

KIC 003103752

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})
003103752-01	OBS	No	398.579907	372.229352	2263.1	2.847	11.0	6.7	0.31	3388	1.46	0.02
003103752-02	OBS	No	415.591072	451.429680	3496.2	6.239	11.7	9.2	0.31	3388	2.09	0.02
003103752-03	OBS	No	411.506159	195.499109	2001.1	4.116	11.1	6.6	0.31	3388	1.42	0.02
003103752-04	OBS	No	438.651193	175.780323	2018.2	4.840	9.8	7.0	0.31	3388	1.43	0.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003103752-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
003103752-03	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—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

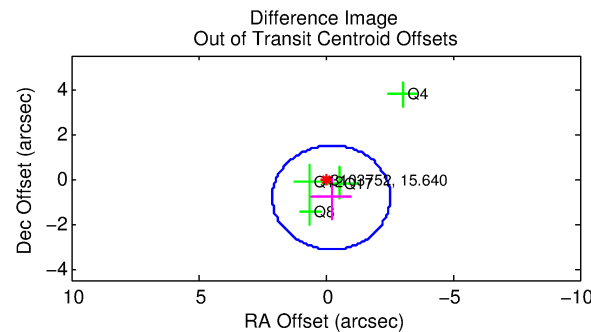
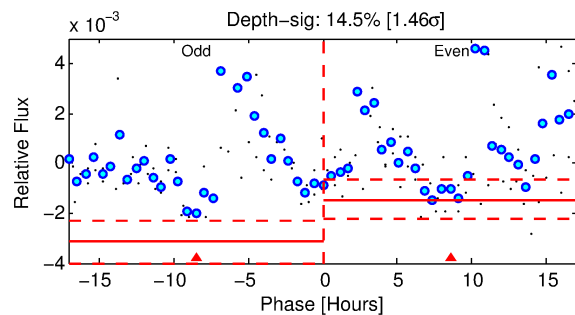
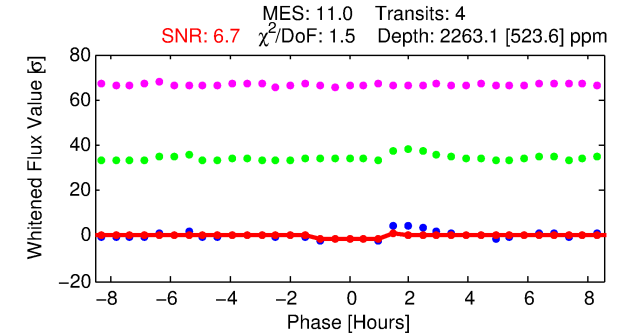
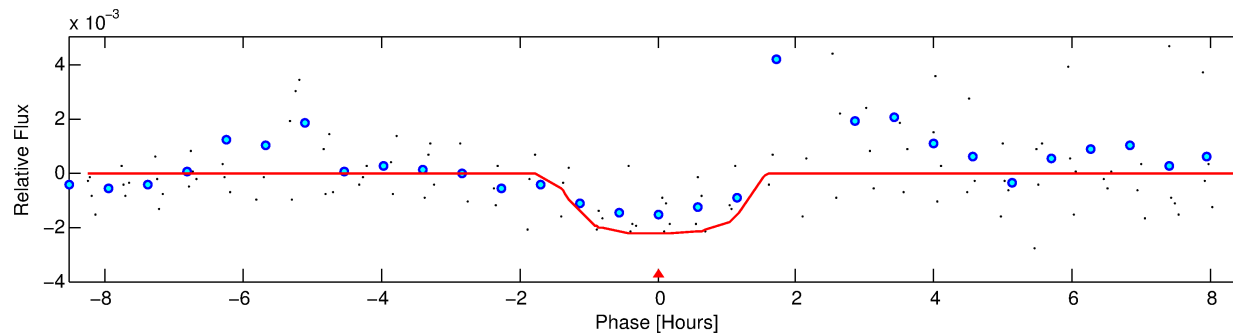
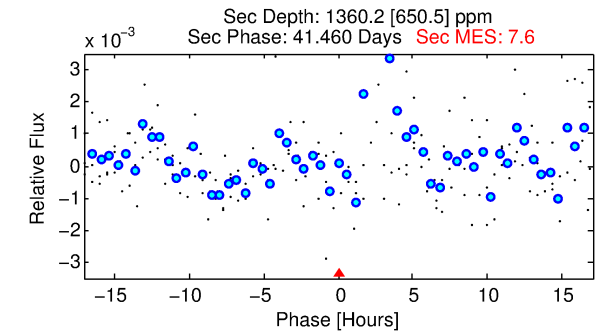
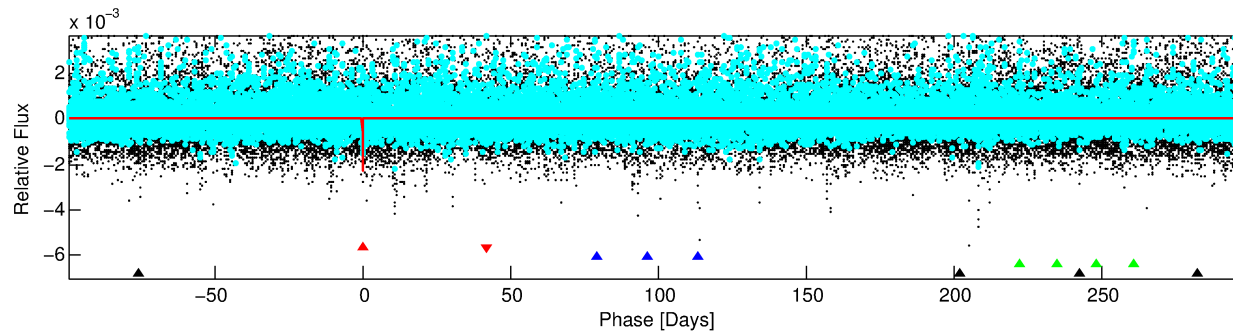
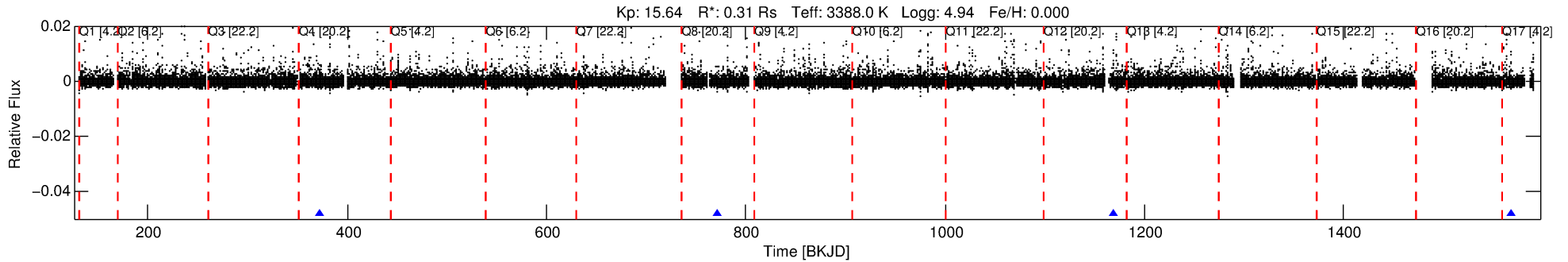
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003103752-01

No Significant Match Found

DV One-Page Summary

KIC: 3103752 Candidate: 1 of 4 Period: 398.580 d



DV Fit Results:

Period = 398.57991 [0.00528] d
Epoch = 372.2294 [0.0097] BKJD
Rp/R* = 0.0436 [0.0739]
a/R* = 1060.46 [7611.07]
b = 0.33 [19.80]
Seff = 0.02 [0.00]
Teq = 98 [3] K
Rp = 1.46 [2.49] Re
a = 0.7102 [0.0645] AU
Ag = 176018.04 [603354.44] [0.29σ]
Teffp = 3117 [2670] K [1.13σ]

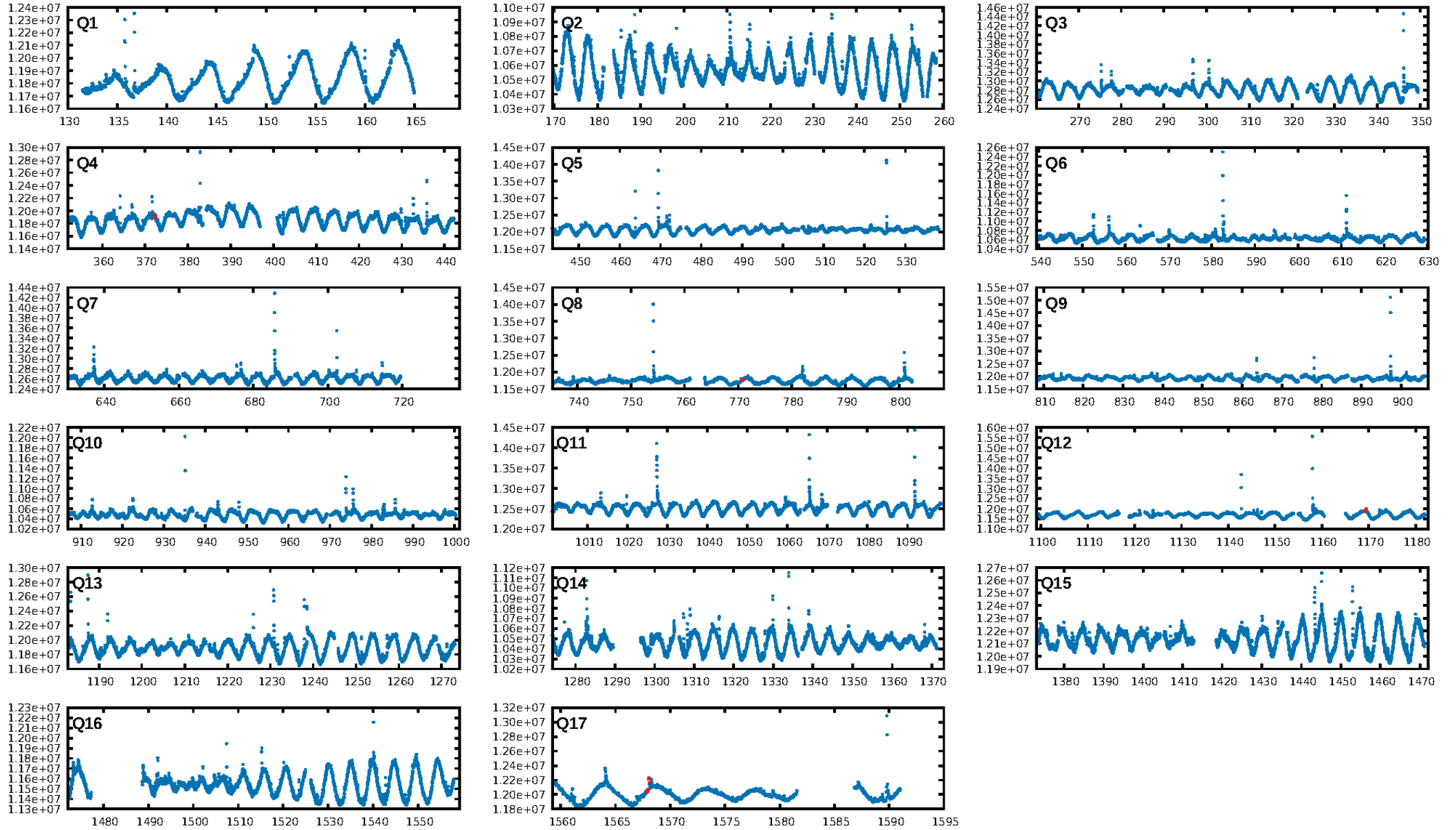
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [61.99σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 50.6%
Bootstrap-pfa: 8.76e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.246
Centroid-sig: 71.2%
Centroid-so: 0.810 arcsec [0.53σ]
OotOffset-rm: 0.856 arcsec [1.11σ]
KicOffset-rm: 0.083 arcsec [0.07σ]
OotOffset-st: 0/0/3/1 [4]
KicOffset-st: 0/0/3/1 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

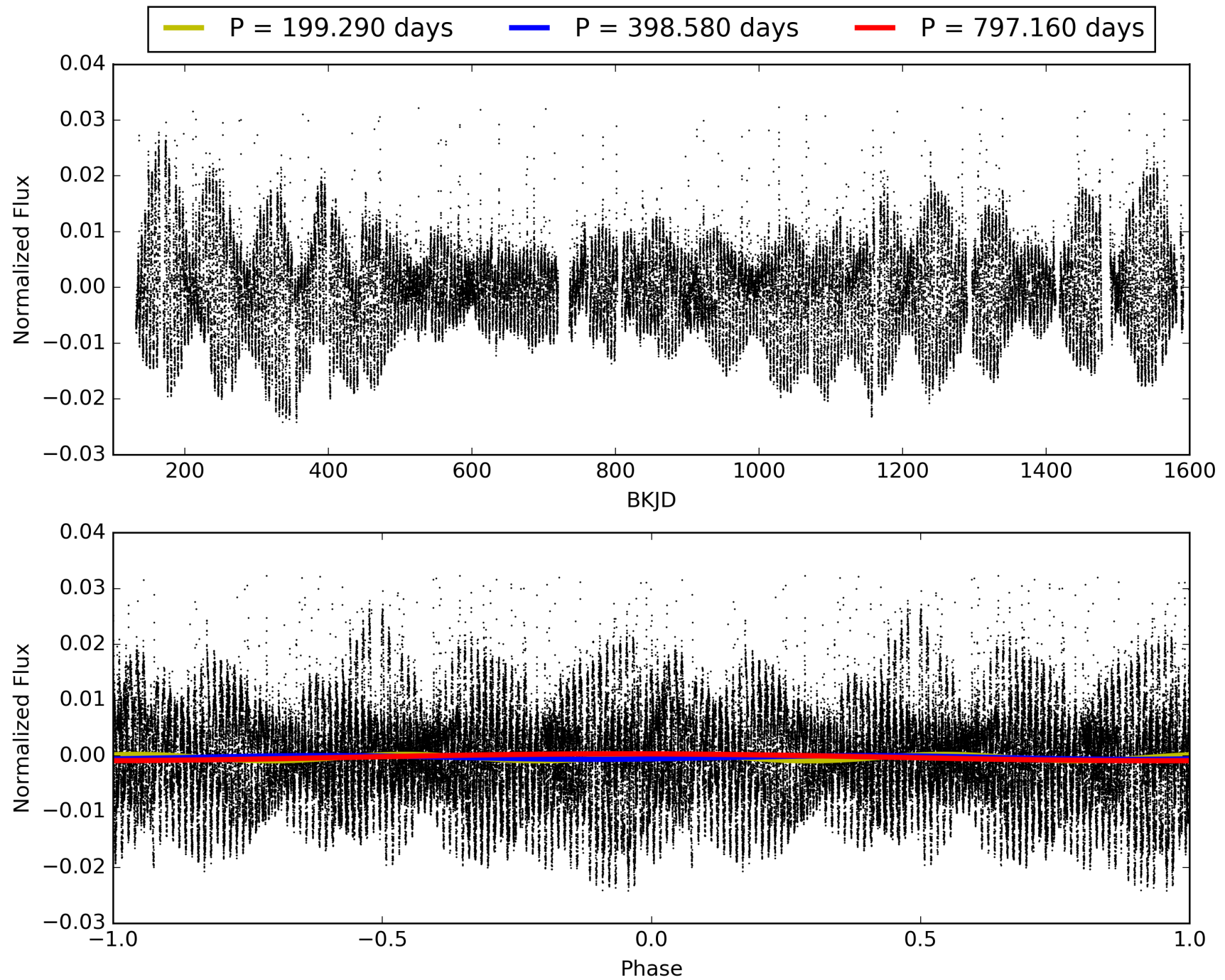
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:05:13 Z

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

TCE 003103752-01, PDC Light Curves

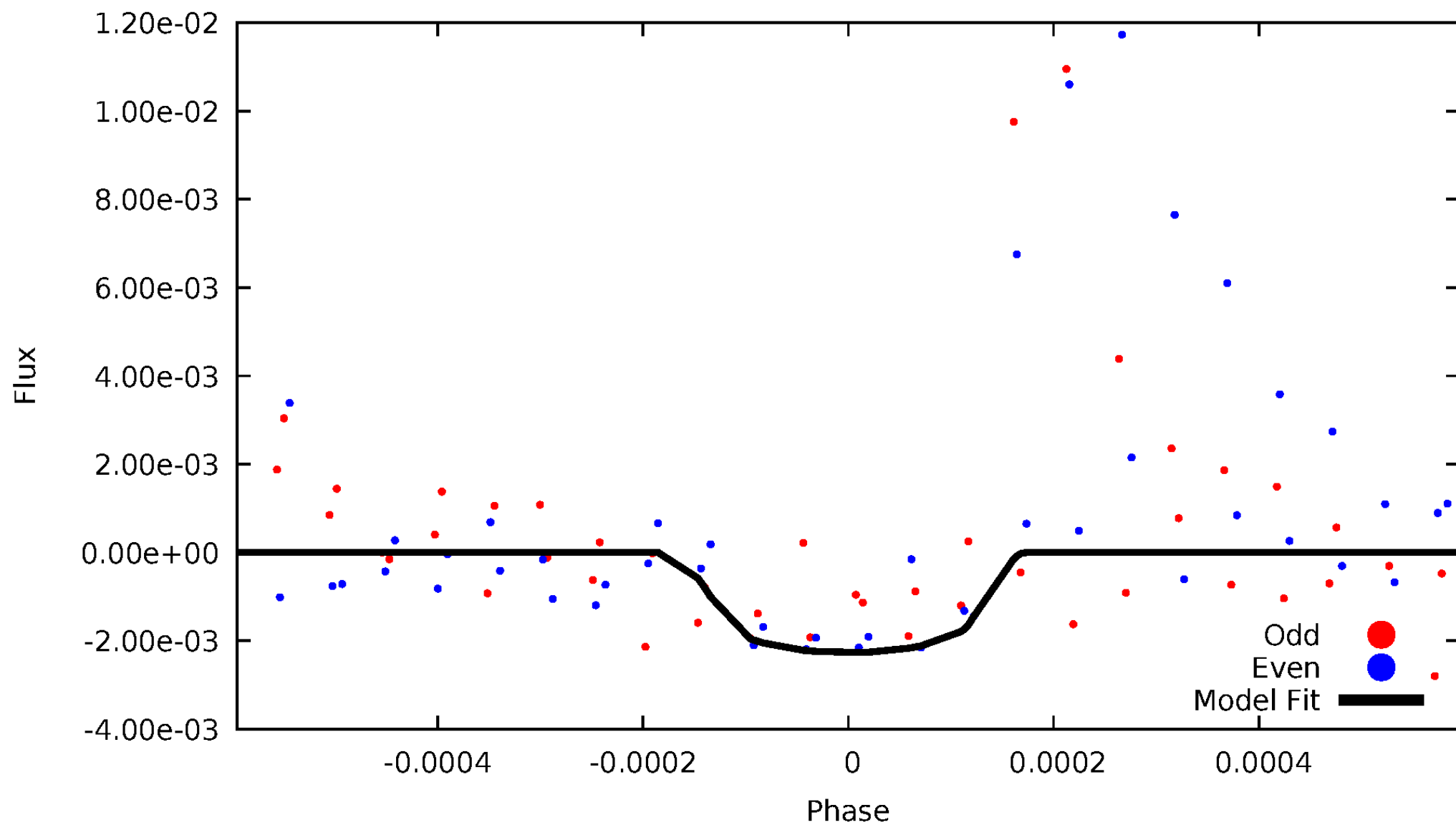


TCE 003103752-01



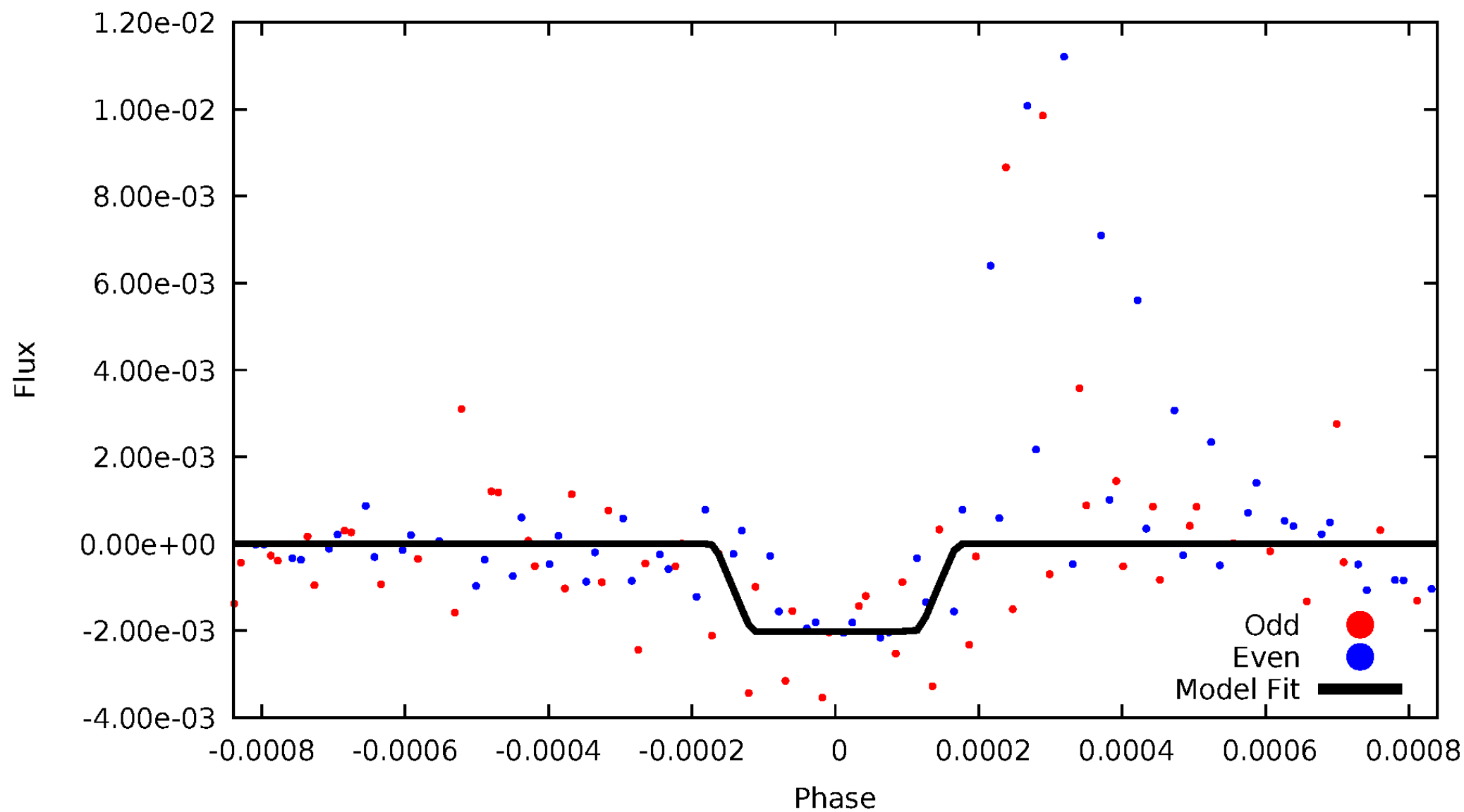
DV Odd/Even

TCE 003103752-01



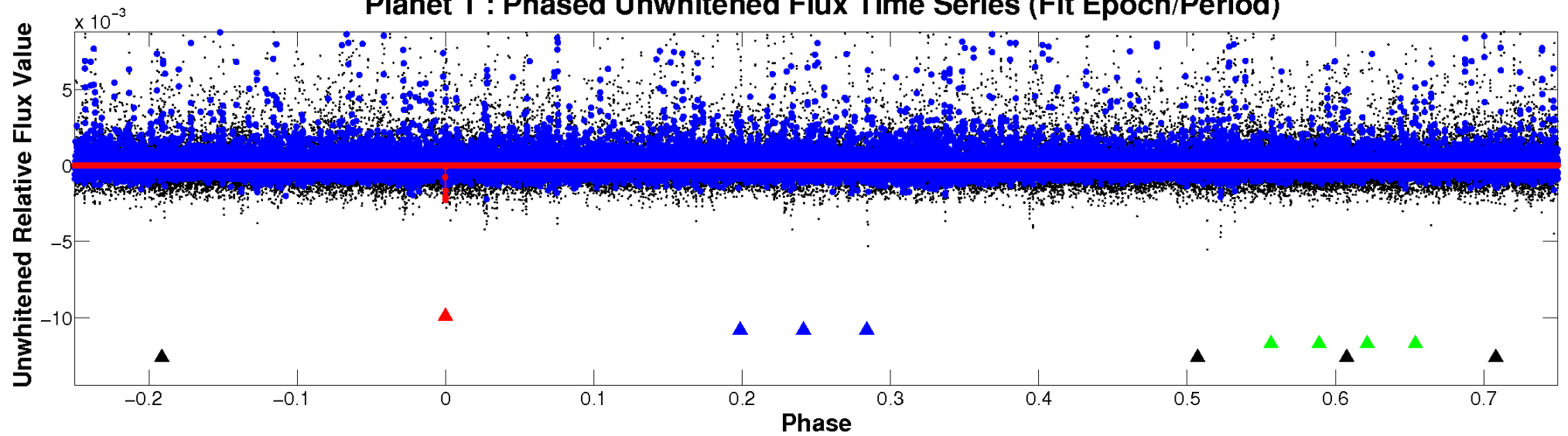
ALT Odd/Even

TCE 003103752-01

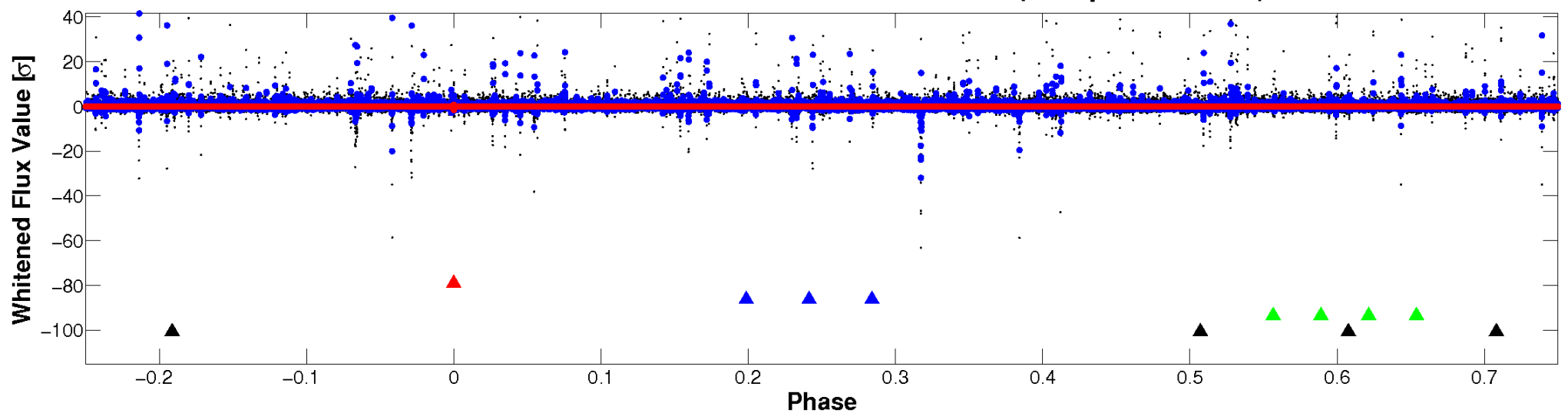


Non-Whitened Vs. Whitened Light Curve

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



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



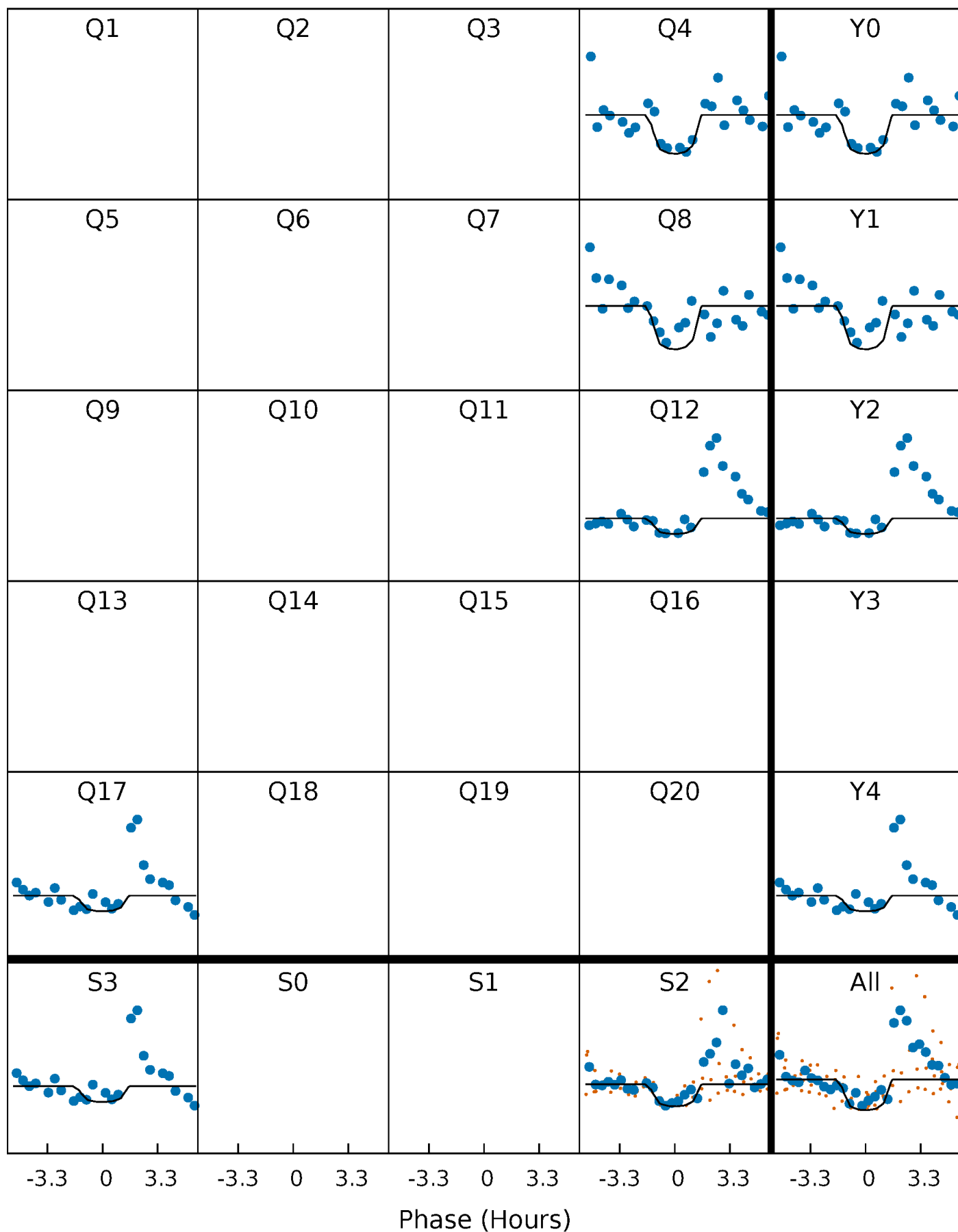
PDC Quarter-Phased Transit Curves

TCE 003103752-01 P=398.579907 Days $T_0=372.229352$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 003103752-01 P=398.579907 Days $T_0=372.229352$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

