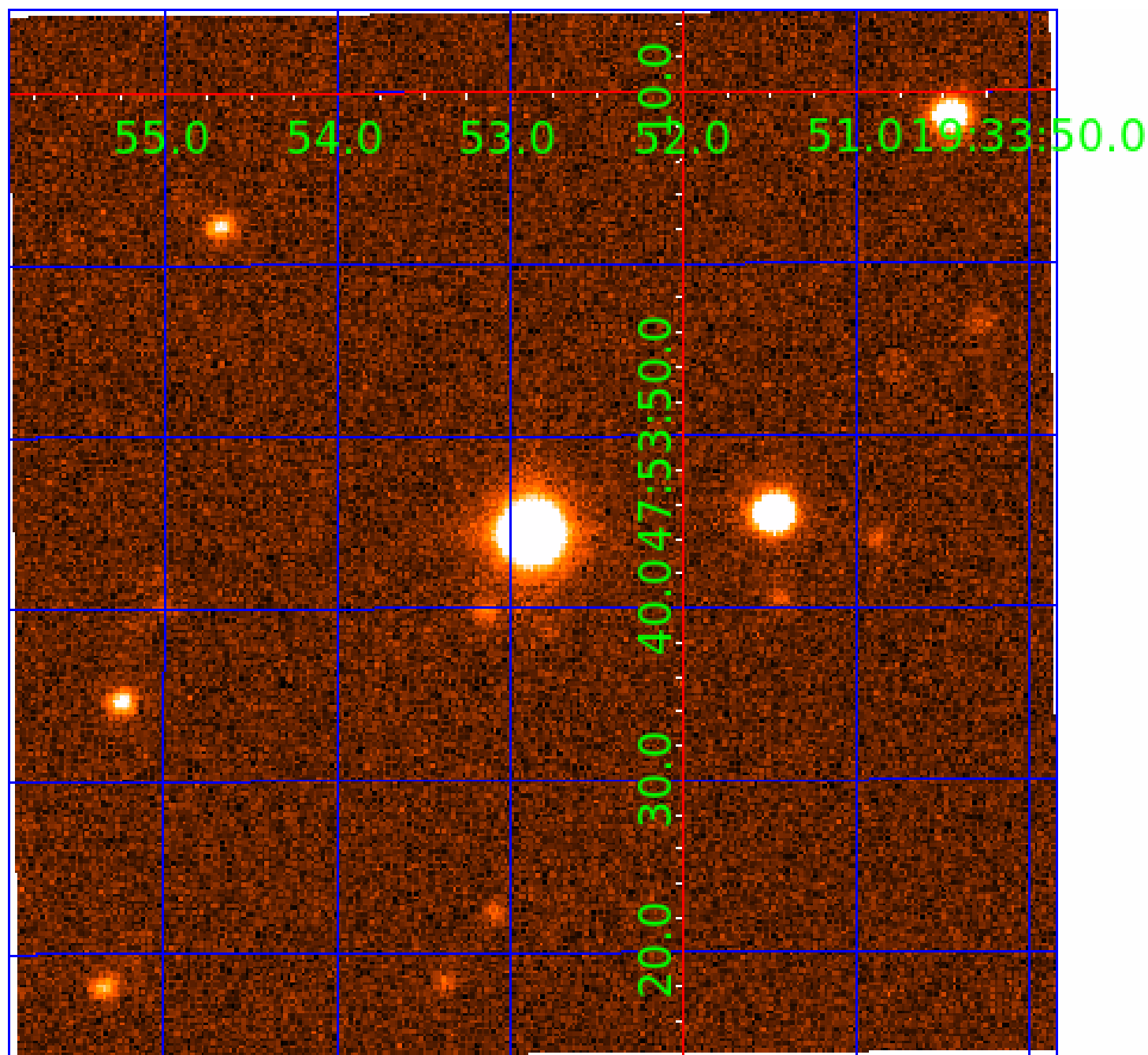


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010603977

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})
010603977-01	OBS	No	283.728121	349.836040	806.7	3.829	15.8	6.8	3.38	4946	9.45	9.40
010603977-02	OBS	No	496.308890	500.081191	1129.7	10.117	17.2	9.4	3.38	4946	11.24	4.46
010603977-03	OBS	No	435.341489	518.994833	830.8	6.504	13.5	7.5	3.38	4946	10.15	5.31
010603977-04	OBS	No	588.391930	209.666961	704.9	7.593	12.0	6.5	3.38	4946	9.49	3.55
010603977-05	OBS	No	328.509606	306.369398	679.0	4.110	12.5	6.5	3.38	4946	9.36	7.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010603977-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010603977-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010603977-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—CENT_FEW_DIFFS
010603977-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010603977-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

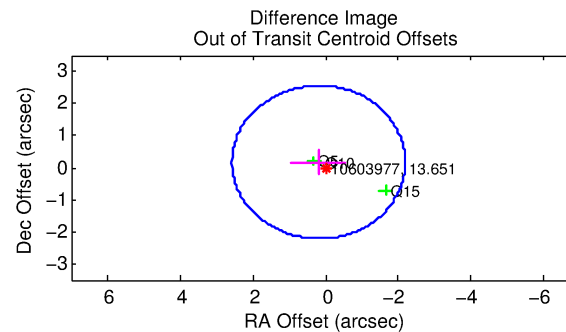
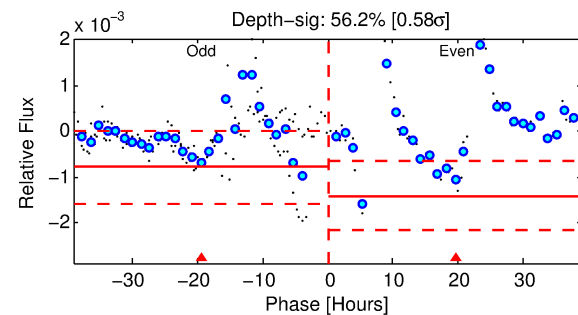
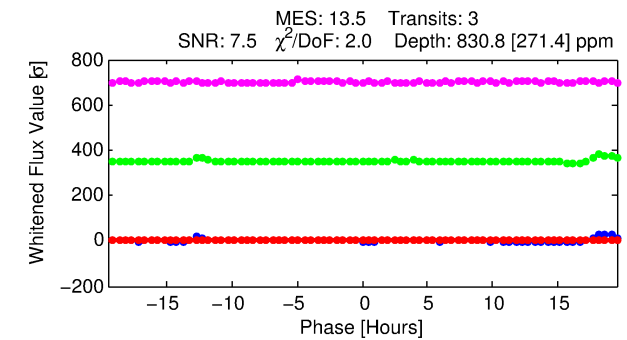
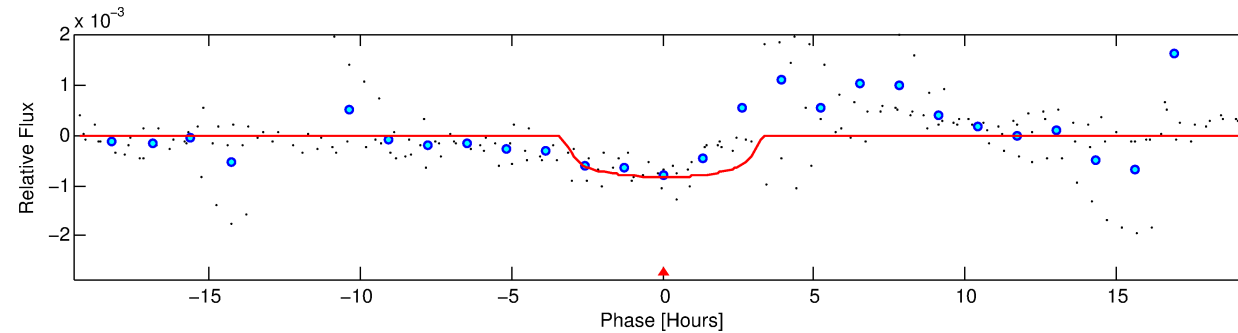
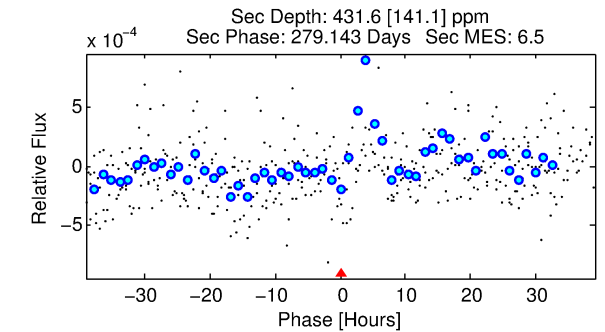
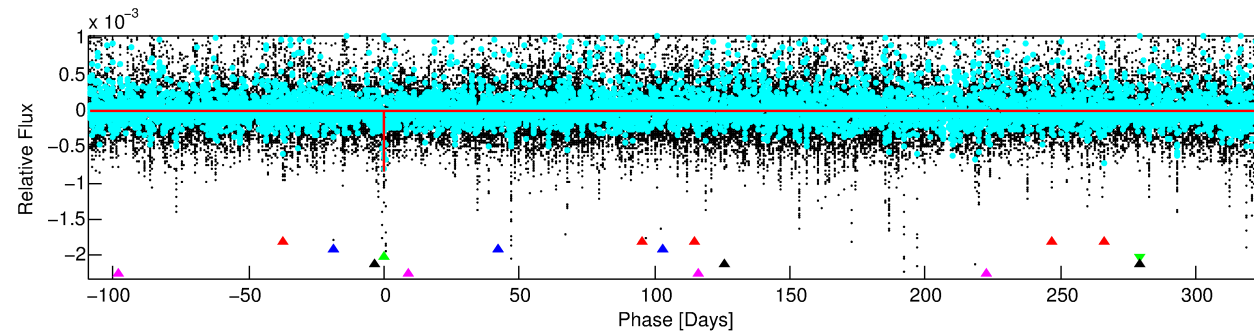
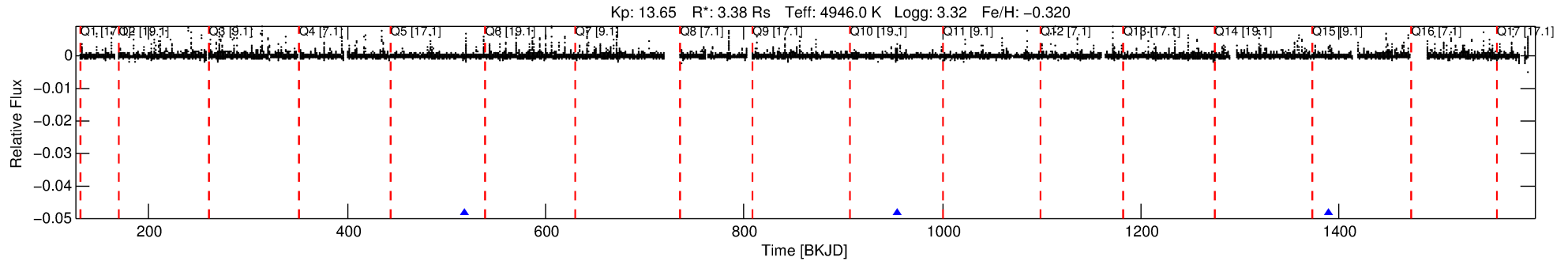
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010603977-03

No Significant Match Found

DV One-Page Summary

KIC: 10603977 Candidate: 3 of 5 Period: 435.341 d



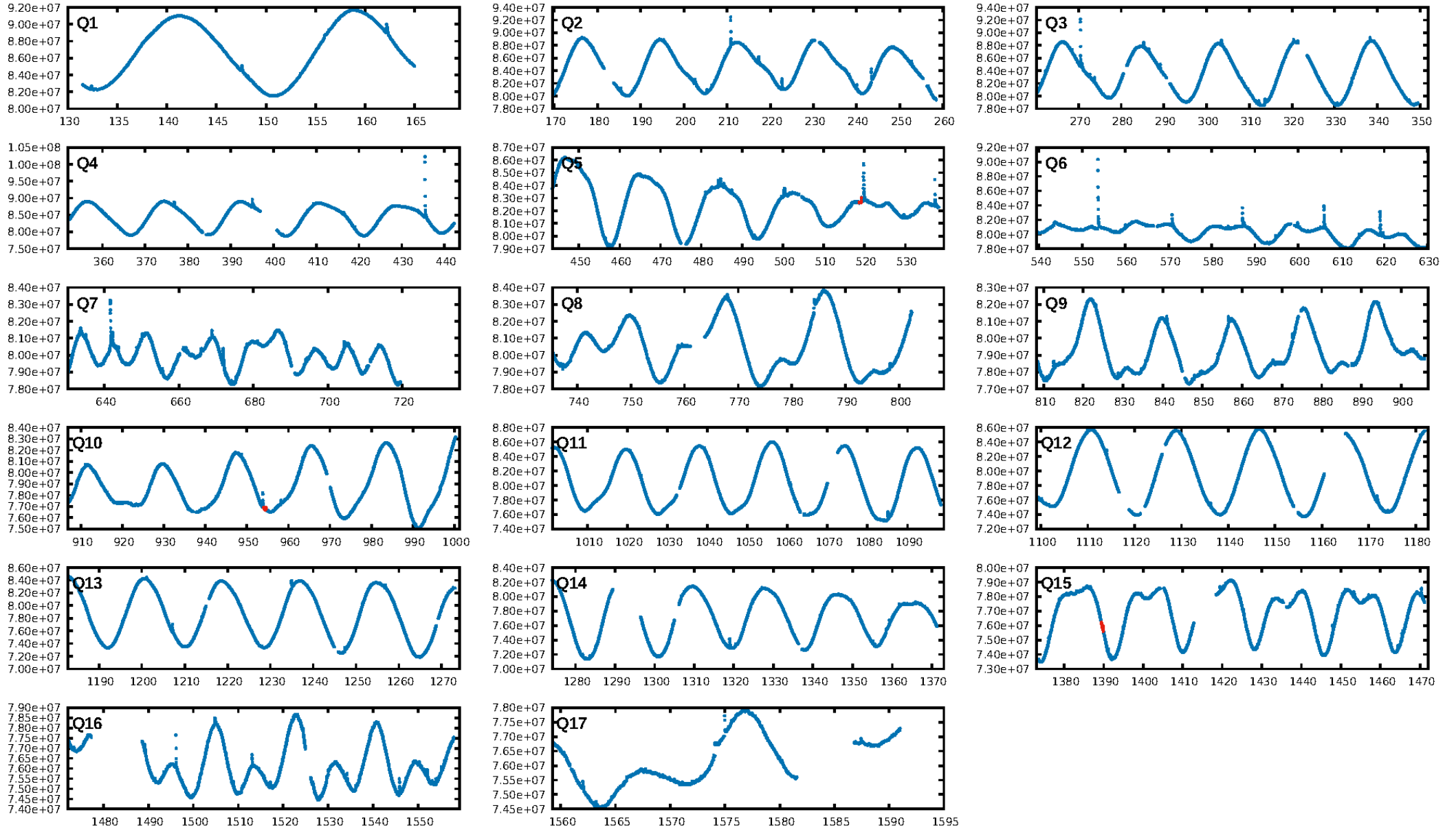
DV Fit Results:

Period = 435.34149 [0.01136] d
Epoch = 518.9948 [0.0166] BKJD
Rp/R* = 0.0275 [0.0347]
a/R* = 413.10 [1805.33]
b = 0.63 [4.16]
Seff = 5.31 [3.28]
Teq = 387 [60] K
Rp = 10.15 [13.95] Re
a = 1.0728 [0.4717] AU
Ag = 2653.20 [6925.37] [0.38 σ]
Teffp = 4295 [2728] K [1.43 σ]

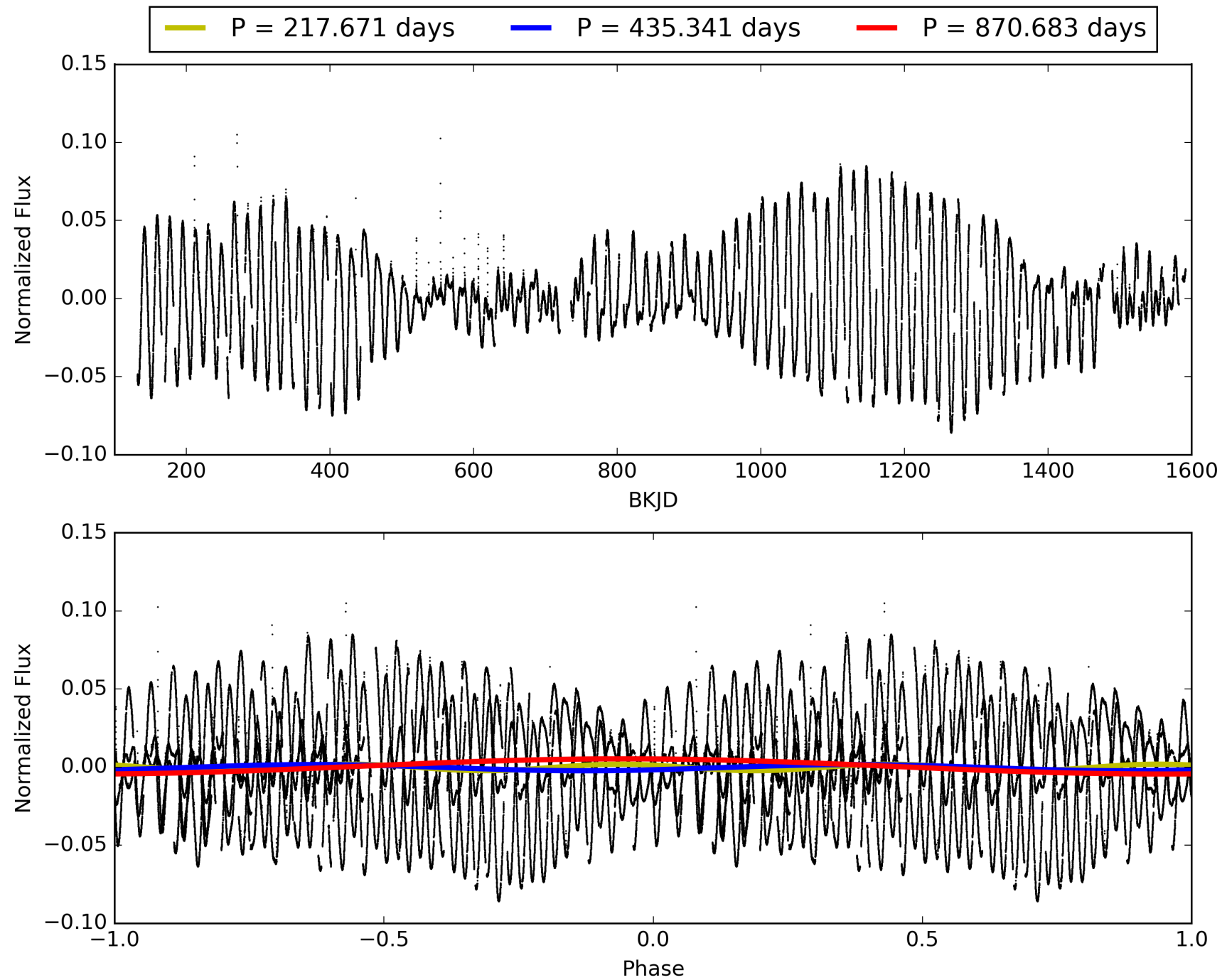
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [333.25 σ]
LongPeriod-sig: 100.0% [121.66 σ]
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 67.1%
Bootstrap-pfa: 1.03e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8076
Centroid-sig: 10.0%
Centroid-so: 0.933 arcsec [1.39 σ]
OotOffset-rm: 0.253 arcsec [0.32 σ]
KicOffset-rm: 0.299 arcsec [0.97 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010603977-03, PDC Light Curves

