

KIC 010802309

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})
010802309-01	OBS	No	478.046439	187.760009	461.9	2.275	17.4	2.9	0.66	5403	1.60	0.31
010802309-02	OBS	No	562.764721	236.544816	610.4	14.216	11.2	2.9	0.66	5403	1.69	0.25
010802309-03	OBS	No	383.600436	465.579054	1243.2	3.326	14.4	7.6	0.66	5403	2.54	0.42
010802309-04	OBS	No	455.785858	355.856550	1662.3	13.672	12.4	3.3	0.66	5403	3.40	0.33

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010802309-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010802309-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

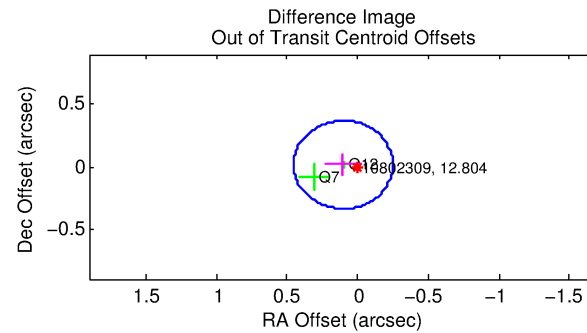
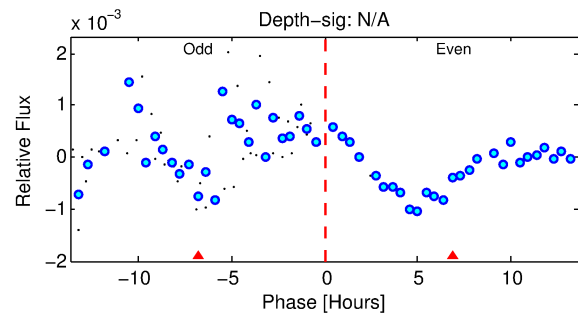
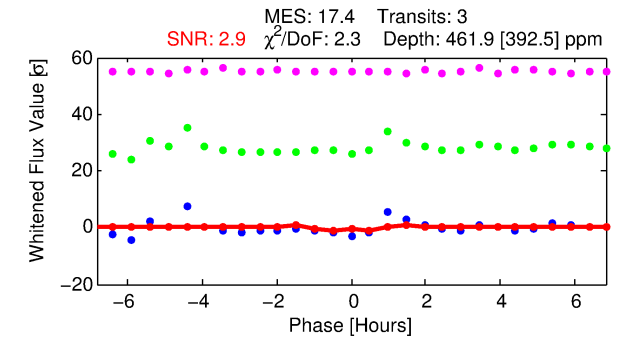
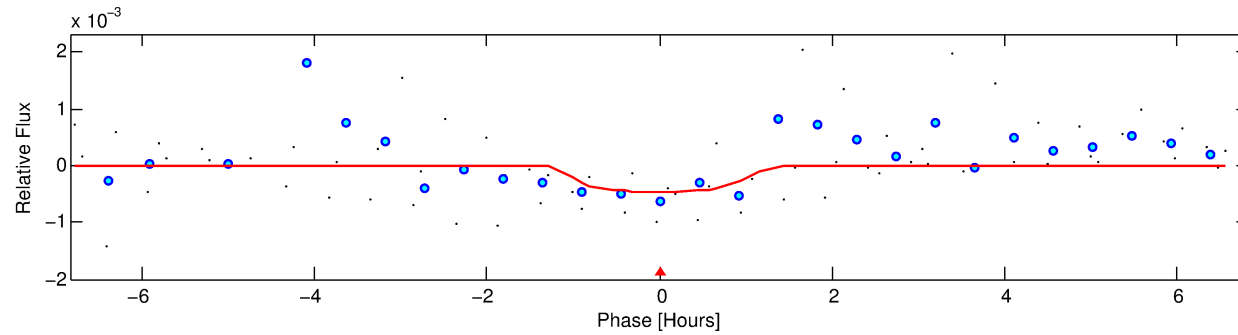
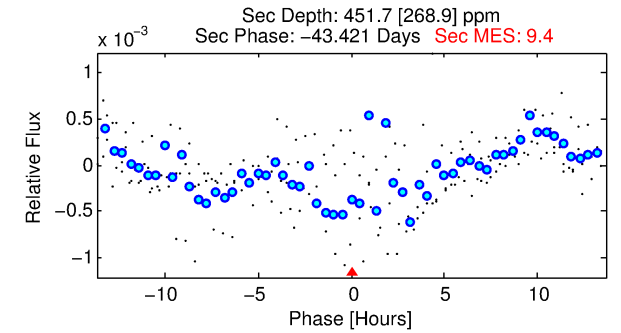
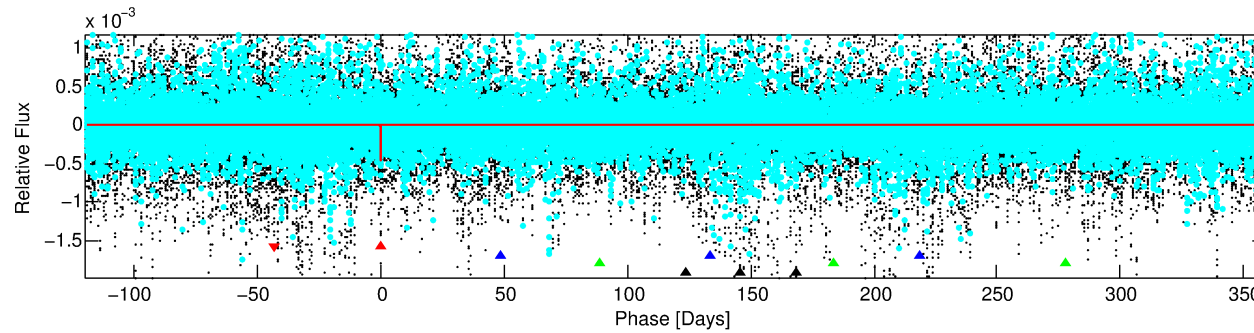
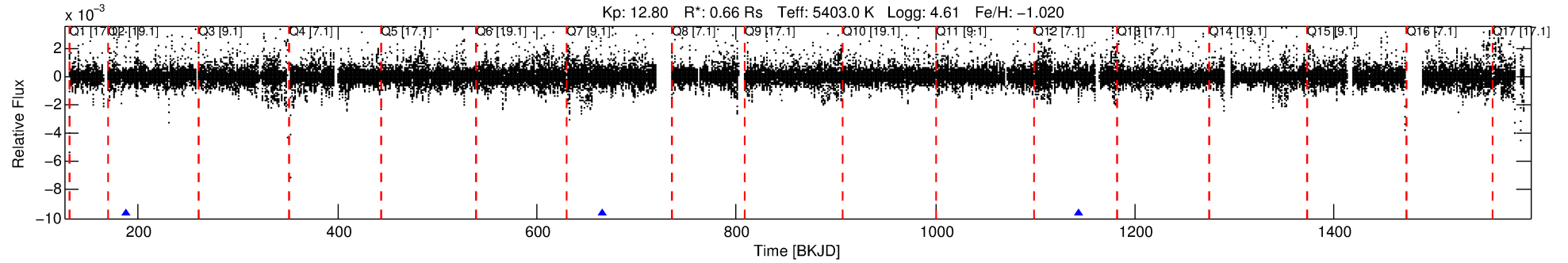
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010802309-01

No Significant Match Found

DV One-Page Summary

KIC: 10802309 Candidate: 1 of 4 Period: 478.046 d



DV Fit Results:

Period = 478.04644 [0.01607] d
Epoch = 187.7600 [0.0195] BKJD
Rp/R* = 0.0223 [0.0588]
a/R* = 943.22 [11512.00]
b = 0.84 [4.44]
Seff = 0.31 [0.05]
Teq = 191 [8] K
Rp = 1.61 [4.24] Re
a = 1.0323 [0.0823] AU
Ag = 102744.18 [546536.38] [0.19] σ
Teffp = 5280 [7021] K [0.72] σ

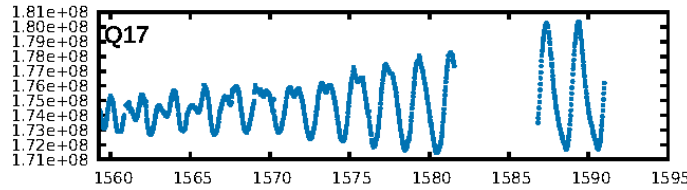
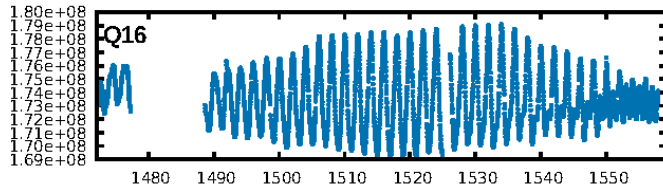
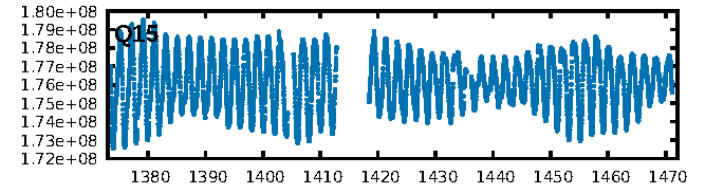
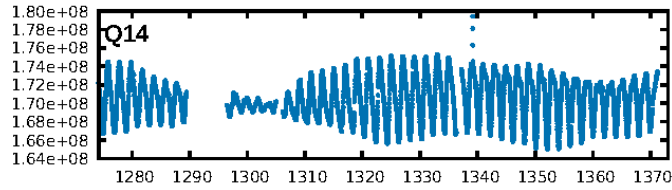
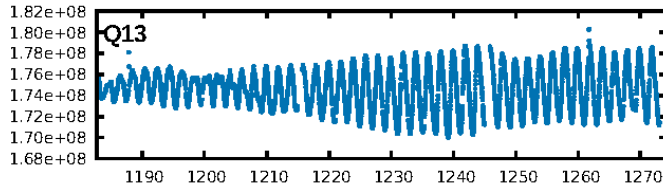
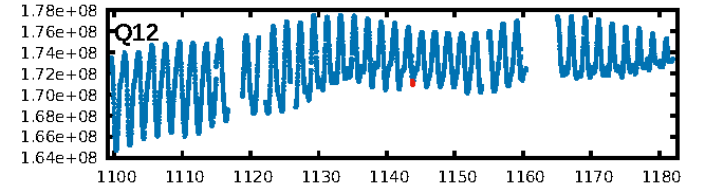
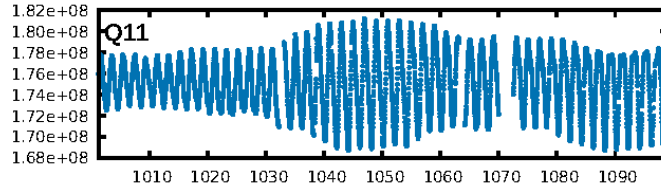
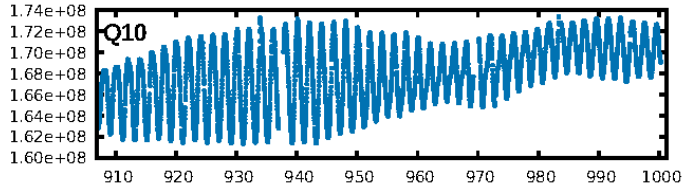
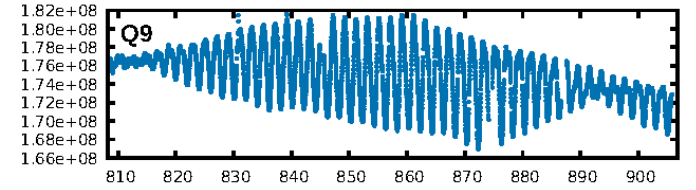
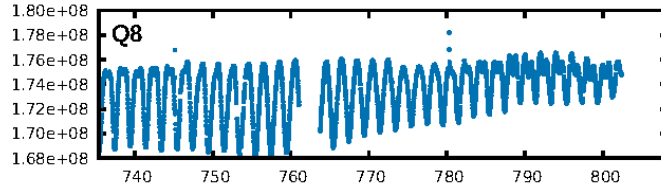
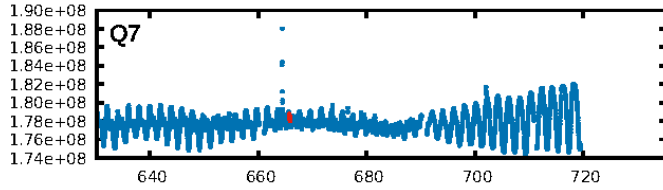
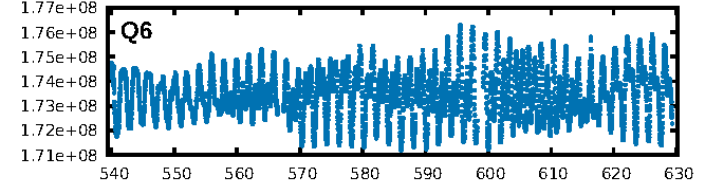
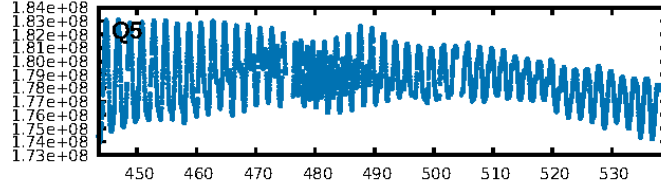
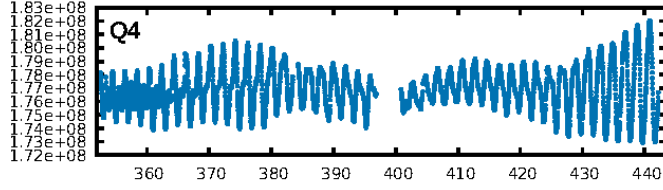
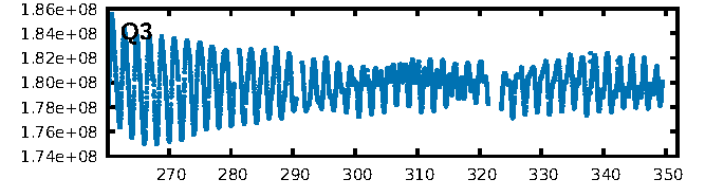
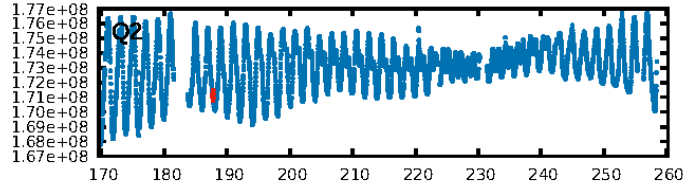
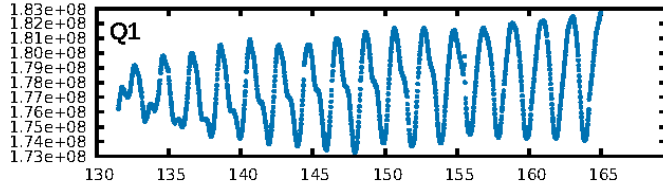
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.55] σ
LongPeriod-sig: 100.0% [141.23] σ
ModelChiSquare2-sig: 20.5%
ModelChiSquareGof-sig: 81.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.6311
Centroid-sig: 30.7%
Centroid-so: 1.327 arcsec [1.30] σ
OotOffset-rm: 0.103 arcsec [0.88] σ
KicOffset-rm: 0.204 arcsec [2.41] σ
OotOffset-st: 0/1/1/0 [2]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

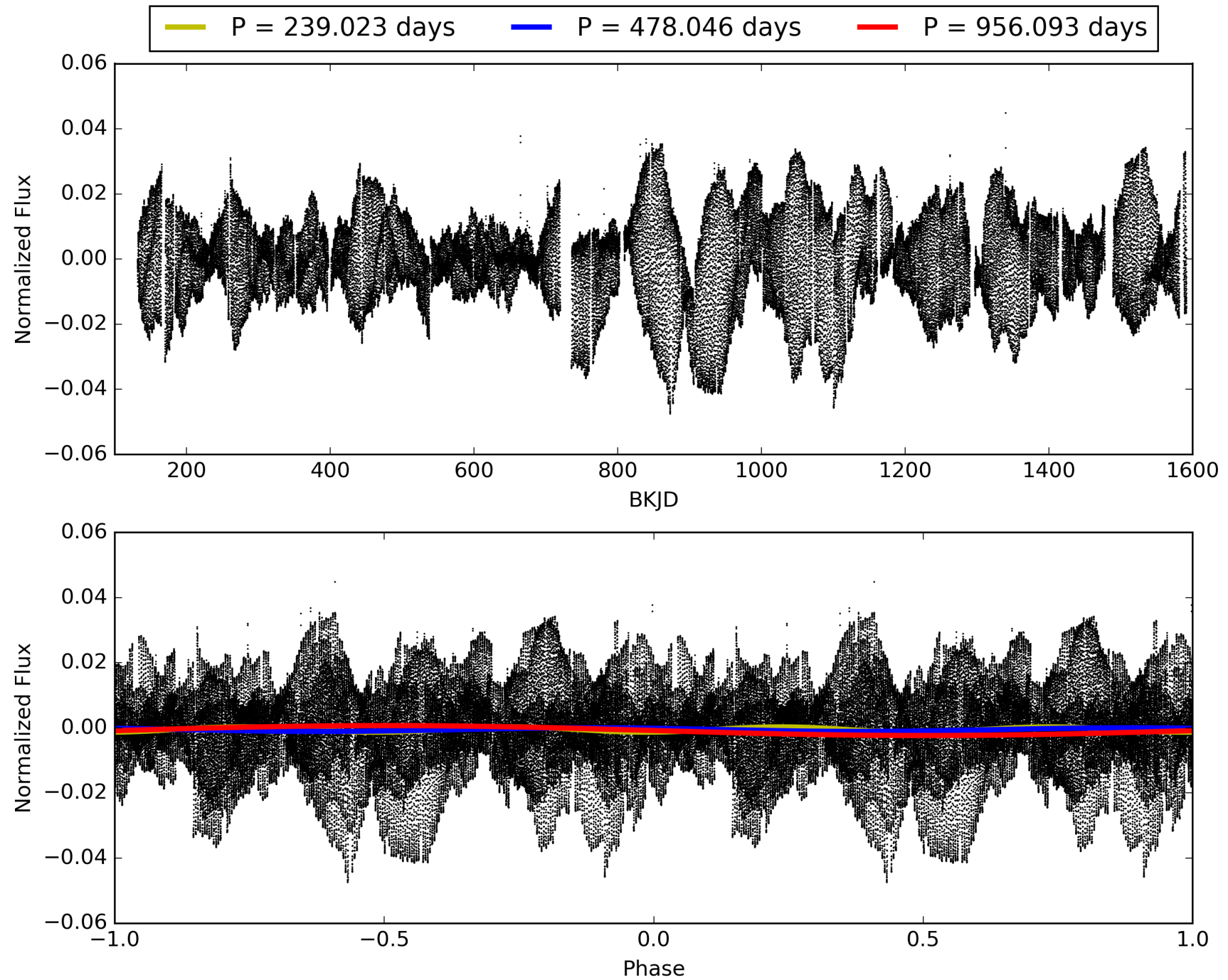
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:46:24 Z

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

TCE 010802309-01, PDC Light Curves

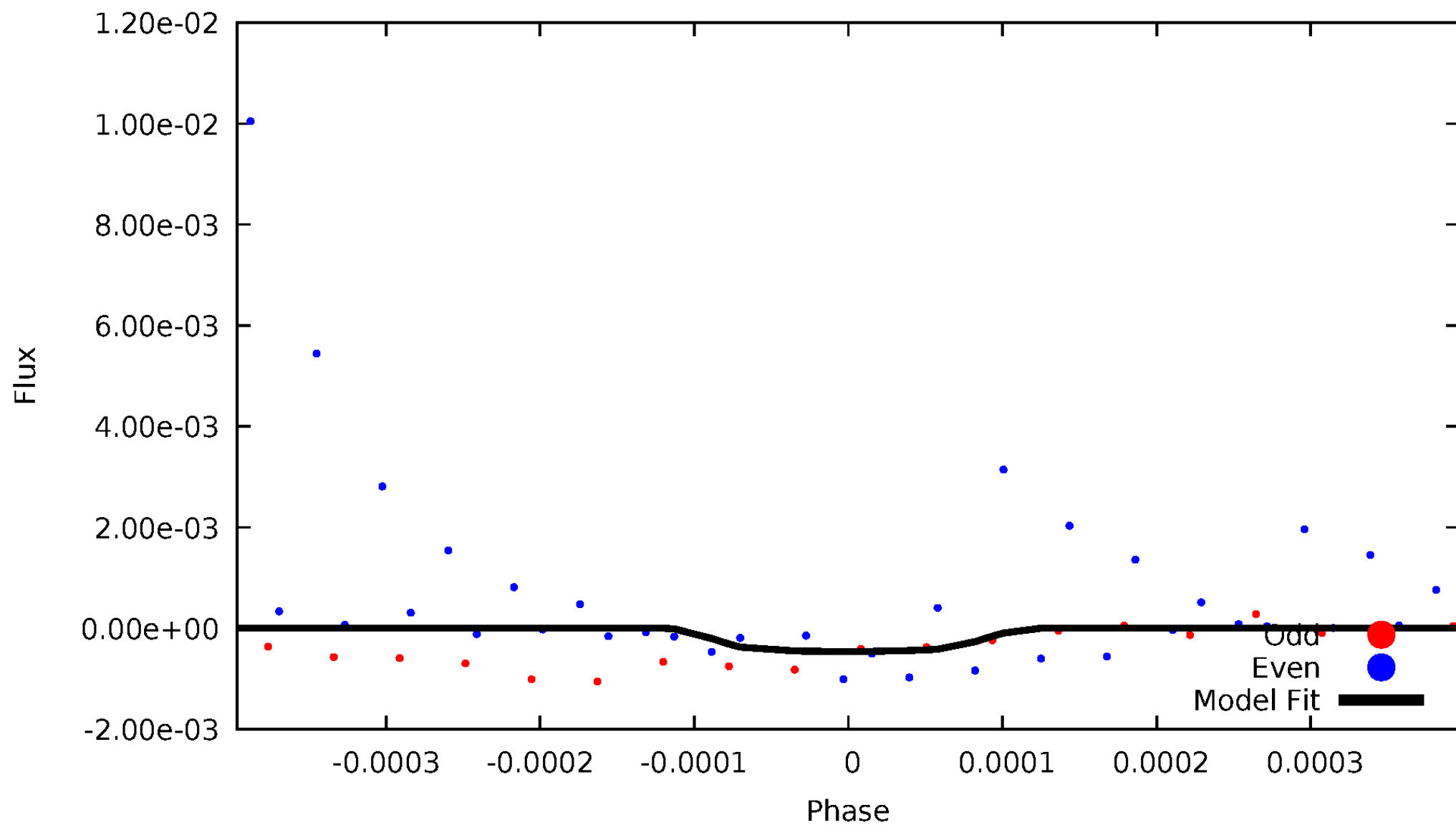


TCE 010802309-01



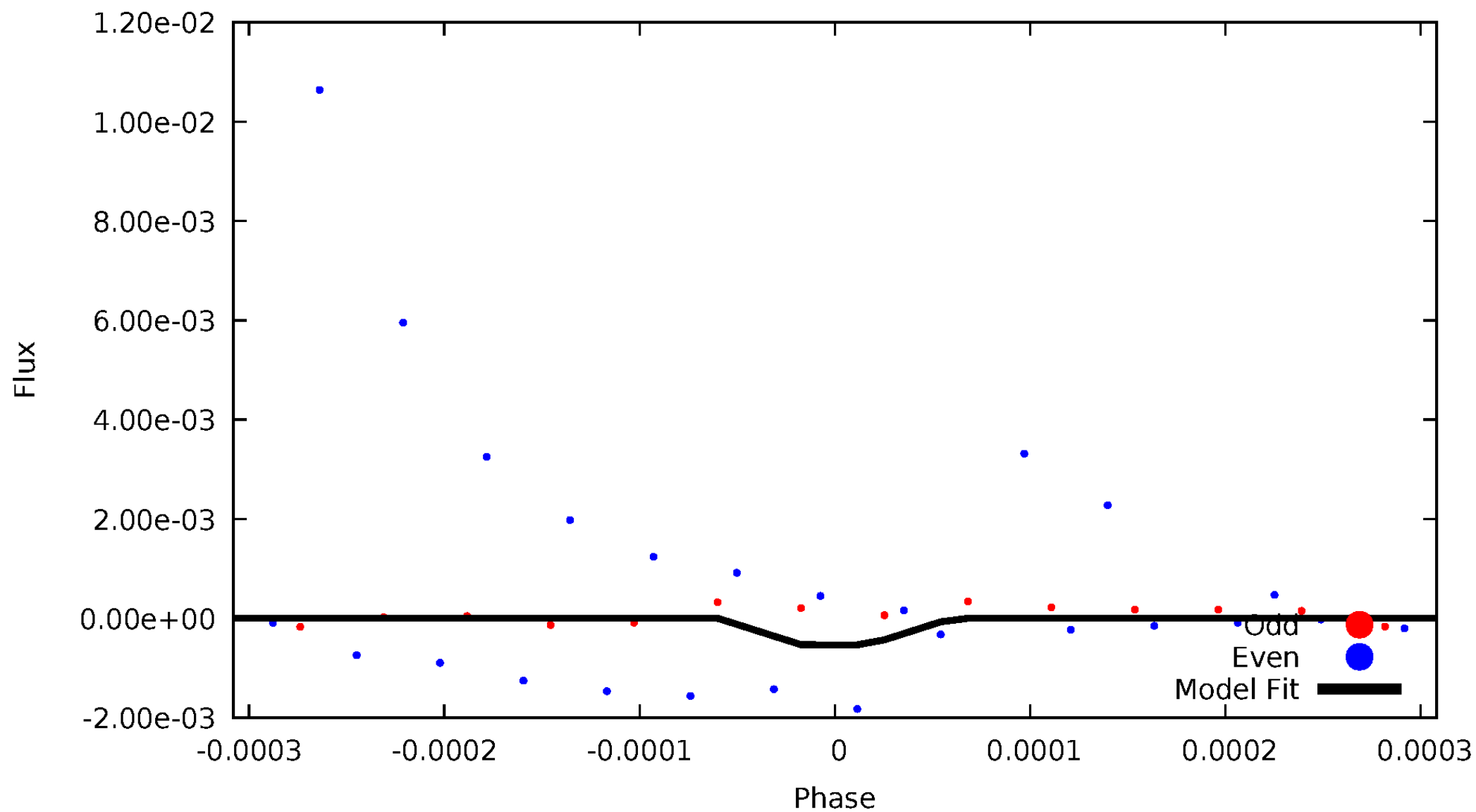
DV Odd/Even

TCE 010802309-01



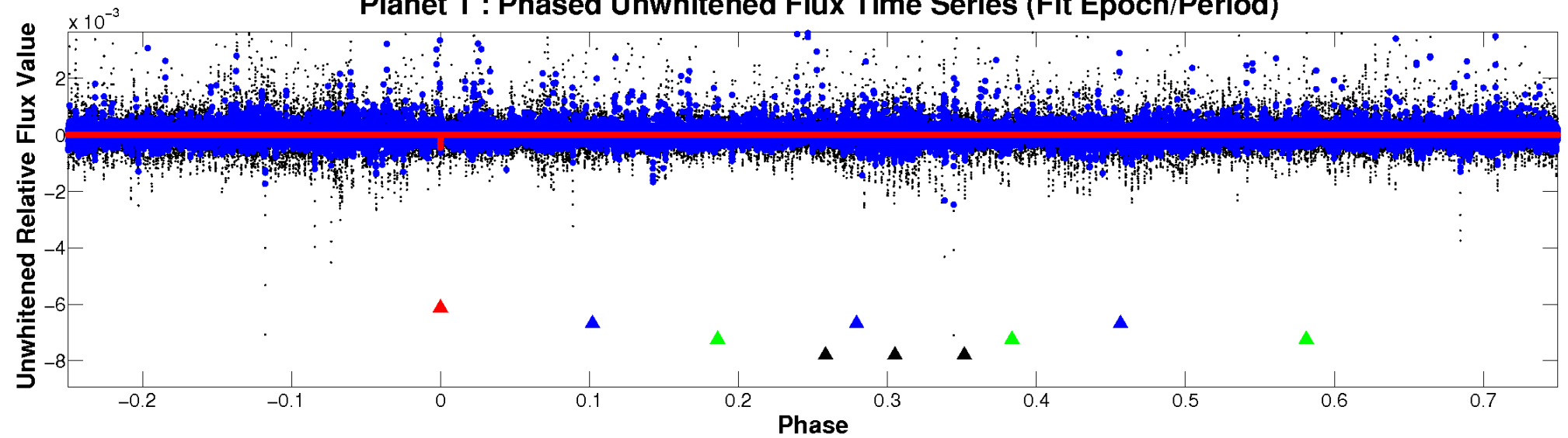
ALT Odd/Even

TCE 010802309-01

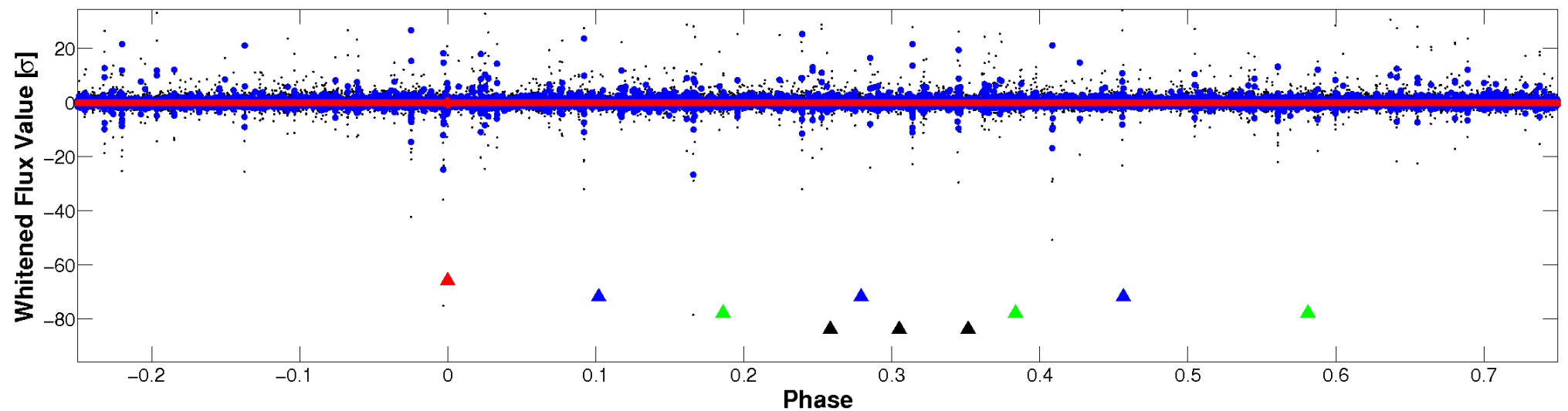


Non-Whitened Vs. Whitened Light Curve

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

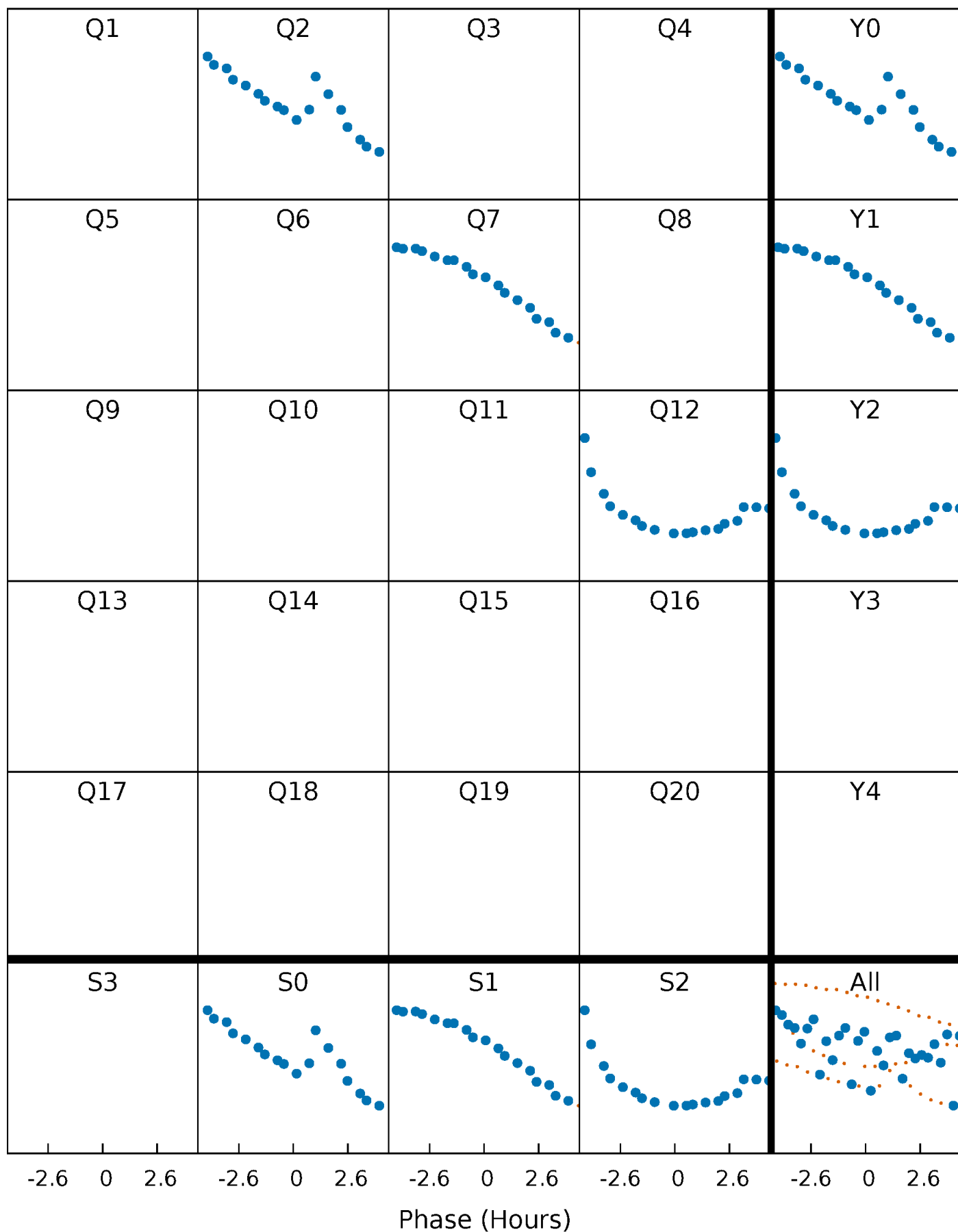


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



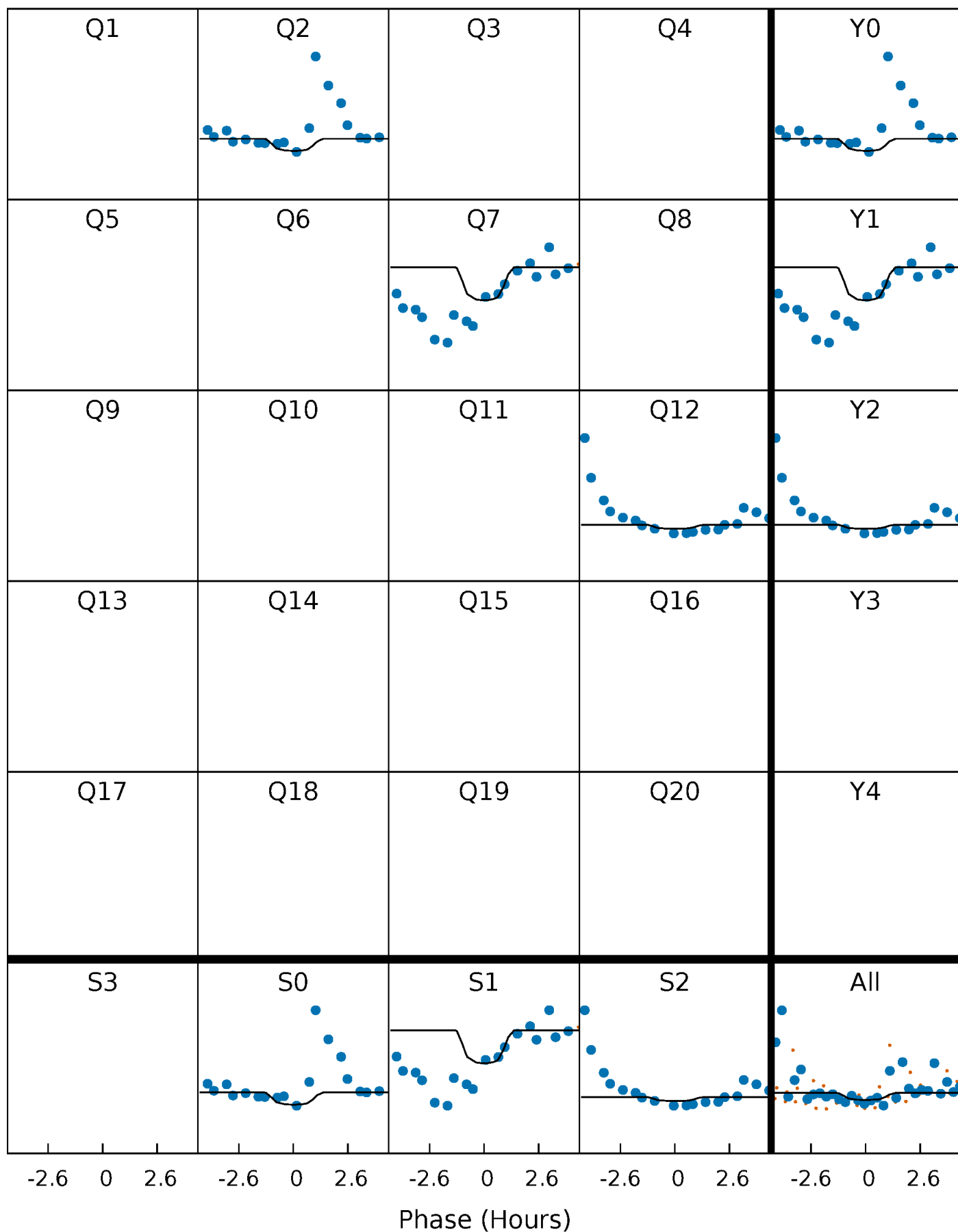
PDC Quarter-Phased Transit Curves

TCE 010802309-01 P=478.046439 Days $T_0=187.760009$ (BKJD)



