

KIC 010402102

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})
010402102-01	OBS	No	365.645556	159.671150	1124.9	23.238	8.3	9.1	0.84	5590	2.78	0.64
010402102-02	OBS	No	412.787227	186.388560	1019.4	18.198	8.8	8.3	0.84	5590	3.17	0.55

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010402102-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
010402102-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

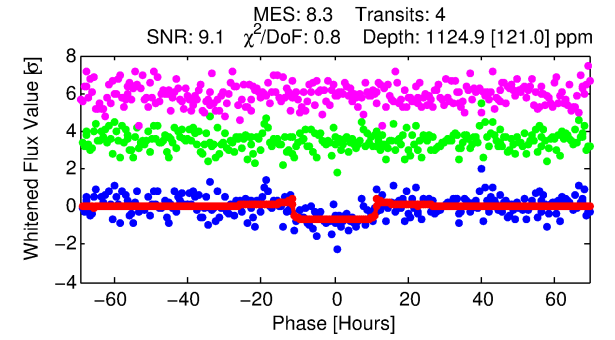
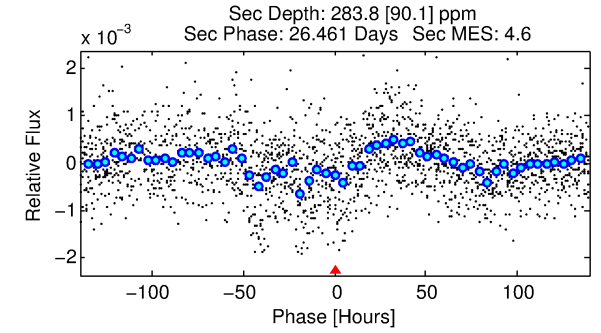
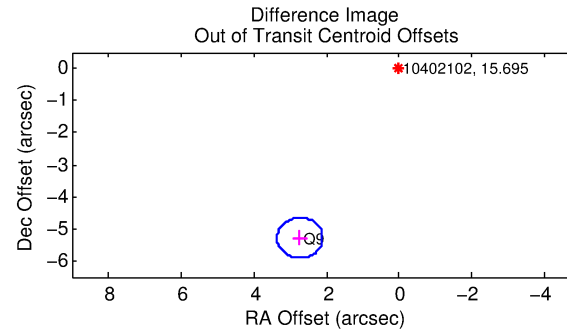
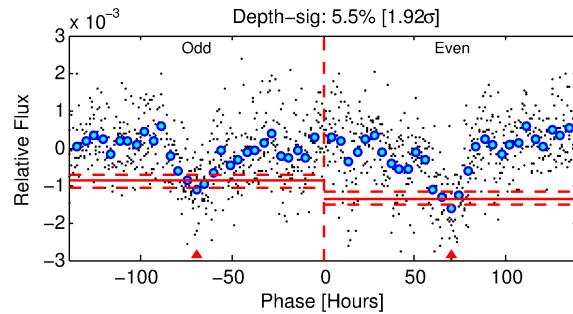
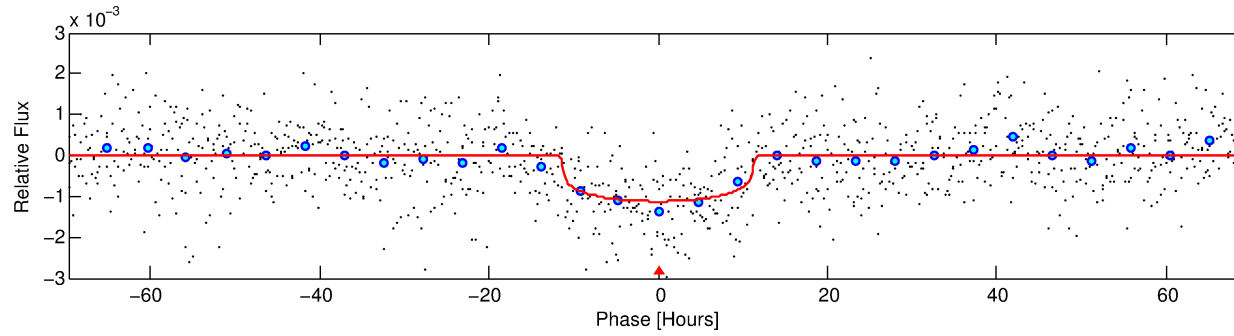
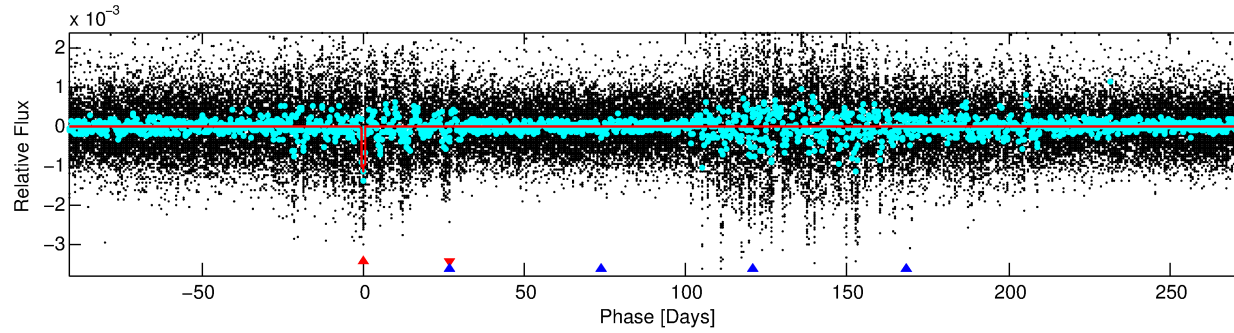
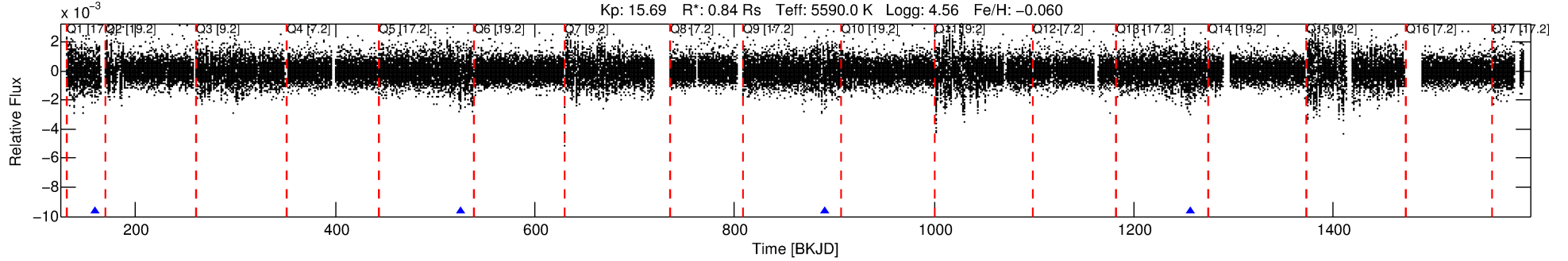
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010402102-01

No Significant Match Found

DV One-Page Summary

KIC: 10402102 Candidate: 1 of 2 Period: 365.646 d



DV Fit Results:

Period = 365.64556 [0.00959] d
Epoch = 159.6712 [0.0181] BKJD
Rp/R* = 0.0303 [0.0118]
a/R* = 122.91 [195.78]
b = 0.13 [12.43]
Seff = 0.64 [0.21]
Teq = 228 [19] K
Rp = 2.78 [1.27] Re
a = 0.9778 [0.2007] AU
Ag = 19369.64 [17277.39] [1.12 σ]
Teffp = 4167 [882] K [4.46 σ]

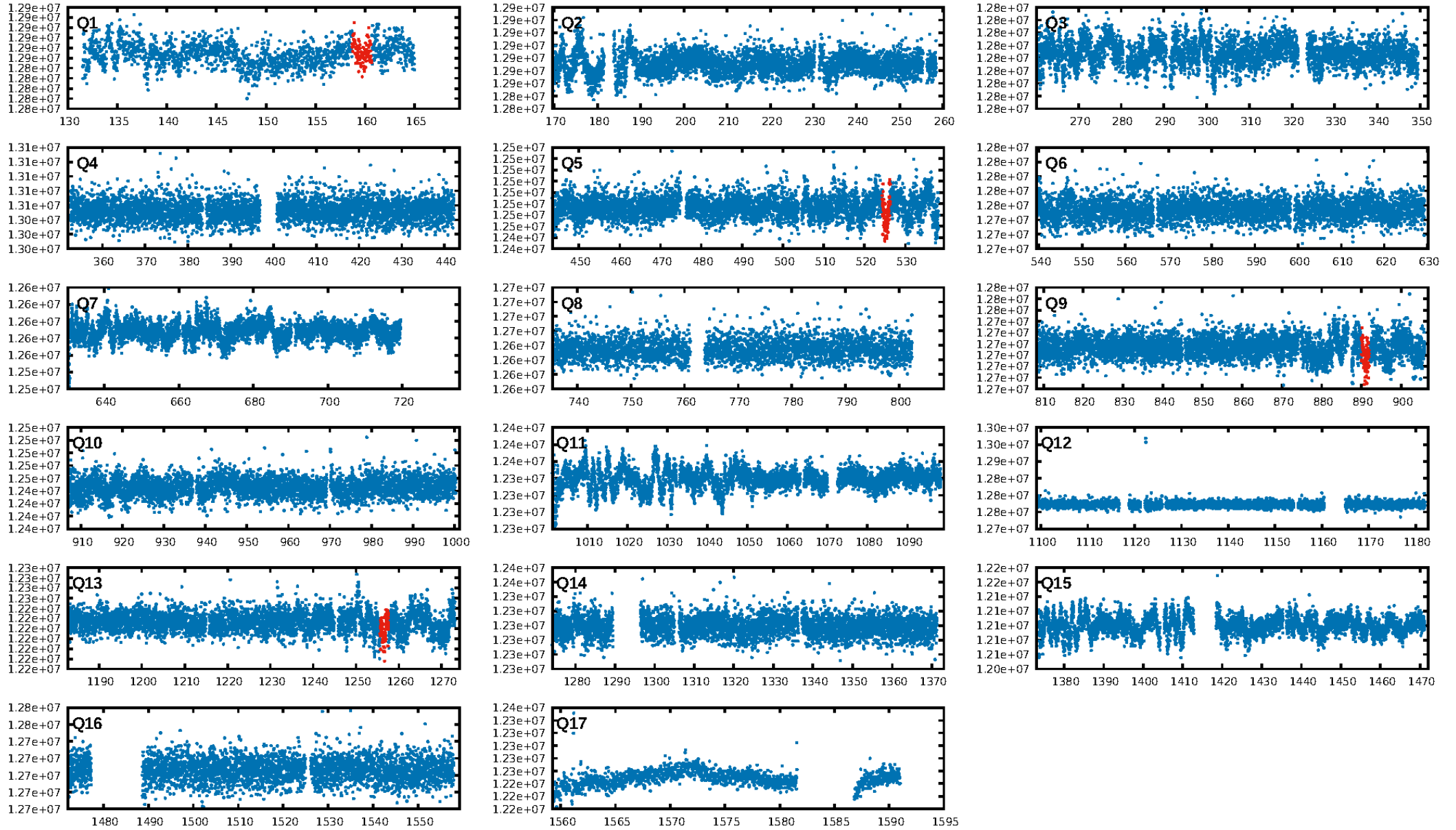
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [38.33 σ]
ModelChiSquare2-sig: 15.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.51e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -7.03
Centroid-sig: 0.2%
Centroid-so: 3.513 arcsec [2.49 σ]
OotOffset-rm: 5.946 arcsec [28.38 σ]
KicOffset-rm: 5.877 arcsec [28.14 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [4/4]

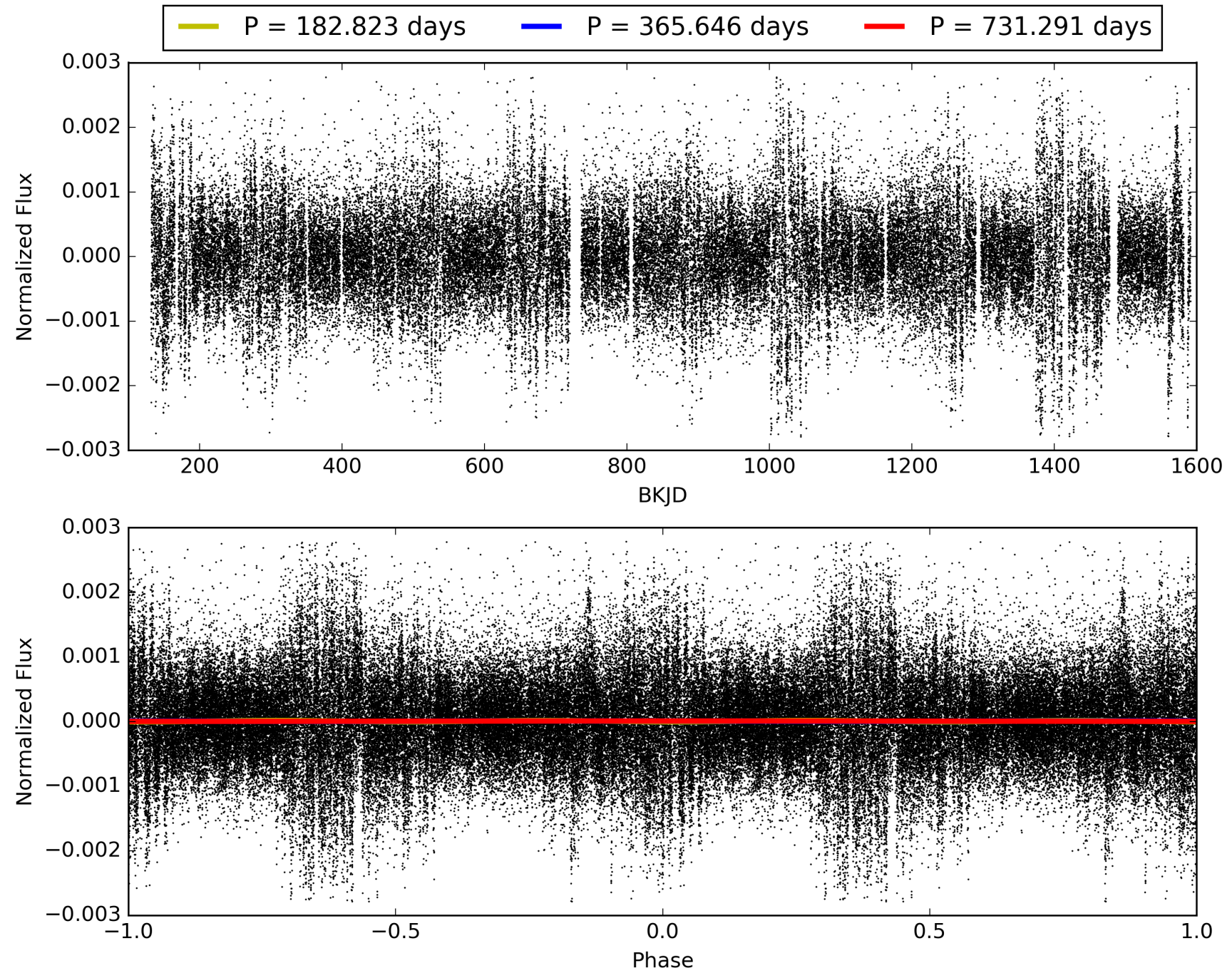
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:45:25 Z

