

KIC 009833666

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})
009833666-01	OBS	No	488.789685	562.770129	1113.3	9.624	16.4	9.7	2.70	5624	8.95	3.59
009833666-03	OBS	No	359.740792	392.910026	546.9	6.230	15.4	5.3	2.70	5624	7.76	5.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009833666-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED
009833666-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

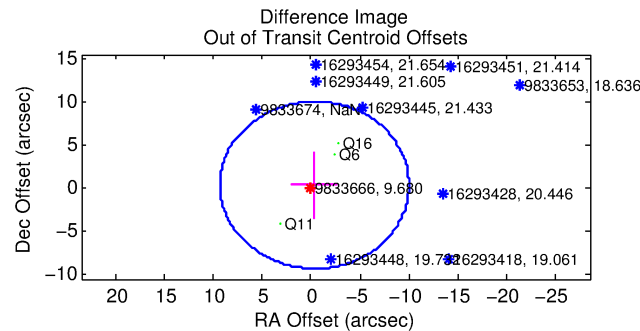
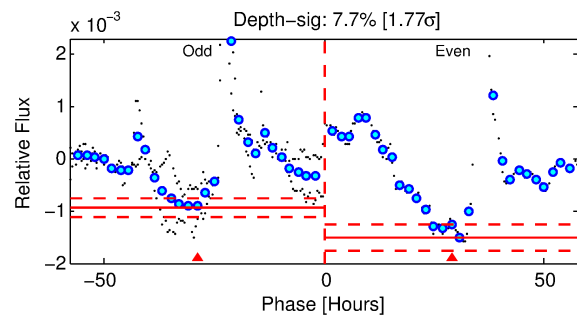
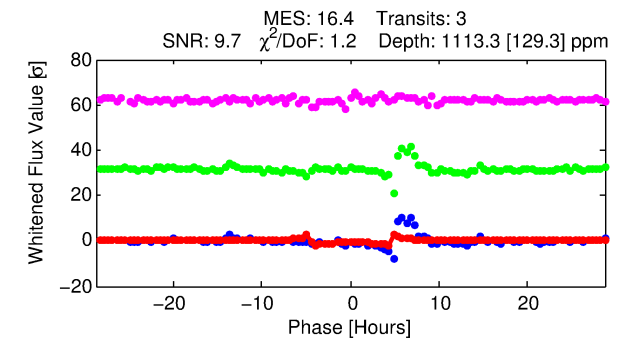
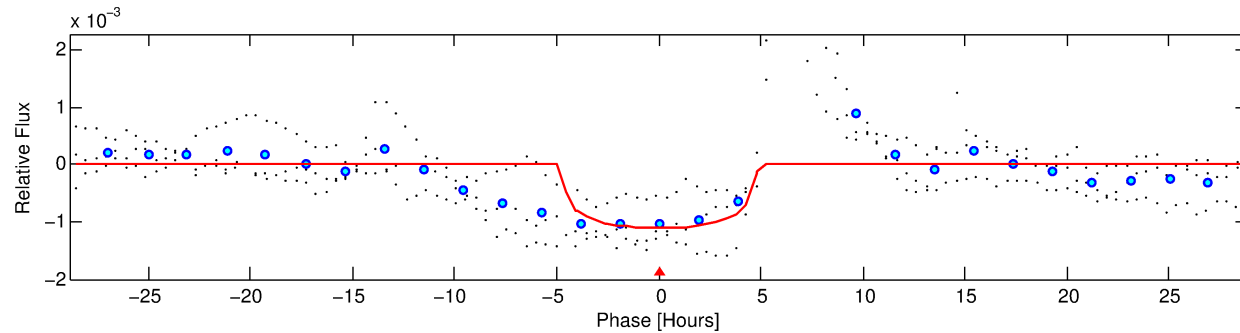
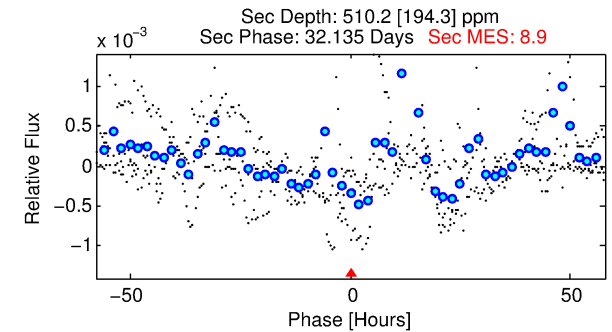
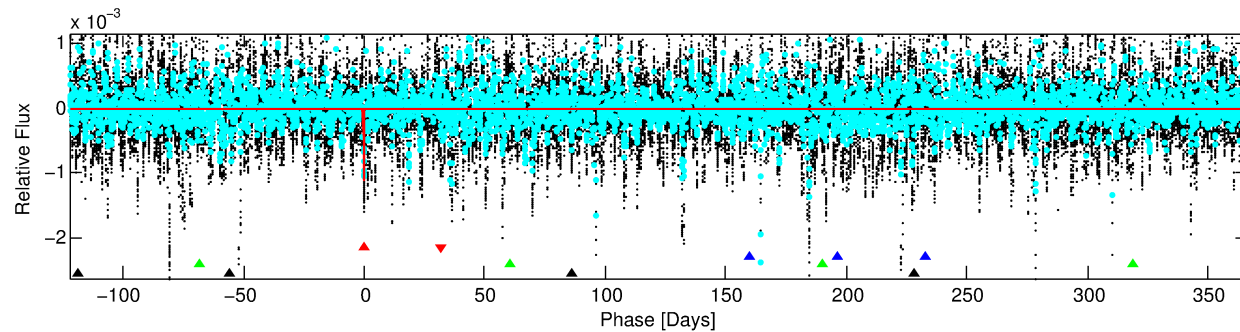
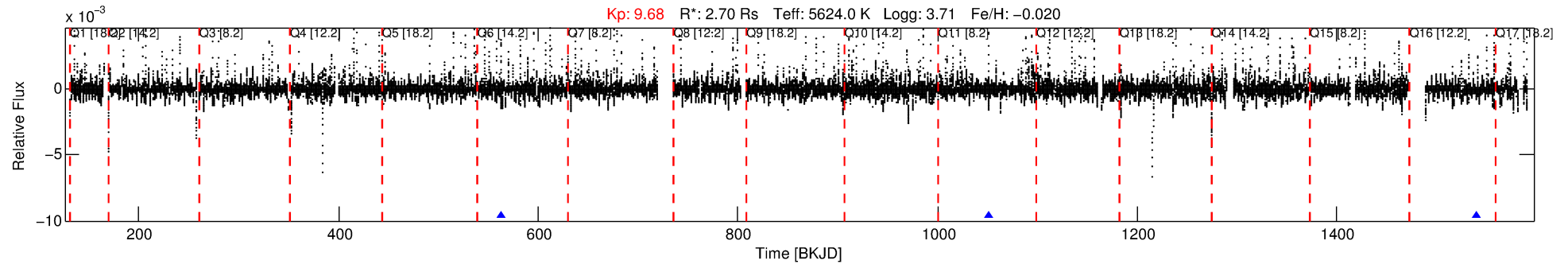
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009833666-01

No Significant Match Found

DV One-Page Summary

KIC: 9833666 Candidate: 1 of 4 Period: 488.790 d



DV Fit Results:

Period = 488.78969 [0.00279] d
Epoch = 562.7701 [0.0038] BKJD
Rp/R* = 0.0303 [0.0205]
a/R* = 390.27 [1099.74]
b = 0.22 [12.08]
Seff = 3.59 [4.13]
Teq = 351 [101] K
Rp = 8.95 [8.16] Re
a = 1.3497 [0.9083] AU
Ag = 6390.40 [11577.49] [0.55 σ]
Teffp = 4853 [1708] K [2.63 σ]

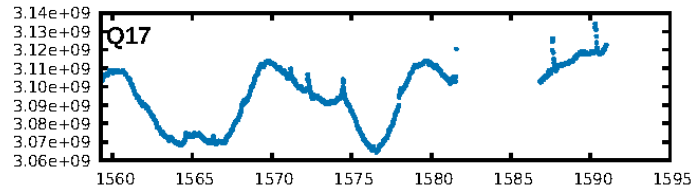
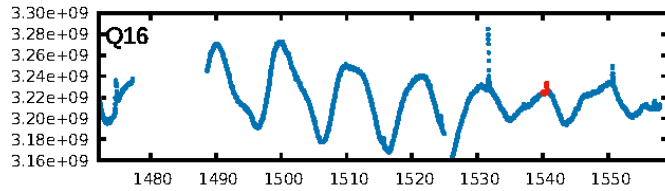
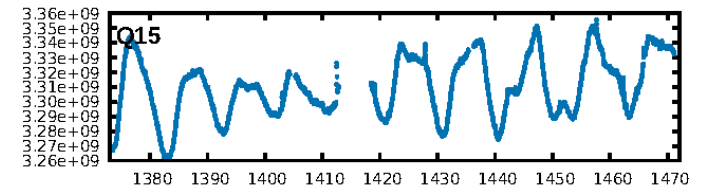
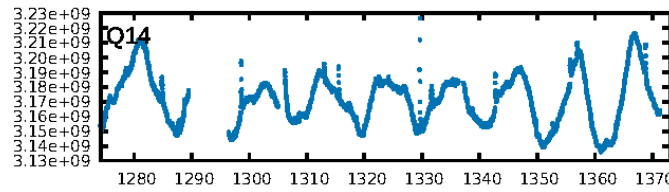
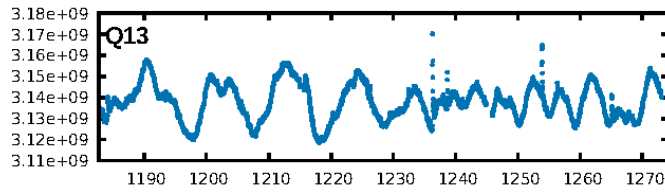
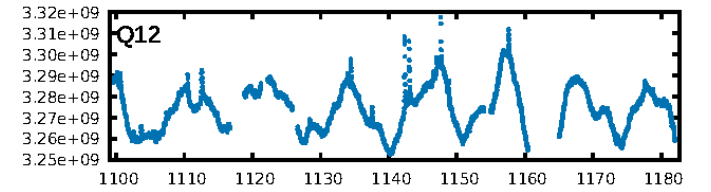
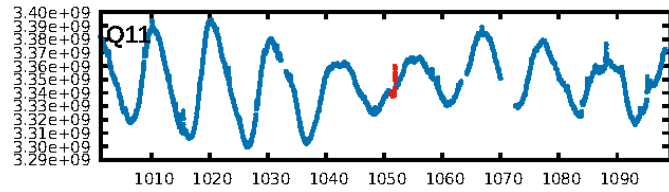
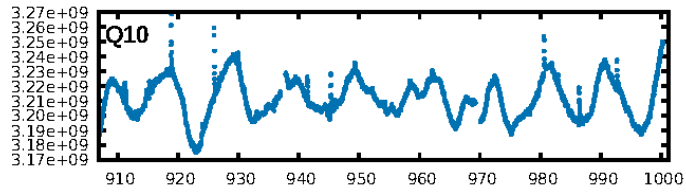
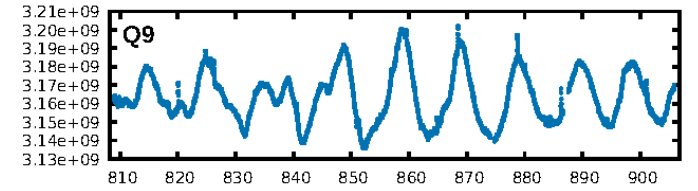
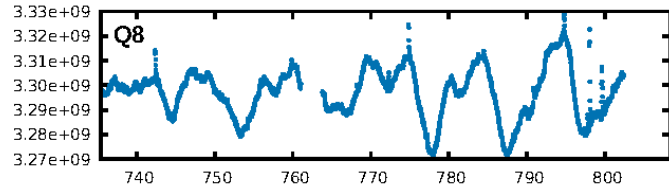
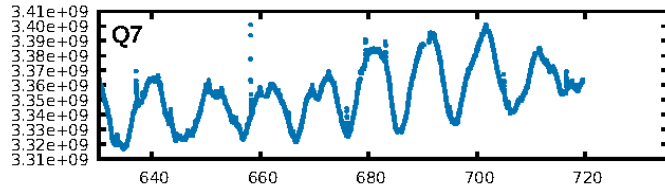
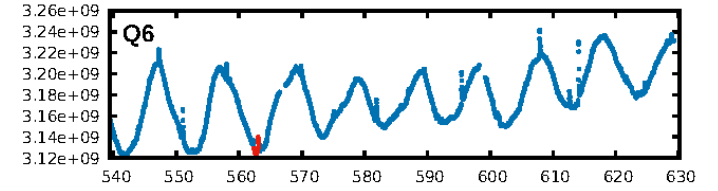
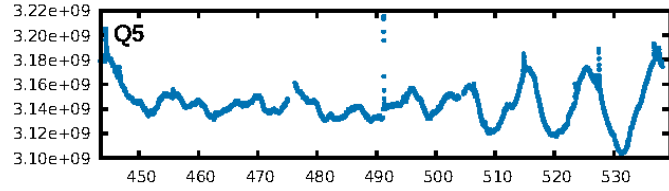
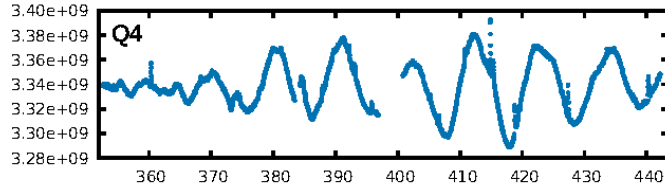
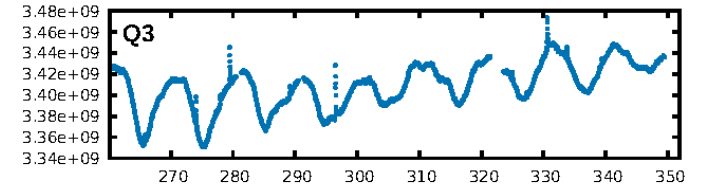
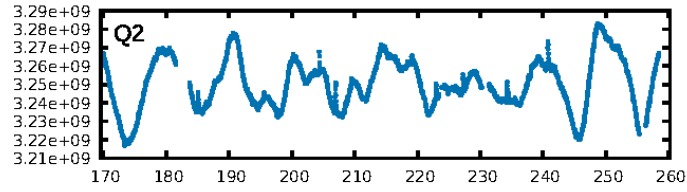
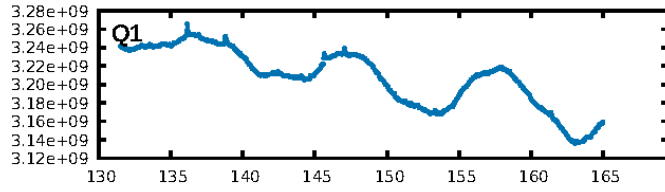
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [270.15 σ]
LongPeriod-sig: 100.0% [76.11 σ]
ModelChiSquare2-sig: 23.7%
ModelChiSquareGof-sig: 95.2%
Bootstrap-pfa: 1.12e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 47.5%
Centroid-so: 0.538 arcsec [1.91 σ]
OotOffset-rm: 0.496 arcsec [0.15 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.582 arcsec [0.31 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

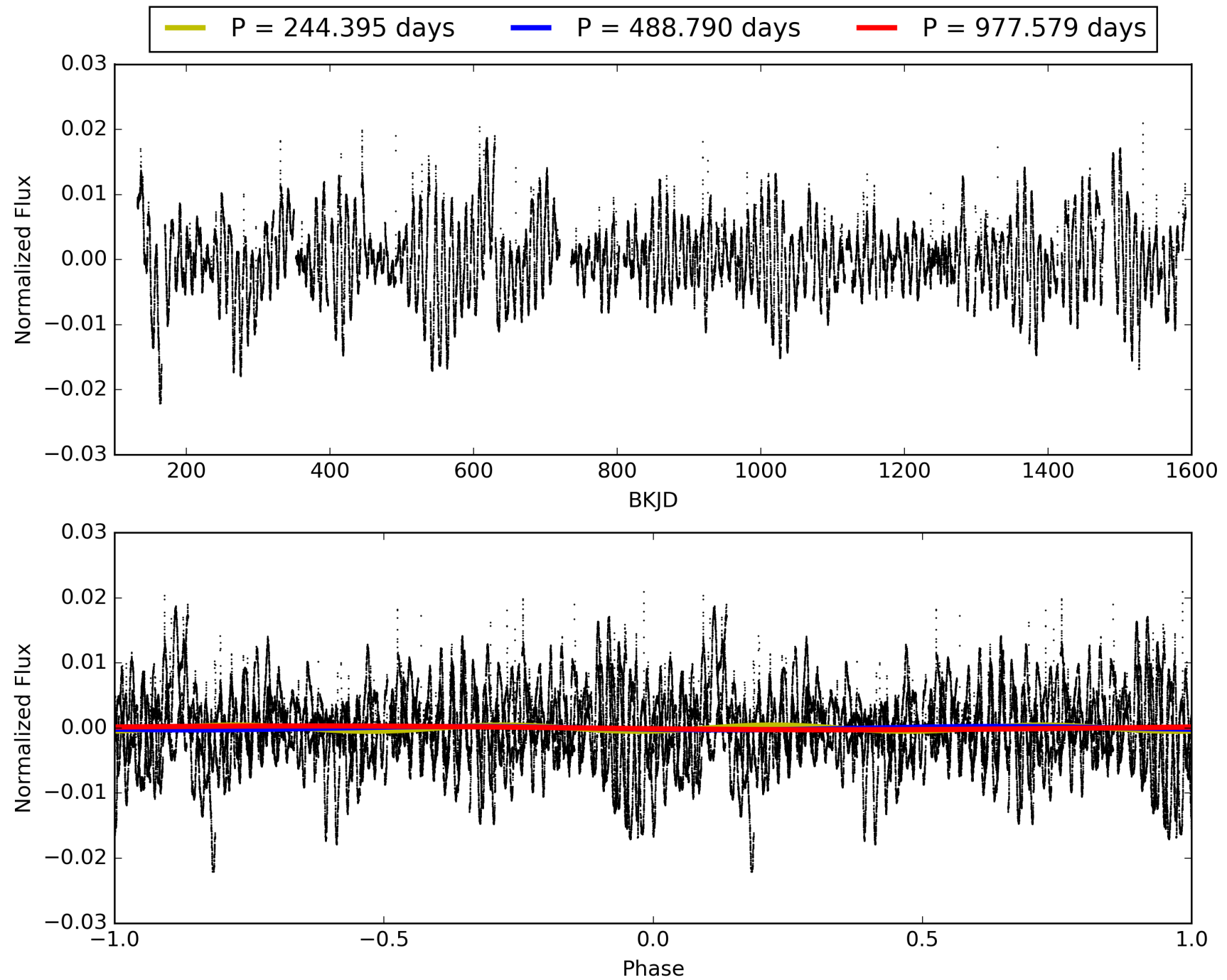
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:45:51 Z

