

KIC 008478373

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})
008478373-01	OBS	No	42.875124	169.034703	8483.7	1.430	9.3	9.6	1.11	6123	10.39	24.35
008478373-02	OBS	No	29.739547	152.476924	2115.8	4.530	9.5	4.7	1.11	6123	5.19	39.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008478373-01	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008478373-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

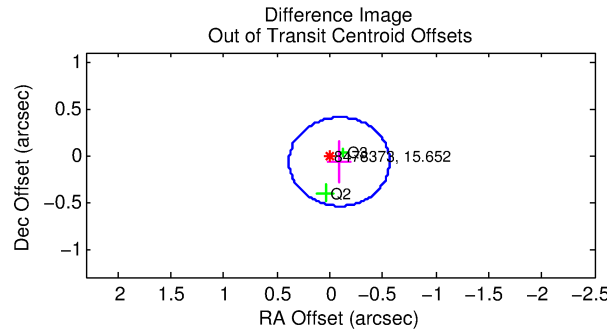
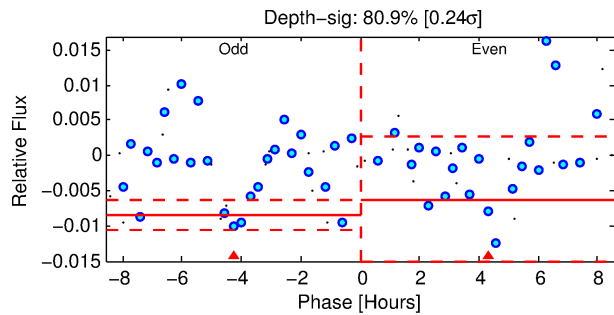
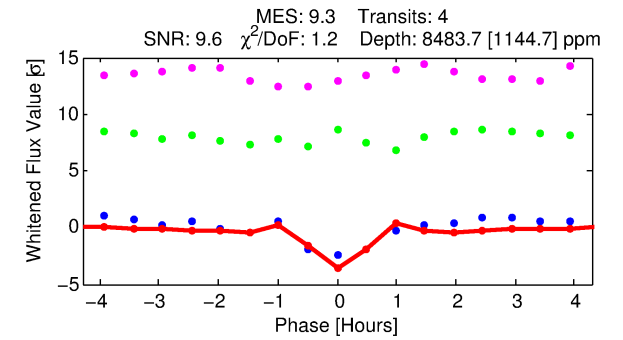
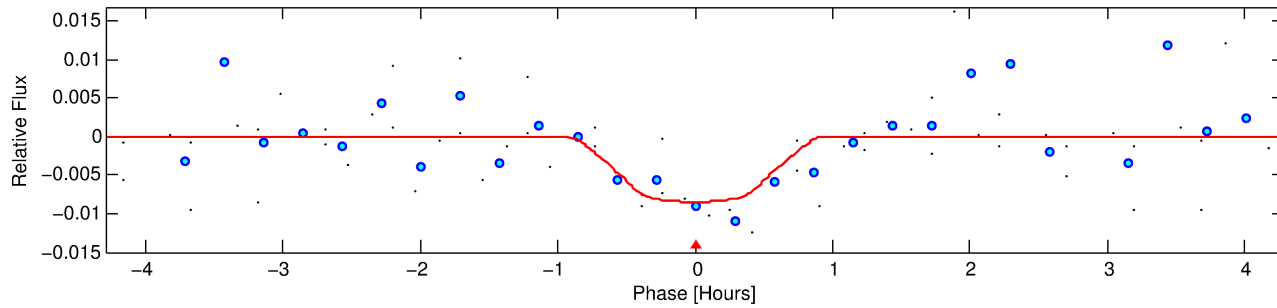
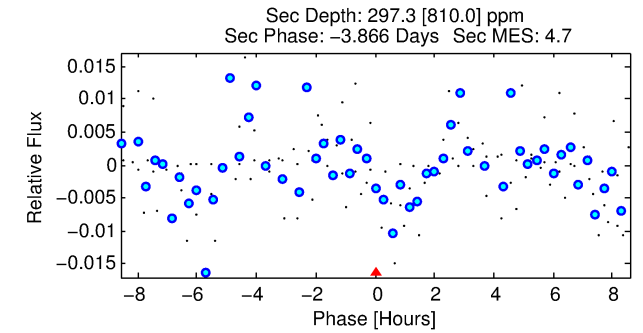
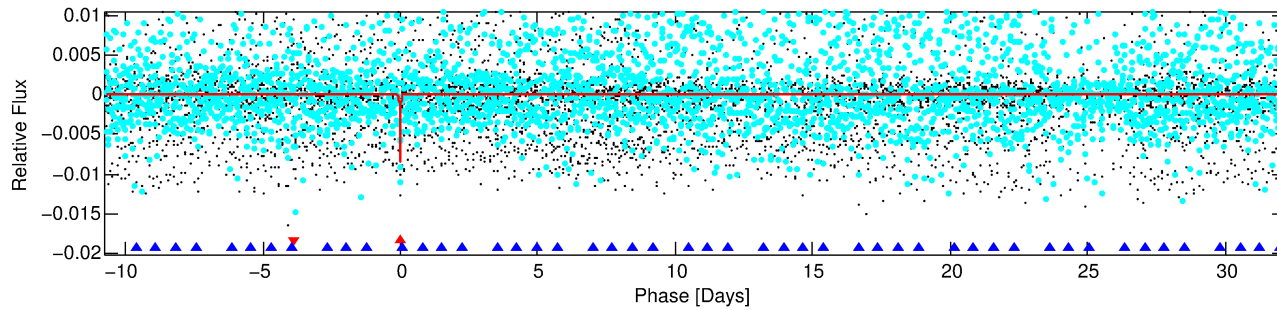
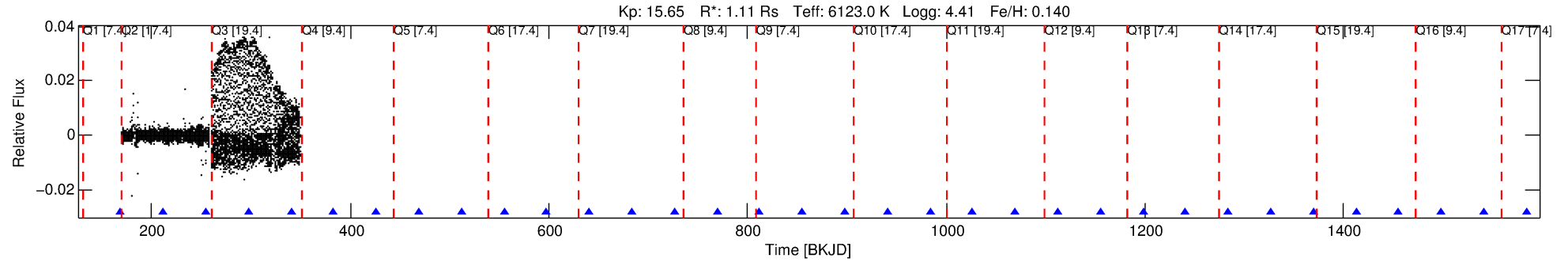
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008478373-01

No Significant Match Found

DV One-Page Summary

KIC: 8478373 Candidate: 1 of 2 Period: 42.875 d



DV Fit Results:

Period = 42.87512 [0.00264] d
Epoch = 169.0347 [0.0053] BKJD
Rp/R* = 0.0860 [0.0533]
a/R* = 231.85 [653.15]
b = 0.39 [6.06]
Seff = 24.35 [10.60]
Teq = 566 [62] K
Rp = 10.39 [7.34] Re
a = 0.2517 [0.0706] AU
Ag = 96.03 [290.05] [0.33σ]
Teffp = 2742 [2055] K [1.06σ]

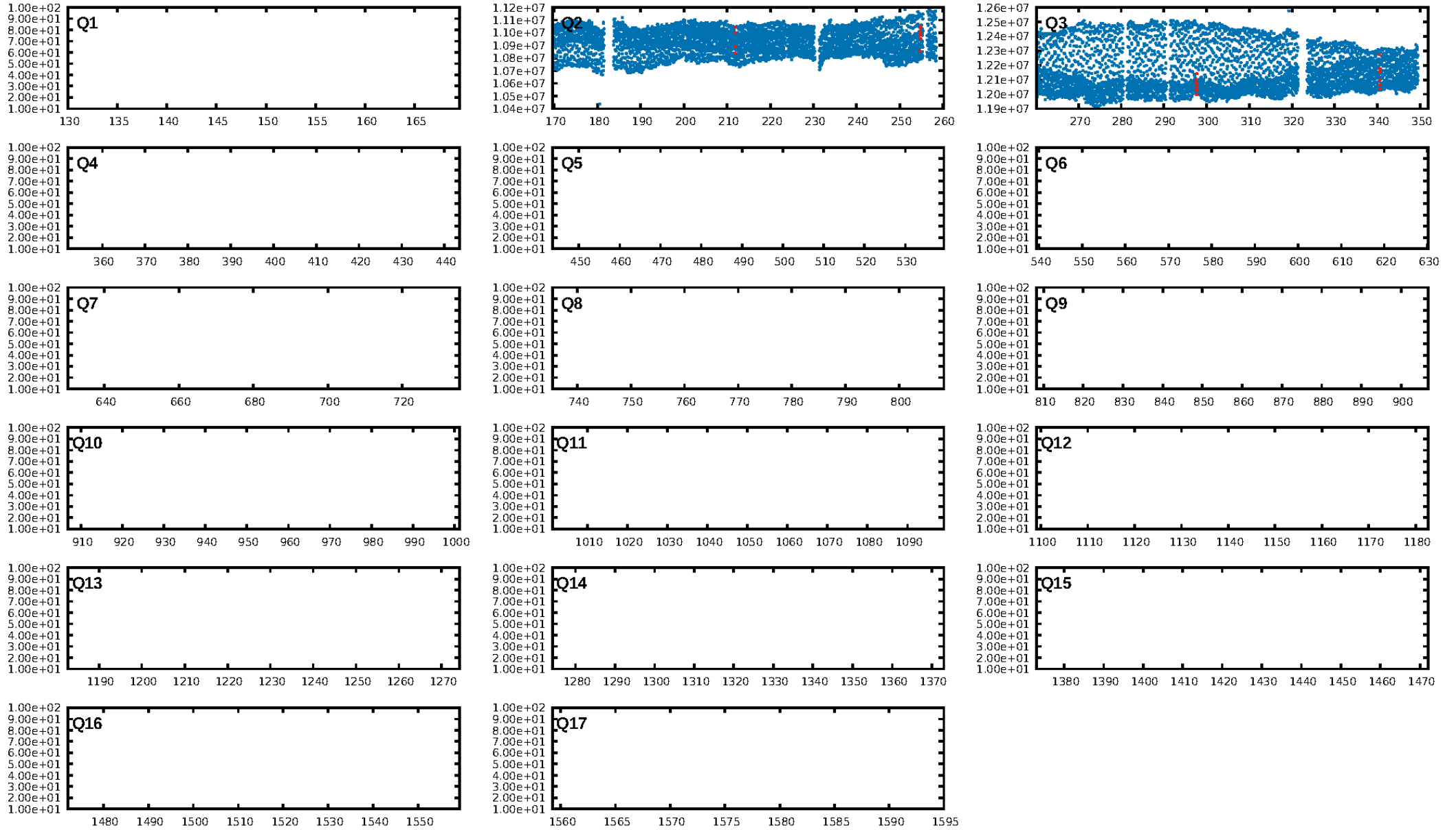
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [66.37σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 15.0%
ModelChiSquareGof-sig: 97.3%
Bootstrap-pfa: 2.39e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.767
Centroid-sig: N/A
Centroid-so: 0.263 arcsec [0.70σ]
OotOffset-rm: 0.115 arcsec [0.73σ]
KicOffset-rm: 0.124 arcsec [0.48σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

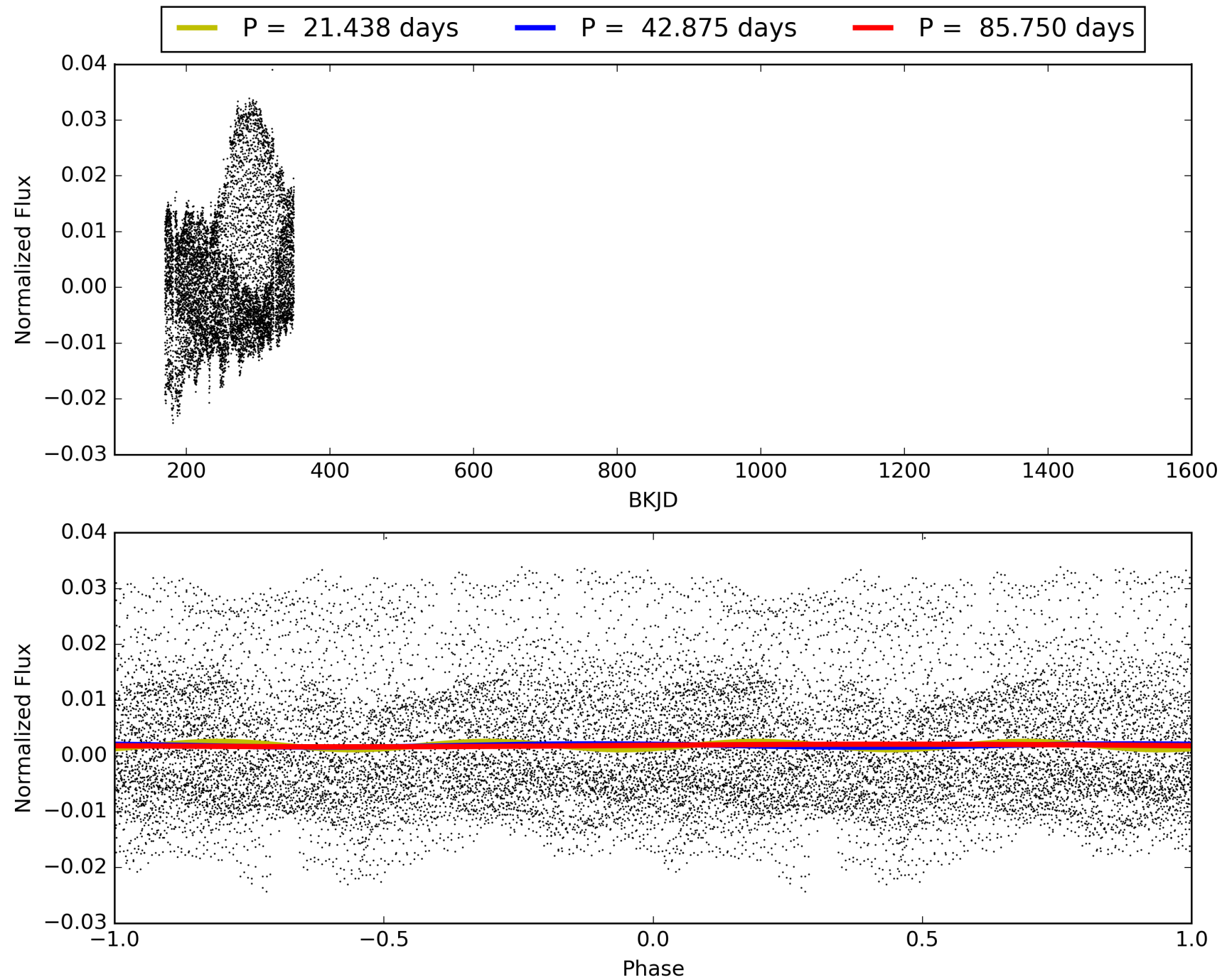
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 07:17:34 Z

