

KIC 009019435

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})
009019435-01	OBS	No	537.357404	346.754700	2421.5	3.754	13.5	6.8	0.38	3489	1.92	0.02
009019435-02	OBS	No	320.682349	420.912052	1984.7	6.844	8.4	7.7	0.38	3489	1.68	0.04
009019435-03	OBS	No	243.774838	157.013760	743.2	2.550	11.8	2.7	0.38	3489	1.05	0.06
009019435-04	OBS	No	385.549452	177.602068	2028.4	2.989	11.2	7.6	0.38	3489	1.71	0.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009019435-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009019435-02	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
009019435-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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
009019435-04	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—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

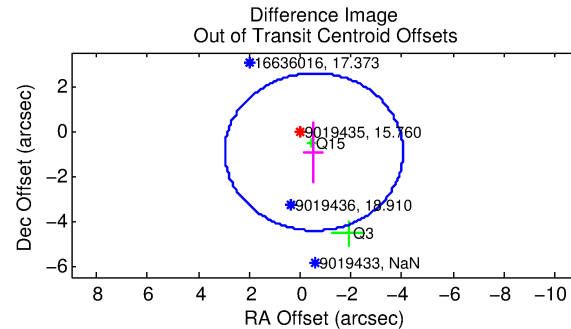
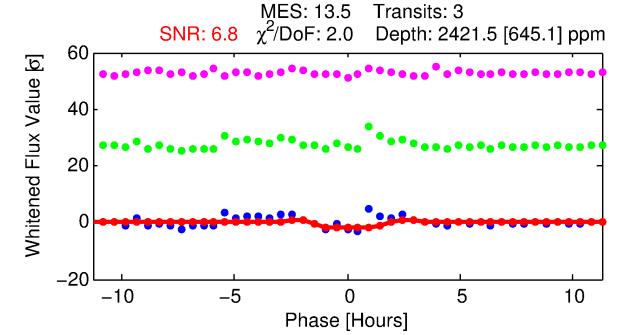
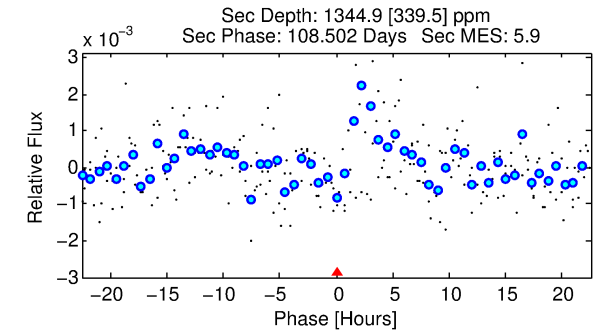
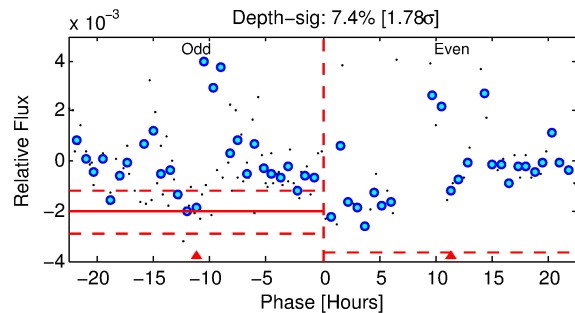
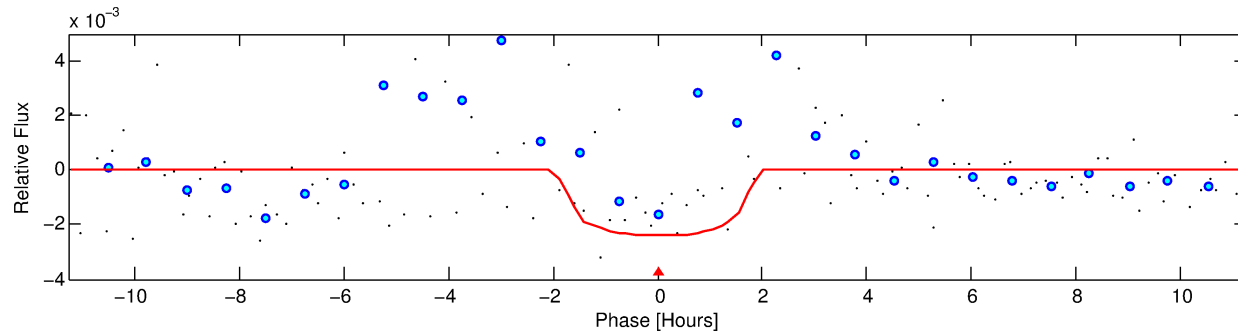
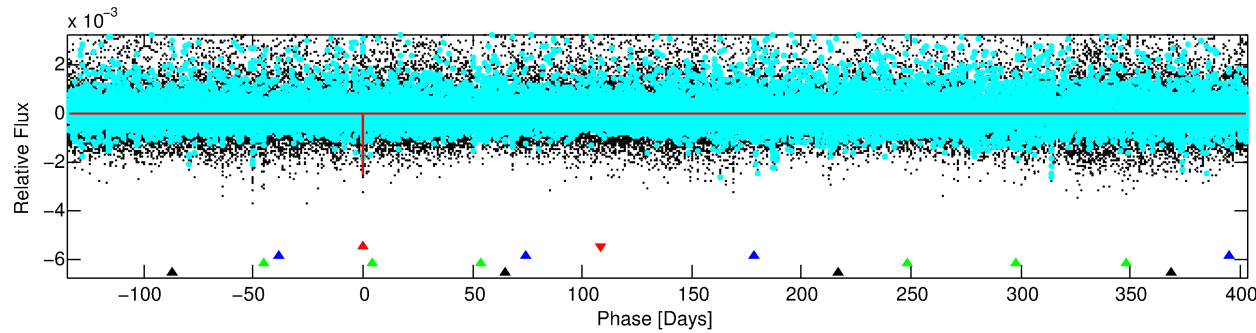
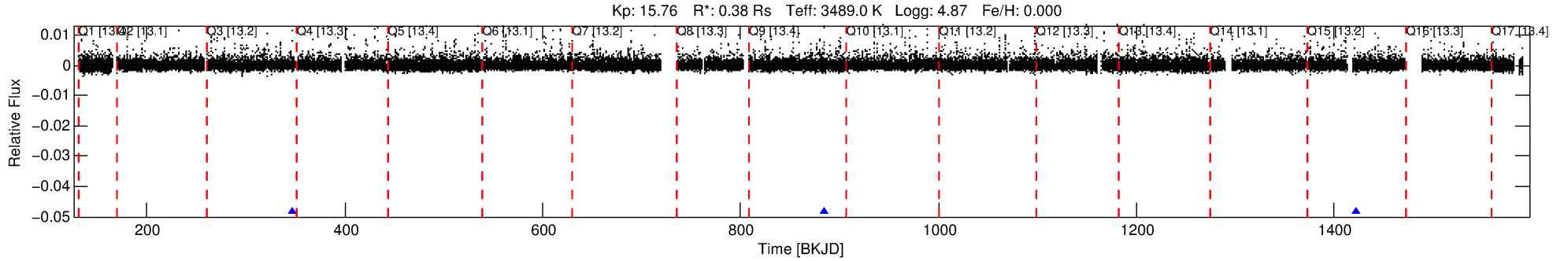
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009019435-01

No Significant Match Found

DV One-Page Summary

KIC: 9019435 Candidate: 1 of 4 Period: 537.357 d



DV Fit Results:

Period = 537.35740 [0.01020] d
Epoch = 346.7547 [0.0141] BKJD
Rp/R* = 0.0465 [0.0653]
a/R* = 958.39 [5543.30]
b = 0.57 [6.82]
Seff = 0.02 [0.00]
Teq = 98 [4] K
Rp = 1.92 [2.72] Re
a = 0.9425 [0.1118] AU
Ag = 177543.10 [500872.29] [0.35 σ]
Teffp = 3098 [2183] K [1.37 σ]

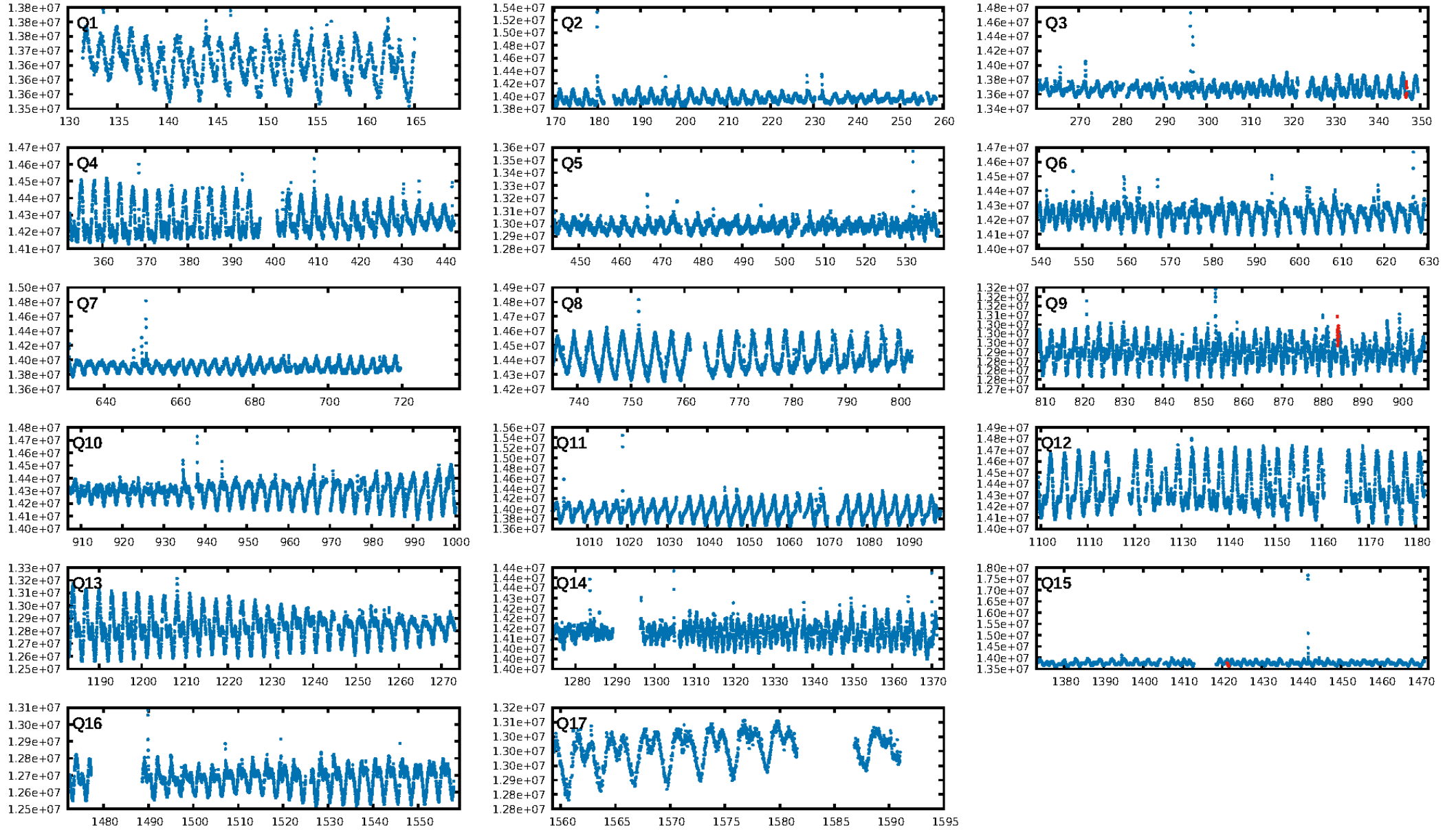
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [759.19 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 43.0%
ModelChiSquareGof-sig: 72.4%
Bootstrap-pfa: 1.28e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.3819
Centroid-sig: N/A
Centroid-so: 1.052 arcsec [1.15 σ]
OotOffset-rm: 1.080 arcsec [0.93 σ]
KicOffset-rm: 0.297 arcsec [0.55 σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-st: 0/2/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

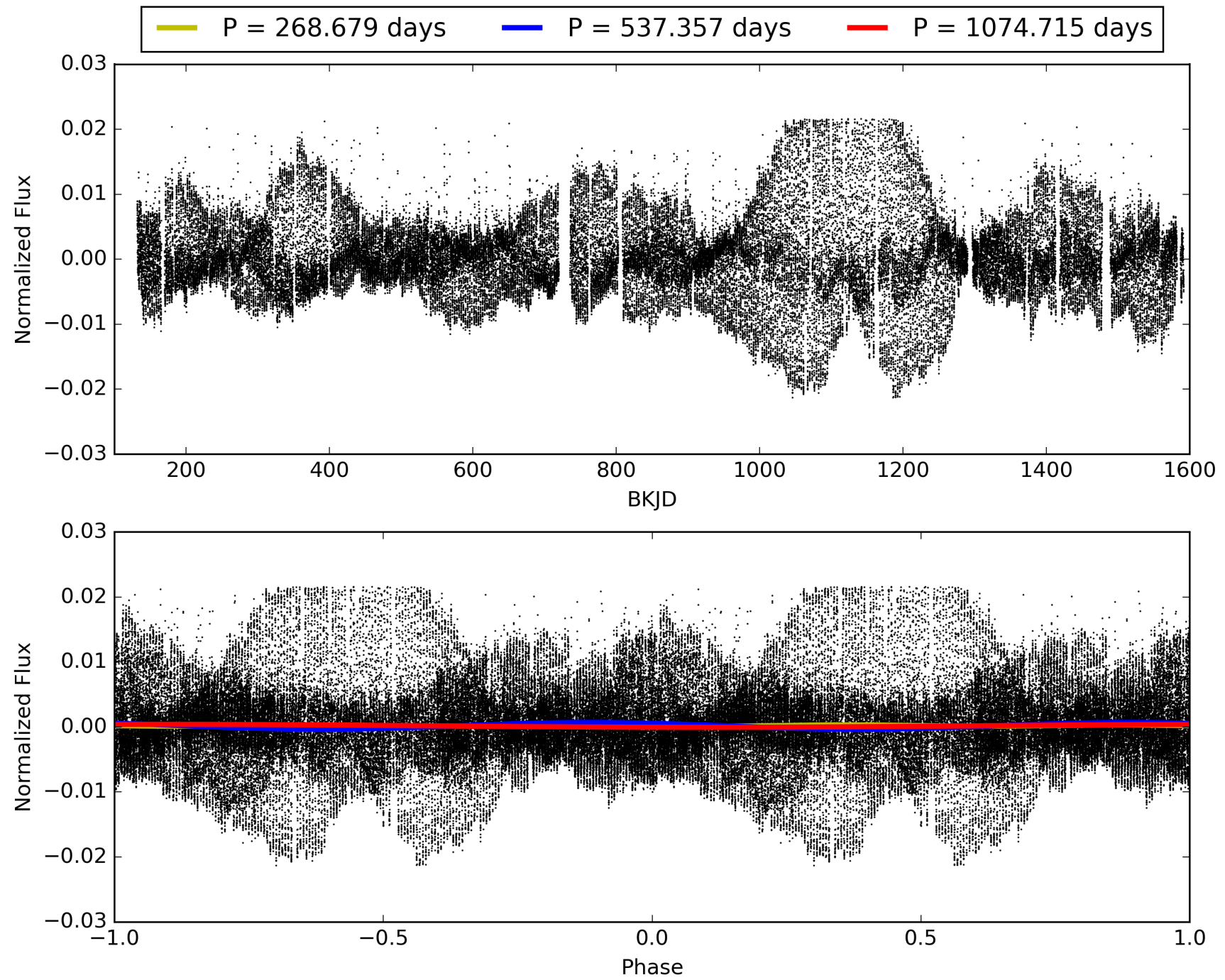
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:31:33 Z

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

TCE 009019435-01, PDC Light Curves

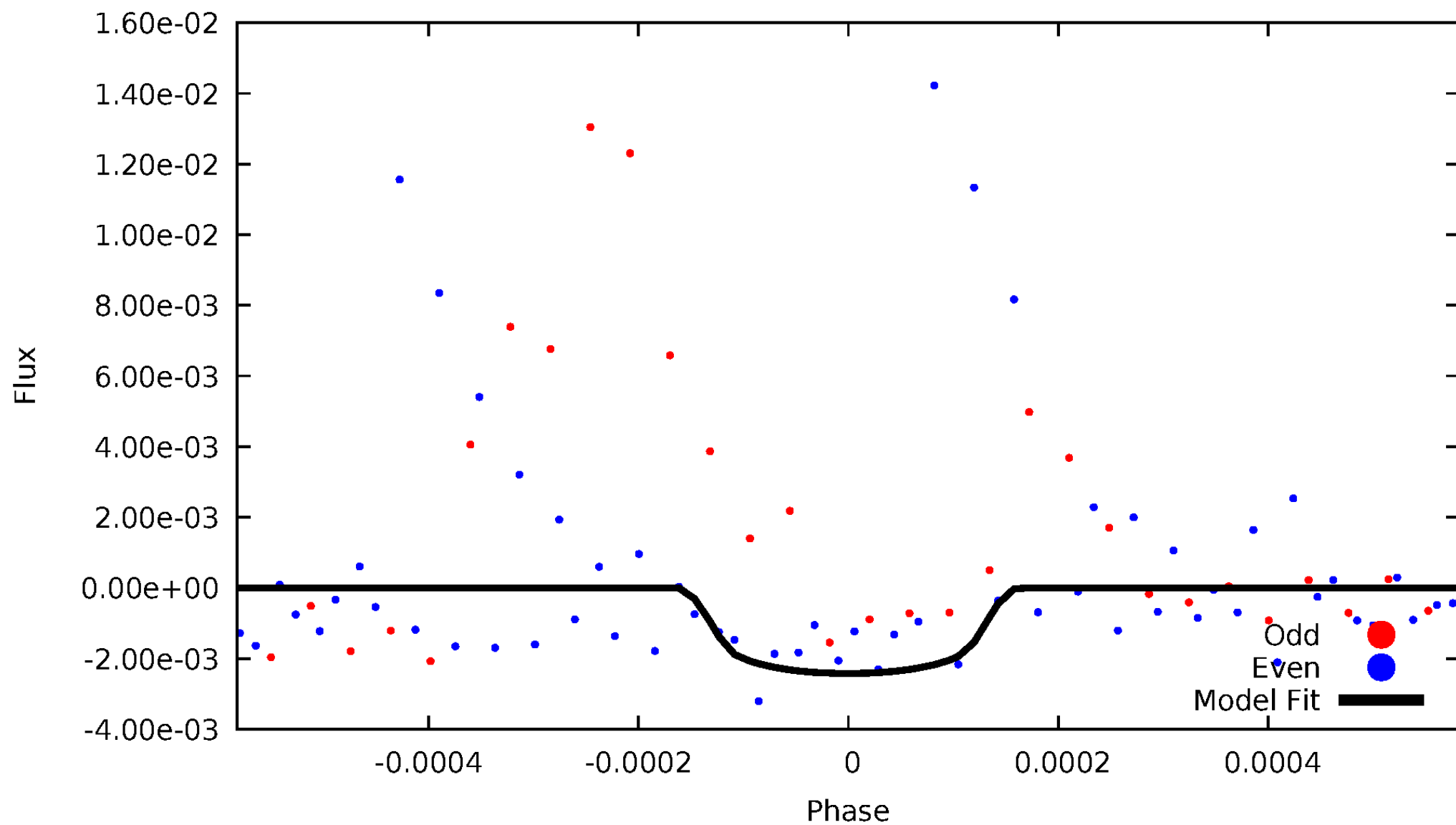


TCE 009019435-01



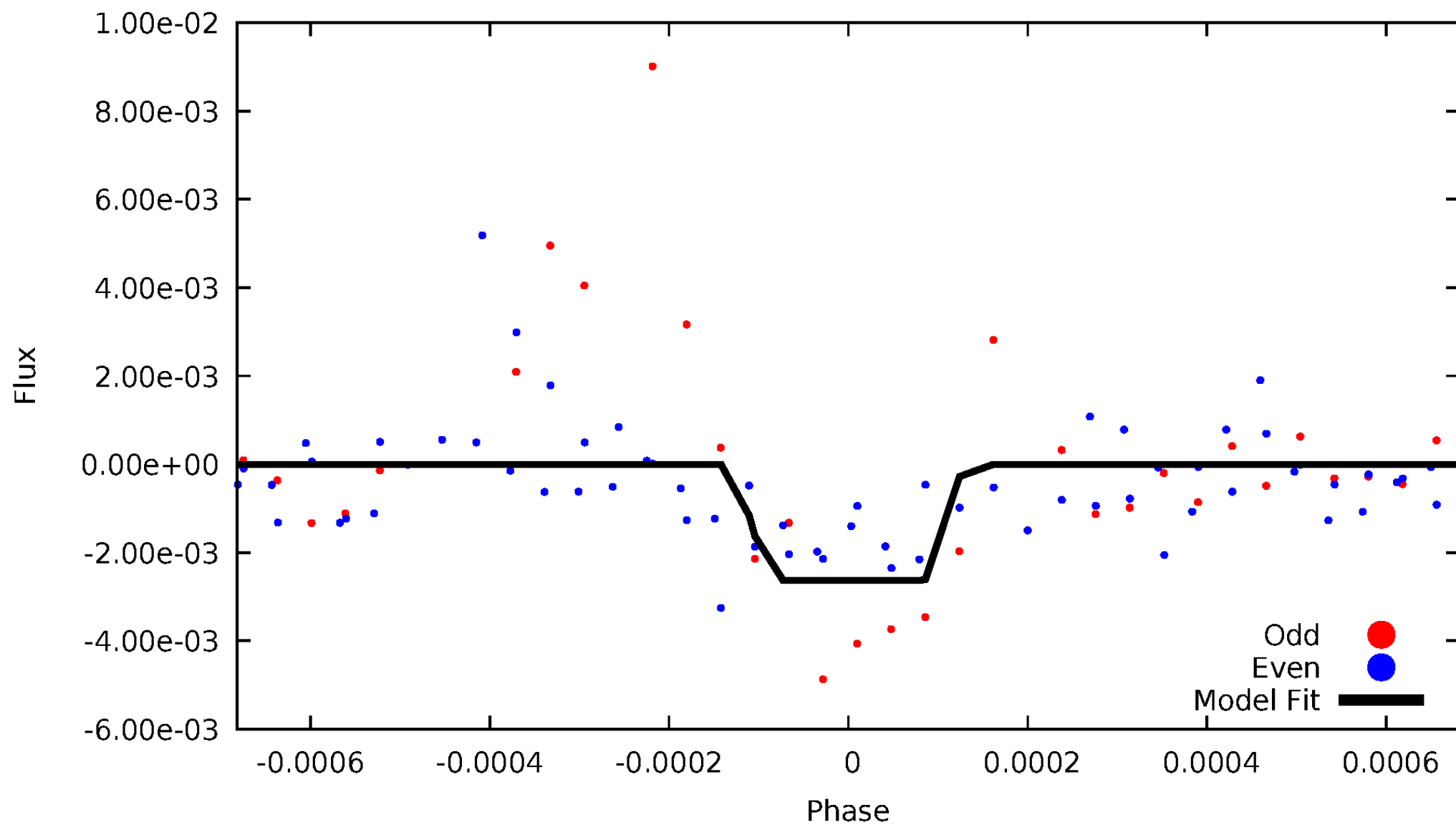
DV Odd/Even

TCE 009019435-01

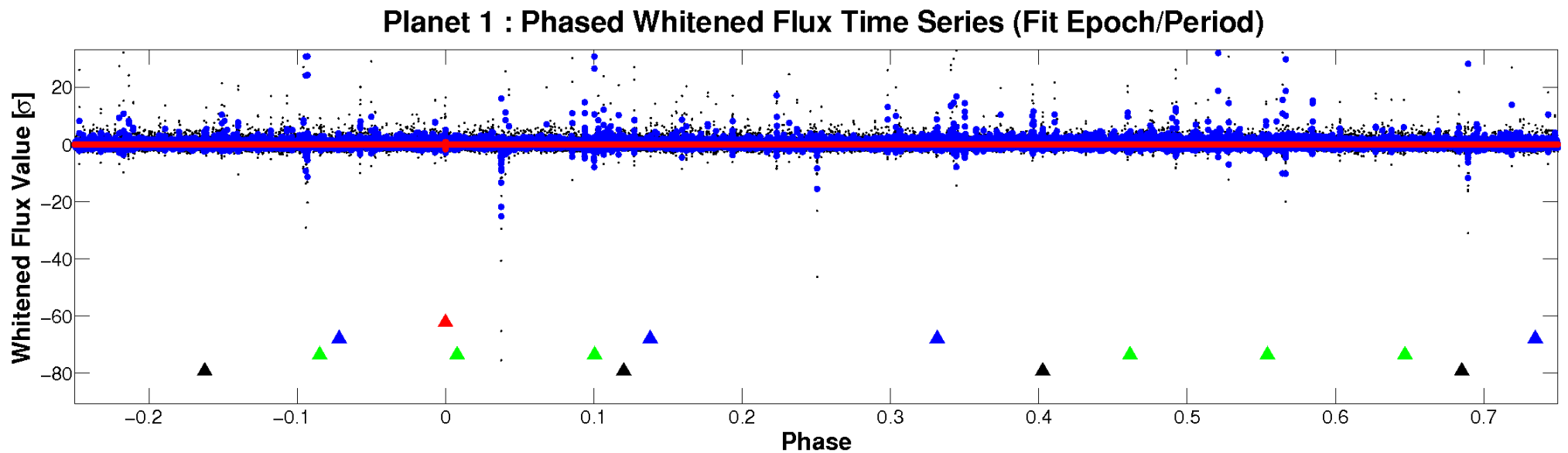
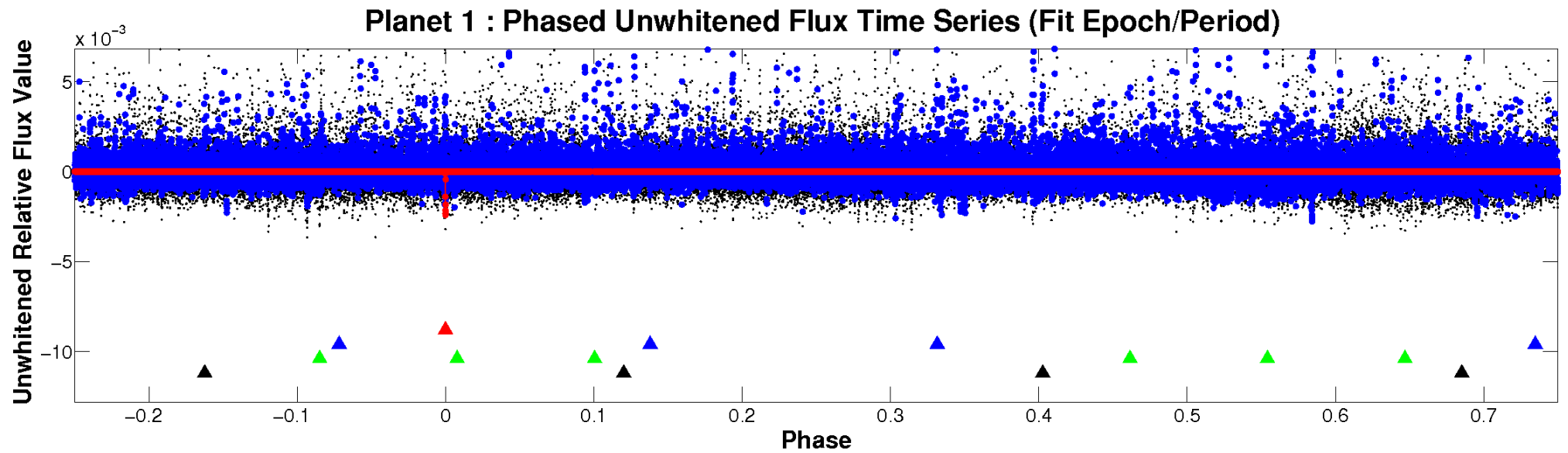


ALT Odd/Even

TCE 009019435-01

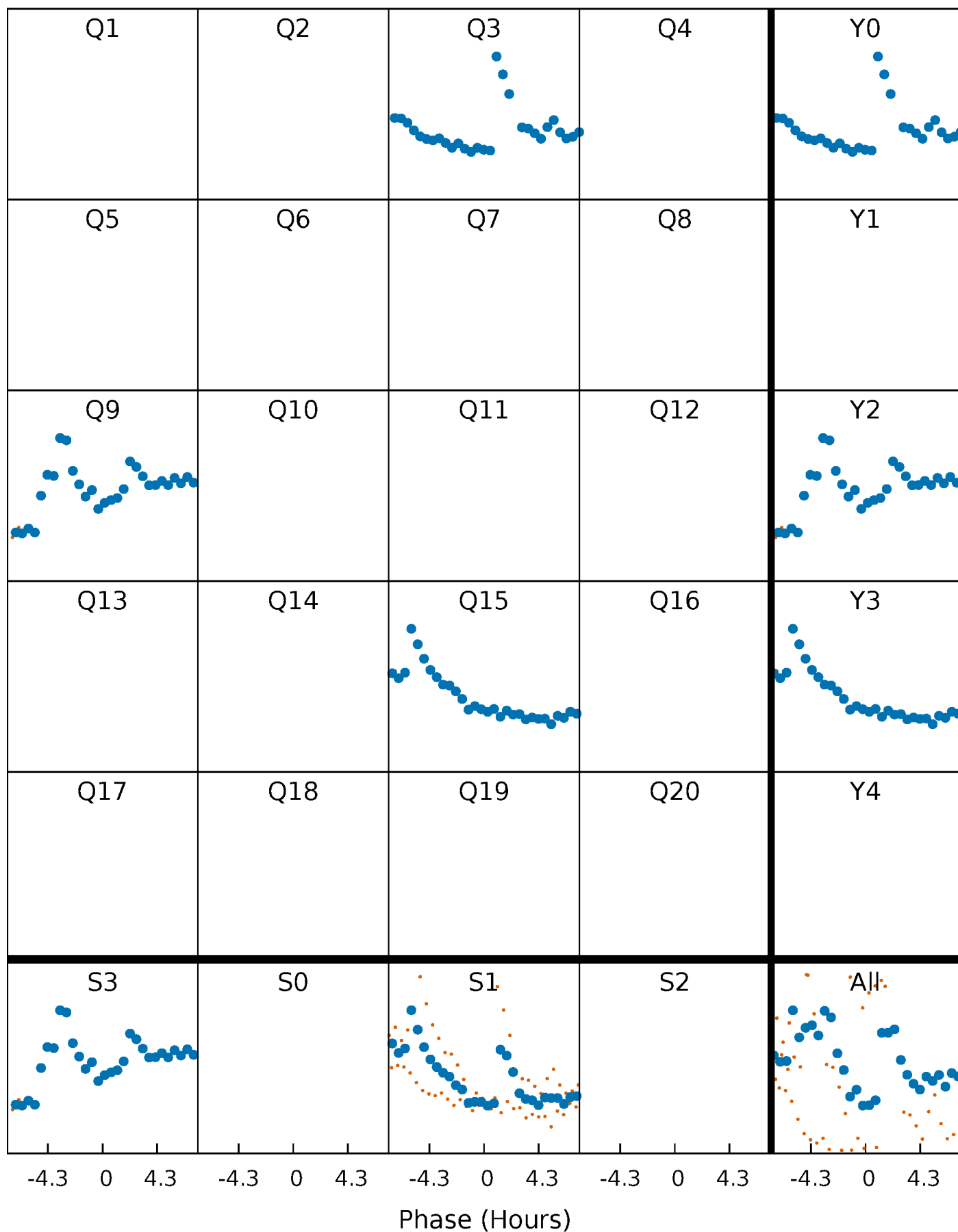


Non-Whitened Vs. Whitened Light Curve



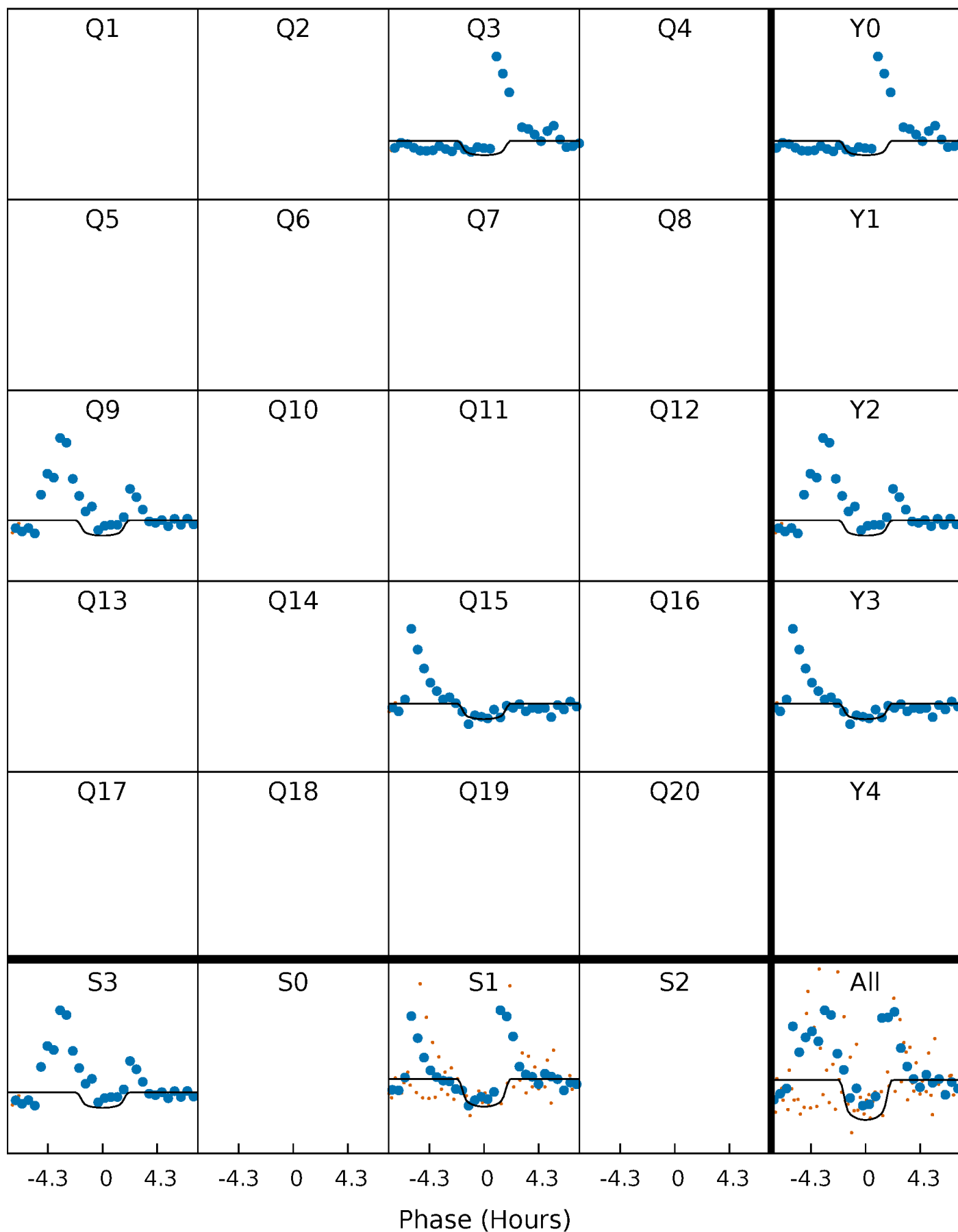
PDC Quarter-Phased Transit Curves

TCE 009019435-01 P=537.357404 Days $T_0=346.754700$ (BKJD)