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

TCE 009833666-01, PDC Light Curves

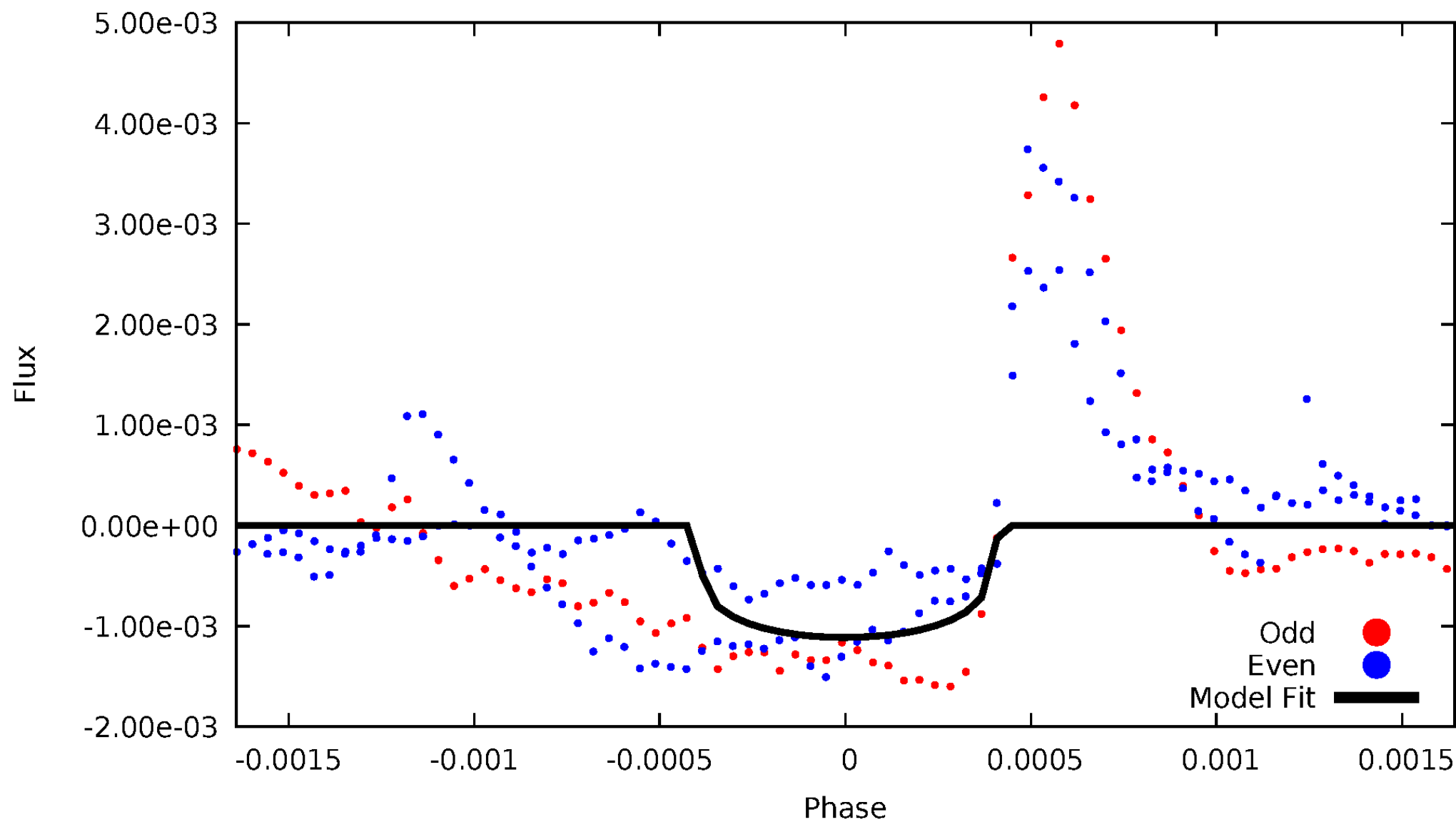


TCE 009833666-01



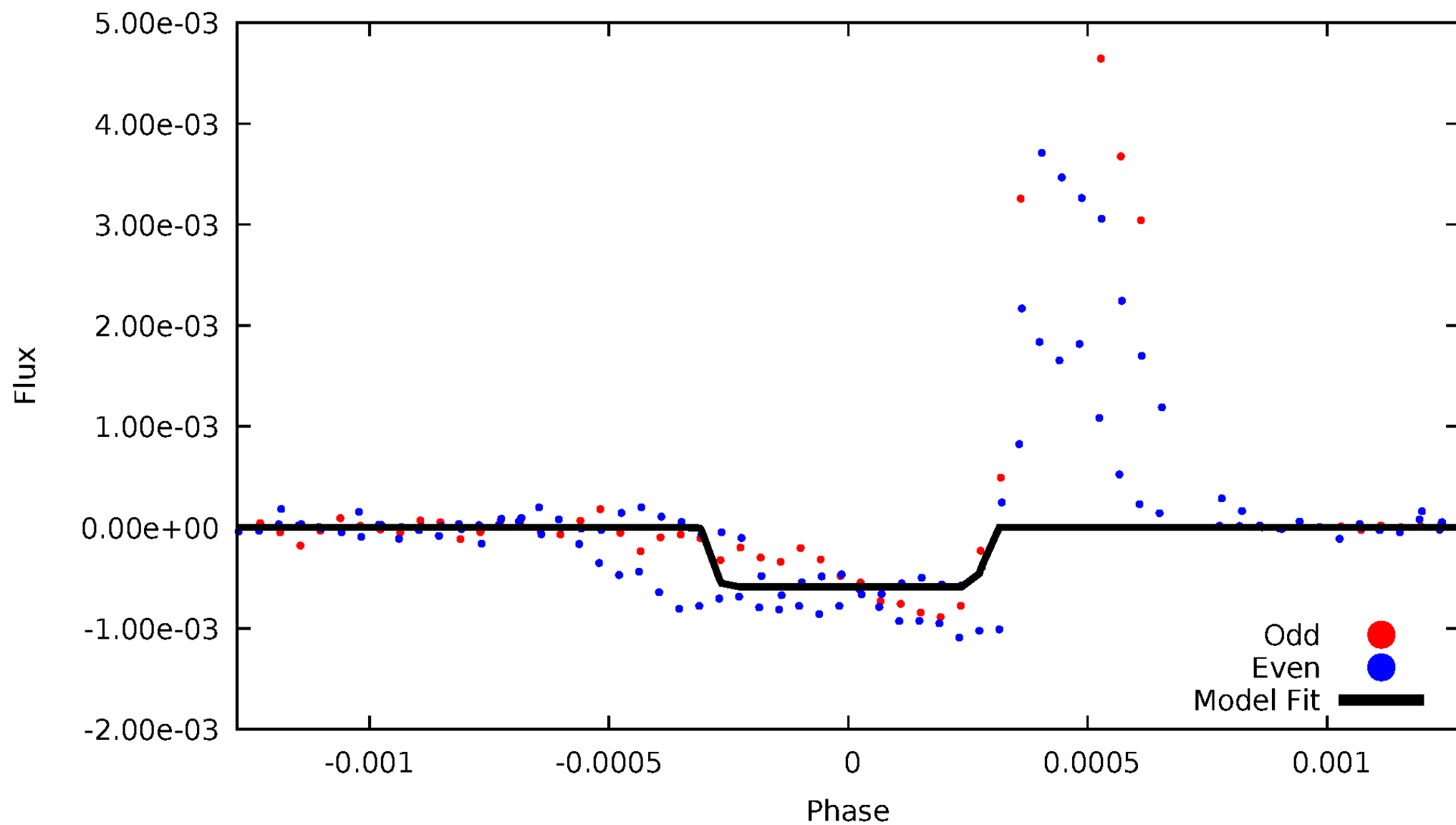
DV Odd/Even

TCE 009833666-01



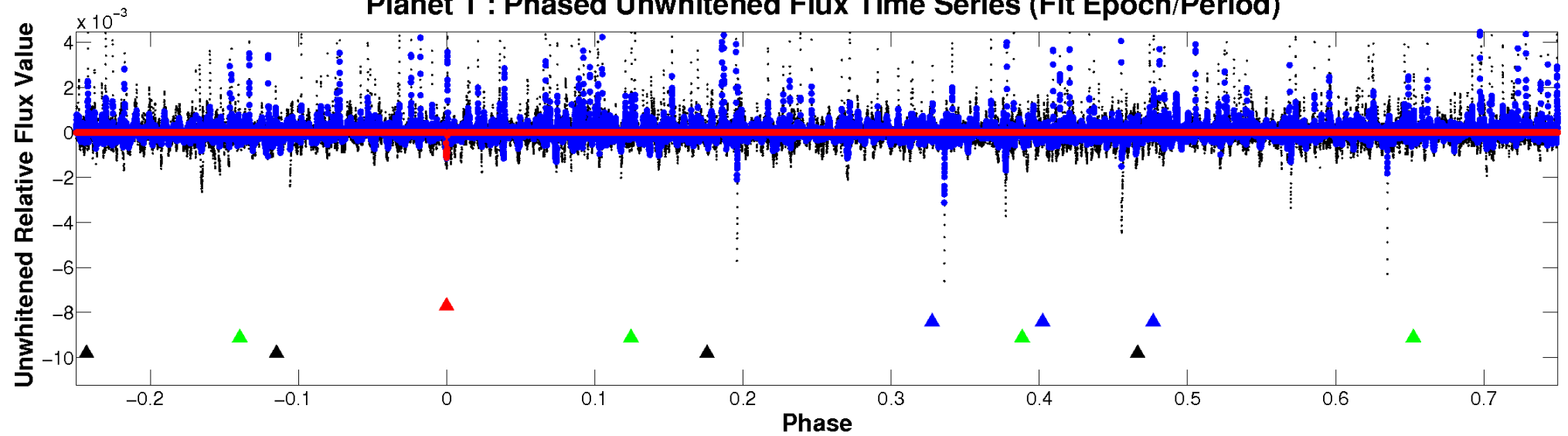
ALT Odd/Even

TCE 009833666-01

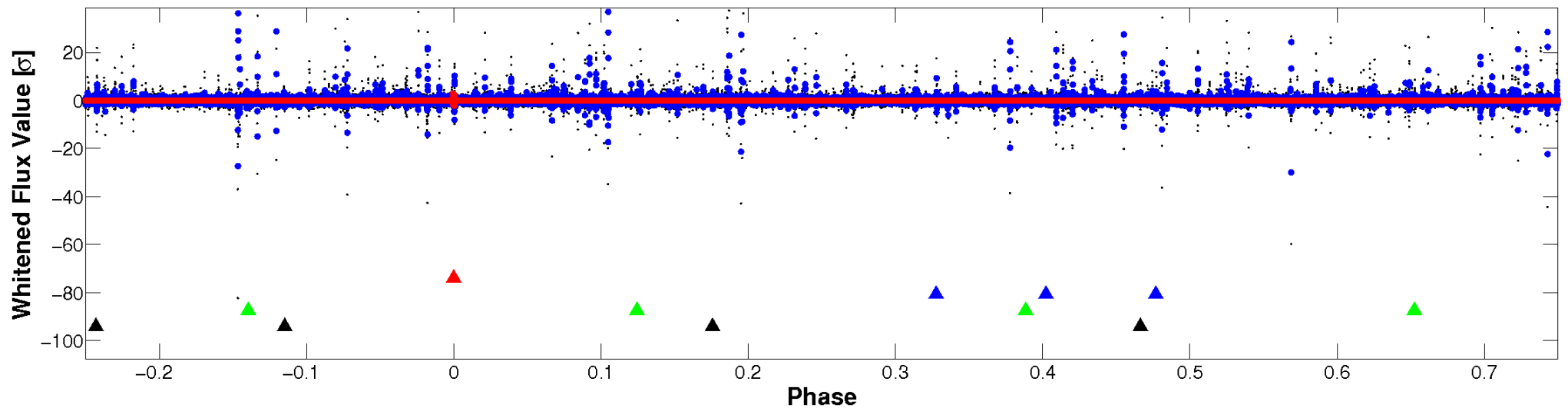


Non-Whitened Vs. Whitened Light Curve

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

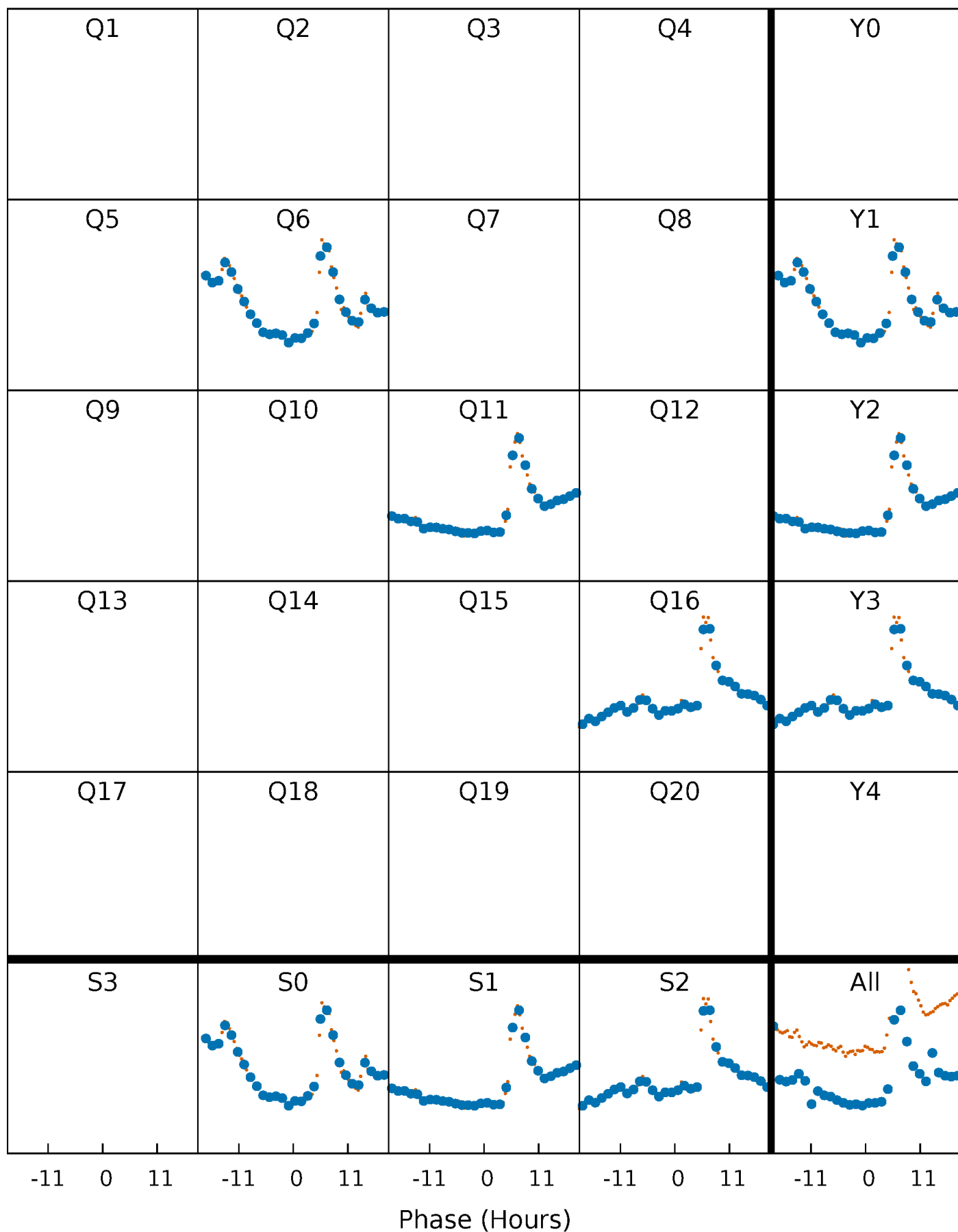


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



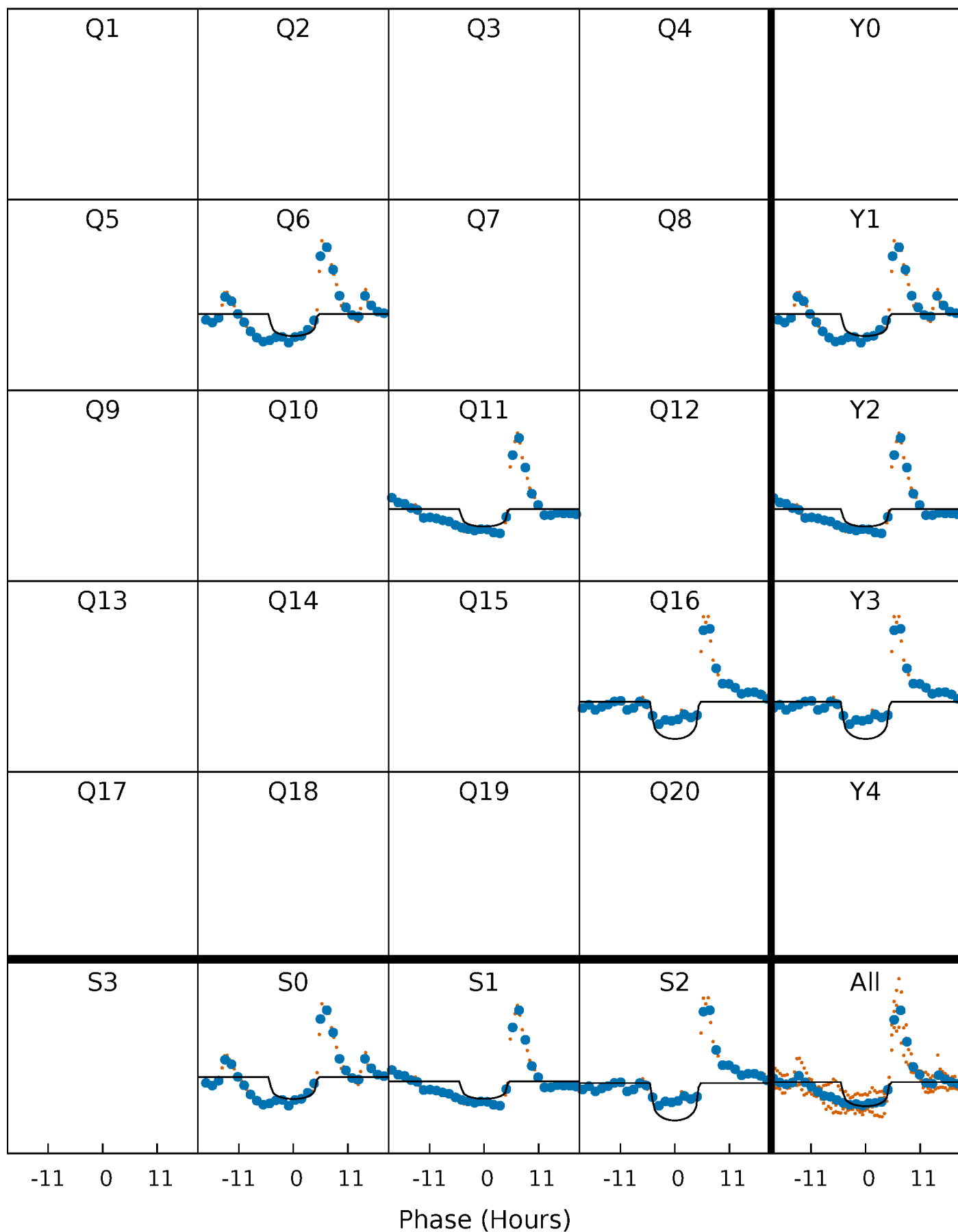
PDC Quarter-Phased Transit Curves

TCE 009833666-01 P=488.789686 Days $T_0=562.770129$ (BKJD)



