

KIC 009413313

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})
009413313-01	OBS	No	441.018105	485.609265	7439.5	10.085	70.6	81.7	0.95	5359	8.17	0.59
009413313-02	OBS	No	361.104303	283.214569	507.5	15.724	53.2	3.9	0.95	5359	4.26	0.77

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009413313-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—INCONSISTENT_TRANS
009413313-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

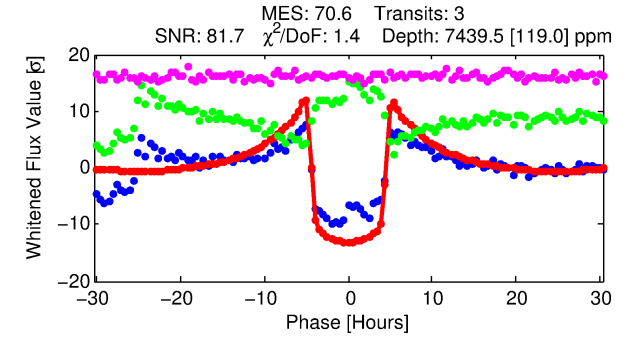
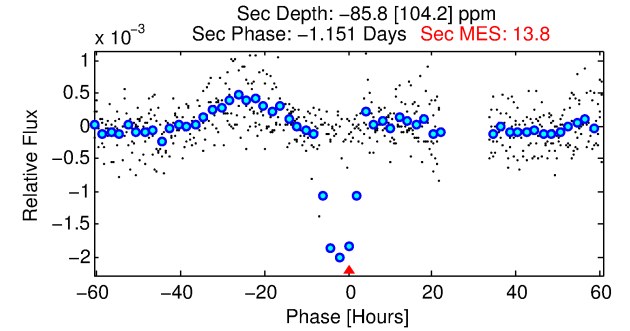
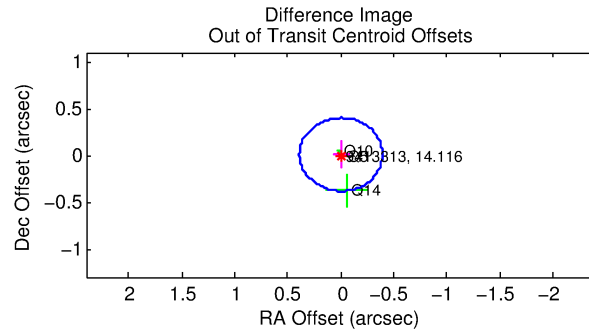
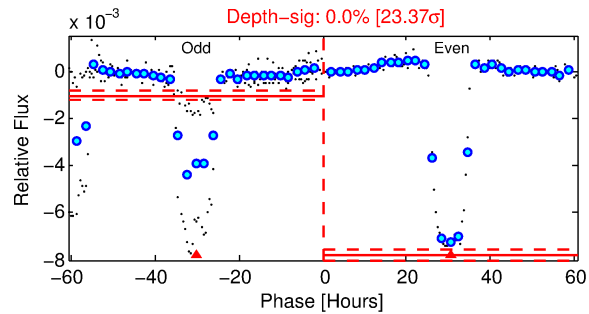
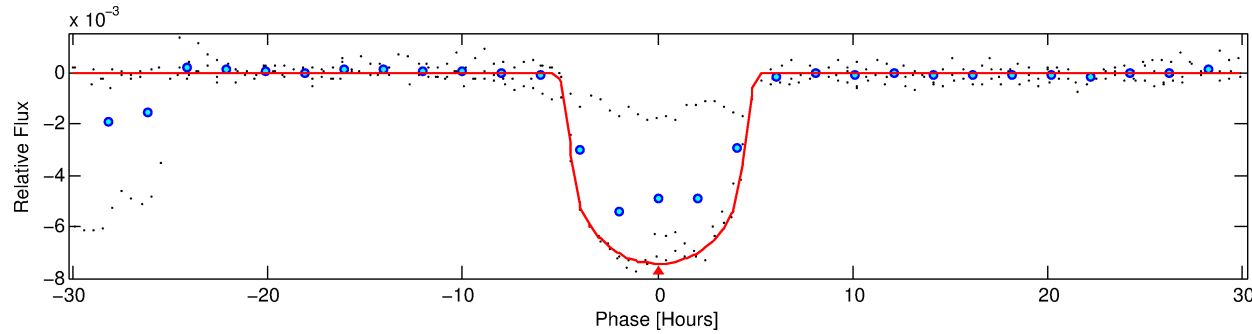
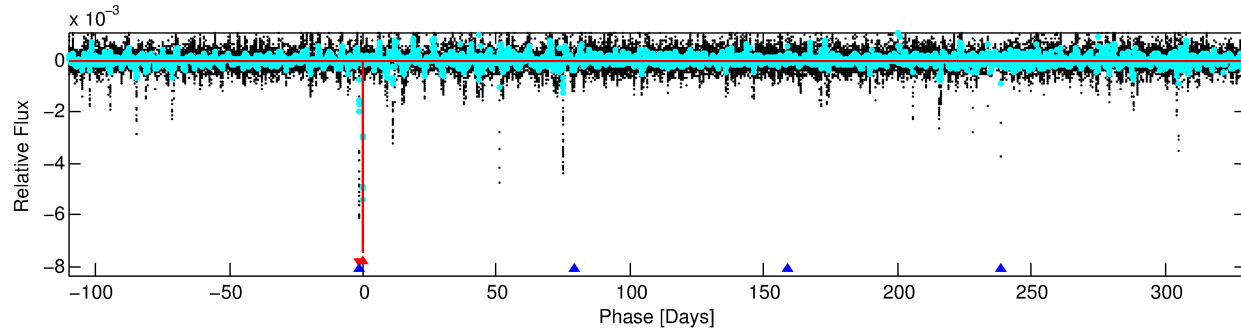
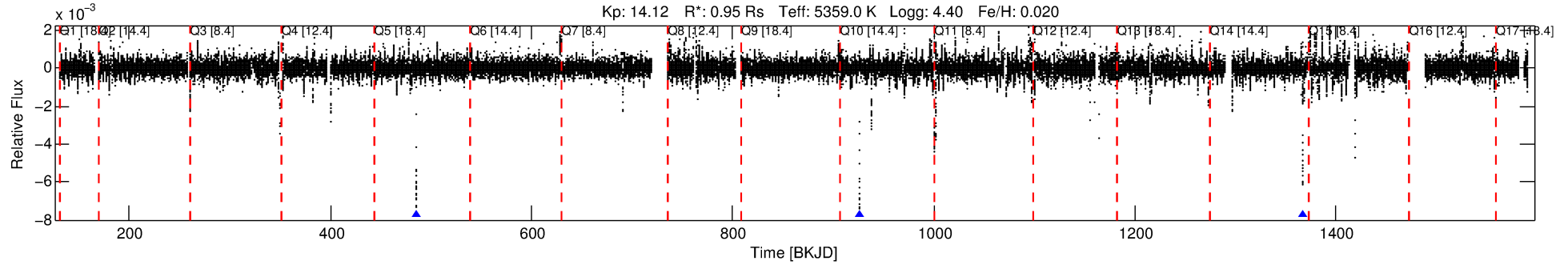
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009413313-01

No Significant Match Found

DV One-Page Summary

KIC: 9413313 Candidate: 1 of 2 Period: 441.018 d



DV Fit Results:

Period = 441.01810 [0.00111] d
Epoch = 485.6093 [0.0015] BKJD
Rp/R* = 0.0788 [0.0017]
a/R* = 337.37 [24.35]
b = 0.38 [0.16]
Seff = 0.59 [0.28]
Teq = 223 [26] K
Rp = 8.17 [2.75] Re
a = 1.0670 [0.3200] AU
Ag = N/A
Teffp = N/A

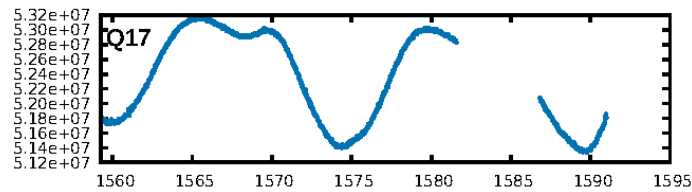
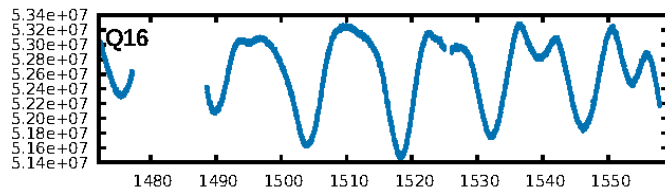
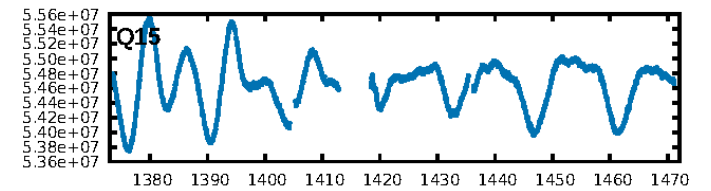
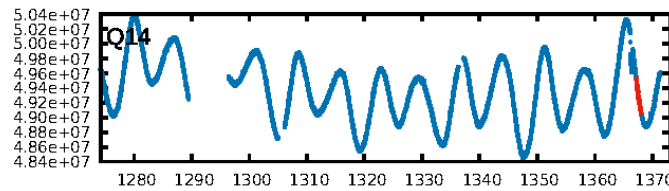
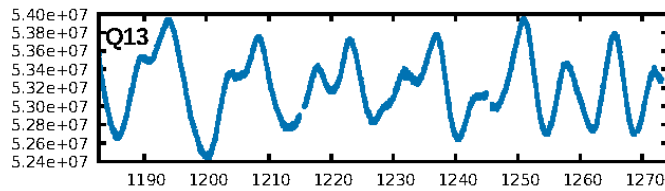
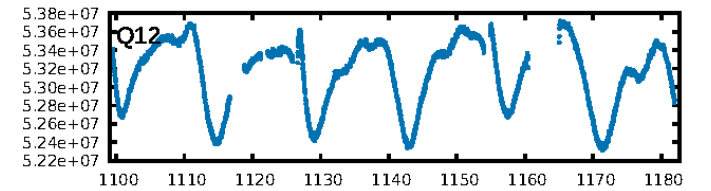
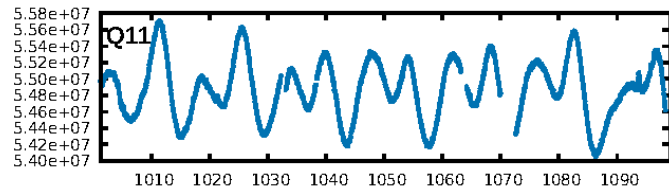
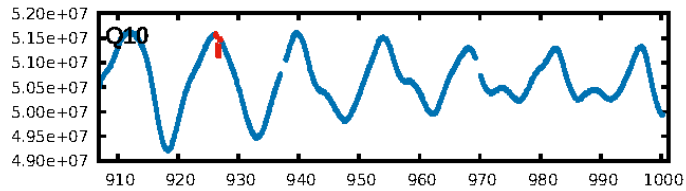
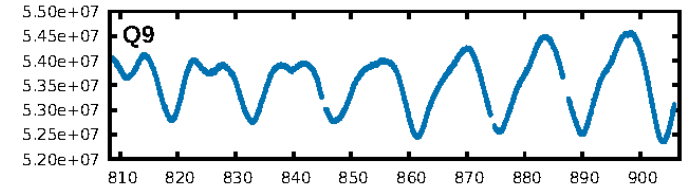
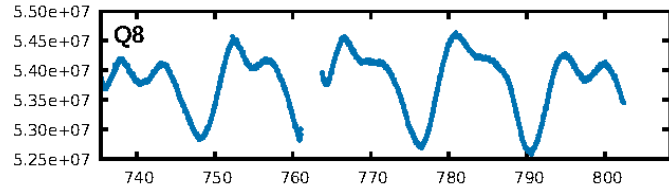
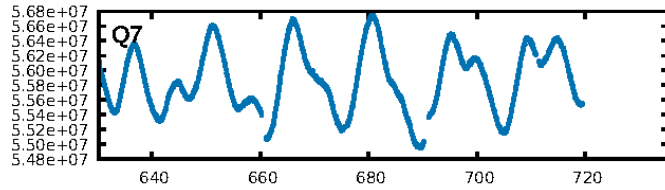
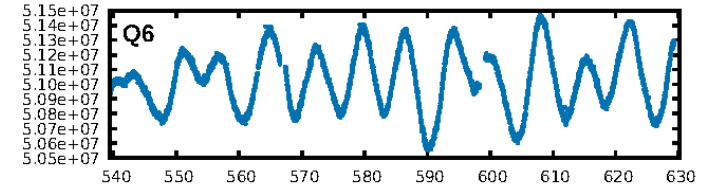
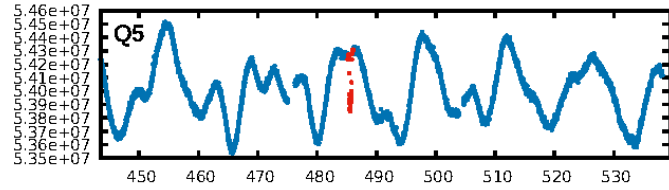
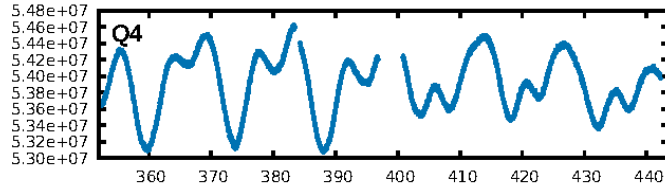
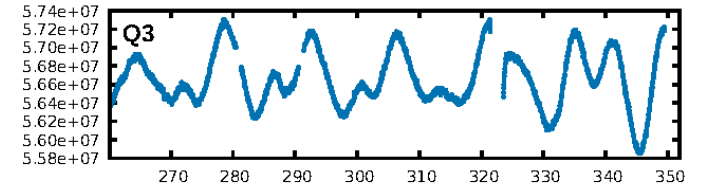
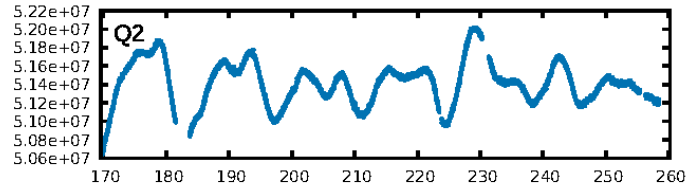
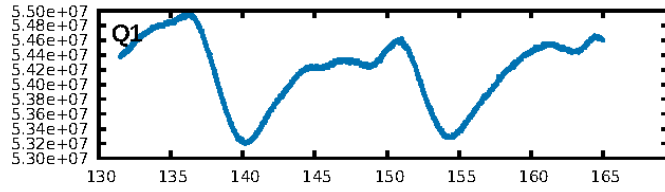
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [102.67 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 89.4%
ModelChiSquareGof-sig: 92.4%
Bootstrap-pfa: 1.46e-168
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.567
Centroid-sig: 80.5%
Centroid-so: 0.078 arcsec [0.84 σ]
OotOffset-rm: 0.009 arcsec [0.07 σ]
OotOffset-st: 2/0/0/1 [3]
KicOffset-rm: 0.140 arcsec [1.47 σ]
KicOffset-st: 2/0/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

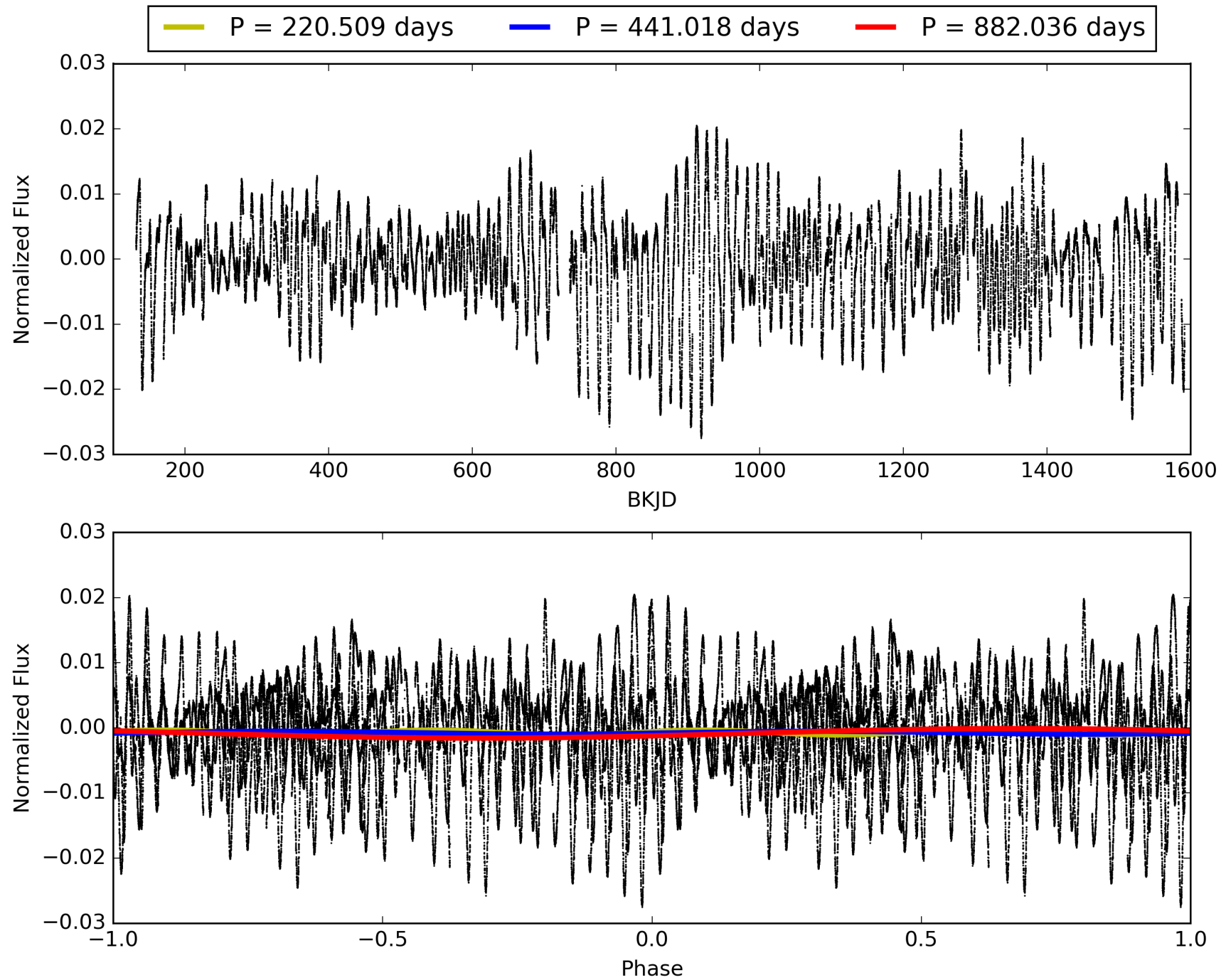
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009413313-01, PDC Light Curves

