

KIC 006228703

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})
006228703-01	OBS	6678.01	4.200208	134.657790	49085.7	5.583	16217.4	9006.3	1.92	6873	72.37	2156.61
006228703-02	OBS	No	432.243121	269.154930	703.6	11.245	22.8	12.1	1.92	6873	9.63	4.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006228703-01	OBS	FP	0.00	0	1	0	0	DEPTH_ODDEVEN_DV—DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED
006228703-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

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

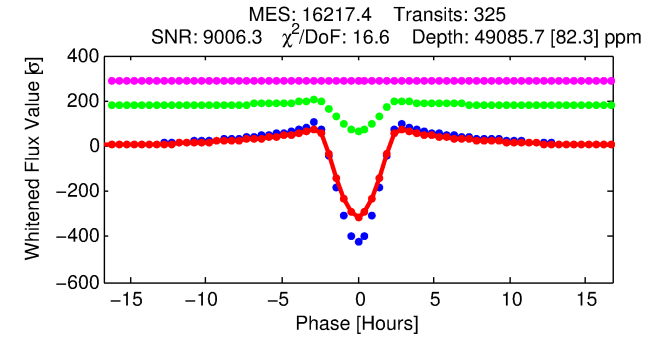
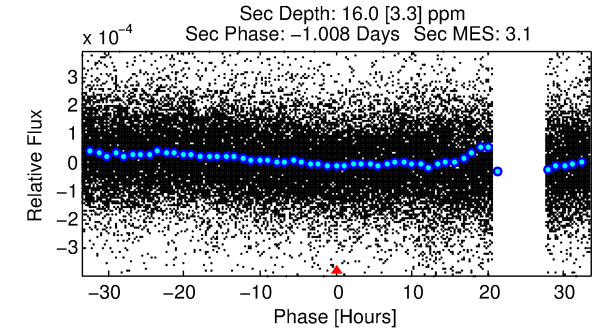
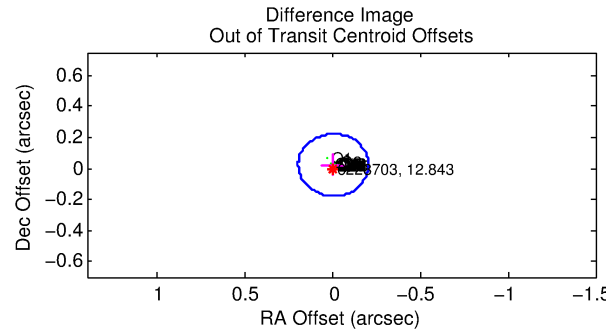
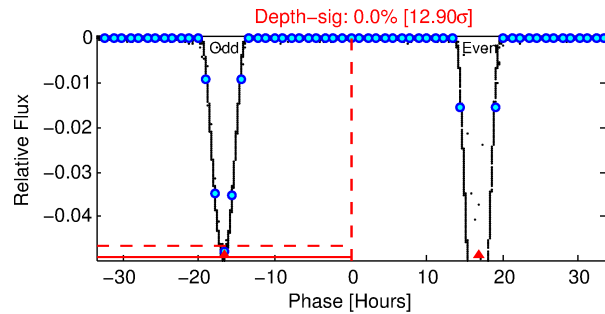
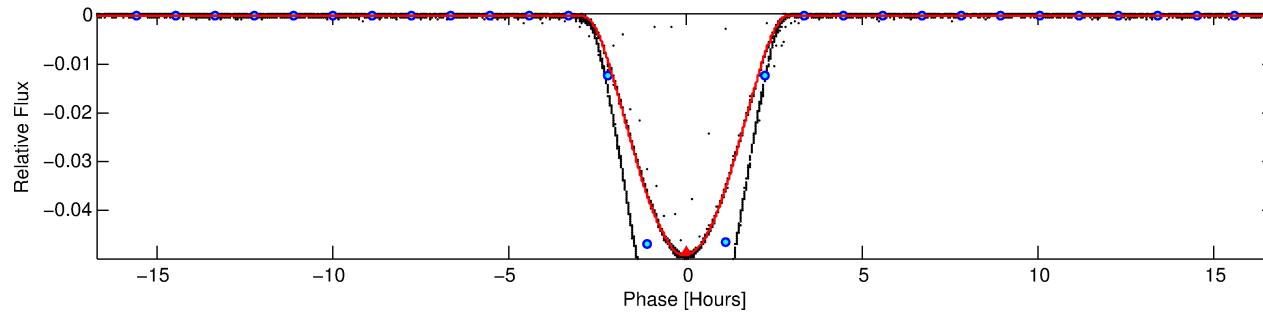
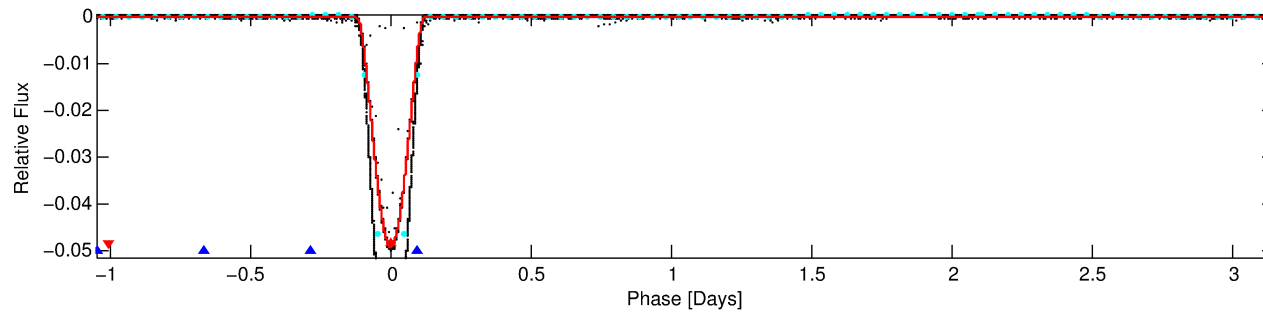
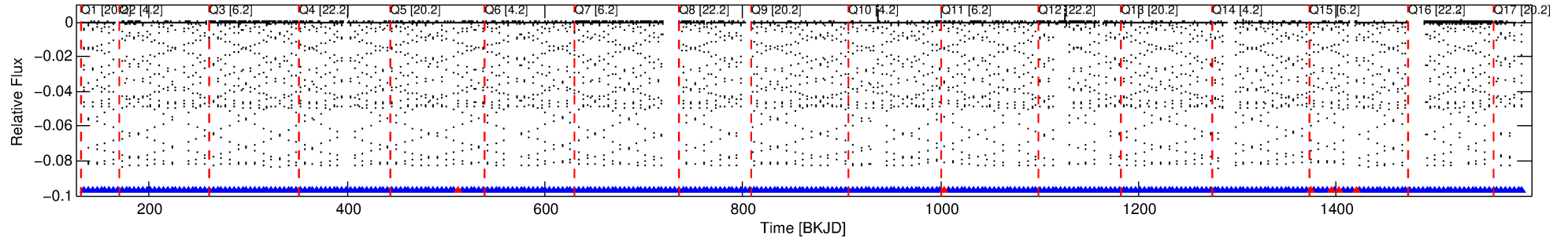
Ephemeris Match Information For 006228703-01

No Significant Match Found

DV One-Page Summary

KIC: 6228703 Candidate: 1 of 2 Period: 4.200 d
KOI: K06678.01 Corr: 0.991

Kp: 12.84 R*: 1.92 Rs Teff: 6873.0 K Logg: 4.05 Fe/H: 0.040



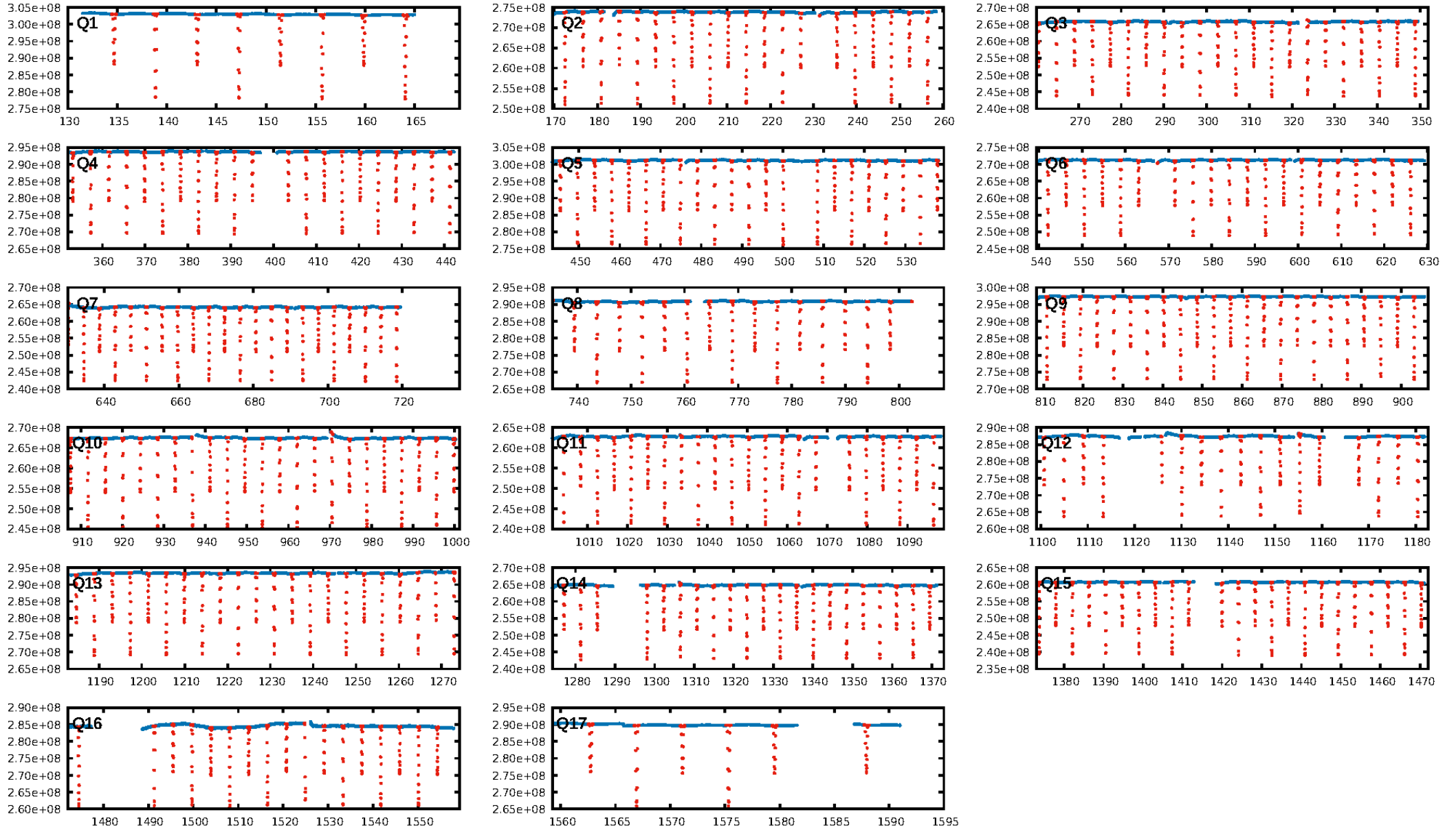
DV Fit Results:

Period = 4.20021 [0.00000] d
Epoch = 134.6578 [0.0000] BKJD
Rp/R* = 0.3449 [0.0099]
a/R* = 5.29 [0.00]
b = 1.00 [0.01]
Seff = 2156.61 [863.69]
Teq = 1738 [174] K
Rp = 72.37 [22.53] Re
a = 0.0586 [0.0149] AU
Ag = 0.01 [0.00] [-407.25σ]
Teffp = 741 [50] K [-5.50σ]

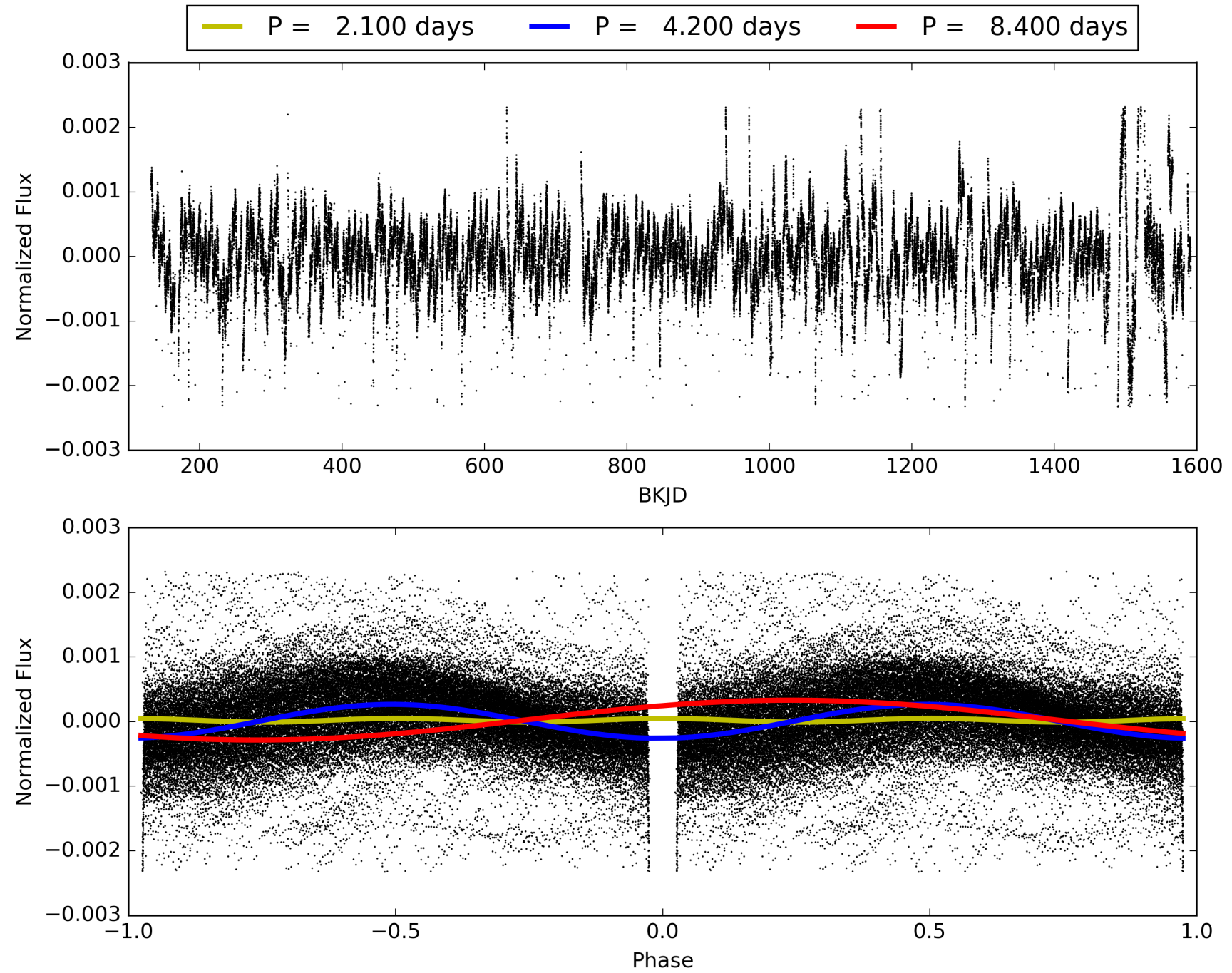
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [818.30σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.98 [305/311]
GhostDiagnostic-chr: 1.058
Centroid-sig: 0.0%
Centroid-so: 0.105 arcsec [148.89σ]
OotOffset-rm: 0.023 arcsec [0.34σ]
KicOffset-rm: 0.036 arcsec [0.53σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006228703-01, PDC Light Curves