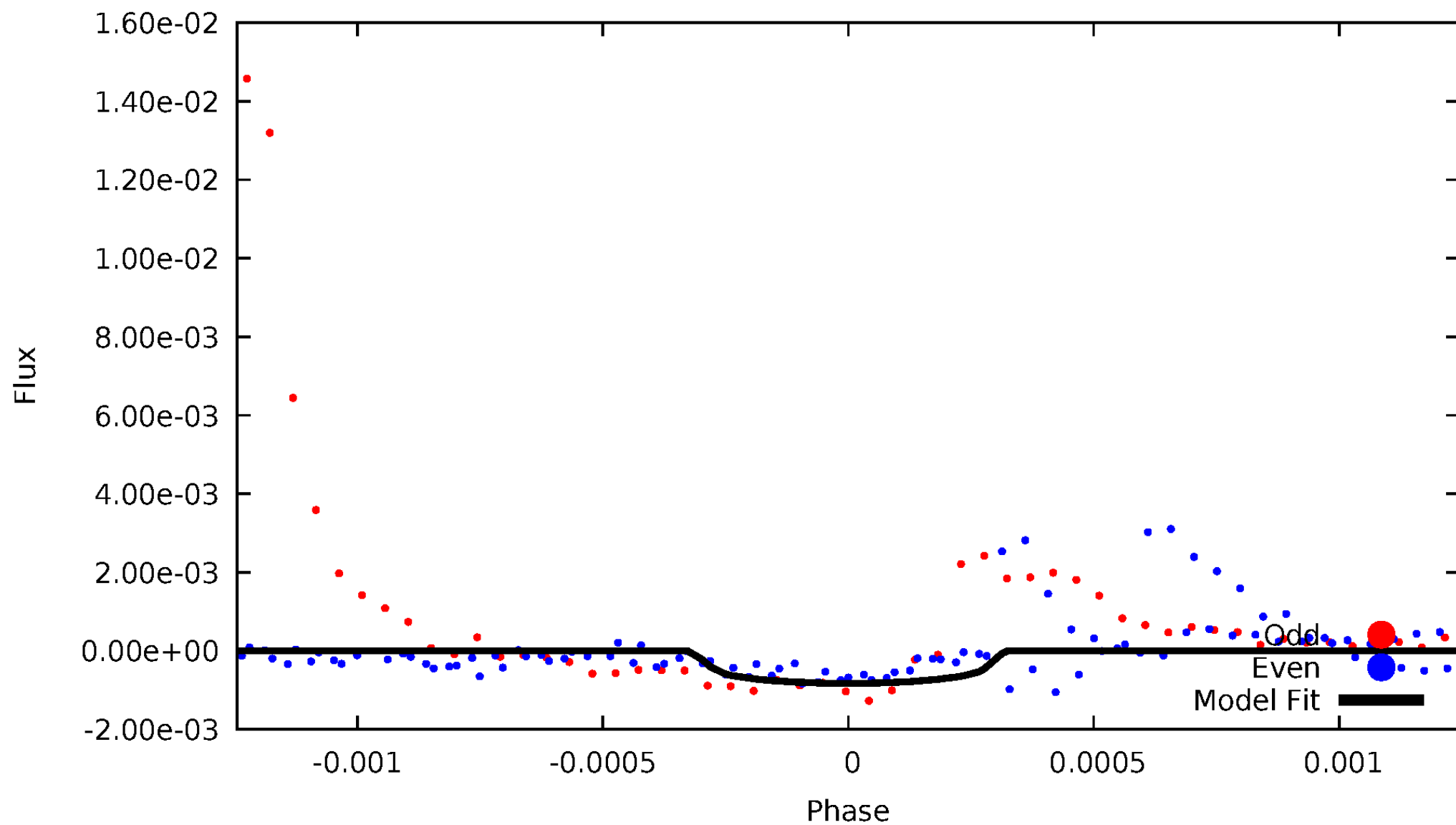


TCE 010603977-03



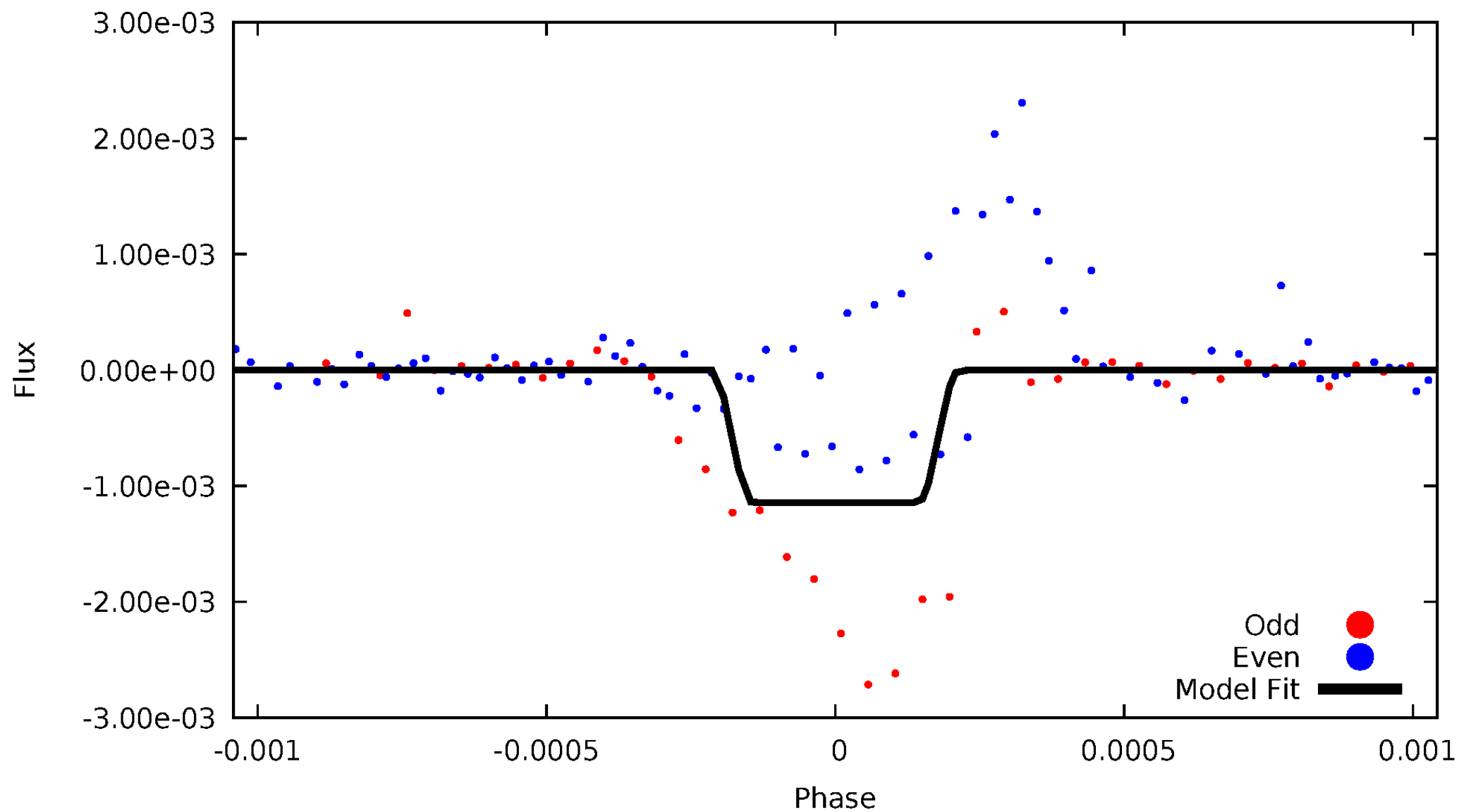
DV Odd/Even

TCE 010603977-03



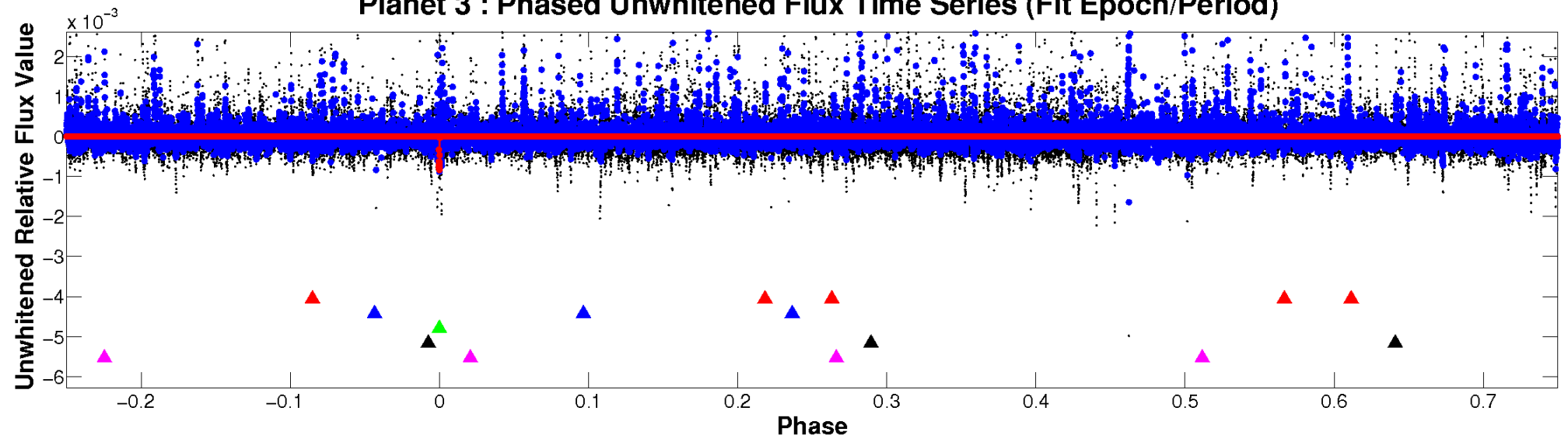
ALT Odd/Even

TCE 010603977-03

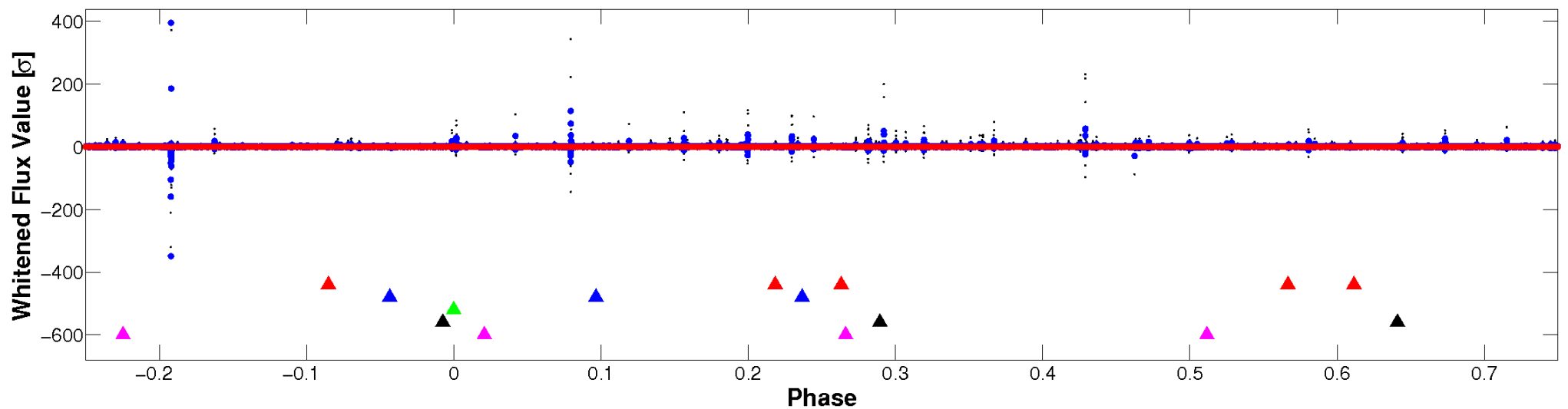


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

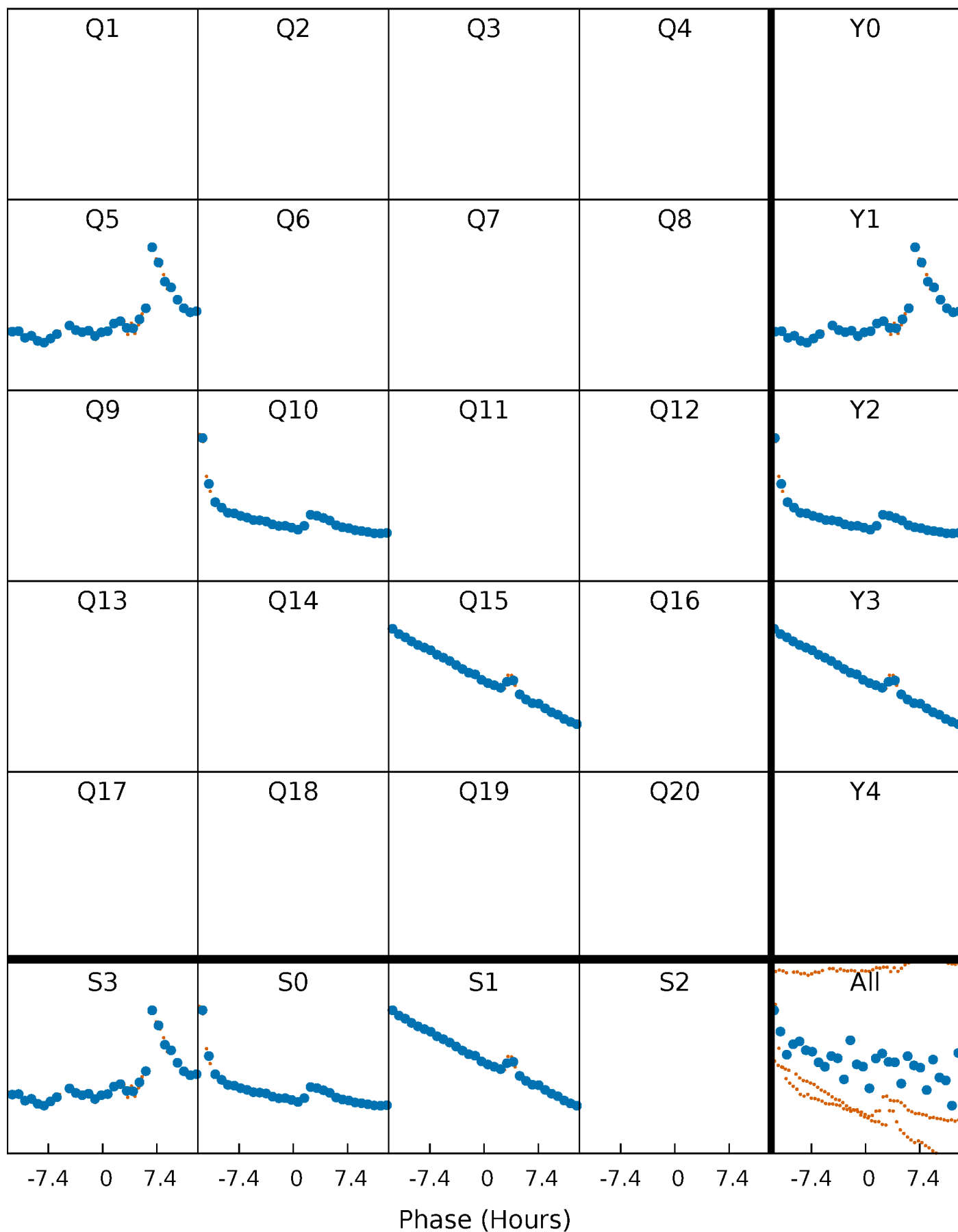


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



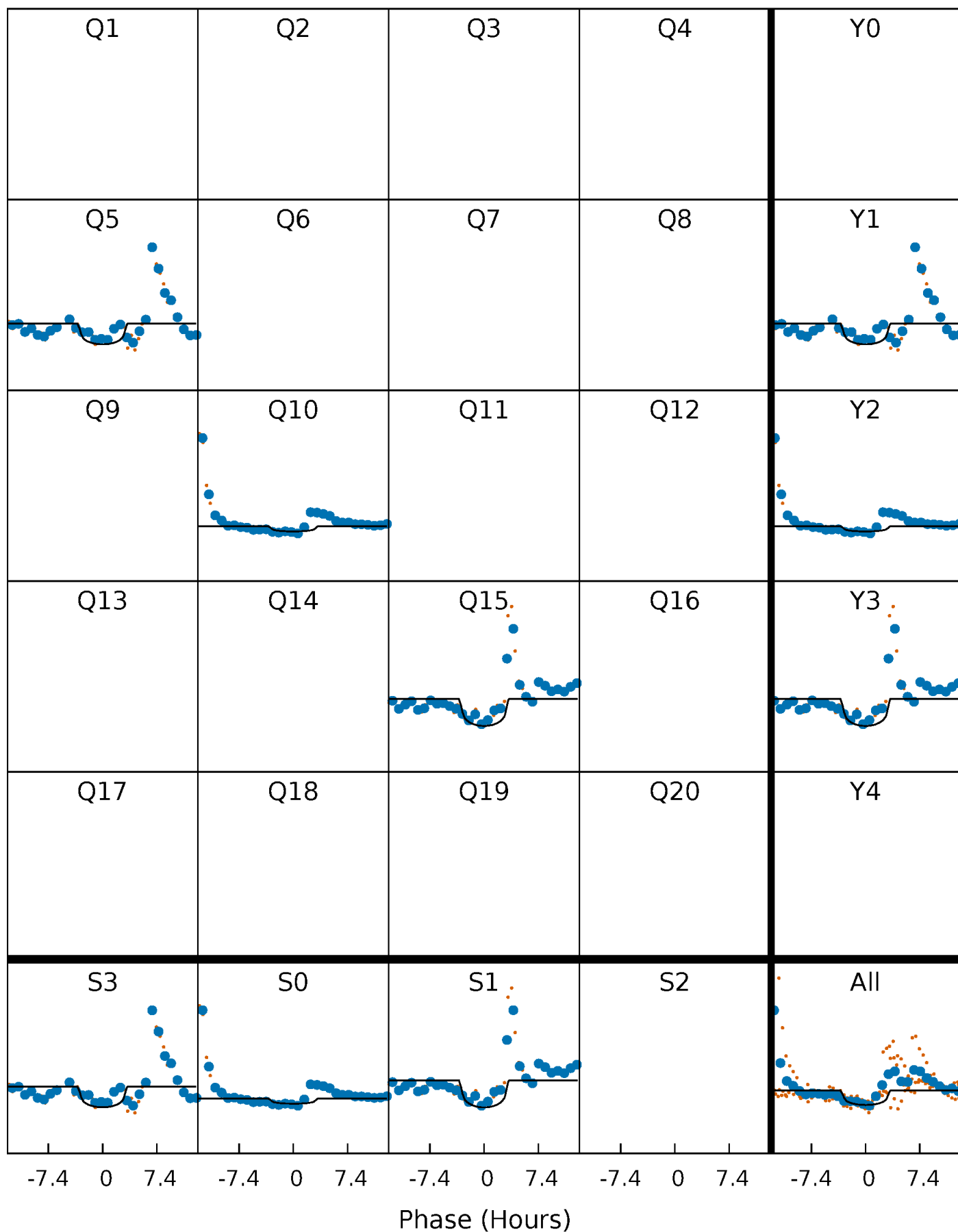
PDC Quarter-Phased Transit Curves

TCE 010603977-03 $P=435.341489$ Days $T_0=518.994833$ (BKJD)



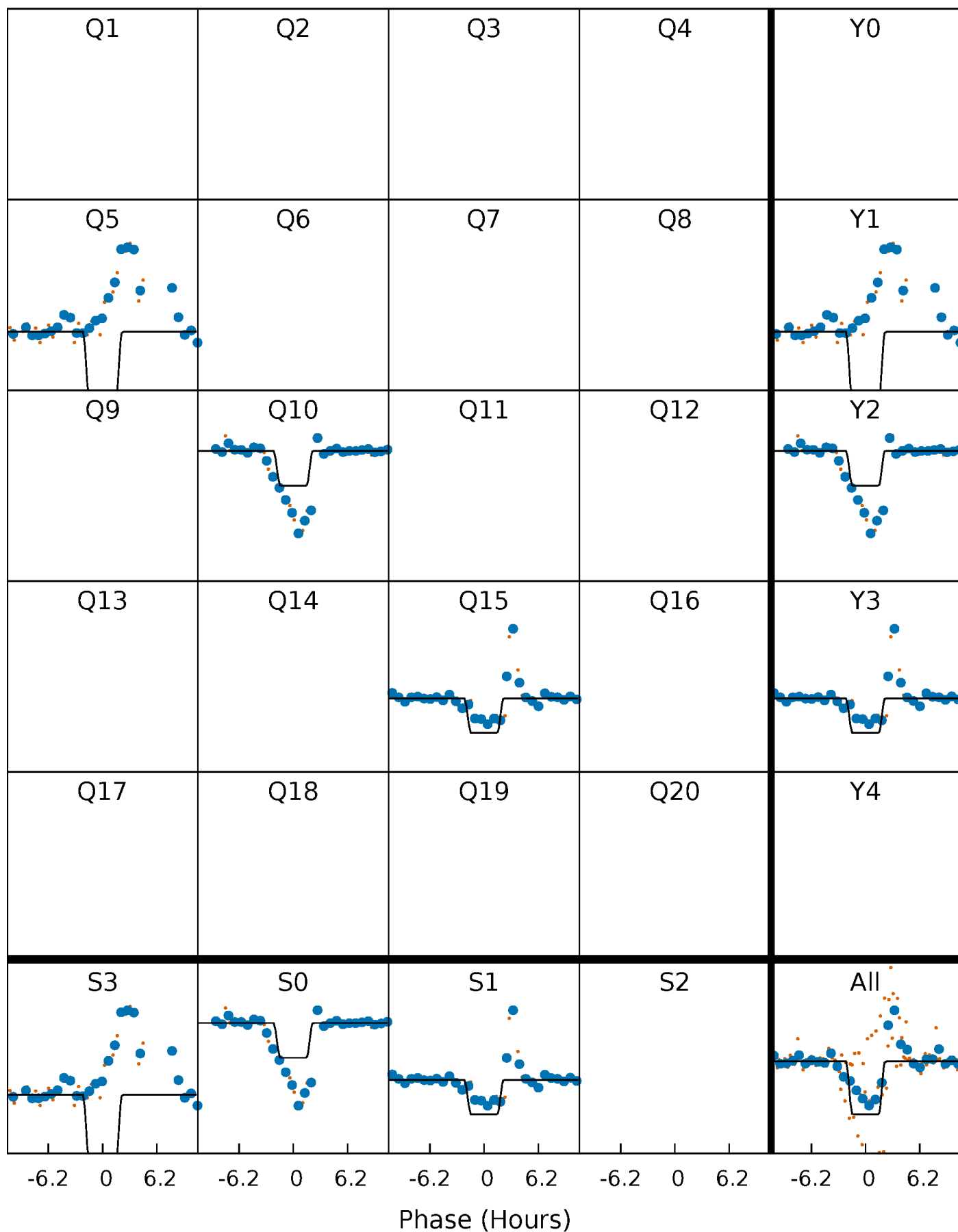
DV Quarter-Phased Transit Curves

TCE 010603977-03 $P=435.341489$ Days $T_0=518.994833$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

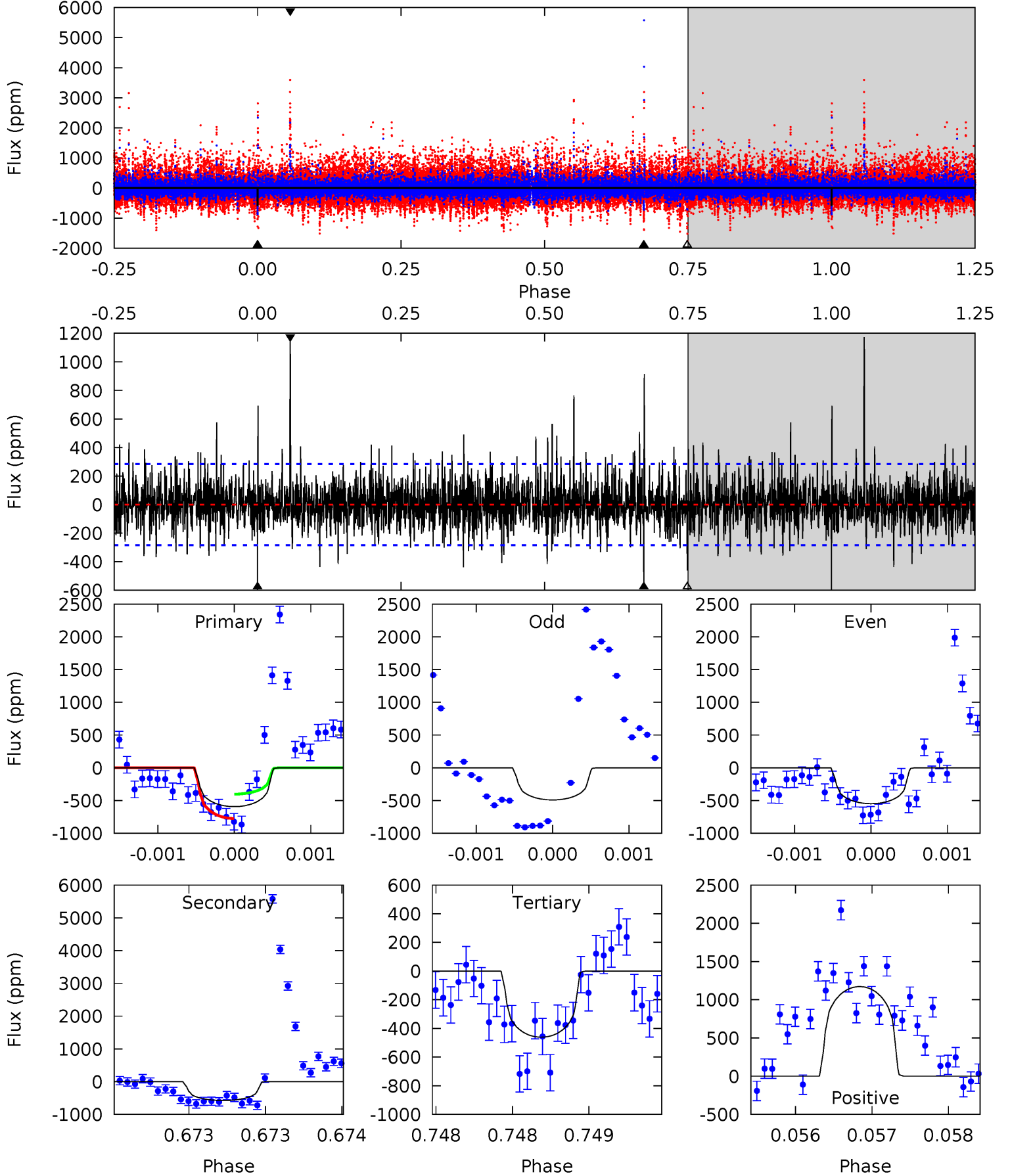
TCE 010603977-03 $P=435.364240$ Days $T_0=518.965475$ (BKJD)



DV Model-Shift Uniqueness Test

010603977-03, P = 435.341489 Days, E = 83.653344 Days

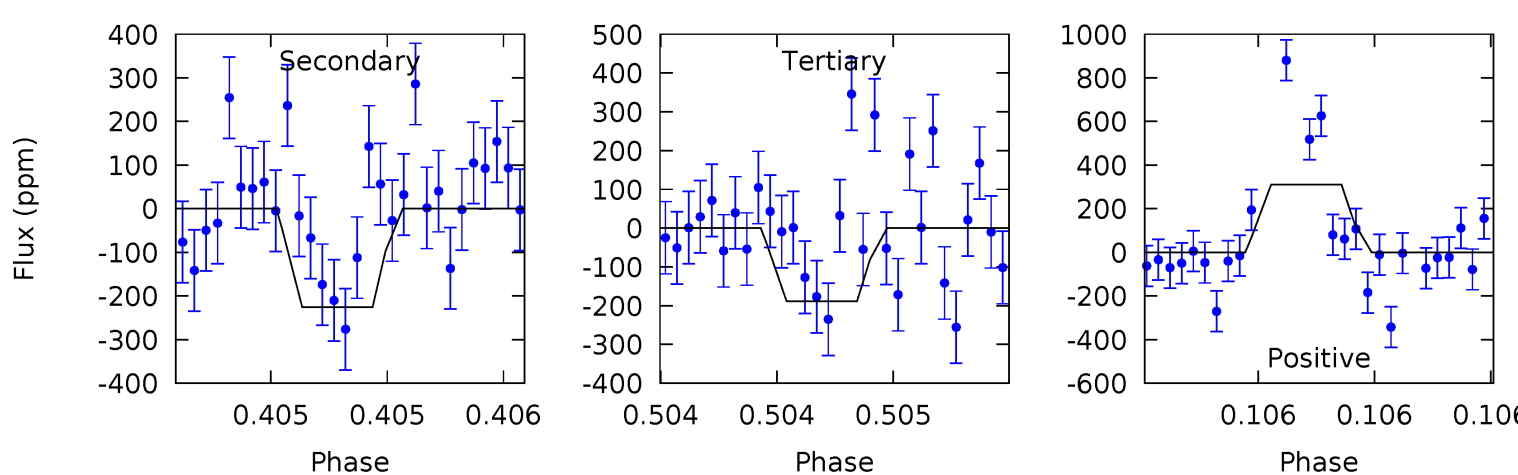
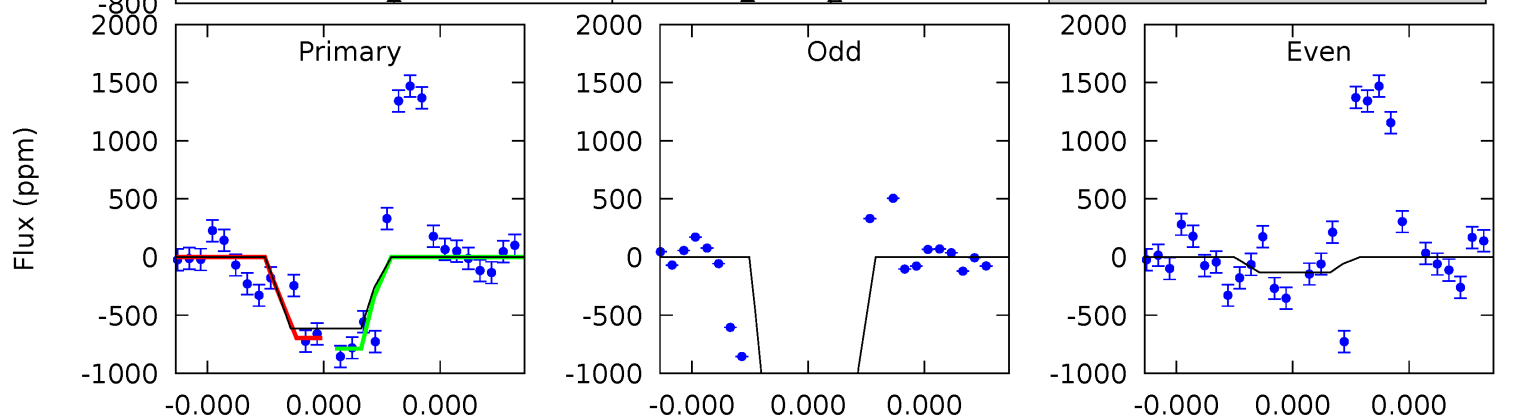
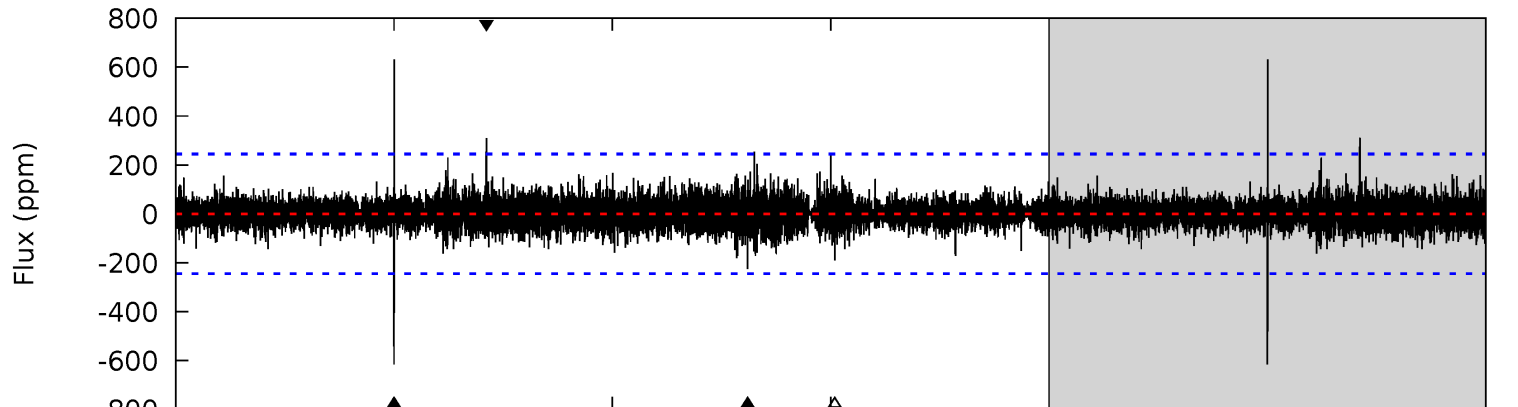
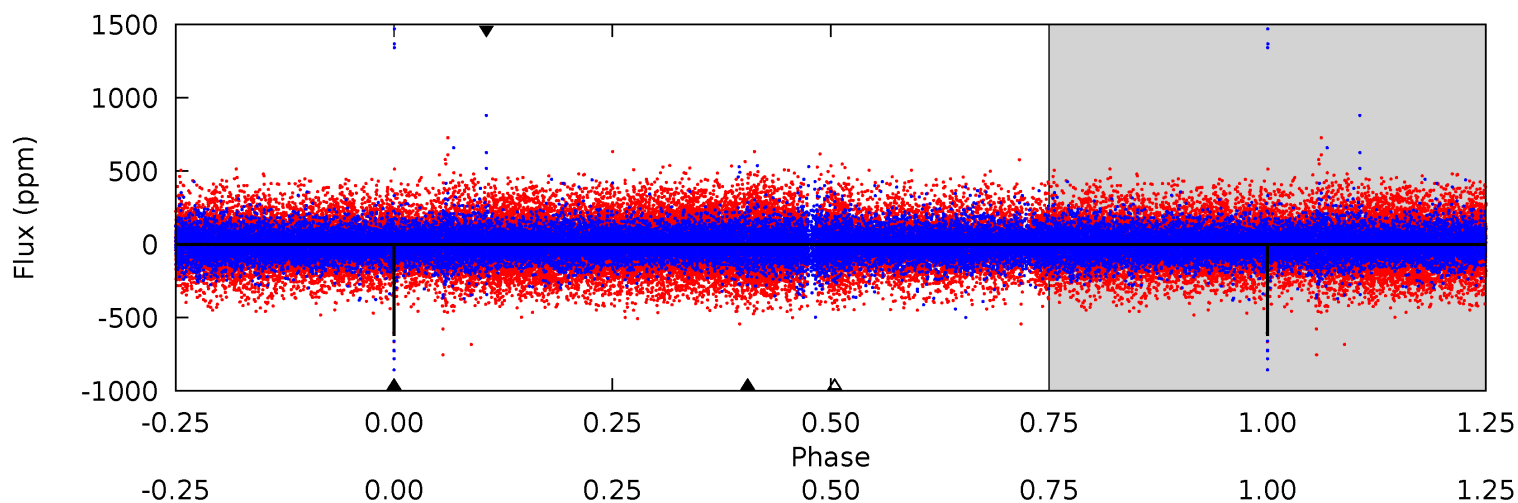
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	11.2	8.97	22.8	5.53	3.42	2.38	2.56	-11.3	2.20	-11.6	0.19	1.03	0.66	3.64