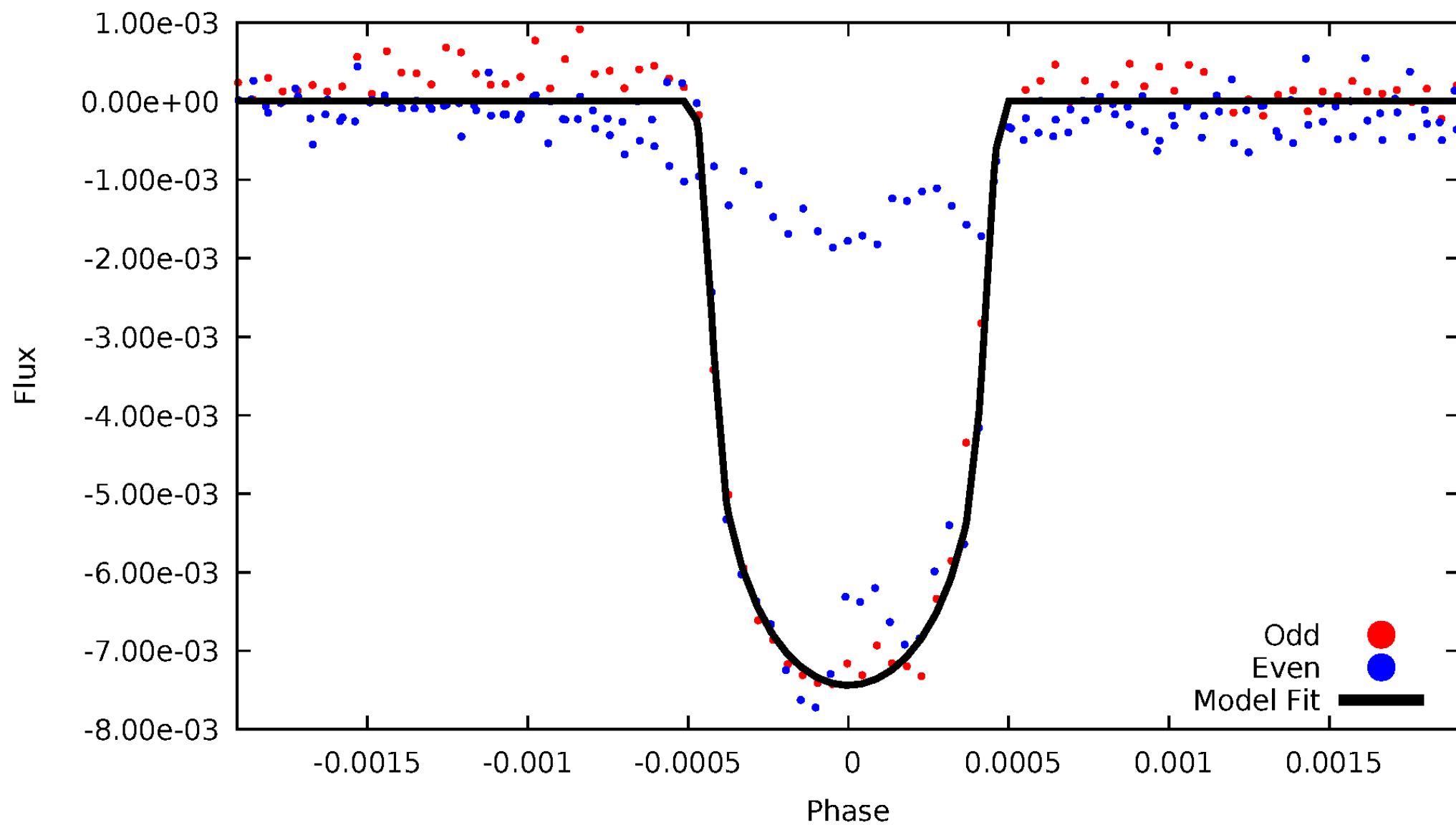


TCE 009413313-01



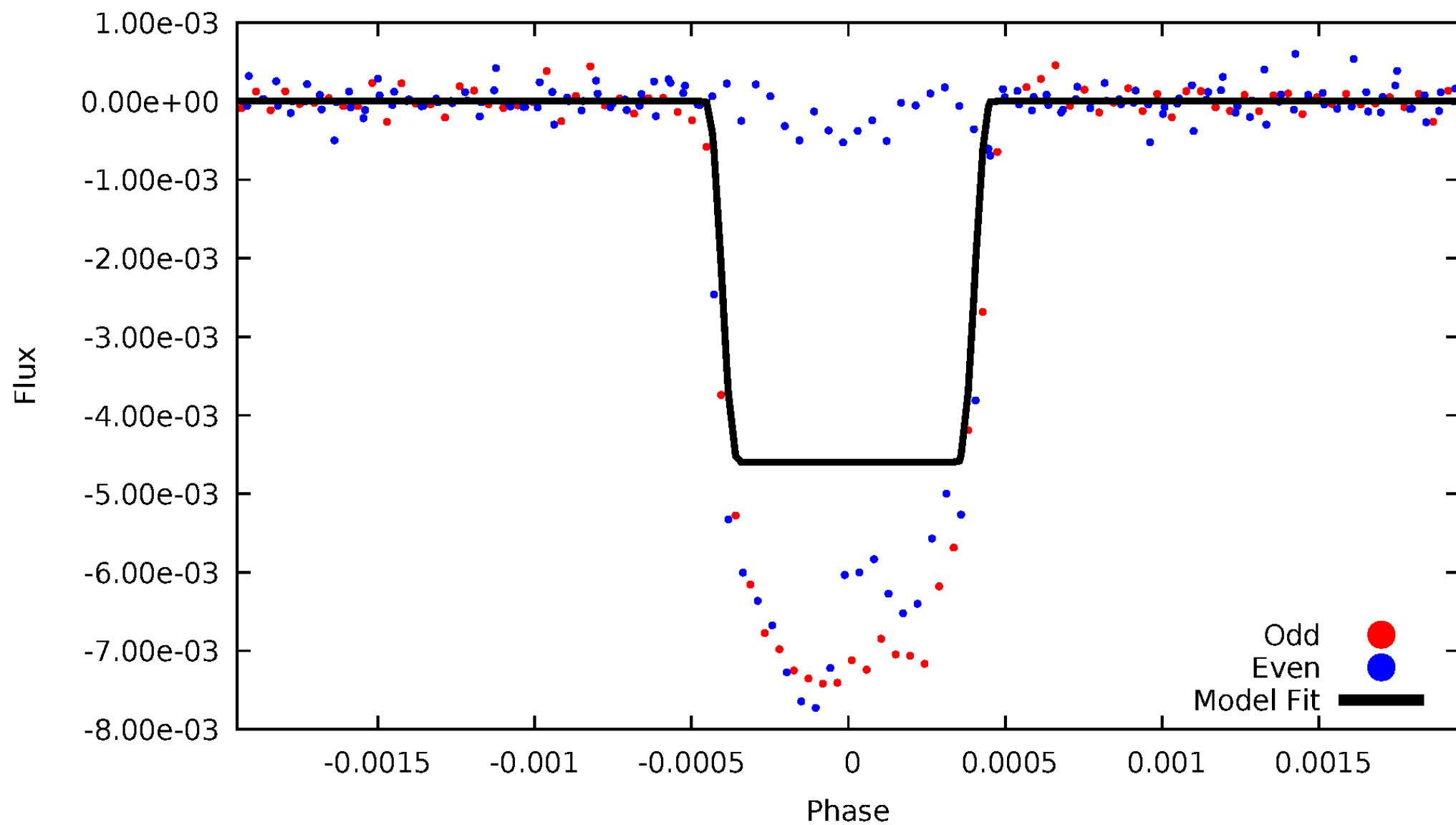
DV Odd/Even

TCE 009413313-01



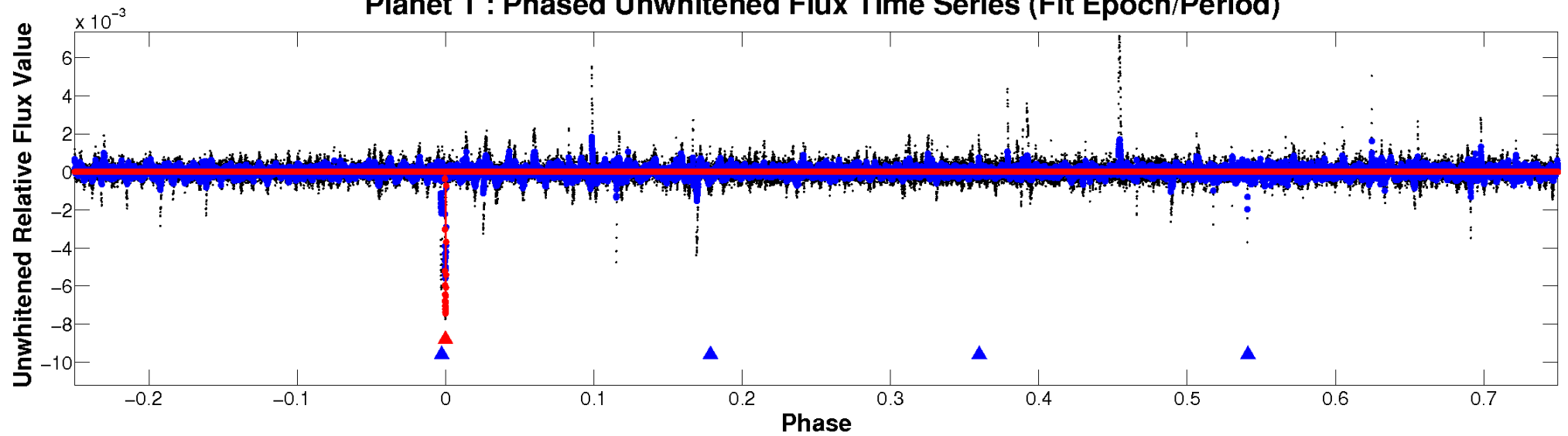
ALT Odd/Even

TCE 009413313-01

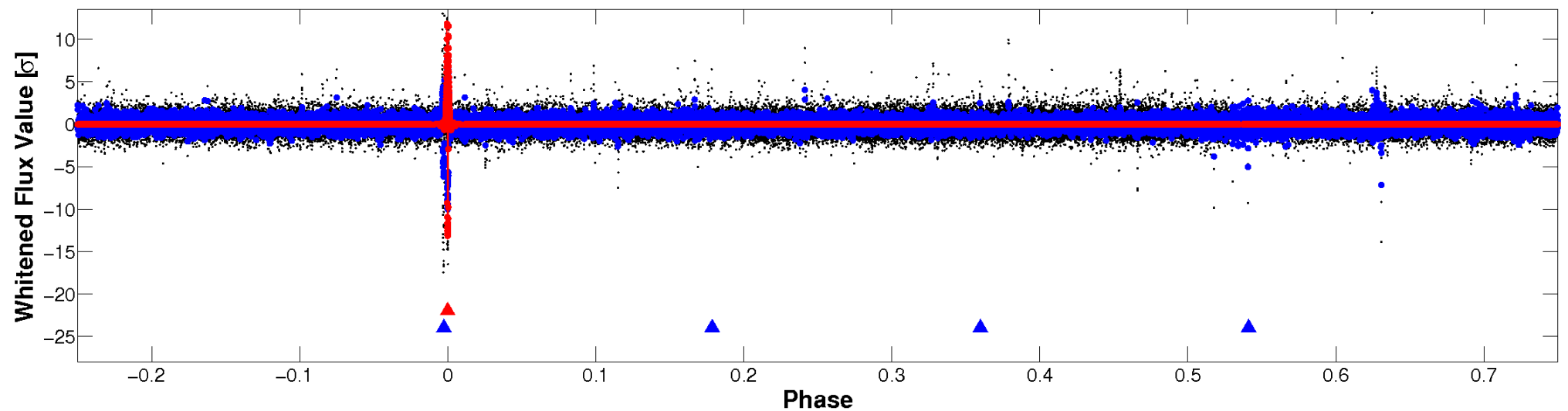


Non-Whitened Vs. Whitened Light Curve

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

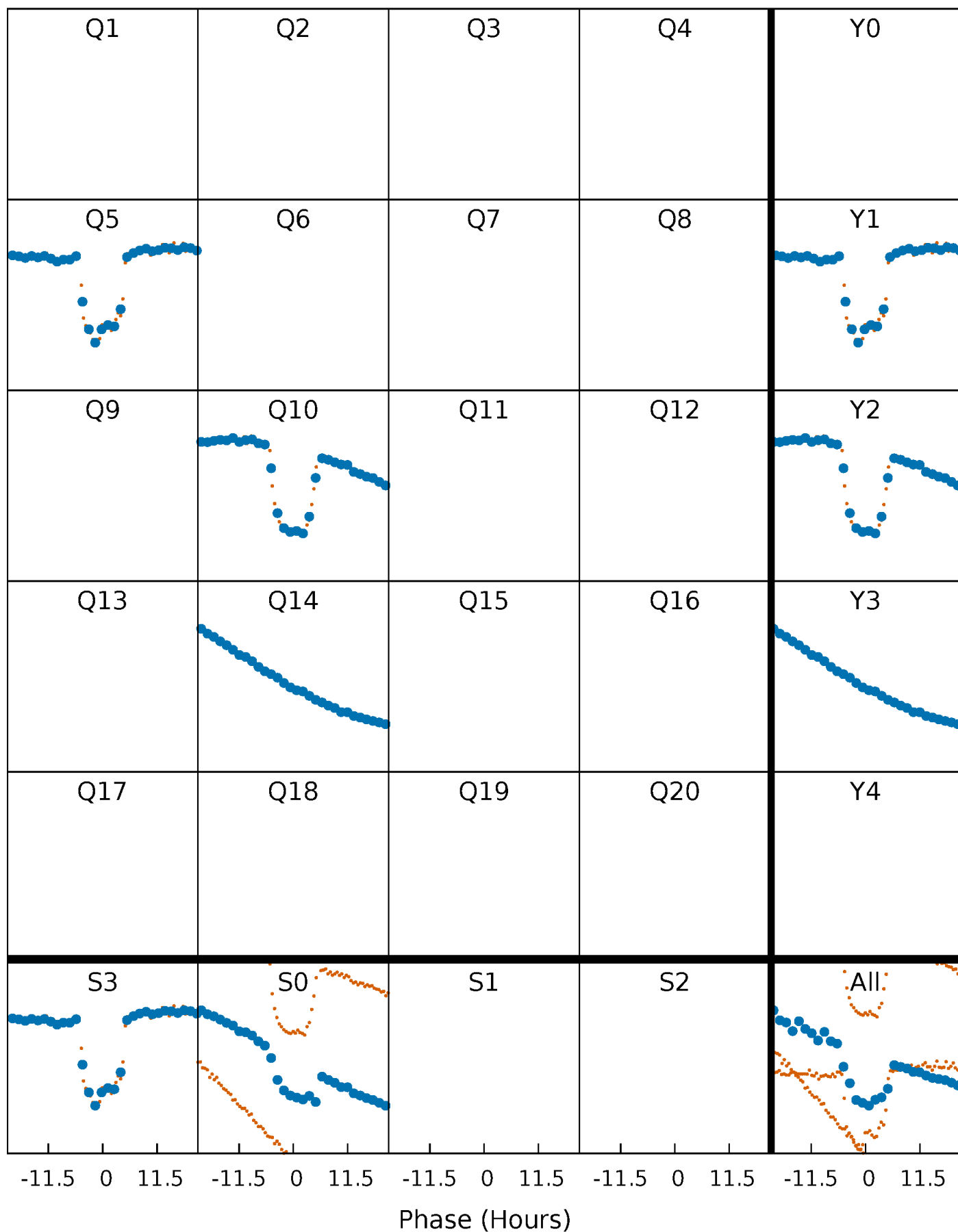


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



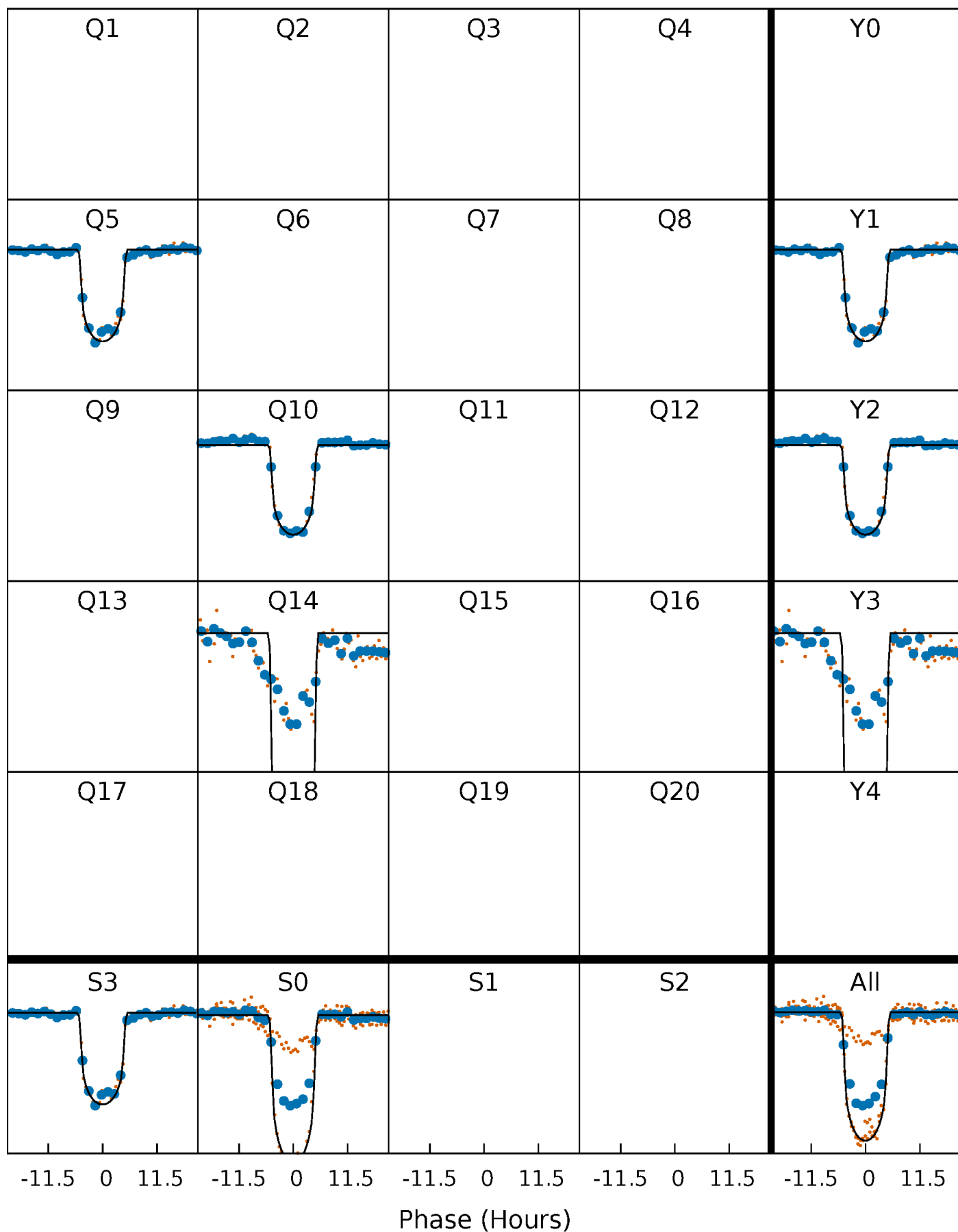
PDC Quarter-Phased Transit Curves

TCE 009413313-01 P=441.018104 Days $T_0=485.609265$ (BKJD)



