

KIC 008022670

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})
008022670-01	OBS	No	338.106337	271.834437	1678.4	4.455	23.6	8.9	4.86	4707	19.52	12.05
008022670-02	OBS	No	489.568902	336.153210	911.1	2.008	17.0	4.6	4.86	4707	14.23	7.36
008022670-03	OBS	No	396.966032	464.162055	562.0	1.892	16.7	3.7	4.86	4707	12.48	9.73
008022670-04	OBS	No	386.854969	147.595611	393.2	6.000	18.7	-1.0	4.86	4707	9.25	10.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022670-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008022670-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

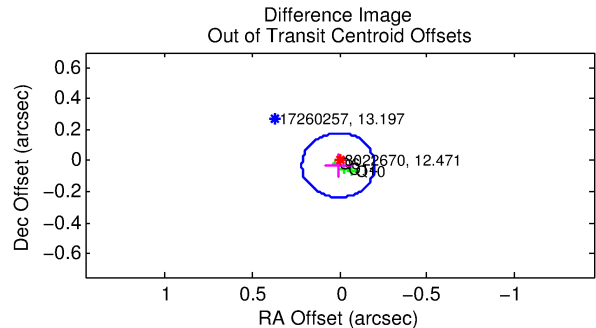
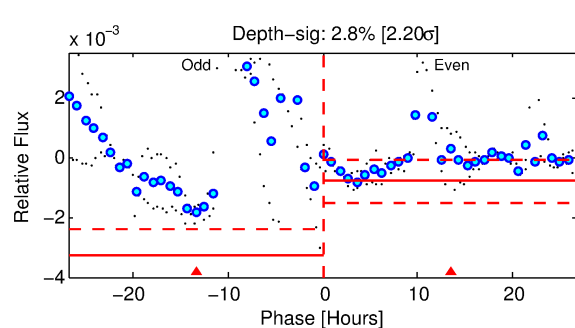
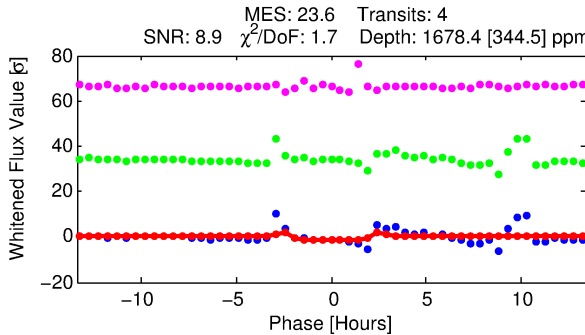
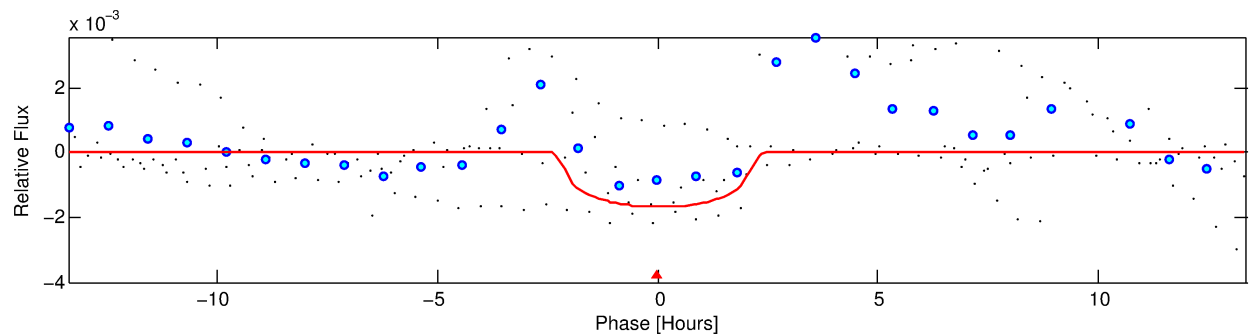
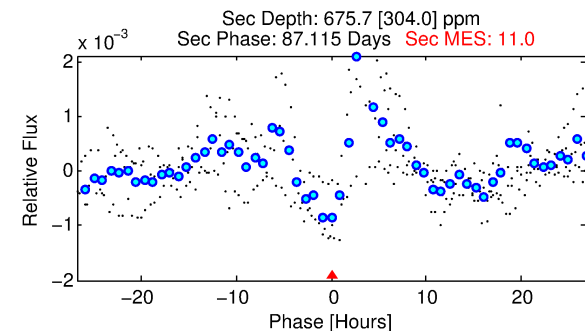
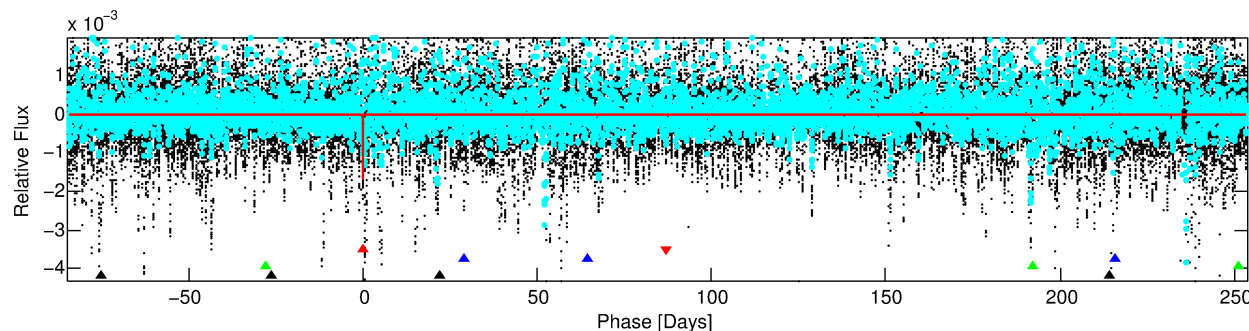
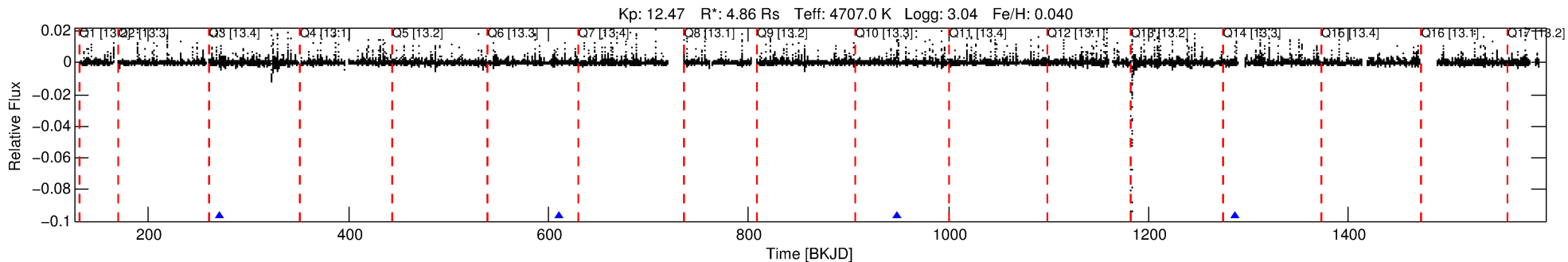
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022670-01

No Significant Match Found

DV One-Page Summary

KIC: 8022670 Candidate: 1 of 4 Period: 338.106 d



DV Fit Results:

Period = 338.10634 [0.00331] d
Epoch = 271.8344 [0.0063] BKJD
Rp/R* = 0.0368 [0.0468]
a/R* = 563.55 [2214.10]
b = 0.36 [9.62]
Seff = 12.05 [3.63]
Teq = 475 [36] K
Rp = 19.52 [25.18] Re
a = 0.9287 [0.1791] AU
Ag = 841.12 [2187.50] [0.38σ]
Teffp = 3956 [2556] K [1.36σ]

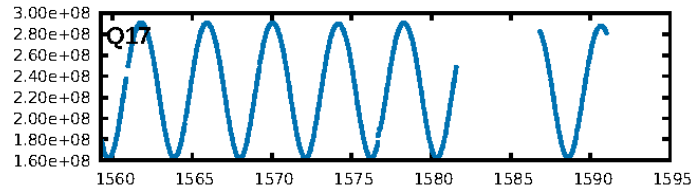
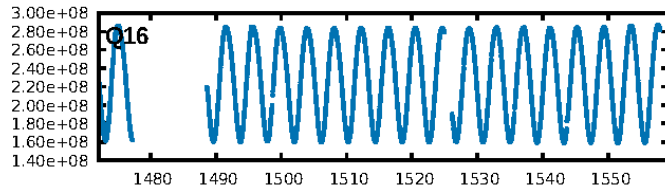
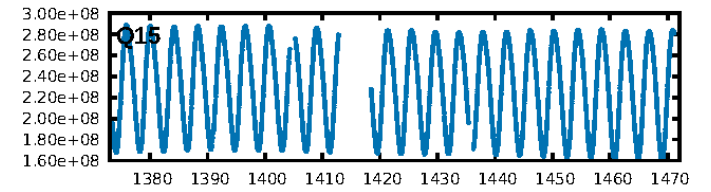
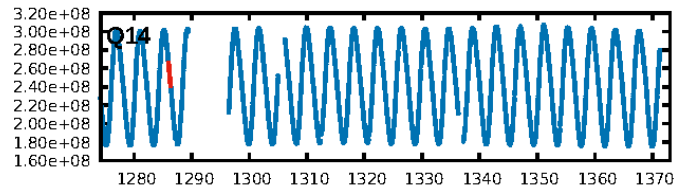
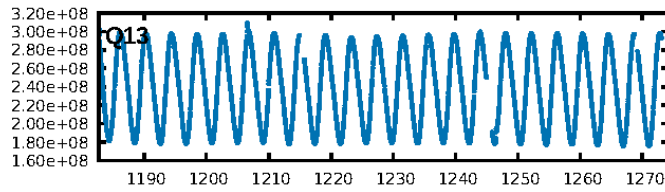
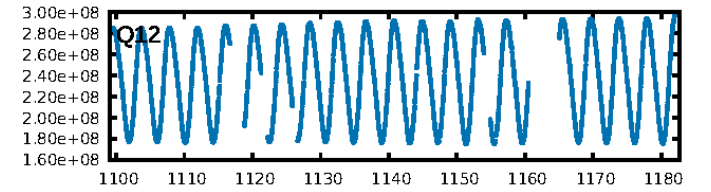
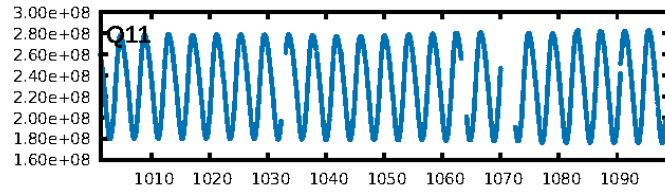
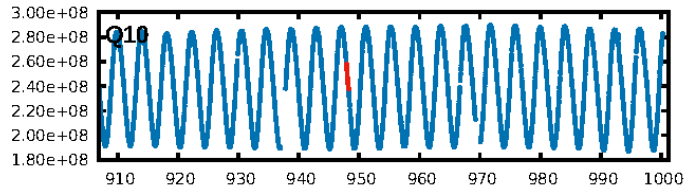
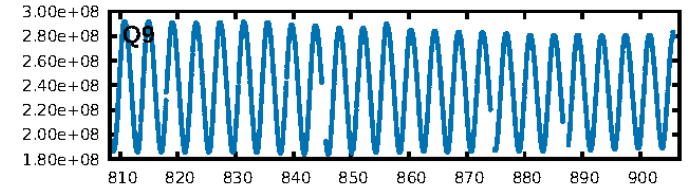
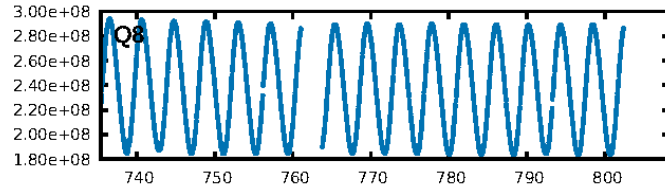
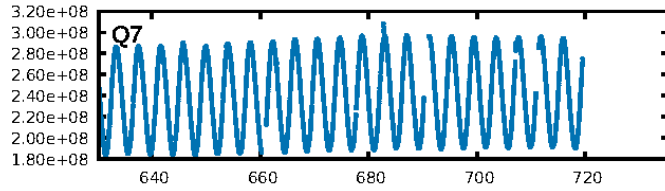
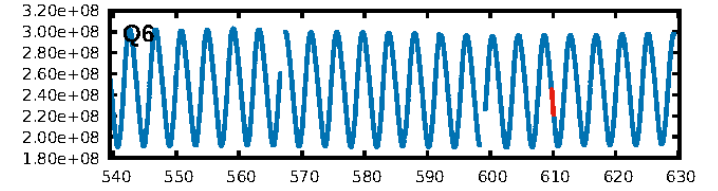
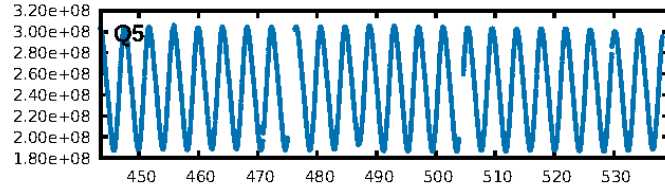
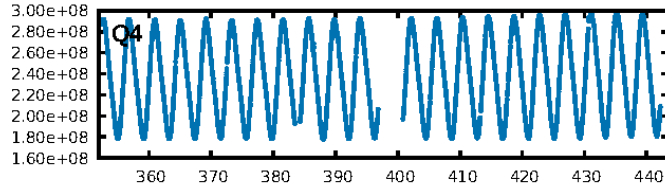
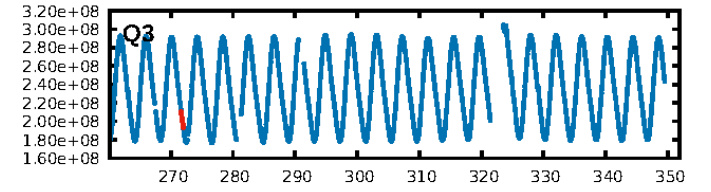
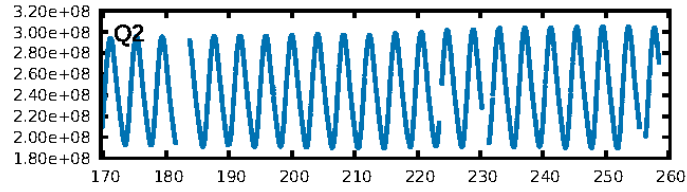
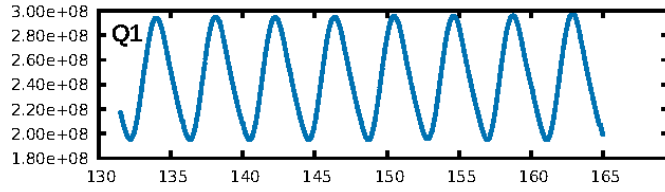
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [156.56σ]
ModelChiSquare2-sig: 0.5%
ModelChiSquareGof-sig: 21.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1642
Centroid-sig: 4.3%
Centroid-so: 0.334 arcsec [1.21σ]
OotOffset-rm: 0.030 arcsec [0.43σ]
KicOffset-rm: 0.086 arcsec [1.21σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

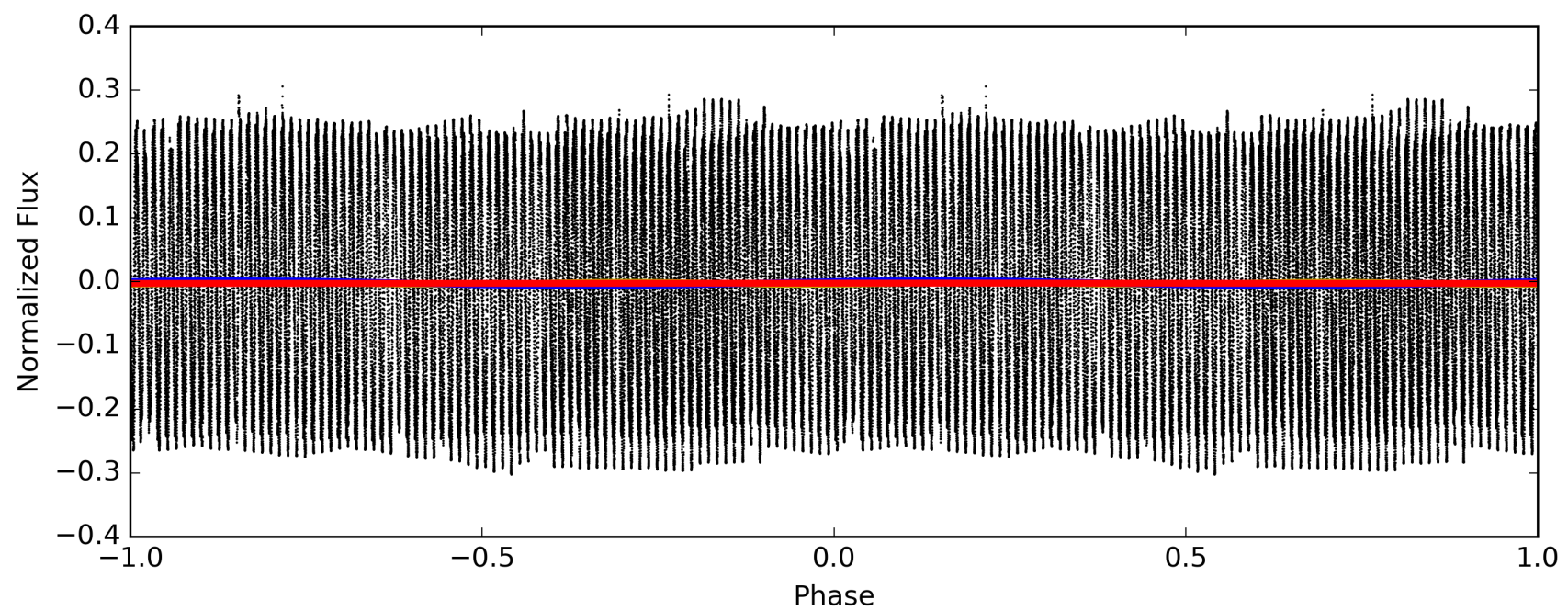
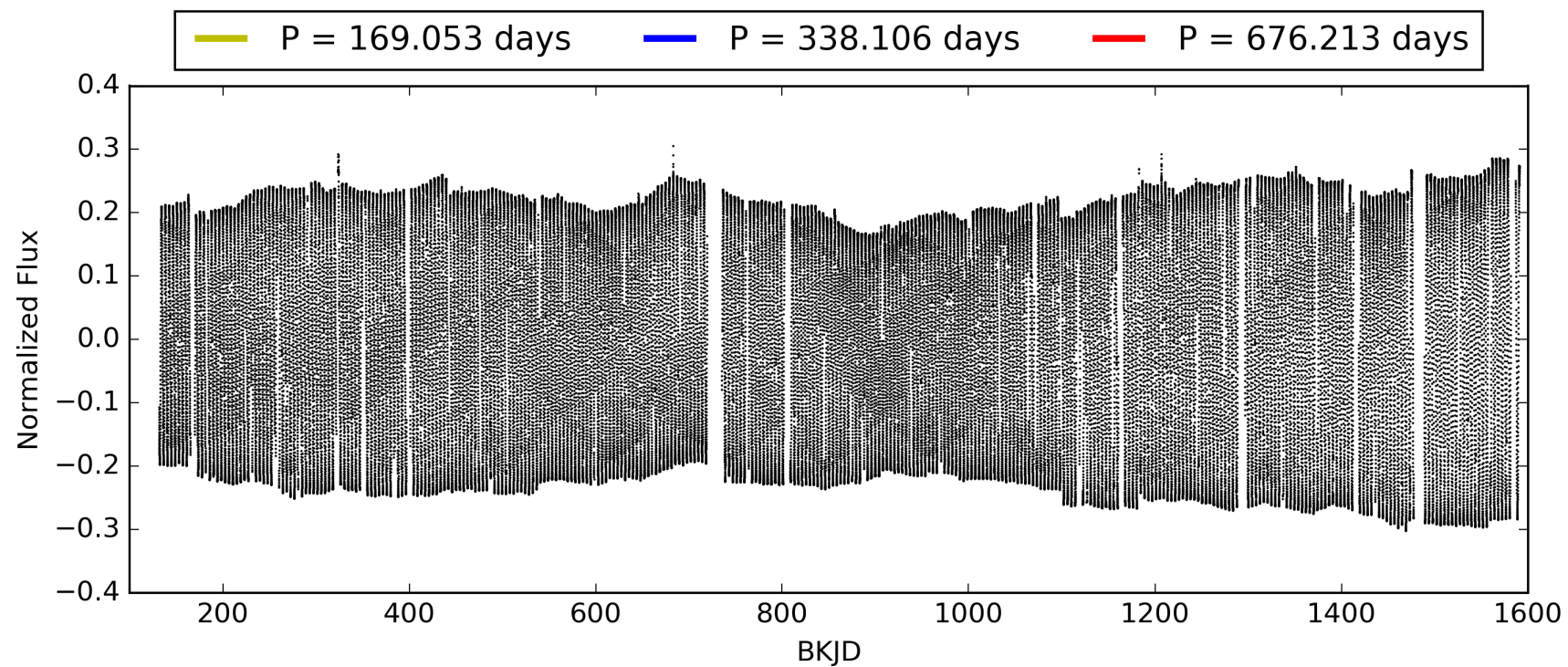
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:05:21 Z

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

TCE 008022670-01, PDC Light Curves

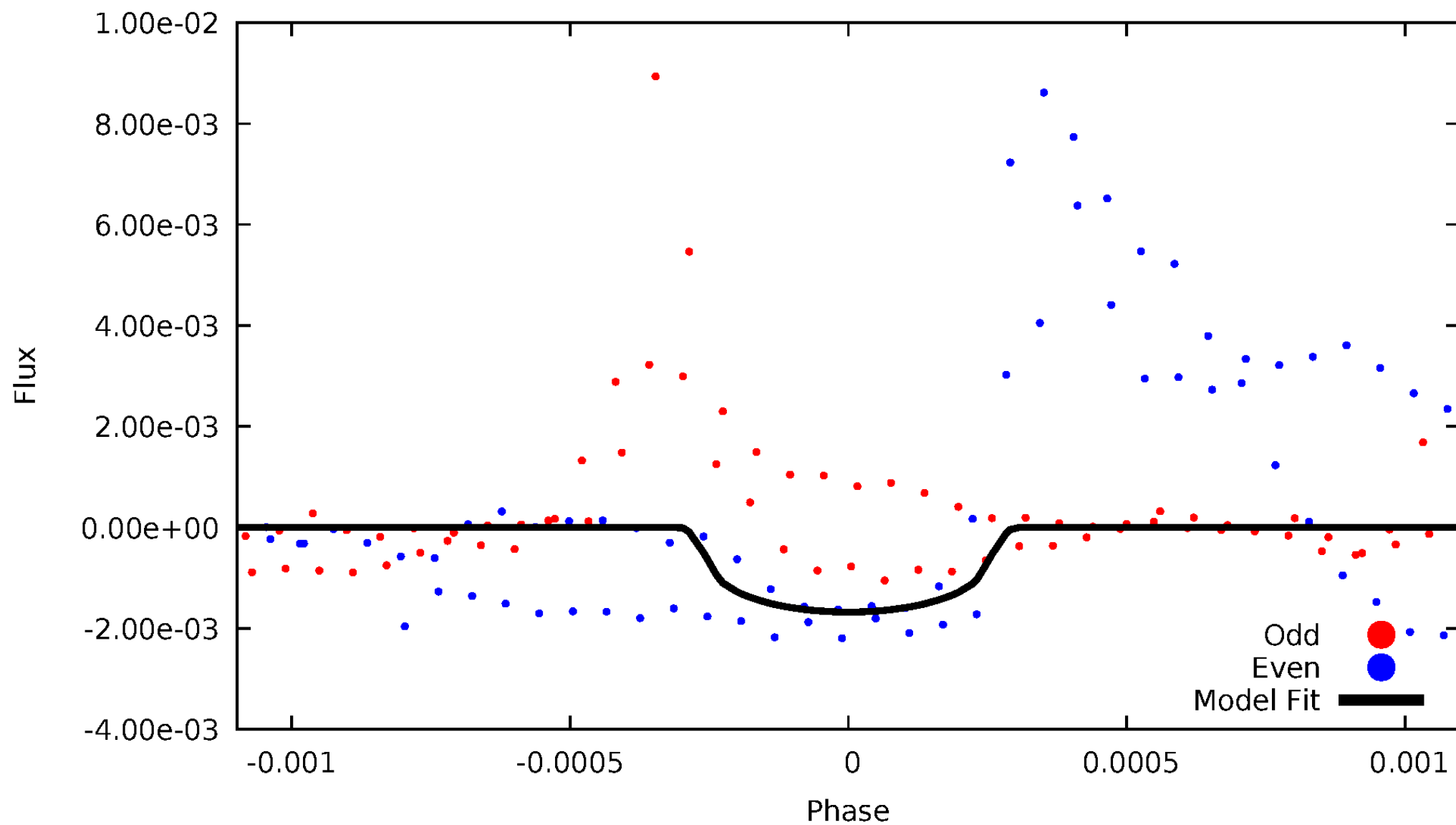


TCE 008022670-01



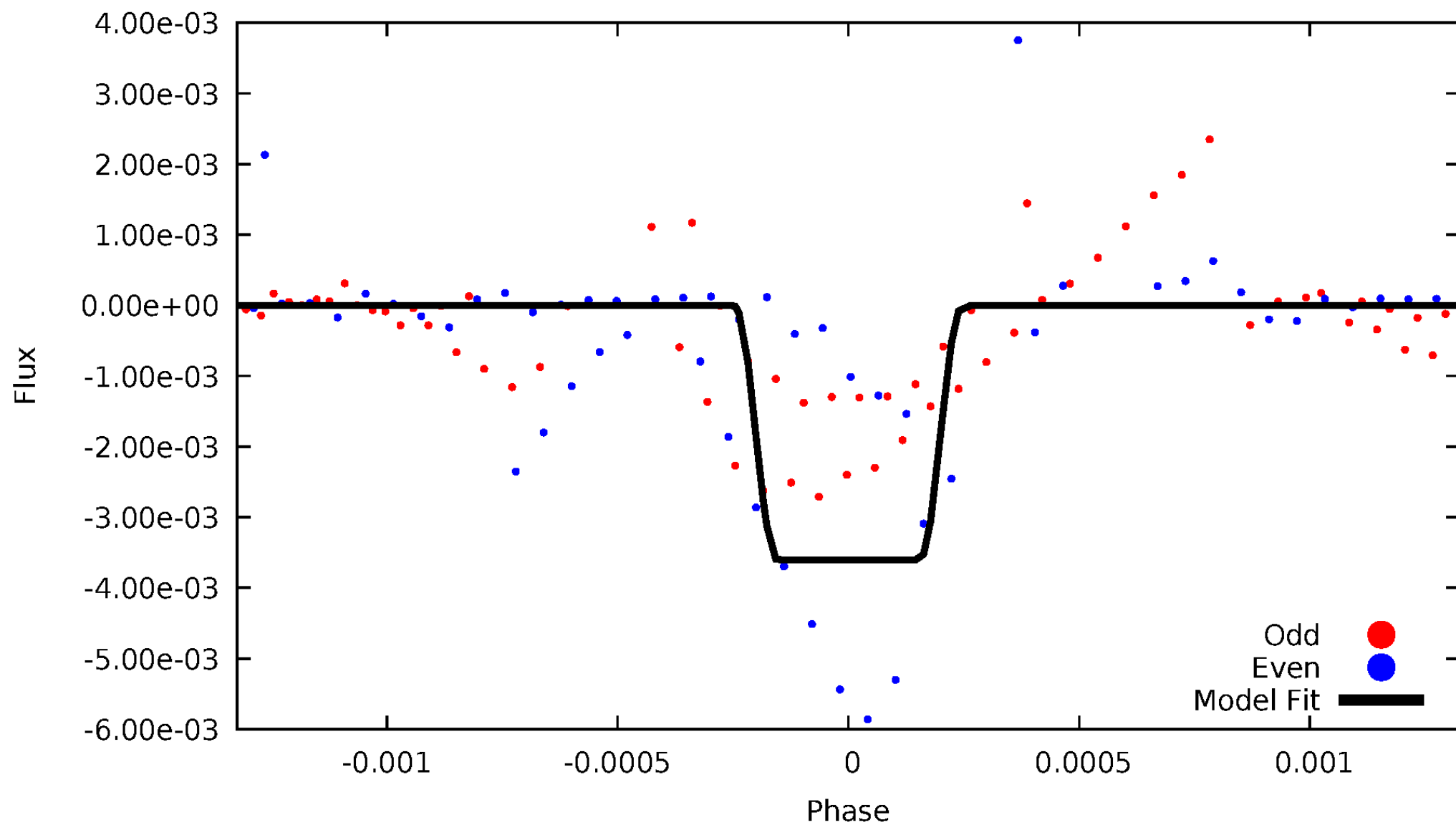
DV Odd/Even

TCE 008022670-01



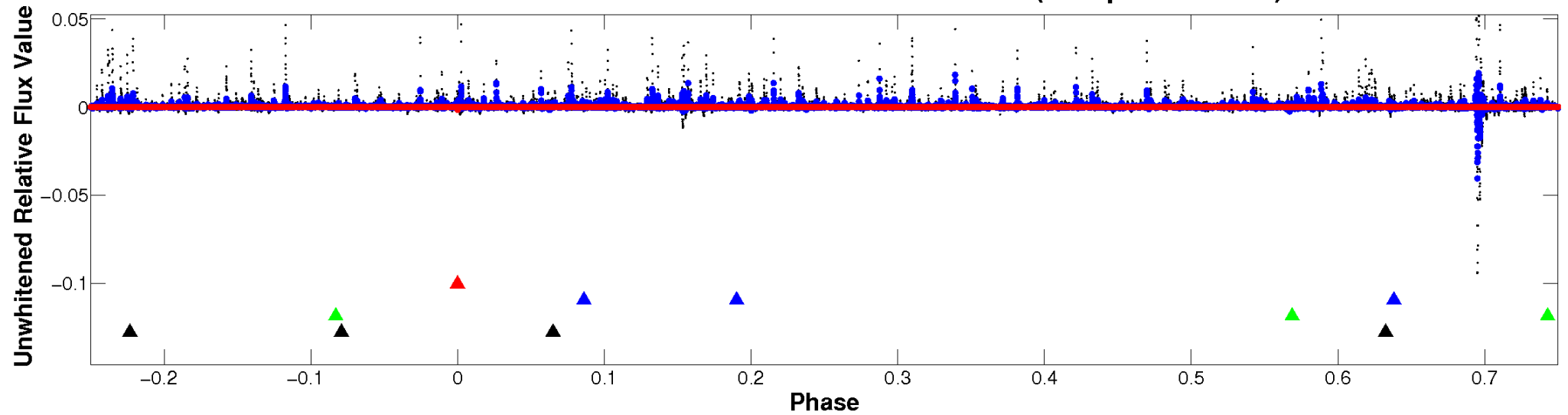
ALT Odd/Even

TCE 008022670-01

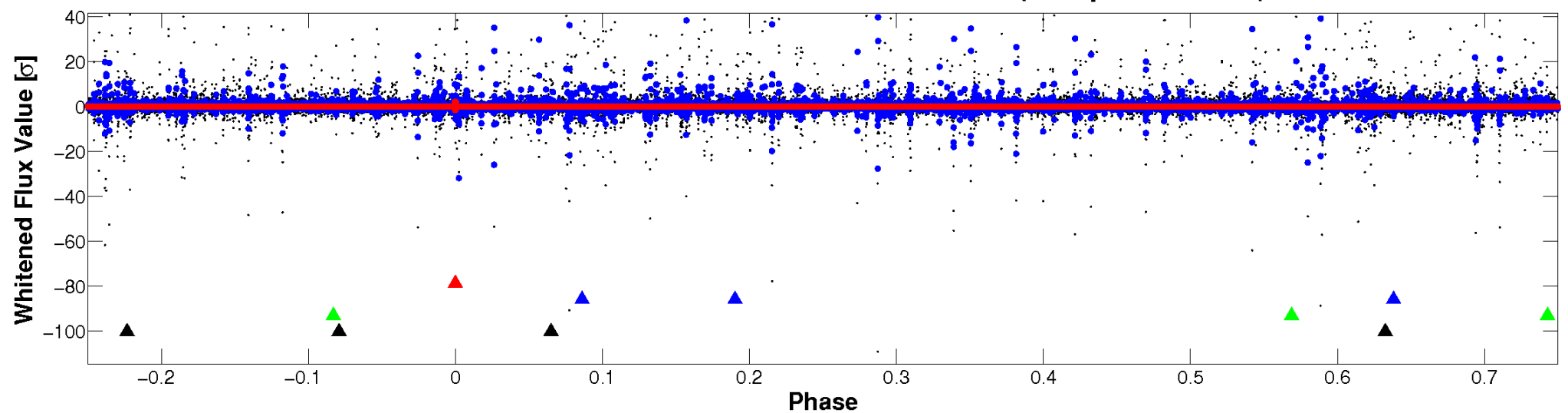


Non-Whitened Vs. Whitened Light Curve

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

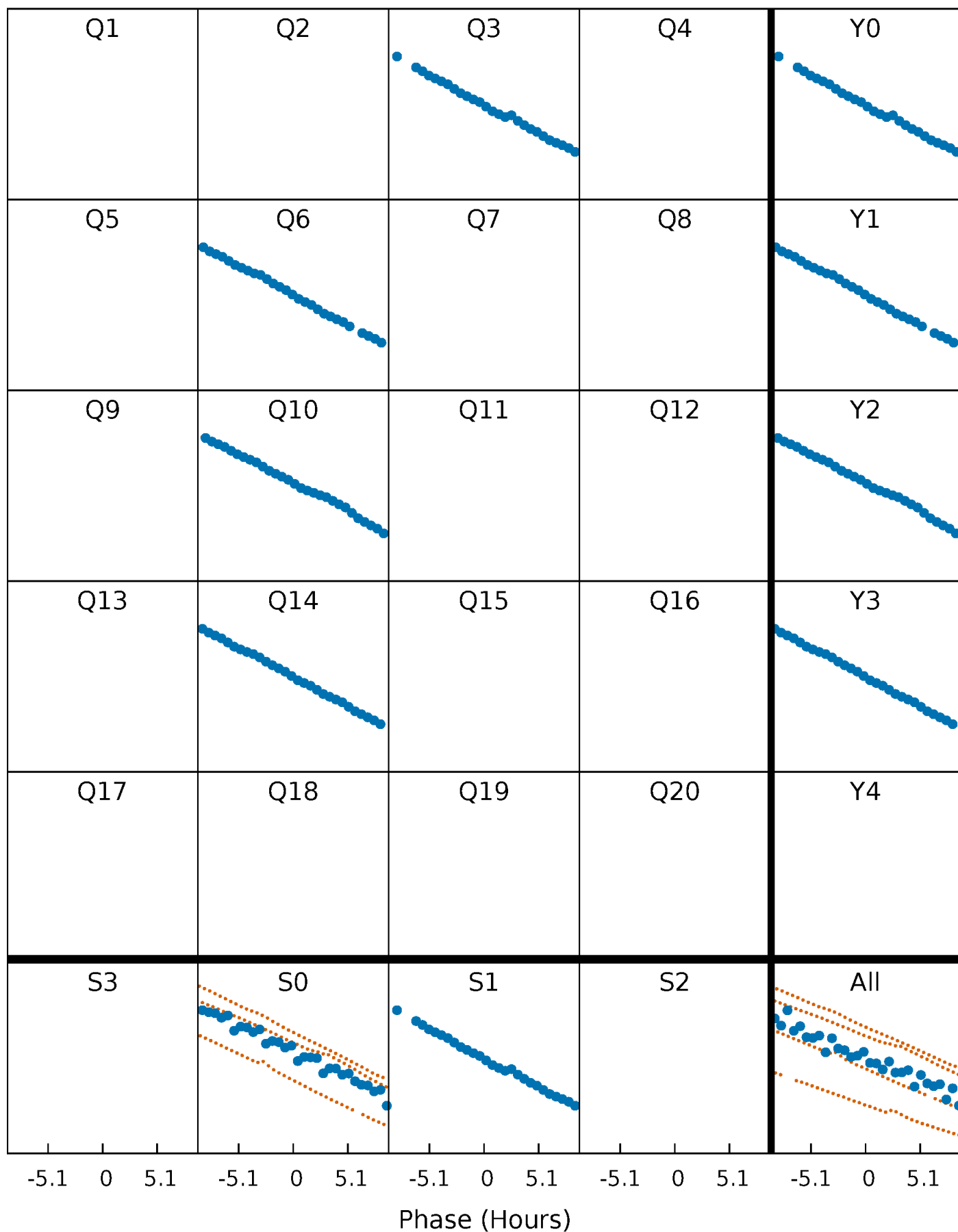


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



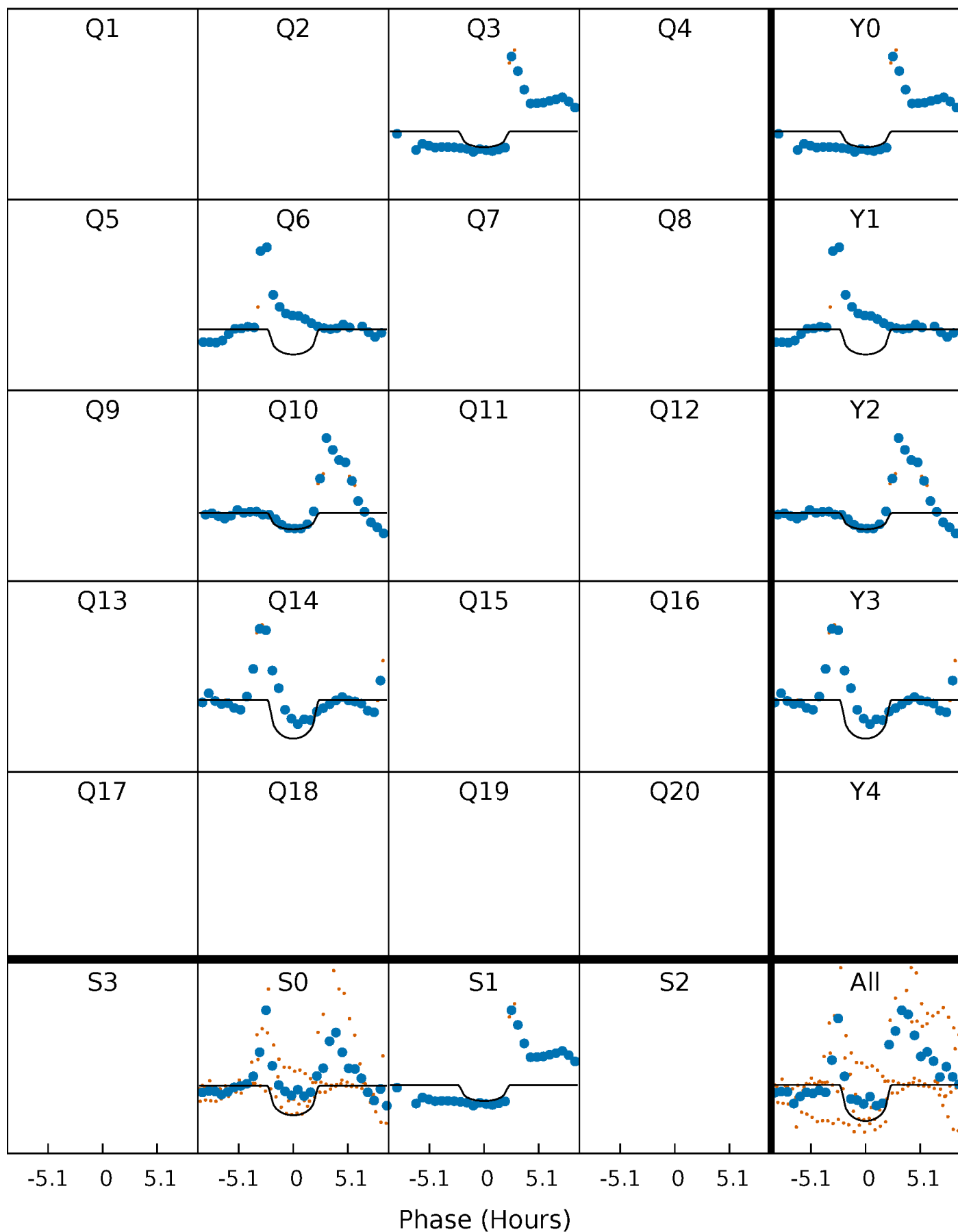
PDC Quarter-Phased Transit Curves

TCE 008022670-01 P=338.106337 Days $T_0=271.834437$ (BKJD)