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

TCE 010402102-01, PDC Light Curves

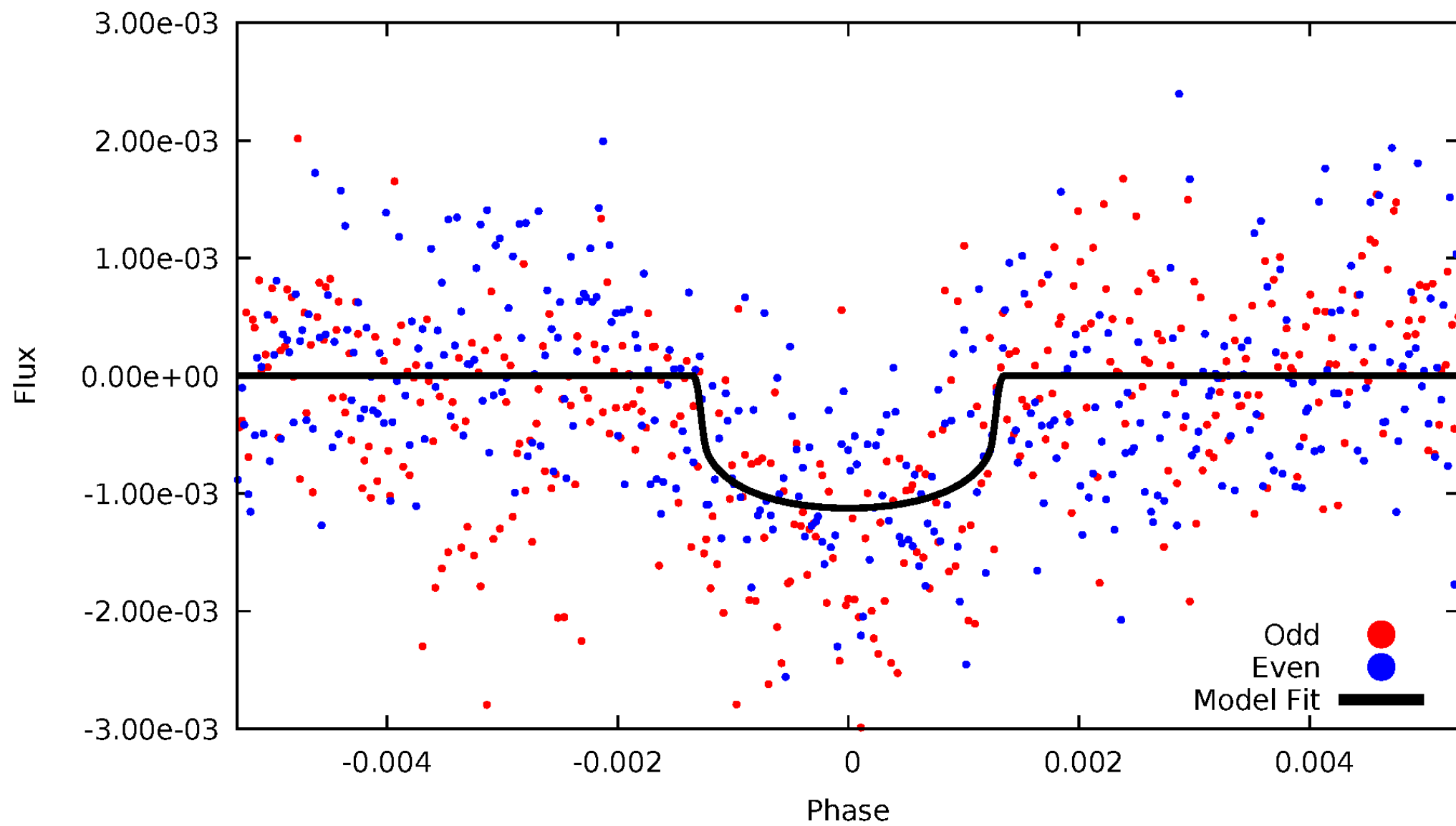


TCE 010402102-01



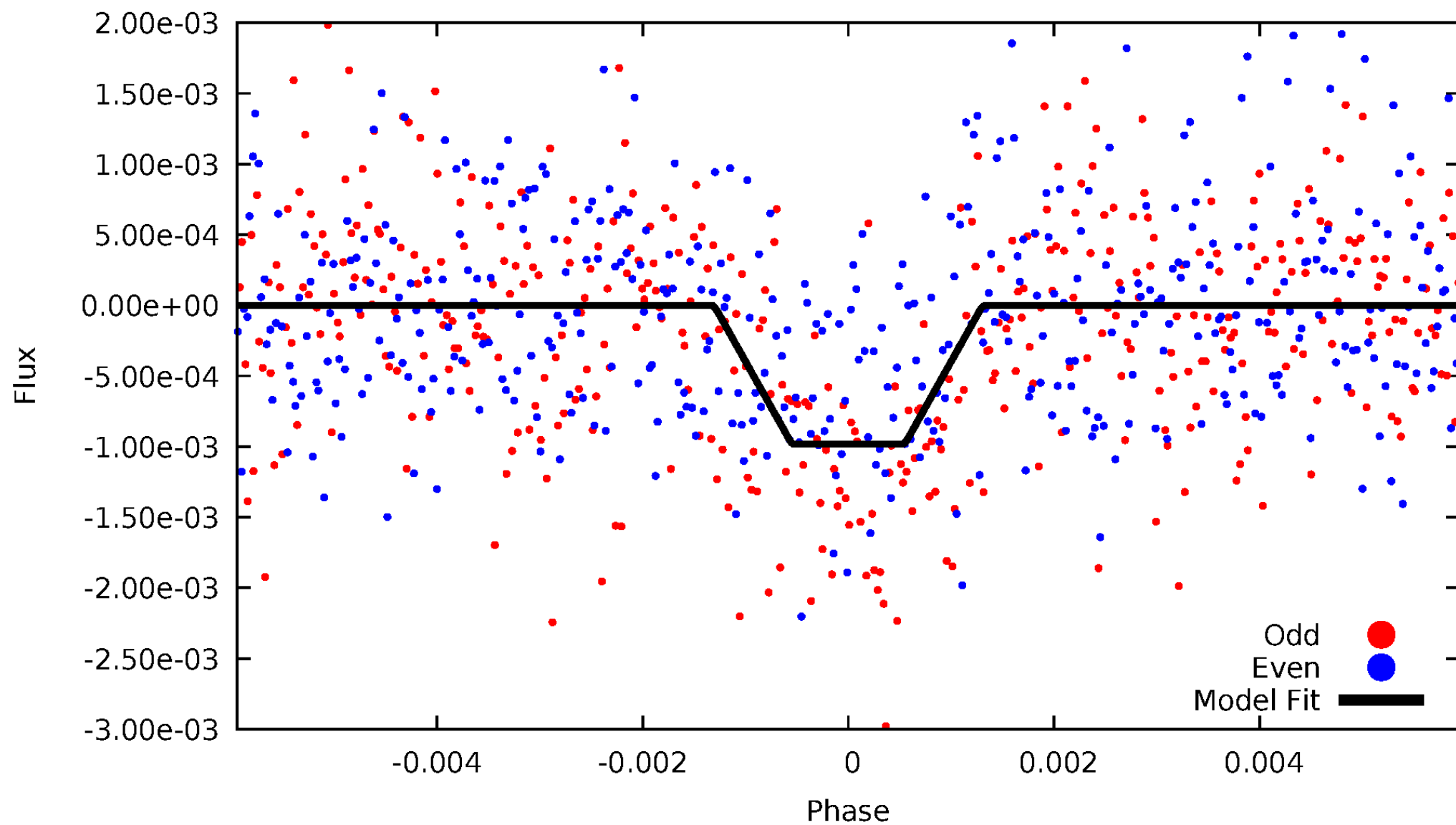
DV Odd/Even

TCE 010402102-01



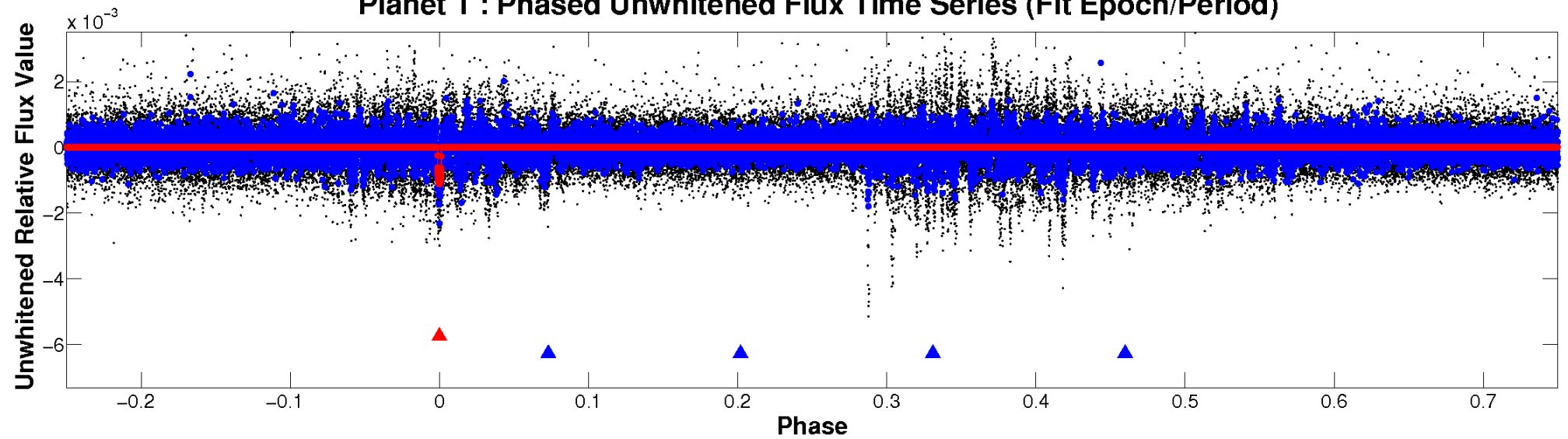
ALT Odd/Even

TCE 010402102-01

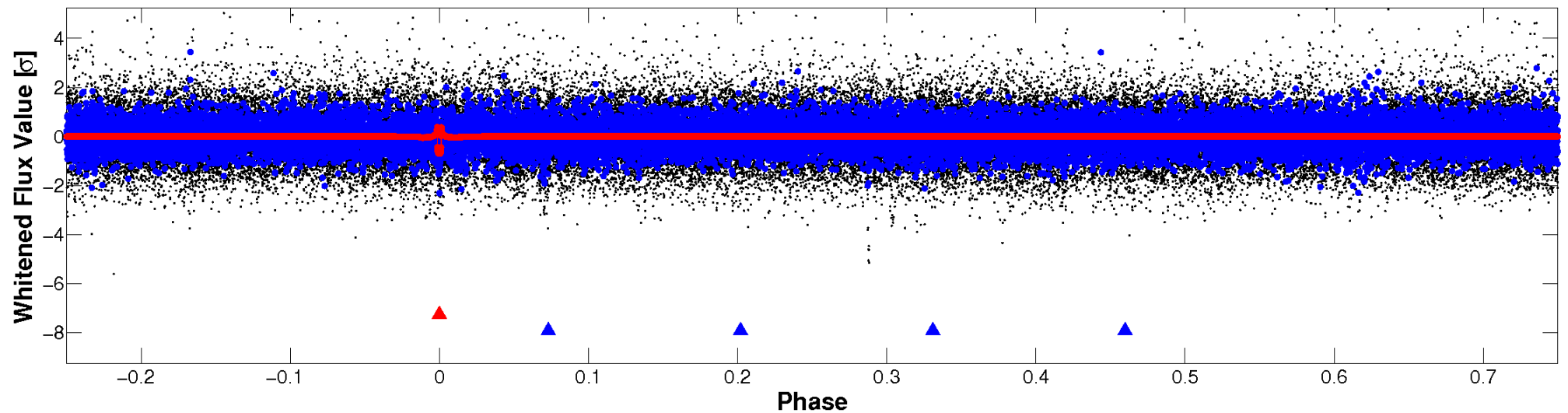


Non-Whitened Vs. Whitened Light Curve

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

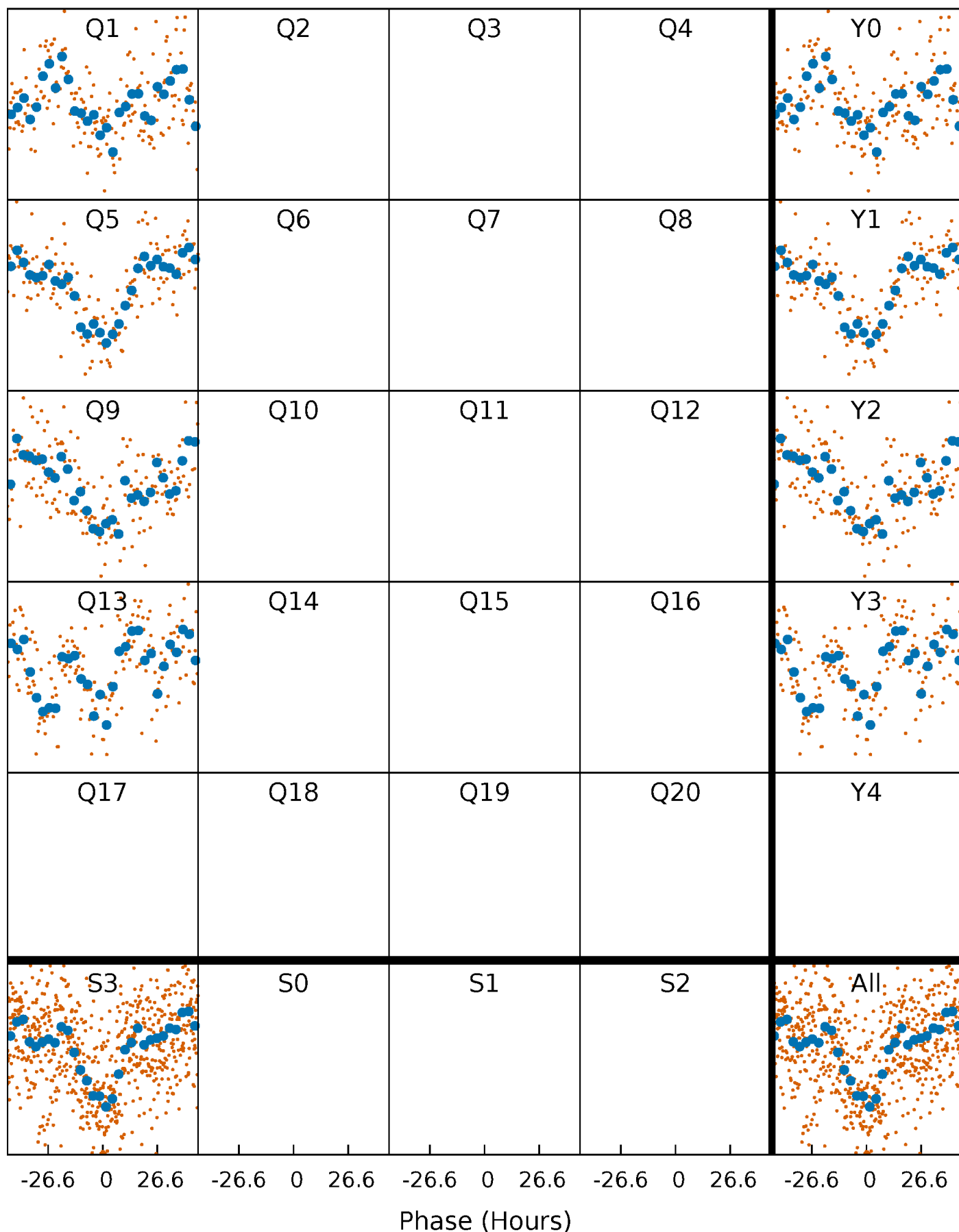


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



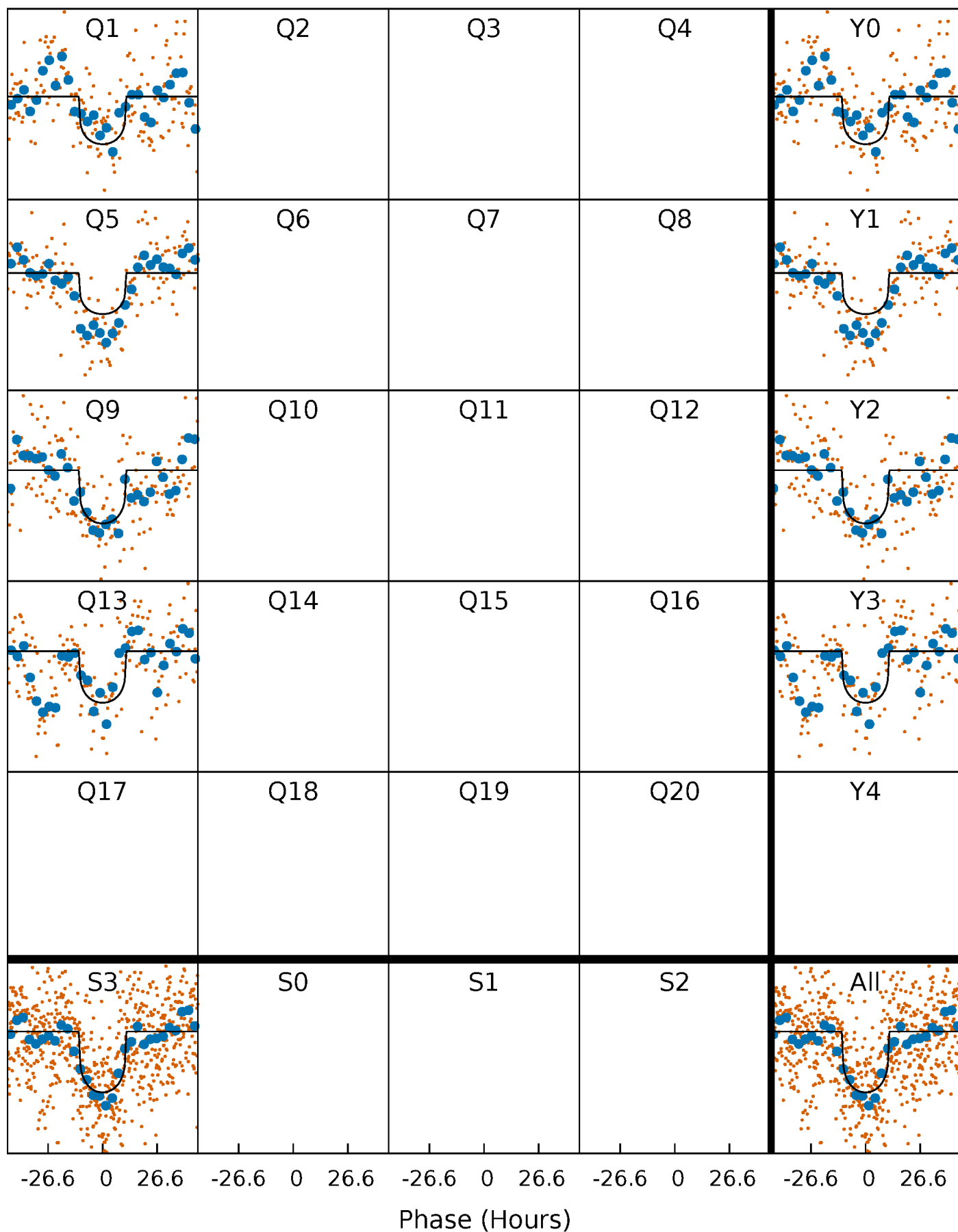
PDC Quarter-Phased Transit Curves

TCE 010402102-01 P=365.645556 Days $T_0=159.671150$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 010402102-01 $P=365.645556$ Days $T_0=159.671150$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