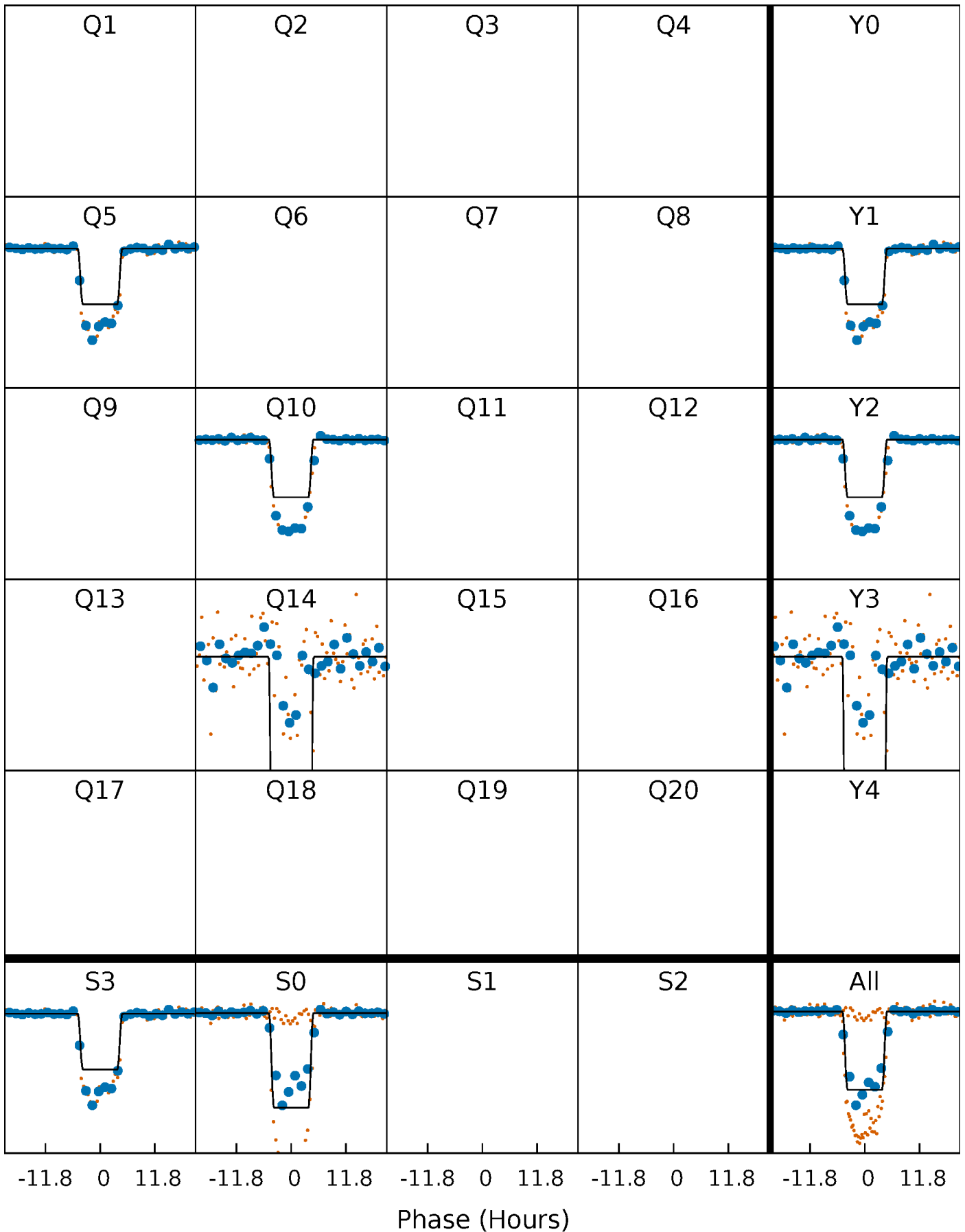
DV Quarter-Phased Transit Curves

TCE 009413313-01 P=441.018104 Days $T_0=485.609265$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

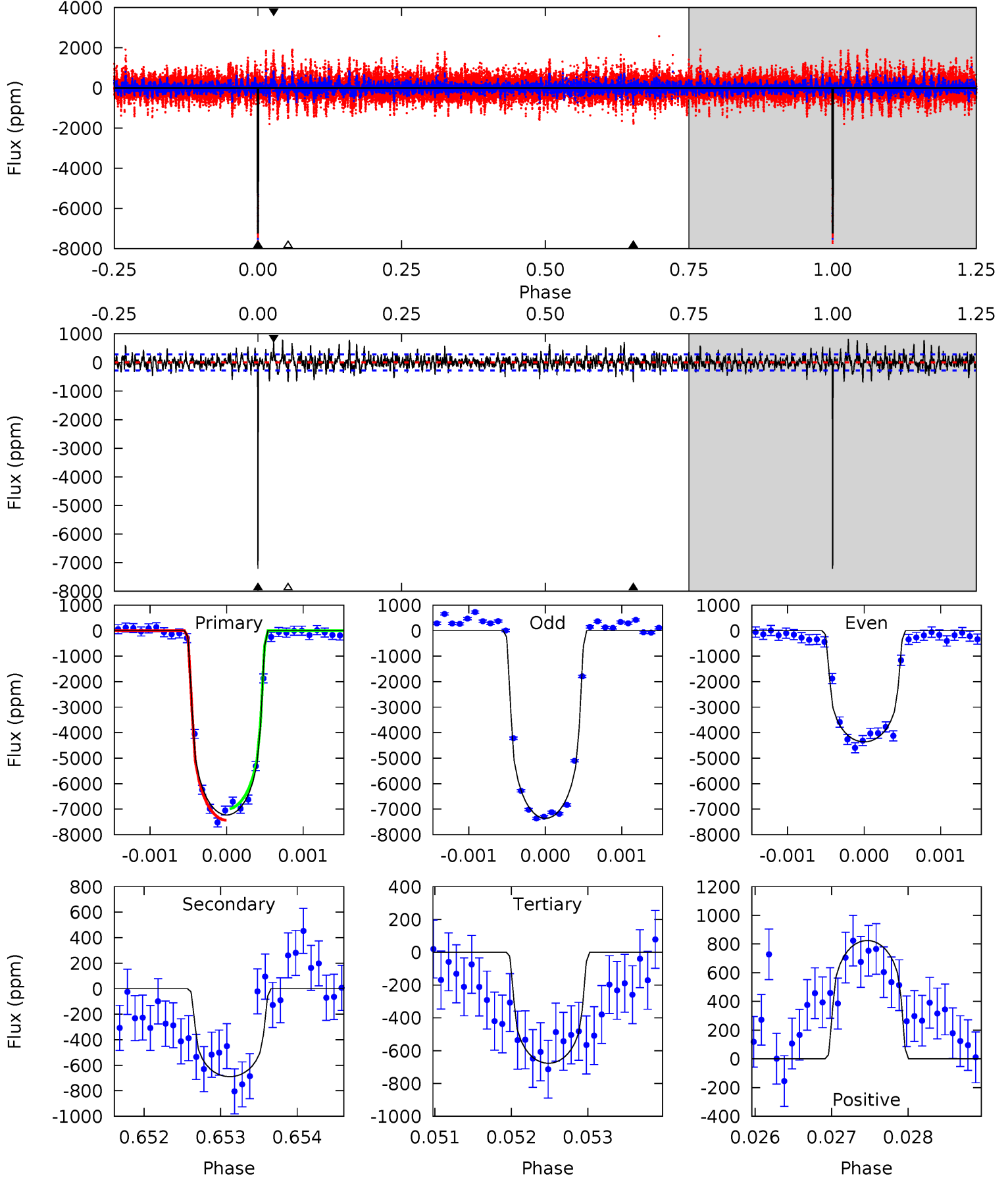
TCE 009413313-01 P=441.010714 Days $T_0=485.610075$ (BKJD)



DV Model-Shift Uniqueness Test

009413313-01, P = 441.018104 Days, E = 44.591161 Days

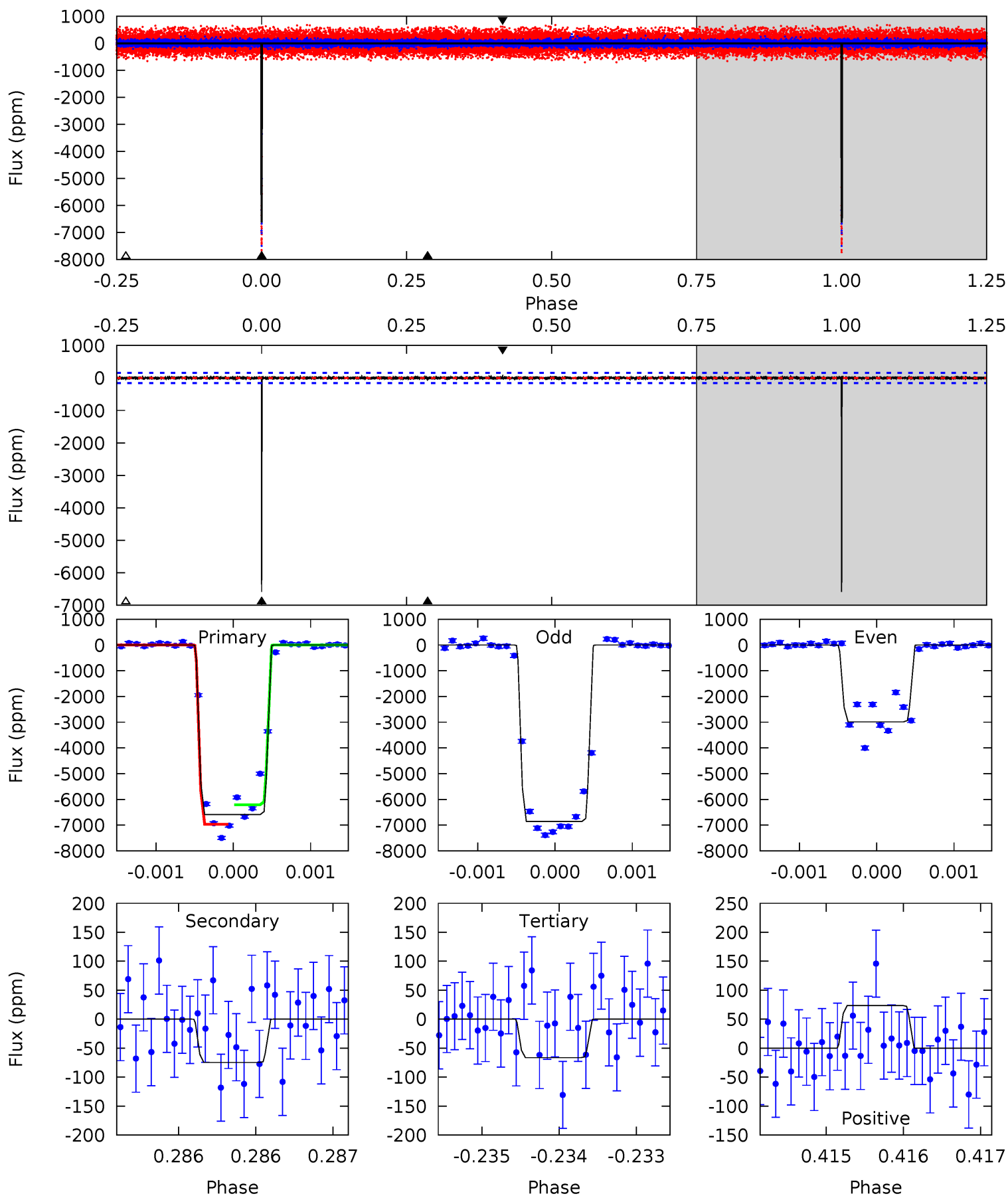
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
139.8	13.3	13.1	16.0	5.46	3.31	3.22	126.7	123.9	0.24	-2.62	26.2	0.75	0.10	0



Alt Model-Shift Uniqueness Test

009413313-01, P = 441.010714 Days, E = 44.599361 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
228.2	2.59	2.30	2.55	5.47	3.32	0.53	225.9	225.6	0.29	0.04	82.1	0.69	0.01	0



Stellar Parameters For KIC 009413313

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5359^{+159}_{-159}	$4.403^{+0.160}_{-0.260}$	$0.020^{+0.300}_{-0.250}$	$0.950^{+0.319}_{-0.159}$	$0.832^{+0.105}_{-0.067}$	$1.366^{+0.866}_{-0.785}$
	+3%/-3%	+4%/-6%	+1500%/-1250%	+34%/-17%	+13%/-8%	+63%/-57%
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 009413313-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-688 ± 52	$8.24^{+1.64}_{-0.88}$	315^{+29}_{-21}	3535^{+98}_{-85}	6231^{+1873}_{-1824}
Alt.	-75 ± 29	$7.09^{+1.44}_{-0.80}$	314^{+31}_{-21}	2684^{+124}_{-156}	886^{+472}_{-401}

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

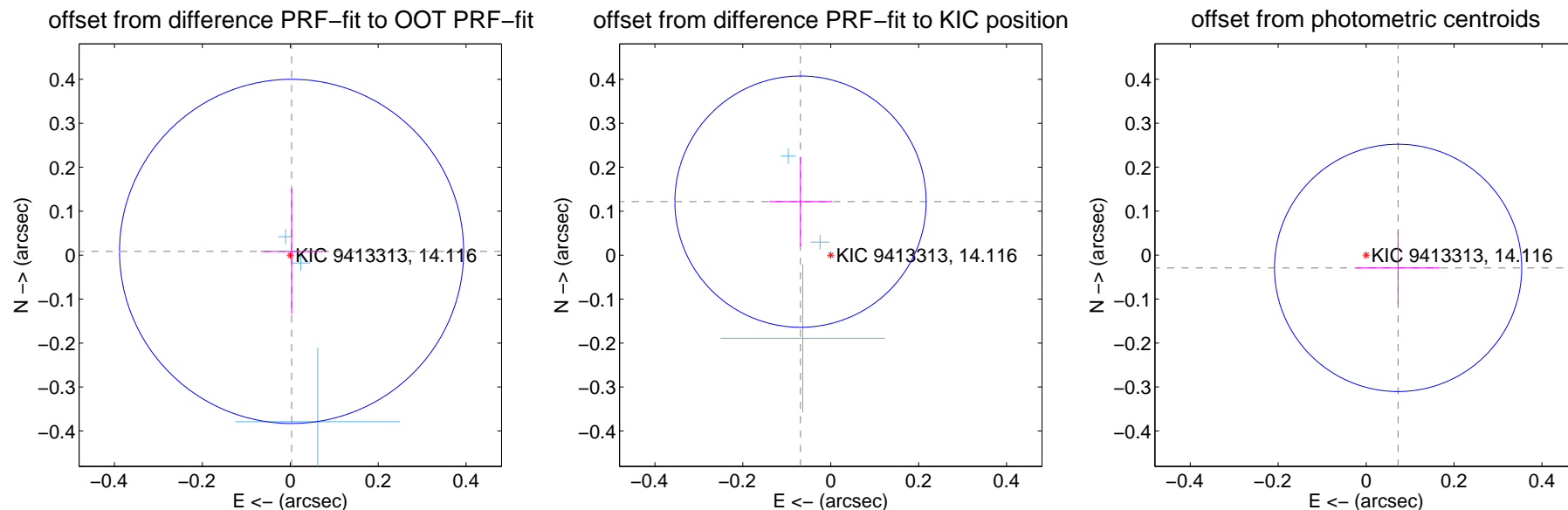
DV Centroid Data

Supplemental centroid analysis for 009413313-01. Kepler magnitude: 14.12. Transit SNR 81.70

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.009 ± 0.130	0.07	-0.003 ± 0.070	0.009 ± 0.143
PRF-fit source offset from KIC position	0.140 ± 0.095	1.47	0.069 ± 0.072	0.122 ± 0.102
photometric centroid source offset	0.08 ± 0.09	0.84	-0.07 ± 0.10	-0.03 ± 0.08