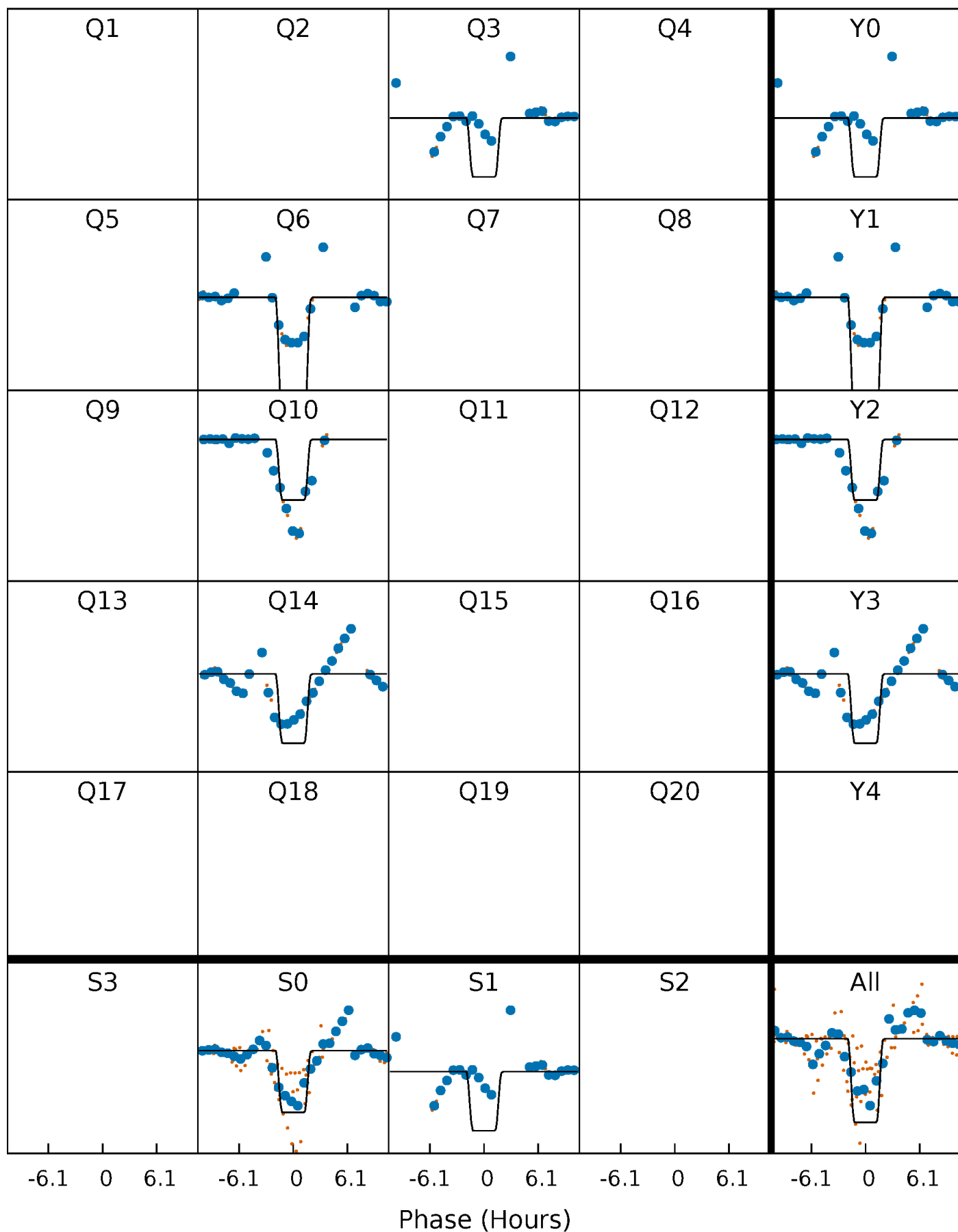
DV Quarter-Phased Transit Curves

TCE 008022670-01 P=338.106337 Days $T_0=271.834437$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

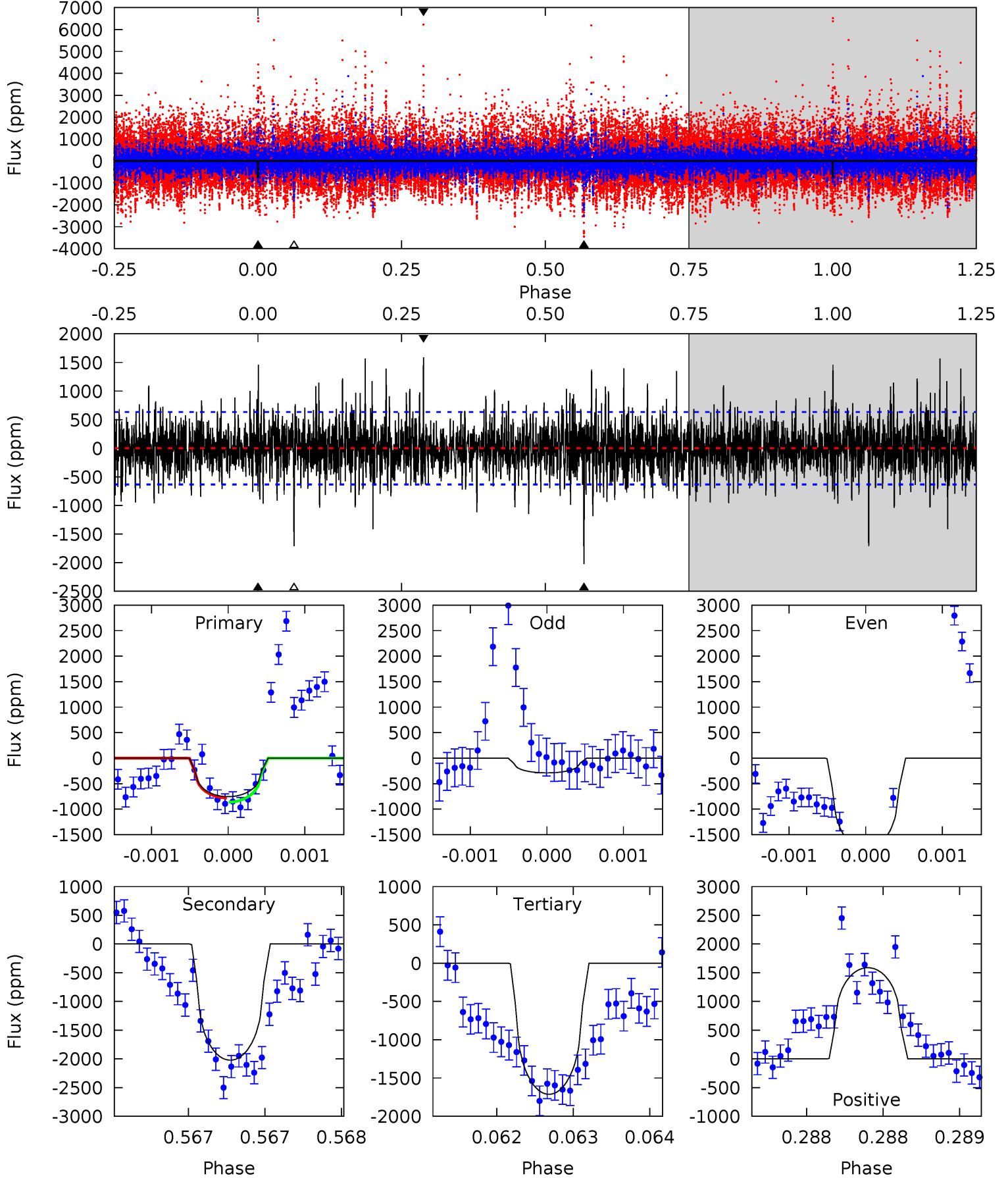
TCE 008022670-01 P=338.109074 Days $T_0=271.869843$ (BKJD)



DV Model-Shift Uniqueness Test

008022670-01, $P = 338.106337$ Days, $E = 271.834437$ Days

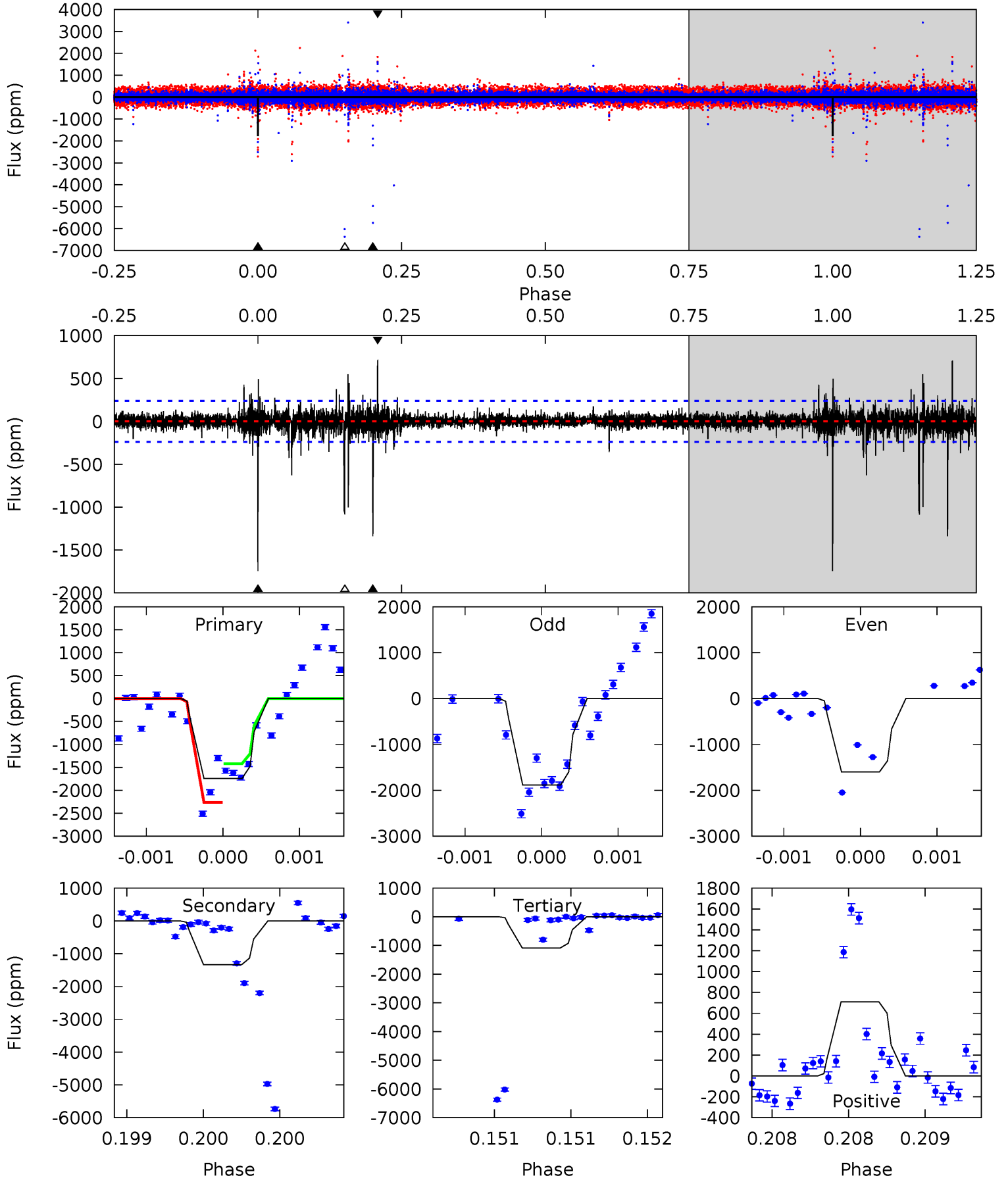
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.59	17.7	15.0	13.9	5.54	3.44	2.87	-8.37	-7.29	2.71	3.79	4.53	0.77	0.44	0.36



Alt Model-Shift Uniqueness Test

008022670-01, P = 338.109074 Days, E = 271.869843 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.7	31.2	25.4	16.6	5.57	3.48	1.39	15.3	24.2	5.85	14.7	1.90	1.26	0.29	9.21



Stellar Parameters For KIC 008022670

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4707^{+61}_{-51}	$3.035^{+0.170}_{-0.139}$	$0.040^{+0.150}_{-0.100}$	$4.861^{+1.035}_{-0.847}$	$0.934^{+0.106}_{-0.013}$	$0.011^{+0.009}_{-0.005}$
	+1%/-1%	+6%/-5%	+375%/-250%	+21%/-17%	+11%/-1%	+74%/-43%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008022670-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2022 ± 114	$25.61^{+21.97}_{-16.89}$	660^{+36}_{-32}	4559^{+3092}_{-926}	1498^{+11240}_{-1074}
Alt.	-1337 ± 43	$35.88^{+23.14}_{-21.80}$	665^{+35}_{-36}	3768^{+1604}_{-541}	502^{+2713}_{-315}

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 $A_{obs} \gg 1.0$

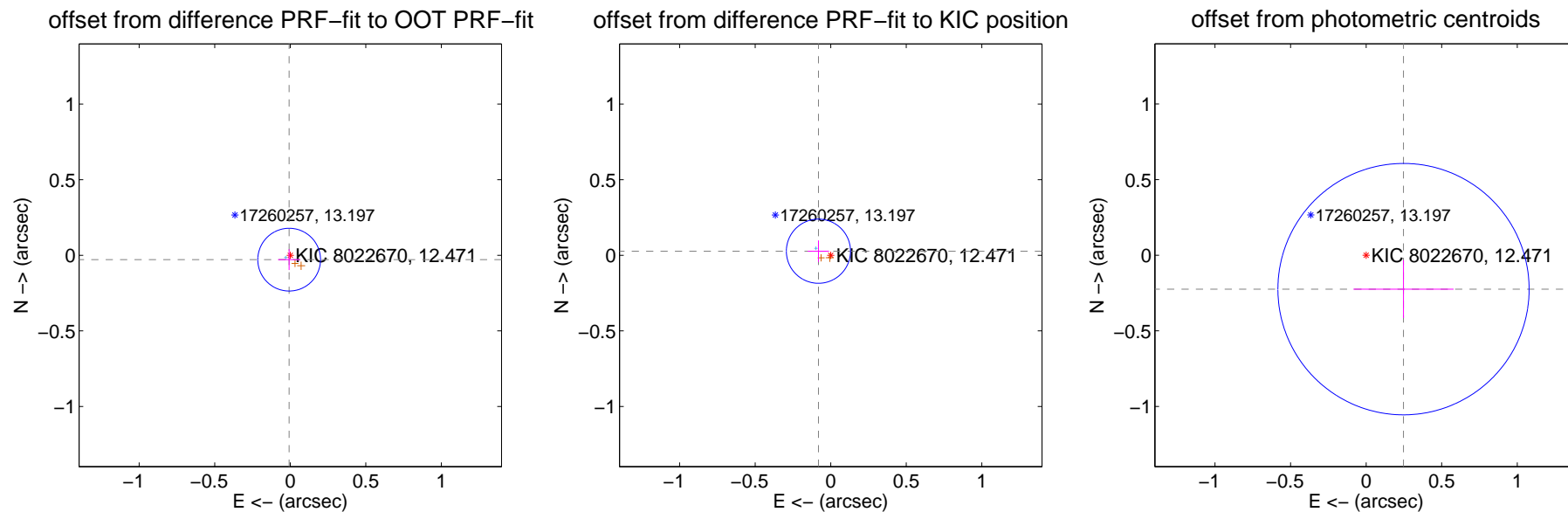
DV Centroid Data

Supplemental centroid analysis for 008022670-01. Kepler magnitude: 12.47. Transit SNR 8.89

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.030 ± 0.069	0.43	0.007 ± 0.073	-0.029 ± 0.069
PRF-fit source offset from KIC position	0.086 ± 0.071	1.21	0.081 ± 0.071	0.027 ± 0.071
photometric centroid source offset	0.33 ± 0.28	1.21	-0.25 ± 0.33	-0.22 ± 0.19

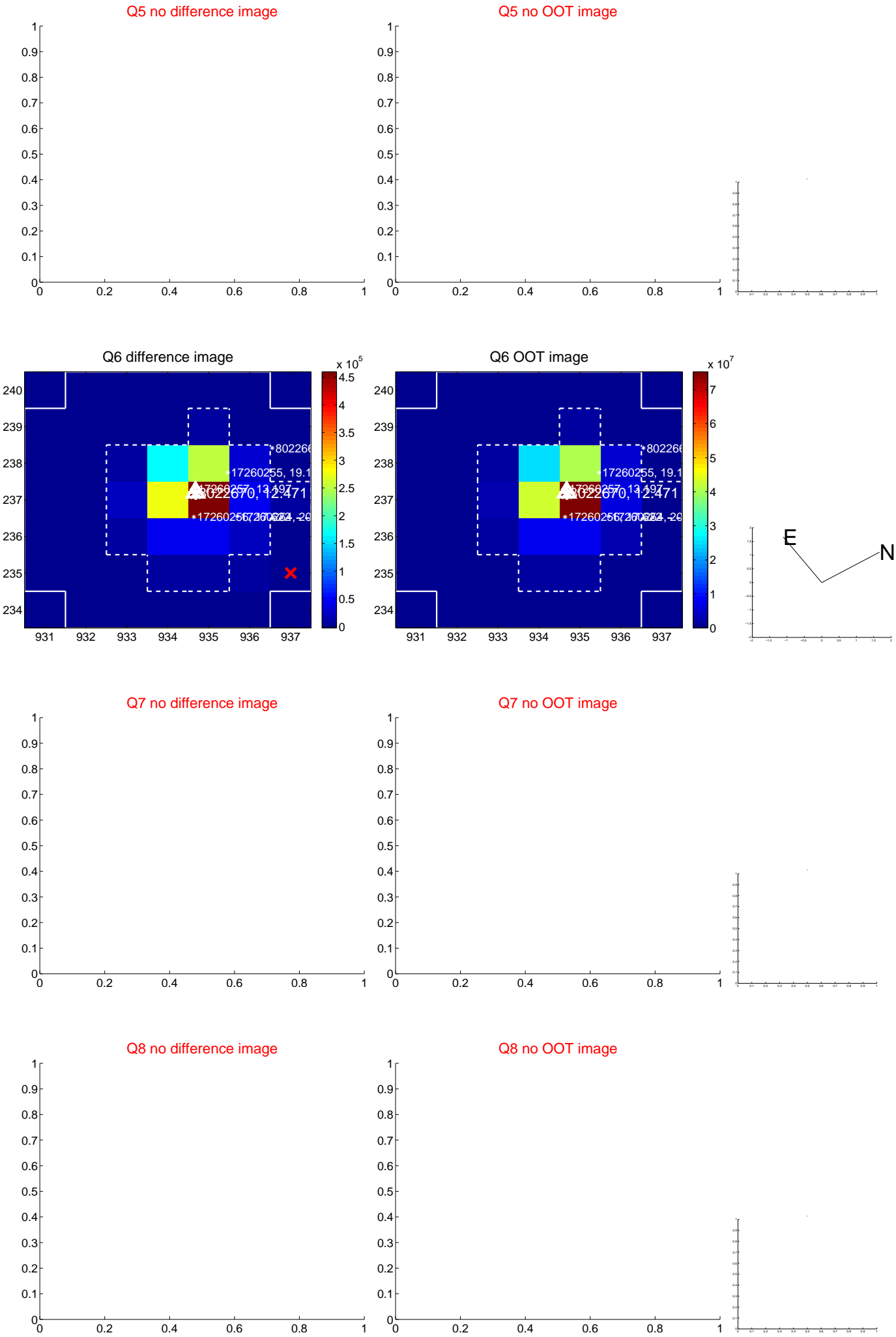


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

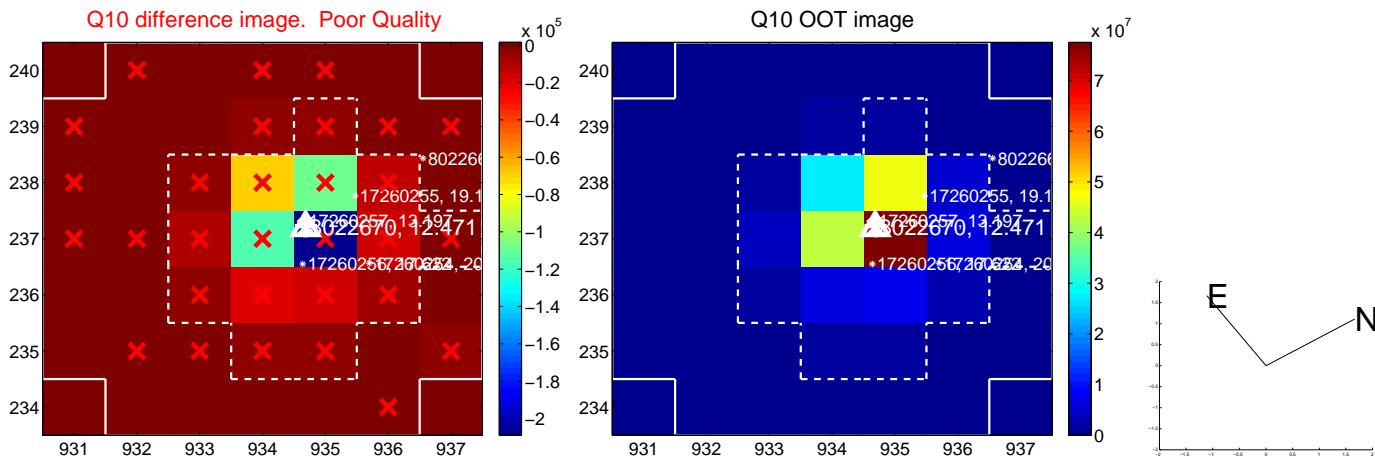
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



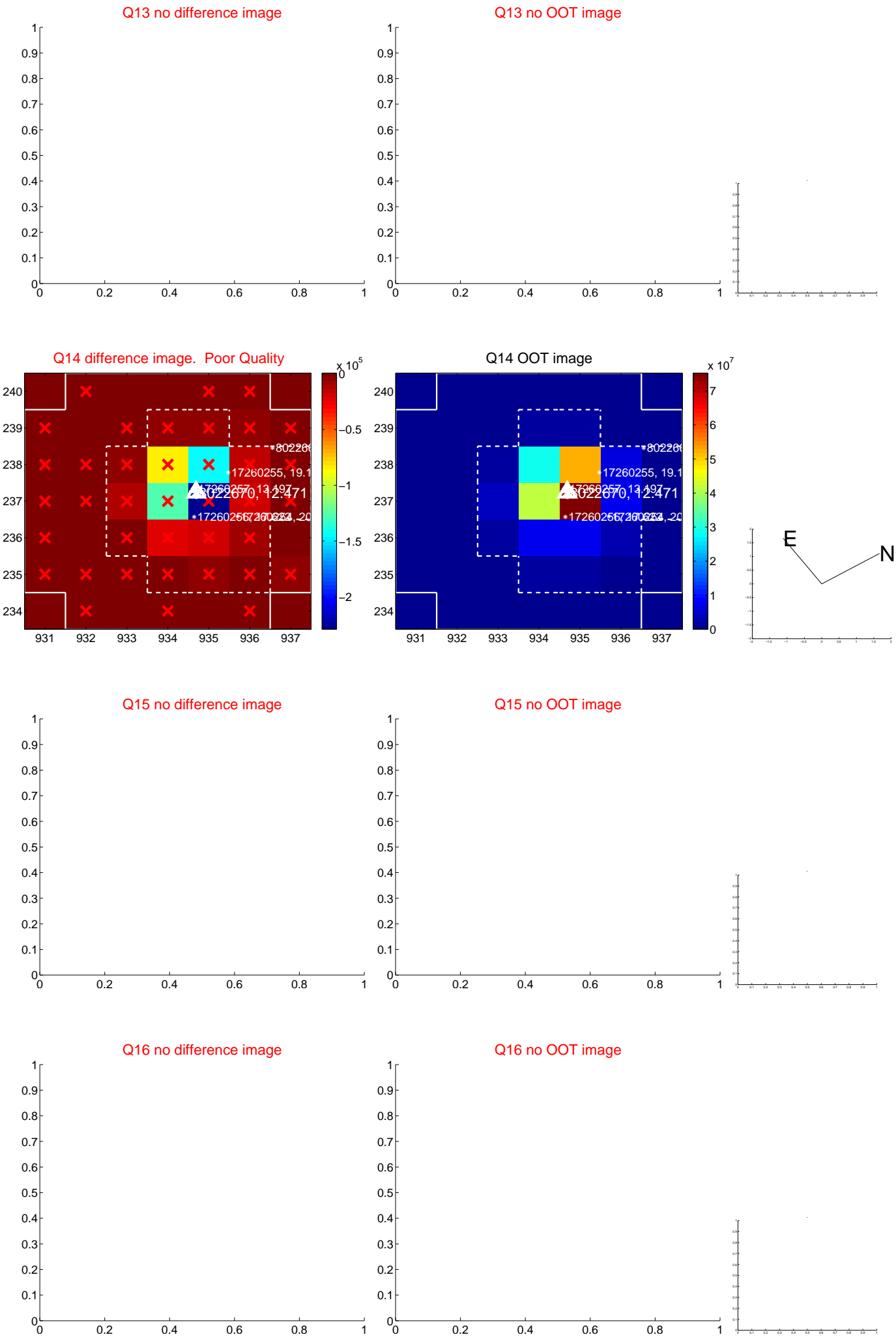
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



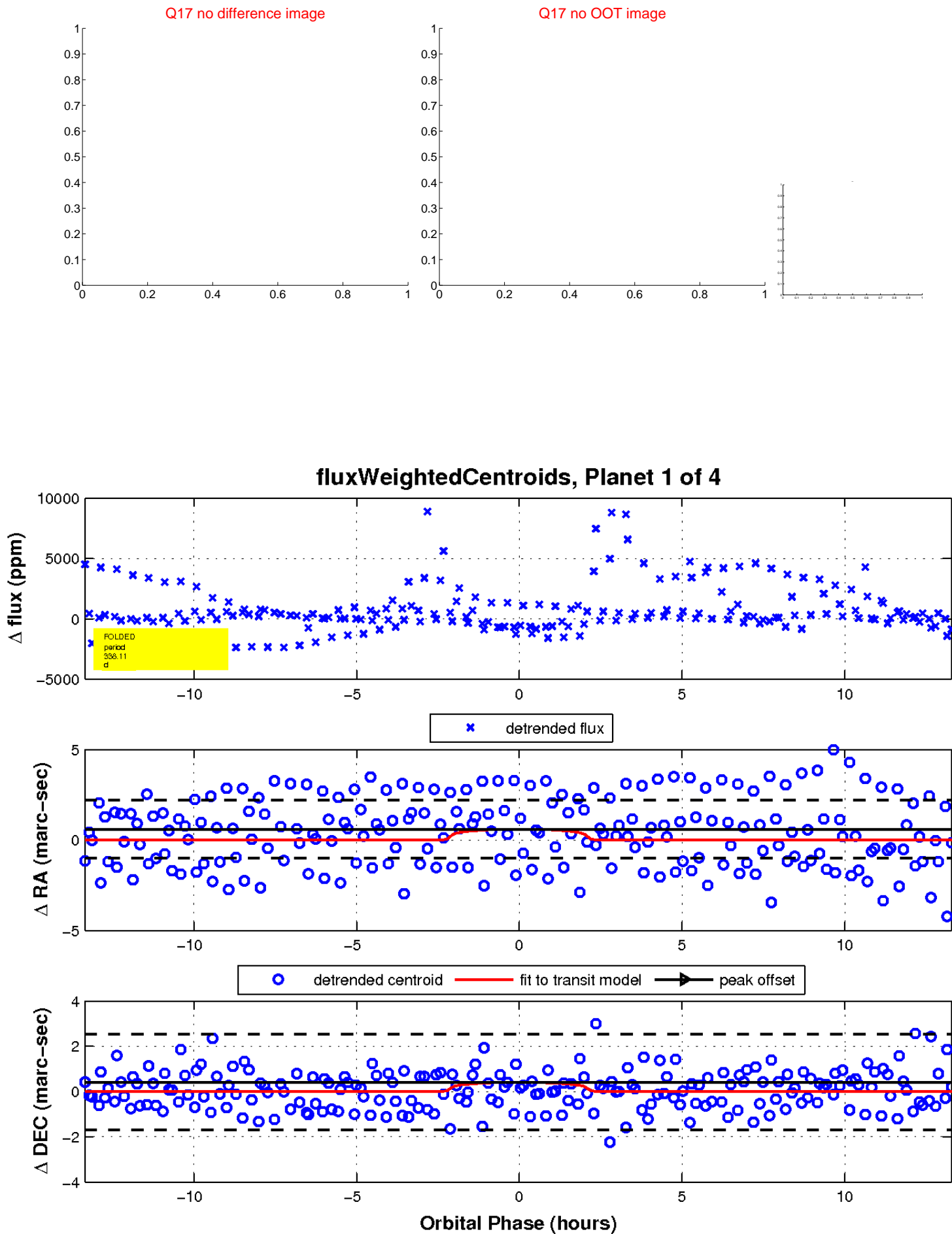
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

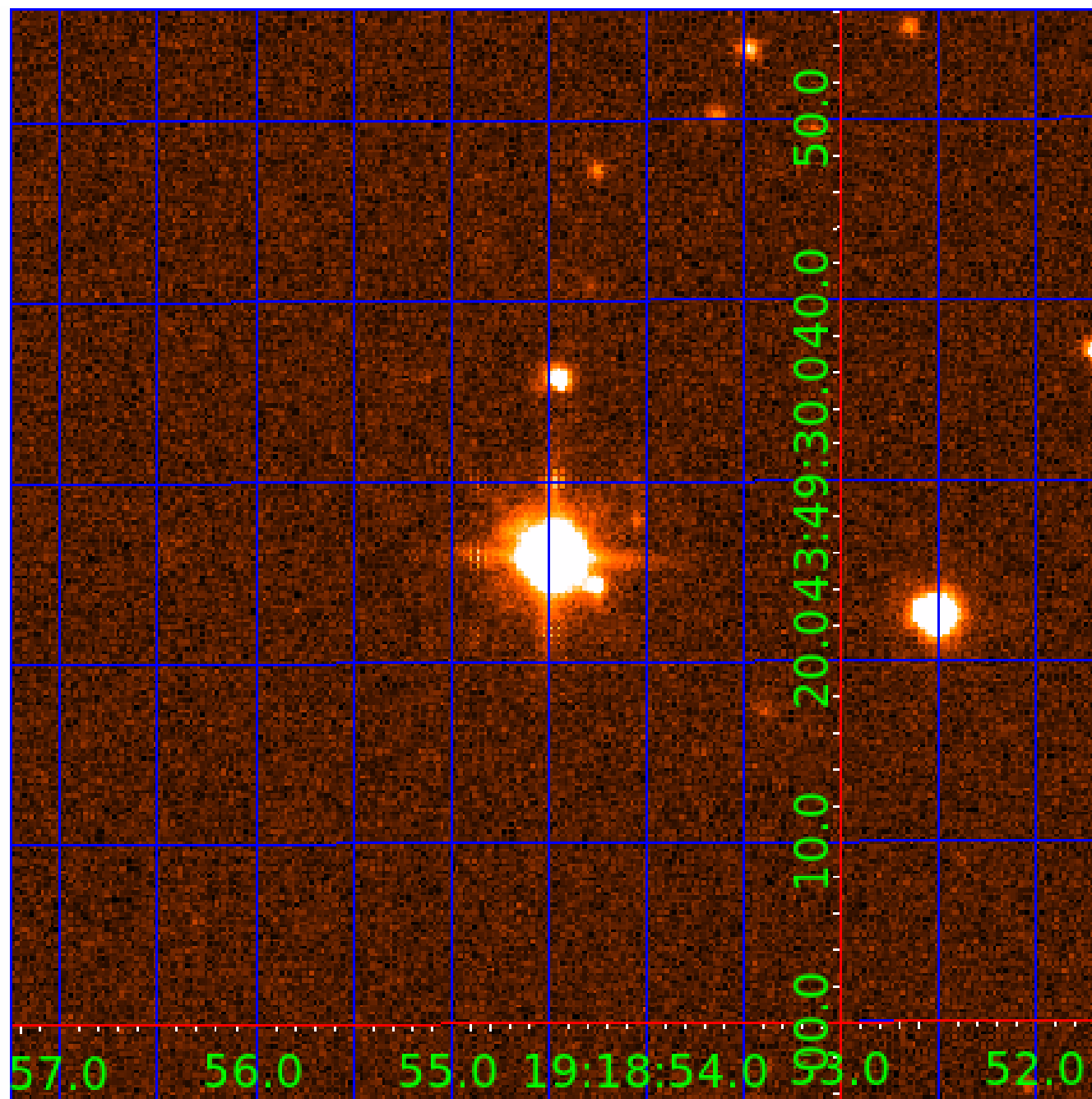


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008022670

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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008022670-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008022670-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

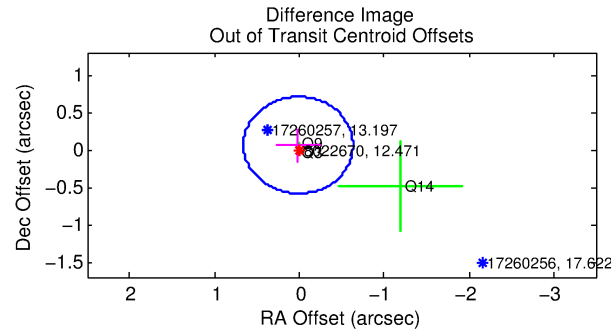
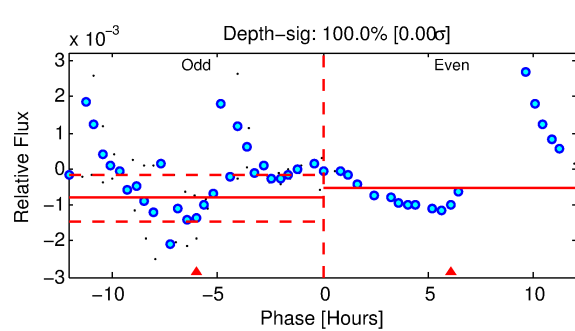
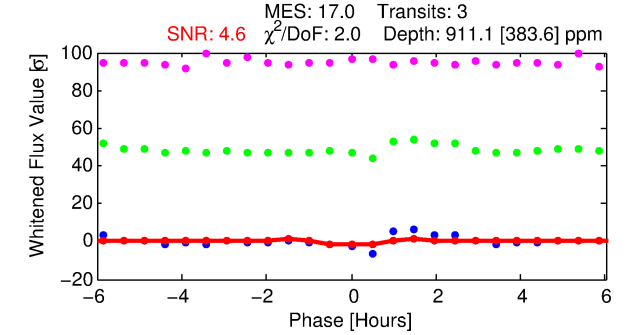
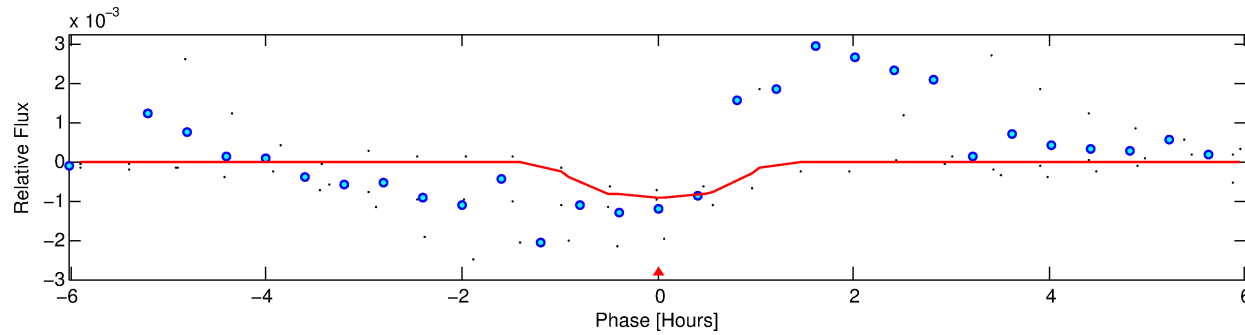
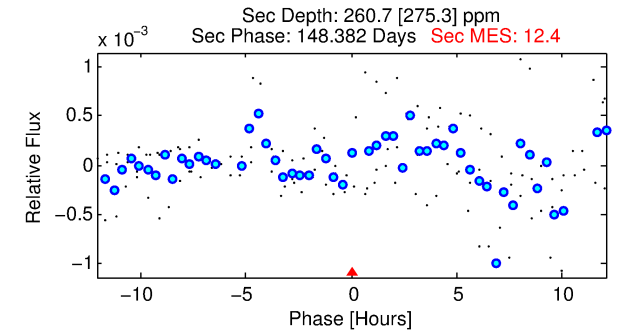
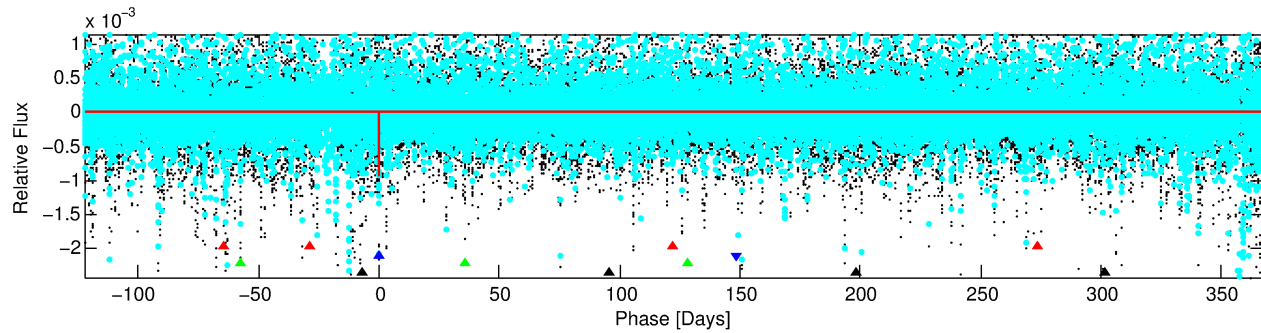
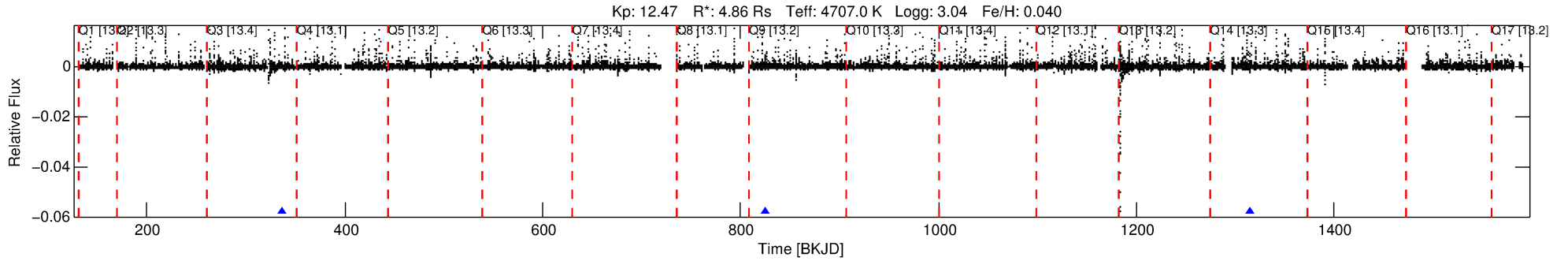
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022670-02

No Significant Match Found

DV One-Page Summary

KIC: 8022670 Candidate: 2 of 4 Period: 489.569 d



DV Fit Results:

Period = 489.56890 [0.00716] d
Epoch = 336.1532 [0.0103] BKJD
Rp/R* = 0.0268 [0.1436]
a/R* = 1863.65 [30459.80]
b = 0.23 [68.68]
Seff = 7.36 [2.22]
Teq = 420 [32] K
Rp = 14.23 [76.25] Re
a = 1.1887 [0.2292] AU
Ag = 1001.33 [10781.48] [0.09σ]
Teffp = 3652 [9827] K [0.33σ]