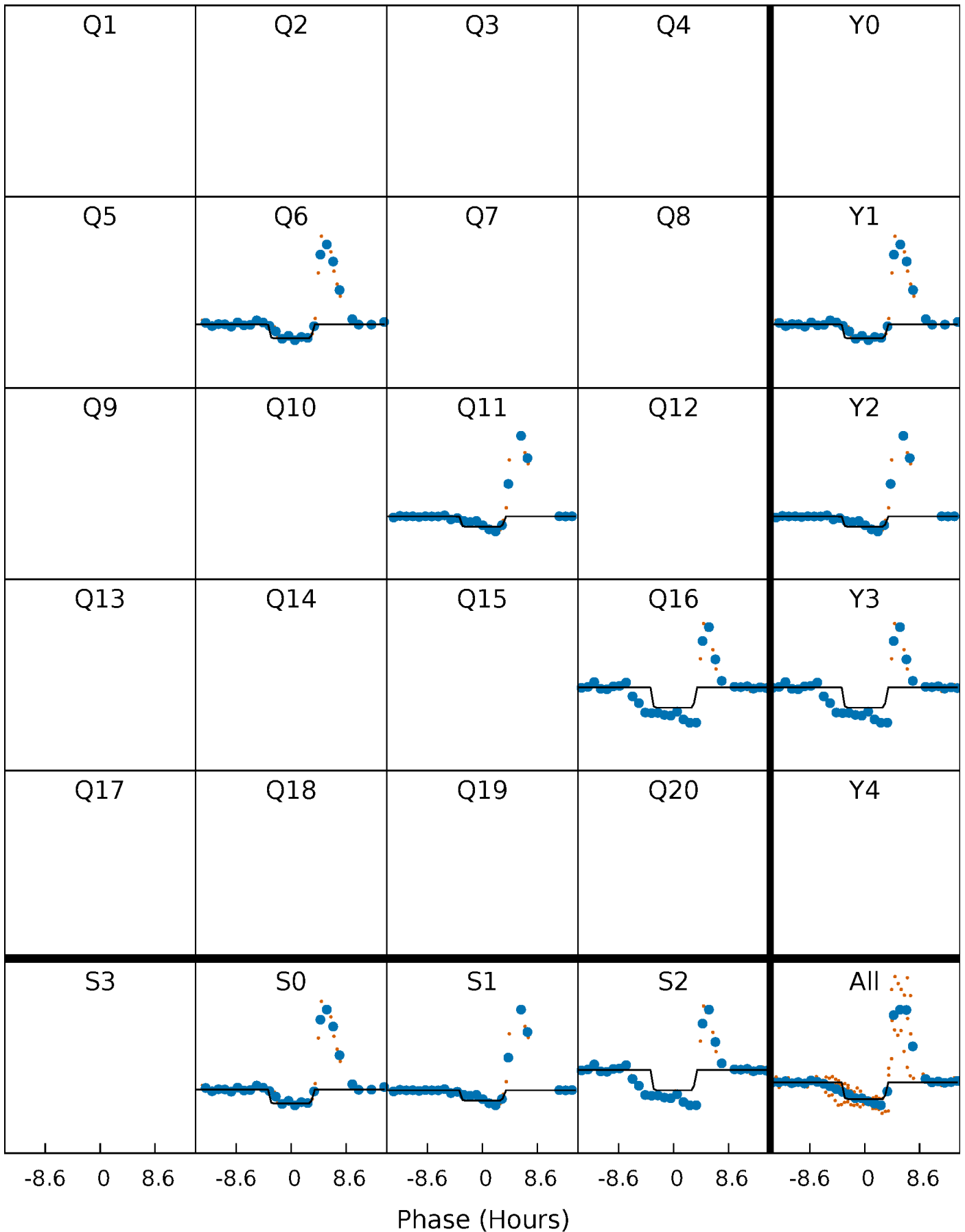
DV Quarter-Phased Transit Curves

TCE 009833666-01 P=488.789686 Days $T_0=562.770129$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

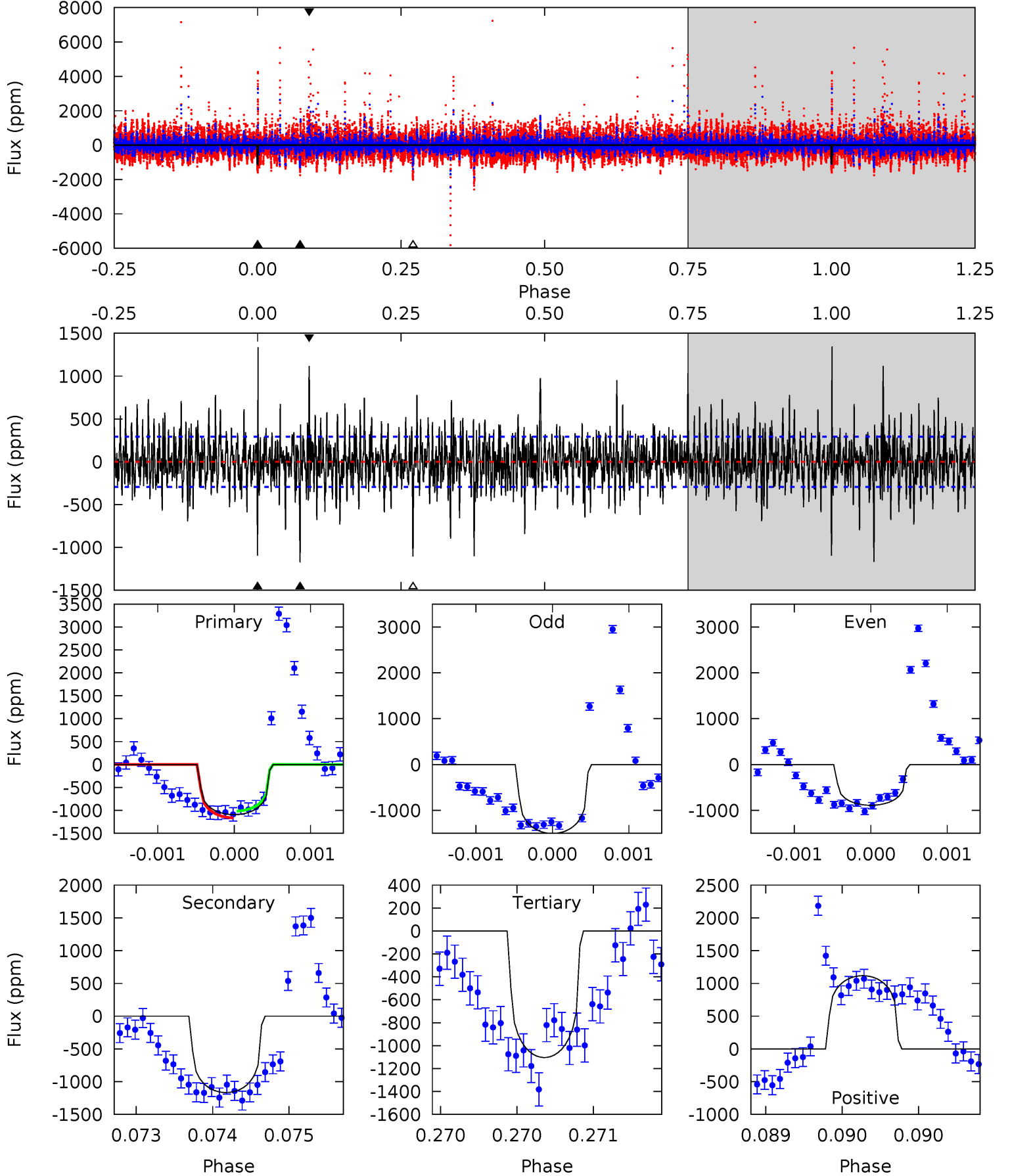
TCE 009833666-01 P=488.791189 Days $T_0=562.812697$ (BKJD)



DV Model-Shift Uniqueness Test

009833666-01, $P = 488.789686$ Days, $E = 73.980443$ Days

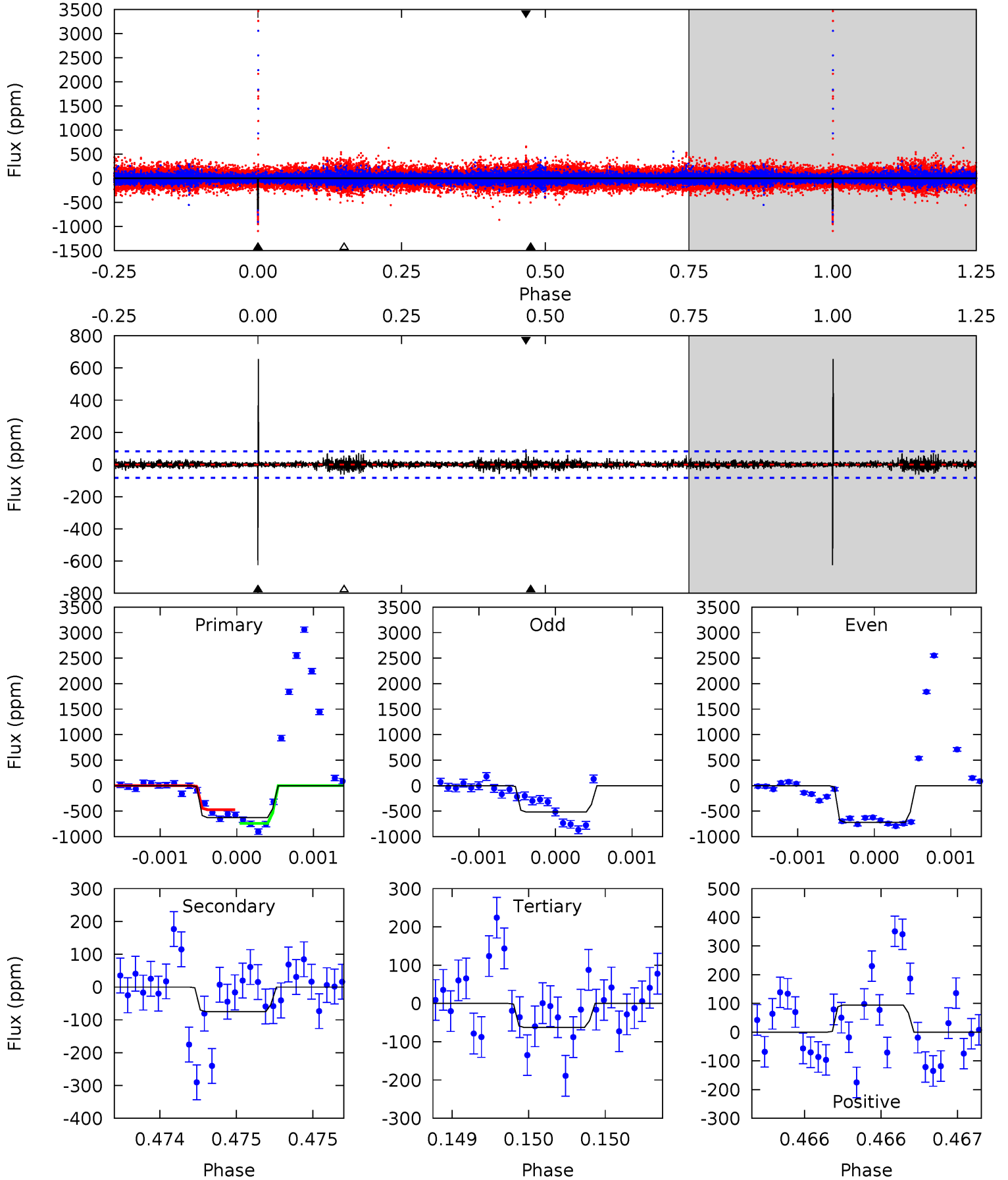
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.4	21.8	20.6	20.9	5.47	3.33	4.30	-0.19	-0.44	1.18	0.92	3.92	0.91	0.53	1.37



Alt Model-Shift Uniqueness Test

009833666-01, P = 488.791189 Days, E = 74.021508 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.1	5.03	4.21	6.35	5.55	3.44	0.98	37.9	35.7	0.81	-1.32	5.93	1.21	0.51	8.85



Stellar Parameters For KIC 009833666

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5624^{+154}_{-140}	$3.712^{+0.697}_{-0.164}$	$-0.020^{+0.300}_{-0.250}$	$2.702^{+0.709}_{-1.655}$	$1.373^{+0.155}_{-0.466}$	$0.098^{+1.212}_{-0.044}$
	+3%/-2%	+19%/-4%	+1500%/-1250%	+26%/-61%	+11%/-34%	+1236%/-45%
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 009833666-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1167 ± 54	$7.88^{+6.24}_{-4.71}$	479^{+44}_{-84}	5821^{+3773}_{-1145}	17585^{+93708}_{-11826}
Alt.	-75 ± 15	$6.90^{+5.86}_{-4.25}$	481^{+40}_{-76}	3625^{+1590}_{-572}	1557^{+8350}_{-1112}

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

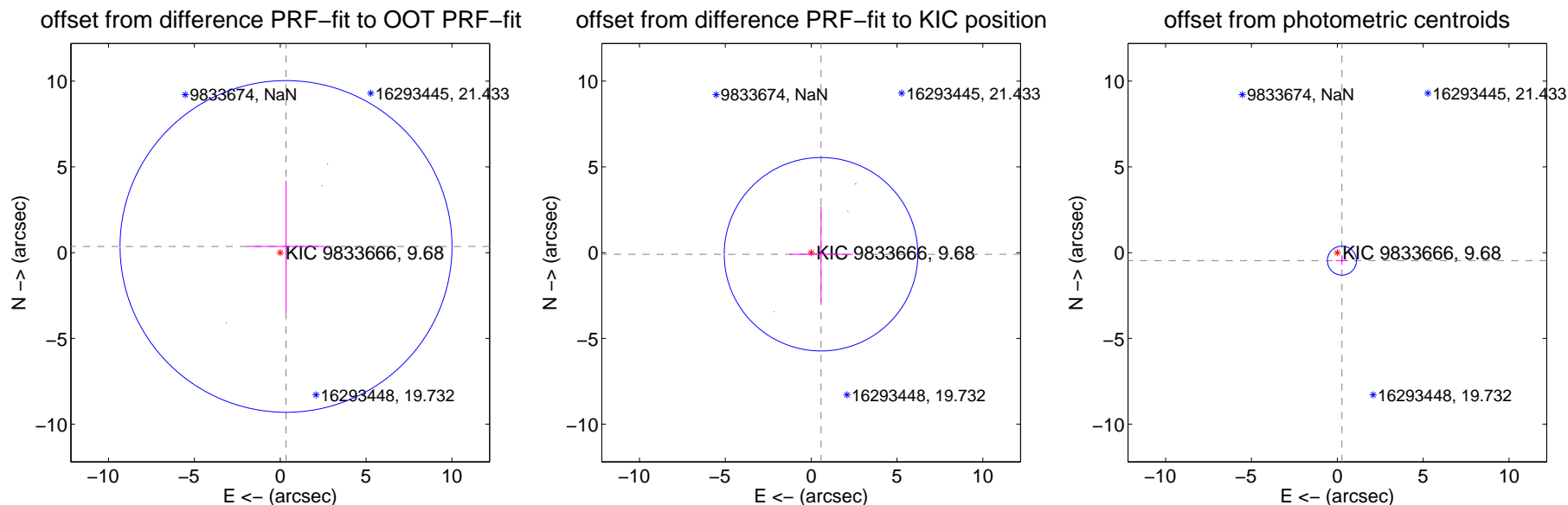
DV Centroid Data

Supplemental centroid analysis for 009833666-01. **Kepler magnitude: 9.68.** Transit SNR 9.65

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 1.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.496 ± 3.223	0.15	-0.338 ± 2.322	0.362 ± 3.840
PRF-fit source offset from KIC position	0.582 ± 1.880	0.31	-0.575 ± 1.849	-0.093 ± 2.809
photometric centroid source offset	0.54 ± 0.28	1.91	-0.27 ± 0.36	-0.47 ± 0.25



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

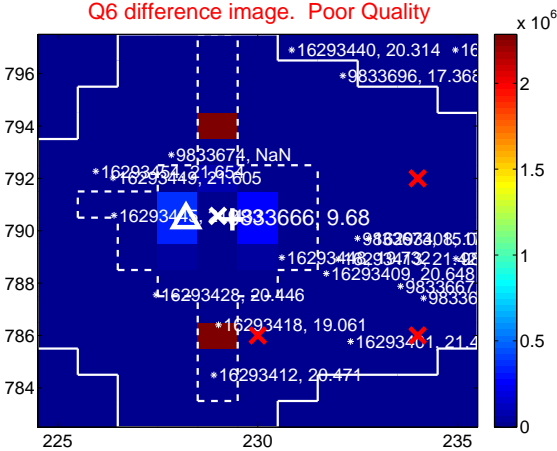
Q5 no difference image



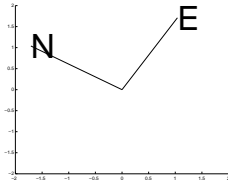
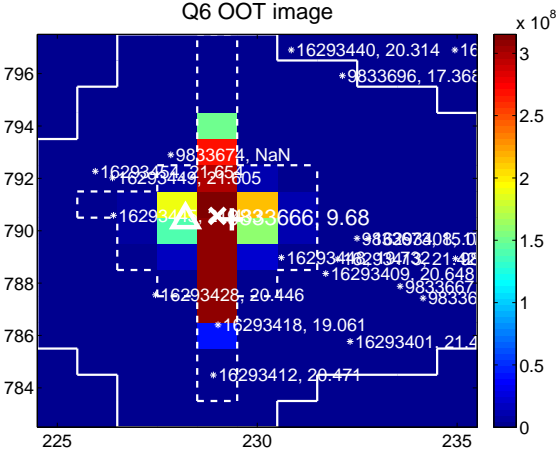
Q5 no OOT image