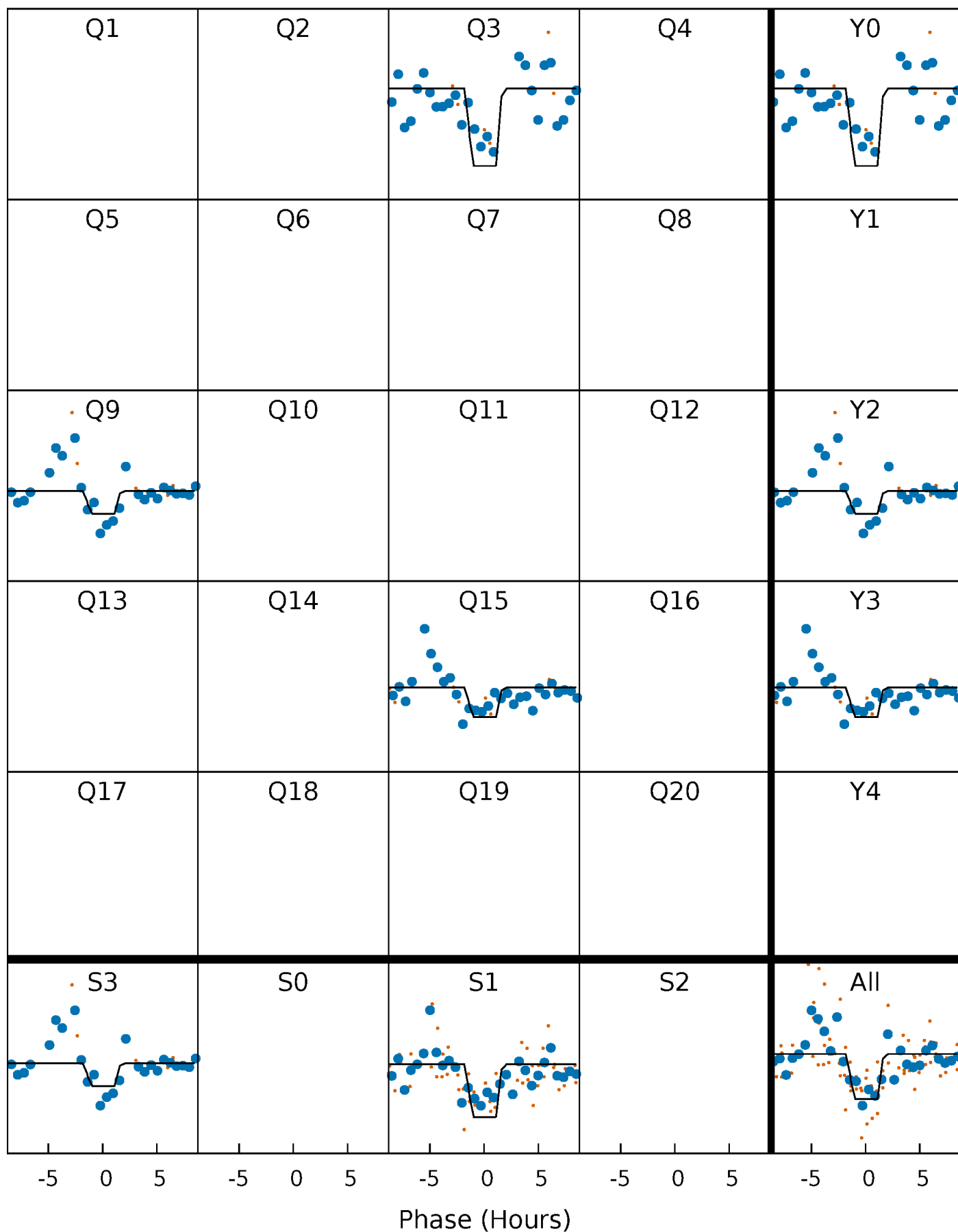
DV Quarter-Phased Transit Curves

TCE 009019435-01 P=537.357404 Days $T_0=346.754700$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

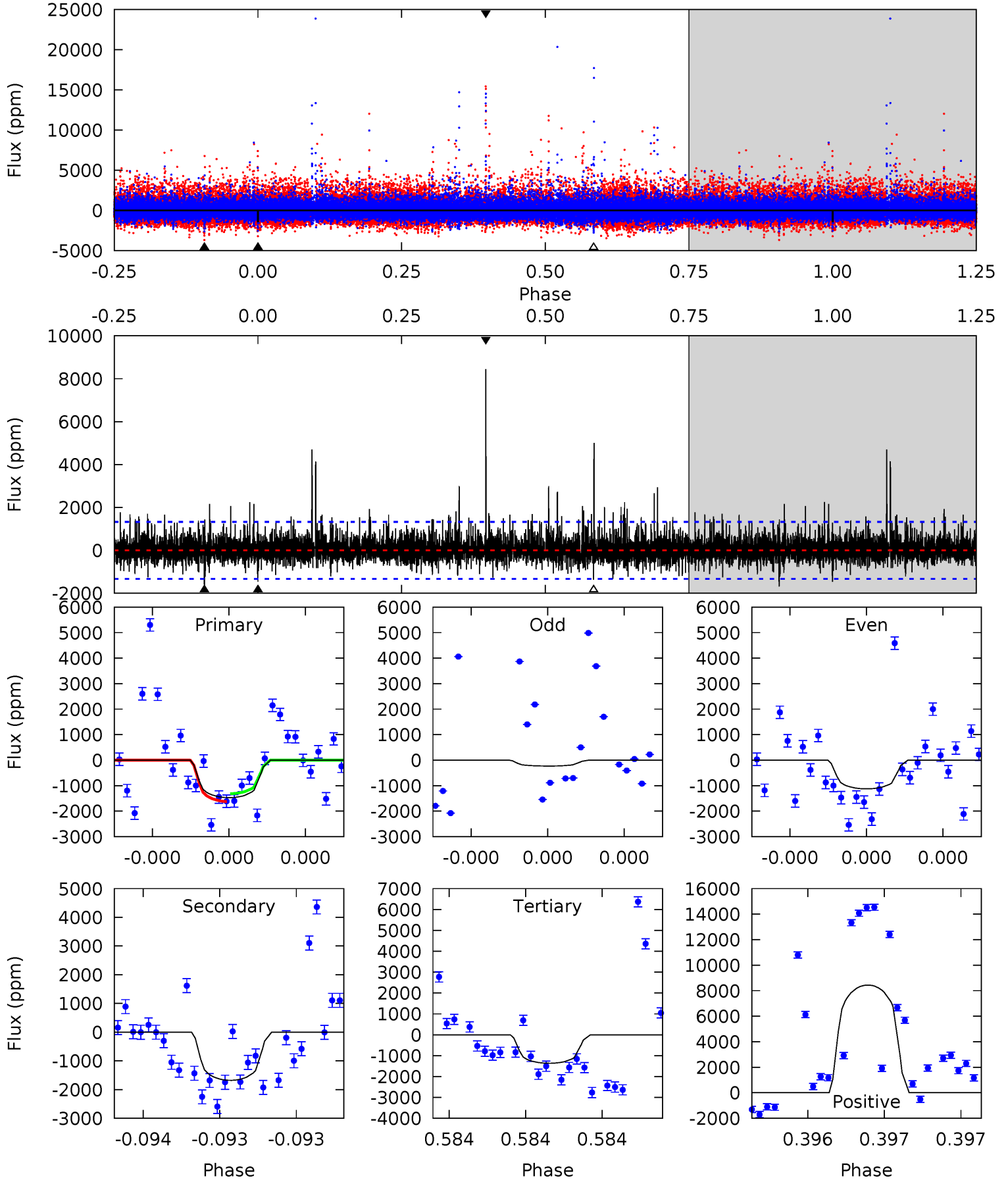
TCE 009019435-01 P=537.382194 Days $T_0=346.735590$ (BKJD)



DV Model-Shift Uniqueness Test

009019435-01, P = 537.357404 Days, E = 346.754700 Days

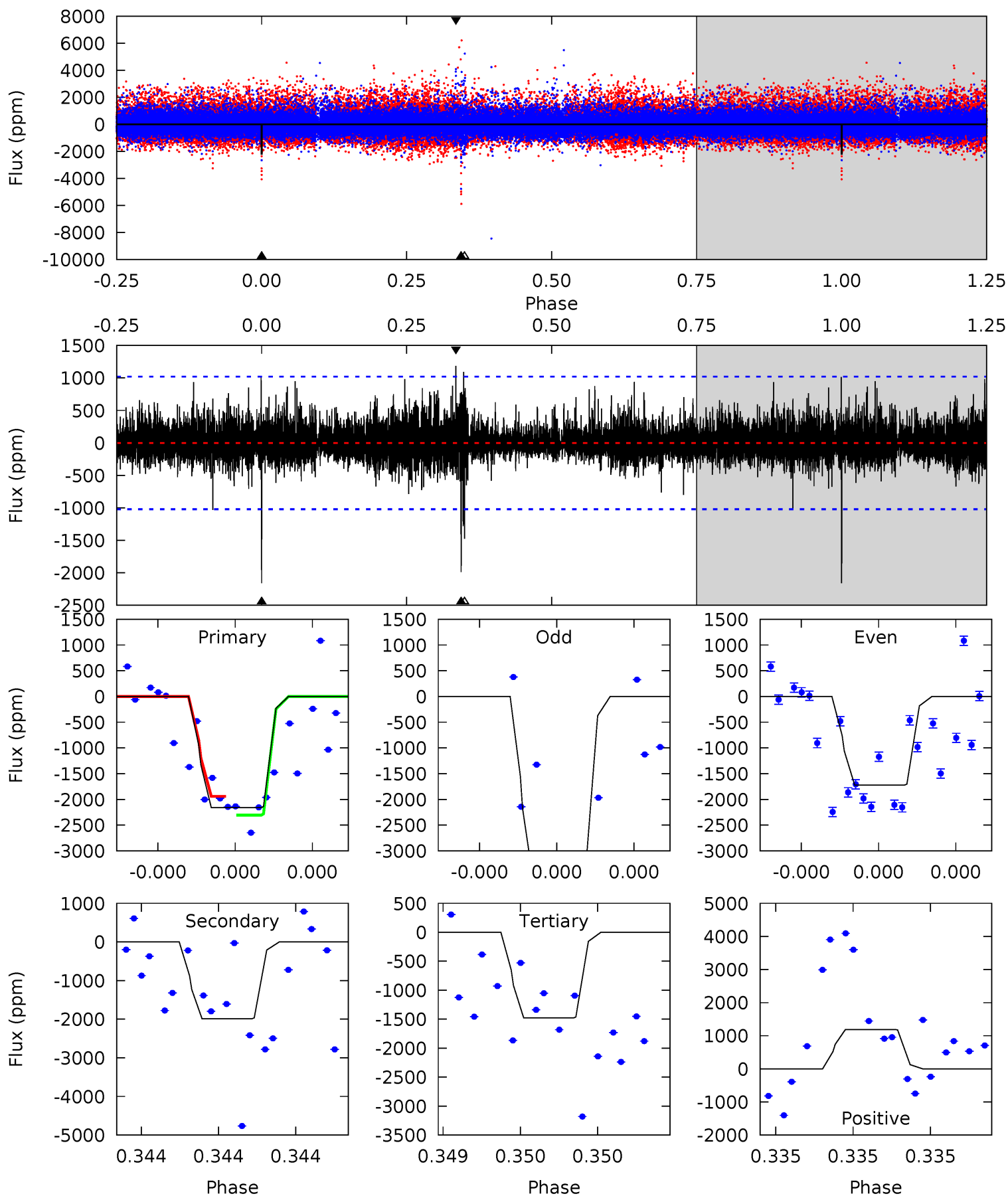
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.25	7.13	5.81	35.9	5.65	3.60	1.95	0.44	-29.6	1.33	-28.8	1.54	0.61	0.83	0.66



Alt Model-Shift Uniqueness Test

009019435-01, P = 537.382194 Days, E = 346.735590 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	11.1	8.26	6.64	5.70	3.68	1.07	3.82	5.44	2.85	4.47	5.03	1.34	0.35	1.02



Stellar Parameters For KIC 009019435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3489^{+79}_{-88}	$4.868^{+0.066}_{-0.048}$	$0.000^{+0.100}_{-0.100}$	$0.379^{+0.050}_{-0.061}$	$0.388^{+0.054}_{-0.075}$	$10.030^{+3.917}_{-1.976}$
	+2%/-3%	+1%/-1%	+inf%/-inf%	+13%/-16%	+14%/-19%	+39%/-20%
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 009019435-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1677 ± 235	$2.74^{+2.38}_{-1.81}$	136^{+4}_{-5}	3009^{+1199}_{-459}	$113269^{+747624}_{-82771}$
Alt.	-1986 ± 179	$2.94^{+2.21}_{-1.80}$	136^{+5}_{-5}	3029^{+1094}_{-429}	$114949^{+657256}_{-78243}$

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

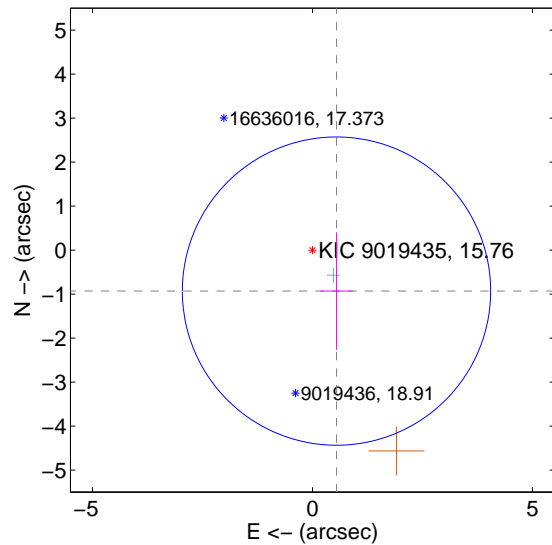
Supplemental centroid analysis for 009019435-01. Kepler magnitude: 15.76. Transit SNR 6.76

There are 1 quarters with good PRF difference image offsets

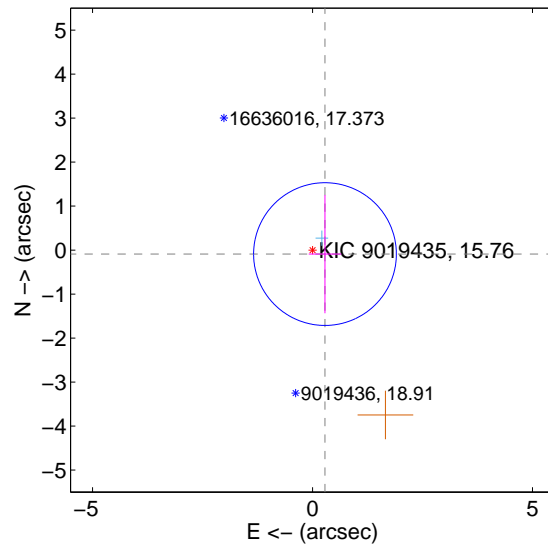
The direct PRF centroid is offset from the target star catalog position by about 0.88 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.080 ± 1.168	0.93	-0.547 ± 0.368	-0.932 ± 1.337
PRF-fit source offset from KIC position	0.297 ± 0.541	0.55	-0.283 ± 0.370	-0.091 ± 1.345
photometric centroid source offset	1.05 ± 0.92	1.15	0.70 ± 0.90	-0.78 ± 0.93

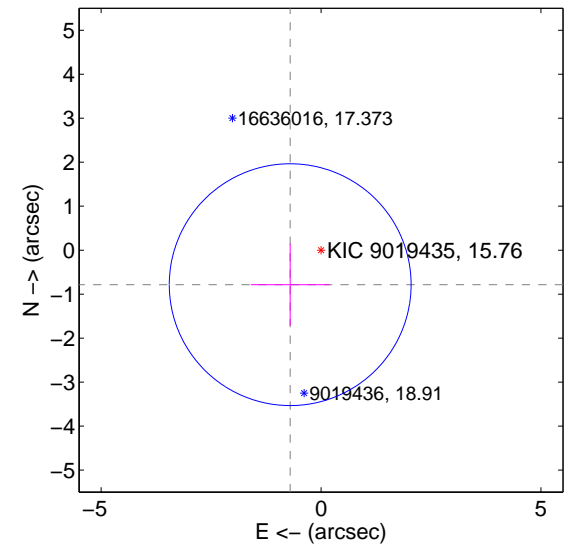
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

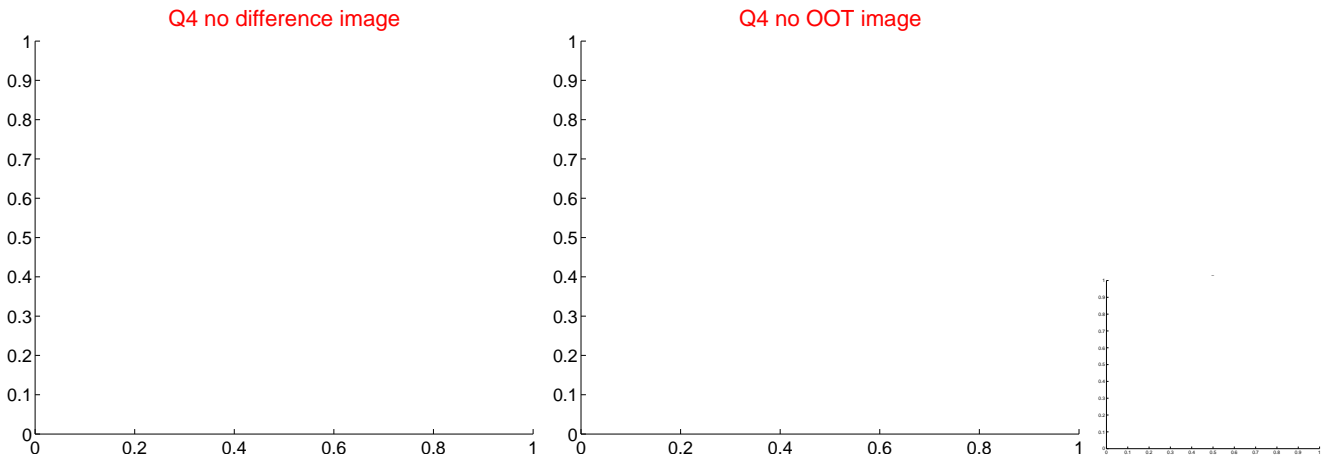
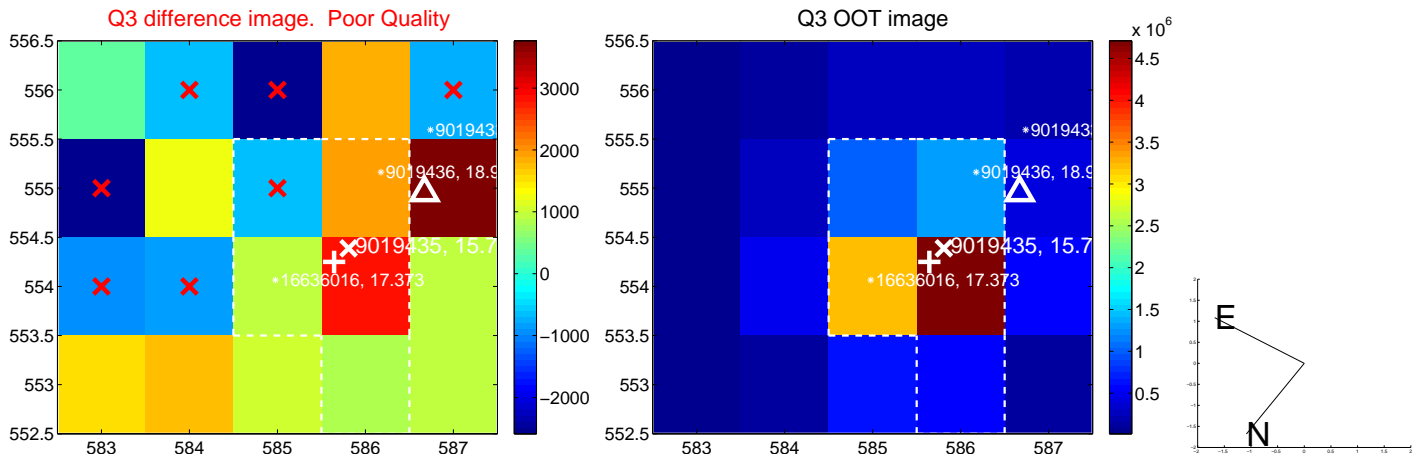
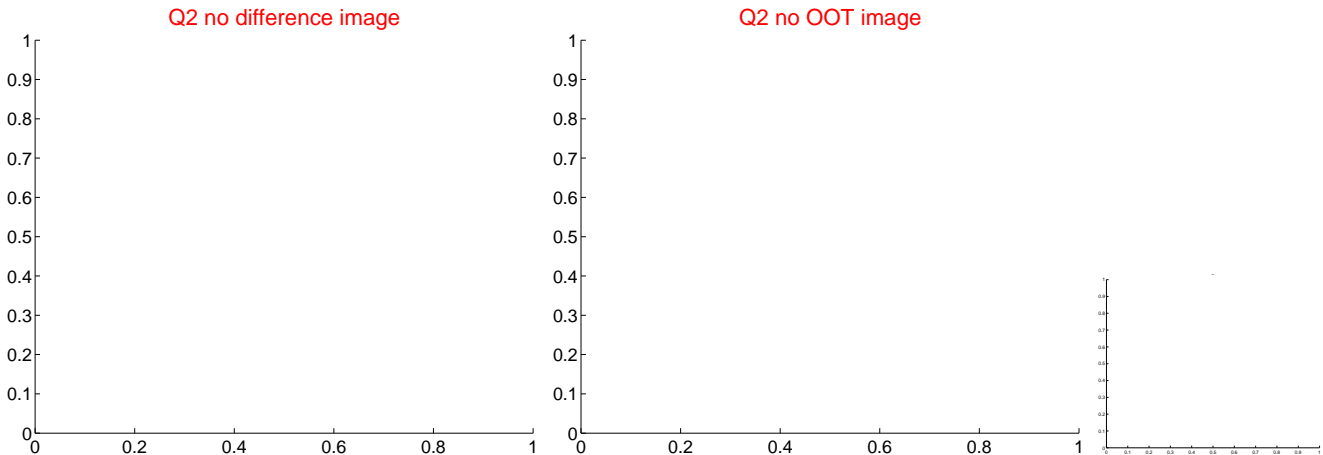


offset from photometric centroids



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.

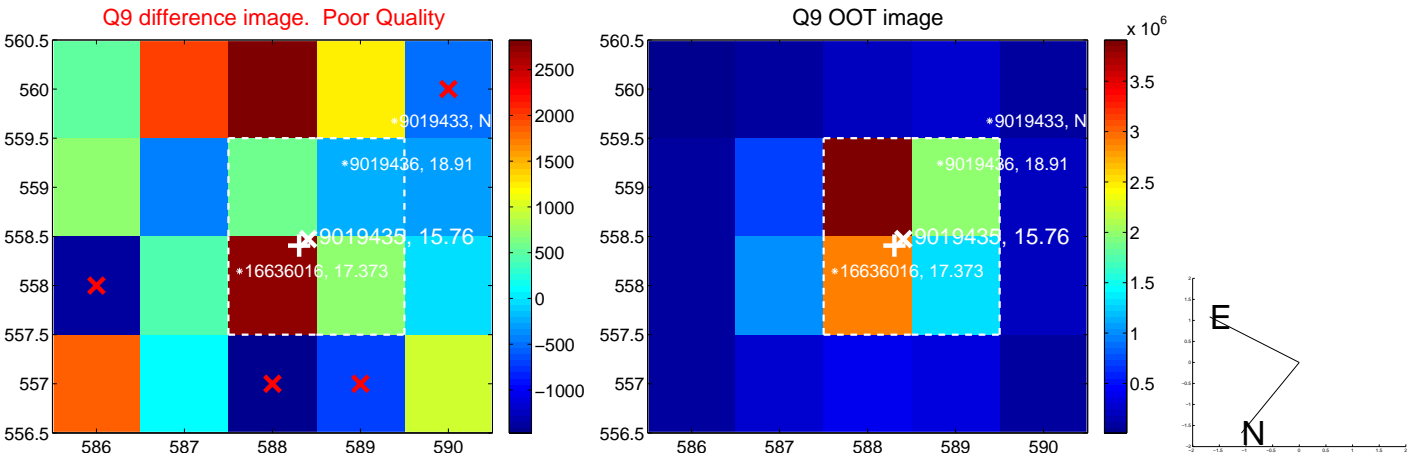
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



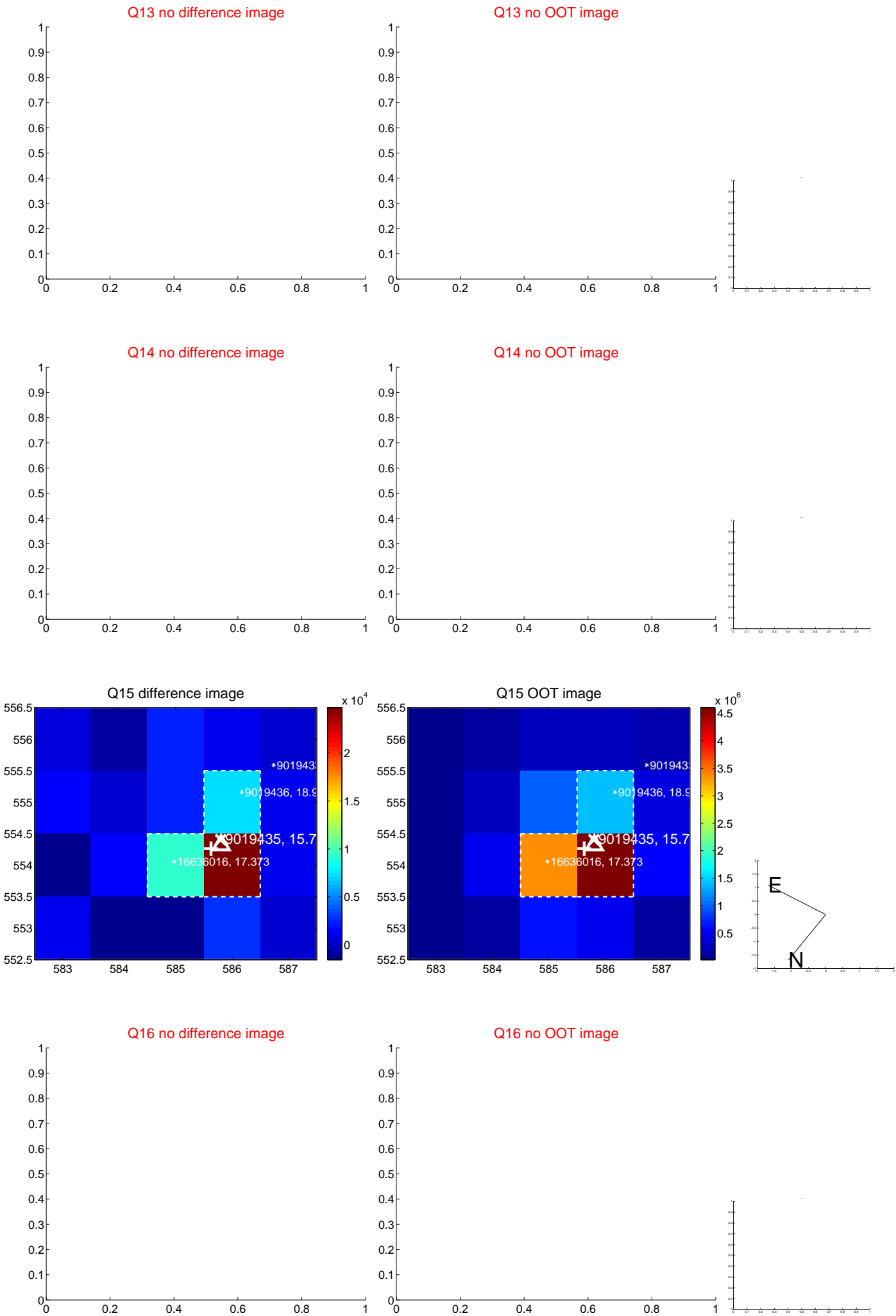
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



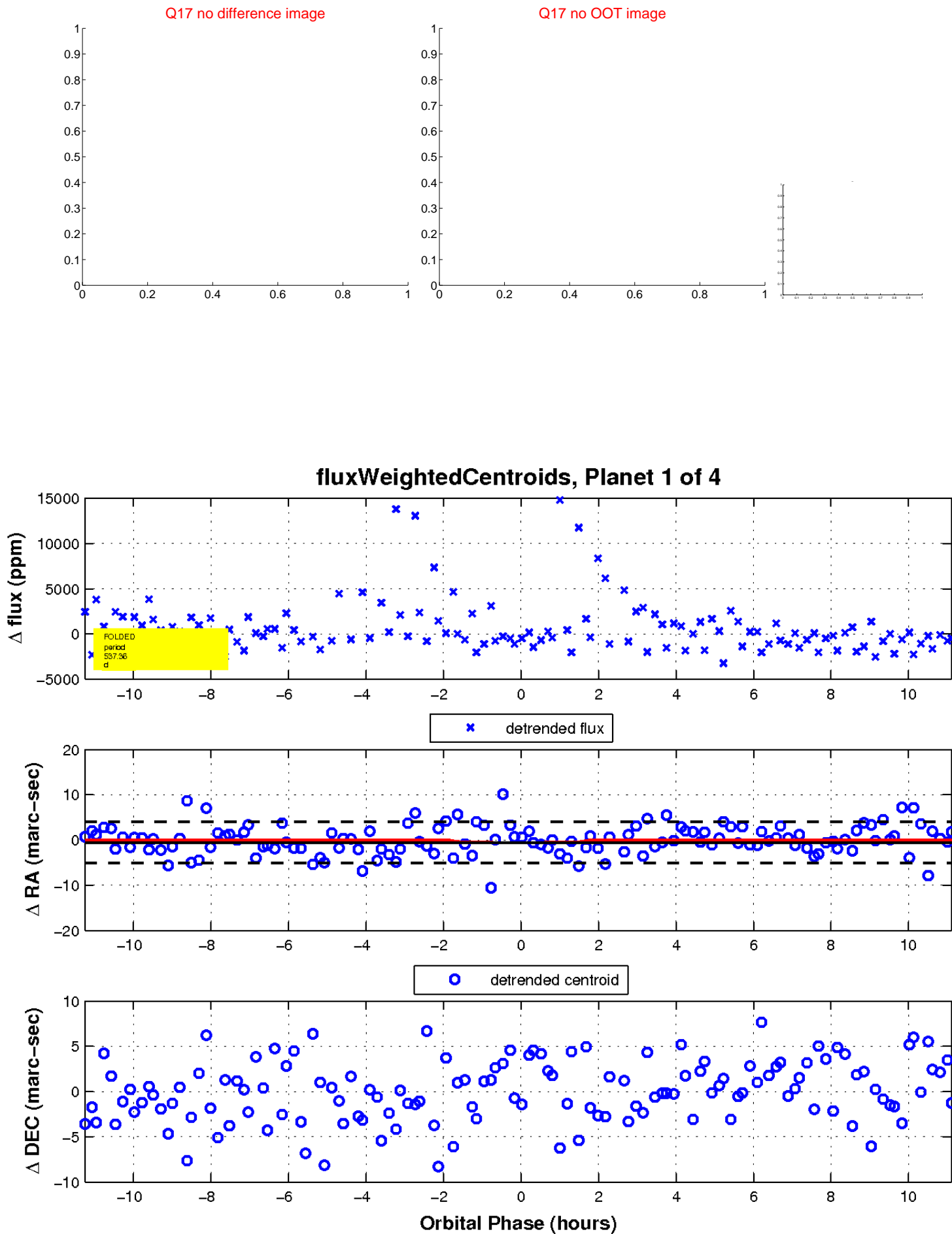
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

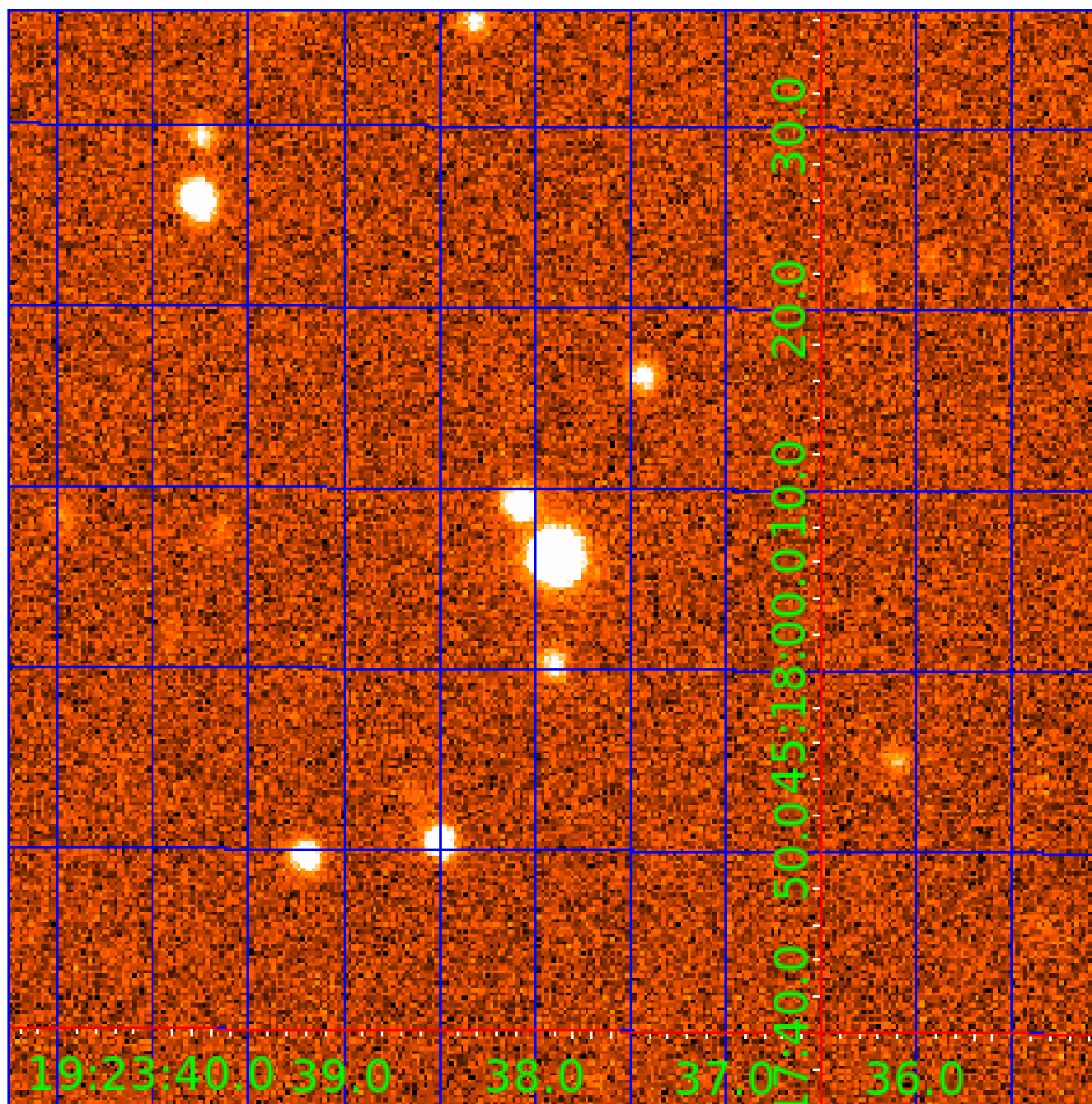


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009019435

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})
009019435-01	OBS	No	537.357404	346.754700	2421.5	3.754	13.5	6.8	0.38	3489	1.92	0.02
009019435-02	OBS	No	320.682349	420.912052	1984.7	6.844	8.4	7.7	0.38	3489	1.68	0.04
009019435-03	OBS	No	243.774838	157.013760	743.2	2.550	11.8	2.7	0.38	3489	1.05	0.06
009019435-04	OBS	No	385.549452	177.602068	2028.4	2.989	11.2	7.6	0.38	3489	1.71	0.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009019435-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009019435-02	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
009019435-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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
009019435-04	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—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

