

KIC 002285420

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})
002285420-01	OBS	No	291.793017	260.328301	364.1	3.598	12.8	1.9	0.60	4174	1.14	0.19
002285420-02	OBS	No	378.302102	332.345672	1167.9	2.945	14.2	6.0	0.60	4174	2.00	0.13
002285420-03	OBS	No	395.607215	472.087017	2562.3	4.722	12.8	10.2	0.60	4174	2.94	0.12
002285420-04	OBS	No	500.069630	281.798662	1375.9	2.684	12.0	5.6	0.60	4174	2.16	0.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002285420-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_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
002285420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
002285420-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002285420-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_NOFITS

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

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

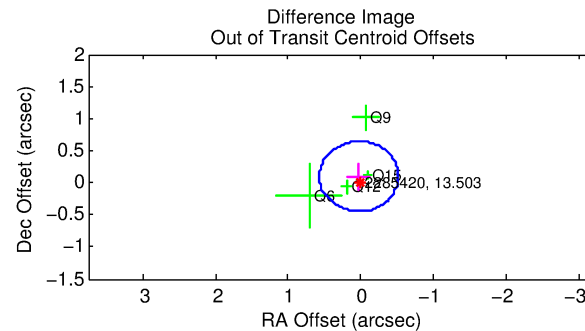
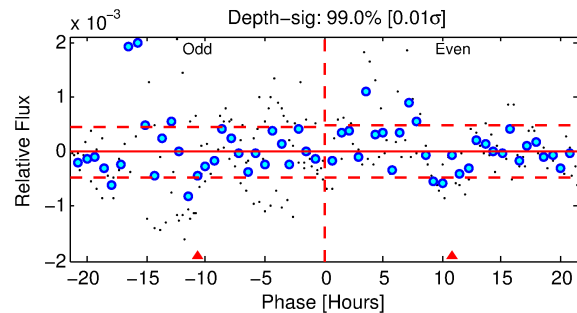
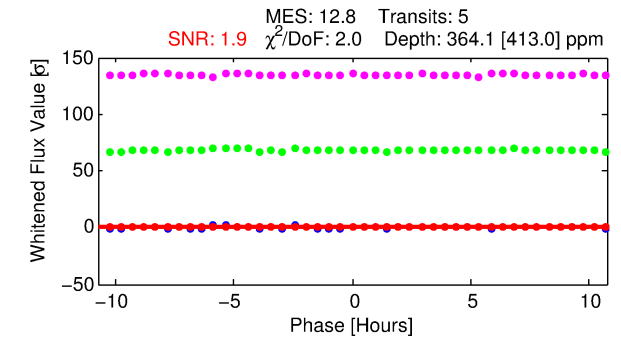
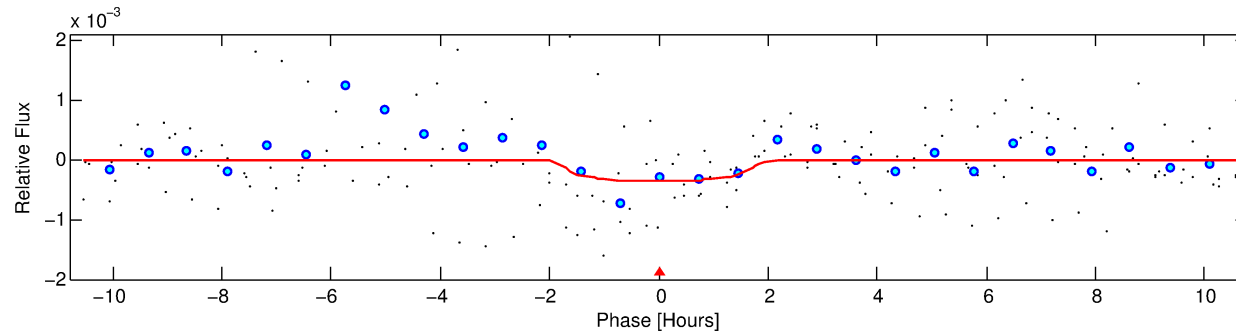
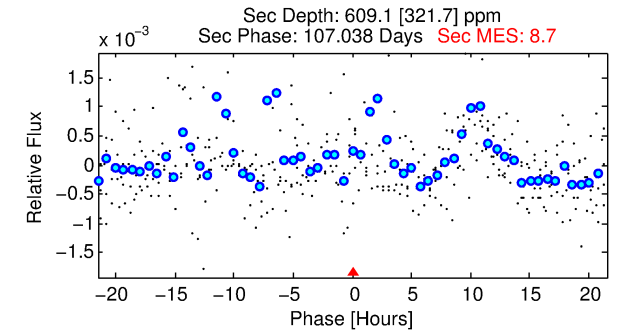
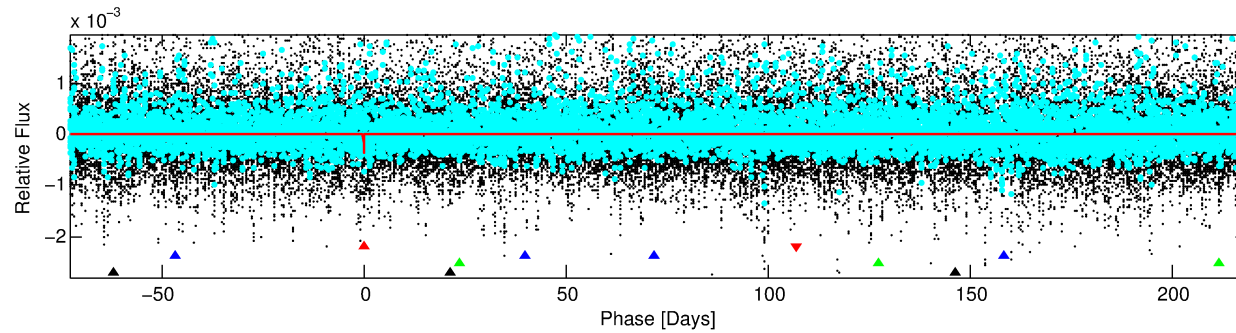
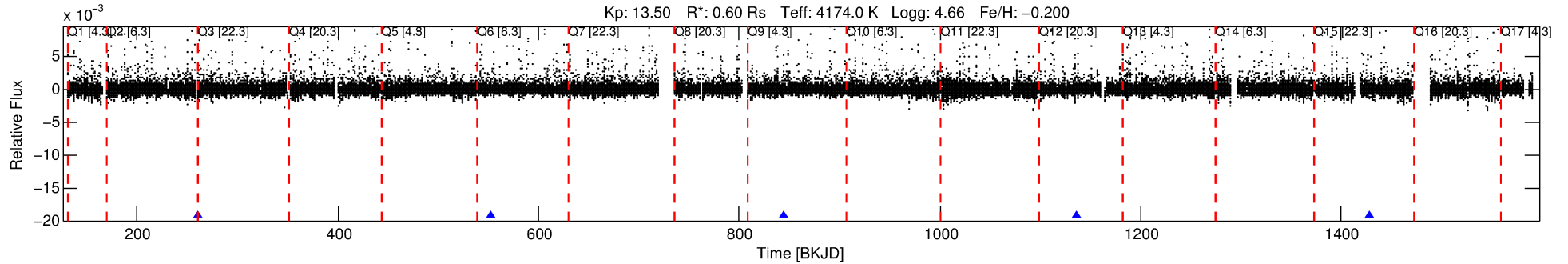
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002285420-01

No Significant Match Found

DV One-Page Summary

KIC: 2285420 Candidate: 1 of 4 Period: 291.793 d



DV Fit Results:

Period = 291.79302 [0.02788] d
Epoch = 260.3283 [0.0387] BKJD
Rp/R* = 0.0174 [0.1399]
a/R* = 577.75 [15892.84]
b = 0.41 [57.37]
Seff = 0.19 [0.04]
Teq = 168 [8] K
Rp = 1.14 [9.16] Re
a = 0.7236 [0.0624] AU
Ag = 135110.81 [2173686.21] [0.06] σ
Teffp = 4970 [19991] K [0.24] σ