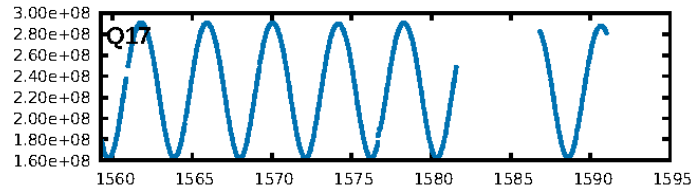
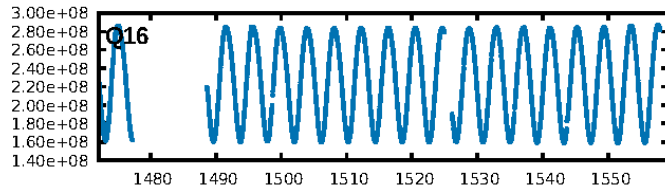
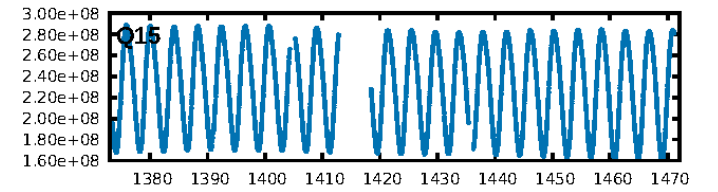
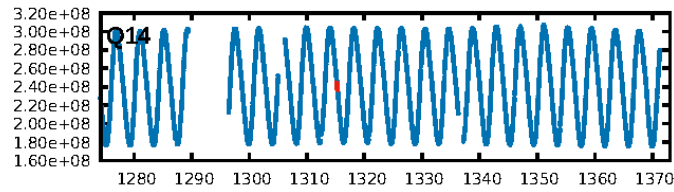
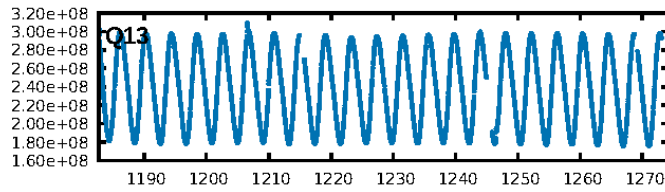
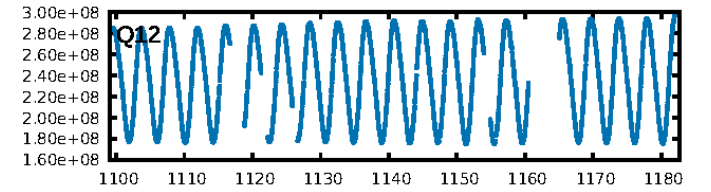
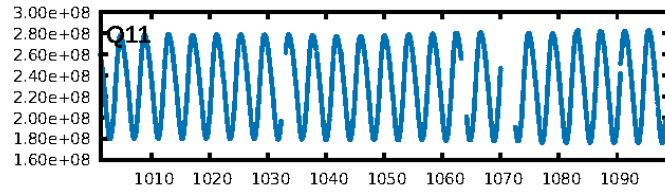
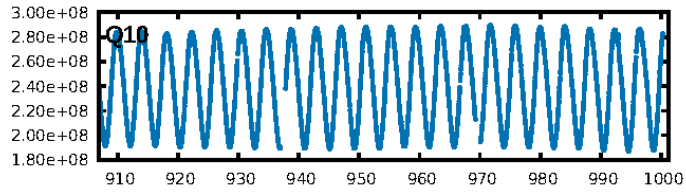
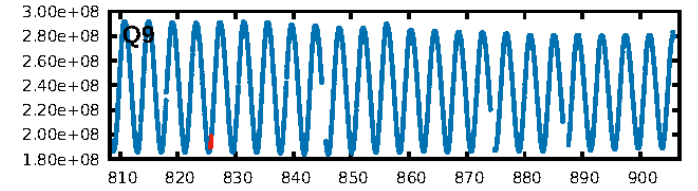
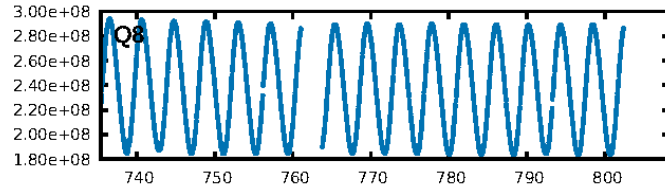
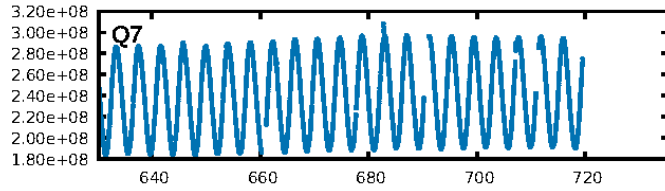
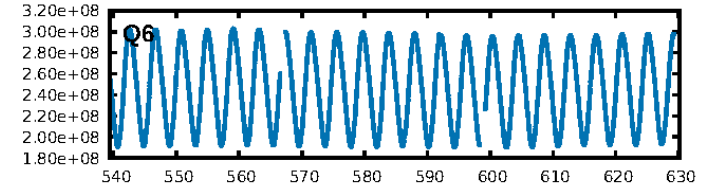
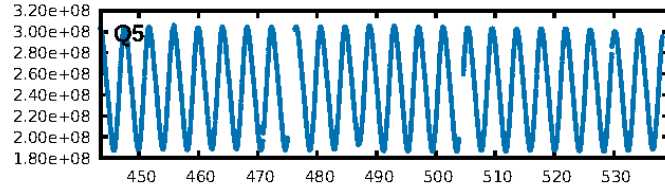
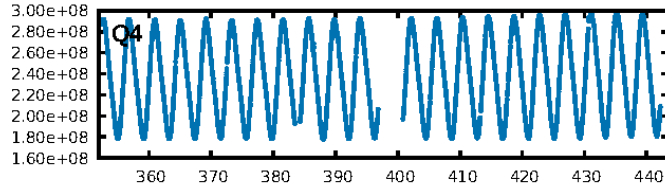
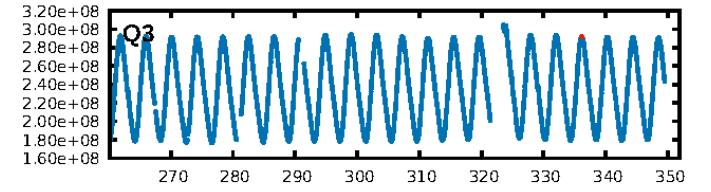
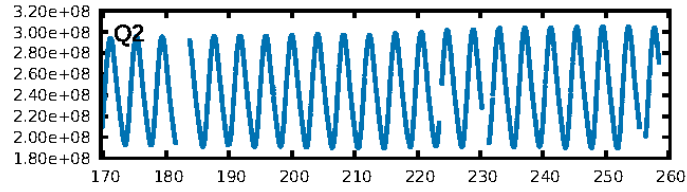
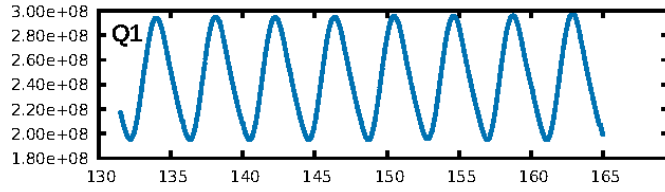
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [805.47σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 15.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.4009
Centroid-sig: 2.2%
Centroid-so: 1.209 arcsec [2.07σ]
OotOffset-rm: 0.062 arcsec [0.29σ]
KicOffset-rm: 0.088 arcsec [0.22σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

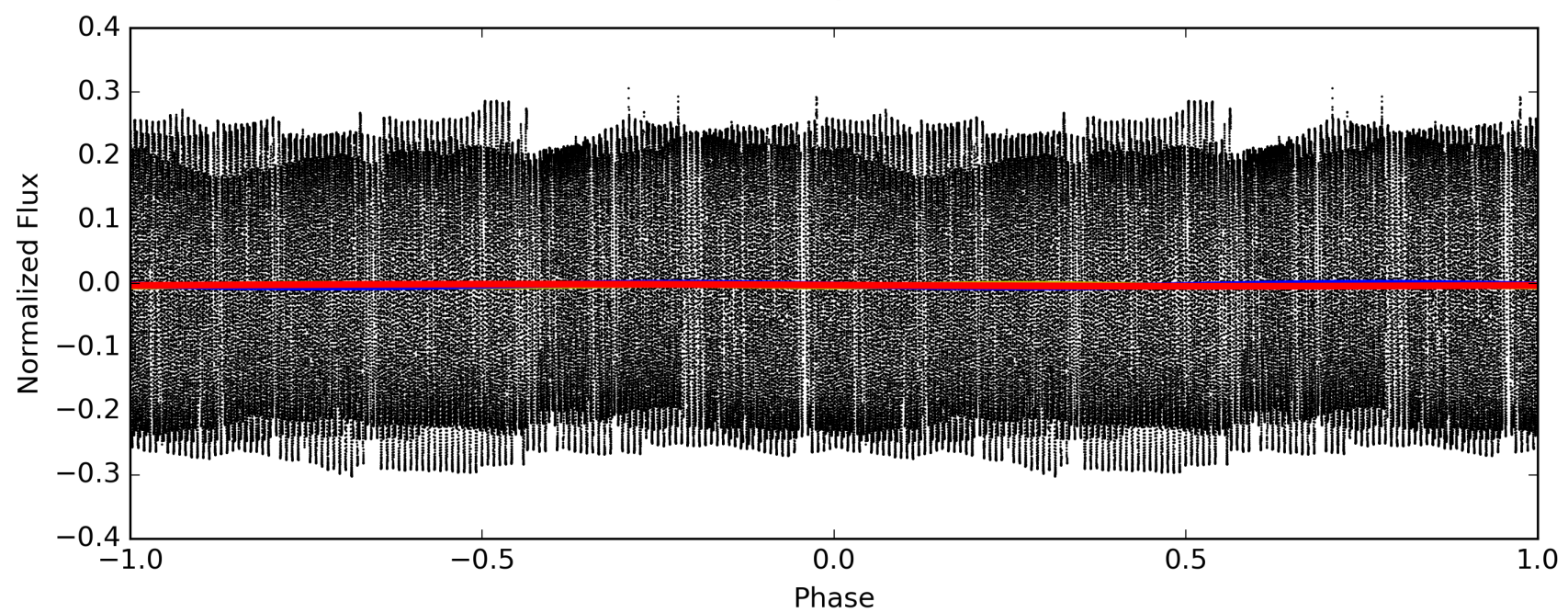
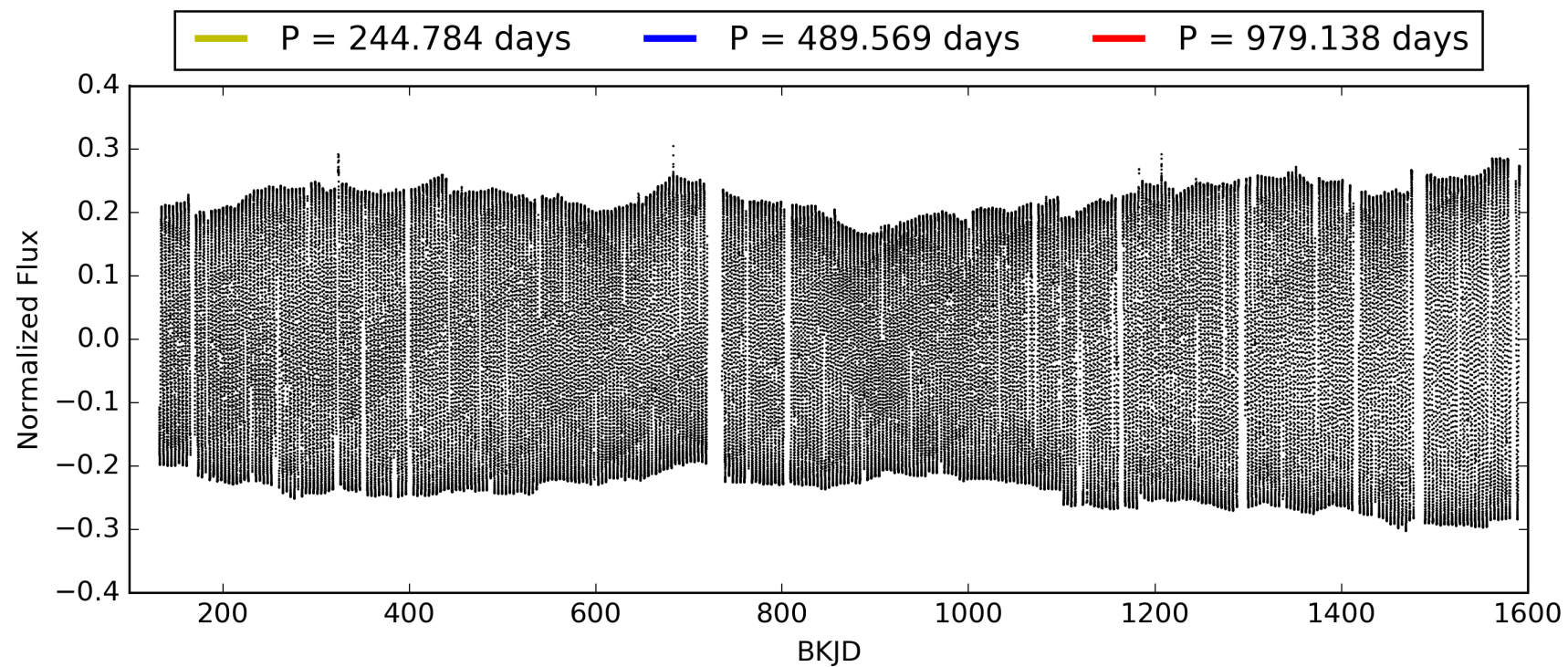
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:05:50 Z

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

TCE 008022670-02, PDC Light Curves

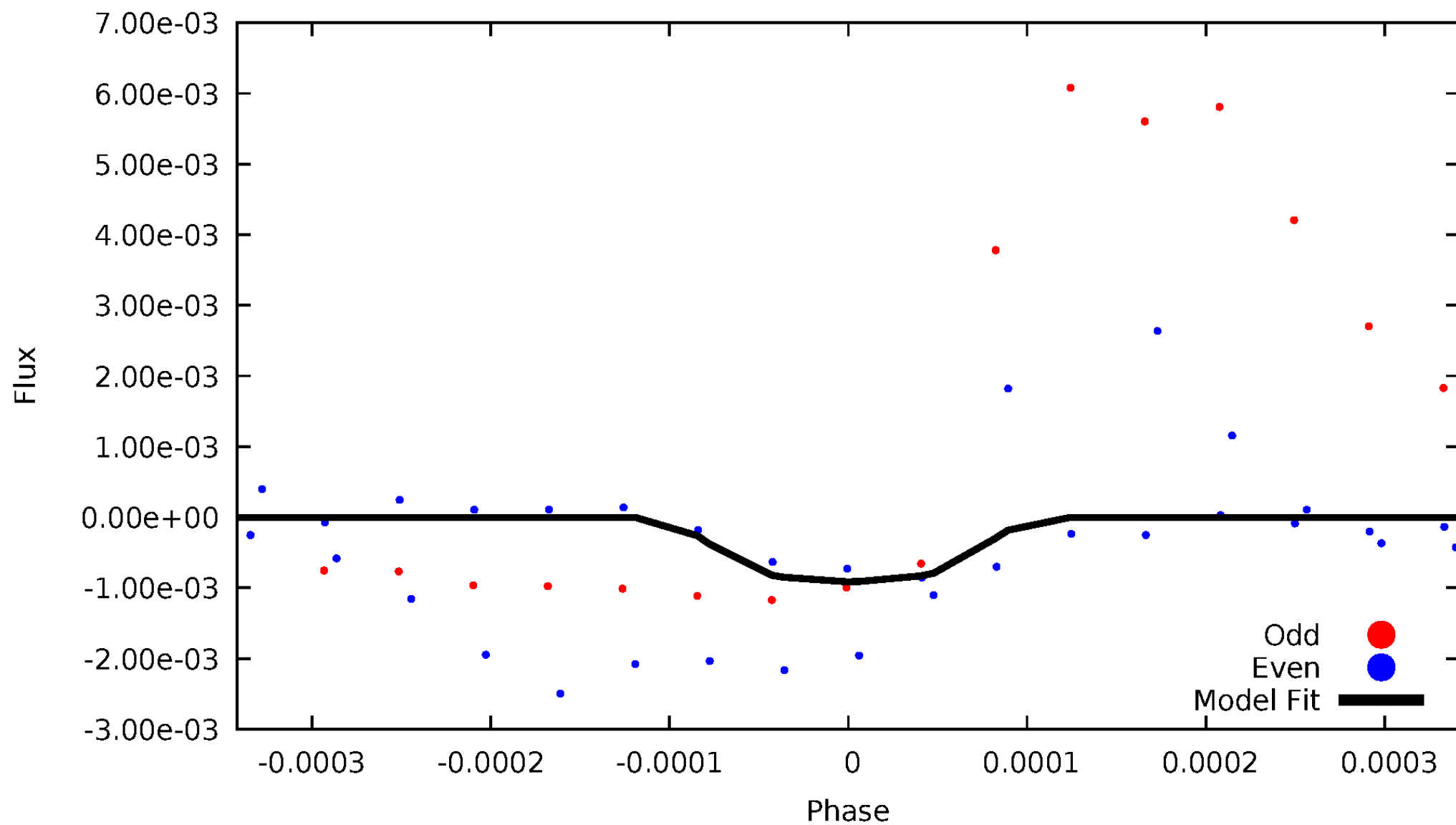


TCE 008022670-02



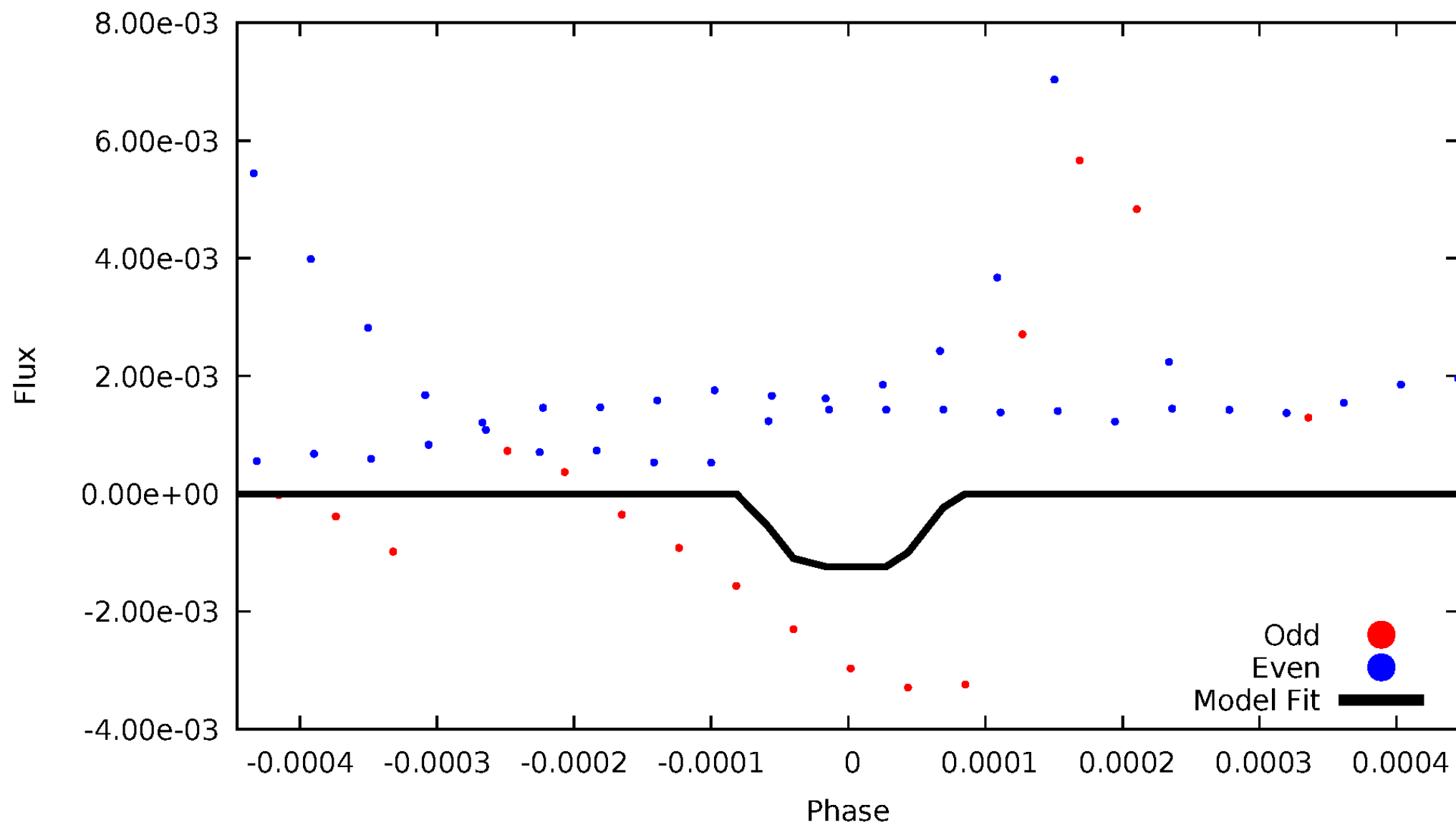
DV Odd/Even

TCE 008022670-02



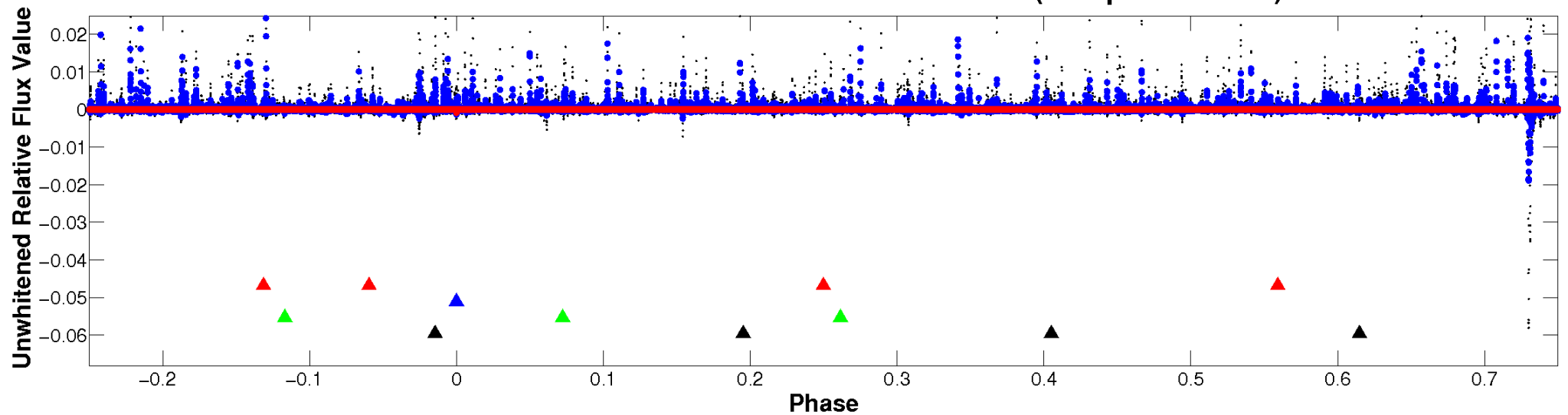
ALT Odd/Even

TCE 008022670-02

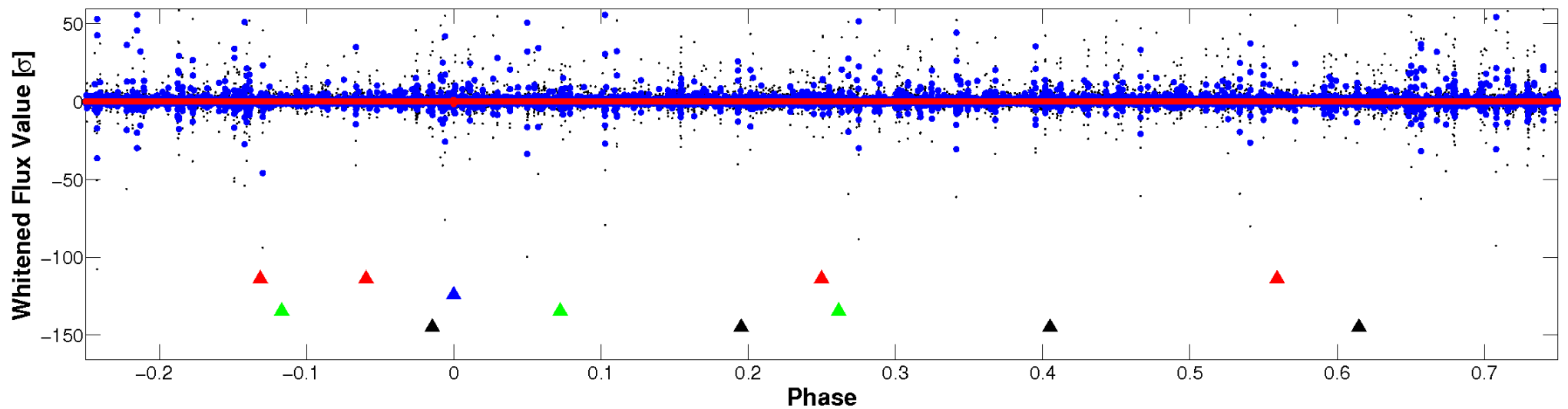


Non-Whitened Vs. Whitened Light Curve

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

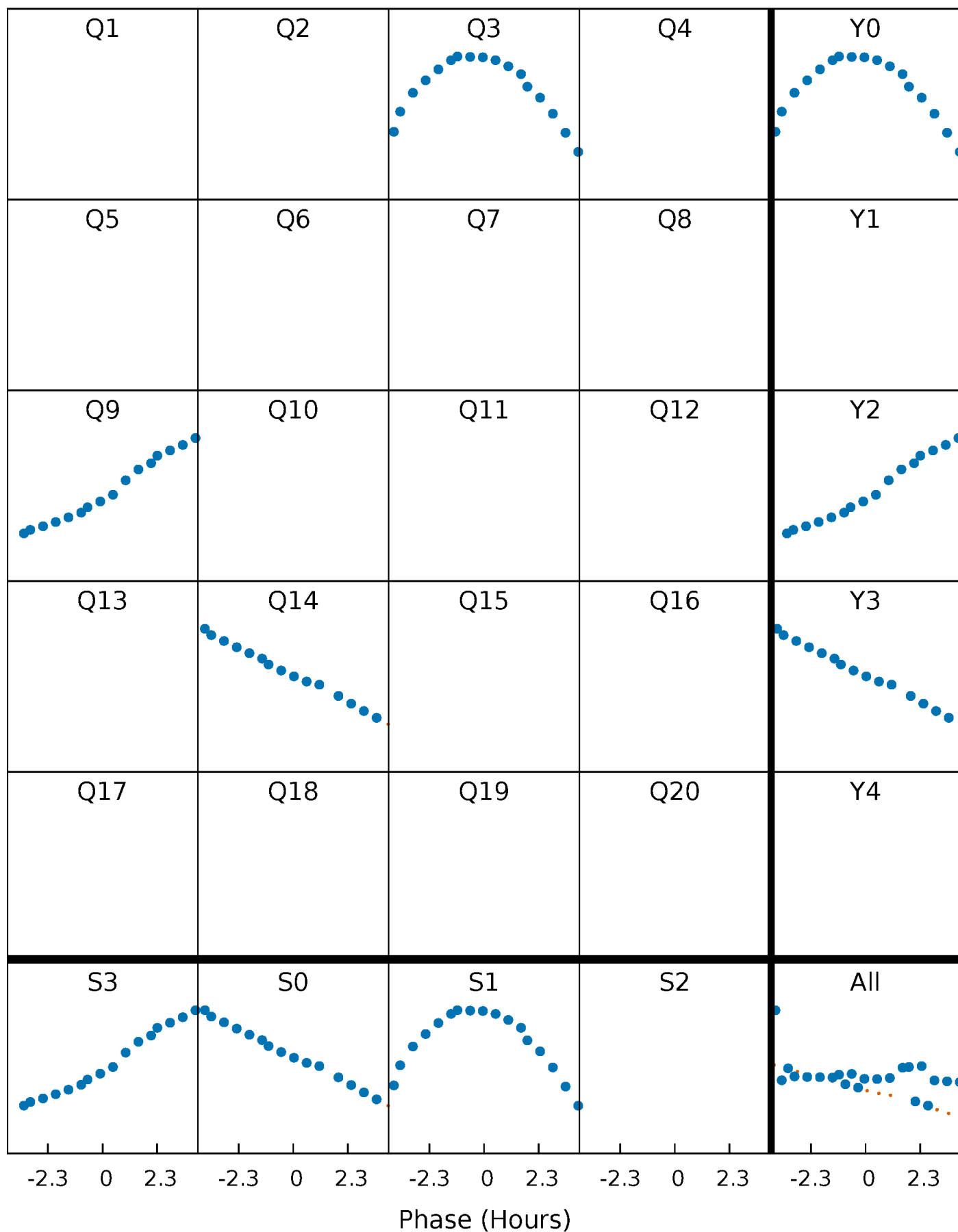


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



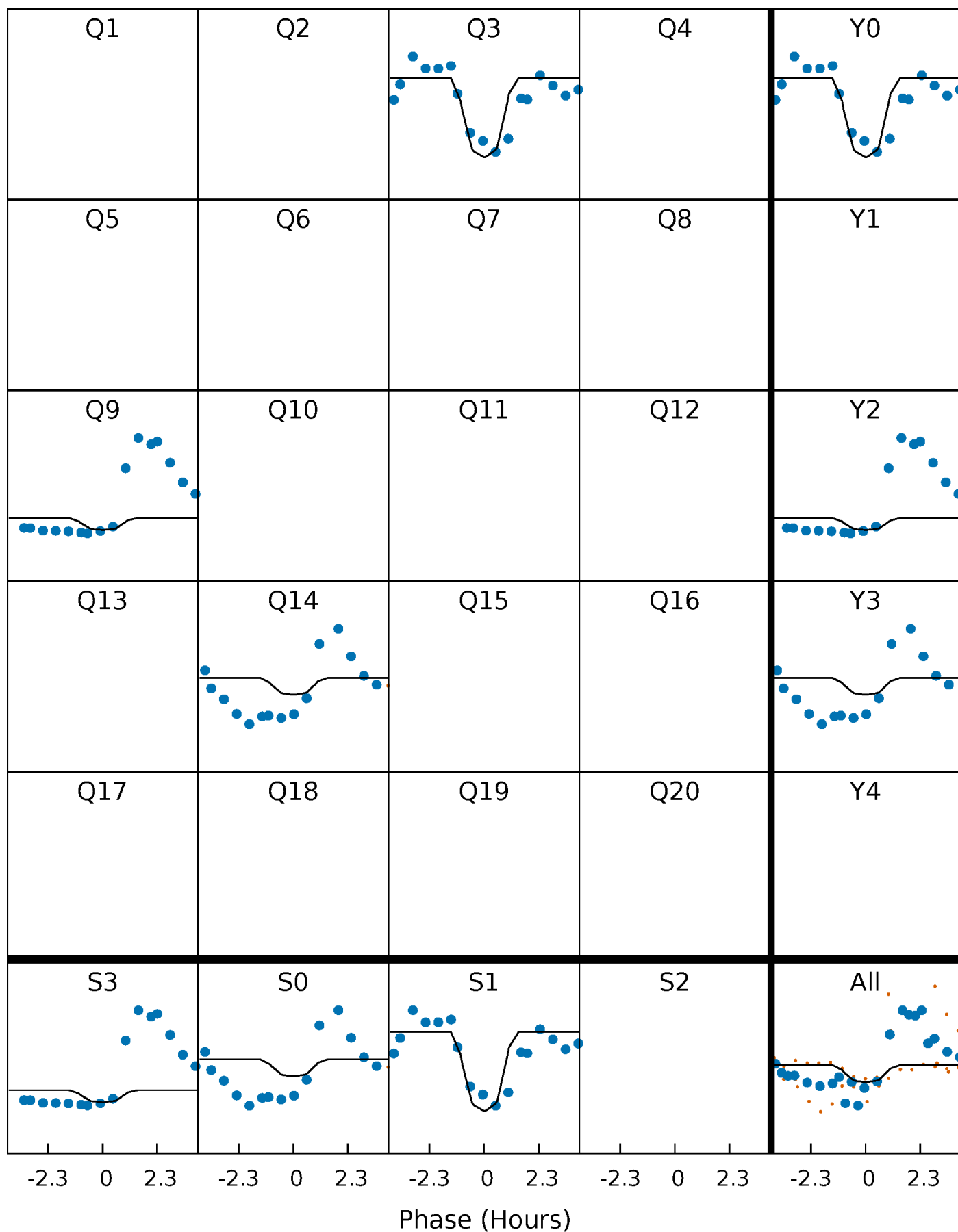
PDC Quarter-Phased Transit Curves

TCE 008022670-02 P=489.568902 Days $T_0=336.153210$ (BKJD)



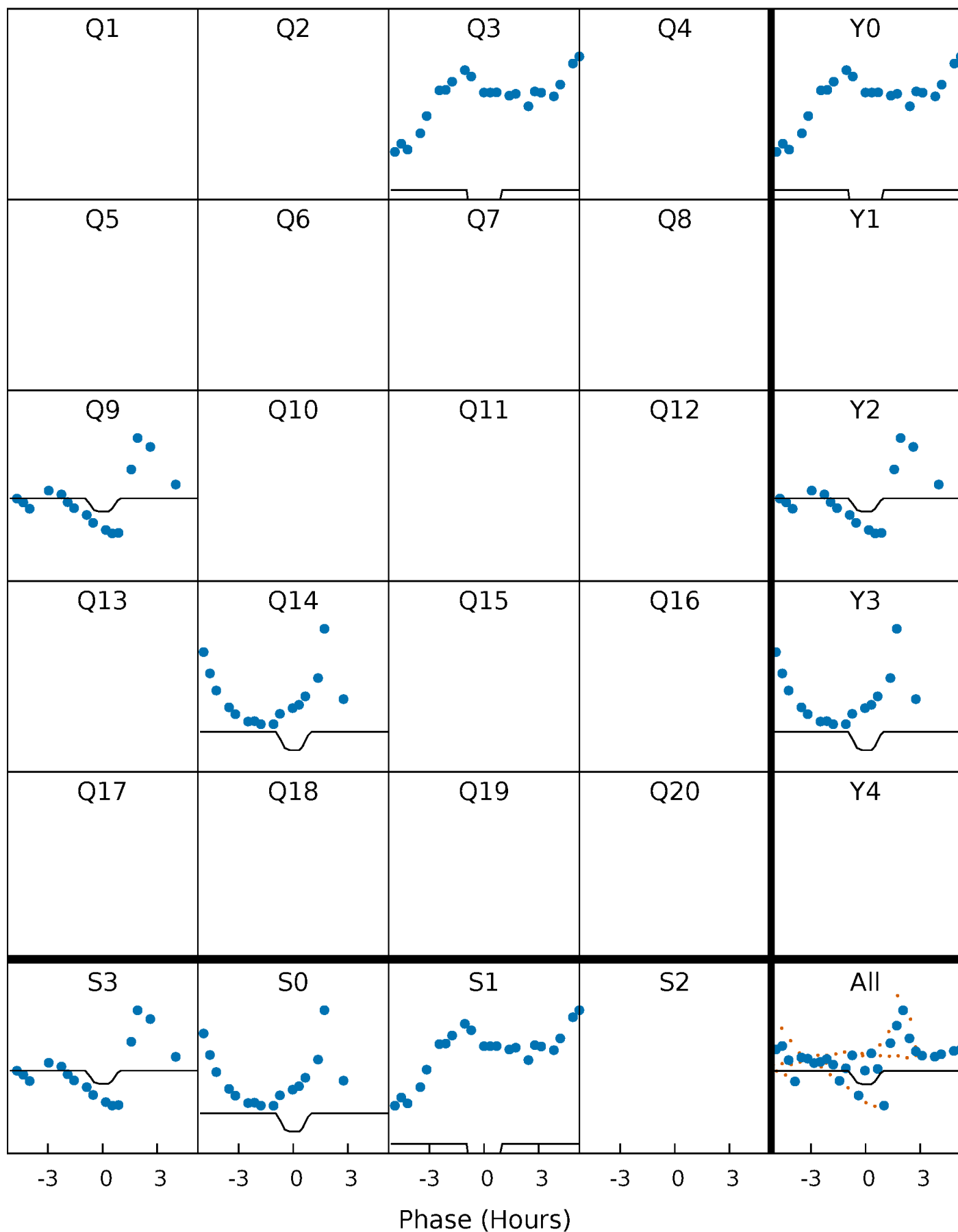
DV Quarter-Phased Transit Curves

TCE 008022670-02 $P=489.568902$ Days $T_0=336.153210$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

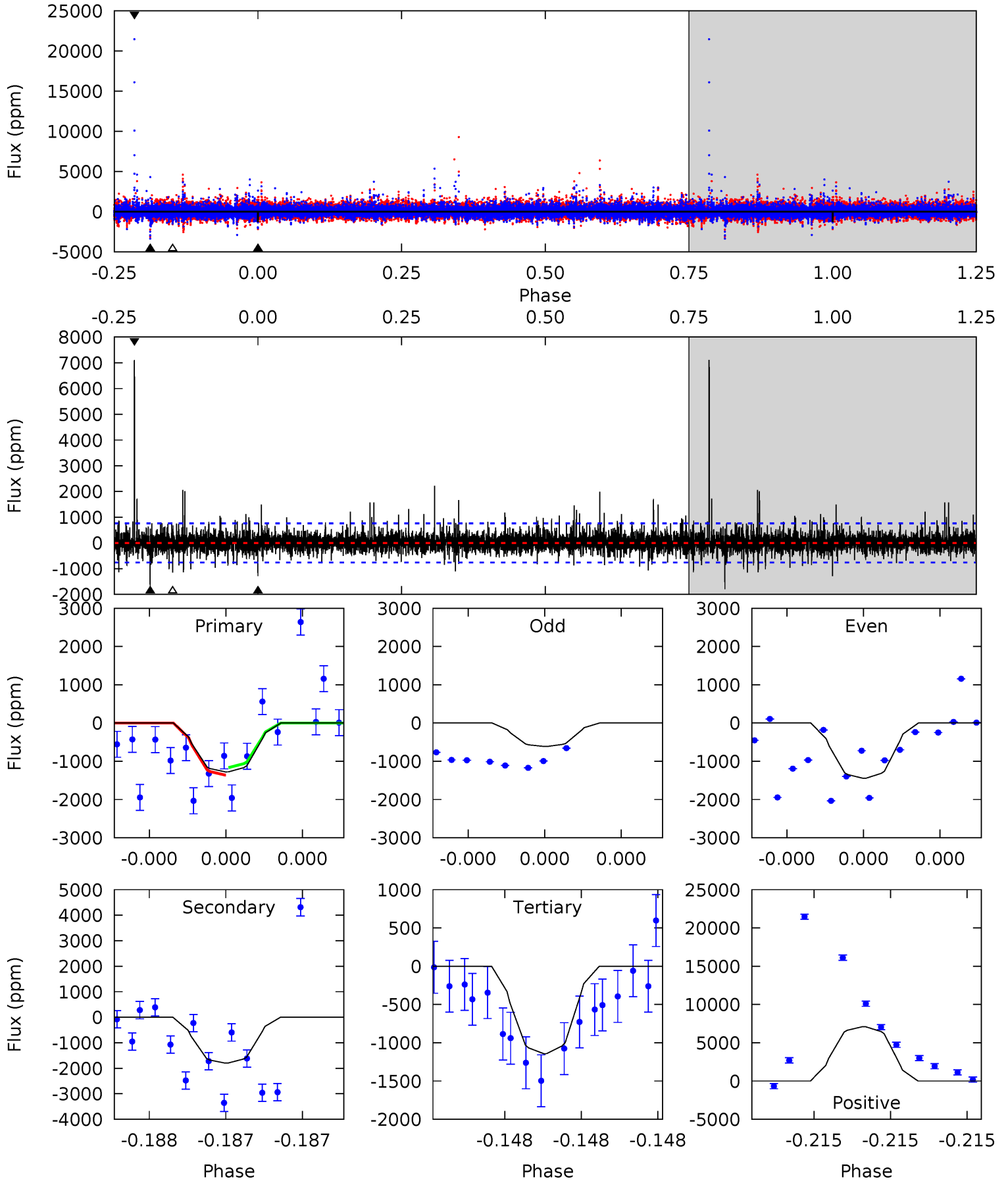
TCE 008022670-02 P=489.560853 Days $T_0=336.139440$ (BKJD)



