

KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

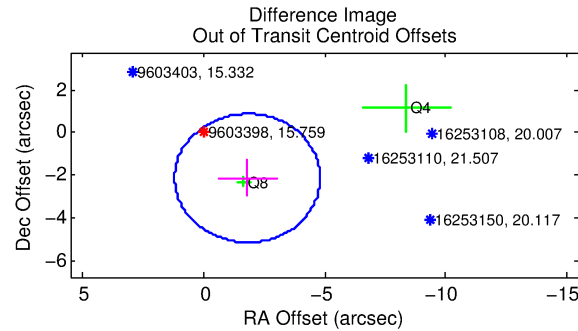
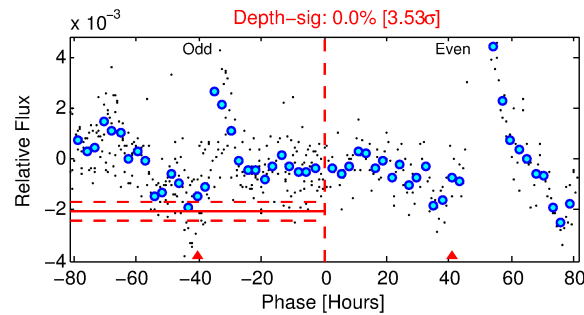
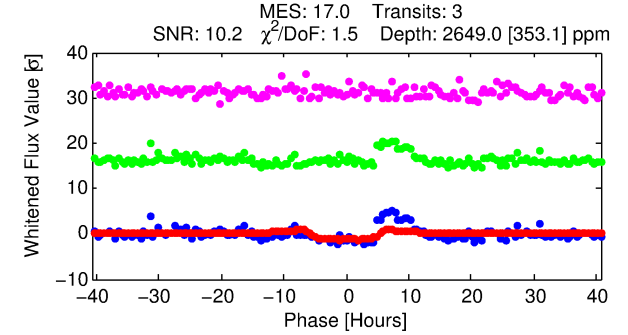
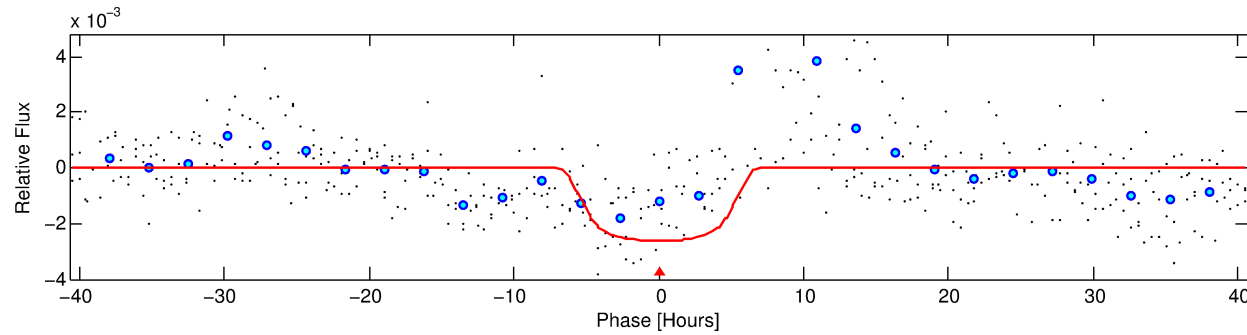
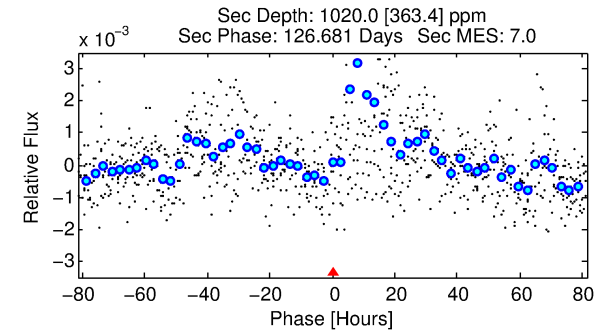
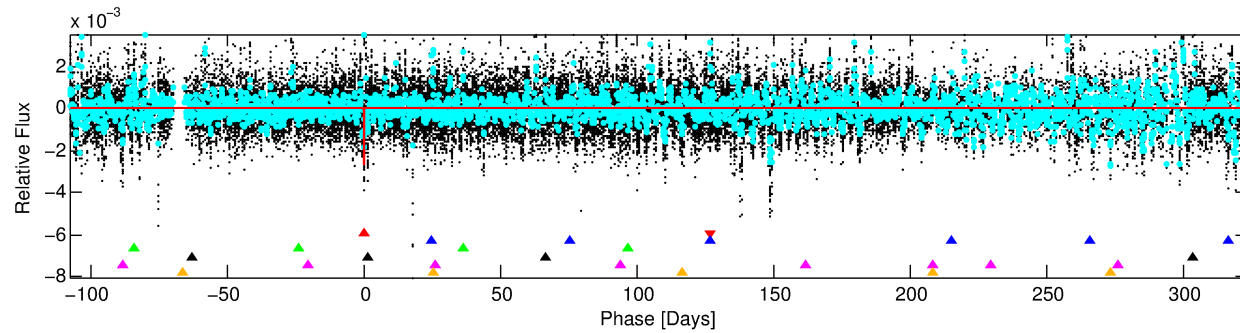
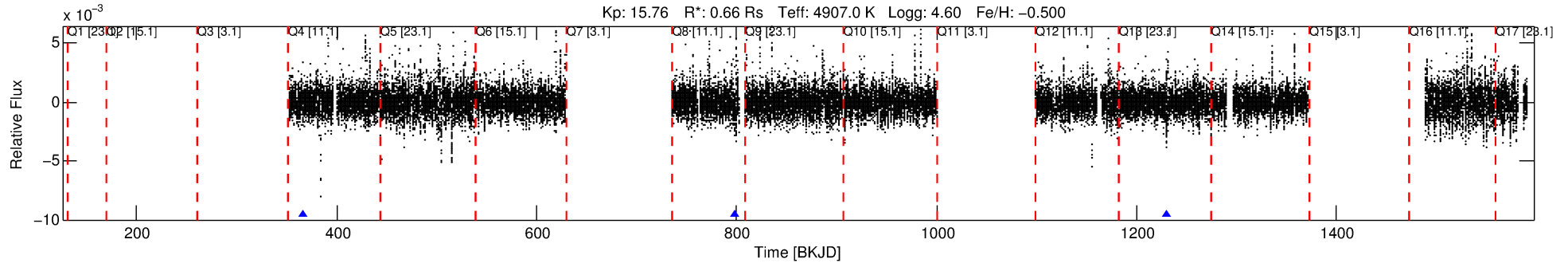
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-01

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 1 of 6 Period: 431.987 d



DV Fit Results:

Period = 431.98676 [0.01369] d
Epoch = 366.6508 [0.0183] BKJD
Rp/R* = 0.0557 [0.0057]
a/R* = 145.21 [34.44]
b = 0.87 [0.07]
Seff = 0.24 [0.05]
Teq = 179 [8] K
Rp = 4.03 [0.57] Re
a = 0.9661 [0.0817] AU
Ag = 32260.74 [13851.65] [2.33 σ]
Teffp = 3716 [403] K [8.78 σ]

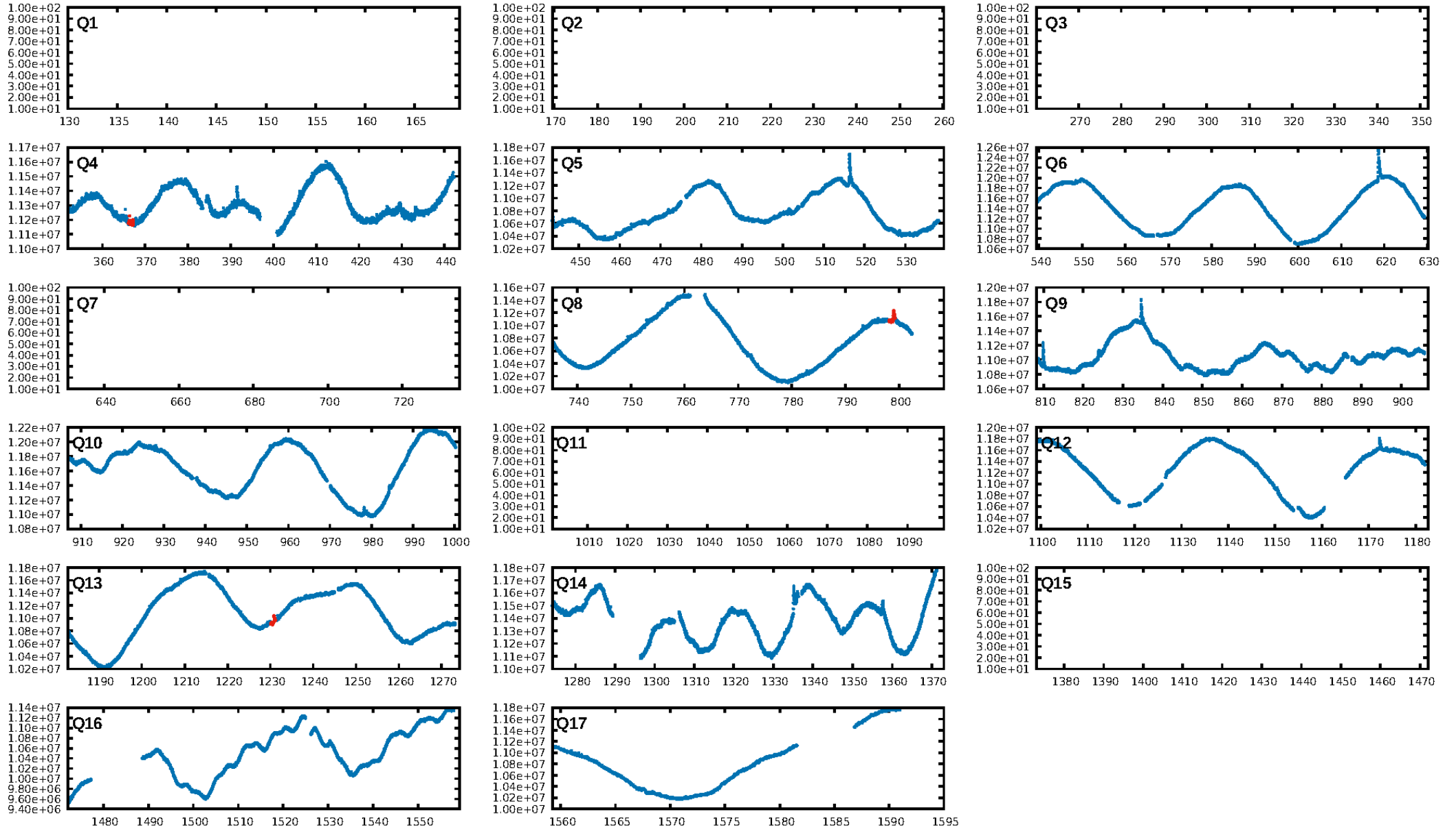
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [93.51 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 7.5%
Bootstrap-pfa: 5.20e-22
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.4594
Centroid-sig: N/A
Centroid-so: 0.283 arcsec [0.43 σ]
OotOffset-rm: 2.797 arcsec [2.79 σ]
OotOffset-st: 0/0/2/0 [2]
KicOffset-rm: 1.152 arcsec [1.18 σ]
KicOffset-st: 0/0/2/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

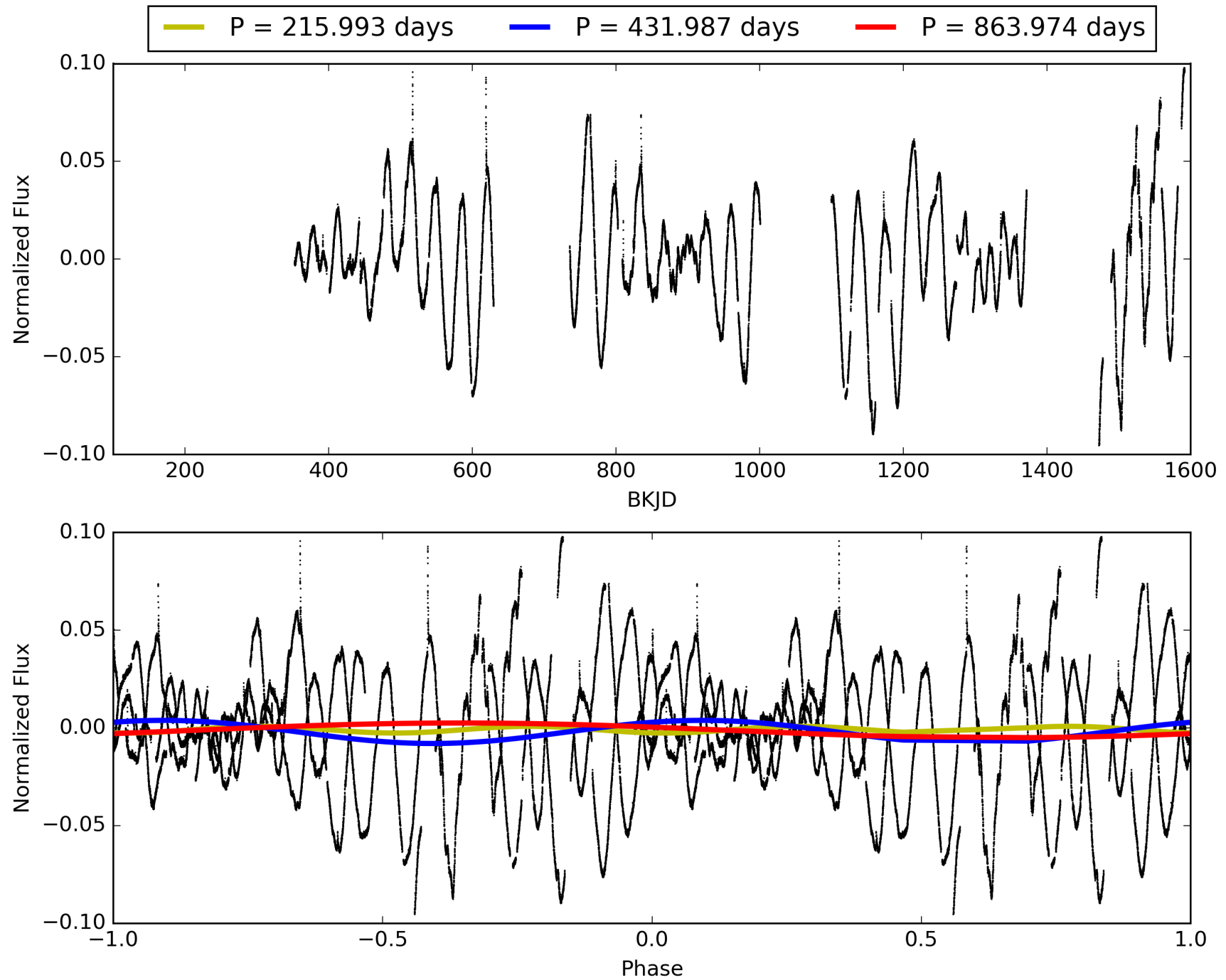
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009603398-01, PDC Light Curves

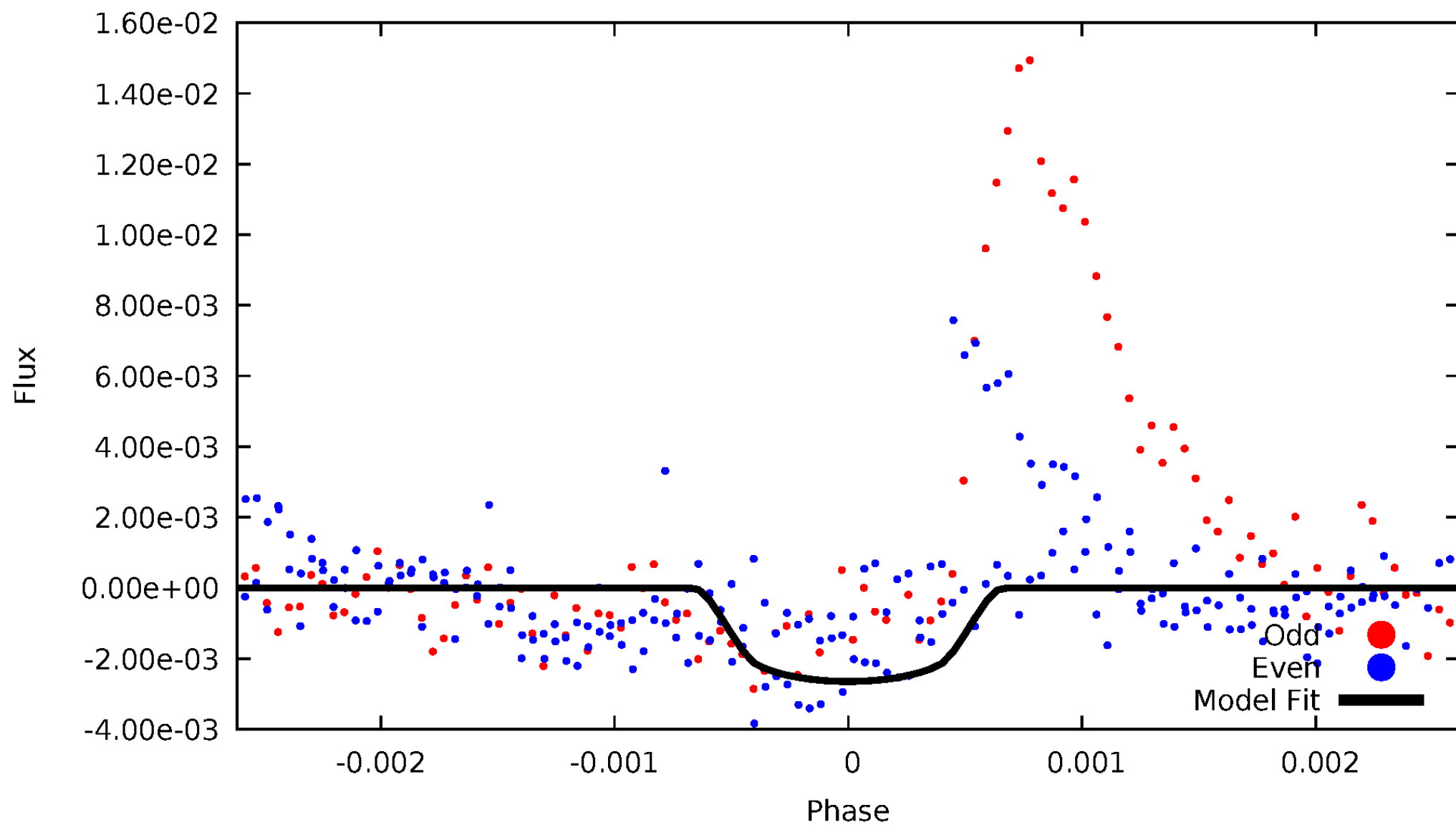


TCE 009603398-01



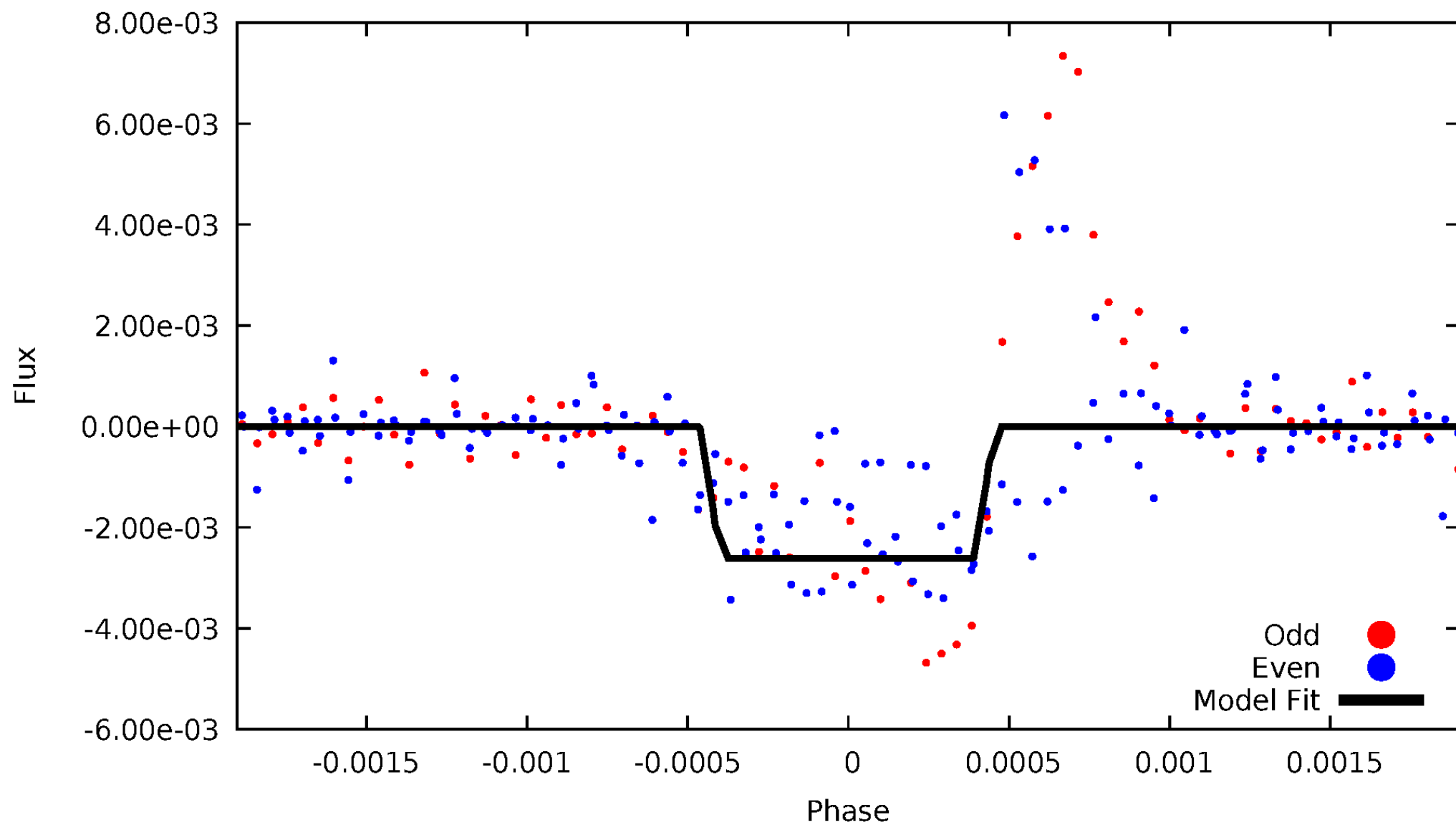
DV Odd/Even

TCE 009603398-01



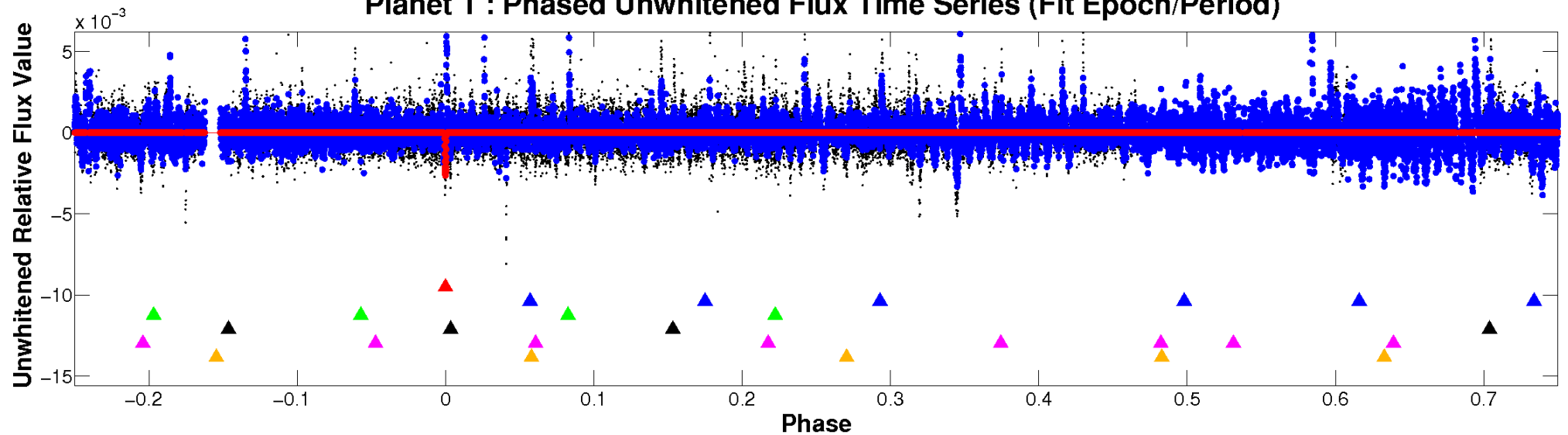
ALT Odd/Even

TCE 009603398-01

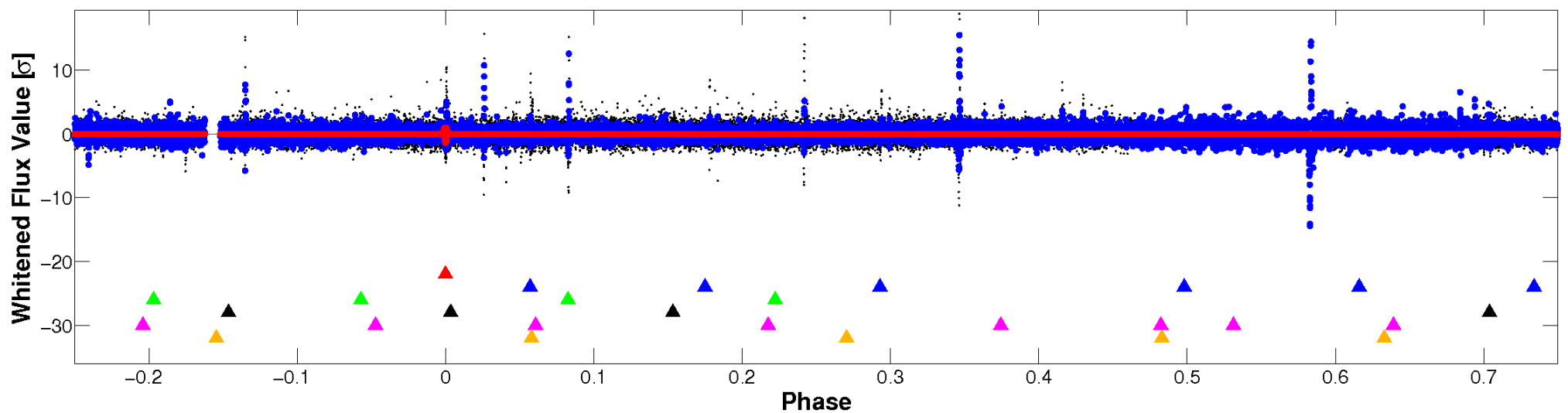


Non-Whitened Vs. Whitened Light Curve

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

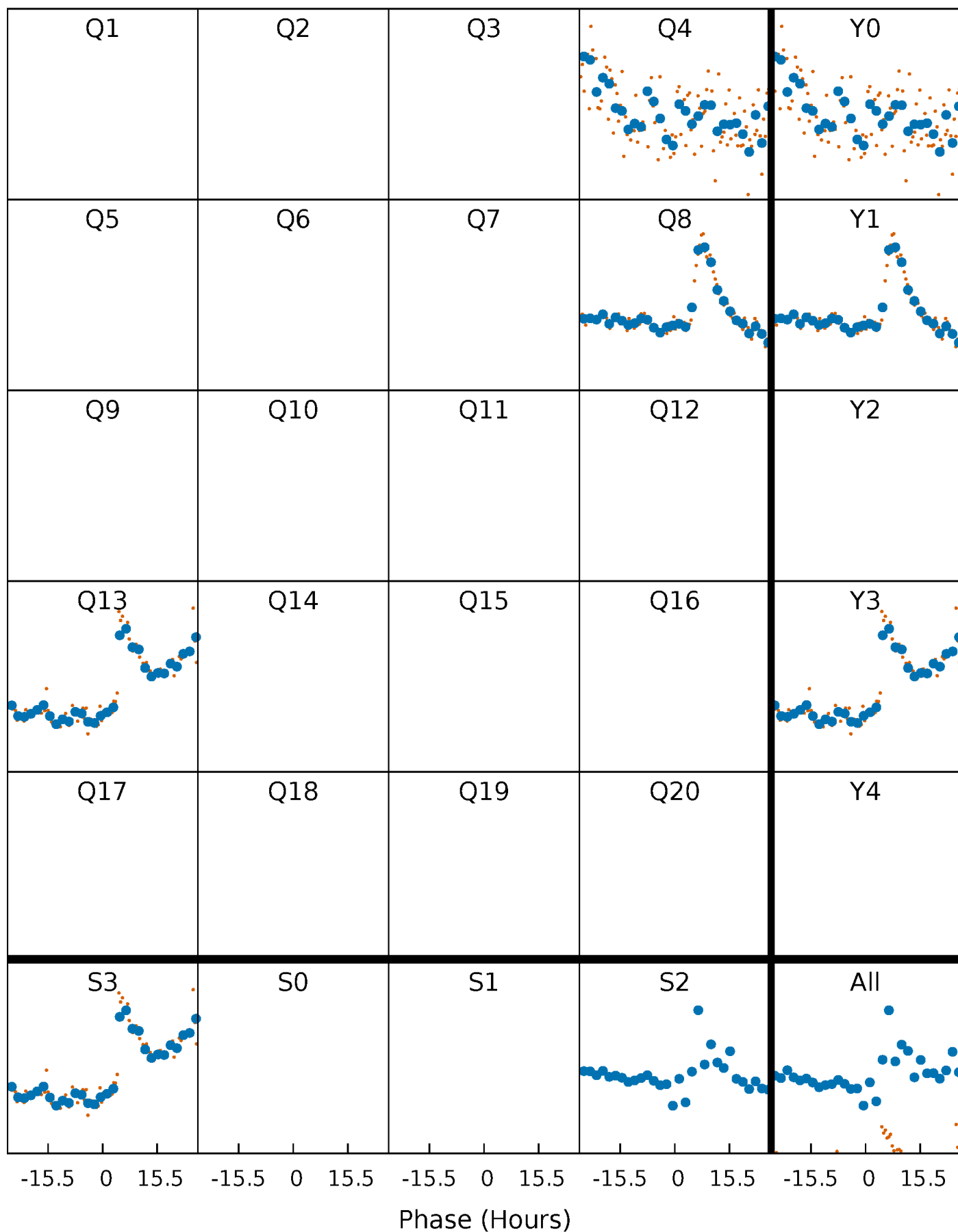


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



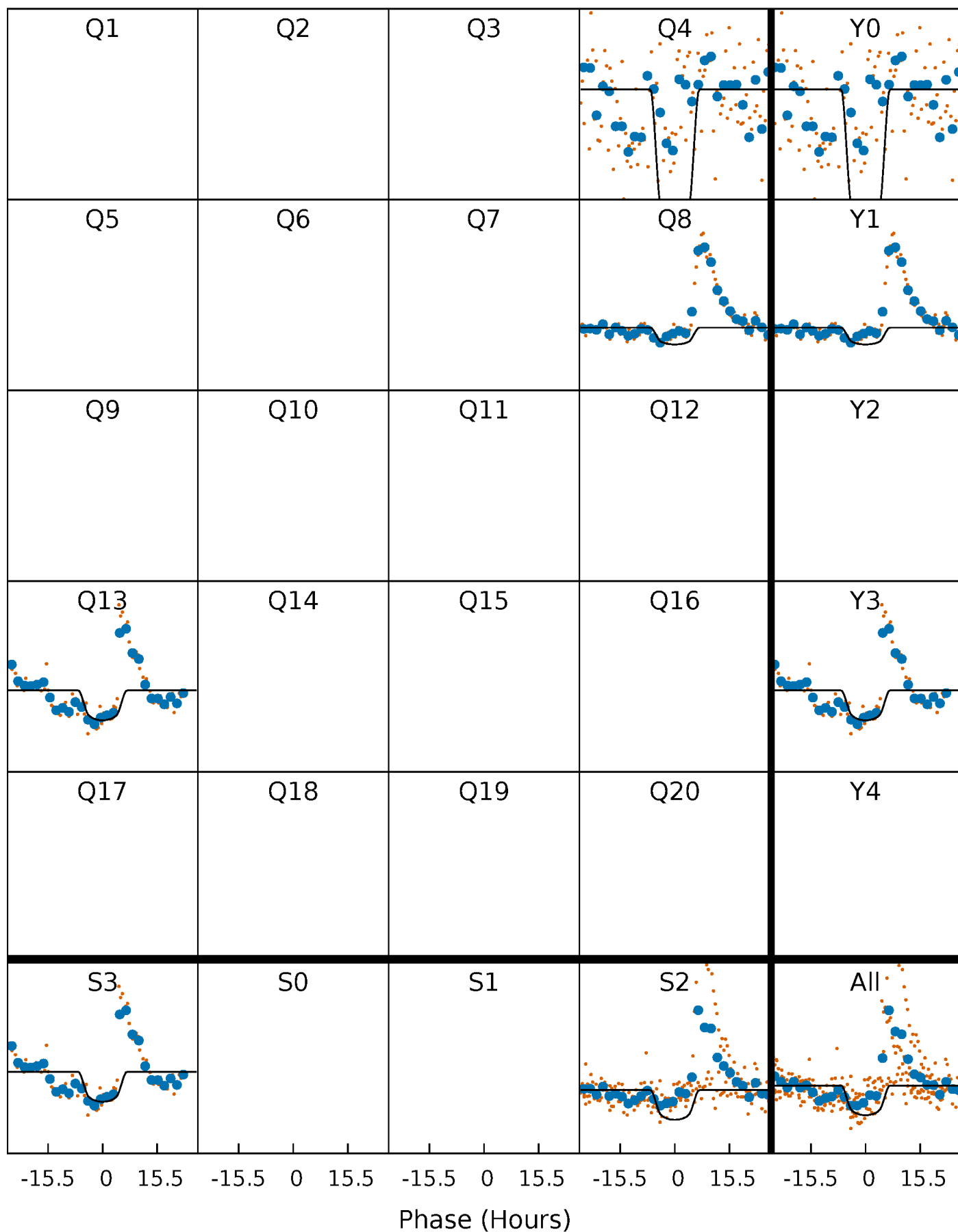
PDC Quarter-Phased Transit Curves

TCE 009603398-01 $P=431.986759$ Days $T_0=366.650758$ (BKJD)



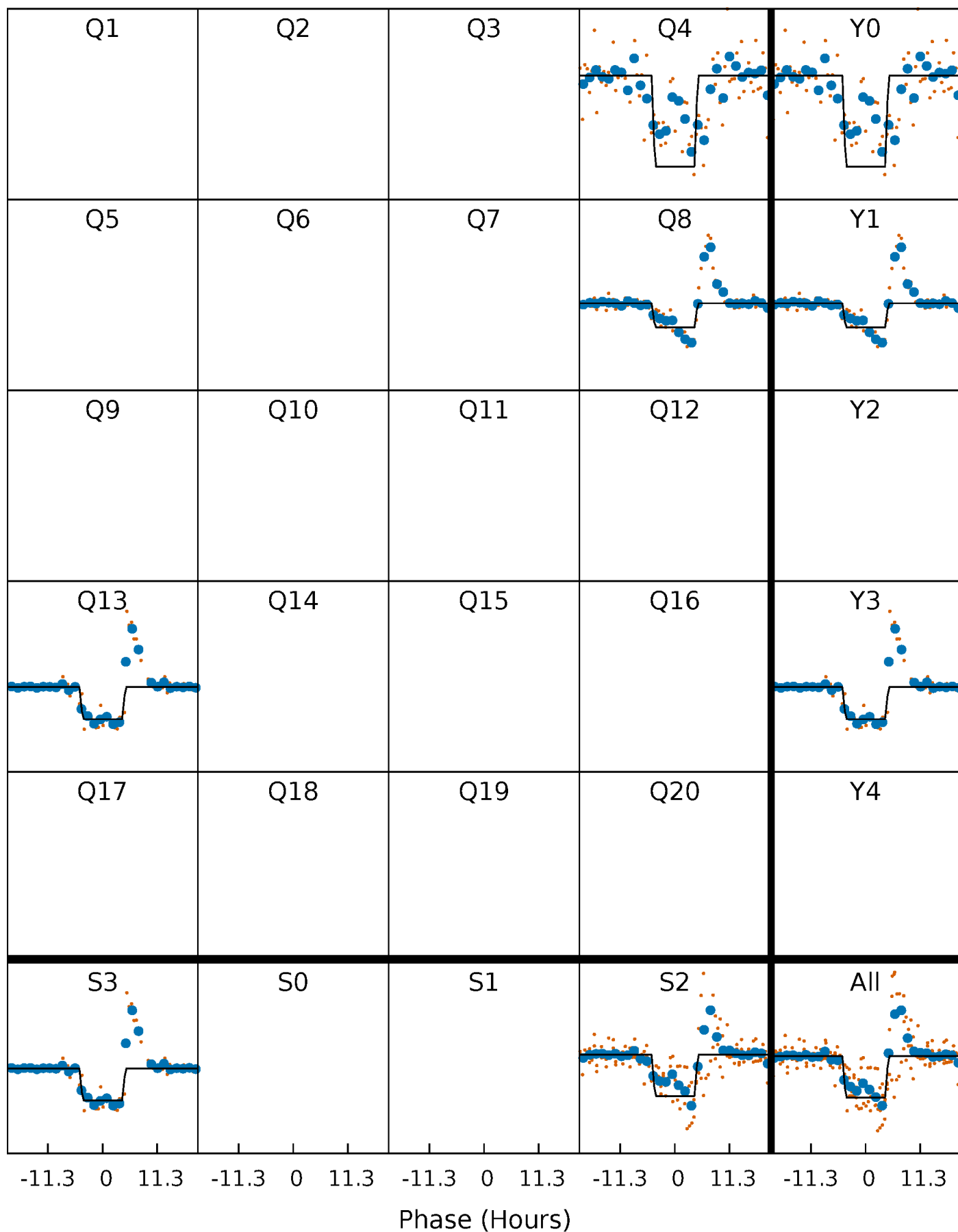
DV Quarter-Phased Transit Curves

TCE 009603398-01 $P=431.986759$ Days $T_0=366.650758$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

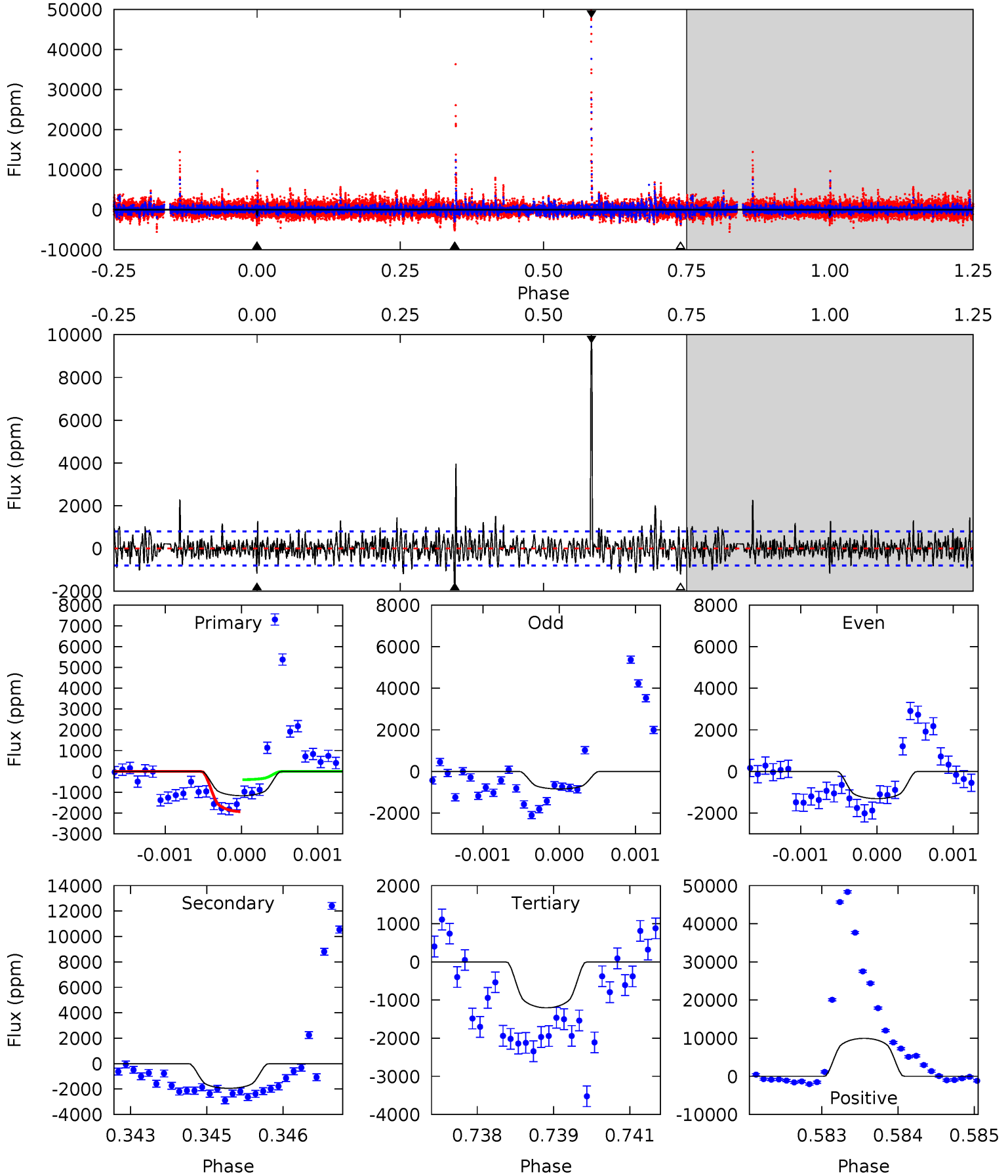
TCE 009603398-01 P=431.945025 Days $T_0=366.718925$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-01, P = 431.986759 Days, E = 366.650758 Days

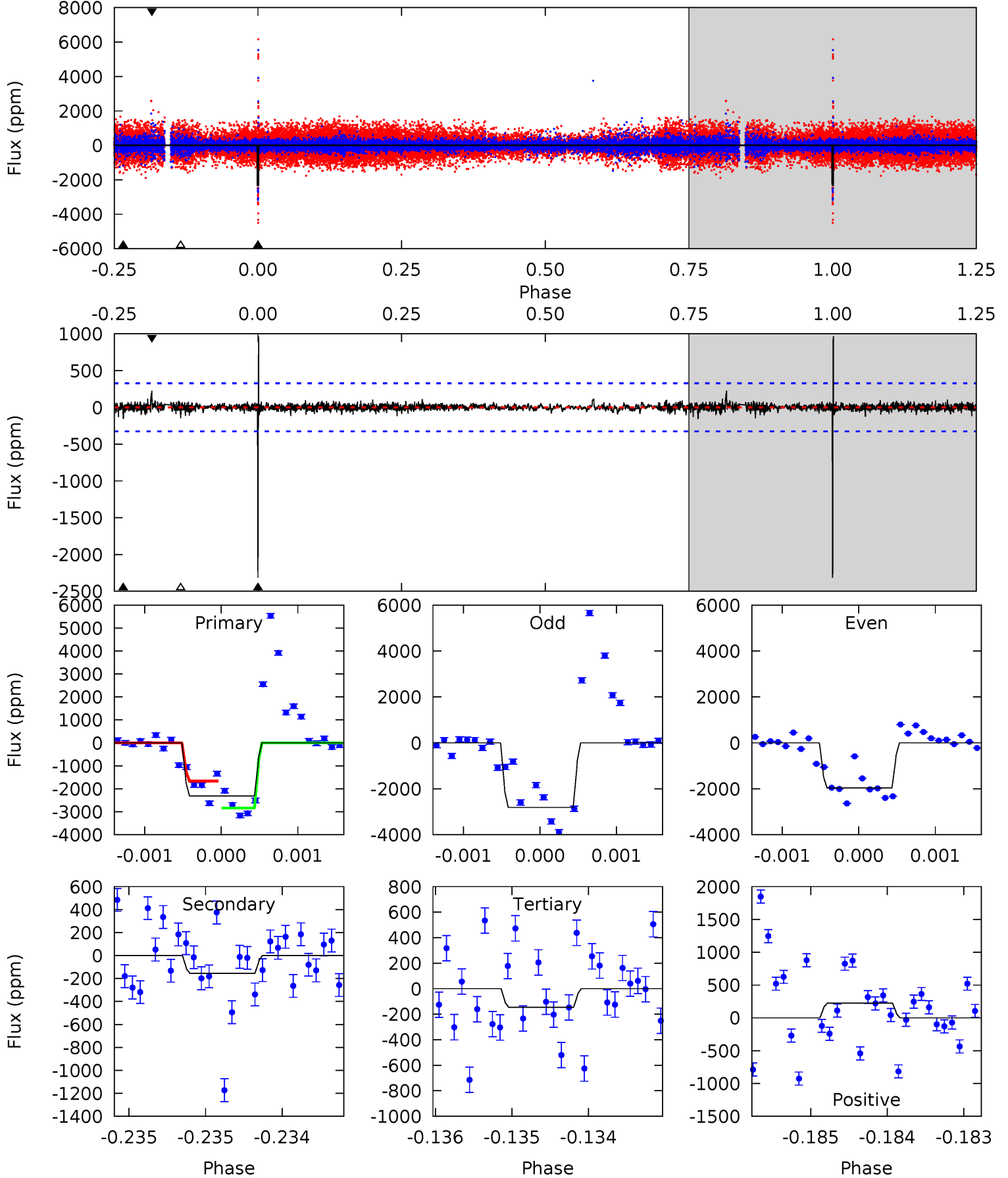
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.88	13.1	8.14	67.4	5.41	3.22	3.51	-0.26	-59.5	4.97	-54.3	1.25	1.24	0.84	5.07



Alt Model-Shift Uniqueness Test

009603398-01, P = 431.945025 Days, E = 366.718925 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.8	2.60	2.44	3.77	5.47	3.32	0.51	36.3	35.0	0.16	-1.17	7.15	0.85	0.29	9.74



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1938 ± 148	$3.98^{+0.49}_{-0.44}$	250^{+10}_{-10}	4488^{+264}_{-225}	63541^{+17828}_{-12622}
Alt.	-155 ± 60	$3.68^{+0.47}_{-0.45}$	249^{+11}_{-10}	3009^{+198}_{-215}	5803^{+2902}_{-2385}

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 $A_{obs} \gg 1.0$

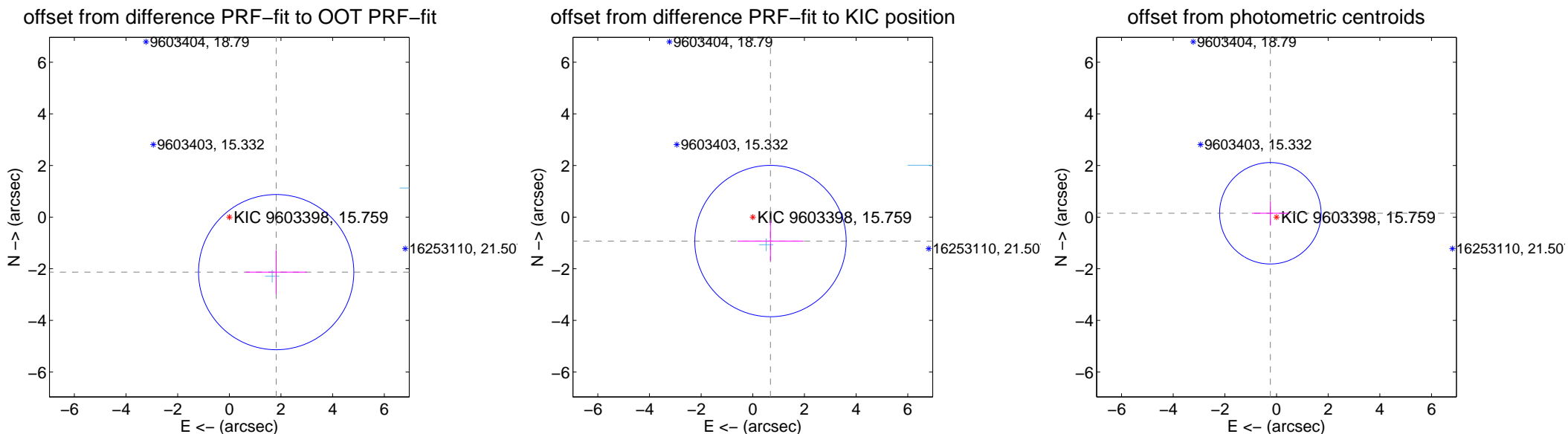
DV Centroid Data

Supplemental centroid analysis for 009603398-01. Kepler magnitude: 15.76. Transit SNR 10.19

There are 2 quarters with good PRF difference image offsets

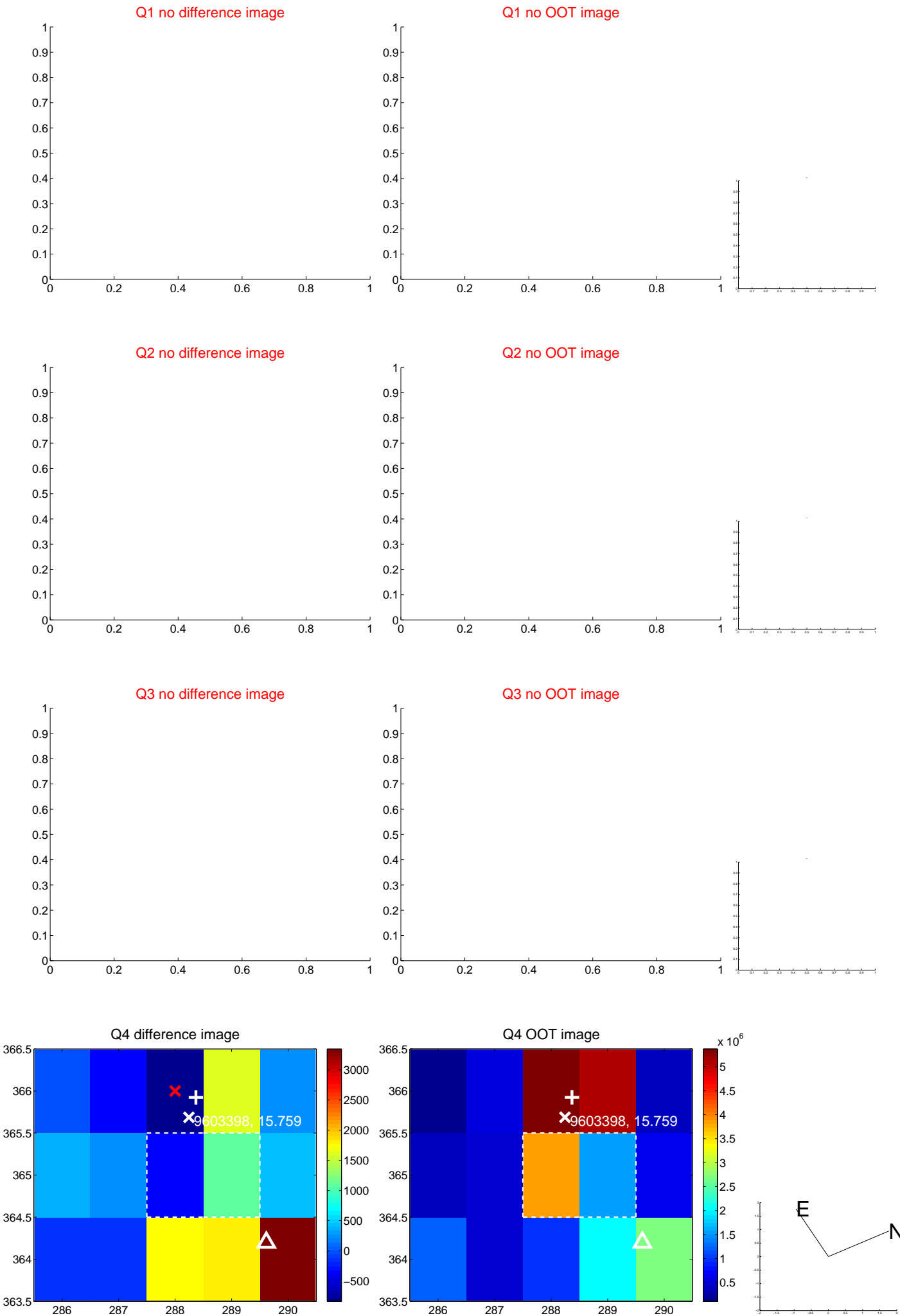
The direct PRF centroid is offset from the target star catalog position by about 1.67 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.797 ± 1.002	2.79	-1.813 ± 1.184	-2.130 ± 0.845
PRF-fit source offset from KIC position	1.152 ± 0.977	1.18	-0.685 ± 1.279	-0.926 ± 0.762
photometric centroid source offset	0.28 ± 0.65	0.43	0.24 ± 0.71	0.15 ± 0.47

