

KIC 008409191

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})
008409191-01	OBS	No	592.666269	203.440229	1044.5	6.259	13.0	7.4	1.25	6139	4.47	1.03
008409191-02	OBS	No	385.062714	249.931203	939.8	2.643	11.7	7.4	1.25	6139	3.85	1.83
008409191-03	OBS	No	449.509433	459.701694	808.1	6.707	9.8	6.2	1.25	6139	3.83	1.49

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008409191-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008409191-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008409191-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—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.

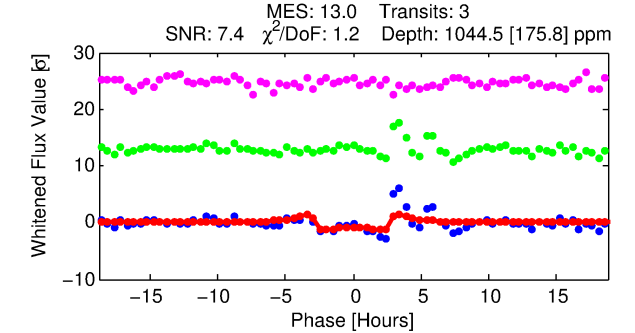
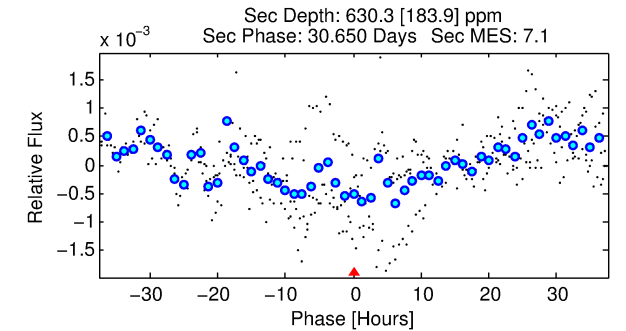
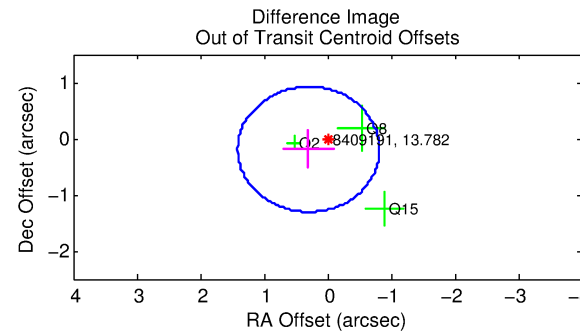
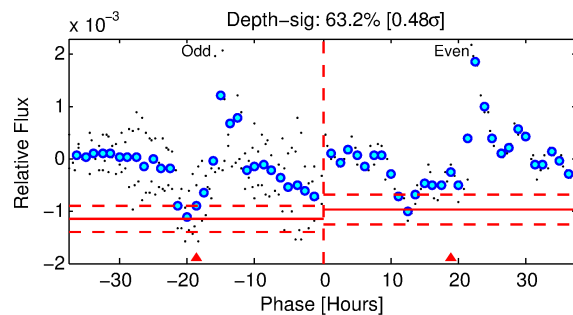
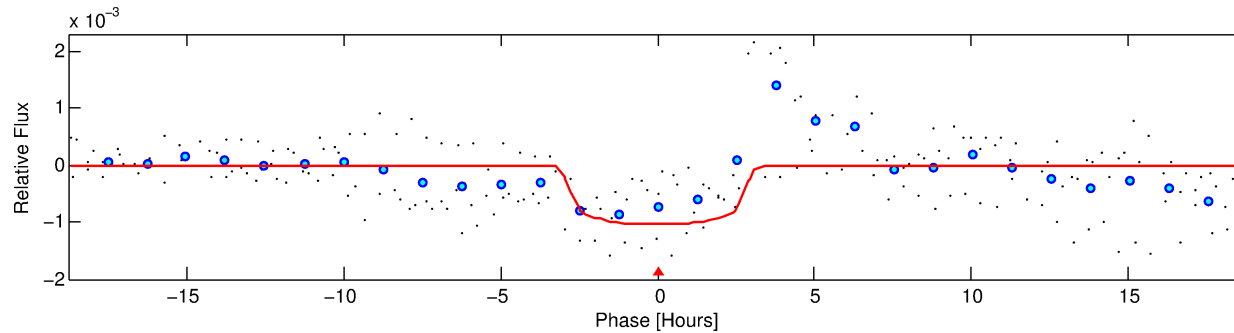
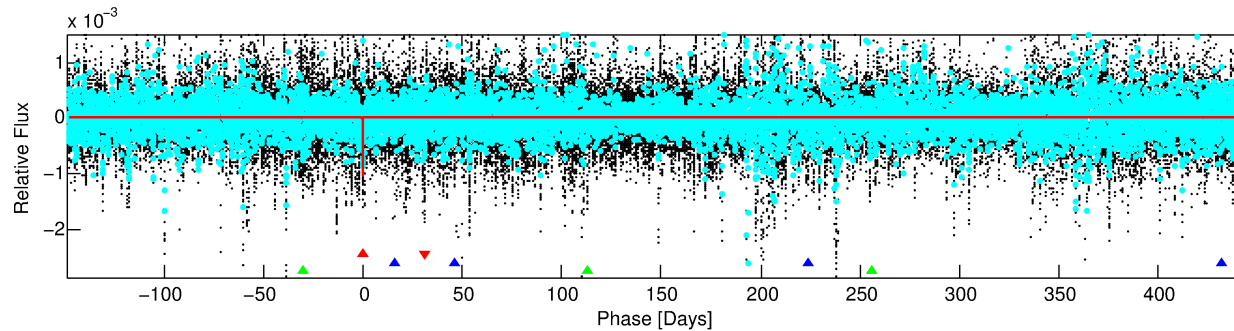
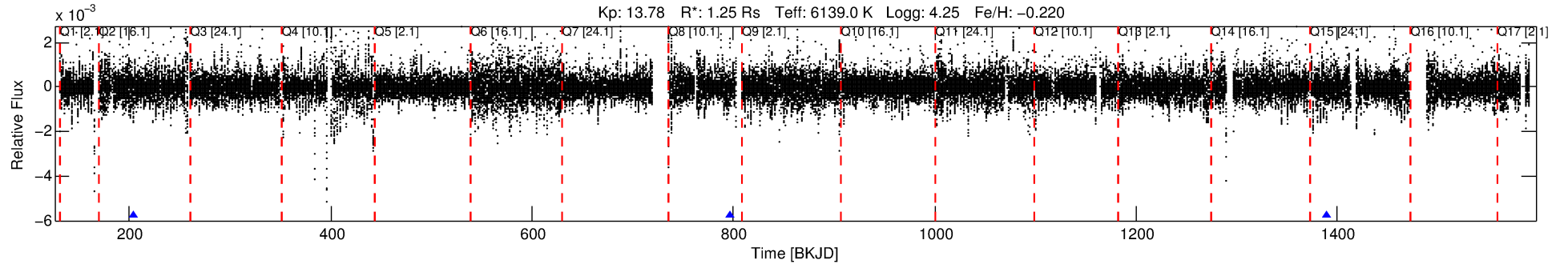
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008409191-01

No Significant Match Found

DV One-Page Summary

KIC: 8409191 Candidate: 1 of 3 Period: 592.666 d



DV Fit Results:

Period = 592.66627 [0.00546] d
Epoch = 203.4402 [0.0073] BKJD
Rp/R* = 0.0329 [0.0060]
a/R* = 466.50 [333.68]
b = 0.81 [0.32]
Seff = 1.03 [0.37]
Teq = 257 [23] K
Rp = 4.47 [1.50] Re
a = 1.3865 [0.3270] AU
Ag = 33381.41 [19328.87] [1.73 σ]
Teffp = 5366 [652] K [7.83 σ]

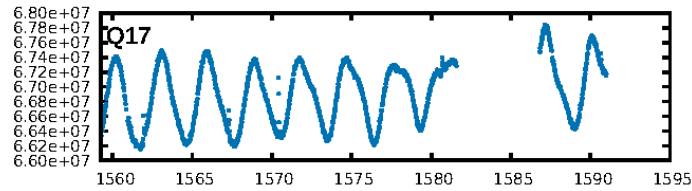
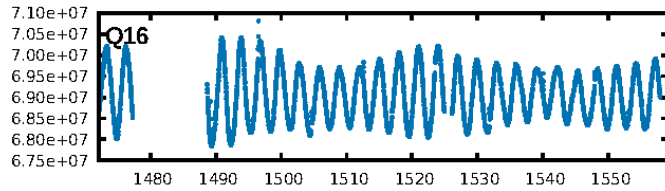
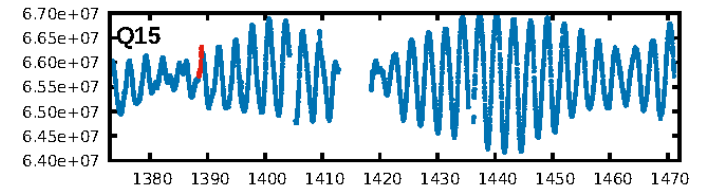
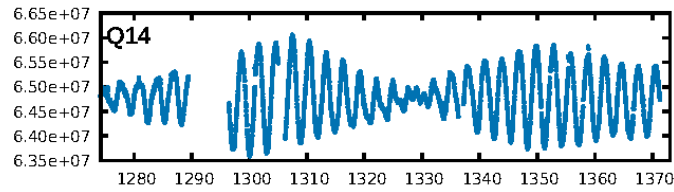
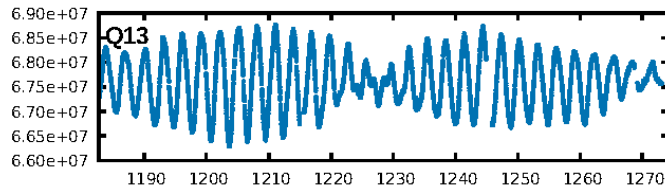
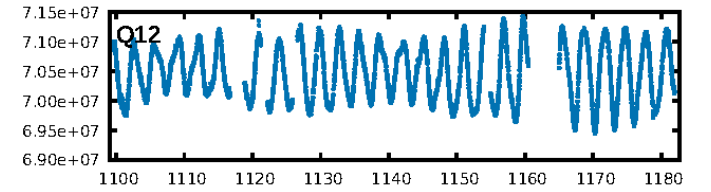
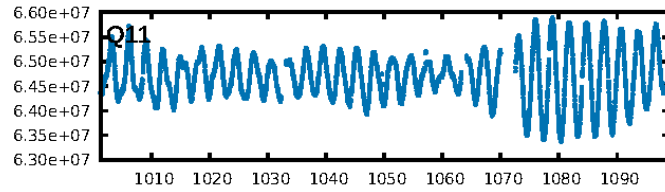
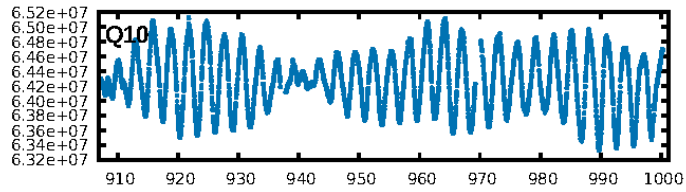
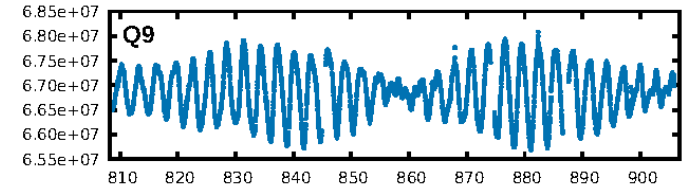
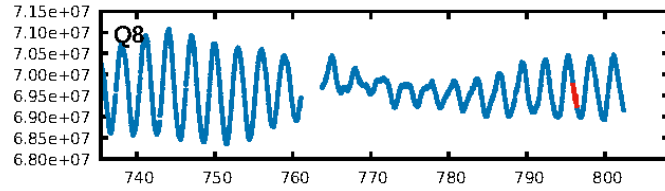
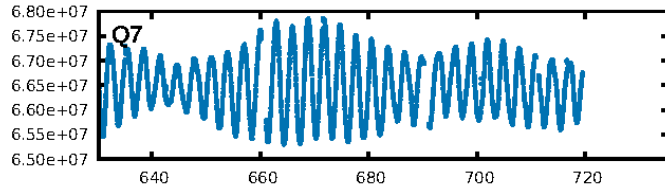
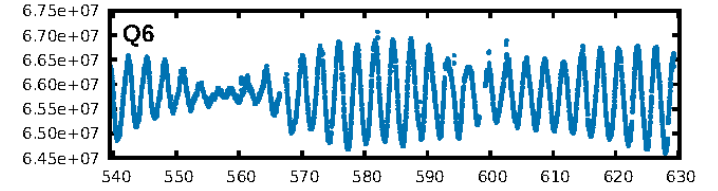
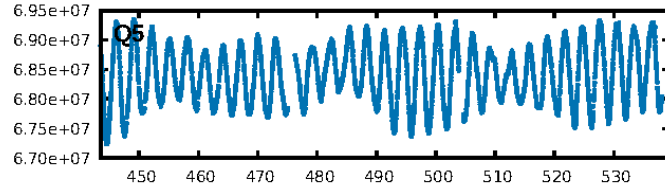
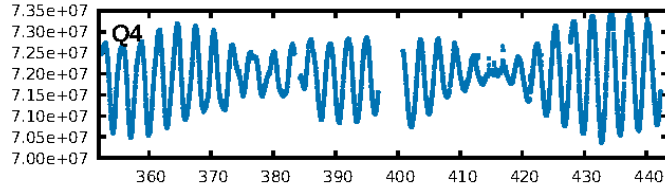
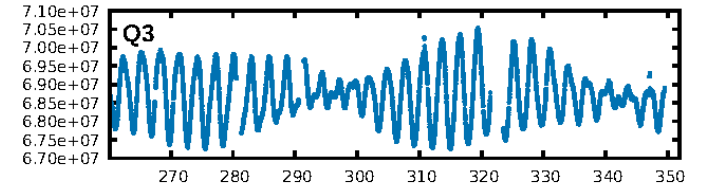
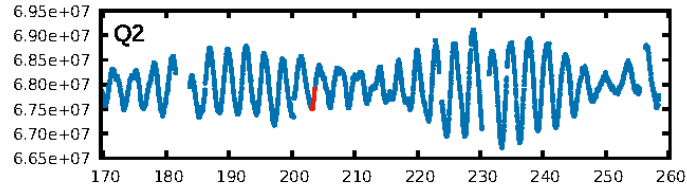
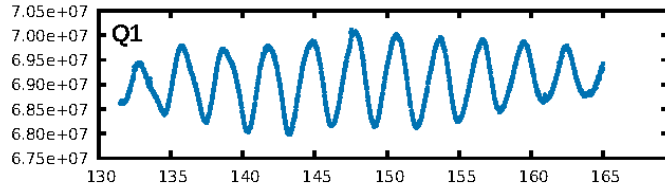
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [374.51 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 1.3%
ModelChiSquareGof-sig: 70.5%
Bootstrap-pfa: 3.76e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.03321
Centroid-sig: 28.7%
Centroid-so: 0.664 arcsec [0.82 σ]
OotOffset-rm: 0.355 arcsec [0.96 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.235 arcsec [0.75 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

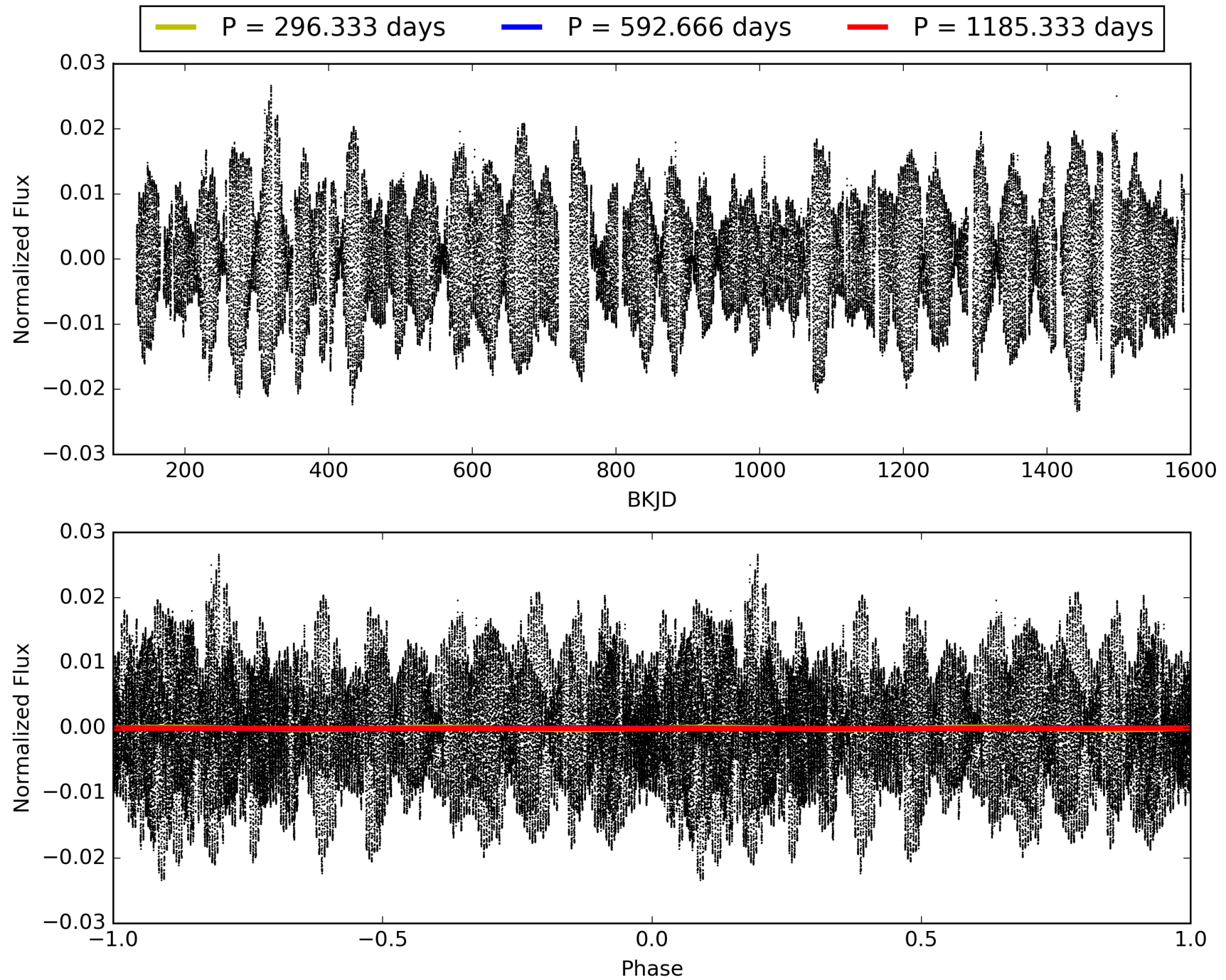
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:43:03 Z

