

KIC 010070247

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})
010070247-01	OBS	No	594.920052	275.955088	3535.1	10.175	21.7	8.5	0.67	4607	3.83	0.13
010070247-02	OBS	No	400.552639	282.790324	5684.4	21.072	22.7	9.7	0.67	4607	5.83	0.21
010070247-03	OBS	No	395.352334	203.669219	5945.5	16.644	21.3	13.1	0.67	4607	4.97	0.22
010070247-04	OBS	No	375.609374	481.595164	1871.5	8.096	19.0	5.3	0.67	4607	2.94	0.23
010070247-05	OBS	No	544.923164	410.267670	4500.5	7.588	17.8	11.2	0.67	4607	4.32	0.14
010070247-06	OBS	No	514.574327	368.857770	2772.1	5.580	15.7	8.5	0.67	4607	3.67	0.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010070247-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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

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

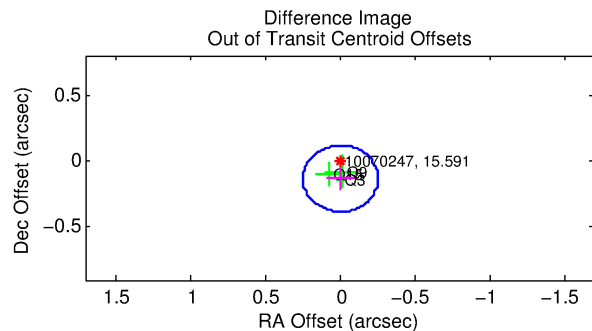
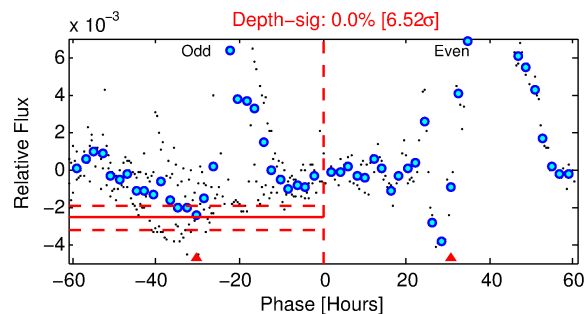
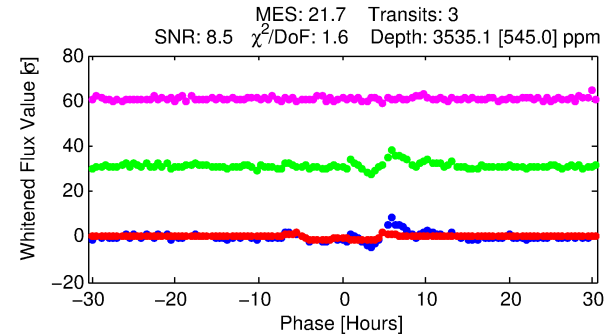
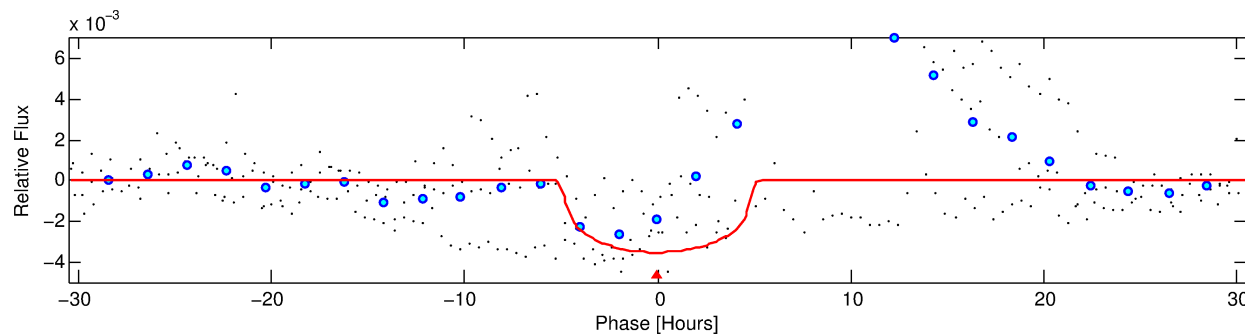
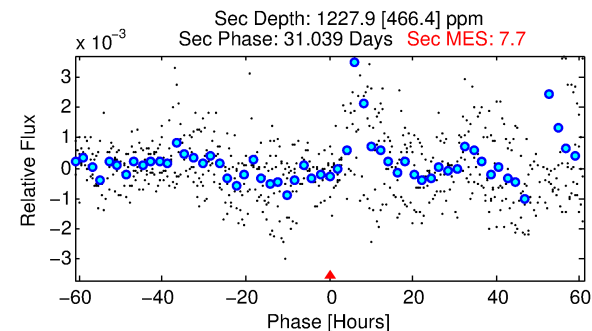
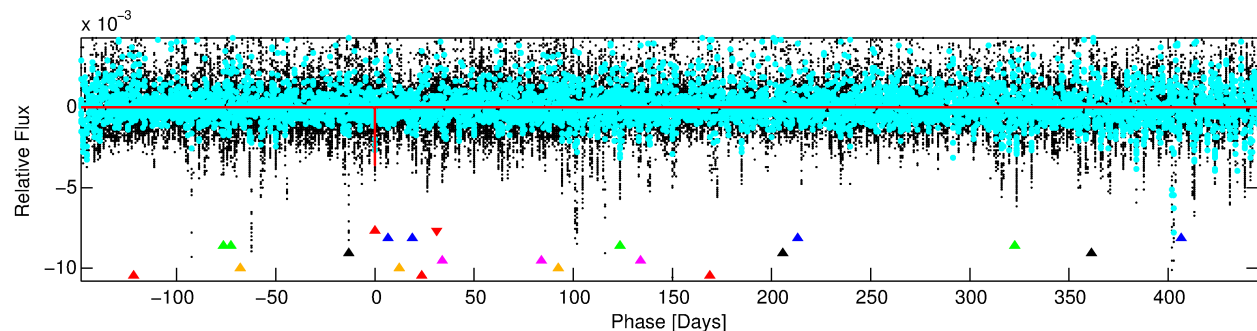
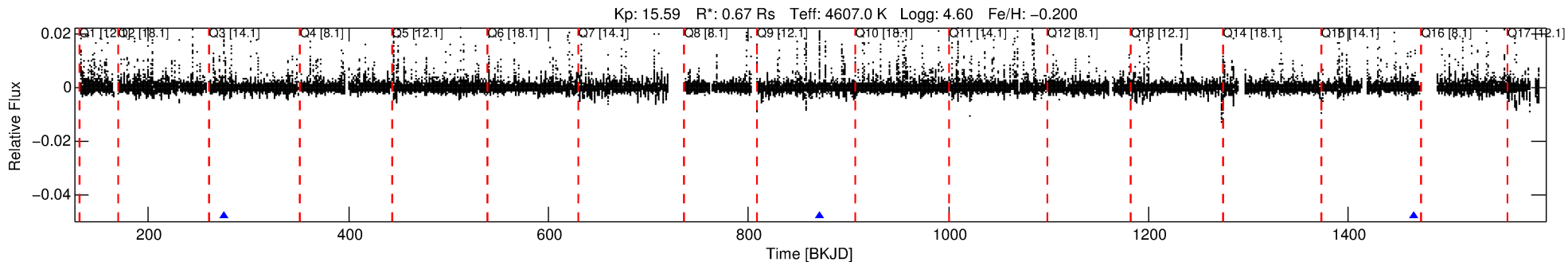
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010070247-01

No Significant Match Found

DV One-Page Summary

KIC: 10070247 Candidate: 1 of 7 Period: 594.920 d



DV Fit Results:

Period = 594.92005 [0.00694] d
Epoch = 275.9551 [0.0088] BKJD
Rp/R* = 0.0522 [0.0208]
a/R* = 469.29 [542.80]
b = 0.06 [20.18]
Seff = 0.13 [0.02]
Teq = 152 [6] K
Rp = 3.83 [1.56] Re
a = 1.2060 [0.0863] AU
Ag = 66863.15 [59344.71] [1.13σ]
Teffp = 3775 [841] K [4.31σ]

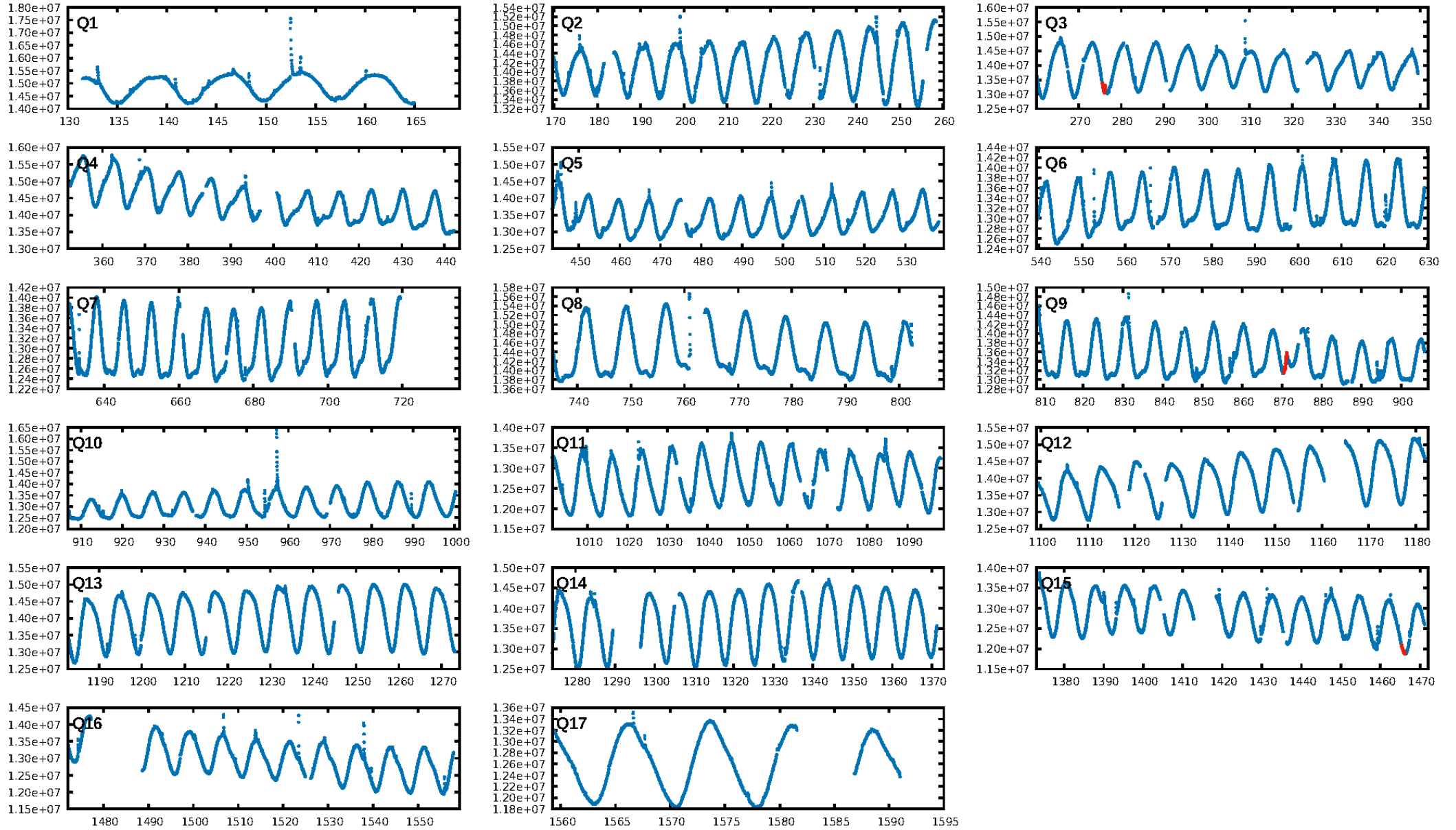
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [94.54σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
a/R* = 469.29 [542.80]
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.1677
Centroid-sig: 88.0%
Centroid-so: 0.268 arcsec [0.83σ]
OotOffset-rm: 0.133 arcsec [1.59σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-rm: 0.201 arcsec [2.40σ]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

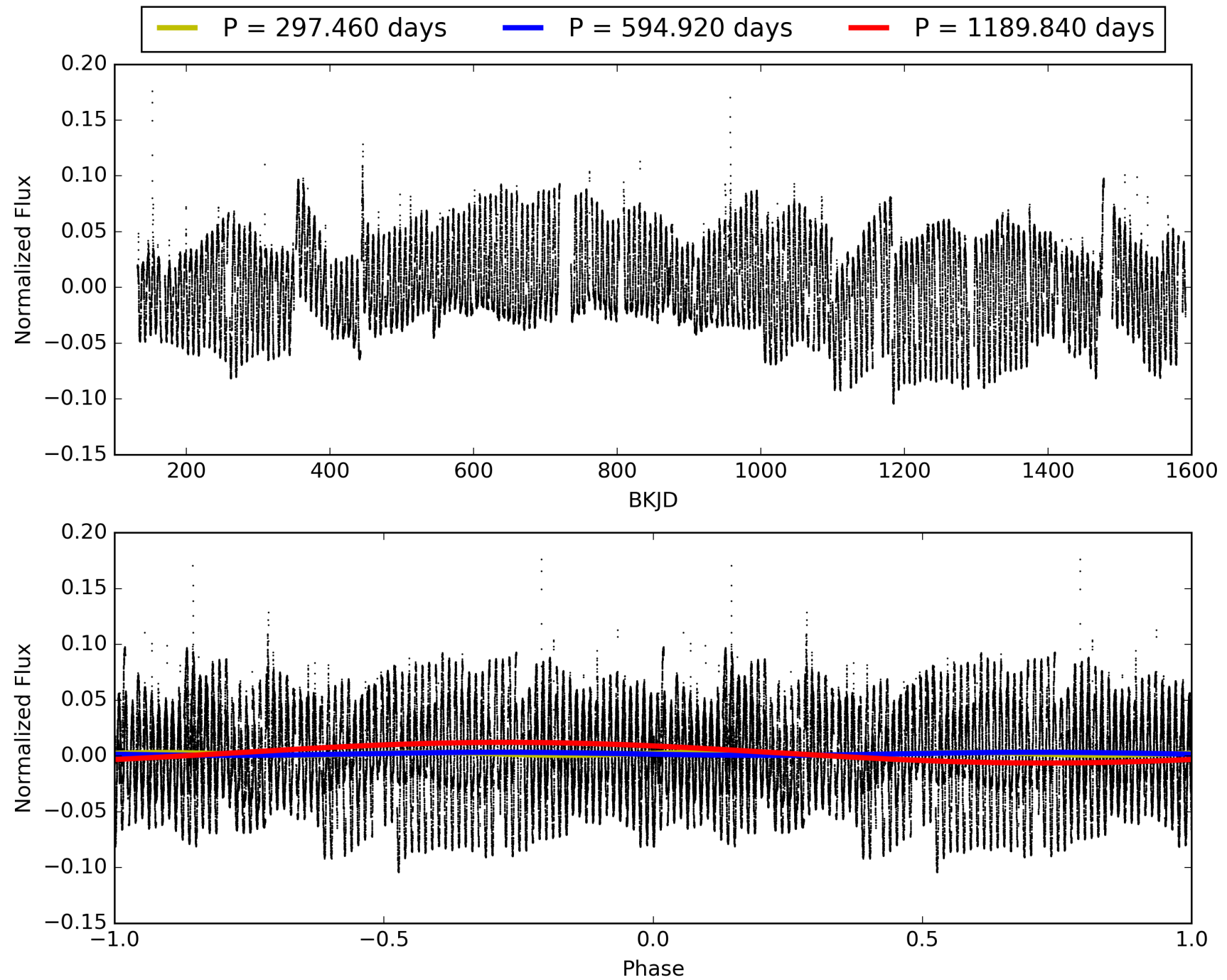
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010070247-01, PDC Light Curves

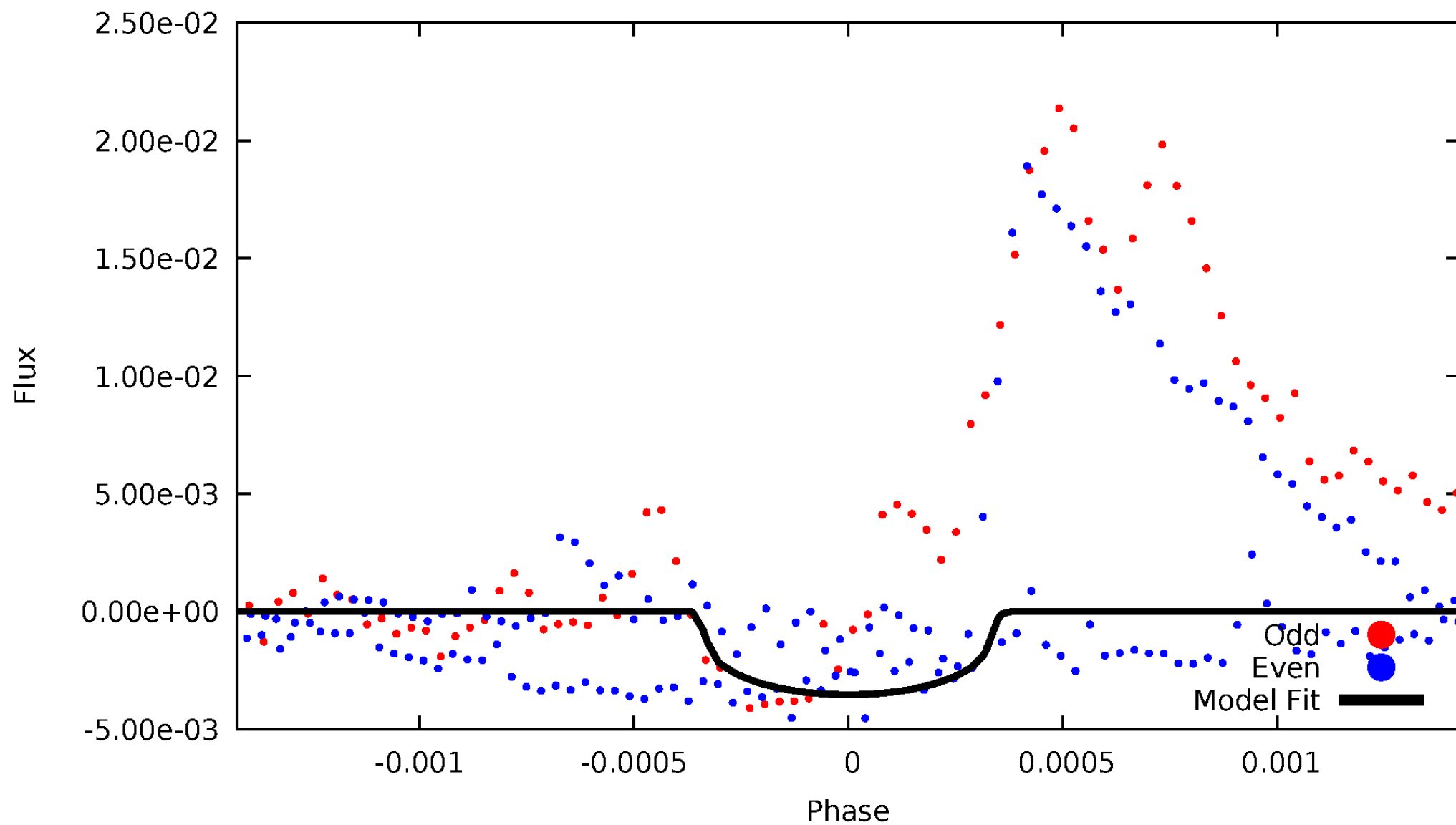


TCE 010070247-01



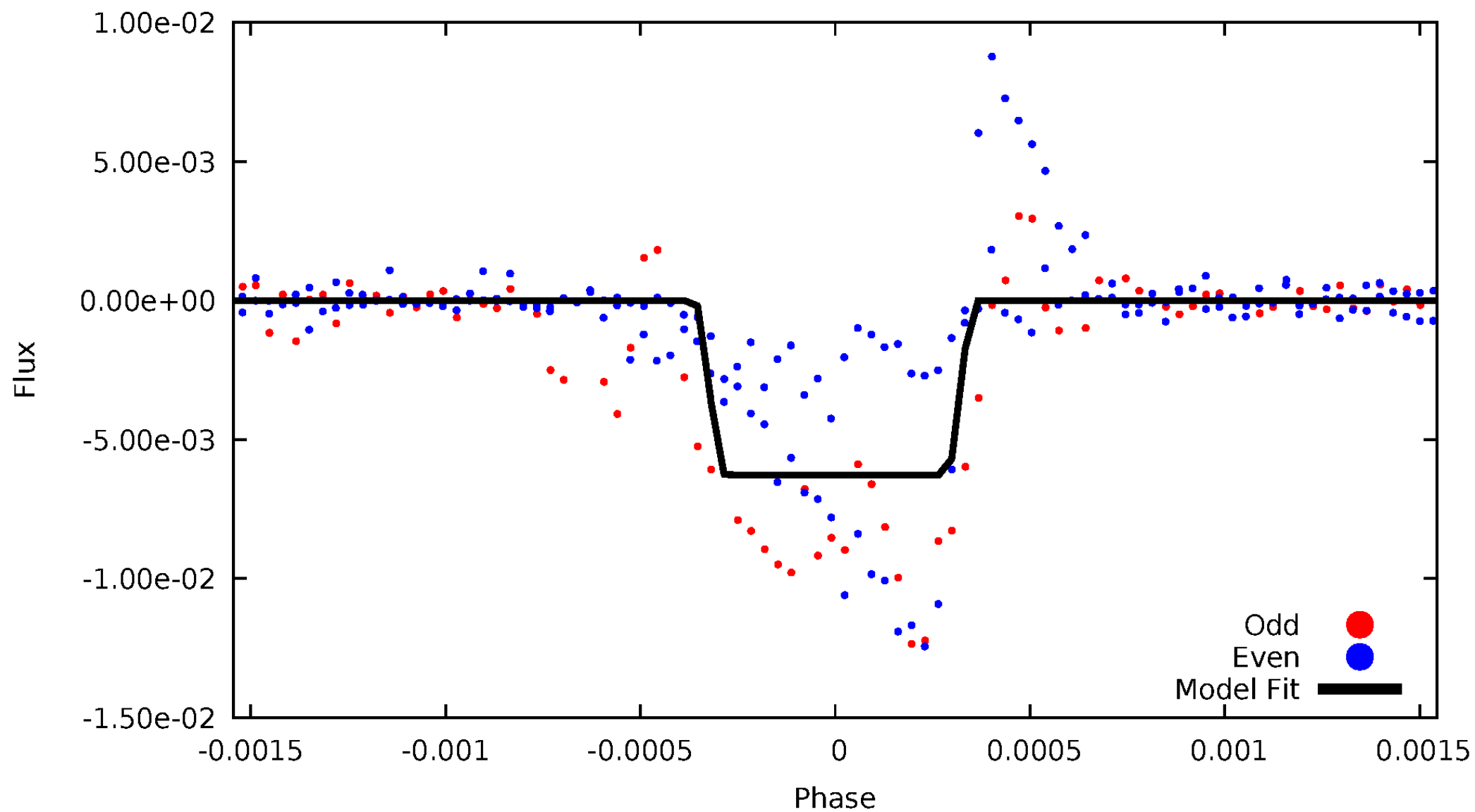
DV Odd/Even

TCE 010070247-01



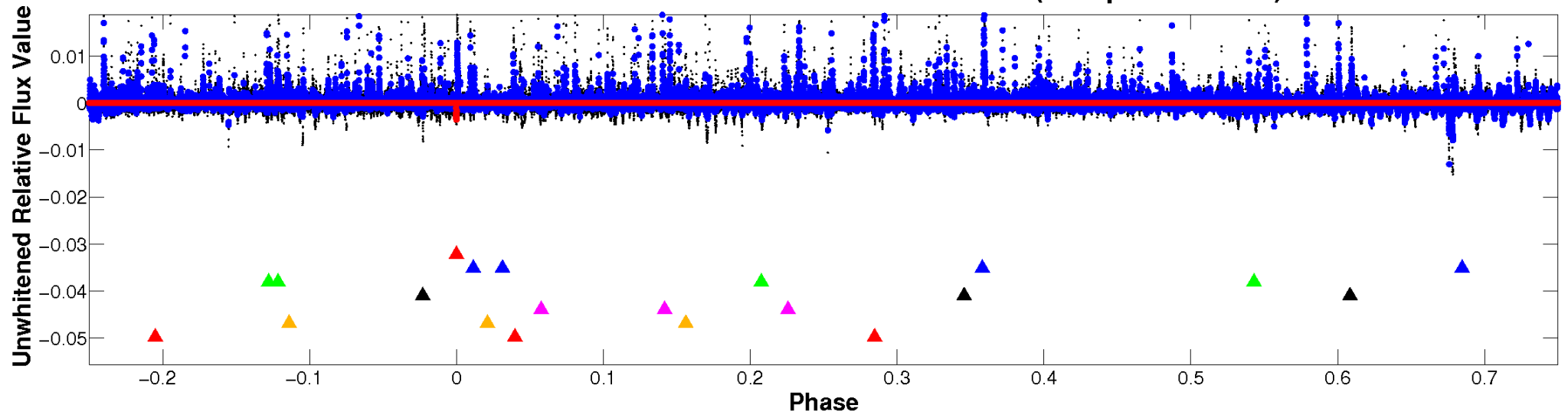
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TCE 010070247-01

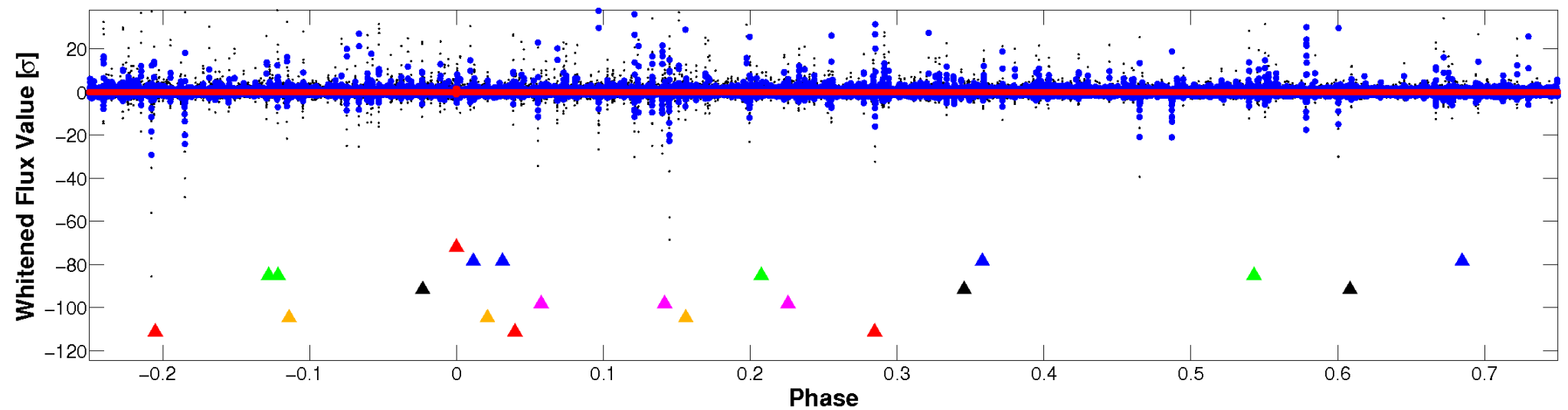


Non-Whitened Vs. Whitened Light Curve

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

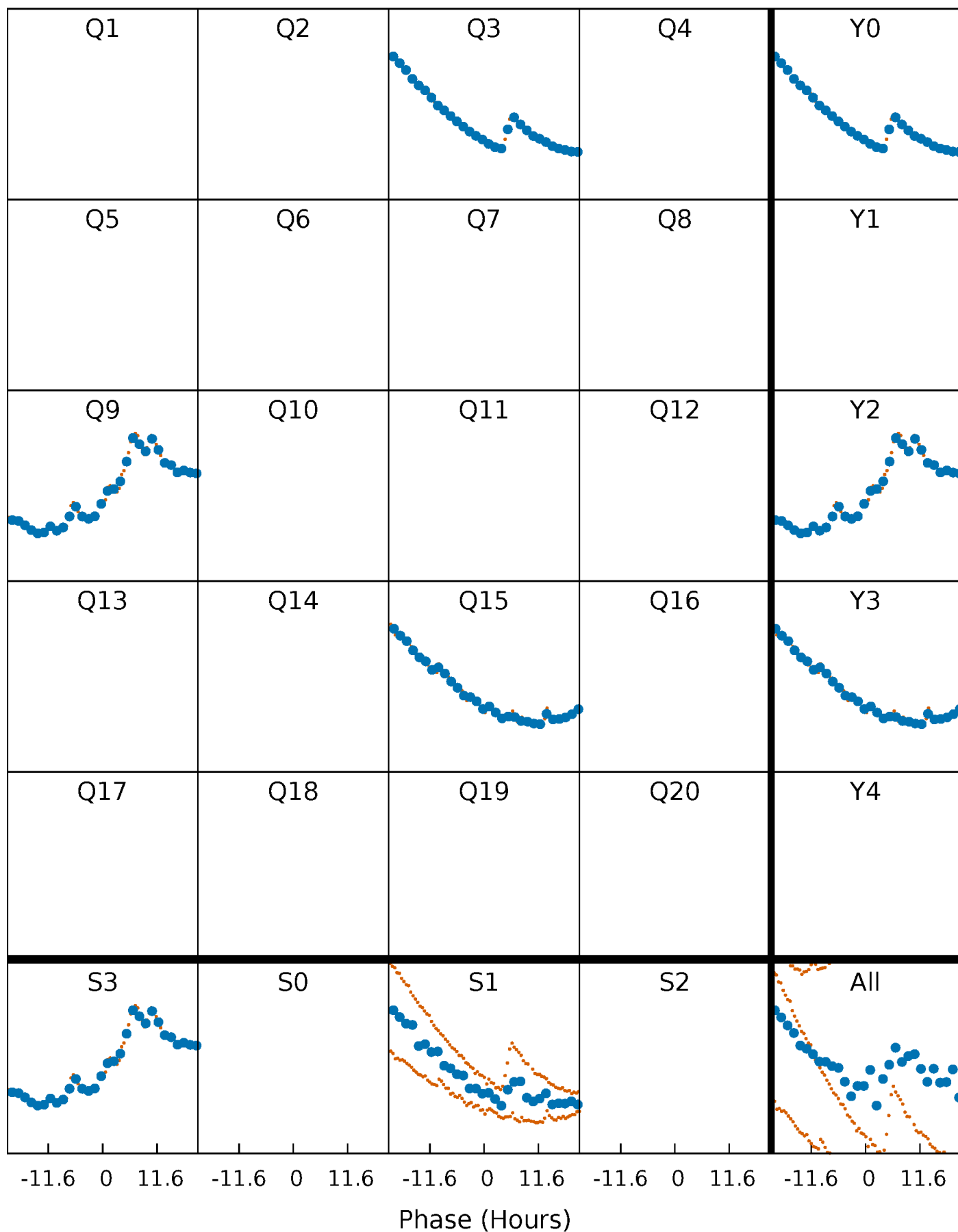


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



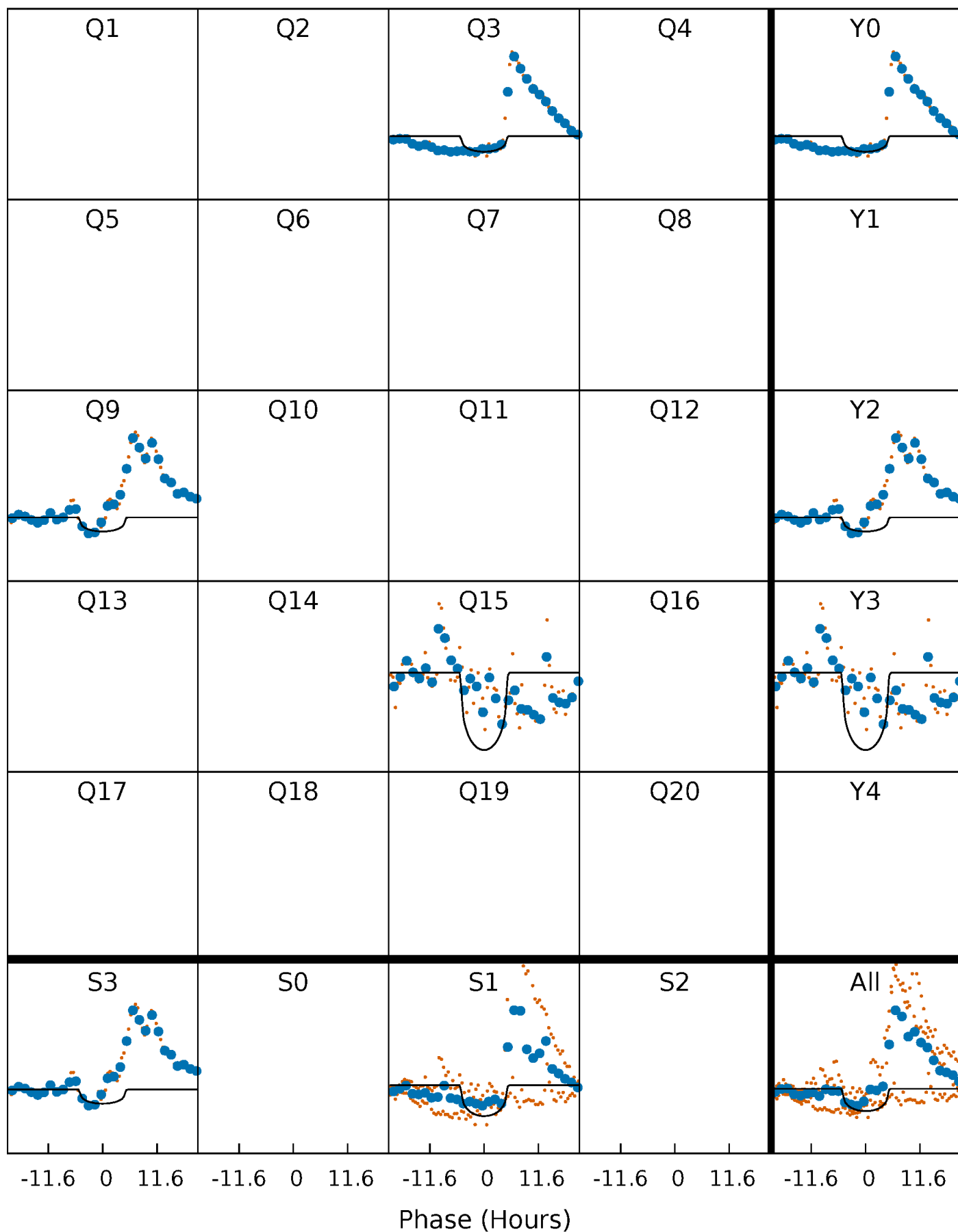
PDC Quarter-Phased Transit Curves

TCE 010070247-01 $P=594.920052$ Days $T_0=275.955088$ (BKJD)



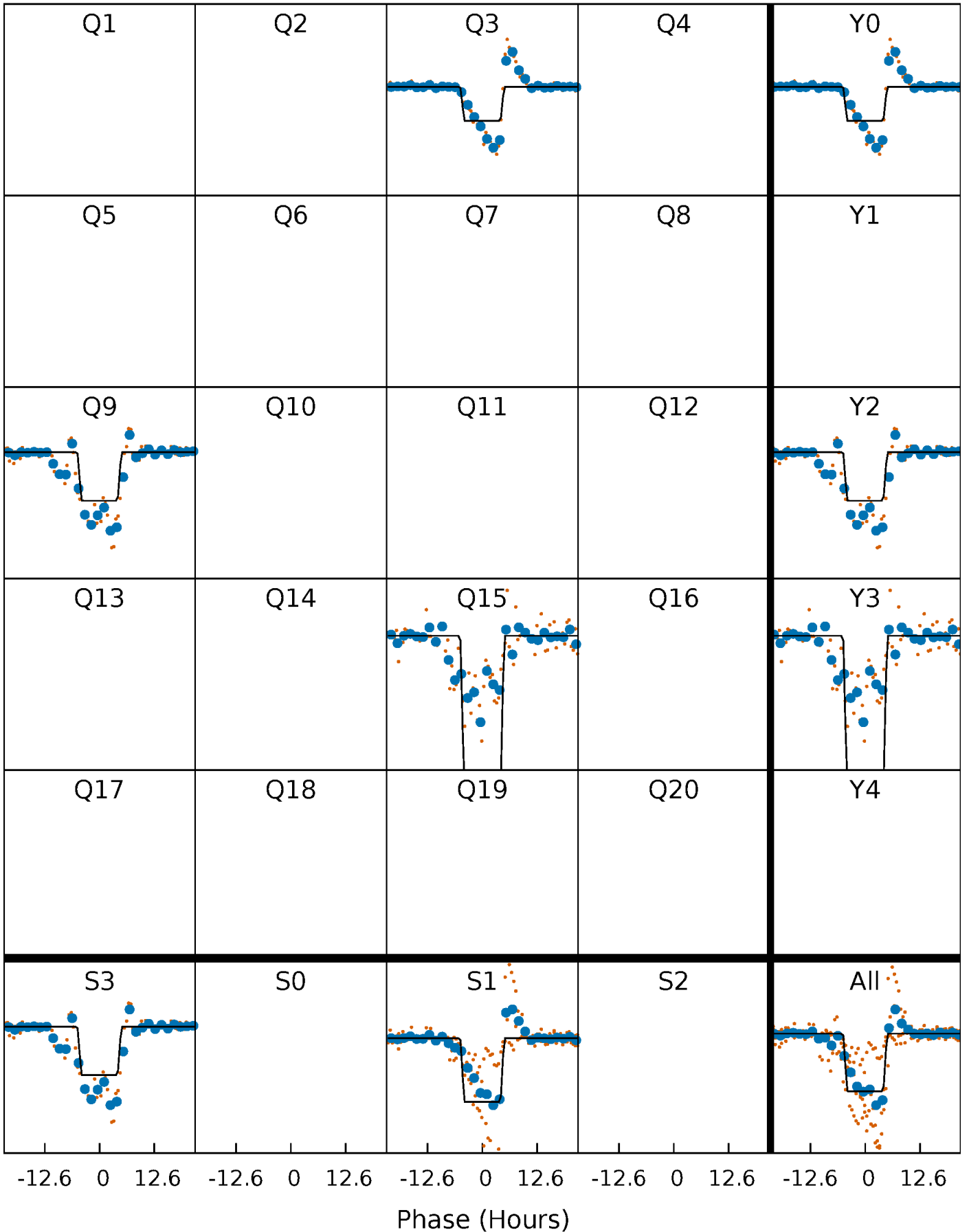
DV Quarter-Phased Transit Curves

TCE 010070247-01 P=594.920052 Days $T_0=275.955088$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

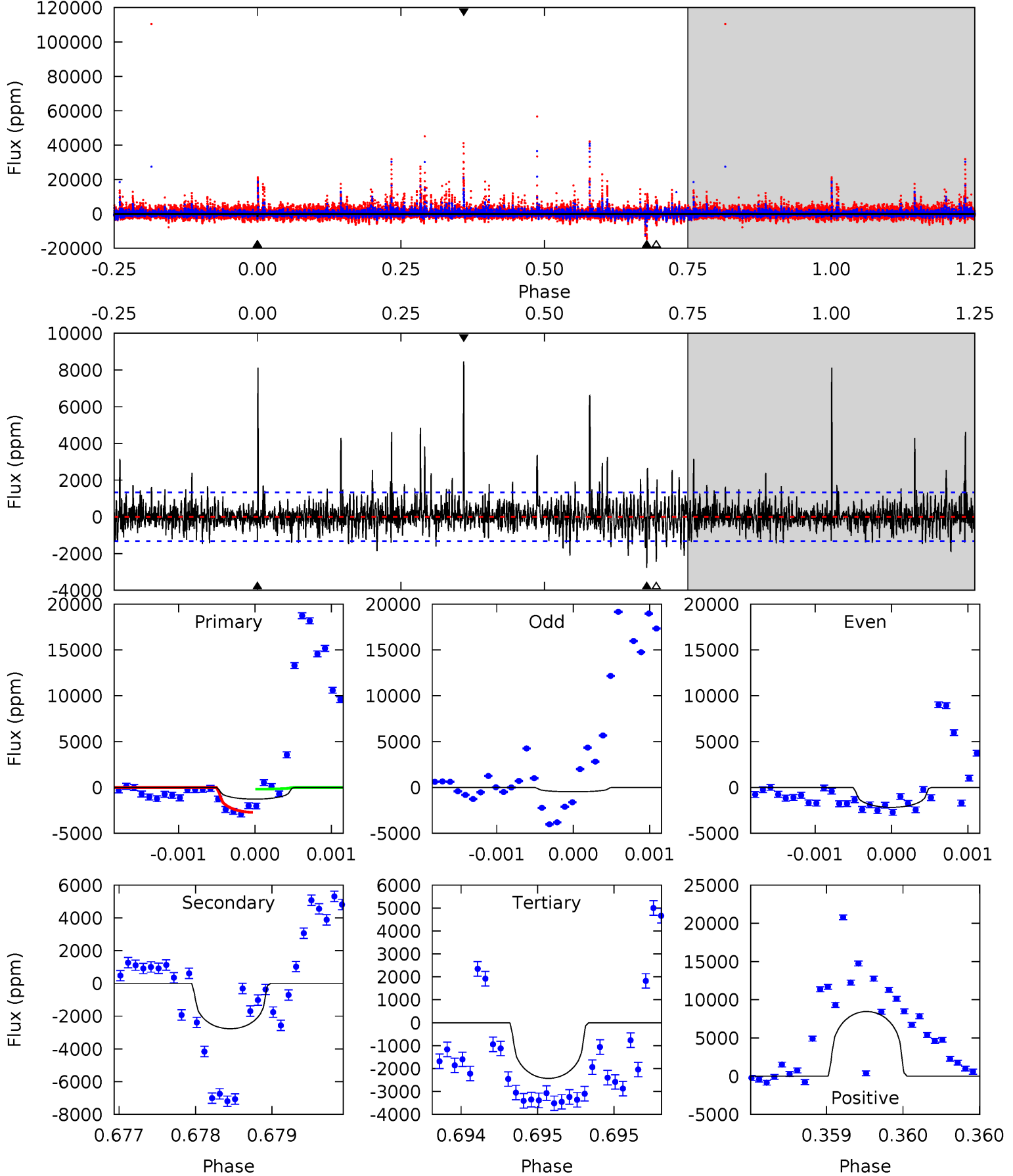
TCE 010070247-01 P=594.923099 Days $T_0=275.964026$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-01, P = 594.920052 Days, E = 275.955088 Days

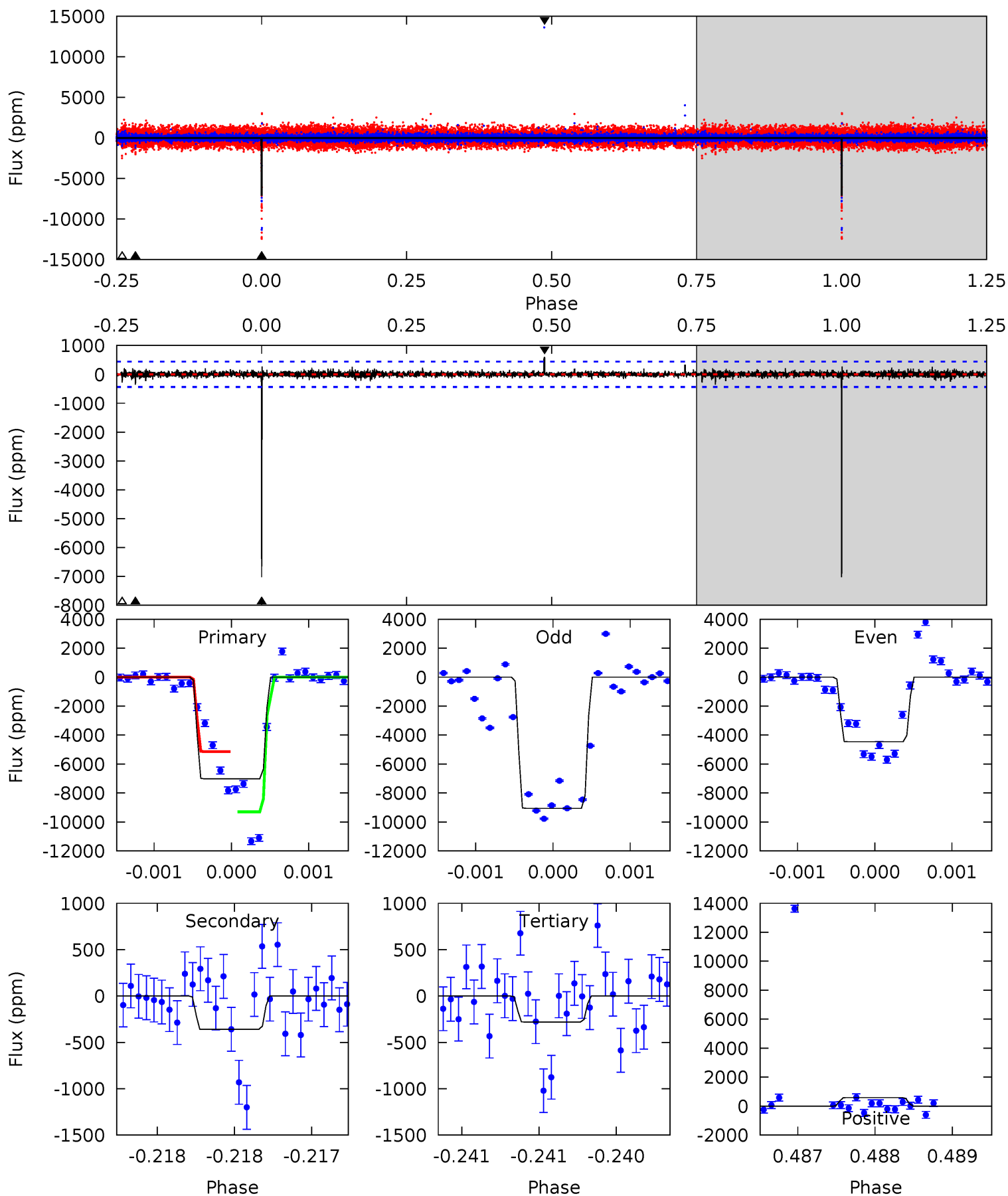
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.31	11.5	10.1	35.1	5.51	3.38	2.88	-4.79	-29.8	1.42	-23.6	2.41	1.08	0.75	5.30



Alt Model-Shift Uniqueness Test

010070247-01, P = 594.923099 Days, E = 275.964026 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
88.1	4.51	3.51	7.34	5.51	3.38	0.58	84.5	80.7	1.00	-2.82	33.8	0.82	0.08	26.0



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2772 ± 241	$3.86^{+1.54}_{-1.43}$	211^{+7}_{-7}	4603^{+1002}_{-576}	$150360^{+240392}_{-74950}$
Alt.	-360 ± 80	$5.71^{+1.53}_{-1.61}$	211^{+8}_{-7}	2908^{+282}_{-209}	9105^{+8421}_{-3830}

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

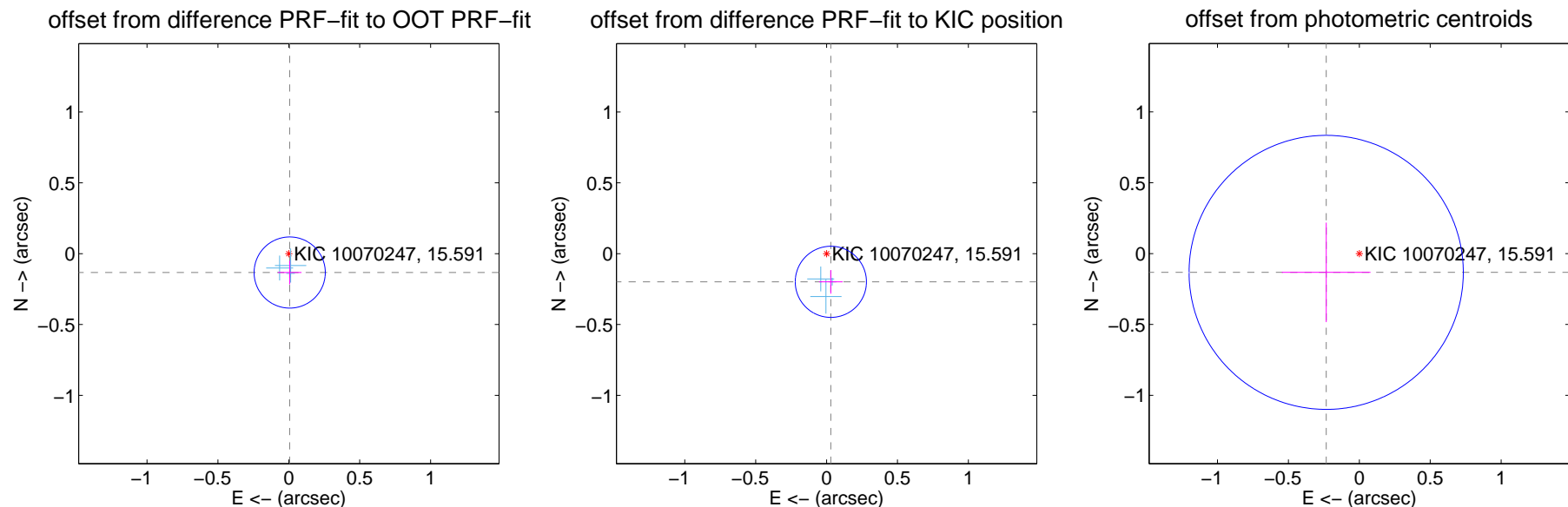
DV Centroid Data

Supplemental centroid analysis for 010070247-01. Kepler magnitude: 15.59. Transit SNR 8.46

There are 3 quarters with good PRF difference image offsets

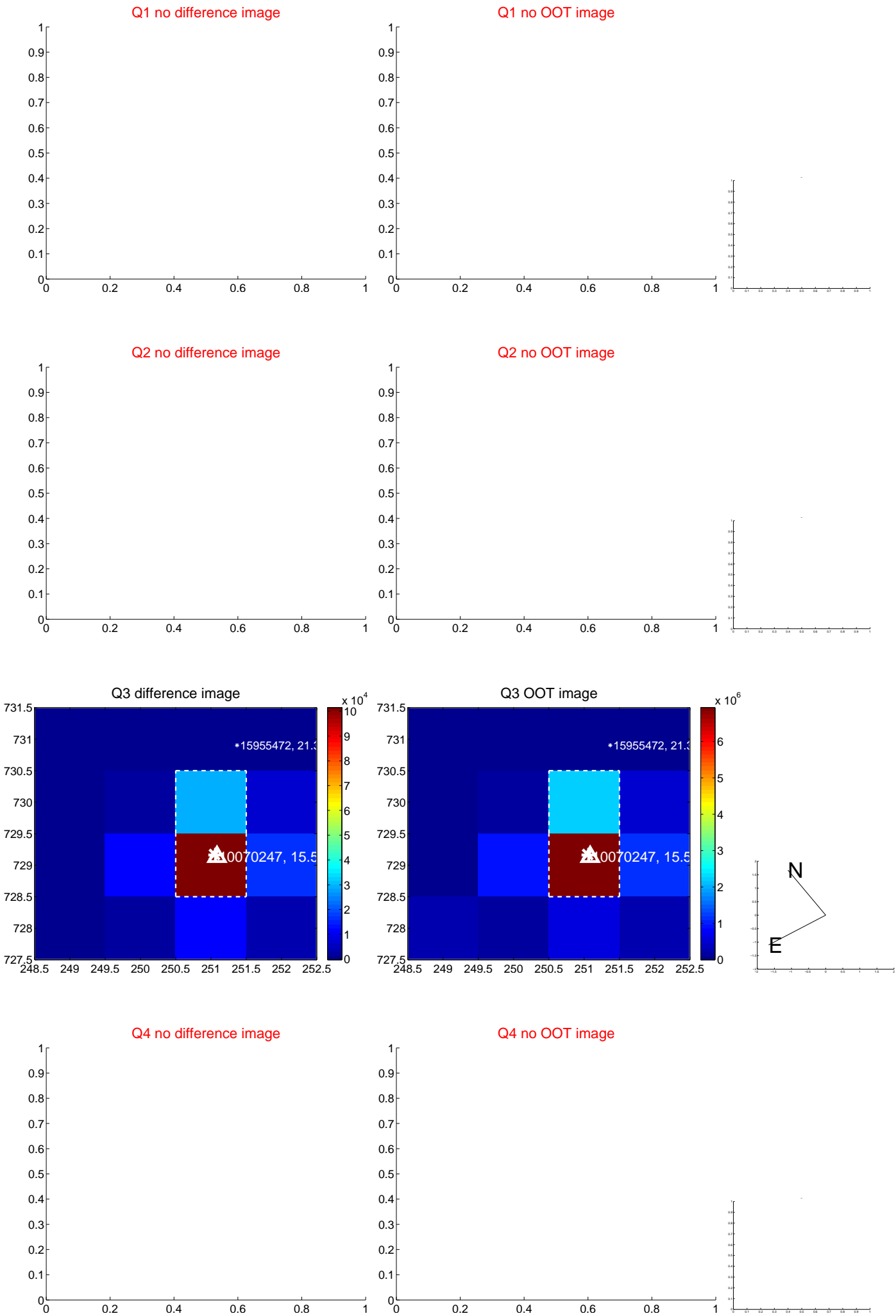
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.133 ± 0.084	1.59	-0.006 ± 0.083	-0.133 ± 0.084
PRF-fit source offset from KIC position	0.201 ± 0.084	2.40	-0.030 ± 0.083	-0.199 ± 0.084
photometric centroid source offset	0.27 ± 0.32	0.83	0.23 ± 0.31	-0.13 ± 0.35



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.