Alt Model-Shift Uniqueness Test

010603977-03, $P = 435.364240$ Days, $E = 83.601235$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	5.17	4.33	7.11	5.60	3.53	0.86	9.78	7.00	0.84	-1.94	34.9	1.20	0.51	0.99



Stellar Parameters For KIC 010603977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4946^{+136}_{-1}	$3.320^{+0.315}_{-0.315}$	$-0.320^{+0.300}_{-0.200}$	$3.376^{+1.860}_{-1.002}$	$0.868^{+0.299}_{-0.161}$	$0.032^{+0.061}_{-0.020}$
	+3%/-0%	+9%/-9%	+94%/-62%	+55%/-30%	+34%/-19%	+192%/-64%
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 010603977-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-575 ± 51	$13.16^{+13.57}_{-8.87}$	536^{+72}_{-52}	4151^{+2665}_{-762}	2136^{+18544}_{-1622}
Alt.	-226 ± 44	$14.80^{+13.15}_{-9.56}$	537^{+71}_{-61}	3458^{+1628}_{-558}	656^{+4887}_{-471}

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 $A_{obs} \gg 1.0$

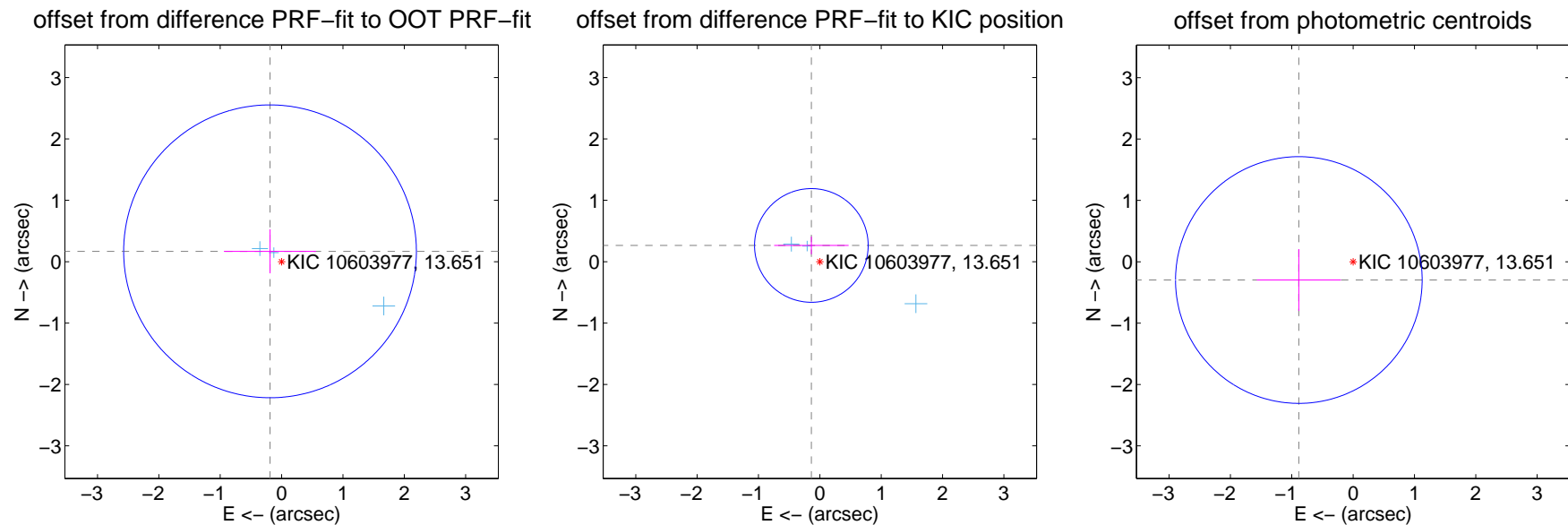
DV Centroid Data

Supplemental centroid analysis for 010603977-03. Kepler magnitude: 13.65. Transit SNR 7.53

There are 3 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	0.253 ± 0.795	0.32	0.188 ± 0.751	0.169 ± 0.359
PRF-fit source offset from KIC position	0.299 ± 0.309	0.97	0.138 ± 0.607	0.265 ± 0.144
photometric centroid source offset	0.93 ± 0.67	1.39	0.88 ± 0.69	-0.30 ± 0.50

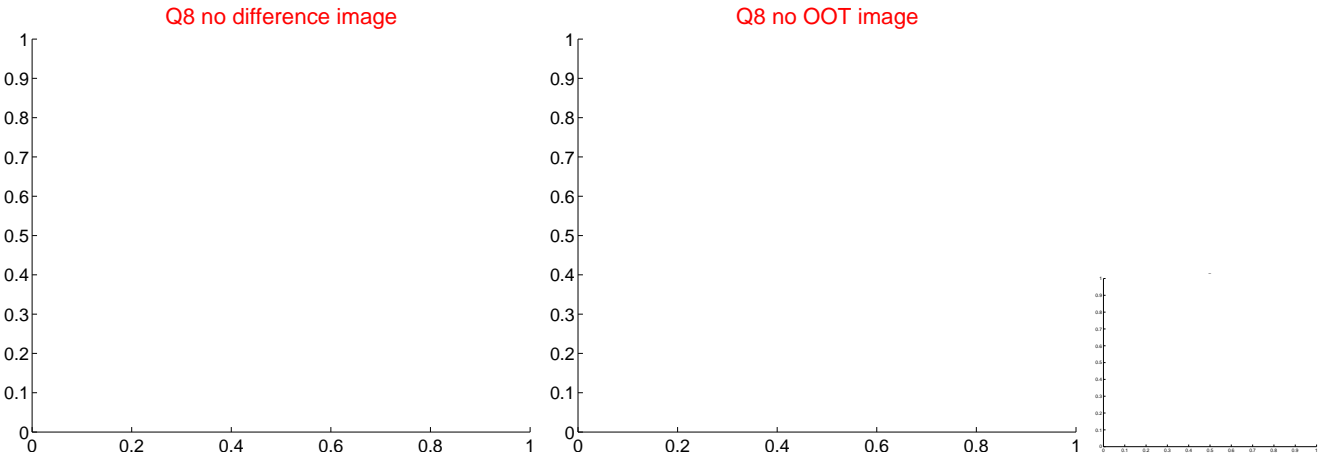
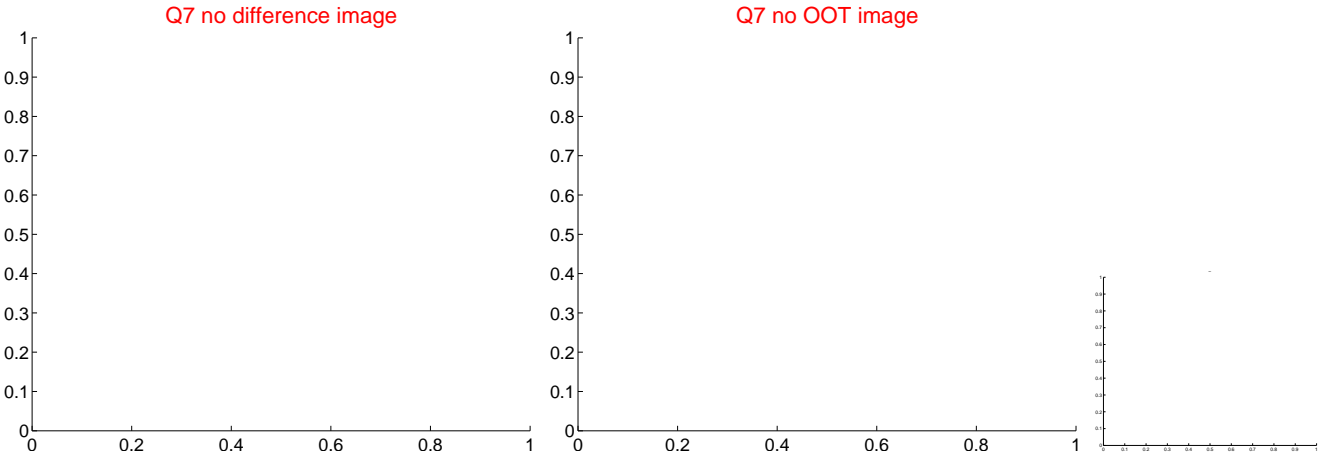
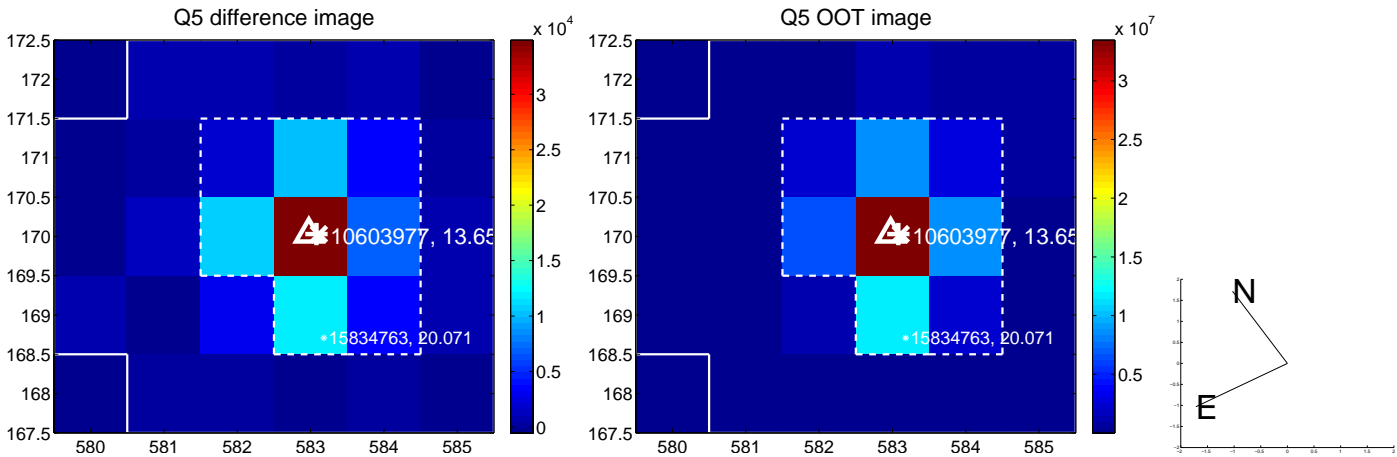


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

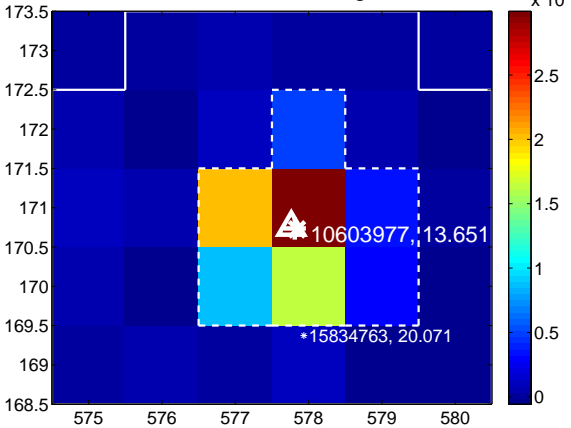
Q9 no difference image



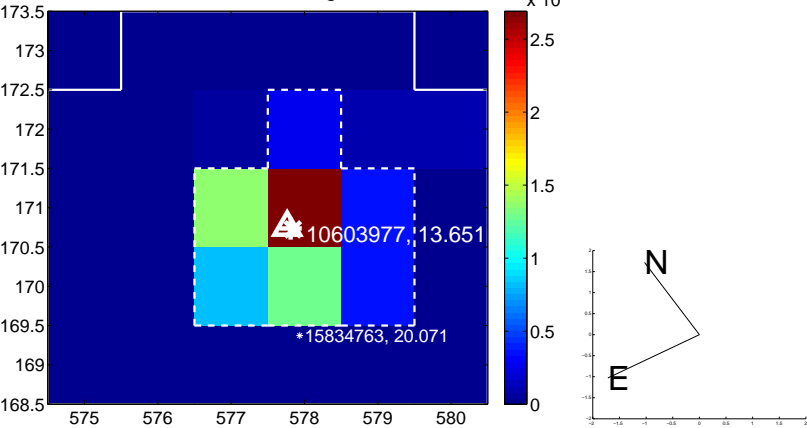
Q9 no OOT image



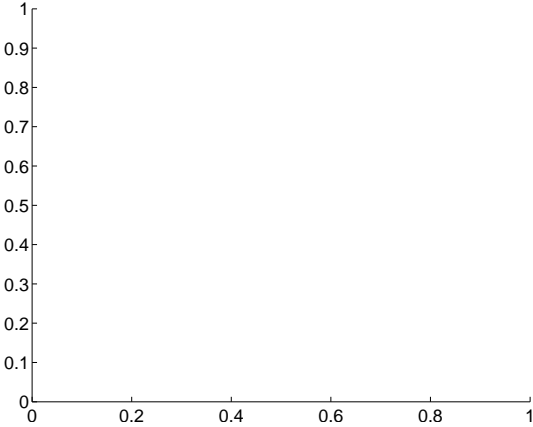
Q10 difference image



Q10 OOT image



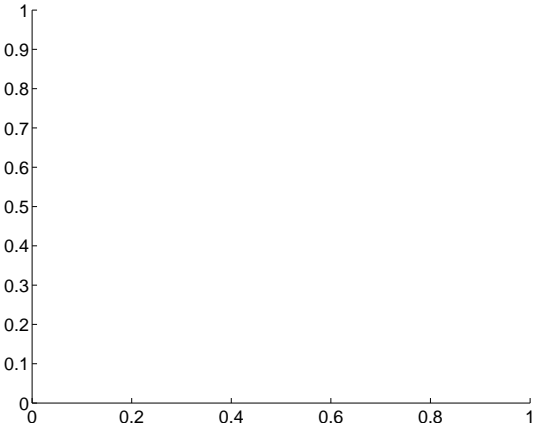
Q11 no difference image



Q11 no OOT image



Q12 no difference image



Q12 no OOT image



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

Q13 no difference image



Q13 no OOT image



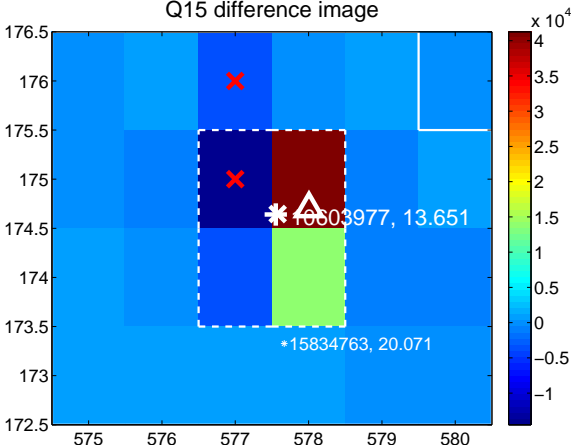
Q14 no difference image



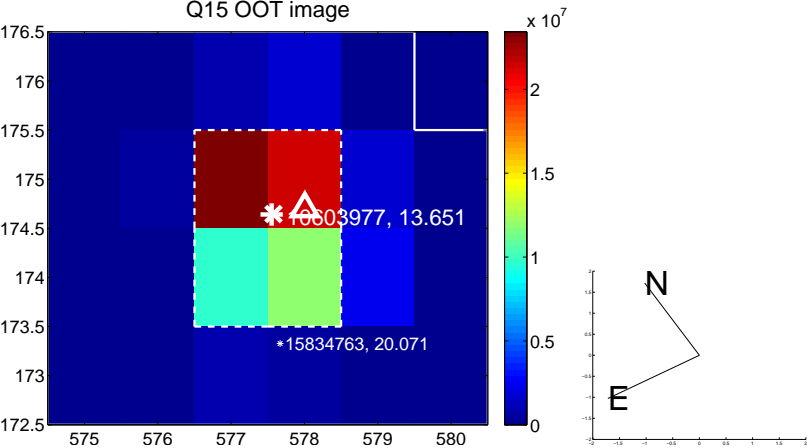
Q14 no OOT image



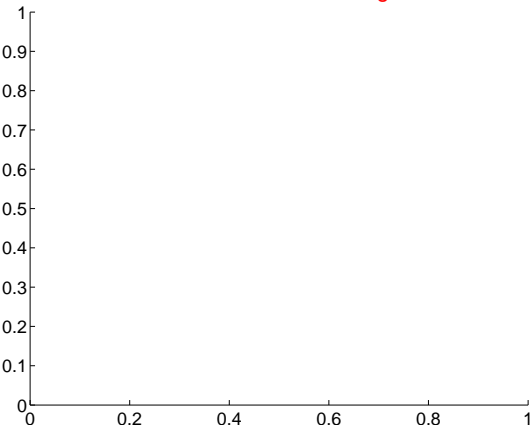
Q15 difference image



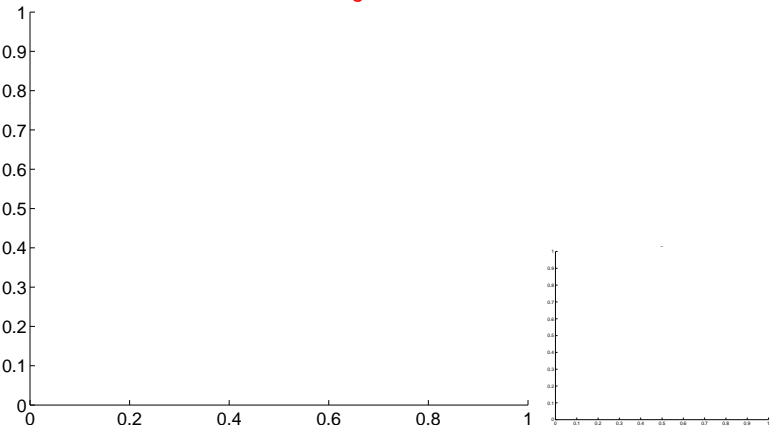
Q15 OOT image



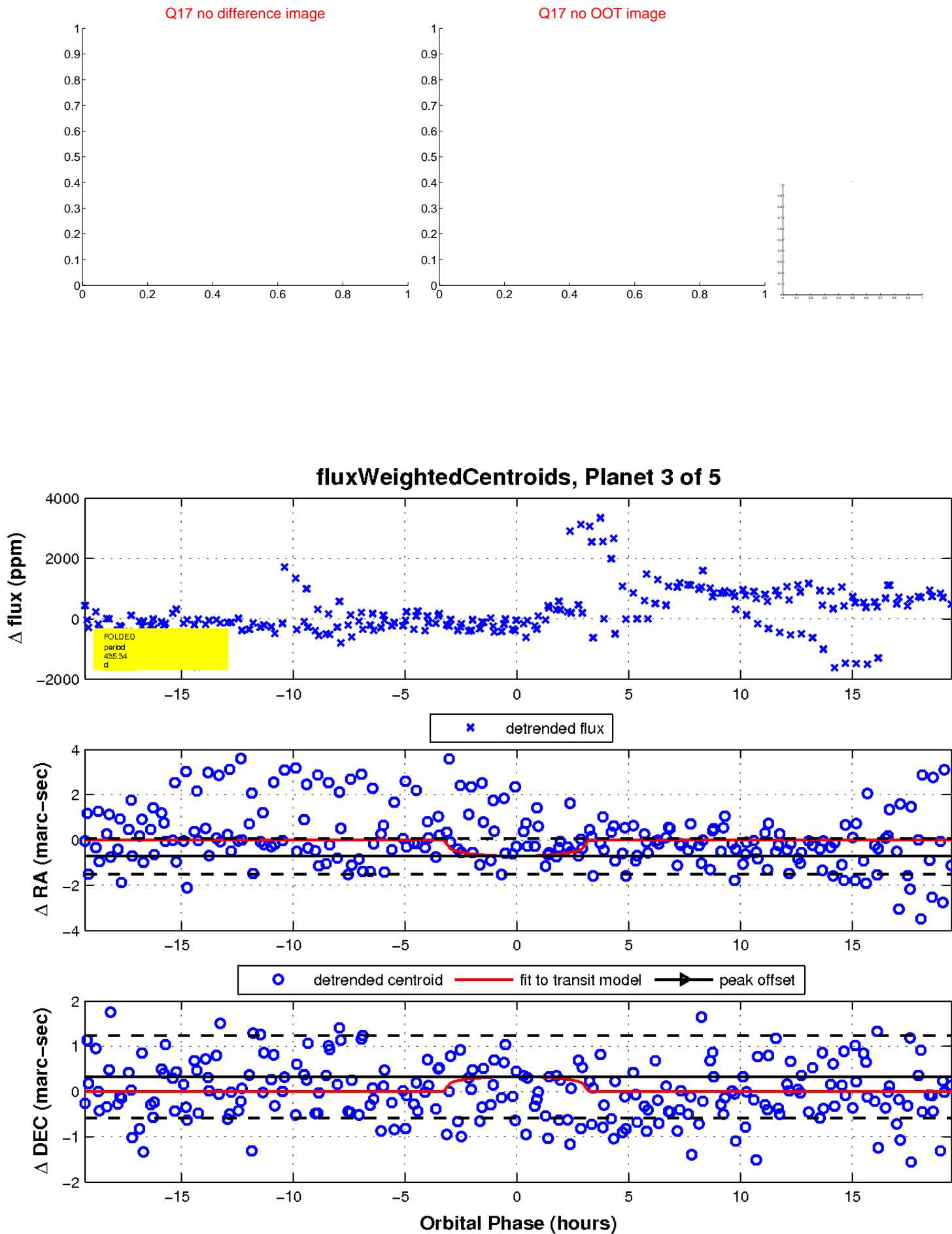
Q16 no difference image



Q16 no OOT image

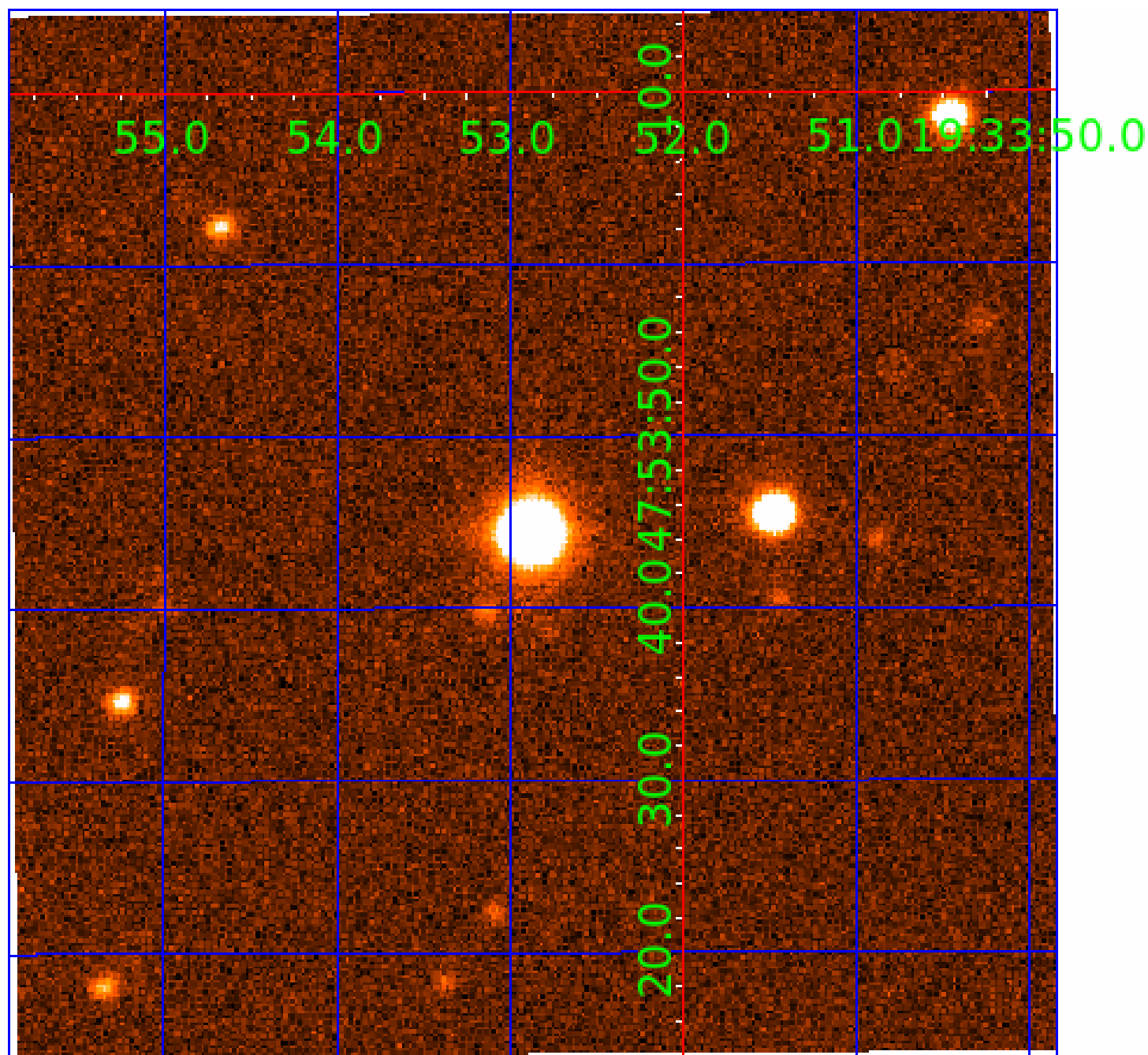


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010603977

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})
010603977-01	OBS	No	283.728121	349.836040	806.7	3.829	15.8	6.8	3.38	4946	9.45	9.40
010603977-02	OBS	No	496.308890	500.081191	1129.7	10.117	17.2	9.4	3.38	4946	11.24	4.46
010603977-03	OBS	No	435.341489	518.994833	830.8	6.504	13.5	7.5	3.38	4946	10.15	5.31
010603977-04	OBS	No	588.391930	209.666961	704.9	7.593	12.0	6.5	3.38	4946	9.49	3.55
010603977-05	OBS	No	328.509606	306.369398	679.0	4.110	12.5	6.5	3.38	4946	9.36	7.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010603977-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010603977-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010603977-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—CENT_FEW_DIFFS
010603977-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010603977-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