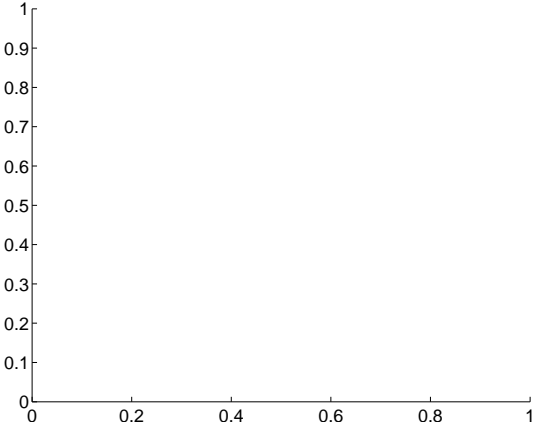
Q6 difference image. Poor Quality



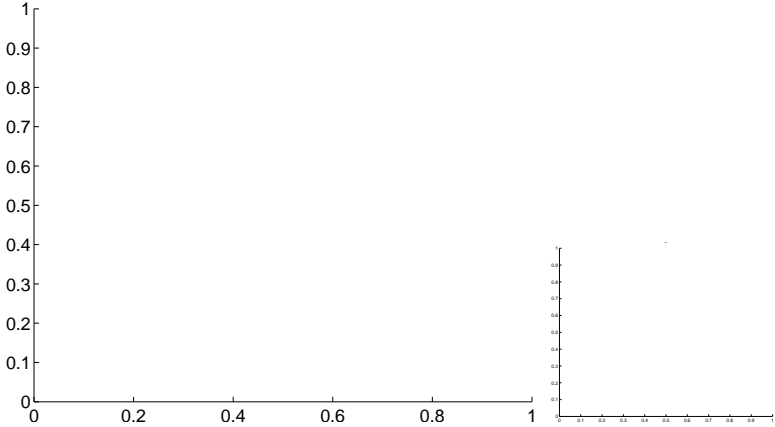
Q6 OOT image



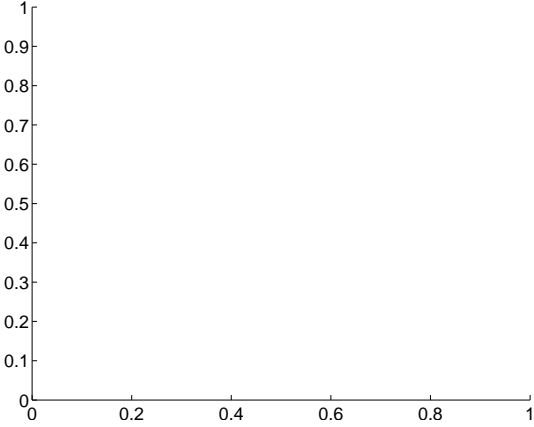
Q7 no difference image



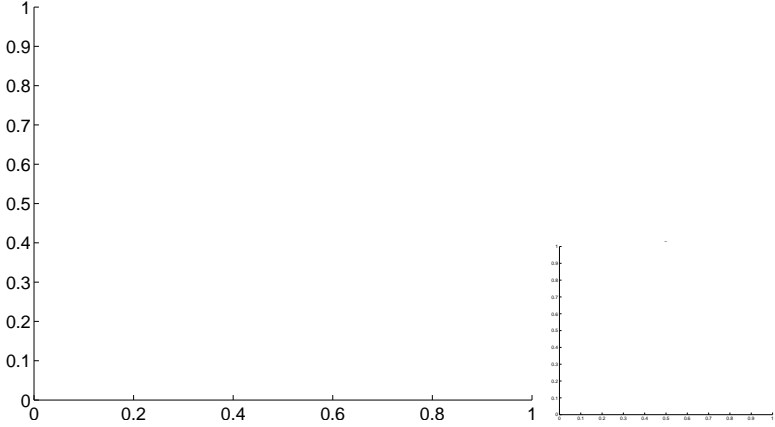
Q7 no OOT image



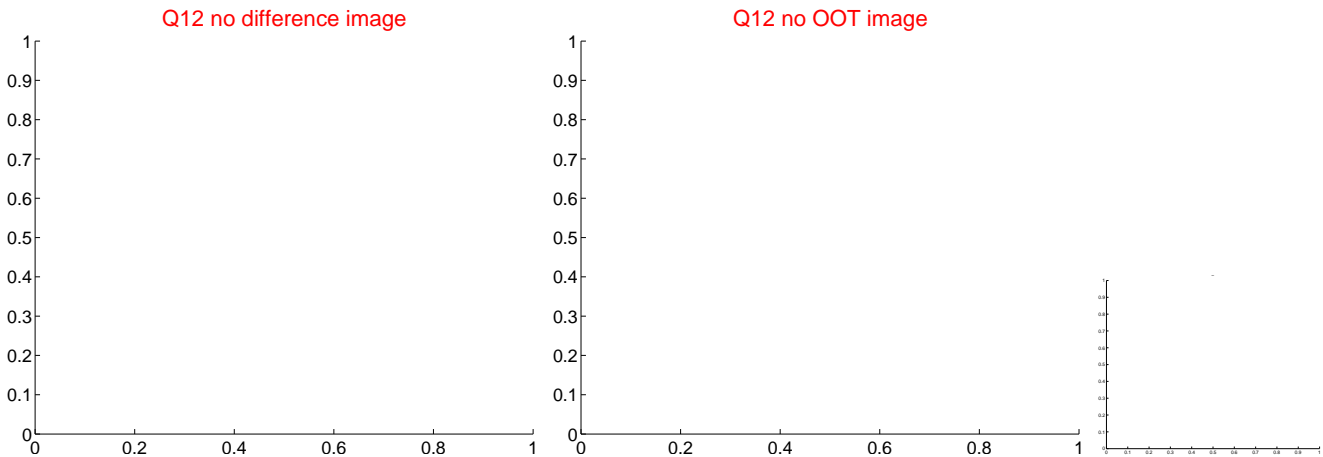
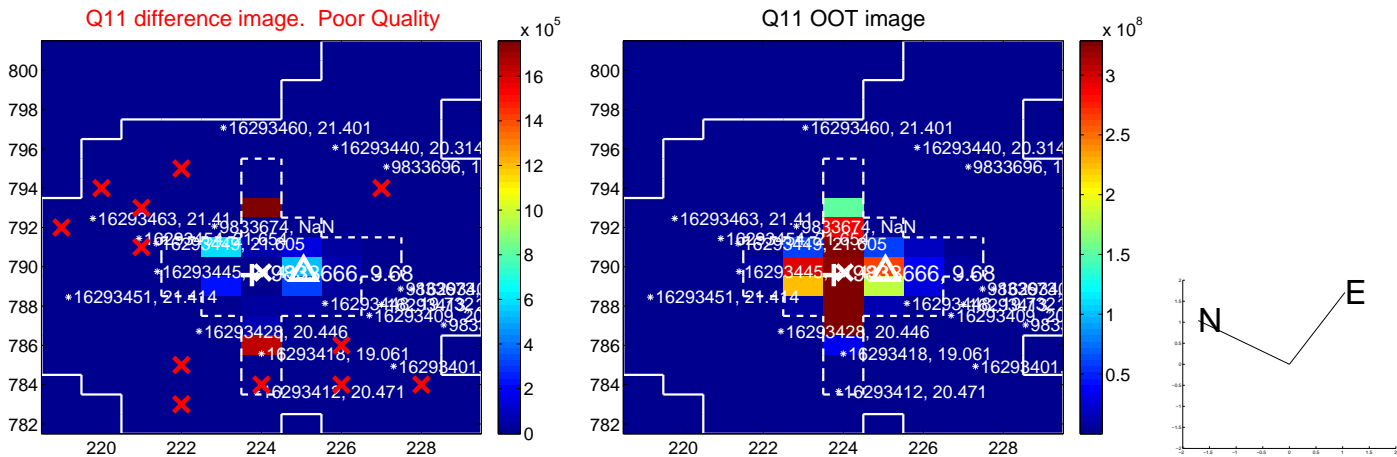
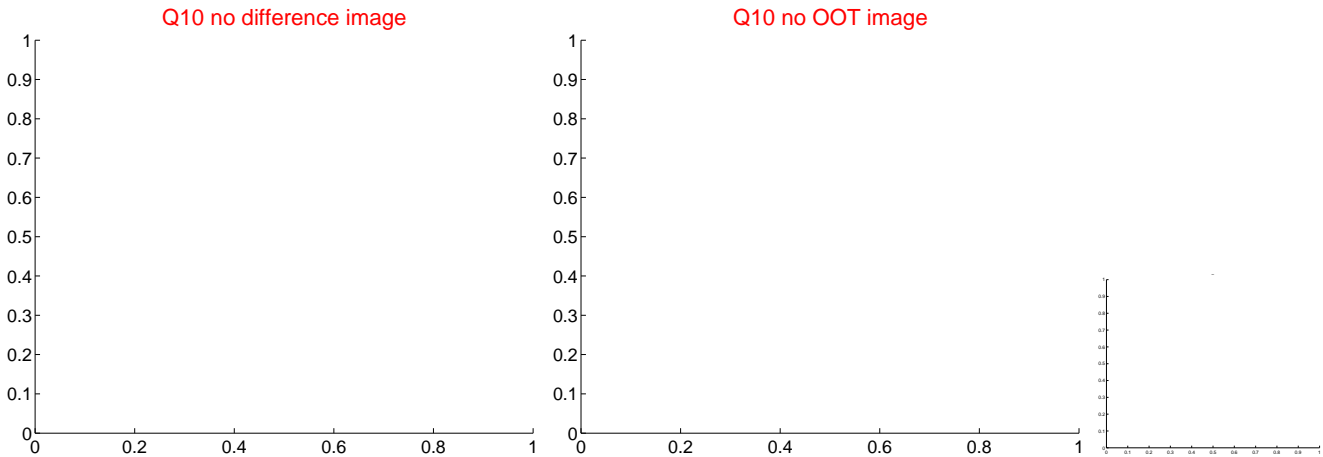
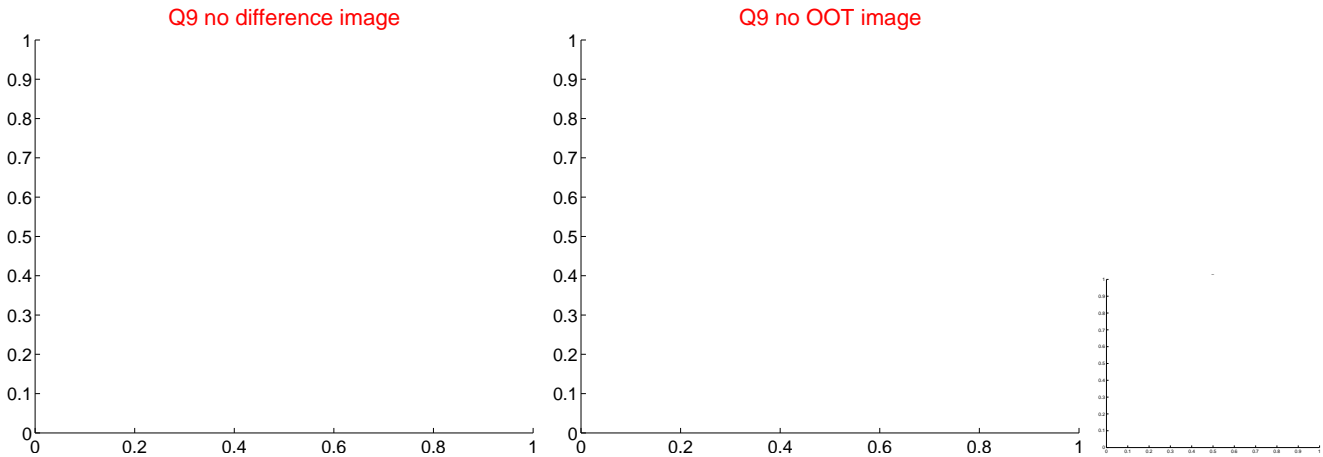
Q8 no difference image



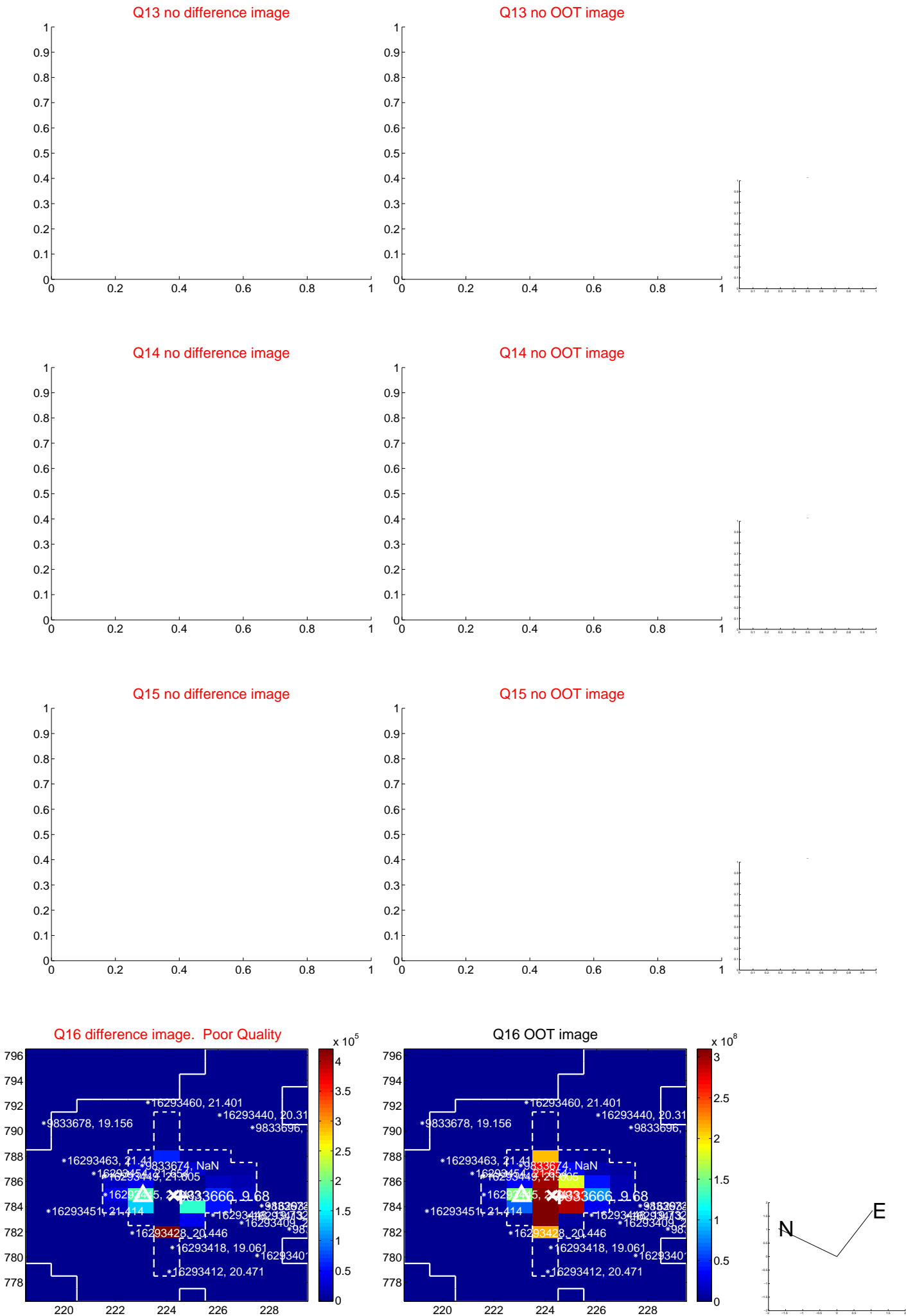
Q8 no OOT image



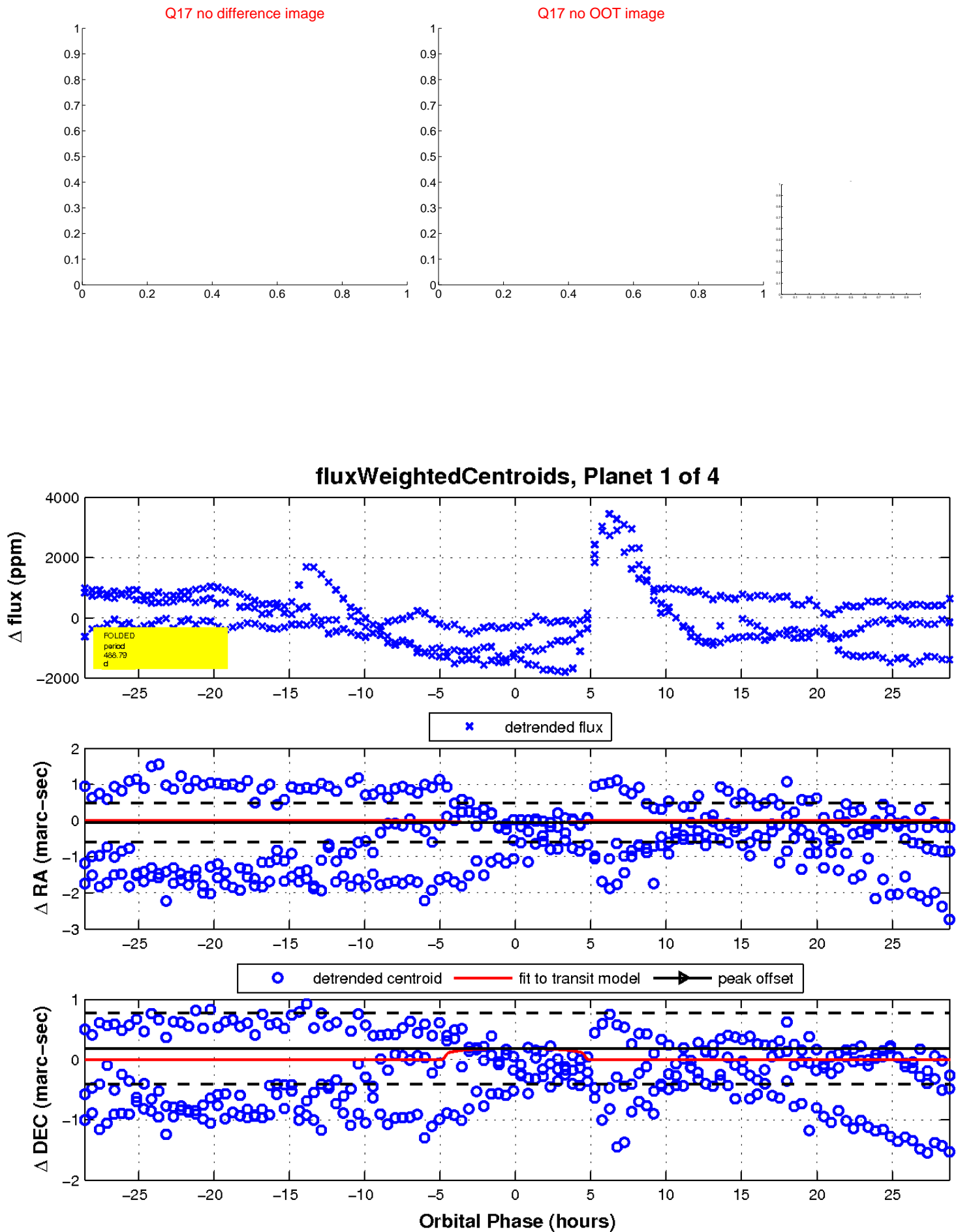
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