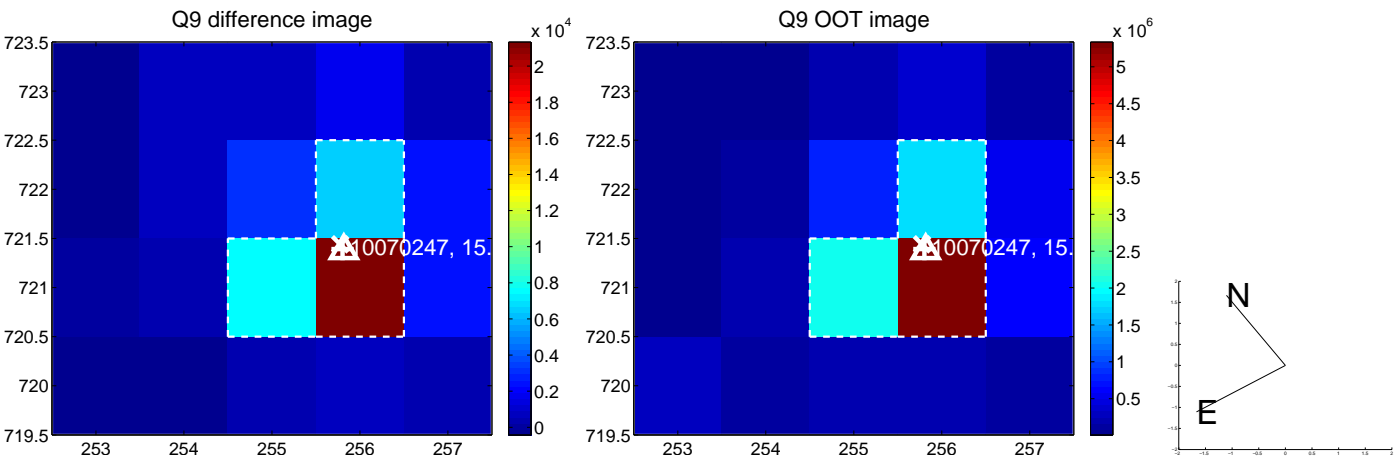
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Q13 no difference image



Q13 no OOT image



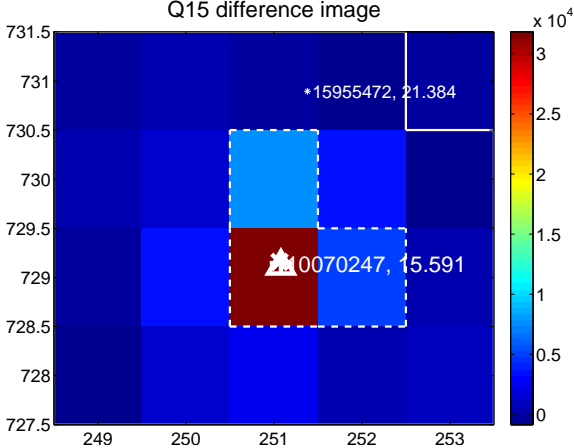
Q14 no difference image



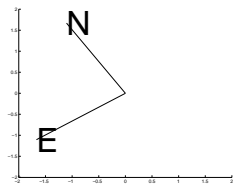
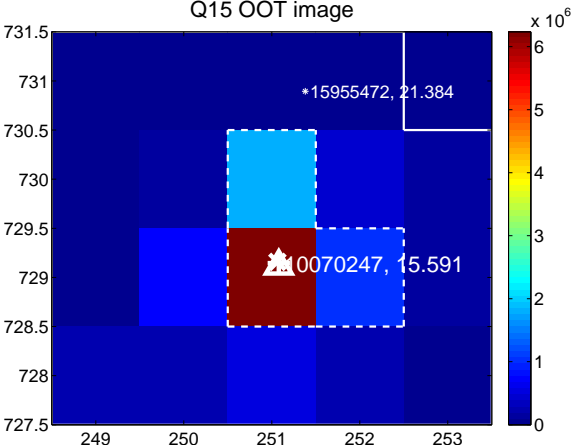
Q14 no OOT image



Q15 difference image



Q15 OOT image



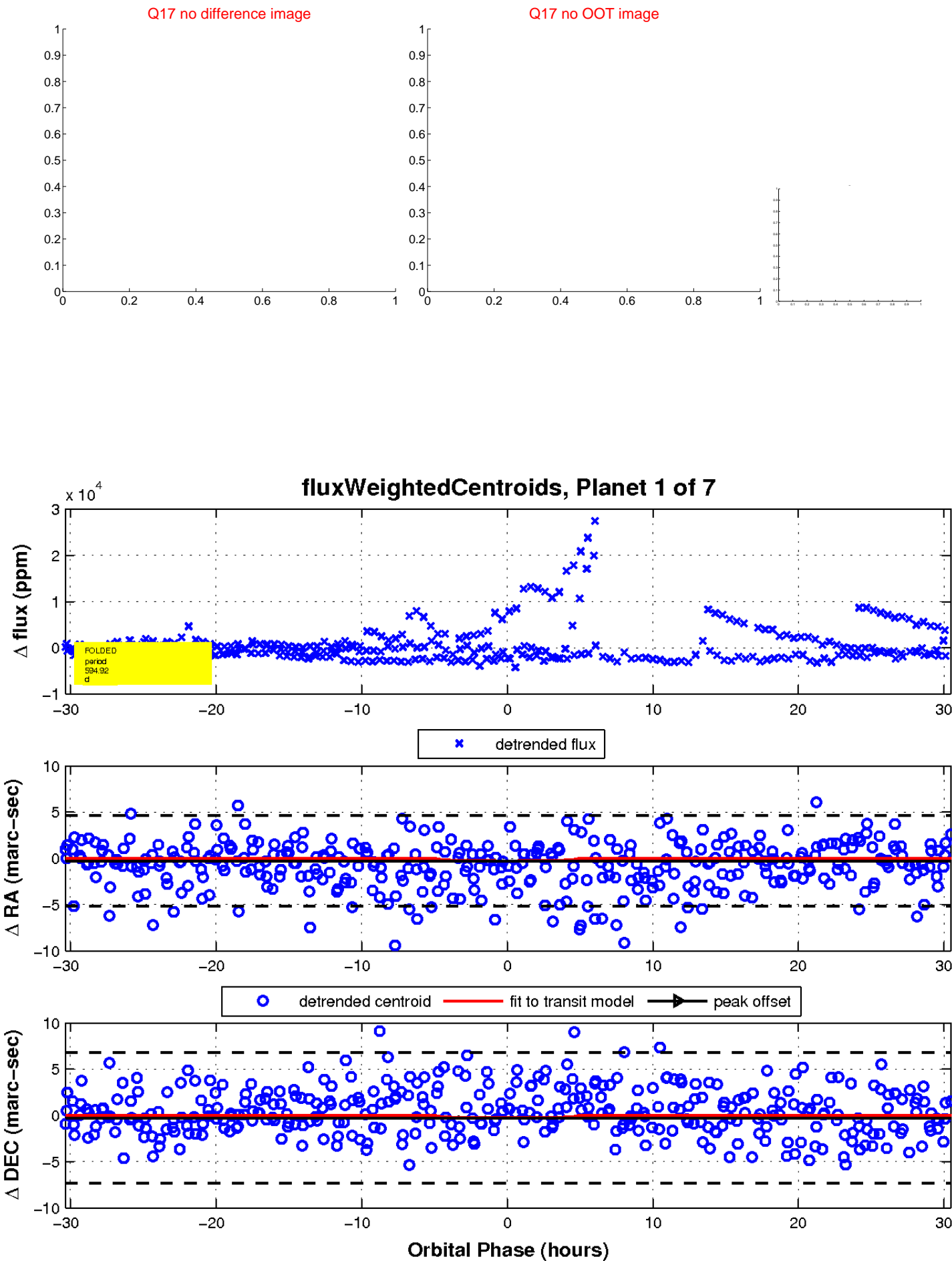
Q16 no difference image



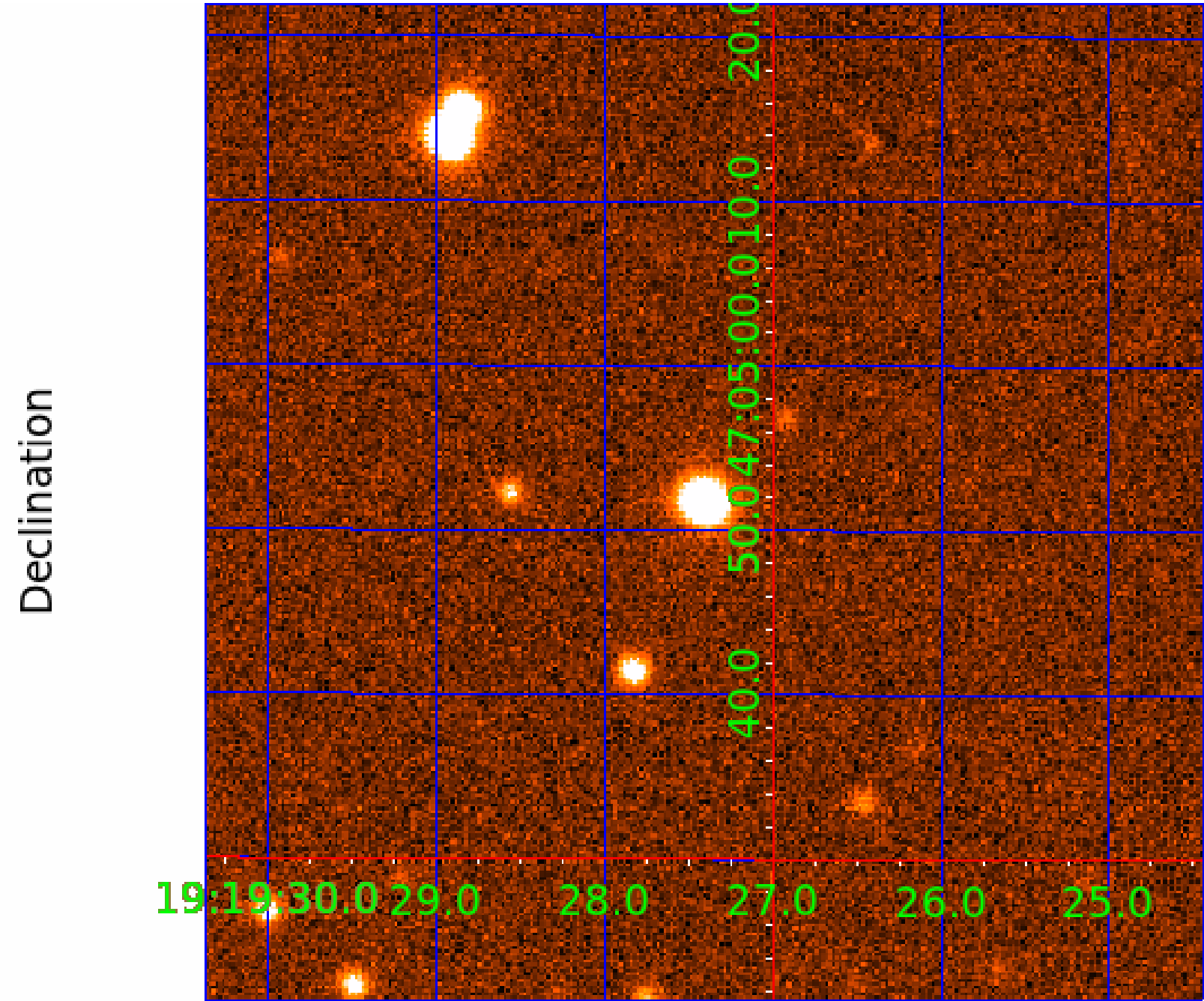
Q16 no OOT image



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



UKIRT Image



KIC 010070247

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})
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Robovetter Results

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010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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

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

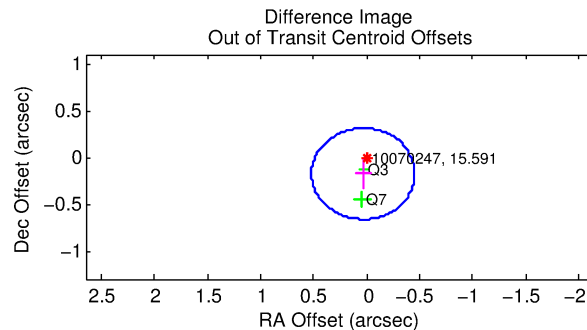
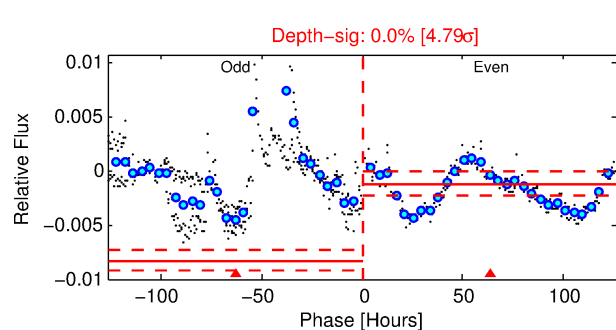
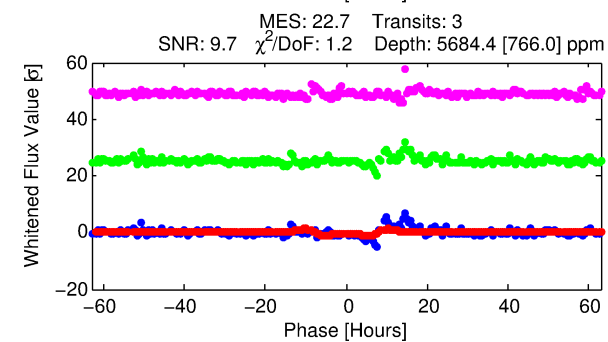
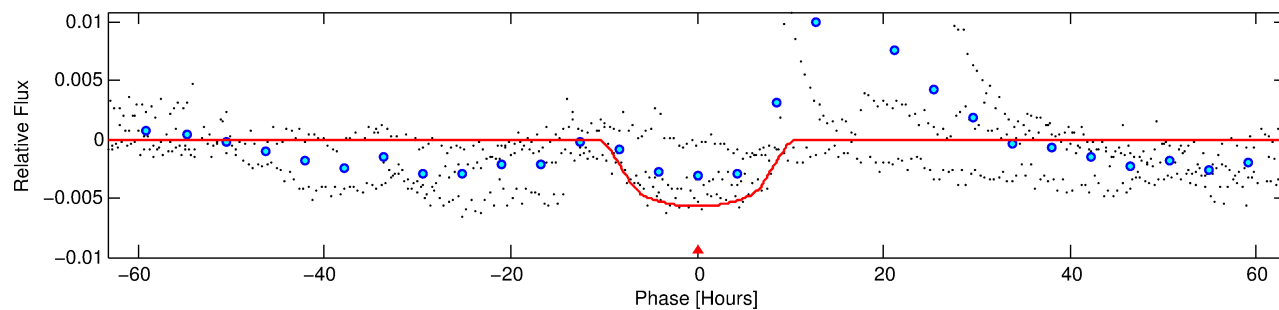
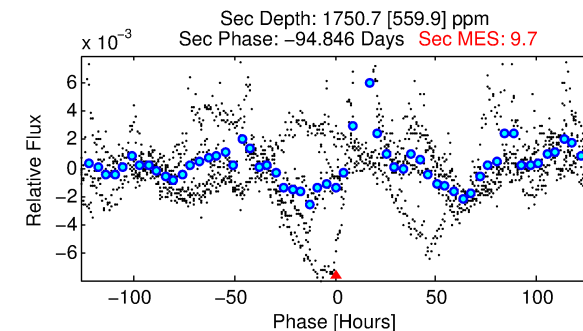
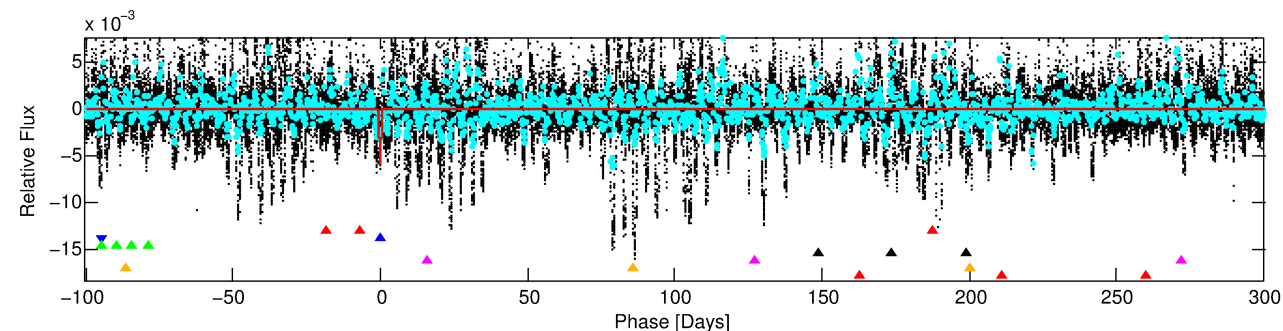
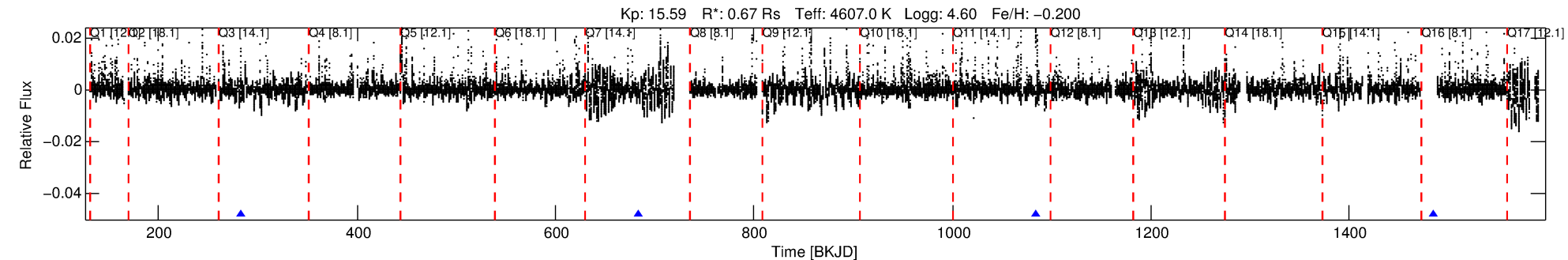
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010070247-02

No Significant Match Found

DV One-Page Summary

KIC: 10070247 Candidate: 2 of 7 Period: 400.553 d



DV Fit Results:

Period = 400.55264 [0.01437] d
Epoch = 282.7903 [0.0185] BKJD
Rp/R* = 0.0795 [0.0060]
a/R* = 100.60 [9.01]
b = 0.83 [0.04]
Seff = 0.21 [0.04]
Teq = 173 [7] K
Rp = 5.84 [0.68] Re
a = 0.9264 [0.0663] AU
Ag = 24278.07 [8919.18] [2.72σ]
Teff = 3343 [315] K [10.05σ]

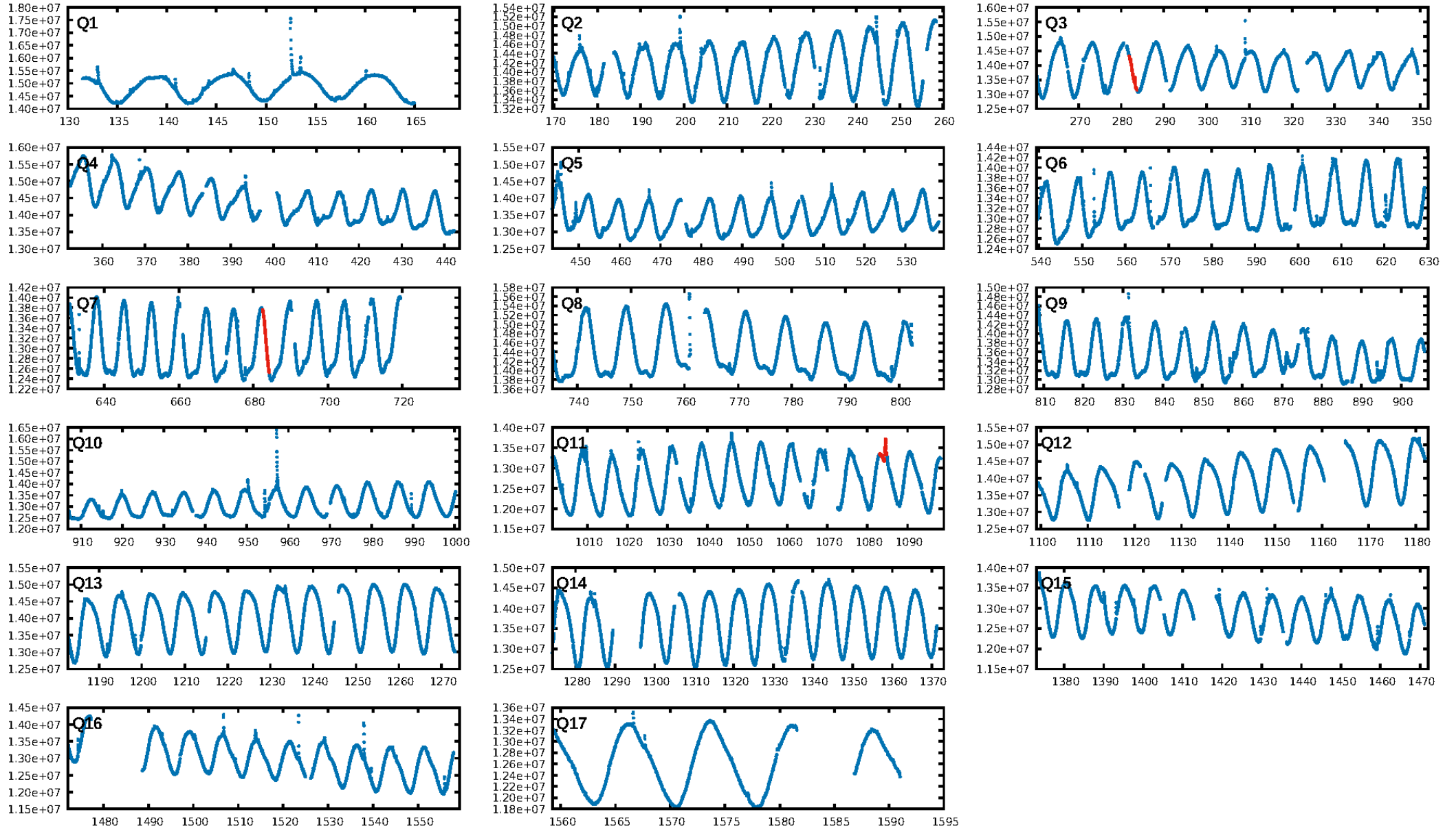
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.65σ]
LongPeriod-sig: 100.0% [49.73σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 3.383
Centroid-sig: 0.6%
Centroid-so: 0.517 arcsec [2.67σ]
OotOffset-rm: 0.179 arcsec [1.10σ]
OotOffset-st: 0/2/0/0 [2]
KicOffset-rm: 0.235 arcsec [1.45σ]
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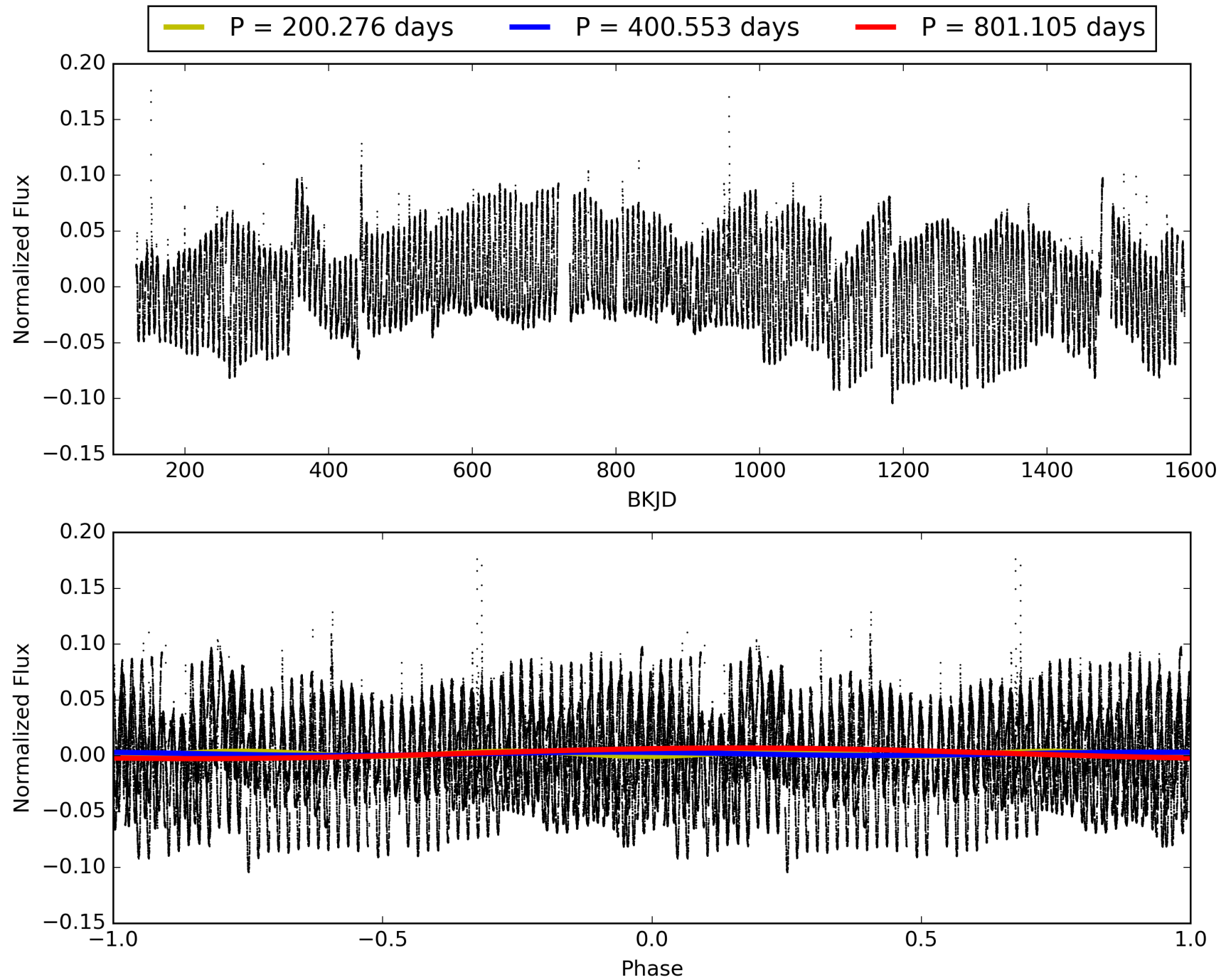
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:08:51 Z

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TCE 010070247-02, PDC Light Curves

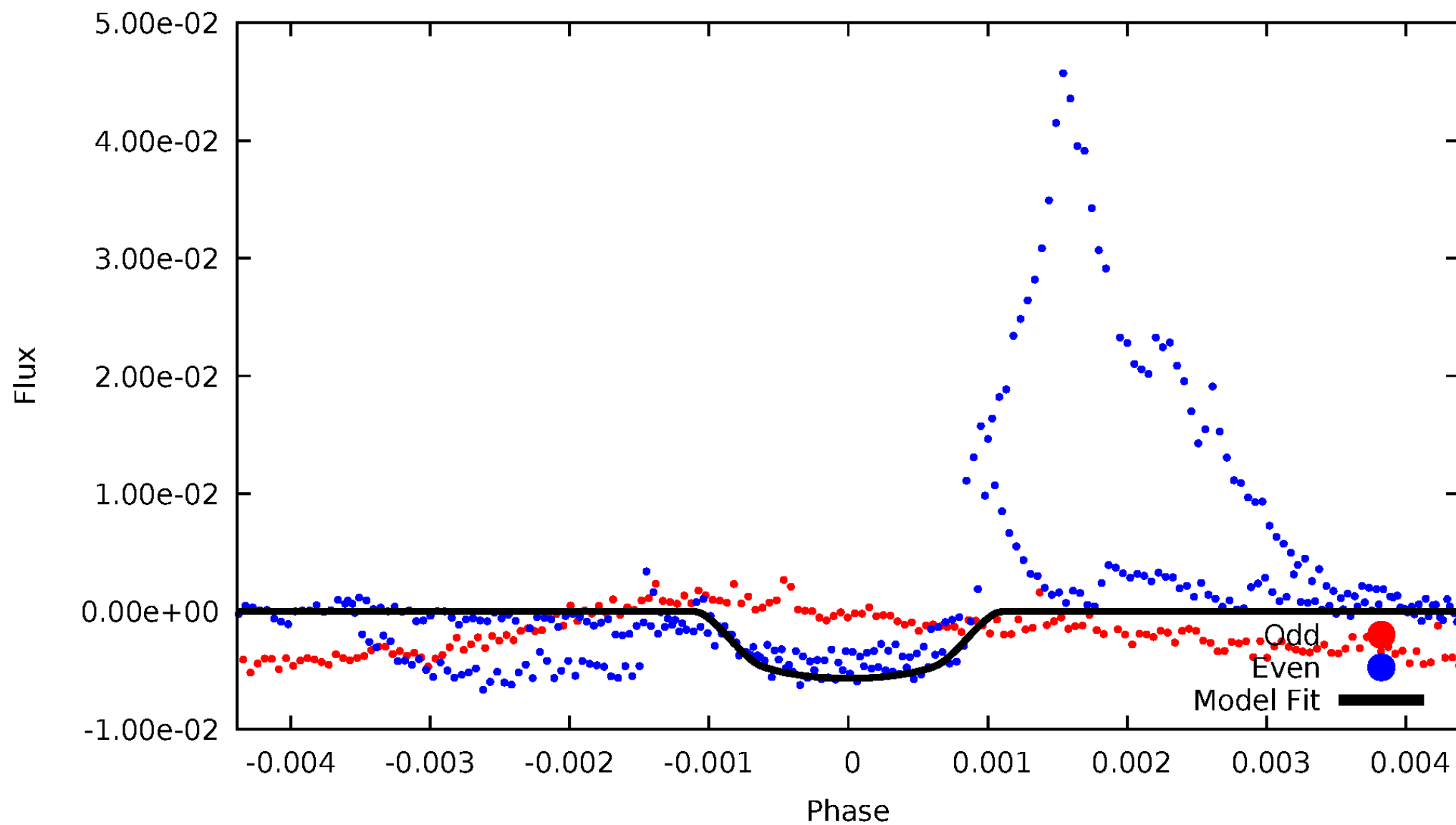


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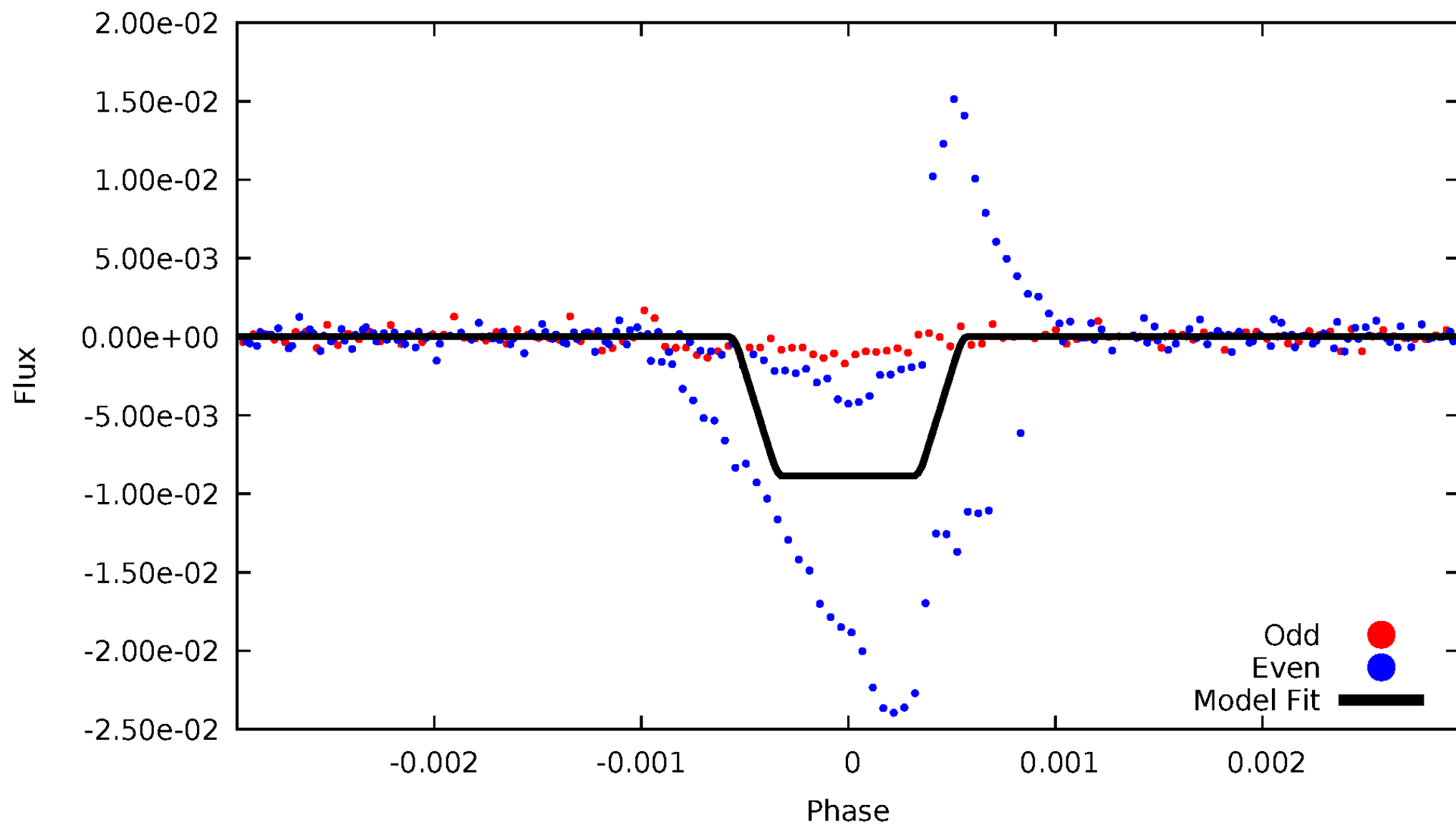
DV Odd/Even

TCE 010070247-02



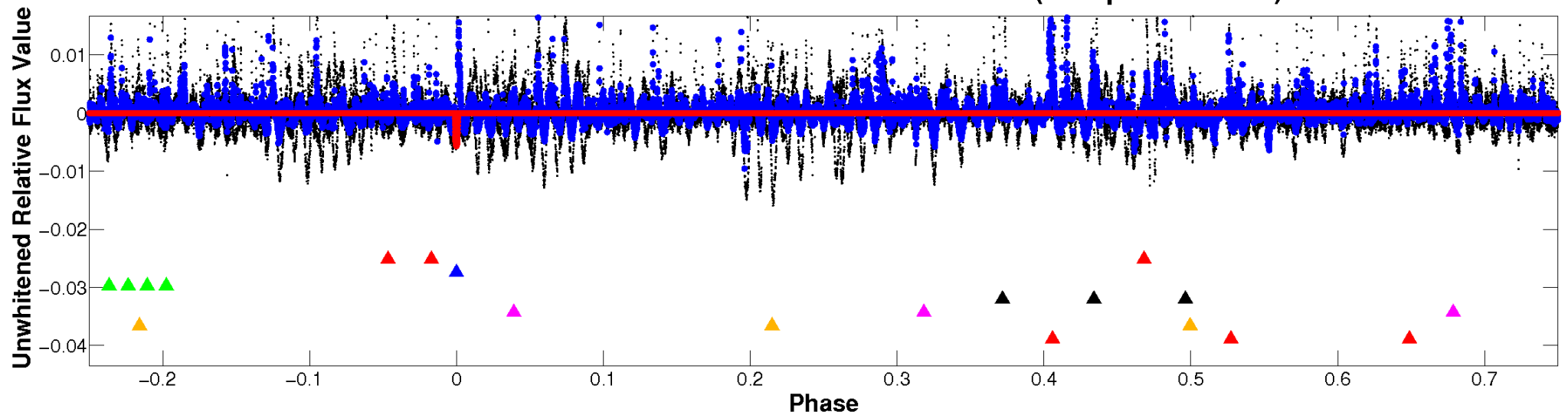
ALT Odd/Even

TCE 010070247-02

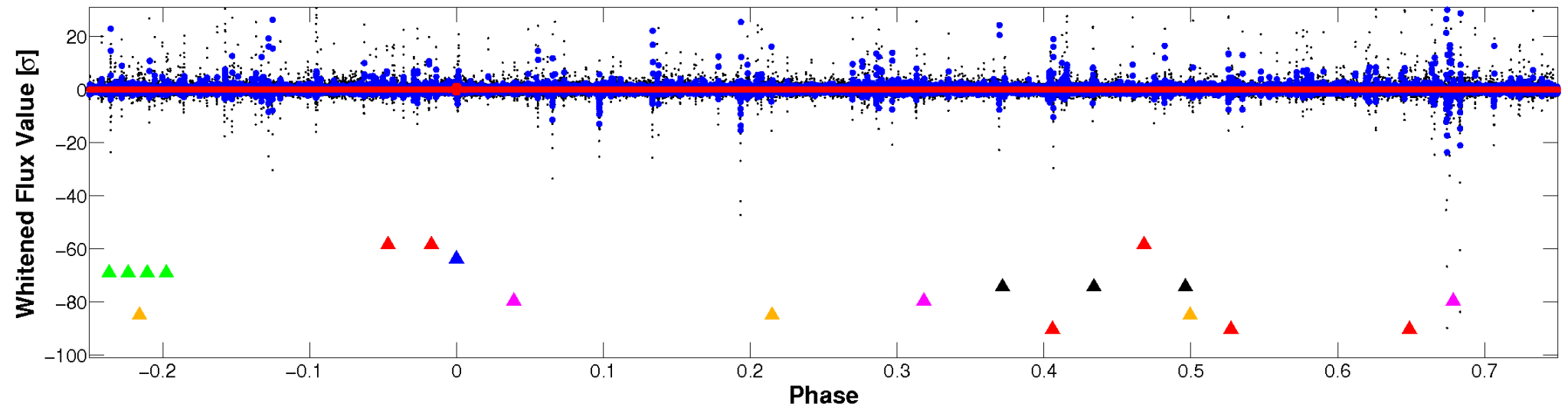


Non-Whitened Vs. Whitened Light Curve

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

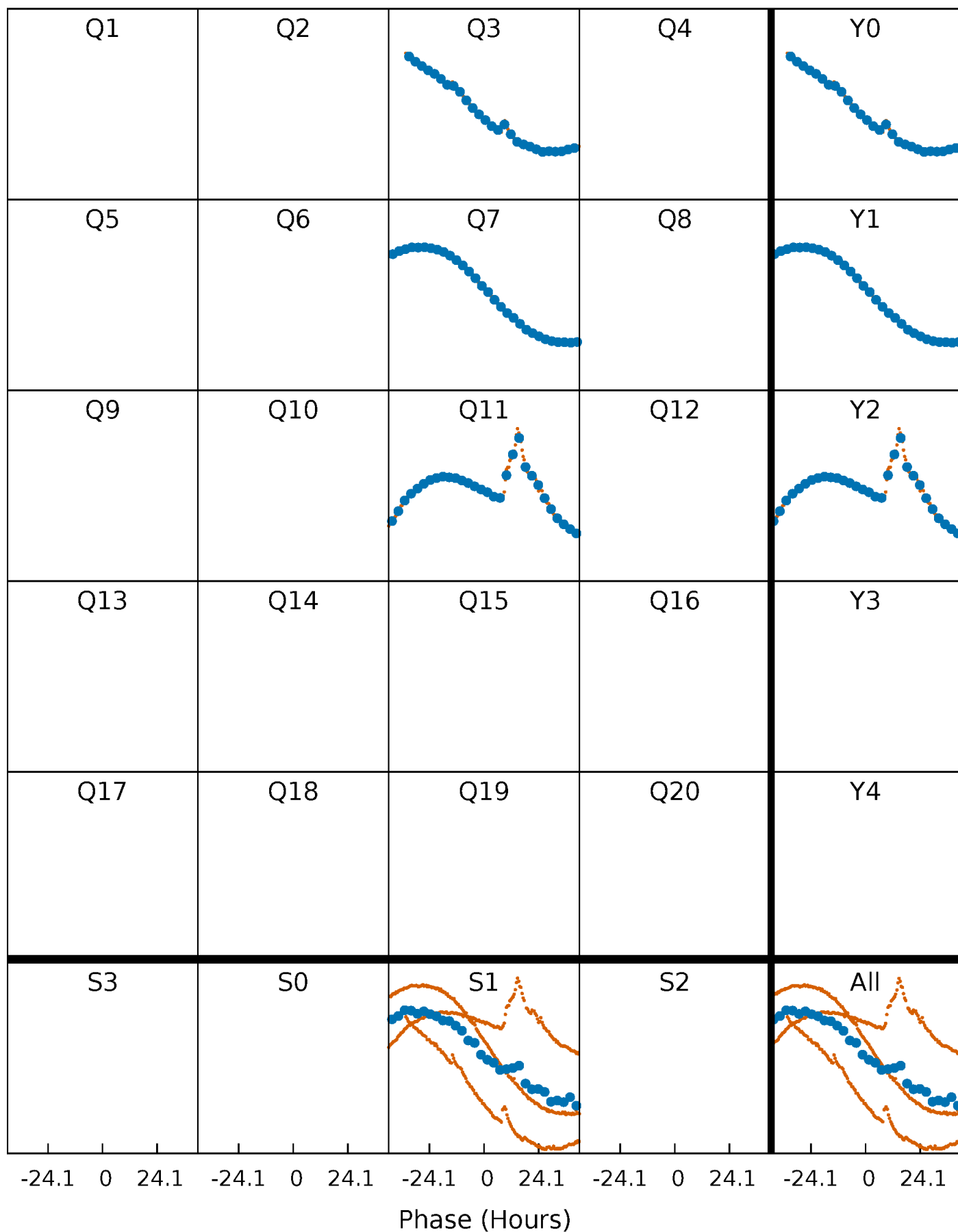


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



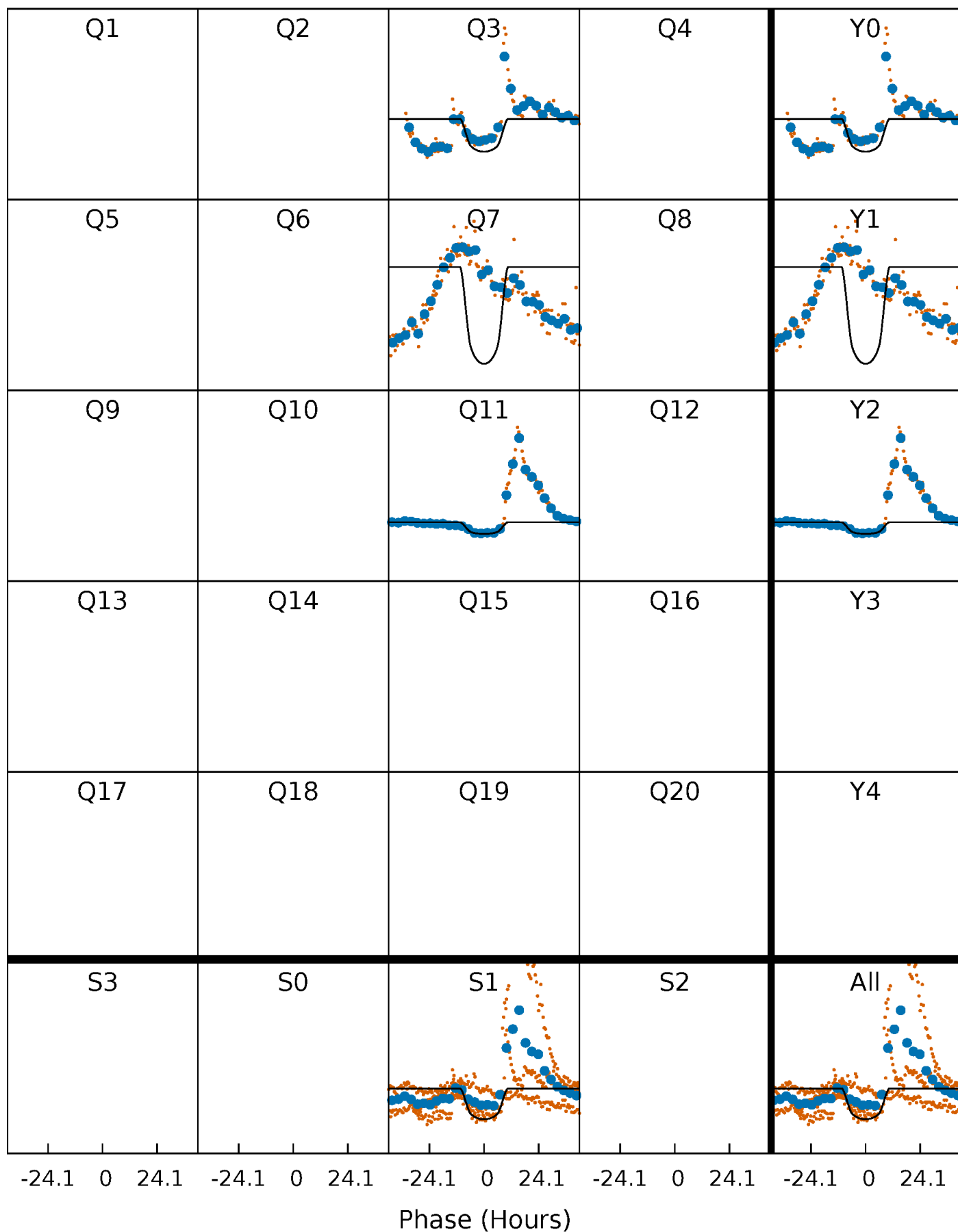
PDC Quarter-Phased Transit Curves

TCE 010070247-02 $P=400.552639$ Days $T_0=282.790324$ (BKJD)