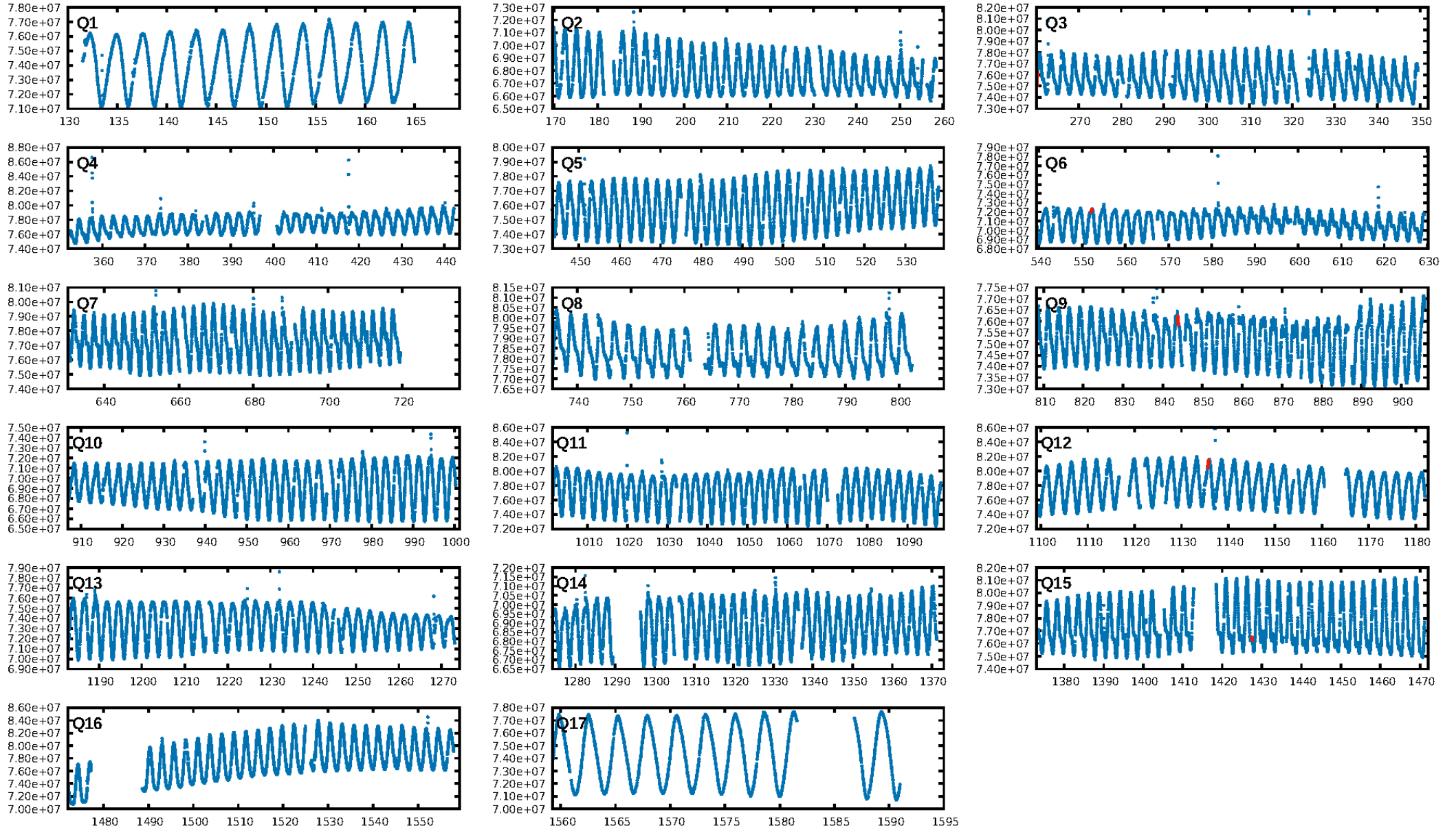
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [446.54 σ]
ModelChiSquare2-sig: 42.9%
ModelChiSquareGof-sig: 99.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -55.46
Centroid-sig: 82.4%
Centroid-so: 0.901 arcsec [0.48 σ]
OotOffset-rm: 0.102 arcsec [0.56 σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-rm: 0.283 arcsec [1.80 σ]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

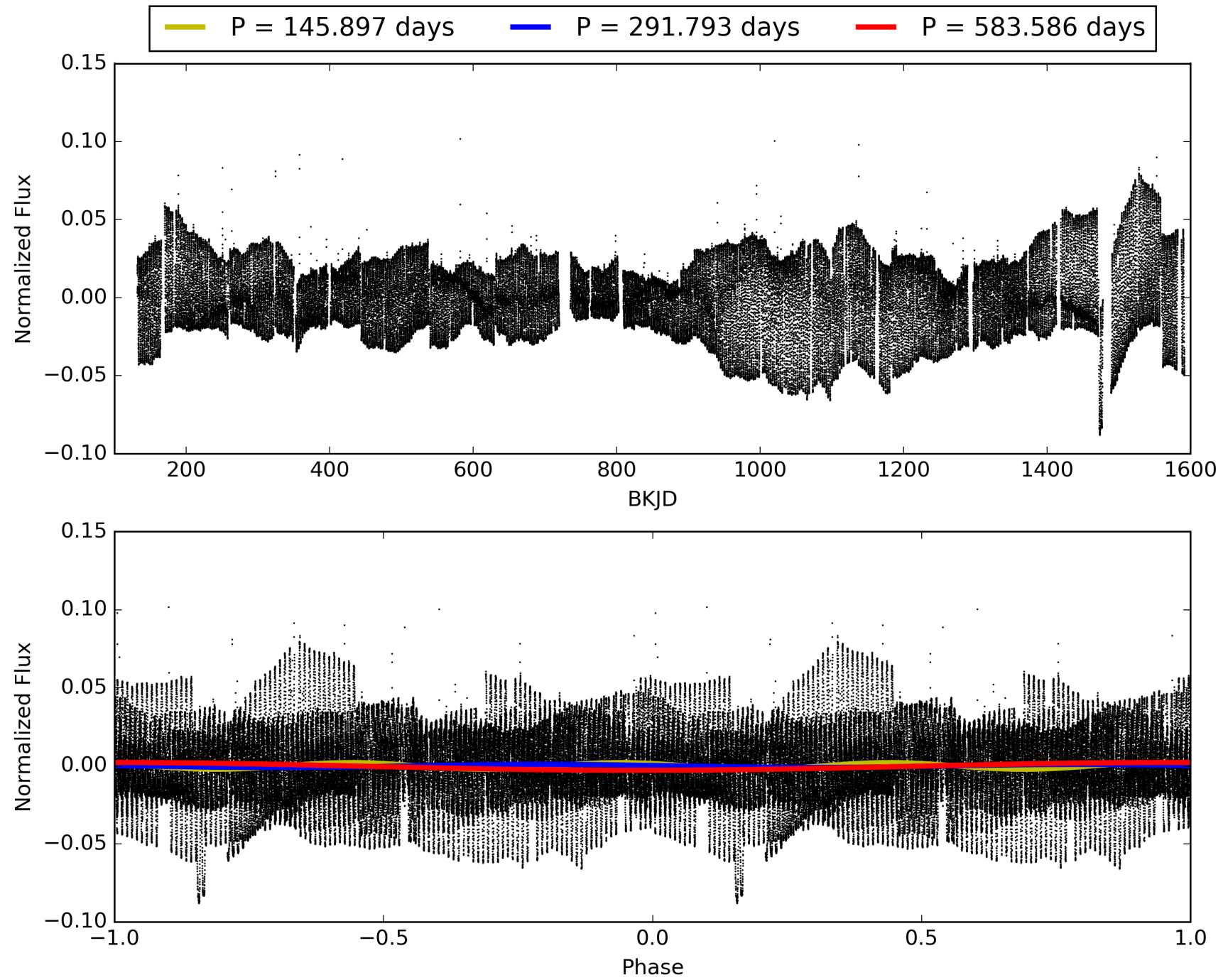
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:50:31 Z