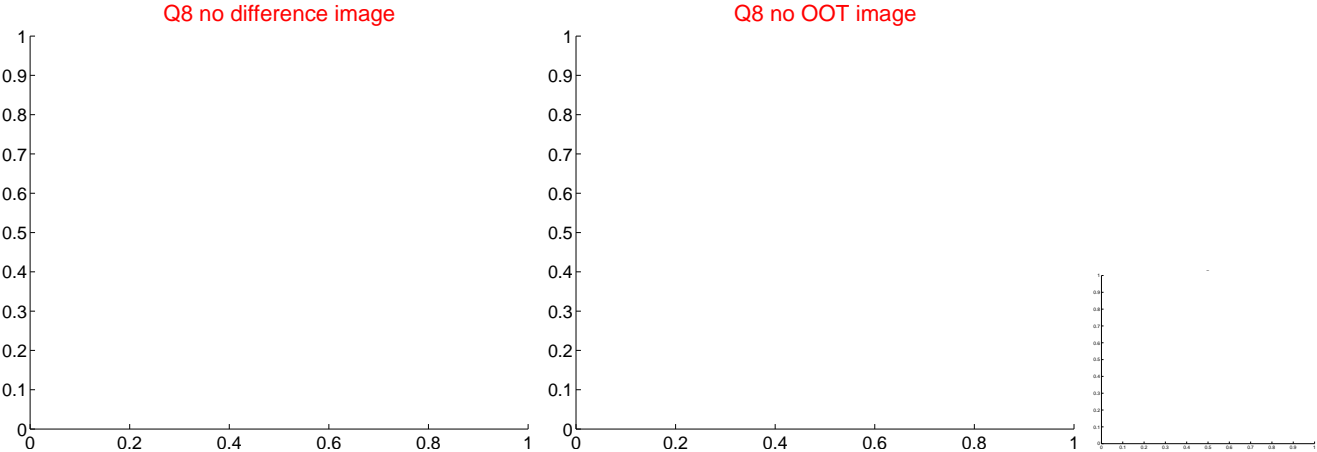
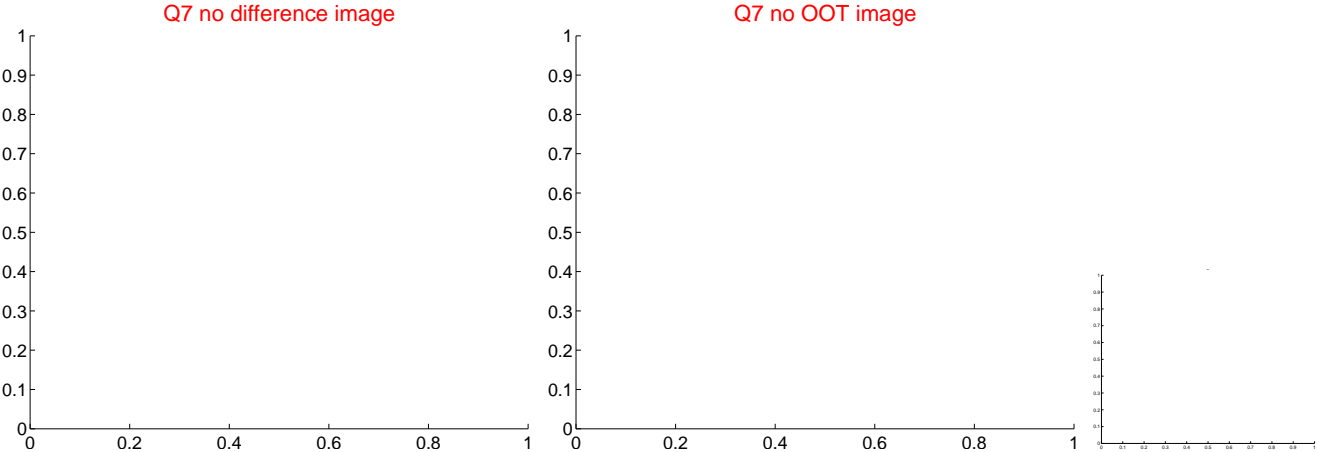
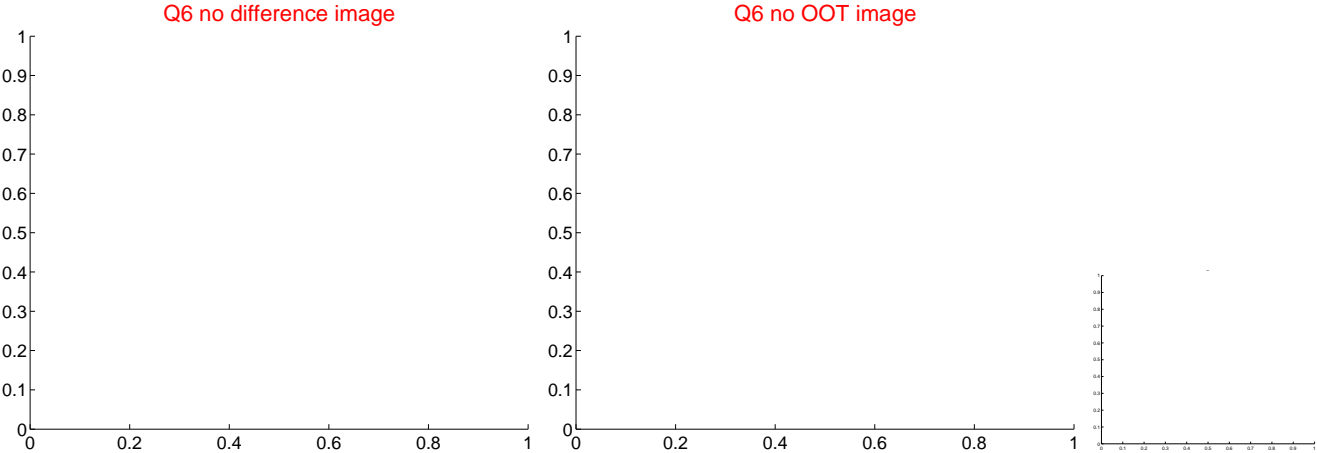
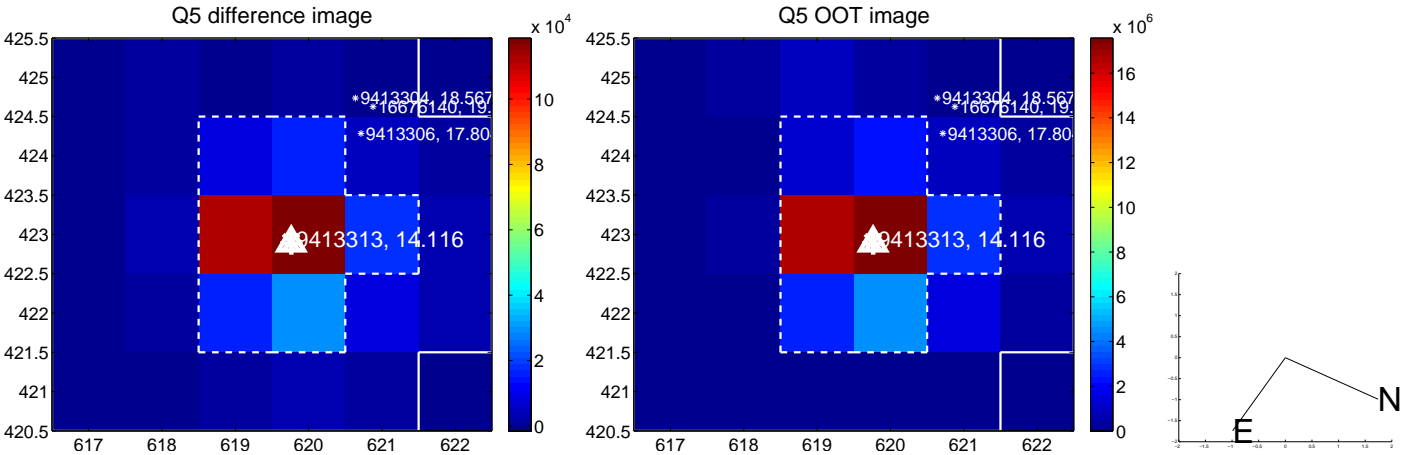


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

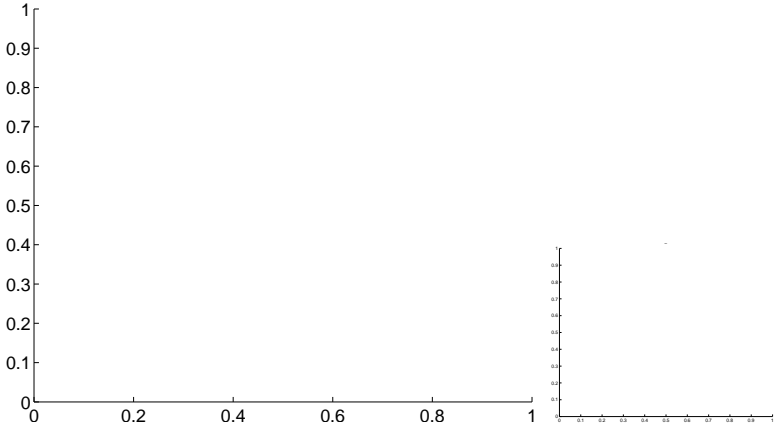


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

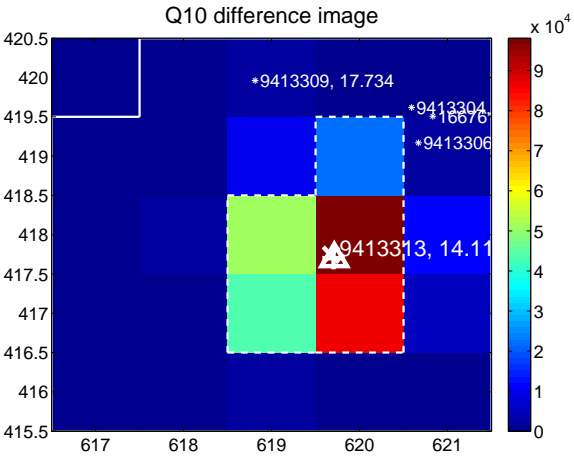
Q9 no difference image



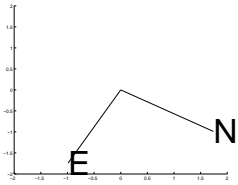
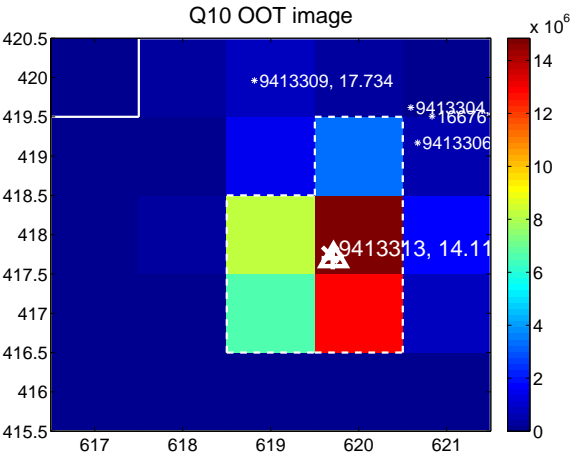
Q9 no OOT image



Q10 difference image



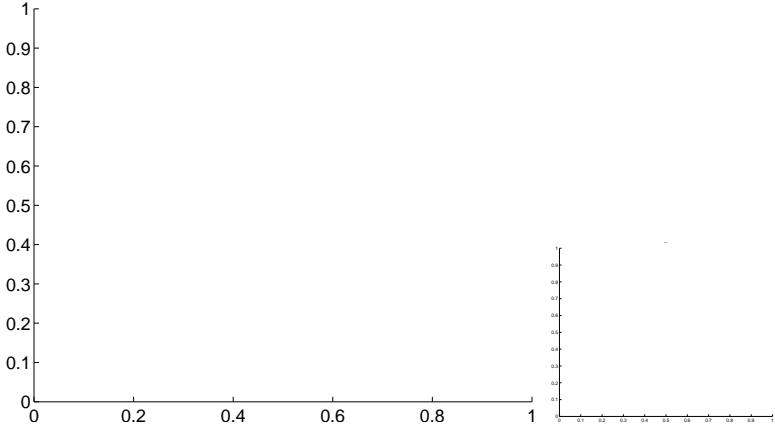
Q10 OOT image



Q11 no difference image



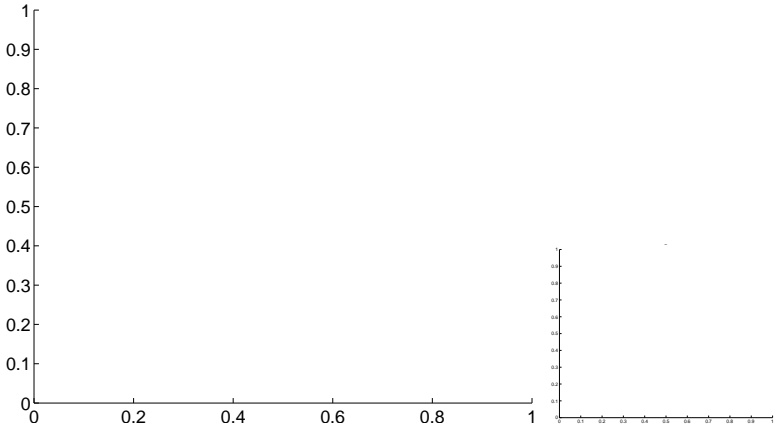
Q11 no OOT image



Q12 no difference image



Q12 no OOT image



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

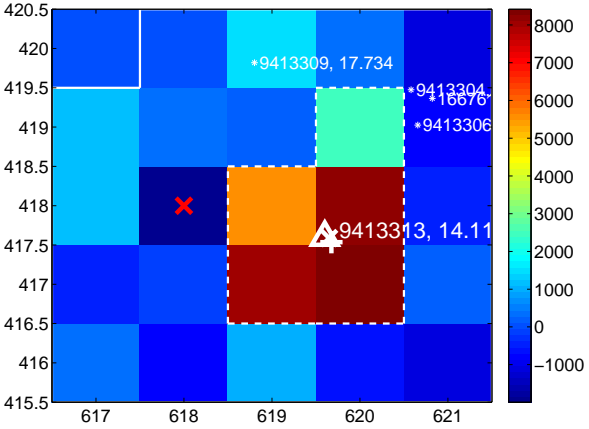
Q13 no difference image



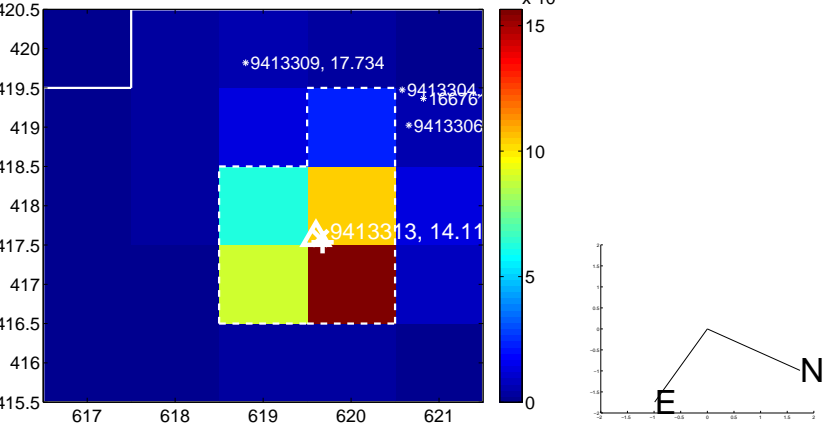
Q13 no OOT image



Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



Q16 no difference image



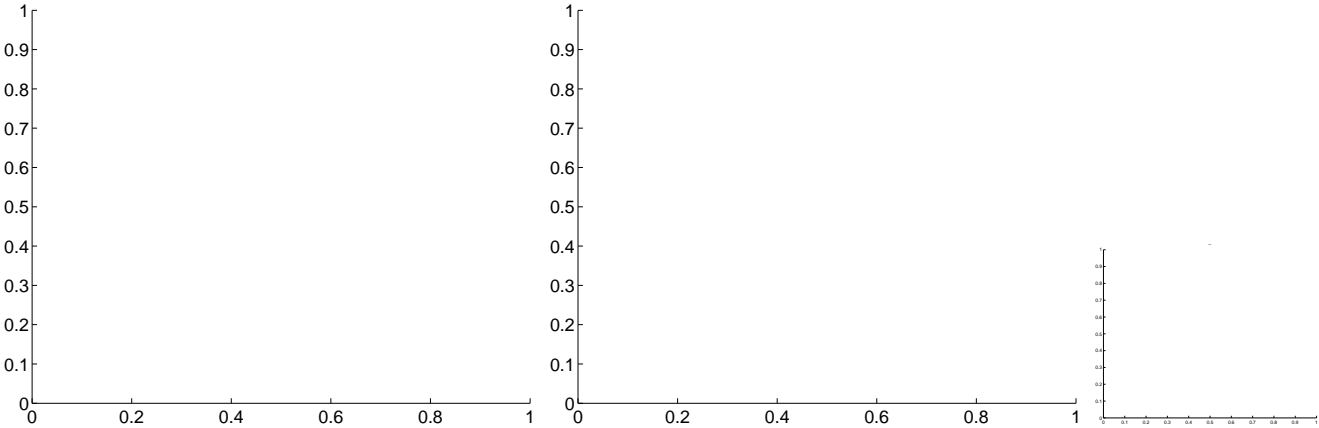
Q16 no OOT image



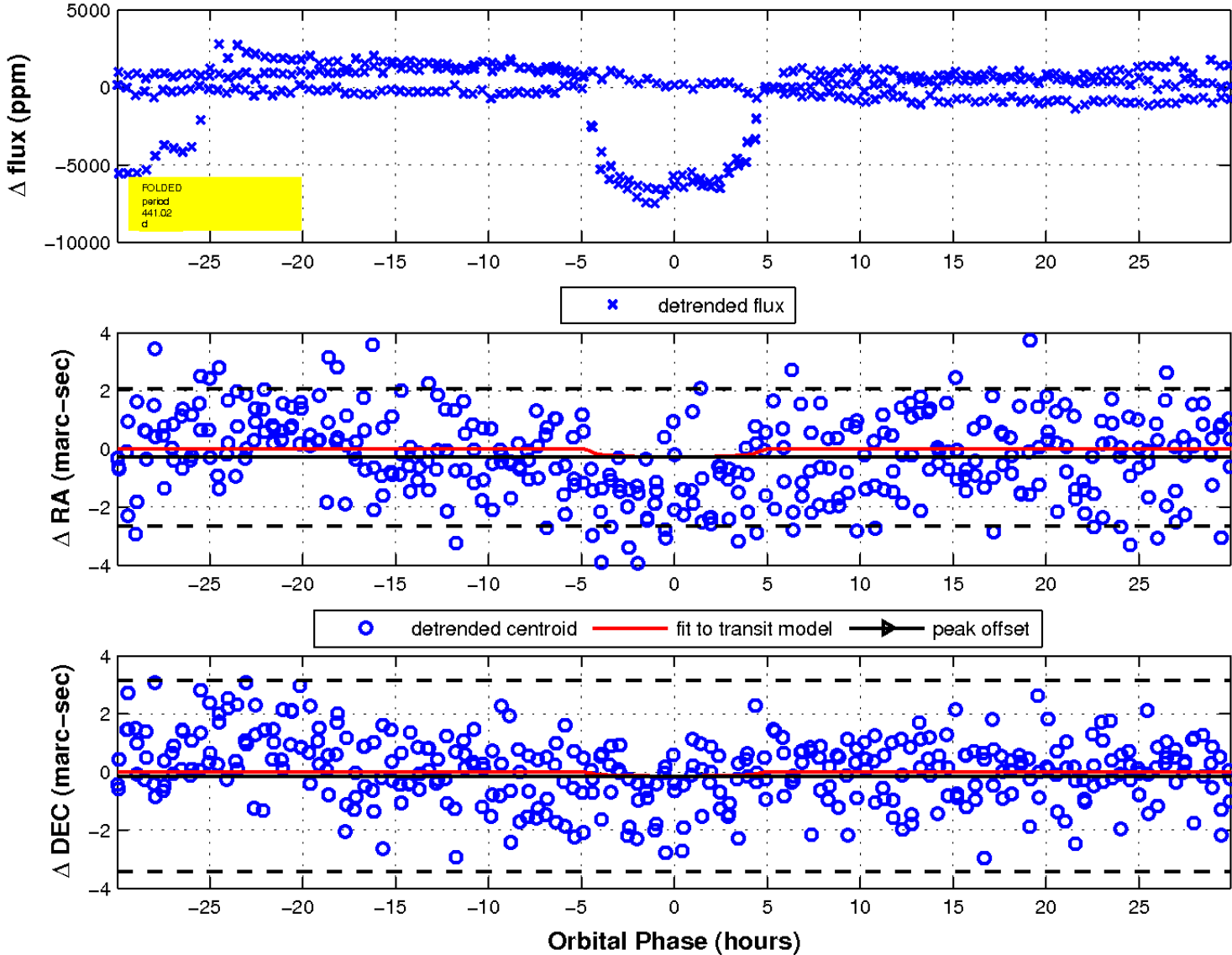
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q17 no difference image