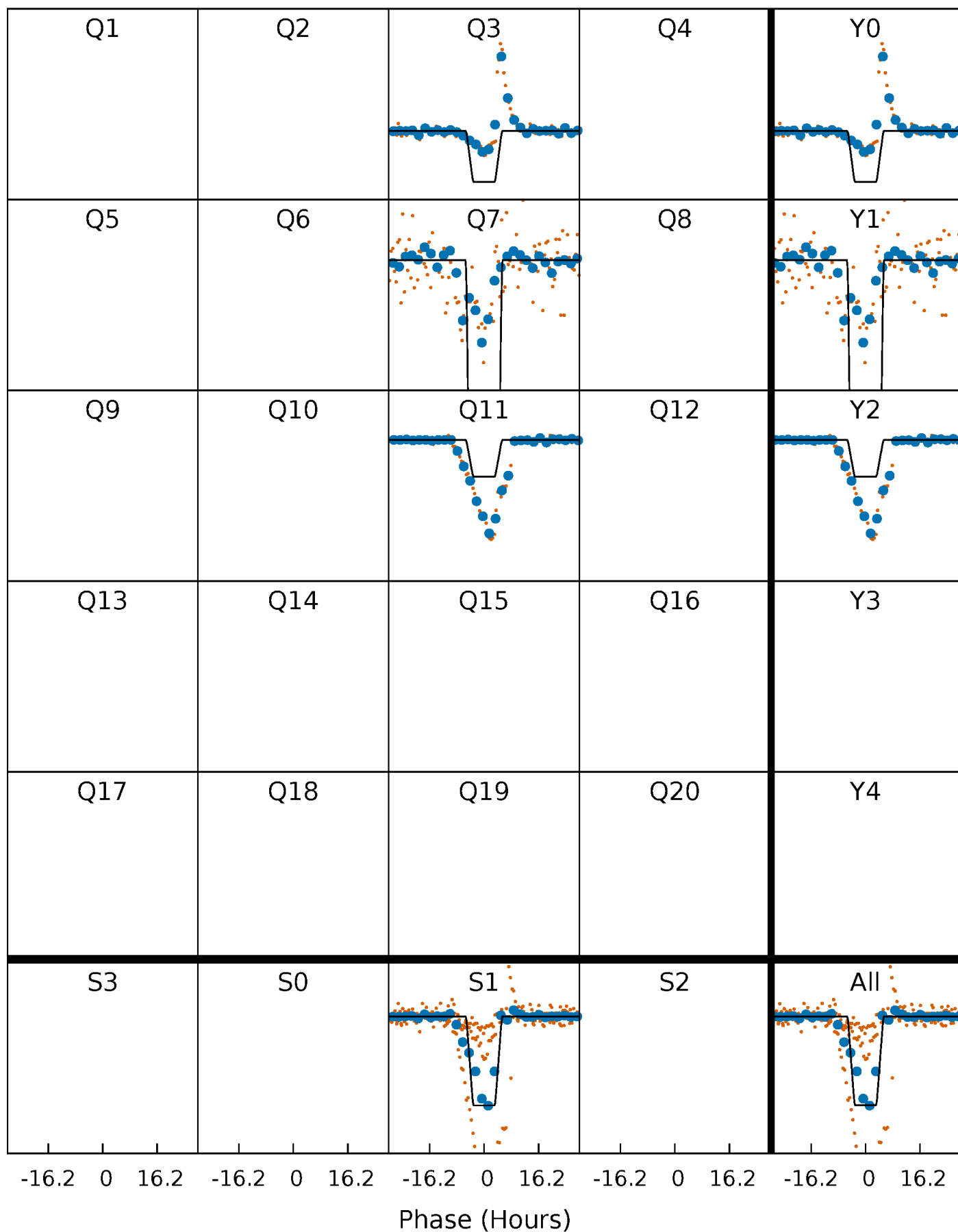
DV Quarter-Phased Transit Curves

TCE 010070247-02 $P=400.552639$ Days $T_0=282.790324$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

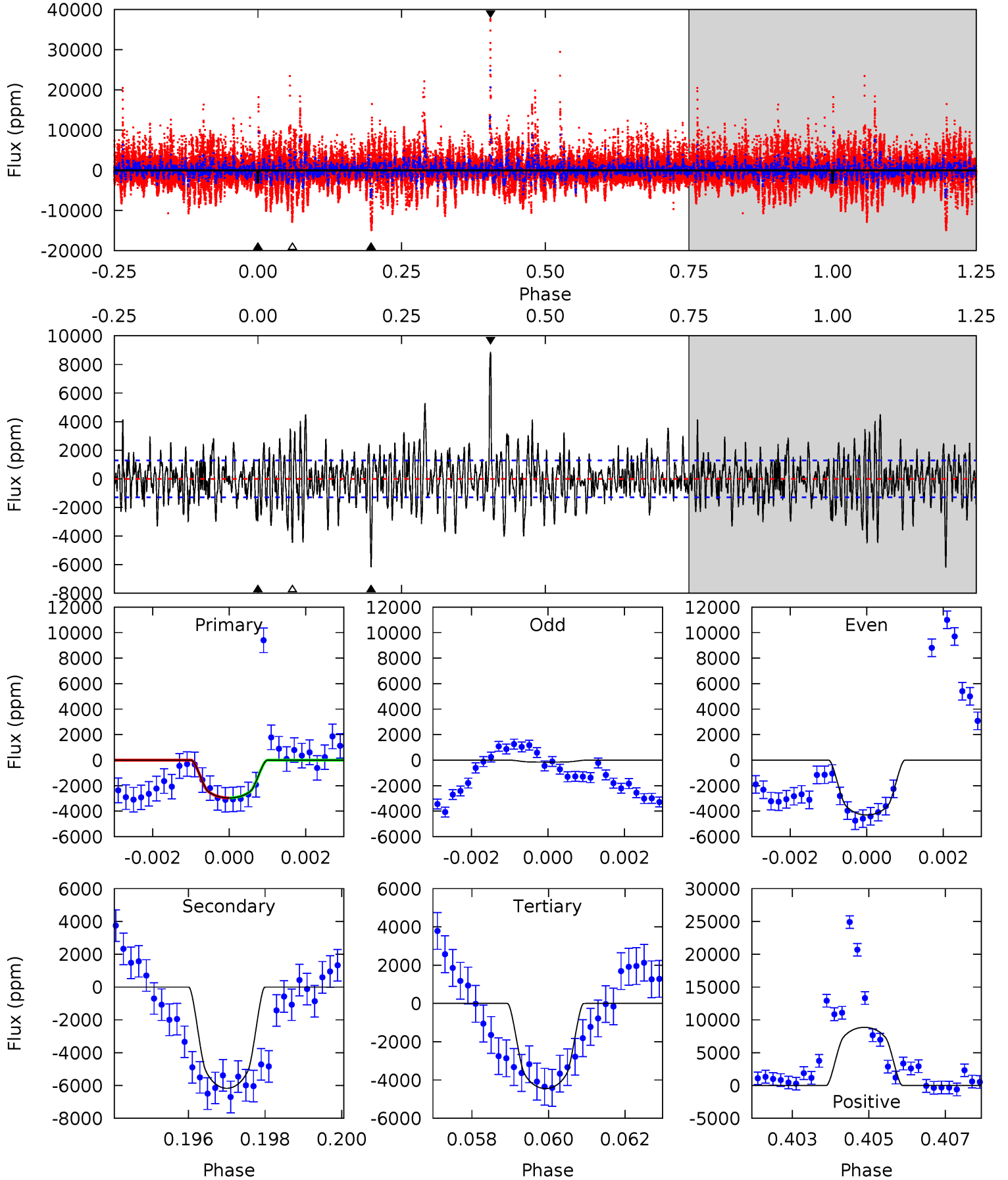
TCE 010070247-02 $P=400.586321$ Days $T_0=282.966443$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-02, P = 400.552639 Days, E = 282.790324 Days

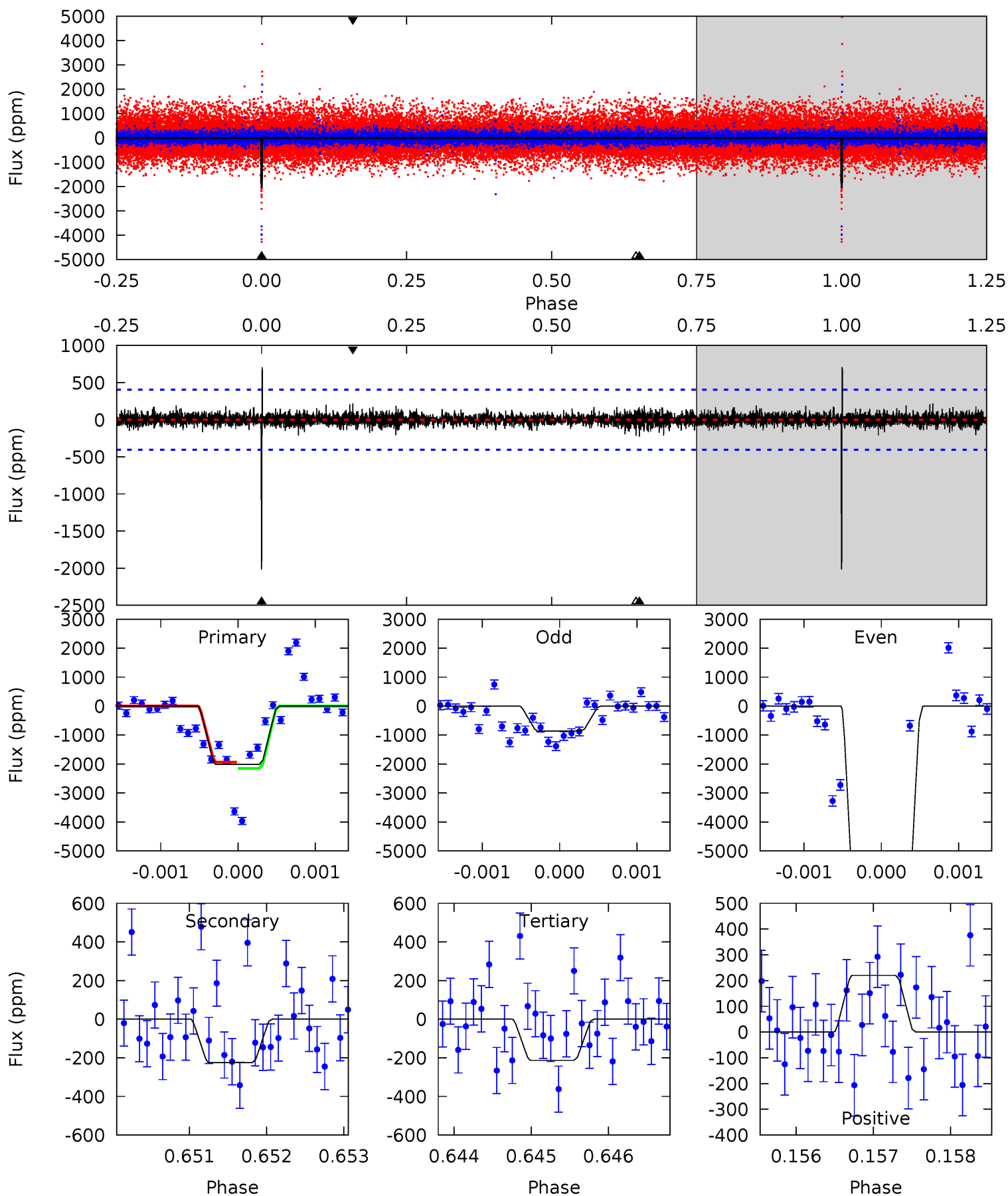
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	25.4	18.3	36.5	5.31	3.06	5.65	-6.12	-24.3	7.11	-11.1	6.47	0.93	0.59	0.02



Alt Model-Shift Uniqueness Test

010070247-02, P = 400.586321 Days, E = 282.966443 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.0	3.02	2.86	2.95	5.43	3.26	0.61	24.2	24.1	0.16	0.06	68.4	4.24	0.26	1.51



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-6172 ± 243	$5.84^{+0.52}_{-0.56}$	241^{+8}_{-9}	4582^{+221}_{-192}	87269^{+18195}_{-12593}
Alt.	-225 ± 75	$6.88^{+0.58}_{-0.52}$	241^{+9}_{-9}	2594^{+126}_{-129}	2245^{+908}_{-697}

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 $A_{obs} \gg 1.0$

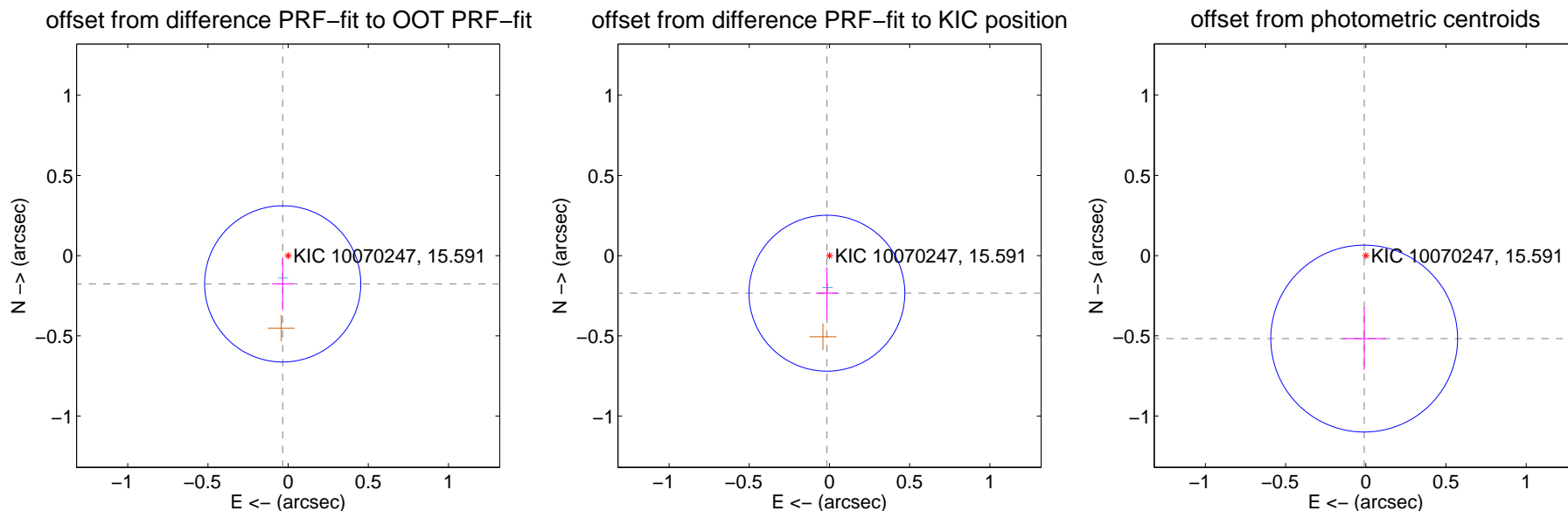
DV Centroid Data

Supplemental centroid analysis for 010070247-02. Kepler magnitude: 15.59. Transit SNR 9.68

There are 1 quarters with good PRF difference image offsets

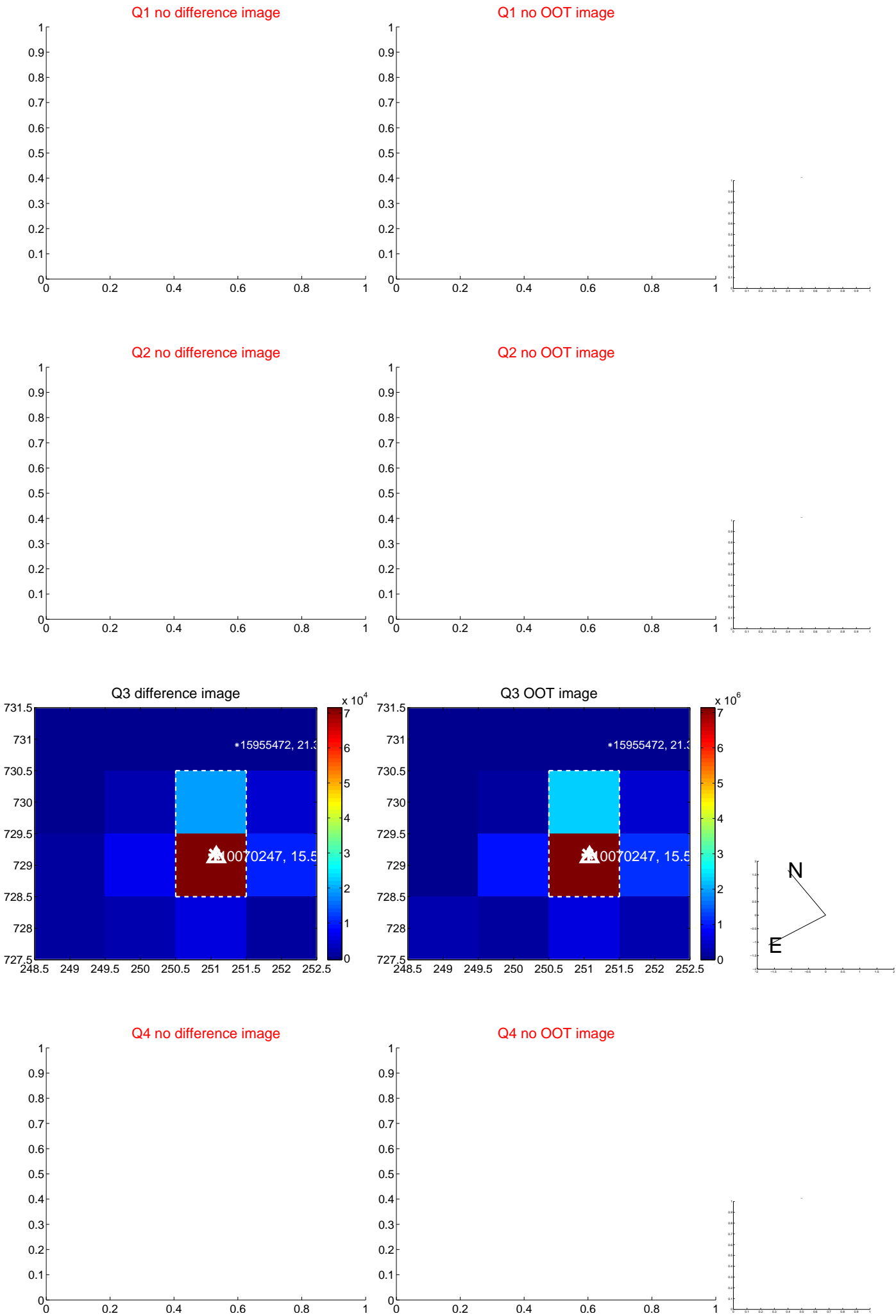
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.179 ± 0.162	1.10	0.034 ± 0.067	-0.176 ± 0.164
PRF-fit source offset from KIC position	0.235 ± 0.162	1.45	0.016 ± 0.068	-0.234 ± 0.161
photometric centroid source offset	0.52 ± 0.19	2.67	0.01 ± 0.13	-0.52 ± 0.19

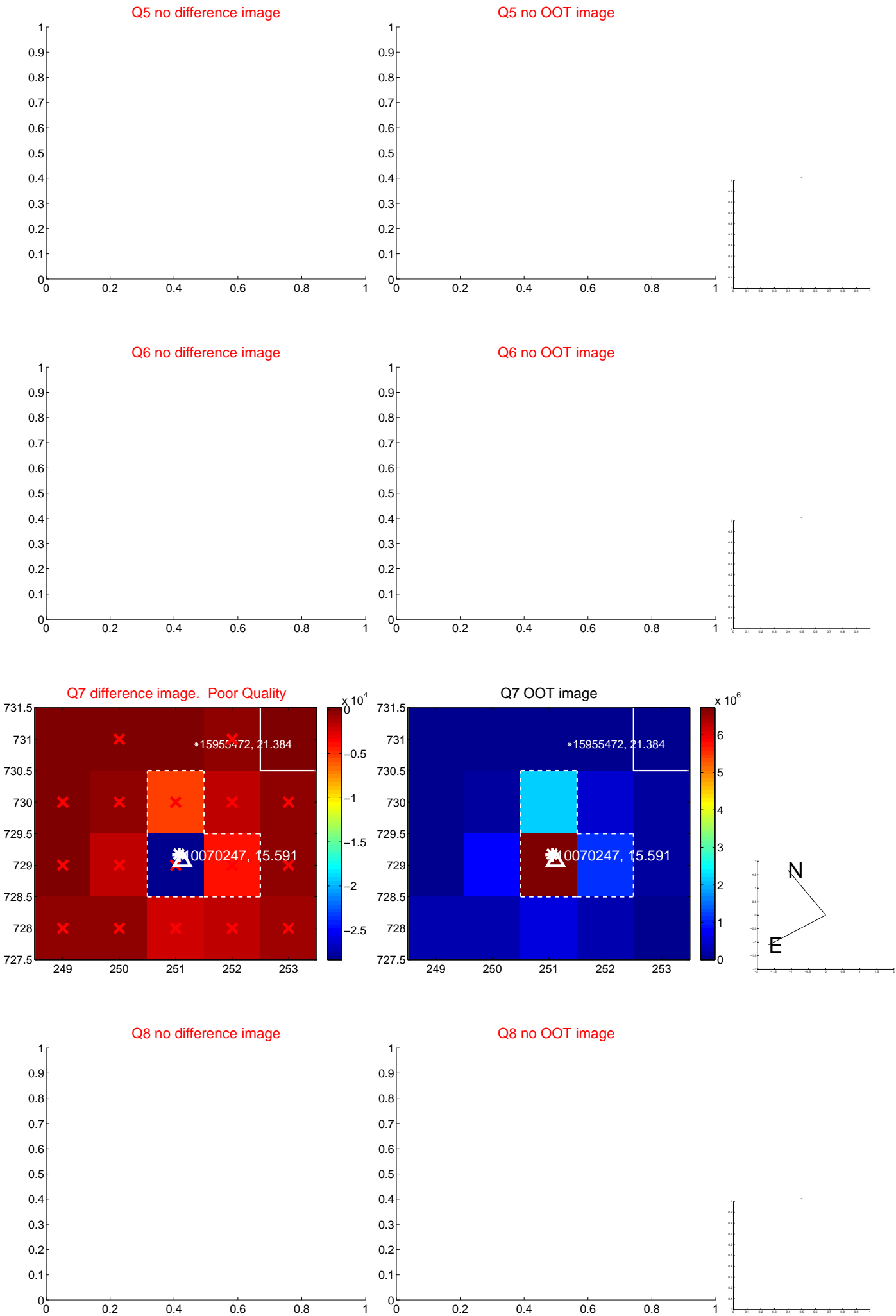


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



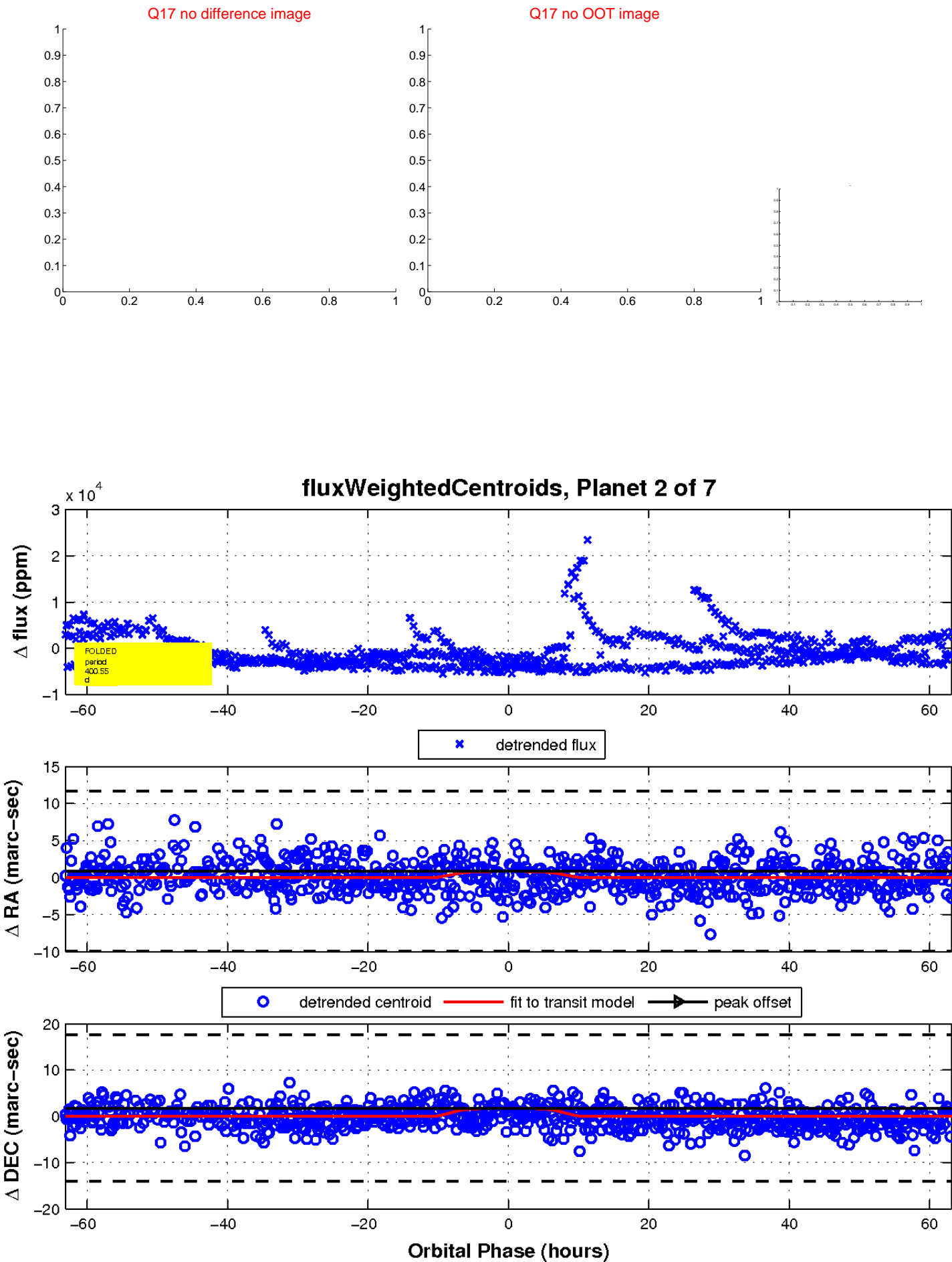
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

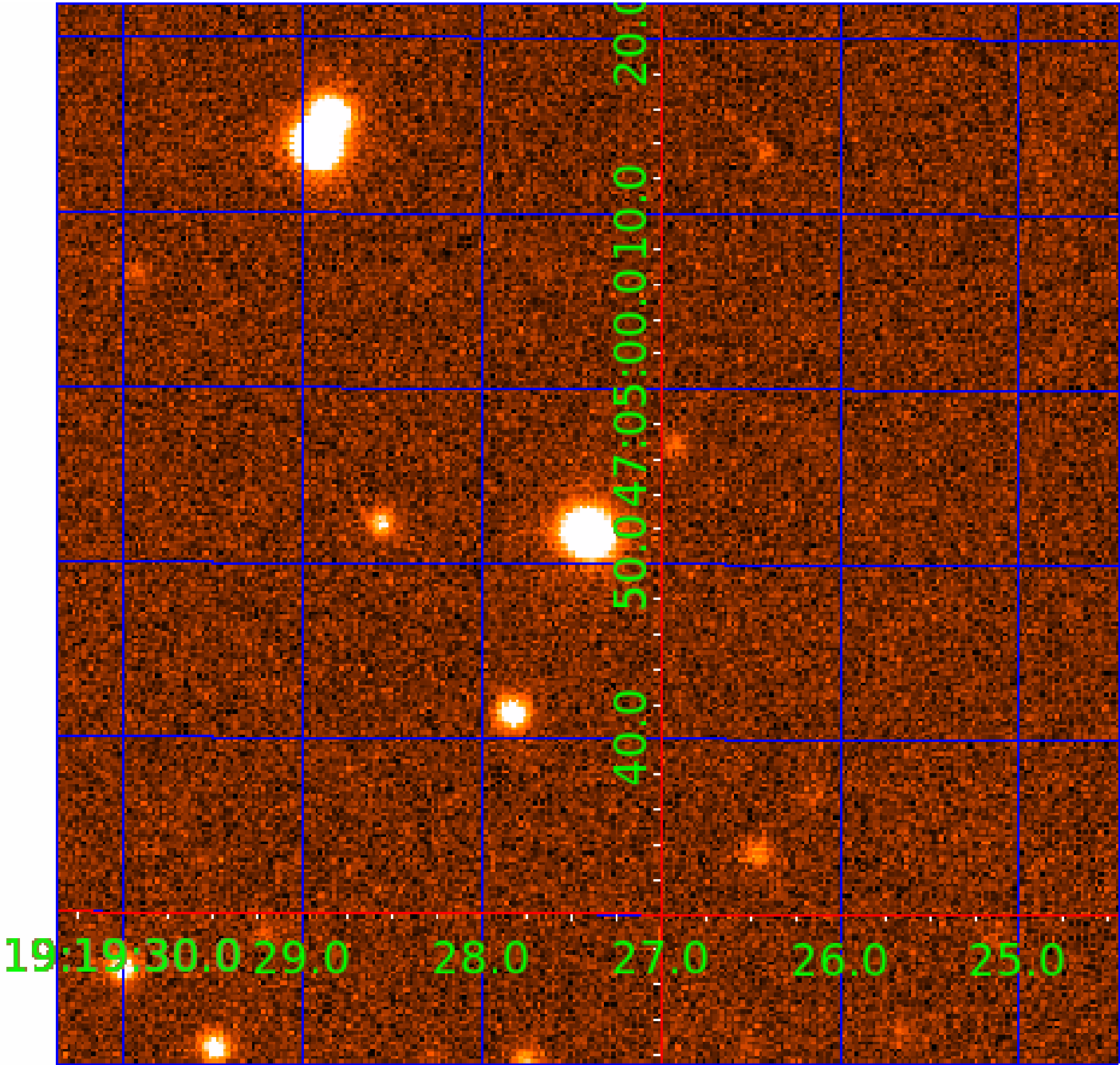


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010070247

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})
010070247-01	OBS	No	594.920052	275.955088	3535.1	10.175	21.7	8.5	0.67	4607	3.83	0.13
010070247-02	OBS	No	400.552639	282.790324	5684.4	21.072	22.7	9.7	0.67	4607	5.83	0.21
010070247-03	OBS	No	395.352334	203.669219	5945.5	16.644	21.3	13.1	0.67	4607	4.97	0.22
010070247-04	OBS	No	375.609374	481.595164	1871.5	8.096	19.0	5.3	0.67	4607	2.94	0.23
010070247-05	OBS	No	544.923164	410.267670	4500.5	7.588	17.8	11.2	0.67	4607	4.32	0.14
010070247-06	OBS	No	514.574327	368.857770	2772.1	5.580	15.7	8.5	0.67	4607	3.67	0.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010070247-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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

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

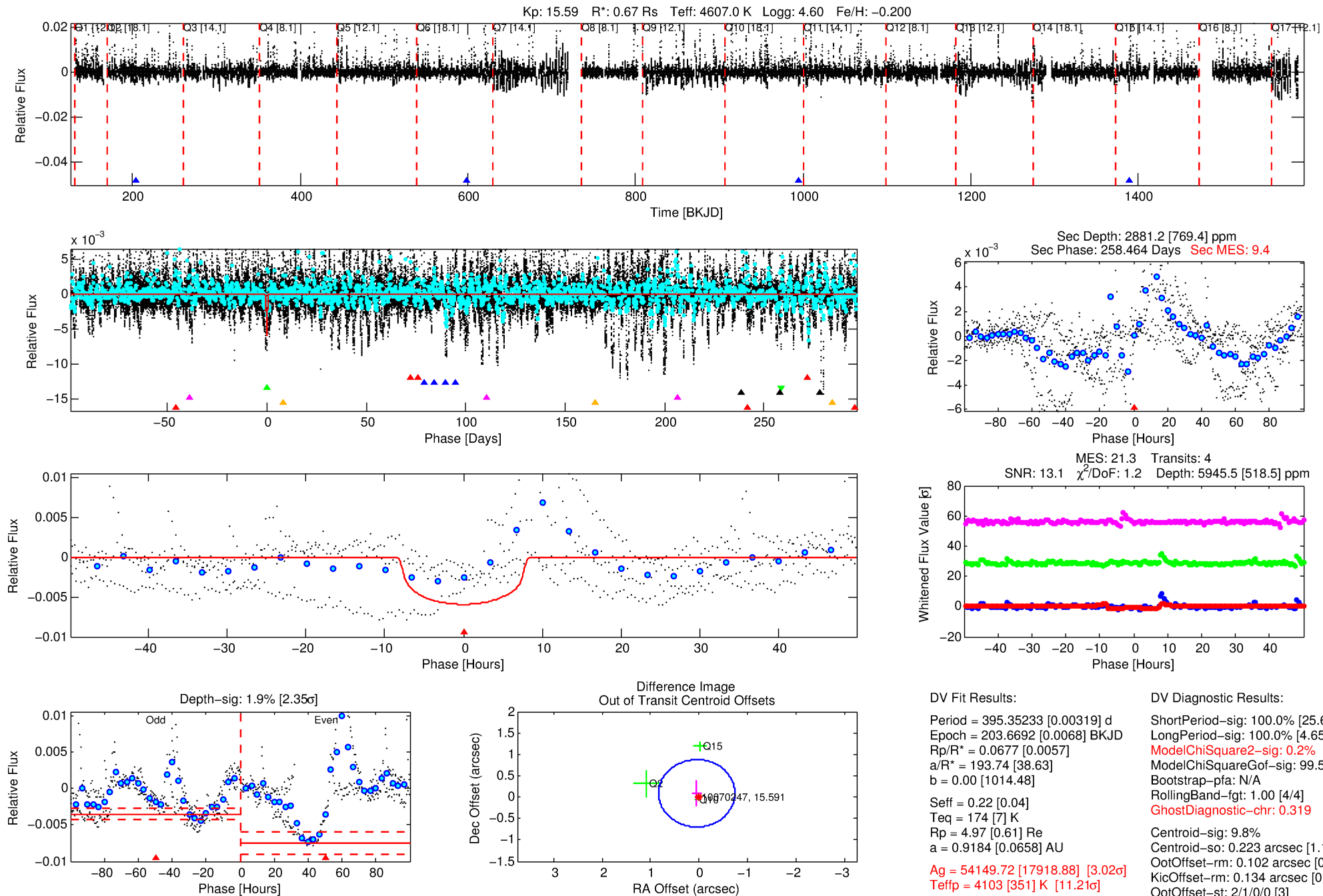
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010070247-03

No Significant Match Found

DV One-Page Summary

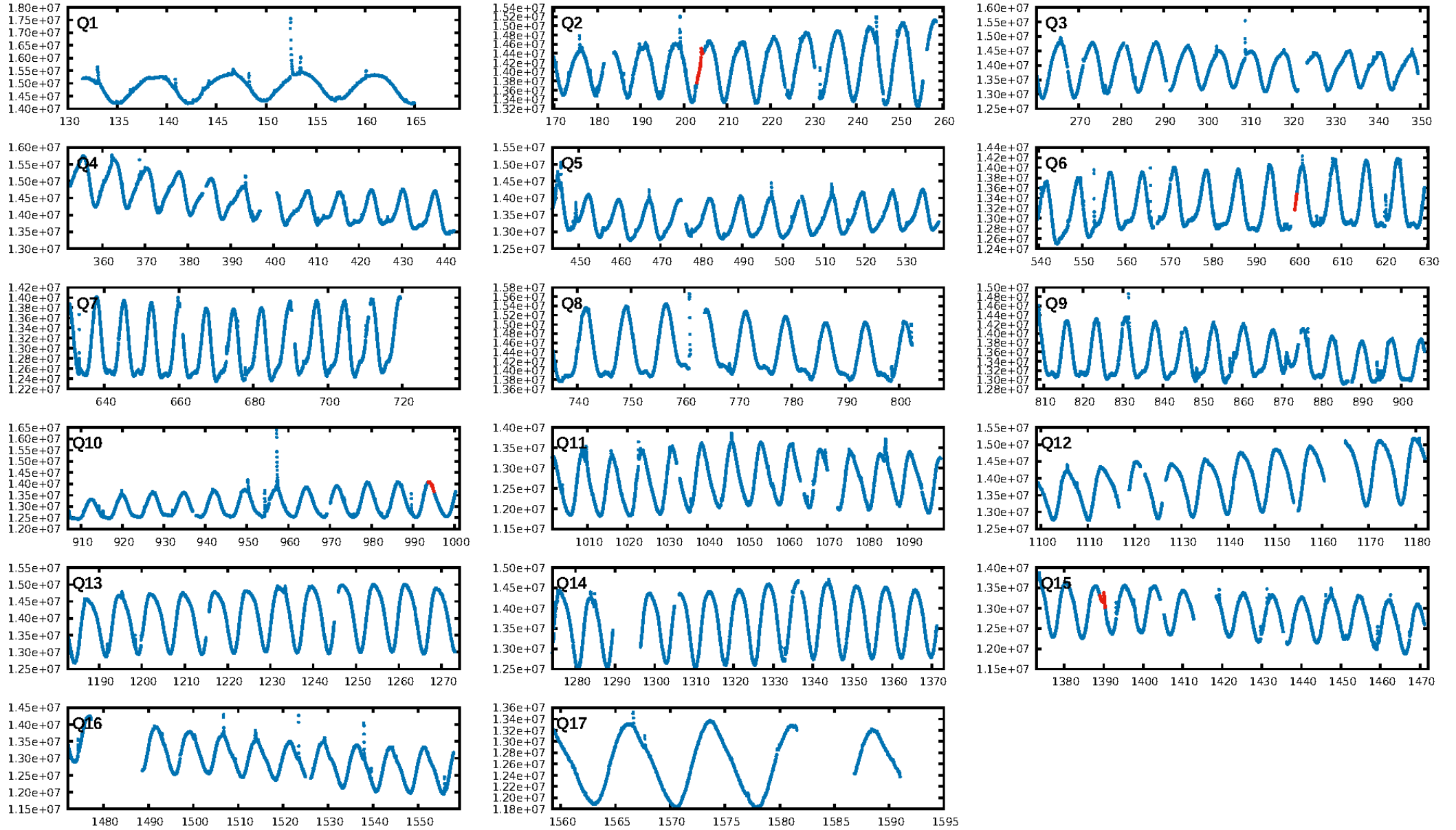
KIC: 10070247 Candidate: 3 of 7 Period: 395.352 d



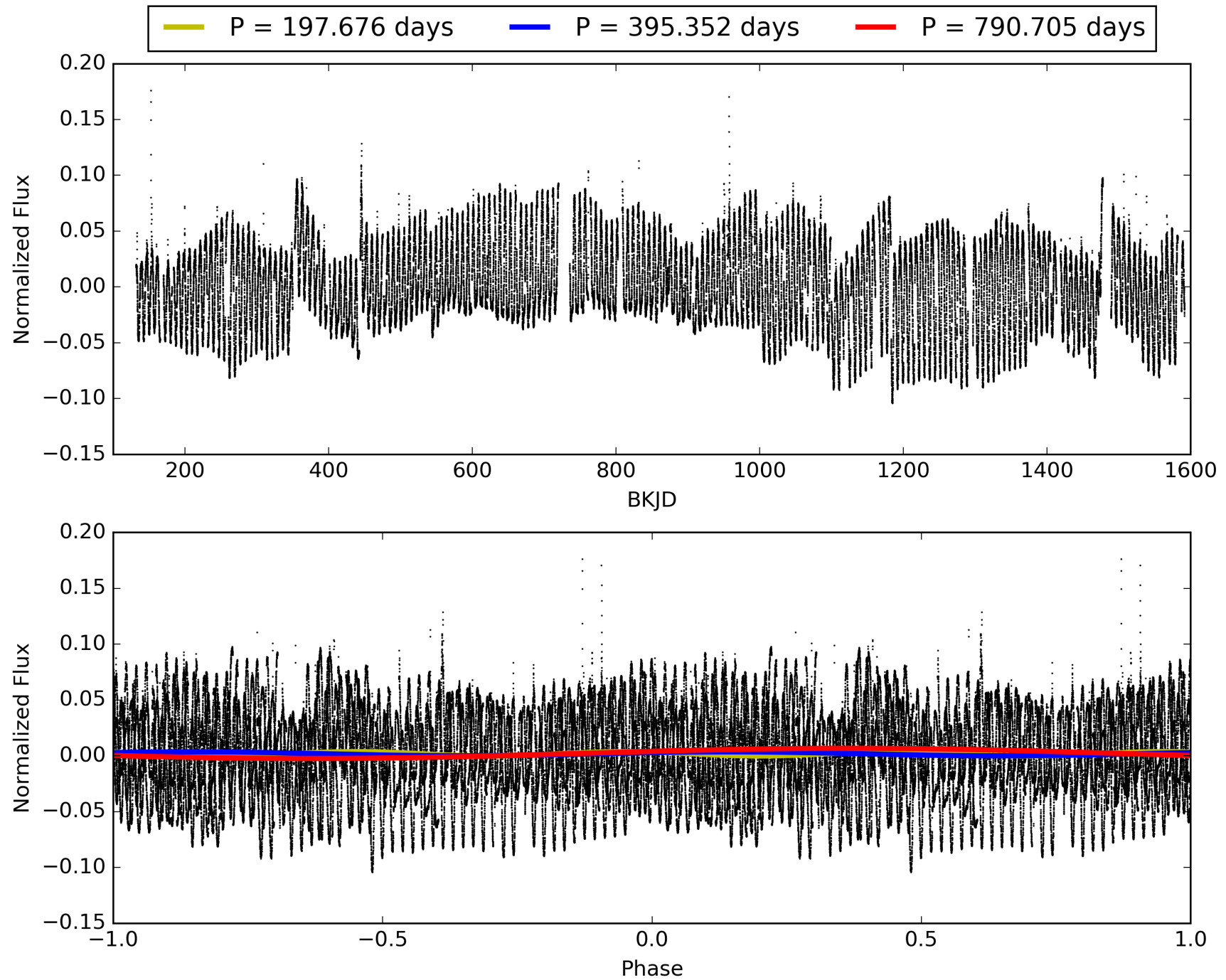
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:08:59 Z