DV Model-Shift Uniqueness Test

008022670-02, P = 489.568902 Days, E = 336.153210 Days

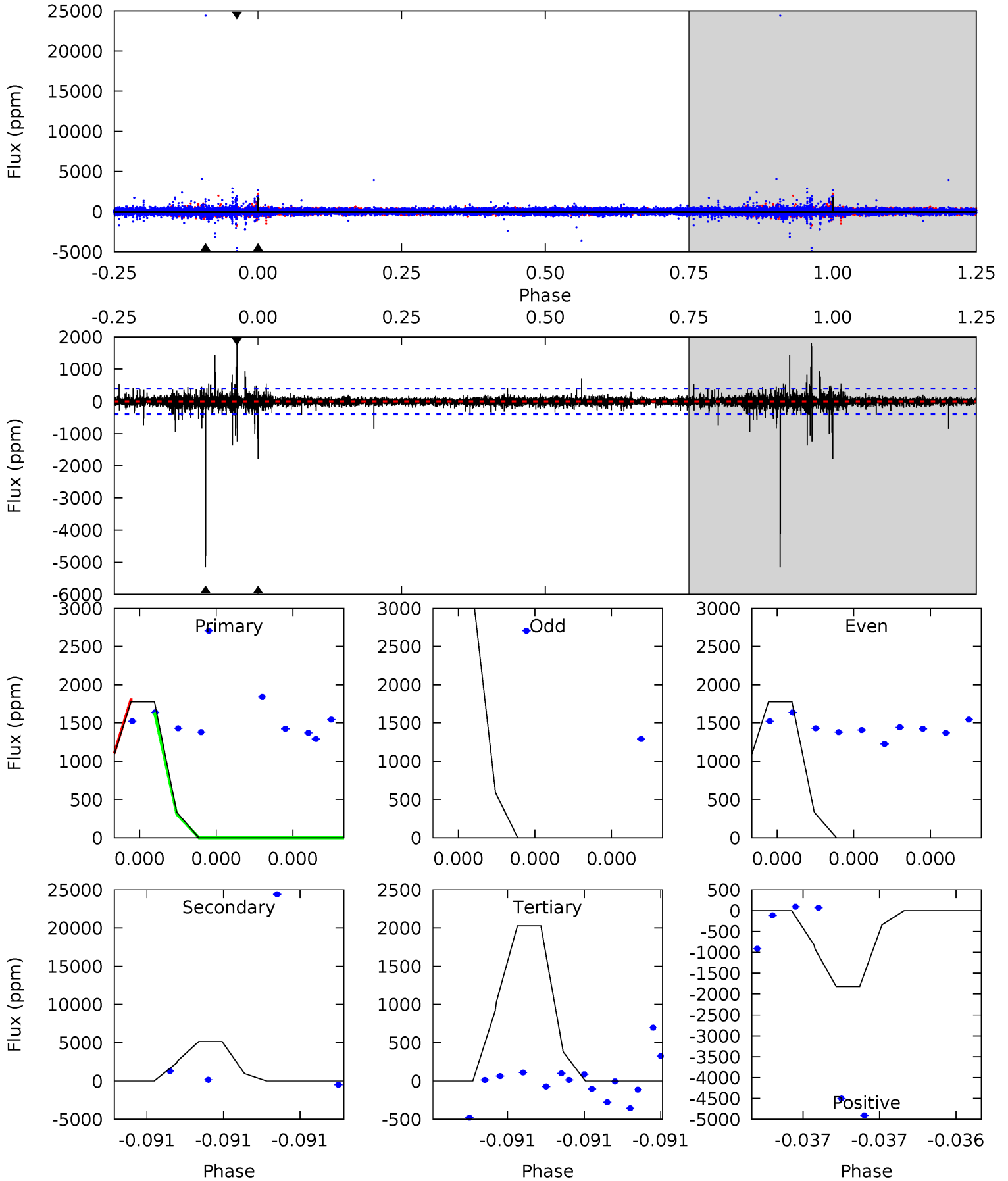
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.72	13.7	8.69	54.0	5.75	3.75	1.87	1.03	-44.3	4.97	-40.3	1.22	1.35	0.80	0.75



Alt Model-Shift Uniqueness Test

008022670-02, P = 489.560853 Days, E = 336.139440 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.0	75.3	29.6	26.6	5.79	3.80	1.28	-3.64	-0.58	45.7	48.7	7.01	0.12	0.26	1.14



Stellar Parameters For KIC 008022670

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4707^{+61}_{-51}	$3.035^{+0.170}_{-0.139}$	$0.040^{+0.150}_{-0.100}$	$4.861^{+1.035}_{-0.847}$	$0.934^{+0.106}_{-0.013}$	$0.011^{+0.009}_{-0.005}$
	+1%/-1%	+6%/-5%	+375%/-250%	+21%/-17%	+11%/-1%	+74%/-43%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008022670-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1798 ± 132	$59.78^{+59.17}_{-41.48}$	584^{+32}_{-31}	3336^{+1956}_{-564}	397^{+4042}_{-297}
Alt.	-5153 ± 68	$62.14^{+57.28}_{-43.89}$	586^{+31}_{-32}	3959^{+2724}_{-755}	1102^{+11472}_{-810}

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 $A_{obs} \gg 1.0$

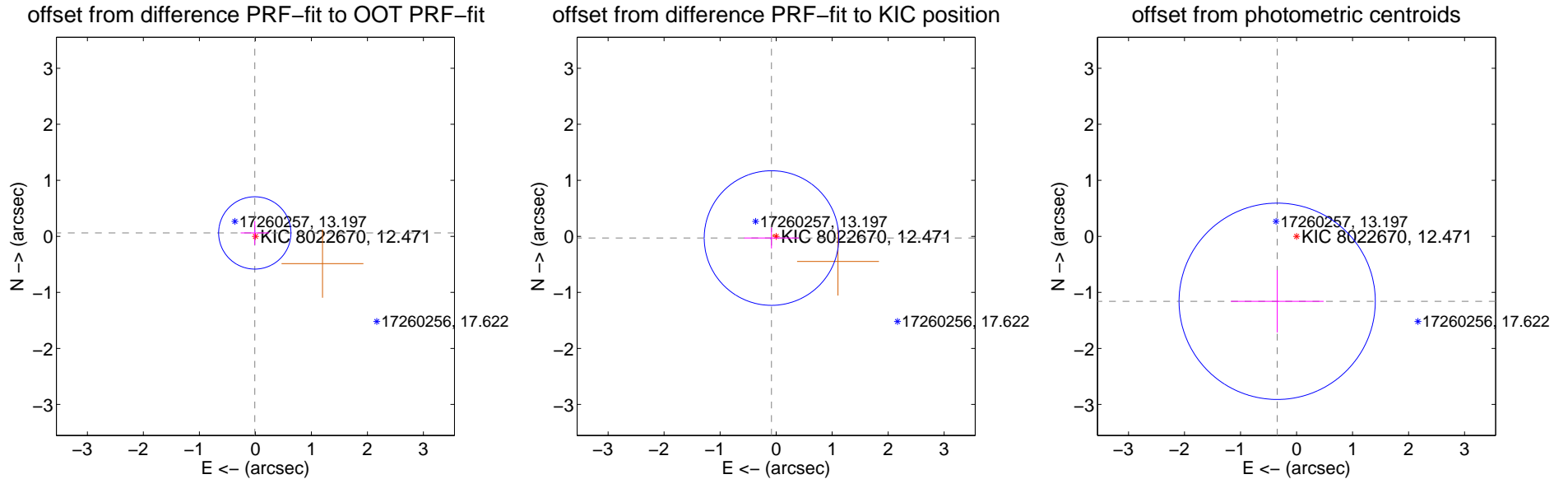
DV Centroid Data

Supplemental centroid analysis for 008022670-02. Kepler magnitude: 12.47. Transit SNR 4.57

There are 1 quarters with good PRF difference image offsets

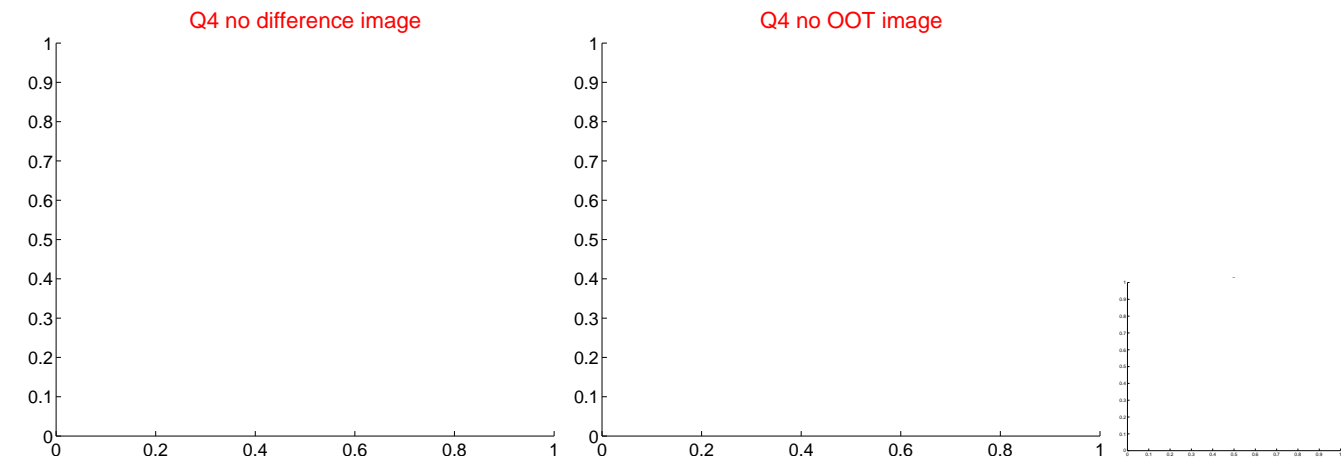
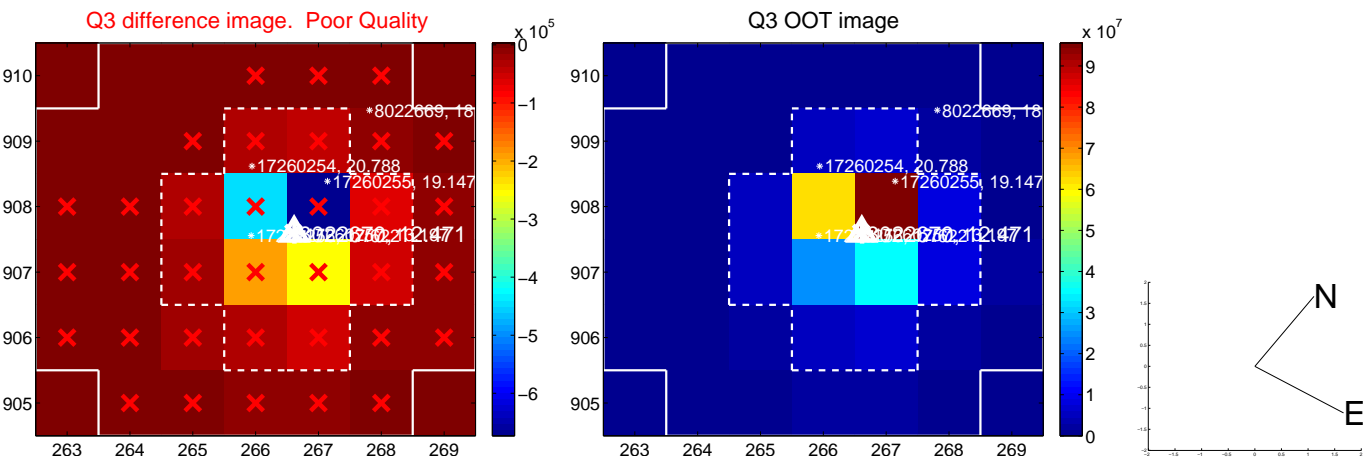
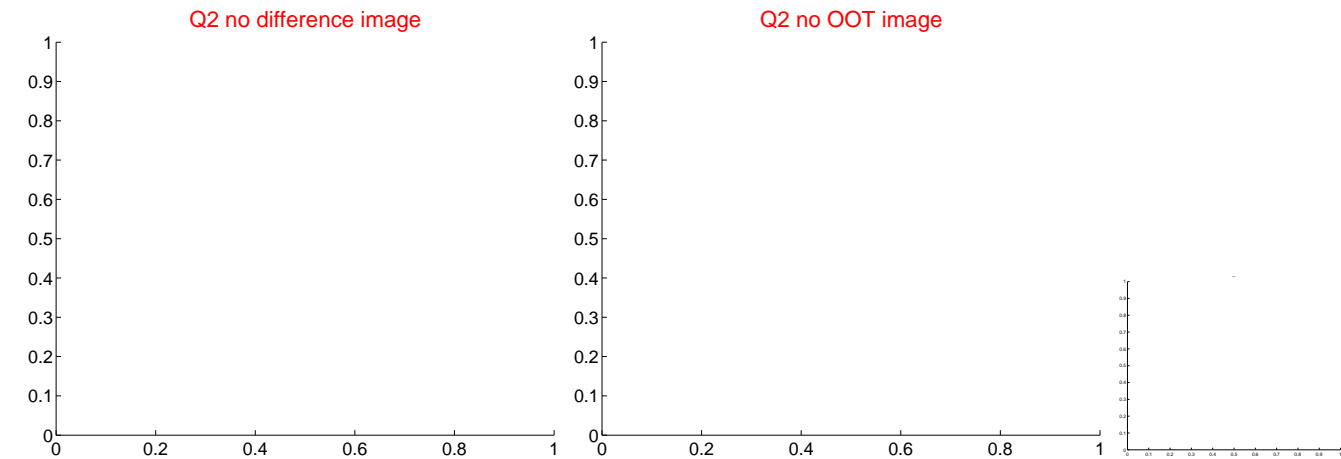
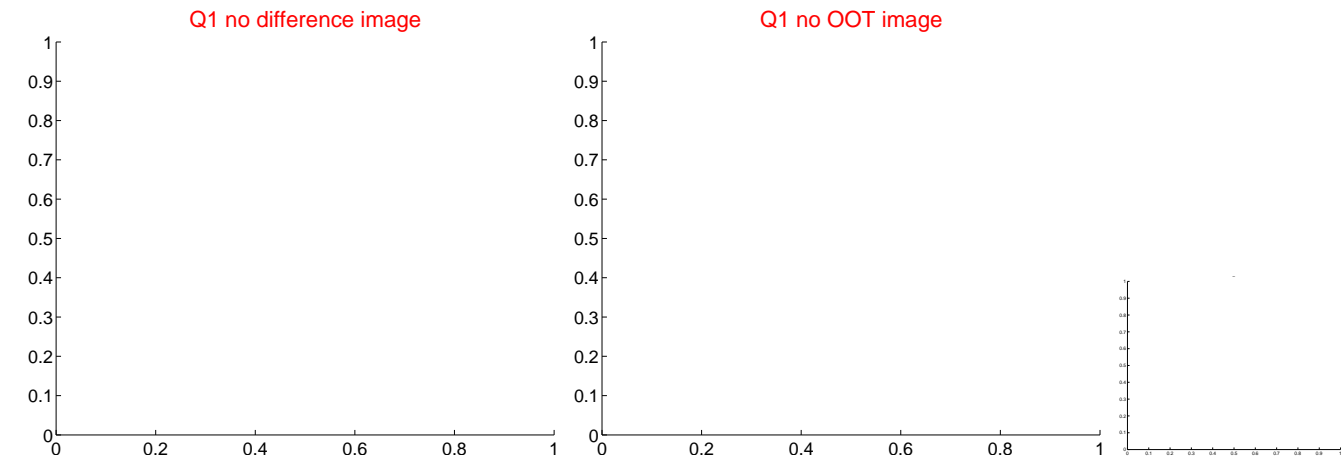
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.062 ± 0.215	0.29	0.011 ± 0.253	0.061 ± 0.214
PRF-fit source offset from KIC position	0.088 ± 0.400	0.22	0.083 ± 0.488	-0.030 ± 0.186
photometric centroid source offset	1.21 ± 0.58	2.07	0.35 ± 0.83	-1.16 ± 0.56



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.

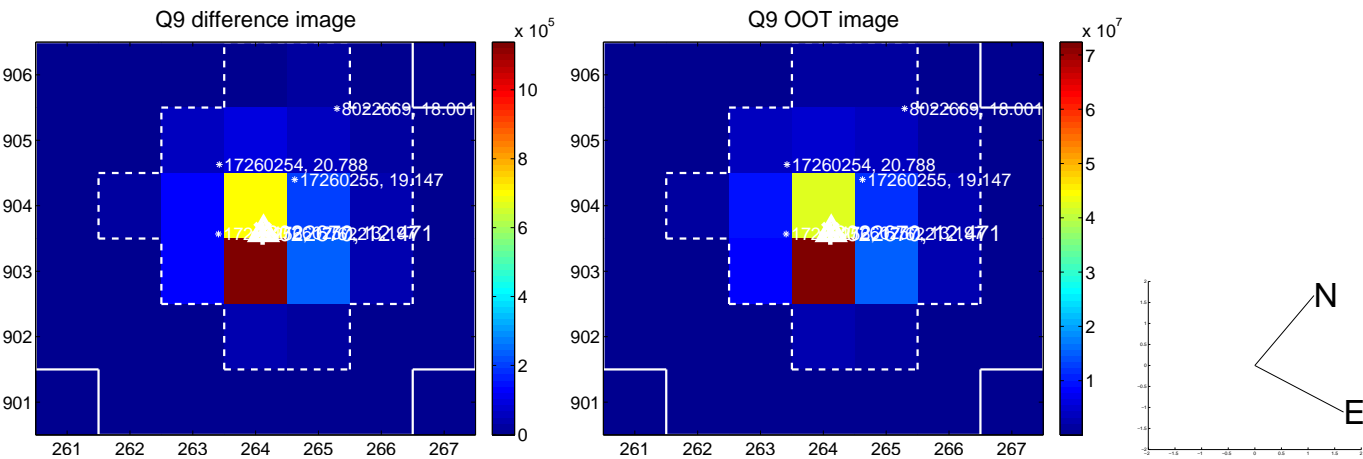
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



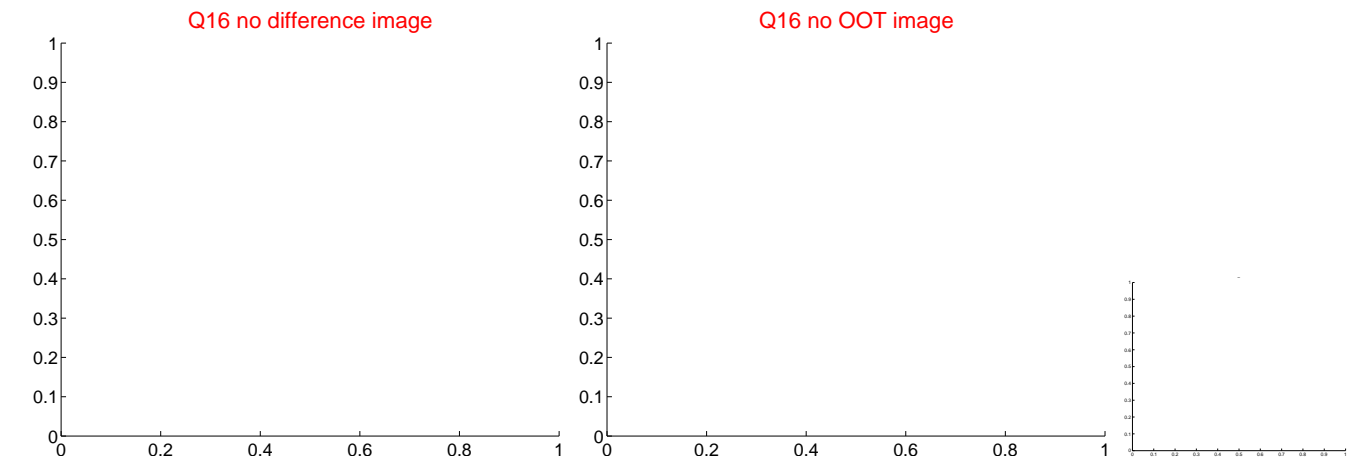
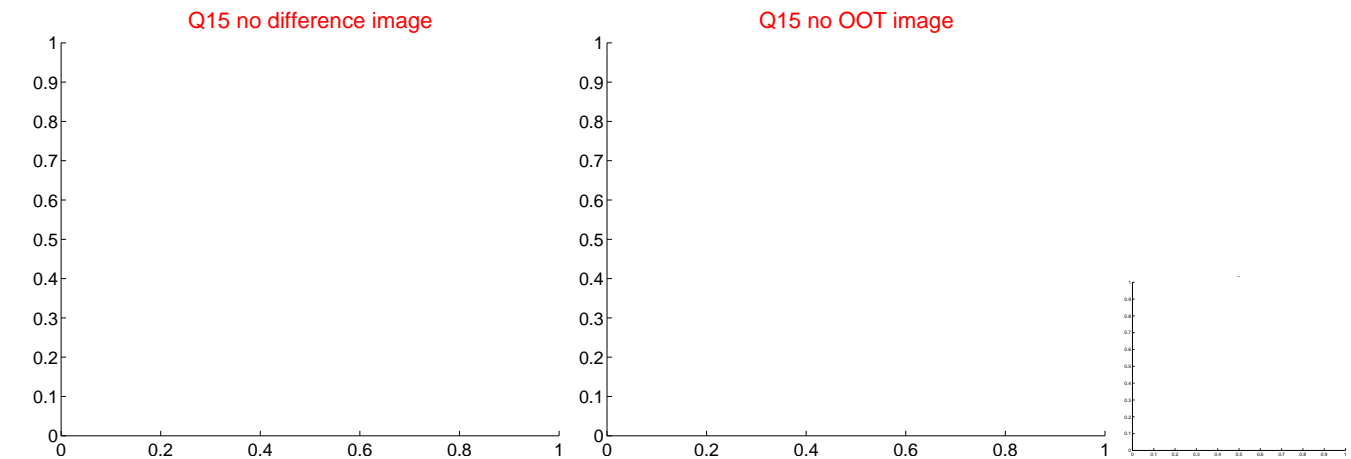
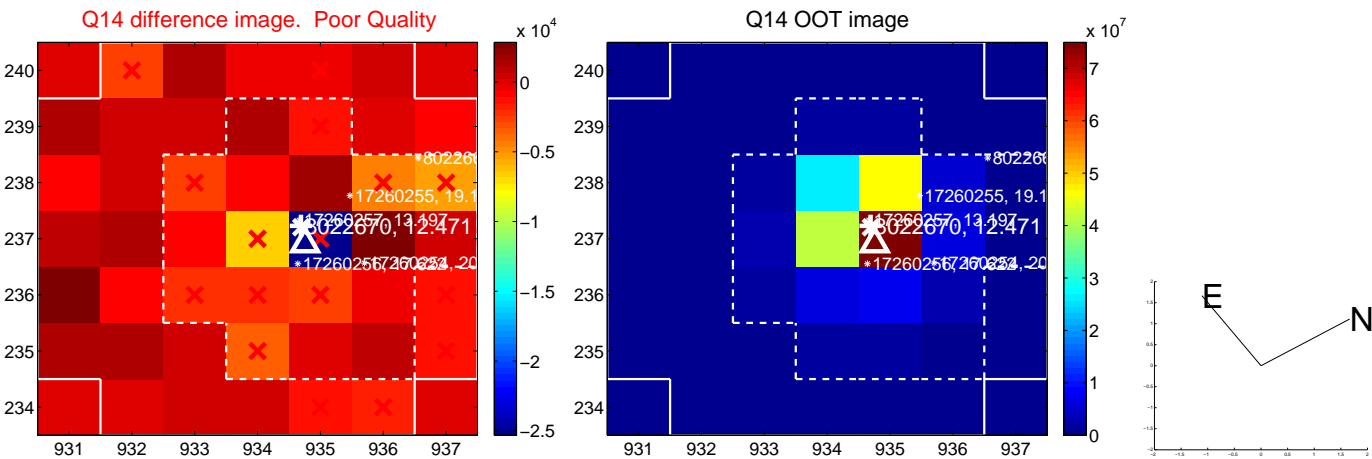
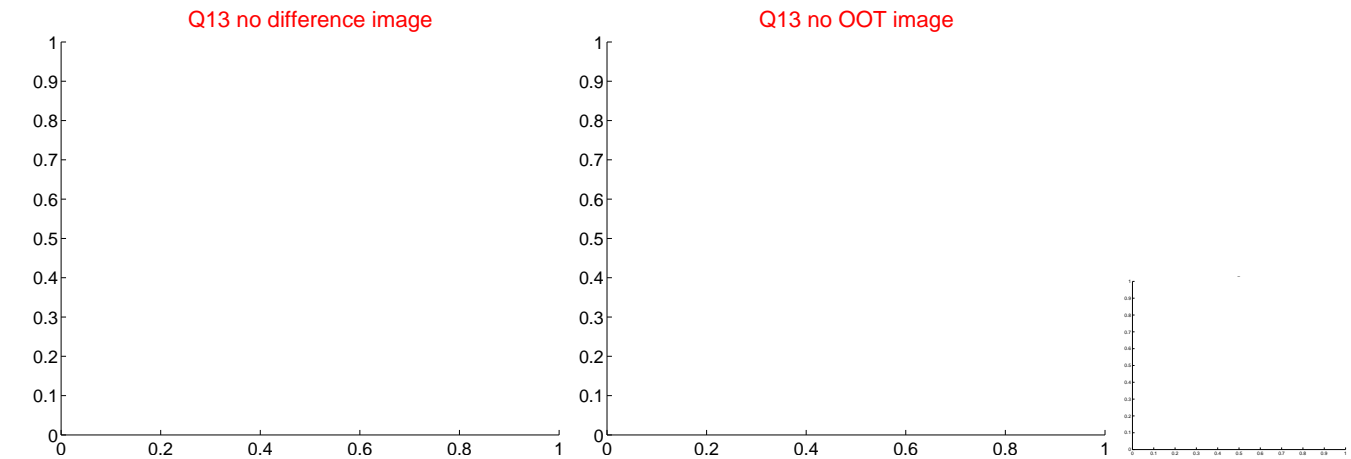
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



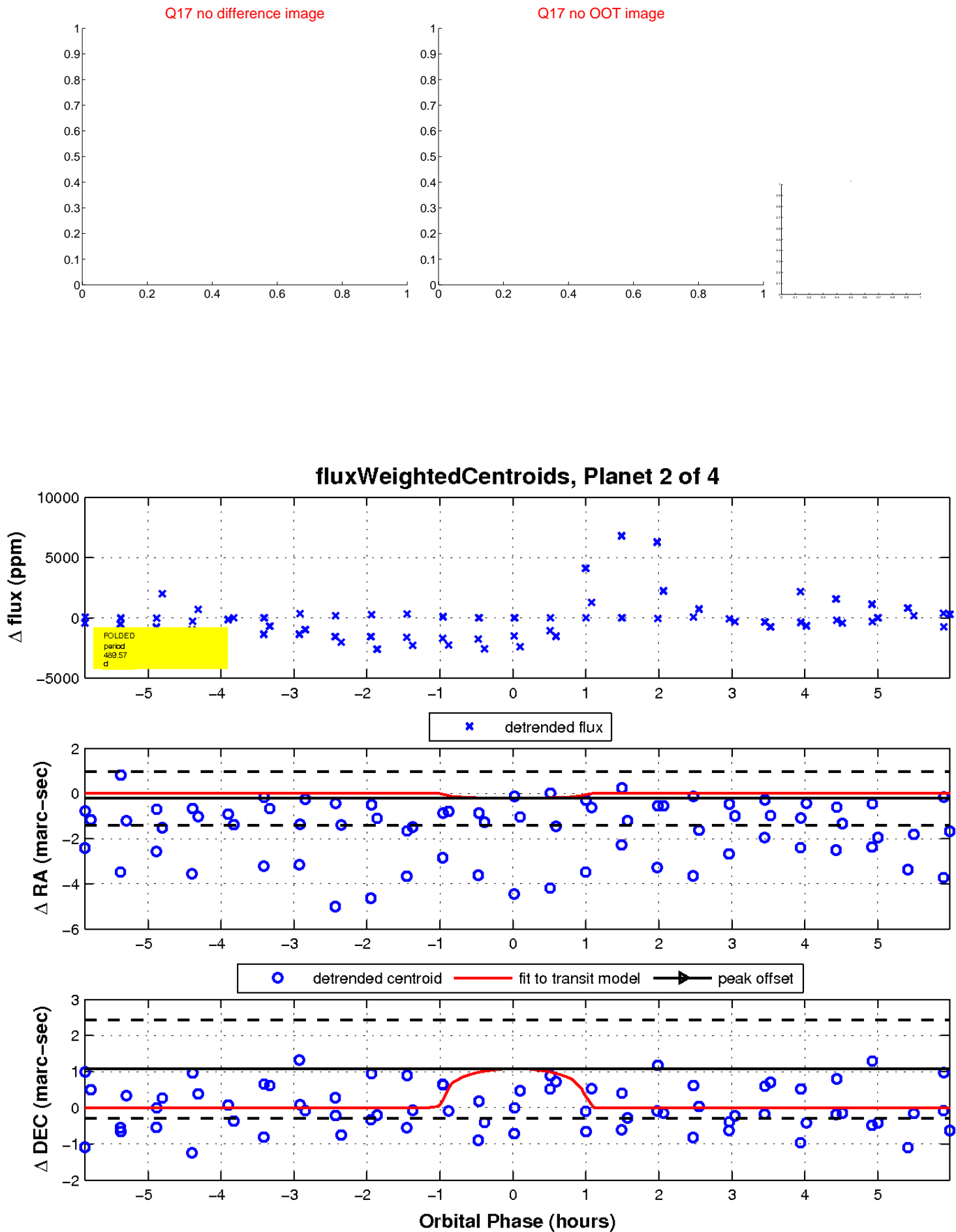
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

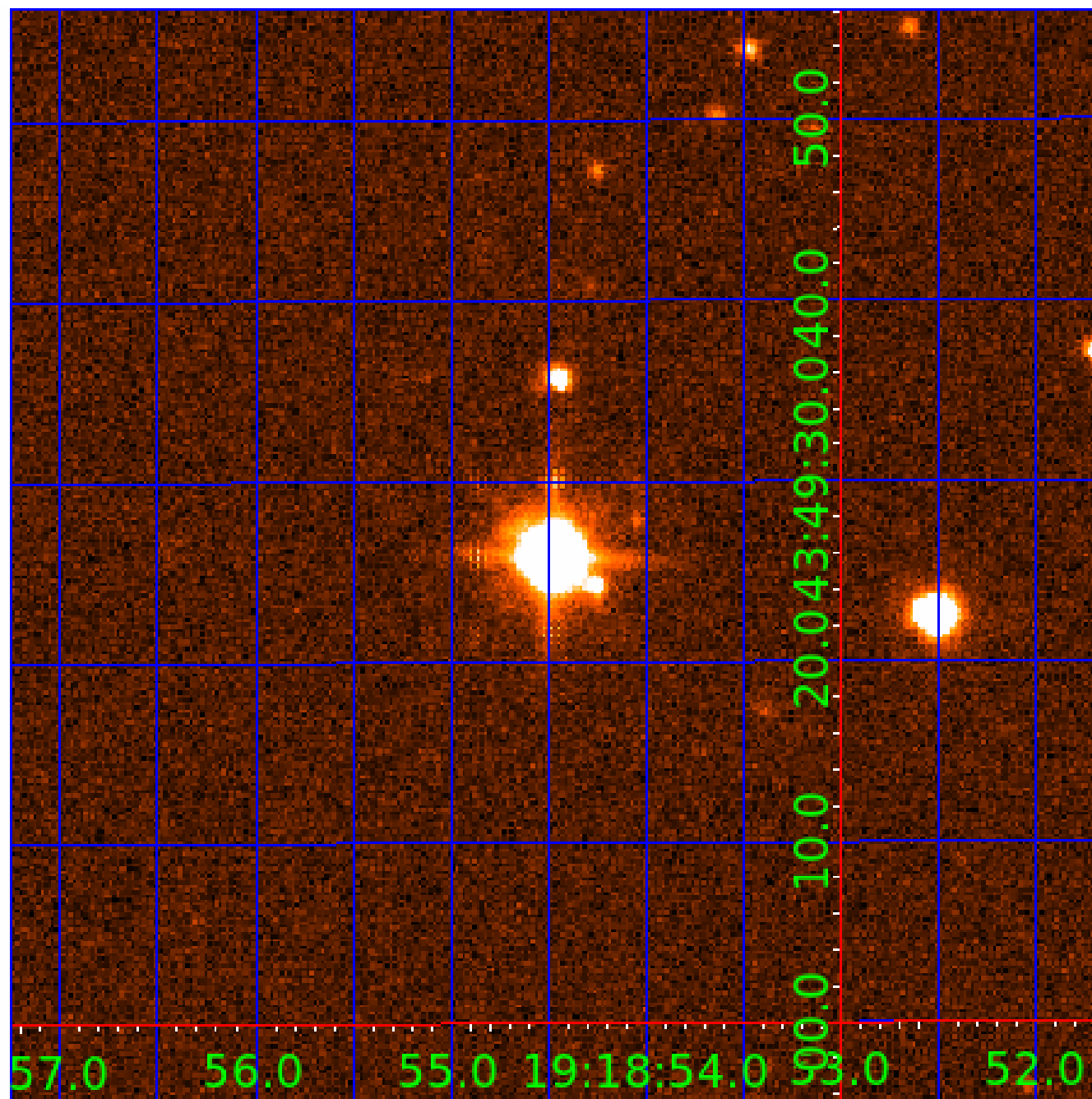


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008022670

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})
008022670-01	OBS	No	338.106337	271.834437	1678.4	4.455	23.6	8.9	4.86	4707	19.52	12.05
008022670-02	OBS	No	489.568902	336.153210	911.1	2.008	17.0	4.6	4.86	4707	14.23	7.36
008022670-03	OBS	No	396.966032	464.162055	562.0	1.892	16.7	3.7	4.86	4707	12.48	9.73
008022670-04	OBS	No	386.854969	147.595611	393.2	6.000	18.7	-1.0	4.86	4707	9.25	10.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022670-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008022670-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

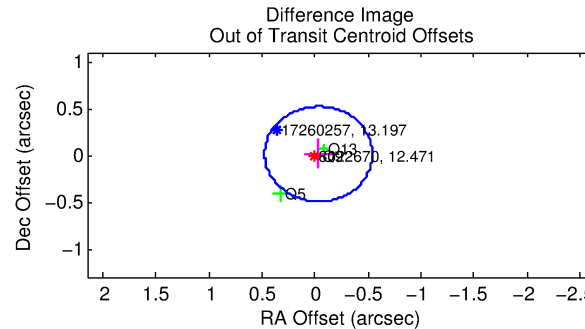
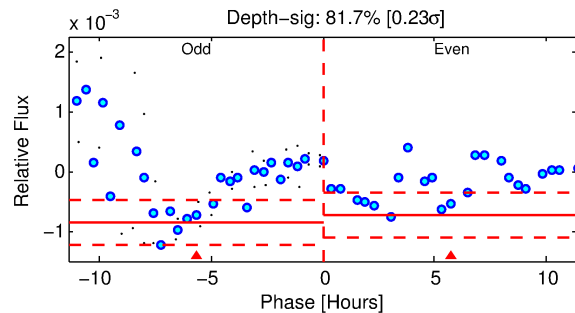
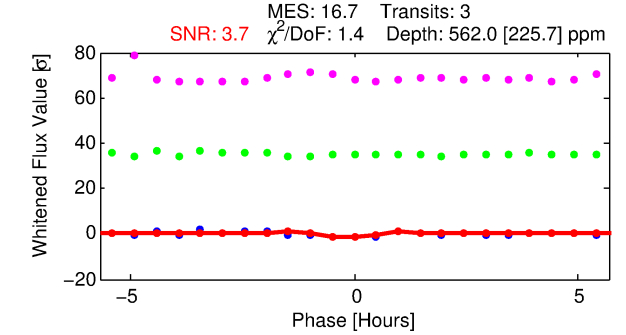
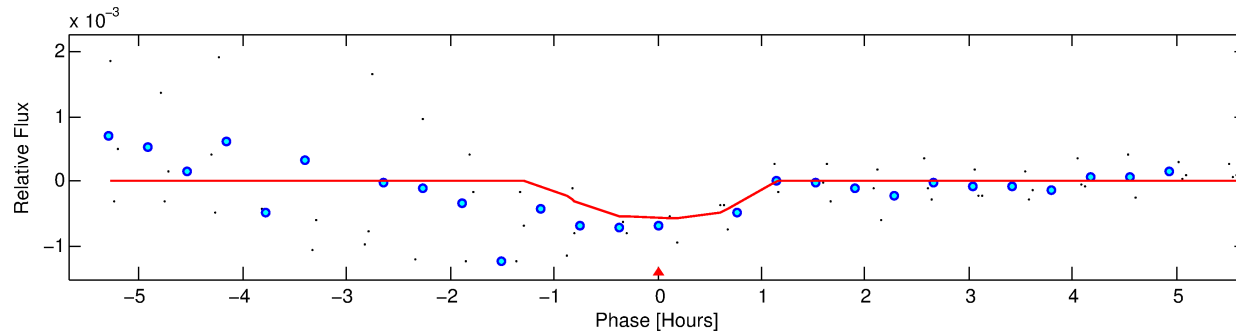
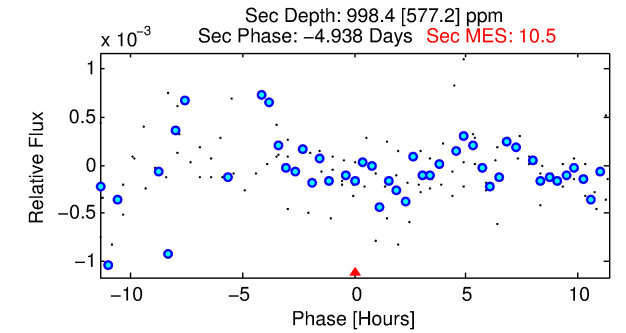
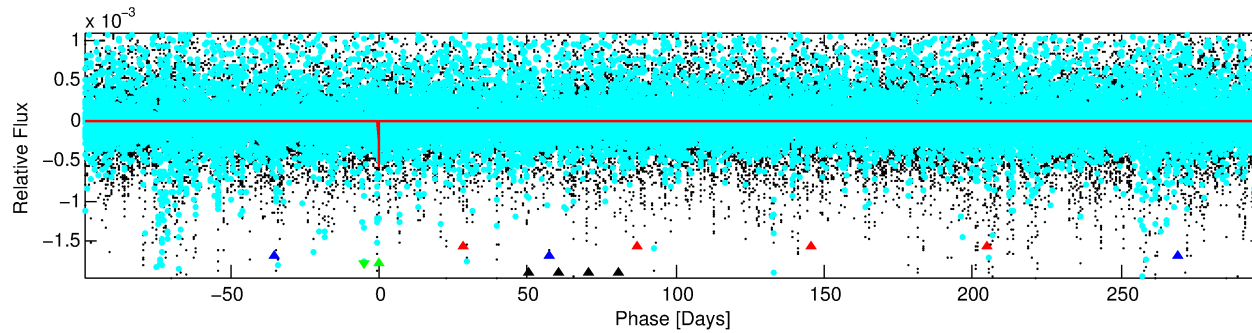
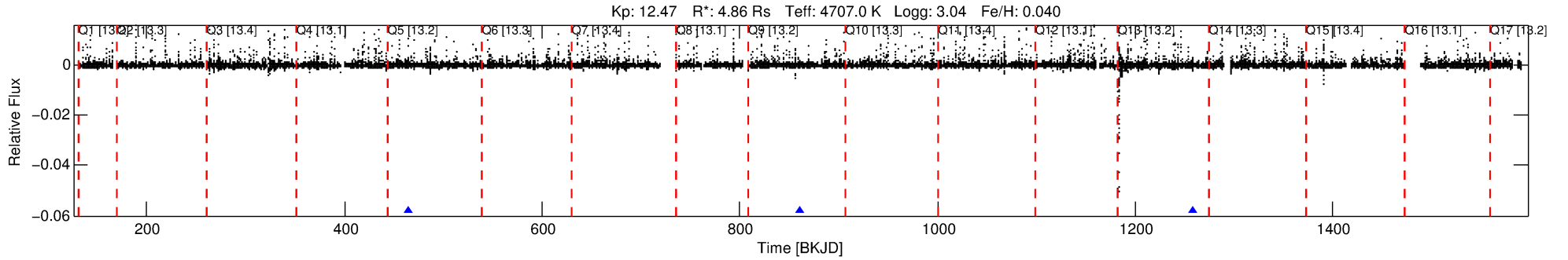
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022670-03

No Significant Match Found

DV One-Page Summary

KIC: 8022670 Candidate: 3 of 4 Period: 396.966 d



DV Fit Results:

Period = 396.96603 [0.00748] d
Epoch = 464.1621 [0.0102] BKJD
Rp/R* = 0.0235 [0.0607]
a/R* = 1163.51 [9578.24]
b = 0.72 [5.63]
Seff = 9.73 [2.93]
Teq = 450 [34] K
Rp = 12.48 [32.30] Re
a = 1.0336 [0.1993] AU
Ag = 3767.37 [19590.07] [0.19σ]
Teffp = 5455 [7080] K [0.71σ]