Q17 no OOT image

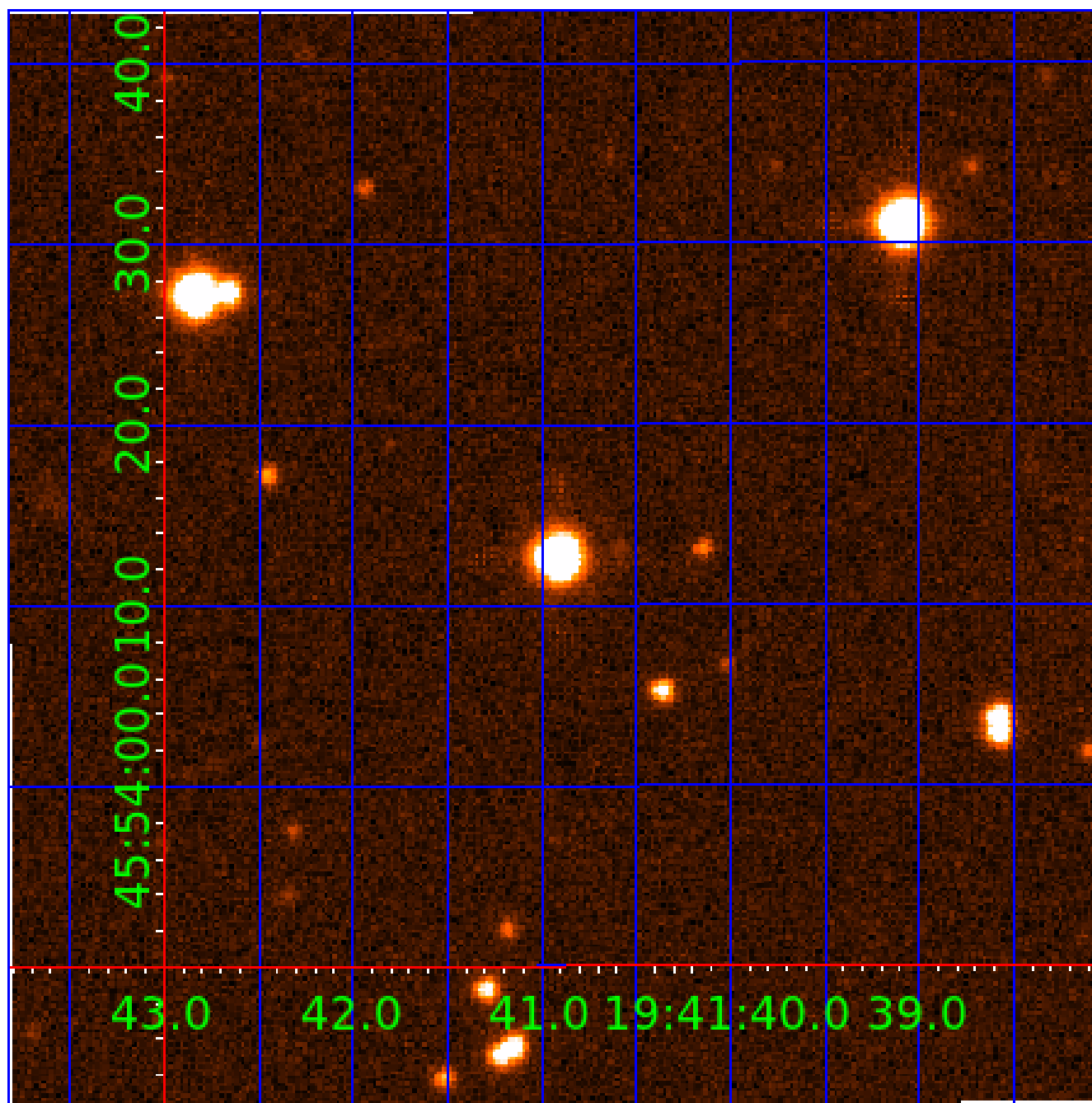


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009413313

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})
009413313-01	OBS	No	441.018105	485.609265	7439.5	10.085	70.6	81.7	0.95	5359	8.17	0.59
009413313-02	OBS	No	361.104303	283.214569	507.5	15.724	53.2	3.9	0.95	5359	4.26	0.77

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009413313-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—INCONSISTENT_TRANS
009413313-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS

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

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

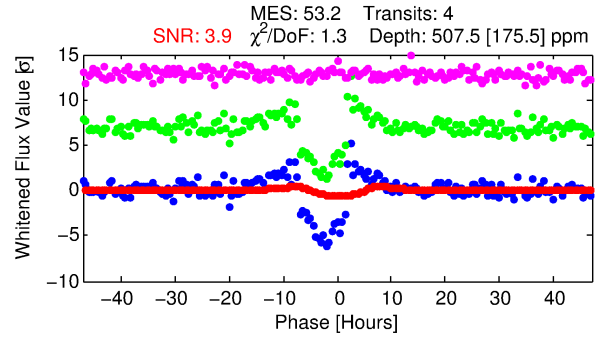
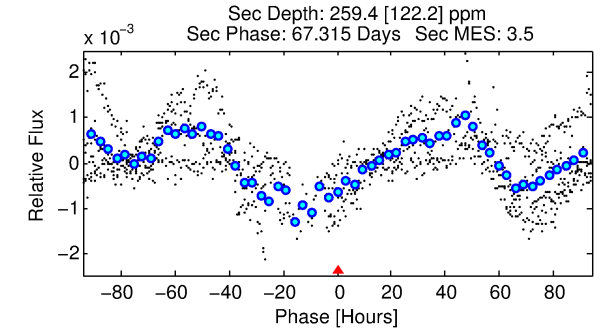
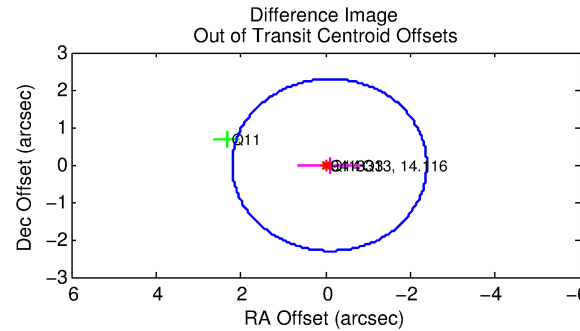
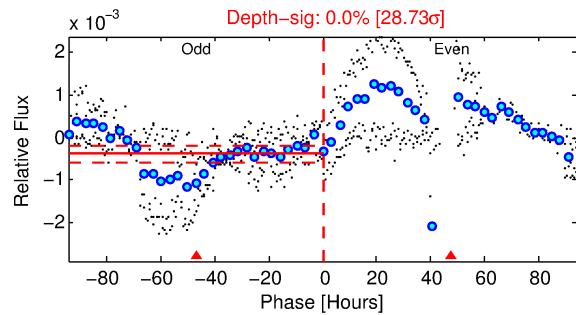
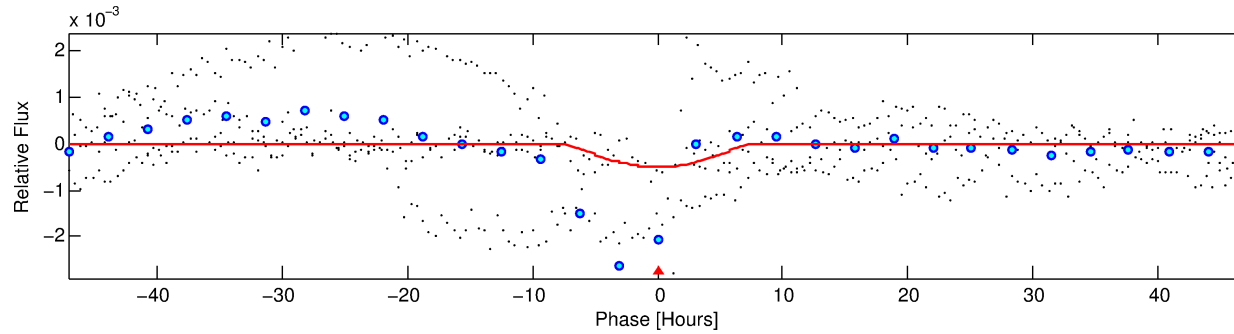
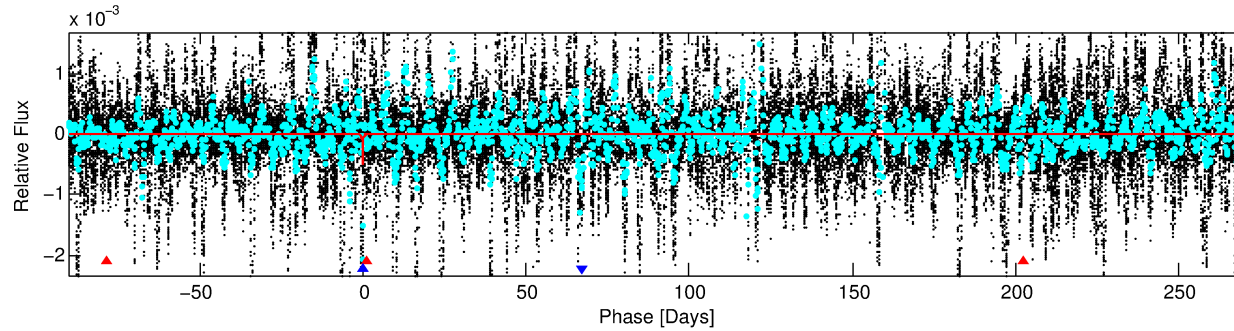
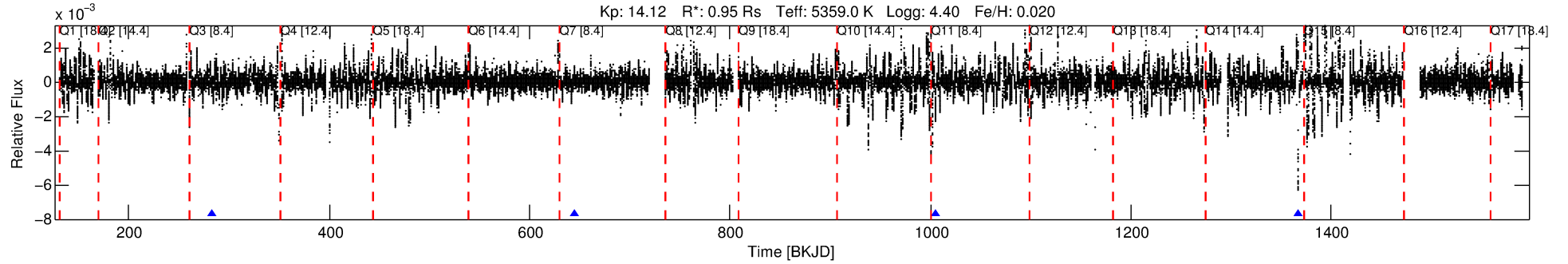
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009413313-02

No Significant Match Found

DV One-Page Summary

KIC: 9413313 Candidate: 2 of 2 Period: 361.104 d



DV Fit Results:

Period = 361.10430 [0.02836] d
Epoch = 283.2146 [0.0593] BKJD
Rp/R* = 0.0411 [0.1782]
a/R* = 51.79 [55.83]
b = 1.00 [0.27]
Seff = 0.76 [0.36]
Teq = 238 [28] K
Rp = 4.26 [18.53] Re
a = 0.9338 [0.2800] AU
Ag = 6849.76 [59547.86] [0.12 σ]
Teffp = 3354 [7280] K [0.43 σ]

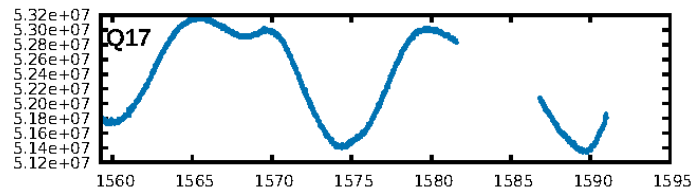
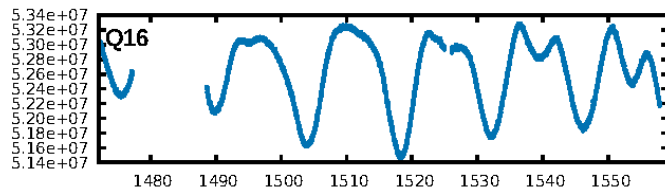
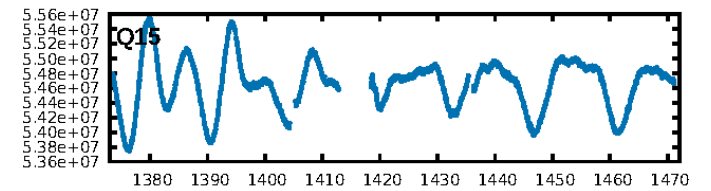
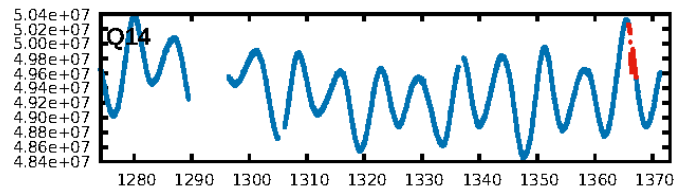
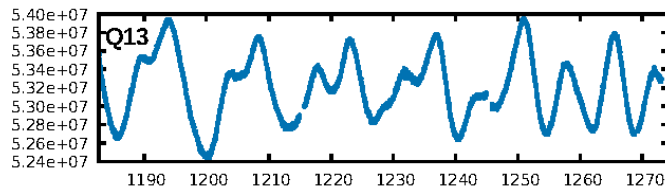
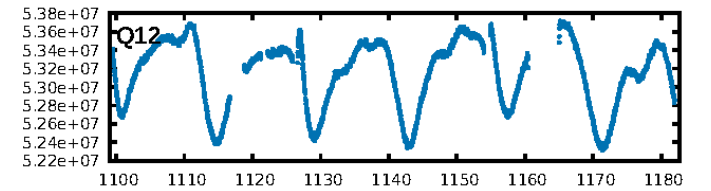
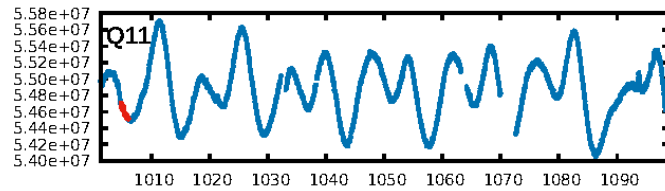
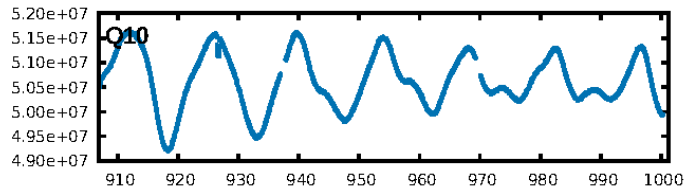
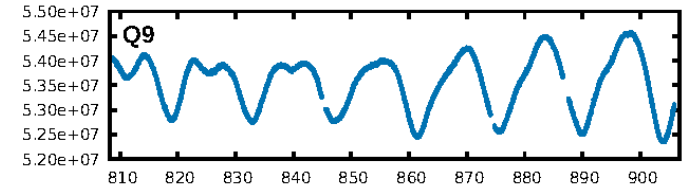
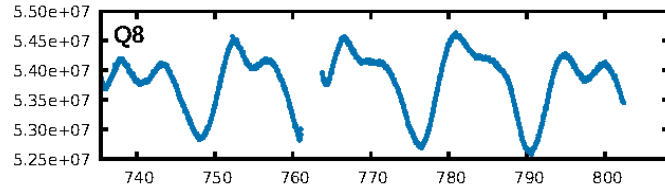
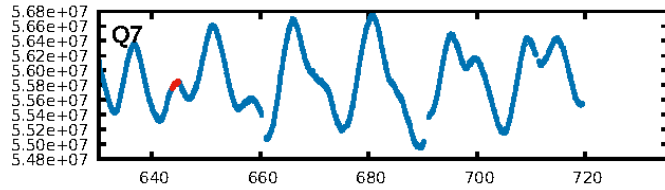
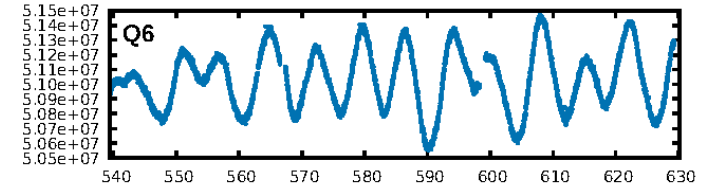
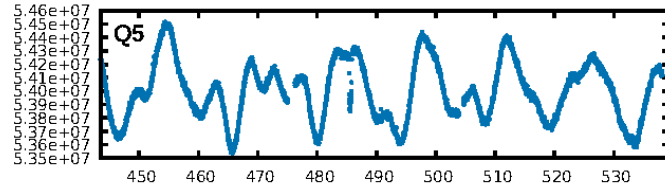
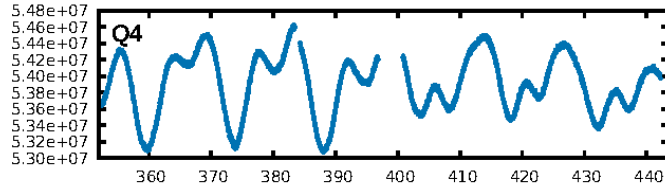
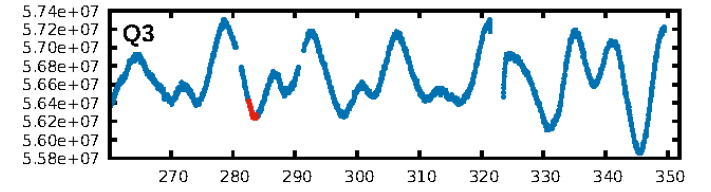
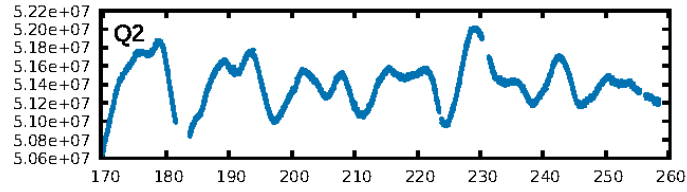
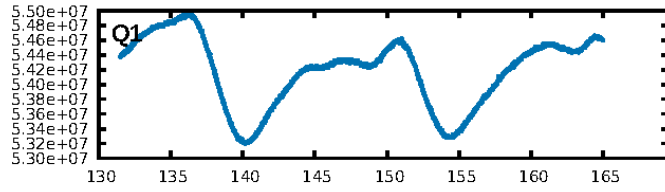
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [102.67 σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.81e-105
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.8467
Centroid-sig: 2.1%
Centroid-so: 1.406 arcsec [1.46 σ]
OotOffset-rm: 0.096 arcsec [0.12 σ]
OotOffset-st: 1/2/0/0 [3]
KicOffset-rm: 0.180 arcsec [0.48 σ]
KicOffset-st: 1/2/0/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.67 [2/3]