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

TCE 010070247-03, PDC Light Curves

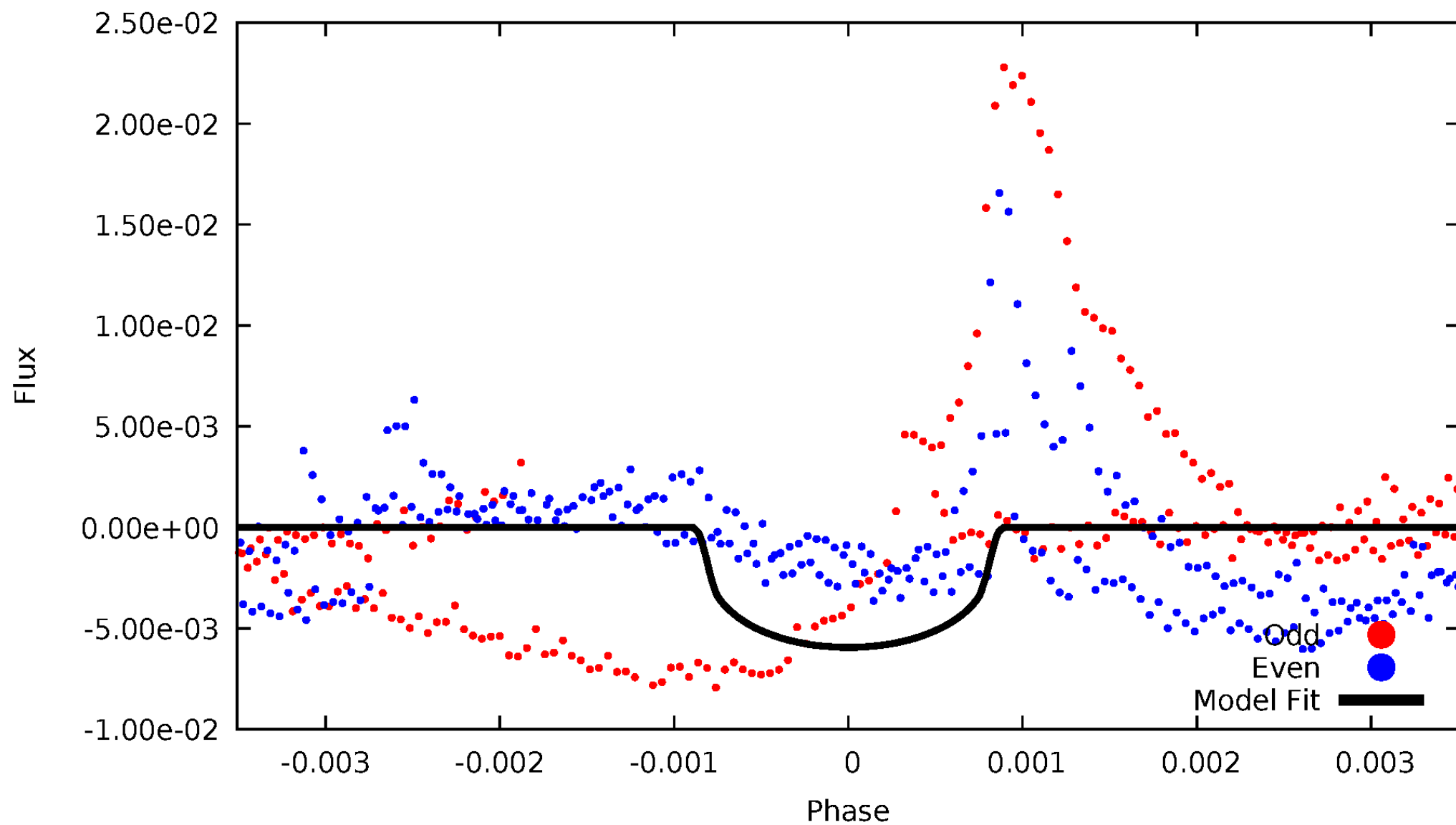


TCE 010070247-03



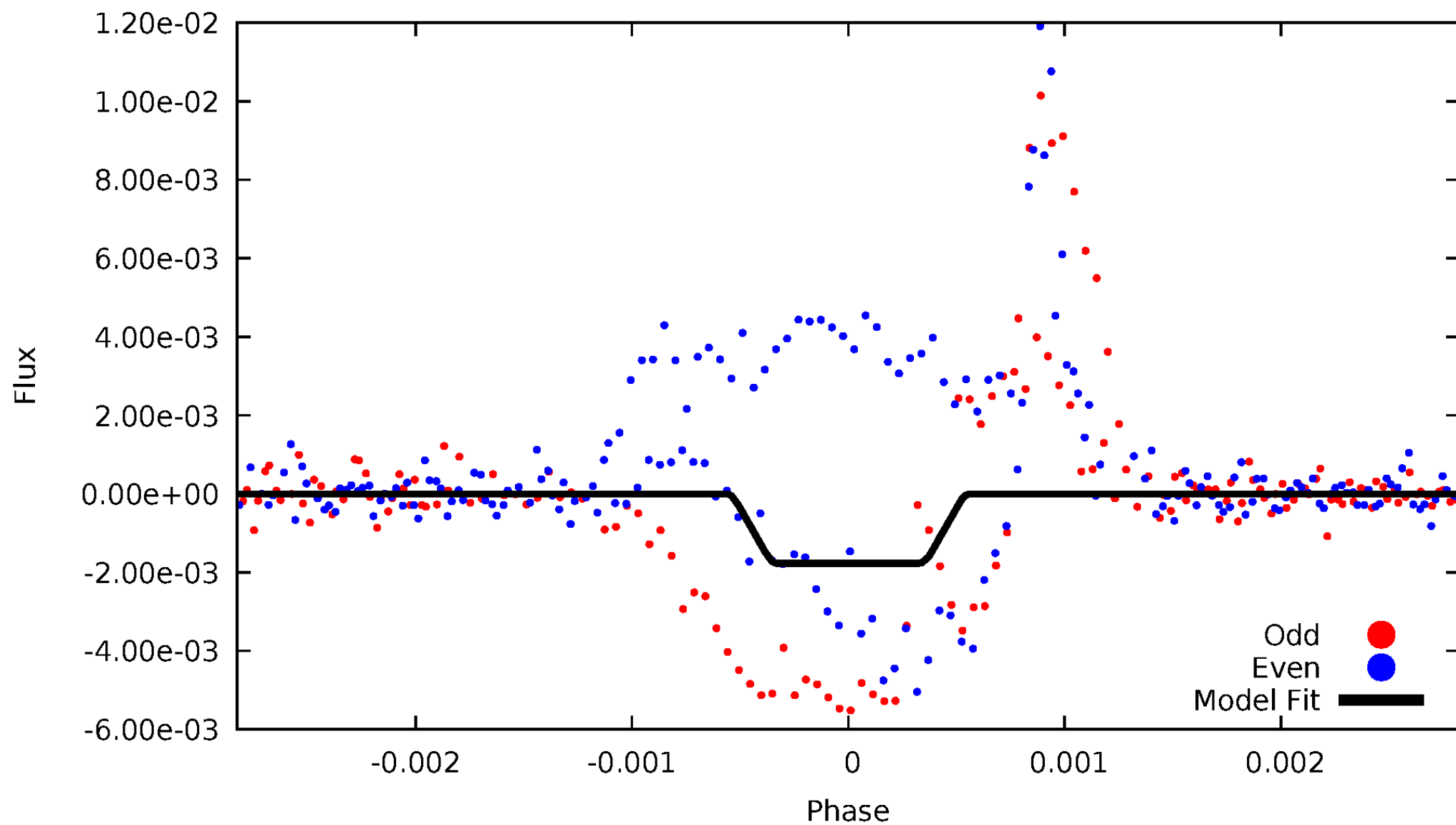
DV Odd/Even

TCE 010070247-03



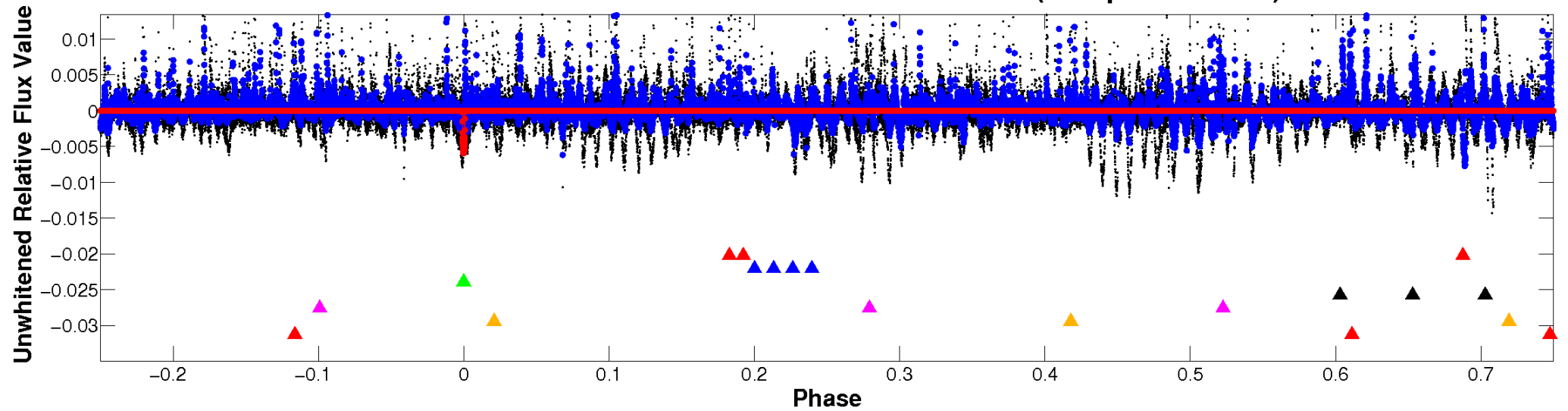
ALT Odd/Even

TCE 010070247-03

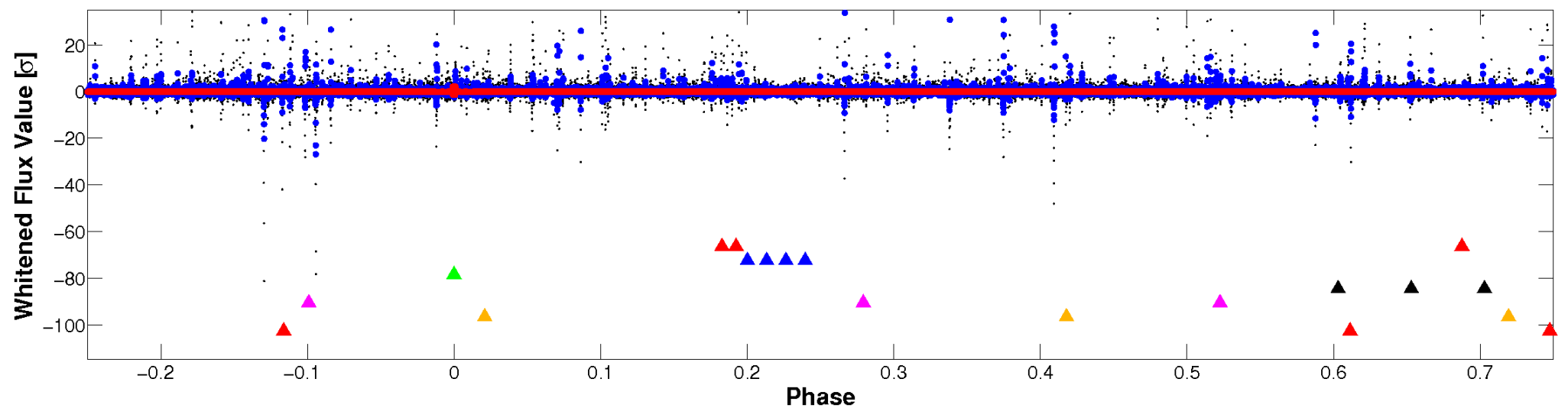


Non-Whitened Vs. Whitened Light Curve

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

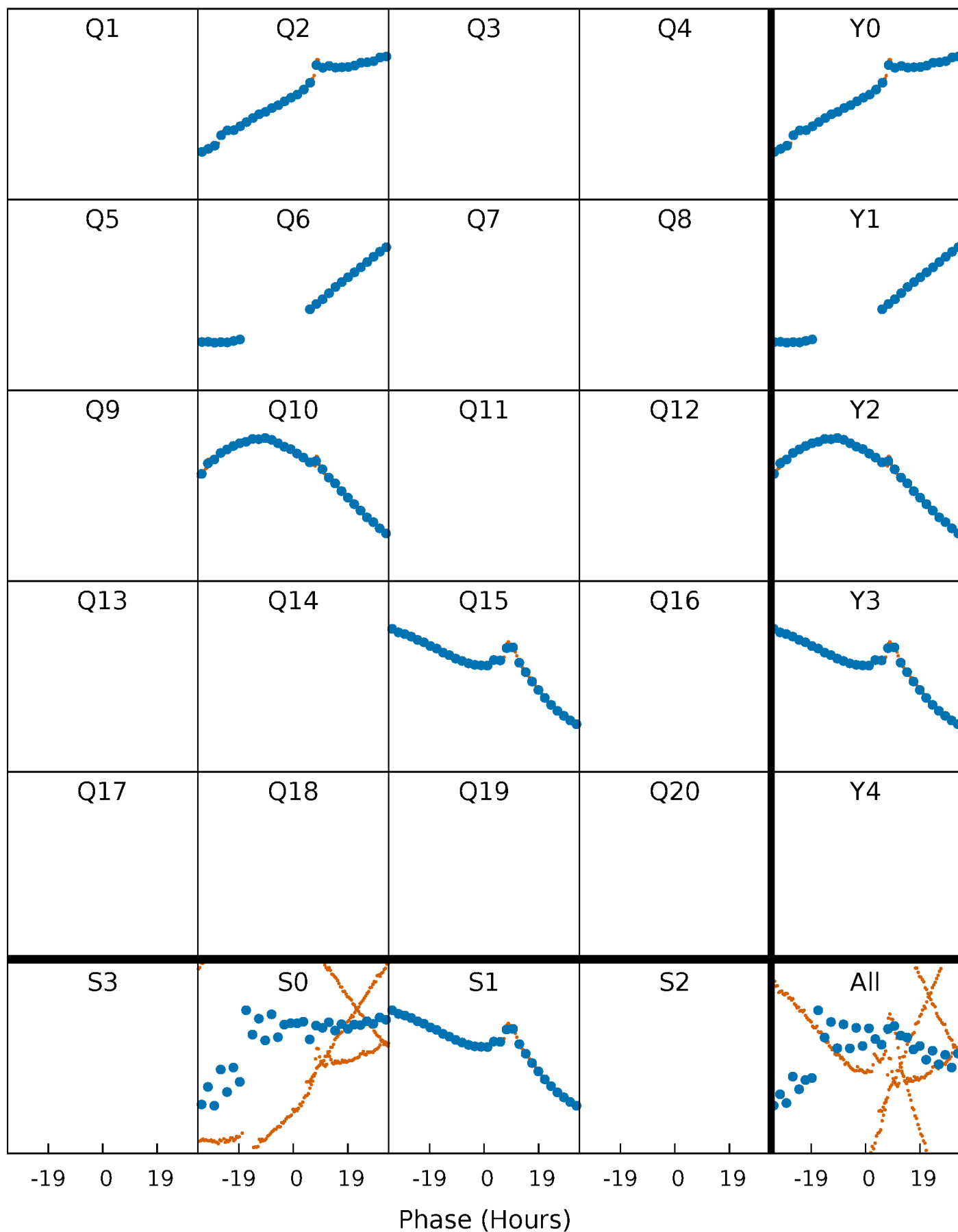


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



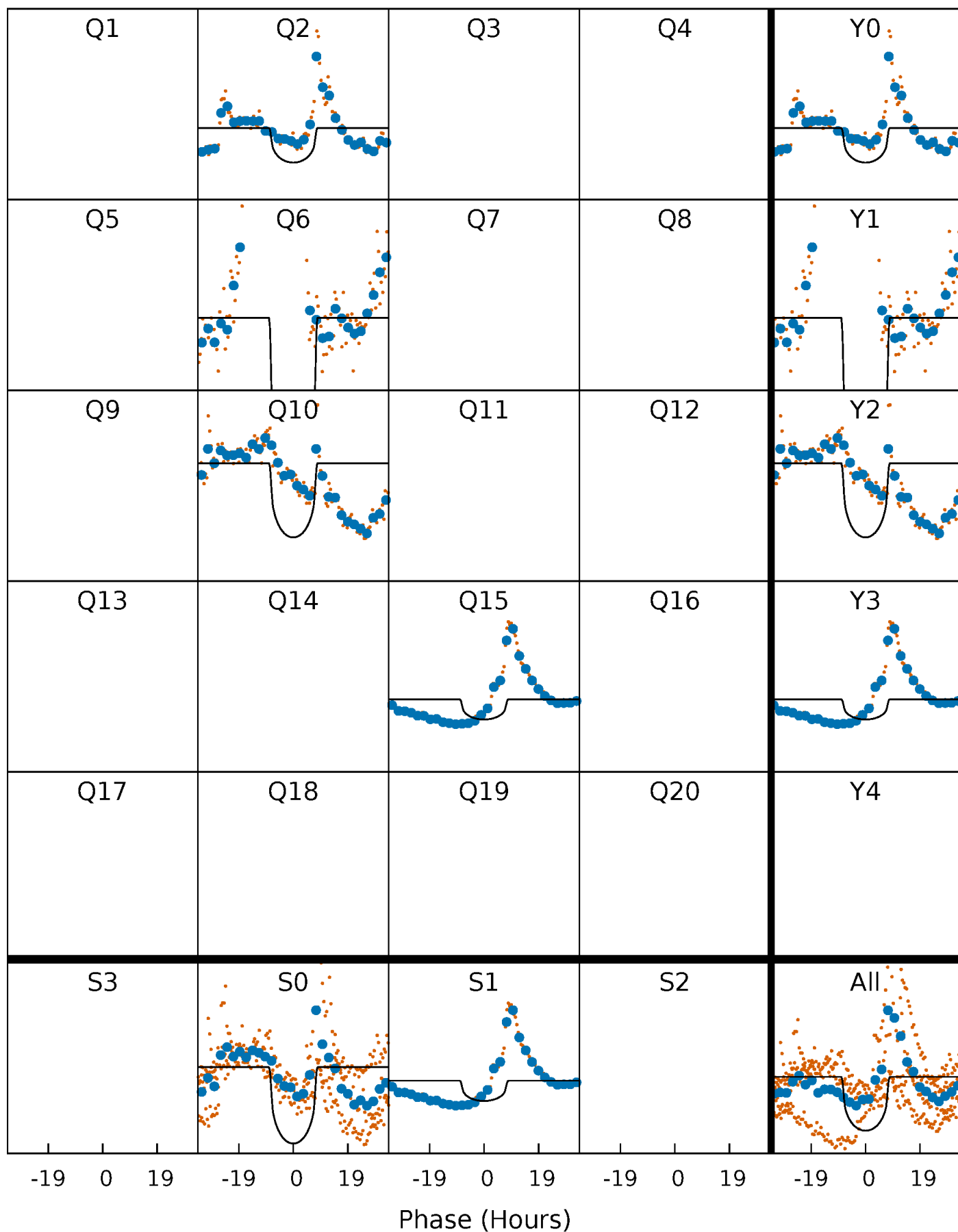
PDC Quarter-Phased Transit Curves

TCE 010070247-03 $P=395.352334$ Days $T_0=203.669219$ (BKJD)



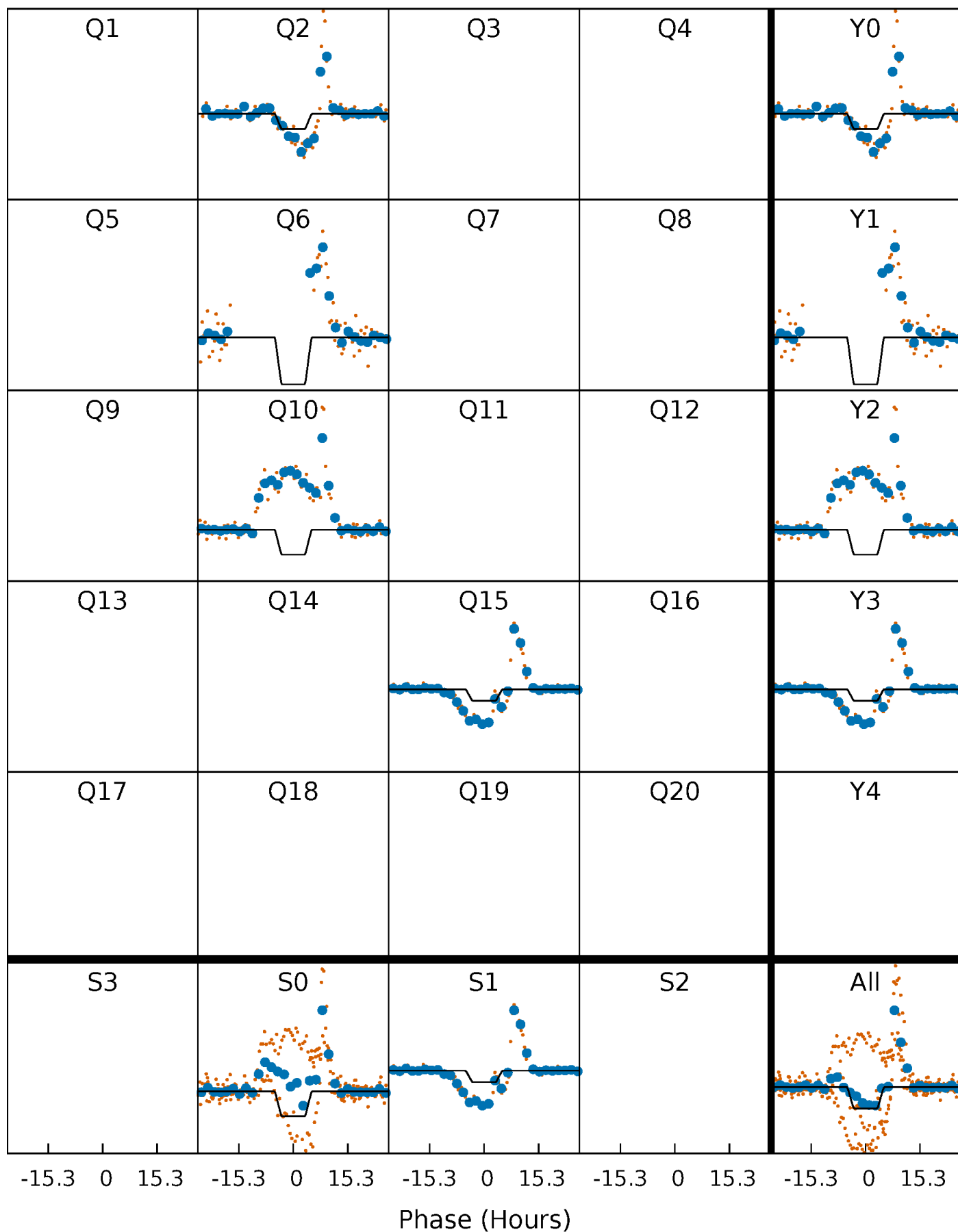
DV Quarter-Phased Transit Curves

TCE 010070247-03 $P=395.352334$ Days $T_0=203.669219$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

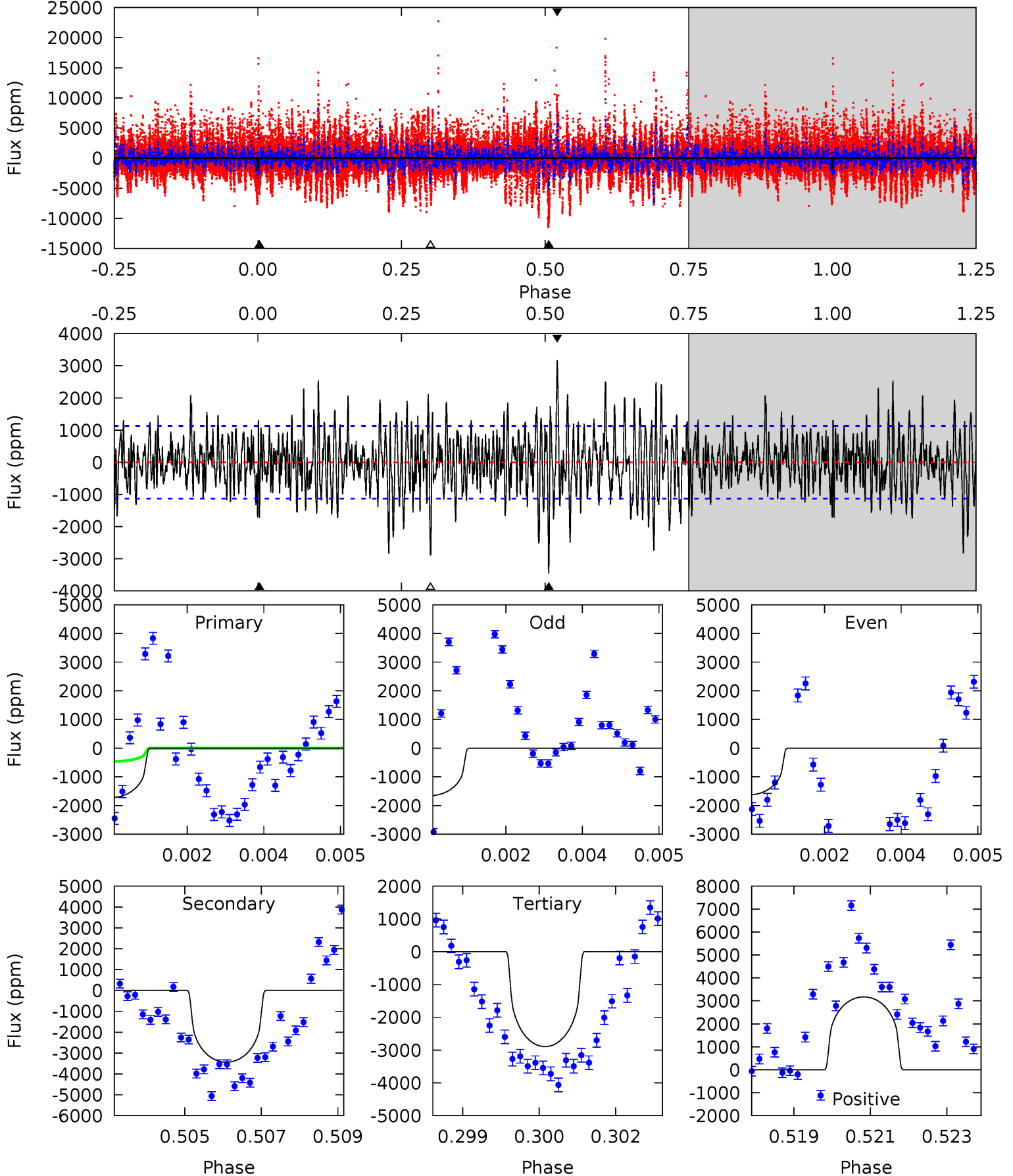
TCE 010070247-03 $P=395.355330$ Days $T_0=203.662013$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-03, P = 395.352334 Days, E = 203.669219 Days

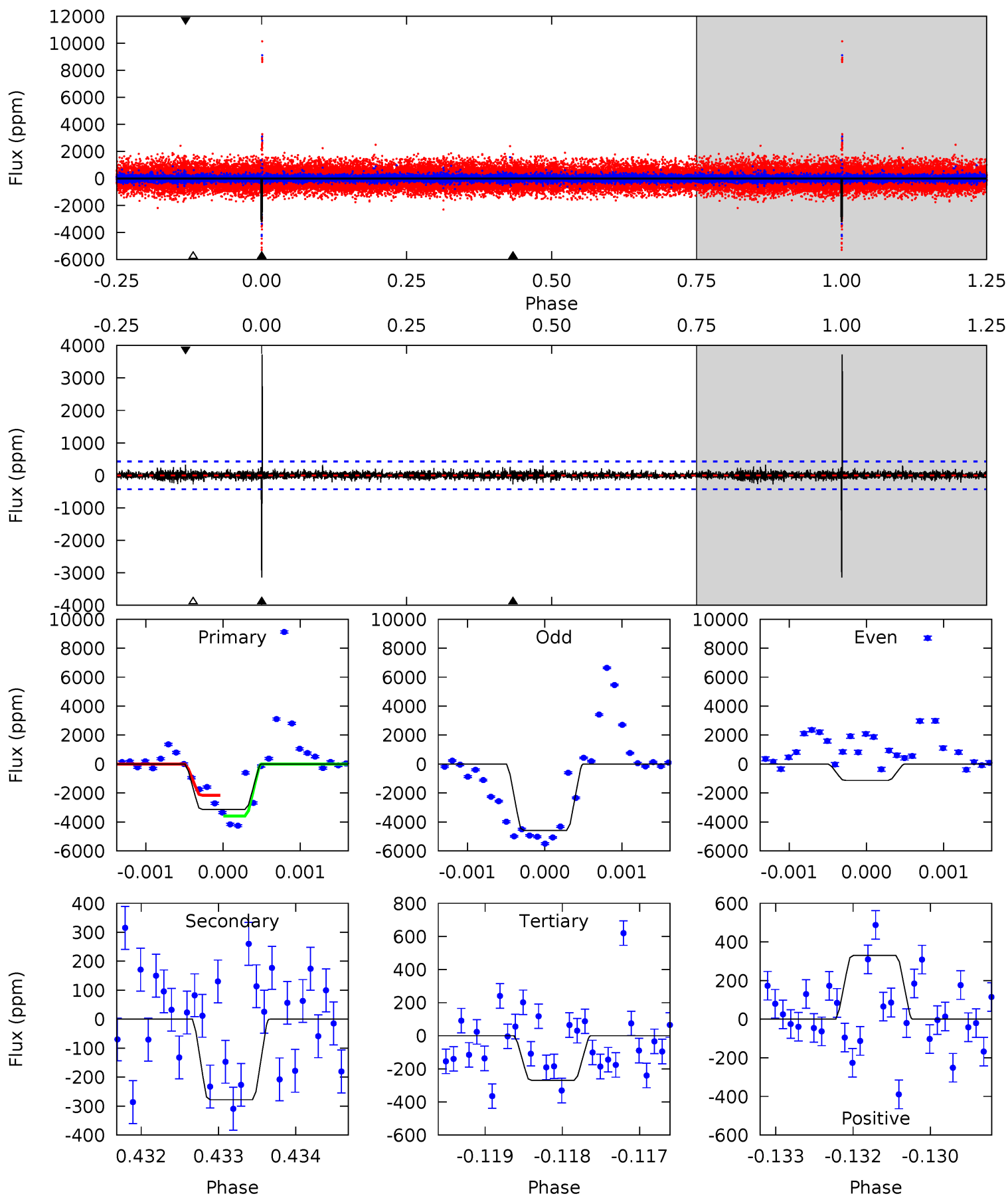
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.15	16.3	13.7	15.0	5.35	3.13	3.72	-5.54	-6.86	2.56	1.25	0.04	0.77	0.48	6.25



Alt Model-Shift Uniqueness Test

010070247-03, P = 395.355330 Days, E = 203.662013 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
39.9	3.53	3.43	4.19	5.43	3.26	0.70	36.5	35.7	0.11	-0.66	29.4	5.90	0.54	0



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3436 ± 211	$4.94^{+0.51}_{-0.49}$	242^{+8}_{-9}	4344^{+211}_{-192}	65654^{+15355}_{-11176}
Alt.	-278 ± 79	$3.09^{+0.43}_{-0.45}$	242^{+9}_{-9}	3324^{+247}_{-208}	13489^{+7296}_{-4445}

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 $A_{obs} \gg 1.0$

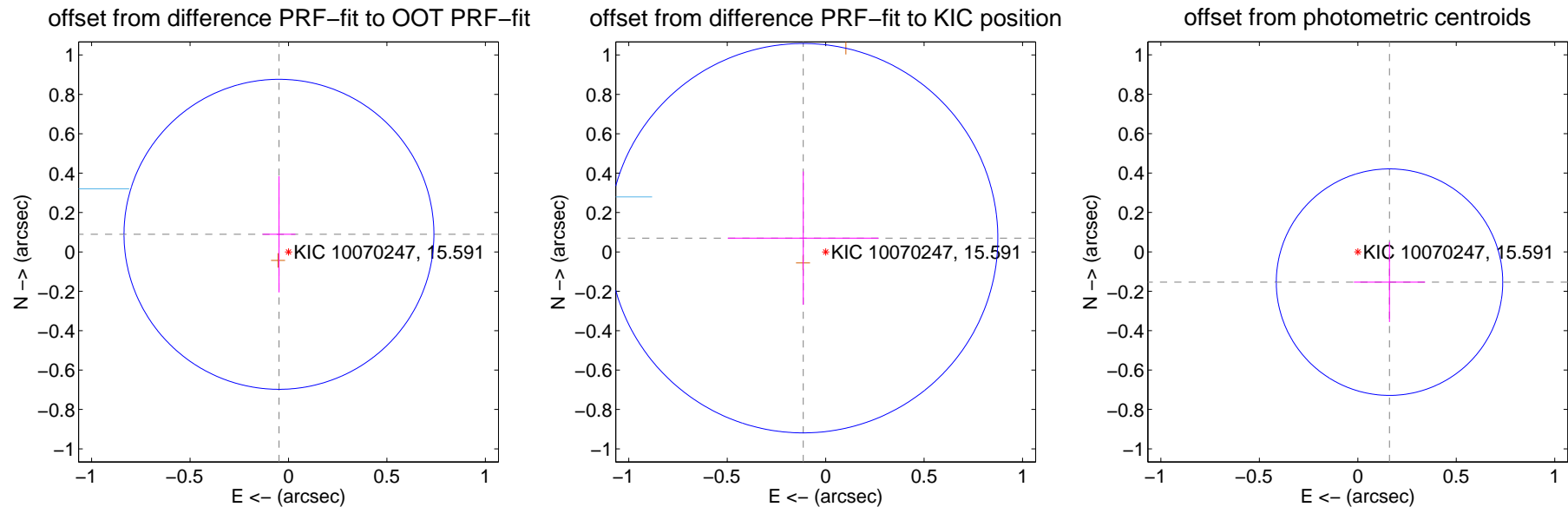
DV Centroid Data

Supplemental centroid analysis for 010070247-03. Kepler magnitude: 15.59. Transit SNR 13.08

There are 1 quarters with good PRF difference image offsets

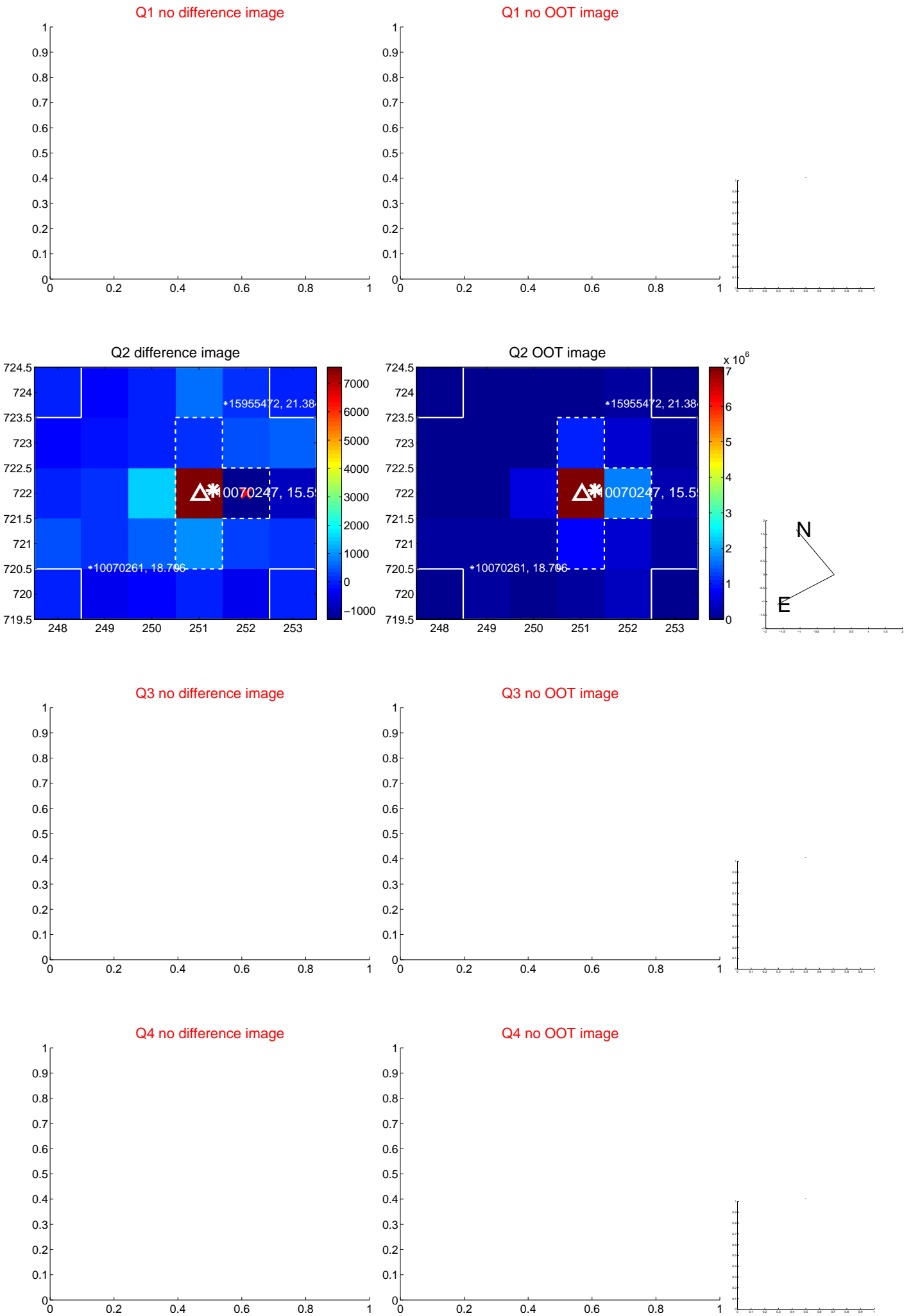
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.102 ± 0.262	0.39	0.048 ± 0.084	0.089 ± 0.295
PRF-fit source offset from KIC position	0.134 ± 0.330	0.41	0.114 ± 0.383	0.070 ± 0.338
photometric centroid source offset	0.22 ± 0.19	1.16	-0.16 ± 0.18	-0.15 ± 0.20



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.

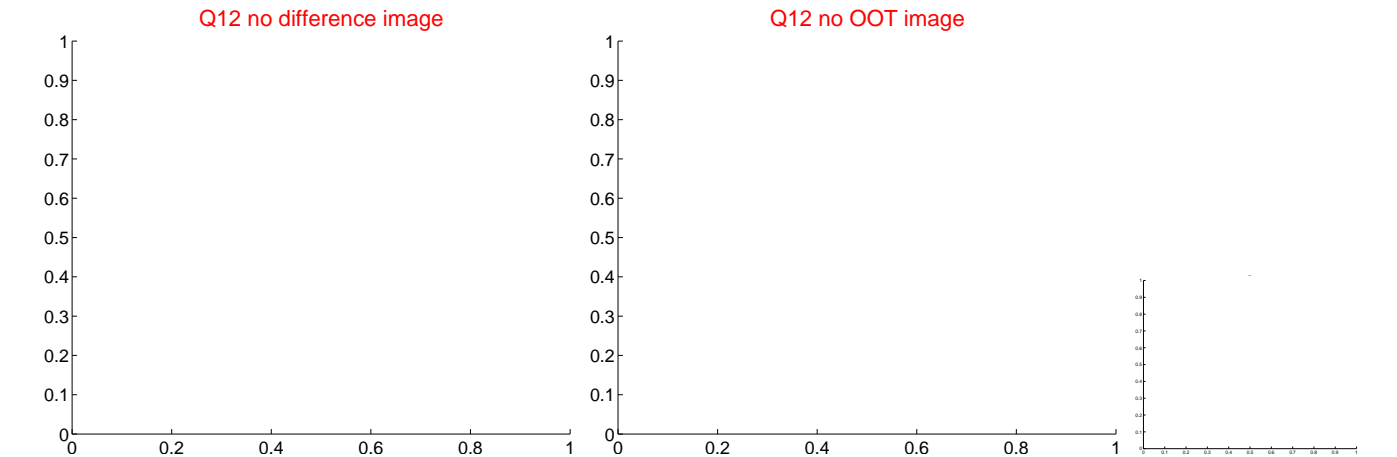
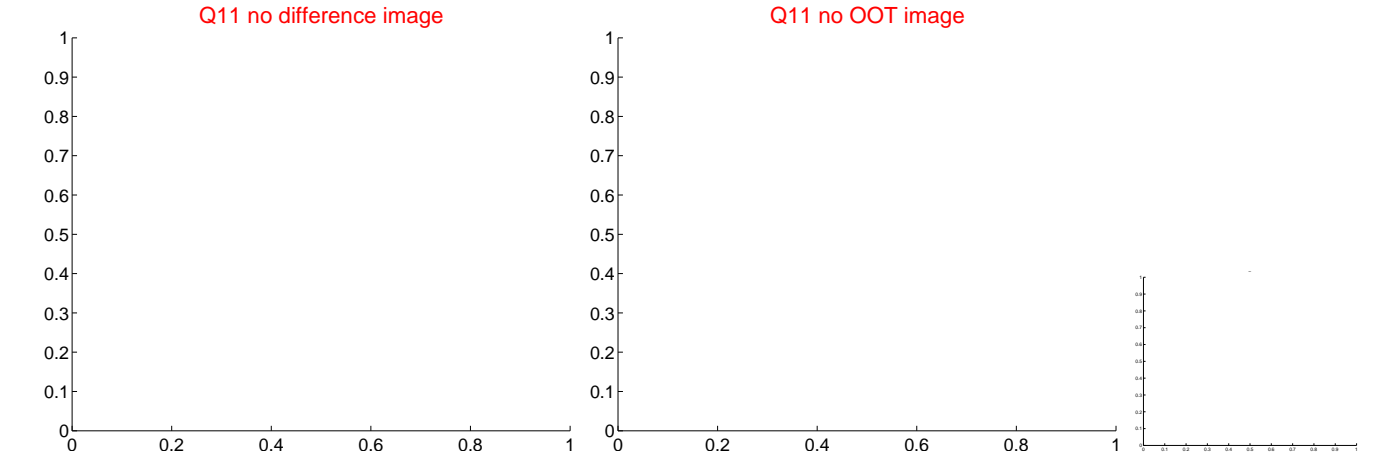
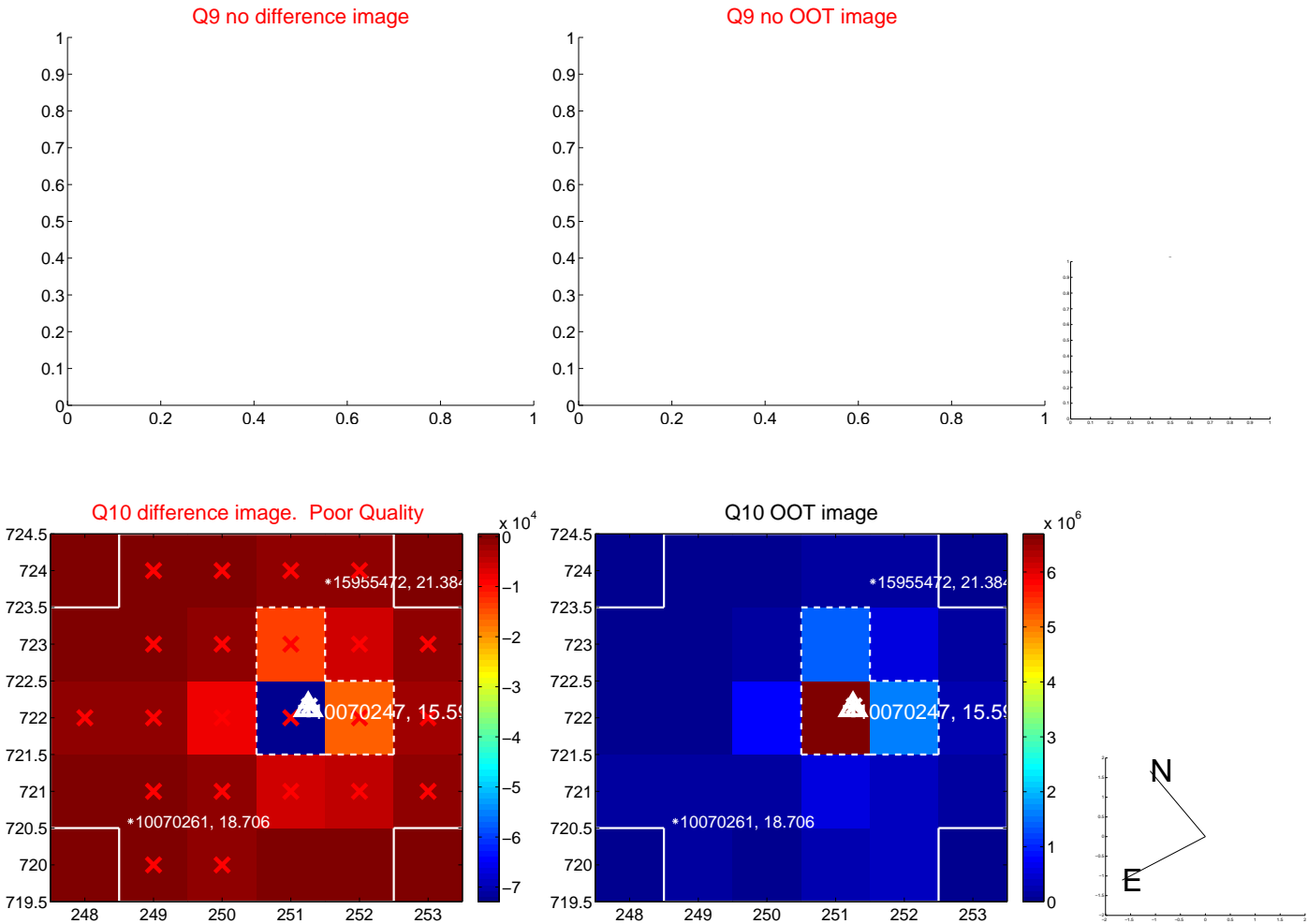
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



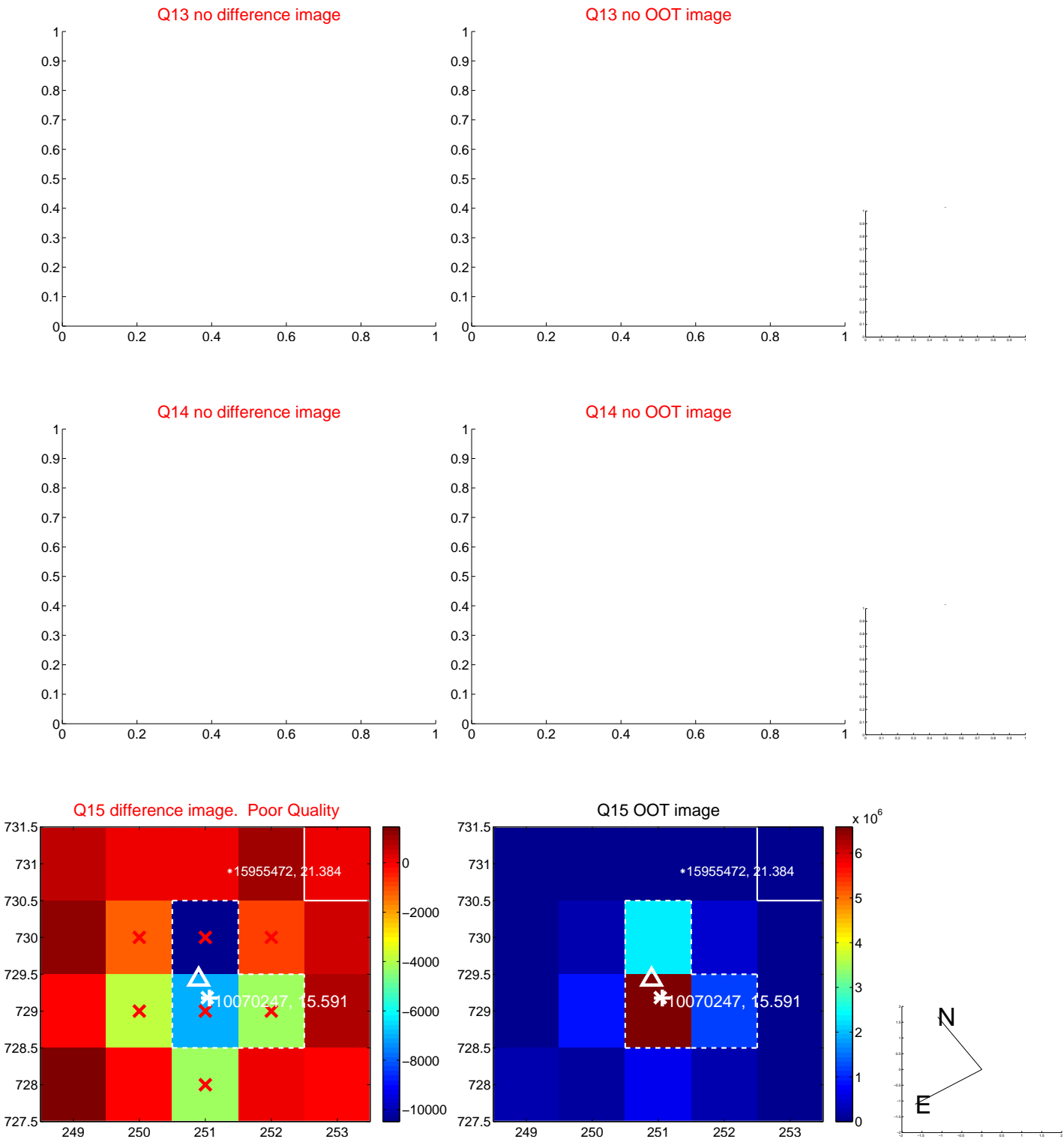
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



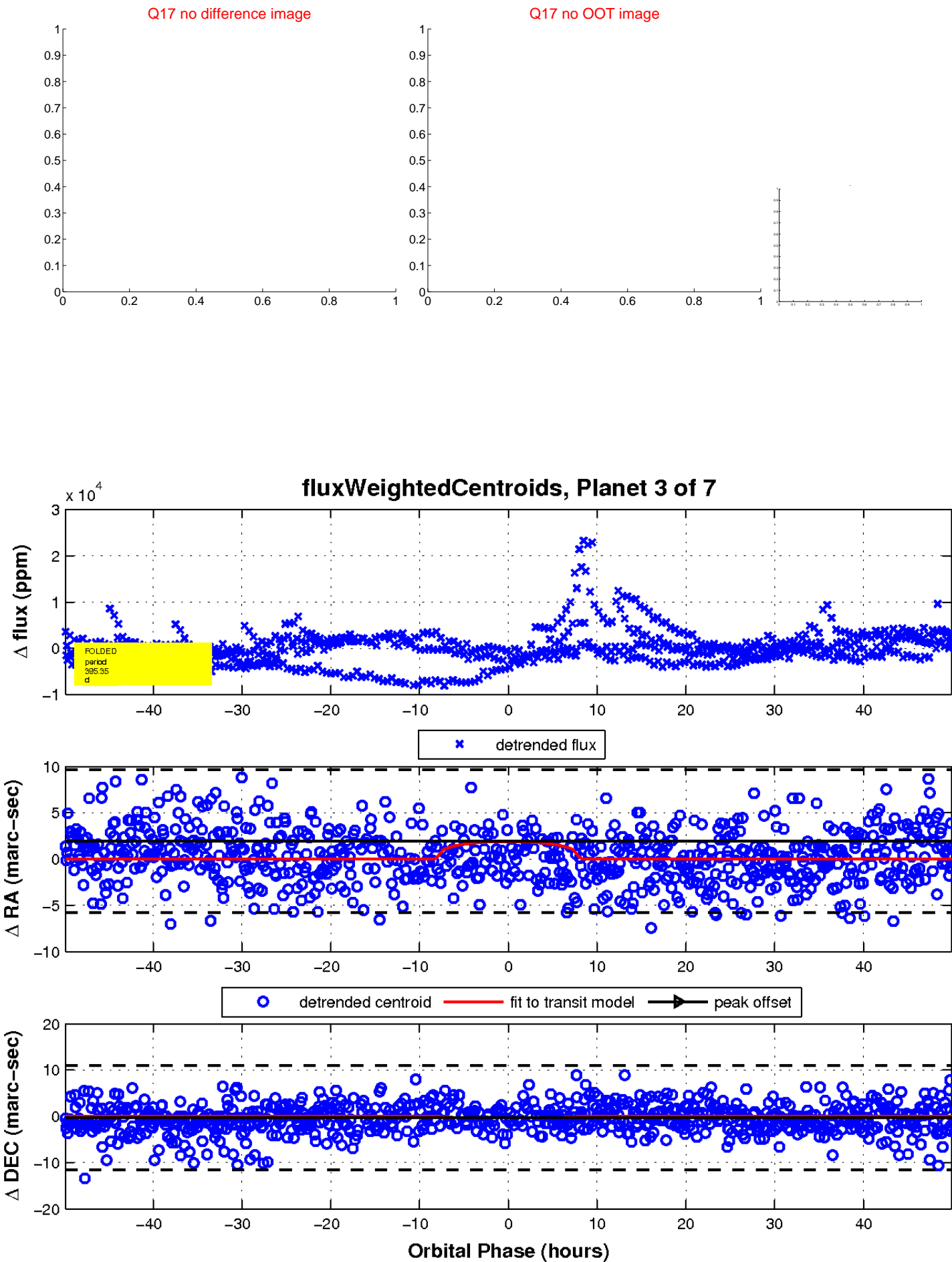
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



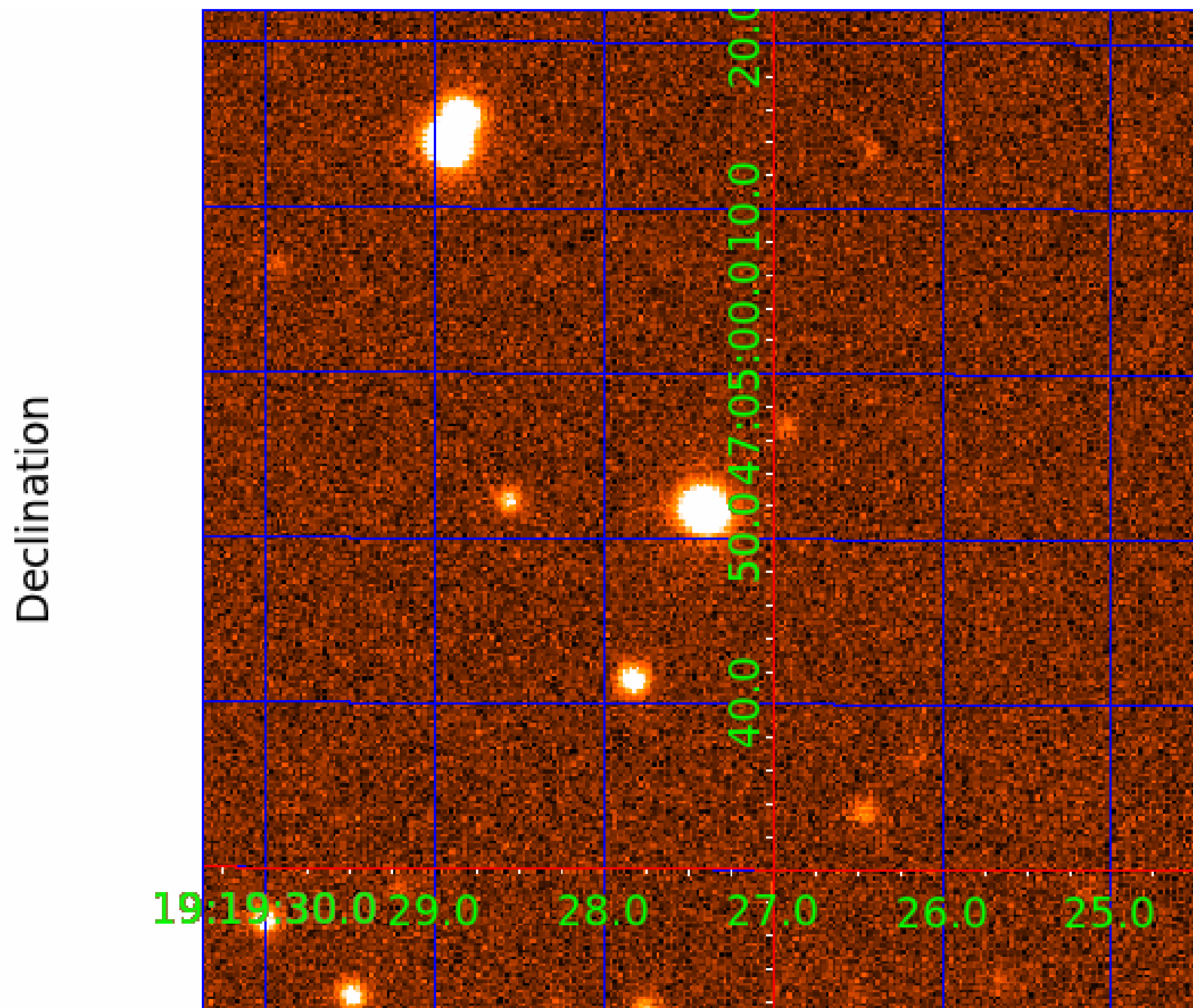
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 010070247