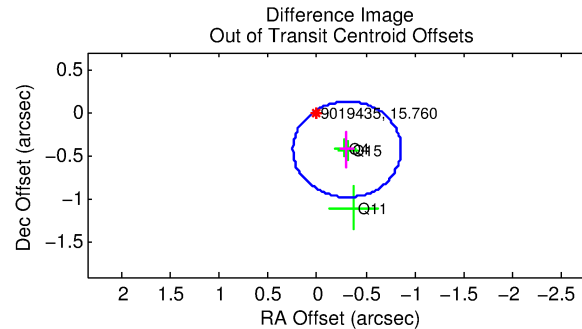
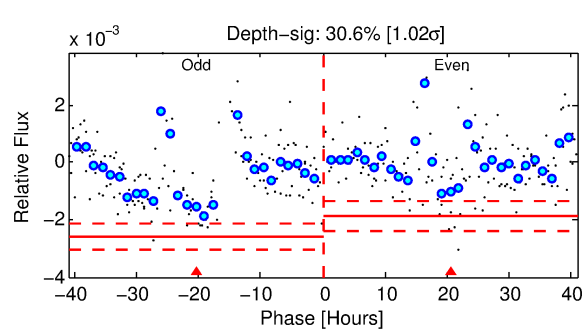
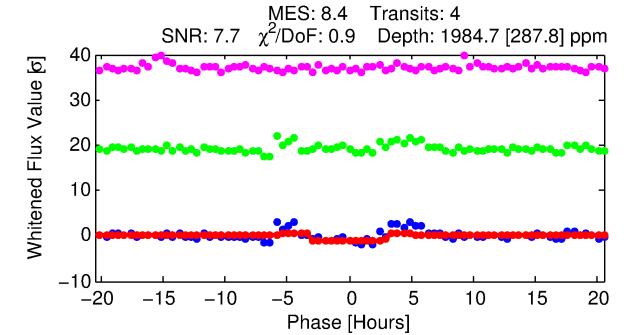
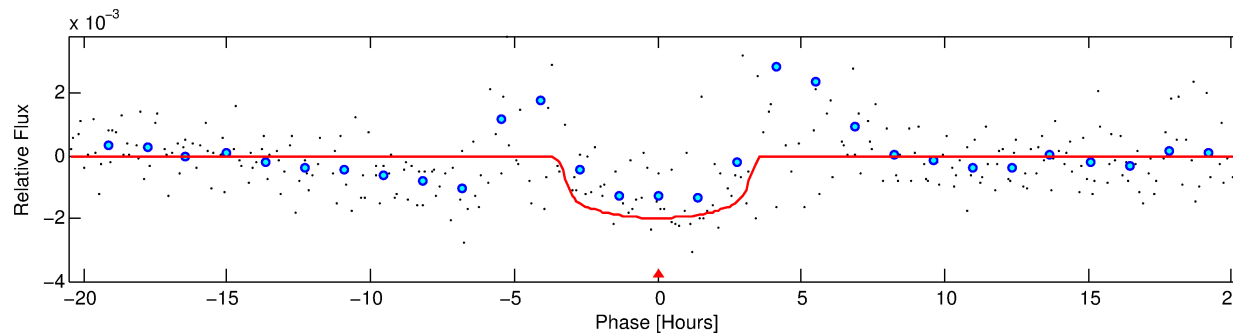
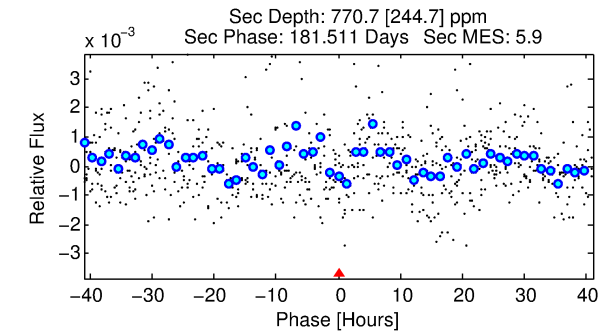
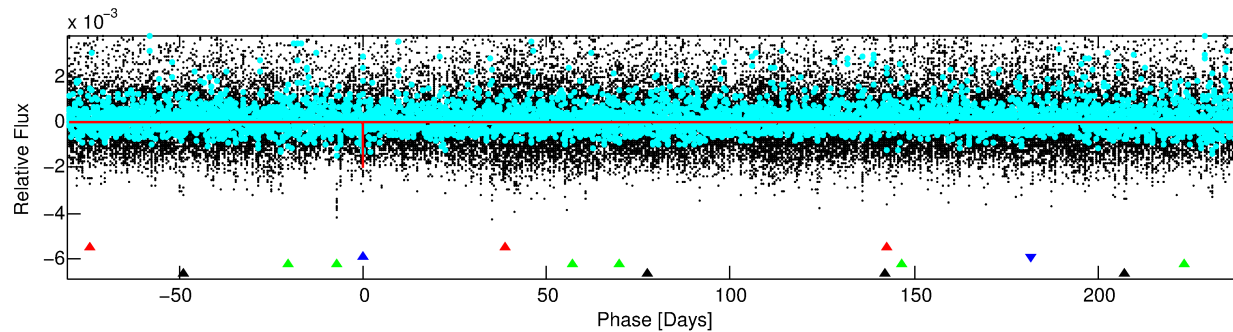
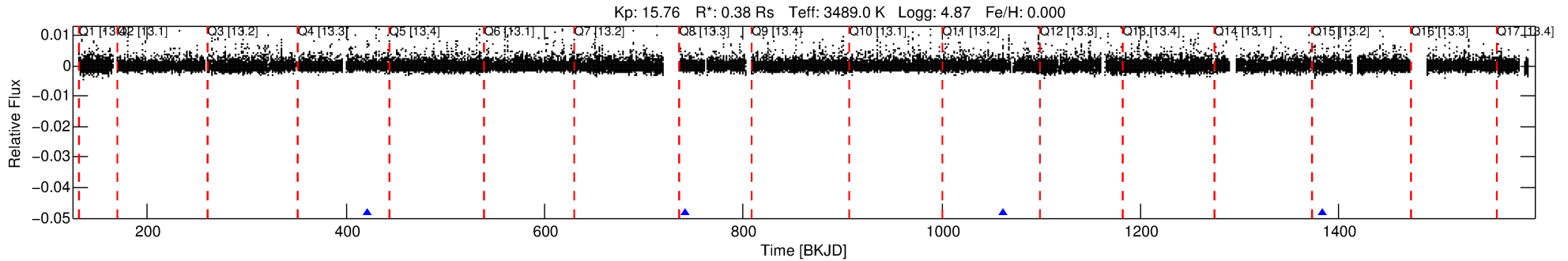
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009019435-02

No Significant Match Found

DV One-Page Summary

KIC: 9019435 Candidate: 2 of 4 Period: 320.682 d



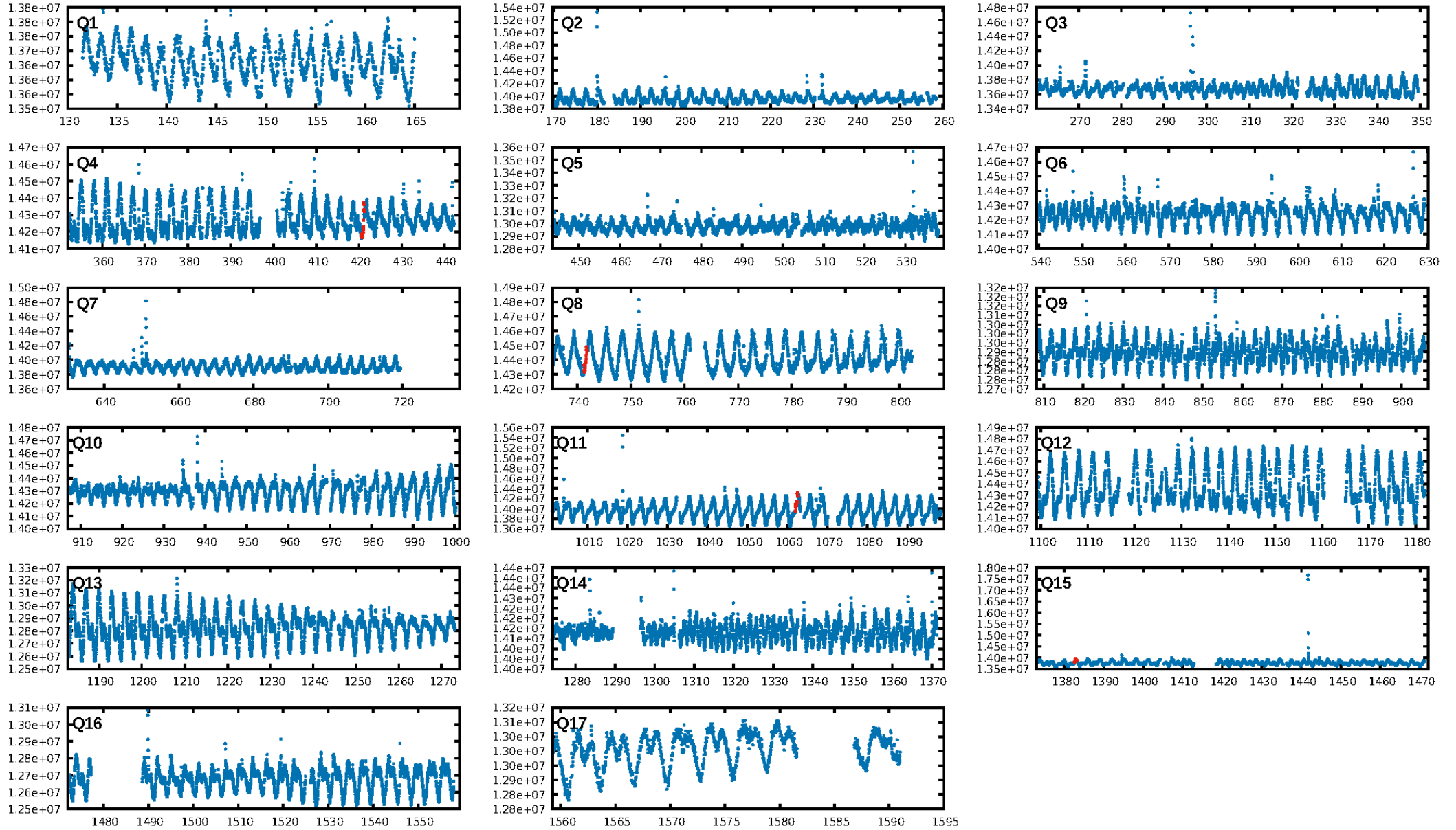
DV Fit Results:

Period = 320.68235 [0.00452] d
Epoch = 420.9121 [0.0094] BKJD
Rp/R* = 0.0407 [0.0225]
a/R* = 355.94 [806.03]
b = 0.31 [6.72]
Seff = 0.04 [0.01]
Teq = 116 [5] K
Rp = 1.68 [0.97] Re
a = 0.6681 [0.0793] AU
Ag = 66942.54 [77576.60] [0.86σ]
Teffp = 2883 [832] K [3.33σ]

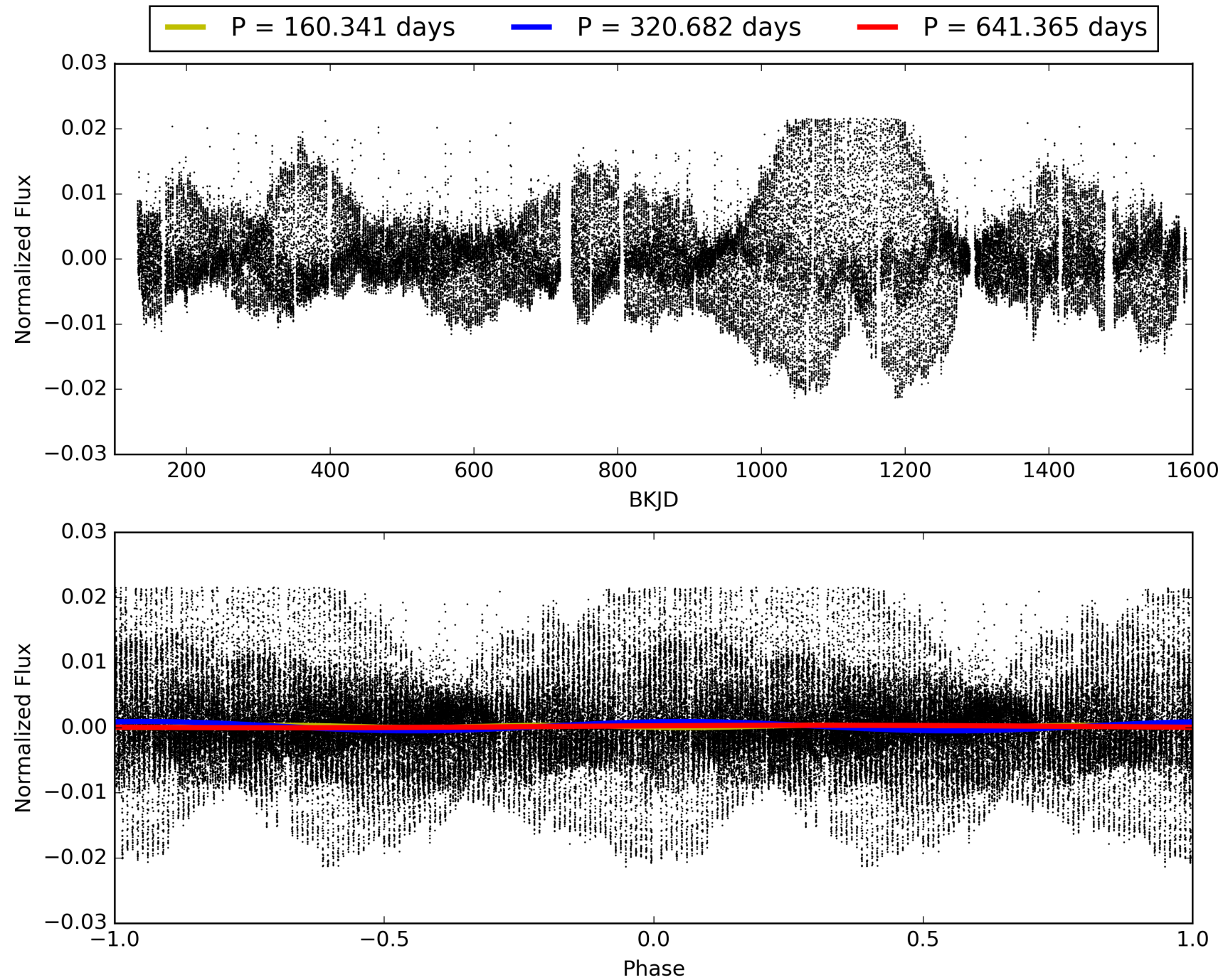
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [252.73σ]
LongPeriod-sig: 100.0% [208.46σ]
ModelChiSquare2-sig: 52.8%
ModelChiSquareGof-sig: 99.4%
Bootstrap-pfa: 1.29e-07
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.526
Centroid-sig: N/A
Centroid-so: 1.106 arcsec [1.39σ]
OotOffset-rm: 0.522 arcsec [2.83σ]
KicOffset-rm: 0.128 arcsec [0.70σ]
OotOffset-st: 0/2/1/0 [3]
KicOffset-st: 0/2/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 009019435-02, PDC Light Curves

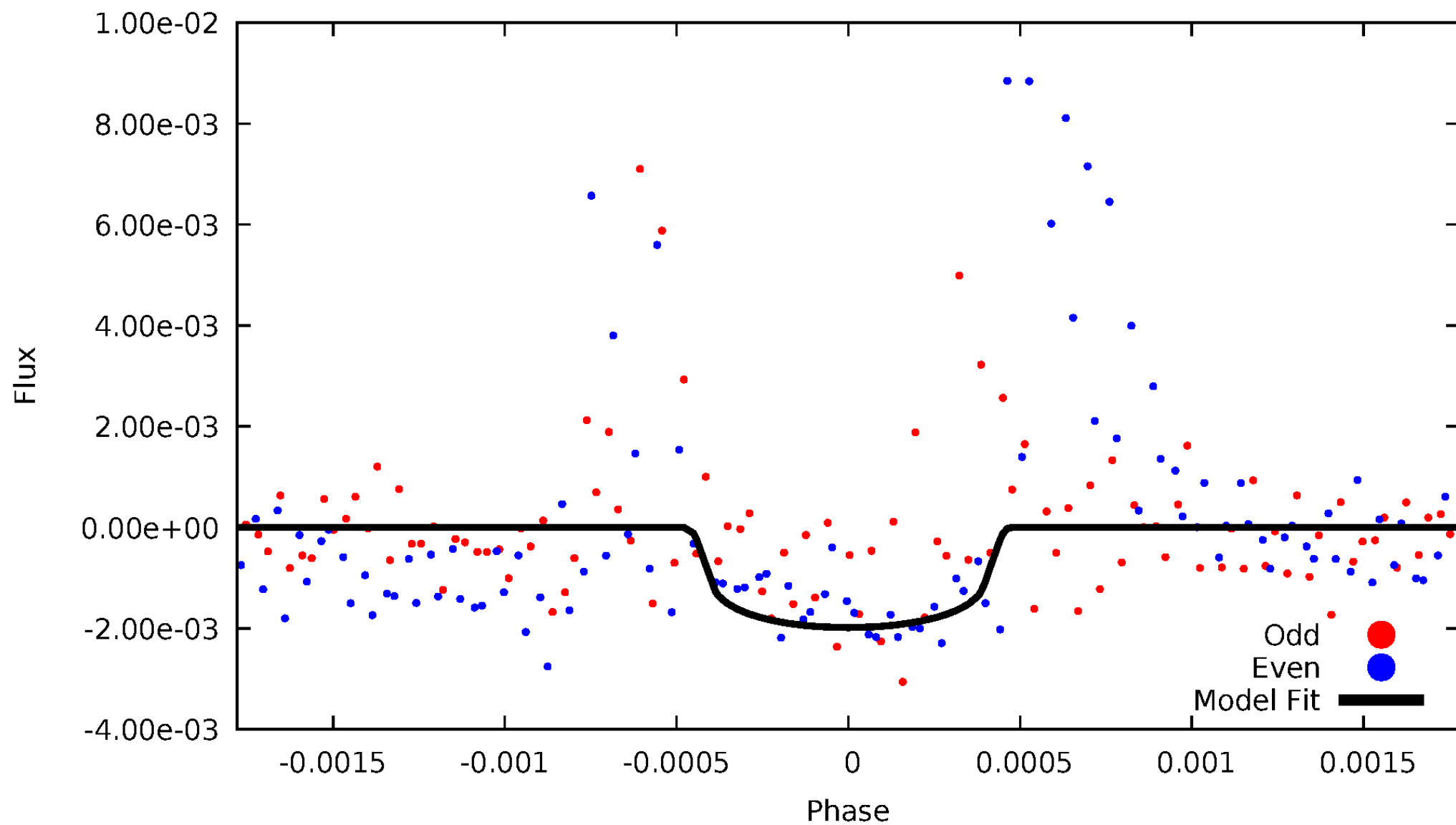


TCE 009019435-02



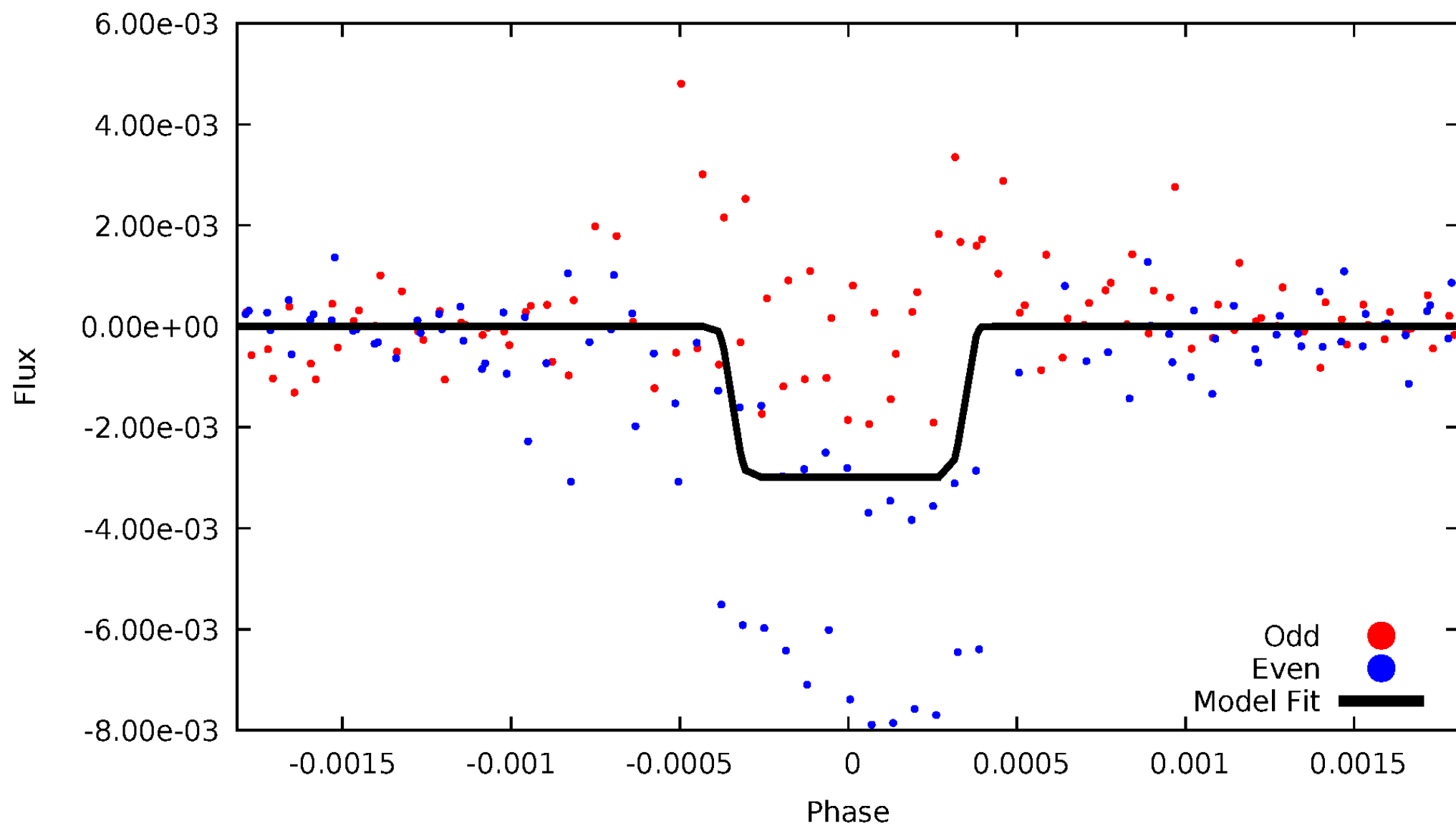
DV Odd/Even

TCE 009019435-02



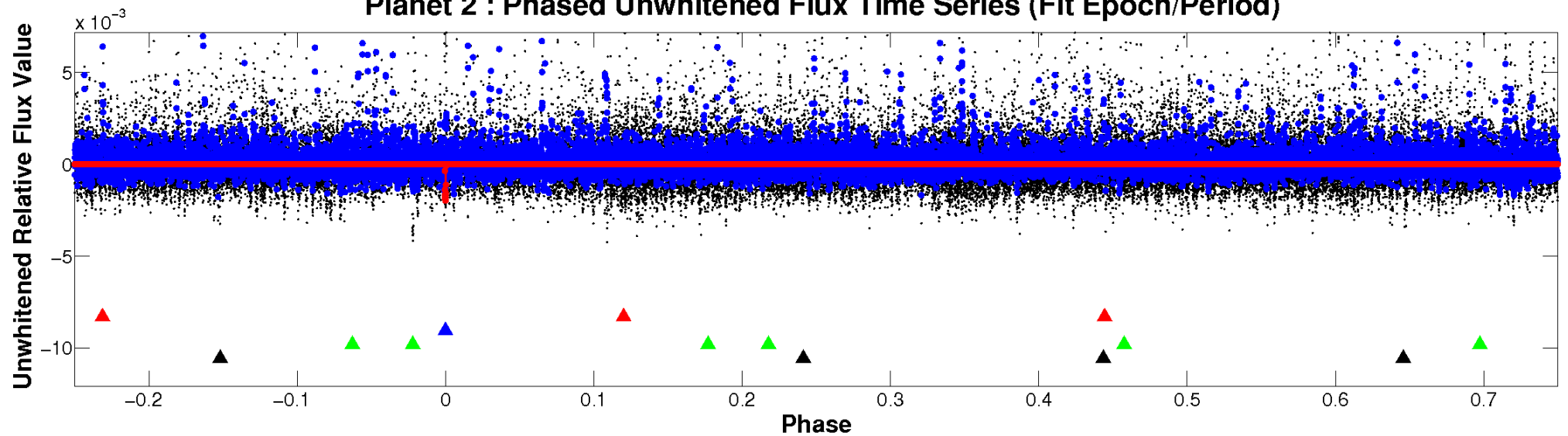
ALT Odd/Even

TCE 009019435-02

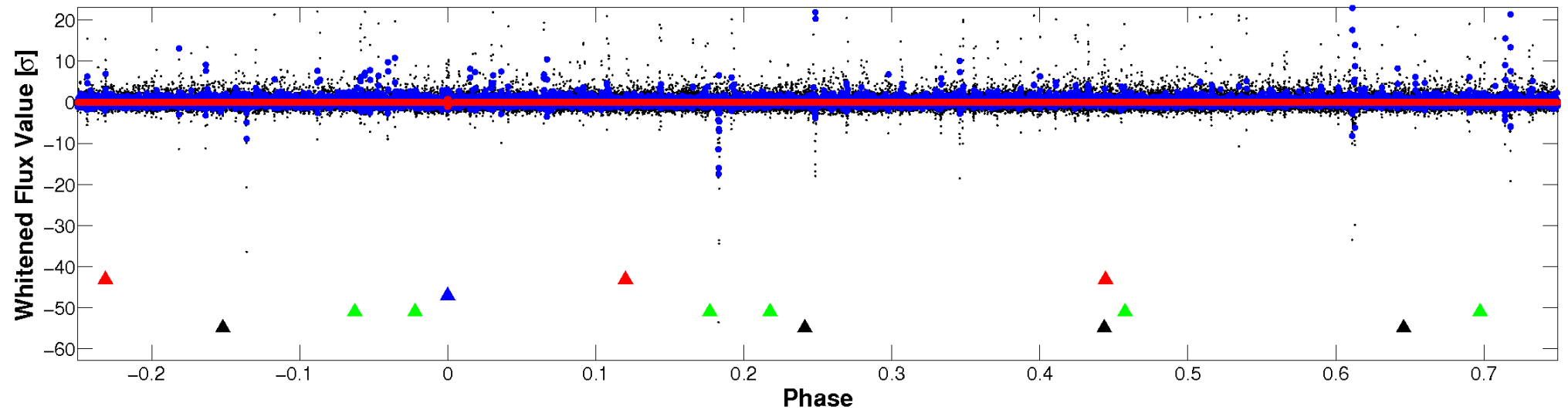


Non-Whitened Vs. Whitened Light Curve

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

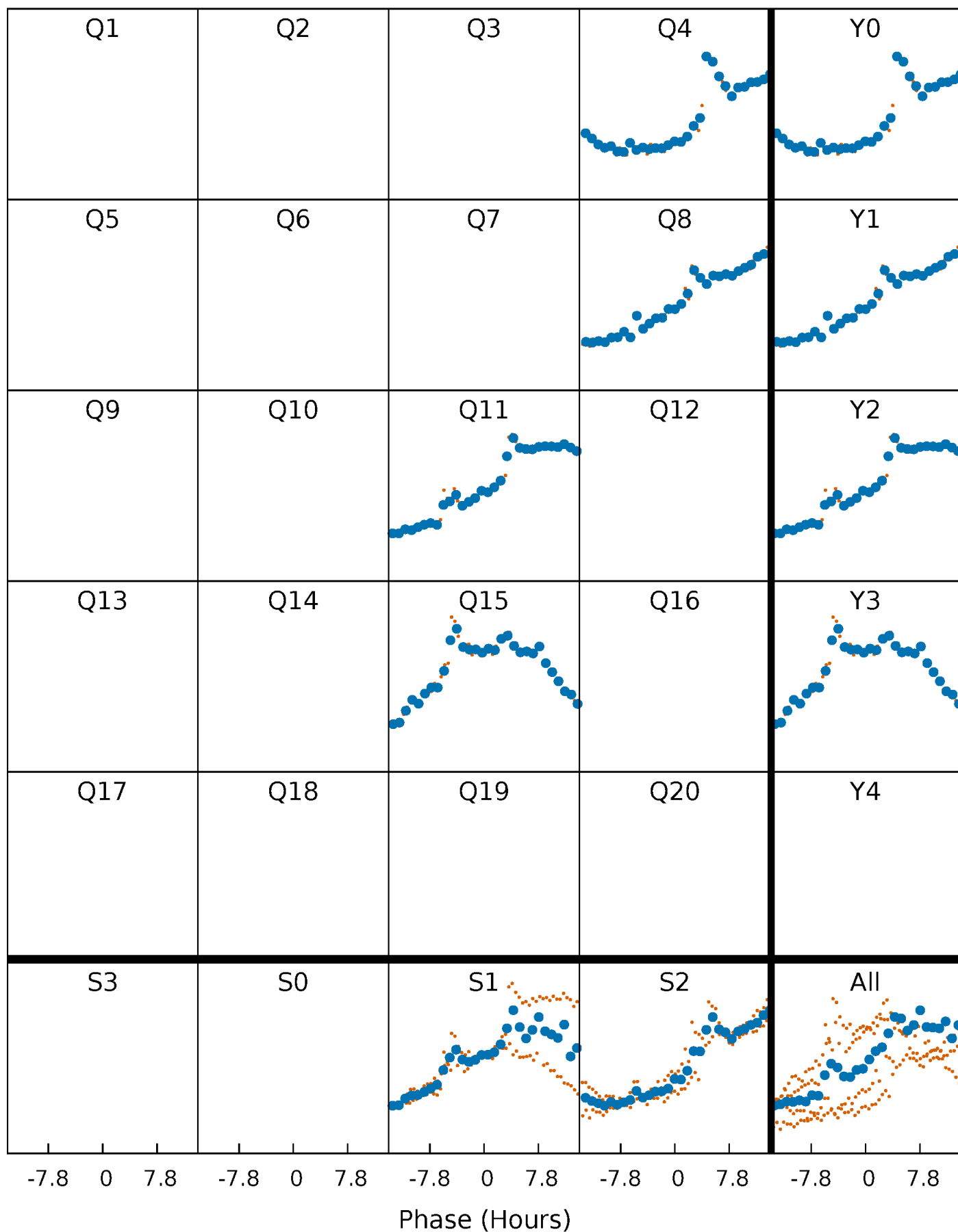


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



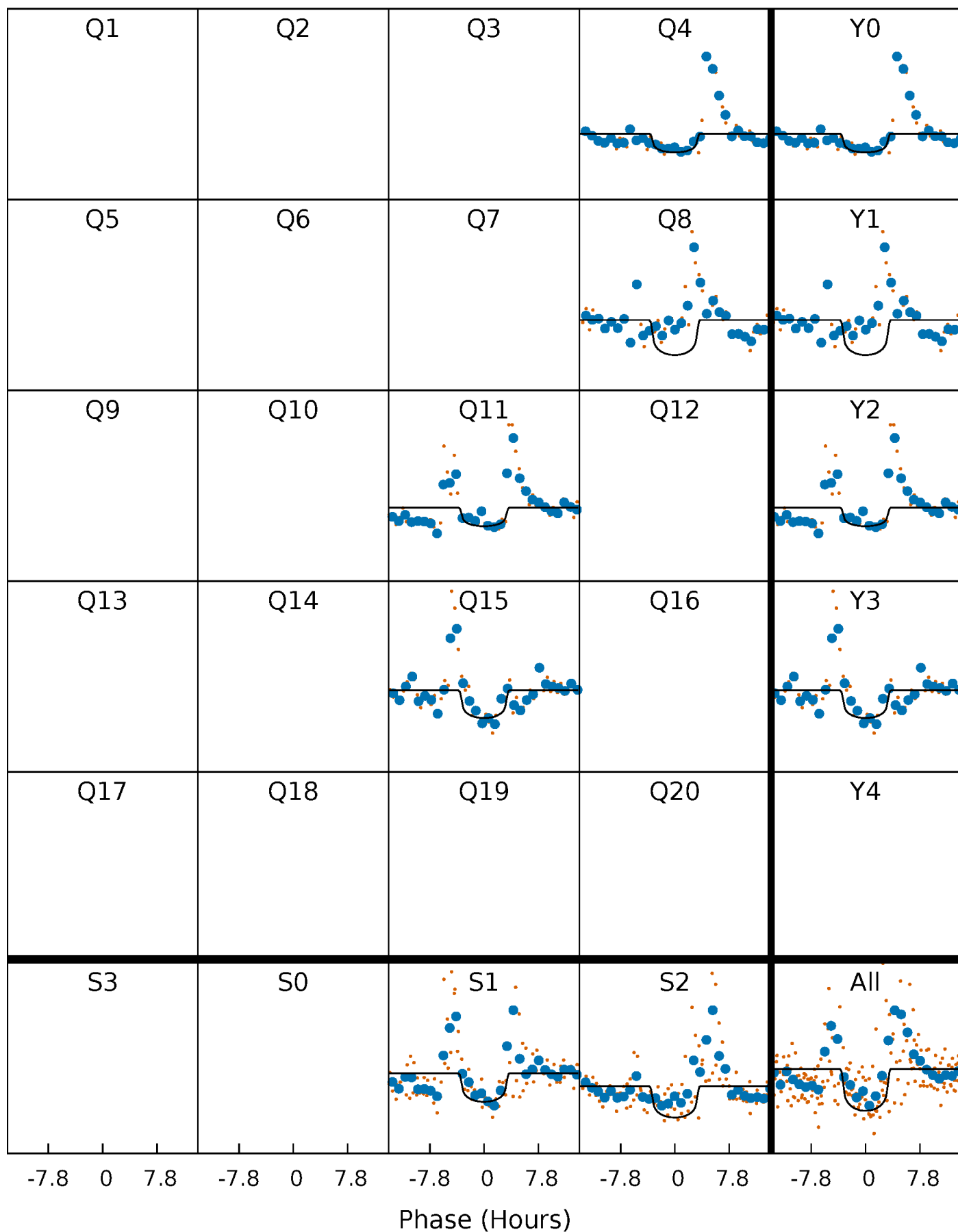
PDC Quarter-Phased Transit Curves

TCE 009019435-02 $P=320.682349$ Days $T_0=420.912052$ (BKJD)



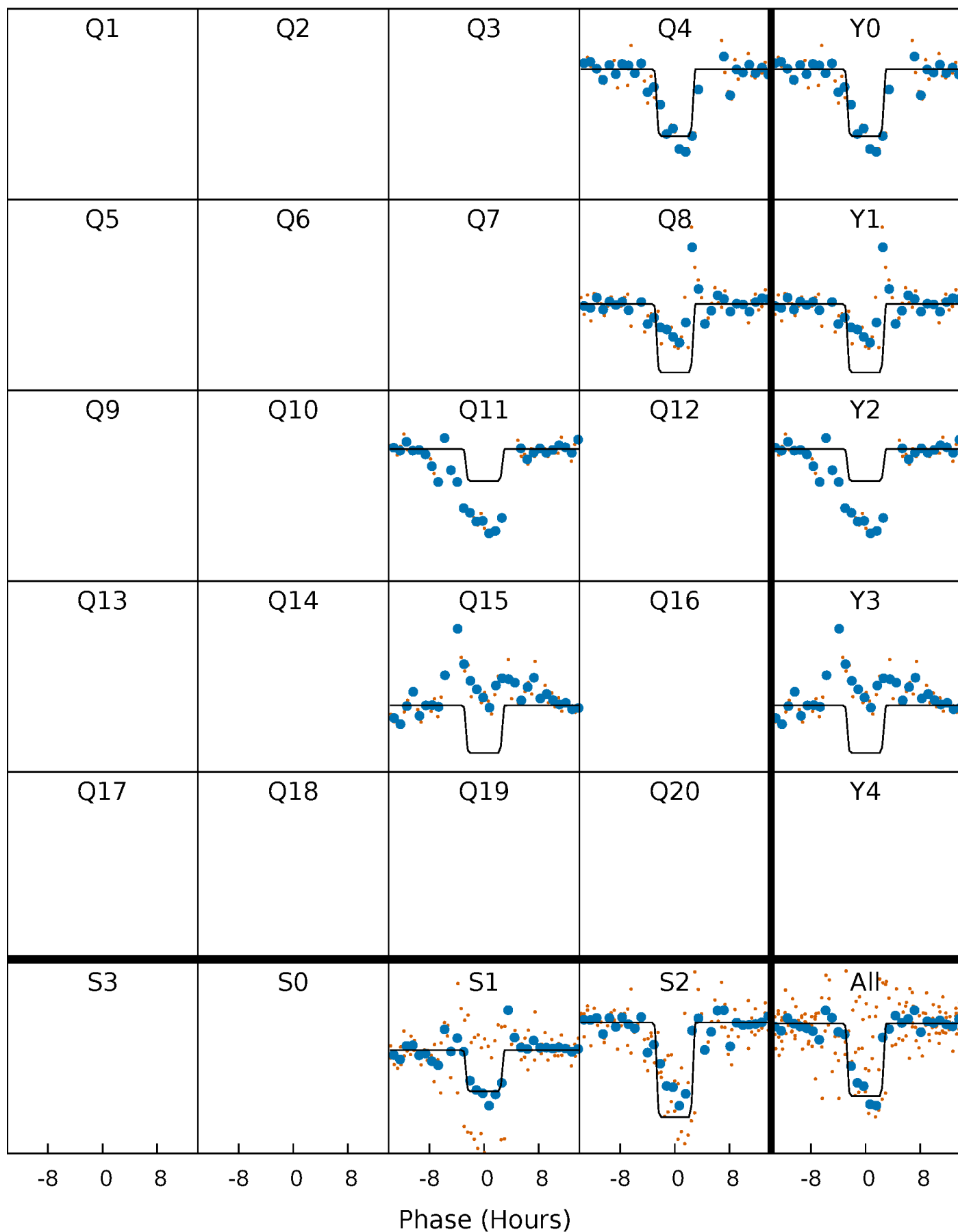
DV Quarter-Phased Transit Curves

TCE 009019435-02 $P=320.682349$ Days $T_0=420.912052$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