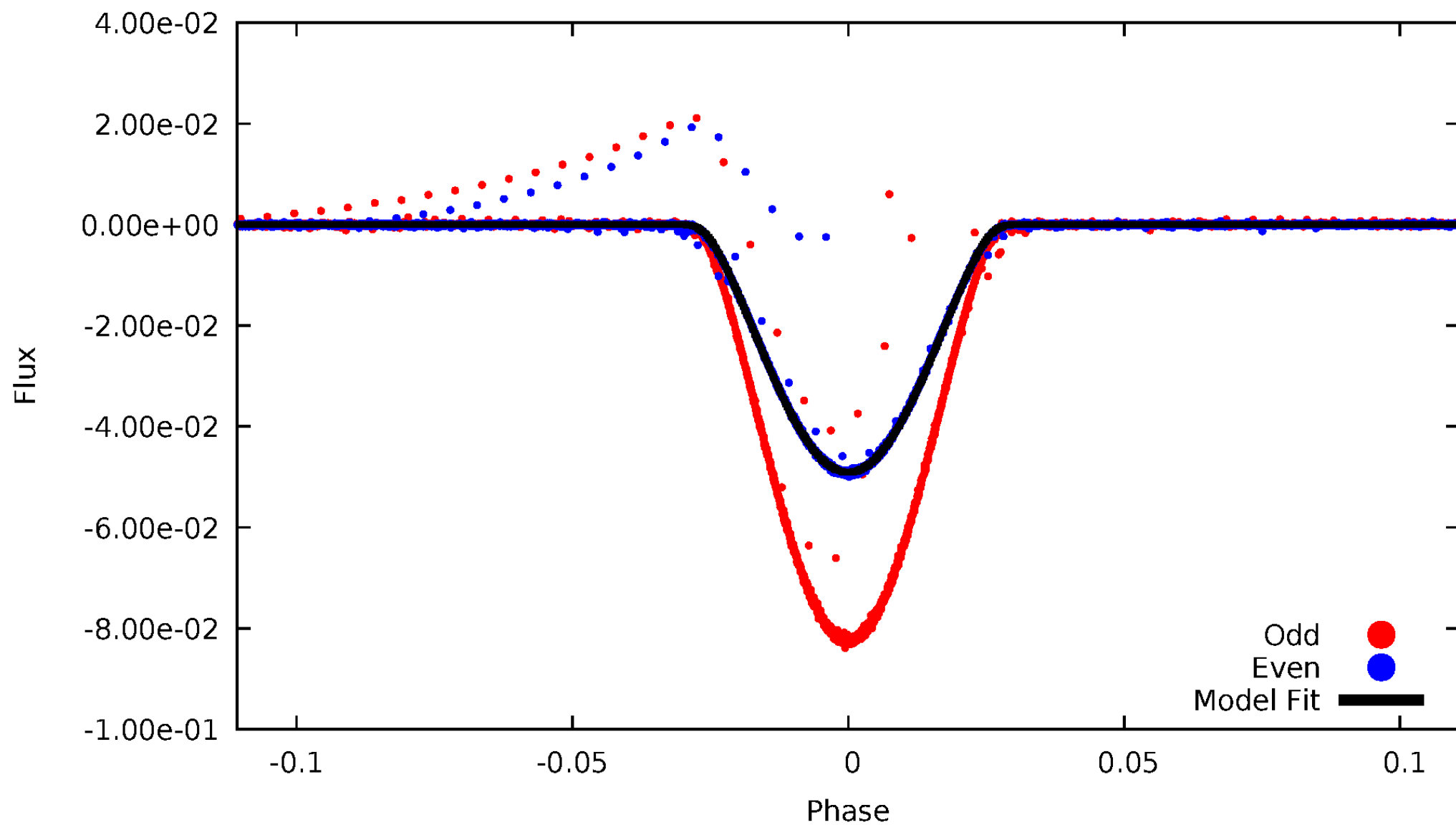


TCE 006228703-01



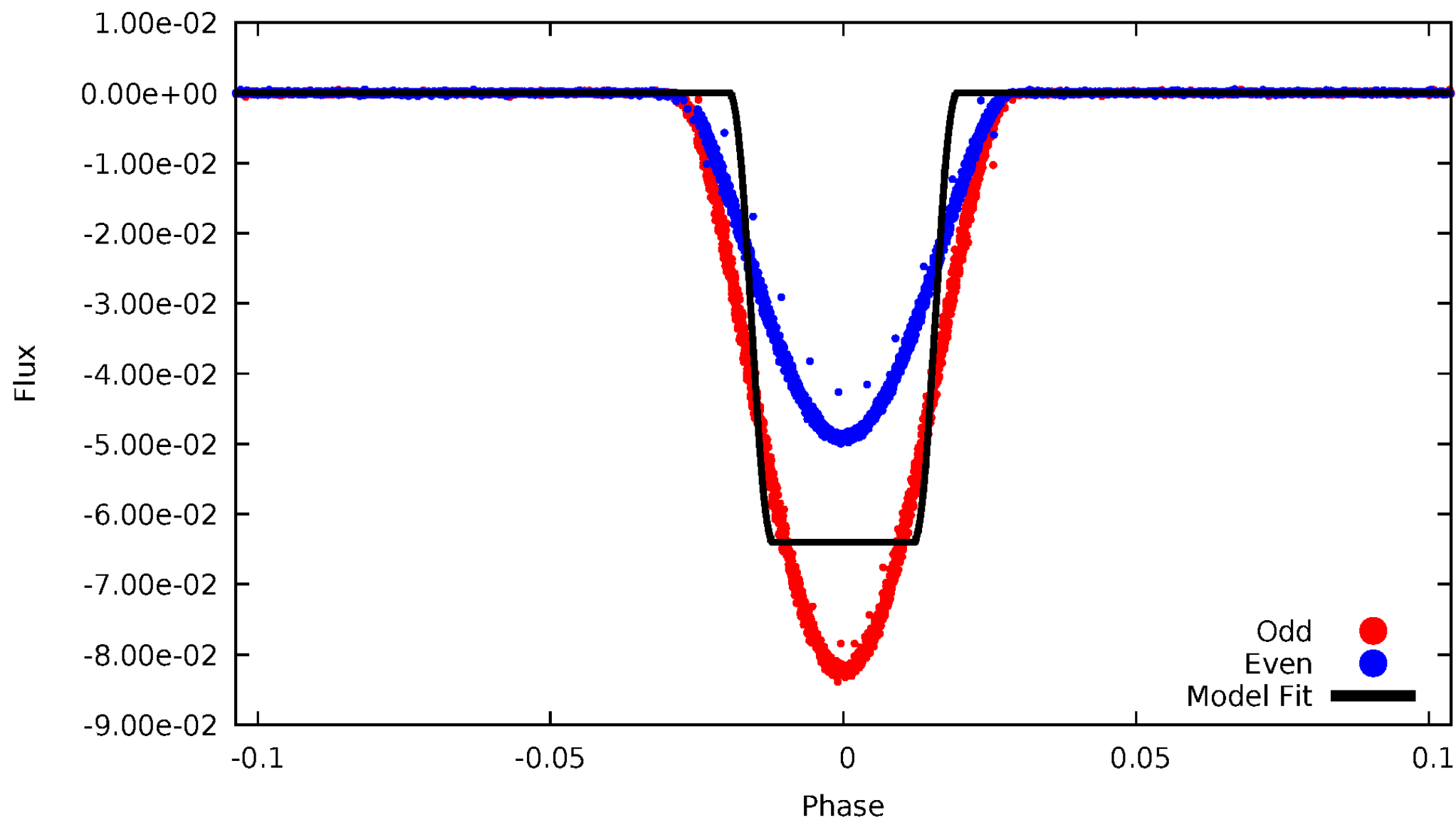
DV Odd/Even

TCE 006228703-01



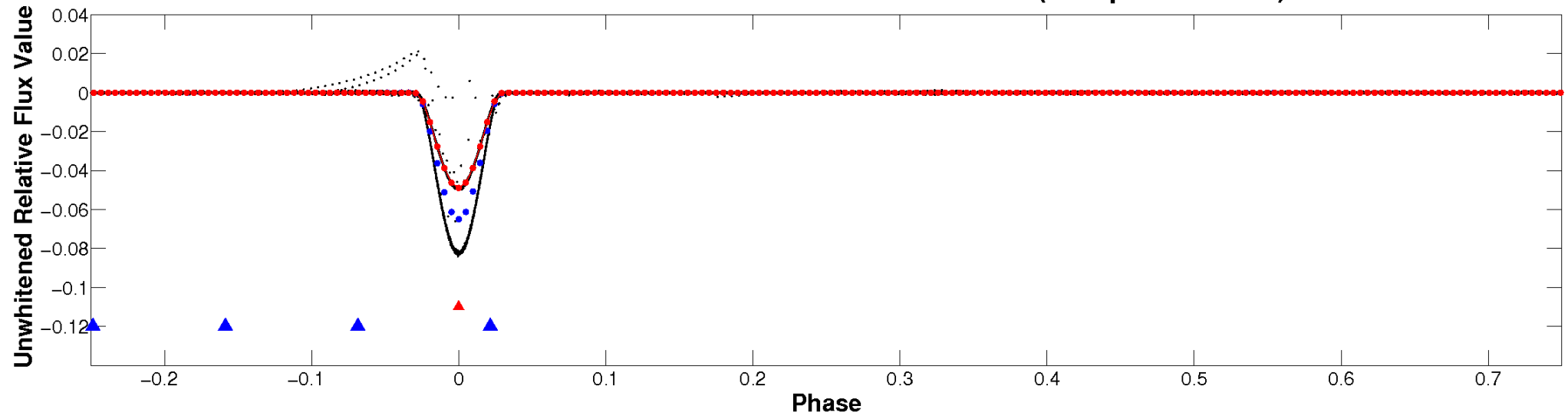
ALT Odd/Even

TCE 006228703-01

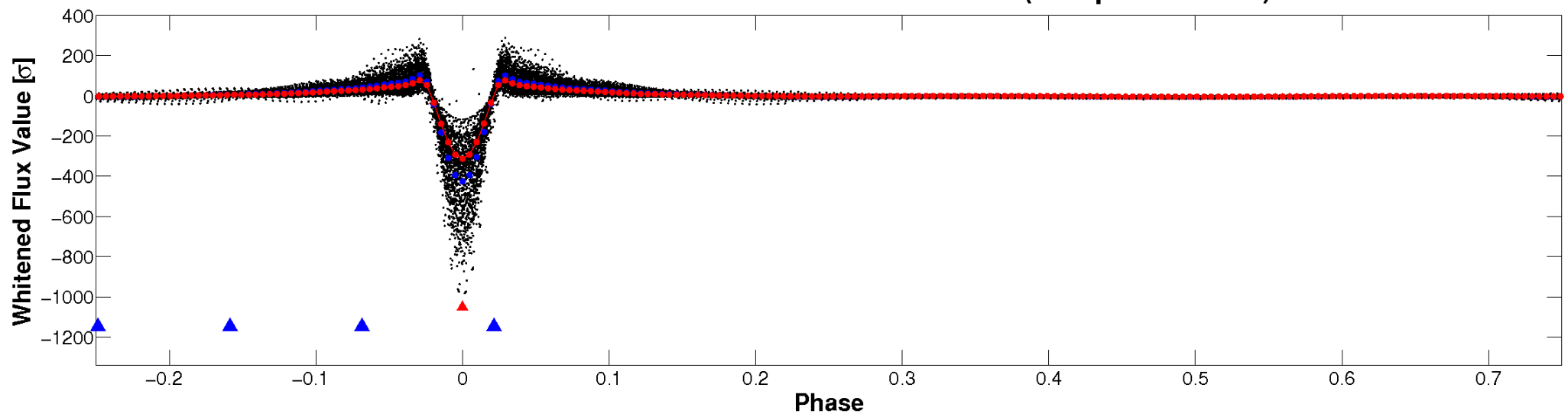


Non-Whitened Vs. Whitened Light Curve

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

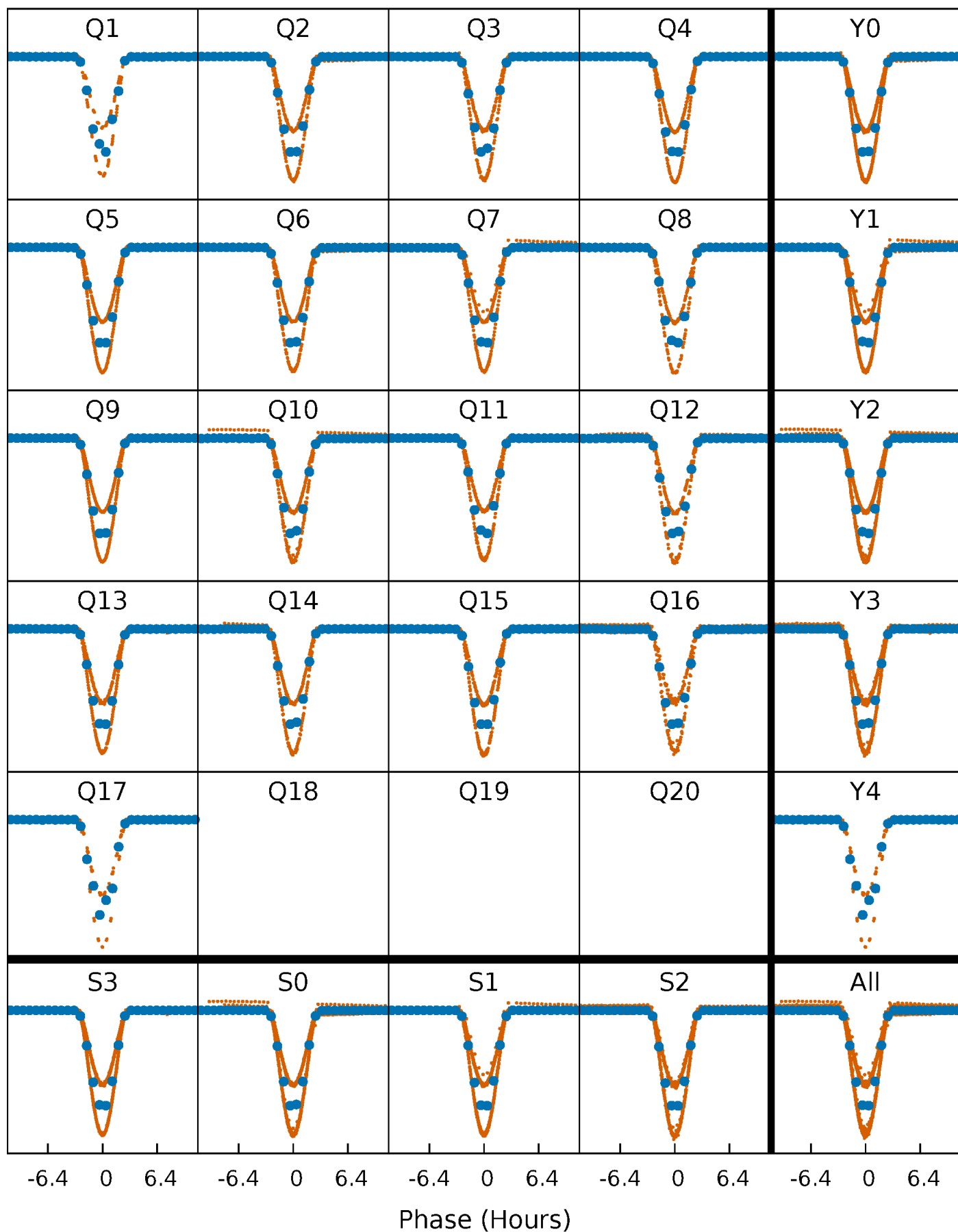


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



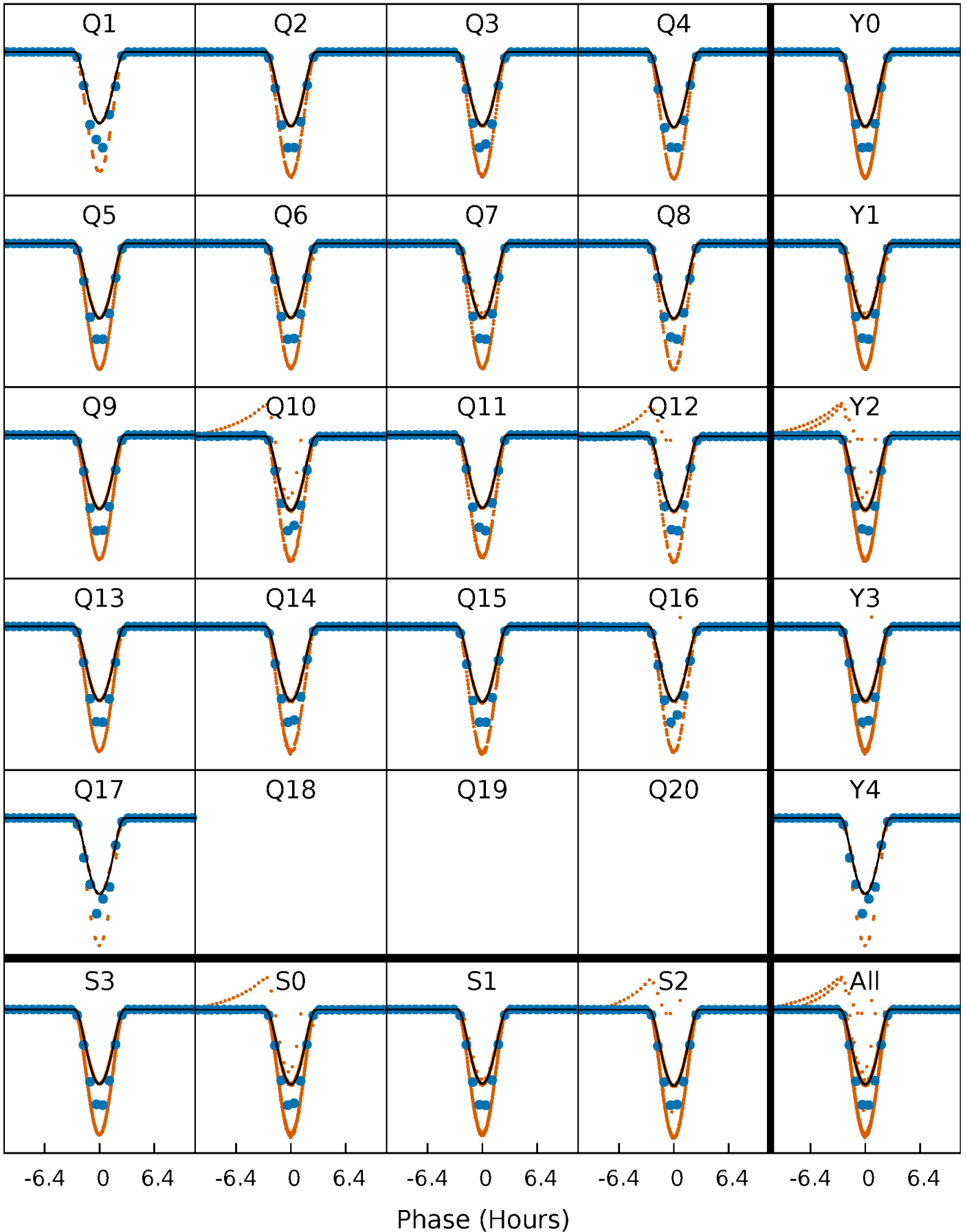
PDC Quarter-Phased Transit Curves

TCE 006228703-01 P= 4.200208 Days $T_0=134.657790$ (BKJD)



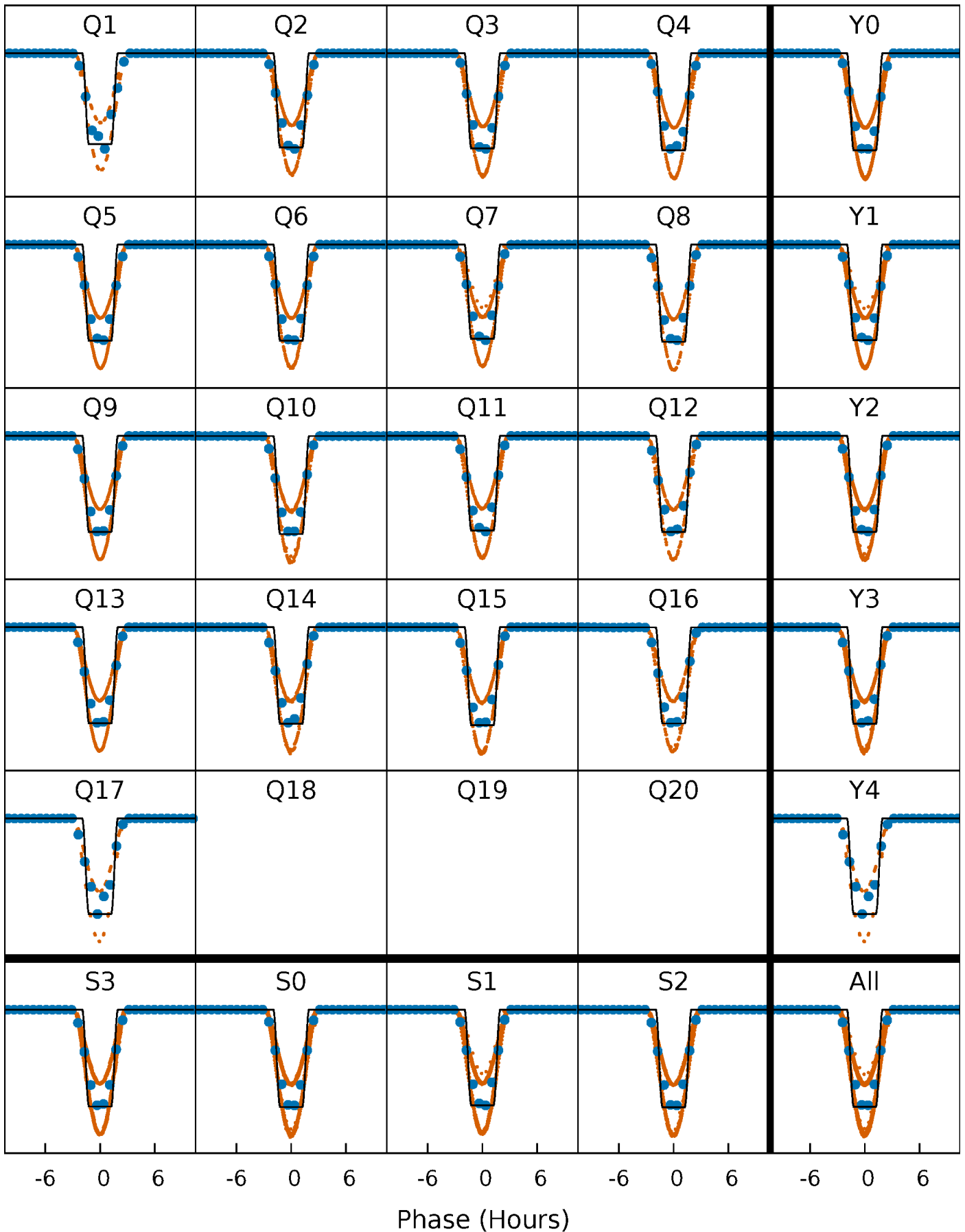
DV Quarter-Phased Transit Curves

TCE 006228703-01 P= 4.200208 Days $T_0=134.657790$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