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})
010070247-01	OBS	No	594.920052	275.955088	3535.1	10.175	21.7	8.5	0.67	4607	3.83	0.13
010070247-02	OBS	No	400.552639	282.790324	5684.4	21.072	22.7	9.7	0.67	4607	5.83	0.21
010070247-03	OBS	No	395.352334	203.669219	5945.5	16.644	21.3	13.1	0.67	4607	4.97	0.22
010070247-04	OBS	No	375.609374	481.595164	1871.5	8.096	19.0	5.3	0.67	4607	2.94	0.23
010070247-05	OBS	No	544.923164	410.267670	4500.5	7.588	17.8	11.2	0.67	4607	4.32	0.14
010070247-06	OBS	No	514.574327	368.857770	2772.1	5.580	15.7	8.5	0.67	4607	3.67	0.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010070247-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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

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

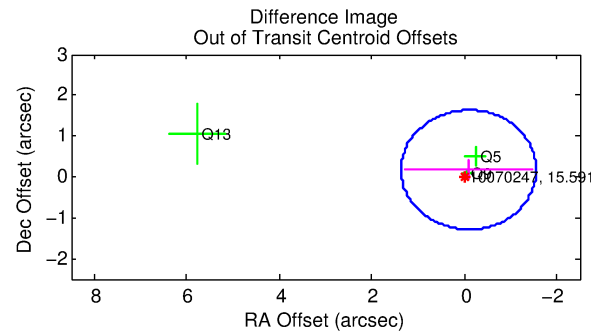
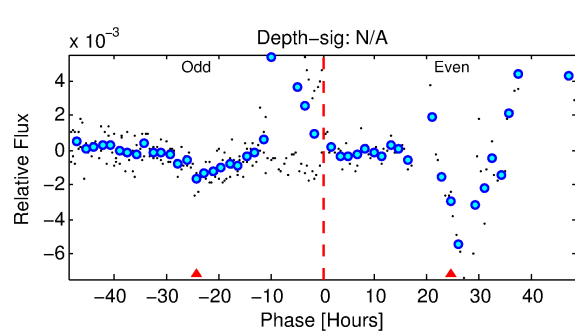
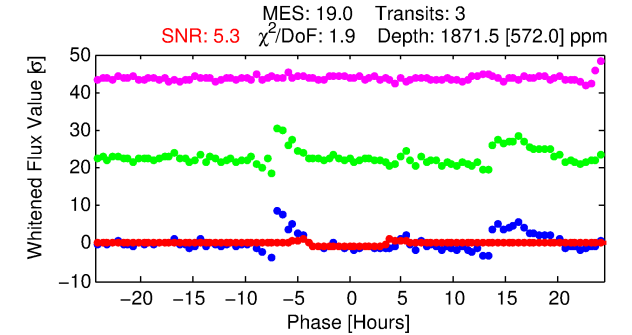
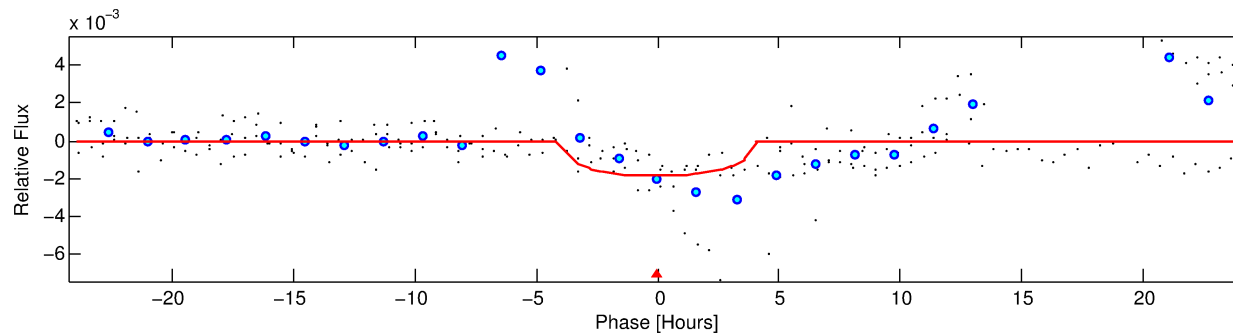
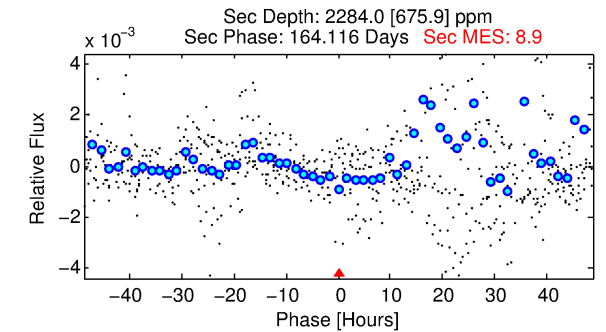
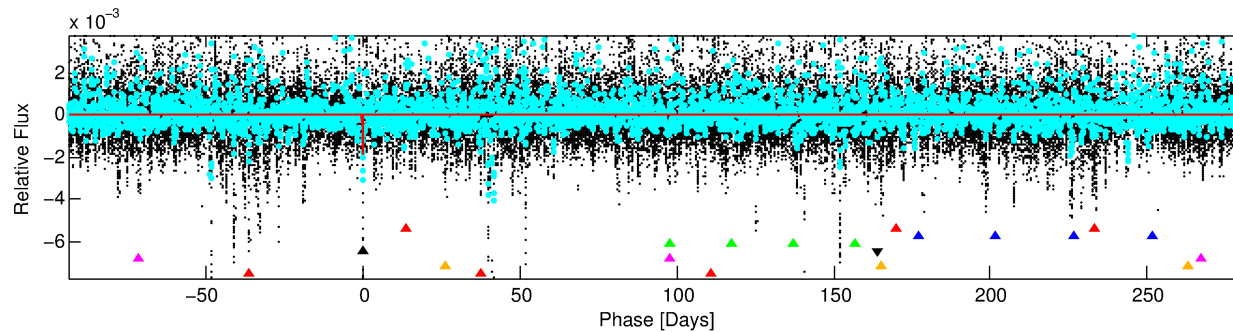
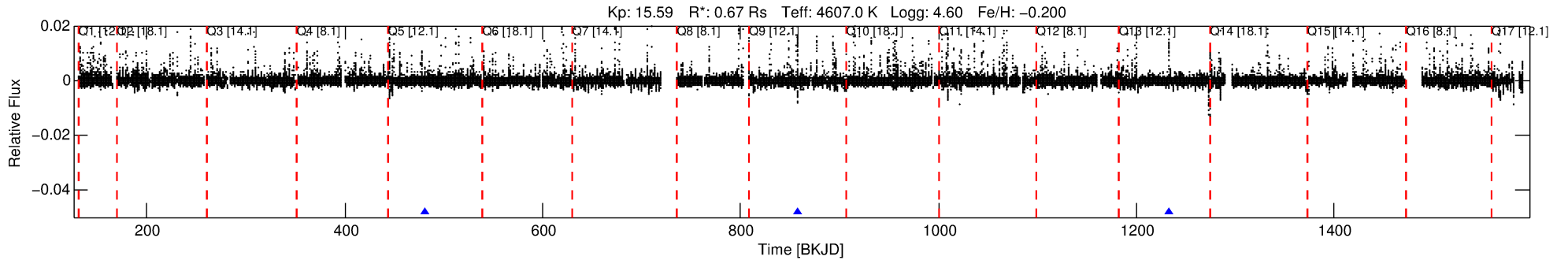
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010070247-04

No Significant Match Found

DV One-Page Summary

KIC: 10070247 Candidate: 4 of 7 Period: 375.609 d



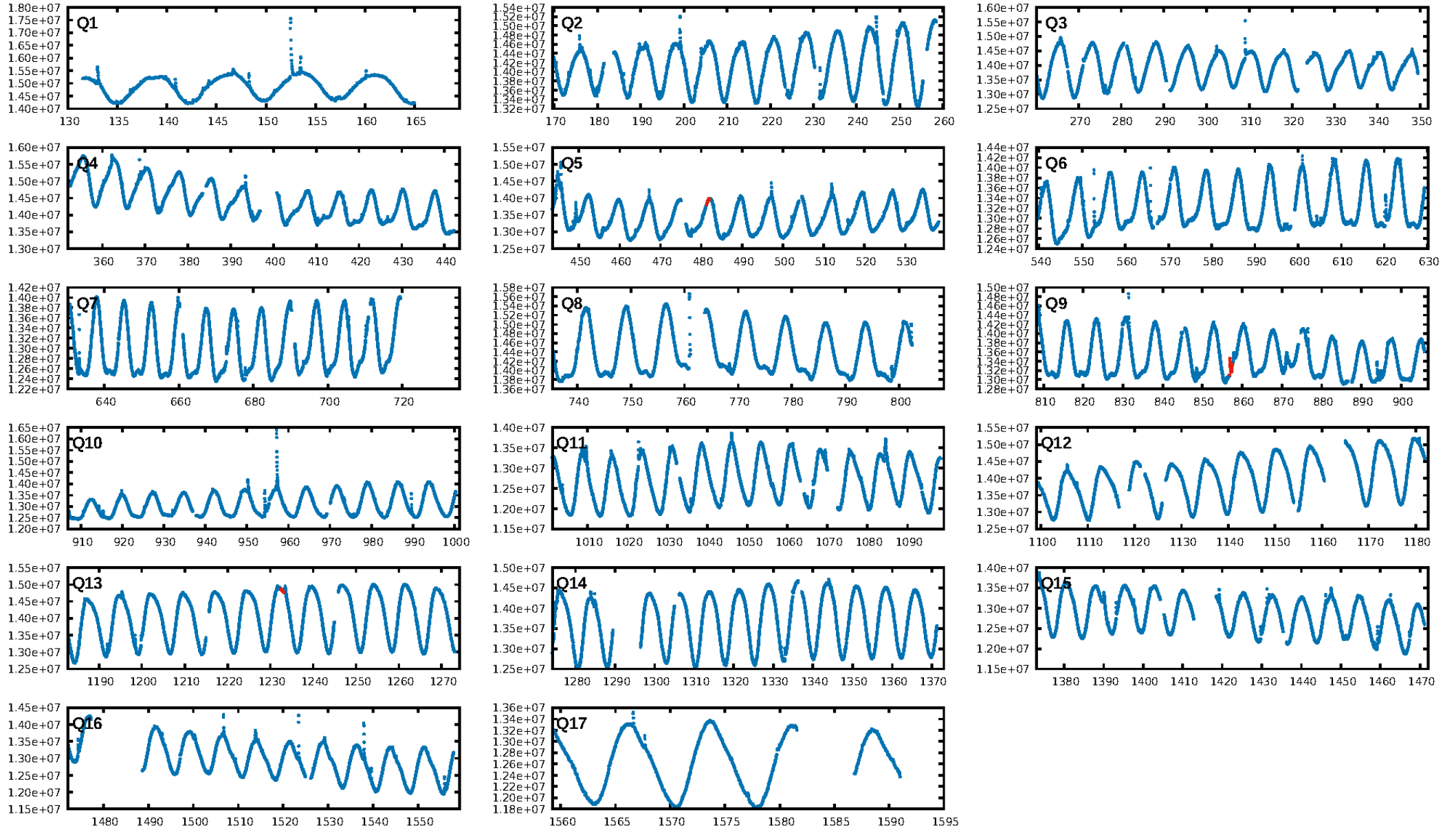
DV Fit Results:

Period = 375.60937 [0.01230] d
Epoch = 481.5952 [0.0167] BKJD
Rp/R* = 0.0400 [0.0352]
a/R* = 317.97 [837.80]
b = 0.53 [3.69]
Seff = 0.23 [0.04]
Teq = 177 [7] K
Rp = 2.94 [2.60] Re
a = 0.8876 [0.0635] AU
Ag = 114650.45 [204884.45] [0.56σ]
Teffp = 5035 [2252] K [2.16σ]

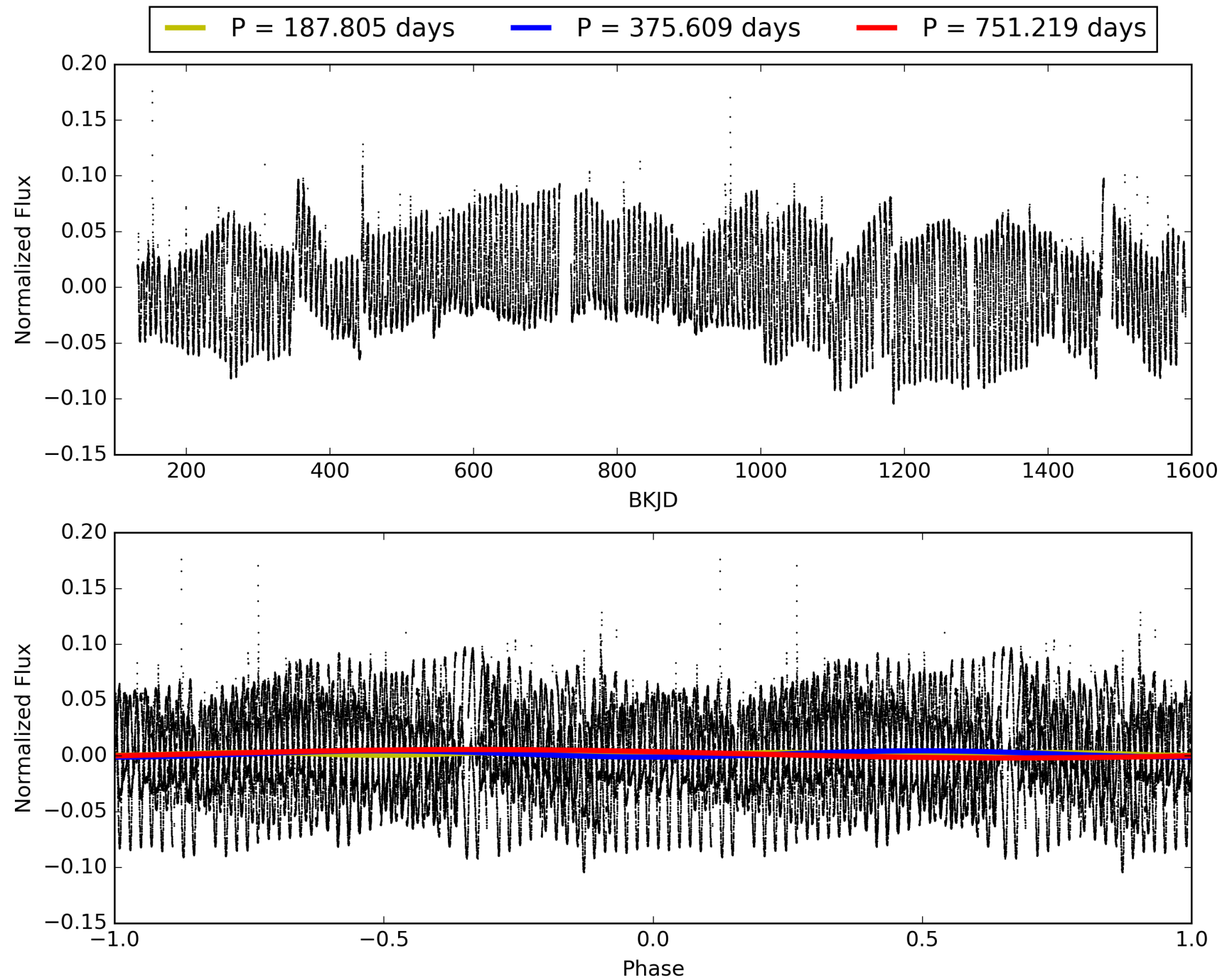
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [25.60σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 6.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.5908
Centroid-sig: 11.0%
Centroid-so: 1.108 arcsec [1.39σ]
OotOffset-rm: 0.195 arcsec [0.40σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-rm: 0.095 arcsec [0.11σ]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010070247-04, PDC Light Curves

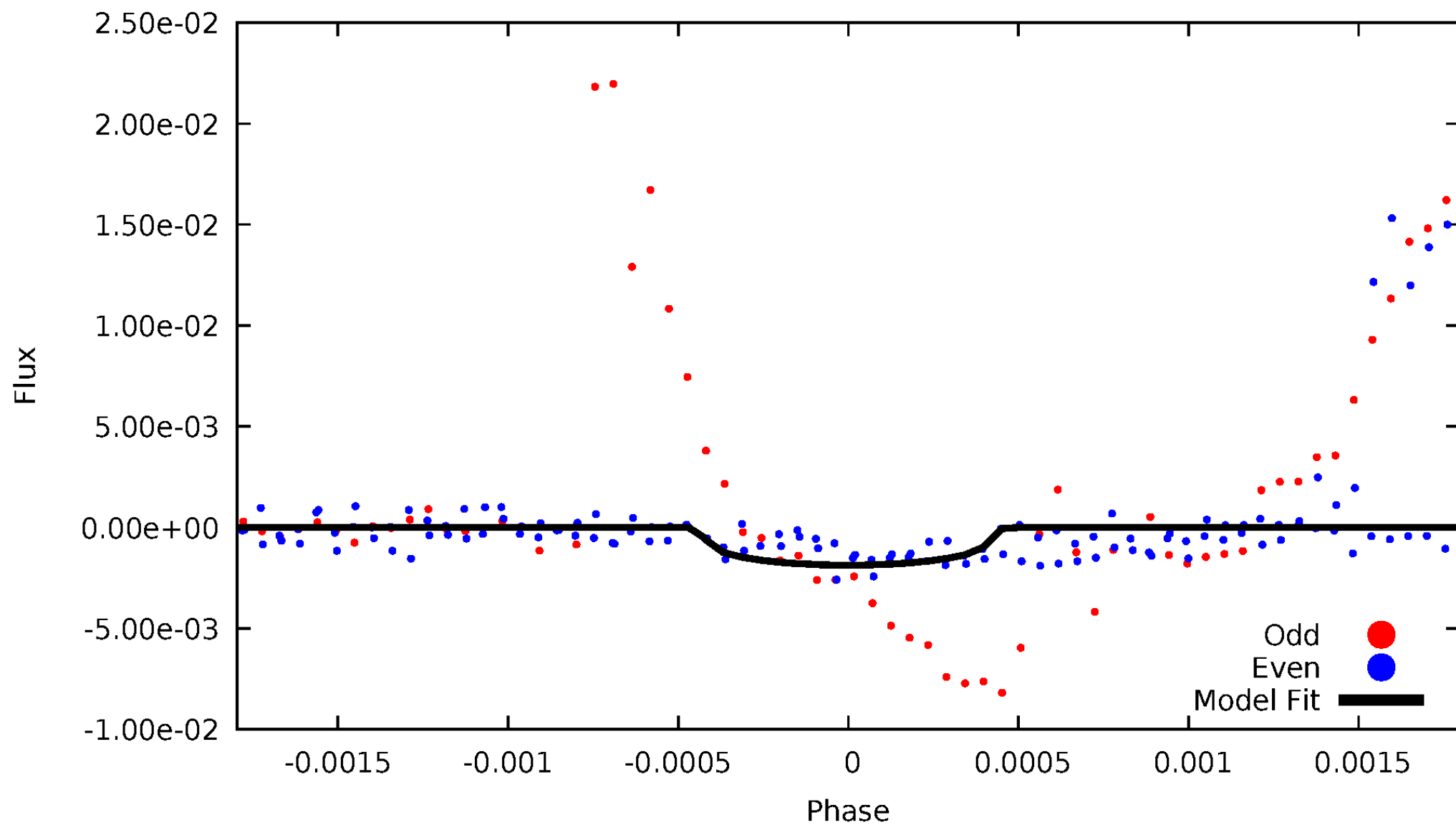


TCE 010070247-04



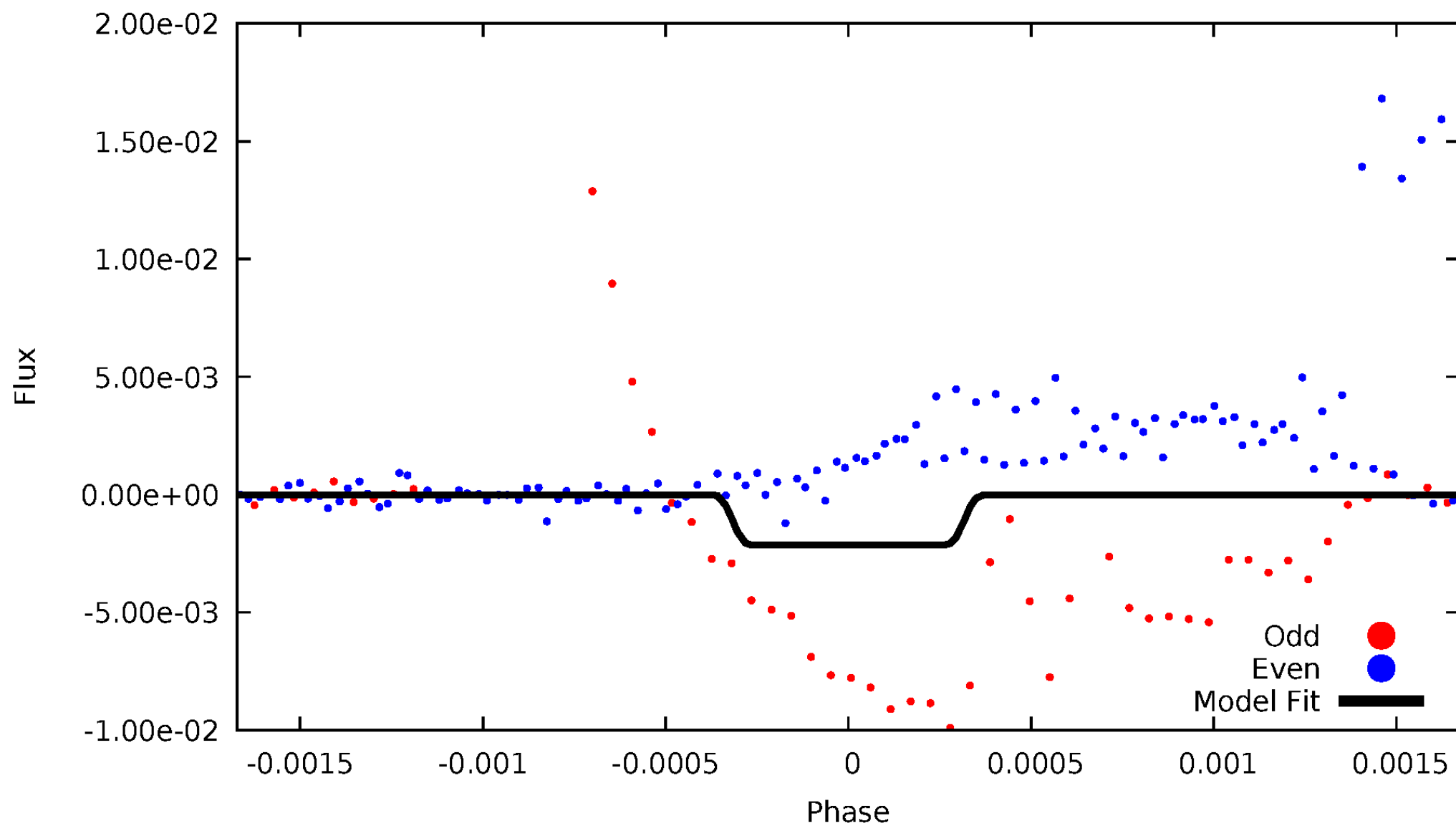
DV Odd/Even

TCE 010070247-04



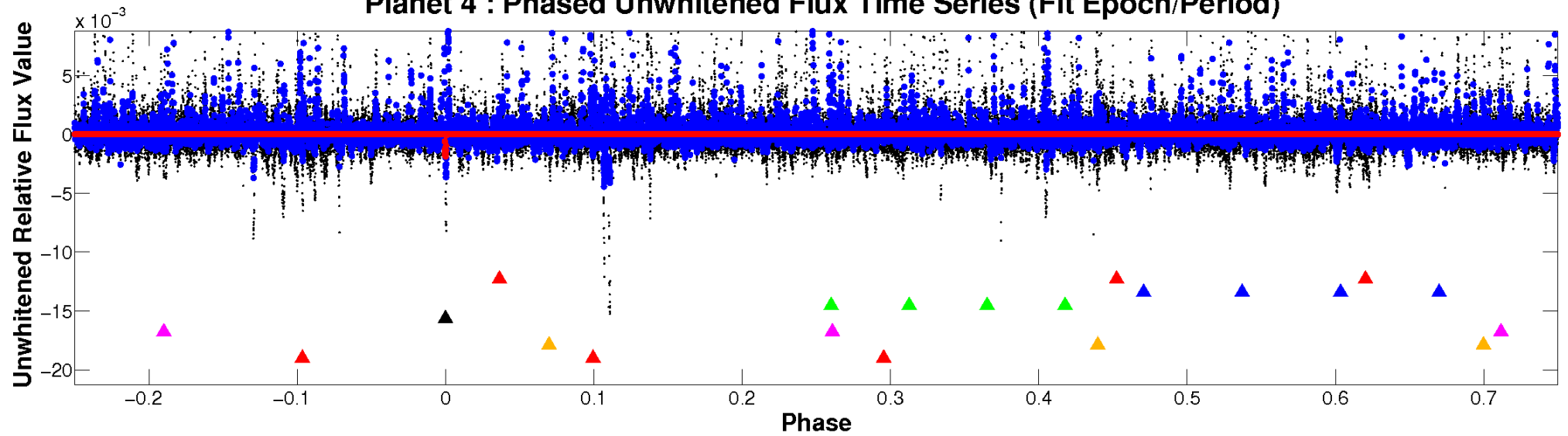
ALT Odd/Even

TCE 010070247-04

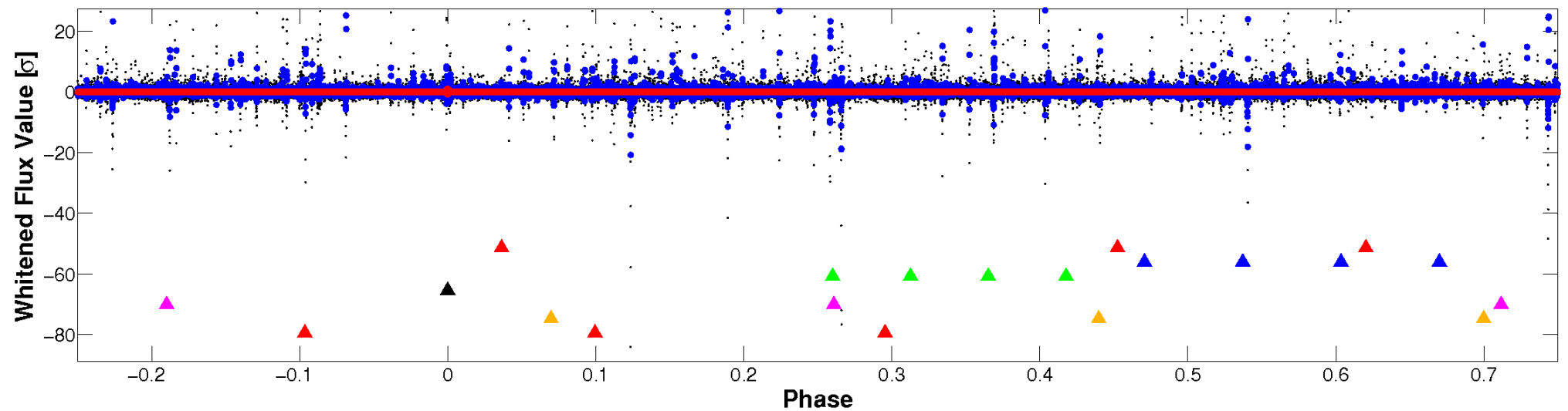


Non-Whitened Vs. Whitened Light Curve

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

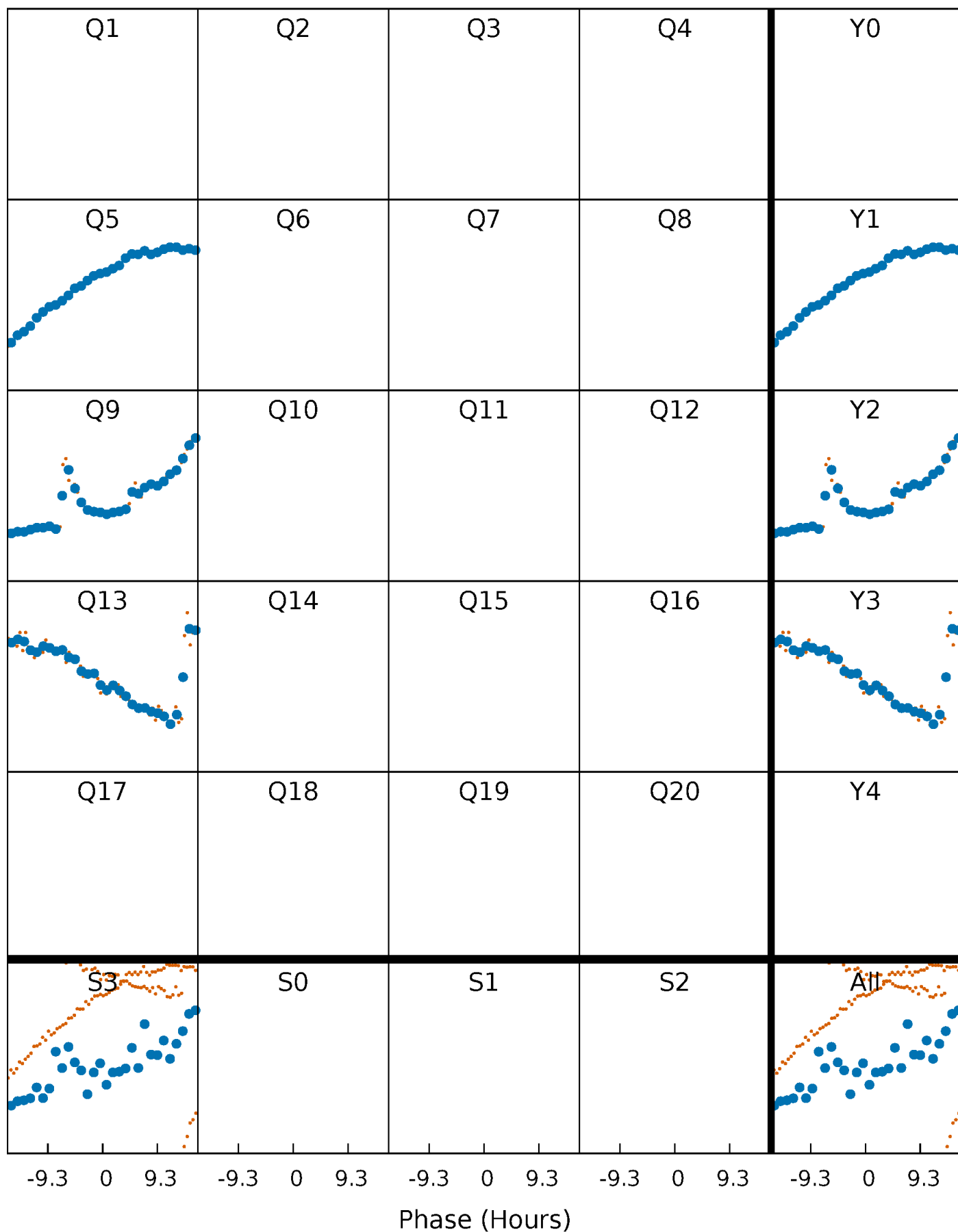


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



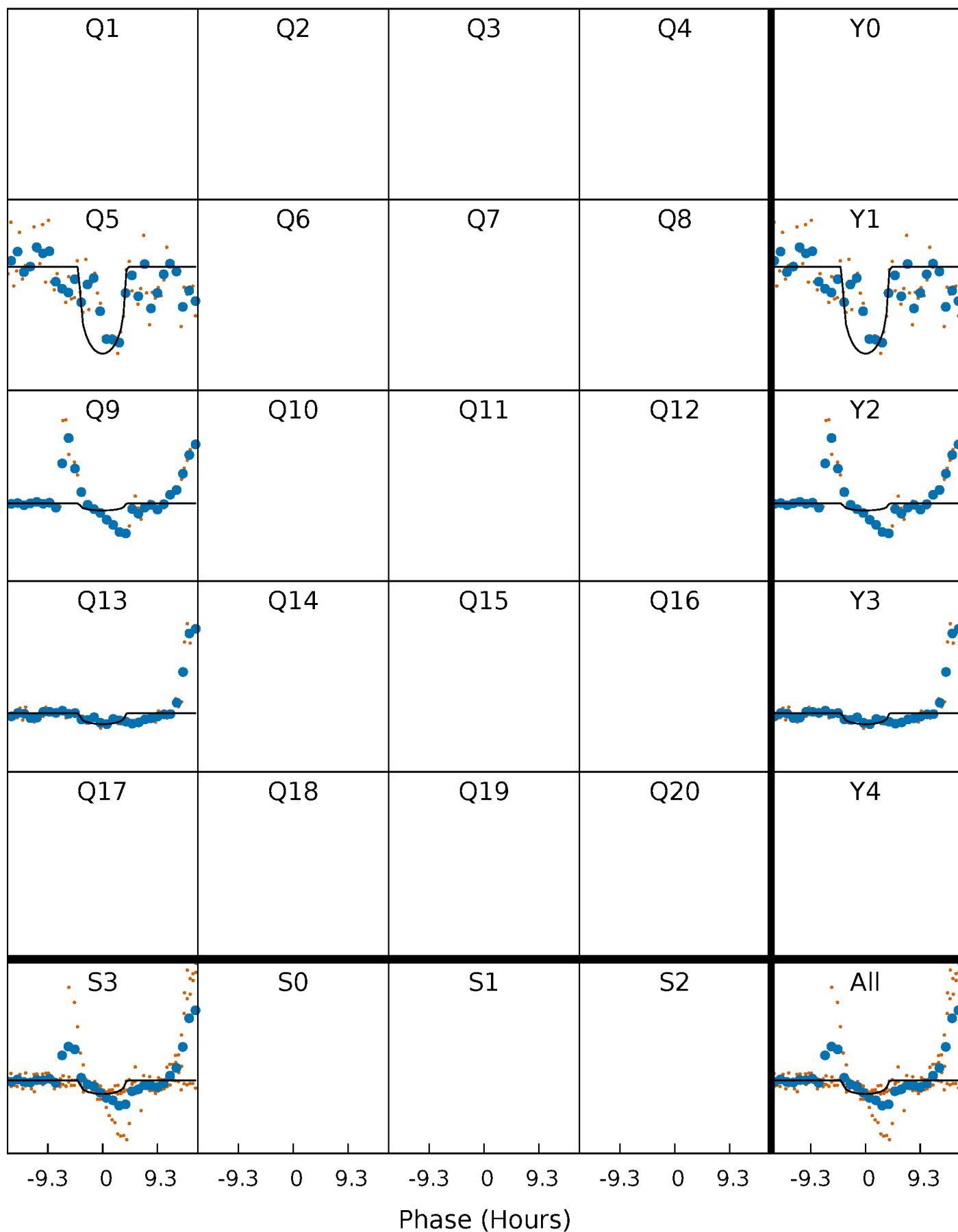
PDC Quarter-Phased Transit Curves

TCE 010070247-04 $P=375.609374$ Days $T_0=481.595164$ (BKJD)



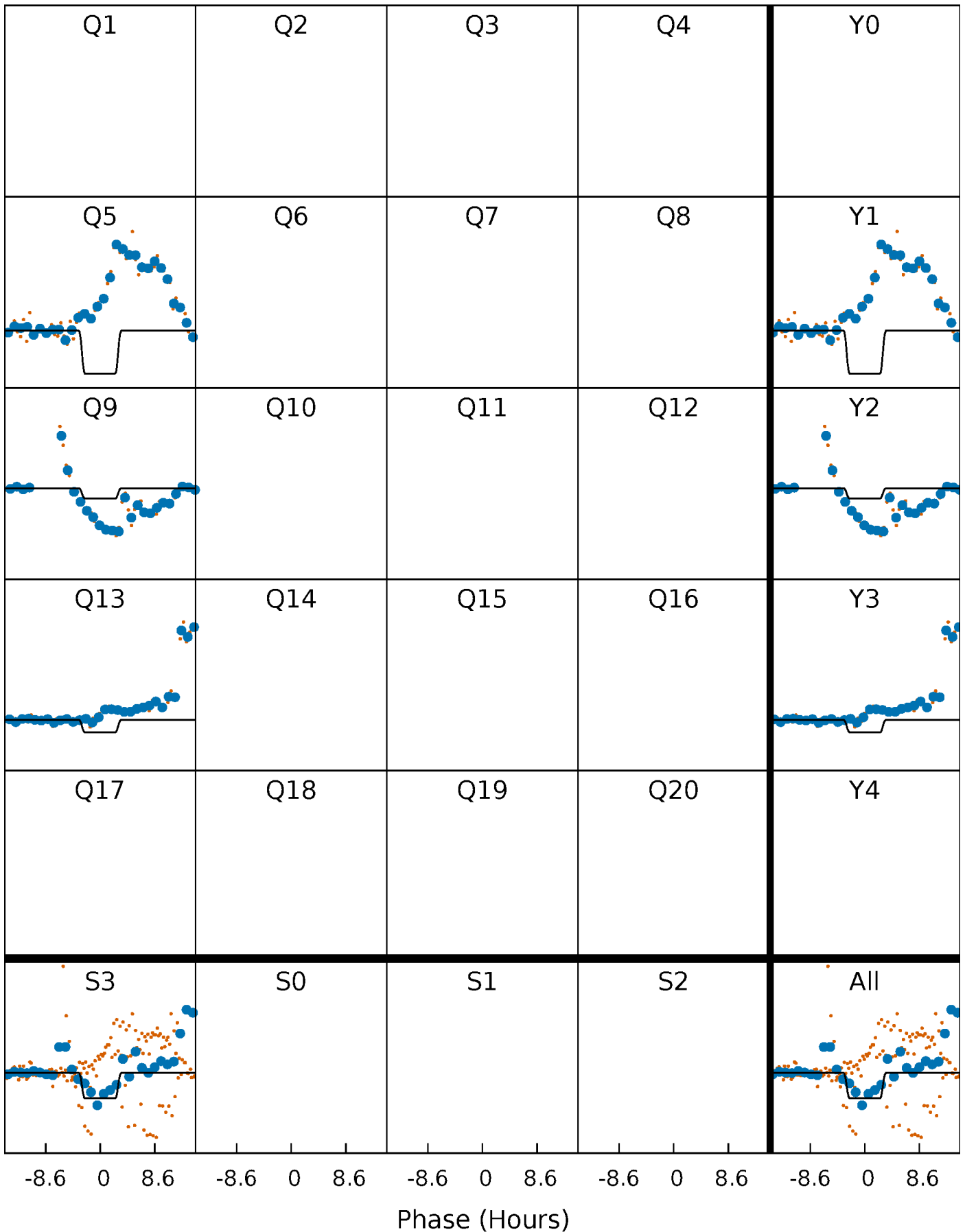
DV Quarter-Phased Transit Curves

TCE 010070247-04 $P=375.609374$ Days $T_0=481.595164$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

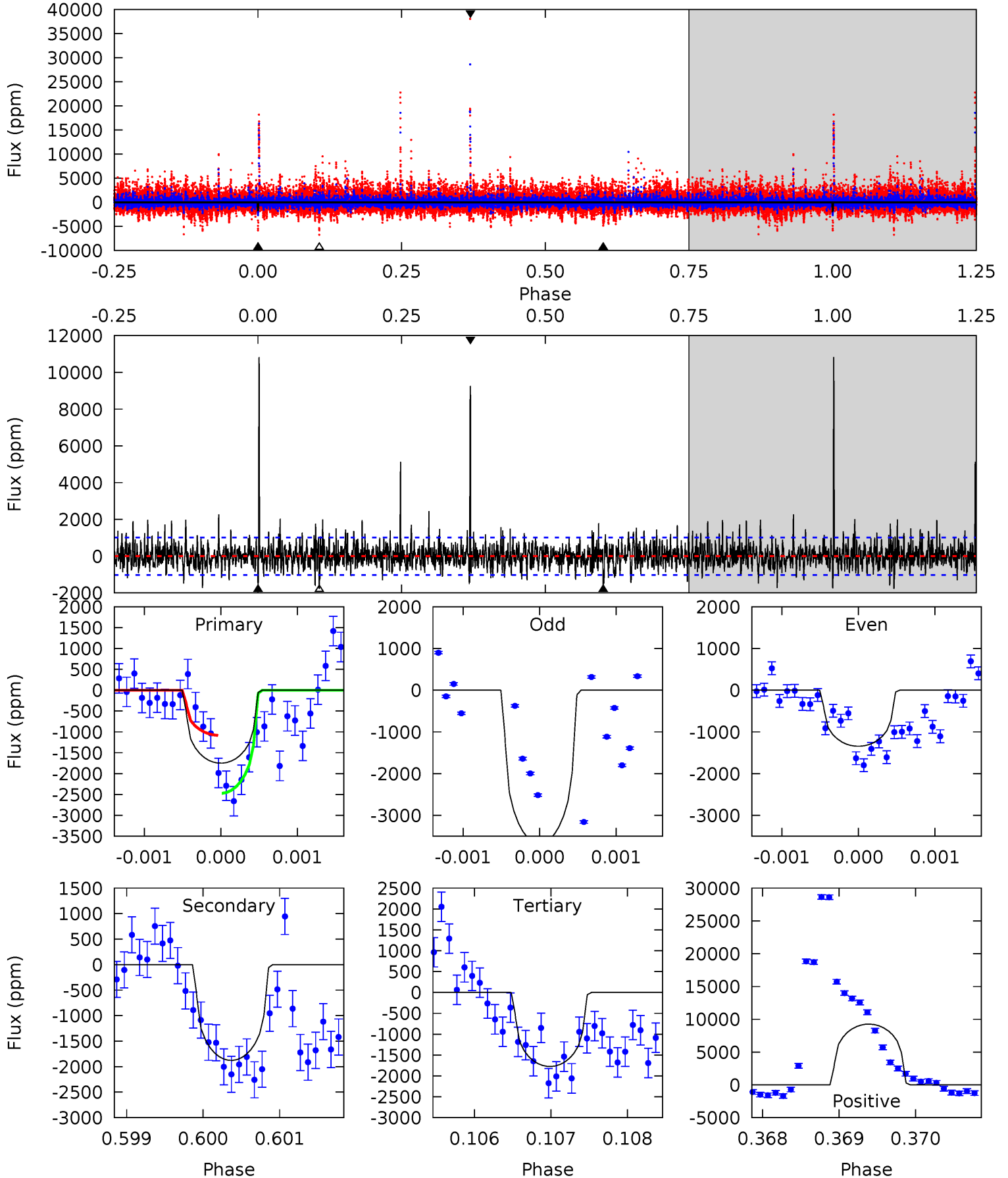
TCE 010070247-04 $P=375.596077$ Days $T_0=481.673544$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-04, P = 375.609374 Days, E = 105.985790 Days

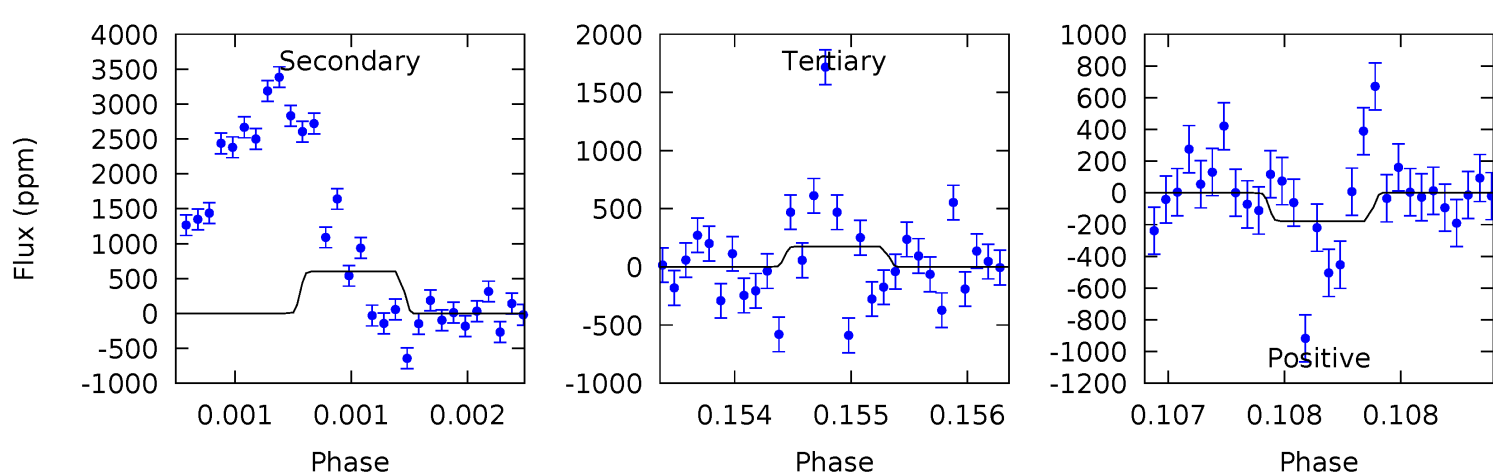
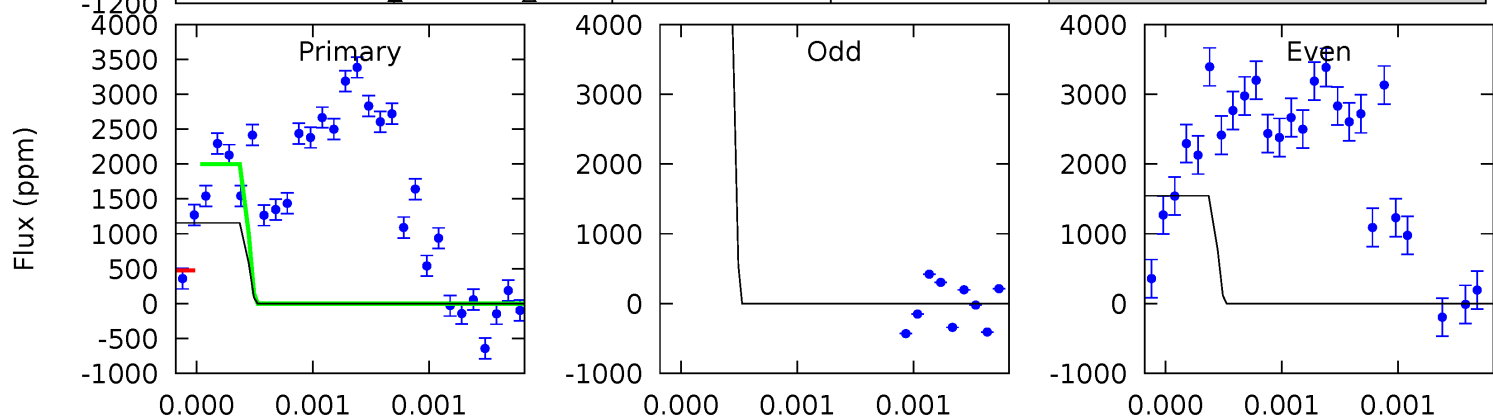
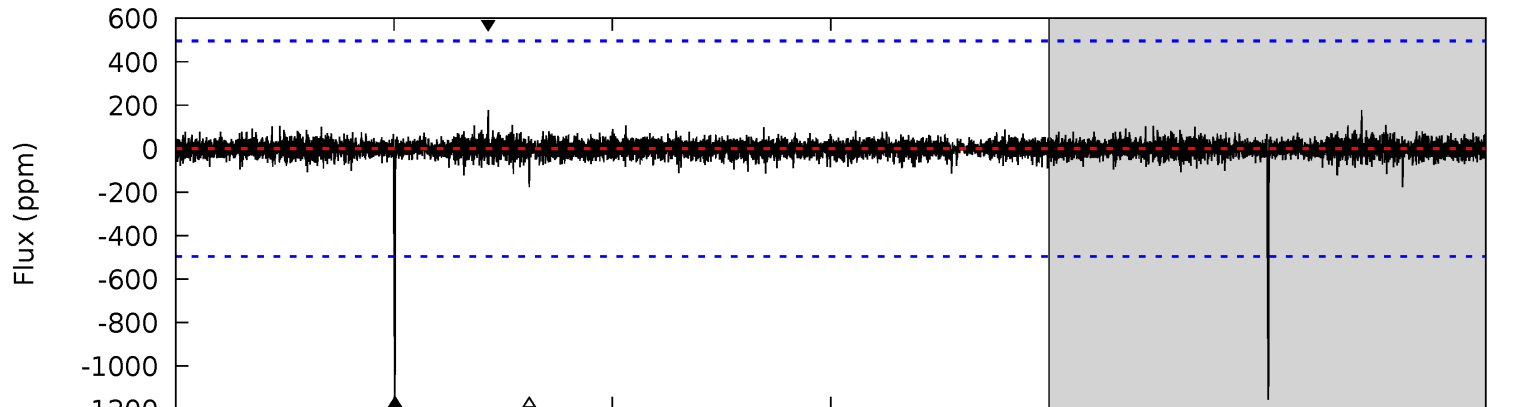
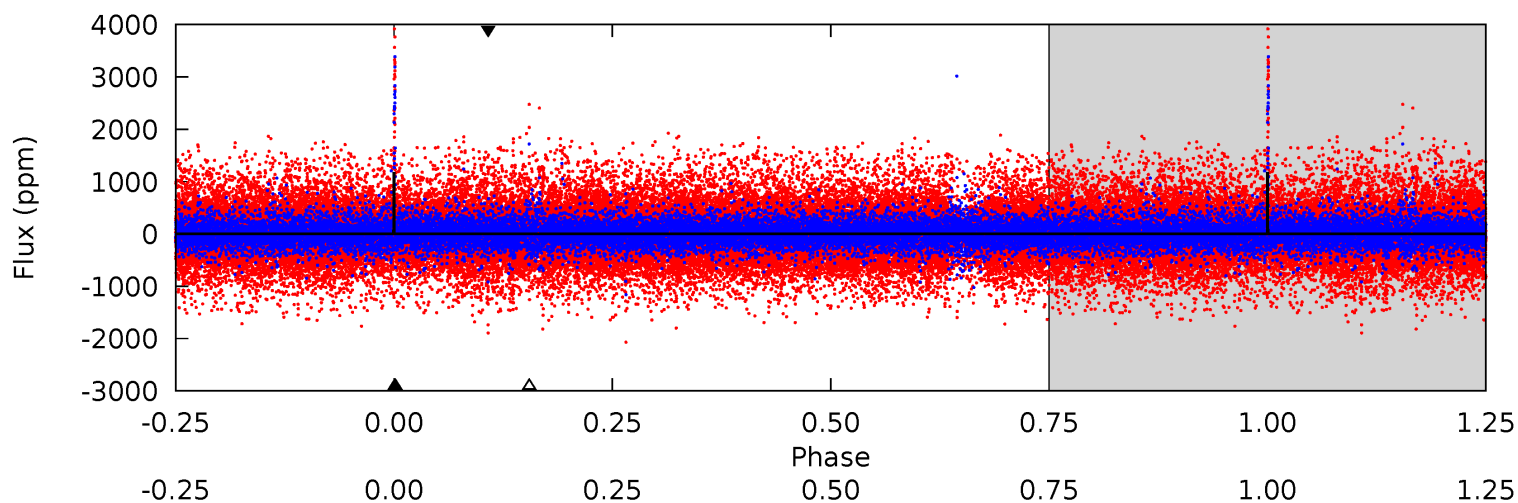
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.38	10.1	9.52	49.7	5.46	3.31	3.19	-0.13	-40.3	0.55	-39.6	3.94	1.40	0.85	3.71