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

TCE 008409191-01, PDC Light Curves

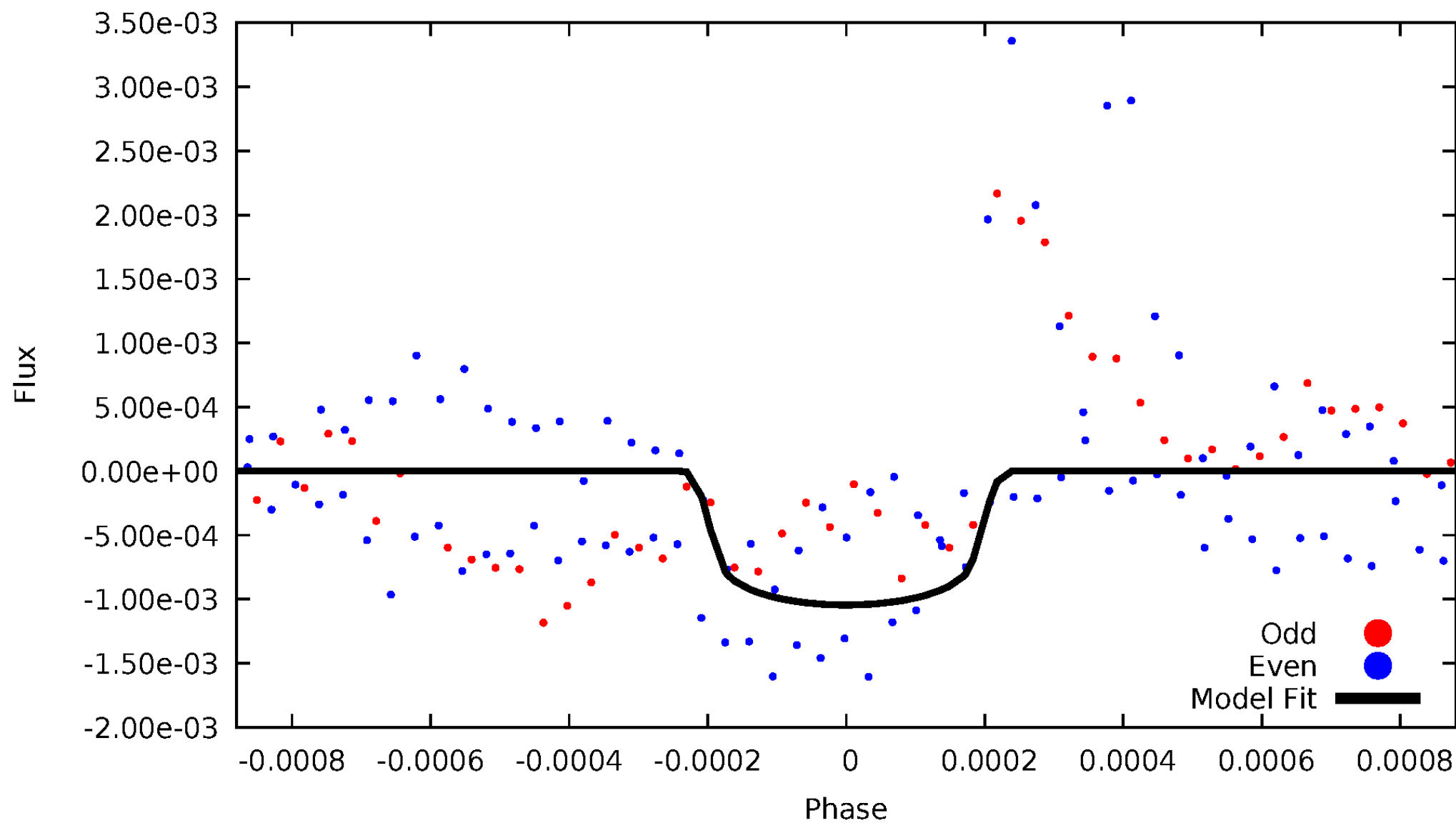


TCE 008409191-01



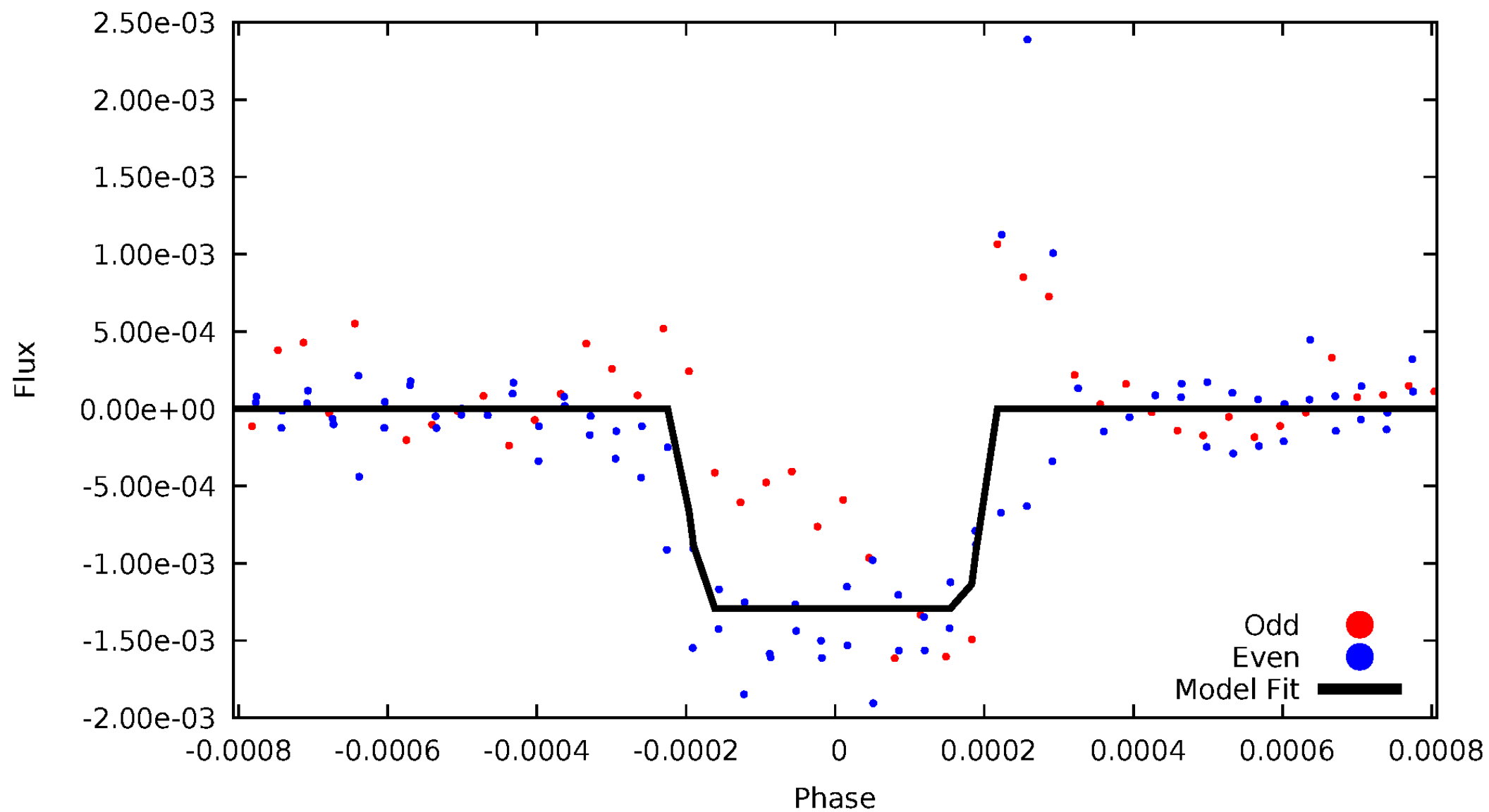
DV Odd/Even

TCE 008409191-01



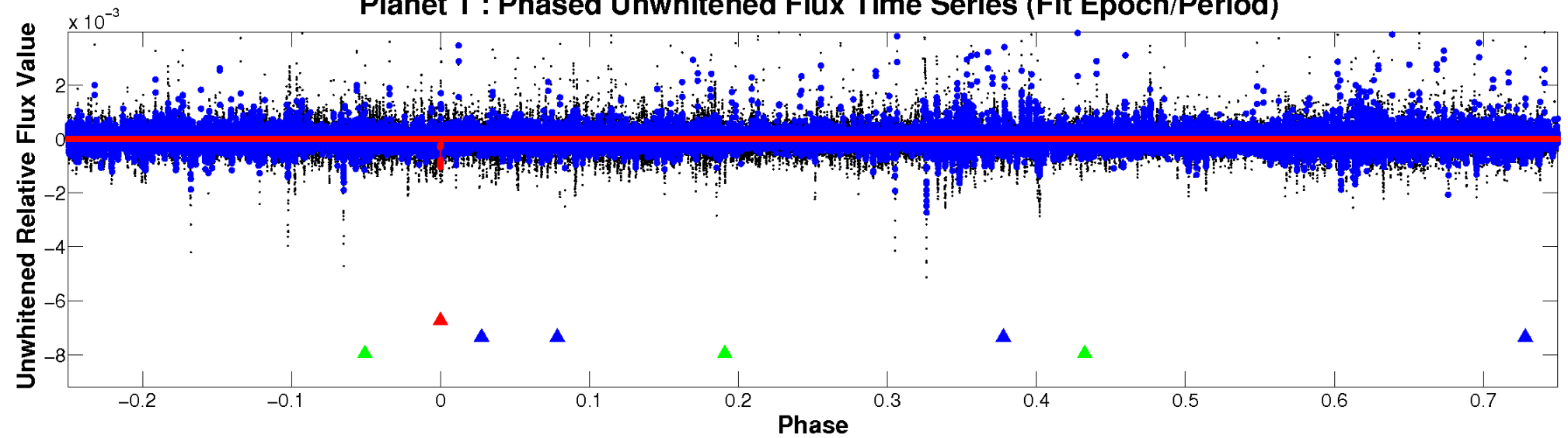
ALT Odd/Even

TCE 008409191-01

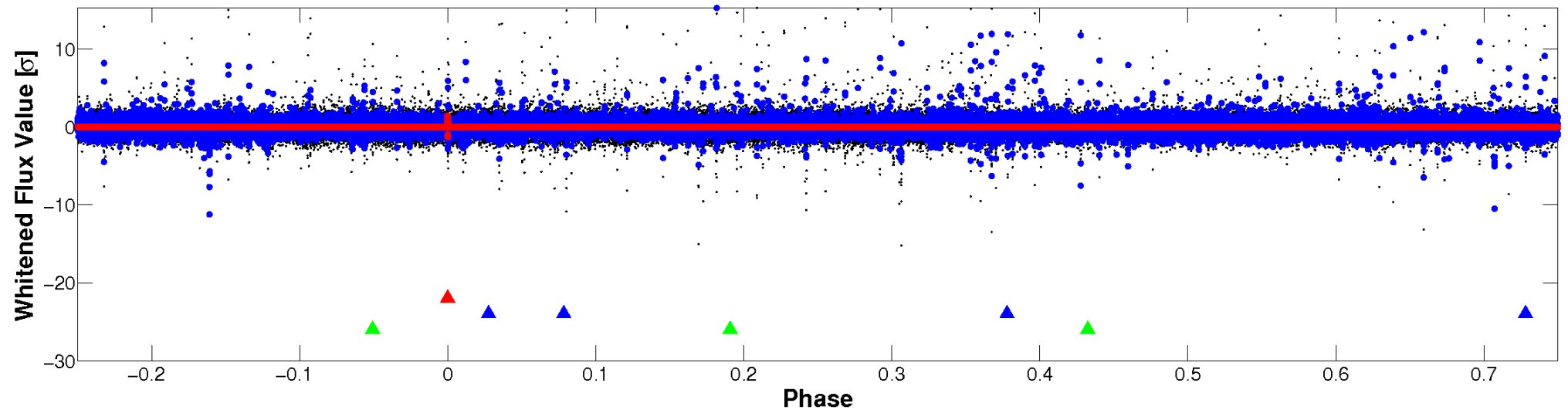


Non-Whitened Vs. Whitened Light Curve

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

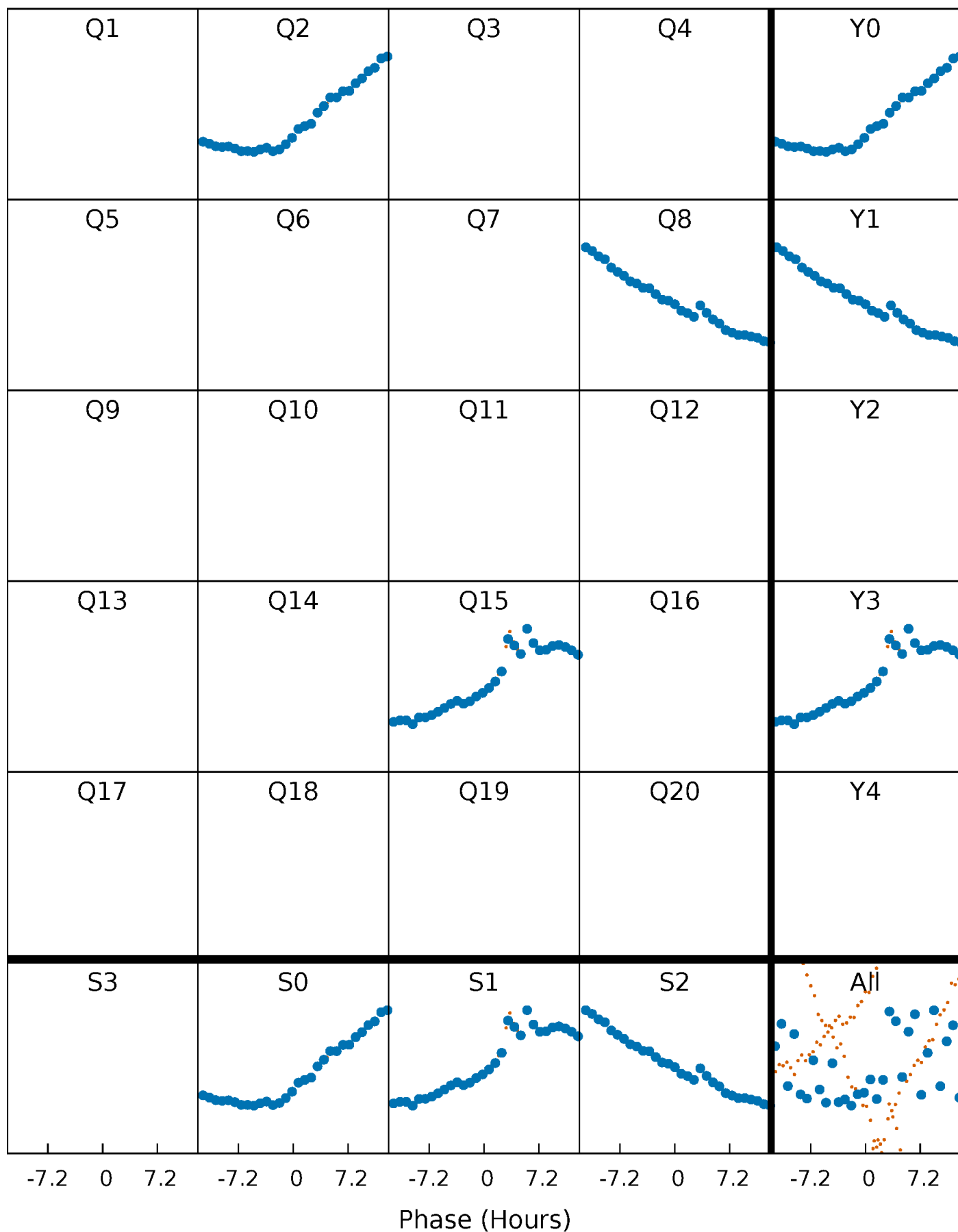


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



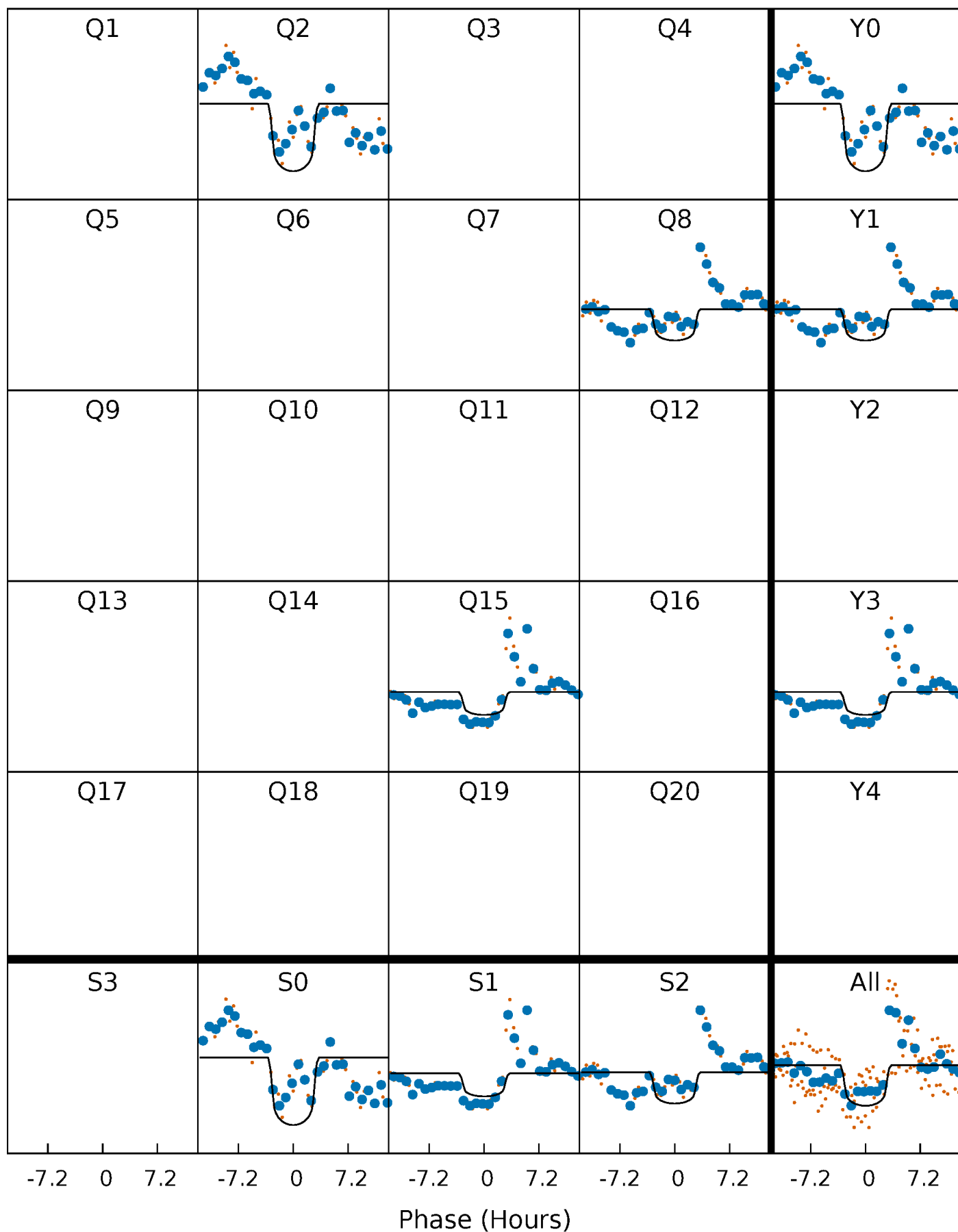
PDC Quarter-Phased Transit Curves

TCE 008409191-01 P=592.666269 Days $T_0=203.440229$ (BKJD)



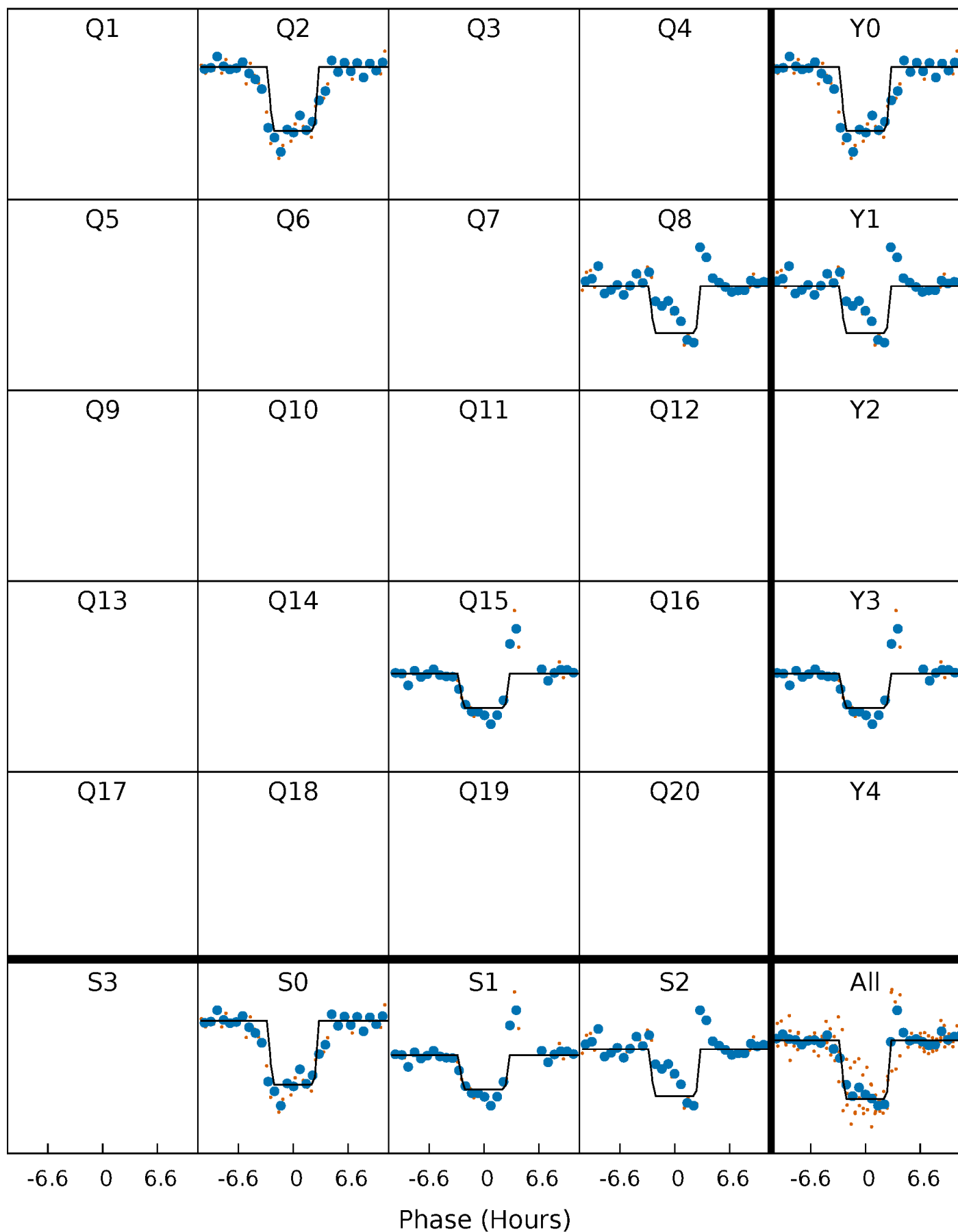
DV Quarter-Phased Transit Curves

TCE 008409191-01 P=592.666269 Days $T_0=203.440229$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

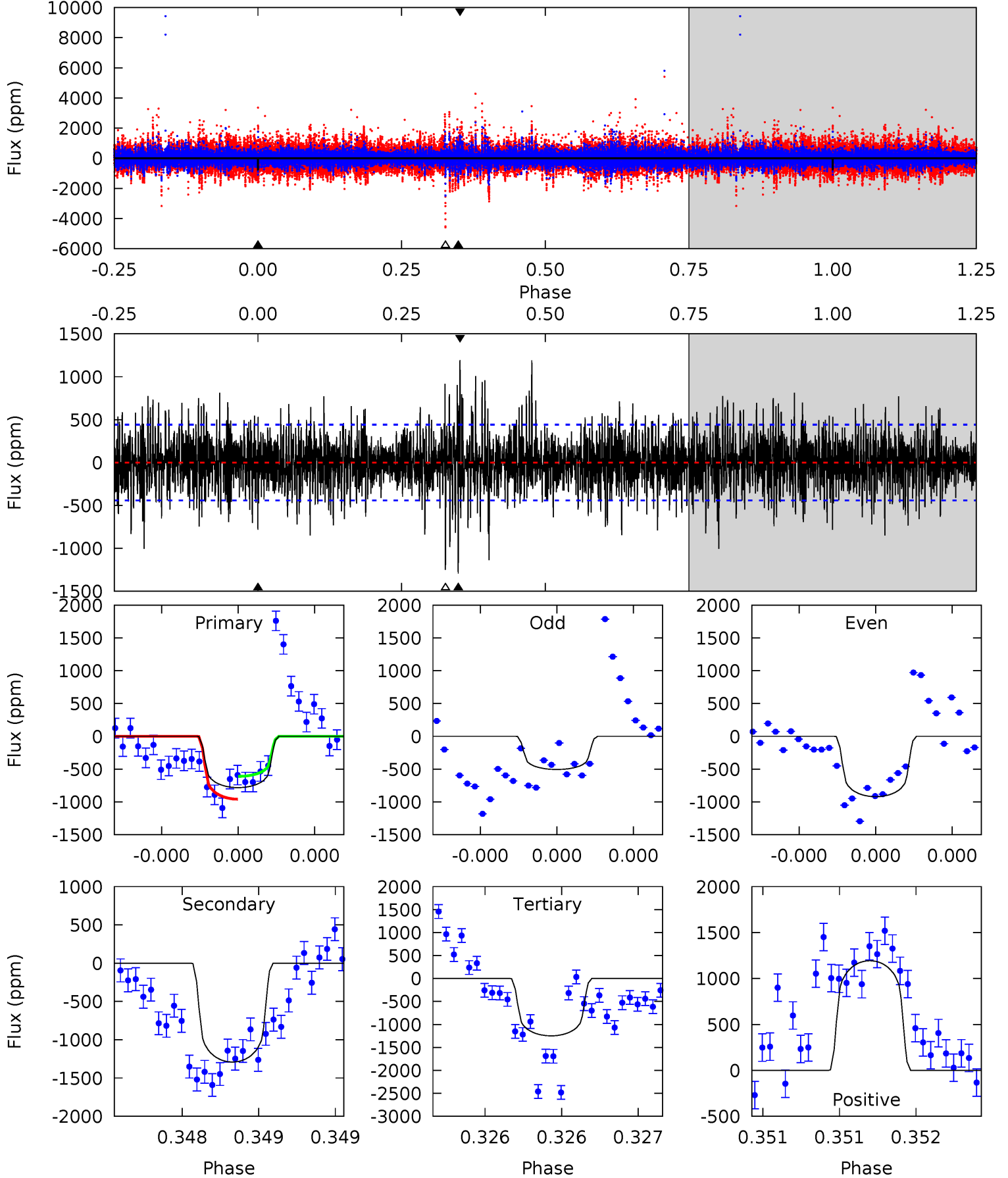
TCE 008409191-01 P=592.654974 Days $T_0=203.451473$ (BKJD)



DV Model-Shift Uniqueness Test

008409191-01, P = 592.666269 Days, E = 203.440229 Days

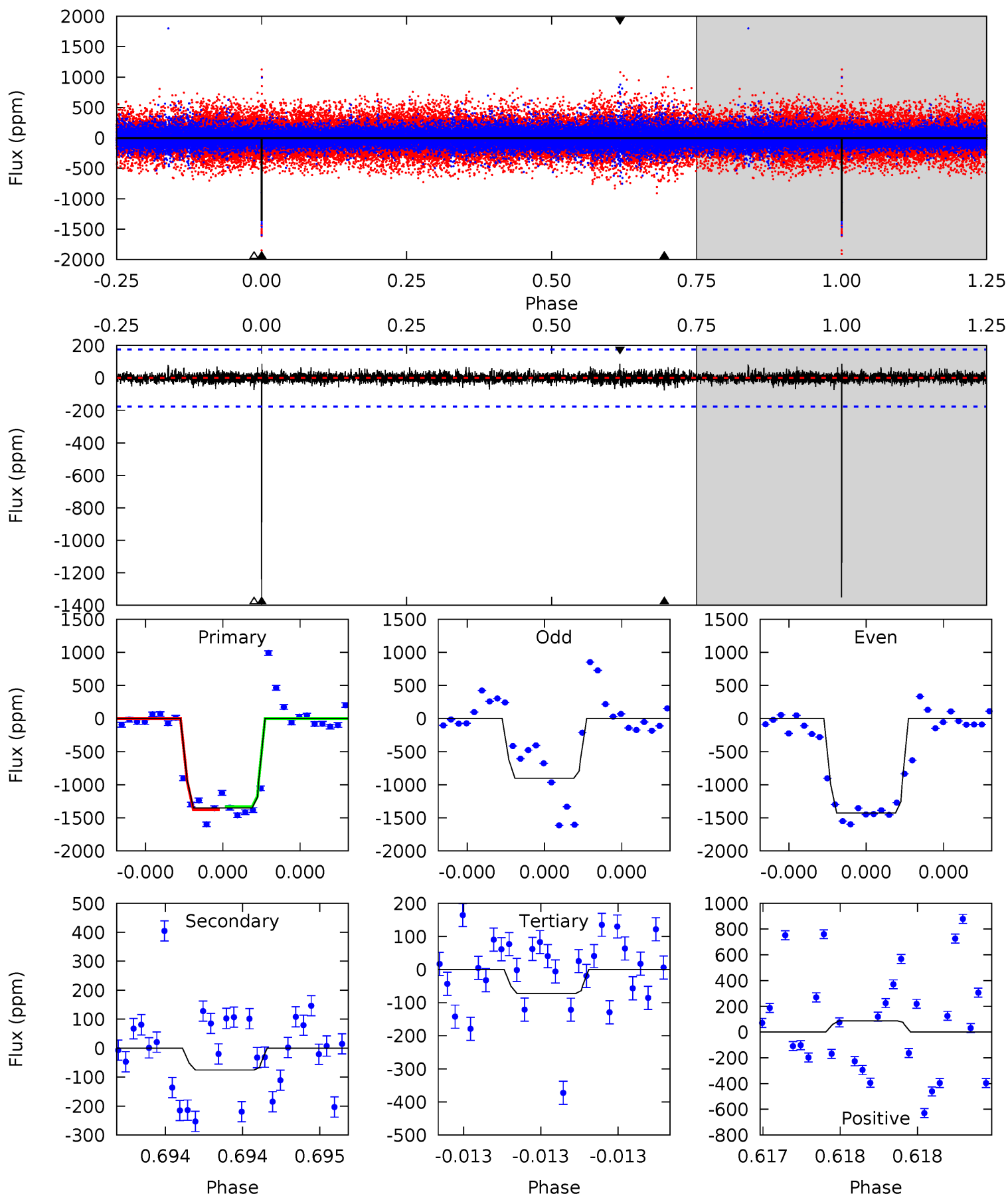
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.91	16.4	15.8	15.1	5.59	3.51	3.11	-5.91	-5.21	0.54	1.24	2.23	1.42	0.48	2.22



Alt Model-Shift Uniqueness Test

008409191-01, P = 592.654974 Days, E = 203.451473 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.1	2.41	2.31	2.76	5.61	3.53	0.50	40.8	40.3	0.10	-0.35	7.85	0.90	0.06	0.64



Stellar Parameters For KIC 008409191

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6139^{+164}_{-200}	$4.252^{+0.185}_{-0.185}$	$-0.220^{+0.250}_{-0.300}$	$1.246^{+0.352}_{-0.288}$	$1.012^{+0.166}_{-0.124}$	$0.737^{+0.689}_{-0.353}$
	+3%/-3%	+4%/-4%	+114%/-136%	+28%/-23%	+16%/-12%	+93%/-48%
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 008409191-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1291 ± 79	$4.47^{+1.11}_{-1.00}$	359^{+29}_{-25}	6419^{+803}_{-582}	67828^{+46929}_{-23873}
Alt.	-75 ± 31	$4.95^{+1.18}_{-1.03}$	360^{+27}_{-25}	3490^{+355}_{-321}	3209^{+2866}_{-1513}

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

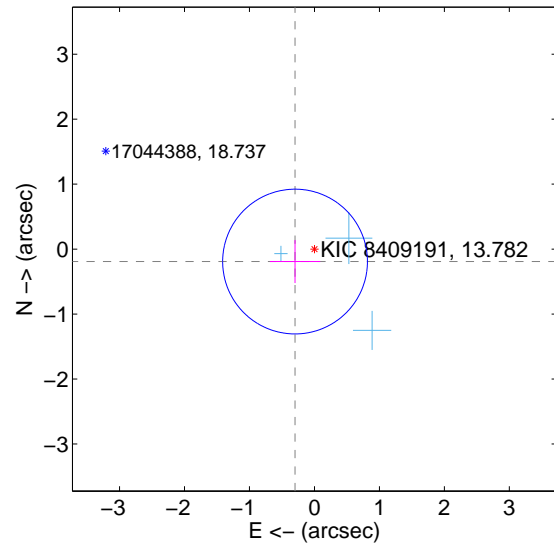
Supplemental centroid analysis for 008409191-01. Kepler magnitude: 13.78. Transit SNR 7.42

There are 3 quarters with good PRF difference image offsets

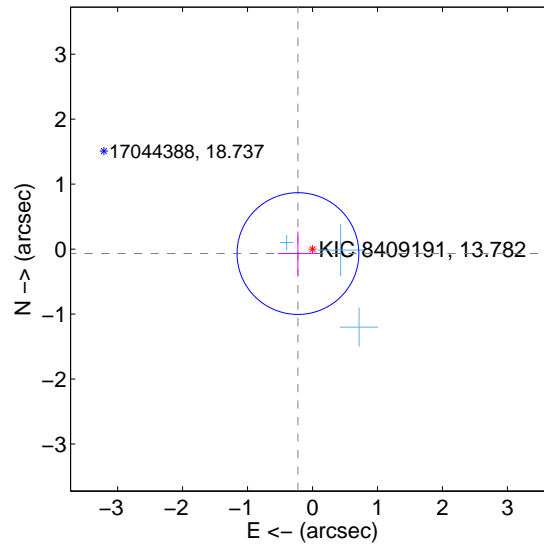
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.355 ± 0.372	0.96	0.299 ± 0.387	-0.192 ± 0.331
PRF-fit source offset from KIC position	0.235 ± 0.312	0.75	0.225 ± 0.310	-0.069 ± 0.339
photometric centroid source offset	0.66 ± 0.81	0.82	0.62 ± 0.85	0.22 ± 0.51

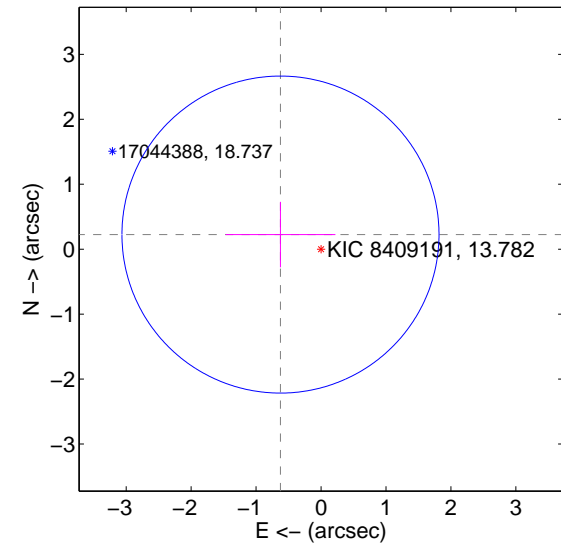
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

