

KIC 009215841

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})
009215841-01	OBS	No	379.314948	328.649729	711.0	3.863	13.7	5.9	0.79	5239	2.18	0.49
009215841-02	OBS	No	615.411688	227.356891	1079.8	5.274	13.9	7.3	0.79	5239	2.62	0.26
009215841-03	OBS	No	263.564645	236.545251	724.4	2.762	12.7	5.1	0.79	5239	2.27	0.80
009215841-04	OBS	No	481.609789	298.033121	865.5	4.330	9.6	6.3	0.79	5239	2.41	0.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009215841-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009215841-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—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.

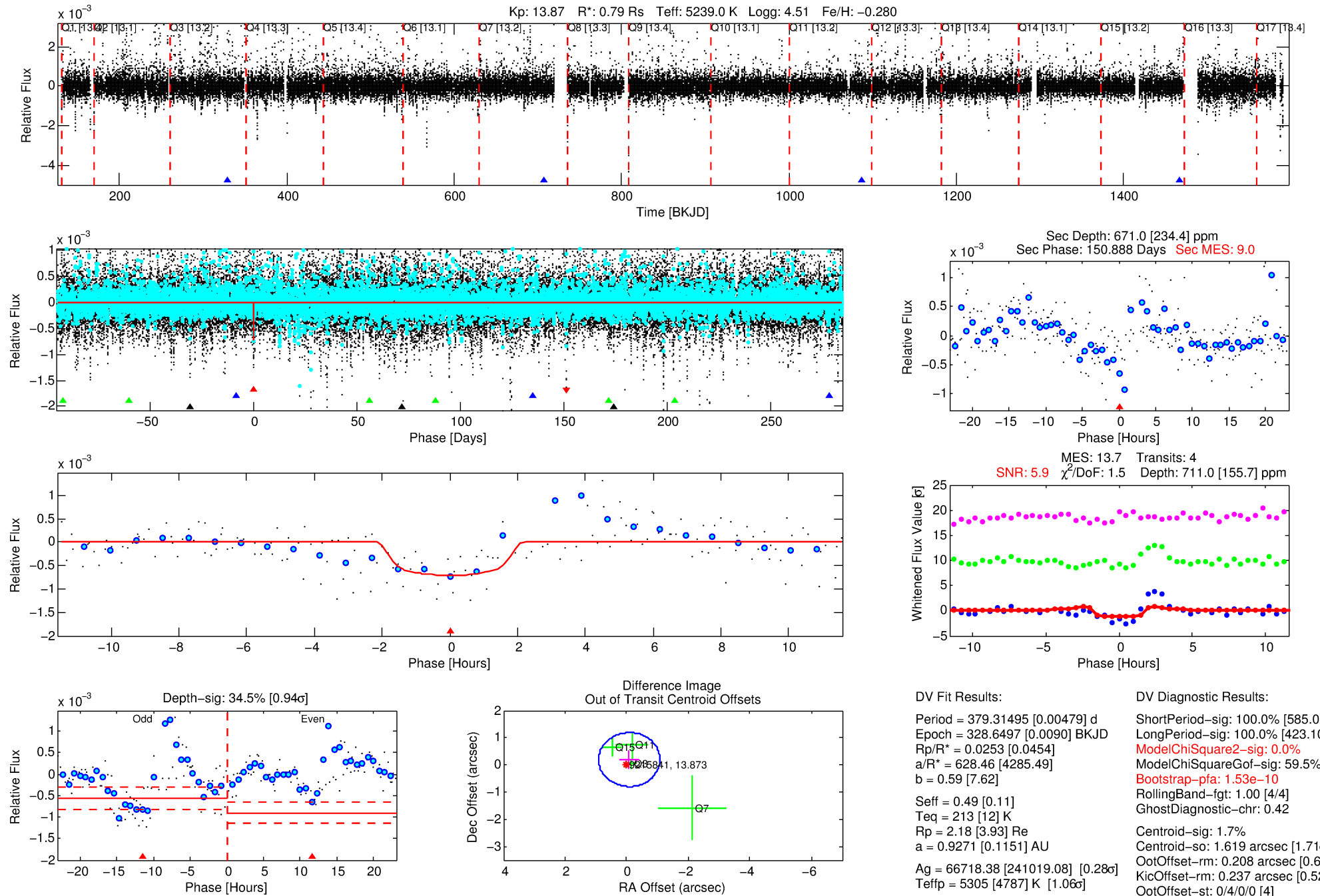
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009215841-01

No Significant Match Found

DV One-Page Summary

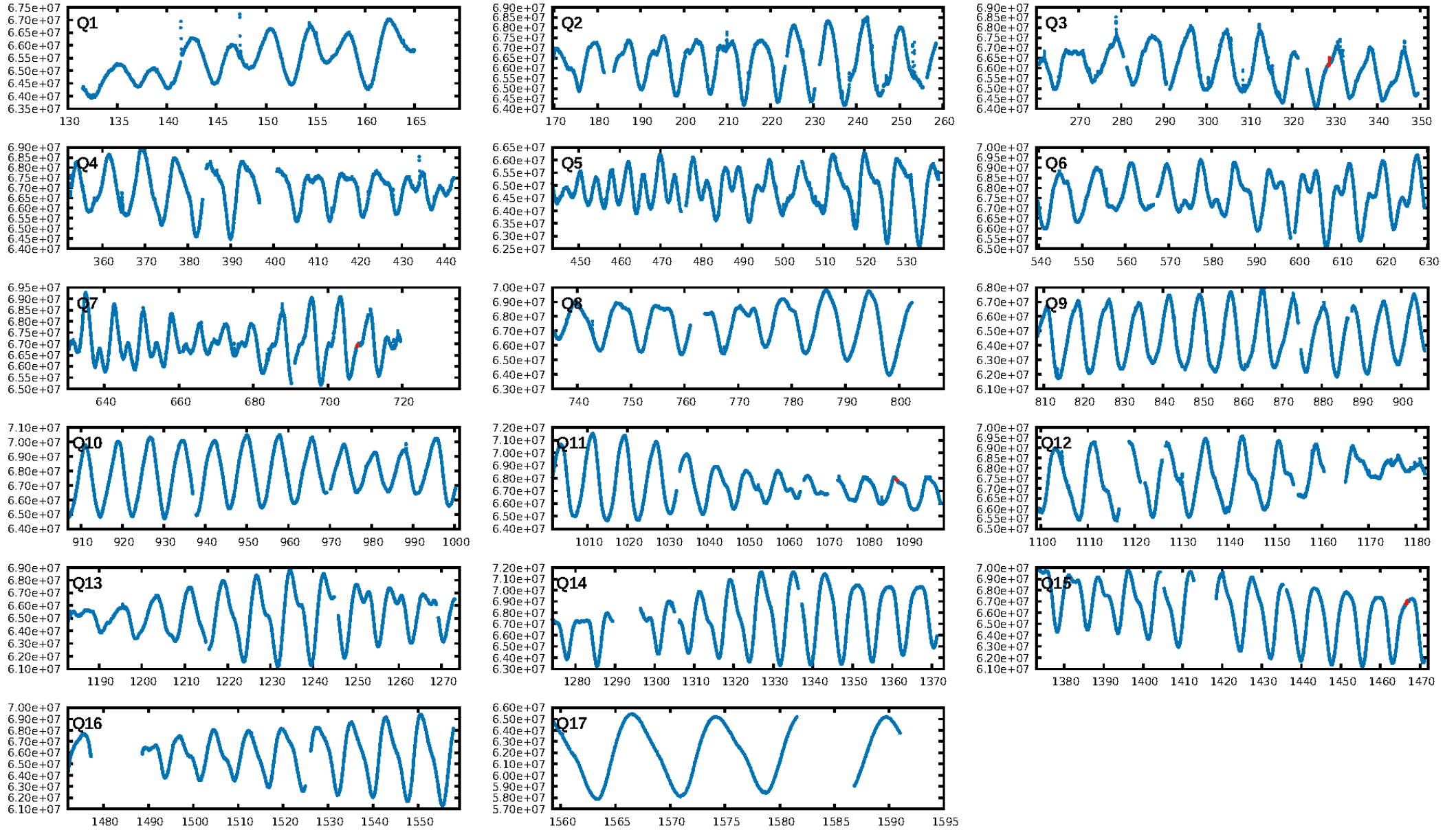
KIC: 9215841 Candidate: 1 of 4 Period: 379.315 d



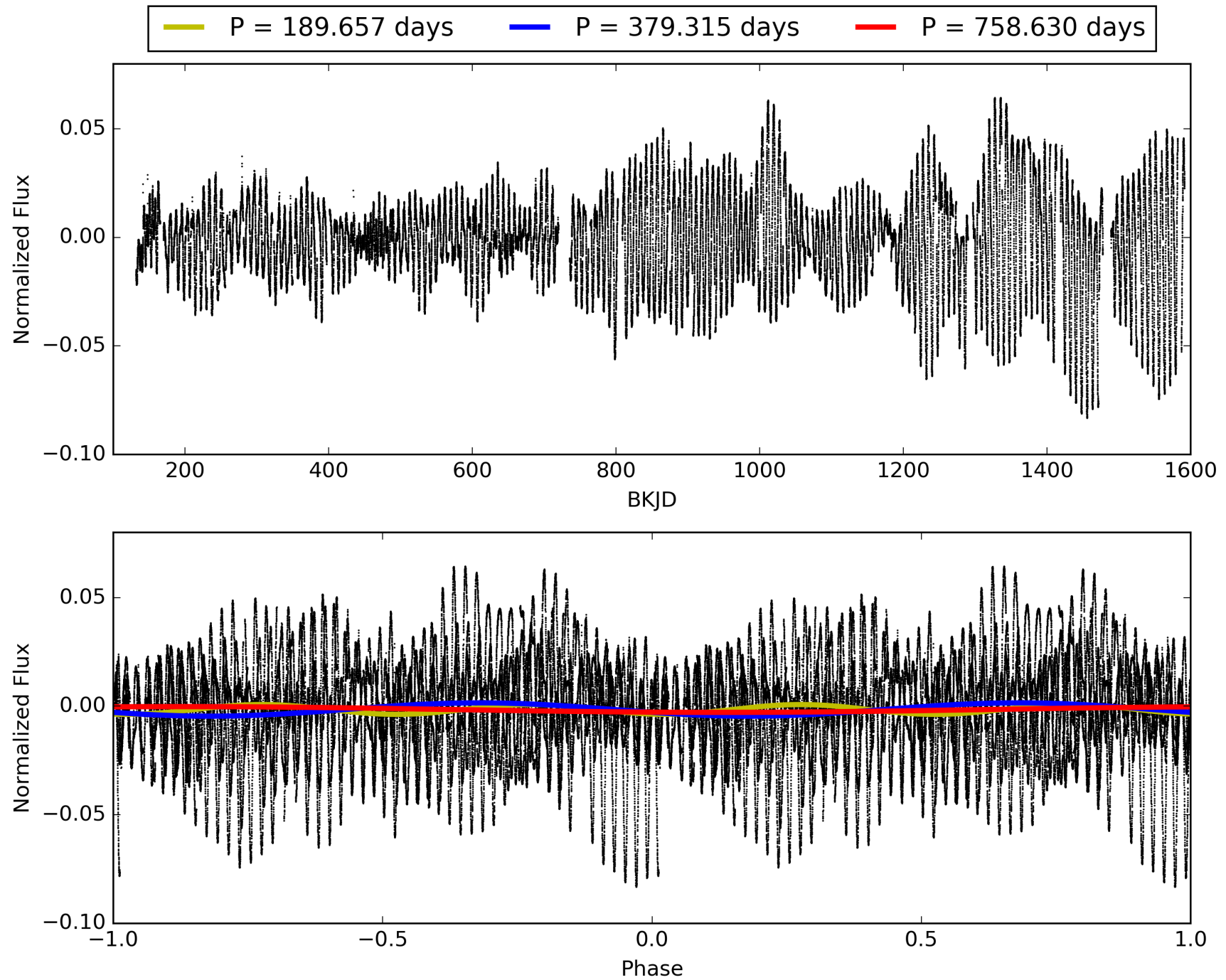
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:35:11 Z

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

TCE 009215841-01, PDC Light Curves

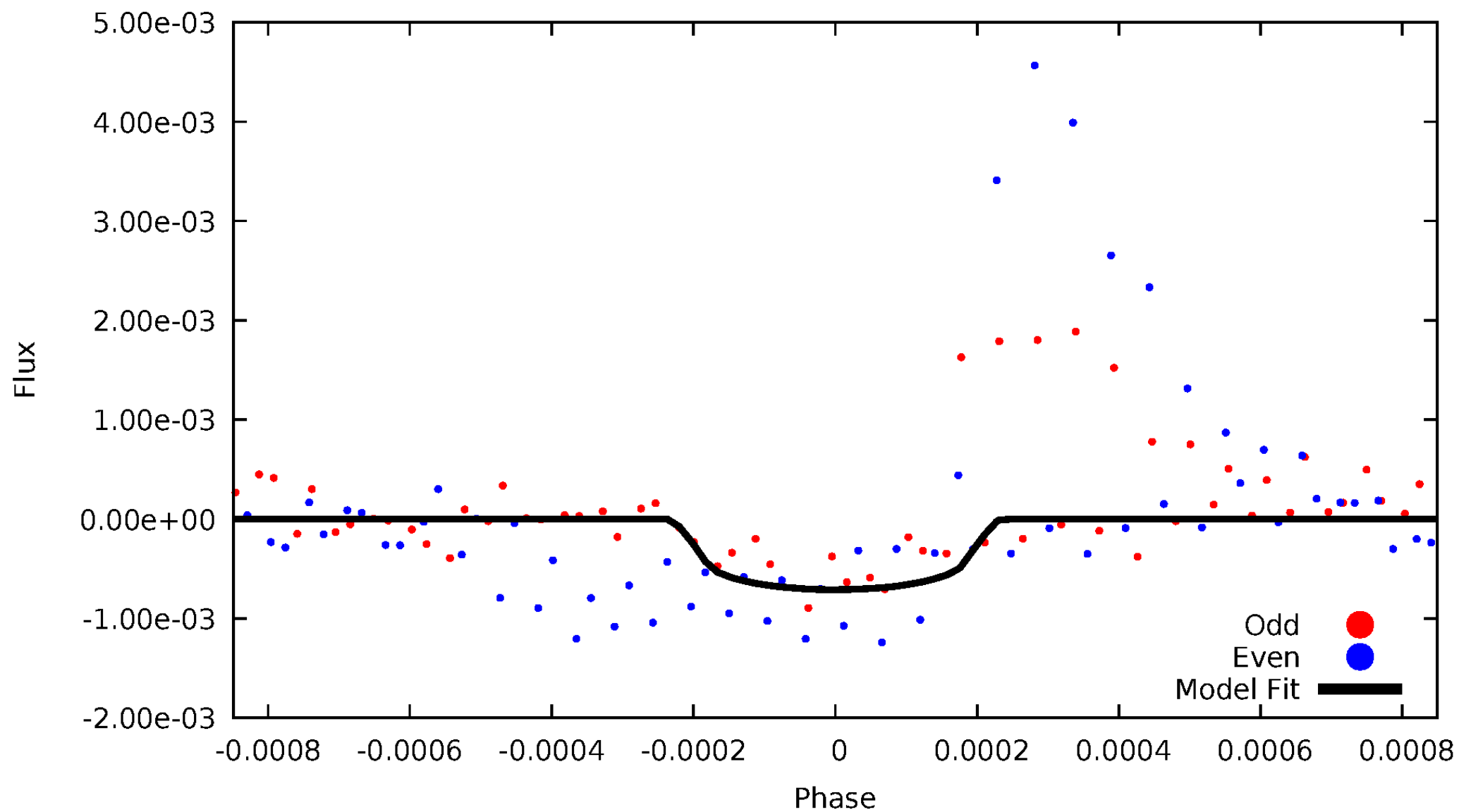


TCE 009215841-01



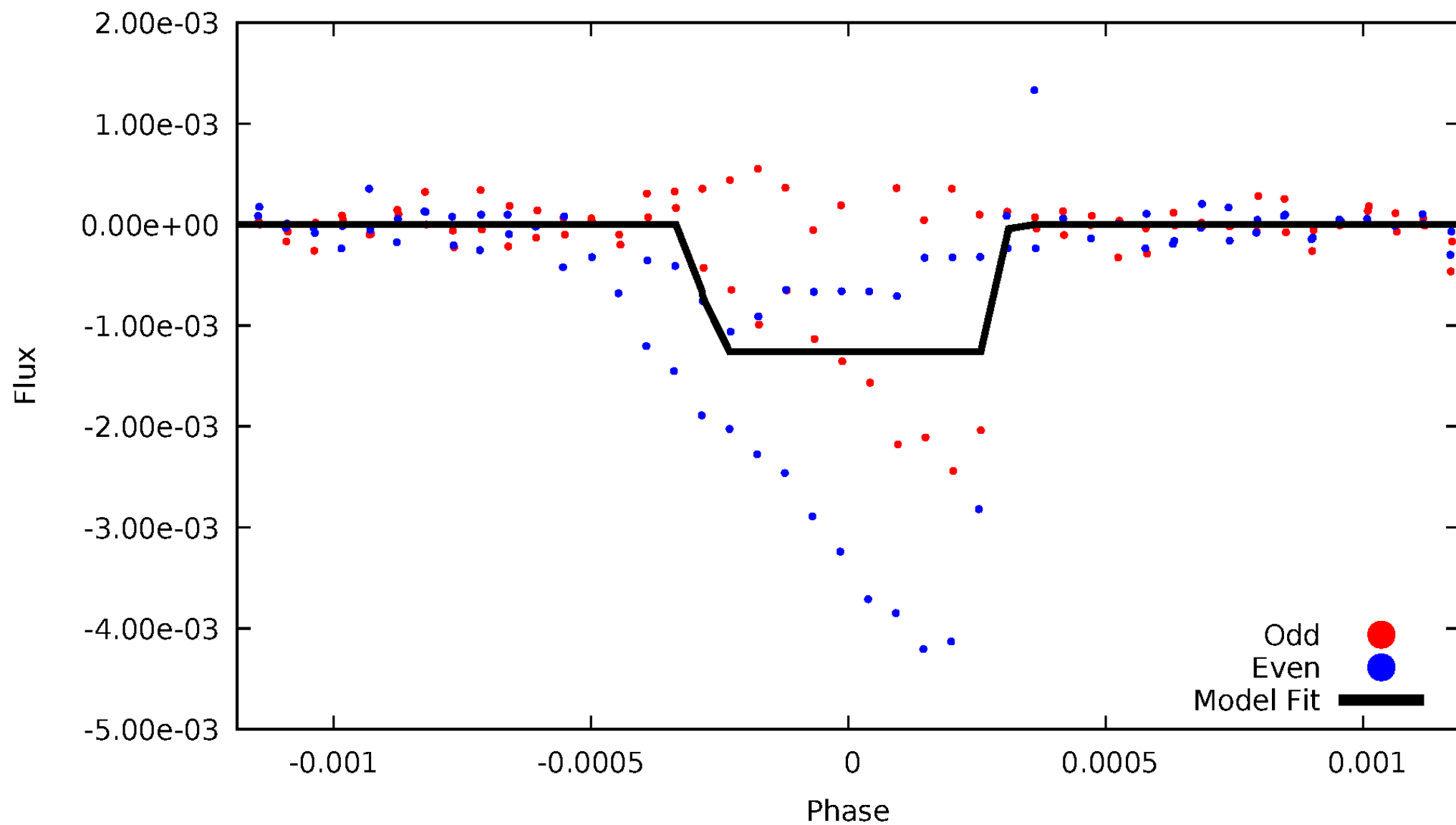
DV Odd/Even

TCE 009215841-01



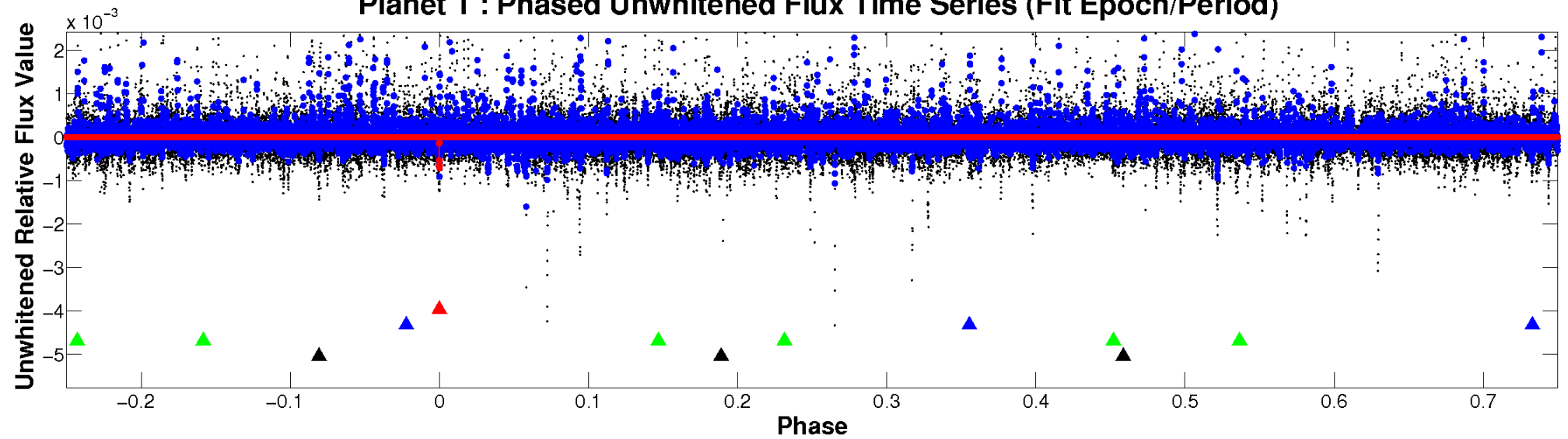
ALT Odd/Even

TCE 009215841-01

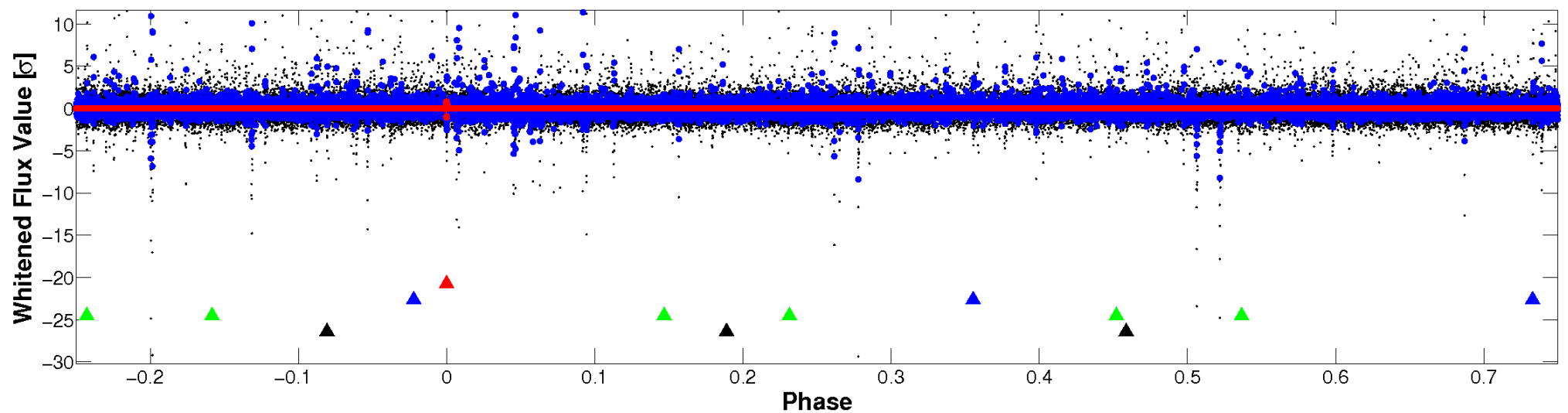


Non-Whitened Vs. Whitened Light Curve

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

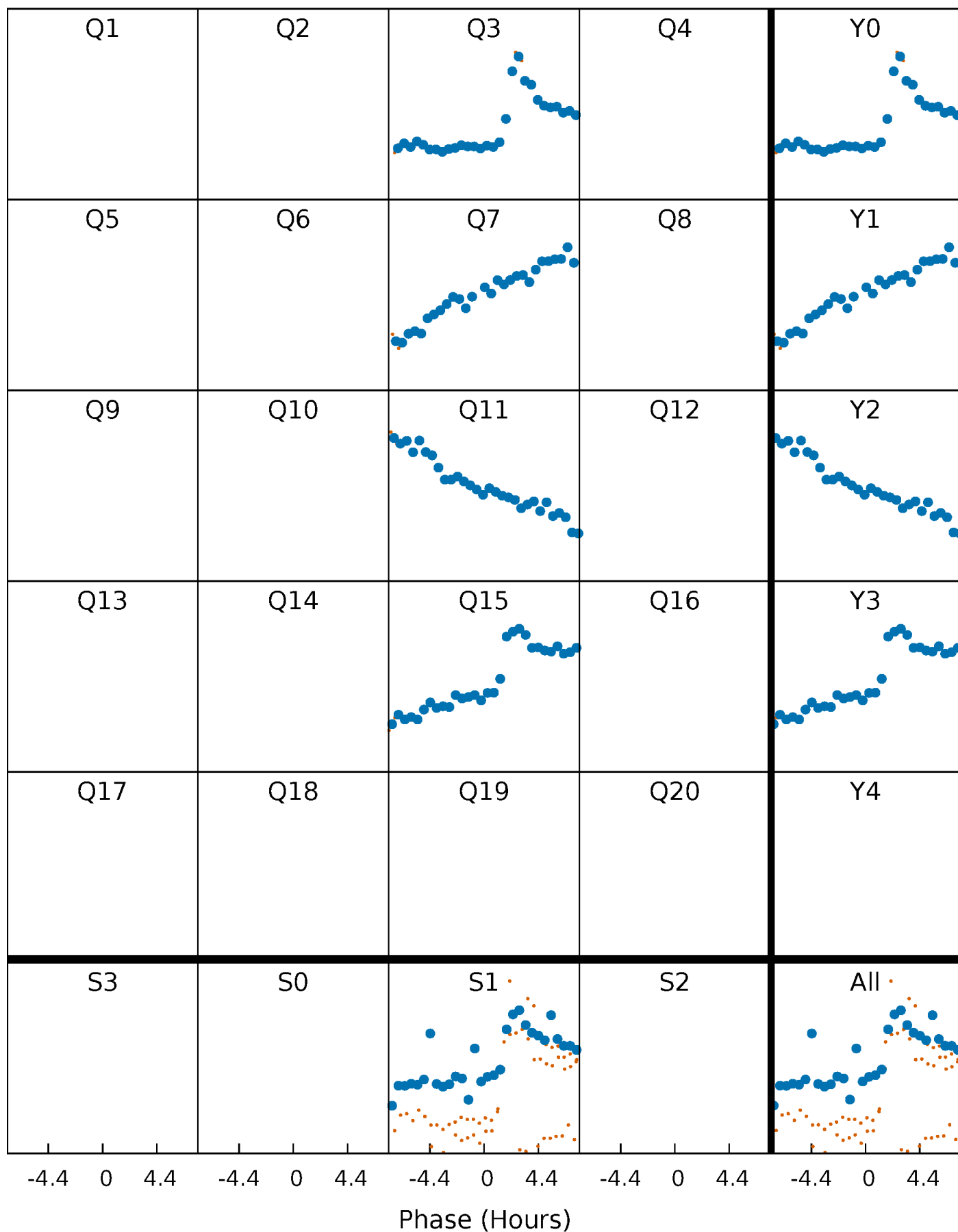


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



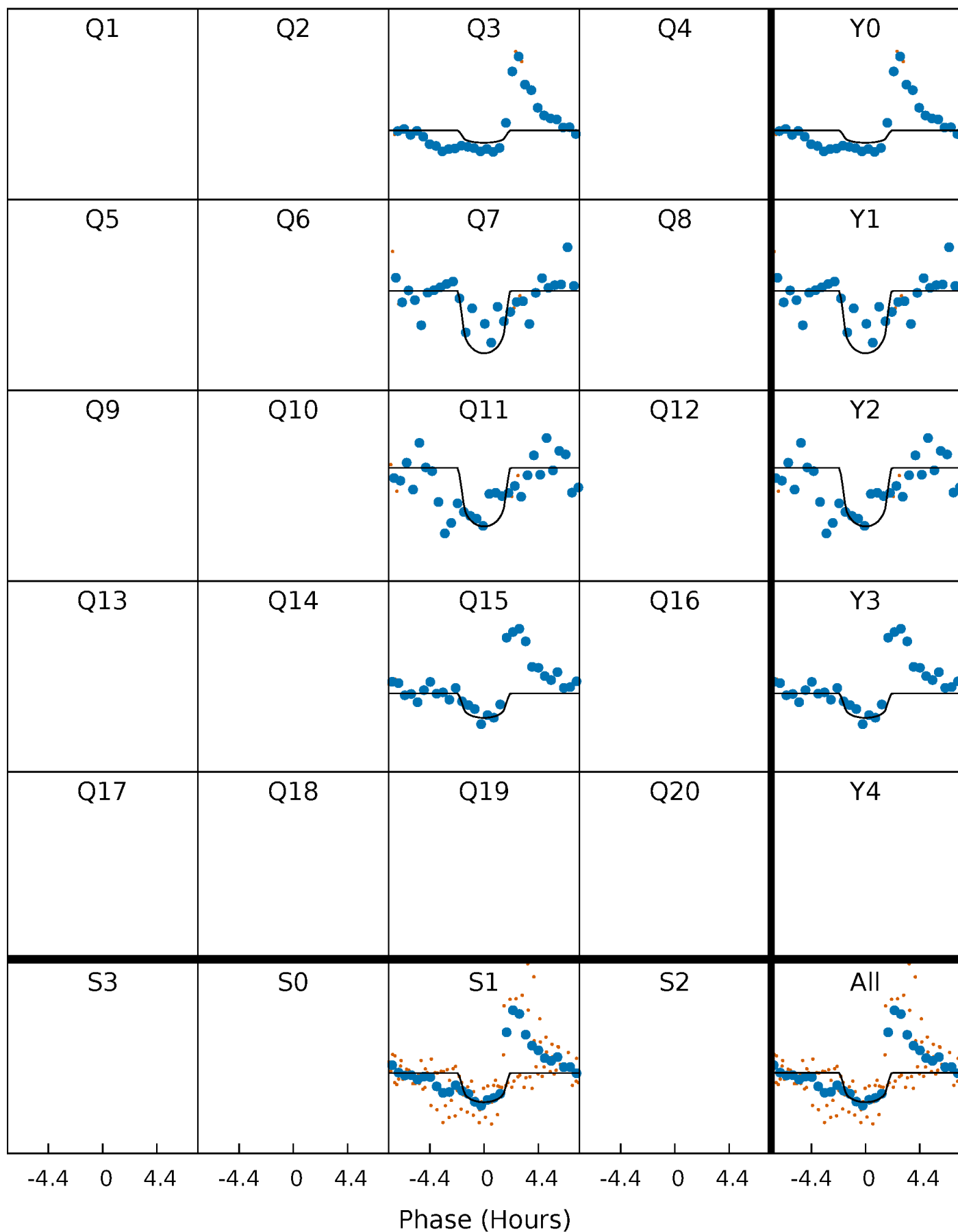
PDC Quarter-Phased Transit Curves

TCE 009215841-01 P=379.314948 Days $T_0=328.649729$ (BKJD)



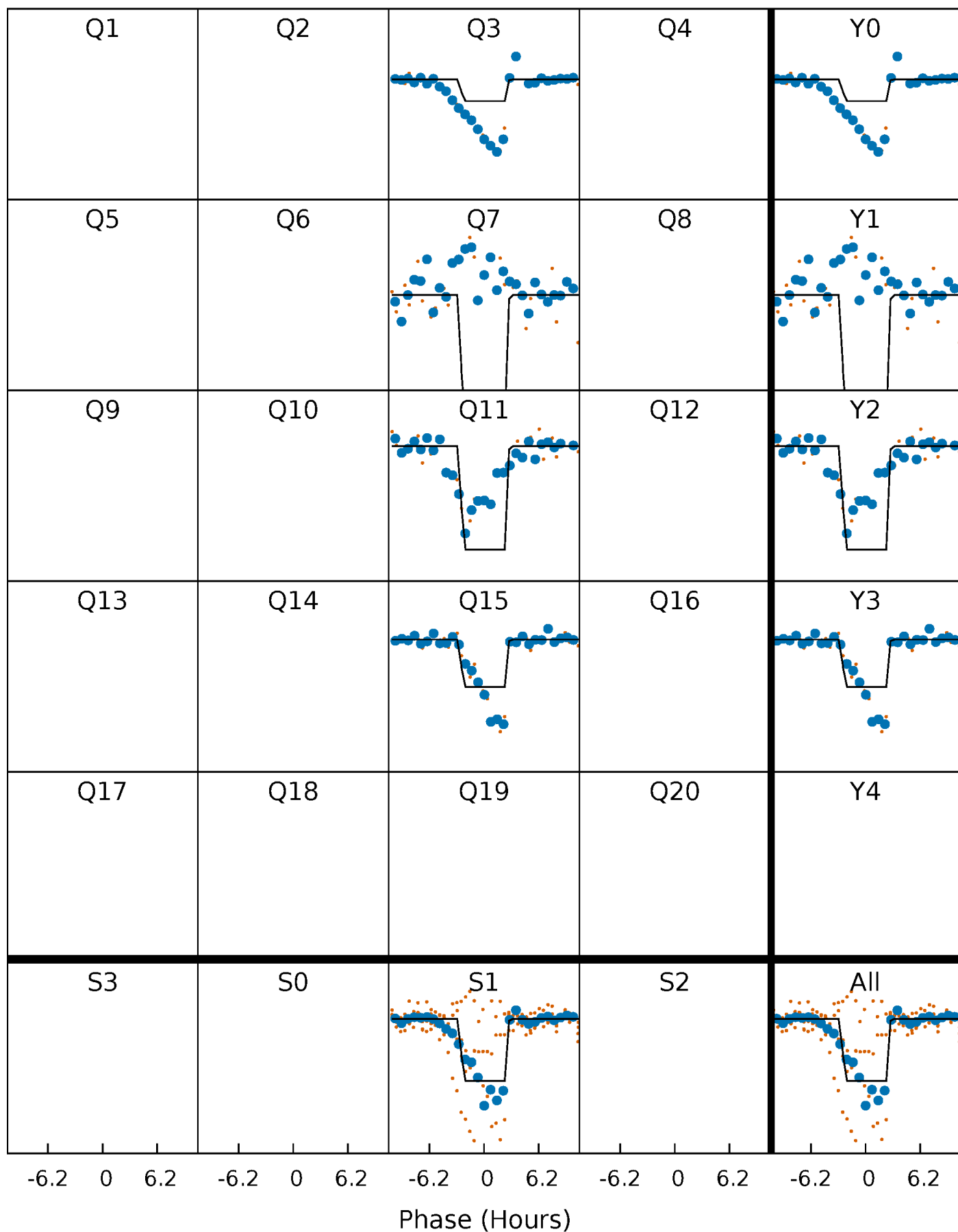
DV Quarter-Phased Transit Curves

TCE 009215841-01 P=379.314948 Days $T_0=328.649729$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

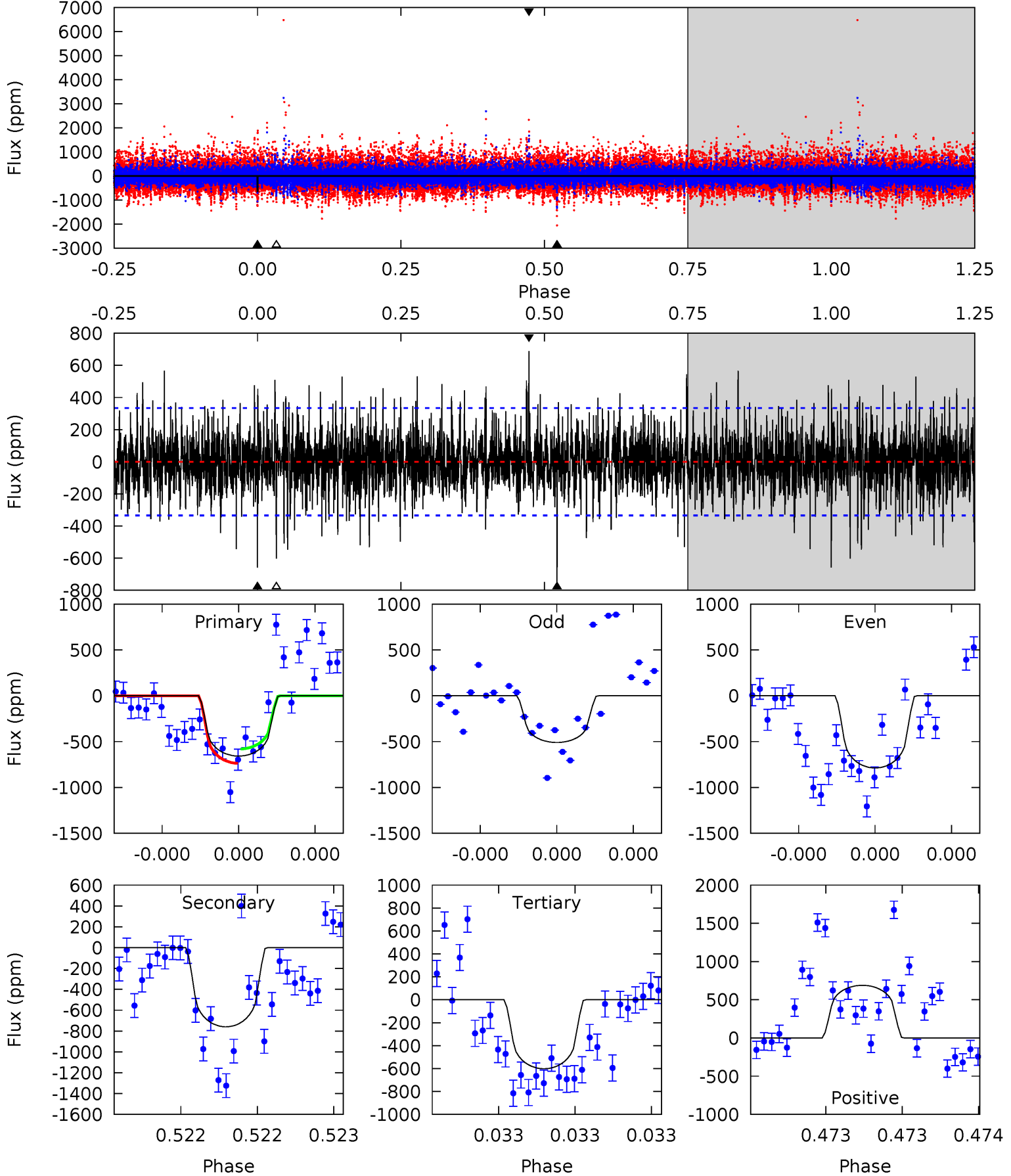
TCE 009215841-01 P=379.308174 Days $T_0=328.619304$ (BKJD)