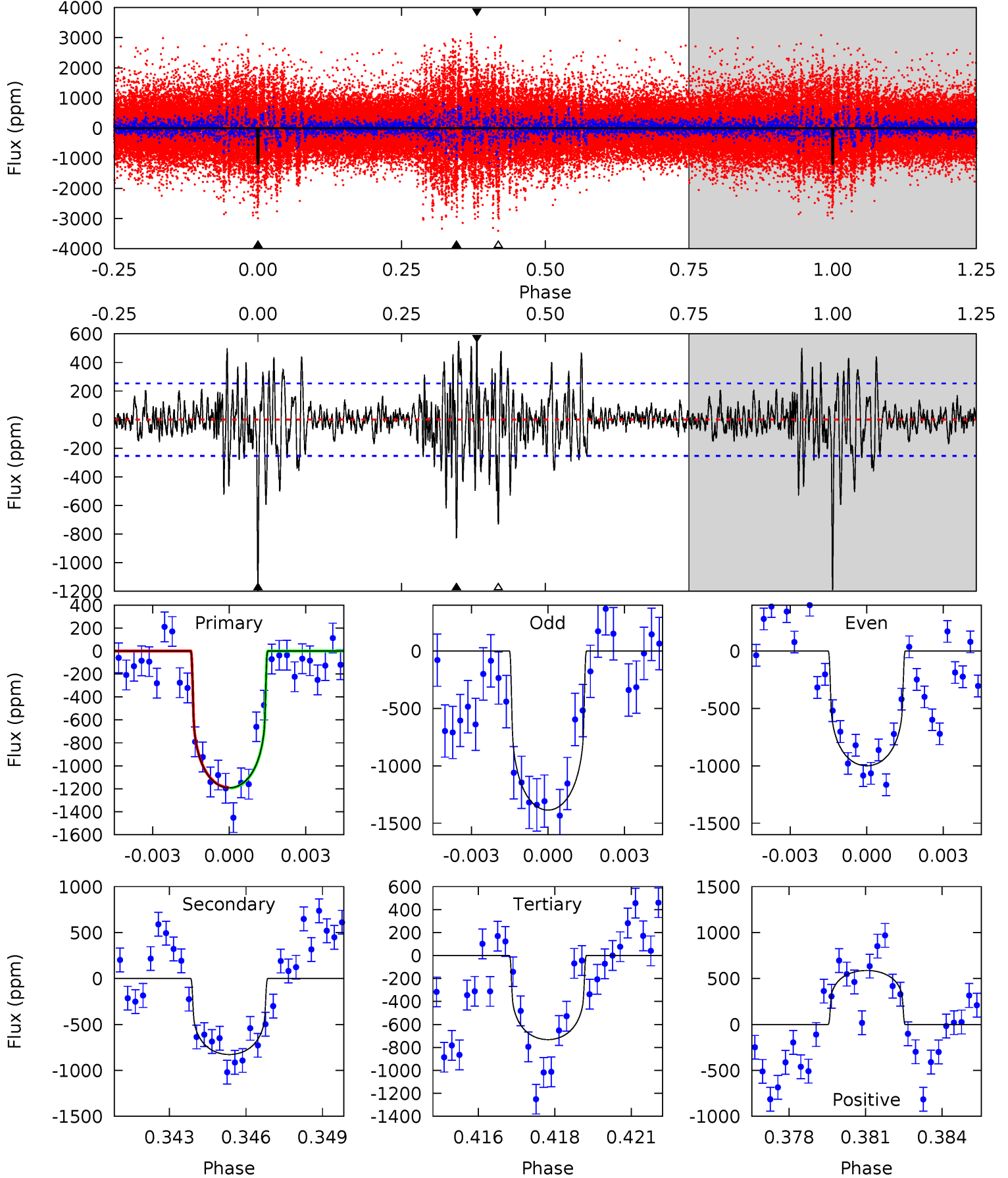
TCE 010402102-01 P=365.583633 Days $T_0=159.763725$ (BKJD)



DV Model-Shift Uniqueness Test

010402102-01, P = 365.645556 Days, E = 159.671150 Days

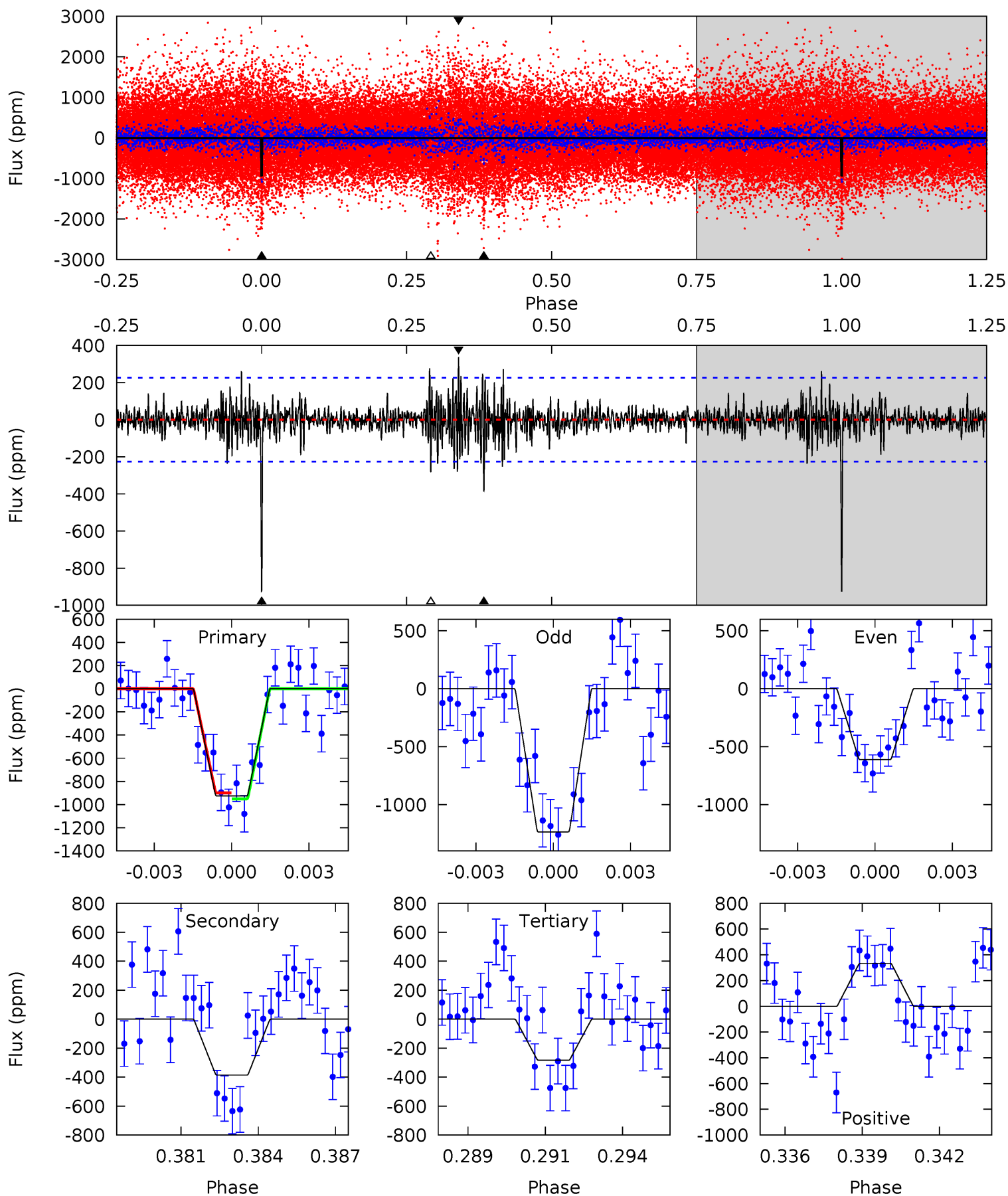
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.8	17.2	15.3	12.2	5.27	3.00	3.15	9.57	12.6	1.99	5.01	4.01	1.10	0.33	0.06



Alt Model-Shift Uniqueness Test

010402102-01, P = 365.583633 Days, E = 159.763725 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.6	9.01	6.61	7.78	5.28	3.01	1.43	15.0	13.8	2.40	1.23	7.26	0.93	0.26	0.60



Stellar Parameters For KIC 010402102

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5590^{+149}_{-166}	$4.560^{+0.032}_{-0.168}$	$-0.060^{+0.300}_{-0.300}$	$0.839^{+0.201}_{-0.080}$	$0.934^{+0.081}_{-0.112}$	$2.227^{+0.385}_{-1.057}$
	+3%/-3%	+1%/-4%	+500%/-500%	+24%/-10%	+9%/-12%	+17%/-47%
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 010402102-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-828 ± 48	$2.93^{+1.26}_{-1.12}$	327^{+19}_{-14}	5462^{+1408}_{-725}	50222^{+80486}_{-25748}
Alt.	-386 ± 43	$2.98^{+1.19}_{-1.08}$	326^{+17}_{-14}	4563^{+1021}_{-525}	22489^{+30456}_{-11127}

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

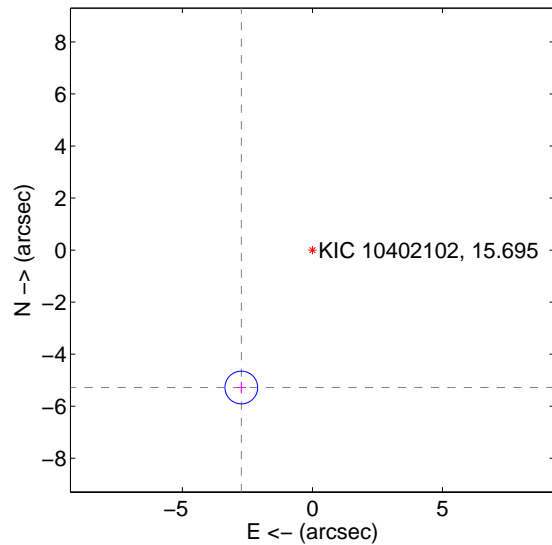
Supplemental centroid analysis for 010402102-01. Kepler magnitude: 15.70. Transit SNR 9.10

There are 1 quarters with good PRF difference image offsets

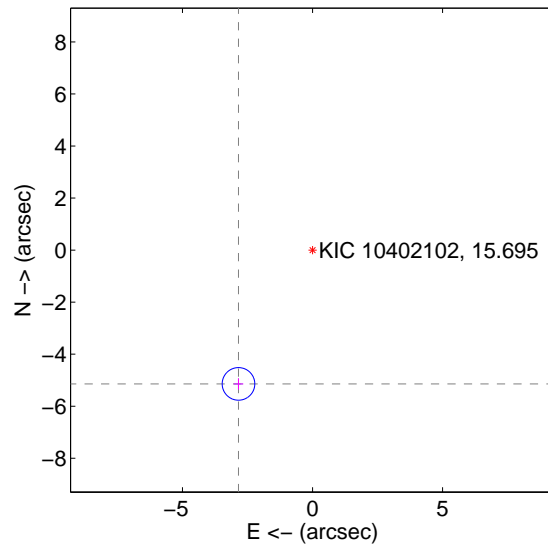
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.946 ± 0.210	28.38	2.733 ± 0.185	-5.281 ± 0.215
PRF-fit source offset from KIC position	5.877 ± 0.209	28.14	2.845 ± 0.185	-5.142 ± 0.215
photometric centroid source offset	3.51 ± 1.41	2.49	2.99 ± 1.39	-1.84 ± 1.47

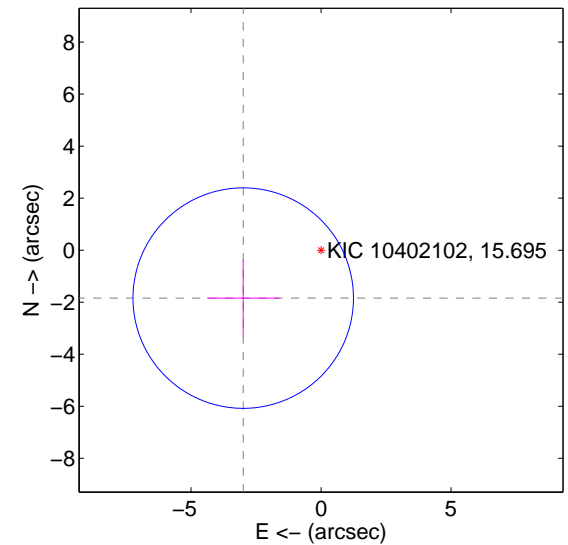
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