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

TCE 008478373-01, PDC Light Curves

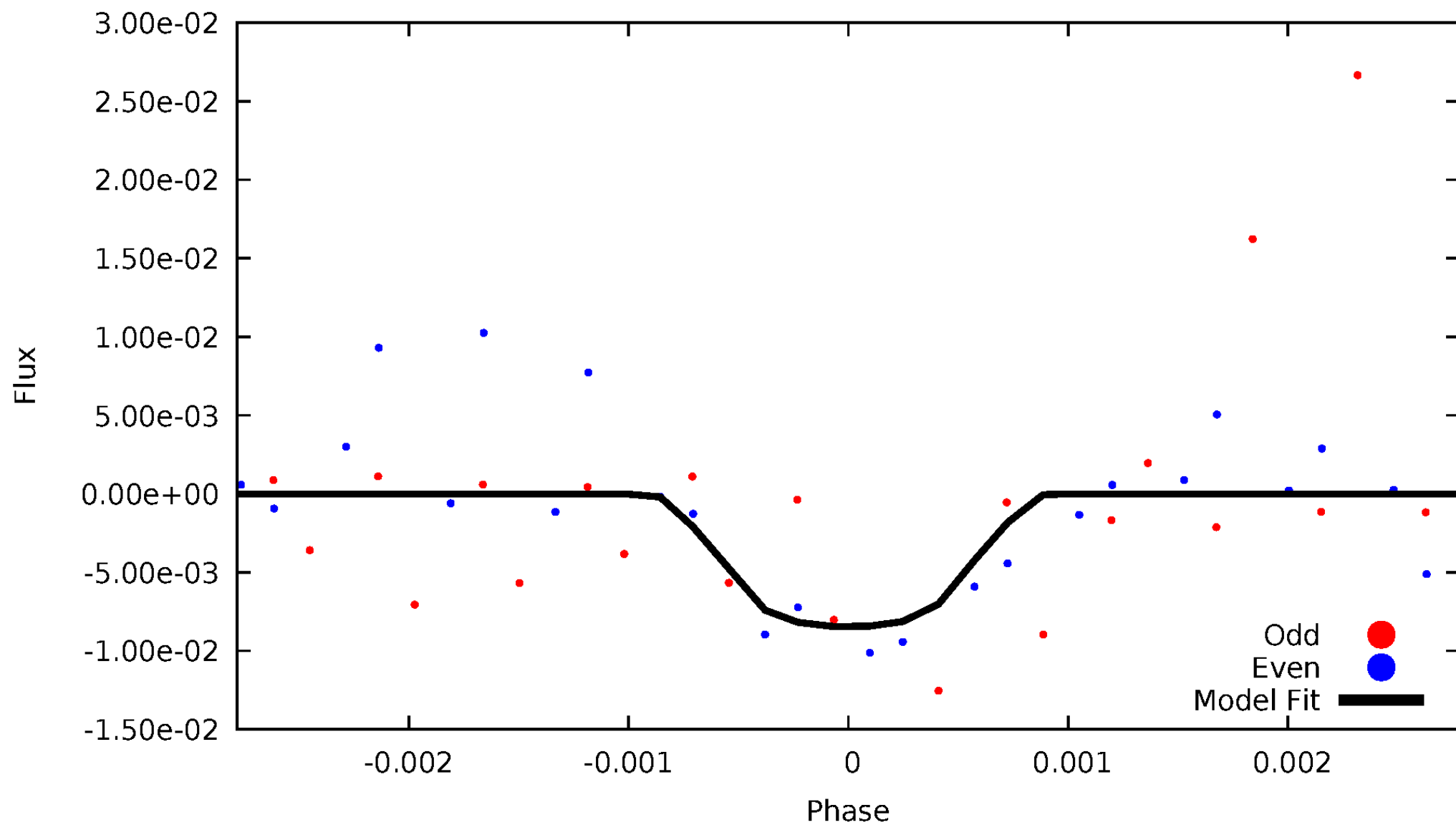


TCE 008478373-01



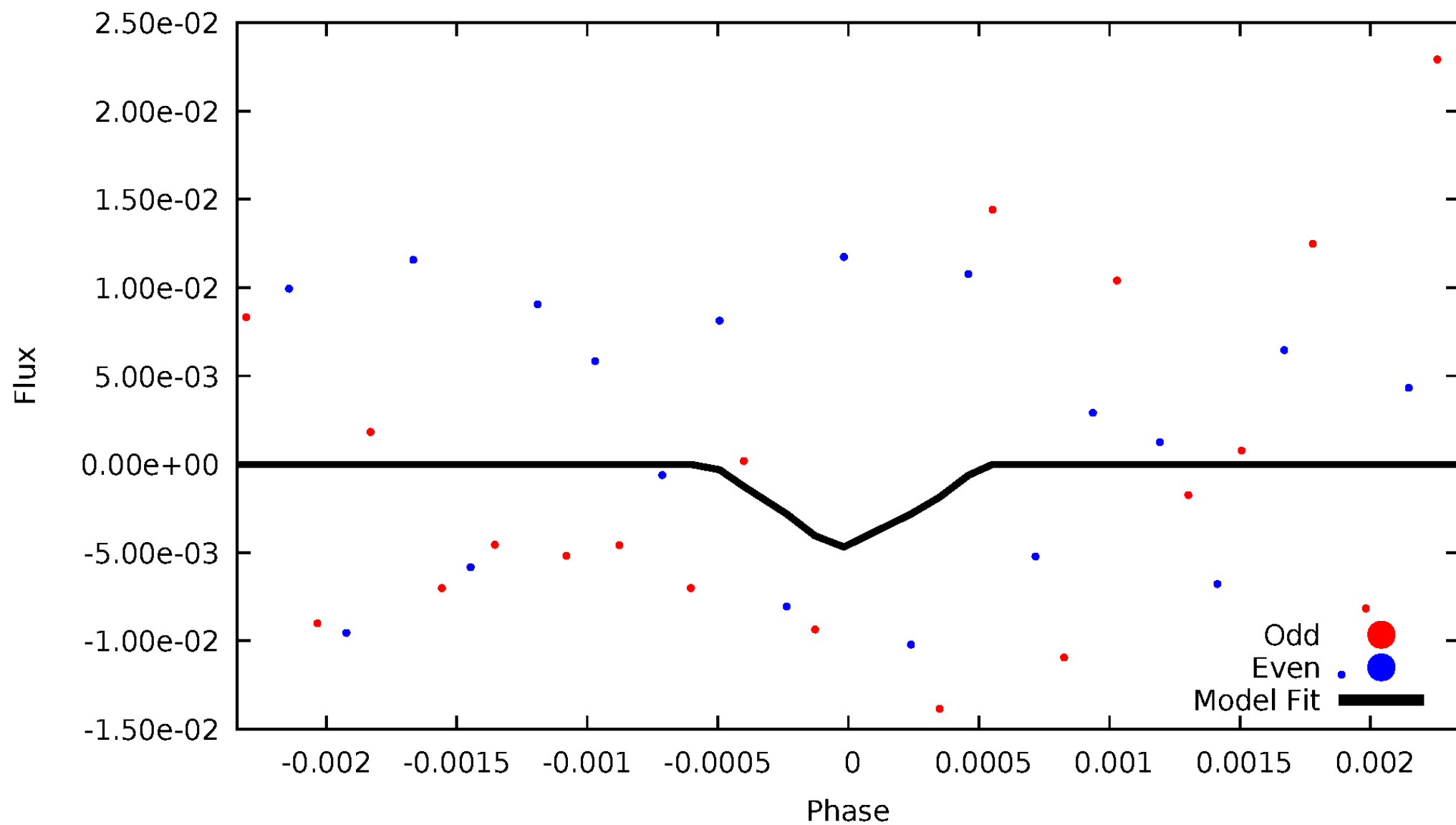
DV Odd/Even

TCE 008478373-01



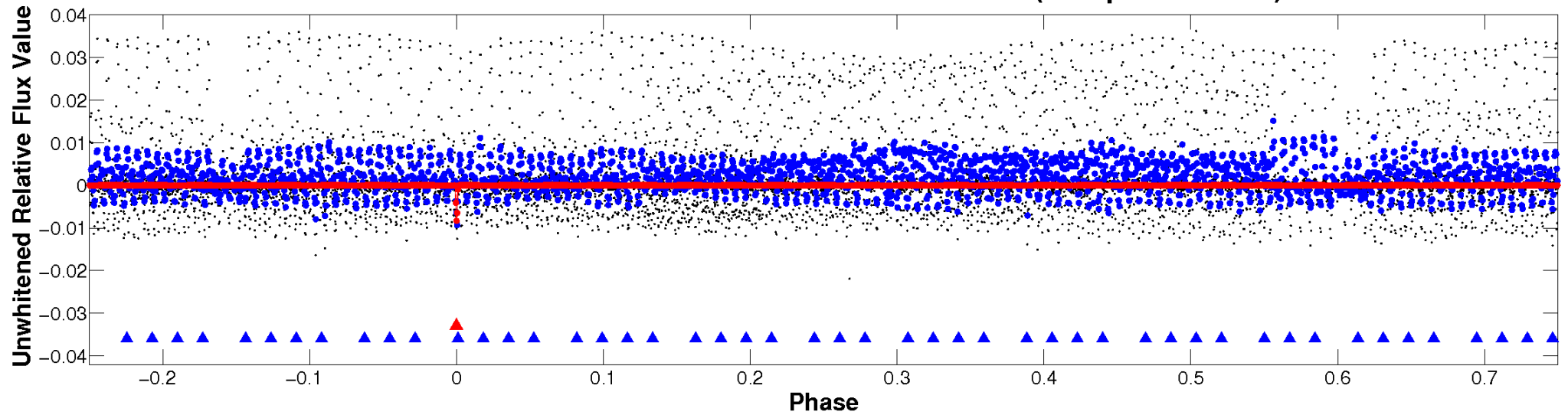
ALT Odd/Even

TCE 008478373-01

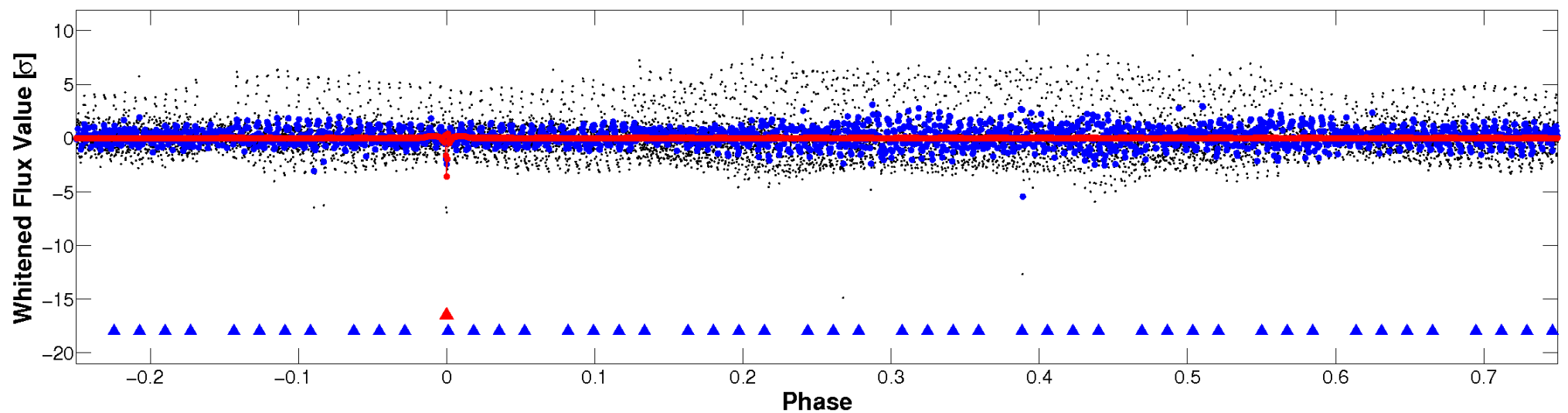


Non-Whitened Vs. Whitened Light Curve

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

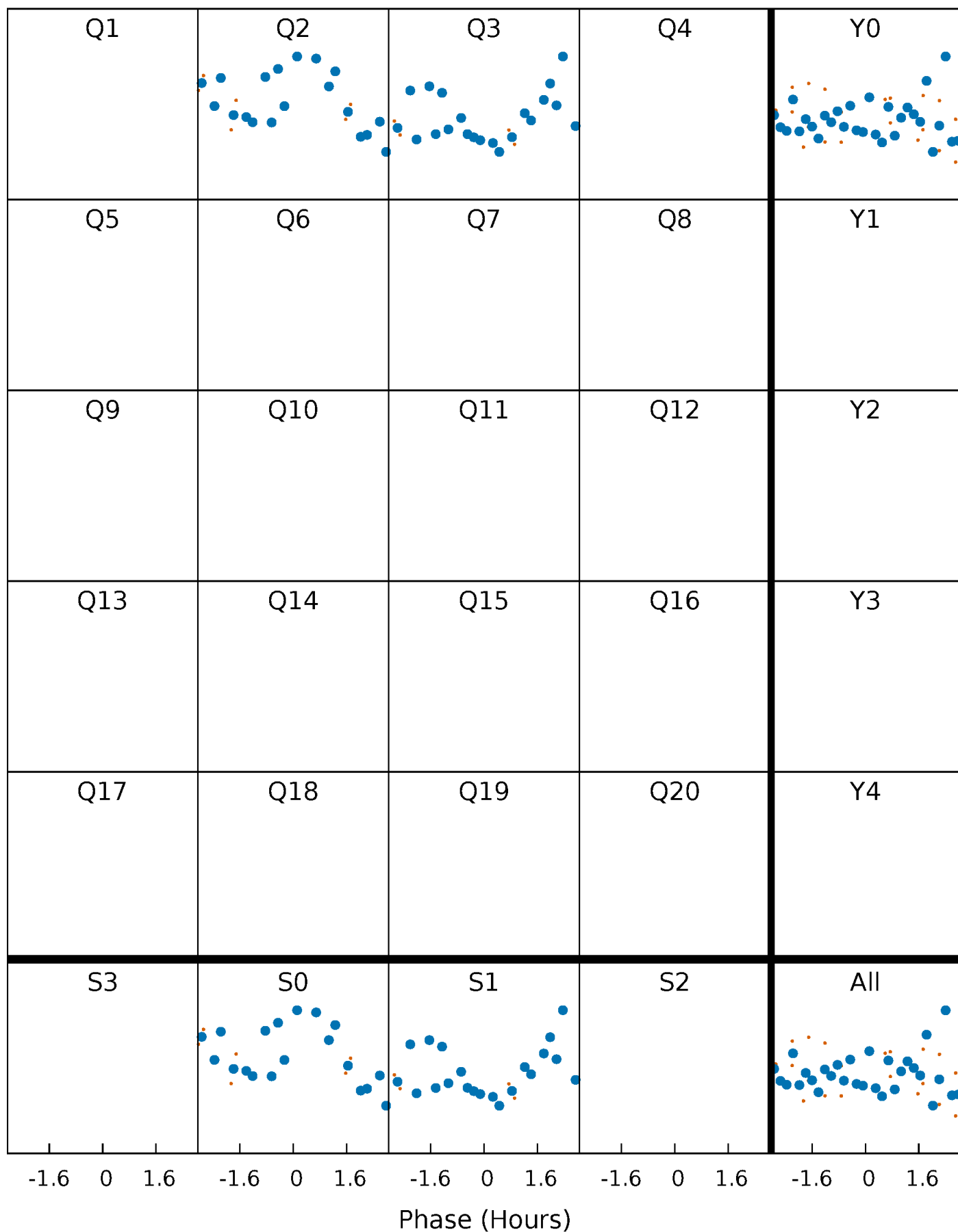


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



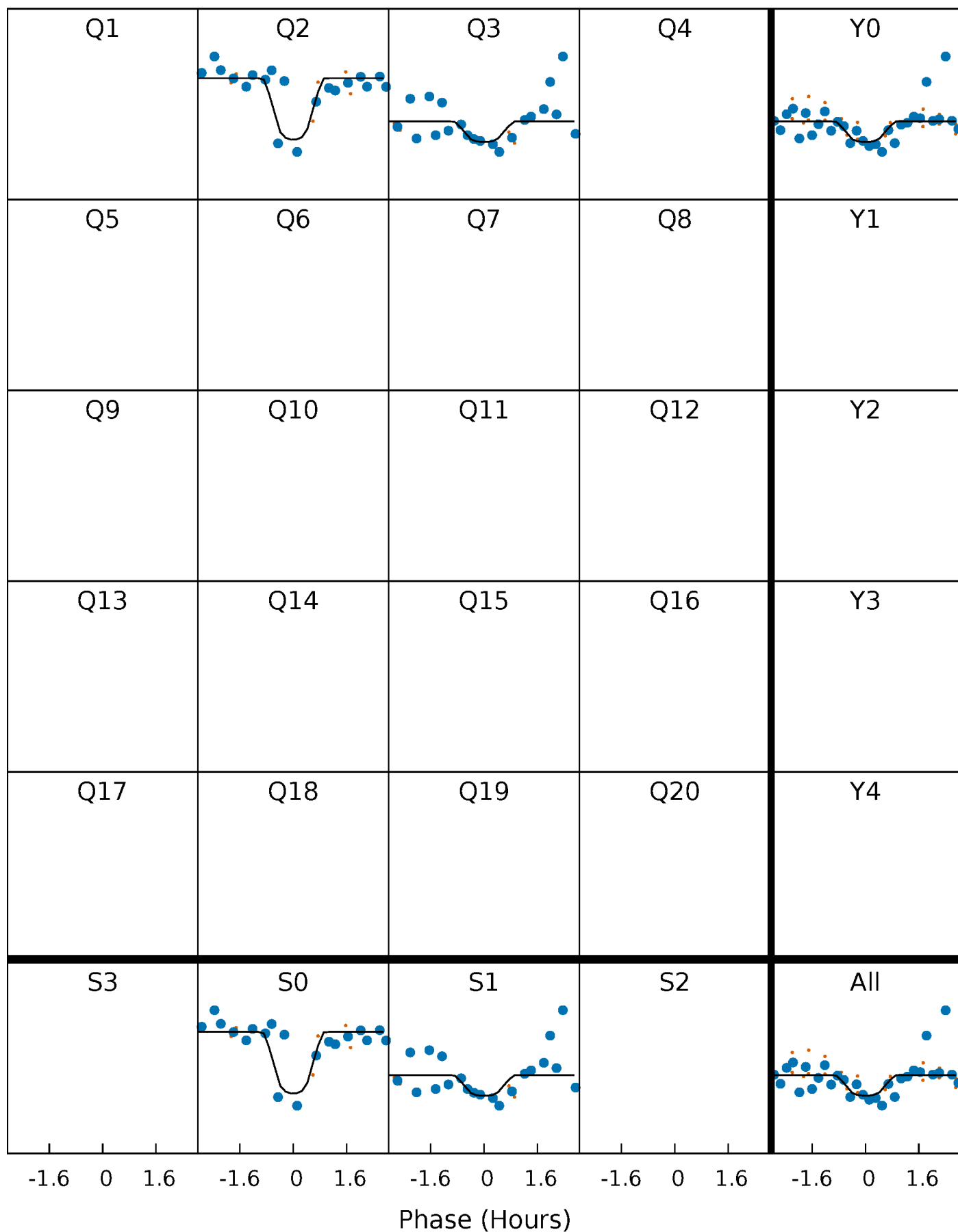
PDC Quarter-Phased Transit Curves

TCE 008478373-01 P= 42.875124 Days $T_0=169.034703$ (BKJD)