DV Model-Shift Uniqueness Test

009215841-01, P = 379.314948 Days, E = 328.649729 Days

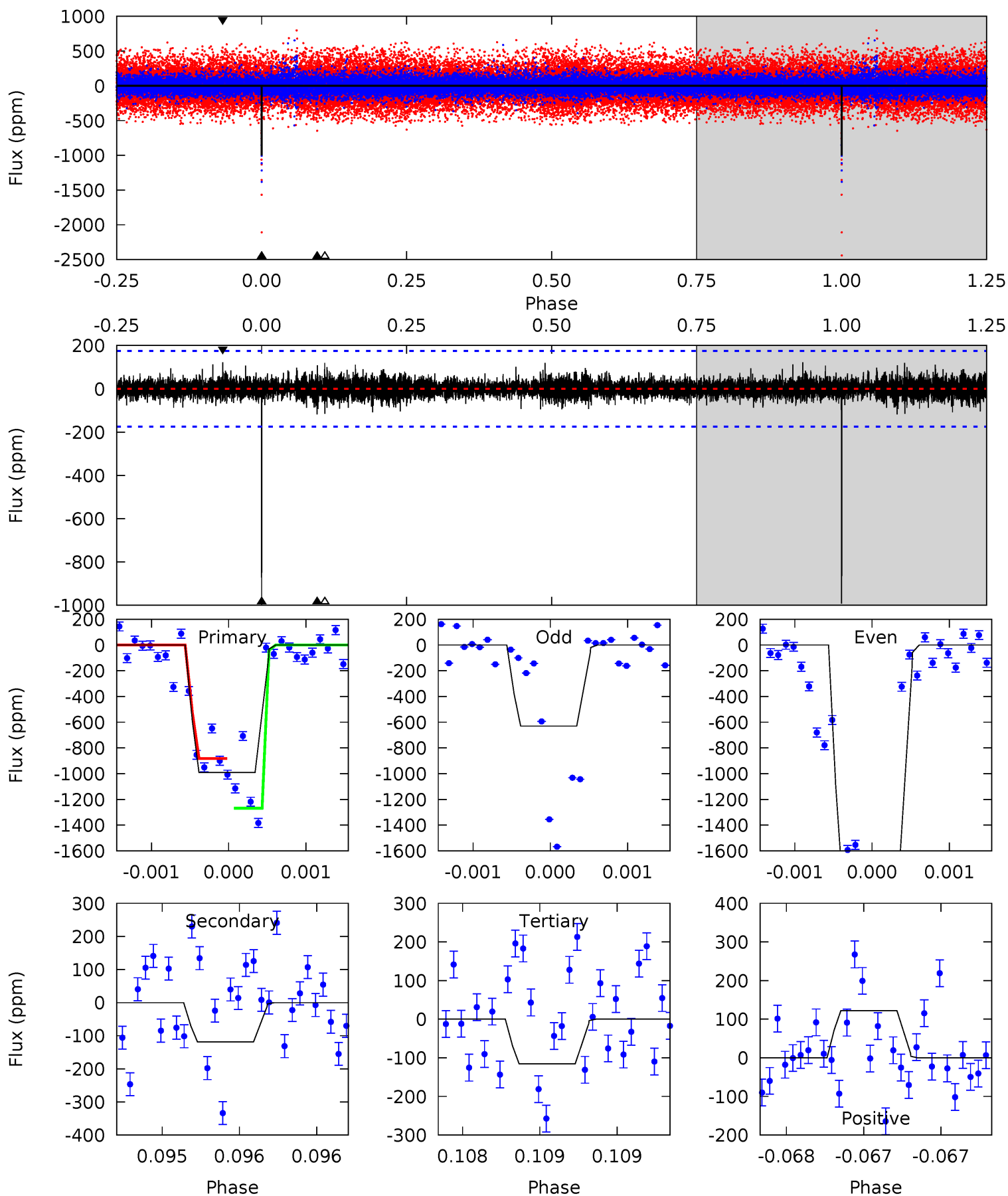
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	12.7	10.1	11.5	5.59	3.51	2.20	0.93	-0.52	2.63	1.18	2.01	1.23	0.48	1.31



Alt Model-Shift Uniqueness Test

009215841-01, P = 379.308174 Days, E = 328.619304 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.4	3.75	3.65	3.86	5.54	3.43	0.73	27.8	27.5	0.09	-0.11	23.7	1.18	0.11	6.27



Stellar Parameters For KIC 009215841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5239^{+158}_{-142}	$4.510^{+0.095}_{-0.105}$	$-0.280^{+0.350}_{-0.250}$	$0.791^{+0.112}_{-0.091}$	$0.738^{+0.112}_{-0.052}$	$2.100^{+0.873}_{-0.618}$
	+3%/-3%	+2%/-2%	+125%/-89%	+14%/-12%	+15%/-7%	+42%/-29%
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 009215841-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-760 ± 60	$3.67^{+3.53}_{-2.47}$	299^{+15}_{-13}	4363^{+2976}_{-825}	$27010^{+220238}_{-19840}$
Alt.	-118 ± 32	$4.21^{+3.60}_{-2.65}$	299^{+16}_{-12}	3068^{+1169}_{-456}	3031^{+19403}_{-2131}

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

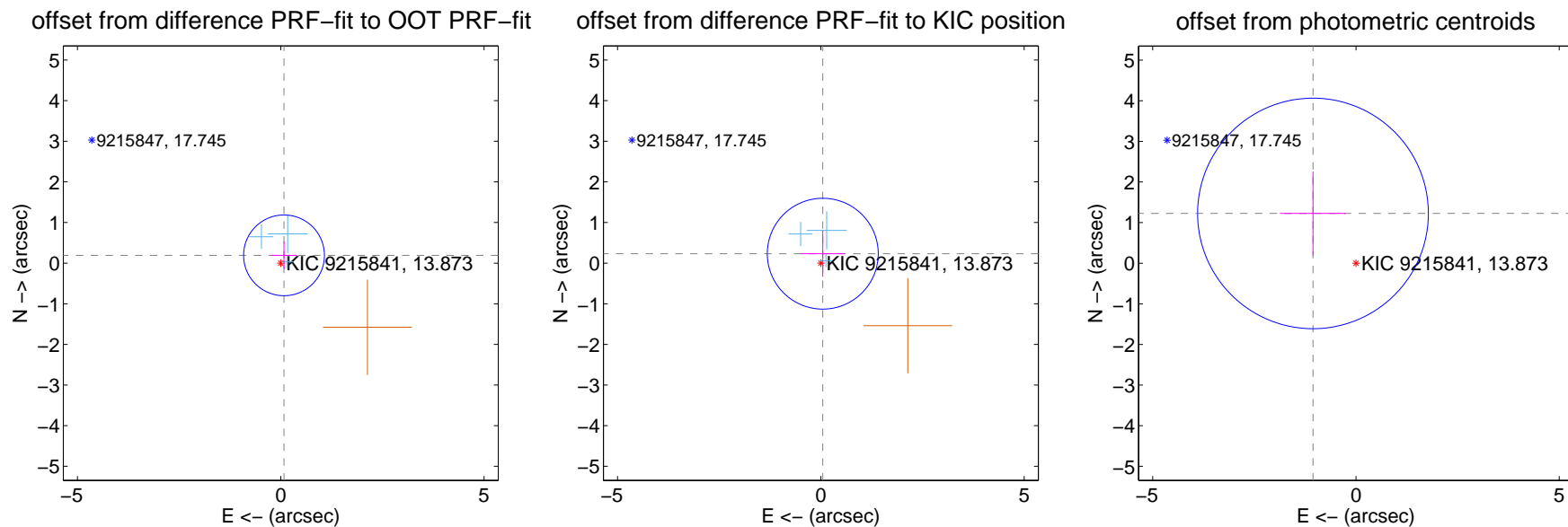
DV Centroid Data

Supplemental centroid analysis for 009215841-01. Kepler magnitude: 13.87. Transit SNR 5.90

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.208 ± 0.331	0.63	-0.080 ± 0.317	0.192 ± 0.334
PRF-fit source offset from KIC position	0.237 ± 0.455	0.52	-0.047 ± 0.544	0.232 ± 0.568
photometric centroid source offset	1.62 ± 0.95	1.71	1.06 ± 0.81	1.23 ± 1.04



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

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

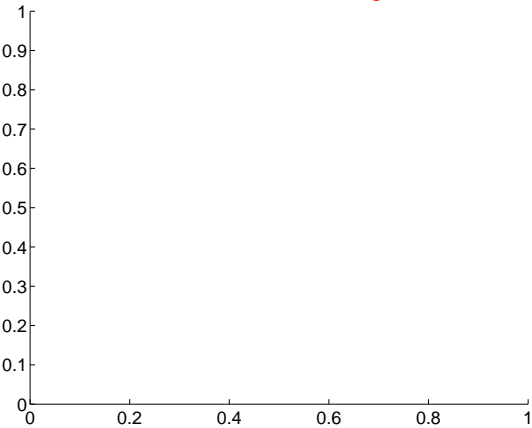
Q1 no difference image



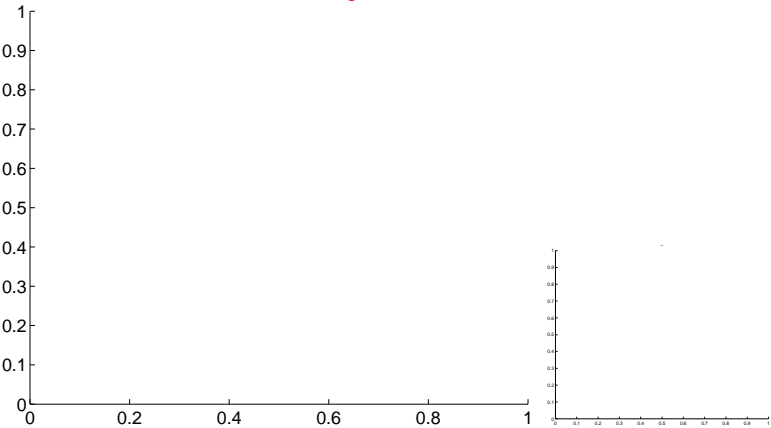
Q1 no OOT image



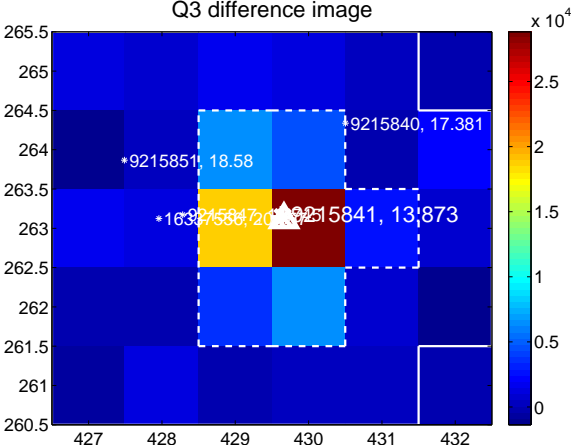
Q2 no difference image



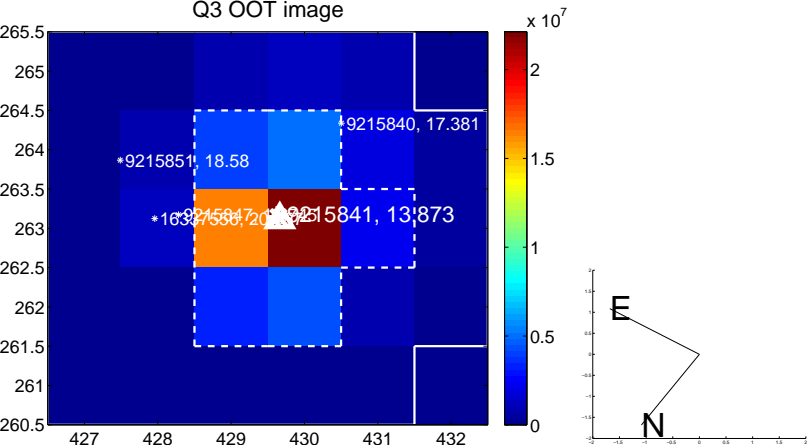
Q2 no OOT image



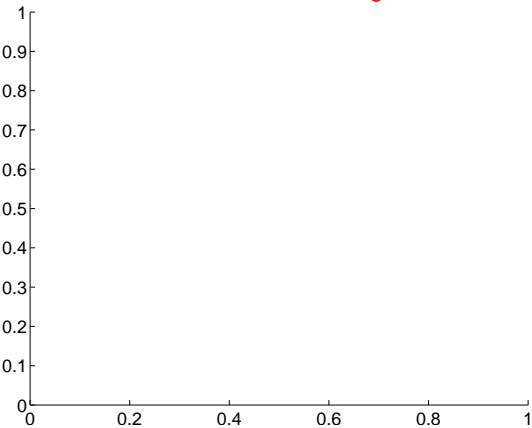
Q3 difference image



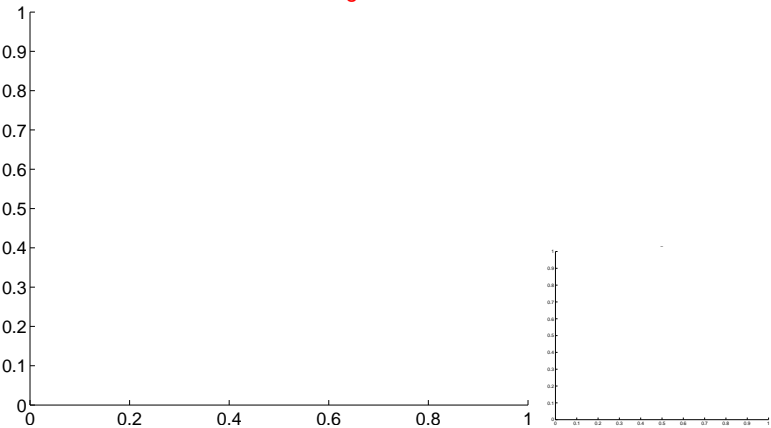
Q3 OOT image



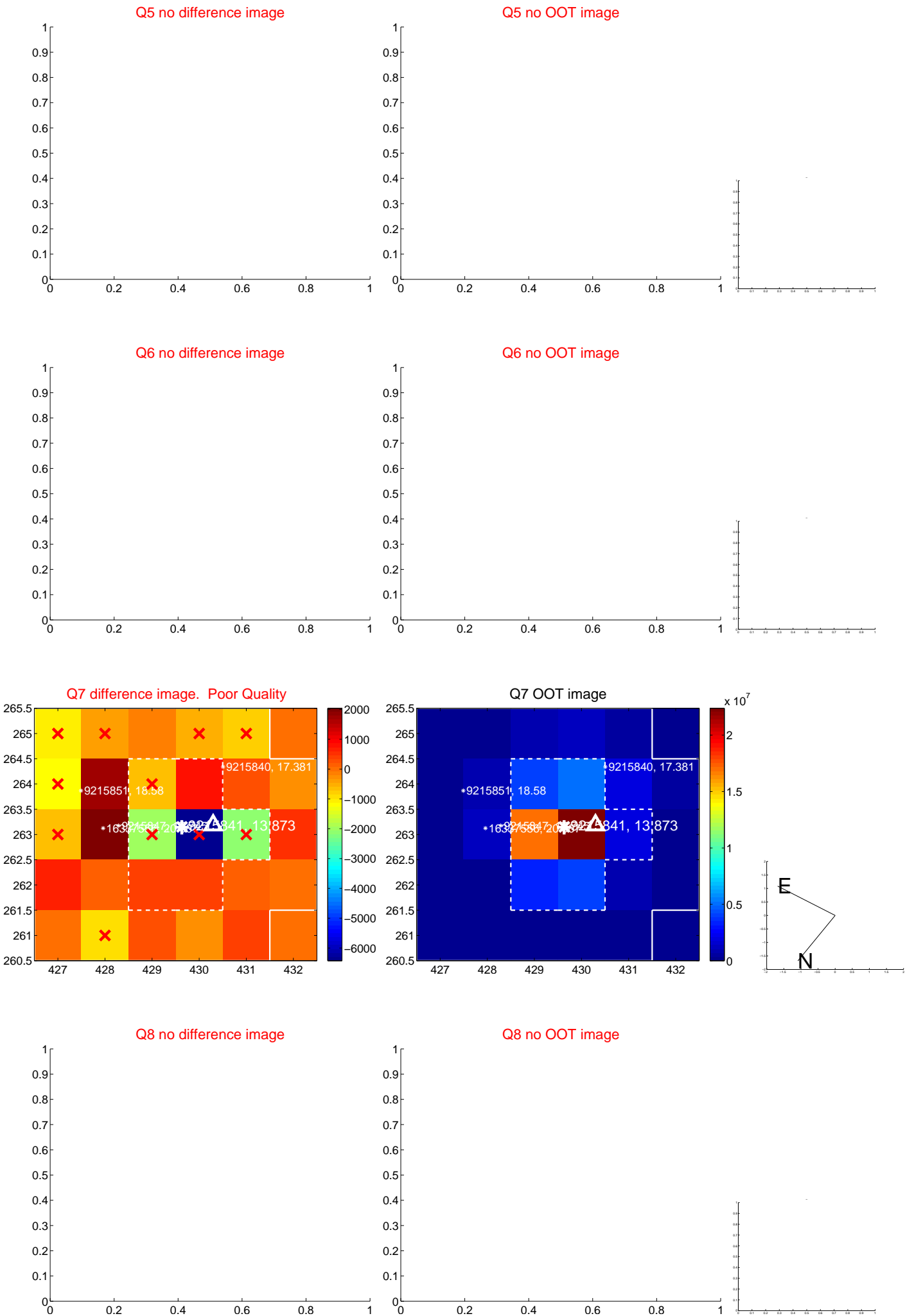
Q4 no difference image



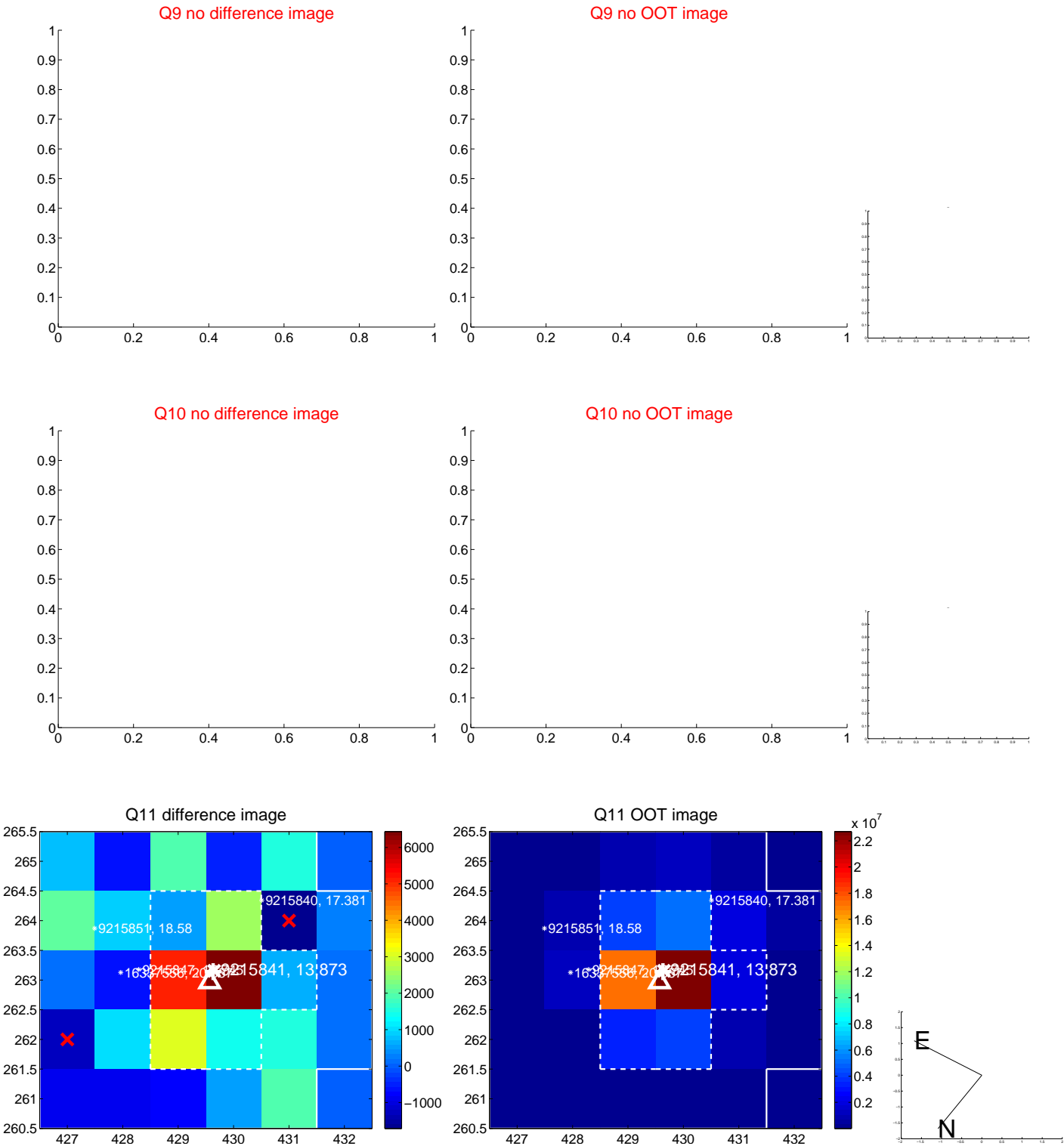
Q4 no OOT image



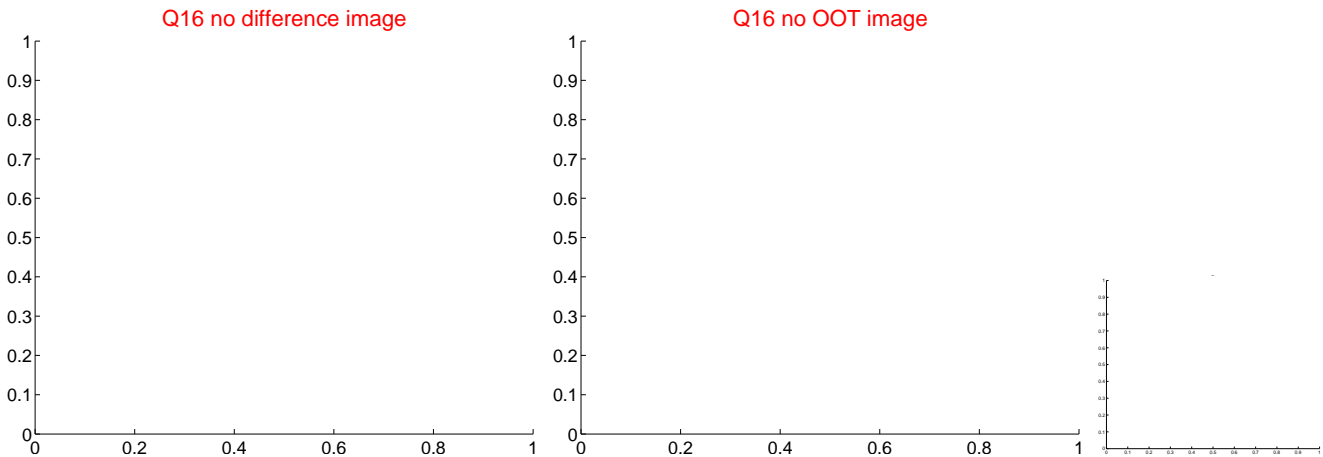
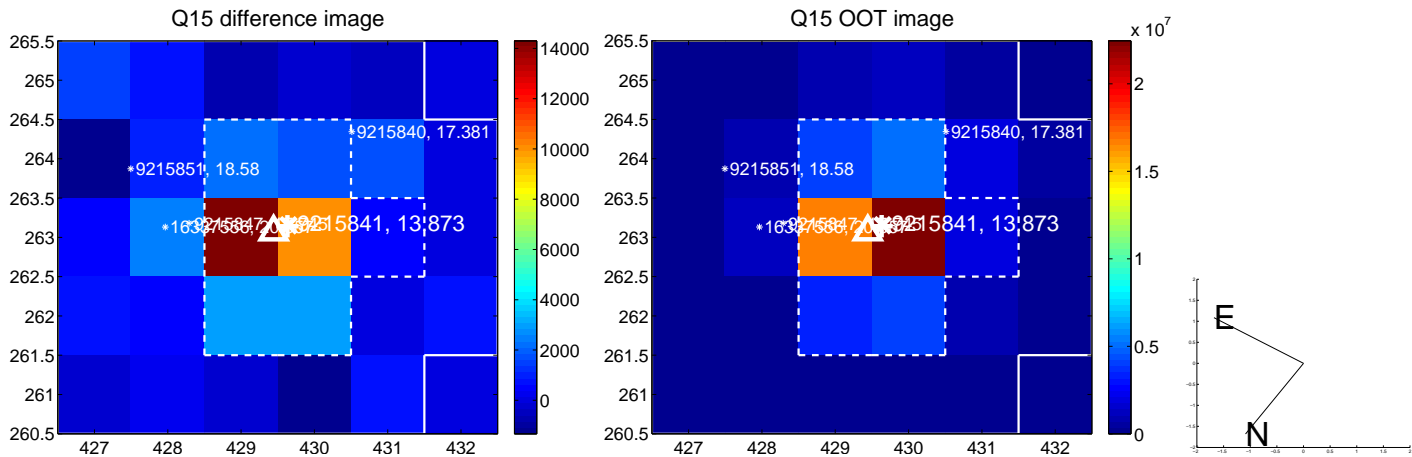
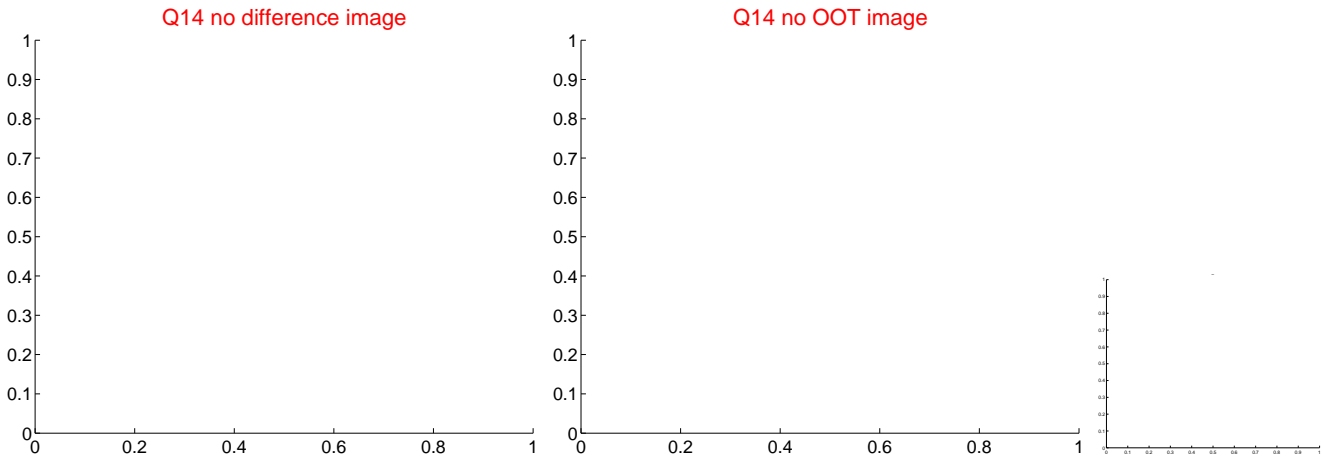
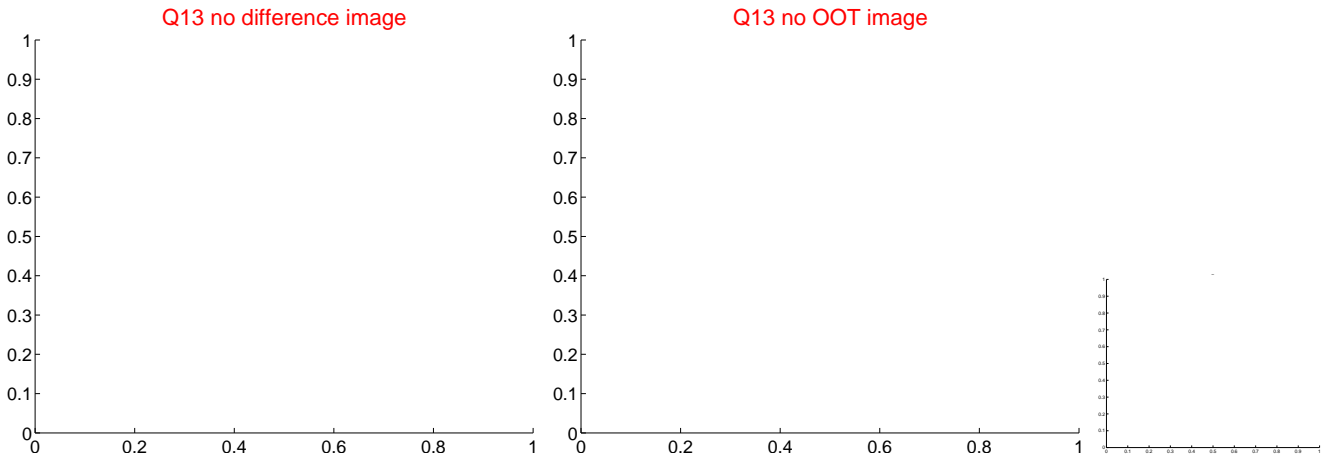
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



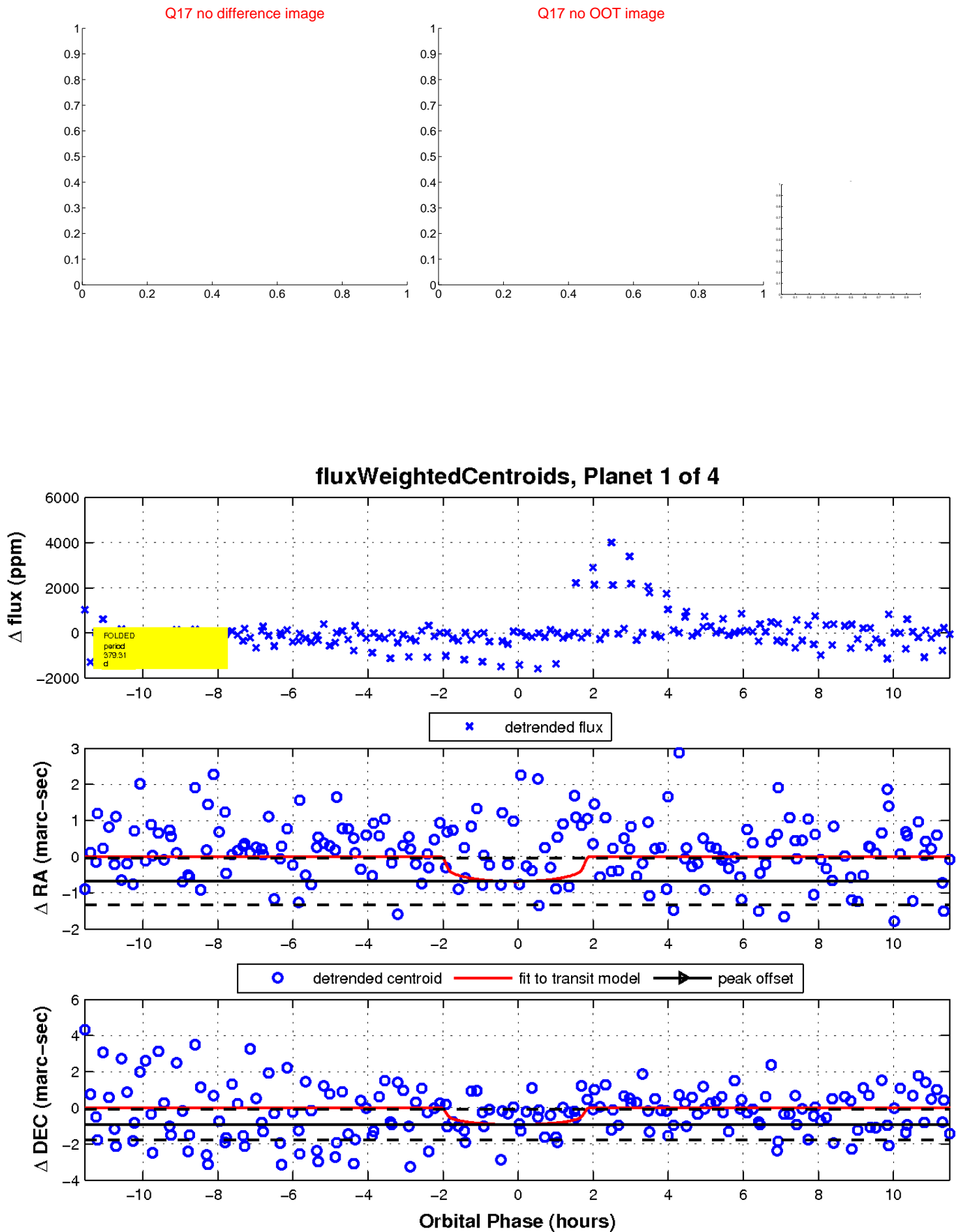
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

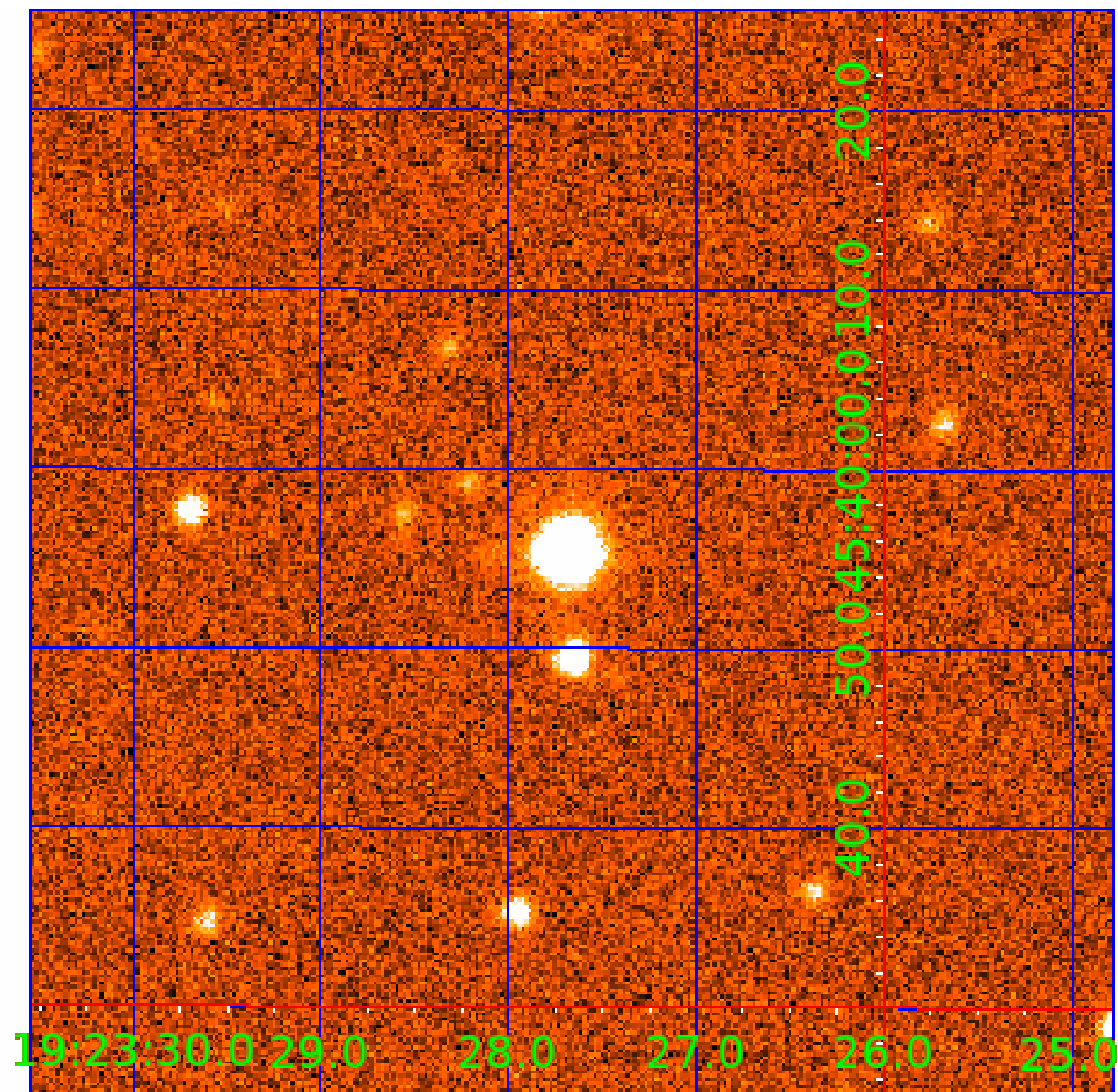


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009215841

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})
009215841-01	OBS	No	379.314948	328.649729	711.0	3.863	13.7	5.9	0.79	5239	2.18	0.49
009215841-02	OBS	No	615.411688	227.356891	1079.8	5.274	13.9	7.3	0.79	5239	2.62	0.26
009215841-03	OBS	No	263.564645	236.545251	724.4	2.762	12.7	5.1	0.79	5239	2.27	0.80
009215841-04	OBS	No	481.609789	298.033121	865.5	4.330	9.6	6.3	0.79	5239	2.41	0.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009215841-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009215841-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—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.