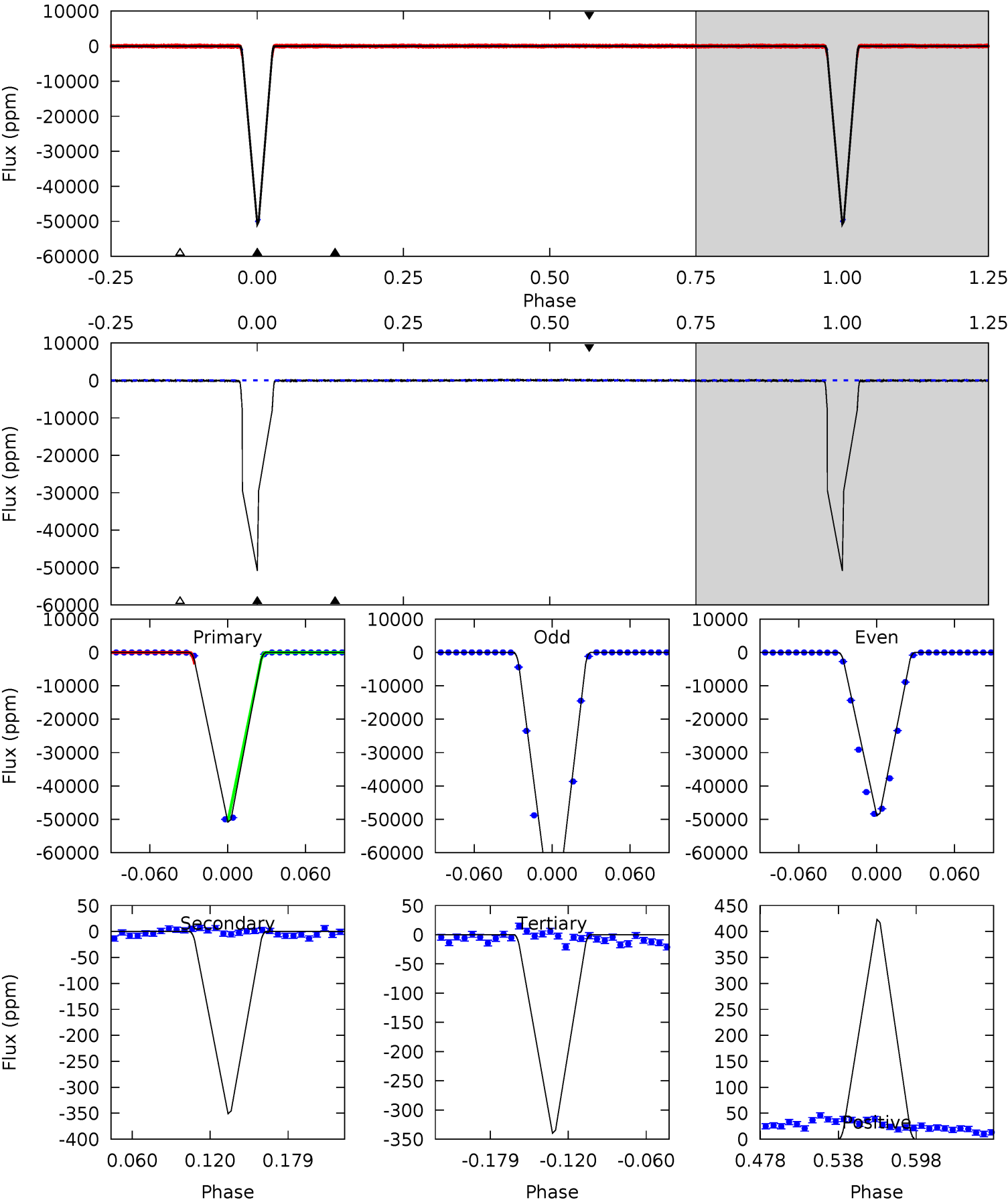
TCE 006228703-01 P= 4.200225 Days $T_0=134.654860$ (BKJD)



DV Model-Shift Uniqueness Test

006228703-01, P = 4.200208 Days, E = 130.457582 Days

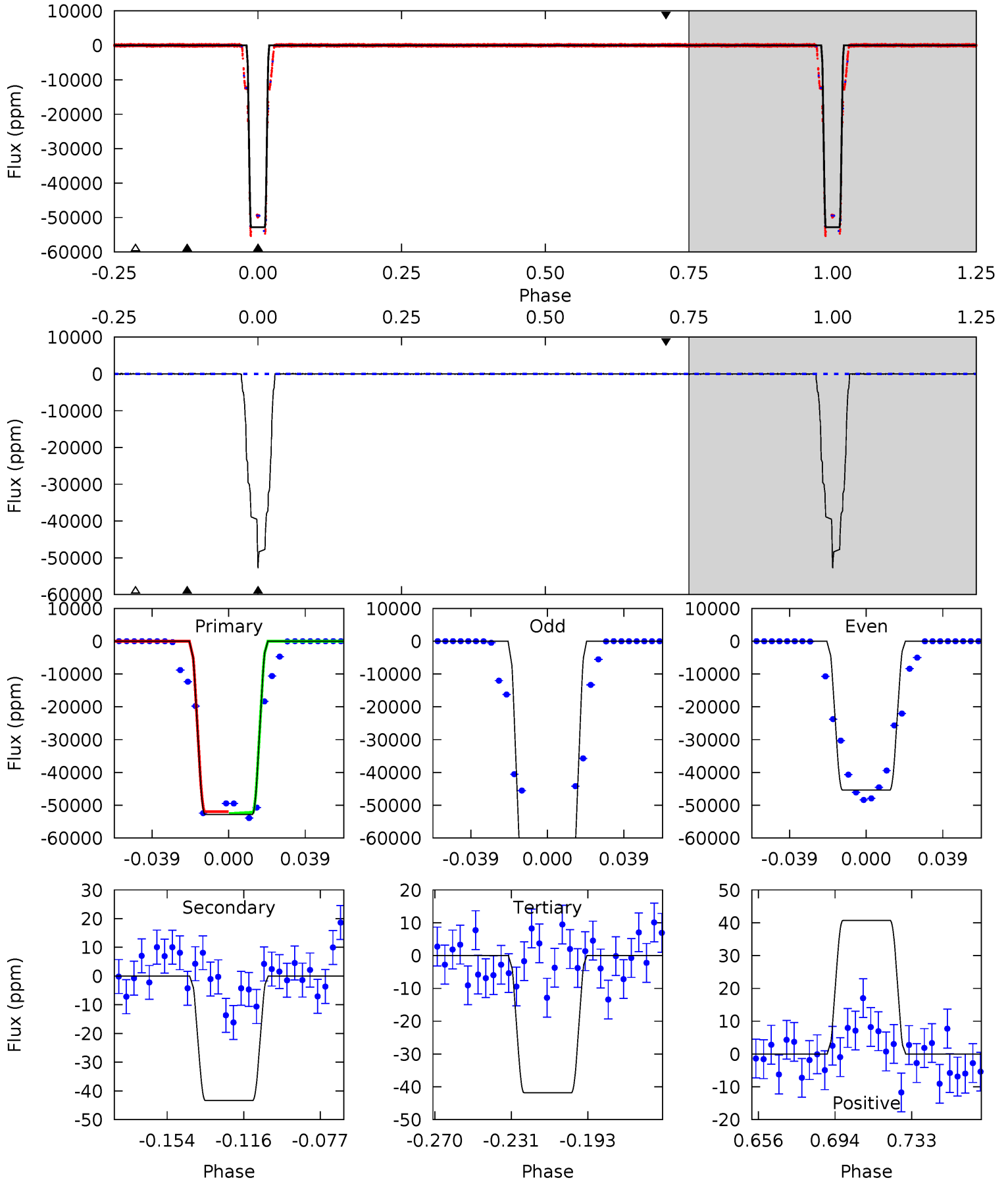
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9790	67.6	65.4	81.5	4.67	1.88	17.0	9724	9708	2.18	-13.9	8814	1.30	0.01	0



Alt Model-Shift Uniqueness Test

006228703-01, P = 4.200225 Days, E = 130.454635 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5048	4.14	4.00	3.89	4.76	2.07	1.16	5044	5044	0.15	0.26	3527	1.31	0.00	0



Stellar Parameters For KIC 006228703

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6873^{+216}_{-288}	$4.051^{+0.195}_{-0.195}$	$0.040^{+0.250}_{-0.300}$	$1.923^{+0.596}_{-0.542}$	$1.518^{+0.208}_{-0.254}$	$0.301^{+0.356}_{-0.150}$
	+3%/-4%	+5%/-5%	+625%/-750%	+31%/-28%	+14%/-17%	+118%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006228703-01 / KOI 6678.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-351 ± 5	$73.18^{+12.08}_{-10.91}$	2427^{+195}_{-186}	-2564^{+174}_{-154}	$0.123^{+0.043}_{-0.031}$
Alt.	-43 ± 10	$53.53^{+8.75}_{-8.55}$	2432^{+195}_{-195}	-2713^{+127}_{-120}	$0.028^{+0.014}_{-0.009}$

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

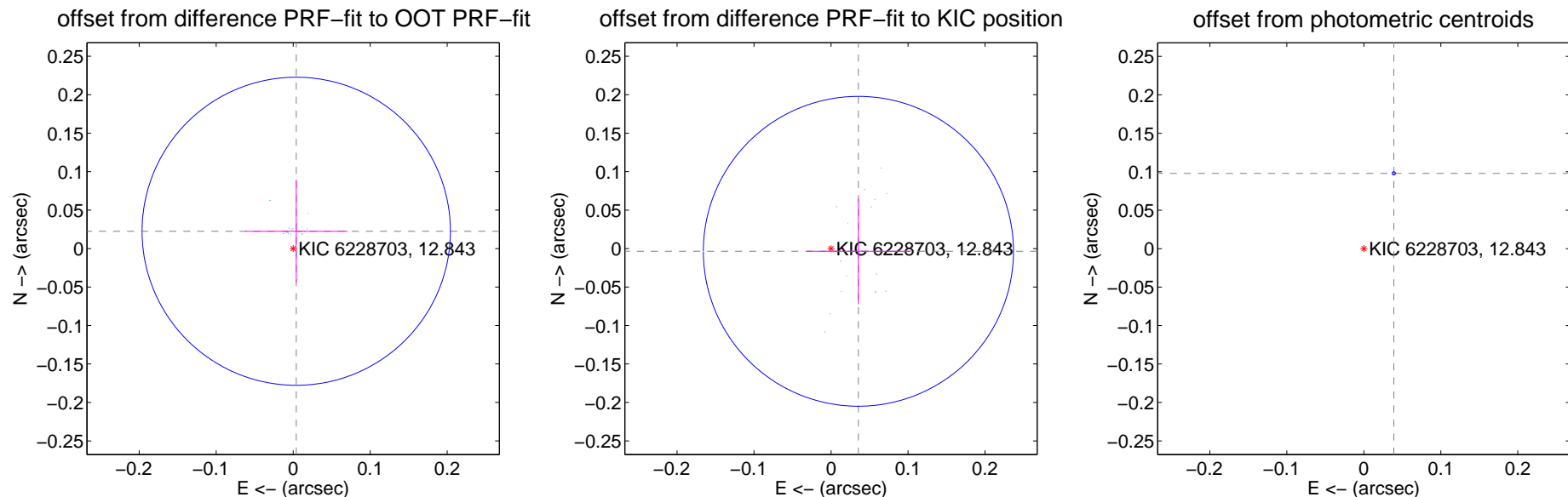
DV Centroid Data

Supplemental centroid analysis for 006228703-01. Kepler magnitude: 12.84. Transit SNR 9006.29

There are 17 quarters with good PRF difference image offsets

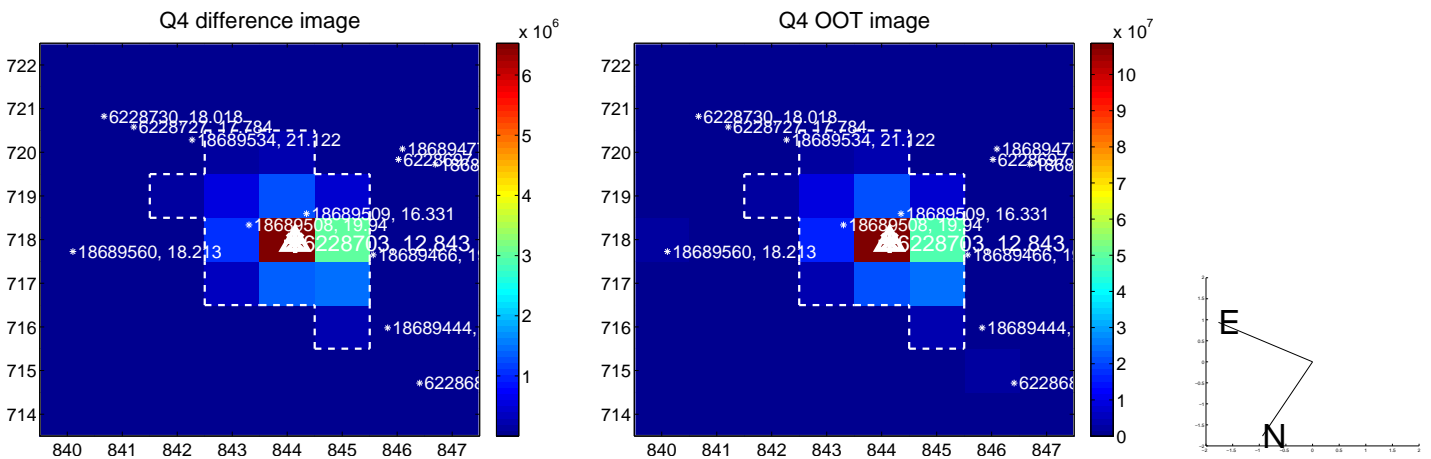
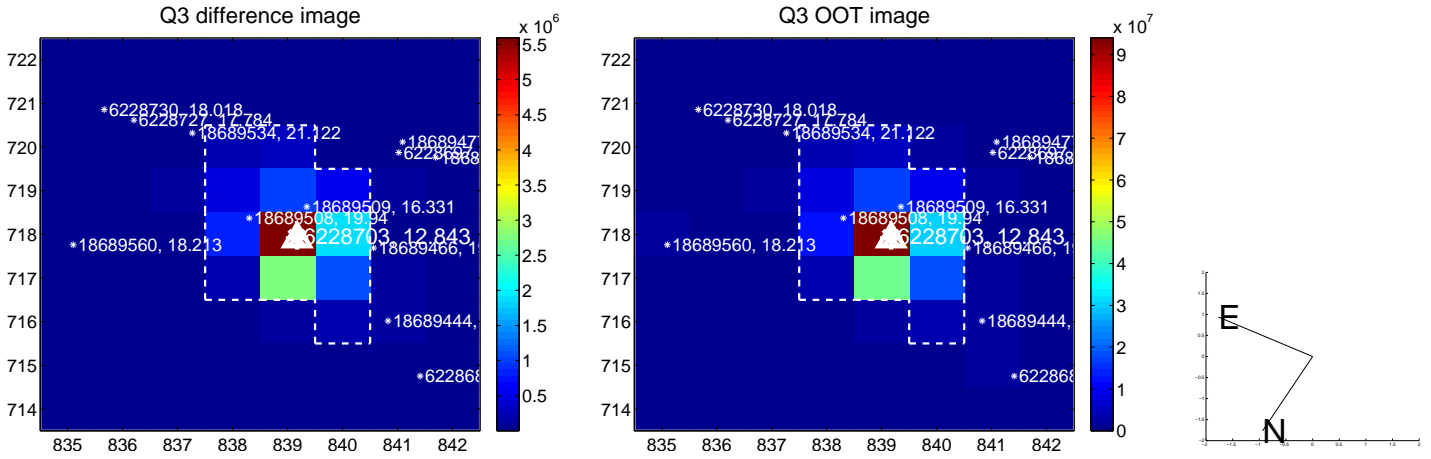
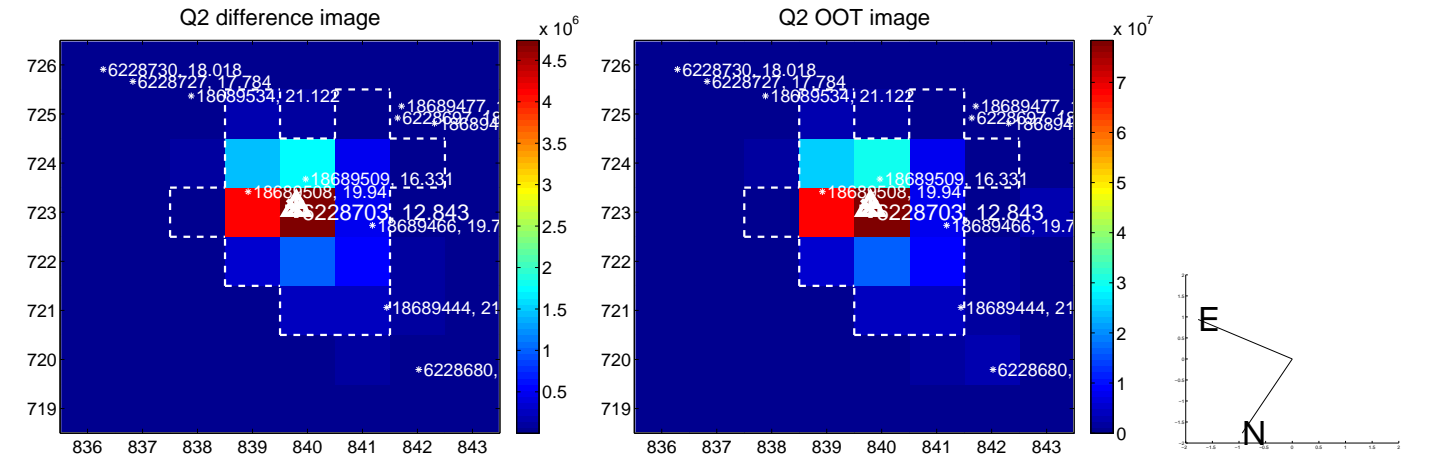
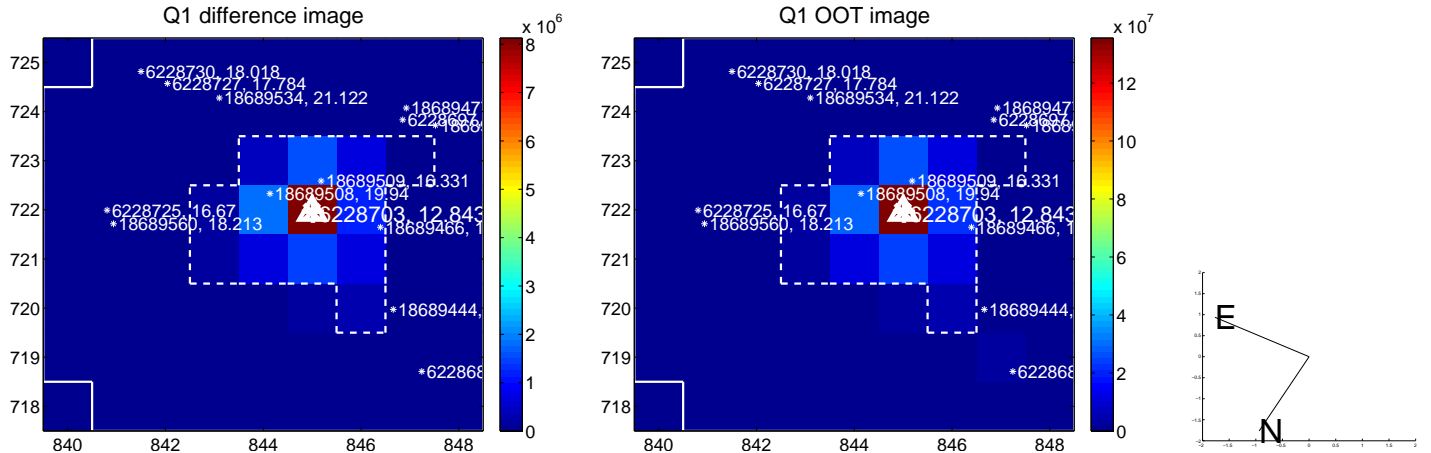
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.023 ± 0.067	0.34	-0.004 ± 0.067	0.023 ± 0.067
PRF-fit source offset from KIC position	0.036 ± 0.067	0.53	-0.036 ± 0.067	-0.004 ± 0.069
photometric centroid source offset	0.11 ± 0.00	148.89	-0.04 ± 0.00	0.10 ± 0.00