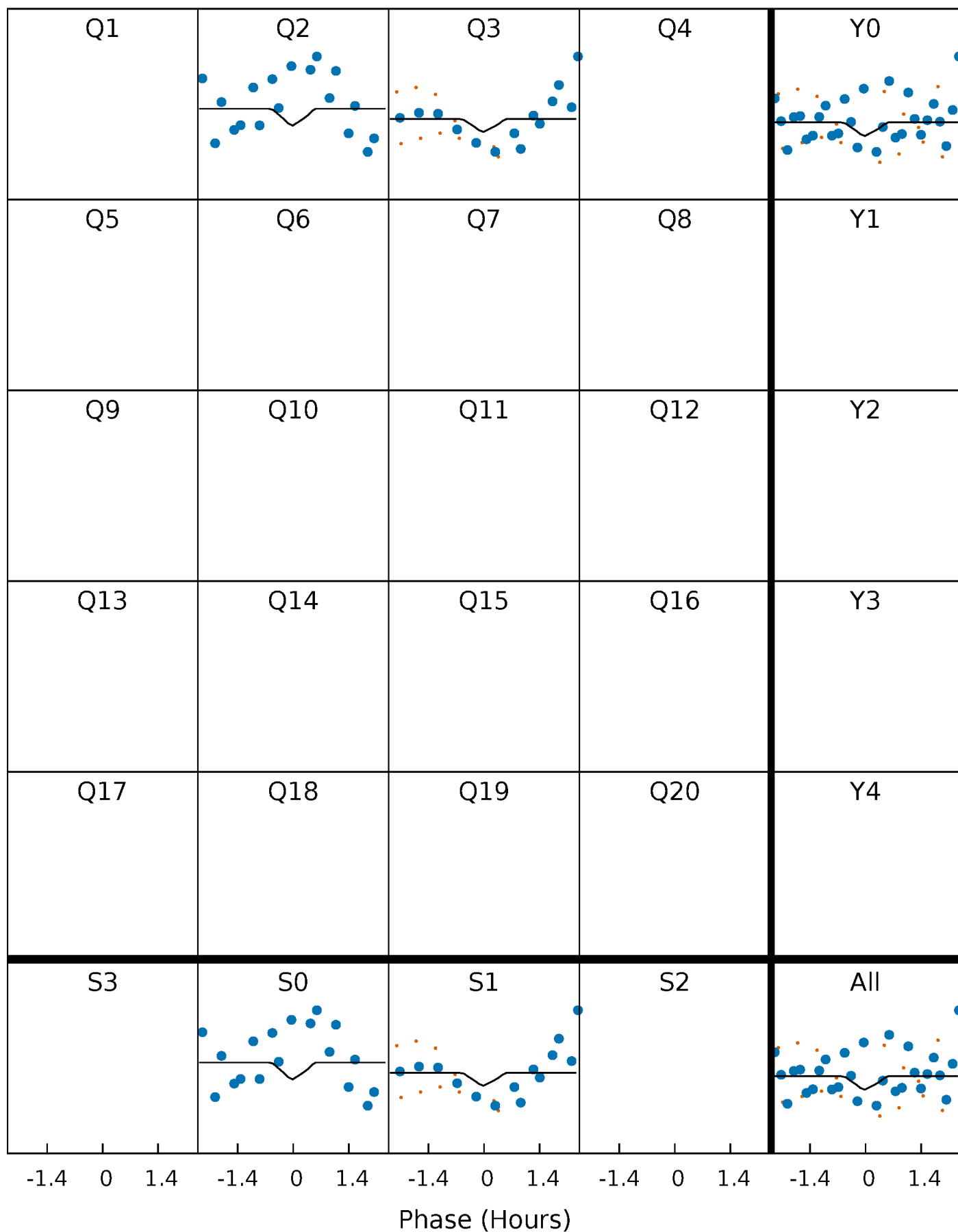
DV Quarter-Phased Transit Curves

TCE 008478373-01 P= 42.875124 Days $T_0=169.034703$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

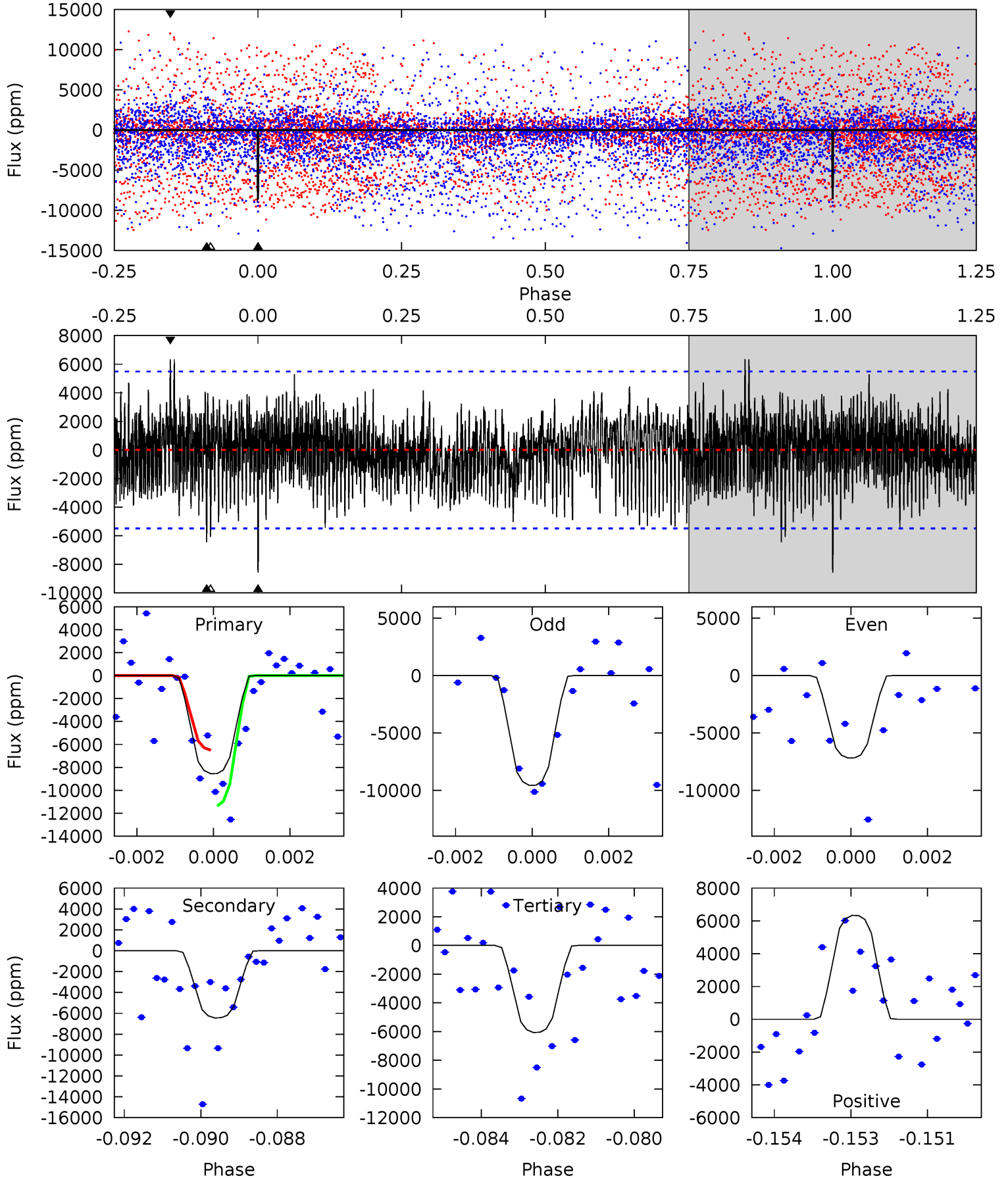
TCE 008478373-01 P= 42.872831 Days $T_0=169.044180$ (BKJD)



DV Model-Shift Uniqueness Test

008478373-01, P = 42.875124 Days, E = 169.034703 Days

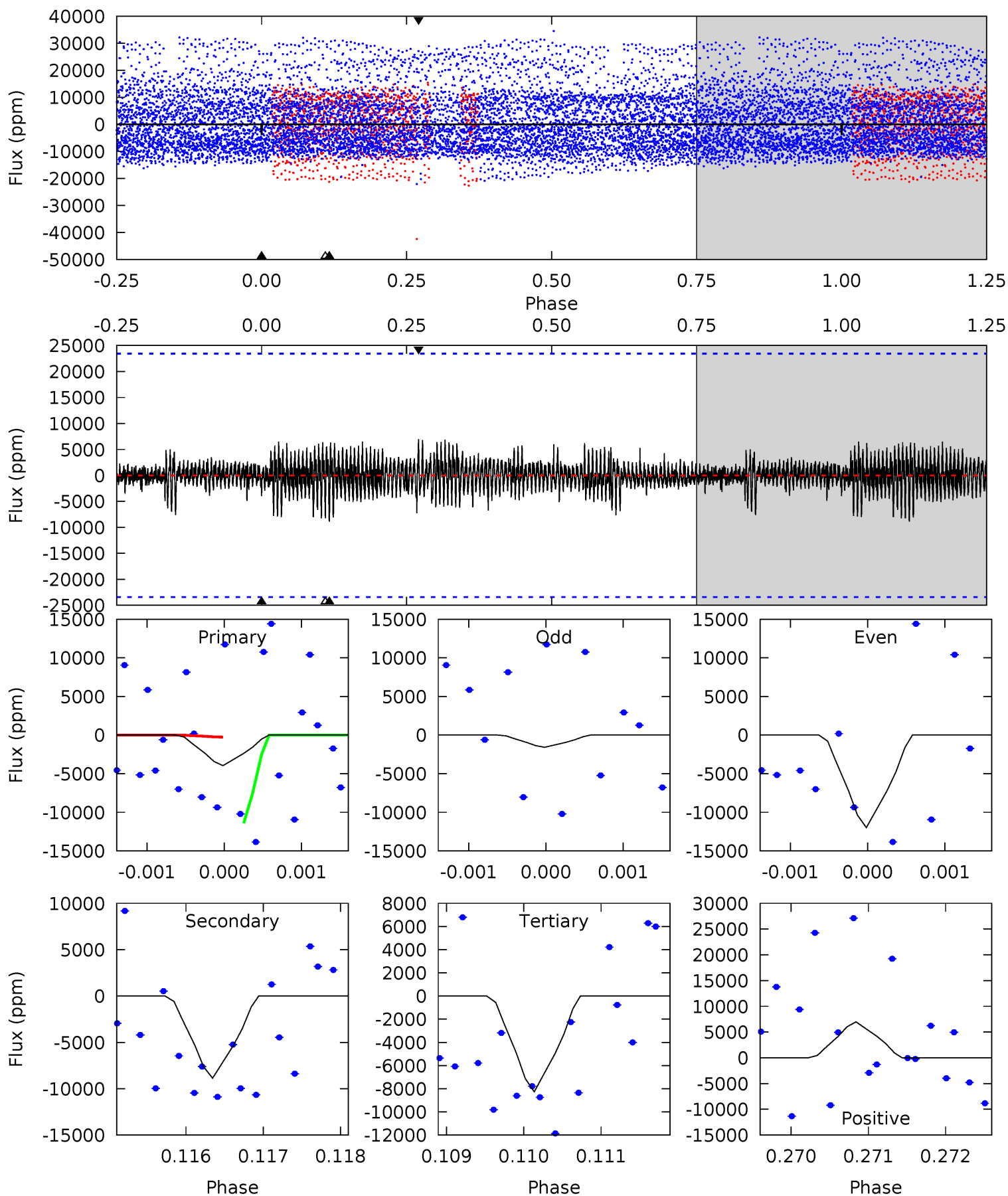
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.31	6.26	5.89	6.16	5.34	3.10	1.82	2.42	2.16	0.36	0.10	0.64	0.79	0.43	2.42



Alt Model-Shift Uniqueness Test

008478373-01, P = 42.872831 Days, E = 169.044180 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.92	2.07	1.93	1.63	5.46	3.30	0.50	-1.00	-0.70	0.14	0.44	1.28	0.37	0.44	1.30



Stellar Parameters For KIC 008478373

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6123^{+190}_{-253}	$4.413^{+0.072}_{-0.217}$	$0.140^{+0.200}_{-0.300}$	$1.107^{+0.375}_{-0.150}$	$1.159^{+0.151}_{-0.166}$	$1.202^{+0.379}_{-0.677}$
	+3%/-4%	+2%/-5%	+143%/-214%	+34%/-14%	+13%/-14%	+31%/-56%
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 008478373-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-6442±1029	$11.32^{+6.75}_{-6.04}$	809^{+64}_{-45}	5805^{+3129}_{-1117}	1736^{+5493}_{-1067}
Alt.	-8862±4291	$9.59^{+6.44}_{-6.10}$	808^{+57}_{-51}	6667^{+6237}_{-1584}	3055^{+18672}_{-2132}

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

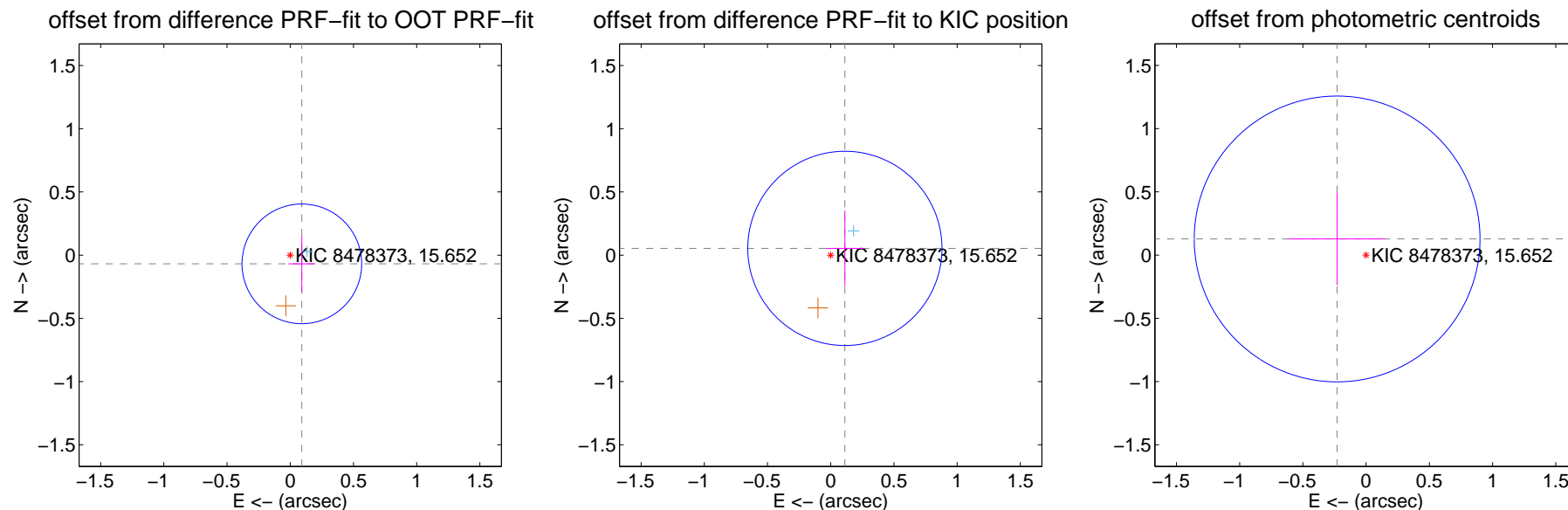
DV Centroid Data

Supplemental centroid analysis for 008478373-01. Kepler magnitude: 15.65. Transit SNR 9.56