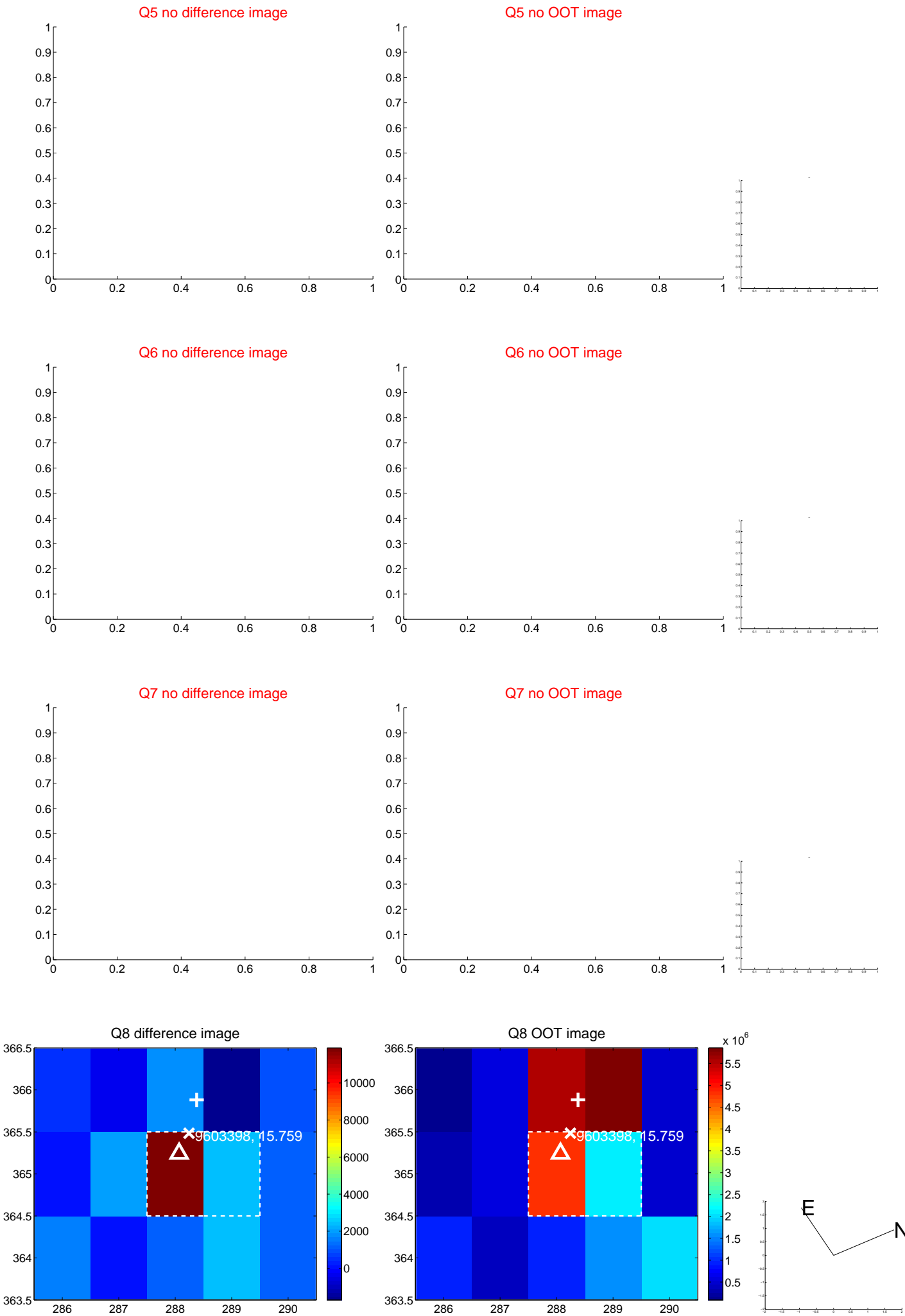


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

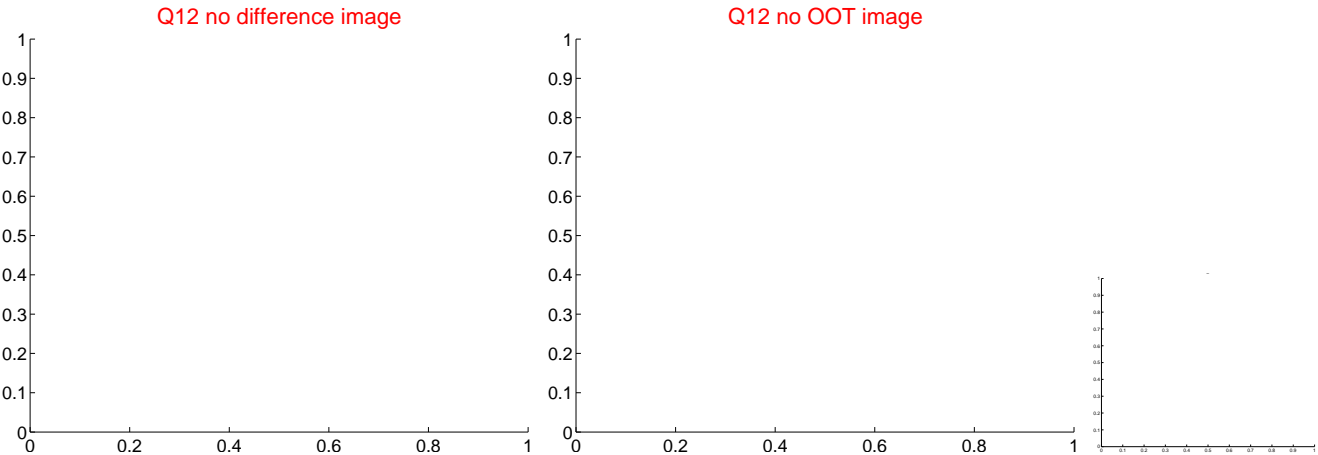
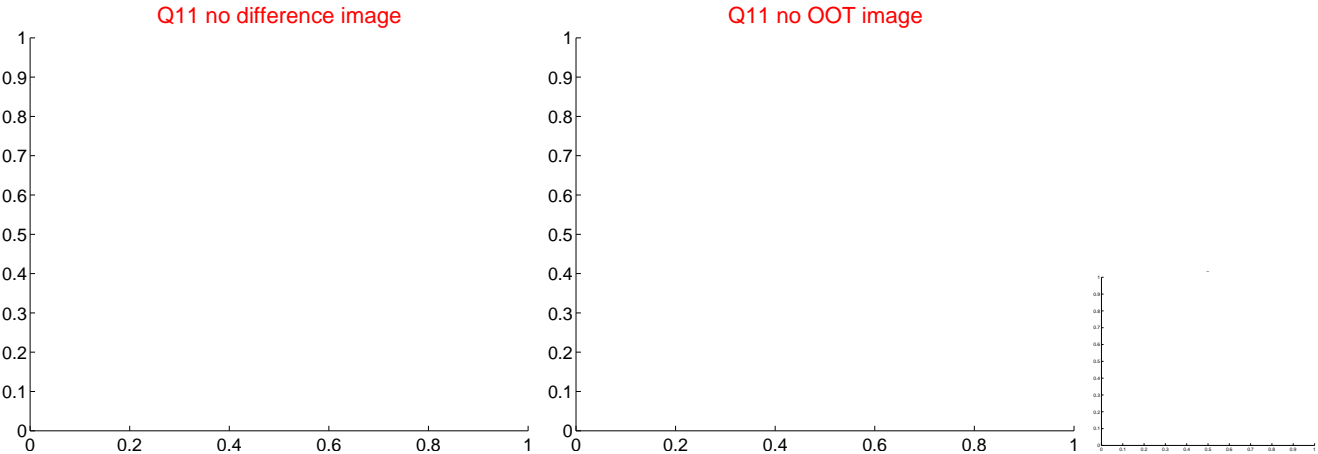
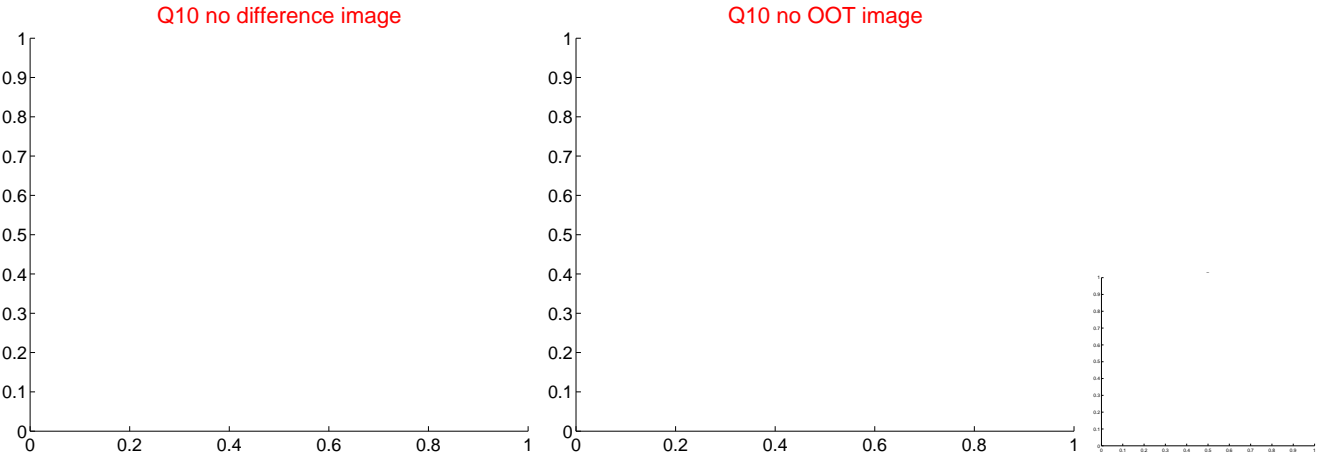
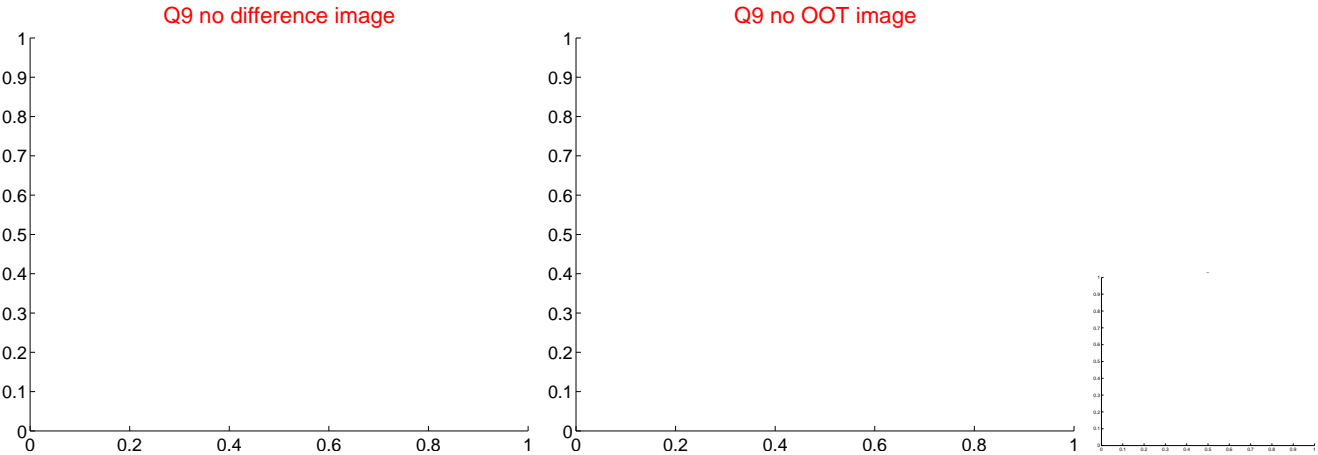
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



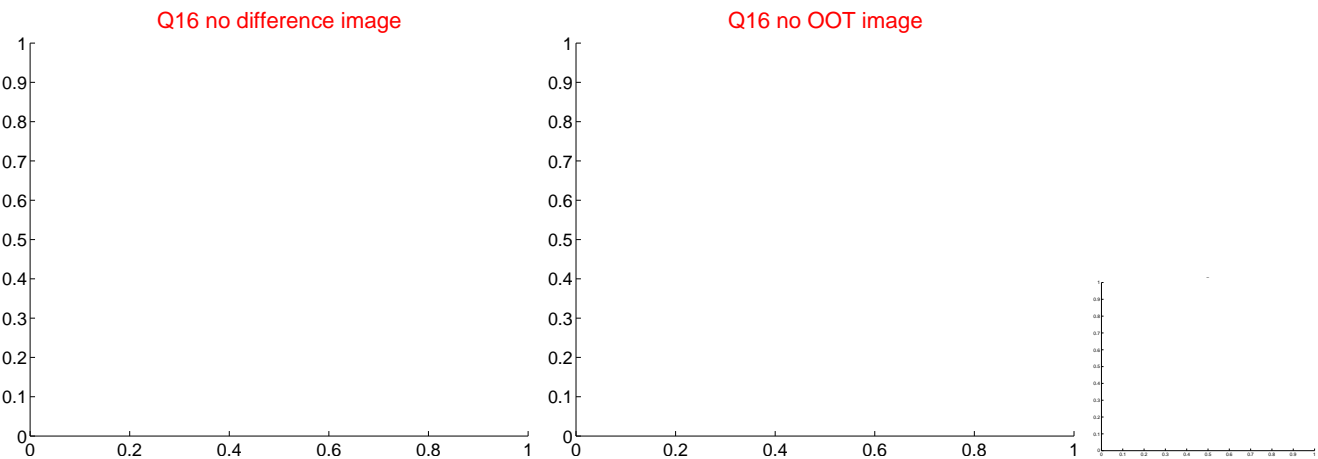
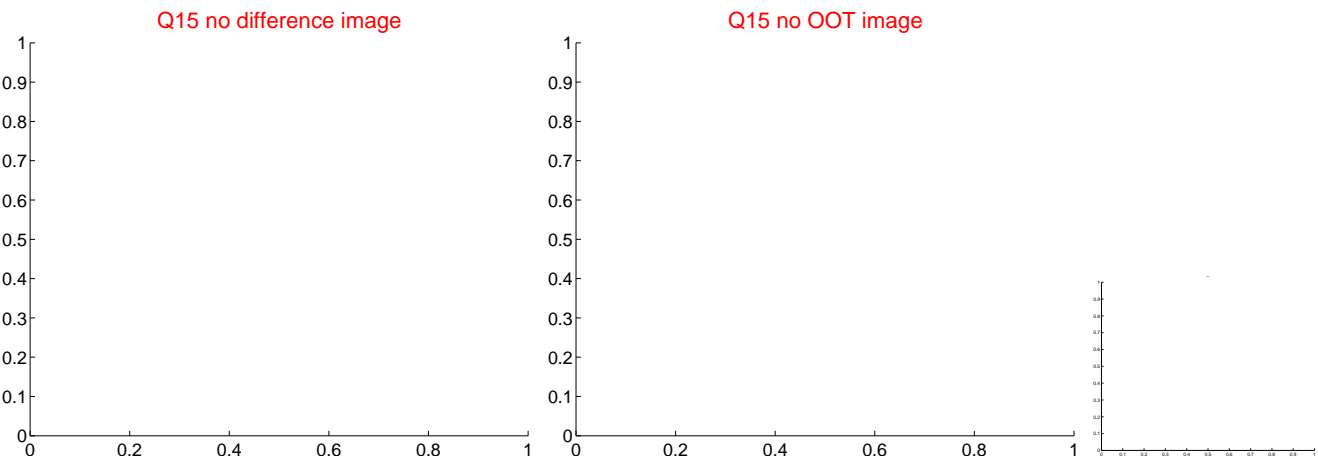
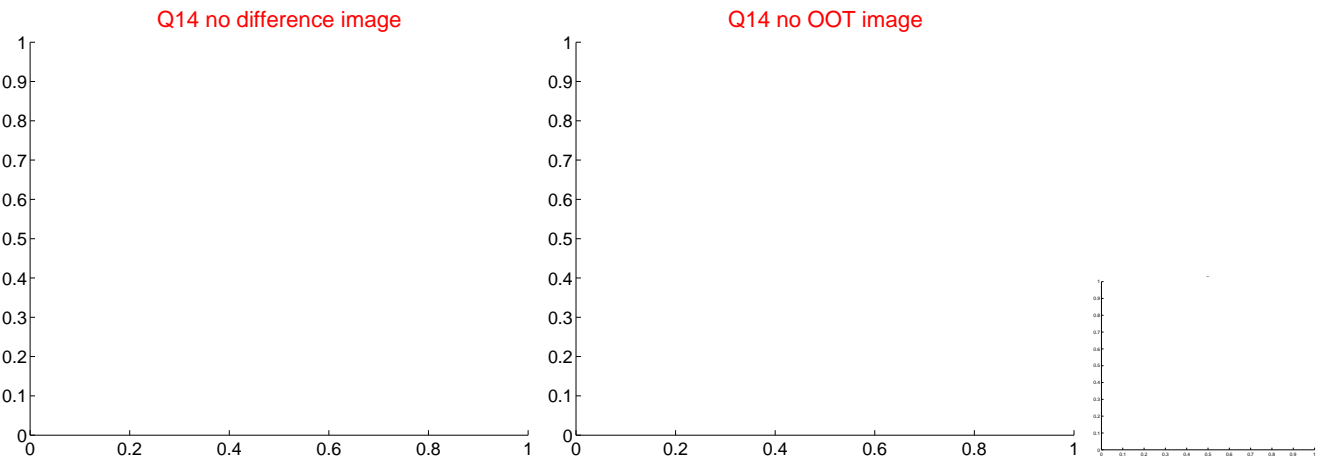
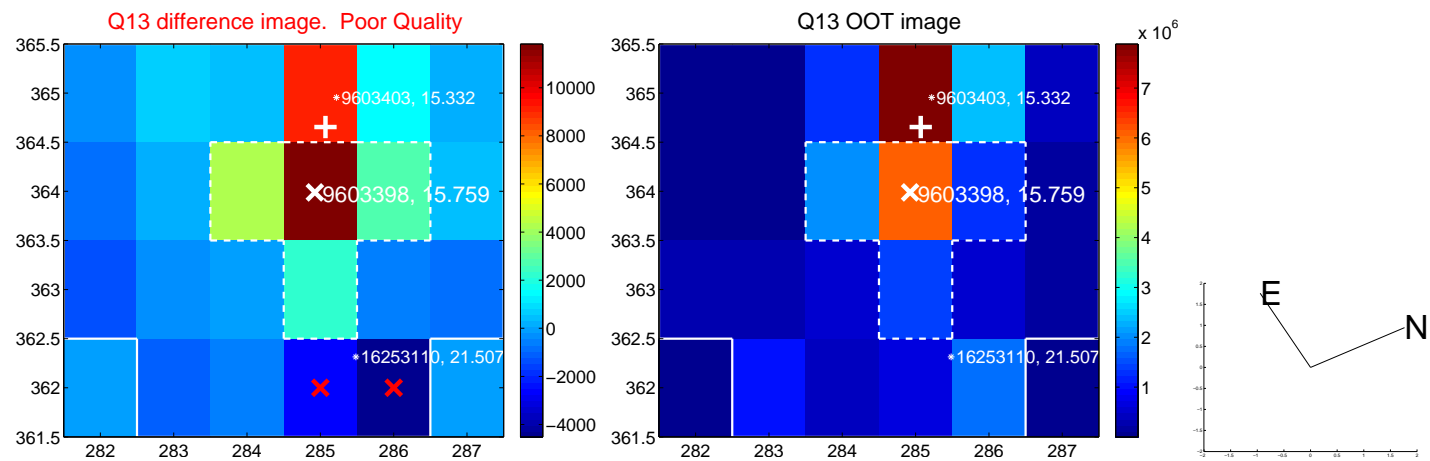
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



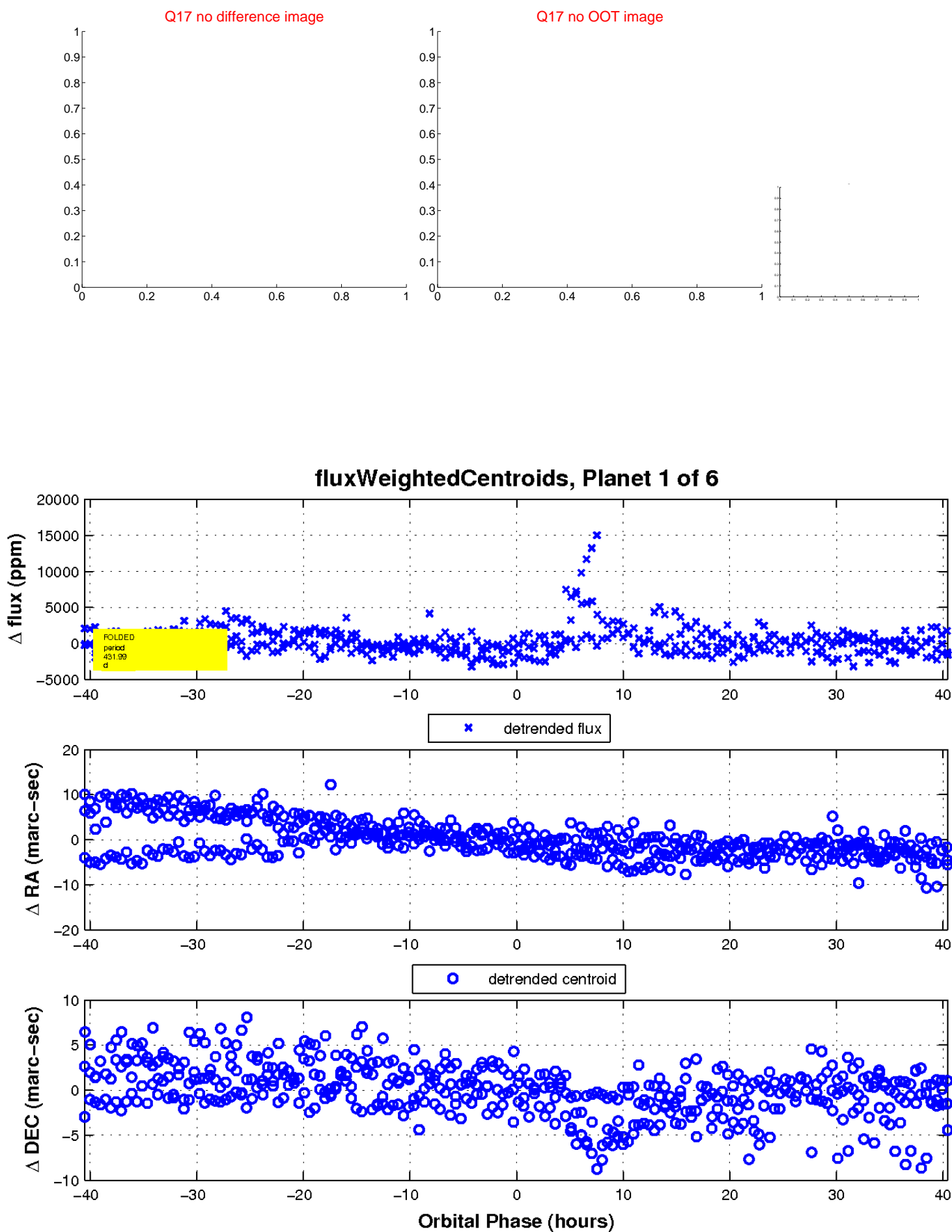
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

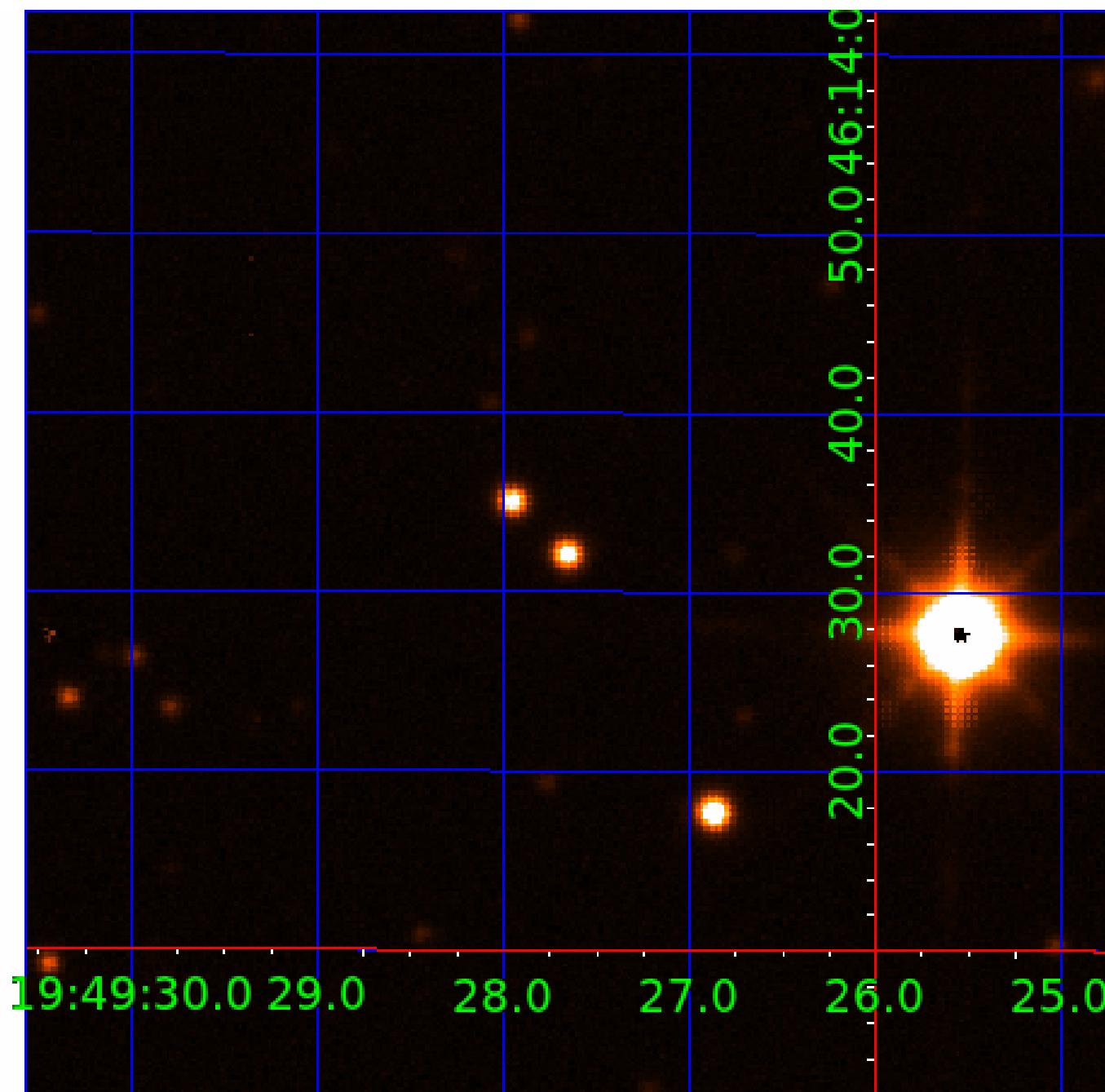


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

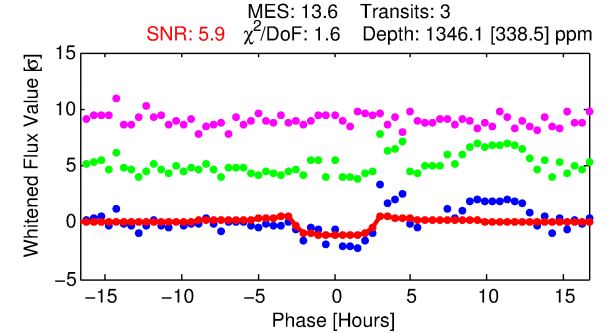
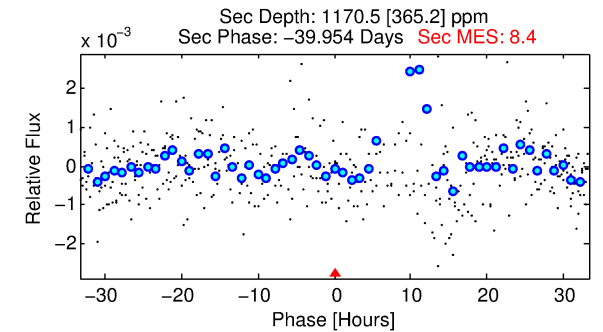
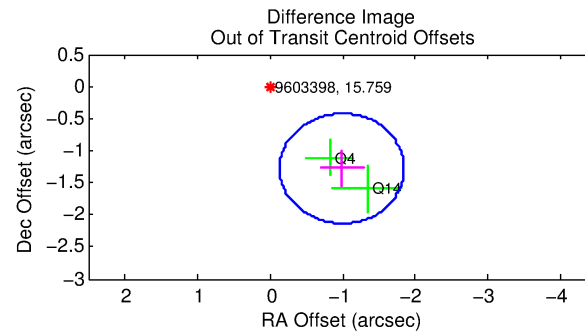
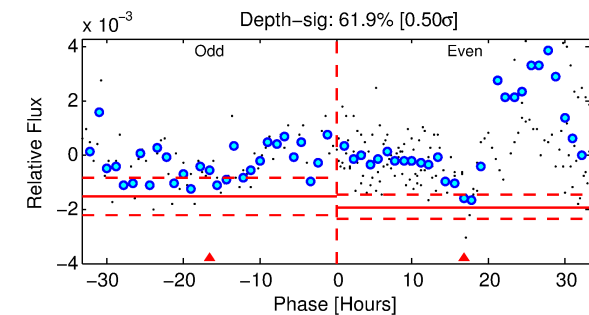
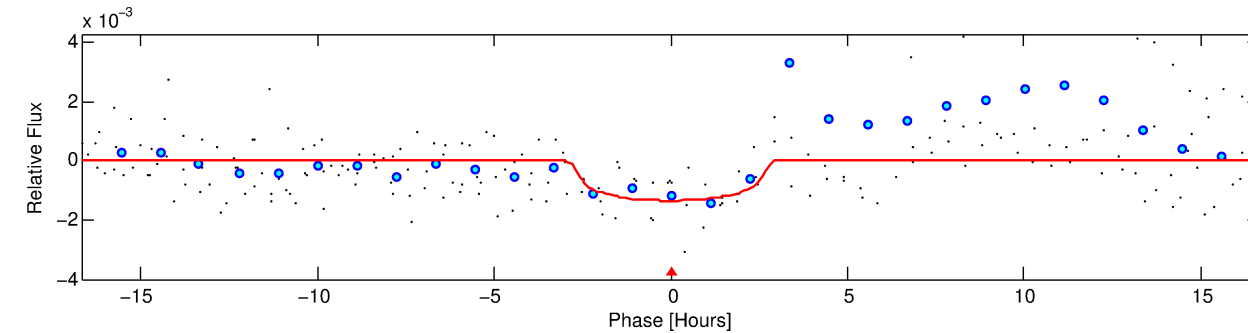
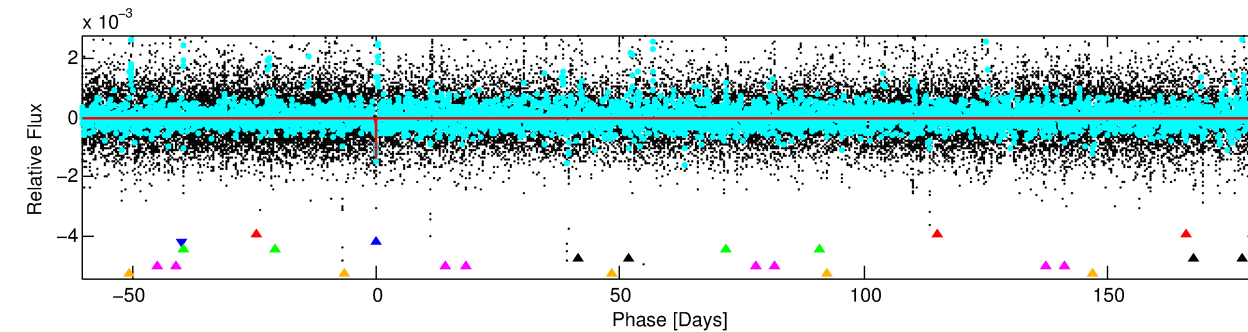
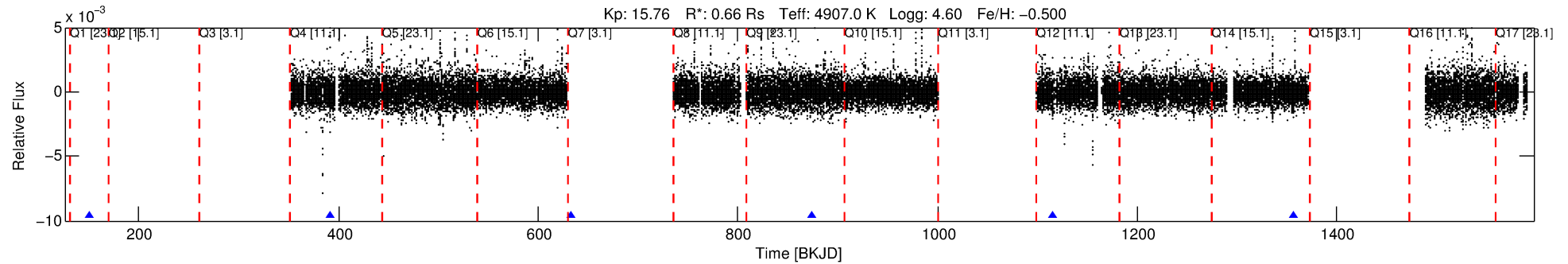
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-02

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 2 of 6 Period: 241.470 d



DV Fit Results:

Period = 241.46966 [0.00636] d
Epoch = 149.8356 [0.0269] BKJD
Rp/R* = 0.0343 [0.0653]
a/R* = 290.49 [1925.38]
b = 0.55 [8.47]
Seff = 0.53 [0.10]
Teq = 218 [10] K
Rp = 2.48 [4.73] Re
a = 0.6556 [0.0555] AU
Ag = 44887.66 [171474.08] [0.26 σ]
Teffp = 4899 [4679] K [1.00 σ]

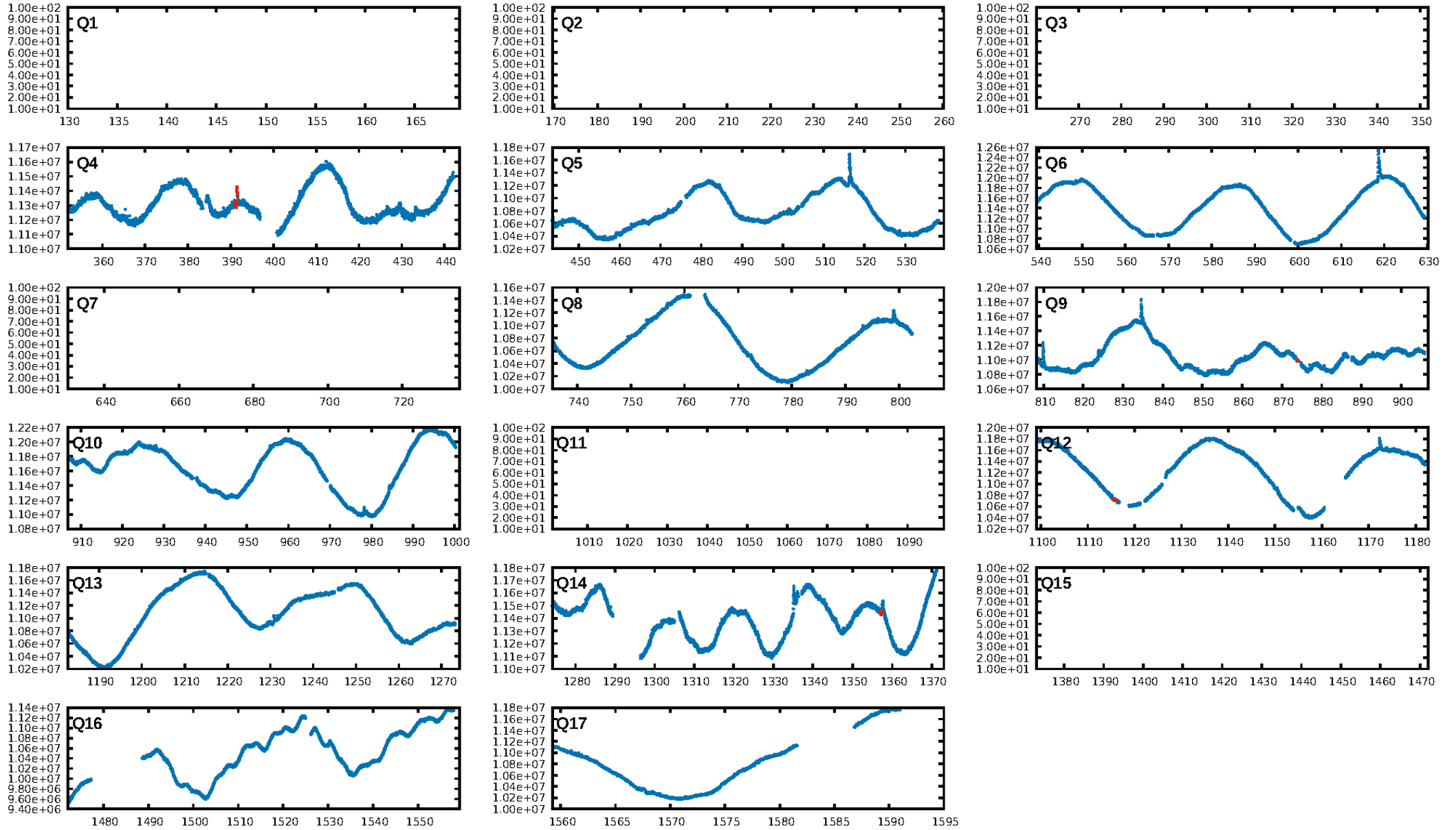
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [115.53 σ]
LongPeriod-sig: 100.0% [217.55 σ]
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 60.7%
Bootstrap-pfa: 7.07e-18
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.892
Centroid-sig: N/A
Centroid-so: 1.052 arcsec [1.01 σ]
OotOffset-rm: 1.618 arcsec [5.66 σ]
KicOffset-rm: 0.052 arcsec [0.17 σ]
OotOffset-st: 1/0/1/0 [2]
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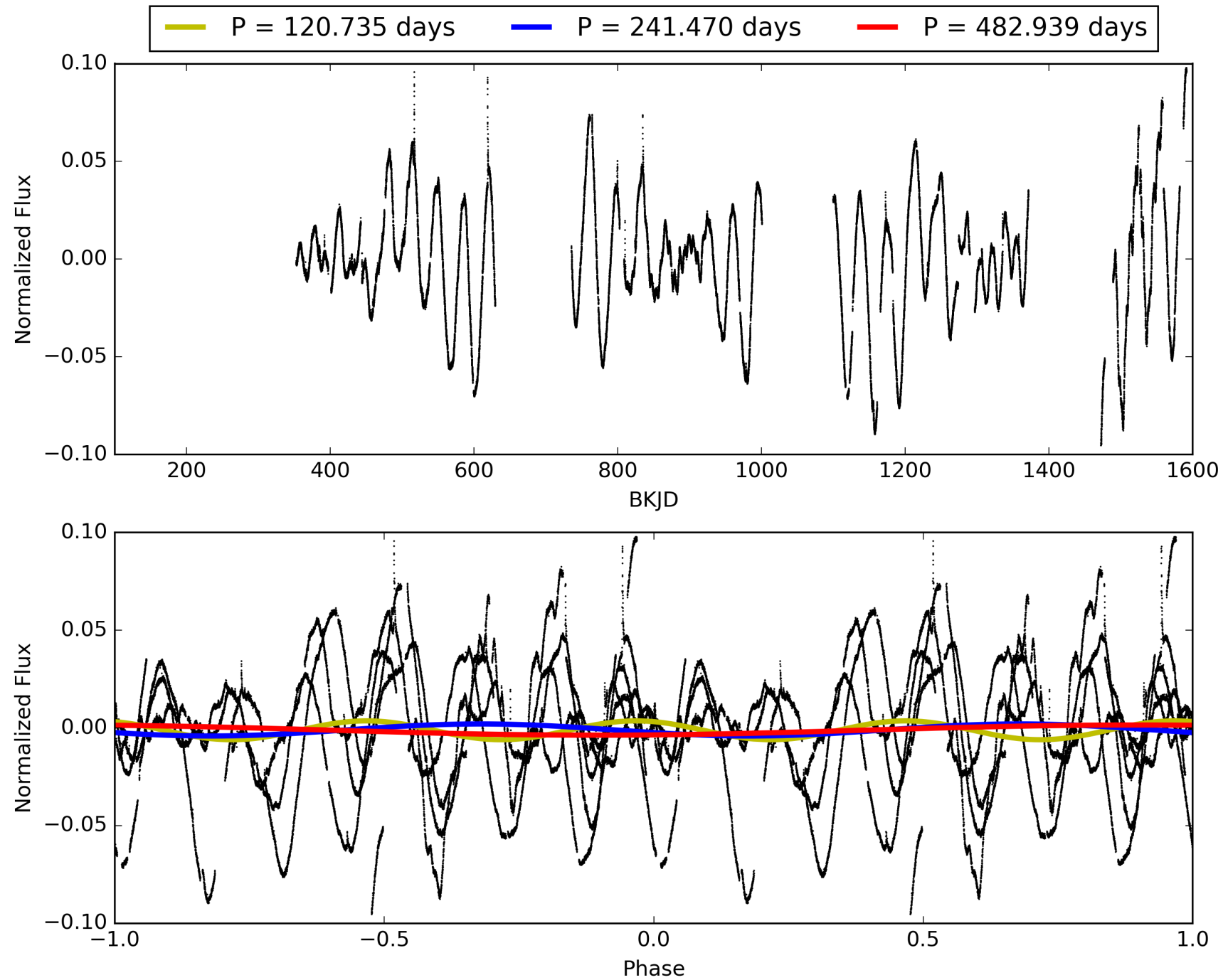
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009603398-02, PDC Light Curves

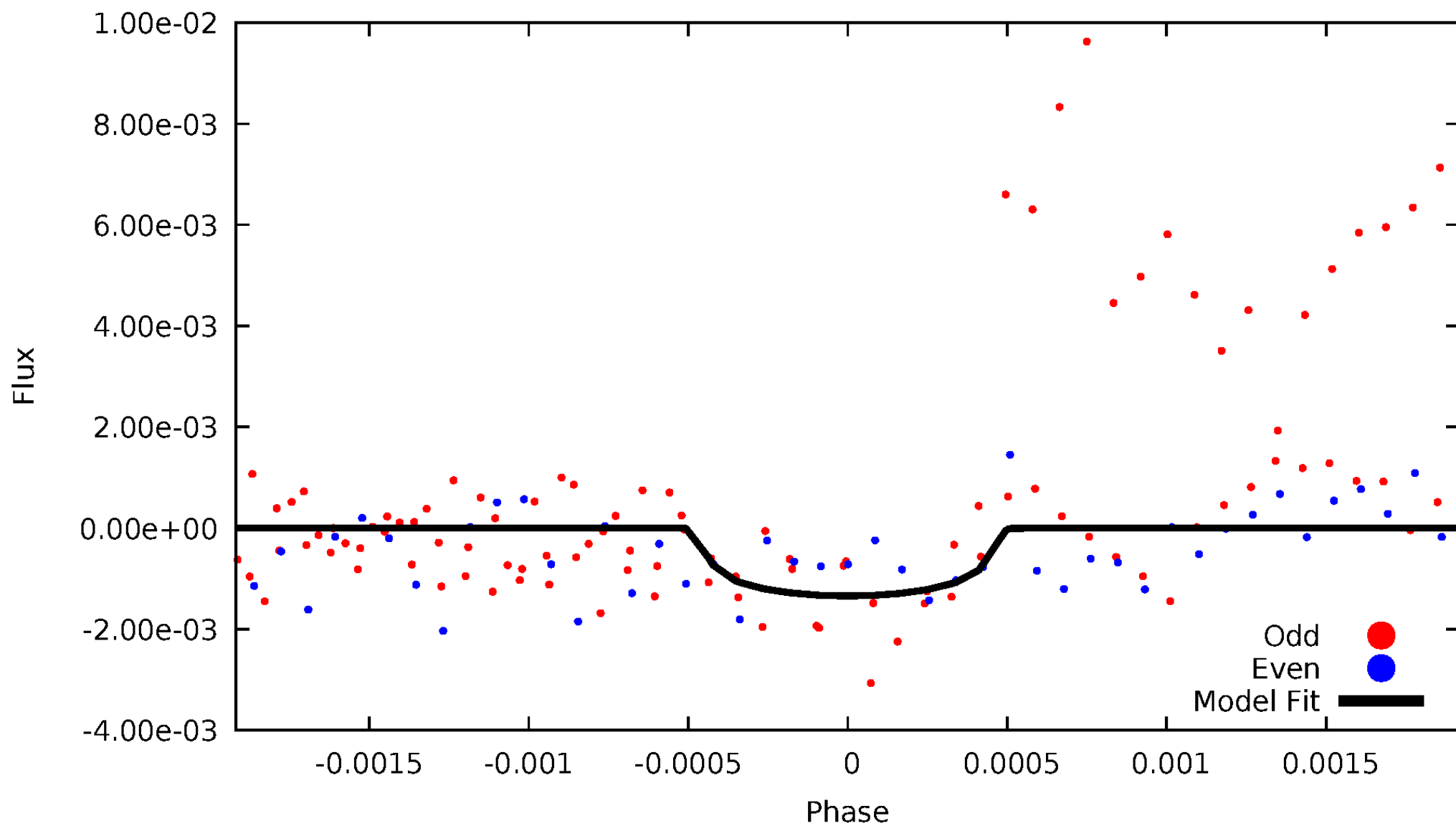


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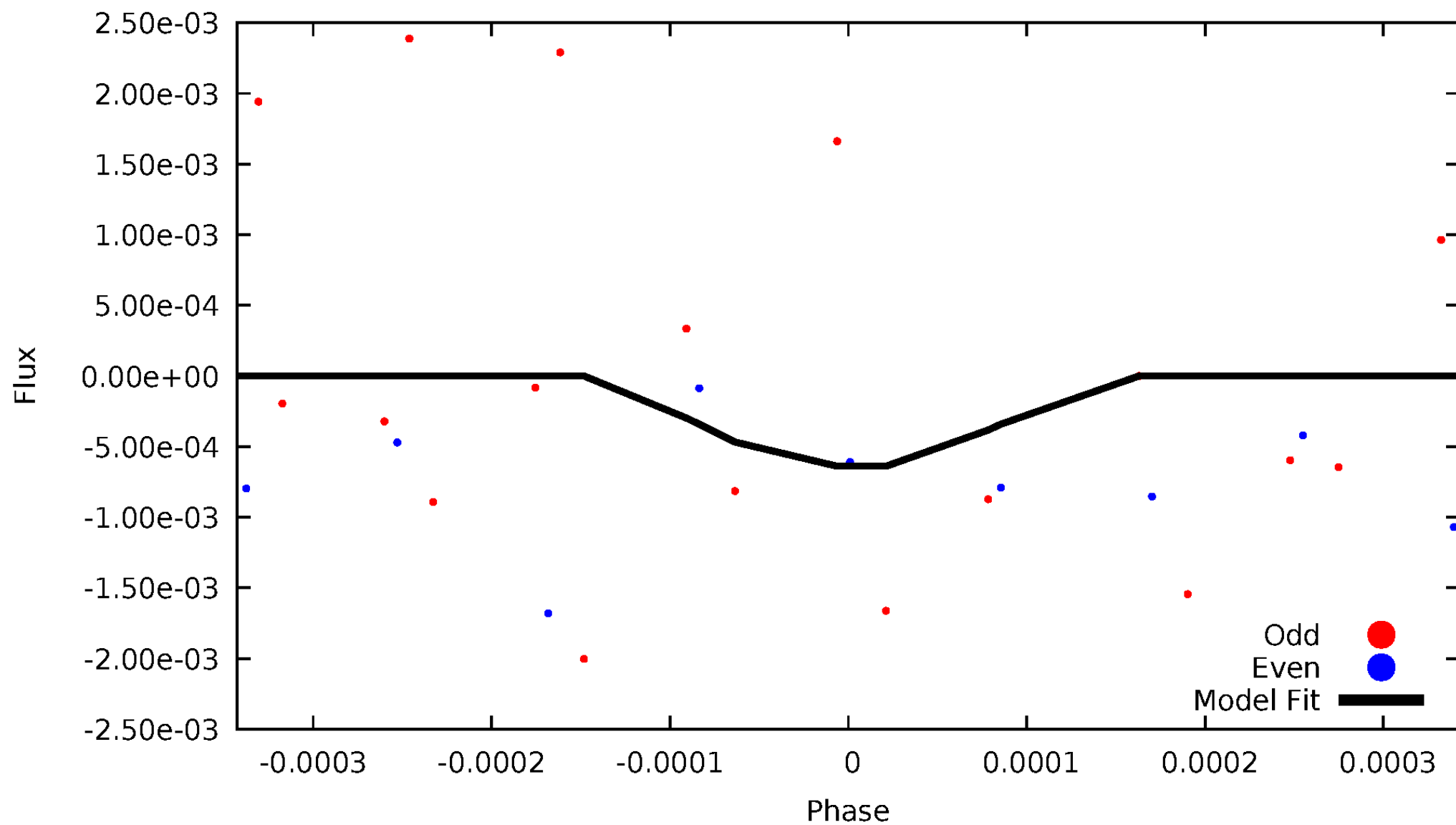
DV Odd/Even

TCE 009603398-02



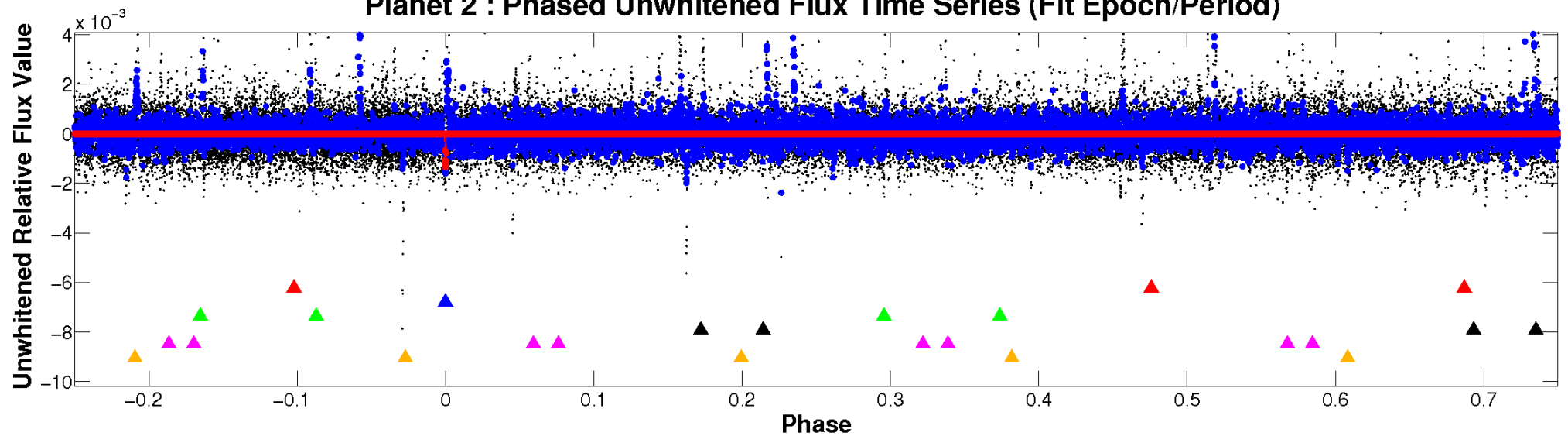
ALT Odd/Even

TCE 009603398-02

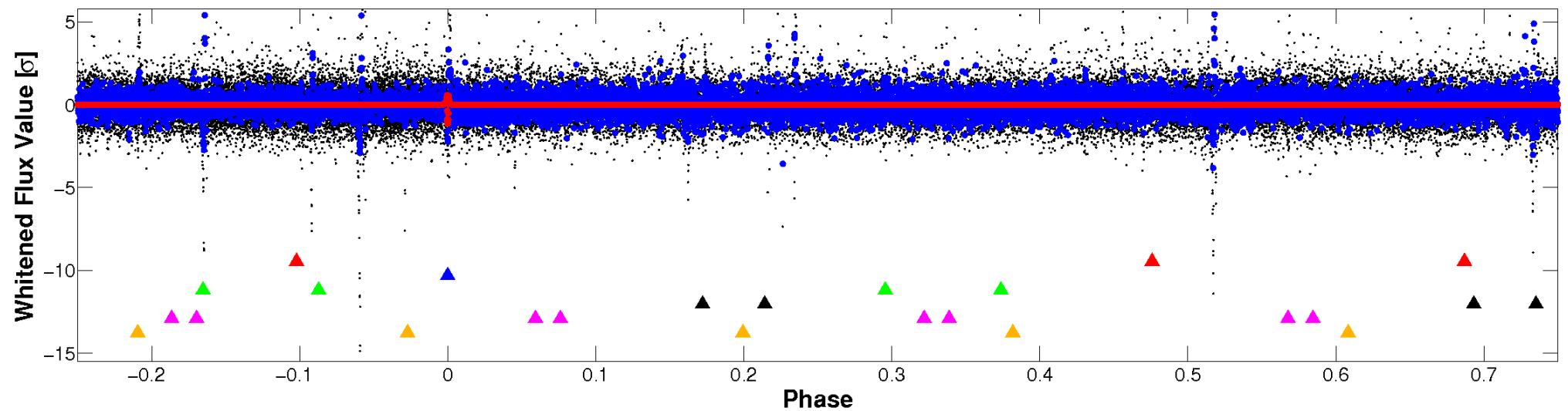


Non-Whitened Vs. Whitened Light Curve

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

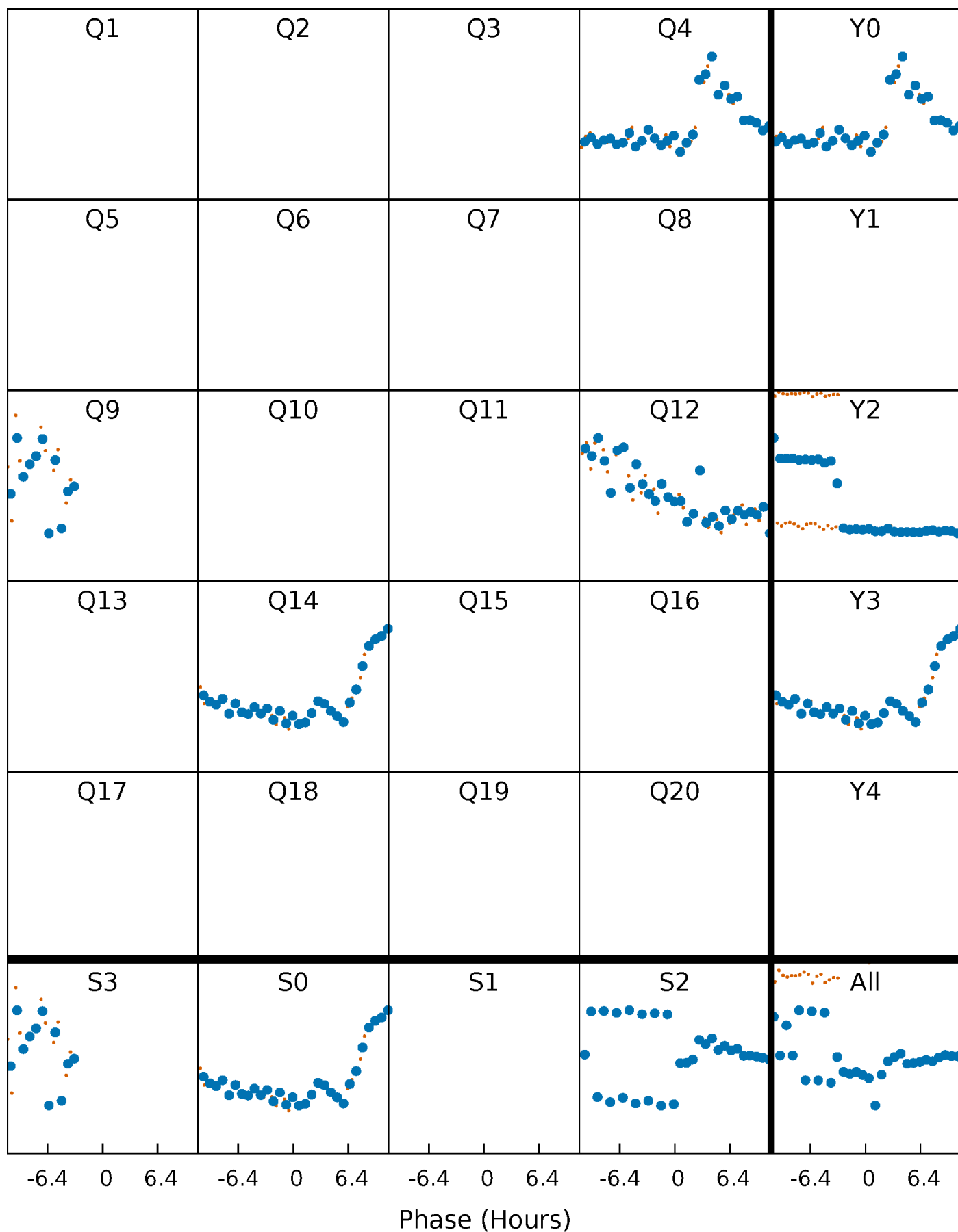


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



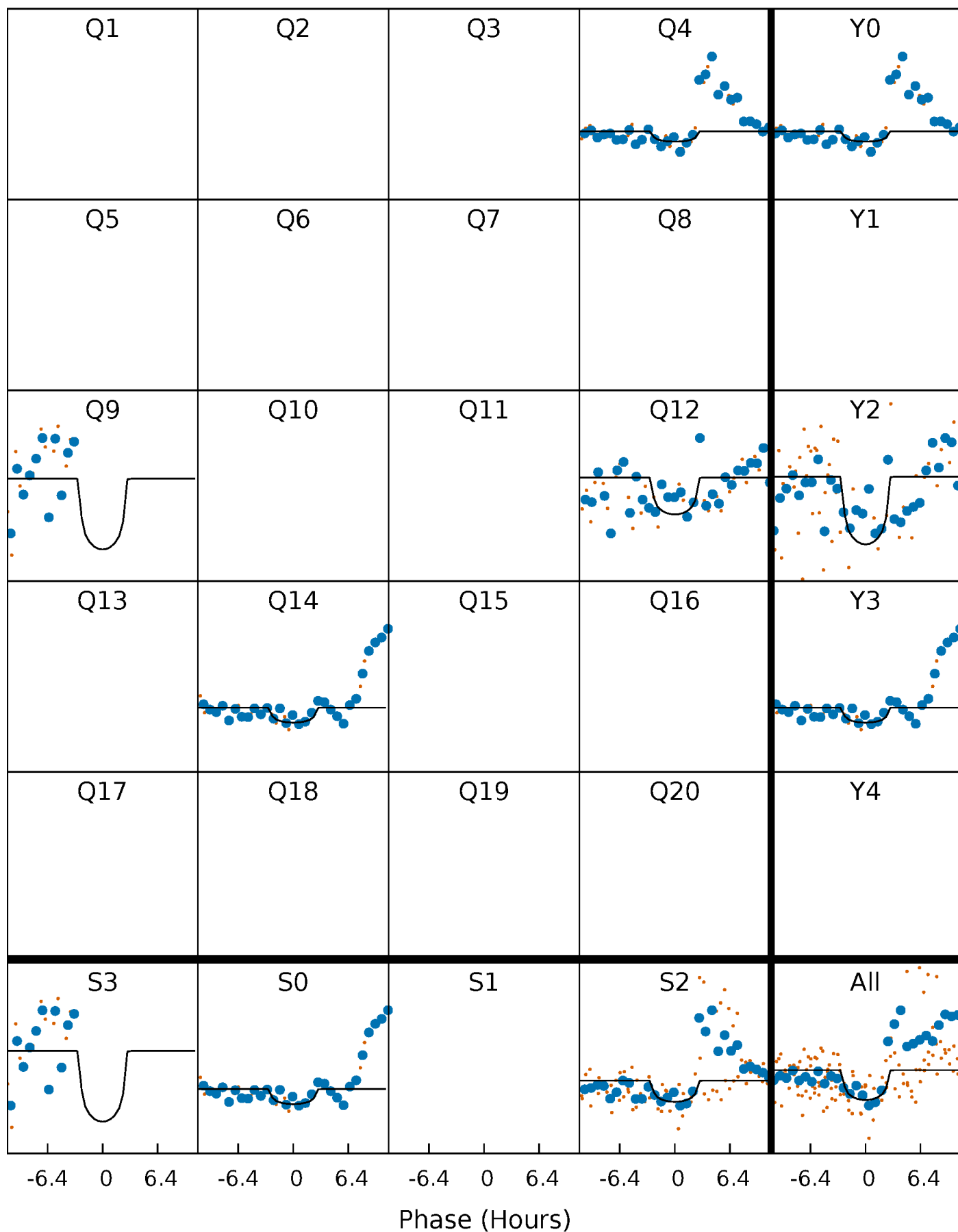
PDC Quarter-Phased Transit Curves

TCE 009603398-02 $P=241.469663$ Days $T_0=149.835622$ (BKJD)