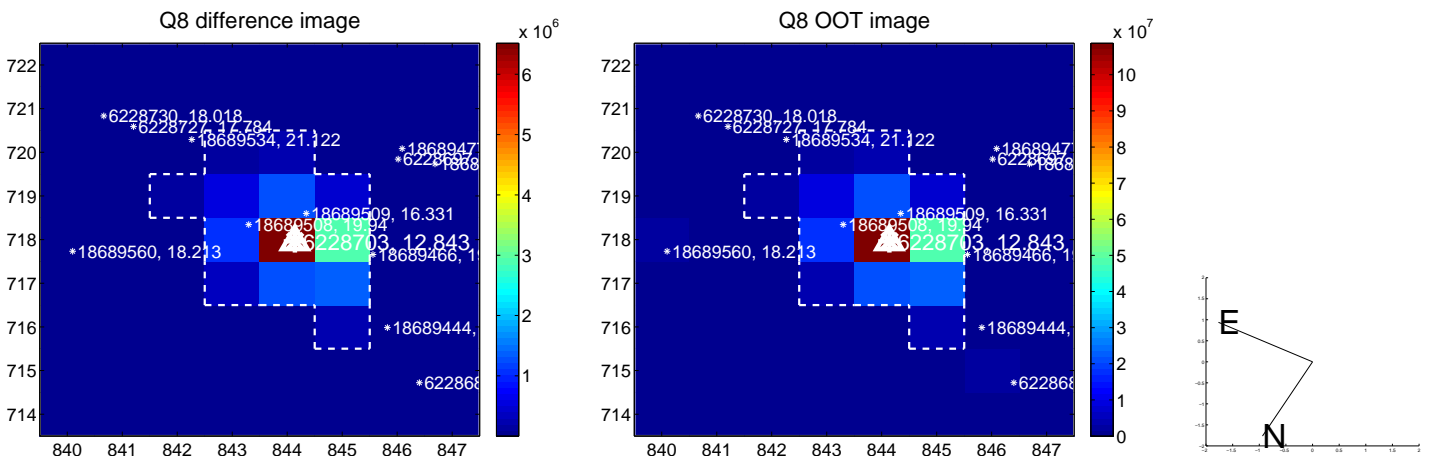
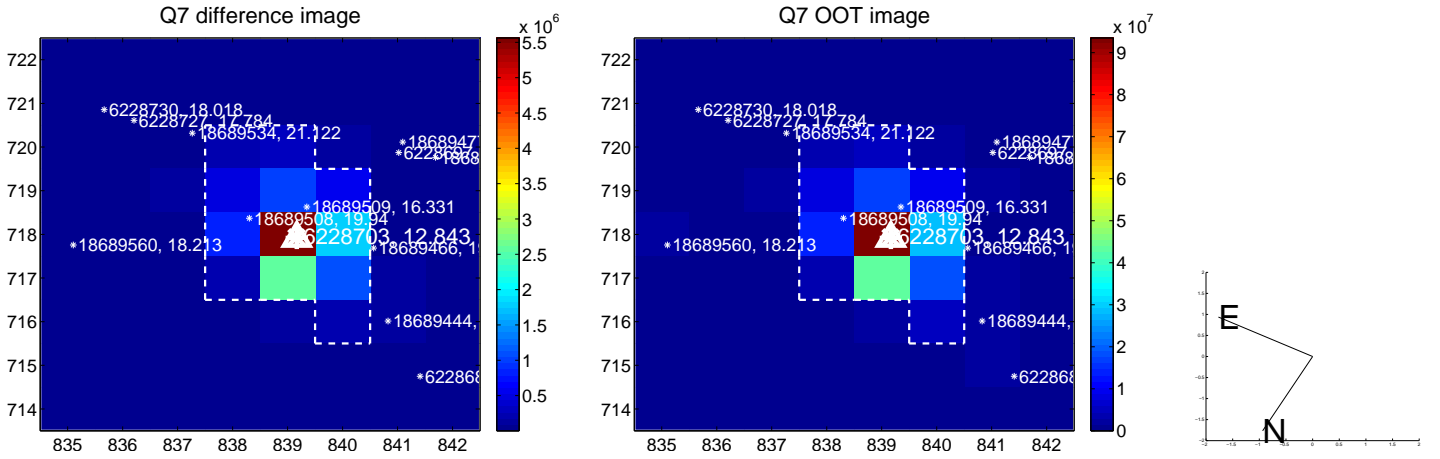
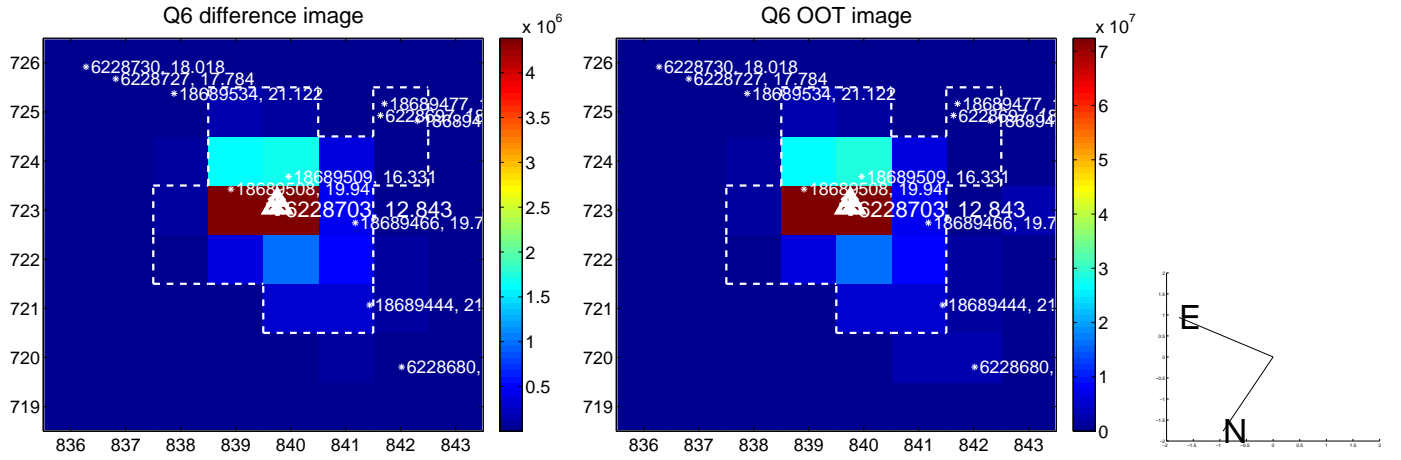
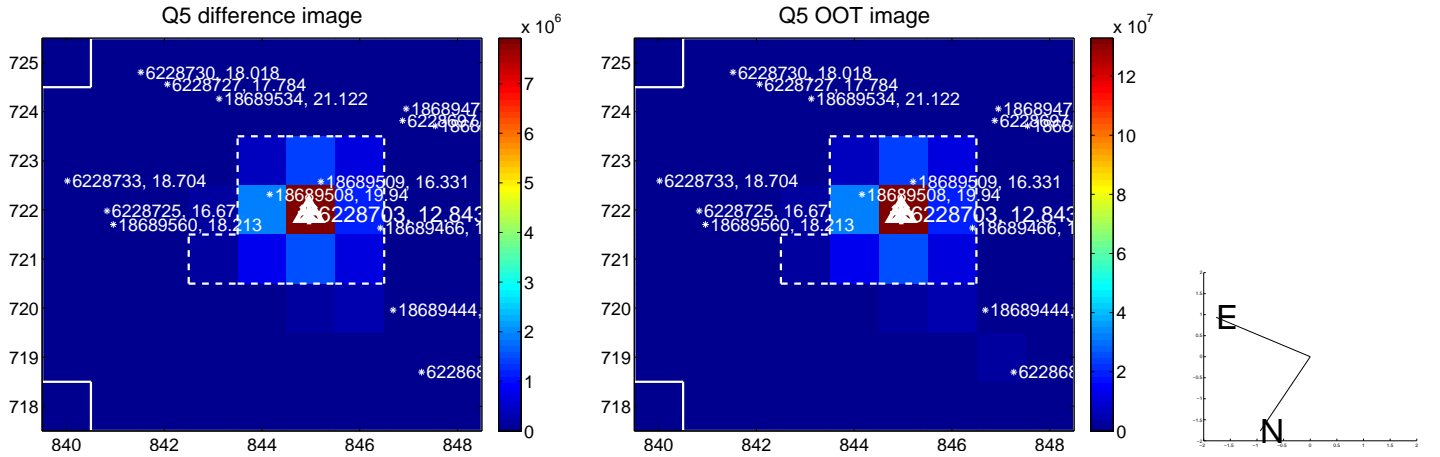


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

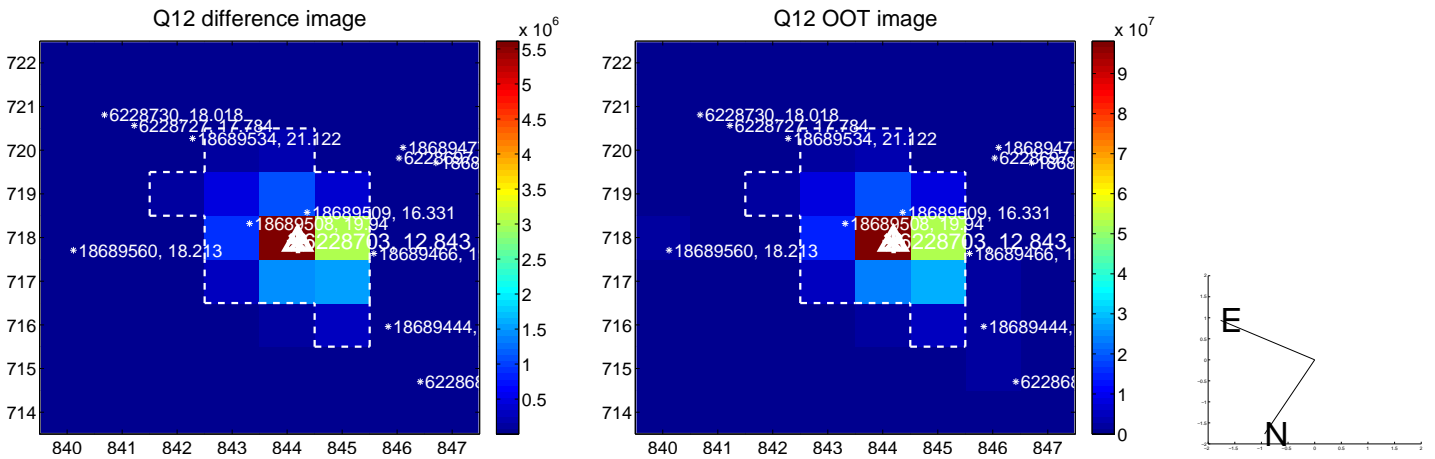
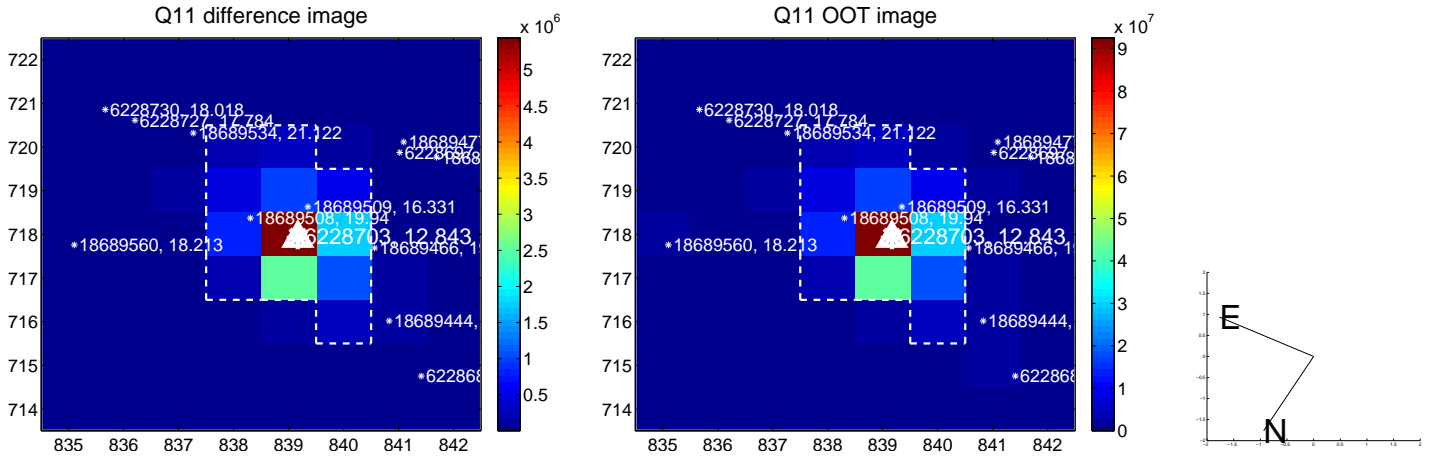
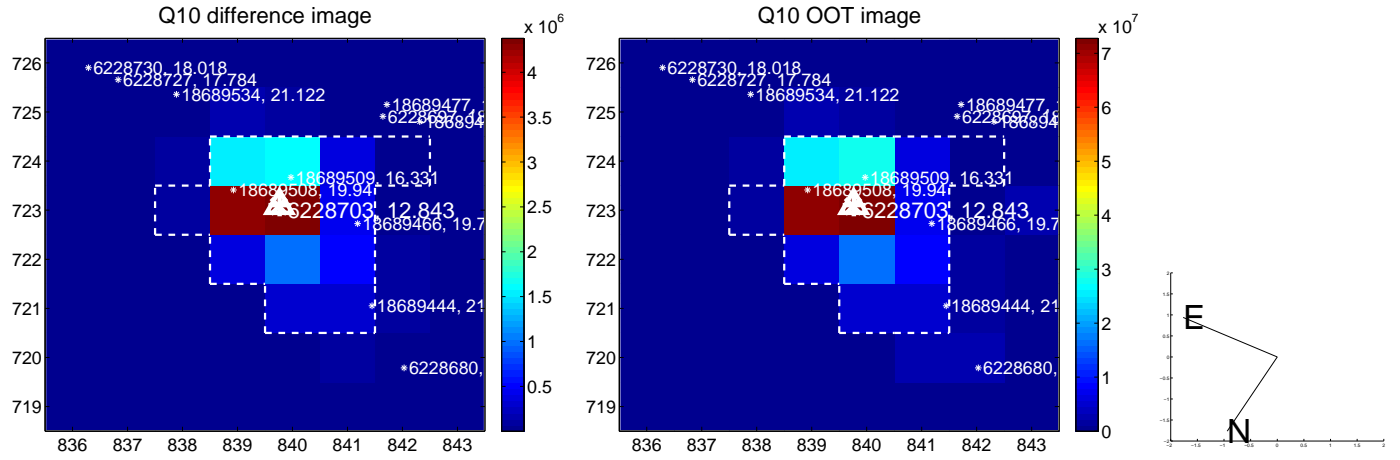
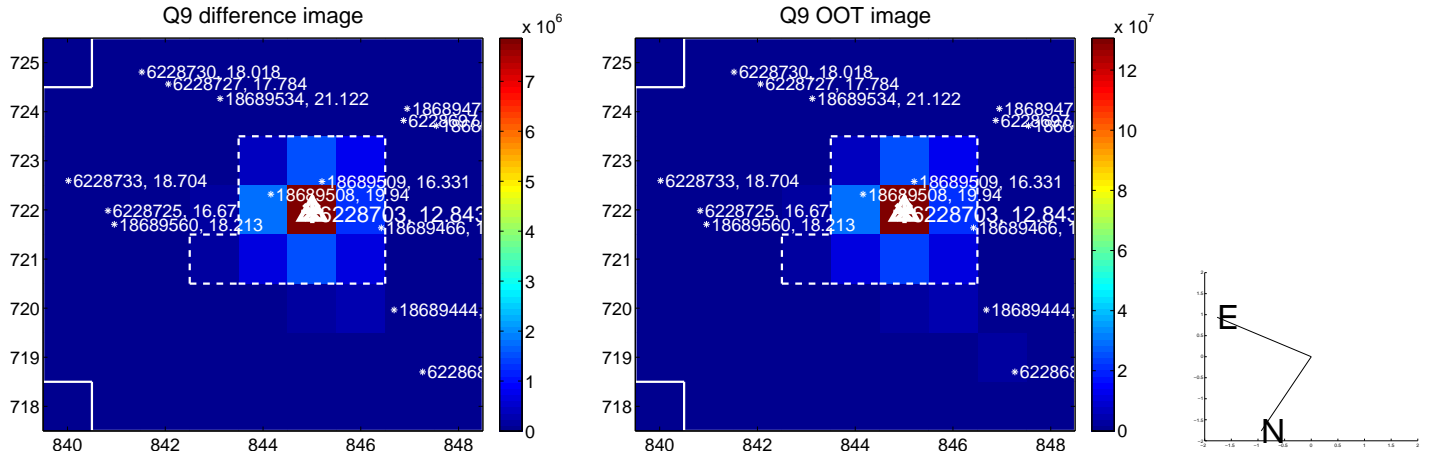
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