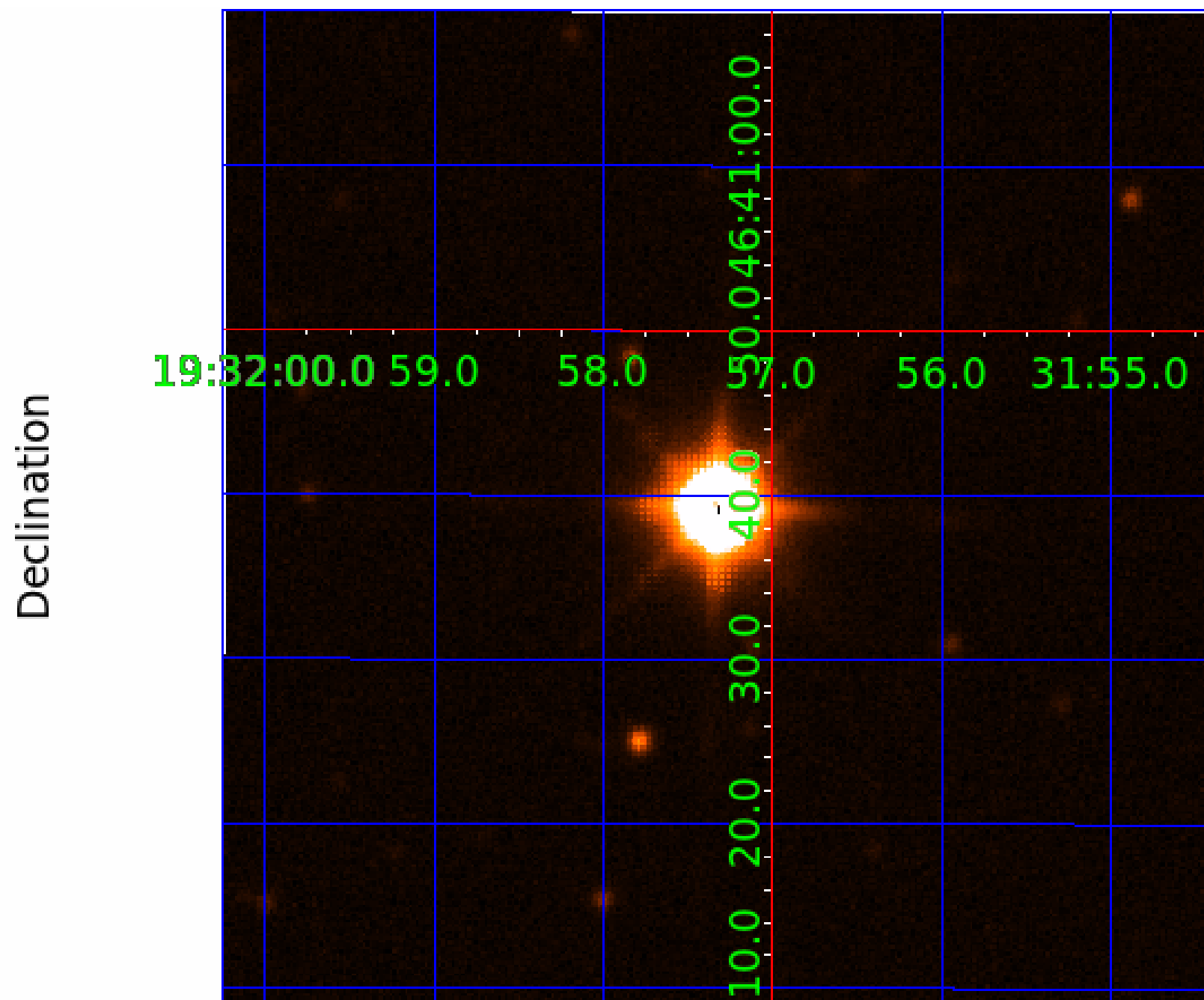
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009833666

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})
009833666-01	OBS	No	488.789685	562.770129	1113.3	9.624	16.4	9.7	2.70	5624	8.95	3.59
009833666-03	OBS	No	359.740792	392.910026	546.9	6.230	15.4	5.3	2.70	5624	7.76	5.41

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009833666-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_SATURATED
009833666-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_SATURATED

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

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

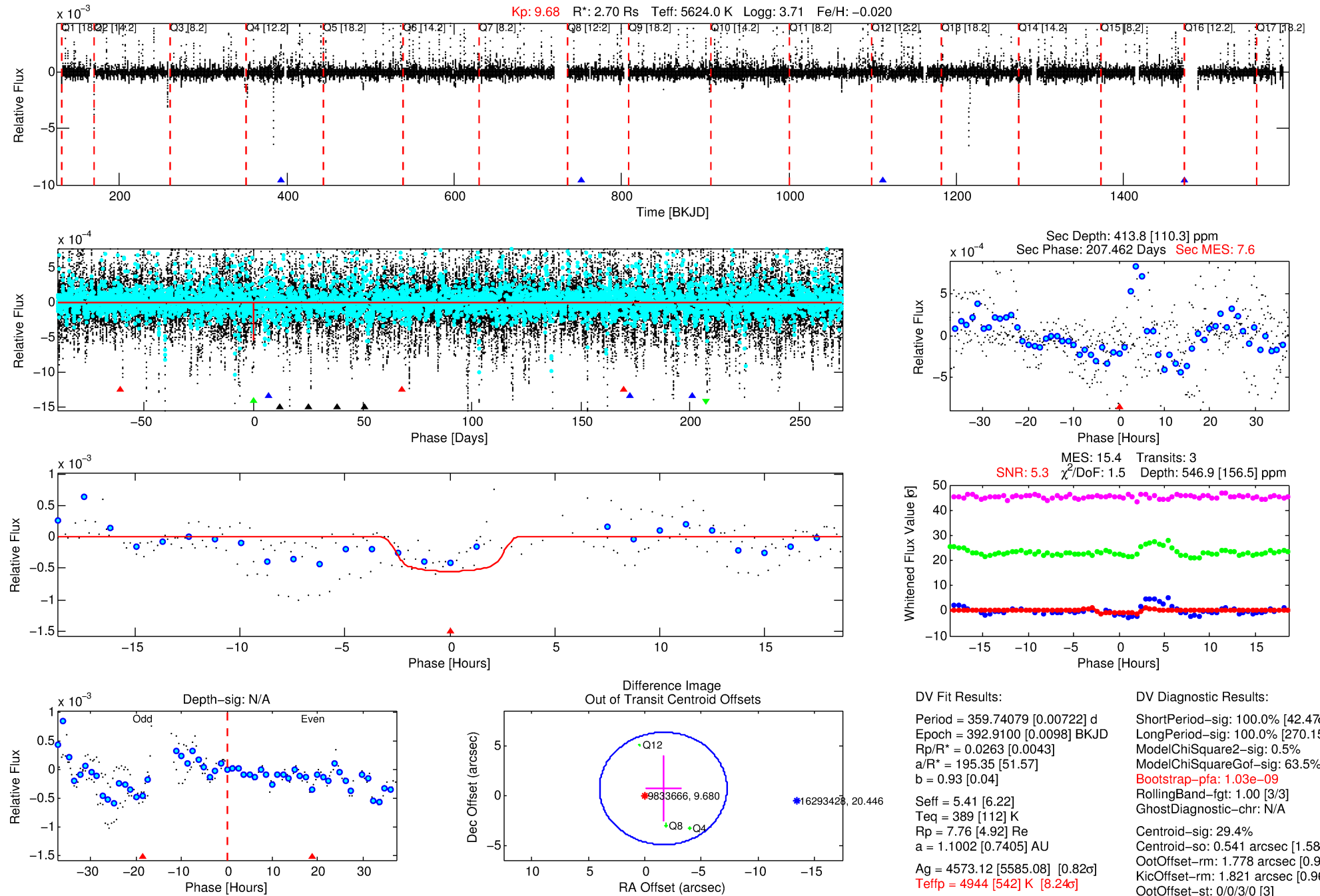
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009833666-03

No Significant Match Found

DV One-Page Summary

KIC: 9833666 Candidate: 3 of 4 Period: 359.741 d



DV Fit Results:

Period = 359.74079 [0.00722] d
Epoch = 392.9100 [0.0098] BKJD
Rp/R* = 0.0263 [0.0043]
a/R* = 195.35 [51.57]
b = 0.93 [0.04]
Seff = 5.41 [6.22]
Teff = 389 [112] K
Rp = 7.76 [4.92] Re
a = 1.1002 [0.7405] AU
Ag = 4573.12 [5585.08] [0.82σ]
Teffp = 4944 [542] K [8.24σ]

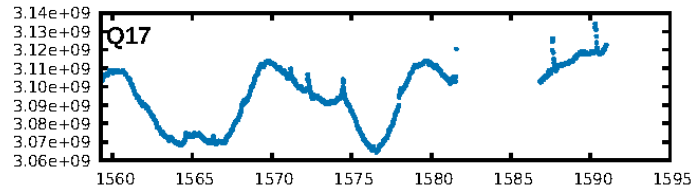
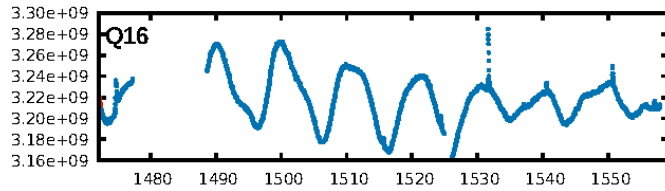
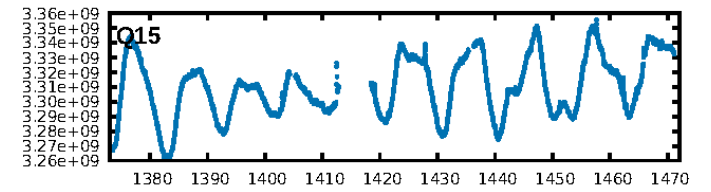
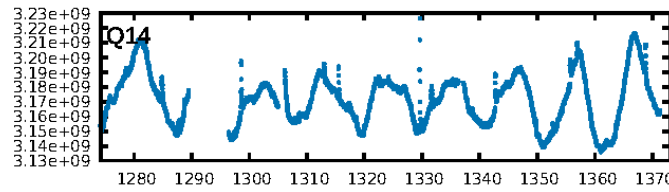
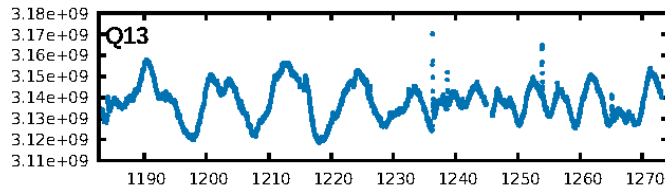
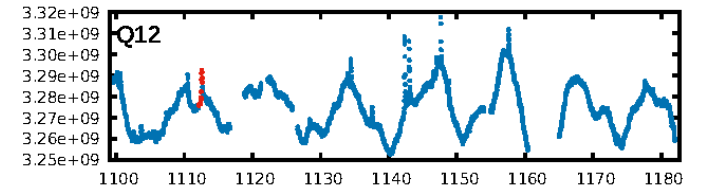
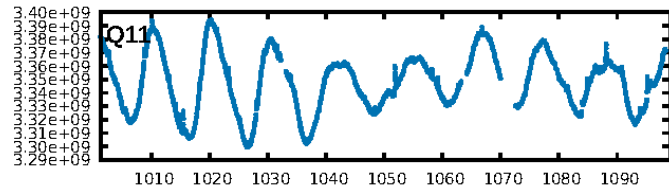
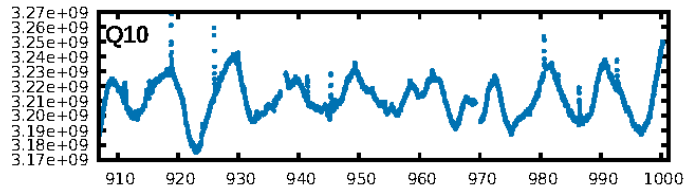
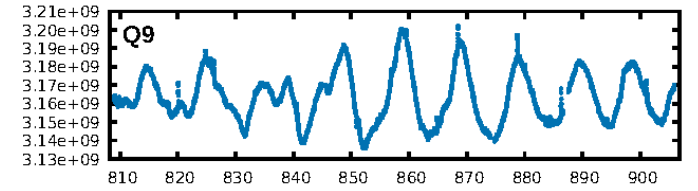
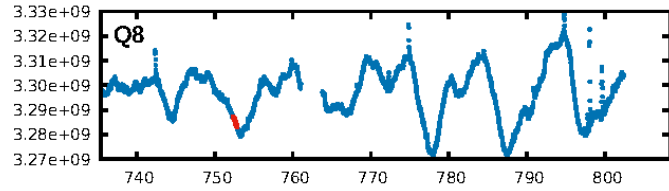
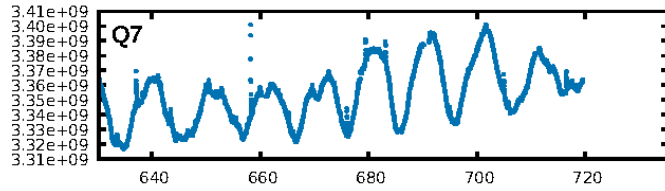
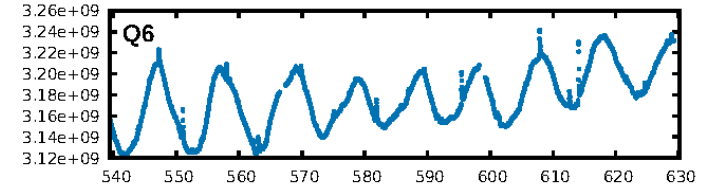
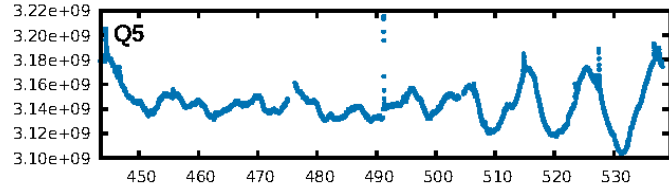
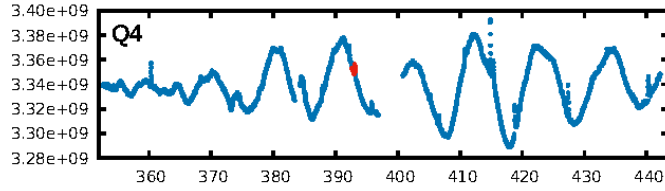
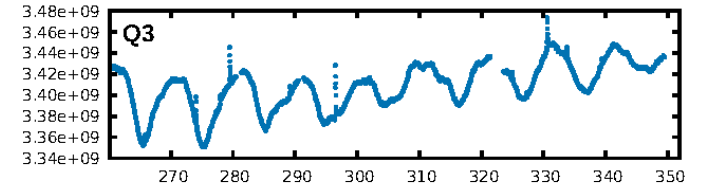
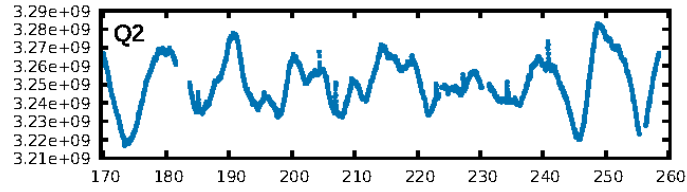
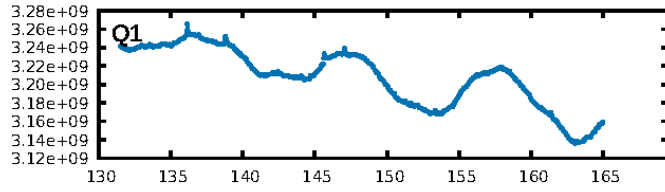
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [42.47σ]
LongPeriod-sig: 100.0% [270.15σ]
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 63.5%
Bootstrap-pfa: 1.03e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: N/A
Centroid-sig: 29.4%
Centroid-so: 0.541 arcsec [1.58σ]
OotOffset-rm: 1.778 arcsec [0.95σ]
OotOffset-st: 0/0/3/0 [3]
KicOffset-rm: 1.821 arcsec [0.96σ]
KicOffset-st: 0/0/3/0 [3]
DiffImageQuality-fgm: 0.00 [0/3]
DiffImageOverlap-fno: 1.00 [3/3]

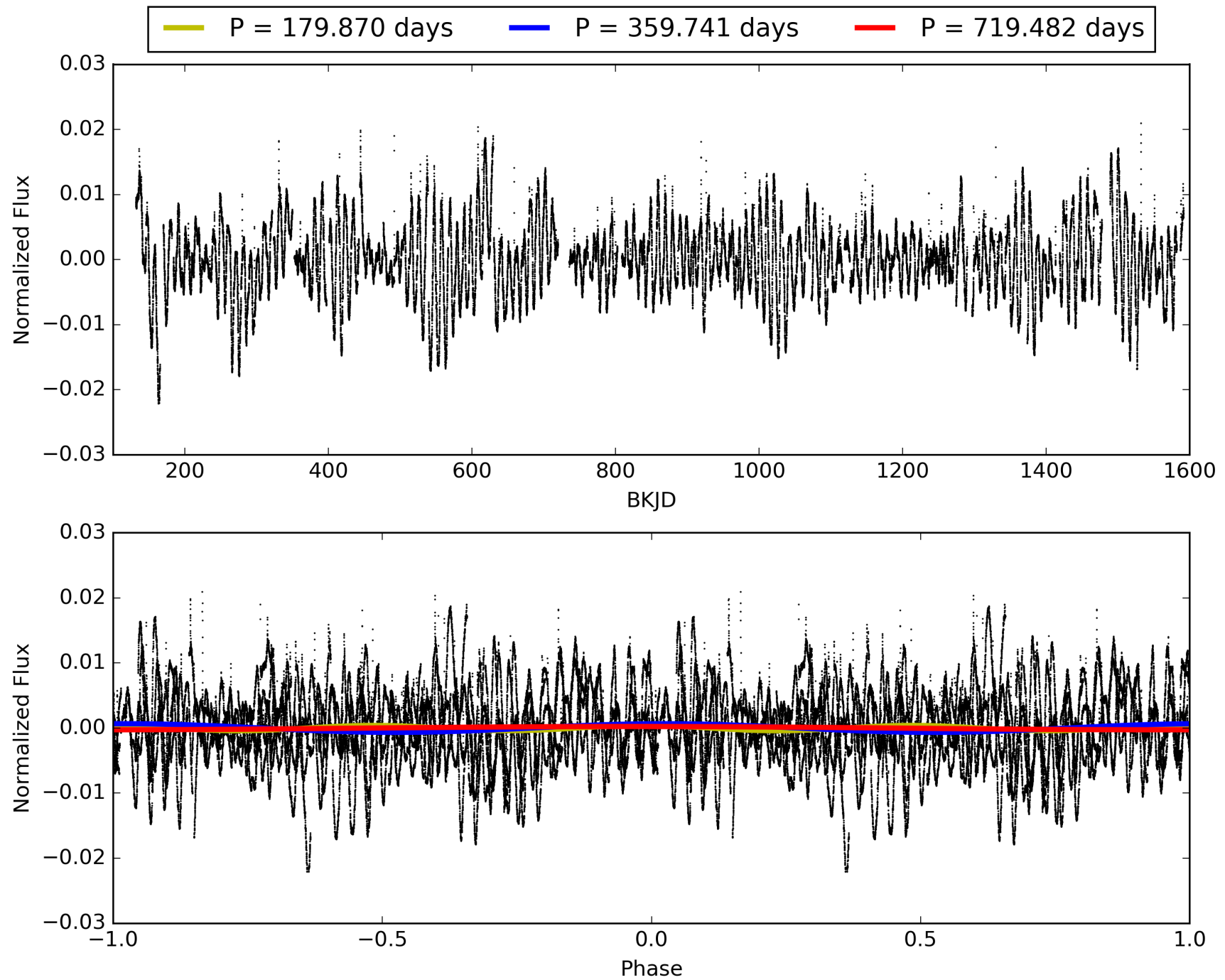
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:46:16 Z