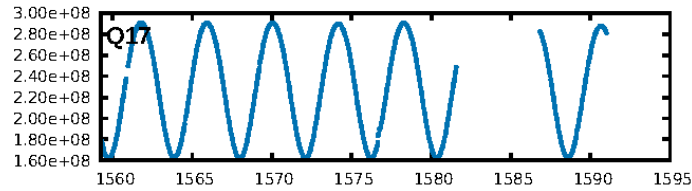
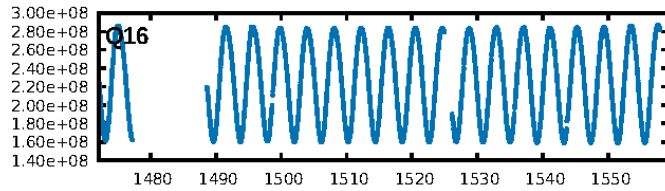
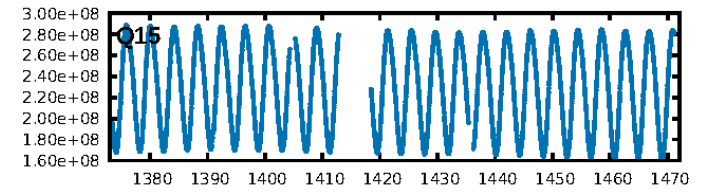
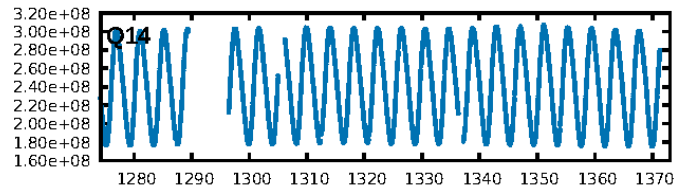
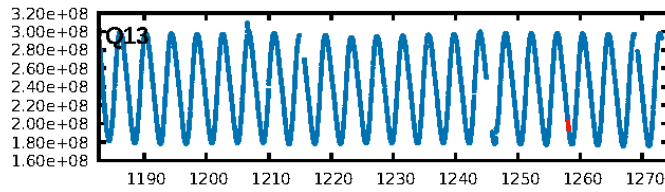
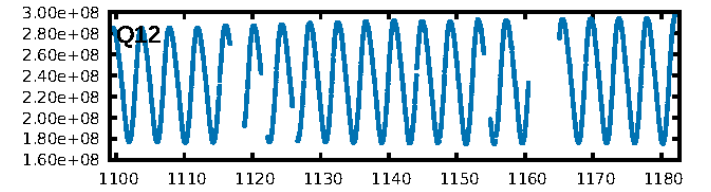
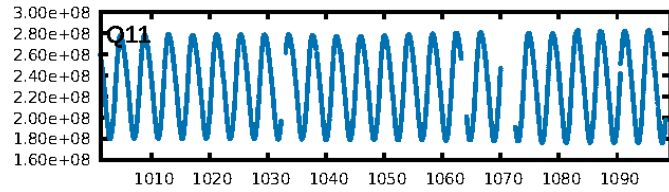
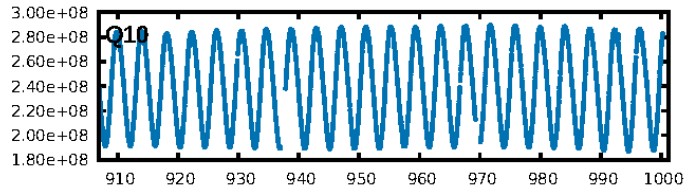
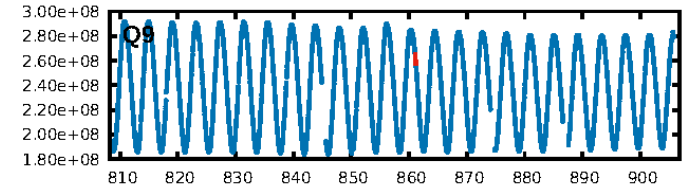
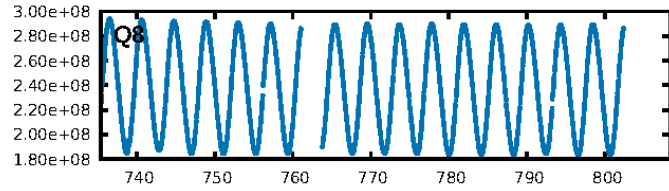
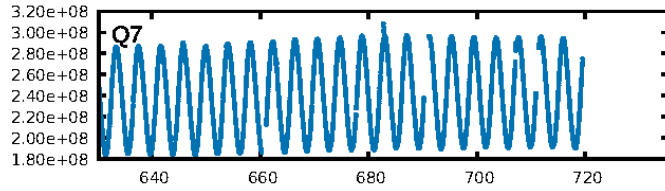
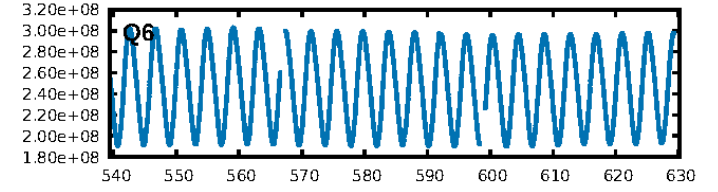
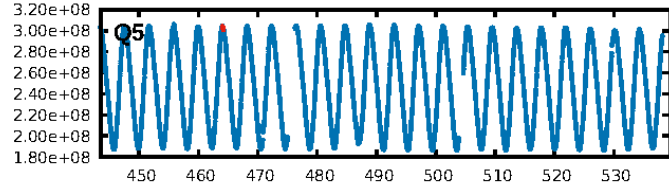
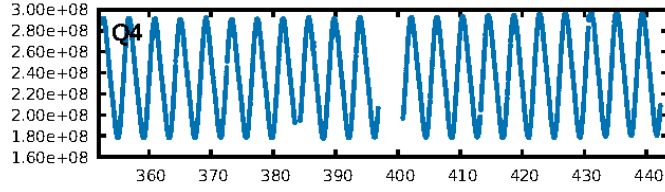
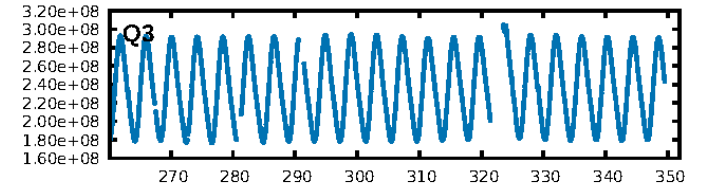
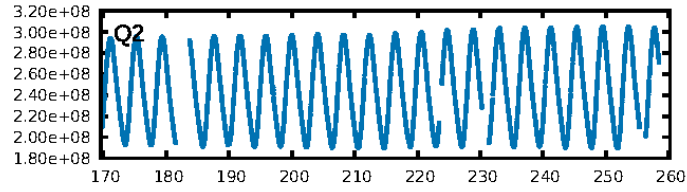
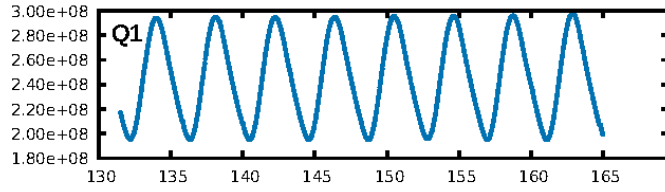
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [38.57σ]
LongPeriod-sig: 100.0% [805.47σ]
ModelChiSquare2-sig: 44.2%
ModelChiSquareGof-sig: 79.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.7924
Centroid-sig: 64.8%
Centroid-so: 0.827 arcsec [0.57σ]
OotOffset-rm: 0.035 arcsec [0.21σ]
KicOffset-rm: 0.066 arcsec [0.35σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

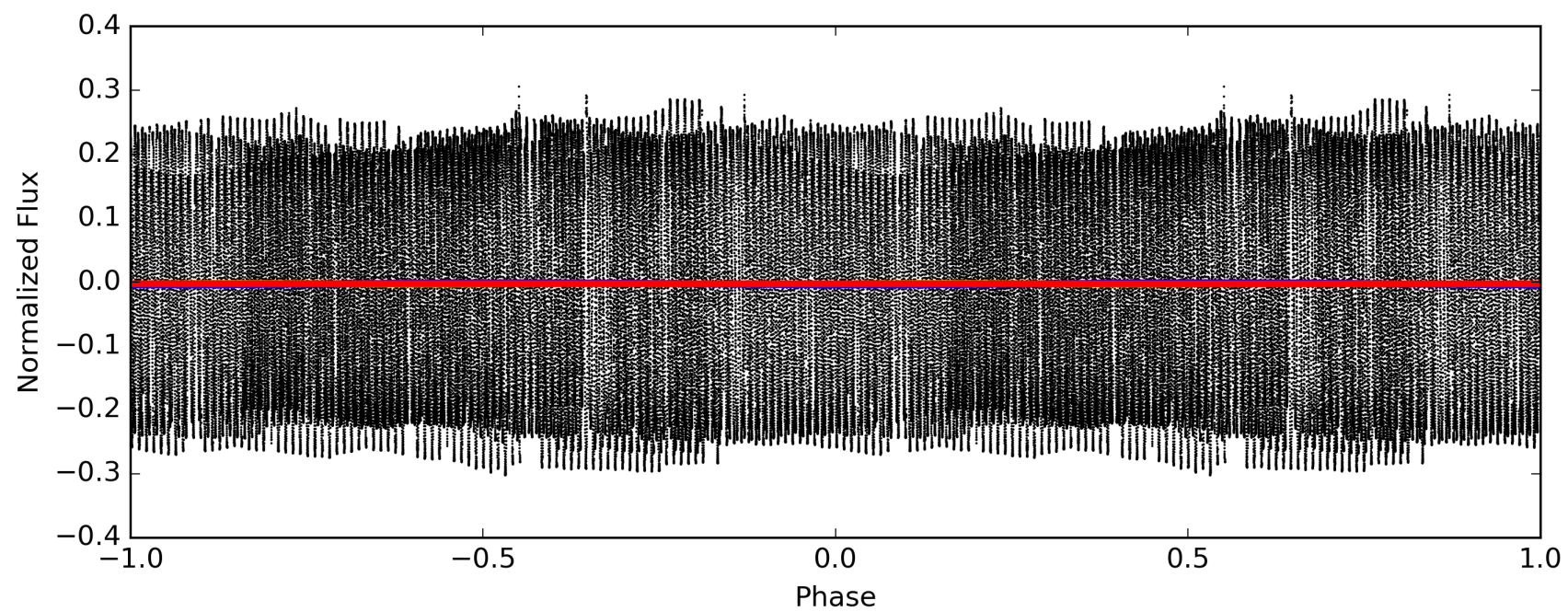
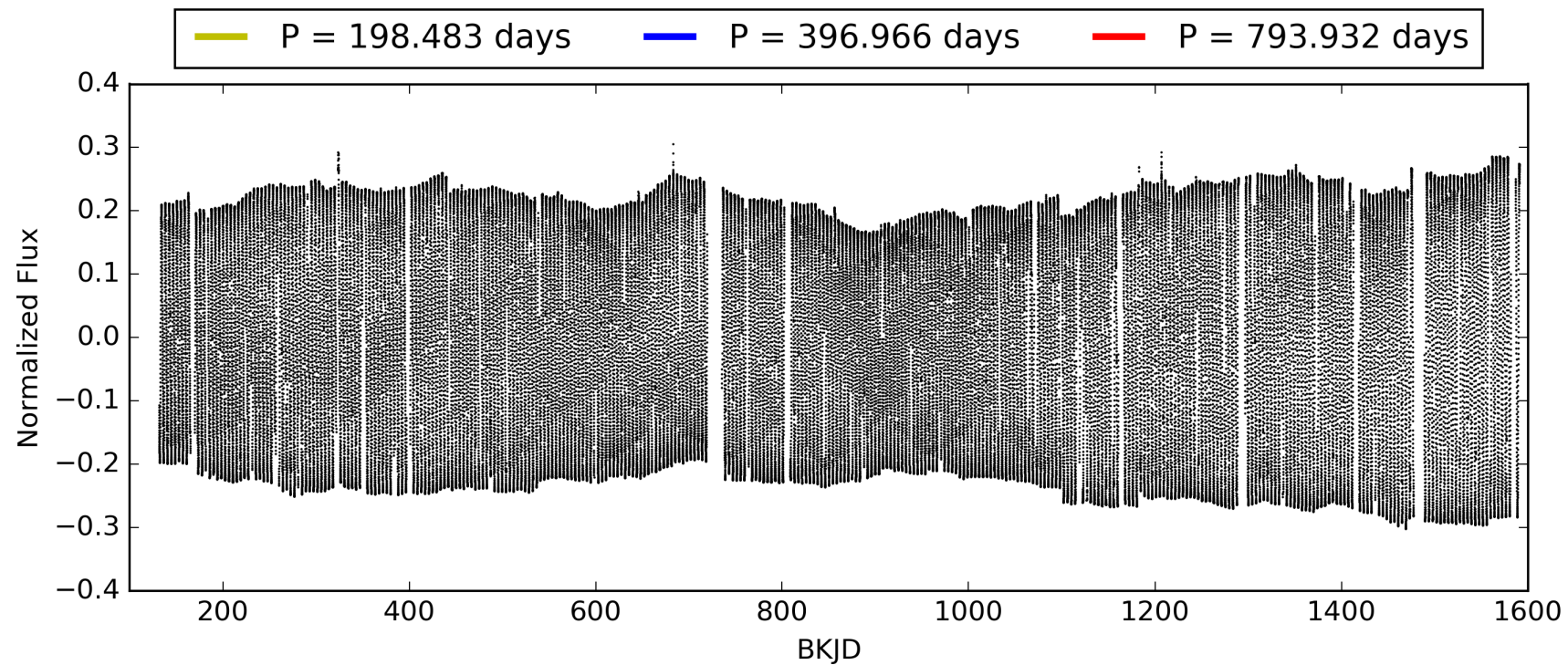
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:06:16 Z

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

TCE 008022670-03, PDC Light Curves

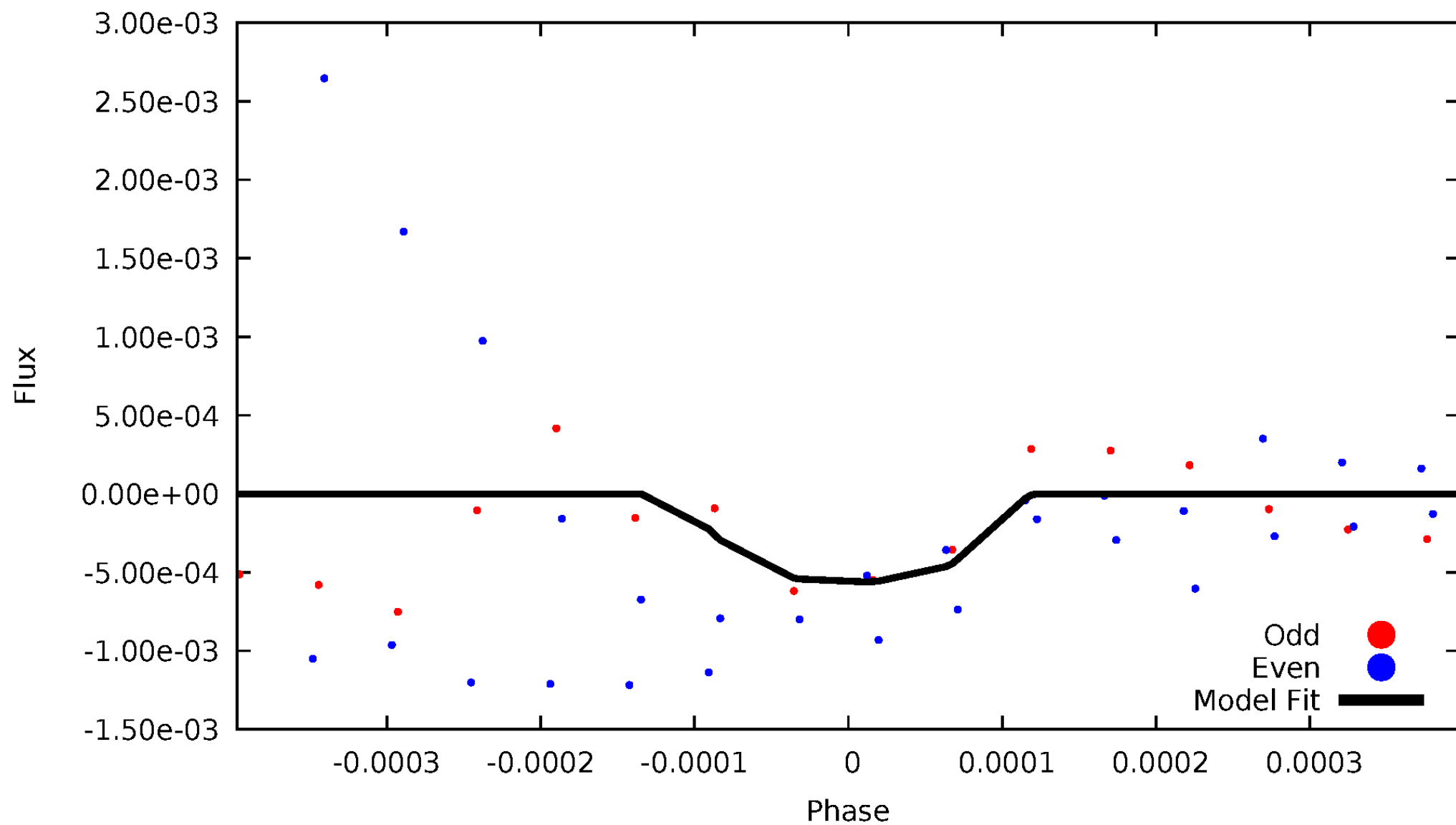


TCE 008022670-03



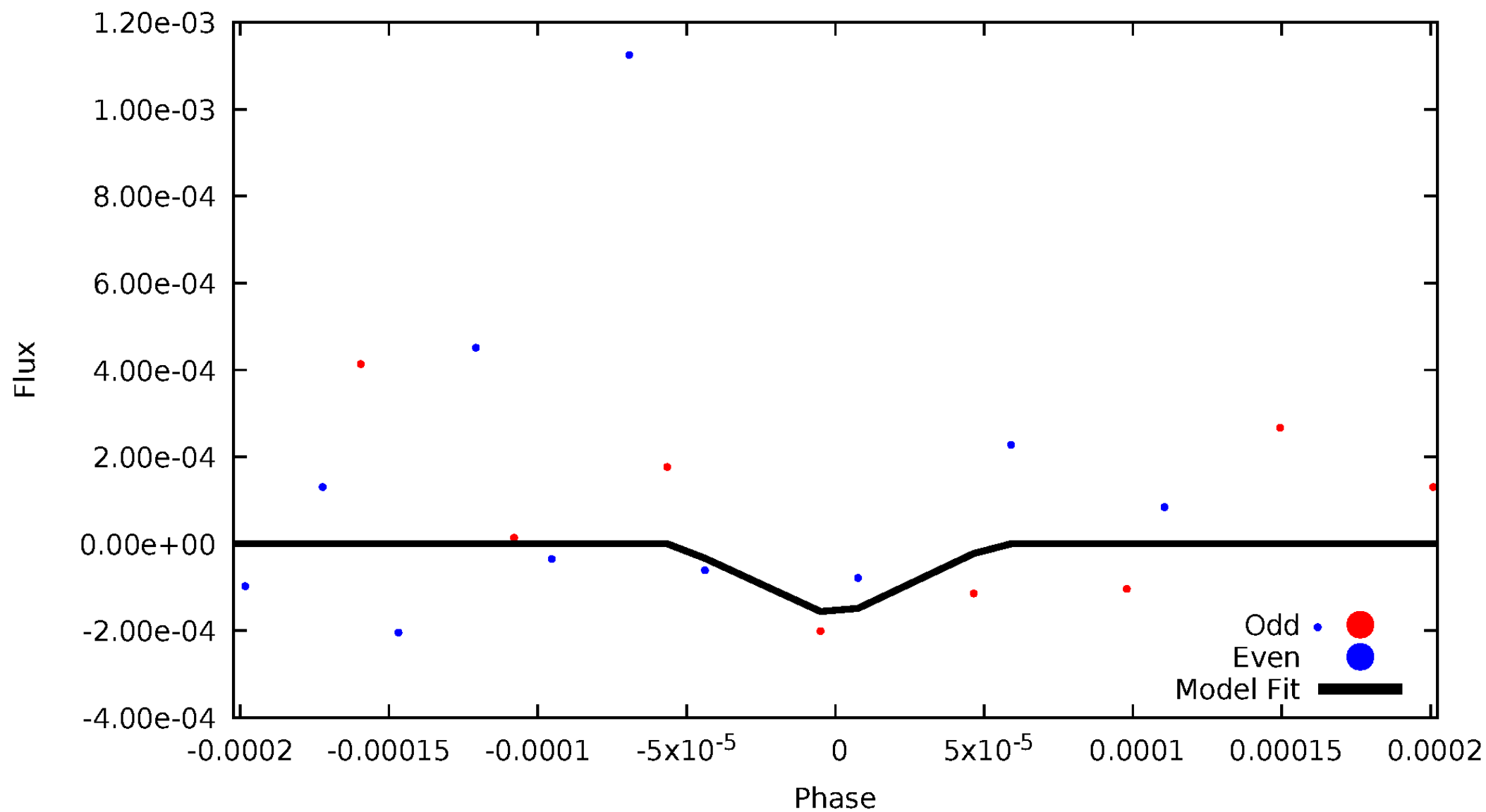
DV Odd/Even

TCE 008022670-03



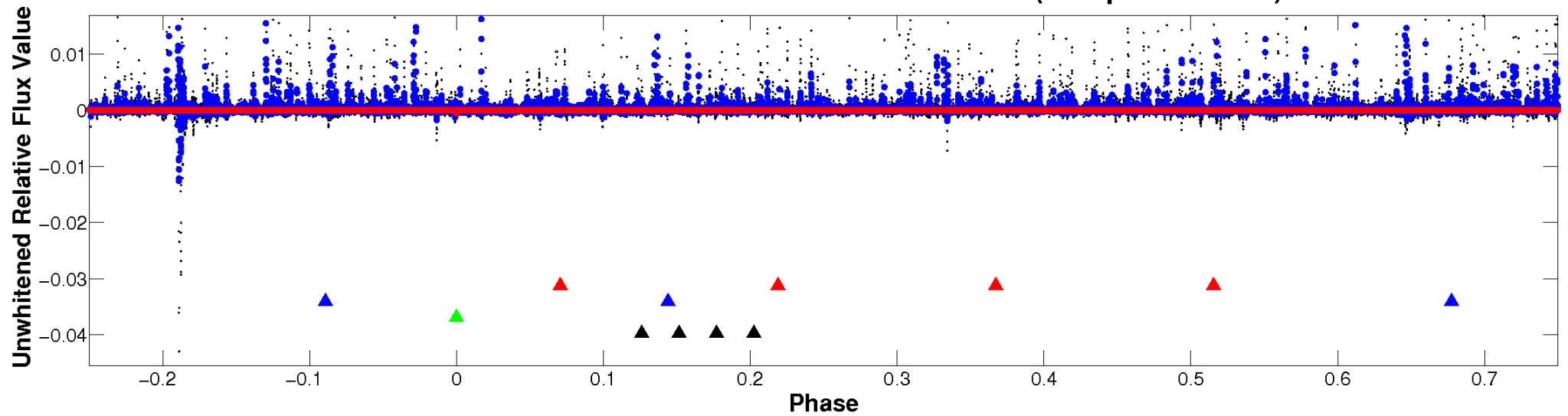
ALT Odd/Even

TCE 008022670-03

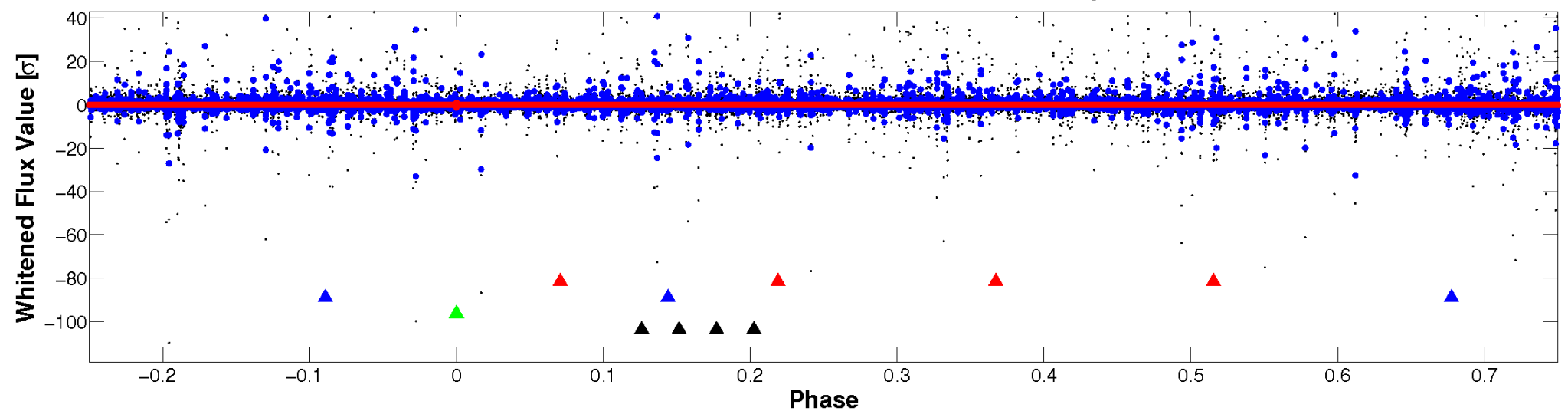


Non-Whitened Vs. Whitened Light Curve

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

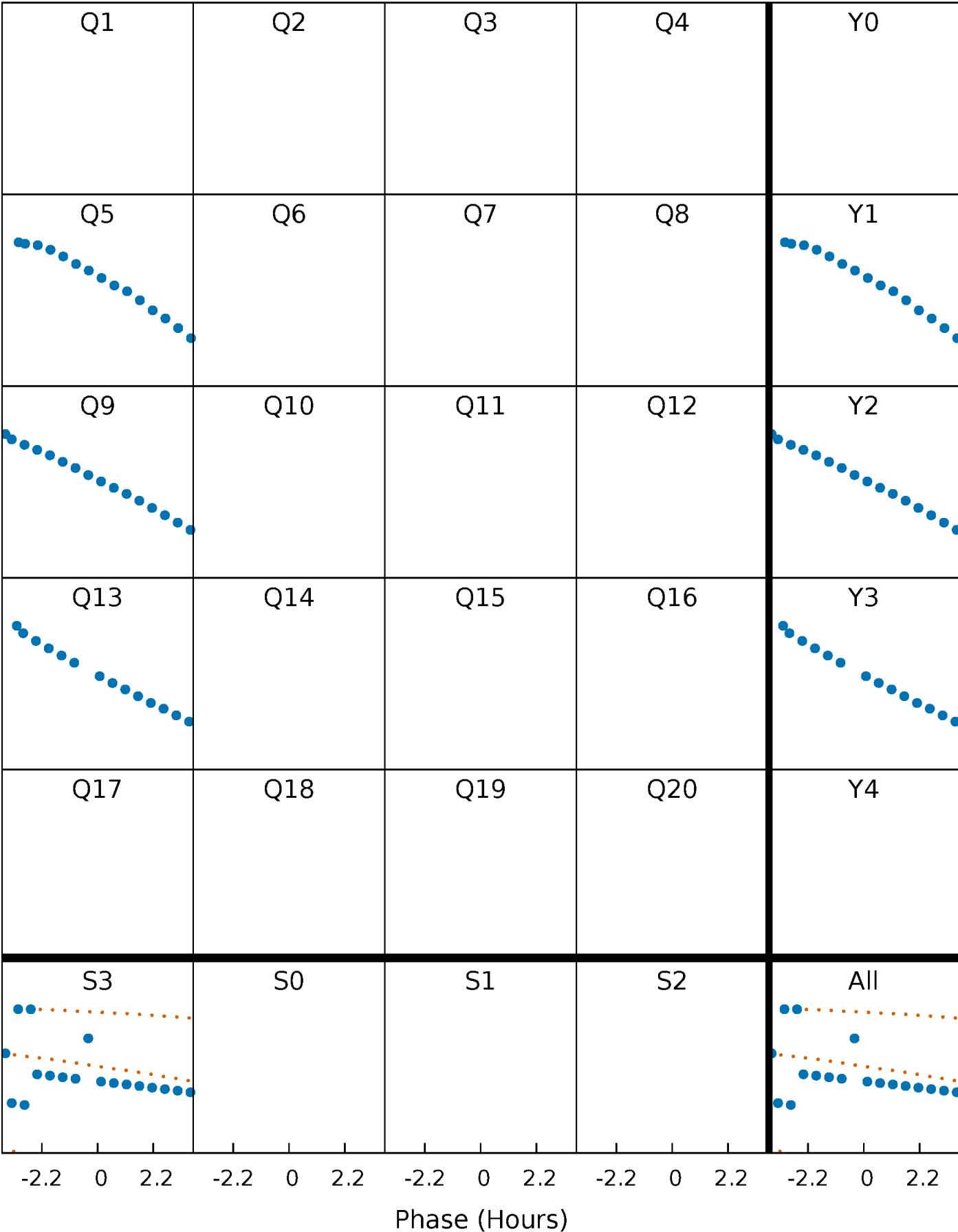


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



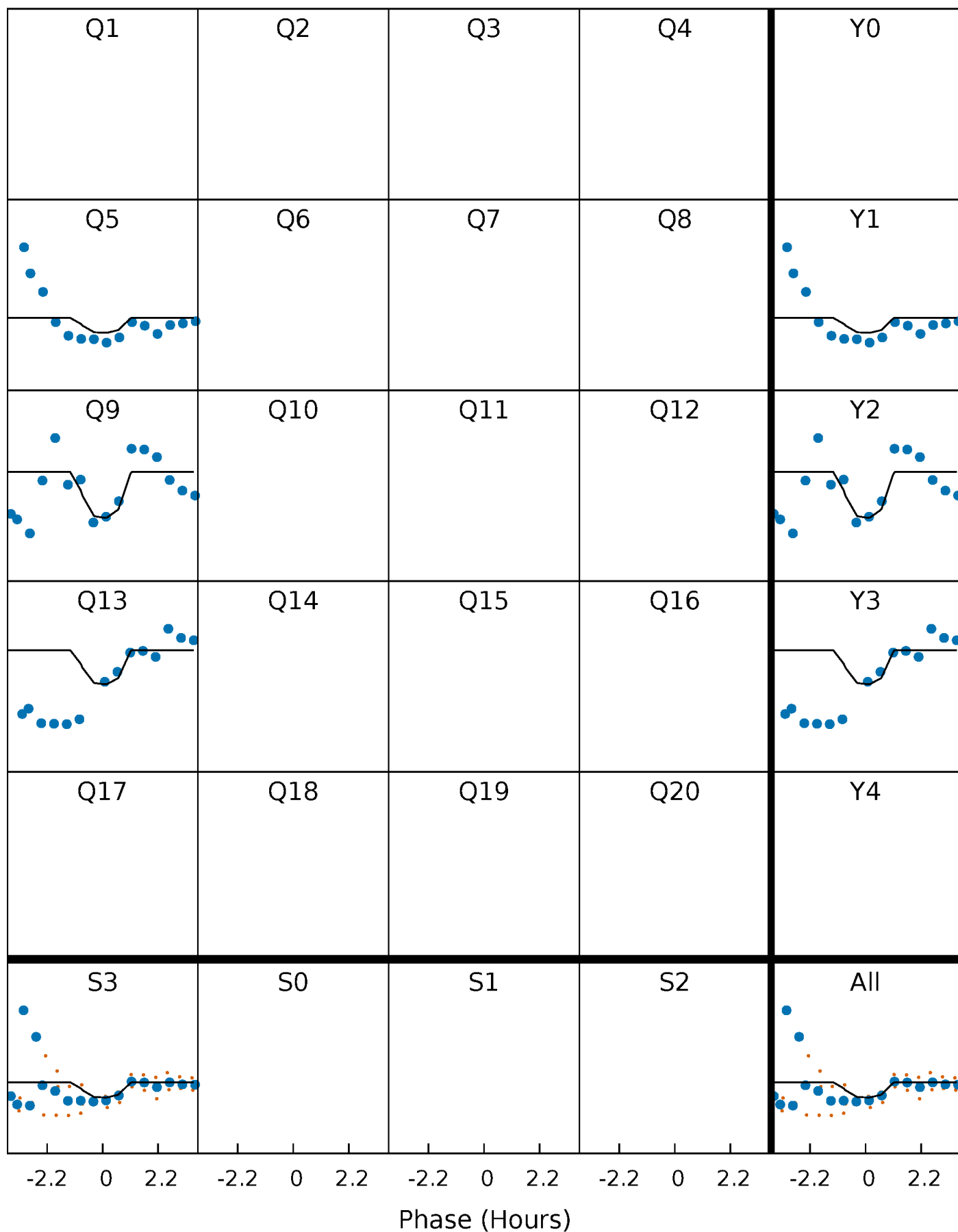
PDC Quarter-Phased Transit Curves

TCE 008022670-03 P=396.966032 Days T₀=464.162055 (BKJD)



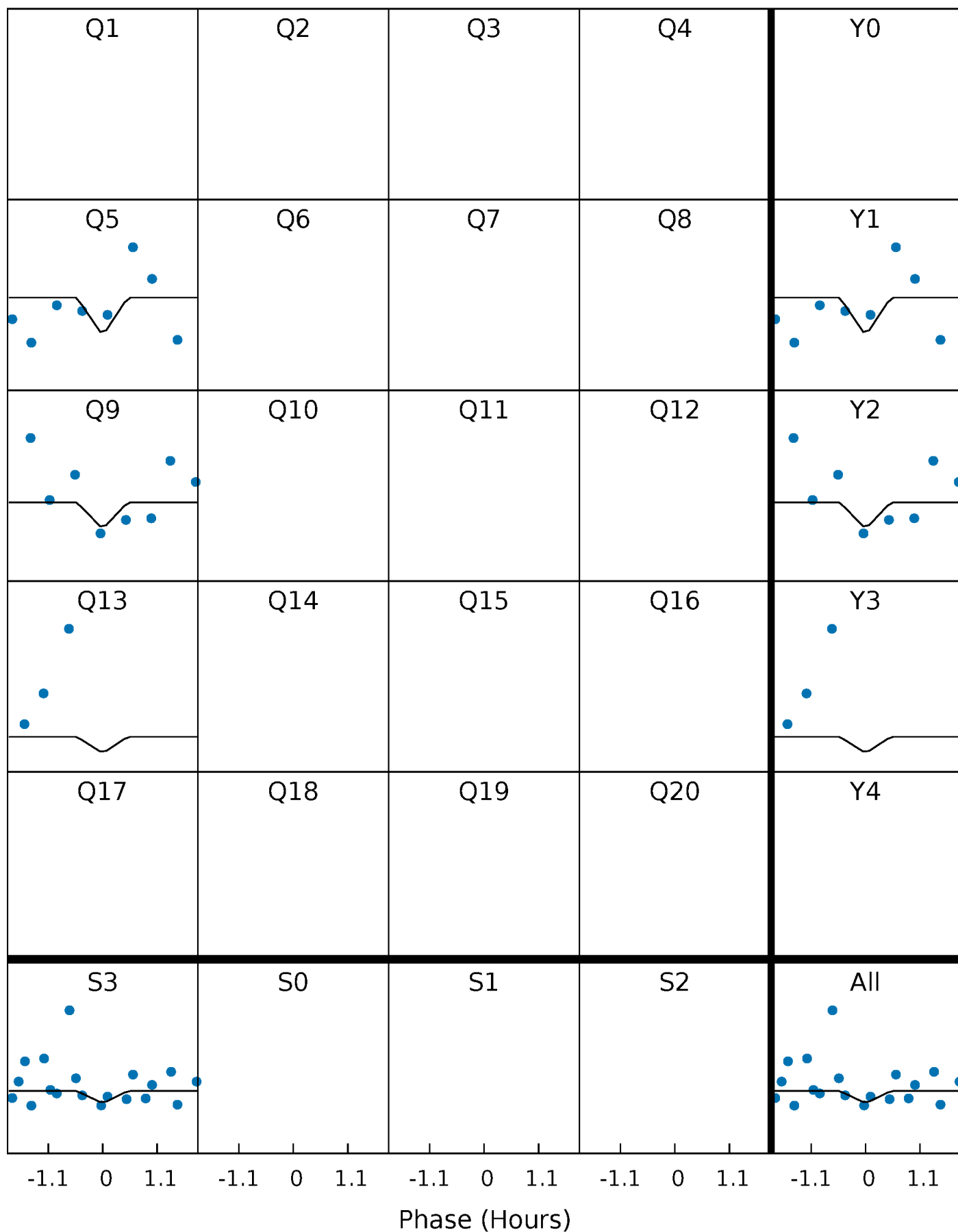
DV Quarter-Phased Transit Curves

TCE 008022670-03 P=396.966032 Days $T_0=464.162055$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

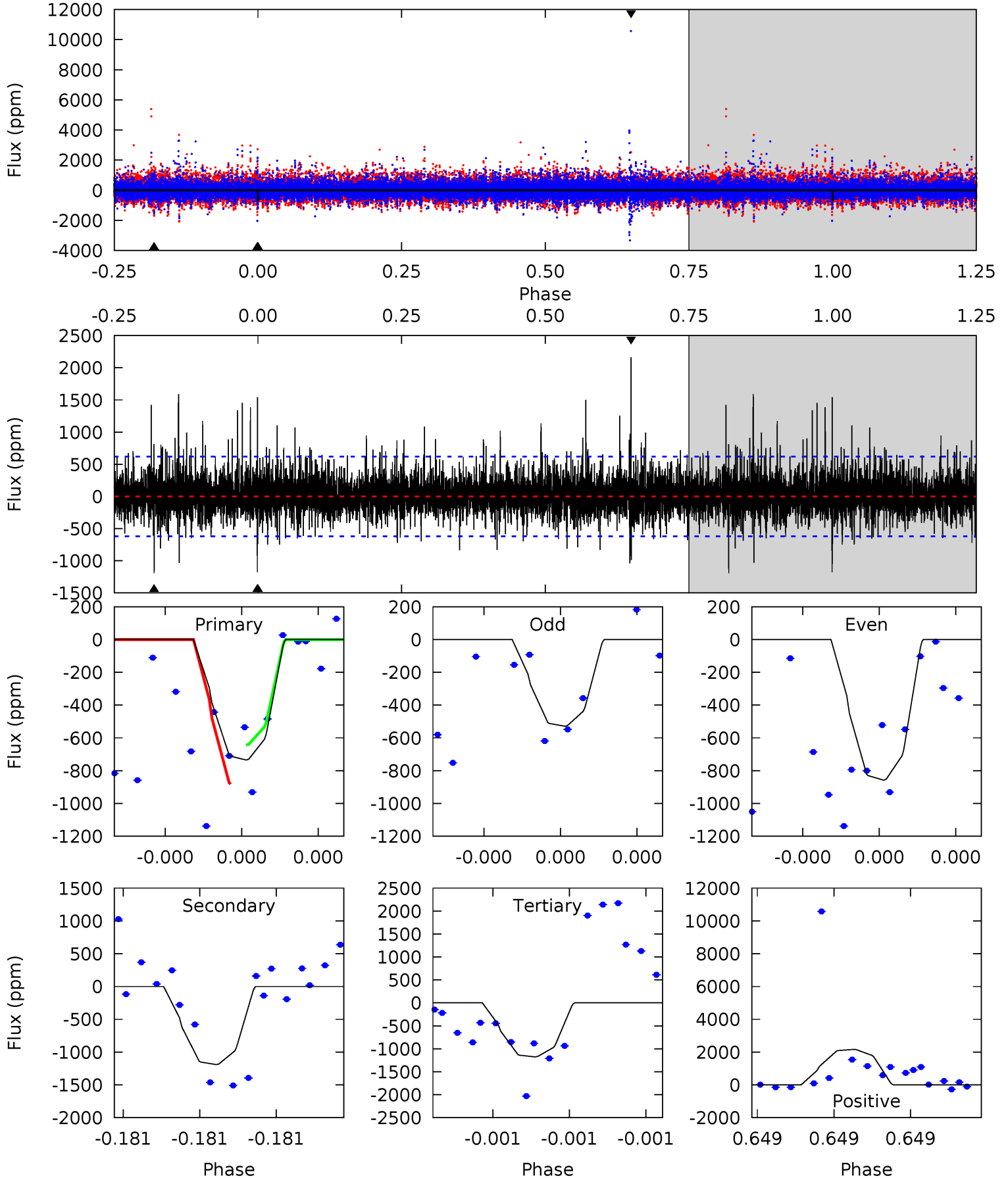
TCE 008022670-03 $P=396.928714$ Days $T_0=464.187288$ (BKJD)