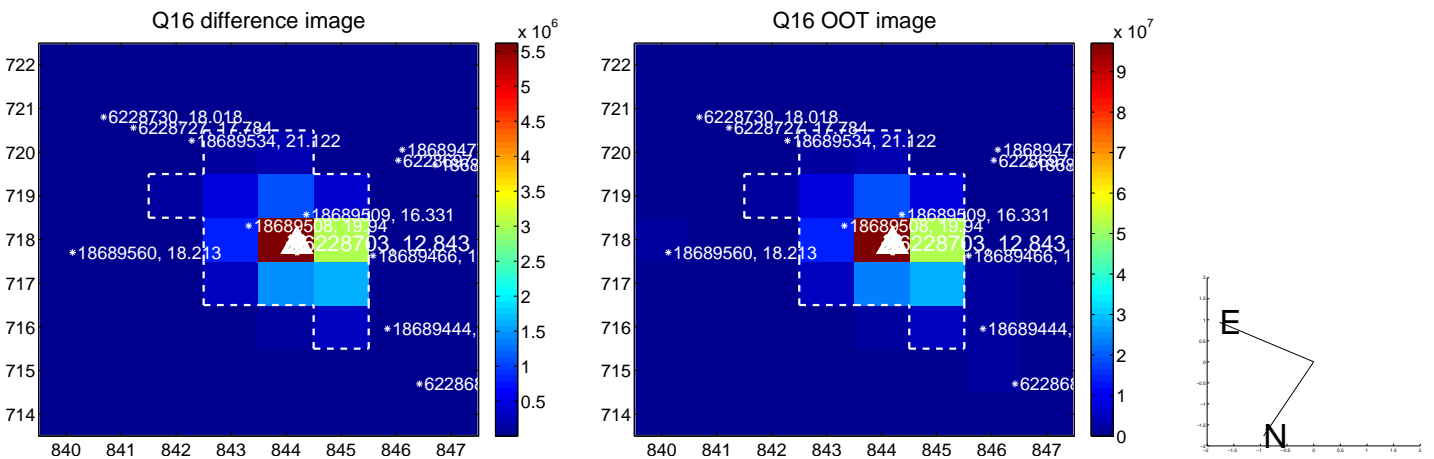
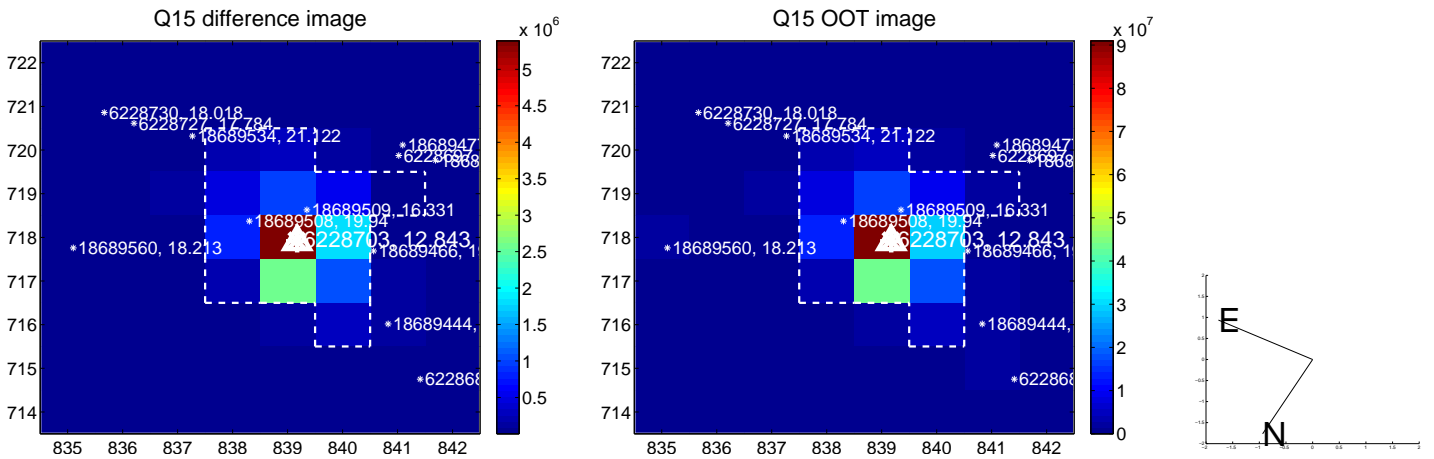
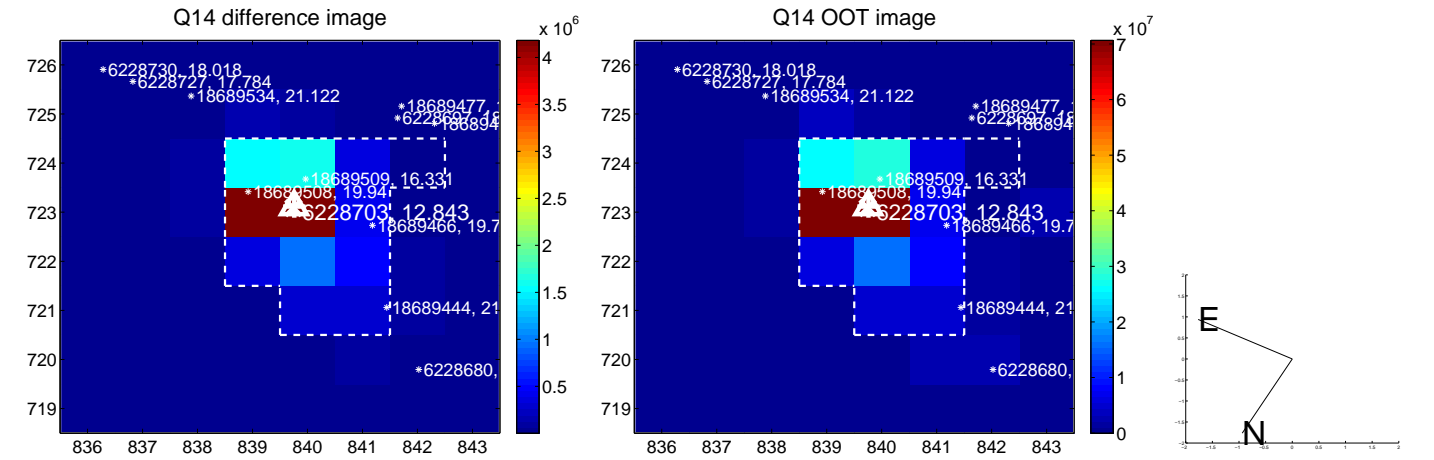
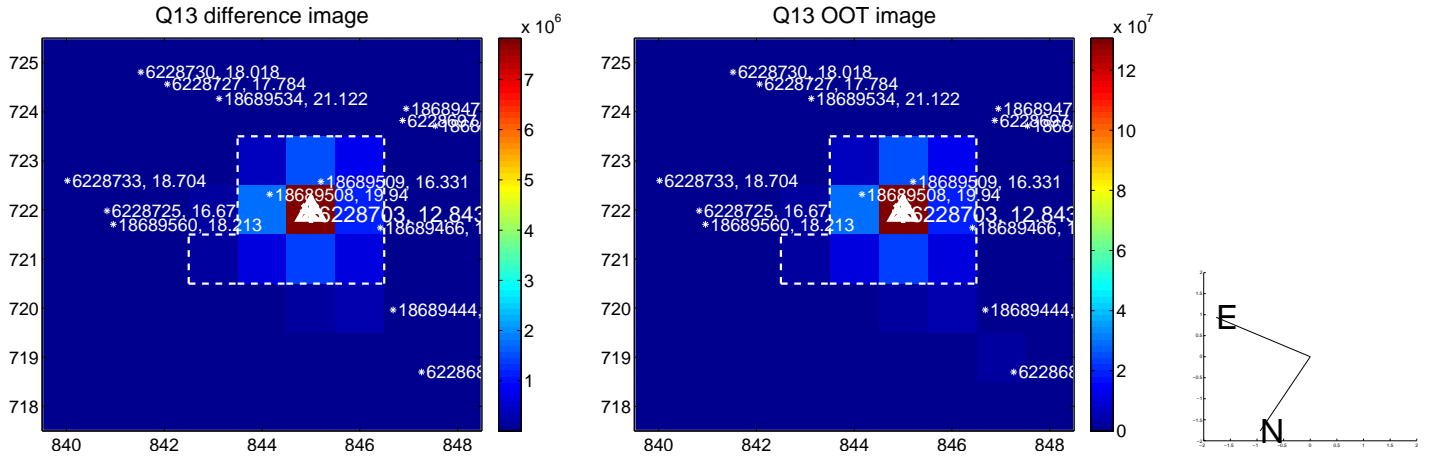
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



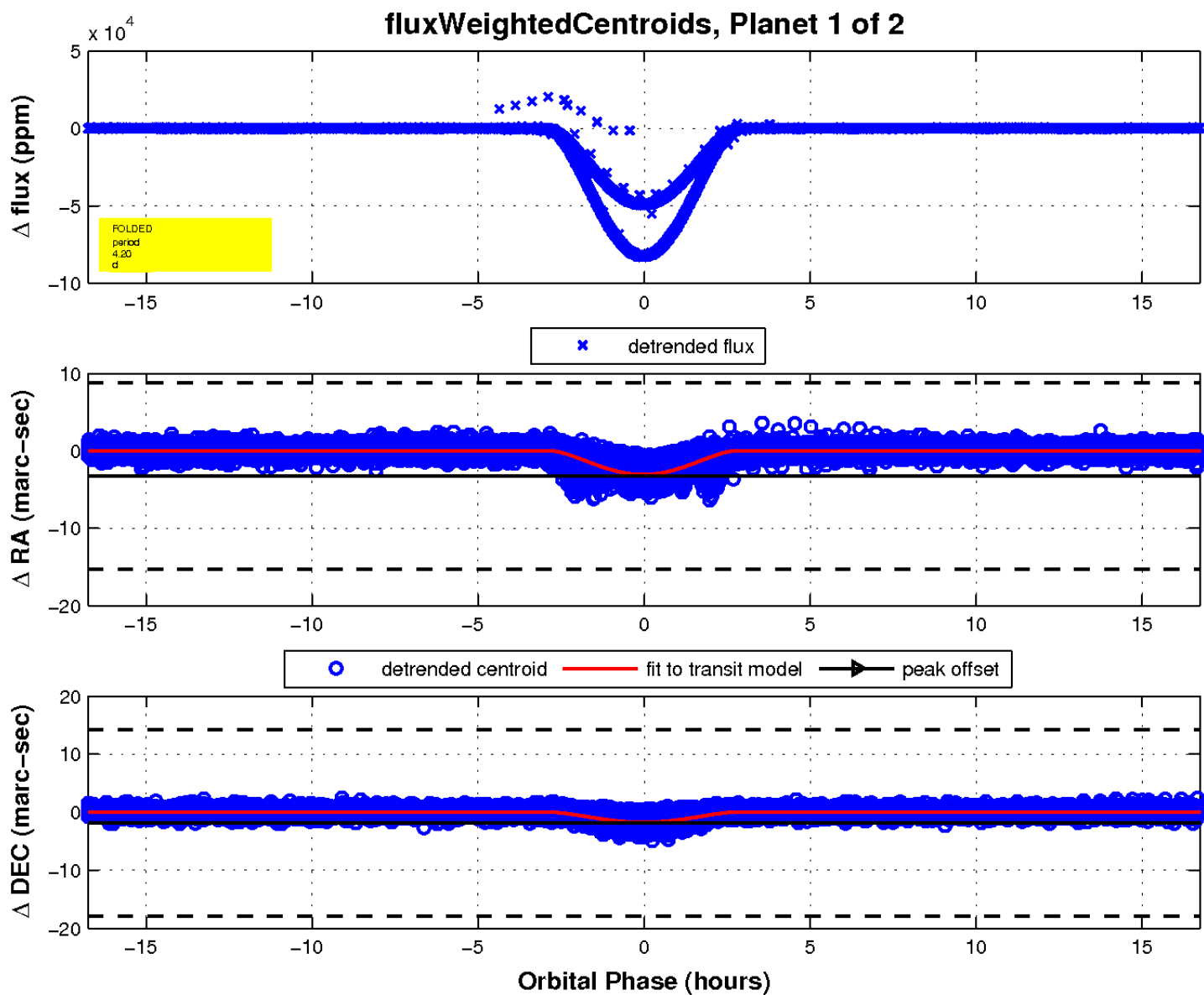
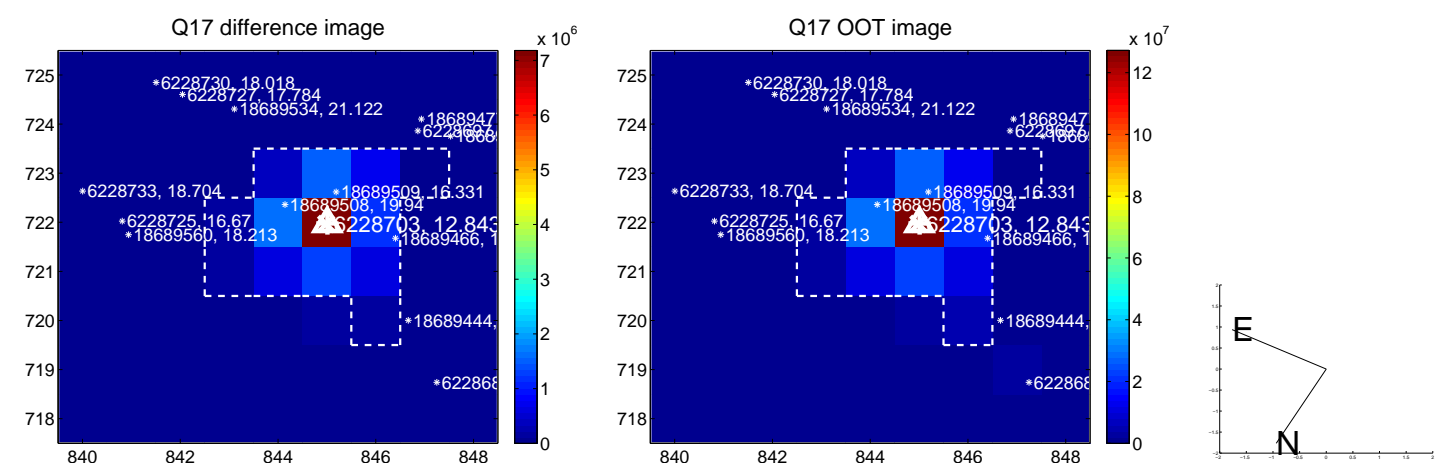
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

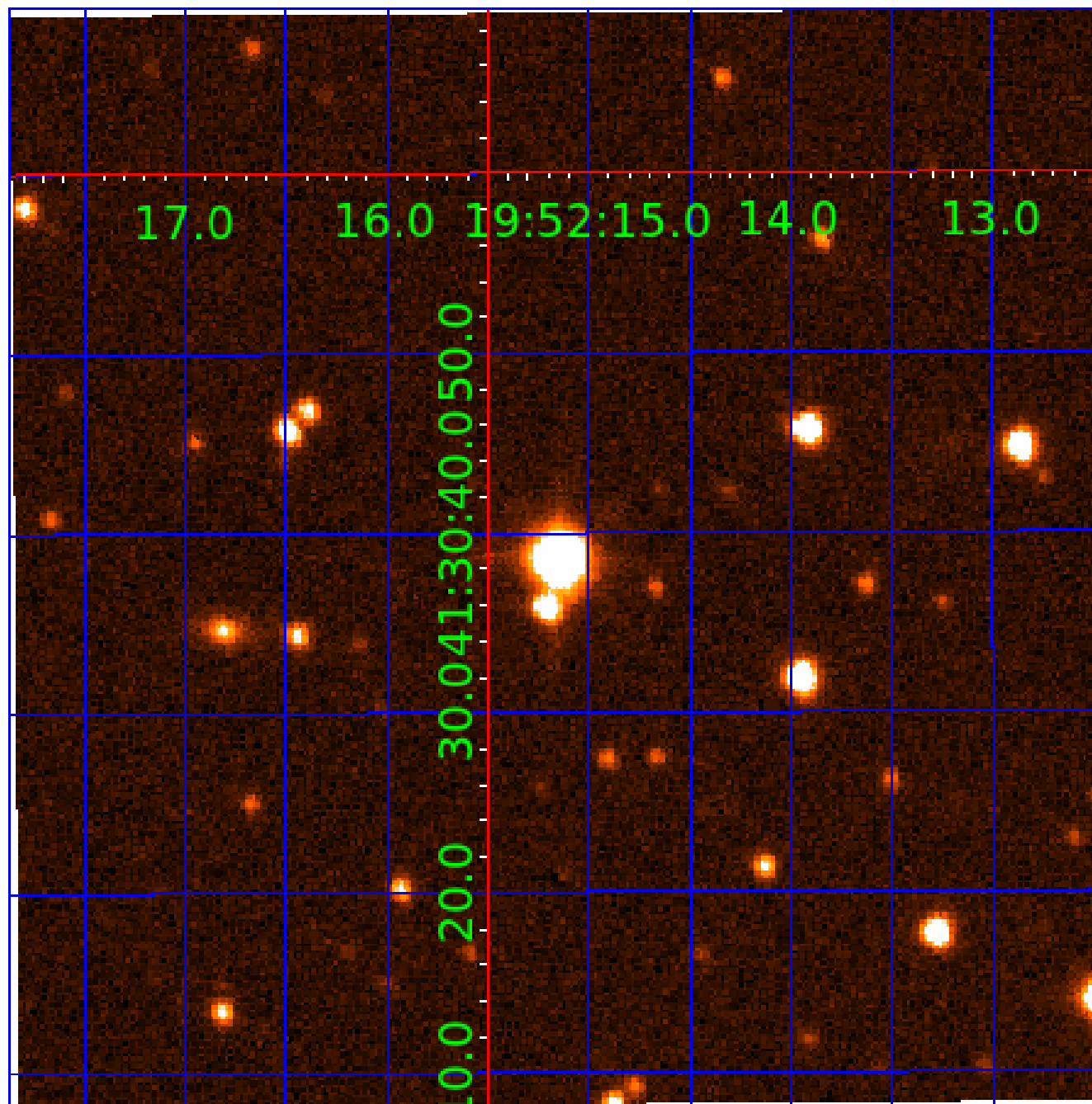


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006228703

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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006228703-02	OBS	No	432.243121	269.154930	703.6	11.245	22.8	12.1	1.92	6873	9.63	4.47

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006228703-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

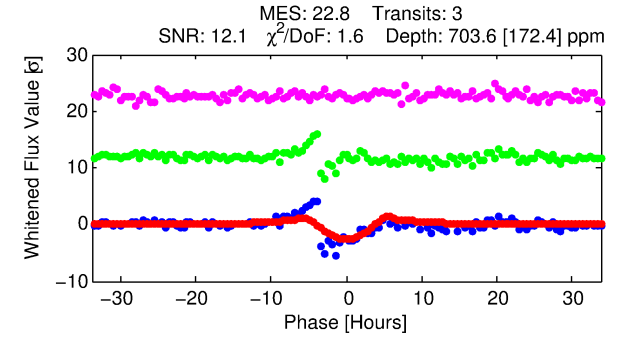
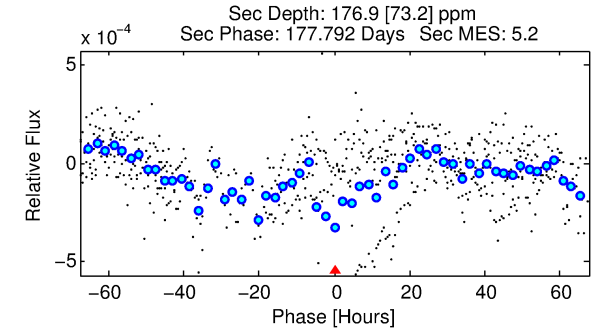
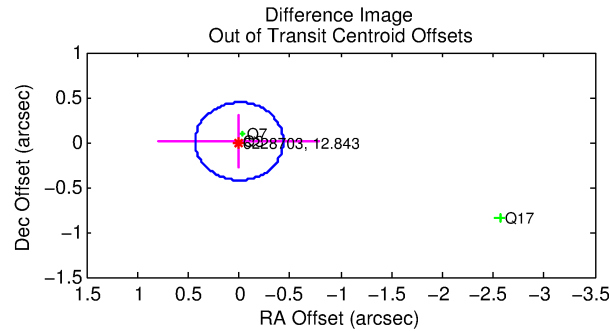
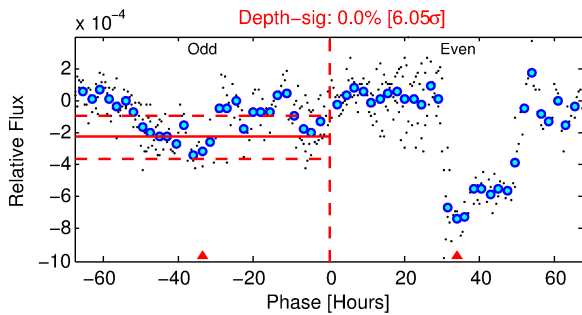
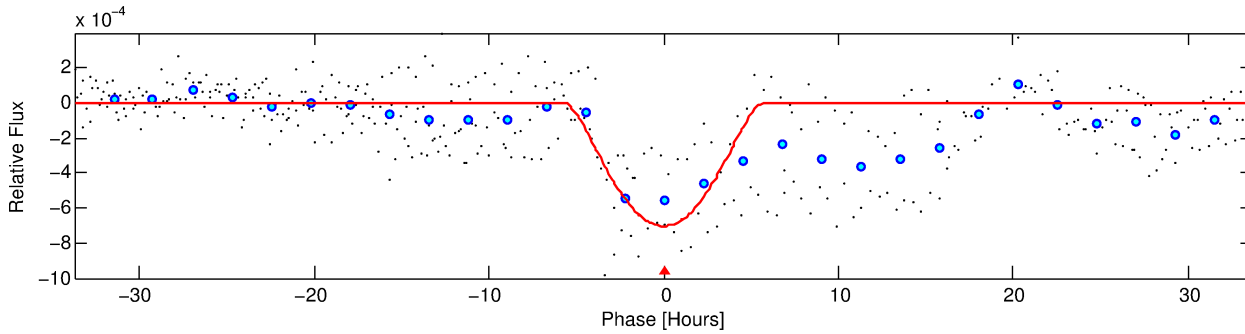
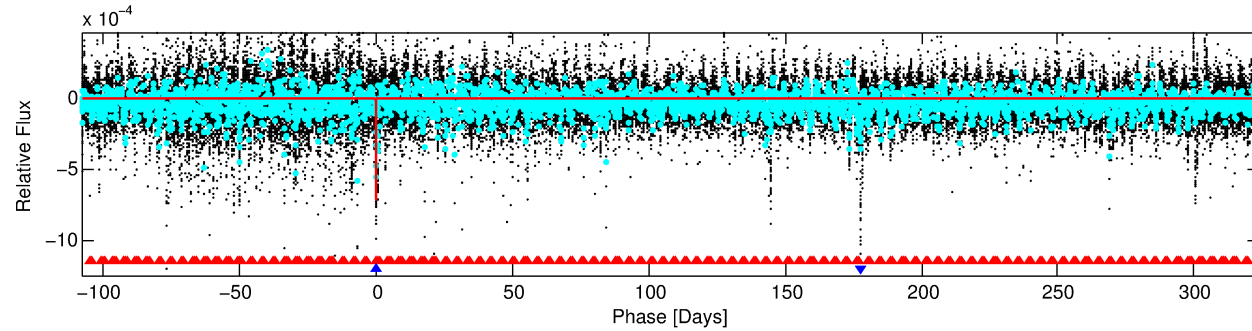
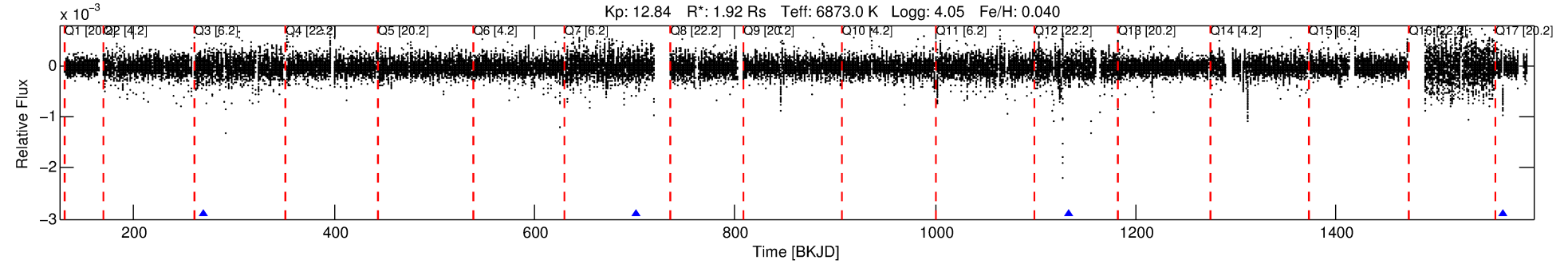
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006228703-02