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

TCE 009833666-03, PDC Light Curves

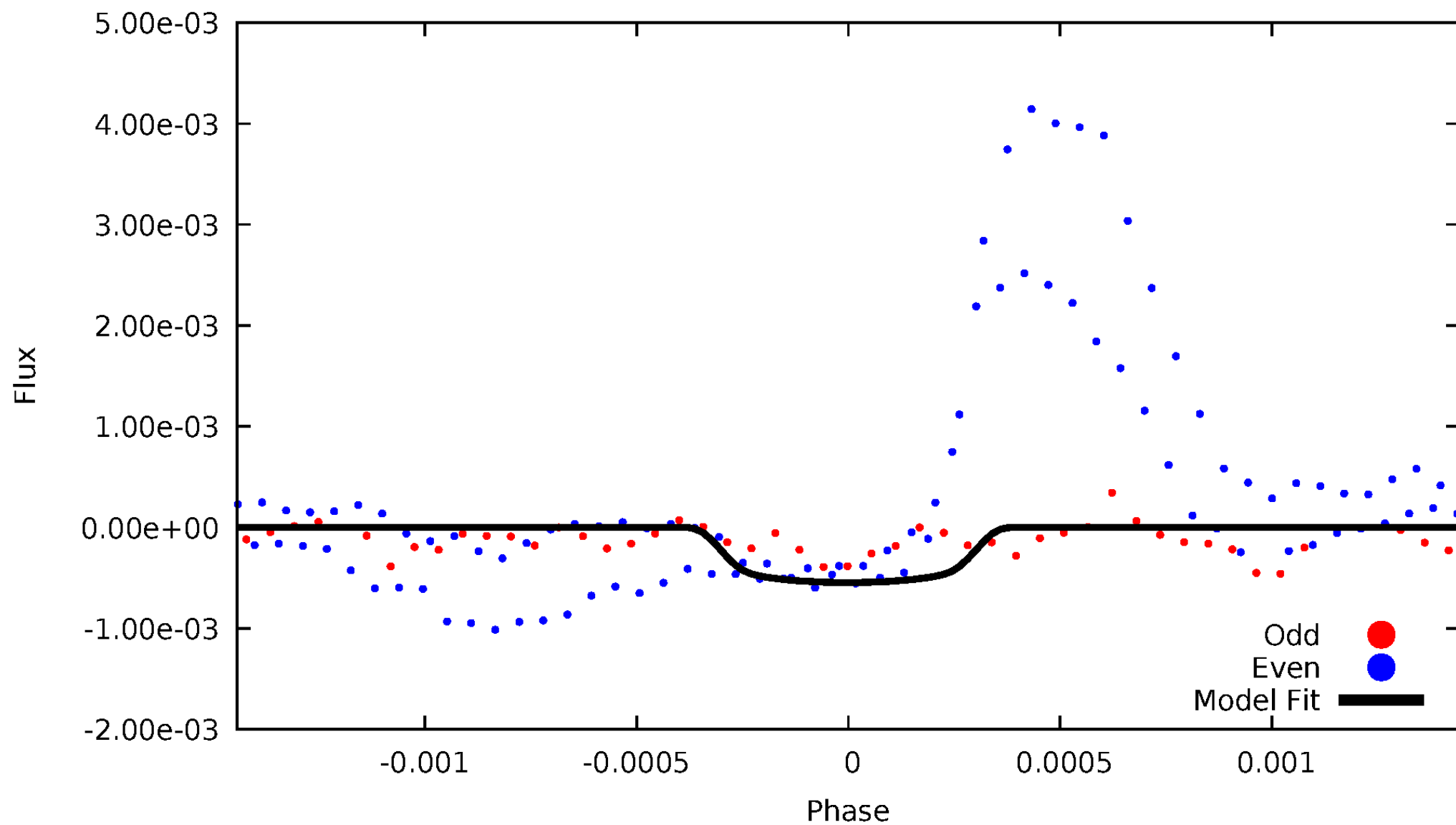


TCE 009833666-03



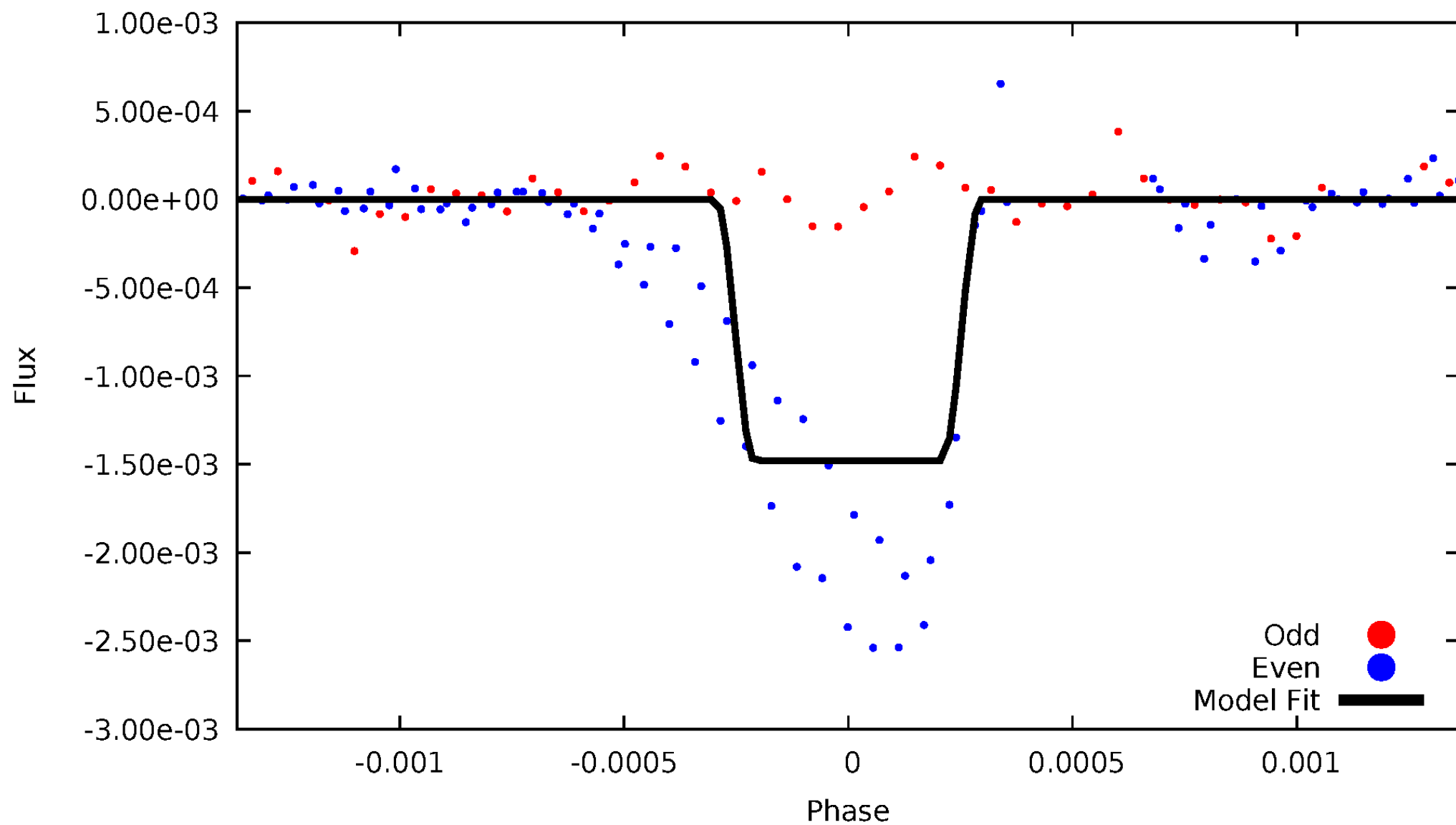
DV Odd/Even

TCE 009833666-03



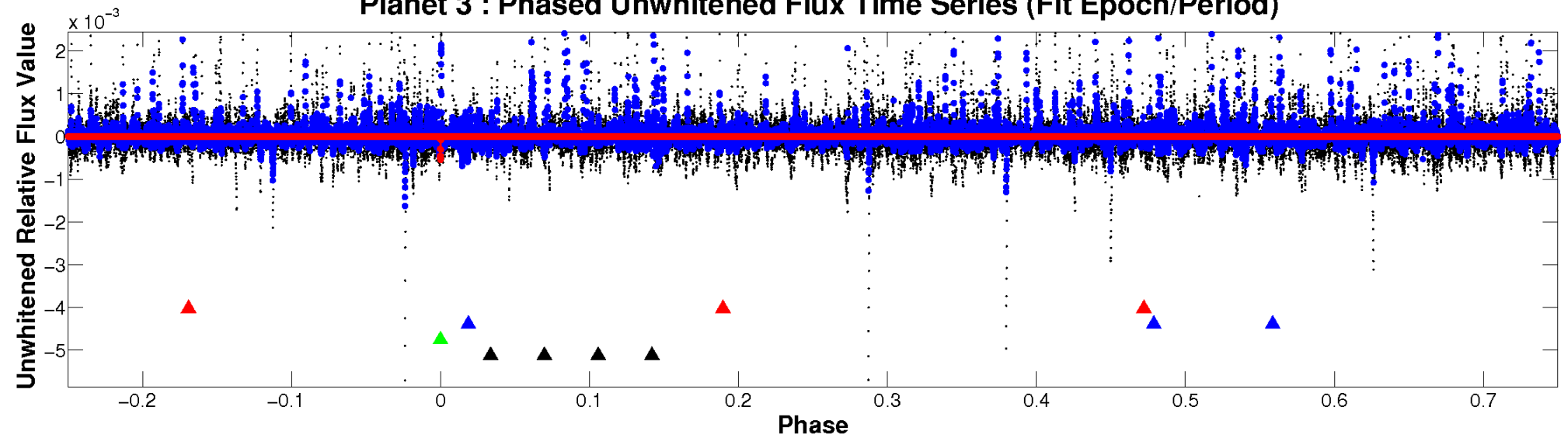
ALT Odd/Even

TCE 009833666-03

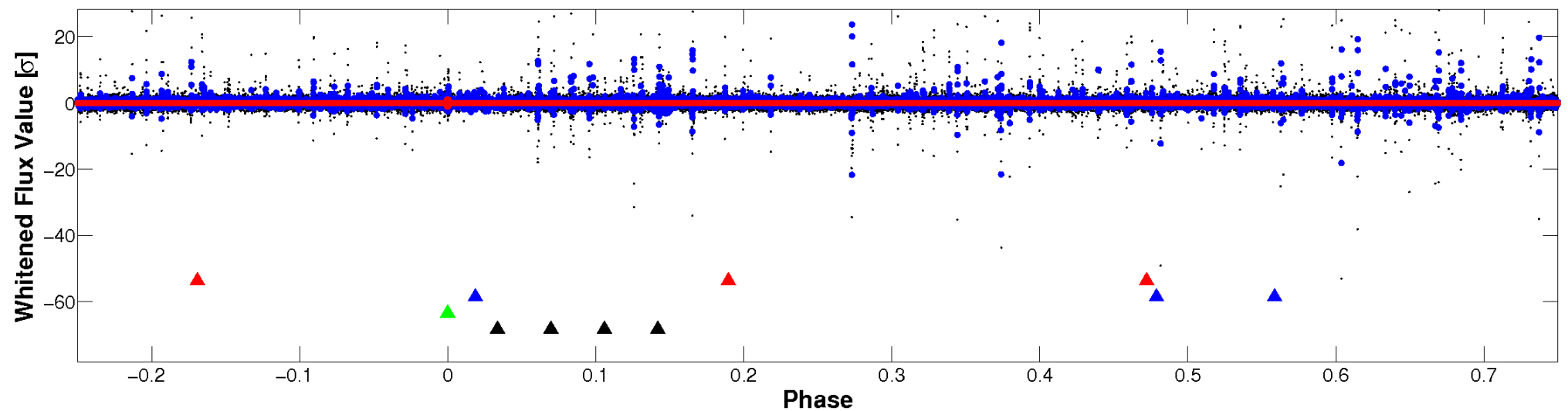


Non-Whitened Vs. Whitened Light Curve

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

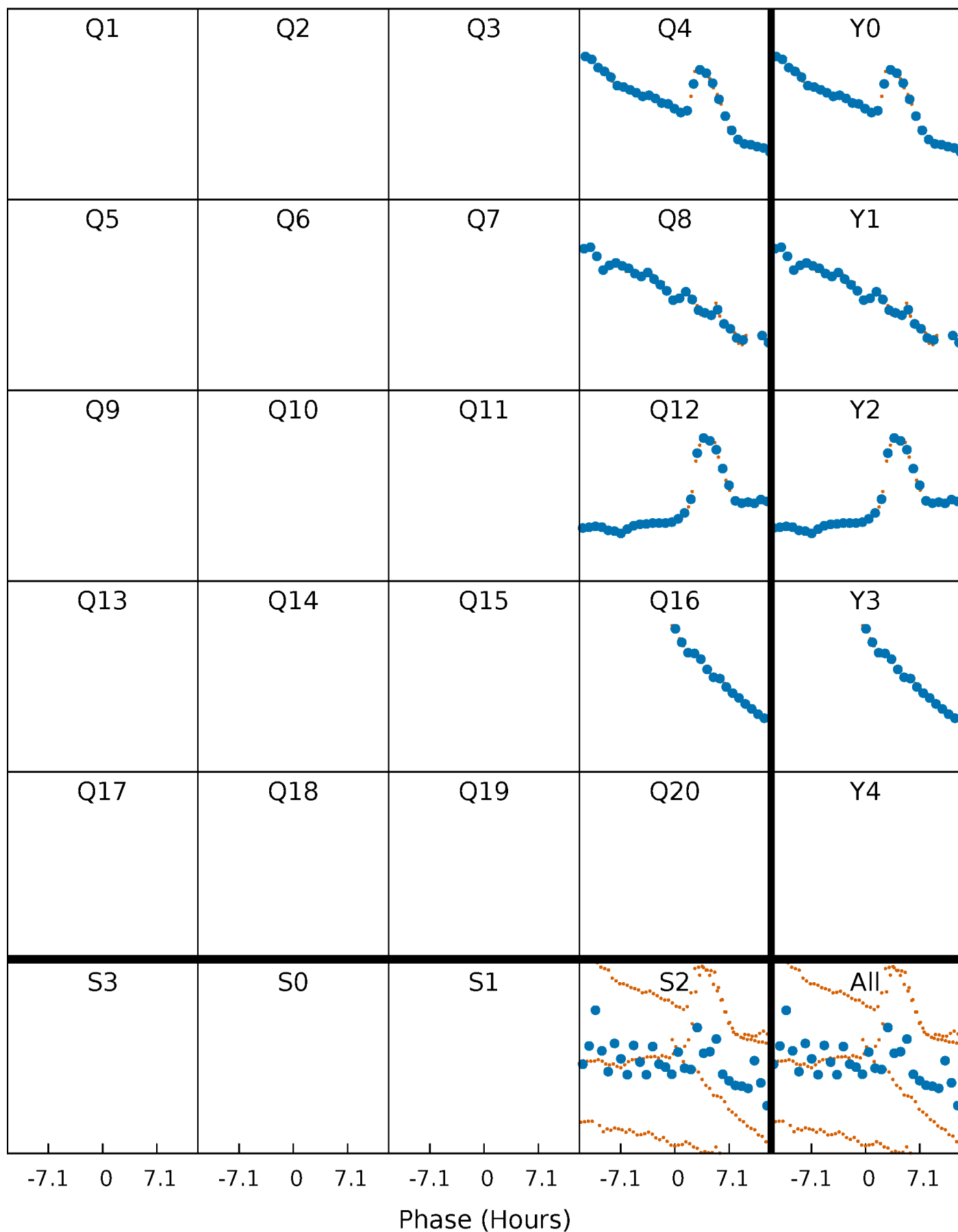


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



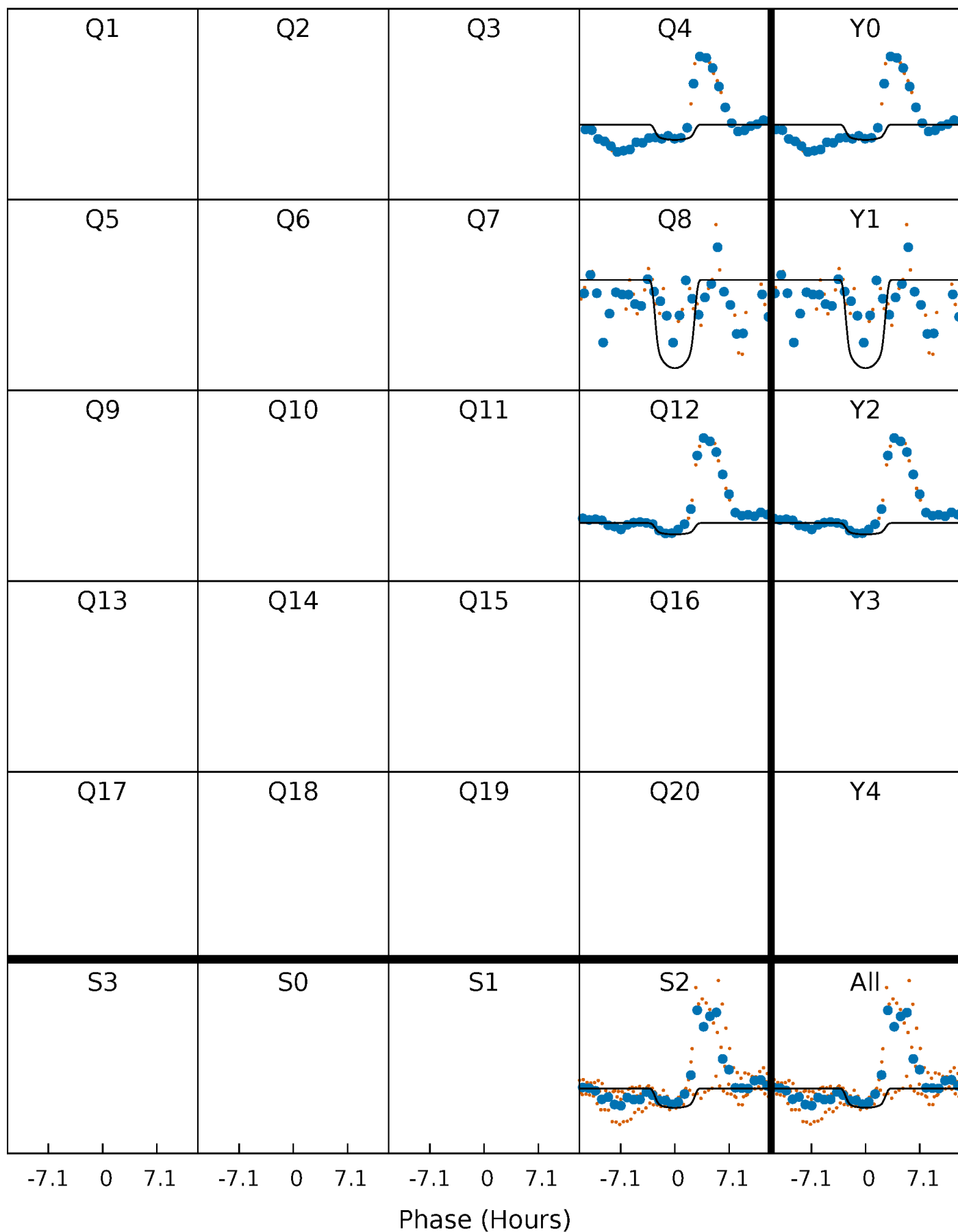
PDC Quarter-Phased Transit Curves

TCE 009833666-03 $P=359.740792$ Days $T_0=392.910026$ (BKJD)