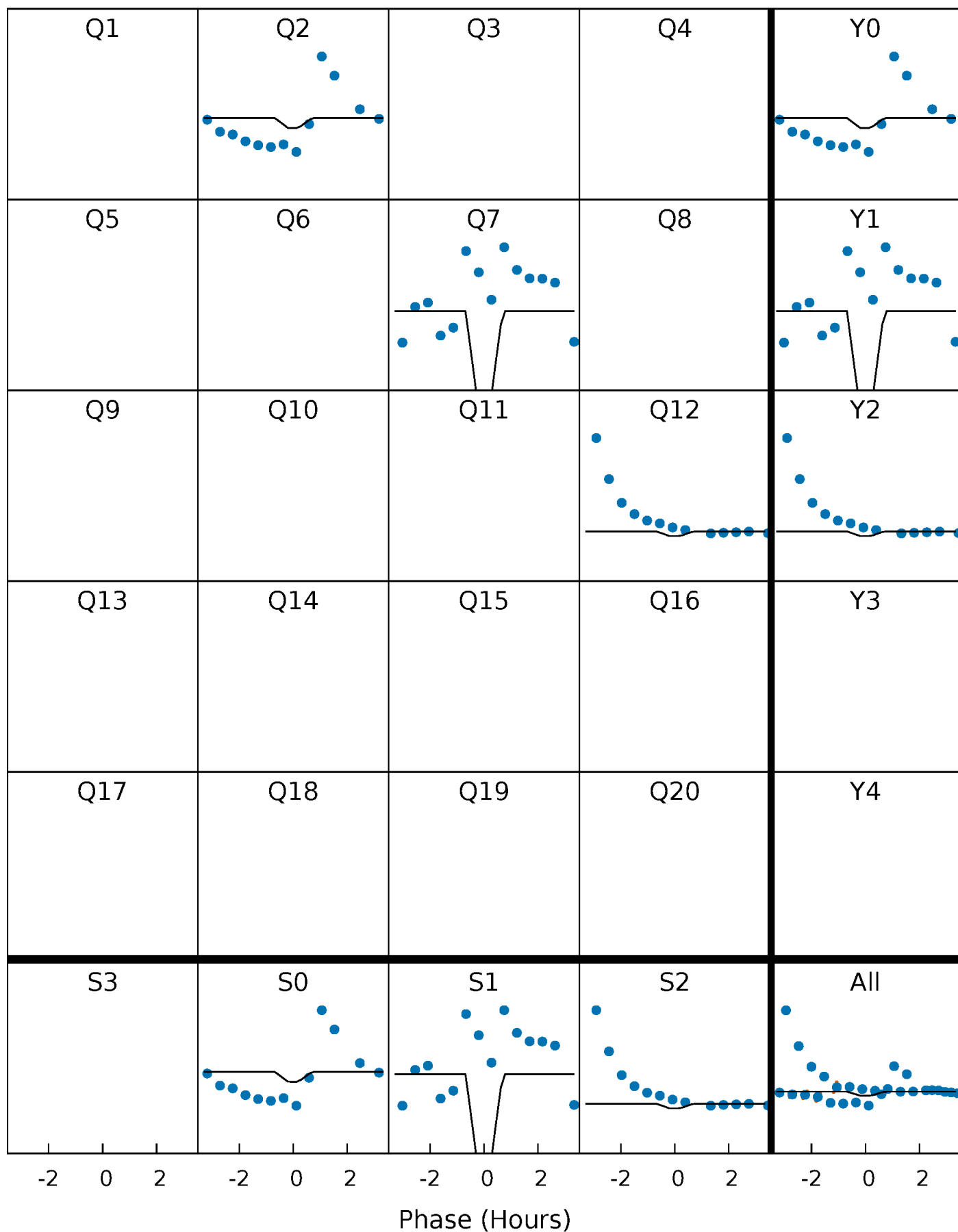
DV Quarter-Phased Transit Curves

TCE 010802309-01 P=478.046439 Days $T_0=187.760009$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

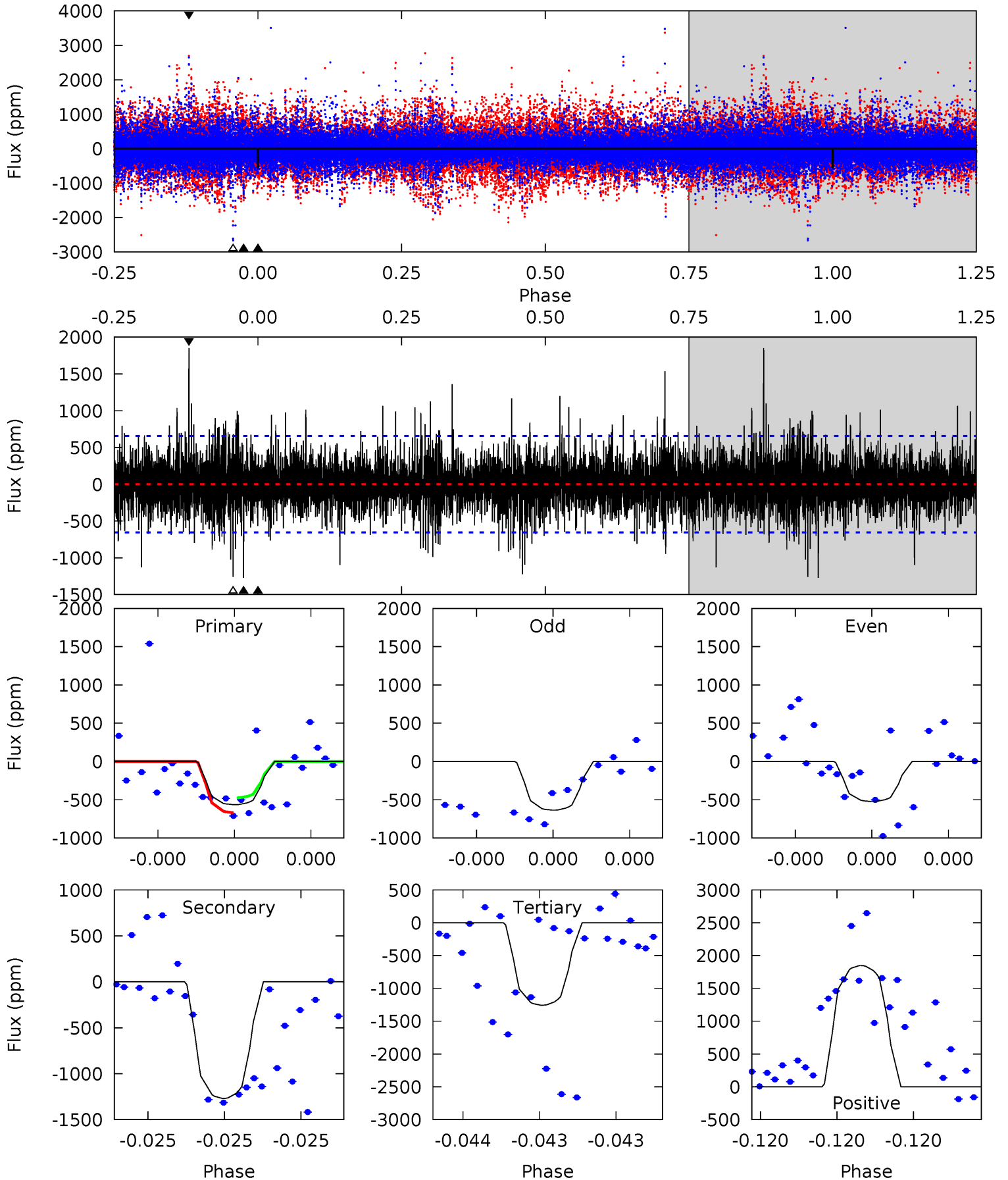
TCE 010802309-01 P=478.015891 Days $T_0=187.761836$ (BKJD)



DV Model-Shift Uniqueness Test

010802309-01, P = 478.046439 Days, E = 187.760009 Days

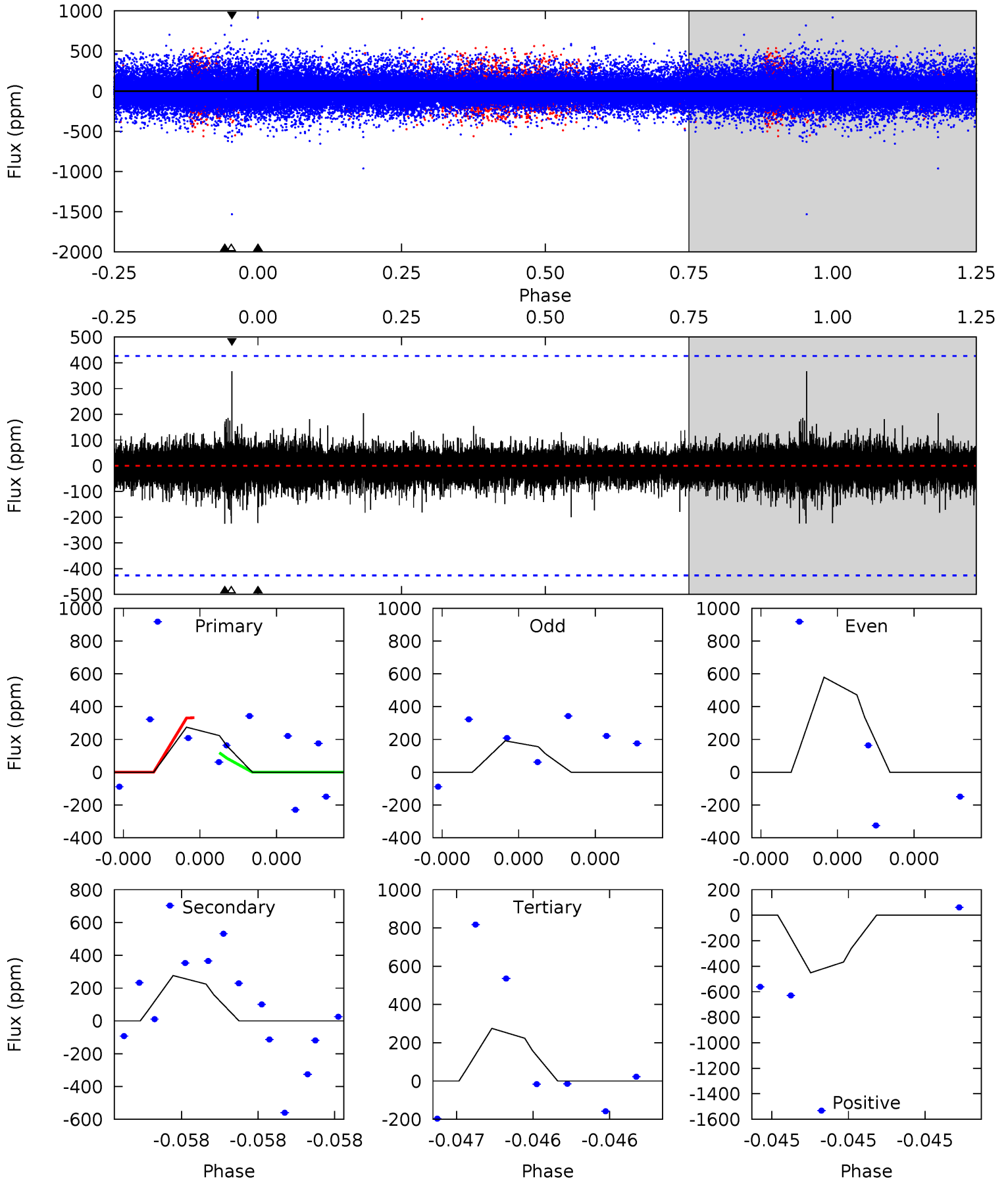
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.92	11.0	10.9	16.1	5.70	3.67	2.13	-6.02	-11.2	0.11	-5.03	0.35	0.86	0.59	0.85



Alt Model-Shift Uniqueness Test

010802309-01, P = 478.015891 Days, E = 187.761836 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.06	3.08	3.07	5.04	5.85	3.89	0.47	-0.00	-1.97	0.01	-1.95	2.35	-2.60	0.62	1.71



Stellar Parameters For KIC 010802309

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5403^{+163}_{-146}	$4.605^{+0.072}_{-0.054}$	$-1.020^{+0.300}_{-0.300}$	$0.661^{+0.057}_{-0.057}$	$0.643^{+0.066}_{-0.024}$	$3.132^{+0.903}_{-0.587}$
	+3%/-3%	+2%/-1%	+29%/-29%	+9%/-9%	+10%/-4%	+29%/-19%
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 010802309-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1270 ± 115	$3.49^{+3.54}_{-2.27}$	266^{+11}_{-9}	4757^{+3345}_{-1059}	$62141^{+469990}_{-46635}$
Alt.	-225 ± 73	$3.67^{+3.39}_{-2.46}$	266^{+9}_{-10}	3419^{+1645}_{-621}	10165^{+71781}_{-7824}

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

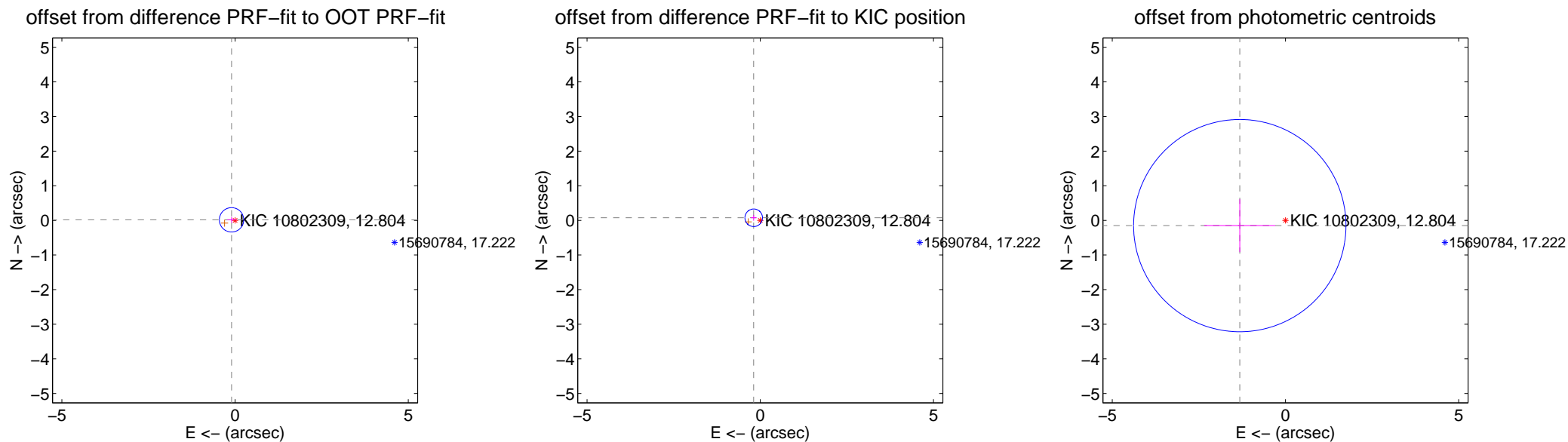
DV Centroid Data

Supplemental centroid analysis for 010802309-01. Kepler magnitude: 12.80. Transit SNR 2.93

There are 1 quarters with good PRF difference image offsets

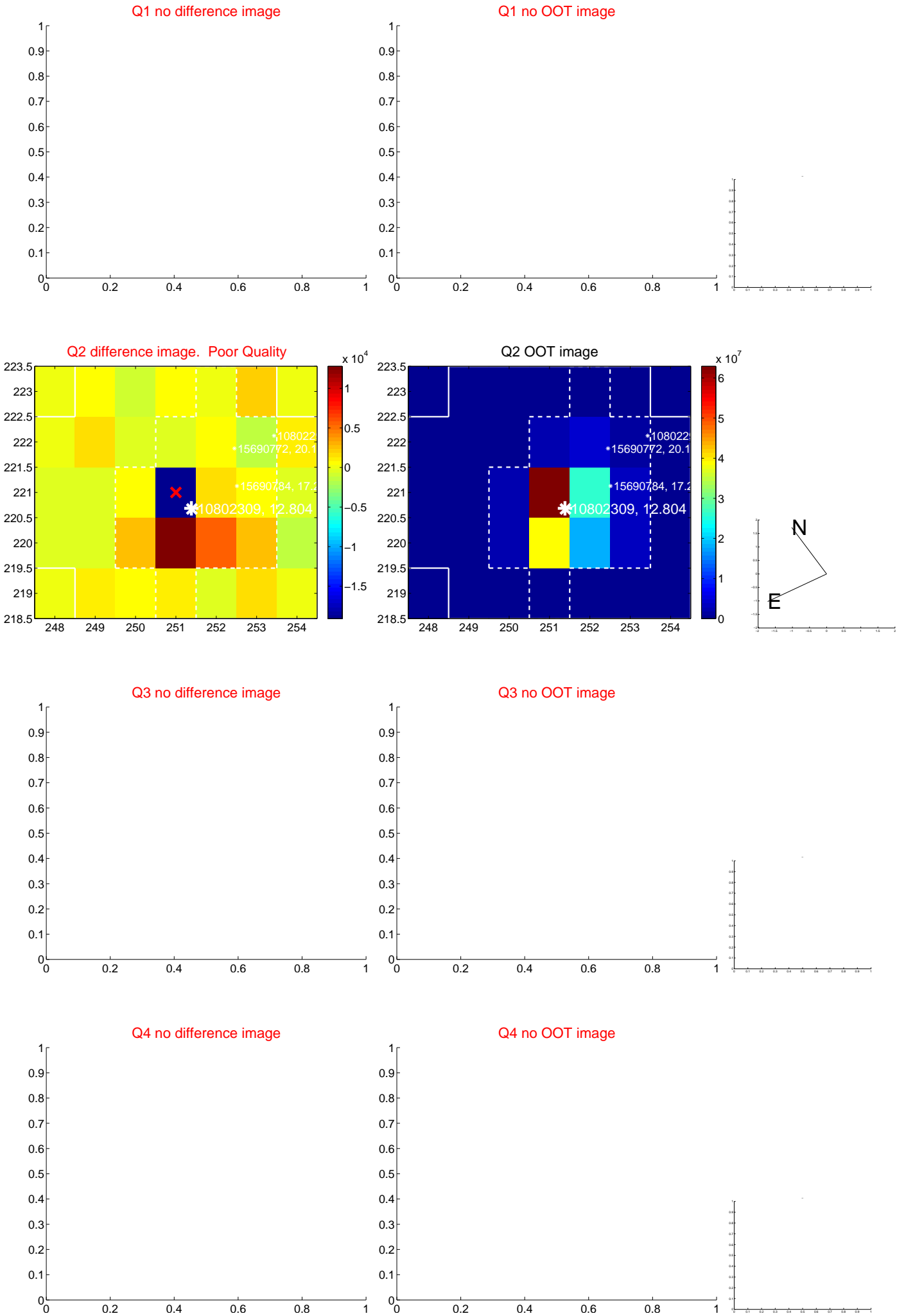
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.103 ± 0.117	0.88	0.102 ± 0.124	0.015 ± 0.083
PRF-fit source offset from KIC position	0.204 ± 0.085	2.41	0.190 ± 0.085	0.075 ± 0.084
photometric centroid source offset	1.33 ± 1.02	1.30	1.32 ± 1.02	-0.15 ± 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.

Q5 no difference image



Q5 no OOT image



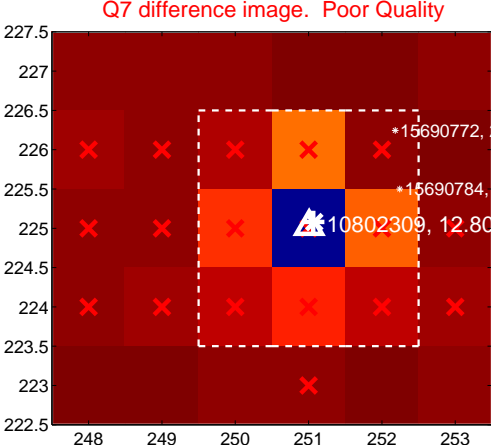
Q6 no difference image



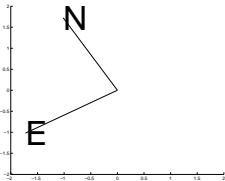
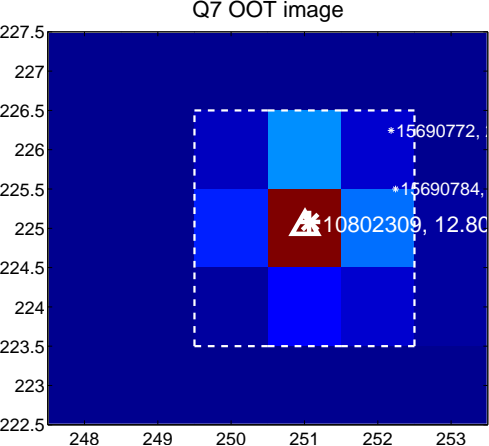
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



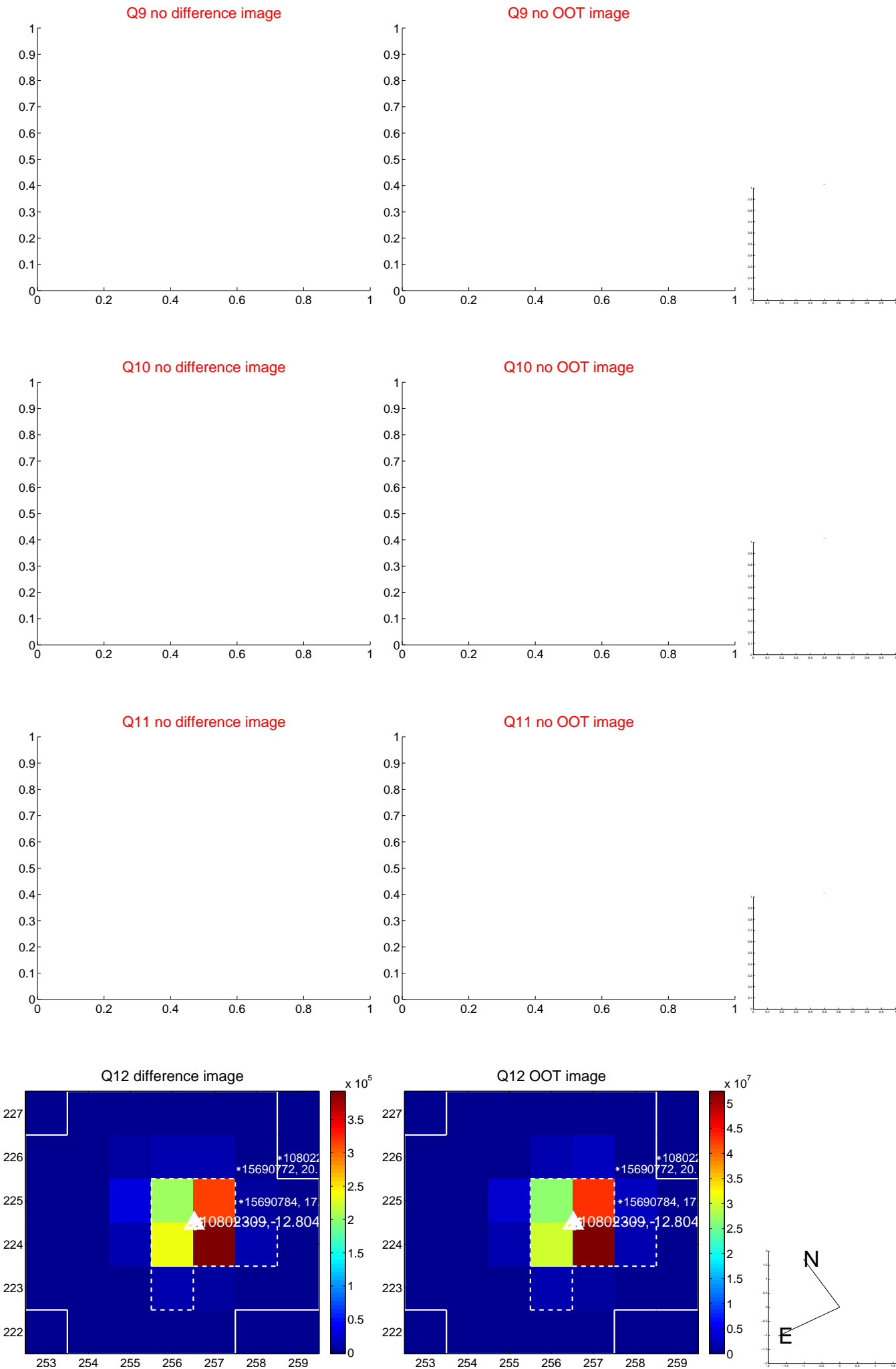
Q8 no difference image



Q8 no OOT image



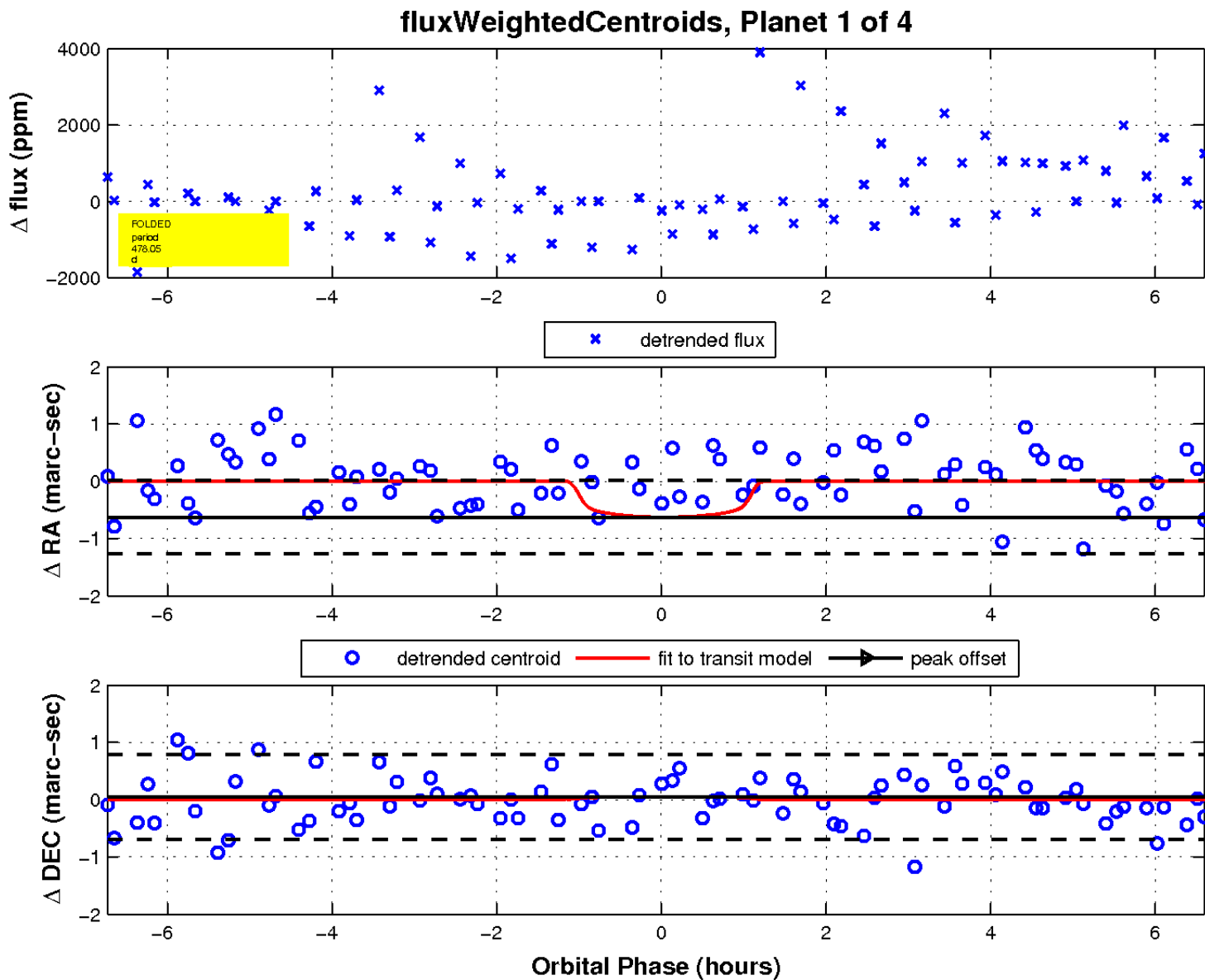
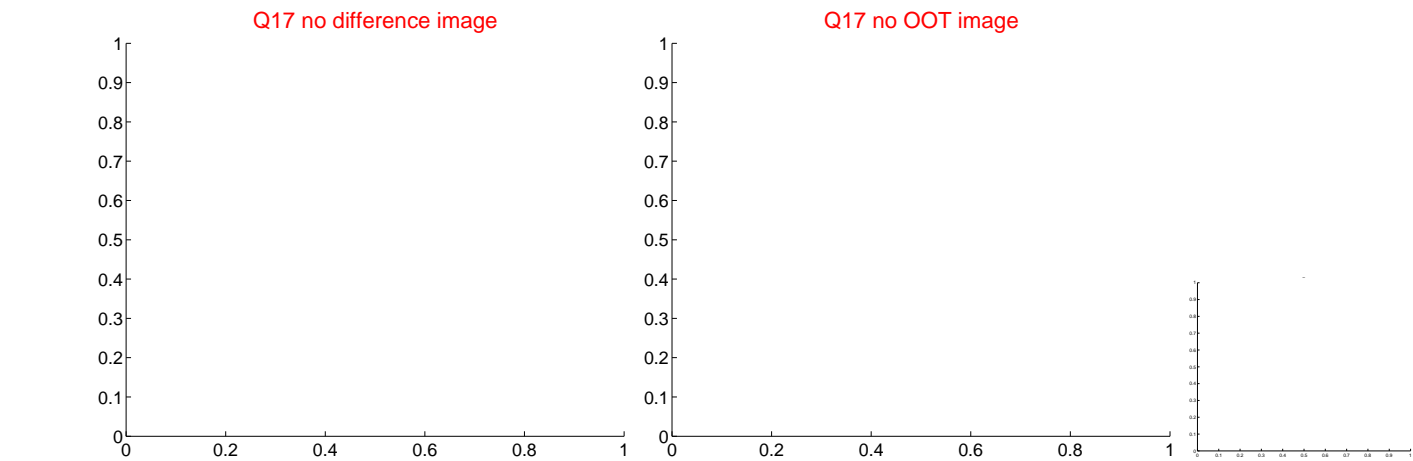
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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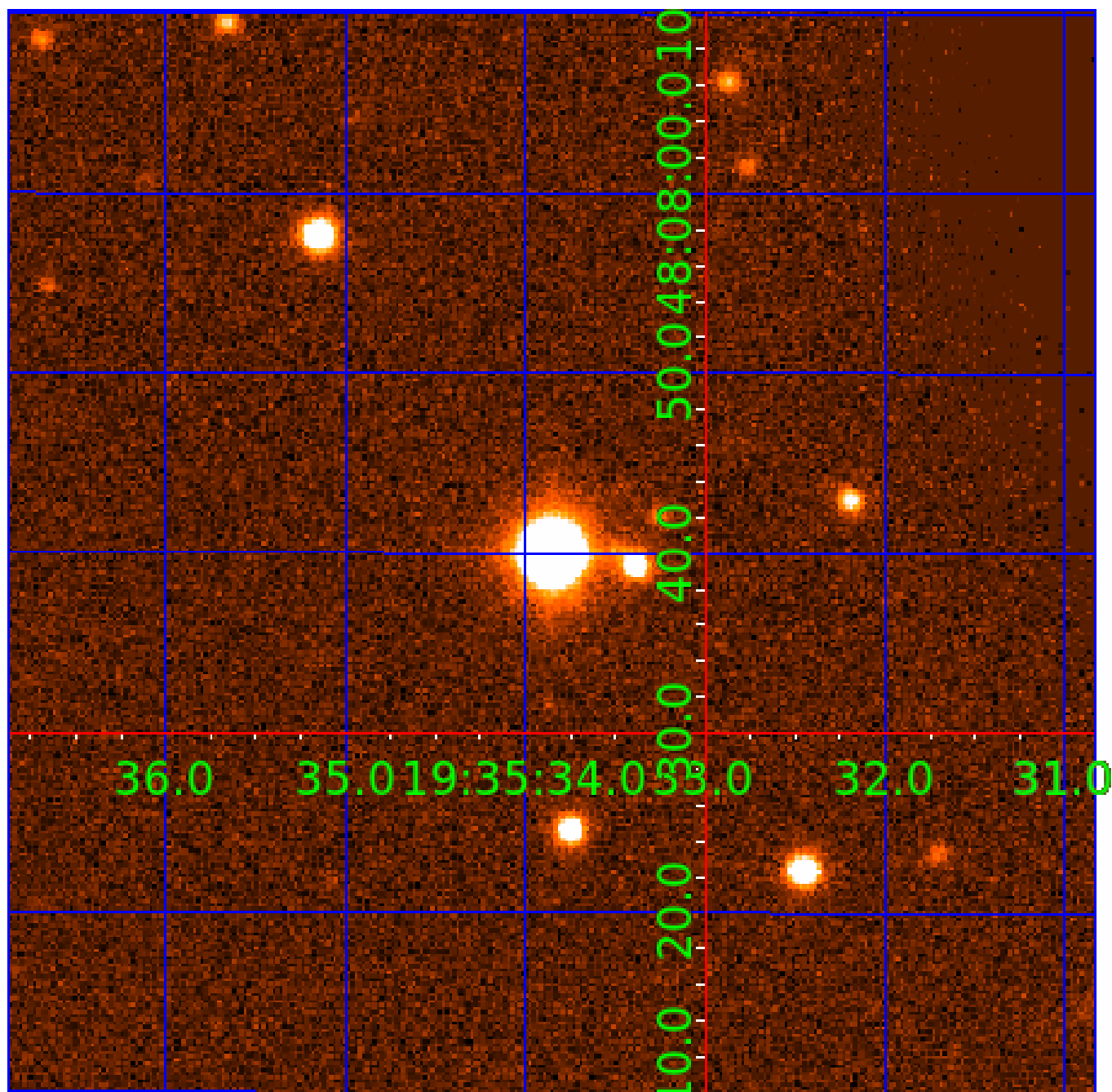