Alt Model-Shift Uniqueness Test

010070247-04, P = 375.596077 Days, E = 106.077467 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	6.70	1.96	1.98	5.51	3.39	0.28	10.9	10.9	4.74	4.72	37.0	-1.76	0.13	8.45



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1877 ± 186	$3.26^{+2.33}_{-2.03}$	246^{+8}_{-9}	4530^{+2622}_{-796}	$75806^{+455899}_{-49920}$
Alt.	-602 ± 90	$3.61^{+2.48}_{-2.13}$	246^{+9}_{-9}	3592^{+1427}_{-542}	$20186^{+101055}_{-12981}$

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 $A_{obs} \gg 1.0$

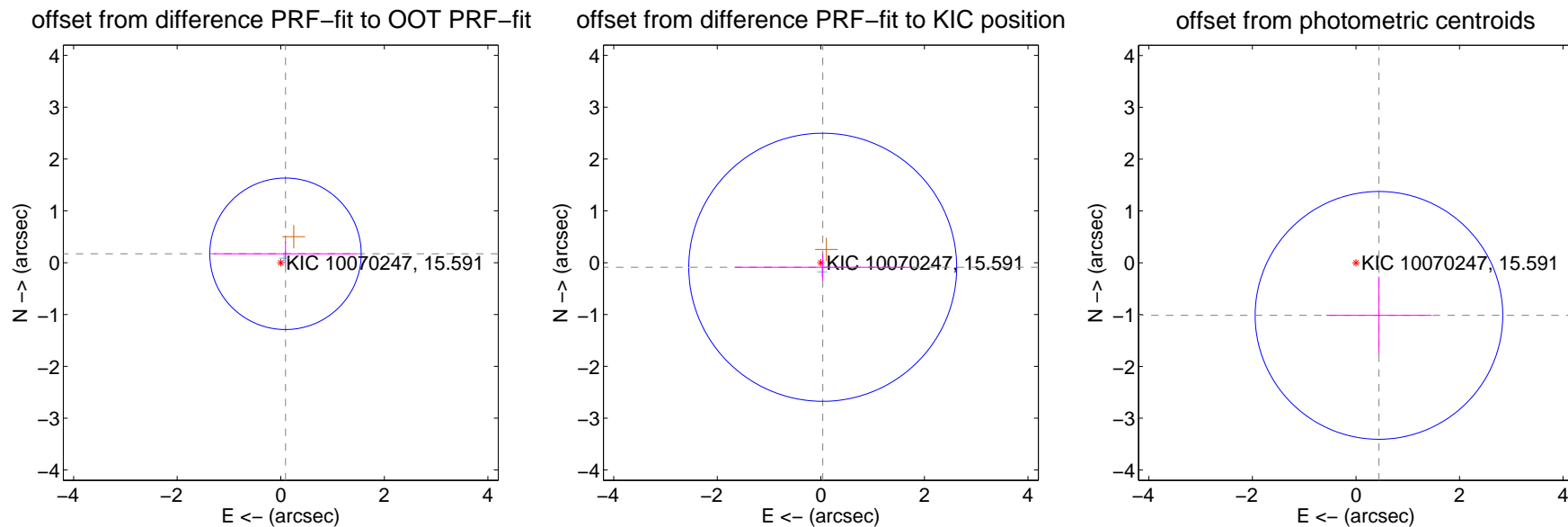
DV Centroid Data

Supplemental centroid analysis for 010070247-04. Kepler magnitude: 15.59. Transit SNR 5.33

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.195 ± 0.487	0.40	-0.092 ± 1.389	0.172 ± 0.232
PRF-fit source offset from KIC position	0.095 ± 0.862	0.11	-0.036 ± 1.694	-0.088 ± 0.260
photometric centroid source offset	1.11 ± 0.80	1.39	-0.44 ± 1.02	-1.02 ± 0.75

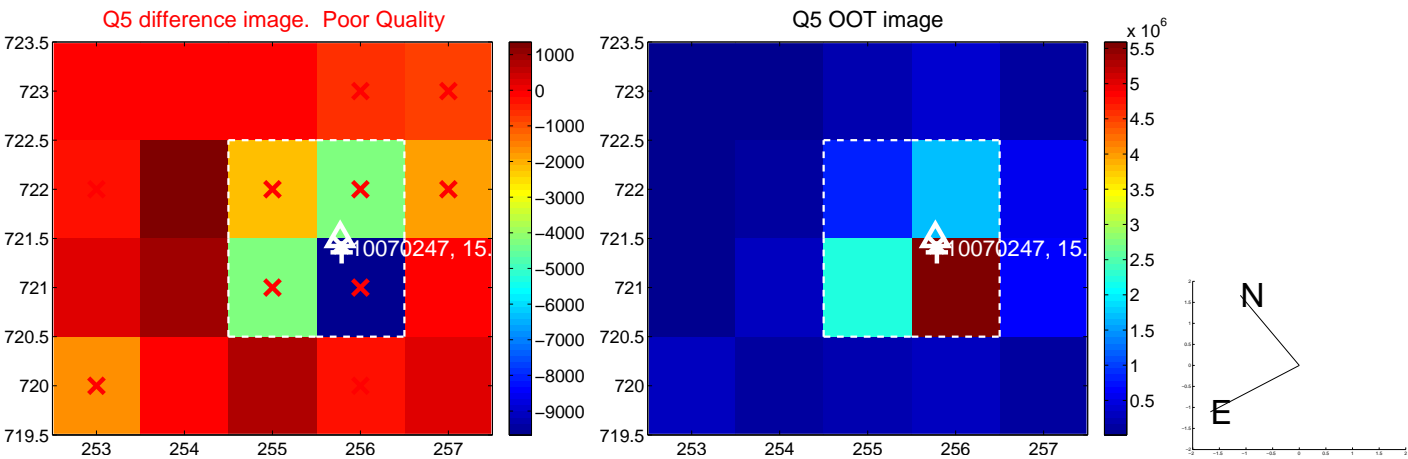


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

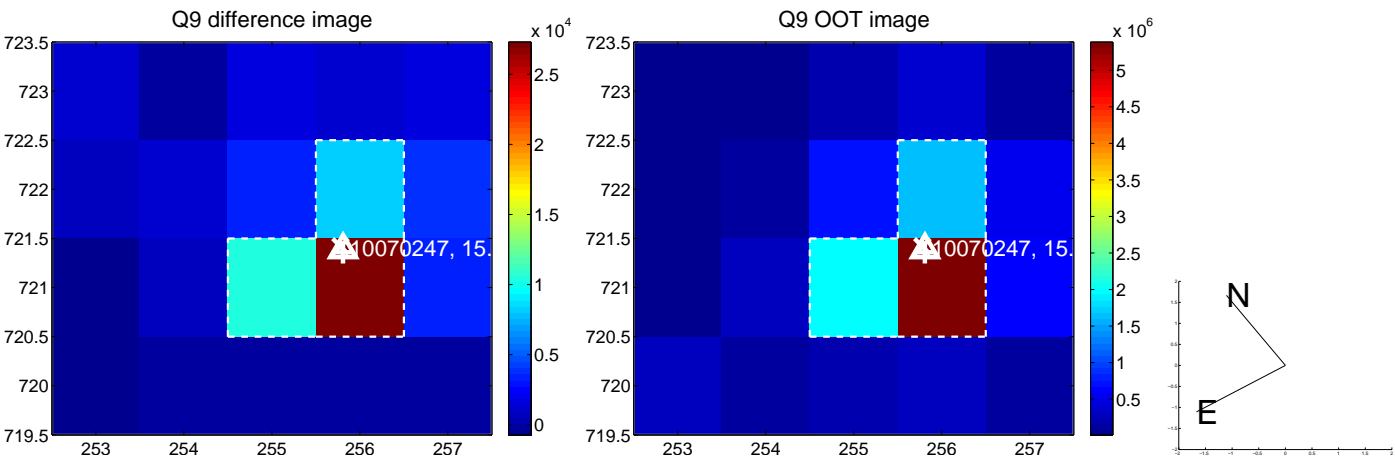
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



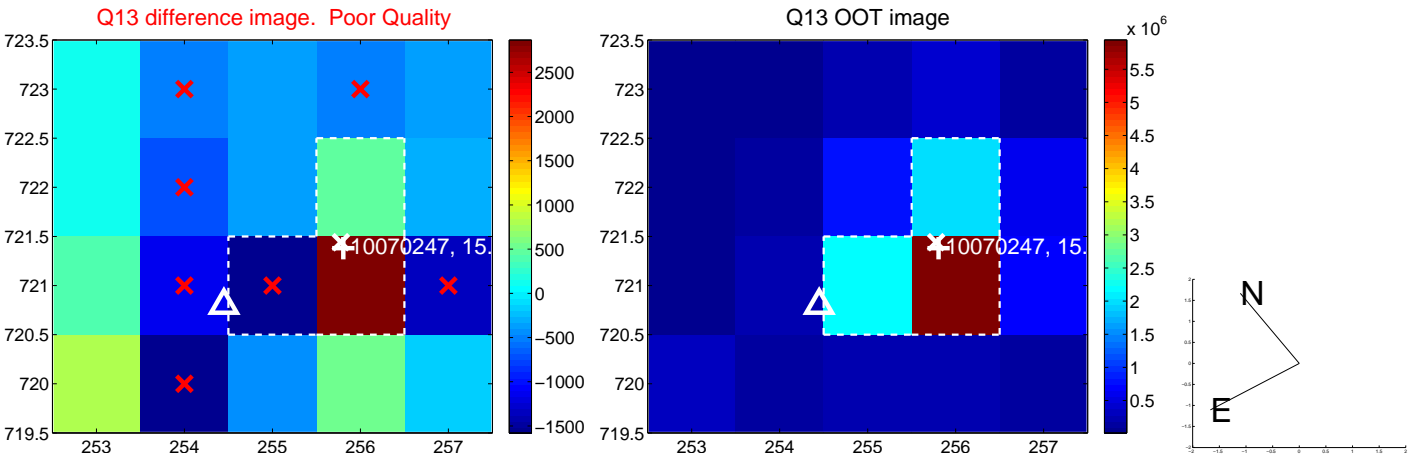
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



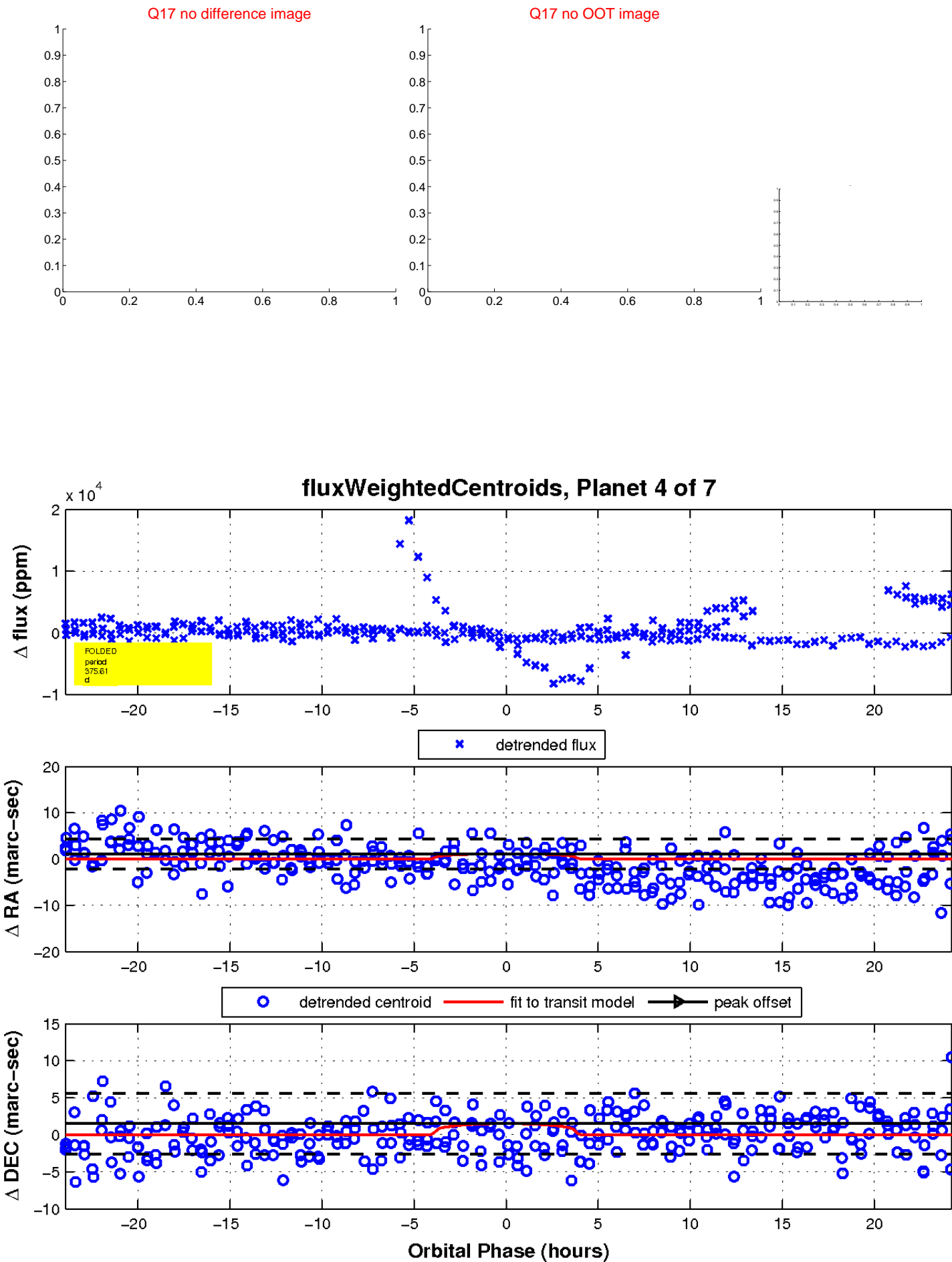
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



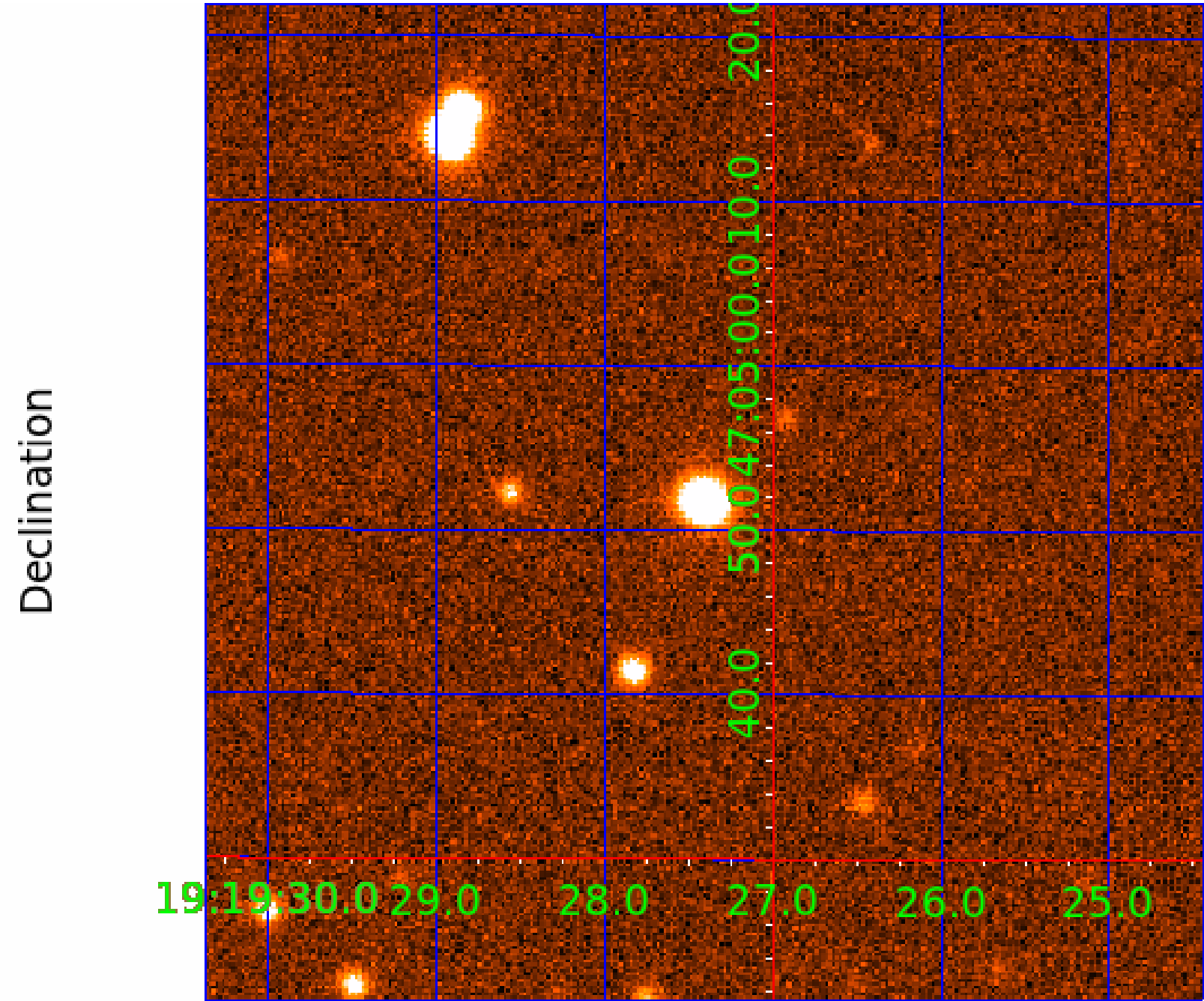
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 010070247

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})
010070247-01	OBS	No	594.920052	275.955088	3535.1	10.175	21.7	8.5	0.67	4607	3.83	0.13
010070247-02	OBS	No	400.552639	282.790324	5684.4	21.072	22.7	9.7	0.67	4607	5.83	0.21
010070247-03	OBS	No	395.352334	203.669219	5945.5	16.644	21.3	13.1	0.67	4607	4.97	0.22
010070247-04	OBS	No	375.609374	481.595164	1871.5	8.096	19.0	5.3	0.67	4607	2.94	0.23
010070247-05	OBS	No	544.923164	410.267670	4500.5	7.588	17.8	11.2	0.67	4607	4.32	0.14
010070247-06	OBS	No	514.574327	368.857770	2772.1	5.580	15.7	8.5	0.67	4607	3.67	0.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010070247-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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

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

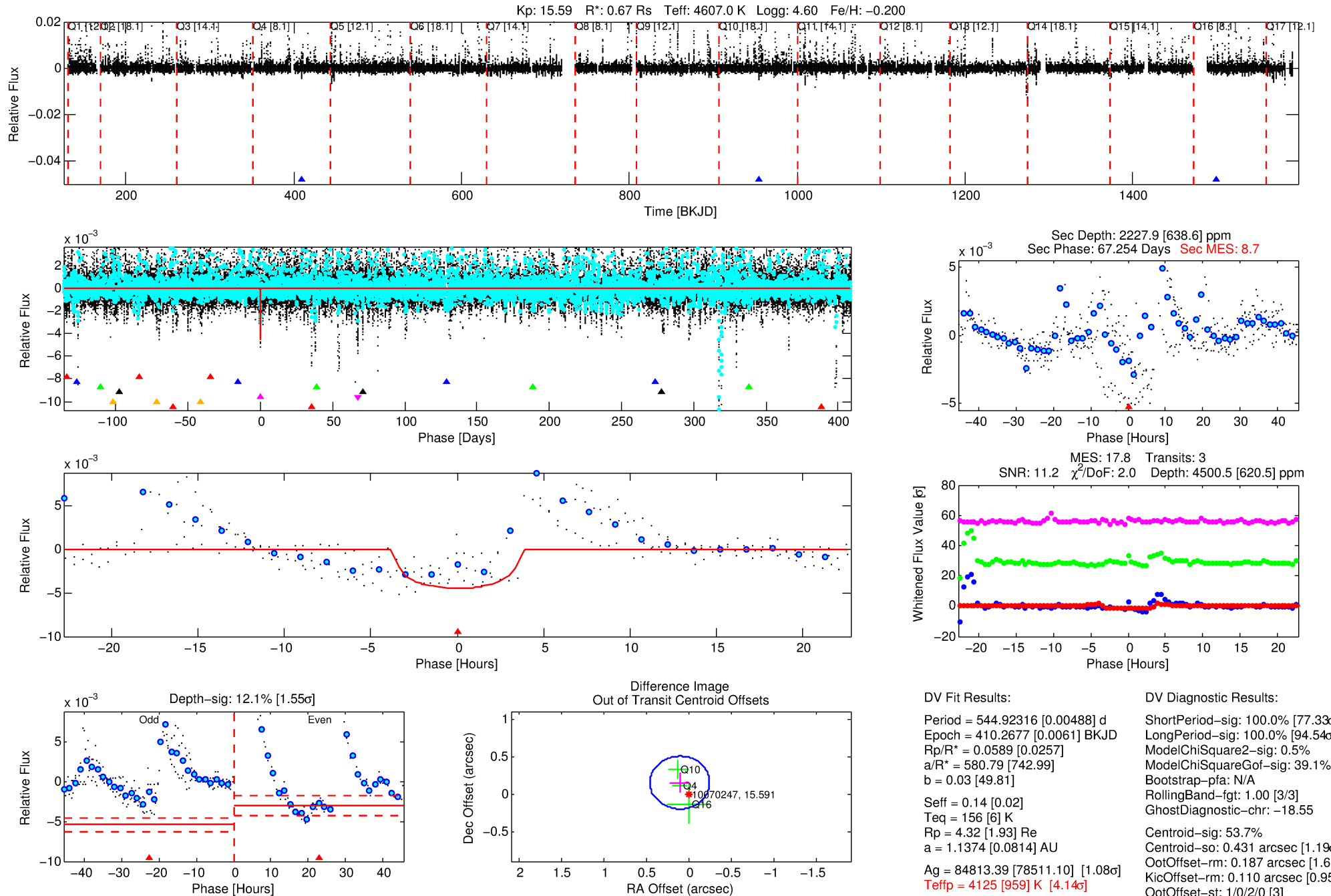
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010070247-05

No Significant Match Found

DV One-Page Summary

KIC: 10070247 Candidate: 5 of 7 Period: 544.923 d



DV Fit Results:

Period = 544.92316 [0.00488] d
Epoch = 410.2677 [0.0061] BKJD
Rp/R* = 0.0589 [0.0257]
a/R* = 580.79 [742.99]
b = 0.03 [49.81]
Seff = 0.14 [0.02]
Teq = 156 [6] K
Rp = 4.32 [1.93] Re
a = 1.1374 [0.0814] AU
Ag = 84813.39 [78511.10] [1.08σ]
Teffp = 4125 [959] K [4.14σ]

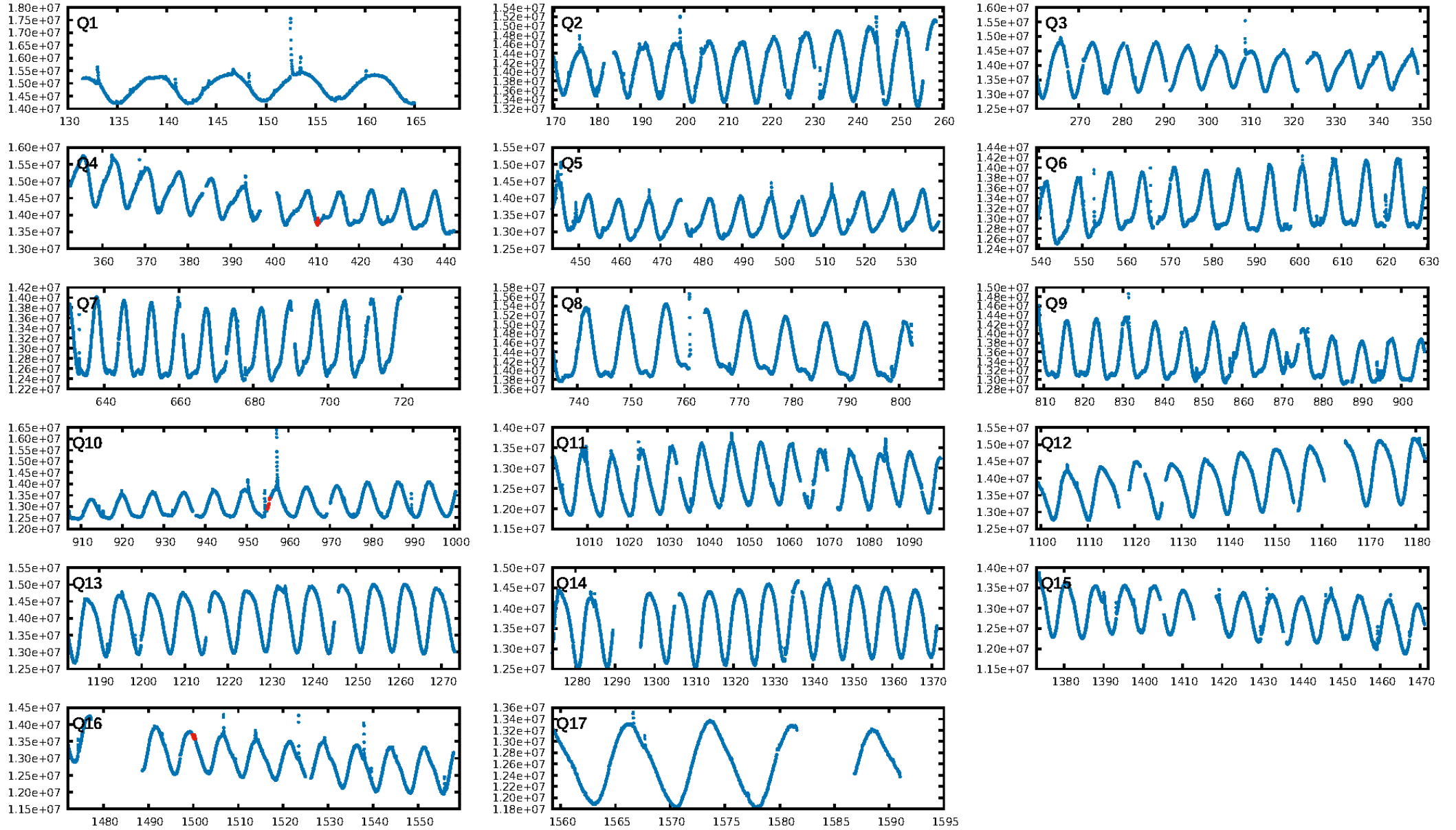
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [77.33σ]
LongPeriod-sig: 100.0% [94.54σ]
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 39.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -18.55
Centroid-sig: 53.7%
Centroid-so: 0.431 arcsec [1.19σ]
OotOffset-rm: 0.187 arcsec [1.60σ]
OotOffset-st: 1/0/2/0 [3]
KicOffset-rm: 0.110 arcsec [0.95σ]
KicOffset-st: 1/0/2/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

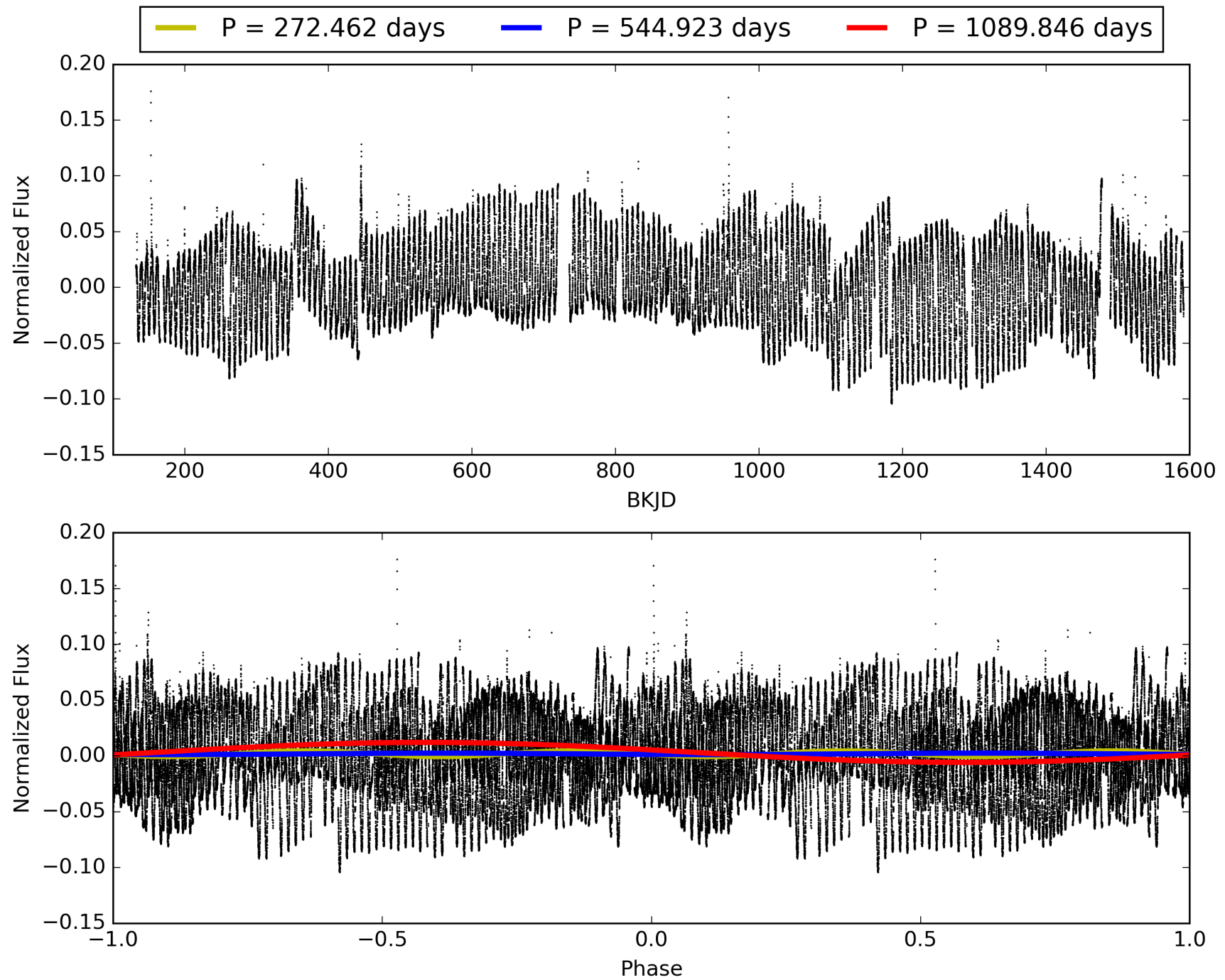
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:09:21 Z

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

TCE 010070247-05, PDC Light Curves

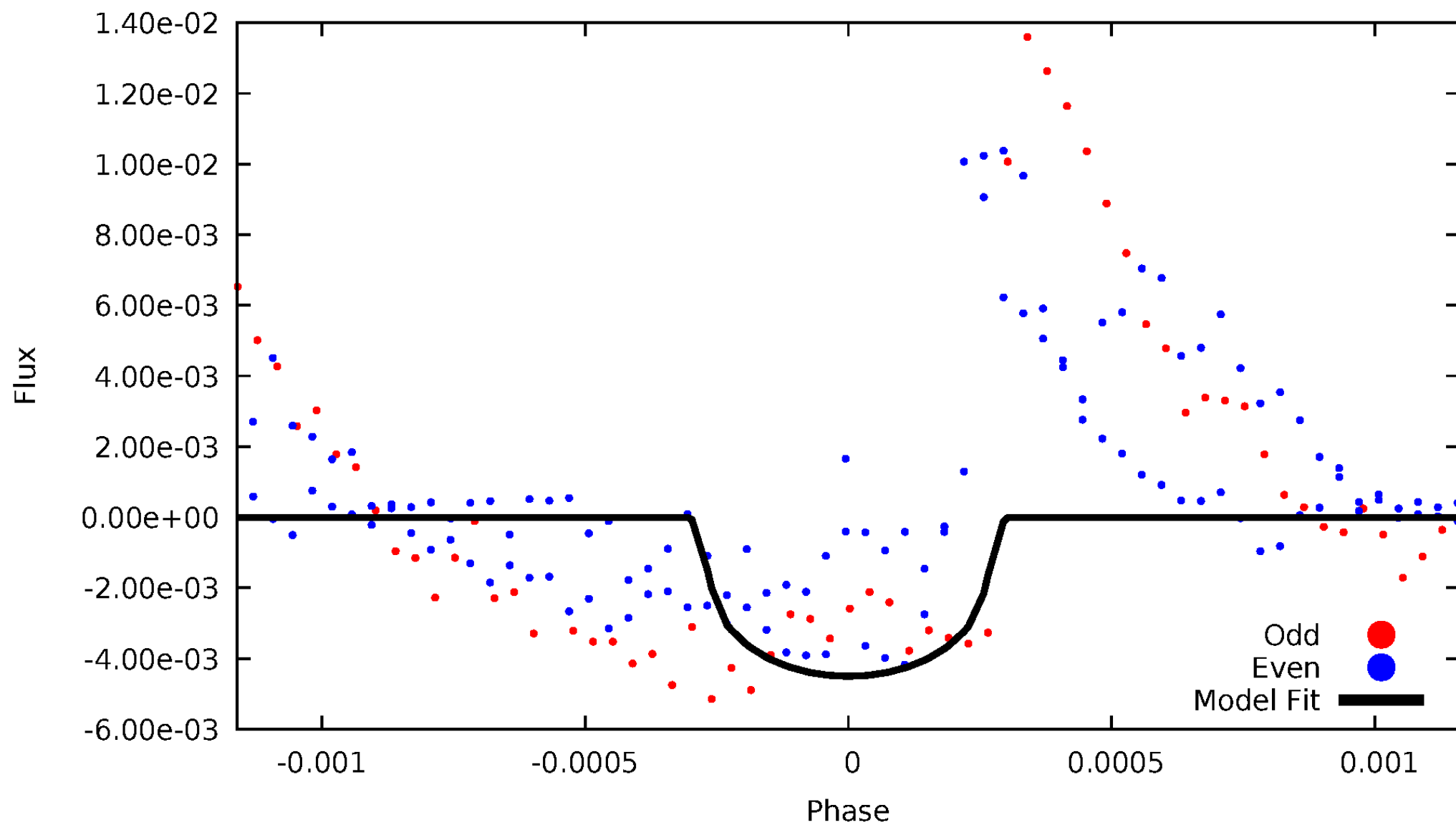


TCE 010070247-05



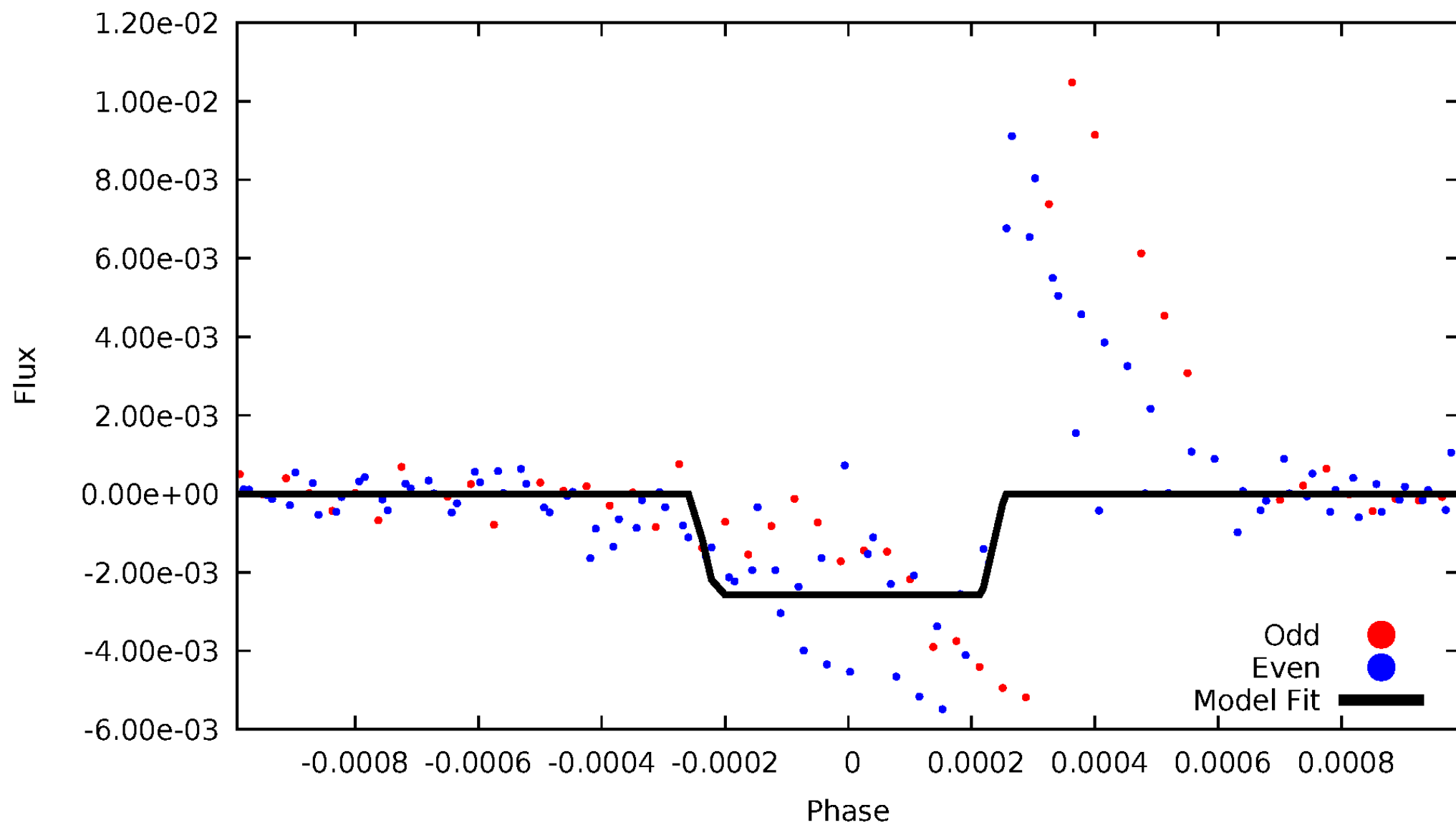
DV Odd/Even

TCE 010070247-05



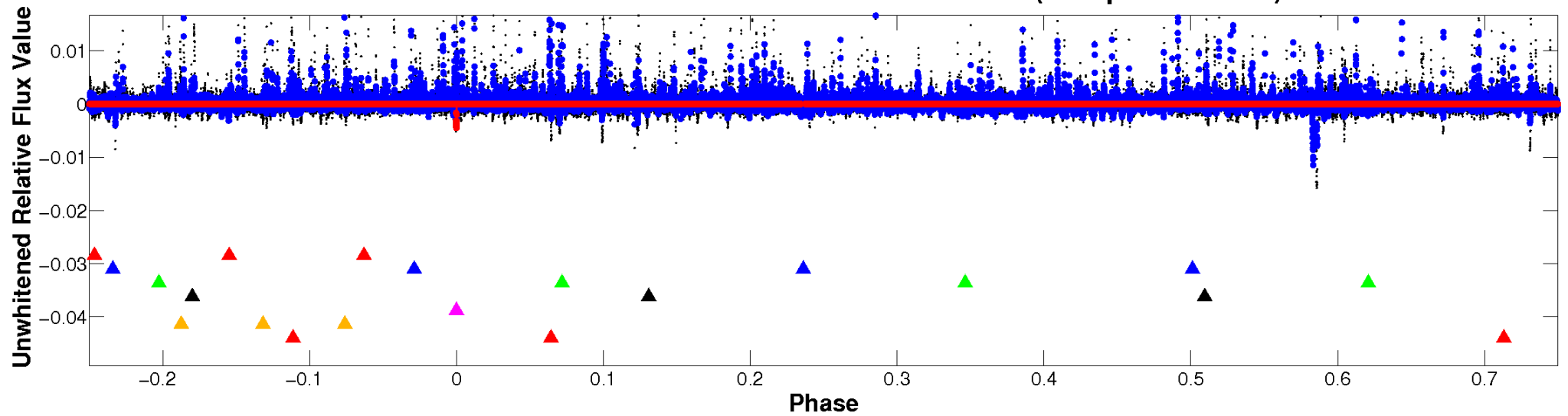
ALT Odd/Even

TCE 010070247-05

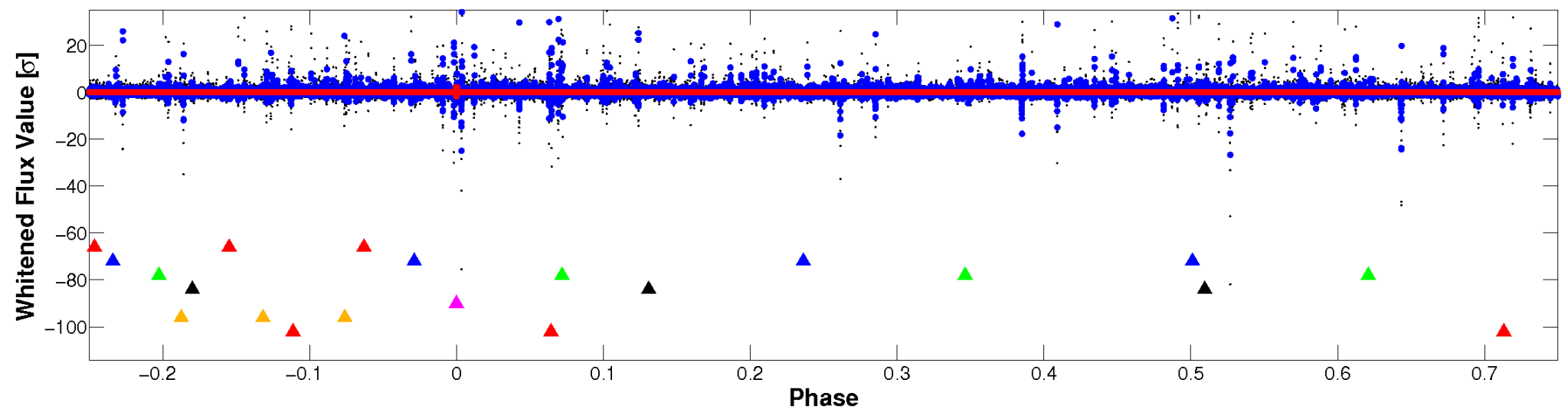


Non-Whitened Vs. Whitened Light Curve

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



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



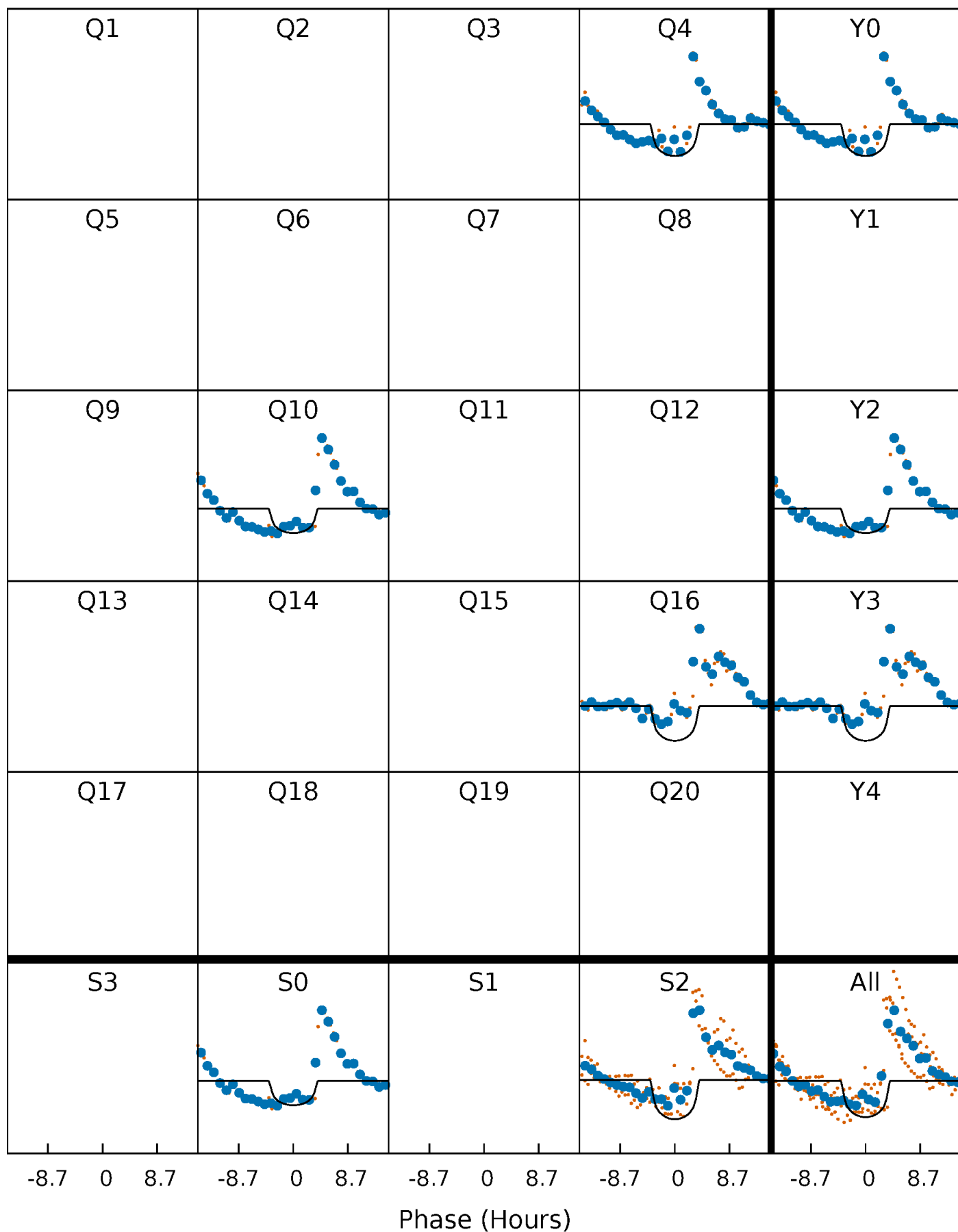
PDC Quarter-Phased Transit Curves

TCE 010070247-05 $P=544.923164$ Days $T_0=410.267670$ (BKJD)