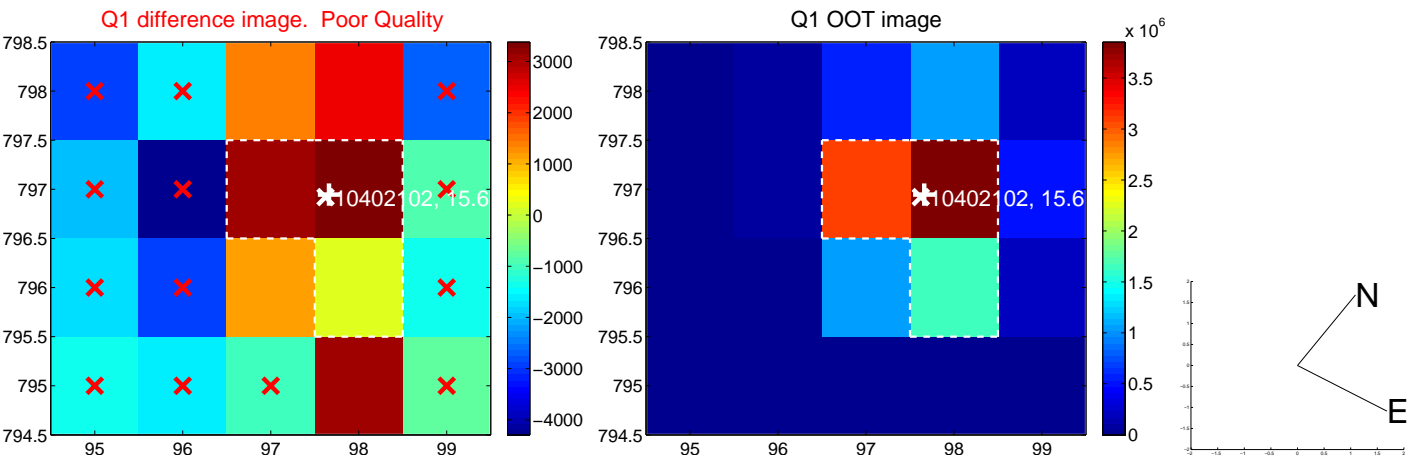


offset from photometric centroids

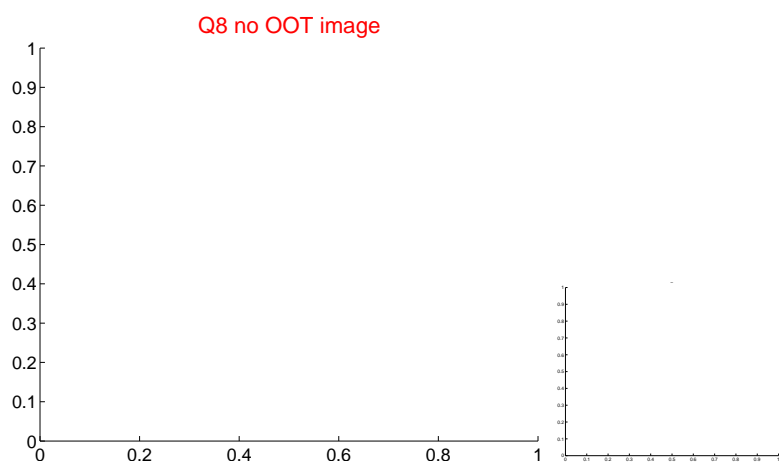
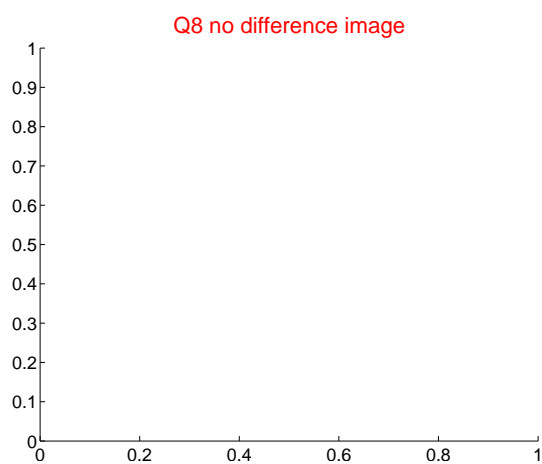
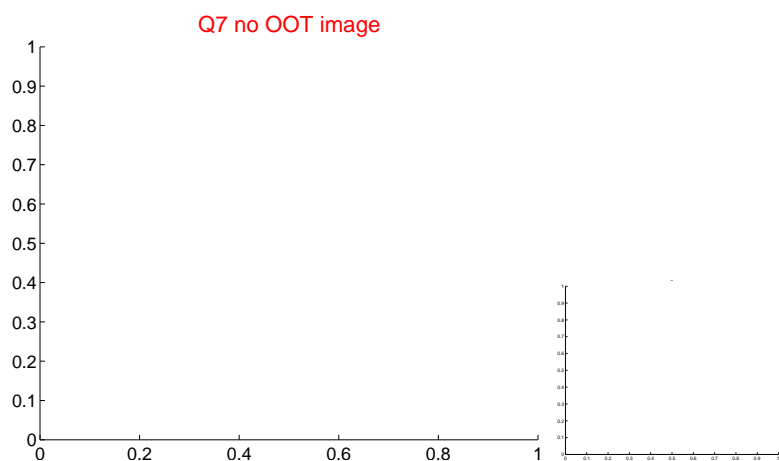
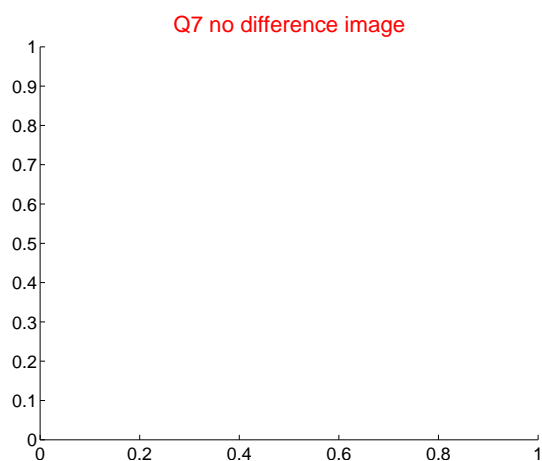
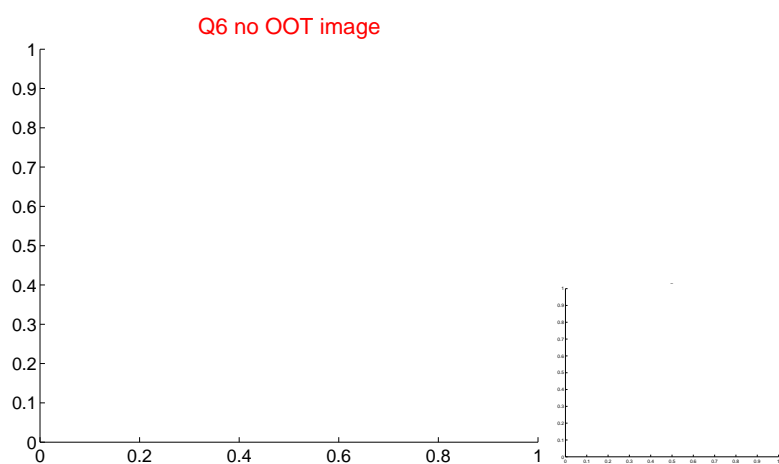
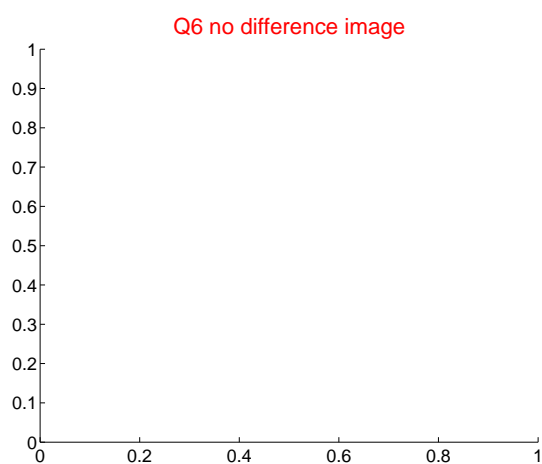
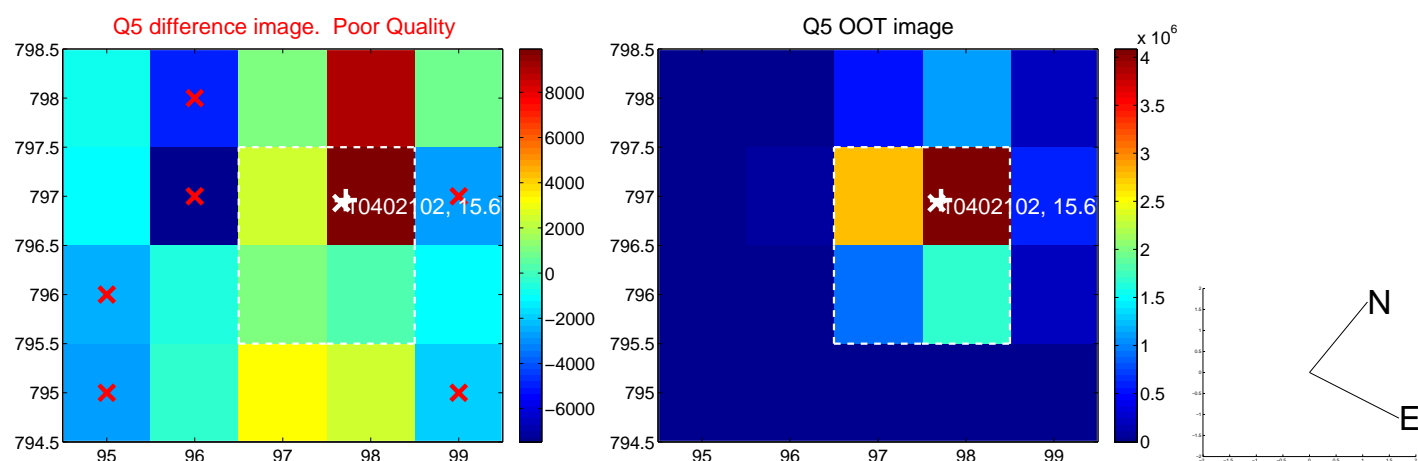


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

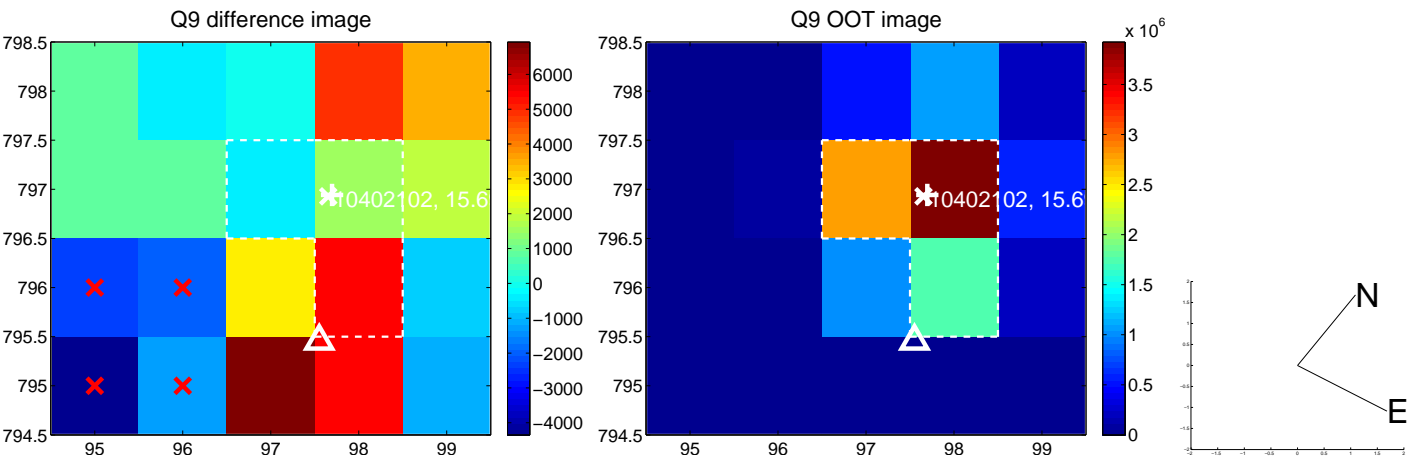
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



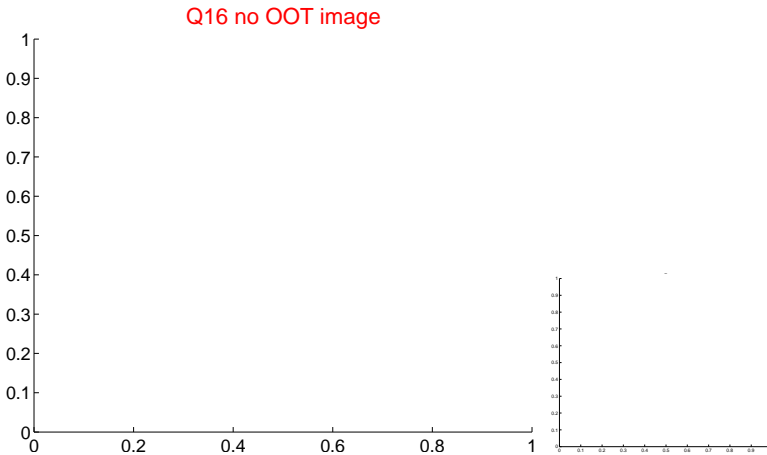
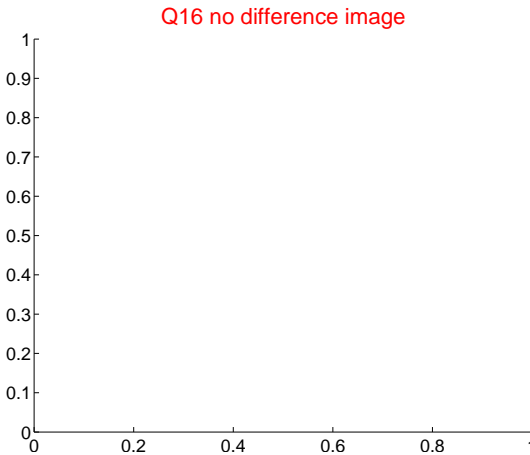
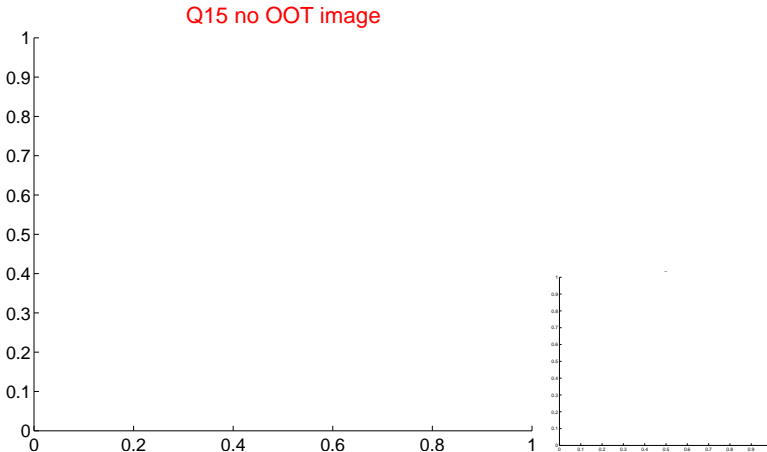
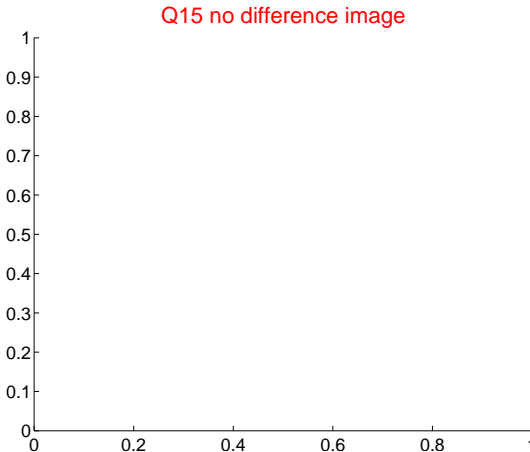
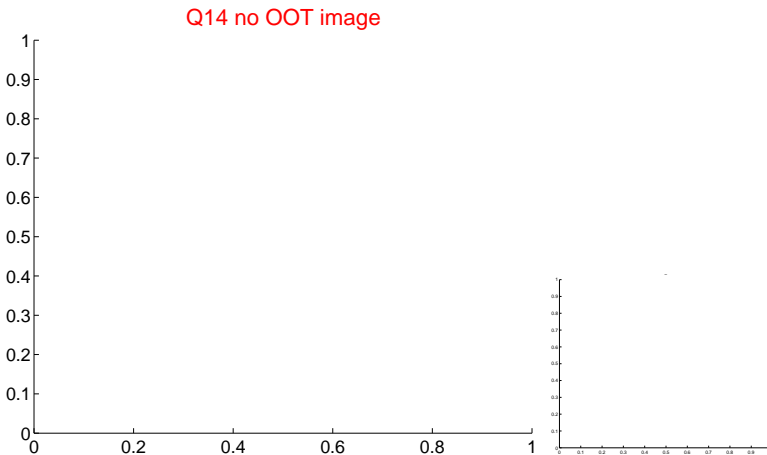
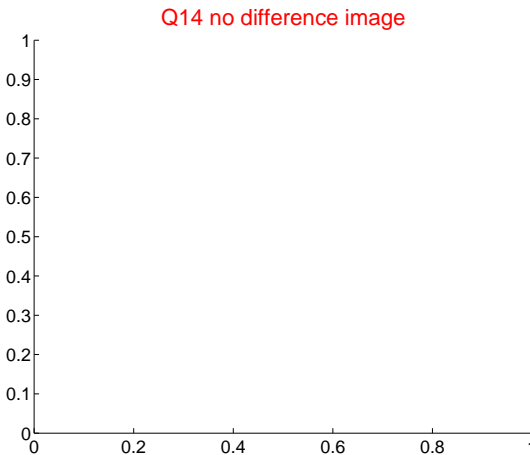
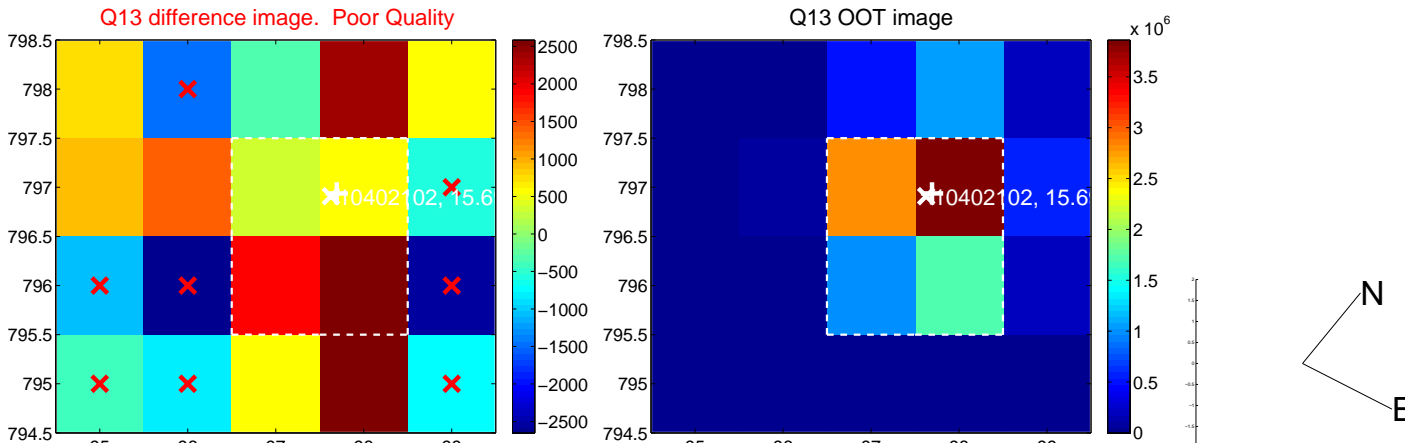
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



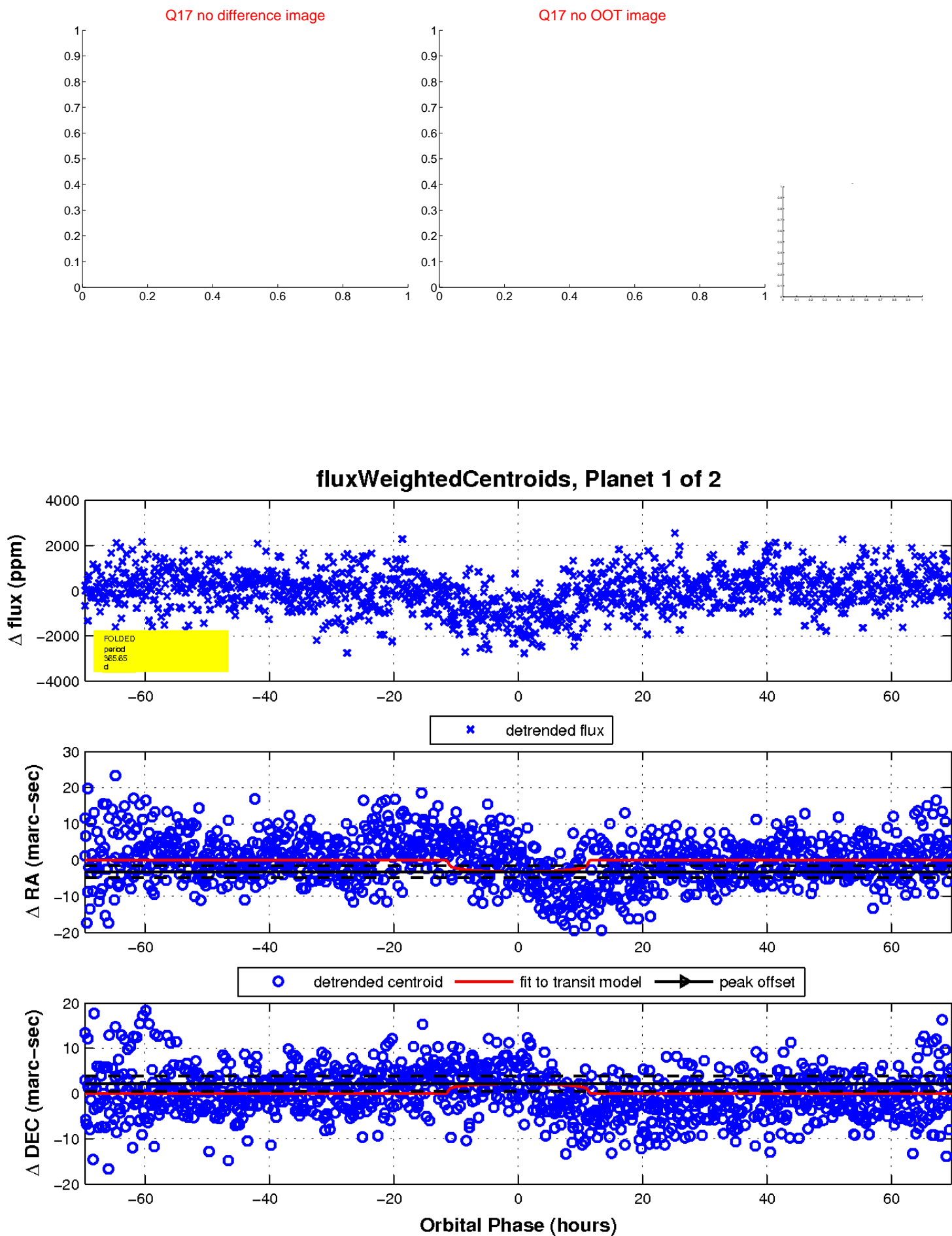
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