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

TCE 002285420-01, PDC Light Curves

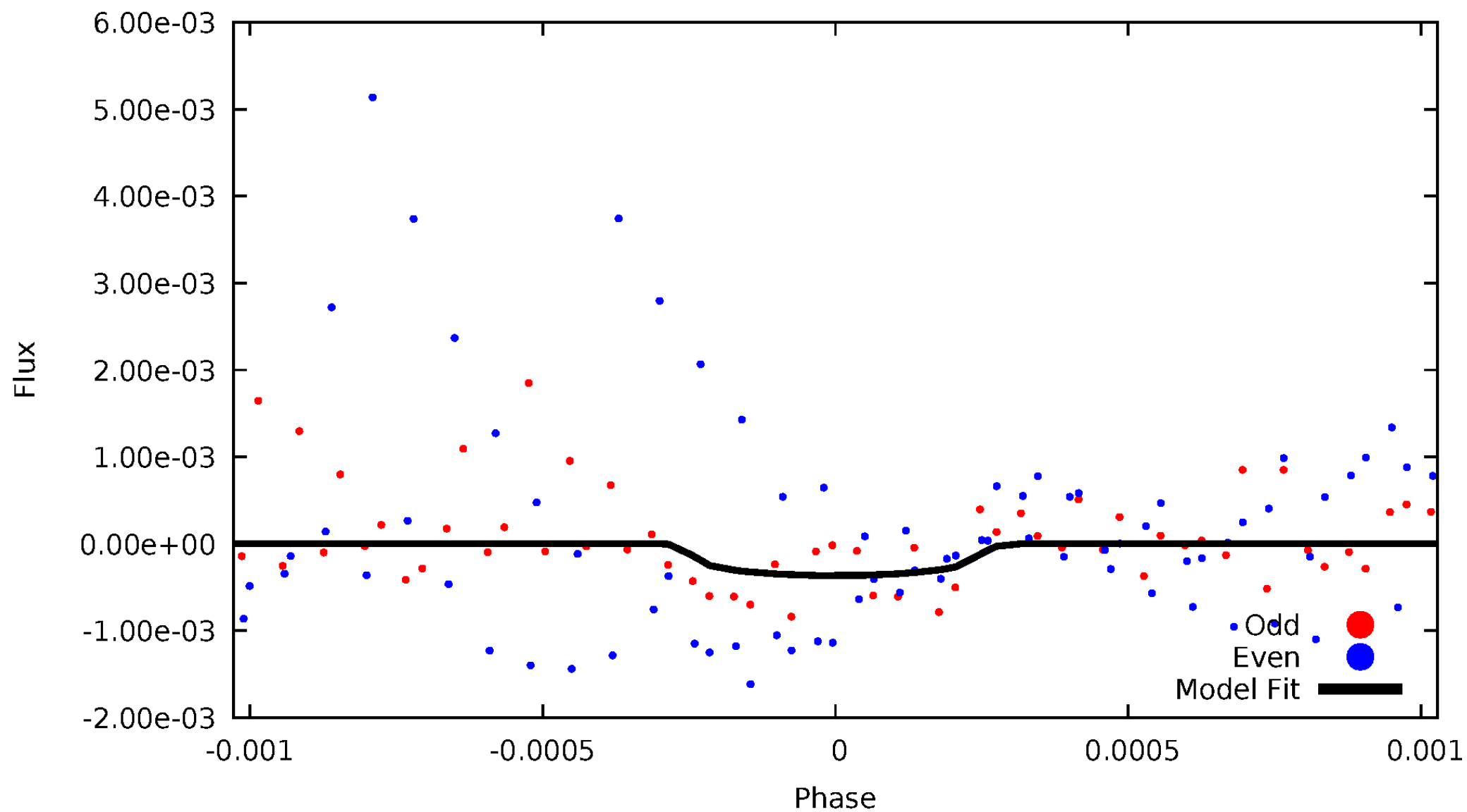


TCE 002285420-01



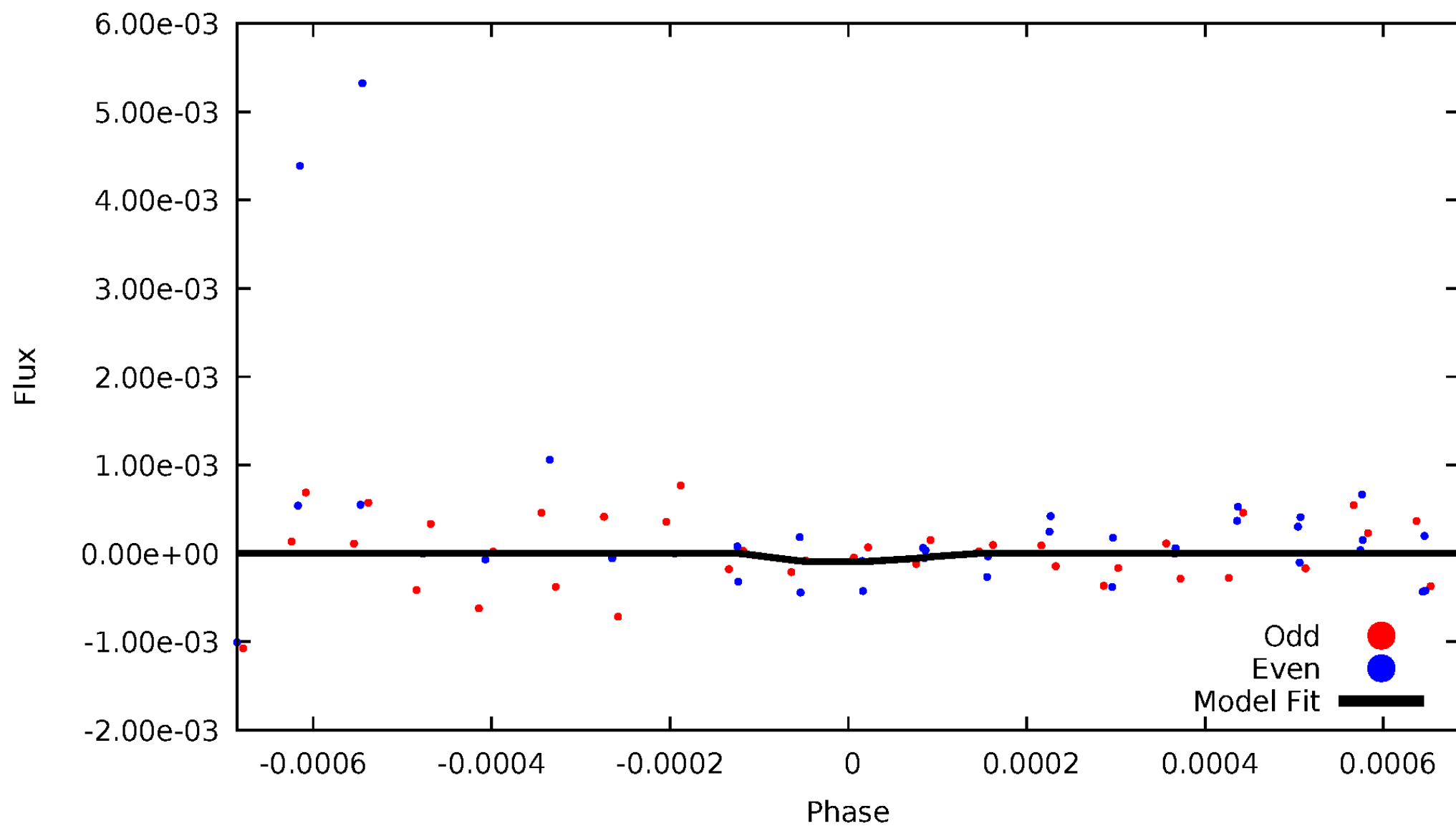
DV Odd/Even

TCE 002285420-01



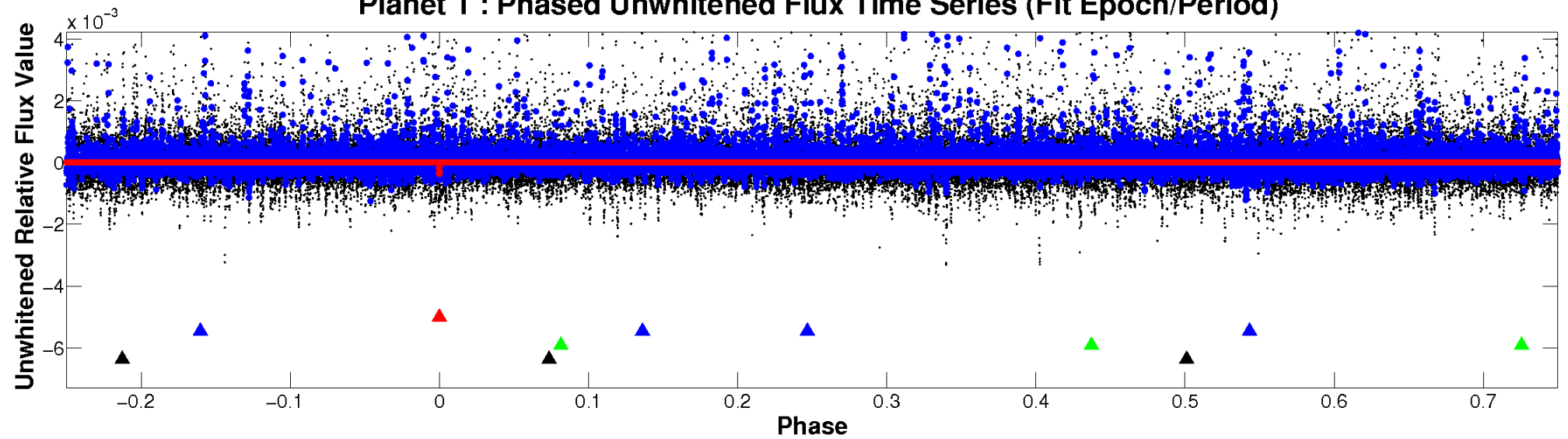
ALT Odd/Even