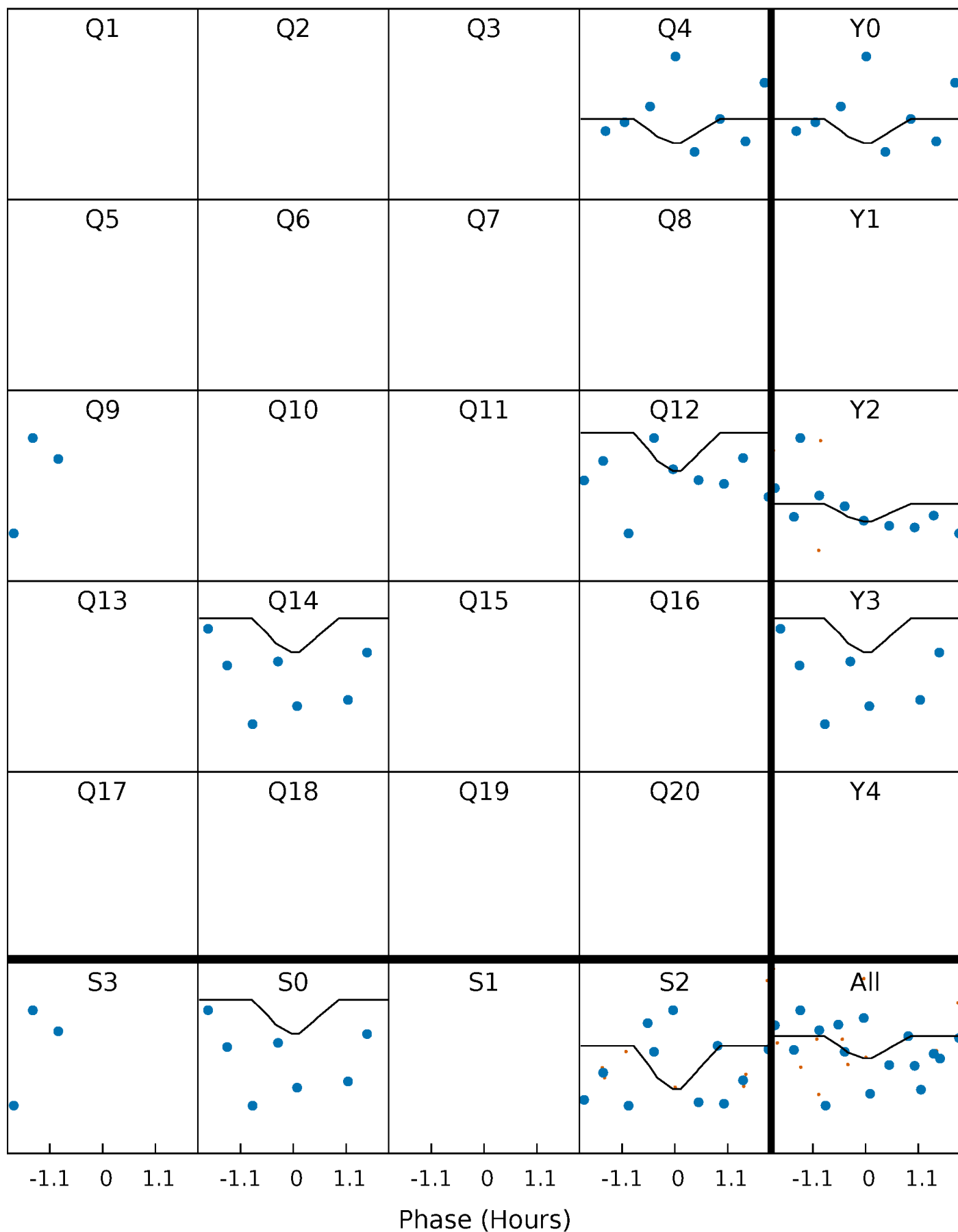
DV Quarter-Phased Transit Curves

TCE 009603398-02 P=241.469663 Days $T_0=149.835622$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

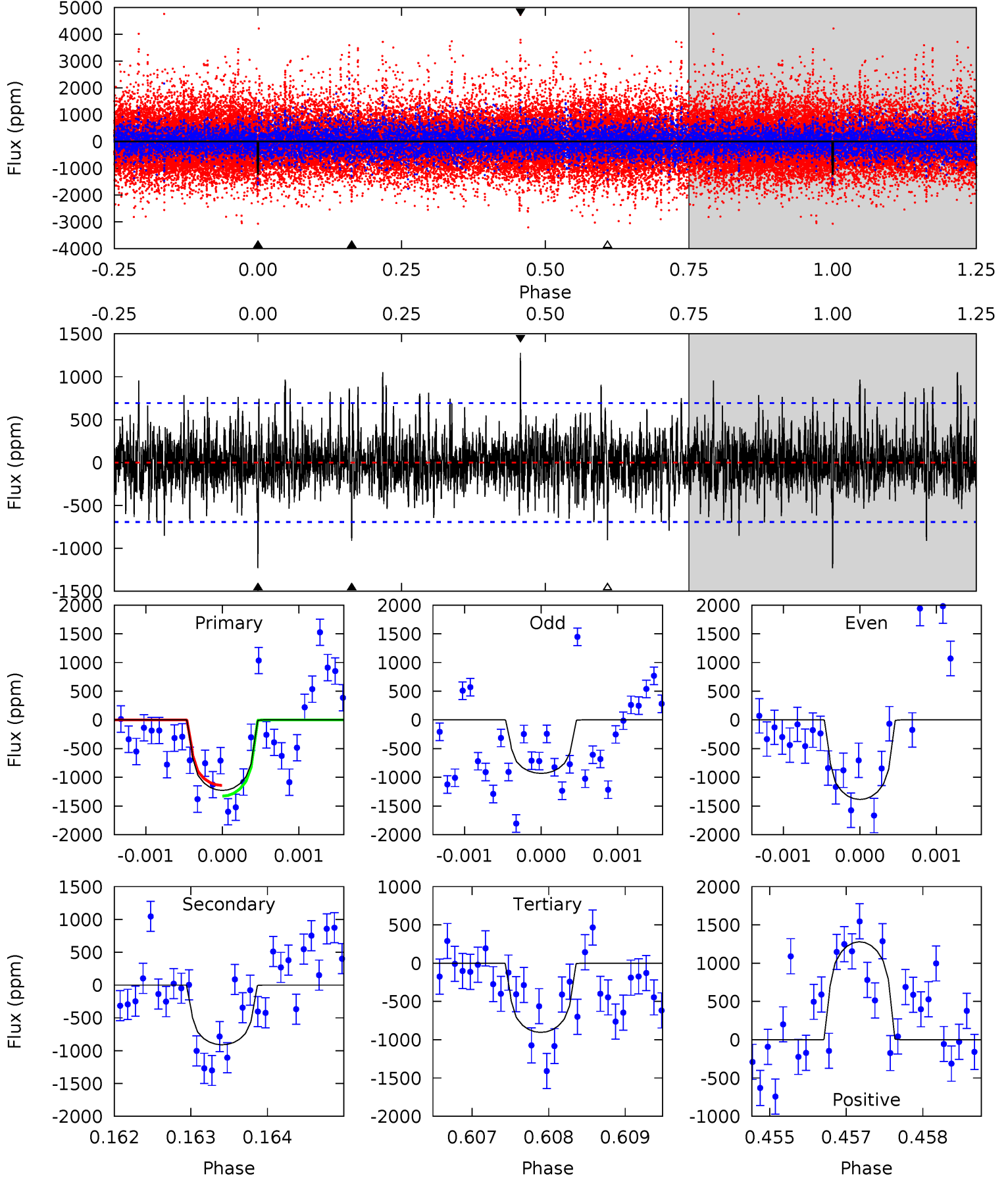
TCE 009603398-02 P=241.524679 Days $T_0=149.574658$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-02, P = 241.469663 Days, E = 149.835622 Days

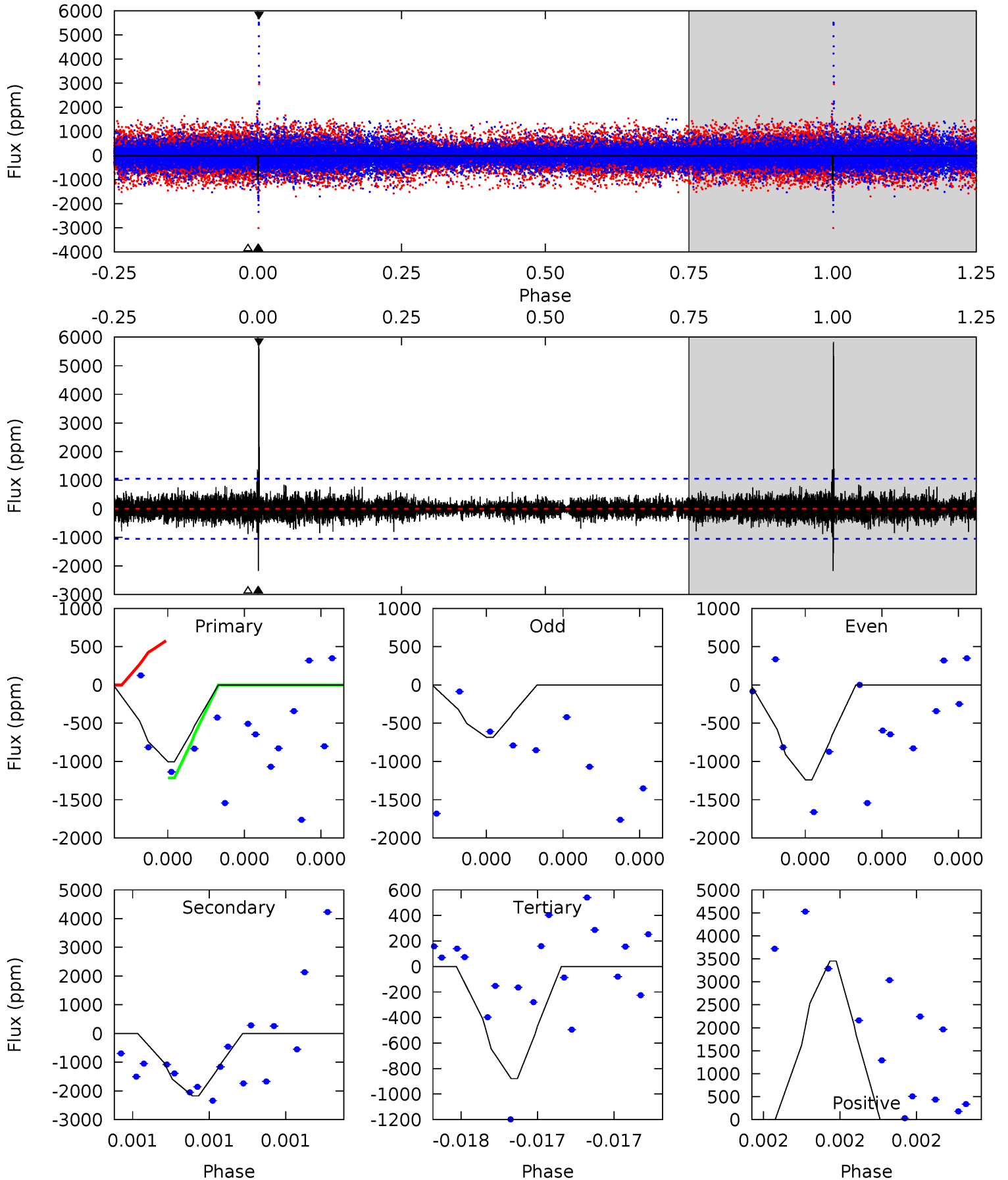
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.64	7.15	7.09	10.0	5.44	3.27	1.87	2.55	-0.39	0.05	-2.89	1.29	1.11	0.51	0.73



Alt Model-Shift Uniqueness Test

009603398-02, P = 241.524679 Days, E = 149.574658 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.45	11.8	4.77	18.7	5.70	3.67	1.05	0.69	-13.3	7.02	-6.94	1.49	0.65	0.73	1.82



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-911 ± 127	$4.28^{+3.99}_{-2.79}$	302^{+13}_{-13}	3787^{+1955}_{-702}	12310^{+83765}_{-9085}
Alt.	-2172 ± 184	$4.16^{+3.75}_{-2.88}$	302^{+13}_{-13}	4490^{+3747}_{-906}	$30537^{+297008}_{-22289}$

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

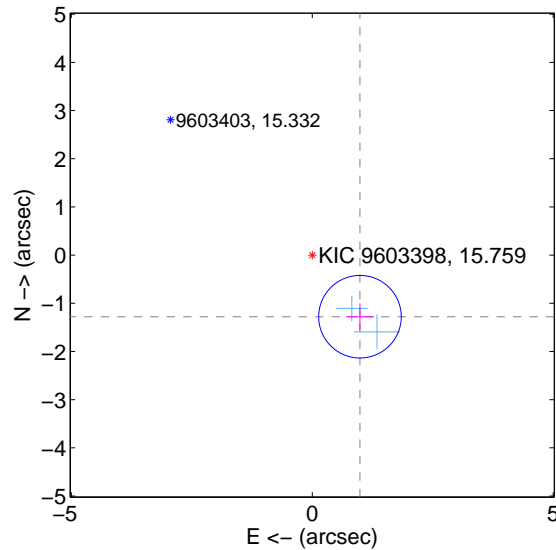
Supplemental centroid analysis for 009603398-02. Kepler magnitude: 15.76. Transit SNR 5.90

There are 2 quarters with good PRF difference image offsets

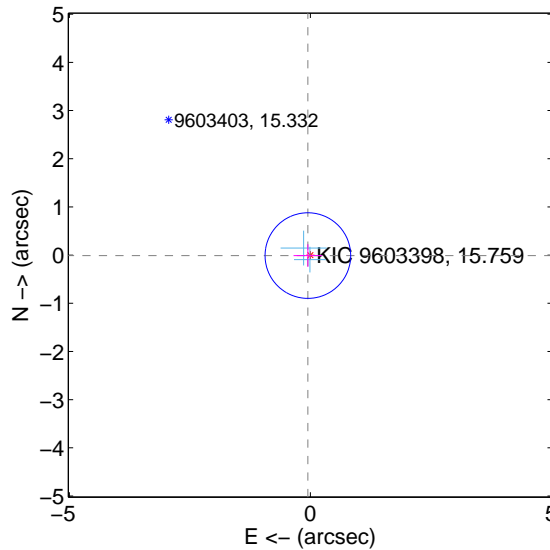
The OOT PRF centroid is offset from the target star catalog position by about 2.29 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.618 ± 0.286	5.66	-0.990 ± 0.295	-1.279 ± 0.280
PRF-fit source offset from KIC position	0.052 ± 0.296	0.17	0.051 ± 0.298	-0.010 ± 0.234
photometric centroid source offset	1.05 ± 1.04	1.01	-0.66 ± 1.20	0.81 ± 0.93

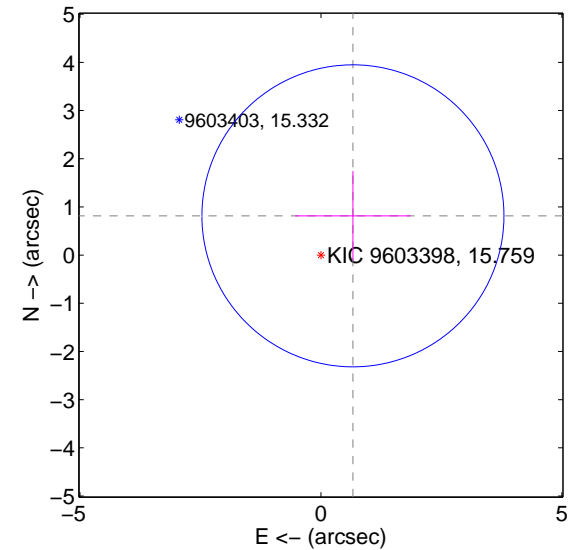
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

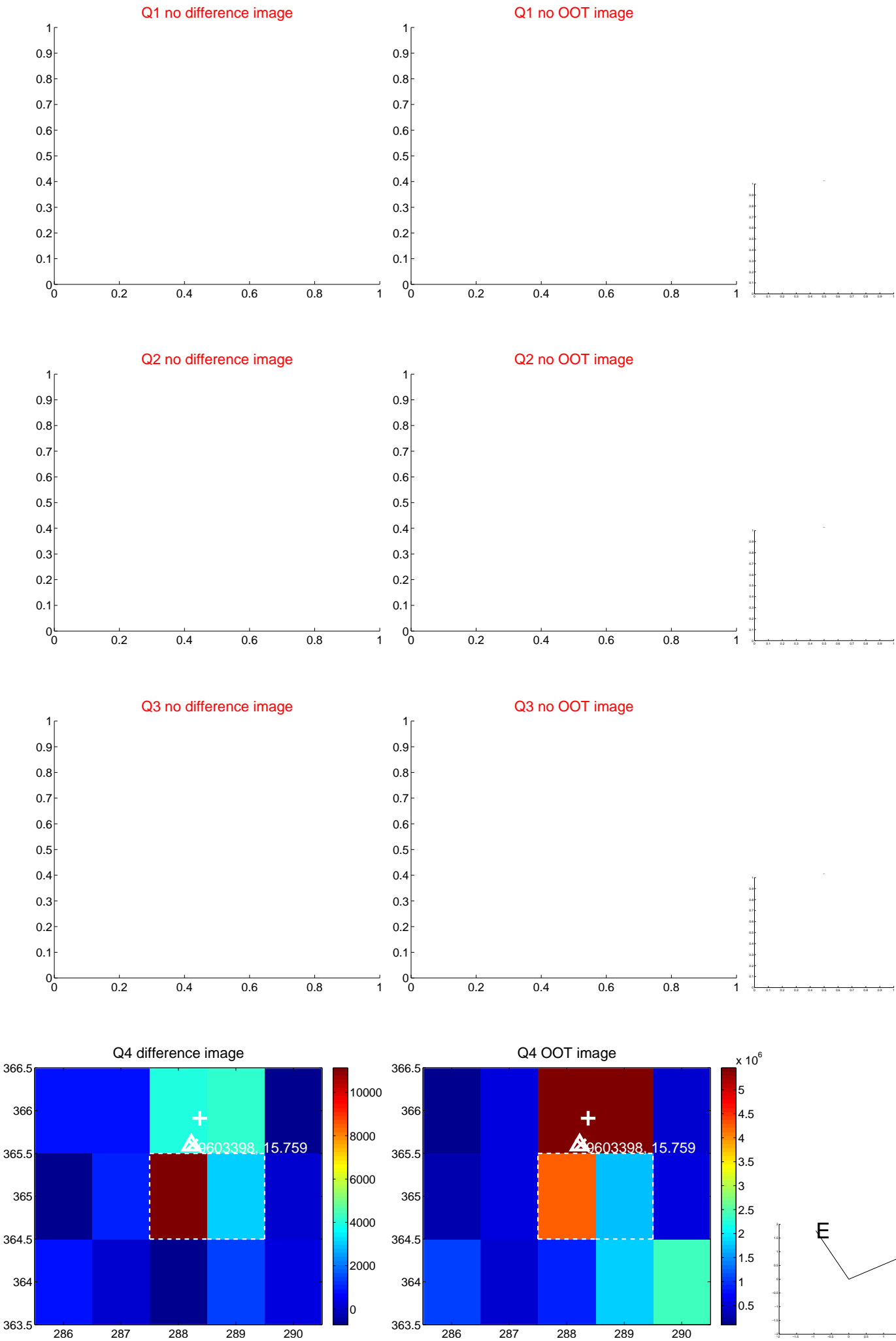


offset from photometric centroids



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

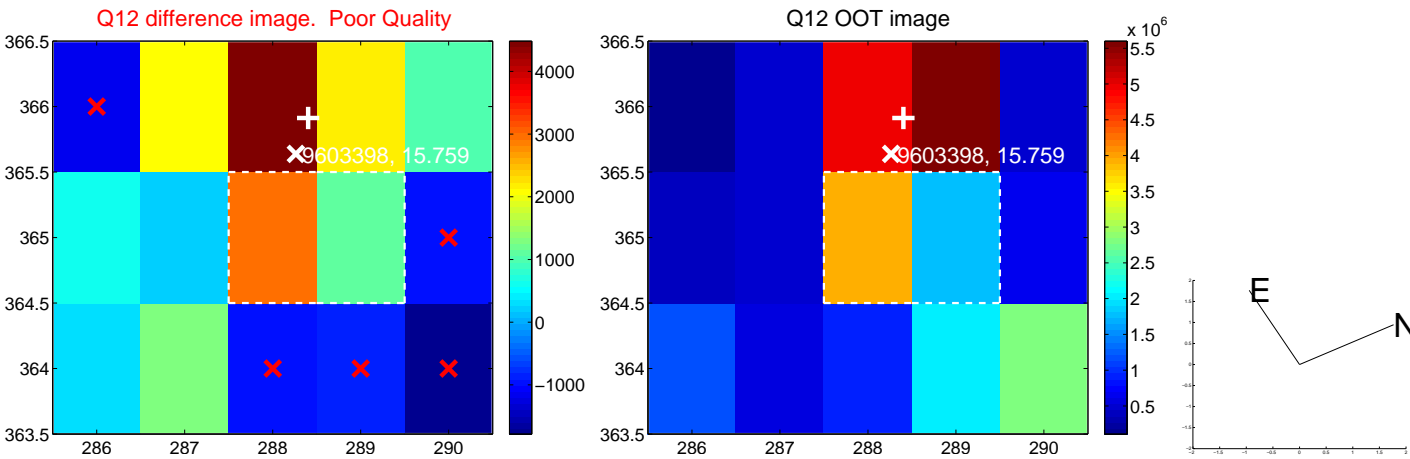
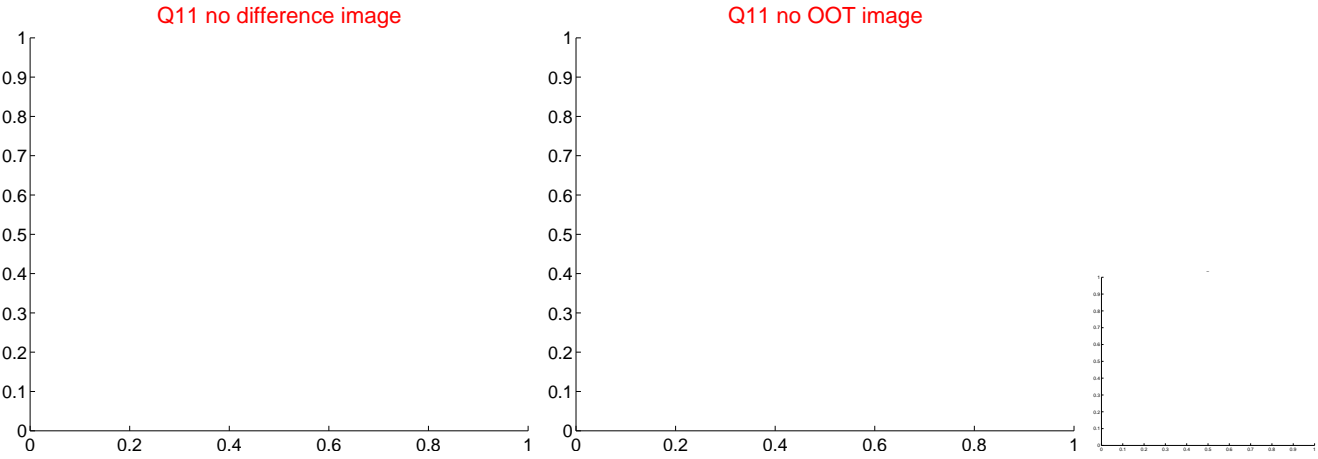
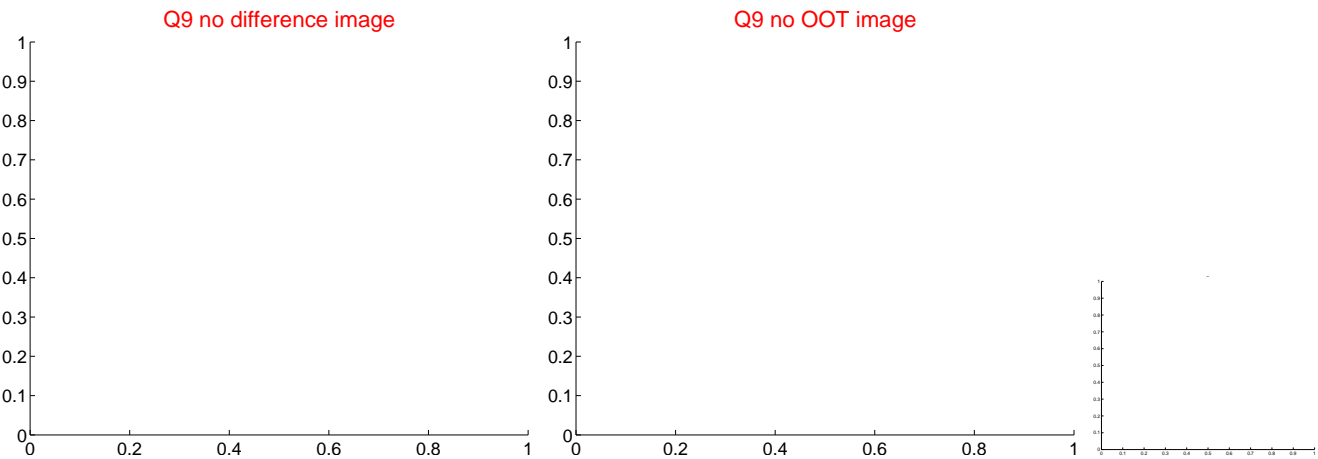
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



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

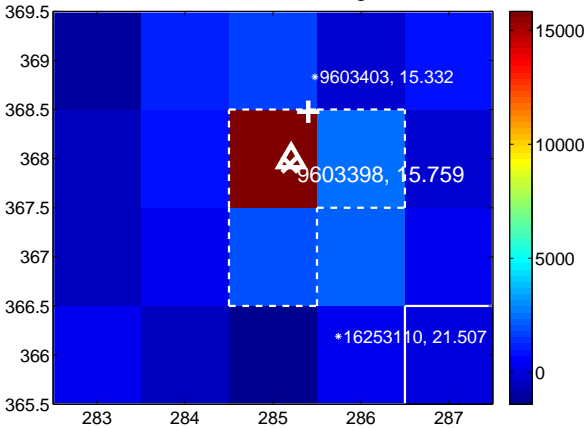
Q13 no difference image



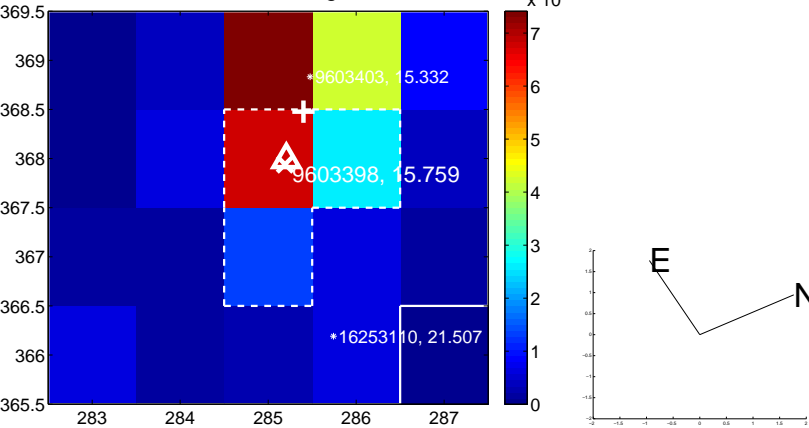
Q13 no OOT image



Q14 difference image



Q14 OOT image



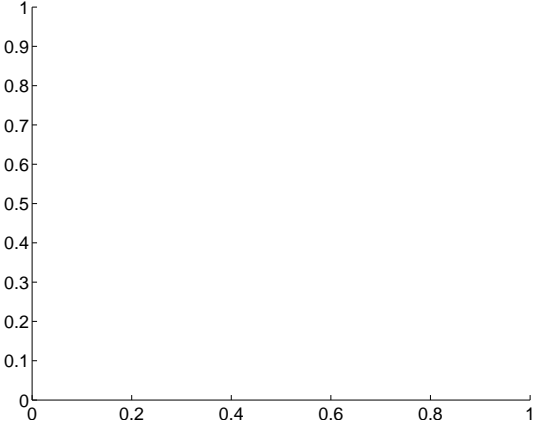
Q15 no difference image



Q15 no OOT image



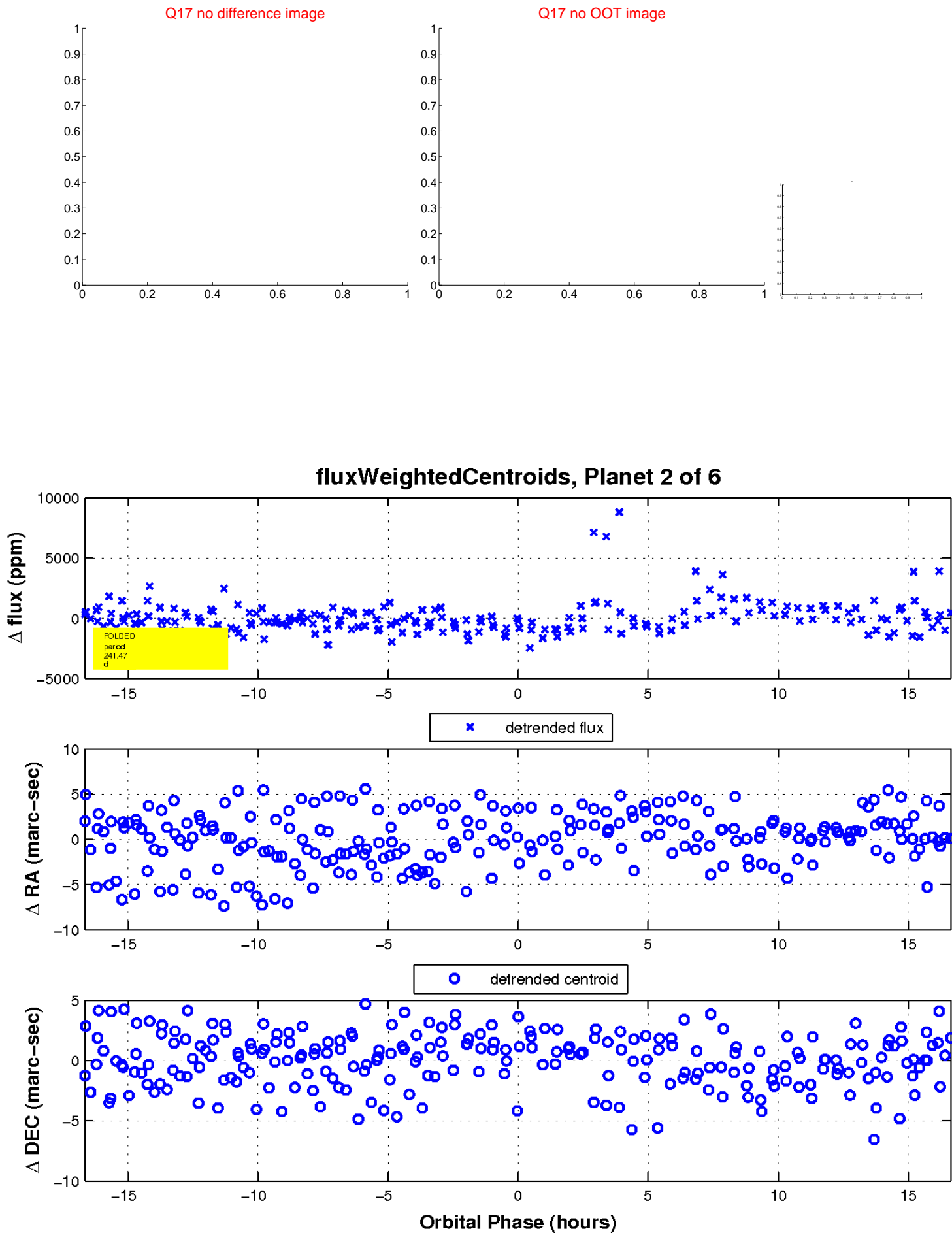
Q16 no difference image



Q16 no OOT image

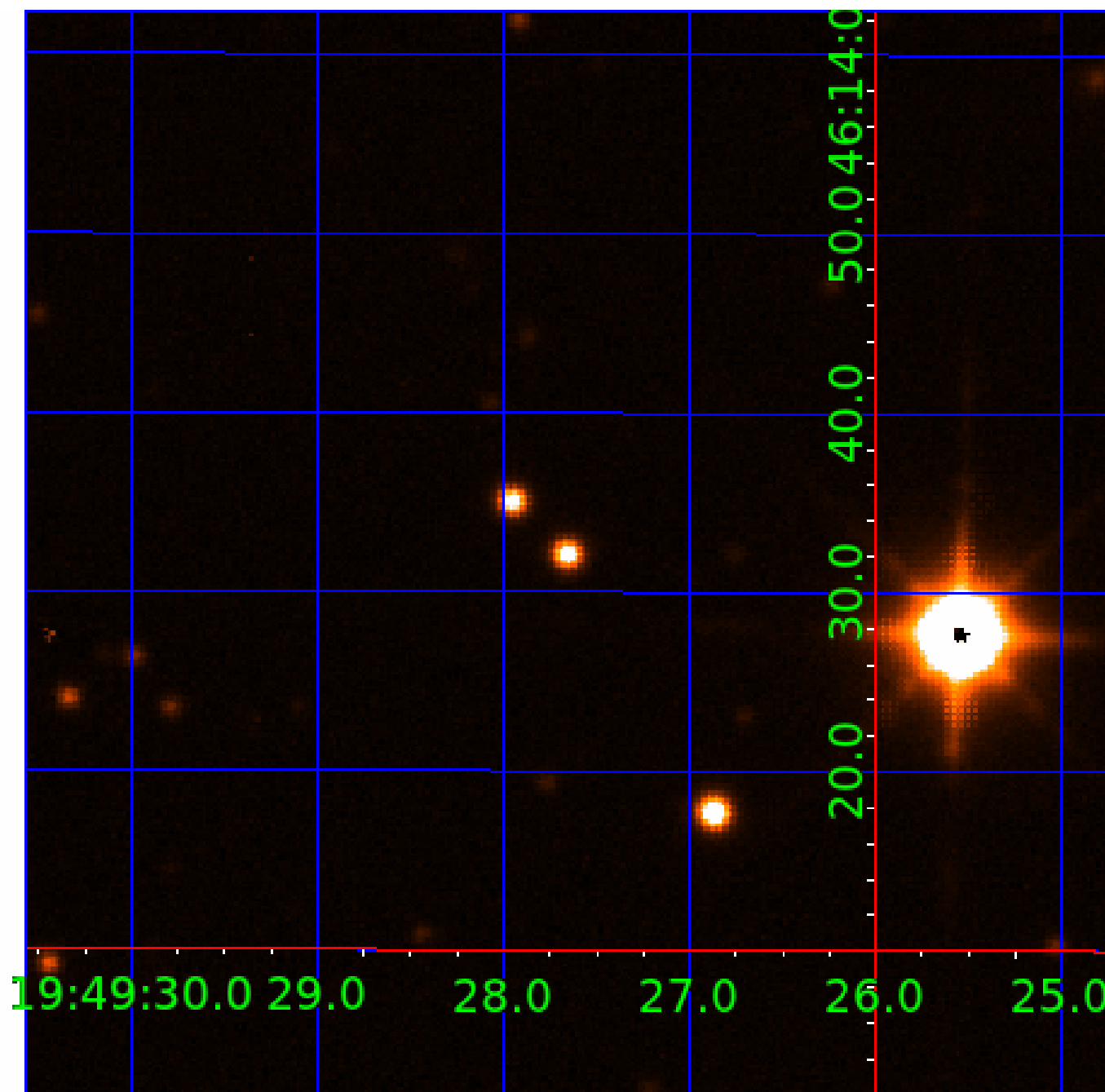


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

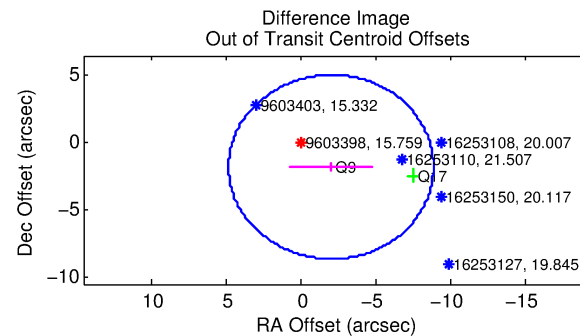
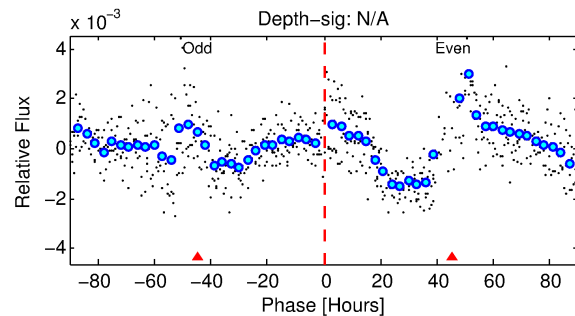
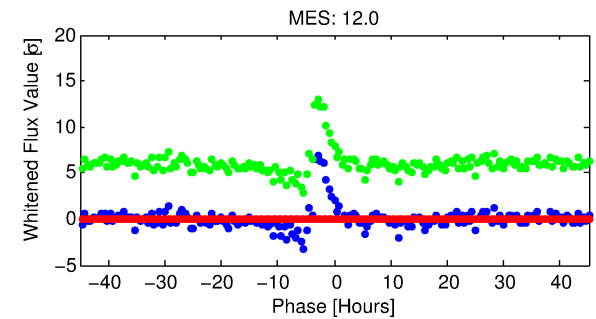
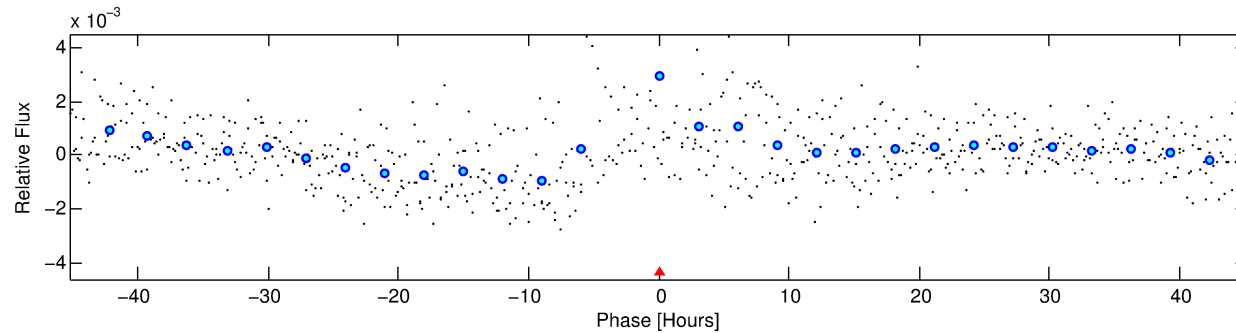
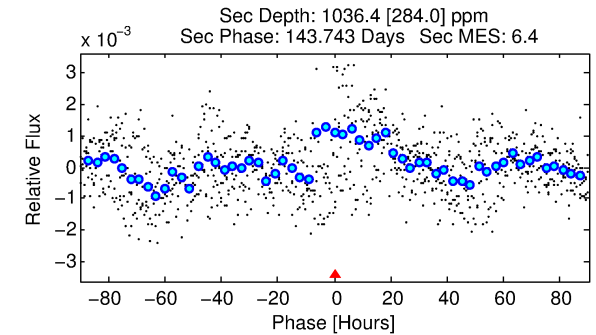
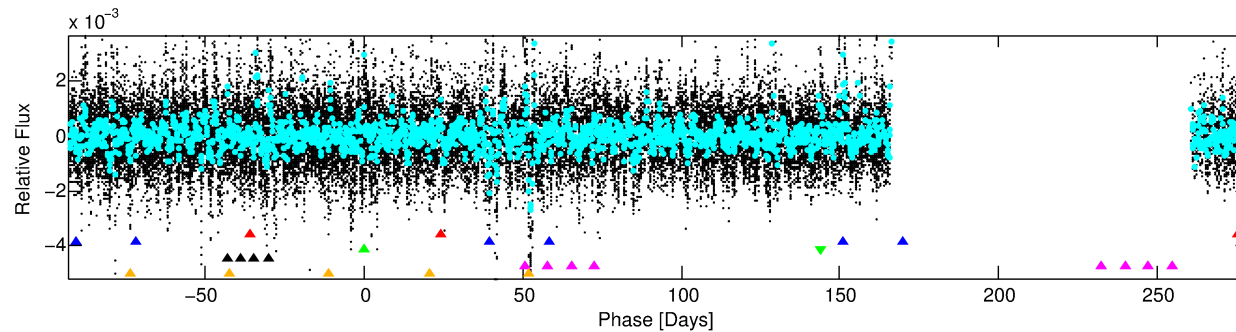
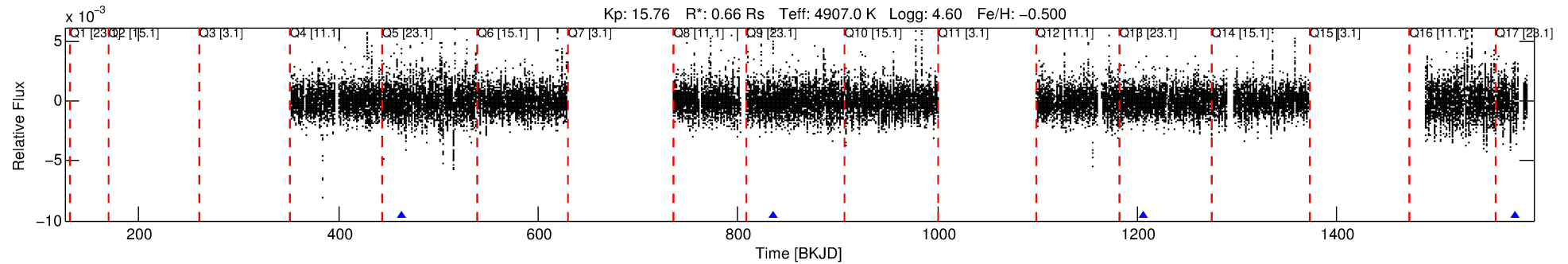
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-03

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 3 of 6 Period: 371.639 d



TPS TCE Results:

Period = 371.63878 d
Epoch = 462.6913 BKJD

DV fit results are unavailable

DV Diagnostic Results:

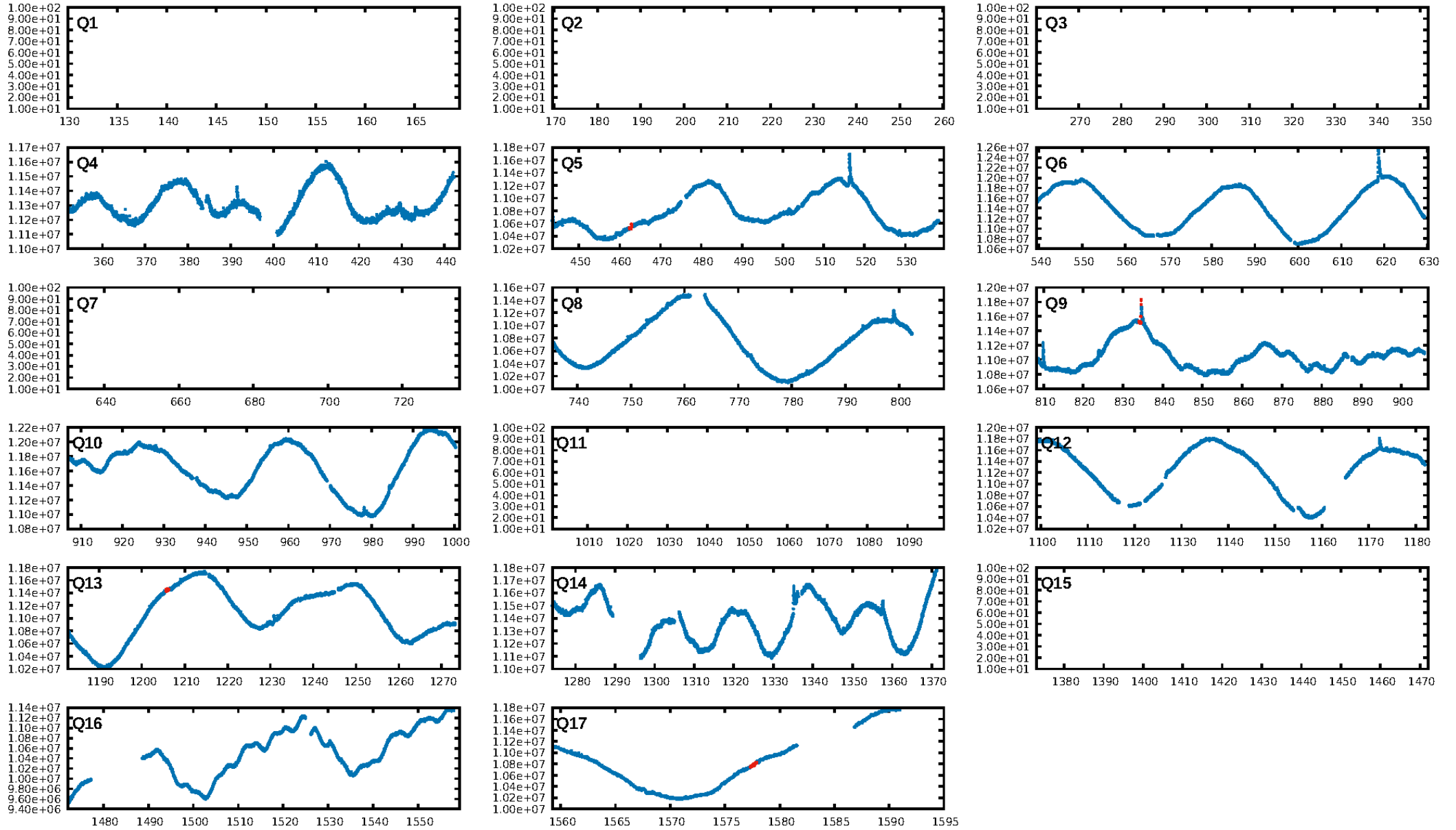
ShortPeriod-sig: 100.0% [6.78 σ]
LongPeriod-sig: 100.0% [93.51 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.44e-15
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.084

Centroid-sig: N/A
Centroid-so: 14.147 arcsec [1.10 σ]
OotOffset-rm: 2.733 arcsec [1.20 σ]
KicOffset-rm: 0.097 arcsec [0.11 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [3/3]

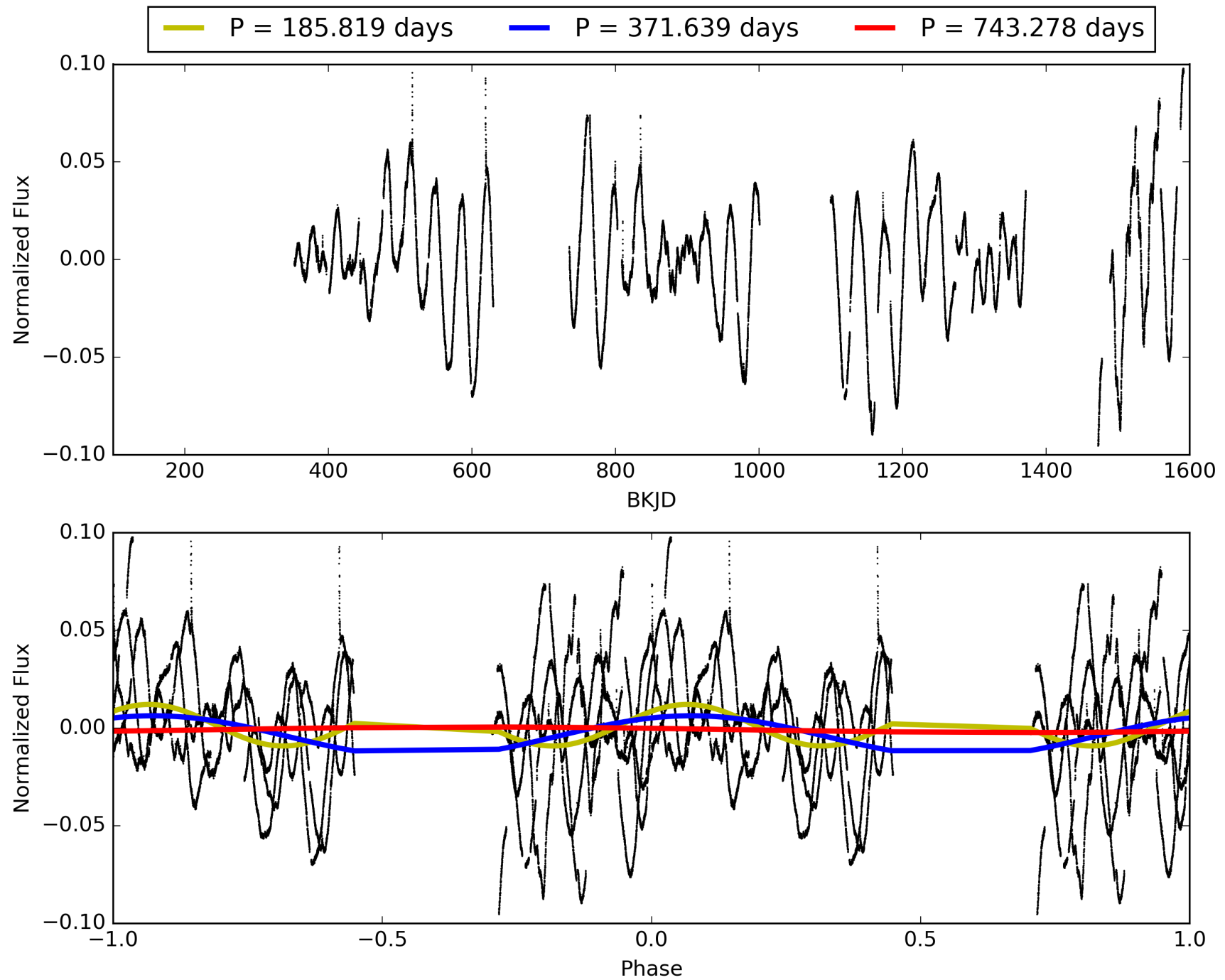
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:57:11 Z