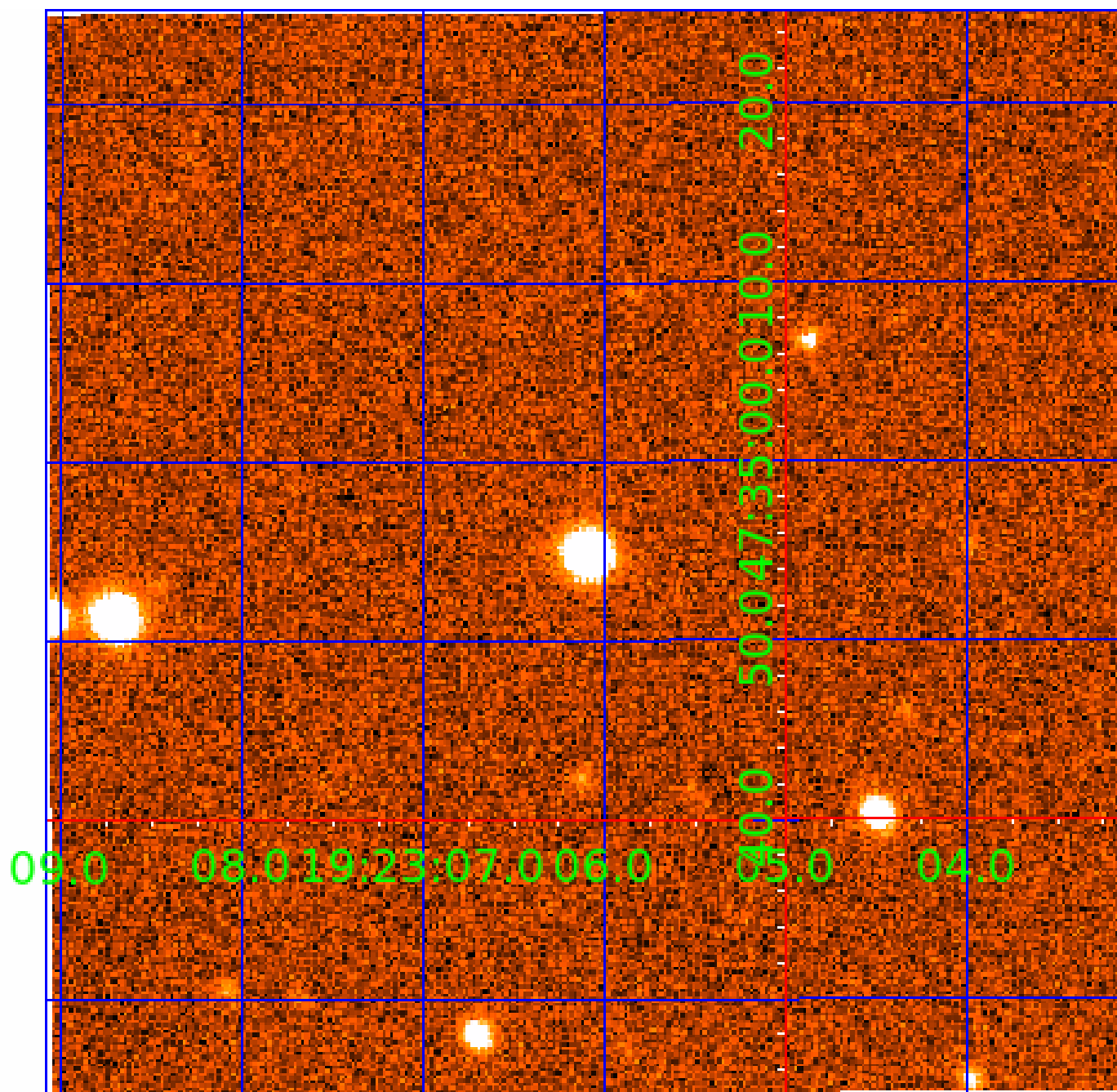


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010402102

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})
010402102-01	OBS	No	365.645556	159.671150	1124.9	23.238	8.3	9.1	0.84	5590	2.78	0.64
010402102-02	OBS	No	412.787227	186.388560	1019.4	18.198	8.8	8.3	0.84	5590	3.17	0.55

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010402102-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
010402102-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

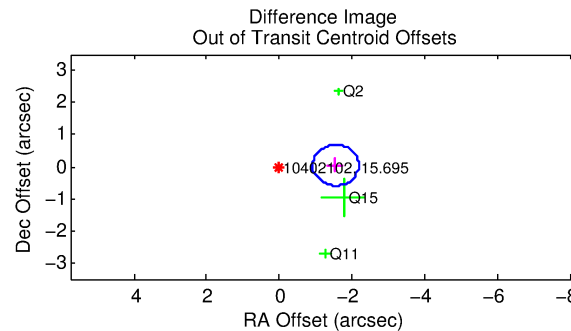
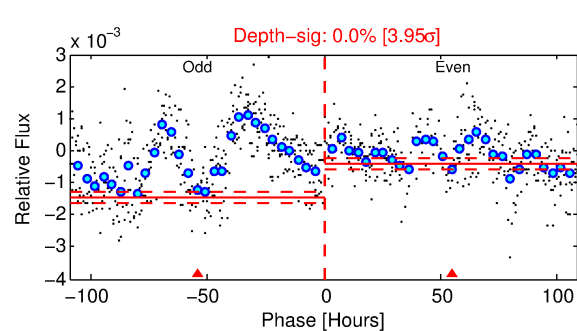
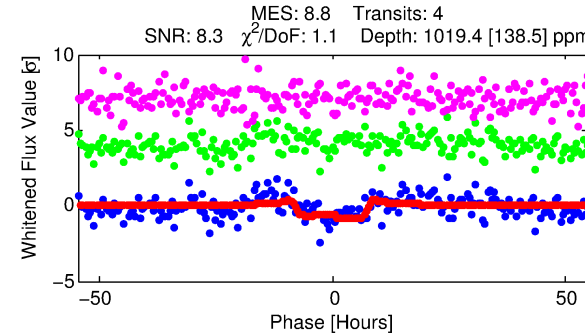
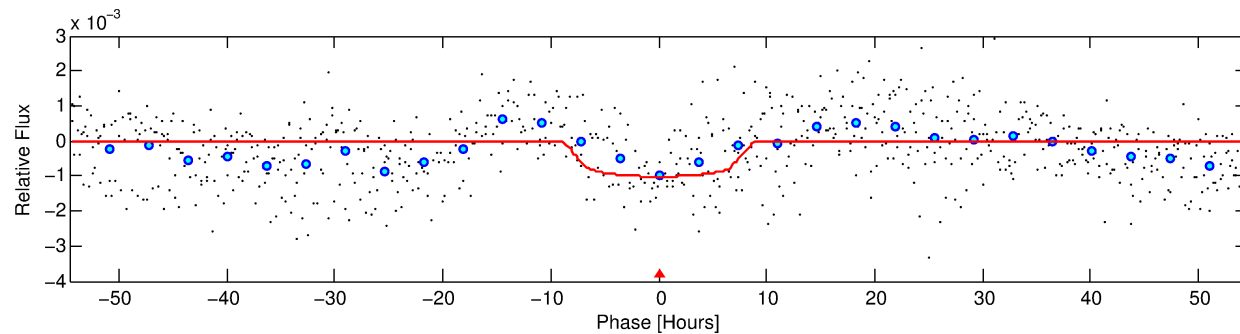
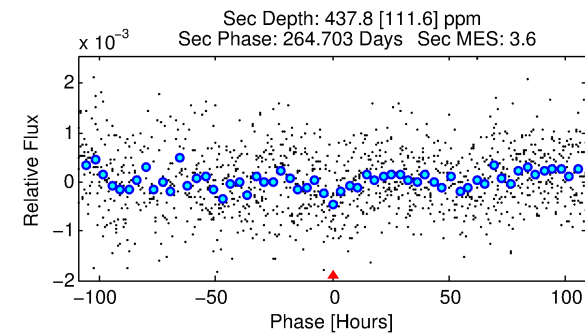
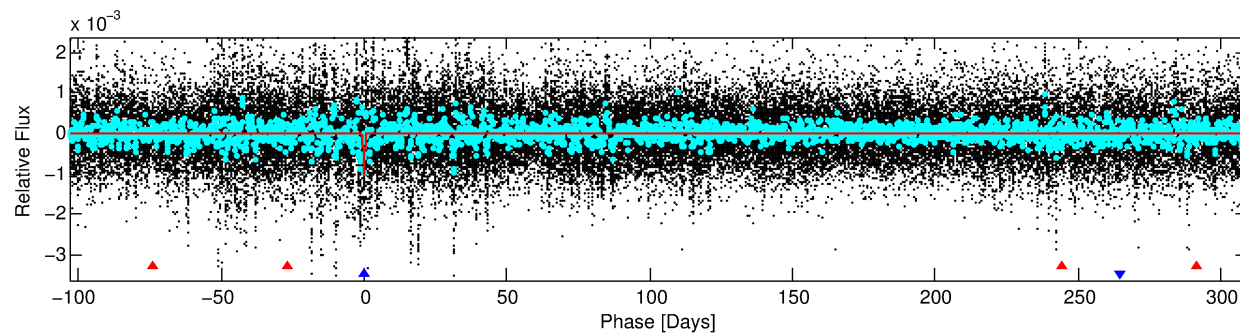
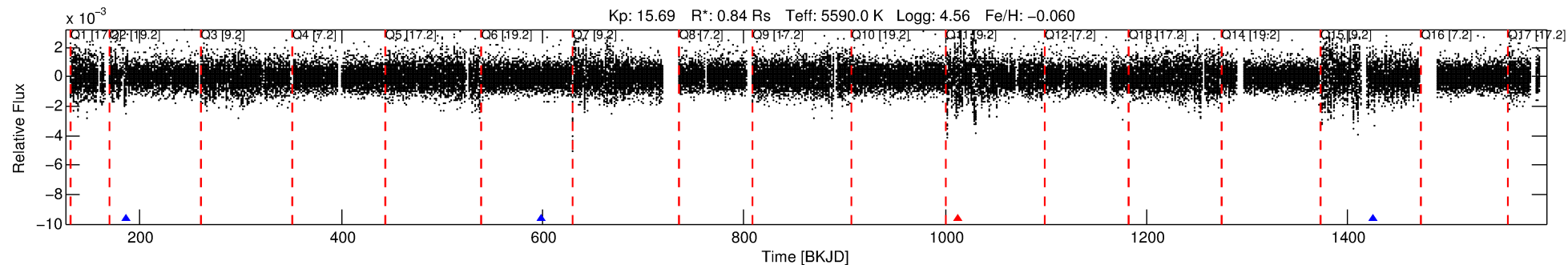
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010402102-02

No Significant Match Found

DV One-Page Summary

KIC: 10402102 Candidate: 2 of 2 Period: 412.787 d



DV Fit Results:

Period = 412.78723 [0.01521] d
Epoch = 186.3886 [0.0239] BKJD
Rp/R* = 0.0346 [0.0037]
a/R* = 91.48 [29.43]
b = 0.89 [0.08]
Seff = 0.55 [0.18]
Teq = 219 [18] K
Rp = 3.17 [0.83] Re
a = 1.0601 [0.2176] AU
Ag = 26957.60 [12116.77] [2.22σ]
Teffp = 4346 [383] K [10.77σ]

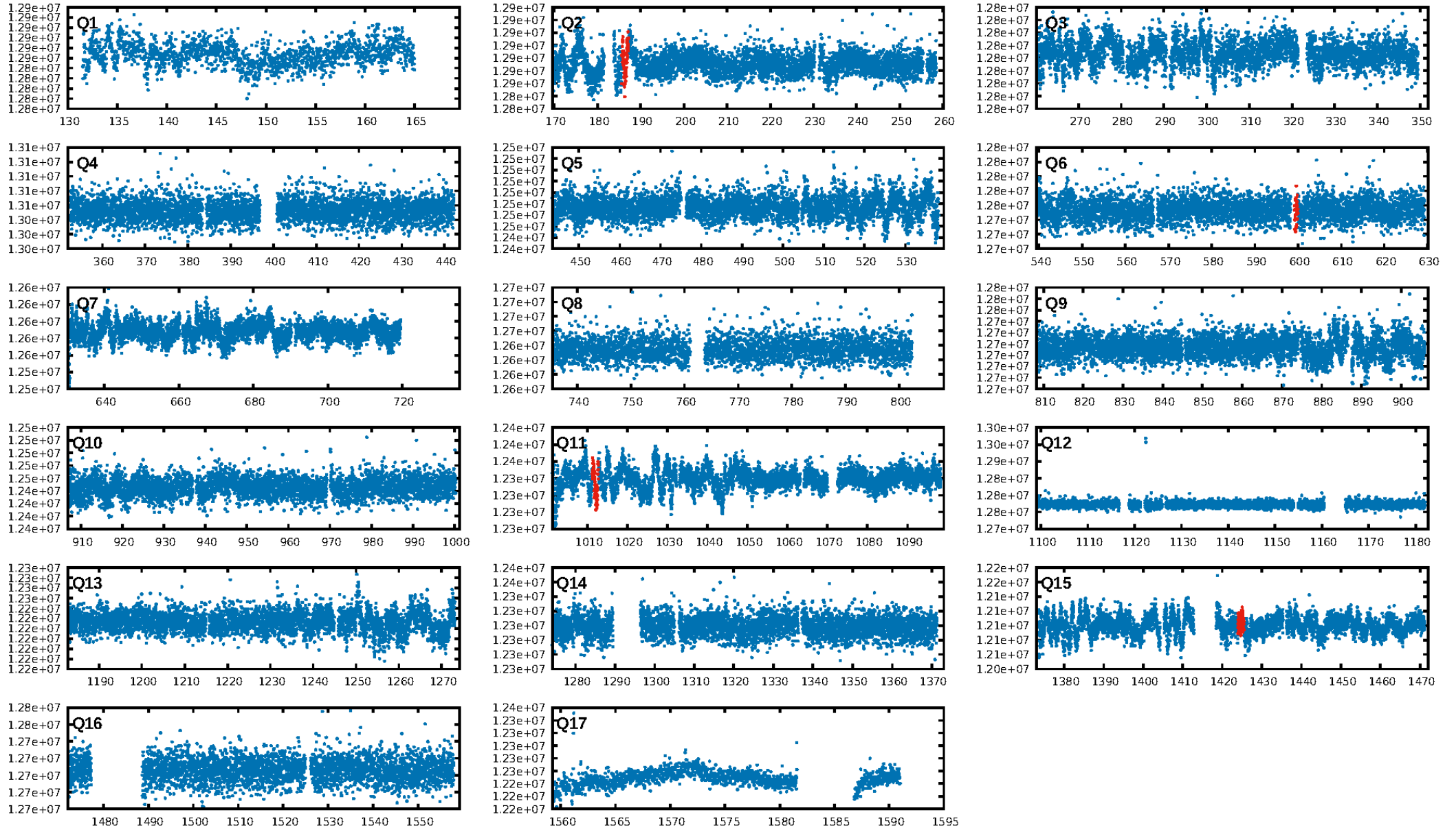
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.33σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.28e-10
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 6.548
Centroid-sig: 4.6%
Centroid-so: 4.319 arcsec [2.08σ]
OotOffset-rm: 1.552 arcsec [7.34σ]
KicOffset-rm: 1.431 arcsec [6.02σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