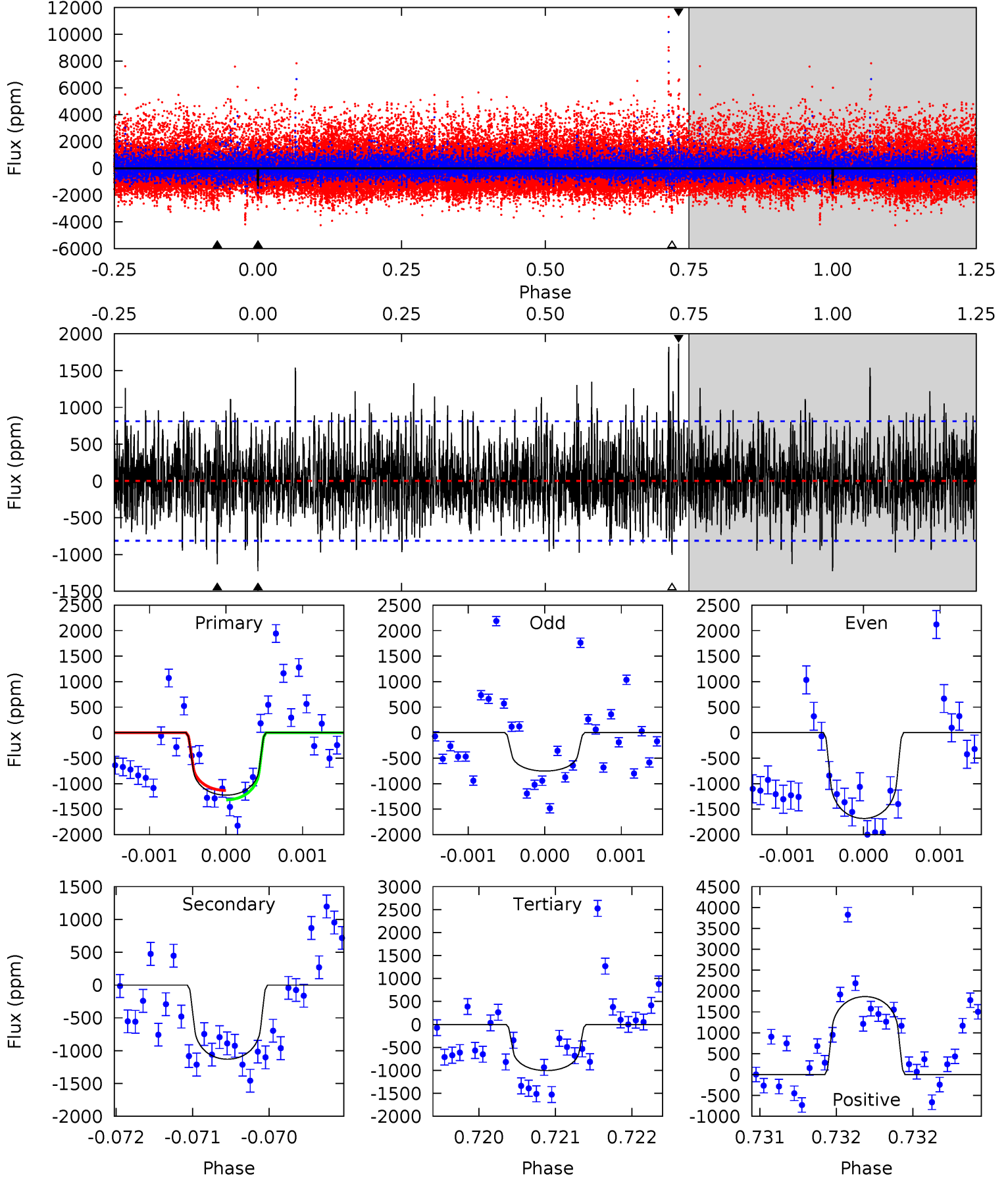
TCE 009019435-02 $P=320.684291$ Days $T_0=420.911784$ (BKJD)



DV Model-Shift Uniqueness Test

009019435-02, P = 320.682349 Days, E = 100.229703 Days

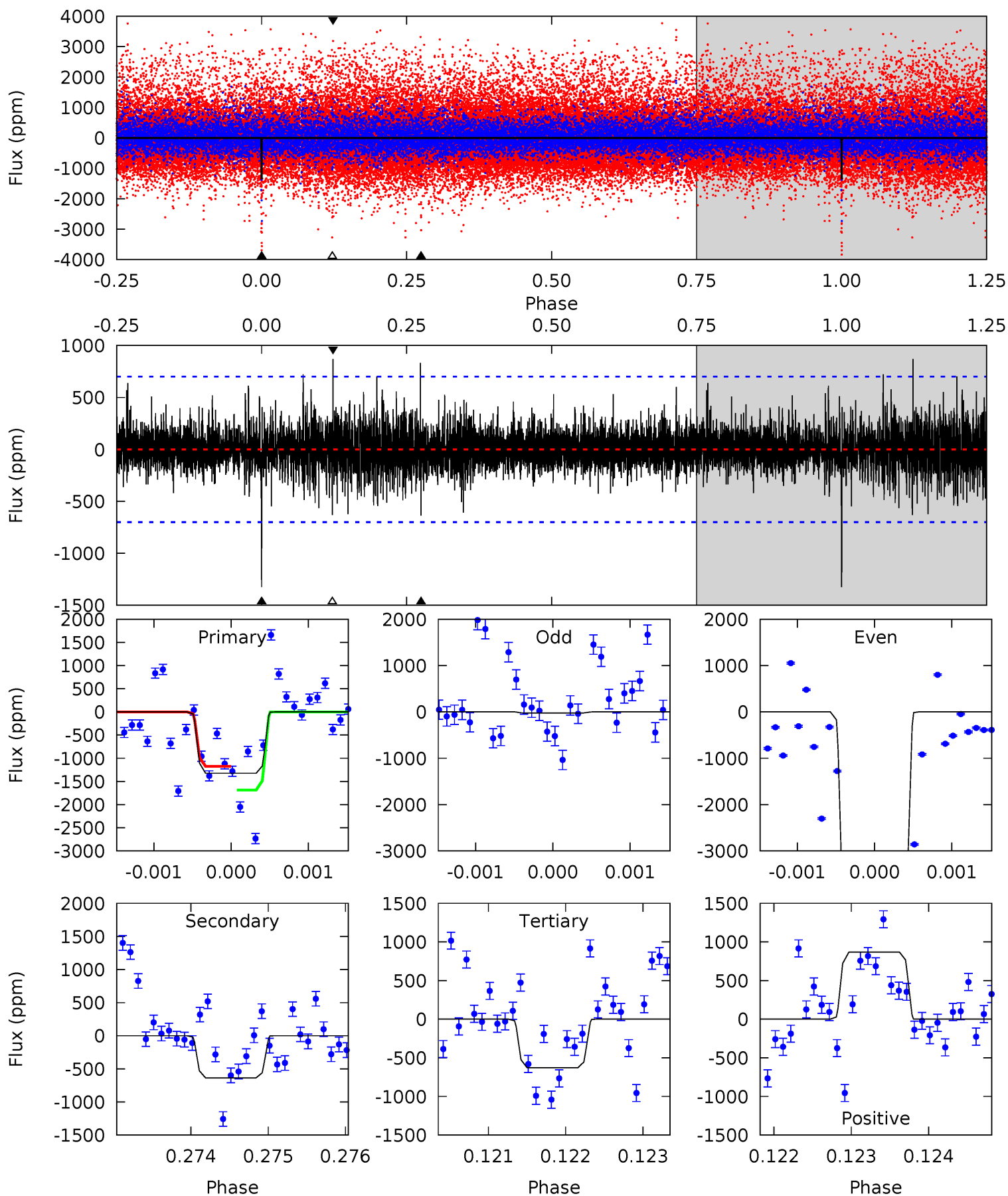
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.25	7.61	6.77	12.6	5.47	3.32	2.44	1.48	-4.32	0.84	-4.96	2.78	0.70	0.60	0.62



Alt Model-Shift Uniqueness Test

009019435-02, P = 320.684291 Days, E = 100.227493 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	4.99	4.94	6.81	5.49	3.36	1.15	5.45	3.57	0.05	-1.83	23.7	1.30	0.40	1.96



Stellar Parameters For KIC 009019435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3489^{+79}_{-88}	$4.868^{+0.066}_{-0.048}$	$0.000^{+0.100}_{-0.100}$	$0.379^{+0.050}_{-0.061}$	$0.388^{+0.054}_{-0.075}$	$10.030^{+3.917}_{-1.976}$
	+2%/-3%	+1%/-1%	+inf%/-inf%	+13%/-16%	+14%/-19%	+39%/-20%
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 009019435-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1130 ± 148	$1.74^{+0.91}_{-0.88}$	161^{+5}_{-5}	3273^{+804}_{-401}	$94162^{+264796}_{-55022}$
Alt.	-635 ± 127	$2.27^{+0.96}_{-0.87}$	161^{+5}_{-6}	2771^{+435}_{-249}	29656^{+53891}_{-14935}

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

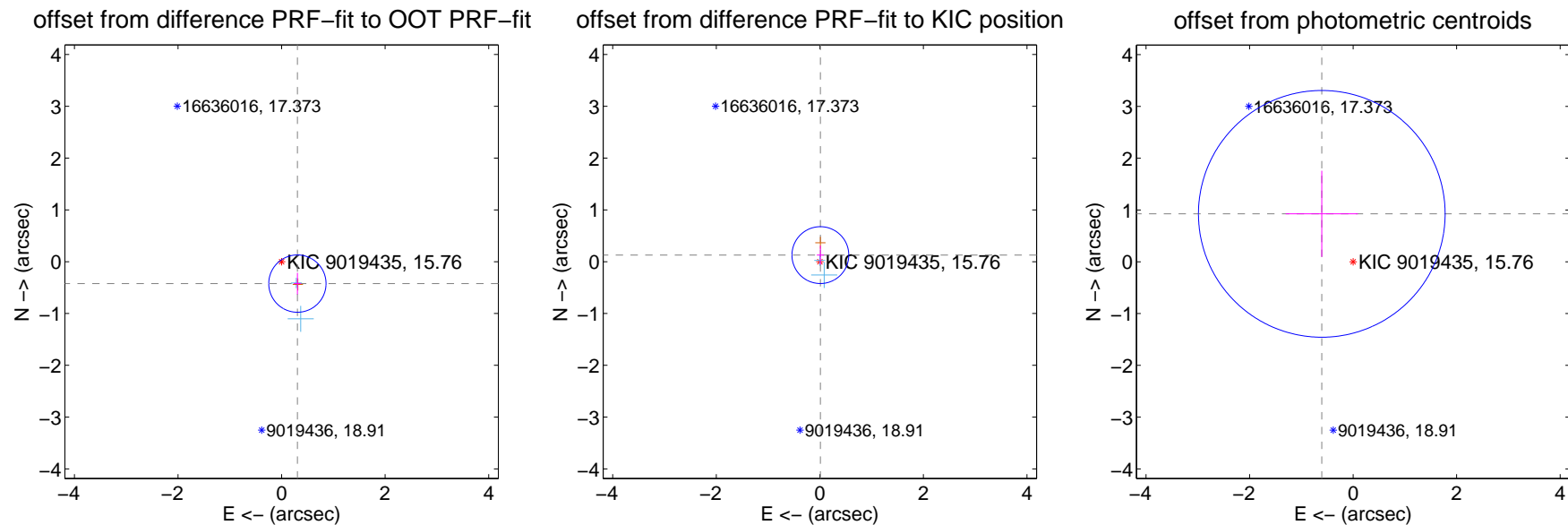
DV Centroid Data

Supplemental centroid analysis for 009019435-02. Kepler magnitude: 15.76. Transit SNR 7.71

There are 2 quarters with good PRF difference image offsets

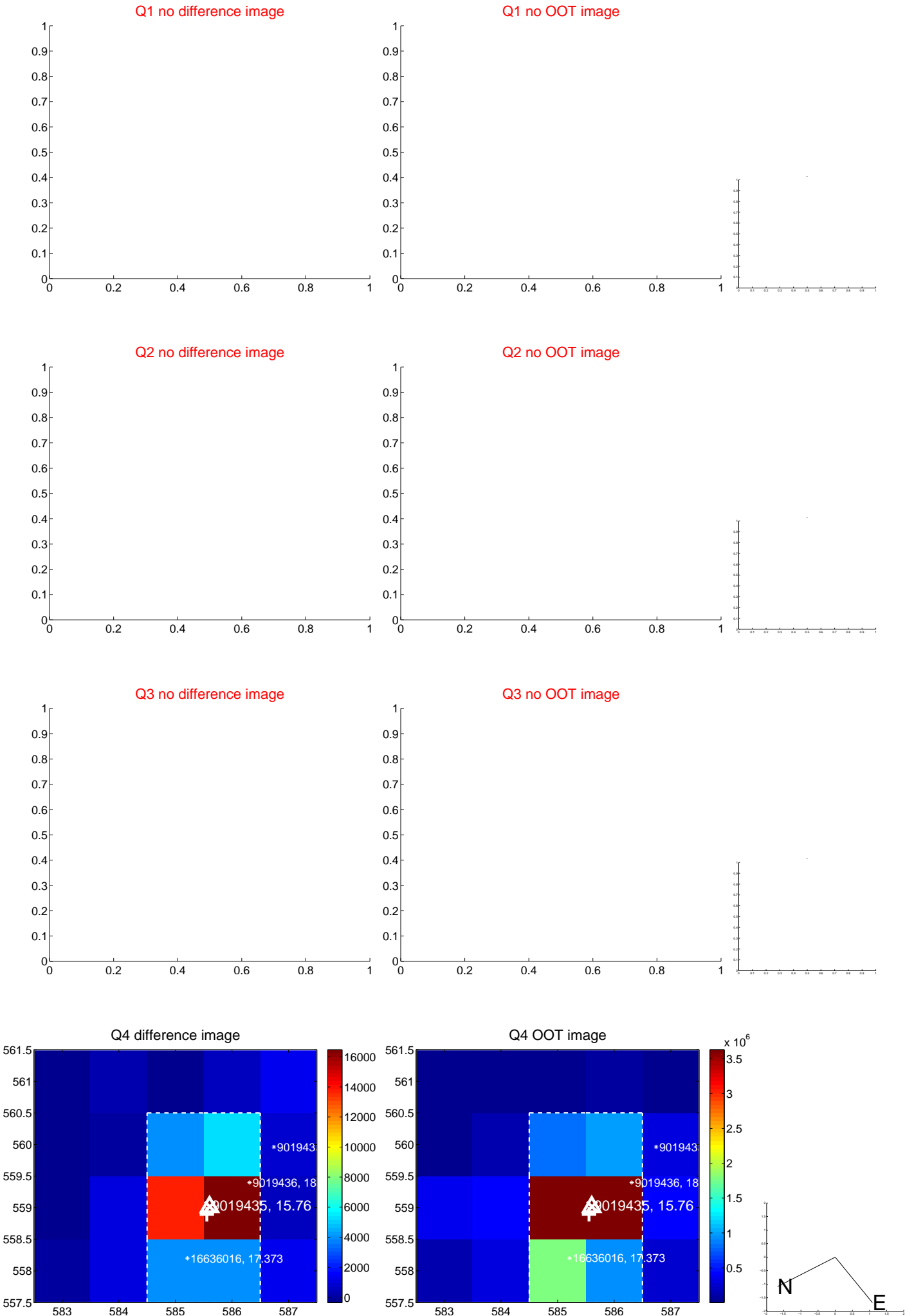
The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.522 ± 0.184	2.83	-0.306 ± 0.070	-0.423 ± 0.208
PRF-fit source offset from KIC position	0.128 ± 0.183	0.70	-0.010 ± 0.069	0.127 ± 0.183
photometric centroid source offset	1.11 ± 0.79	1.39	0.61 ± 0.70	0.93 ± 0.83

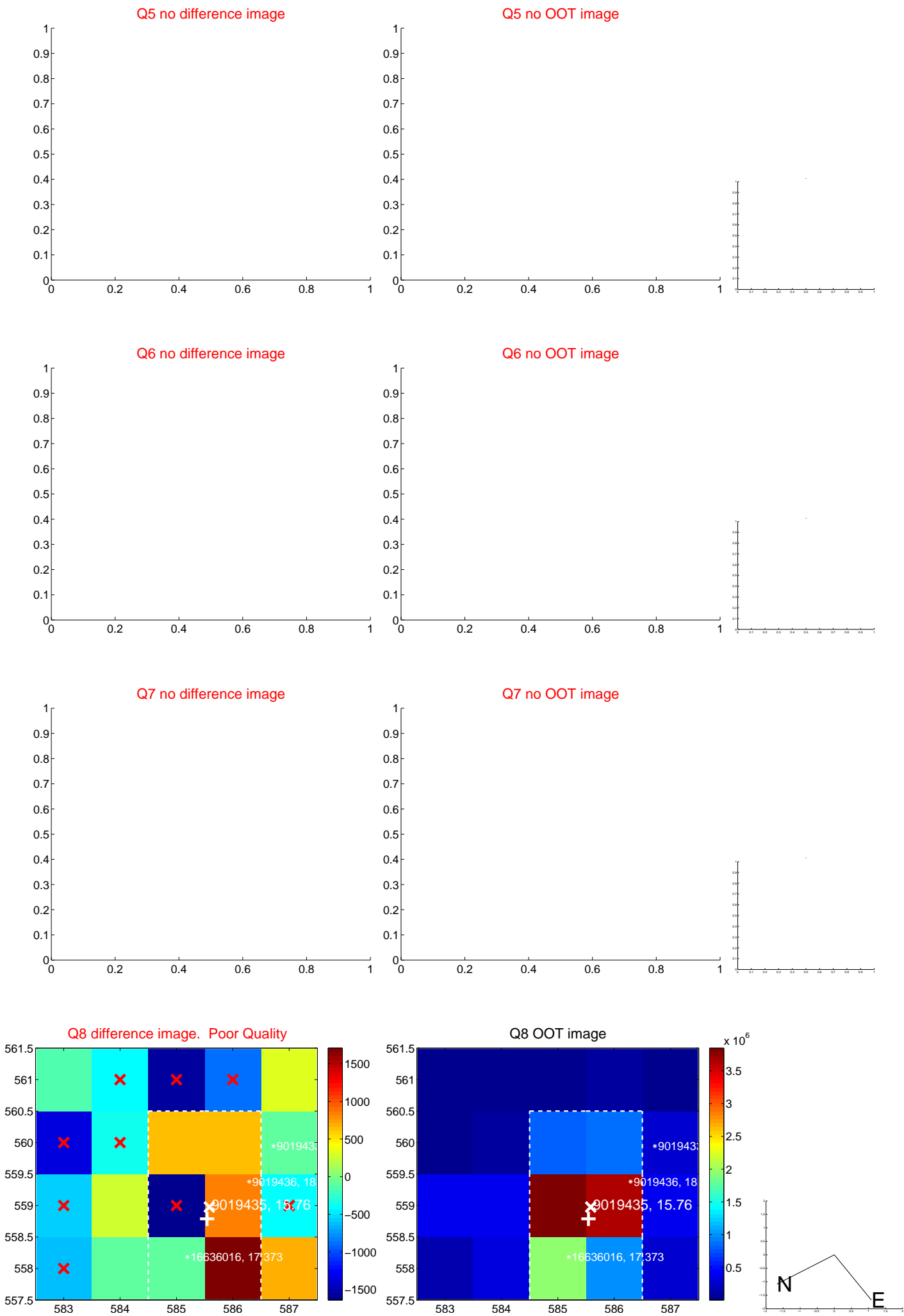


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

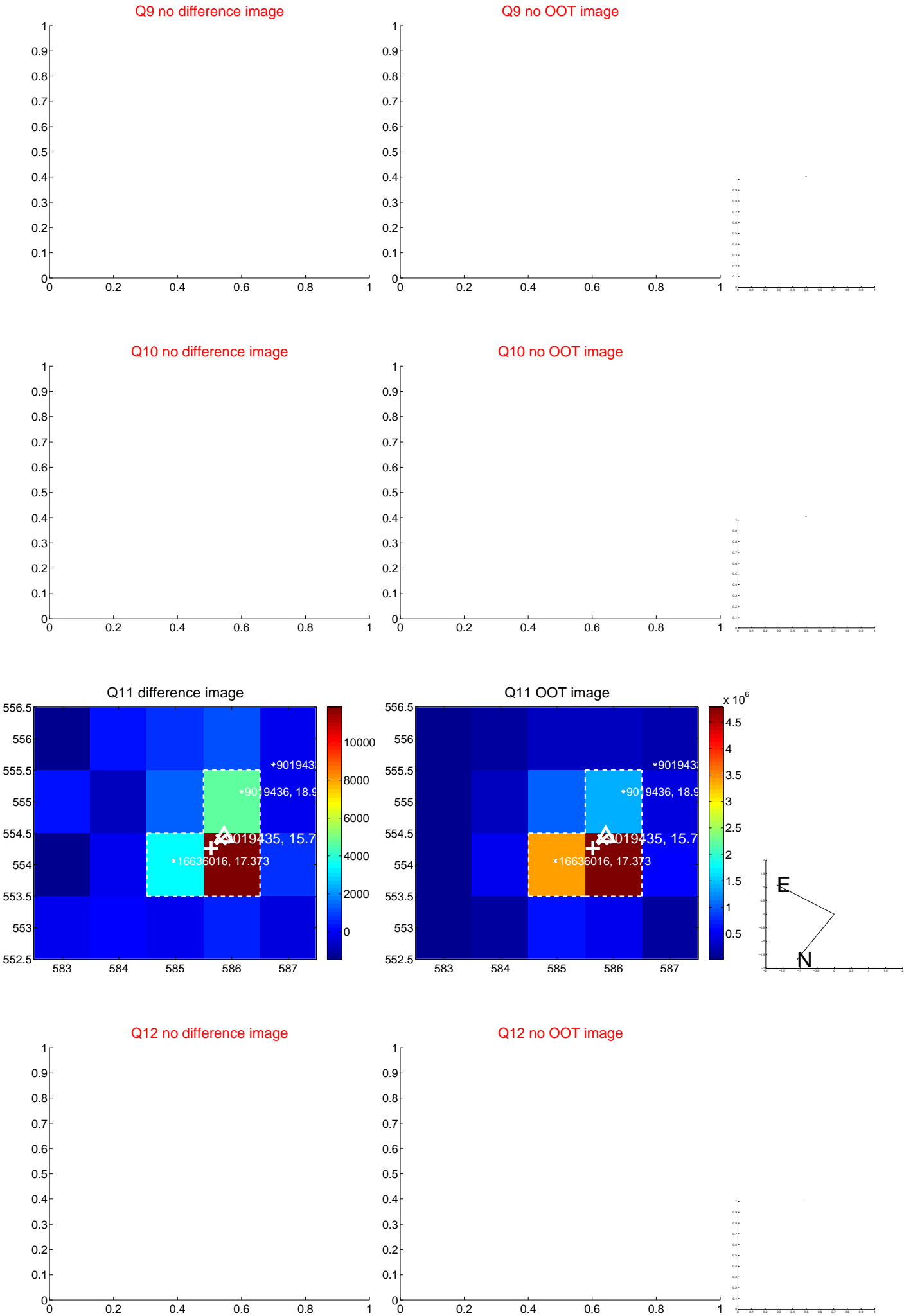
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



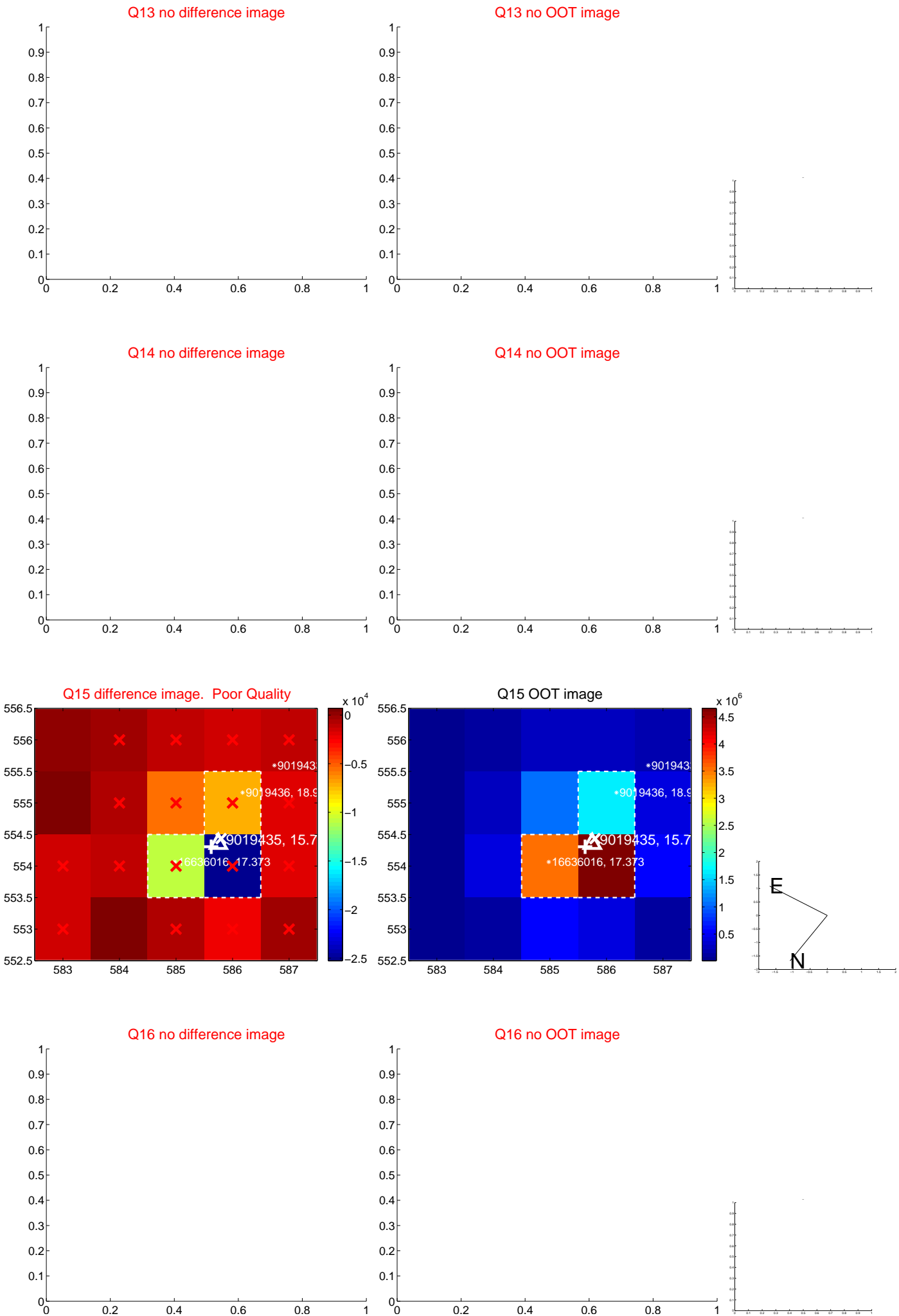
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



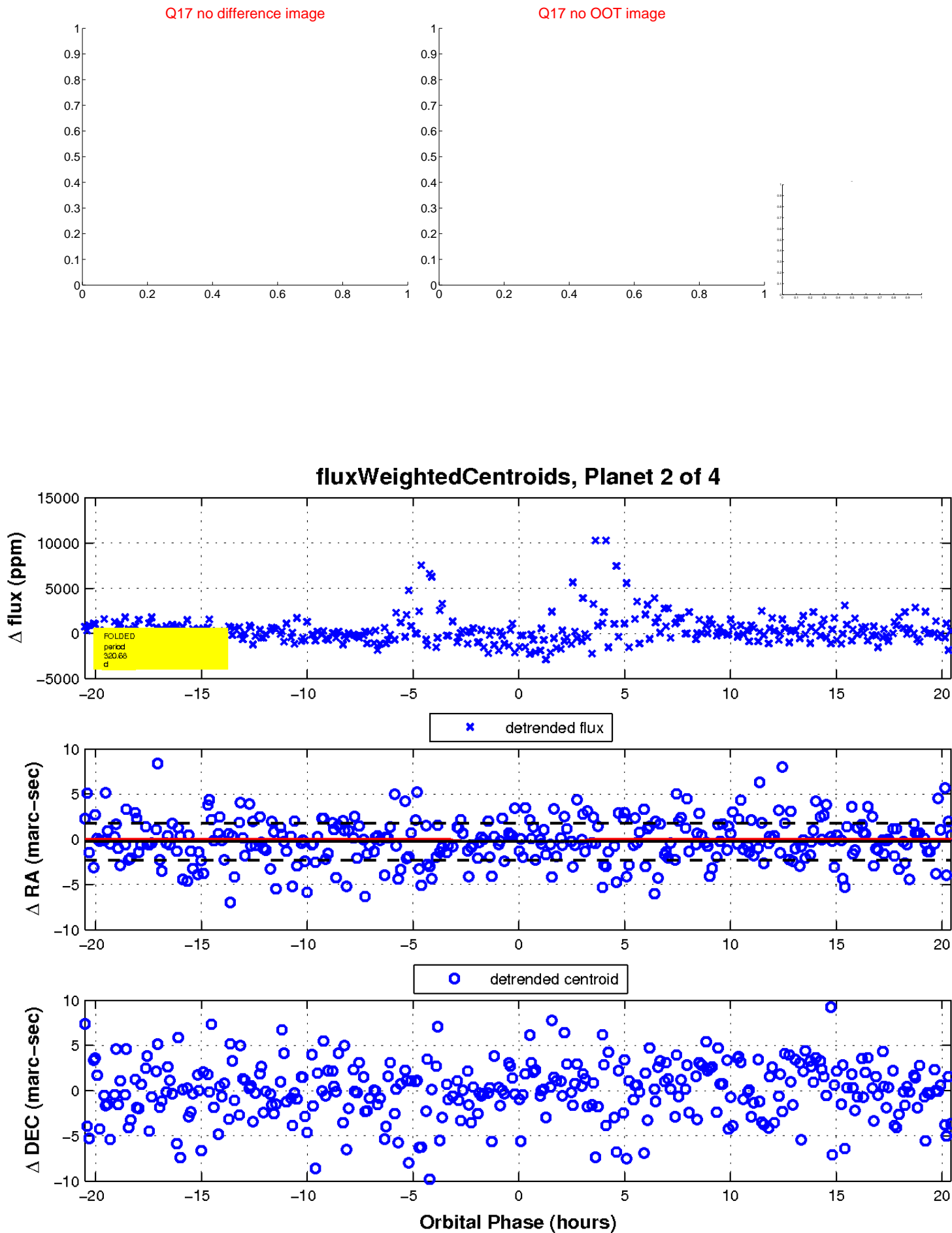
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

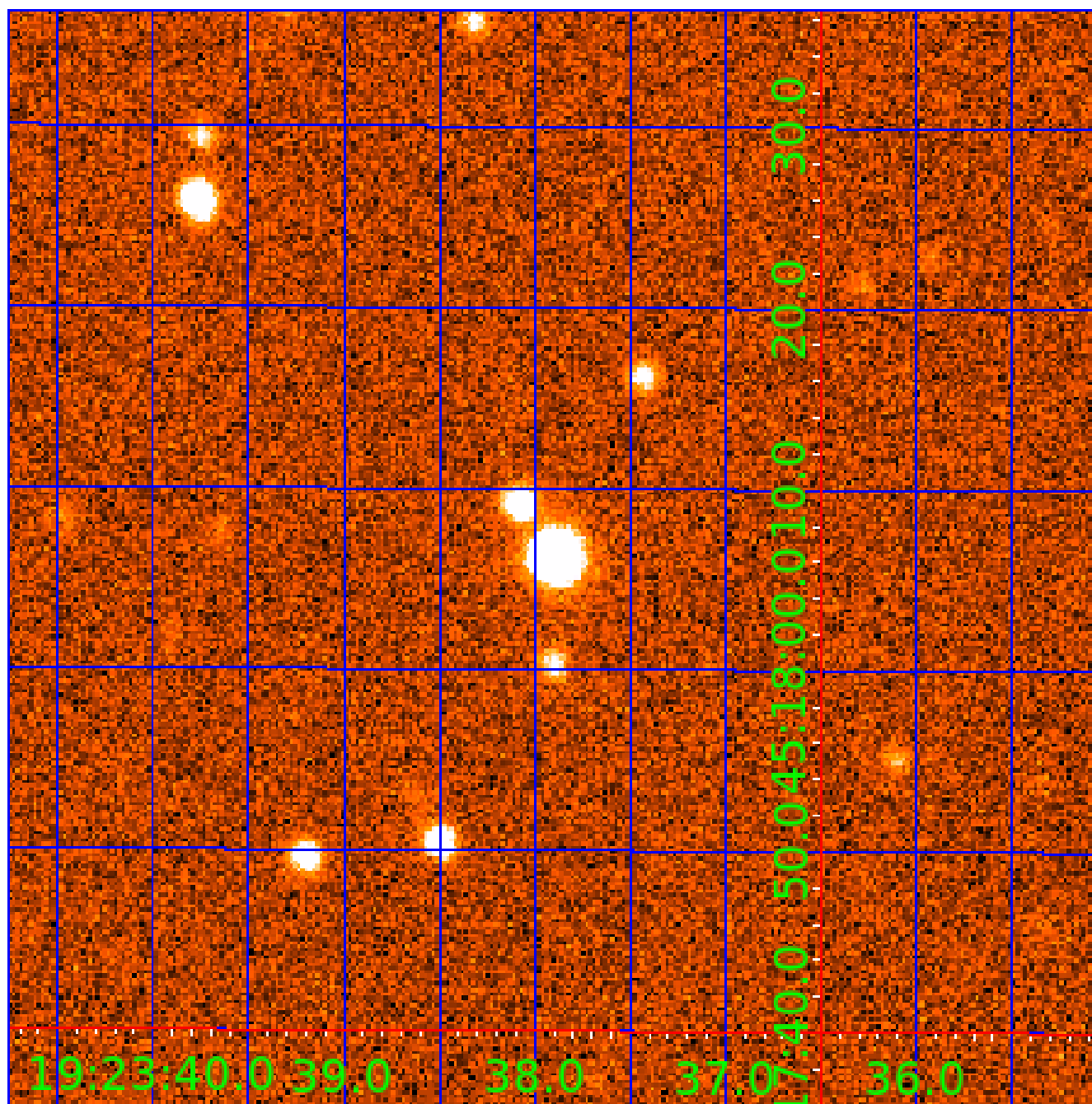


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009019435

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})
009019435-01	OBS	No	537.357404	346.754700	2421.5	3.754	13.5	6.8	0.38	3489	1.92	0.02
009019435-02	OBS	No	320.682349	420.912052	1984.7	6.844	8.4	7.7	0.38	3489	1.68	0.04
009019435-03	OBS	No	243.774838	157.013760	743.2	2.550	11.8	2.7	0.38	3489	1.05	0.06
009019435-04	OBS	No	385.549452	177.602068	2028.4	2.989	11.2	7.6	0.38	3489	1.71	0.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009019435-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009019435-02	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
009019435-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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
009019435-04	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—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