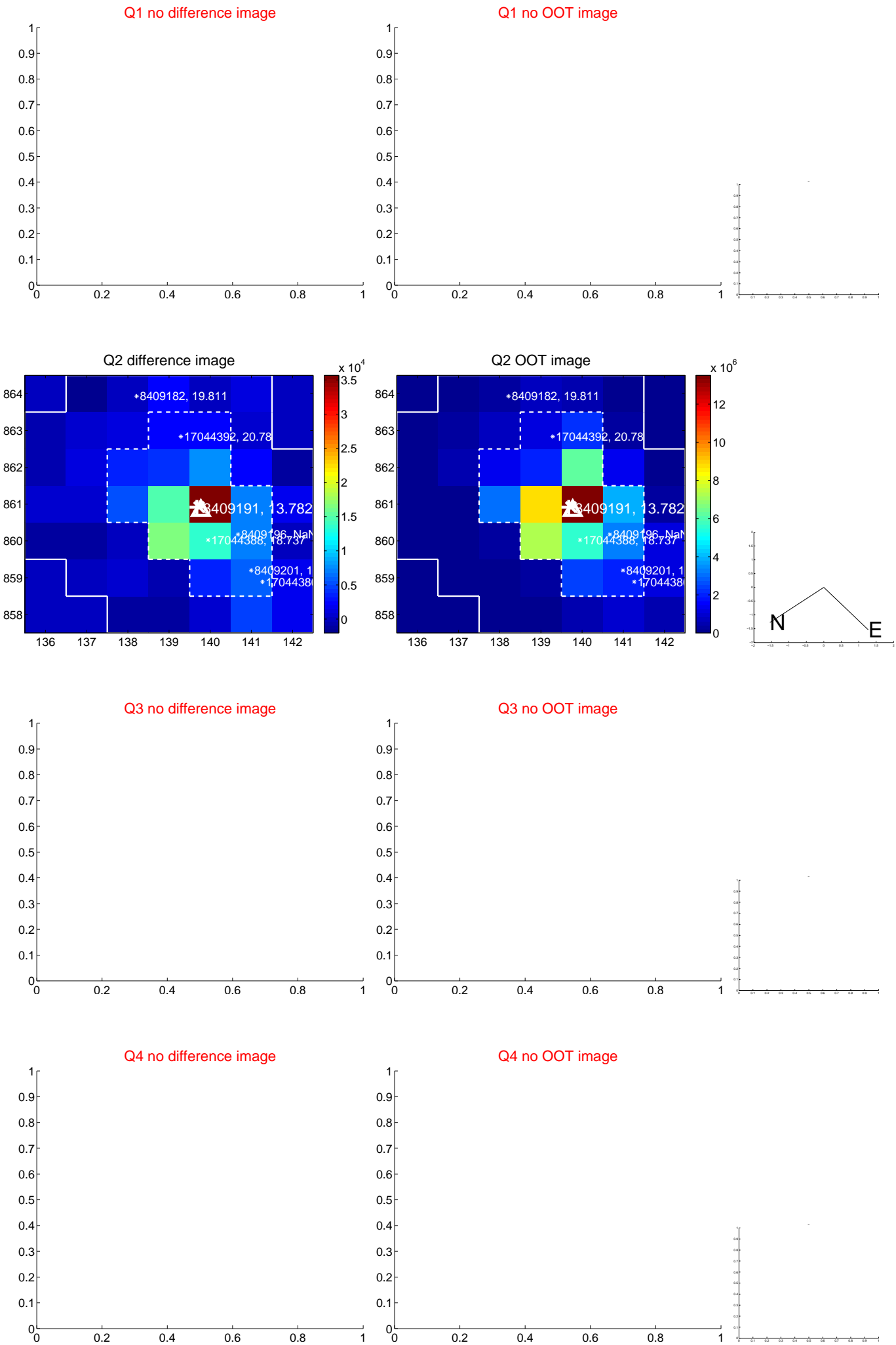


offset from photometric centroids

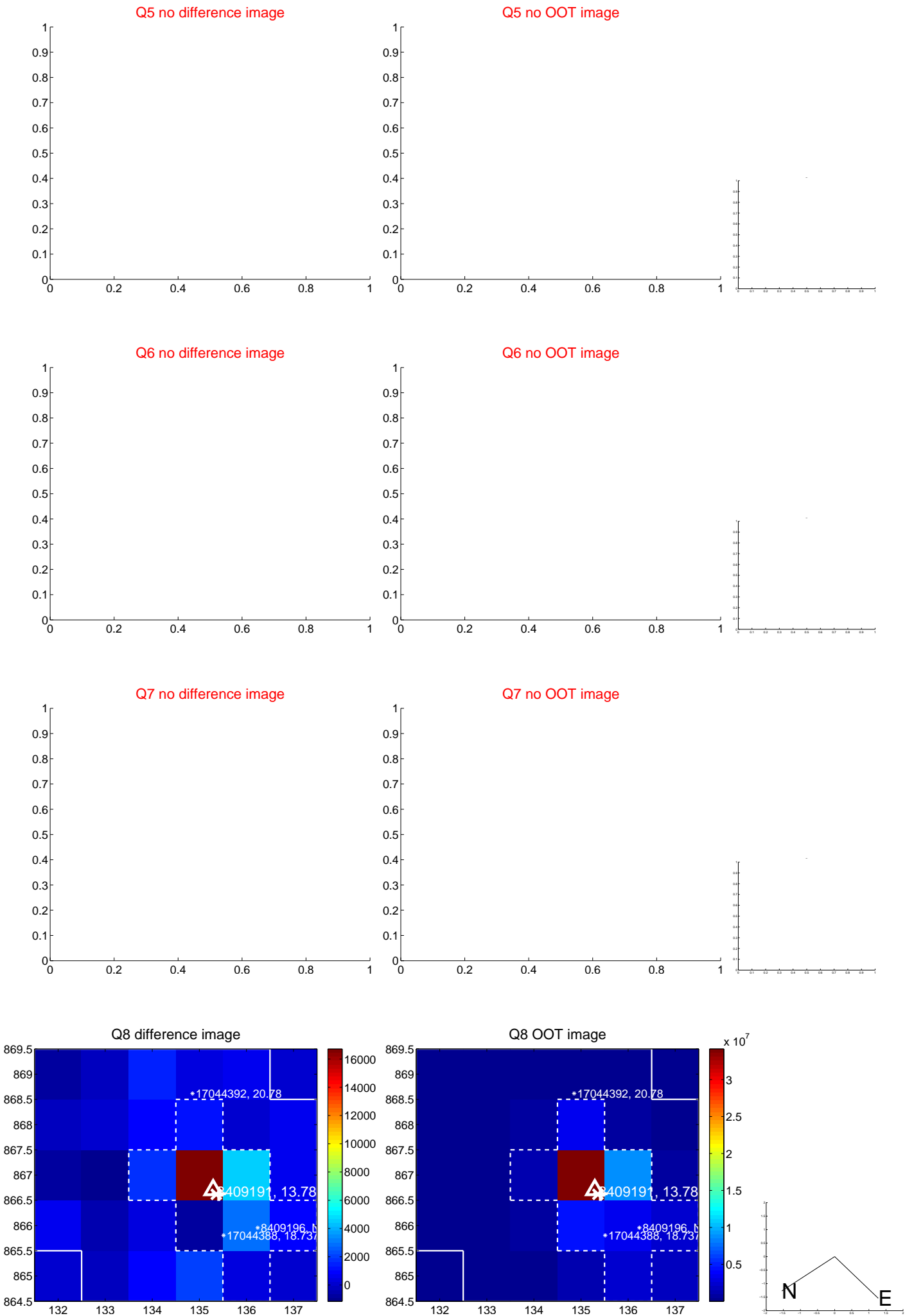


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



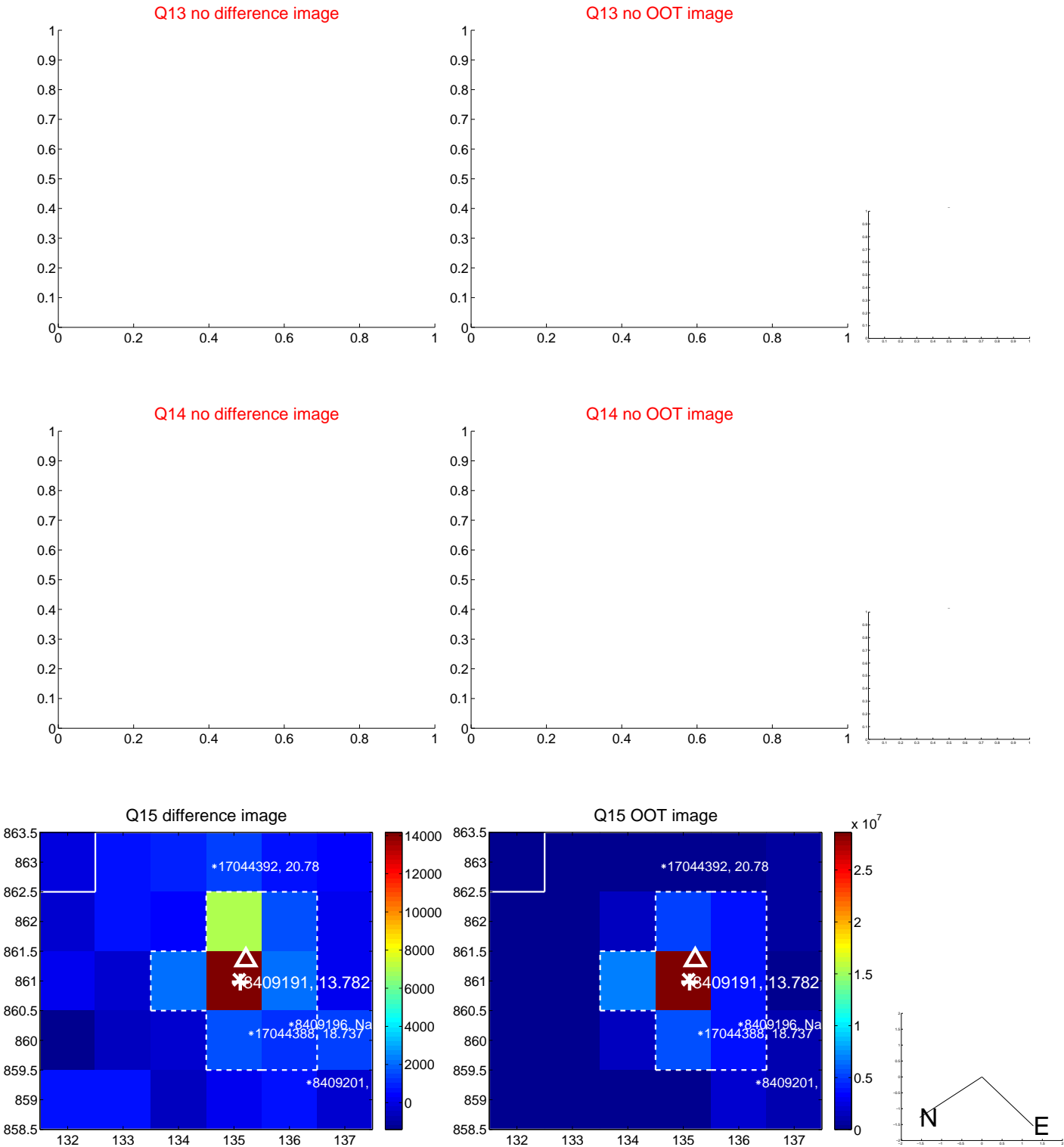
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



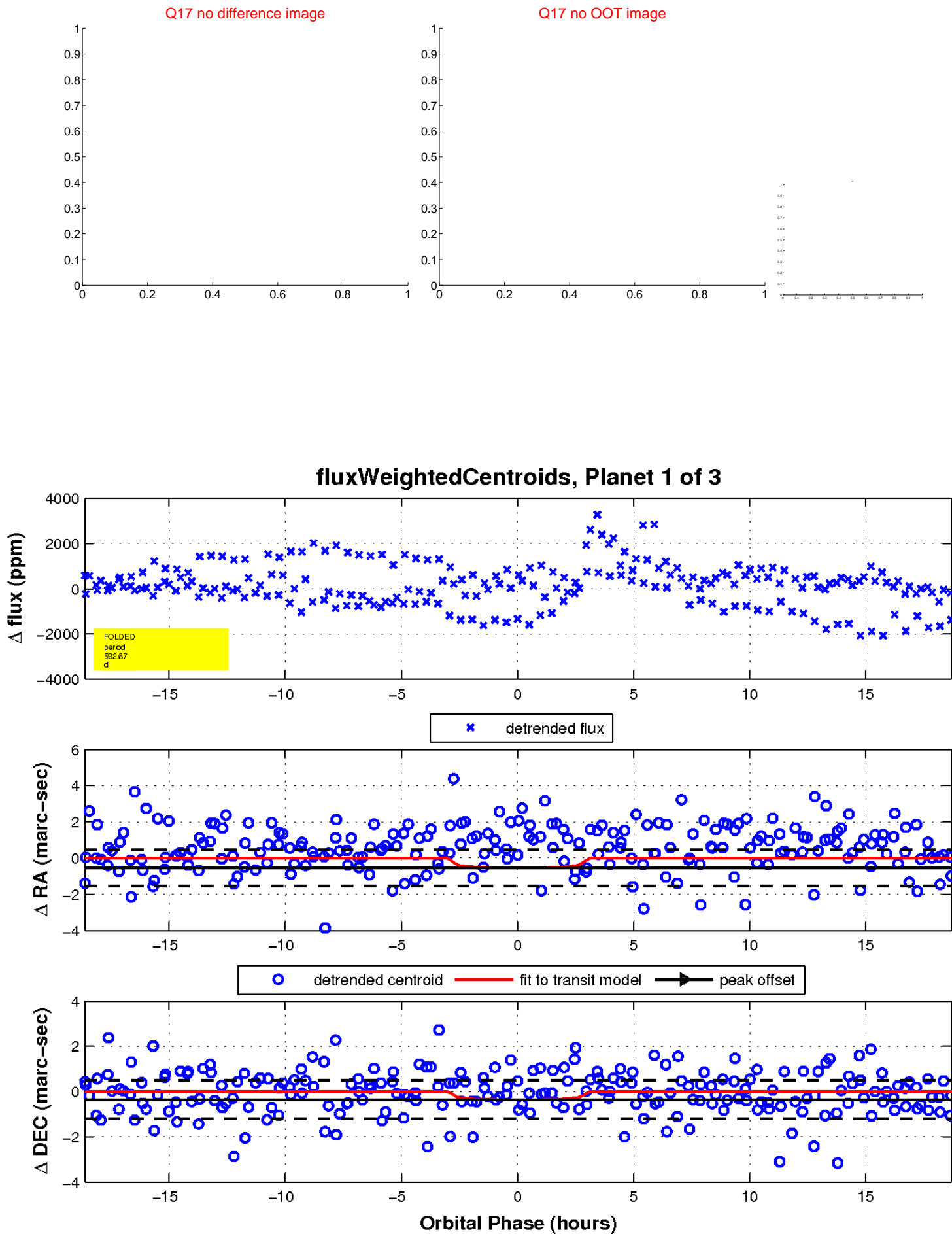
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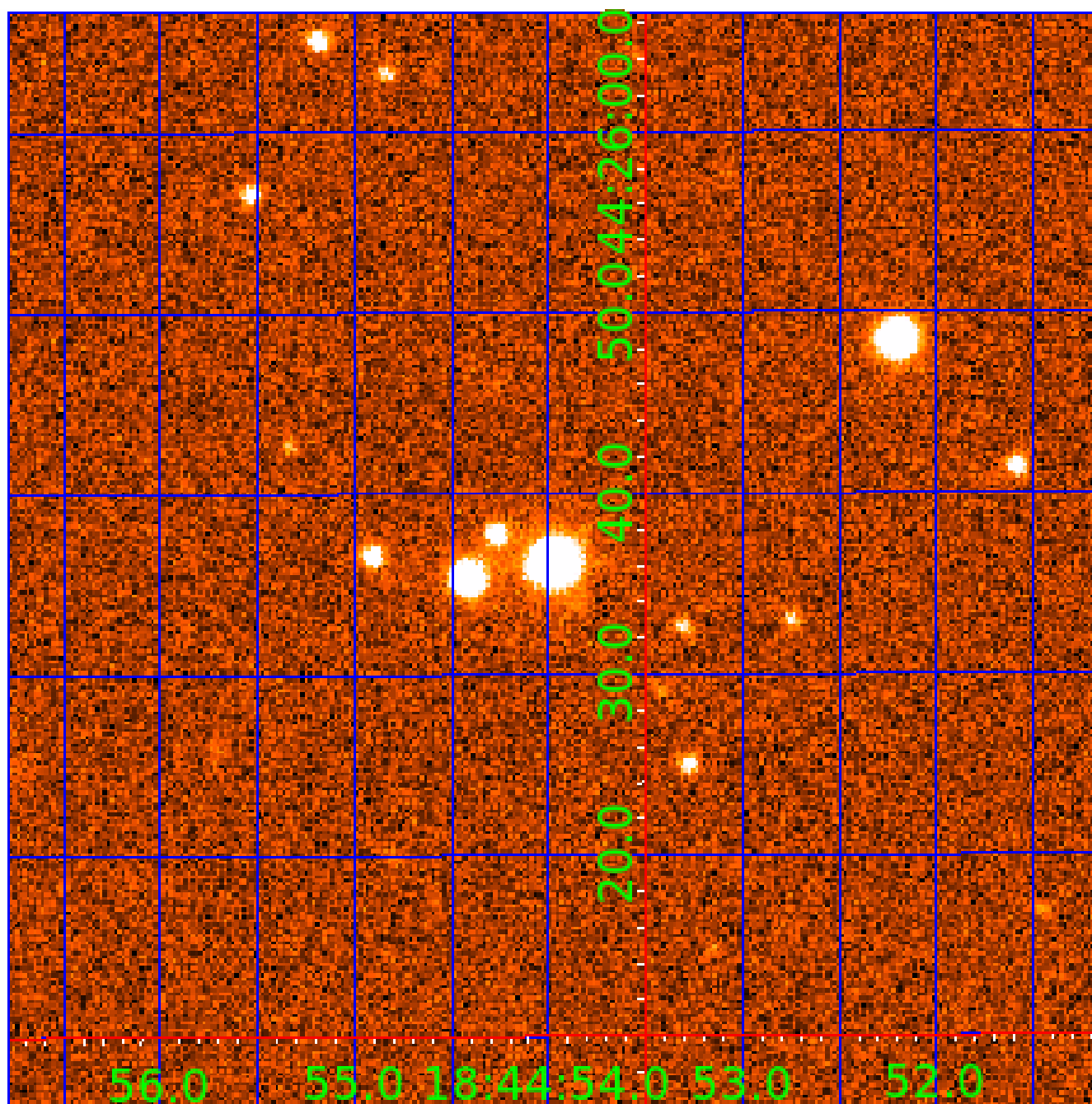


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UKIRT Image

Declination



KIC 008409191

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008409191-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008409191-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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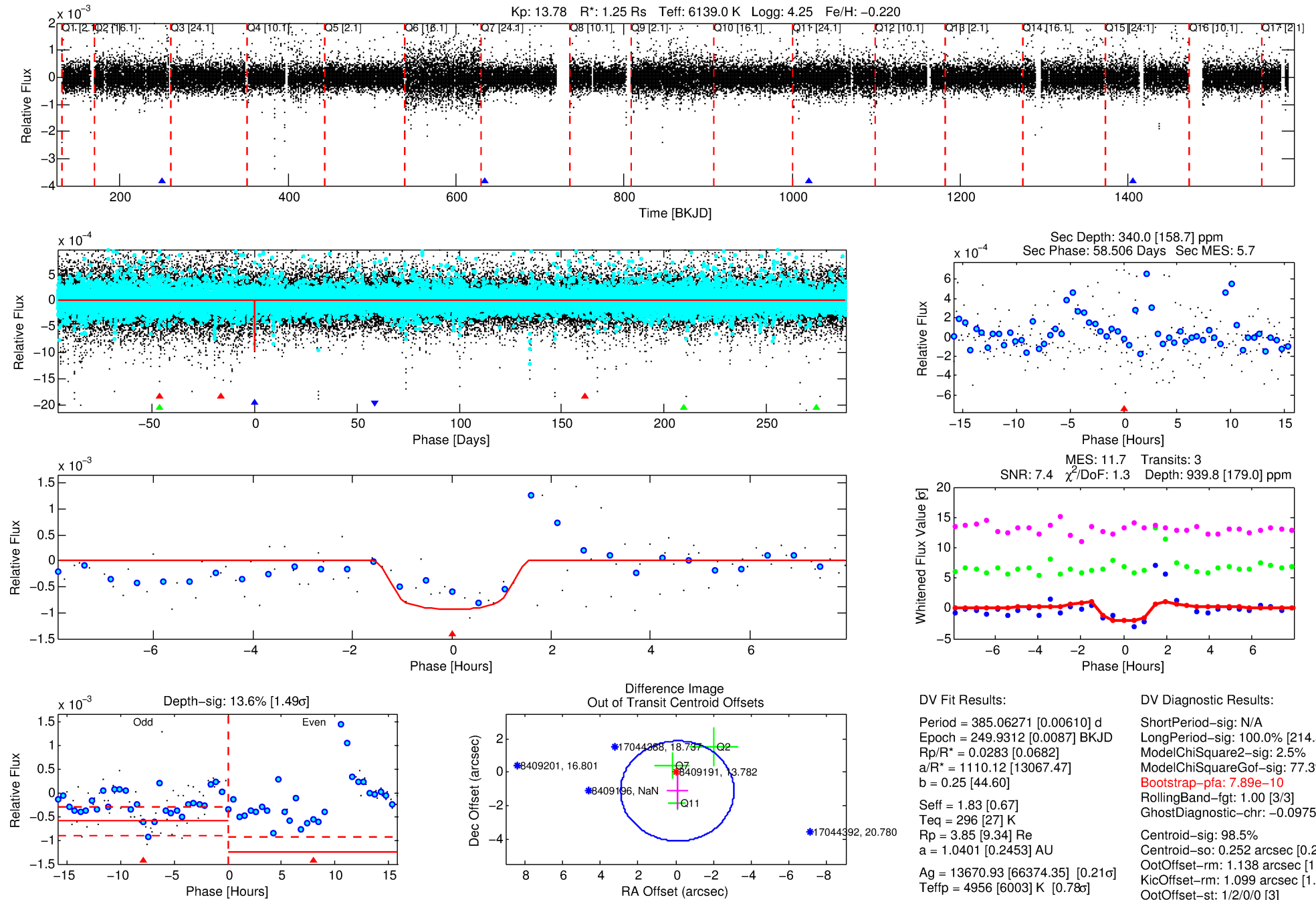
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008409191-02

No Significant Match Found

DV One-Page Summary

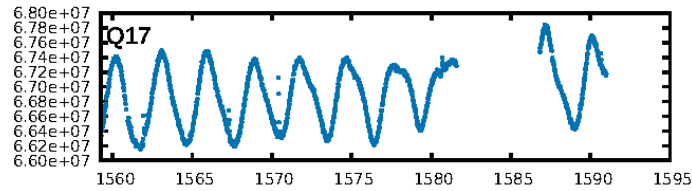
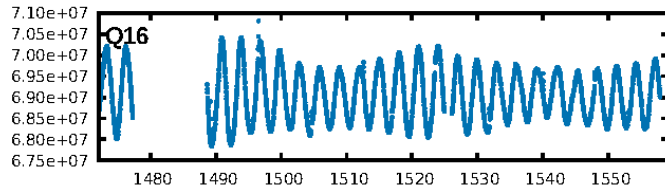
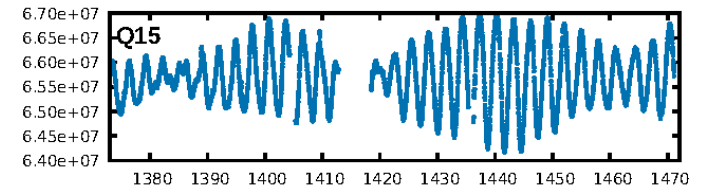
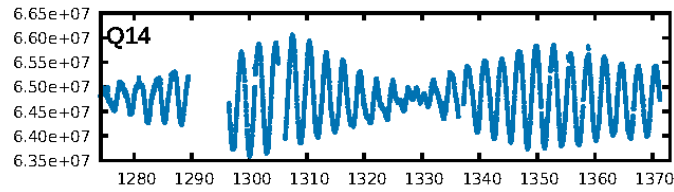
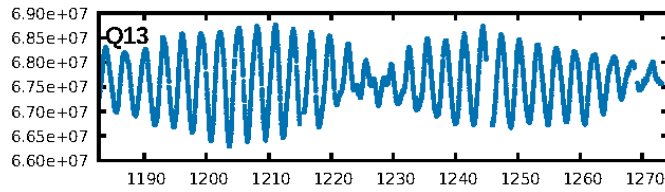
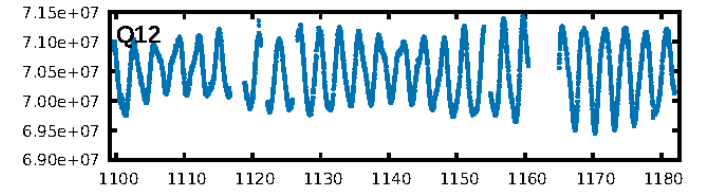
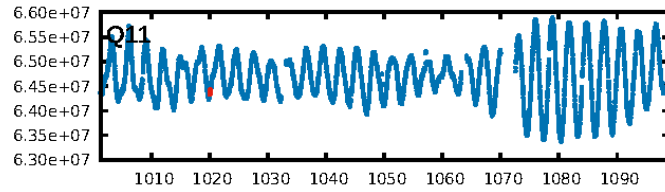
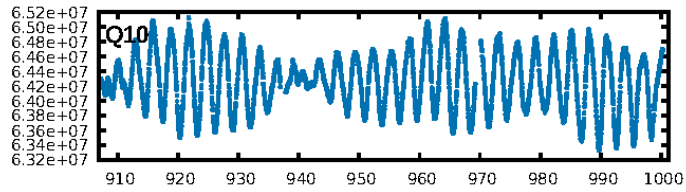
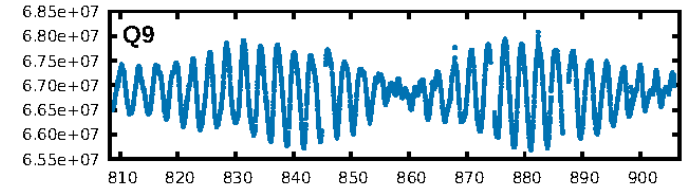
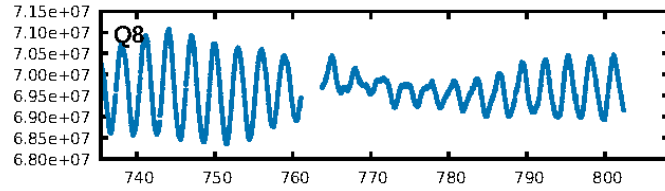
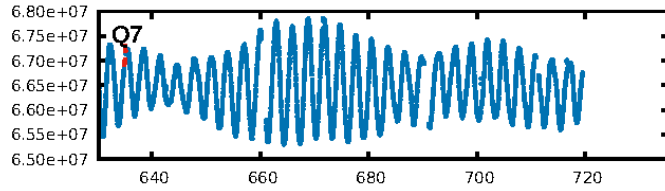
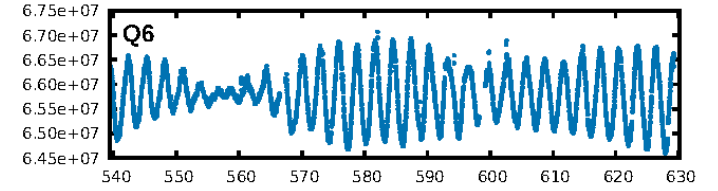
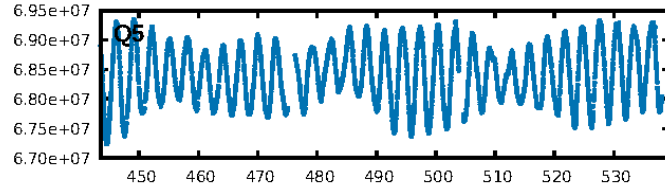
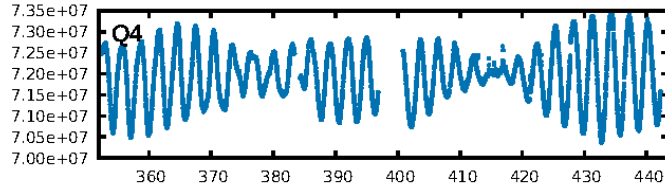
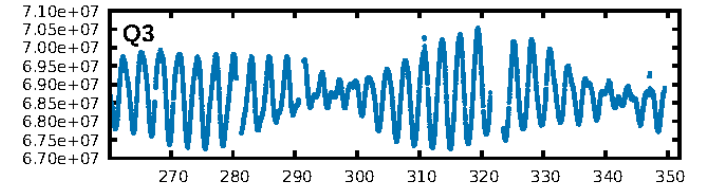
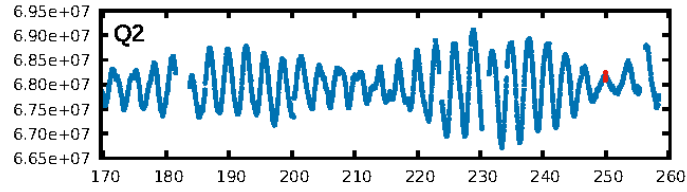
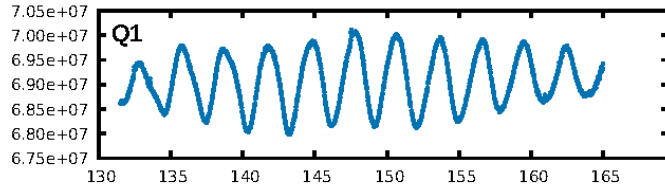
KIC: 8409191 Candidate: 2 of 3 Period: 385.063 d



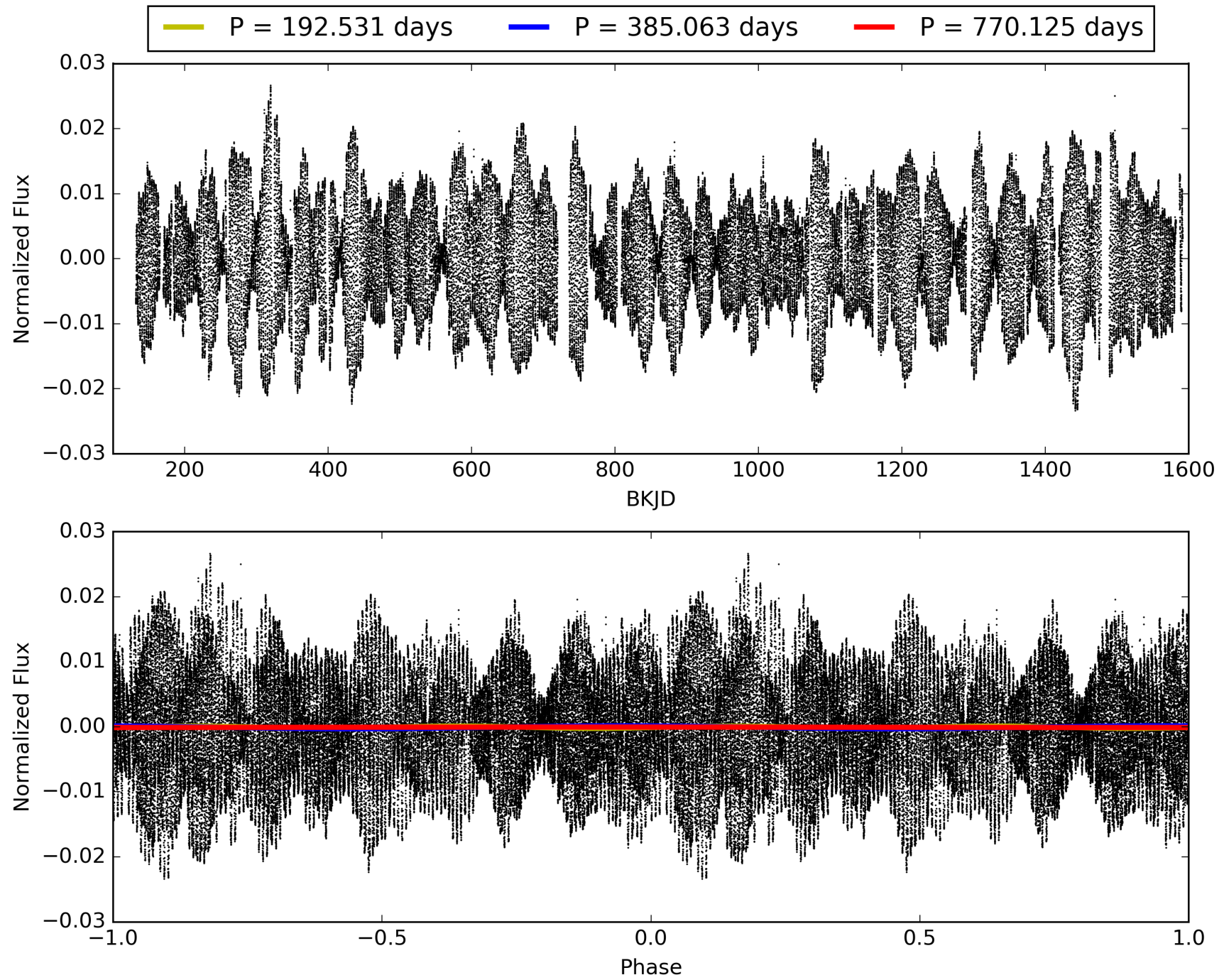
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:43:24 Z