DV Model-Shift Uniqueness Test

008022670-03, P = 396.966032 Days, E = 67.196023 Days

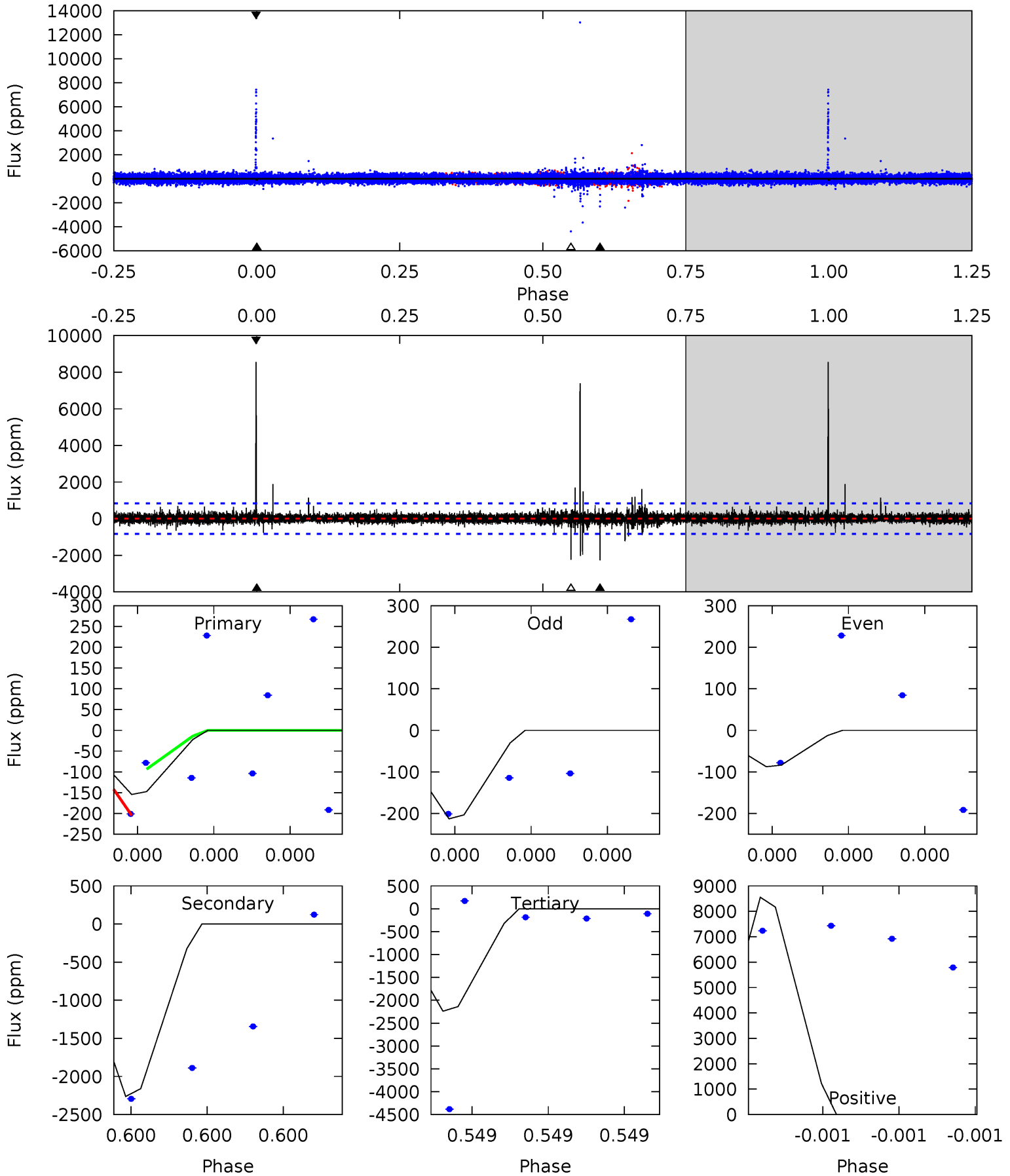
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.79	11.0	10.9	20.0	5.72	3.70	1.89	-4.08	-13.2	0.12	-8.98	0.83	1.06	0.65	1.02



Alt Model-Shift Uniqueness Test

008022670-03, P = 396.928714 Days, E = 67.258574 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.10	16.1	16.0	61.0	5.92	4.00	1.31	-14.9	-59.9	0.16	-44.8	0.31	1.00	0.79	0.00



Stellar Parameters For KIC 008022670

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4707^{+61}_{-51}	$3.035^{+0.170}_{-0.139}$	$0.040^{+0.150}_{-0.100}$	$4.861^{+1.035}_{-0.847}$	$0.934^{+0.106}_{-0.013}$	$0.011^{+0.009}_{-0.005}$
	+1%/-1%	+6%/-5%	+375%/-250%	+21%/-17%	+11%/-1%	+74%/-43%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008022670-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1191 ± 108	$27.89^{+25.33}_{-19.85}$	629^{+32}_{-34}	4039^{+2916}_{-776}	961^{+10328}_{-716}
Alt.	-2263 ± 140	$25.06^{+26.50}_{-17.06}$	629^{+36}_{-34}	4744^{+3434}_{-1117}	2133^{+18957}_{-1627}

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

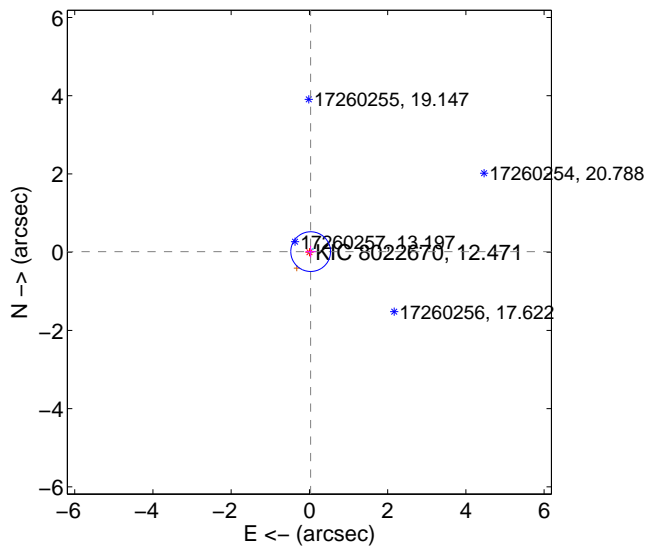
Supplemental centroid analysis for 008022670-03. Kepler magnitude: 12.47. Transit SNR 3.67

There are 2 quarters with good PRF difference image offsets

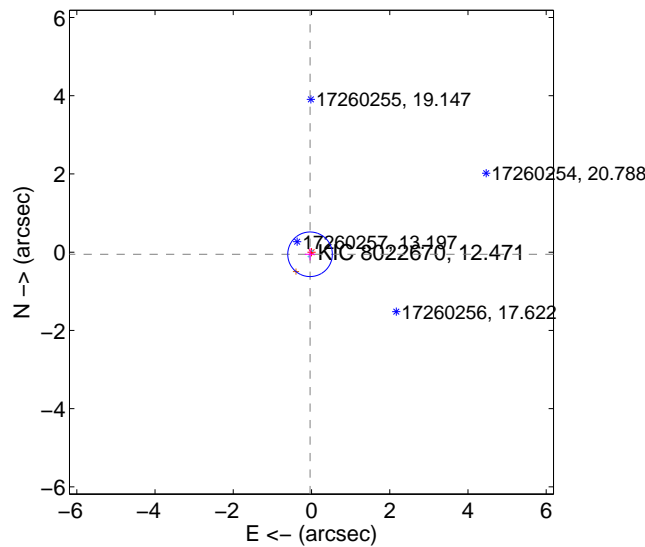
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.035 ± 0.169	0.21	-0.032 ± 0.130	0.014 ± 0.148
PRF-fit source offset from KIC position	0.066 ± 0.190	0.35	0.037 ± 0.131	-0.054 ± 0.154
photometric centroid source offset	0.83 ± 1.44	0.57	0.76 ± 1.52	0.33 ± 0.92

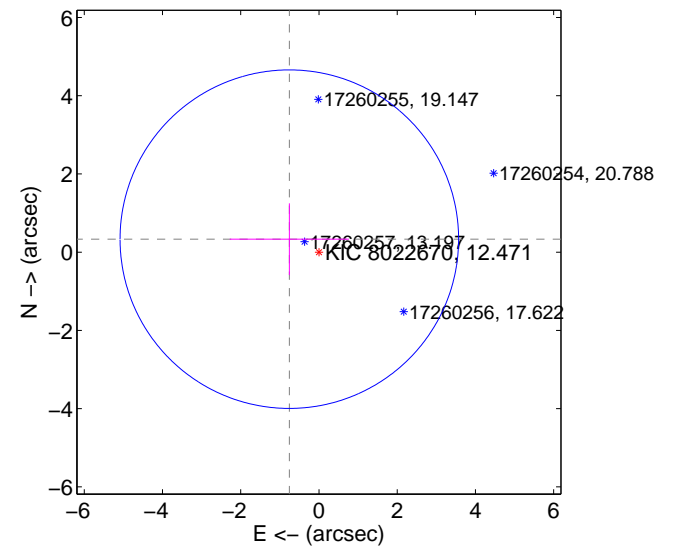
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

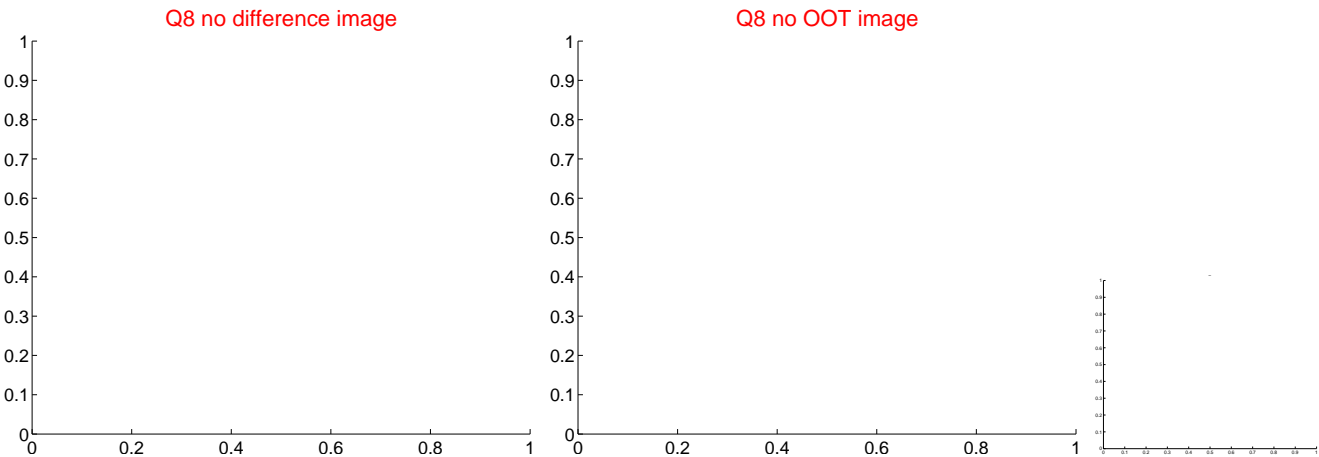
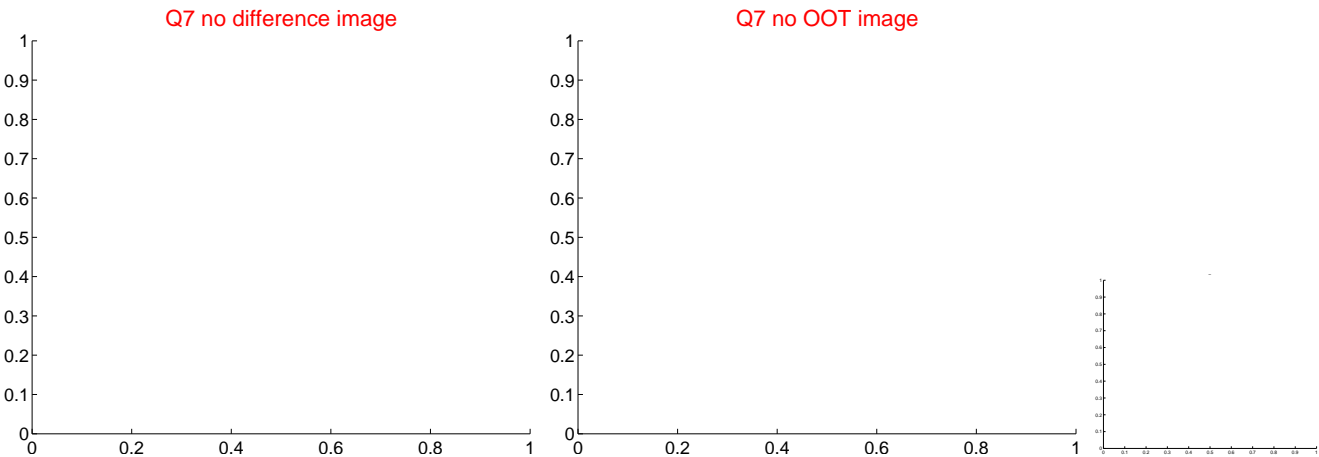
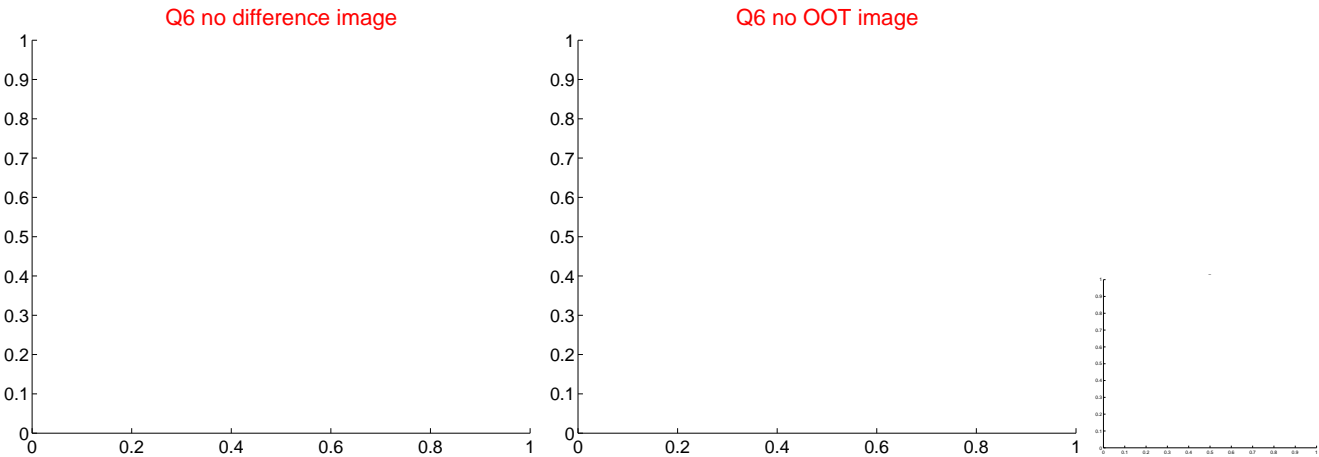
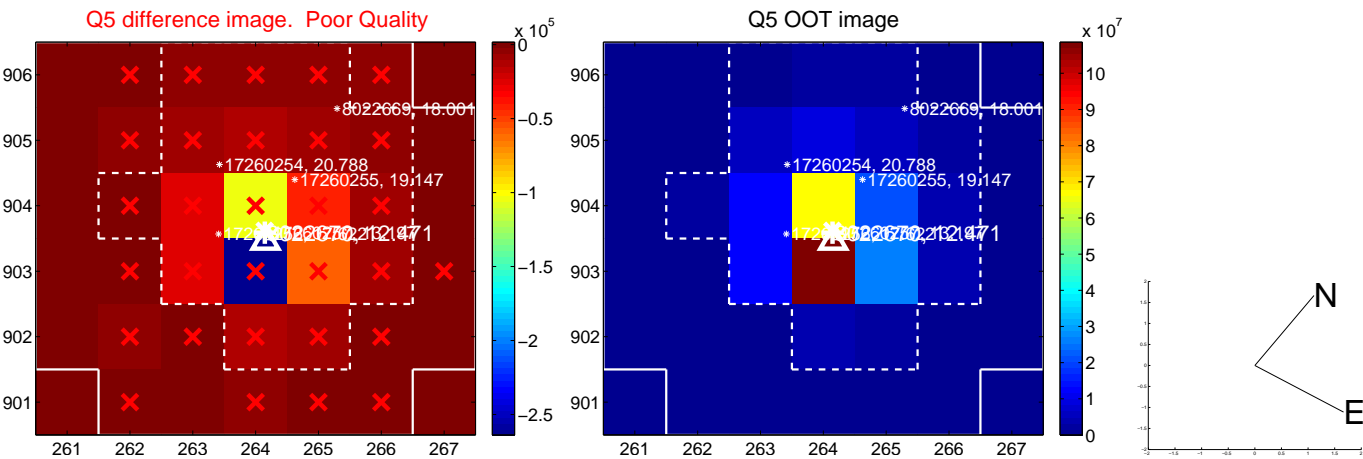


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

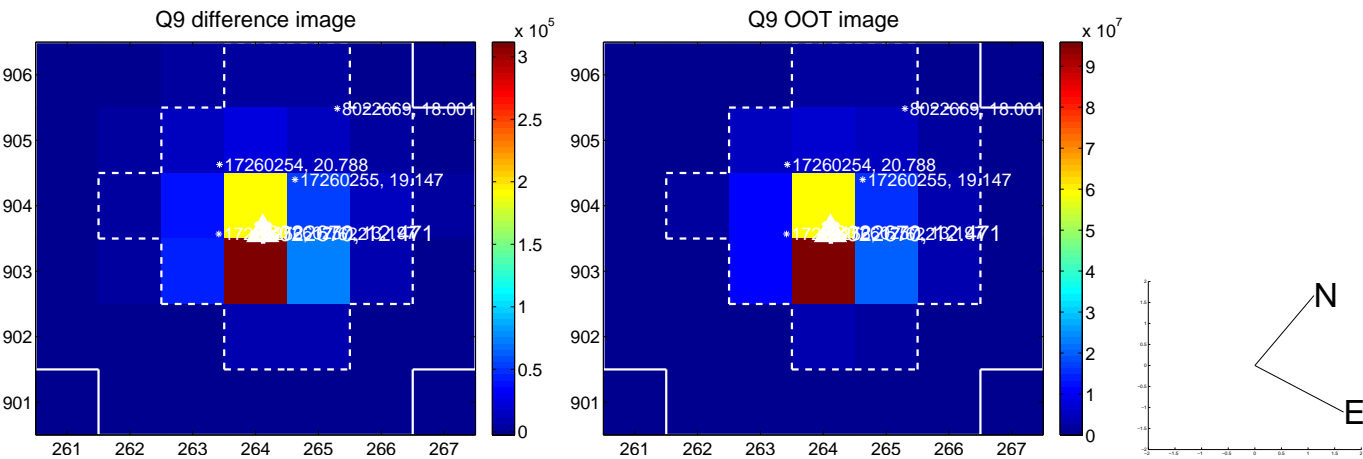
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



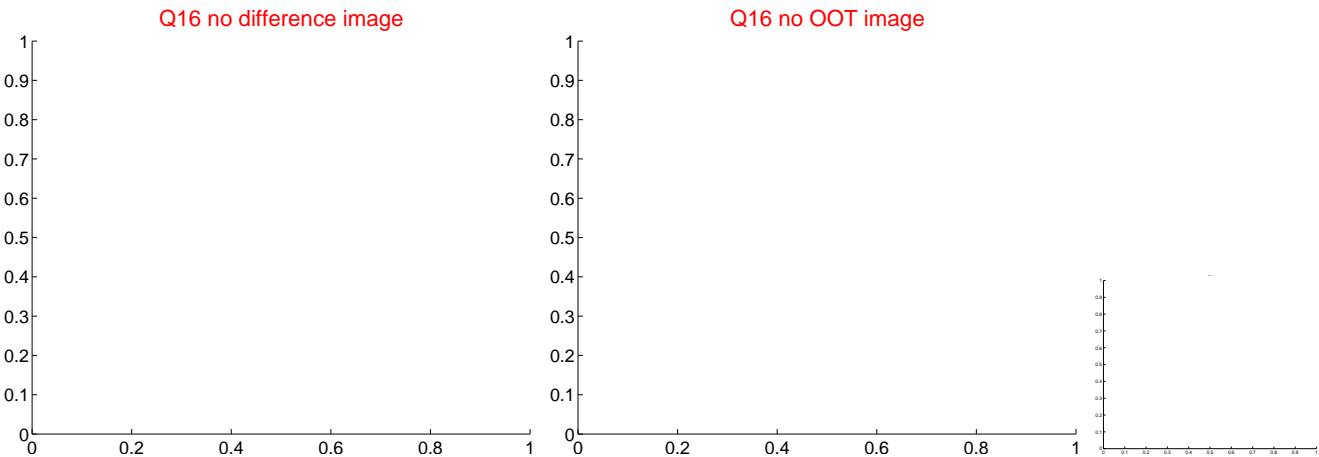
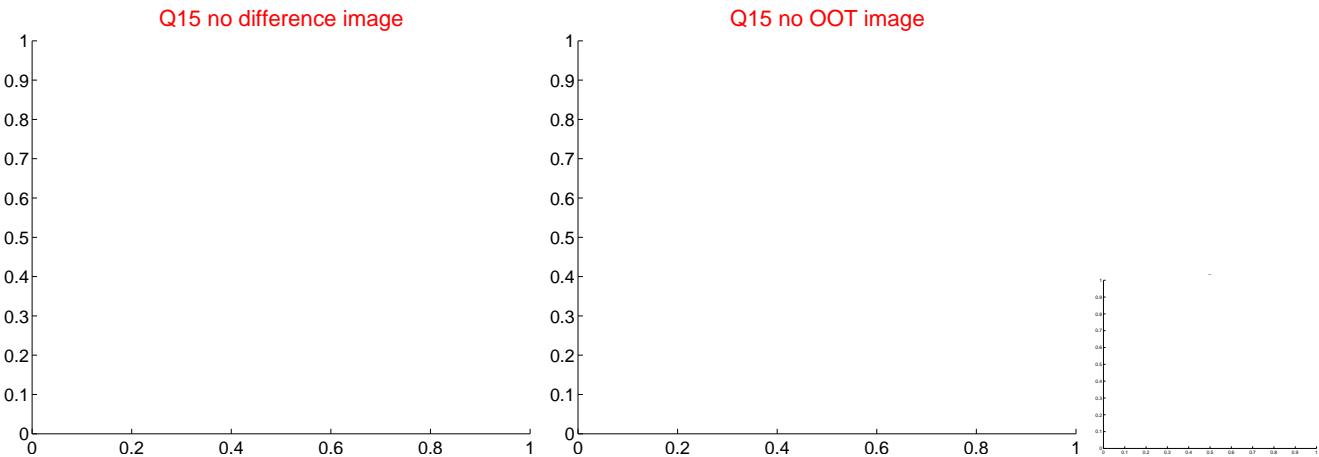
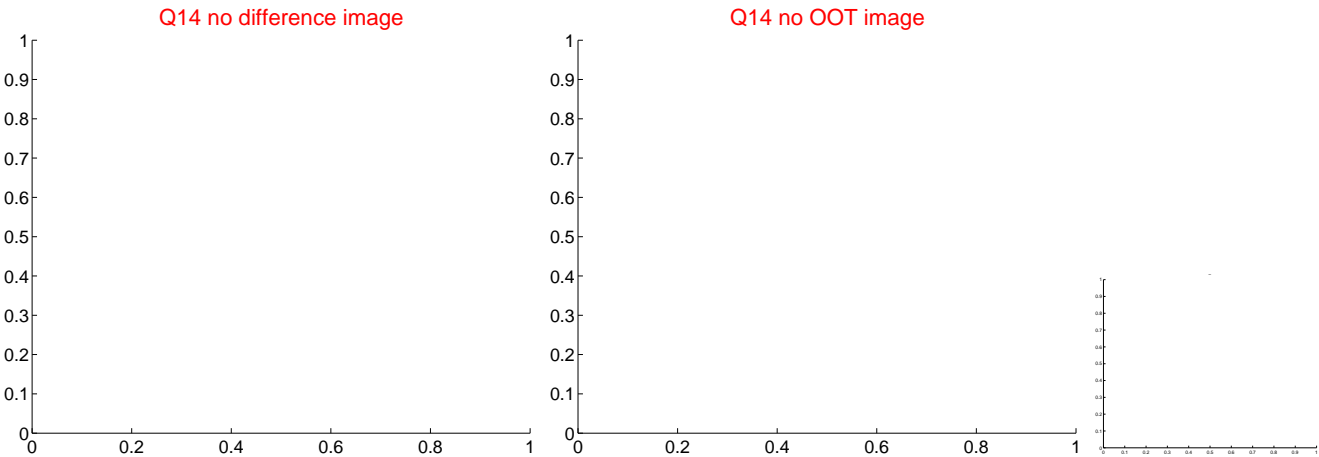
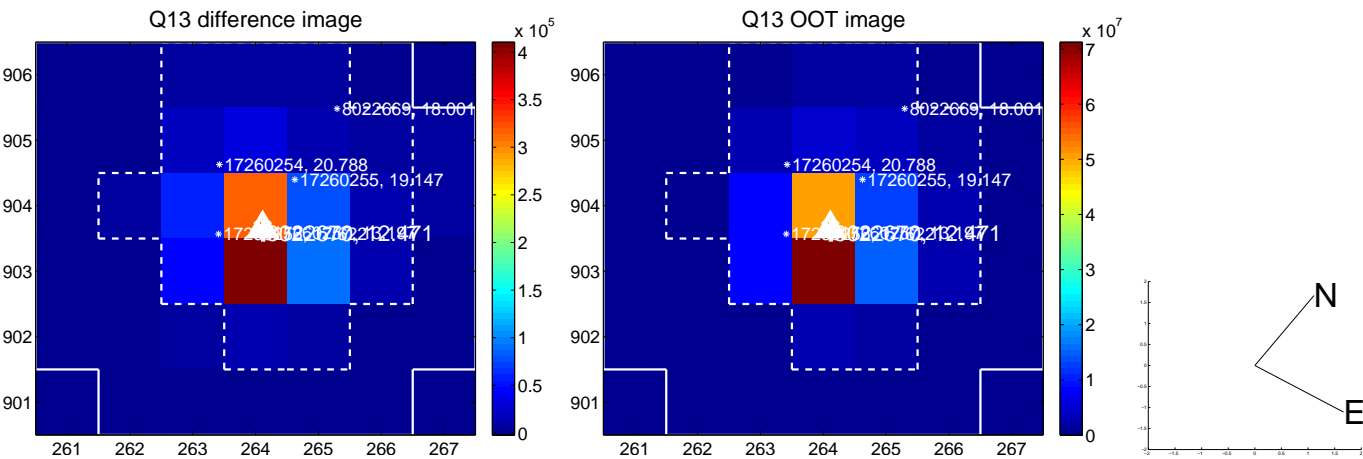
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



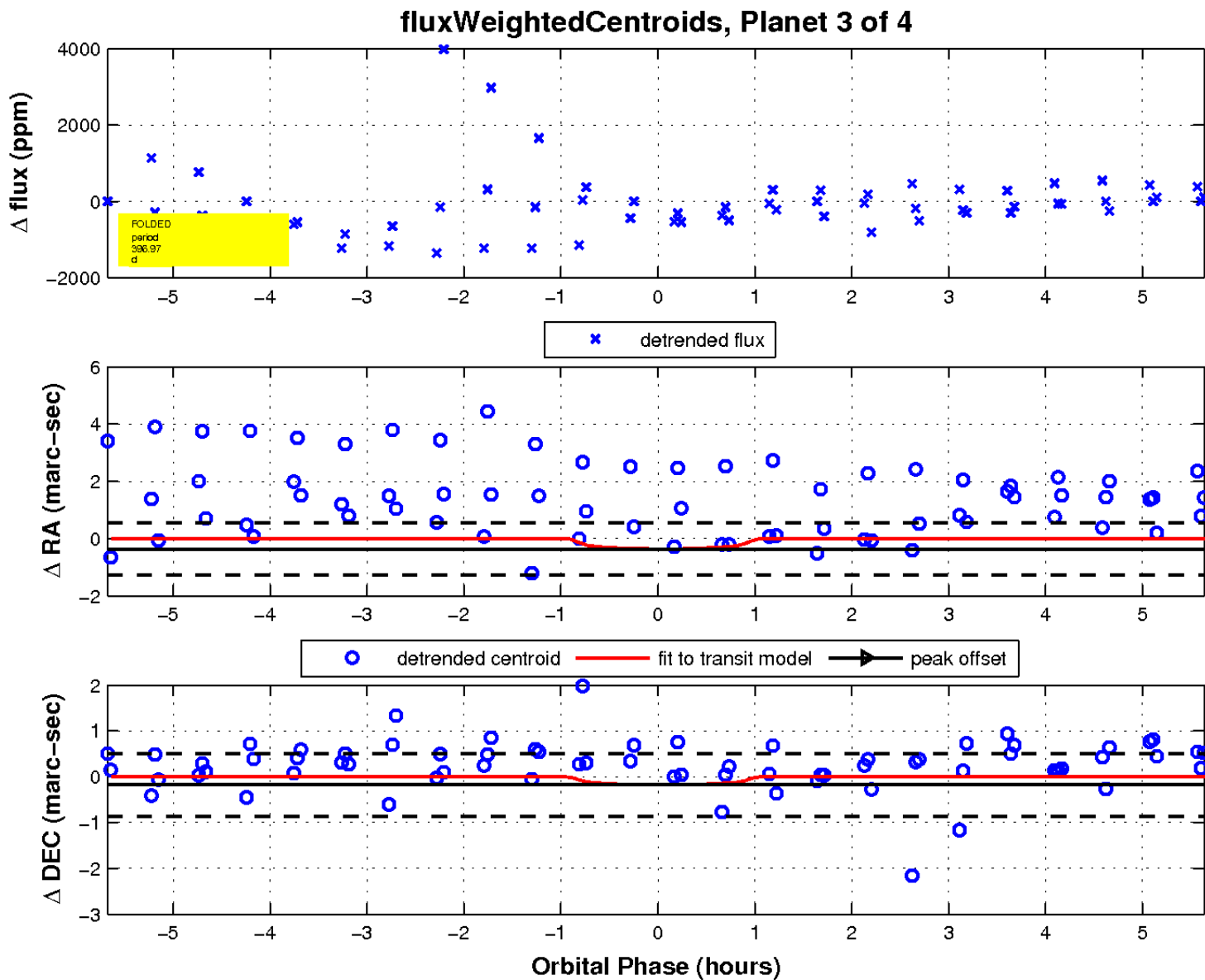
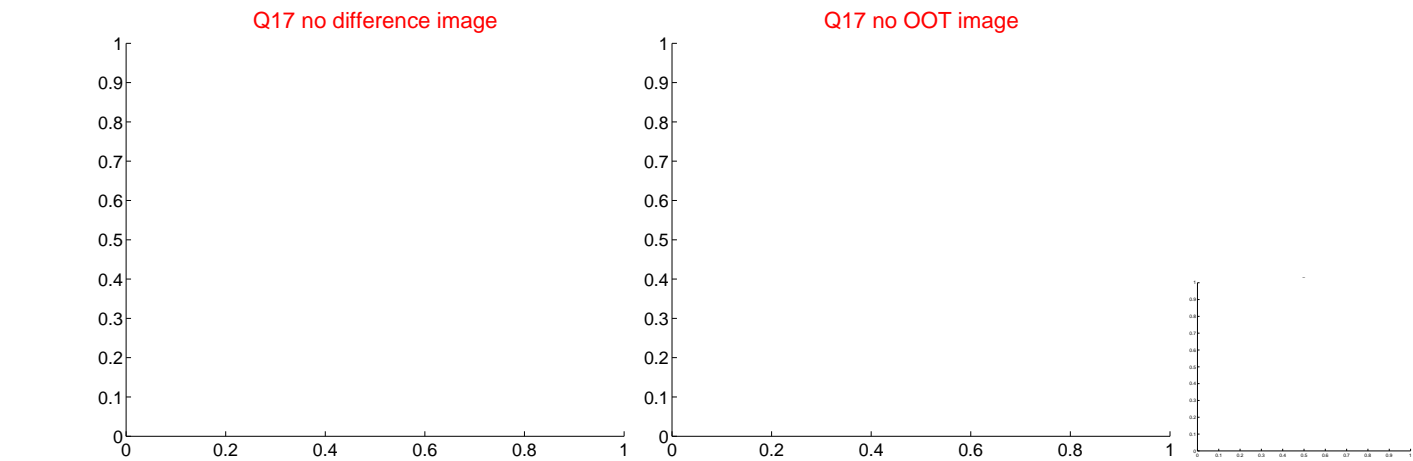
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

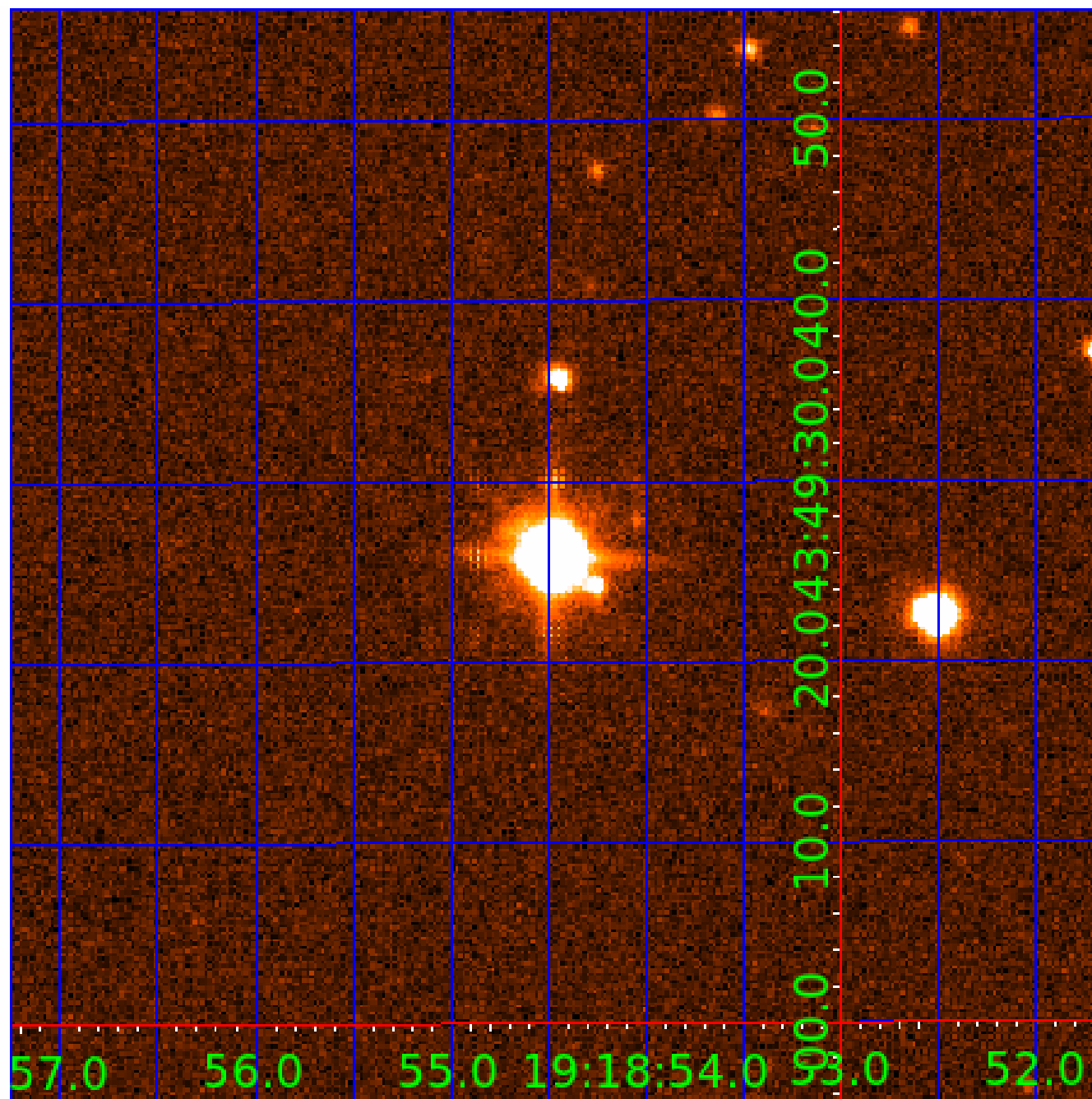


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008022670

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})
008022670-01	OBS	No	338.106337	271.834437	1678.4	4.455	23.6	8.9	4.86	4707	19.52	12.05
008022670-02	OBS	No	489.568902	336.153210	911.1	2.008	17.0	4.6	4.86	4707	14.23	7.36
008022670-03	OBS	No	396.966032	464.162055	562.0	1.892	16.7	3.7	4.86	4707	12.48	9.73
008022670-04	OBS	No	386.854969	147.595611	393.2	6.000	18.7	-1.0	4.86	4707	9.25	10.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008022670-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008022670-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008022670-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

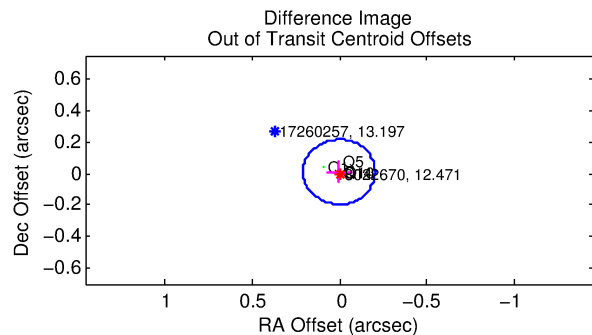
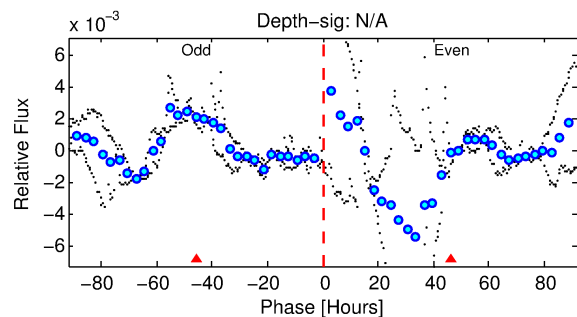
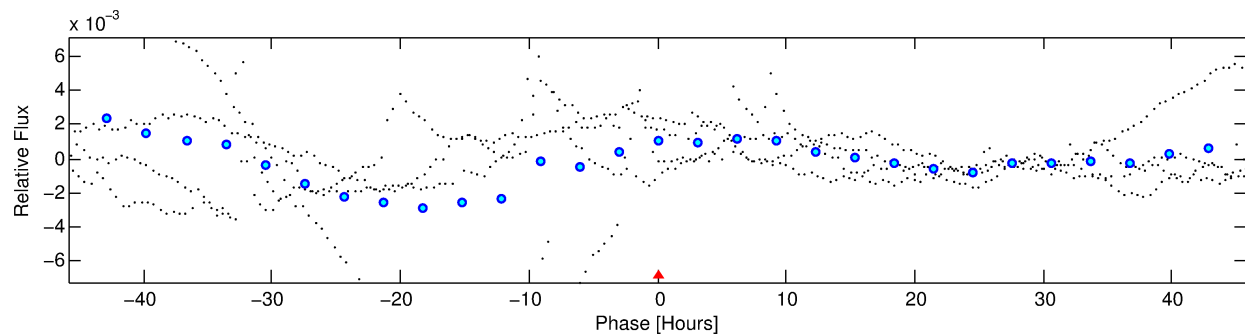
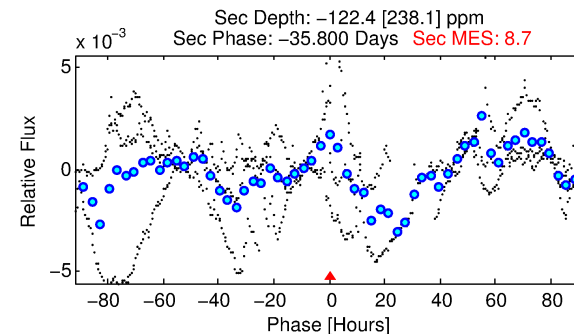
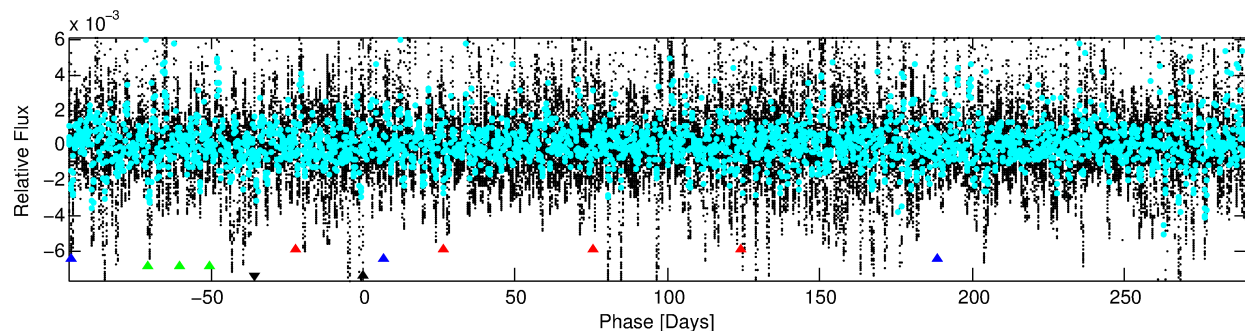
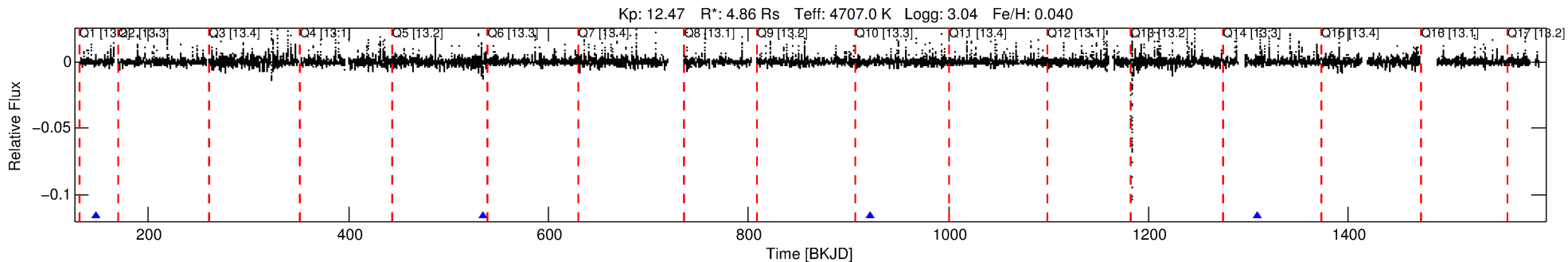
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008022670-04