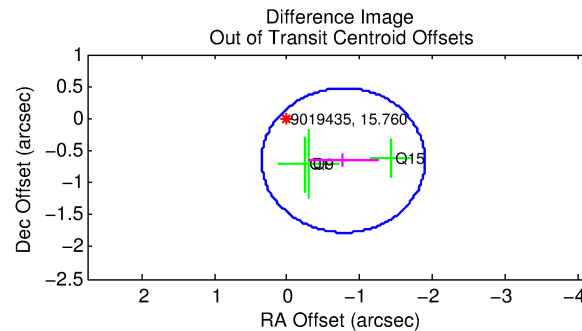
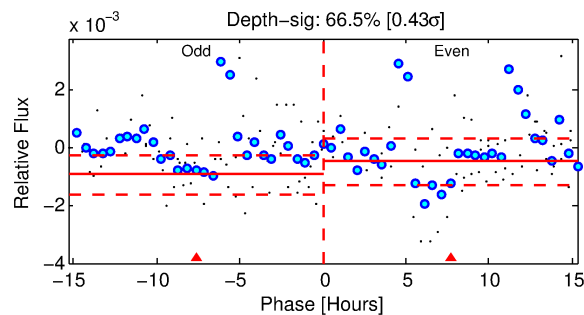
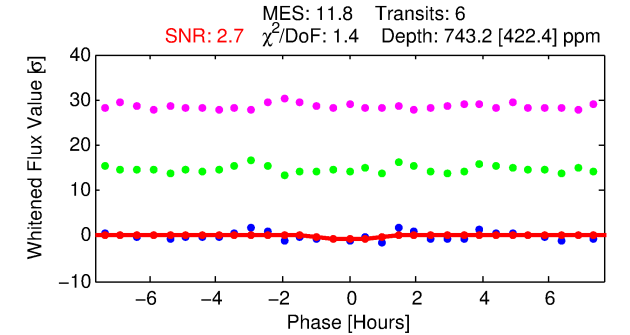
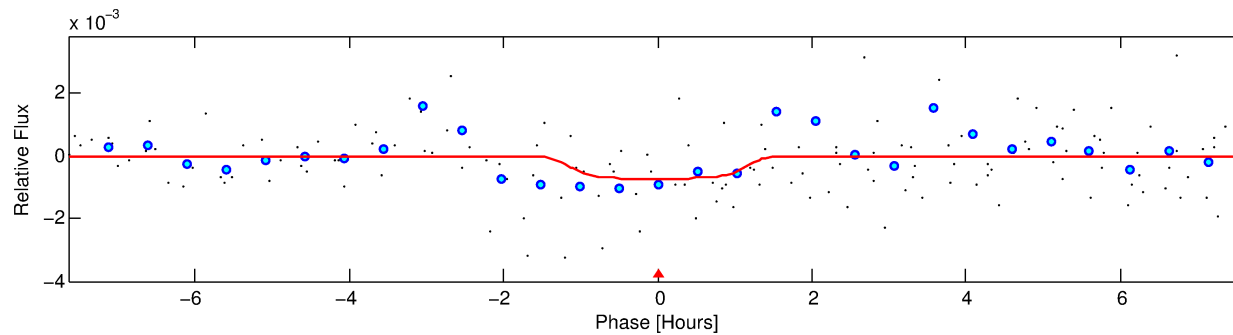
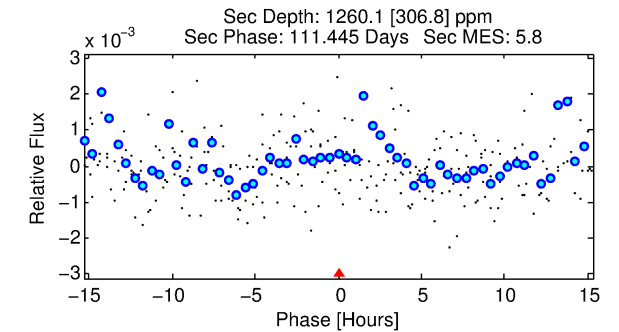
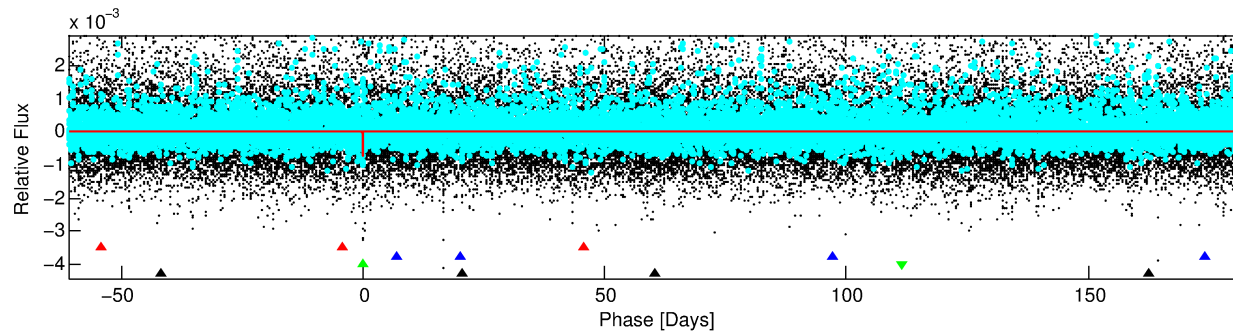
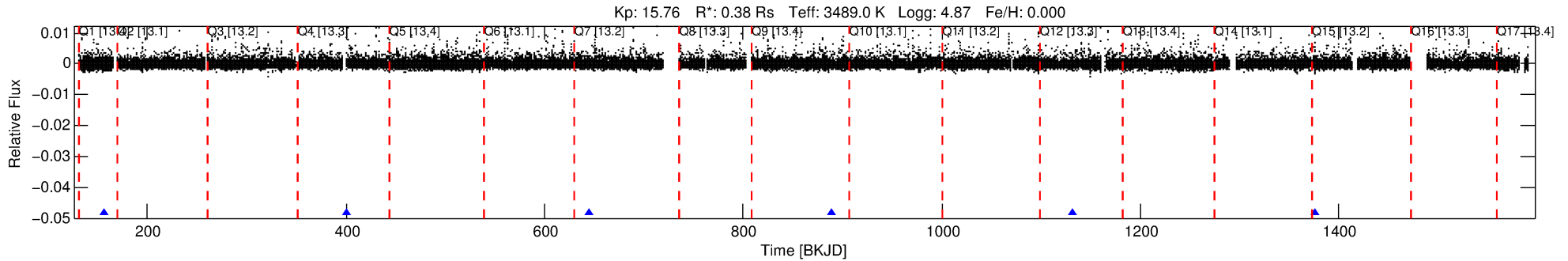
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009019435-03

No Significant Match Found

DV One-Page Summary

KIC: 9019435 Candidate: 3 of 4 Period: 243.775 d



DV Fit Results:

Period = 243.77484 [0.00807] d
Epoch = 157.0138 [0.0277] BKJD
Rp/R* = 0.0255 [0.2308]
a/R* = 647.81 [24873.45]
b = 0.51 [54.91]
Seff = 0.06 [0.01]
Teq = 127 [6] K
Rp = 1.06 [9.55] Re
a = 0.5565 [0.0660] AU
Ag = 192689.97 [3485113.11] [0.06σ]
Teffp = 4115 [18605] K [0.21σ]

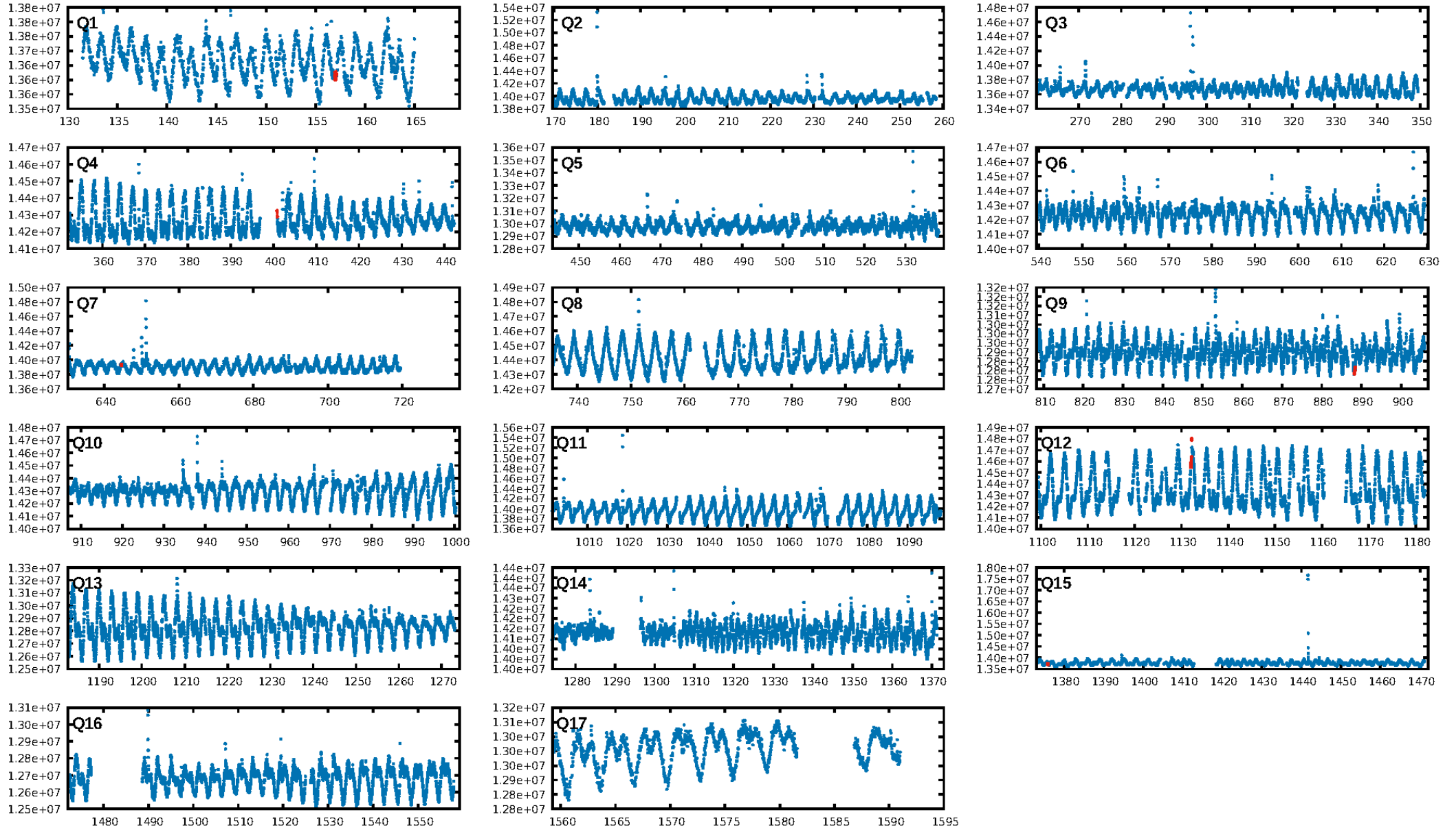
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [252.73σ]
ModelChiSquare2-sig: 21.9%
ModelChiSquareGof-sig: 77.4%
Bootstrap-pfa: 1.24e-12
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -1.475
Centroid-sig: N/A
Centroid-so: 1.866 arcsec [0.71σ]
OotOffset-rm: 1.013 arcsec [2.70σ]
KicOffset-rm: 0.536 arcsec [1.22σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [4/4]

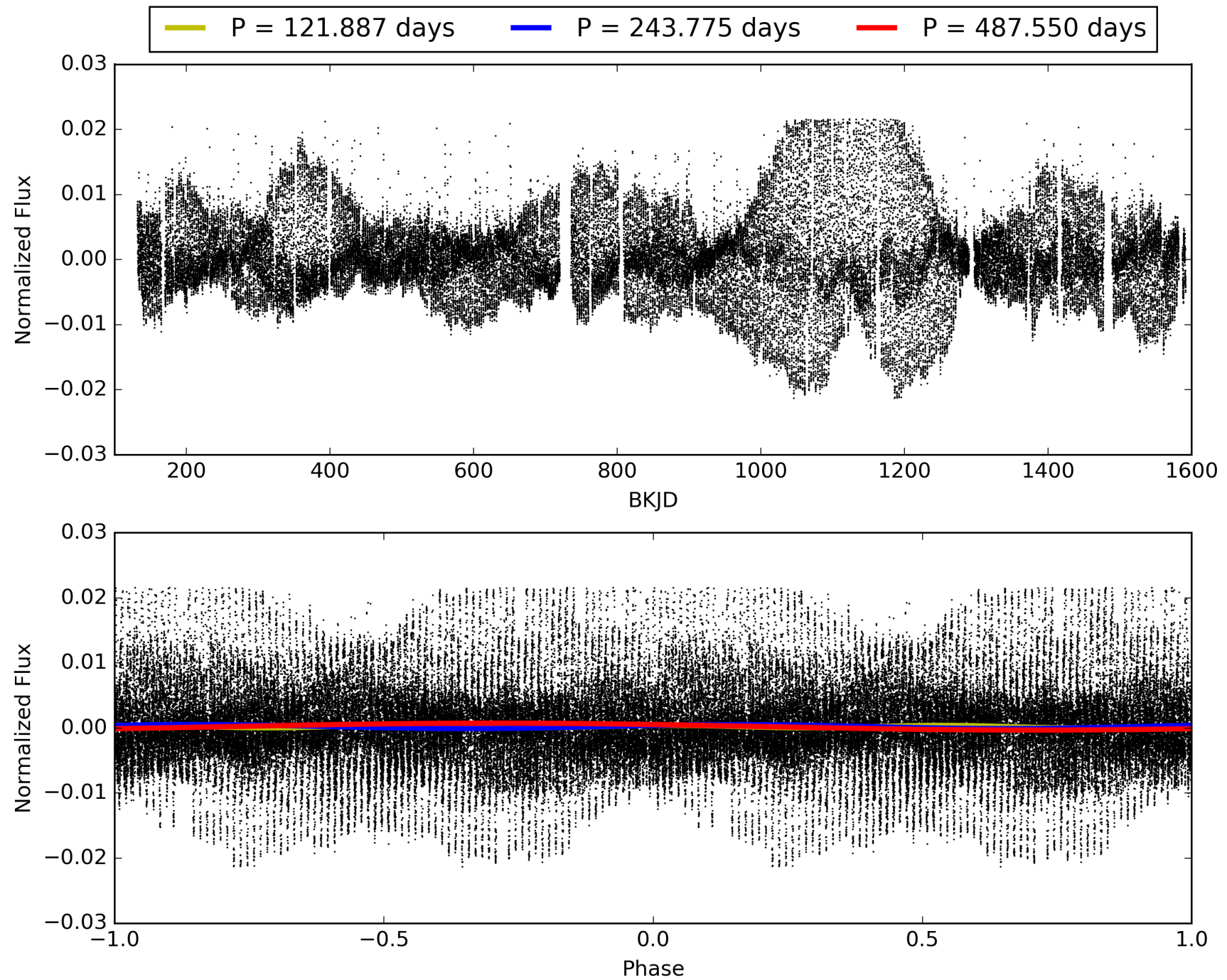
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:31:59 Z

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

TCE 009019435-03, PDC Light Curves

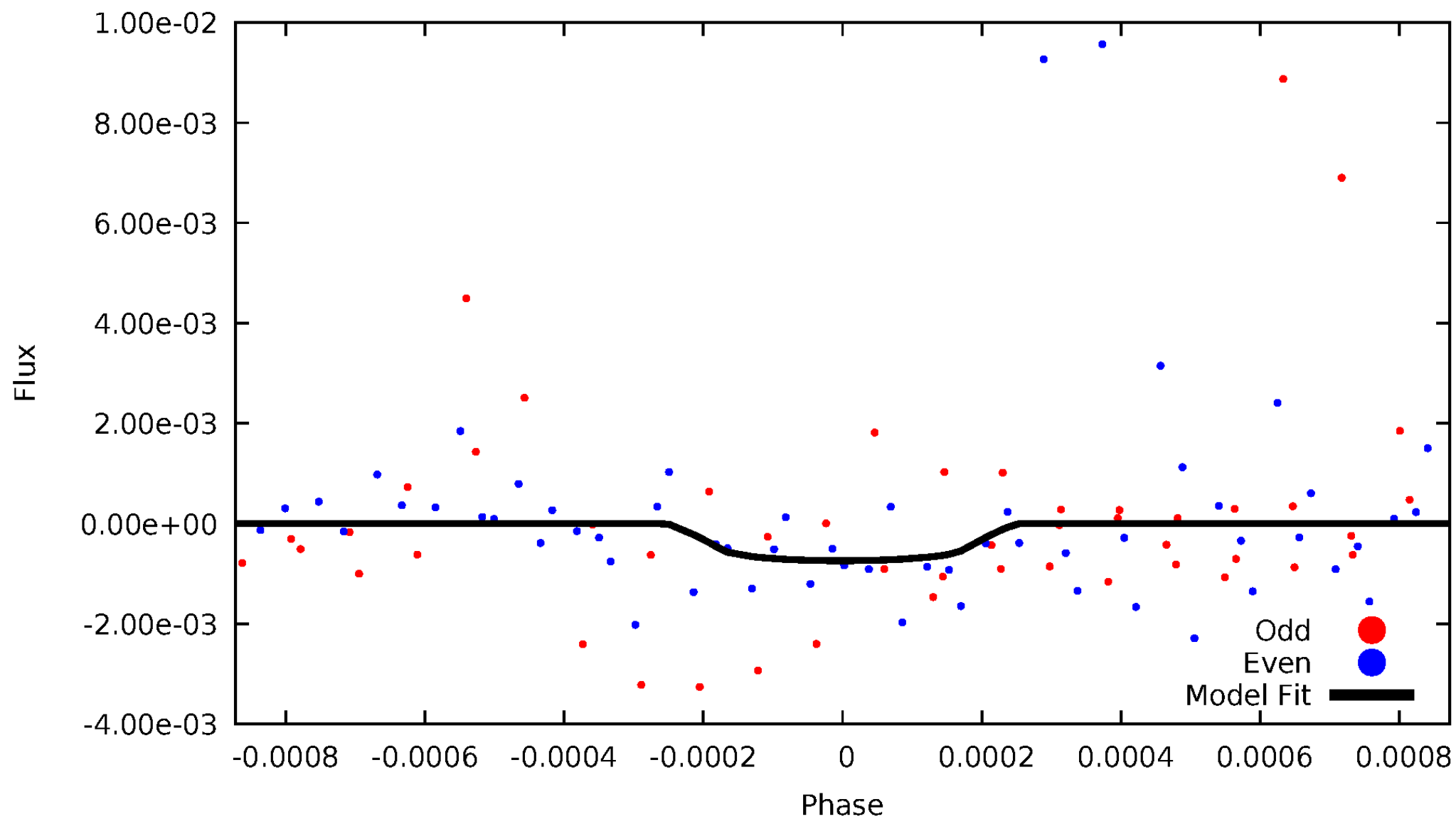


TCE 009019435-03



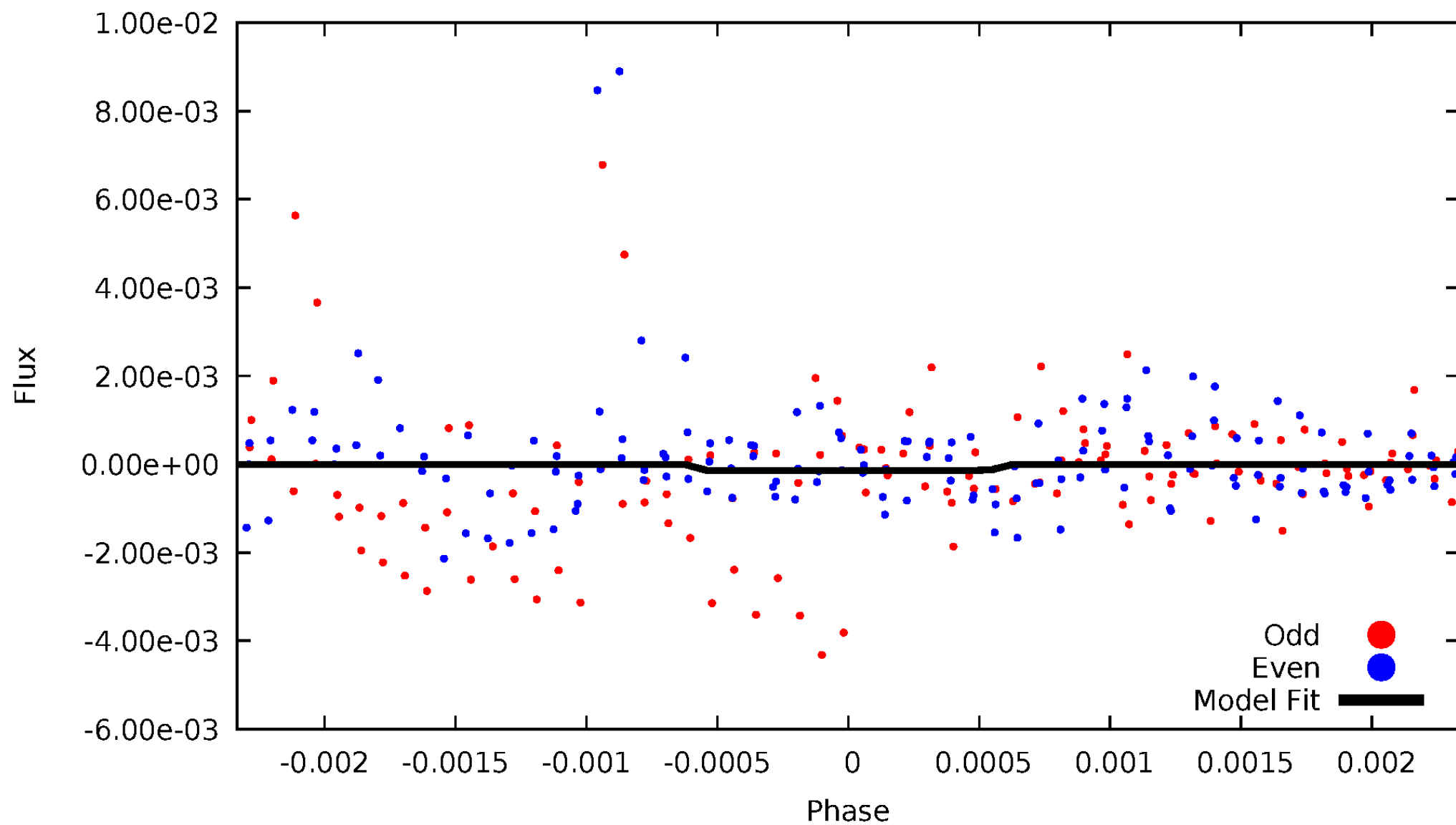
DV Odd/Even

TCE 009019435-03



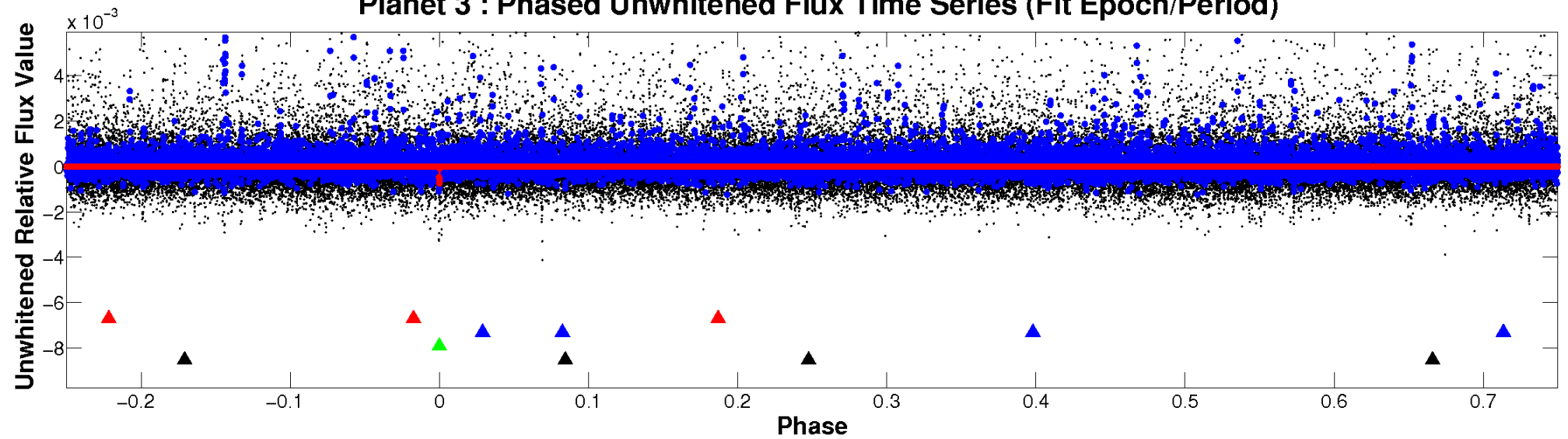
ALT Odd/Even

TCE 009019435-03

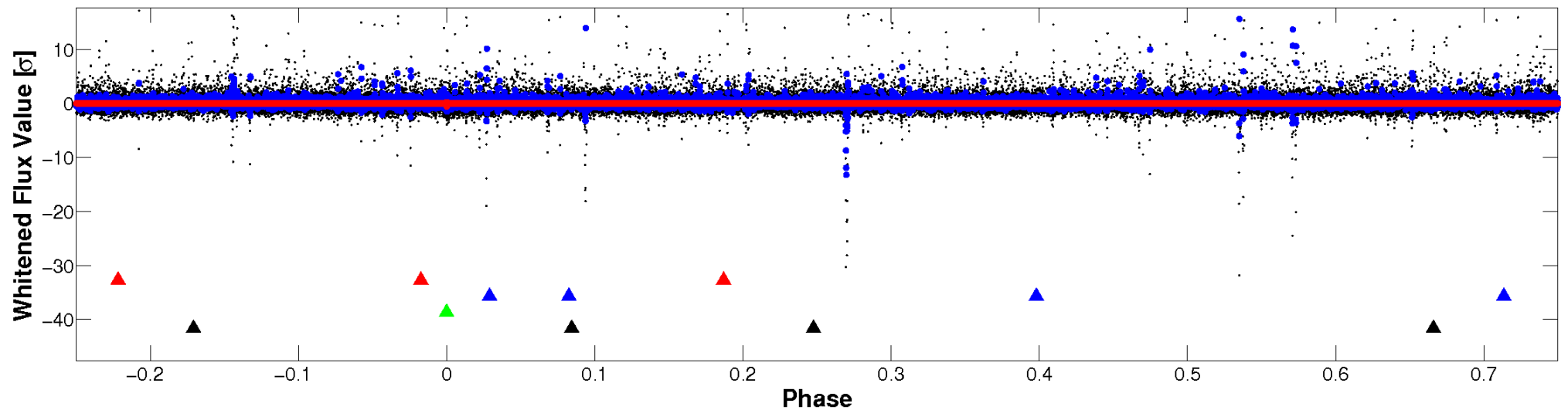


Non-Whitened Vs. Whitened Light Curve

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

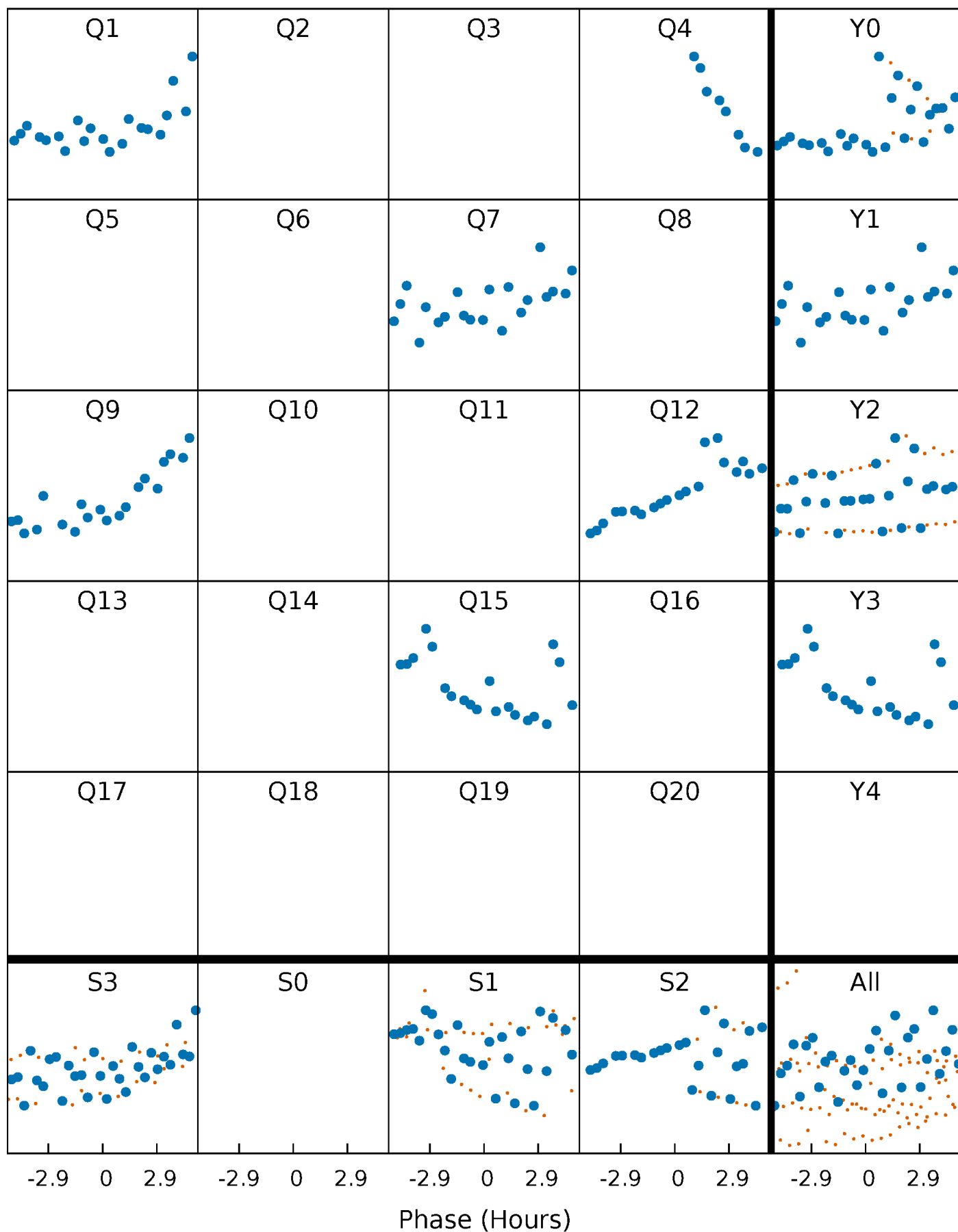


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009019435-03 $P=243.774838$ Days $T_0=157.013760$ (BKJD)



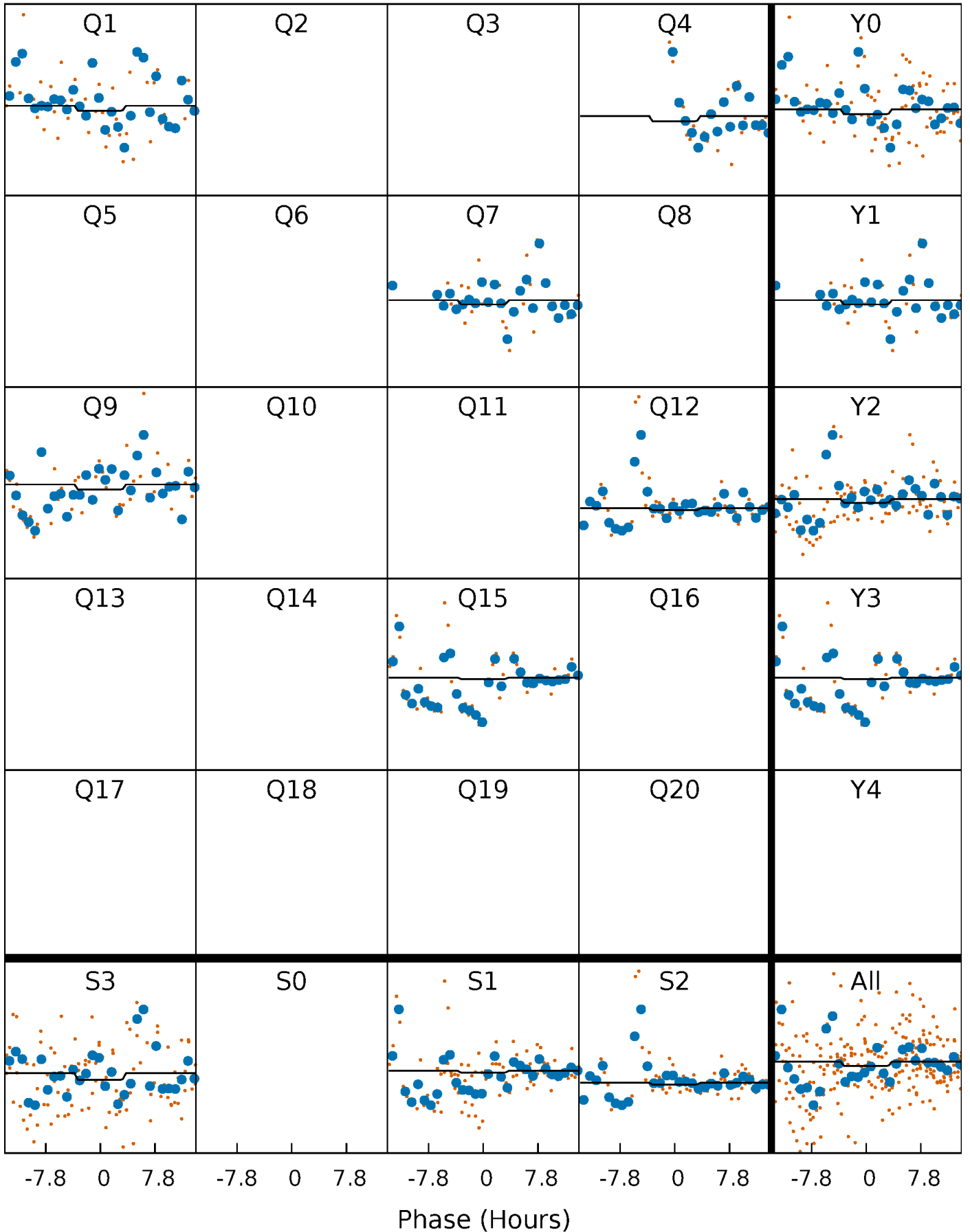
DV Quarter-Phased Transit Curves

TCE 009019435-03 $P=243.774838$ Days $T_0=157.013760$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

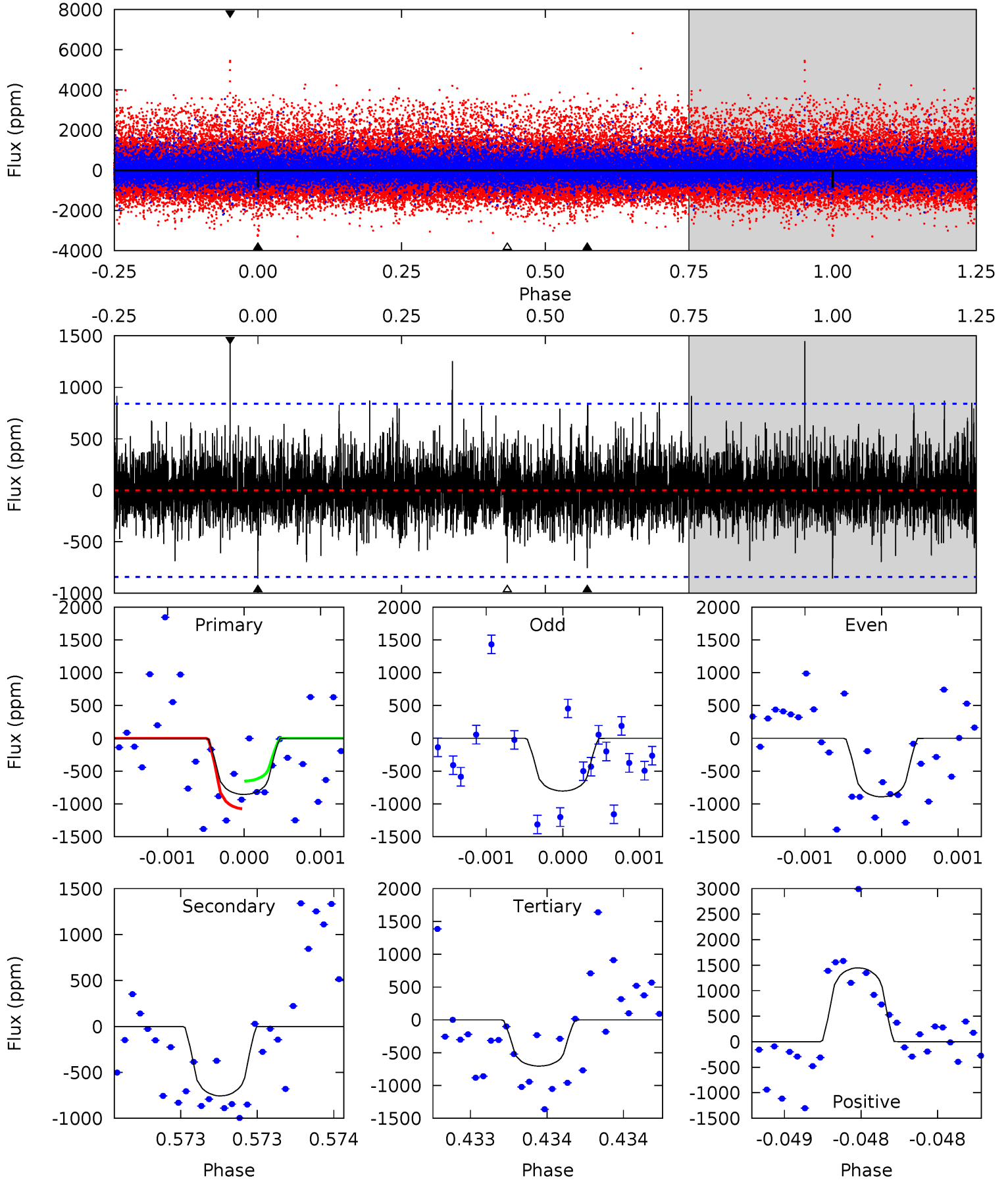
TCE 009019435-03 P=243.854105 Days $T_0=157.000720$ (BKJD)