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

TCE 009603398-03, PDC Light Curves

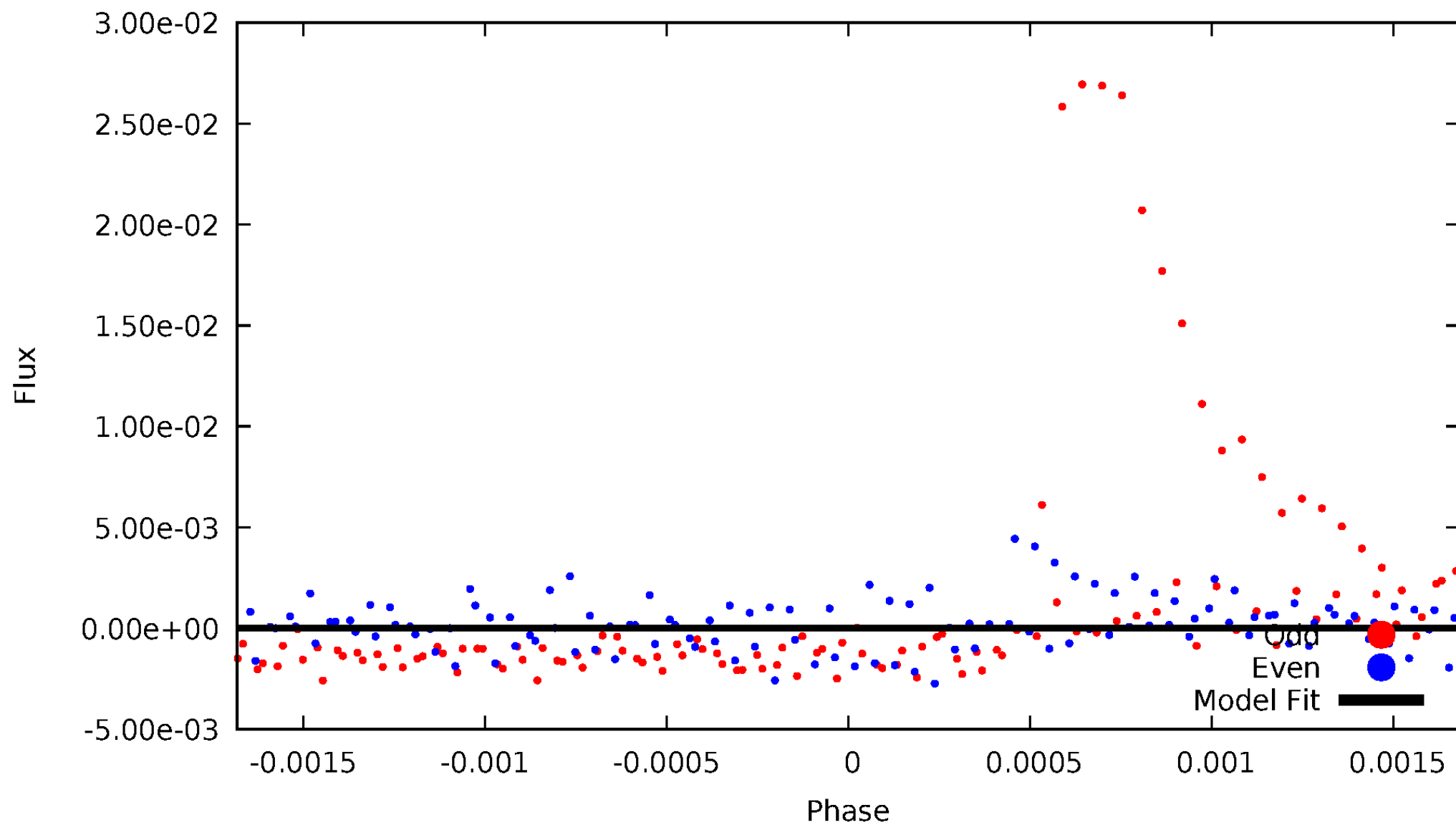


TCE 009603398-03



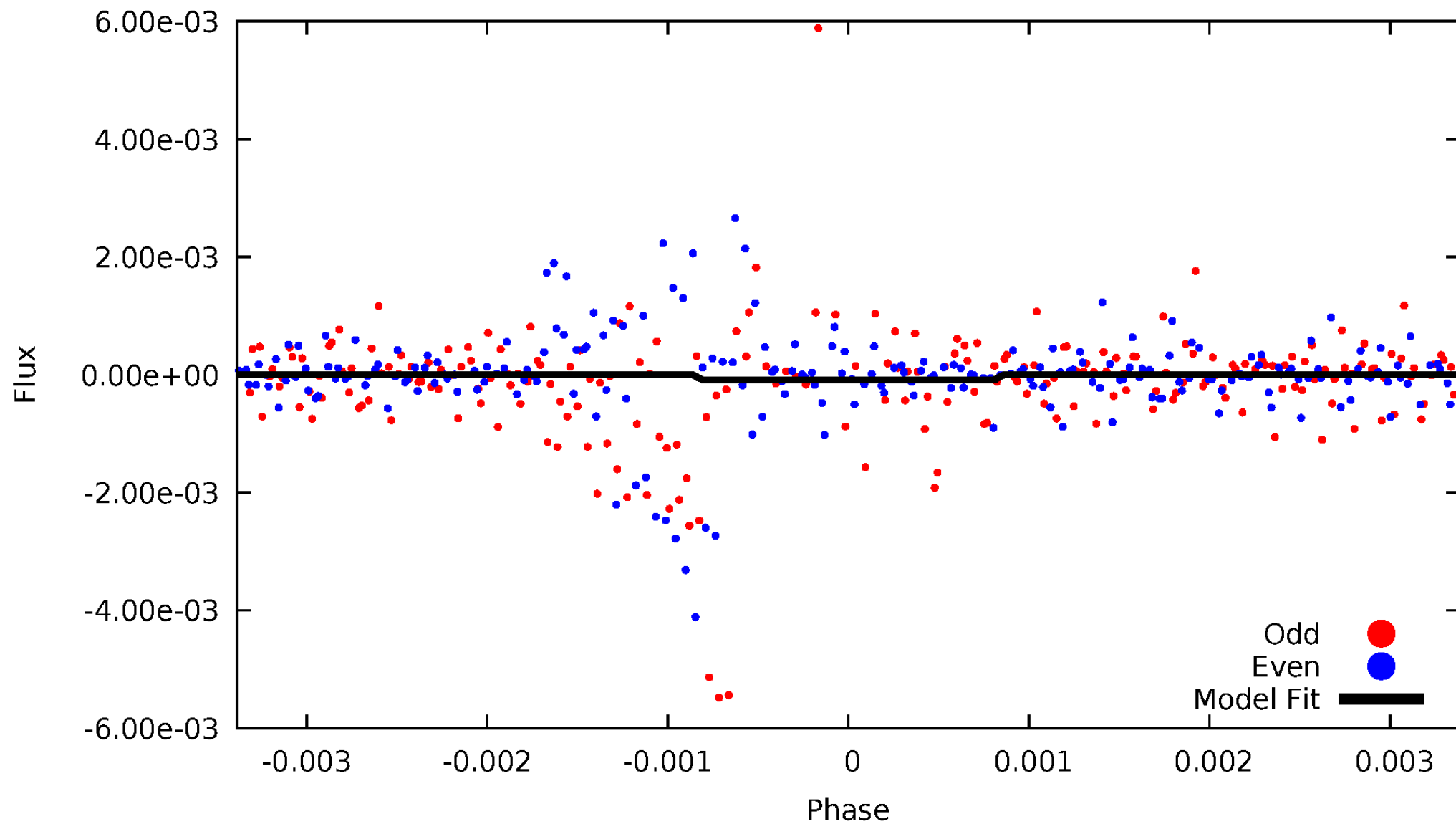
DV Odd/Even

TCE 009603398-03

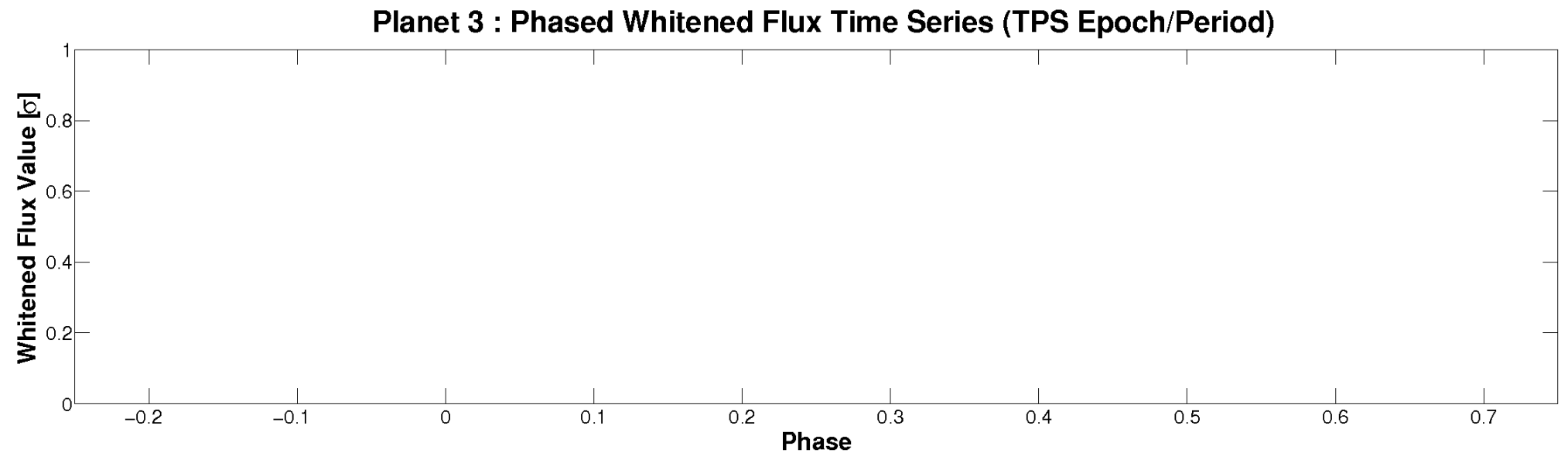
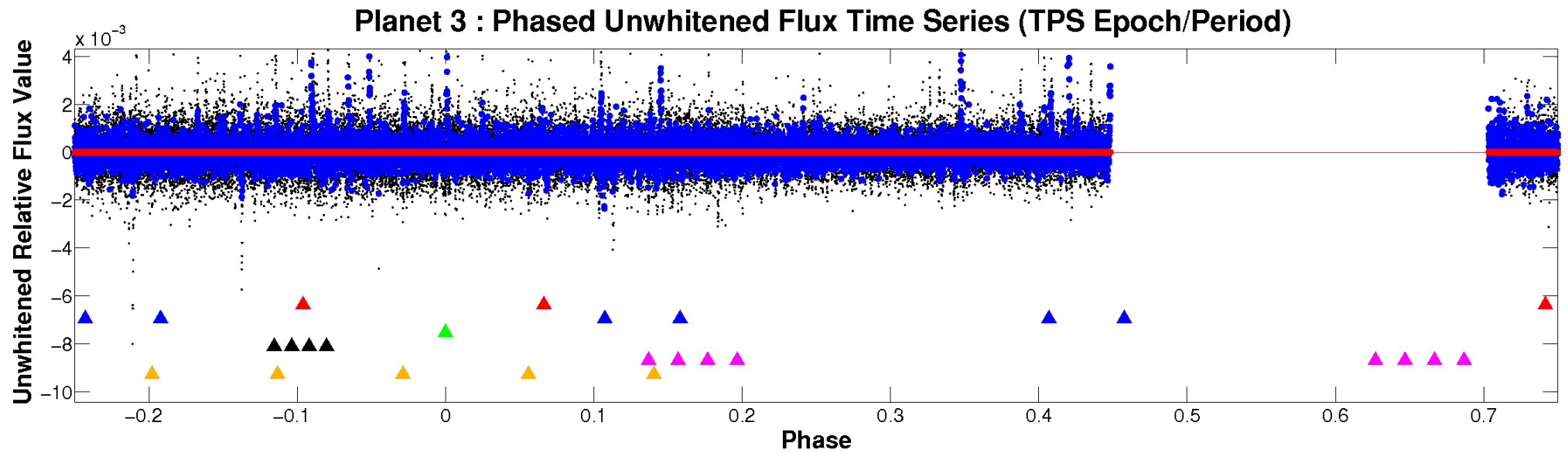


ALT Odd/Even

TCE 009603398-03

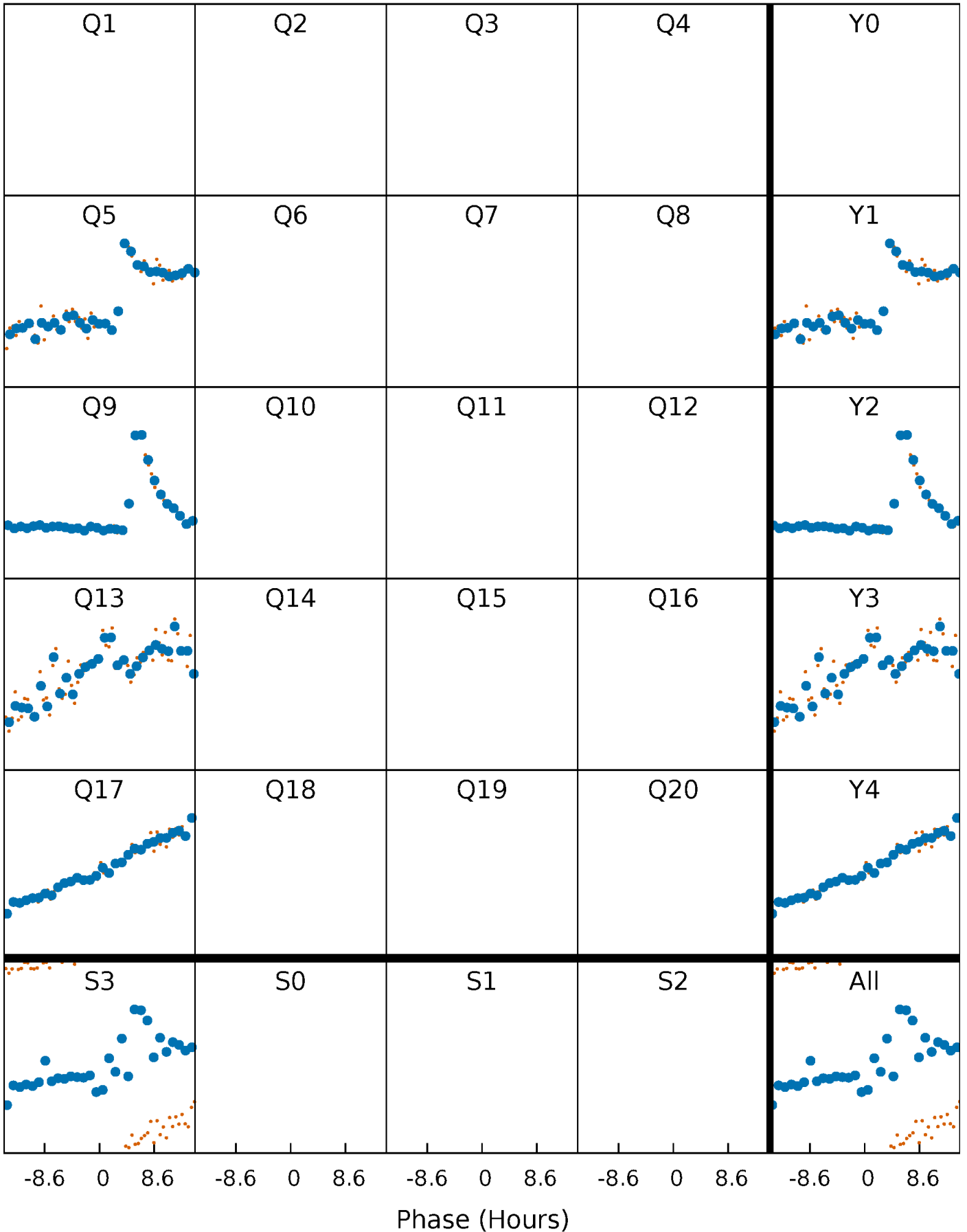


Non-Whitened Vs. Whitened Light Curve



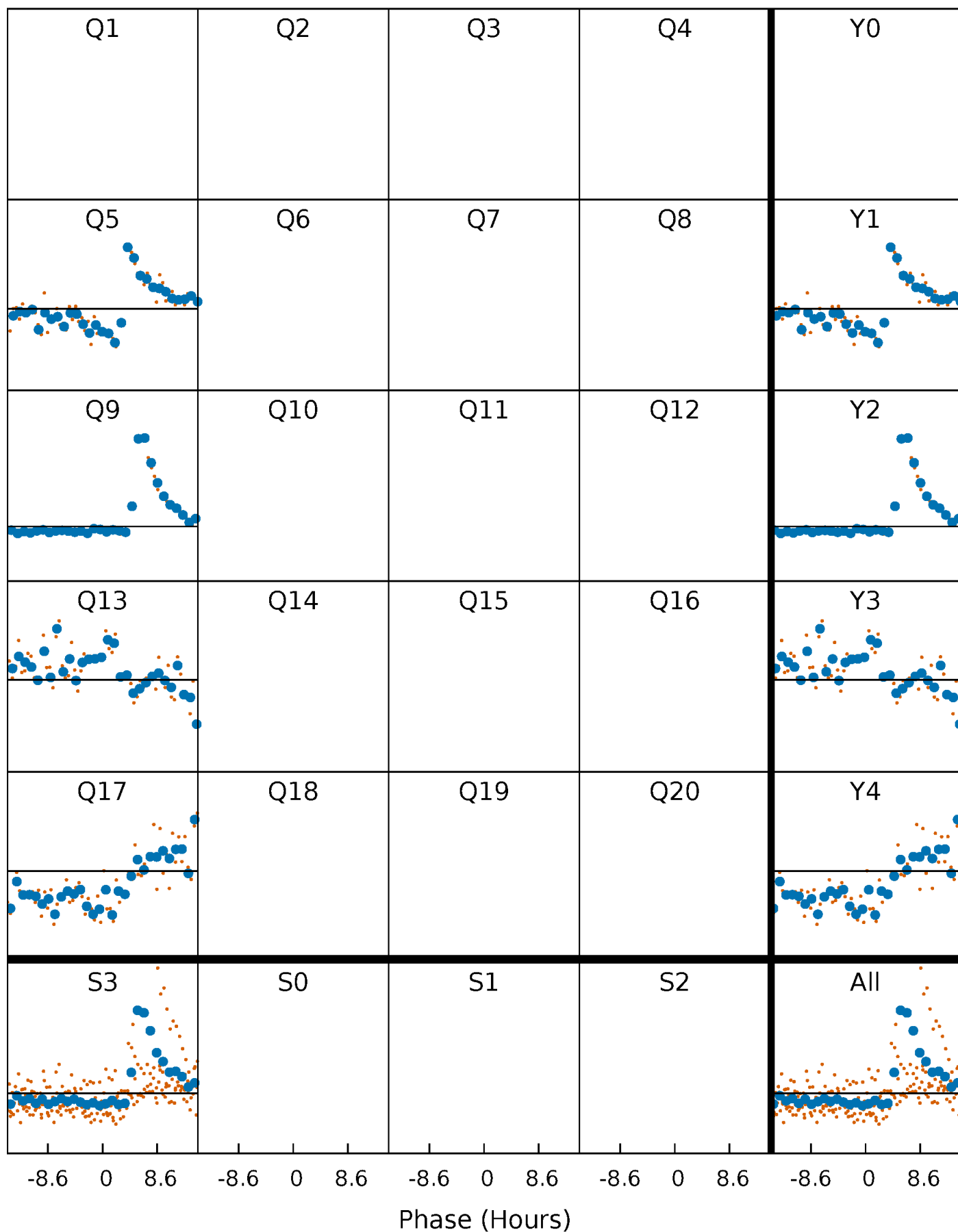
PDC Quarter-Phased Transit Curves

TCE 009603398-03 $P=371.638778$ Days $T_0=462.691323$ (BKJD)



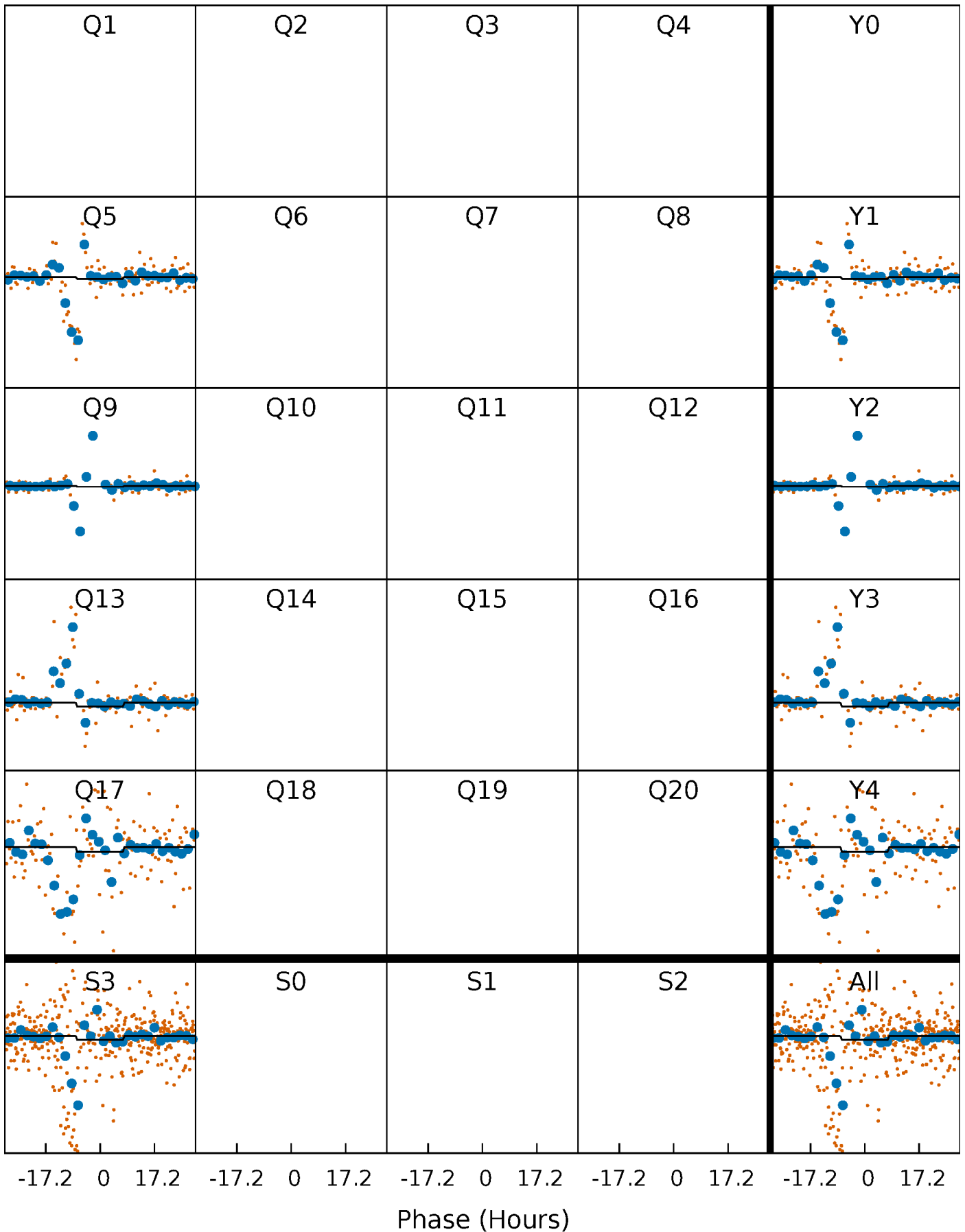
DV Quarter-Phased Transit Curves

TCE 009603398-03 $P=371.638778$ Days $T_0=462.691323$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

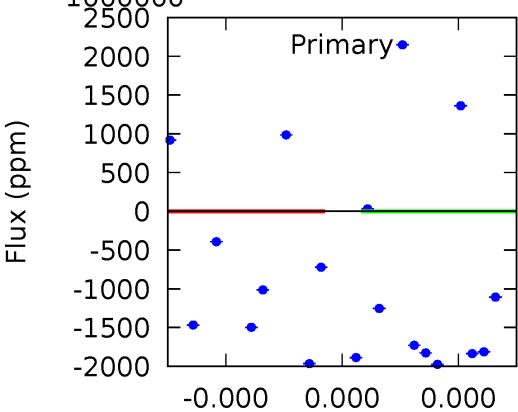
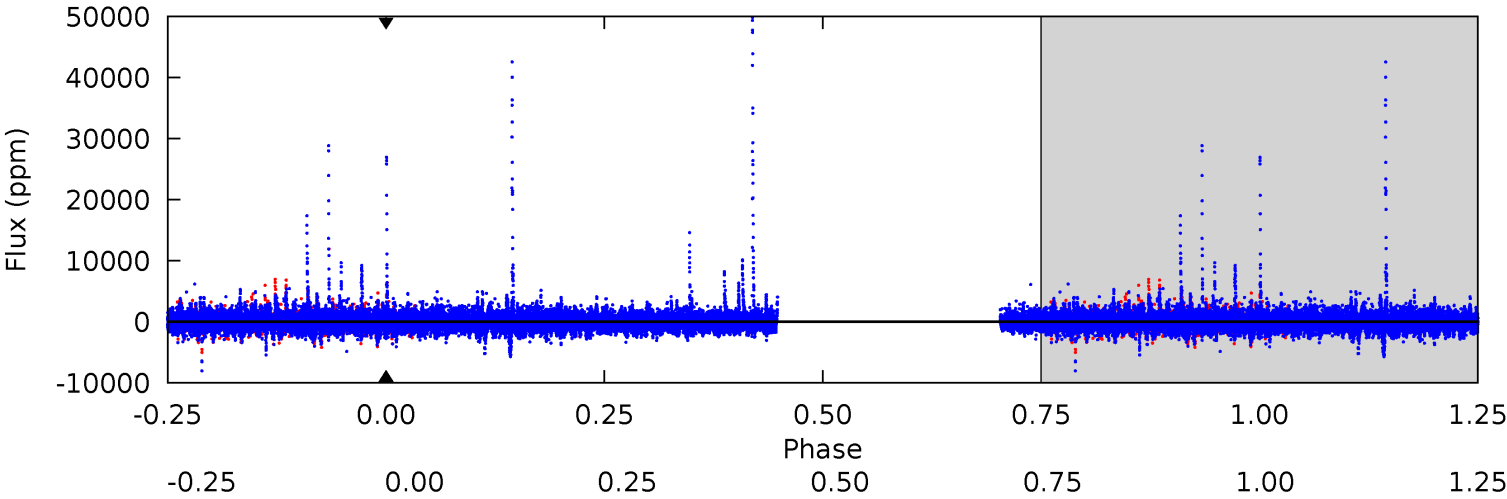
TCE 009603398-03 $P=371.638778$ Days $T_0=463.094284$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-03, P = 371.638778 Days, E = 91.052545 Days

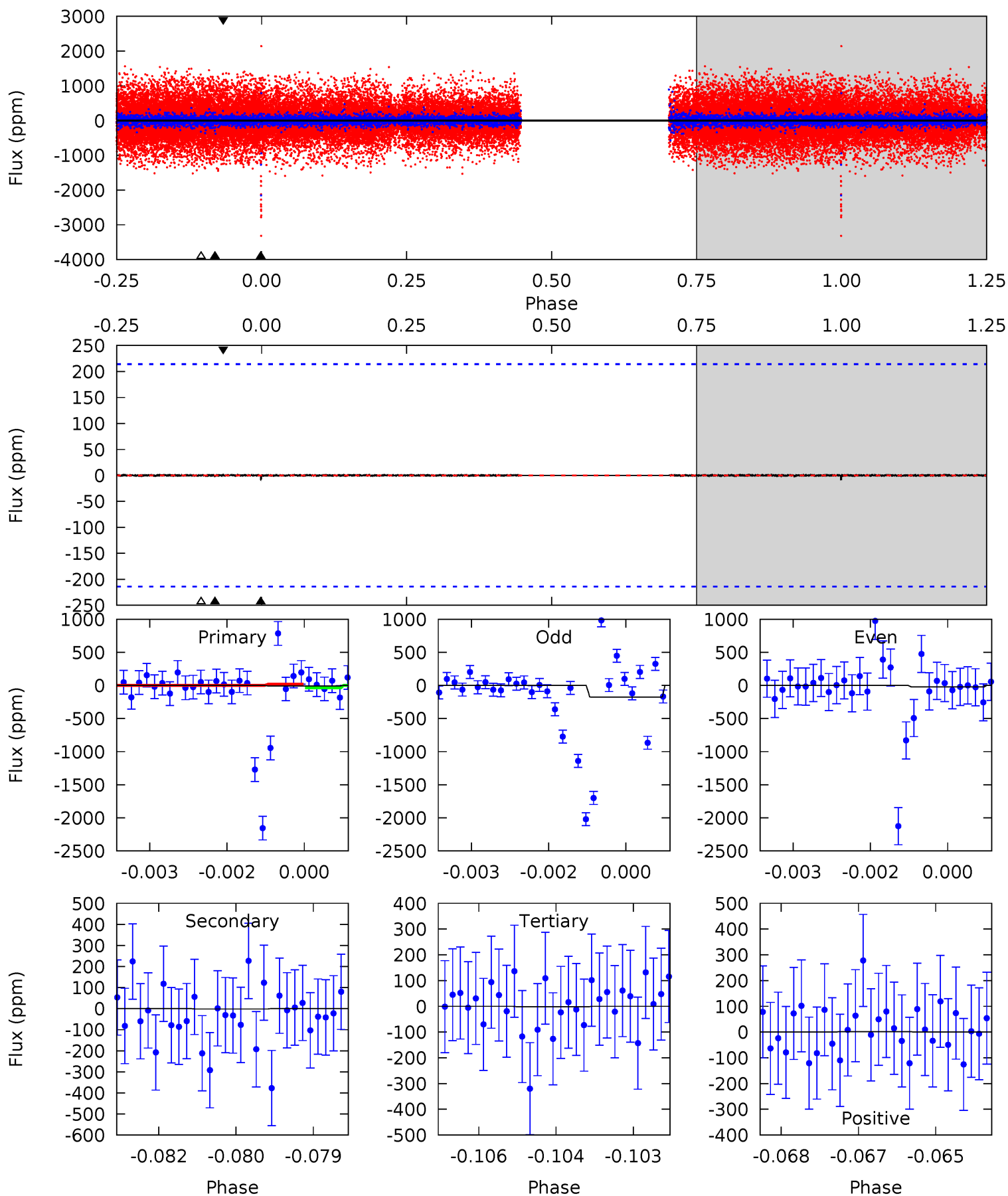
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009603398-03, P = 371.638778 Days, E = 91.455506 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.22	0.05	0.04	0.03	5.36	3.14	0.01	0.18	0.19	0.01	0.01	1.99	4.59	0.18	0.23



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$5.79^{+5.98}_{-3.99}$	262^{+11}_{-11}	-4033^{+17397}_{-8864}	$-31514.964^{+2409693.847}_{-2067888.238}$
Alt.	-2 ± 40	$5.24^{+5.52}_{-3.69}$	262^{+11}_{-10}	1641^{+921}_{-4149}	19^{+1393}_{-1214}

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 $A_{obs} \gg 1.0$

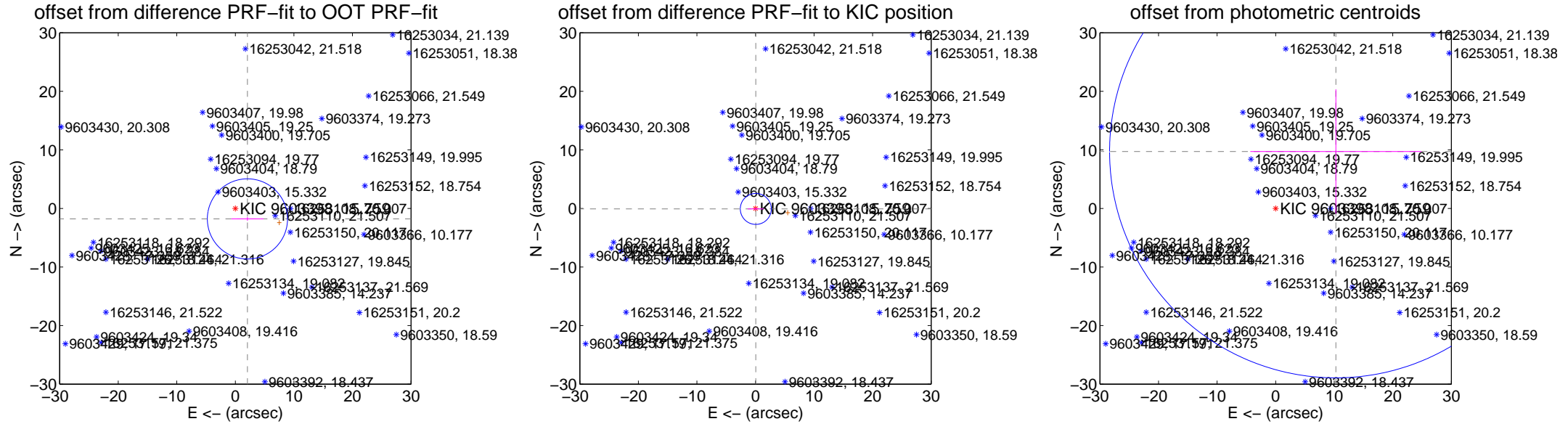
DV Centroid Data

Supplemental centroid analysis for 009603398-03. Kepler magnitude: 15.76. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 2.62 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.733 ± 2.282	1.20	-2.066 ± 2.743	-1.788 ± 0.323
PRF-fit source offset from KIC position	0.097 ± 0.881	0.11	-0.052 ± 1.375	-0.081 ± 0.176
photometric centroid source offset	14.15 ± 12.88	1.10	-10.28 ± 14.61	9.71 ± 10.62

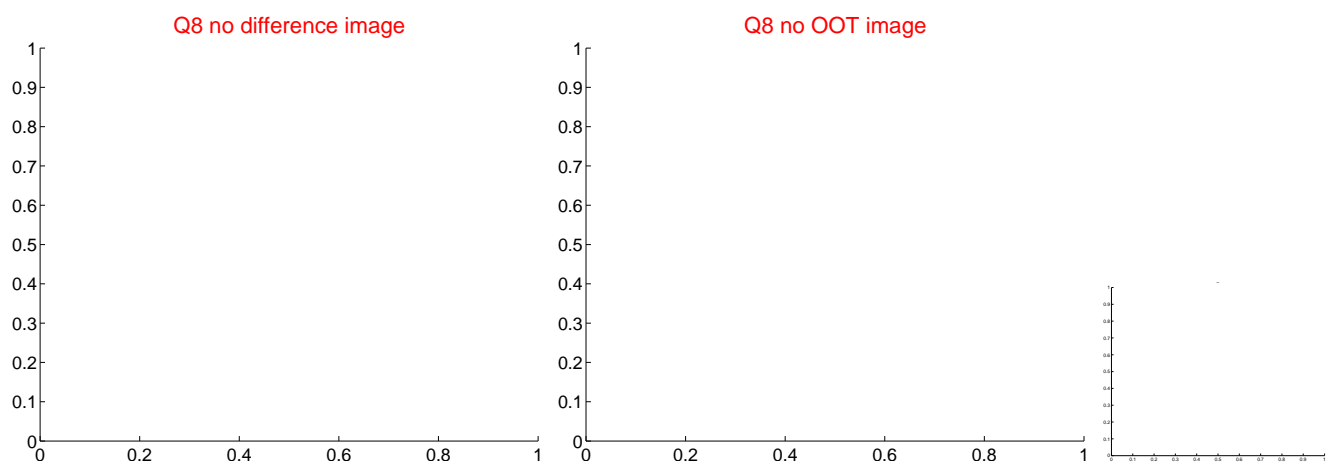
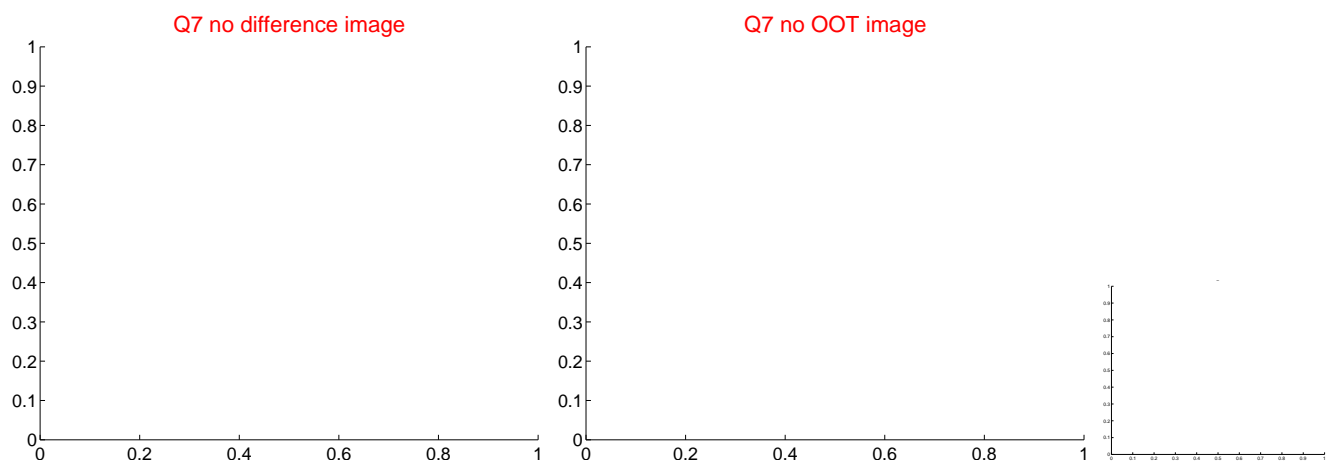
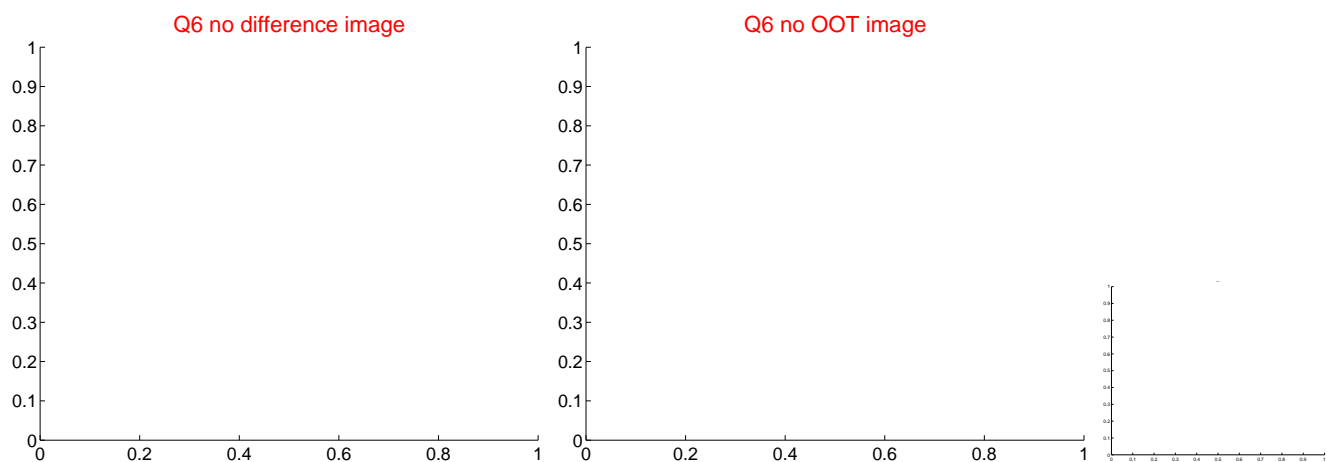
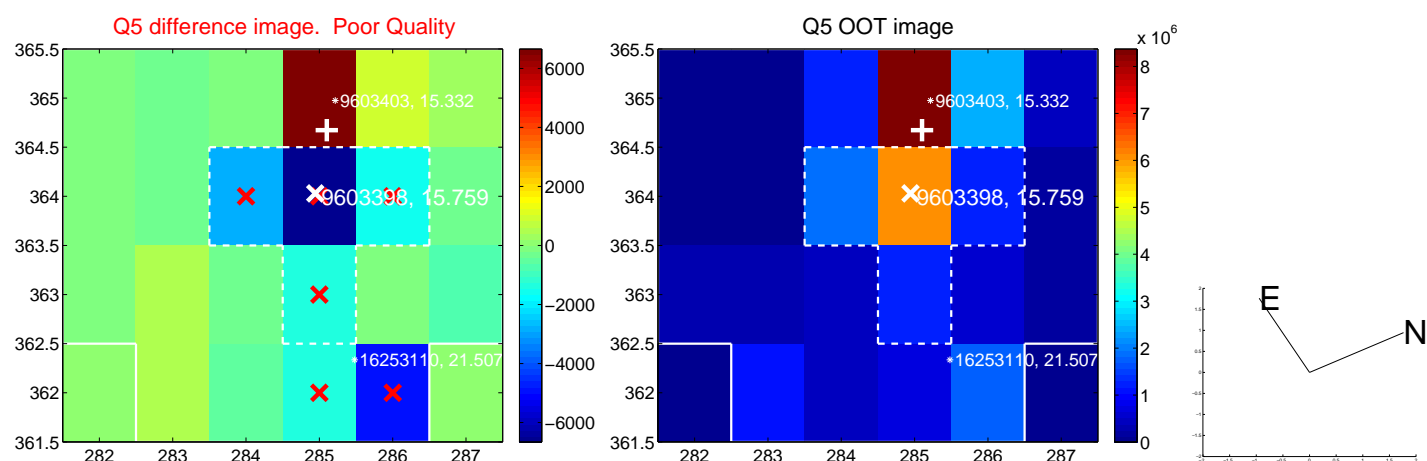


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

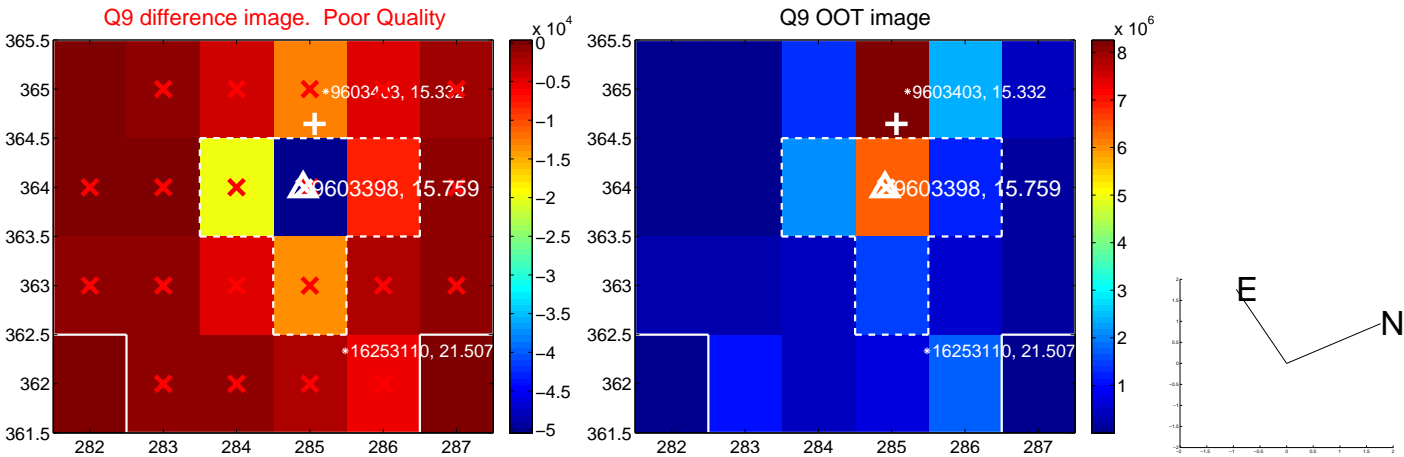
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



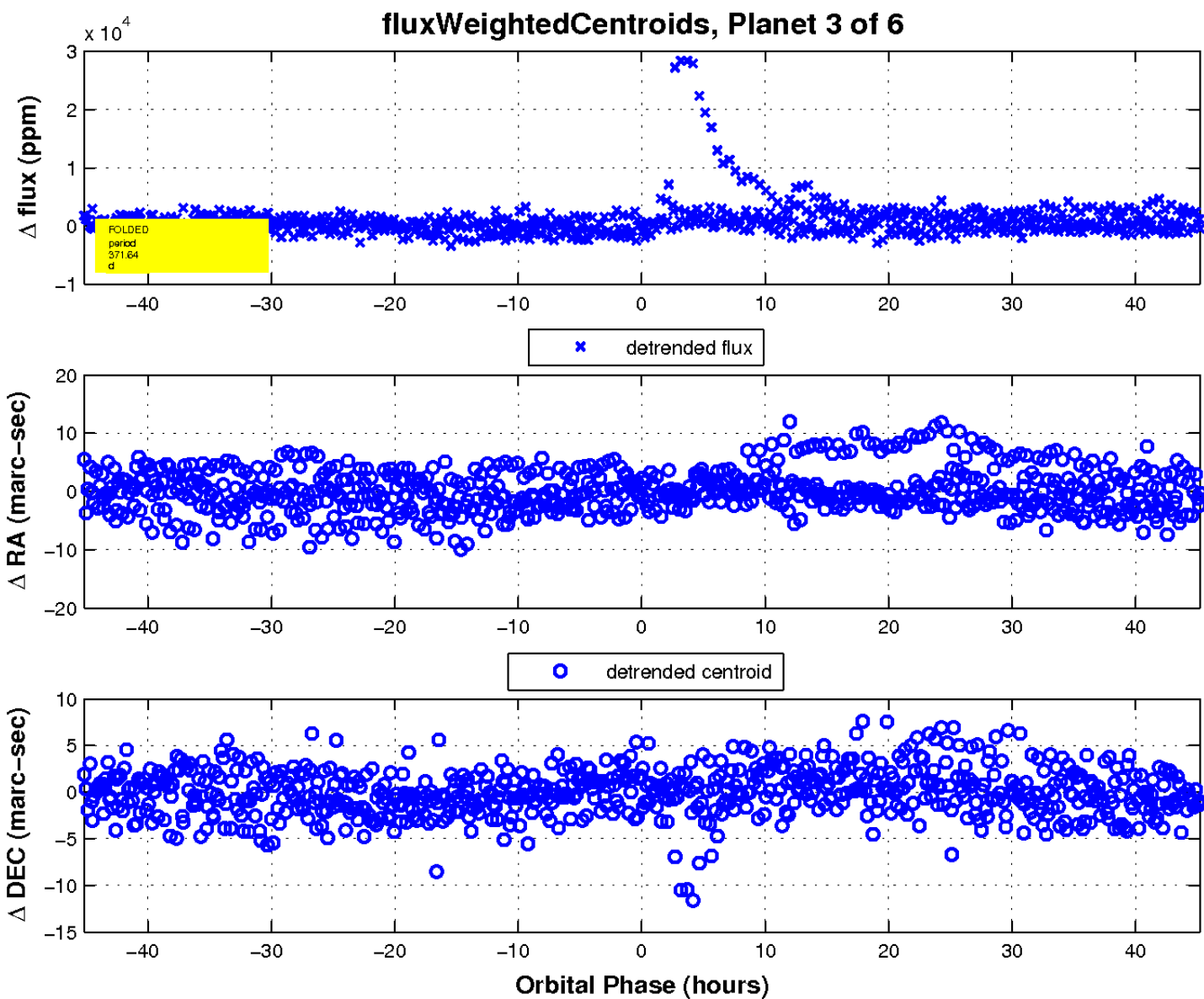
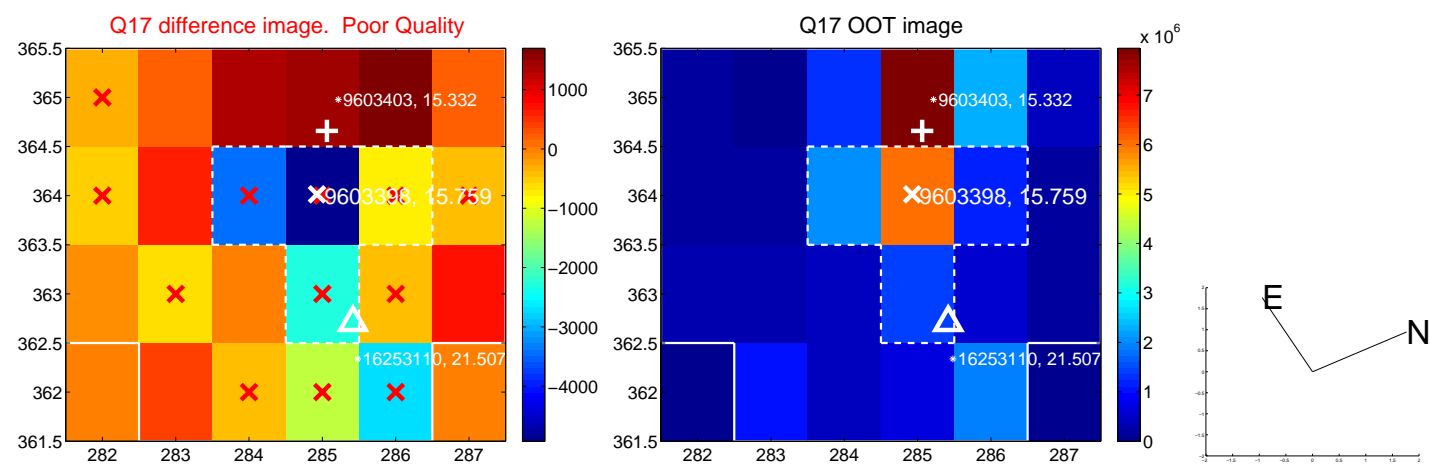
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

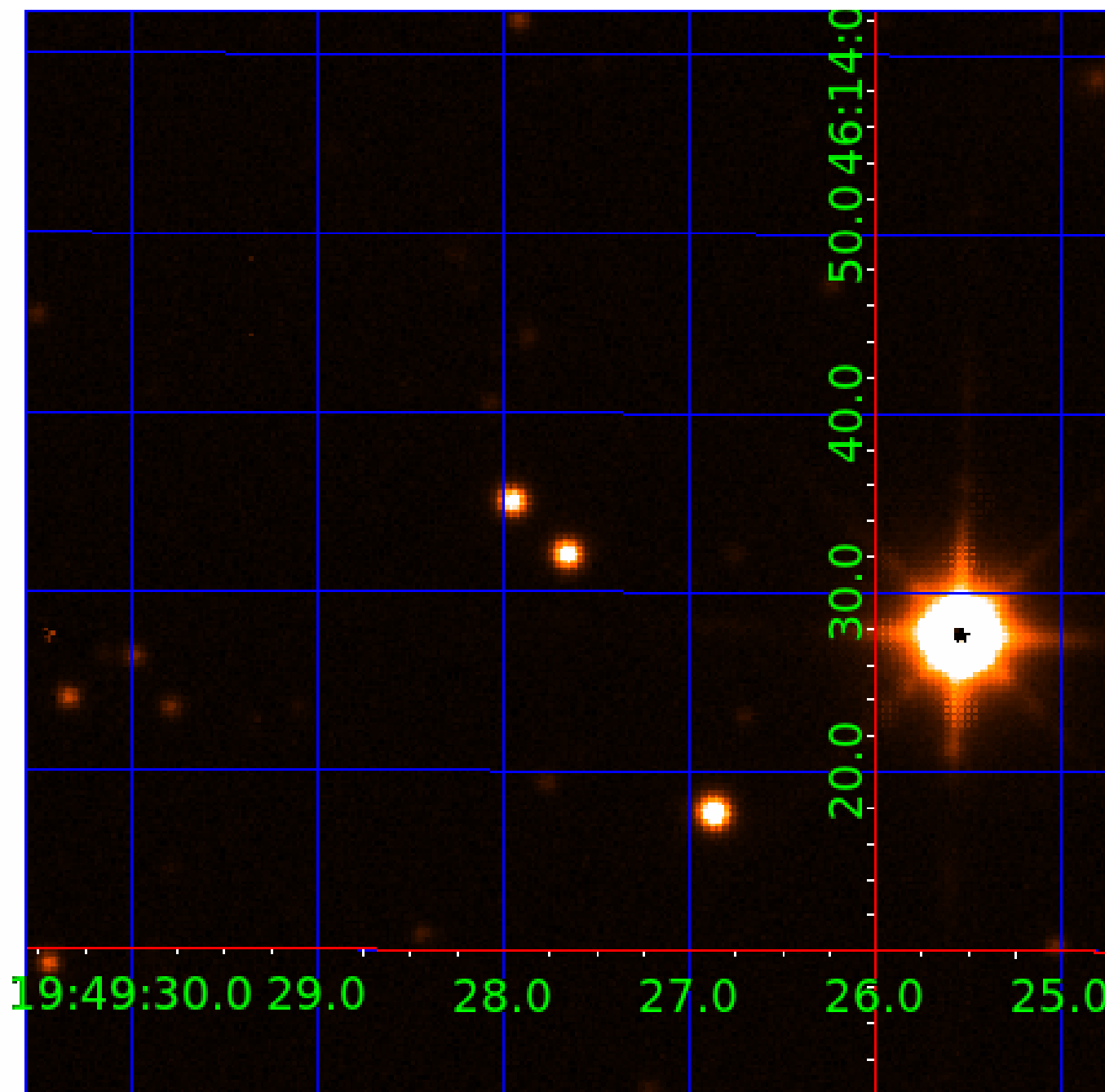


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

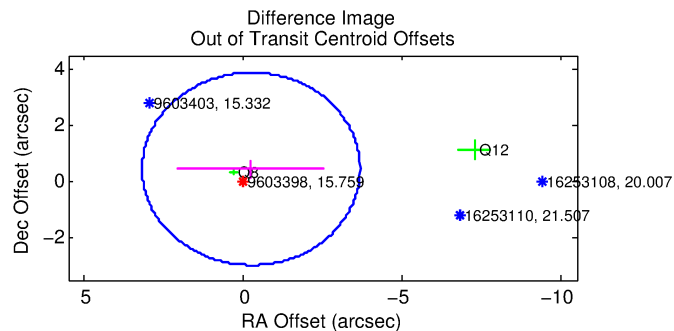
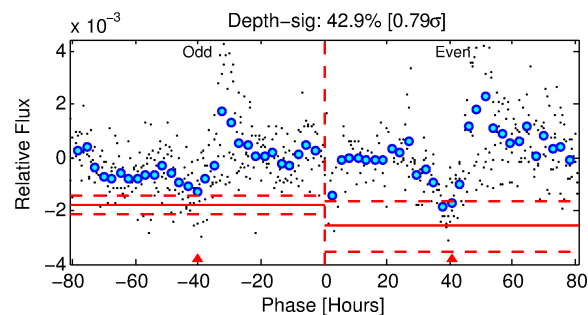
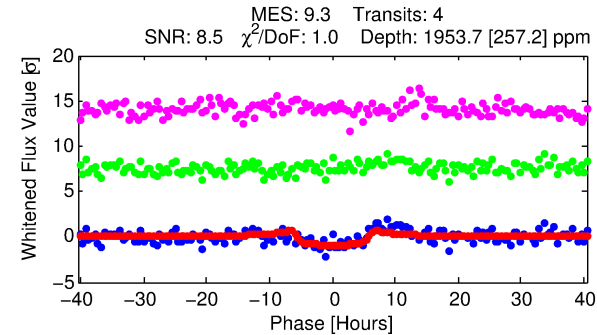
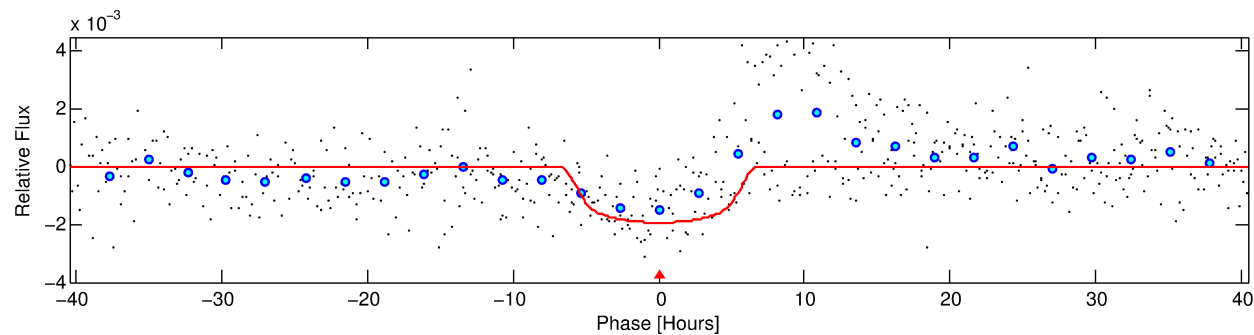
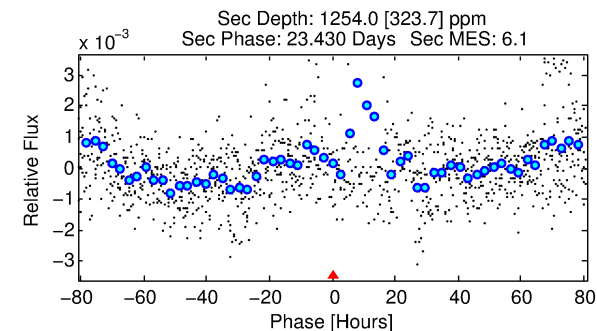
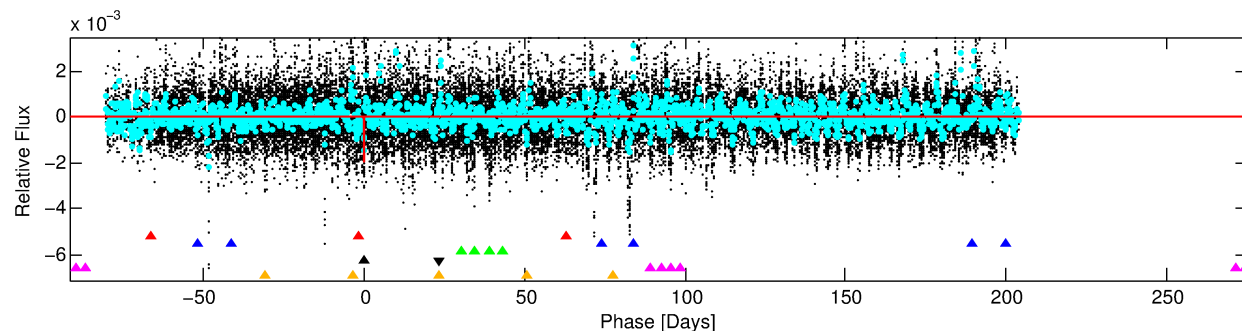
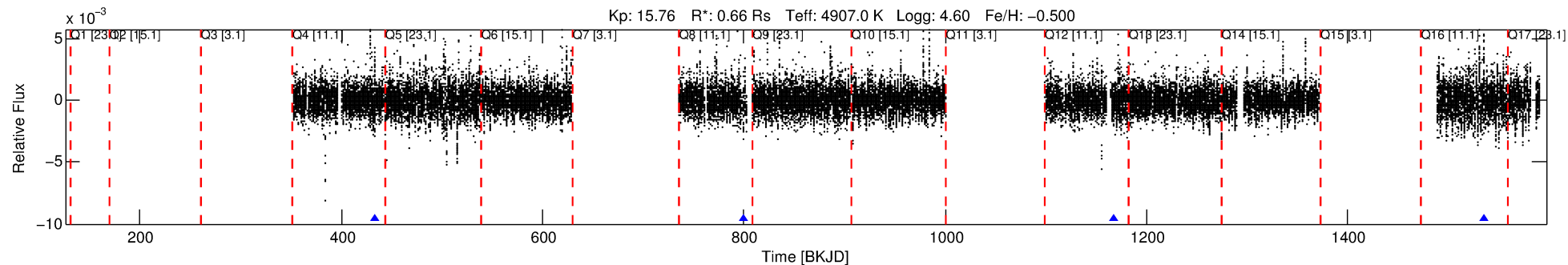
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-04

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 4 of 6 Period: 367.277 d



DV Fit Results:

Period = 367.27718 [0.00979] d
Epoch = 432.8828 [0.0181] BKJD
Rp/R* = 0.0474 [0.0049]
a/R* = 123.50 [32.45]
b = 0.86 [0.08]
Seff = 0.30 [0.06]
Teq = 189 [9] K
Rp = 3.43 [0.49] Re
a = 0.8670 [0.0734] AU
Ag = 44080.49 [15626.53] [2.82σ]
Teffp = 4241 [381] K [10.63σ]