TCE 002285420-01

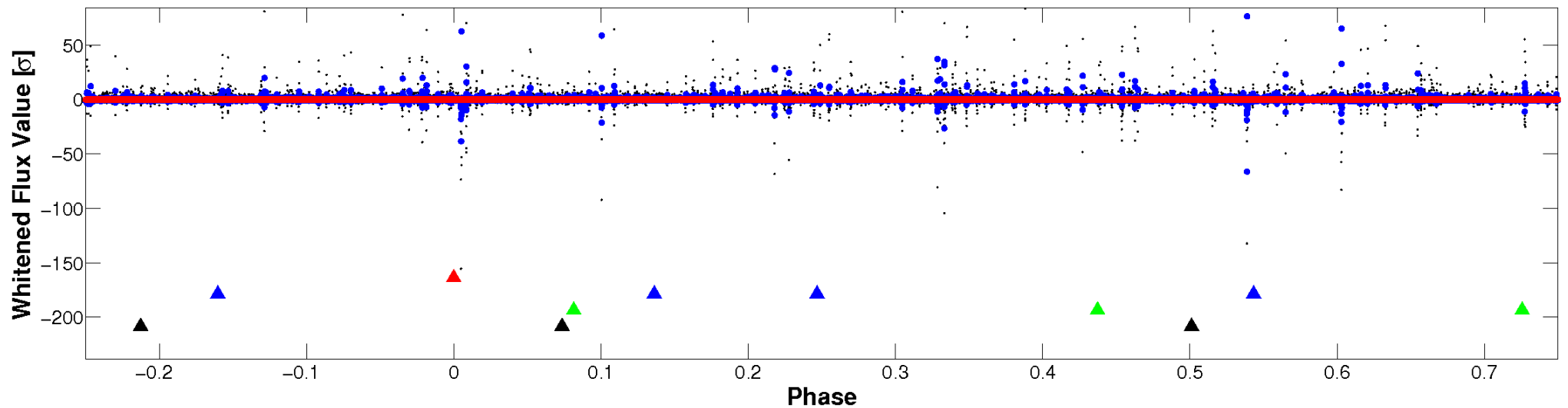


Non-Whitened Vs. Whitened Light Curve

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

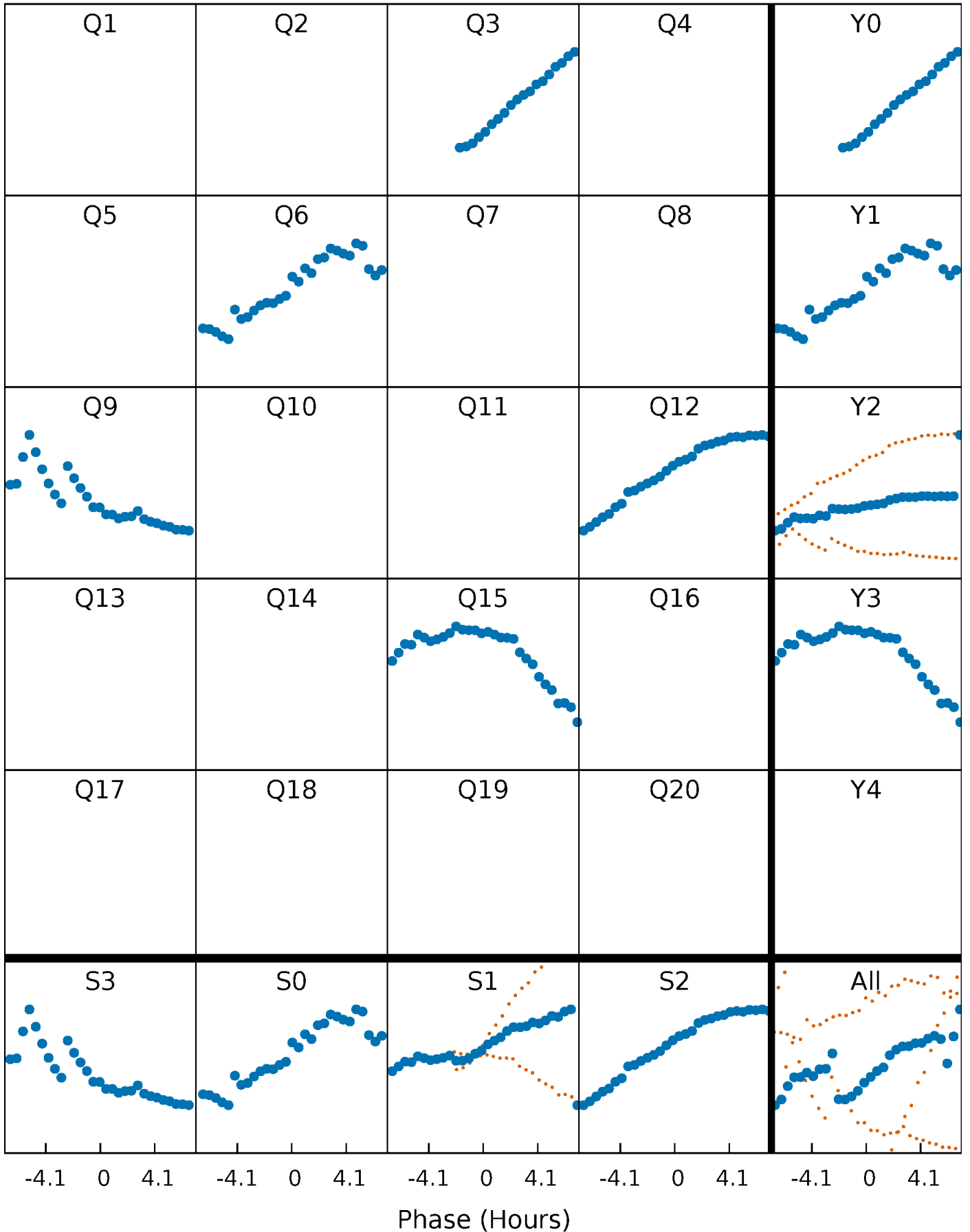


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



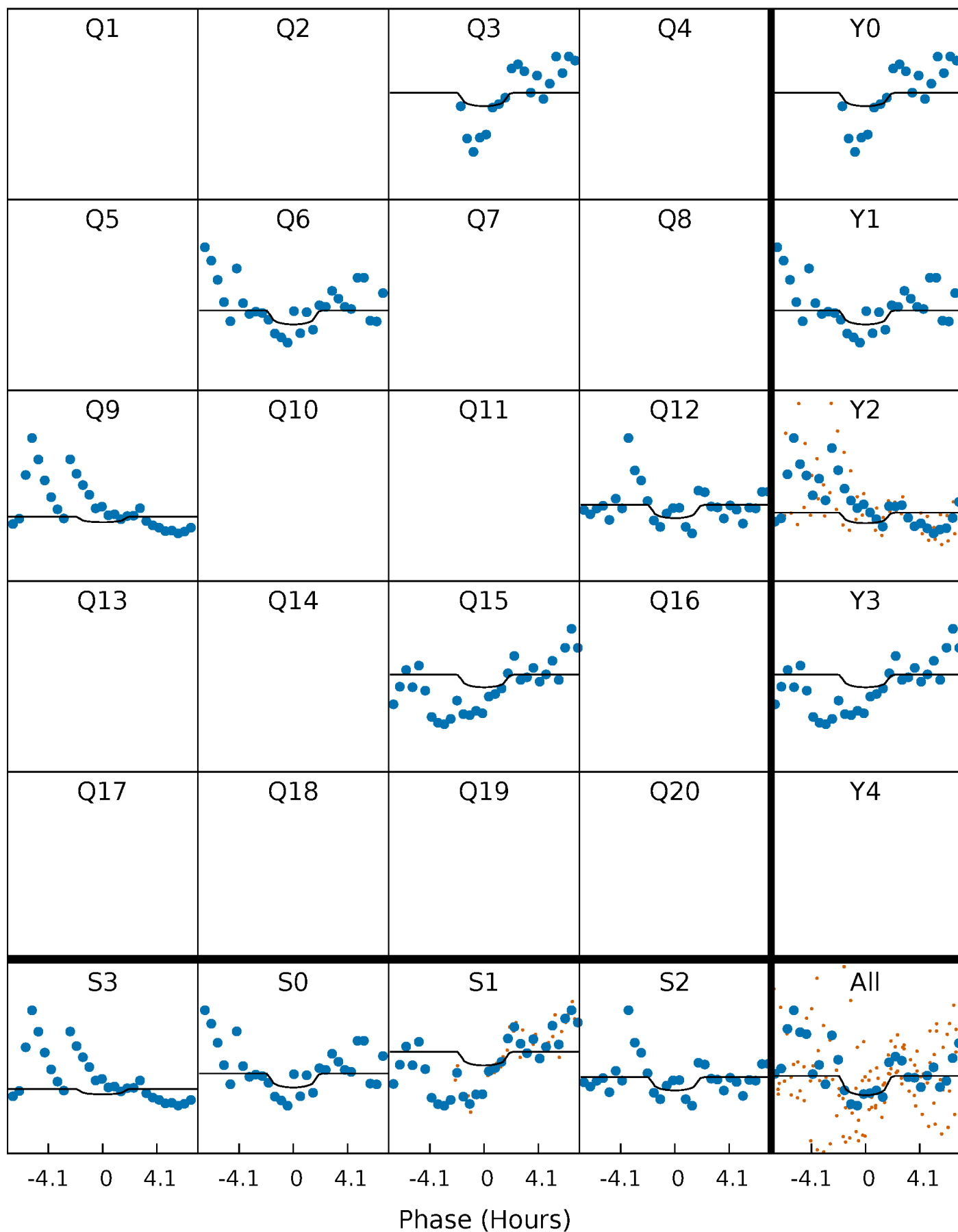