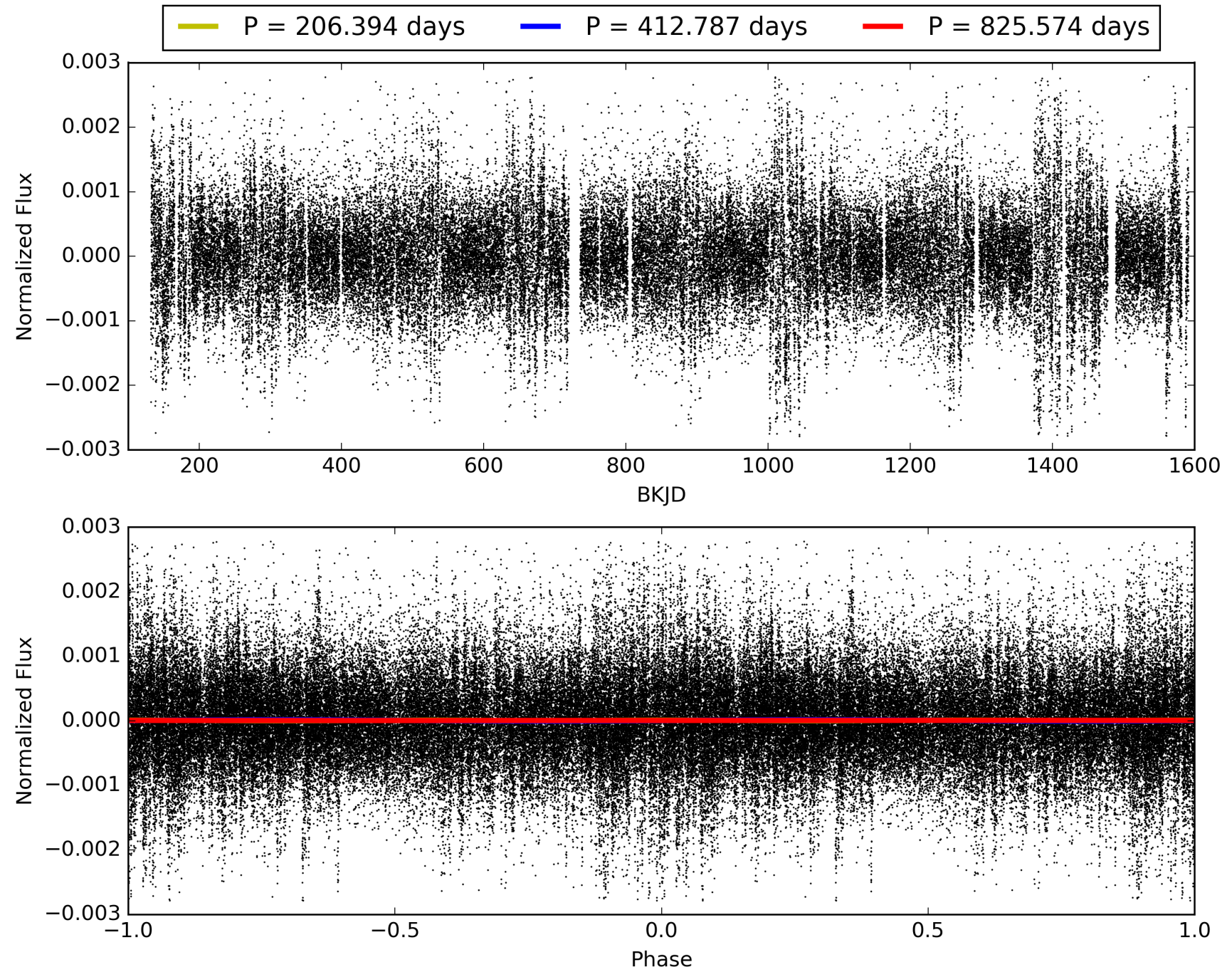
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 01:45:33 Z