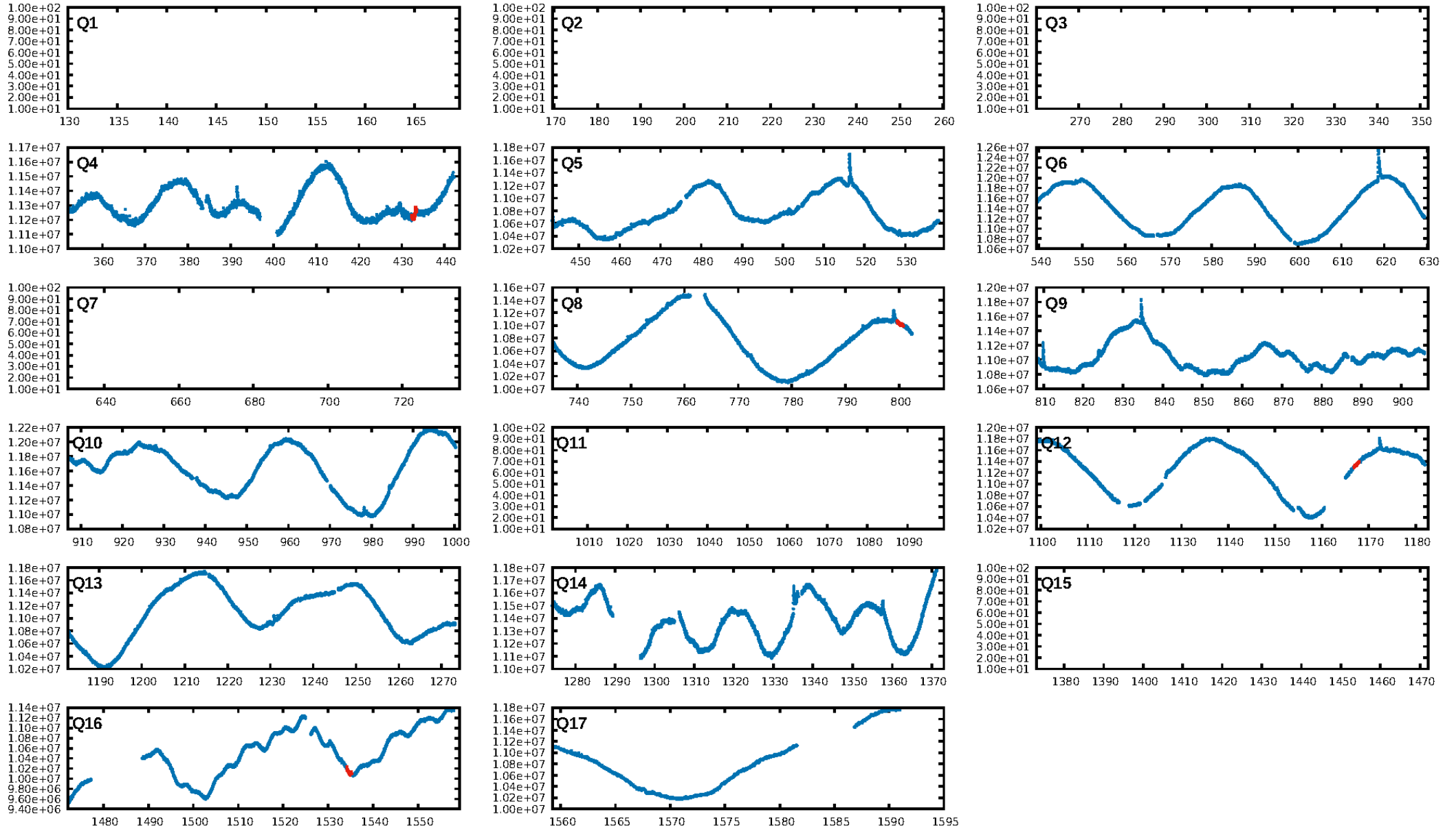
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.55σ]
LongPeriod-sig: 100.0% [6.78σ]
ModelChiSquare2-sig: 10.5%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 1.17e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.657
Centroid-sig: N/A
Centroid-so: 0.177 arcsec [0.22σ]
OotOffset-rm: 0.520 arcsec [0.46σ]
OotOffset-st: 0/0/2/0 [2]
KicOffset-rm: 1.916 arcsec [1.65σ]
KicOffset-st: 0/0/2/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [4/4]

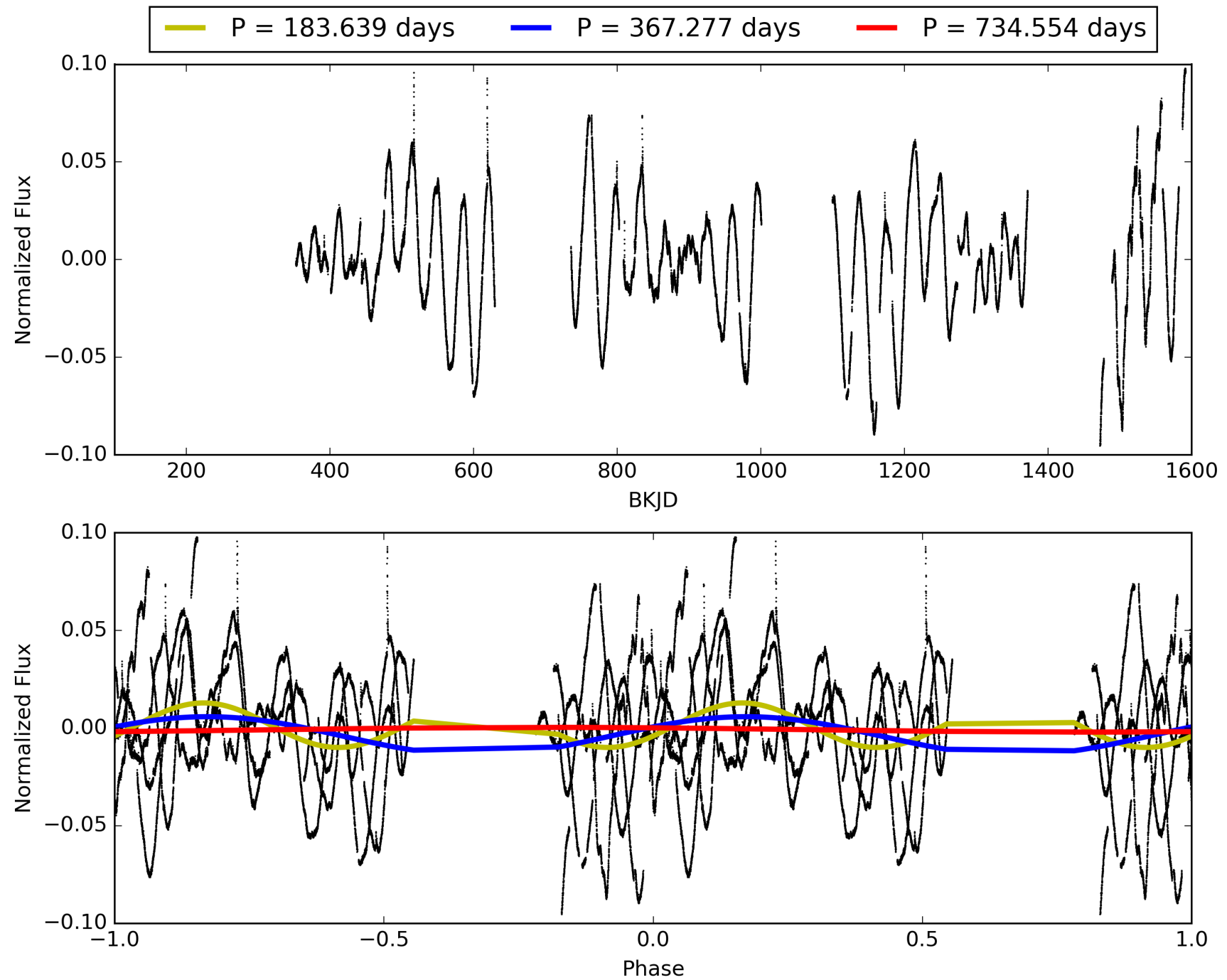
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:57:17 Z

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

TCE 009603398-04, PDC Light Curves

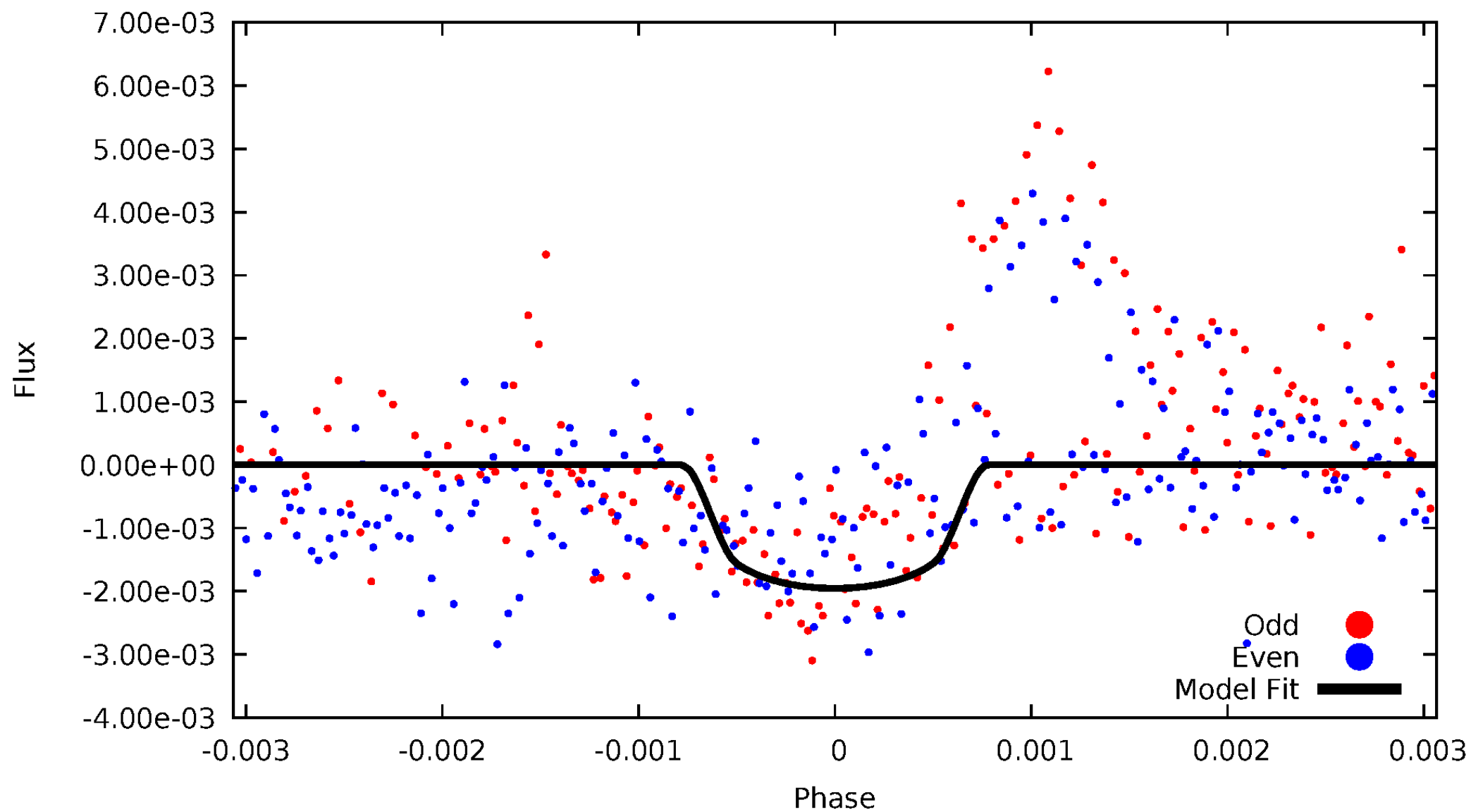


TCE 009603398-04



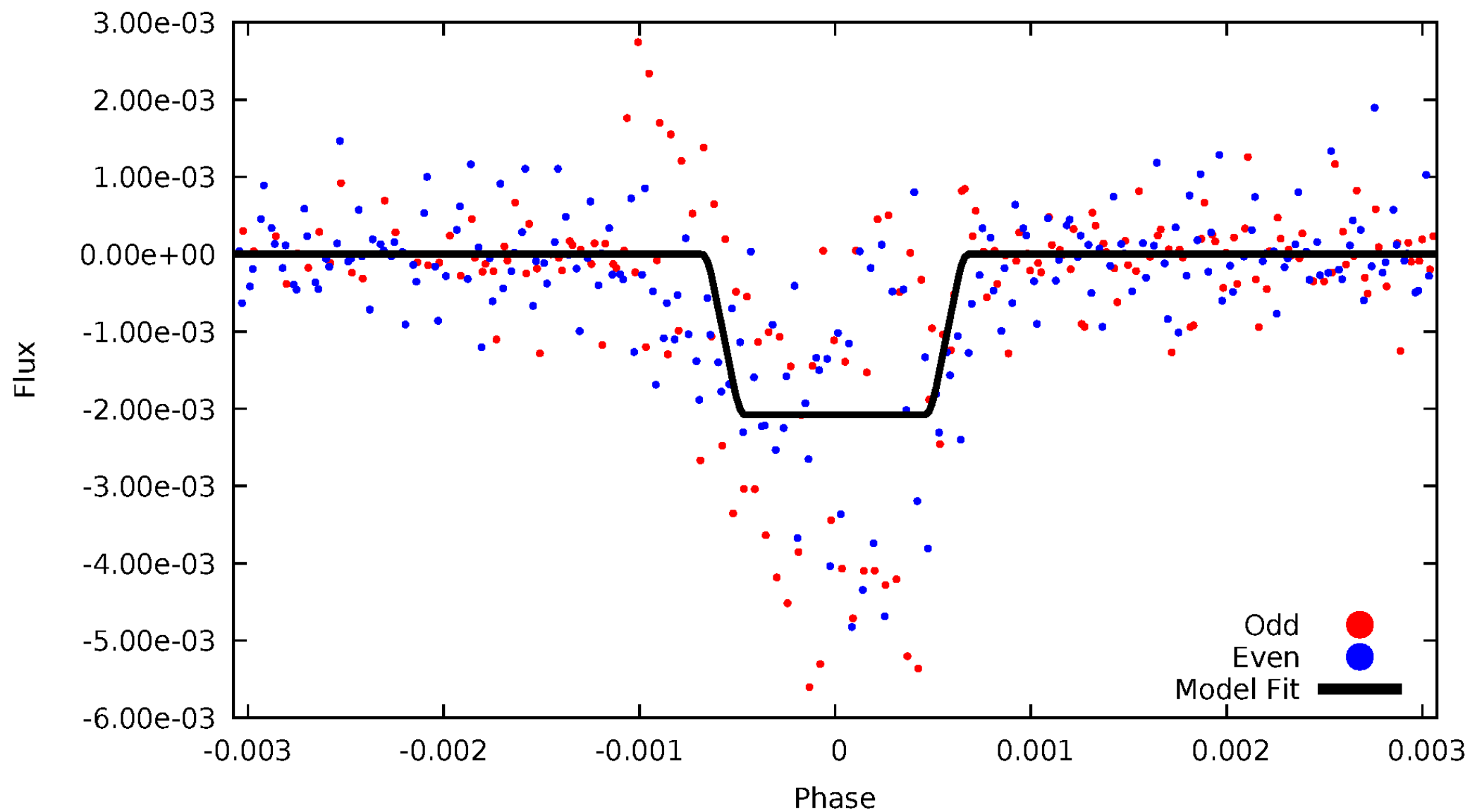
DV Odd/Even

TCE 009603398-04



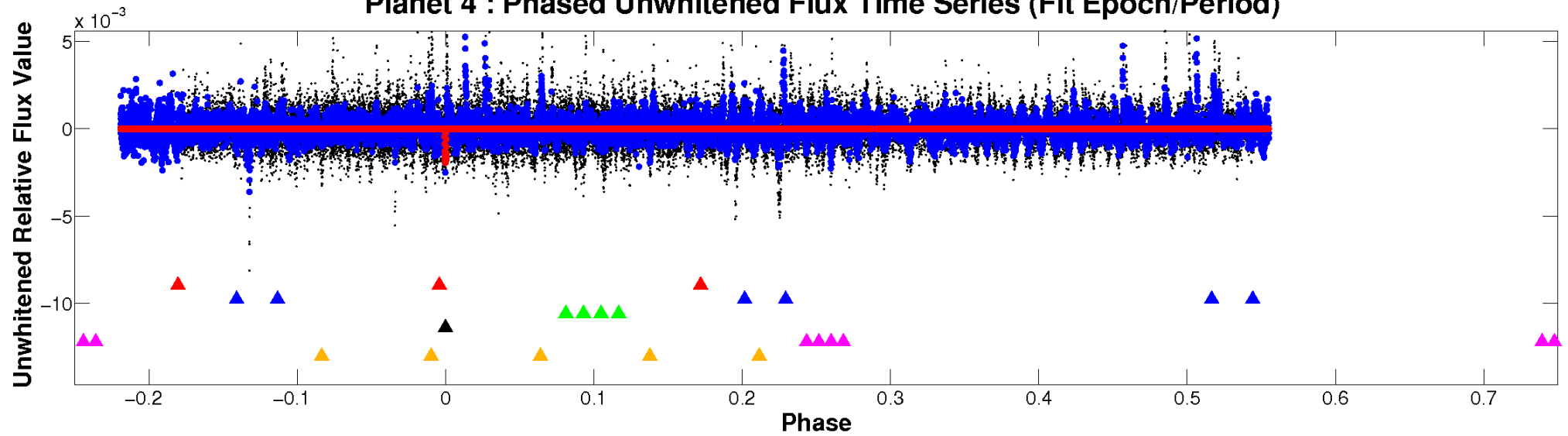
ALT Odd/Even

TCE 009603398-04

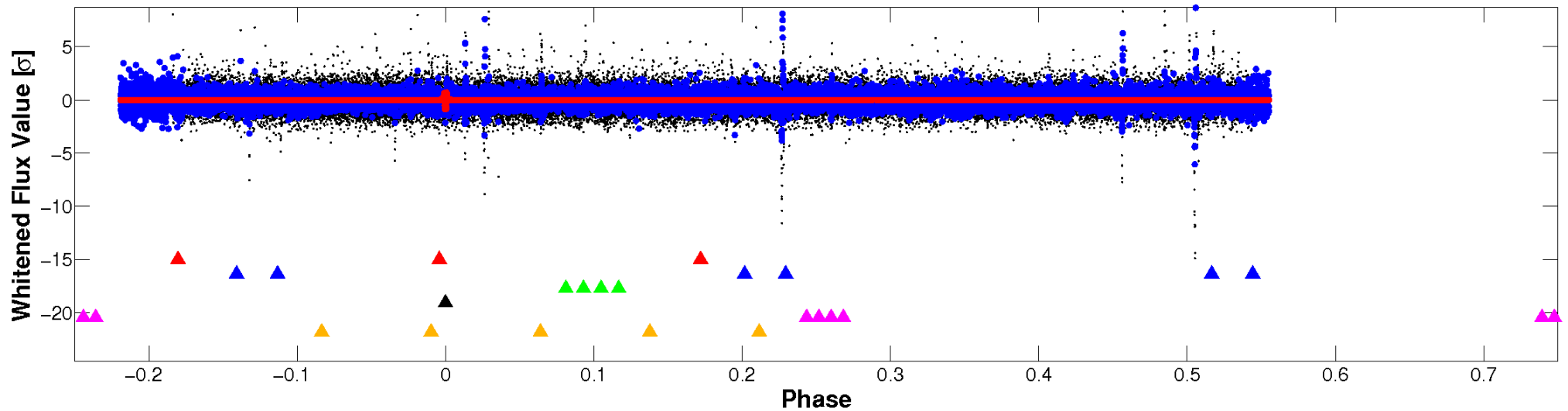


Non-Whitened Vs. Whitened Light Curve

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

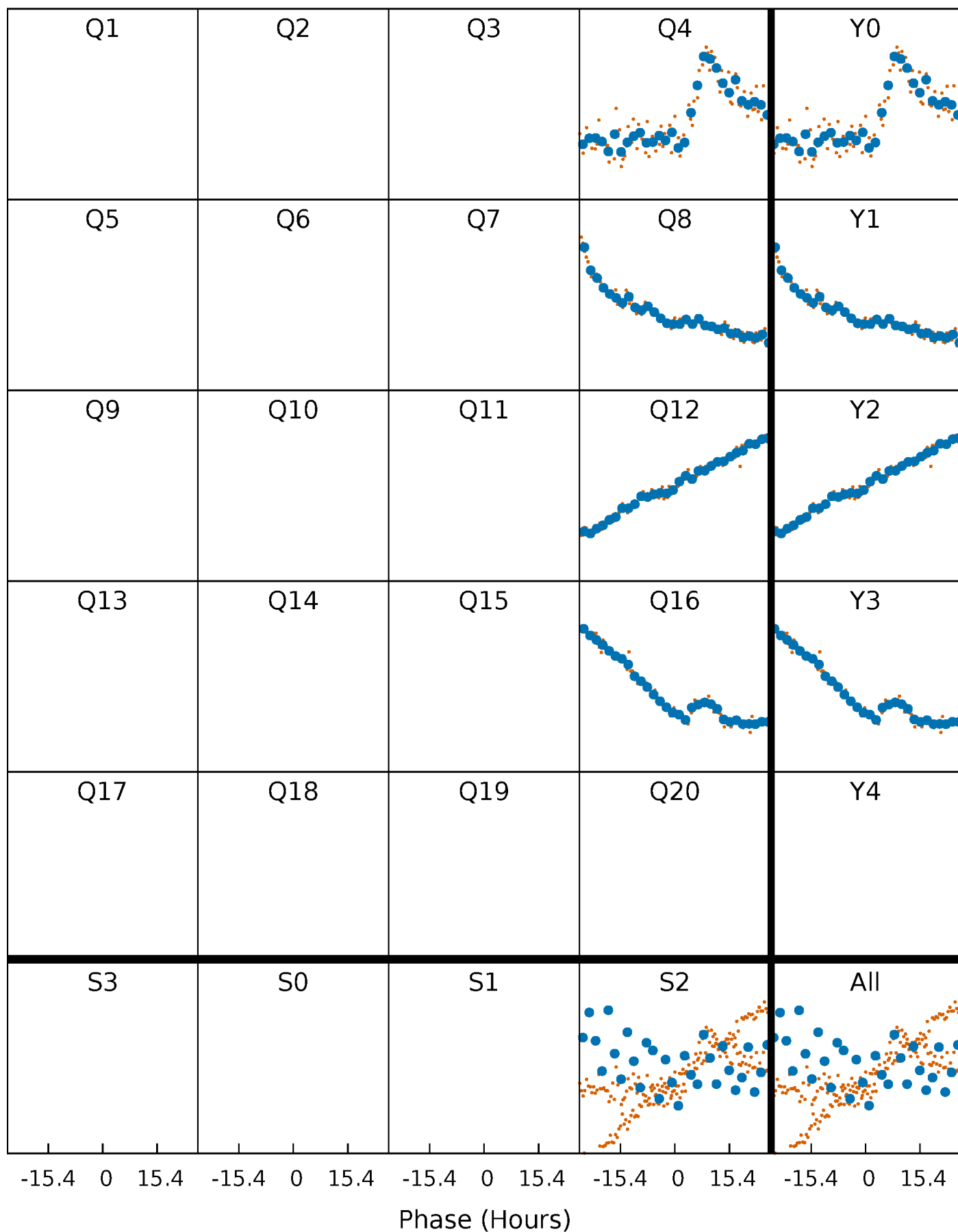


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



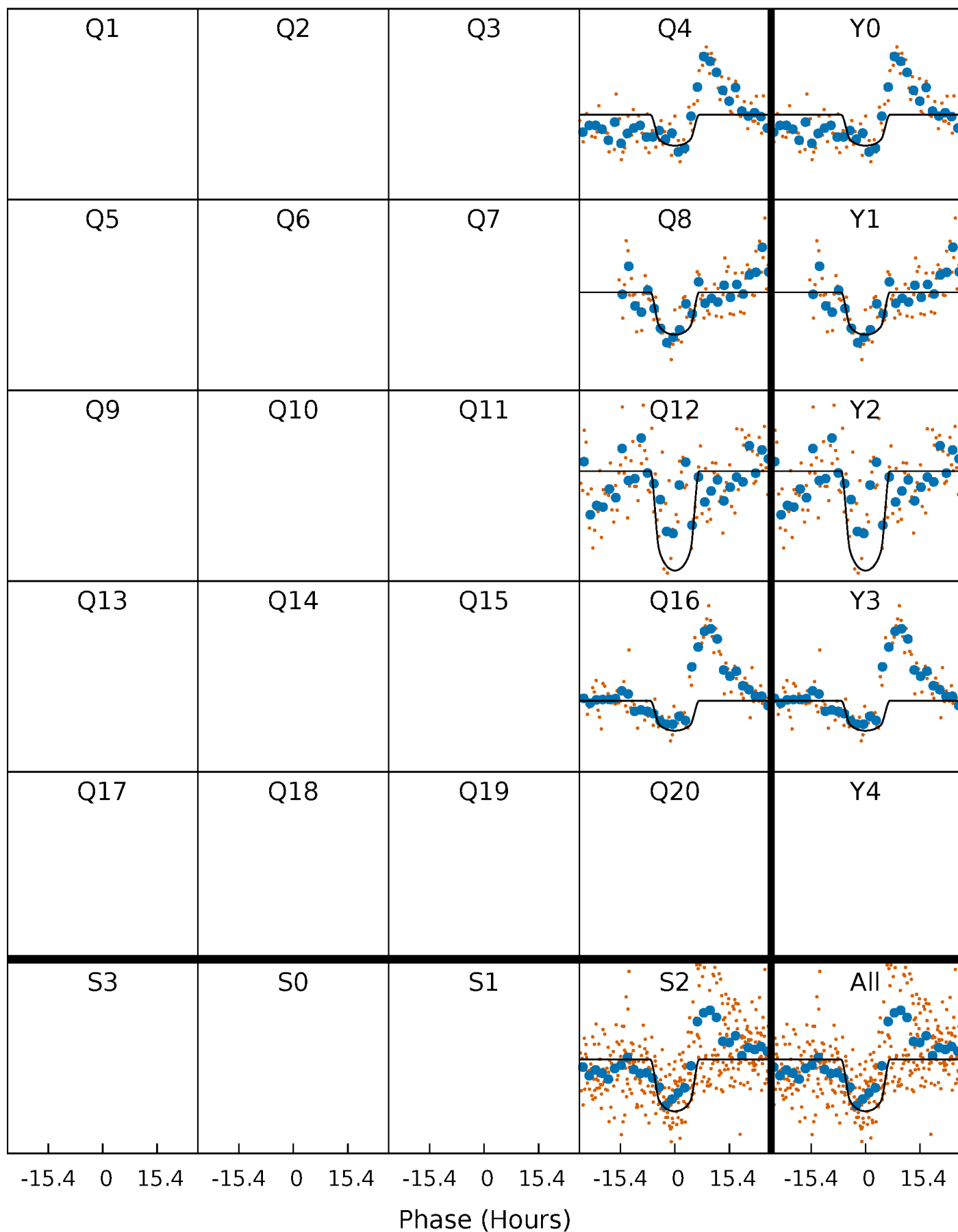
PDC Quarter-Phased Transit Curves

TCE 009603398-04 $P=367.277178$ Days $T_0=432.882791$ (BKJD)



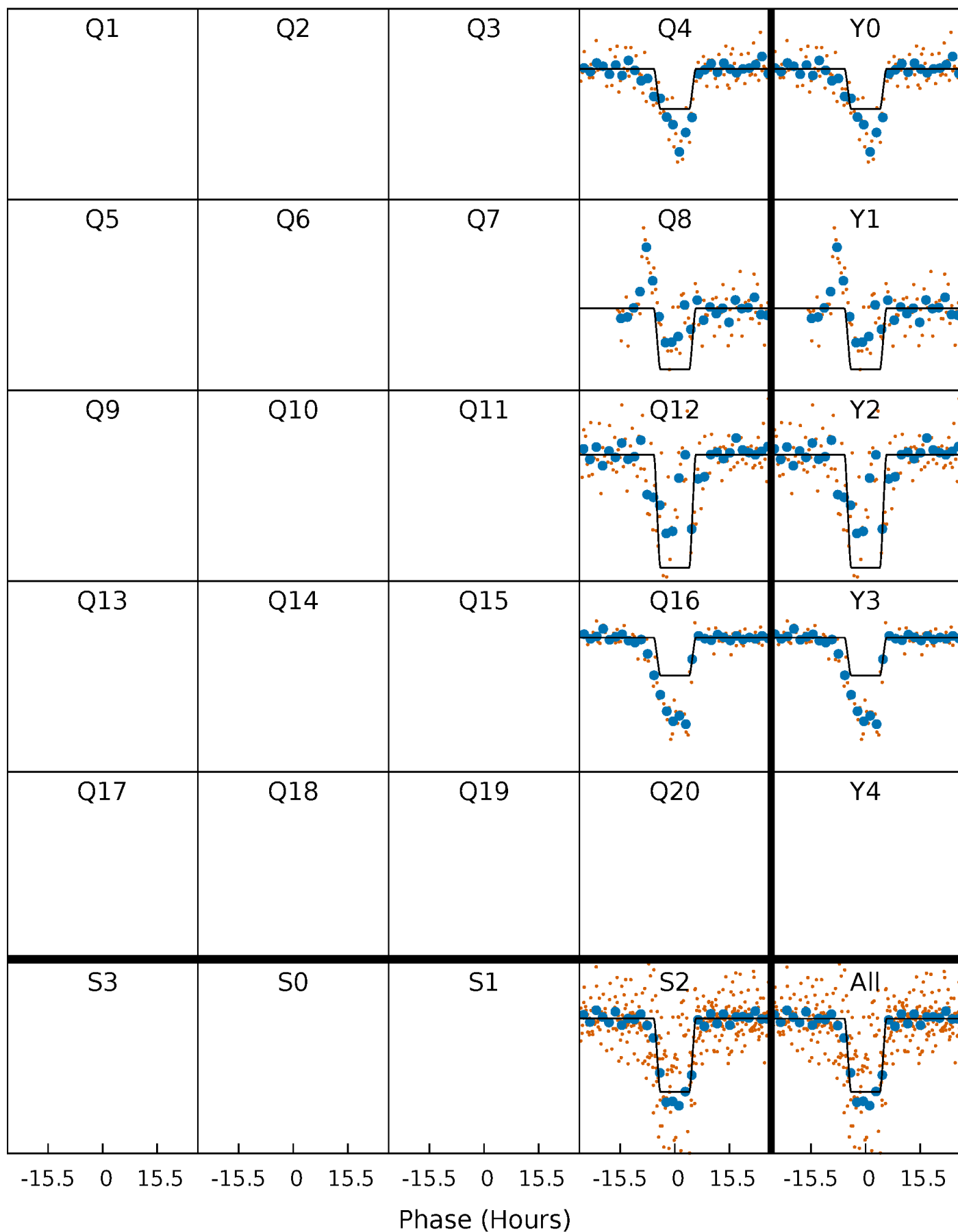
DV Quarter-Phased Transit Curves

TCE 009603398-04 $P=367.277178$ Days $T_0=432.882791$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

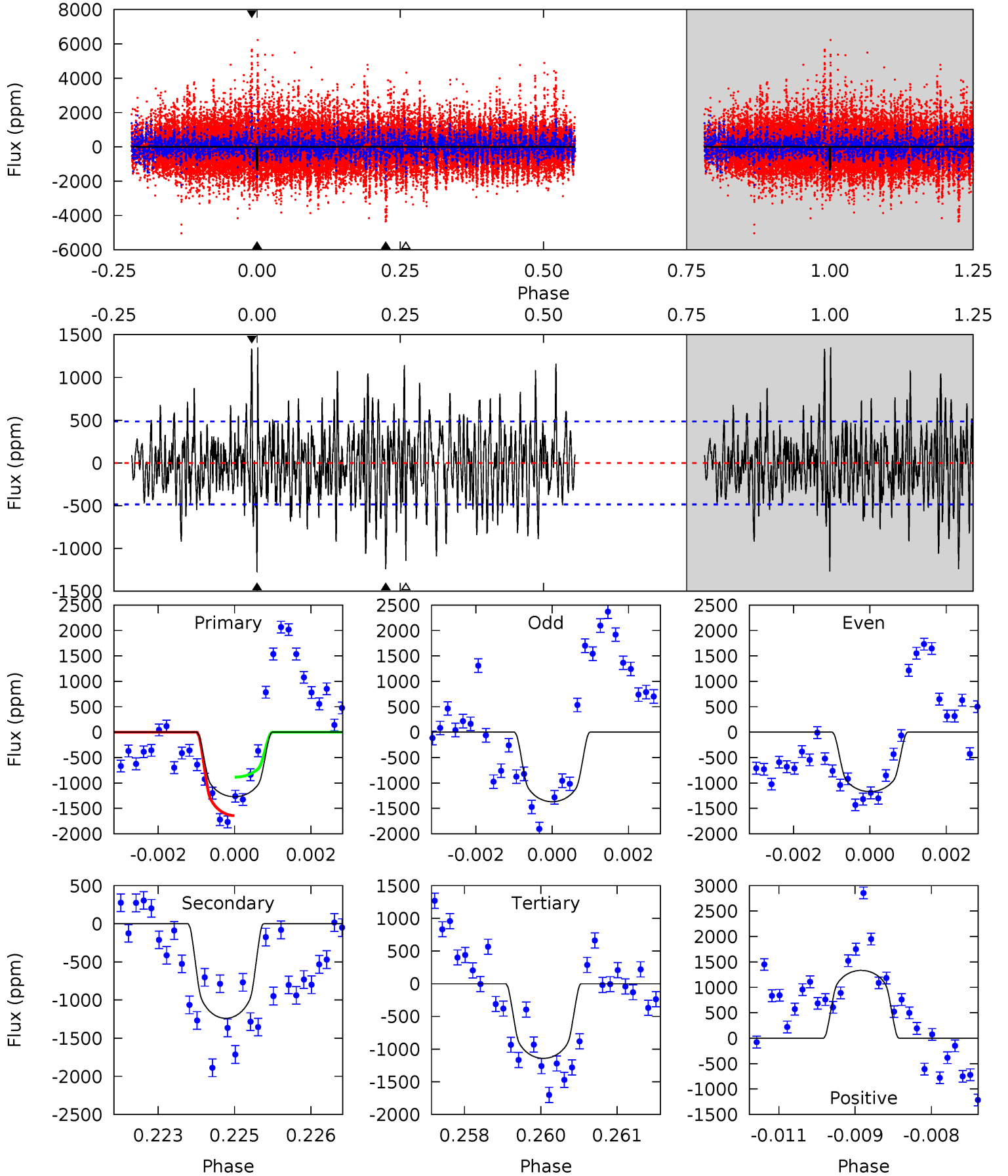
TCE 009603398-04 $P=367.265996$ Days $T_0=432.914501$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-04, $P = 367.277178$ Days, $E = 65.605613$ Days

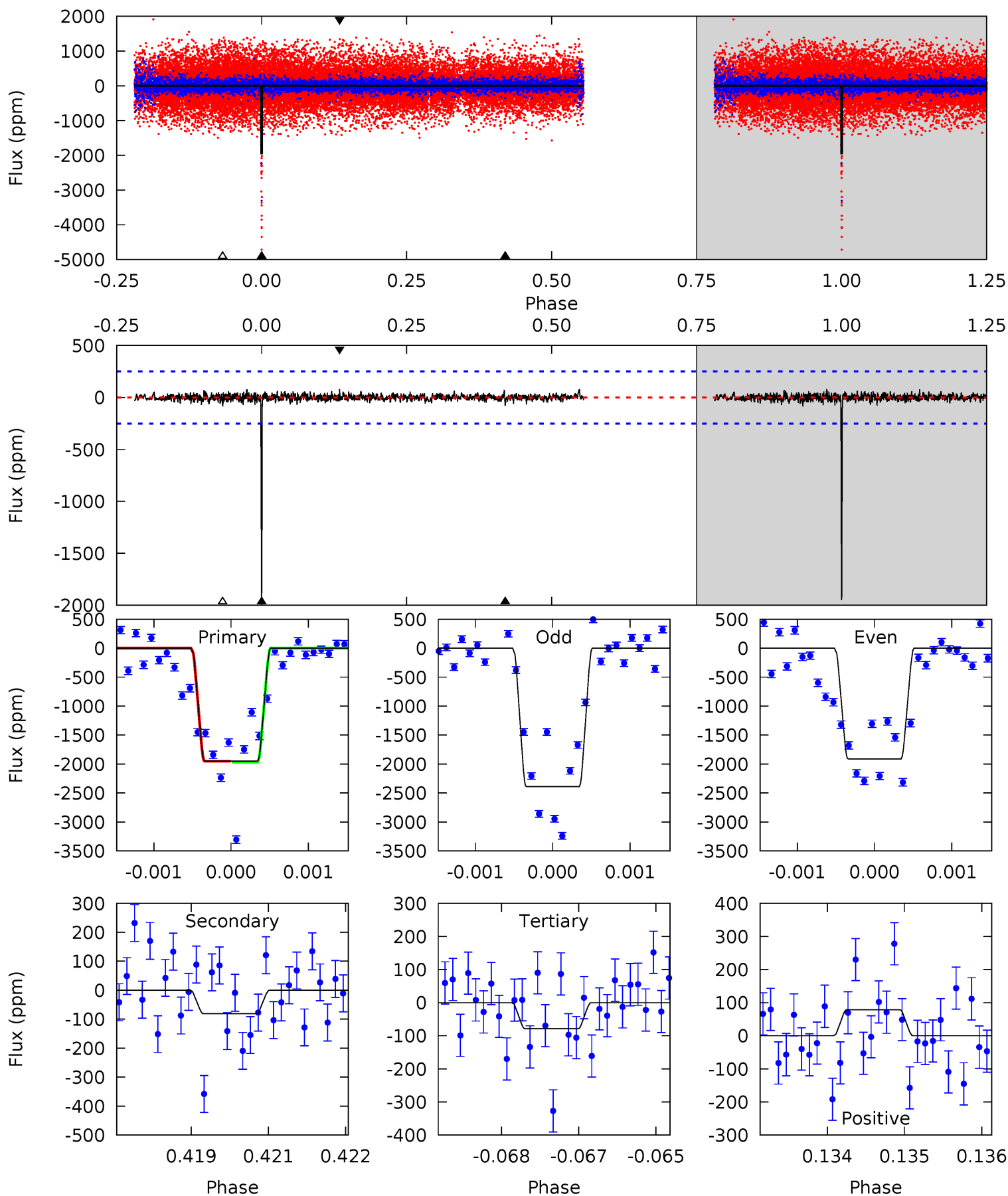
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.1	13.7	12.7	14.8	5.37	3.16	3.92	1.42	-0.70	1.08	-1.04	0.86	1.00	0.52	4.19



Alt Model-Shift Uniqueness Test

009603398-04, P = 367.265996 Days, E = 65.648505 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.8	1.74	1.70	1.69	5.40	3.21	0.43	40.1	40.1	0.05	0.05	5.84	1.11	0.04	0.16



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1239 ± 90	$3.38^{+0.44}_{-0.39}$	263^{+11}_{-11}	4377^{+222}_{-216}	45260^{+12304}_{-9750}
Alt.	-81 ± 47	$3.28^{+0.39}_{-0.37}$	262^{+12}_{-11}	2864^{+205}_{-313}	3155^{+2233}_{-1821}

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 $A_{obs} \gg 1.0$

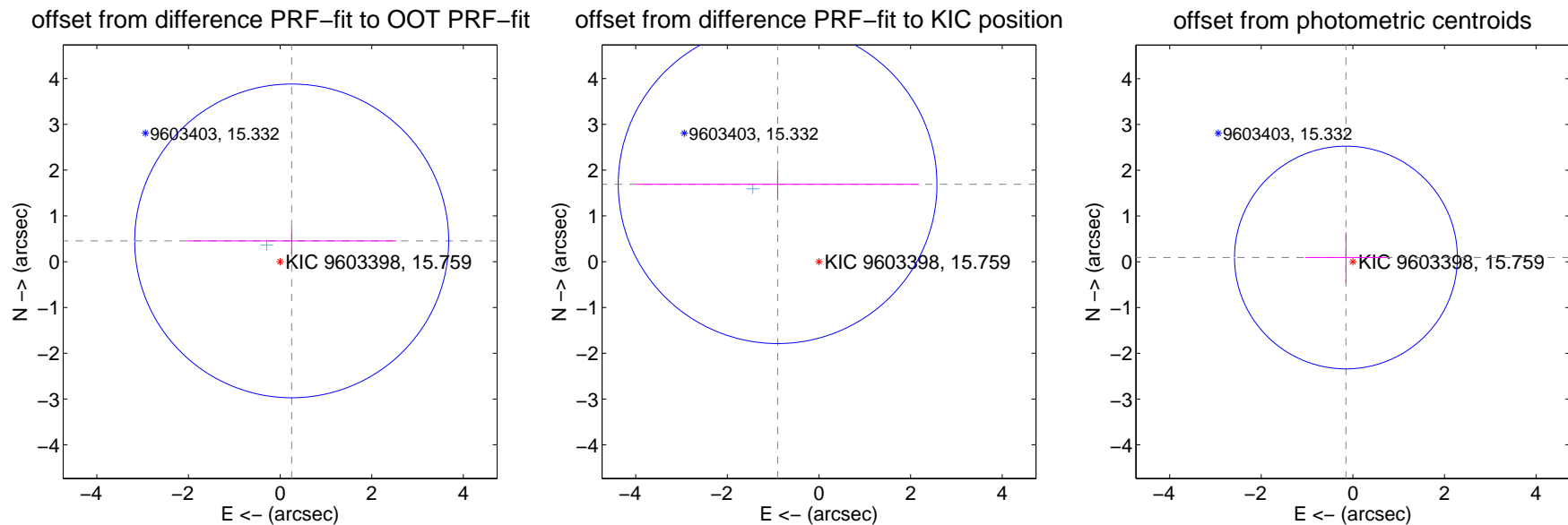
DV Centroid Data

Supplemental centroid analysis for 009603398-04. Kepler magnitude: 15.76. Transit SNR 8.49

There are 1 quarters with good PRF difference image offsets

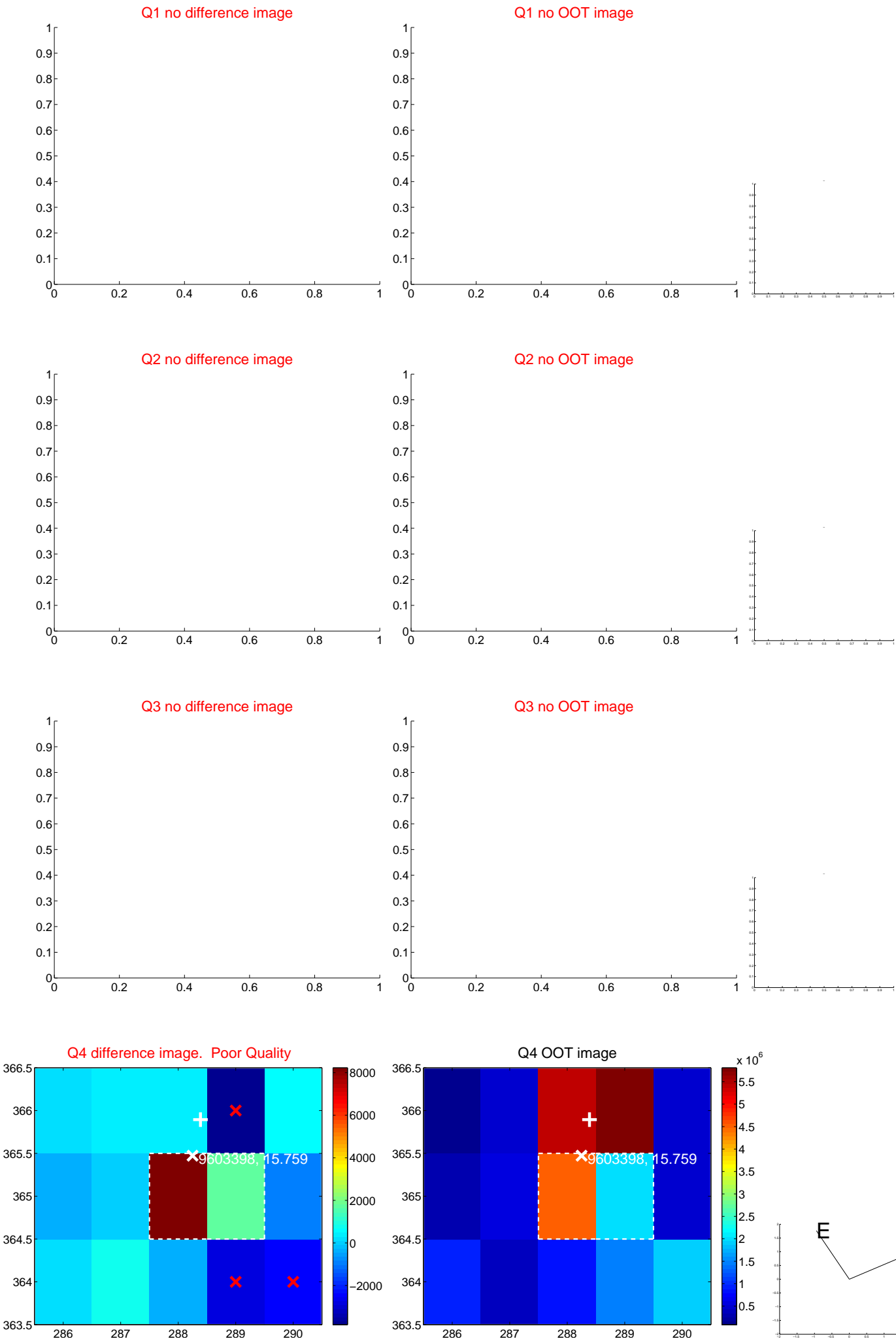
The direct PRF centroid is offset from the target star catalog position by about 1.73 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.520 ± 1.142	0.46	-0.253 ± 2.287	0.455 ± 0.302
PRF-fit source offset from KIC position	1.916 ± 1.159	1.65	0.903 ± 3.085	1.690 ± 0.342
photometric centroid source offset	0.18 ± 0.81	0.22	0.15 ± 0.89	0.09 ± 0.55

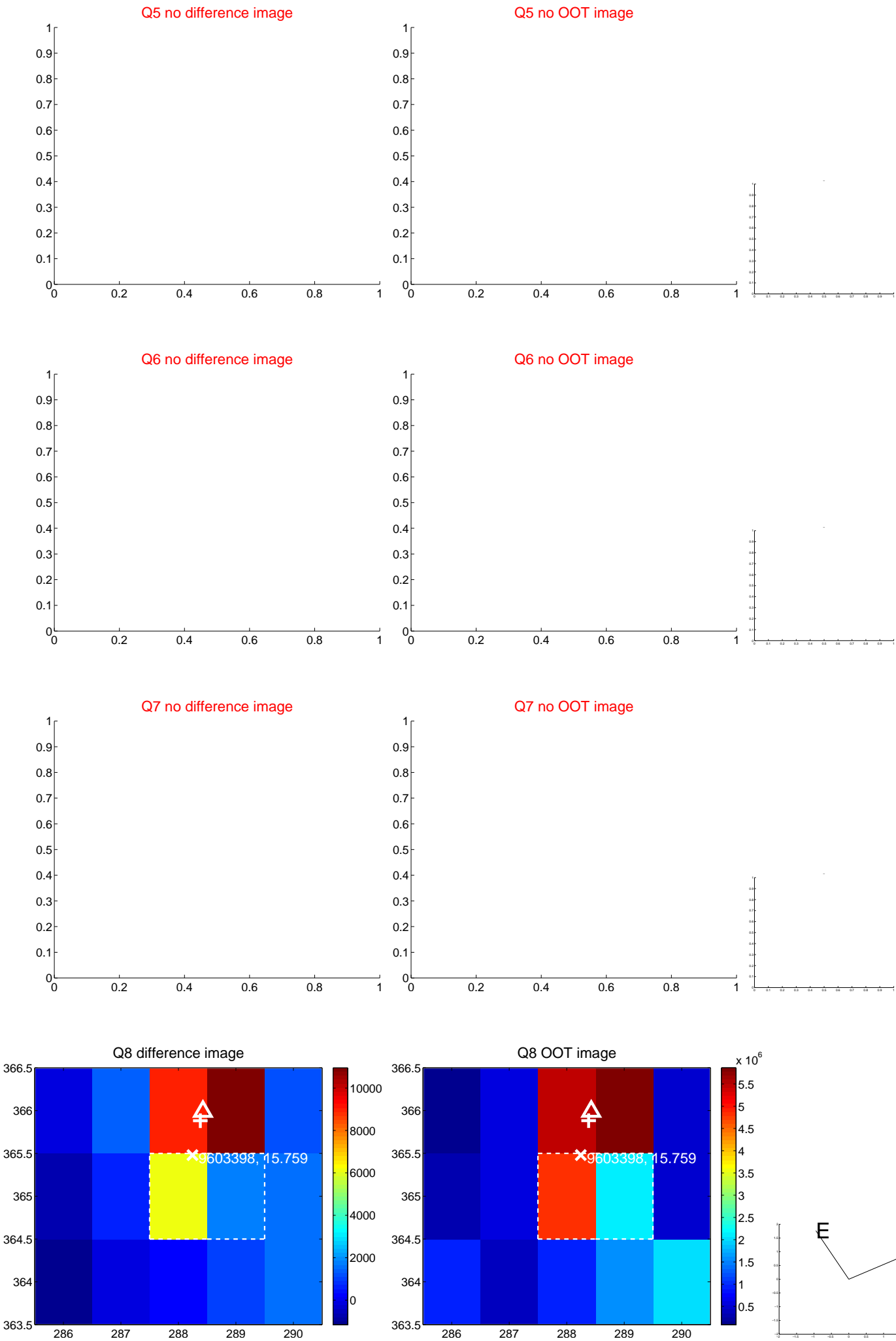


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

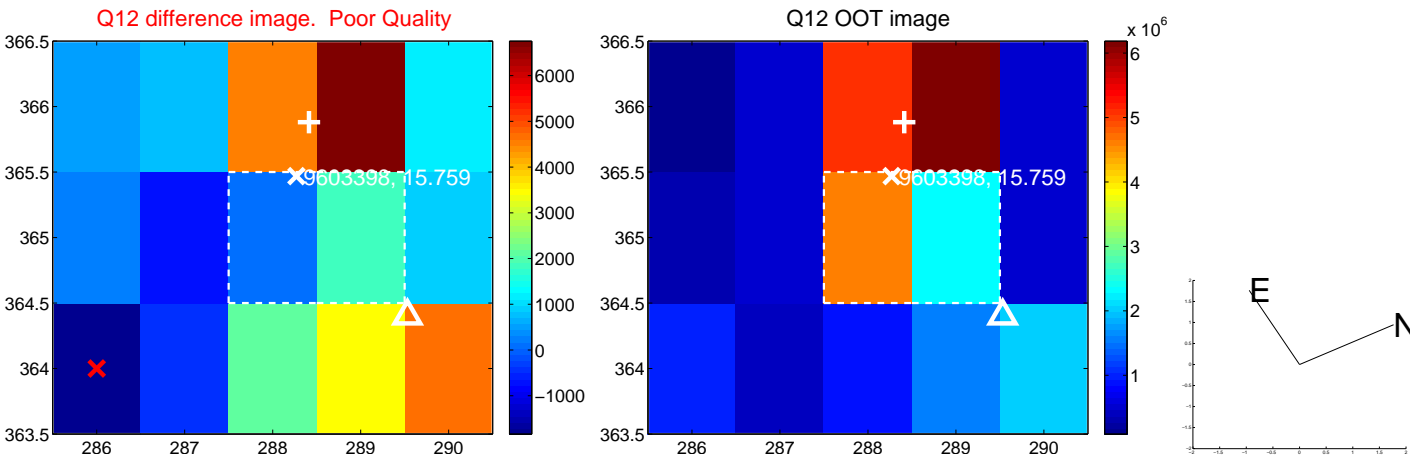
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



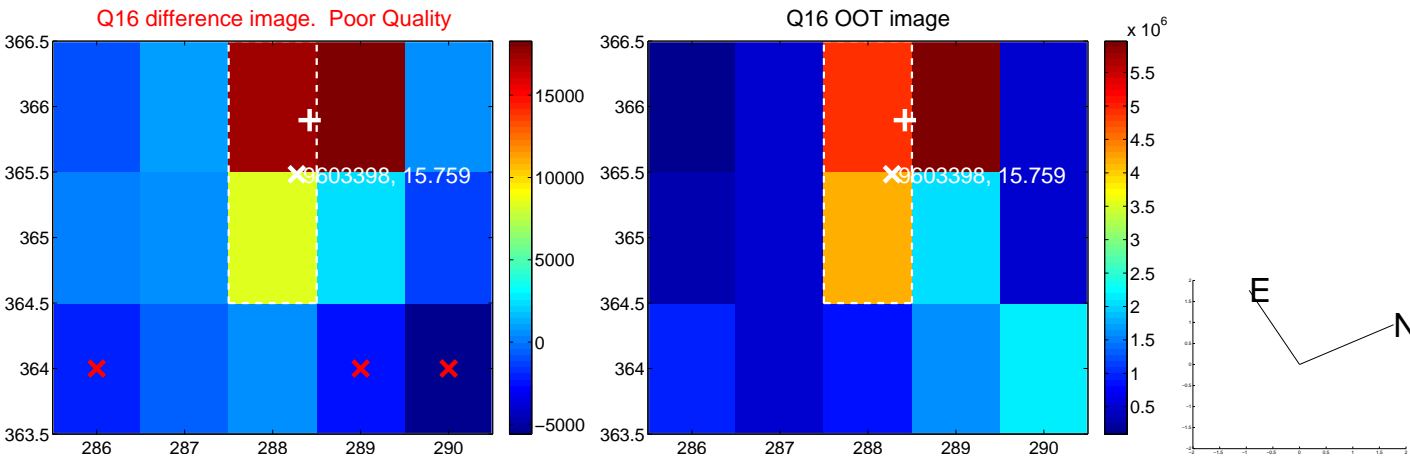
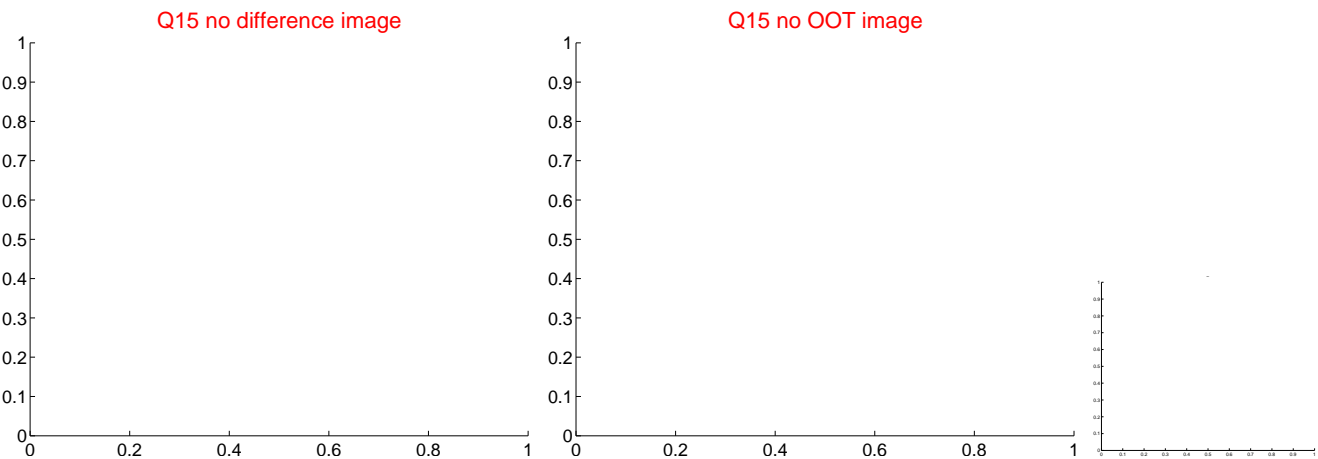
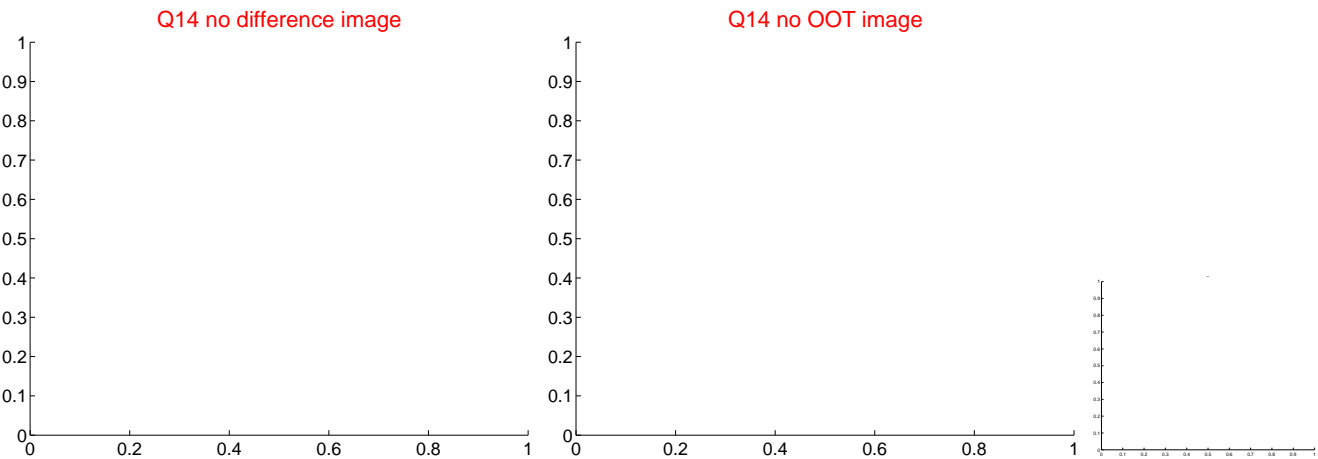
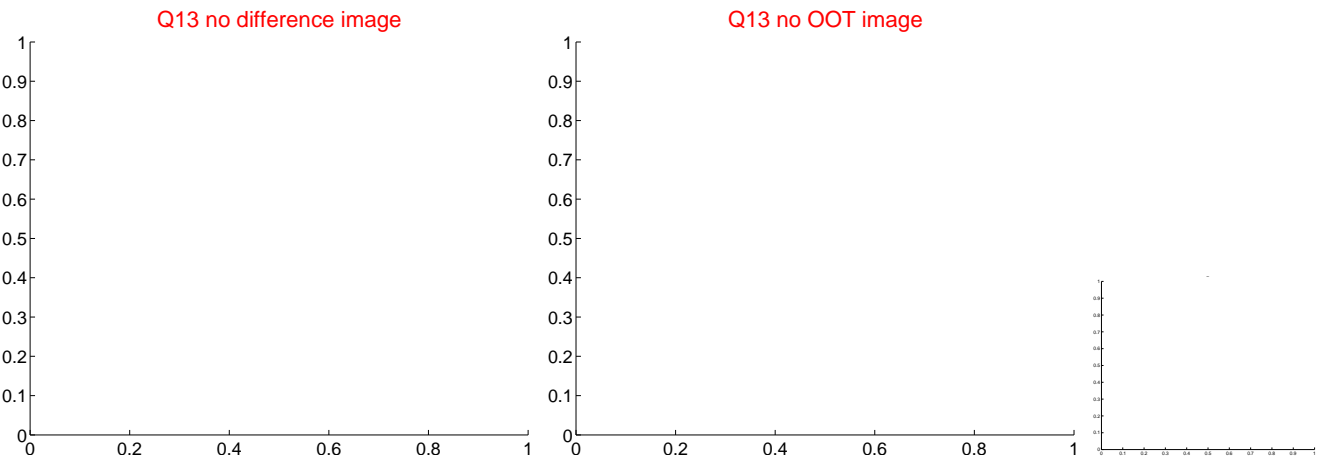
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