PDC Quarter-Phased Transit Curves

TCE 002285420-01 P=291.793017 Days $T_0=260.328301$ (BKJD)



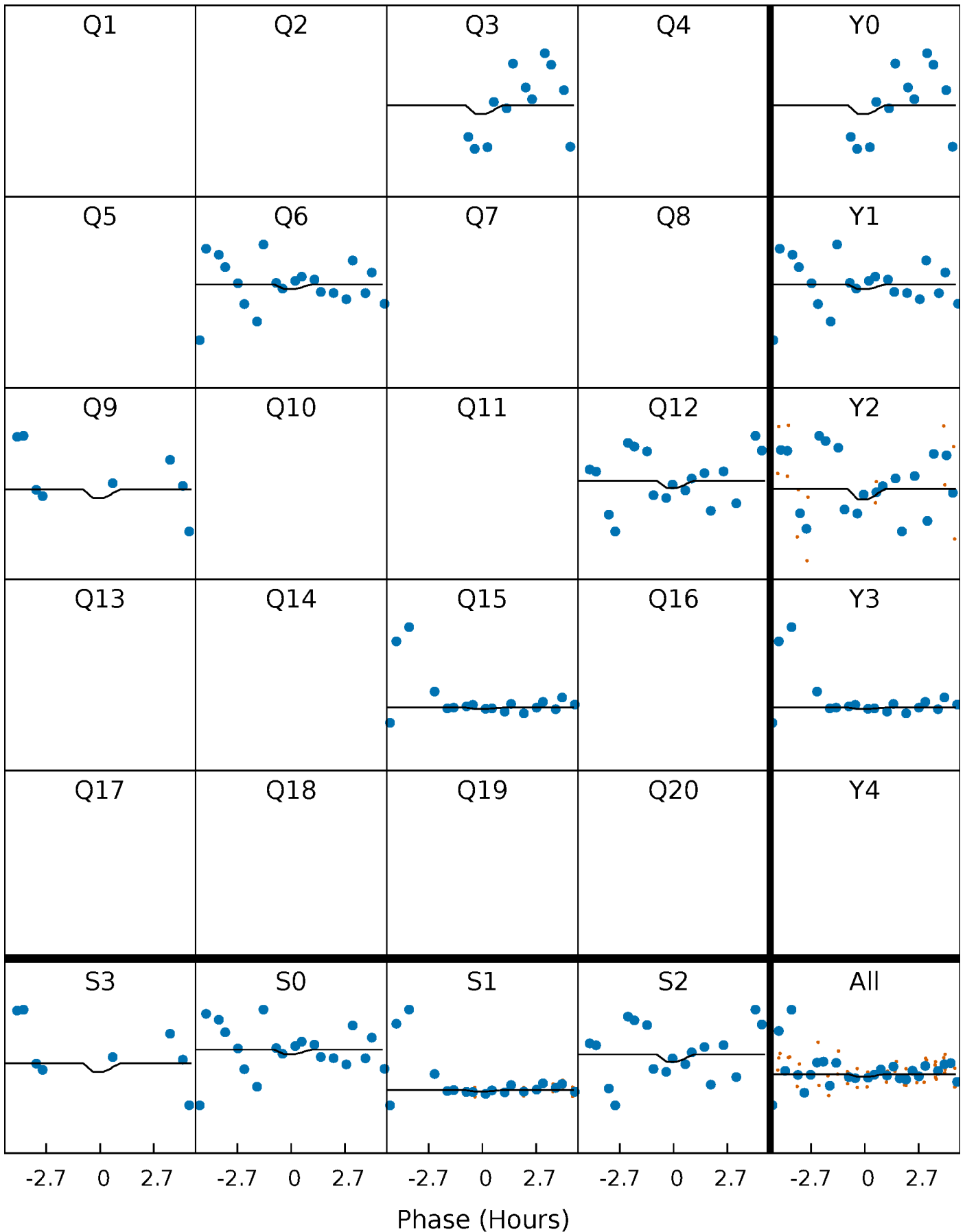
DV Quarter-Phased Transit Curves

TCE 002285420-01 P=291.793017 Days $T_0=260.328301$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