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

TCE 008409191-02, PDC Light Curves

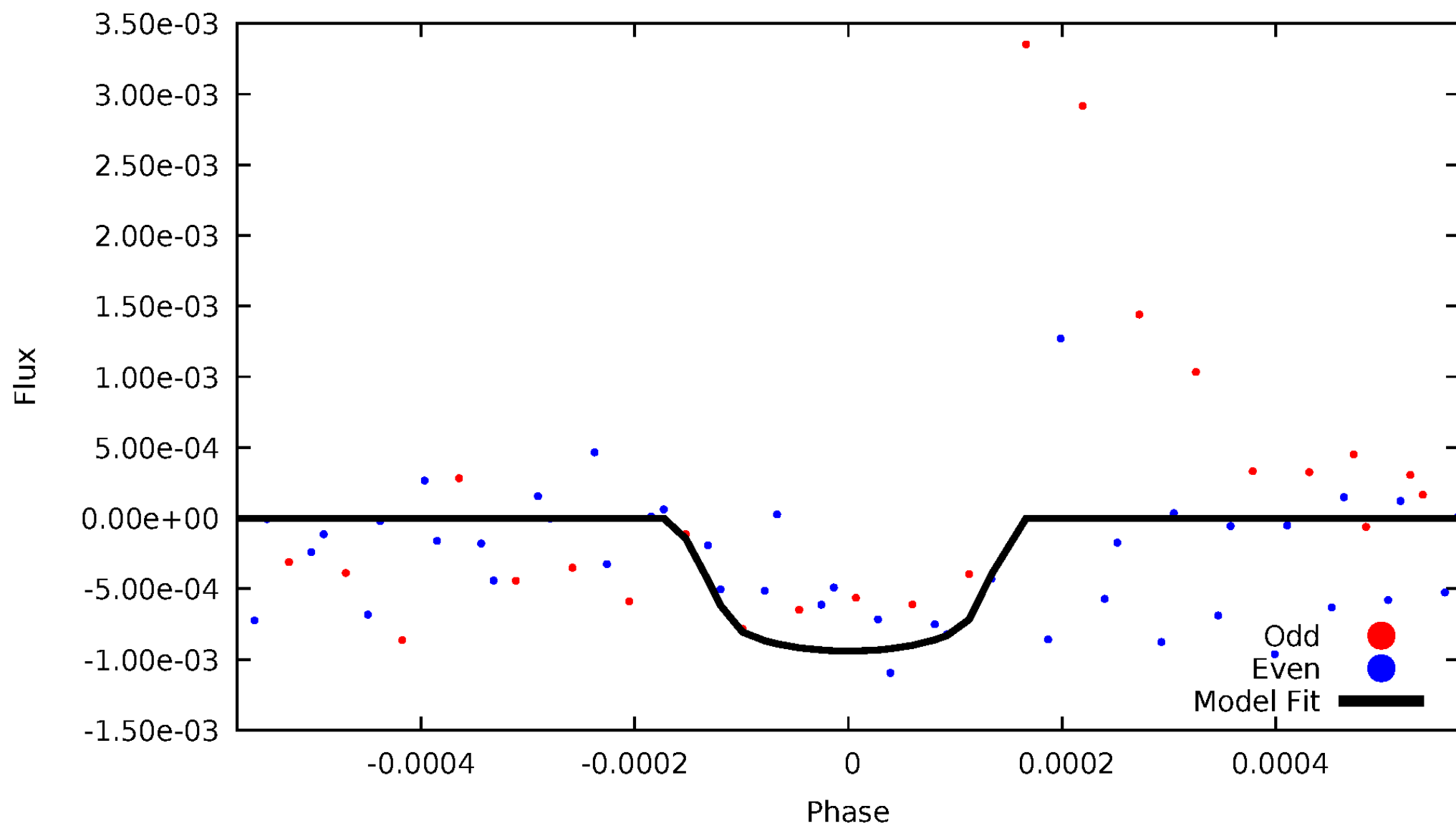


TCE 008409191-02



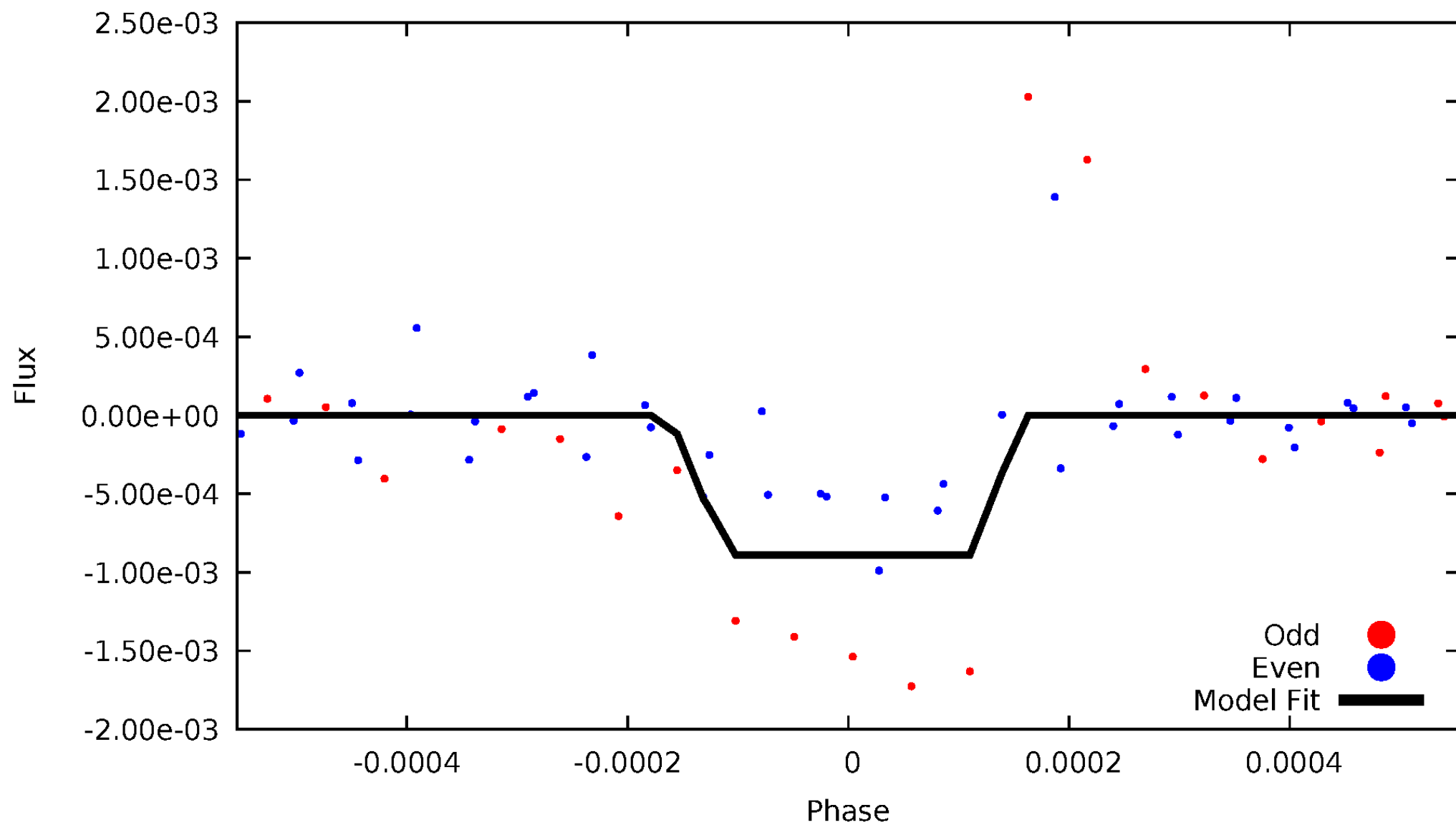
DV Odd/Even

TCE 008409191-02



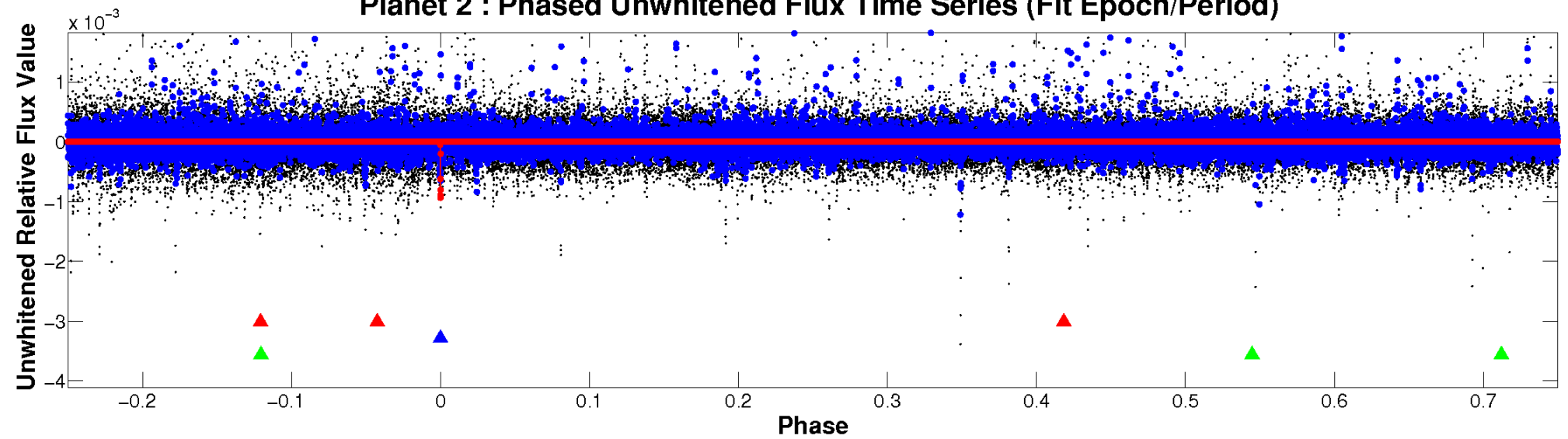
ALT Odd/Even

TCE 008409191-02

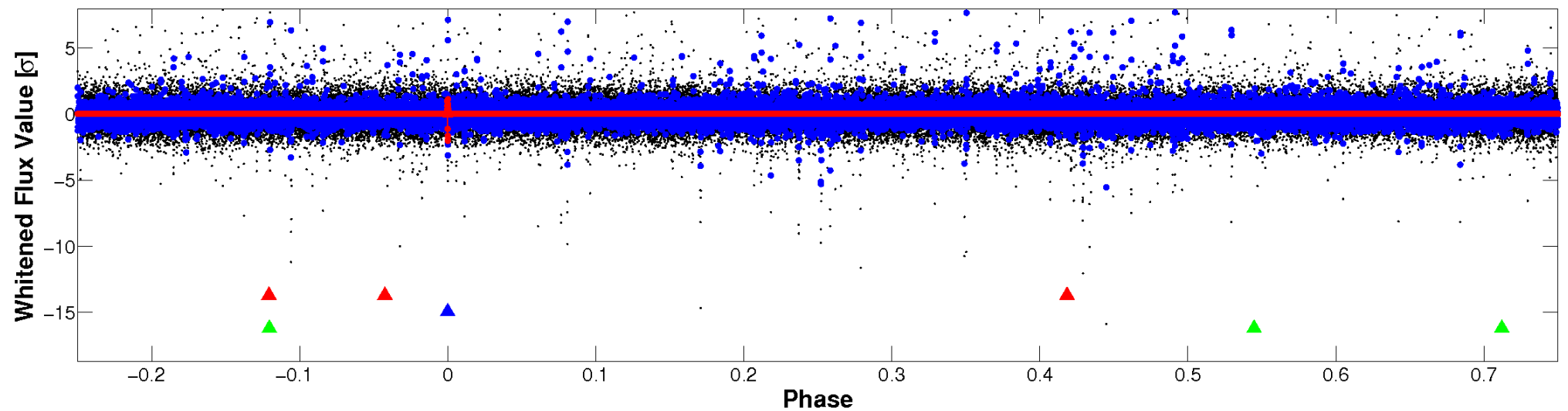


Non-Whitened Vs. Whitened Light Curve

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

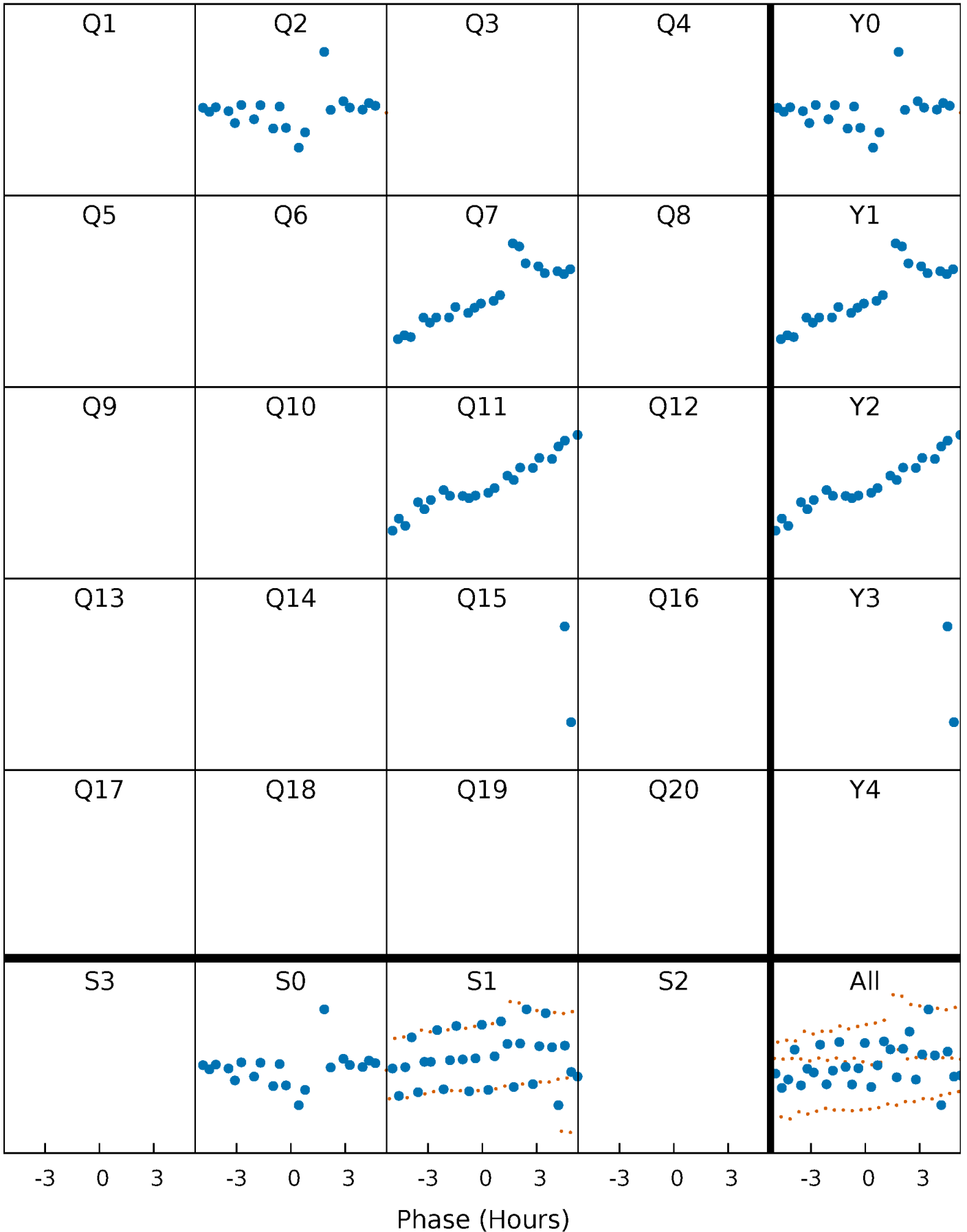


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



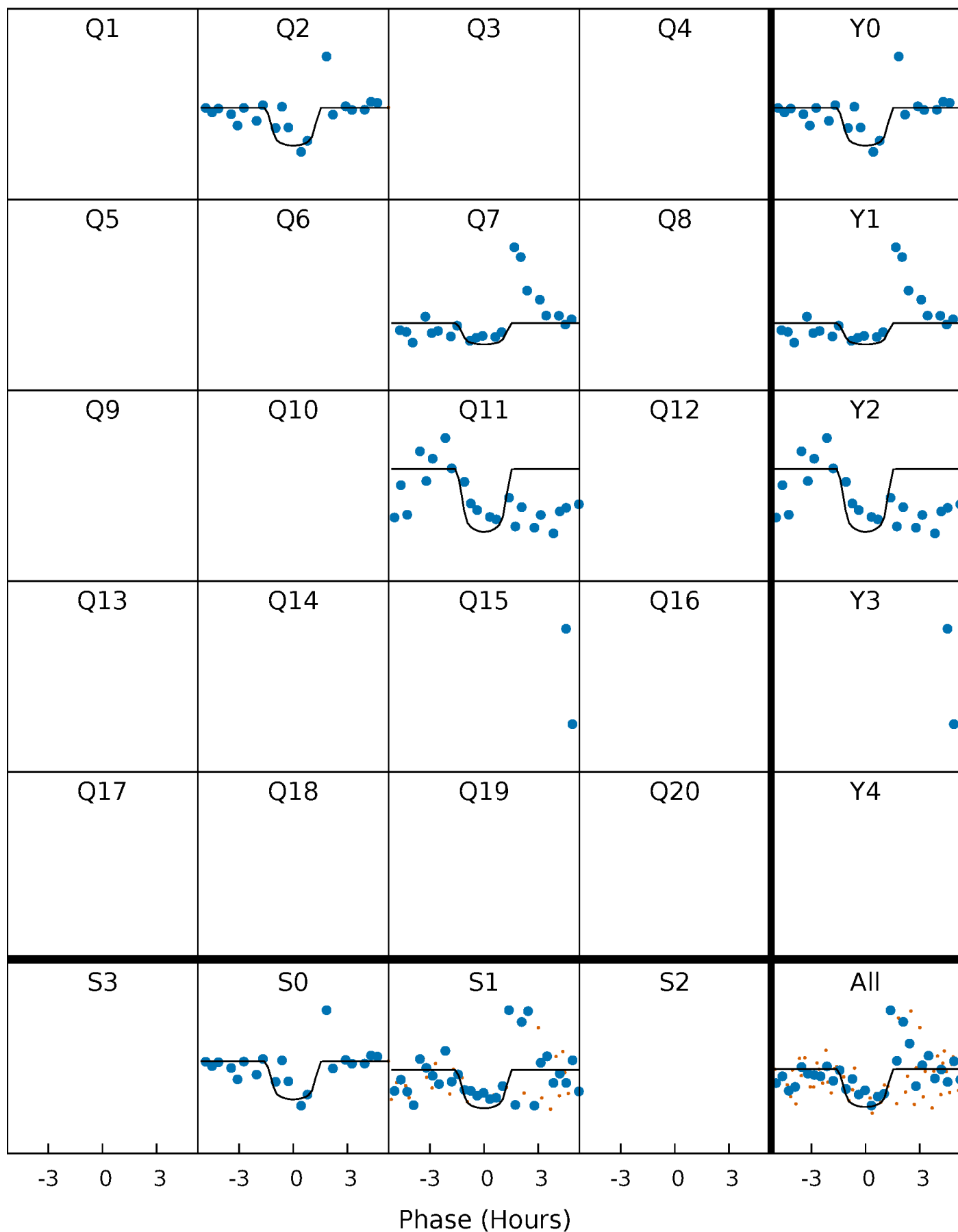
PDC Quarter-Phased Transit Curves

TCE 008409191-02 $P=385.062714$ Days $T_0=249.931203$ (BKJD)



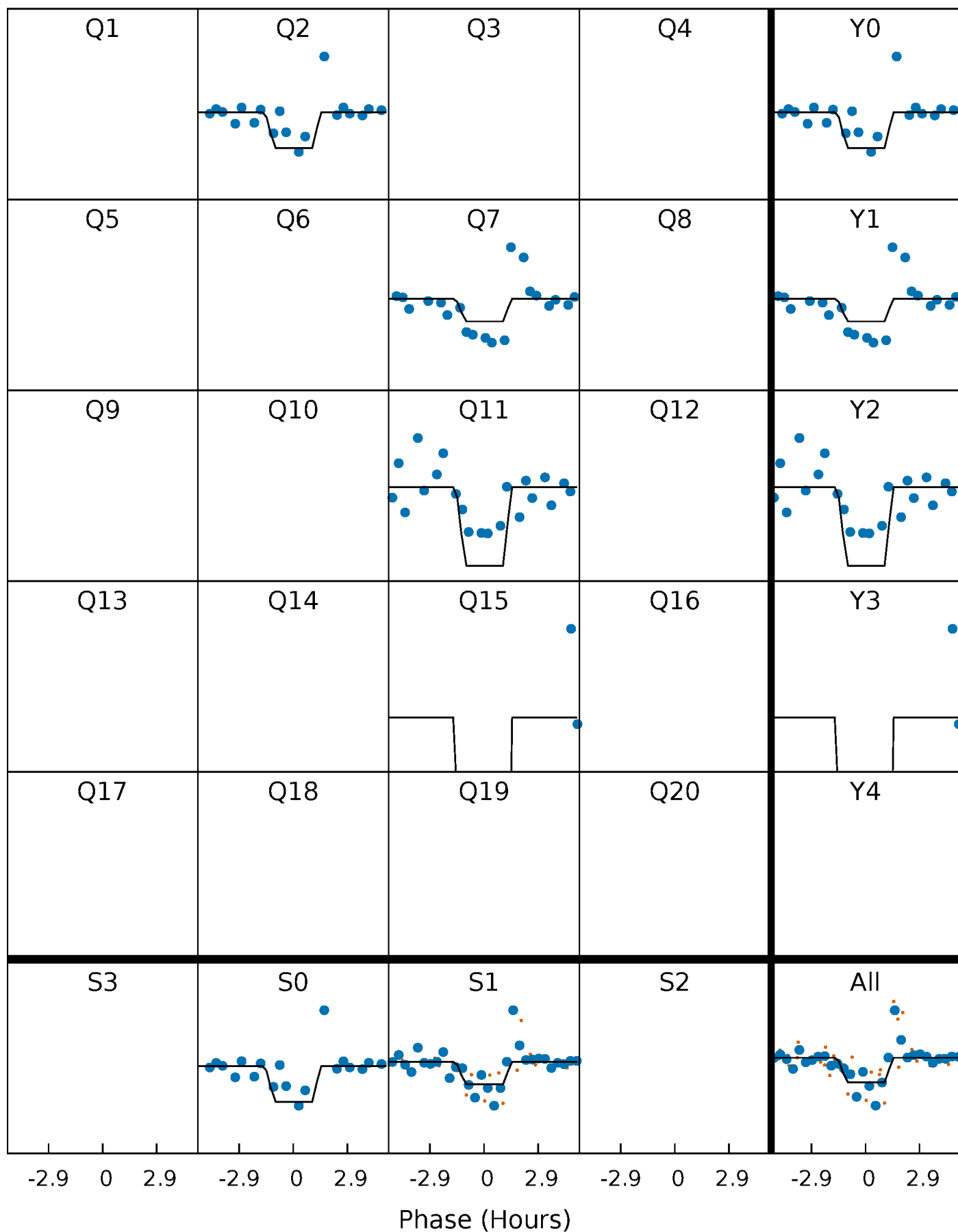
DV Quarter-Phased Transit Curves

TCE 008409191-02 $P=385.062714$ Days $T_0=249.931203$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

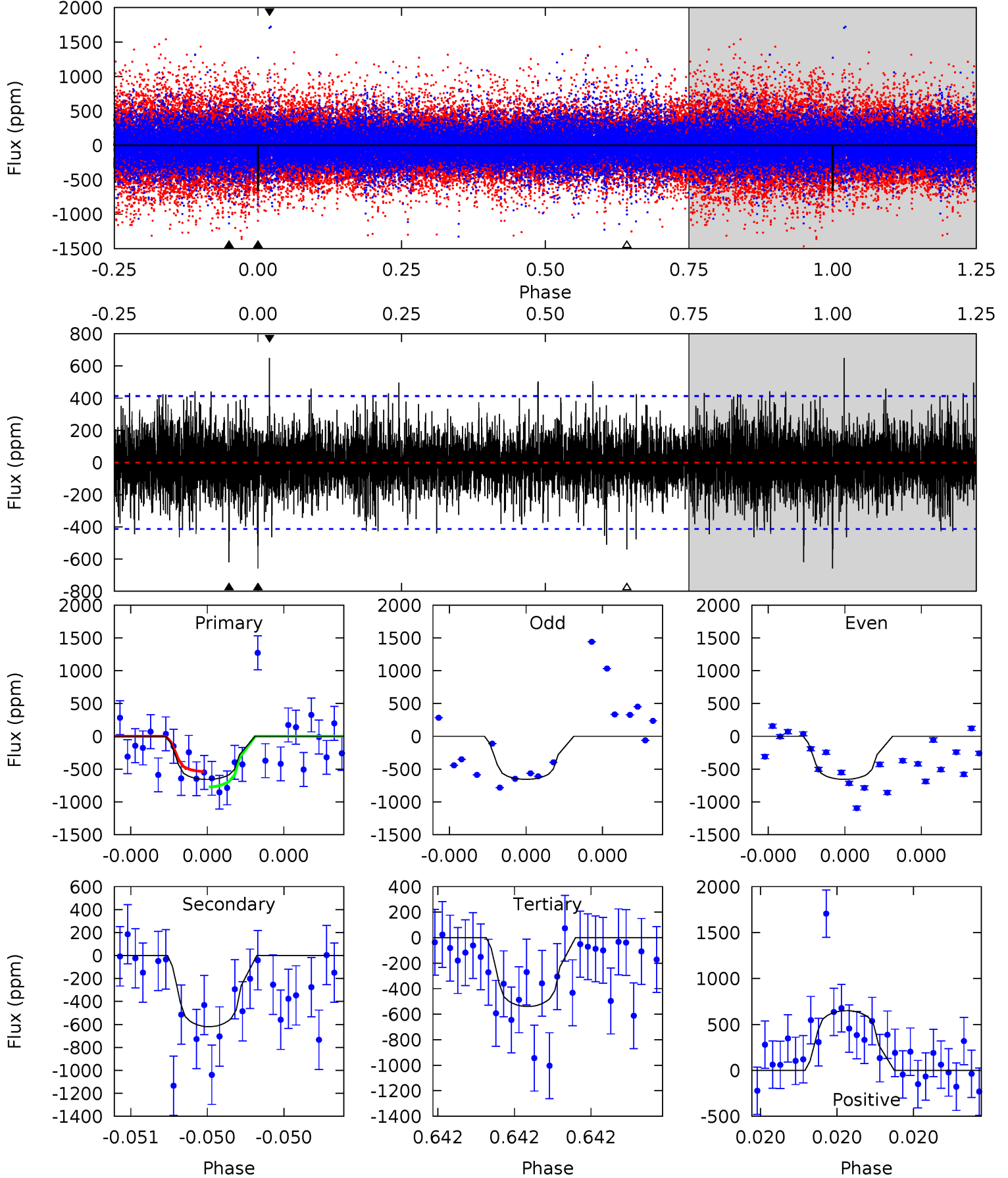
TCE 008409191-02 P=385.059442 Days $T_0=249.935647$ (BKJD)