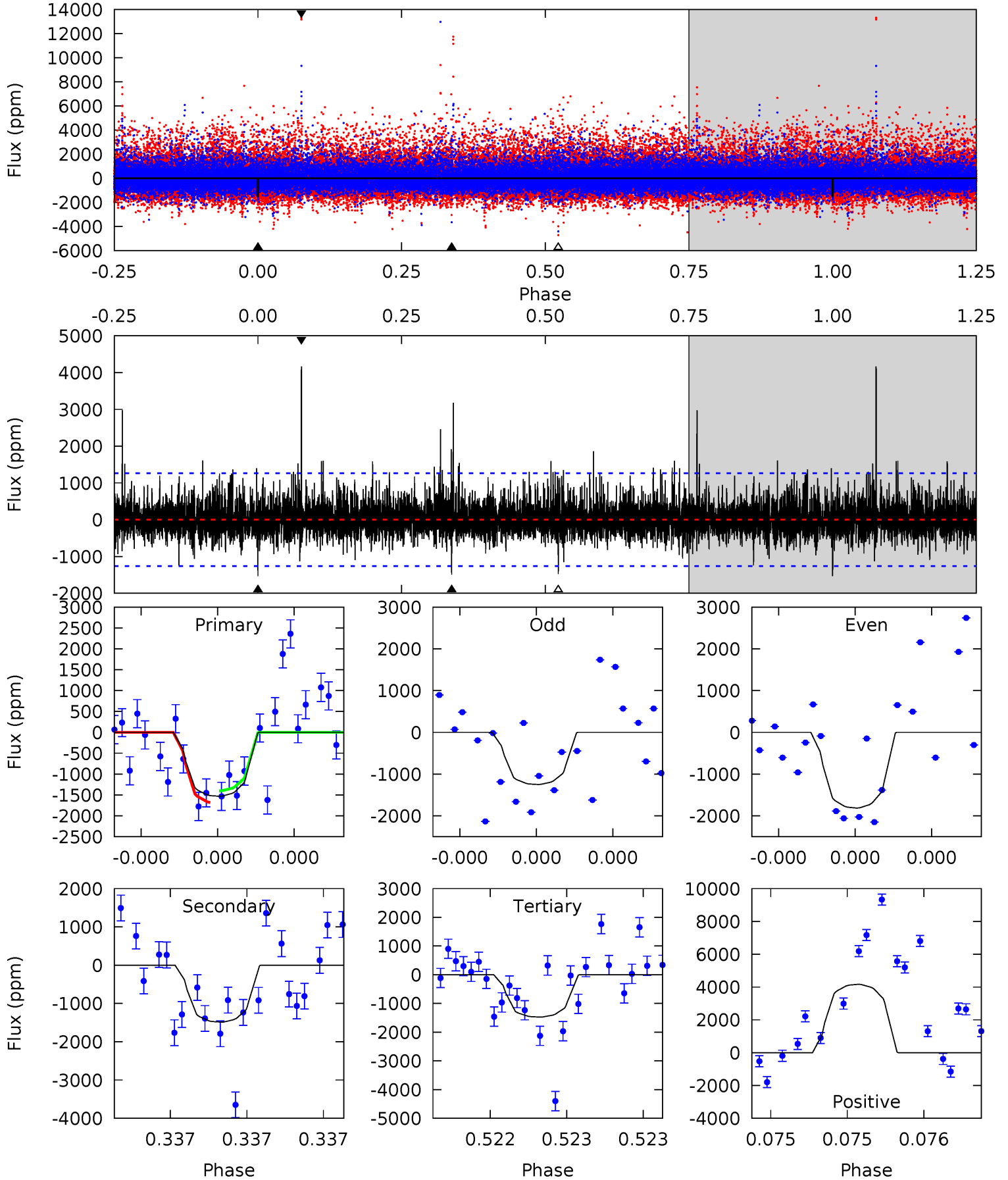
TCE 003103752-01 P=398.570210 Days $T_0=372.227784$ (BKJD)



DV Model-Shift Uniqueness Test

003103752-01, P = 398.579907 Days, E = 372.229352 Days

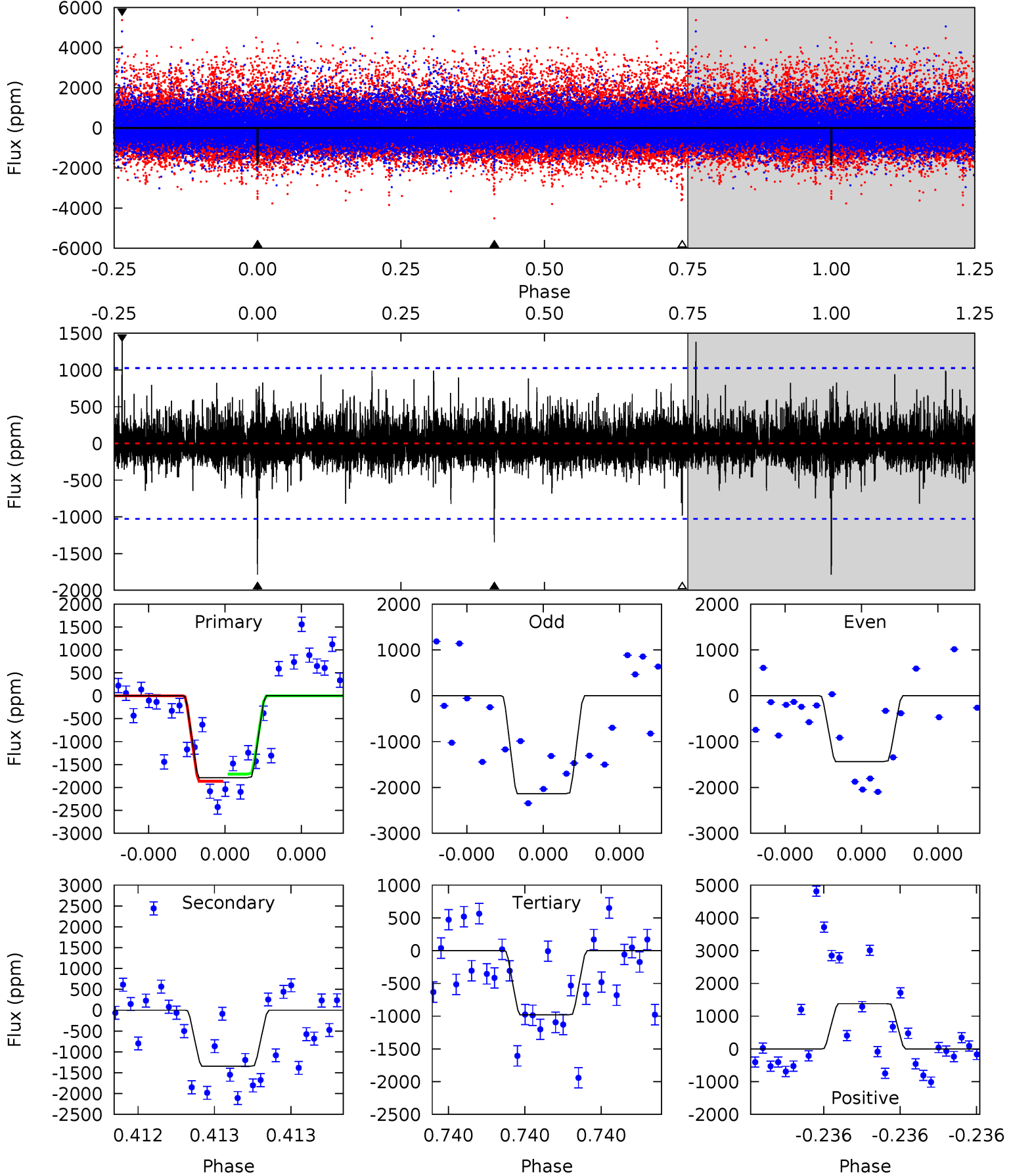
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.85	6.66	6.60	18.6	5.65	3.60	1.63	0.25	-11.8	0.06	-12.0	0.75	1.04	0.73	0.64



Alt Model-Shift Uniqueness Test

003103752-01, P = 398.570210 Days, E = 372.227784 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.83	7.40	5.40	7.59	5.65	3.59	1.06	4.44	2.24	2.01	-0.19	1.84	1.24	0.44	0.43



Stellar Parameters For KIC 003103752

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3388^{+45}_{-45}	$4.939^{+0.050}_{-0.036}$	$0.000^{+0.100}_{-0.100}$	$0.308^{+0.038}_{-0.038}$	$0.301^{+0.051}_{-0.042}$	$14.500^{+3.943}_{-2.590}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+12%/-12%	+17%/-14%	+27%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003103752-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1489 ± 224	$2.36^{+2.15}_{-1.56}$	137^{+4}_{-3}	2854^{+1096}_{-438}	$76151^{+579461}_{-55704}$
Alt.	-1346 ± 182	$2.54^{+2.04}_{-1.77}$	137^{+3}_{-4}	2753^{+1155}_{-385}	$57758^{+567160}_{-40453}$

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 $A_{obs} \gg 1.0$

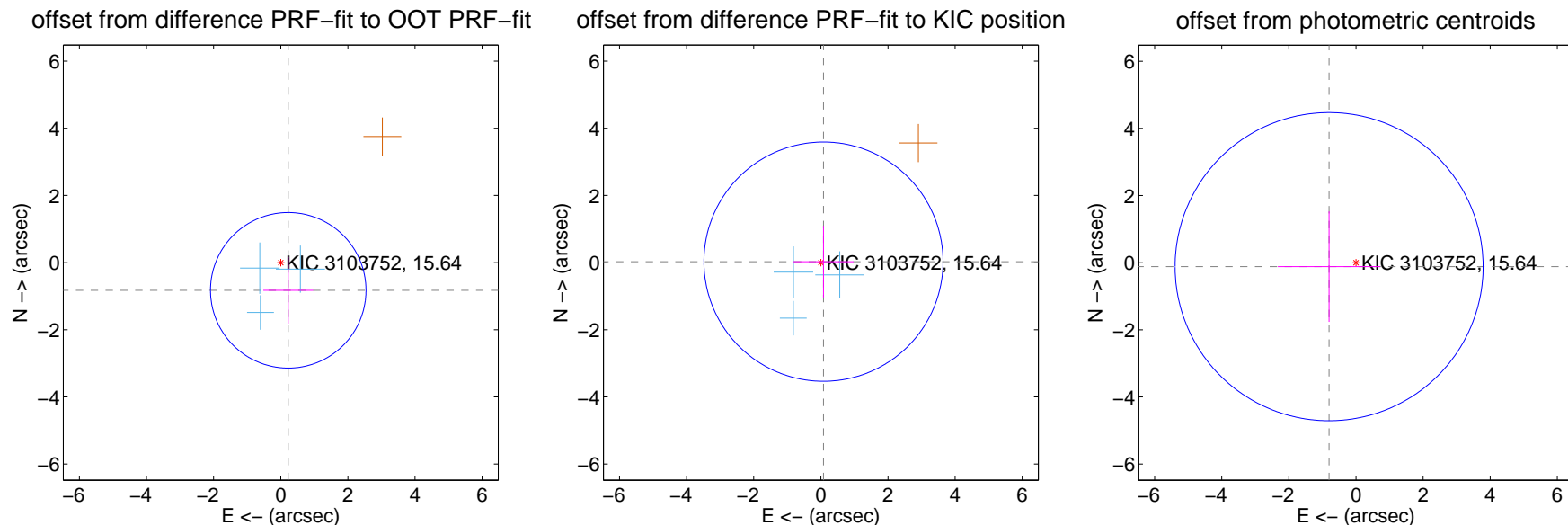
DV Centroid Data

Supplemental centroid analysis for 003103752-01. Kepler magnitude: 15.64. Transit SNR 6.69

There are 3 quarters with good PRF difference image offsets

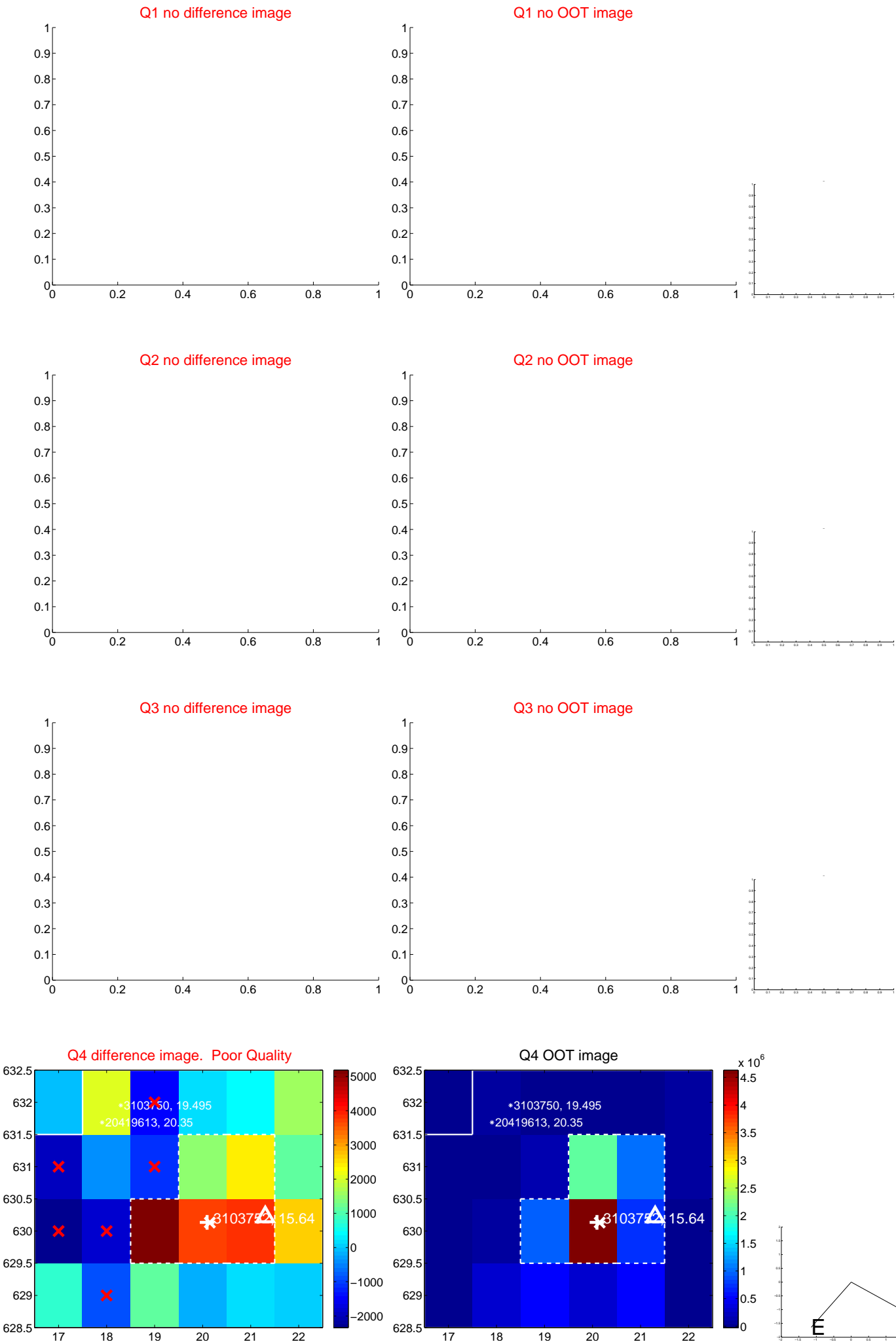
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.856 ± 0.772	1.11	-0.223 ± 0.745	-0.826 ± 0.992
PRF-fit source offset from KIC position	0.083 ± 1.188	0.07	-0.078 ± 0.895	0.028 ± 1.066
photometric centroid source offset	0.81 ± 1.53	0.53	0.80 ± 1.53	-0.12 ± 1.65



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; Δ : difference centroid. red \times : large negative pixel value.

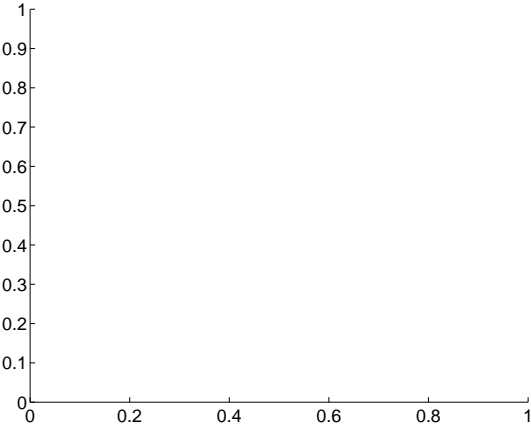
Q5 no difference image



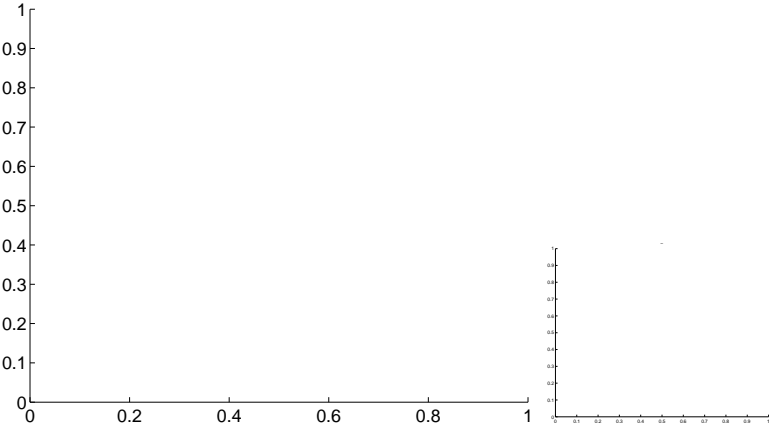
Q5 no OOT image



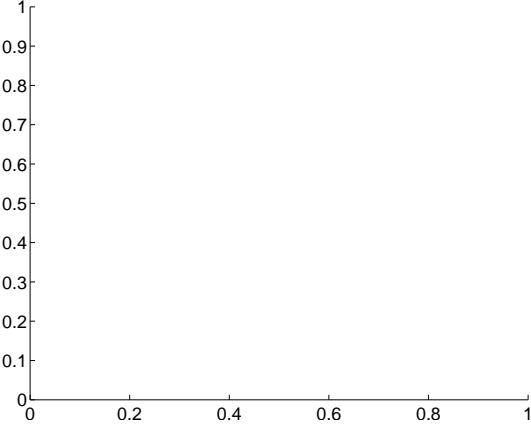
Q6 no difference image



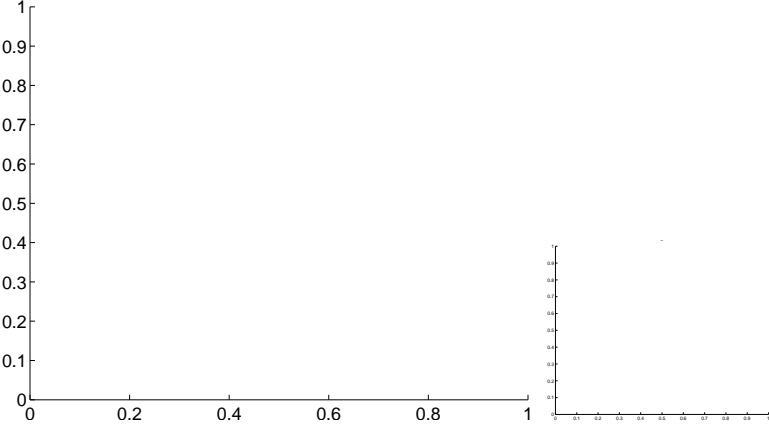
Q6 no OOT image



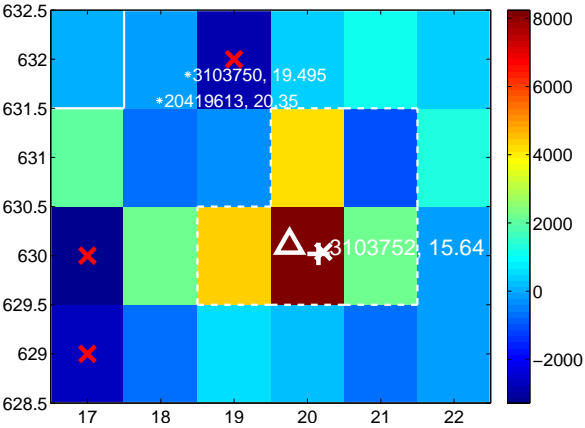
Q7 no difference image



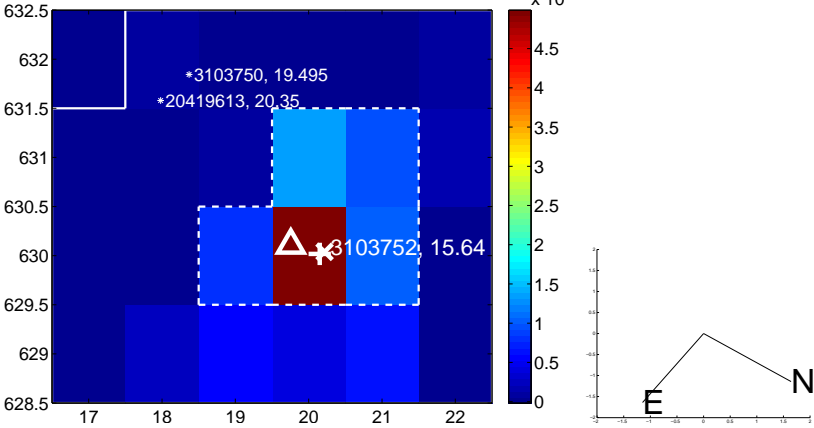
Q7 no OOT image



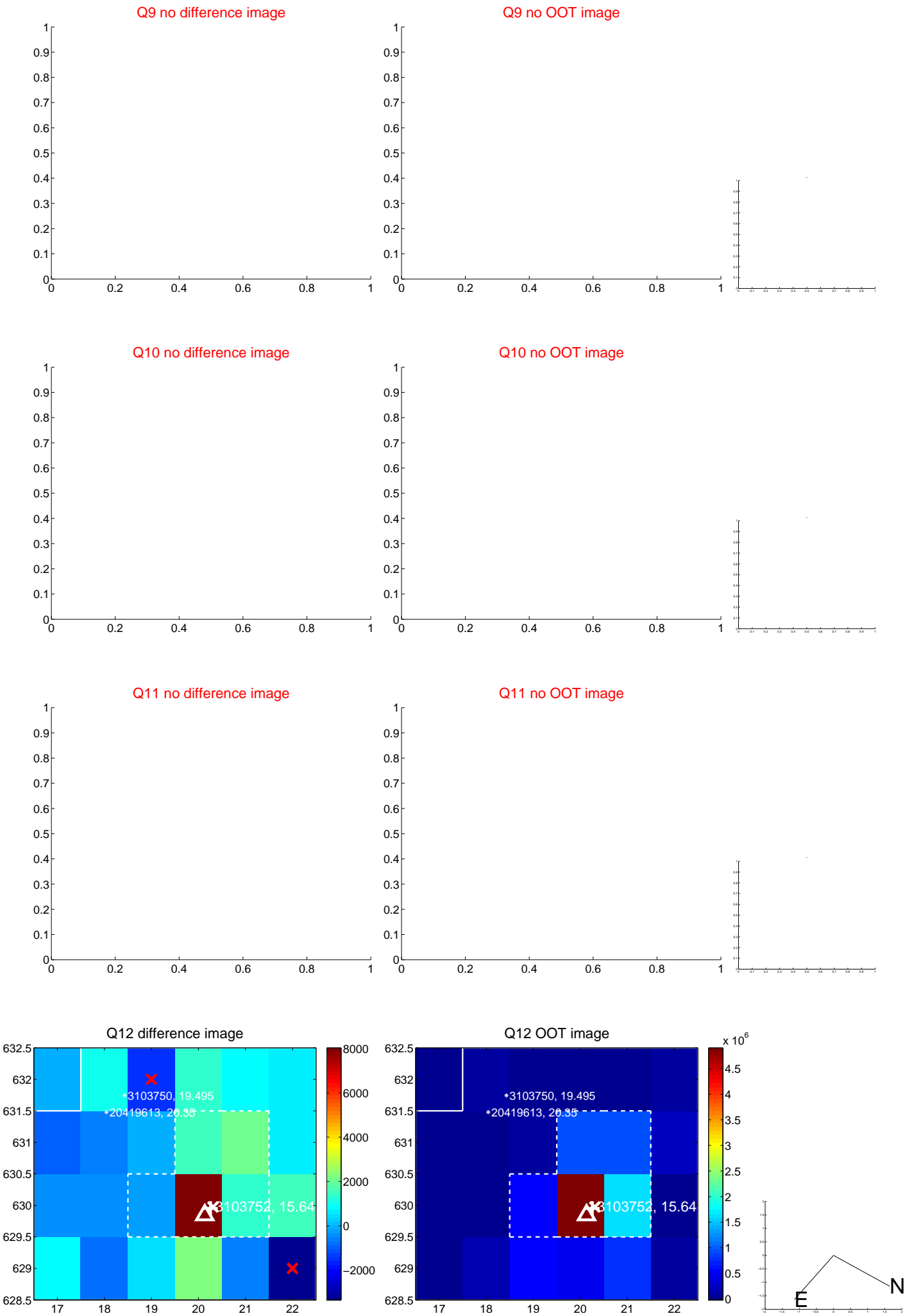
Q8 difference image



Q8 OOT image



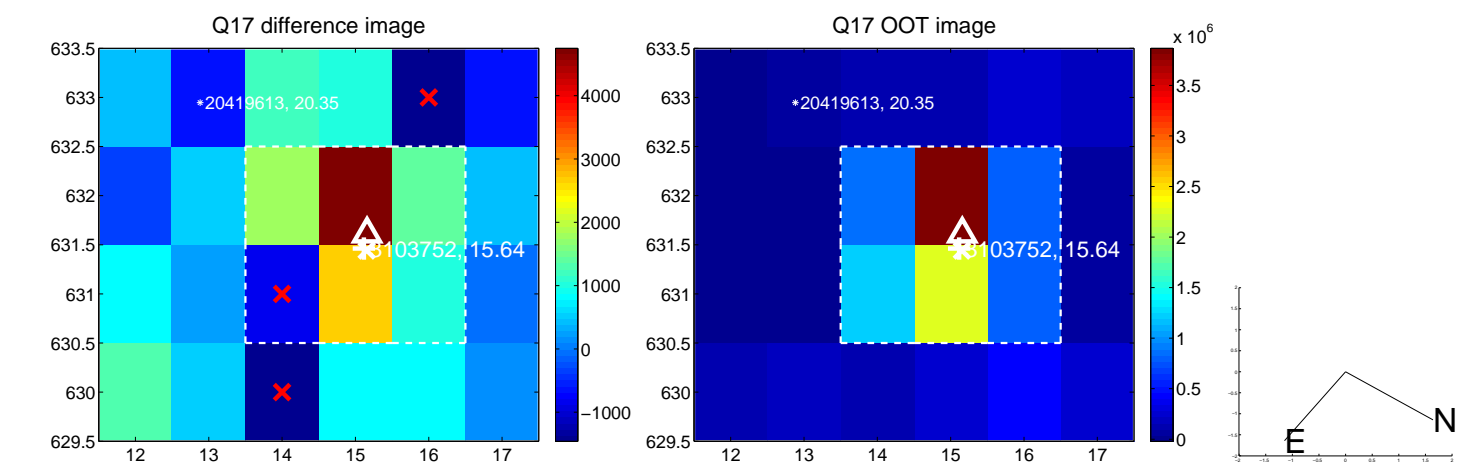
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



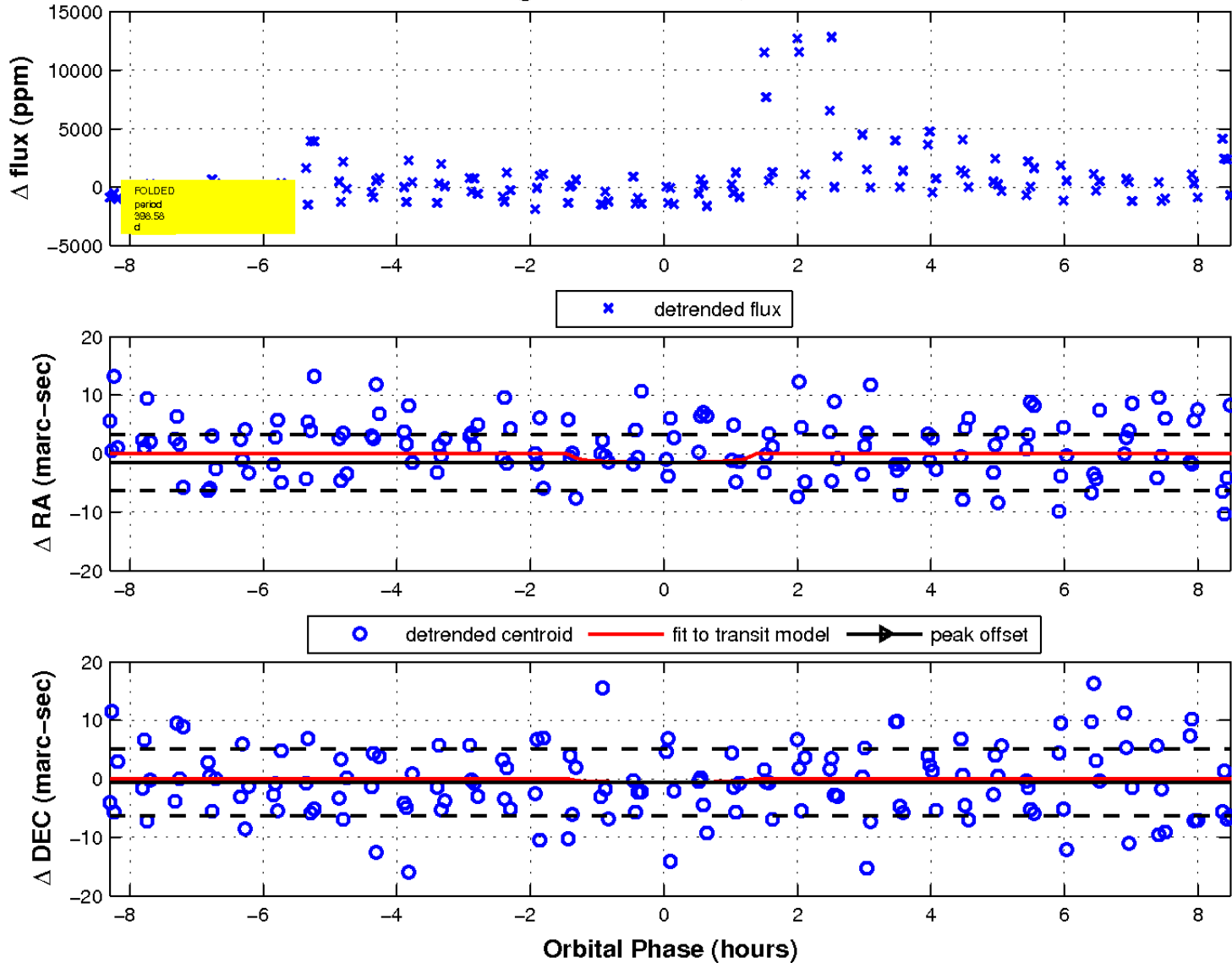
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



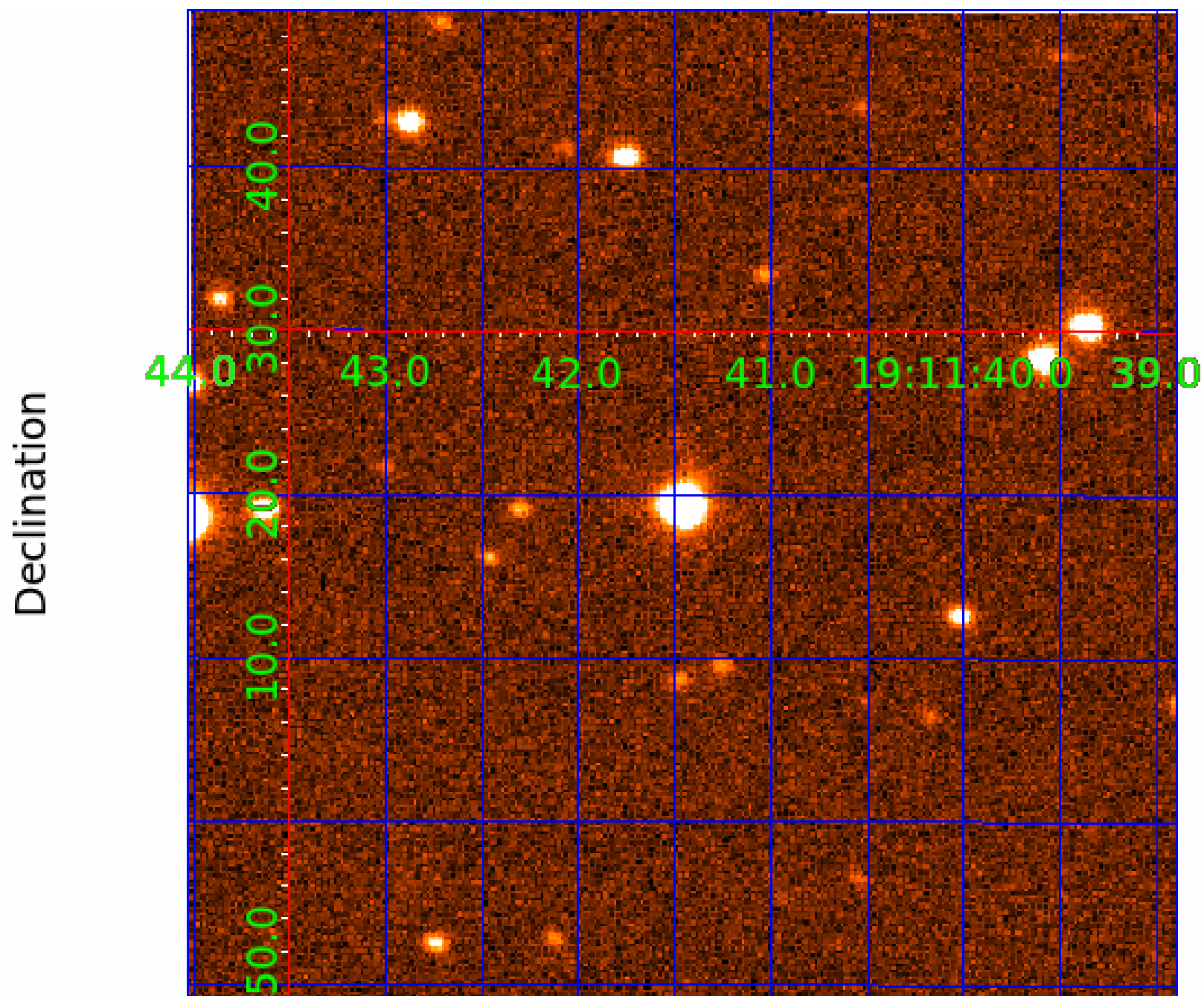
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