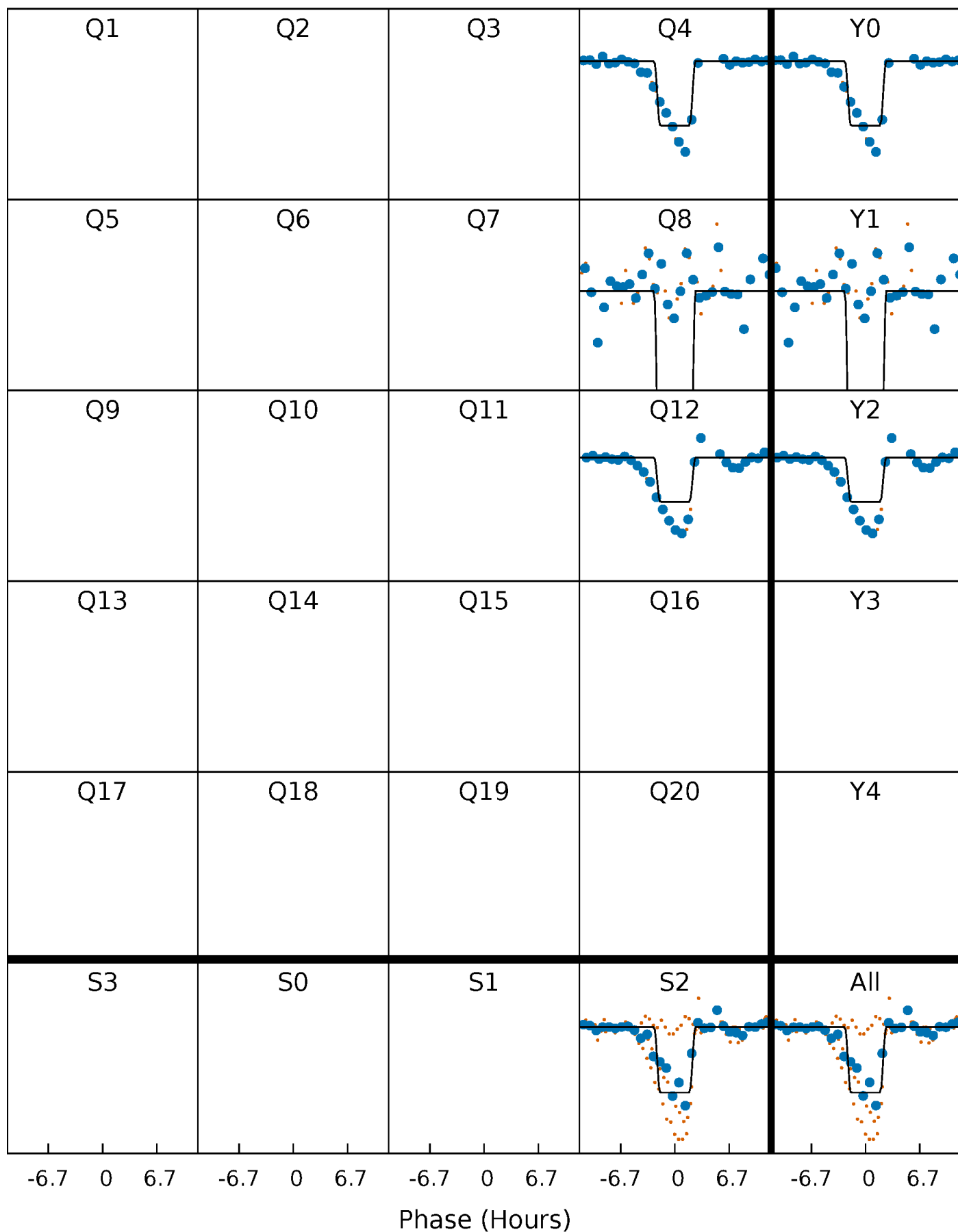
DV Quarter-Phased Transit Curves

TCE 009833666-03 $P=359.740792$ Days $T_0=392.910026$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

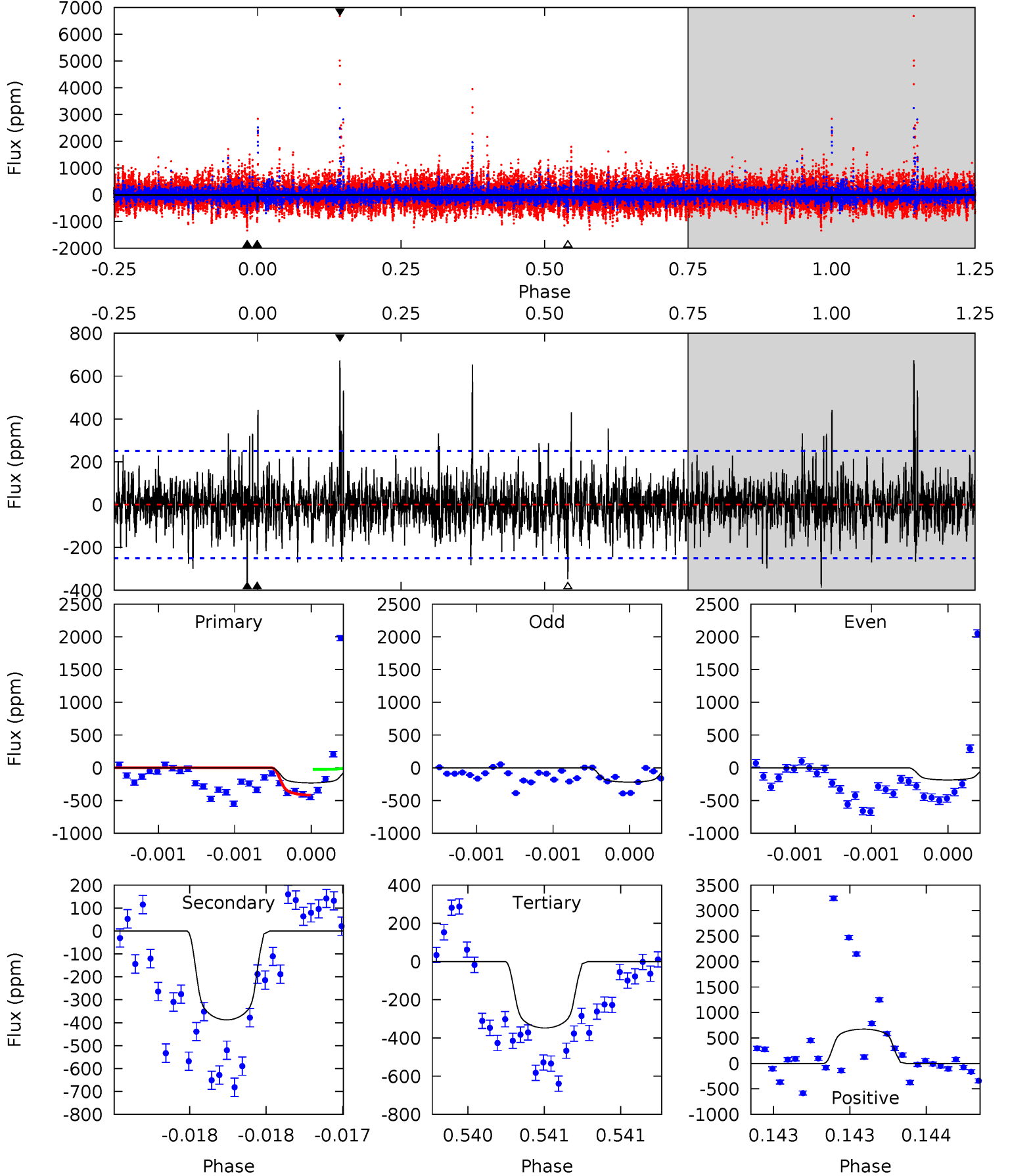
TCE 009833666-03 P=359.746446 Days $T_0=392.911861$ (BKJD)



DV Model-Shift Uniqueness Test

009833666-03, P = 359.740792 Days, E = 33.169234 Days

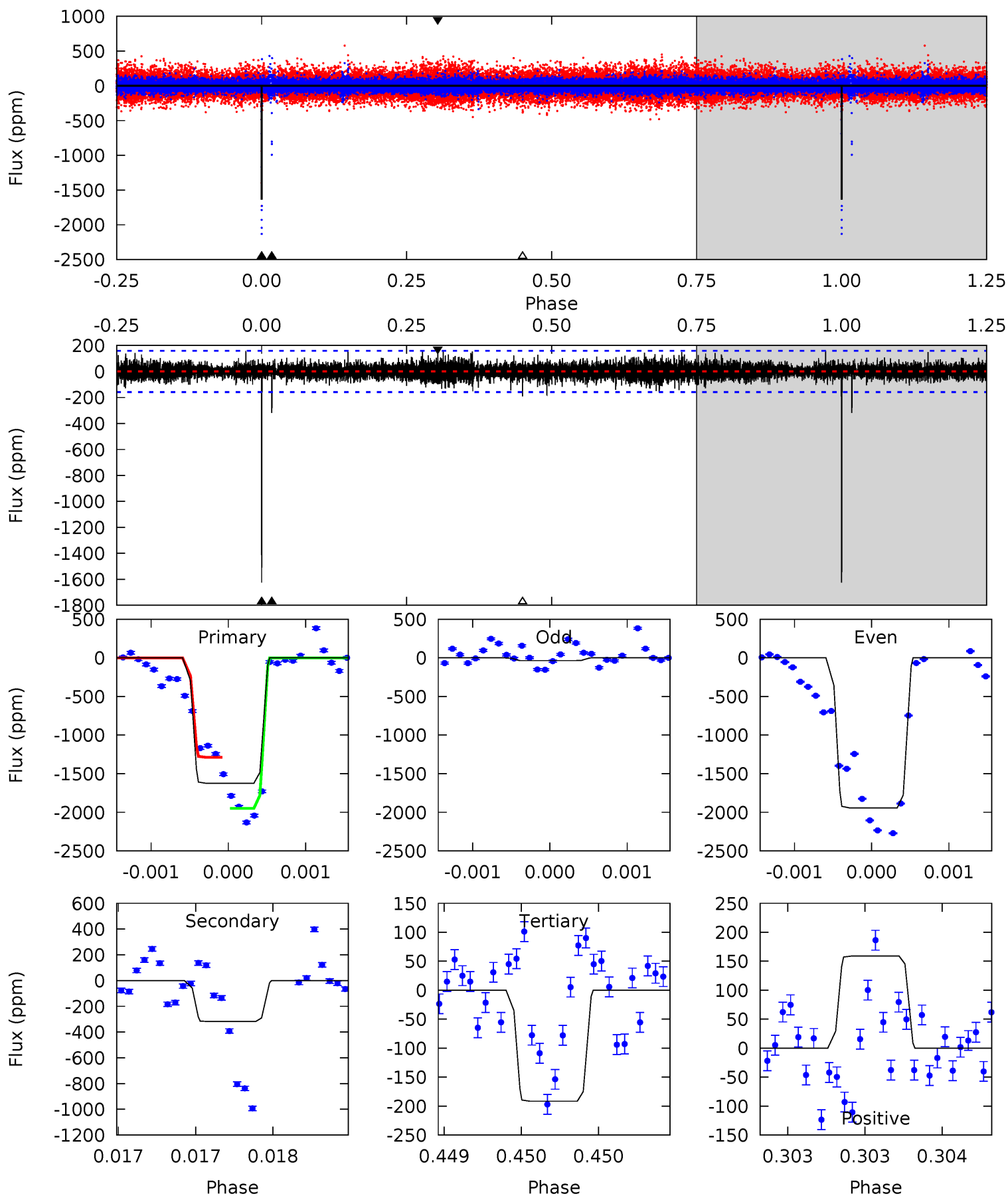
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.08	8.54	7.66	14.8	5.50	3.37	1.78	-2.57	-9.73	0.88	-6.28	0.27	0.90	0.63	4.35



Alt Model-Shift Uniqueness Test

009833666-03, P = 359.746446 Days, E = 33.165415 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
56.7	11.1	6.68	5.55	5.56	3.45	1.20	50.0	51.2	4.41	5.55	50.3	0.77	0.09	0



Stellar Parameters For KIC 009833666

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5624^{+154}_{-140}	$3.712^{+0.697}_{-0.164}$	$-0.020^{+0.300}_{-0.250}$	$2.702^{+0.709}_{-1.655}$	$1.373^{+0.155}_{-0.466}$	$0.098^{+1.212}_{-0.044}$
	+3%/-2%	+19%/-4%	+1500%/-1250%	+26%/-61%	+11%/-34%	+1236%/-45%
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 009833666-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-388 ± 45	$7.02^{+2.26}_{-2.30}$	532^{+45}_{-86}	4944^{+467}_{-357}	5147^{+5679}_{-2205}
Alt.	-318 ± 29	$10.62^{+2.61}_{-3.57}$	530^{+50}_{-88}	4096^{+212}_{-186}	1862^{+2014}_{-690}

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

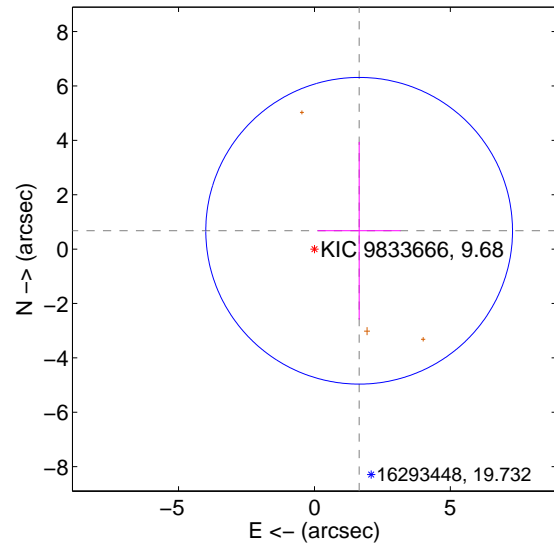
Supplemental centroid analysis for 009833666-03. **Kepler magnitude: 9.68.** Transit SNR 5.30

There are 0 quarters with good PRF difference image offsets

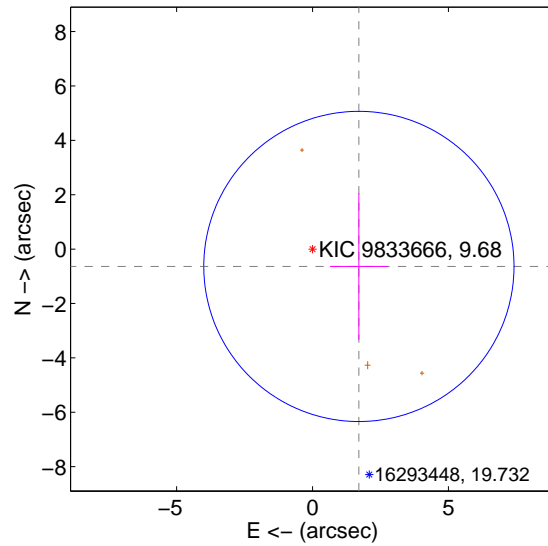
The direct PRF centroid is offset from the target star catalog position by about 1.39 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.778 ± 1.880	0.95	-1.645 ± 1.527	0.675 ± 3.268
PRF-fit source offset from KIC position	1.821 ± 1.902	0.96	-1.706 ± 1.069	-0.638 ± 2.697
photometric centroid source offset	0.54 ± 0.34	1.58	0.07 ± 0.54	-0.54 ± 0.34

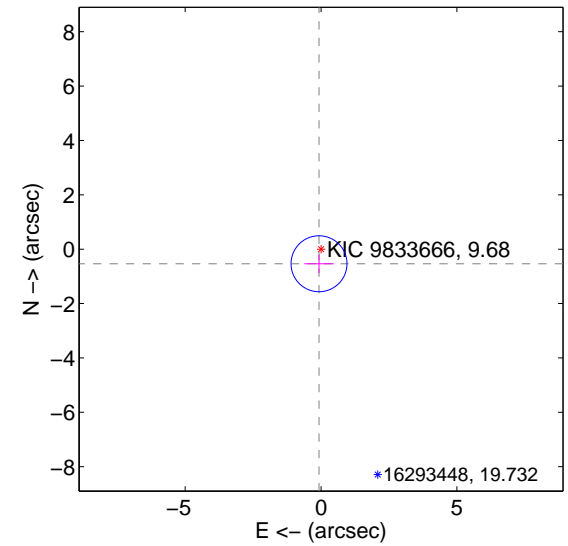
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