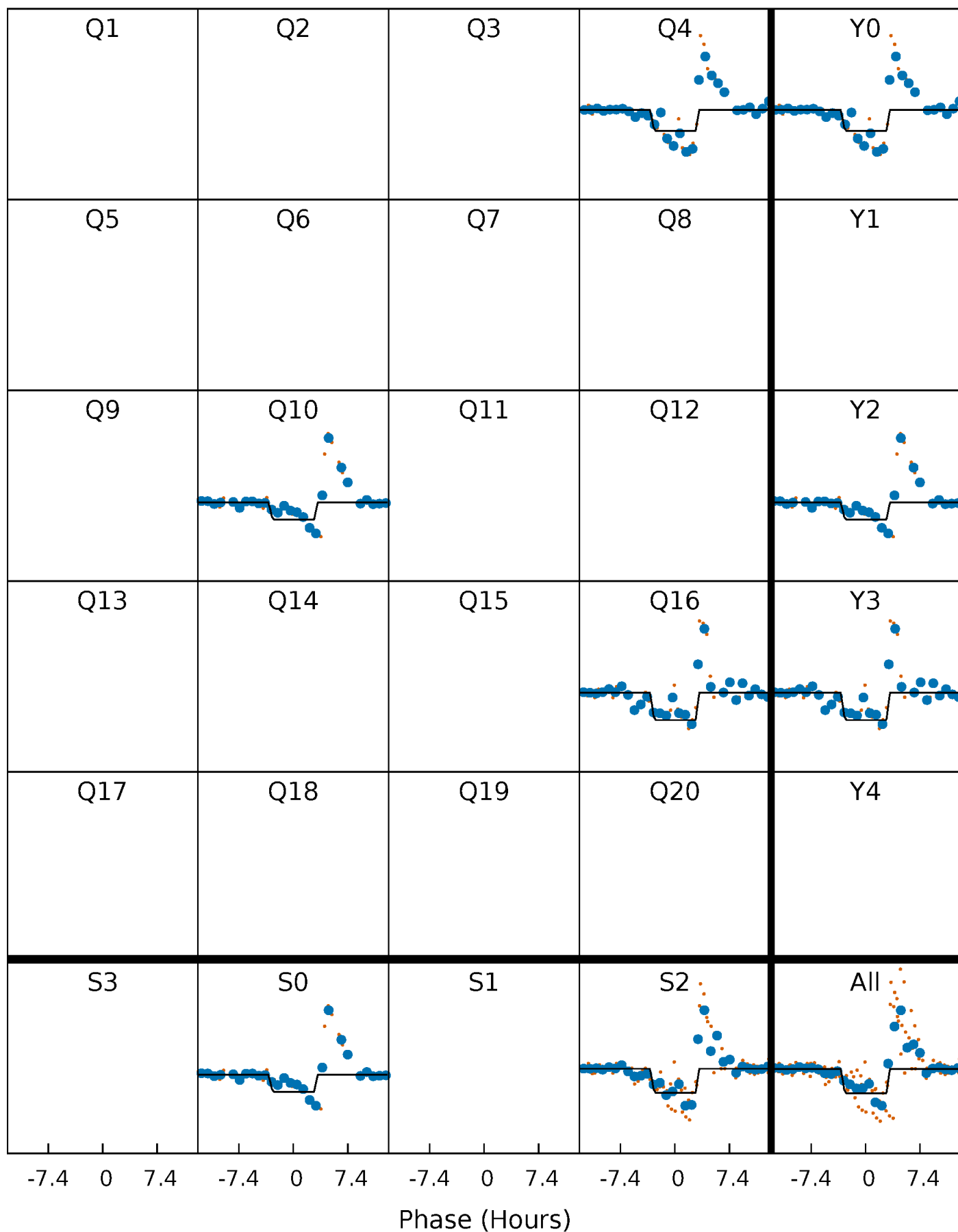
DV Quarter-Phased Transit Curves

TCE 010070247-05 $P=544.923164$ Days $T_0=410.267670$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

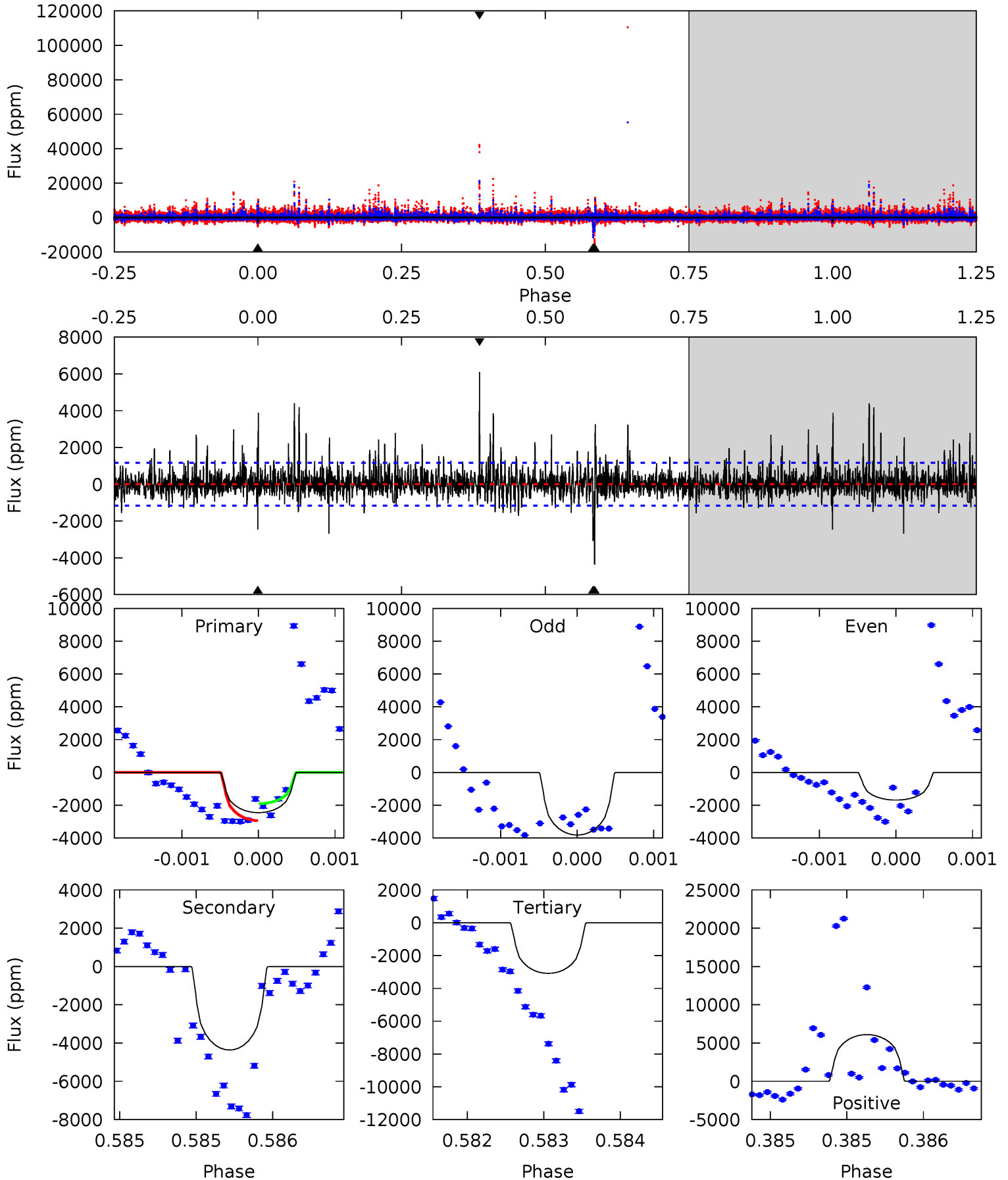
TCE 010070247-05 $P=544.935800$ Days $T_0=410.242801$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-05, P = 544.923164 Days, E = 410.267670 Days

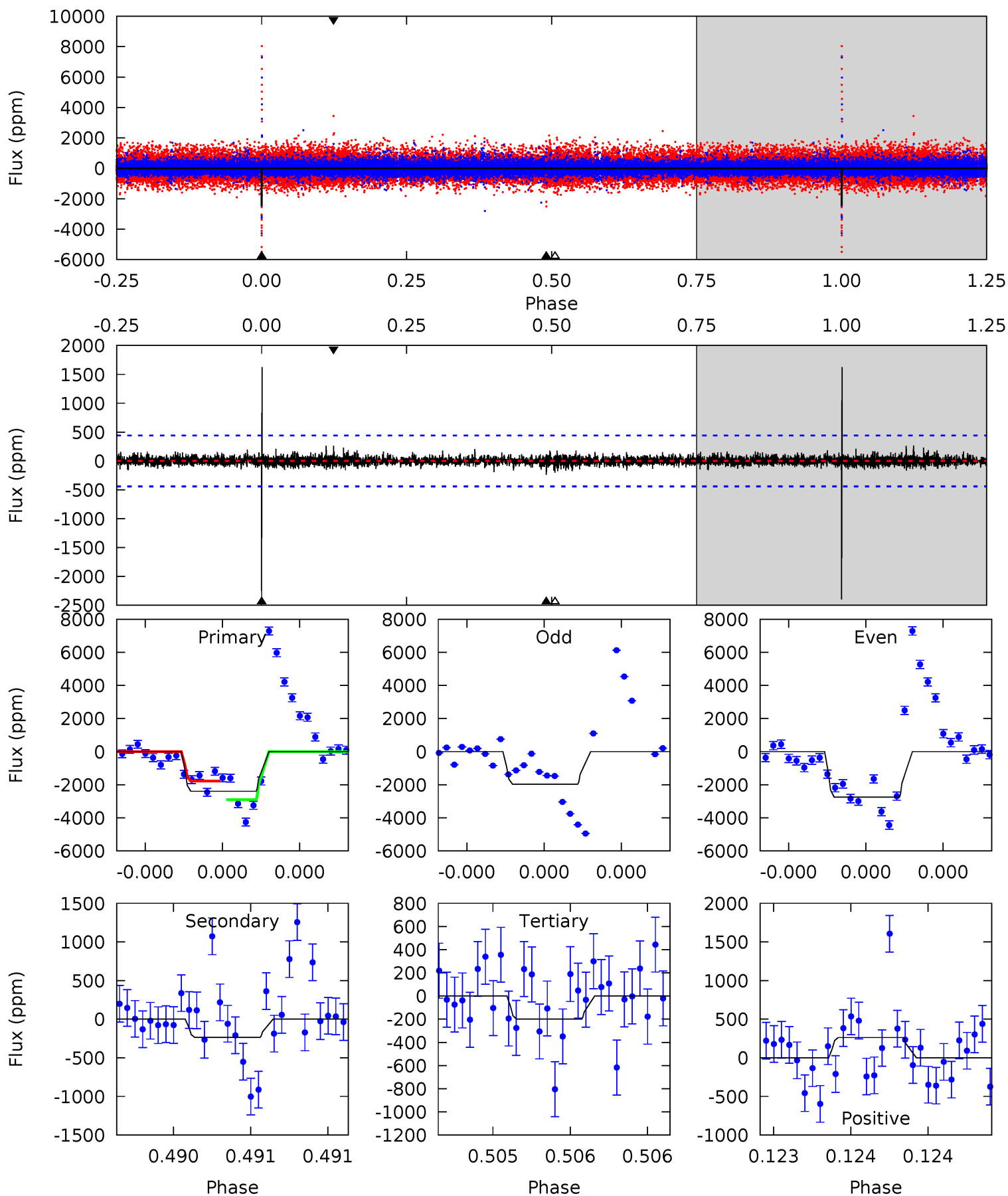
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	20.7	14.7	29.0	5.54	3.43	2.64	-3.00	-17.3	6.07	-8.26	2.41	1.11	0.58	2.45



Alt Model-Shift Uniqueness Test

010070247-05, P = 544.935800 Days, E = 410.242801 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.2	2.97	2.51	3.31	5.58	3.49	0.58	27.7	26.9	0.46	-0.34	4.72	1.24	0.40	0



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-4364 ± 210	$4.33^{+1.93}_{-1.79}$	217^{+8}_{-8}	4815^{+1318}_{-640}	$169025^{+311206}_{-88934}$
Alt.	-236 ± 79	$3.67^{+1.90}_{-1.85}$	218^{+7}_{-9}	3086^{+726}_{-371}	12311^{+34382}_{-7398}

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

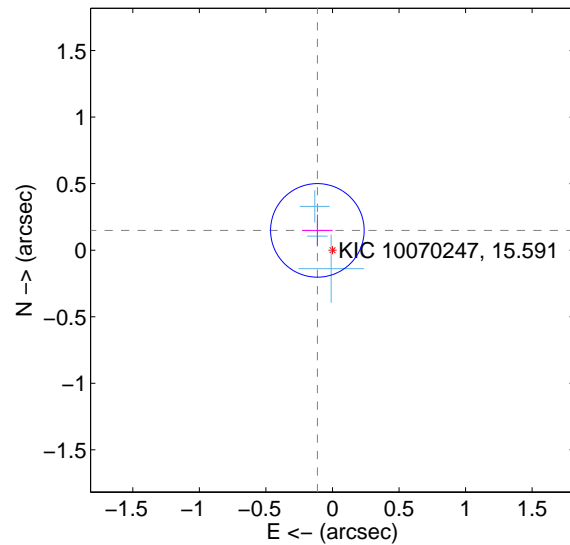
Supplemental centroid analysis for 010070247-05. Kepler magnitude: 15.59. Transit SNR 11.18

There are 3 quarters with good PRF difference image offsets

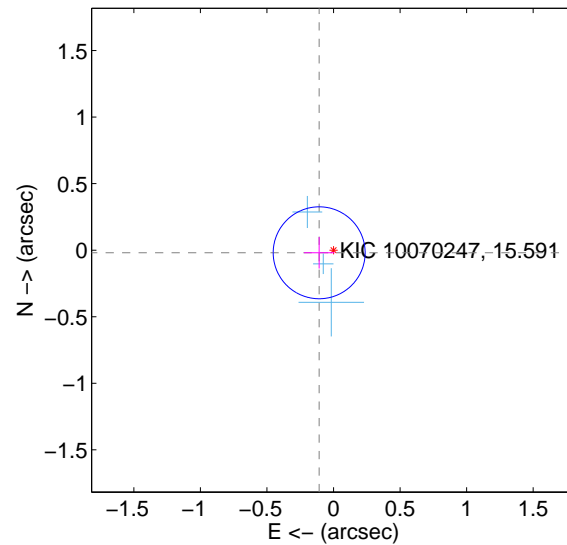
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.187 ± 0.117	1.60	0.114 ± 0.115	0.149 ± 0.118
PRF-fit source offset from KIC position	0.110 ± 0.115	0.95	0.108 ± 0.115	-0.020 ± 0.118
photometric centroid source offset	0.43 ± 0.36	1.19	0.42 ± 0.36	-0.09 ± 0.32

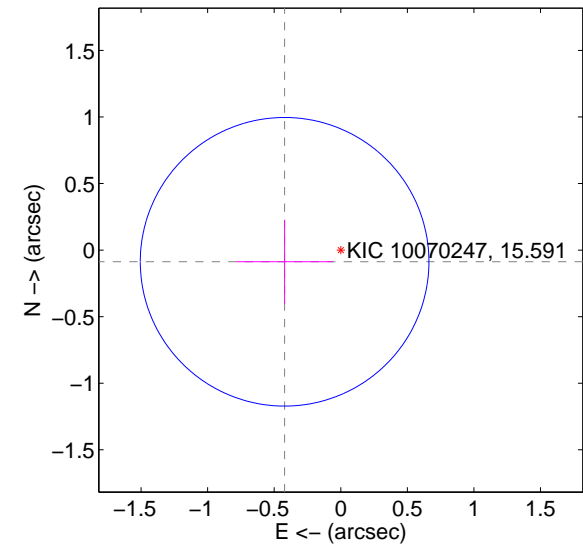
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

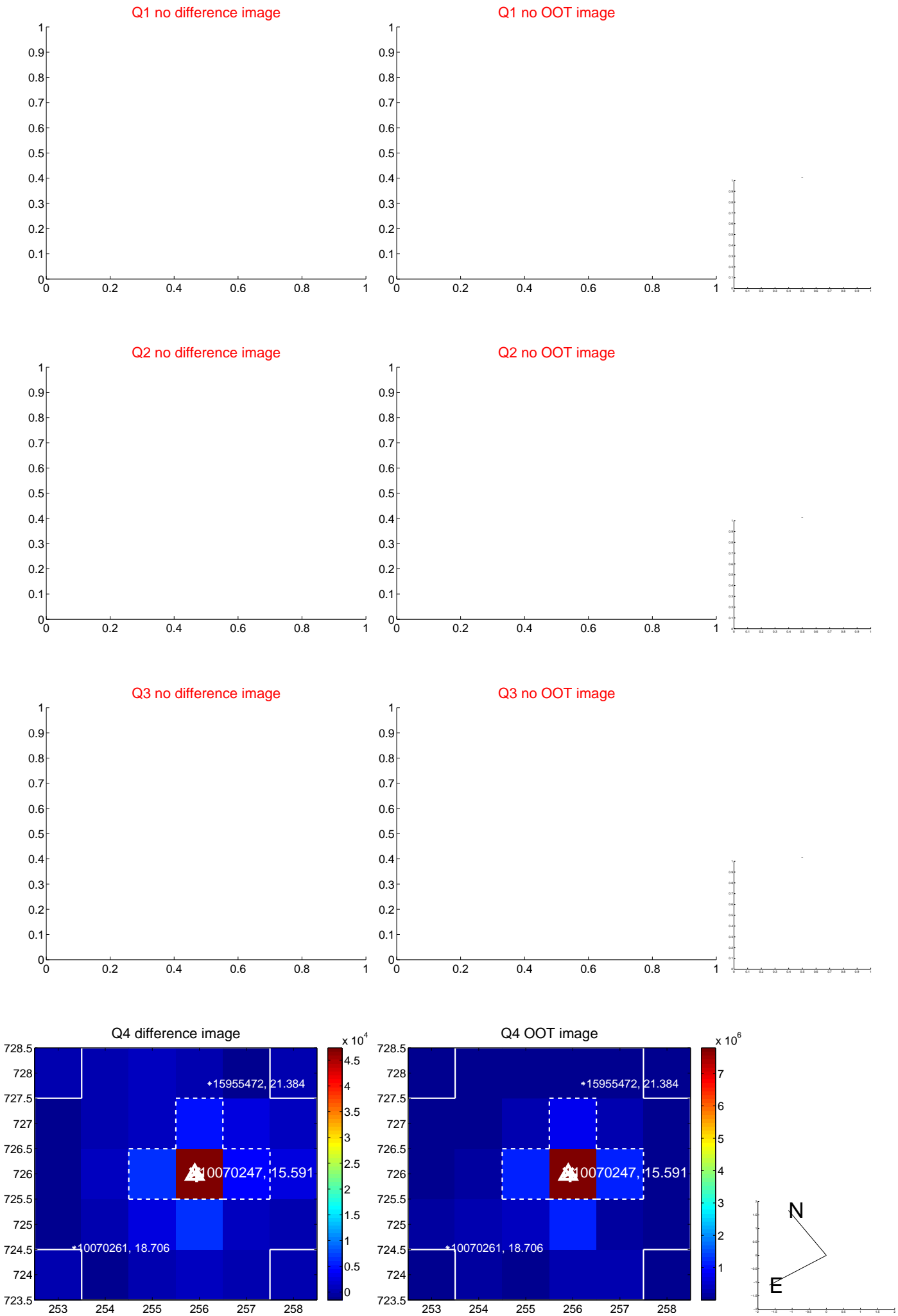


offset from photometric centroids



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.

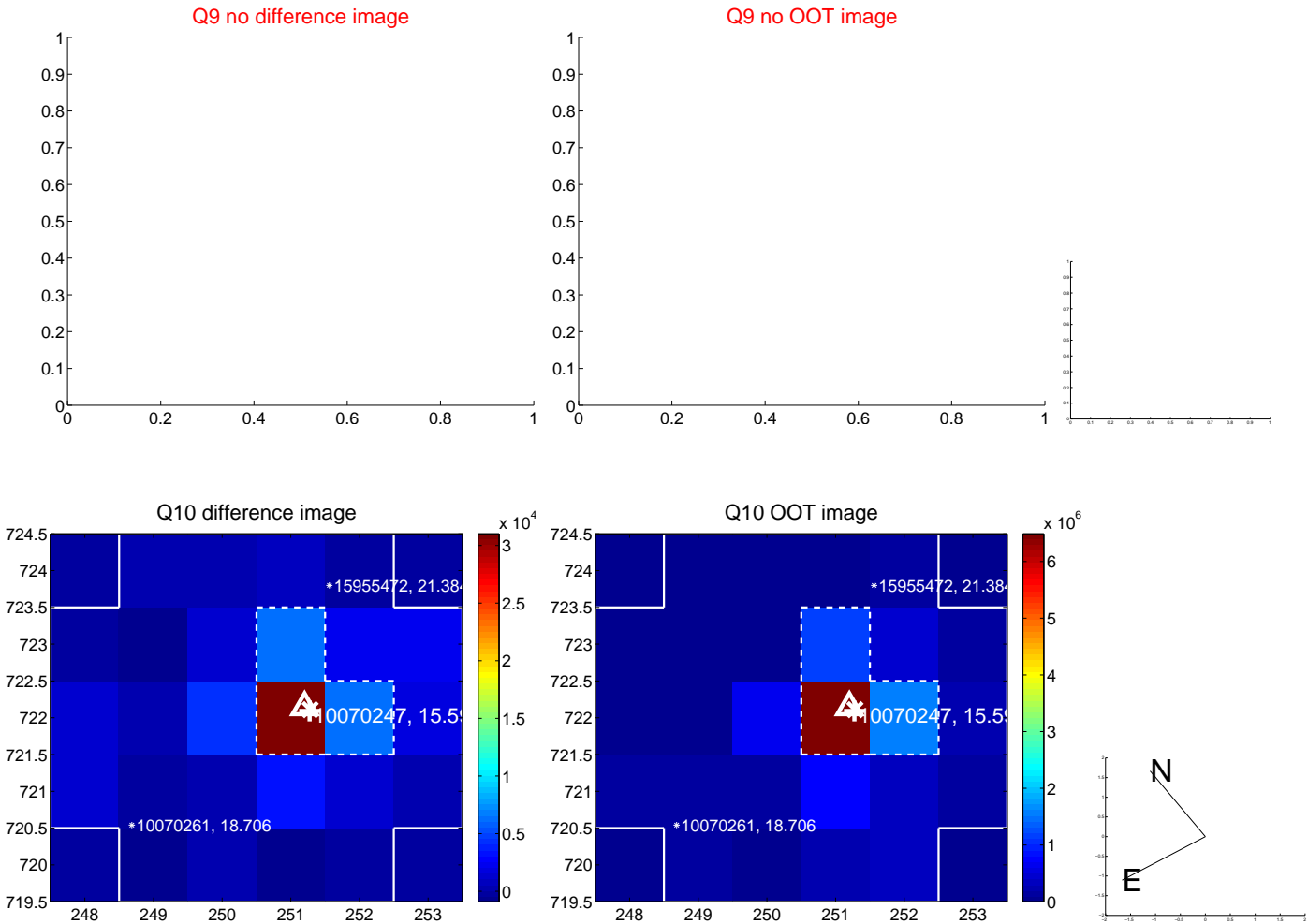
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



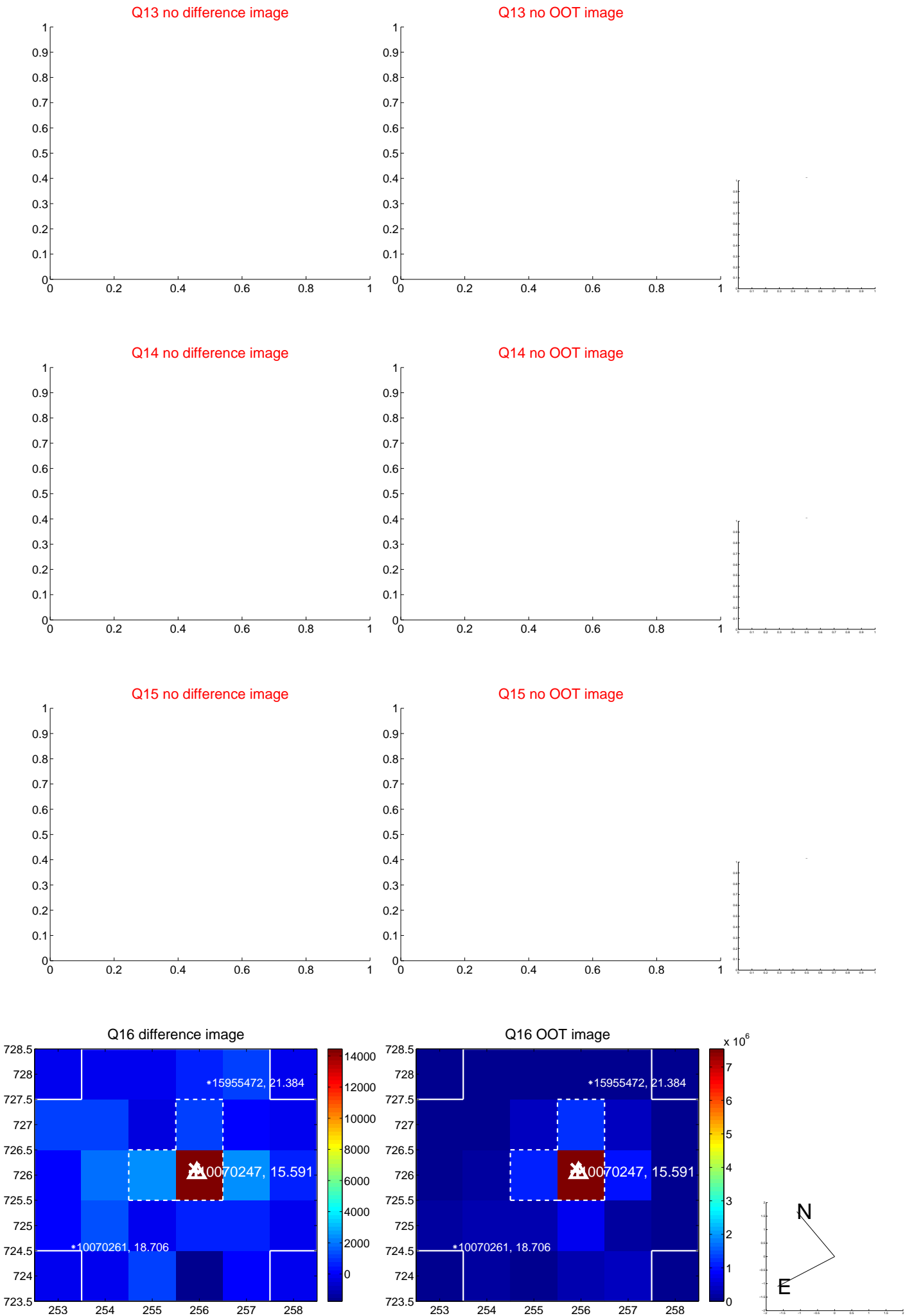
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



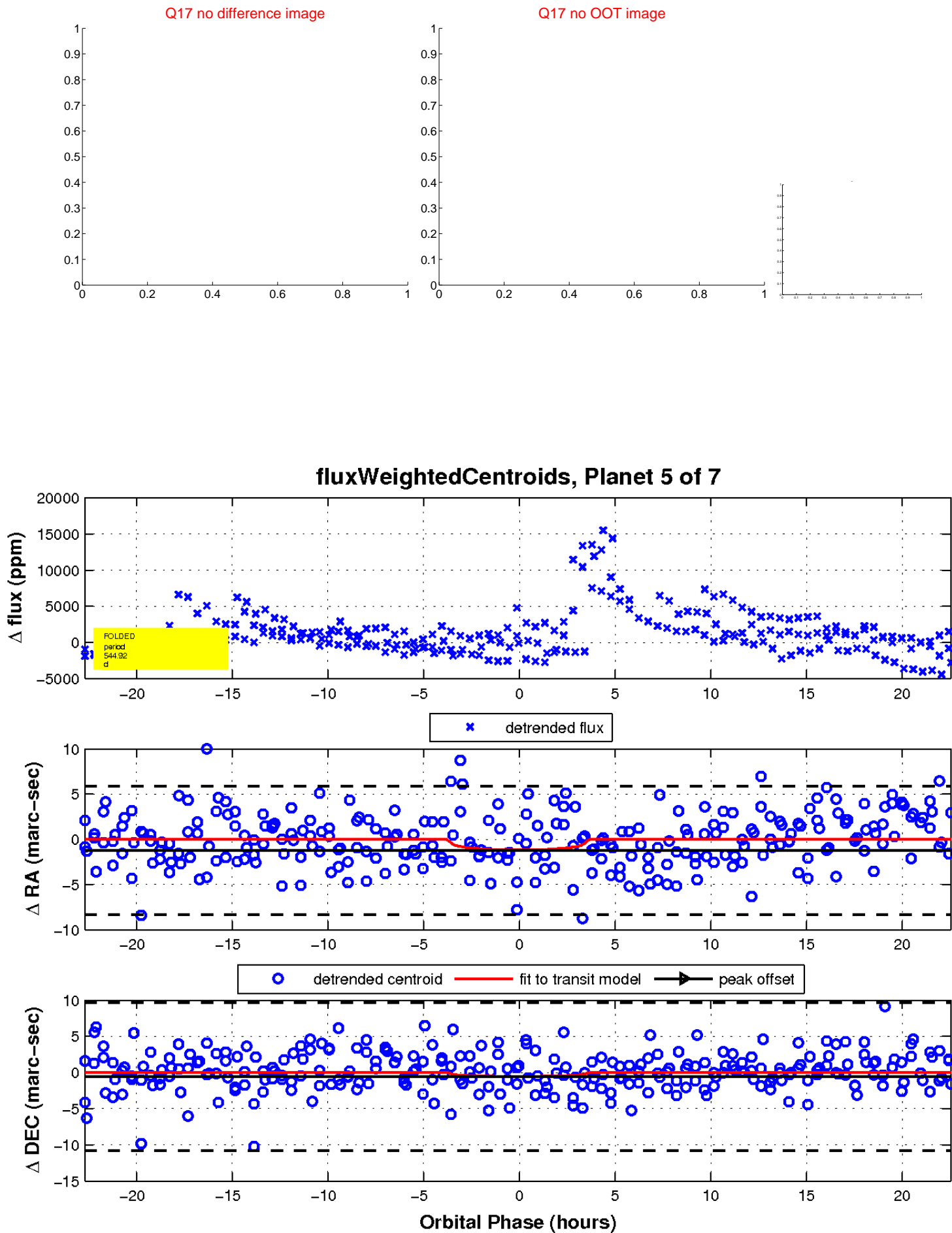
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



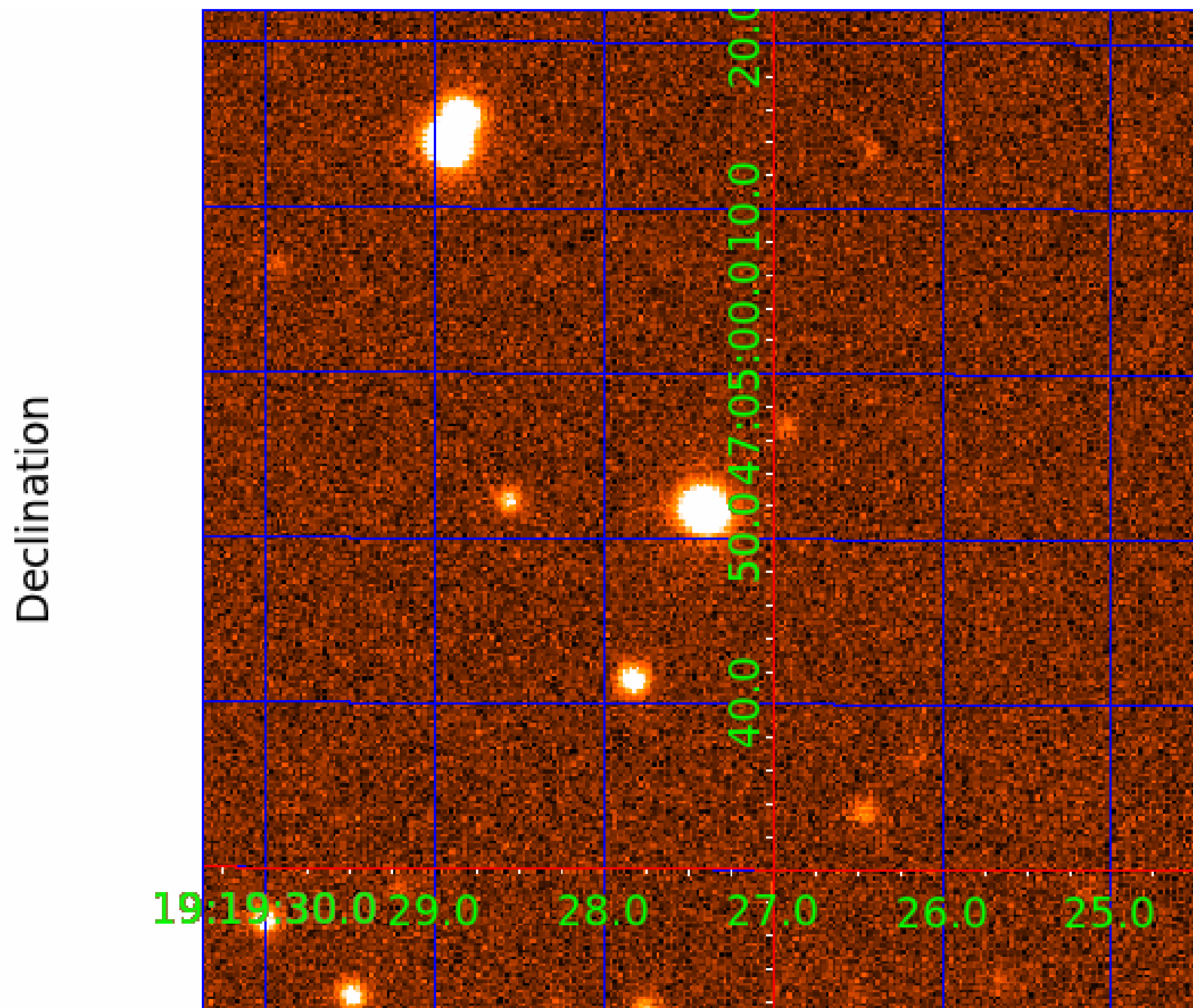
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



KIC 010070247

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})
010070247-01	OBS	No	594.920052	275.955088	3535.1	10.175	21.7	8.5	0.67	4607	3.83	0.13
010070247-02	OBS	No	400.552639	282.790324	5684.4	21.072	22.7	9.7	0.67	4607	5.83	0.21
010070247-03	OBS	No	395.352334	203.669219	5945.5	16.644	21.3	13.1	0.67	4607	4.97	0.22
010070247-04	OBS	No	375.609374	481.595164	1871.5	8.096	19.0	5.3	0.67	4607	2.94	0.23
010070247-05	OBS	No	544.923164	410.267670	4500.5	7.588	17.8	11.2	0.67	4607	4.32	0.14
010070247-06	OBS	No	514.574327	368.857770	2772.1	5.580	15.7	8.5	0.67	4607	3.67	0.15

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010070247-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
010070247-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
010070247-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010070247-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
010070247-06	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

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.

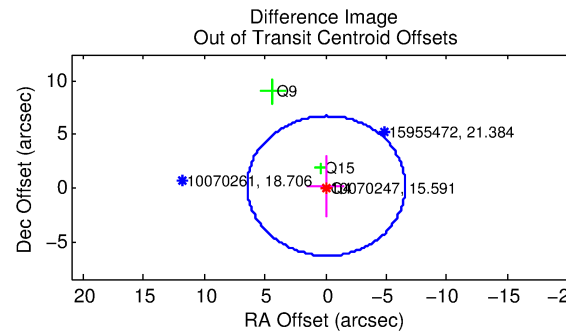
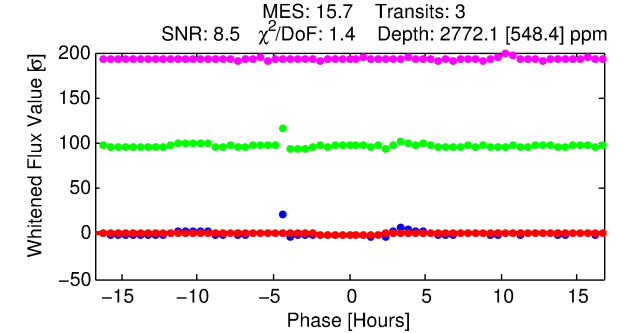
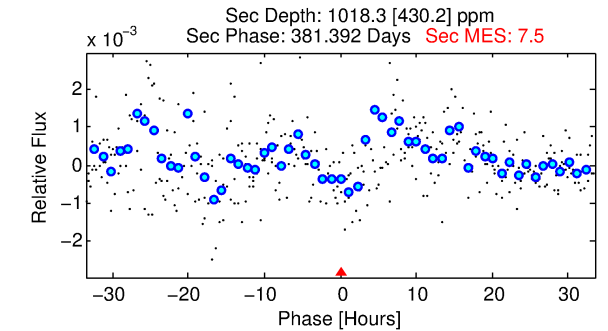
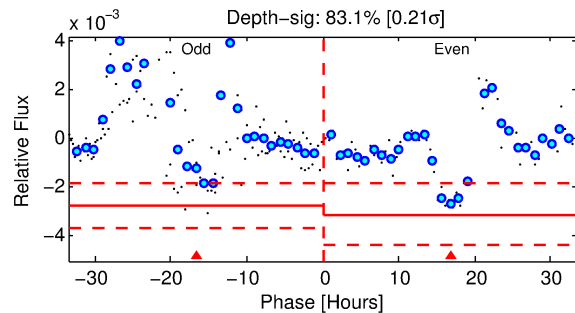
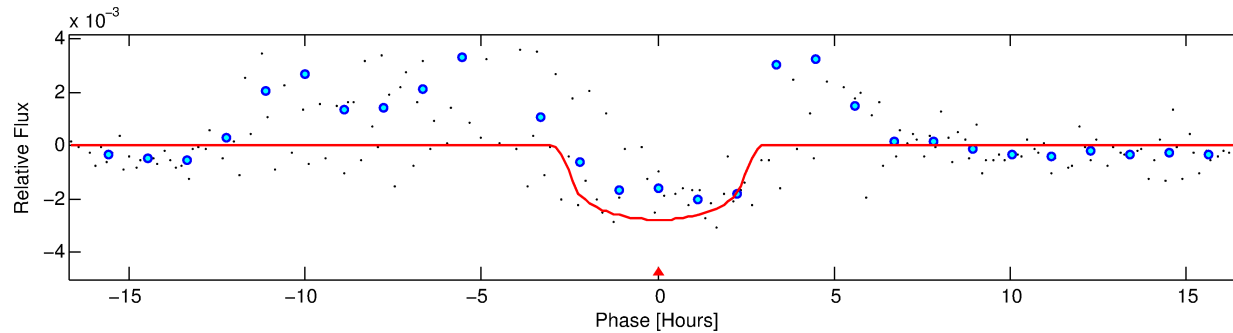
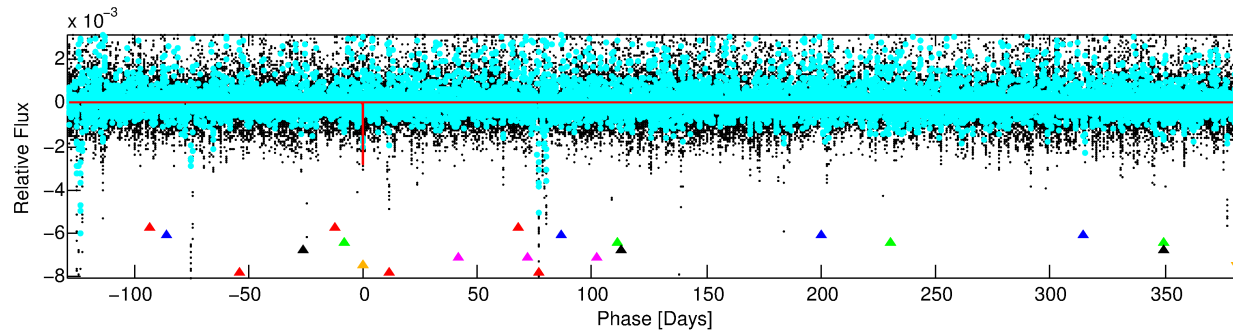
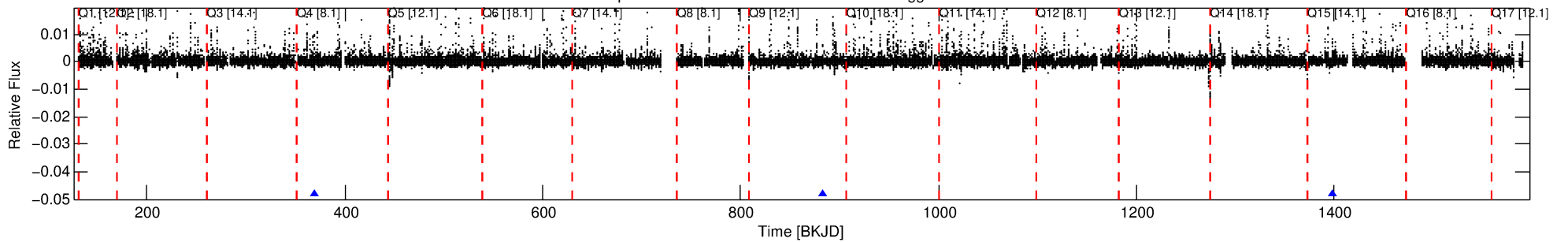
Ephemeris Match Information For 010070247-06

No Significant Match Found

DV One-Page Summary

KIC: 10070247 Candidate: 6 of 7 Period: 514.574 d

Kp: 15.59 R*: 0.67 Rs Teff: 4607.0 K Logg: 4.60 Fe/H: -0.200



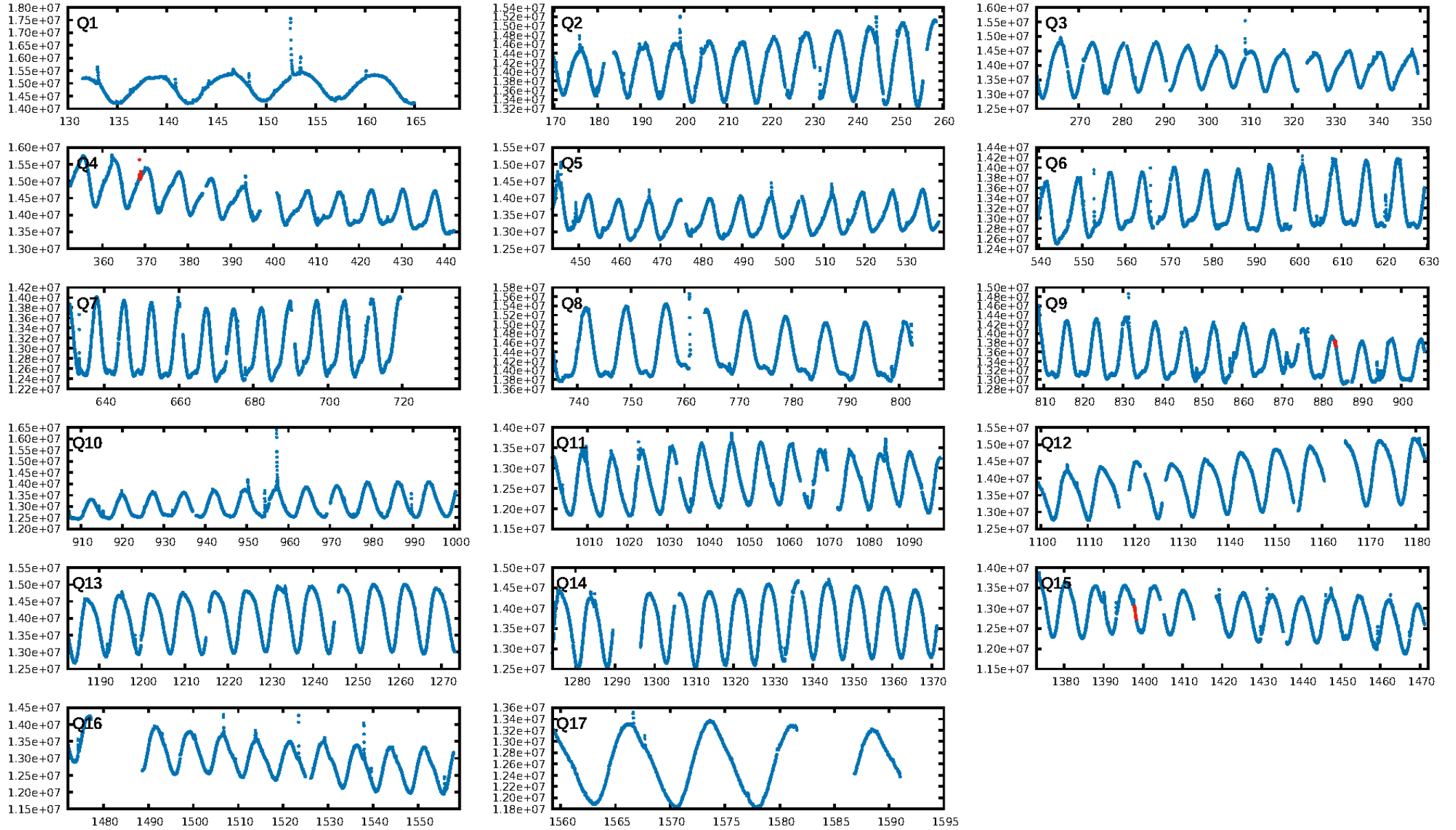
DV Fit Results:

Period = 514.57433 [0.00748] d
Epoch = 368.8578 [0.0107] BKJD
Rp/R* = 0.0499 [0.0319]
a/R* = 598.62 [1148.10]
b = 0.62 [1.97]
Seff = 0.15 [0.03]
Teq = 159 [7] K
Rp = 3.67 [2.37] Re
a = 1.0948 [0.0784] AU
Ag = 49944.55 [67421.73] [0.74σ]
Teffp = 3683 [1245] K [2.83σ]

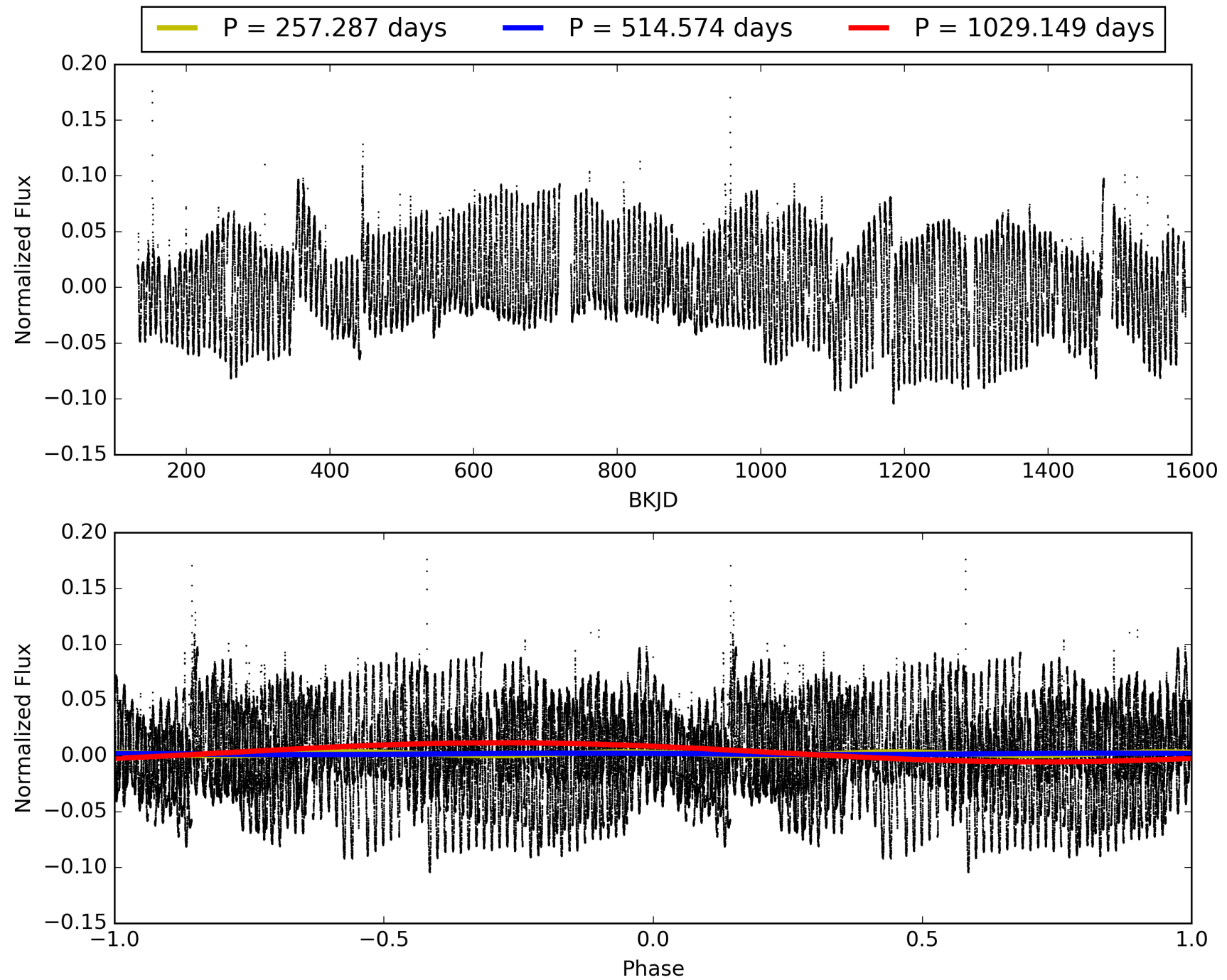
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [133.10σ]
LongPeriod-sig: 100.0% [77.33σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 75.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5742
Centroid-sig: 84.4%
Centroid-so: 0.478 arcsec [0.78σ]
OotOffset-rm: 0.207 arcsec [0.09σ]
KicOffset-rm: 0.072 arcsec [0.04σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 010070247-06, PDC Light Curves