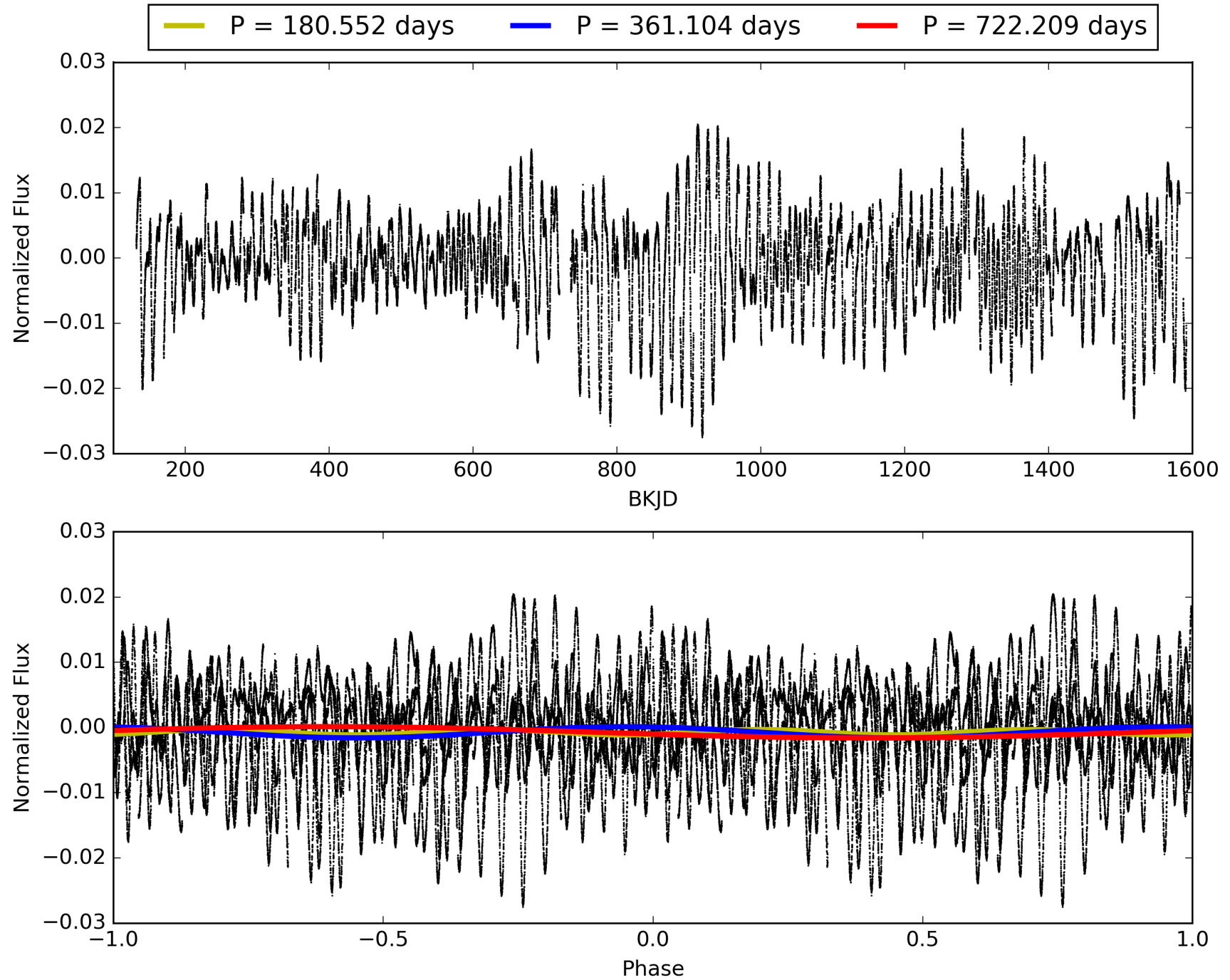
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:14:29 Z