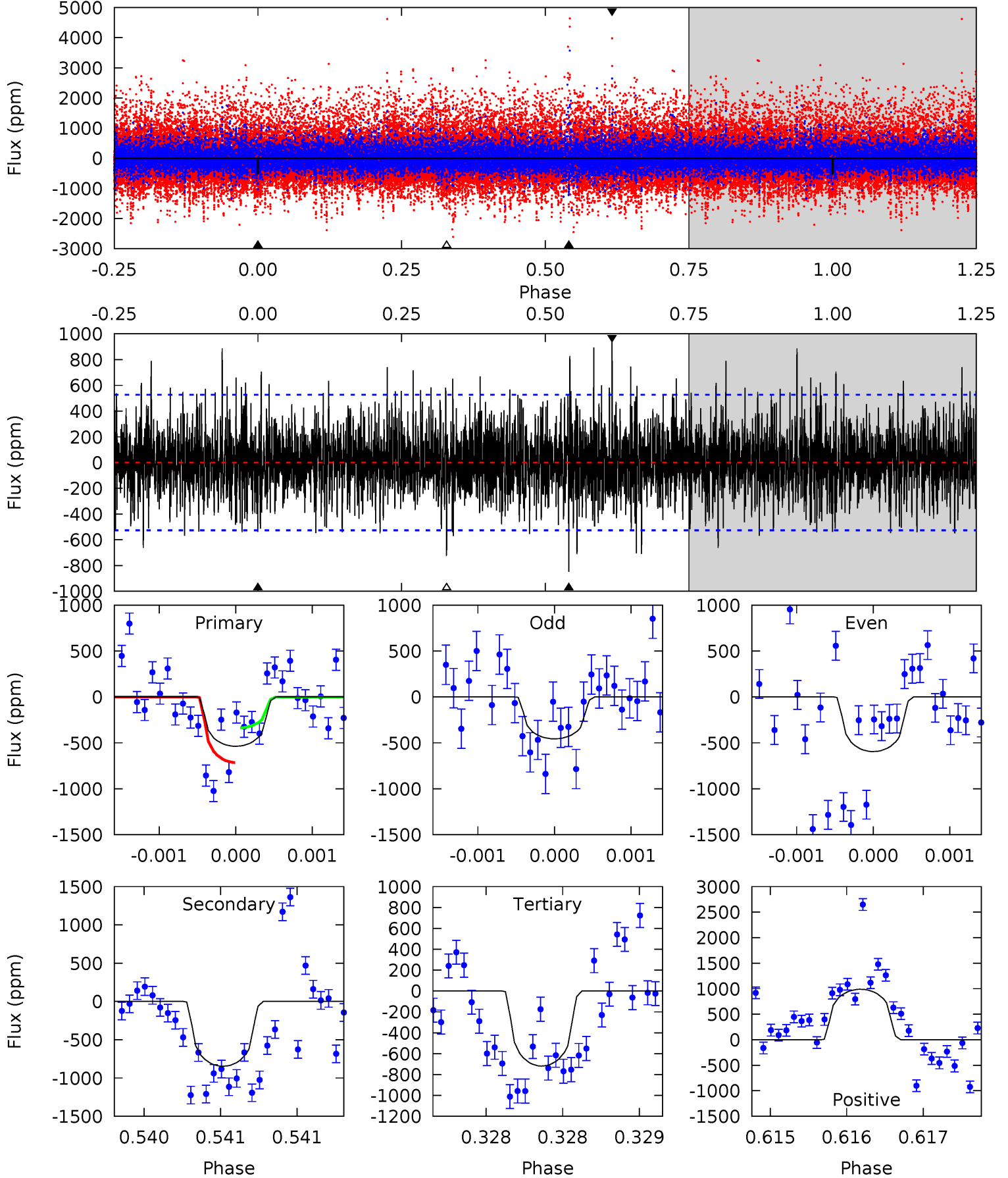
TCE 002285420-01 P=291.709502 Days $T_0=260.281224$ (BKJD)



DV Model-Shift Uniqueness Test

002285420-01, P = 291.793017 Days, E = 260.328301 Days

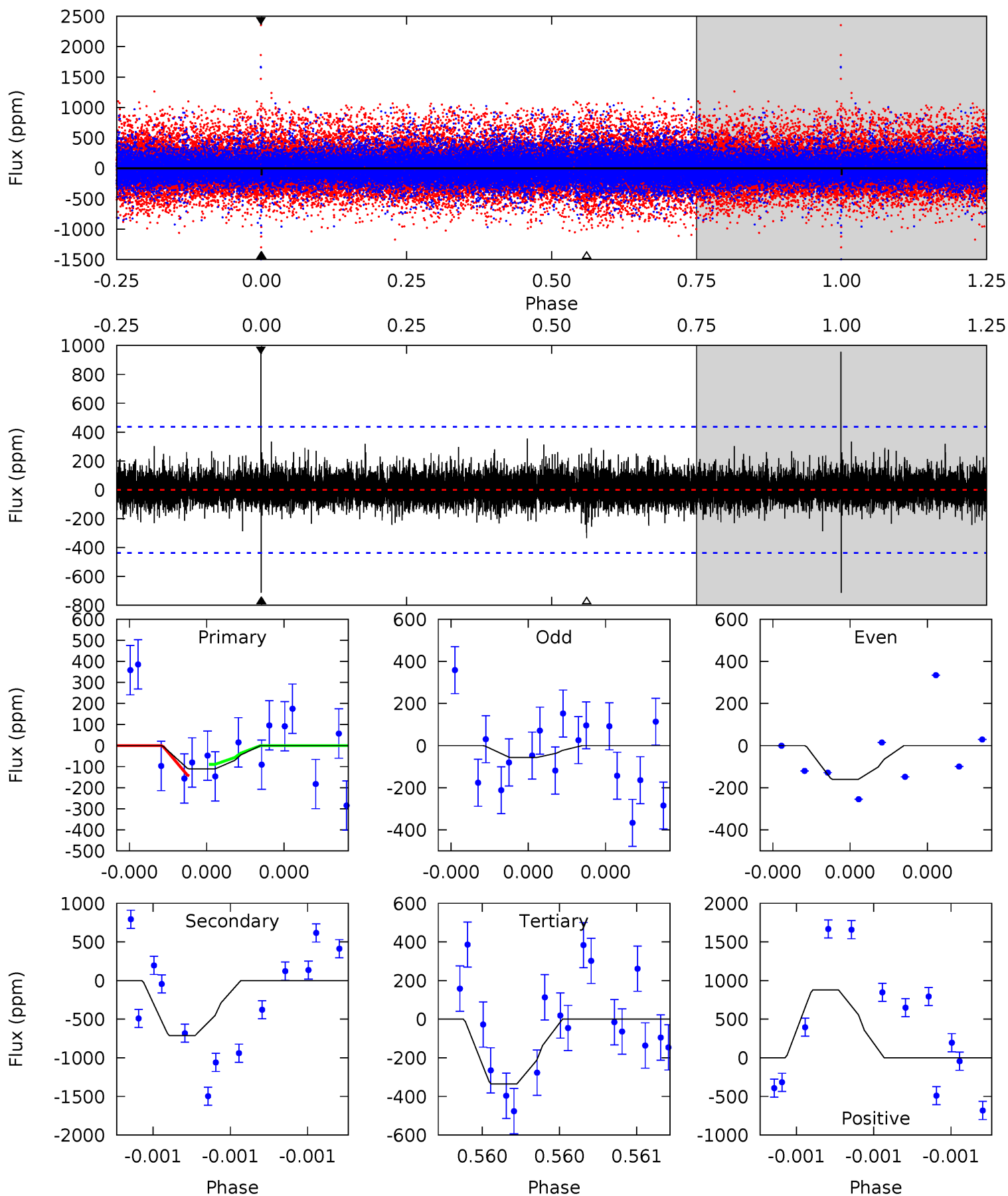
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.66	8.91	7.57	10.4	5.54	3.43	2.11	-1.91	-4.75	1.35	-1.50	0.50	0.84	0.54	1.99



Alt Model-Shift Uniqueness Test

002285420-01, P = 291.709502 Days, E = 260.281224 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.45	9.32	4.39	11.5	5.72	3.71	0.87	-2.94	-10.0	4.93	-2.17	0.64	2.01	0.57	0.31