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010802309

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})
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010802309-03	OBS	No	383.600436	465.579054	1243.2	3.326	14.4	7.6	0.66	5403	2.54	0.42
010802309-04	OBS	No	455.785858	355.856550	1662.3	13.672	12.4	3.3	0.66	5403	3.40	0.33

Robovetter Results

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010802309-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010802309-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

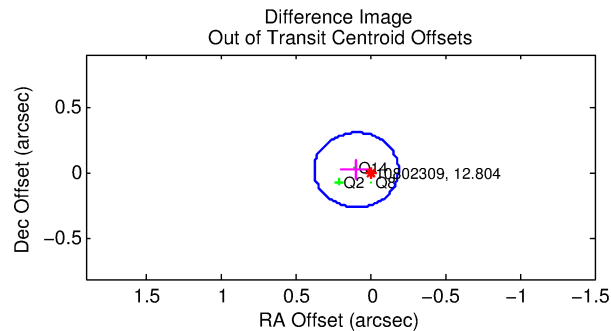
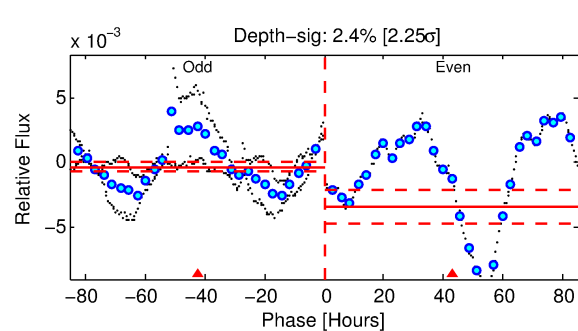
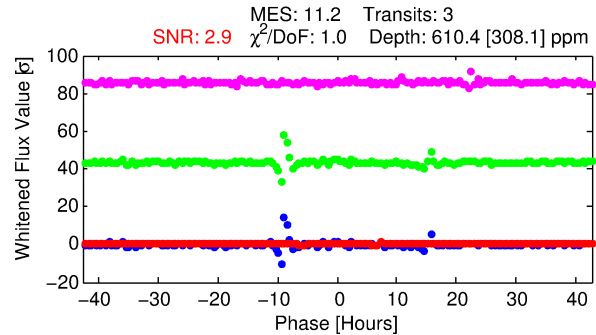
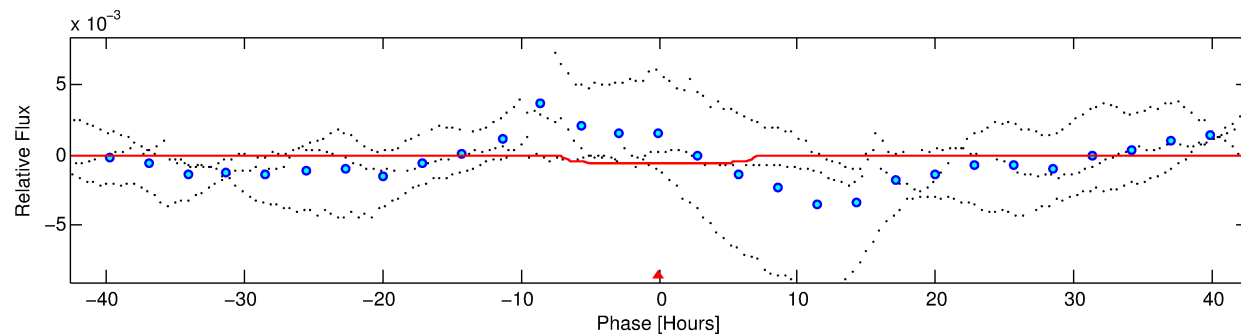
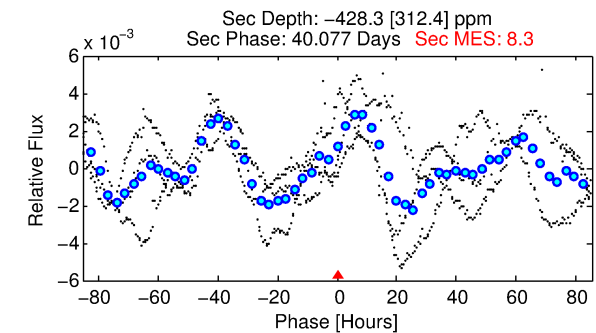
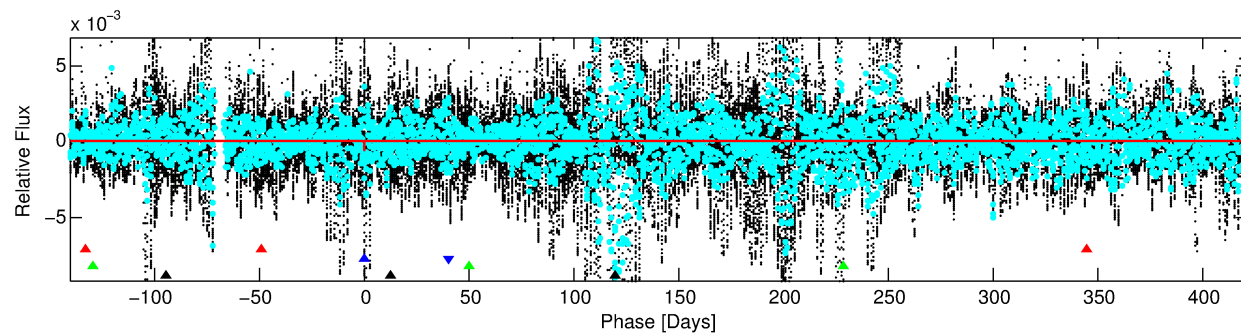
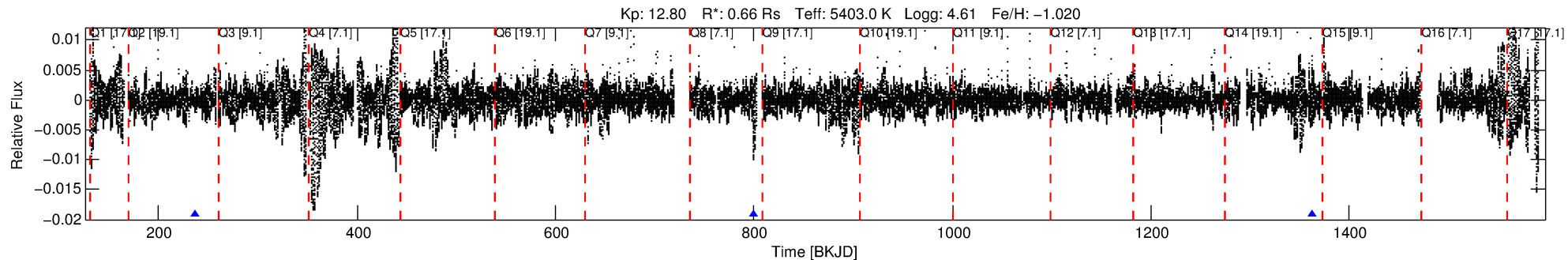
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010802309-02

No Significant Match Found

DV One-Page Summary

KIC: 10802309 Candidate: 2 of 4 Period: 562.765 d



DV Fit Results:

Period = 562.76472 [0.00808] d
Epoch = 236.5448 [0.0089] BKJD
Rp/R* = 0.0234 [0.0091]
a/R* = 259.30 [239.08]
b = 0.56 [1.14]
Seff = 0.25 [0.04]
Teq = 181 [8] K
Rp = 1.69 [0.67] Re
a = 1.1509 [0.0918] AU
Ag = N/A
Teffp = N/A

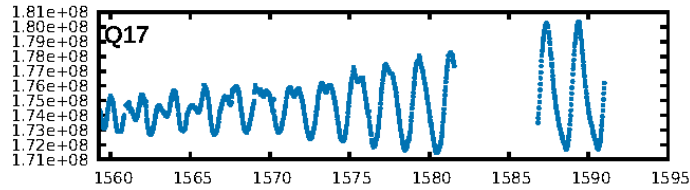
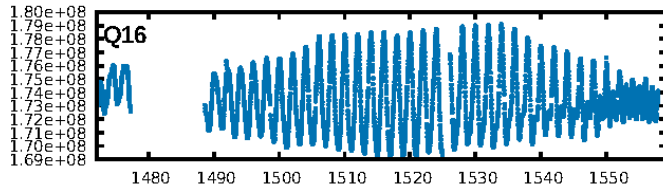
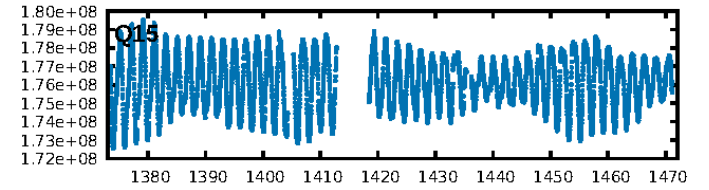
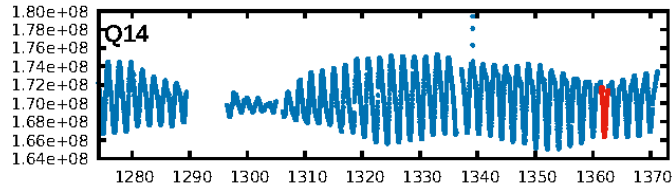
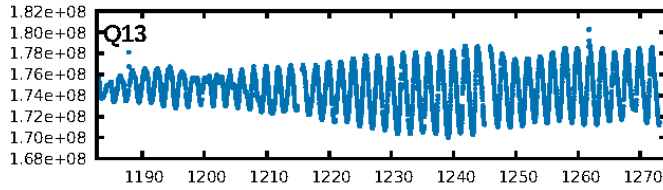
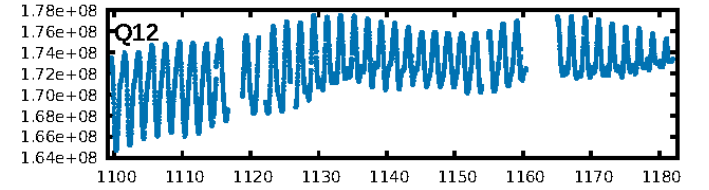
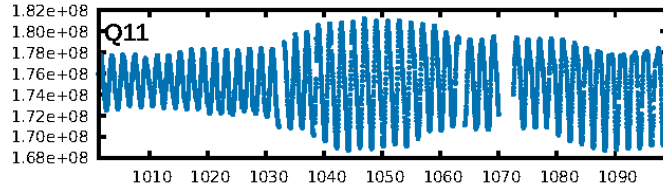
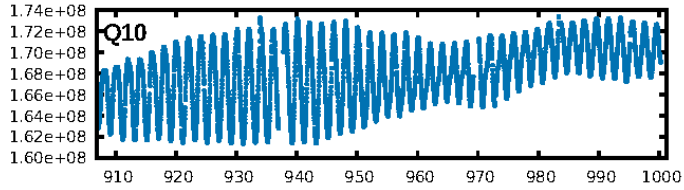
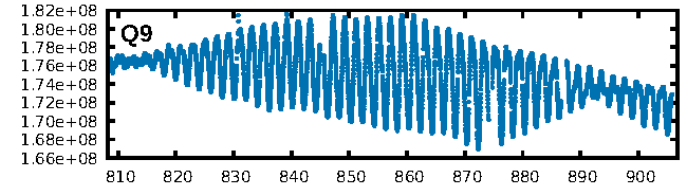
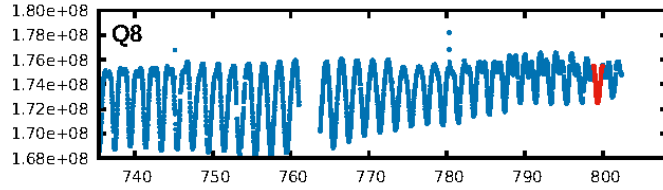
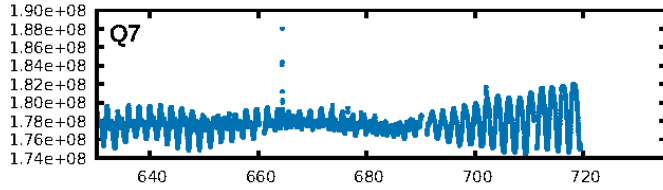
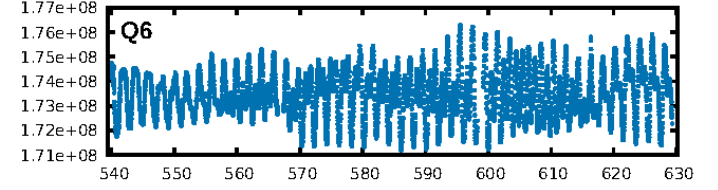
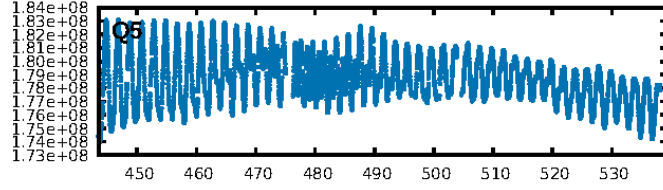
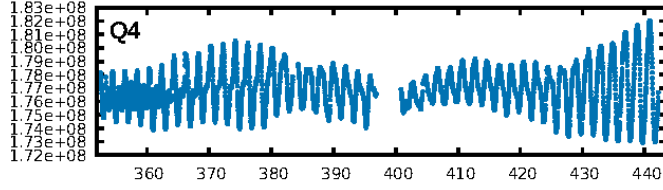
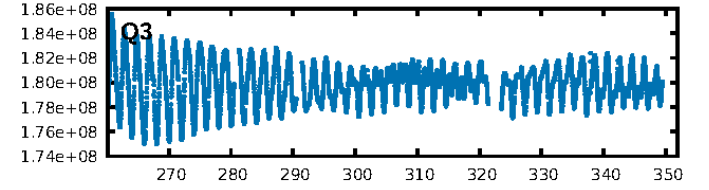
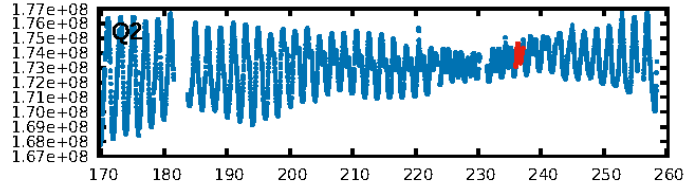
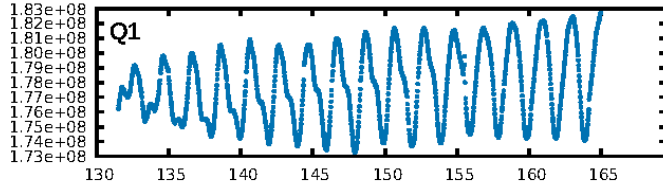
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [141.23σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 12.1%
ModelChiSquareGof-sig: 96.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.59
Centroid-sig: 60.1%
Centroid-so: 0.416 arcsec [0.81σ]
OotOffset-rm: 0.096 arcsec [1.02σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-rm: 0.191 arcsec [2.47σ]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

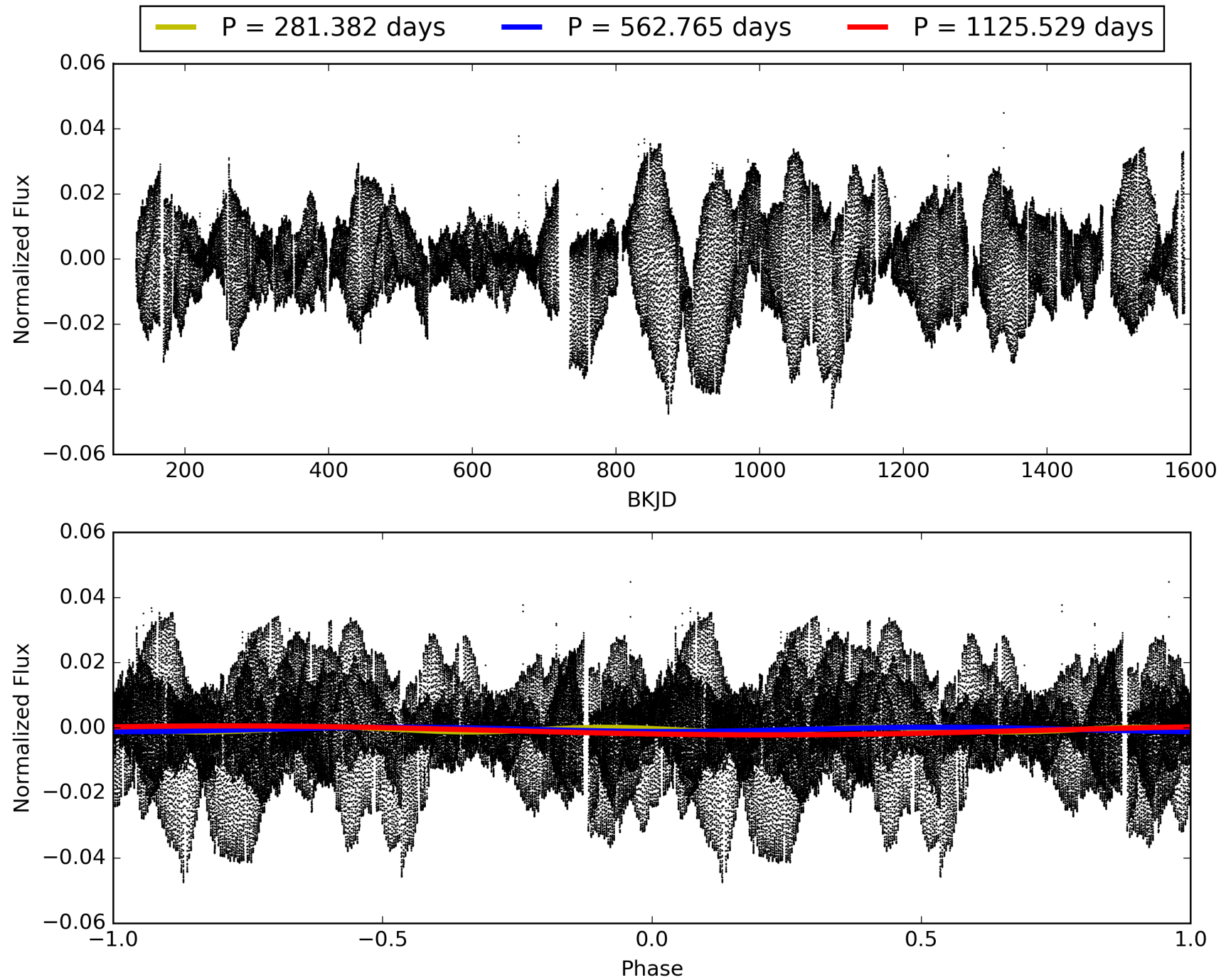
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:46:35 Z