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

TCE 009413313-02, PDC Light Curves

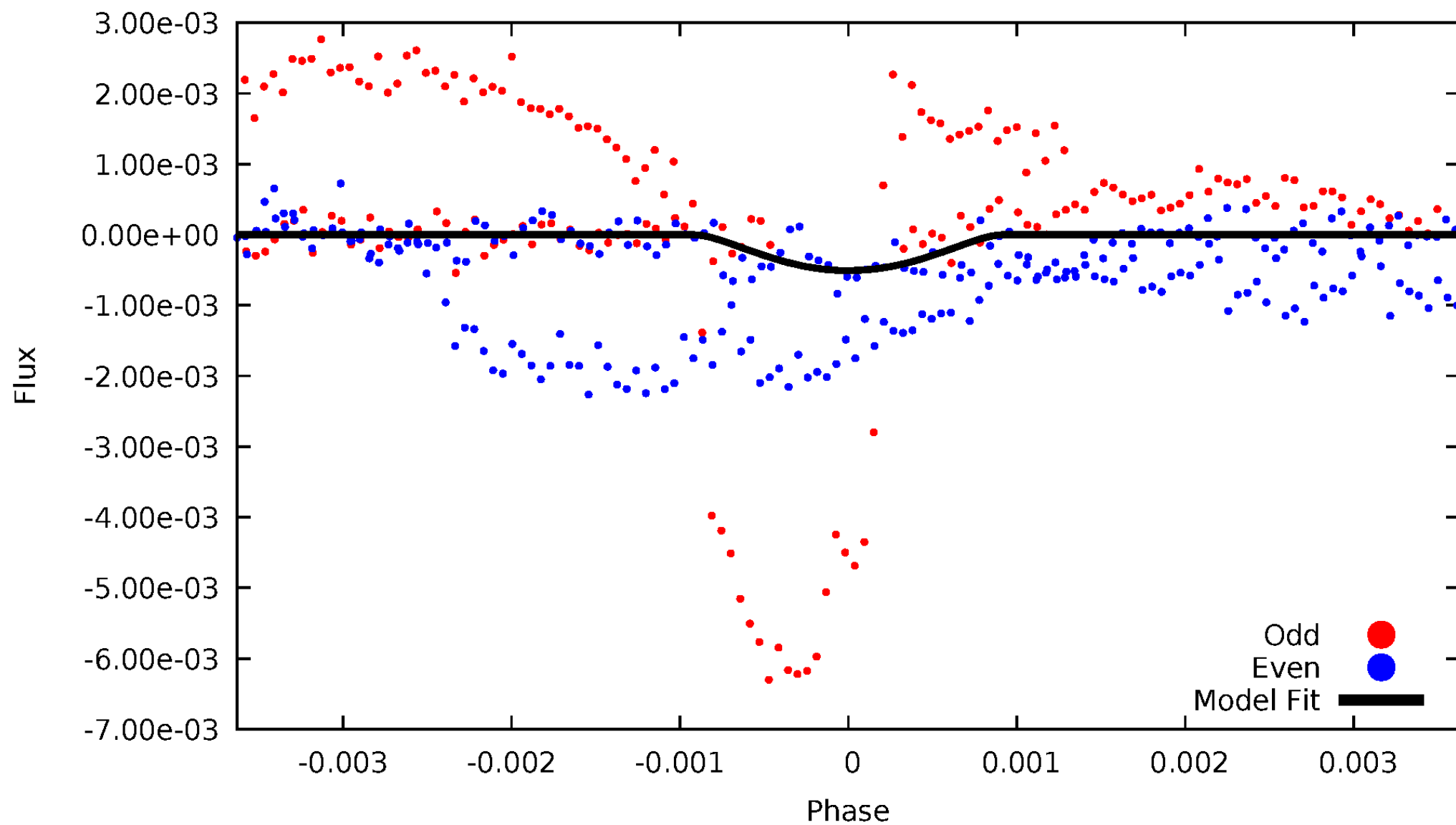


TCE 009413313-02



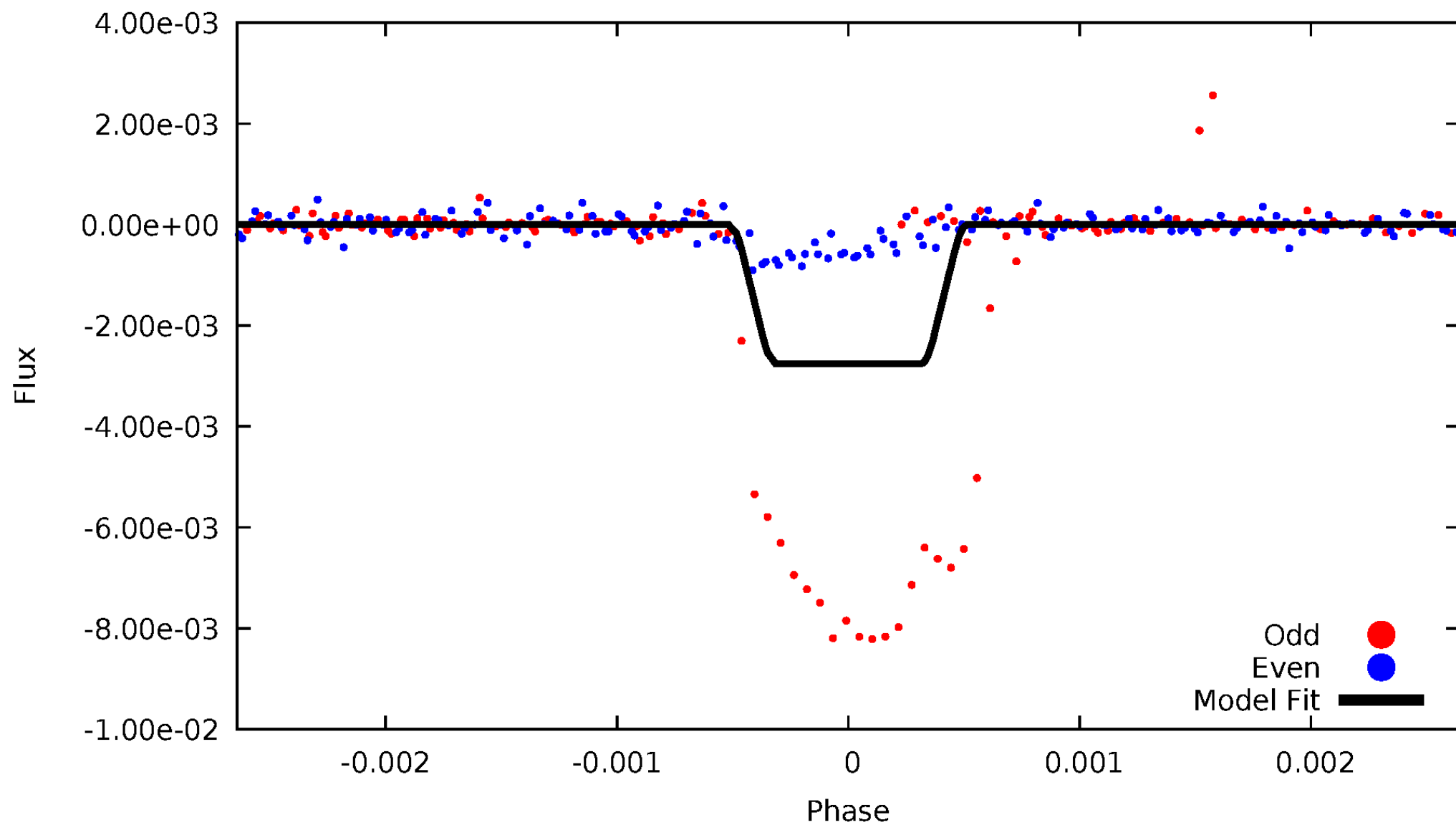
DV Odd/Even

TCE 009413313-02



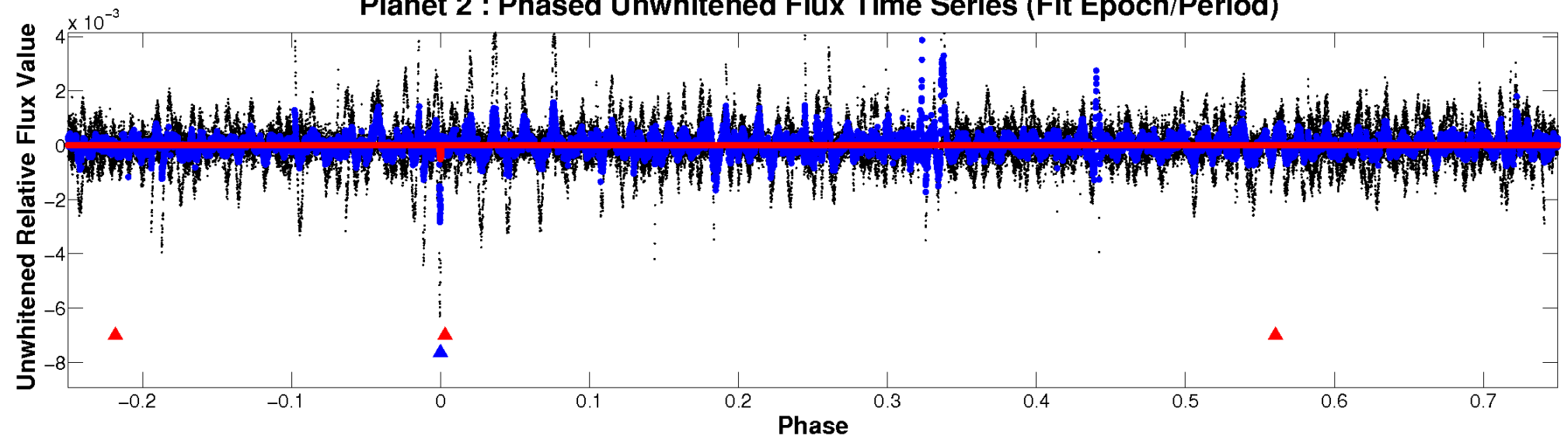
ALT Odd/Even

TCE 009413313-02

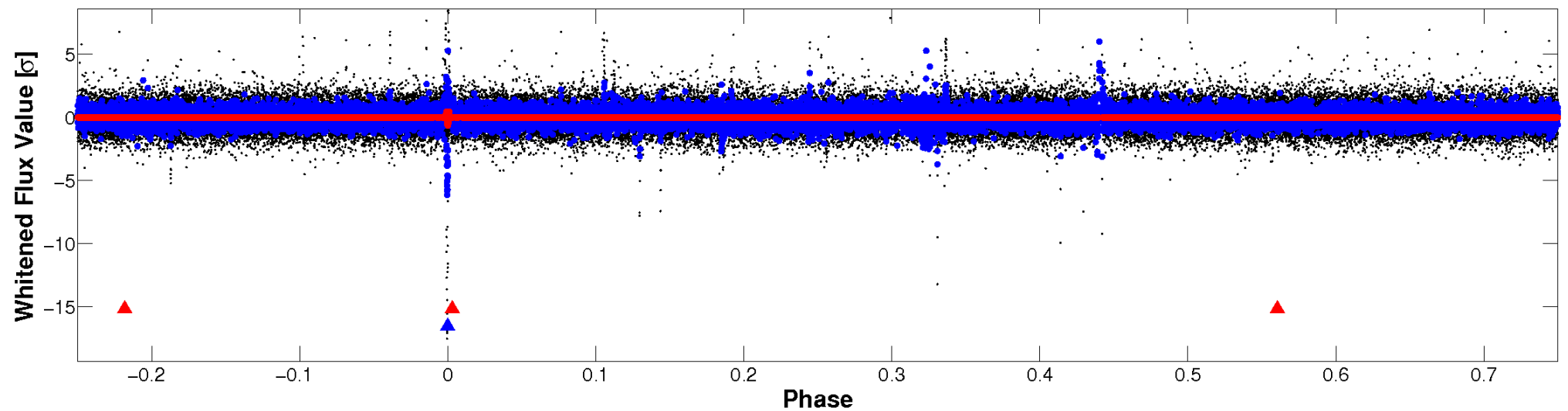


Non-Whitened Vs. Whitened Light Curve

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

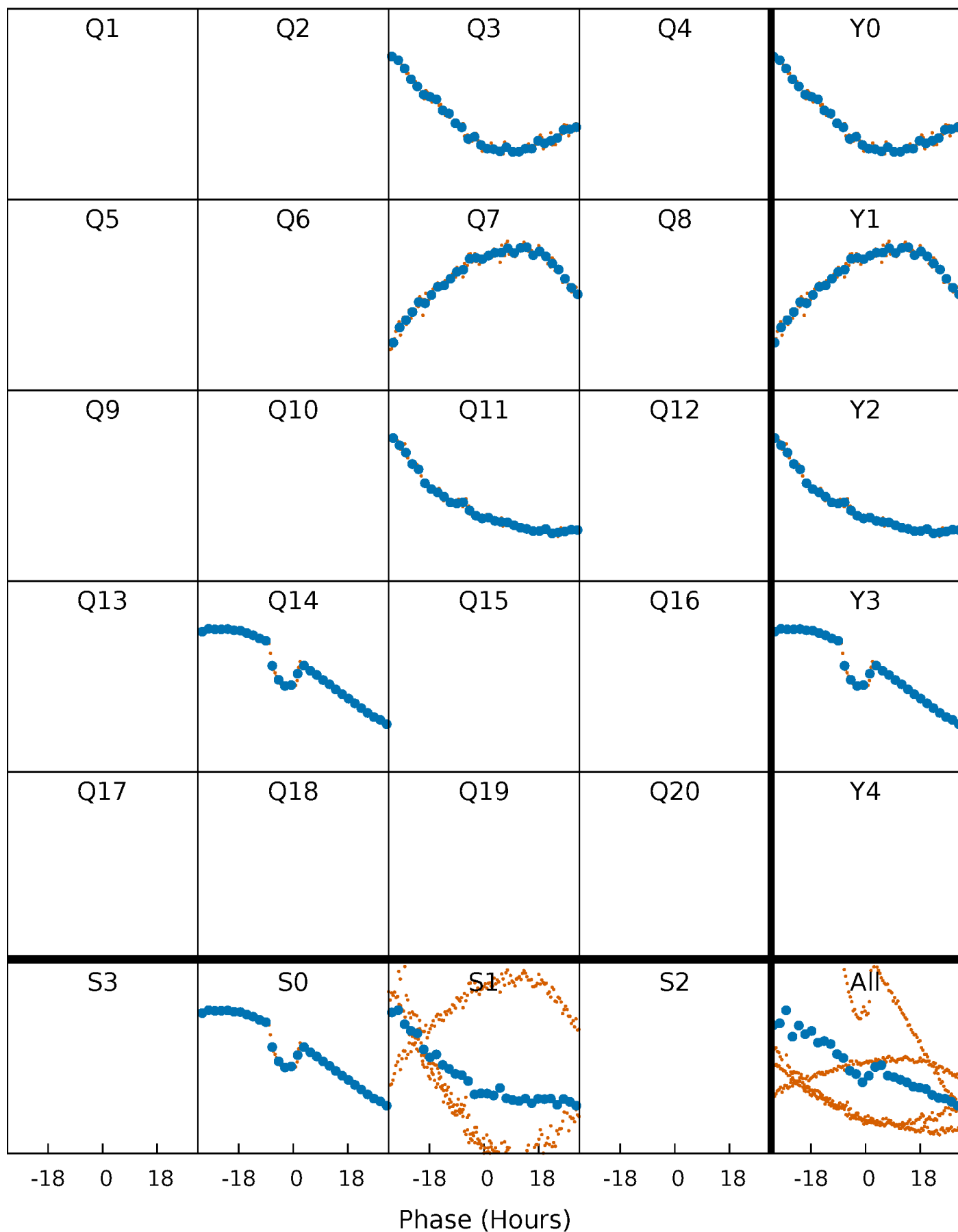


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



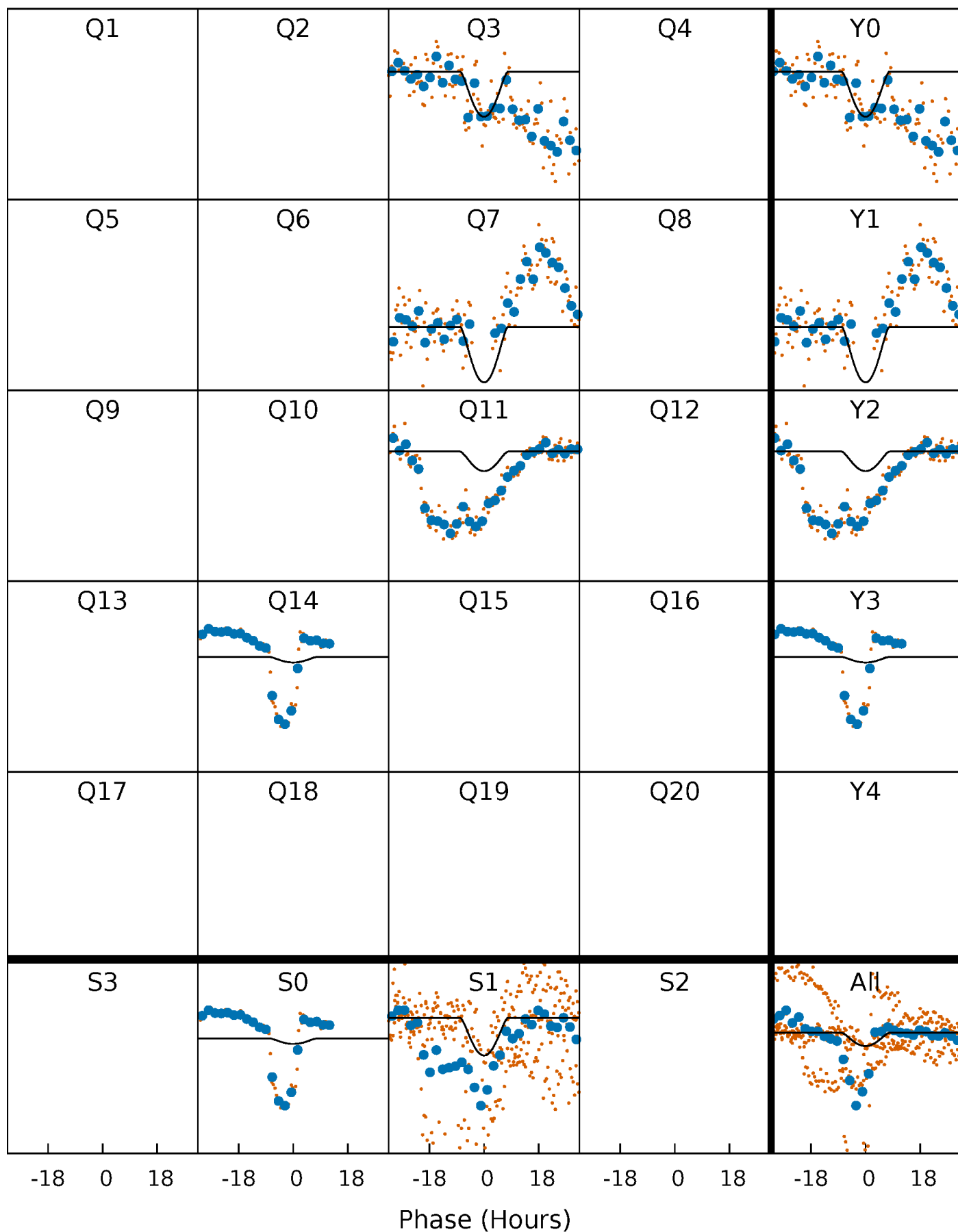
PDC Quarter-Phased Transit Curves

TCE 009413313-02 $P=361.104304$ Days $T_0=283.214569$ (BKJD)



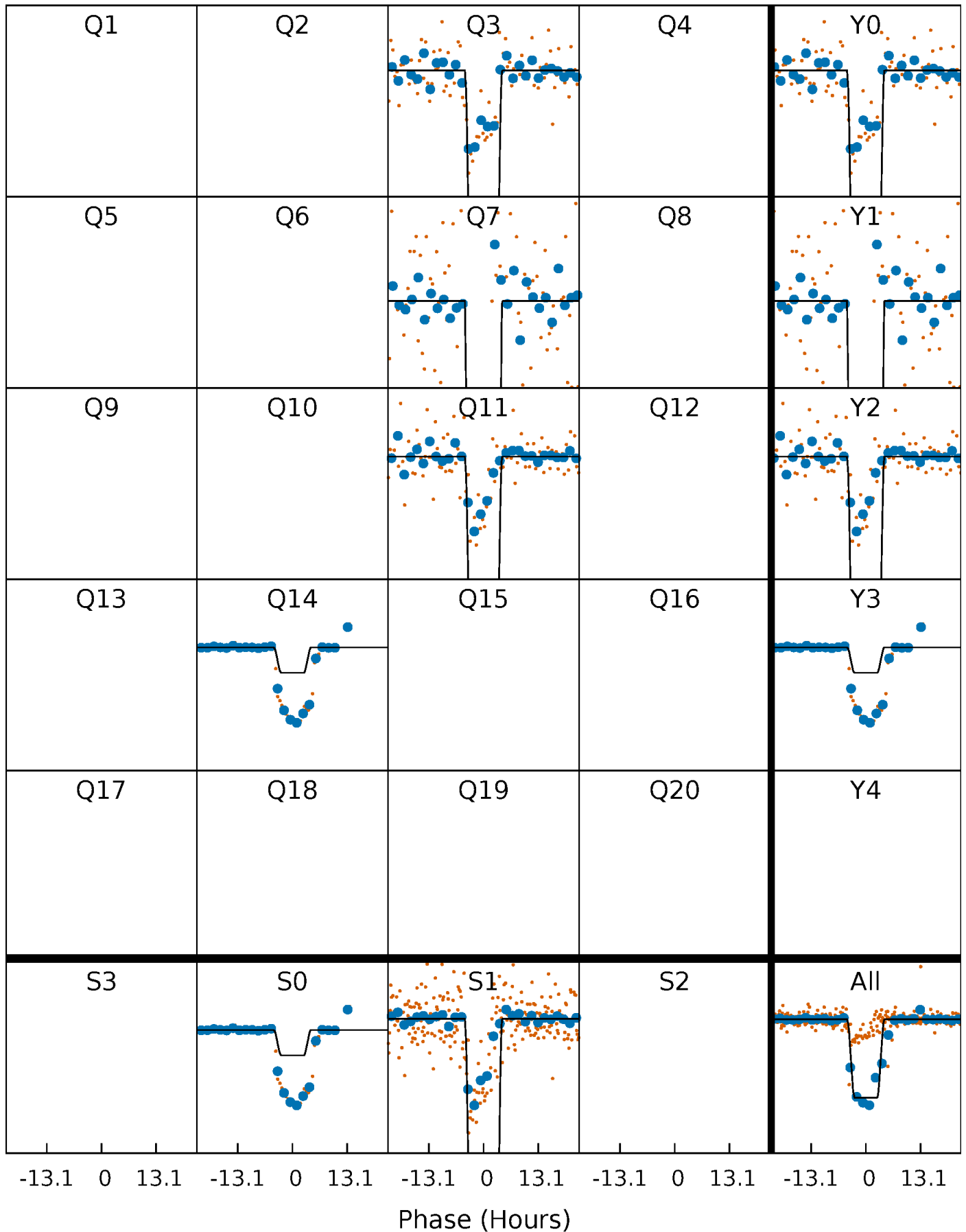
DV Quarter-Phased Transit Curves

TCE 009413313-02 P=361.104304 Days $T_0=283.214569$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

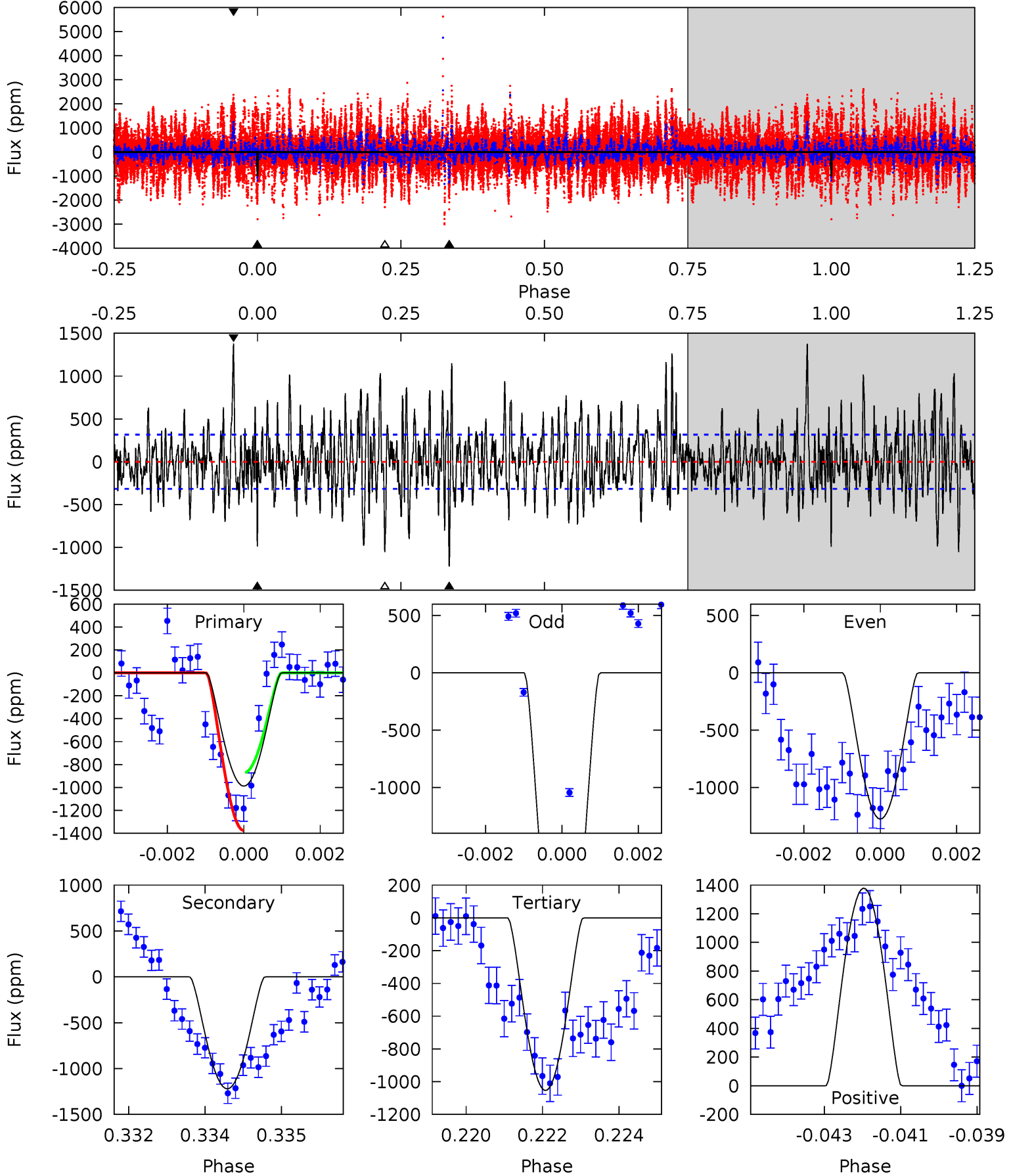
TCE 009413313-02 P=361.013327 Days $T_0=283.341095$ (BKJD)



DV Model-Shift Uniqueness Test

009413313-02, P = 361.104304 Days, E = 283.214569 Days

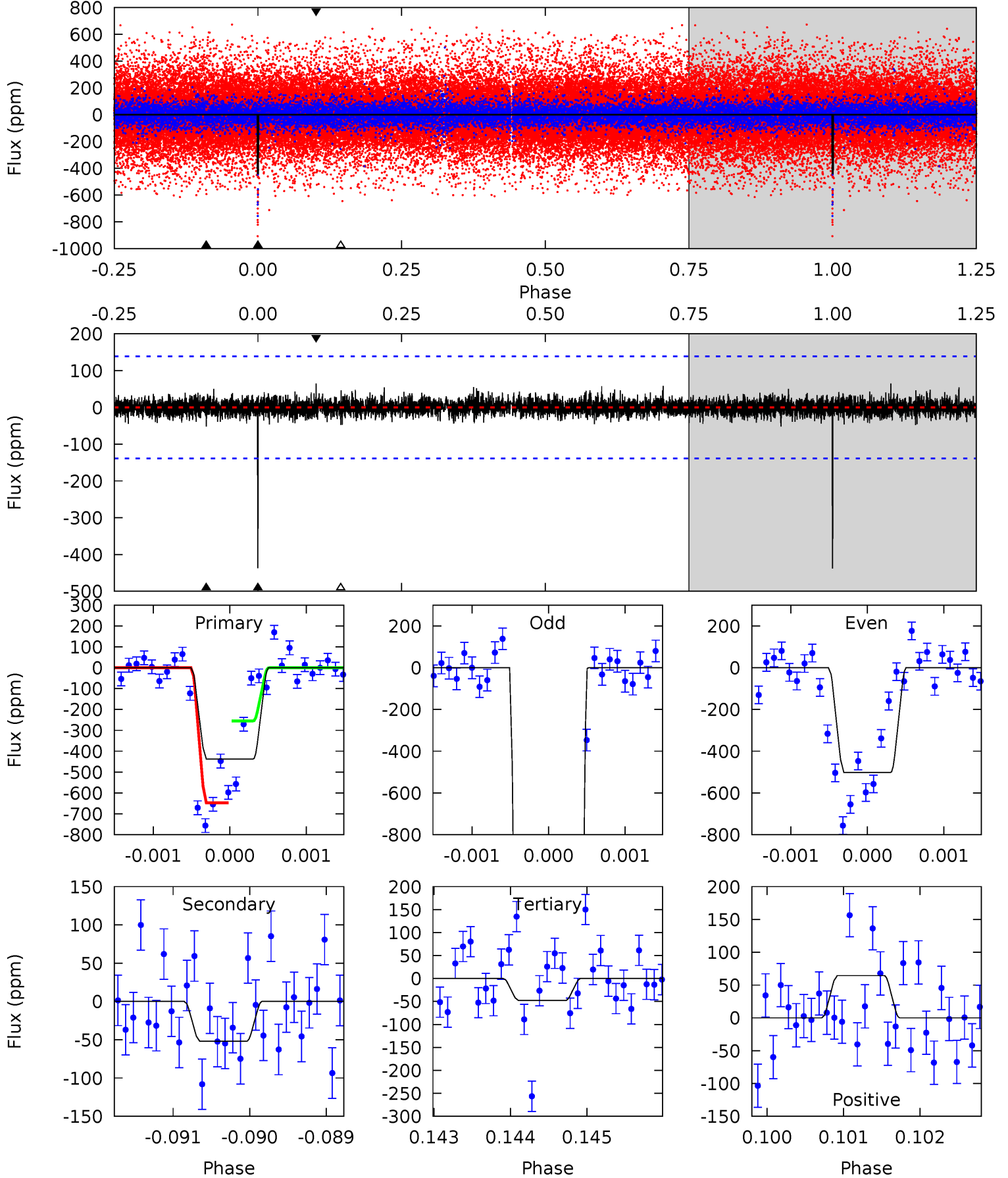
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.6	20.6	17.7	23.2	5.34	3.11	5.34	-1.10	-6.57	2.81	-2.65	13.7	1.24	0.53	4.28



Alt Model-Shift Uniqueness Test

009413313-02, P = 361.013327 Days, E = 283.341095 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.2	2.04	1.88	2.53	5.45	3.29	0.50	15.3	14.6	0.15	-0.49	141.8	4.25	0.13	0



Stellar Parameters For KIC 009413313

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5359^{+159}_{-159}	$4.403^{+0.160}_{-0.260}$	$0.020^{+0.300}_{-0.250}$	$0.950^{+0.319}_{-0.159}$	$0.832^{+0.105}_{-0.067}$	$1.366^{+0.866}_{-0.785}$
	+3%/-3%	+4%/-6%	+1500%/-1250%	+34%/-17%	+13%/-8%	+63%/-57%
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 009413313-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1221 ± 59	$13.66^{+14.93}_{-9.59}$	335^{+28}_{-21}	3313^{+1782}_{-608}	3156^{+32848}_{-2421}
Alt.	-52 ± 25	$15.45^{+16.04}_{-11.01}$	337^{+32}_{-22}	2115^{+749}_{-302}	90^{+1110}_{-71}

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

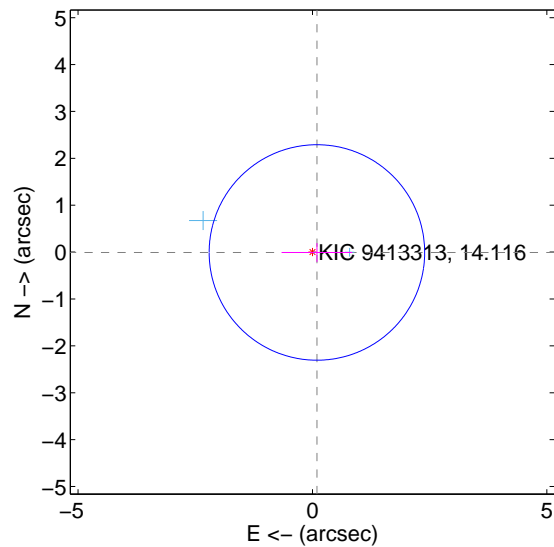
Supplemental centroid analysis for 009413313-02. Kepler magnitude: 14.12. Transit SNR 3.88

There are 3 quarters with good PRF difference image offsets

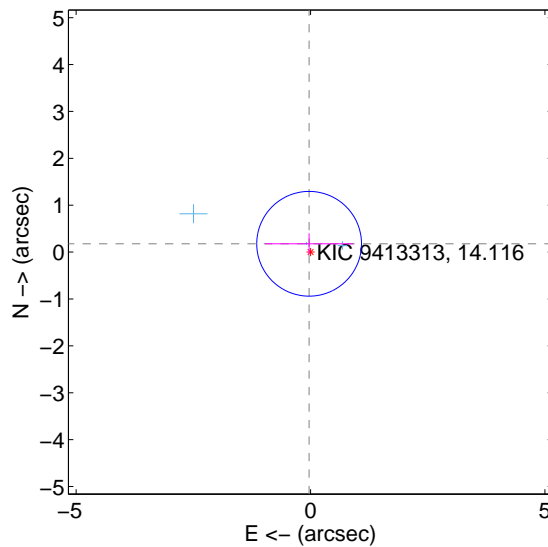
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.096 ± 0.766	0.12	-0.095 ± 0.754	-0.008 ± 0.200
PRF-fit source offset from KIC position	0.180 ± 0.372	0.48	0.030 ± 0.945	0.177 ± 0.224
photometric centroid source offset	1.41 ± 0.97	1.46	0.40 ± 0.99	1.35 ± 0.96