KIC 003103752

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})
003103752-01	OBS	No	398.579907	372.229352	2263.1	2.847	11.0	6.7	0.31	3388	1.46	0.02
003103752-02	OBS	No	415.591072	451.429680	3496.2	6.239	11.7	9.2	0.31	3388	2.09	0.02
003103752-03	OBS	No	411.506159	195.499109	2001.1	4.116	11.1	6.6	0.31	3388	1.42	0.02
003103752-04	OBS	No	438.651193	175.780323	2018.2	4.840	9.8	7.0	0.31	3388	1.43	0.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003103752-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
003103752-03	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—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

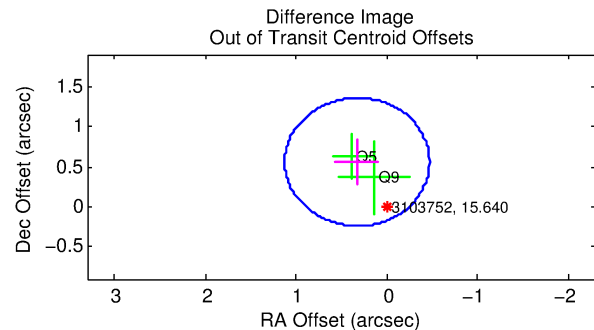
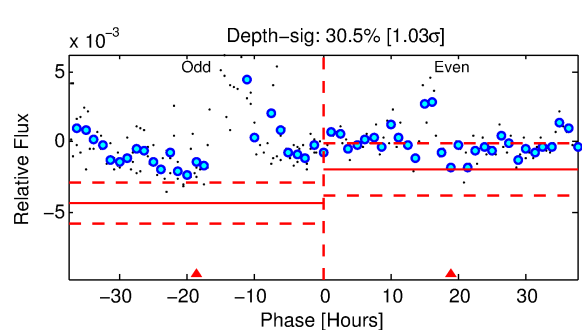
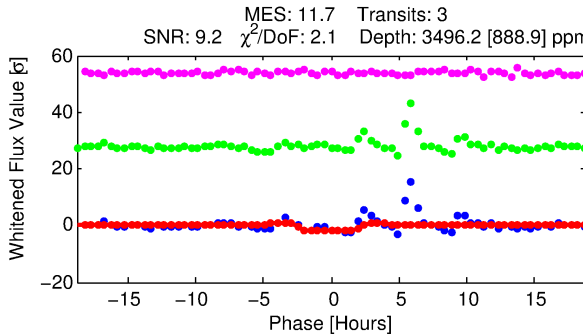
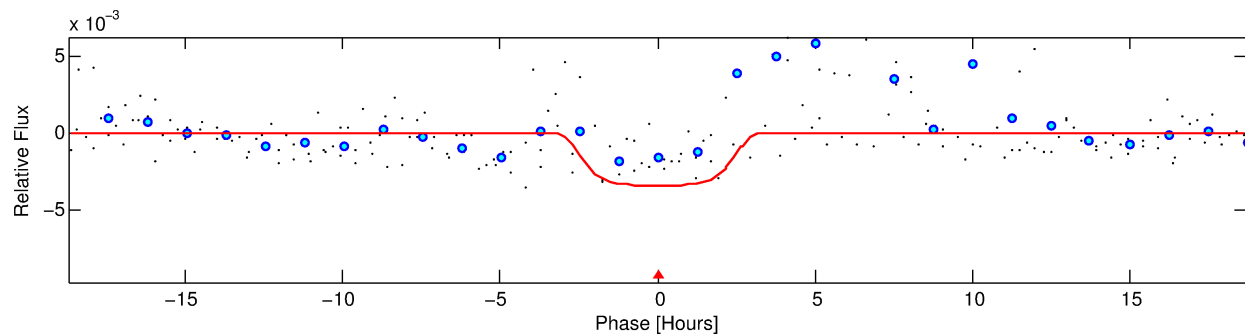
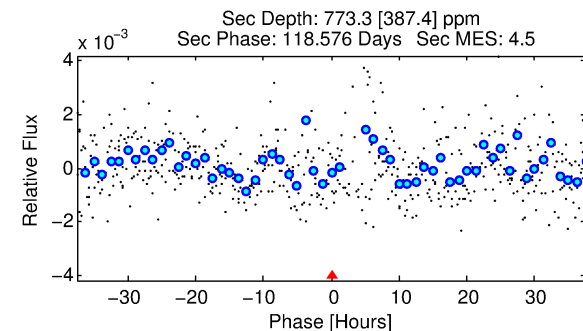
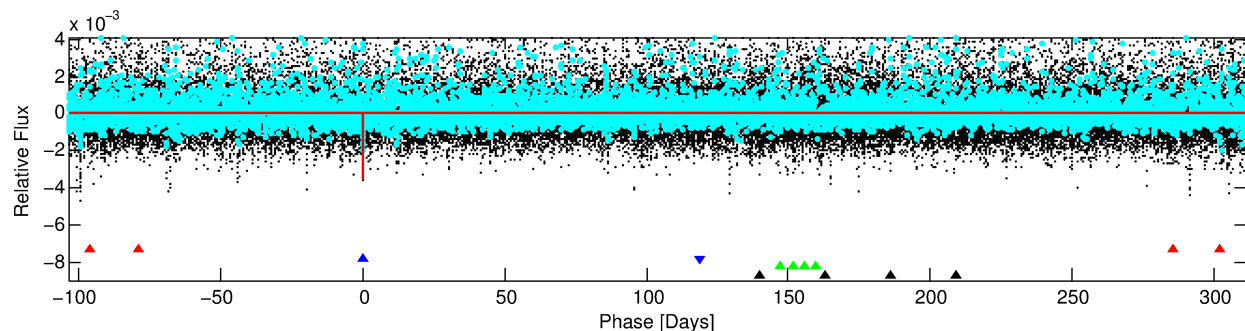
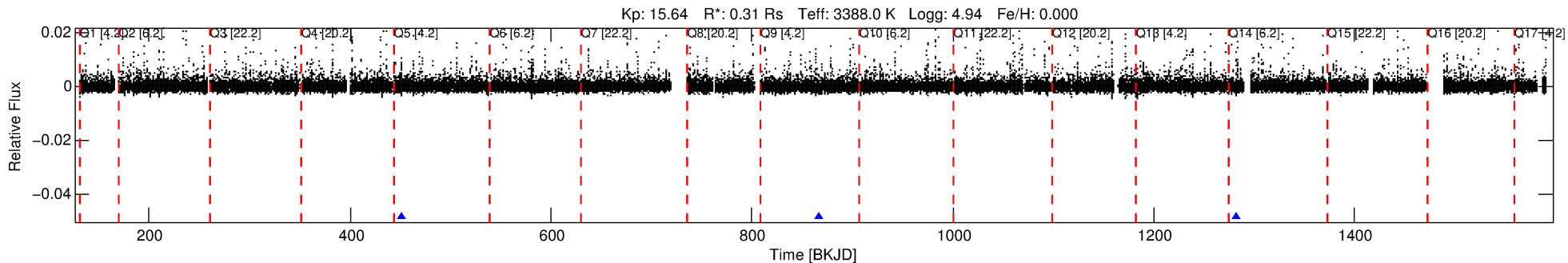
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003103752-02

No Significant Match Found

DV One-Page Summary

KIC: 3103752 Candidate: 2 of 4 Period: 415.591 d



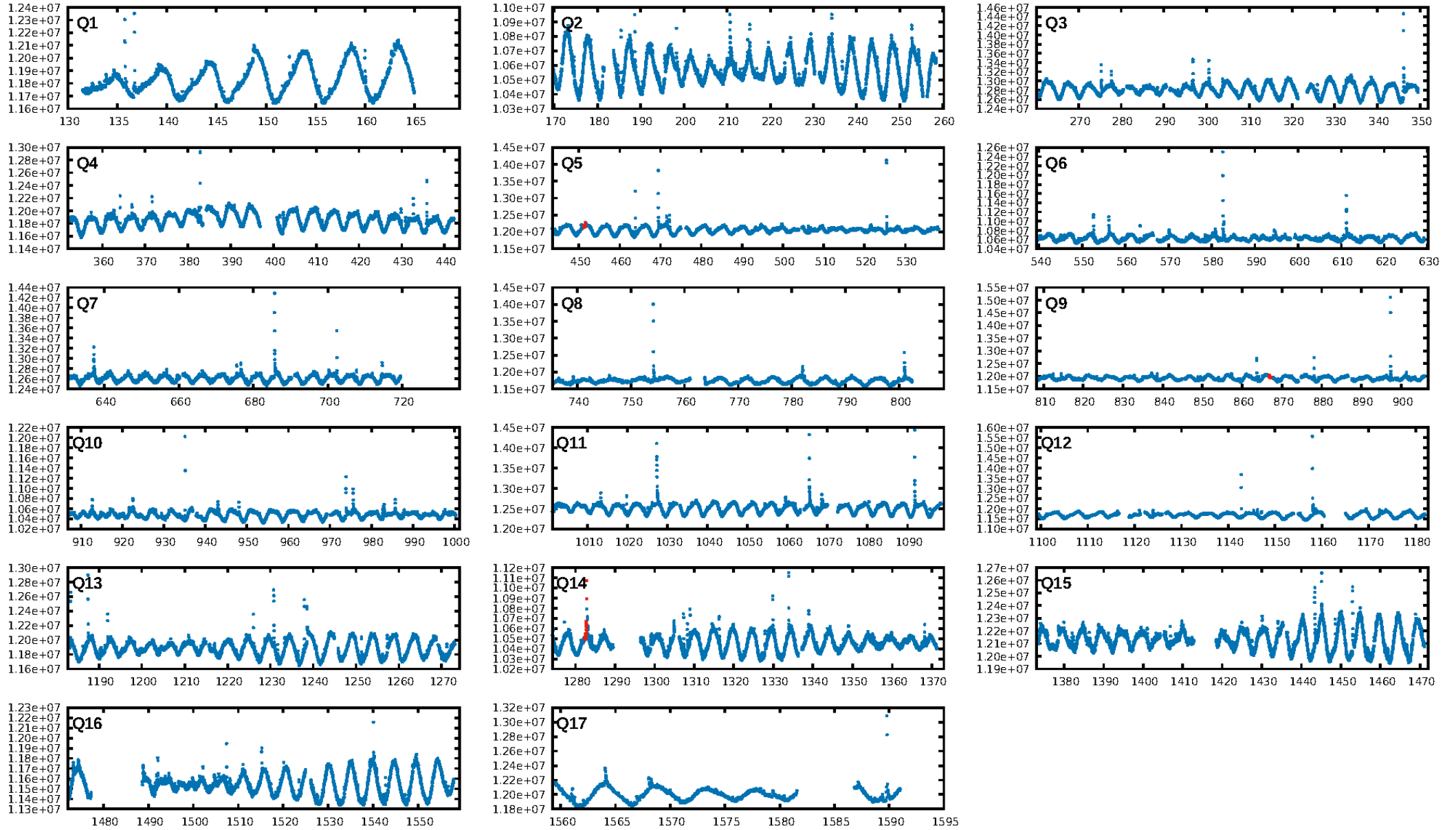
DV Fit Results:

Period = 415.59107 [0.01259] d
Epoch = 451.4297 [0.0157] BKJD
Rp/R* = 0.0621 [0.0123]
a/R* = 322.32 [163.91]
b = 0.85 [0.17]
Seff = 0.02 [0.00]
Teq = 97 [3] K
Rp = 2.09 [0.49] Re
a = 0.7303 [0.0663] AU
Ag = 52008.72 [33739.67] [1.54σ]
Teffp = 2266 [363] K [5.97σ]

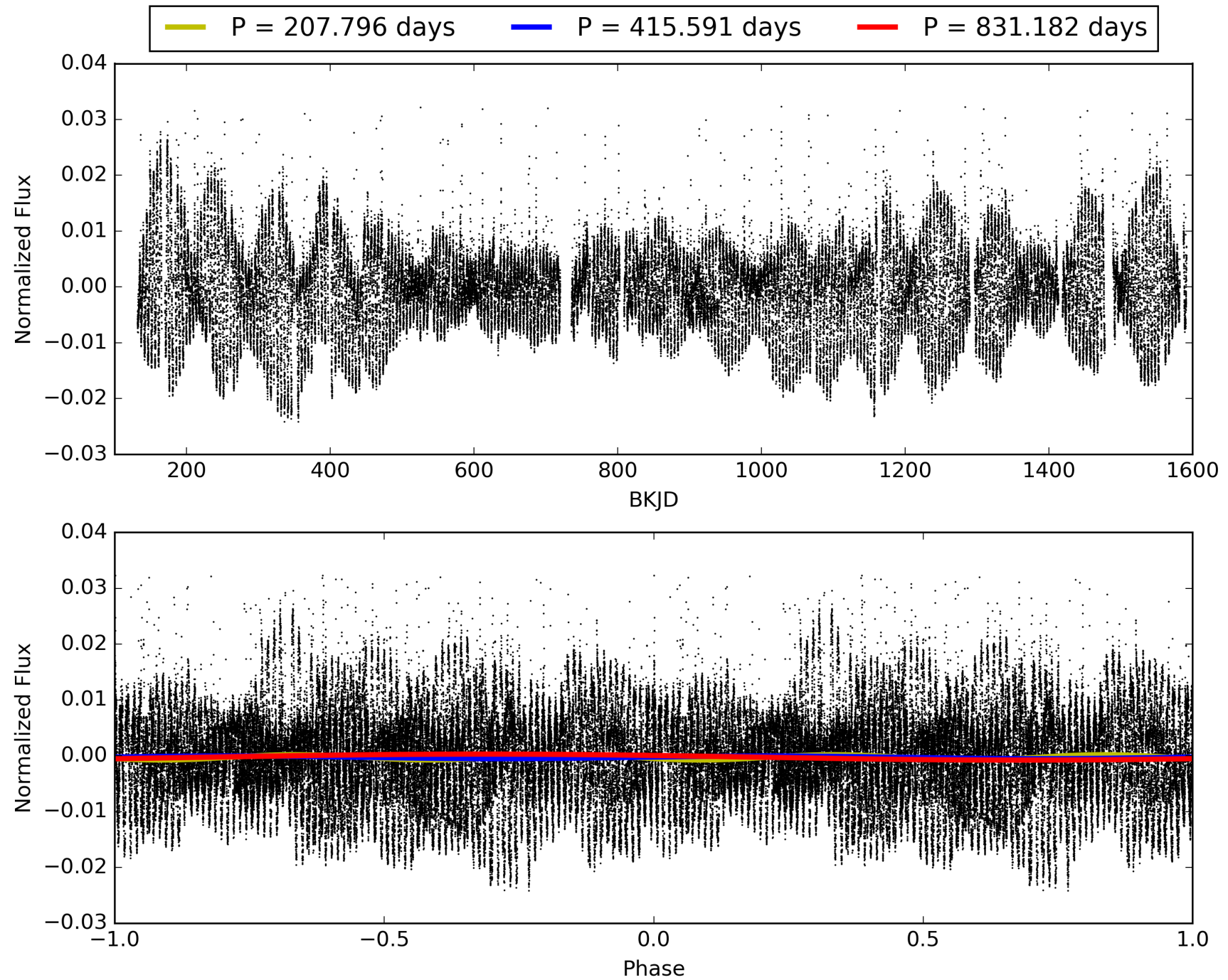
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [13.12σ]
LongPeriod-sig: 100.0% [70.09σ]
ModelChiSquare2-sig: 0.0%
a/R* = 322.32 [163.91]
Bootstrap-pfa: 4.08e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.6012
Centroid-sig: 0.5%
Centroid-so: 1.722 arcsec [2.28σ]
OotOffset-rm: 0.647 arcsec [2.43σ]
KicOffset-rm: 0.587 arcsec [2.29σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 003103752-02, PDC Light Curves

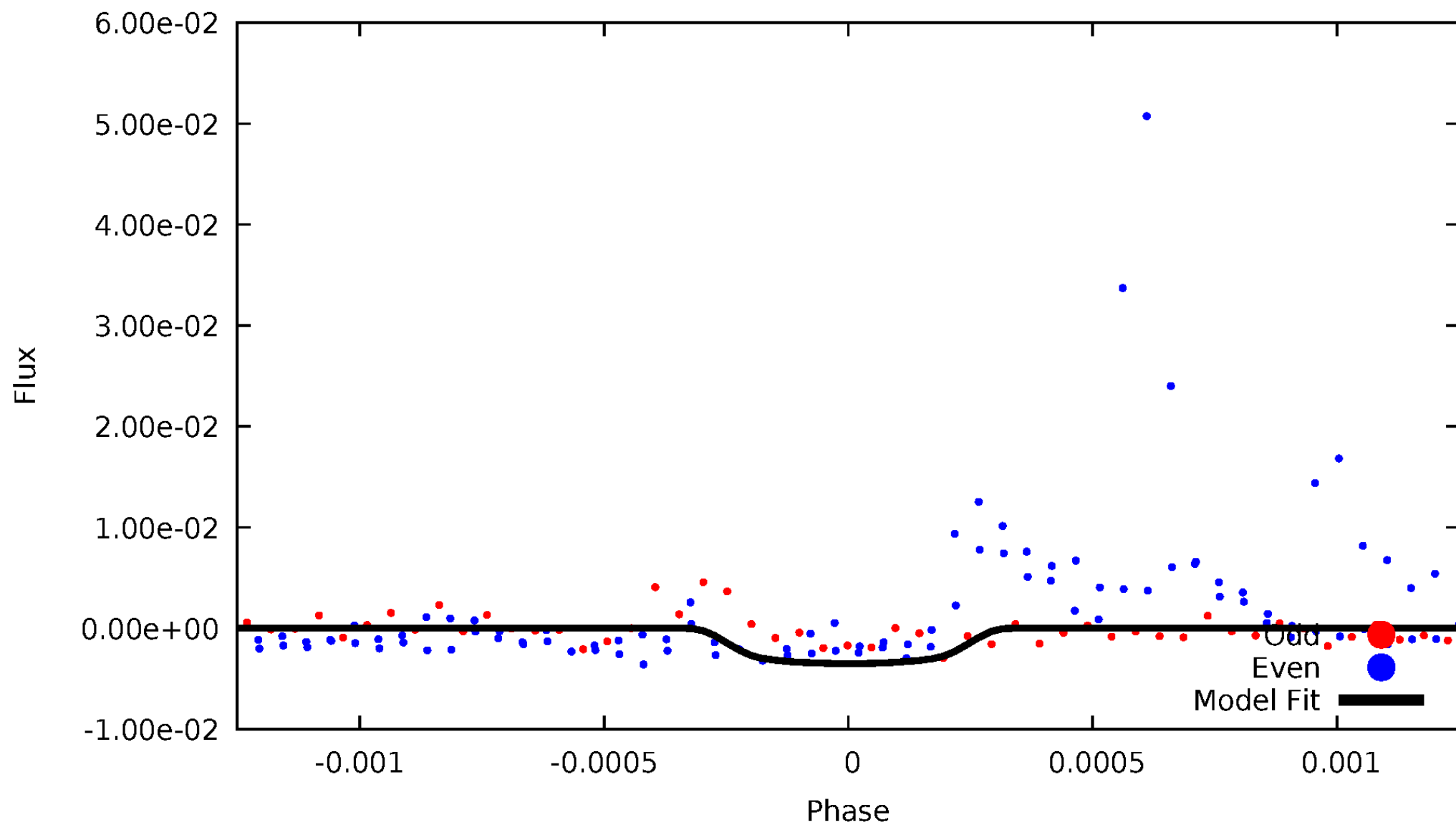


TCE 003103752-02



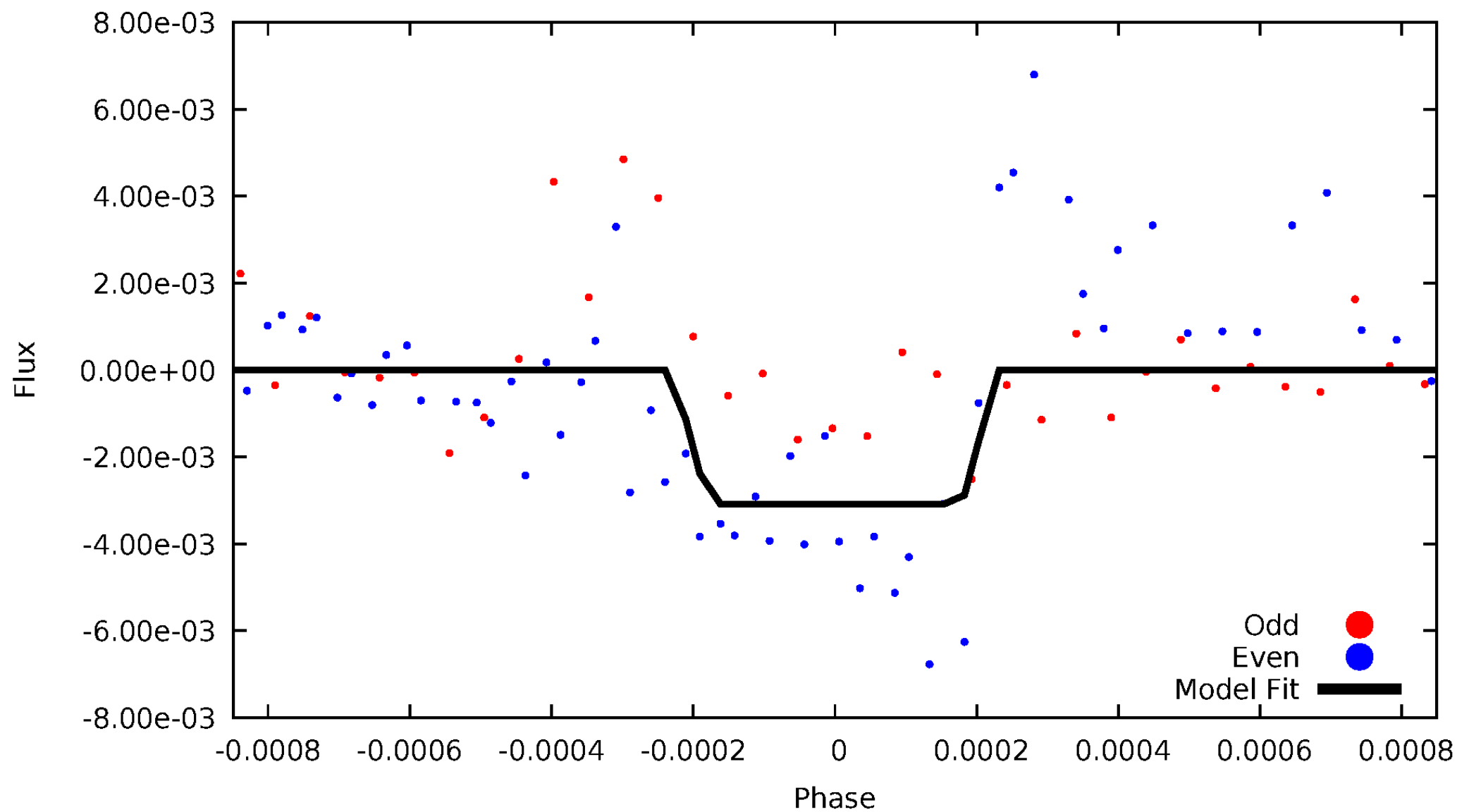
DV Odd/Even

TCE 003103752-02



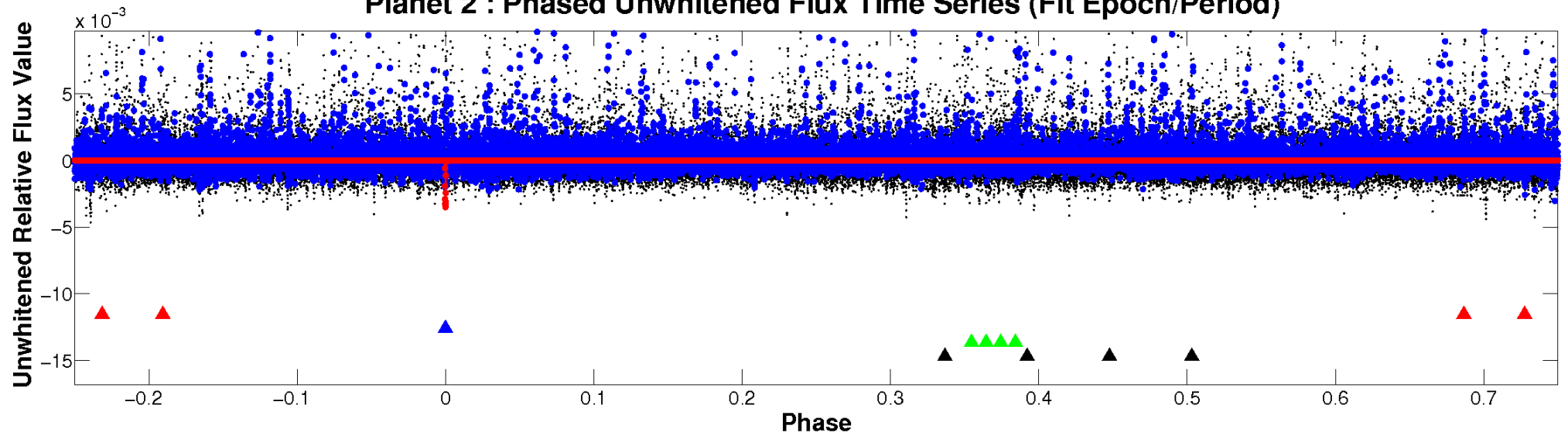
ALT Odd/Even

TCE 003103752-02

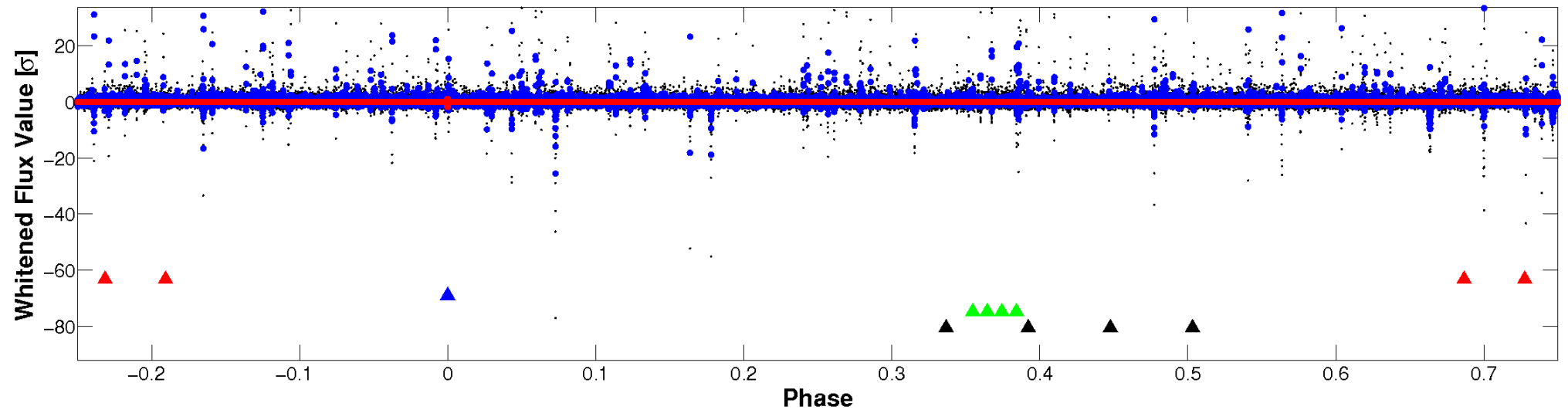


Non-Whitened Vs. Whitened Light Curve

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

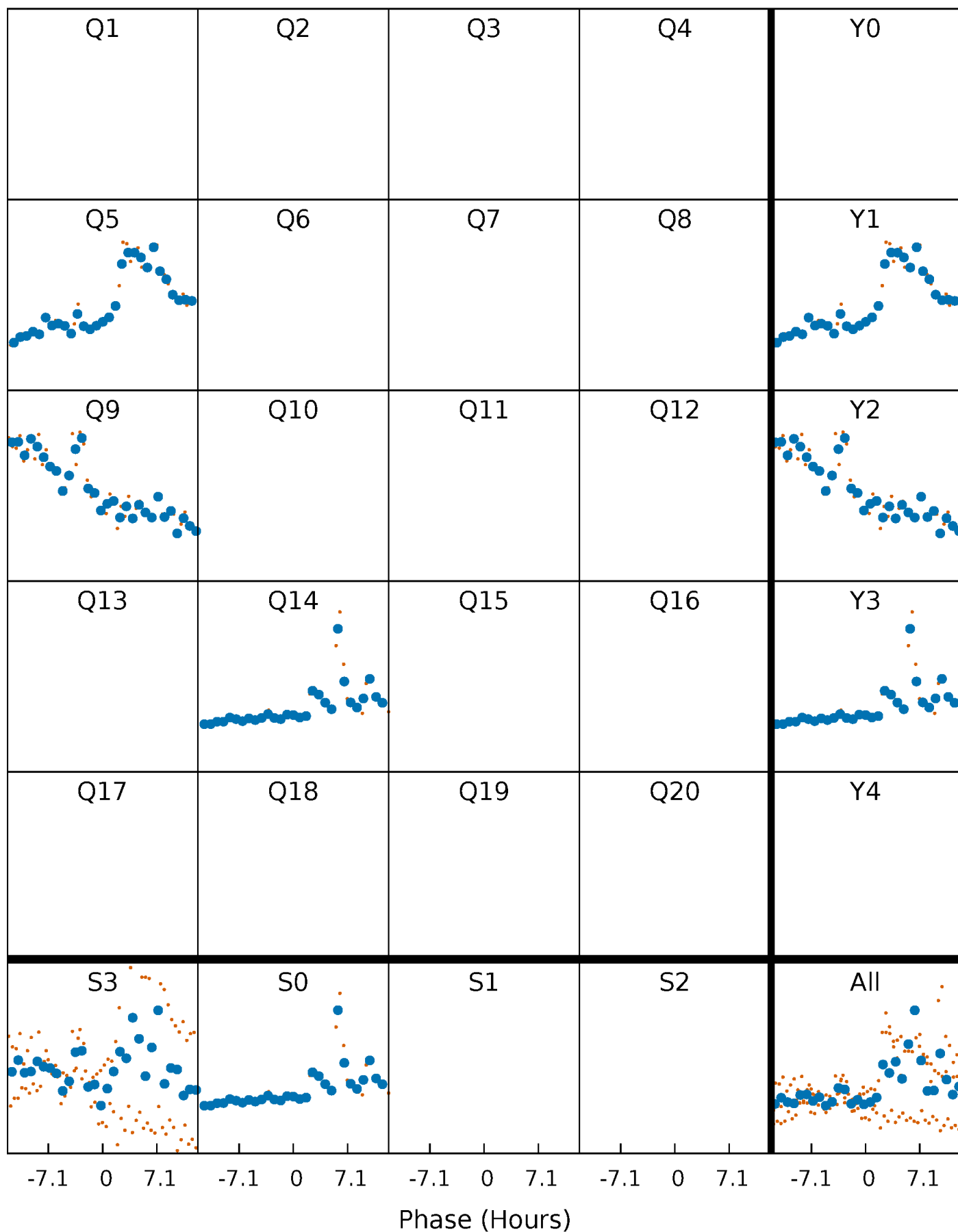


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 003103752-02 $P=415.591072$ Days $T_0=451.429680$ (BKJD)