No Significant Match Found

DV One-Page Summary

KIC: 6228703 Candidate: 2 of 2 Period: 432.243 d
KOI: K06678 Corr: No Ephemeris Match



DV Fit Results:

Period = 432.24312 [0.01565] d
Epoch = 269.1549 [0.0423] BKJD
Rp/R* = 0.0459 [0.0901]
a/R* = 90.15 [43.74]
b = 1.00 [0.14]
Seff = 4.47 [1.79]
Teq = 371 [37] K
Rp = 9.63 [19.14] Re
a = 1.2858 [0.3280] AU
Ag = 1735.19 [6879.04] [0.25σ]
Teffp = 3700 [3655] K [0.91σ]

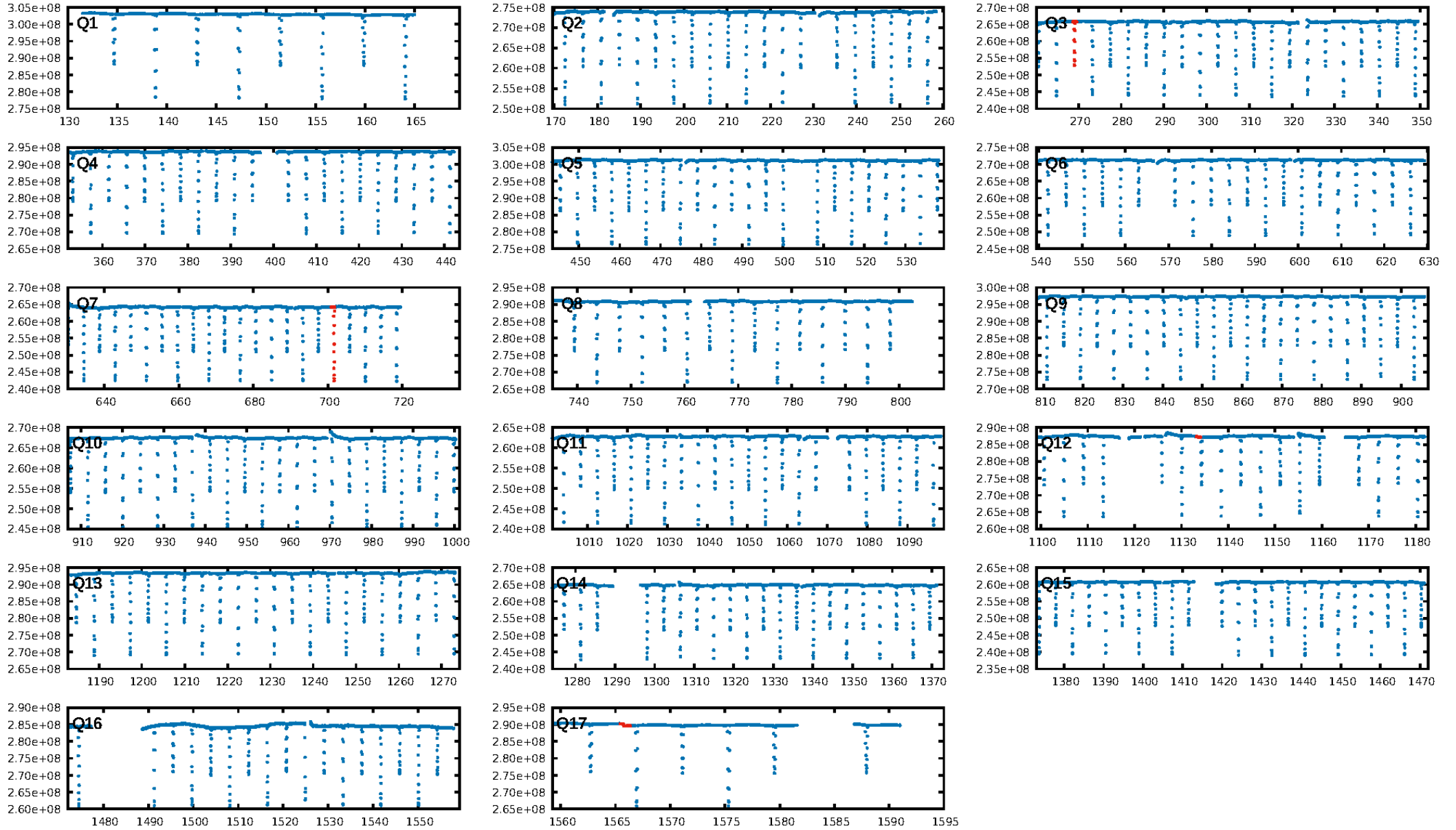
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [818.30σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 87.9%
Bootstrap-pfa: 6.90e-45
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -8.905
Centroid-sig: 0.1%
Centroid-so: 0.884 arcsec [2.47σ]
OotOffset-rm: 0.010 arcsec [0.07σ]
KicOffset-rm: 0.069 arcsec [0.13σ]
OotOffset-st: 0.2/0/1 [3]
KicOffset-st: 0.2/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

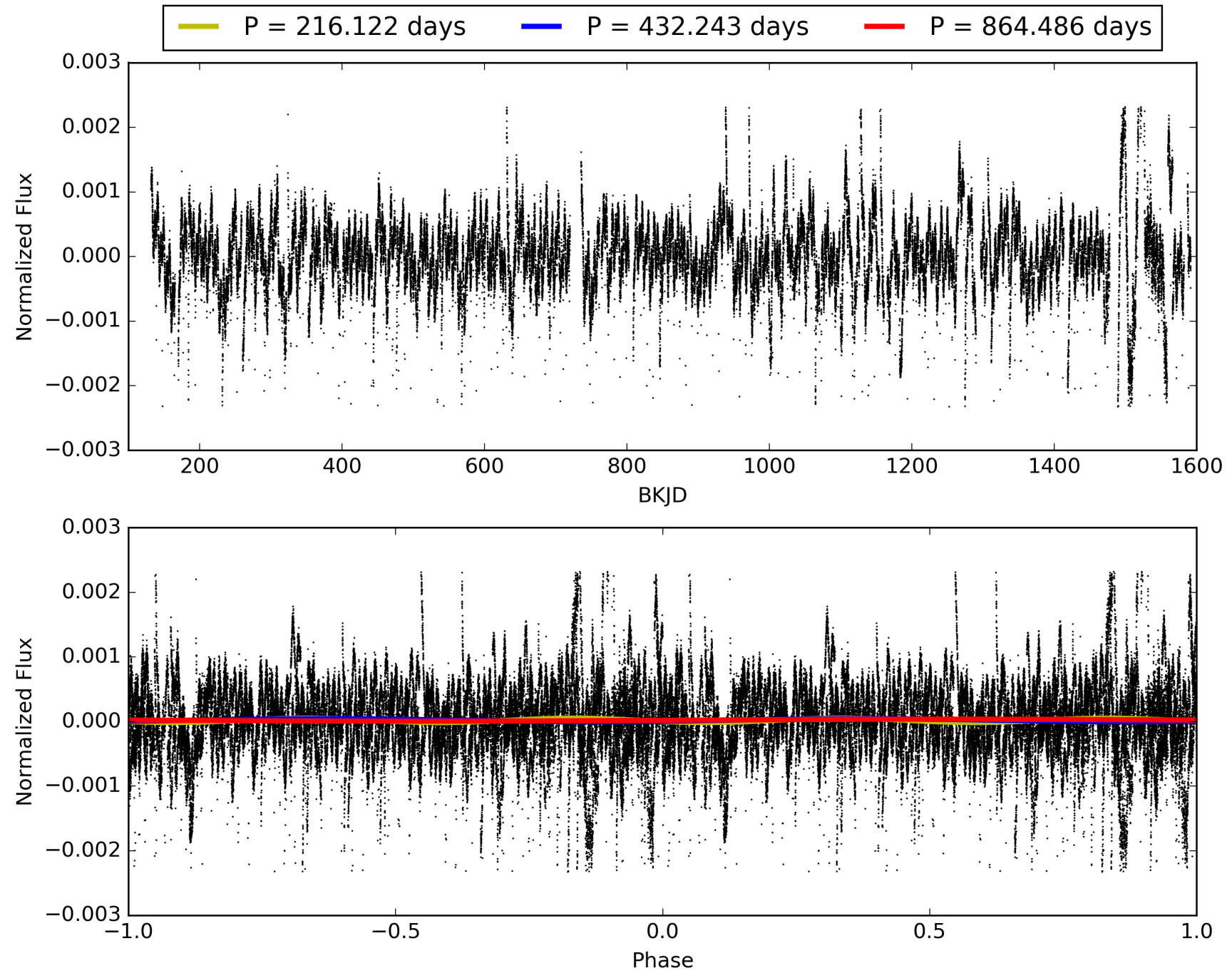
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:22:59 Z