There are 1 quarters with good PRF difference image offsets

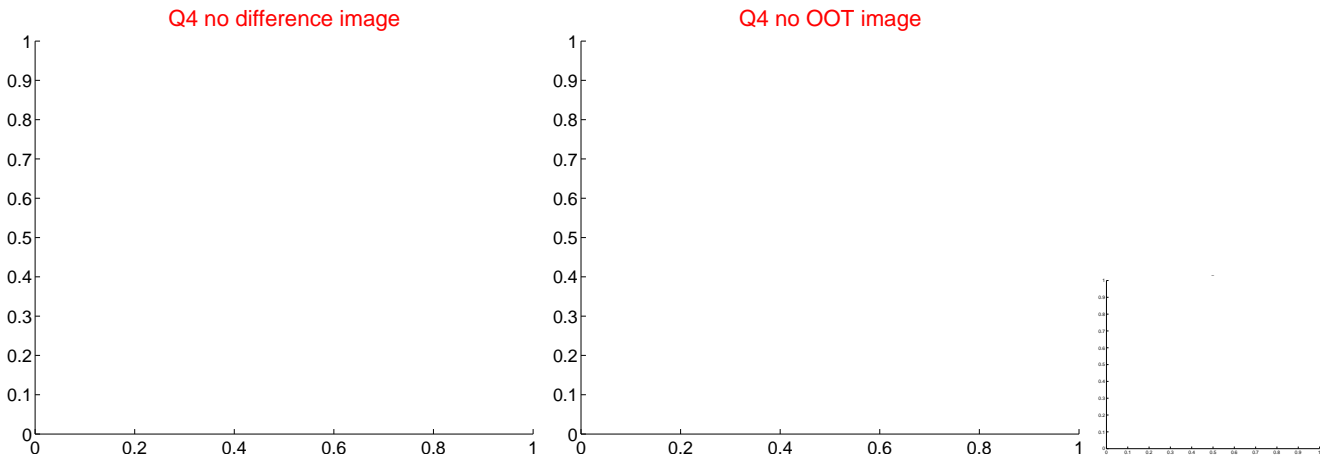
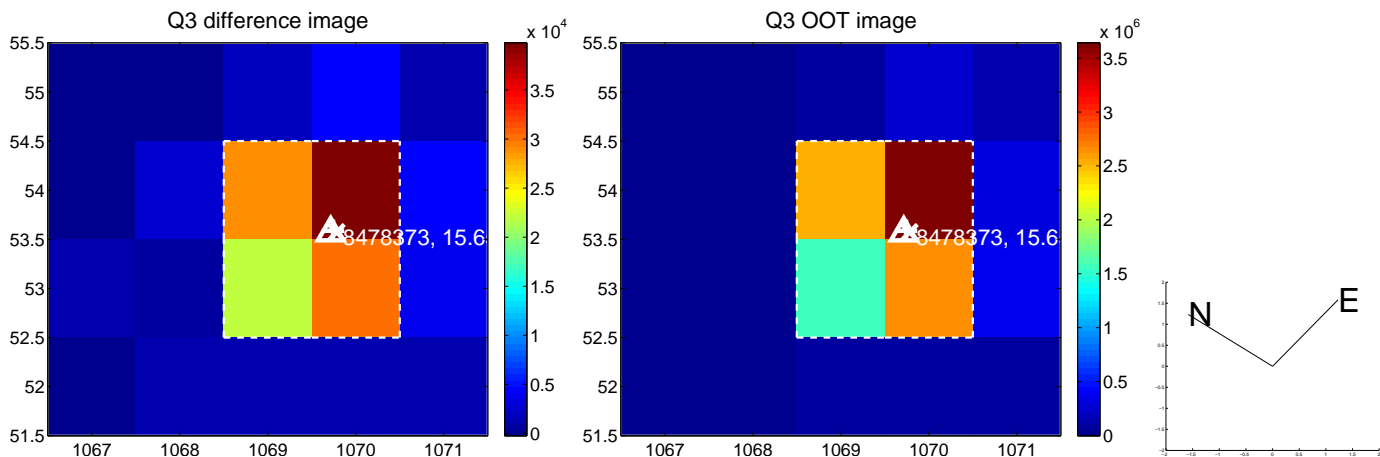
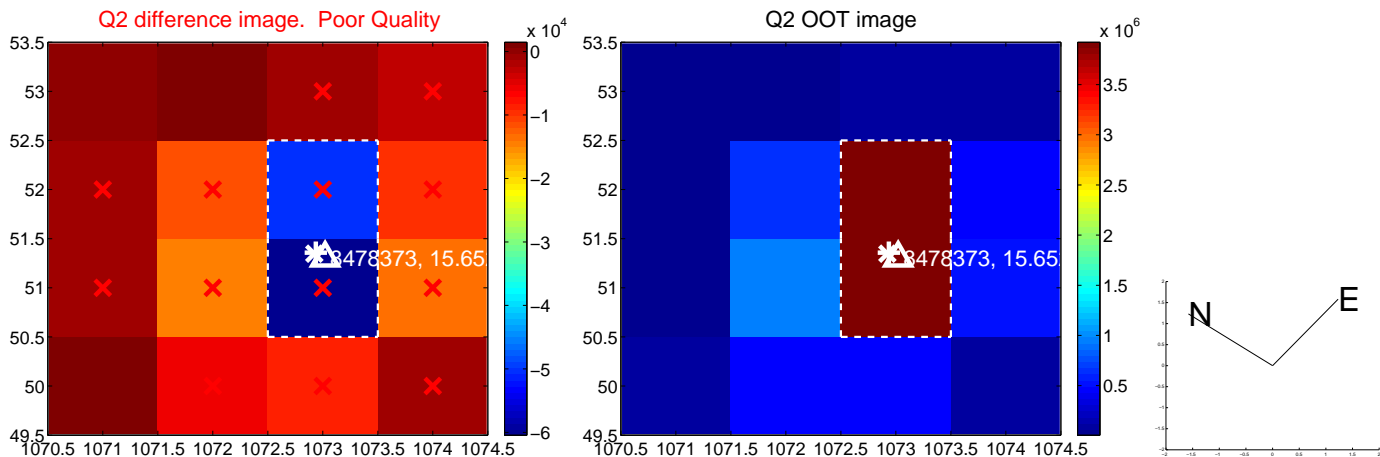
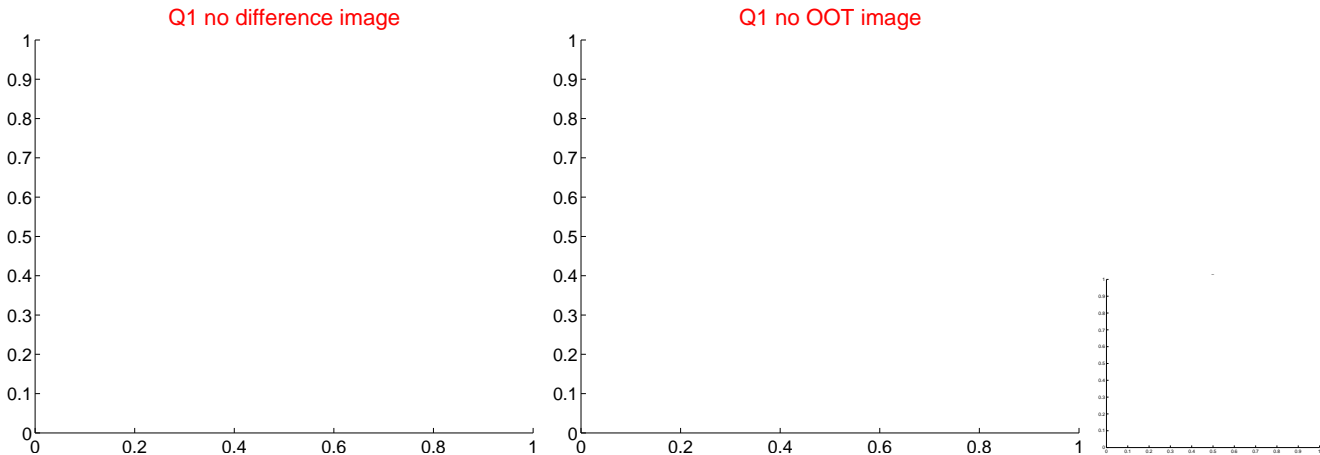
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.115 ± 0.158	0.73	-0.092 ± 0.107	-0.069 ± 0.220
PRF-fit source offset from KIC position	0.124 ± 0.256	0.48	-0.112 ± 0.150	0.054 ± 0.299
photometric centroid source offset	0.26 ± 0.38	0.70	0.23 ± 0.38	0.13 ± 0.36



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.



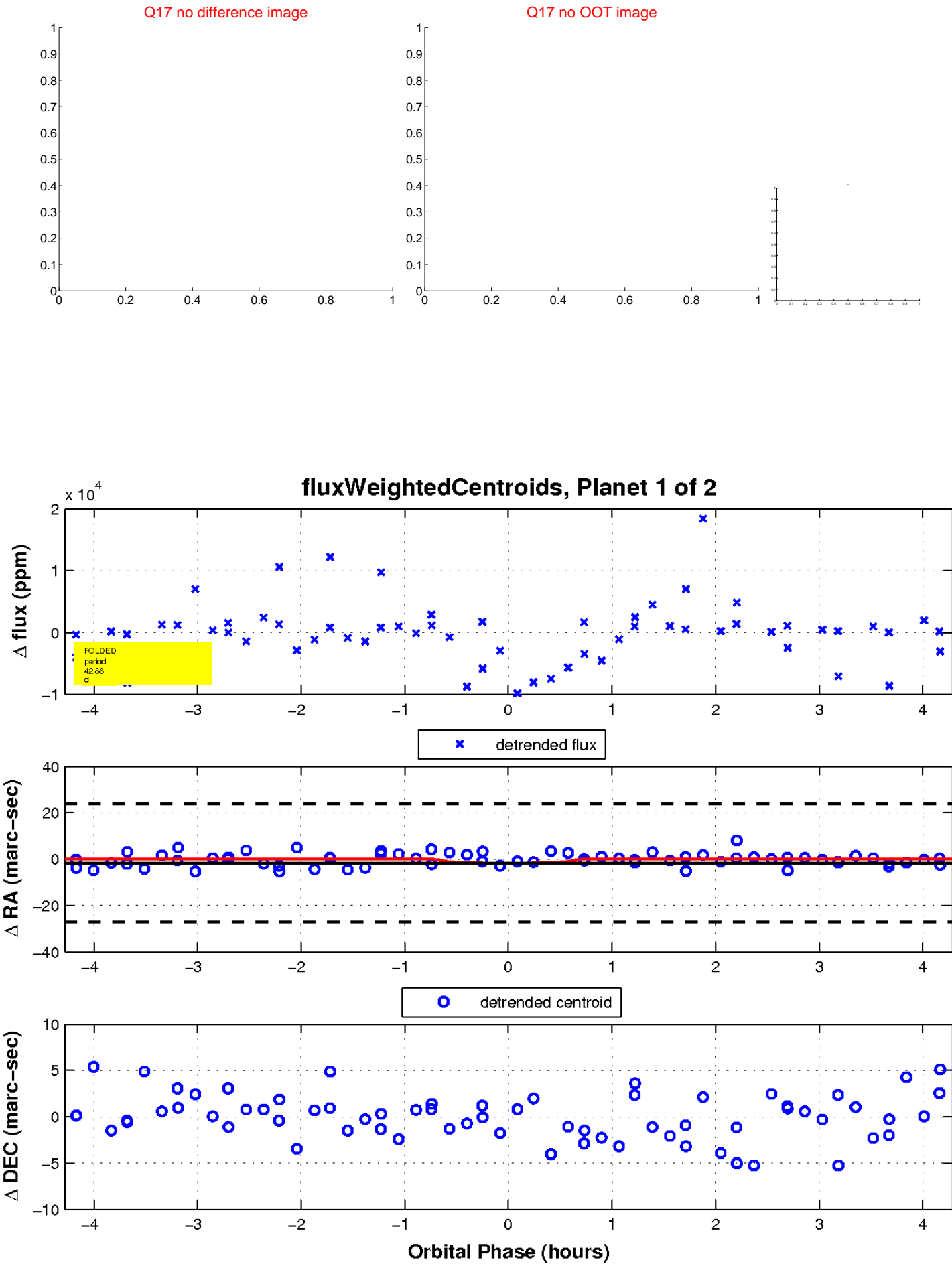
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

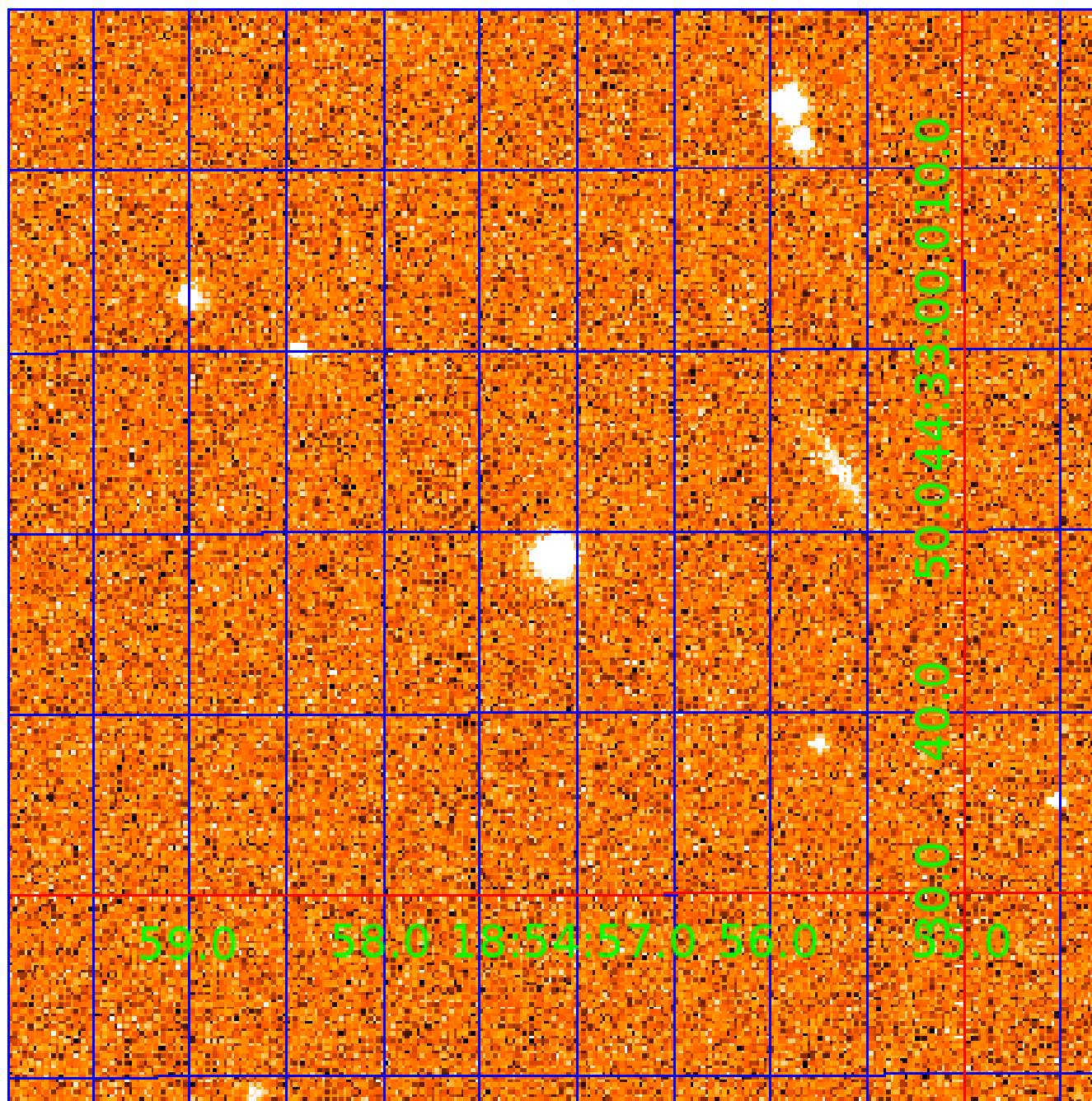


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008478373

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})
008478373-01	OBS	No	42.875124	169.034703	8483.7	1.430	9.3	9.6	1.11	6123	10.39	24.35
008478373-02	OBS	No	29.739547	152.476924	2115.8	4.530	9.5	4.7	1.11	6123	5.19	39.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008478373-01	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008478373-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