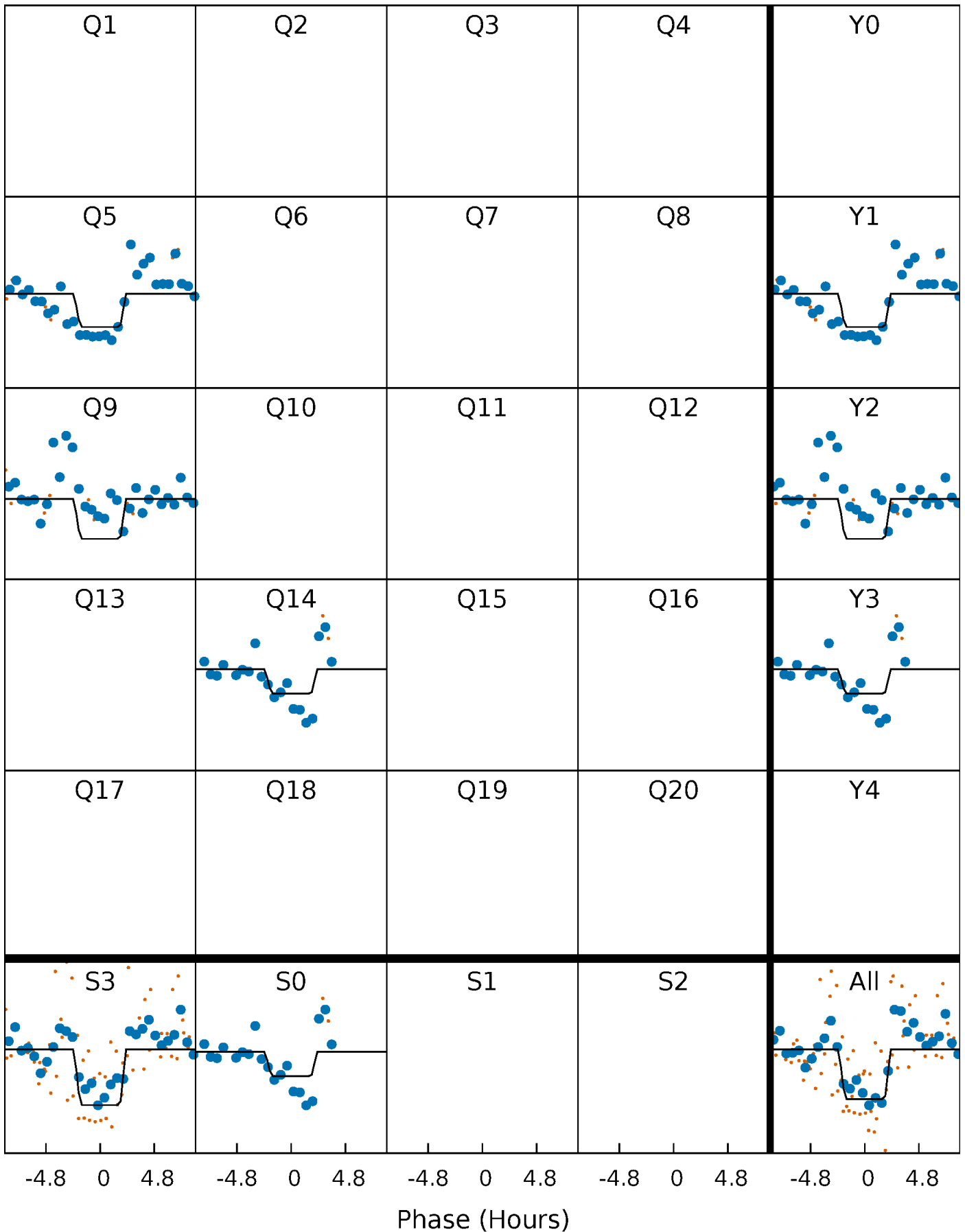
DV Quarter-Phased Transit Curves

TCE 003103752-02 $P=415.591072$ Days $T_0=451.429680$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

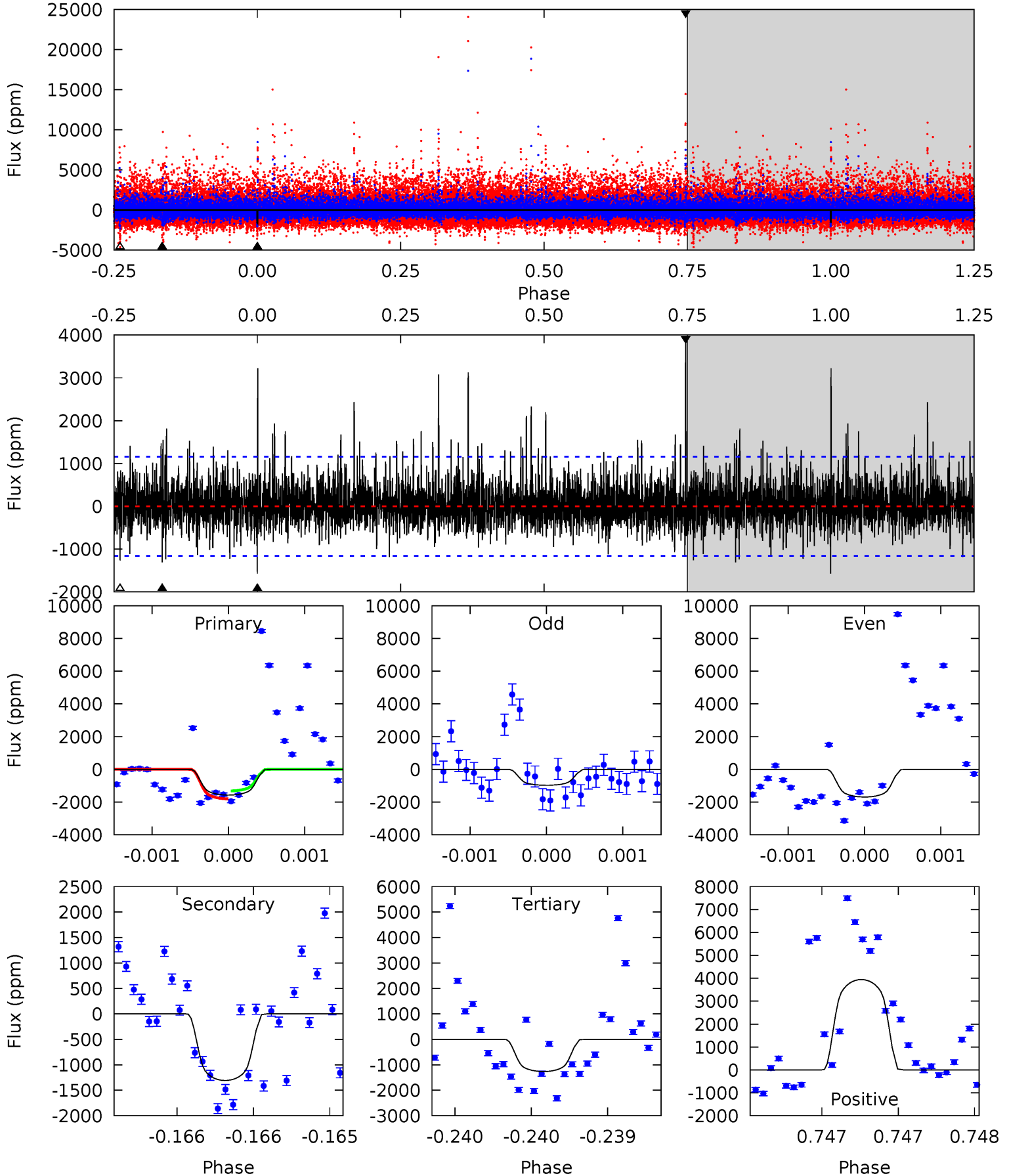
TCE 003103752-02 $P=415.584555$ Days $T_0=451.436836$ (BKJD)



DV Model-Shift Uniqueness Test

003103752-02, P = 415.591072 Days, E = 35.838608 Days

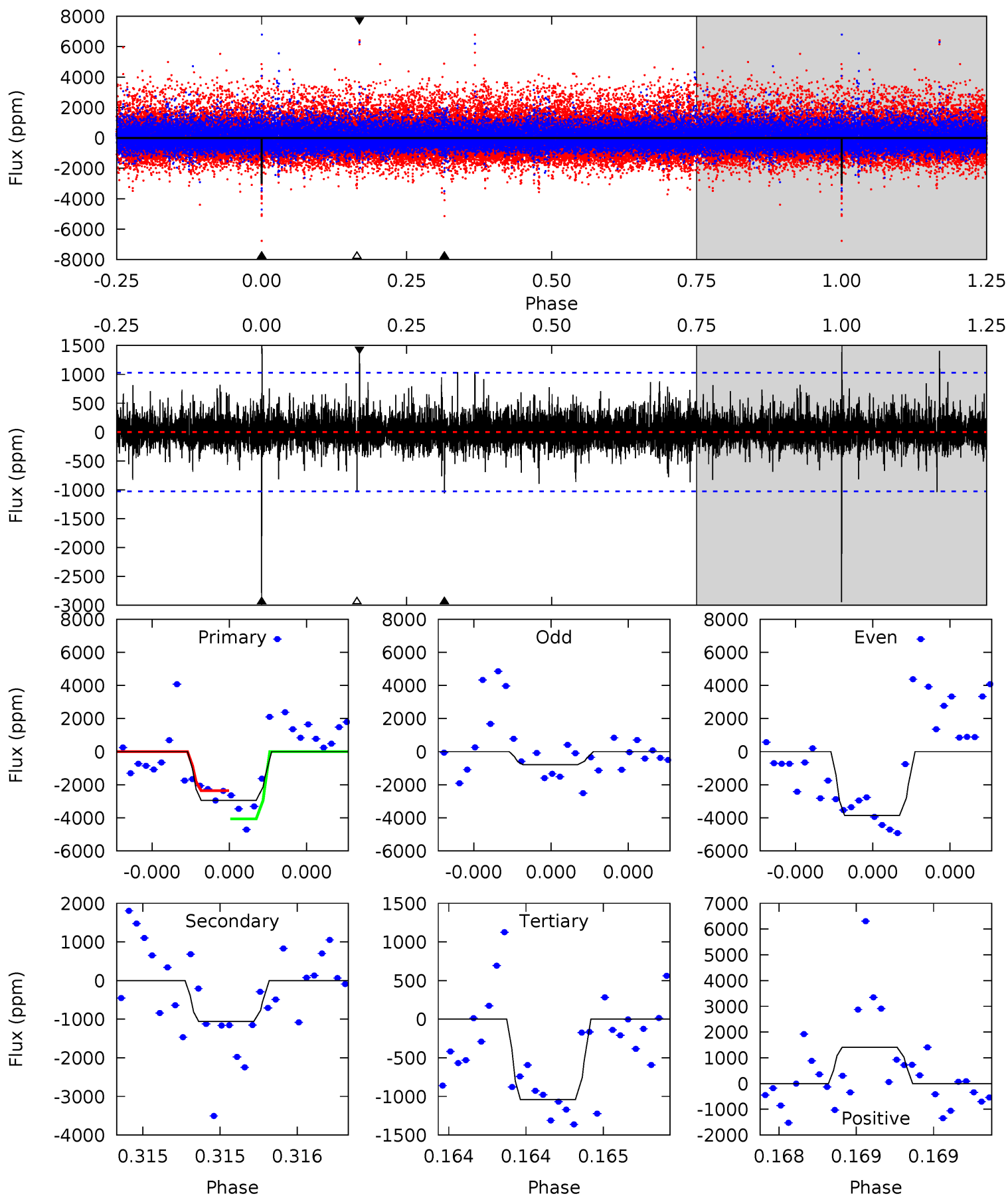
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.51	6.25	6.03	18.8	5.52	3.40	1.97	1.49	-11.3	0.22	-12.6	0.87	1.11	0.71	1.17



Alt Model-Shift Uniqueness Test

003103752-02, P = 415.584555 Days, E = 35.852281 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	5.77	5.67	7.66	5.59	3.51	1.08	10.4	8.37	0.10	-1.89	7.55	0.76	0.34	4.53



Stellar Parameters For KIC 003103752

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3388^{+45}_{-45}	$4.939^{+0.050}_{-0.036}$	$0.000^{+0.100}_{-0.100}$	$0.308^{+0.038}_{-0.038}$	$0.301^{+0.051}_{-0.042}$	$14.500^{+3.943}_{-2.590}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+12%/-12%	+17%/-14%	+27%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003103752-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1308 ± 209	$2.09^{+0.49}_{-0.45}$	135^{+3}_{-3}	2892^{+200}_{-161}	87909^{+52973}_{-31166}
Alt.	-1060 ± 184	$1.87^{+0.45}_{-0.45}$	135^{+3}_{-3}	2897^{+231}_{-169}	90210^{+65645}_{-32813}

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 $A_{obs} \gg 1.0$

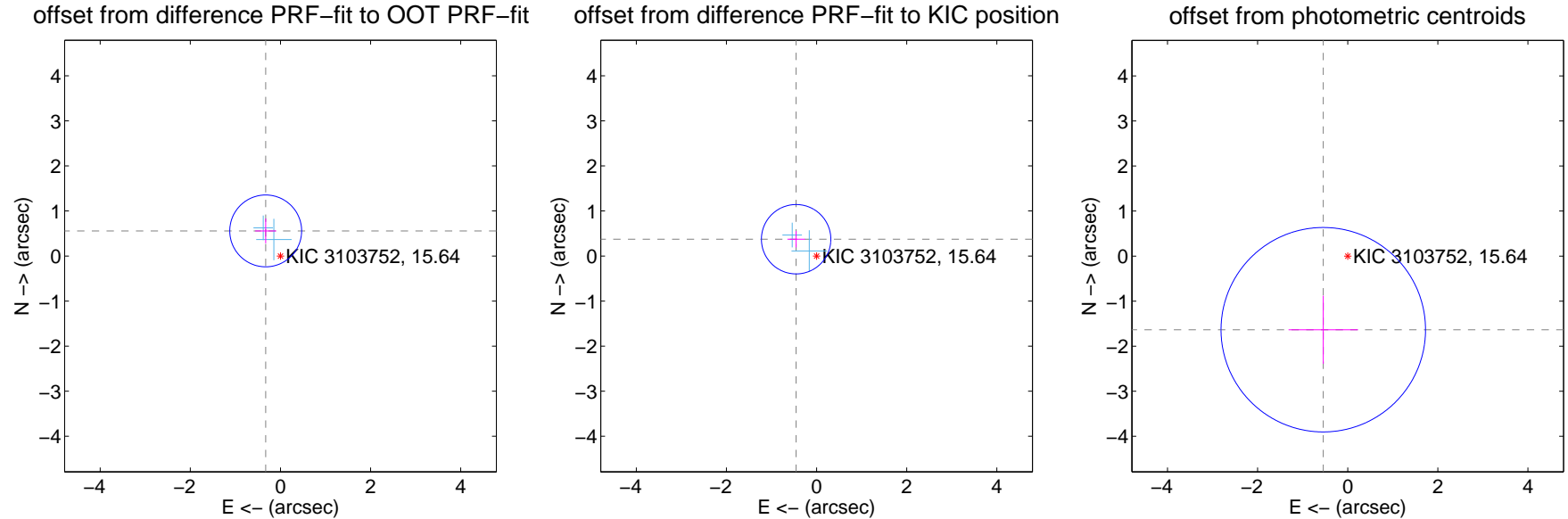
DV Centroid Data

Supplemental centroid analysis for 003103752-02. Kepler magnitude: 15.64. Transit SNR 9.22

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.647 ± 0.266	2.43	0.328 ± 0.234	0.558 ± 0.276
PRF-fit source offset from KIC position	0.587 ± 0.257	2.29	0.454 ± 0.194	0.373 ± 0.182
photometric centroid source offset	1.72 ± 0.76	2.28	0.54 ± 0.77	-1.63 ± 0.76

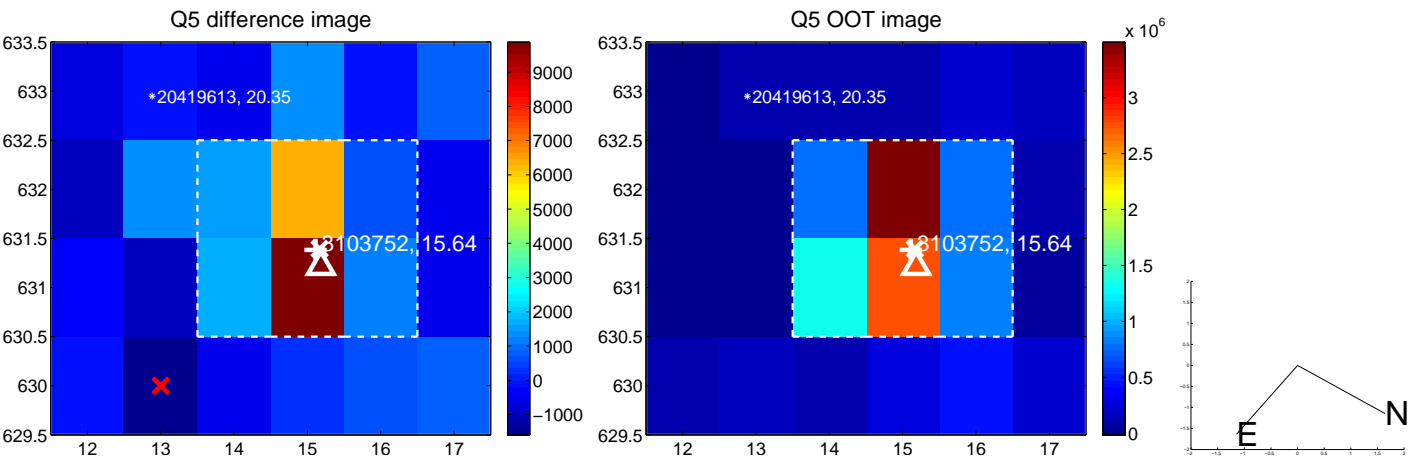


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

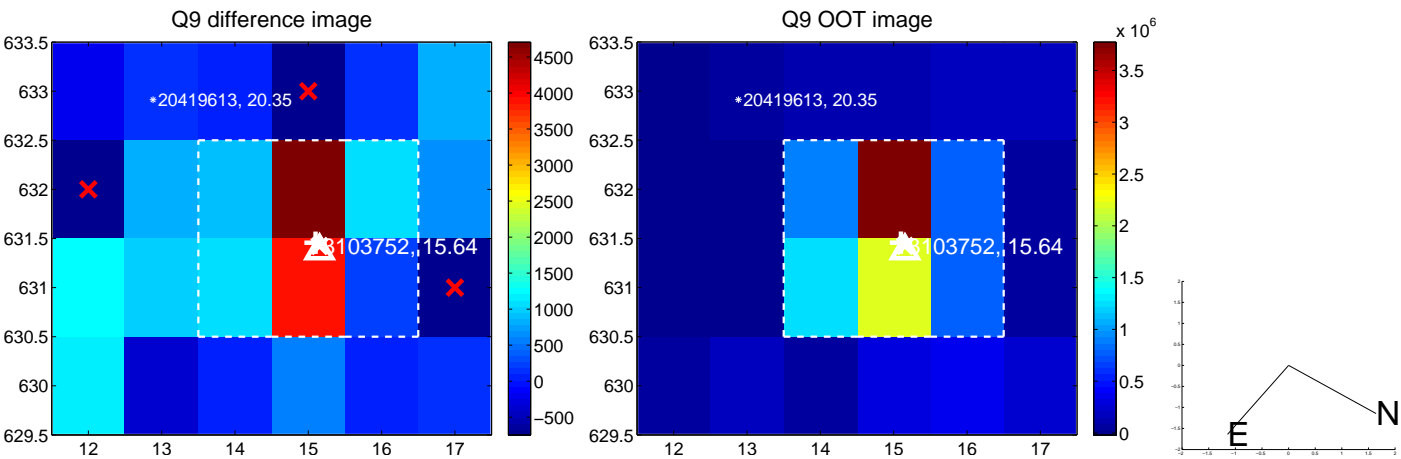
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



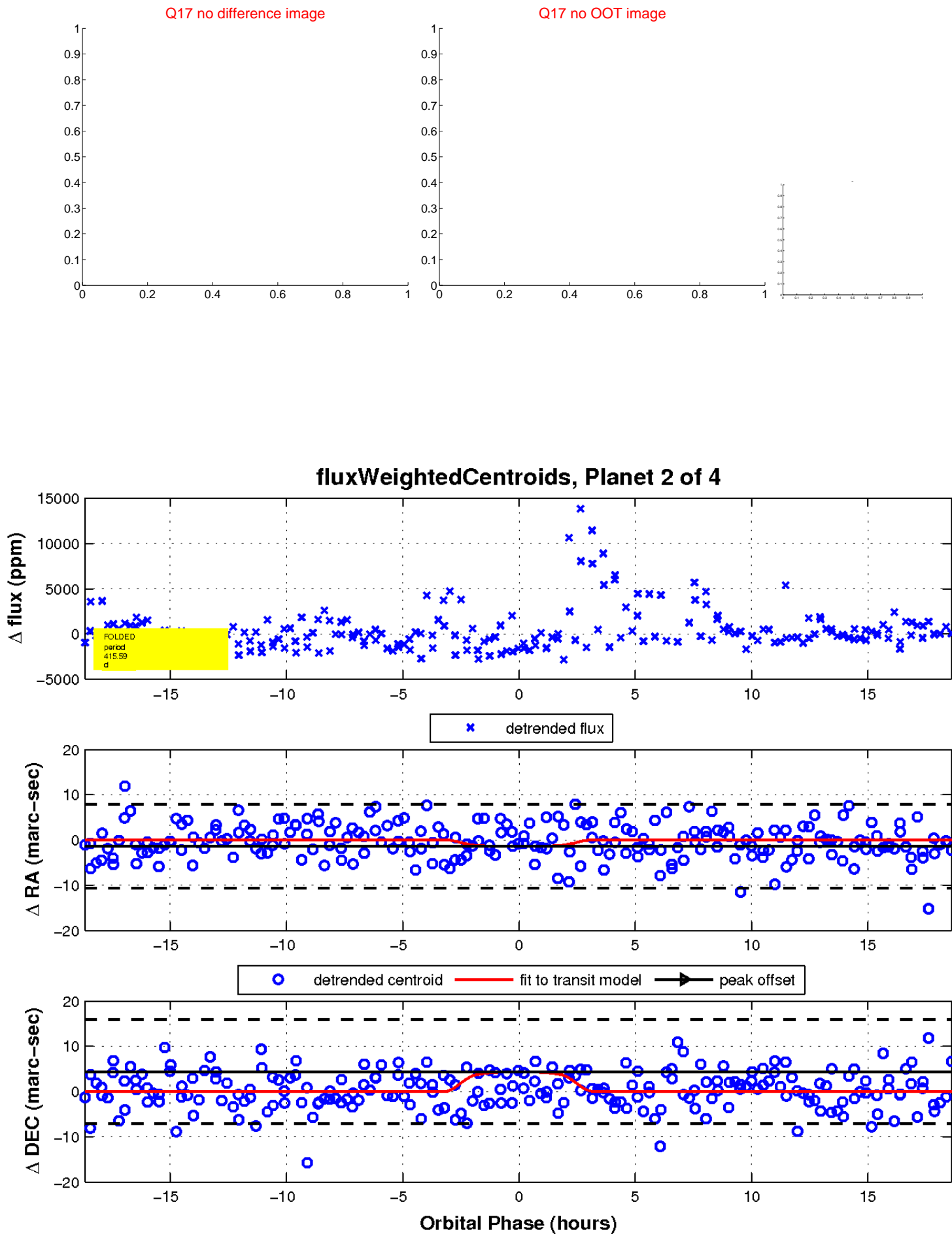
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



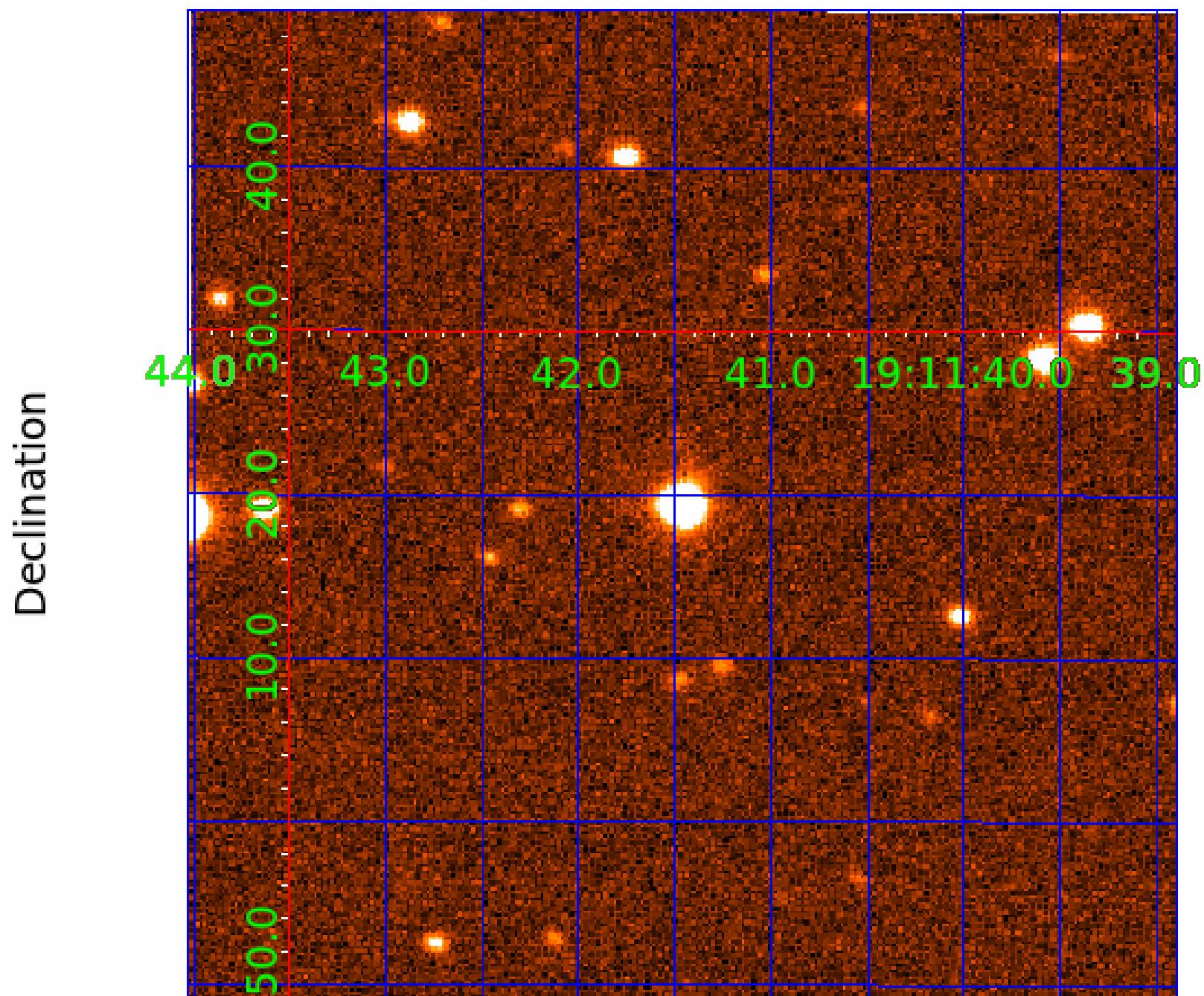
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 003103752

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})
003103752-01	OBS	No	398.579907	372.229352	2263.1	2.847	11.0	6.7	0.31	3388	1.46	0.02
003103752-02	OBS	No	415.591072	451.429680	3496.2	6.239	11.7	9.2	0.31	3388	2.09	0.02
003103752-03	OBS	No	411.506159	195.499109	2001.1	4.116	11.1	6.6	0.31	3388	1.42	0.02
003103752-04	OBS	No	438.651193	175.780323	2018.2	4.840	9.8	7.0	0.31	3388	1.43	0.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003103752-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
003103752-03	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—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

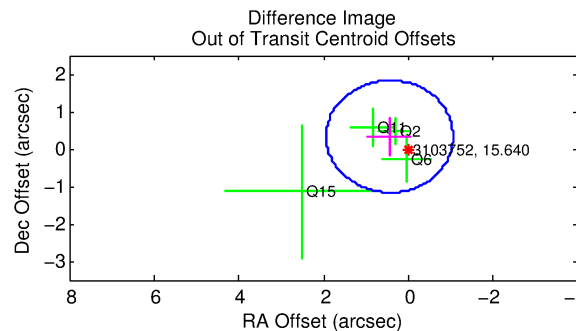
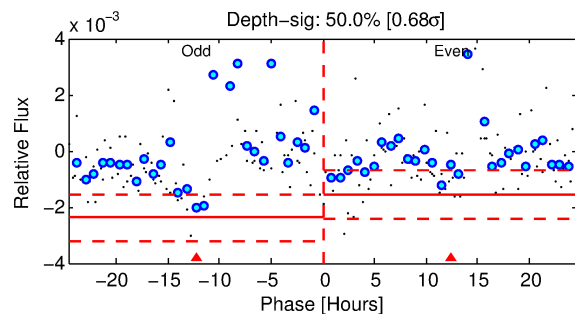
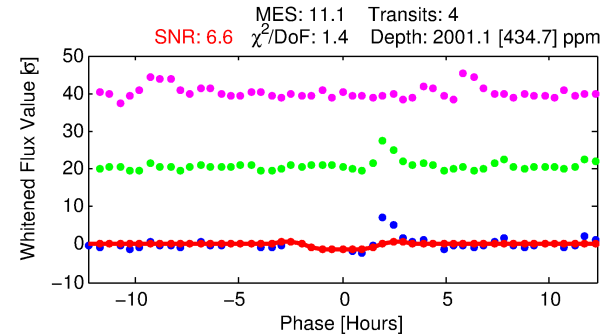
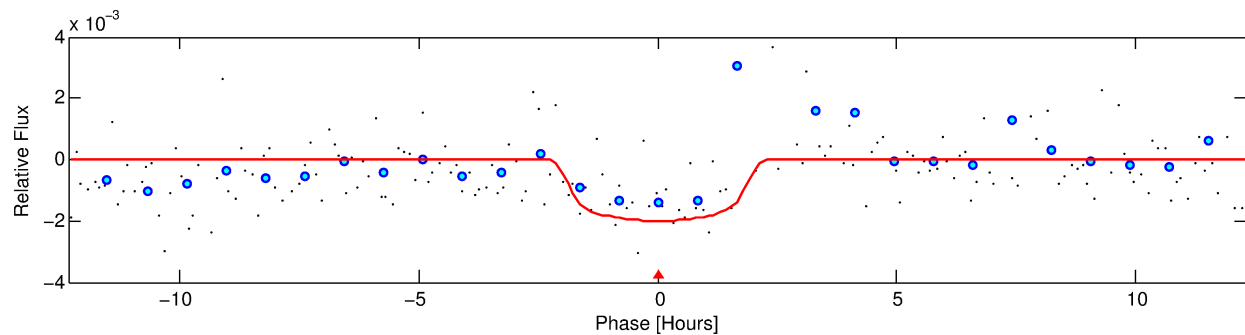
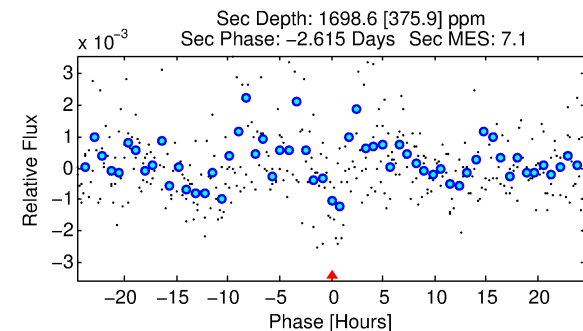
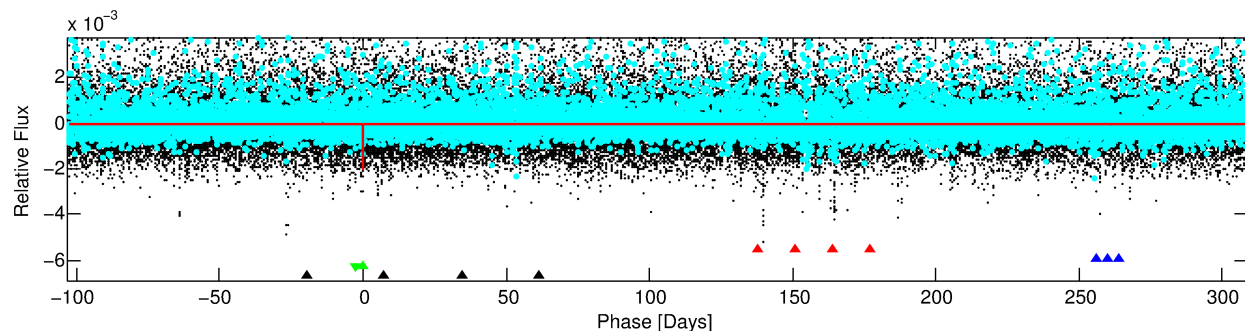
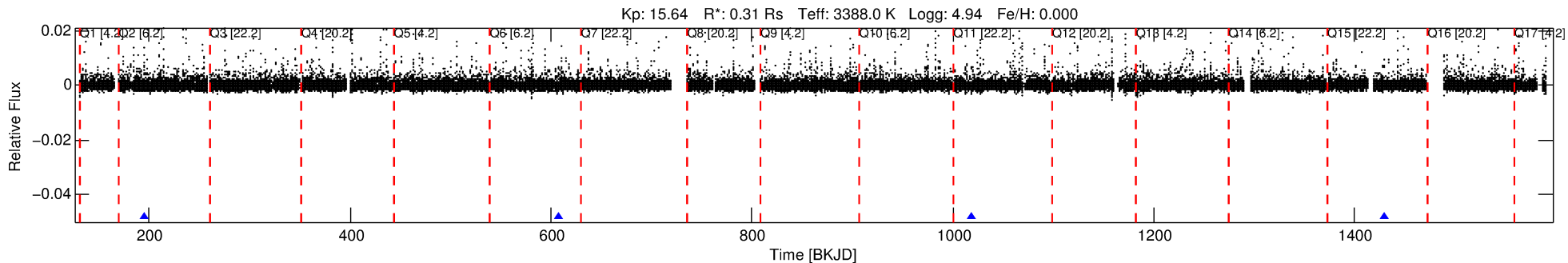
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003103752-03