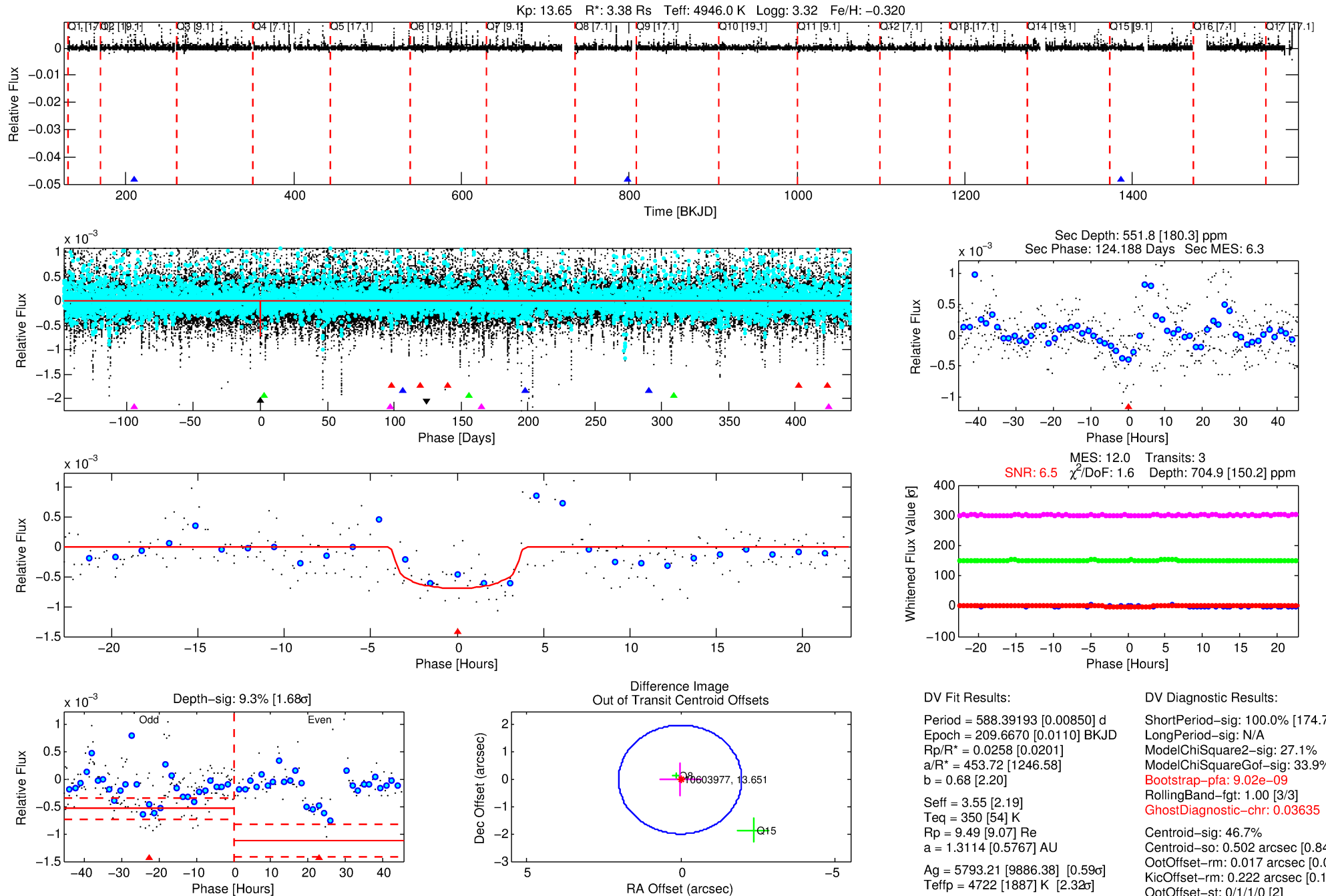
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010603977-04

No Significant Match Found

DV One-Page Summary

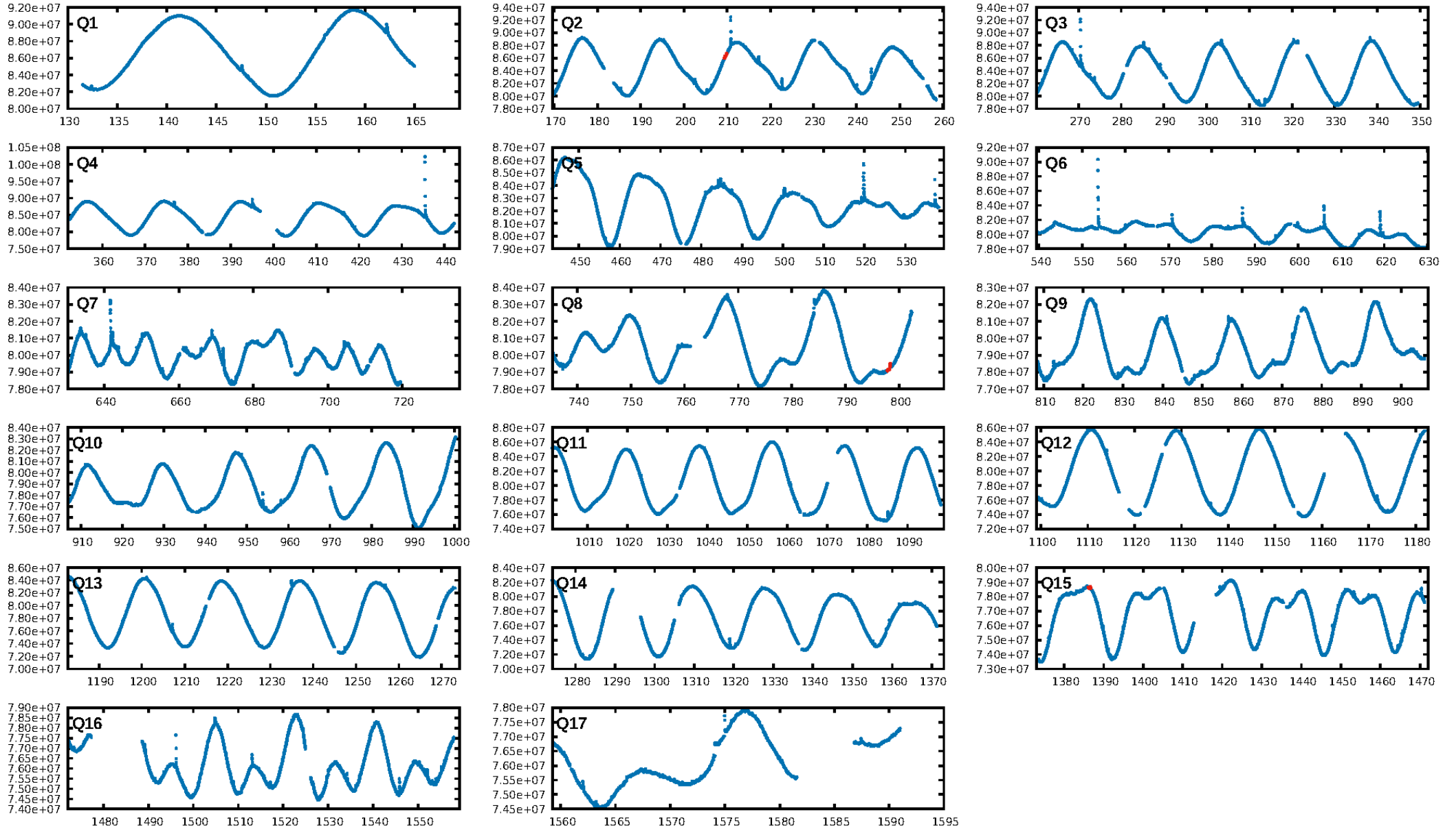
KIC: 10603977 Candidate: 4 of 5 Period: 588.392 d



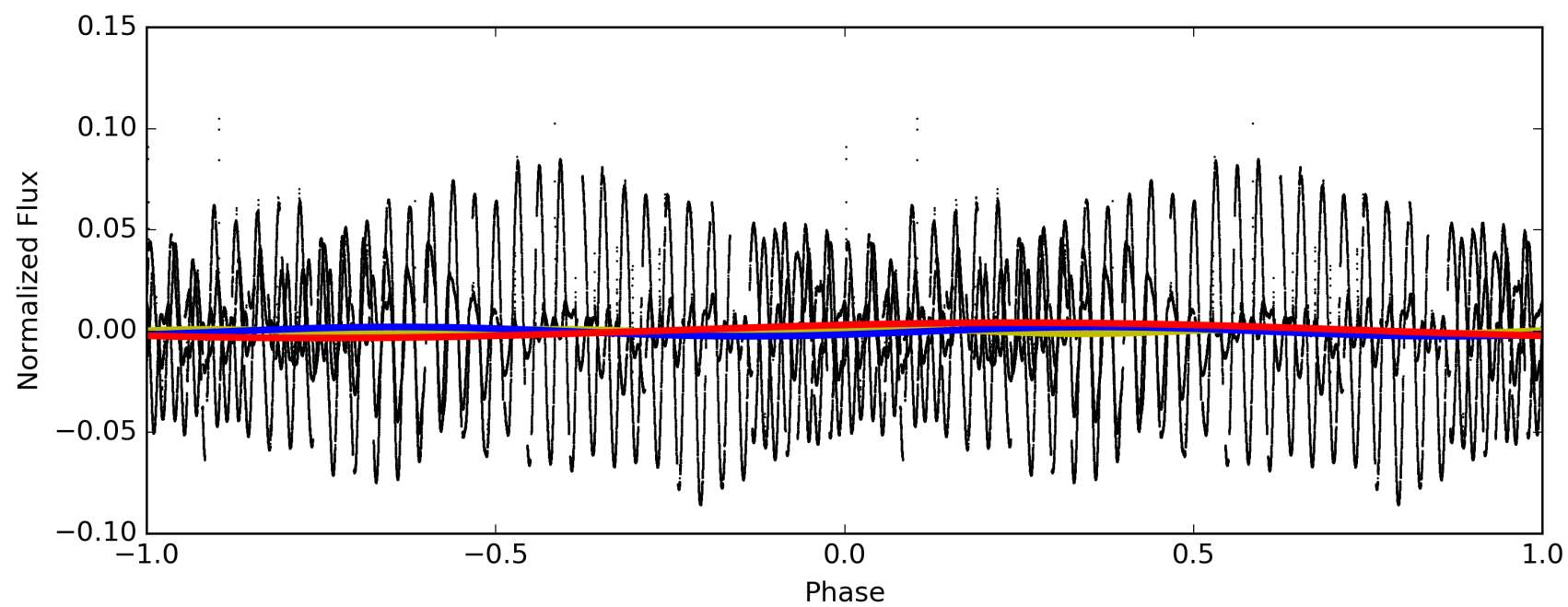
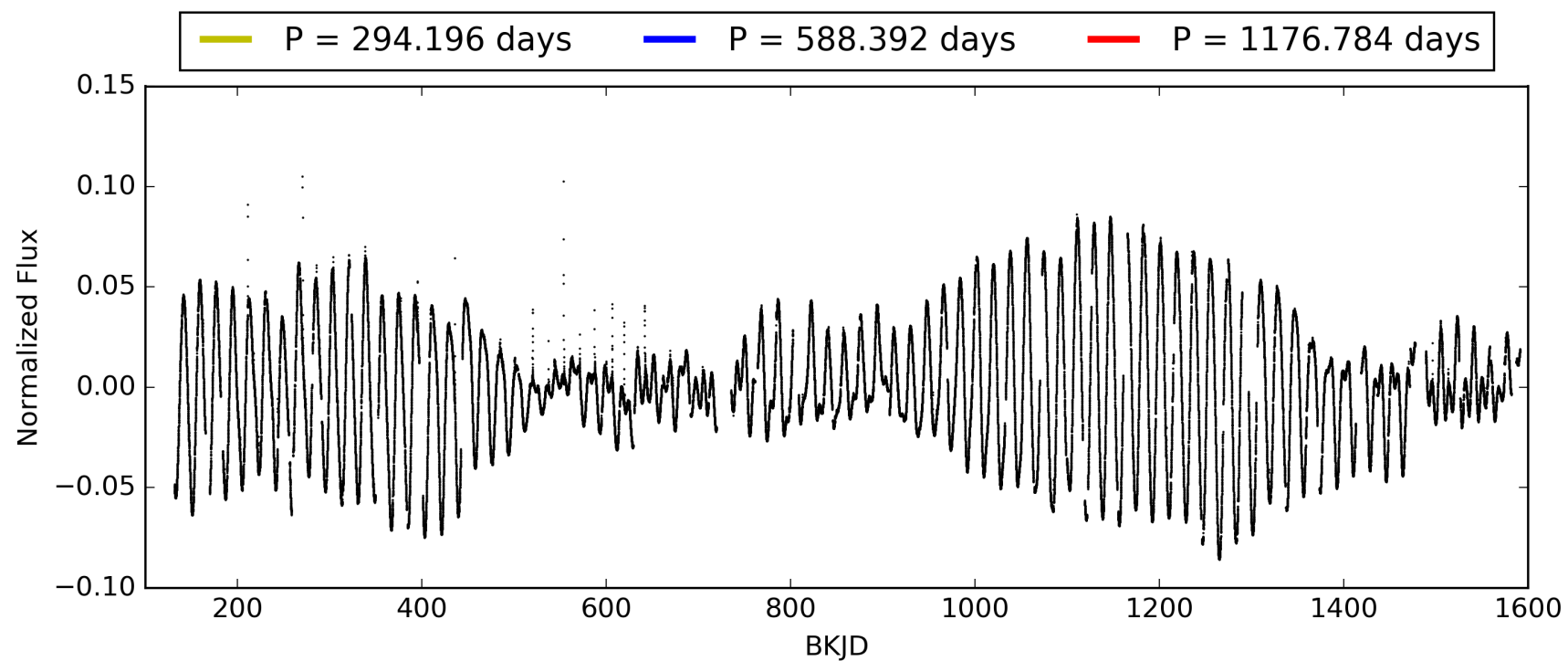
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:34:46 Z