Stellar Parameters For KIC 002285420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4174^{+145}_{-160}	$4.655^{+0.059}_{-0.027}$	$-0.200^{+0.300}_{-0.300}$	$0.600^{+0.042}_{-0.066}$	$0.593^{+0.059}_{-0.059}$	$3.873^{+1.049}_{-0.469}$
	+3%/-4%	+1%/-1%	+150%/-150%	+7%/-11%	+10%/-10%	+27%/-12%
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 002285420-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-847 ± 95	$6.76^{+6.99}_{-4.76}$	233^{+9}_{-10}	2796^{+1297}_{-444}	5296^{+57821}_{-3977}
Alt.	-712 ± 76	$6.51^{+6.73}_{-4.51}$	232^{+9}_{-10}	2780^{+1168}_{-473}	4876^{+46679}_{-3740}

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

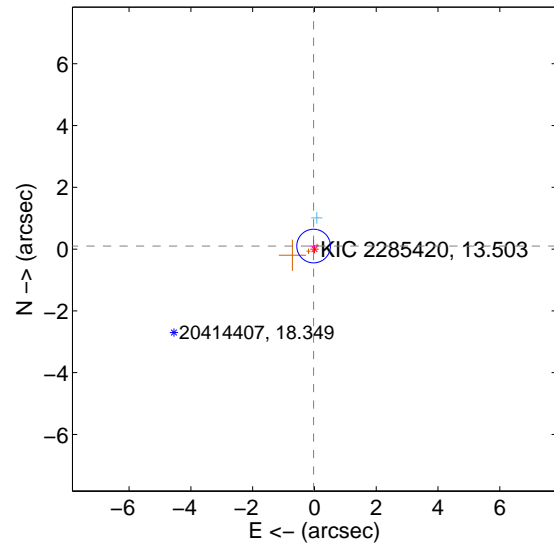
Supplemental centroid analysis for 002285420-01. Kepler magnitude: 13.50. Transit SNR 1.91

There are 1 quarters with good PRF difference image offsets

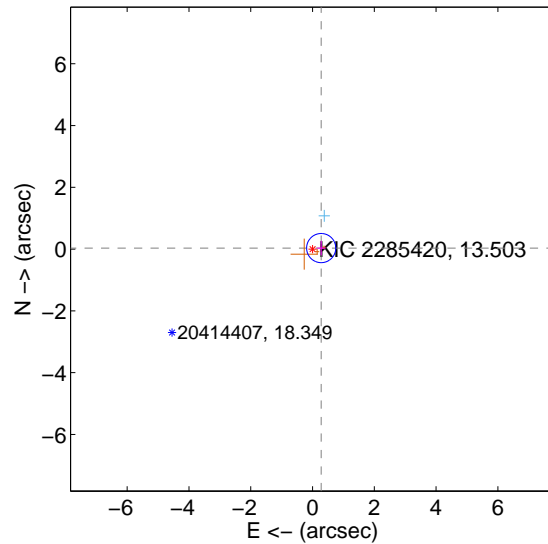
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.102 ± 0.182	0.56	0.027 ± 0.147	0.099 ± 0.203
PRF-fit source offset from KIC position	0.283 ± 0.157	1.80	-0.281 ± 0.142	0.033 ± 0.235
photometric centroid source offset	0.90 ± 1.88	0.48	-0.28 ± 1.64	-0.86 ± 1.90

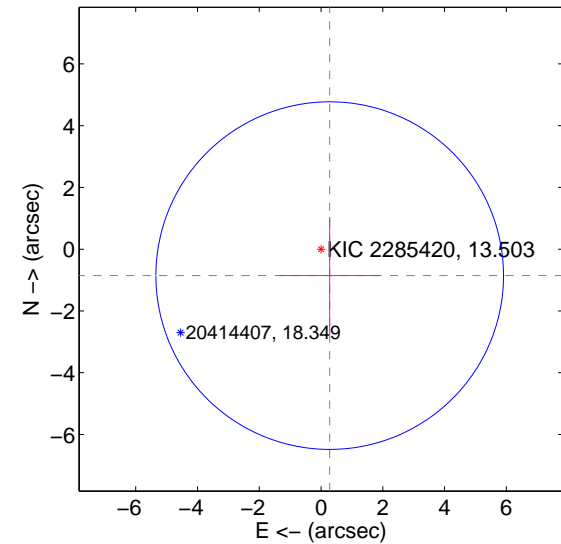
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