No Significant Match Found

DV One-Page Summary

KIC: 3103752 Candidate: 3 of 4 Period: 411.506 d



DV Fit Results:

Period = 411.50616 [0.00604] d
Epoch = 195.4991 [0.0118] BKJD
Rp/R* = 0.0423 [0.0478]
a/R* = 666.97 [3139.56]
b = 0.57 [5.62]
Seff = 0.02 [0.00]
Teq = 97 [3] K
Rp = 1.42 [1.61] Re
a = 0.7255 [0.0659] AU
Ag = 243677.68 [553958.25] [0.44σ]
Teffp = 3345 [1899] K [1.71σ]

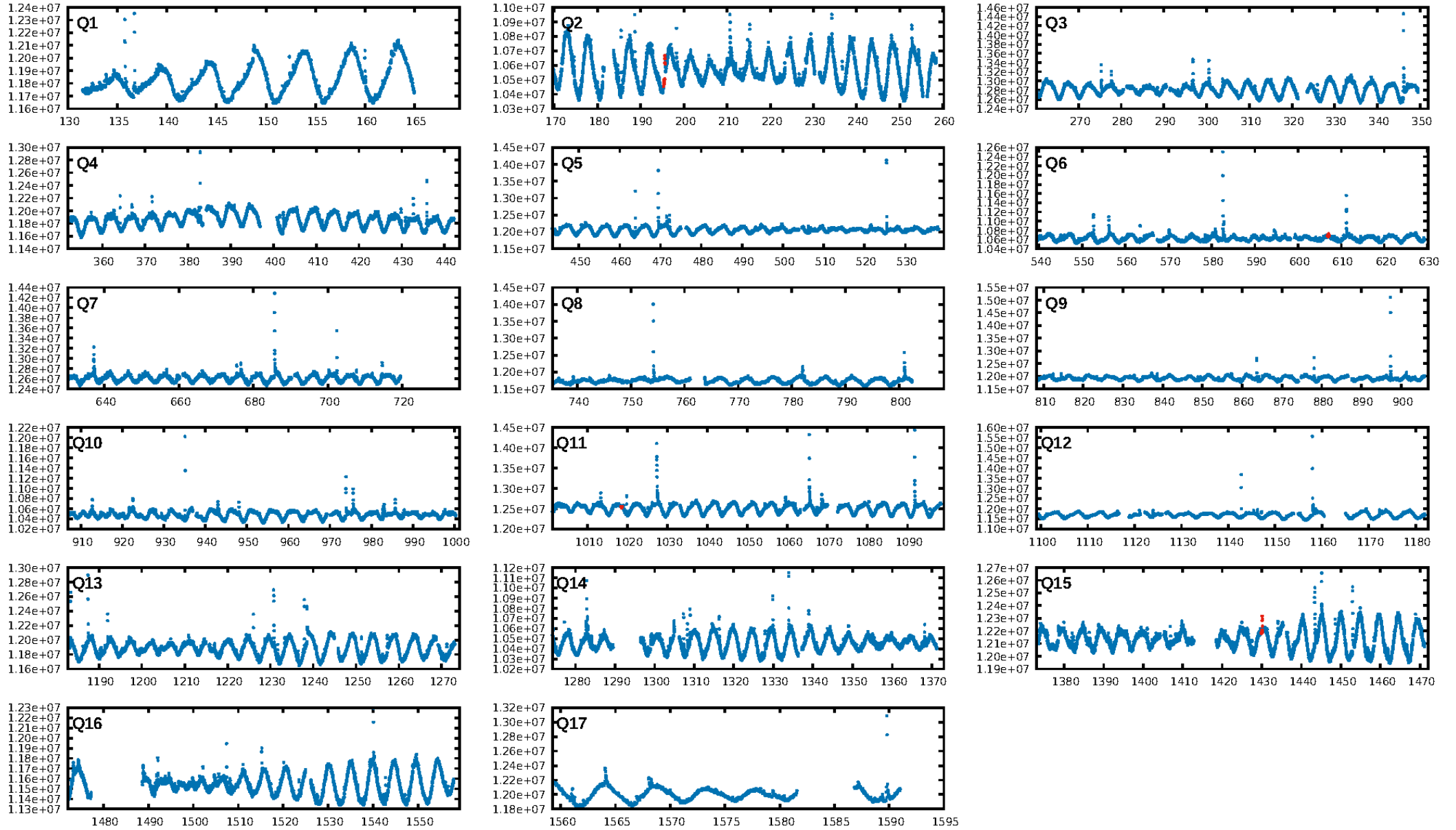
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [61.99σ]
LongPeriod-sig: 100.0% [13.12σ]
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 93.1%
Bootstrap-pfa: 6.01e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 10.68
Centroid-sig: 14.4%
Centroid-so: 0.922 arcsec [0.71σ]
OotOffset-rm: 0.552 arcsec [1.11σ]
KicOffset-rm: 0.561 arcsec [1.13σ]
OotOffset-st: 2/2/0/0 [4]
KicOffset-st: 2/2/0/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

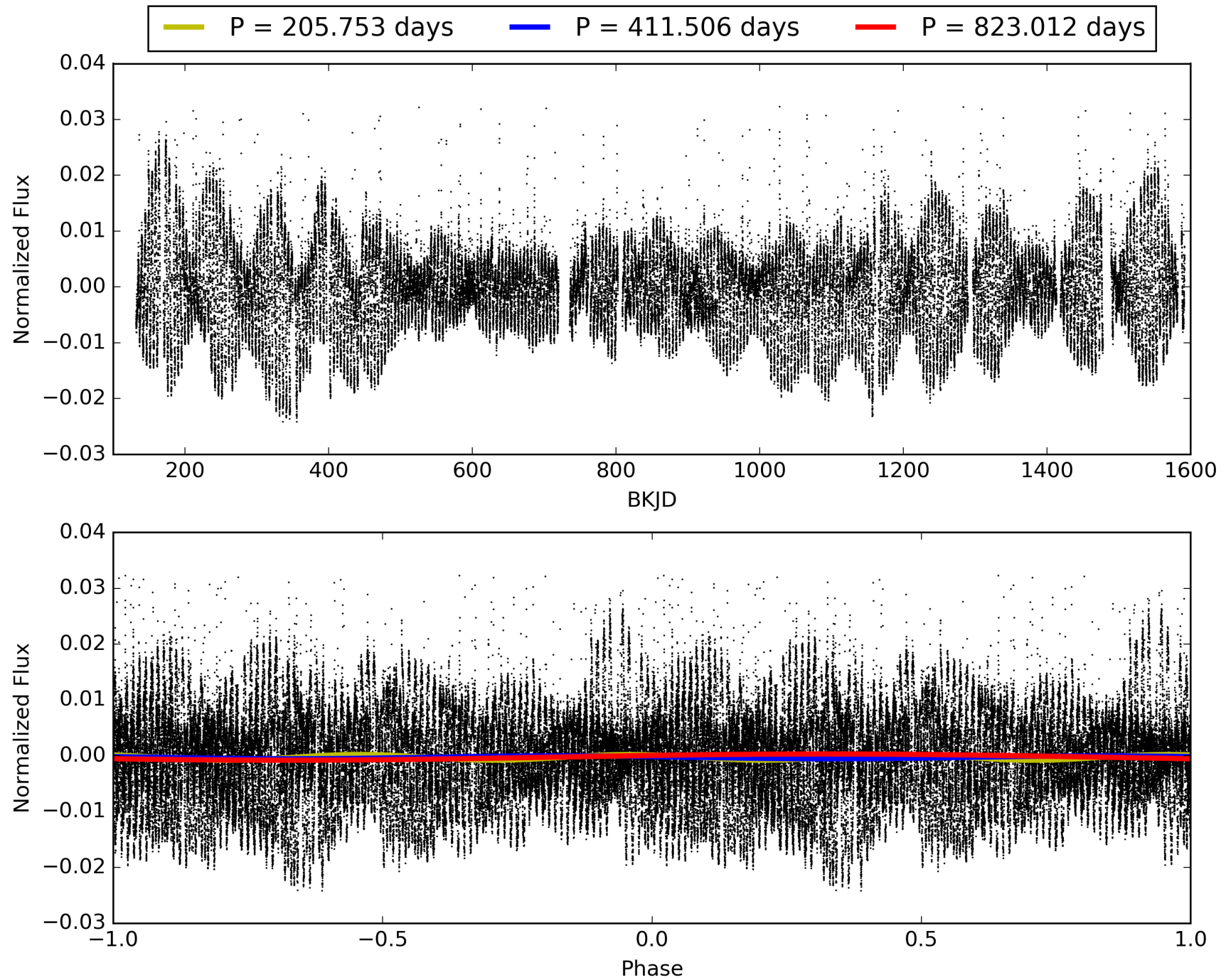
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:05:41 Z

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

TCE 003103752-03, PDC Light Curves

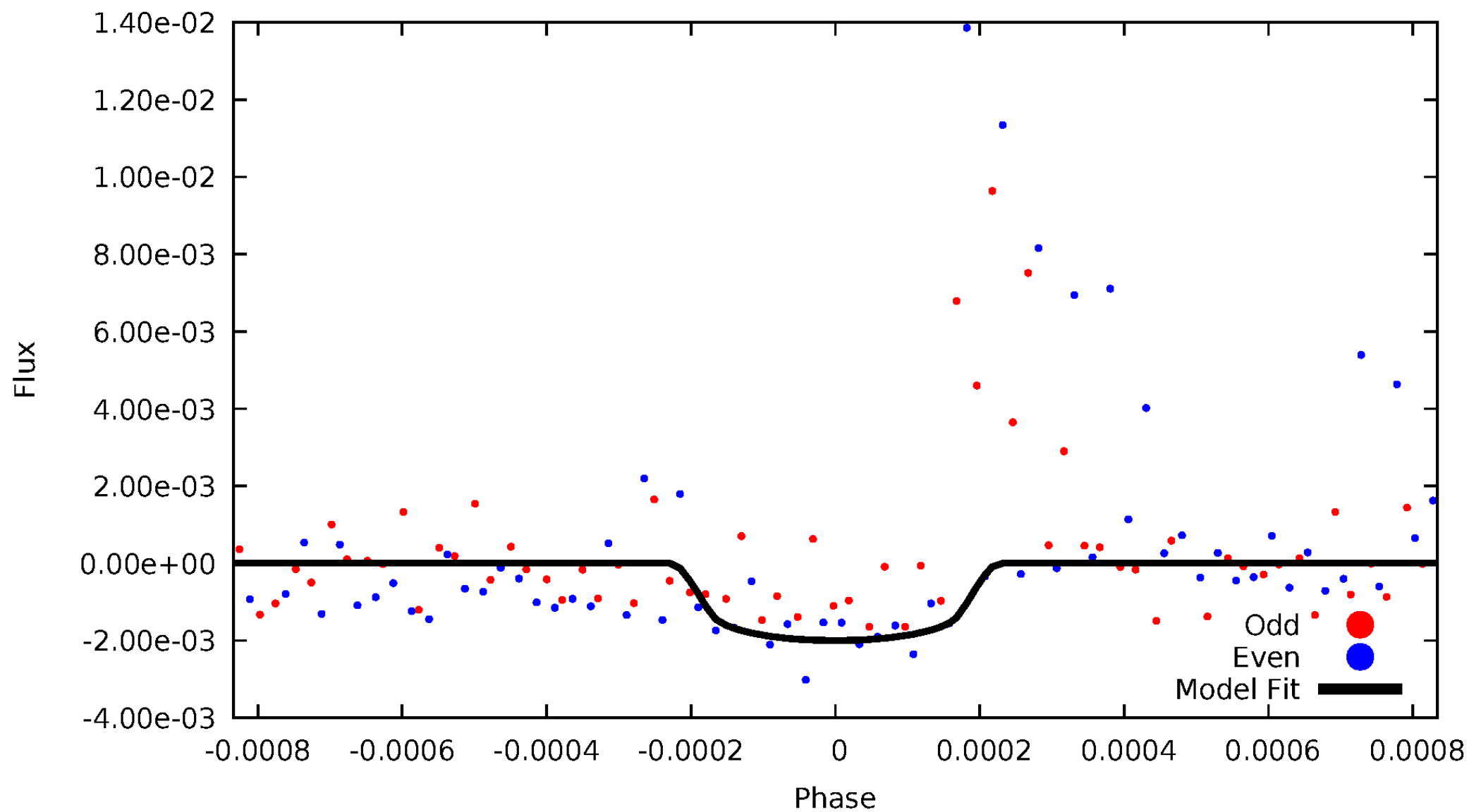


TCE 003103752-03



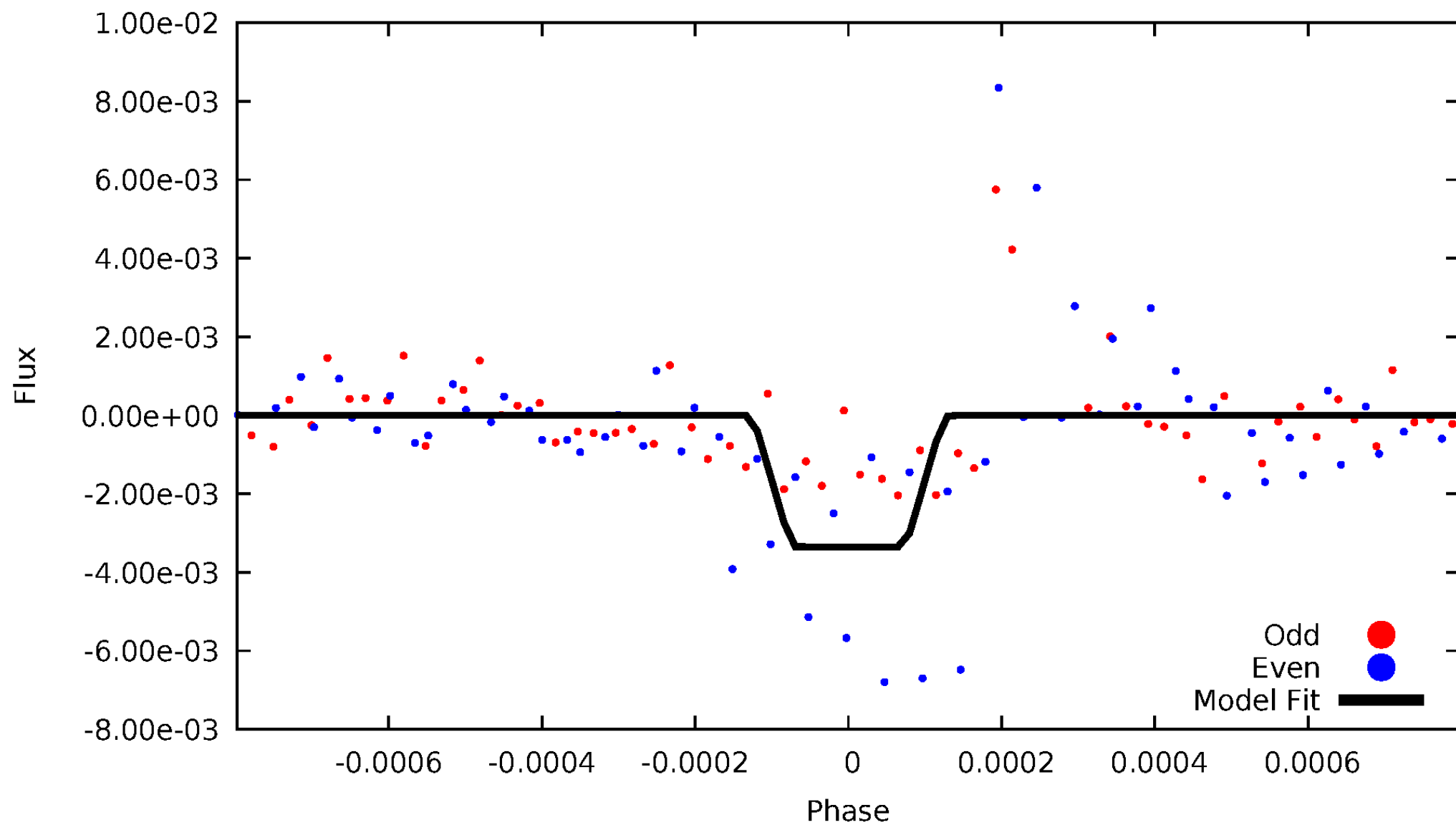
DV Odd/Even

TCE 003103752-03

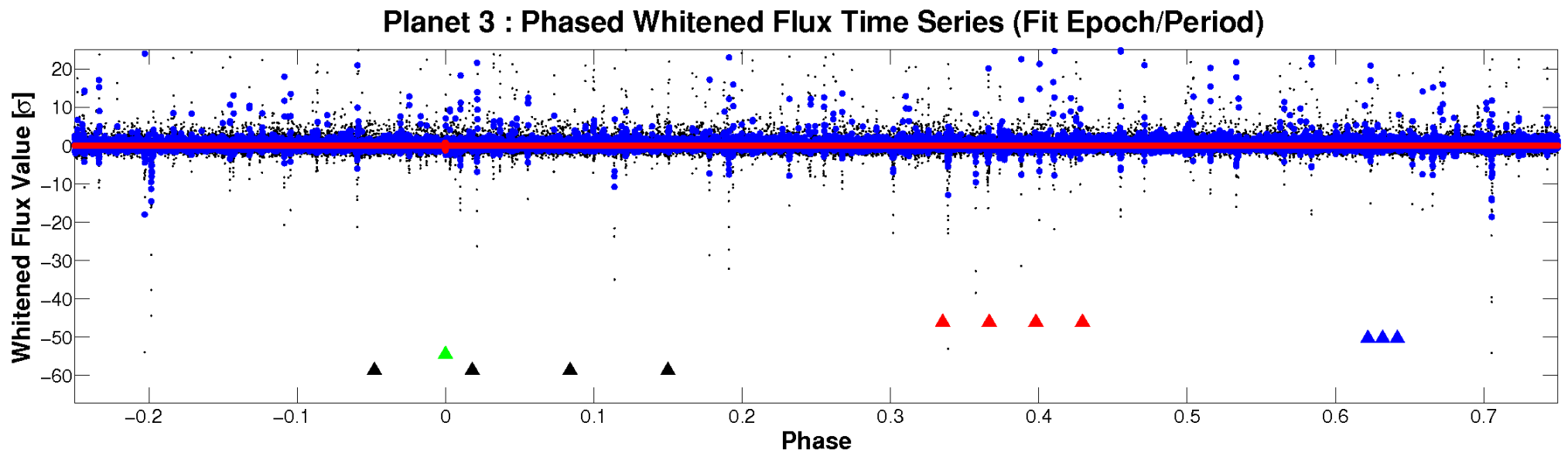
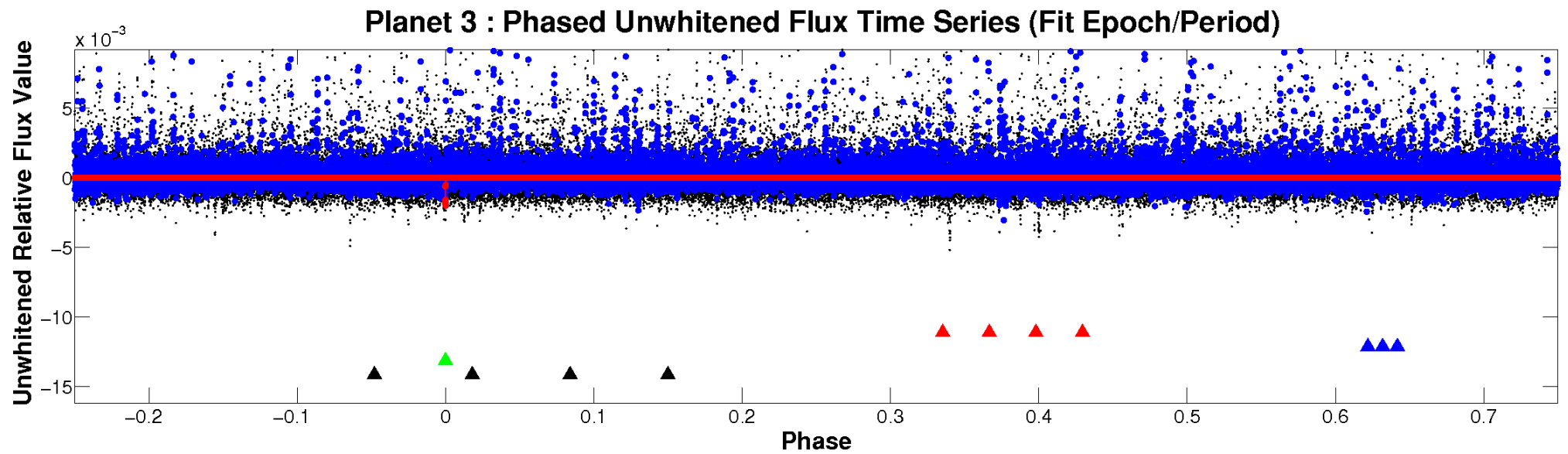


ALT Odd/Even

TCE 003103752-03

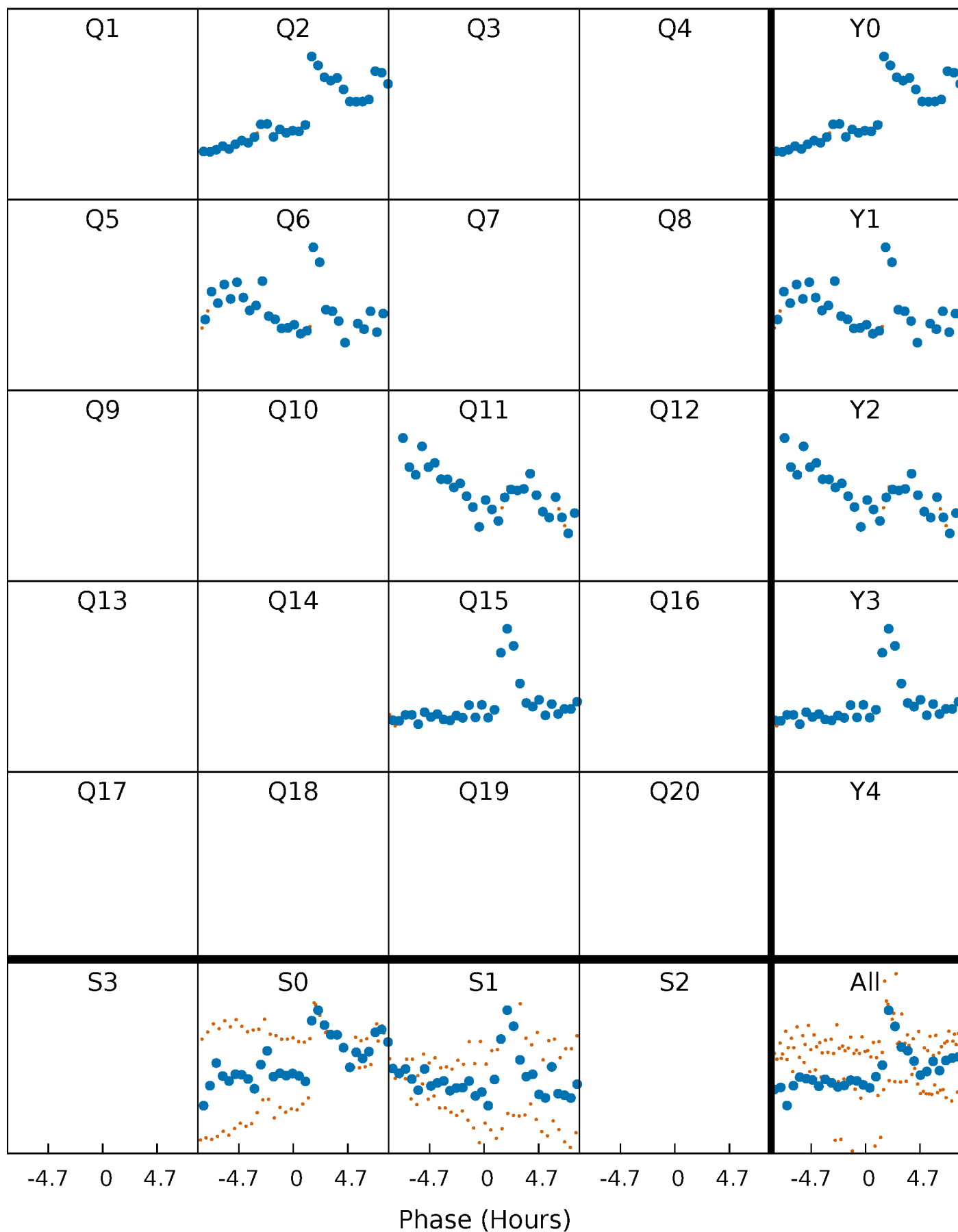


Non-Whitened Vs. Whitened Light Curve



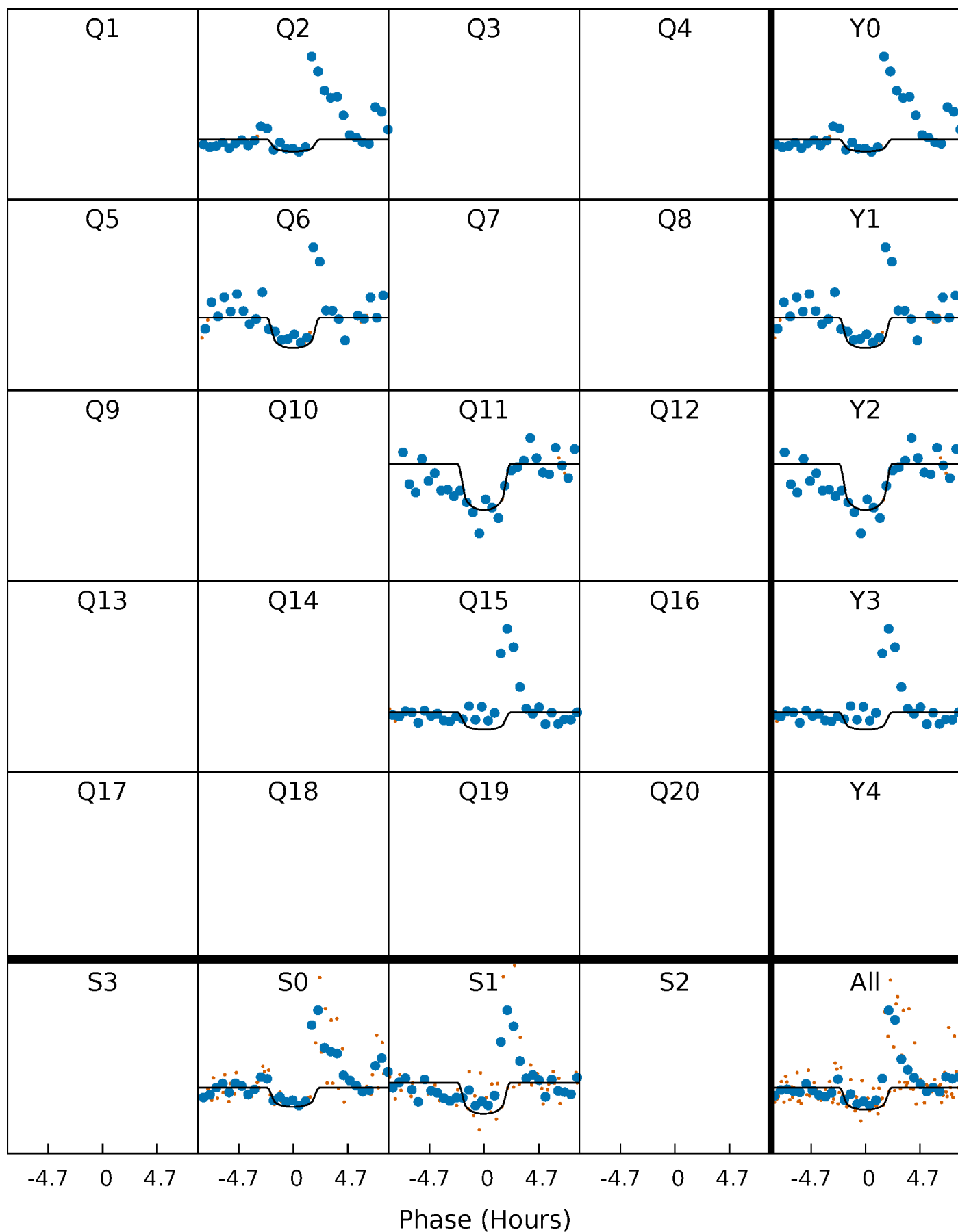
PDC Quarter-Phased Transit Curves

TCE 003103752-03 P=411.506159 Days $T_0=195.499109$ (BKJD)



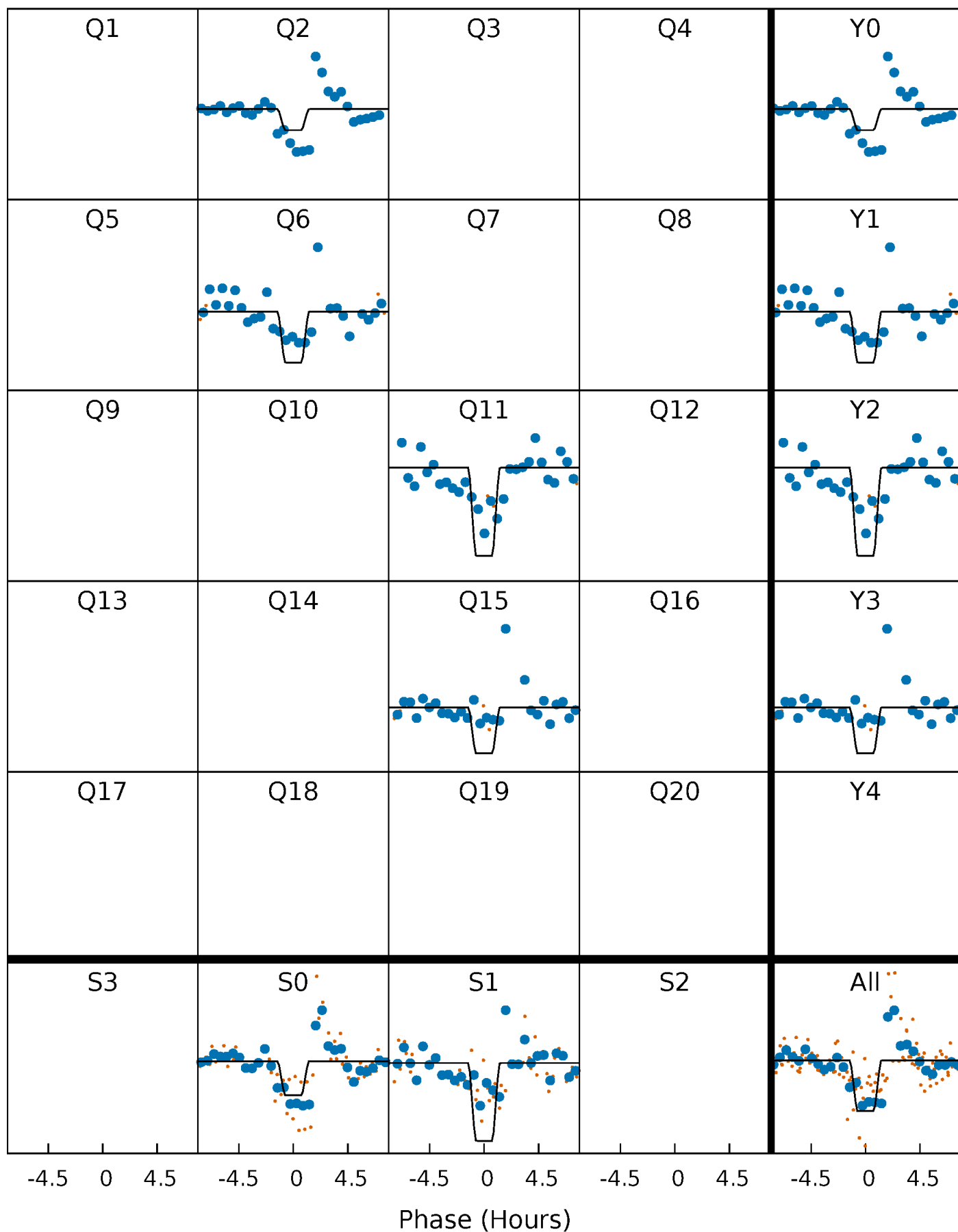
DV Quarter-Phased Transit Curves

TCE 003103752-03 P=411.506159 Days $T_0=195.499109$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