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

TCE 010802309-02, PDC Light Curves

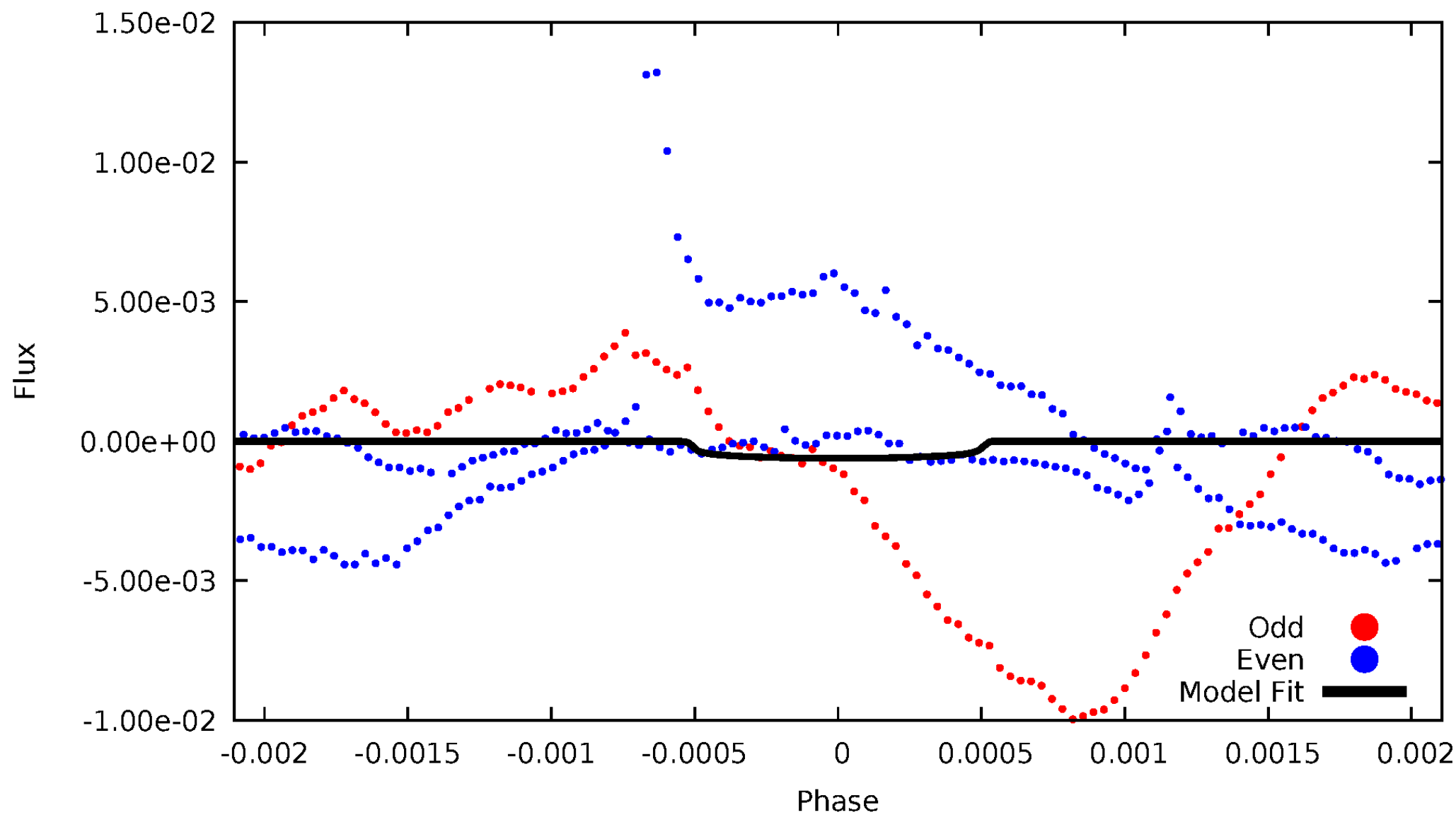


TCE 010802309-02



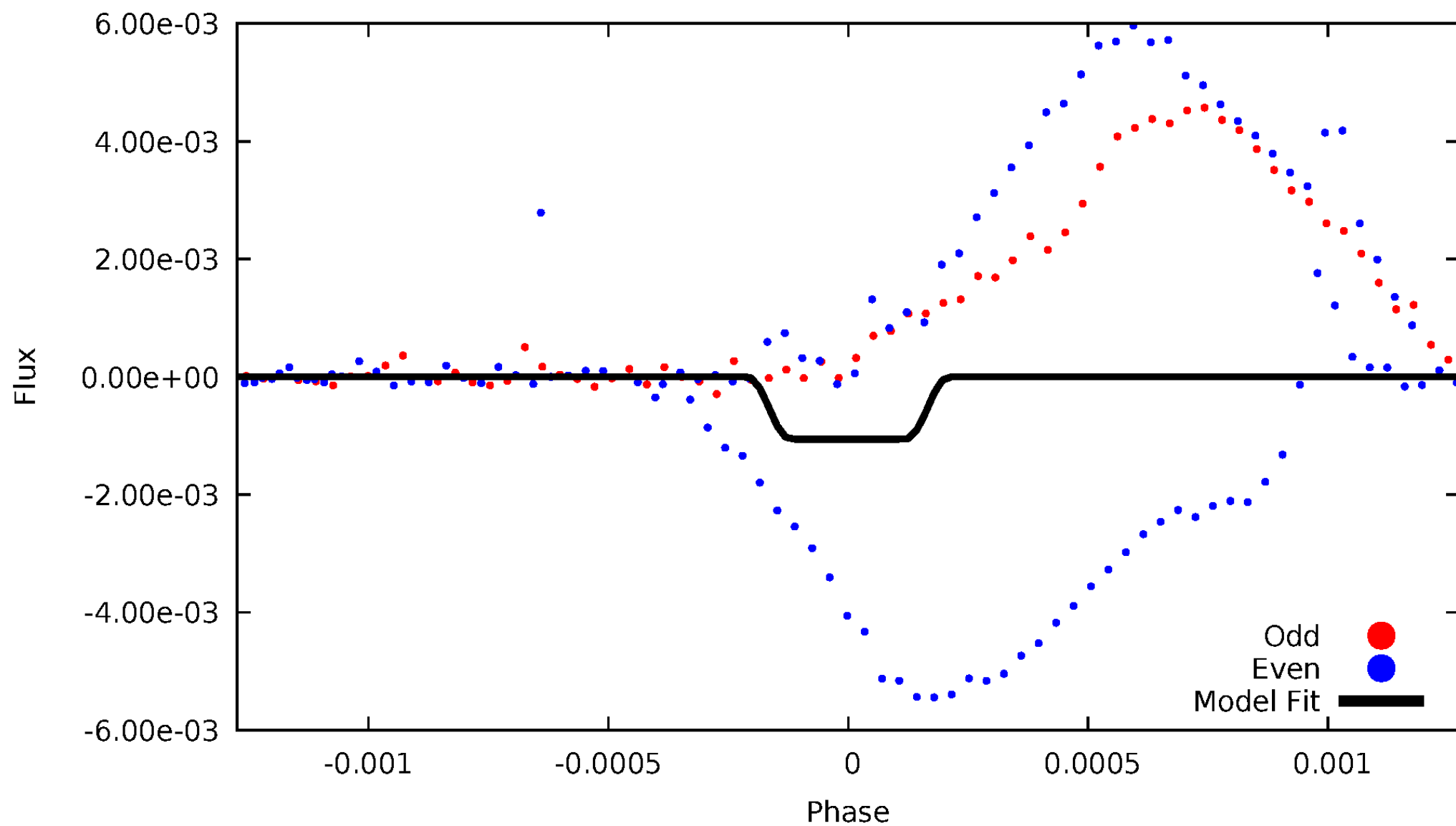
DV Odd/Even

TCE 010802309-02



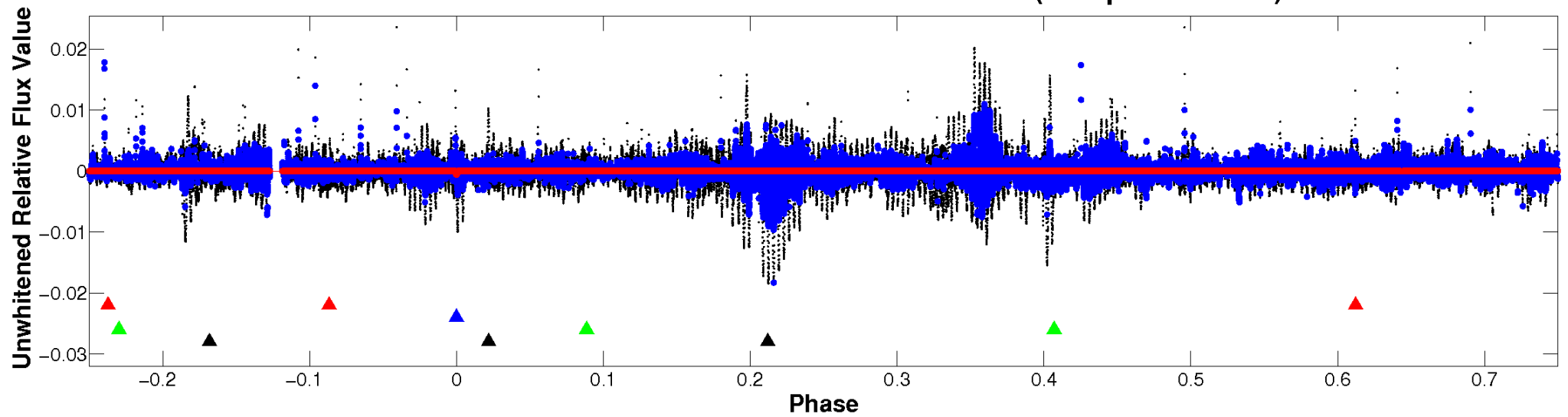
ALT Odd/Even

TCE 010802309-02

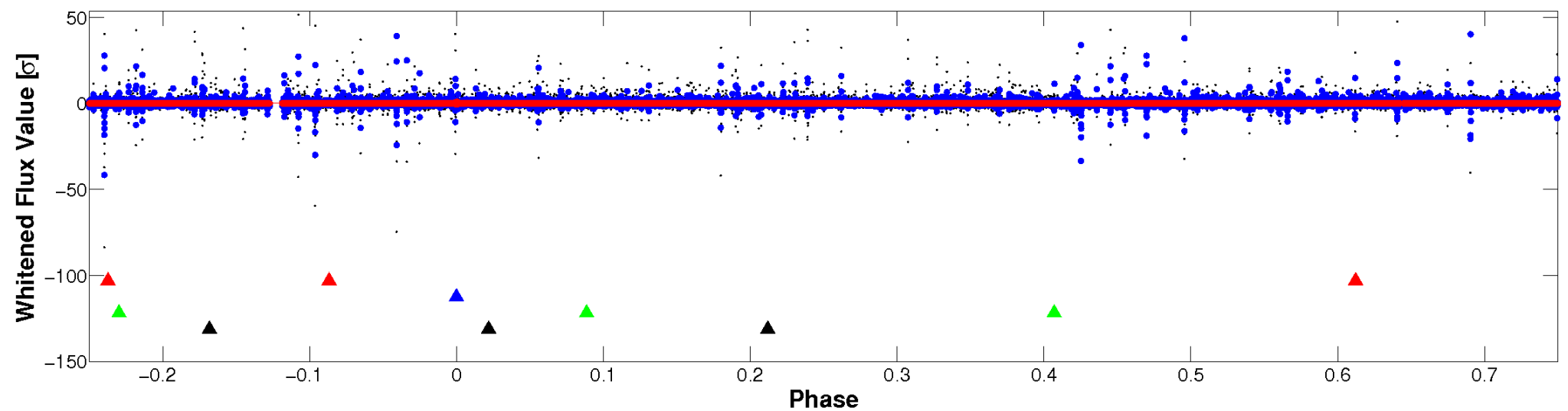


Non-Whitened Vs. Whitened Light Curve

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

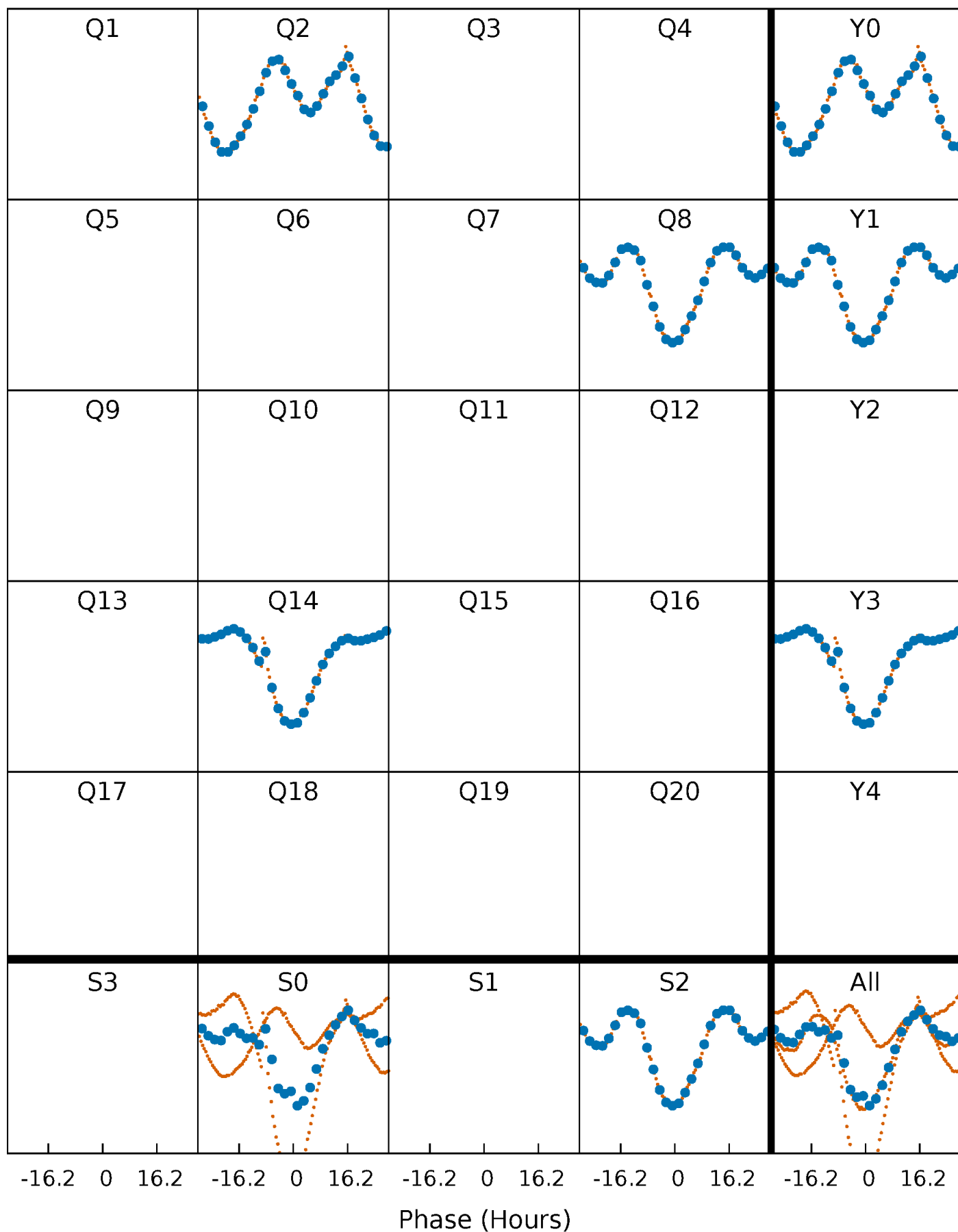


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



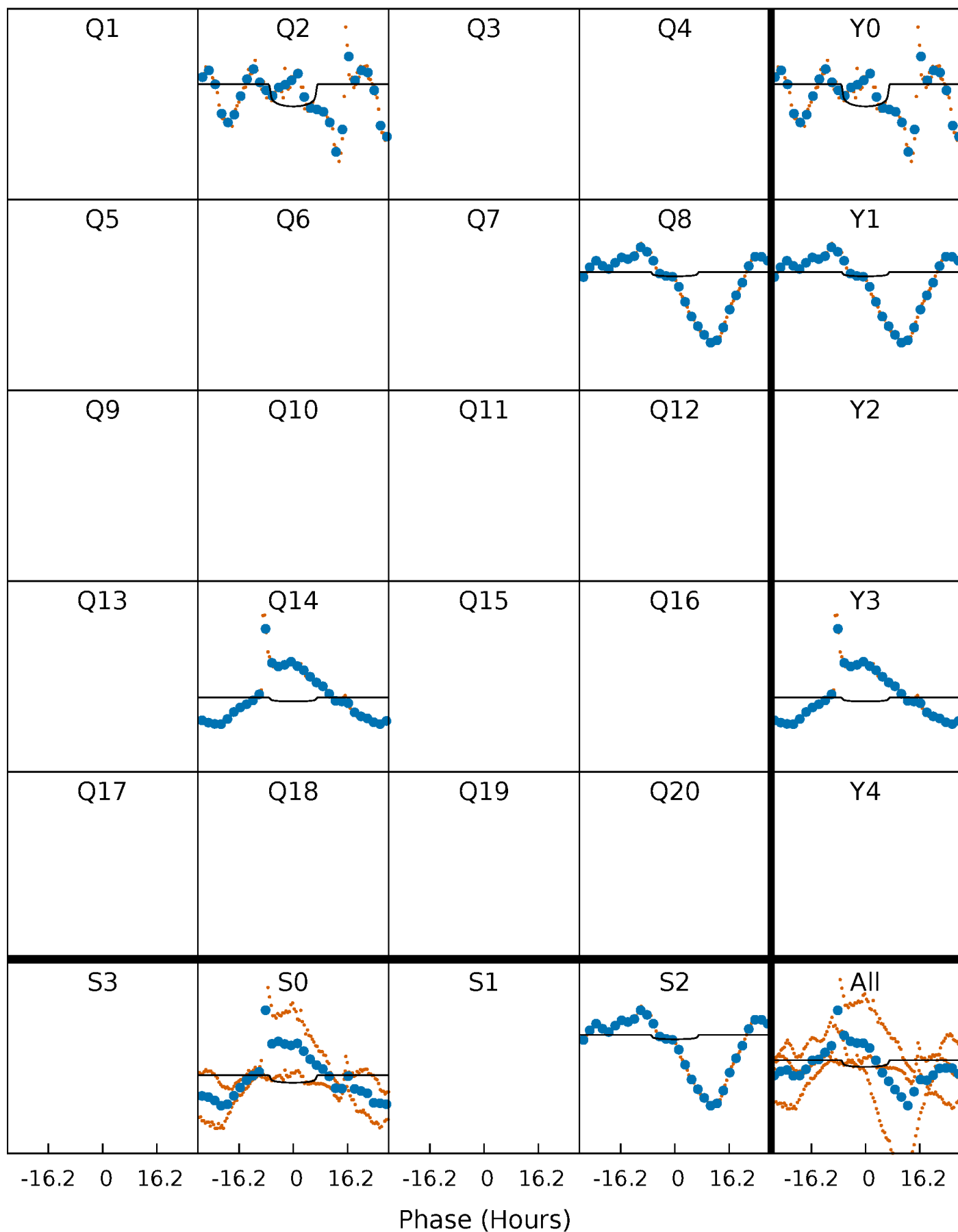
PDC Quarter-Phased Transit Curves

TCE 010802309-02 P=562.764721 Days $T_0=236.544816$ (BKJD)



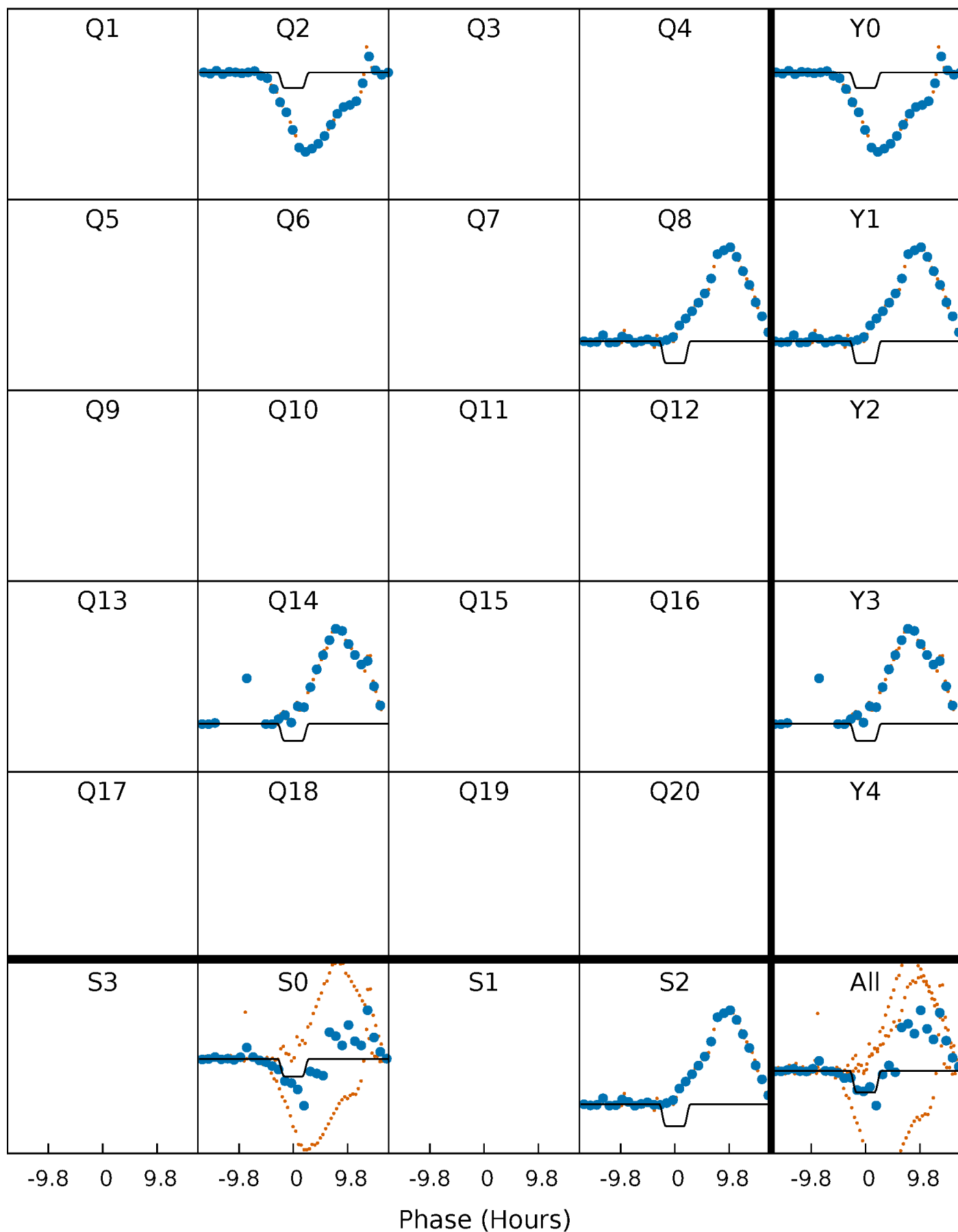
DV Quarter-Phased Transit Curves

TCE 010802309-02 $P=562.764721$ Days $T_0=236.544816$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

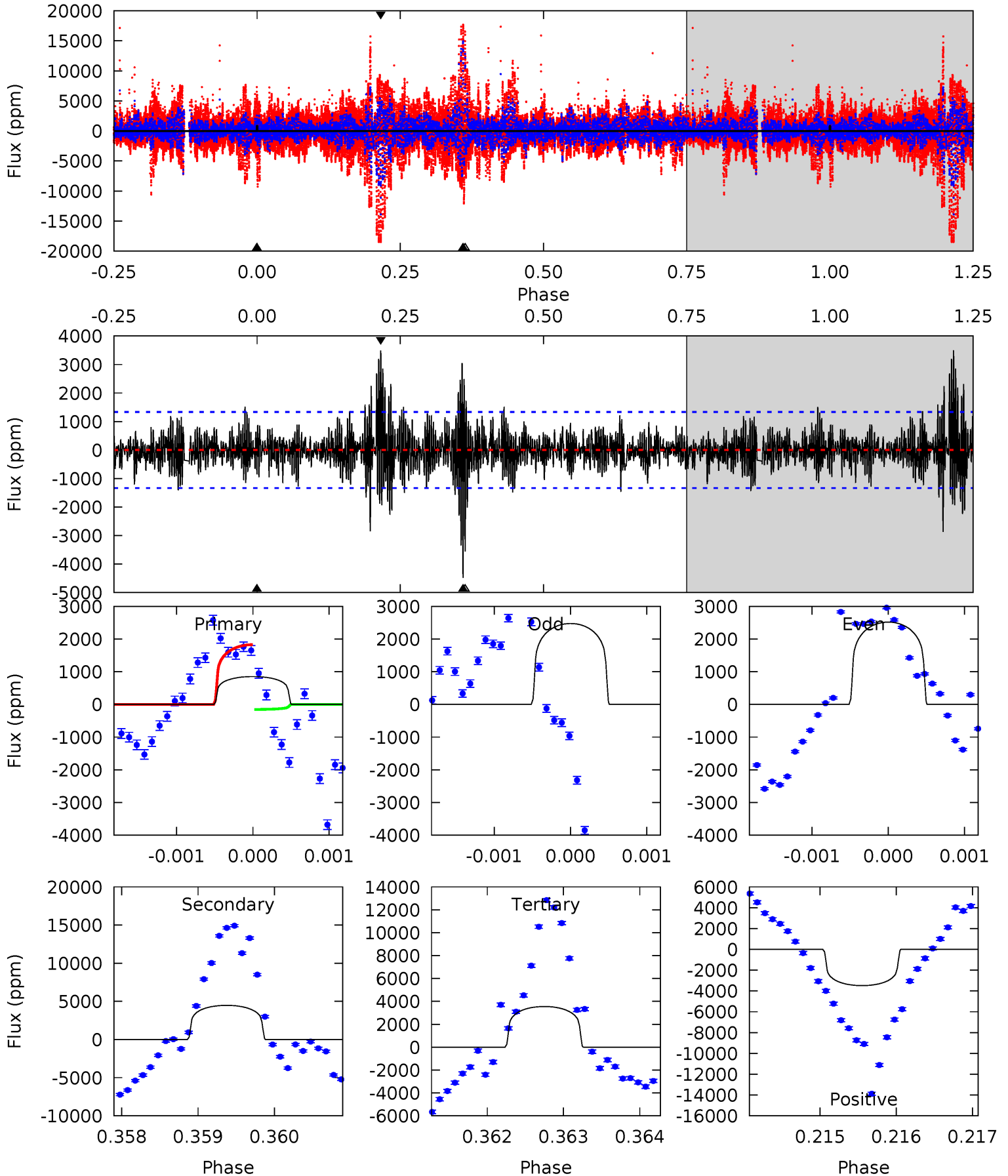
TCE 010802309-02 P=562.747054 Days $T_0=236.646294$ (BKJD)



DV Model-Shift Uniqueness Test

010802309-02, P = 562.764721 Days, E = 236.544816 Days

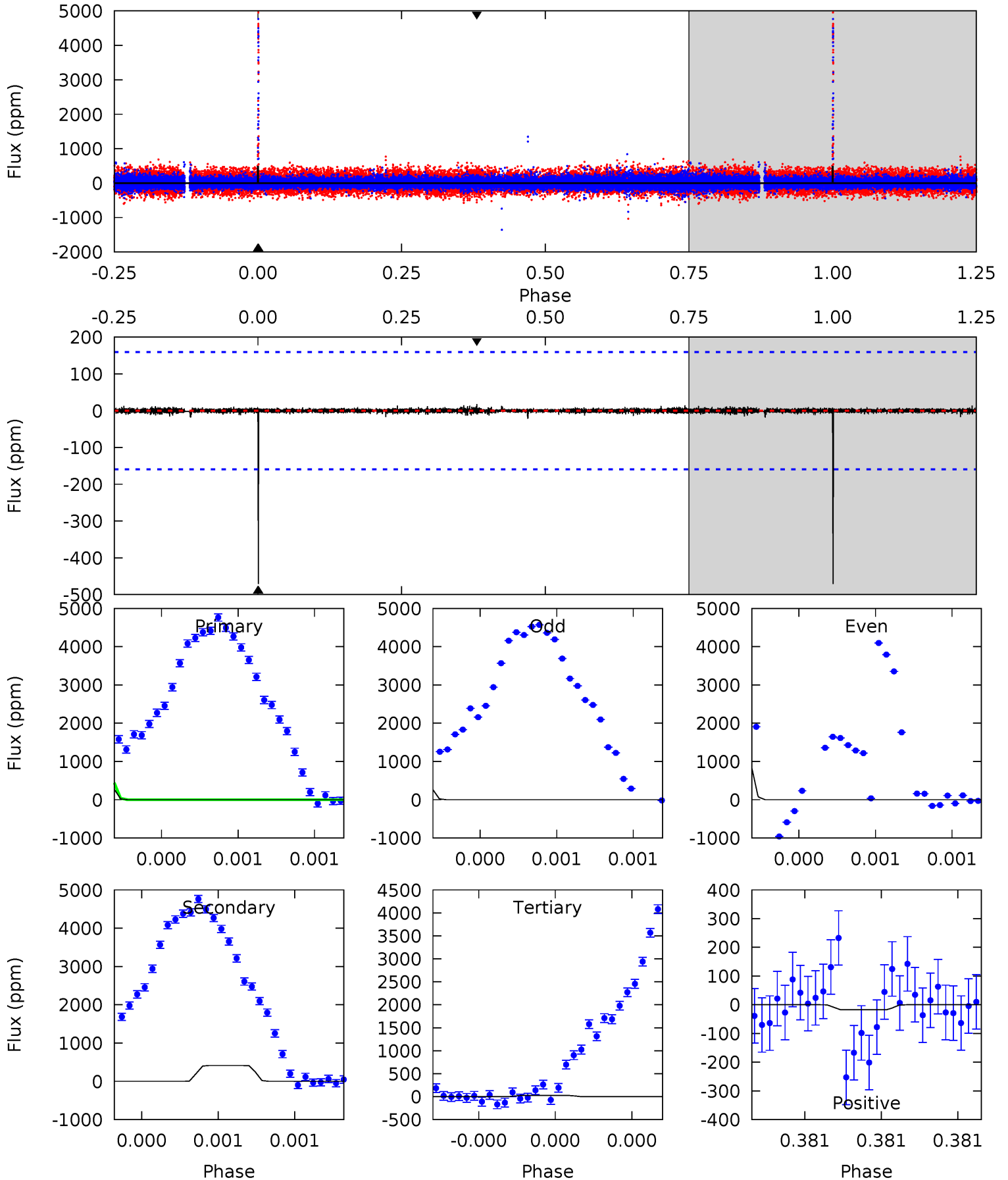
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.47	18.2	14.5	14.2	5.44	3.27	2.41	-11.0	-10.7	3.78	4.04	0.09	-4.96	0.44	3.45



Alt Model-Shift Uniqueness Test

010802309-02, P = 562.747054 Days, E = 236.646294 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.5	14.5	0.97	0.61	5.60	3.53	0.13	15.6	15.9	13.5	13.9	17.7	-2.30	0.04	0



Stellar Parameters For KIC 010802309

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5403^{+163}_{-146}	$4.605^{+0.072}_{-0.054}$	$-1.020^{+0.300}_{-0.300}$	$0.661^{+0.057}_{-0.057}$	$0.643^{+0.066}_{-0.024}$	$3.132^{+0.903}_{-0.587}$
	+3%/-3%	+2%/-1%	+29%/-29%	+9%/-9%	+10%/-4%	+29%/-19%
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 010802309-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-4478 ± 245	$1.69^{+0.66}_{-0.65}$	252^{+10}_{-10}	9723^{+5070}_{-1854}	$1167007^{+1934771}_{-562214}$
Alt.	-412 ± 28	$2.35^{+0.68}_{-0.61}$	252^{+9}_{-9}	4428^{+584}_{-384}	54714^{+47460}_{-20780}

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

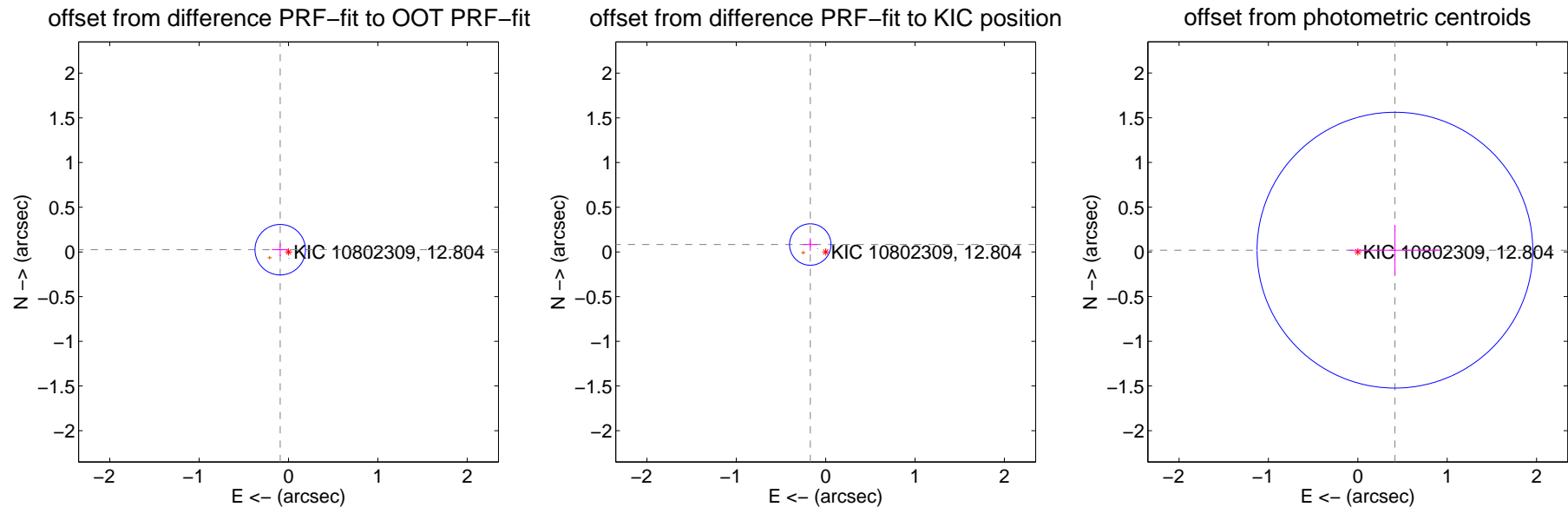
DV Centroid Data

Supplemental centroid analysis for 010802309-02. Kepler magnitude: 12.80. Transit SNR 2.90

There are 2 quarters with good PRF difference image offsets

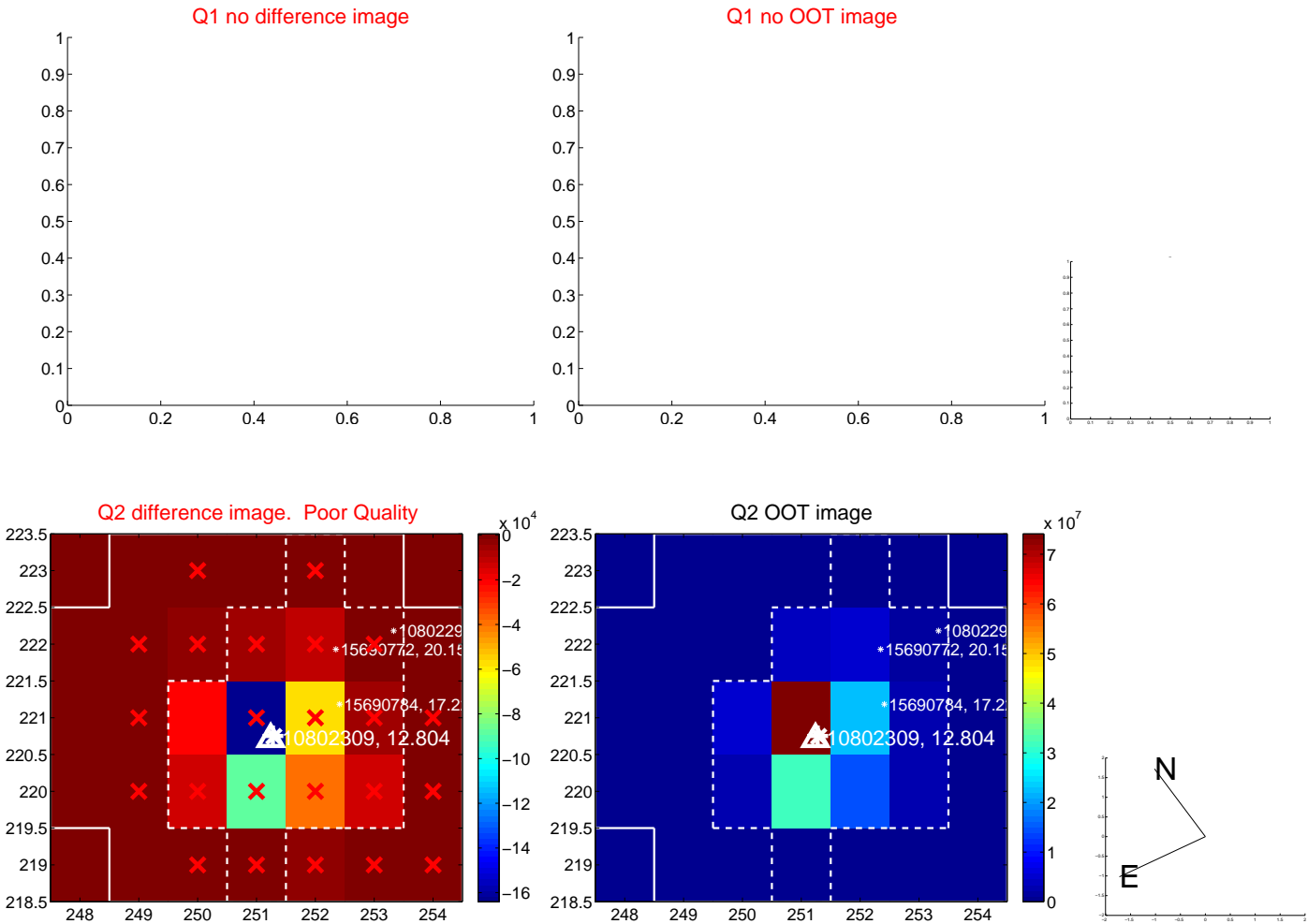
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.096 ± 0.094	1.02	0.093 ± 0.095	0.025 ± 0.072
PRF-fit source offset from KIC position	0.191 ± 0.077	2.47	0.172 ± 0.082	0.083 ± 0.072
photometric centroid source offset	0.42 ± 0.51	0.81	-0.42 ± 0.51	0.02 ± 0.28

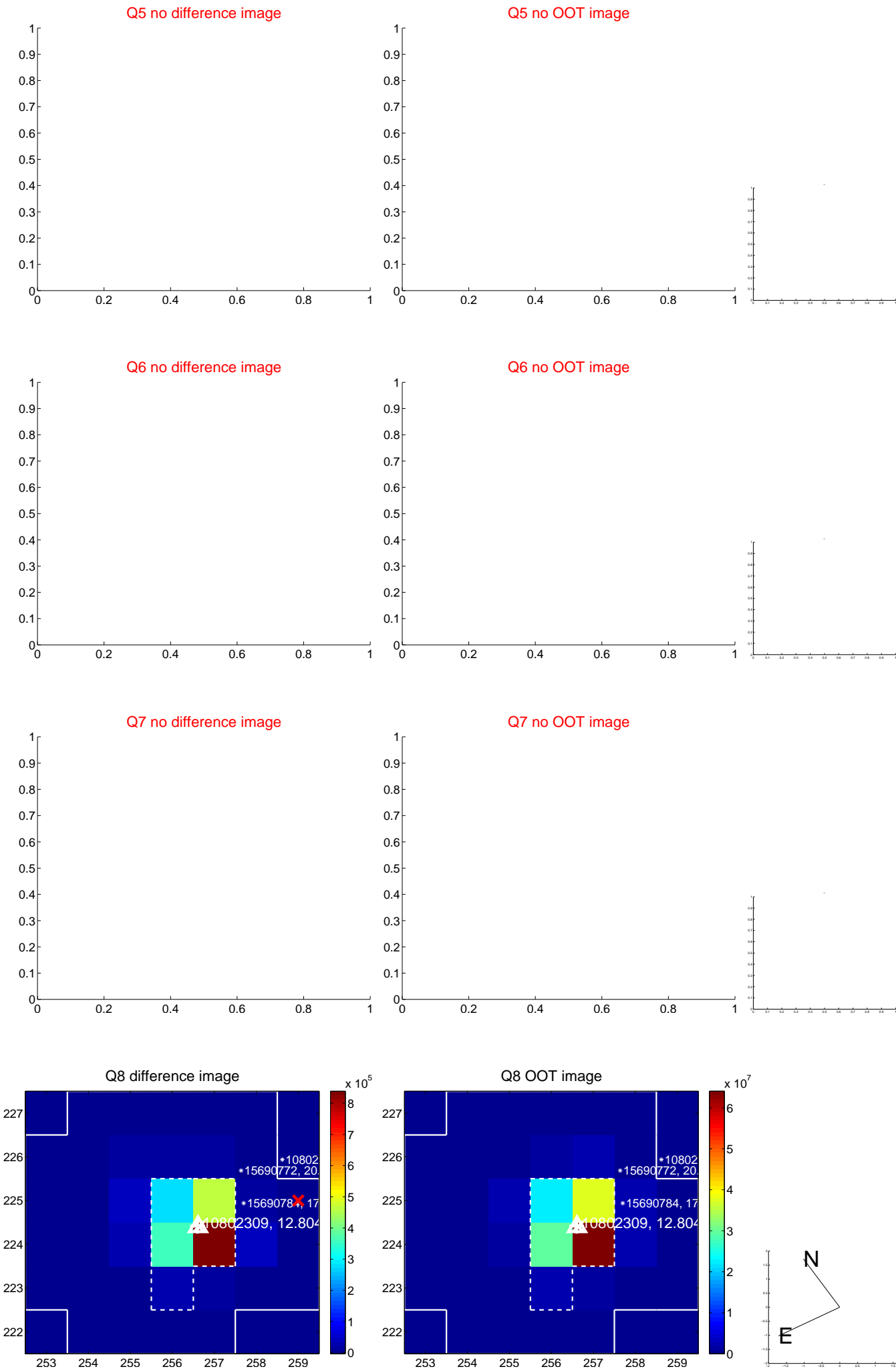


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



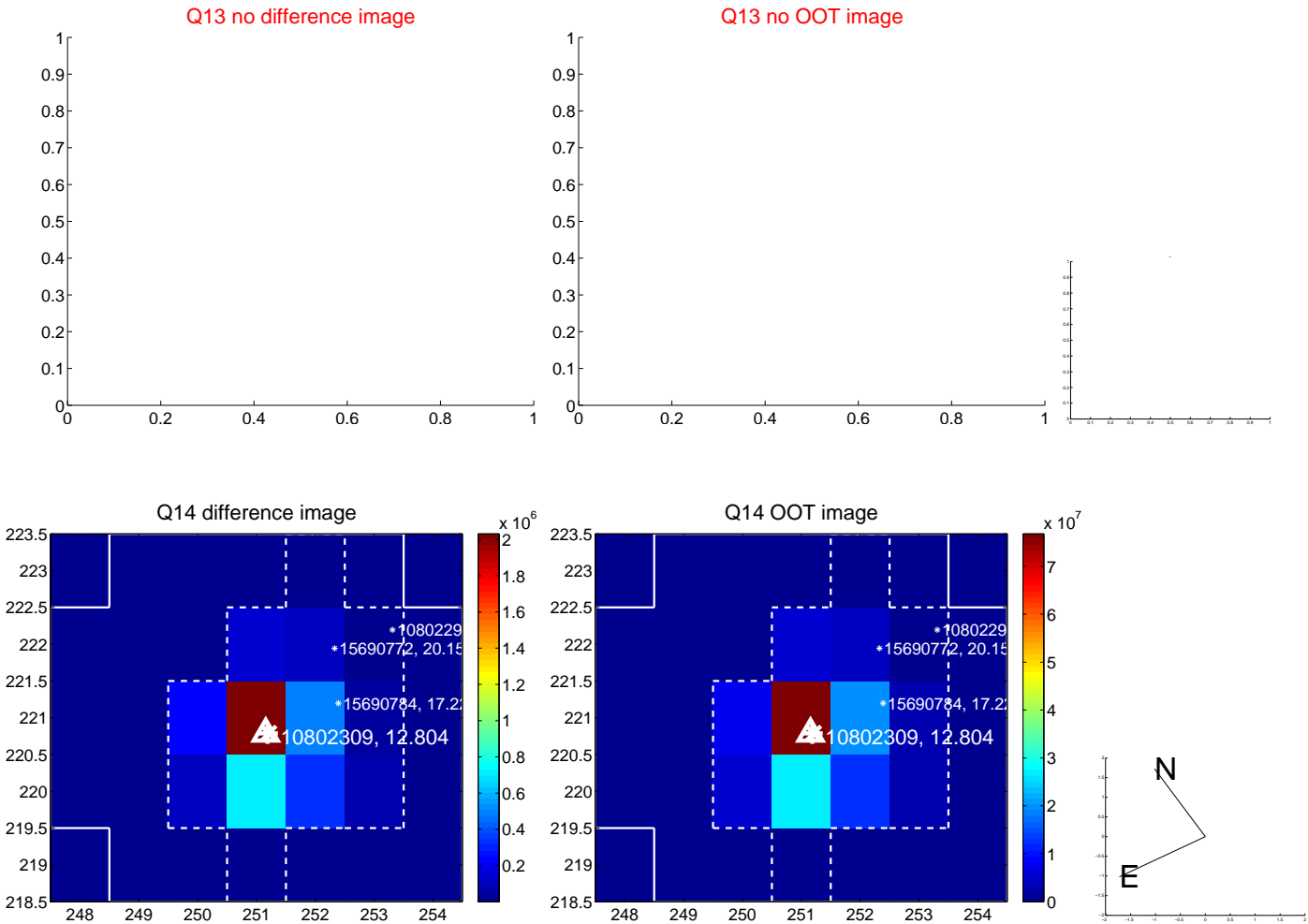
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



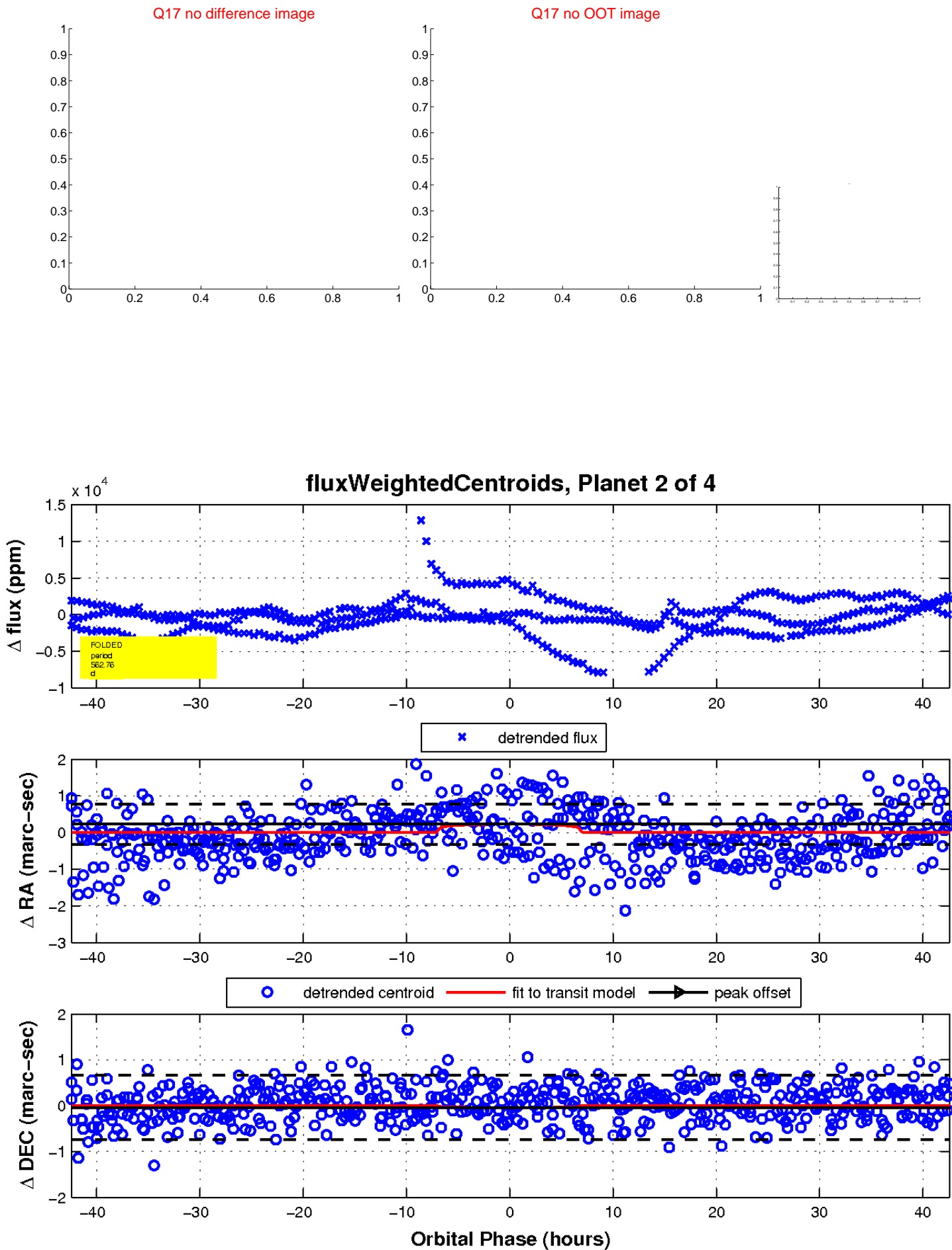
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