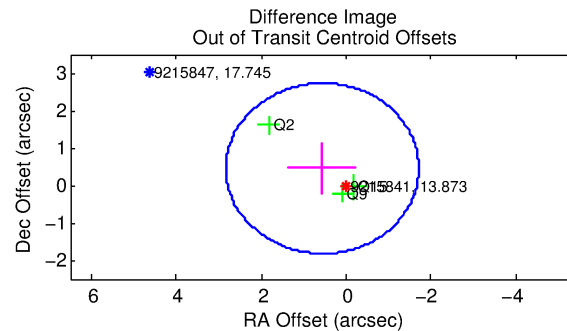
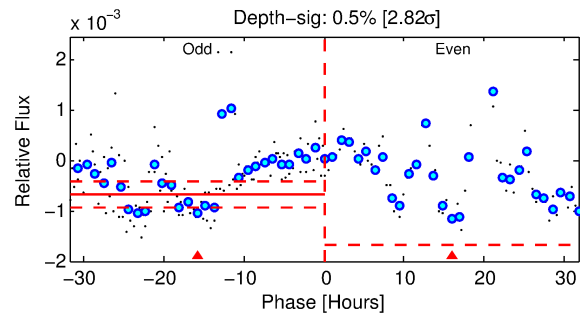
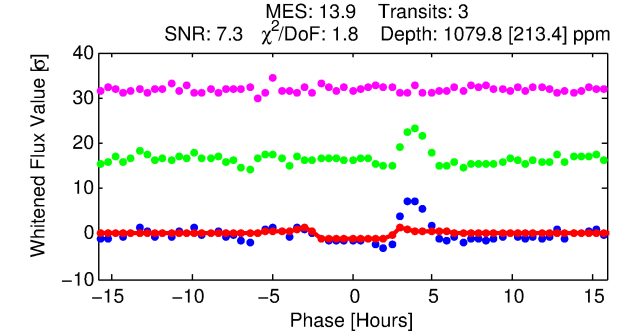
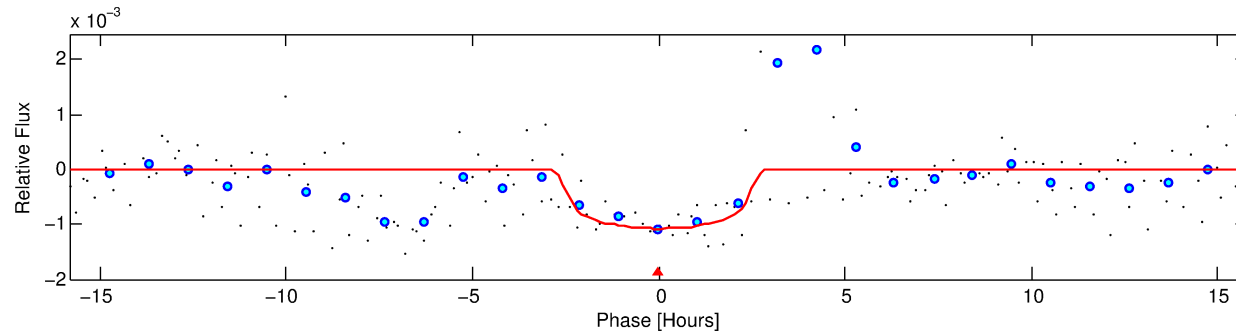
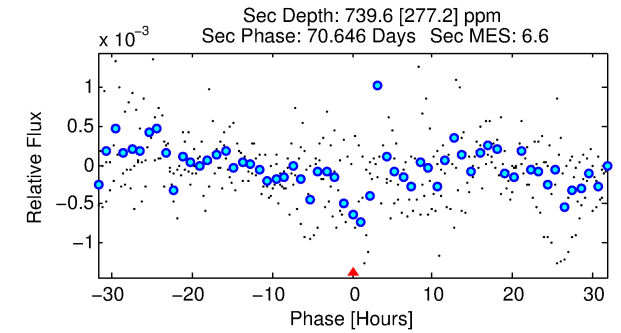
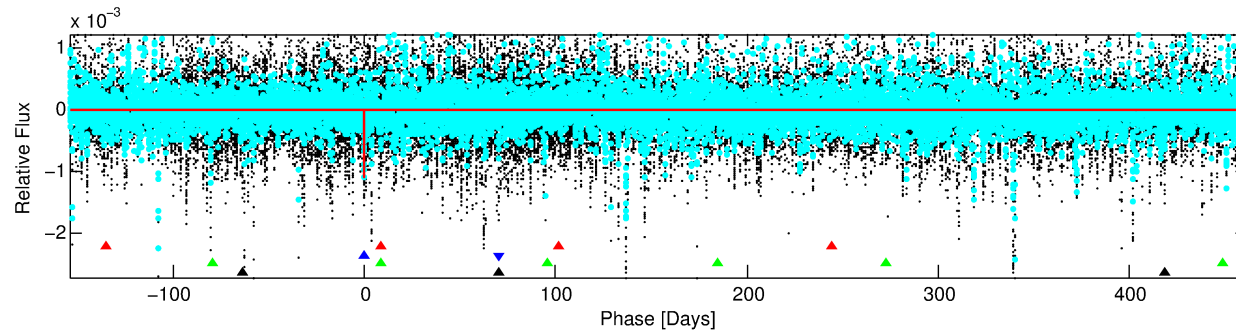
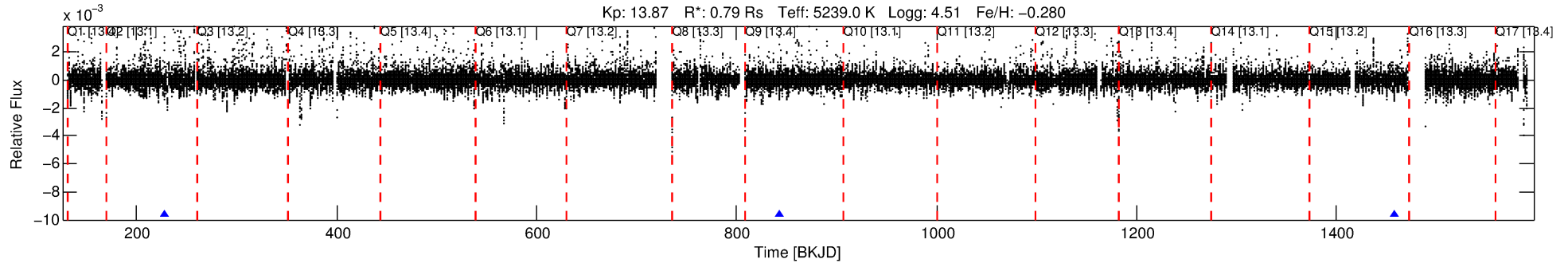
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009215841-02

No Significant Match Found

DV One-Page Summary

KIC: 9215841 Candidate: 2 of 4 Period: 615.412 d



DV Fit Results:

Period = 615.41169 [0.00647] d
Epoch = 227.3569 [0.0101] BKJD
Rp/R* = 0.0304 [0.0631]
a/R* = 822.73 [6499.35]
b = 0.46 [13.80]
Seff = 0.26 [0.06]
Teq = 182 [10] K
Rp = 2.62 [5.46] Re
a = 1.2801 [0.1589] AU
Ag = 97146.17 [405783.39] [0.24 σ]
Teffp = 4959 [5176] K [0.92 σ]

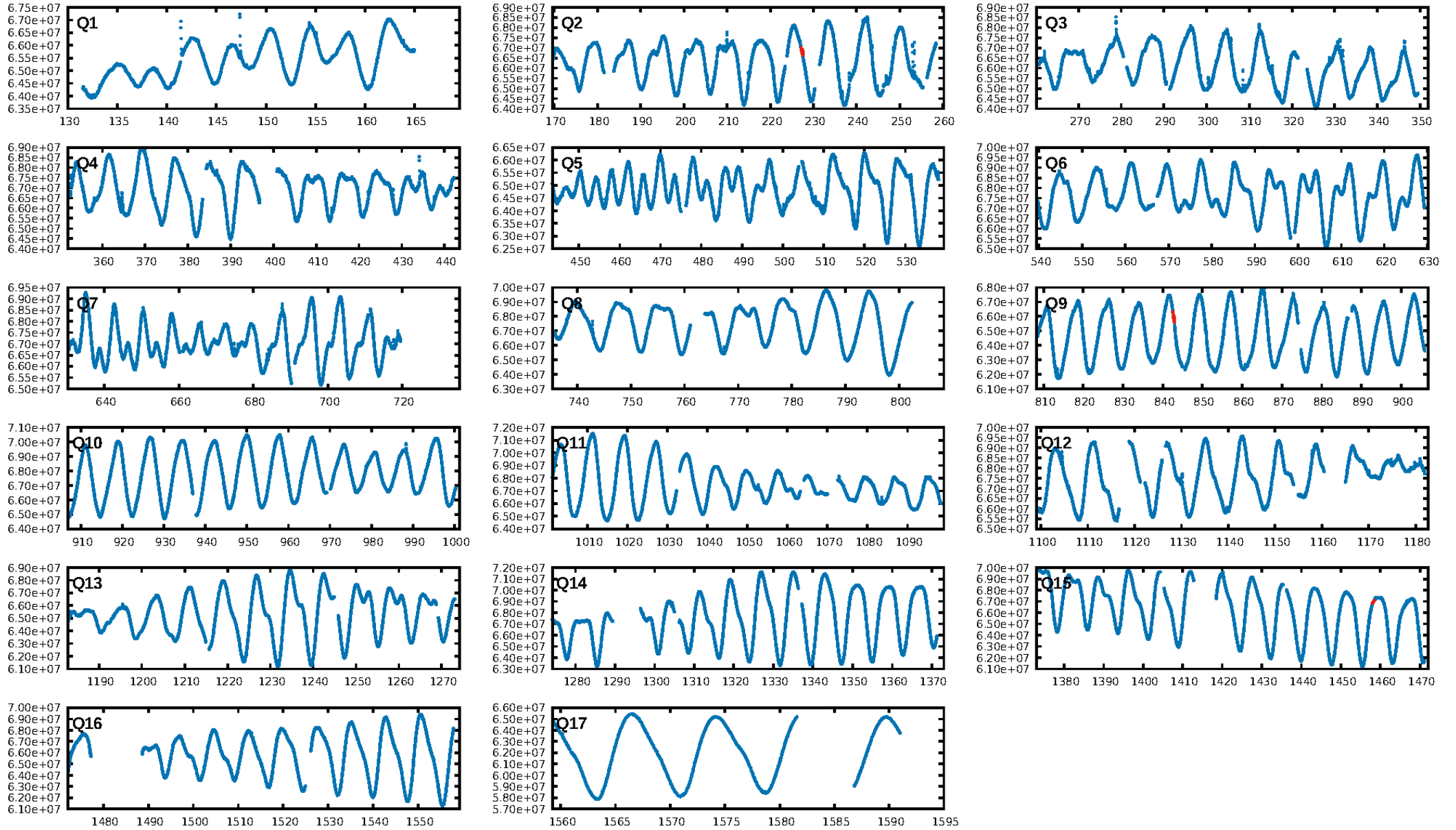
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [470.62 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 48.9%
Bootstrap-pfa: 3.43e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5023
Centroid-sig: 97.6%
Centroid-so: 0.123 arcsec [0.14 σ]
OotOffset-rm: 0.716 arcsec [0.94 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-rm: 0.710 arcsec [0.93 σ]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

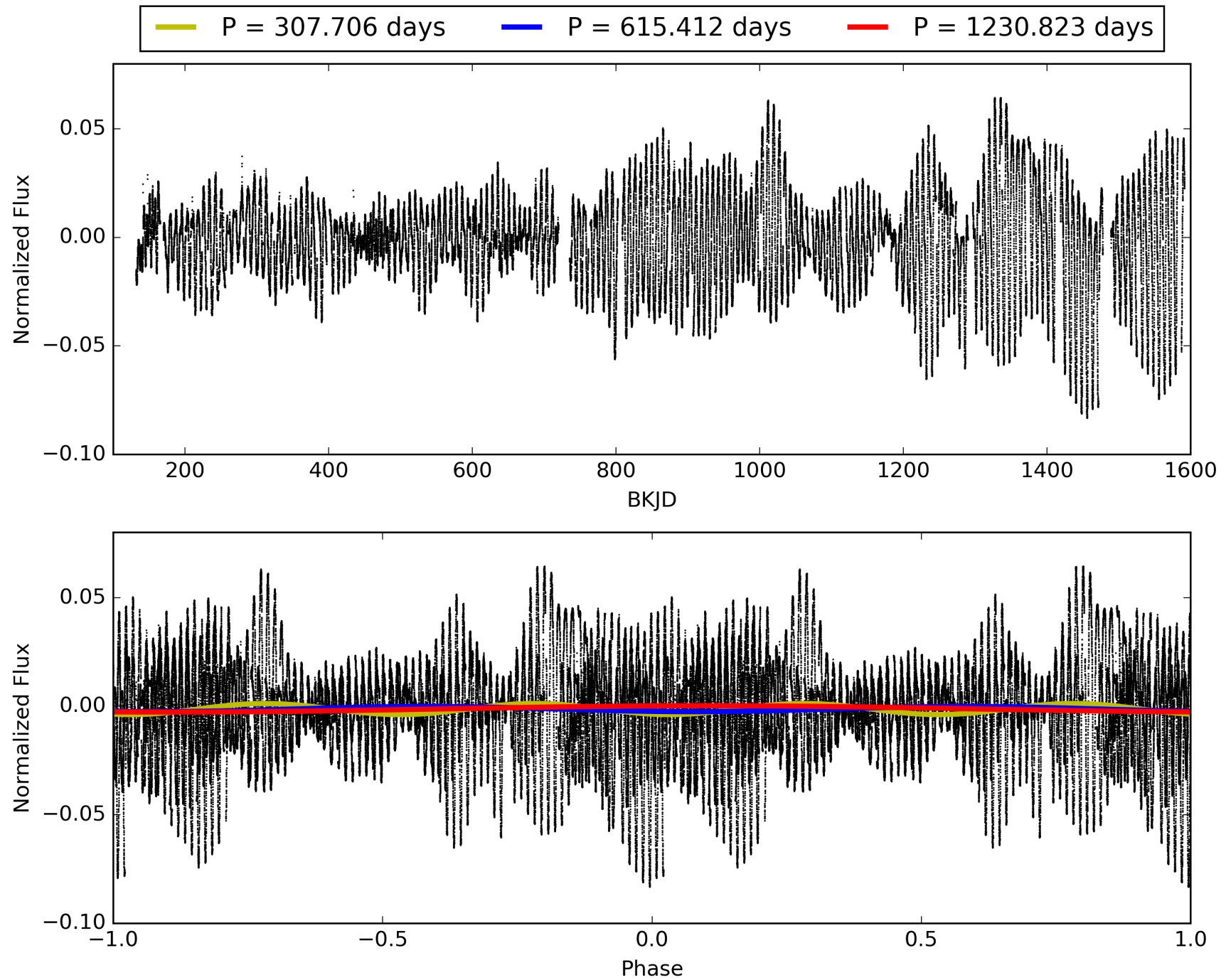
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:35:28 Z

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

TCE 009215841-02, PDC Light Curves

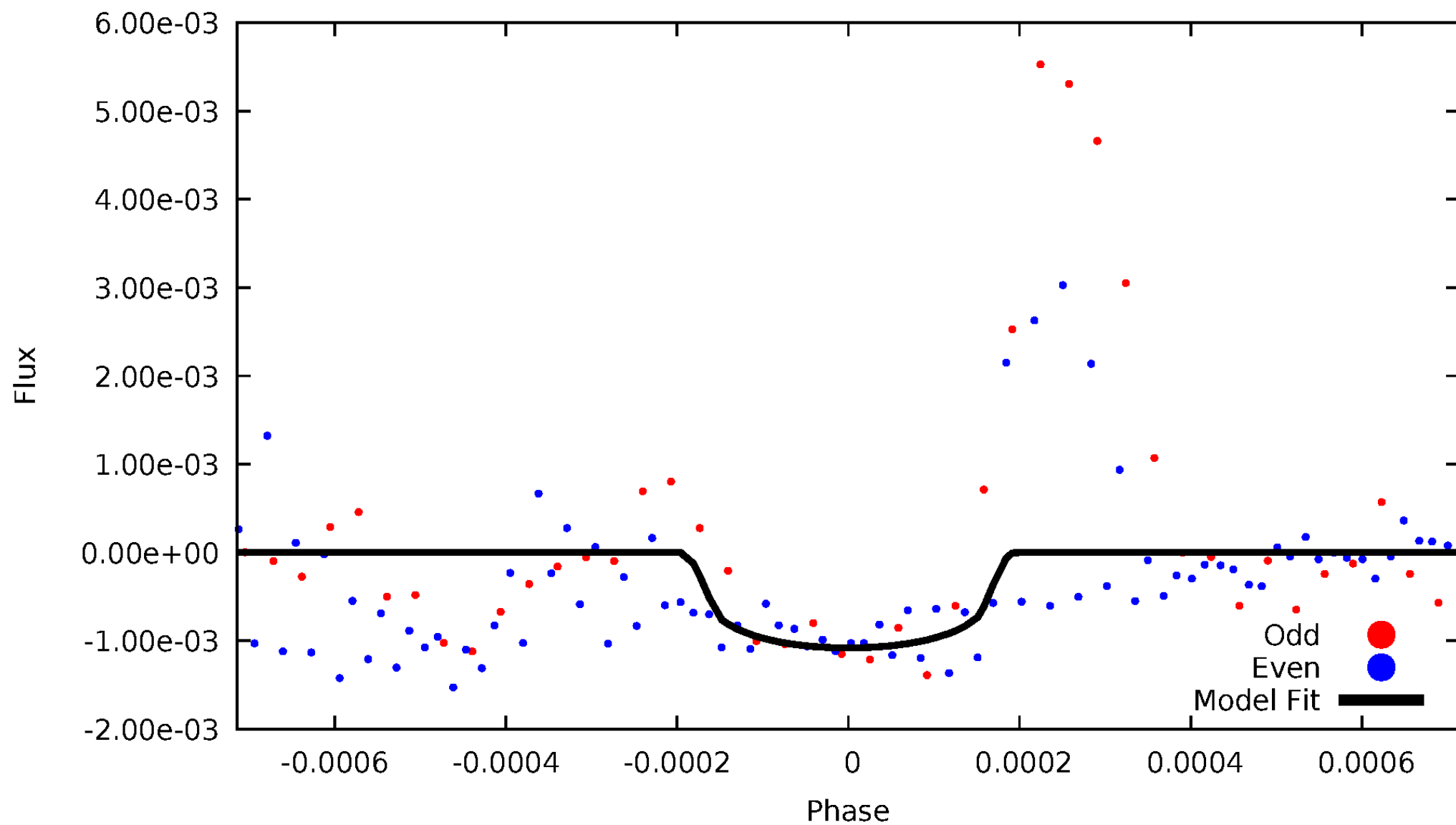


TCE 009215841-02



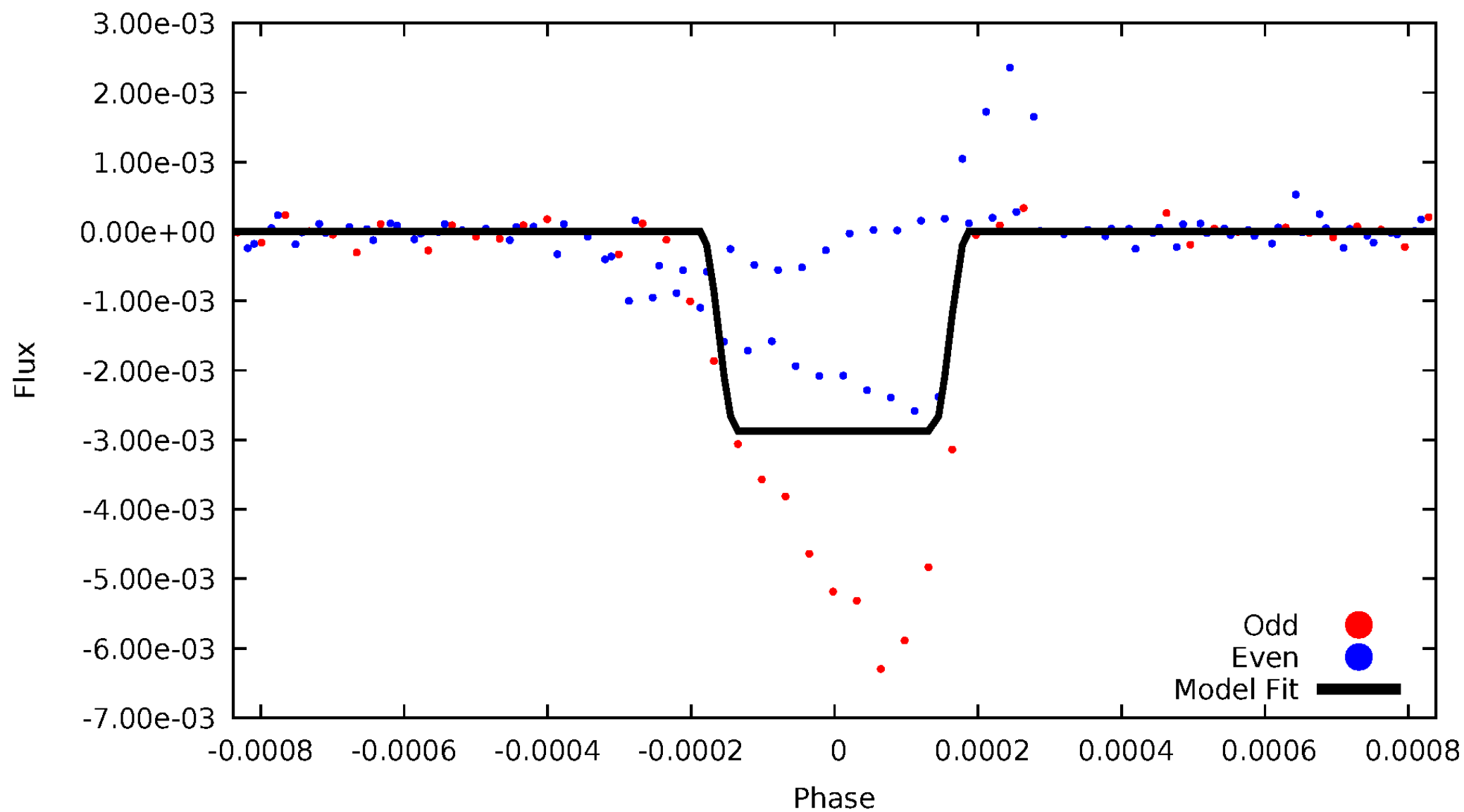
DV Odd/Even

TCE 009215841-02



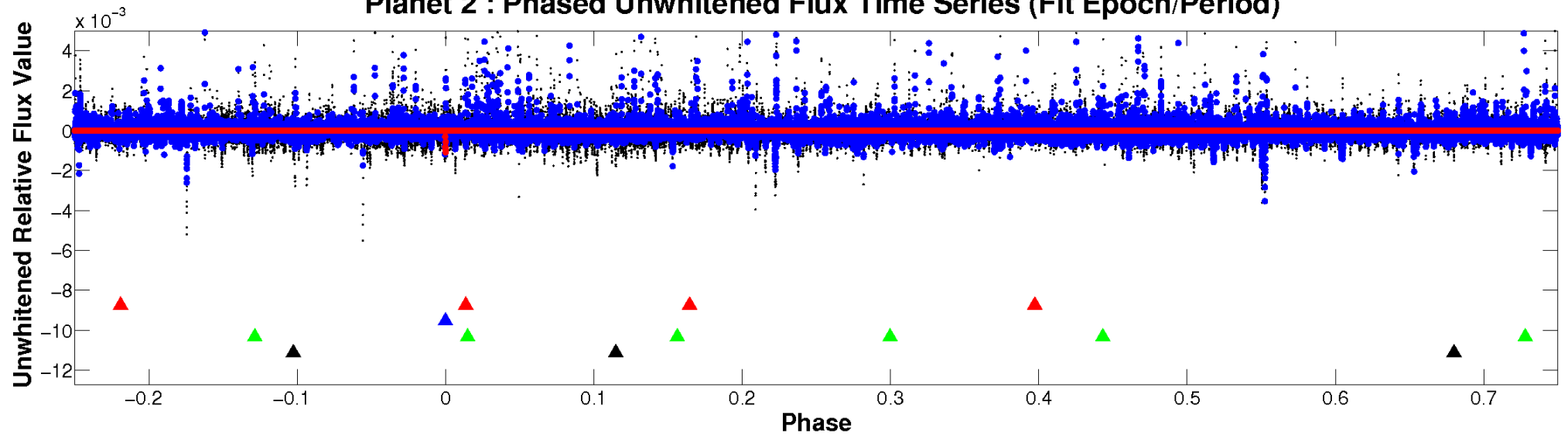
ALT Odd/Even

TCE 009215841-02

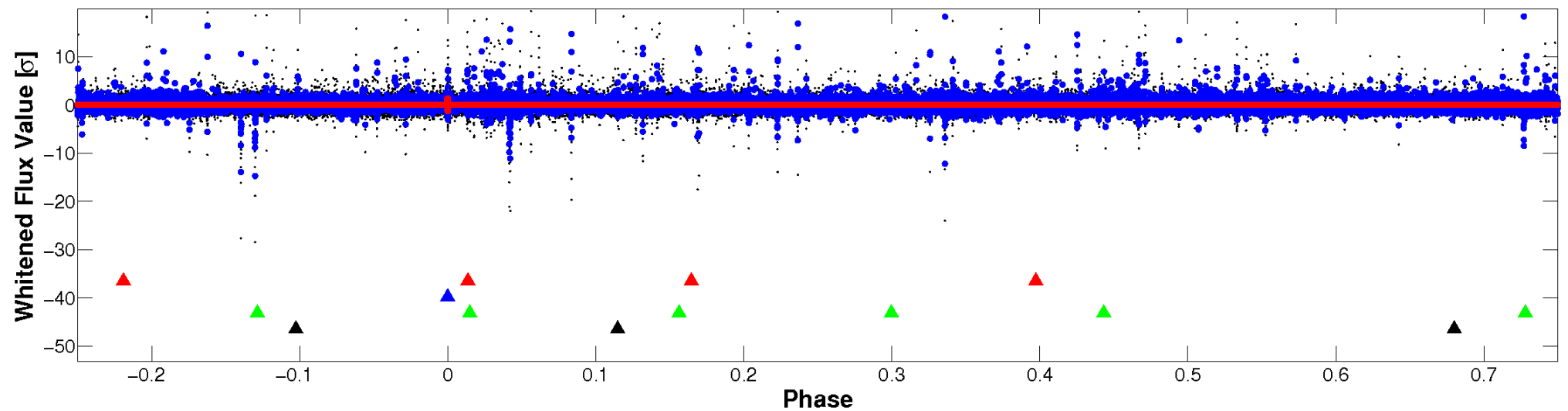


Non-Whitened Vs. Whitened Light Curve

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

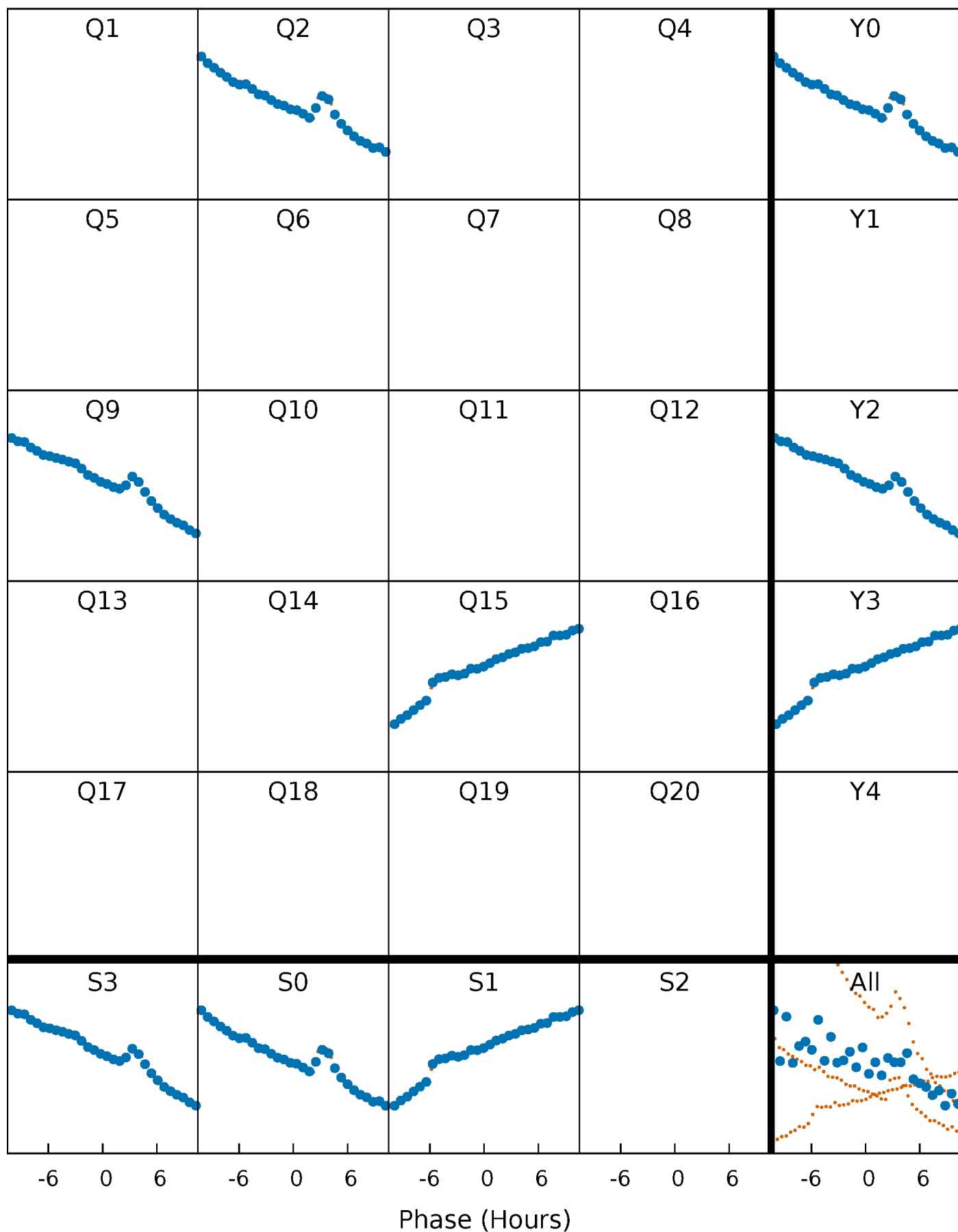


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



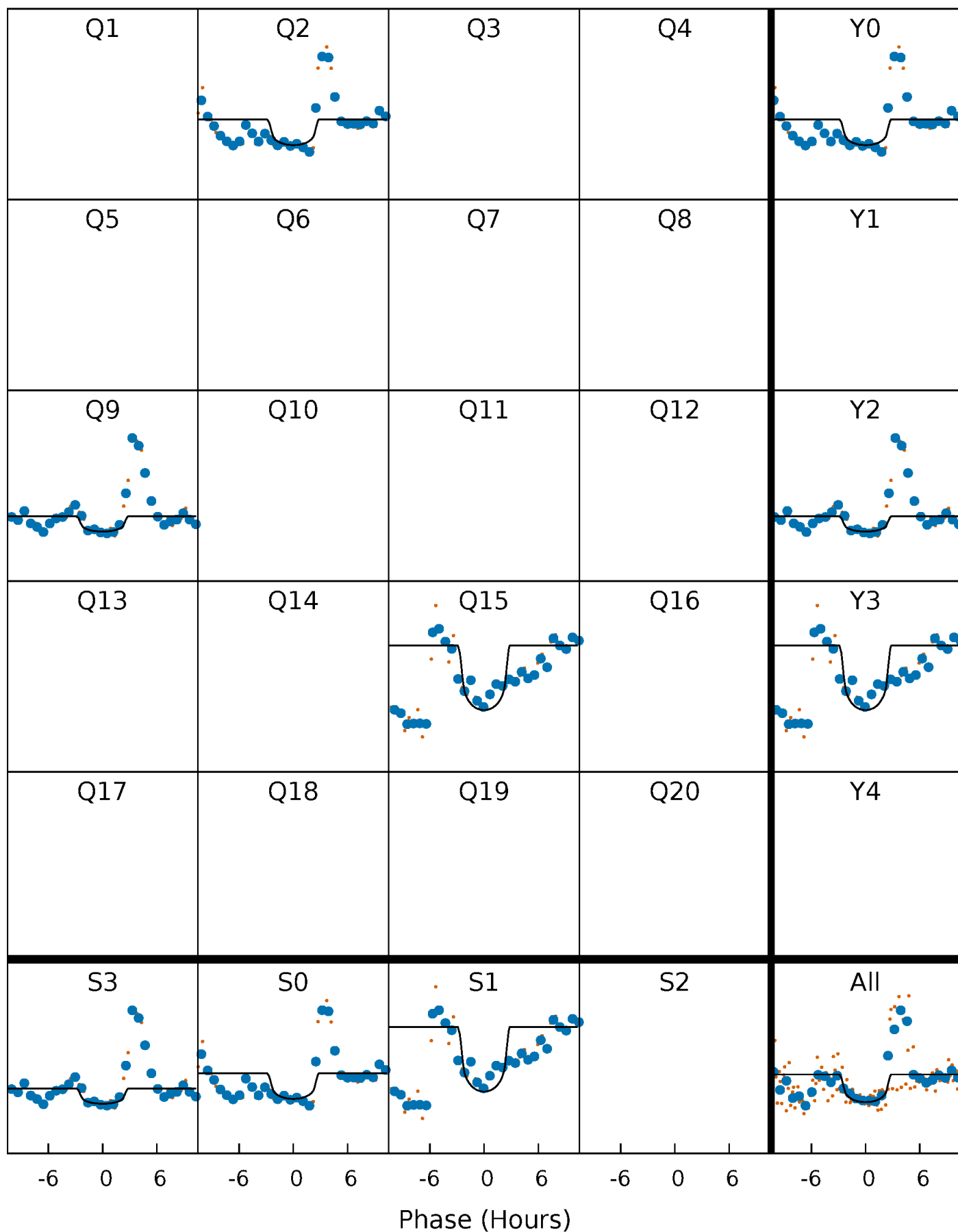
PDC Quarter-Phased Transit Curves

TCE 009215841-02 P=615.411688 Days $T_0=227.356891$ (BKJD)



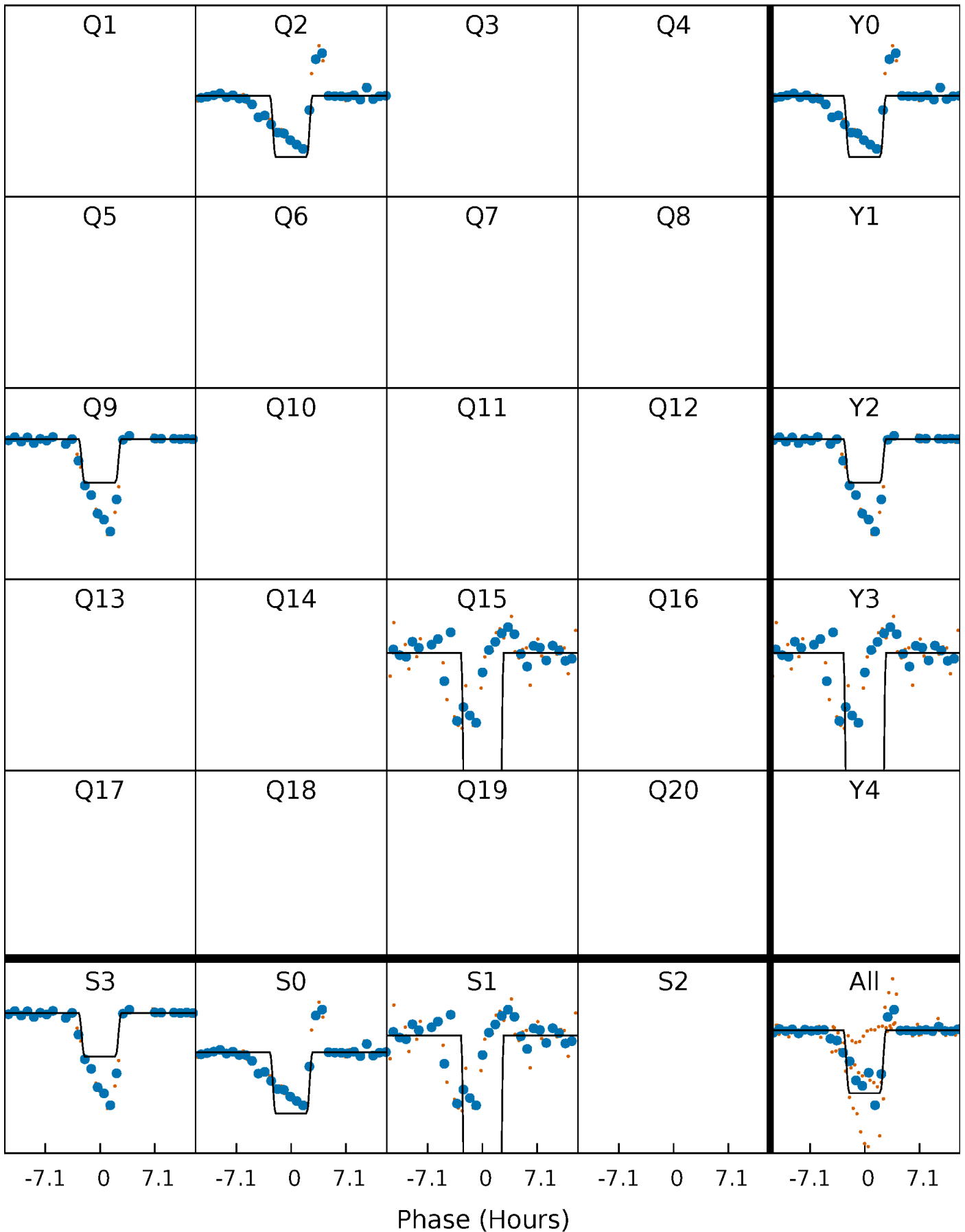
DV Quarter-Phased Transit Curves

TCE 009215841-02 P=615.411688 Days $T_0=227.356891$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

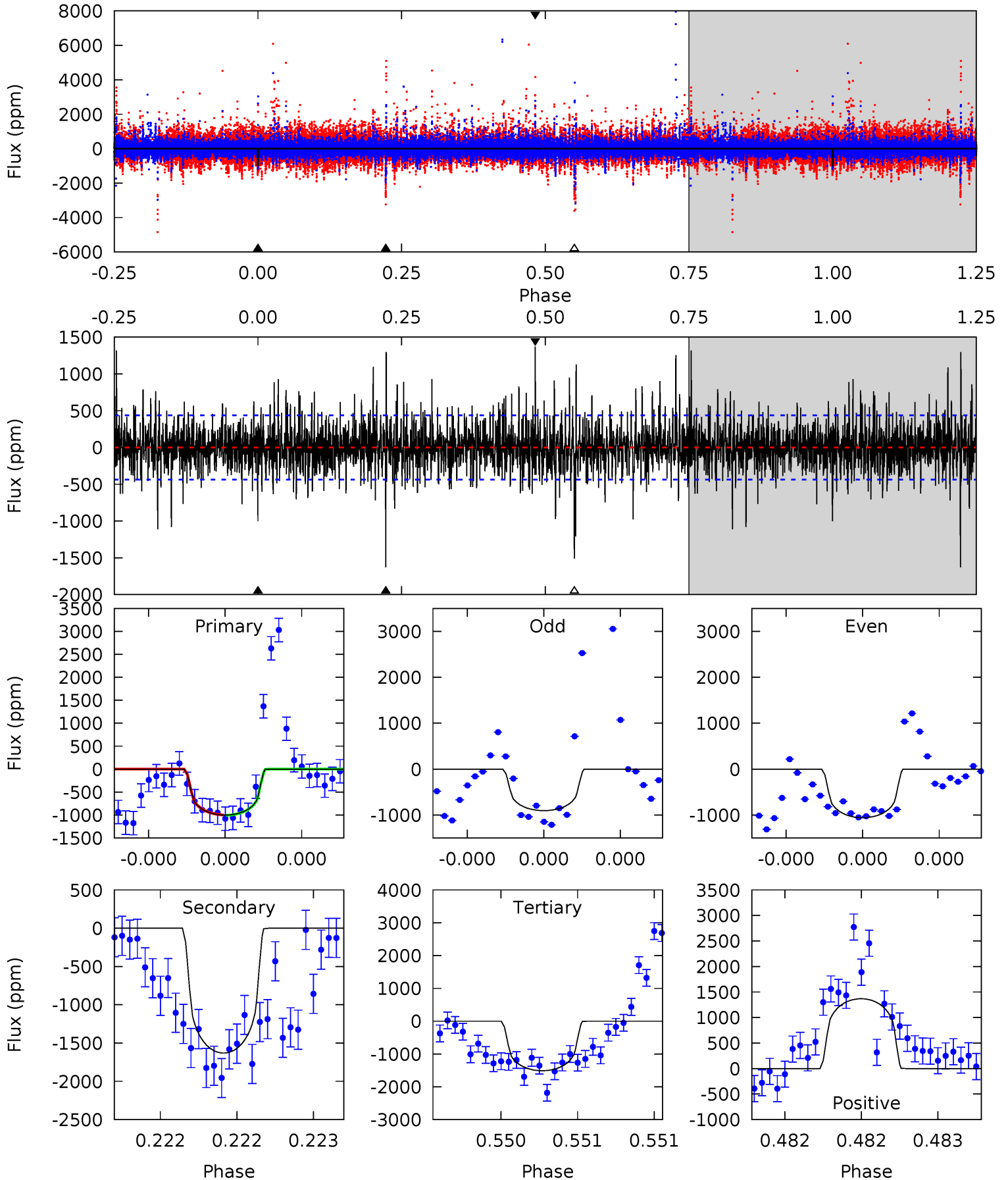
TCE 009215841-02 P=615.424771 Days $T_0=227.360640$ (BKJD)



DV Model-Shift Uniqueness Test

009215841-02, P = 615.411688 Days, E = 227.356891 Days

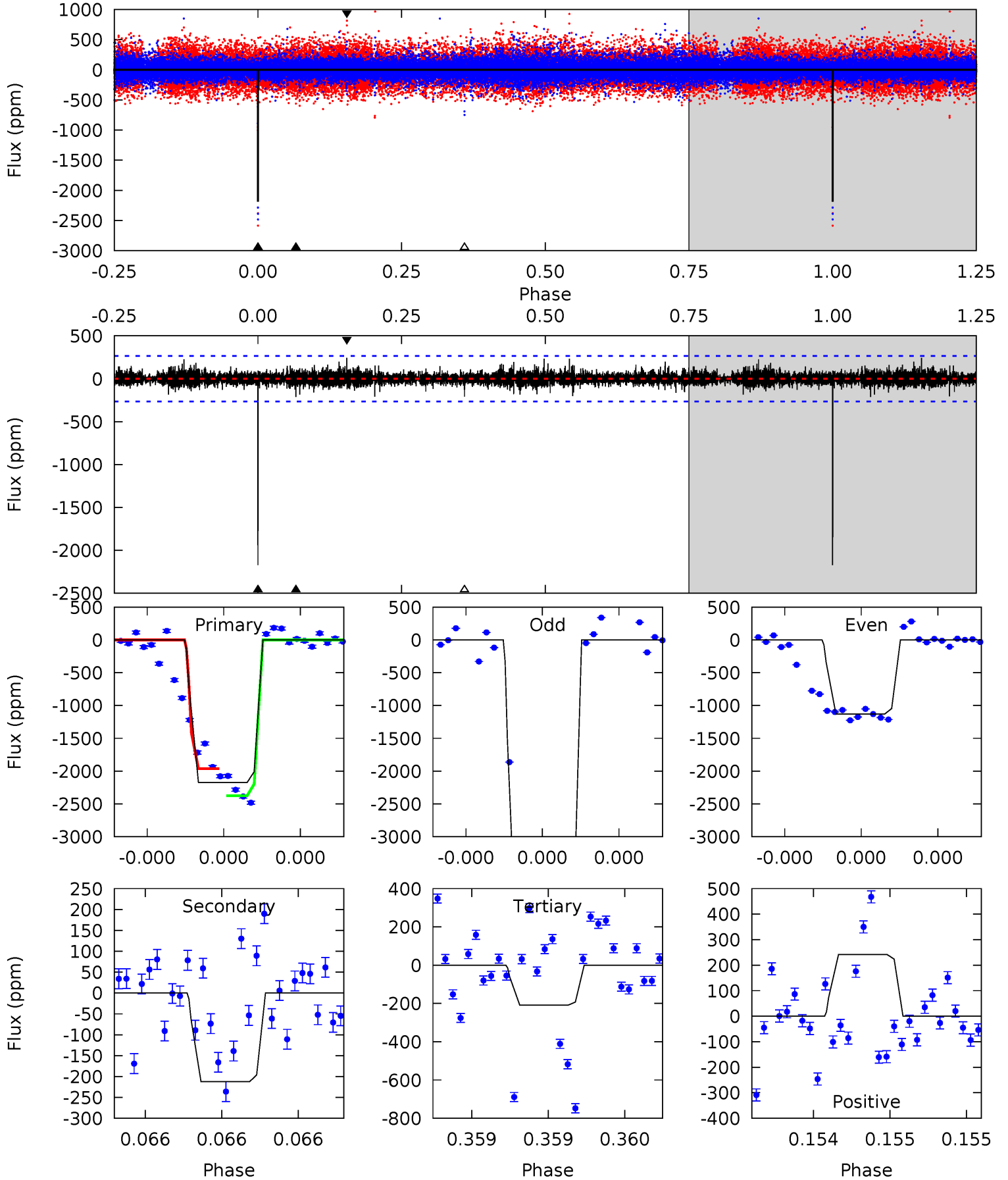
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	21.0	19.4	17.6	5.63	3.56	2.95	-6.55	-4.72	1.55	3.37	0.76	1.11	0.46	0.05