DV Model-Shift Uniqueness Test

009019435-03, P = 243.774838 Days, E = 157.013760 Days

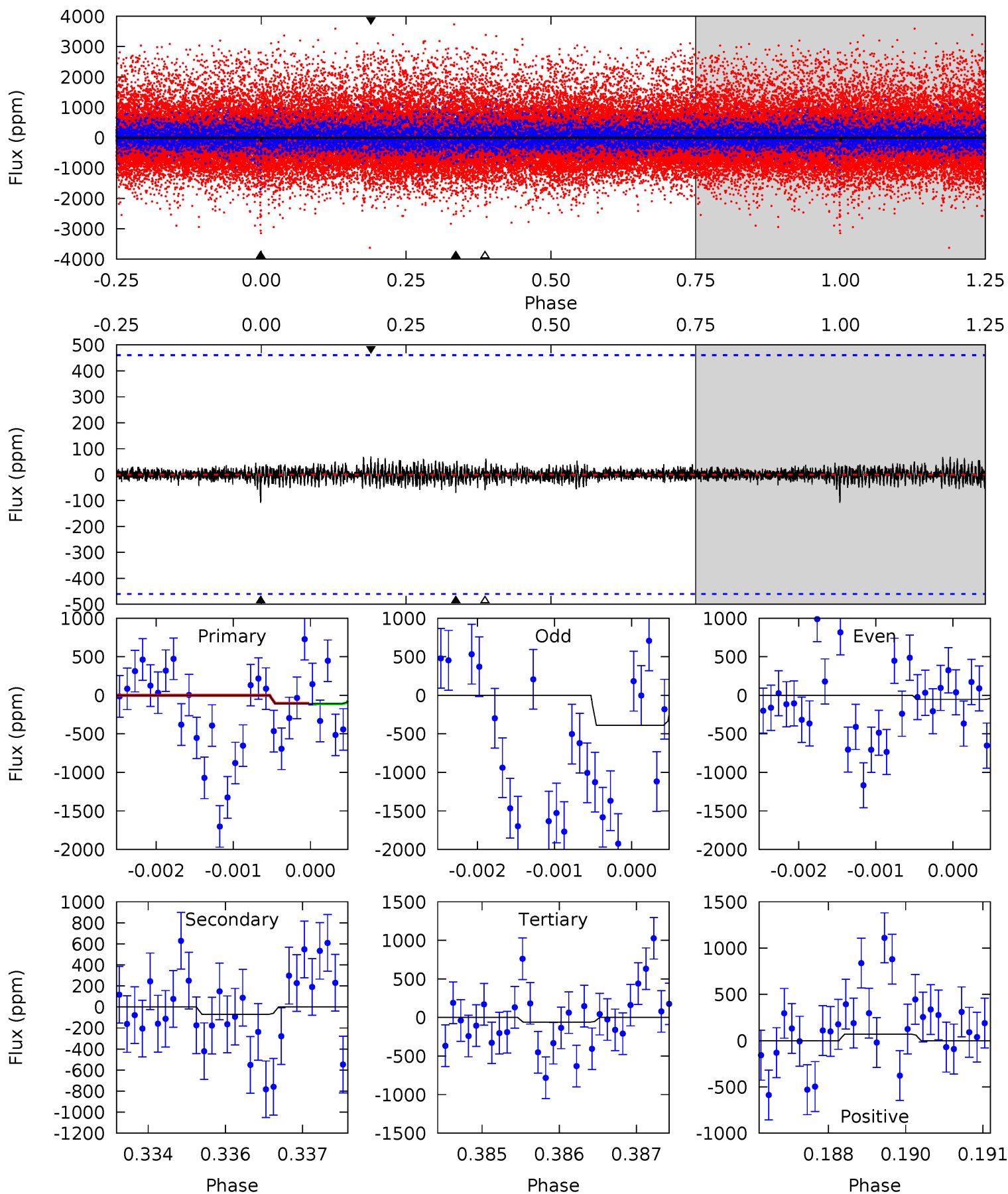
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.67	5.00	4.66	9.57	5.56	3.46	1.38	1.01	-3.91	0.34	-4.57	0.28	0.72	0.63	1.40



Alt Model-Shift Uniqueness Test

009019435-03, P = 243.854105 Days, E = 157.000720 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.28	0.82	0.71	0.81	5.42	3.24	0.19	0.57	0.46	0.11	0.01	1.94	8.14	0.39	0



Stellar Parameters For KIC 009019435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3489^{+79}_{-88}	$4.868^{+0.066}_{-0.048}$	$0.000^{+0.100}_{-0.100}$	$0.379^{+0.050}_{-0.061}$	$0.388^{+0.054}_{-0.075}$	$10.030^{+3.917}_{-1.976}$
	+2%/-3%	+1%/-1%	+inf%/-inf%	+13%/-16%	+14%/-19%	+39%/-20%
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 009019435-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-756 ± 151	$6.95^{+7.39}_{-4.89}$	177^{+6}_{-6}	2168^{+786}_{-295}	2703^{+29712}_{-2078}
Alt.	-70 ± 85	$6.93^{+7.38}_{-4.97}$	177^{+6}_{-6}	1662^{+500}_{-2985}	176^{+2517}_{-187}

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 $A_{obs} \gg 1.0$

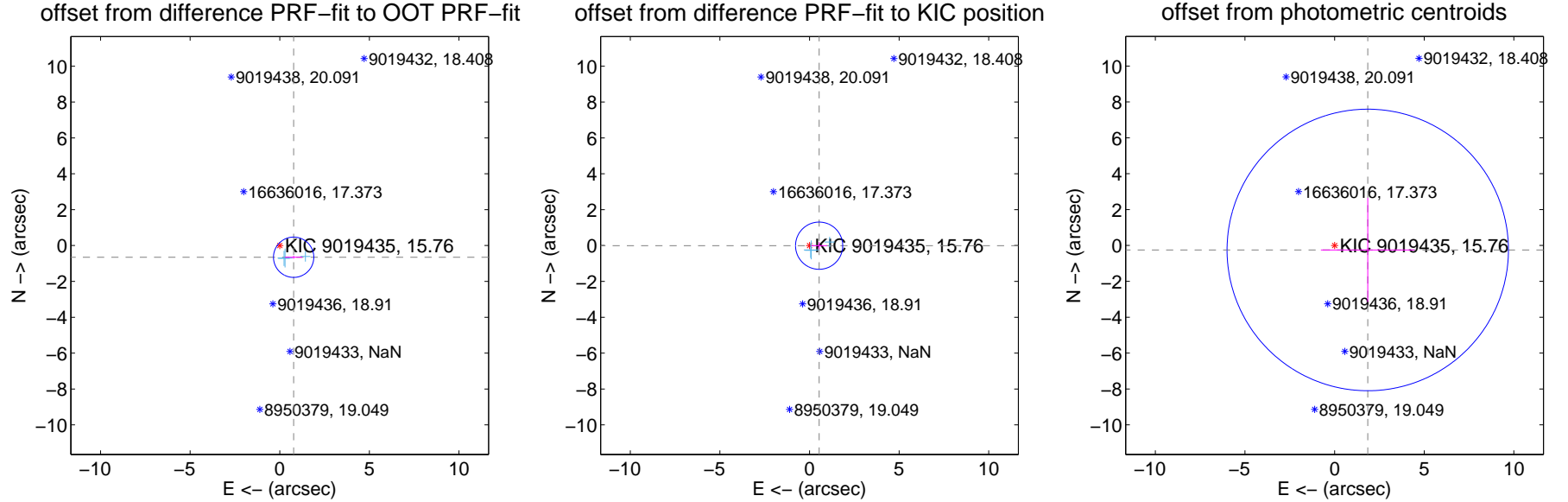
DV Centroid Data

Supplemental centroid analysis for 009019435-03. Kepler magnitude: 15.76. Transit SNR 2.67

There are 3 quarters with good PRF difference image offsets

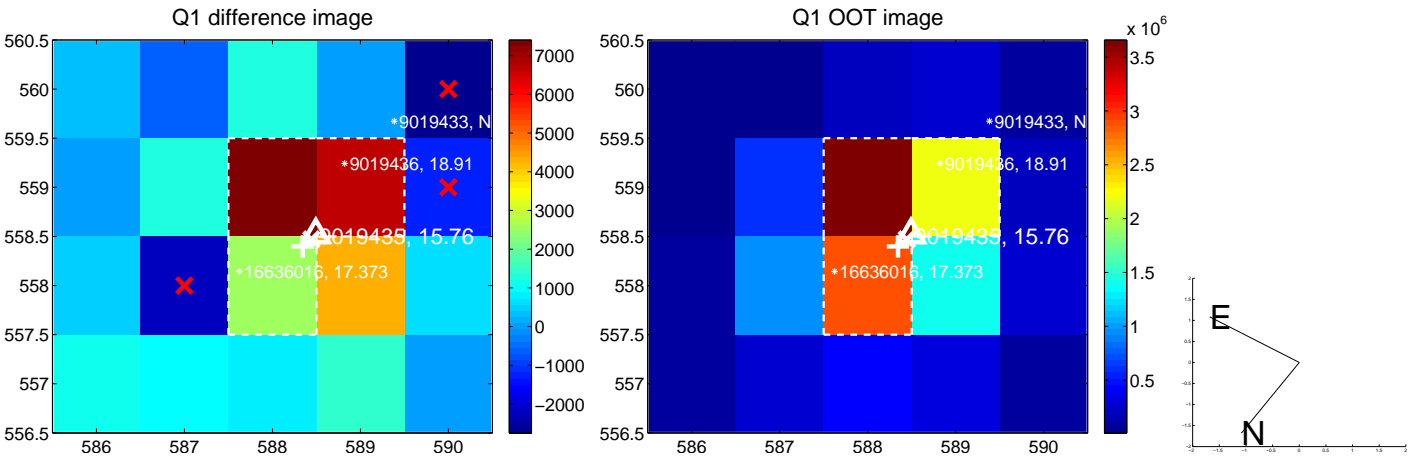
The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.013 ± 0.375	2.70	-0.775 ± 0.486	-0.653 ± 0.078
PRF-fit source offset from KIC position	0.536 ± 0.439	1.22	-0.536 ± 0.439	-0.009 ± 0.199
photometric centroid source offset	1.87 ± 2.62	0.71	-1.85 ± 2.61	-0.25 ± 2.90



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.

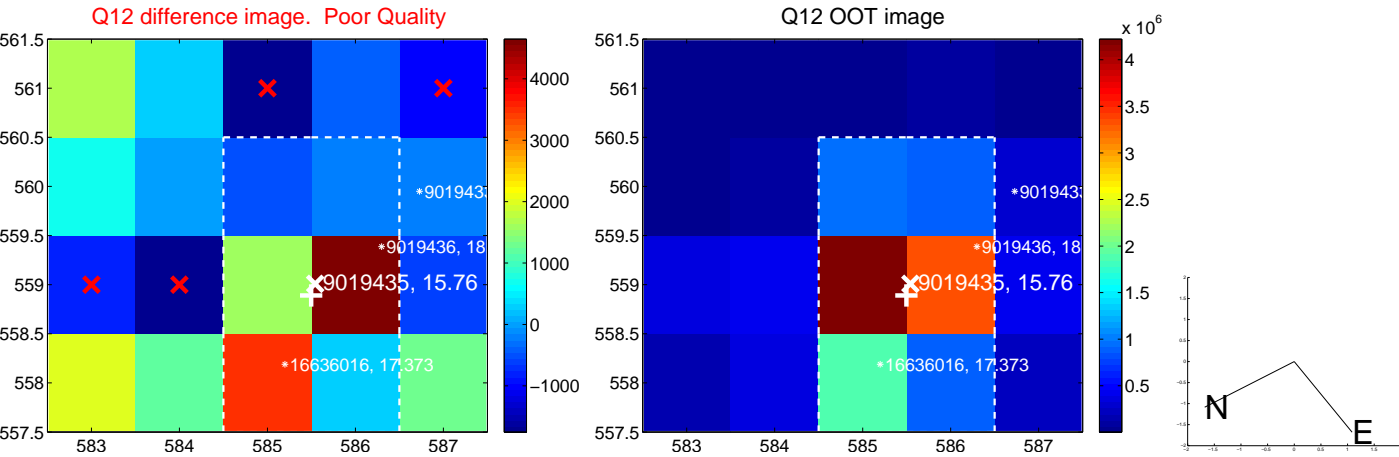
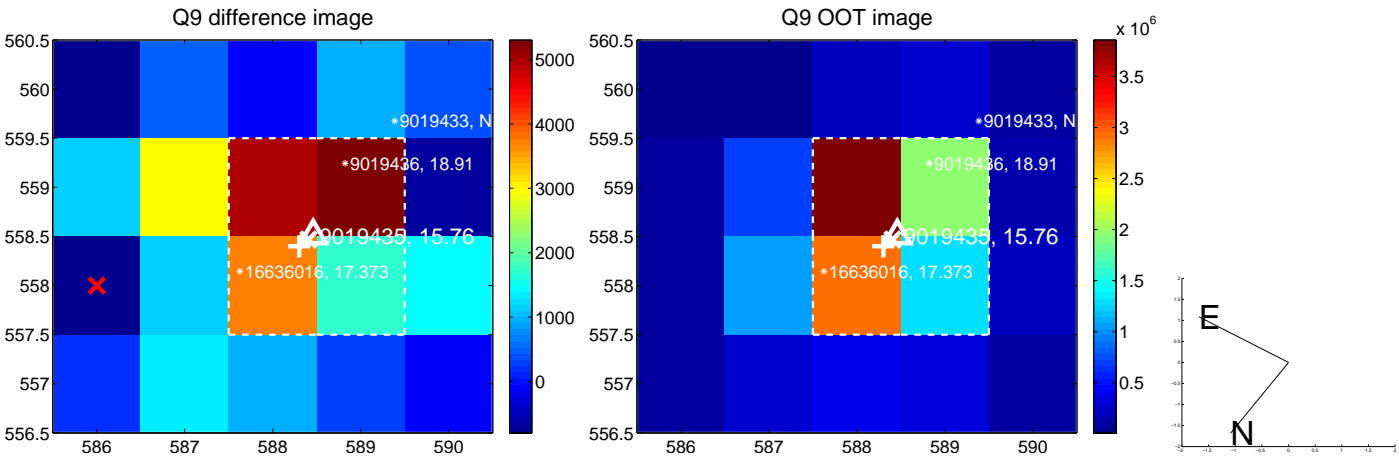
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



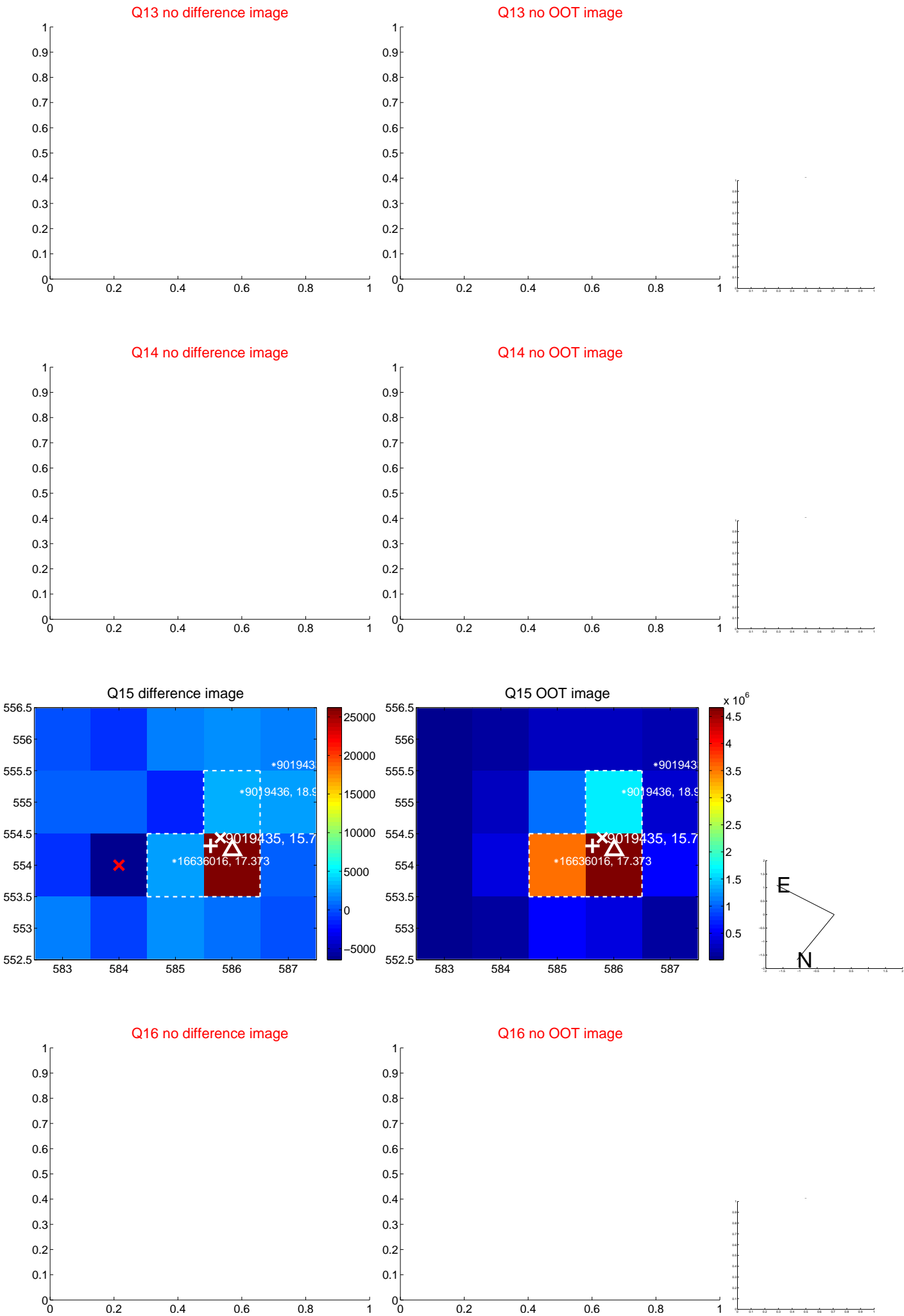
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



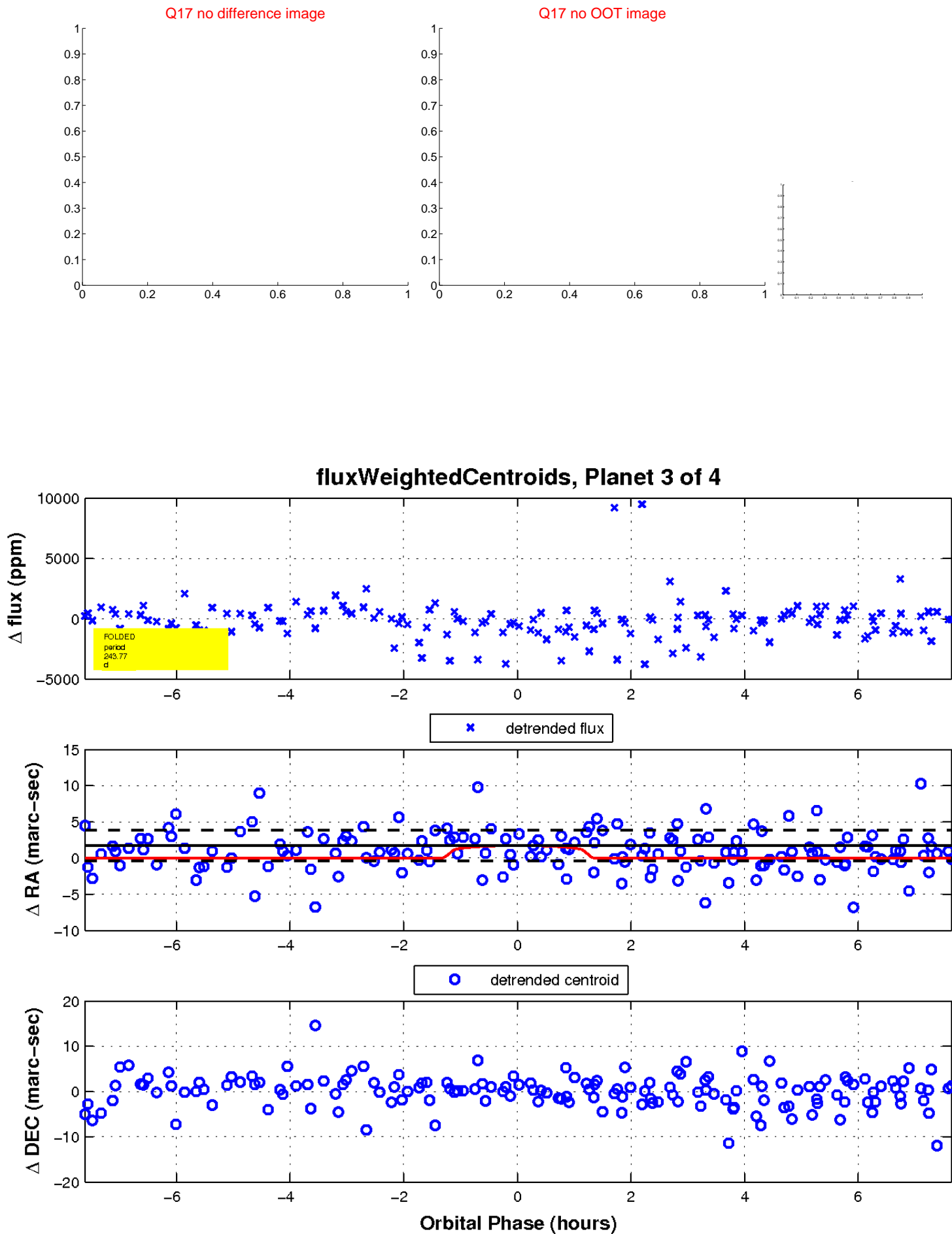
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

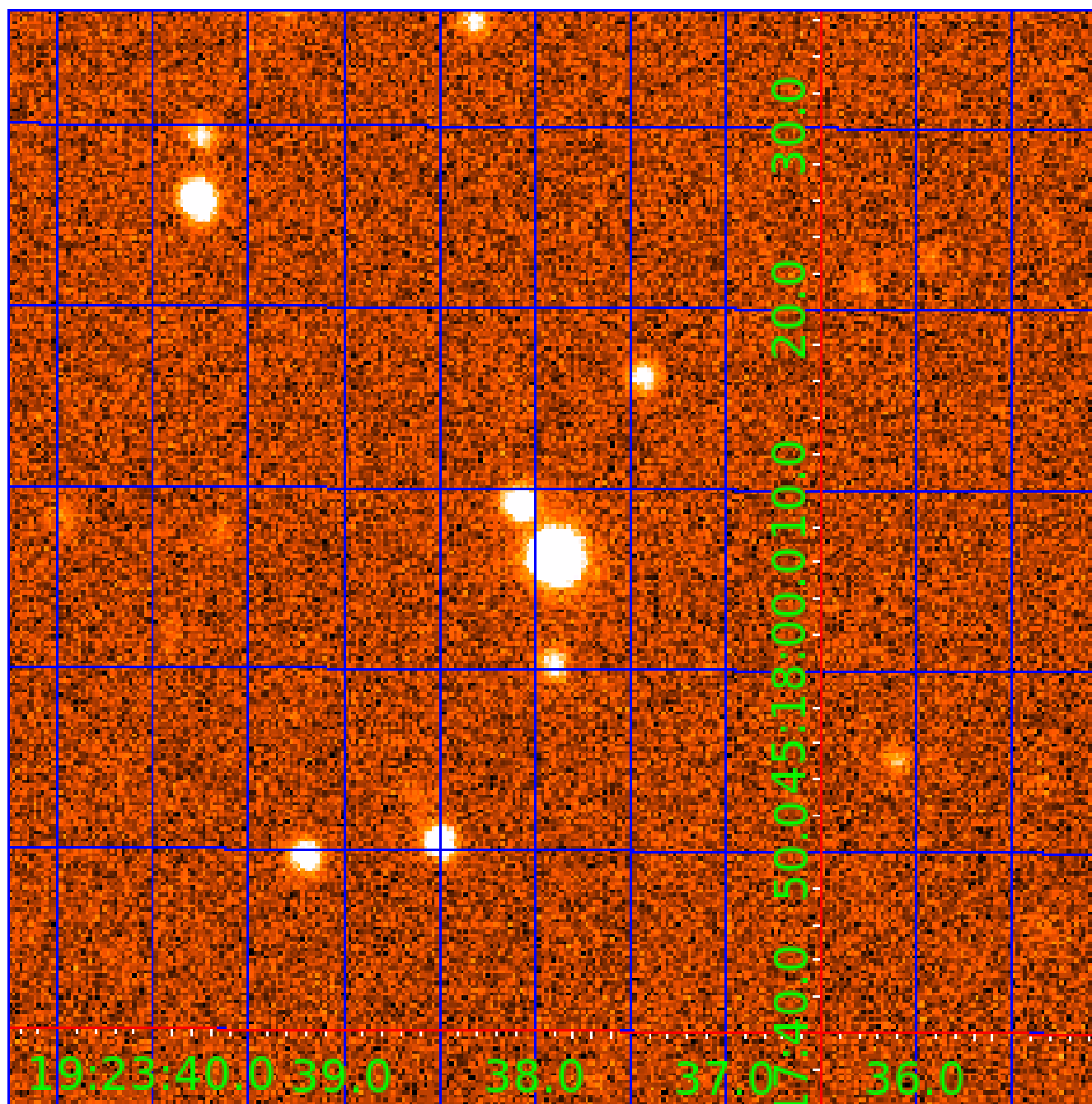


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009019435

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})
009019435-01	OBS	No	537.357404	346.754700	2421.5	3.754	13.5	6.8	0.38	3489	1.92	0.02
009019435-02	OBS	No	320.682349	420.912052	1984.7	6.844	8.4	7.7	0.38	3489	1.68	0.04
009019435-03	OBS	No	243.774838	157.013760	743.2	2.550	11.8	2.7	0.38	3489	1.05	0.06
009019435-04	OBS	No	385.549452	177.602068	2028.4	2.989	11.2	7.6	0.38	3489	1.71	0.03

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009019435-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009019435-02	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
009019435-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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
009019435-04	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—INCONSISTENT_TRANS—CENT_KIC_POS

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

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

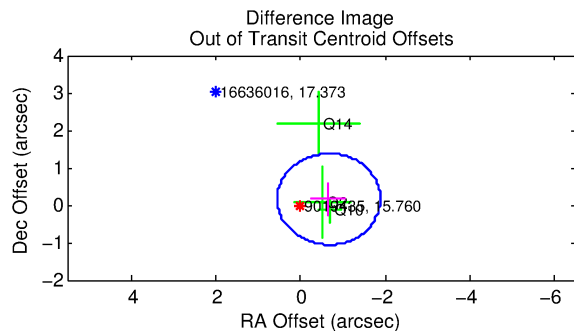
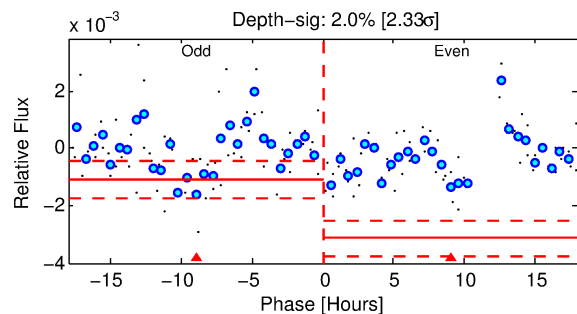
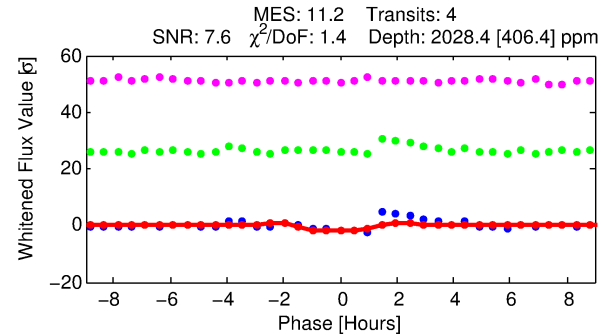
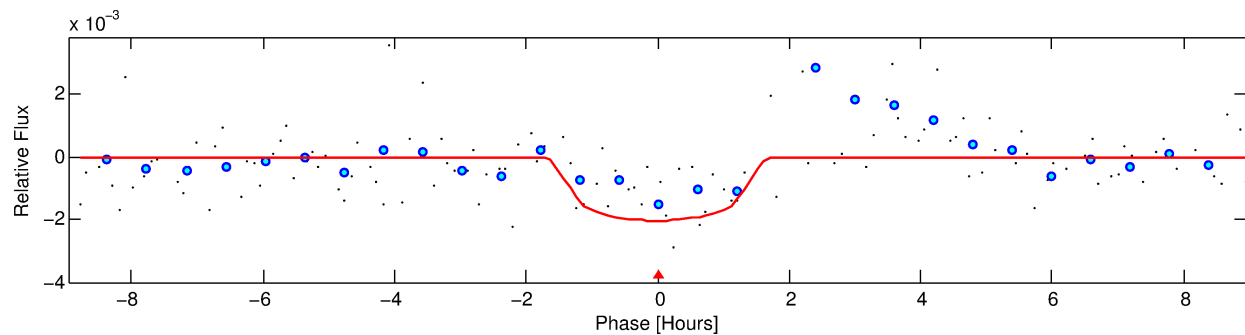
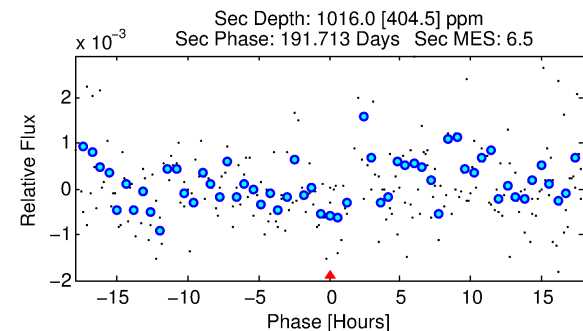
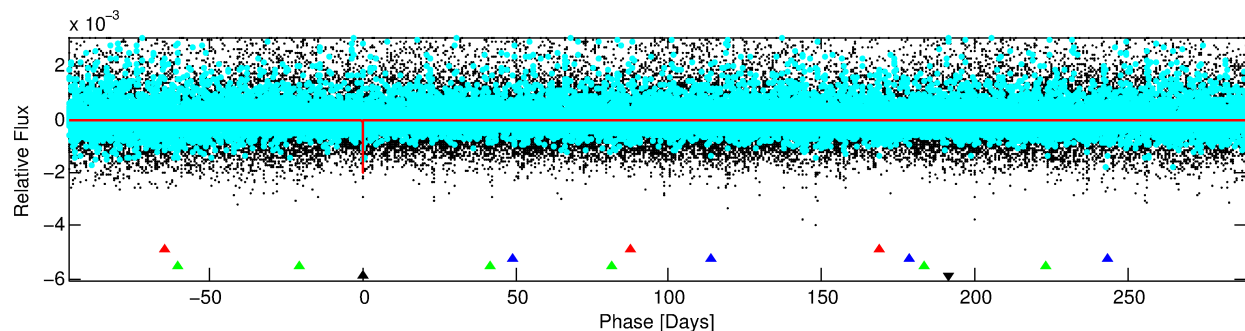
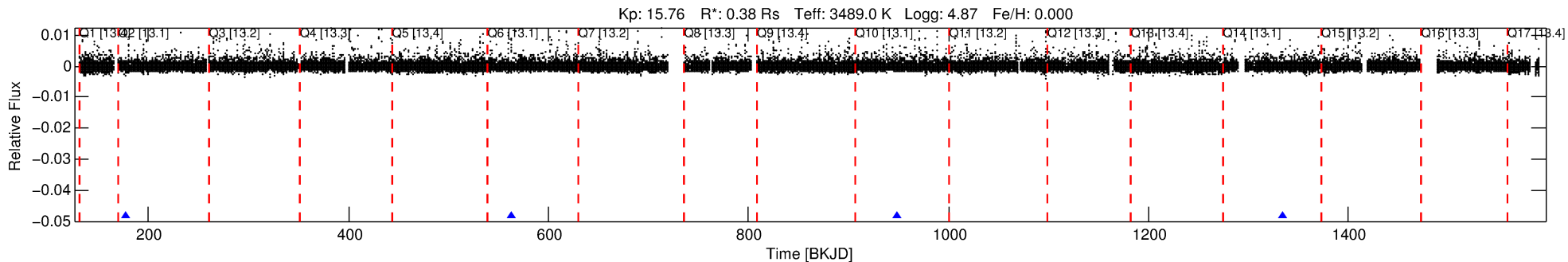
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009019435-04

No Significant Match Found

DV One-Page Summary

KIC: 9019435 Candidate: 4 of 4 Period: 385.549 d



DV Fit Results:

Period = 385.54945 [0.00425] d
Epoch = 177.6021 [0.0084] BKJD
Rp/R* = 0.0412 [0.1175]
a/R* = 972.91 [11722.54]
b = 0.33 [32.58]
Seff = 0.03 [0.01]
Teq = 109 [5] K
Rp = 1.70 [4.87] Re
a = 0.7554 [0.0896] AU
Ag = 109741.83 [627375.50] [0.17σ]
Teffp = 3068 [4384] K [0.67σ]