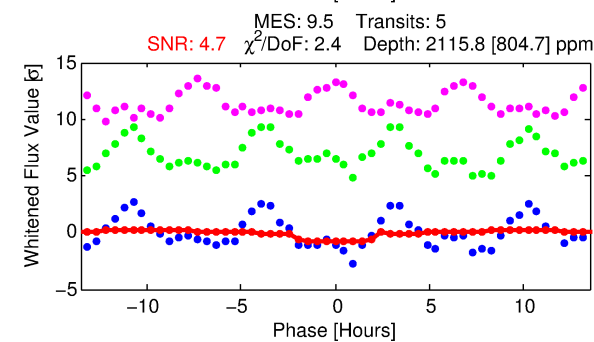
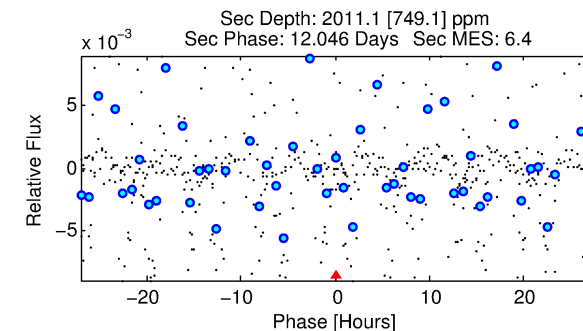
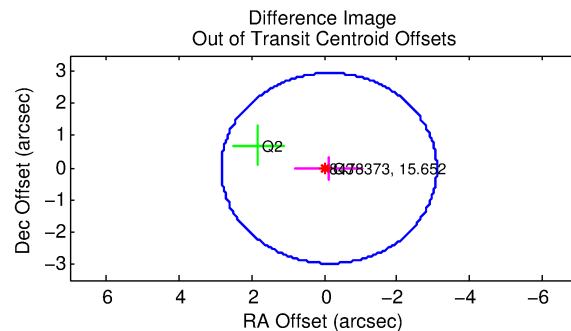
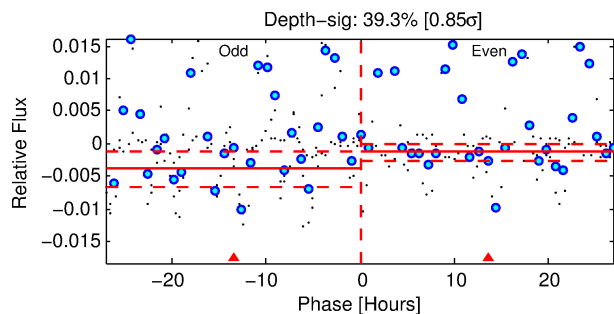
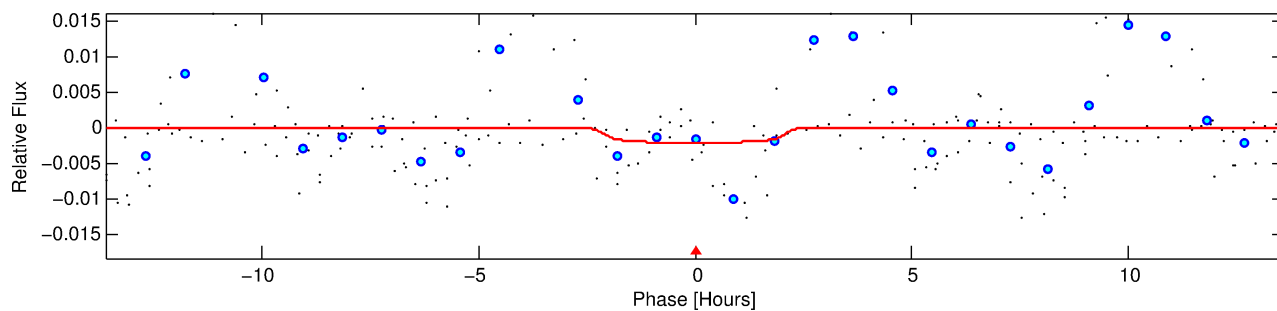
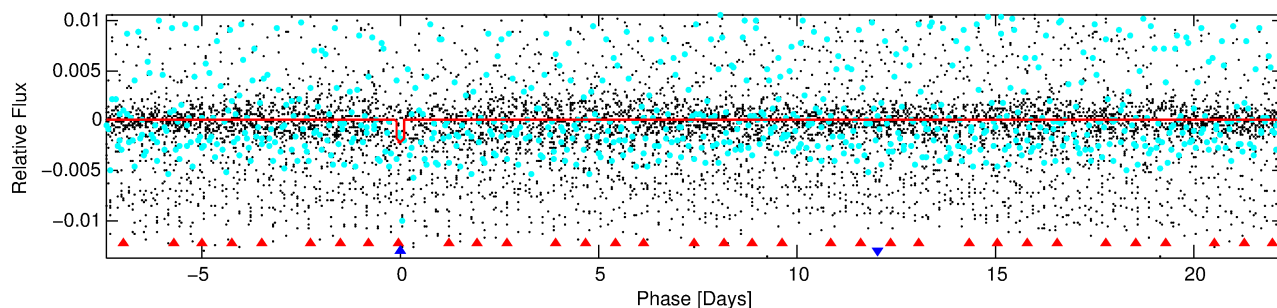
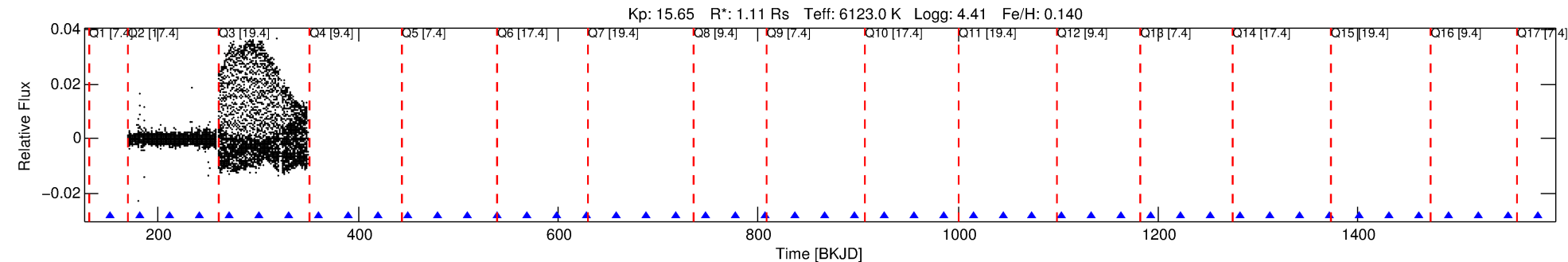
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008478373-02

No Significant Match Found

DV One-Page Summary

KIC: 8478373 Candidate: 2 of 2 Period: 29.740 d



DV Fit Results:

Period = 29.73955 [0.01103] d
Epoch = 152.4769 [0.0374] BKJD
Rp/R* = 0.0430 [0.0985]
a/R* = 47.22 [506.98]
b = 0.45 [19.19]
Seff = 39.66 [17.26]
Teq = 640 [70] K
Rp = 5.19 [12.03] Re
a = 0.1973 [0.0554] AU
Ag = 1596.59 [7368.56] [0.22 σ]
Teffp = 6254 [7193] K [0.78 σ]

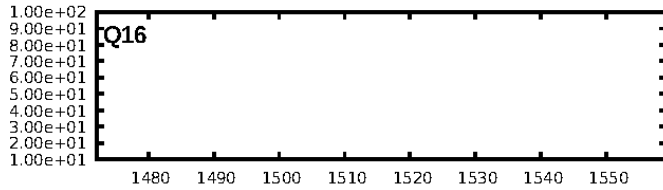
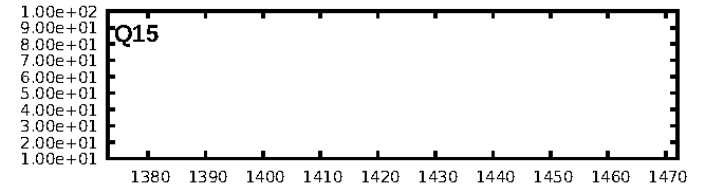
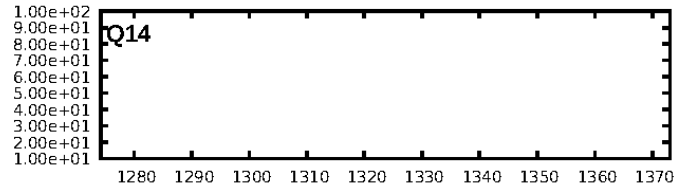
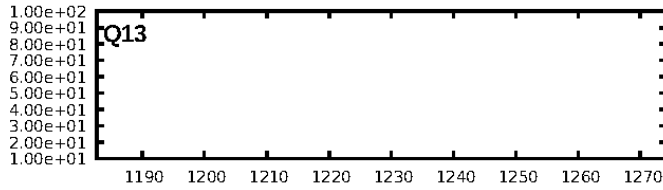
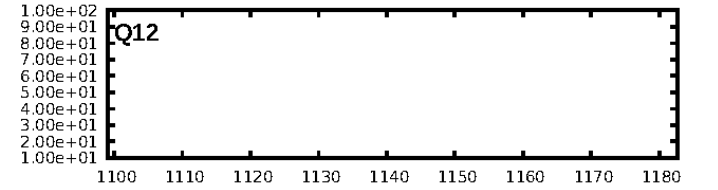
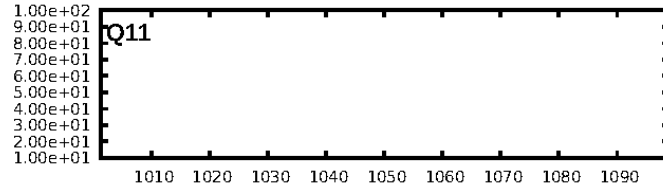
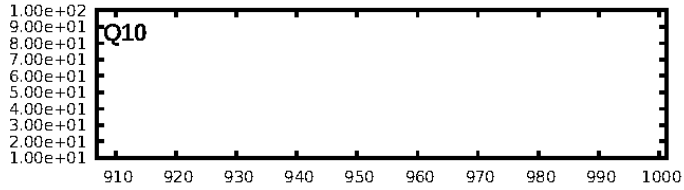
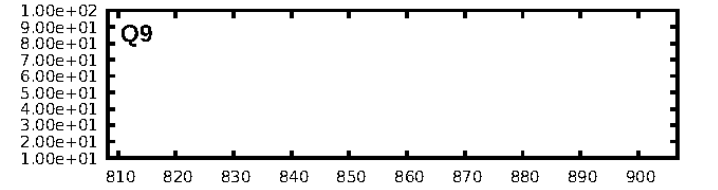
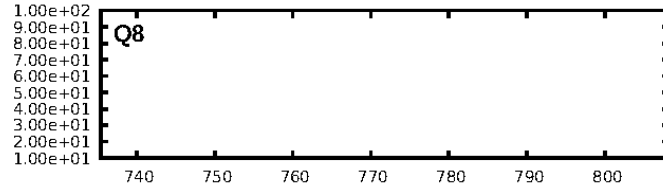
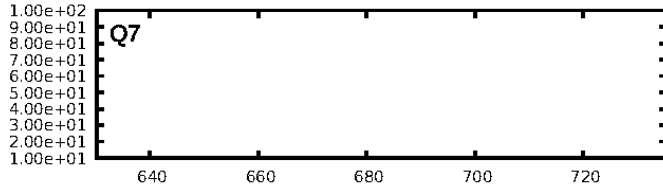
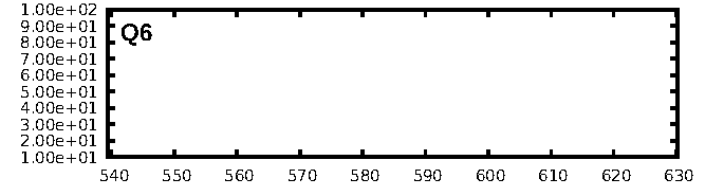
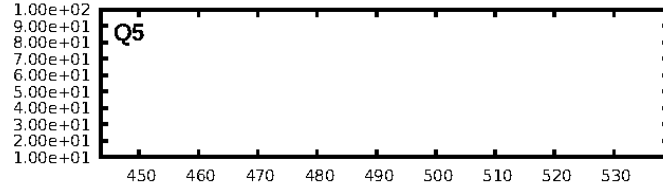
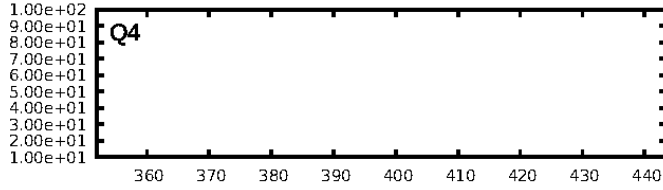
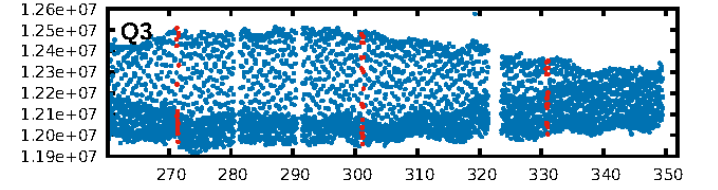
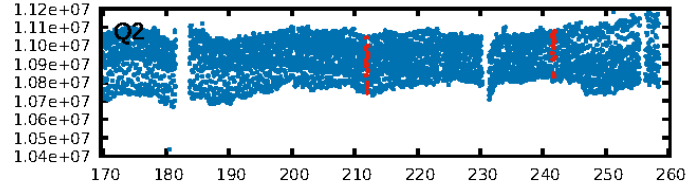
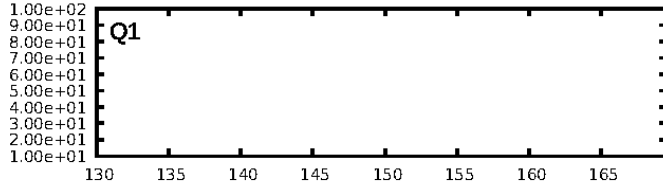
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [66.37 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 87.6%
Bootstrap-pfa: 3.71e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -2.7
Centroid-sig: N/A
Centroid-so: 0.759 arcsec [1.02 σ]
OotOffset-rm: 0.136 arcsec [0.14 σ]
KicOffset-rm: 0.239 arcsec [0.61 σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