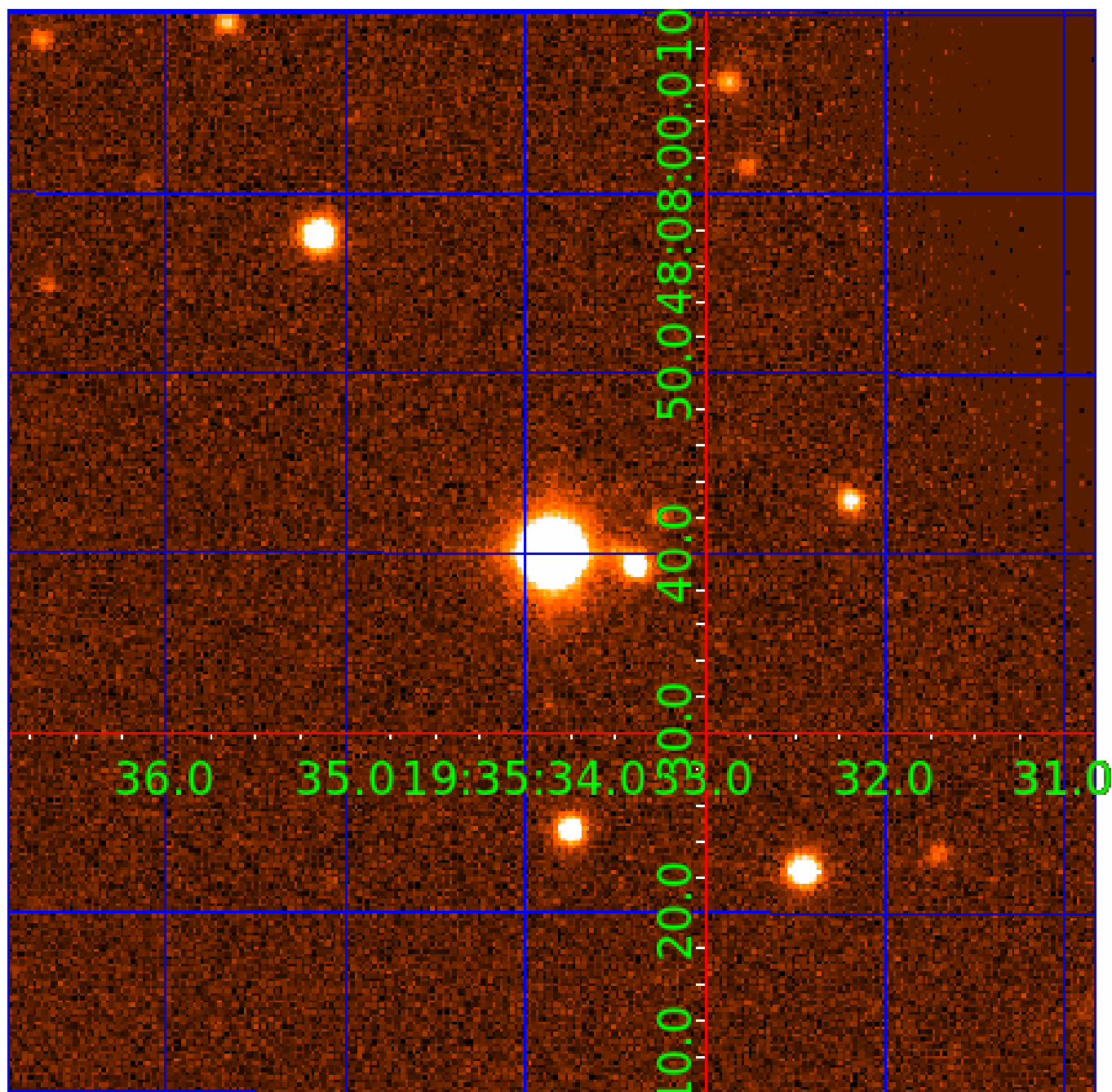


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010802309

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})
010802309-01	OBS	No	478.046439	187.760009	461.9	2.275	17.4	2.9	0.66	5403	1.60	0.31
010802309-02	OBS	No	562.764721	236.544816	610.4	14.216	11.2	2.9	0.66	5403	1.69	0.25
010802309-03	OBS	No	383.600436	465.579054	1243.2	3.326	14.4	7.6	0.66	5403	2.54	0.42
010802309-04	OBS	No	455.785858	355.856550	1662.3	13.672	12.4	3.3	0.66	5403	3.40	0.33

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010802309-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010802309-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

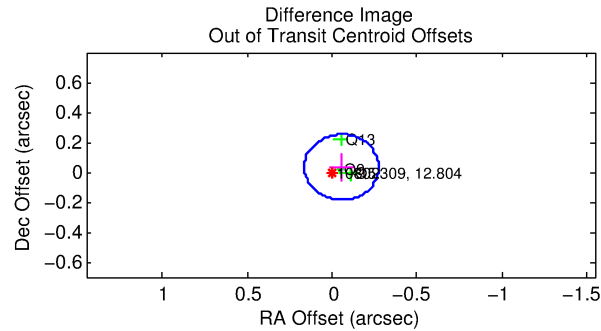
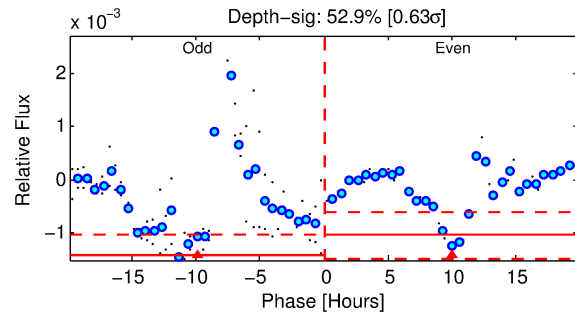
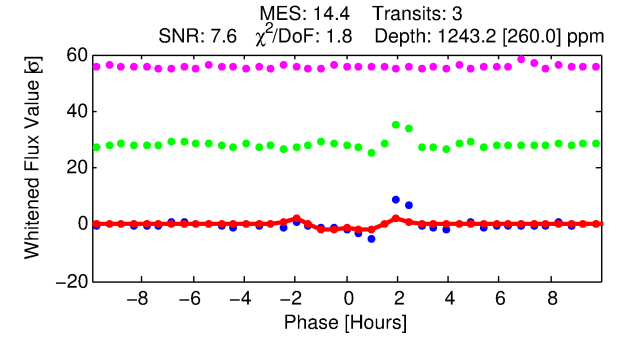
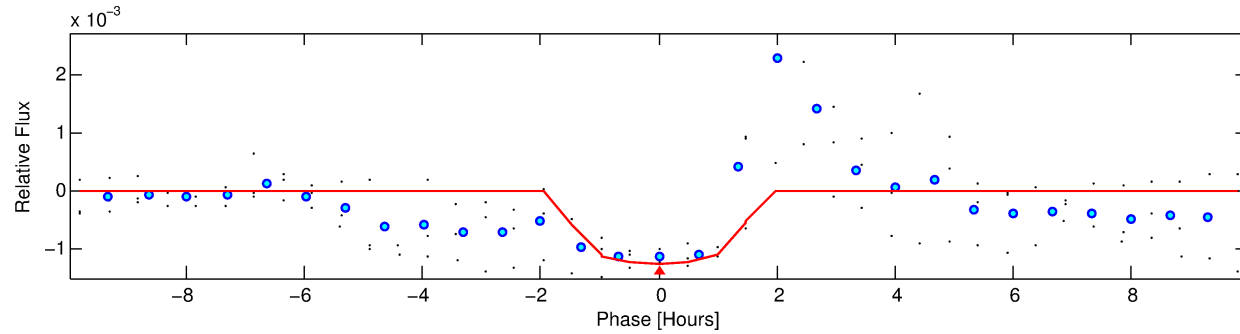
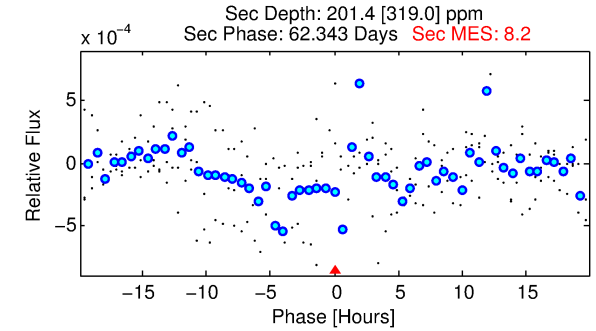
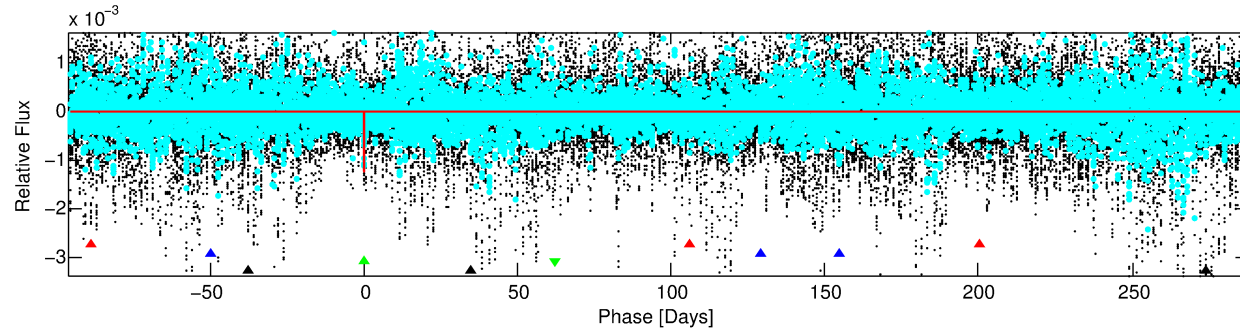
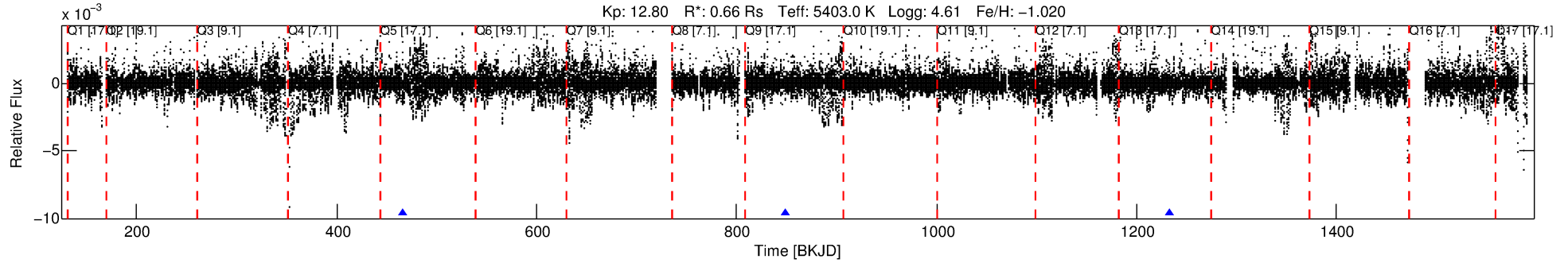
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010802309-03

No Significant Match Found

DV One-Page Summary

KIC: 10802309 Candidate: 3 of 4 Period: 383.600 d



DV Fit Results:

Period = 383.60044 [0.00447] d
Epoch = 465.5791 [0.0112] BKJD
Rp/R* = 0.0353 [0.2992]
a/R* = 615.41 [24695.46]
b = 0.76 [22.20]
Seff = 0.42 [0.07]
Teq = 205 [9] K
Rp = 2.54 [21.58] Re
a = 0.8914 [0.0711] AU
Ag = 13603.49 [231783.05] [0.06 σ]
Teffp = 3427 [14599] K [0.22 σ]

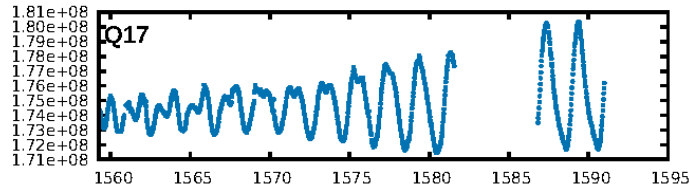
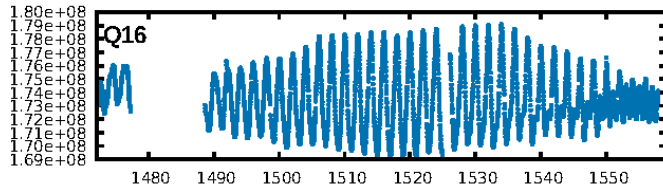
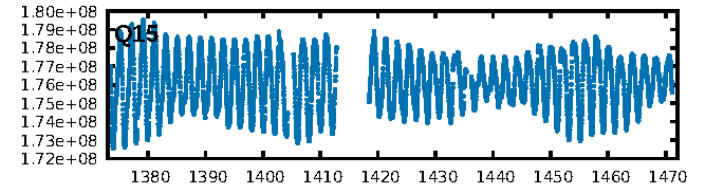
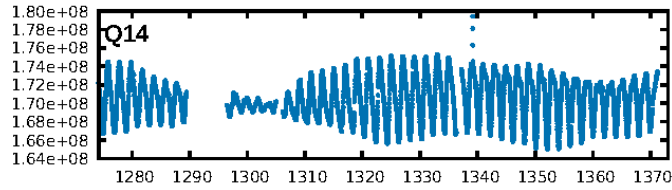
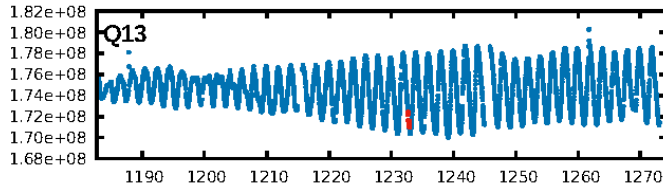
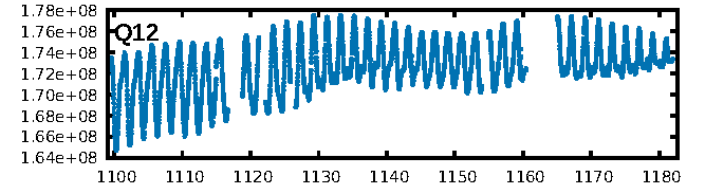
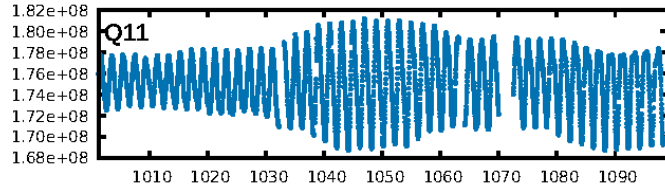
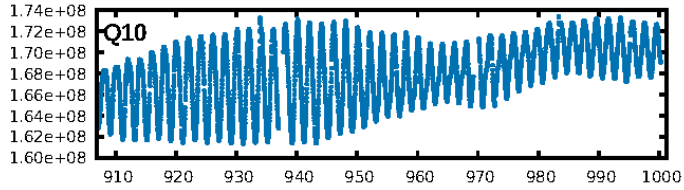
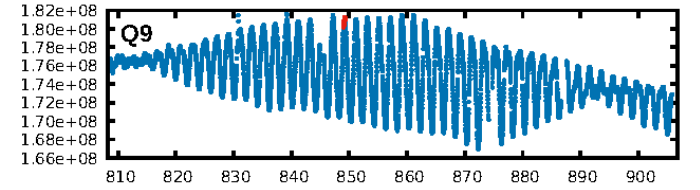
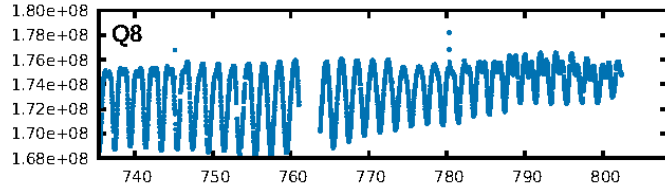
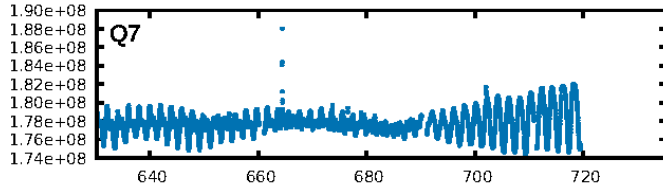
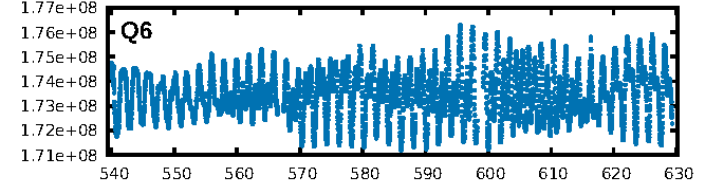
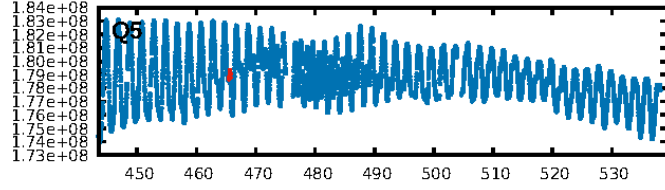
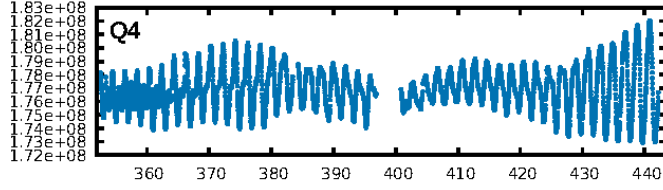
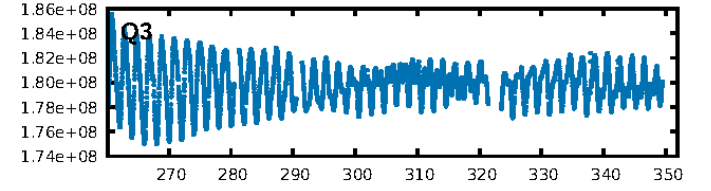
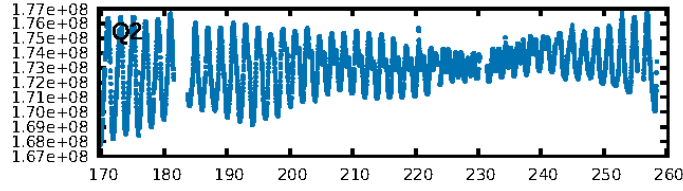
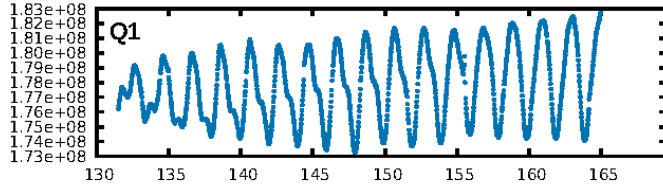
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [123.12 σ]
ModelChiSquare2-sig: 3.4%
ModelChiSquareGof-sig: 40.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.213
Centroid-sig: 12.5%
Centroid-so: 0.376 arcsec [1.18 σ]
OotOffset-rm: 0.064 arcsec [0.88 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-rm: 0.073 arcsec [0.81 σ]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

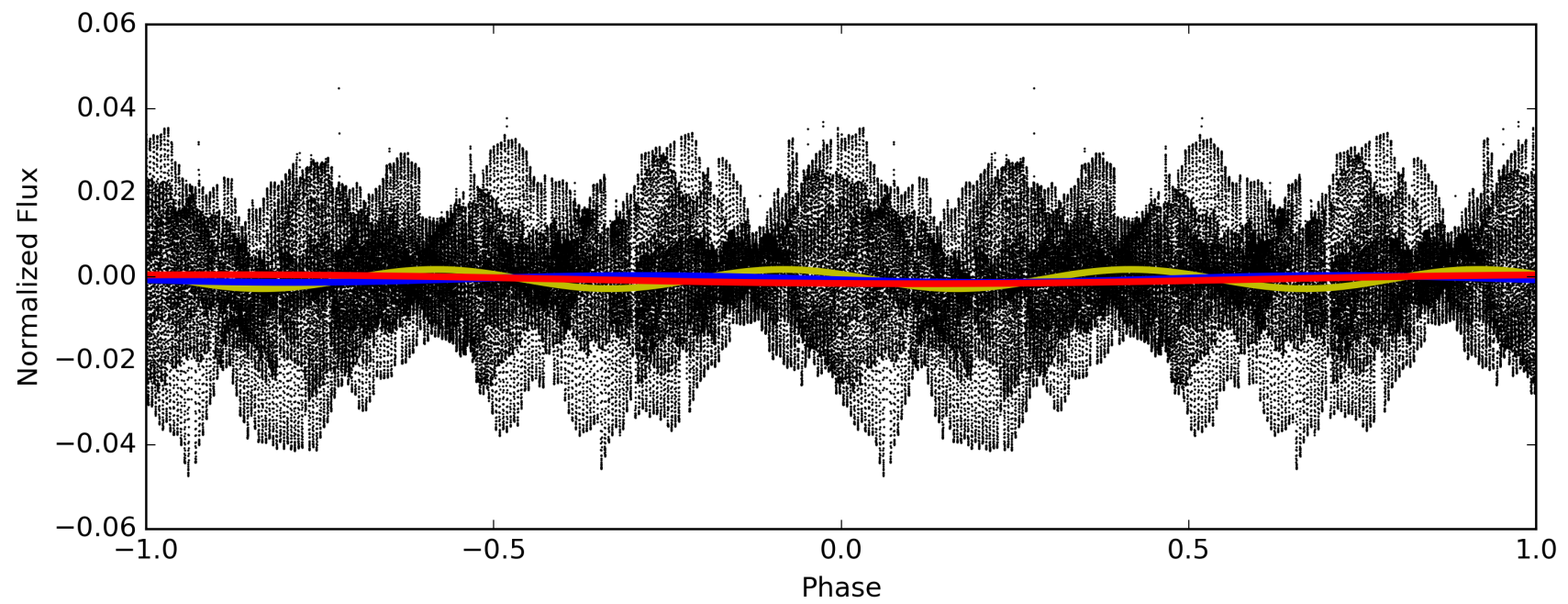
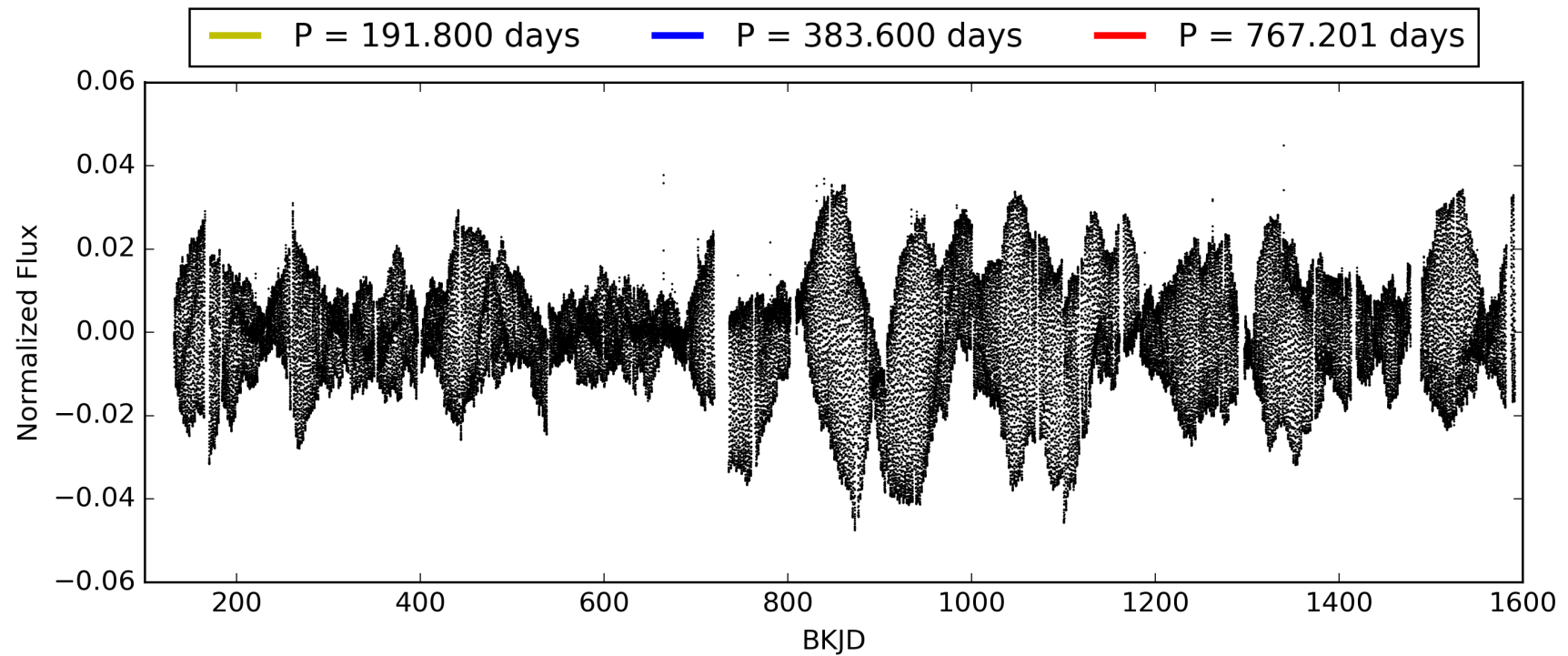
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:46:52 Z