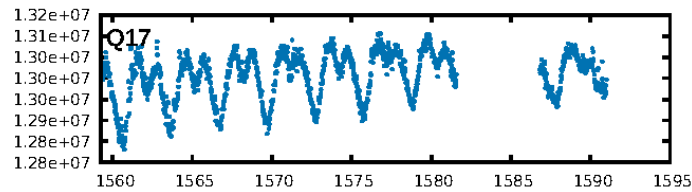
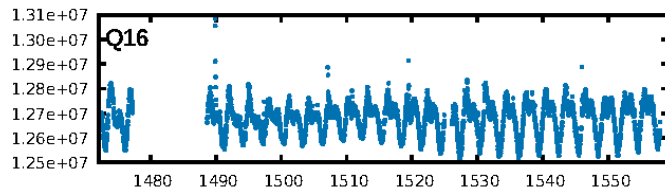
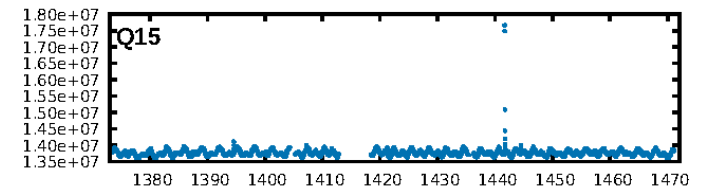
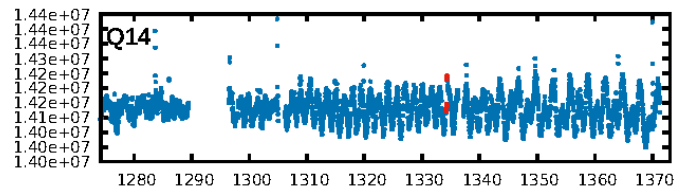
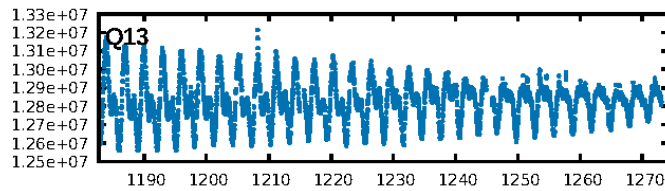
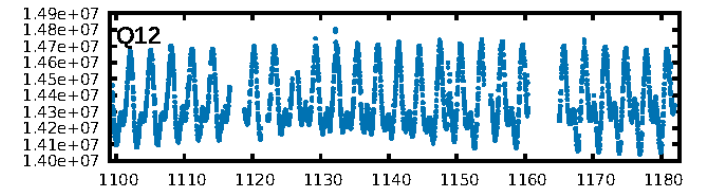
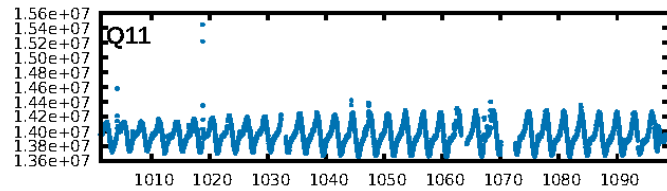
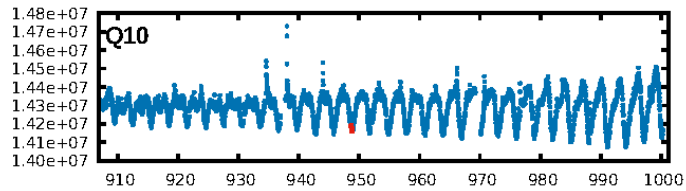
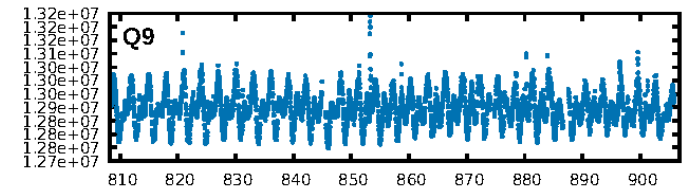
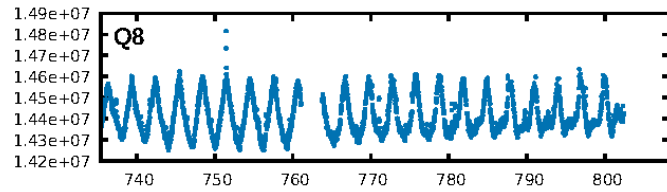
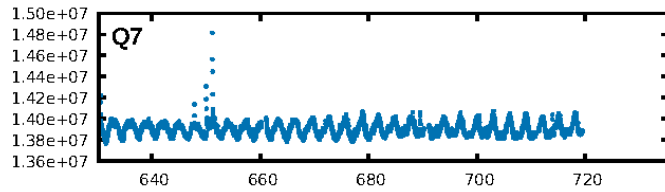
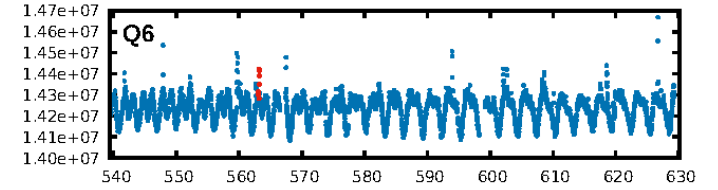
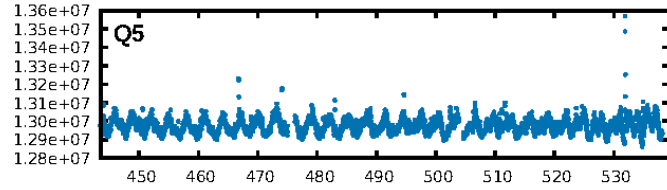
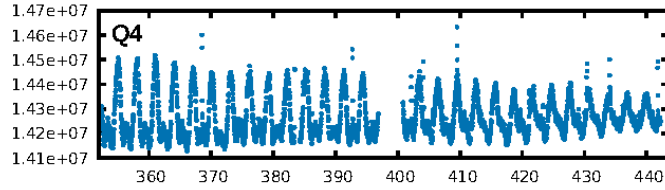
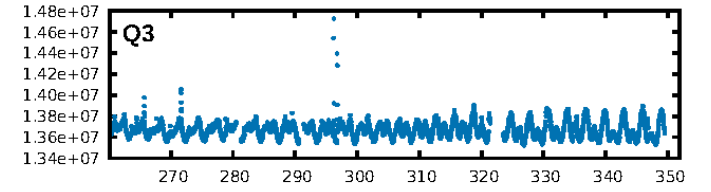
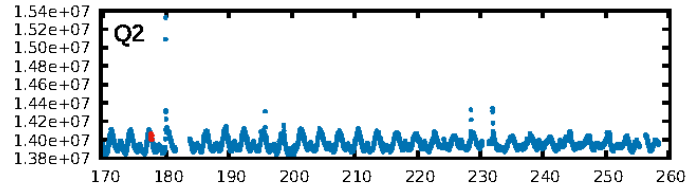
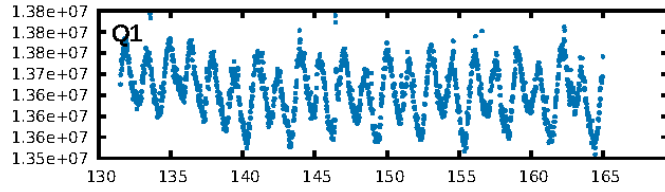
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [208.46σ]
LongPeriod-sig: 100.0% [759.19σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 43.1%
Bootstrap-pfa: 7.95e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.291
Centroid-sig: N/A
Centroid-so: 1.595 arcsec [1.39σ]
OotOffset-rm: 0.685 arcsec [1.69σ]
KicOffset-rm: 0.800 arcsec [1.52σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [4/4]

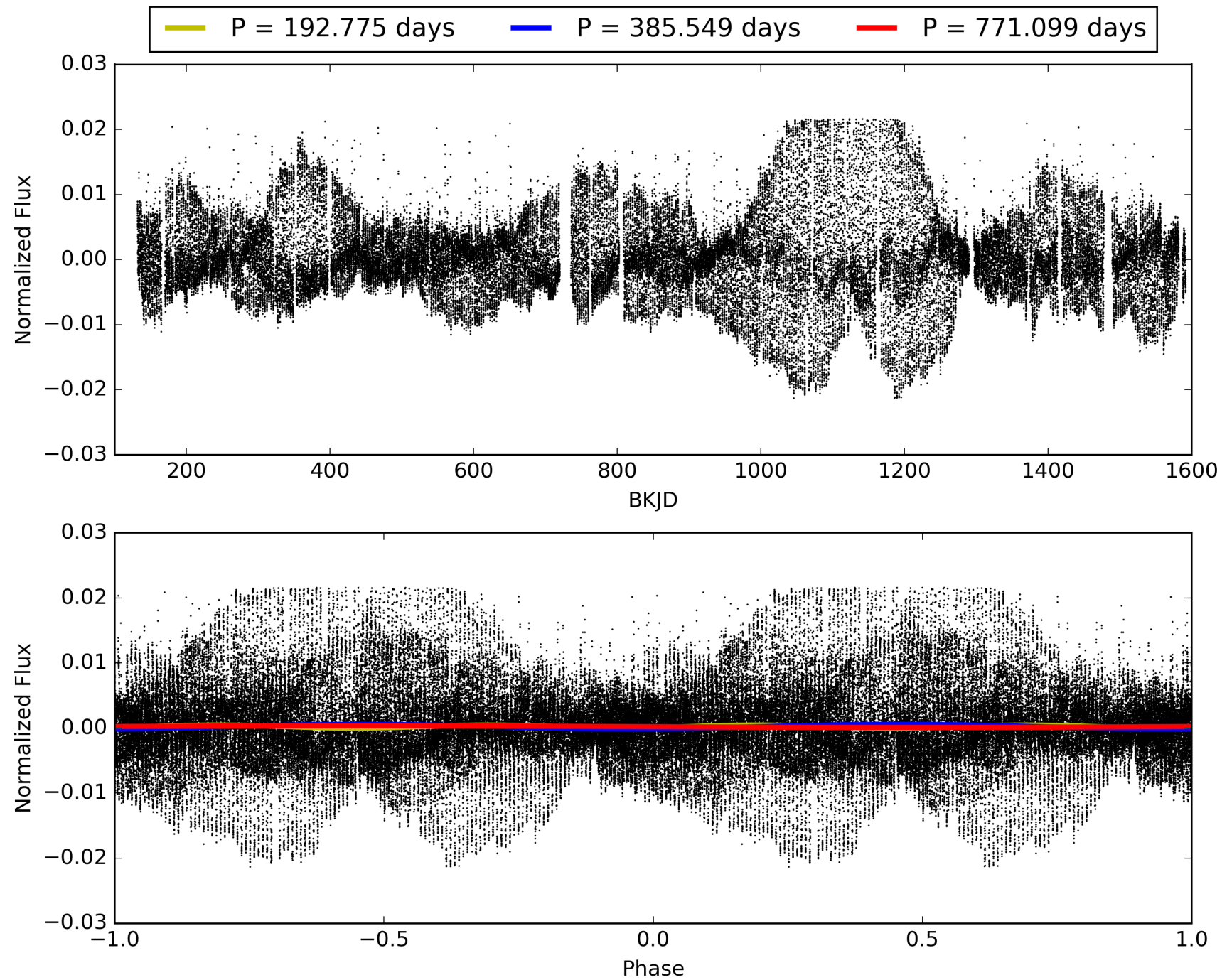
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:32:17 Z

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

TCE 009019435-04, PDC Light Curves

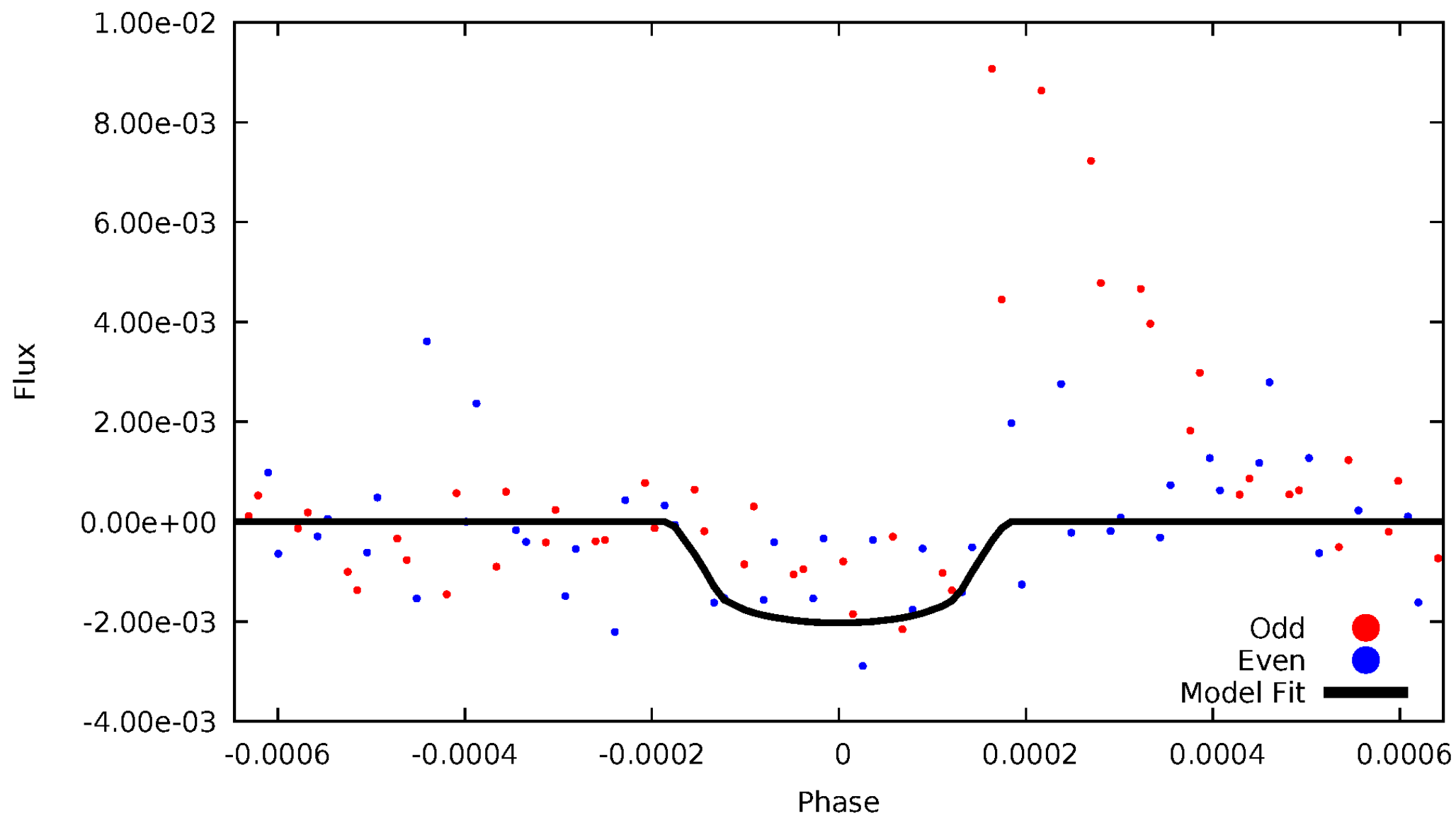


TCE 009019435-04



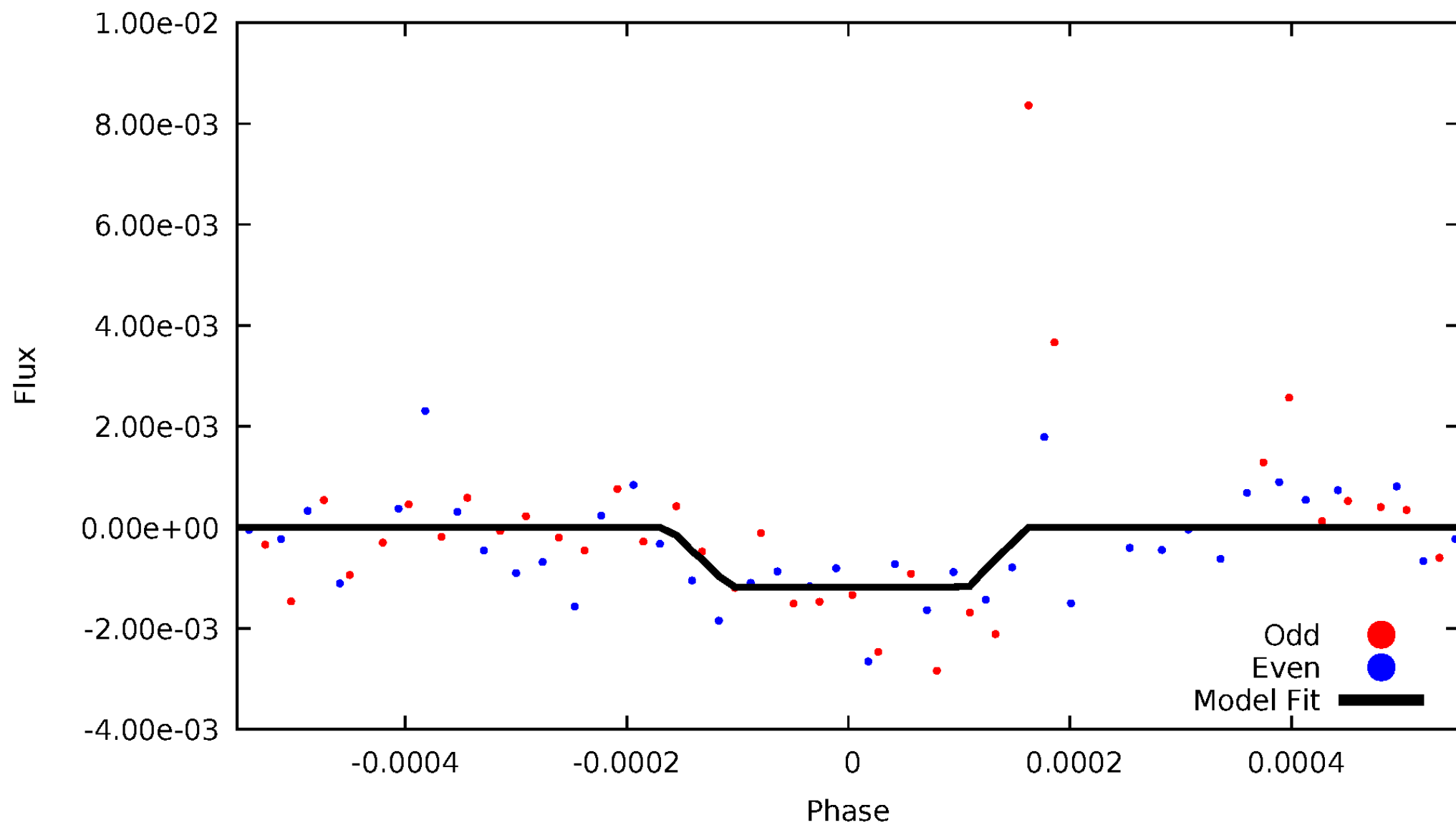
DV Odd/Even

TCE 009019435-04



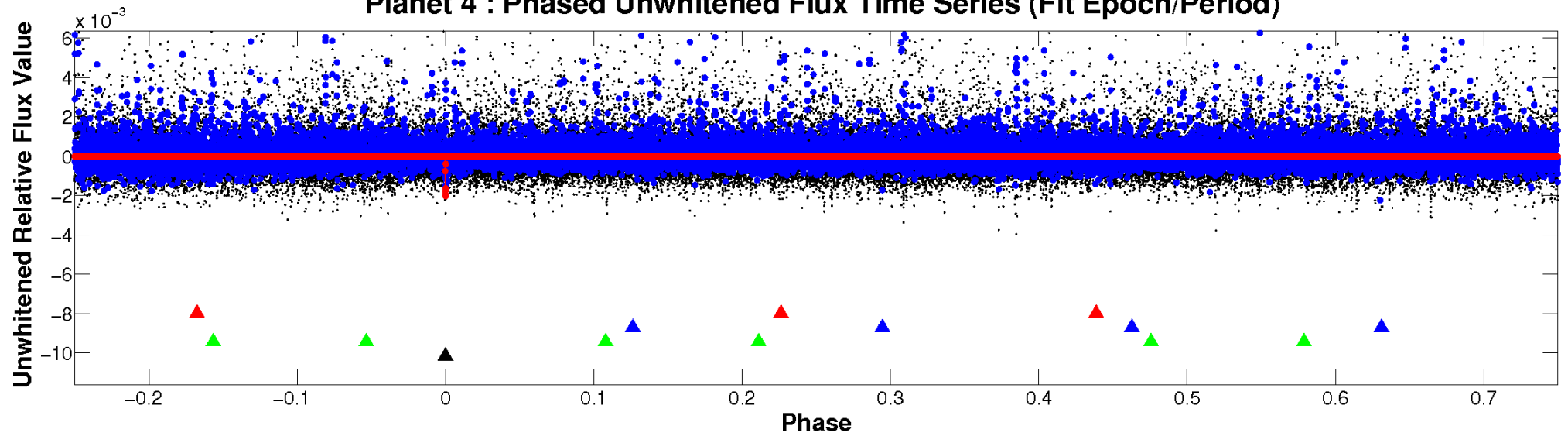
ALT Odd/Even

TCE 009019435-04

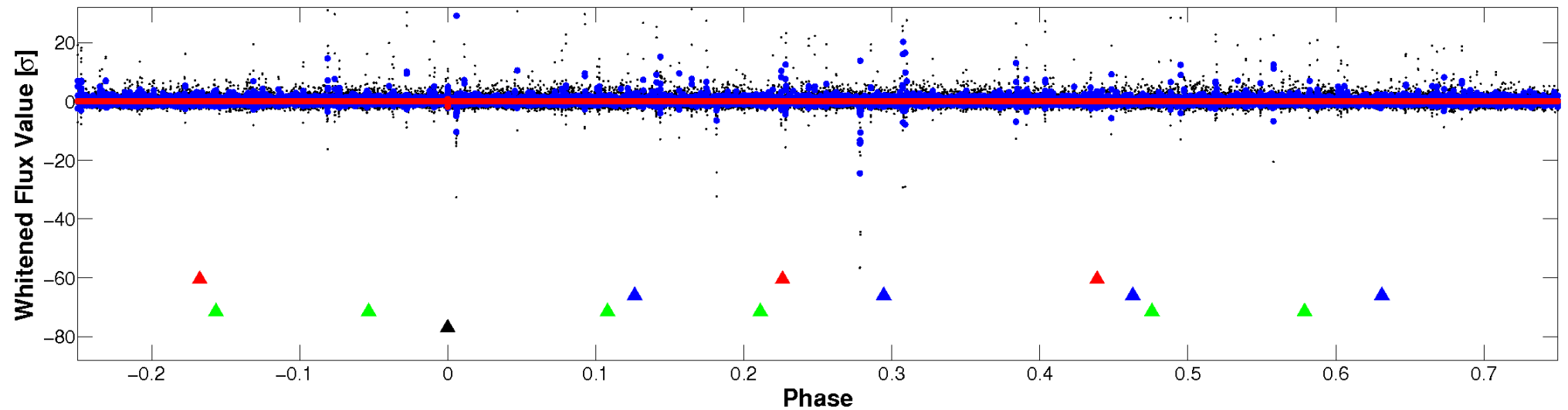


Non-Whitened Vs. Whitened Light Curve

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

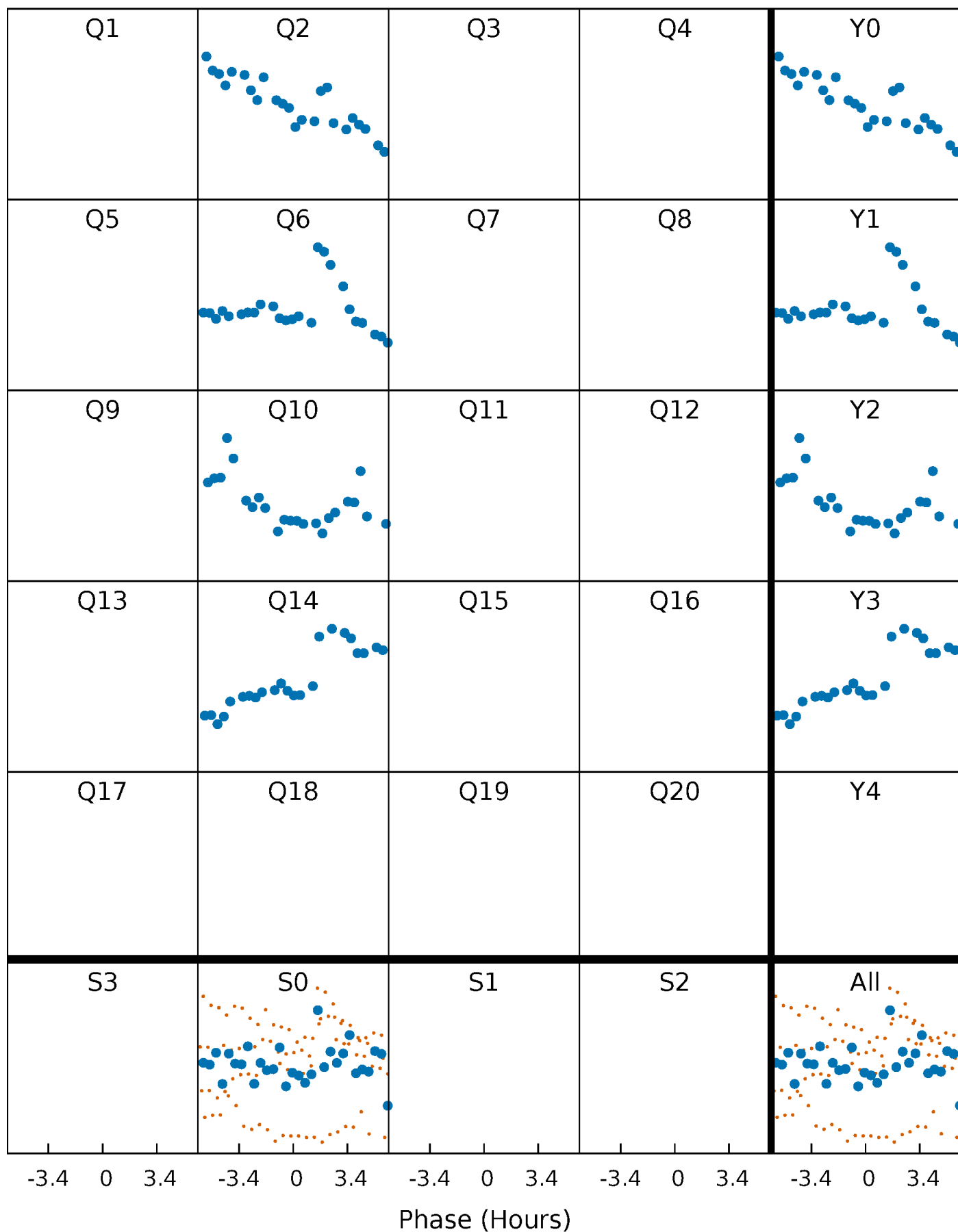


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



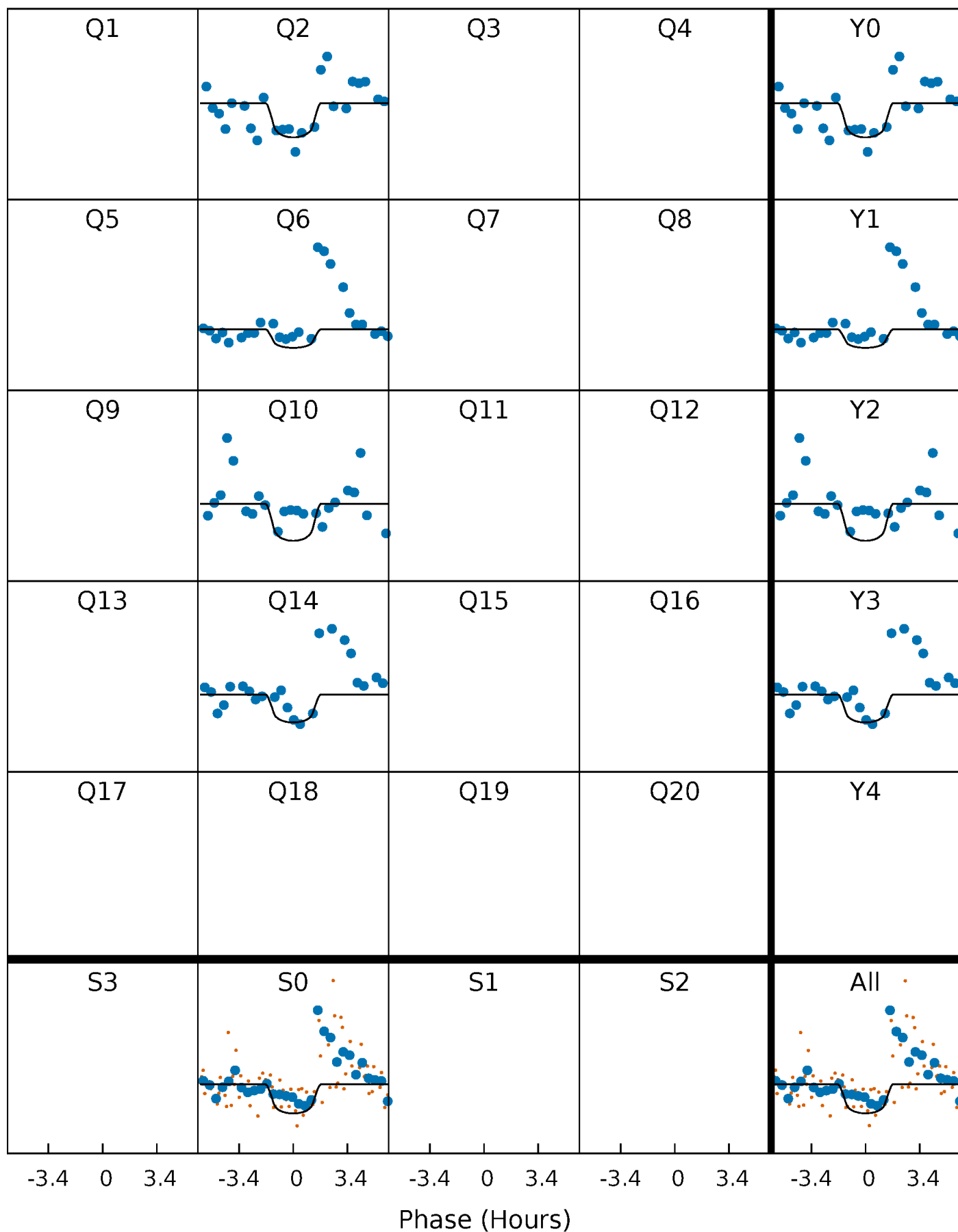
PDC Quarter-Phased Transit Curves

TCE 009019435-04 P=385.549452 Days $T_0=177.602069$ (BKJD)



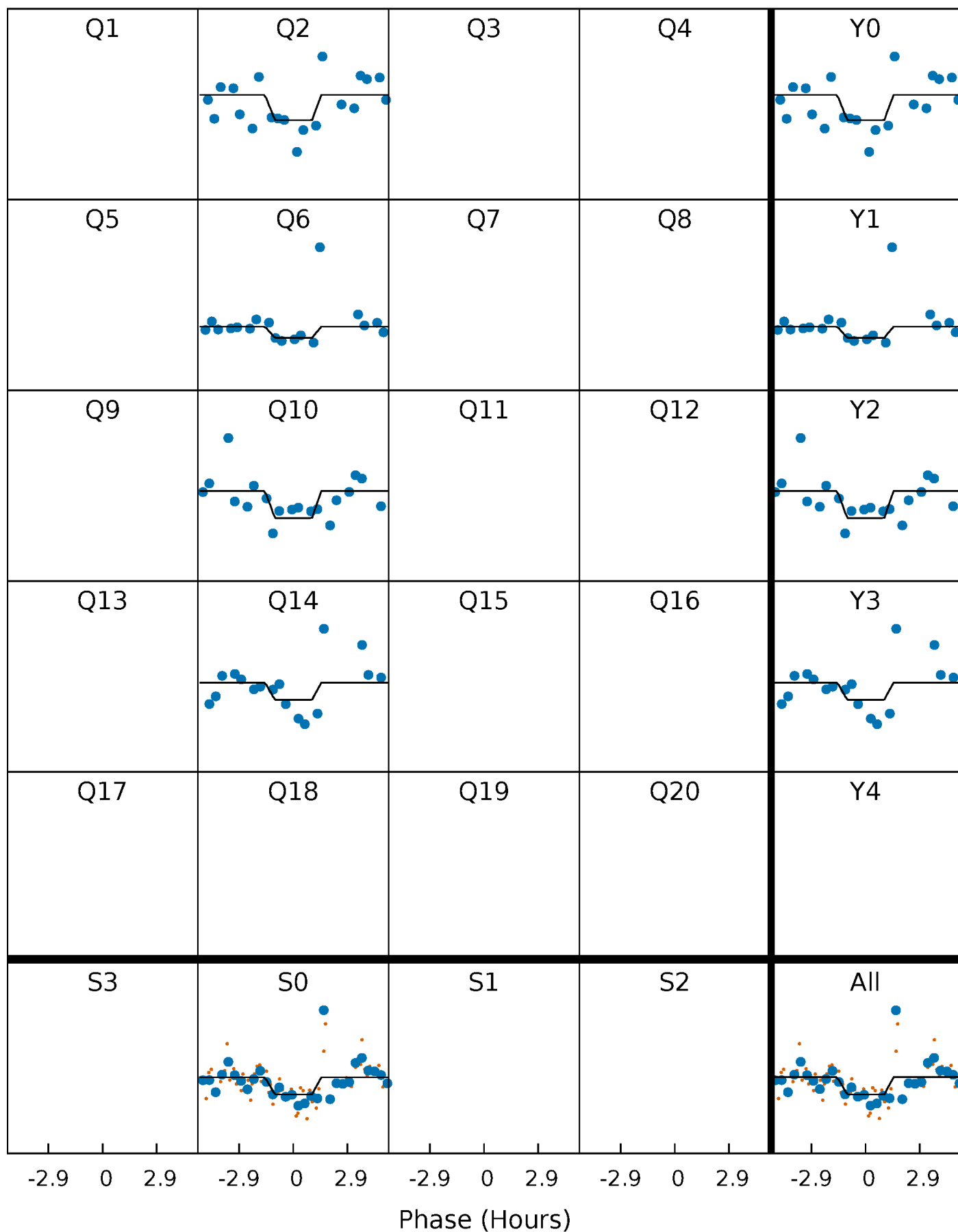
DV Quarter-Phased Transit Curves

TCE 009019435-04 P=385.549452 Days $T_0=177.602069$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

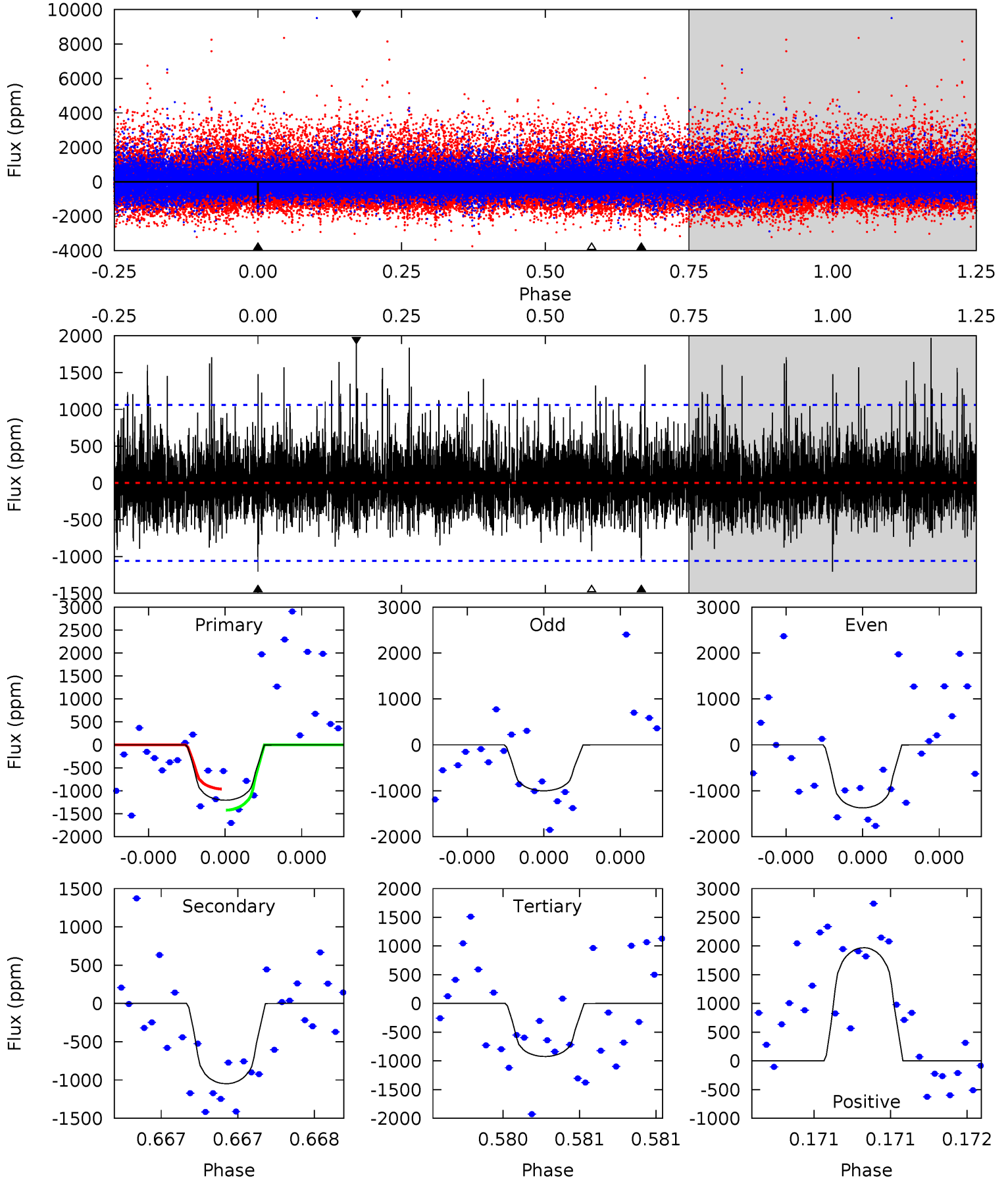
TCE 009019435-04 P=385.546942 Days $T_0=177.605007$ (BKJD)