Alt Model-Shift Uniqueness Test

009215841-02, P = 615.424771 Days, E = 227.360640 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
46.2	4.51	4.43	5.13	5.63	3.56	0.76	41.8	41.0	0.08	-0.63	61.5	1.12	0.10	0



Stellar Parameters For KIC 009215841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5239^{+158}_{-142}	$4.510^{+0.095}_{-0.105}$	$-0.280^{+0.350}_{-0.250}$	$0.791^{+0.112}_{-0.091}$	$0.738^{+0.112}_{-0.052}$	$2.100^{+0.873}_{-0.618}$
	+3%/-3%	+2%/-2%	+125%/-89%	+14%/-12%	+15%/-7%	+42%/-29%
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 009215841-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1631 ± 78	$4.73^{+4.47}_{-3.09}$	254^{+12}_{-11}	4595^{+3233}_{-951}	$65213^{+479917}_{-47935}$
Alt.	-212 ± 47	$6.12^{+4.80}_{-4.07}$	255^{+11}_{-12}	3038^{+1253}_{-452}	5037^{+42199}_{-3449}

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

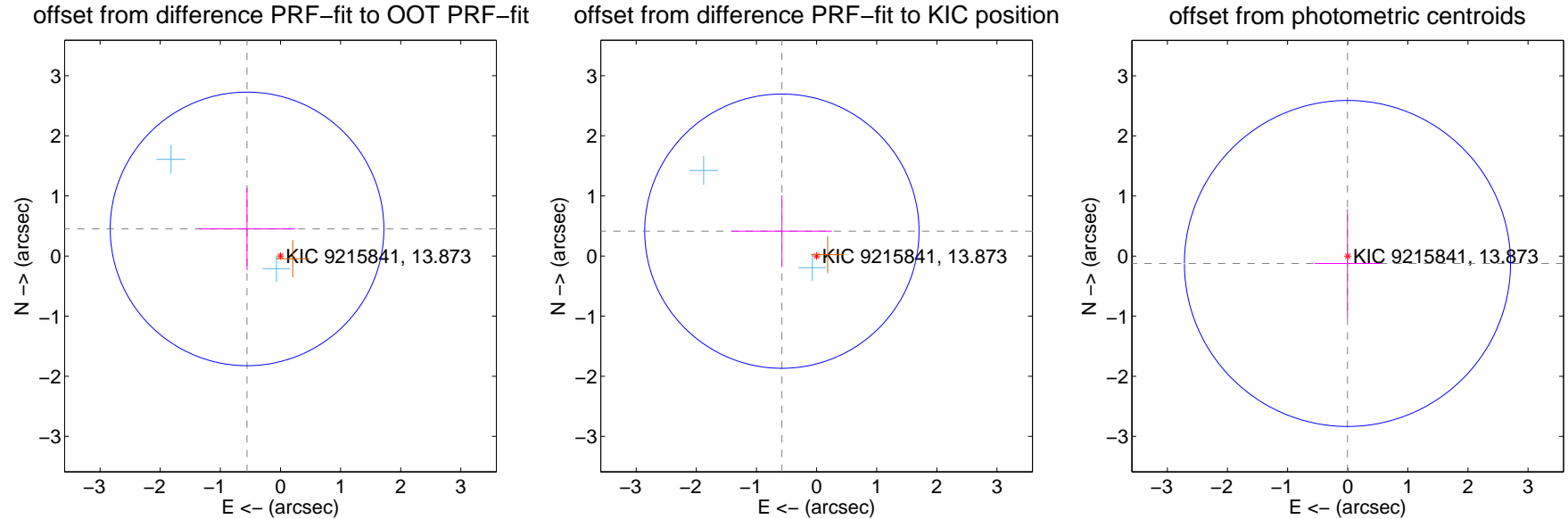
DV Centroid Data

Supplemental centroid analysis for 009215841-02. Kepler magnitude: 13.87. Transit SNR 7.33

There are 2 quarters with good PRF difference image offsets

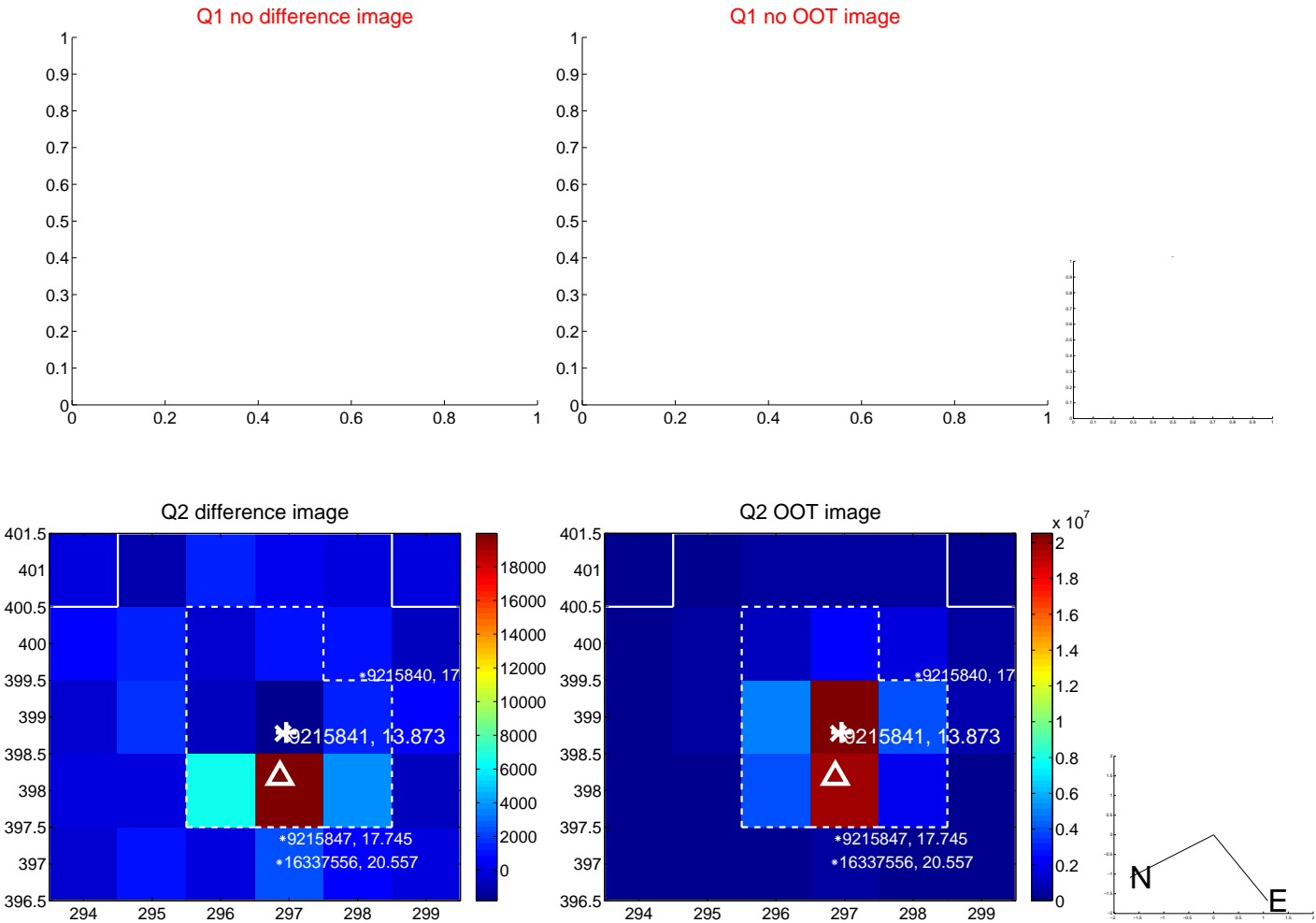
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.716 ± 0.759	0.94	0.556 ± 0.803	0.451 ± 0.686
PRF-fit source offset from KIC position	0.710 ± 0.760	0.93	0.578 ± 0.832	0.413 ± 0.597
photometric centroid source offset	0.12 ± 0.90	0.14	0.00 ± 0.55	-0.12 ± 0.90

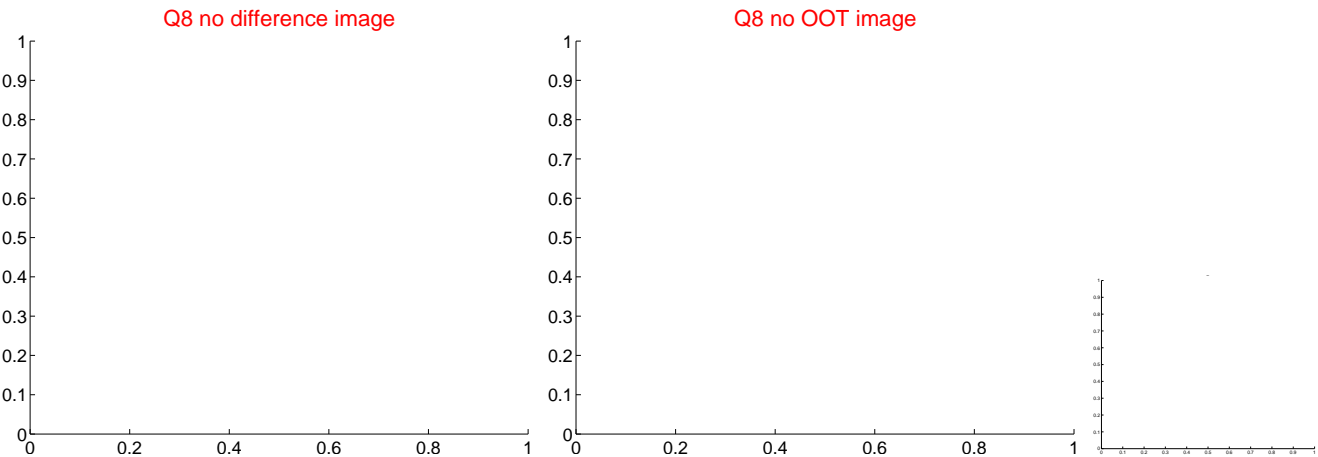
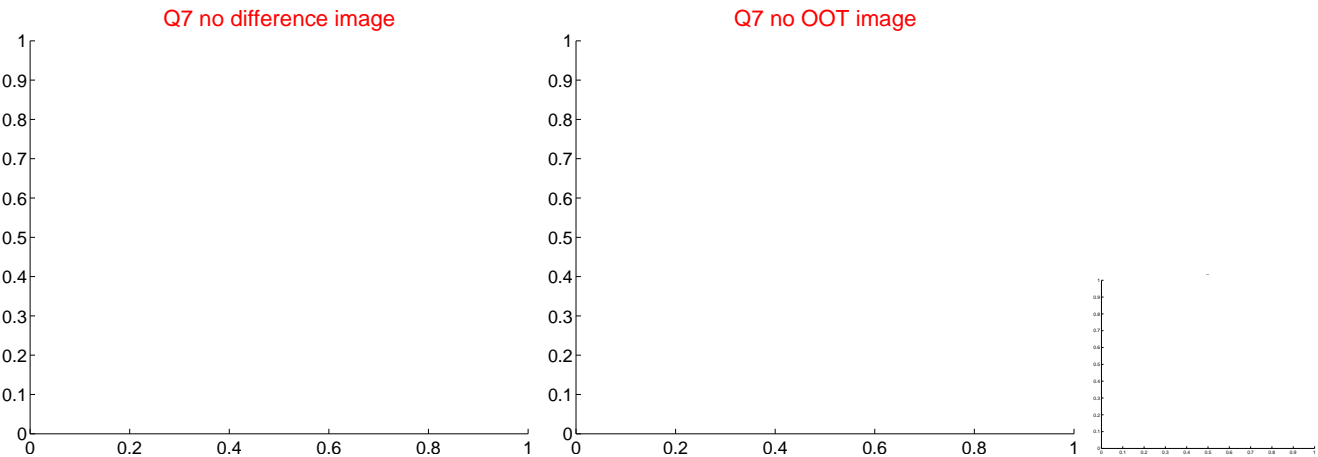
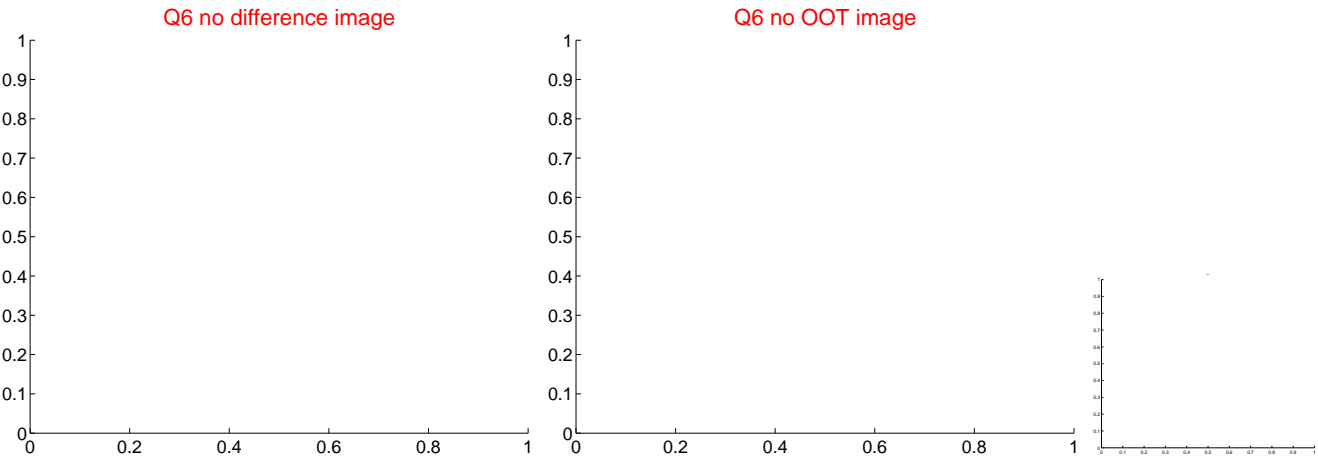
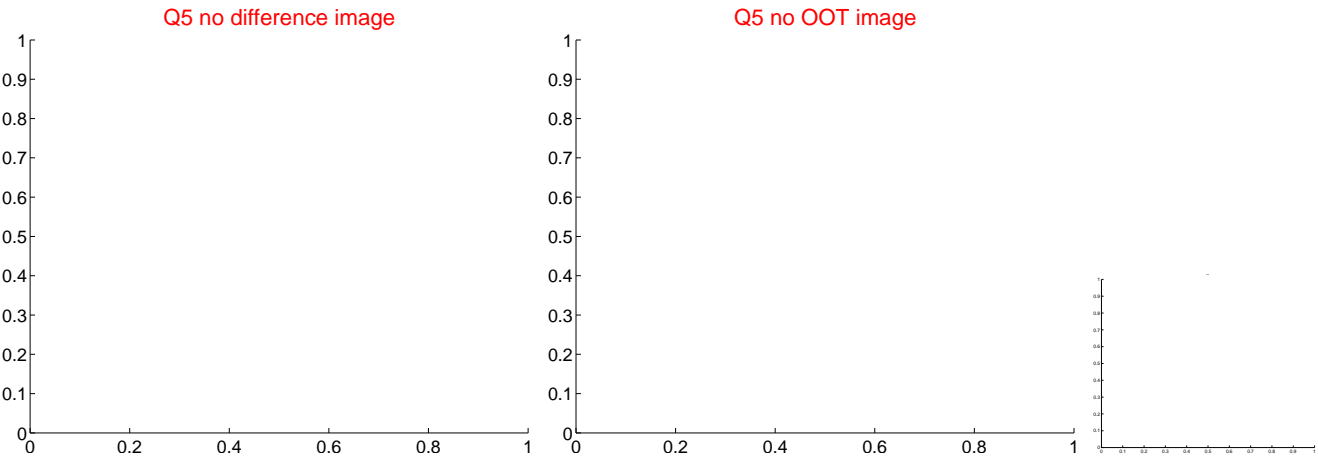


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

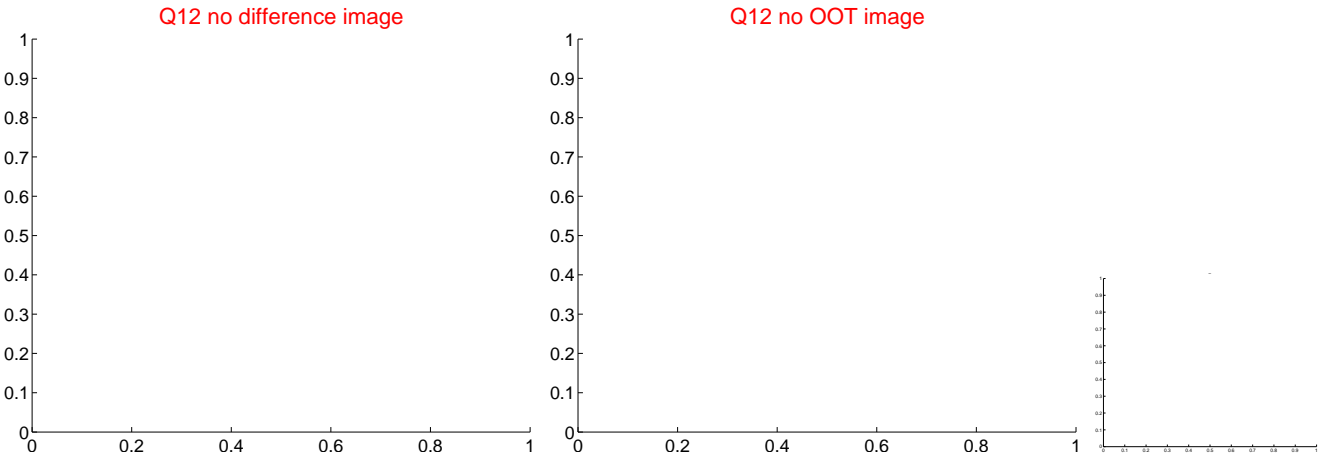
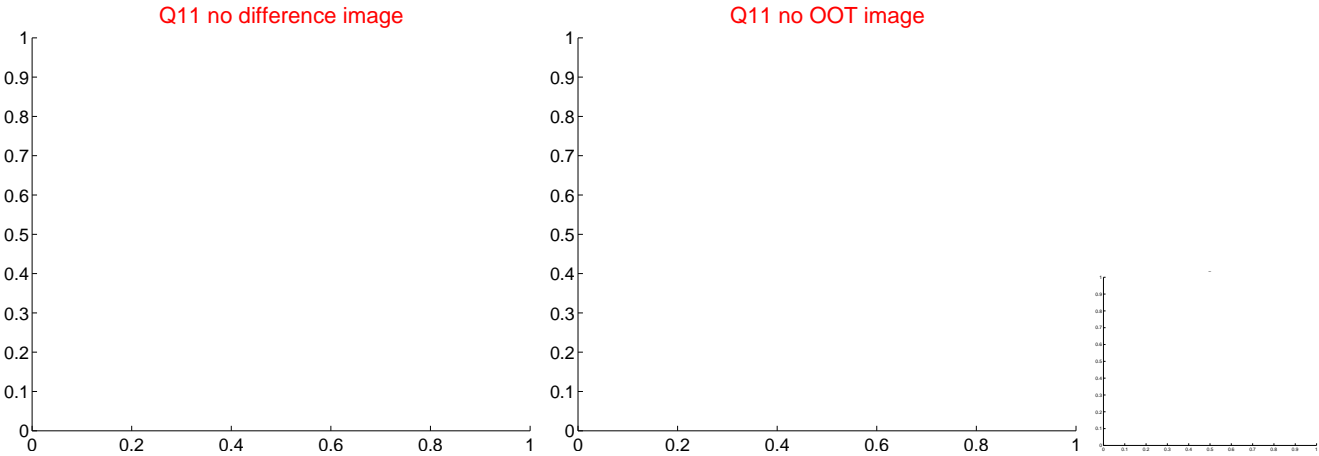
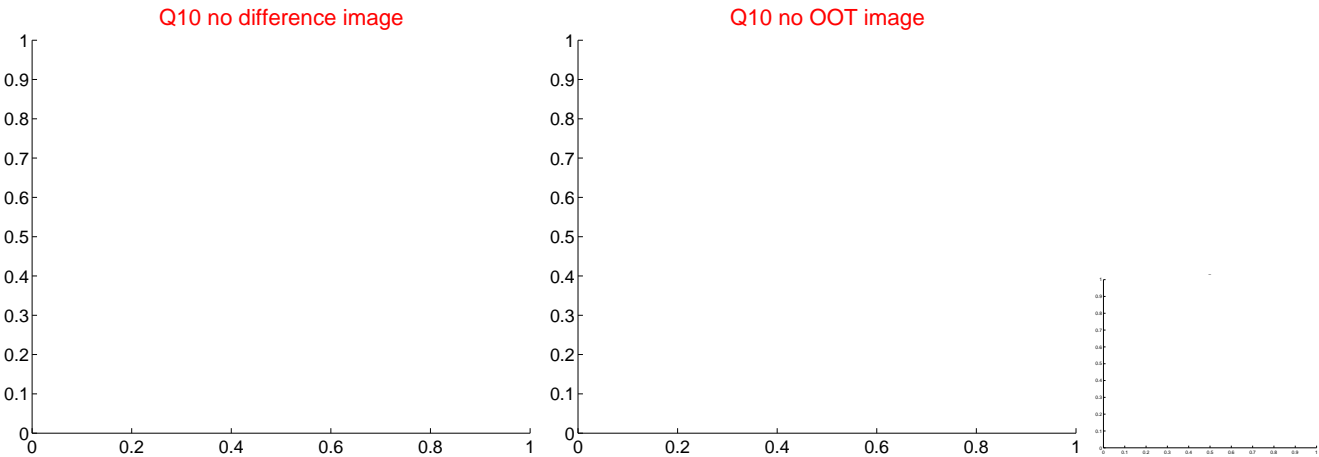
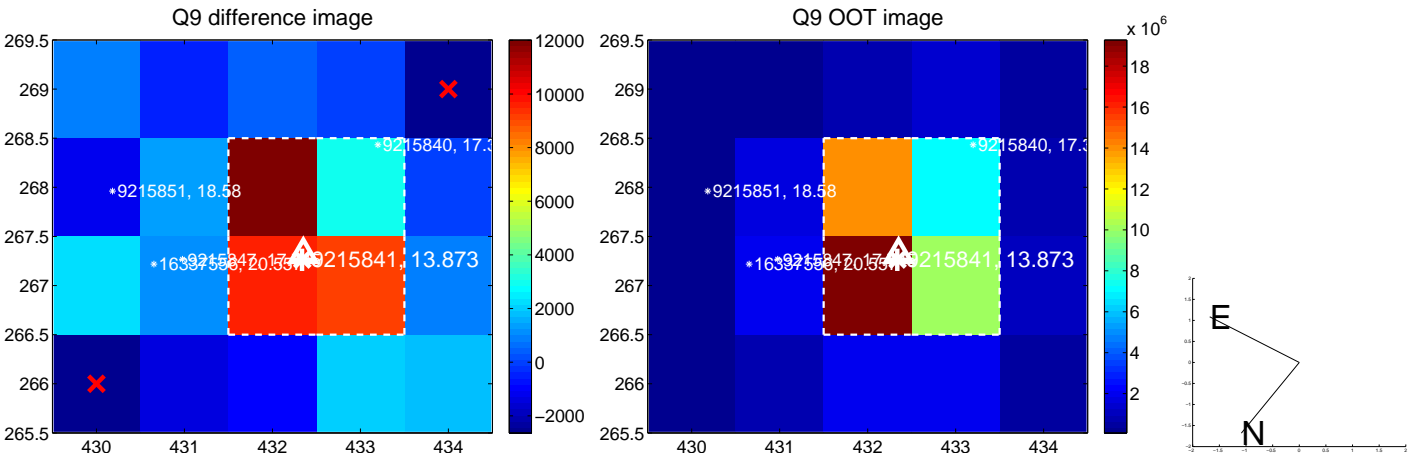
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



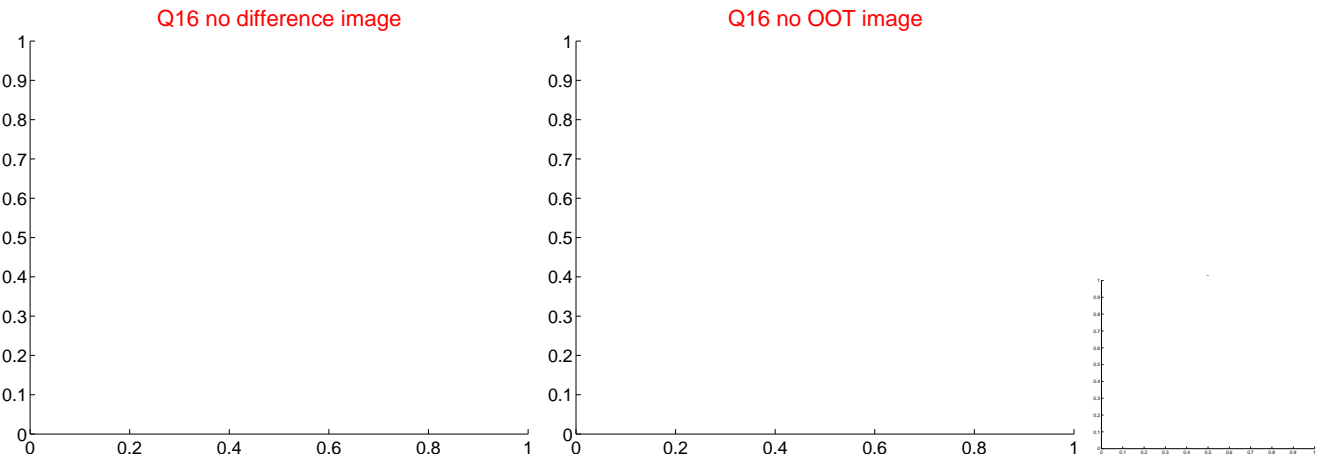
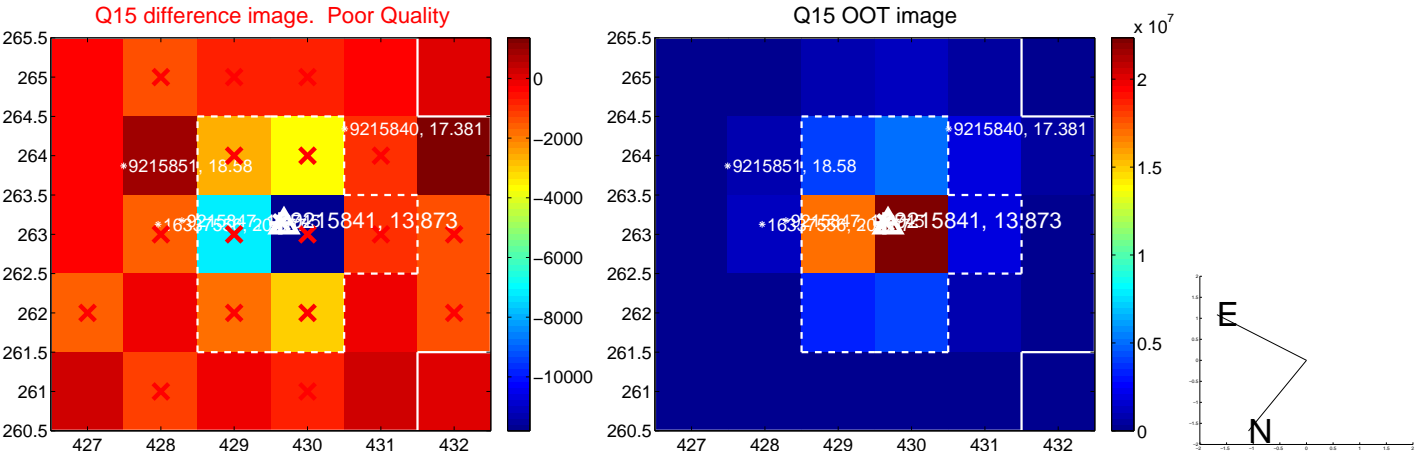
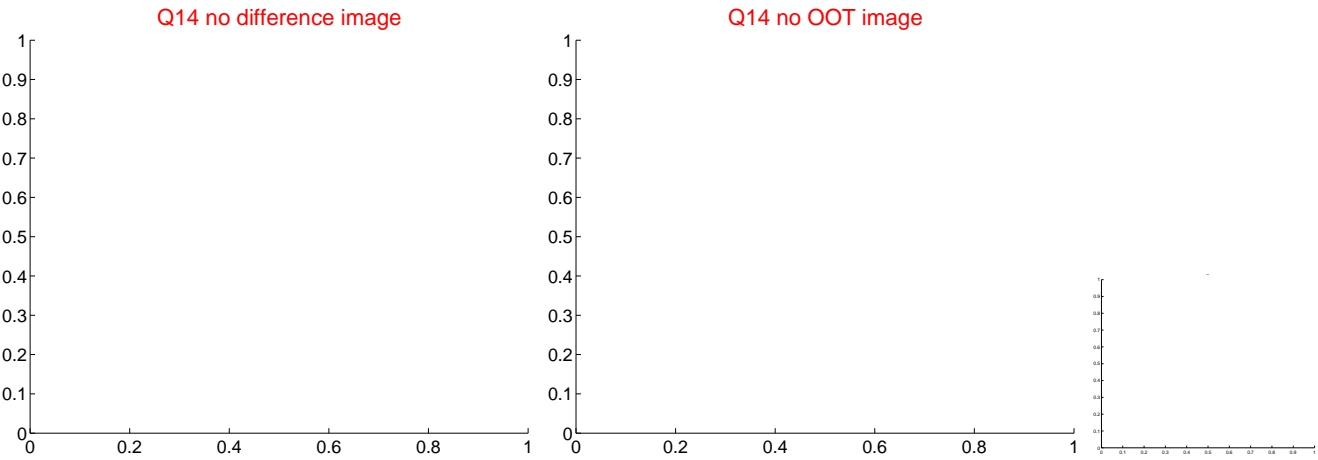
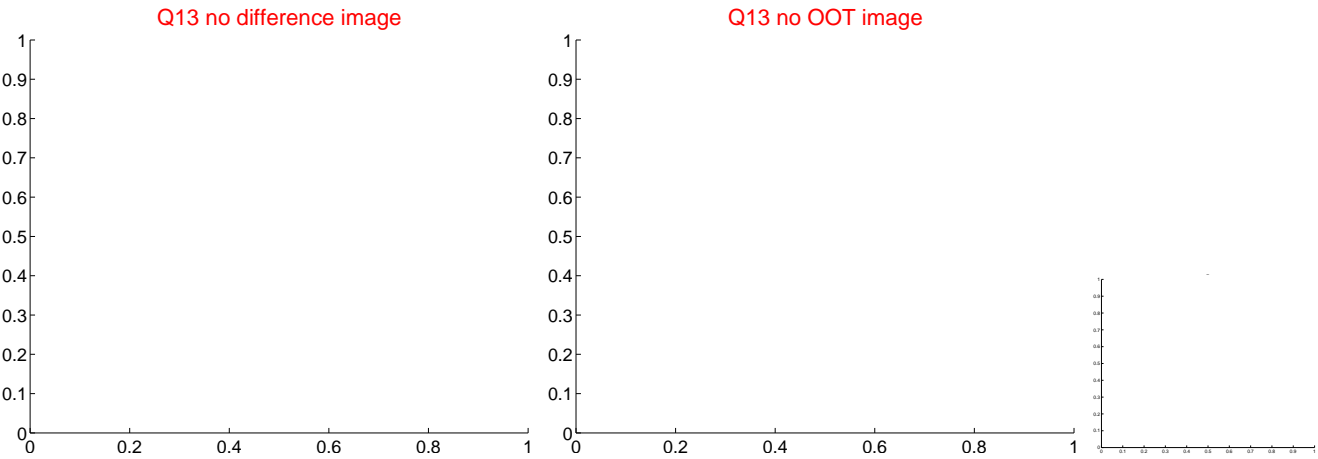
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



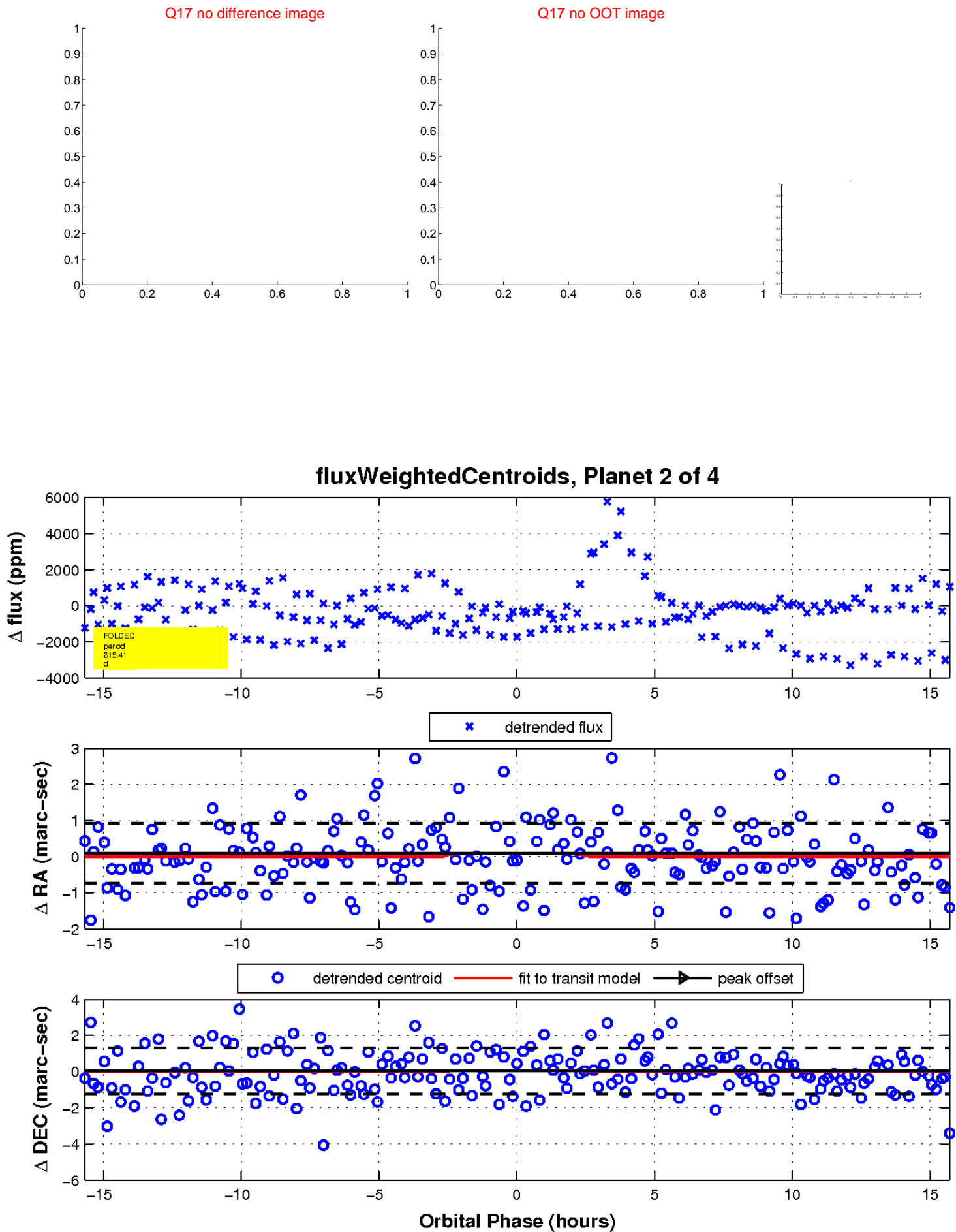
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

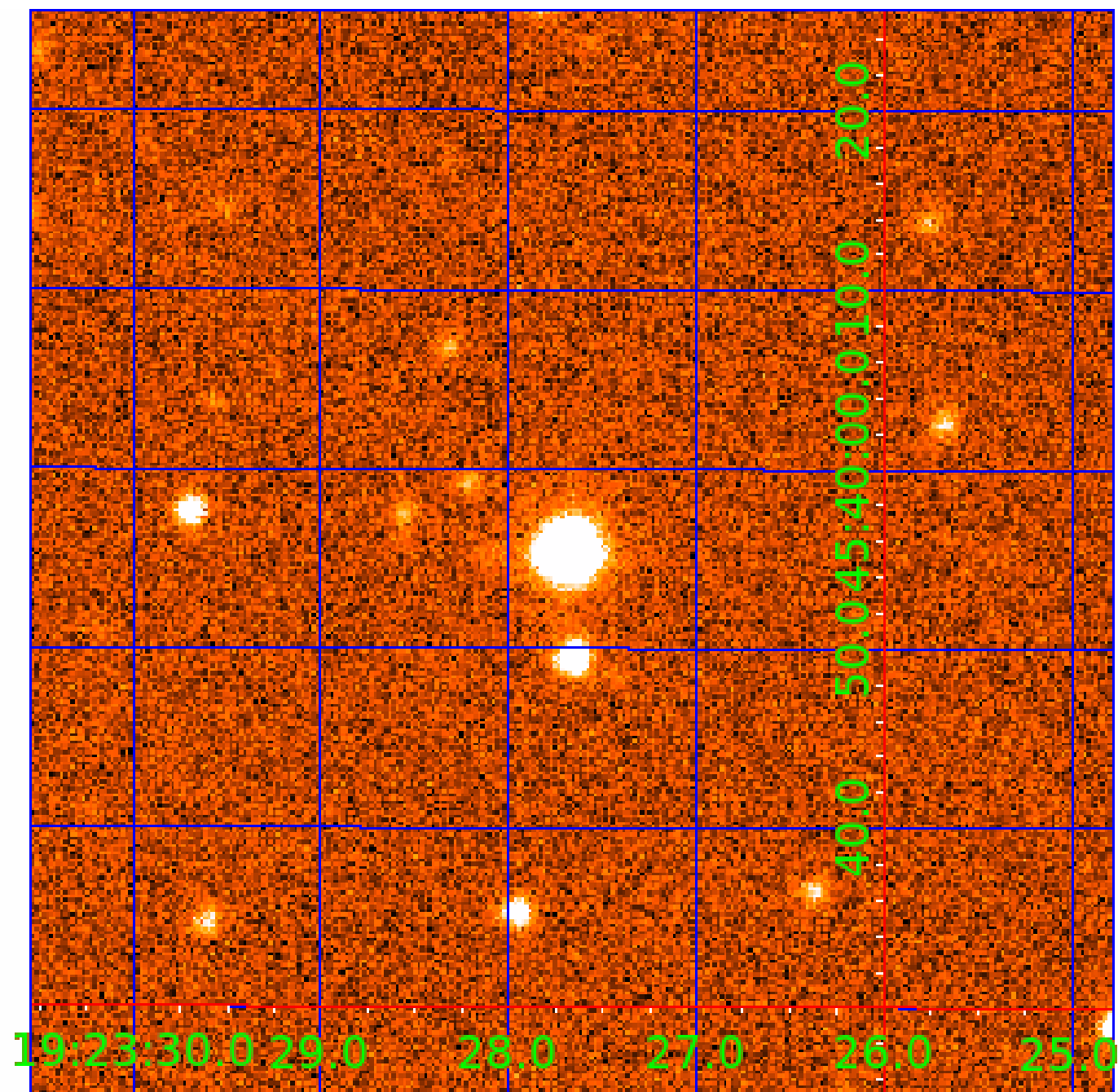


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009215841

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})
009215841-01	OBS	No	379.314948	328.649729	711.0	3.863	13.7	5.9	0.79	5239	2.18	0.49
009215841-02	OBS	No	615.411688	227.356891	1079.8	5.274	13.9	7.3	0.79	5239	2.62	0.26
009215841-03	OBS	No	263.564645	236.545251	724.4	2.762	12.7	5.1	0.79	5239	2.27	0.80
009215841-04	OBS	No	481.609789	298.033121	865.5	4.330	9.6	6.3	0.79	5239	2.41	0.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009215841-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009215841-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—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.