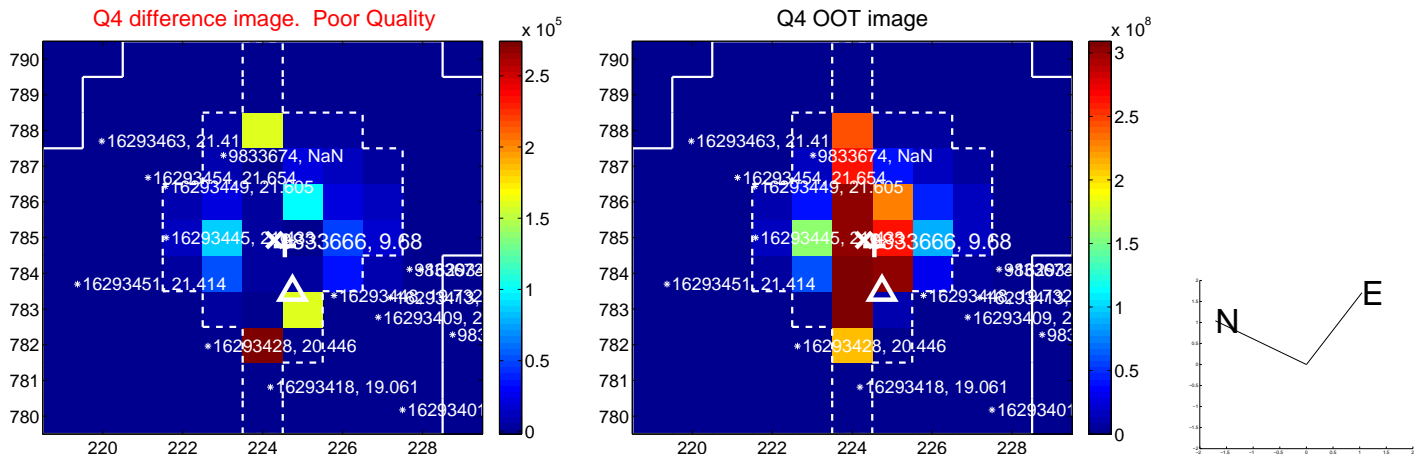
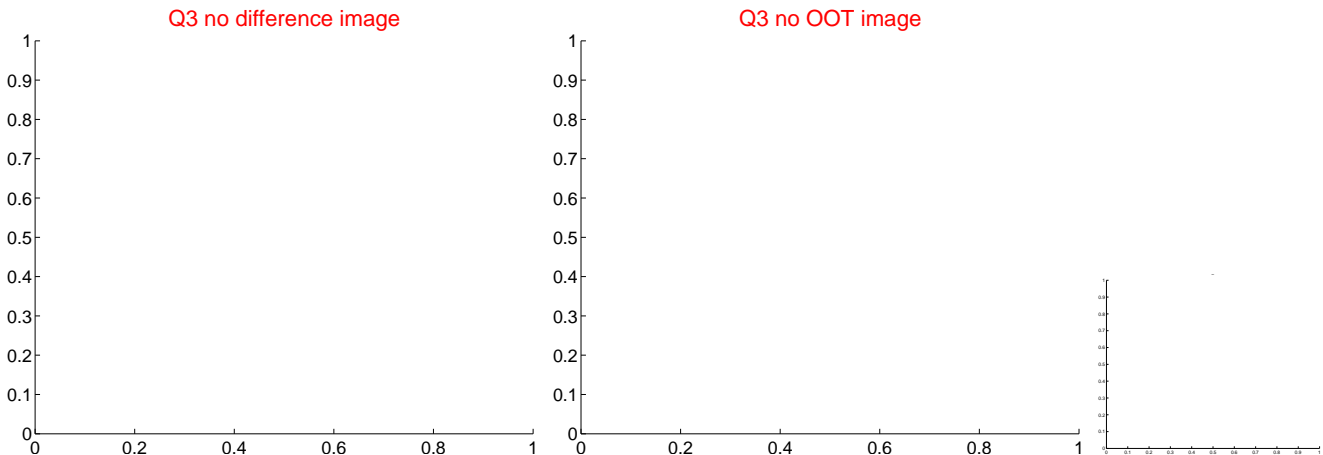


offset from photometric centroids

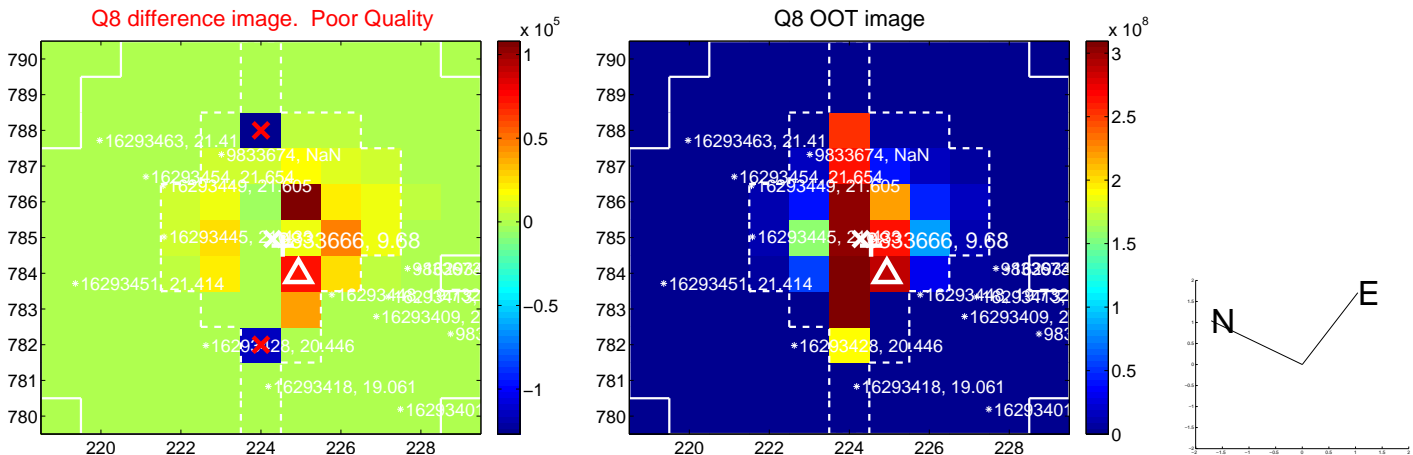
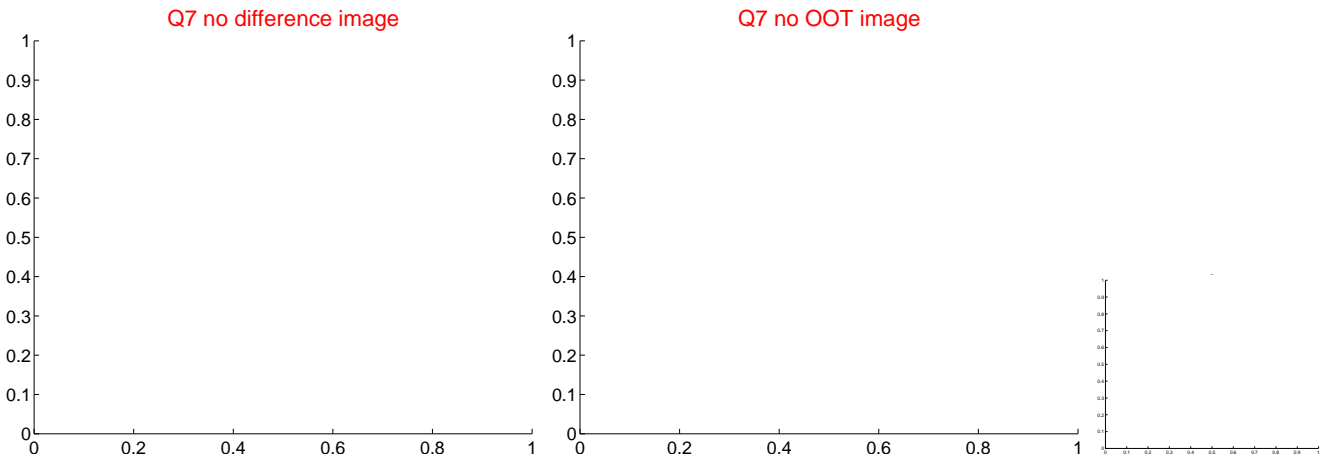
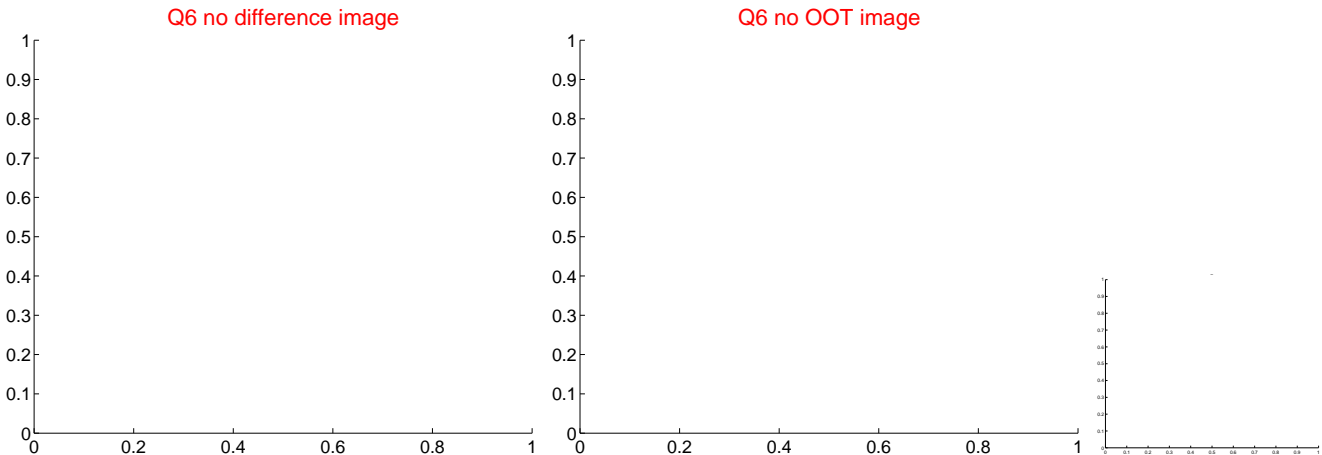
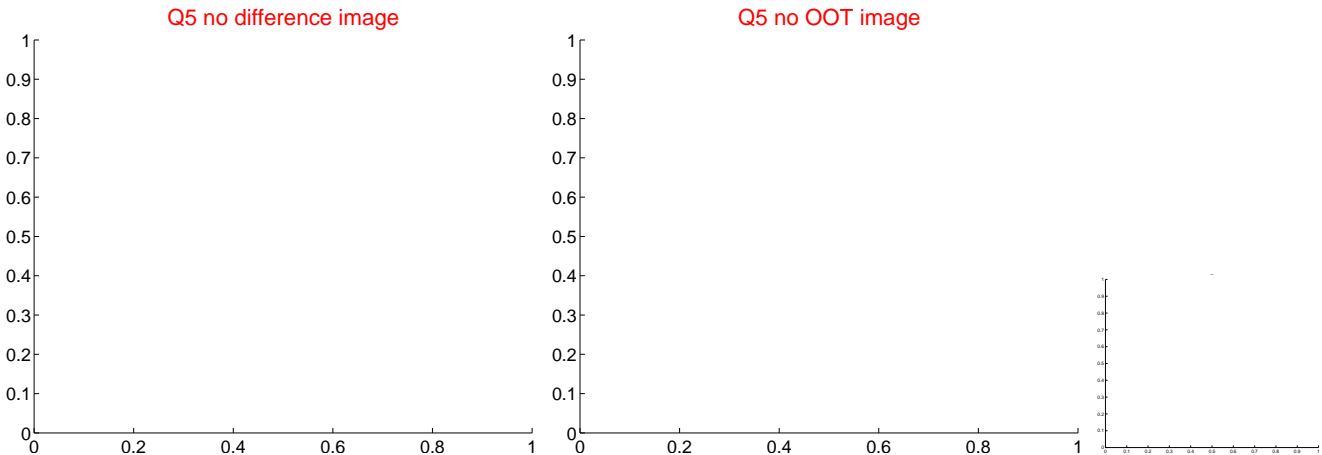


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

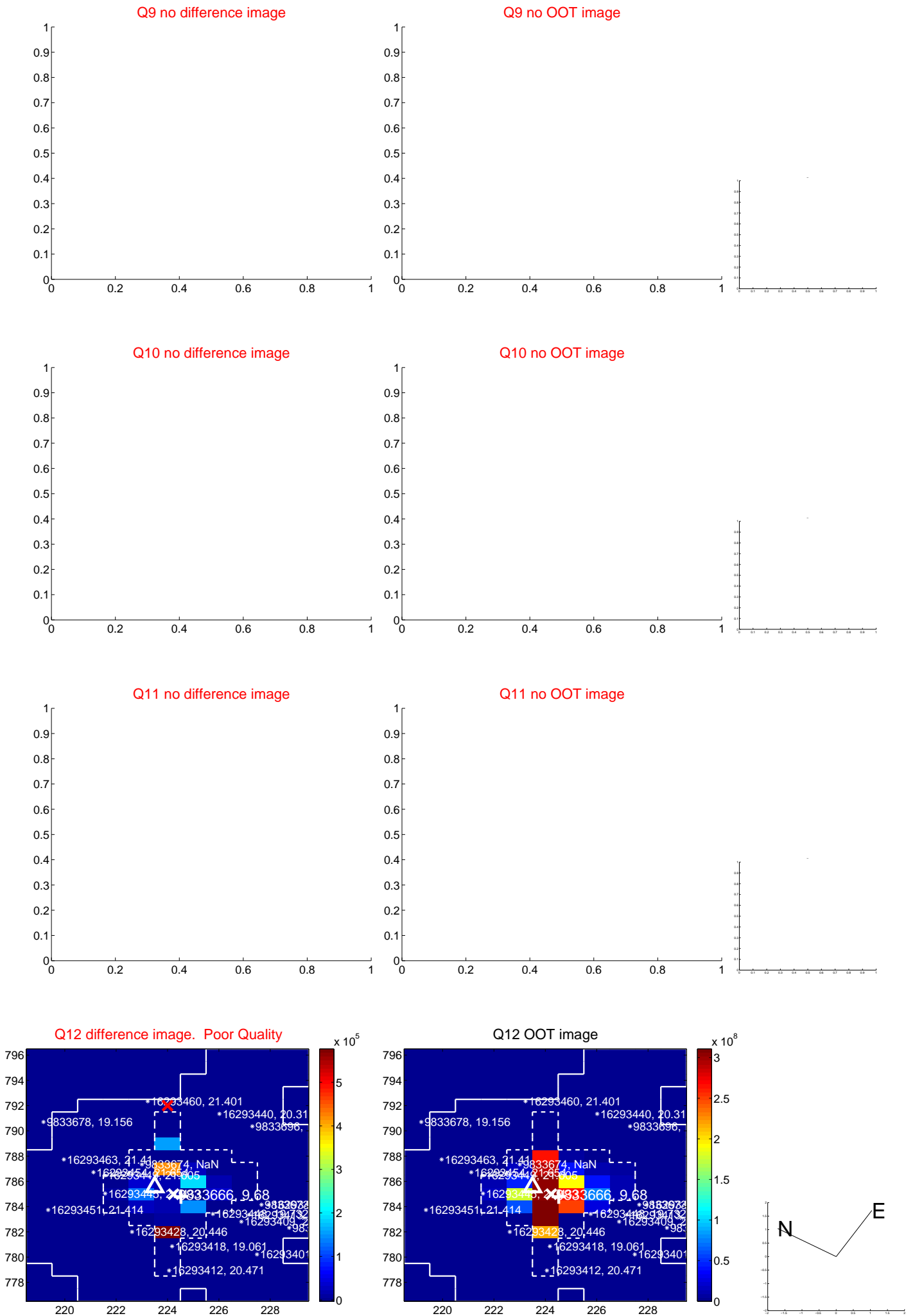
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



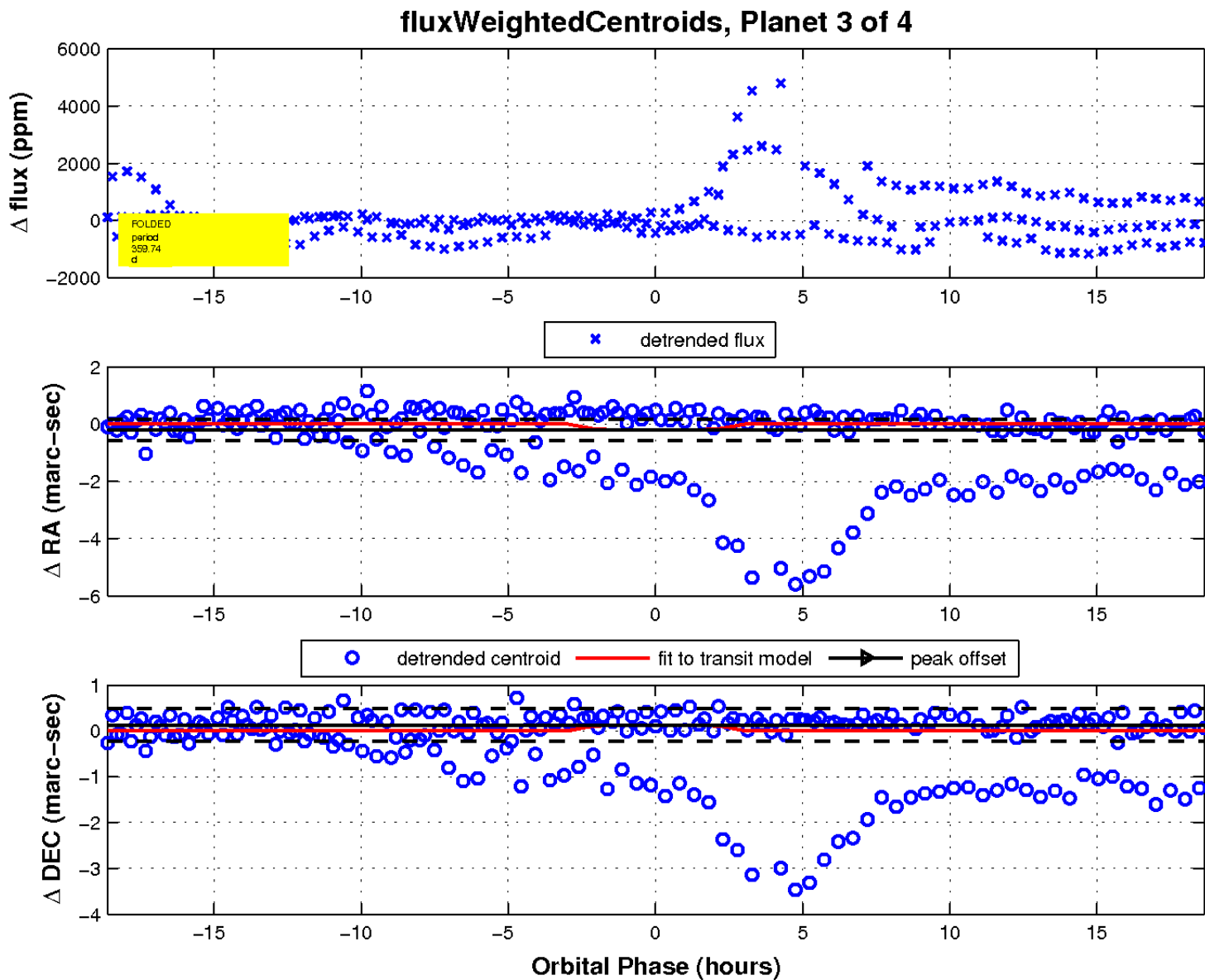
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