DV Model-Shift Uniqueness Test

009019435-04, P = 385.549452 Days, E = 177.602069 Days

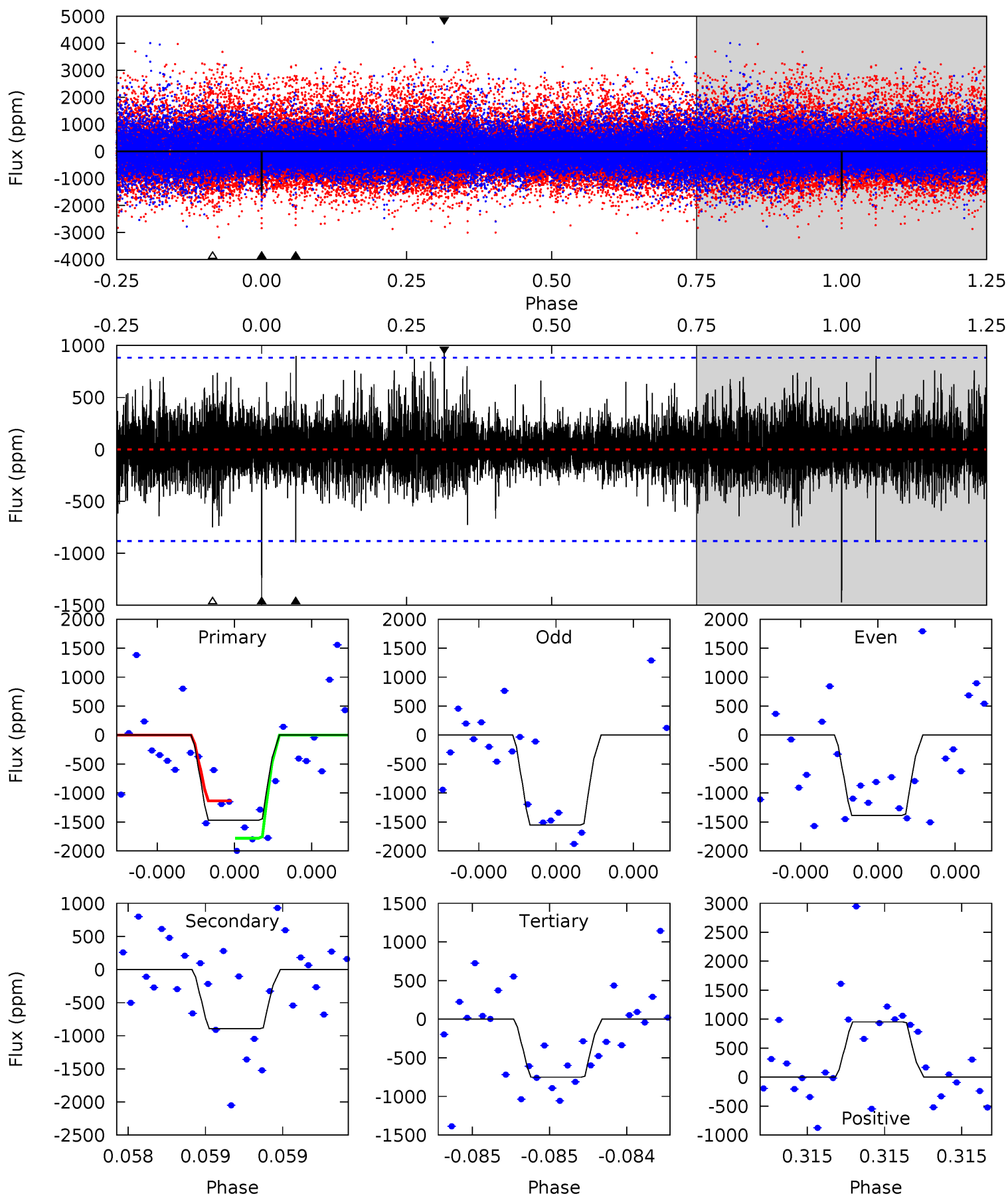
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.40	5.56	4.90	10.5	5.63	3.57	1.67	1.49	-4.06	0.66	-4.90	0.88	1.16	0.62	1.23



Alt Model-Shift Uniqueness Test

009019435-04, P = 385.546942 Days, E = 177.605007 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.43	5.74	4.81	6.11	5.66	3.61	1.16	4.62	3.32	0.92	-0.38	0.54	0.97	0.39	2.08



Stellar Parameters For KIC 009019435

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3489^{+79}_{-88}	$4.868^{+0.066}_{-0.048}$	$0.000^{+0.100}_{-0.100}$	$0.379^{+0.050}_{-0.061}$	$0.388^{+0.054}_{-0.075}$	$10.030^{+3.917}_{-1.976}$
	+2%/-3%	+1%/-1%	+inf%/-inf%	+13%/-16%	+14%/-19%	+39%/-20%
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 009019435-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1048 ± 188	$3.92^{+3.68}_{-2.73}$	152^{+5}_{-5}	2570^{+1088}_{-373}	$20813^{+216474}_{-15475}$
Alt.	-894 ± 156	$3.83^{+4.08}_{-2.65}$	152^{+5}_{-6}	2529^{+979}_{-378}	$20016^{+175342}_{-15333}$

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 $A_{obs} \gg 1.0$

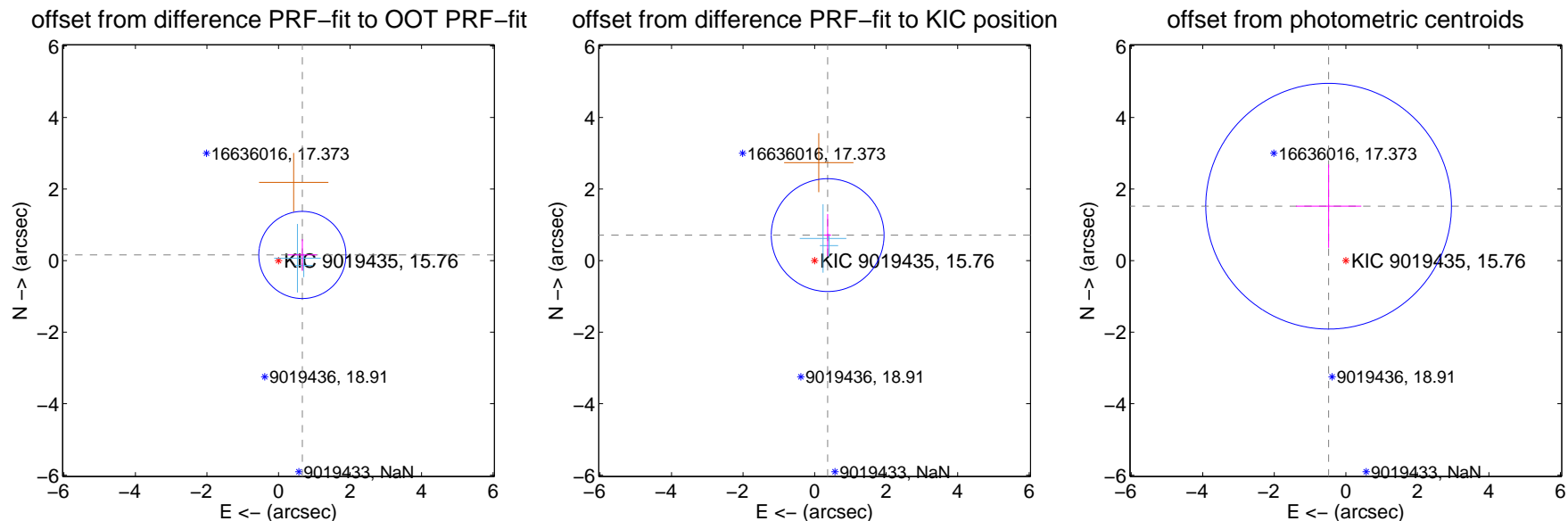
DV Centroid Data

Supplemental centroid analysis for 009019435-04. Kepler magnitude: 15.76. Transit SNR 7.58

There are 2 quarters with good PRF difference image offsets

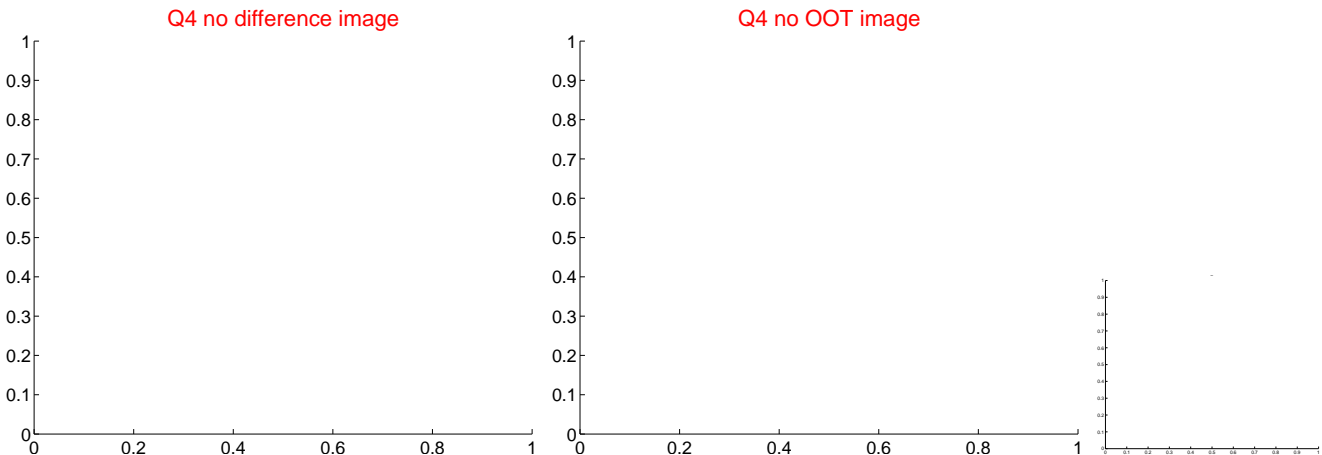
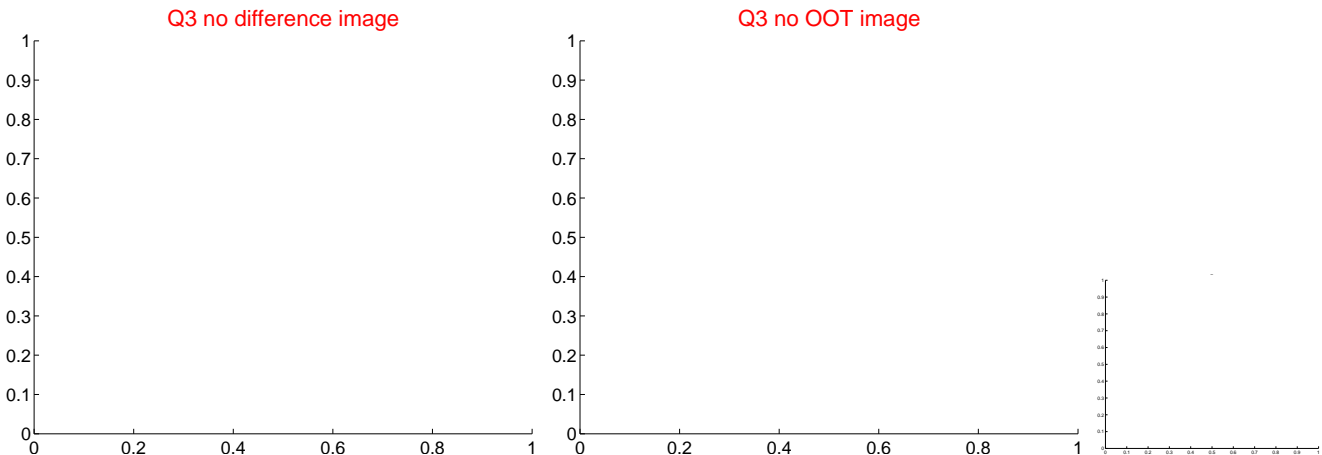
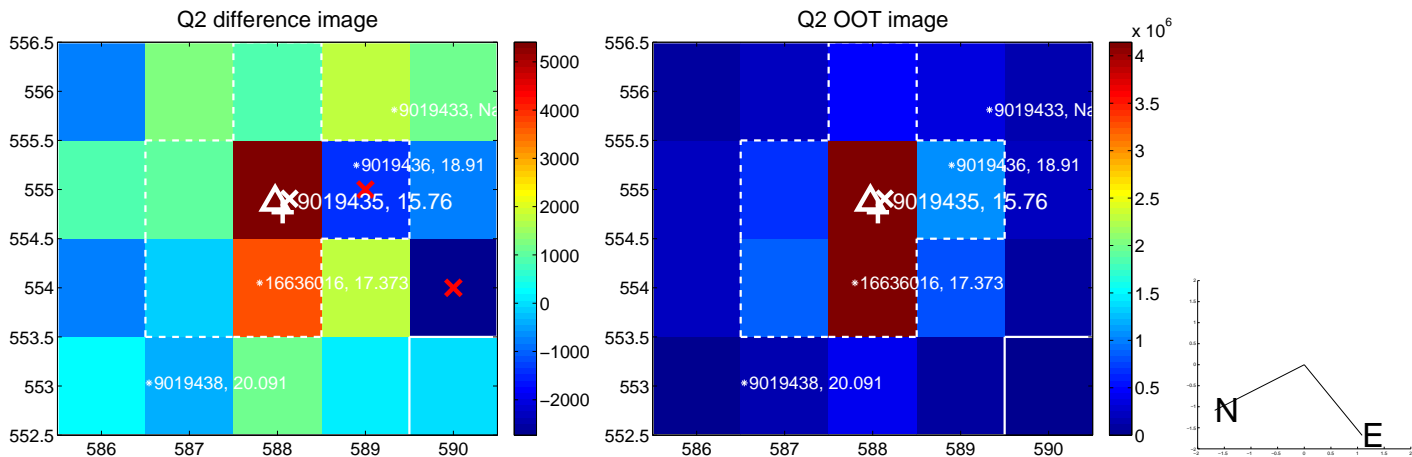
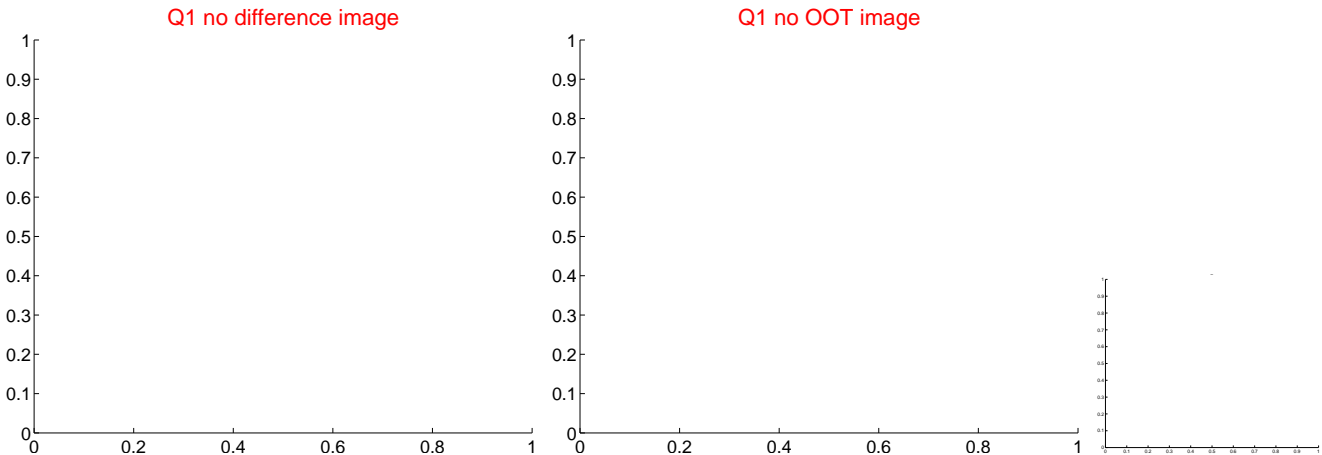
The direct PRF centroid is offset from the target star catalog position by about 0.63 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.685 ± 0.406	1.69	-0.667 ± 0.404	0.157 ± 0.440
PRF-fit source offset from KIC position	0.800 ± 0.526	1.52	-0.365 ± 0.095	0.712 ± 0.589
photometric centroid source offset	1.60 ± 1.14	1.39	0.48 ± 0.91	1.52 ± 1.17

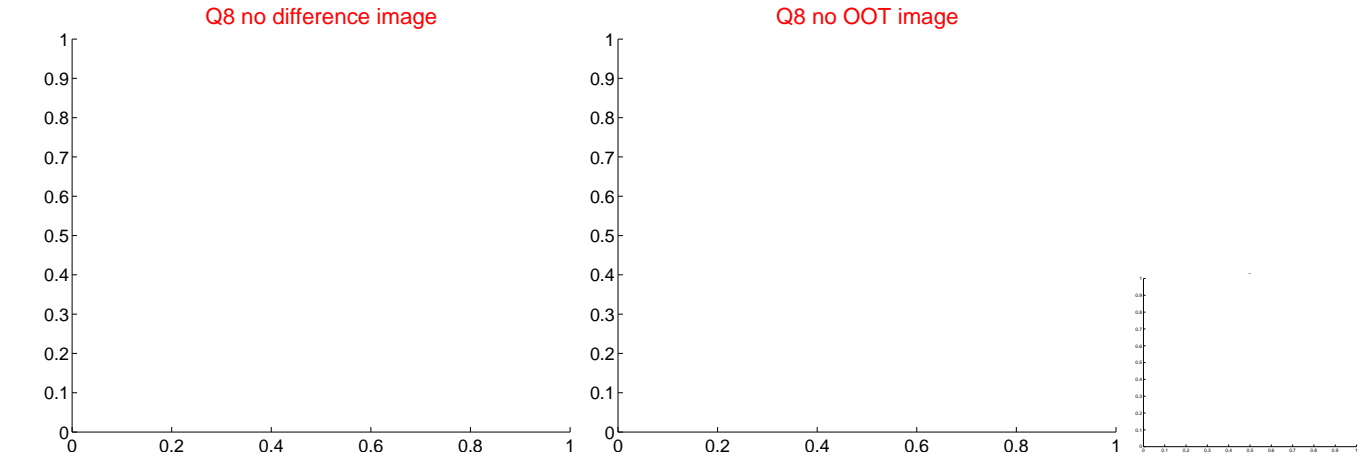
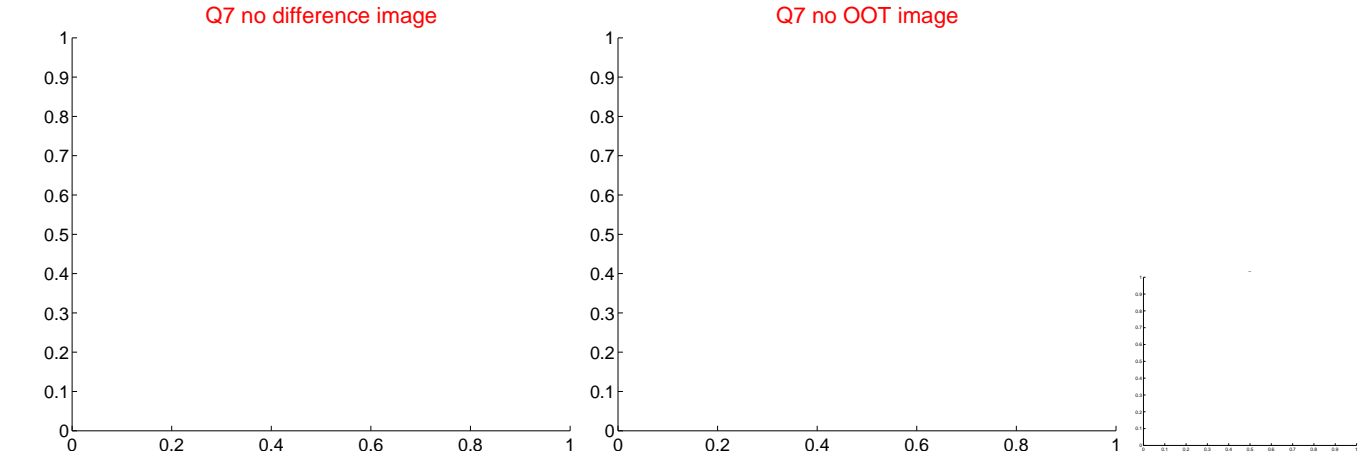
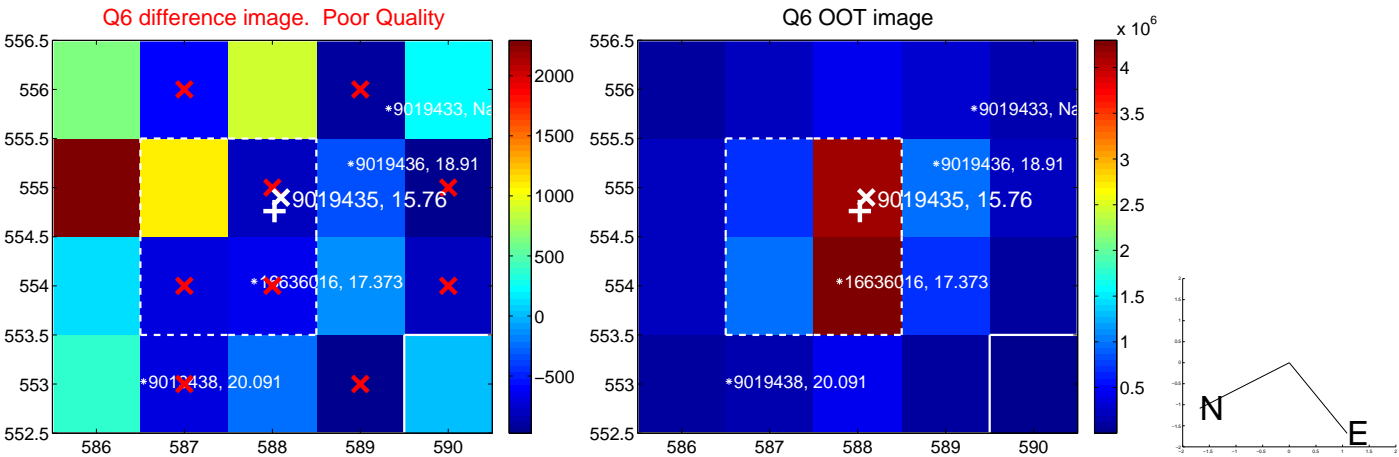
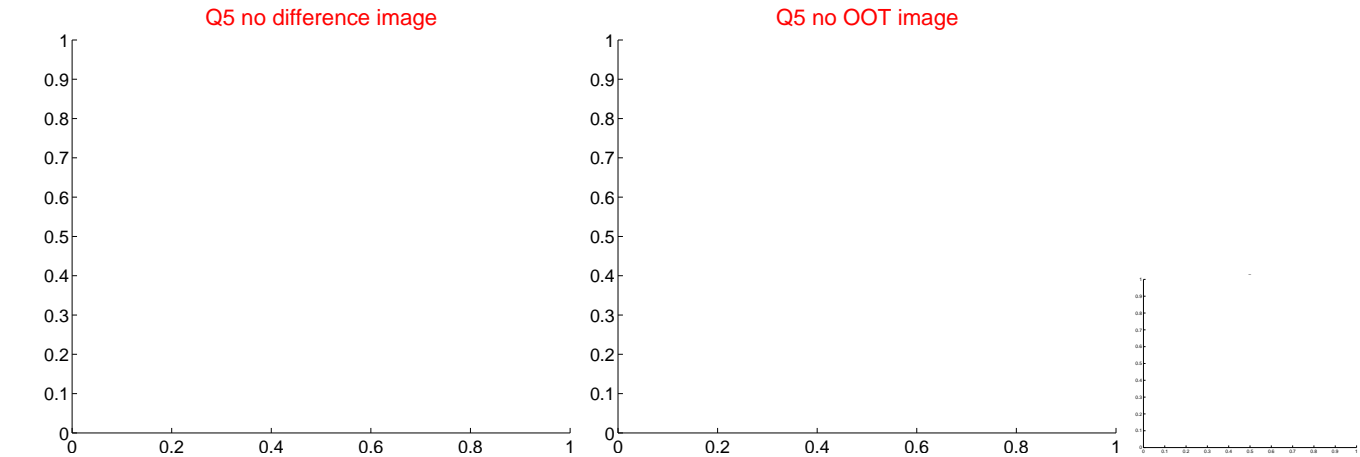


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

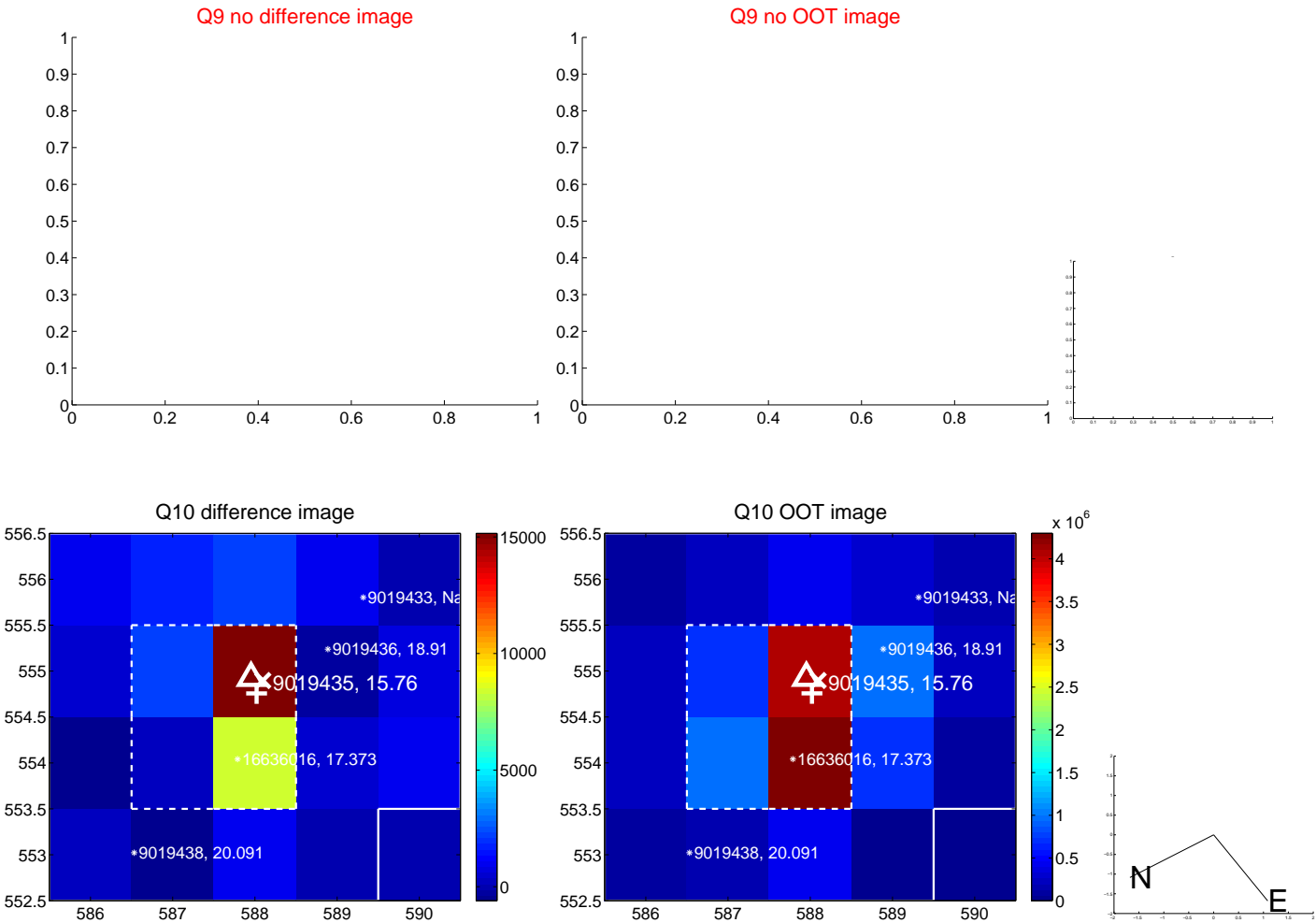
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



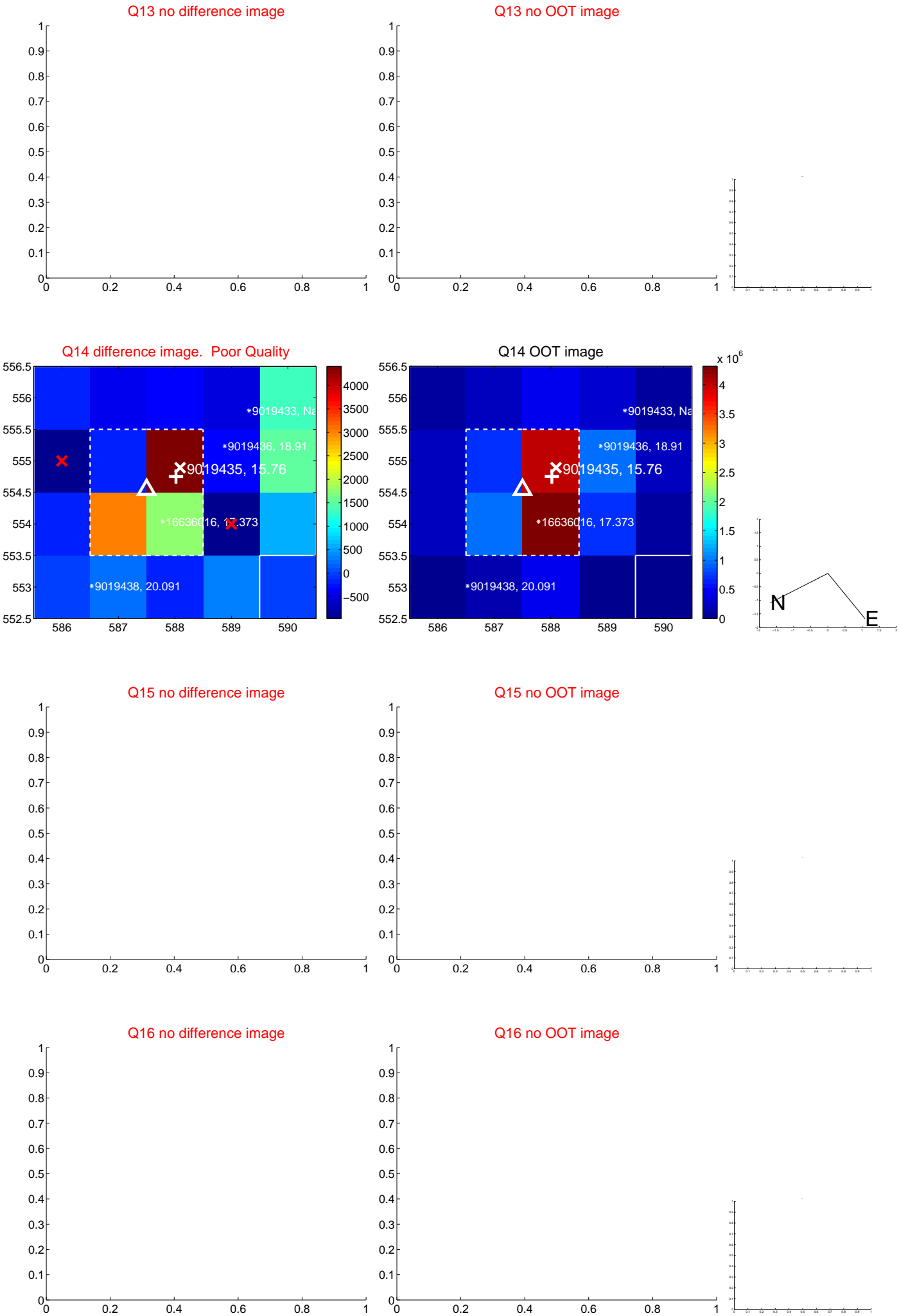
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



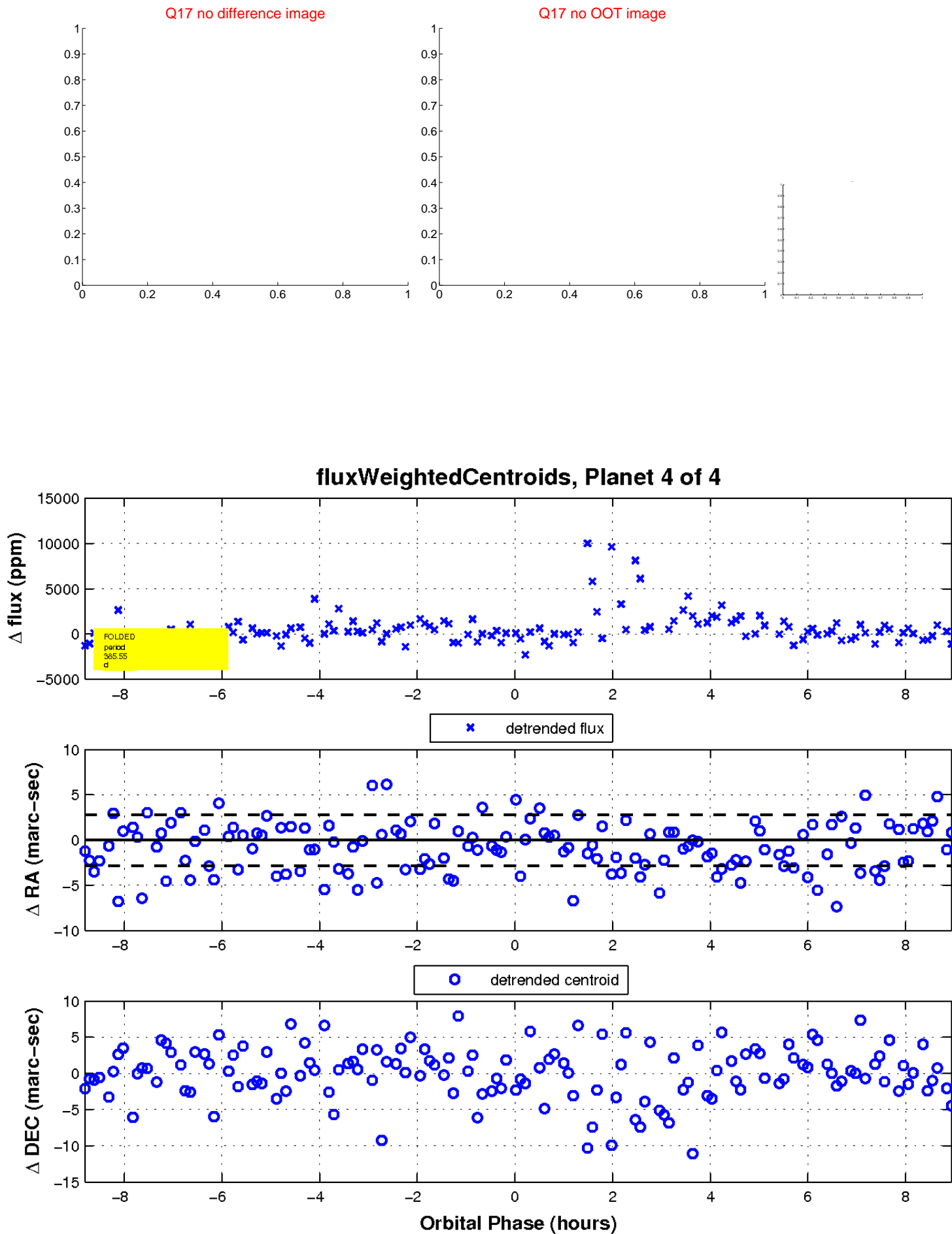
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