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

TCE 010402102-02, PDC Light Curves

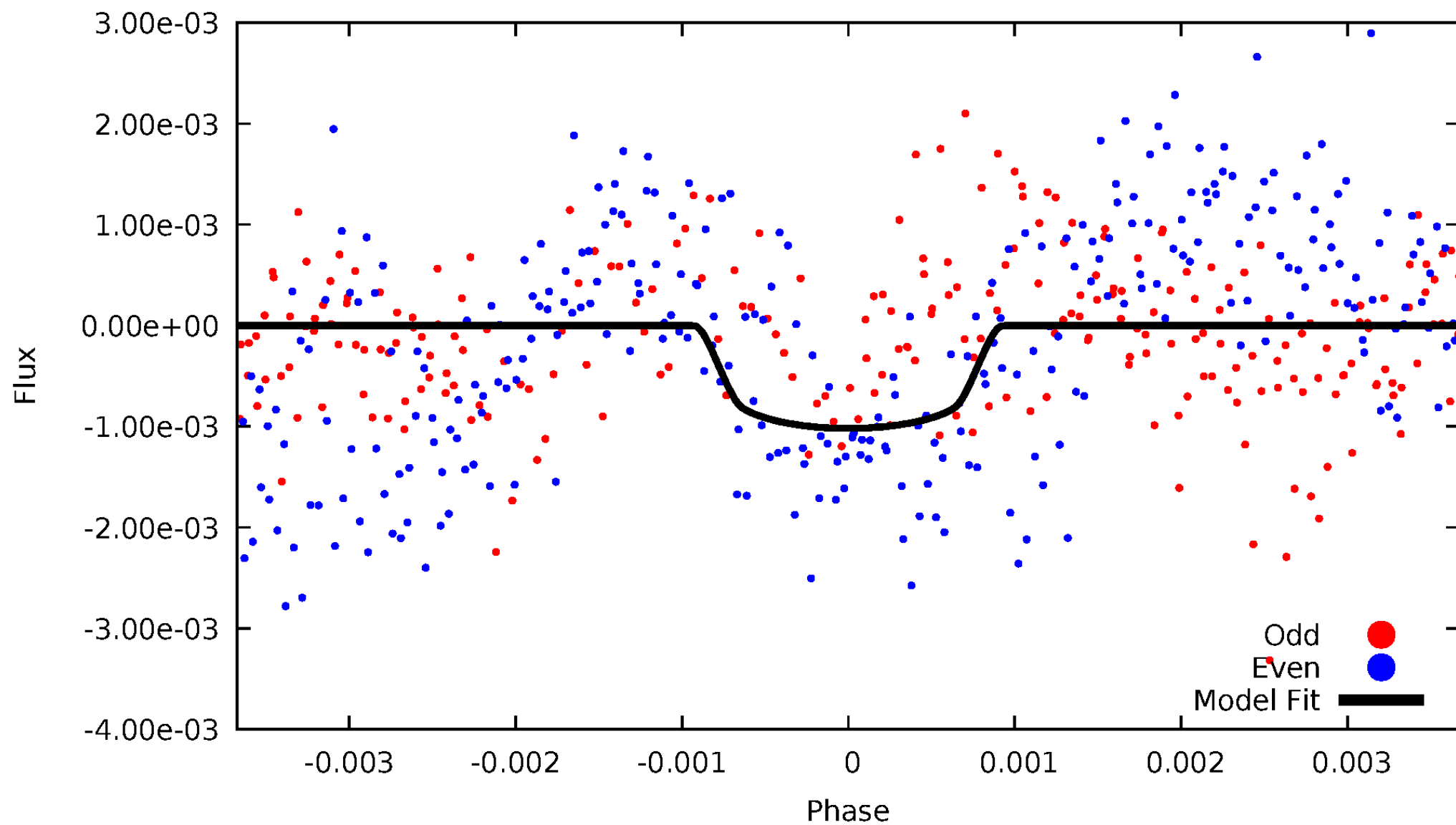


TCE 010402102-02



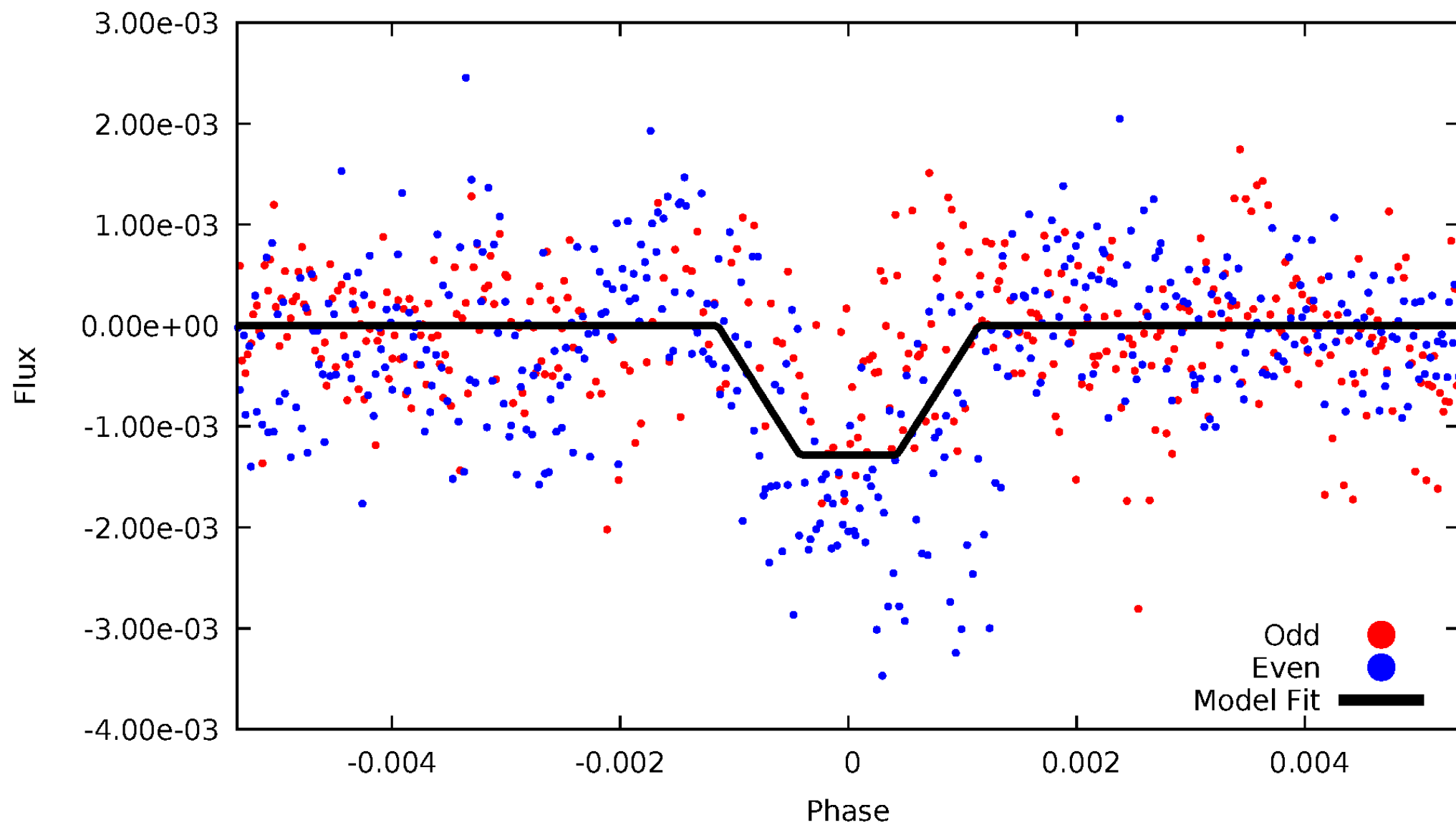
DV Odd/Even

TCE 010402102-02



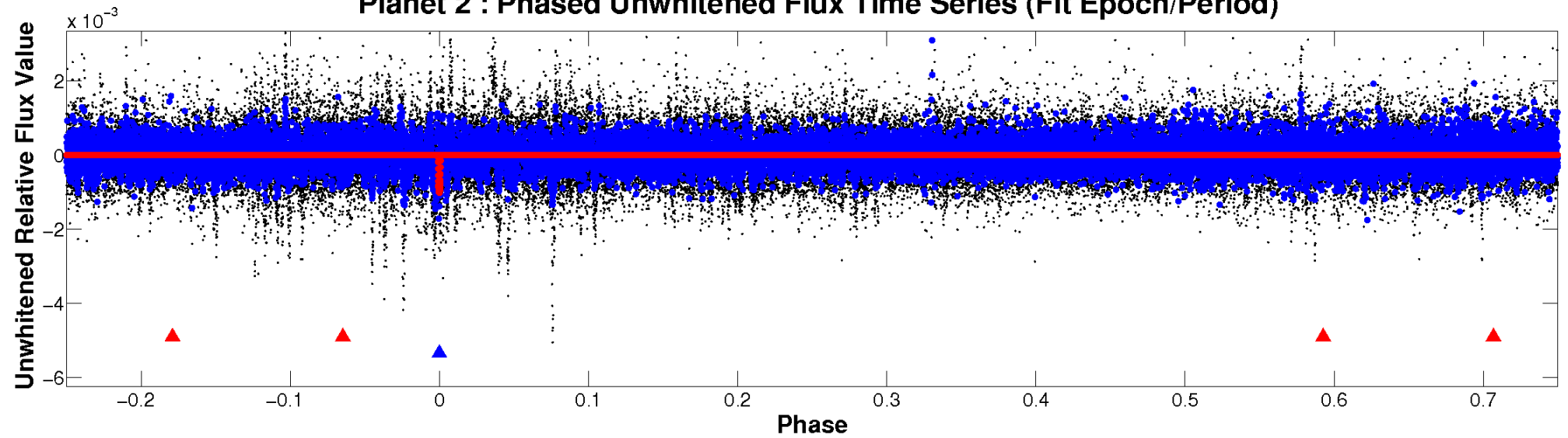
ALT Odd/Even

TCE 010402102-02

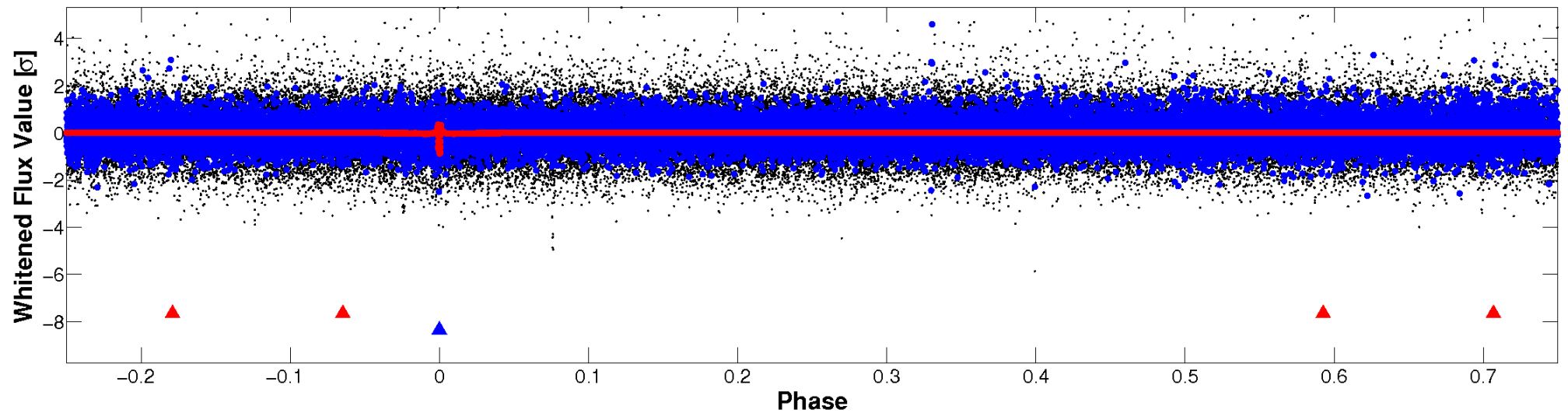


Non-Whitened Vs. Whitened Light Curve

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

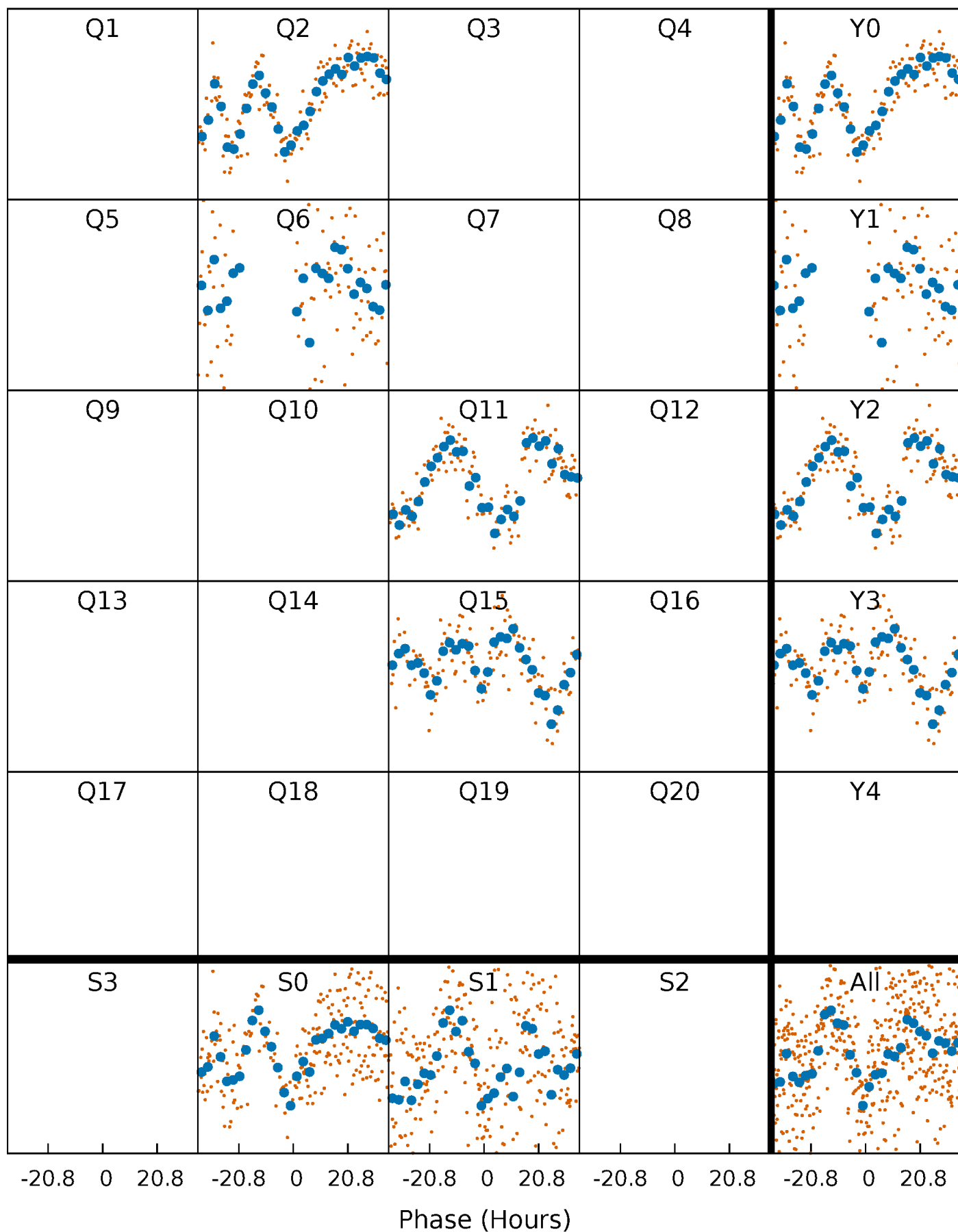


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



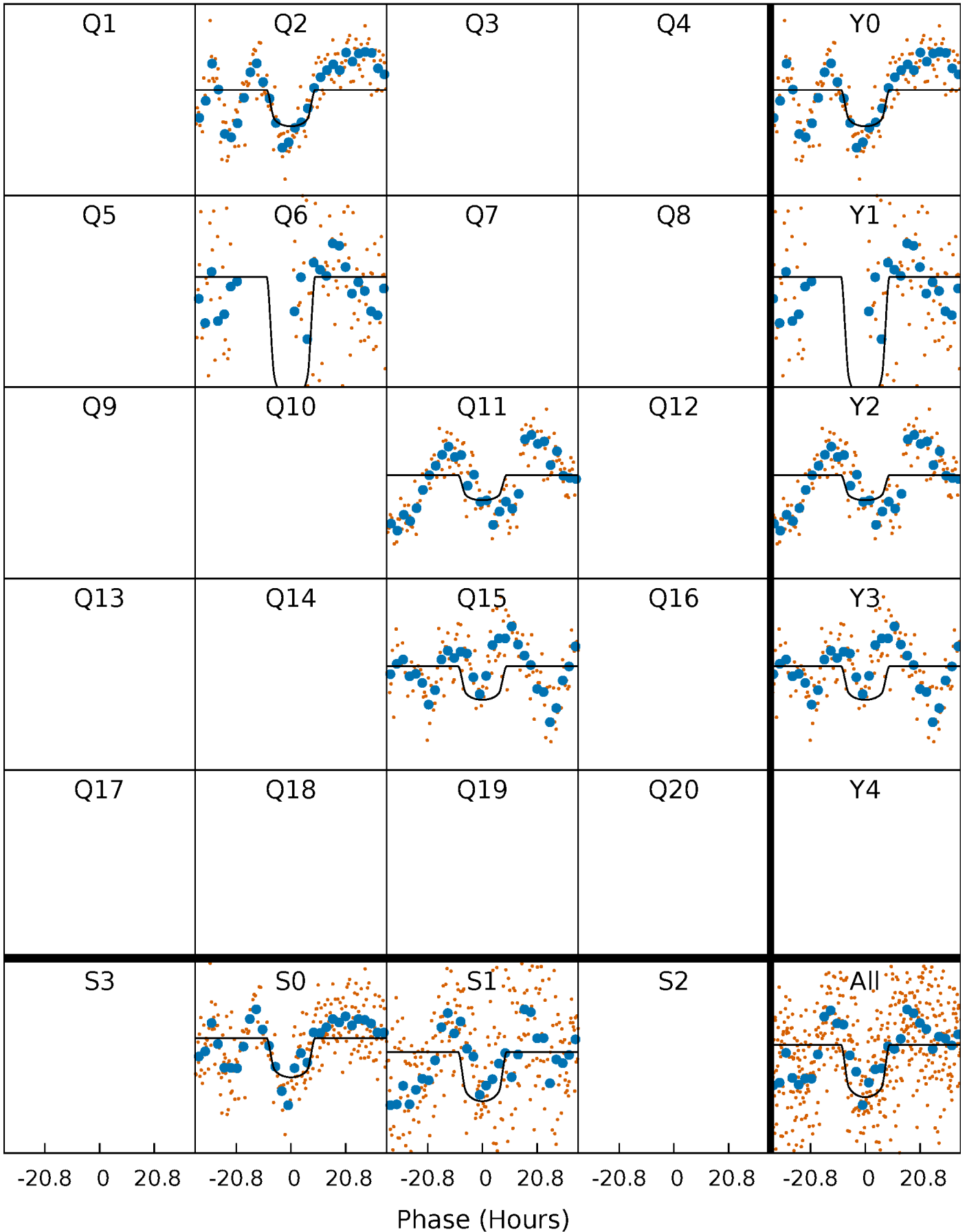
PDC Quarter-Phased Transit Curves

TCE 010402102-02 $P=412.787227$ Days $T_0=186.388560$ (BKJD)



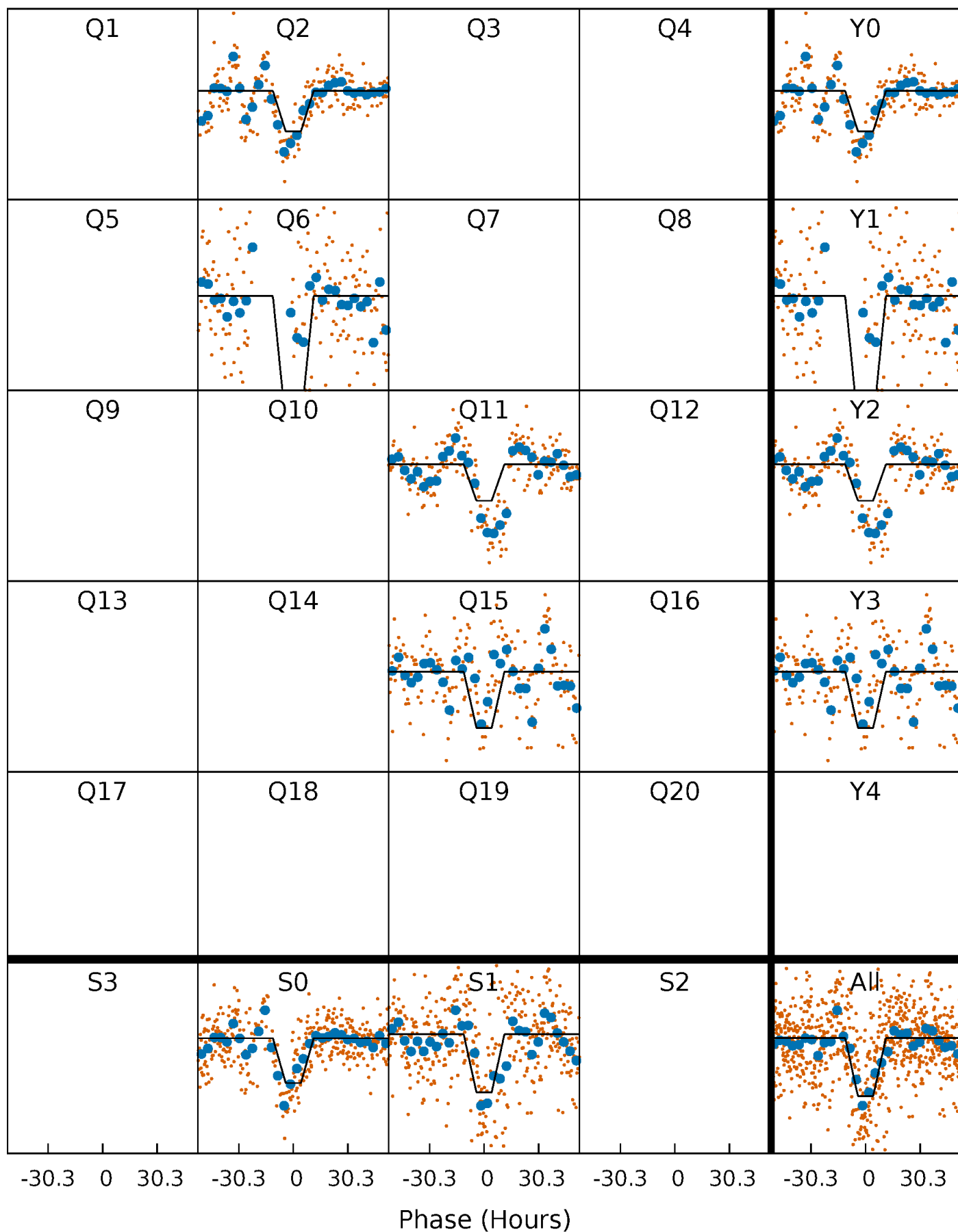
DV Quarter-Phased Transit Curves

TCE 010402102-02 $P=412.787227$ Days $T_0=186.388560$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

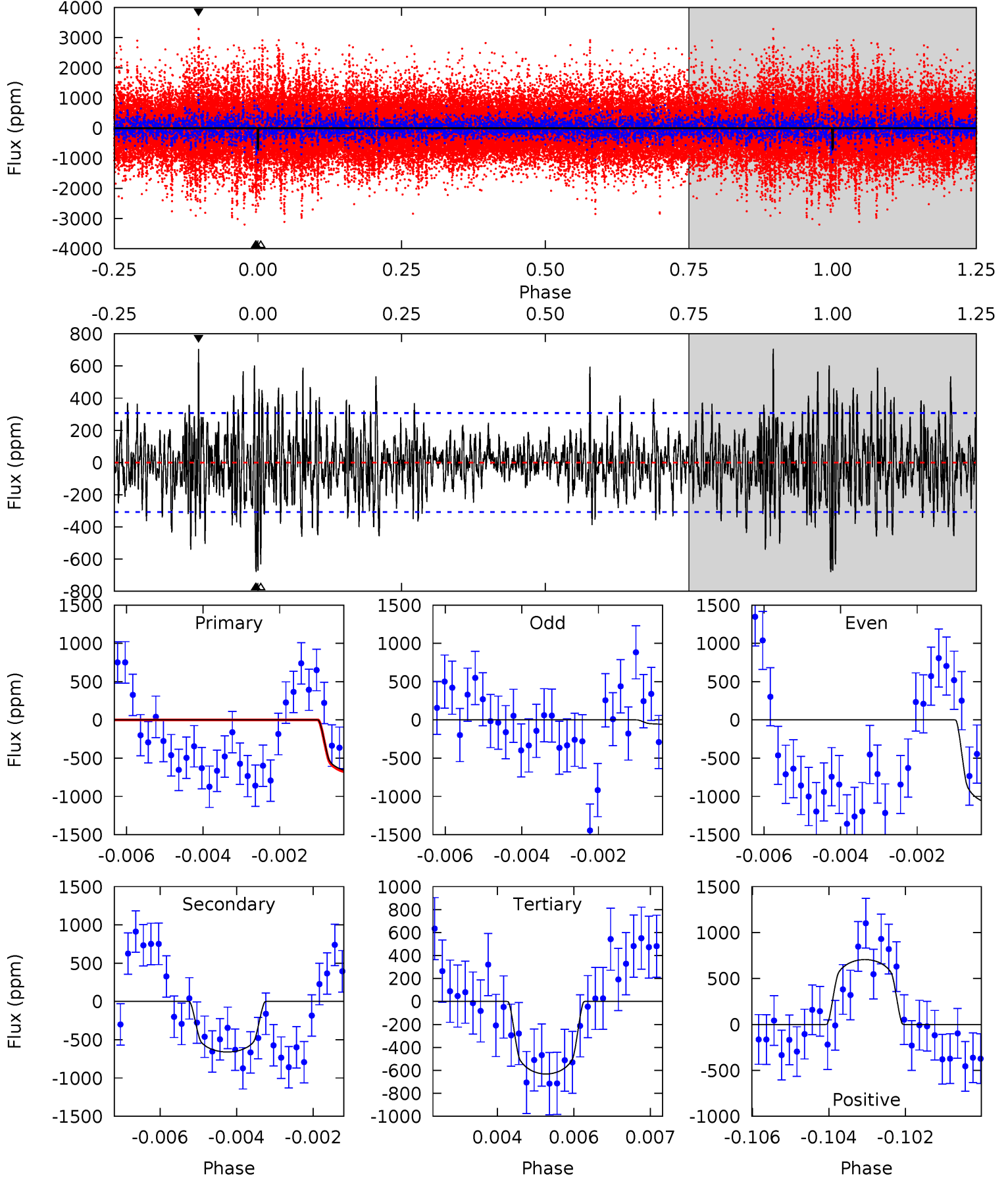
TCE 010402102-02 $P=412.751101$ Days $T_0=186.494412$ (BKJD)



DV Model-Shift Uniqueness Test

010402102-02, P = 412.787227 Days, E = 186.388560 Days

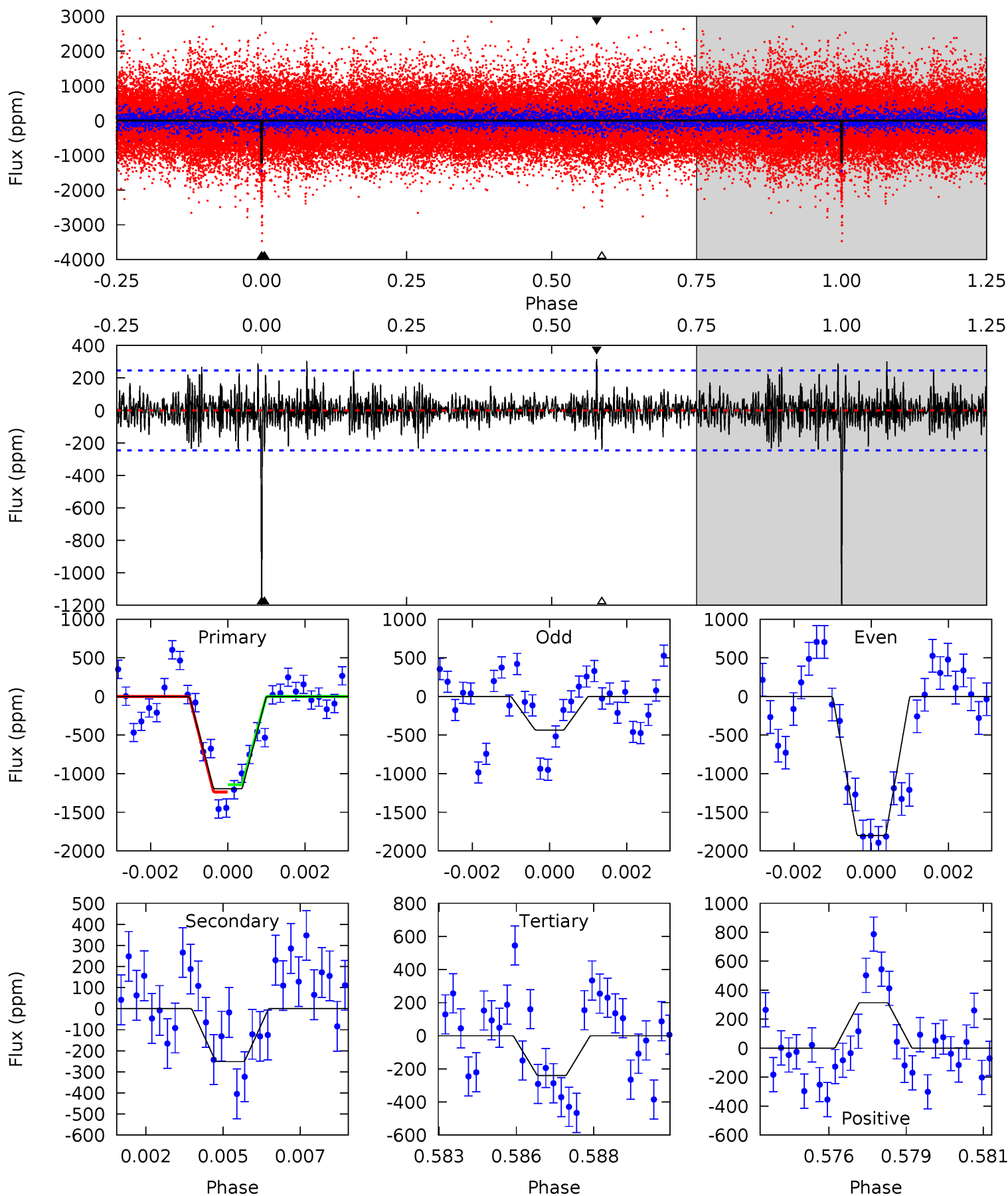
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	11.5	11.0	12.2	5.34	3.11	2.78	0.83	-0.46	0.50	-0.79	8.82	0.98	0.51	0.01



Alt Model-Shift Uniqueness Test

010402102-02, P = 412.751101 Days, E = 186.494412 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.7	5.41	5.19	6.76	5.30	3.05	1.41	20.5	19.0	0.22	-1.35	14.8	1.07	0.21	1.00



Stellar Parameters For KIC 010402102

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5590^{+149}_{-166}	$4.560^{+0.032}_{-0.168}$	$-0.060^{+0.300}_{-0.300}$	$0.839^{+0.201}_{-0.080}$	$0.934^{+0.081}_{-0.112}$	$2.227^{+0.385}_{-1.057}$
	+3%/-3%	+1%/-4%	+500%/-500%	+24%/-10%	+9%/-12%	+17%/-47%
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 010402102-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-660 ± 58	$3.27^{+0.56}_{-0.41}$	314^{+17}_{-14}	4913^{+272}_{-262}	36479^{+11948}_{-9145}
Alt.	-251 ± 46	$3.42^{+0.49}_{-0.43}$	314^{+17}_{-13}	4020^{+216}_{-214}	12818^{+4720}_{-3650}