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

TCE 010802309-03, PDC Light Curves

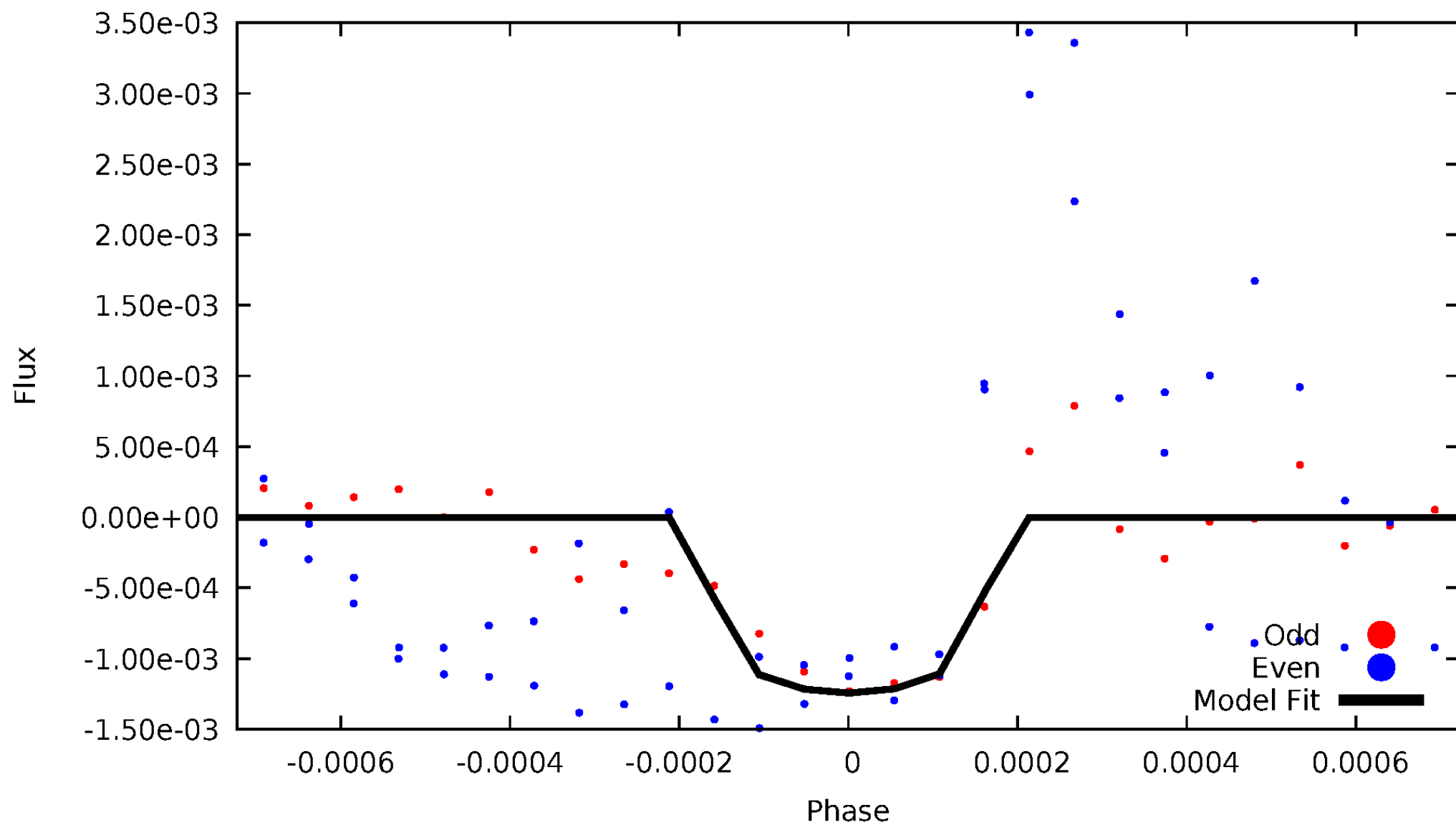


TCE 010802309-03



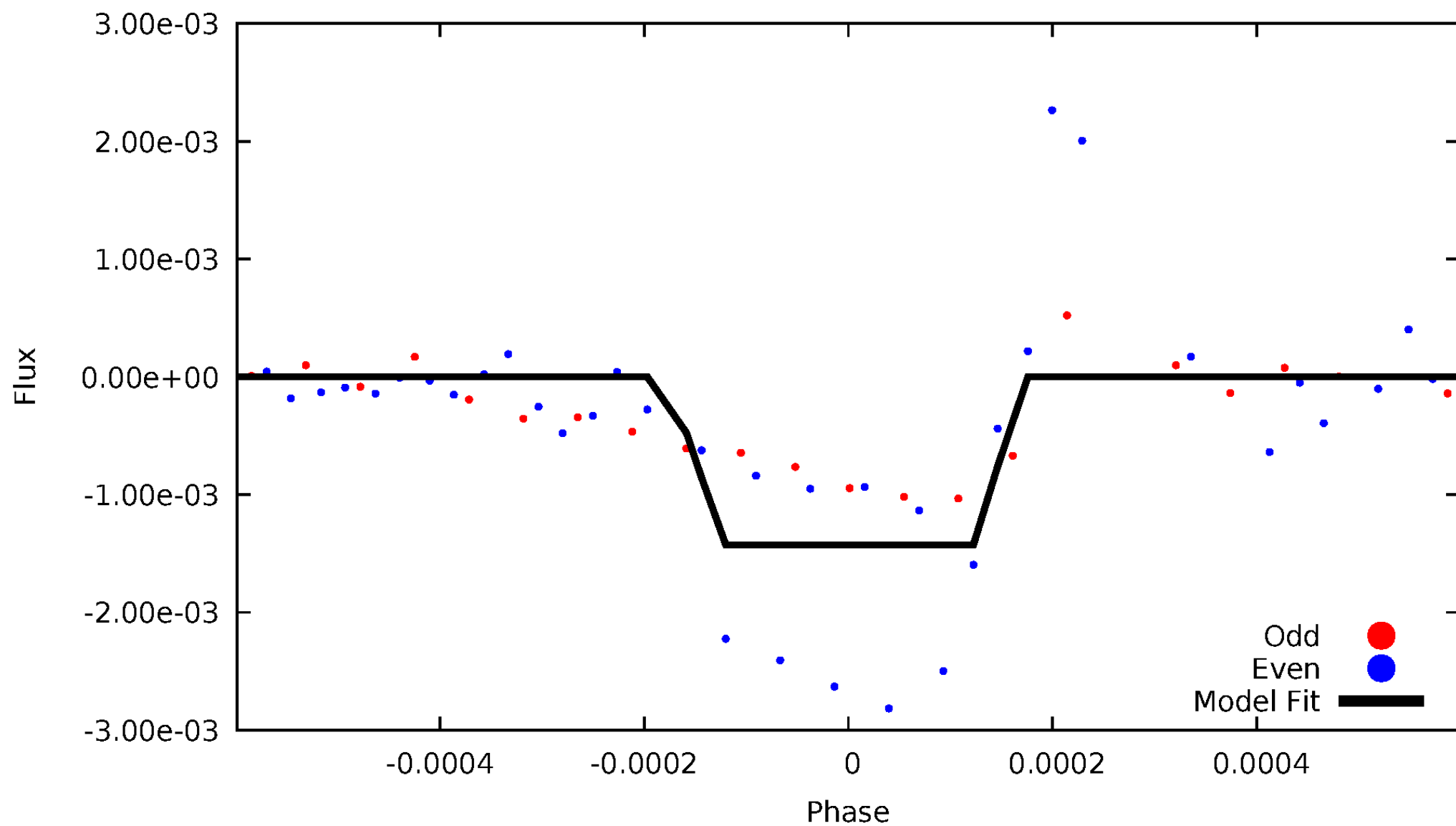
DV Odd/Even

TCE 010802309-03



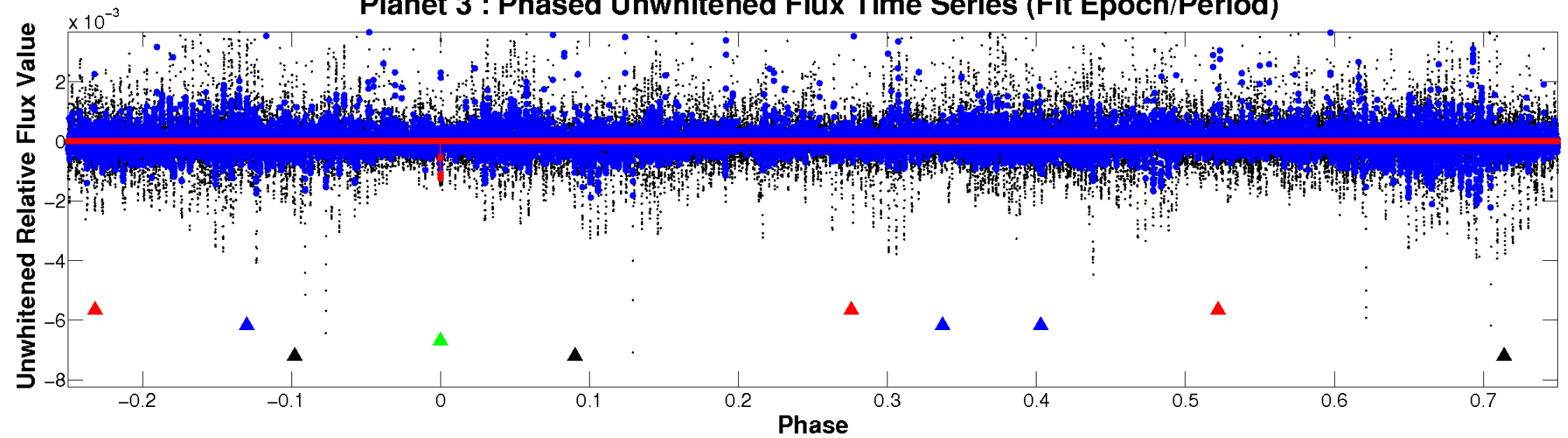
ALT Odd/Even

TCE 010802309-03

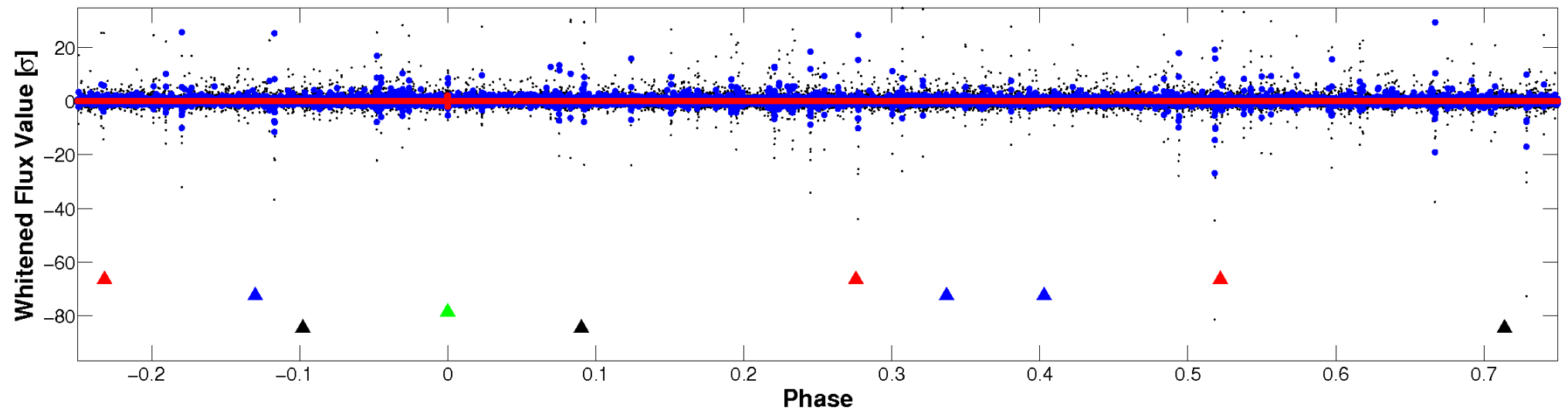


Non-Whitened Vs. Whitened Light Curve

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

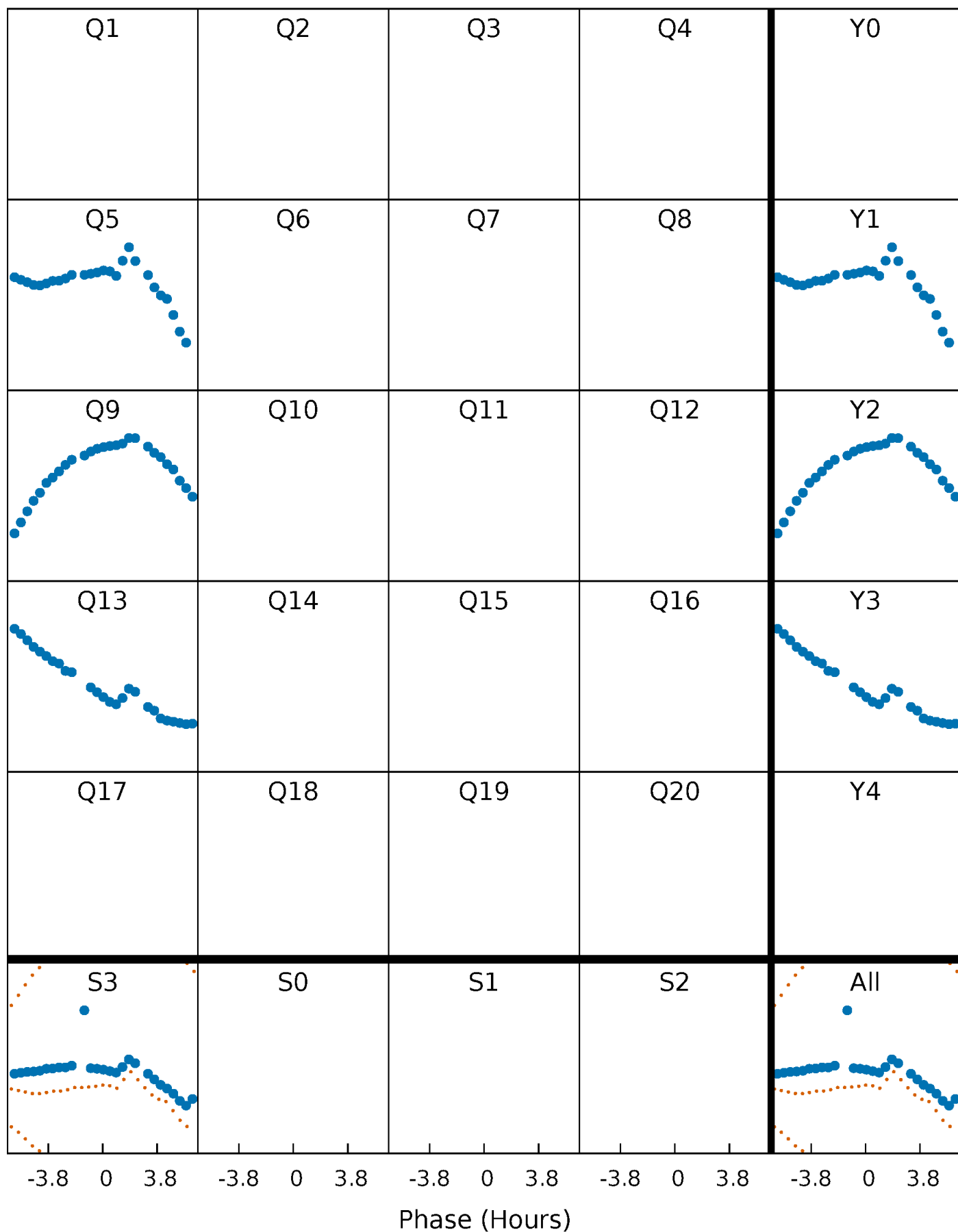


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



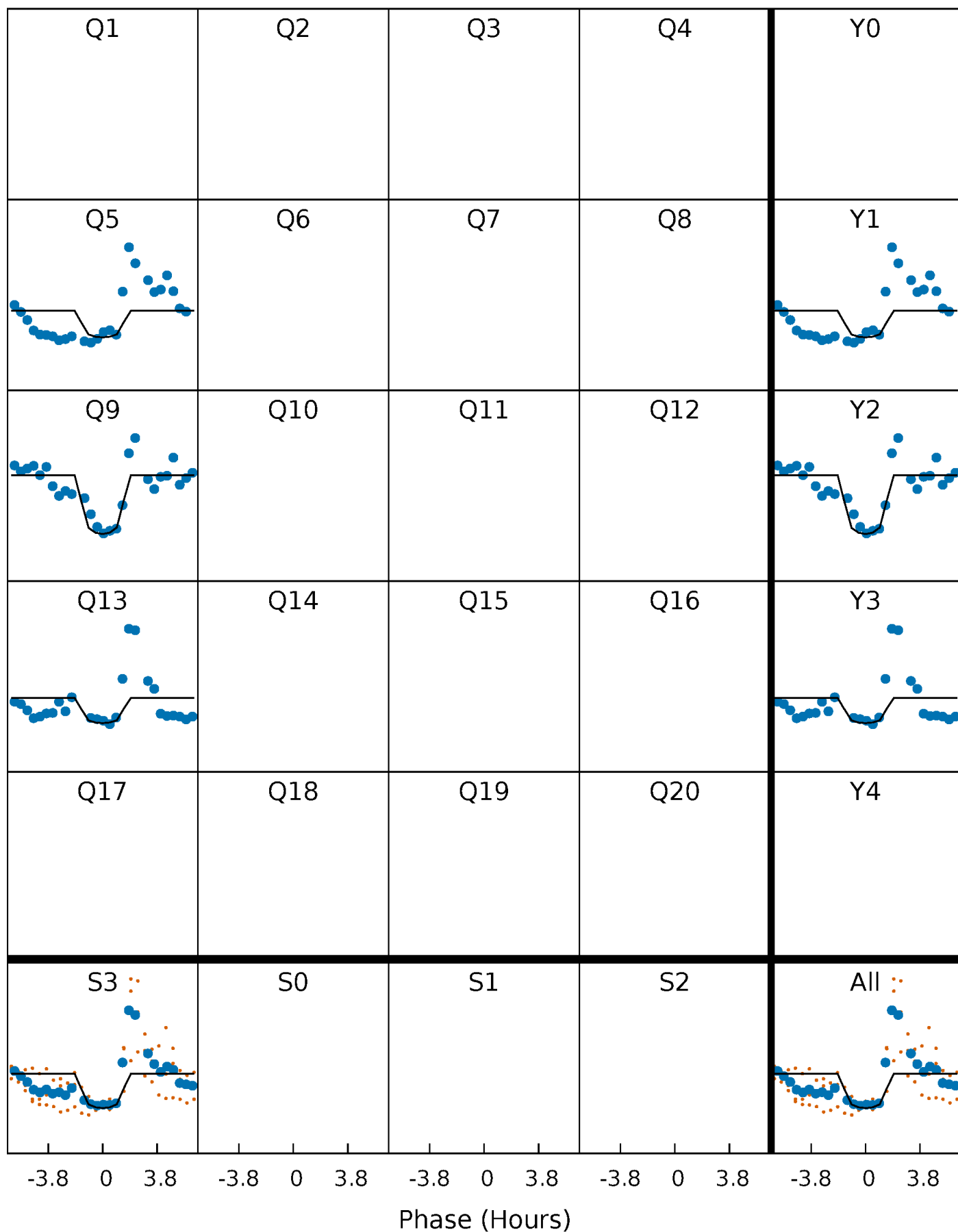
PDC Quarter-Phased Transit Curves

TCE 010802309-03 $P=383.600436$ Days $T_0=465.579054$ (BKJD)



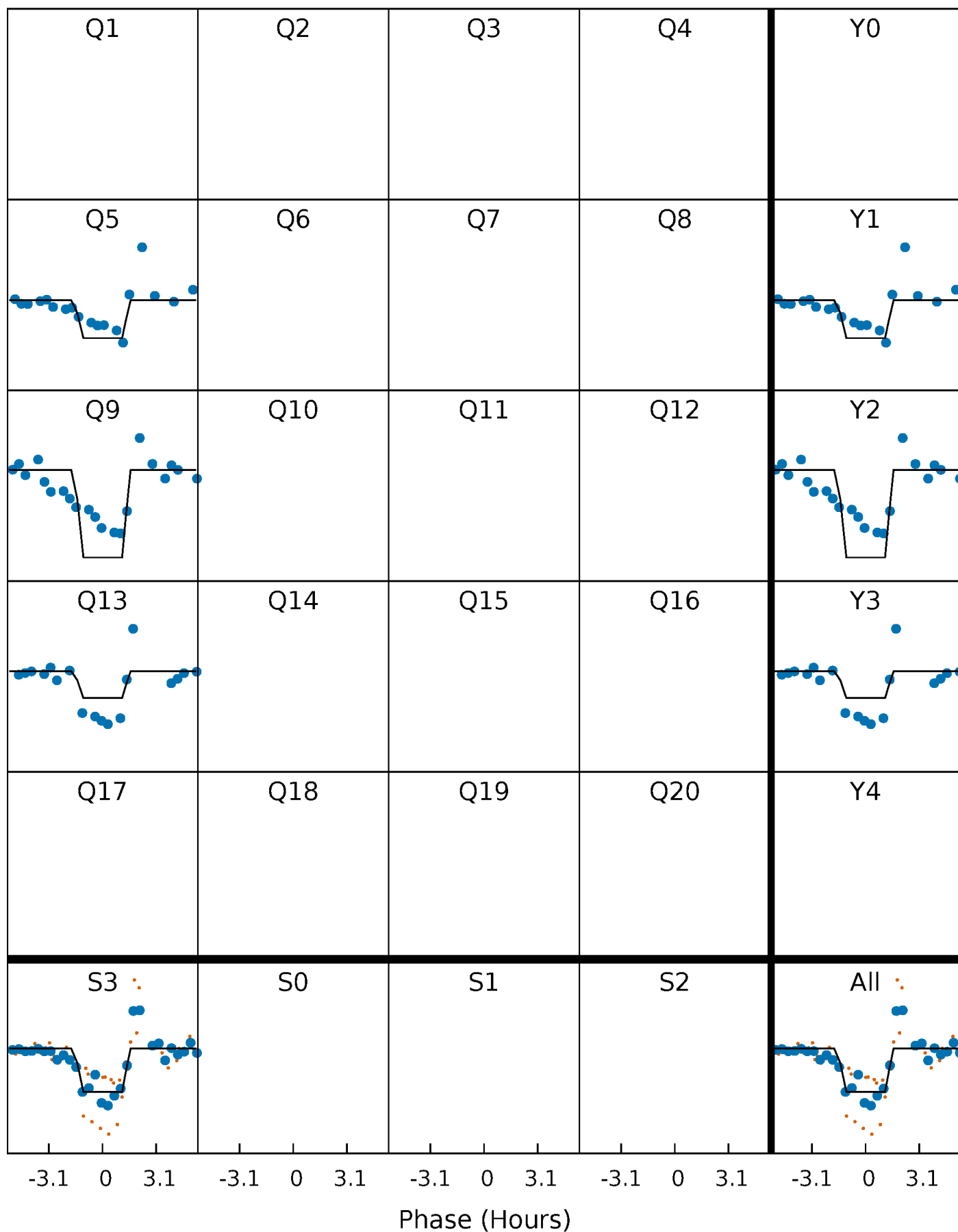
DV Quarter-Phased Transit Curves

TCE 010802309-03 $P=383.600436$ Days $T_0=465.579054$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

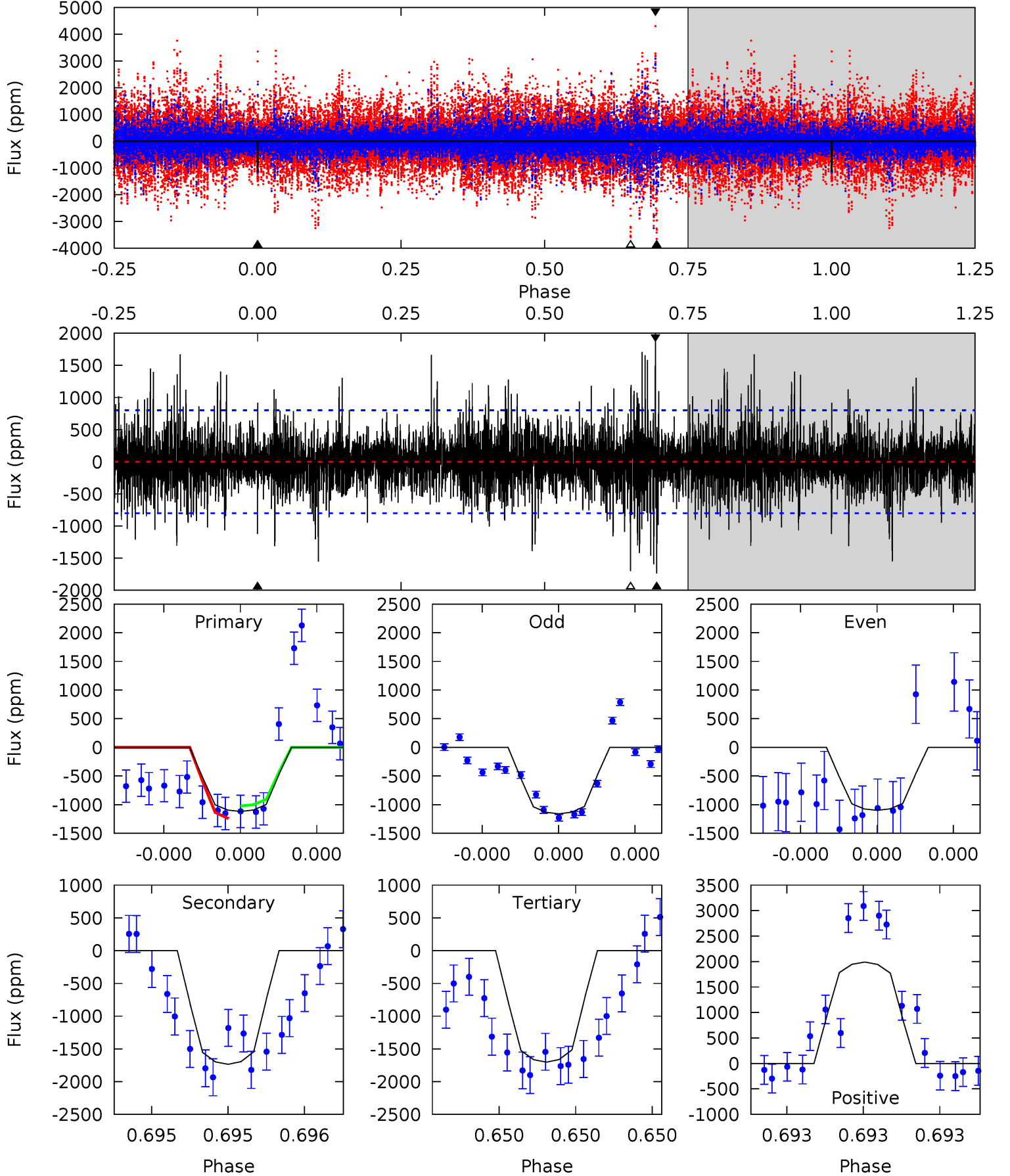
TCE 010802309-03 $P=383.606033$ Days $T_0=465.573388$ (BKJD)



DV Model-Shift Uniqueness Test

010802309-03, P = 383.600436 Days, E = 81.978618 Days

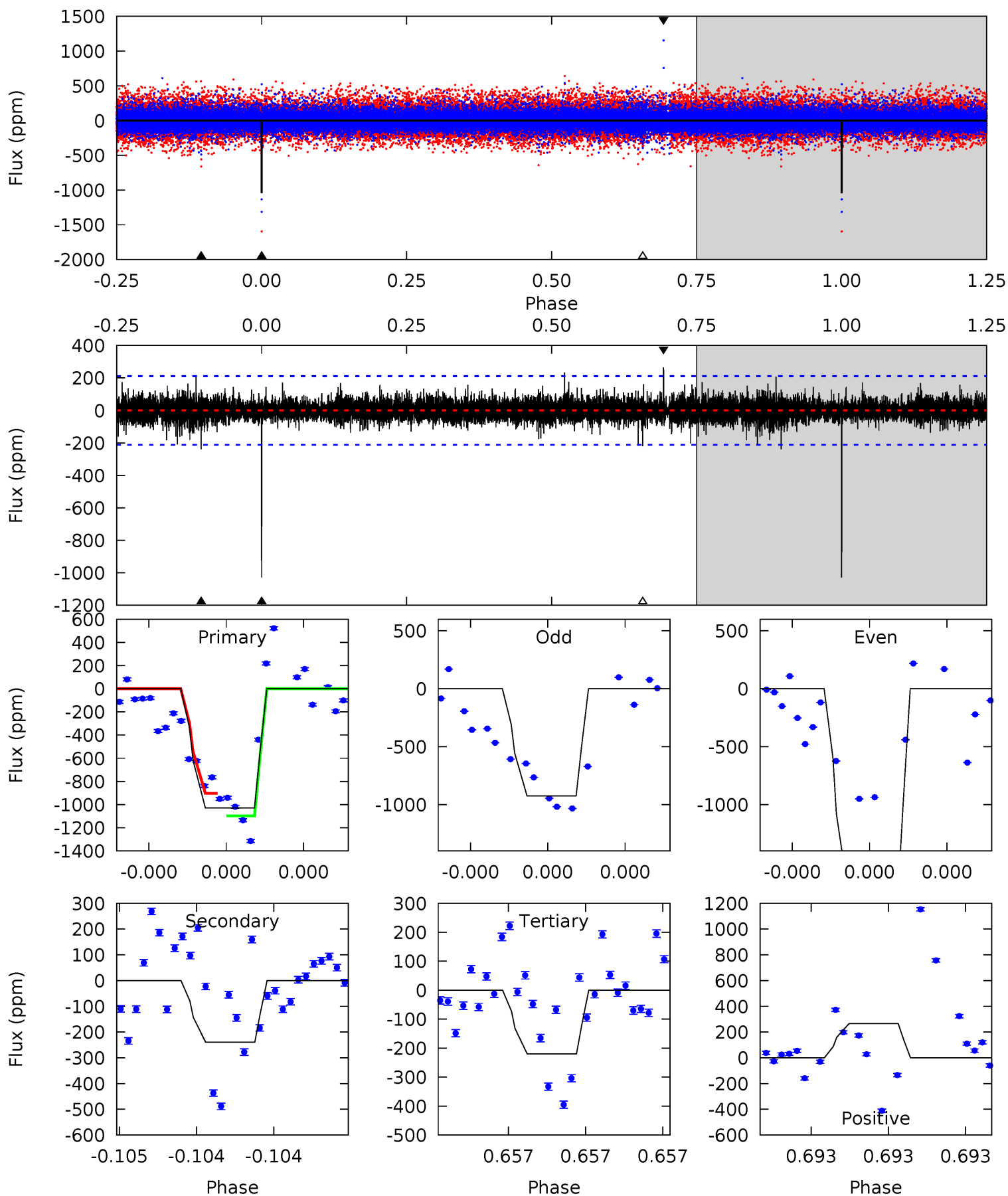
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.90	12.2	12.0	14.0	5.65	3.60	2.28	-4.10	-6.13	0.24	-1.79	0.18	0.96	0.53	0.74



Alt Model-Shift Uniqueness Test

010802309-03, P = 383.606033 Days, E = 81.967355 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.5	6.38	5.87	7.08	5.64	3.59	1.06	21.6	20.4	0.51	-0.70	12.8	1.36	0.20	0



Stellar Parameters For KIC 010802309

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5403^{+163}_{-146}	$4.605^{+0.072}_{-0.054}$	$-1.020^{+0.300}_{-0.300}$	$0.661^{+0.057}_{-0.057}$	$0.643^{+0.066}_{-0.024}$	$3.132^{+0.903}_{-0.587}$
	+3%/-3%	+2%/-1%	+29%/-29%	+9%/-9%	+10%/-4%	+29%/-19%
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 010802309-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1736 ± 142	$16.49^{+15.97}_{-10.98}$	286^{+10}_{-10}	2989^{+1314}_{-489}	2911^{+22791}_{-2187}
Alt.	-239 ± 37	$15.01^{+15.99}_{-10.21}$	286^{+11}_{-10}	2369^{+832}_{-365}	471^{+4018}_{-365}

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 $A_{obs} \gg 1.0$

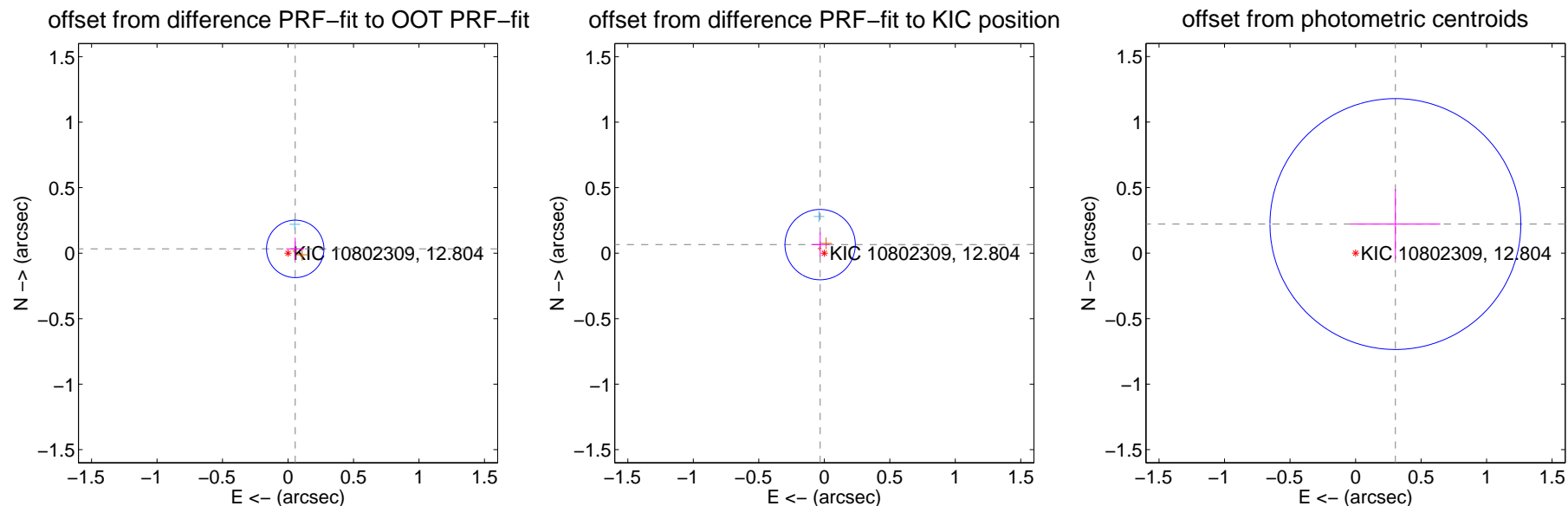
DV Centroid Data

Supplemental centroid analysis for 010802309-03. Kepler magnitude: 12.80. Transit SNR 7.63

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	0.064 ± 0.073	0.88	-0.055 ± 0.068	0.033 ± 0.086
PRF-fit source offset from KIC position	0.073 ± 0.089	0.81	0.032 ± 0.068	0.065 ± 0.091
photometric centroid source offset	0.38 ± 0.32	1.18	-0.30 ± 0.34	0.22 ± 0.27

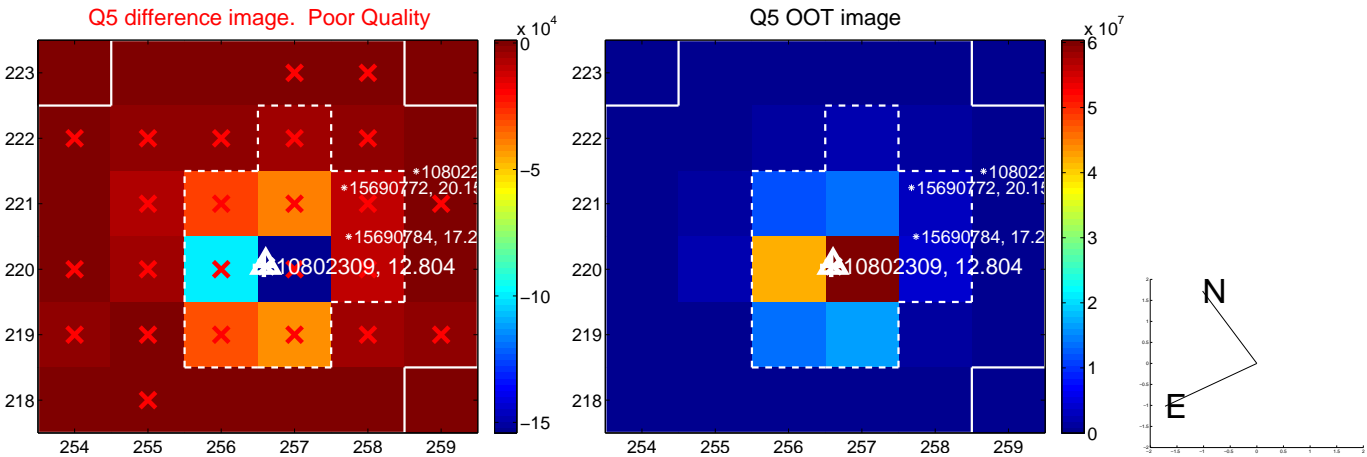


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

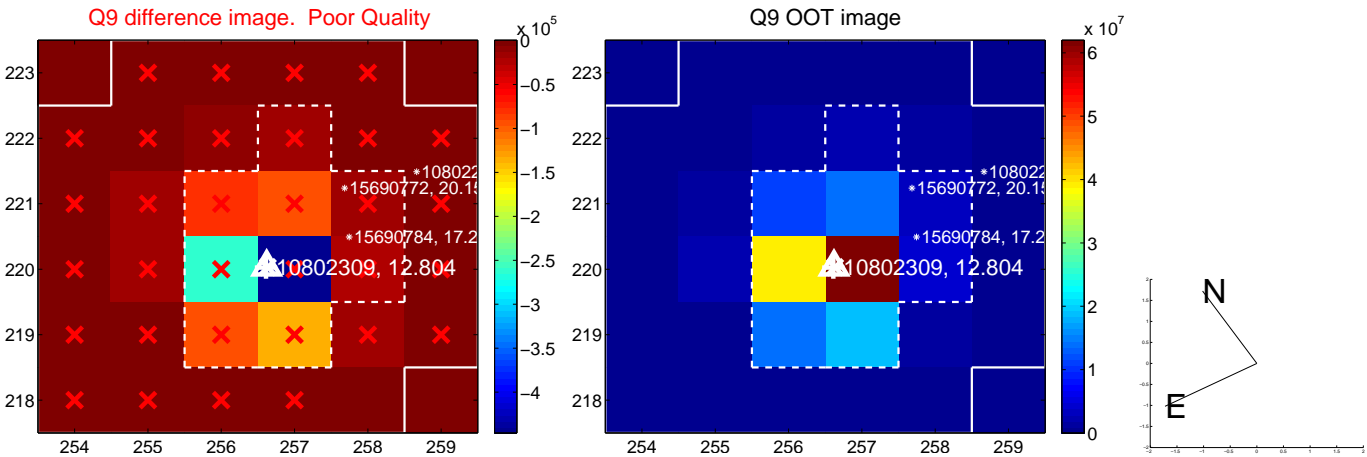
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



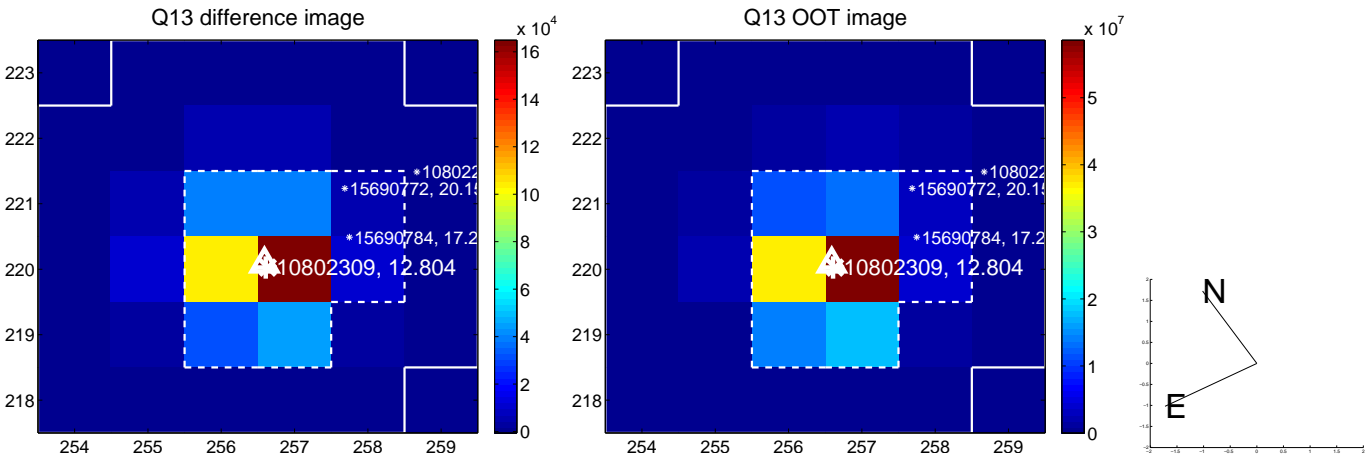
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