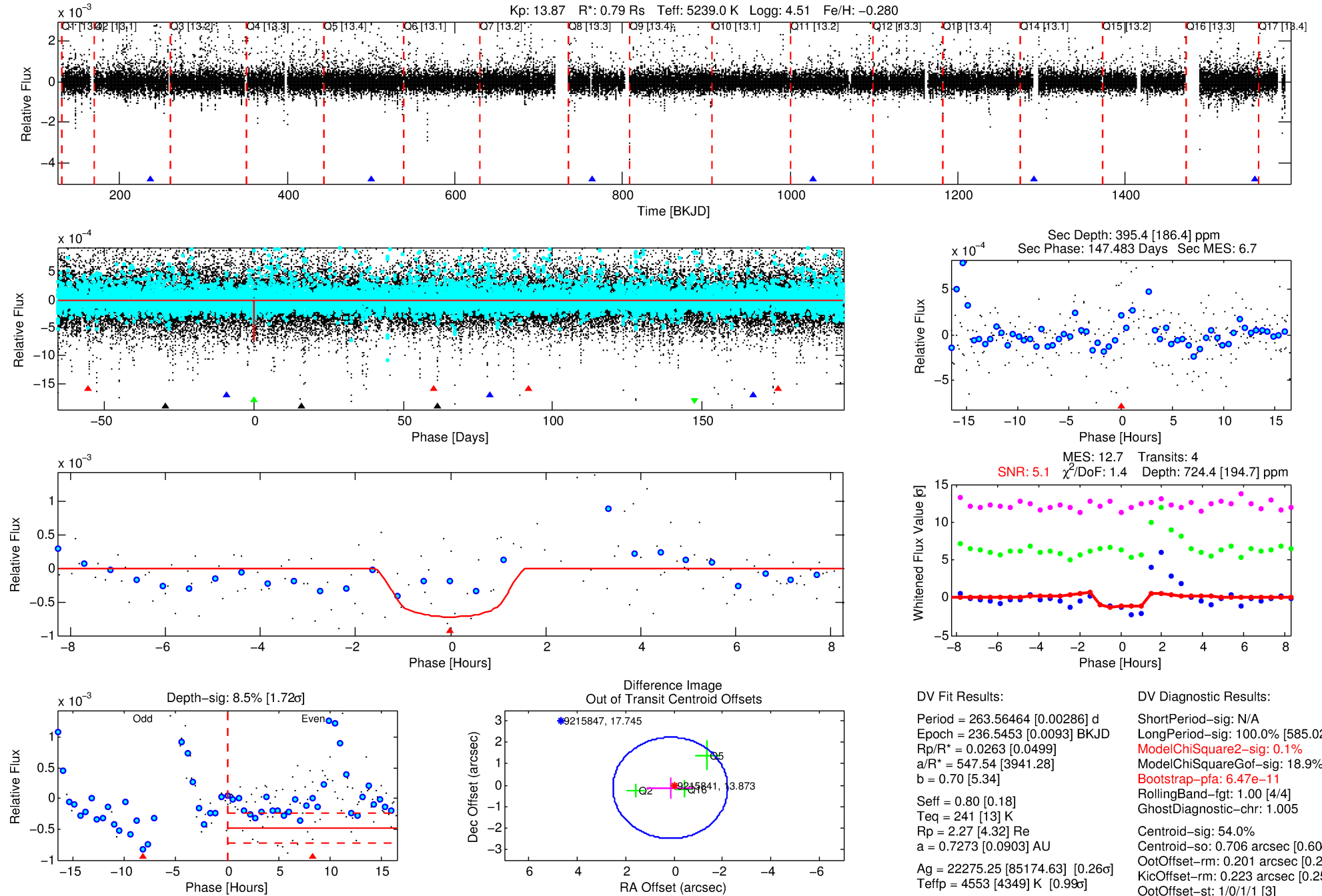
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009215841-03

No Significant Match Found

DV One-Page Summary

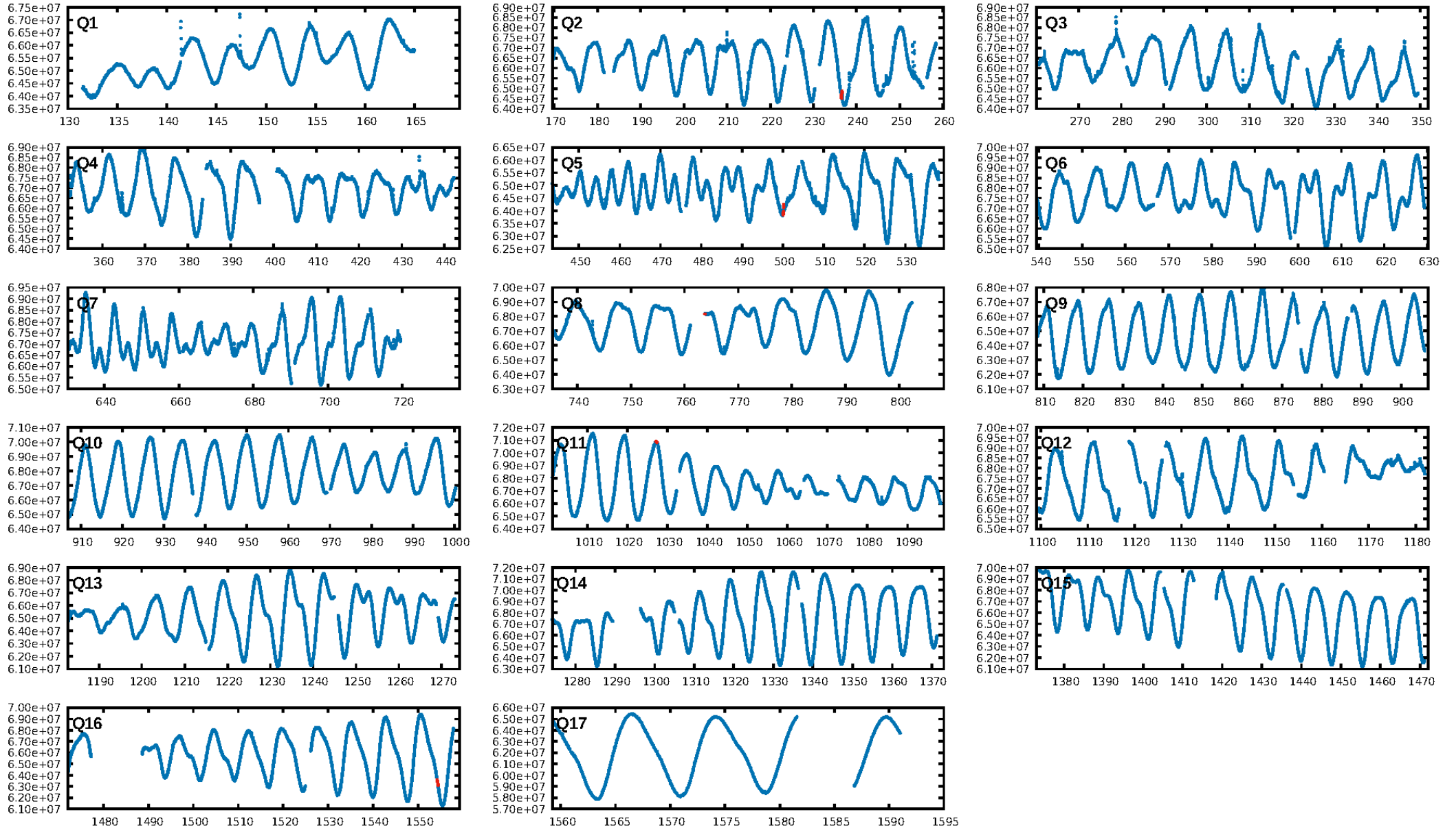
KIC: 9215841 Candidate: 3 of 4 Period: 263.565 d



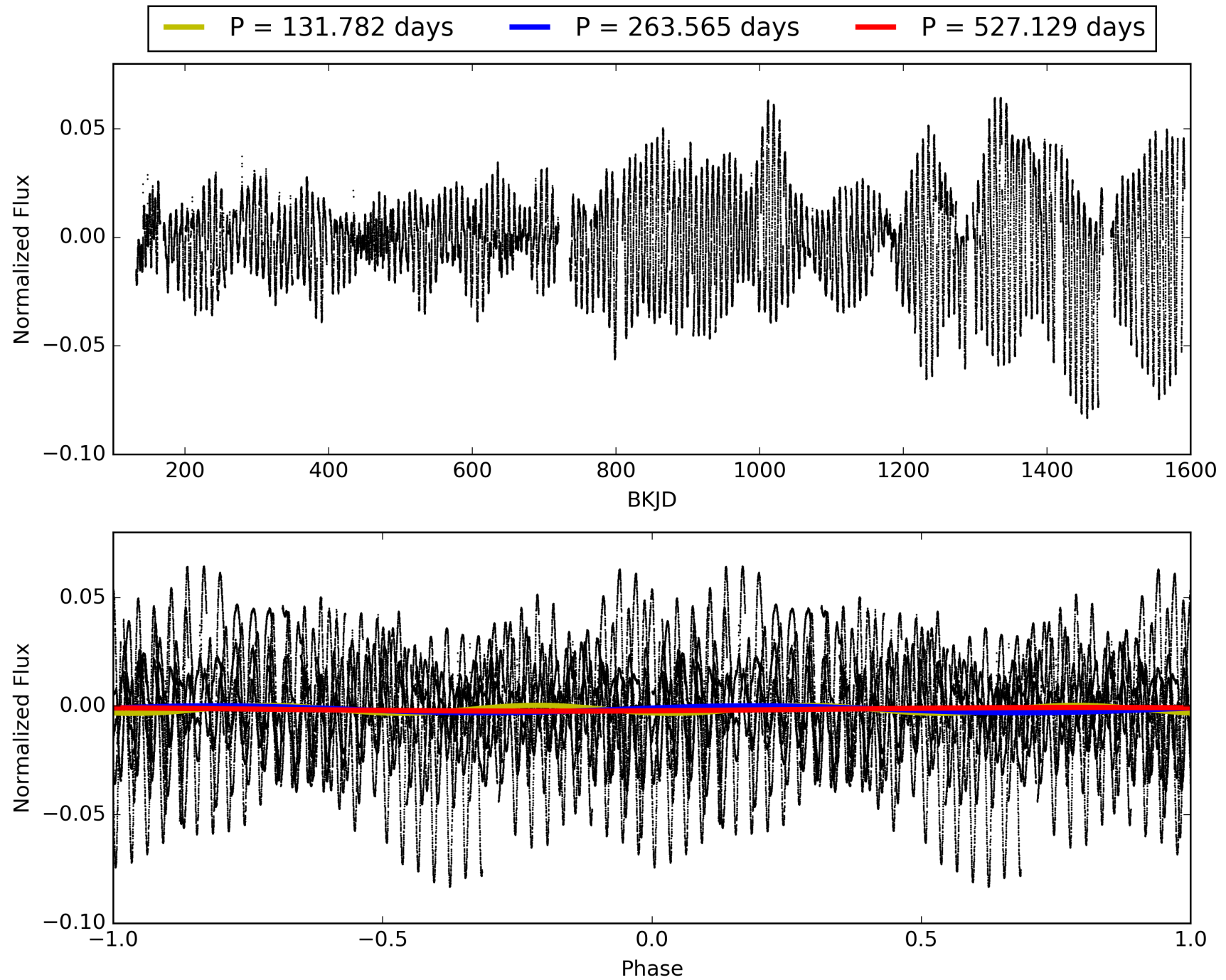
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:35:44 Z

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

TCE 009215841-03, PDC Light Curves

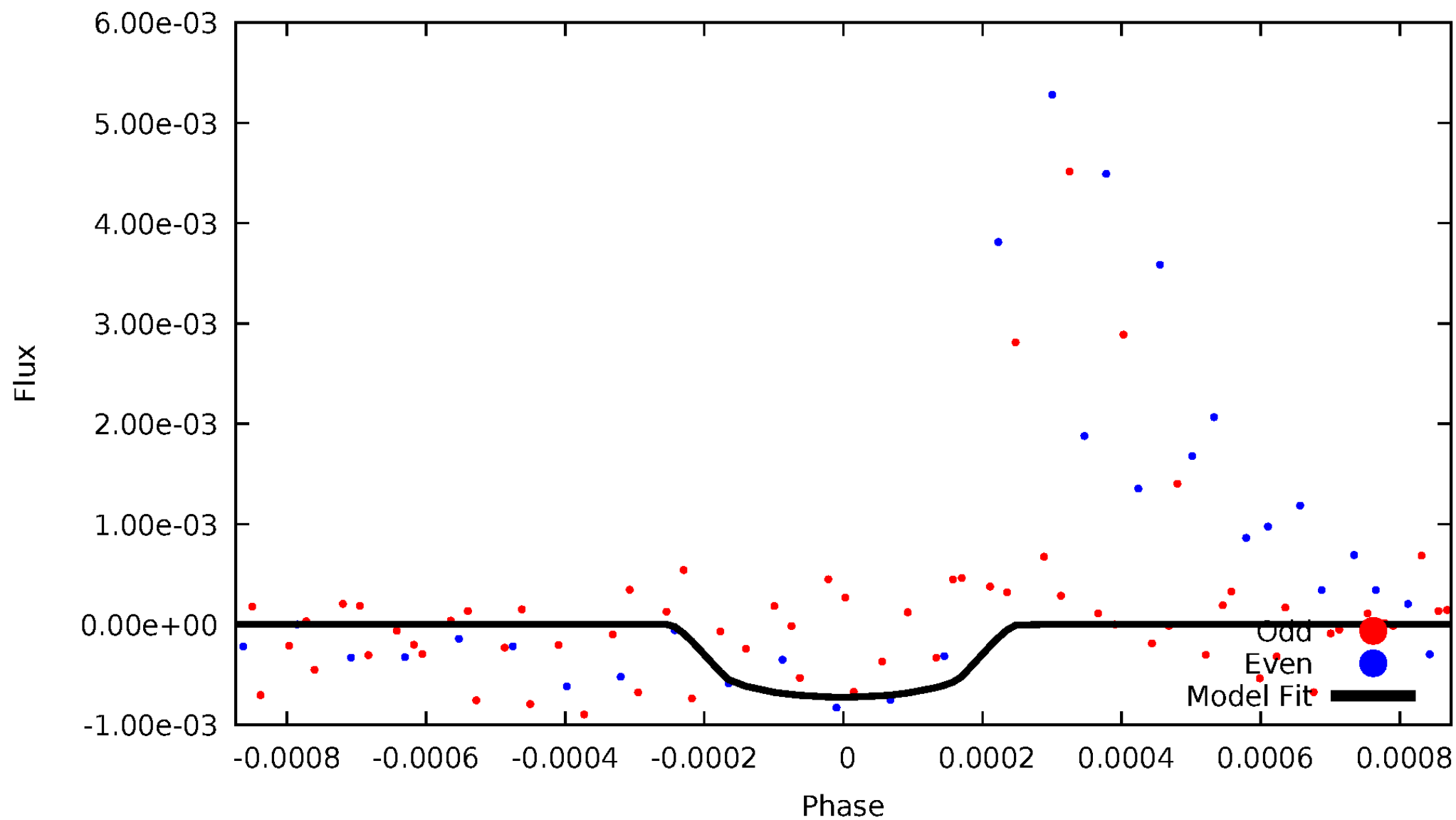


TCE 009215841-03



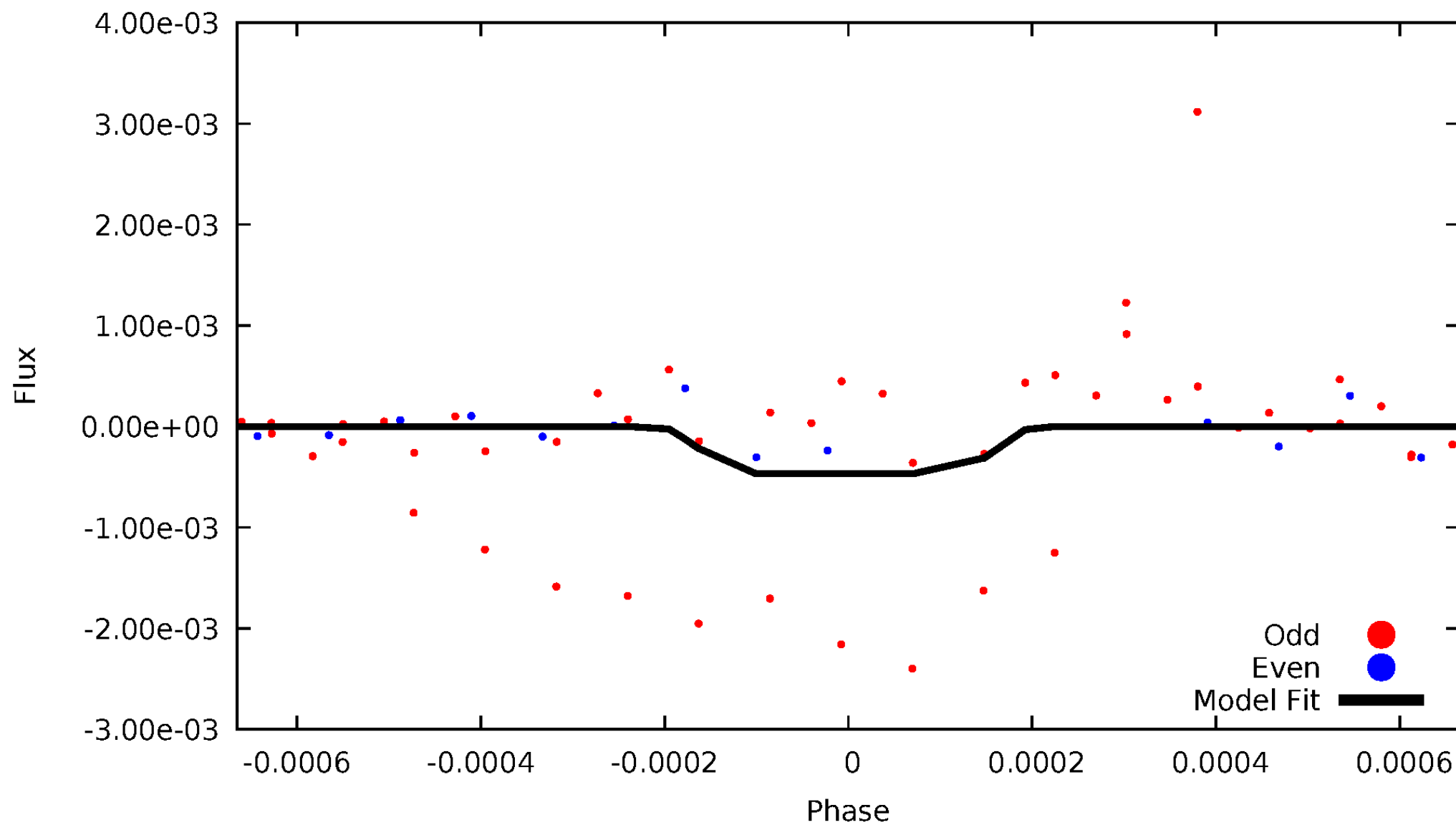
DV Odd/Even

TCE 009215841-03



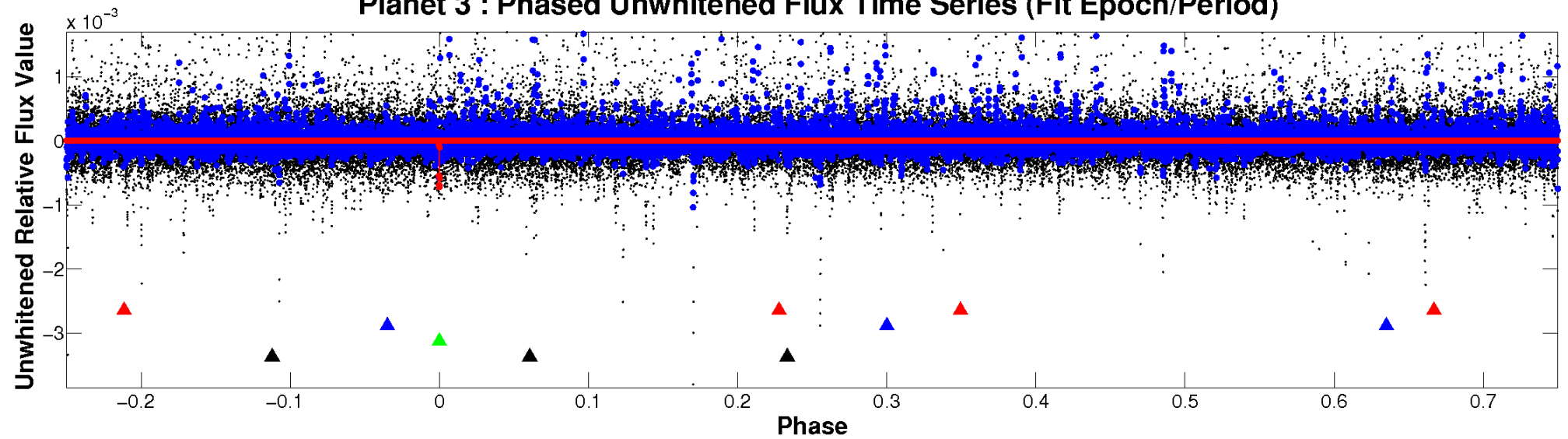
ALT Odd/Even

TCE 009215841-03

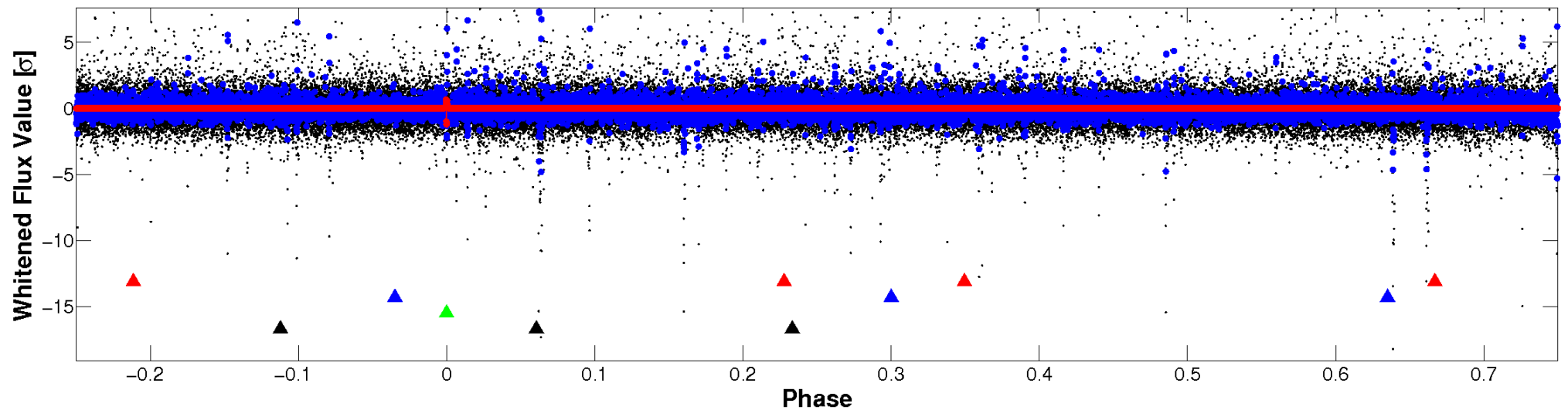


Non-Whitened Vs. Whitened Light Curve

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

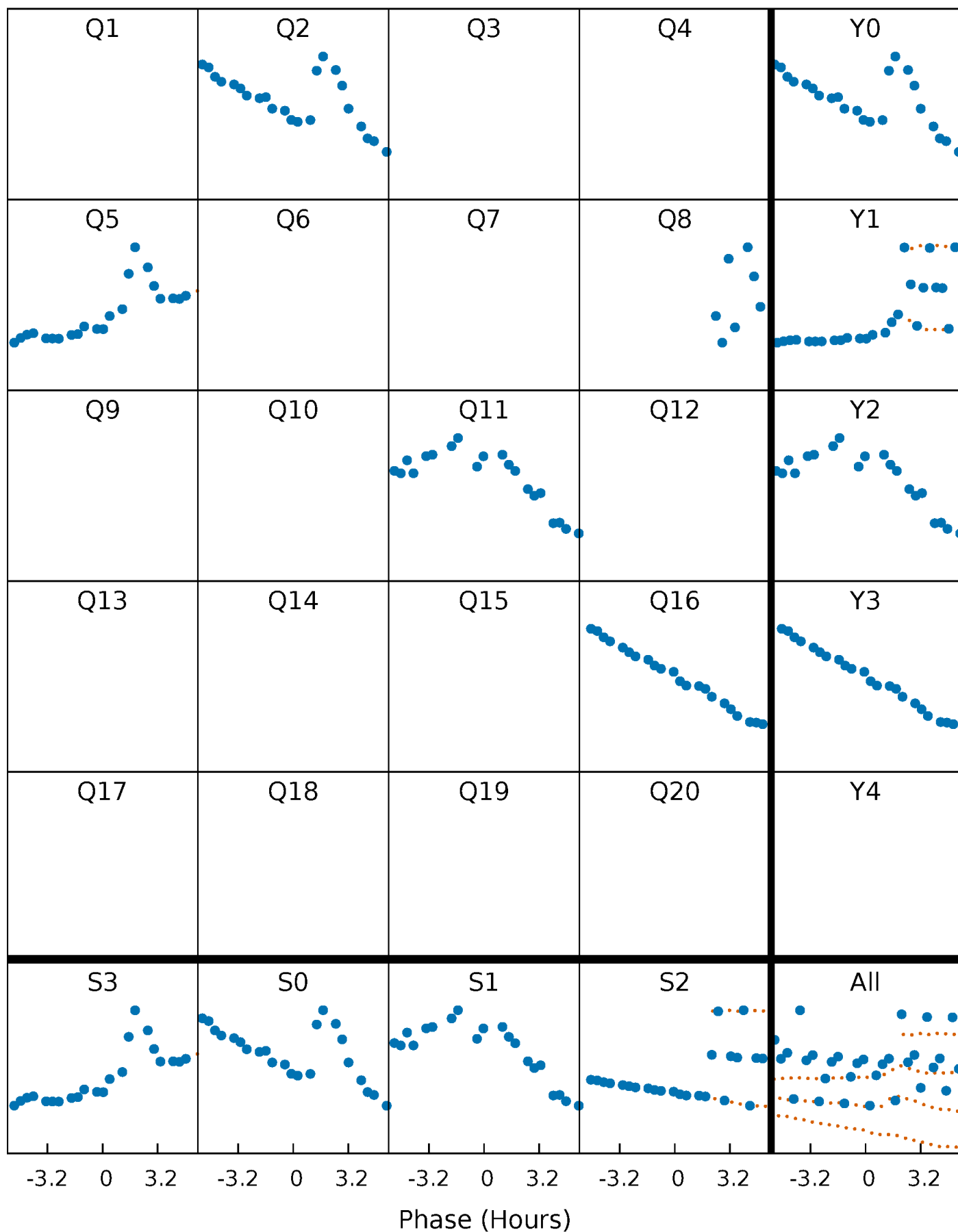


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



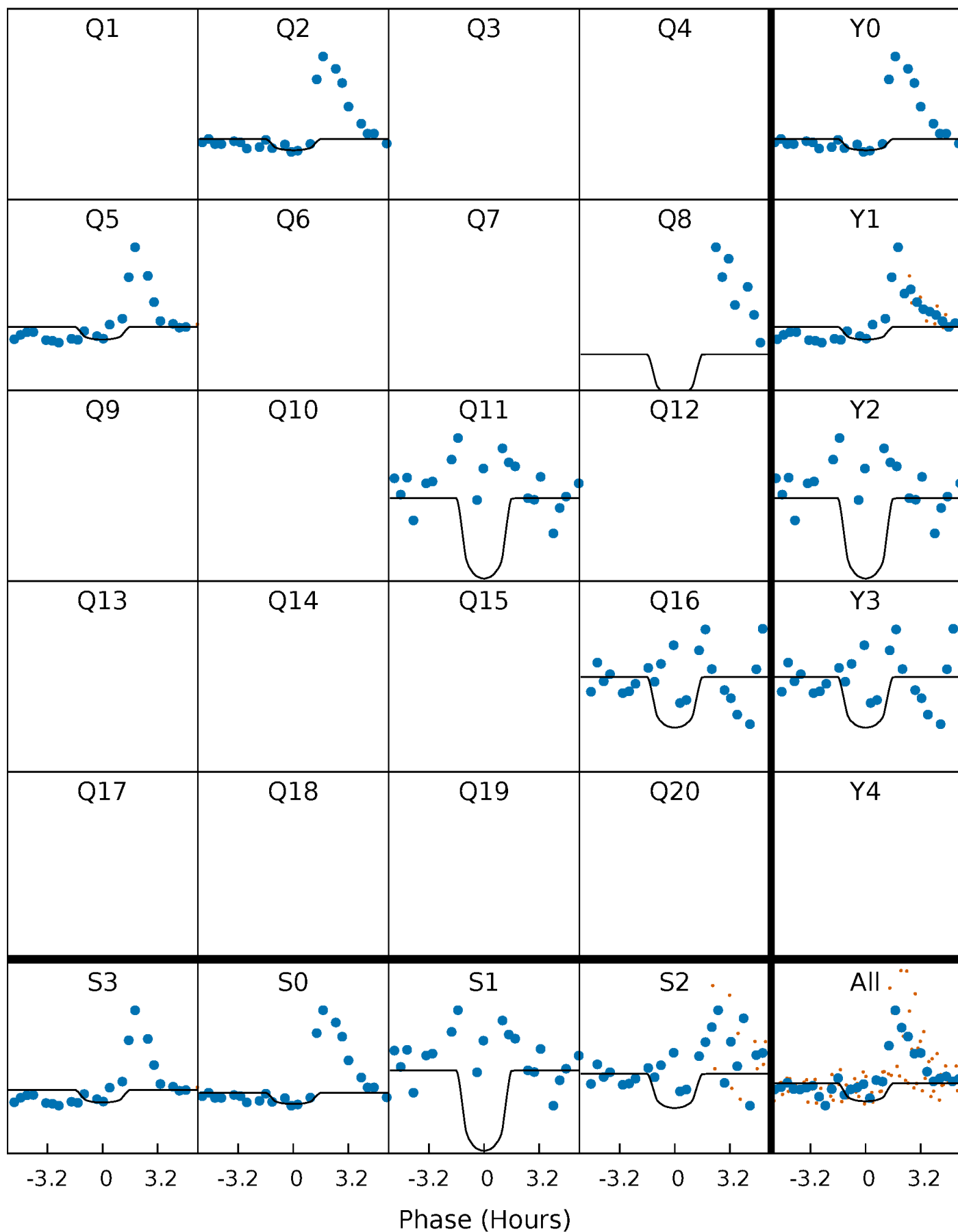
PDC Quarter-Phased Transit Curves

TCE 009215841-03 P=263.564645 Days $T_0=236.545251$ (BKJD)



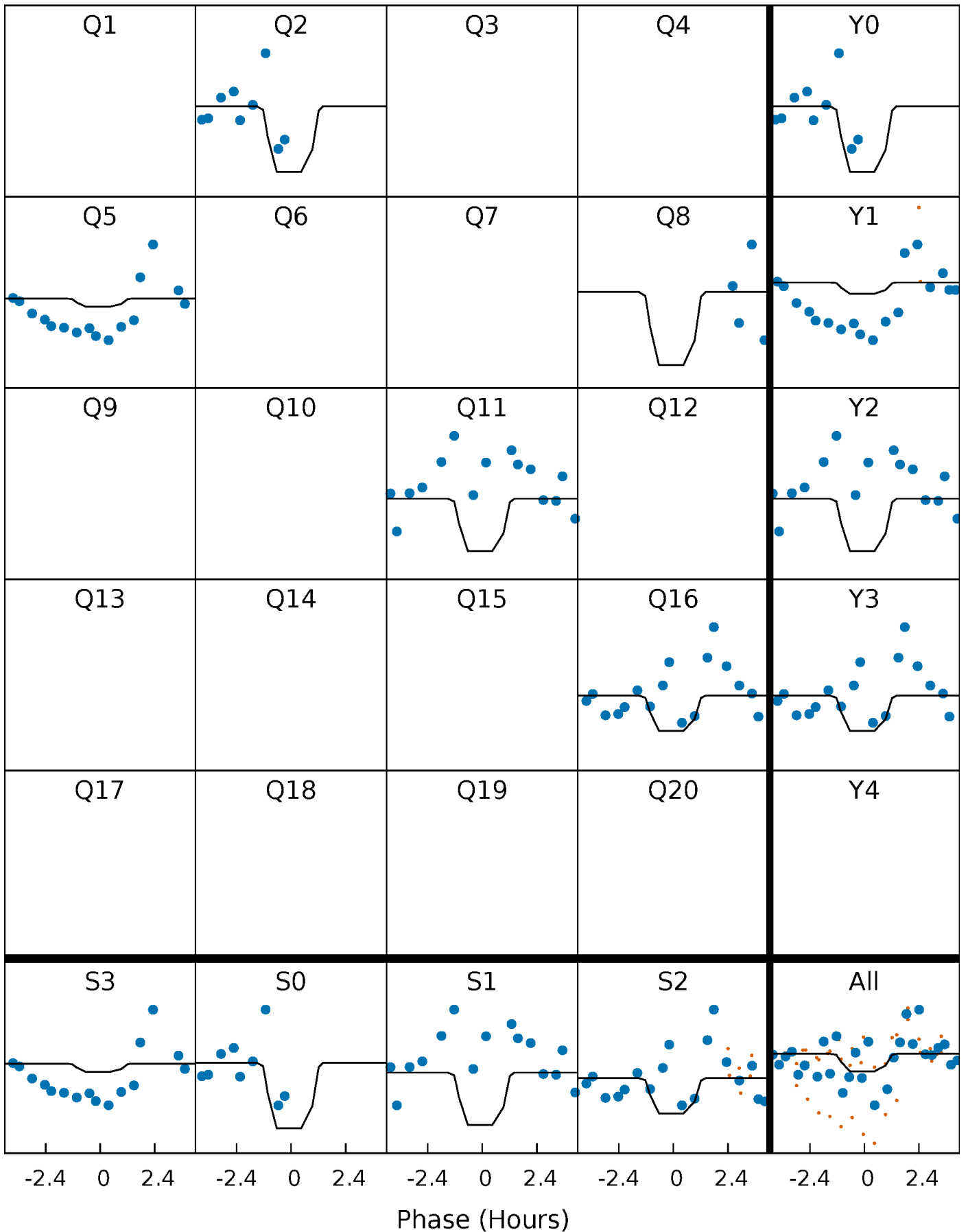
DV Quarter-Phased Transit Curves

TCE 009215841-03 P=263.564645 Days $T_0=236.545251$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

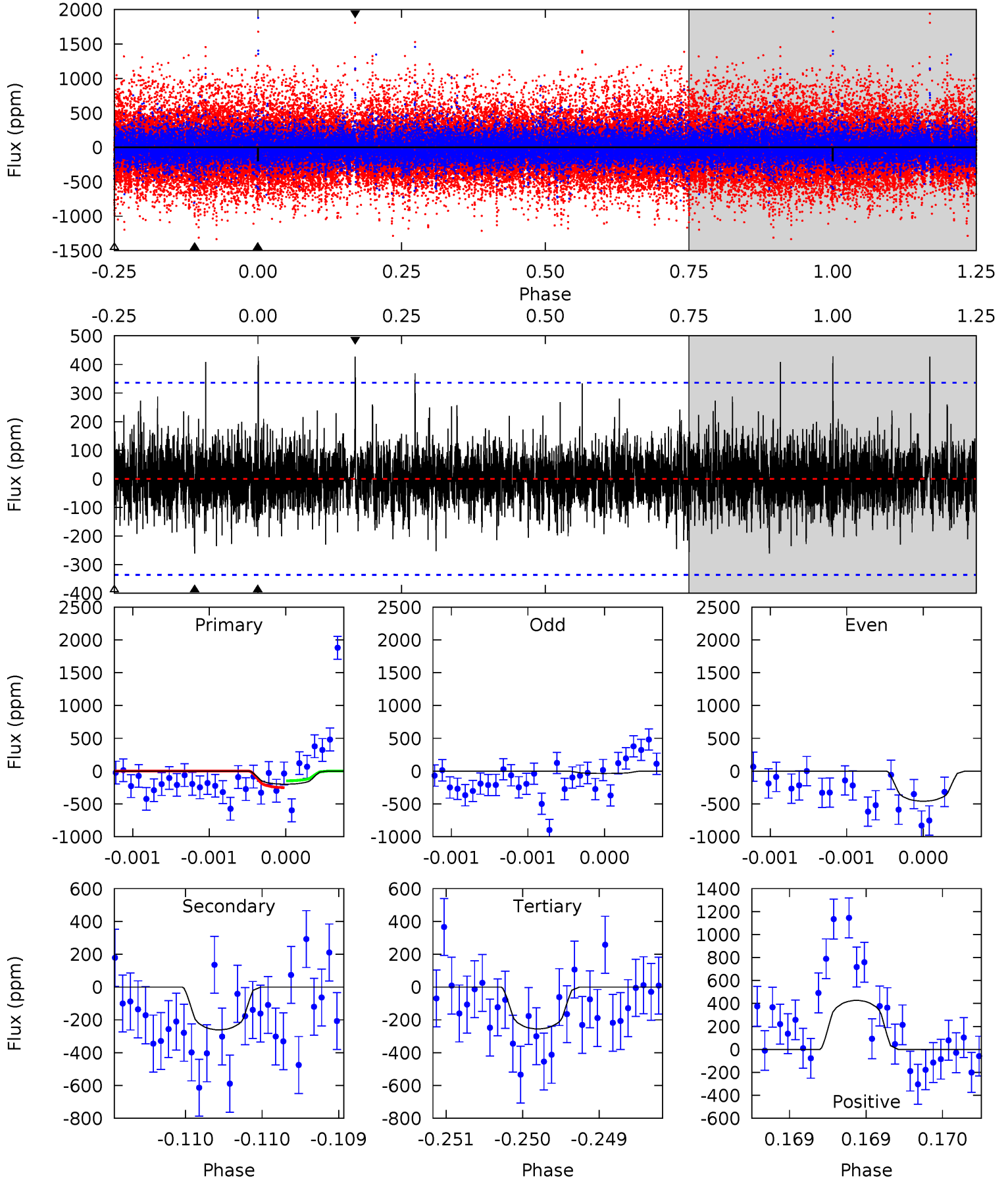
TCE 009215841-03 P=263.567299 Days $T_0=236.528201$ (BKJD)



DV Model-Shift Uniqueness Test

009215841-03, P = 263.564645 Days, E = 236.545251 Days

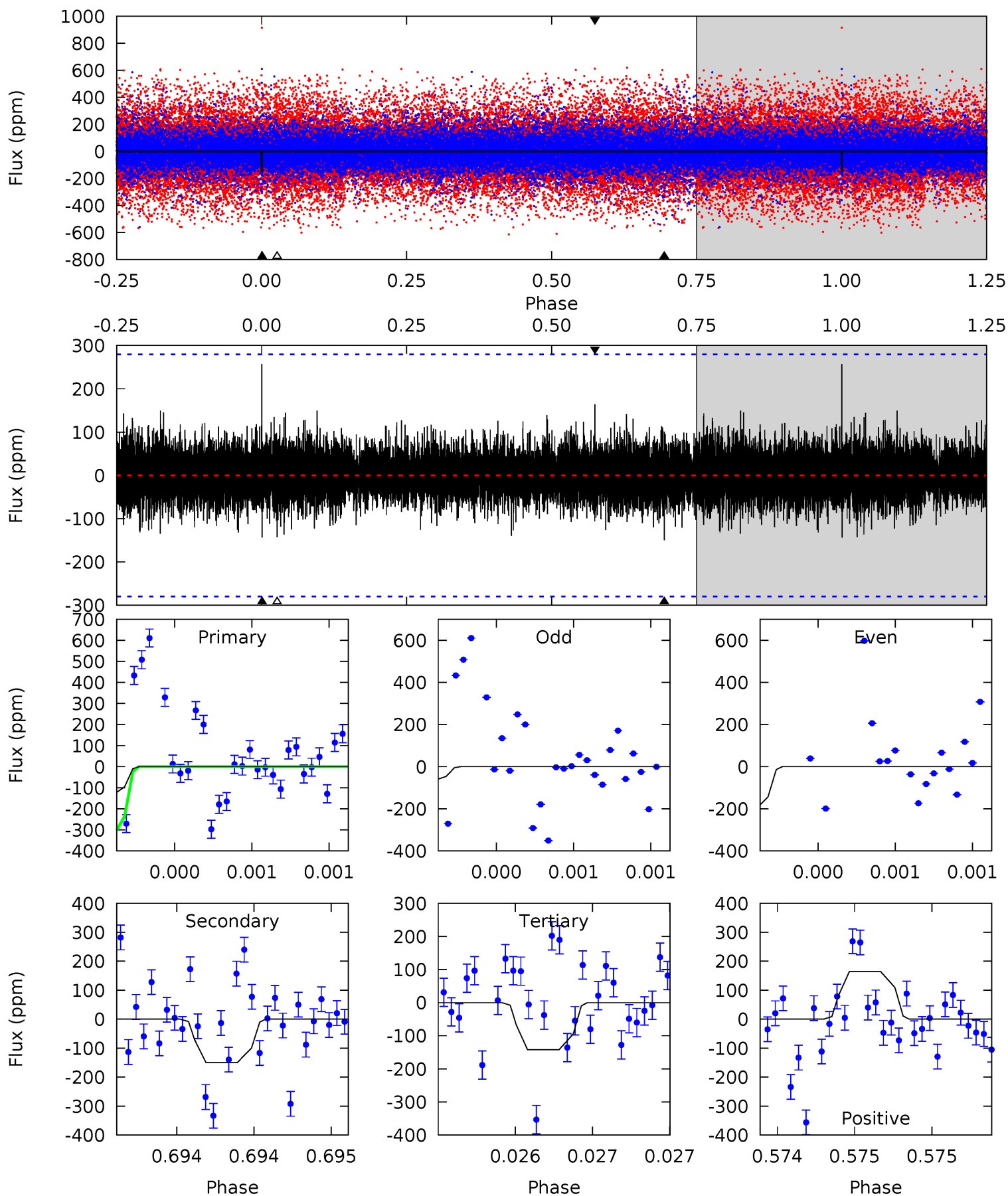
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.32	4.33	4.24	7.08	5.56	3.46	1.12	-0.92	-3.76	0.09	-2.75	3.03	0.87	0.62	0.87