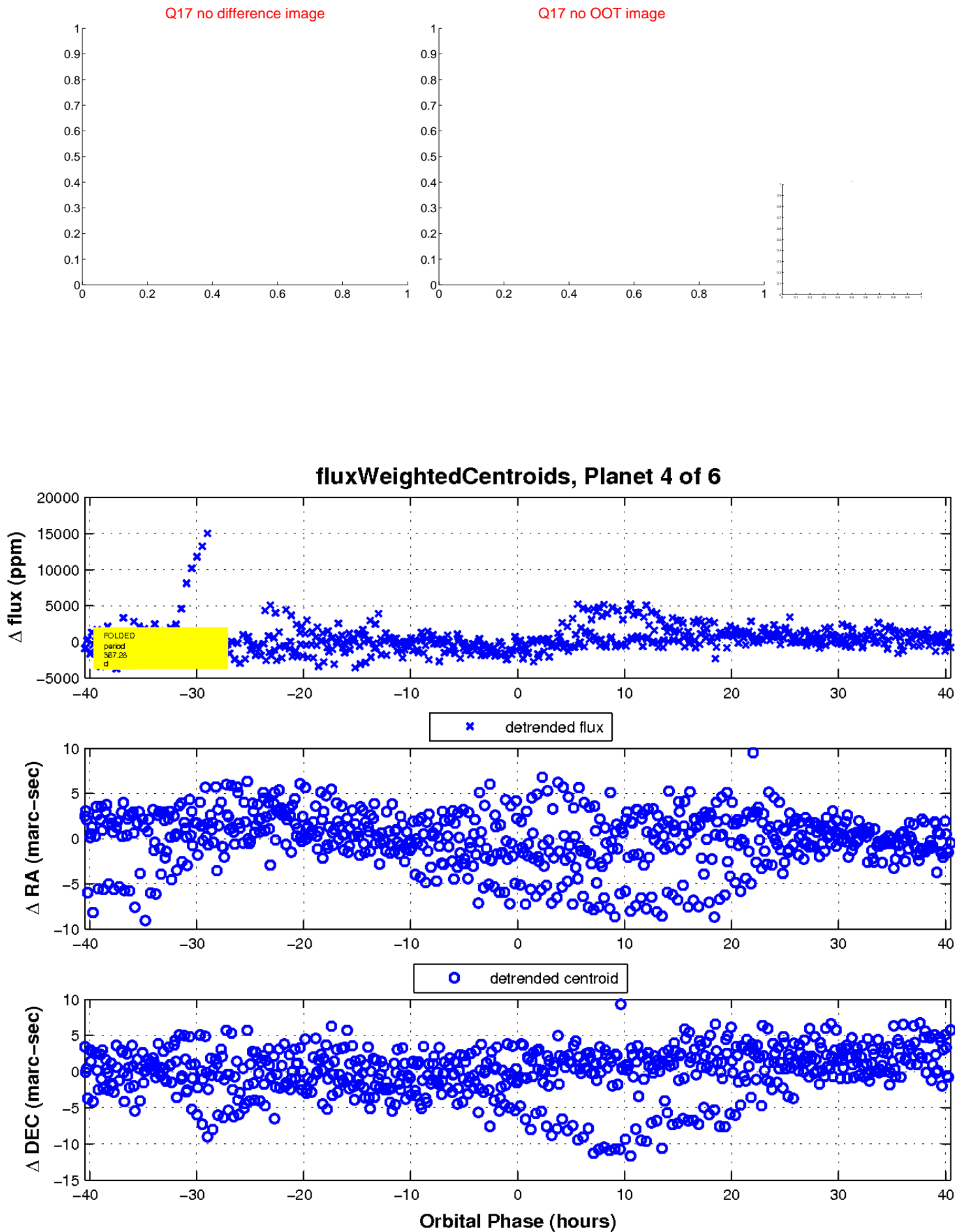
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

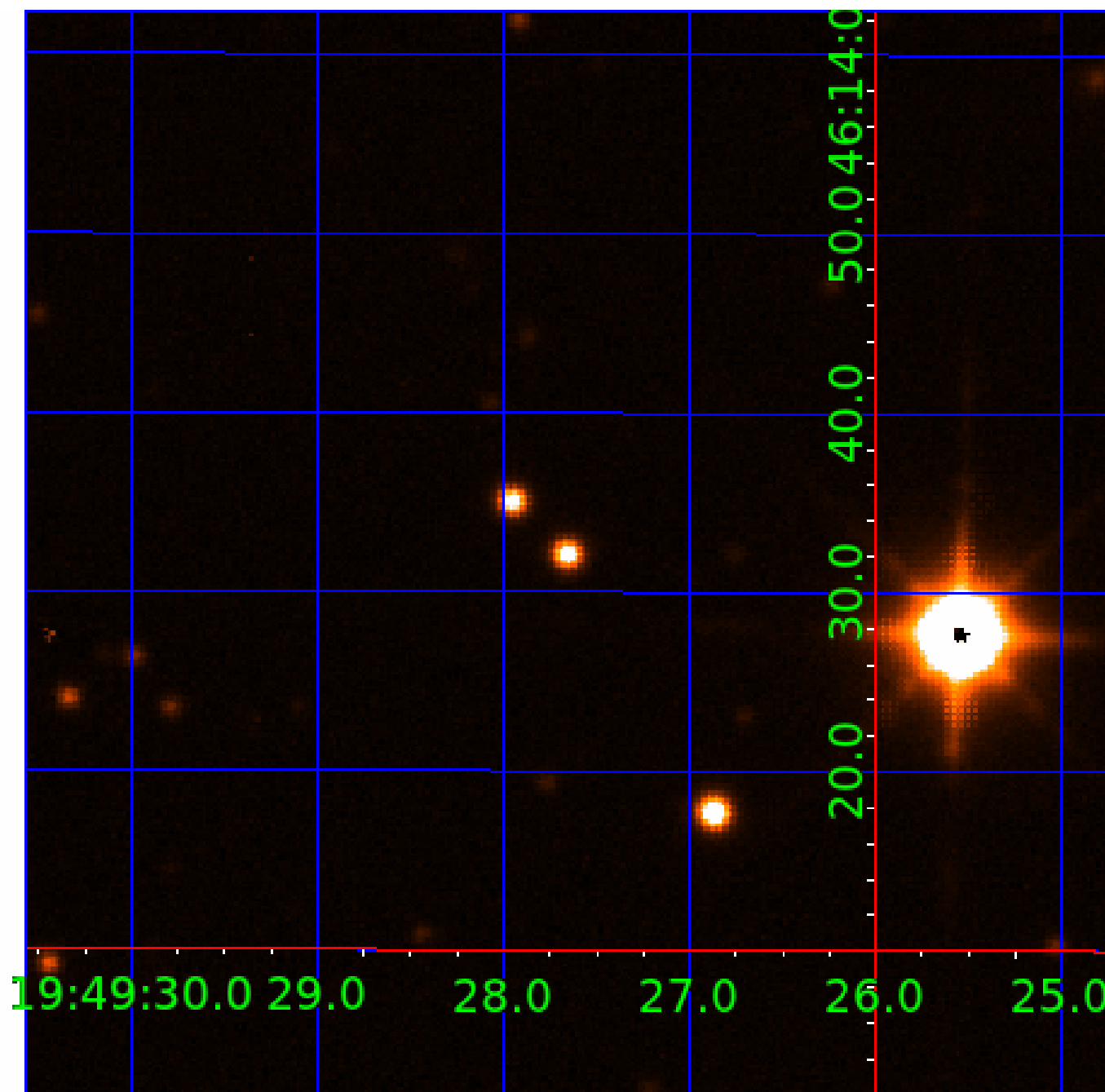


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

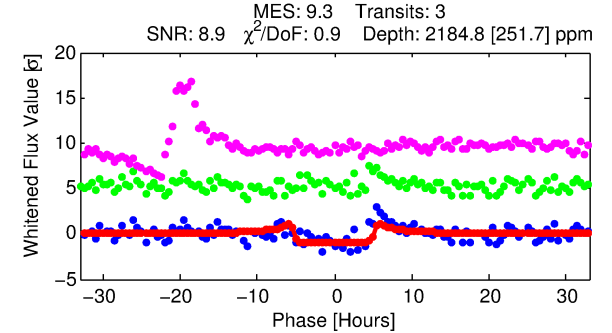
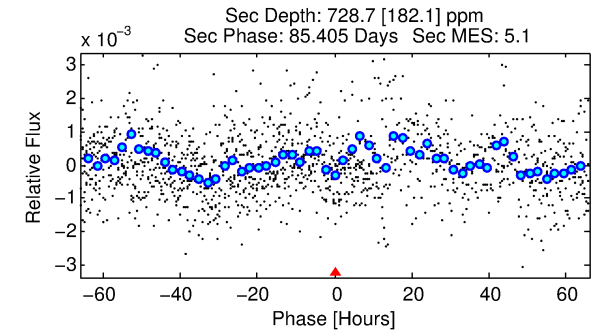
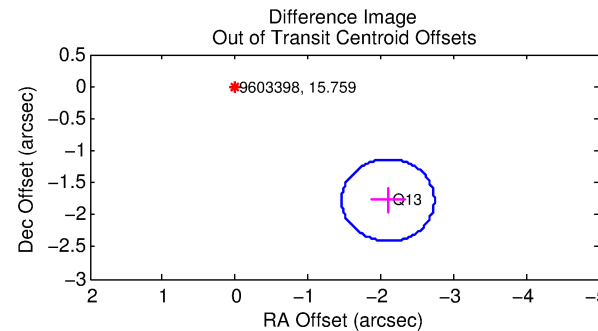
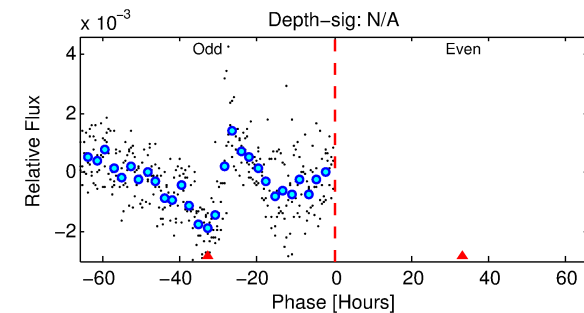
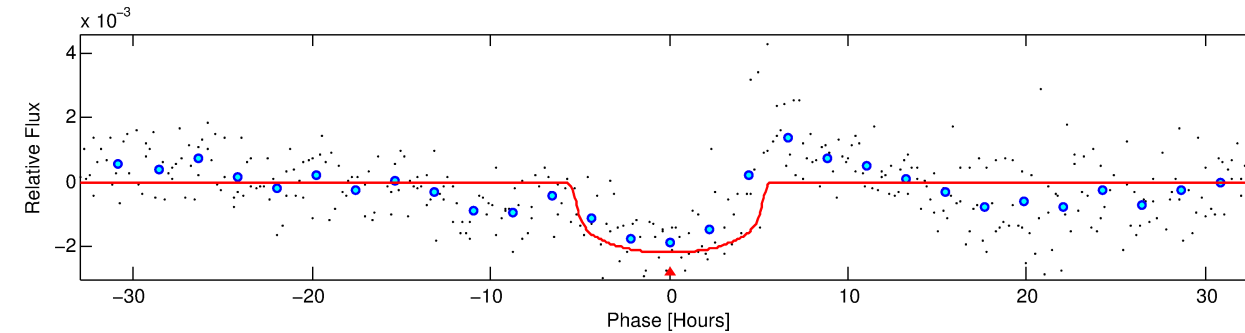
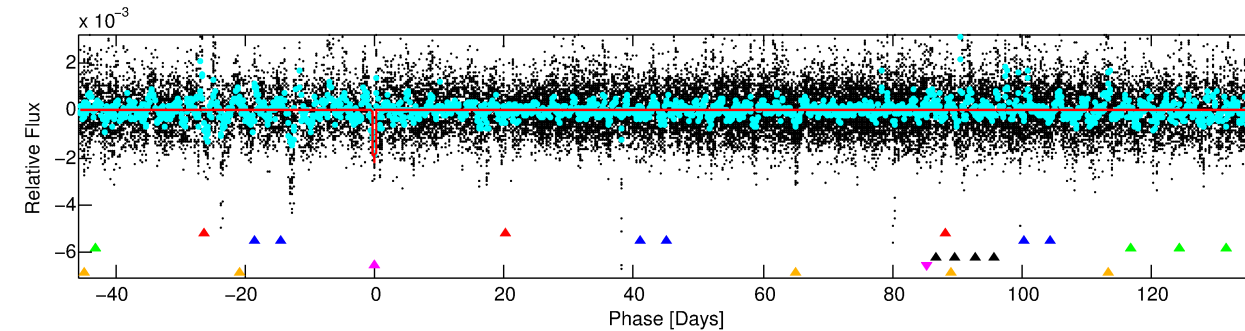
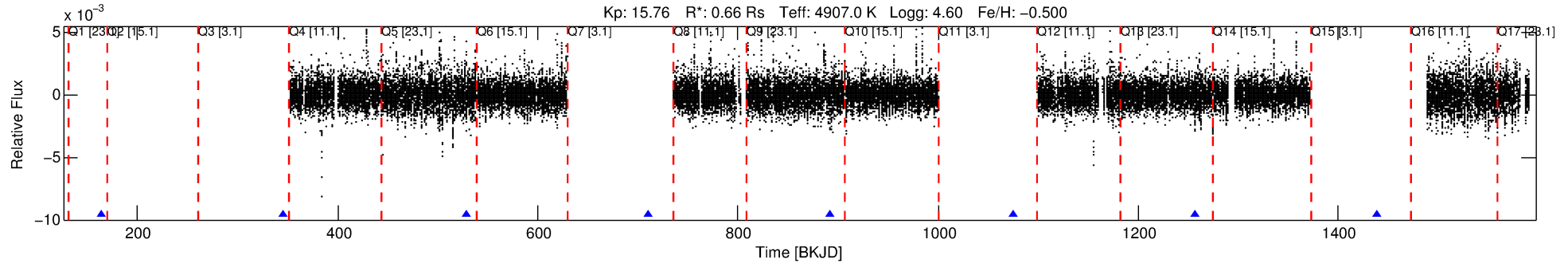
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-05

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 5 of 6 Period: 182.119 d



DV Fit Results:

Period = 182.11887 [0.00349] d
Epoch = 164.1525 [0.0165] BKJD
Rp/R* = 0.0417 [0.0208]
a/R* = 129.67 [223.34]
b = 0.18 [9.25]
Seff = 0.77 [0.14]
Teq = 239 [11] K
Rp = 3.02 [1.53] Re
a = 0.5432 [0.0460] AU
Ag = 12970.97 [13404.58] [0.97σ]
Teffp = 3946 [1021] K [3.63σ]

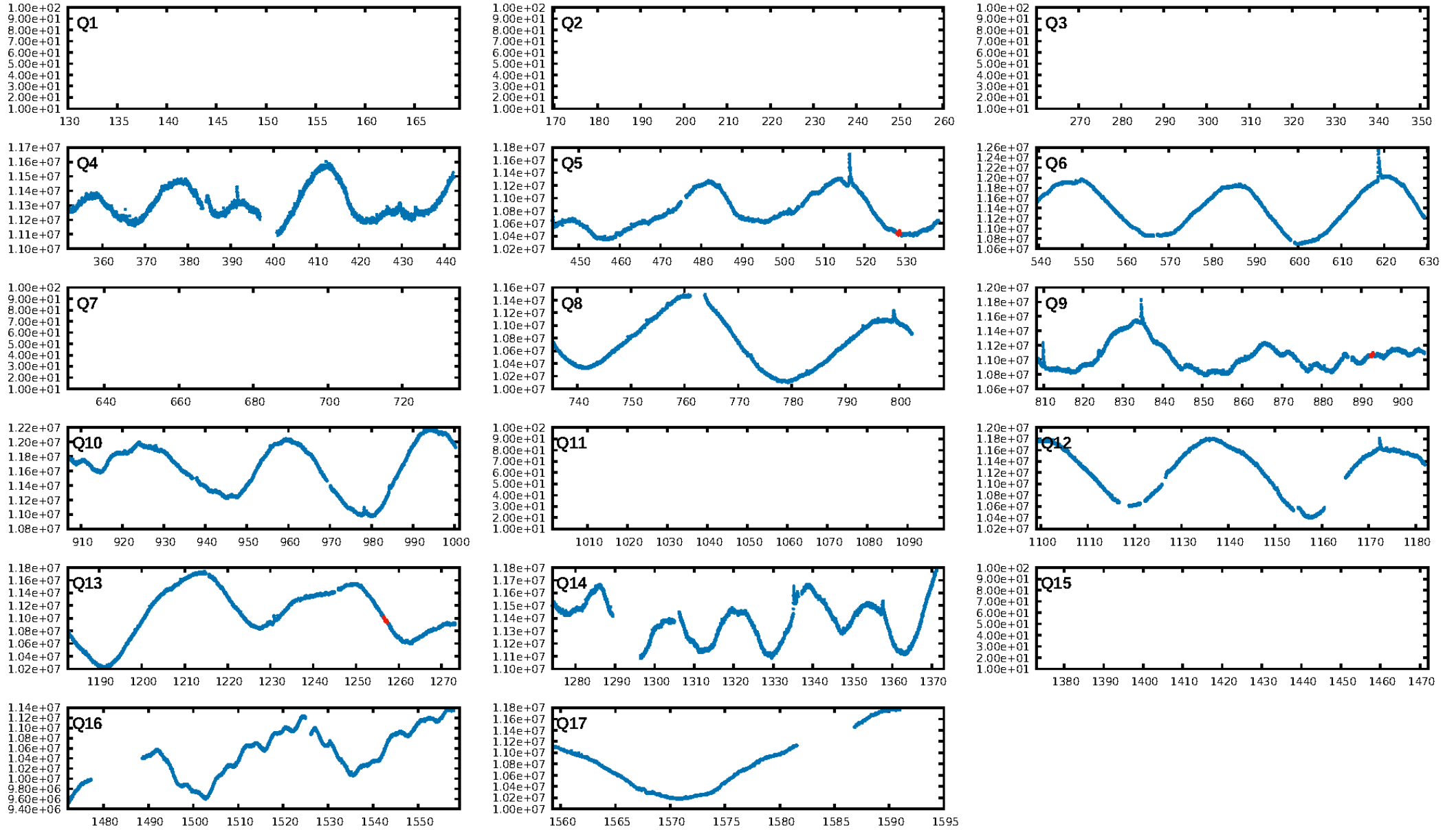
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [115.53σ]
ModelChiSquare2-sig: 42.1%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 8.03e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.2047
Centroid-sig: N/A
Centroid-so: 1.752 arcsec [2.55σ]
OotOffset-rm: 2.748 arcsec [12.90σ]
KicOffset-rm: 0.157 arcsec [0.75σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

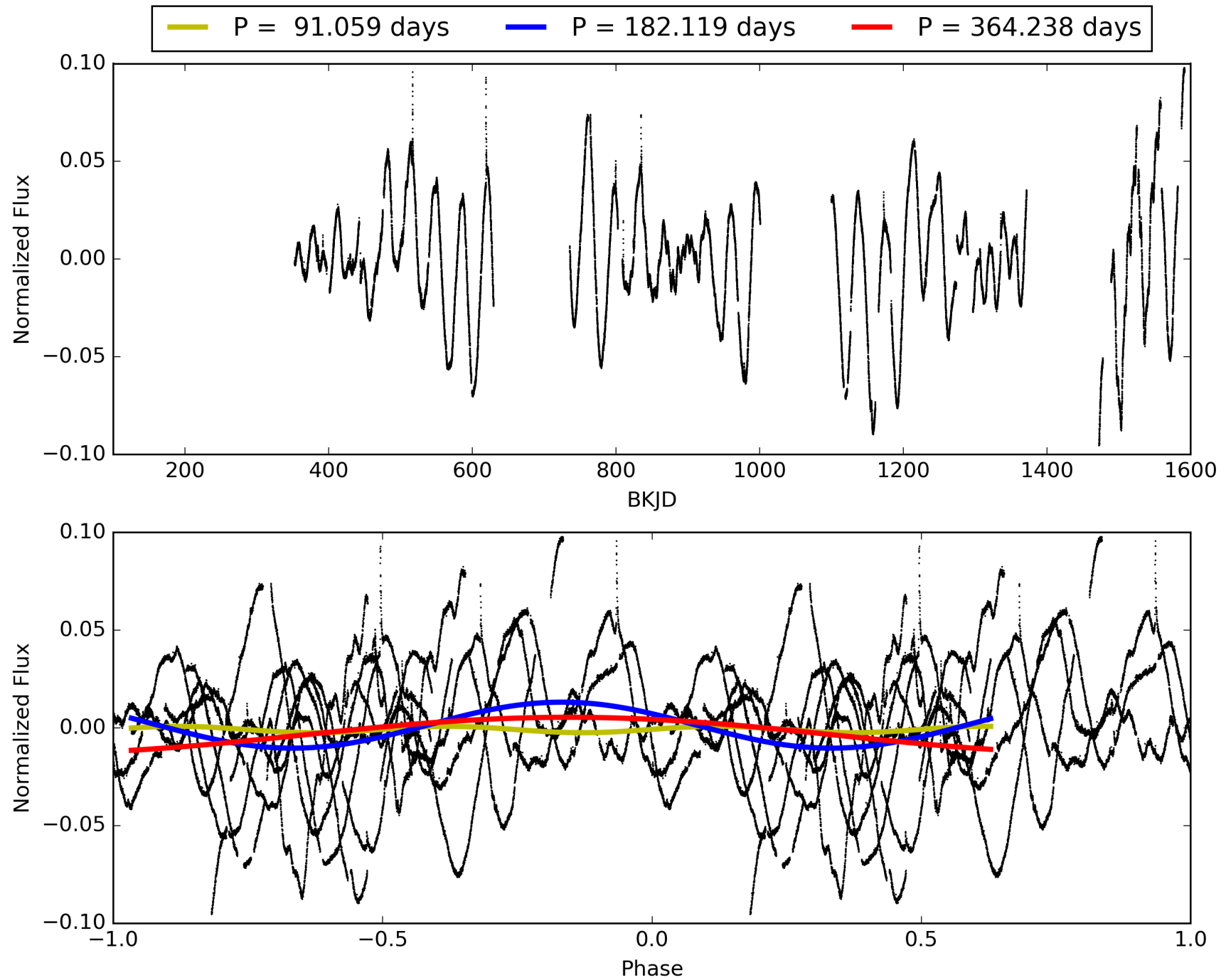
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:57:23 Z

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

TCE 009603398-05, PDC Light Curves

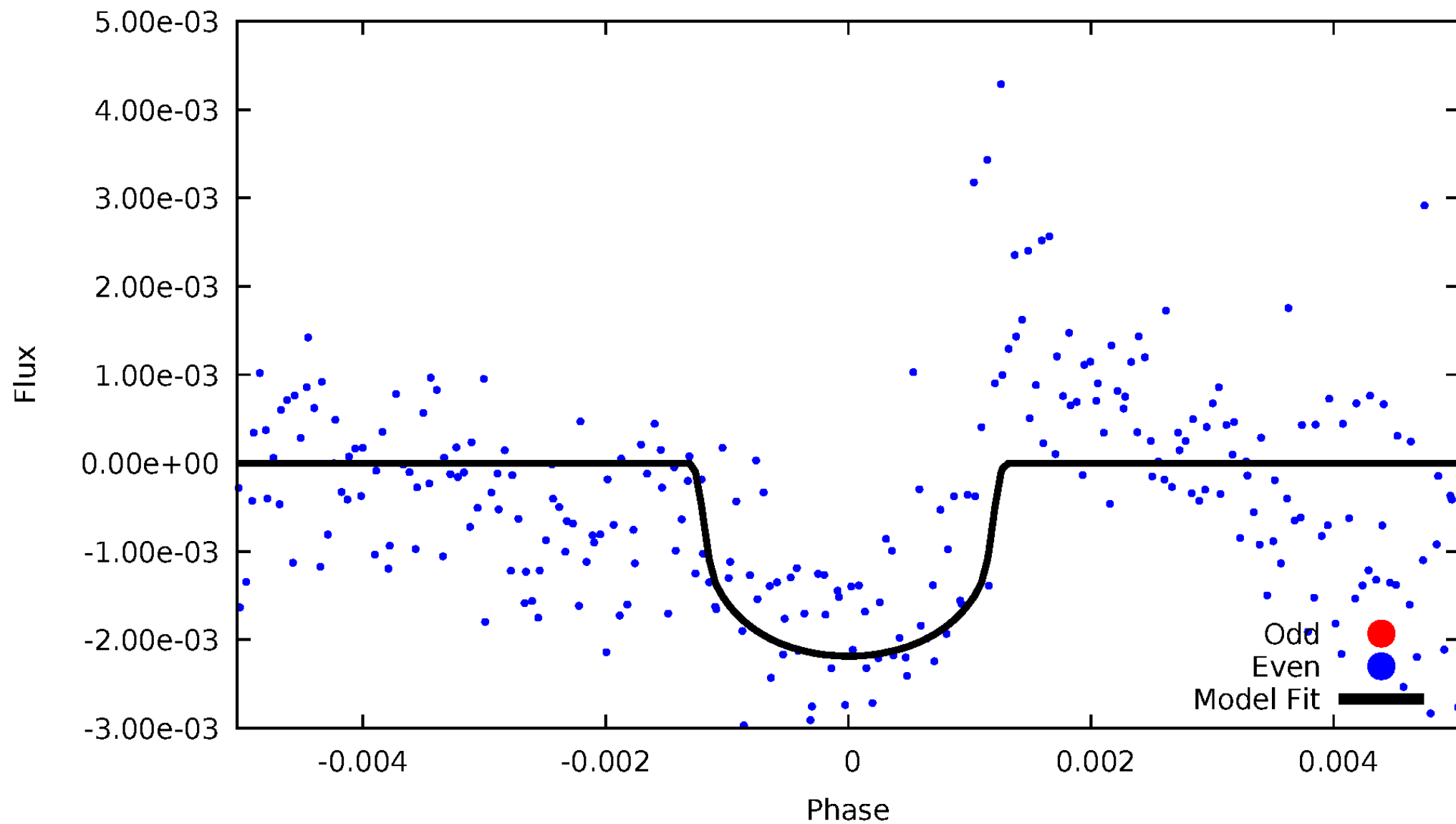


TCE 009603398-05



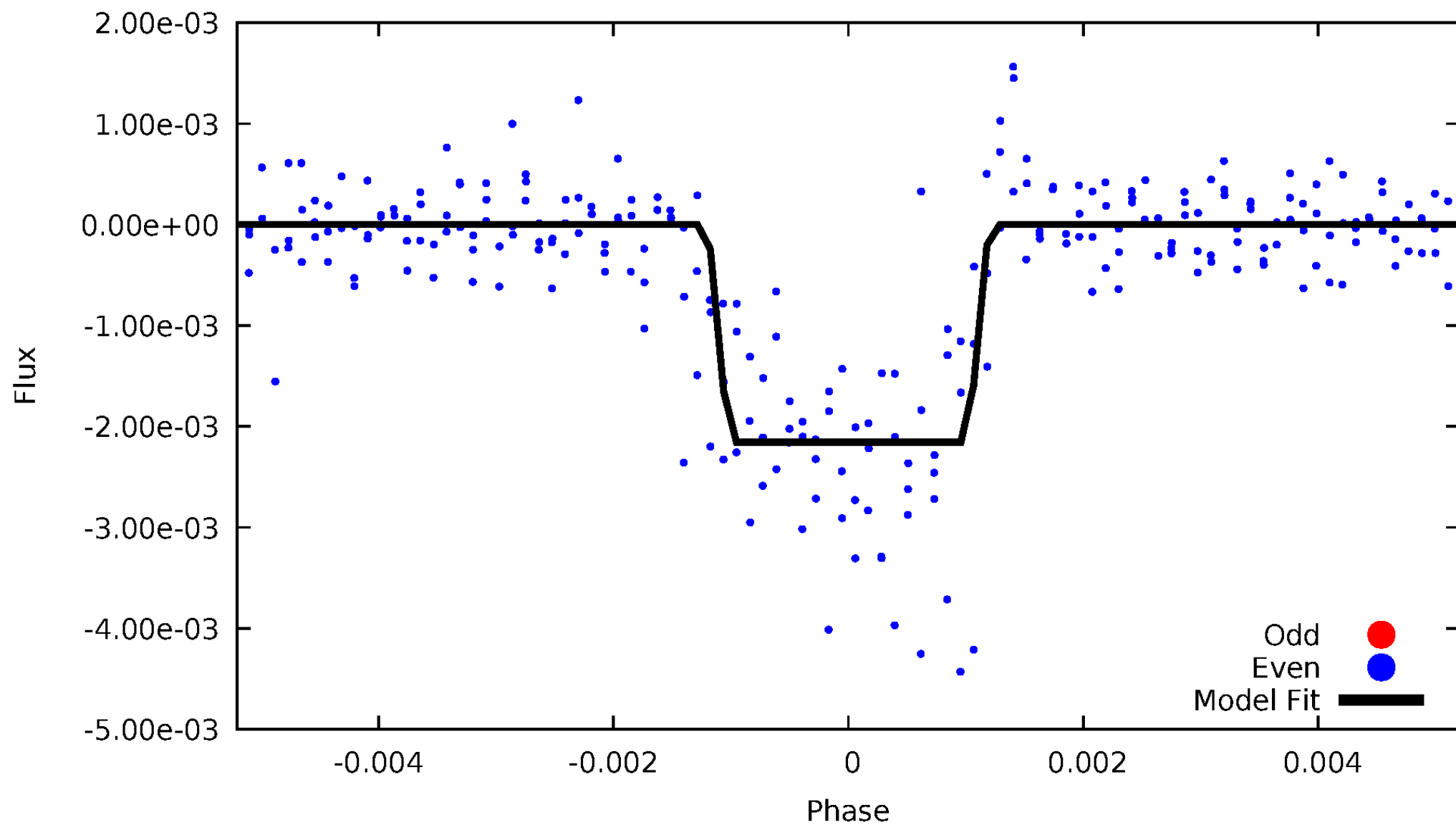
DV Odd/Even

TCE 009603398-05



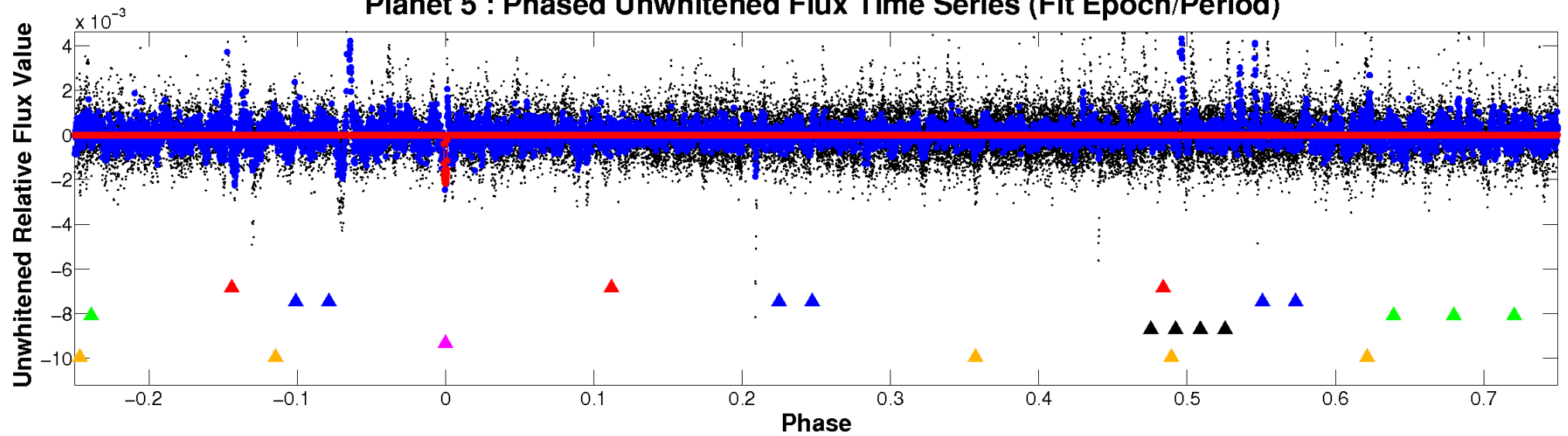
ALT Odd/Even

TCE 009603398-05

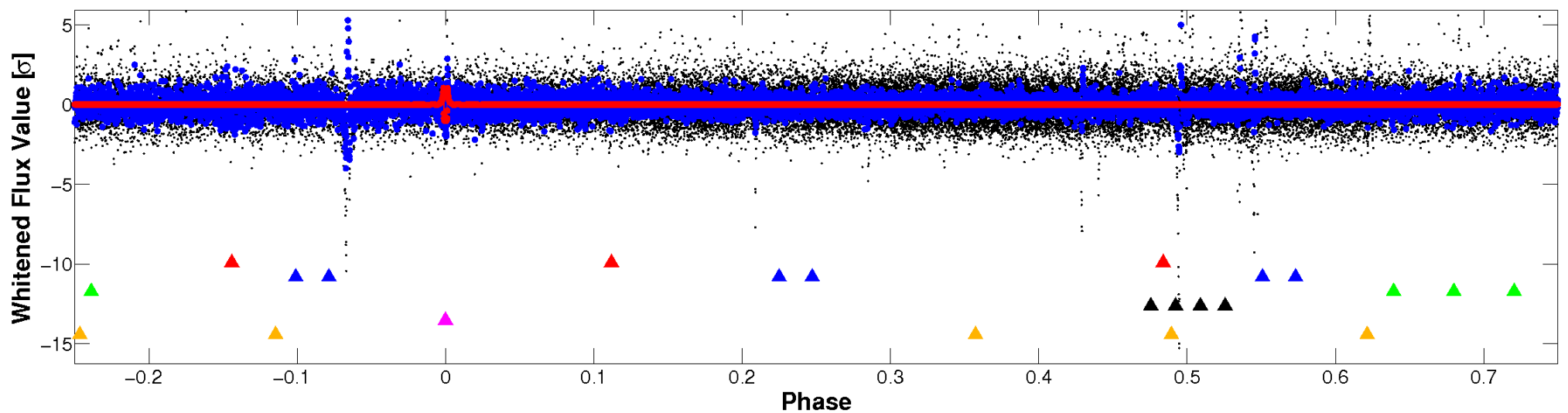


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

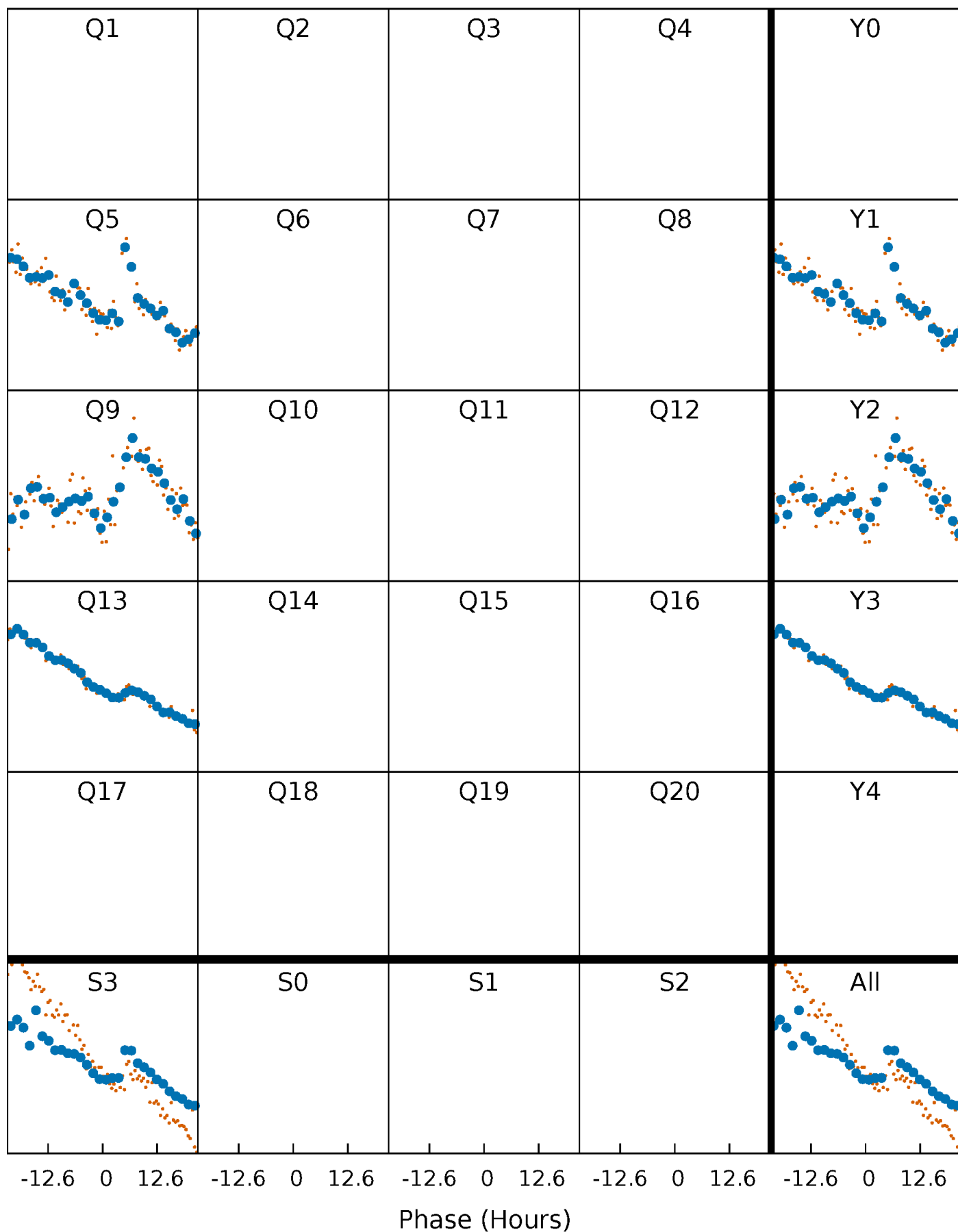


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



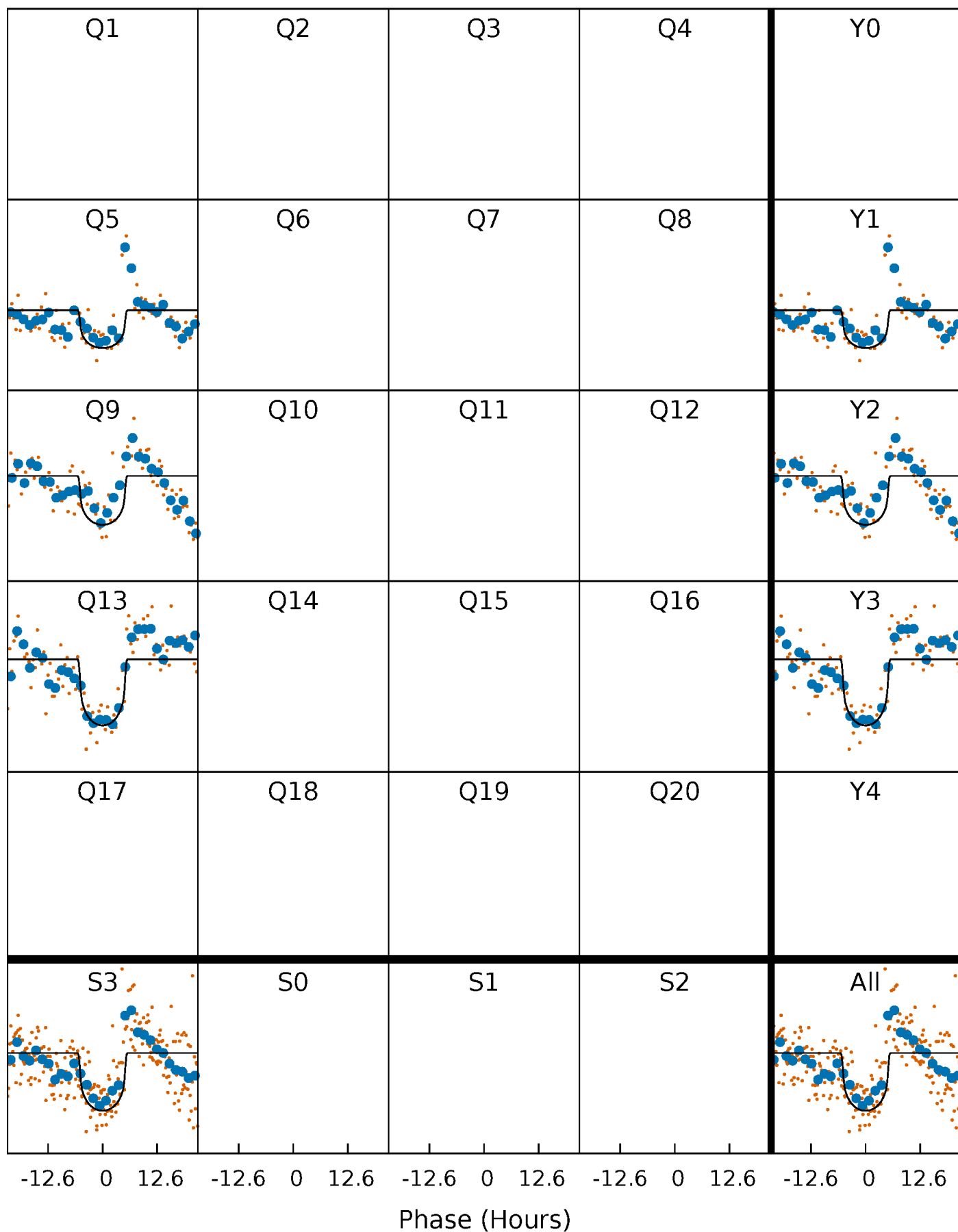
PDC Quarter-Phased Transit Curves

TCE 009603398-05 $P=182.118869$ Days $T_0=164.152503$ (BKJD)



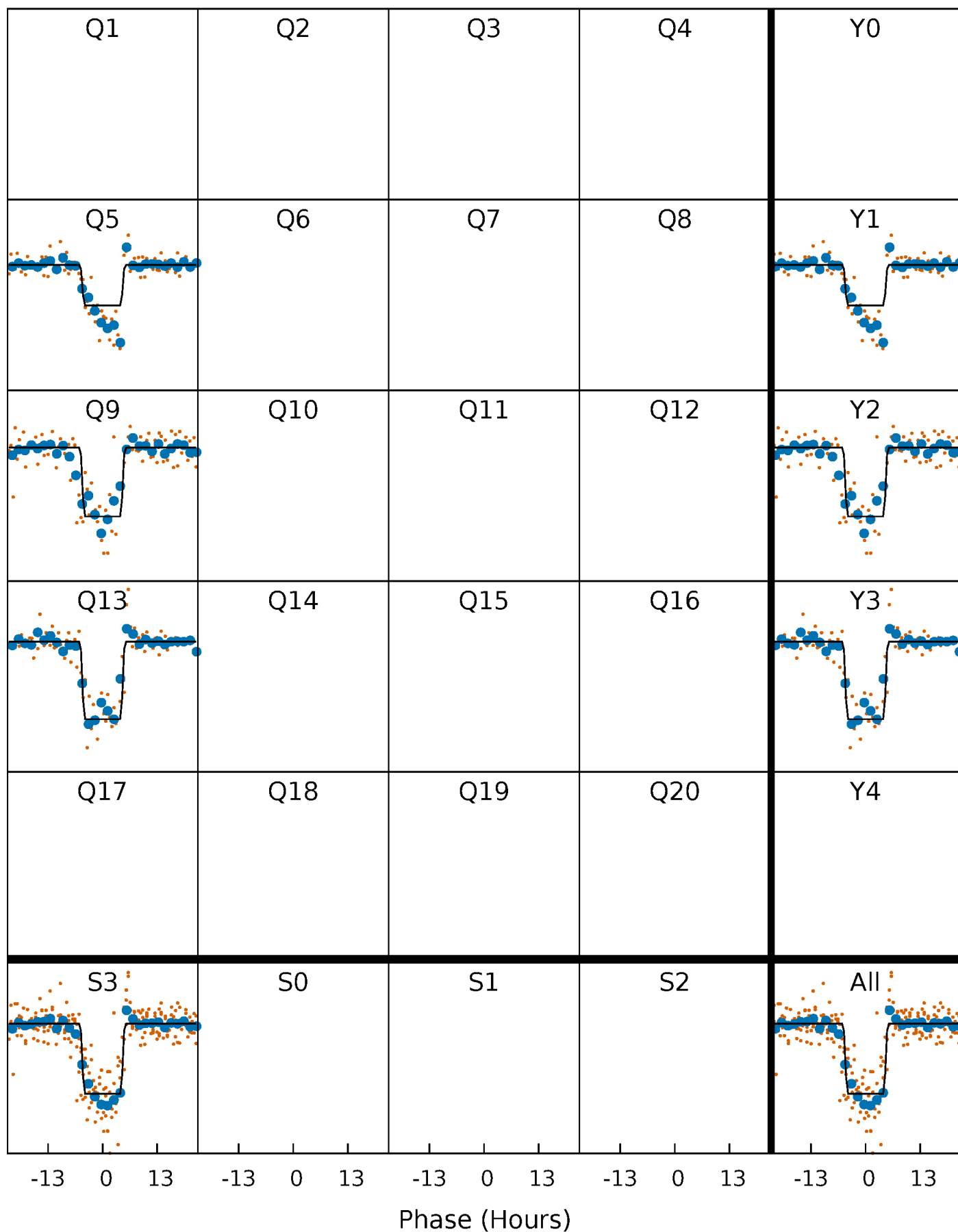
DV Quarter-Phased Transit Curves

TCE 009603398-05 $P=182.118869$ Days $T_0=164.152503$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

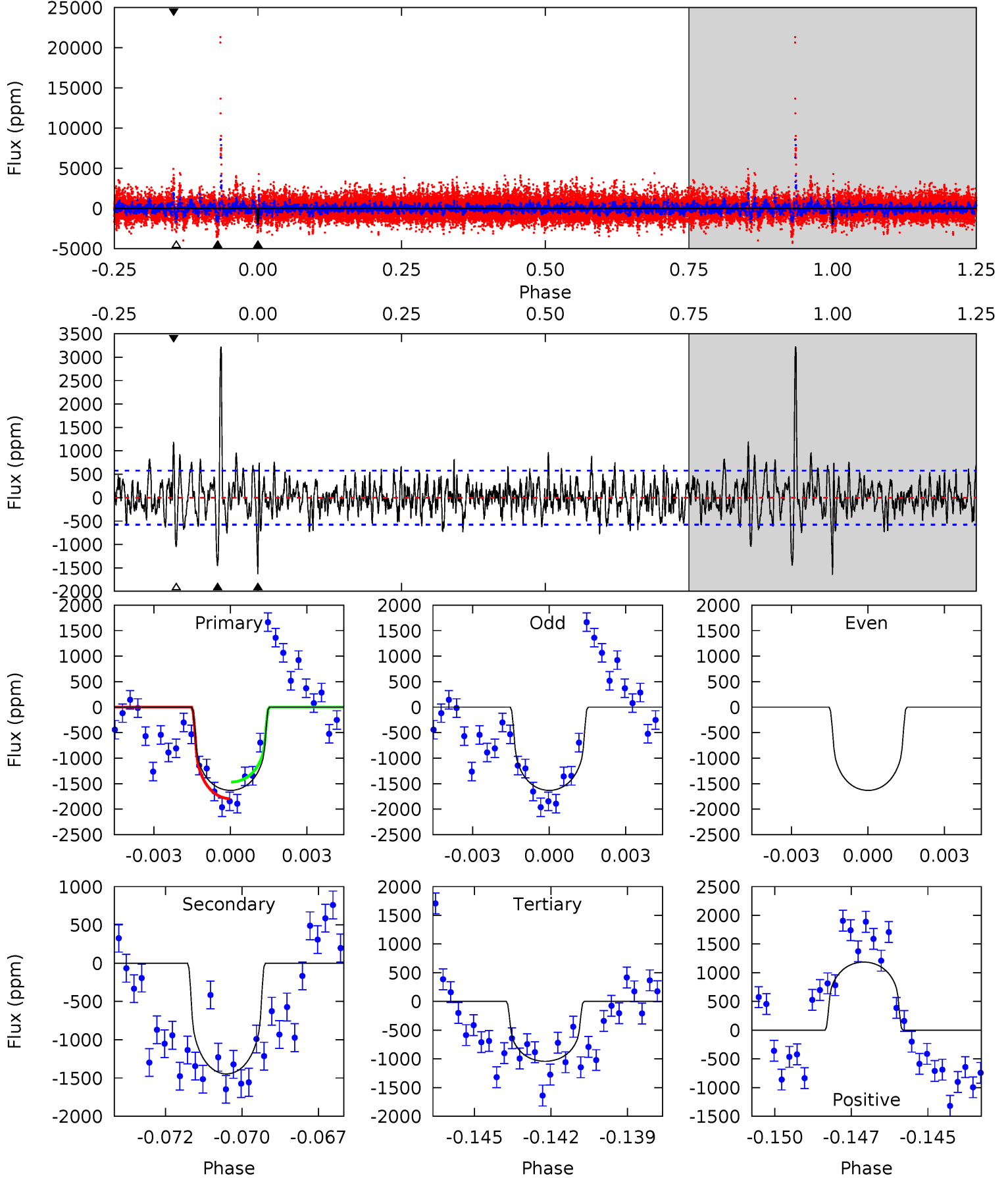
TCE 009603398-05 $P=182.124320$ Days $T_0=164.115274$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-05, P = 182.118869 Days, E = 164.152503 Days

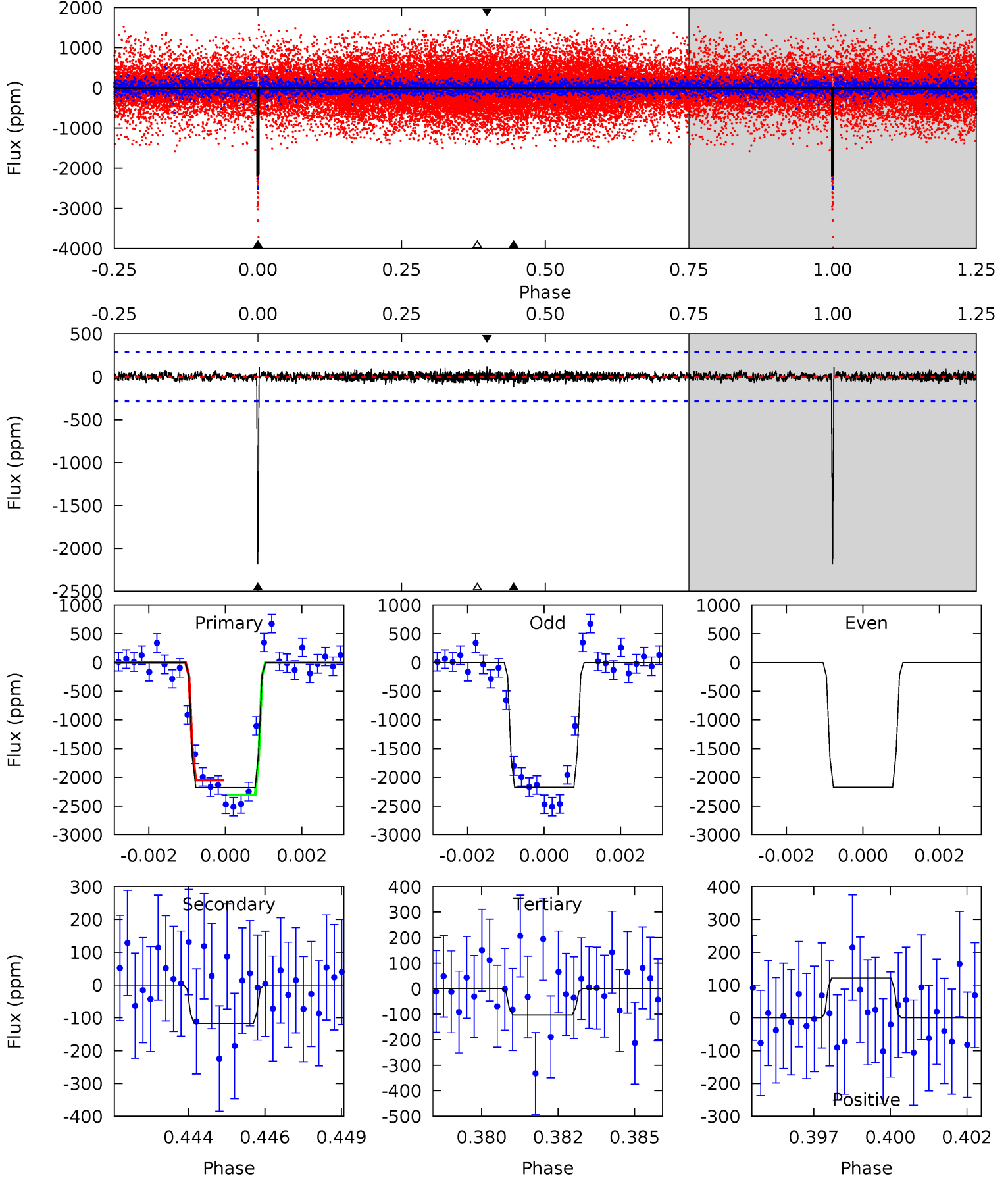
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	13.2	9.54	10.9	5.28	3.01	2.70	5.39	4.09	3.69	2.39	0	1.18	0.66	1.47



Alt Model-Shift Uniqueness Test

009603398-05, P = 182.124320 Days, E = 164.115274 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.6	2.17	1.92	2.26	5.29	3.03	0.47	38.7	38.4	0.25	-0.09	0	1.16	0.05	2.47