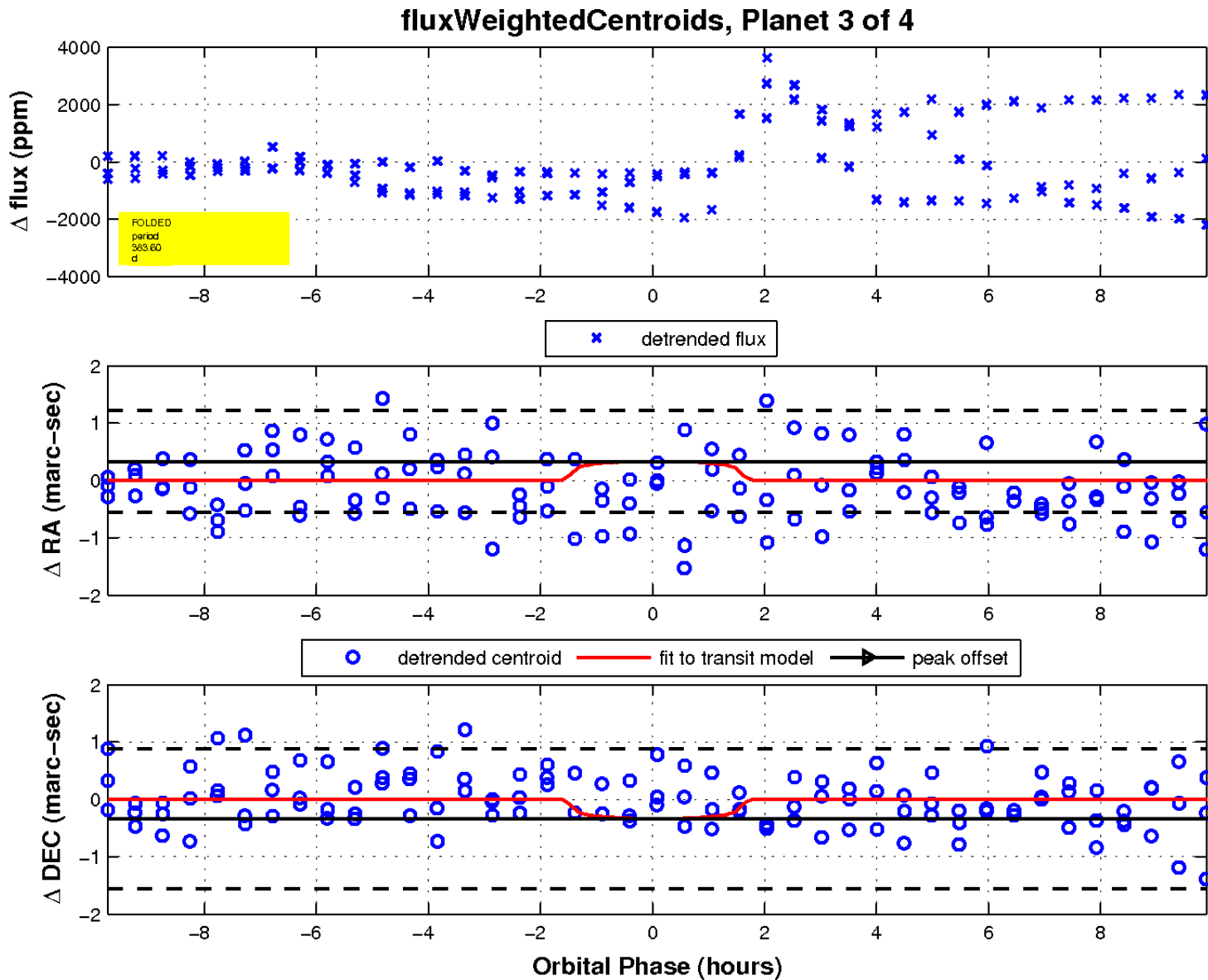
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

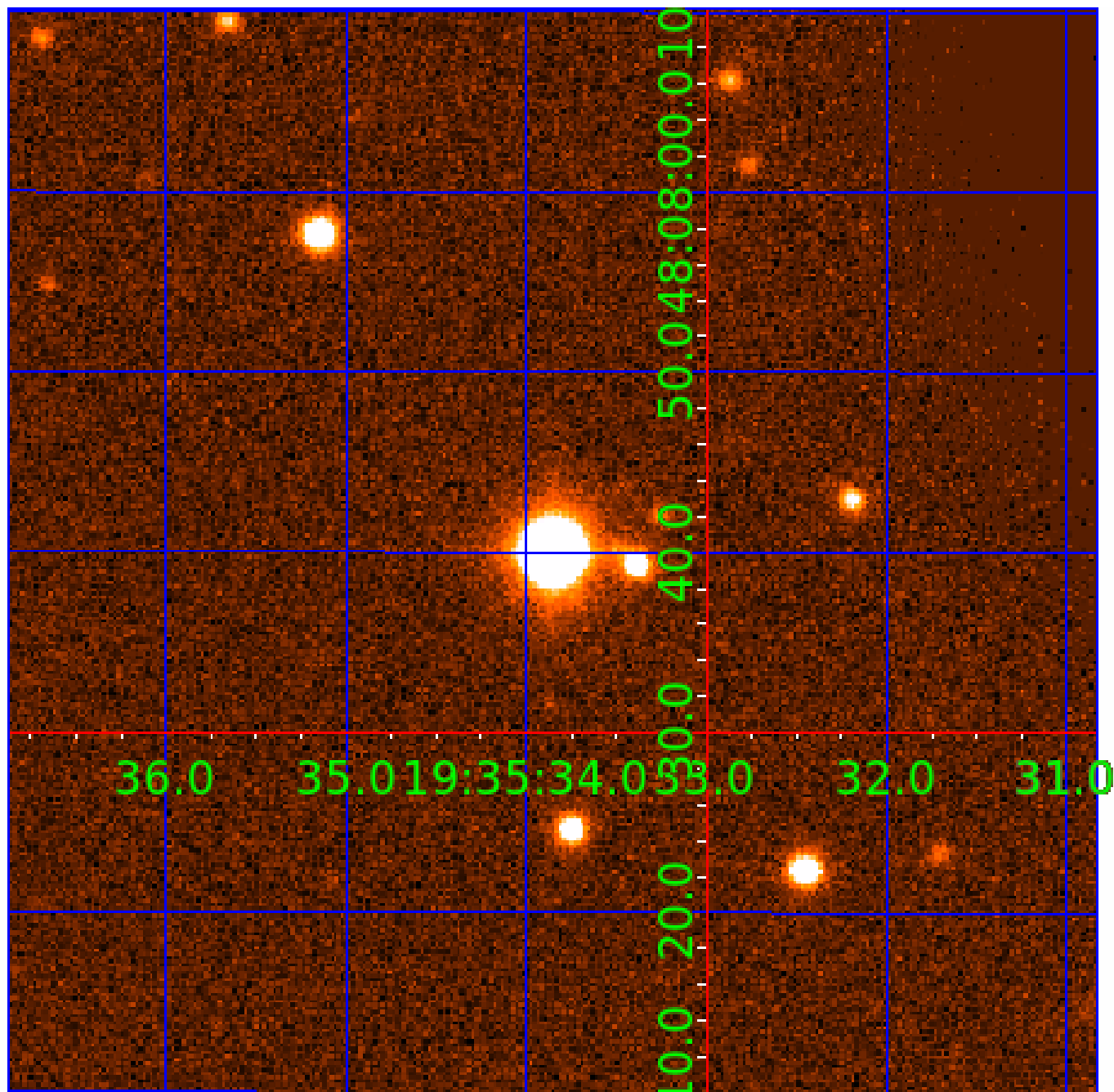


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010802309

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})
010802309-01	OBS	No	478.046439	187.760009	461.9	2.275	17.4	2.9	0.66	5403	1.60	0.31
010802309-02	OBS	No	562.764721	236.544816	610.4	14.216	11.2	2.9	0.66	5403	1.69	0.25
010802309-03	OBS	No	383.600436	465.579054	1243.2	3.326	14.4	7.6	0.66	5403	2.54	0.42
010802309-04	OBS	No	455.785858	355.856550	1662.3	13.672	12.4	3.3	0.66	5403	3.40	0.33

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010802309-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010802309-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010802309-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_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.

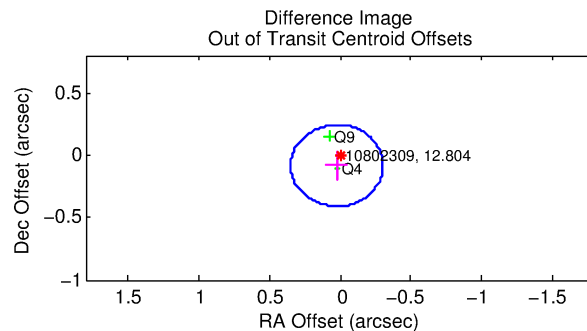
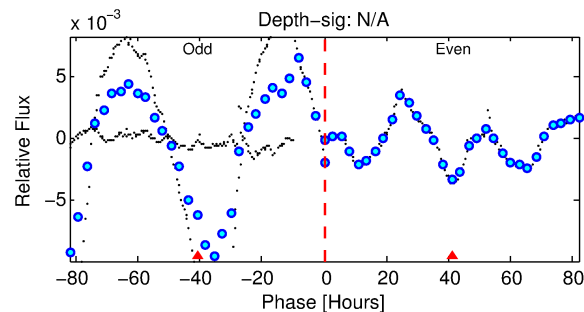
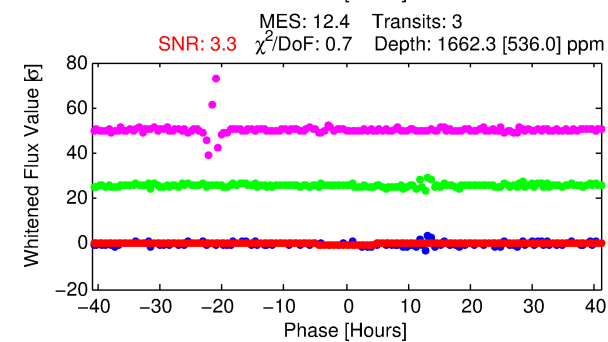
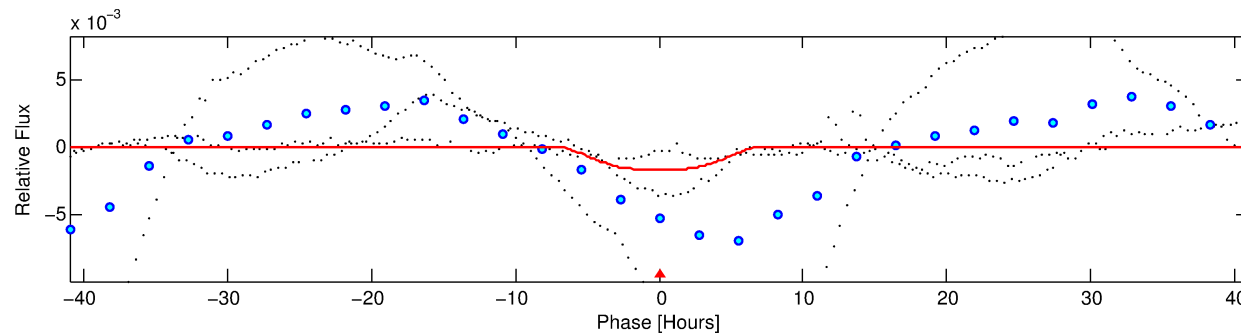
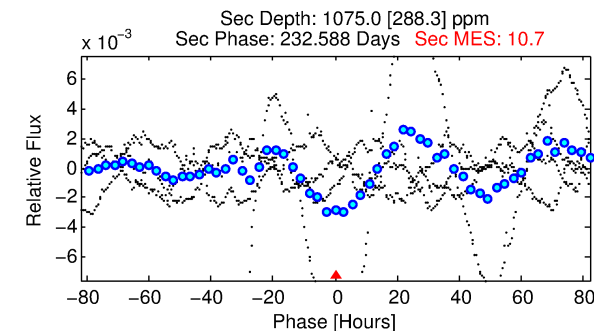
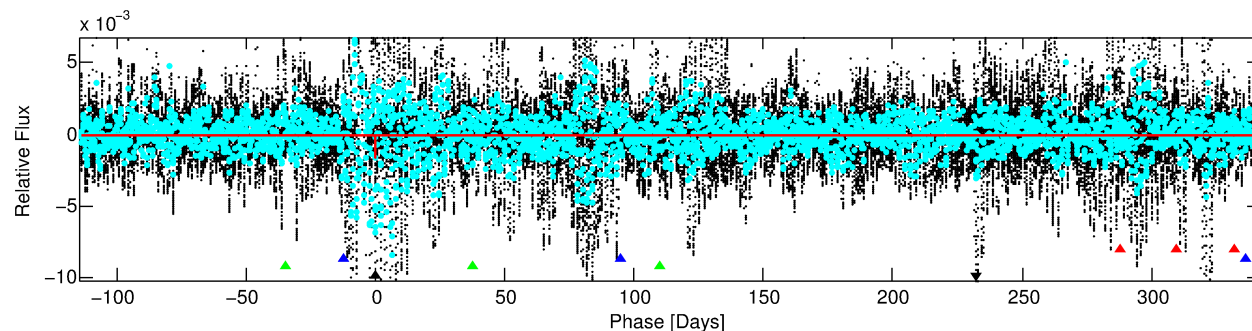
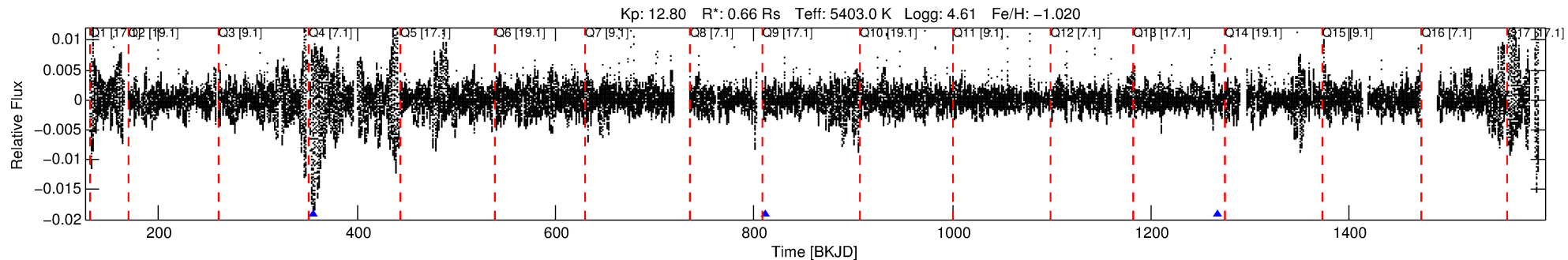
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010802309-04

No Significant Match Found

DV One-Page Summary

KIC: 10802309 Candidate: 4 of 4 Period: 455.786 d



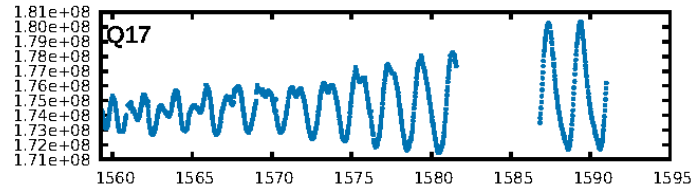
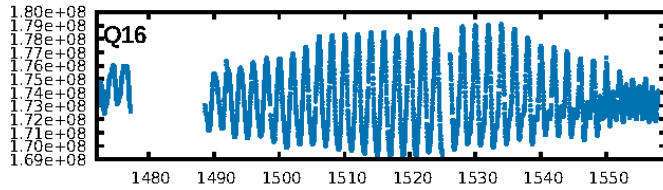
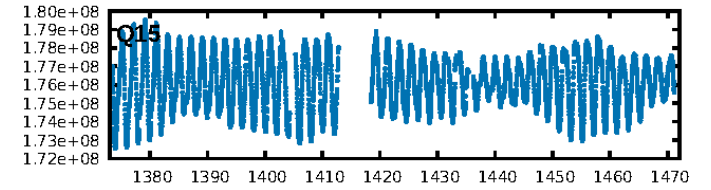
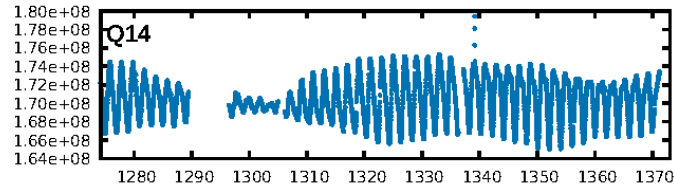
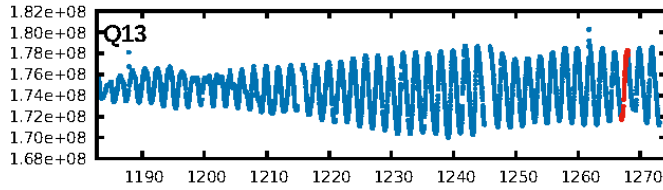
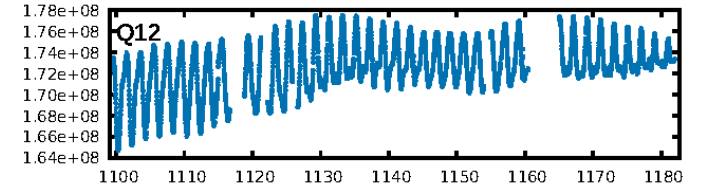
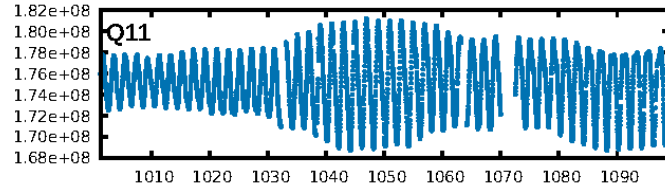
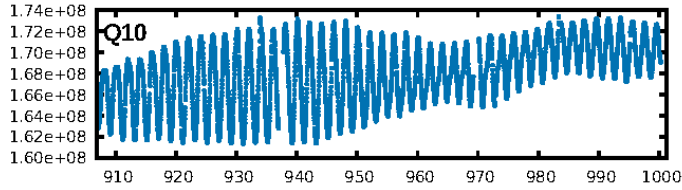
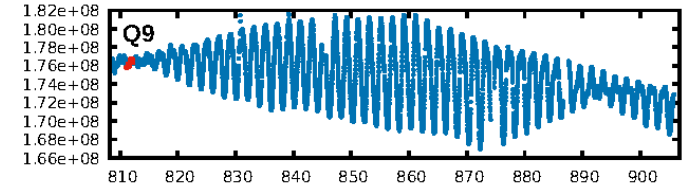
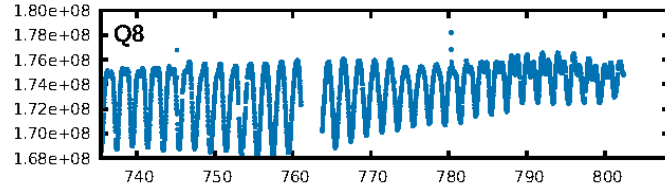
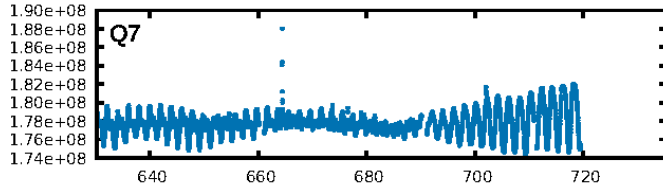
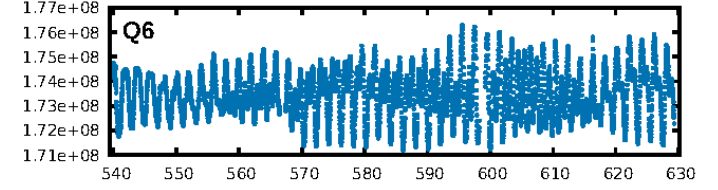
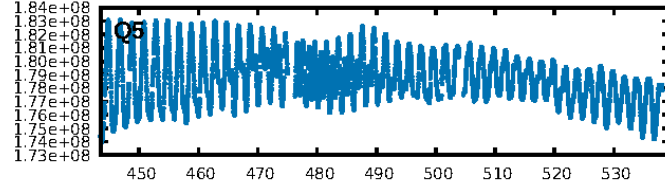
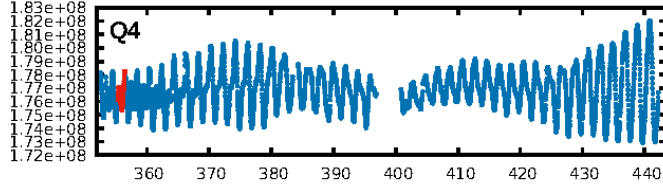
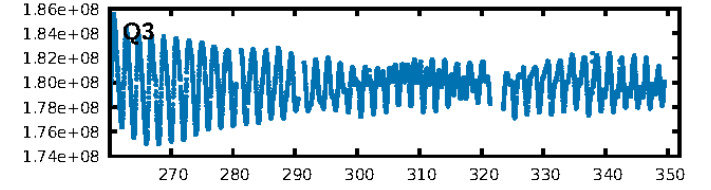
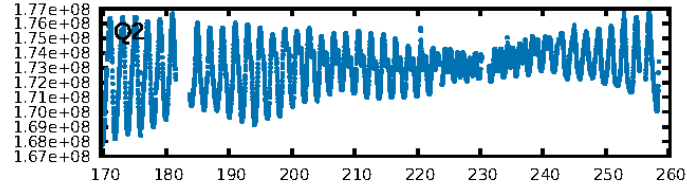
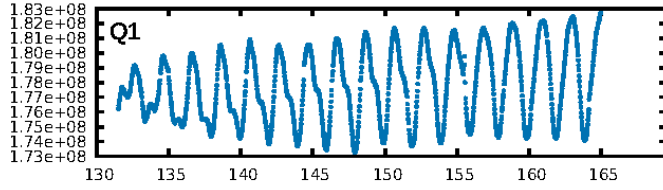
DV Fit Results:

Period = 455.78586 [0.02071] d
Epoch = 355.8565 [0.0310] BKJD
Rp/R* = 0.0472 [0.0079]
a/R* = 113.91 [11.33]
b = 0.95 [0.02]
Seff = 0.33 [0.06]
Teq = 194 [8] K
Rp = 3.40 [0.64] Re
a = 1.0000 [0.0797] AU
Ag = 51121.12 [22824.89] [2.24σ]
Teff = 4505 [502] K [8.59σ]

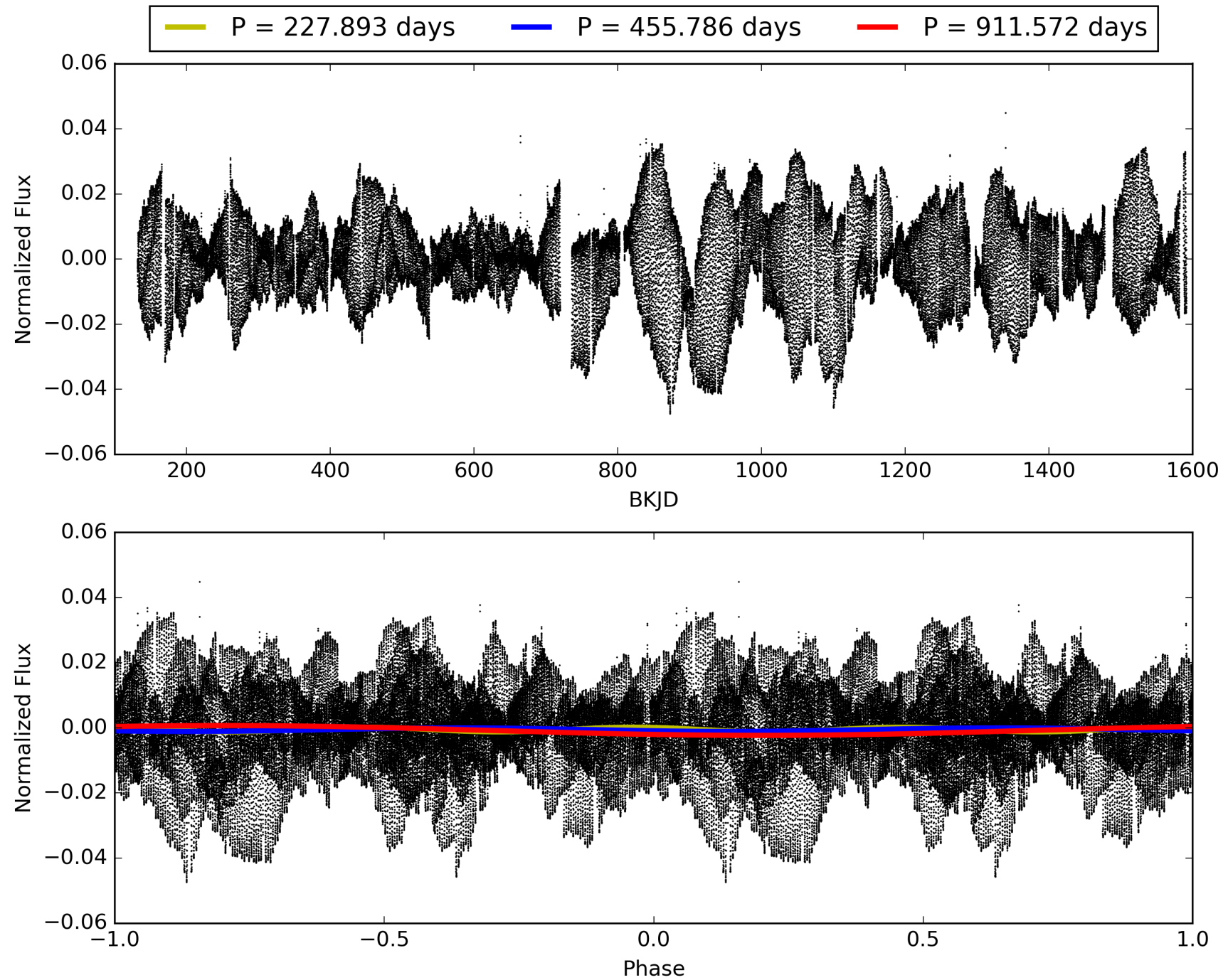
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [123.12σ]
LongPeriod-sig: 100.0% [38.55σ]
ModelChiSquare2-sig: 30.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.437
Centroid-sig: 11.8%
Centroid-so: 0.249 arcsec [0.95σ]
OotOffset-rm: 0.087 arcsec [0.80σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-rm: 0.145 arcsec [1.93σ]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 010802309-04, PDC Light Curves