Alt Model-Shift Uniqueness Test

009215841-03, P = 263.567299 Days, E = 236.528201 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.87	3.00	2.86	3.29	5.60	3.53	0.70	0.01	-0.42	0.14	-0.29	1.45	5.16	0.63	3.24



Stellar Parameters For KIC 009215841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5239^{+158}_{-142}	$4.510^{+0.095}_{-0.105}$	$-0.280^{+0.350}_{-0.250}$	$0.791^{+0.112}_{-0.091}$	$0.738^{+0.112}_{-0.052}$	$2.100^{+0.873}_{-0.618}$
	+3%/-3%	+2%/-2%	+125%/-89%	+14%/-12%	+15%/-7%	+42%/-29%
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 009215841-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-261 ± 60	$4.12^{+3.52}_{-2.85}$	338^{+15}_{-15}	3562^{+1891}_{-644}	4774^{+42221}_{-3521}
Alt.	-150 ± 50	$3.85^{+3.75}_{-2.74}$	337^{+17}_{-14}	3274^{+1783}_{-583}	2770^{+31043}_{-2066}

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

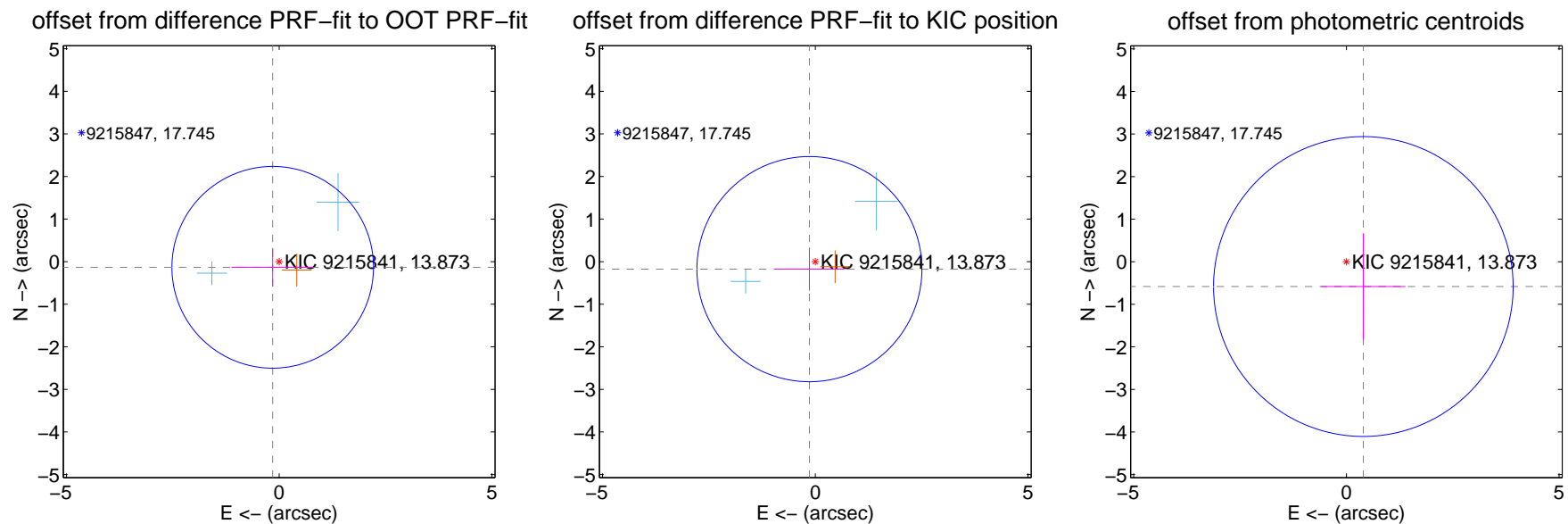
DV Centroid Data

Supplemental centroid analysis for 009215841-03. Kepler magnitude: 13.87. Transit SNR 5.06

There are 2 quarters with good PRF difference image offsets

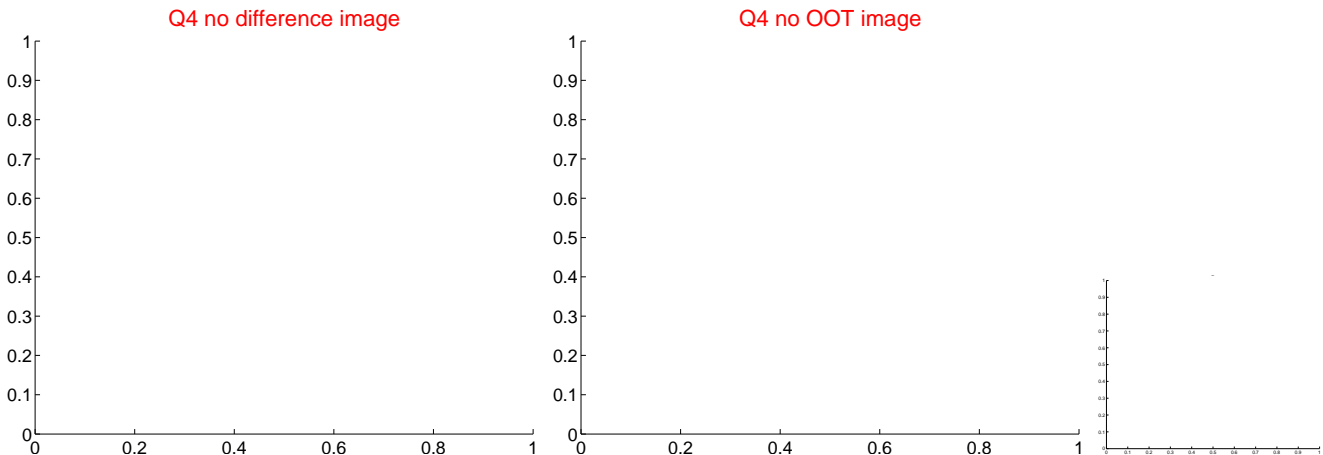
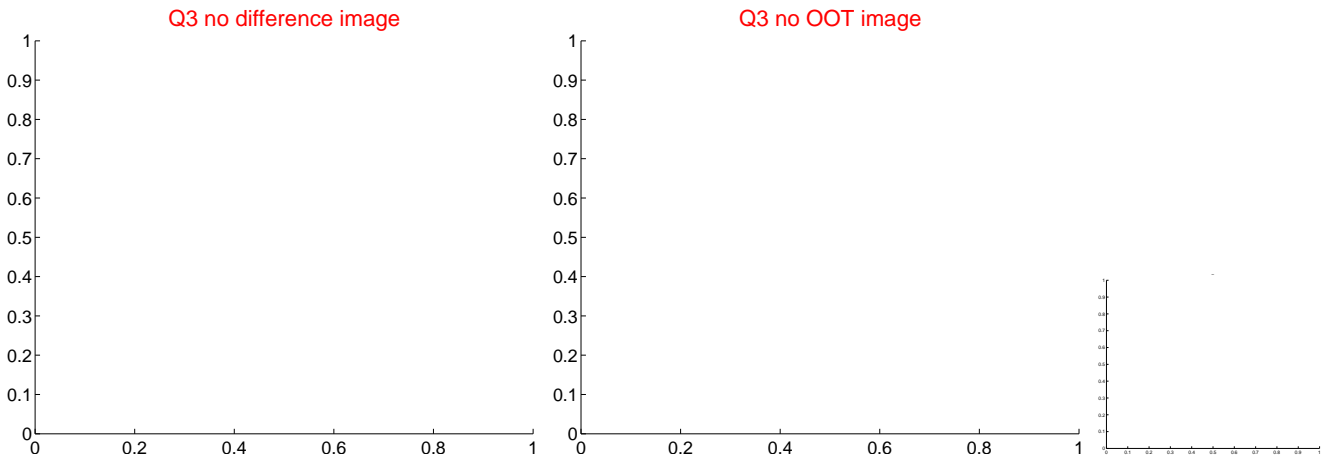
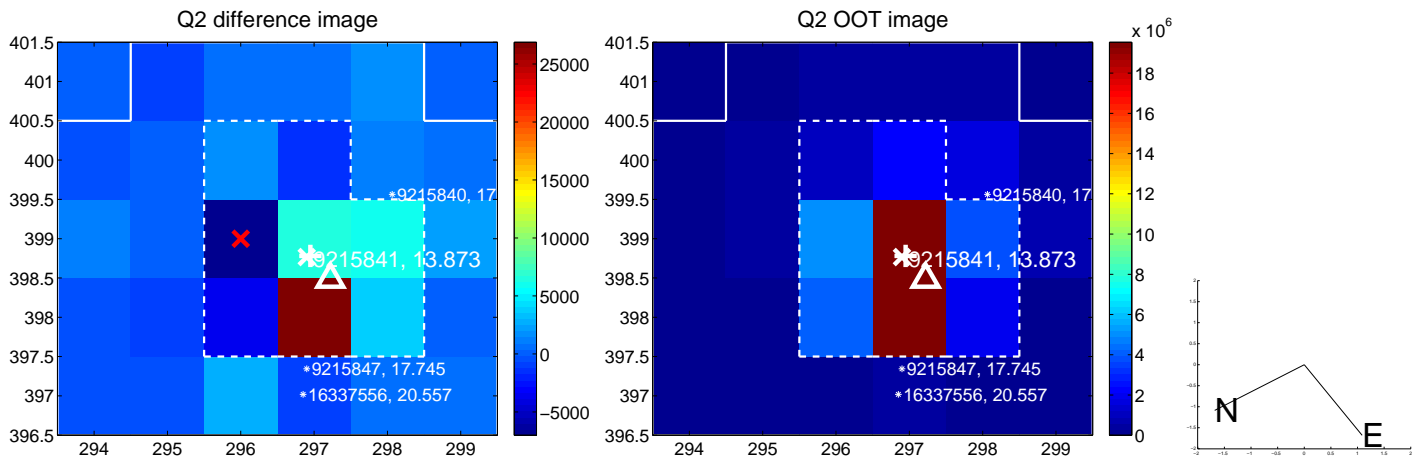
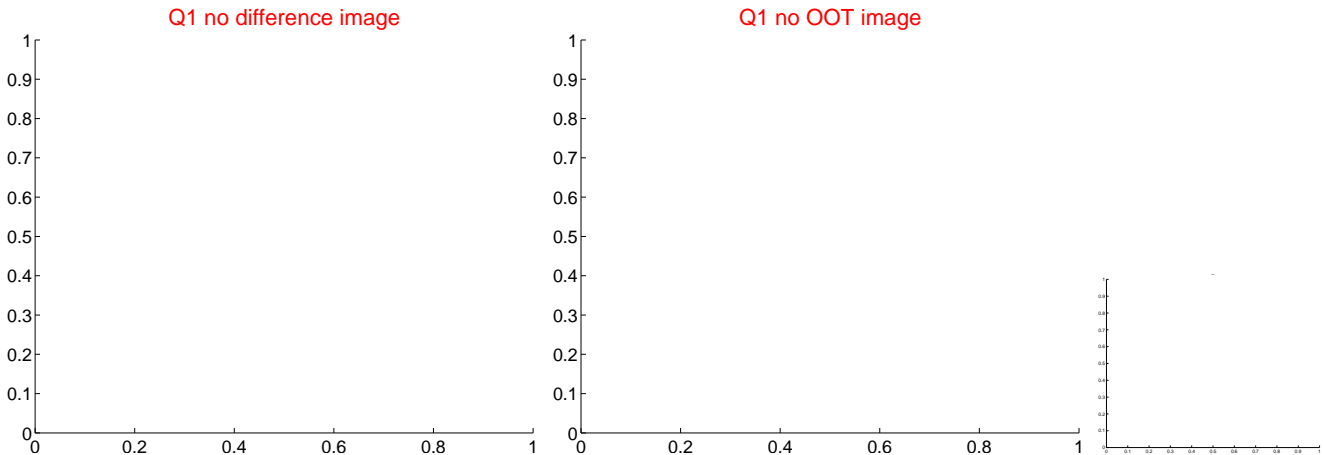
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.201 ± 0.790	0.26	0.151 ± 0.973	-0.133 ± 0.453
PRF-fit source offset from KIC position	0.223 ± 0.881	0.25	0.138 ± 0.820	-0.176 ± 0.505
photometric centroid source offset	0.71 ± 1.17	0.60	-0.40 ± 0.99	-0.58 ± 1.25

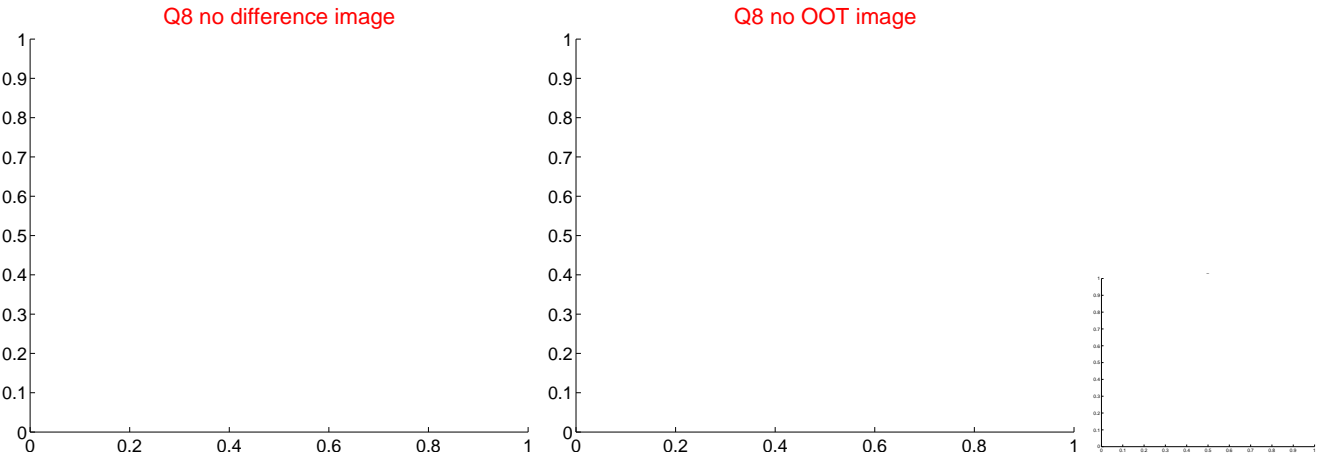
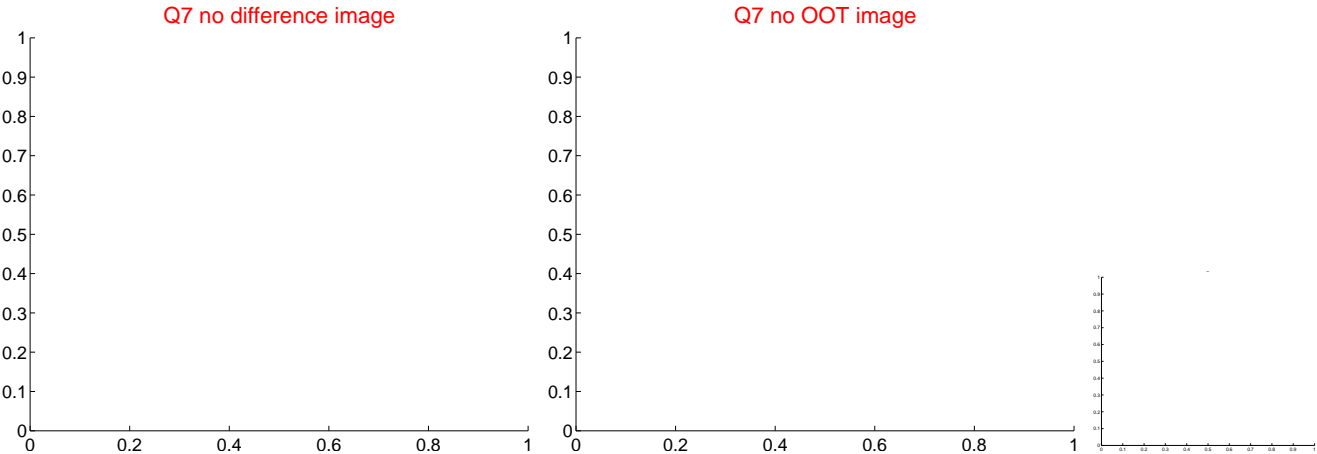
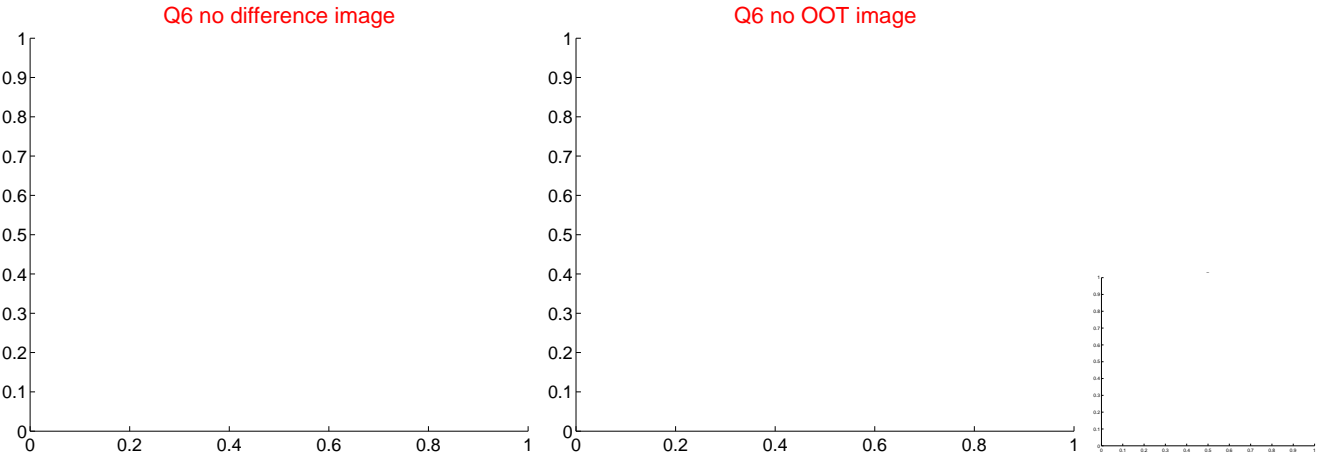
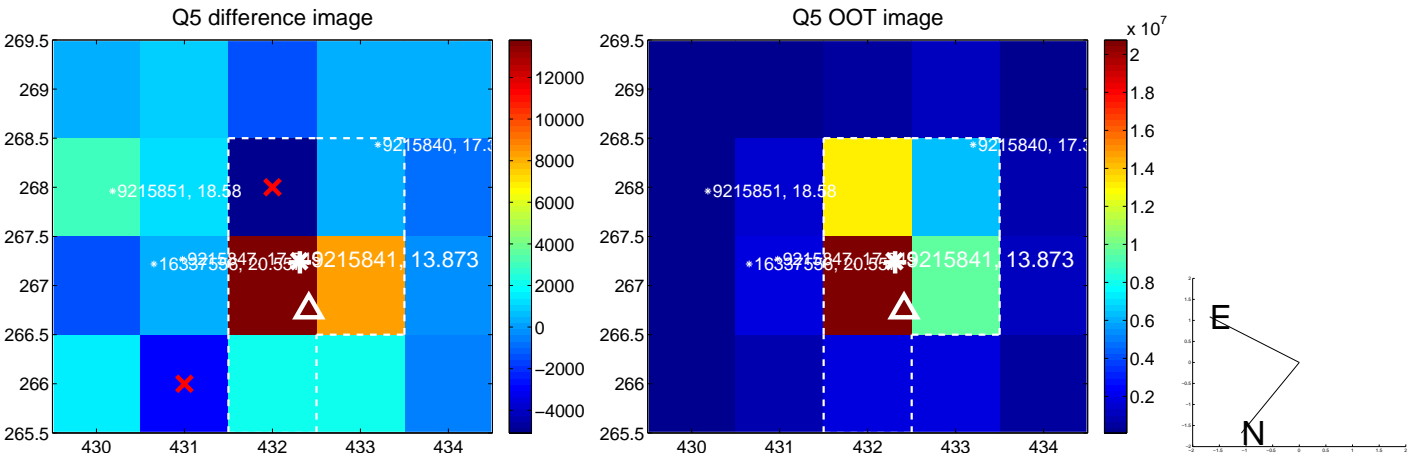


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

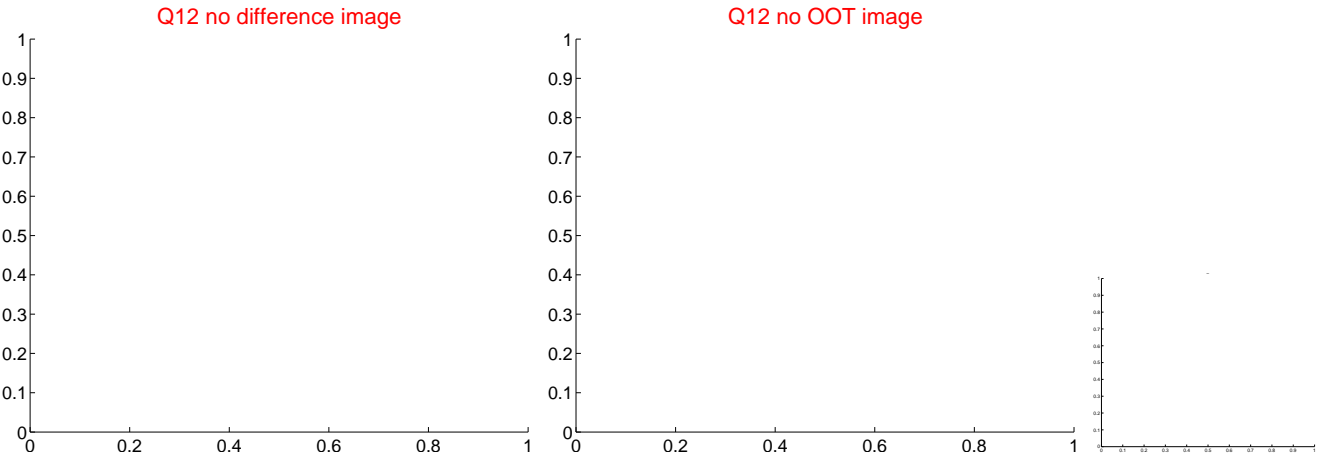
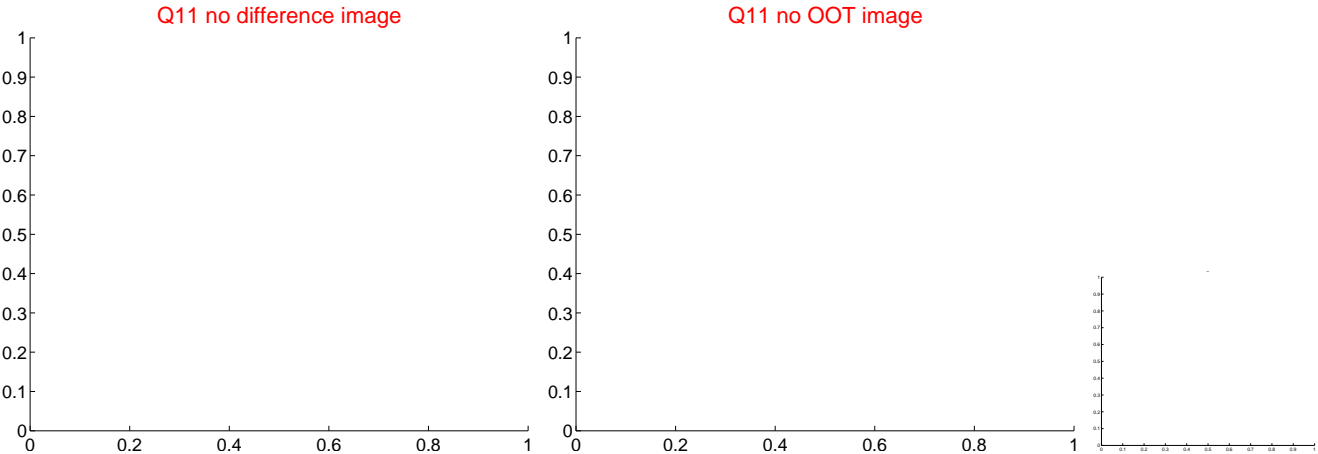
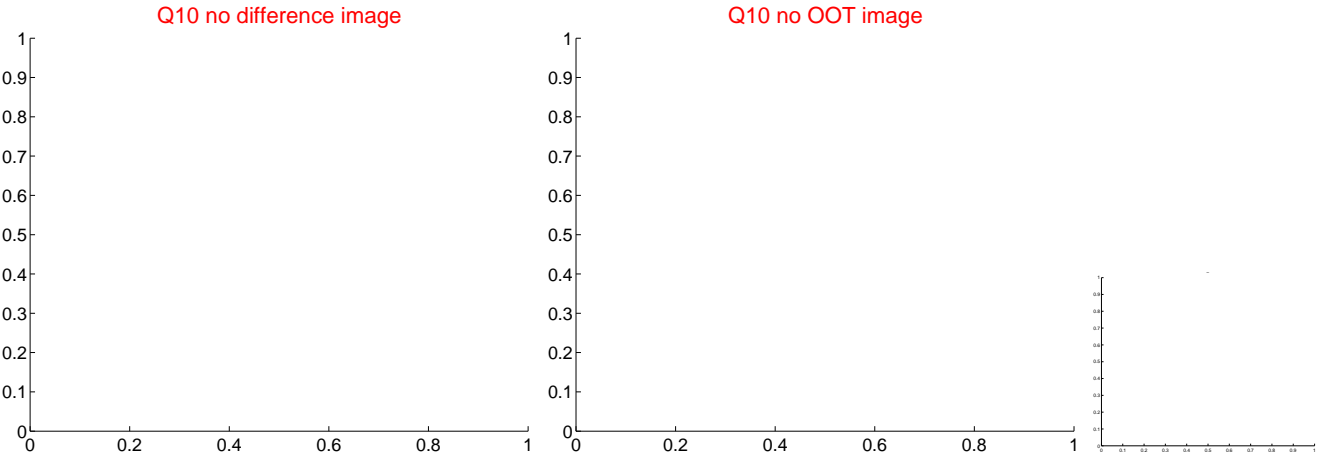
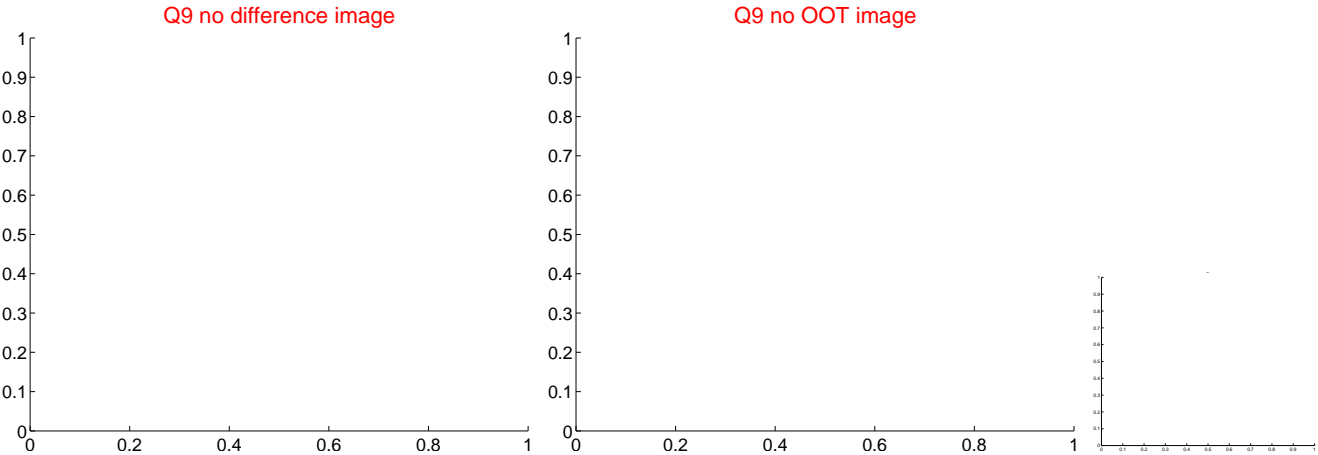
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



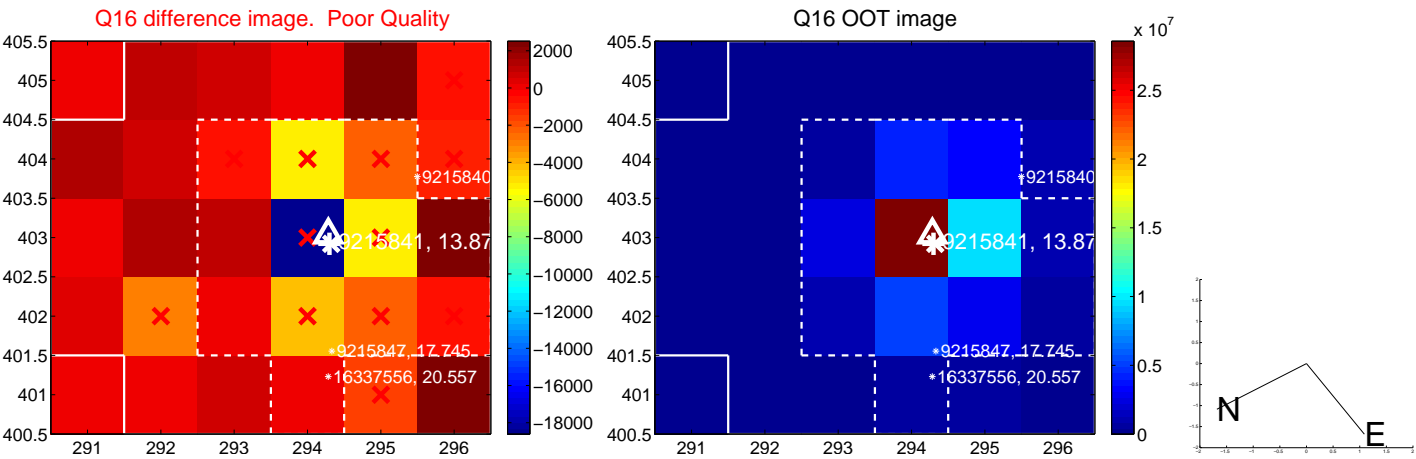
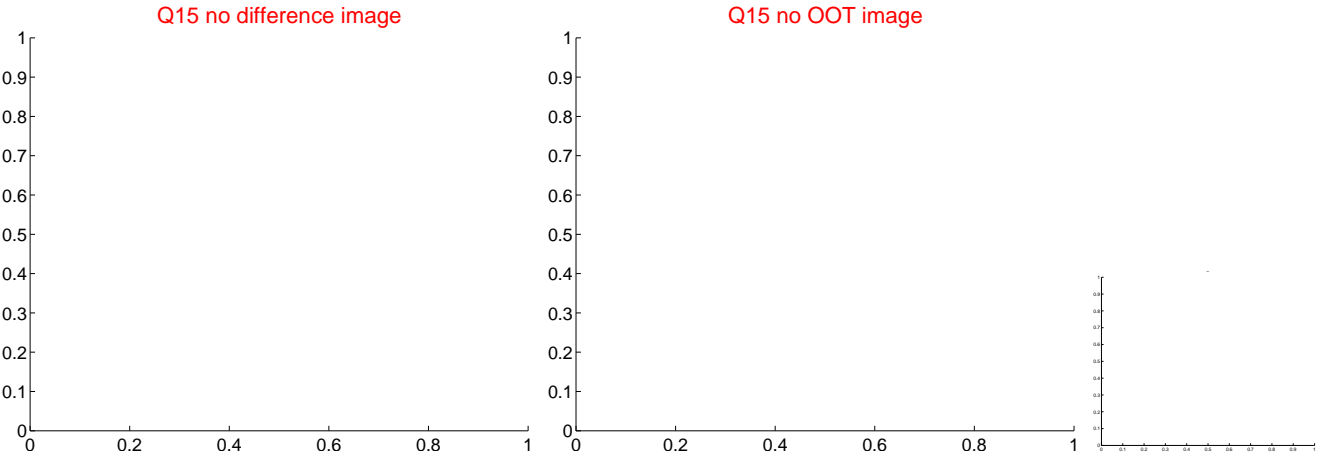
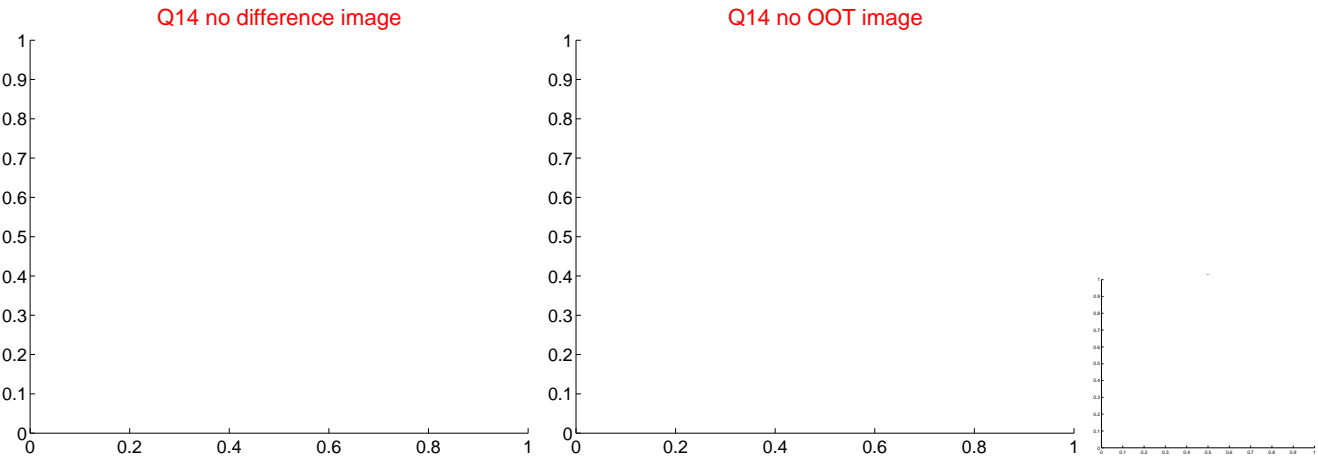
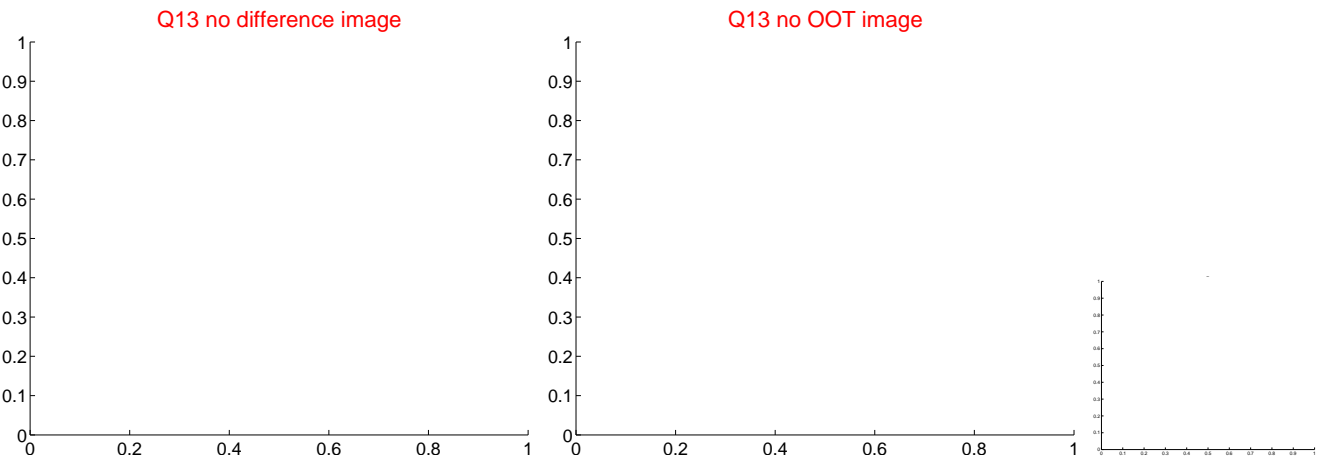
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



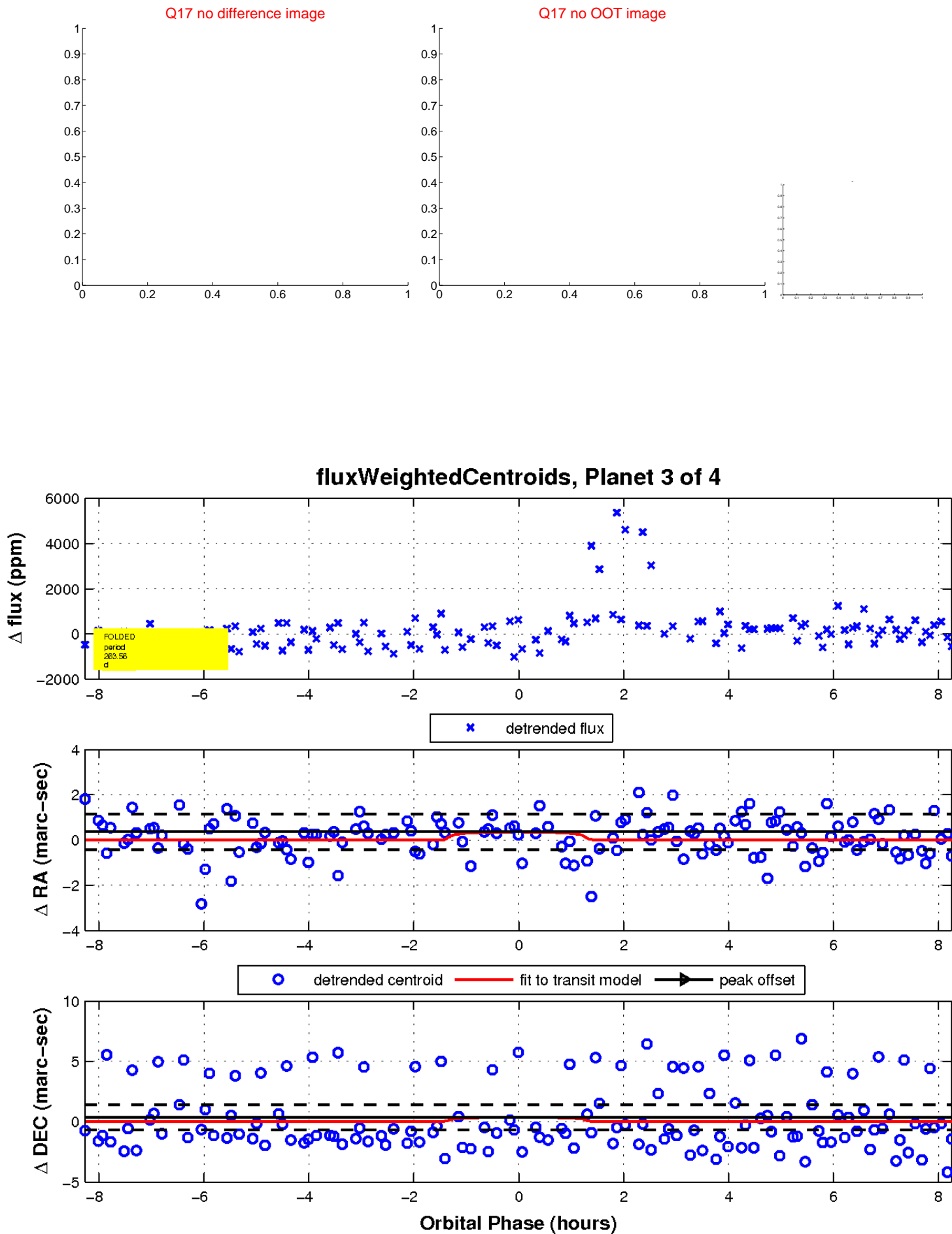
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

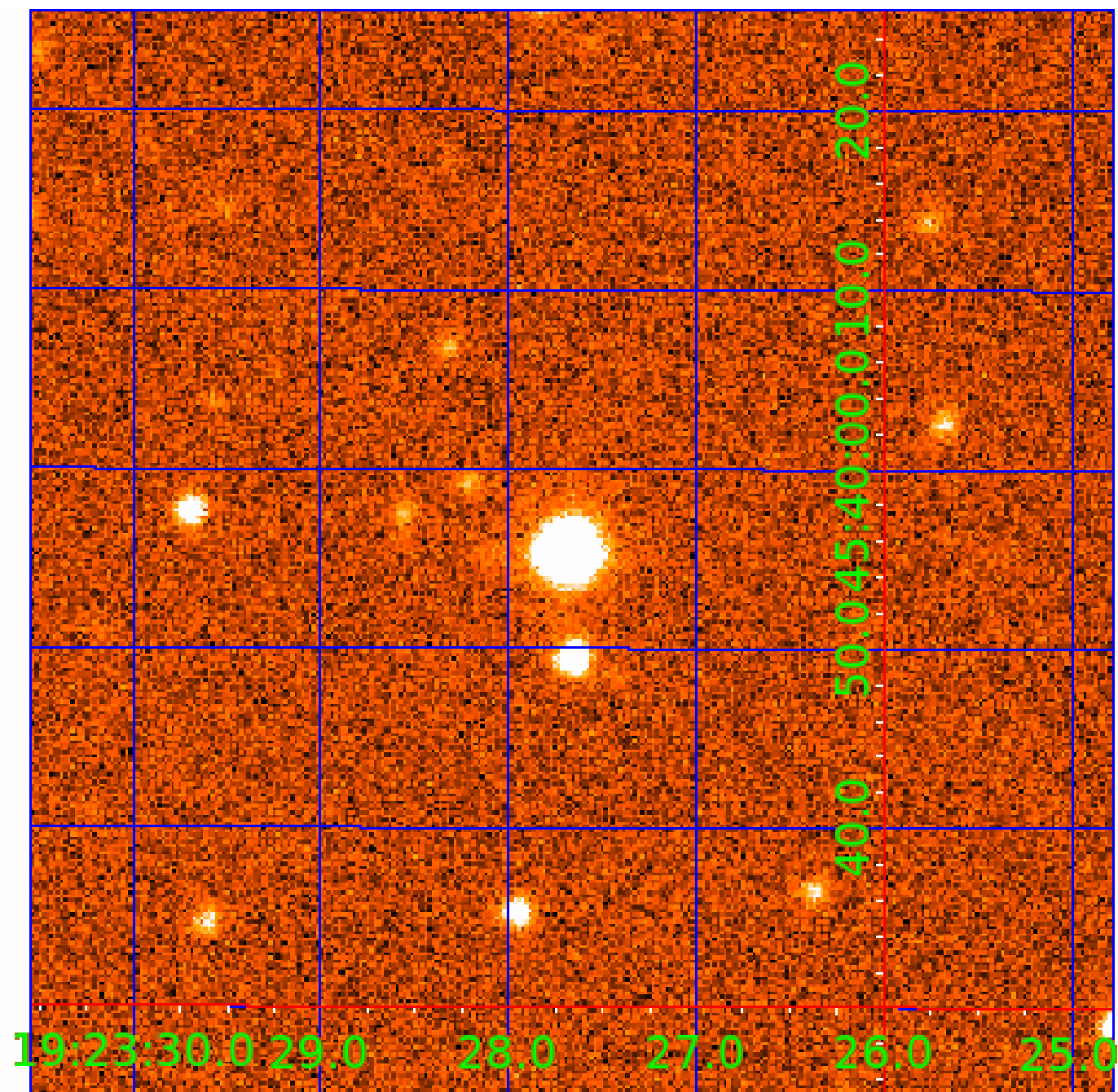


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009215841

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})
009215841-01	OBS	No	379.314948	328.649729	711.0	3.863	13.7	5.9	0.79	5239	2.18	0.49
009215841-02	OBS	No	615.411688	227.356891	1079.8	5.274	13.9	7.3	0.79	5239	2.62	0.26
009215841-03	OBS	No	263.564645	236.545251	724.4	2.762	12.7	5.1	0.79	5239	2.27	0.80
009215841-04	OBS	No	481.609789	298.033121	865.5	4.330	9.6	6.3	0.79	5239	2.41	0.36

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009215841-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS
009215841-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009215841-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—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.