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

TCE 006228703-02, PDC Light Curves

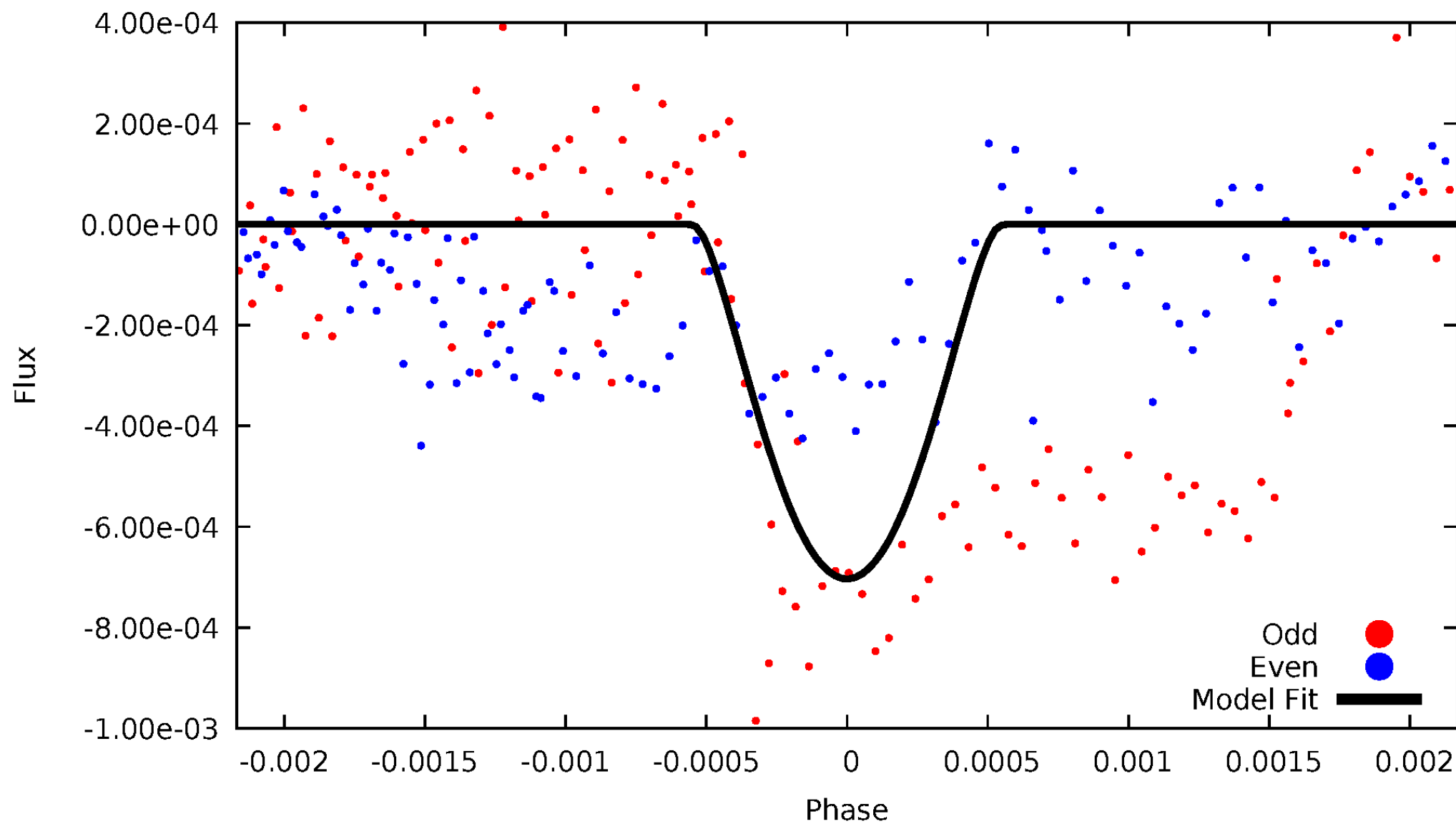


TCE 006228703-02



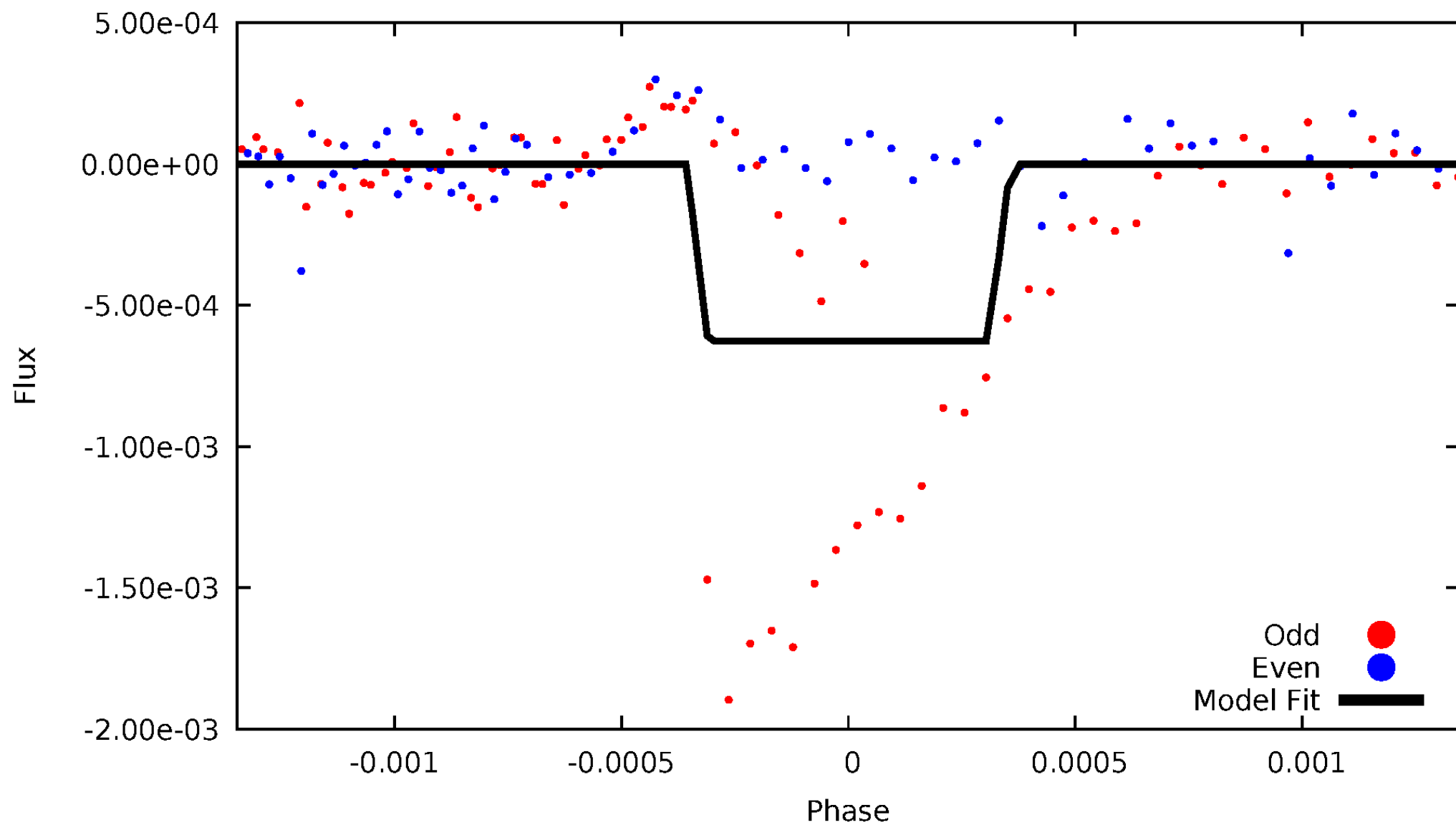
DV Odd/Even

TCE 006228703-02



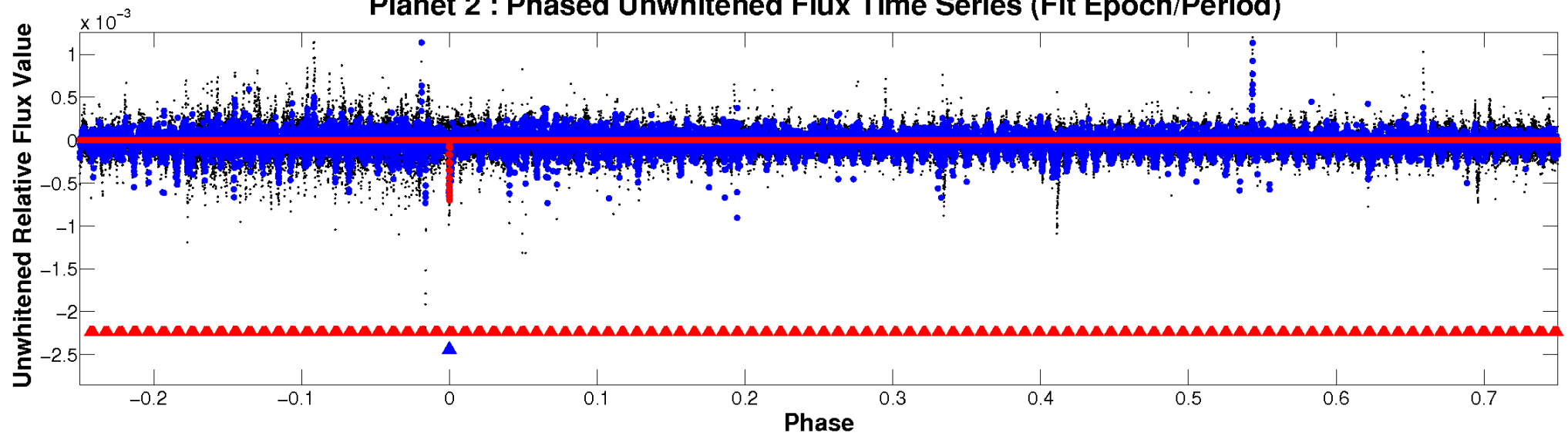
ALT Odd/Even

TCE 006228703-02

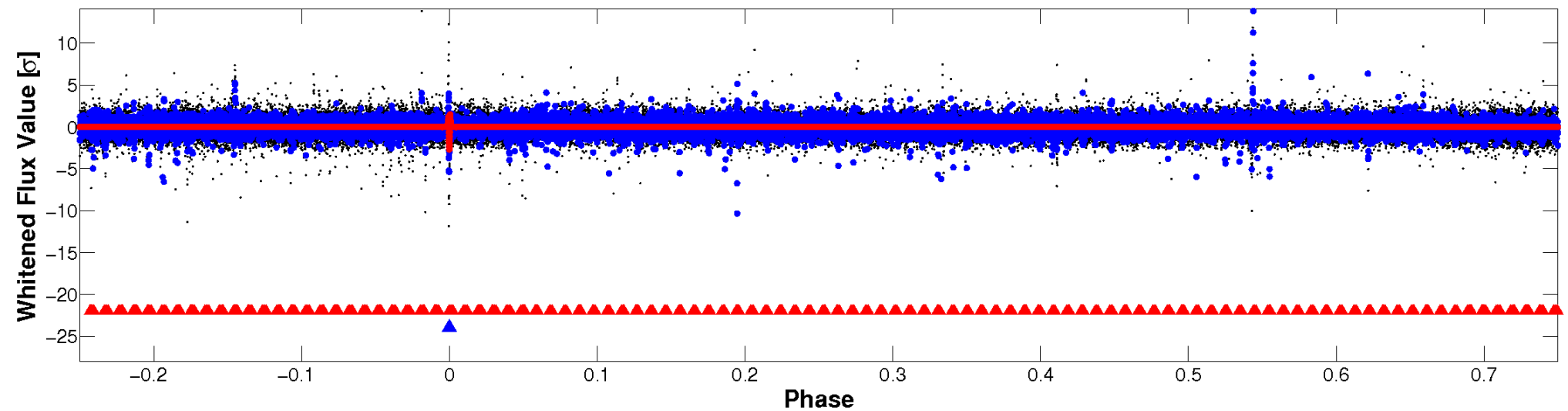


Non-Whitened Vs. Whitened Light Curve

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

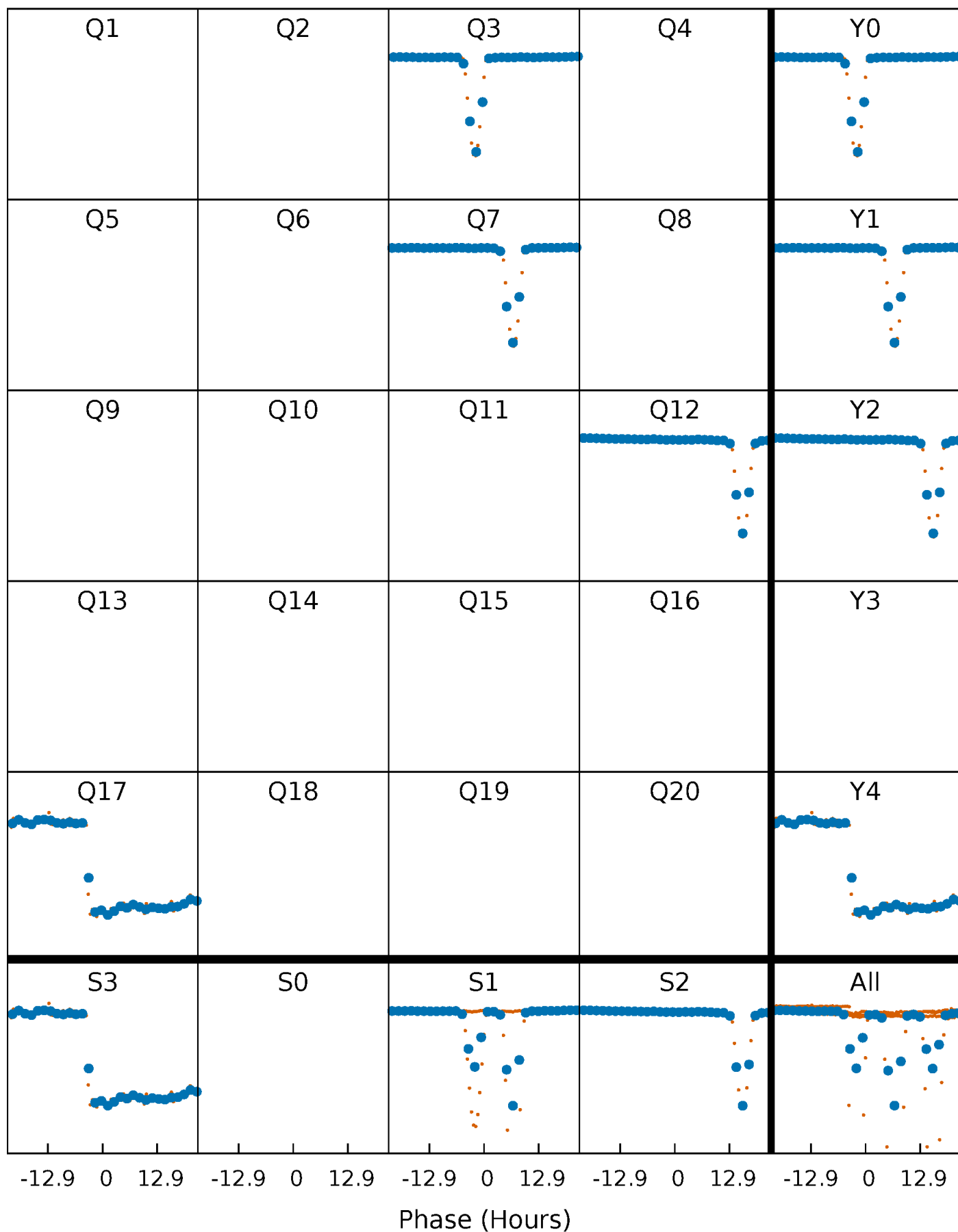


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



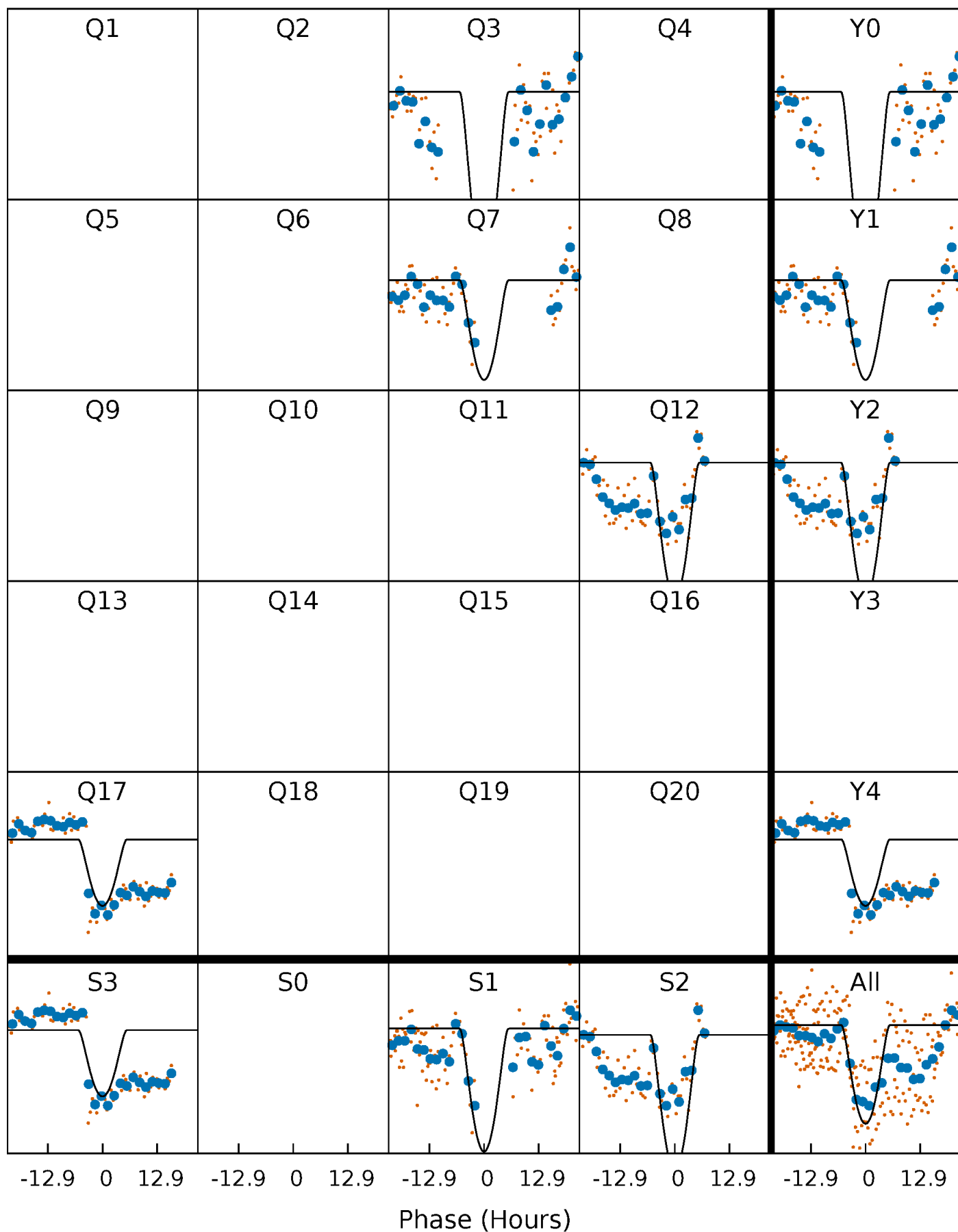
PDC Quarter-Phased Transit Curves

TCE 006228703-02 P=432.243121 Days $T_0=269.154930$ (BKJD)



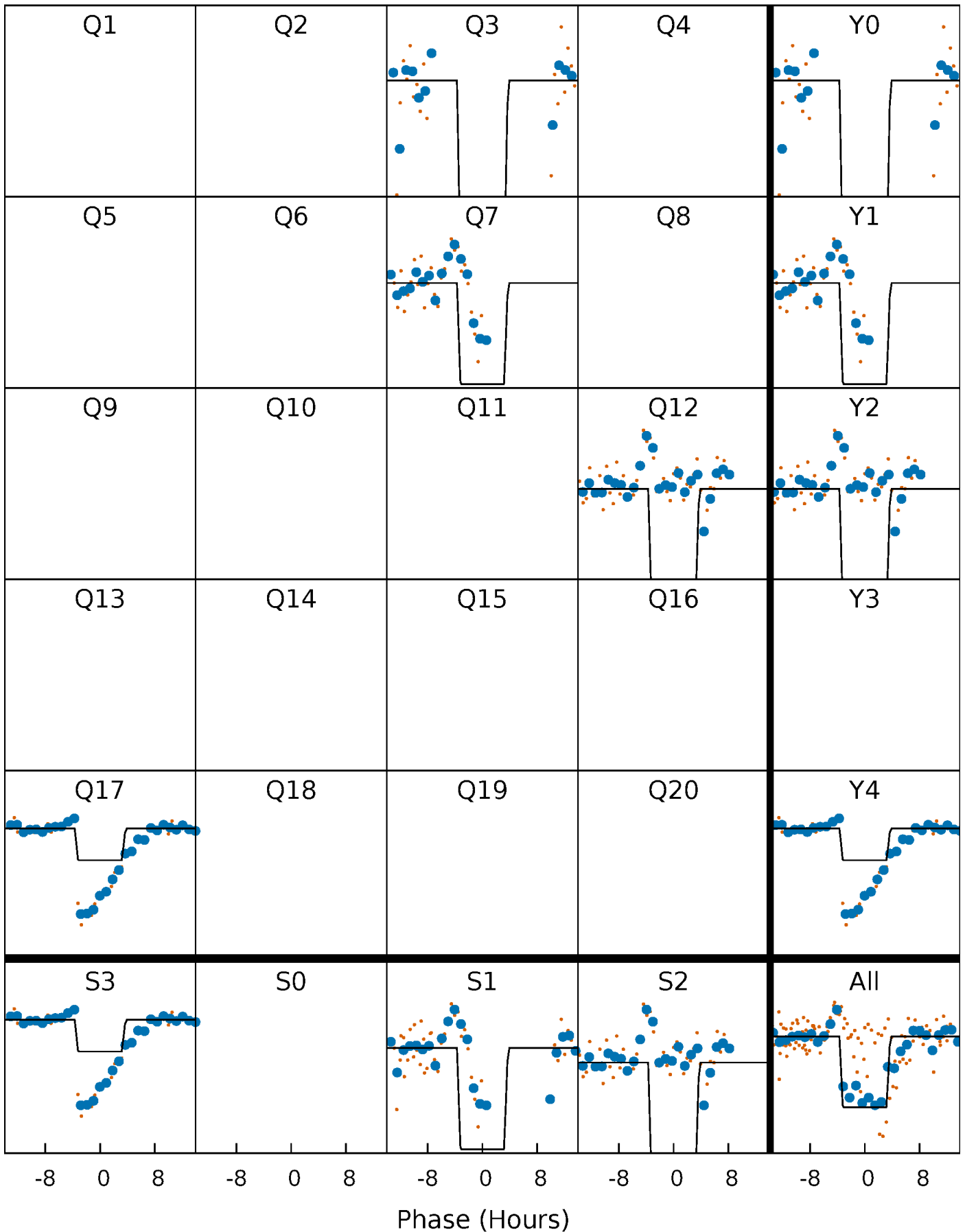
DV Quarter-Phased Transit Curves

TCE 006228703-02 $P=432.243121$ Days $T_0=269.154930$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

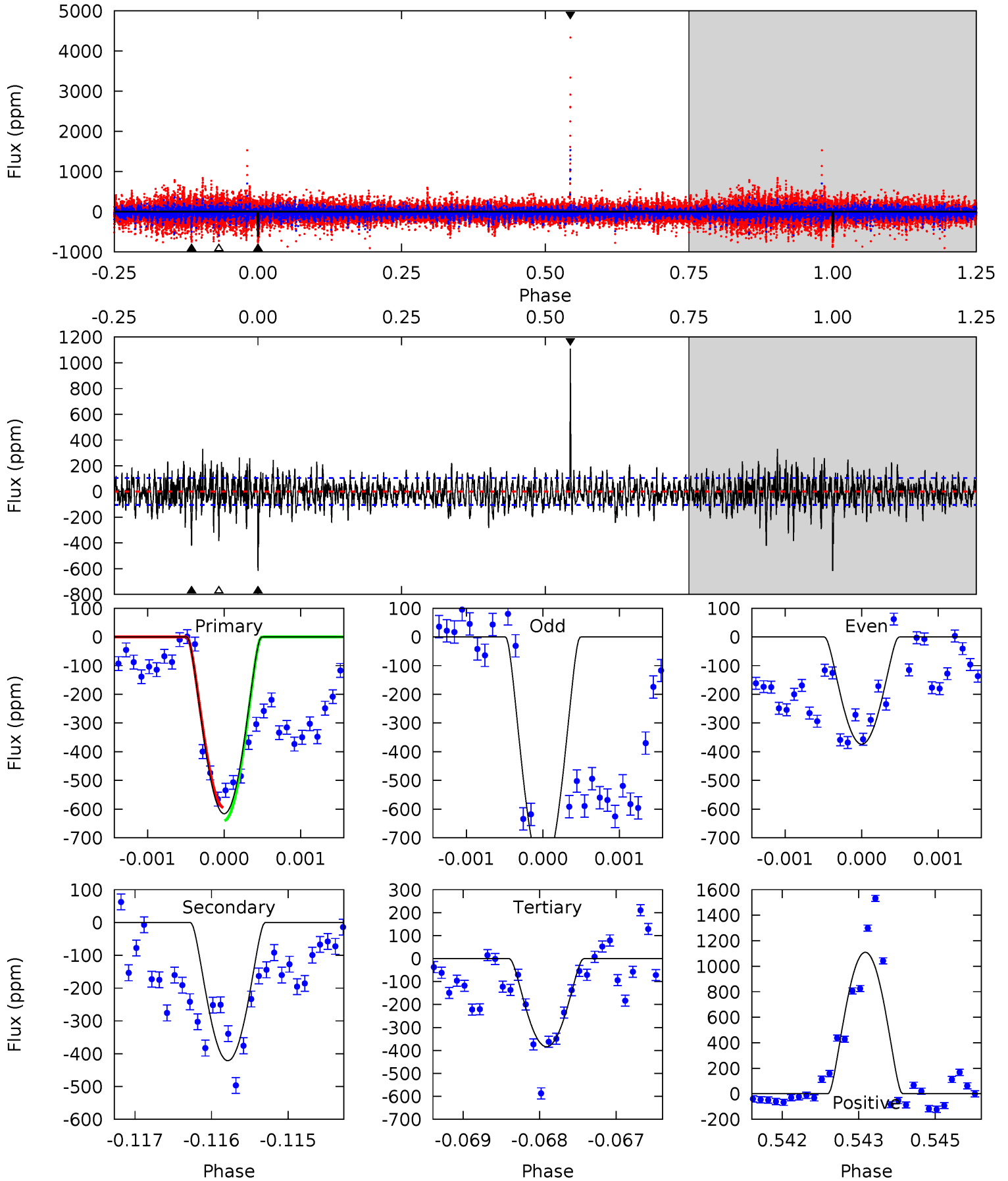
TCE 006228703-02 P=432.285584 Days $T_0=269.021668$ (BKJD)



DV Model-Shift Uniqueness Test

006228703-02, P = 432.243121 Days, E = 269.154930 Days

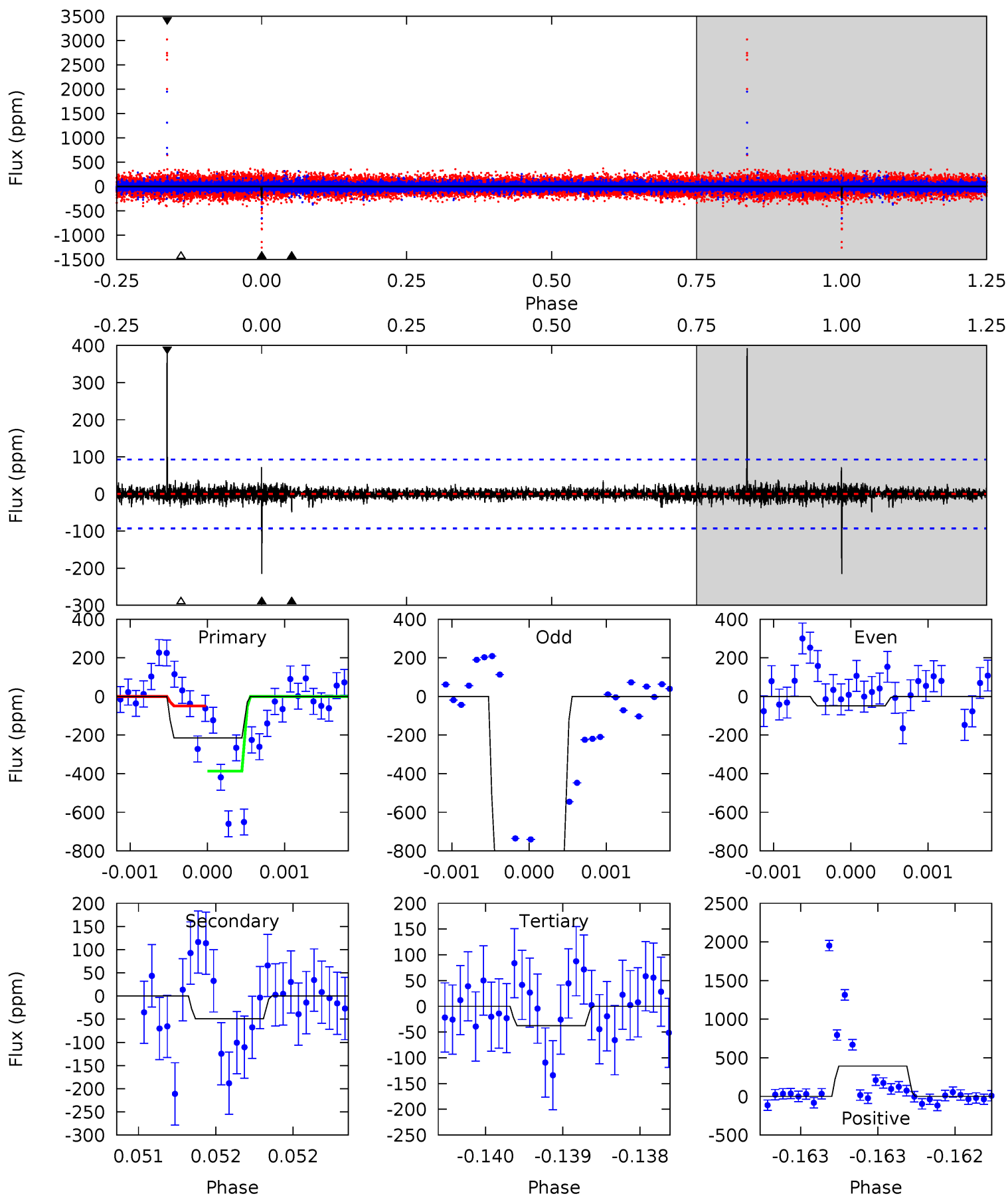
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.1	22.0	20.0	57.8	5.43	3.25	4.33	12.1	-25.7	1.95	-35.9	10.4	1.02	0.64	1.20