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

TCE 010603977-04, PDC Light Curves

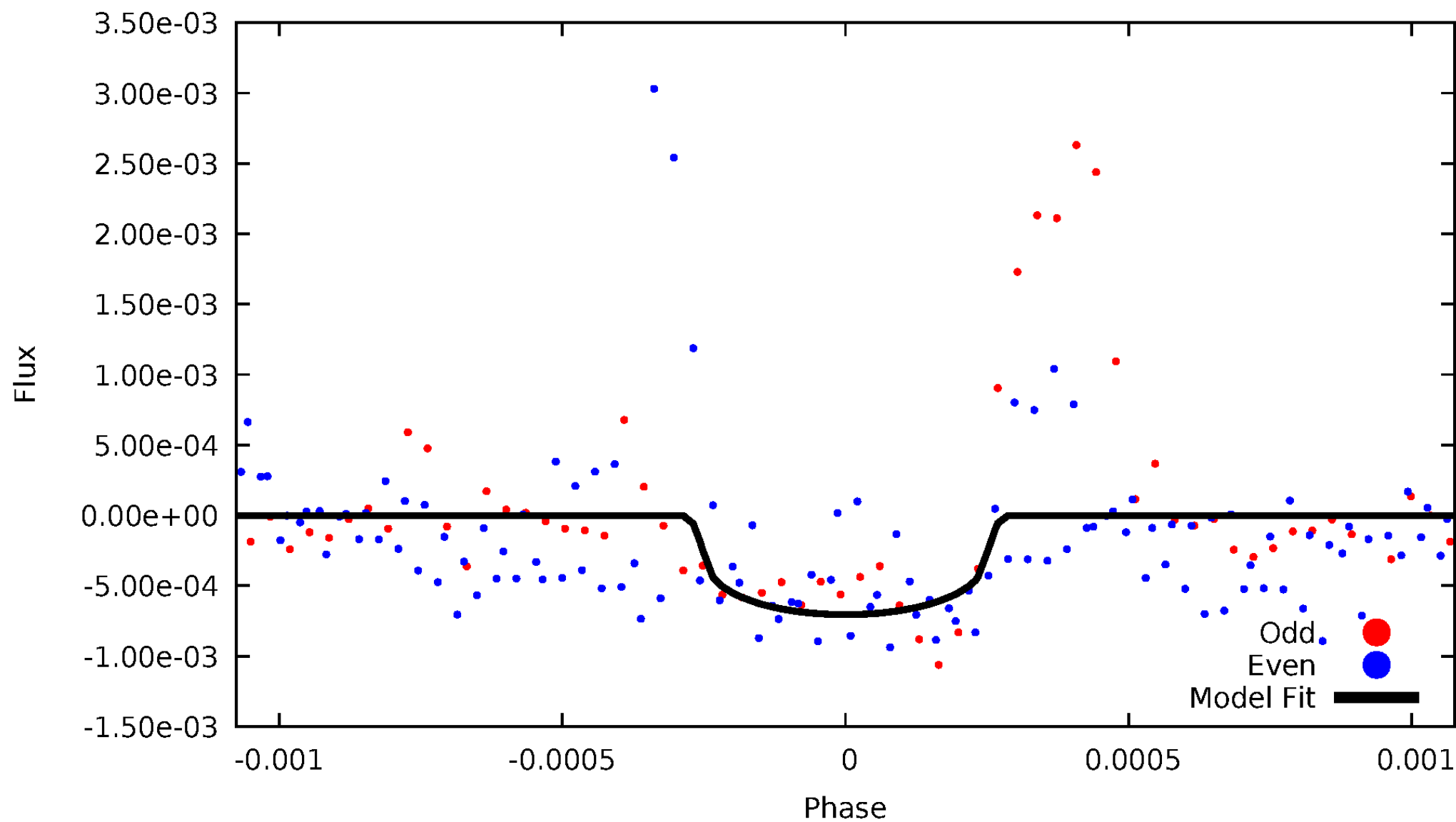


TCE 010603977-04



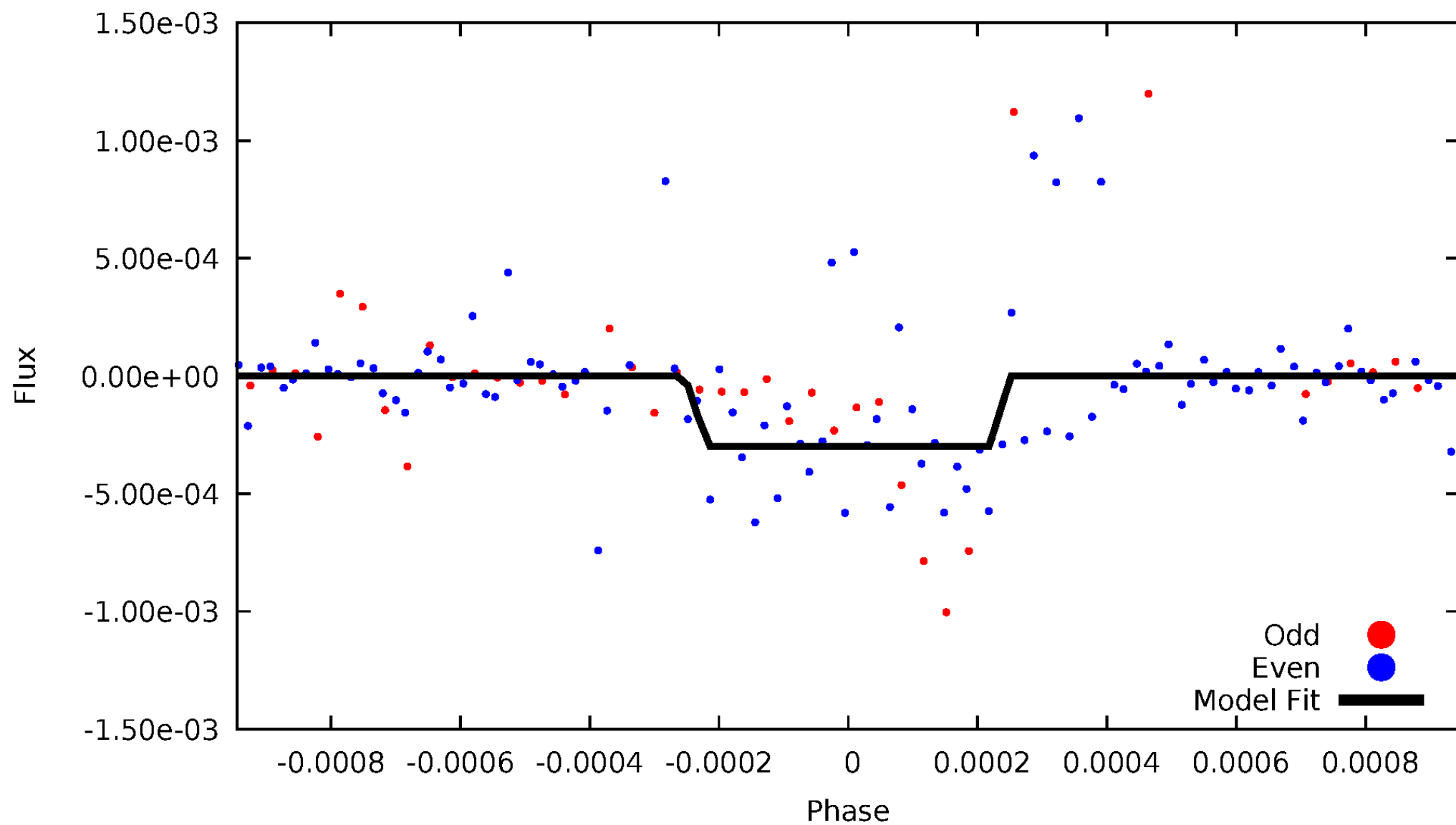
DV Odd/Even

TCE 010603977-04



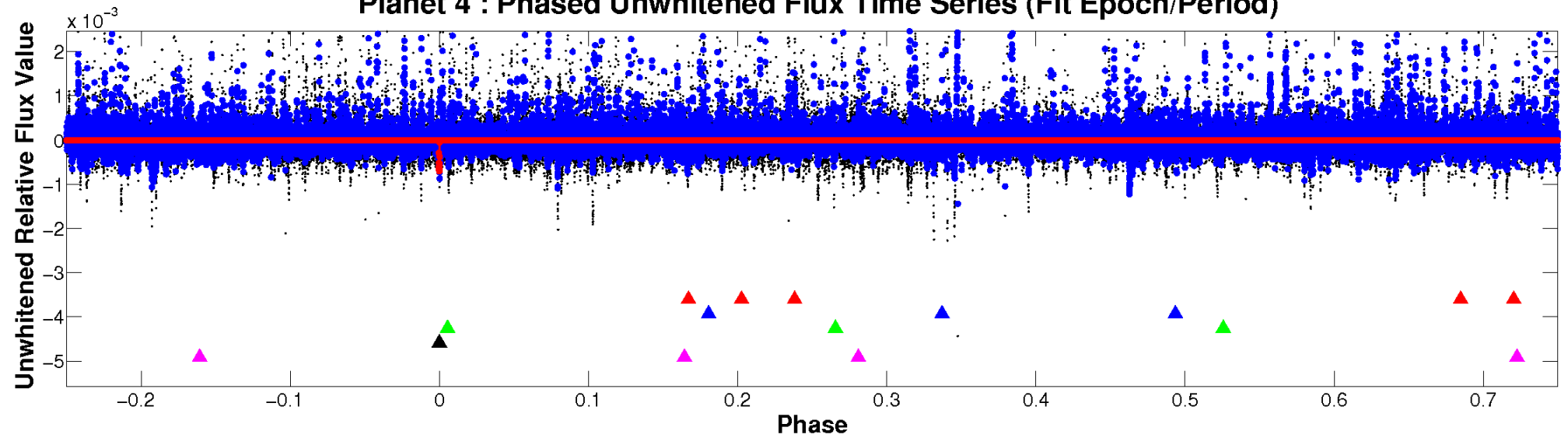
ALT Odd/Even

TCE 010603977-04

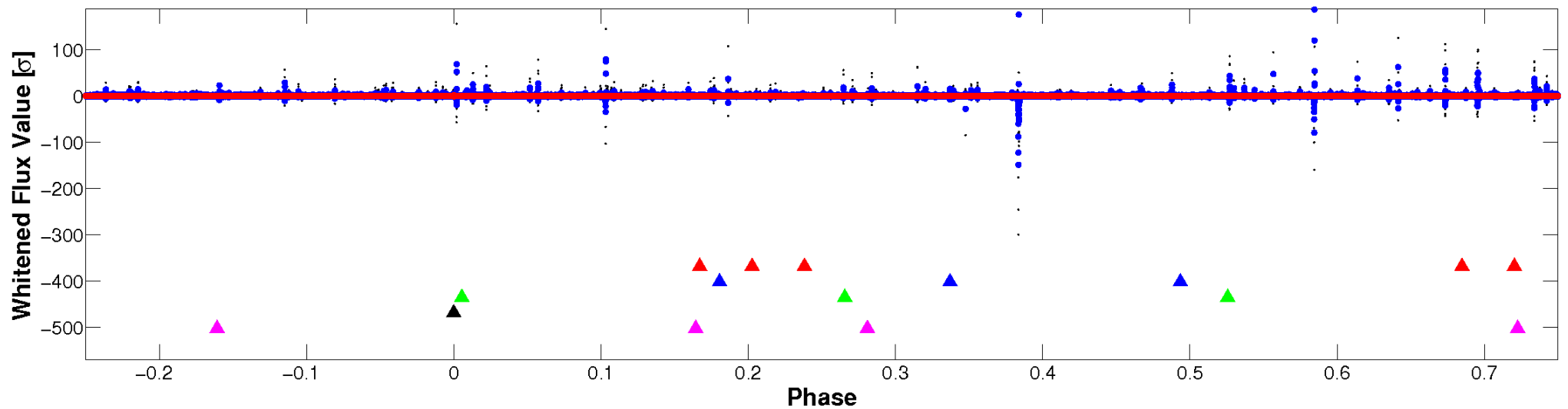


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

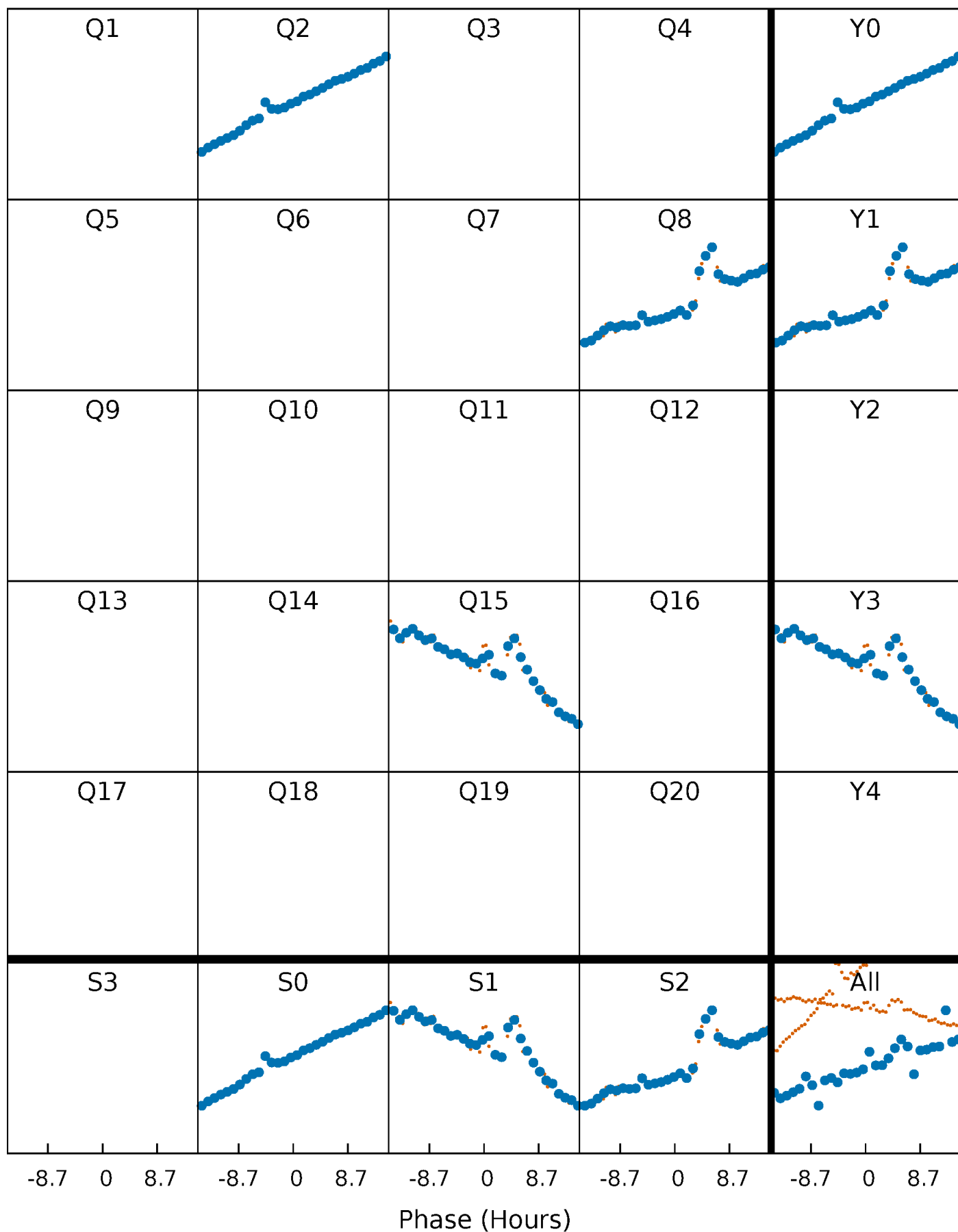


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



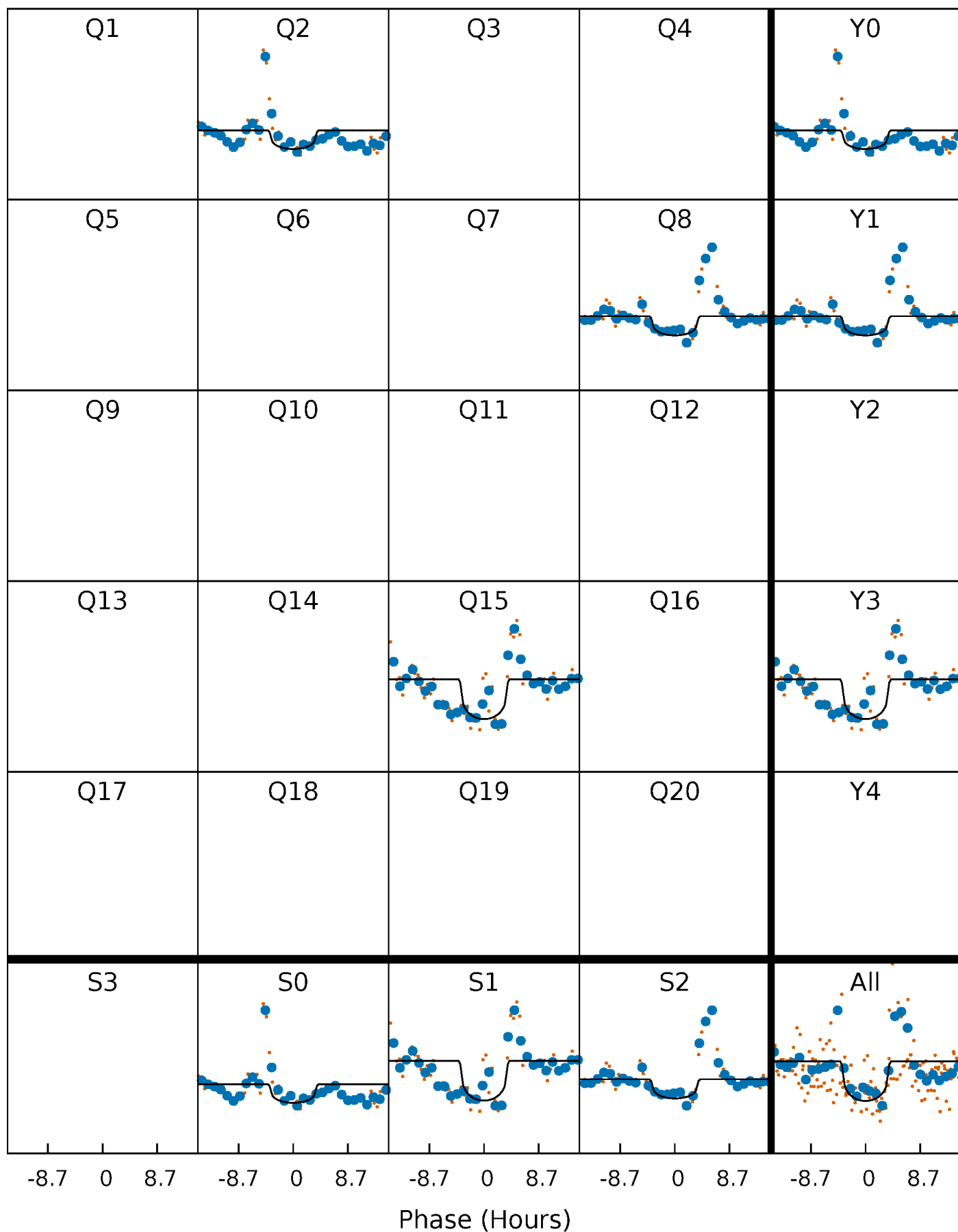
PDC Quarter-Phased Transit Curves

TCE 010603977-04 $P=588.391930$ Days $T_0=209.666961$ (BKJD)



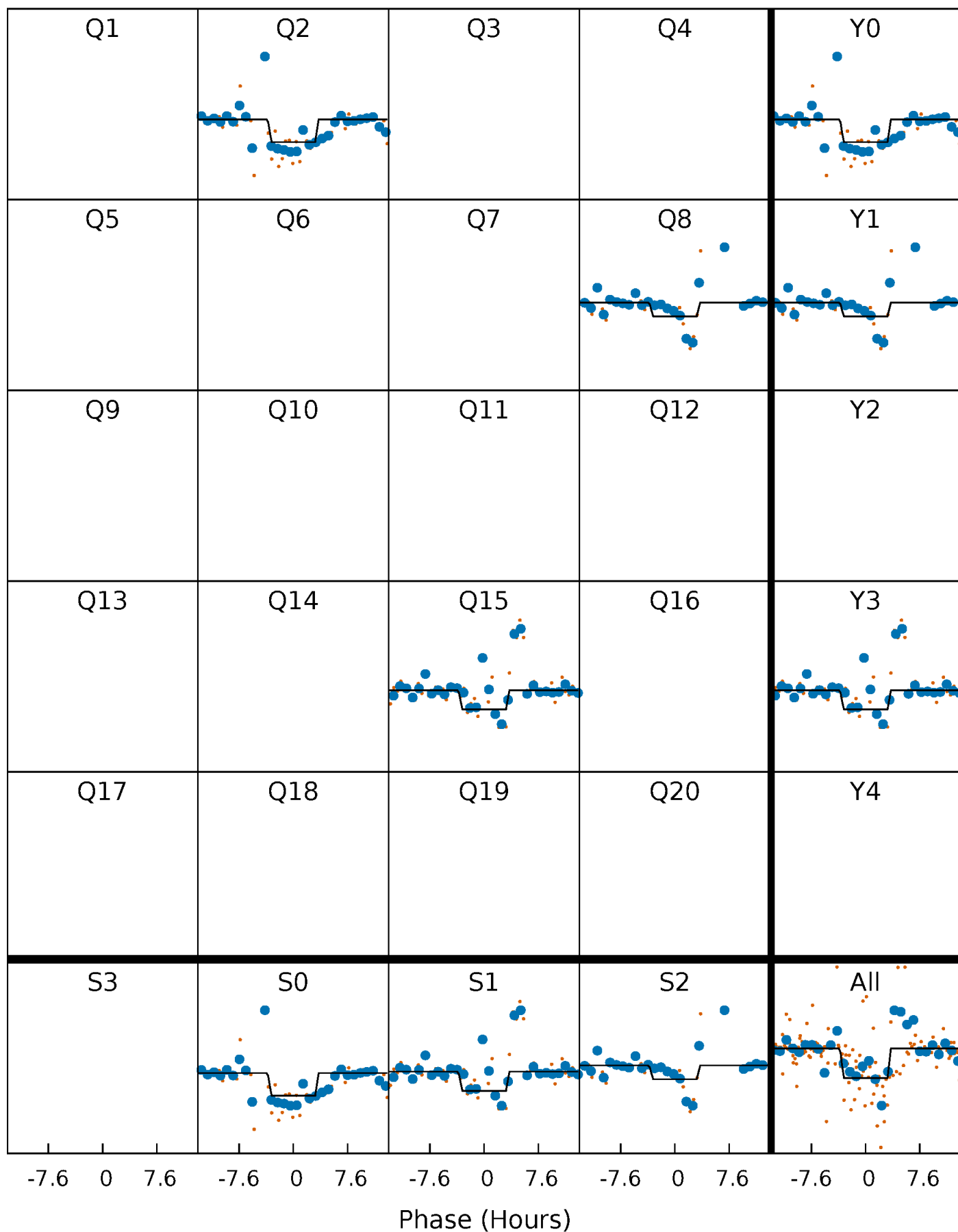
DV Quarter-Phased Transit Curves

TCE 010603977-04 $P=588.391930$ Days $T_0=209.666961$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

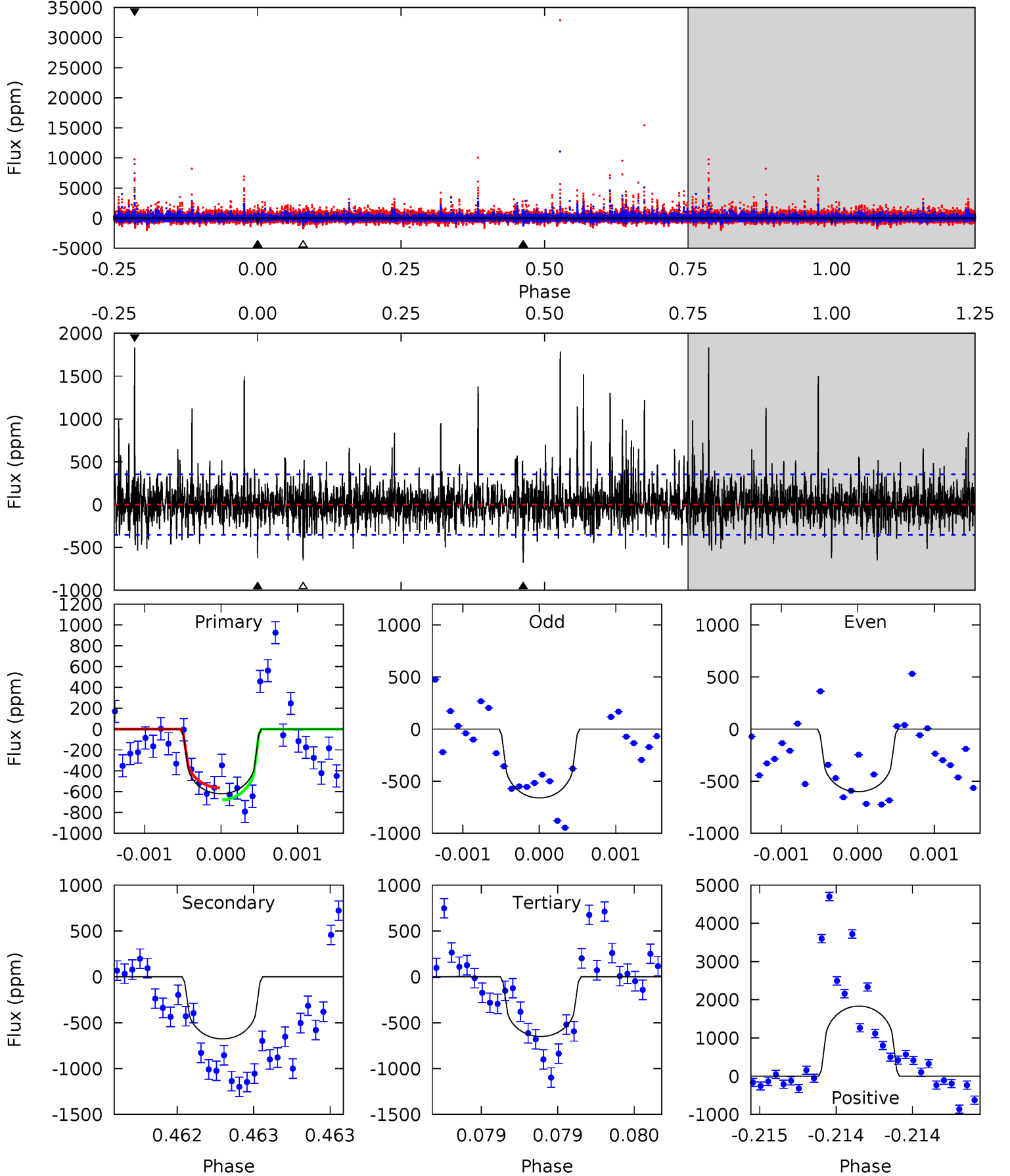
TCE 010603977-04 P=588.391171 Days $T_0=209.675495$ (BKJD)



DV Model-Shift Uniqueness Test

010603977-04, P = 588.391930 Days, E = 209.666961 Days

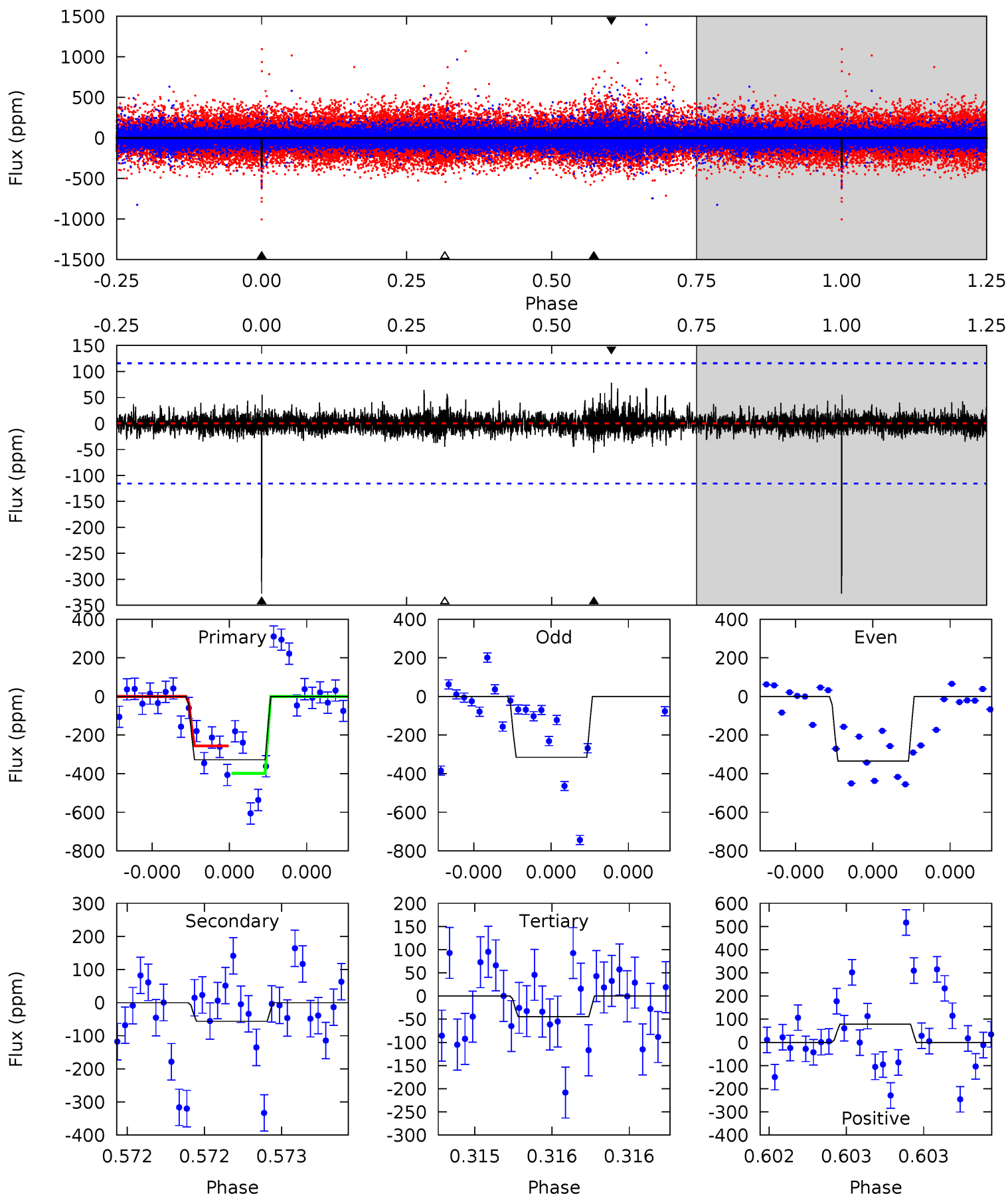
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.76	10.6	10.2	28.8	5.56	3.46	2.99	-0.46	-19.1	0.41	-18.2	0.14	1.01	0.73	0.89



Alt Model-Shift Uniqueness Test

010603977-04, P = 588.391171 Days, E = 209.675495 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	2.73	2.16	3.77	5.58	3.50	0.52	13.6	12.0	0.57	-1.04	0.39	0.91	0.19	3.45



Stellar Parameters For KIC 010603977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4946^{+136}_{-1}	$3.320^{+0.315}_{-0.315}$	$-0.320^{+0.300}_{-0.200}$	$3.376^{+1.860}_{-1.002}$	$0.868^{+0.299}_{-0.161}$	$0.032^{+0.061}_{-0.020}$
	+3%/-0%	+9%/-9%	+94%/-62%	+55%/-30%	+34%/-19%	+192%/-64%
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 010603977-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-677 ± 64	$10.52^{+8.22}_{-6.44}$	487^{+66}_{-50}	4776^{+2442}_{-847}	5963^{+33784}_{-4094}
Alt.	-57 ± 21	$8.42^{+7.13}_{-5.29}$	483^{+66}_{-50}	3318^{+1233}_{-547}	730^{+4536}_{-529}

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

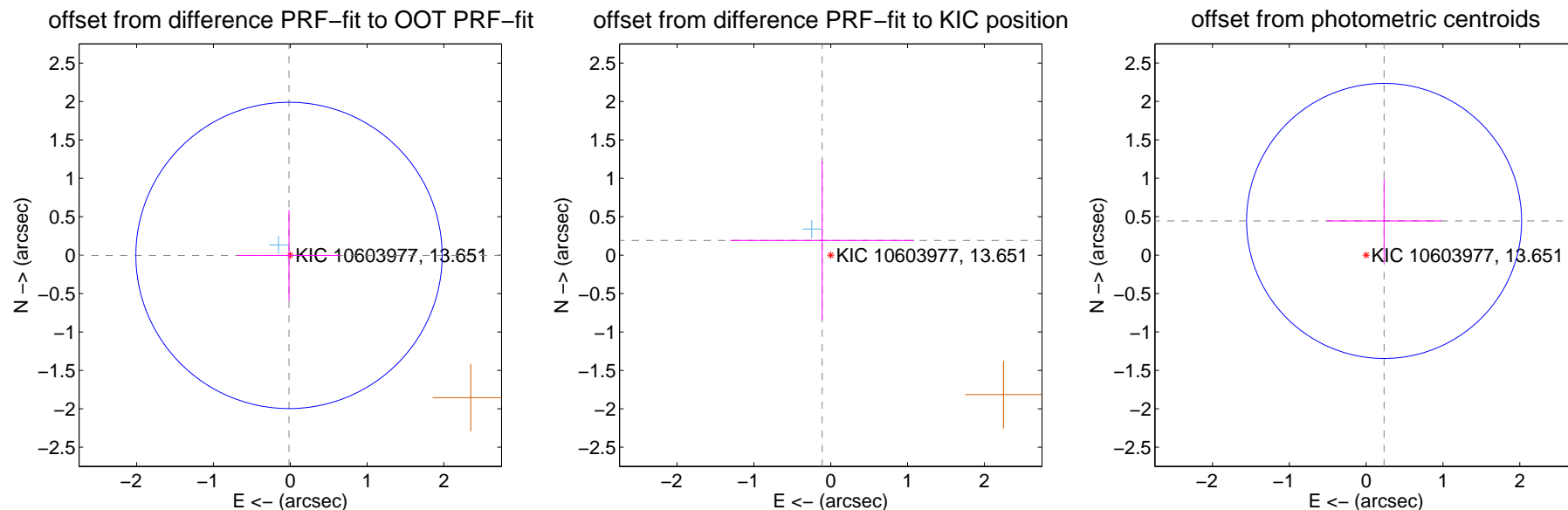
DV Centroid Data

Supplemental centroid analysis for 010603977-04. Kepler magnitude: 13.65. Transit SNR 6.49

There are 1 quarters with good PRF difference image offsets

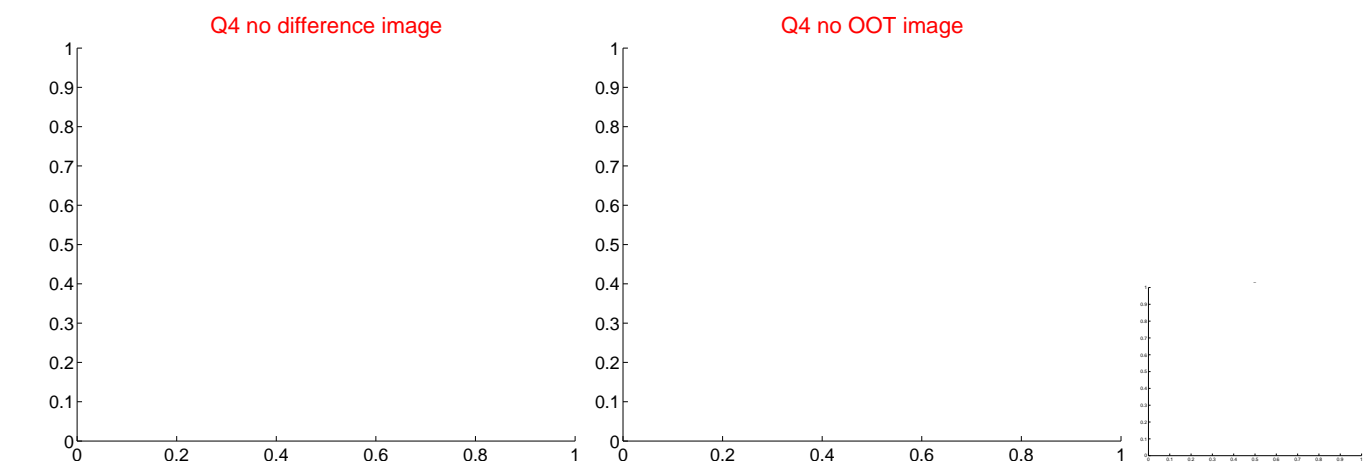
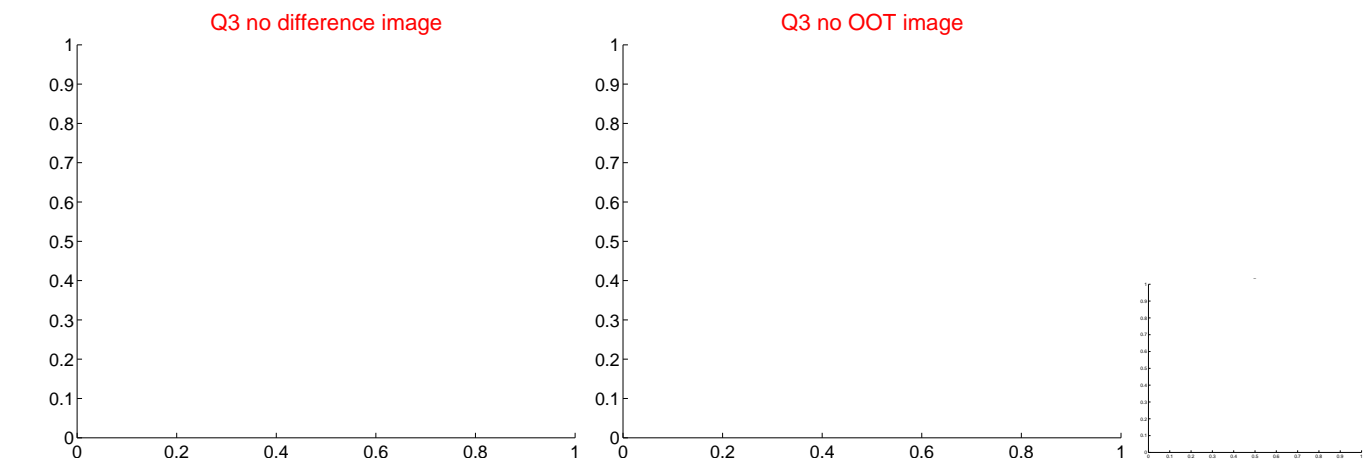
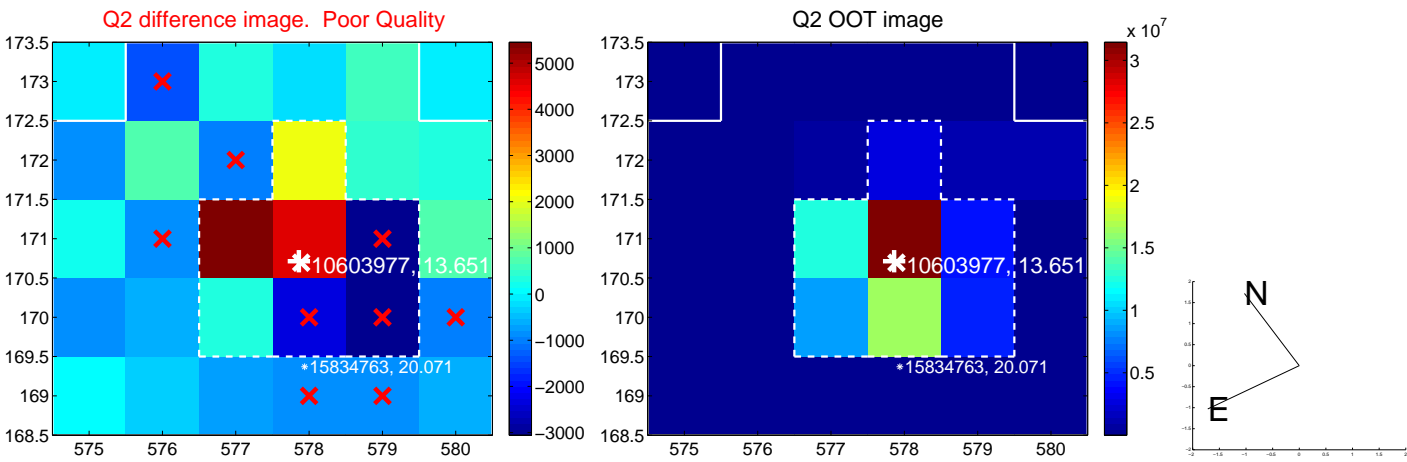
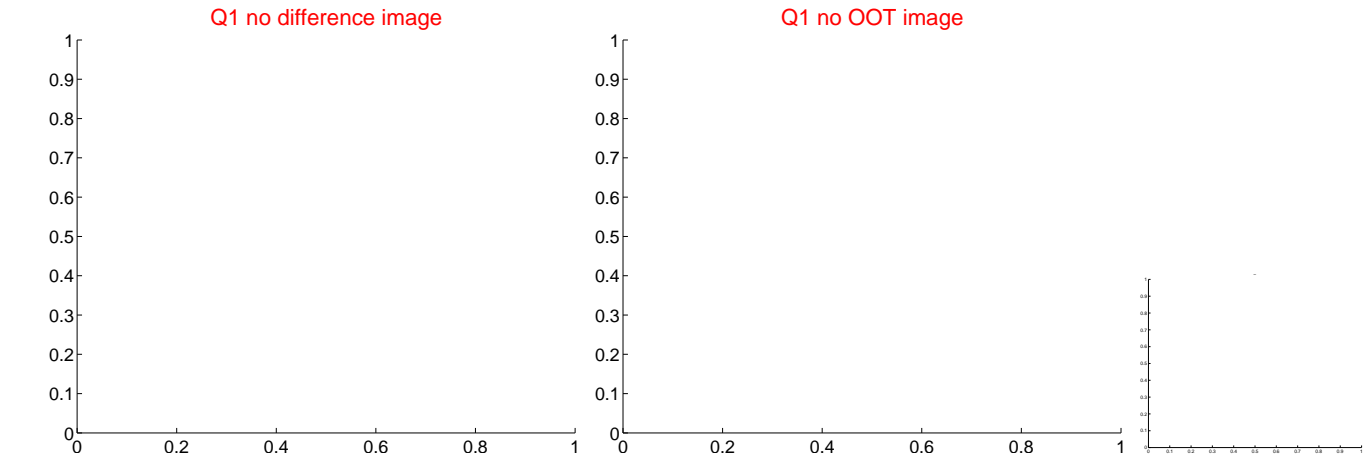
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.017 ± 0.665	0.03	0.016 ± 0.668	-0.004 ± 0.591
PRF-fit source offset from KIC position	0.222 ± 1.493	0.15	0.111 ± 1.197	0.193 ± 1.034
photometric centroid source offset	0.50 ± 0.60	0.84	-0.23 ± 0.75	0.44 ± 0.55