DV Model-Shift Uniqueness Test

008409191-02, P = 385.062714 Days, E = 249.931203 Days

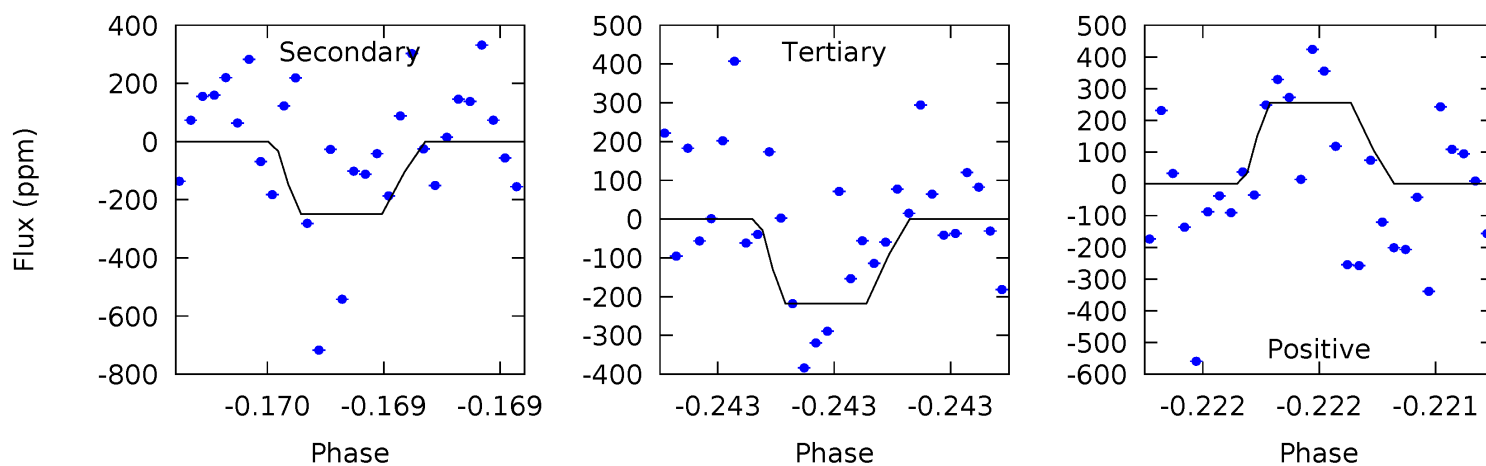
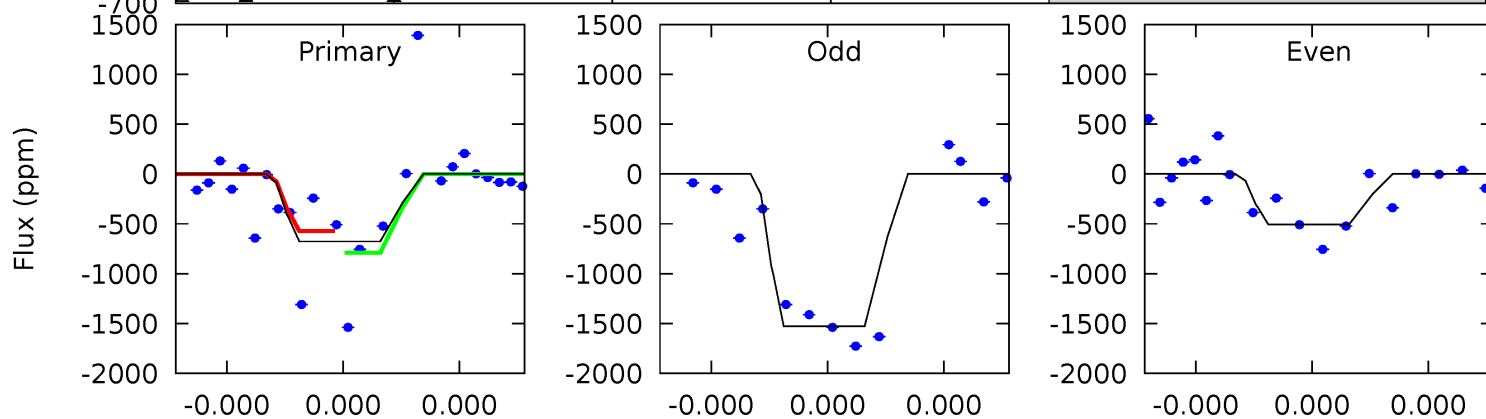
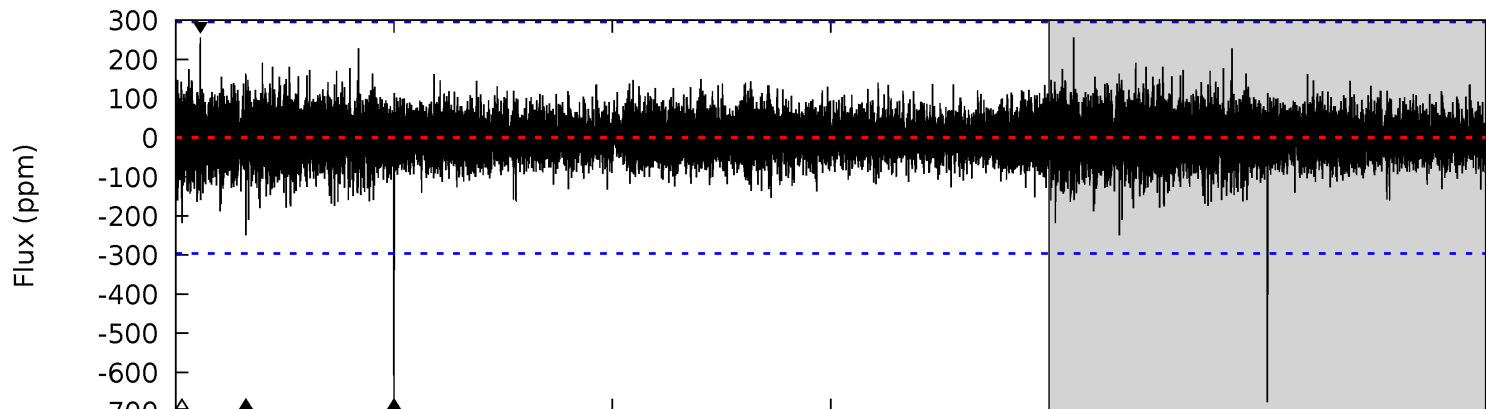
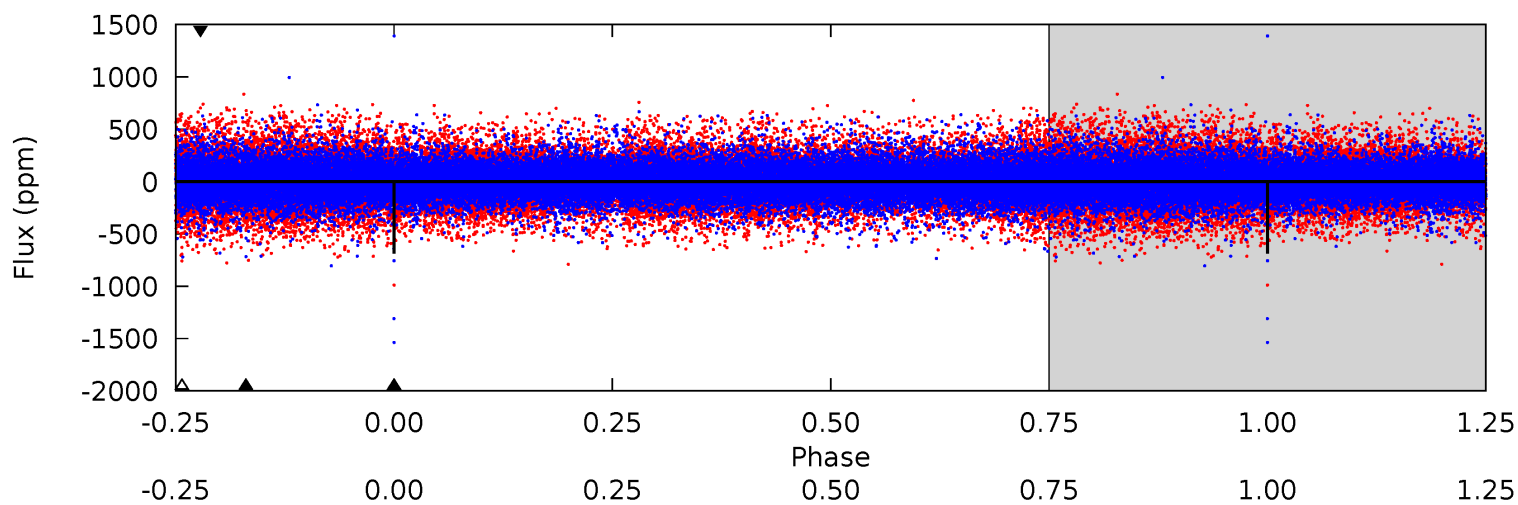
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.01	8.49	7.39	8.90	5.65	3.60	1.63	1.62	0.12	1.09	-0.41	0.00	1.00	0.50	1.60



Alt Model-Shift Uniqueness Test

008409191-02, P = 385.059442 Days, E = 249.935647 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.0	4.78	4.18	4.90	5.68	3.64	0.80	8.79	8.07	0.60	-0.12	10.7	1.55	0.27	2.10



Stellar Parameters For KIC 008409191

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6139^{+164}_{-200}	$4.252^{+0.185}_{-0.185}$	$-0.220^{+0.250}_{-0.300}$	$1.246^{+0.352}_{-0.288}$	$1.012^{+0.166}_{-0.124}$	$0.737^{+0.689}_{-0.353}$
	+3%/-3%	+4%/-4%	+114%/-136%	+28%/-23%	+16%/-12%	+93%/-48%
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 008409191-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-620 ± 73	$8.35^{+7.79}_{-5.76}$	414^{+32}_{-28}	4176^{+2701}_{-809}	5181^{+48079}_{-3767}
Alt.	-249 ± 52	$7.90^{+8.02}_{-5.25}$	413^{+33}_{-28}	3621^{+1927}_{-683}	2382^{+16368}_{-1804}

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 $A_{obs} \gg 1.0$

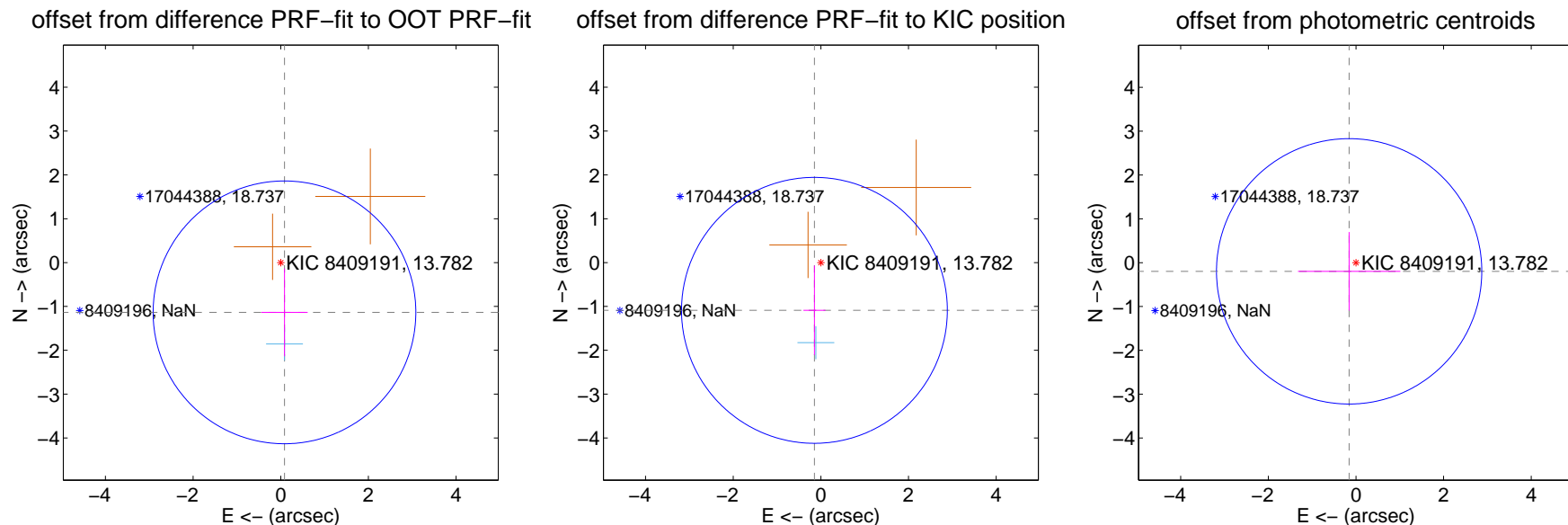
DV Centroid Data

Supplemental centroid analysis for 008409191-02. Kepler magnitude: 13.78. Transit SNR 7.38

There are 1 quarters with good PRF difference image offsets

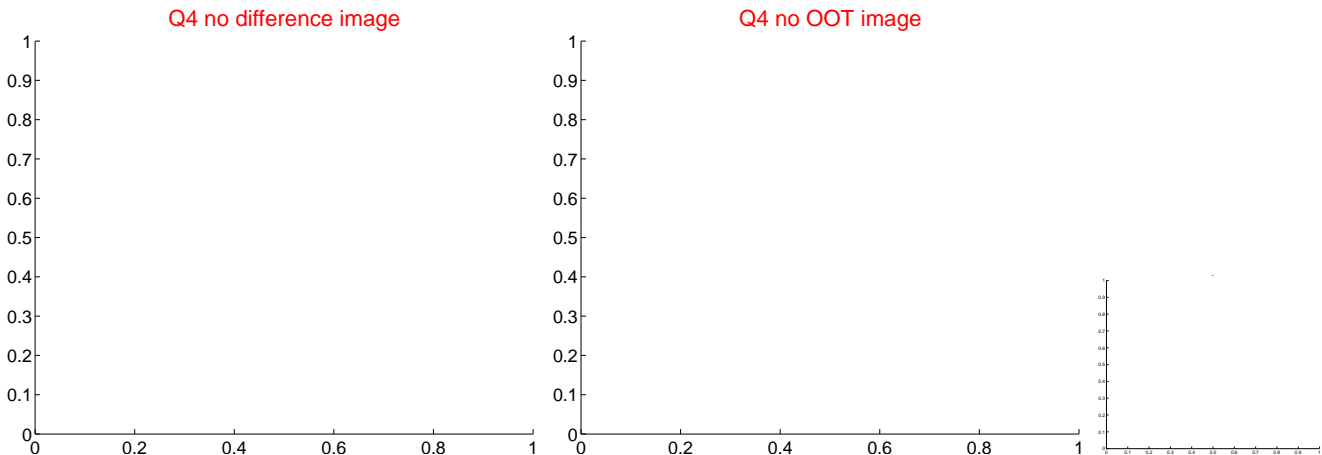
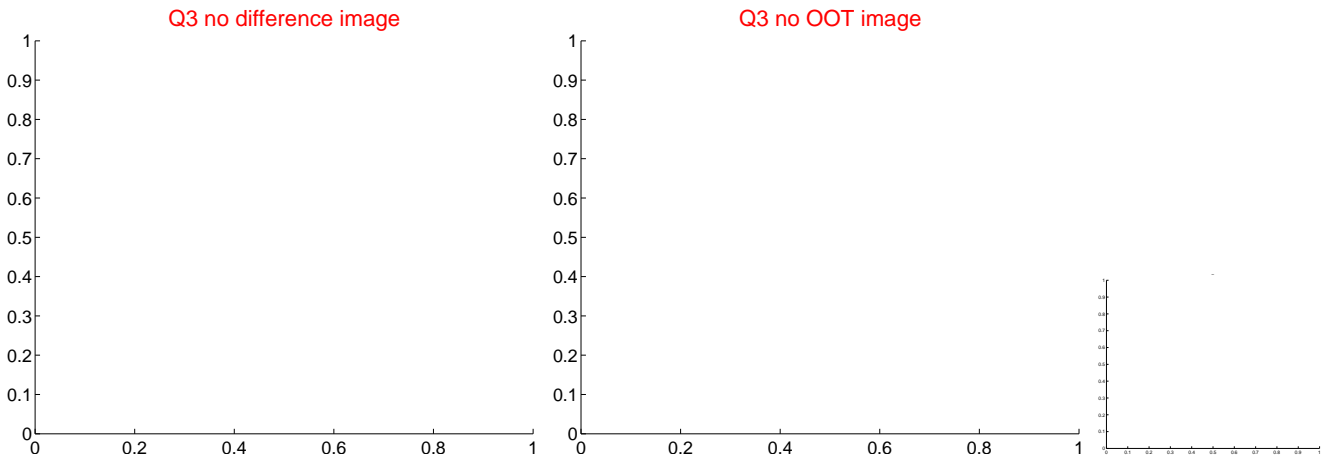
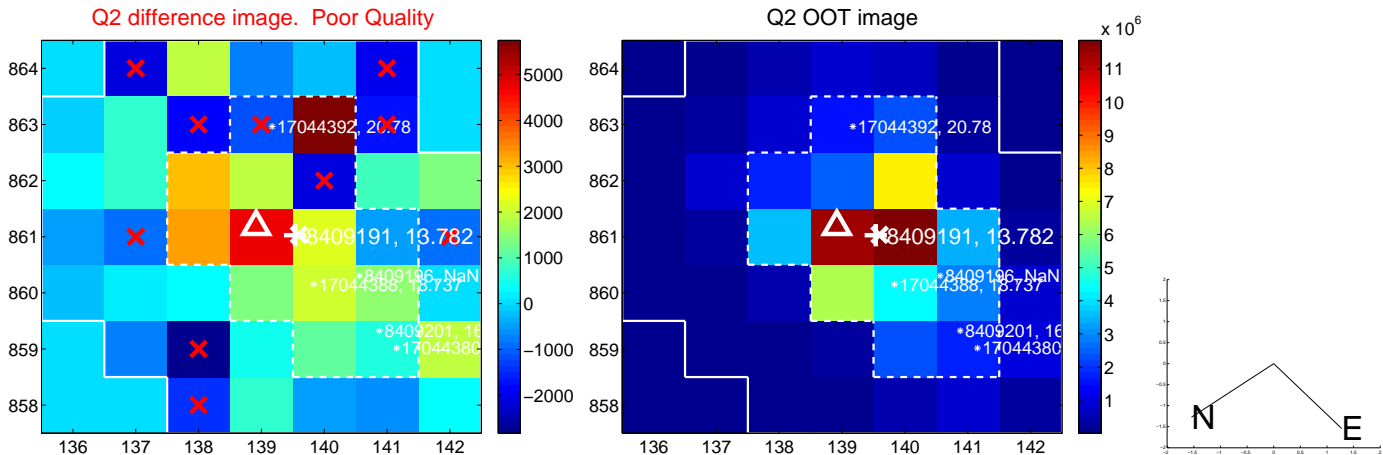
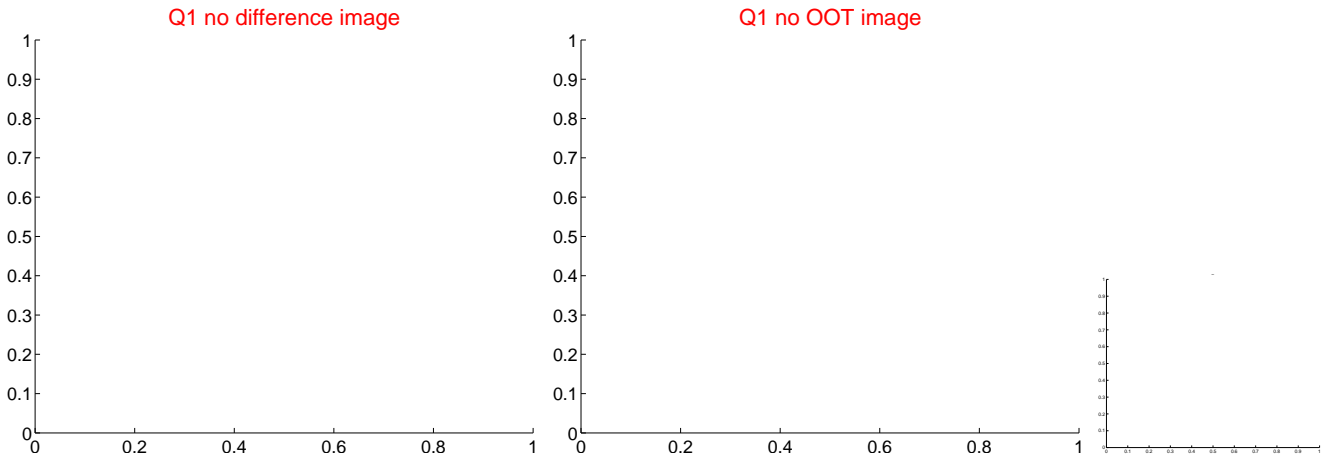
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.138 ± 0.999	1.14	-0.085 ± 0.529	-1.135 ± 1.001
PRF-fit source offset from KIC position	1.099 ± 1.011	1.09	0.147 ± 0.251	-1.089 ± 1.020
photometric centroid source offset	0.25 ± 1.01	0.25	0.16 ± 1.17	-0.20 ± 0.90

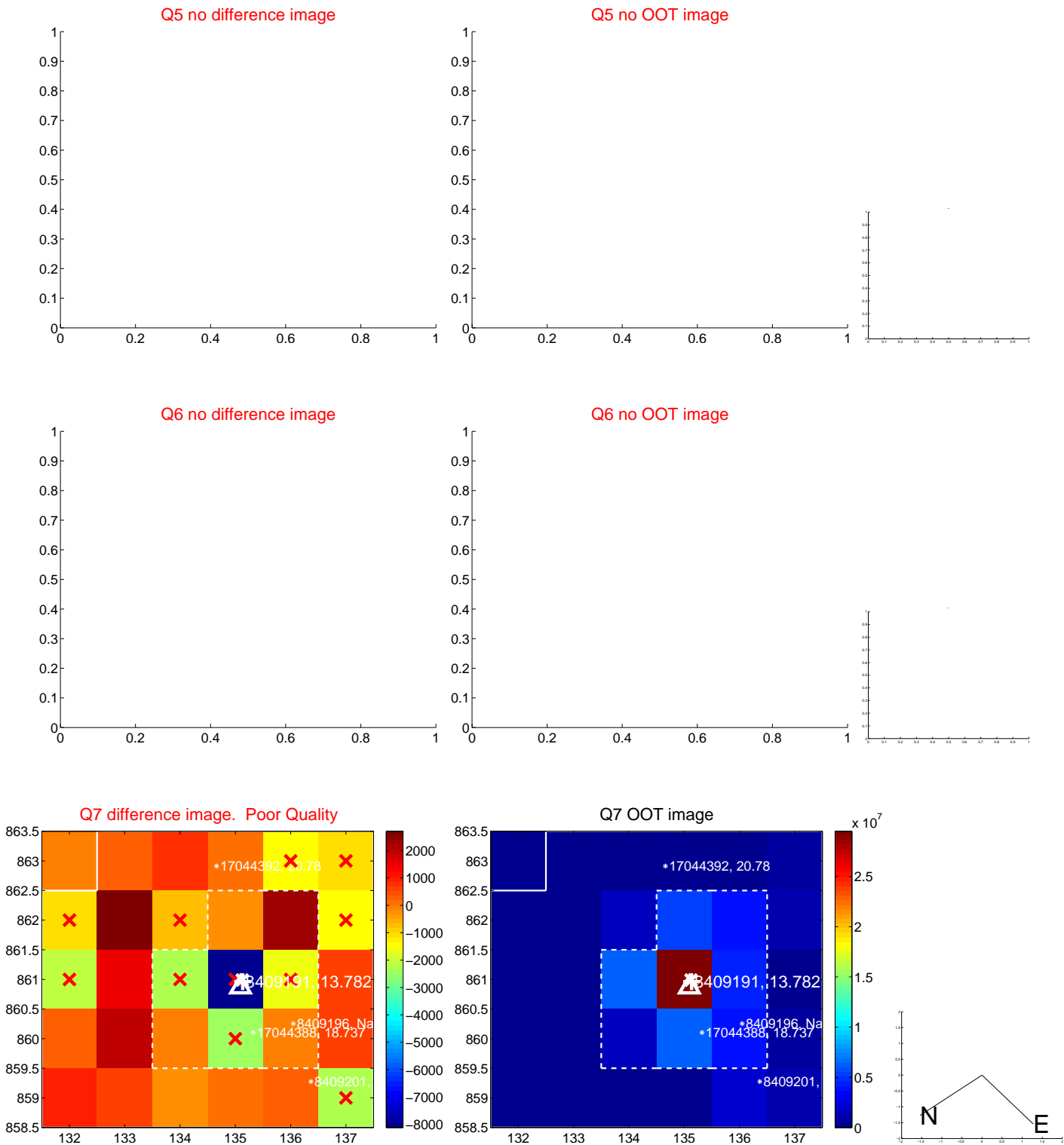


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

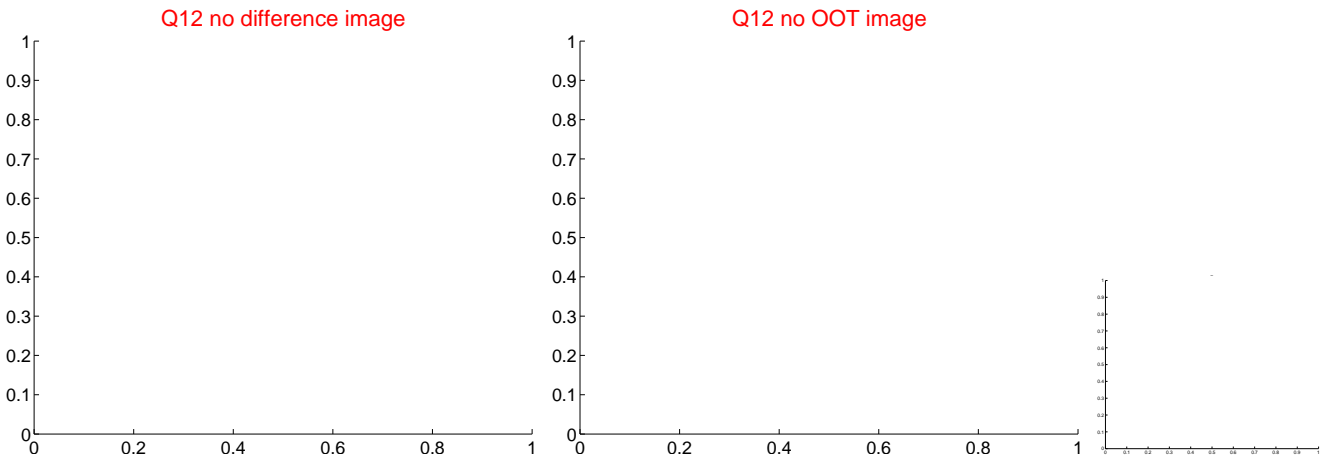
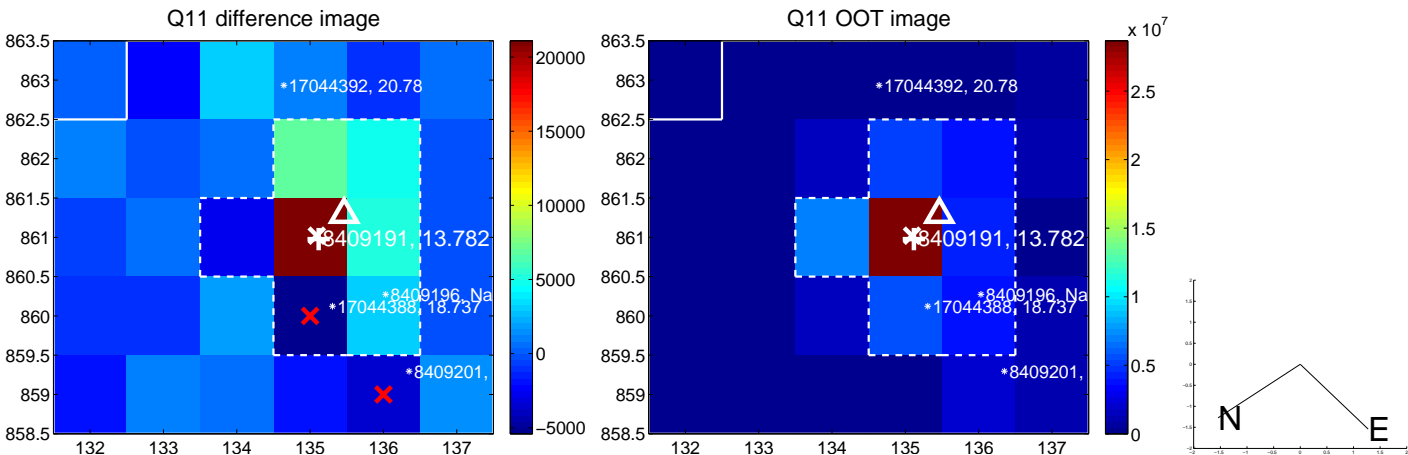
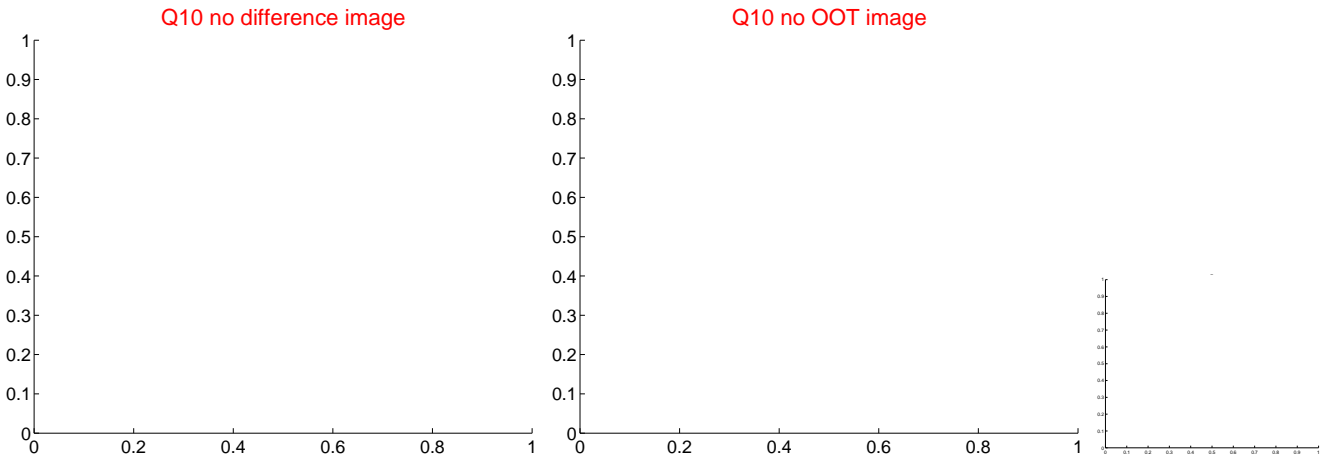
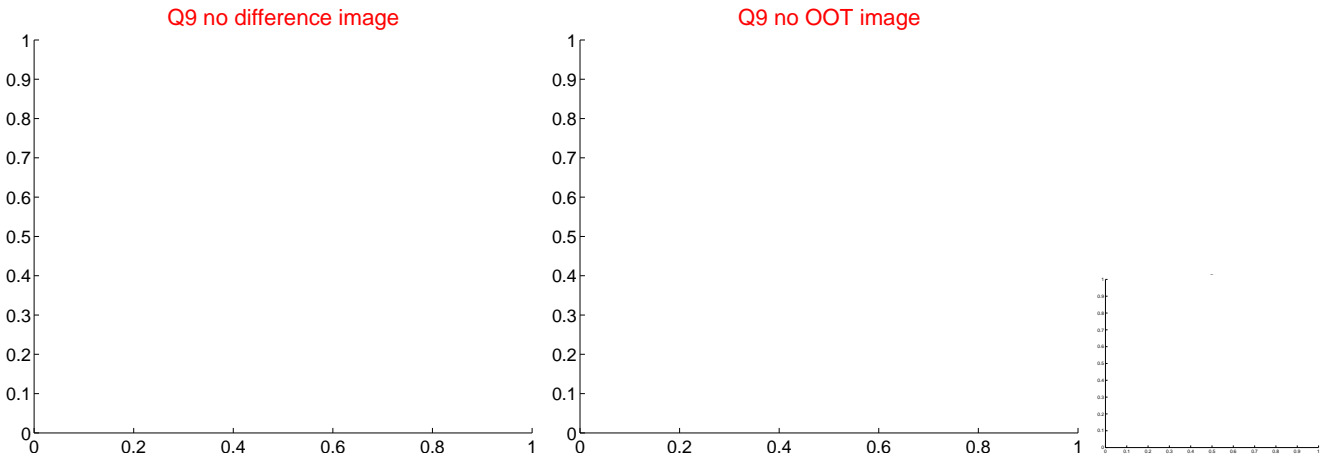
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