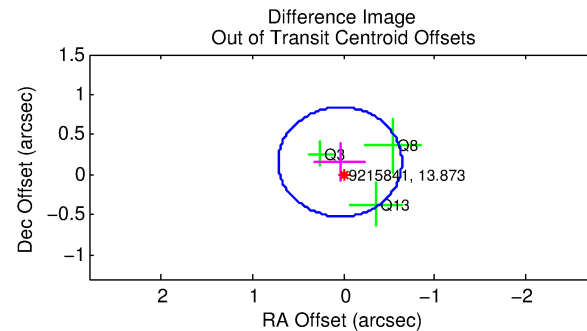
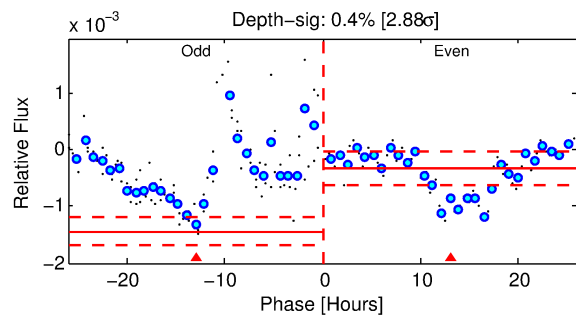
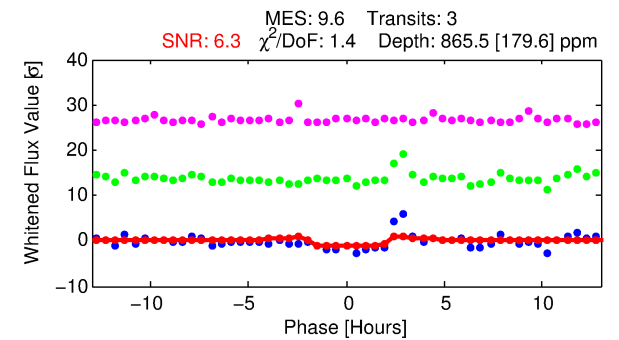
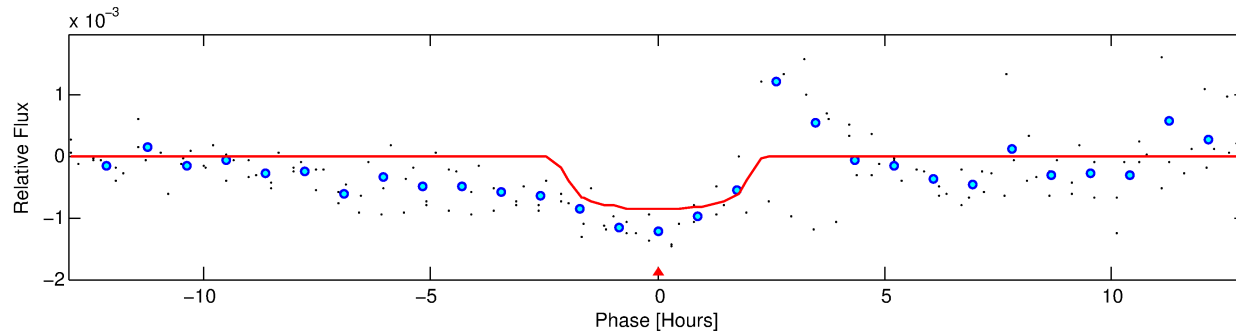
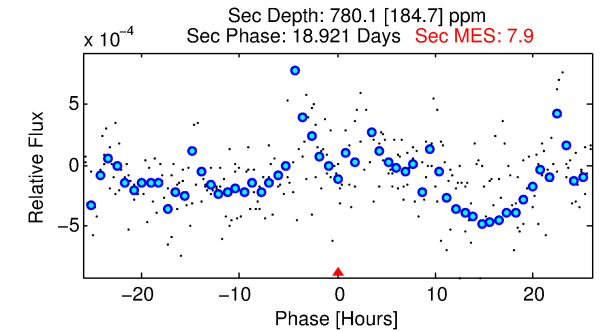
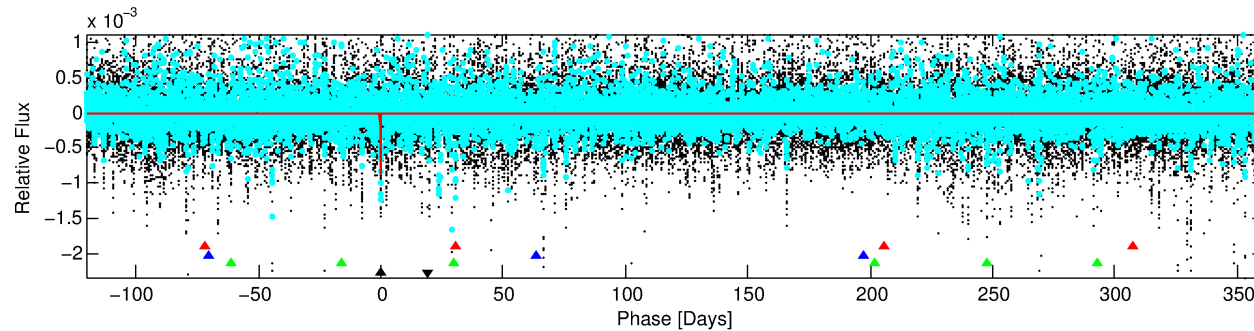
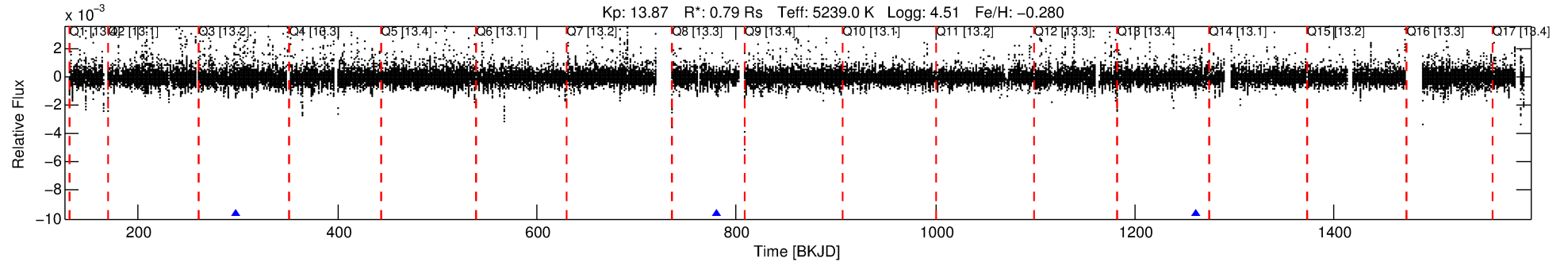
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009215841-04

No Significant Match Found

DV One-Page Summary

KIC: 9215841 Candidate: 4 of 4 Period: 481.610 d



DV Fit Results:

Period = 481.60979 [0.00701] d
Epoch = 298.0331 [0.0087] BKJD
Rp/R* = 0.0279 [0.0464]
a/R* = 712.87 [4495.47]
b = 0.59 [6.99]
Seff = 0.36 [0.08]
Teq = 197 [11] K
Rp = 2.41 [4.02] Re
a = 1.0871 [0.1349] AU
Ag = 87525.48 [292216.50] [0.30σ]
Teffp = 5243 [4372] K [1.15σ]

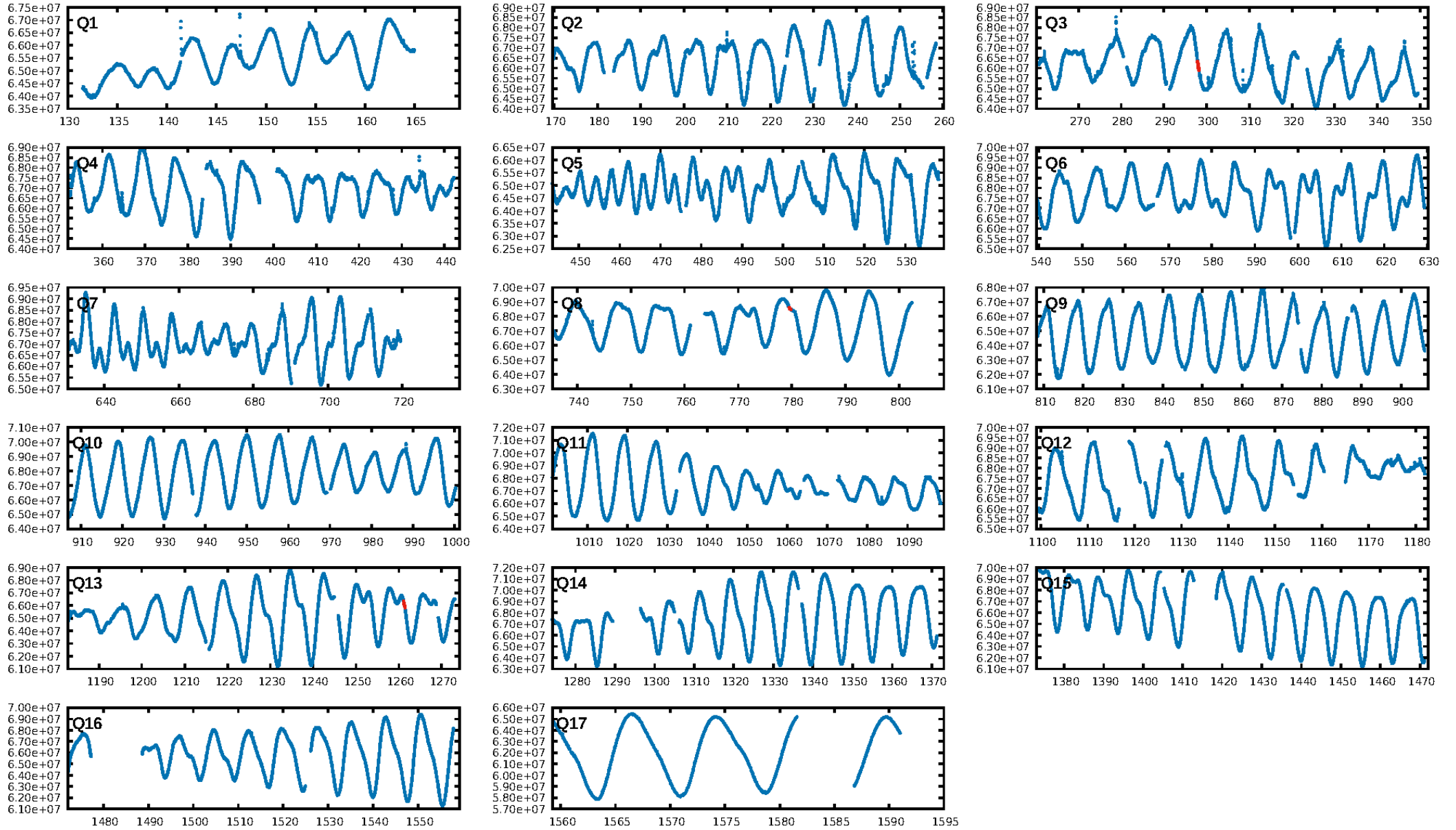
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [423.10σ]
LongPeriod-sig: 100.0% [470.62σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 51.1%
Bootstrap-pfa: 1.01e-06
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -9.628
Centroid-sig: 15.4%
Centroid-so: 0.883 arcsec [1.15σ]
OotOffset-rm: 0.163 arcsec [0.72σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-rm: 0.218 arcsec [1.00σ]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

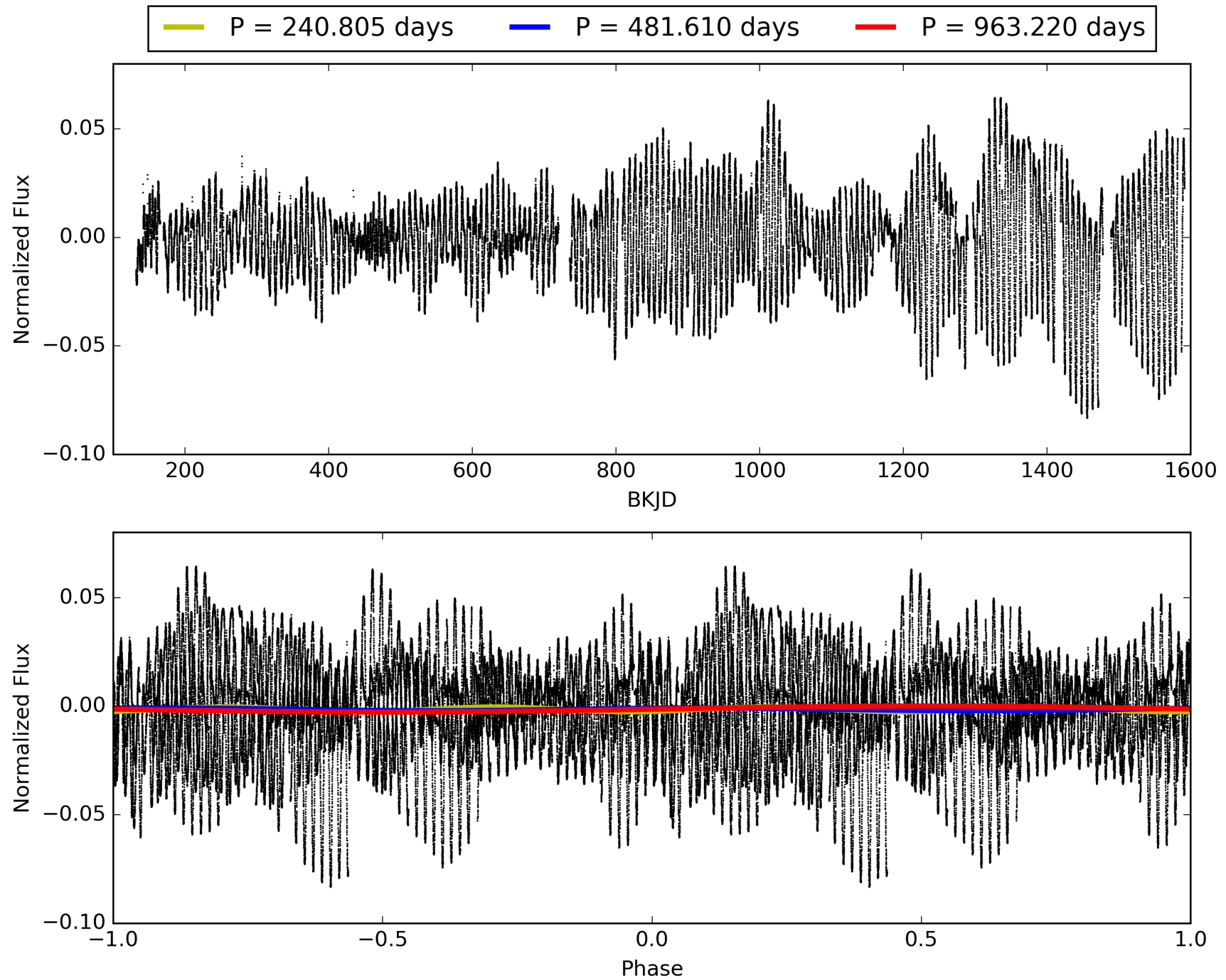
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:36:01 Z

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

TCE 009215841-04, PDC Light Curves

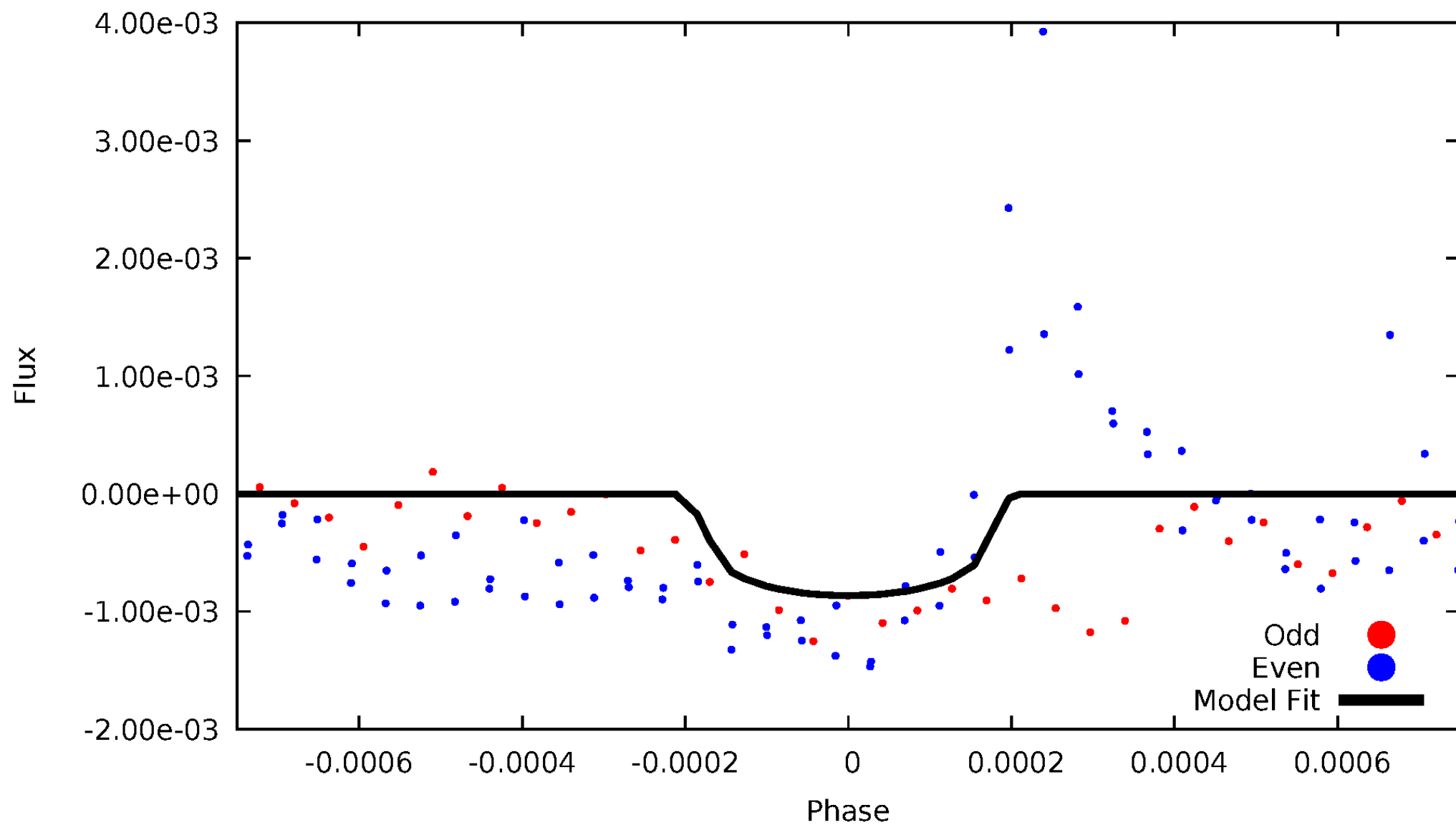


TCE 009215841-04



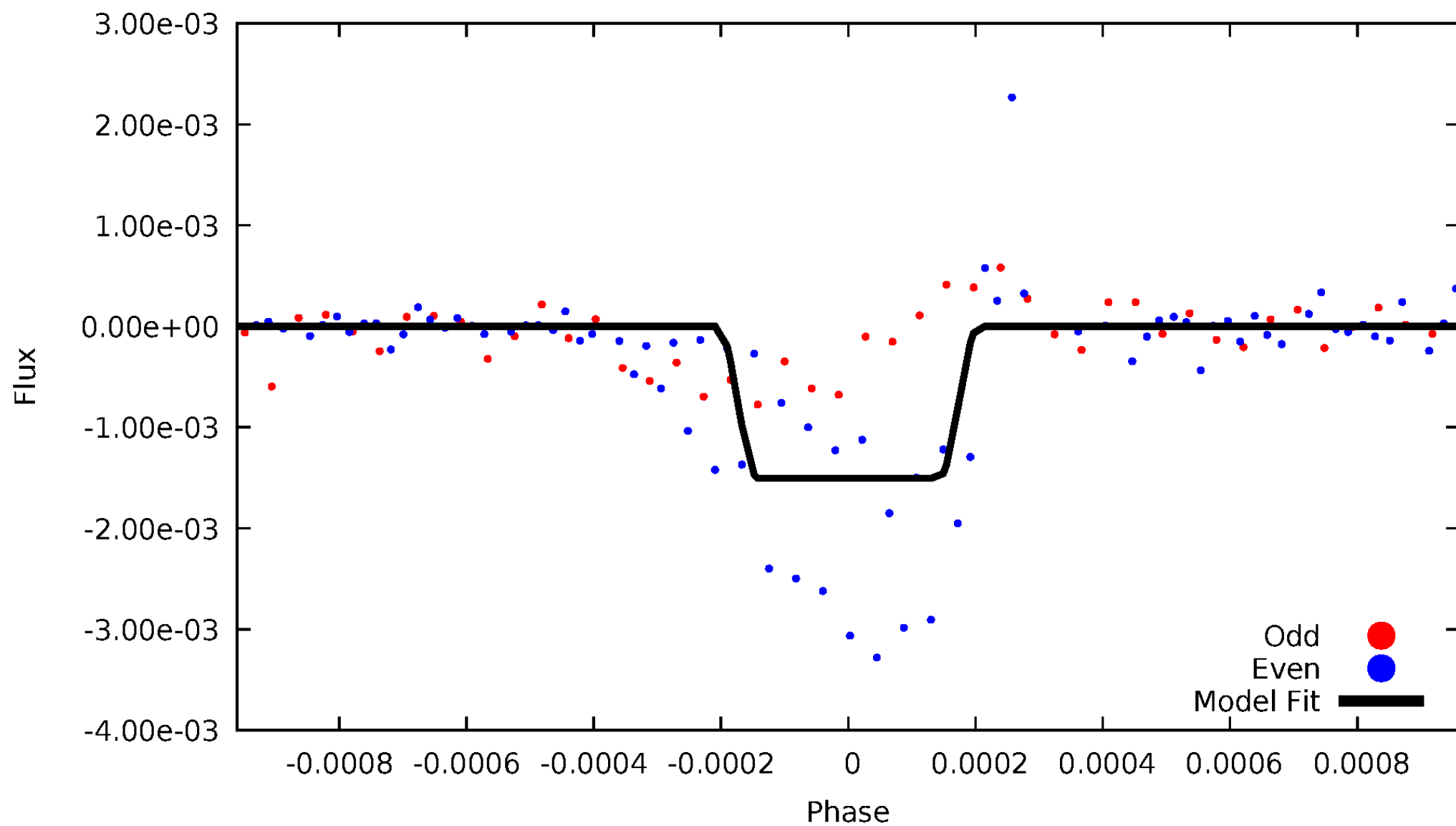
DV Odd/Even

TCE 009215841-04



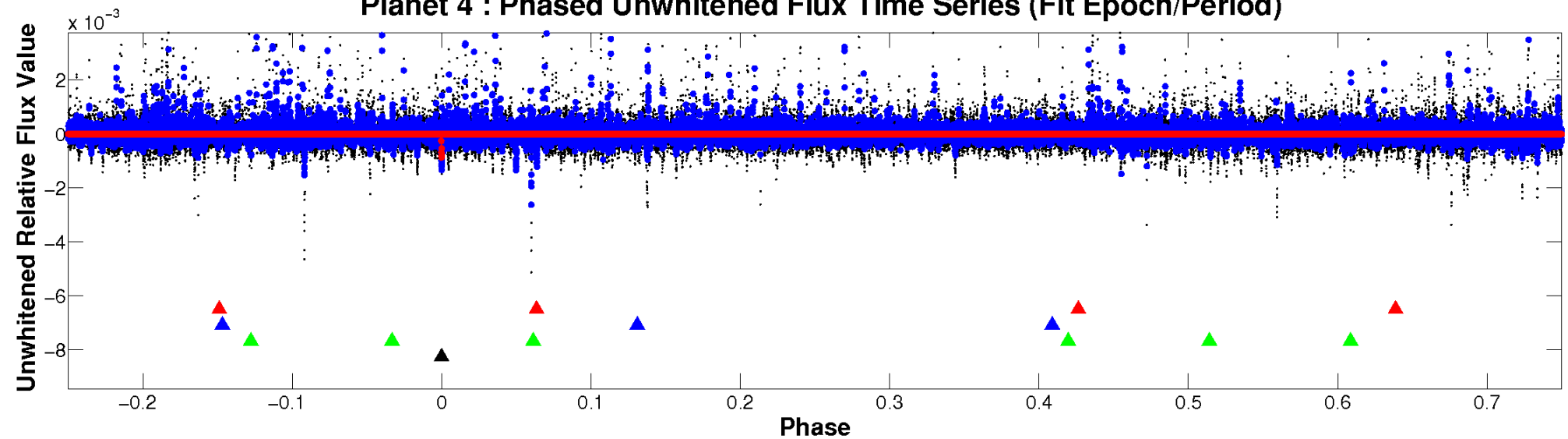
ALT Odd/Even

TCE 009215841-04

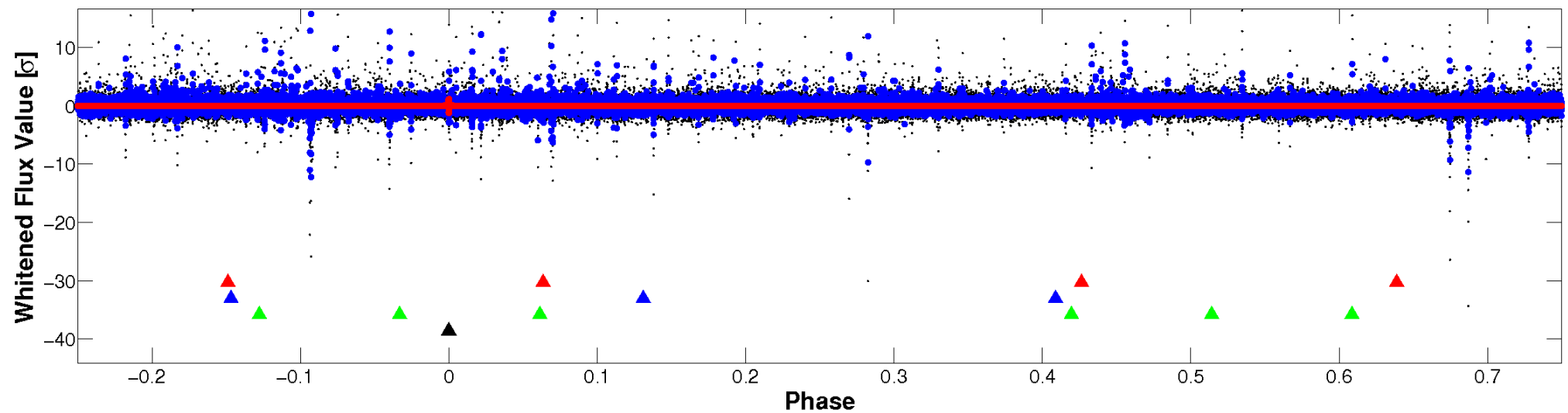


Non-Whitened Vs. Whitened Light Curve

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

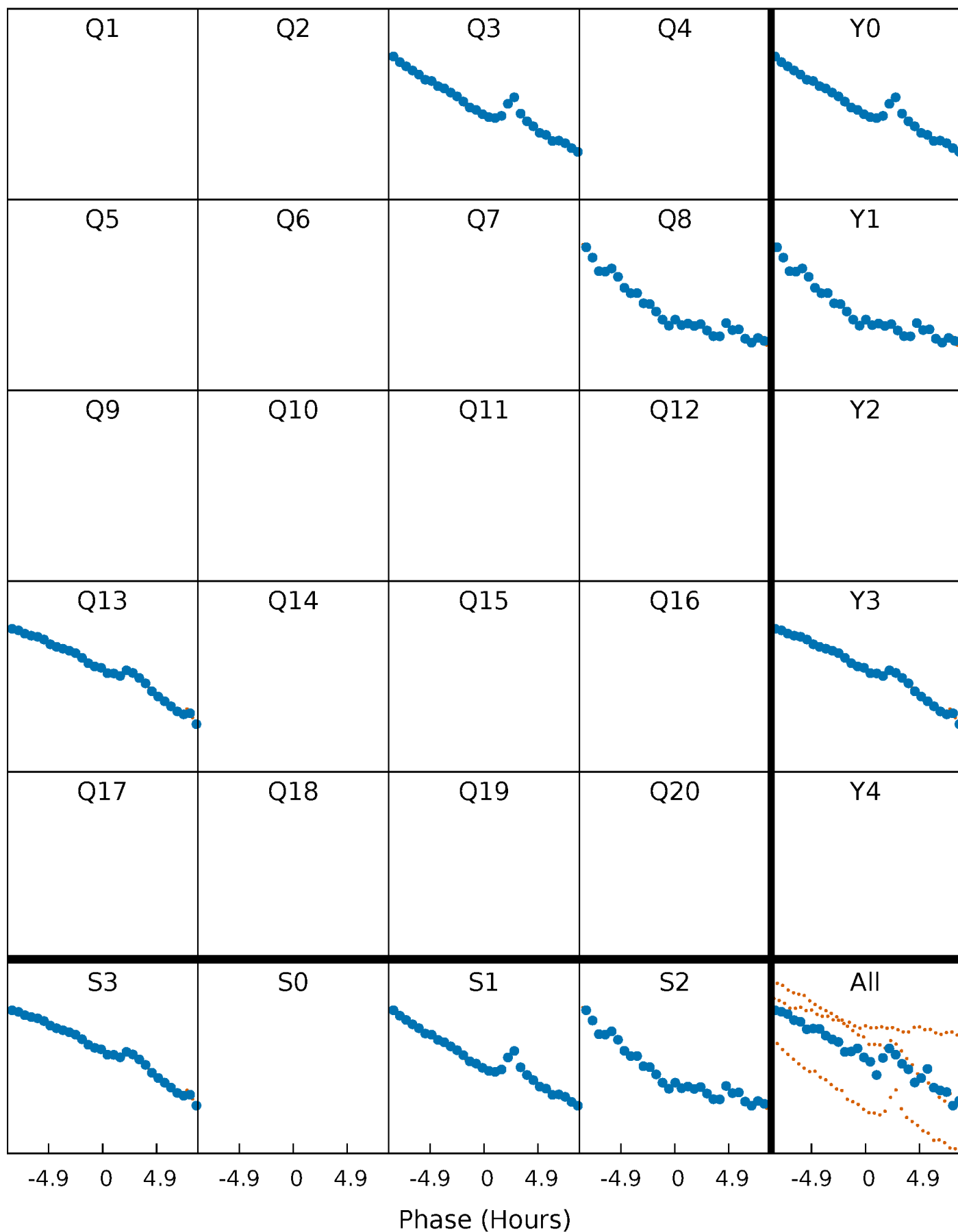


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



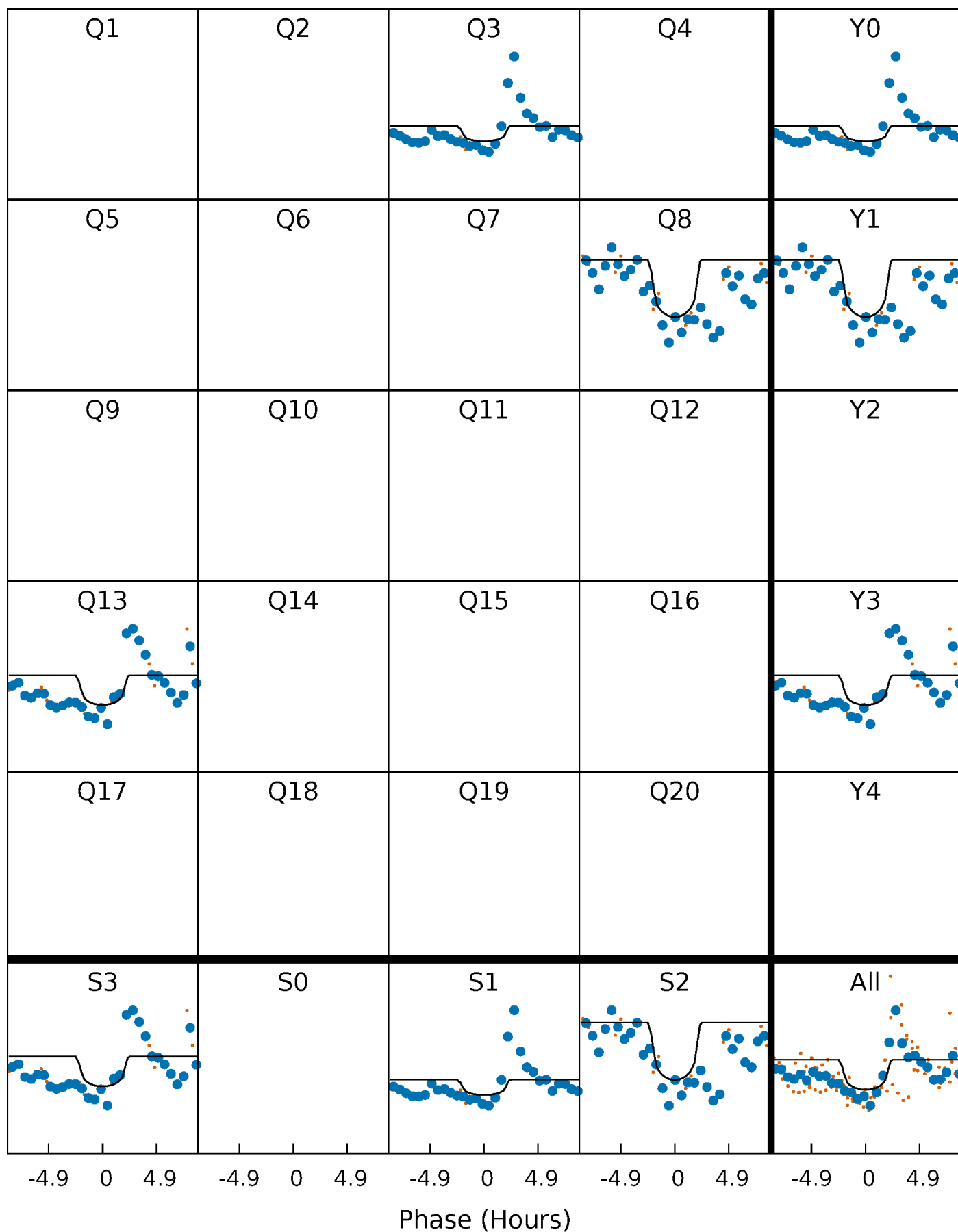
PDC Quarter-Phased Transit Curves

TCE 009215841-04 P=481.609789 Days $T_0=298.033121$ (BKJD)



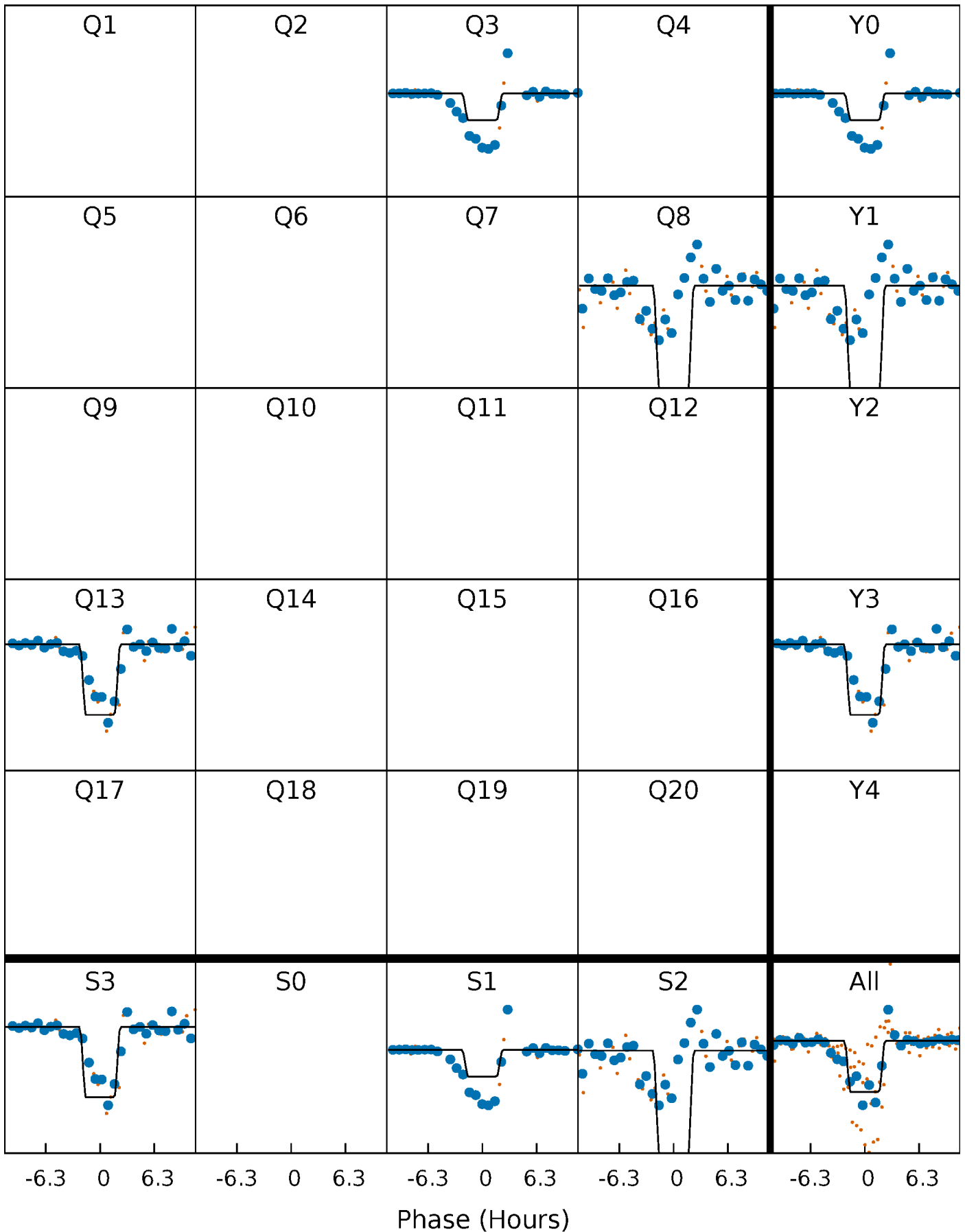
DV Quarter-Phased Transit Curves

TCE 009215841-04 $P=481.609789$ Days $T_0=298.033121$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