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 $A_{obs} \gg 1.0$

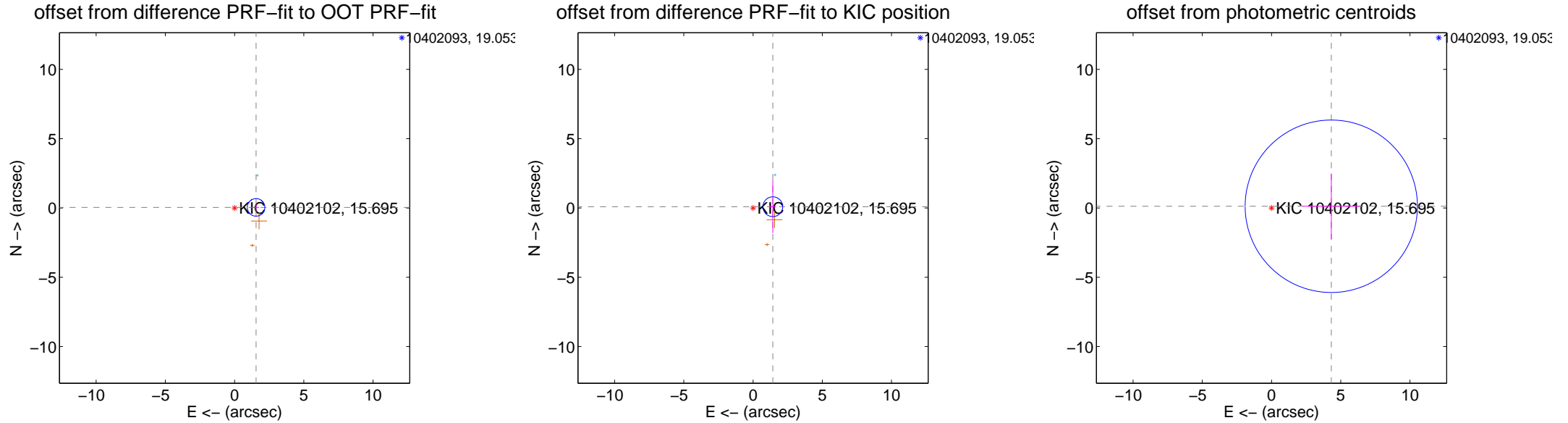
DV Centroid Data

Supplemental centroid analysis for 010402102-02. Kepler magnitude: 15.70. Transit SNR 8.34

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.552 ± 0.211	7.34	-1.552 ± 0.211	0.041 ± 0.213
PRF-fit source offset from KIC position	1.431 ± 0.238	6.02	-1.428 ± 0.207	0.090 ± 1.894
photometric centroid source offset	4.32 ± 2.07	2.08	-4.32 ± 2.07	0.12 ± 2.37



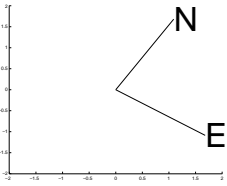
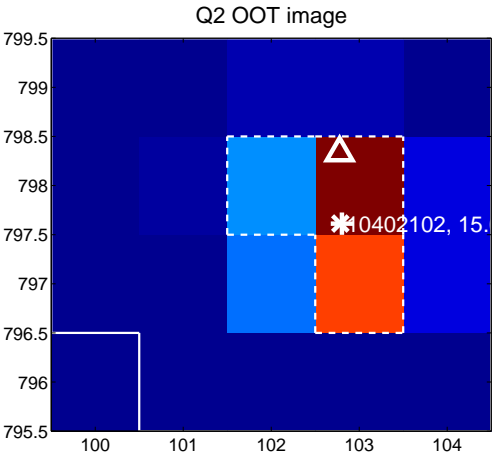
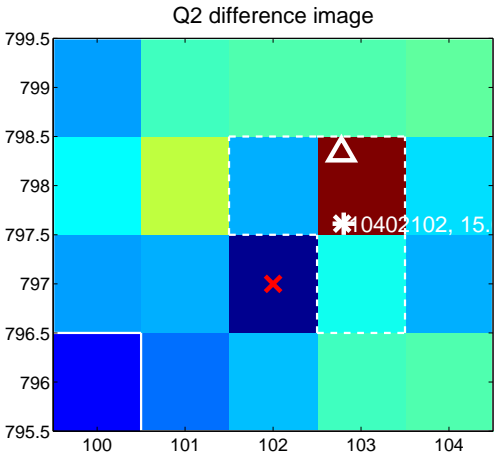
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

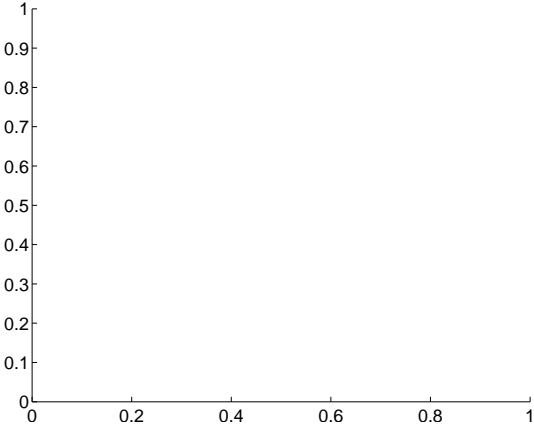
Q1 no difference image



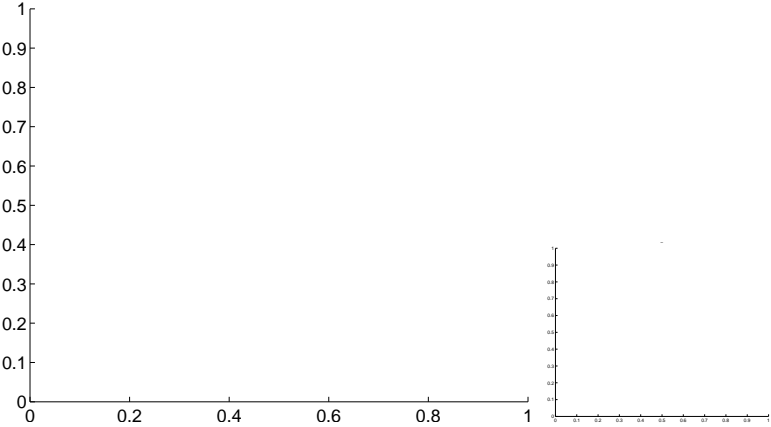
Q1 no OOT image



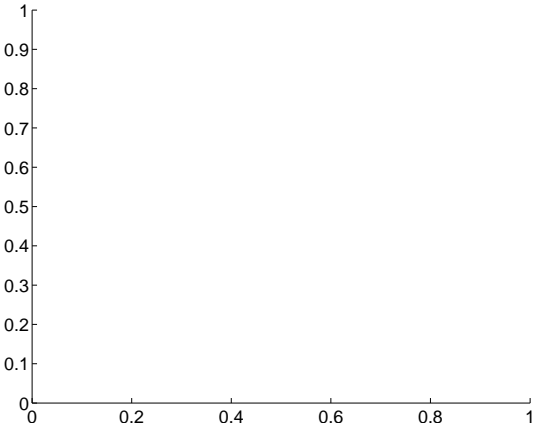
Q3 no difference image



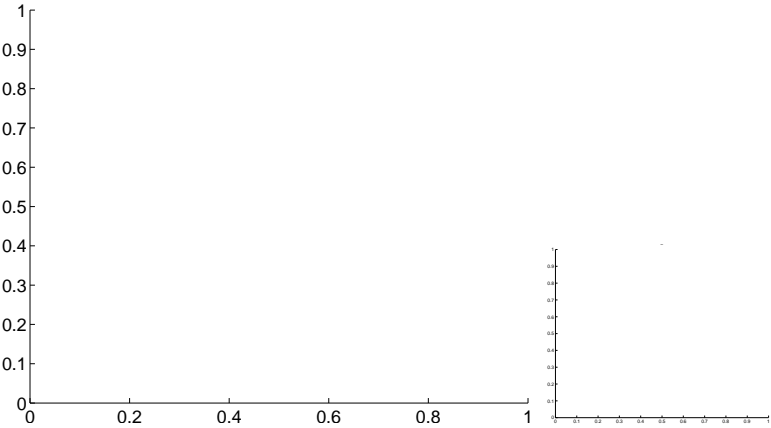
Q3 no OOT image



Q4 no difference image



Q4 no OOT image



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



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

Q9 no difference image



Q9 no OOT image



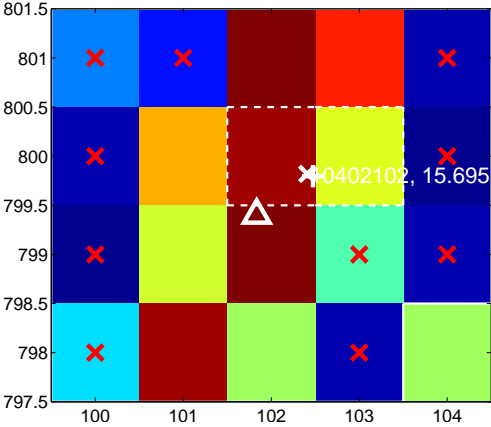
Q10 no difference image



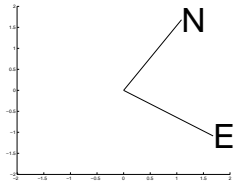
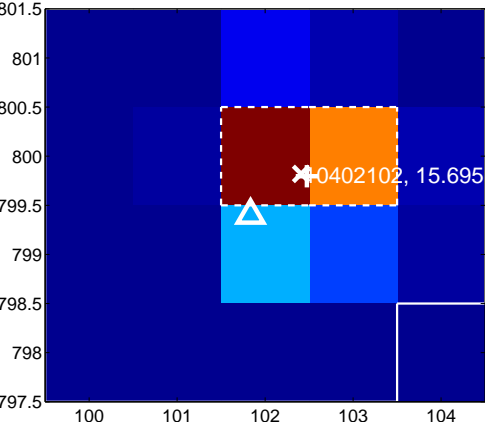
Q10 no OOT image



Q11 difference image. Poor Quality



Q11 OOT image



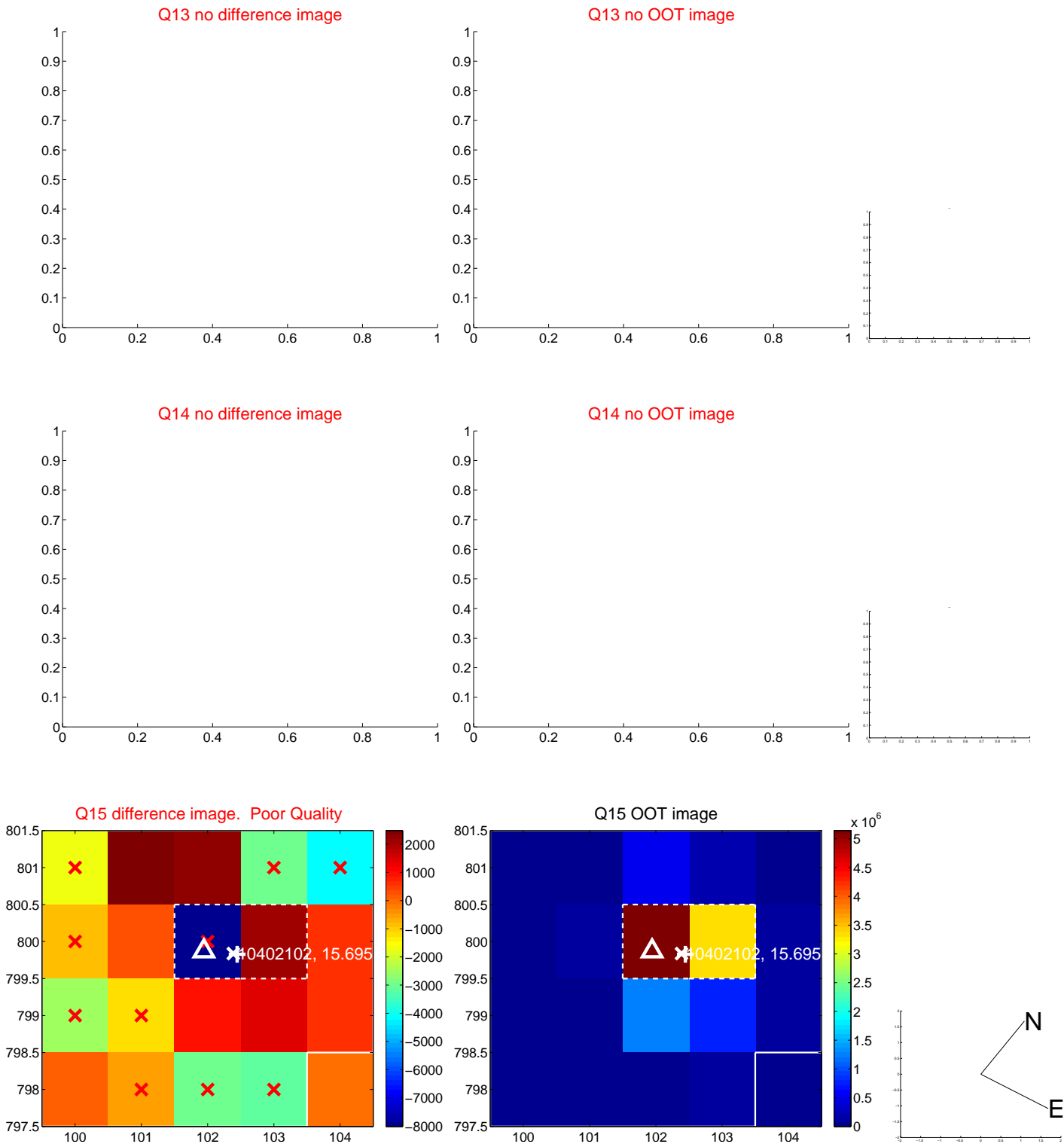
Q12 no difference image



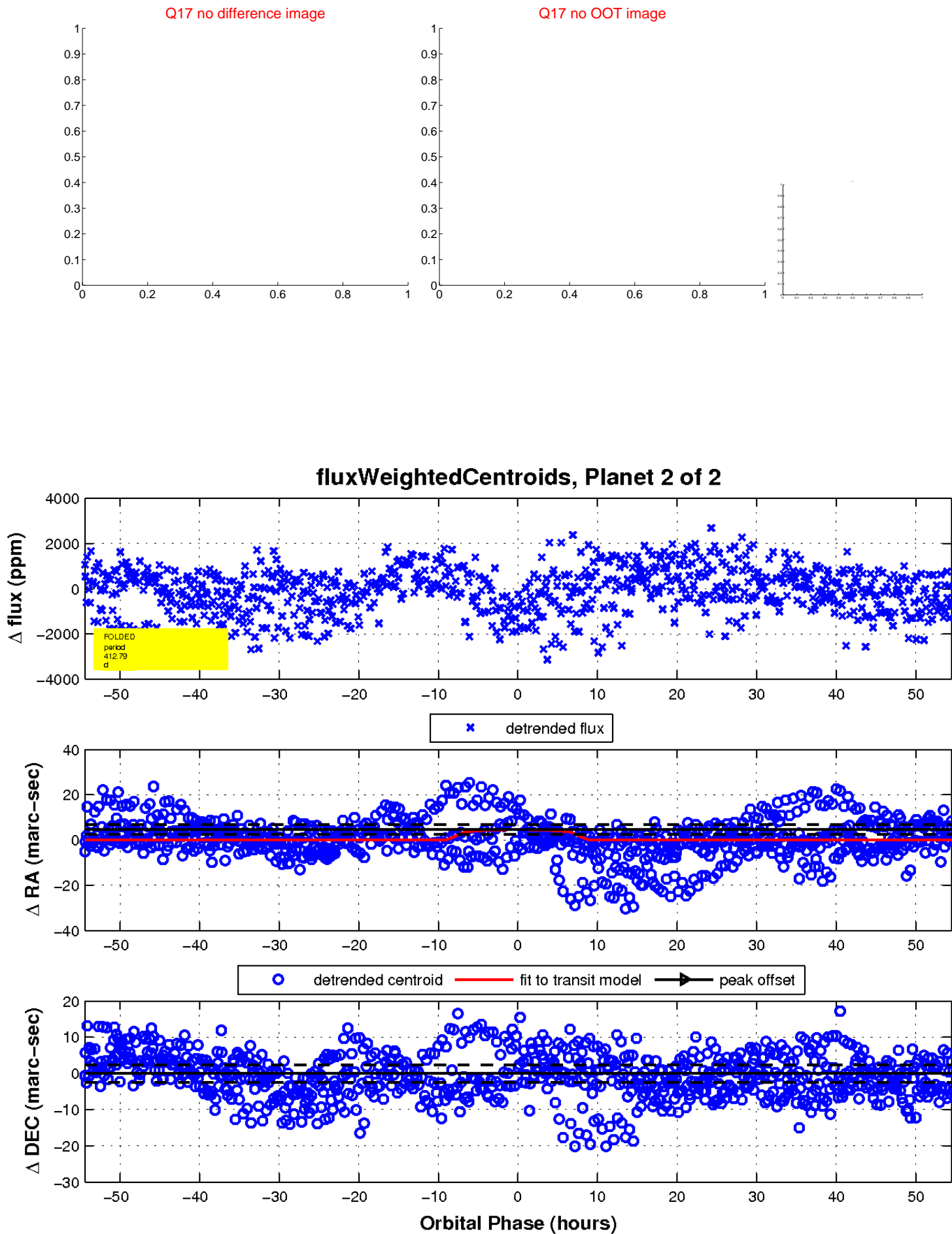
Q12 no OOT image



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



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



UKIRT Image

Declination