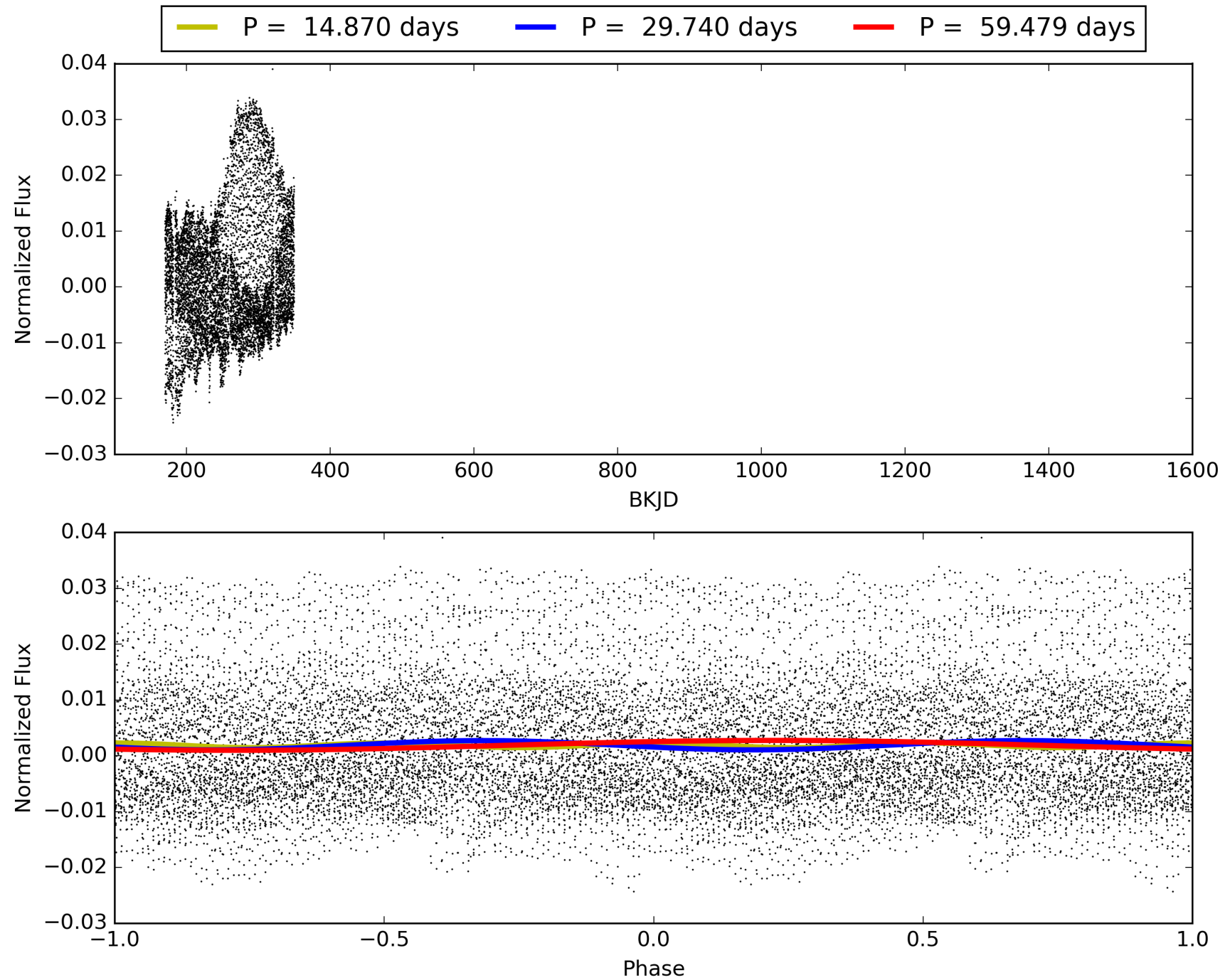
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 07:17:37 Z