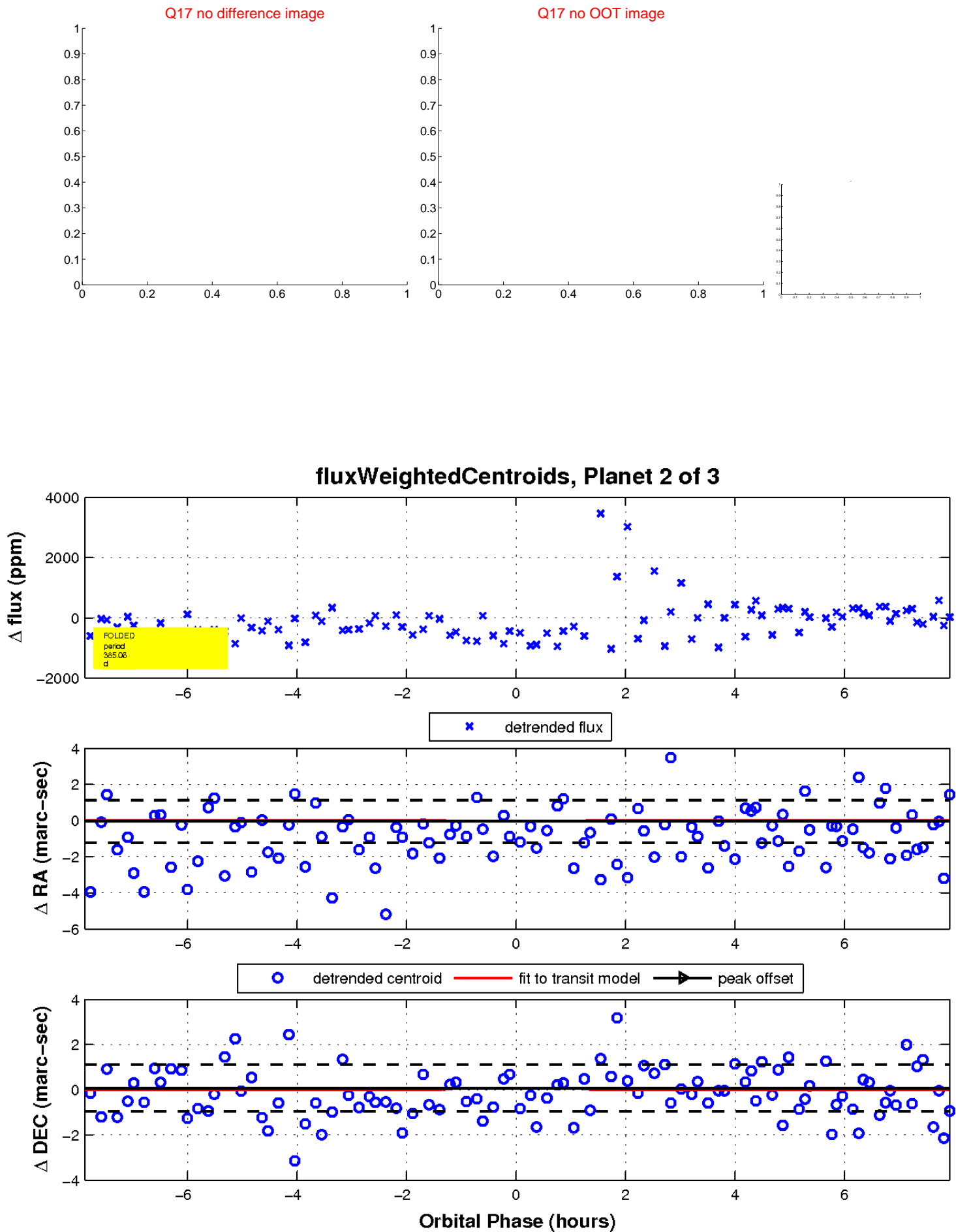
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

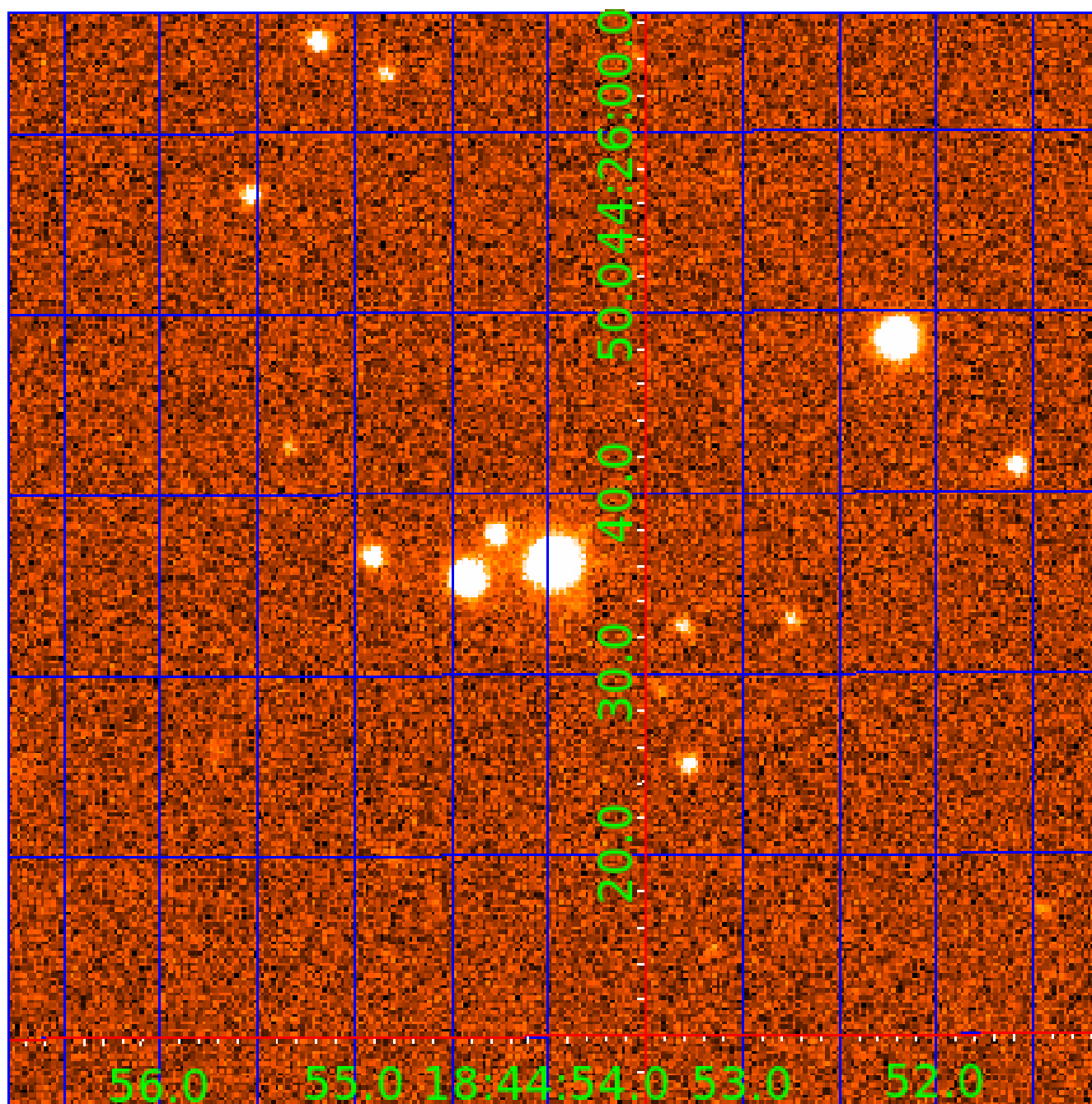


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008409191

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})
008409191-01	OBS	No	592.666269	203.440229	1044.5	6.259	13.0	7.4	1.25	6139	4.47	1.03
008409191-02	OBS	No	385.062714	249.931203	939.8	2.643	11.7	7.4	1.25	6139	3.85	1.83
008409191-03	OBS	No	449.509433	459.701694	808.1	6.707	9.8	6.2	1.25	6139	3.83	1.49

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008409191-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
008409191-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008409191-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—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.

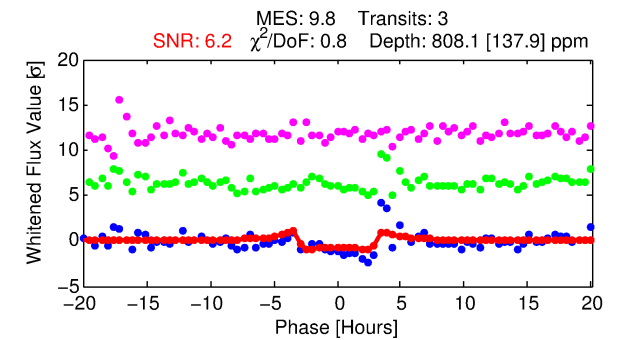
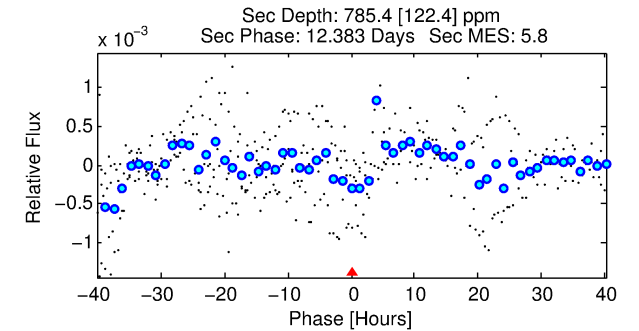
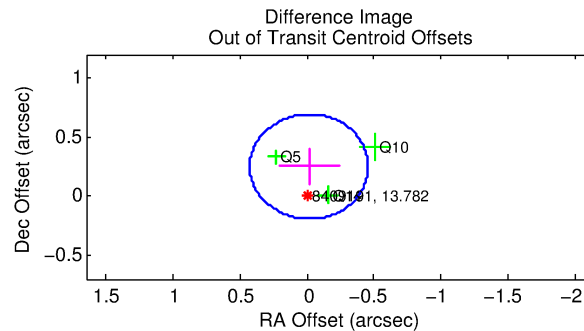
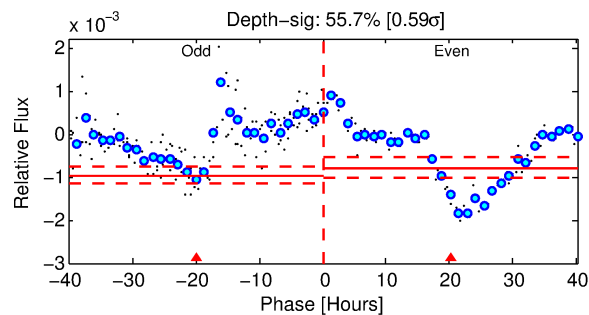
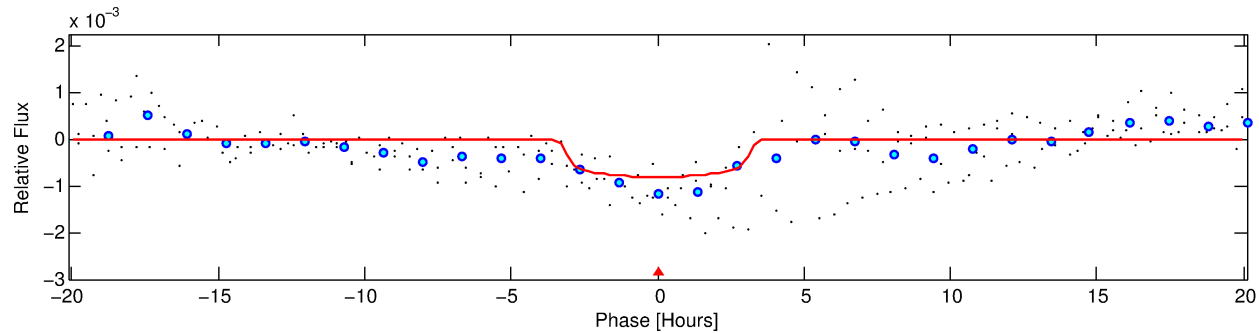
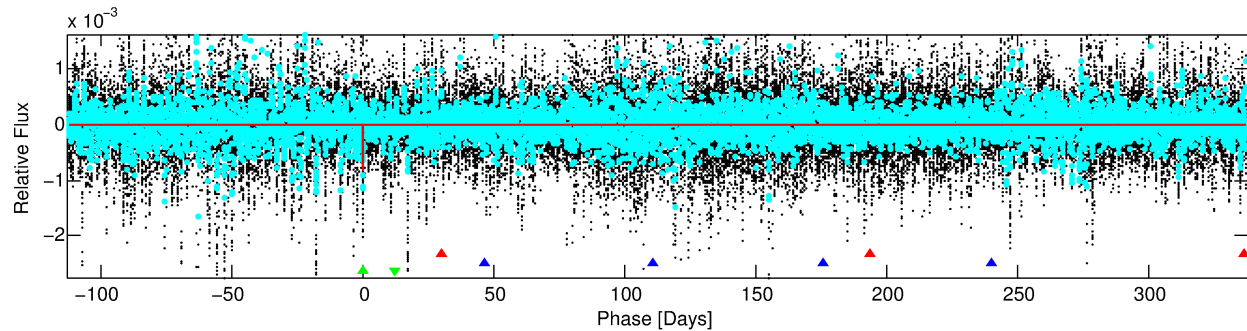
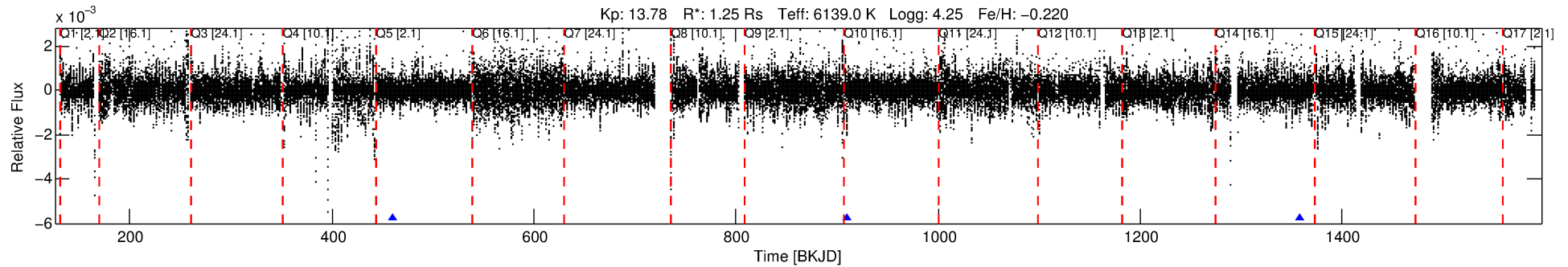
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008409191-03

No Significant Match Found

DV One-Page Summary

KIC: 8409191 Candidate: 3 of 3 Period: 449.509 d



DV Fit Results:

Period = 449.50943 [0.00602] d
Epoch = 459.7017 [0.0075] BKJD
Rp/R* = 0.0282 [0.0096]
a/R* = 365.61 [573.13]
b = 0.74 [0.97]
Seff = 1.49 [0.54]
Teq = 282 [26] K
Rp = 3.83 [1.69] Re
a = 1.1531 [0.2720] AU
Ag = 39118.26 [30351.63] [1.29σ]
Teffp = 6121 [1085] K [5.38σ]

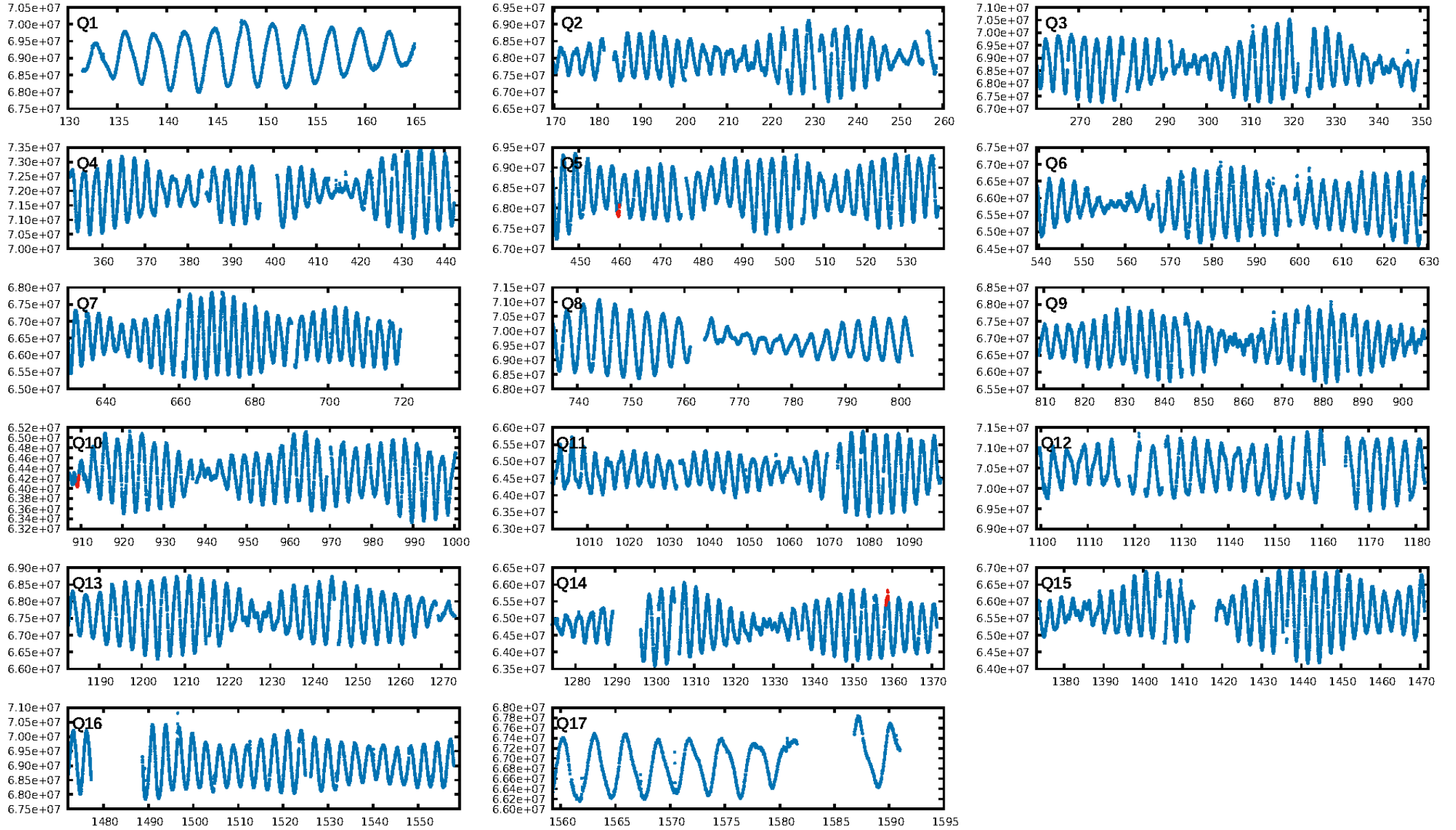
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [214.54σ]
LongPeriod-sig: 100.0% [374.51σ]
ModelChiSquare2-sig: 55.3%
ModelChiSquareGof-sig: 99.0%
Bootstrap-pfa: 3.03e-07
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.466
Centroid-sig: 29.4%
Centroid-so: 1.092 arcsec [0.96σ]
OotOffset-rm: 0.251 arcsec [1.70σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 0.275 arcsec [2.48σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

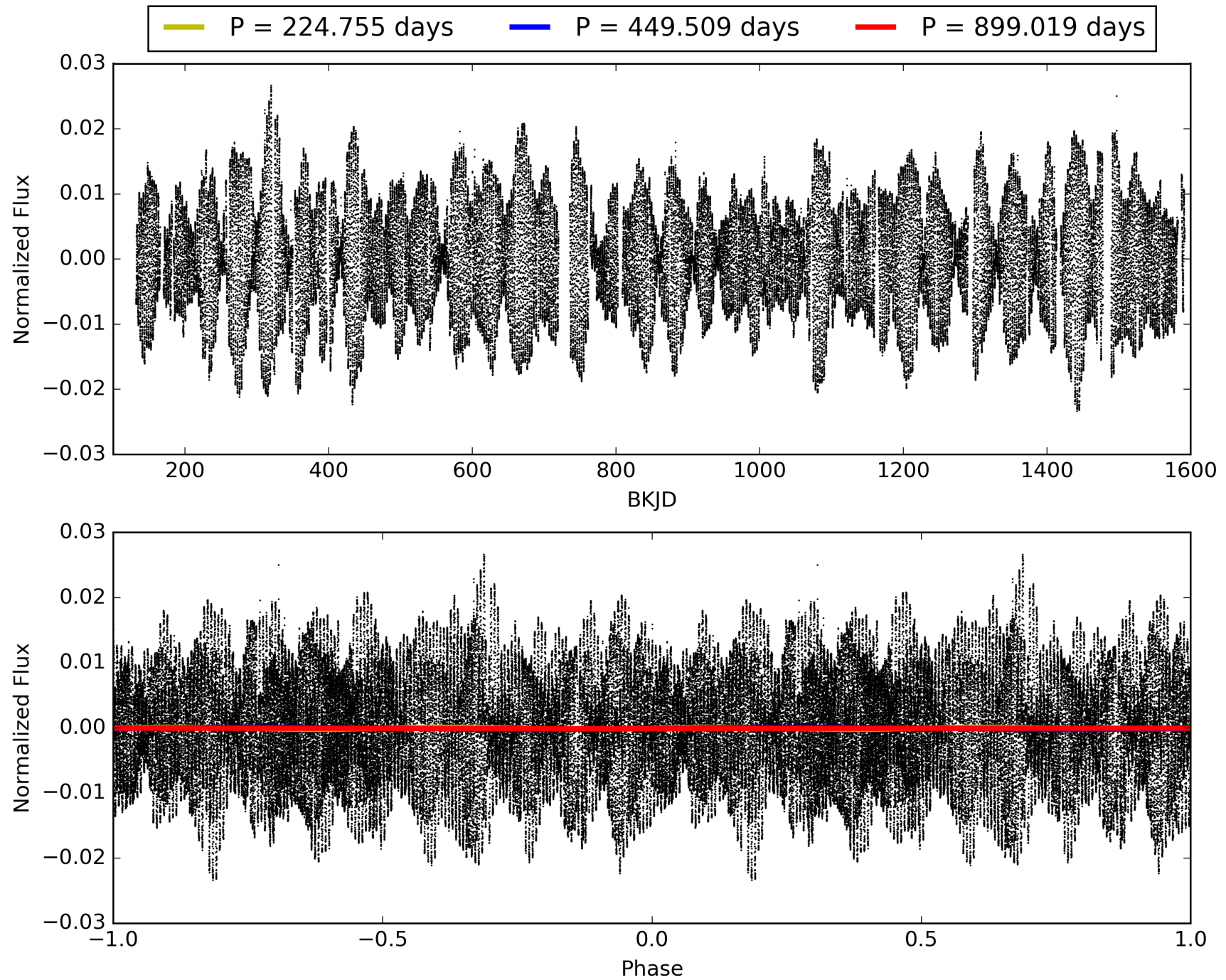
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 19:43:37 Z