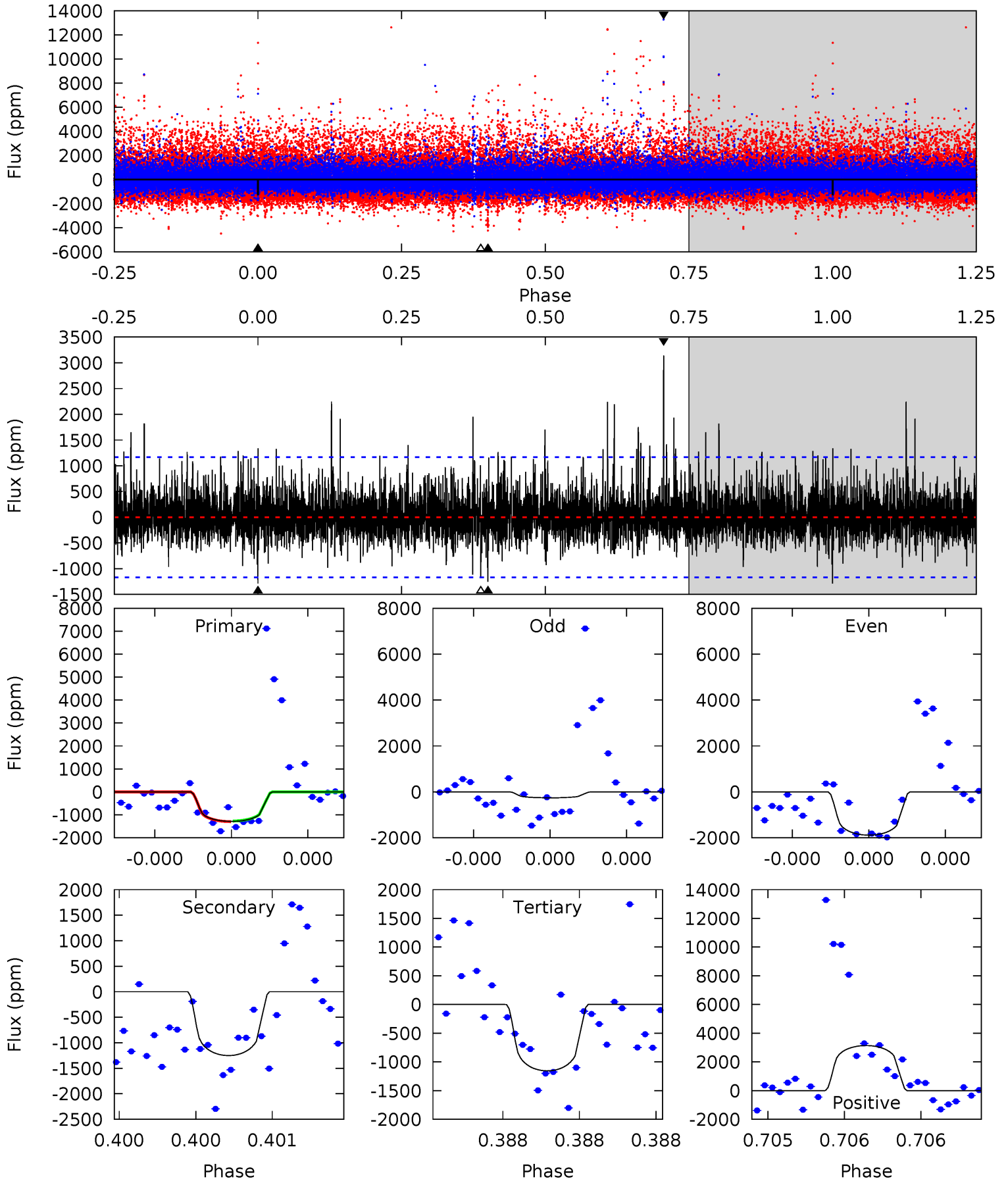
TCE 003103752-03 P=411.504654 Days $T_0=195.493294$ (BKJD)



DV Model-Shift Uniqueness Test

003103752-03, P = 411.506159 Days, E = 195.499109 Days

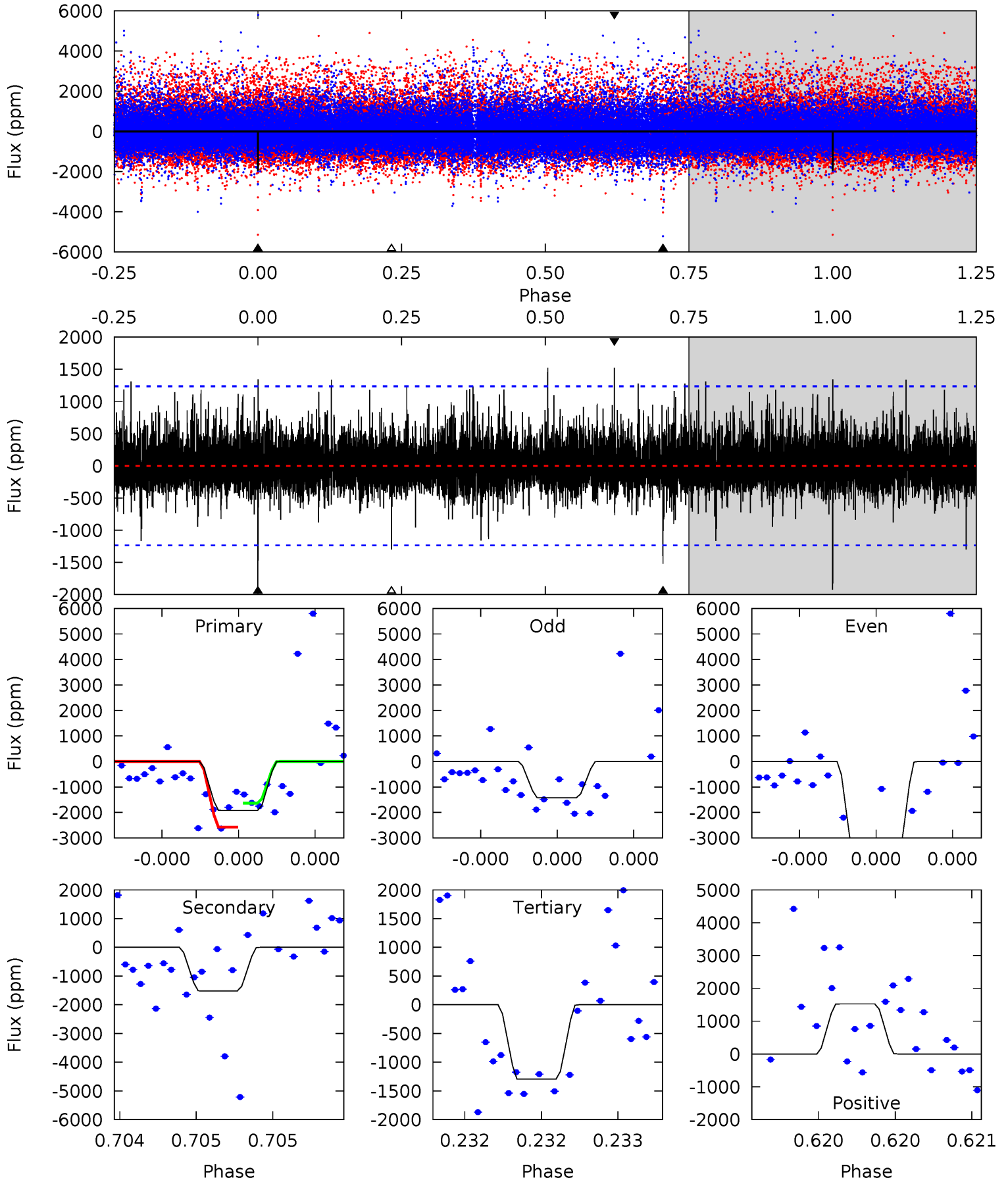
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.16	6.00	5.54	15.1	5.60	3.52	1.67	0.62	-8.89	0.45	-9.06	2.43	1.01	0.71	0.06



Alt Model-Shift Uniqueness Test

003103752-03, P = 411.504654 Days, E = 195.493294 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.84	6.99	5.97	7.02	5.68	3.65	1.24	2.88	1.82	1.02	-0.03	6.91	1.49	0.44	2.24



Stellar Parameters For KIC 003103752

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3388^{+45}_{-45}	$4.939^{+0.050}_{-0.036}$	$0.000^{+0.100}_{-0.100}$	$0.308^{+0.038}_{-0.038}$	$0.301^{+0.051}_{-0.042}$	$14.500^{+3.943}_{-2.590}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+12%/-12%	+17%/-14%	+27%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003103752-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1251 ± 209	$1.82^{+1.37}_{-1.19}$	136^{+3}_{-3}	3003^{+1186}_{-453}	$111030^{+772814}_{-77543}$
Alt.	-1519 ± 217	$2.15^{+1.51}_{-1.24}$	136^{+3}_{-3}	2920^{+879}_{-369}	$94186^{+453968}_{-60470}$

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

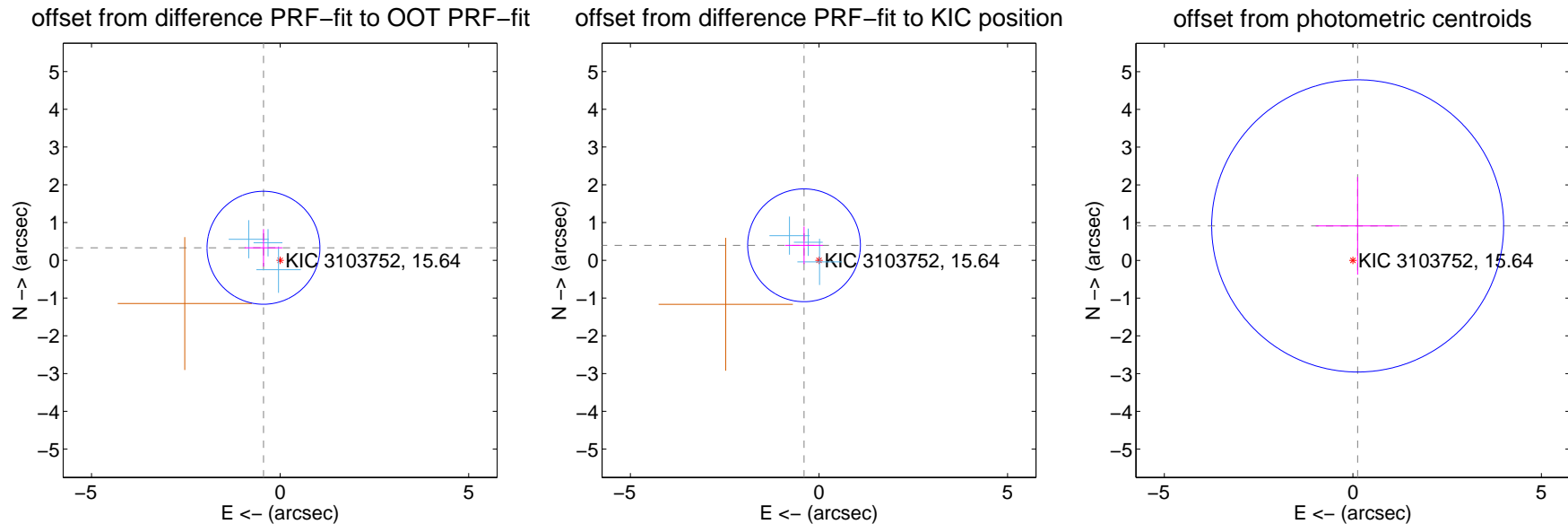
DV Centroid Data

Supplemental centroid analysis for 003103752-03. Kepler magnitude: 15.64. Transit SNR 6.57

There are 3 quarters with good PRF difference image offsets

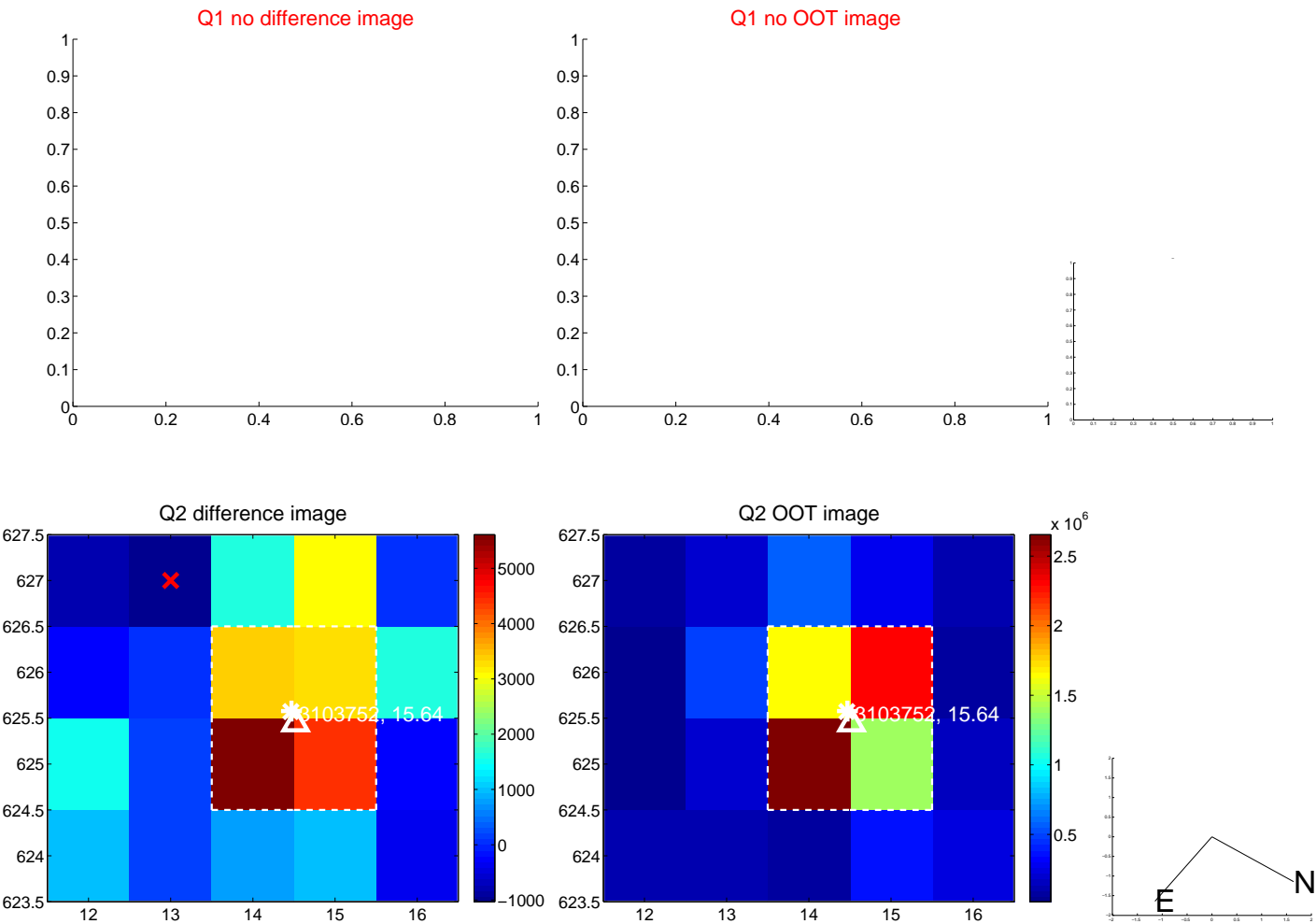
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.552 ± 0.499	1.11	0.441 ± 0.501	0.332 ± 0.496
PRF-fit source offset from KIC position	0.561 ± 0.498	1.13	0.396 ± 0.501	0.397 ± 0.496
photometric centroid source offset	0.92 ± 1.29	0.71	-0.13 ± 1.11	0.91 ± 1.29



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.

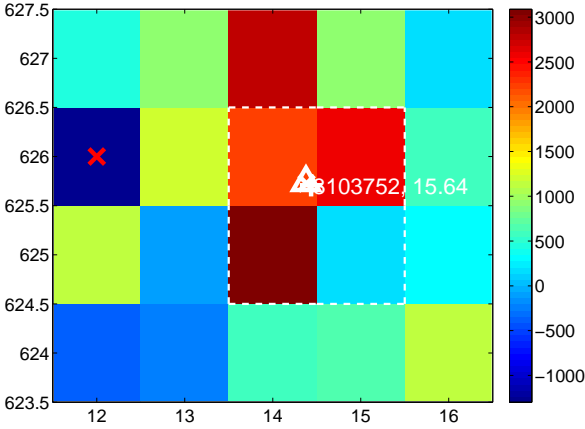
Q5 no difference image



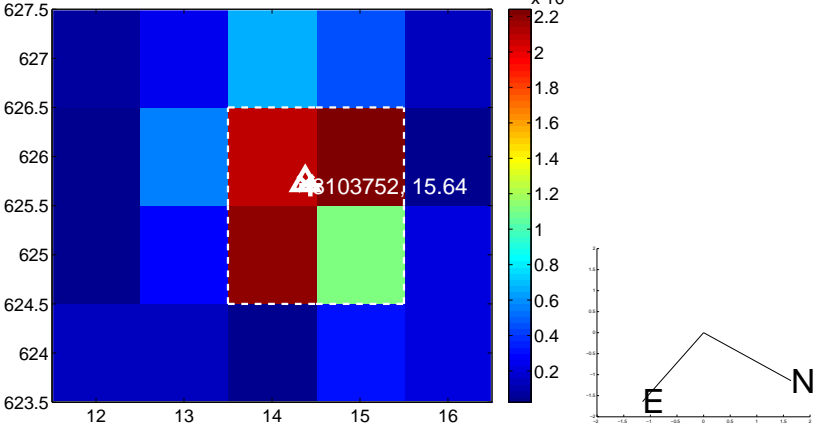
Q5 no OOT image



Q6 difference image



Q6 OOT image



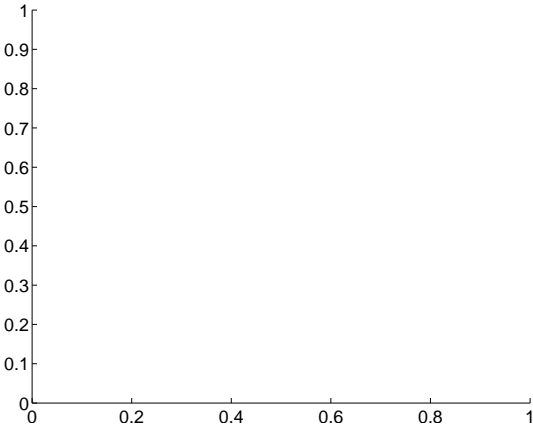
Q7 no difference image



Q7 no OOT image



Q8 no difference image



Q8 no OOT image



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

Q9 no difference image



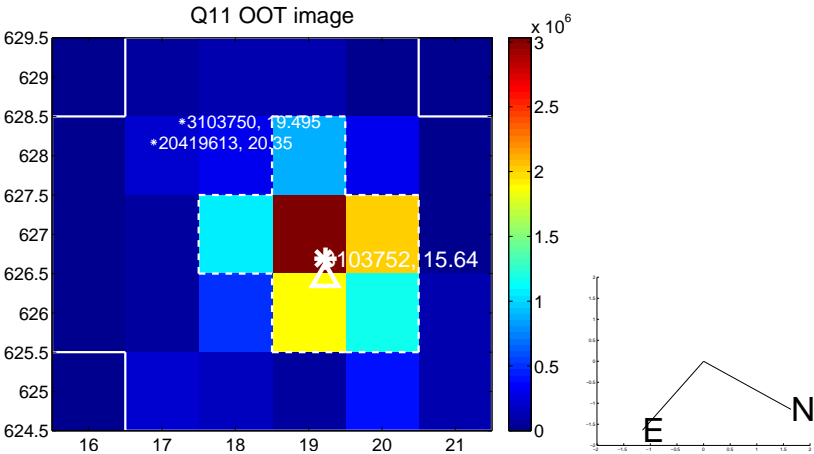
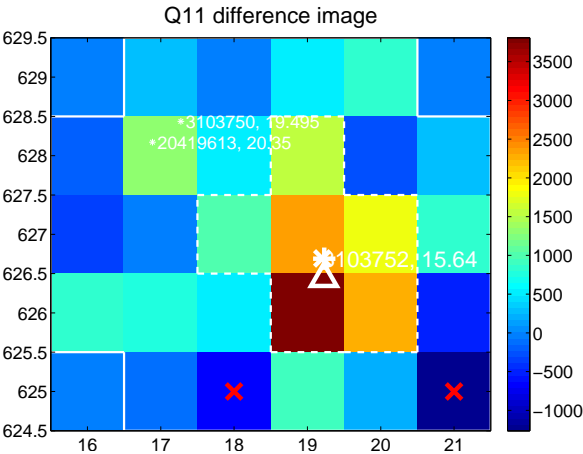
Q9 no OOT image



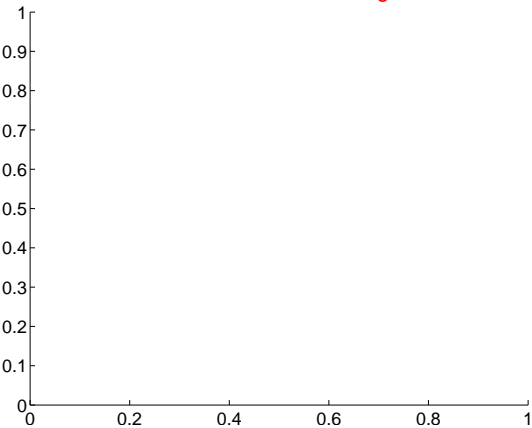
Q10 no difference image



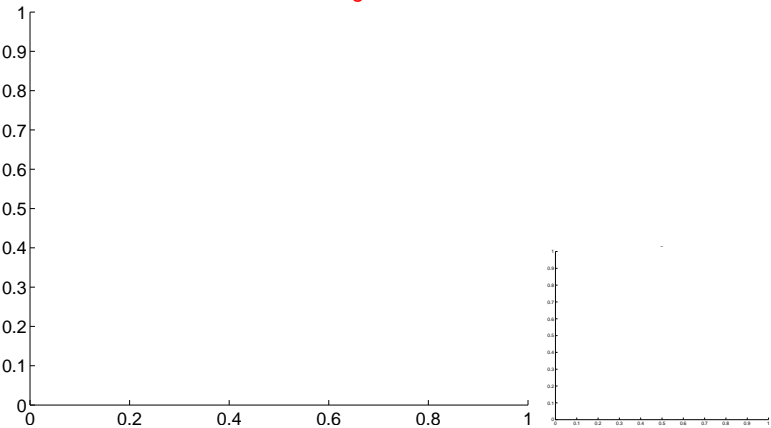
Q10 no OOT image



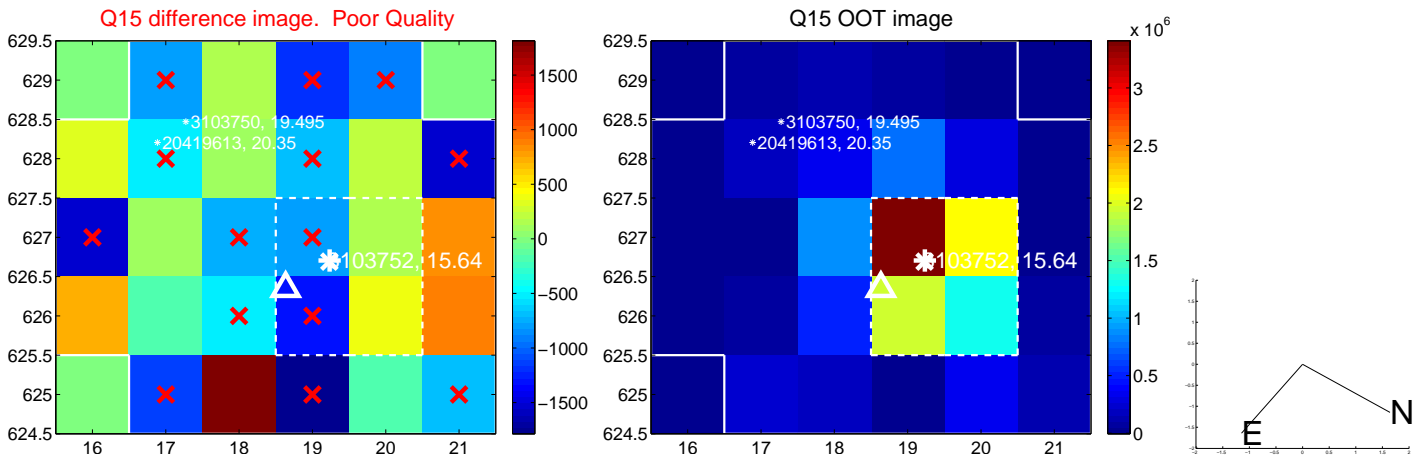
Q12 no difference image



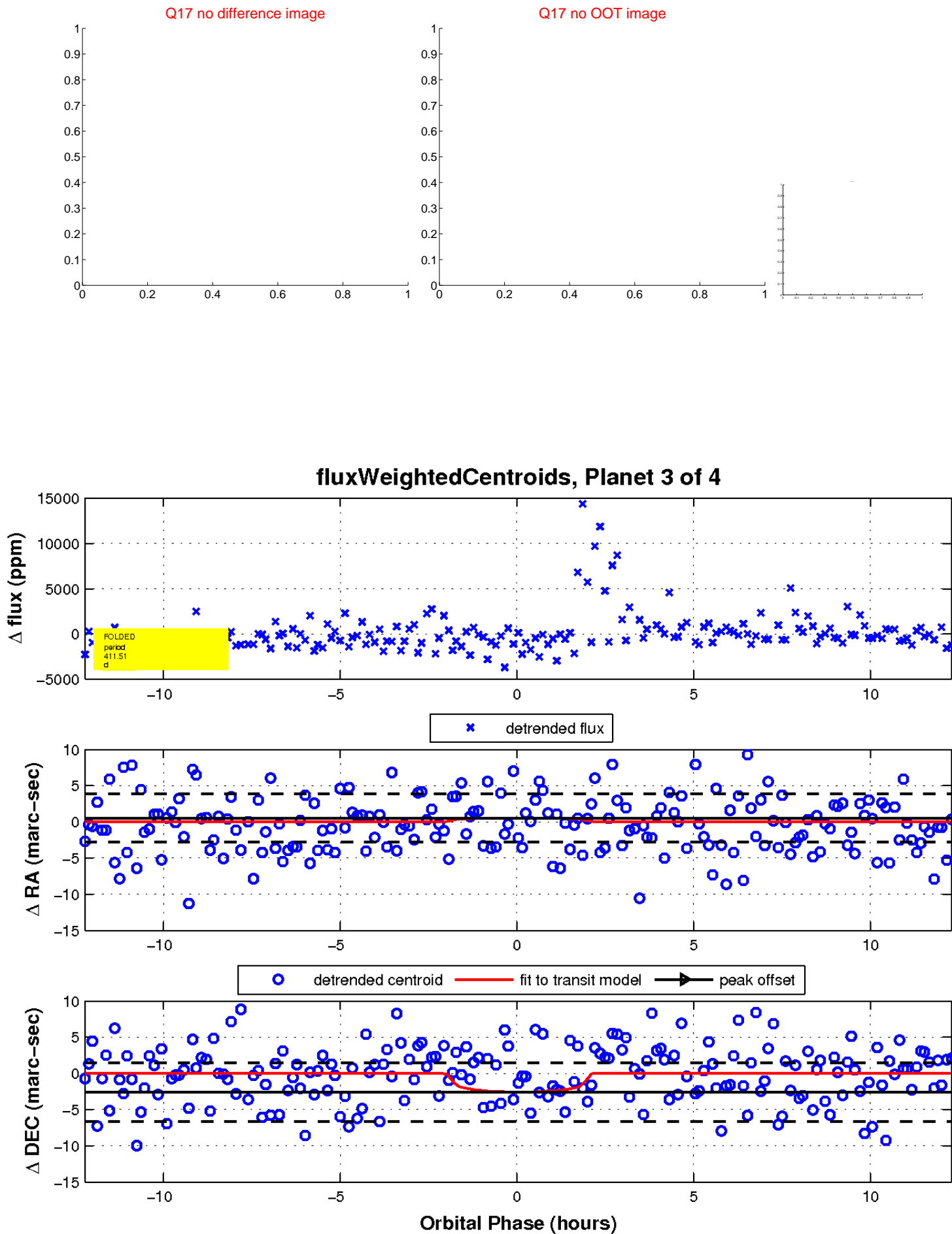
Q12 no OOT image



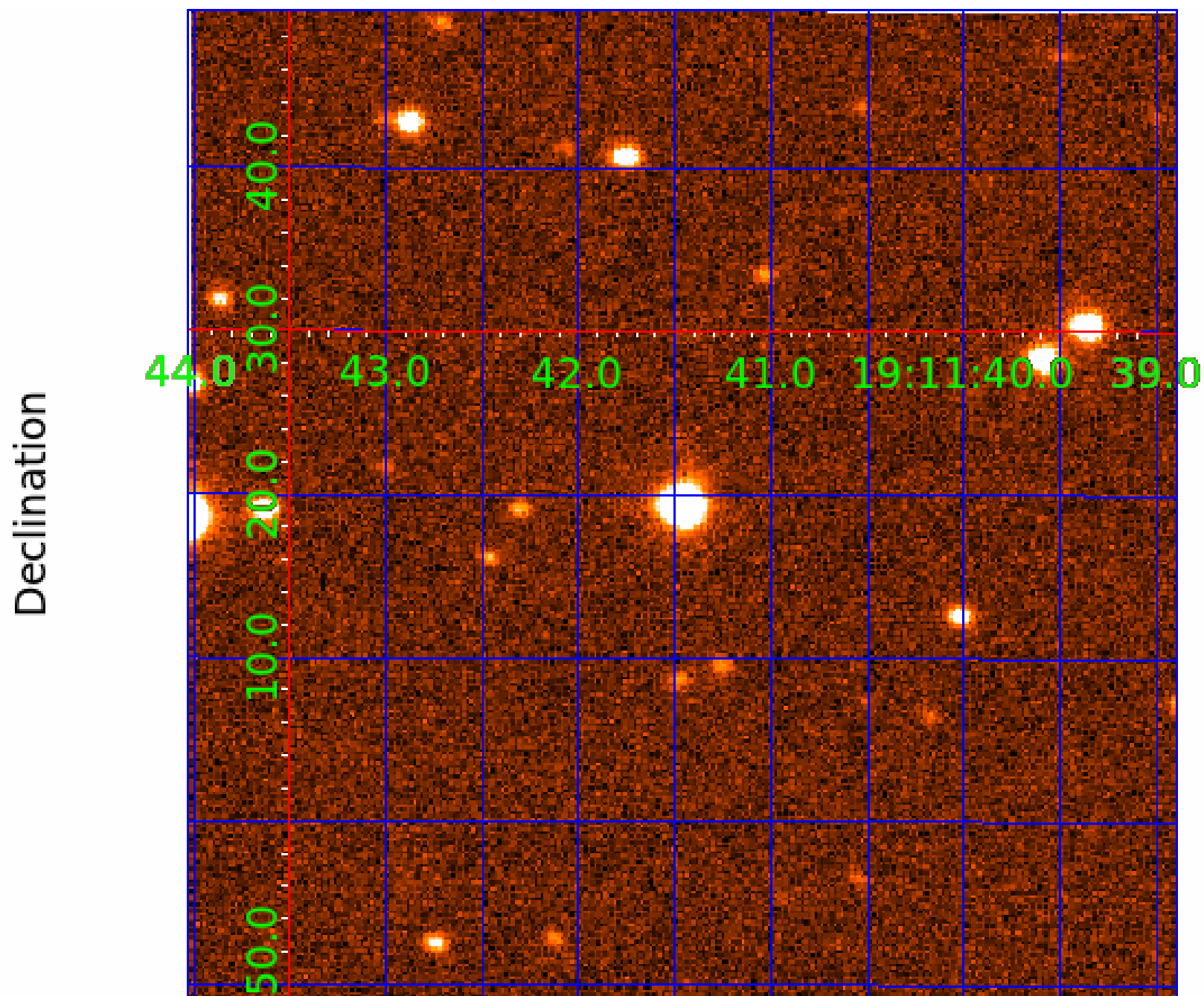
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



UKIRT Image



KIC 003103752

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})
003103752-01	OBS	No	398.579907	372.229352	2263.1	2.847	11.0	6.7	0.31	3388	1.46	0.02
003103752-02	OBS	No	415.591072	451.429680	3496.2	6.239	11.7	9.2	0.31	3388	2.09	0.02
003103752-03	OBS	No	411.506159	195.499109	2001.1	4.116	11.1	6.6	0.31	3388	1.42	0.02
003103752-04	OBS	No	438.651193	175.780323	2018.2	4.840	9.8	7.0	0.31	3388	1.43	0.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003103752-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_FEW_DIFFS
003103752-03	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—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003103752-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