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



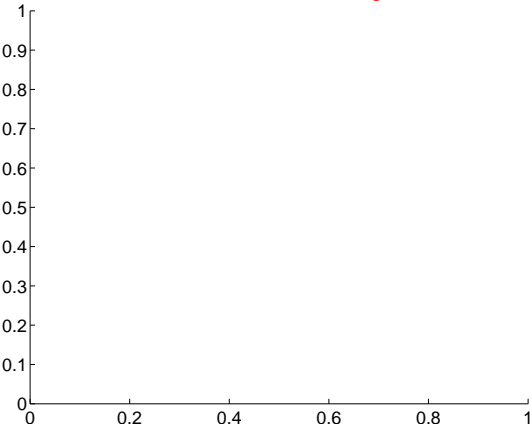
Q6 no difference image



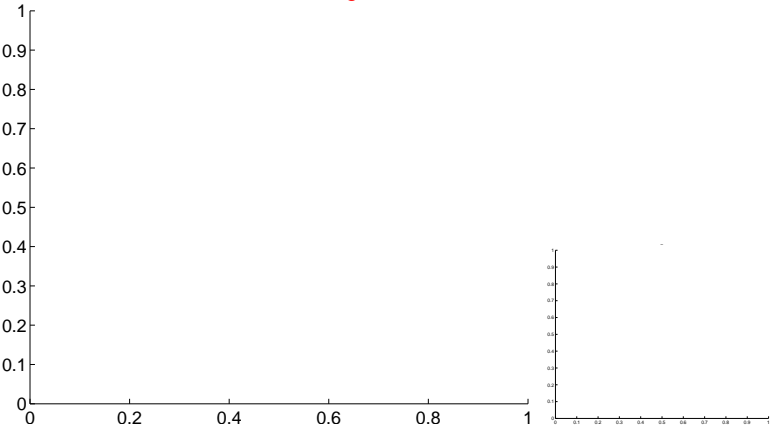
Q6 no OOT image



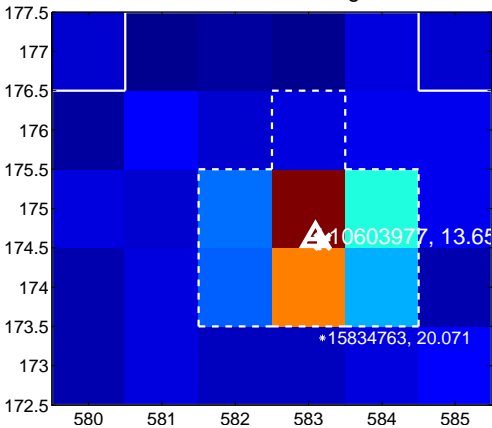
Q7 no difference image



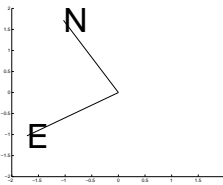
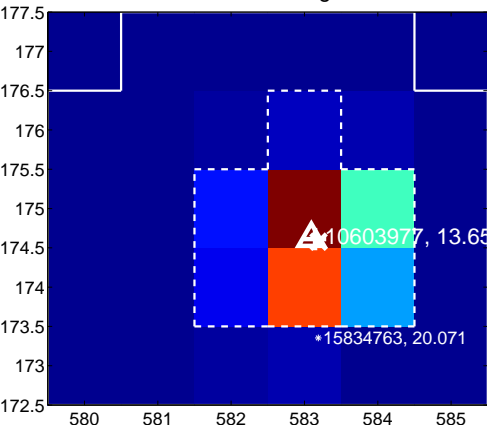
Q7 no OOT image



Q8 difference image



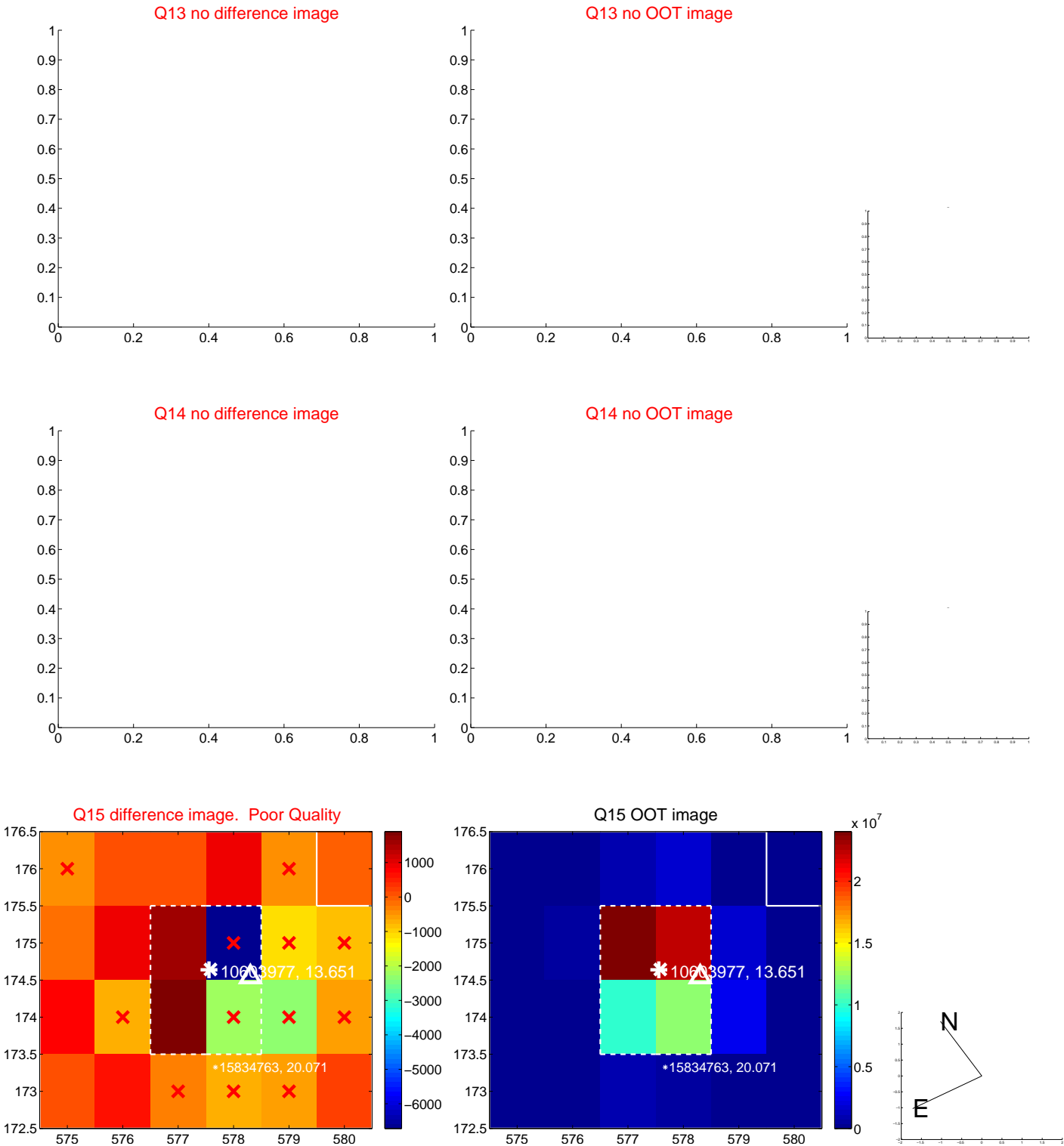
Q8 OOT image



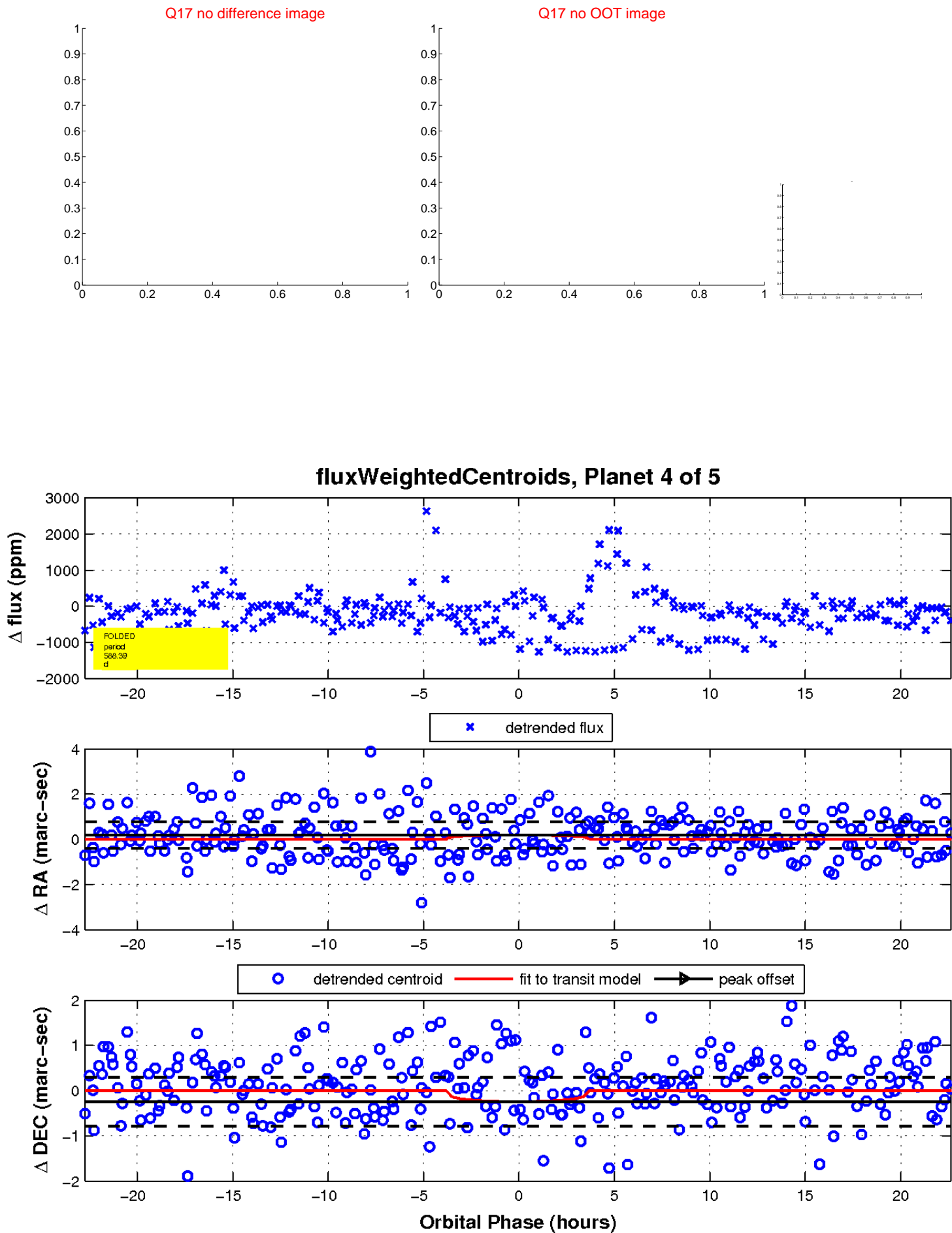
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

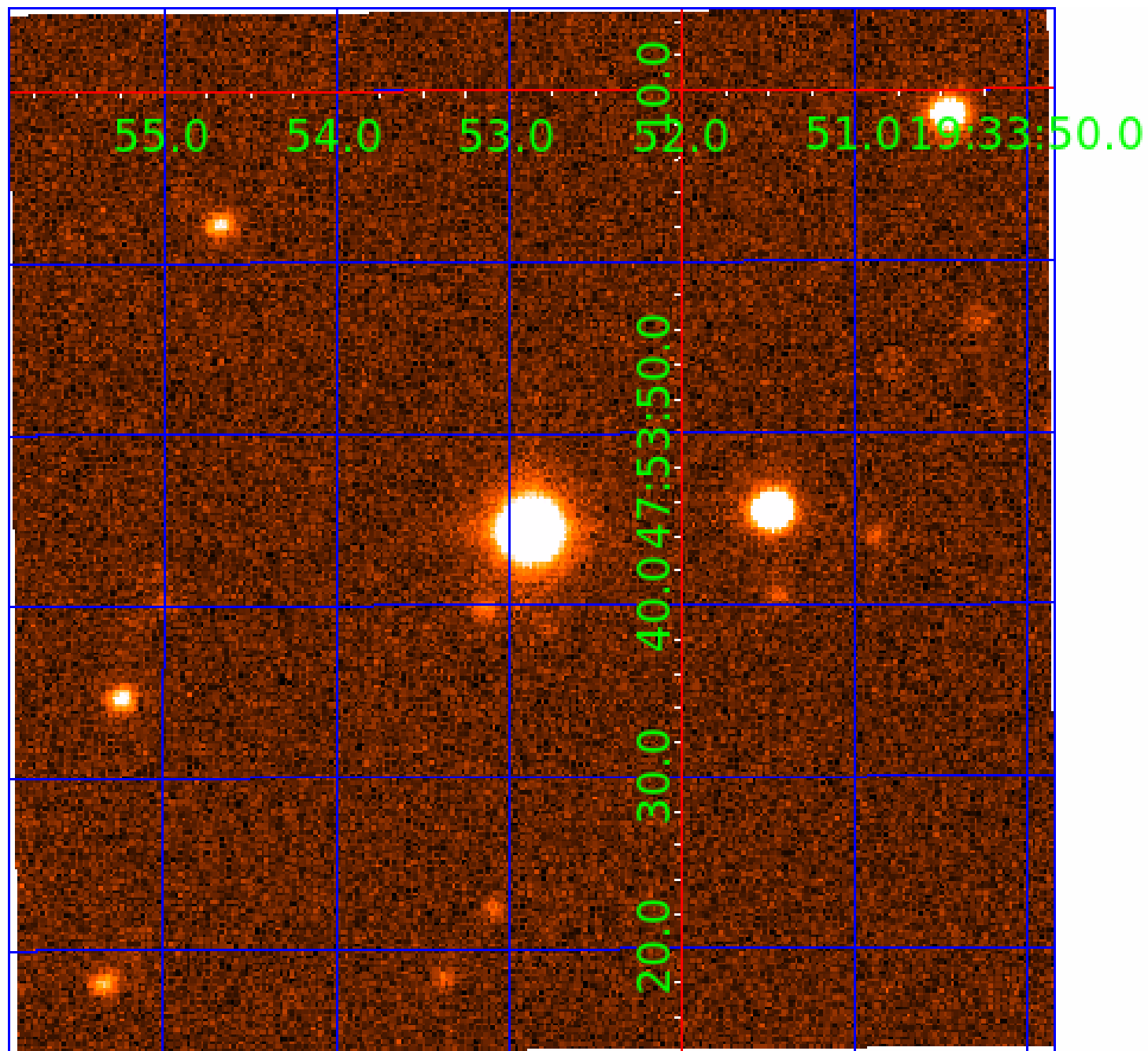


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010603977

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})
010603977-01	OBS	No	283.728121	349.836040	806.7	3.829	15.8	6.8	3.38	4946	9.45	9.40
010603977-02	OBS	No	496.308890	500.081191	1129.7	10.117	17.2	9.4	3.38	4946	11.24	4.46
010603977-03	OBS	No	435.341489	518.994833	830.8	6.504	13.5	7.5	3.38	4946	10.15	5.31
010603977-04	OBS	No	588.391930	209.666961	704.9	7.593	12.0	6.5	3.38	4946	9.49	3.55
010603977-05	OBS	No	328.509606	306.369398	679.0	4.110	12.5	6.5	3.38	4946	9.36	7.73

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010603977-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010603977-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
010603977-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV—CENT_FEW_DIFFS
010603977-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010603977-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

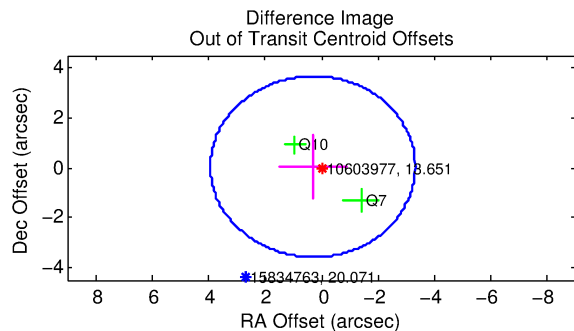
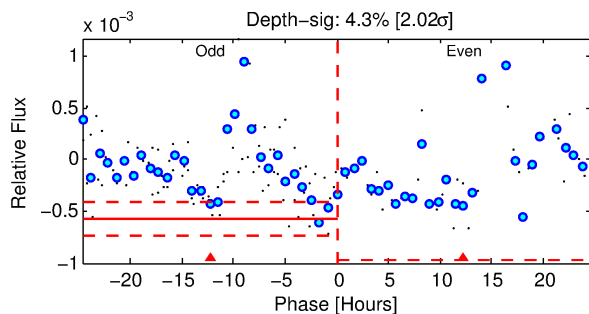
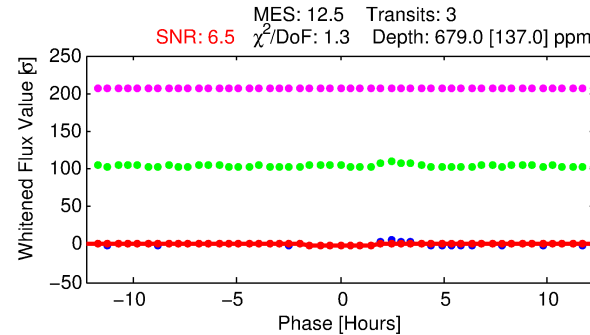
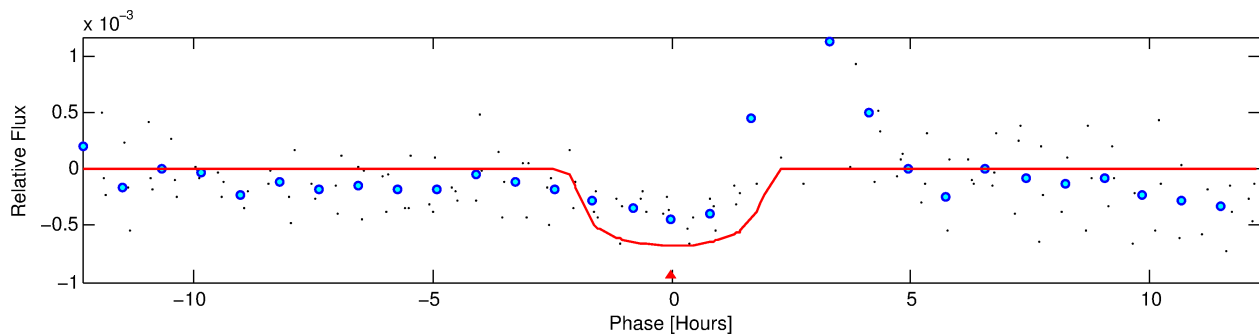
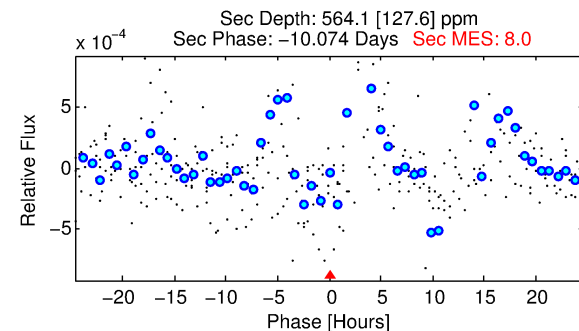
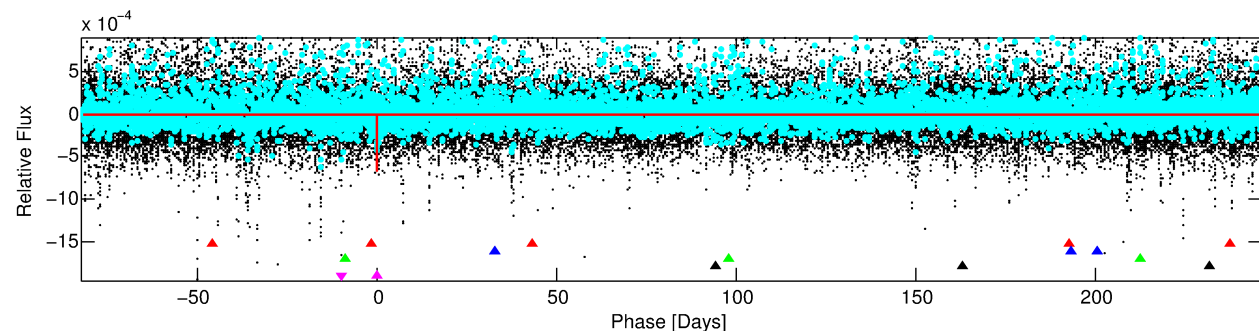
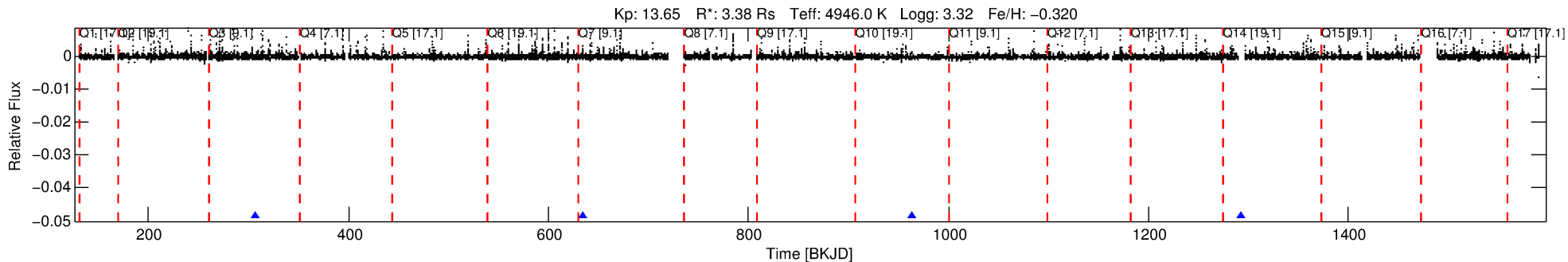
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010603977-05

No Significant Match Found

DV One-Page Summary

KIC: 10603977 Candidate: 5 of 5 Period: 328.510 d



DV Fit Results:

Period = 328.50961 [0.00724] d
Epoch = 306.3694 [0.0102] BKJD
Rp/R* = 0.0254 [0.0496]
a/R* = 461.96 [3233.31]
b = 0.69 [5.39]
Seff = 7.73 [4.77]
Teq = 425 [66] K
Rp = 9.36 [18.99] Re
a = 0.8892 [0.3910] AU
Ag = 2803.28 [11101.44] [0.25σ]
Teffp = 4783 [4681] K [0.93σ]