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

TCE 008409191-03, PDC Light Curves

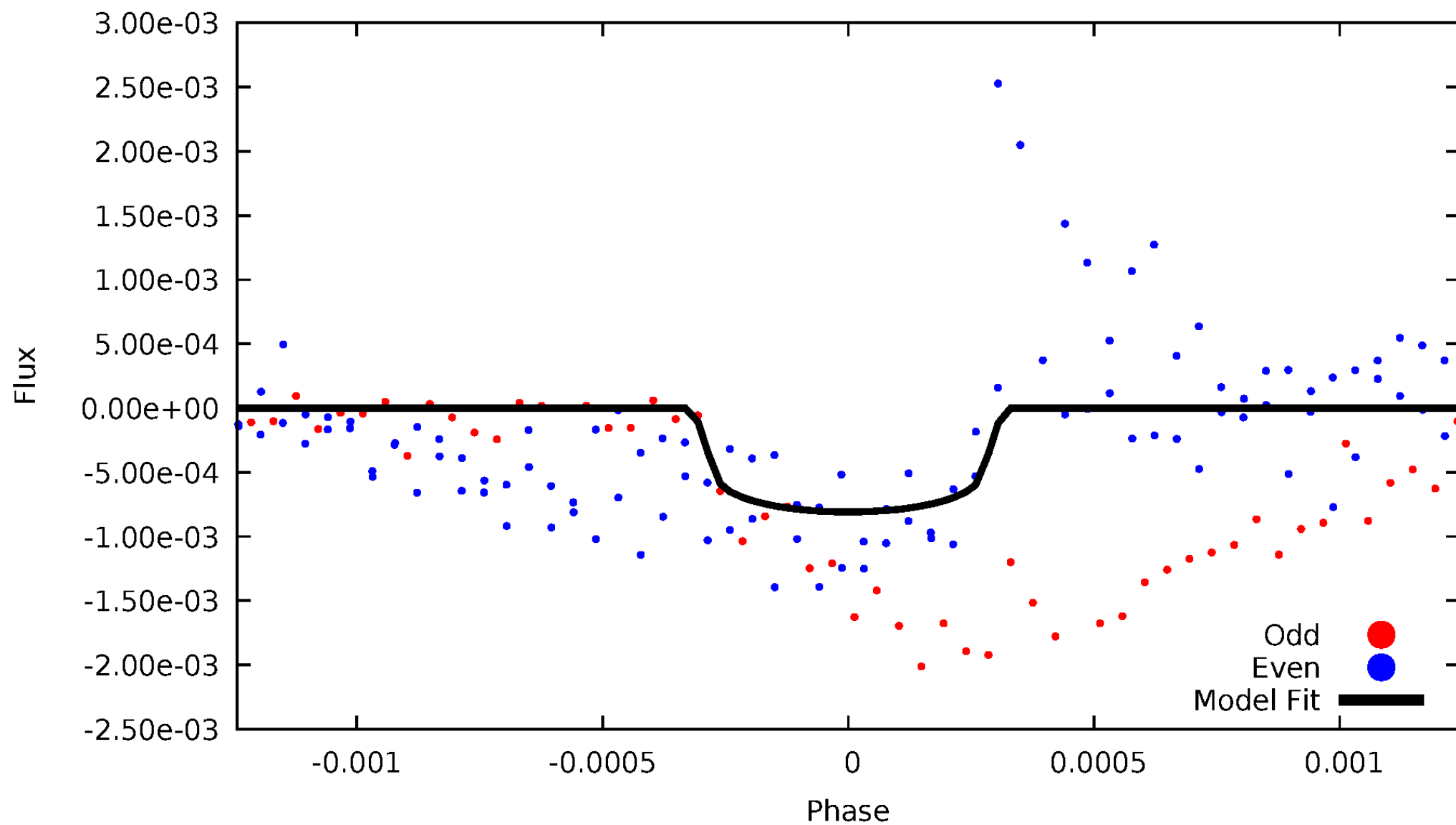


TCE 008409191-03



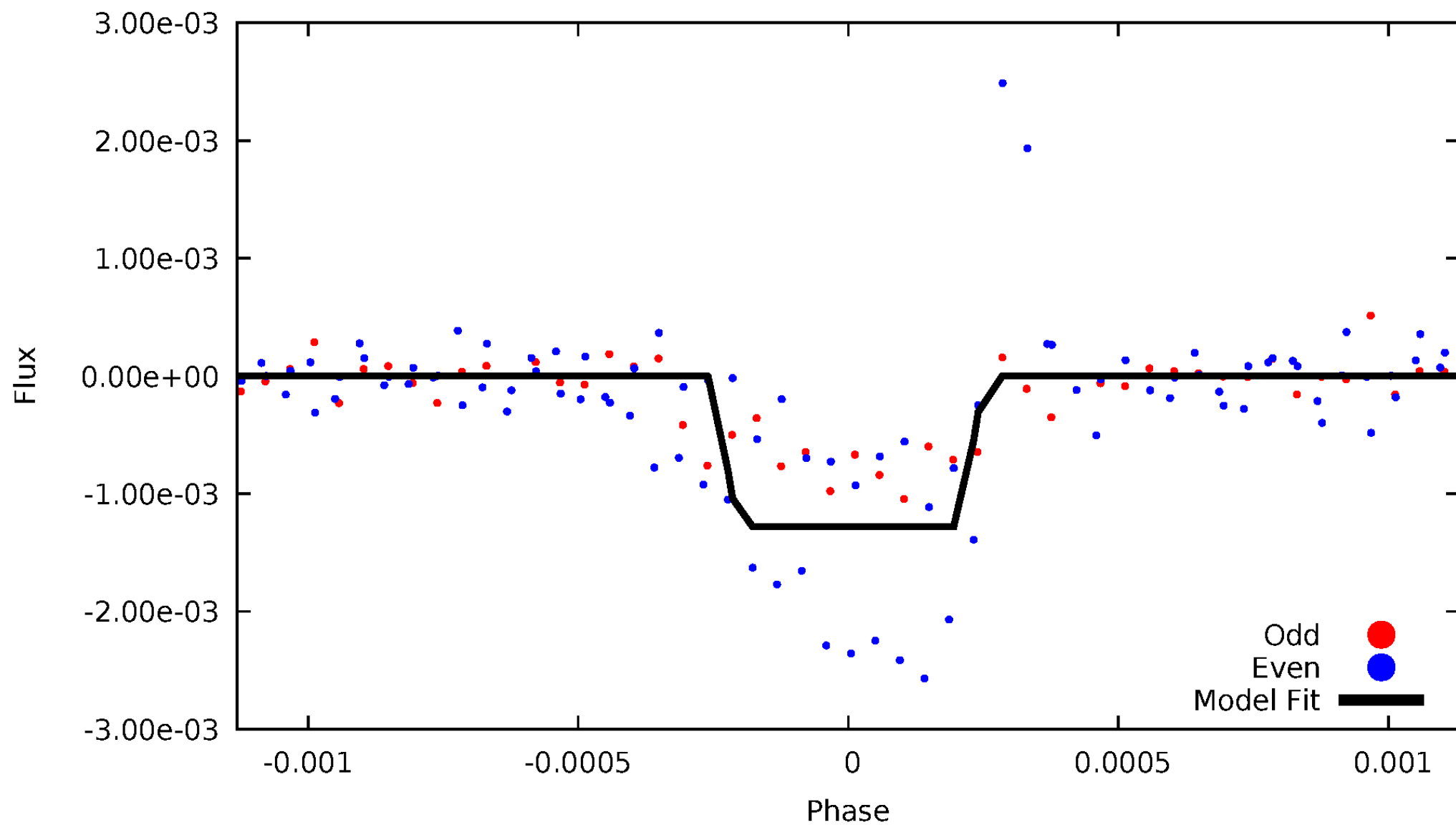
DV Odd/Even

TCE 008409191-03



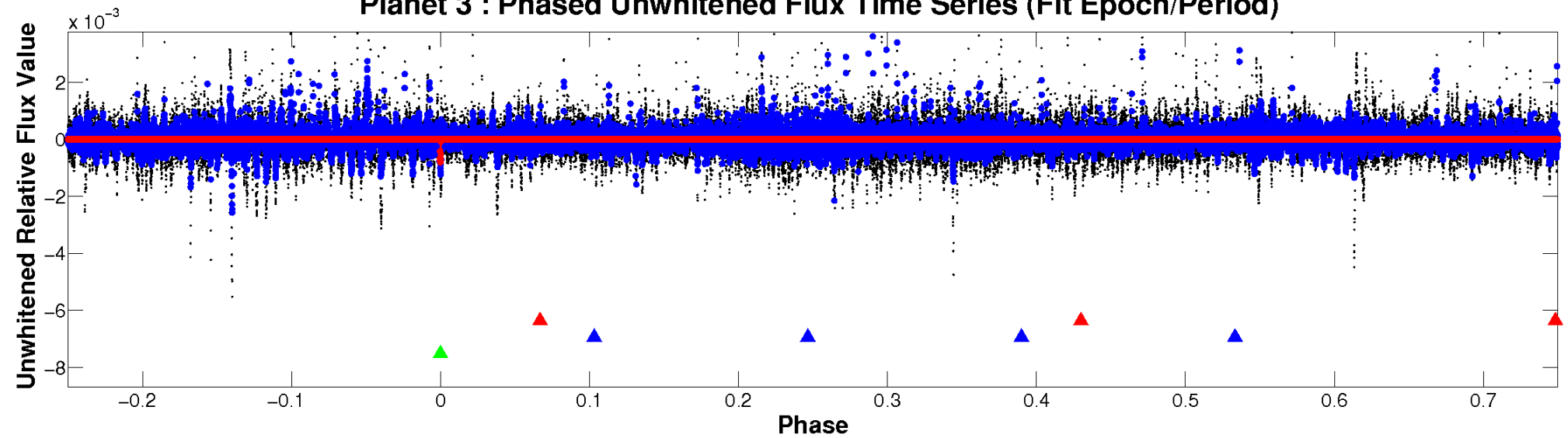
ALT Odd/Even

TCE 008409191-03

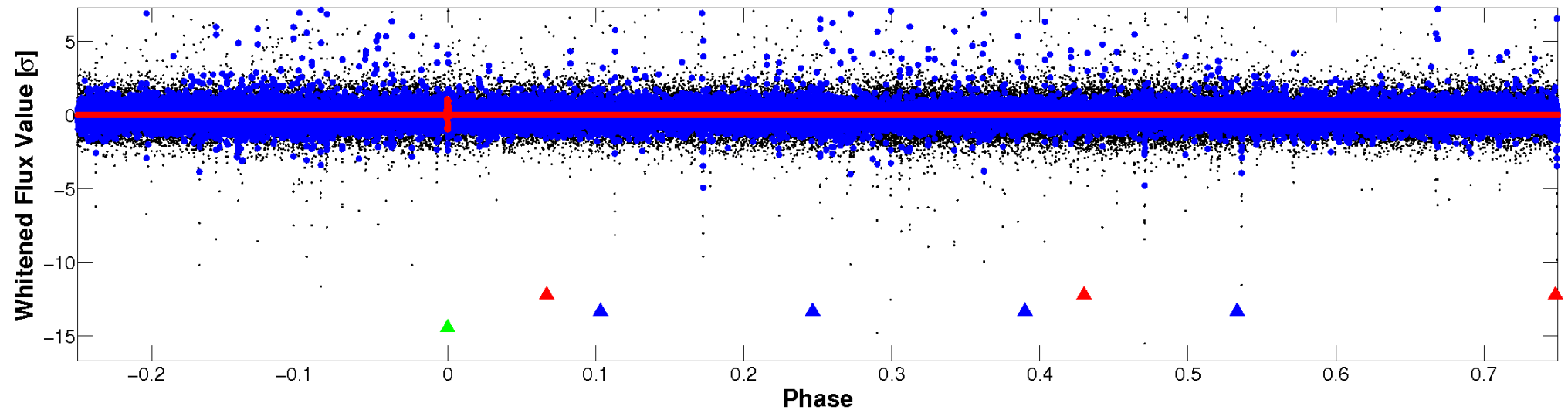


Non-Whitened Vs. Whitened Light Curve

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

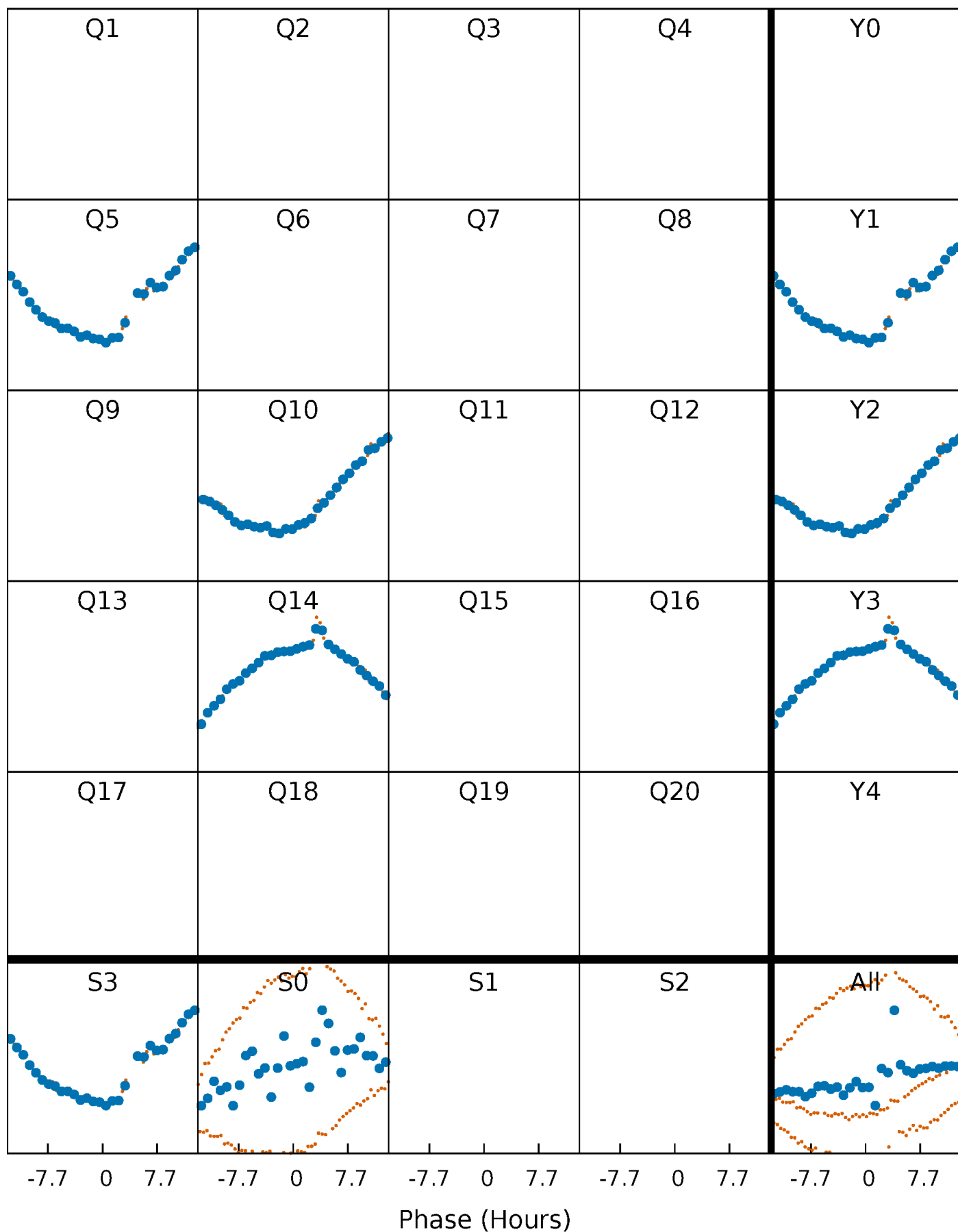


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



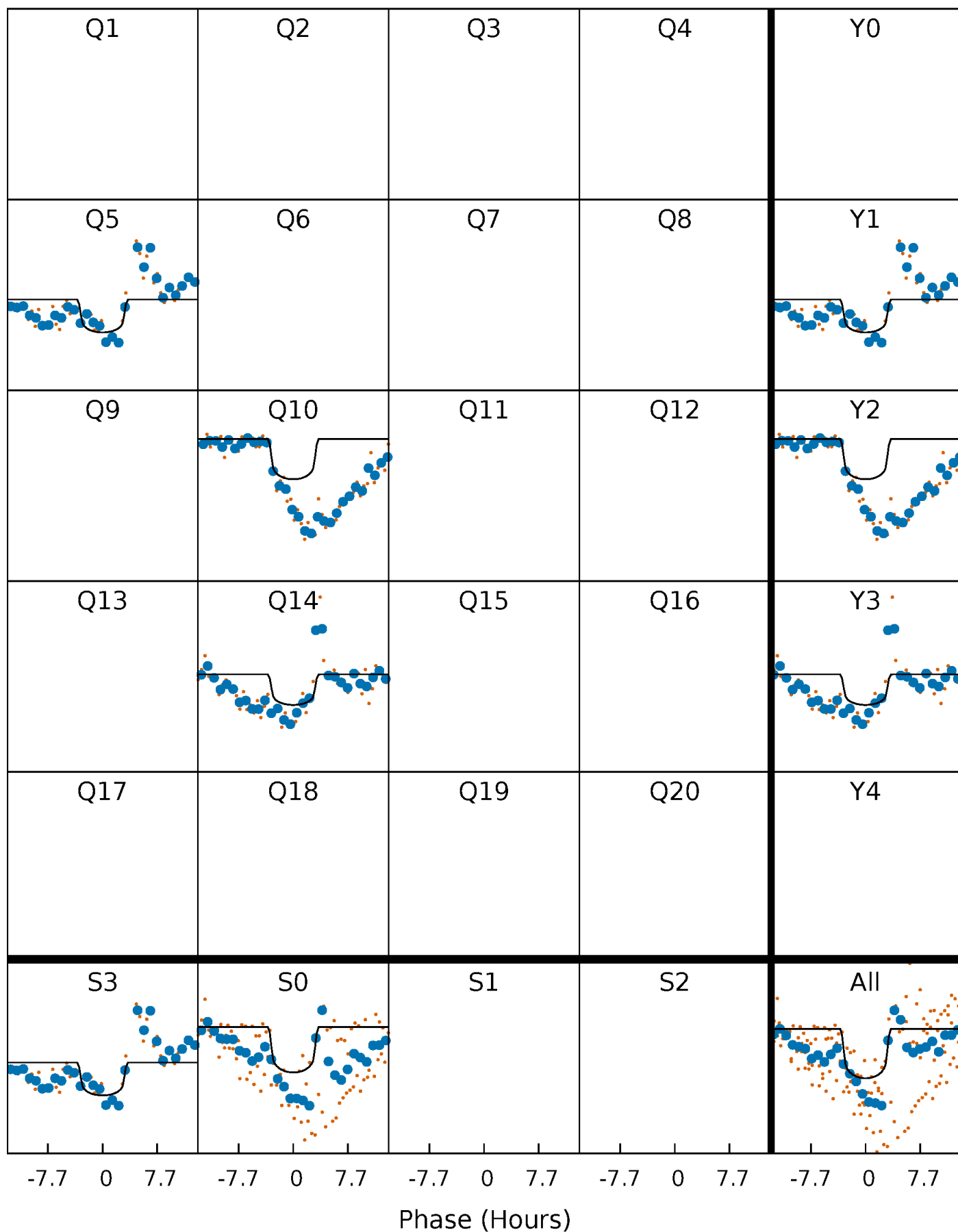
PDC Quarter-Phased Transit Curves

TCE 008409191-03 P=449.509433 Days $T_0=459.701694$ (BKJD)



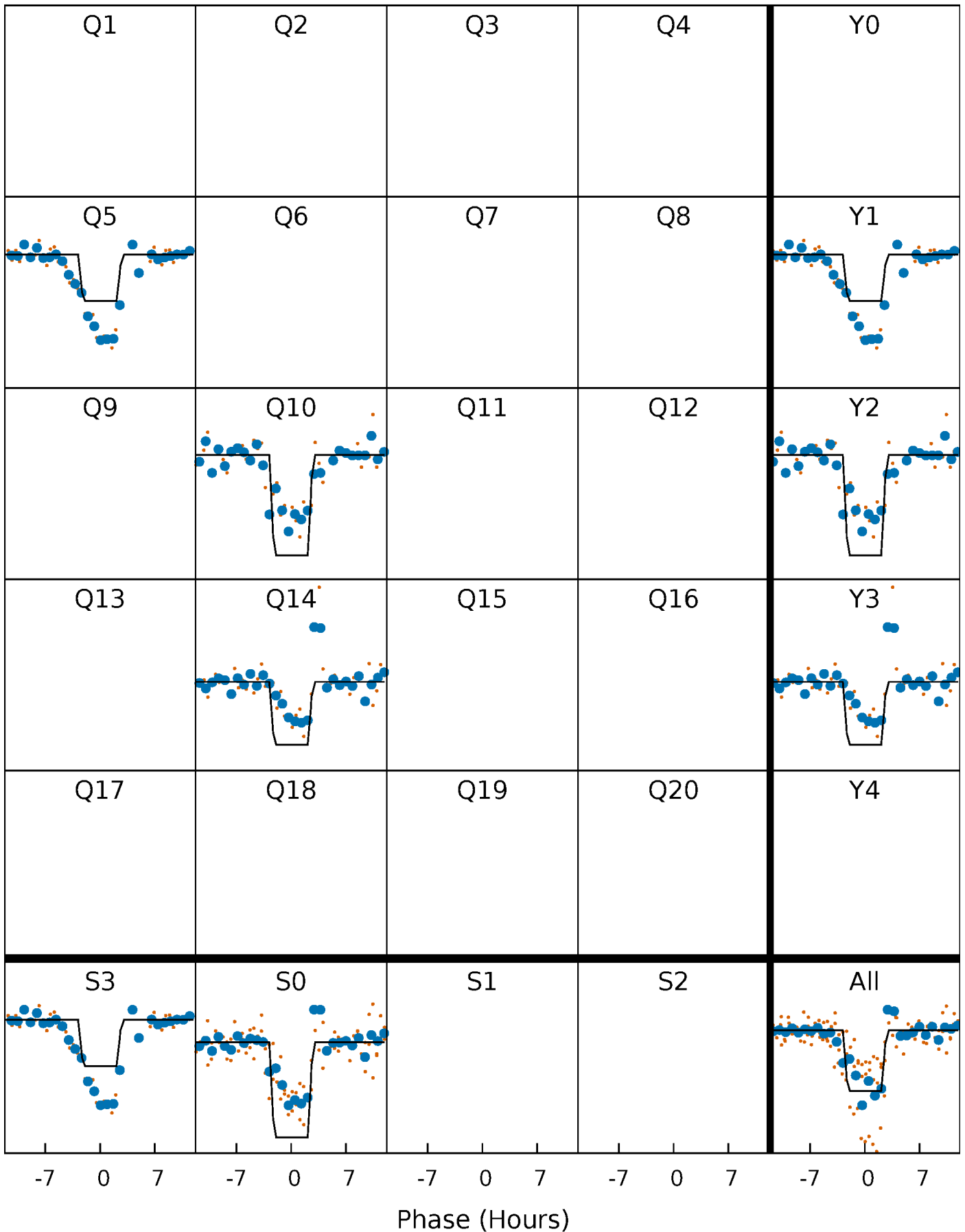
DV Quarter-Phased Transit Curves

TCE 008409191-03 $P=449.509433$ Days $T_0=459.701694$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

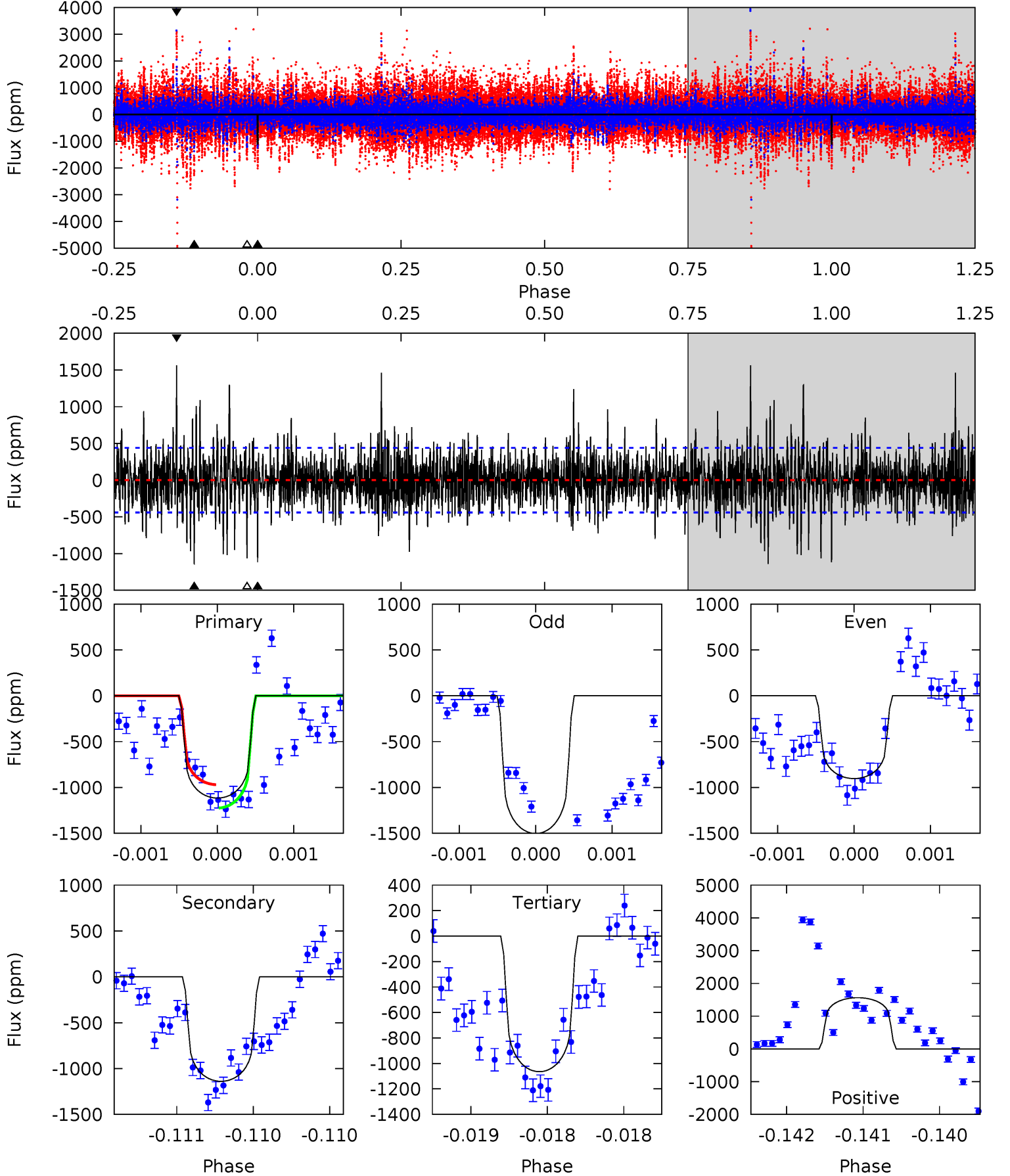
TCE 008409191-03 P=449.497453 Days $T_0=459.734188$ (BKJD)



DV Model-Shift Uniqueness Test

008409191-03, P = 449.509433 Days, E = 10.192261 Days

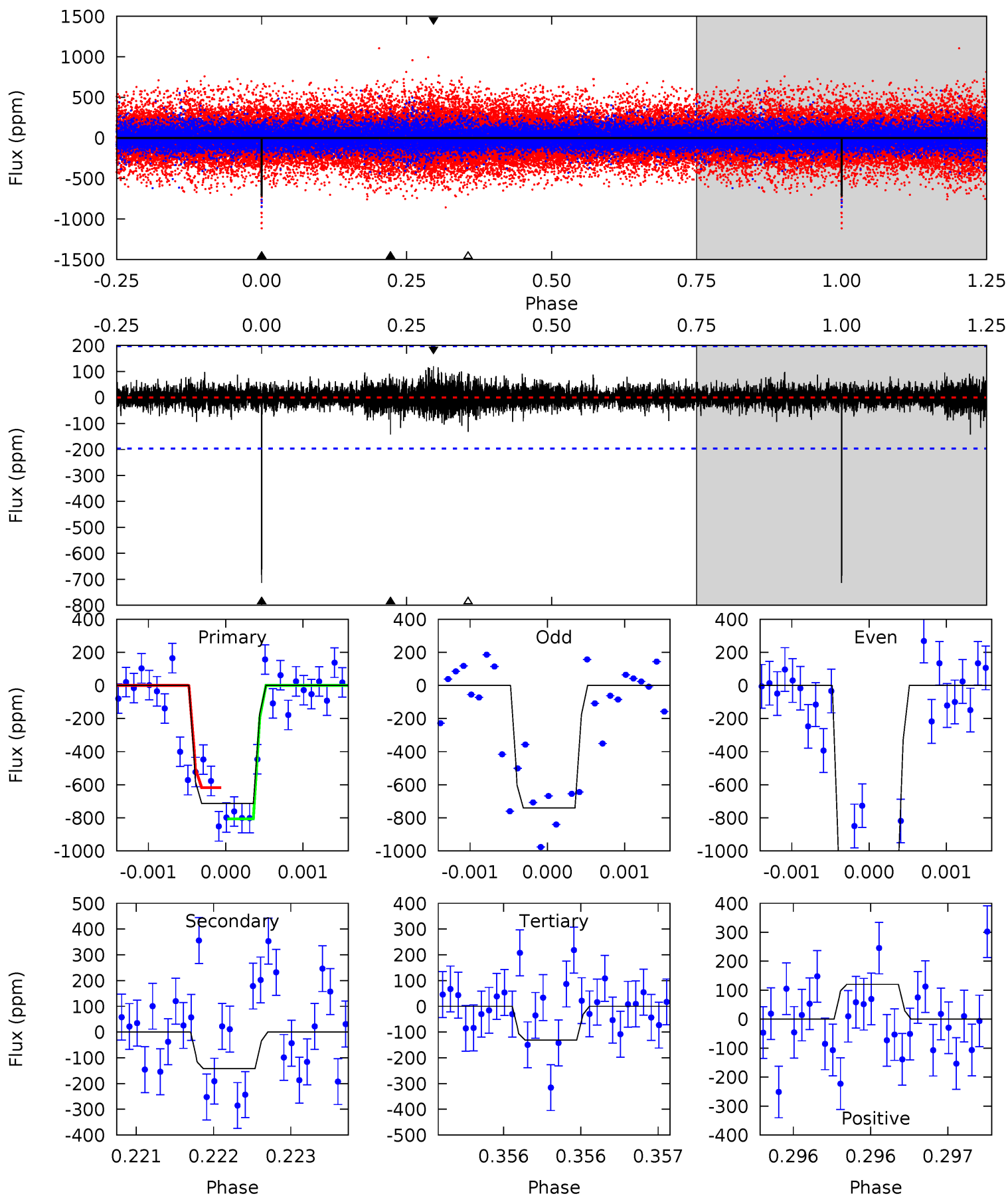
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	14.3	13.4	19.6	5.53	3.41	3.25	0.64	-5.62	0.94	-5.32	3.38	1.09	0.58	1.59



Alt Model-Shift Uniqueness Test

008409191-03, P = 449.497453 Days, E = 10.236735 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.1	4.01	3.71	3.39	5.56	3.46	0.65	16.4	16.8	0.31	0.63	9.74	1.58	0.14	2.67