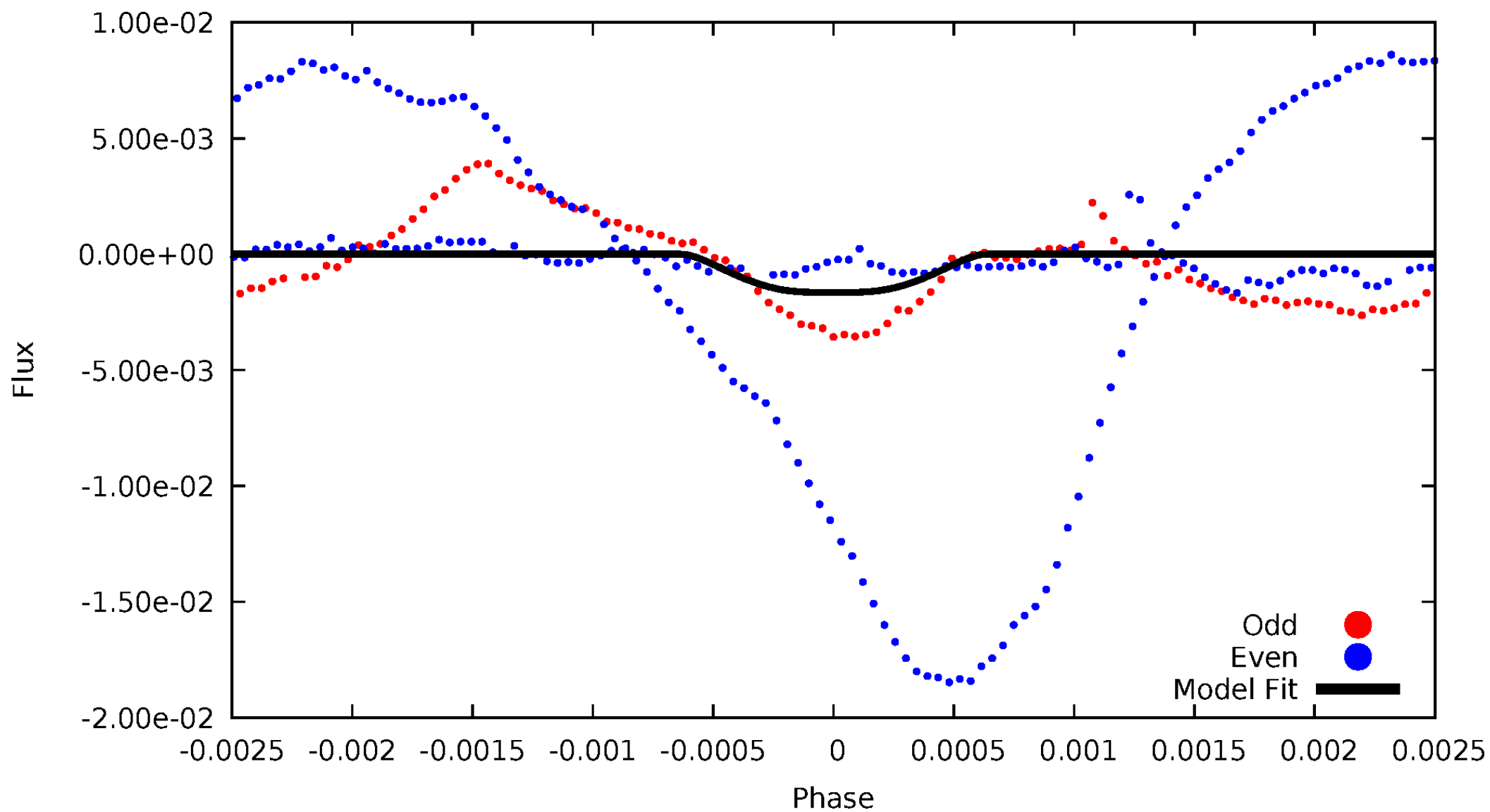


TCE 010802309-04



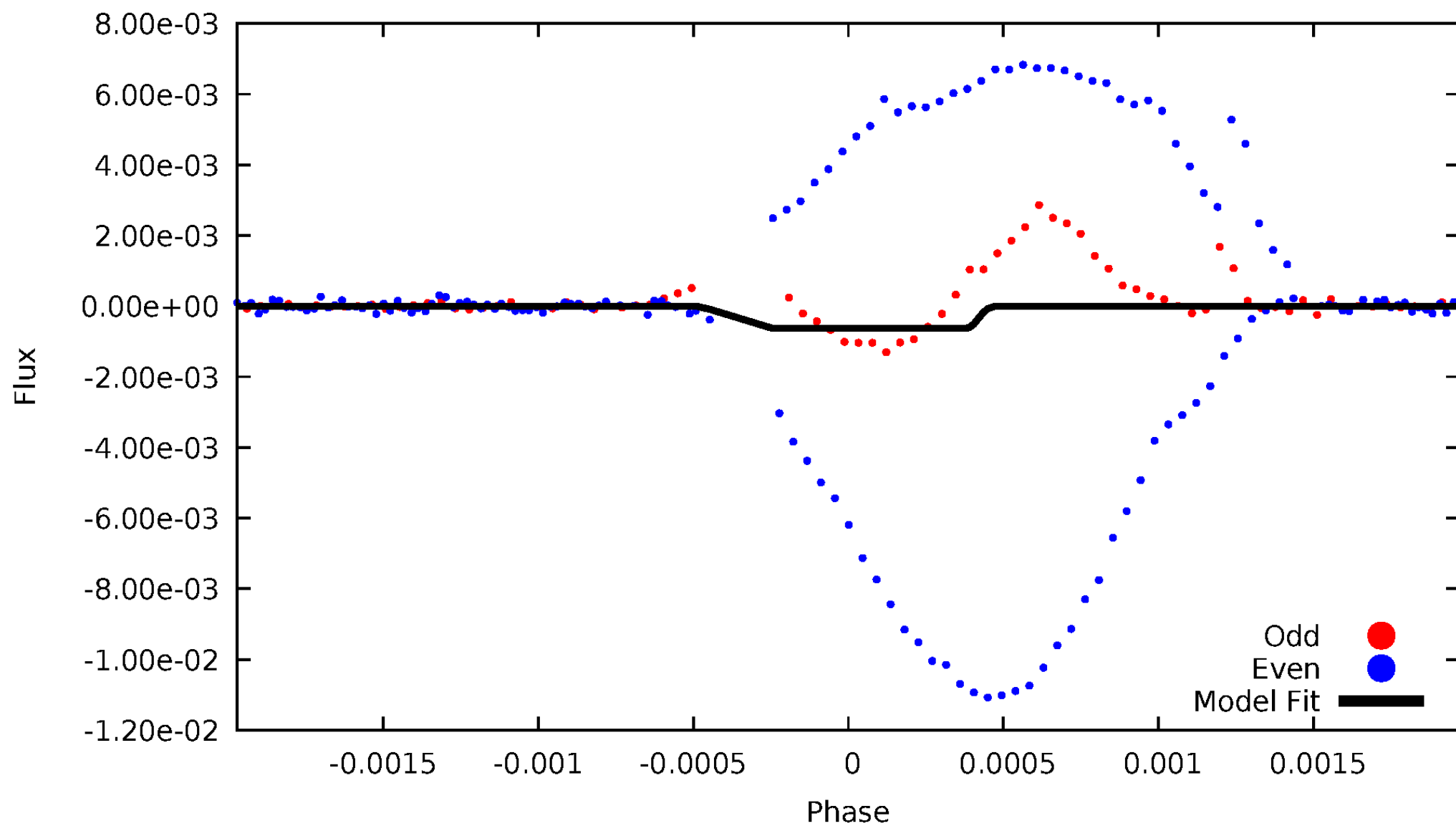
DV Odd/Even

TCE 010802309-04



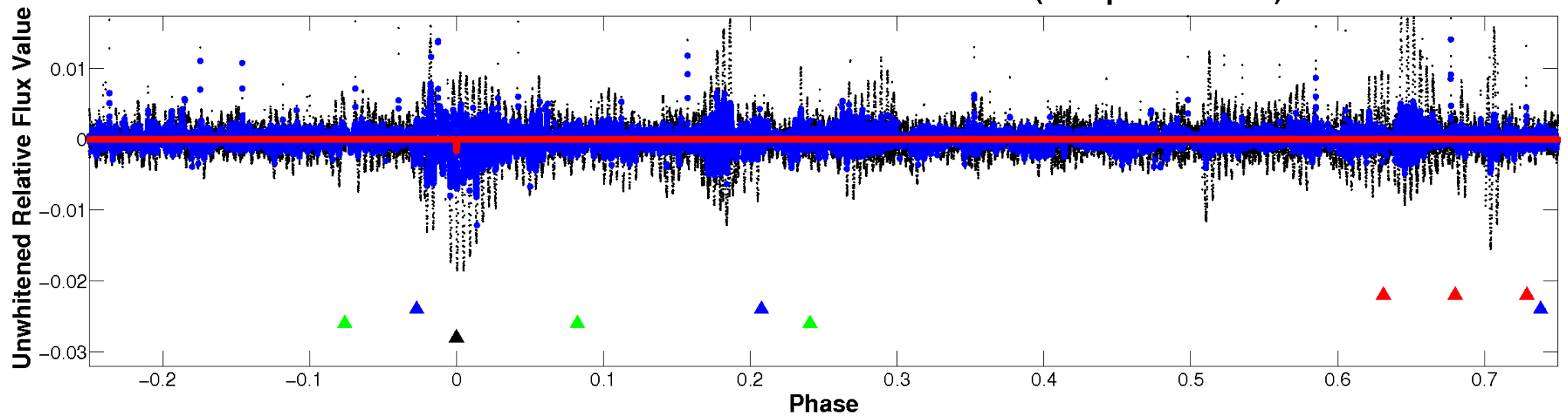
ALT Odd/Even

TCE 010802309-04

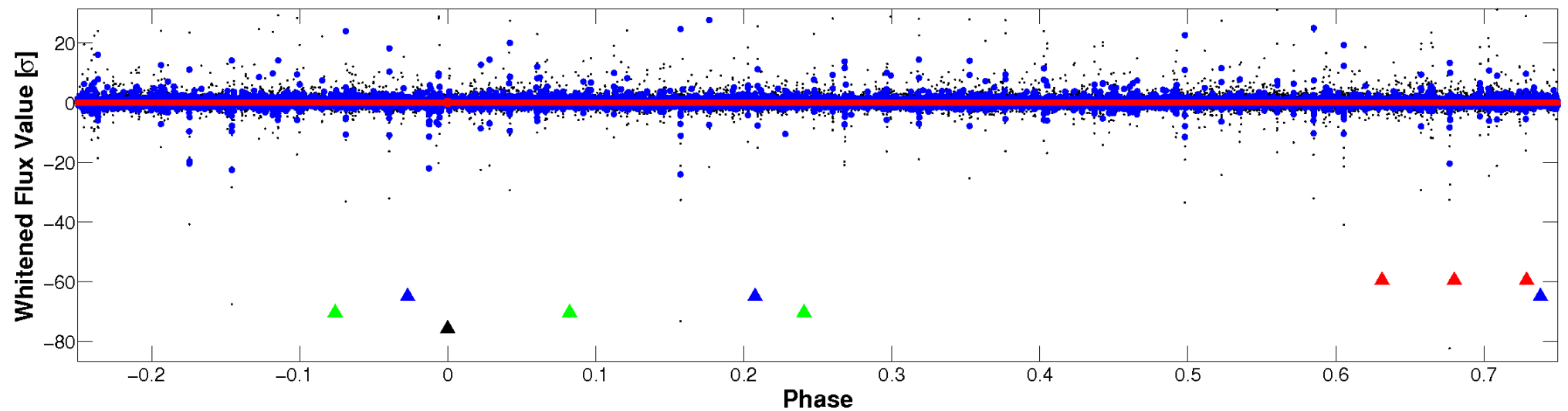


Non-Whitened Vs. Whitened Light Curve

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

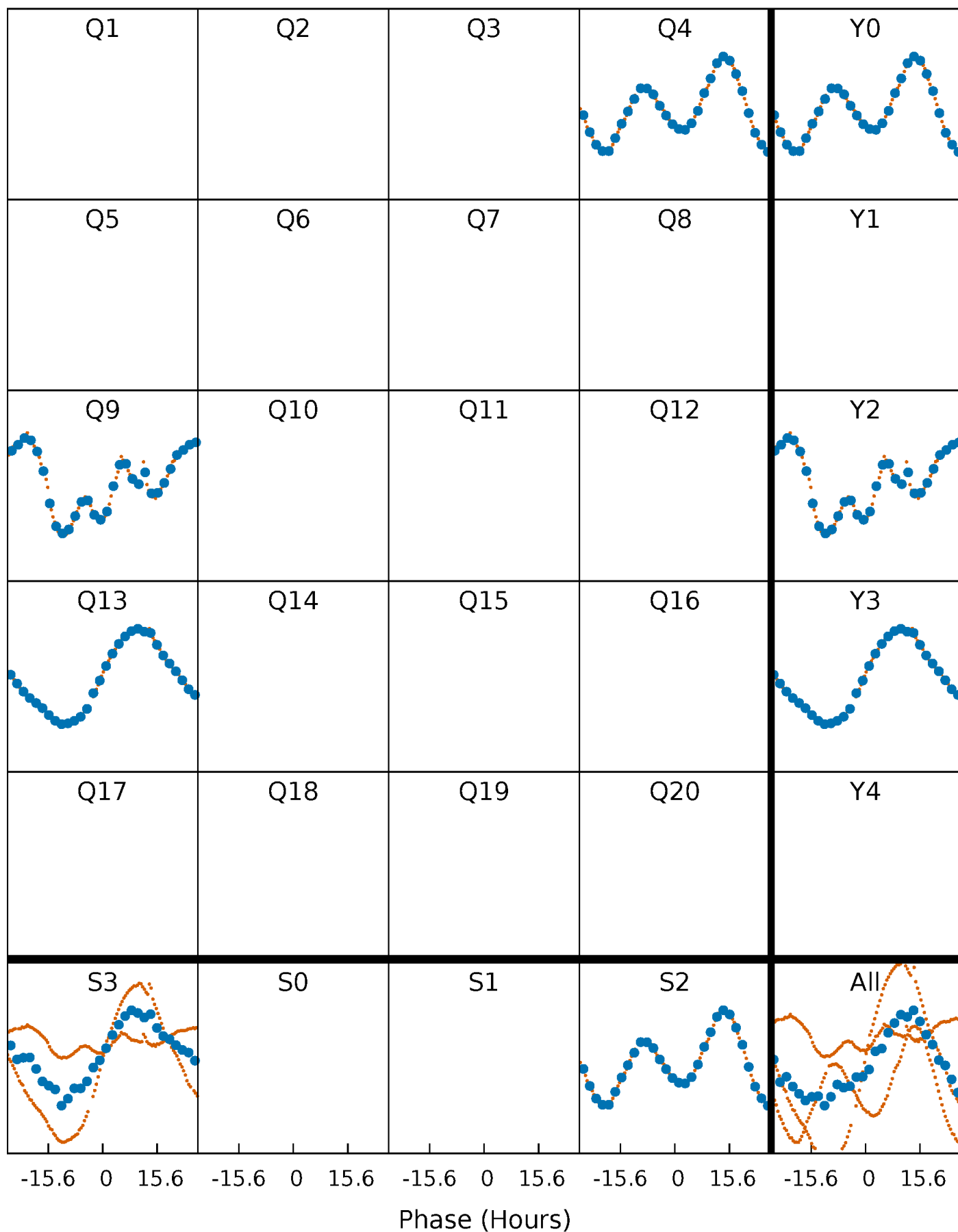


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



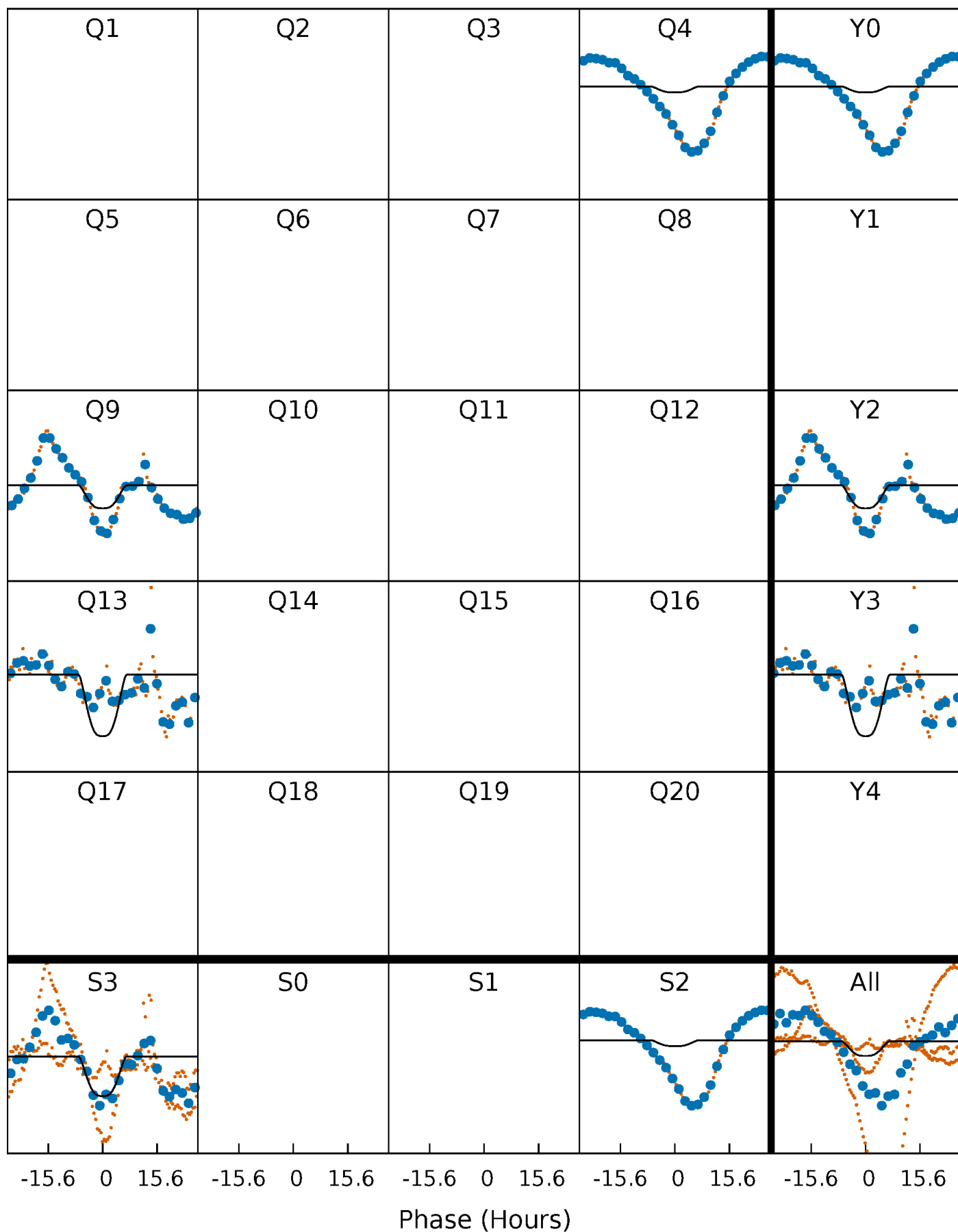
PDC Quarter-Phased Transit Curves

TCE 010802309-04 $P=455.785858$ Days $T_0=355.856550$ (BKJD)



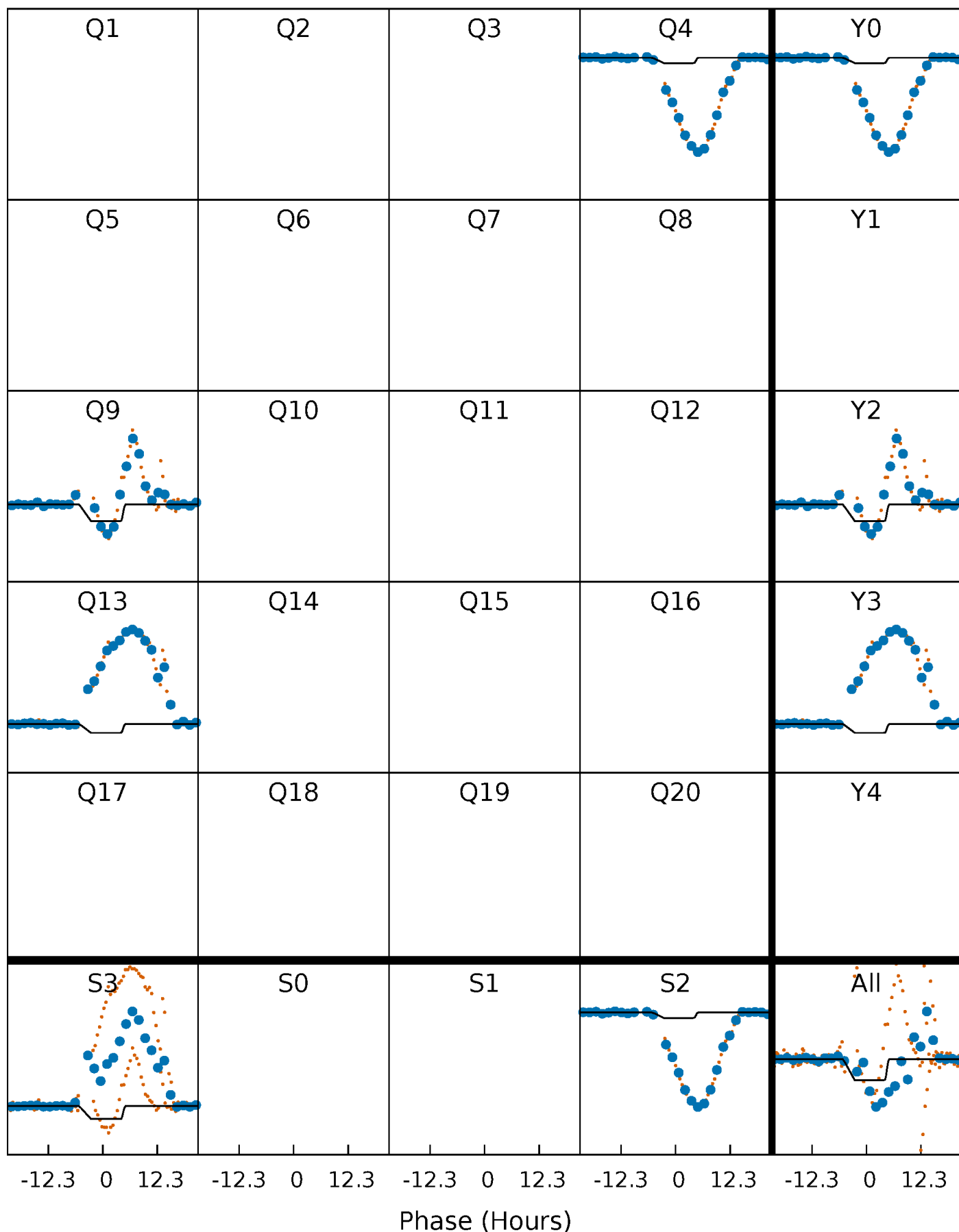
DV Quarter-Phased Transit Curves

TCE 010802309-04 $P=455.785858$ Days $T_0=355.856550$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

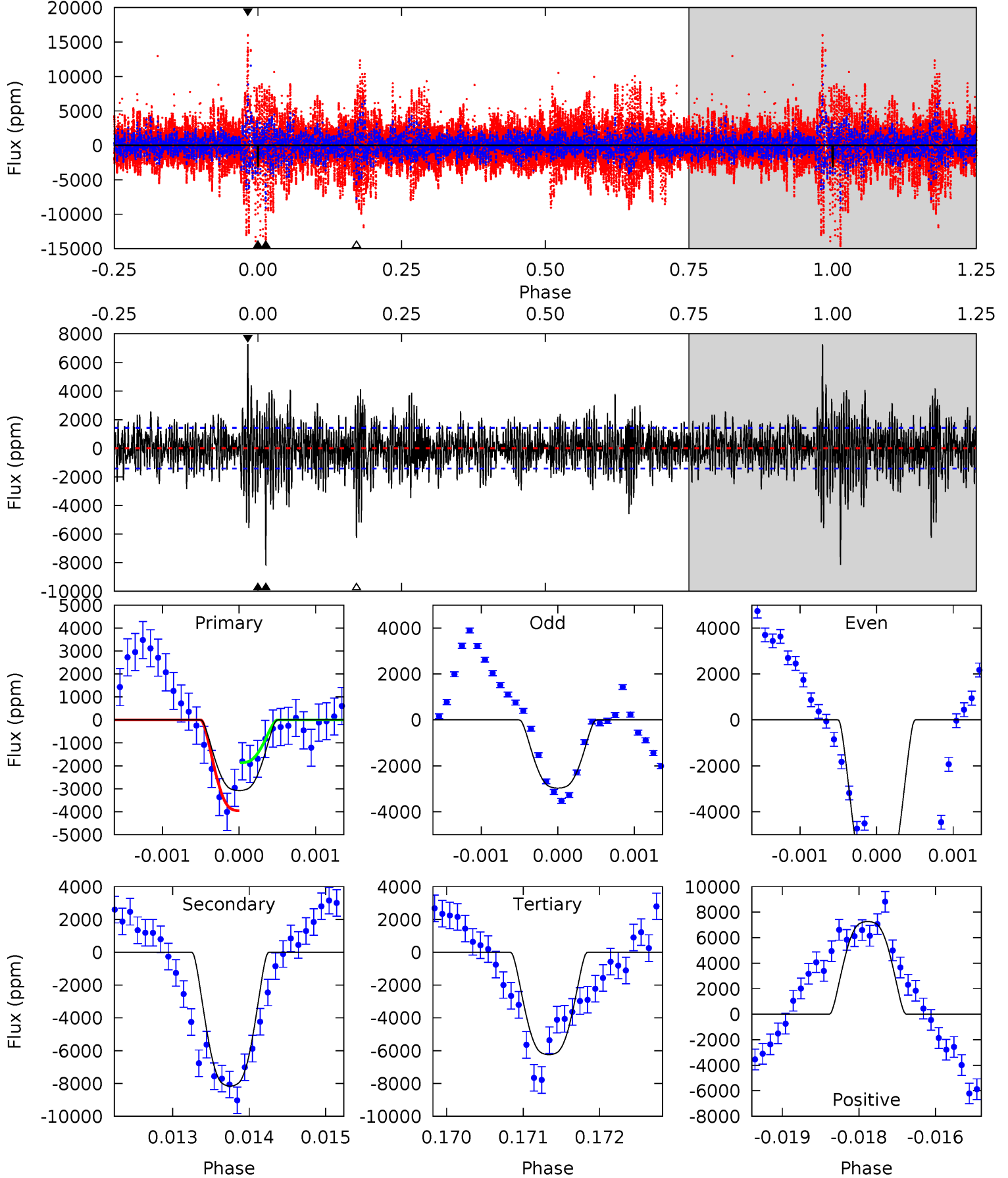
TCE 010802309-04 P=455.838668 Days $T_0=355.747914$ (BKJD)



DV Model-Shift Uniqueness Test

010802309-04, P = 455.785858 Days, E = 355.856550 Days

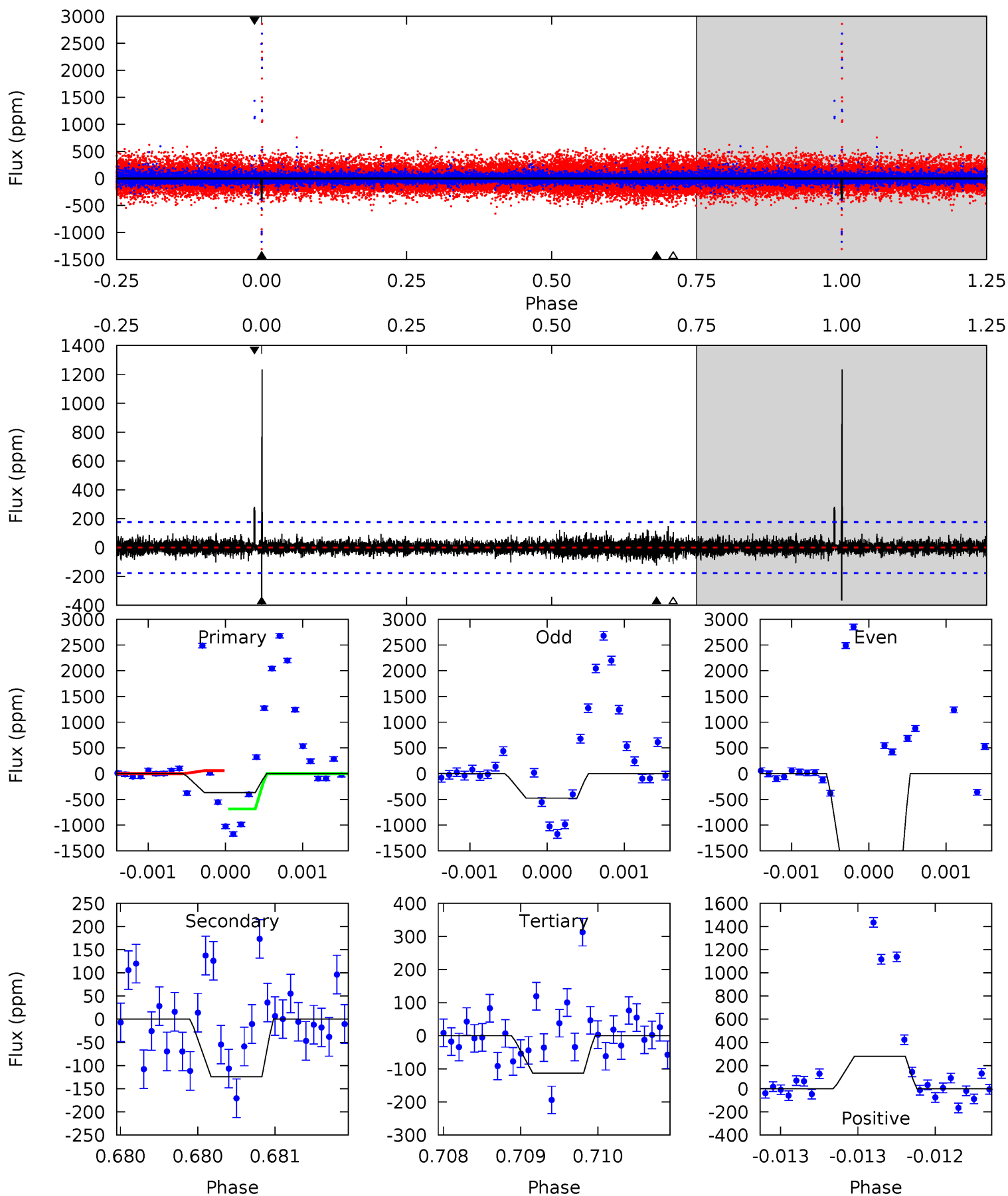
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	31.1	23.8	27.7	5.41	3.22	4.78	-12.1	-16.0	7.31	3.42	8.66	2.01	0.47	3.93



Alt Model-Shift Uniqueness Test

010802309-04, P = 455.838668 Days, E = 355.747914 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	3.86	3.51	8.72	5.47	3.32	0.78	7.90	2.69	0.36	-4.85	42.6	2.25	0.77	9.45



Stellar Parameters For KIC 010802309

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5403^{+163}_{-146}	$4.605^{+0.072}_{-0.054}$	$-1.020^{+0.300}_{-0.300}$	$0.661^{+0.057}_{-0.057}$	$0.643^{+0.066}_{-0.024}$	$3.132^{+0.903}_{-0.587}$
	+3%/-3%	+2%/-1%	+29%/-29%	+9%/-9%	+10%/-4%	+29%/-19%
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 010802309-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-8162 ± 262	$3.44^{+0.56}_{-0.59}$	269^{+10}_{-10}	7530^{+907}_{-687}	$385626^{+175754}_{-97749}$
Alt.	-124 ± 32	$1.80^{+0.56}_{-0.57}$	271^{+9}_{-11}	3918^{+601}_{-369}	20790^{+25141}_{-9337}

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

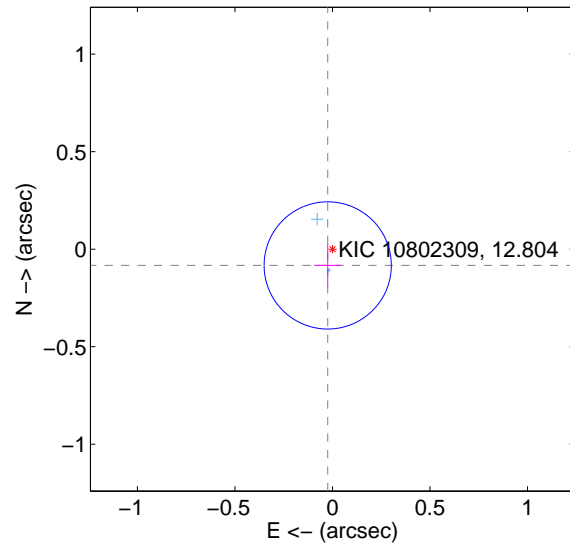
Supplemental centroid analysis for 010802309-04. Kepler magnitude: 12.80. Transit SNR 3.28

There are 2 quarters with good PRF difference image offsets

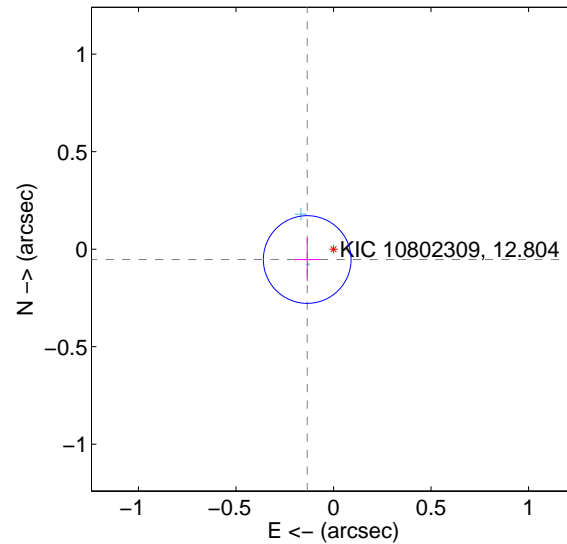
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.087 ± 0.109	0.80	0.024 ± 0.070	-0.083 ± 0.111
PRF-fit source offset from KIC position	0.145 ± 0.075	1.93	0.135 ± 0.068	-0.053 ± 0.110
photometric centroid source offset	0.25 ± 0.26	0.95	0.23 ± 0.27	0.08 ± 0.15

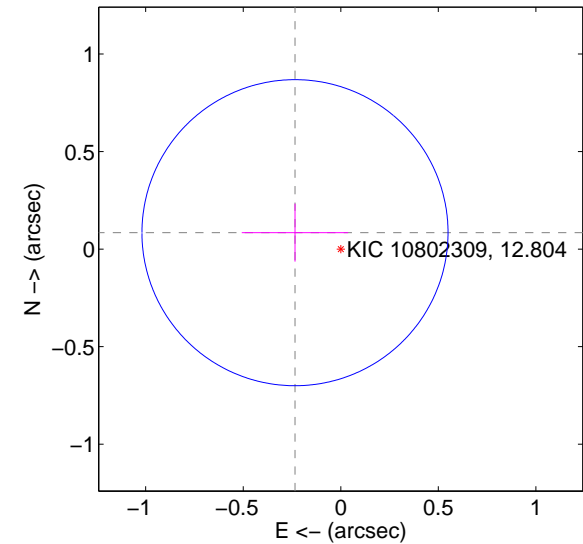
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

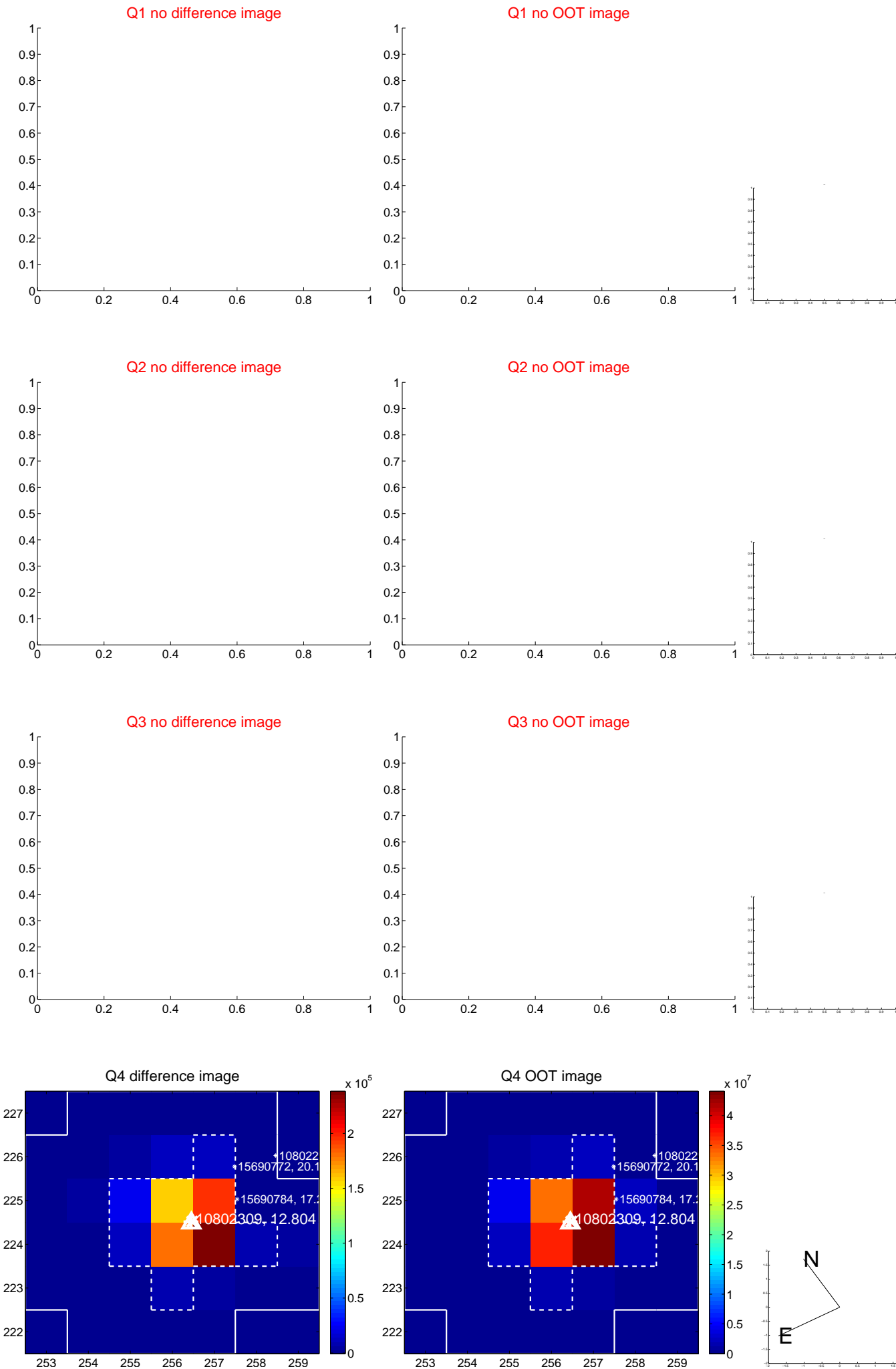


offset from photometric centroids



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

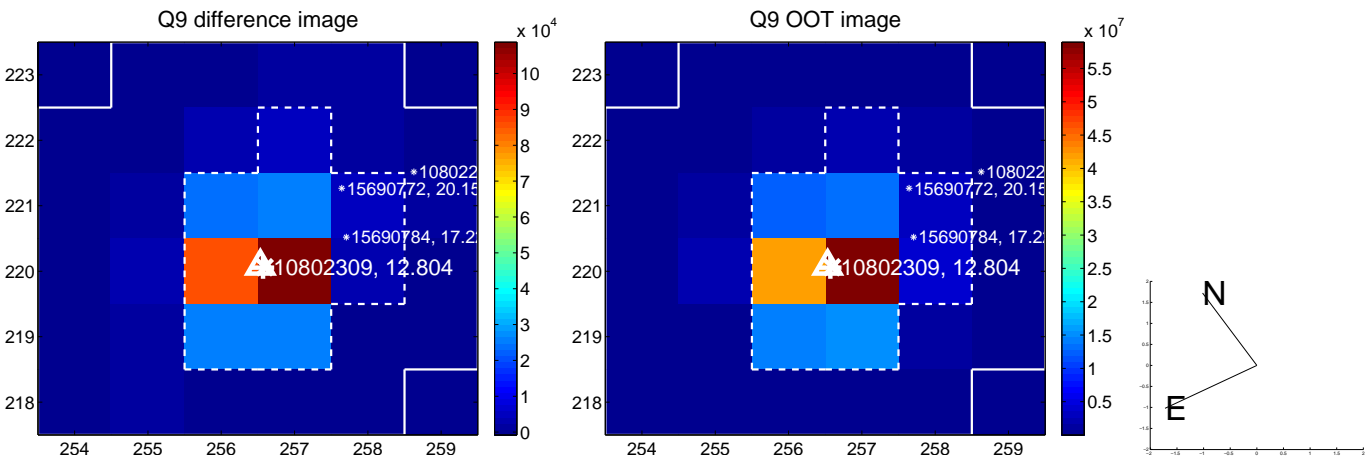
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



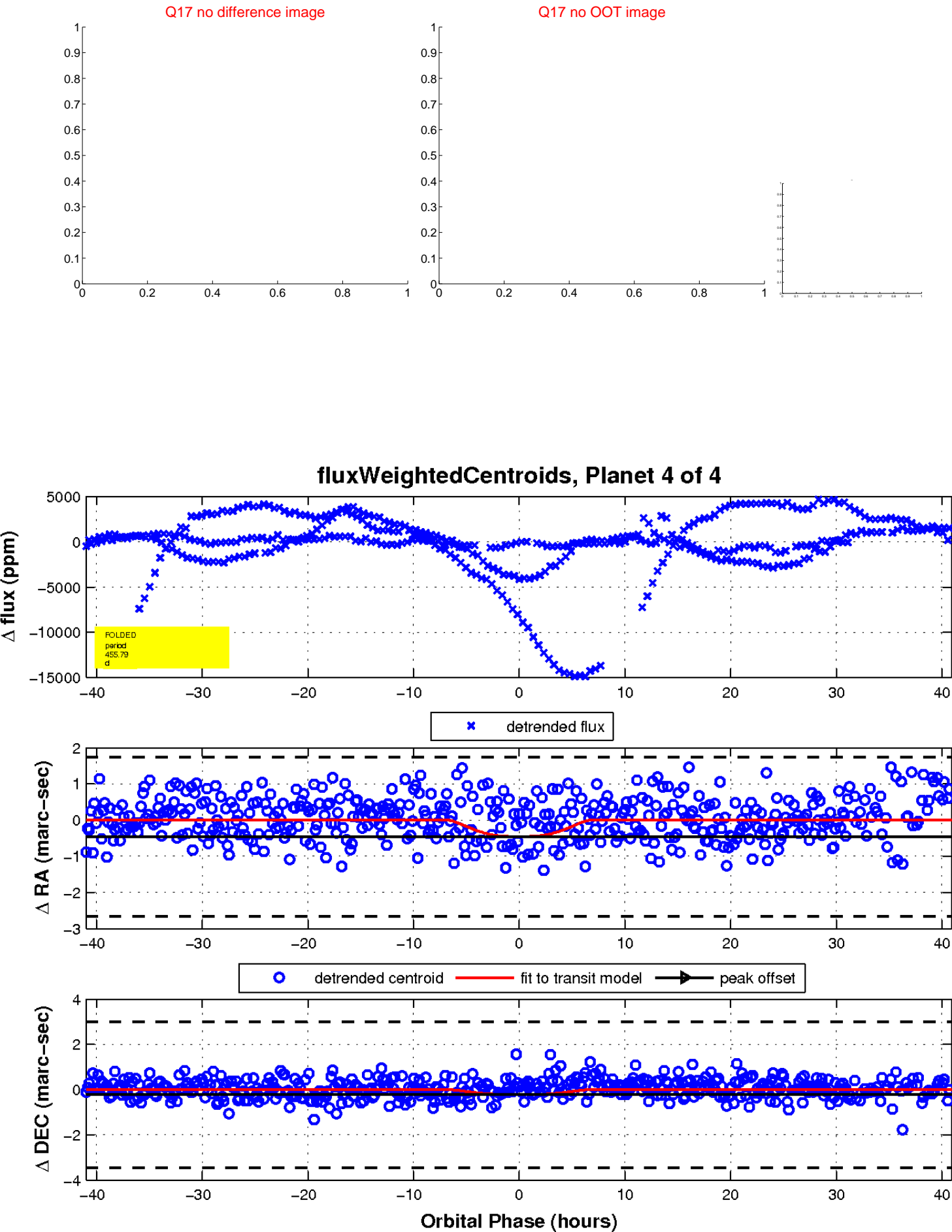
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