No Significant Match Found

DV One-Page Summary

KIC: 8022670 Candidate: 4 of 4 Period: 386.855 d



TPS TCE Results:

Period = 386.85497 d
Epoch = 147.5956 BKJD

DV fit results are unavailable

DV Diagnostic Results:

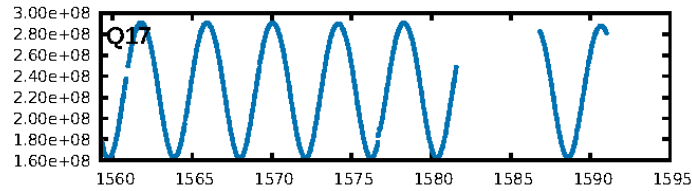
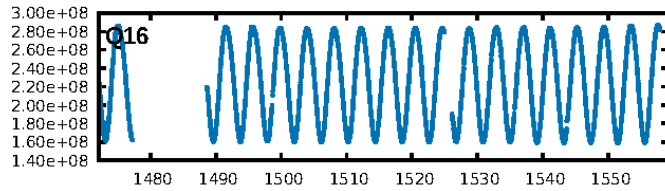
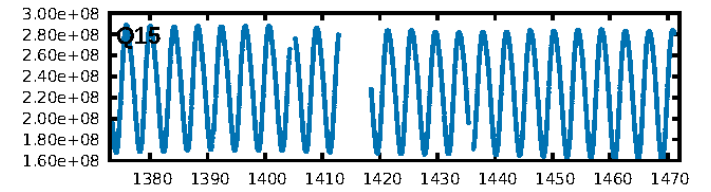
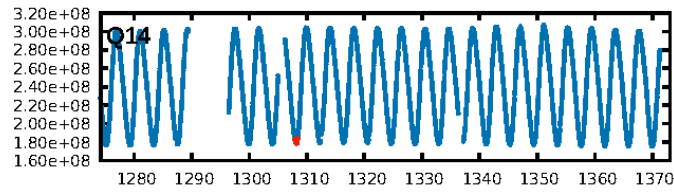
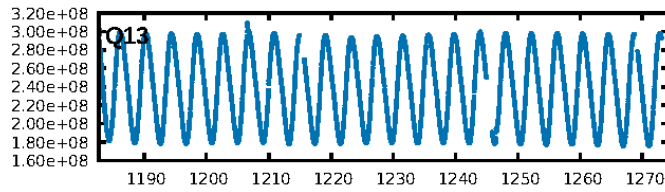
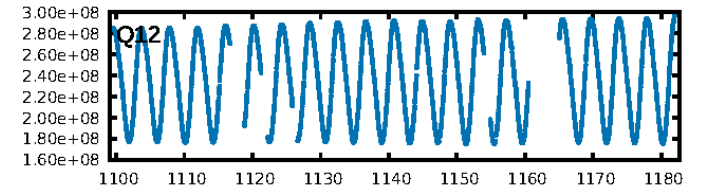
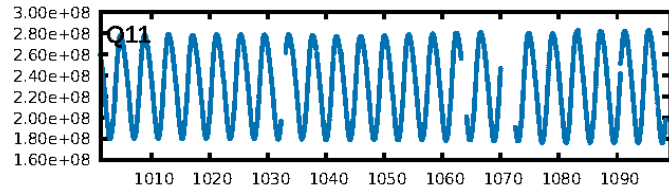
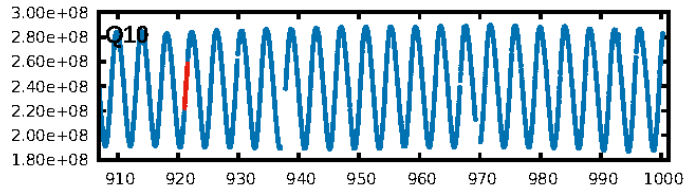
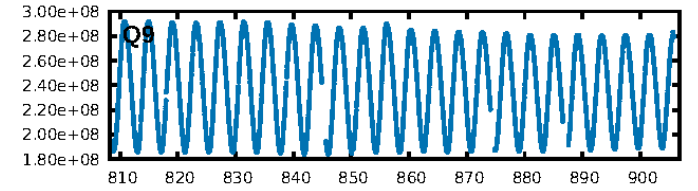
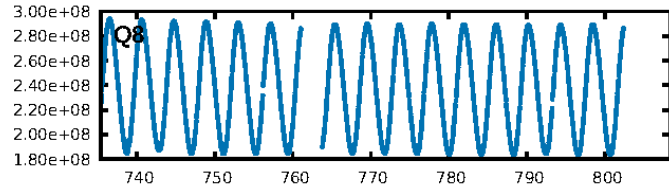
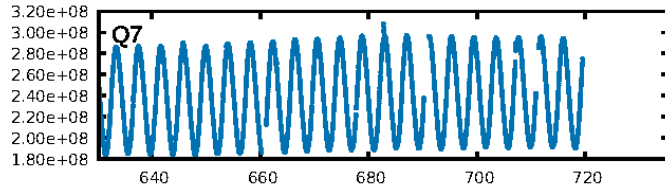
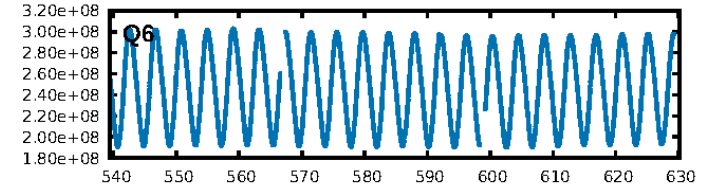
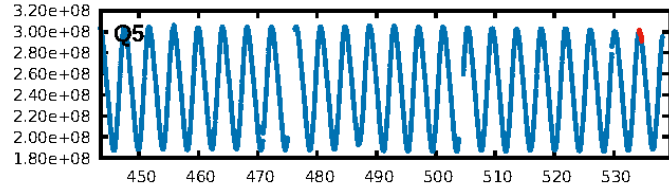
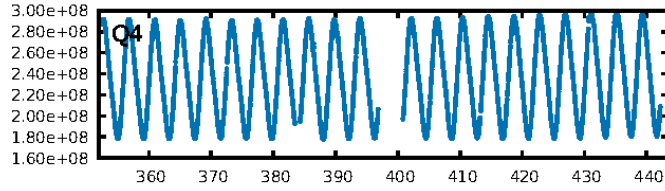
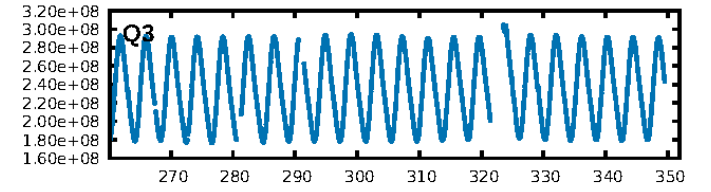
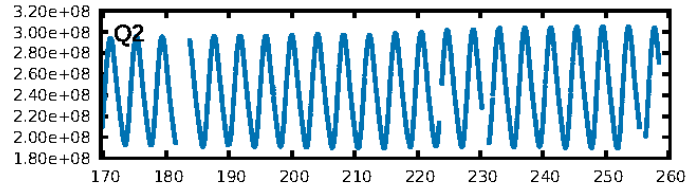
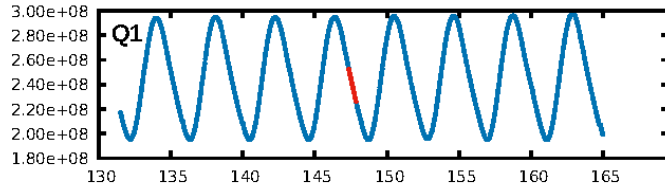
ShortPeriod-sig: 100.0% [156.56σ]
LongPeriod-sig: 100.0% [38.57σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8297

Centroid-sig: 69.5%
Centroid-so: 1.234 arcsec [0.47σ]
OotOffset-rm: 0.012 arcsec [0.17σ]
KicOffset-rm: 0.098 arcsec [1.47σ]
OotOffset-st: 2/0/0/2 [4]
KicOffset-st: 2/0/0/2 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 1.00 [4/4]

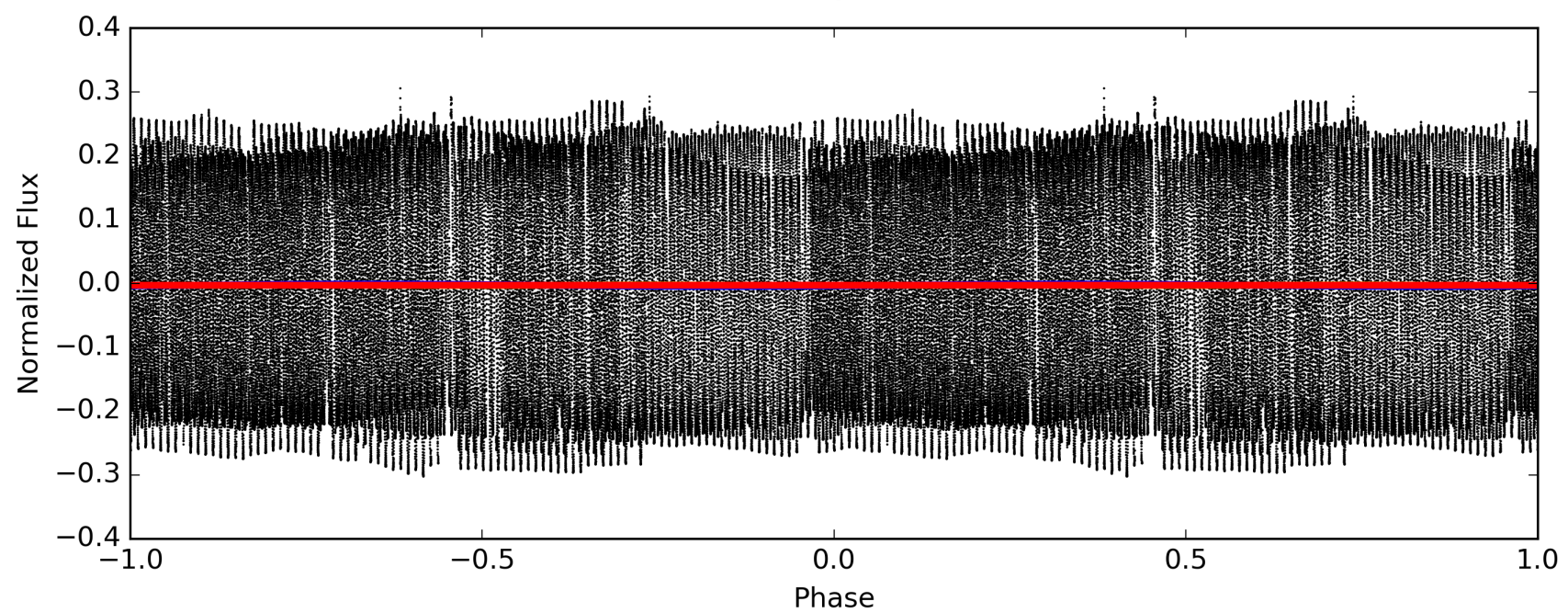
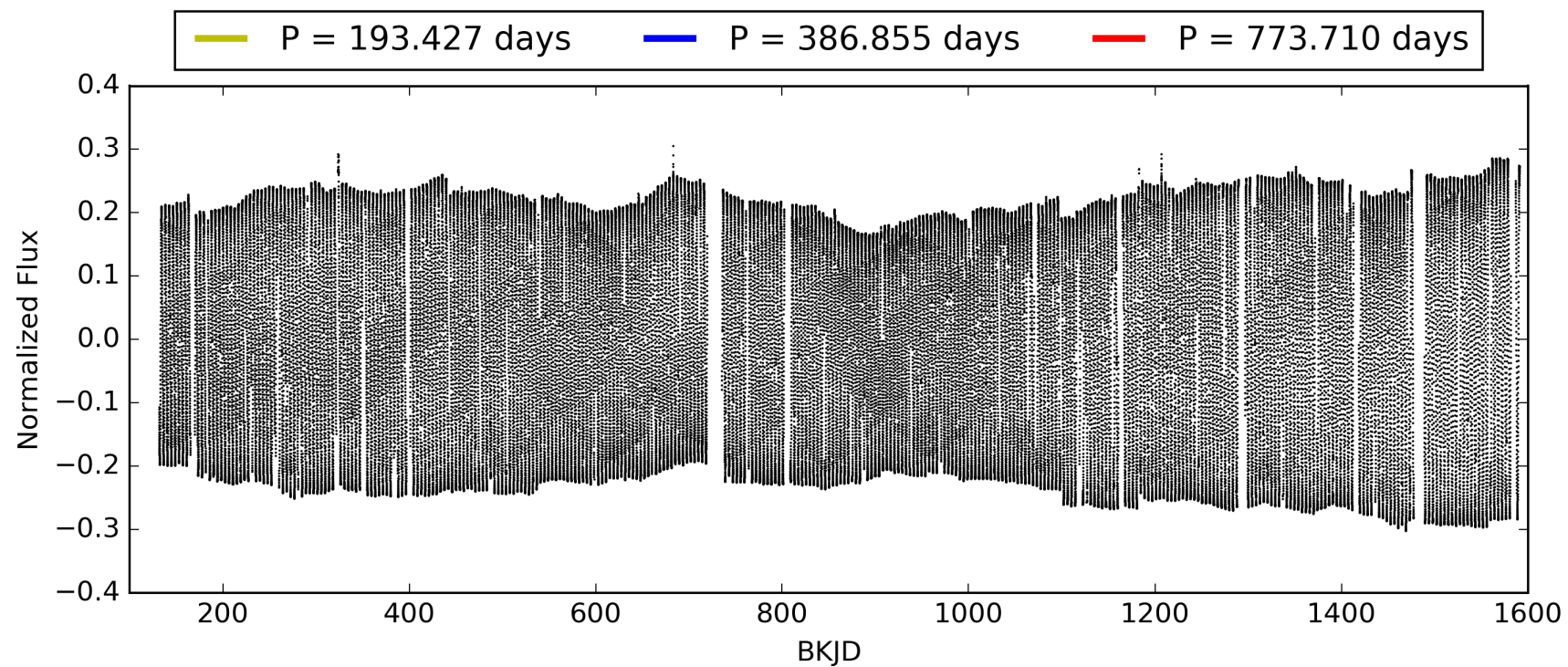
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:06:25 Z

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

TCE 008022670-04, PDC Light Curves

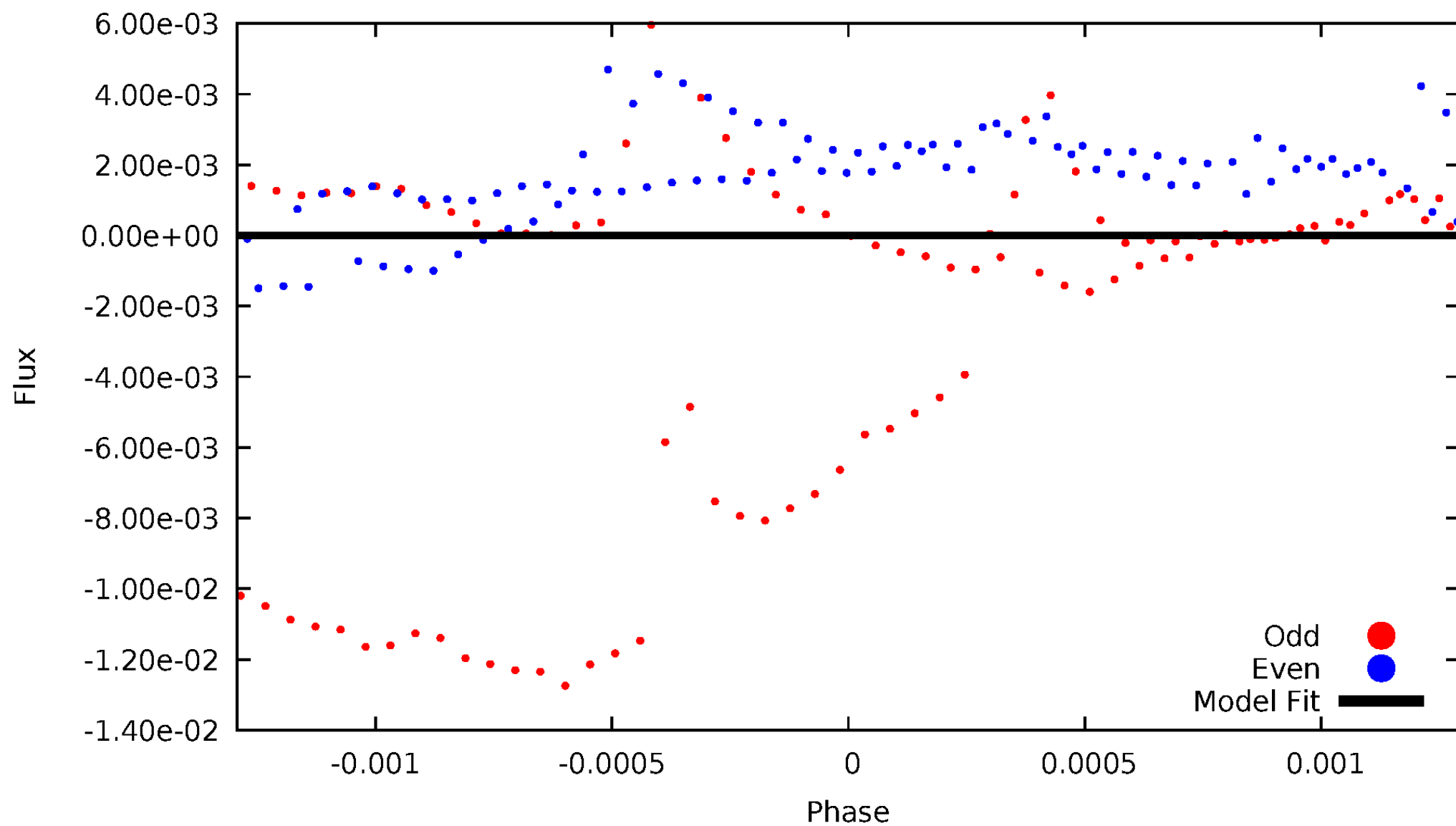


TCE 008022670-04



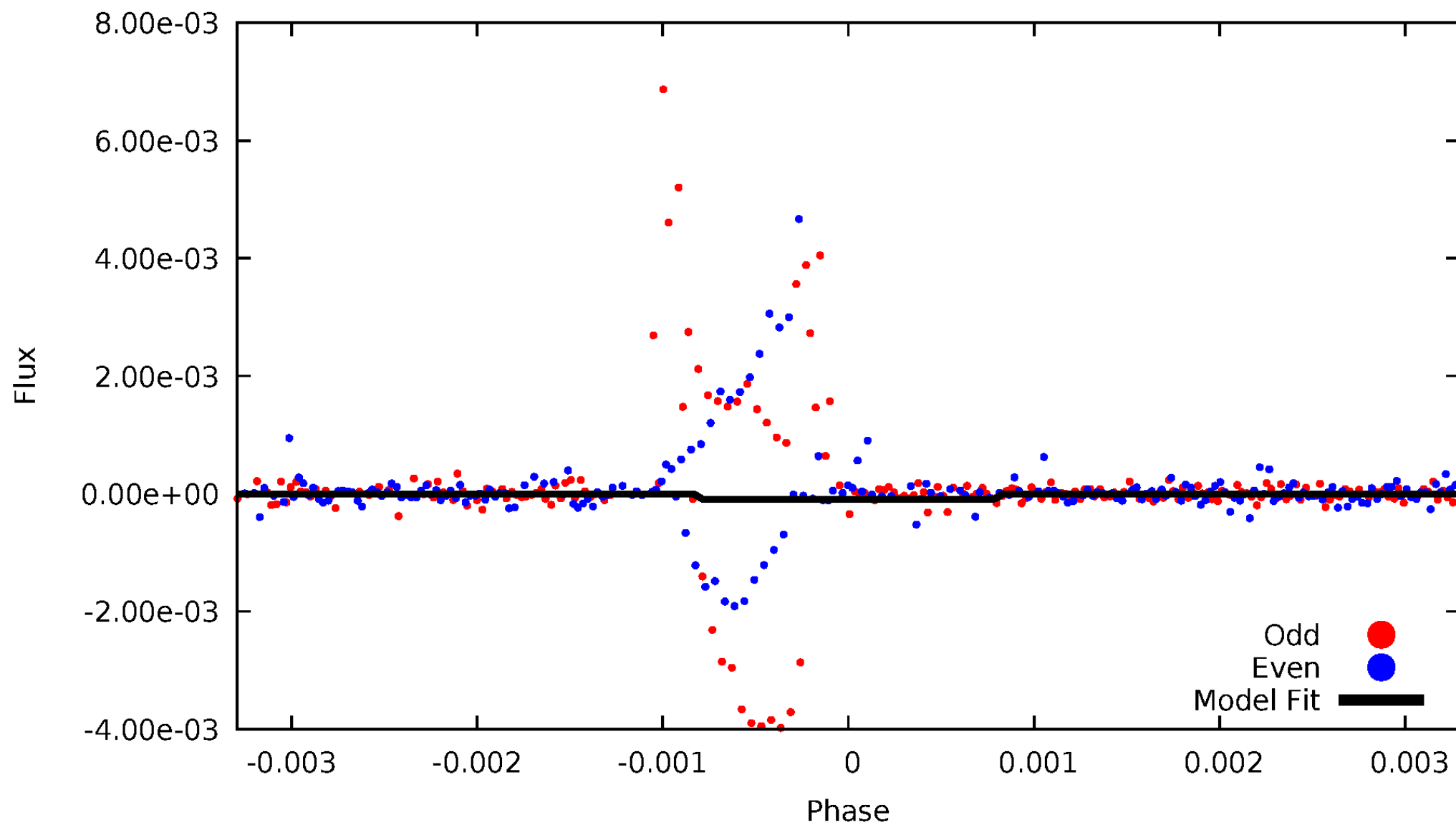
DV Odd/Even

TCE 008022670-04



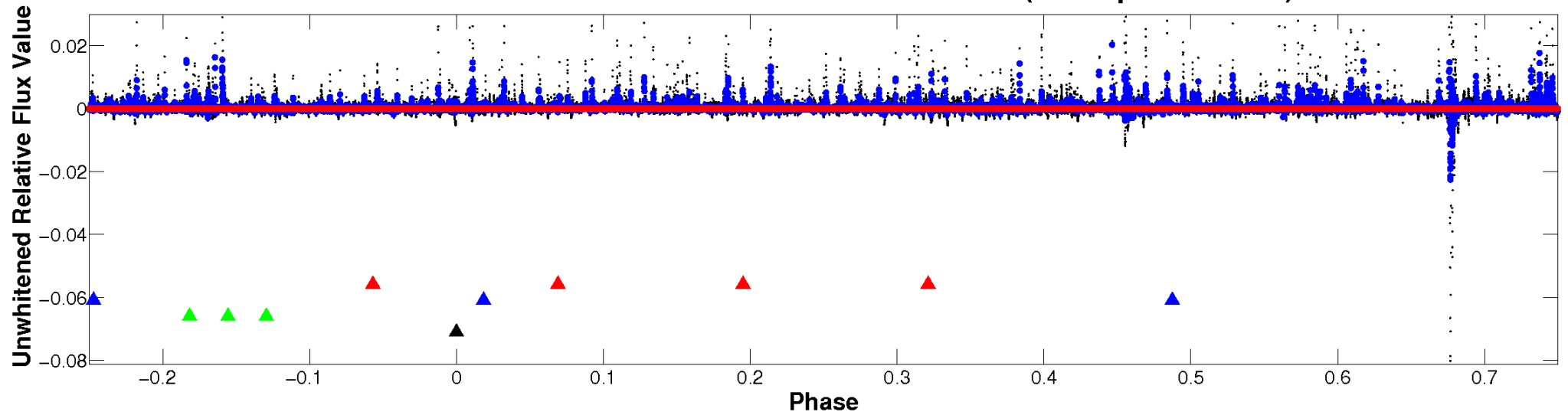
ALT Odd/Even

TCE 008022670-04

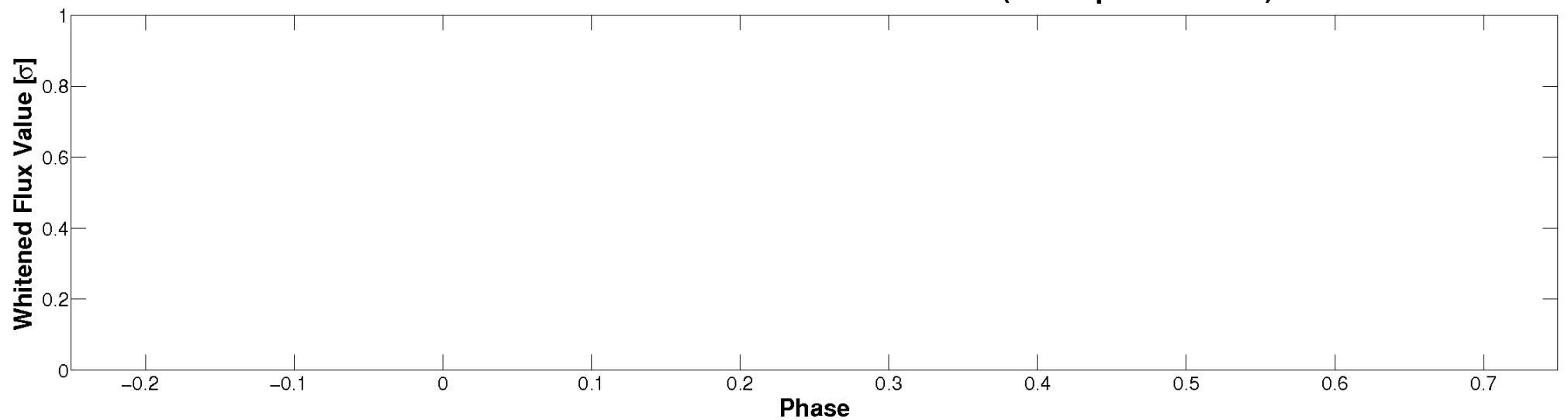


Non-Whitened Vs. Whitened Light Curve

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

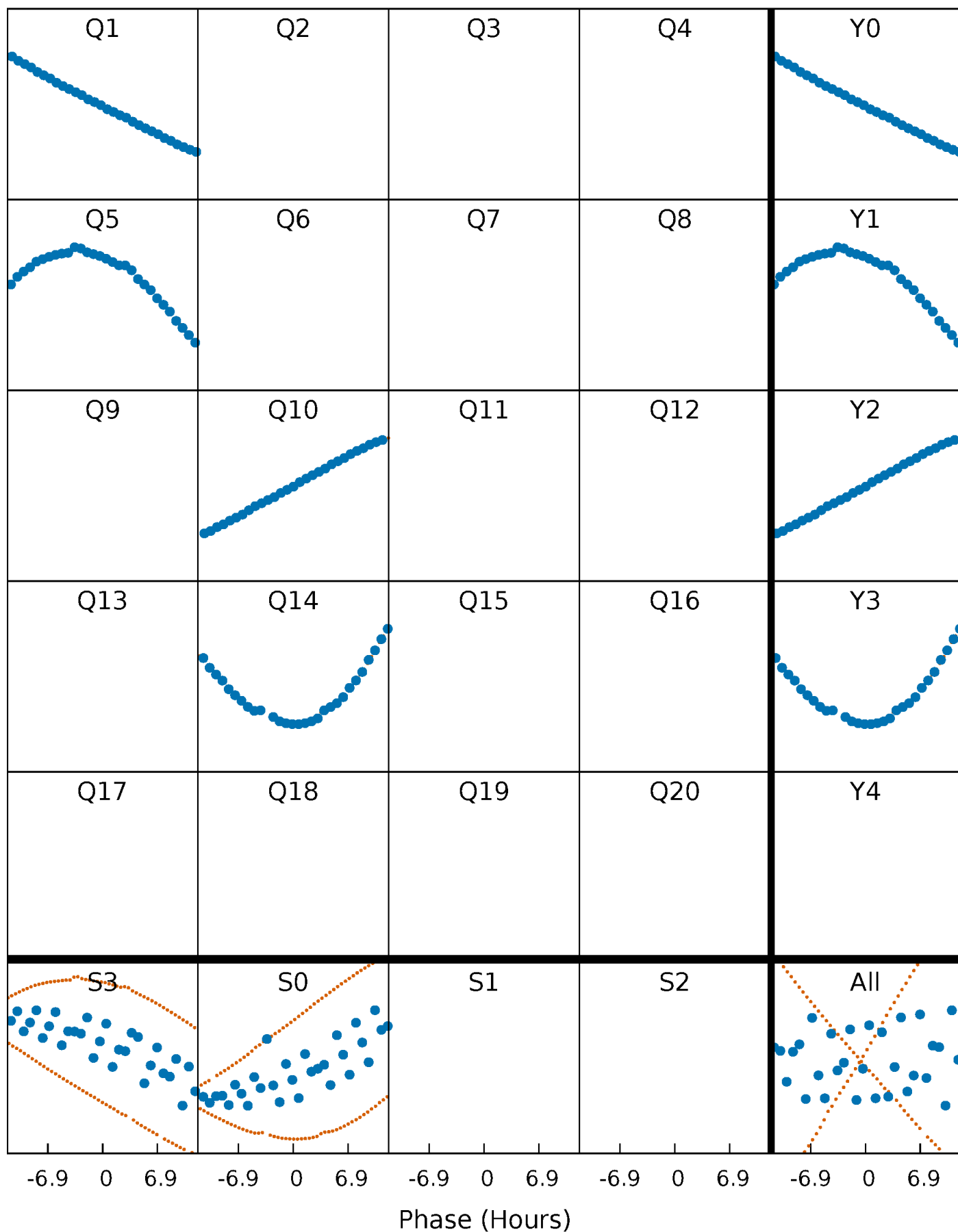


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



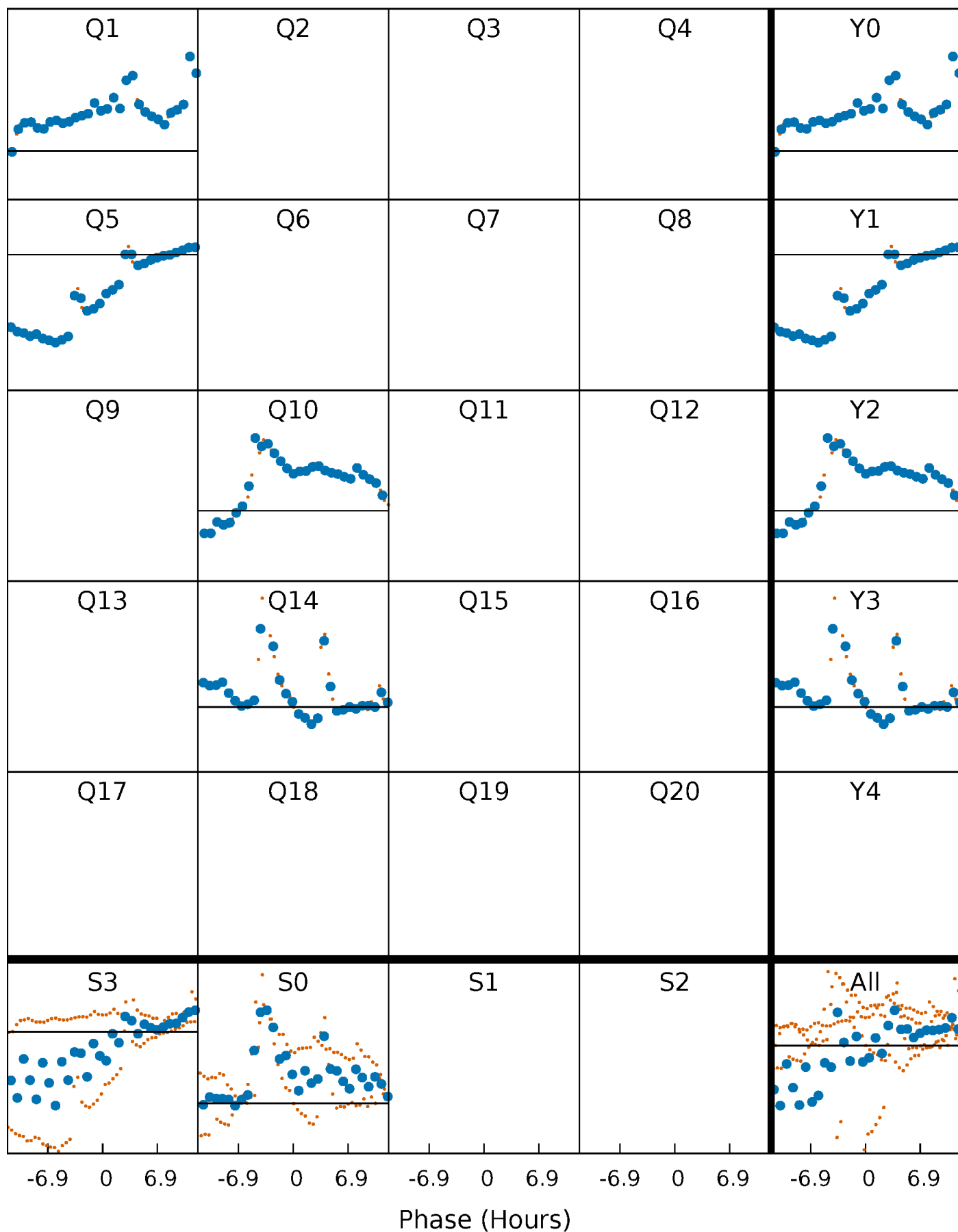
PDC Quarter-Phased Transit Curves

TCE 008022670-04 $P=386.854969$ Days $T_0=147.595611$ (BKJD)



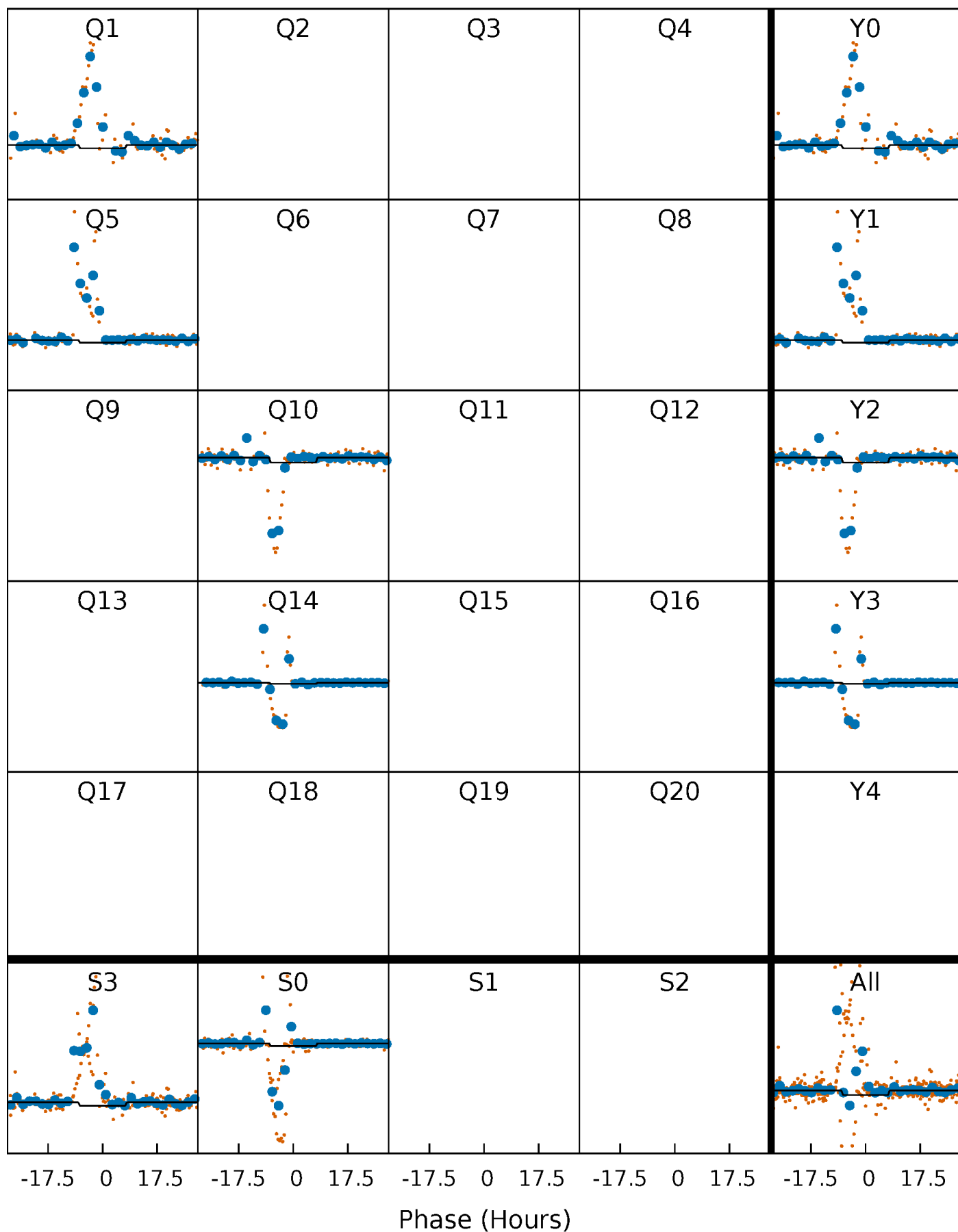
DV Quarter-Phased Transit Curves

TCE 008022670-04 $P=386.854969$ Days $T_0=147.595611$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