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1446 ± 109	$3.02^{+1.40}_{-1.49}$	332^{+13}_{-13}	4709^{+1716}_{-651}	26268^{+74430}_{-13978}
Alt.	-116 ± 54	$3.34^{+1.60}_{-1.54}$	333^{+13}_{-15}	2945^{+598}_{-360}	1511^{+4013}_{-924}

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

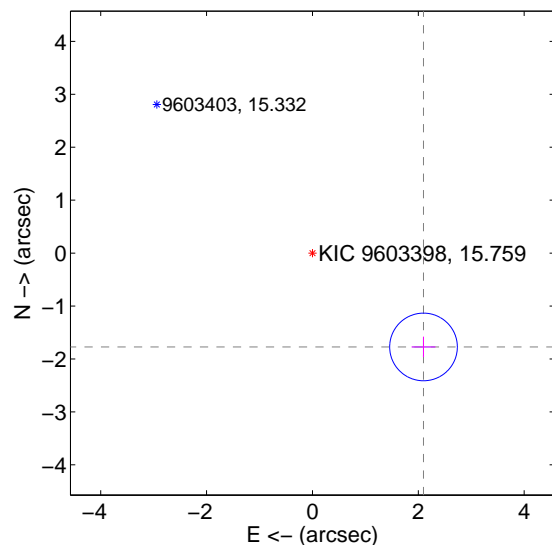
Supplemental centroid analysis for 009603398-05. Kepler magnitude: 15.76. Transit SNR 8.87

There are 1 quarters with good PRF difference image offsets

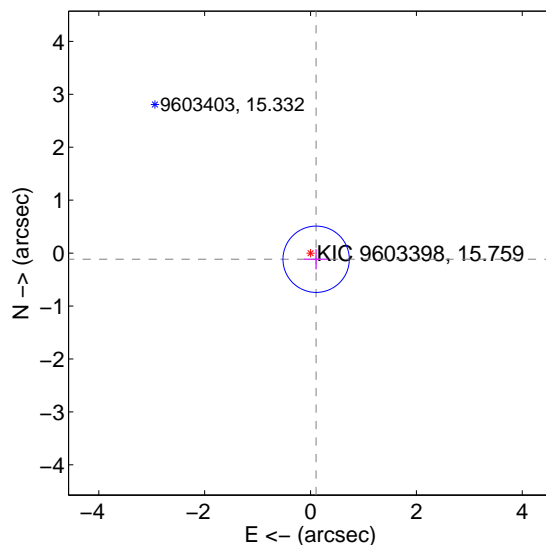
The OOT PRF centroid is offset from the target star catalog position by about 2.59 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.748 ± 0.213	12.90	-2.099 ± 0.226	-1.773 ± 0.194
PRF-fit source offset from KIC position	0.157 ± 0.209	0.75	-0.106 ± 0.226	-0.116 ± 0.194
photometric centroid source offset	1.75 ± 0.69	2.55	0.06 ± 0.89	1.75 ± 0.69

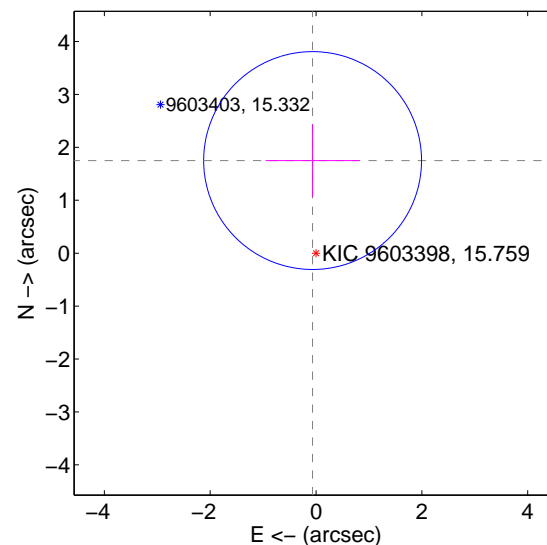
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

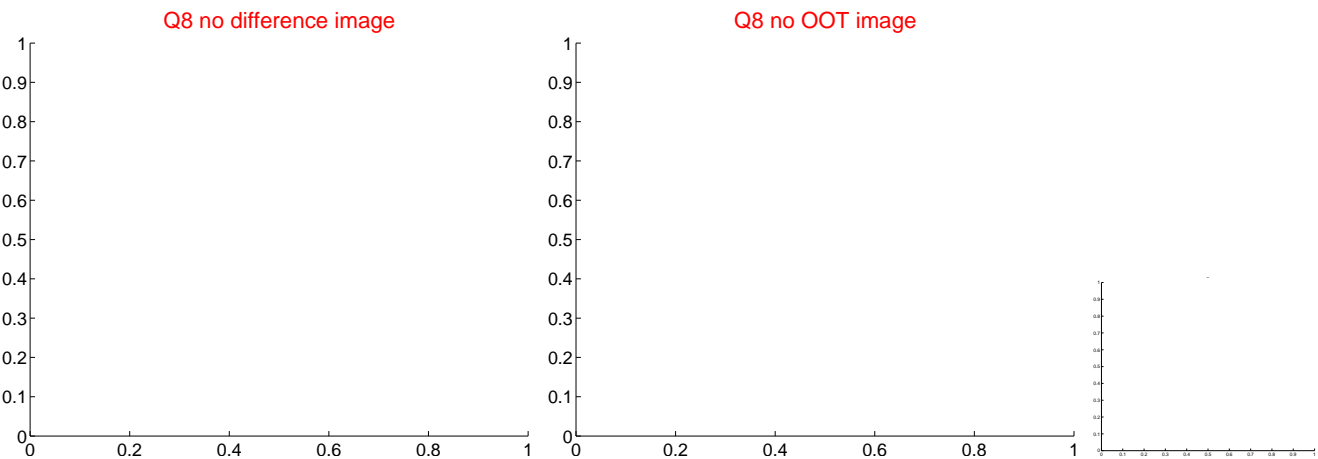
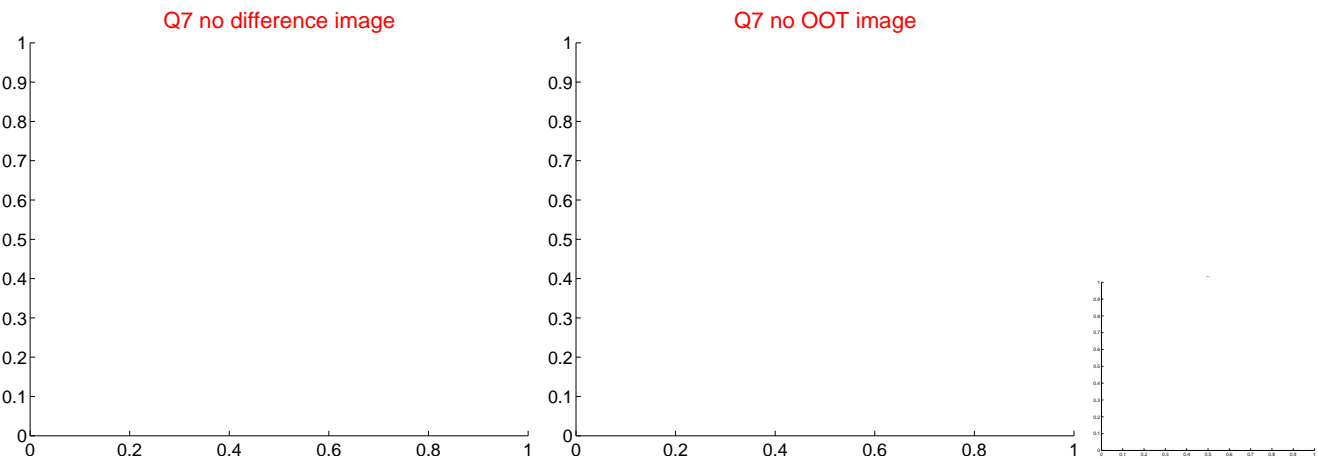
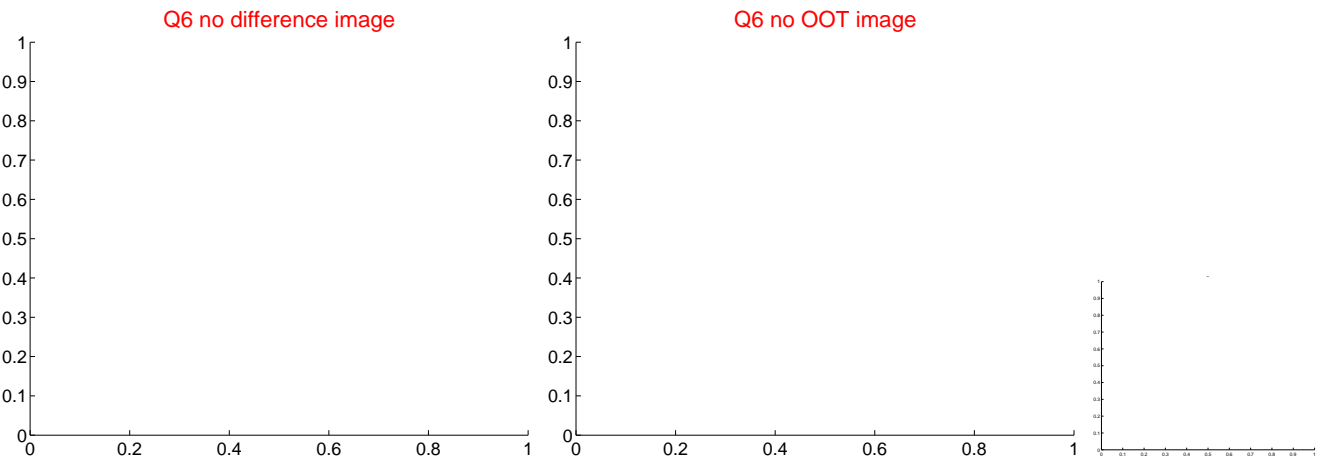
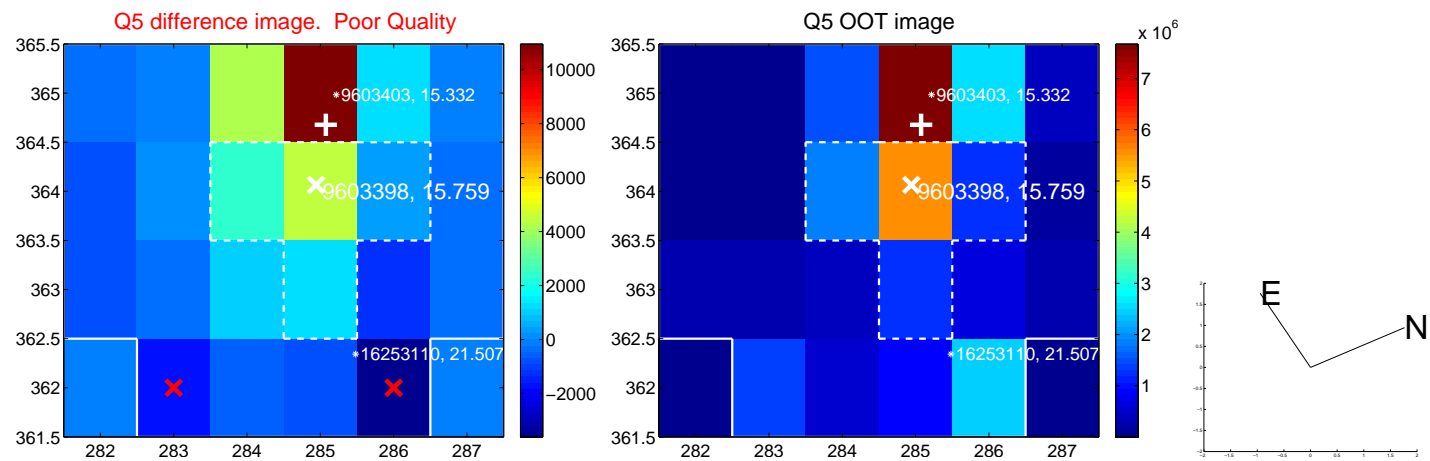


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

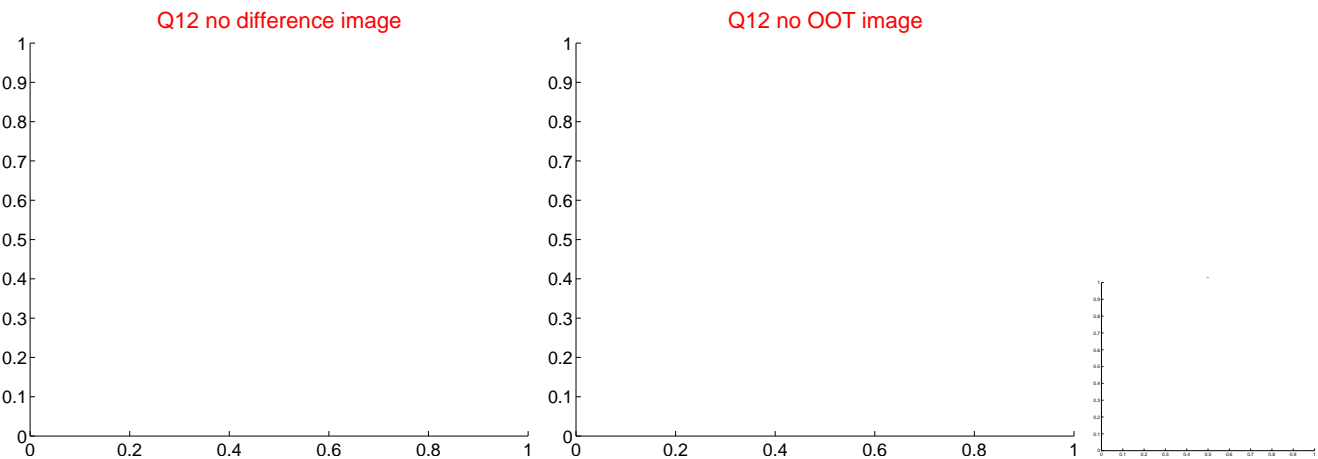
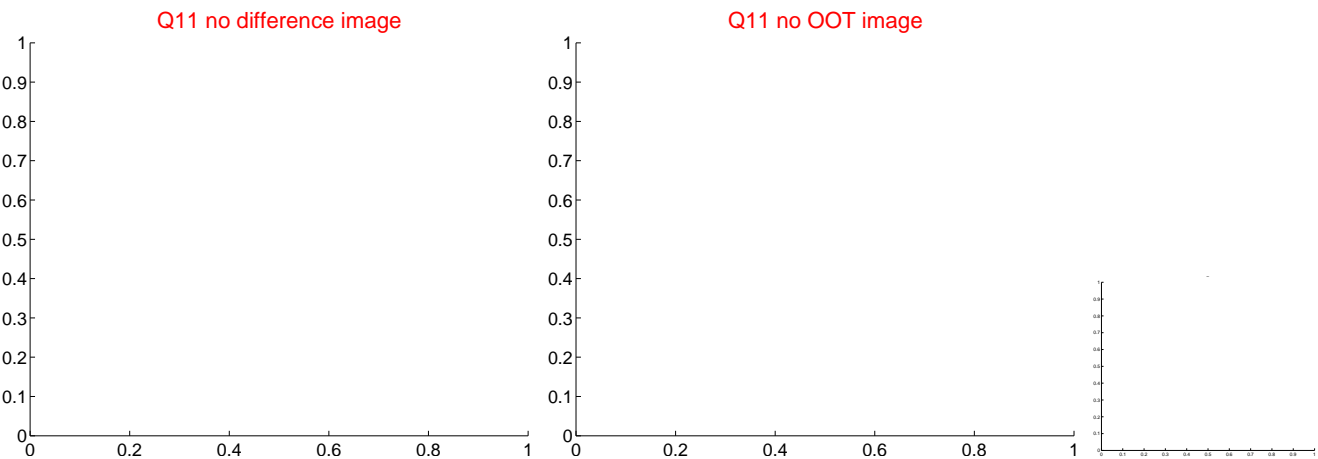
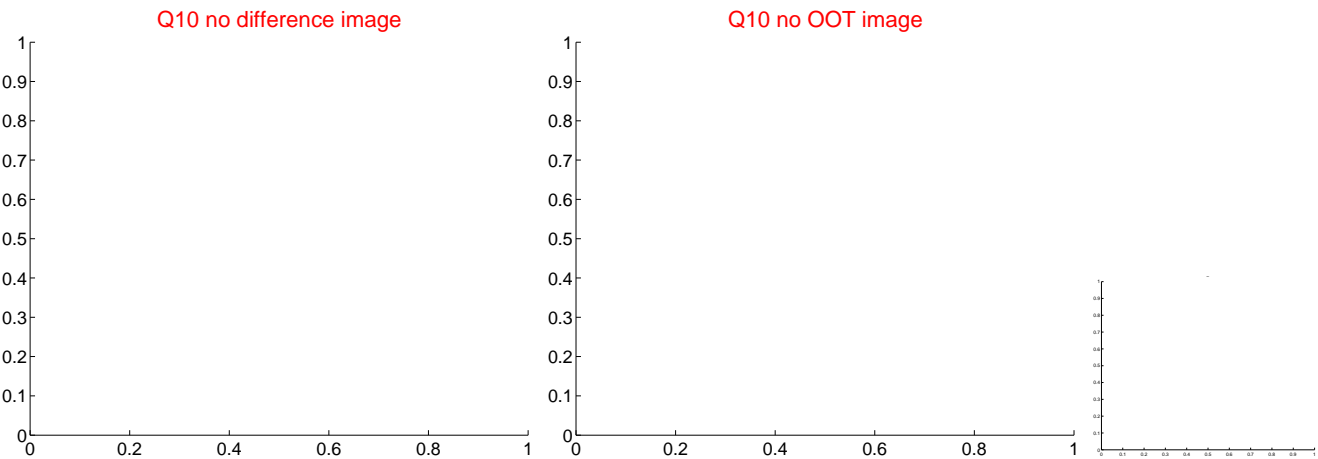
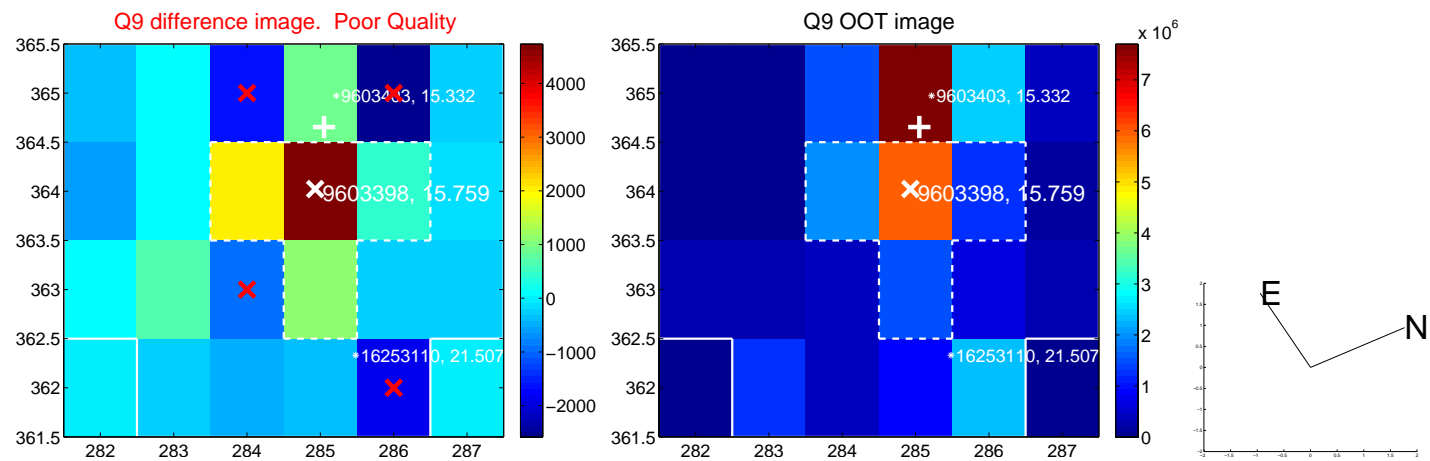
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



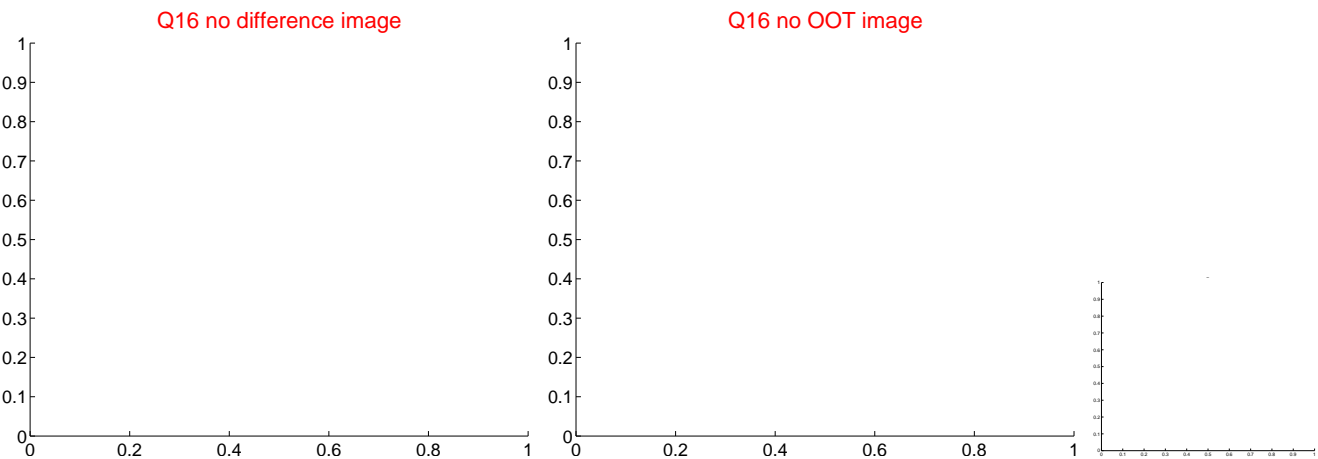
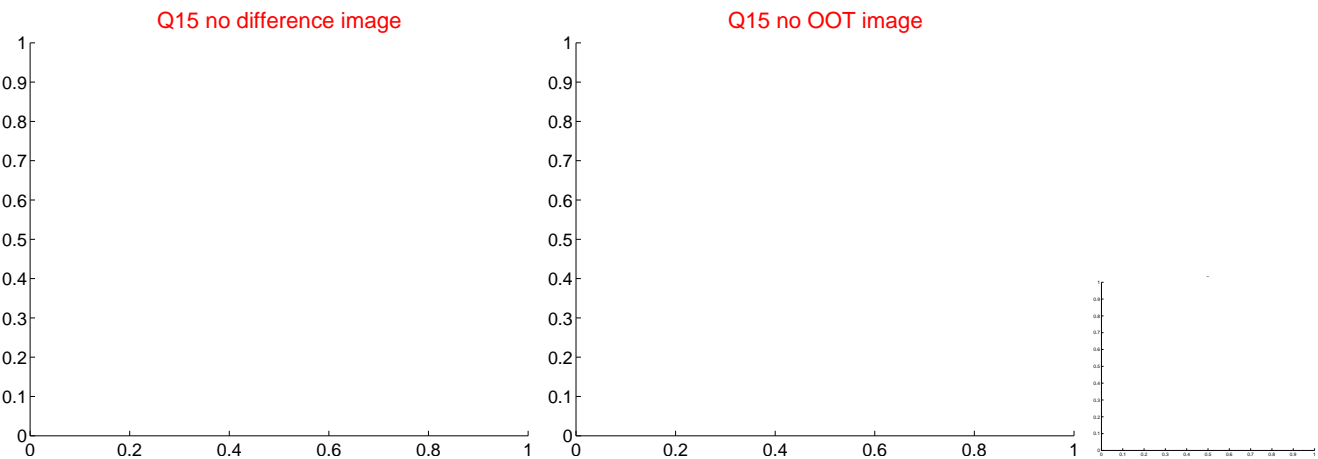
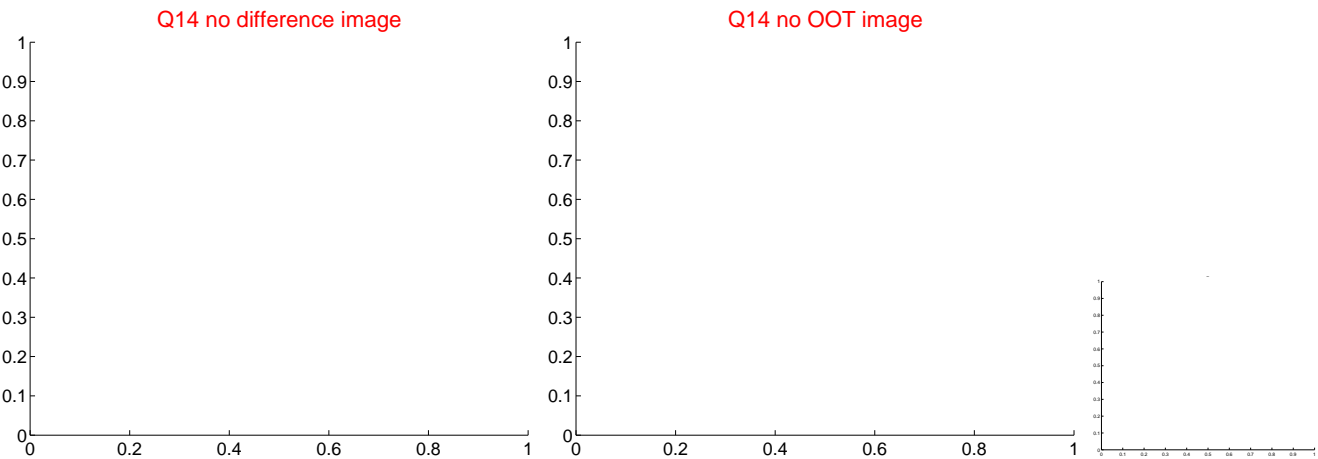
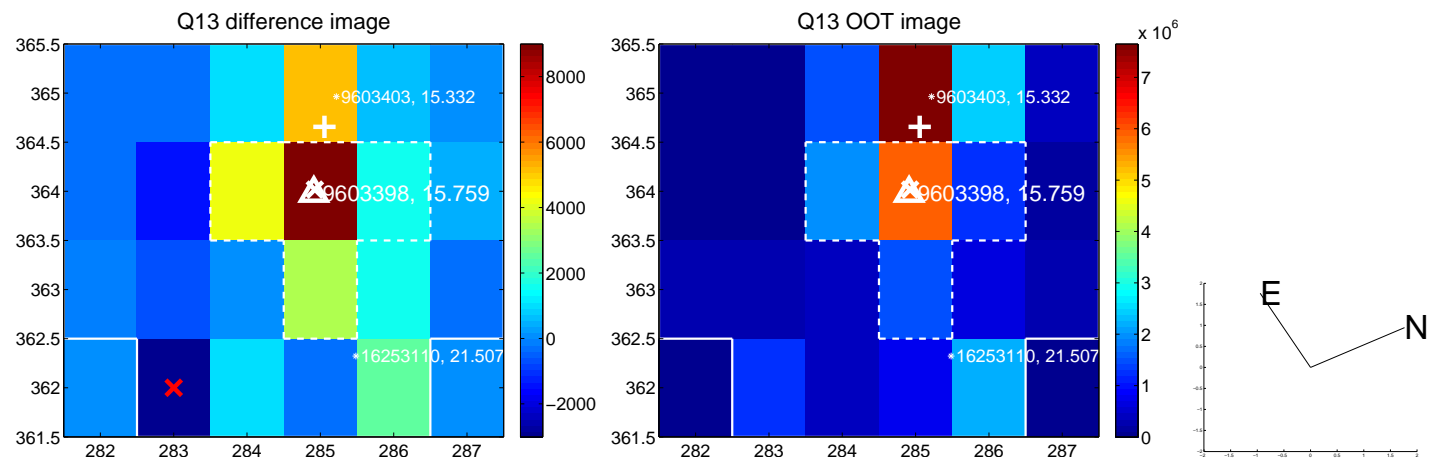
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



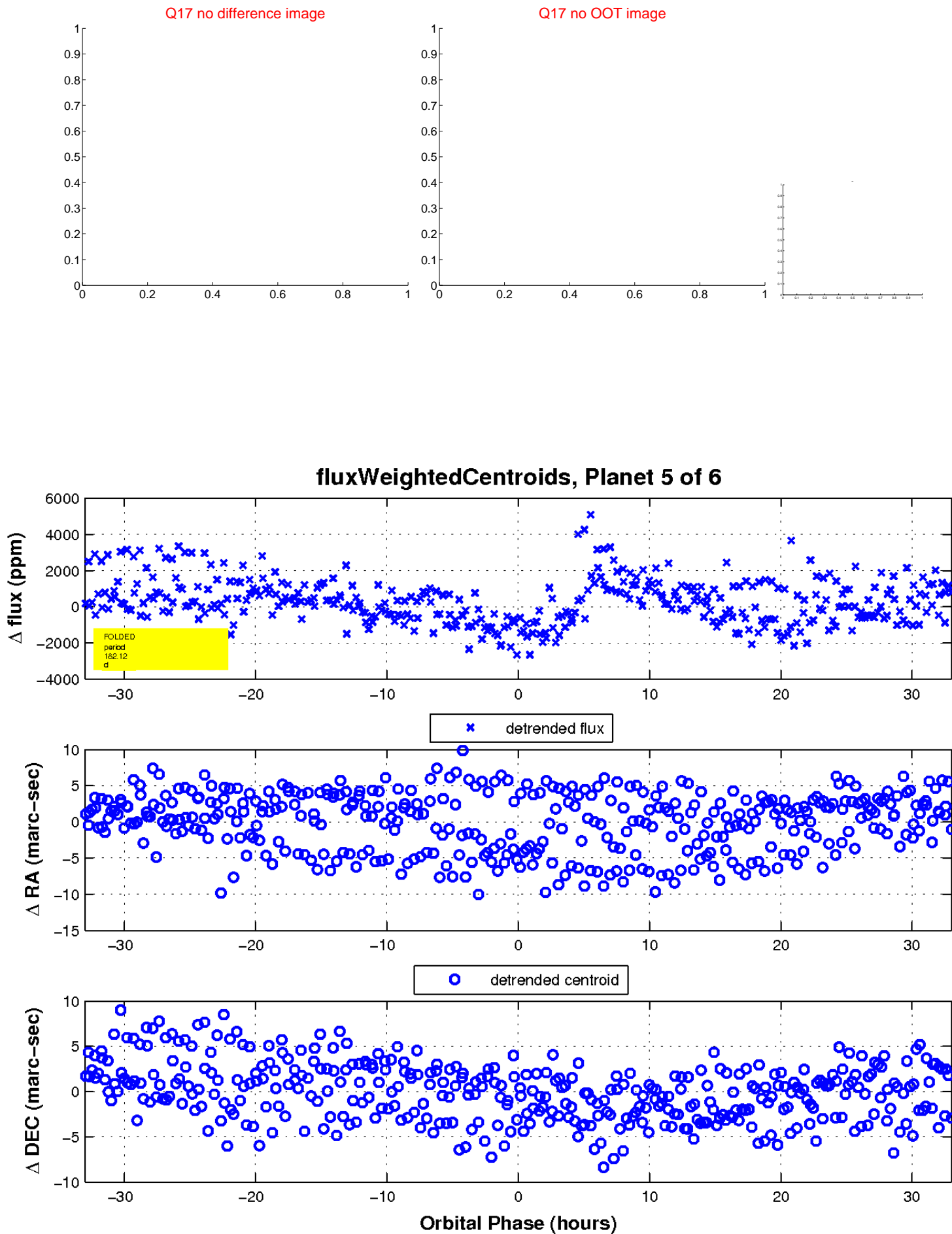
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

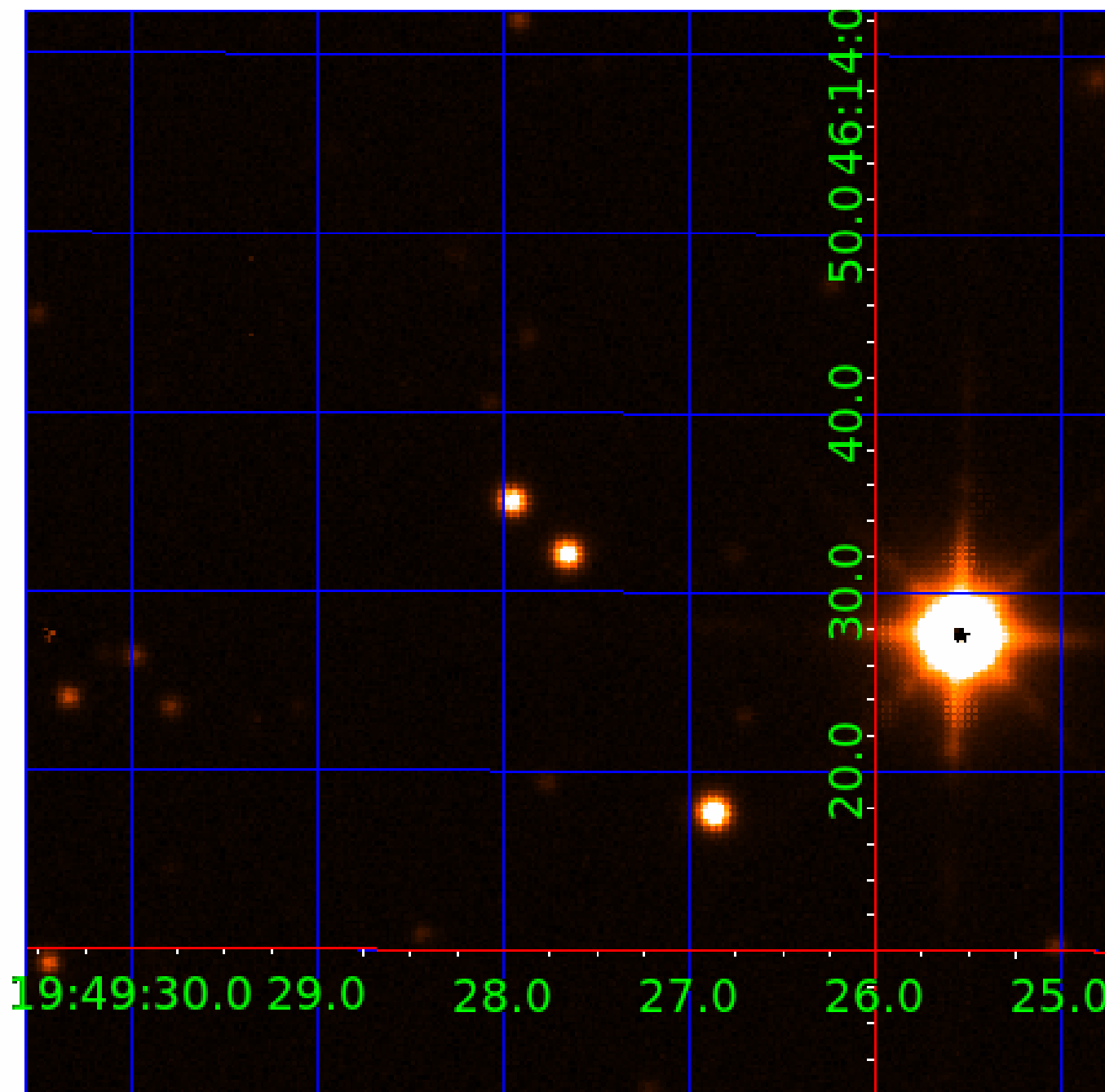


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009603398

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})
009603398-01	OBS	No	431.986759	366.650758	2649.0	13.552	17.0	10.2	0.66	4907	4.03	0.24
009603398-02	OBS	No	241.469663	149.835622	1346.1	5.556	13.6	5.9	0.66	4907	2.48	0.53
009603398-03	OBS	No	371.638778	462.691323	2032.9	7.500	12.0	-1.0	0.66	4907	2.90	0.30
009603398-04	OBS	No	367.277178	432.882791	1953.7	13.504	9.3	8.5	0.66	4907	3.43	0.30
009603398-05	OBS	No	182.118869	164.152503	2184.8	11.006	9.3	8.9	0.66	4907	3.02	0.77
009603398-06	OBS	No	340.193438	143.296262	1813.0	9.367	9.3	7.1	0.66	4907	3.55	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009603398-01	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_FEW_DIFFS
009603398-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009603398-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
009603398-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
009603398-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS—HALO_GHOST
009603398-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

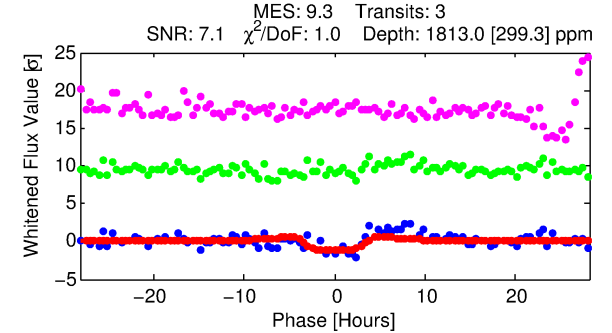
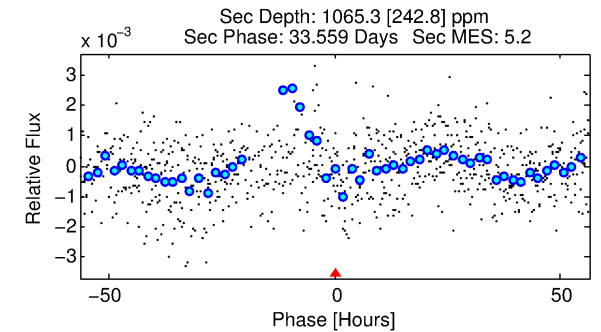
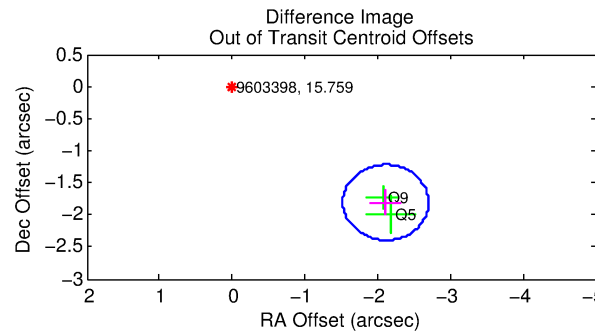
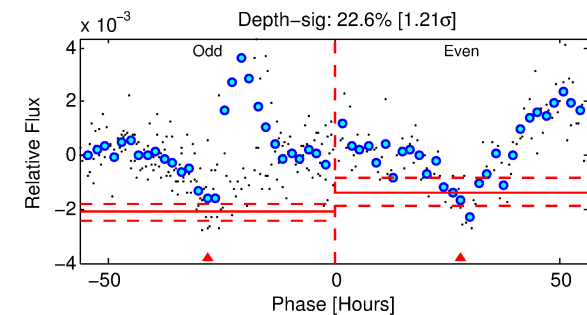
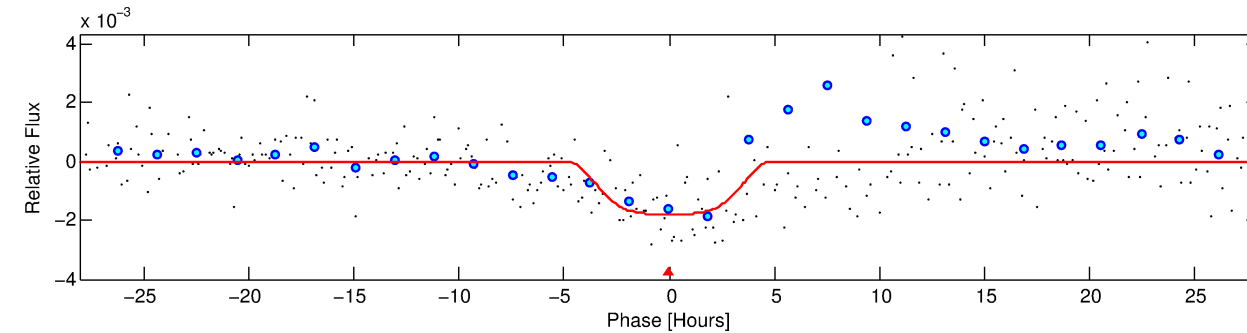
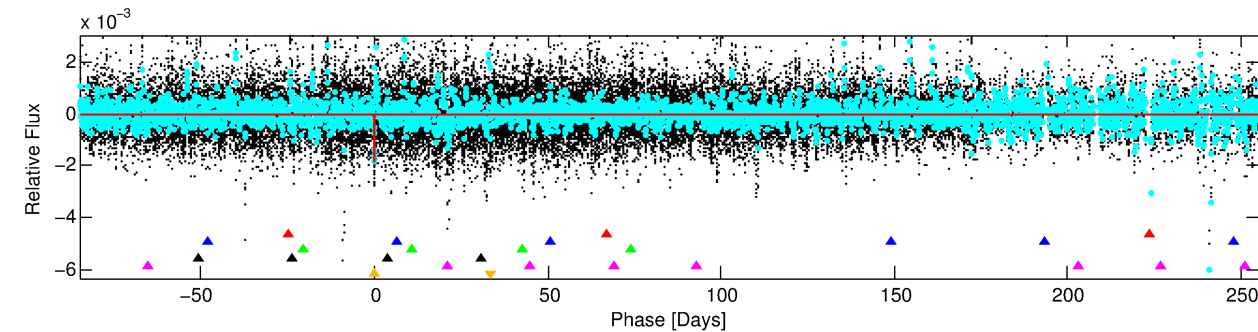
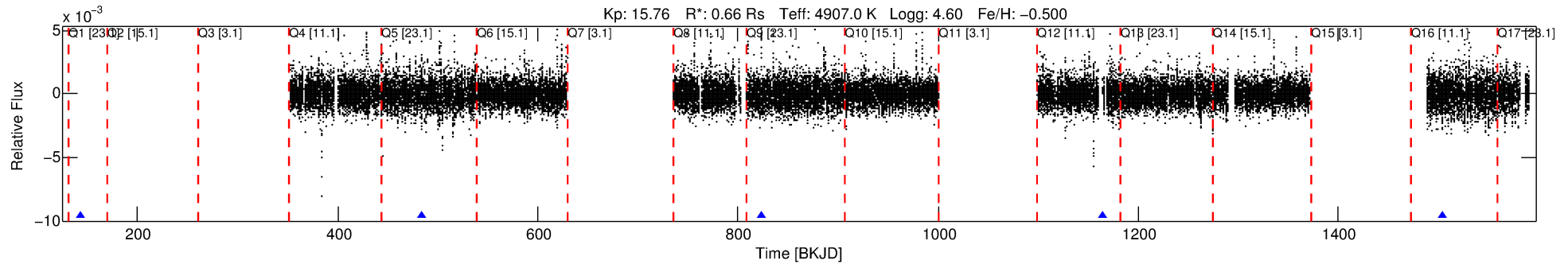
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009603398-06

No Significant Match Found

DV One-Page Summary

KIC: 9603398 Candidate: 6 of 6 Period: 340.193 d



DV Fit Results:

Period = 340.19344 [0.00913] d
Epoch = 143.2963 [0.0253] BKJD
Rp/R* = 0.0491 [0.0059]
a/R* = 137.62 [34.64]
b = 0.92 [0.04]
Seff = 0.34 [0.06]
Teq = 194 [9] K
Rp = 3.55 [0.55] Re
a = 0.8239 [0.0697] AU
Ag = 31525.33 [11193.06] [2.82 σ]
Teffp = 4001 [360] K [10.57 σ]

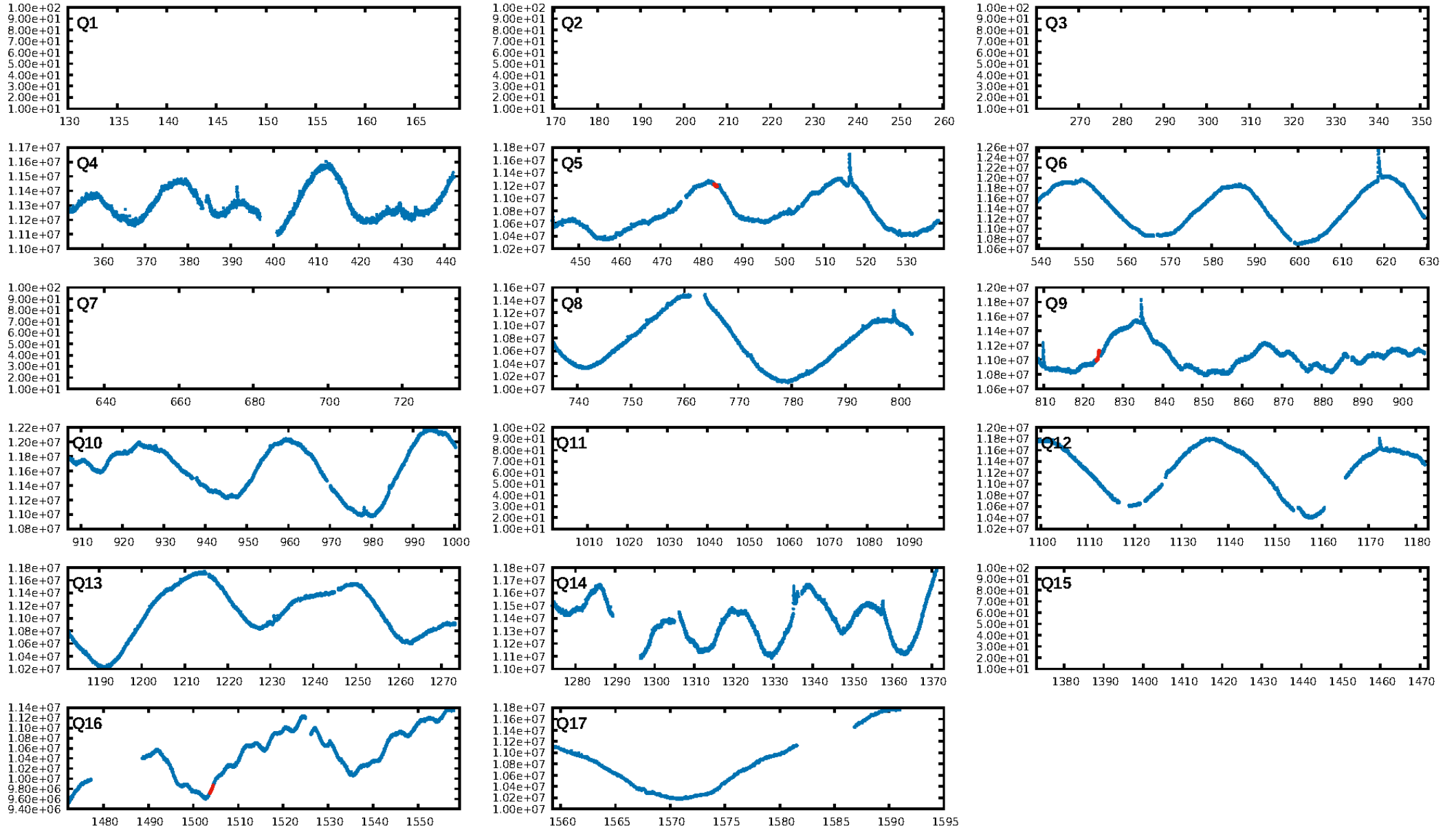
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [217.55 σ]
LongPeriod-sig: 100.0% [39.55 σ]
ModelChiSquare2-sig: 7.2%
ModelChiSquareGof-sig: 97.1%
Bootstrap-pfa: 2.58e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -15.43
Centroid-sig: N/A
Centroid-so: 2.178 arcsec [2.13 σ]
OotOffset-rm: 2.776 arcsec [14.16 σ]
KicOffset-rm: 0.151 arcsec [0.76 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

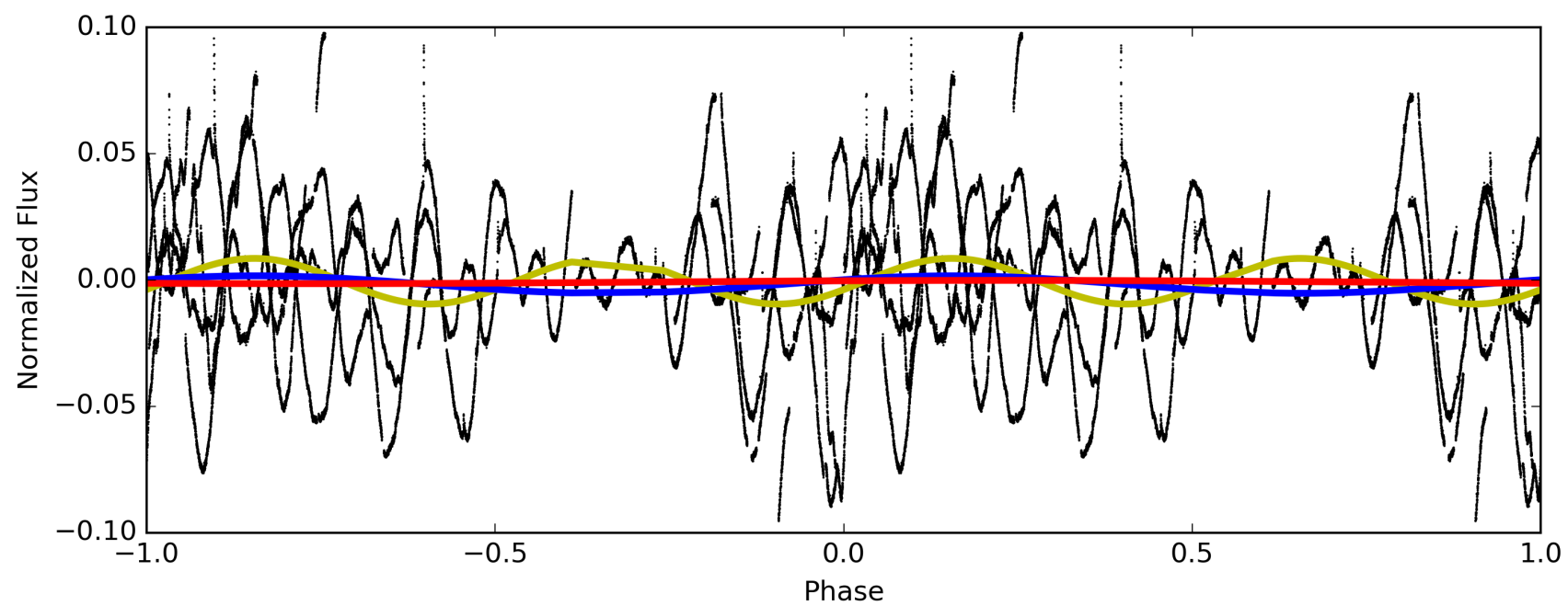
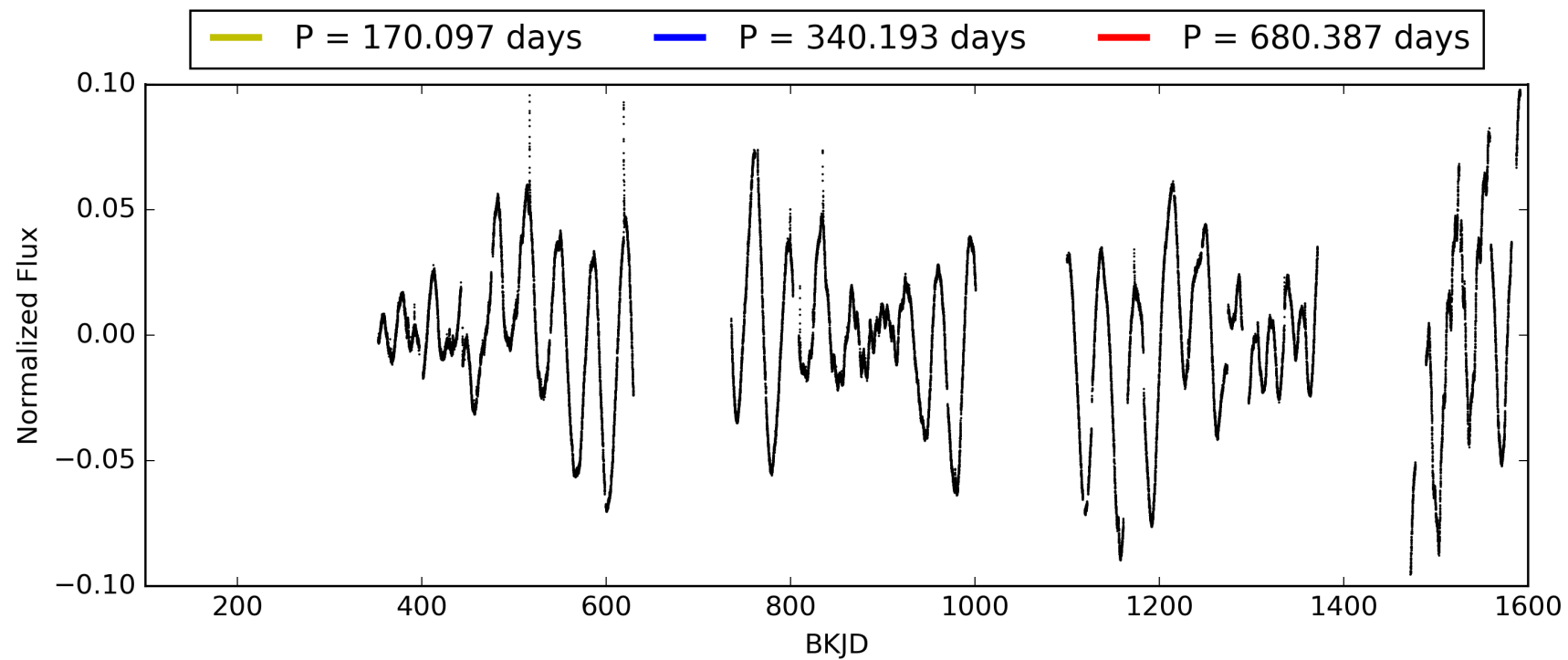
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:57:30 Z