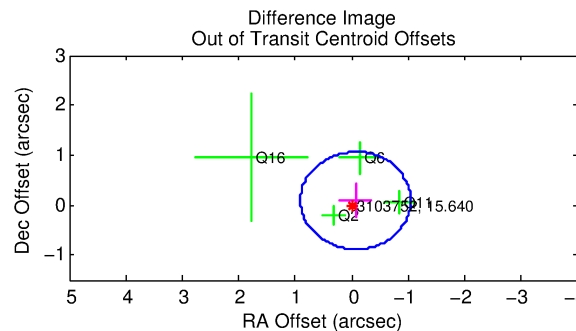
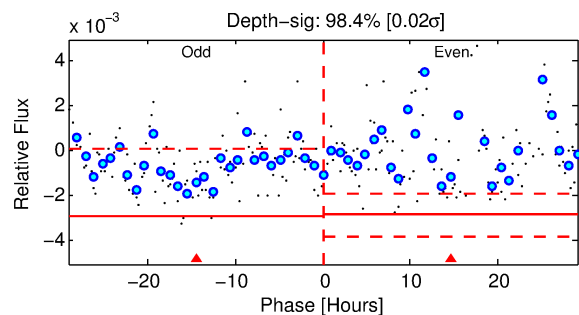
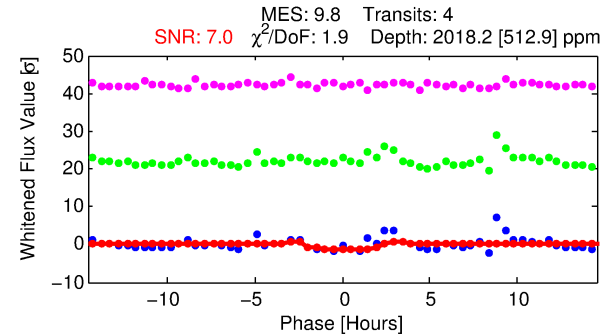
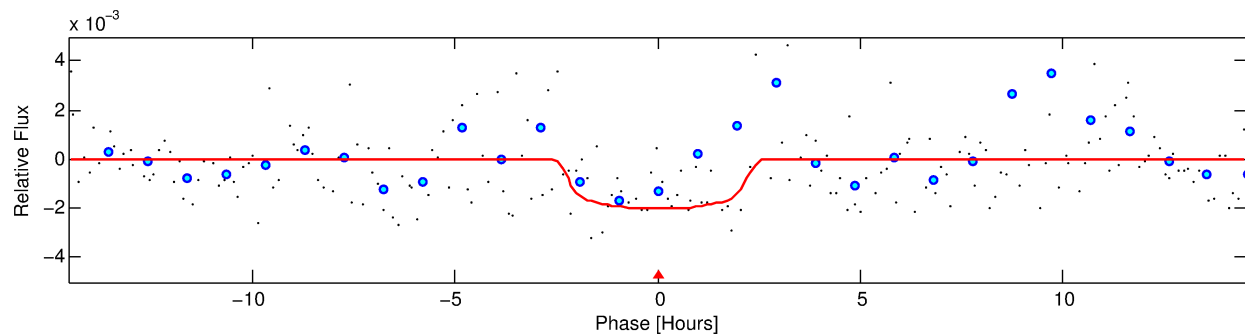
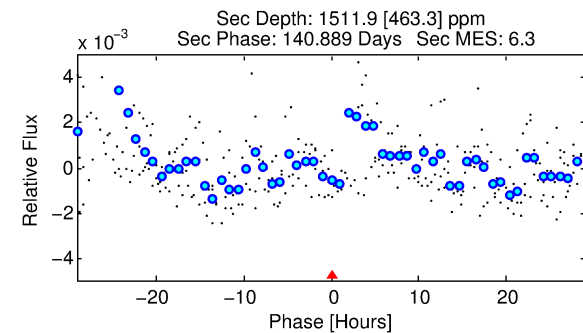
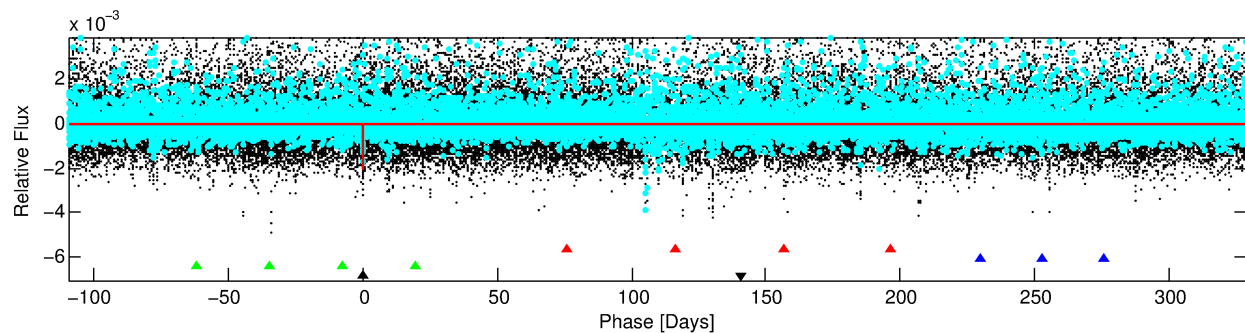
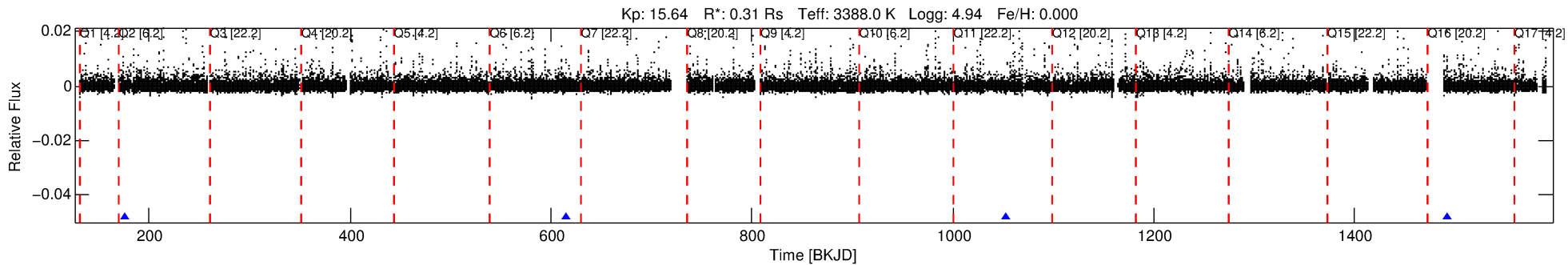
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003103752-04

No Significant Match Found

DV One-Page Summary

KIC: 3103752 Candidate: 4 of 4 Period: 438.651 d



DV Fit Results:

Period = 438.65119 [0.00918] d
Epoch = 175.7803 [0.0161] BKJD
Rp/R* = 0.0425 [0.0521]
a/R* = 602.75 [3091.68]
b = 0.57 [6.03]
Seff = 0.02 [0.00]
Teq = 95 [3] K
Rp = 1.43 [1.76] Re
a = 0.7571 [0.0687] AU
Ag = 233861.93 [578668.21] [0.40σ]
Teffp = 3241 [2003] K [1.57σ]

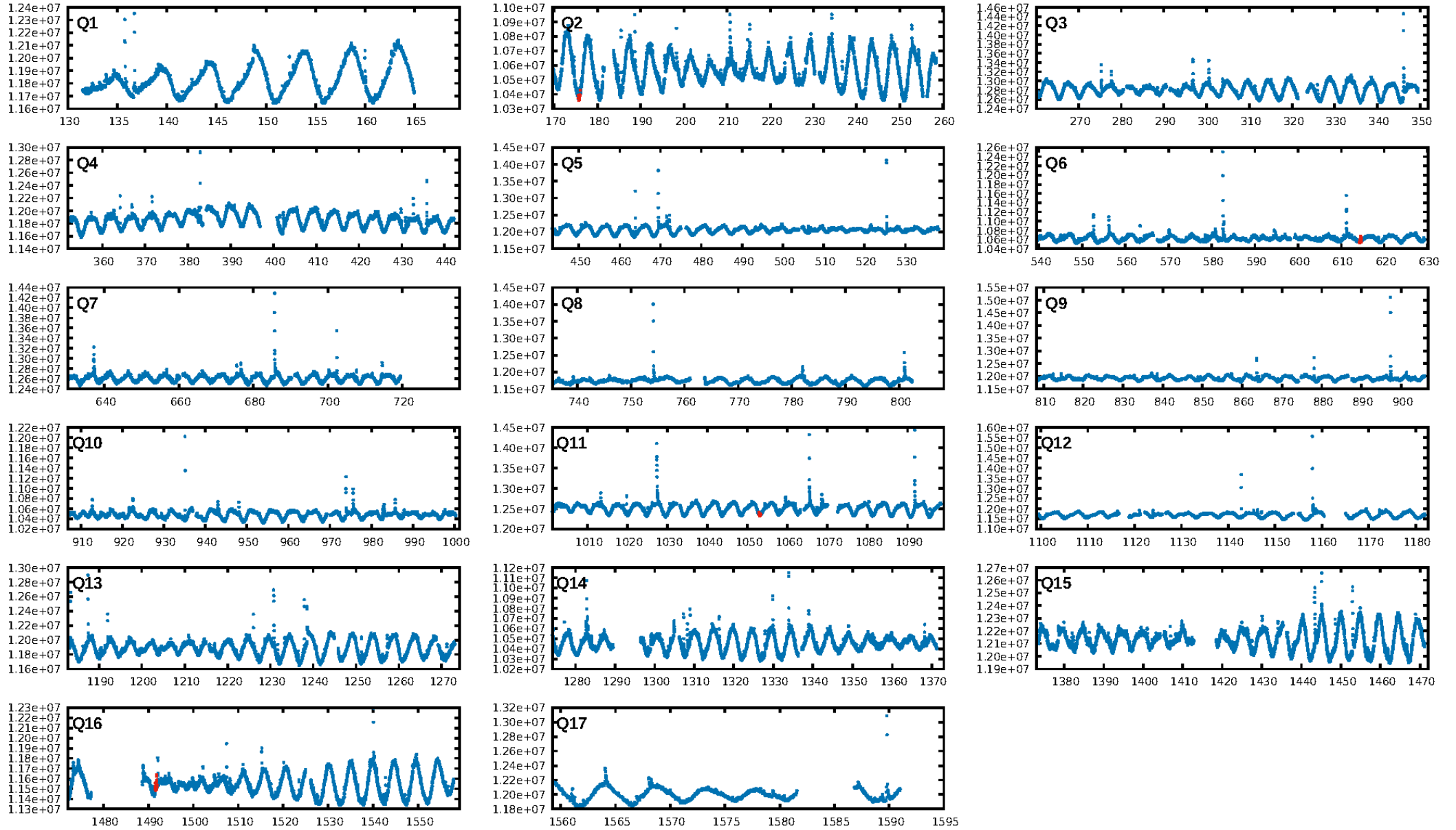
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [70.09σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 40.4%
ModelChiSquareGof-sig: 78.5%
Bootstrap-pfa: 1.70e-08
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 2.242
Centroid-sig: 31.0%
Centroid-so: 0.837 arcsec [0.66σ]
OotOffset-rm: 0.110 arcsec [0.34σ]
KicOffset-rm: 0.104 arcsec [0.17σ]
OotOffset-st: 2/1/1/0 [4]
KicOffset-st: 2/1/1/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

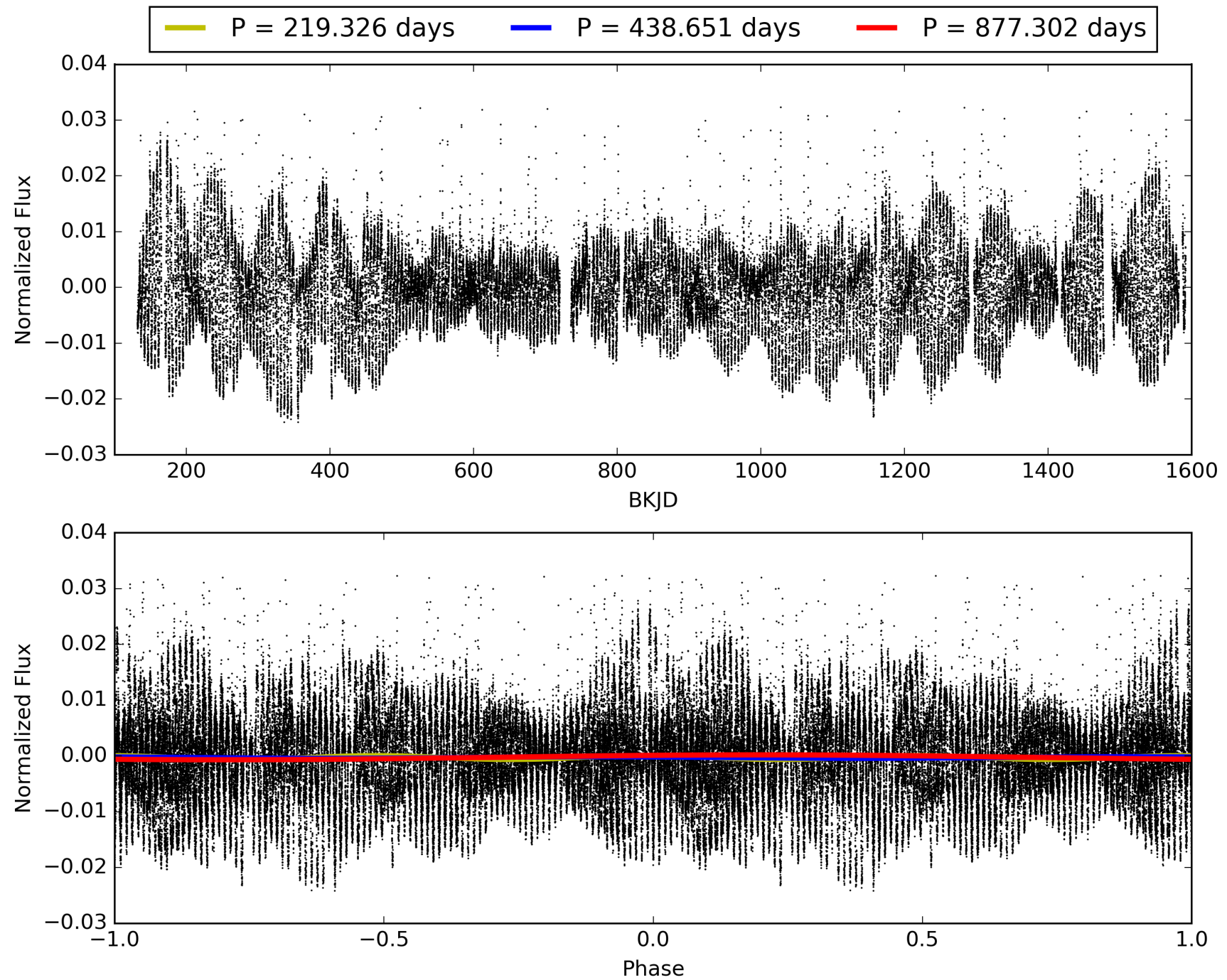
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 20:05:56 Z

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

TCE 003103752-04, PDC Light Curves

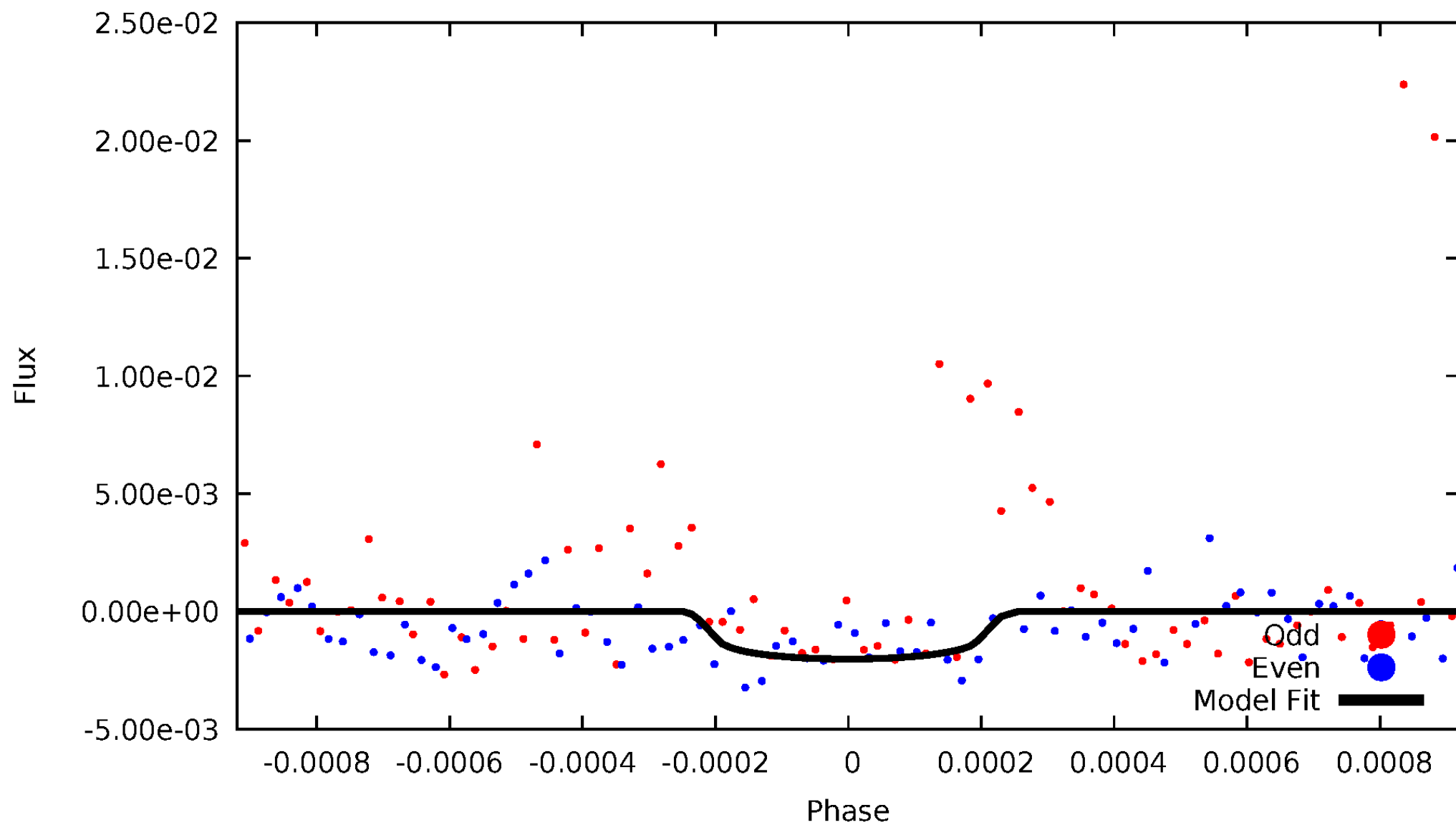


TCE 003103752-04



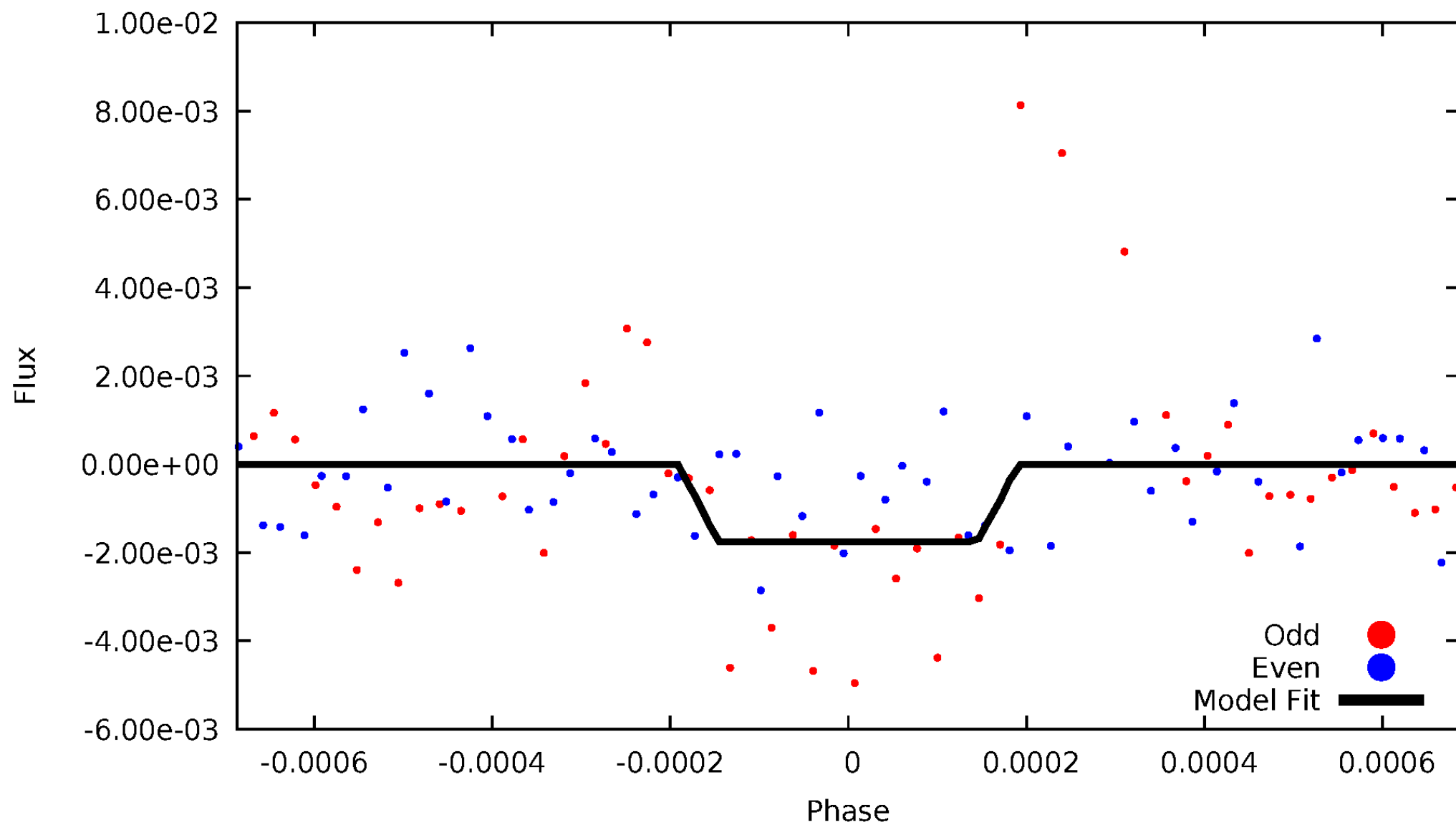
DV Odd/Even

TCE 003103752-04



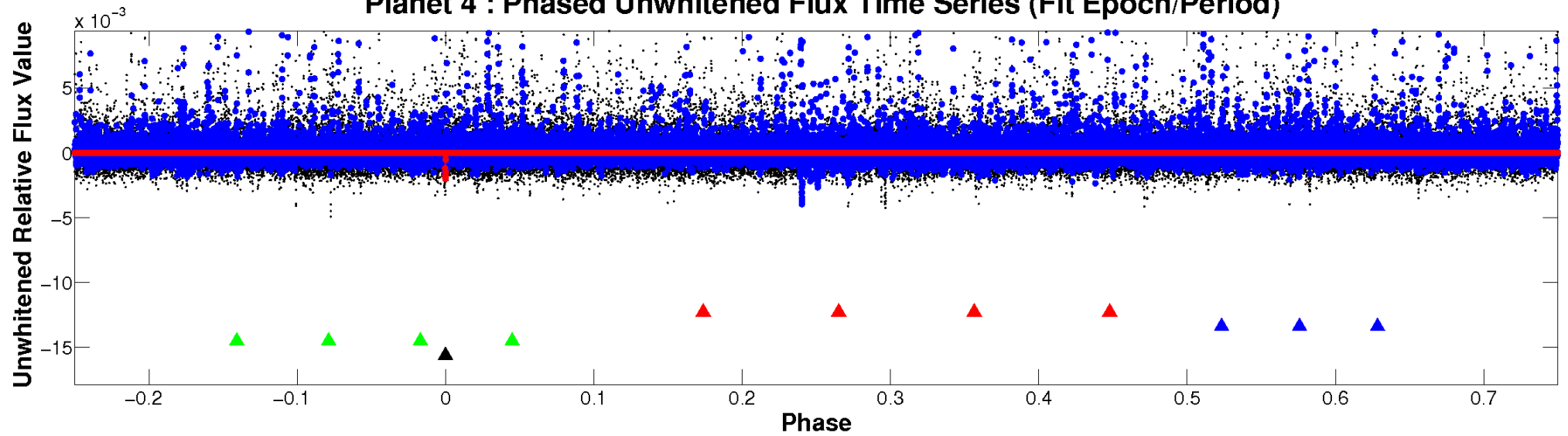
ALT Odd/Even

TCE 003103752-04

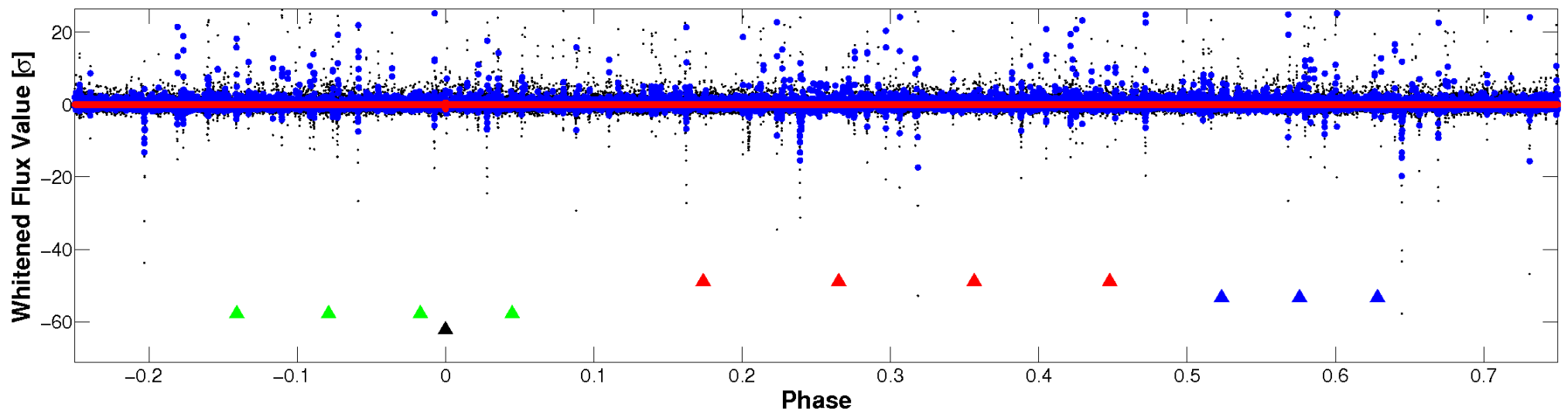


Non-Whitened Vs. Whitened Light Curve

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

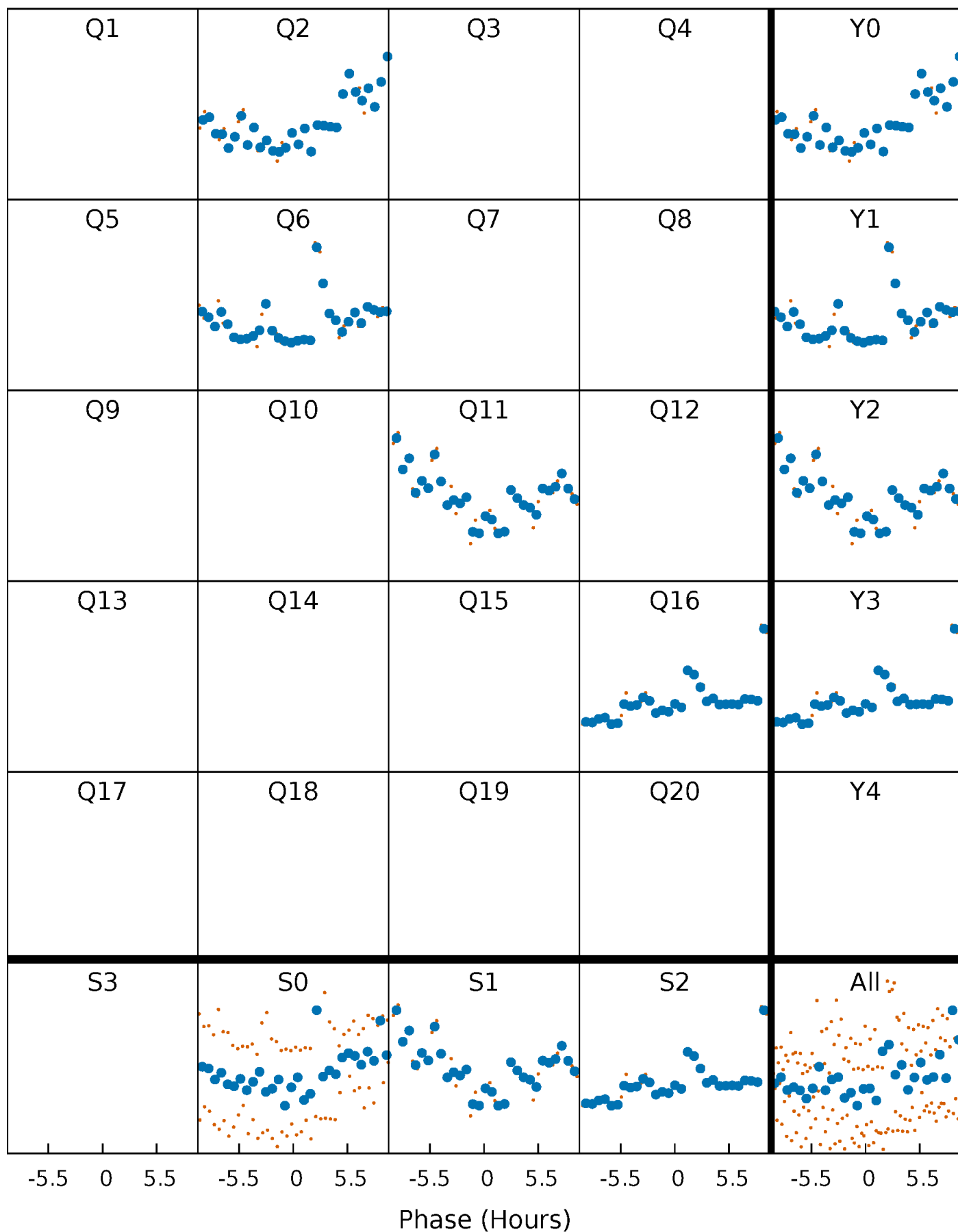


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



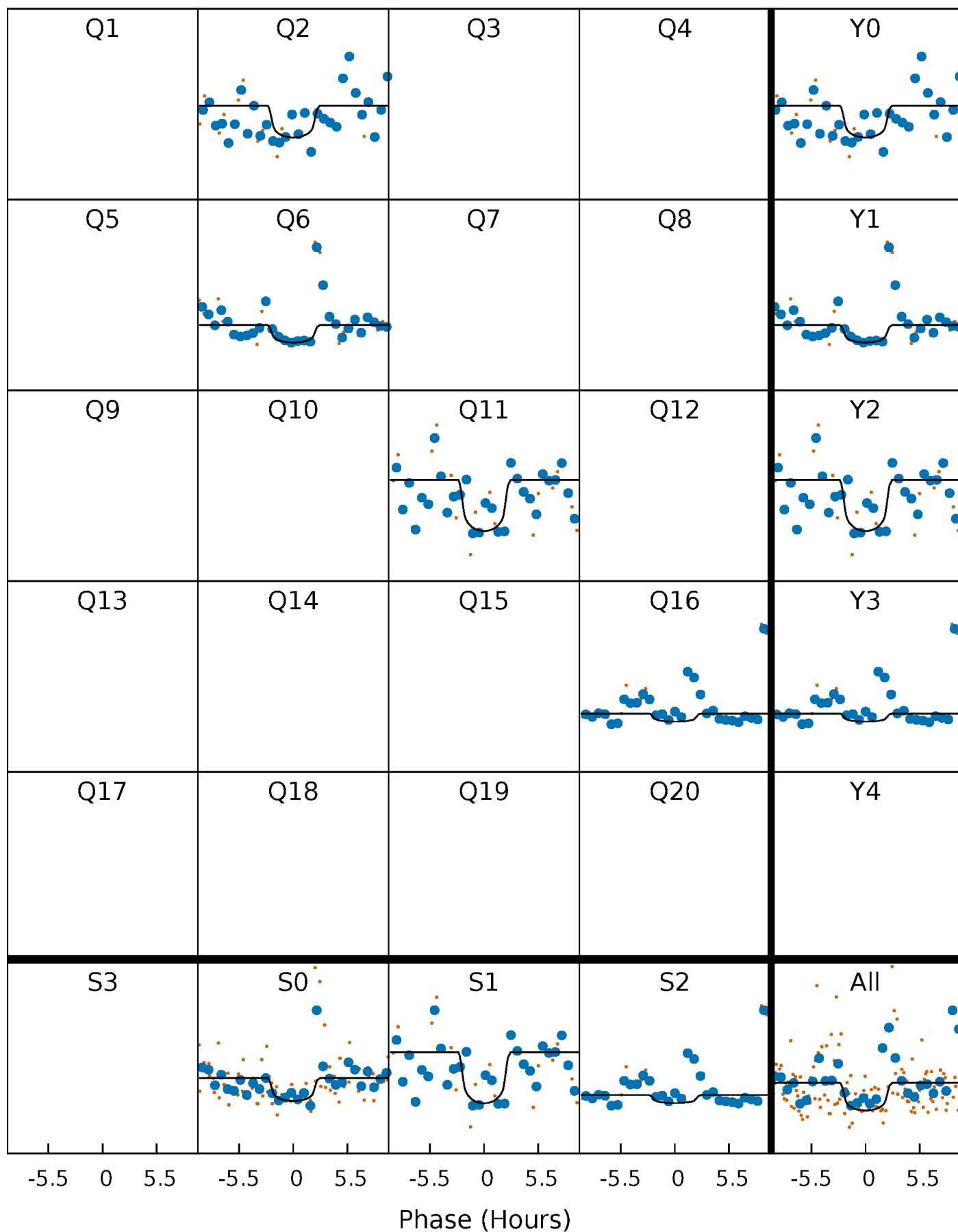
PDC Quarter-Phased Transit Curves

TCE 003103752-04 P=438.651193 Days $T_0=175.780323$ (BKJD)