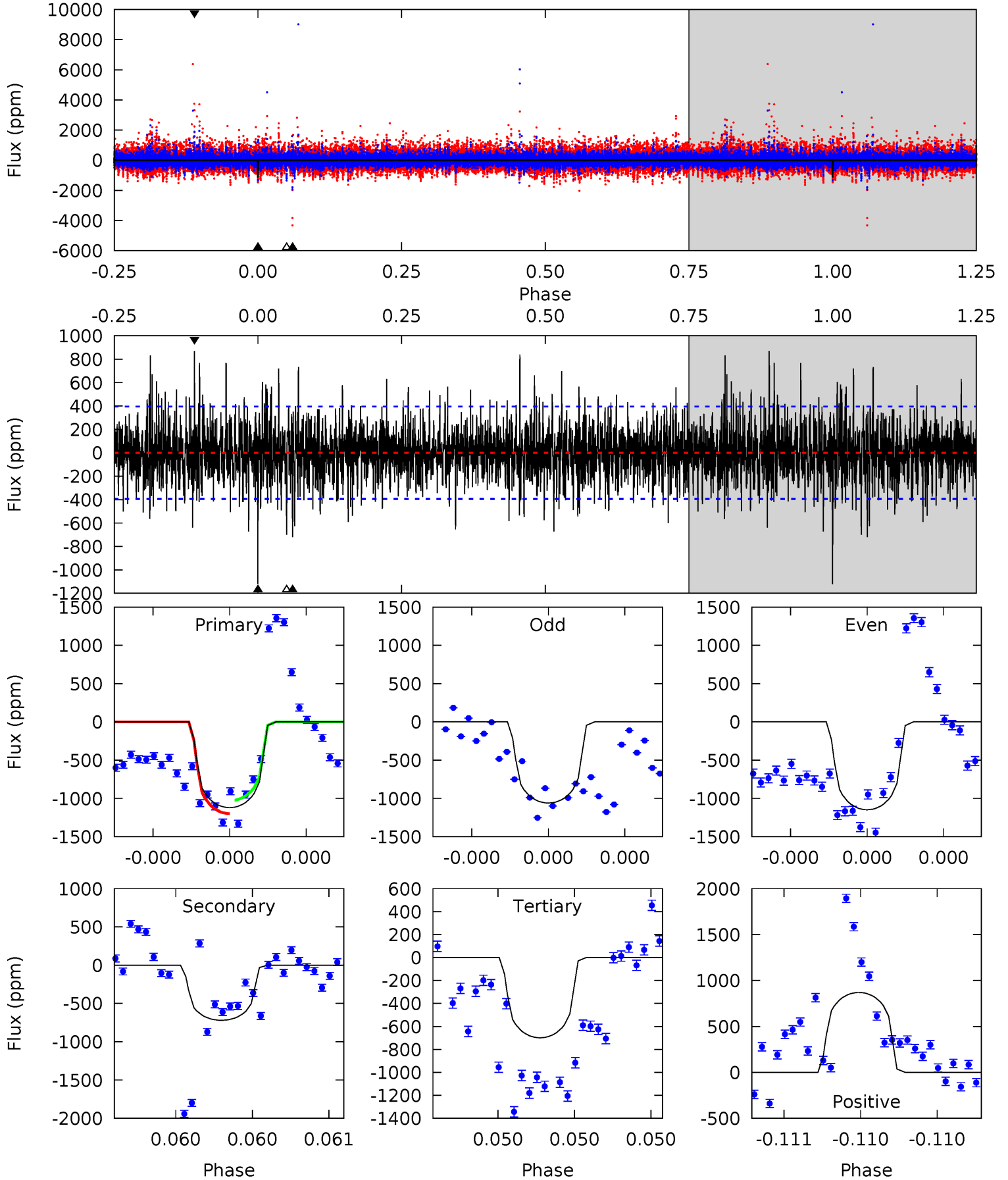
TCE 009215841-04 P=481.605387 Days $T_0=298.024323$ (BKJD)



DV Model-Shift Uniqueness Test

009215841-04, P = 481.609789 Days, E = 298.033121 Days

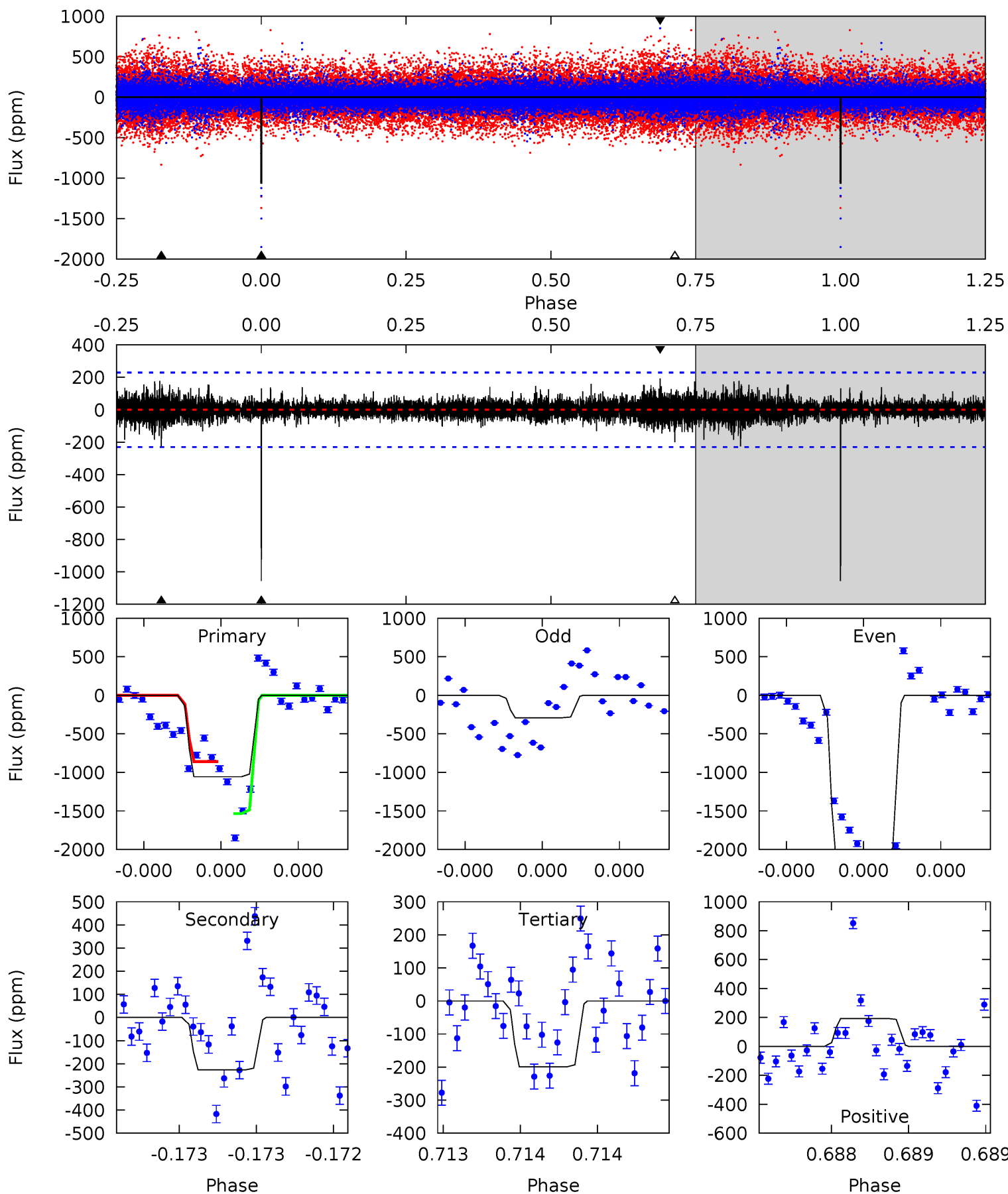
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	10.2	9.94	12.4	5.61	3.54	2.43	5.99	3.56	0.30	-2.13	0.50	1.02	0.44	1.25



Alt Model-Shift Uniqueness Test

009215841-04, P = 481.605387 Days, E = 298.024323 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.8	5.53	4.87	4.71	5.61	3.54	0.80	20.9	21.1	0.66	0.82	30.6	1.24	0.15	7.67



Stellar Parameters For KIC 009215841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5239^{+158}_{-142}	$4.510^{+0.095}_{-0.105}$	$-0.280^{+0.350}_{-0.250}$	$0.791^{+0.112}_{-0.091}$	$0.738^{+0.112}_{-0.052}$	$2.100^{+0.873}_{-0.618}$
	+3%/-3%	+2%/-2%	+125%/-89%	+14%/-12%	+15%/-7%	+42%/-29%
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 009215841-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-720 ± 70	$3.95^{+3.56}_{-2.69}$	276^{+13}_{-12}	4230^{+2761}_{-822}	$30993^{+263919}_{-22592}$
Alt.	-226 ± 41	$4.35^{+3.87}_{-2.74}$	276^{+14}_{-13}	3390^{+1385}_{-577}	7824^{+47639}_{-5625}

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

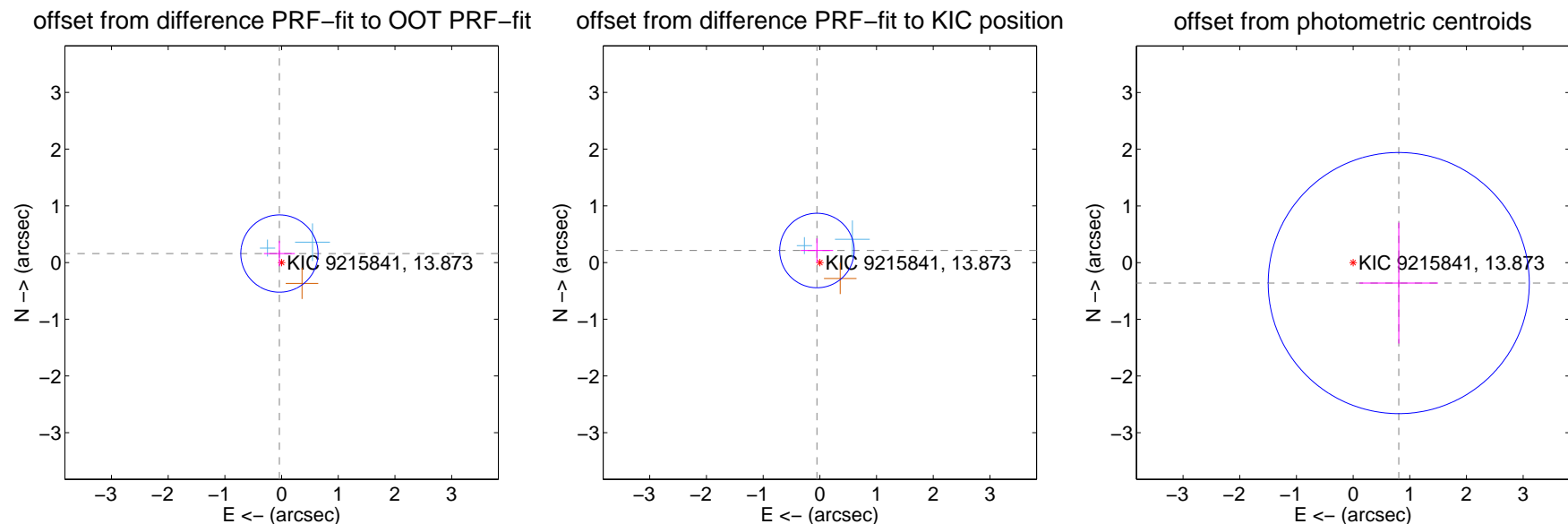
DV Centroid Data

Supplemental centroid analysis for 009215841-04. Kepler magnitude: 13.87. Transit SNR 6.32

There are 2 quarters with good PRF difference image offsets

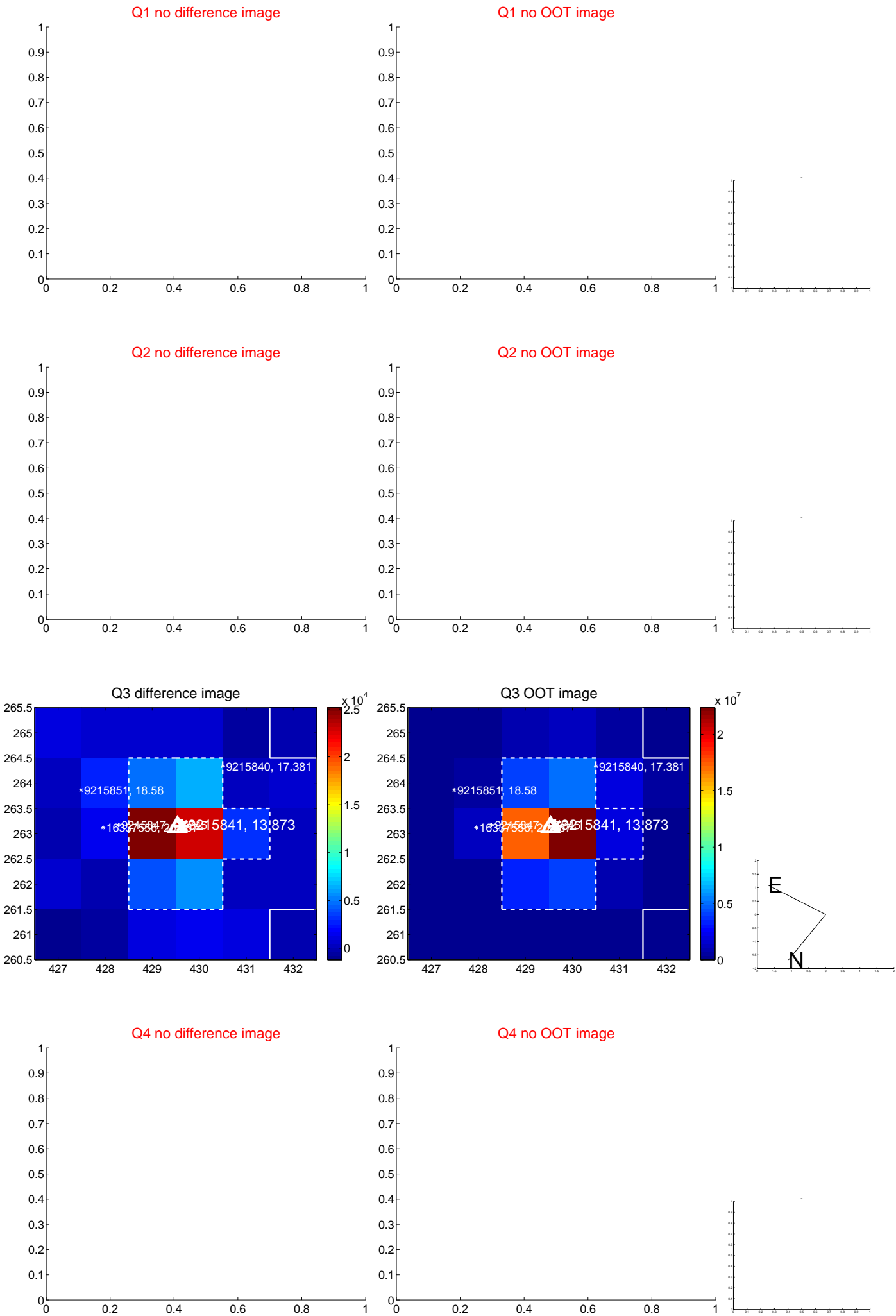
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.163 ± 0.227	0.72	0.038 ± 0.273	0.159 ± 0.224
PRF-fit source offset from KIC position	0.218 ± 0.219	1.00	0.051 ± 0.286	0.212 ± 0.214
photometric centroid source offset	0.88 ± 0.77	1.15	-0.81 ± 0.69	-0.36 ± 1.07

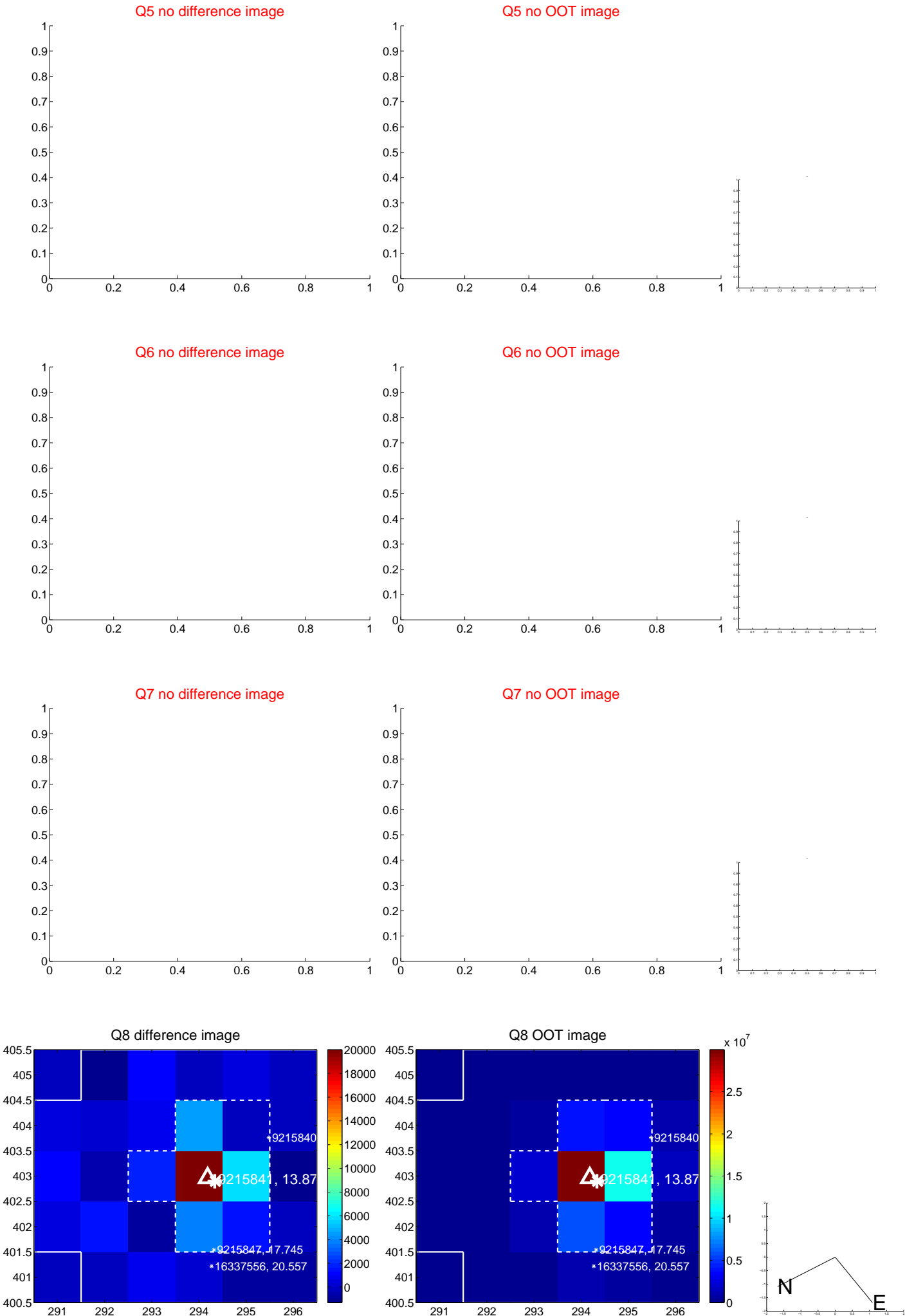


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

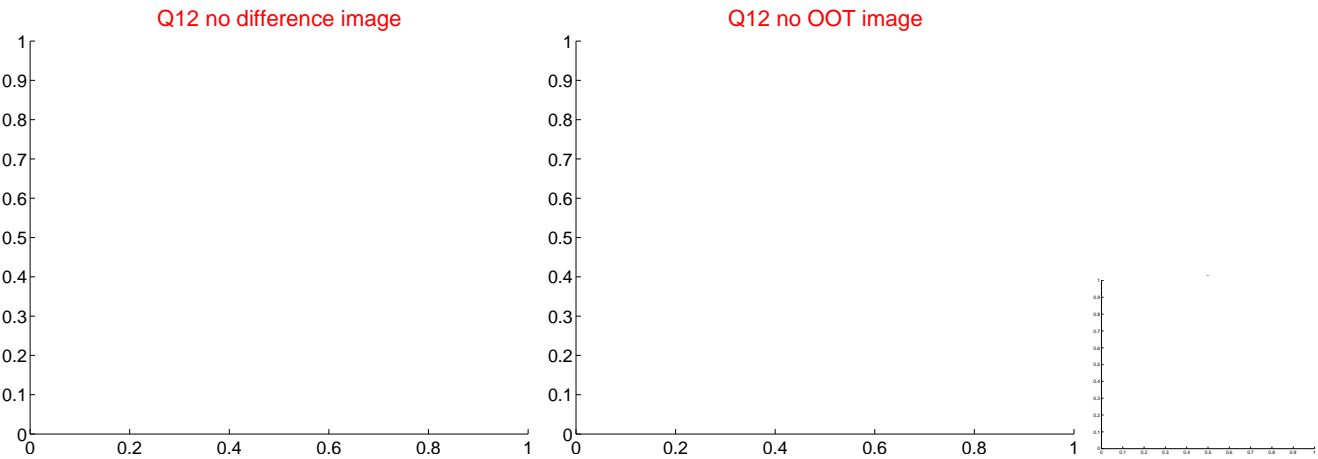
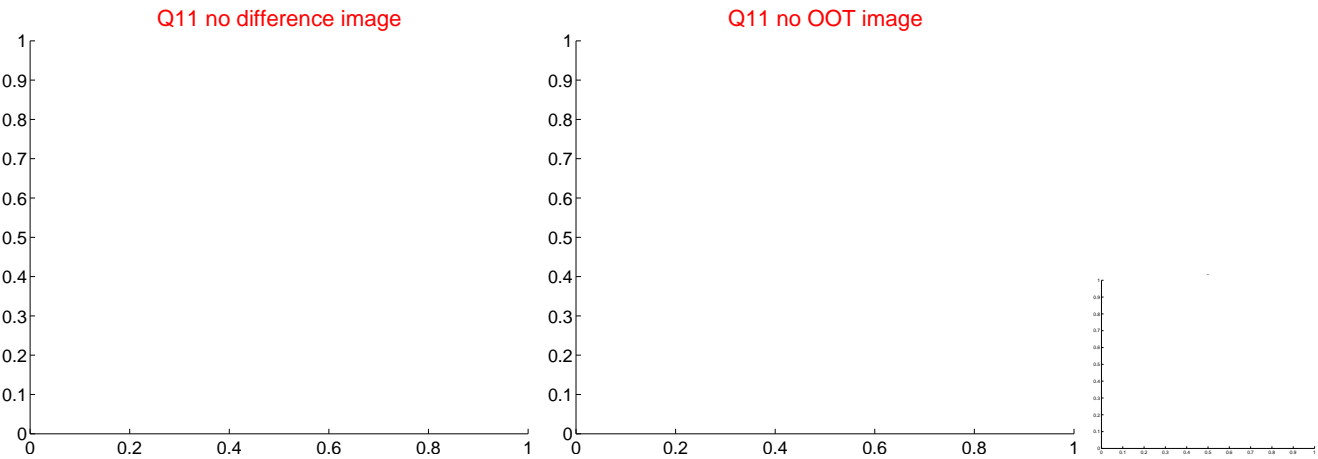
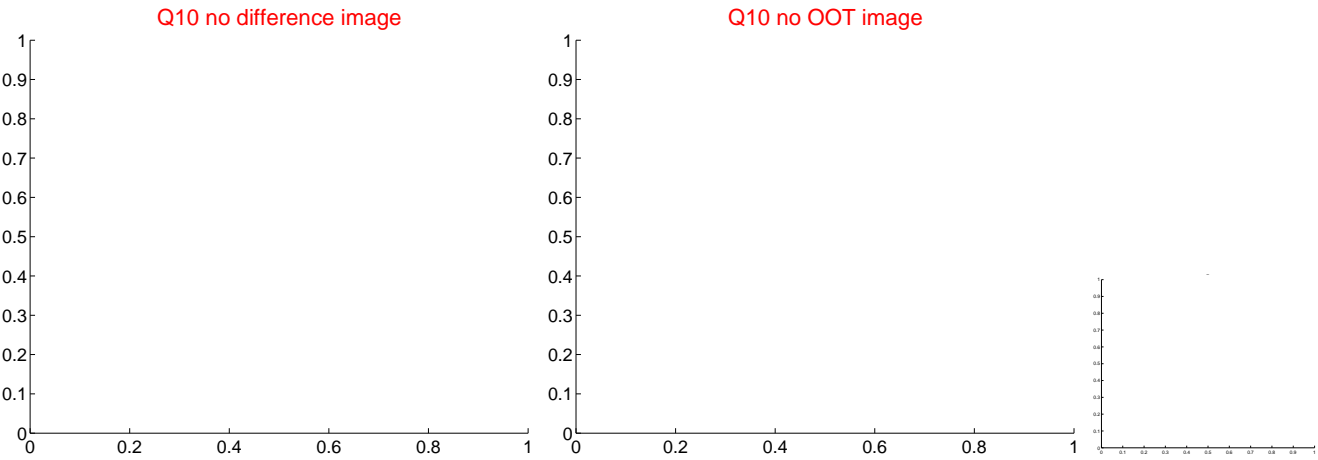
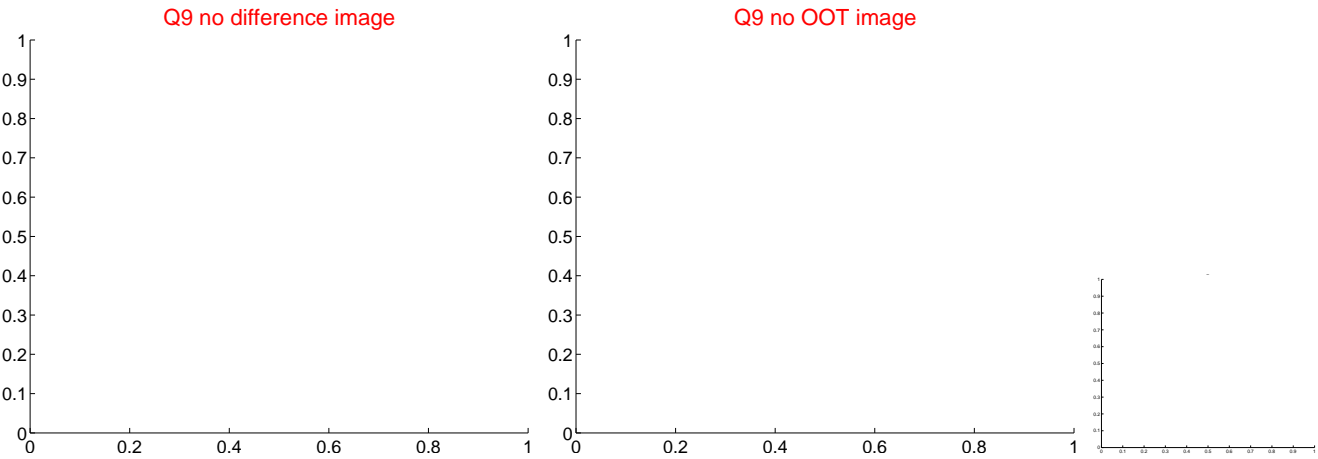
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



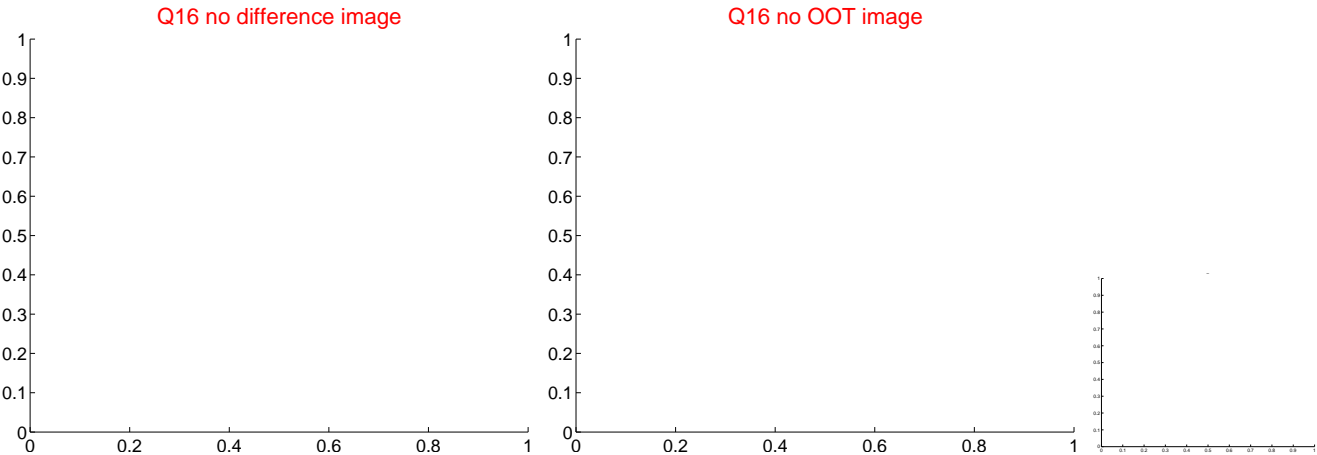
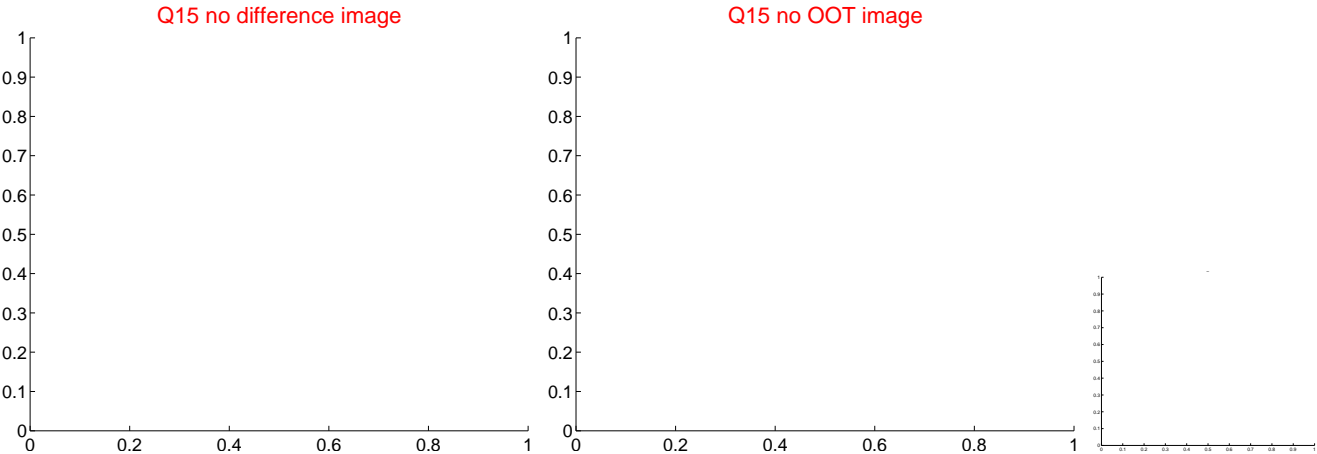
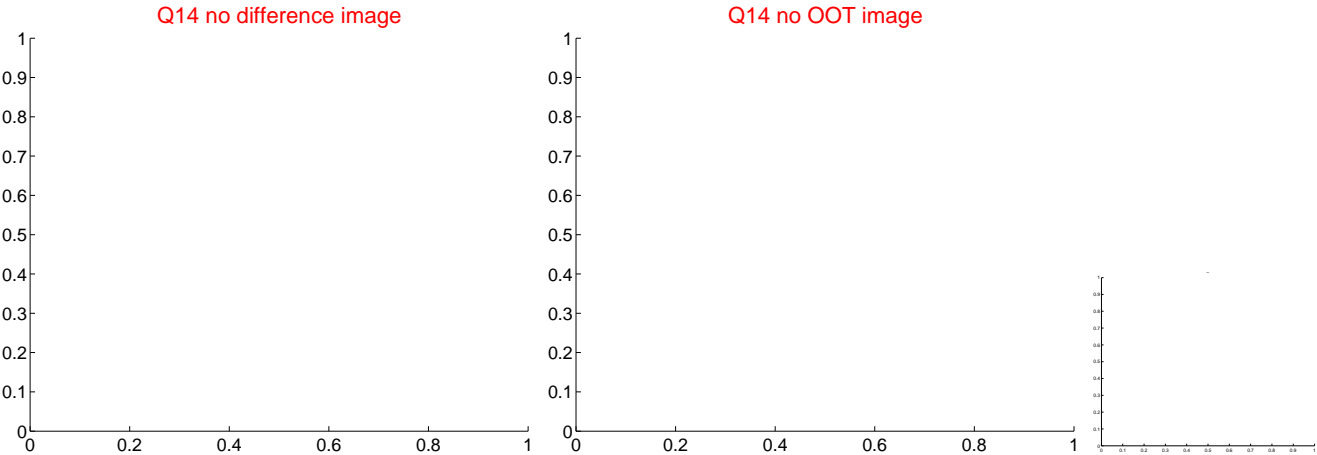
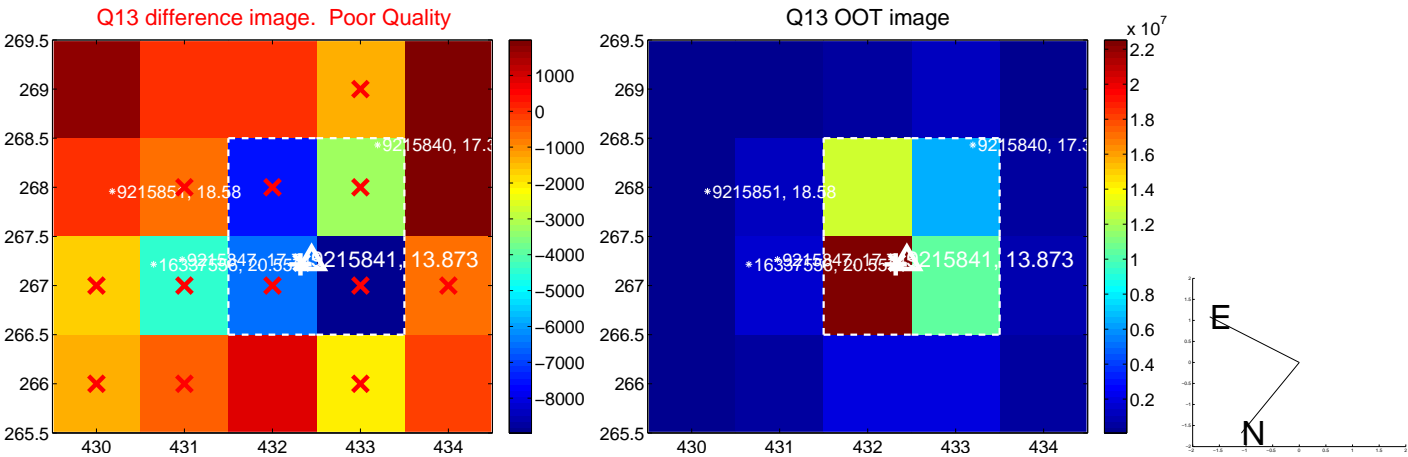
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



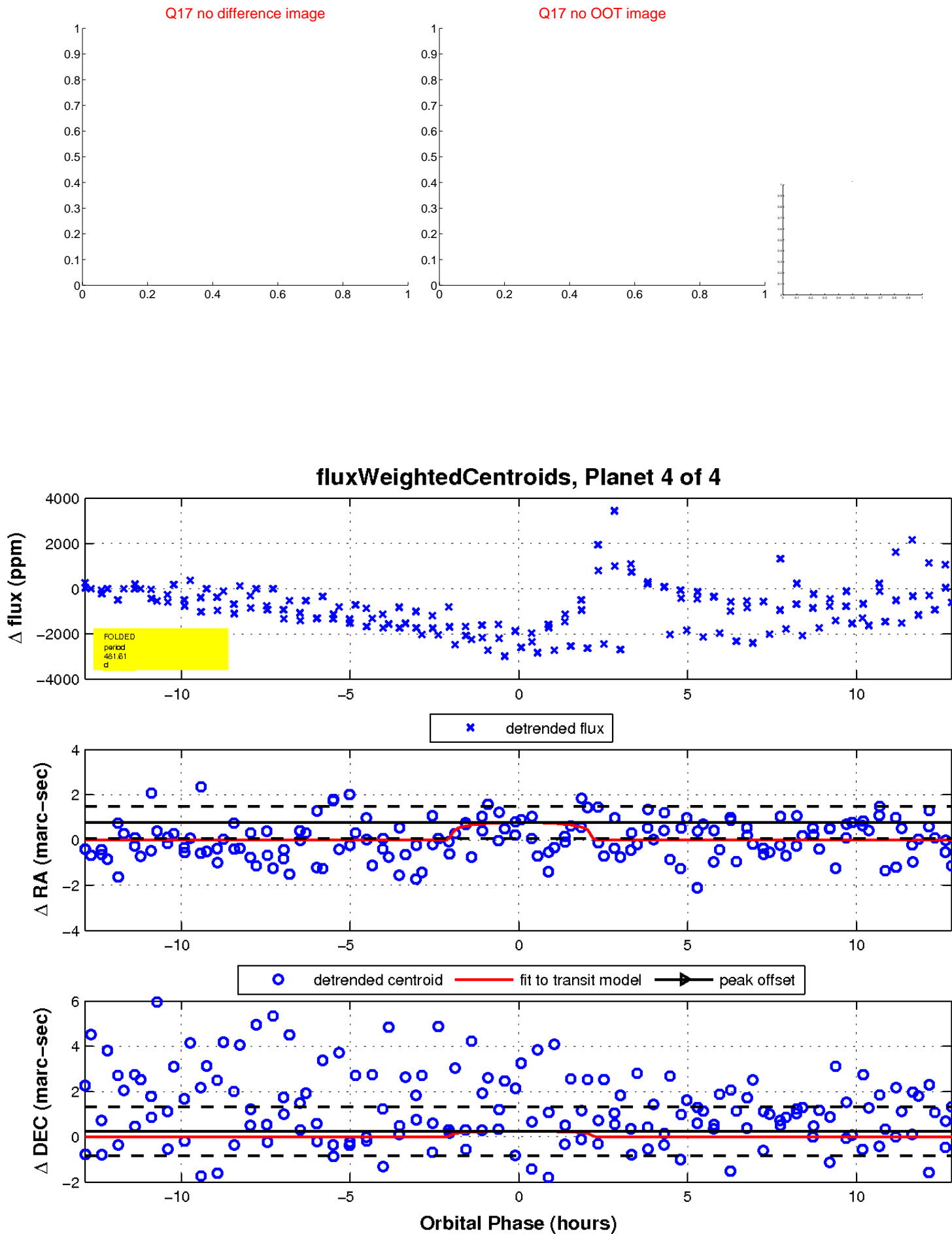
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