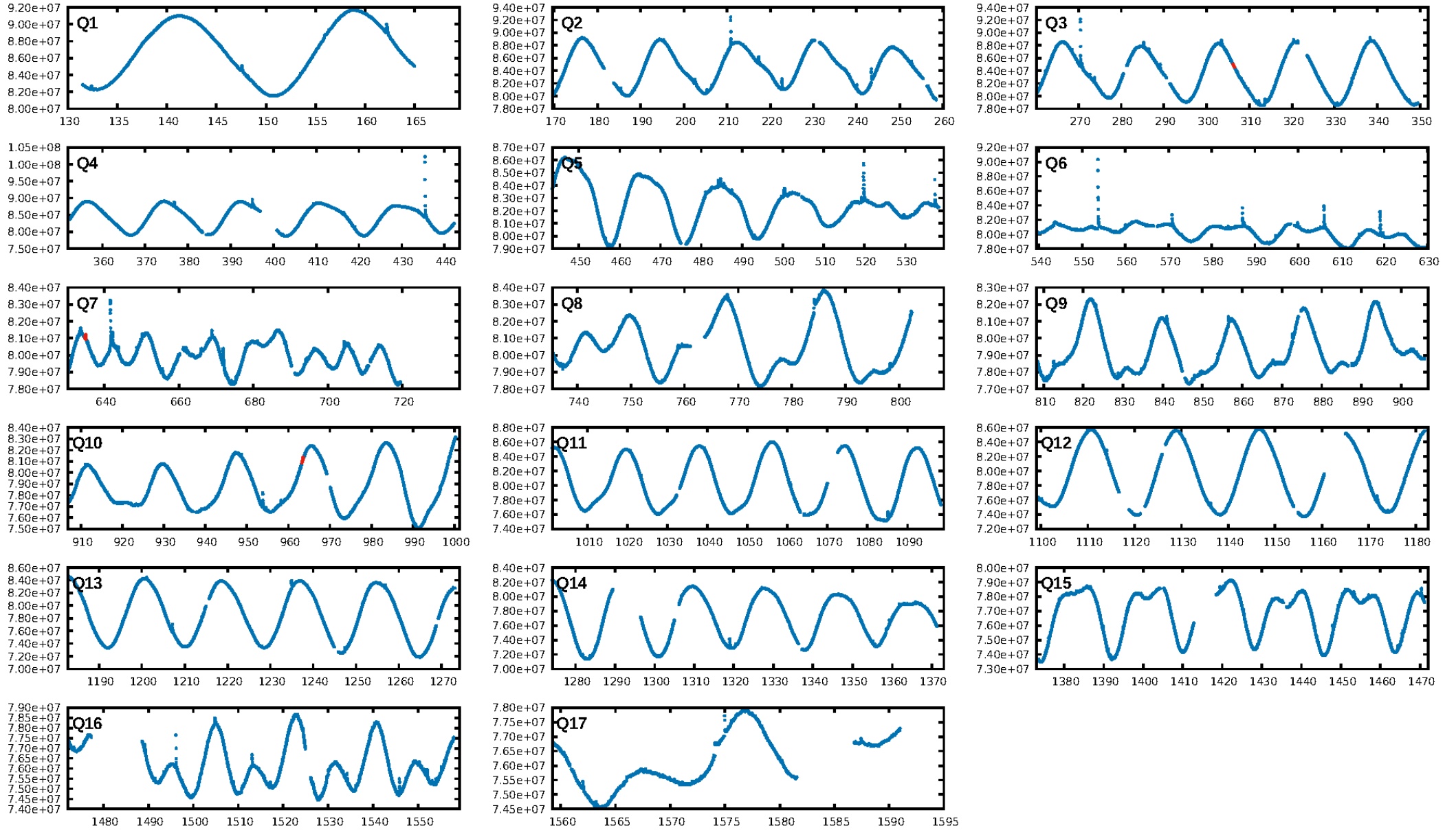
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [191.34σ]
LongPeriod-sig: 100.0% [333.25σ]
ModelChiSquare2-sig: 11.2%
ModelChiSquareGof-sig: 80.9%
Bootstrap-pfa: 1.41e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -4.3
Centroid-sig: 0.0%
Centroid-so: 2.158 arcsec [2.84σ]
OotOffset-rm: 0.308 arcsec [0.26σ]
KicOffset-rm: 0.397 arcsec [0.33σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

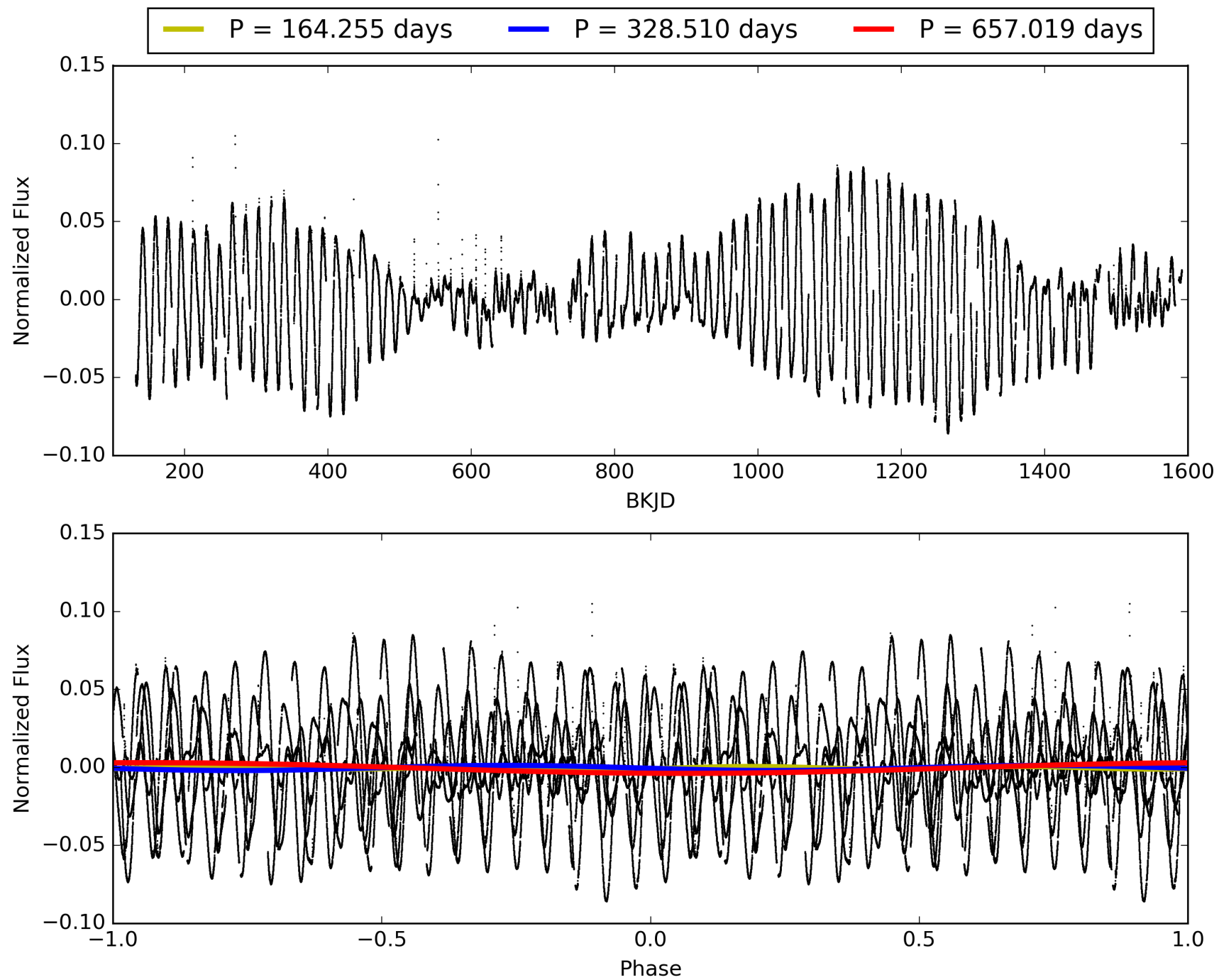
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:34:59 Z

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

TCE 010603977-05, PDC Light Curves

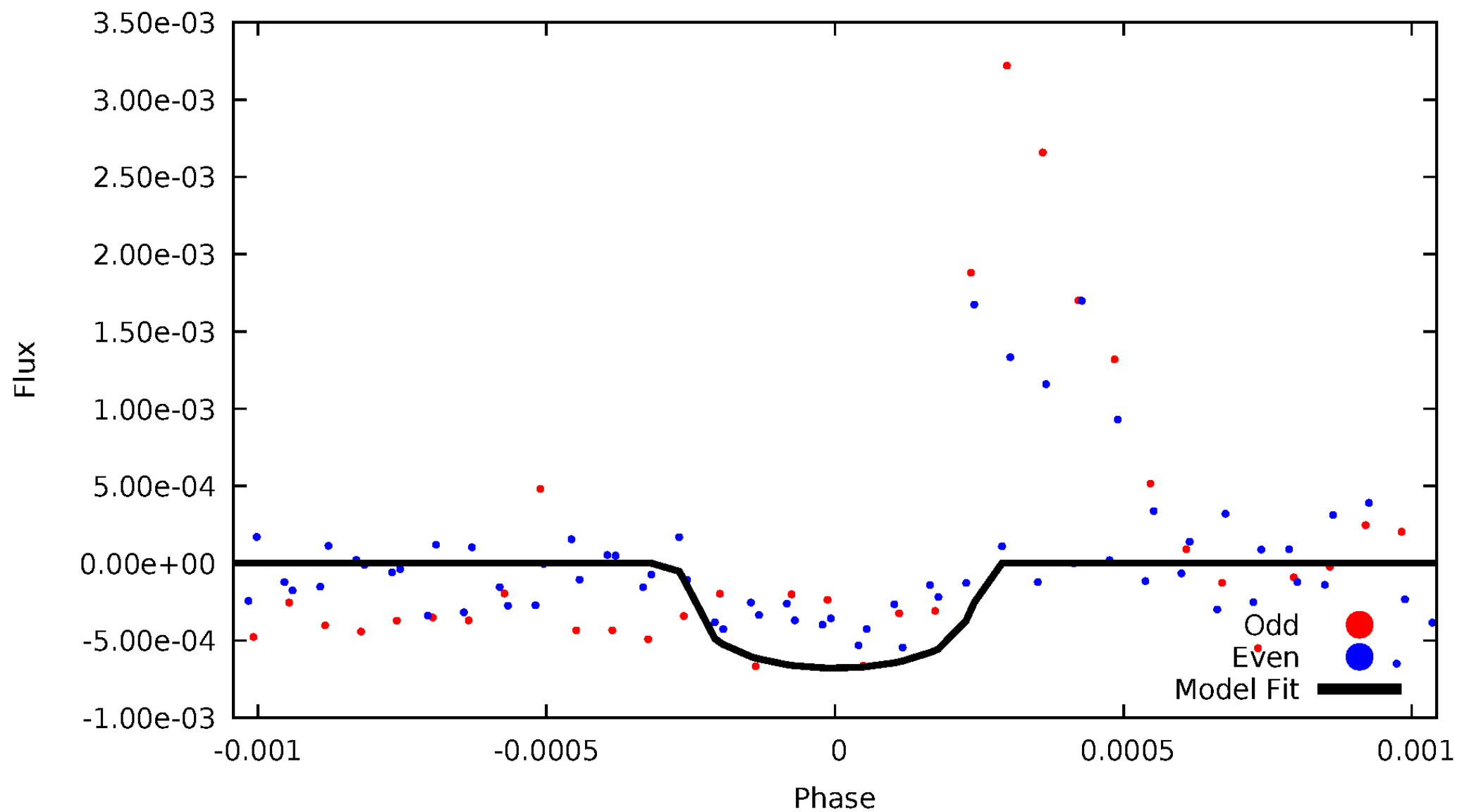


TCE 010603977-05



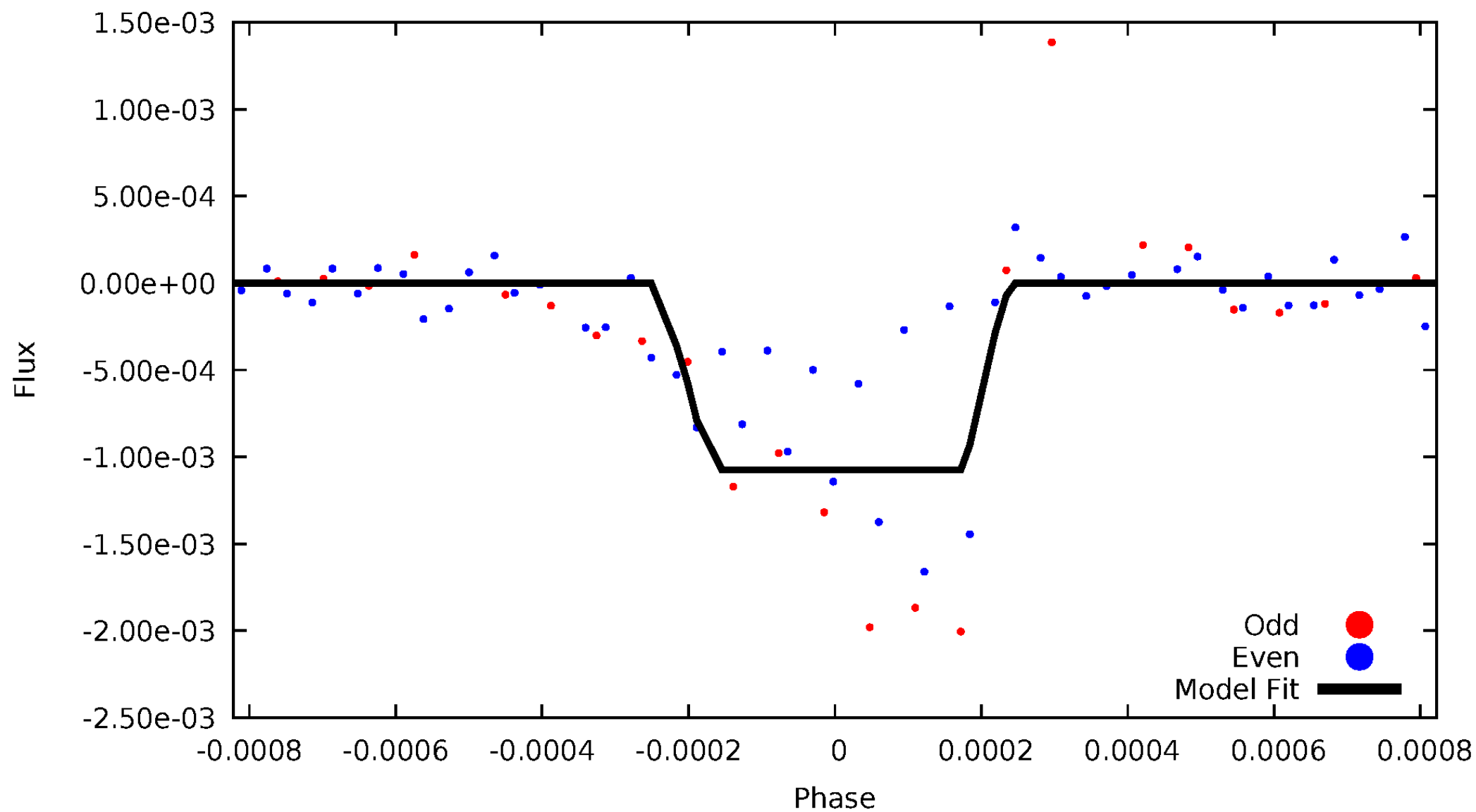
DV Odd/Even

TCE 010603977-05



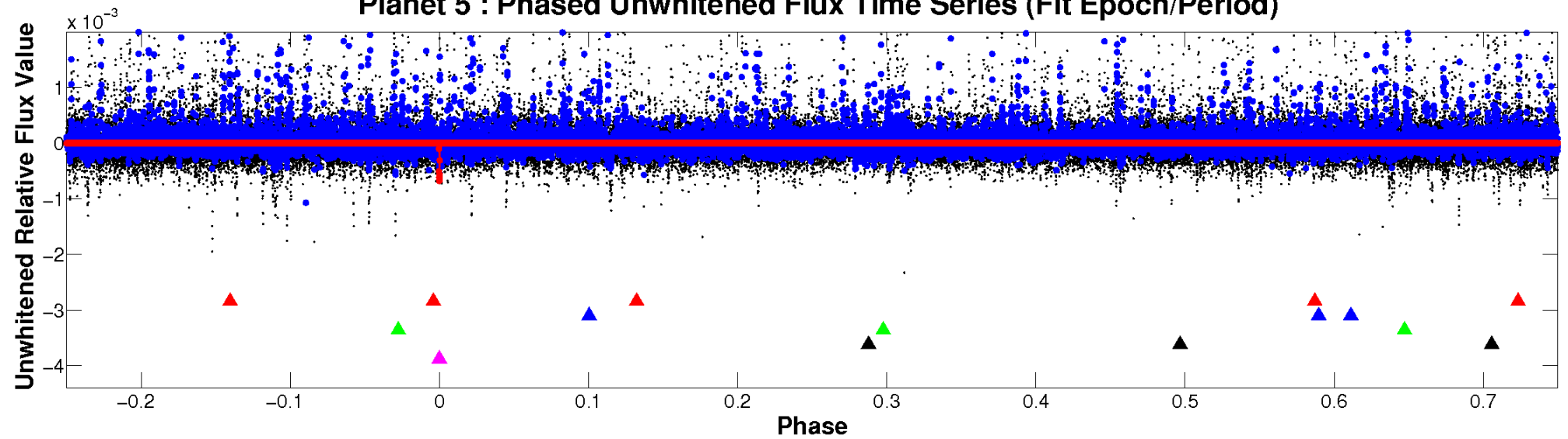
ALT Odd/Even

TCE 010603977-05

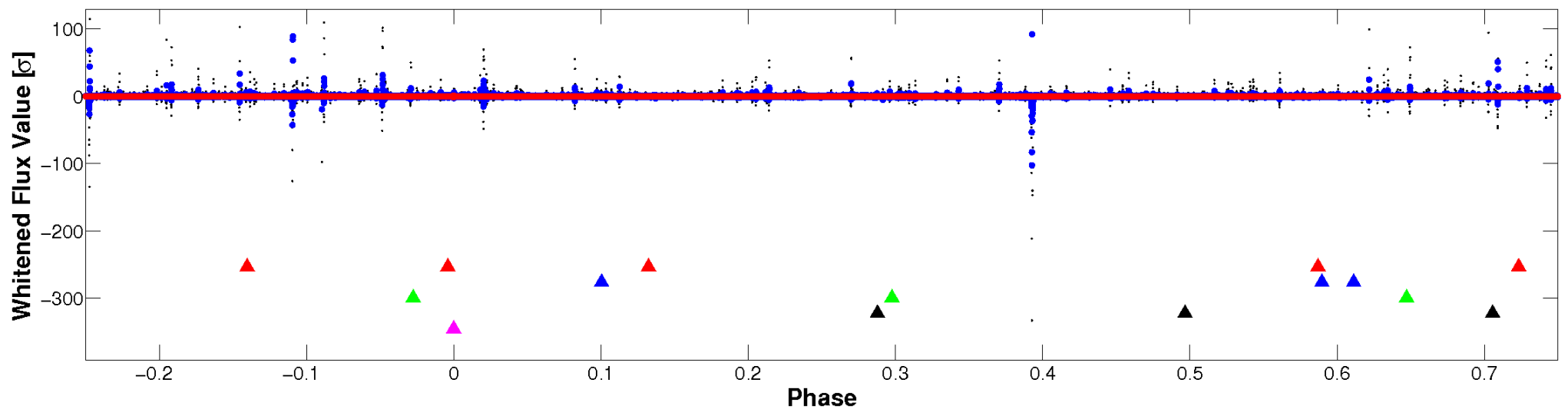


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

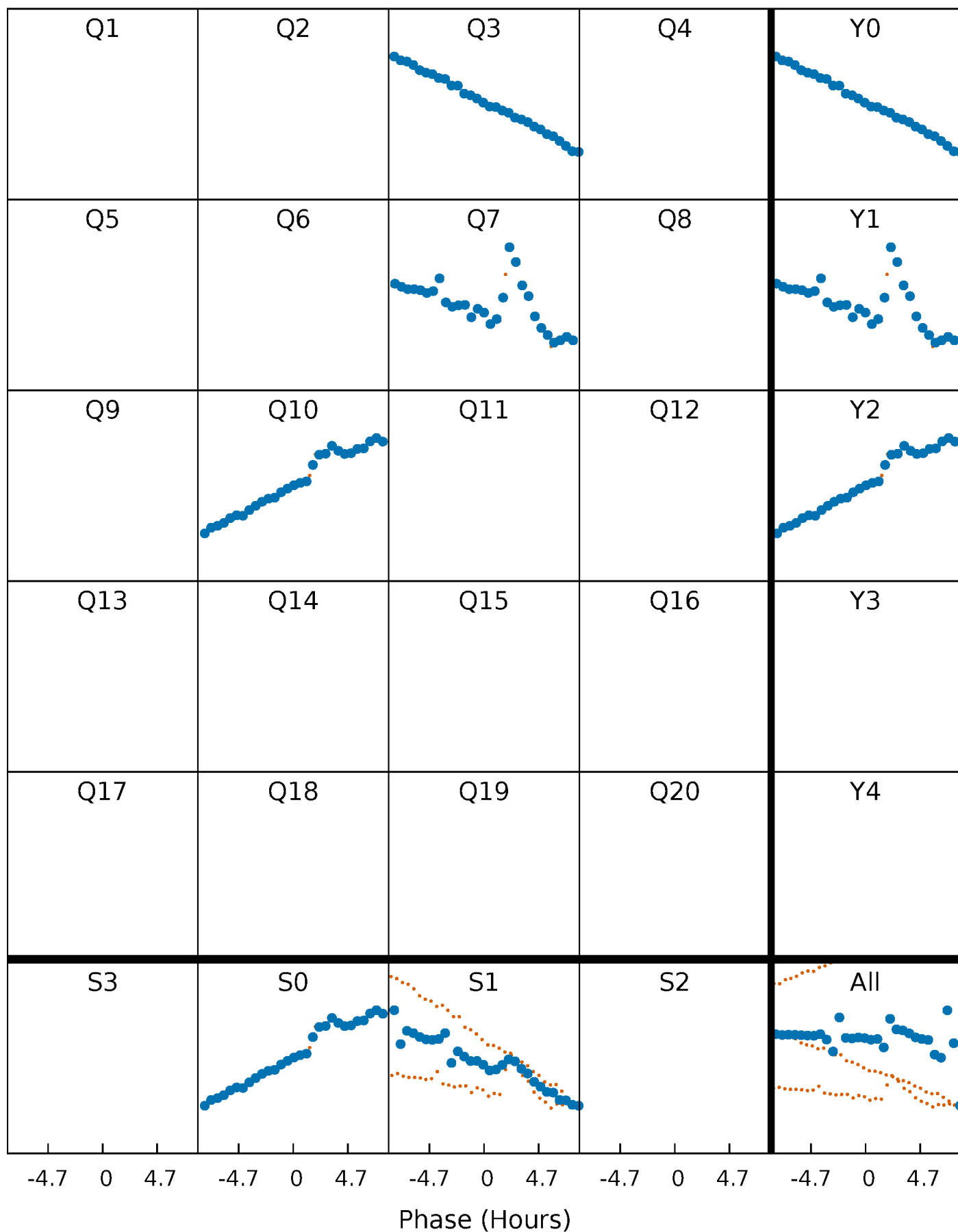


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



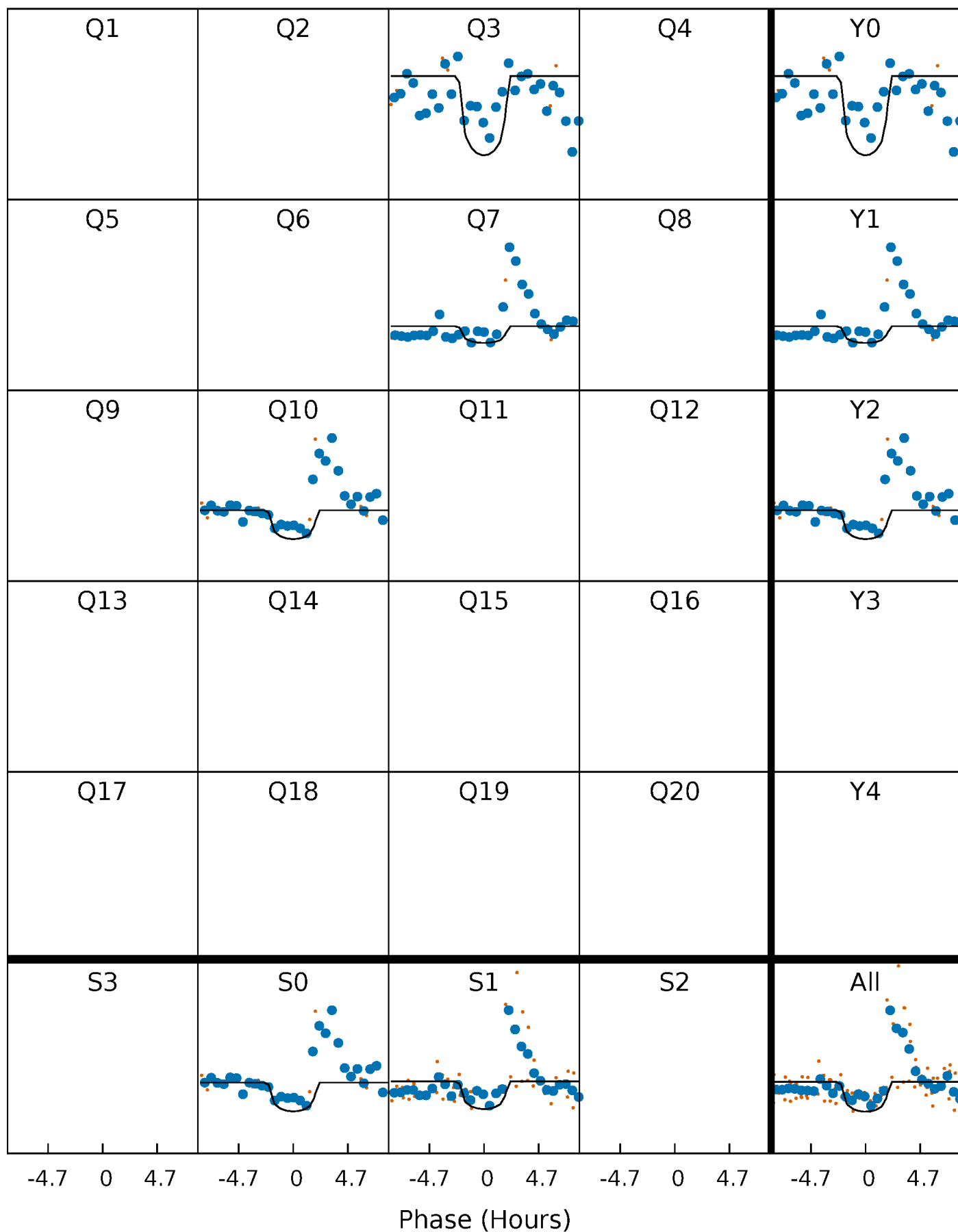
PDC Quarter-Phased Transit Curves

TCE 010603977-05 $P=328.509606$ Days $T_0=306.369397$ (BKJD)