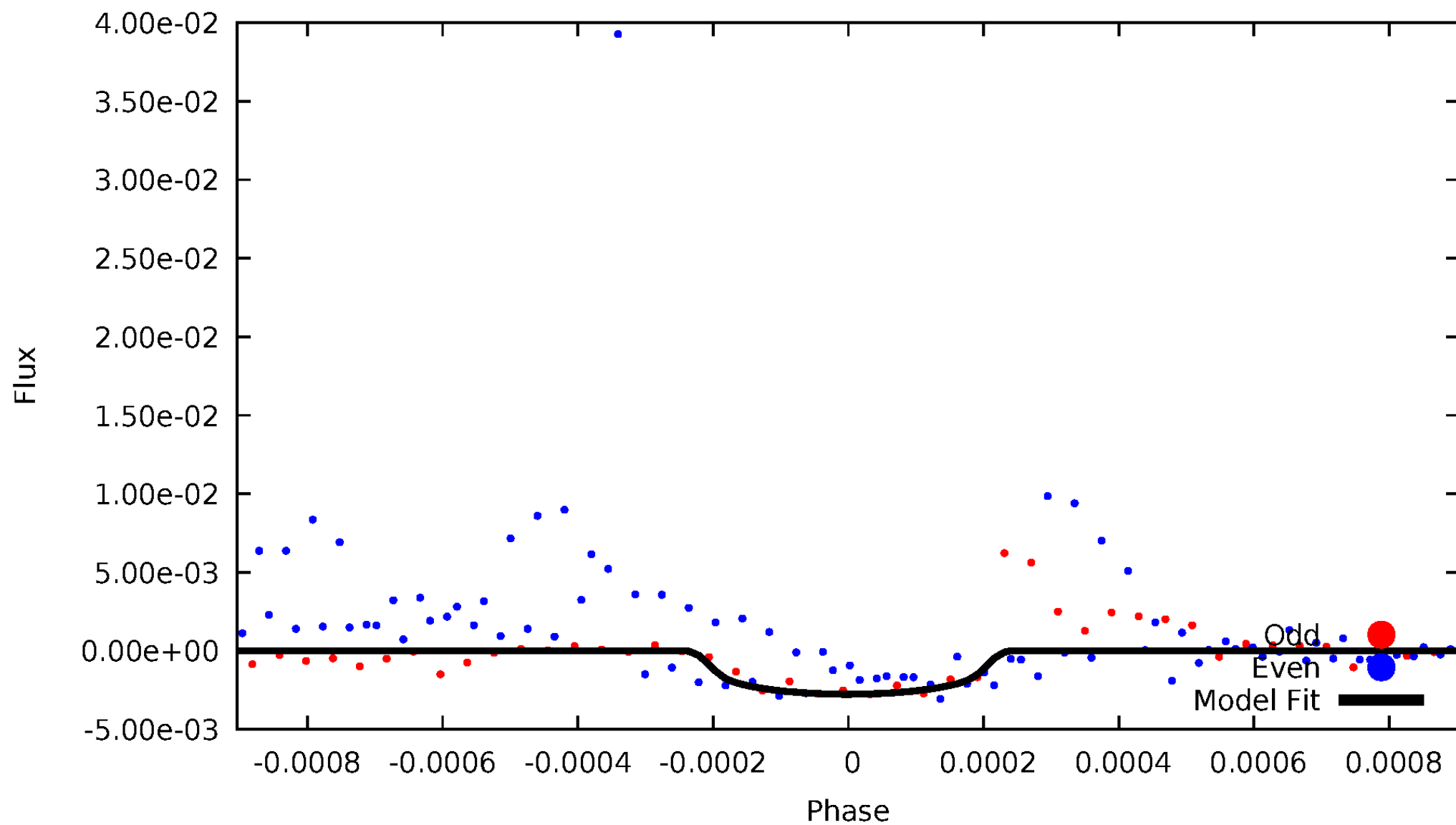


TCE 010070247-06



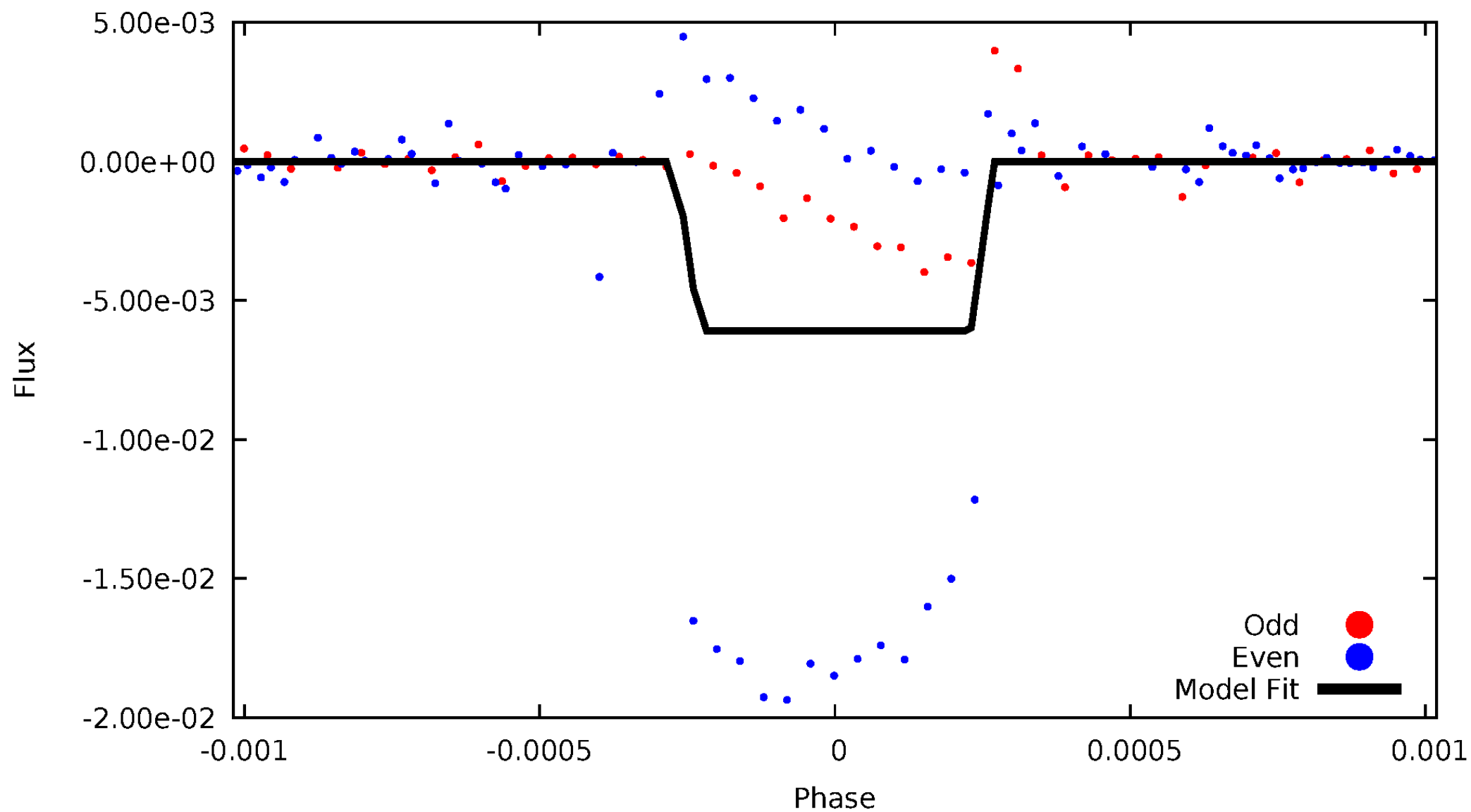
DV Odd/Even

TCE 010070247-06



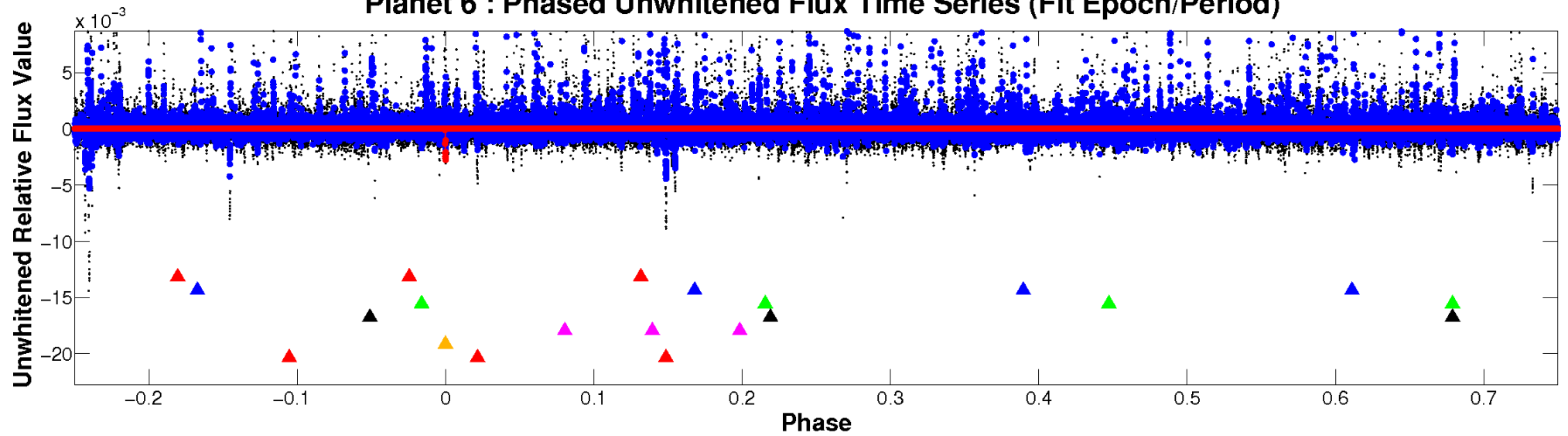
ALT Odd/Even

TCE 010070247-06

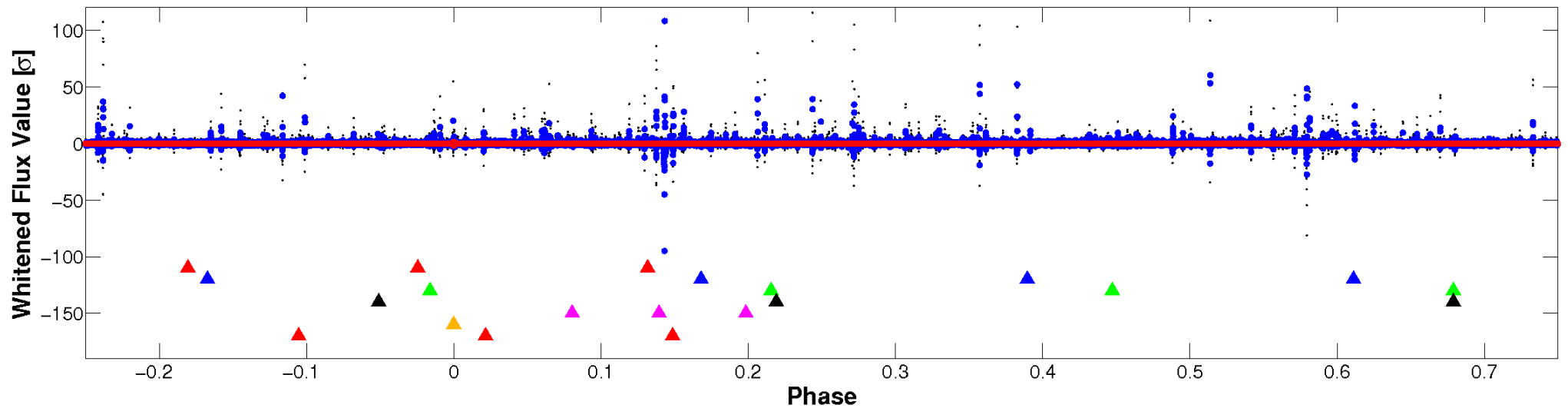


Non-Whitened Vs. Whitened Light Curve

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

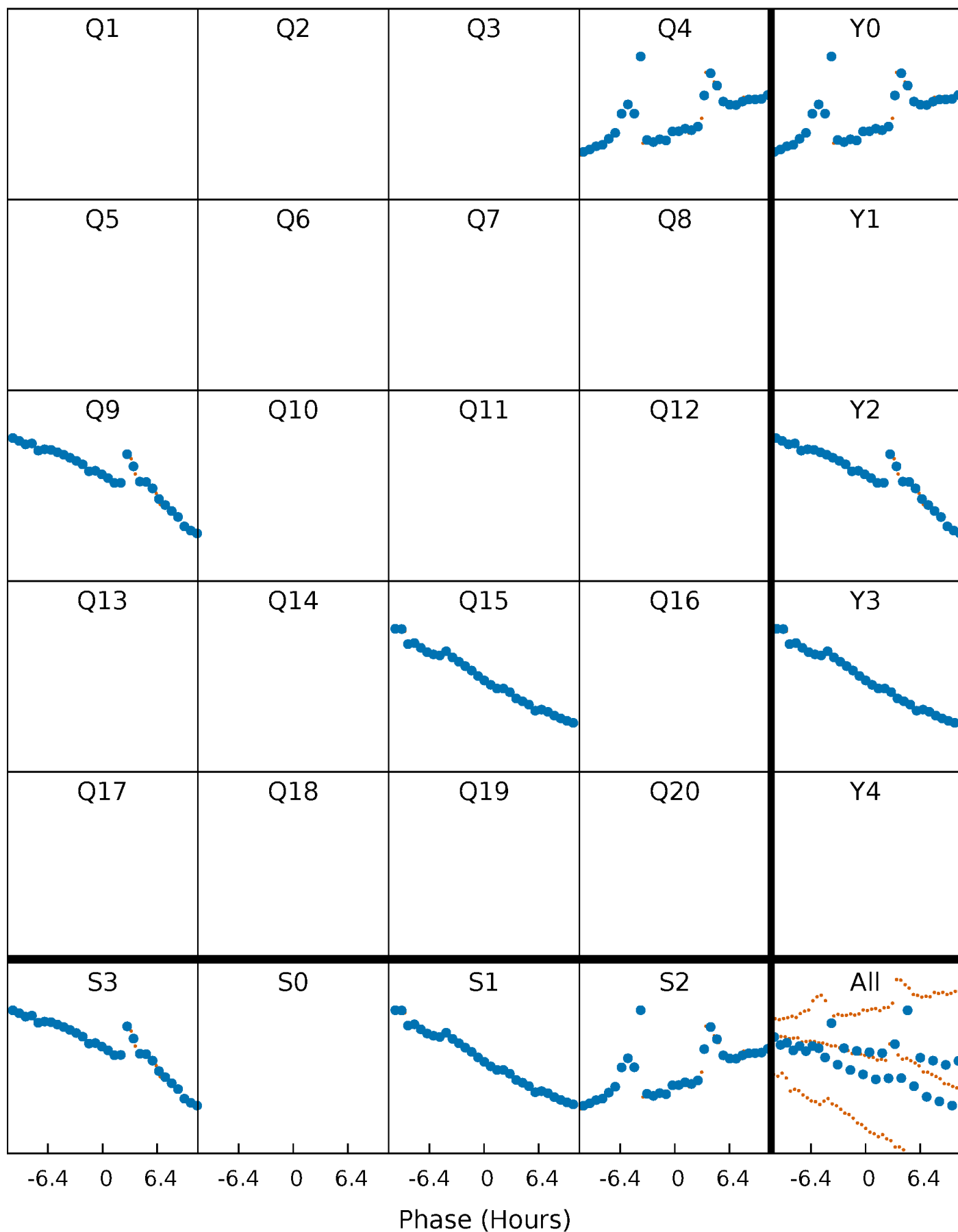


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



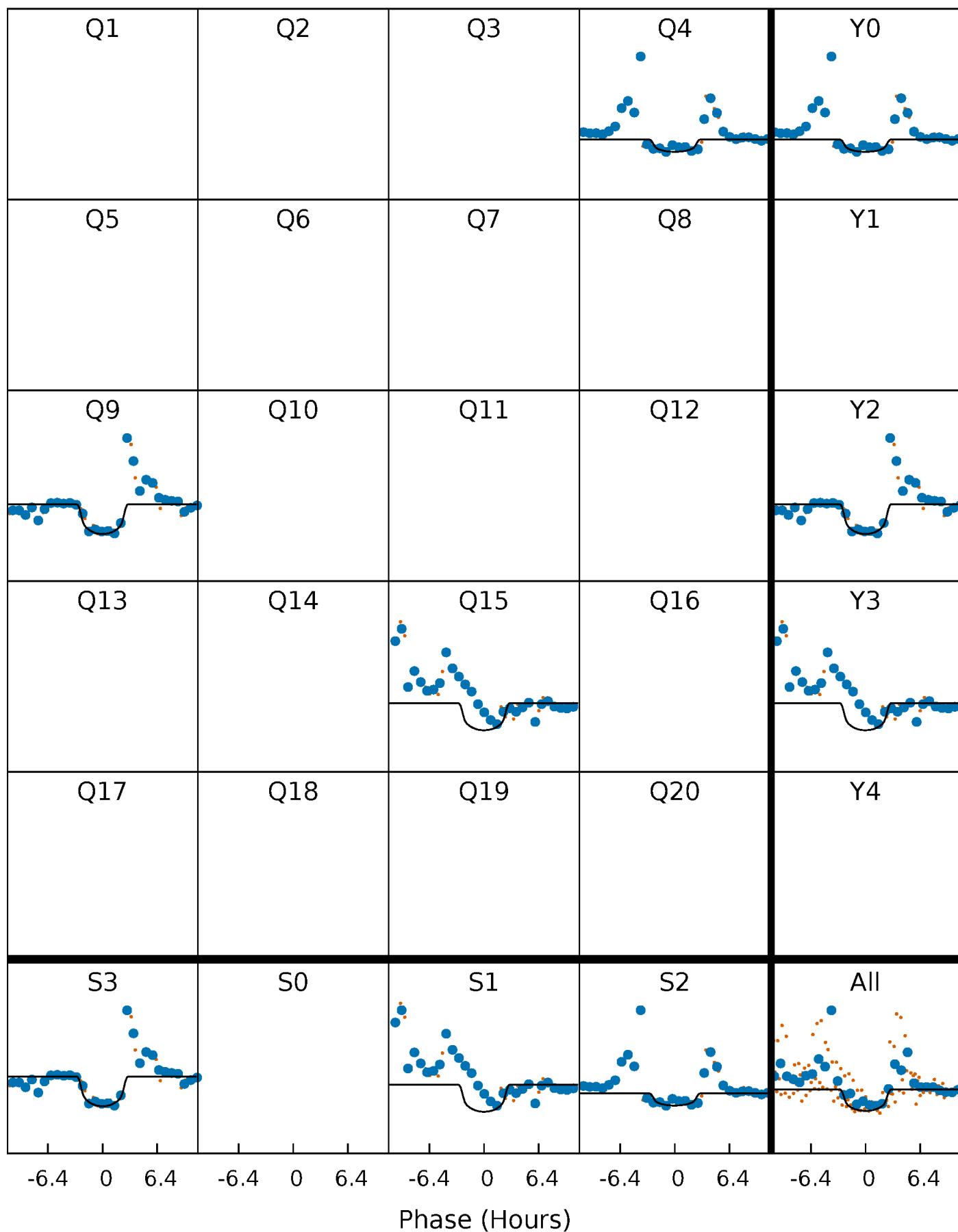
PDC Quarter-Phased Transit Curves

TCE 010070247-06 P=514.574327 Days $T_0=368.857770$ (BKJD)



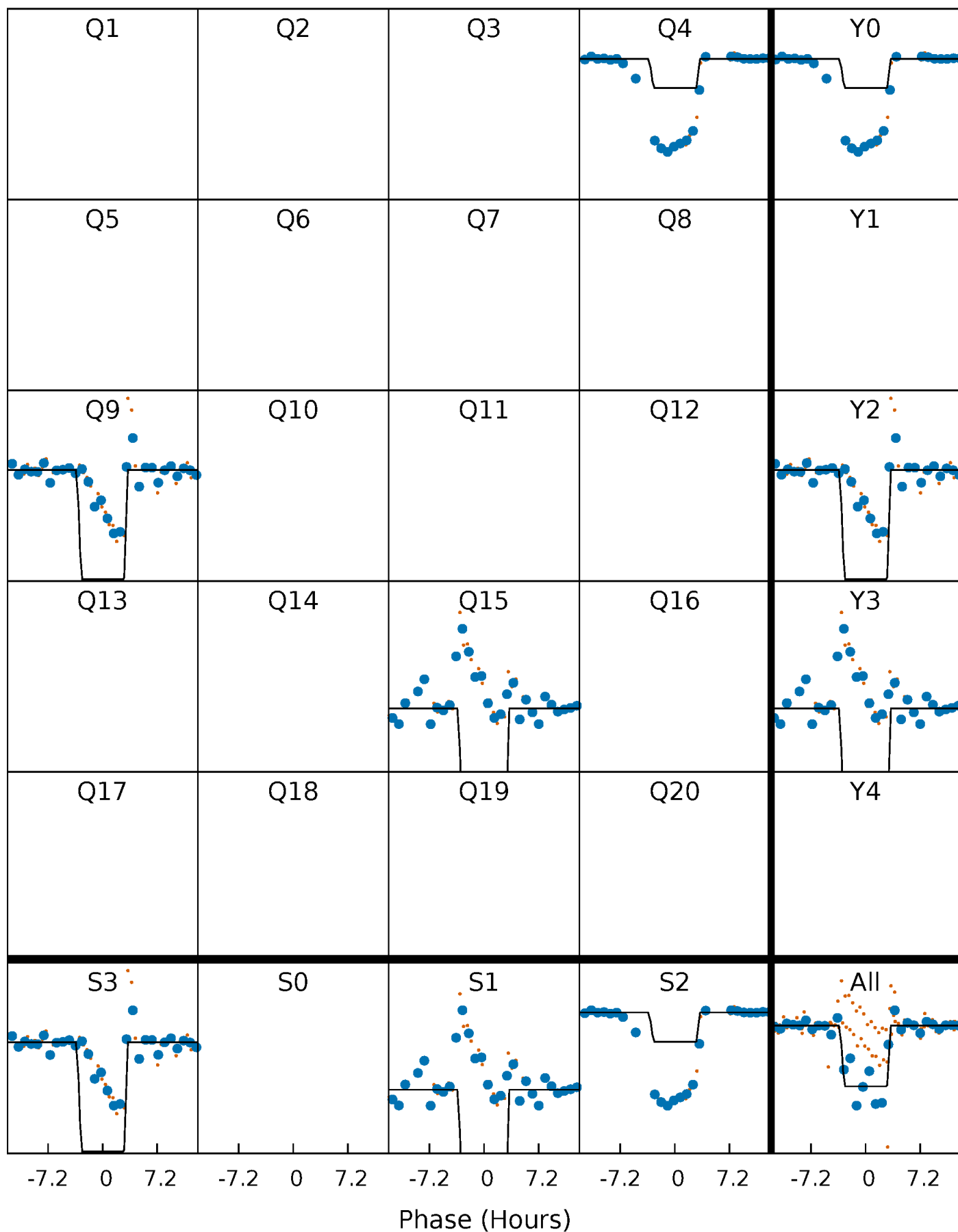
DV Quarter-Phased Transit Curves

TCE 010070247-06 $P=514.574327$ Days $T_0=368.857770$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

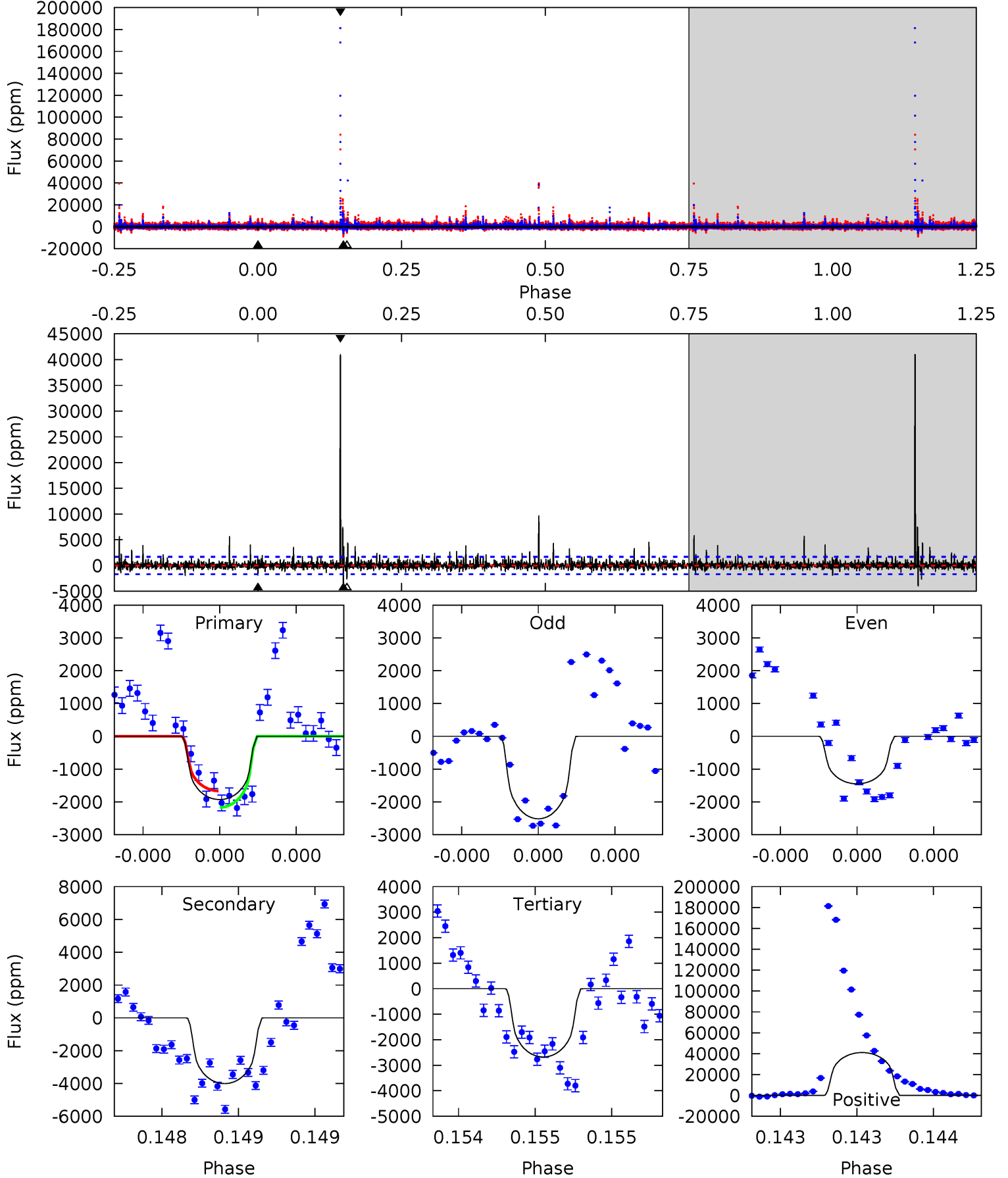
TCE 010070247-06 P=514.544286 Days $T_0=368.867288$ (BKJD)



DV Model-Shift Uniqueness Test

010070247-06, P = 514.574327 Days, E = 368.857770 Days

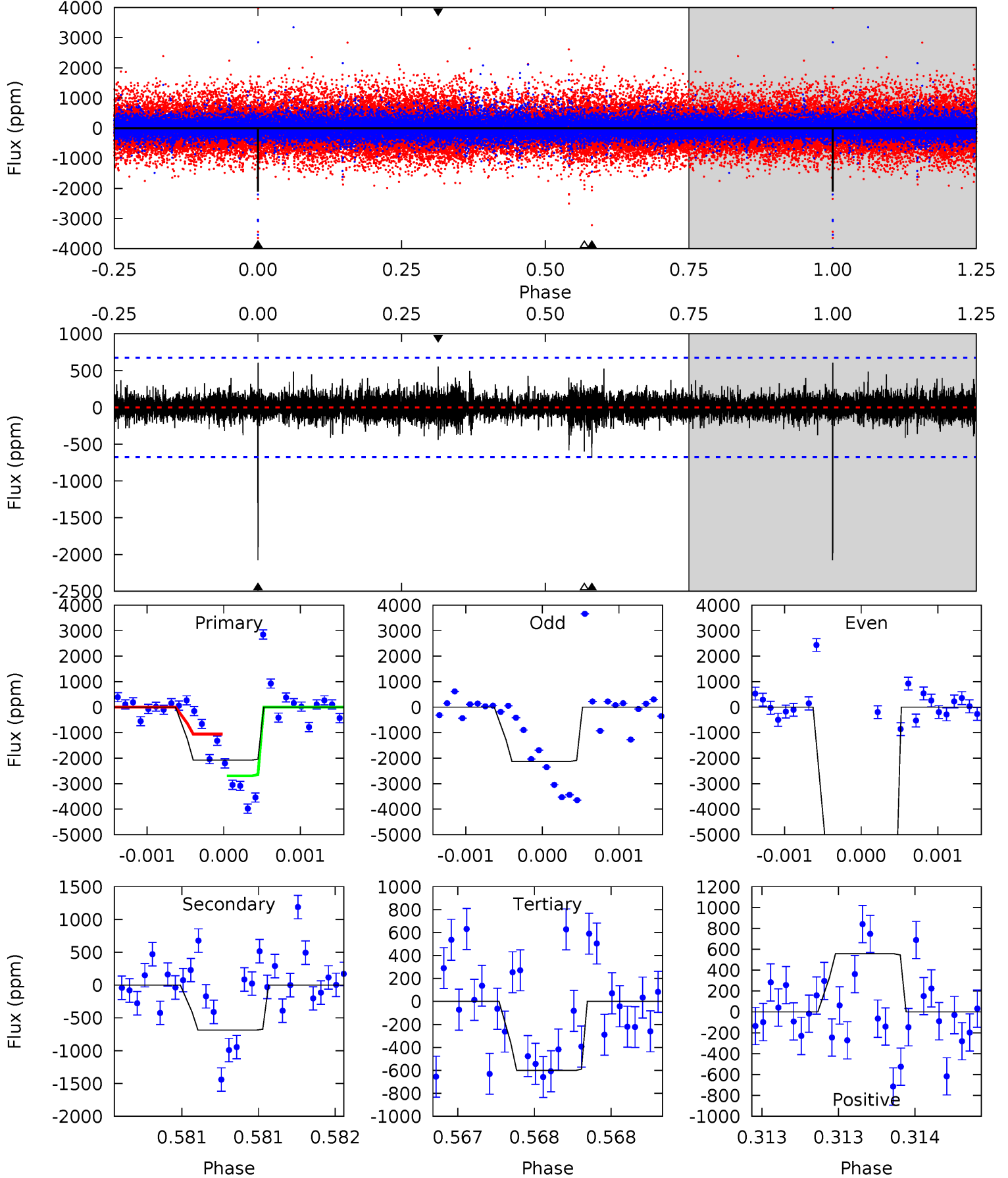
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.34	13.2	8.78	134.9	5.58	3.49	3.19	-2.45	-128.5	4.38	-121.7	1.05	0.74	0.91	0.83



Alt Model-Shift Uniqueness Test

010070247-06, P = 514.544286 Days, E = 368.867288 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	5.65	4.95	4.58	5.57	3.47	0.72	12.2	12.5	0.70	1.07	32.8	2.94	0.23	0



Stellar Parameters For KIC 010070247

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4607^{+151}_{-151}	$4.602^{+0.052}_{-0.028}$	$-0.200^{+0.300}_{-0.300}$	$0.673^{+0.054}_{-0.060}$	$0.661^{+0.075}_{-0.048}$	$3.053^{+0.706}_{-0.396}$
	+3%/-3%	+1%/-1%	+150%/-150%	+8%/-9%	+11%/-7%	+23%/-13%
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 010070247-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-4008 ± 305	$3.80^{+2.24}_{-2.11}$	222^{+8}_{-8}	4973^{+2506}_{-821}	$182562^{+763703}_{-112135}$
Alt.	-686 ± 121	$5.76^{+2.36}_{-2.29}$	222^{+8}_{-9}	3184^{+564}_{-335}	14051^{+24709}_{-7457}

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

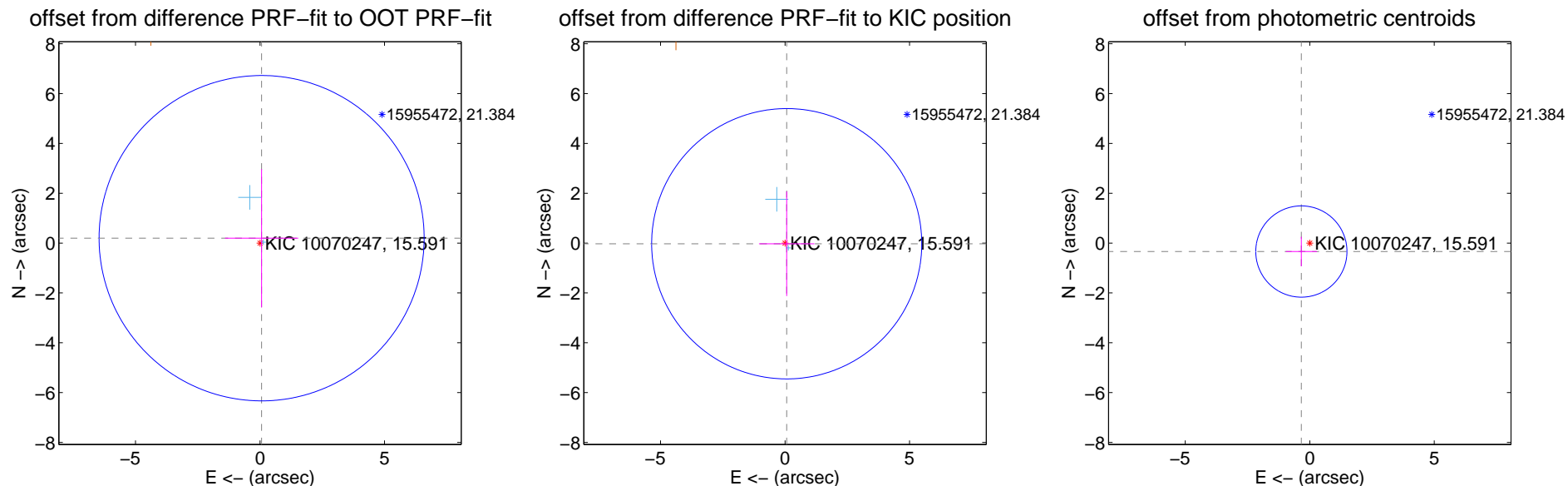
DV Centroid Data

Supplemental centroid analysis for 010070247-06. Kepler magnitude: 15.59. Transit SNR 8.48

There are 2 quarters with good PRF difference image offsets

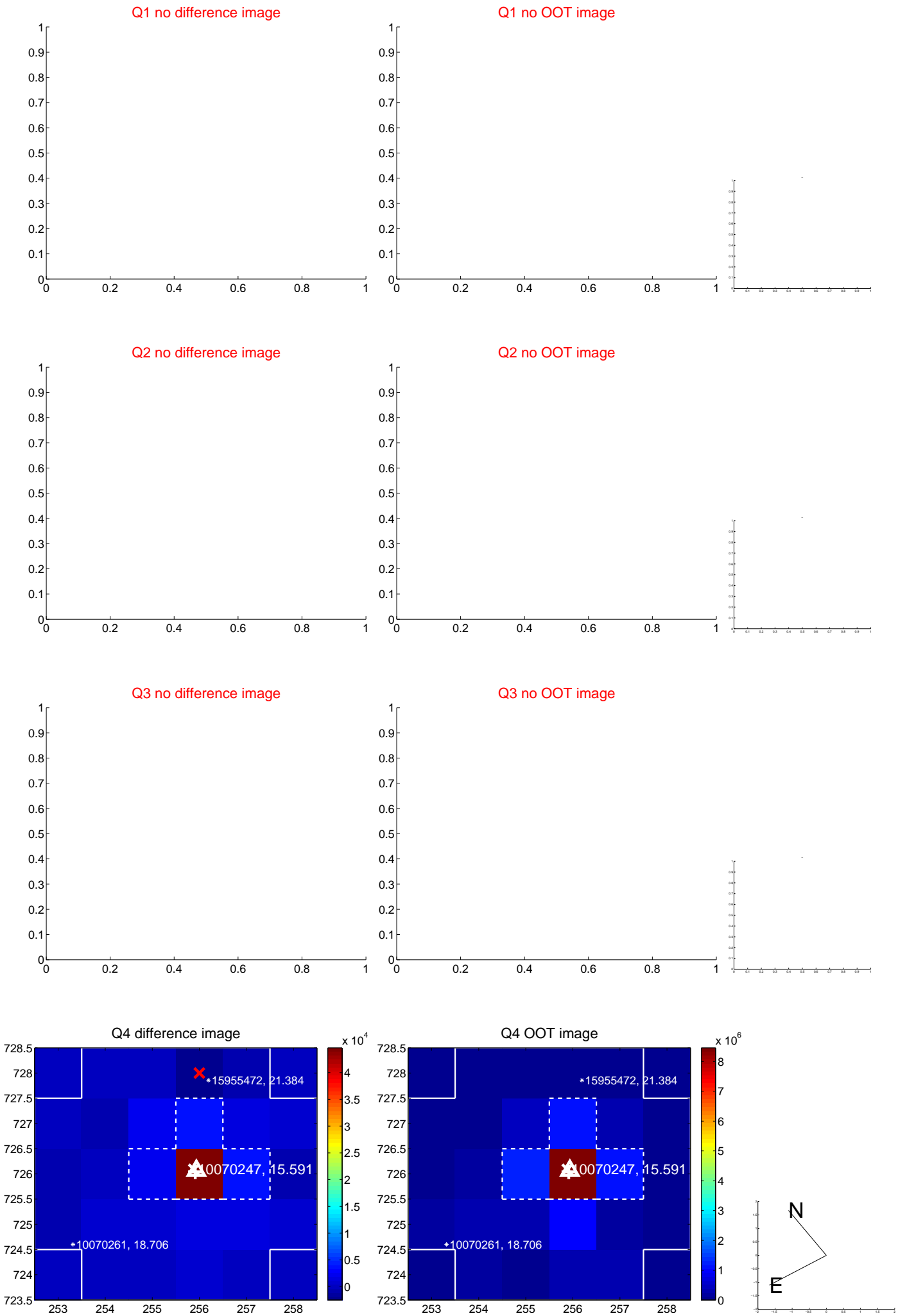
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.207 ± 2.176	0.09	-0.065 ± 1.471	0.196 ± 2.775
PRF-fit source offset from KIC position	0.072 ± 1.808	0.04	-0.067 ± 1.112	-0.027 ± 2.096
photometric centroid source offset	0.48 ± 0.61	0.78	0.34 ± 0.63	-0.34 ± 0.59



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.

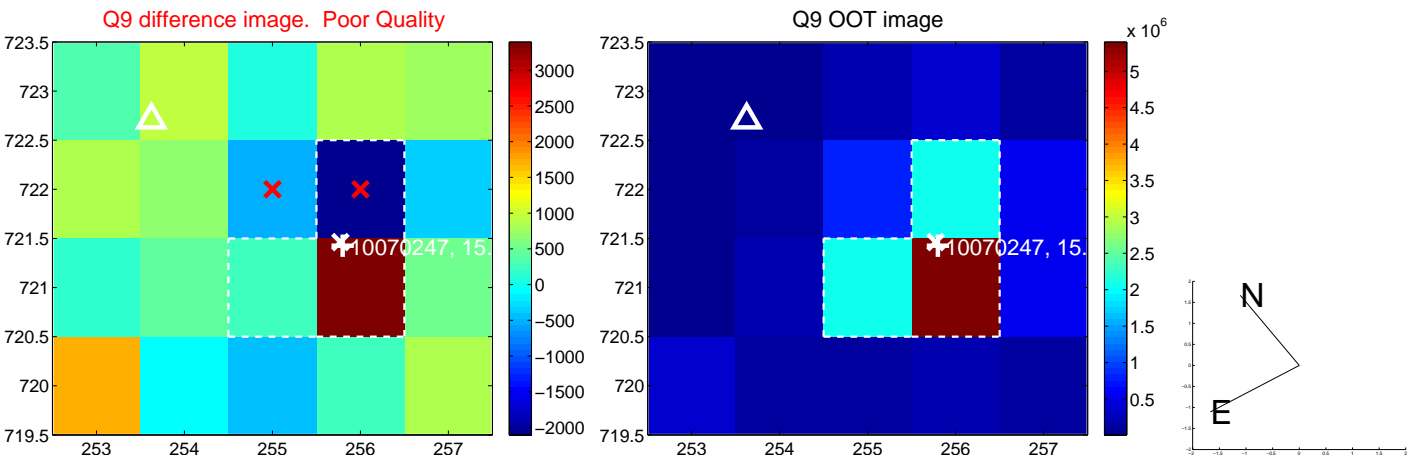
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



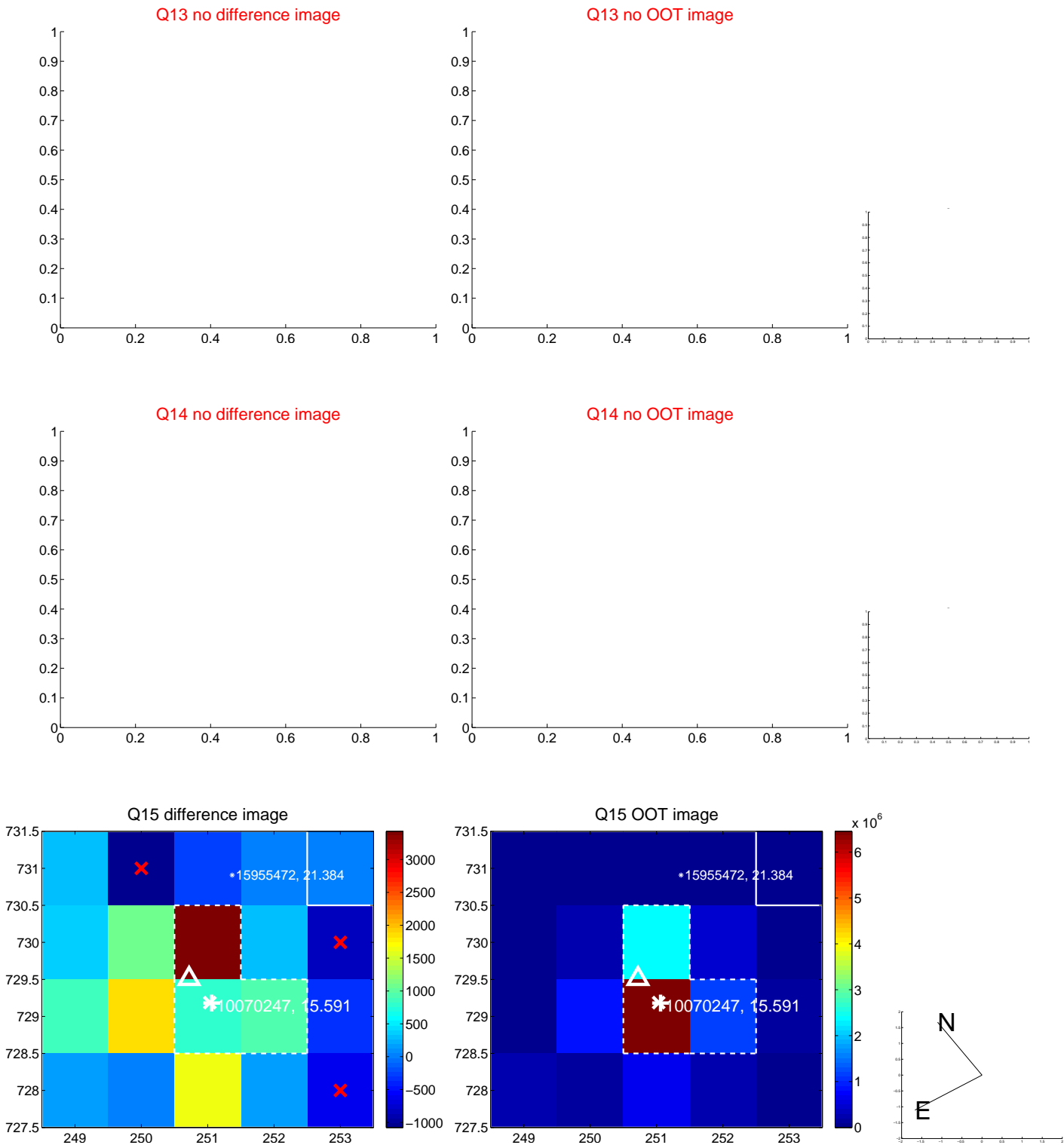
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



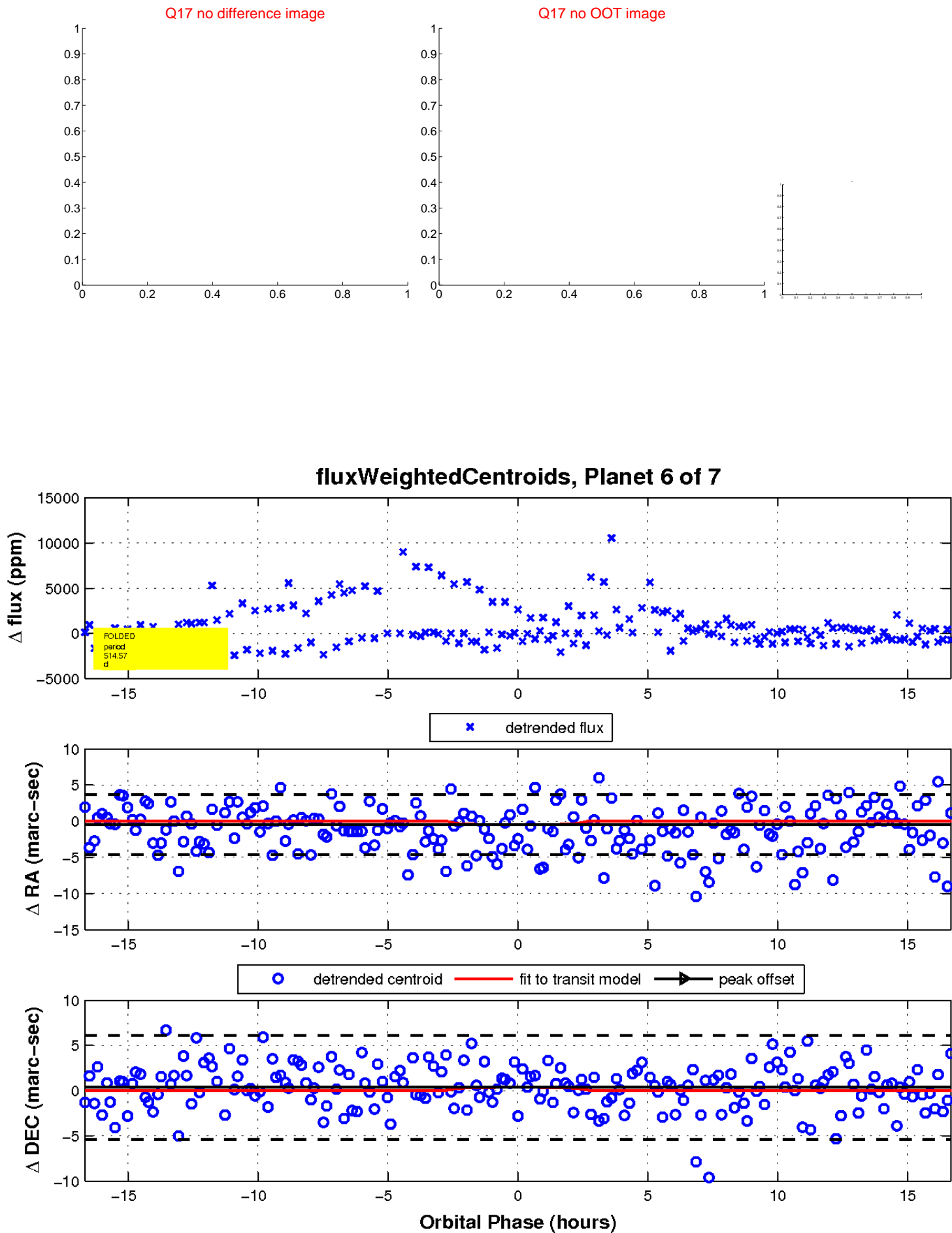
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