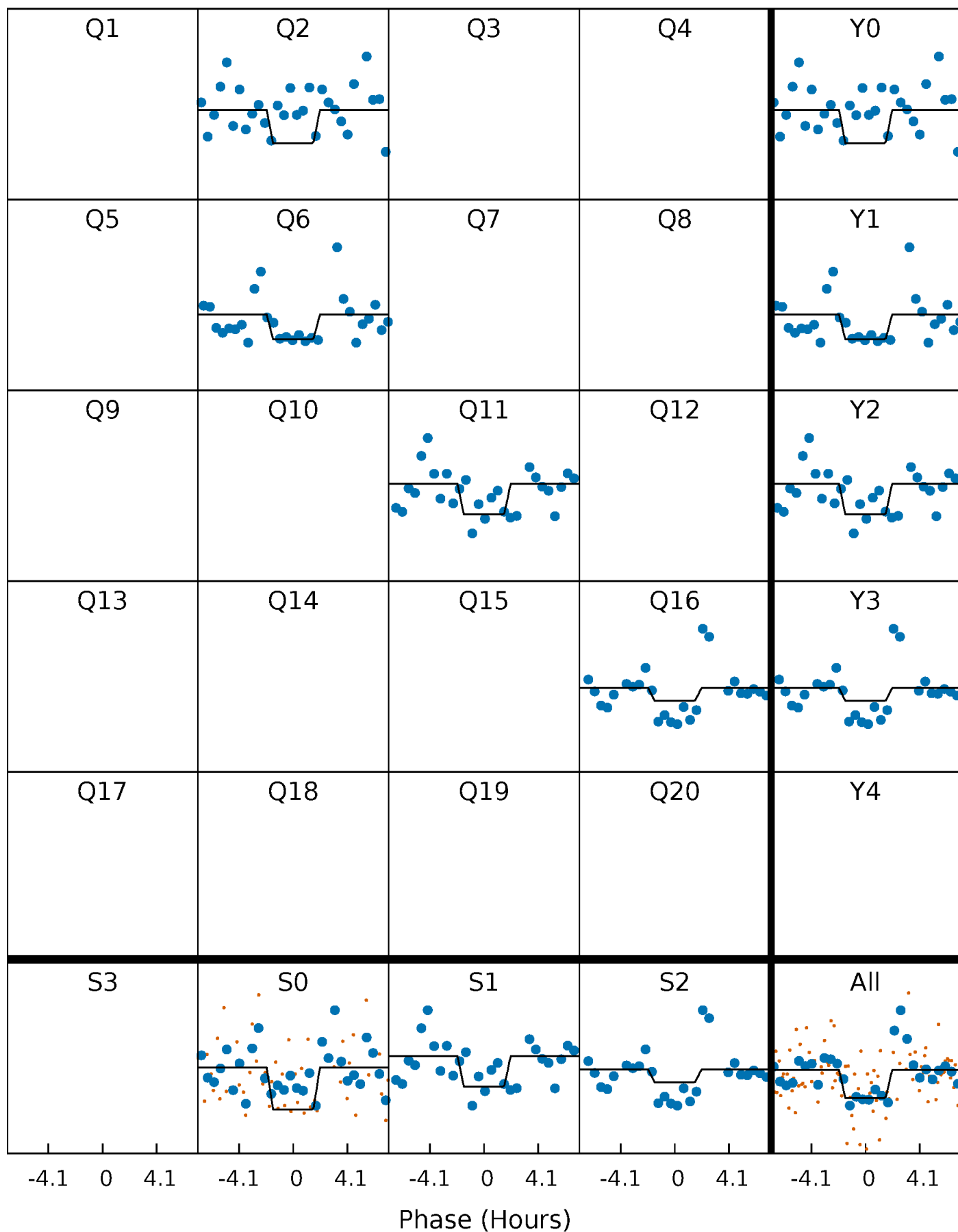
DV Quarter-Phased Transit Curves

TCE 003103752-04 P=438.651193 Days $T_0=175.780323$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

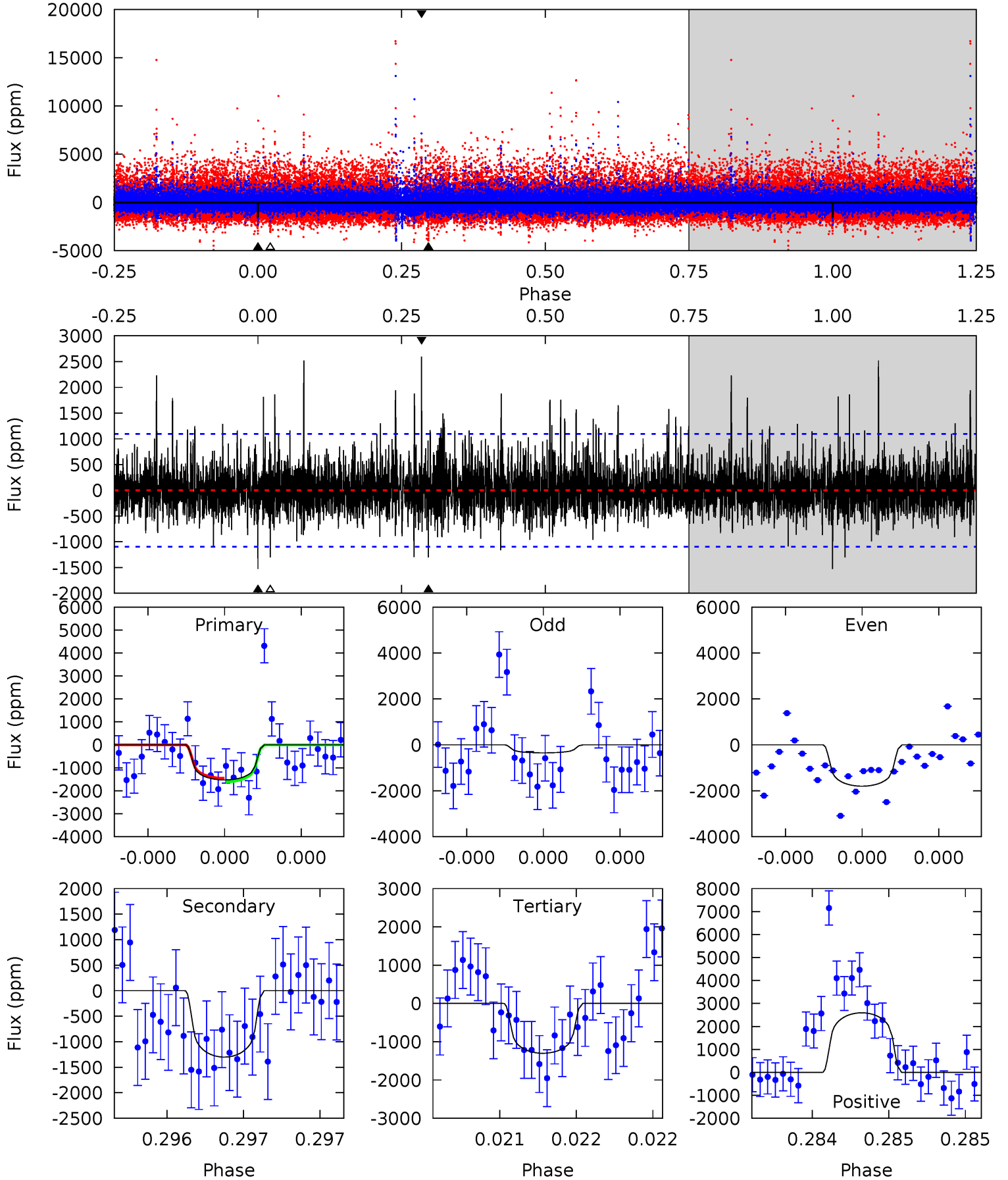
TCE 003103752-04 P=438.640421 Days $T_0=175.787929$ (BKJD)



DV Model-Shift Uniqueness Test

003103752-04, P = 438.651193 Days, E = 175.780323 Days

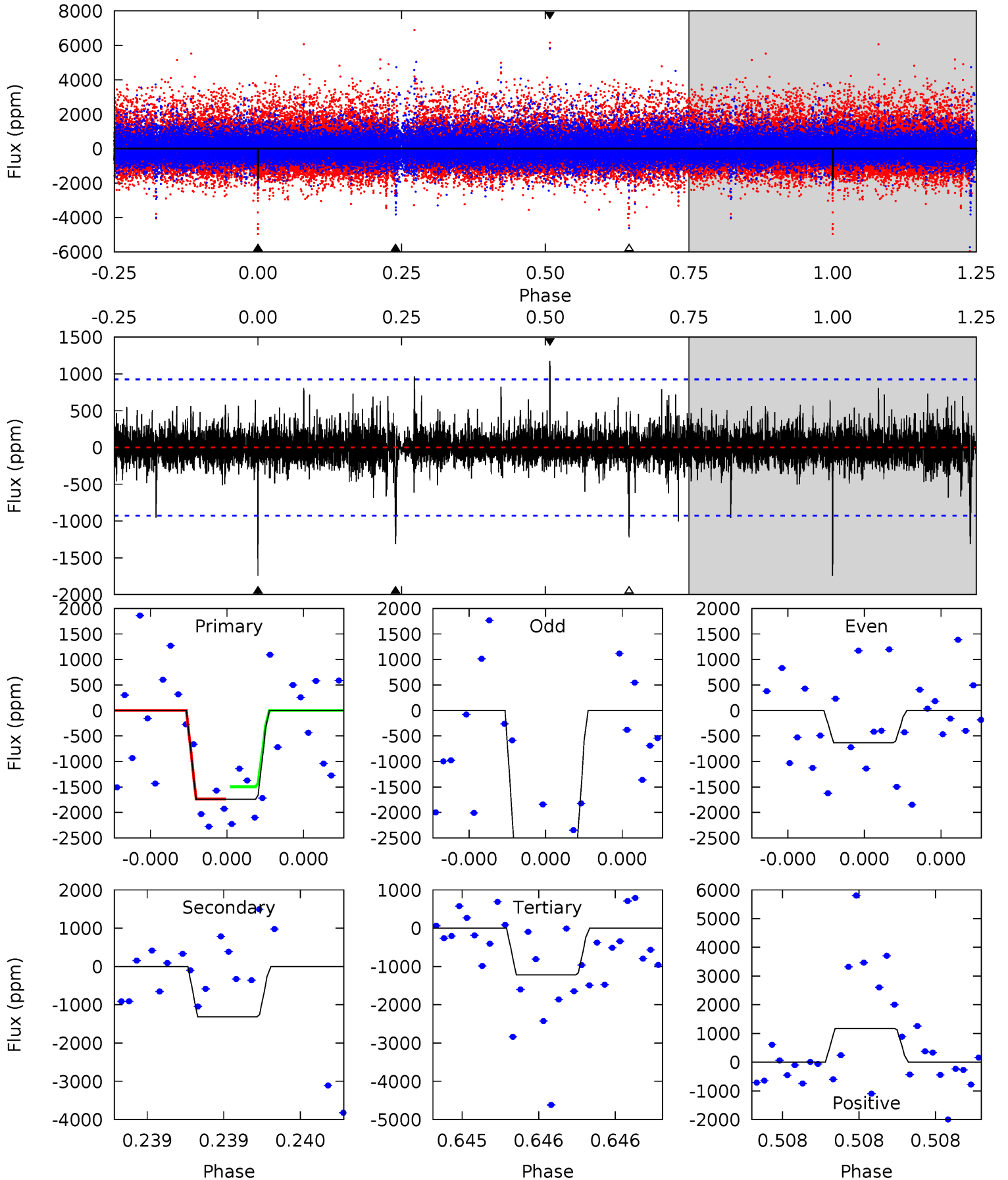
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.78	6.62	6.62	13.2	5.58	3.49	1.88	1.16	-5.42	0.00	-6.57	1.99	0.53	0.63	0.40



Alt Model-Shift Uniqueness Test

003103752-04, P = 438.640421 Days, E = 175.787929 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	7.99	7.43	7.15	5.63	3.57	0.98	3.16	3.43	0.56	0.84	6.39	1.17	0.40	0.72



Stellar Parameters For KIC 003103752

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3388^{+45}_{-45}	$4.939^{+0.050}_{-0.036}$	$0.000^{+0.100}_{-0.100}$	$0.308^{+0.038}_{-0.038}$	$0.301^{+0.051}_{-0.042}$	$14.500^{+3.943}_{-2.590}$
	+1%/-1%	+1%/-1%	+inf%/-inf%	+12%/-12%	+17%/-14%	+27%/-18%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 003103752-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1301 ± 196	$1.81^{+1.62}_{-1.15}$	133^{+3}_{-3}	2998^{+1227}_{-452}	$124017^{+859912}_{-89813}$
Alt.	-1313 ± 164	$1.85^{+1.53}_{-1.11}$	133^{+3}_{-4}	2992^{+1060}_{-438}	$120942^{+726894}_{-84750}$

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

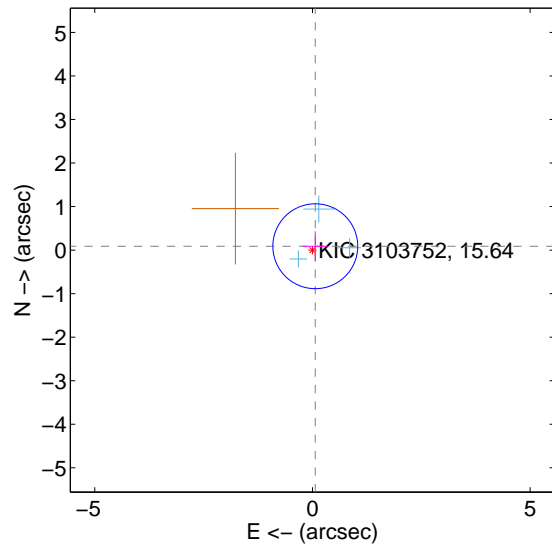
Supplemental centroid analysis for 003103752-04. Kepler magnitude: 15.64. Transit SNR 7.02

There are 3 quarters with good PRF difference image offsets

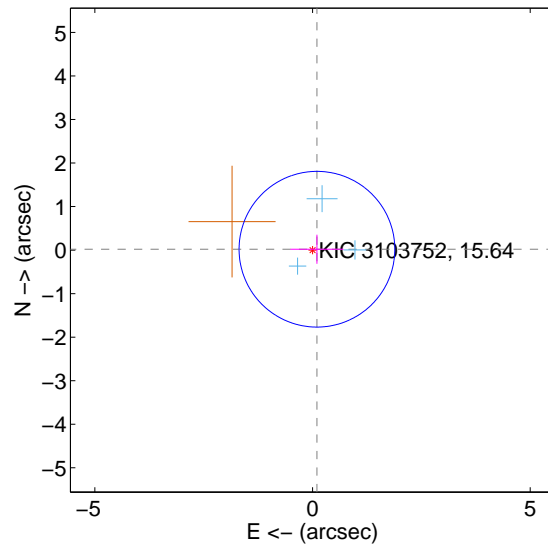
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.110 ± 0.325	0.34	-0.066 ± 0.286	0.089 ± 0.345
PRF-fit source offset from KIC position	0.104 ± 0.596	0.17	-0.102 ± 0.608	0.020 ± 0.333
photometric centroid source offset	0.84 ± 1.27	0.66	-0.68 ± 1.25	0.48 ± 1.30

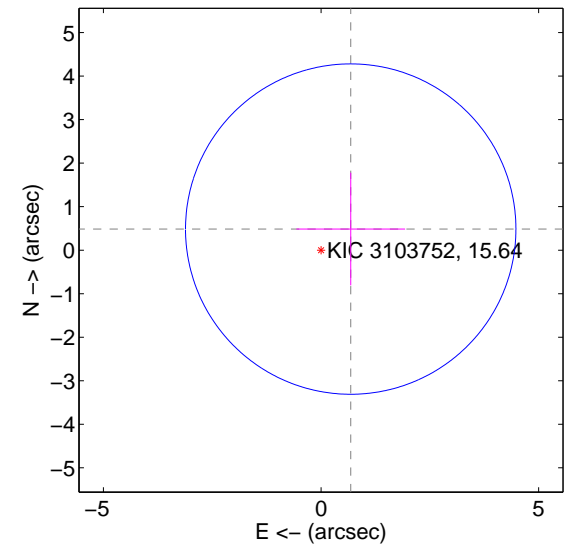
offset from difference PRF-fit to OOT PRF-fit



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.

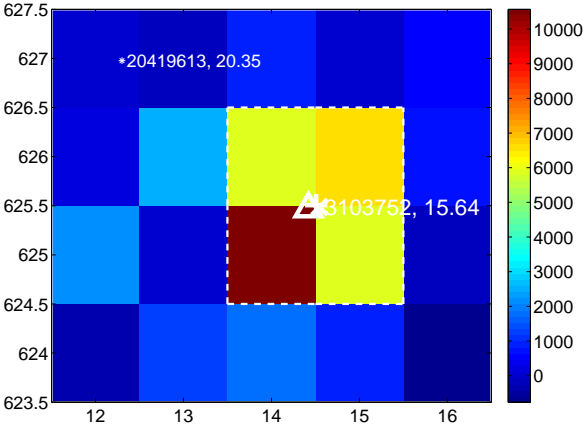
Q1 no difference image



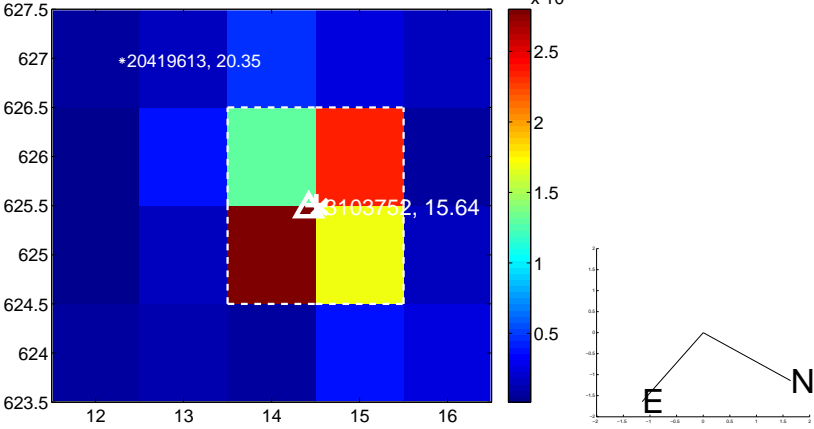
Q1 no OOT image



Q2 difference image



Q2 OOT image



Q3 no difference image



Q3 no OOT image



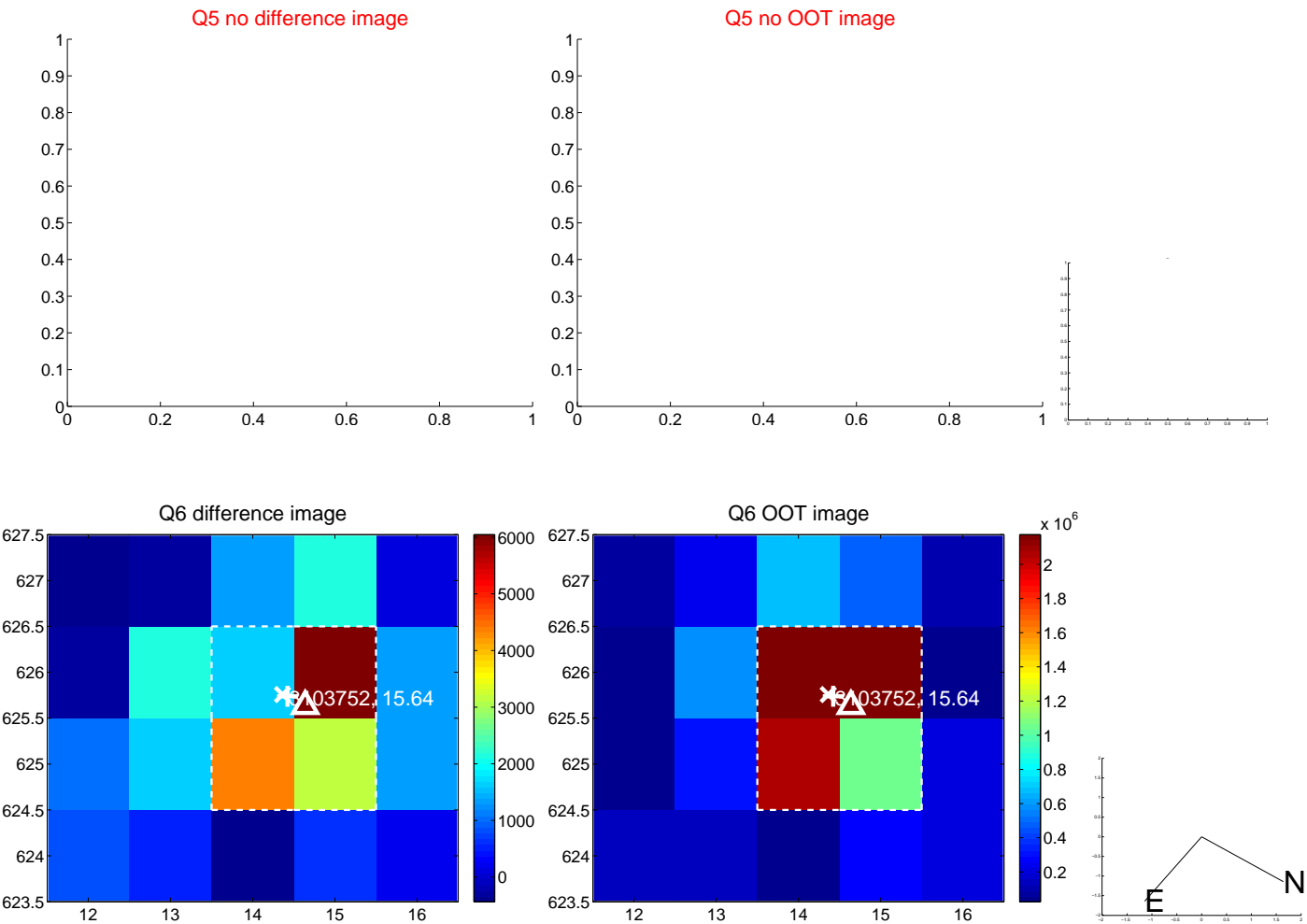
Q4 no difference image



Q4 no OOT image



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



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

Q9 no difference image



Q9 no OOT image



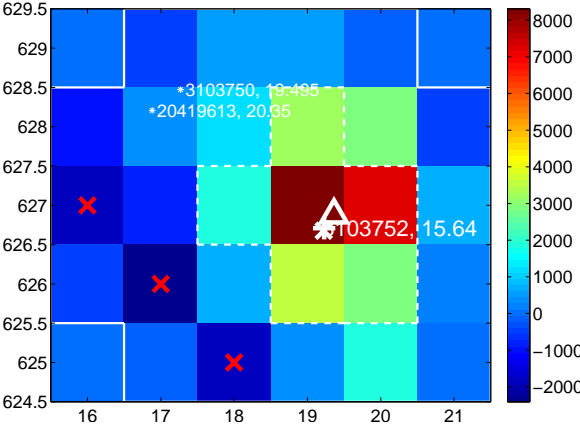
Q10 no difference image



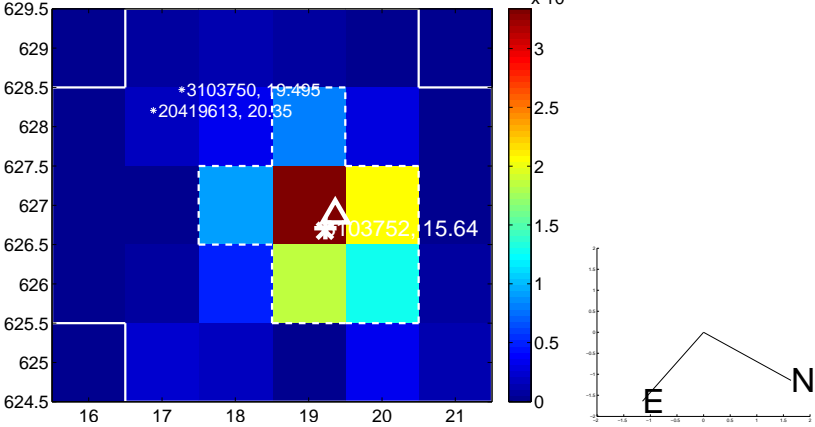
Q10 no OOT image



Q11 difference image



Q11 OOT image



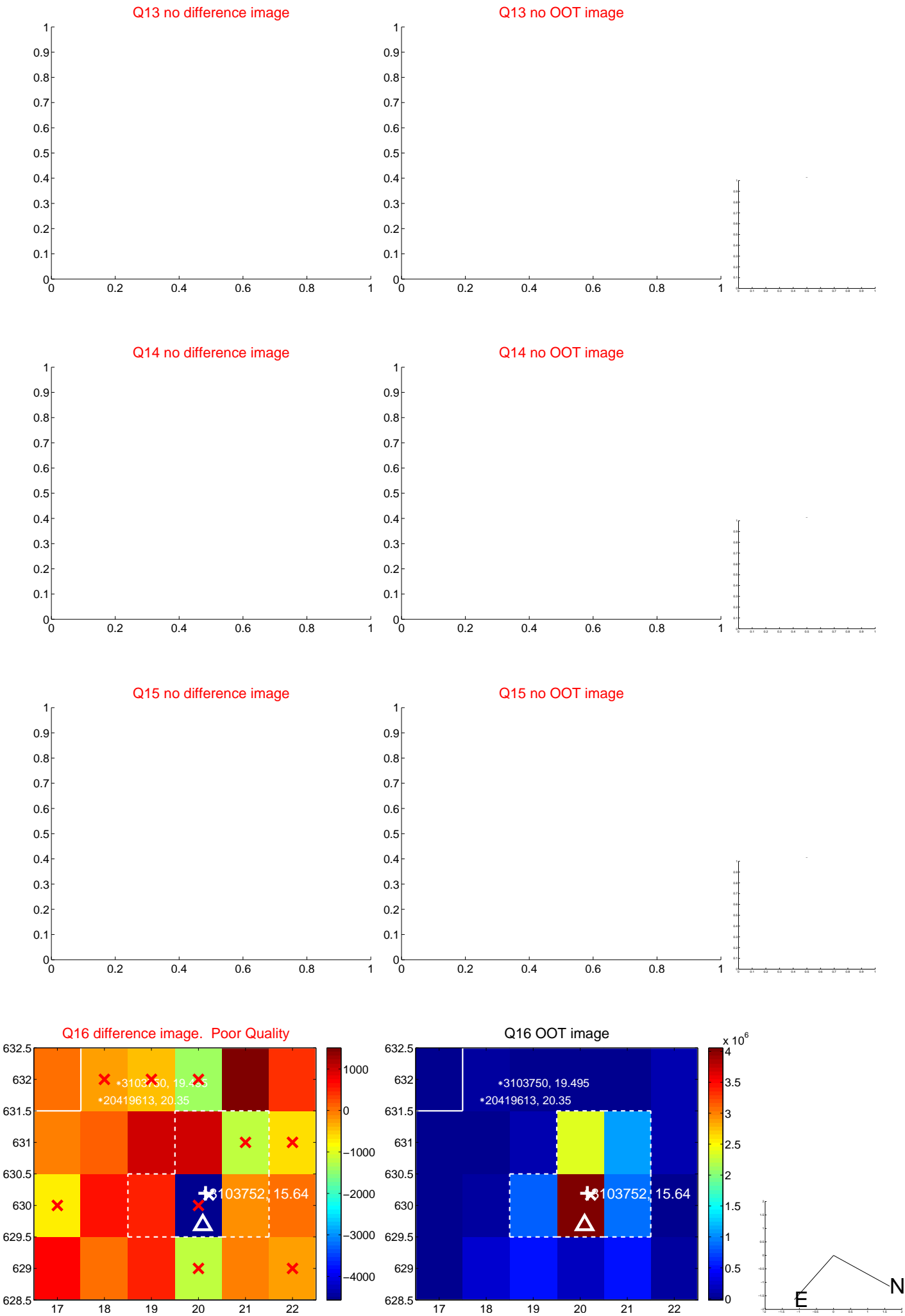
Q12 no difference image



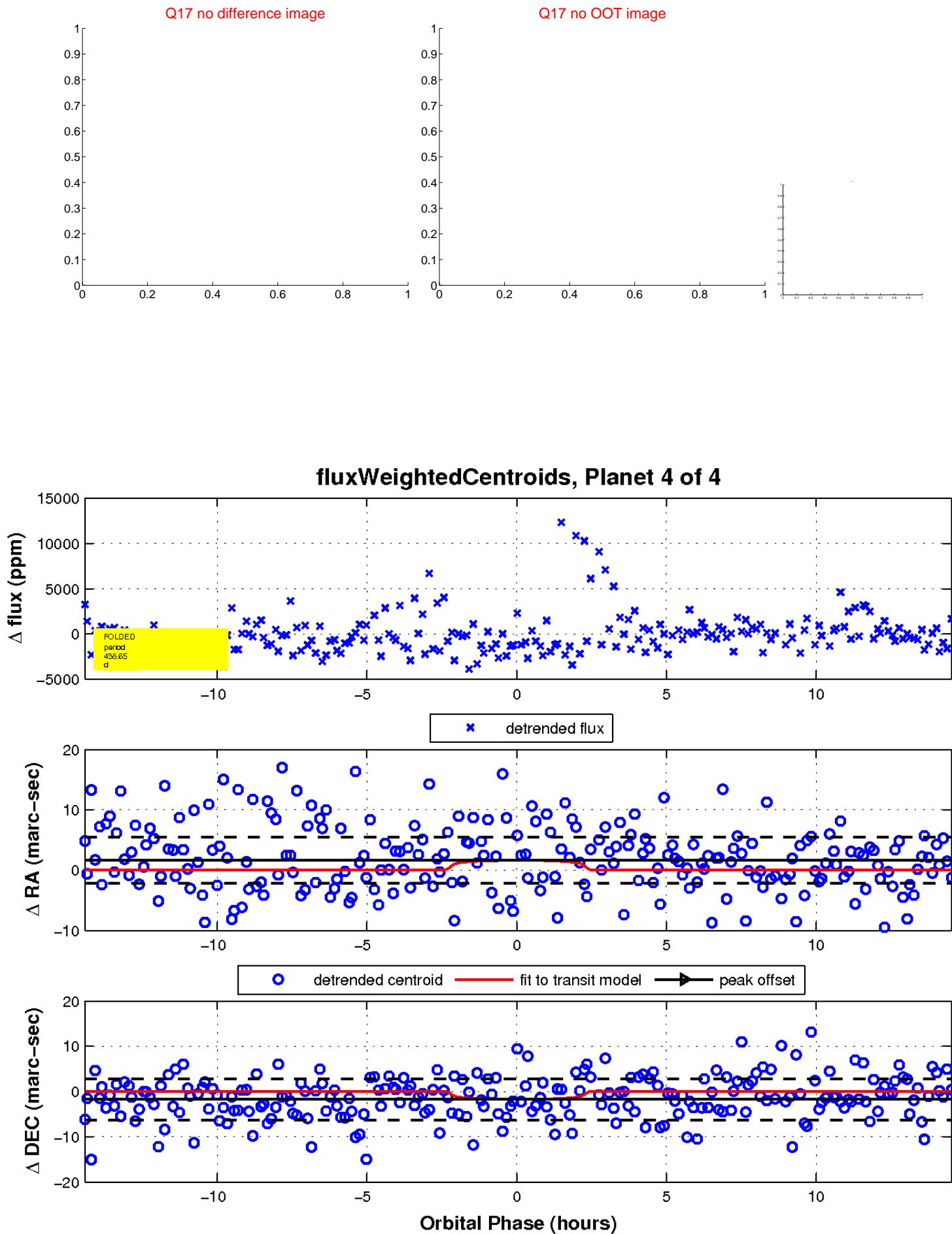
Q12 no OOT image



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