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

TCE 008478373-02, PDC Light Curves

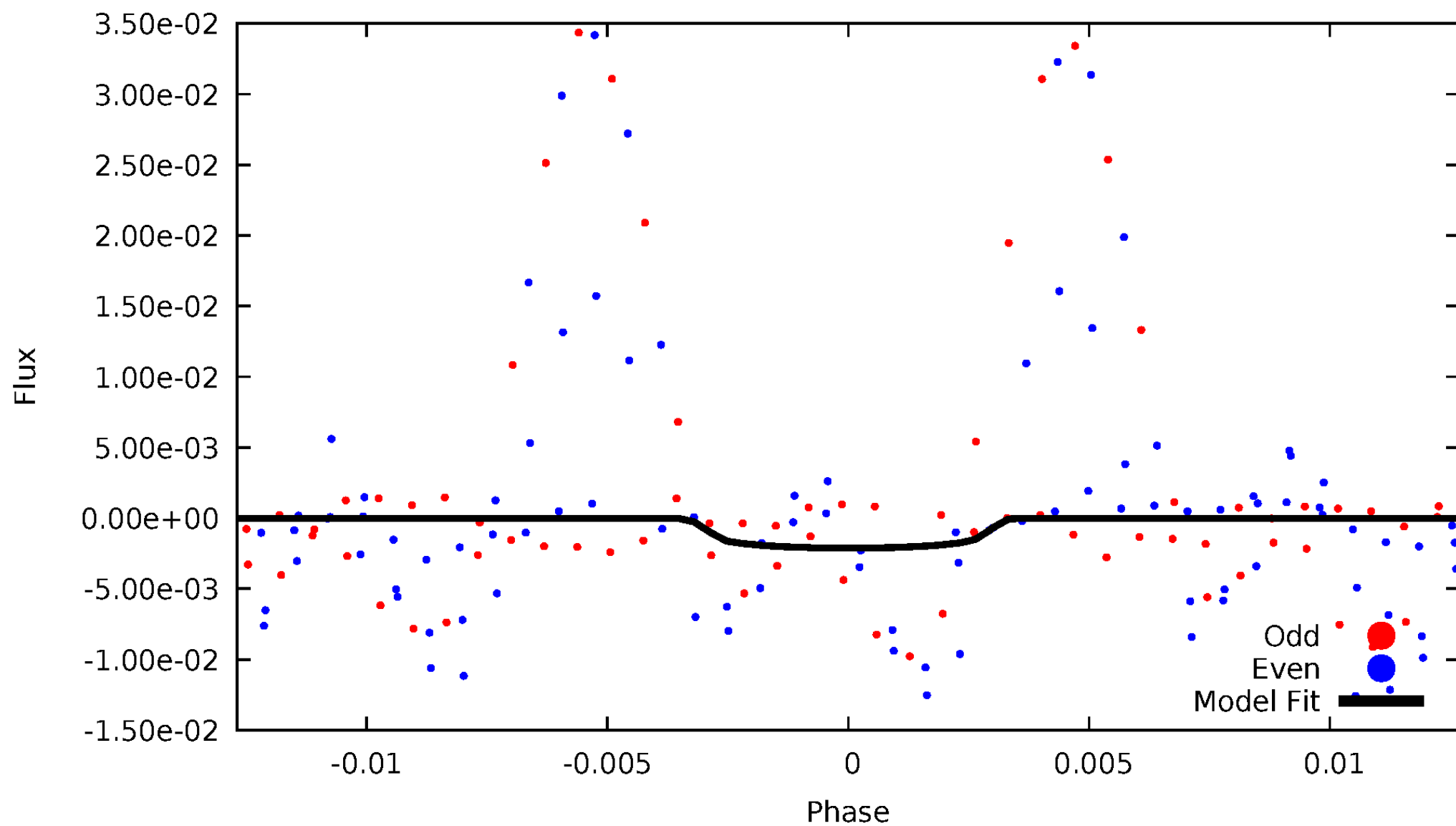


TCE 008478373-02



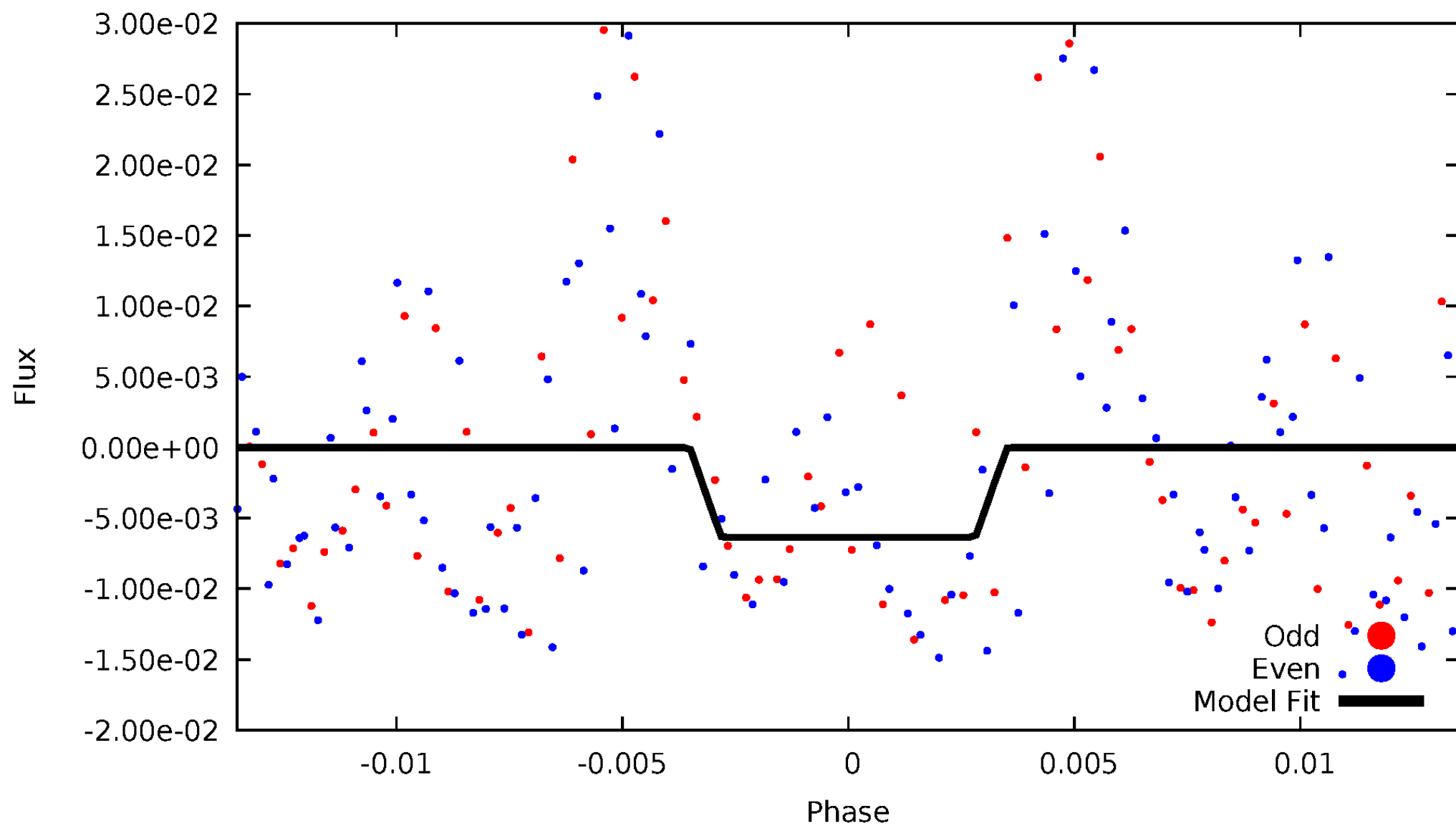
DV Odd/Even

TCE 008478373-02



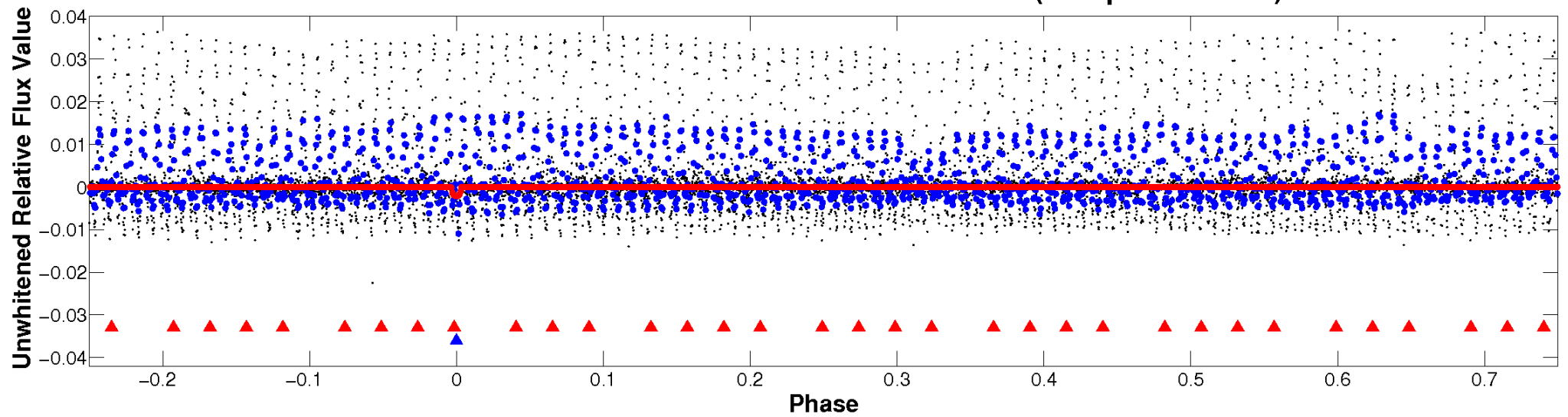
ALT Odd/Even

TCE 008478373-02

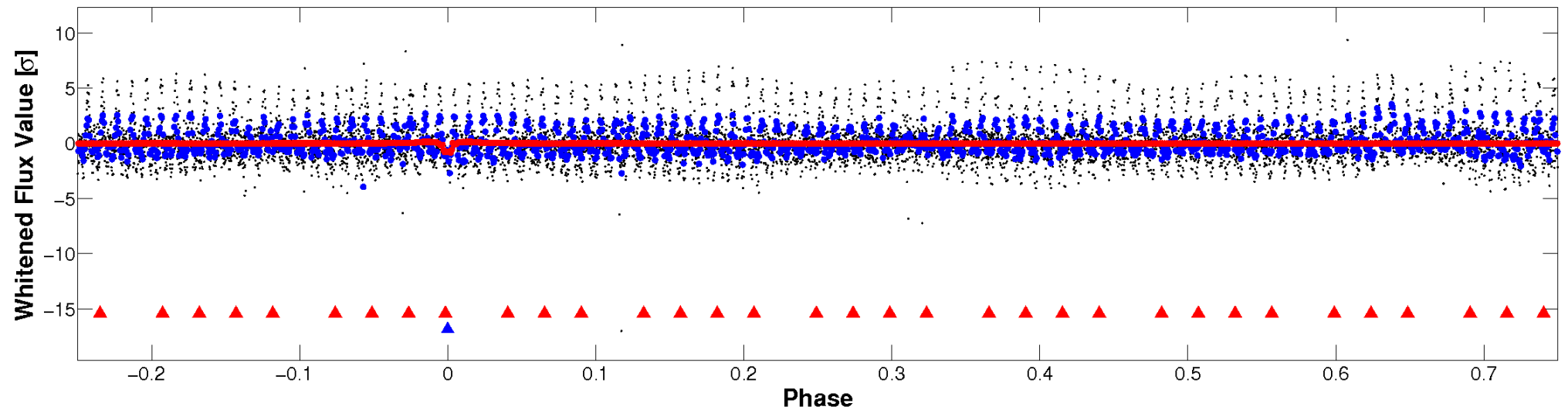


Non-Whitened Vs. Whitened Light Curve

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

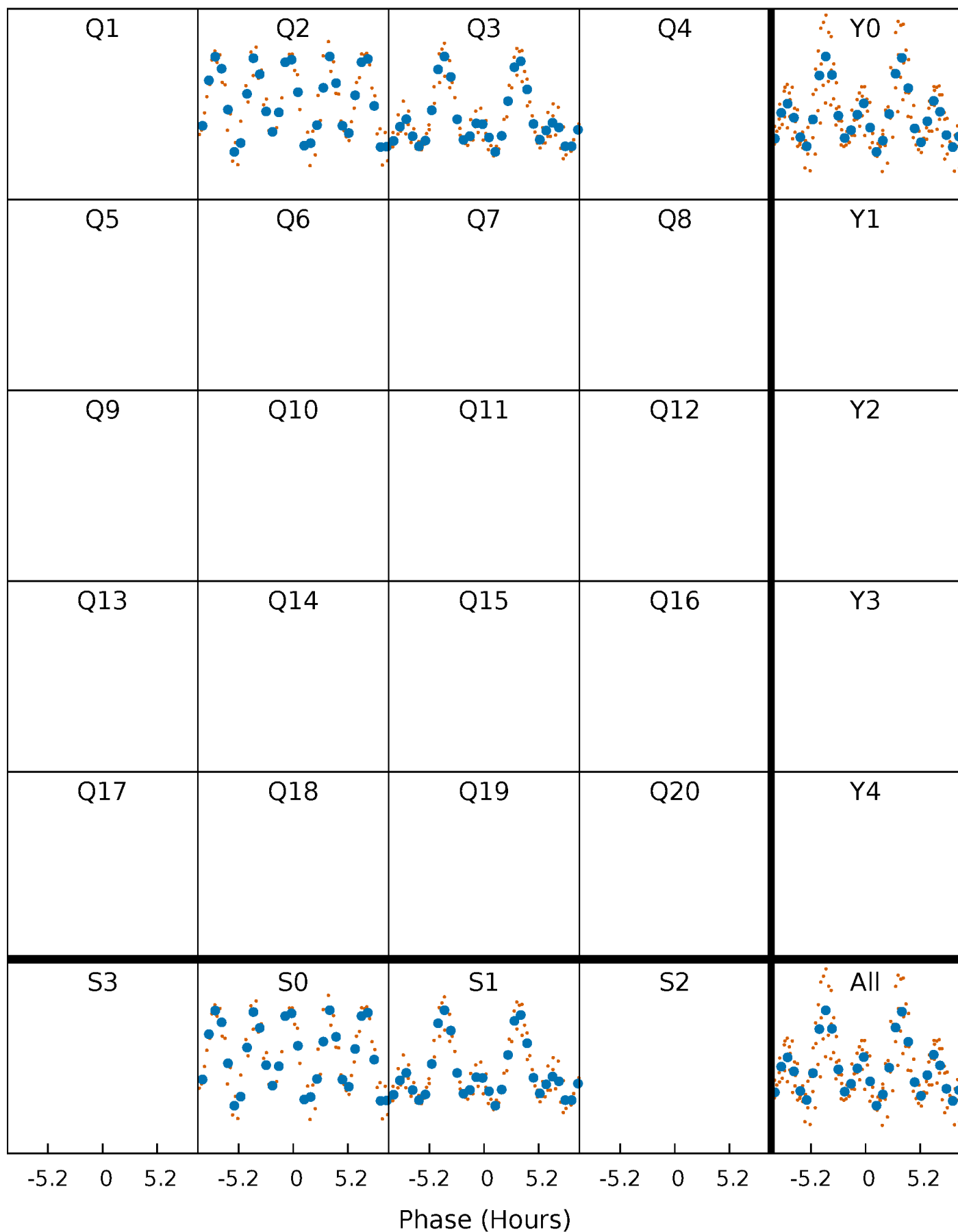


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



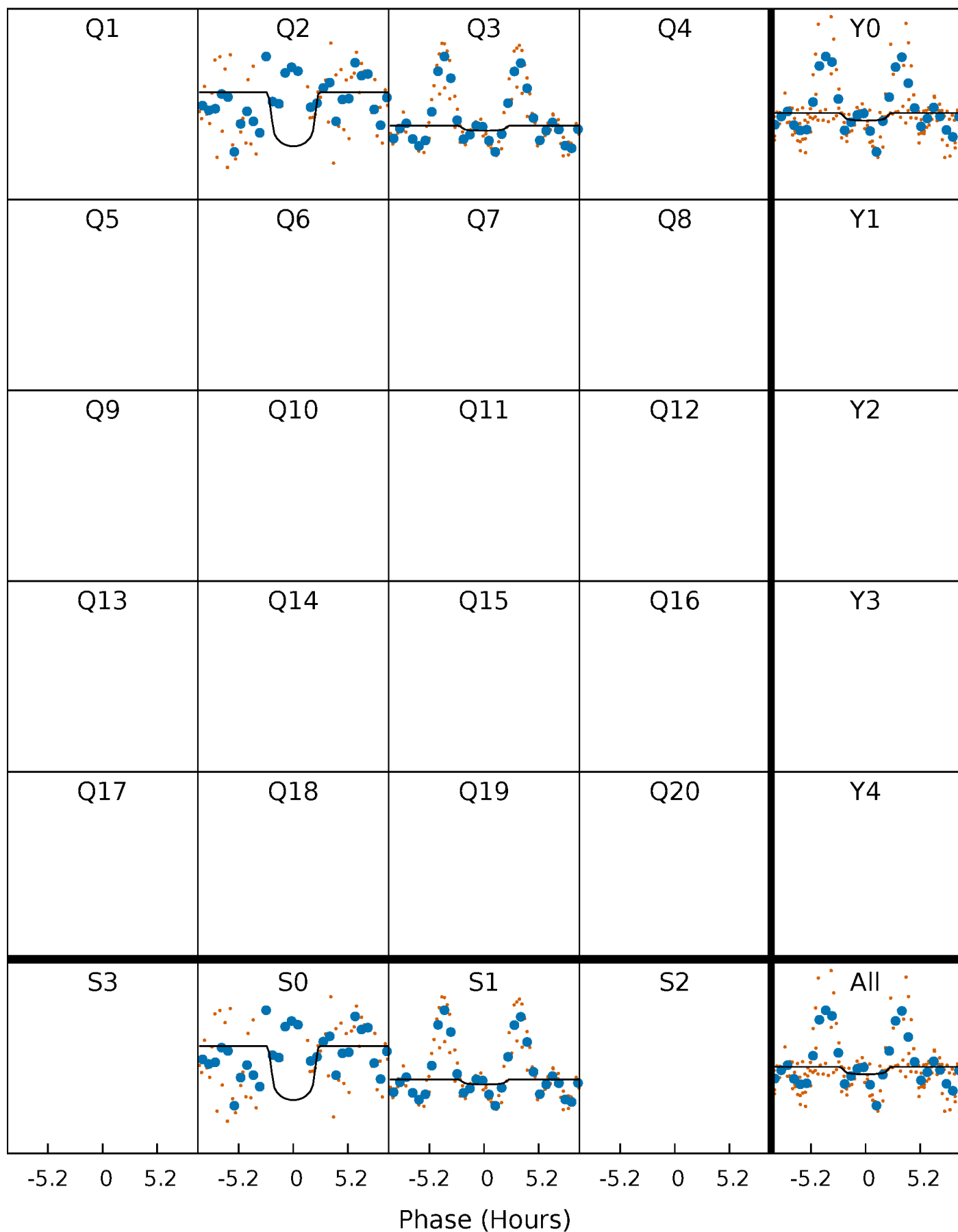
PDC Quarter-Phased Transit Curves

TCE 008478373-02 $P = 29.739547$ Days $T_0 = 152.476924$ (BKJD)



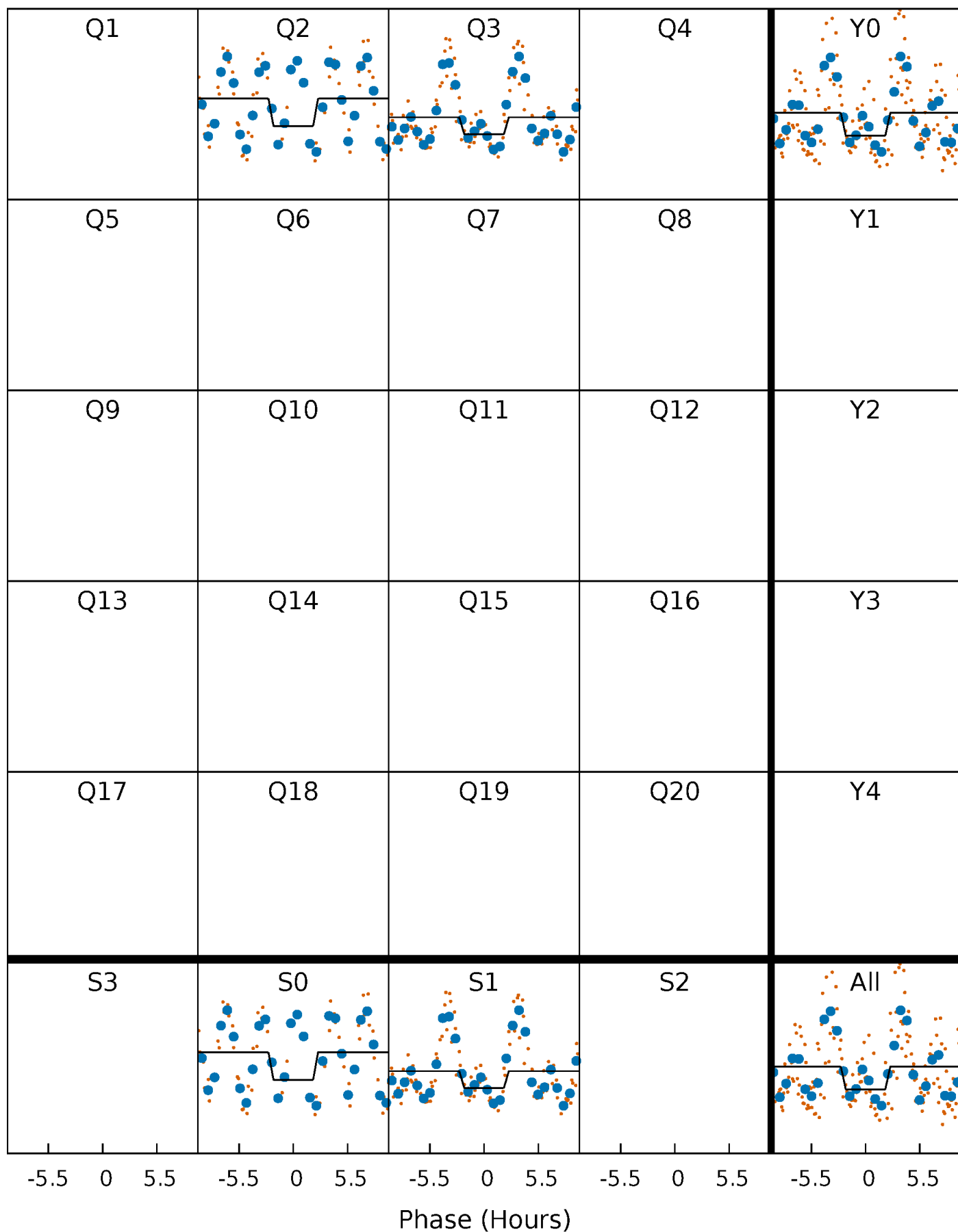
DV Quarter-Phased Transit Curves

TCE 008478373-02 $P = 29.739547$ Days $T_0 = 152.476924$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

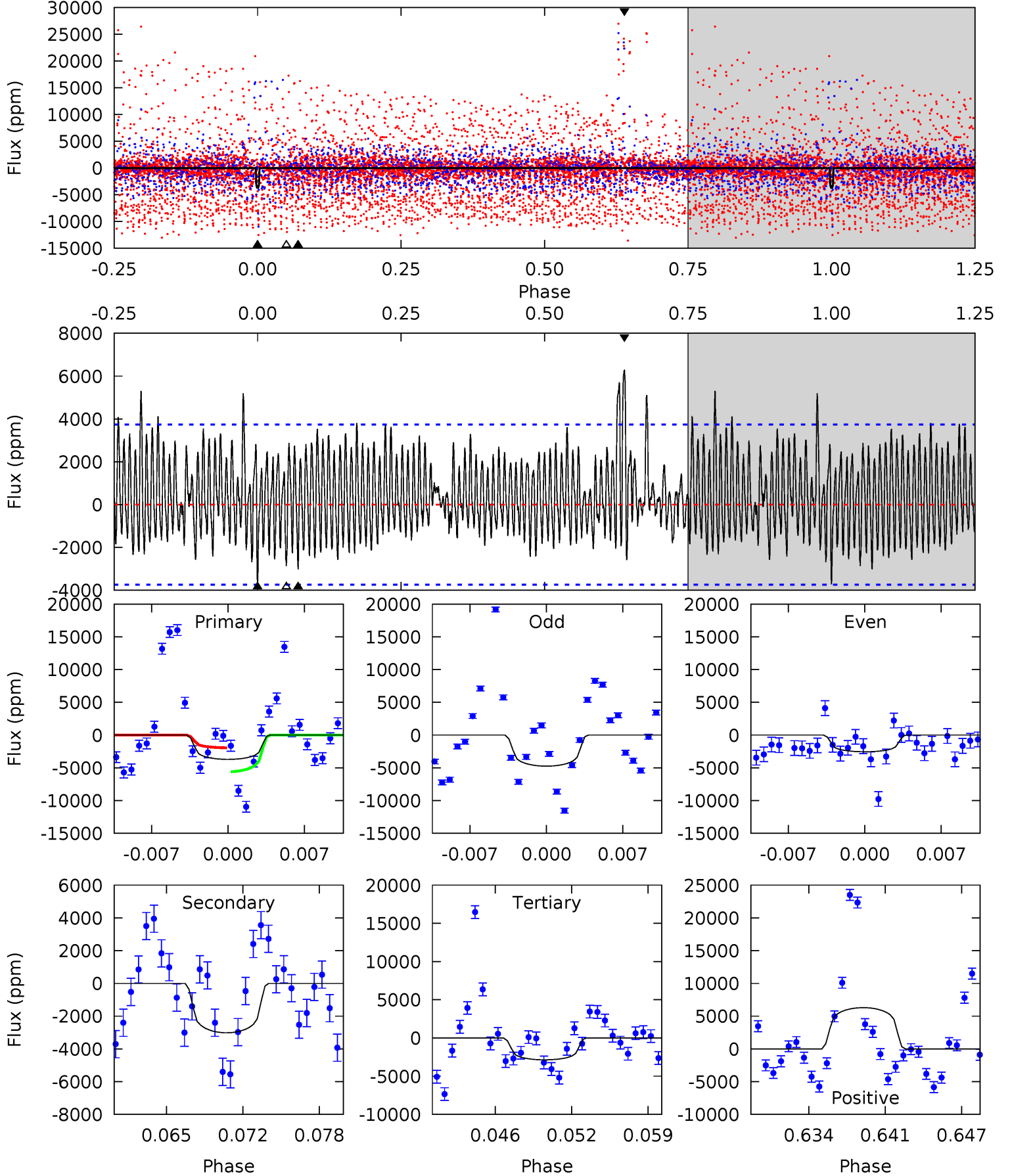
TCE 008478373-02 $P = 29.746057$ Days $T_0 = 152.438966$ (BKJD)



DV Model-Shift Uniqueness Test

008478373-02, P = 29.739547 Days, E = 152.476924 Days

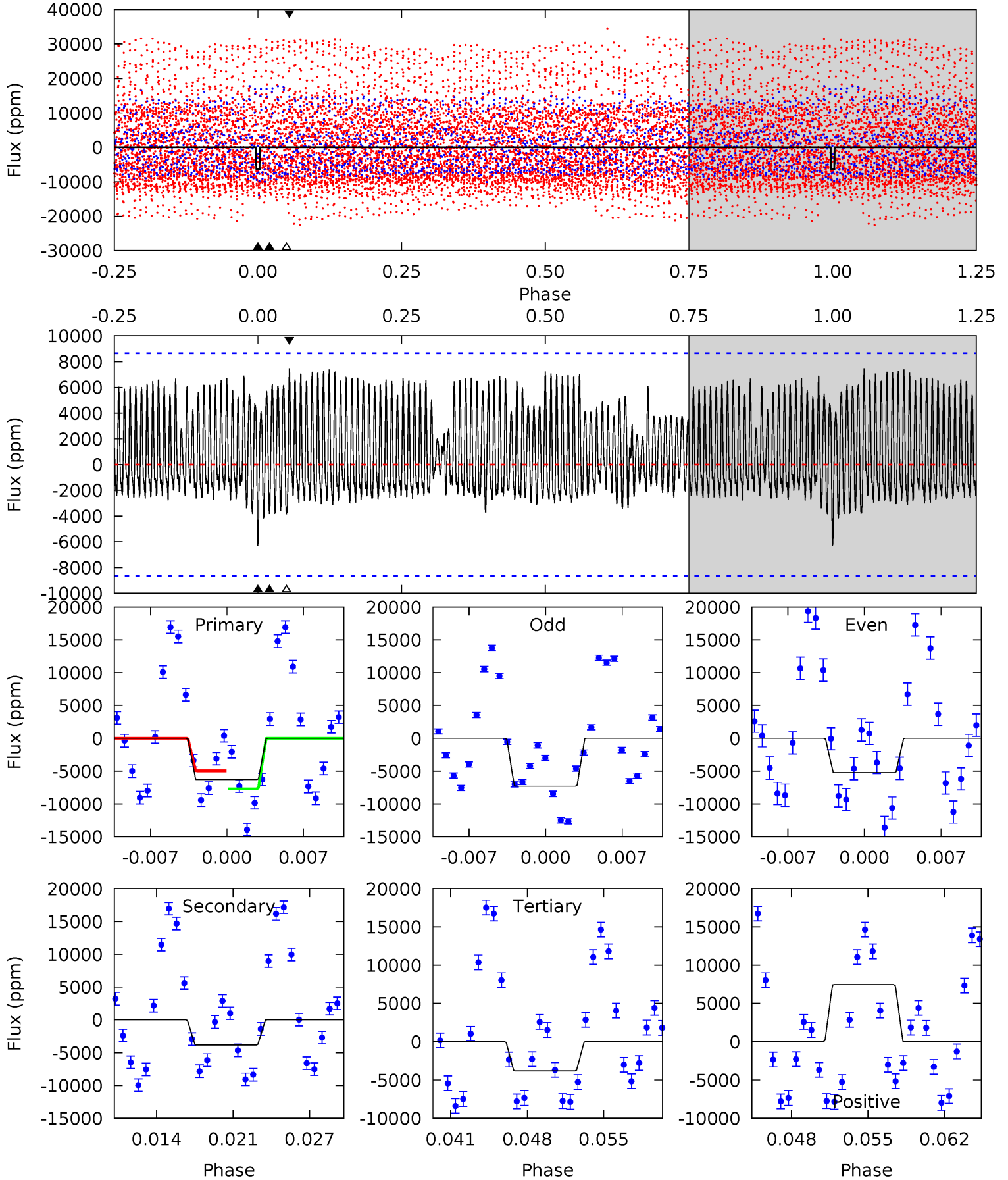
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.07	4.11	3.90	8.59	5.11	2.72	2.06	1.17	-3.52	0.21	-4.48	1.18	0.67	0.63	2.56