Stellar Parameters For KIC 008409191

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6139^{+164}_{-200}	$4.252^{+0.185}_{-0.185}$	$-0.220^{+0.250}_{-0.300}$	$1.246^{+0.352}_{-0.288}$	$1.012^{+0.166}_{-0.124}$	$0.737^{+0.689}_{-0.353}$
	+3%/-3%	+4%/-4%	+114%/-136%	+28%/-23%	+16%/-12%	+93%/-48%
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 008409191-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1139 \pm 80	$3.75^{+1.56}_{-1.22}$	393^{+31}_{-26}	6770^{+1746}_{-923}	60161^{+69454}_{-30872}
Alt.	-142 \pm 35	$4.83^{+1.67}_{-1.45}$	393^{+29}_{-28}	3891^{+469}_{-346}	4422^{+4316}_{-2002}

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 $A_{obs} \gg 1.0$

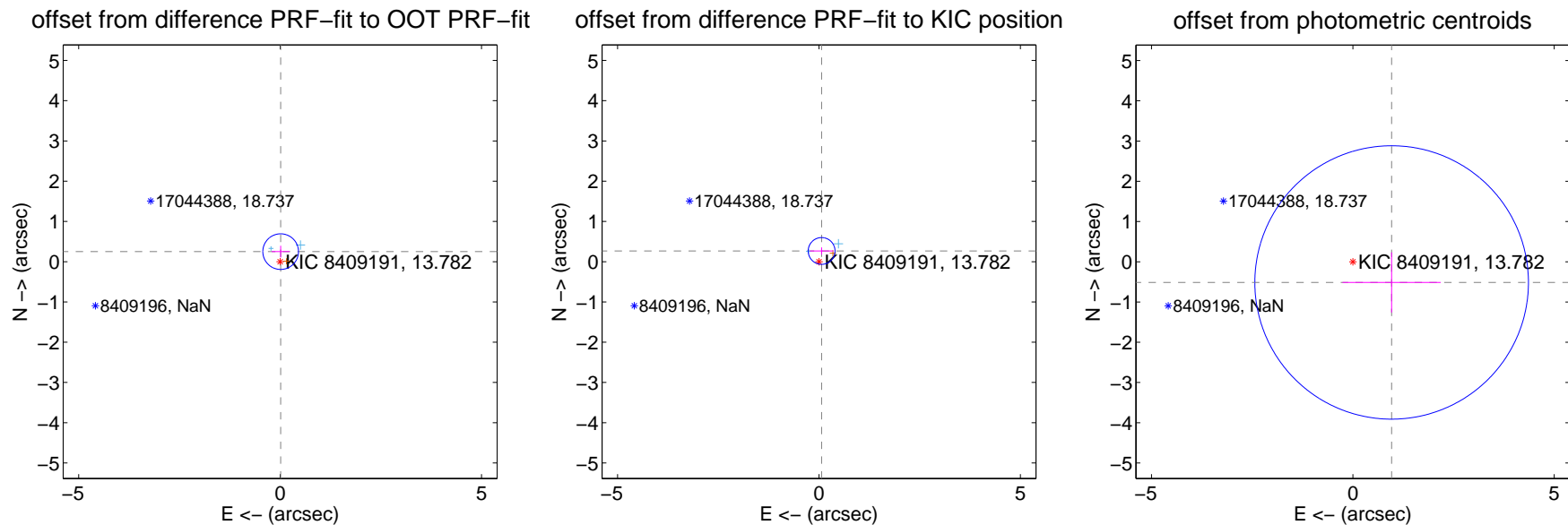
DV Centroid Data

Supplemental centroid analysis for 008409191-03. Kepler magnitude: 13.78. Transit SNR 6.23

There are 2 quarters with good PRF difference image offsets

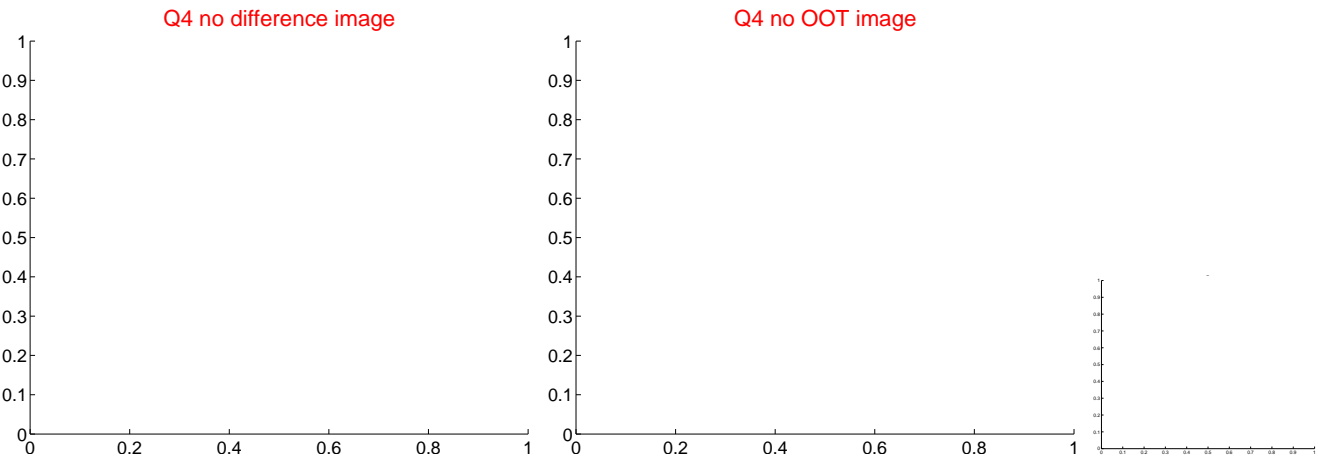
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.251 ± 0.148	1.70	-0.014 ± 0.224	0.250 ± 0.147
PRF-fit source offset from KIC position	0.275 ± 0.111	2.48	-0.065 ± 0.294	0.267 ± 0.089
photometric centroid source offset	1.09 ± 1.13	0.96	-0.96 ± 1.22	-0.51 ± 0.75

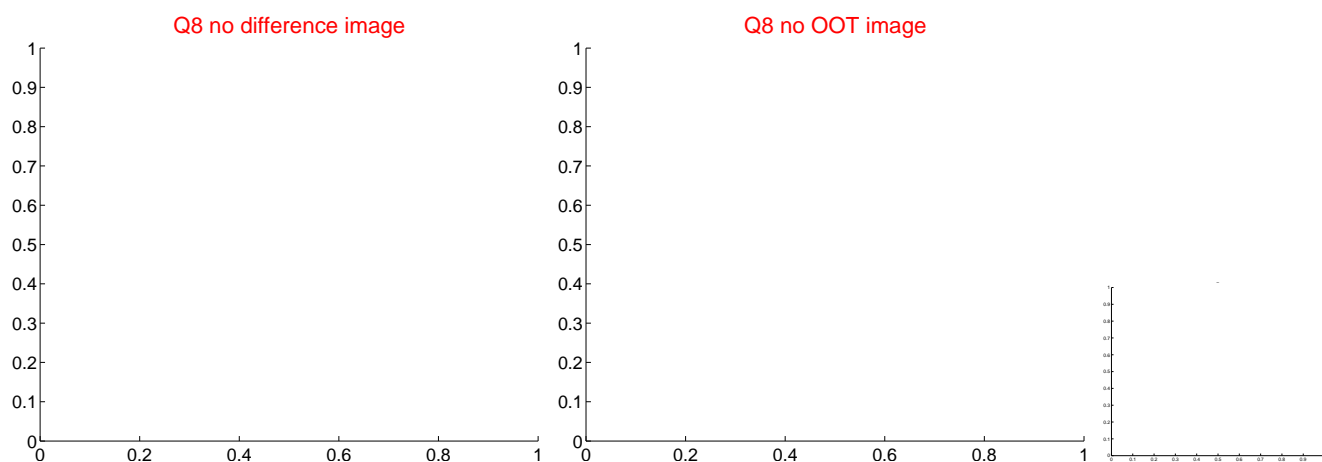
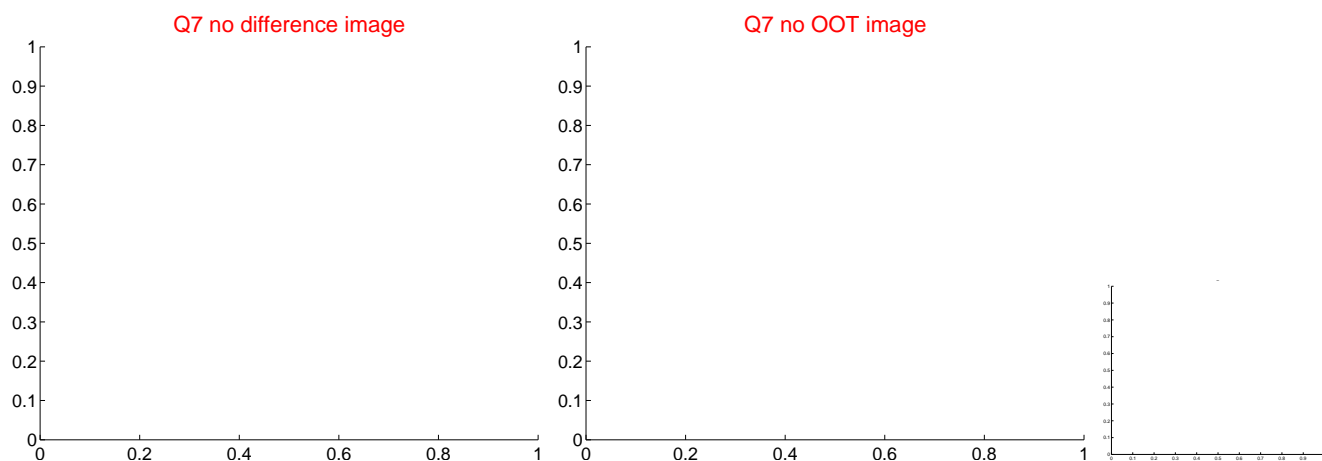
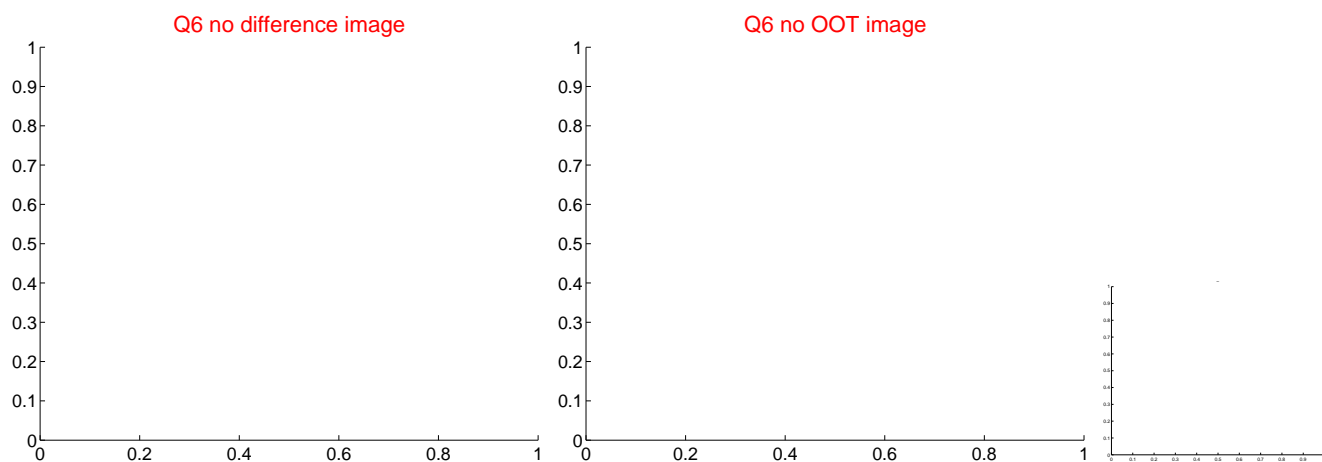
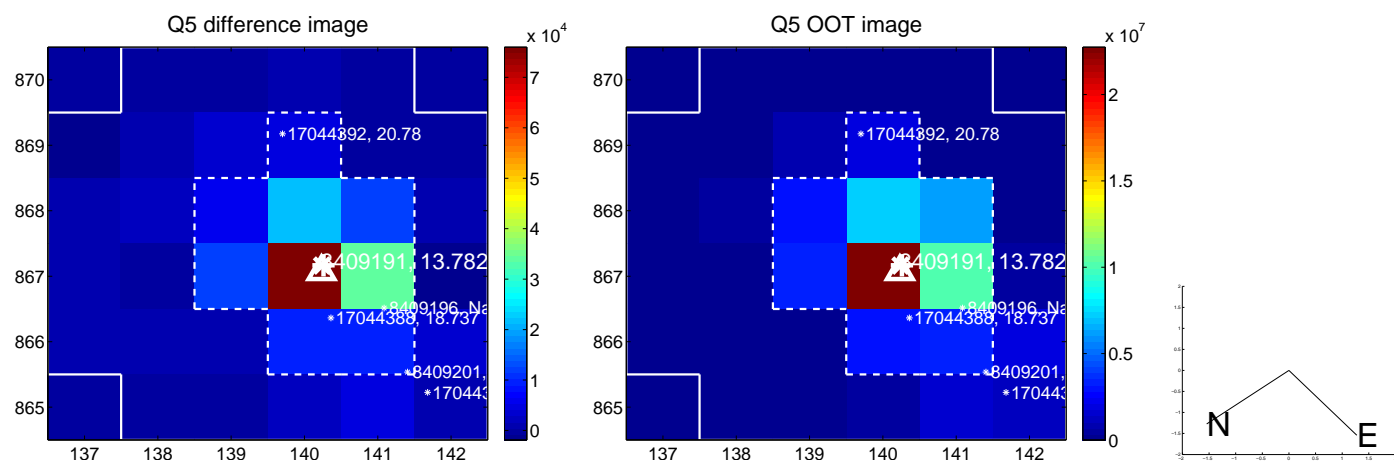


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

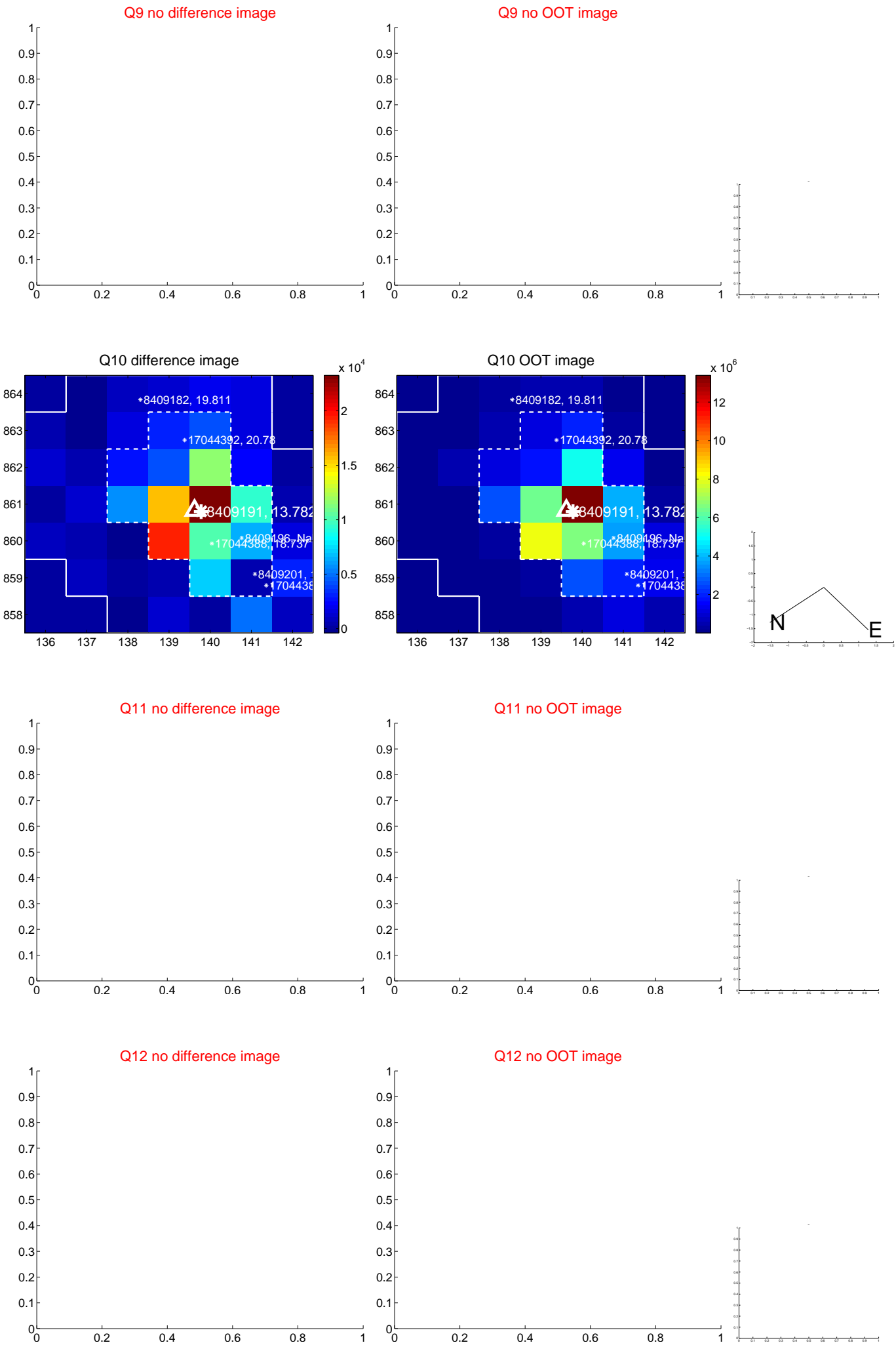
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



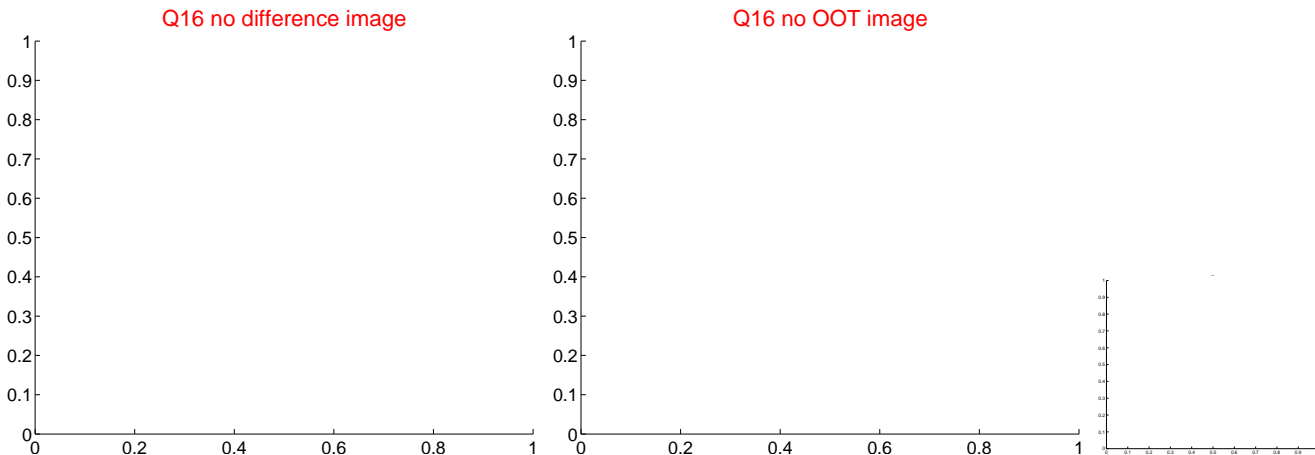
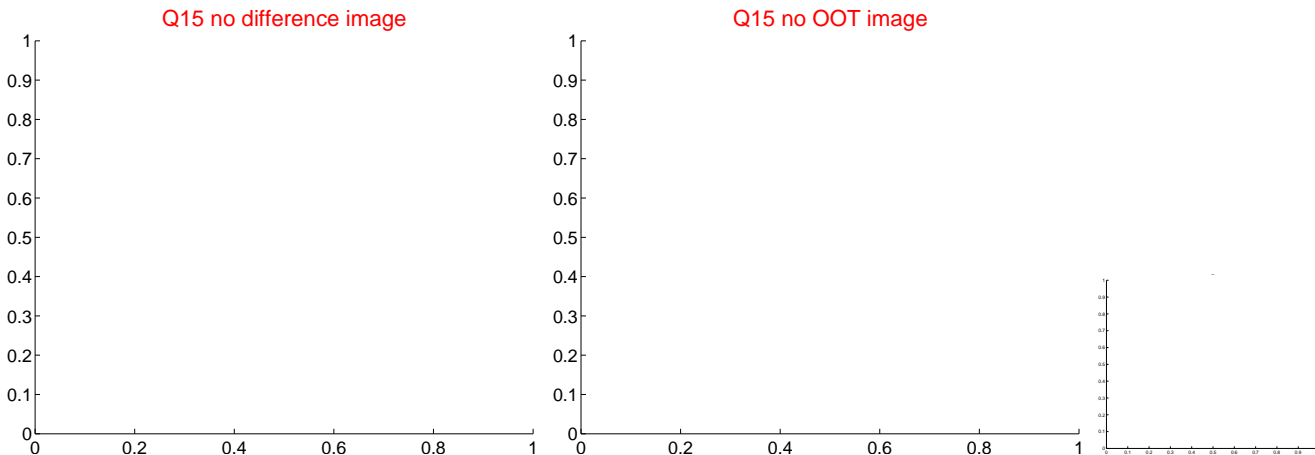
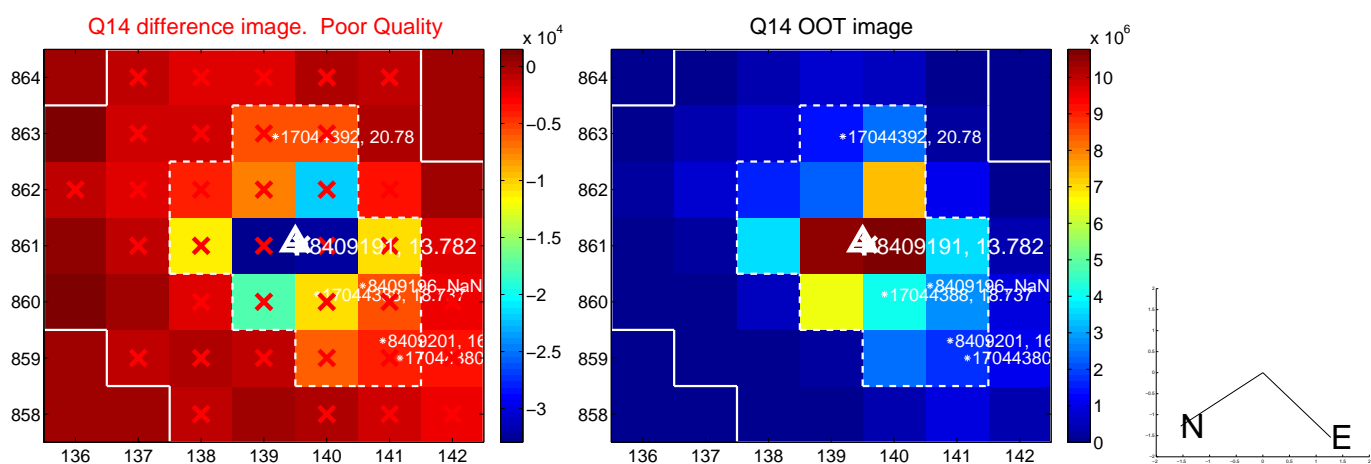
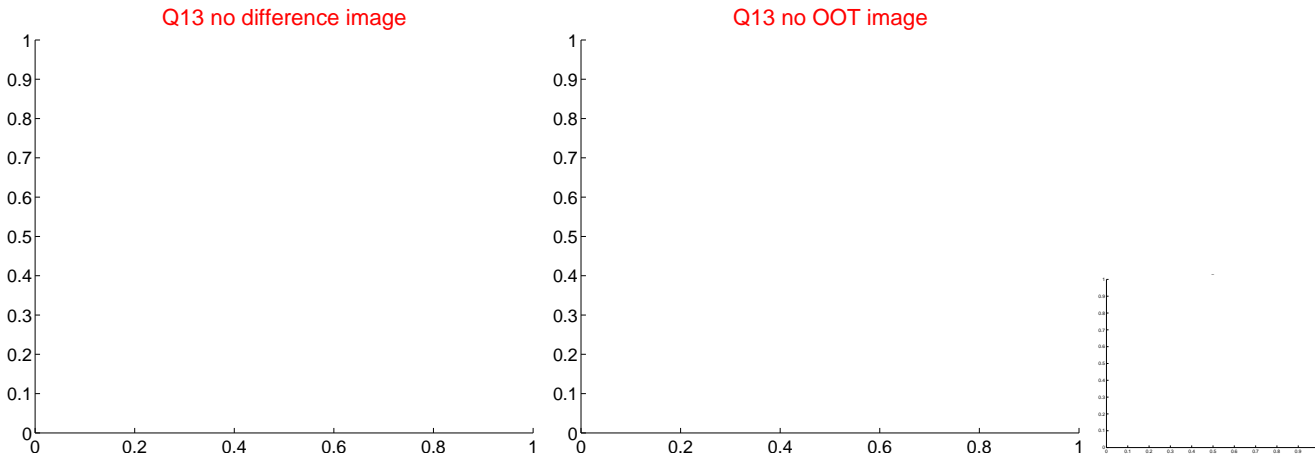
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



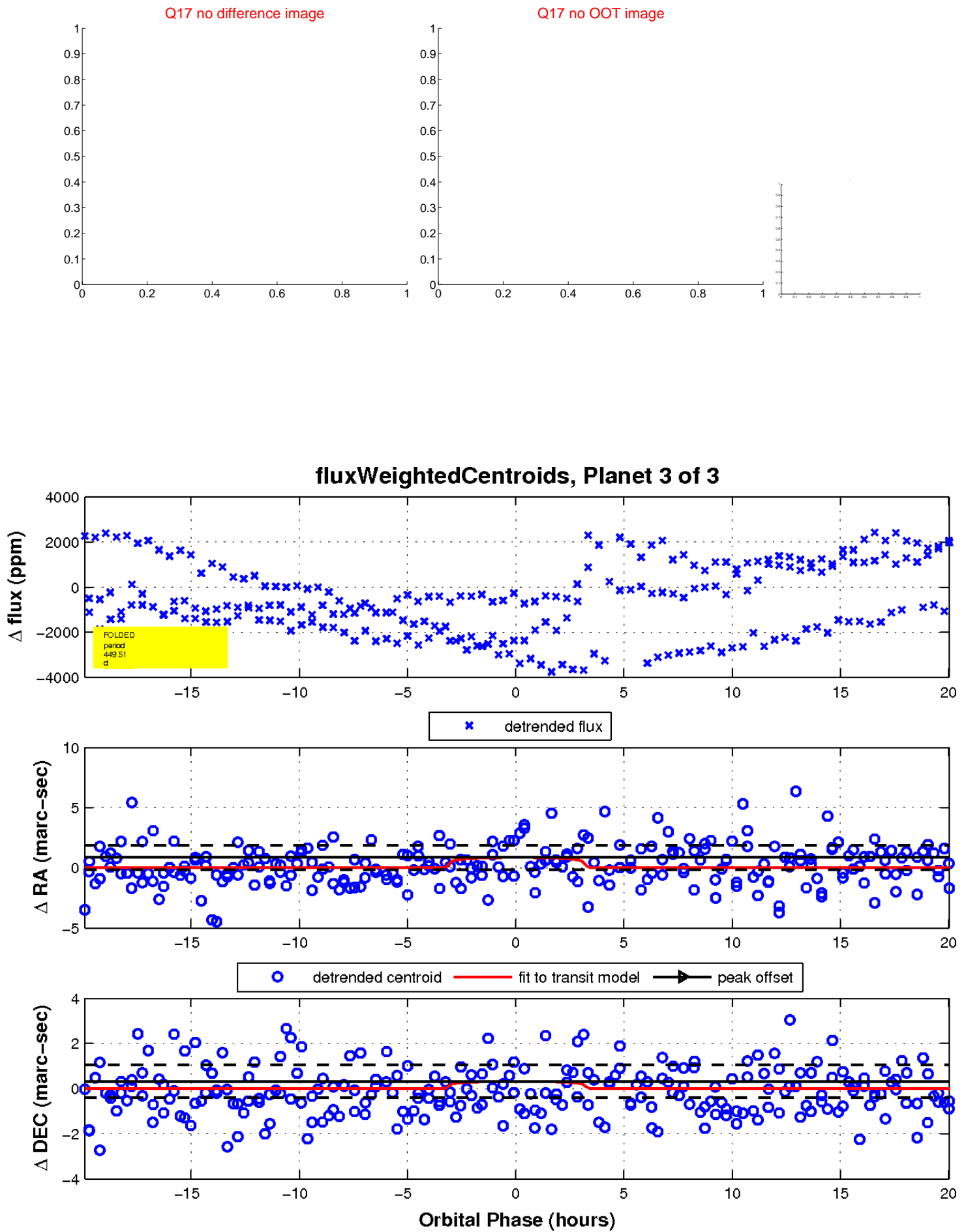
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