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

TCE 009603398-06, PDC Light Curves

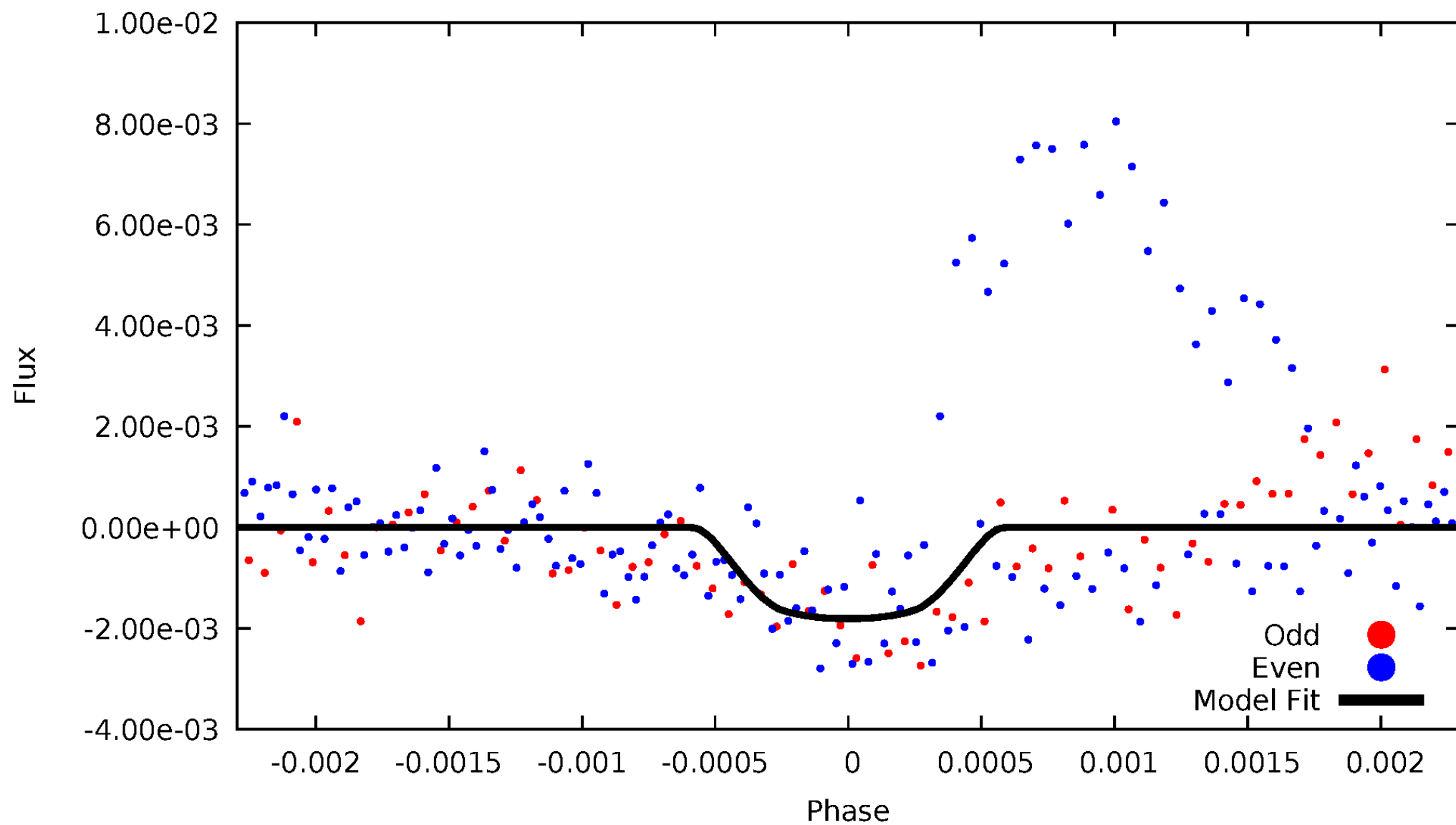


TCE 009603398-06



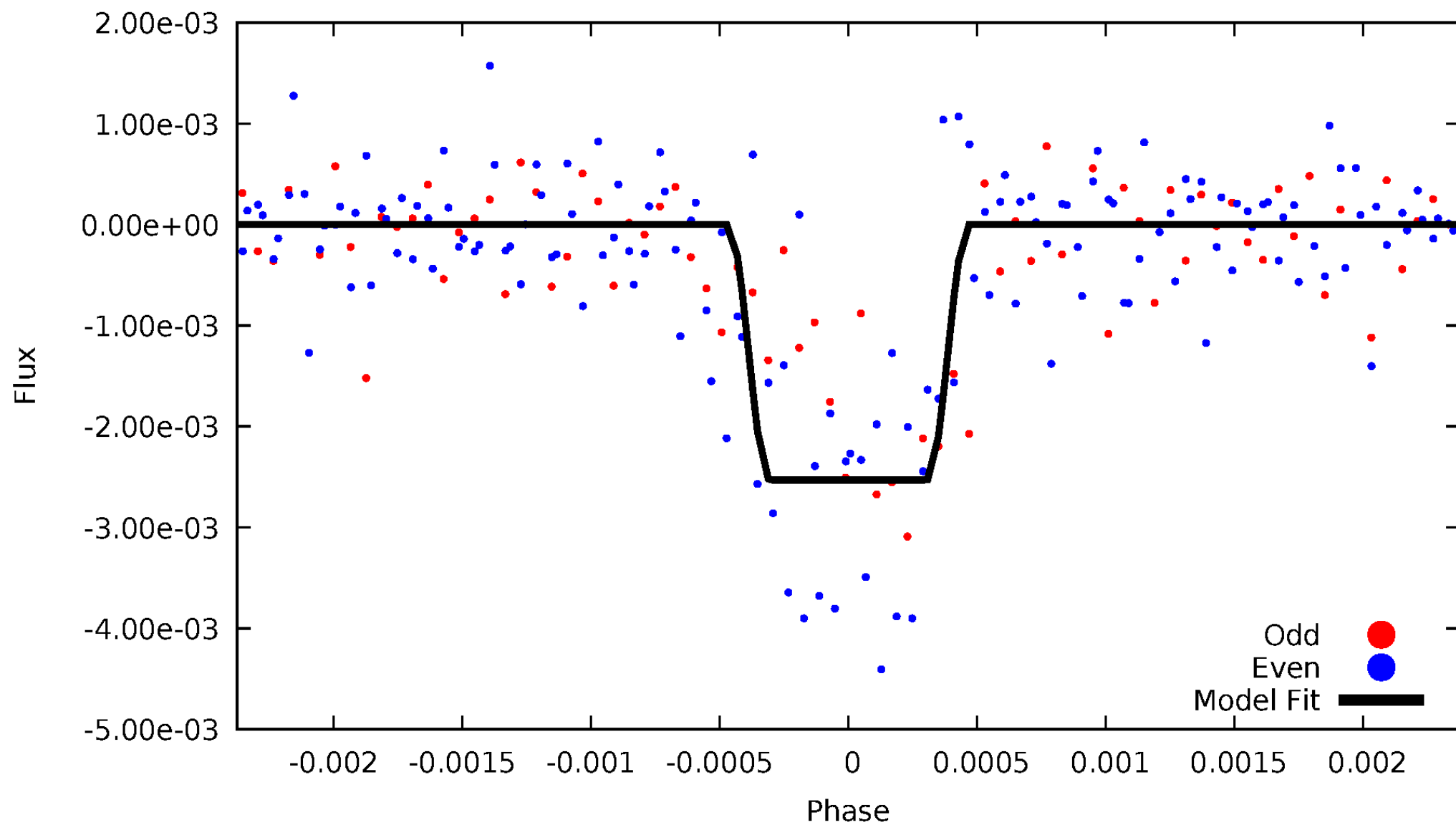
DV Odd/Even

TCE 009603398-06



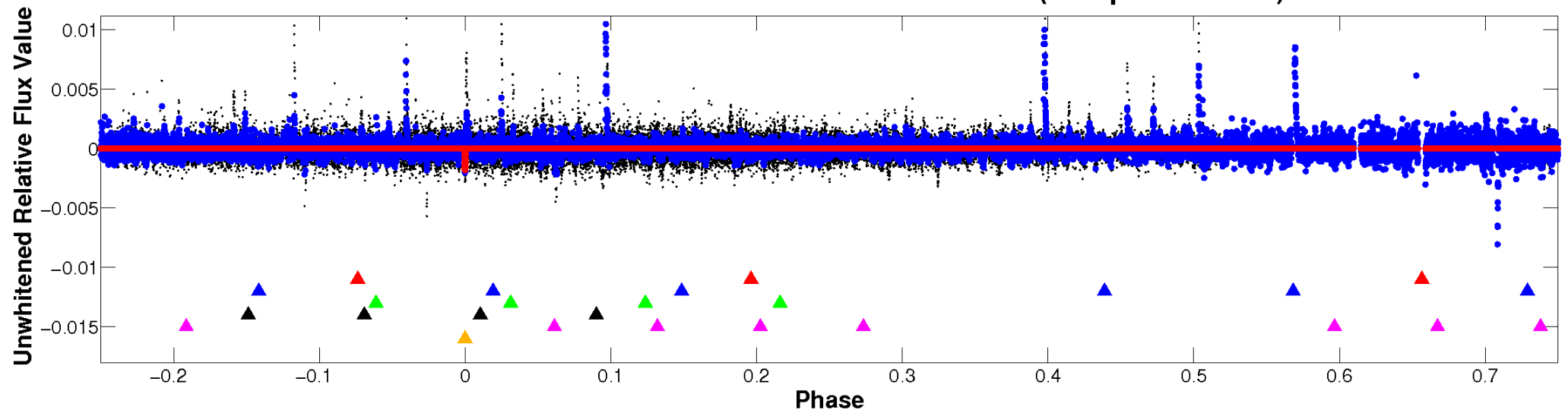
ALT Odd/Even

TCE 009603398-06

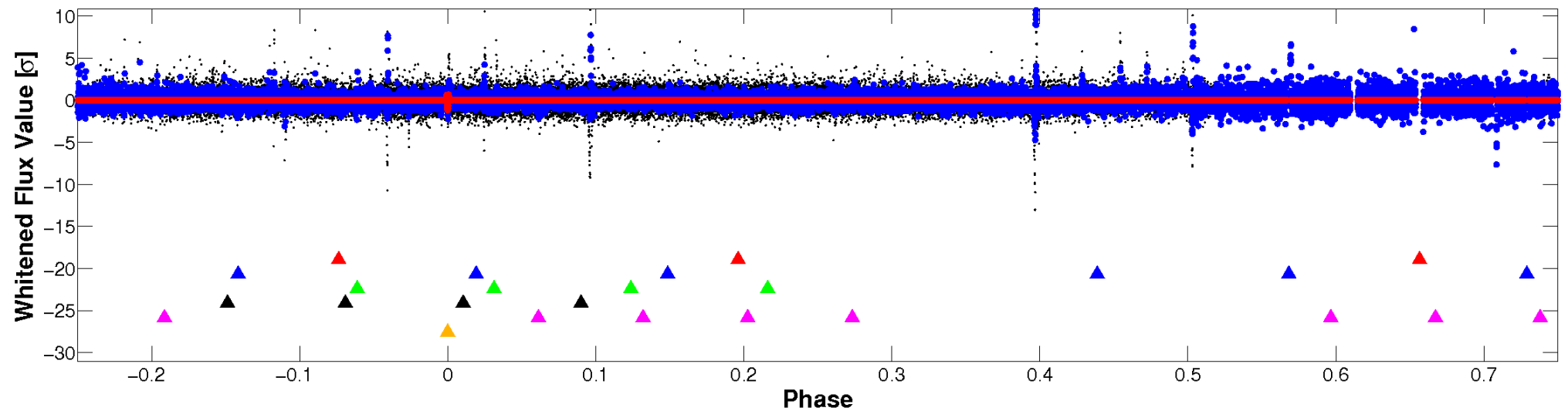


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

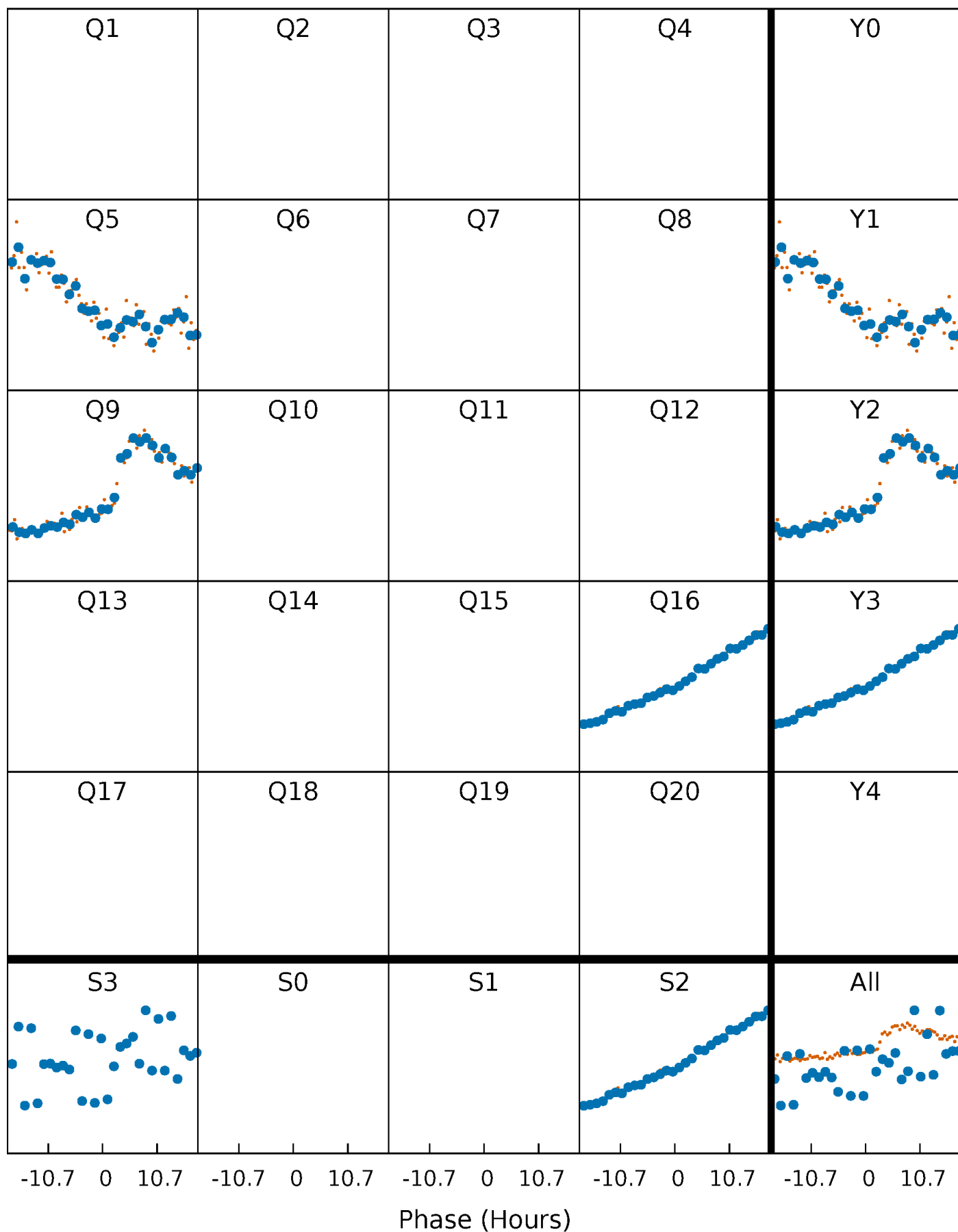


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



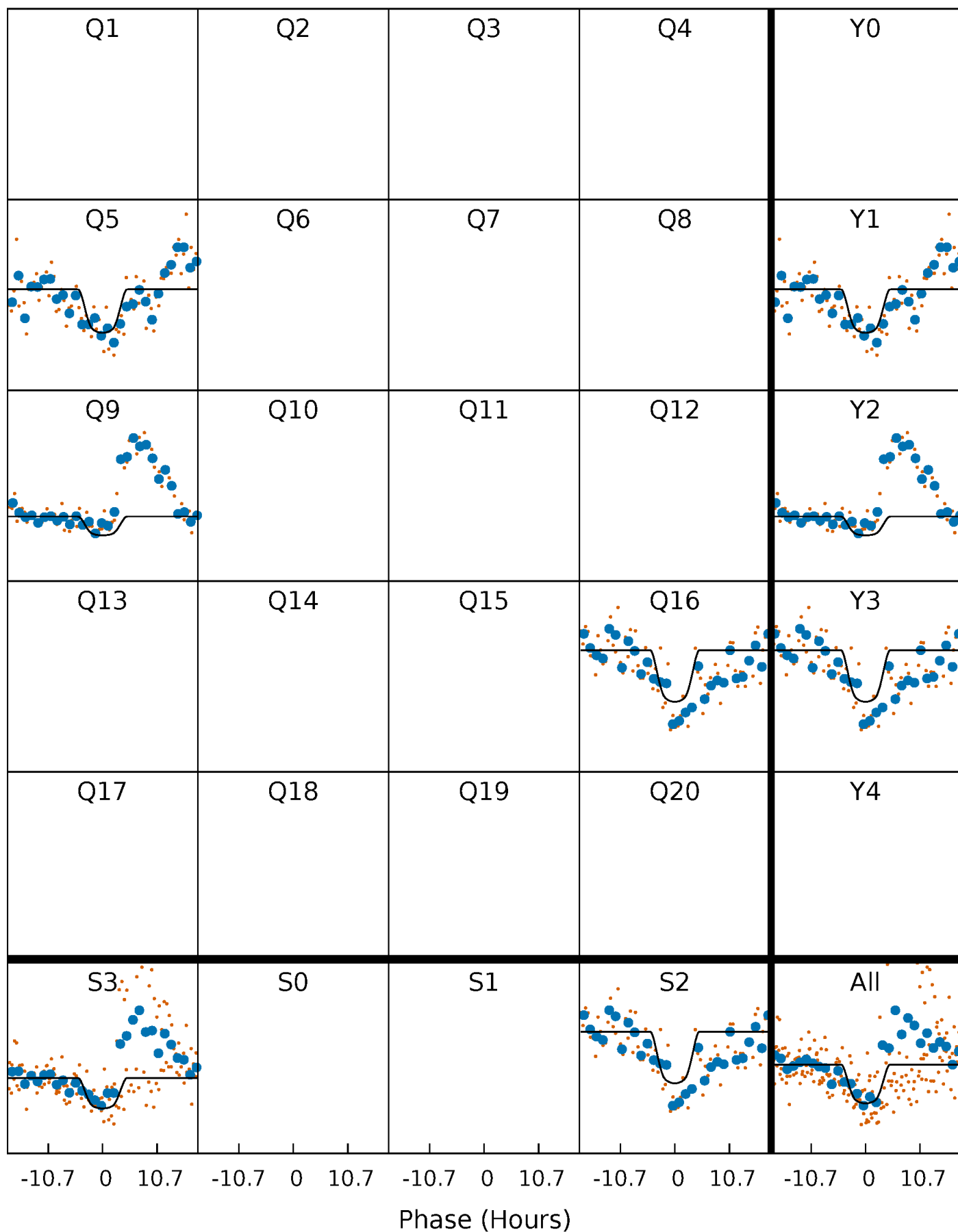
PDC Quarter-Phased Transit Curves

TCE 009603398-06 $P=340.193438$ Days $T_0=143.296262$ (BKJD)



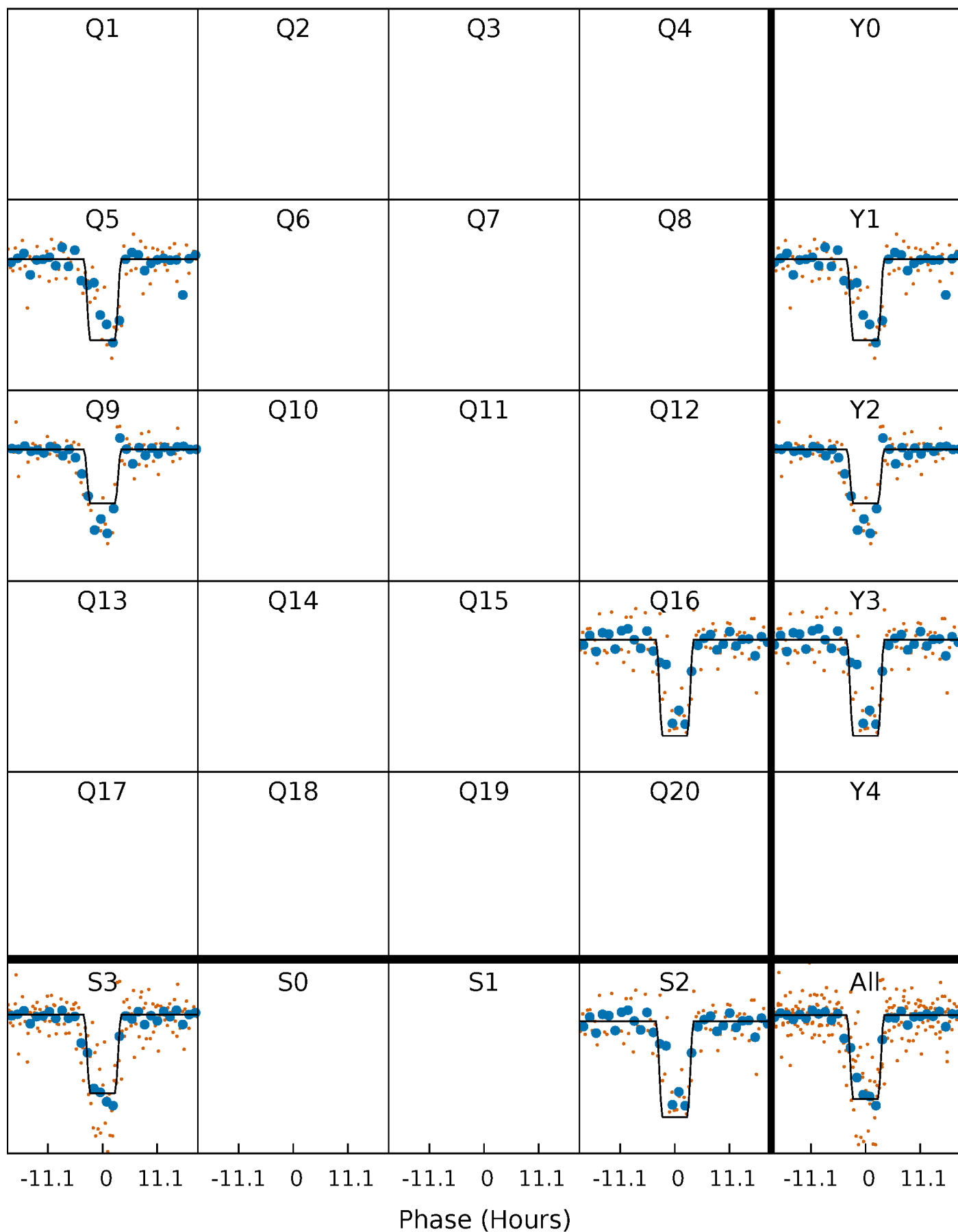
DV Quarter-Phased Transit Curves

TCE 009603398-06 $P=340.193438$ Days $T_0=143.296262$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

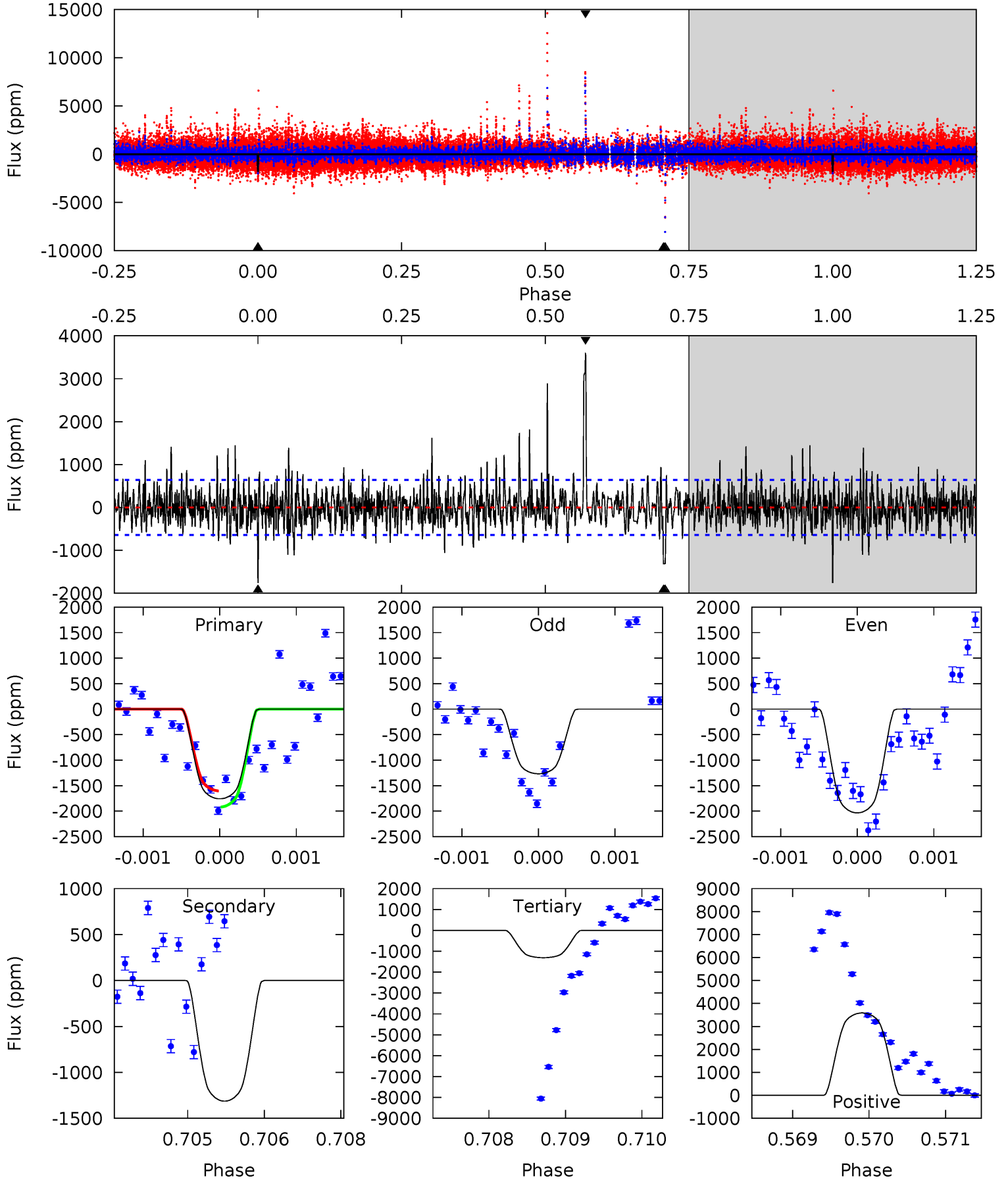
TCE 009603398-06 $P=340.191529$ Days $T_0=143.312458$ (BKJD)



DV Model-Shift Uniqueness Test

009603398-06, P = 340.193438 Days, E = 143.296262 Days

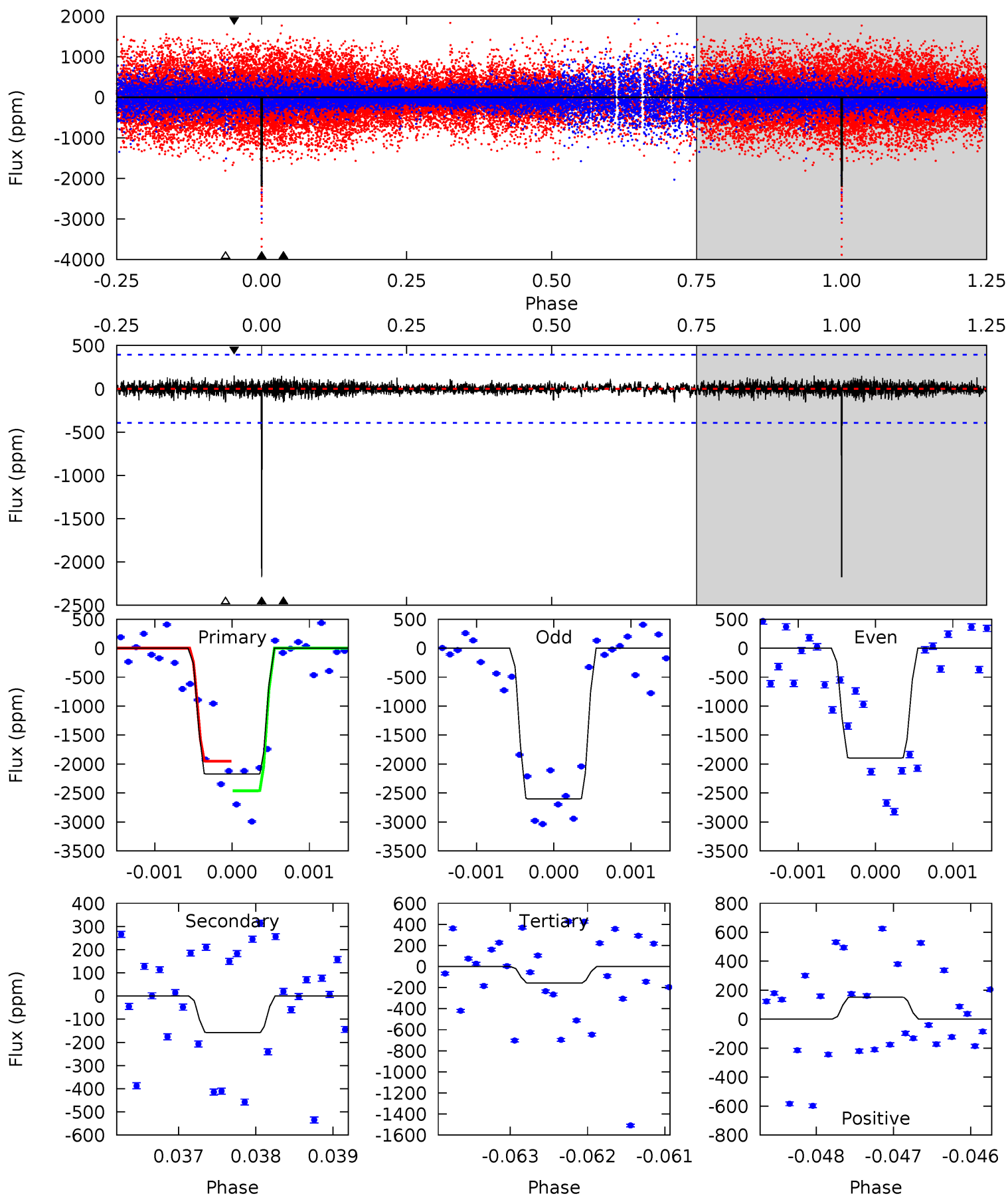
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	11.1	11.1	30.4	5.42	3.24	3.03	3.79	-15.5	0.03	-19.2	2.56	0.75	0.67	1.34



Alt Model-Shift Uniqueness Test

009603398-06, P = 340.191529 Days, E = 143.312458 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.3	2.19	2.18	2.11	5.48	3.33	0.47	28.1	28.2	0.01	0.09	5.00	1.24	0.07	3.57



Stellar Parameters For KIC 009603398

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4907^{+170}_{-170}	$4.604^{+0.070}_{-0.040}$	$-0.500^{+0.300}_{-0.300}$	$0.663^{+0.058}_{-0.065}$	$0.645^{+0.084}_{-0.042}$	$3.109^{+0.869}_{-0.470}$
	+3%/-3%	+2%/-1%	+60%/-60%	+9%/-10%	+13%/-7%	+28%/-15%
Source	KIC0	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 009603398-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1313 ± 118	$3.52^{+0.47}_{-0.44}$	270^{+10}_{-12}	4368^{+284}_{-271}	39810^{+13743}_{-9003}
Alt.	-157 ± 72	$3.63^{+0.48}_{-0.48}$	270^{+11}_{-12}	3053^{+237}_{-271}	4570^{+2811}_{-2263}

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

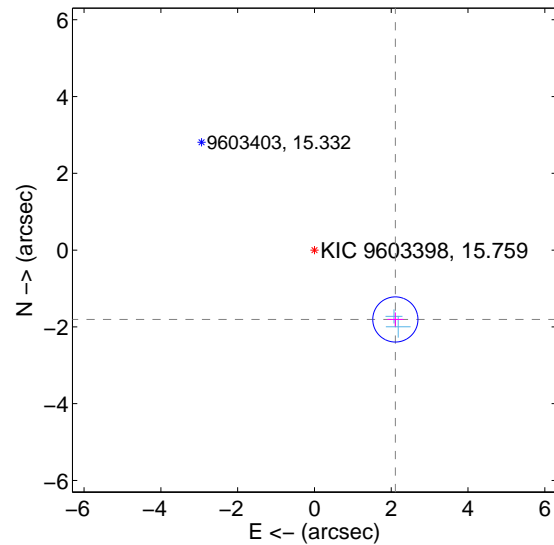
Supplemental centroid analysis for 009603398-06. Kepler magnitude: 15.76. Transit SNR 7.13

There are 2 quarters with good PRF difference image offsets

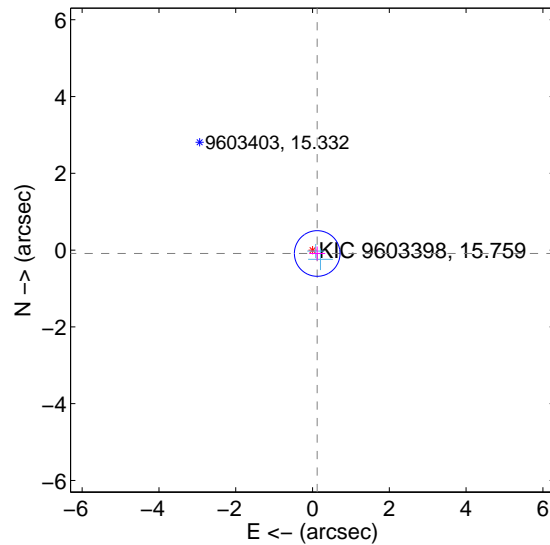
The OOT PRF centroid is offset from the target star catalog position by about 2.62 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.776 \pm 0.196	14.16	-2.107 \pm 0.206	-1.807 \pm 0.181
PRF-fit source offset from KIC position	0.151 \pm 0.198	0.76	-0.122 \pm 0.206	-0.088 \pm 0.181
photometric centroid source offset	2.18 \pm 1.02	2.13	-1.71 \pm 1.12	1.35 \pm 0.86

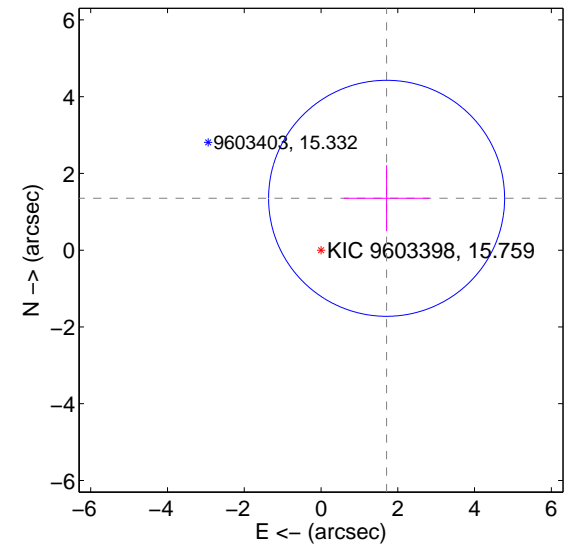
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

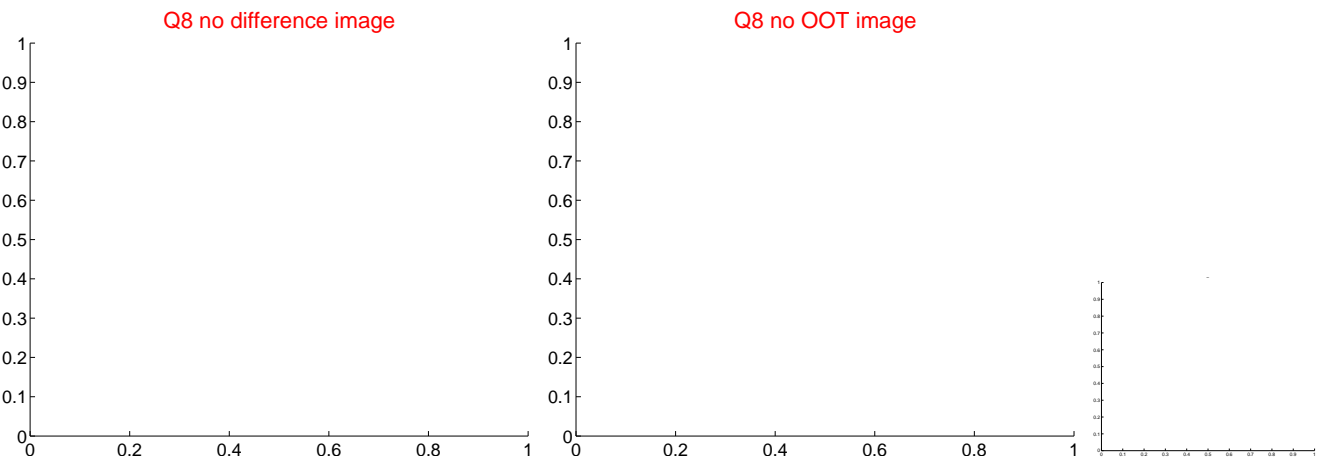
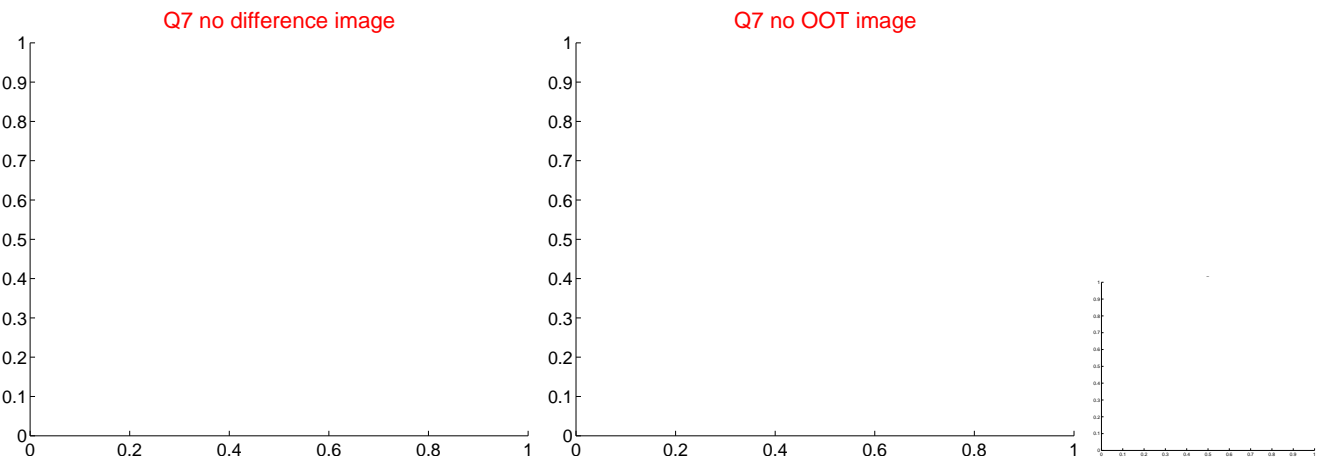
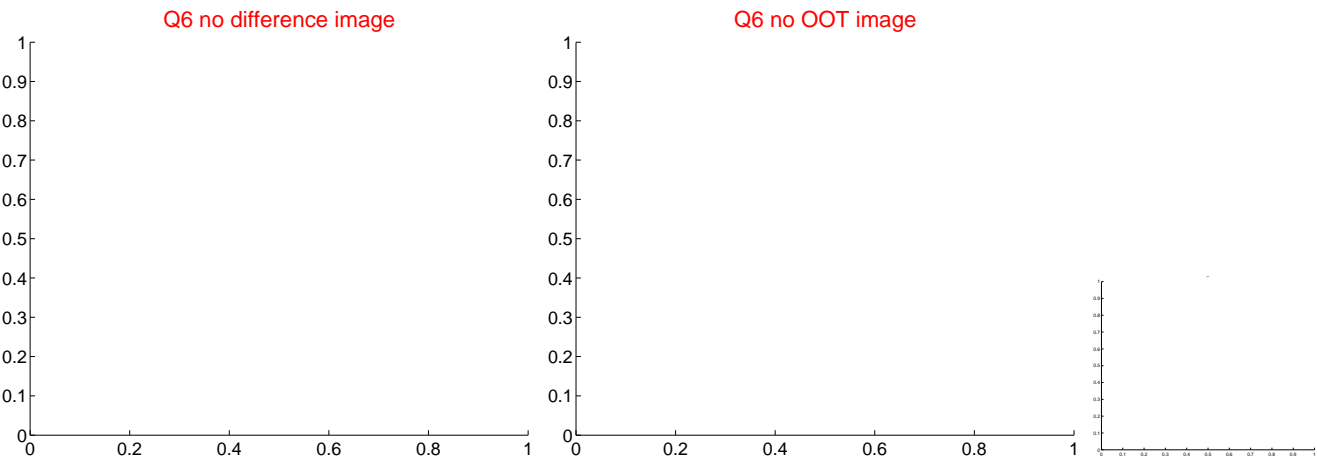
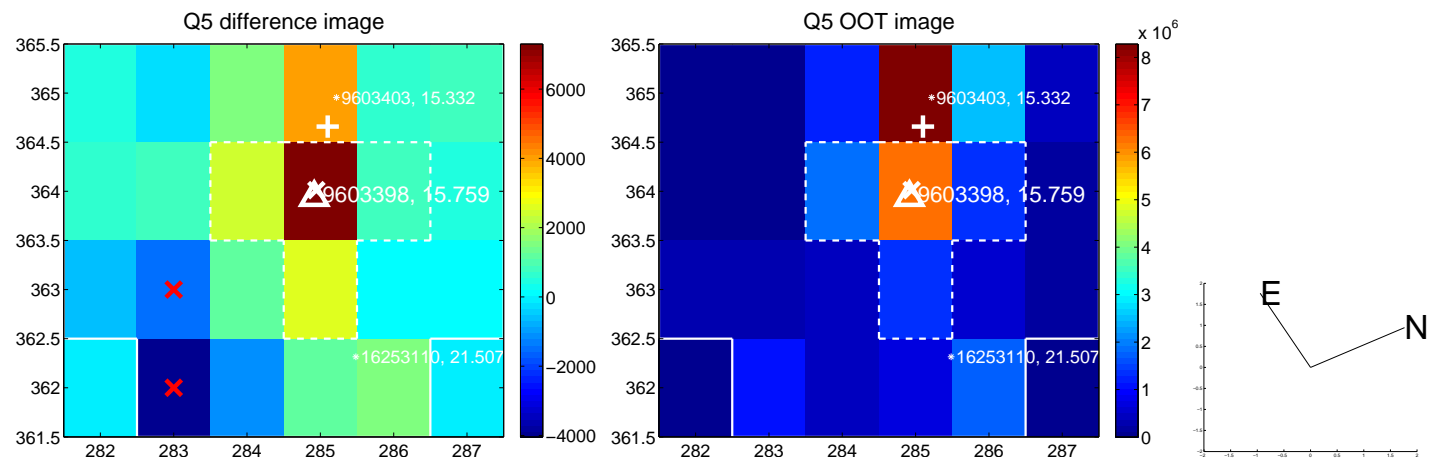


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

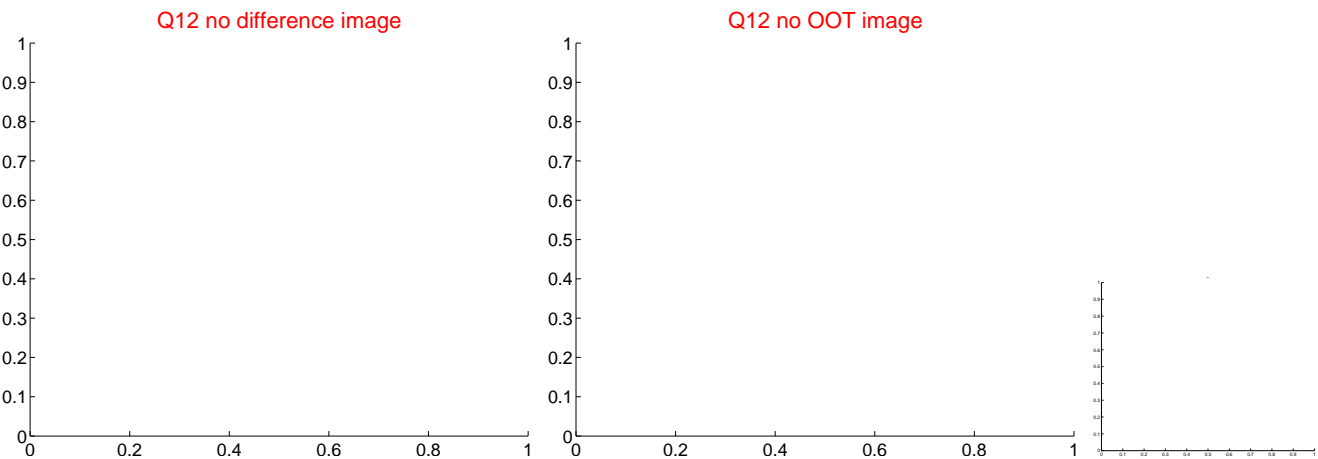
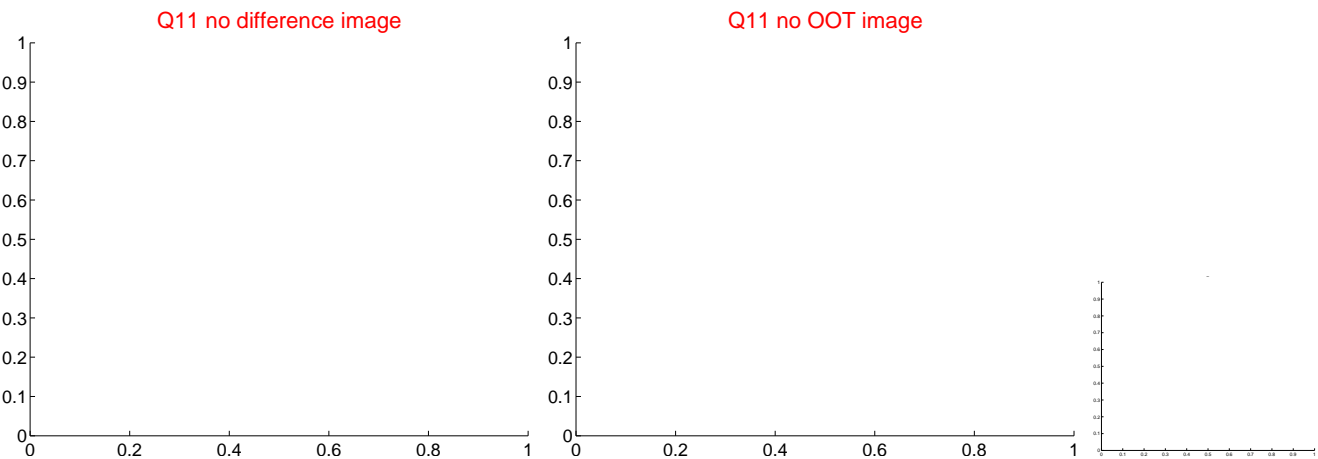
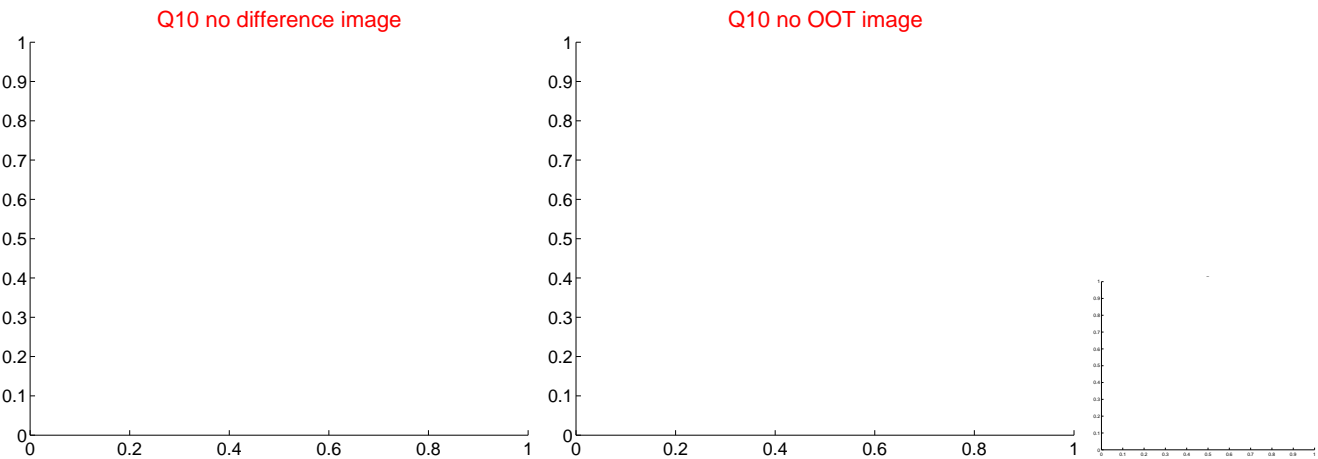
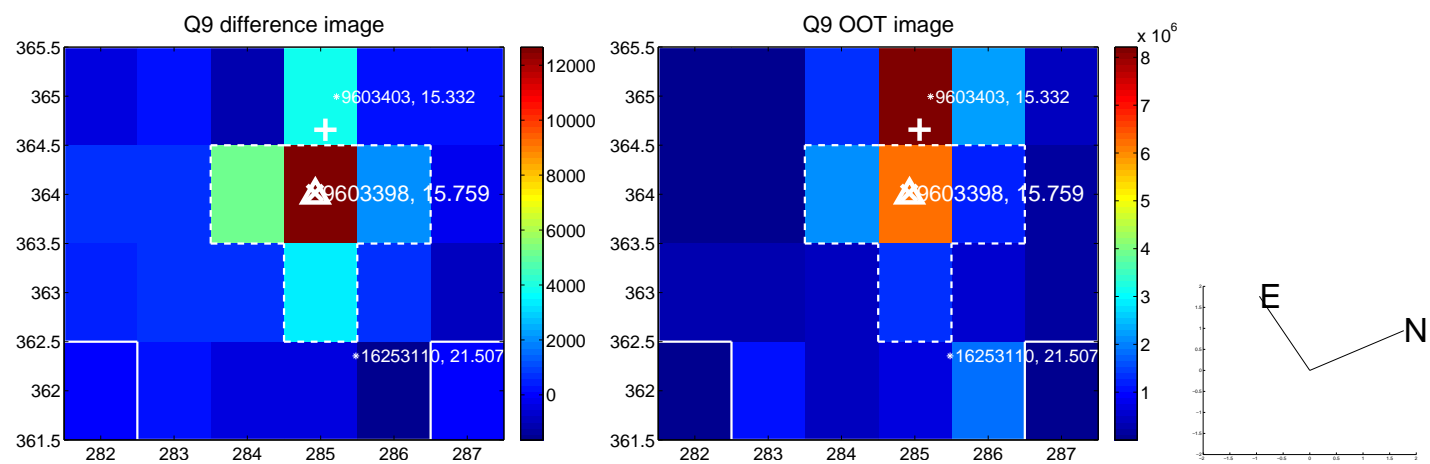
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



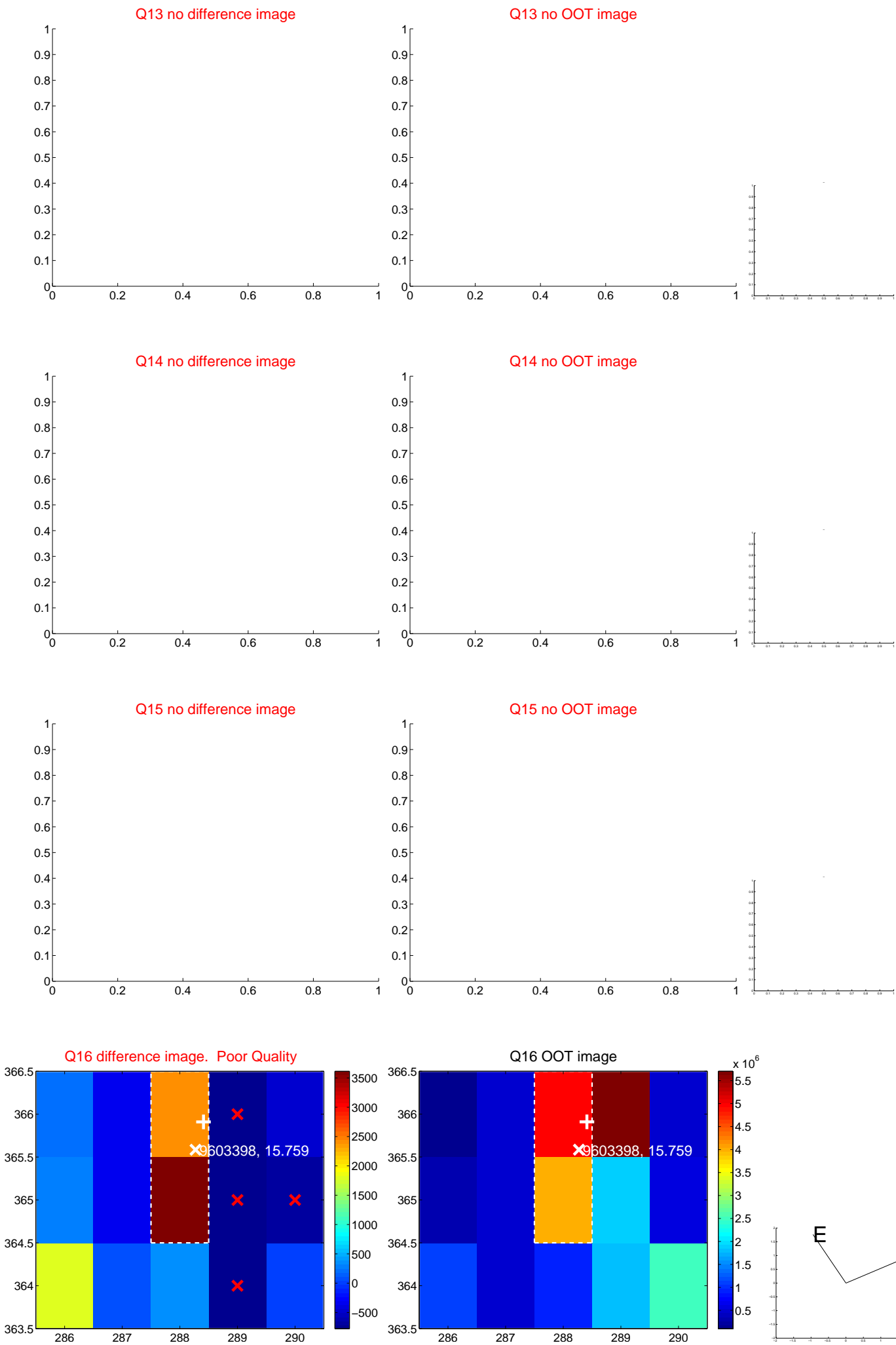
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



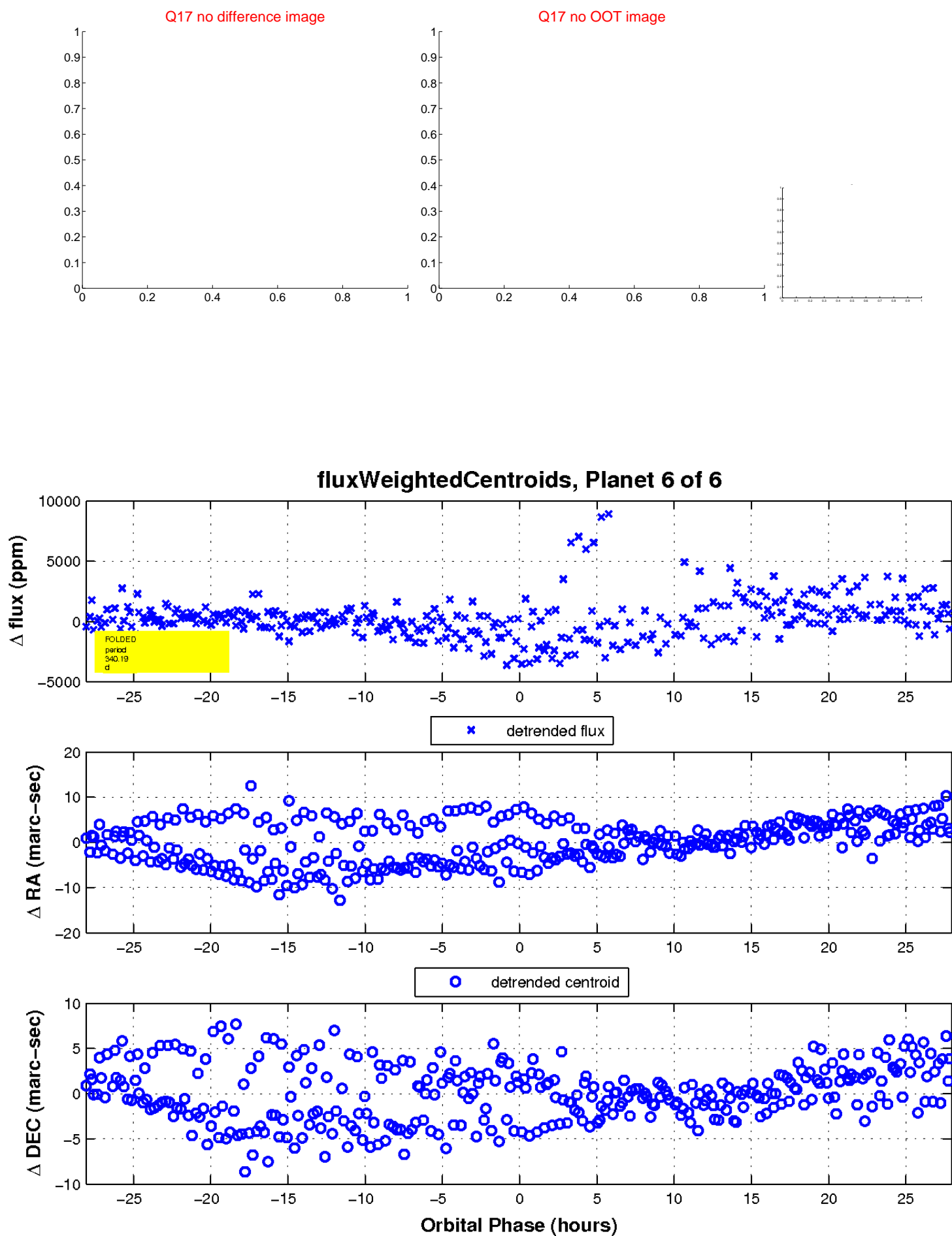
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: 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