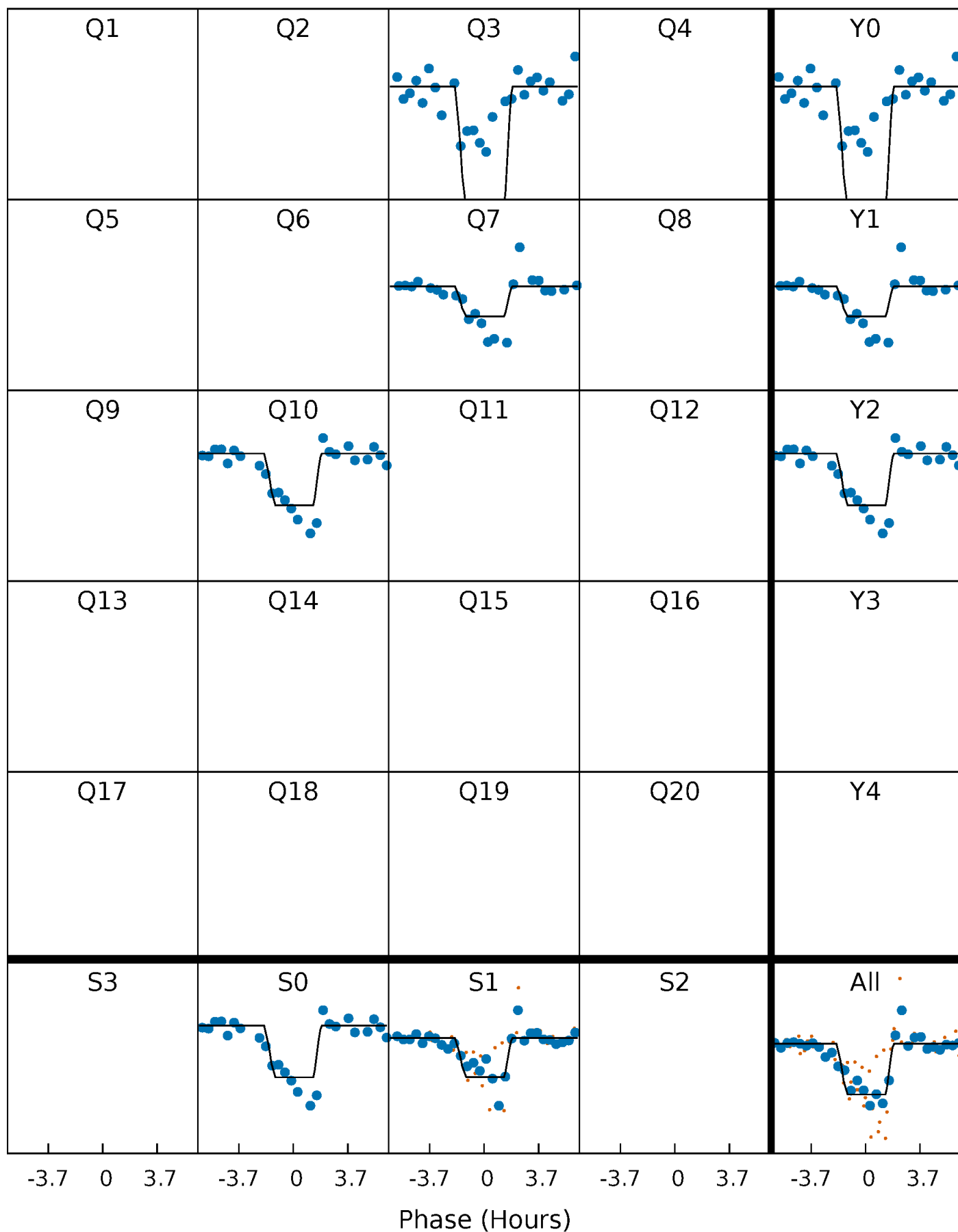
DV Quarter-Phased Transit Curves

TCE 010603977-05 $P=328.509606$ Days $T_0=306.369397$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

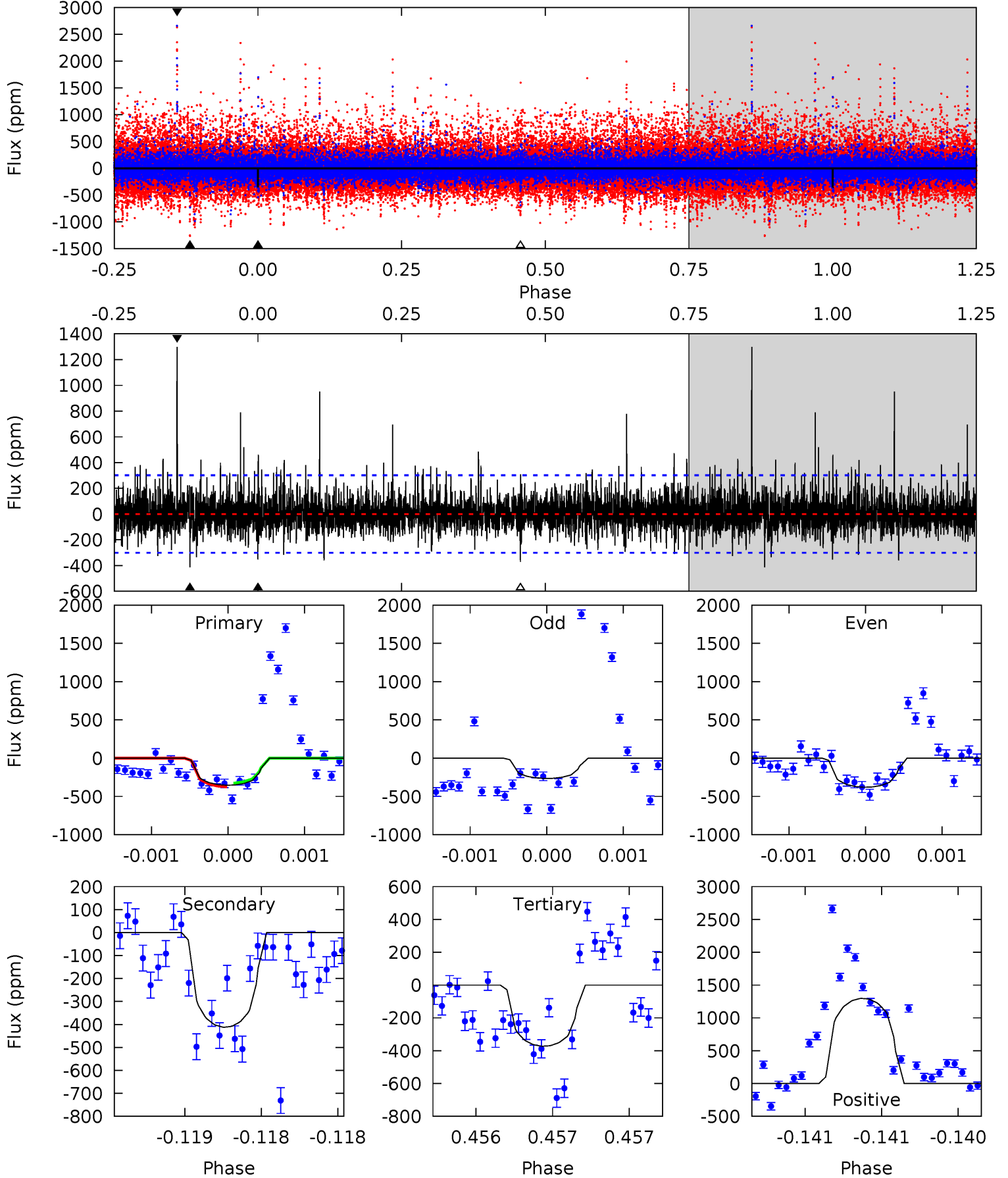
TCE 010603977-05 $P=328.507405$ Days $T_0=306.372158$ (BKJD)



DV Model-Shift Uniqueness Test

010603977-05, P = 328.509606 Days, E = 306.369397 Days

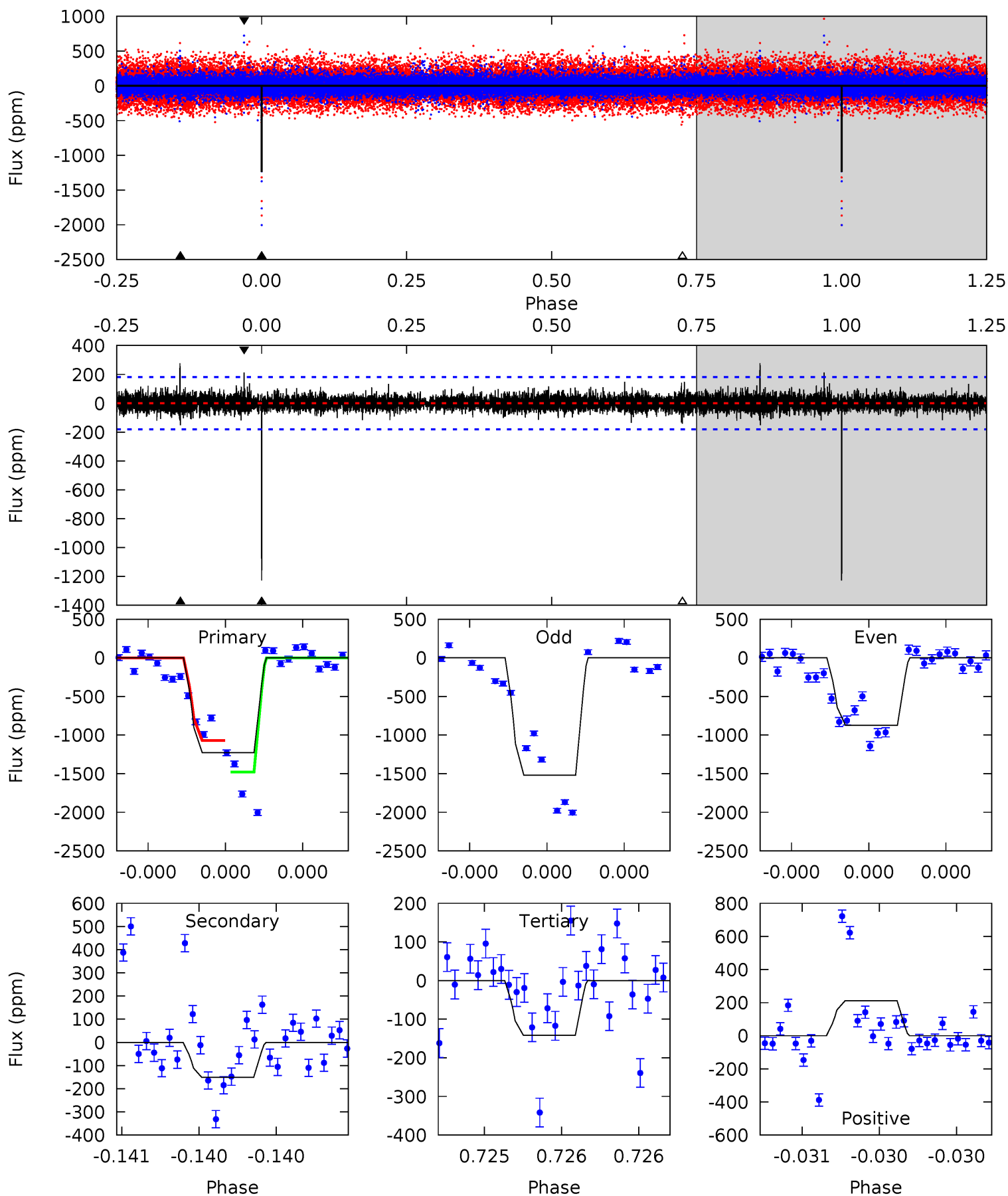
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.53	7.61	6.88	23.9	5.55	3.45	1.90	-0.35	-17.4	0.73	-16.3	0.71	1.00	0.76	0.44



Alt Model-Shift Uniqueness Test

010603977-05, P = 328.507405 Days, E = 306.372158 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.9	4.67	4.39	6.54	5.59	3.50	0.92	33.6	31.4	0.29	-1.87	10.8	0.85	0.18	6.37



Stellar Parameters For KIC 010603977

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4946^{+136}_{-1}	$3.320^{+0.315}_{-0.315}$	$-0.320^{+0.300}_{-0.200}$	$3.376^{+1.860}_{-1.002}$	$0.868^{+0.299}_{-0.161}$	$0.032^{+0.061}_{-0.020}$
	+3%/-0%	+9%/-9%	+94%/-62%	+55%/-30%	+34%/-19%	+192%/-64%
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 010603977-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-412 ± 54	$15.27^{+17.75}_{-10.13}$	586^{+83}_{-59}	3762^{+2028}_{-765}	772^{+6041}_{-600}
Alt.	-151 ± 32	$17.99^{+18.72}_{-12.21}$	590^{+82}_{-63}	3058^{+1294}_{-517}	214^{+1779}_{-166}

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 $A_{obs} \gg 1.0$

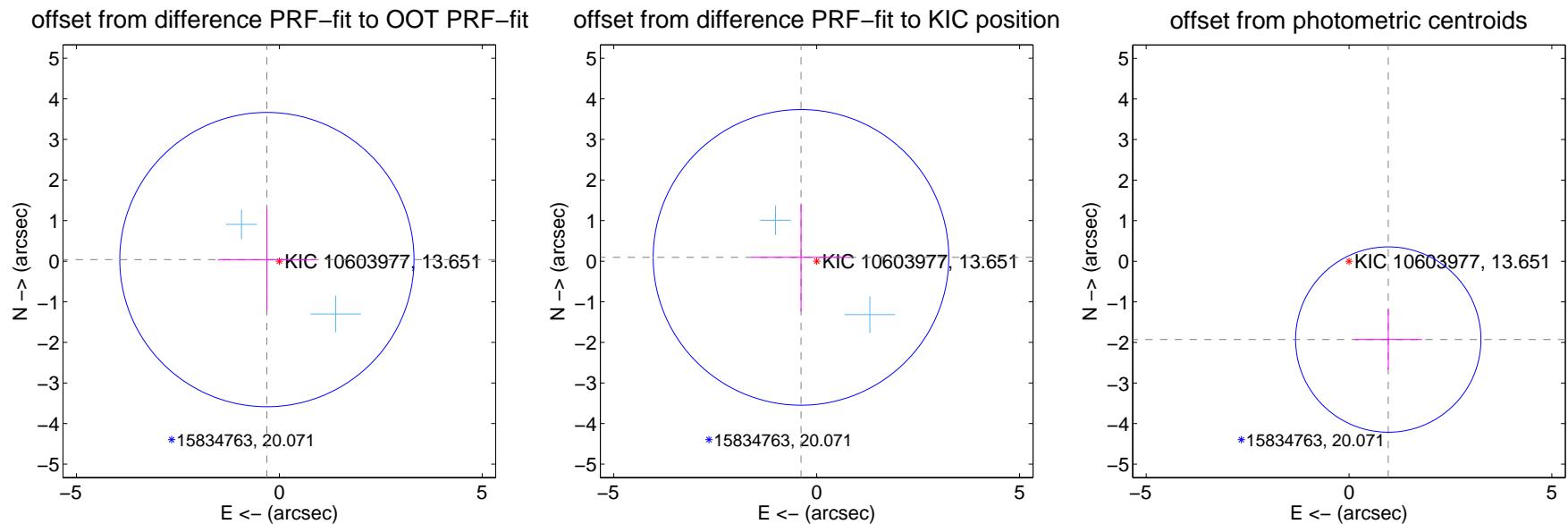
DV Centroid Data

Supplemental centroid analysis for 010603977-05. Kepler magnitude: 13.65. Transit SNR 6.51

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.308 ± 1.208	0.26	0.306 ± 1.207	0.040 ± 1.261
PRF-fit source offset from KIC position	0.397 ± 1.214	0.33	0.386 ± 1.207	0.094 ± 1.328
photometric centroid source offset	2.16 ± 0.76	2.84	-0.97 ± 0.83	-1.93 ± 0.74



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



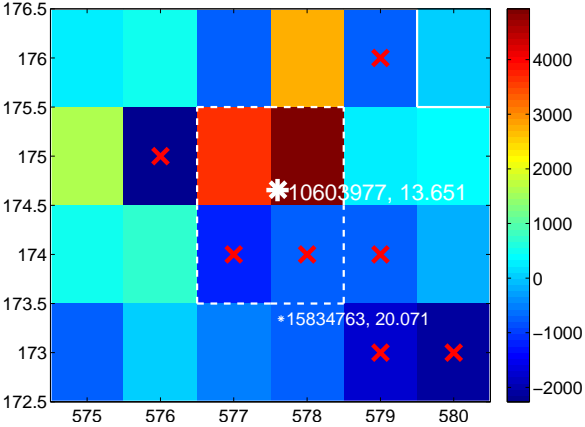
Q2 no difference image



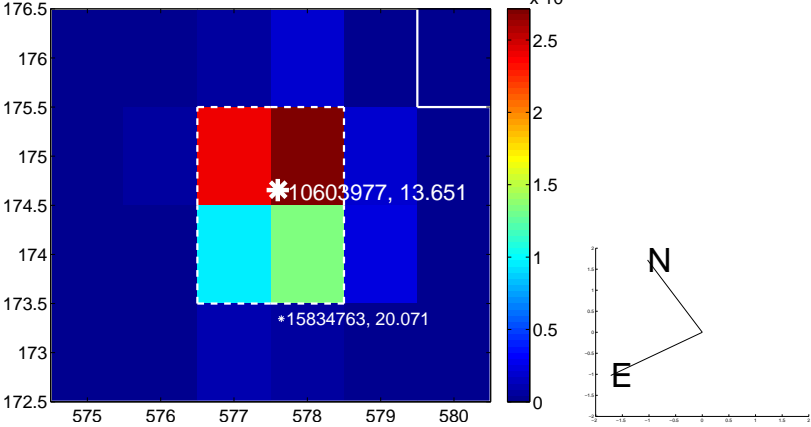
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



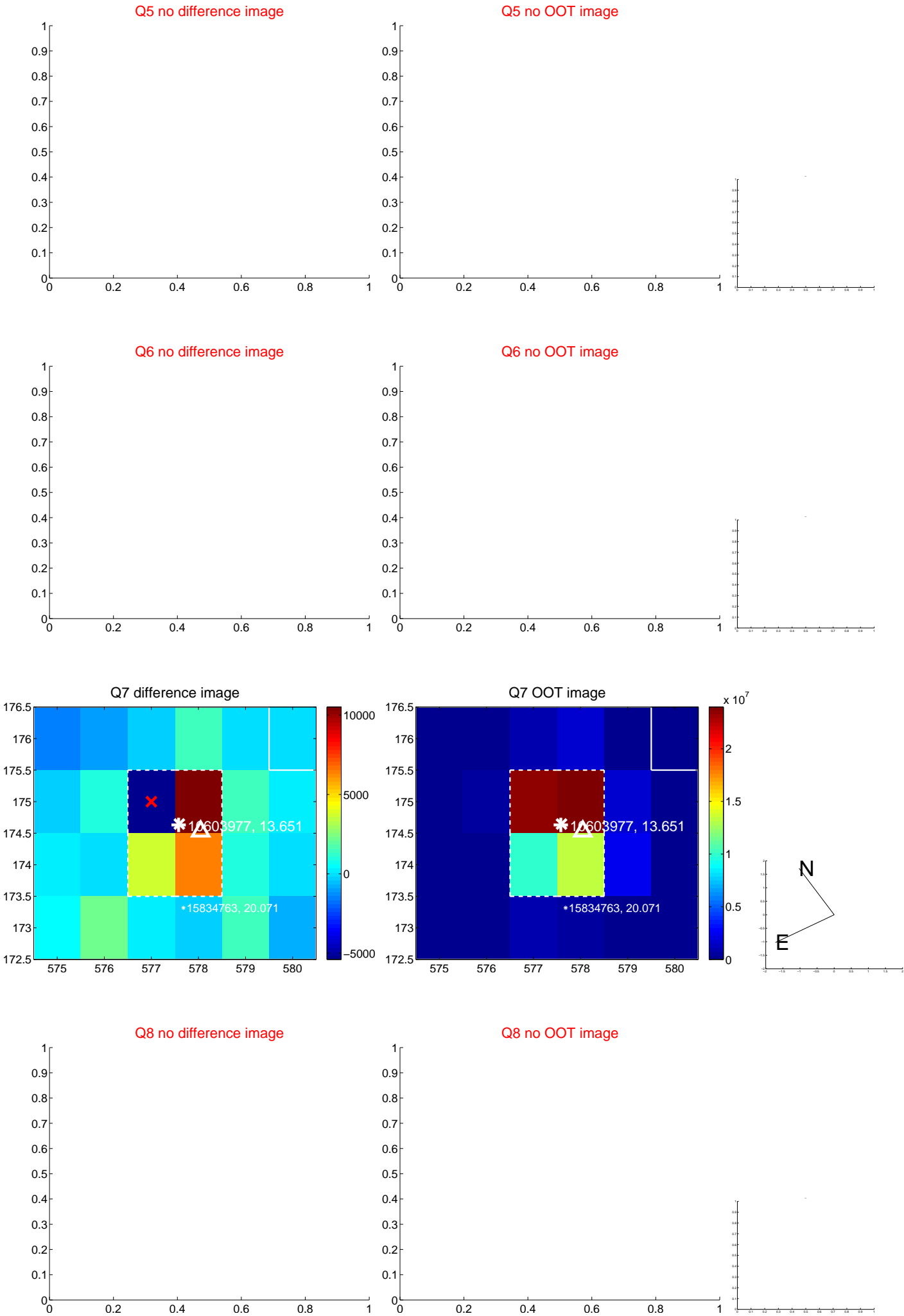
Q4 no difference image



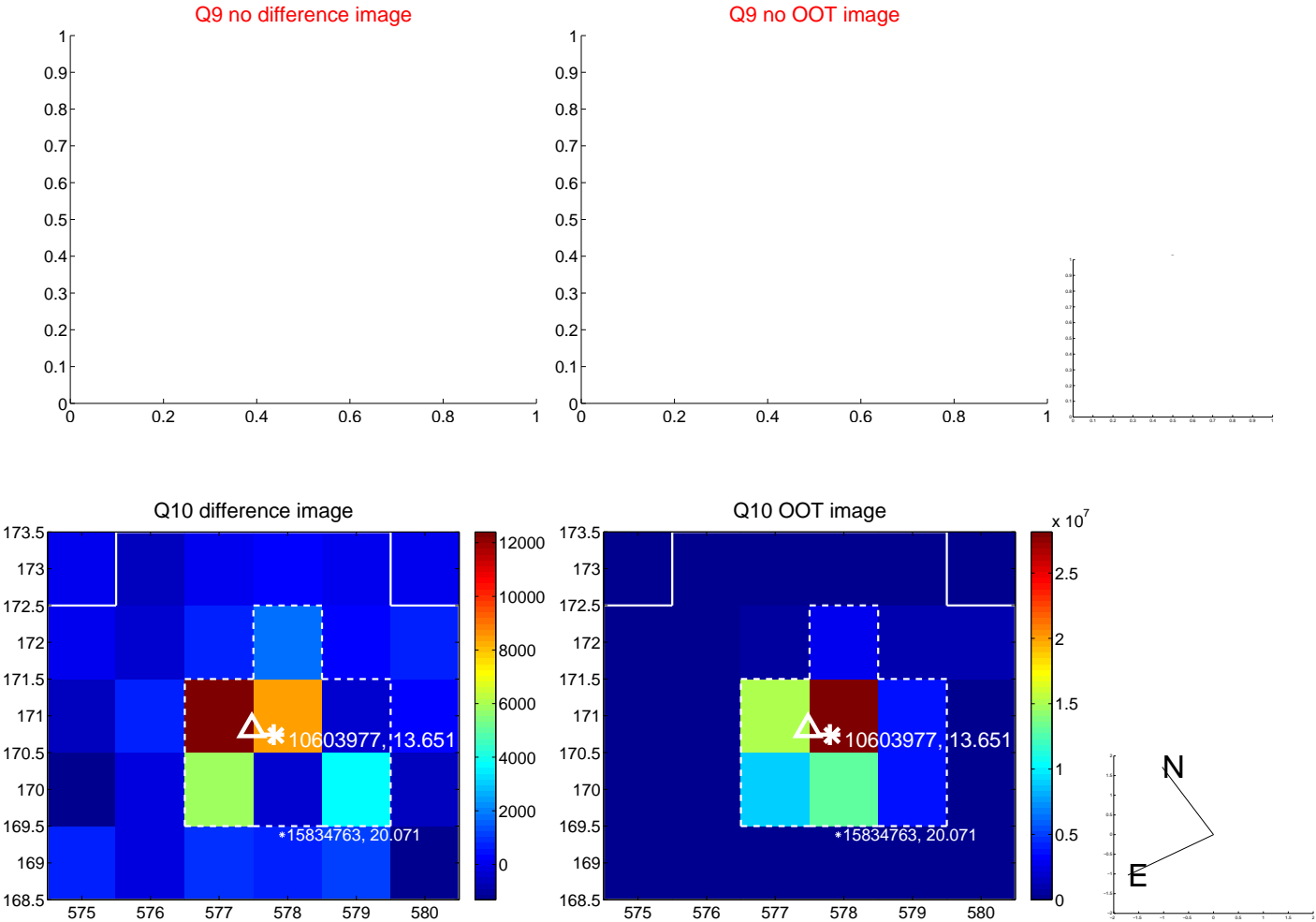
Q4 no OOT image



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



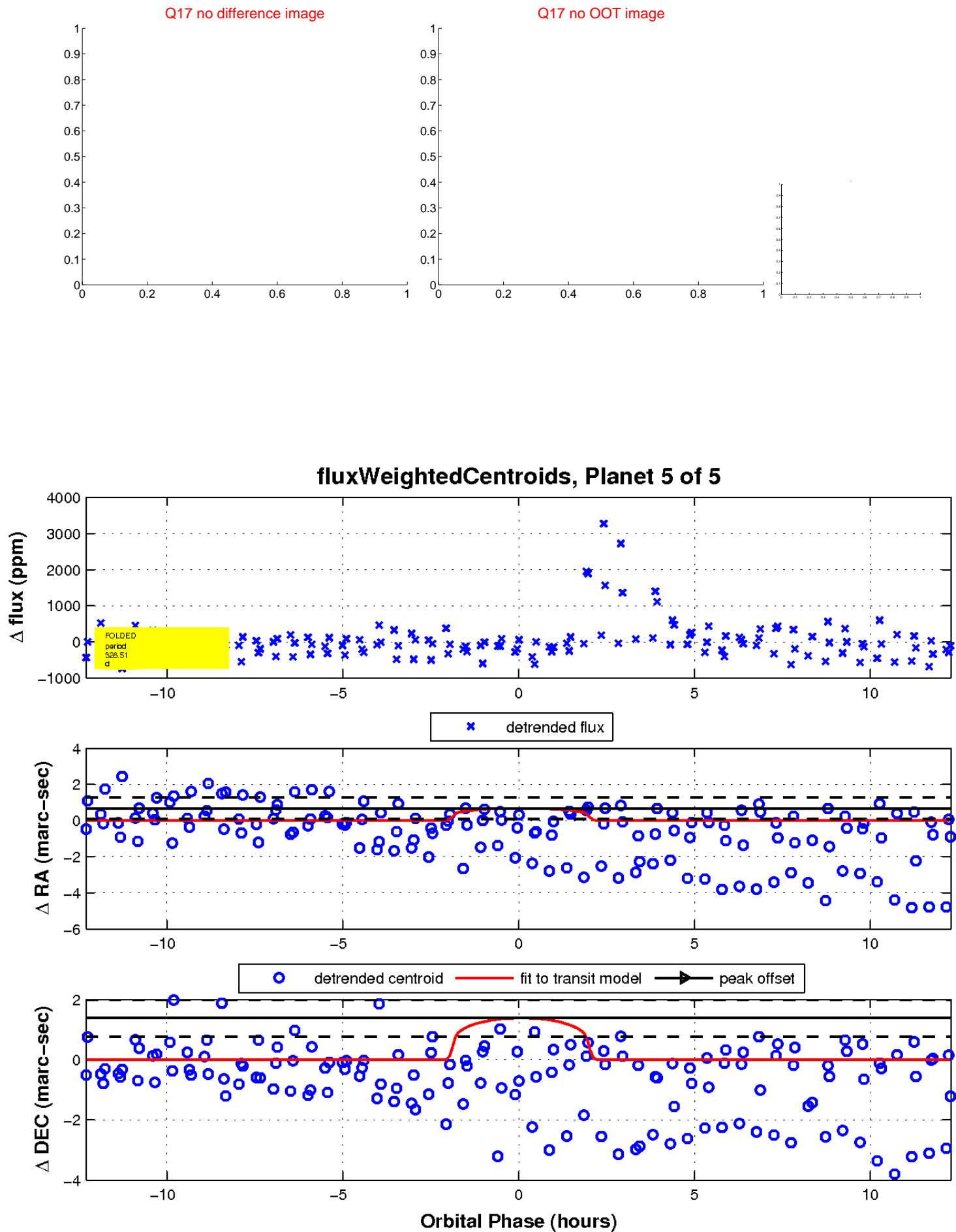
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