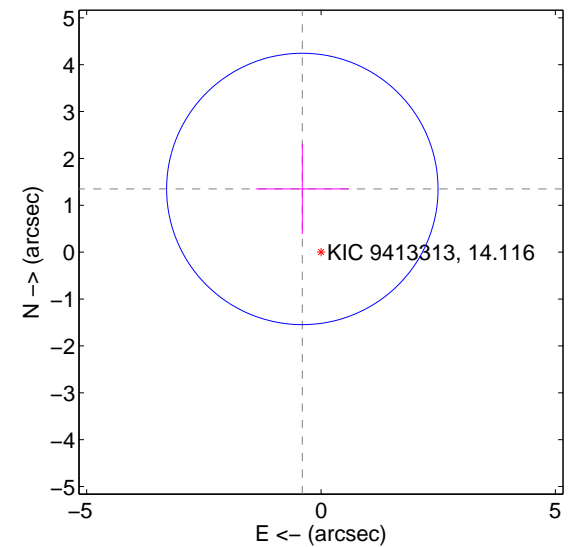
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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

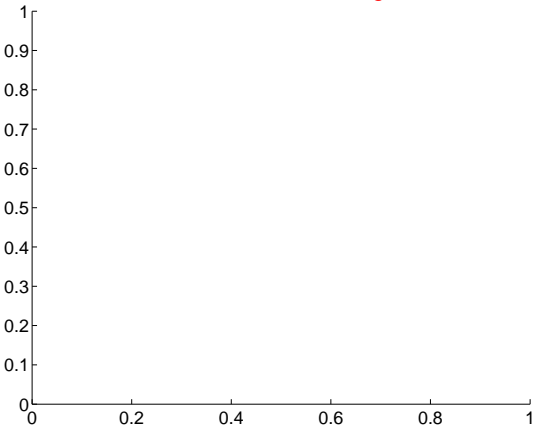
Q1 no difference image



Q1 no OOT image



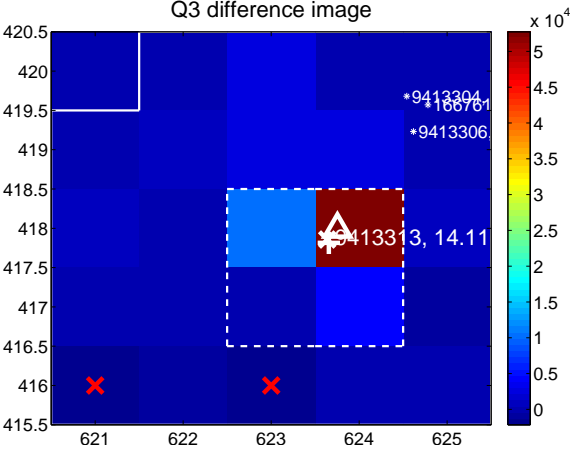
Q2 no difference image



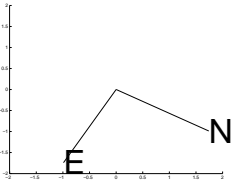
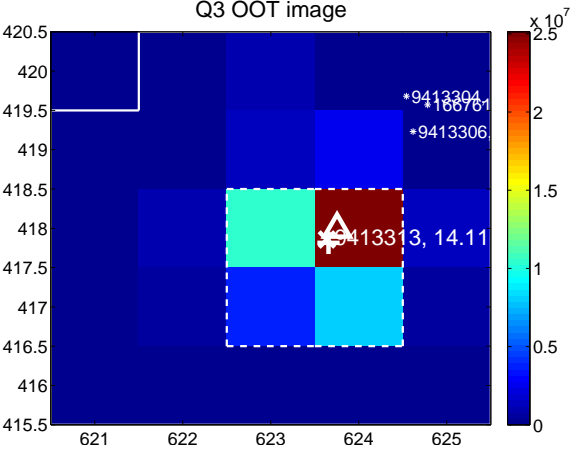
Q2 no OOT image



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.

Q9 no difference image



Q9 no OOT image



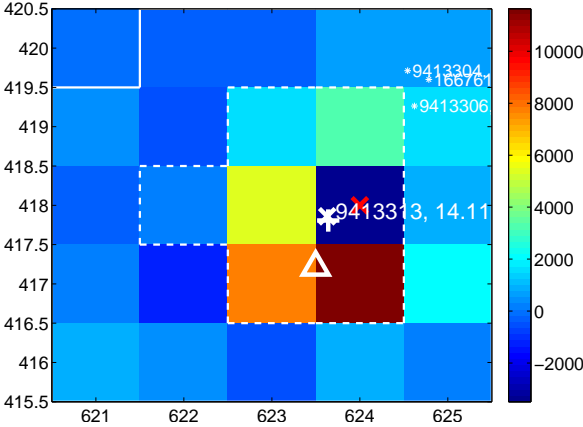
Q10 no difference image



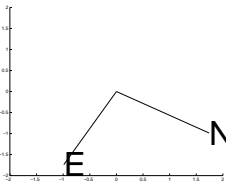
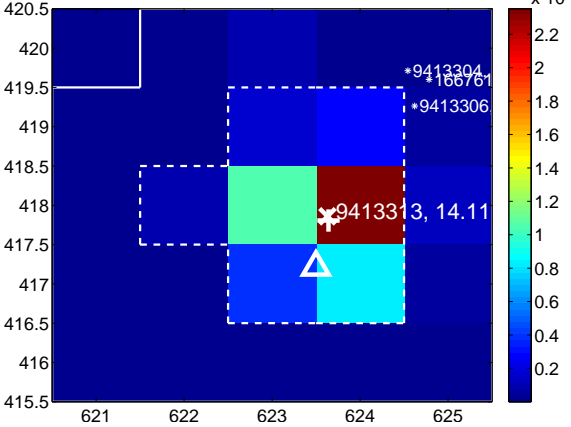
Q10 no OOT image



Q11 difference image



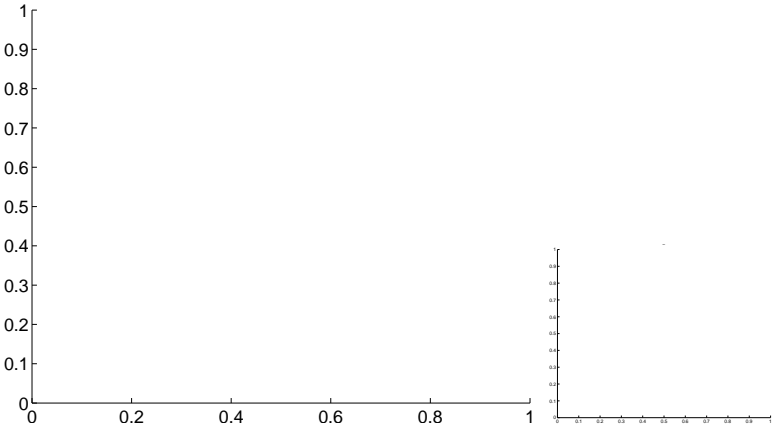
Q11 OOT image



Q12 no difference image

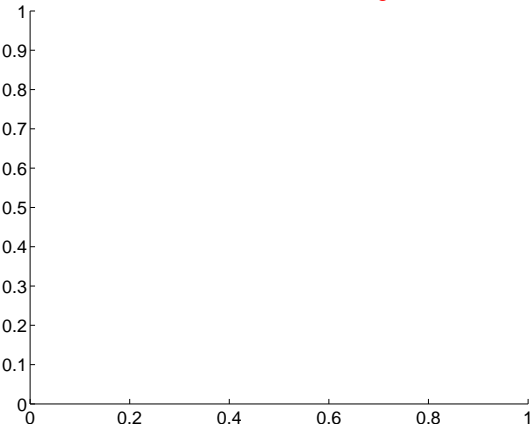


Q12 no OOT image

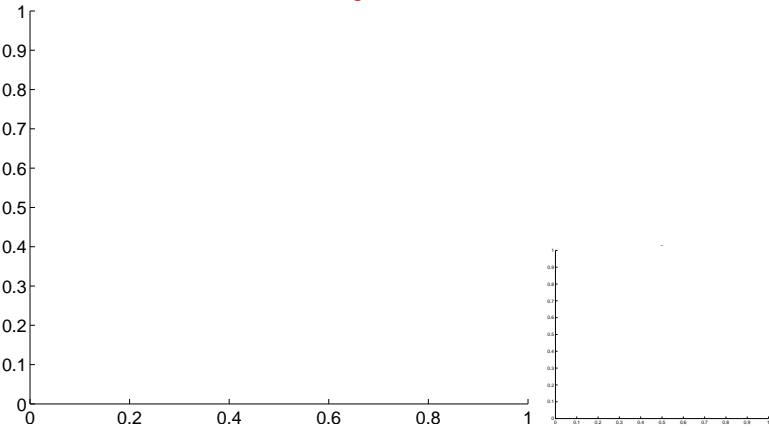


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

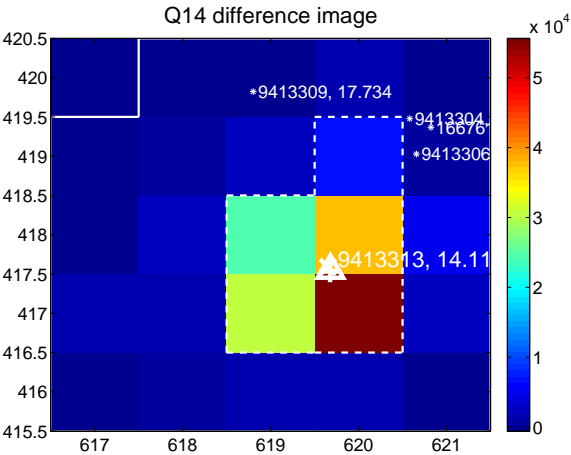
Q13 no difference image



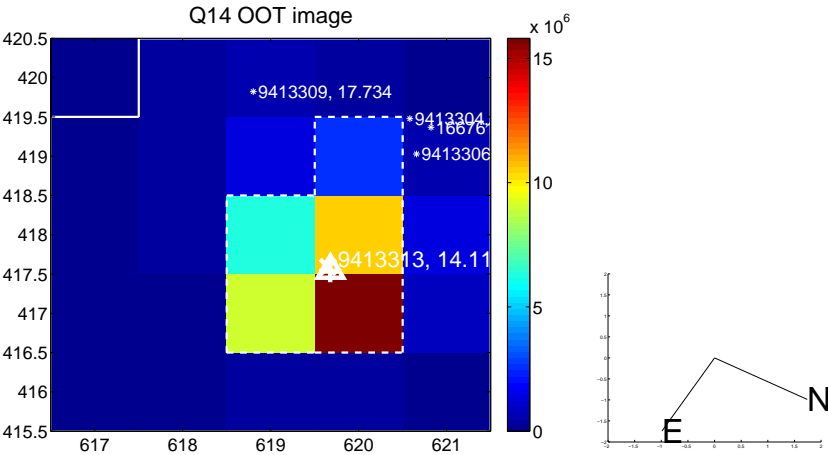
Q13 no OOT image



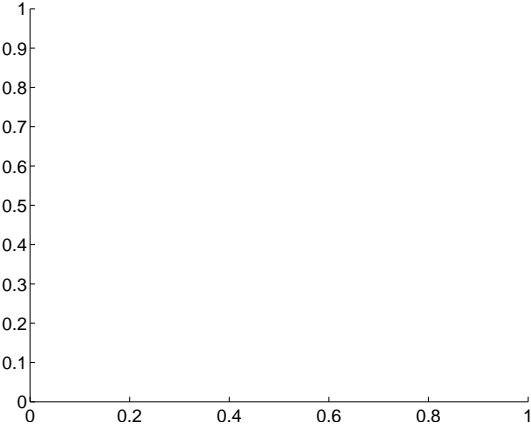
Q14 difference image



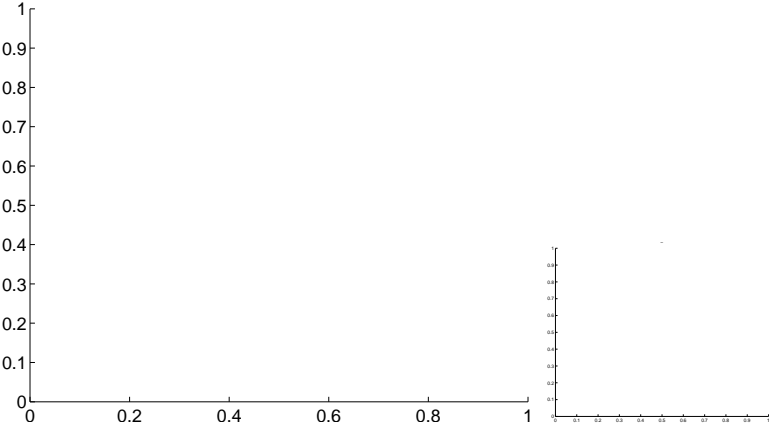
Q14 OOT image



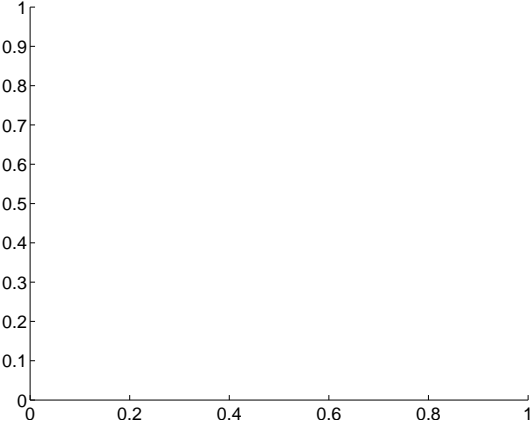
Q15 no difference image



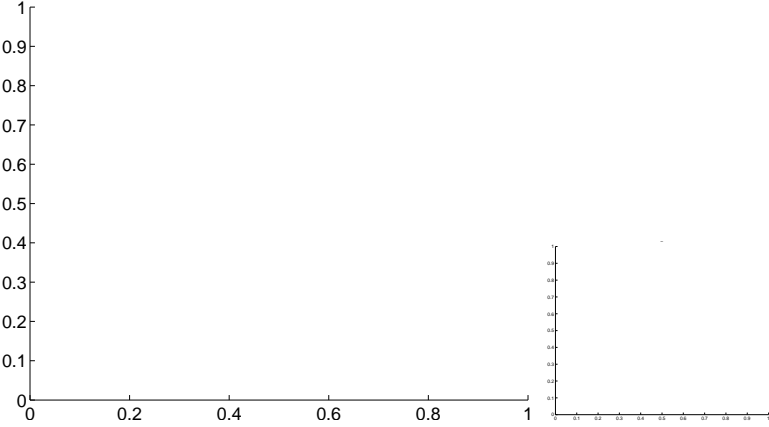
Q15 no OOT image



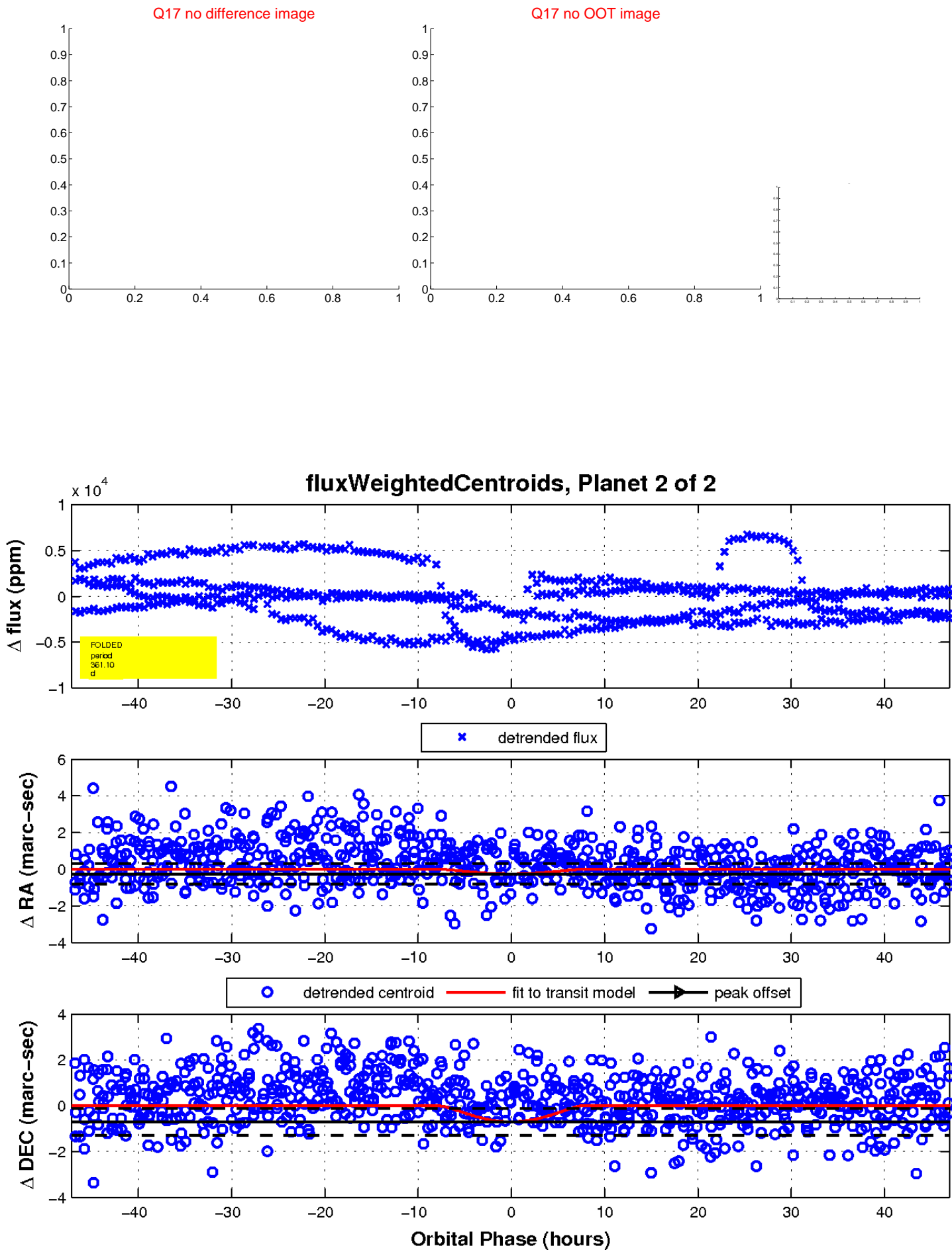
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