Alt Model-Shift Uniqueness Test

008478373-02, P = 29.746057 Days, E = 152.438966 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.72	2.26	2.24	4.40	5.10	2.70	1.70	1.48	-0.68	0.02	-2.15	0.60	0.90	0.54	0.80



Stellar Parameters For KIC 008478373

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6123^{+190}_{-253}	$4.413^{+0.072}_{-0.217}$	$0.140^{+0.200}_{-0.300}$	$1.107^{+0.375}_{-0.150}$	$1.159^{+0.151}_{-0.166}$	$1.202^{+0.379}_{-0.677}$
	+3%/-4%	+2%/-5%	+143%/-214%	+34%/-14%	+13%/-14%	+31%/-56%
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 008478373-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3016 ± 733	$10.94^{+11.10}_{-7.62}$	907^{+74}_{-52}	4930^{+4003}_{-1158}	546^{+4770}_{-420}
Alt.	-3827 ± 1696	$13.52^{+11.42}_{-8.58}$	918^{+77}_{-56}	4673^{+3074}_{-962}	415^{+2612}_{-309}

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 $A_{obs} \gg 1.0$

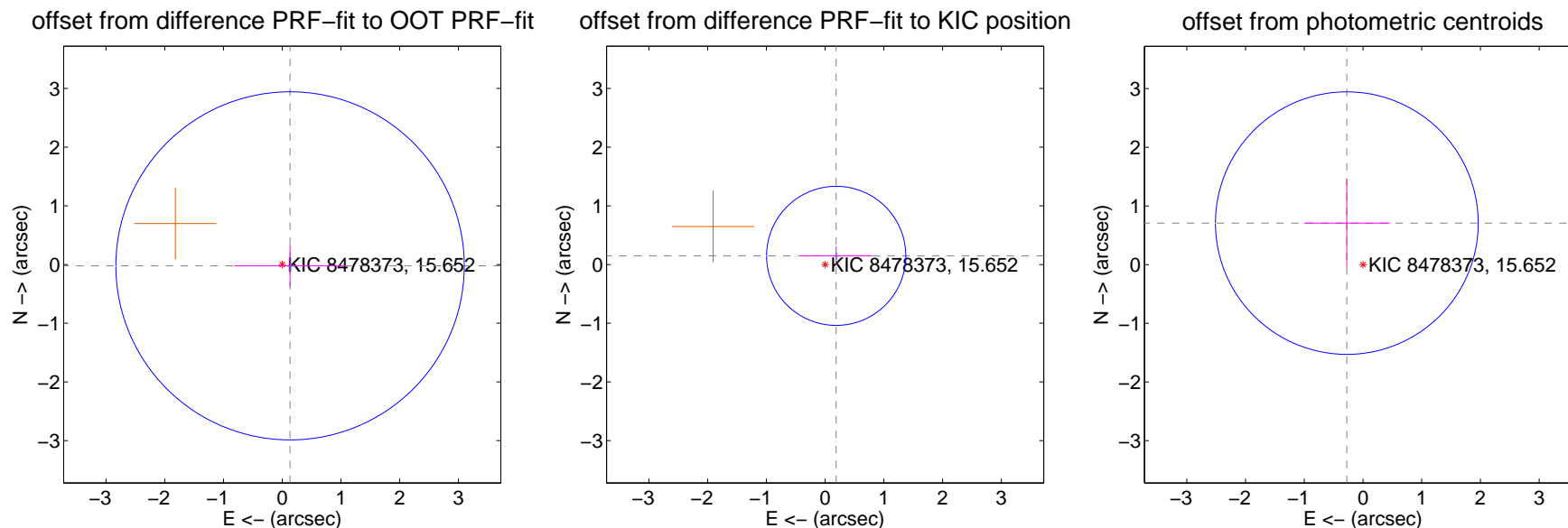
DV Centroid Data

Supplemental centroid analysis for 008478373-02. Kepler magnitude: 15.65. Transit SNR 4.73

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.136 ± 0.988	0.14	-0.134 ± 0.944	-0.022 ± 0.354
PRF-fit source offset from KIC position	0.239 ± 0.395	0.61	-0.188 ± 0.613	0.148 ± 0.160
photometric centroid source offset	0.76 ± 0.75	1.02	0.28 ± 0.73	0.71 ± 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.

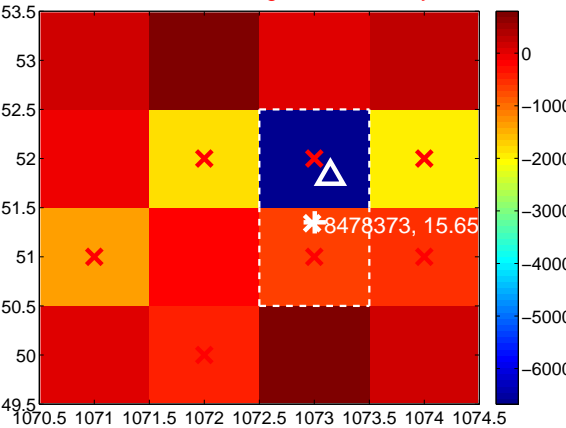
Q1 no difference image



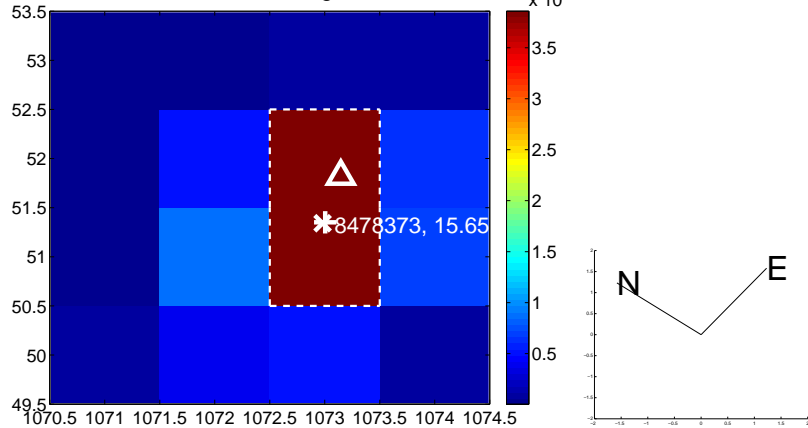
Q1 no OOT image



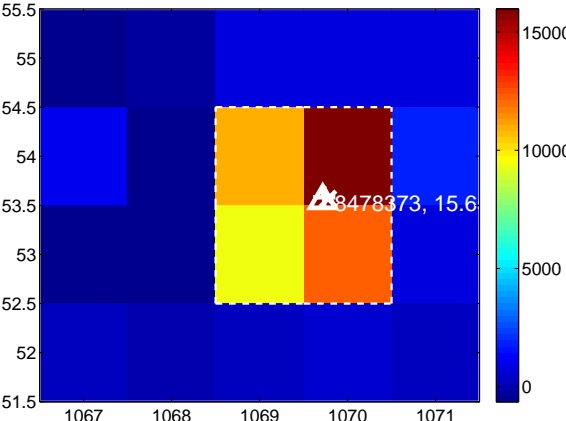
Q2 difference image. Poor Quality



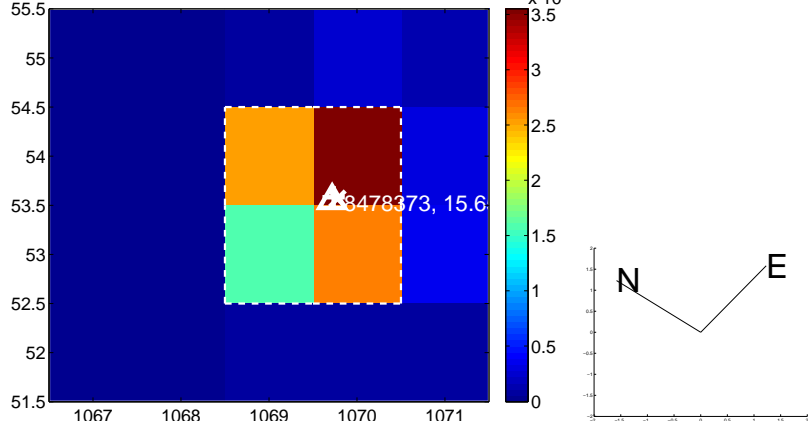
Q2 OOT image



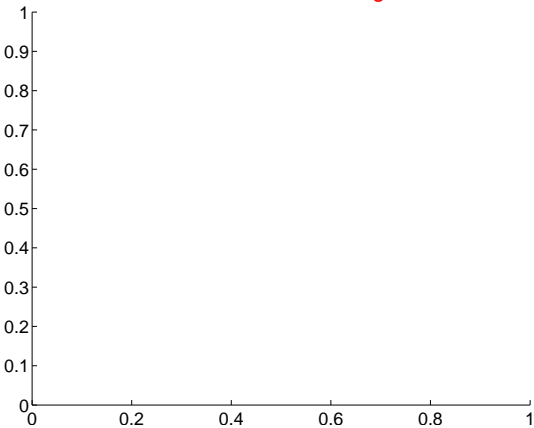
Q3 difference image



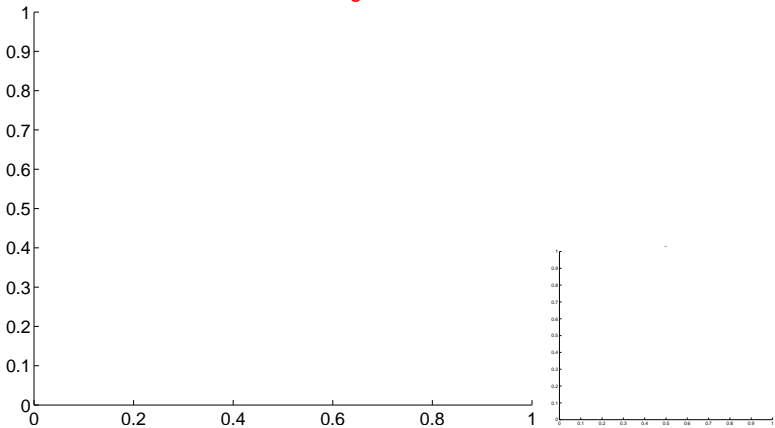
Q3 OOT image



Q4 no difference image



Q4 no OOT image



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



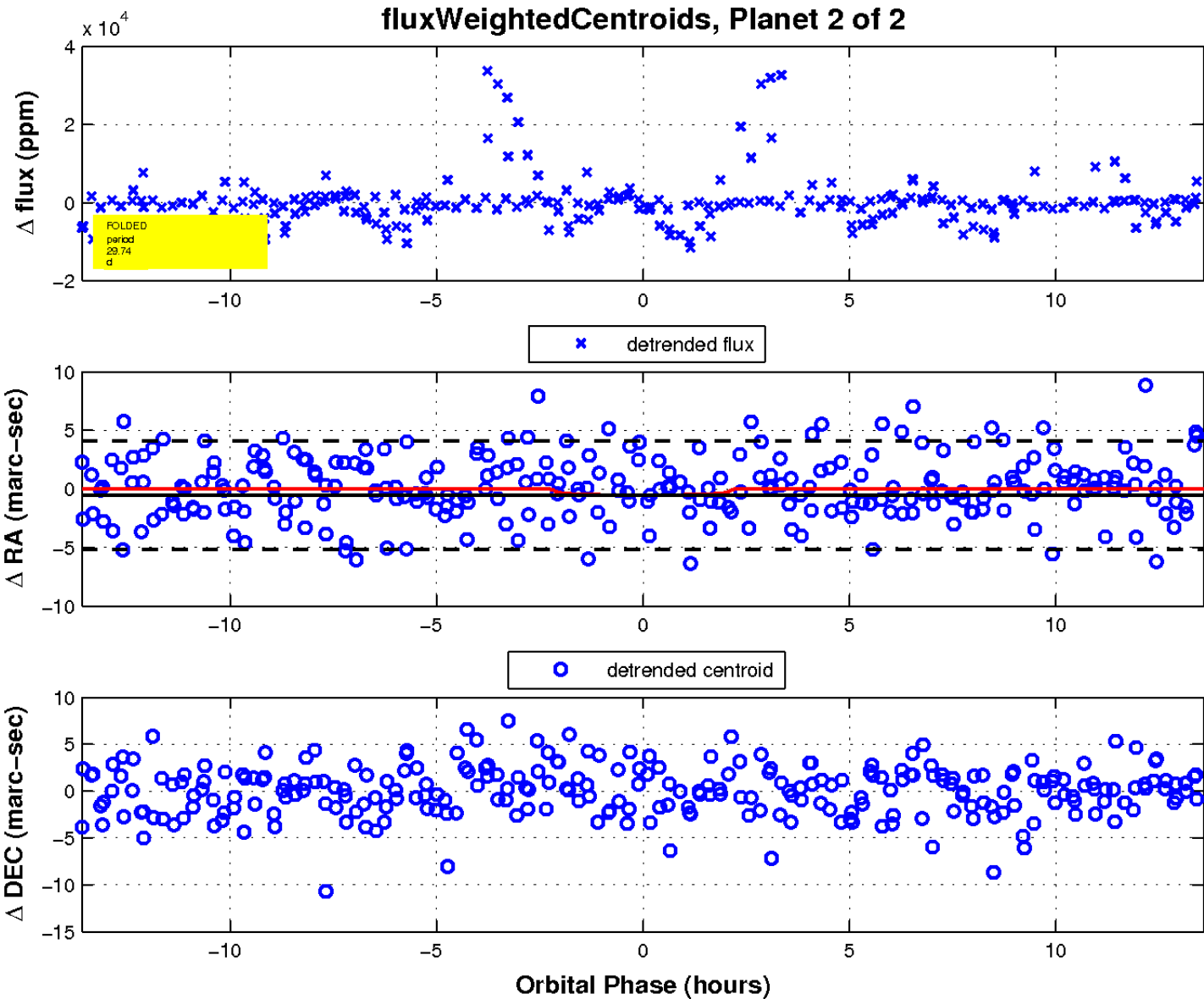
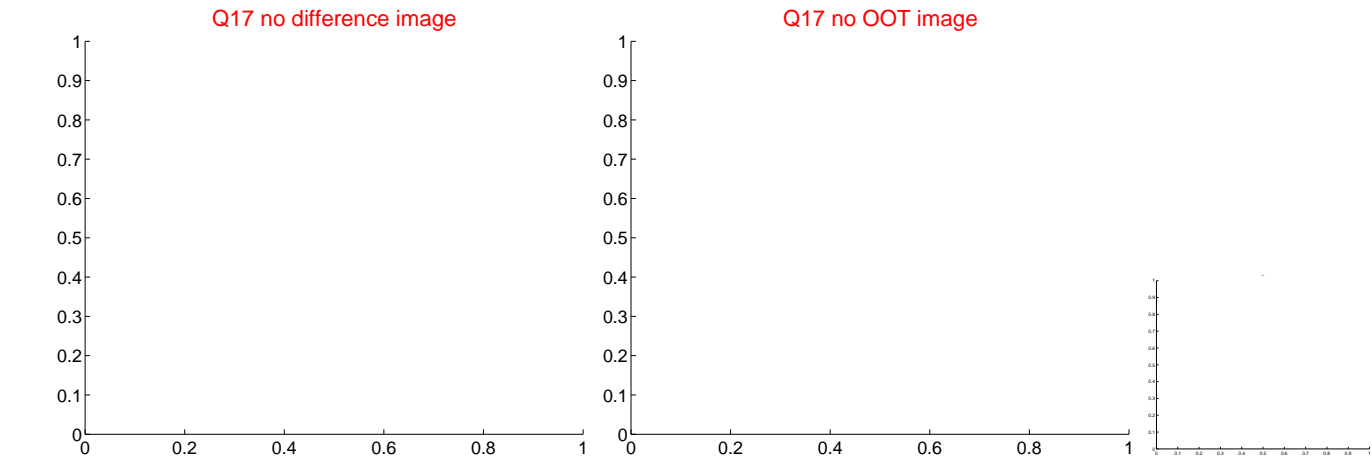
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