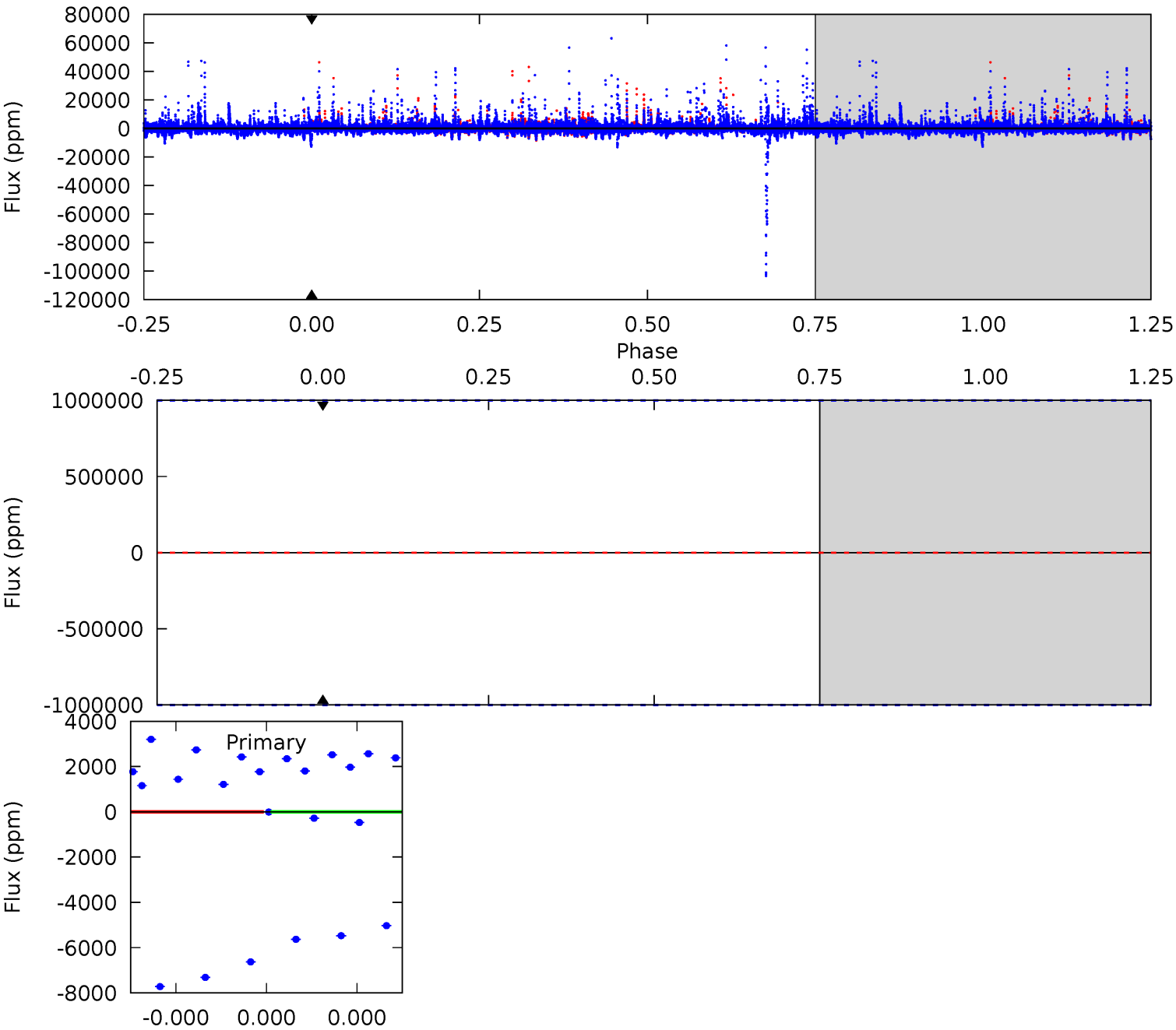
TCE 008022670-04 P=386.854969 Days $T_0=147.820010$ (BKJD)



DV Model-Shift Uniqueness Test

008022670-04, P = 386.854969 Days, E = 147.595611 Days

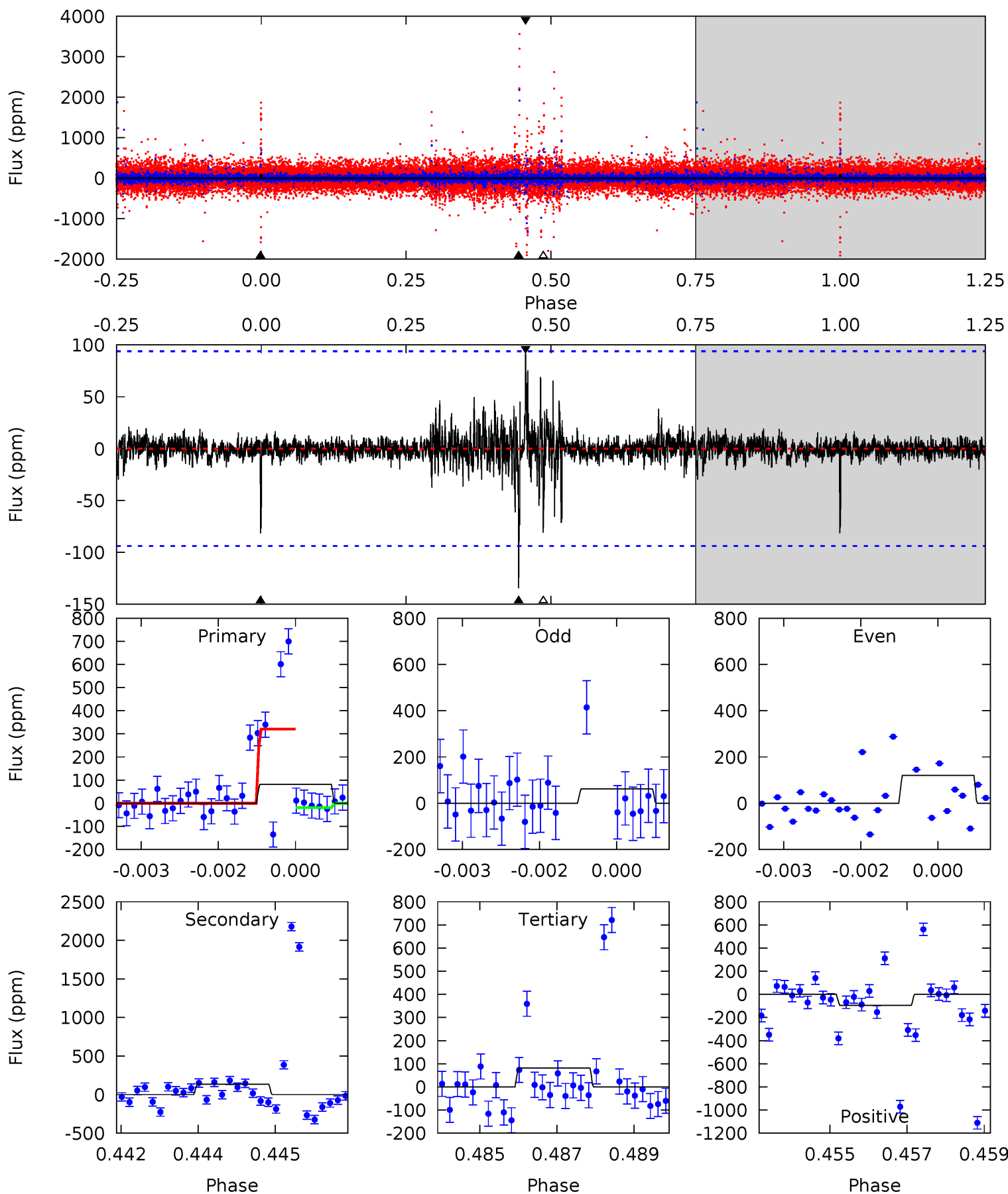
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008022670-04, P = 386.854969 Days, E = 147.820010 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.66	7.68	4.63	5.42	5.36	3.14	0.57	0.03	-0.76	3.04	2.26	0.99	1.04	0.41	8.34



Stellar Parameters For KIC 008022670

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4707^{+61}_{-51}	$3.035^{+0.170}_{-0.139}$	$0.040^{+0.150}_{-0.100}$	$4.861^{+1.035}_{-0.847}$	$0.934^{+0.106}_{-0.013}$	$0.011^{+0.009}_{-0.005}$
	+1%/-1%	+6%/-5%	+375%/-250%	+21%/-17%	+11%/-1%	+74%/-43%
Source	SPE68	SPE68	SPE68	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 008022670-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$39.07^{+41.04}_{-26.11}$	632^{+32}_{-33}	-4044^{+16160}_{-8856}	$-898.278^{+58562.657}_{-66764.695}$
Alt.	-134 ± 17	$36.53^{+45.09}_{-25.66}$	632^{+36}_{-33}	2676^{+1173}_{-472}	59^{+576}_{-47}

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

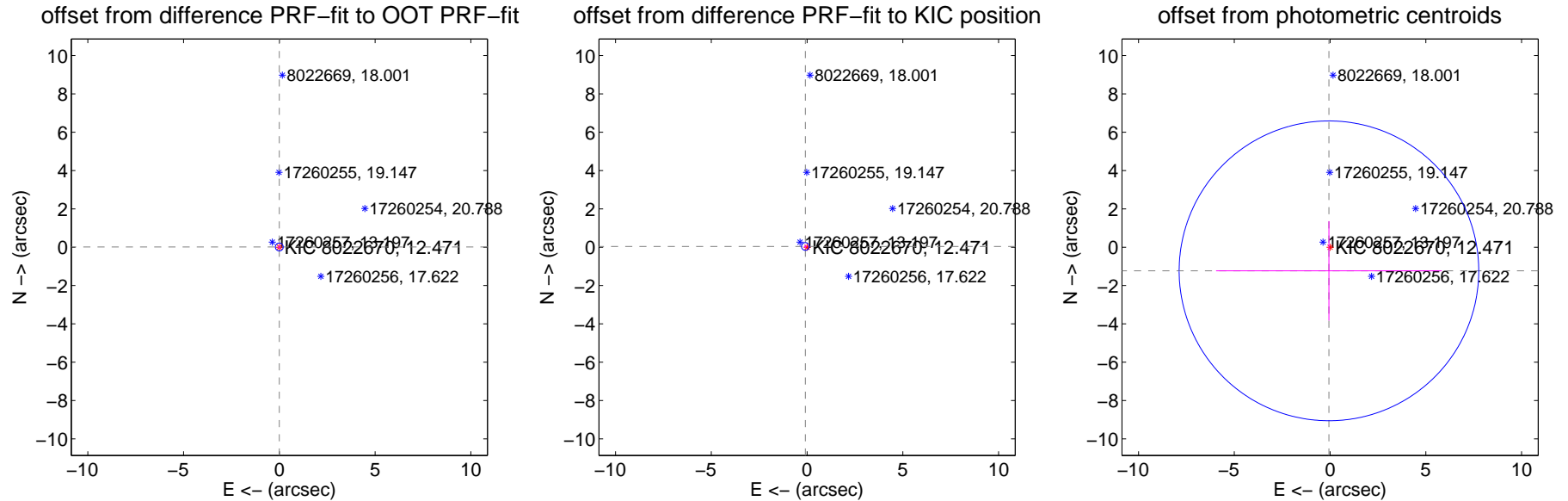
DV Centroid Data

Supplemental centroid analysis for 008022670-04. Kepler magnitude: 12.47. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

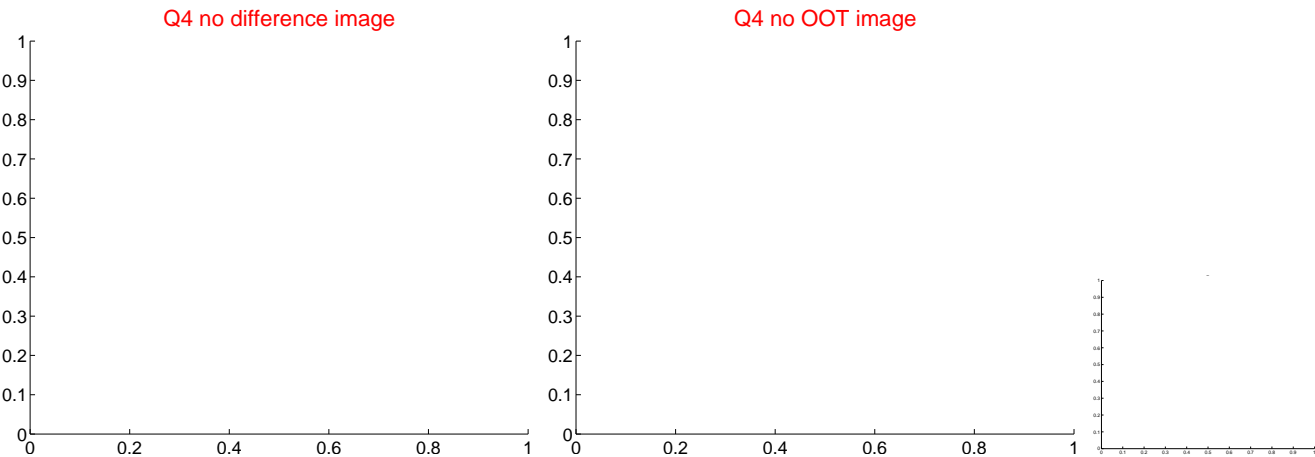
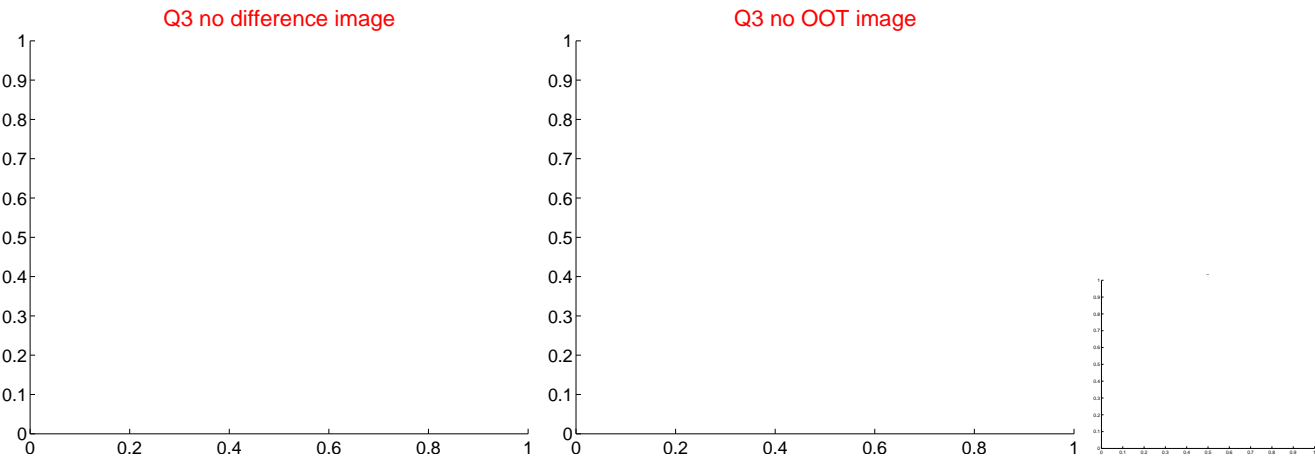
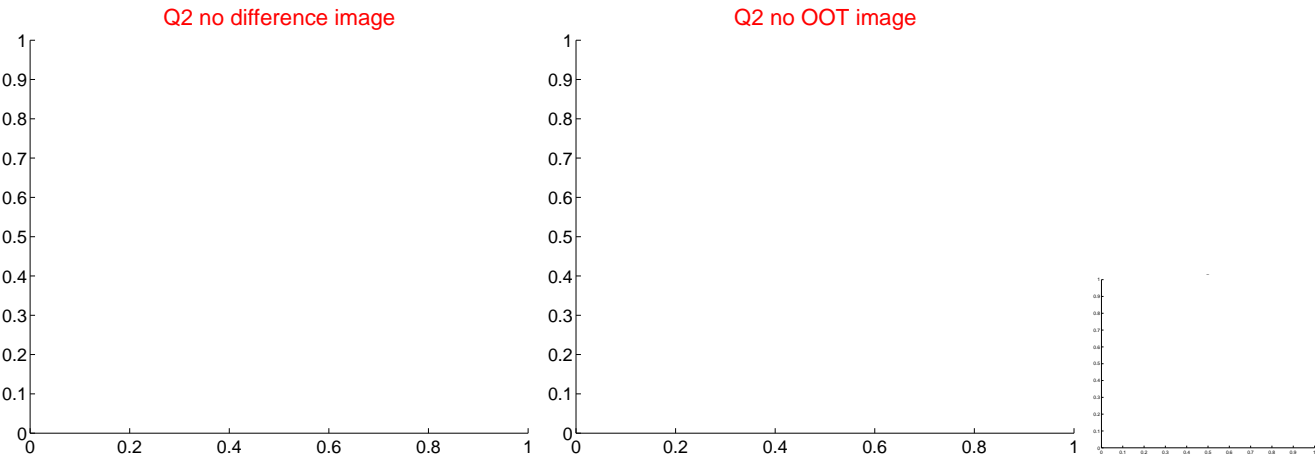
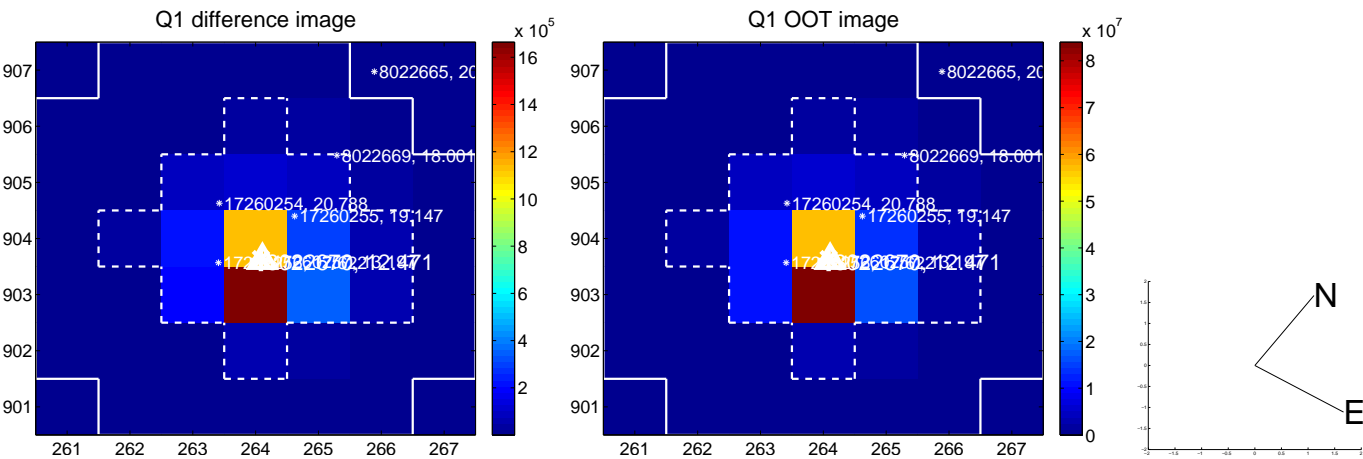
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.012 ± 0.069	0.17	0.003 ± 0.067	0.011 ± 0.069
PRF-fit source offset from KIC position	0.098 ± 0.067	1.47	0.090 ± 0.067	0.040 ± 0.067
photometric centroid source offset	1.23 ± 2.61	0.47	0.06 ± 5.89	-1.23 ± 2.59

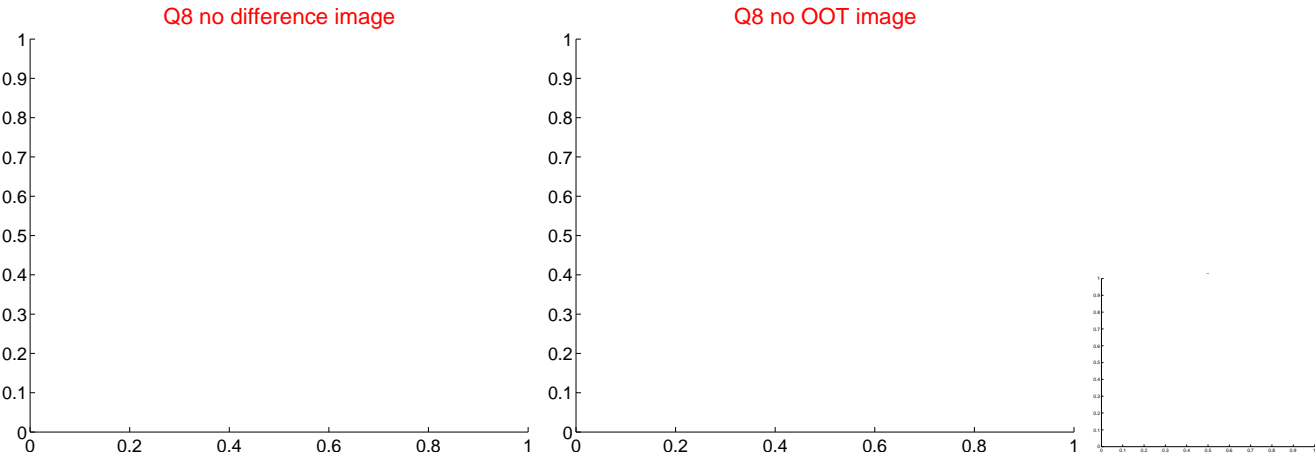
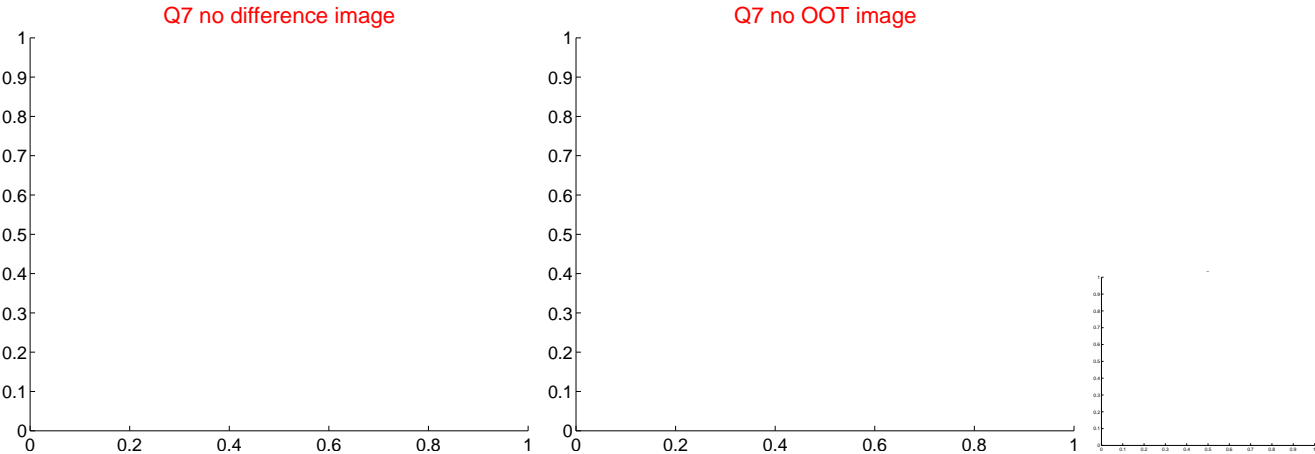
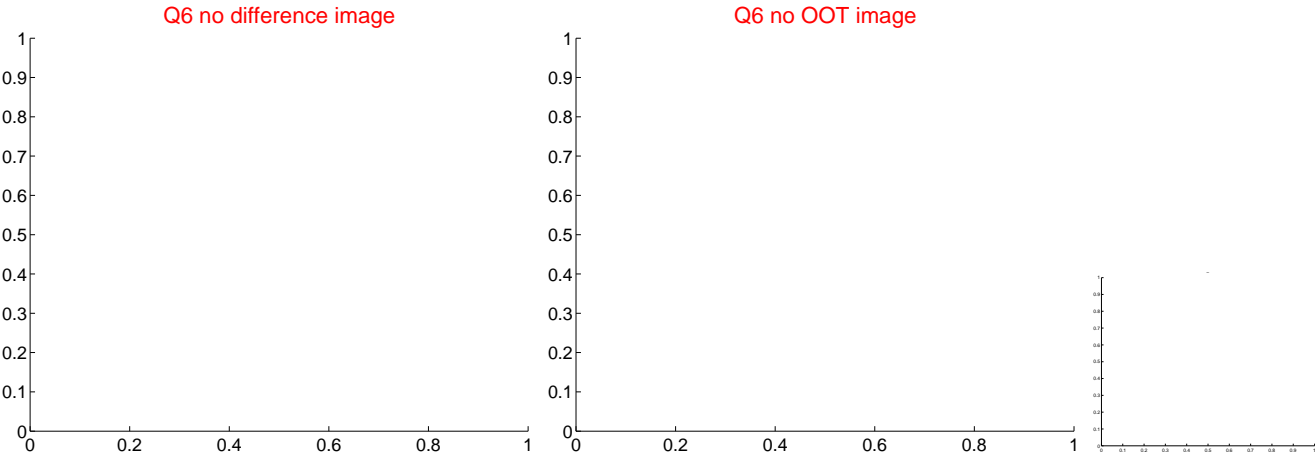
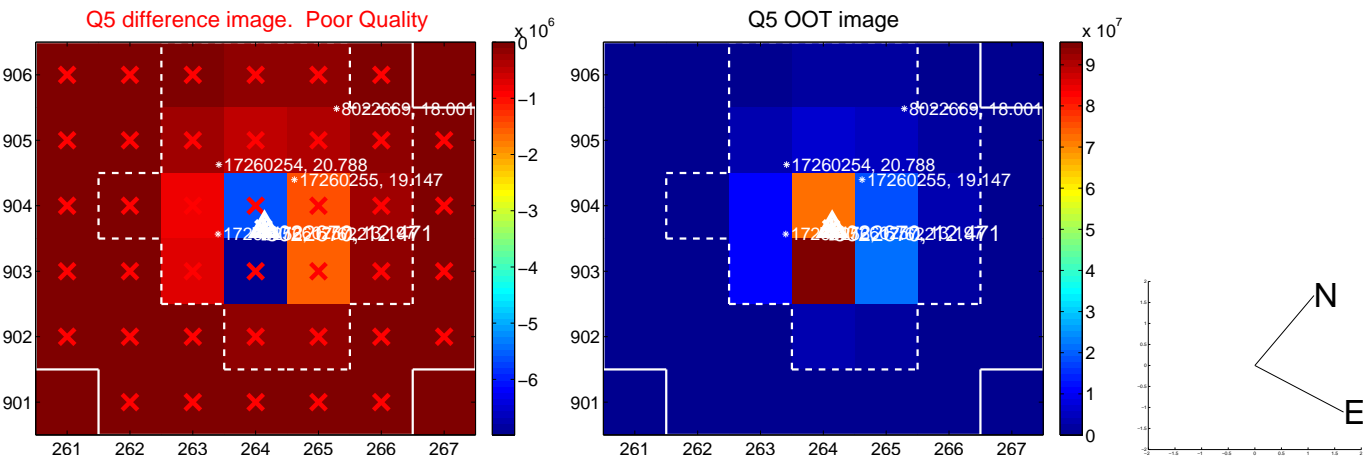


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

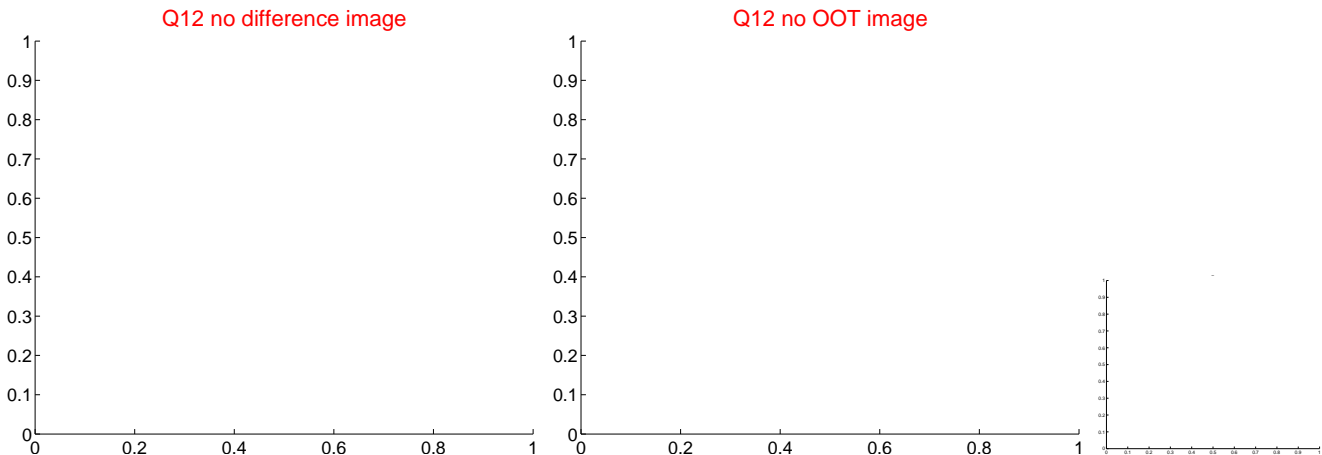
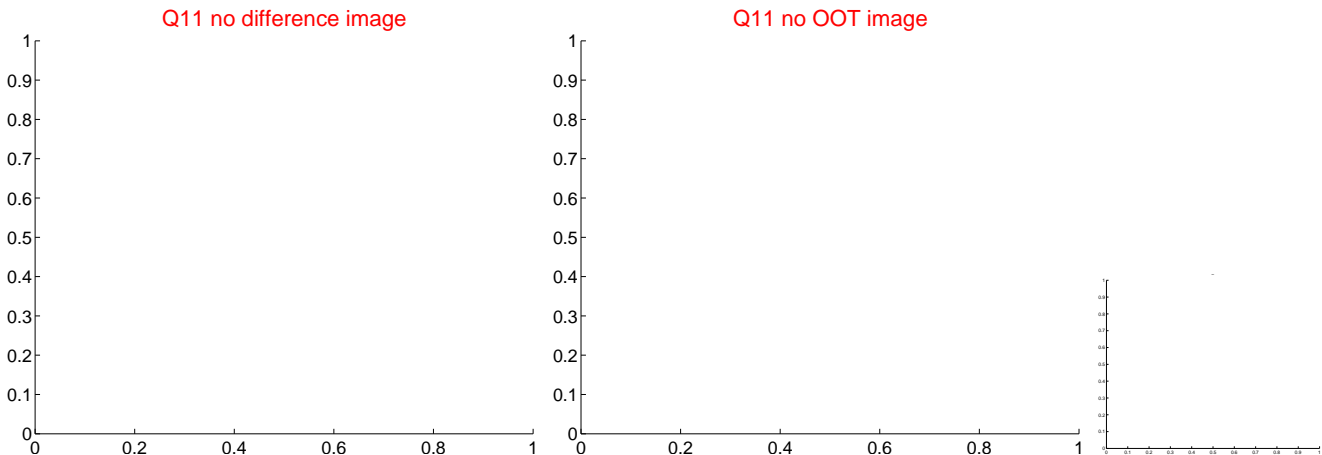
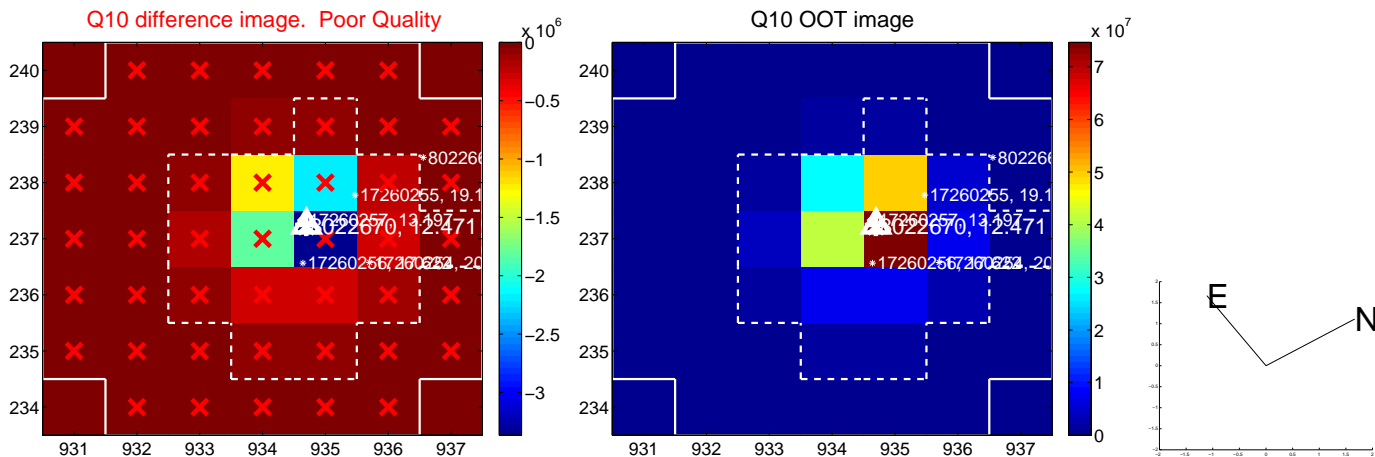
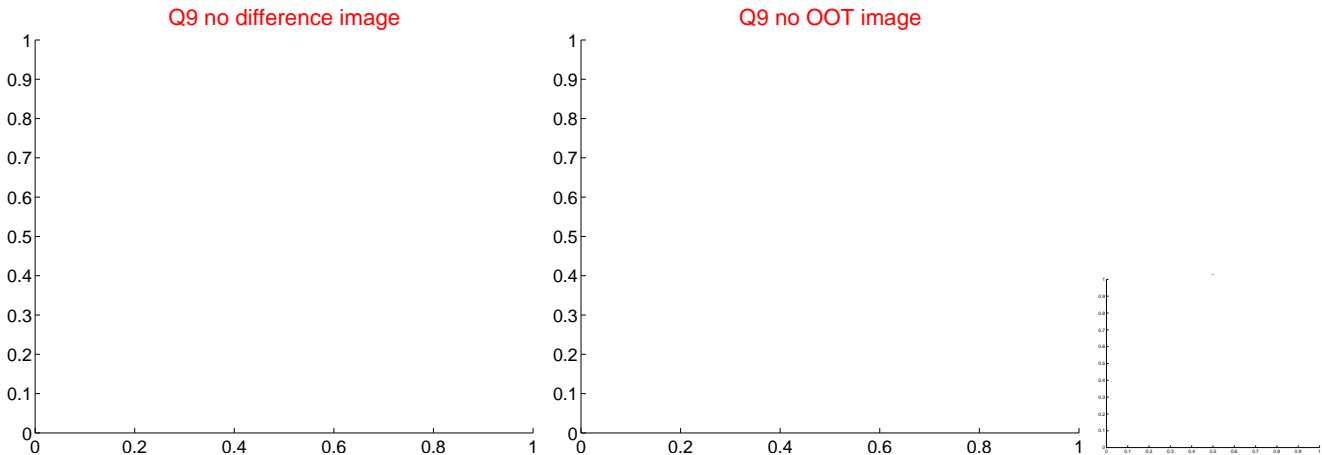
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



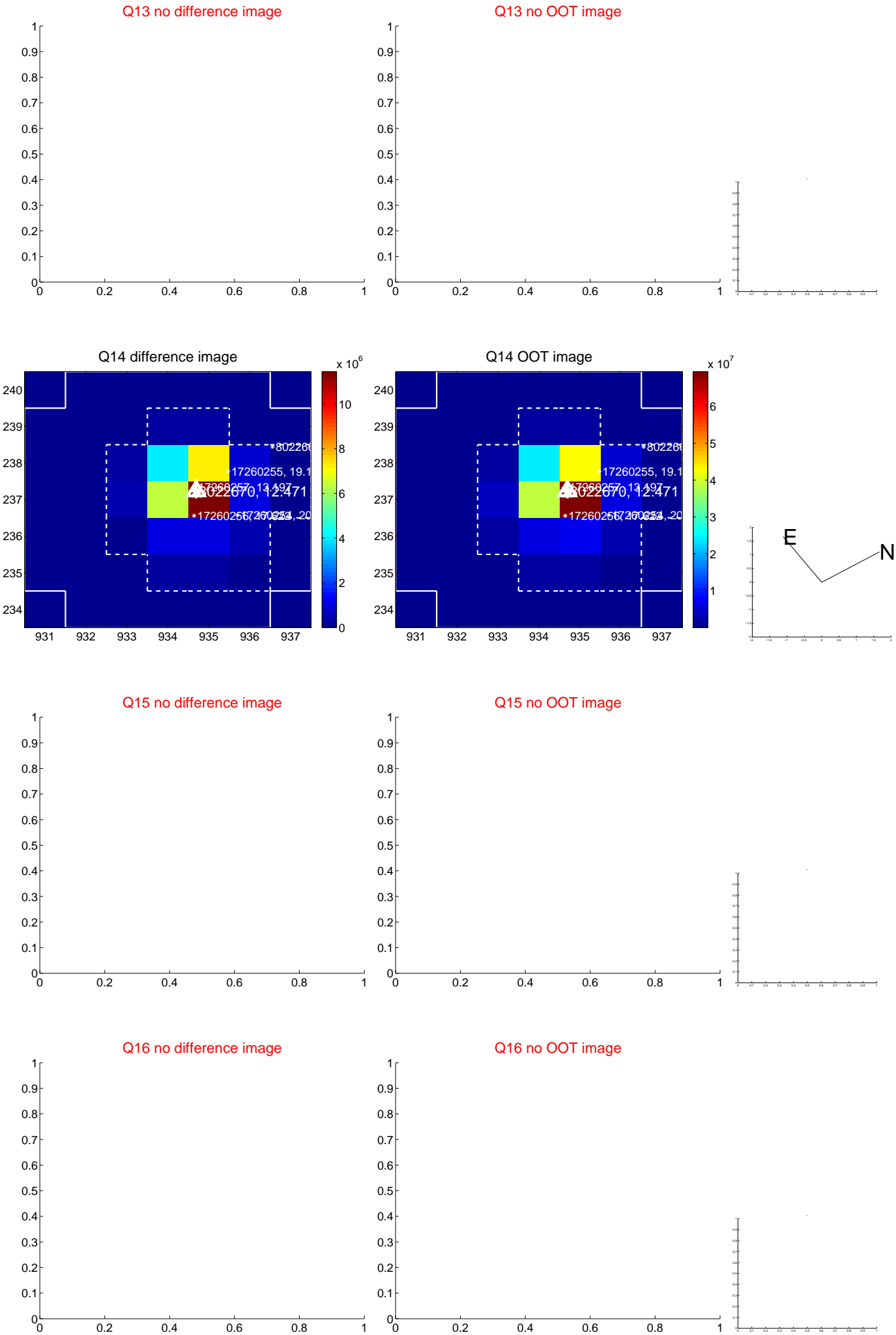
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



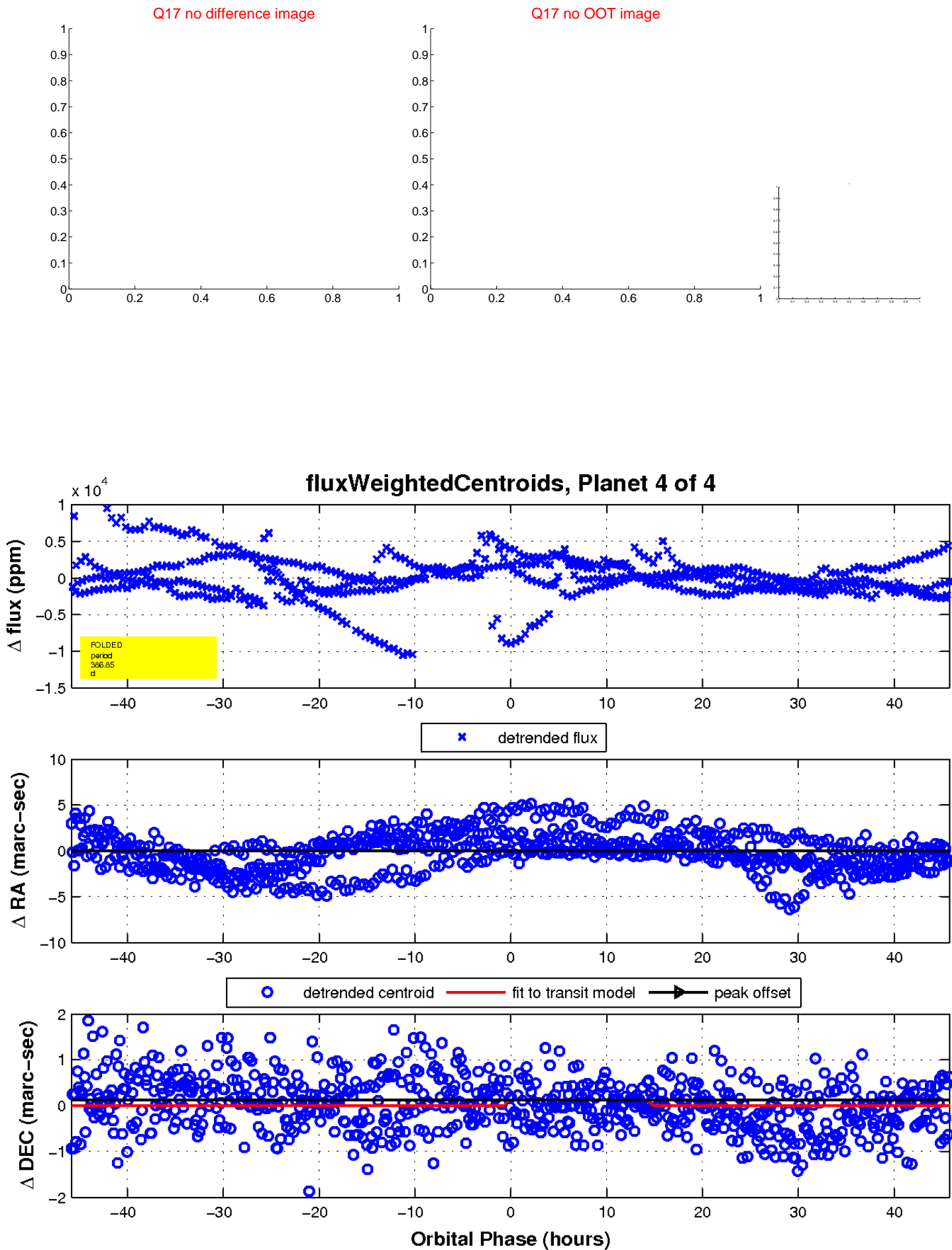
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



UKIRT Image

Declination