Alt Model-Shift Uniqueness Test

006228703-02, P = 432.285584 Days, E = 269.021668 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	2.90	2.24	23.3	5.52	3.40	0.67	10.5	-10.5	0.66	-20.4	27.7	3.03	0.65	10.1



Stellar Parameters For KIC 006228703

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6873^{+216}_{-288}	$4.051^{+0.195}_{-0.195}$	$0.040^{+0.250}_{-0.300}$	$1.923^{+0.596}_{-0.542}$	$1.518^{+0.208}_{-0.254}$	$0.301^{+0.356}_{-0.150}$
	+3%/-4%	+5%/-5%	+625%/-750%	+31%/-28%	+14%/-17%	+118%/-50%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006228703-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-421 ± 19	$17.33^{+18.22}_{-11.63}$	517^{+48}_{-37}	3804^{+1935}_{-741}	1300^{+10060}_{-997}
Alt.	-49 ± 17	$15.09^{+16.53}_{-10.25}$	519^{+44}_{-38}	2835^{+1239}_{-498}	183^{+1717}_{-145}

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 $A_{obs} \gg 1.0$

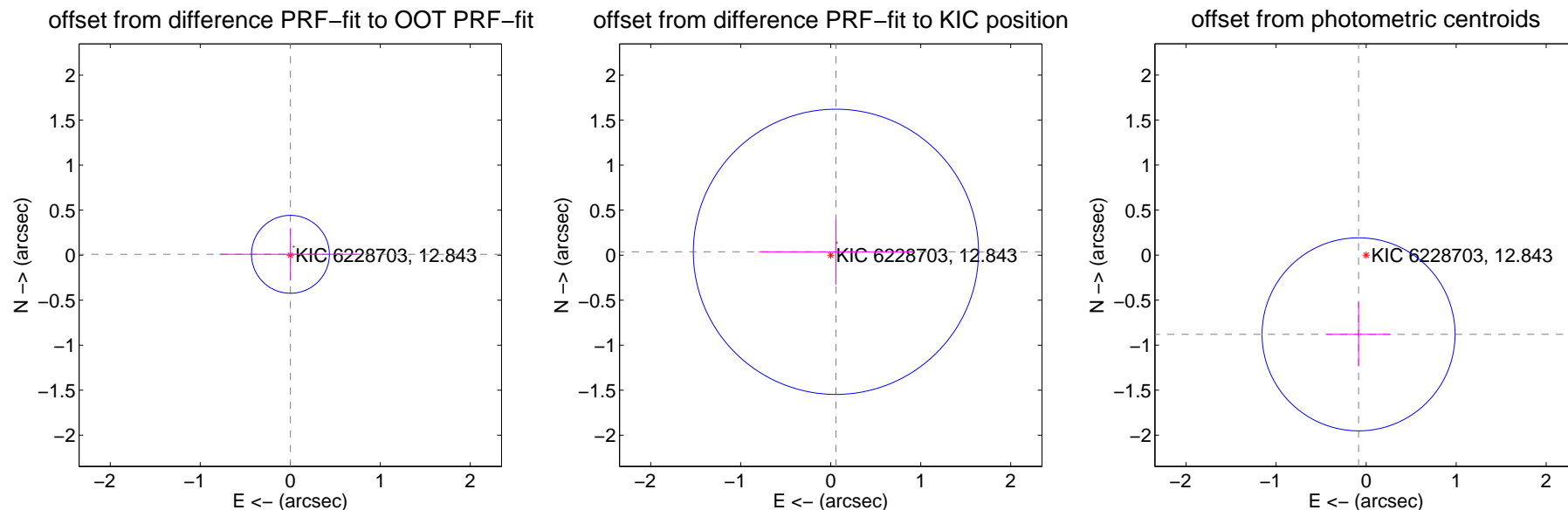
DV Centroid Data

Supplemental centroid analysis for 006228703-02. Kepler magnitude: 12.84. Transit SNR 12.07

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	0.010 ± 0.144	0.07	-0.002 ± 0.789	0.009 ± 0.291
PRF-fit source offset from KIC position	0.069 ± 0.528	0.13	-0.058 ± 0.856	0.037 ± 0.364
photometric centroid source offset	0.88 ± 0.36	2.47	0.08 ± 0.36	-0.88 ± 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q1 no difference image



Q1 no OOT image



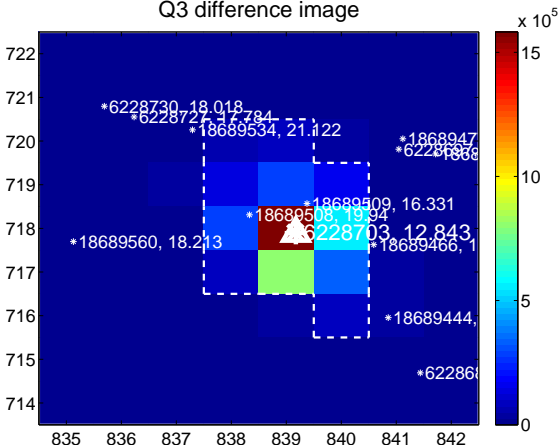
Q2 no difference image



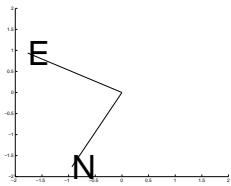
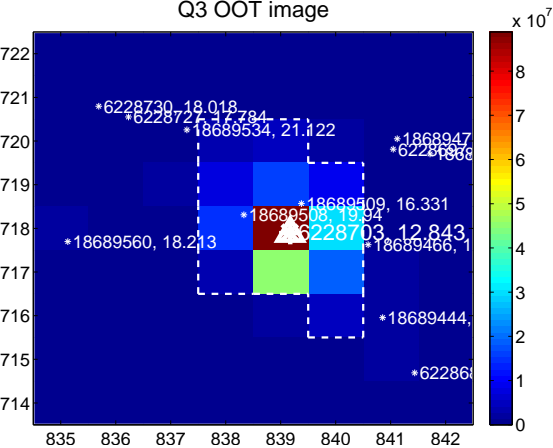
Q2 no OOT image



Q3 difference image



Q3 OOT image



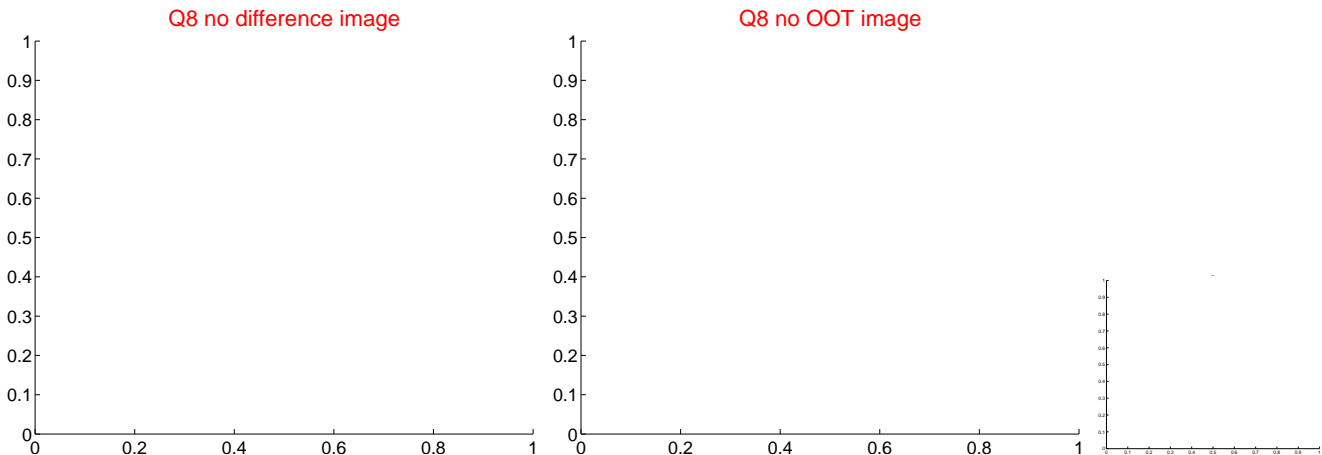
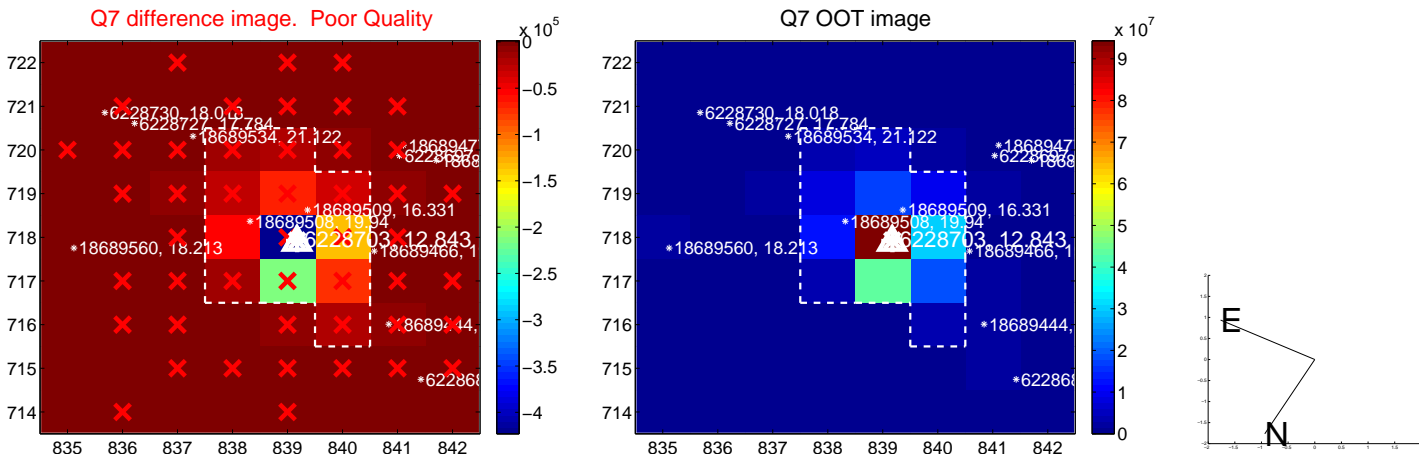
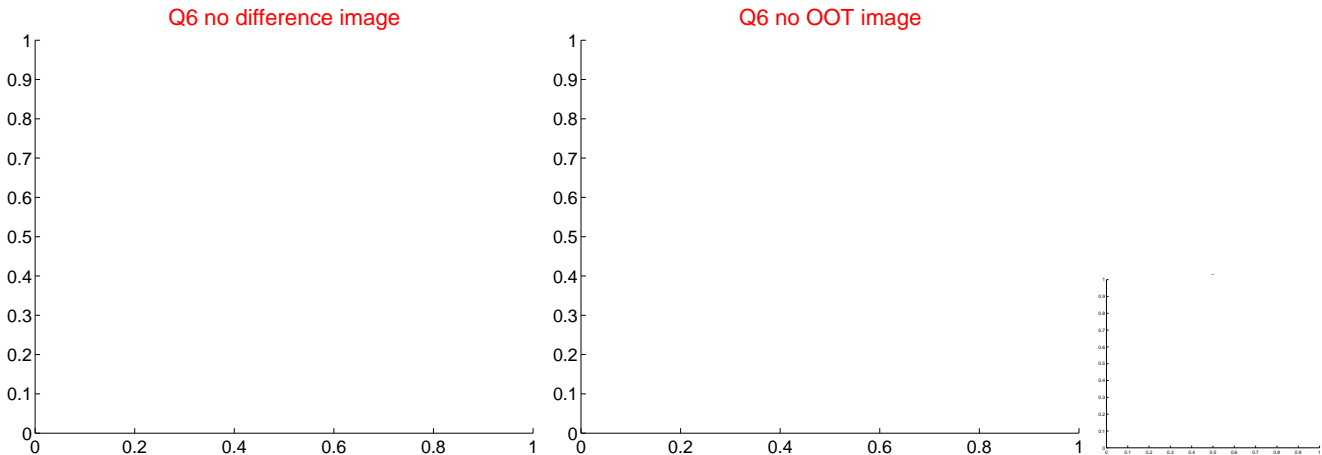
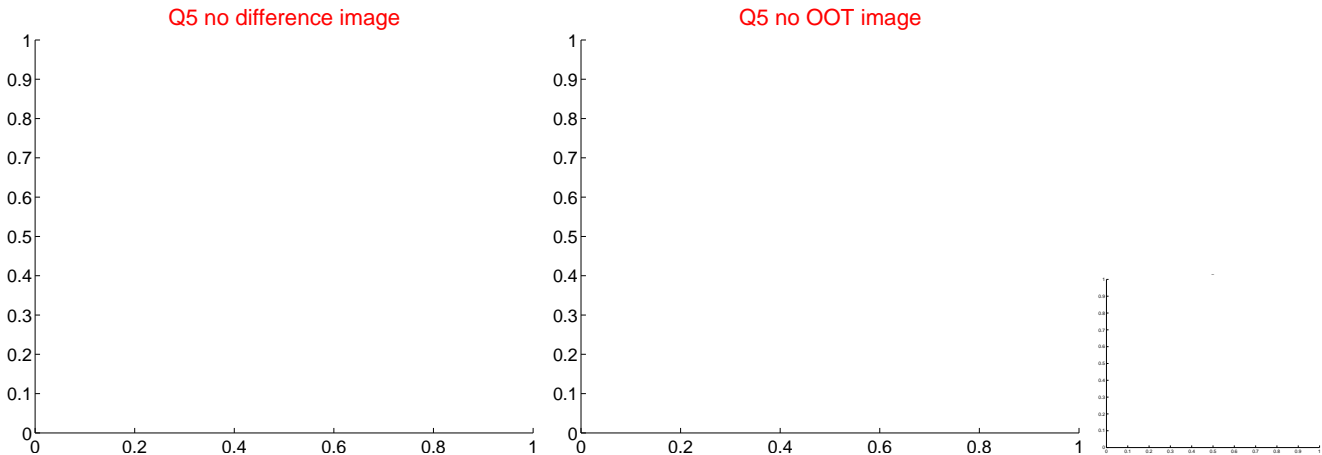
Q4 no difference image



Q4 no OOT image



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



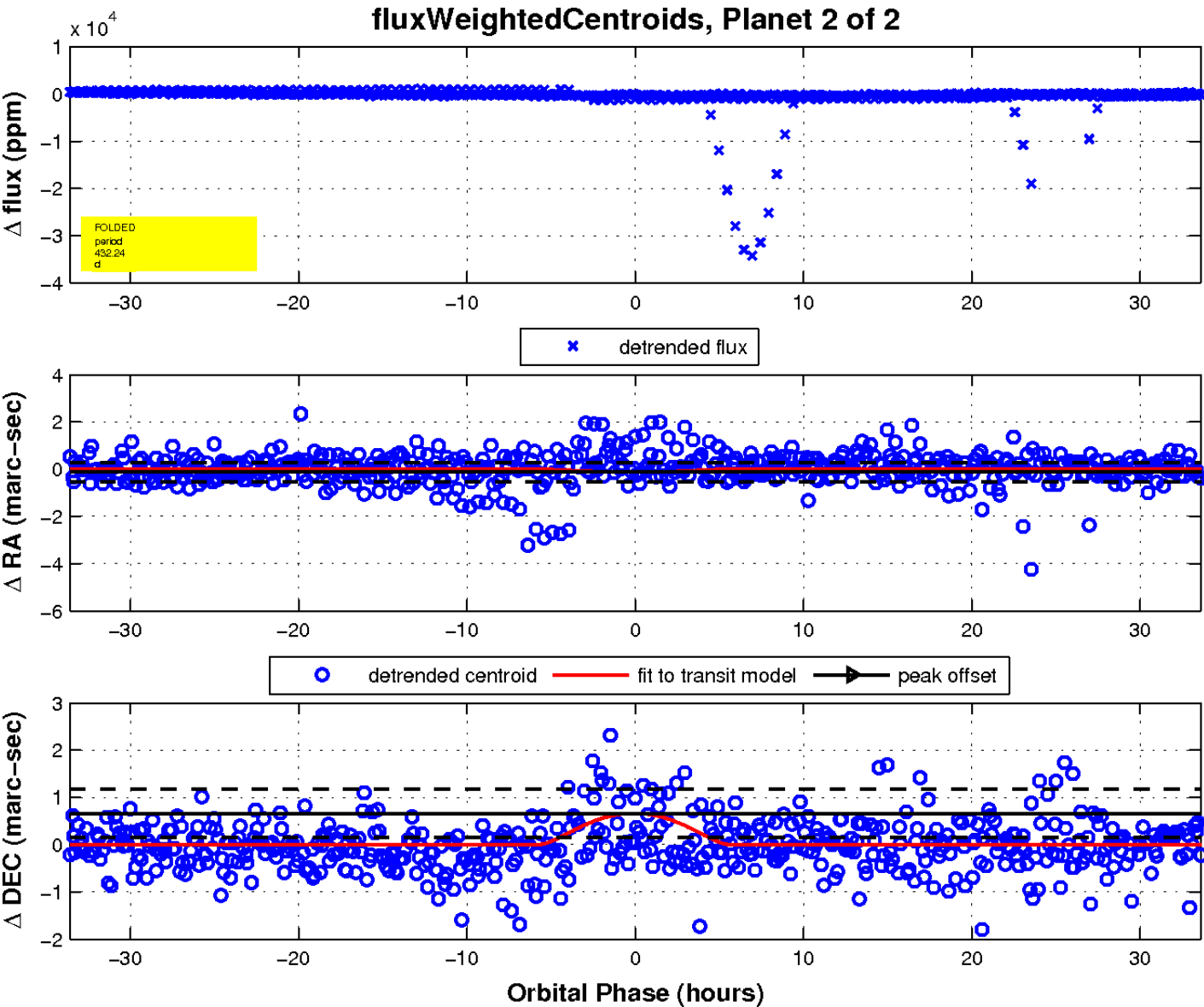
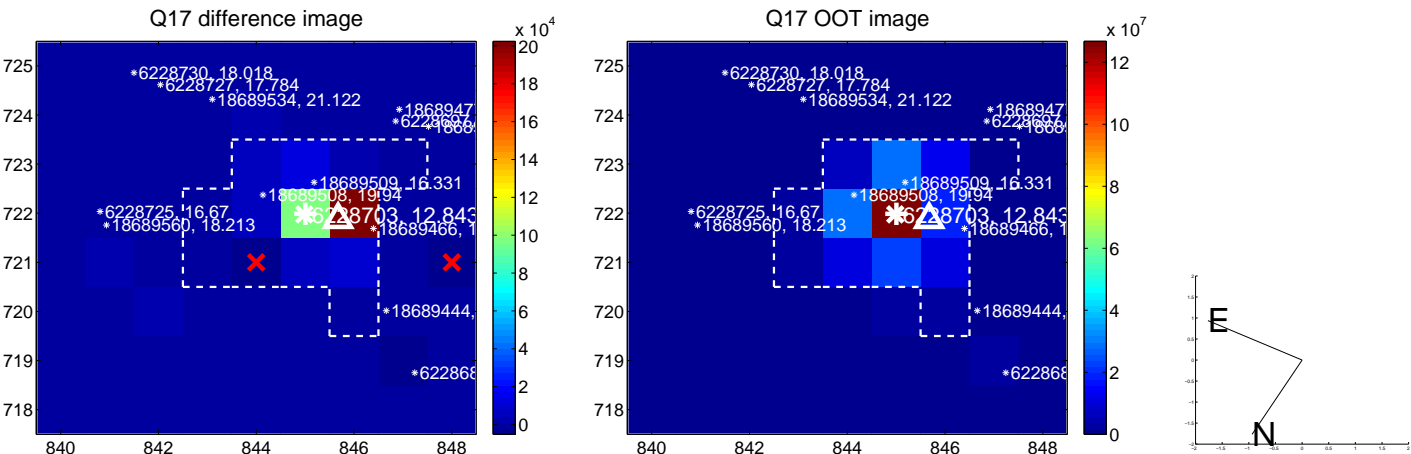
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