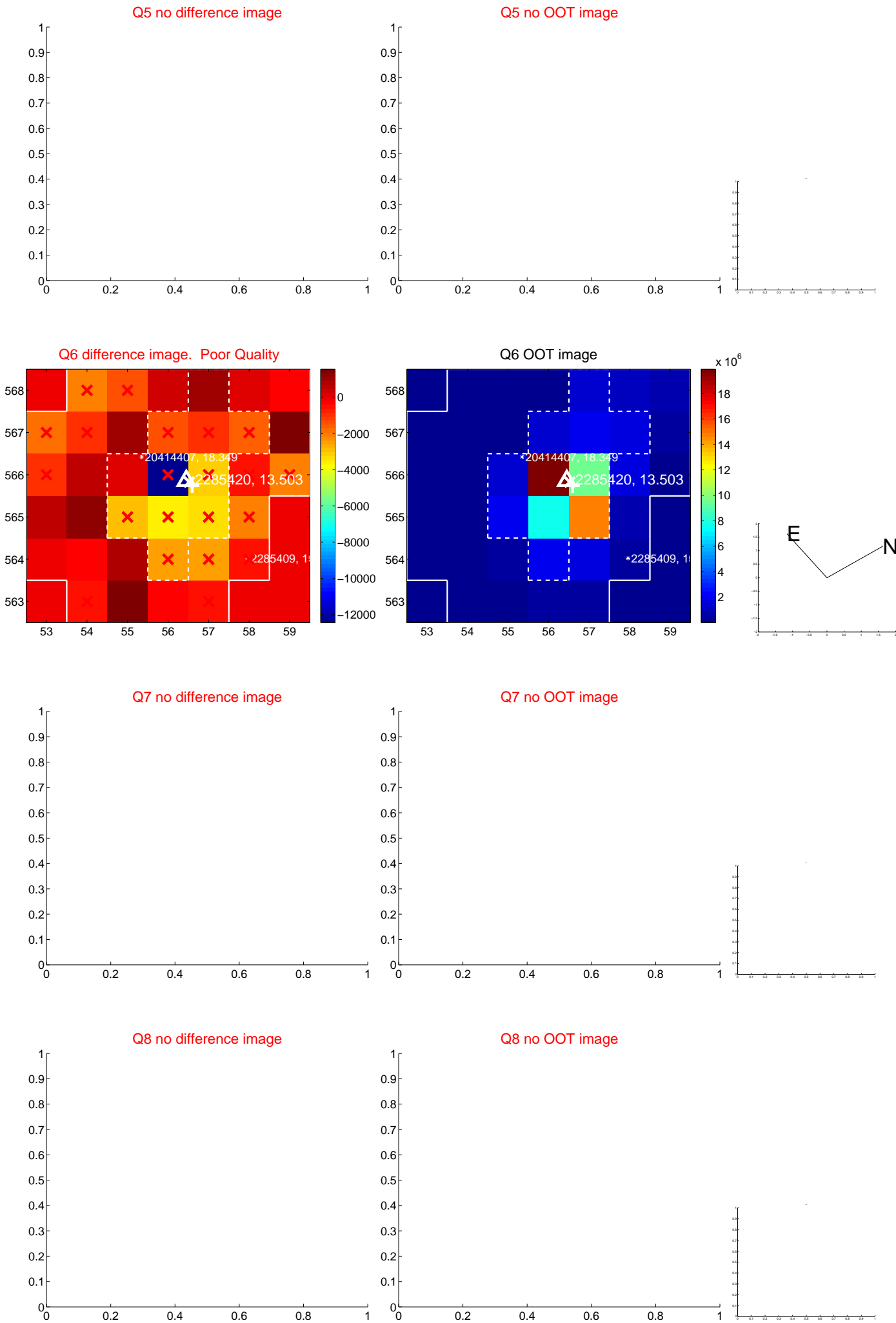


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

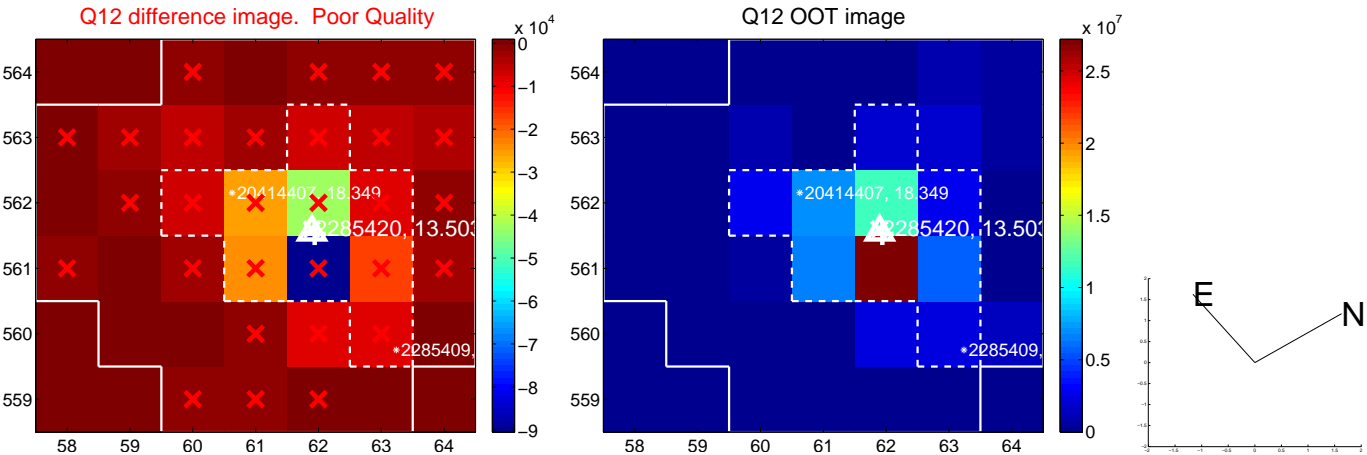
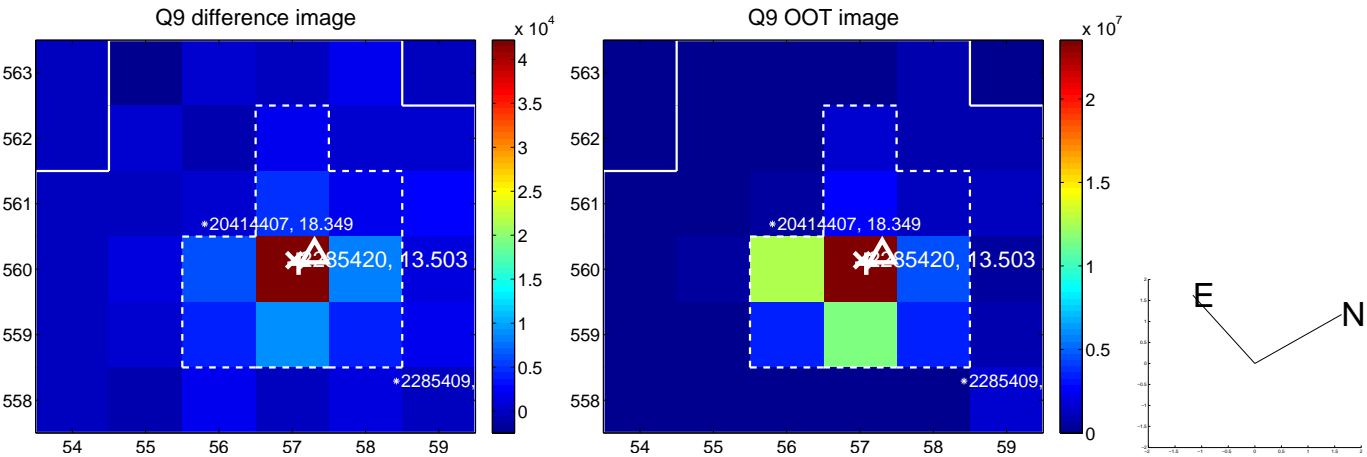
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



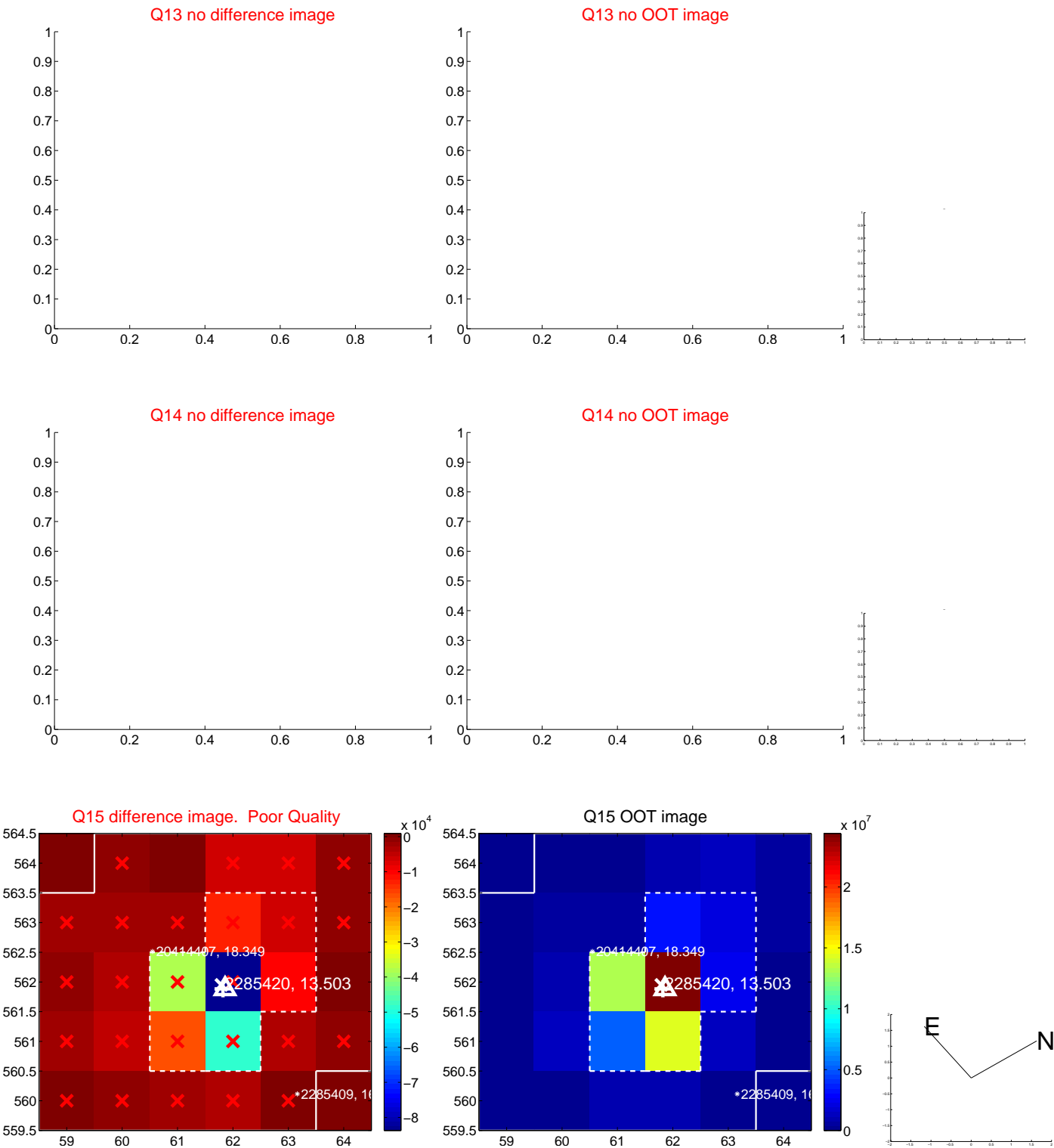
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



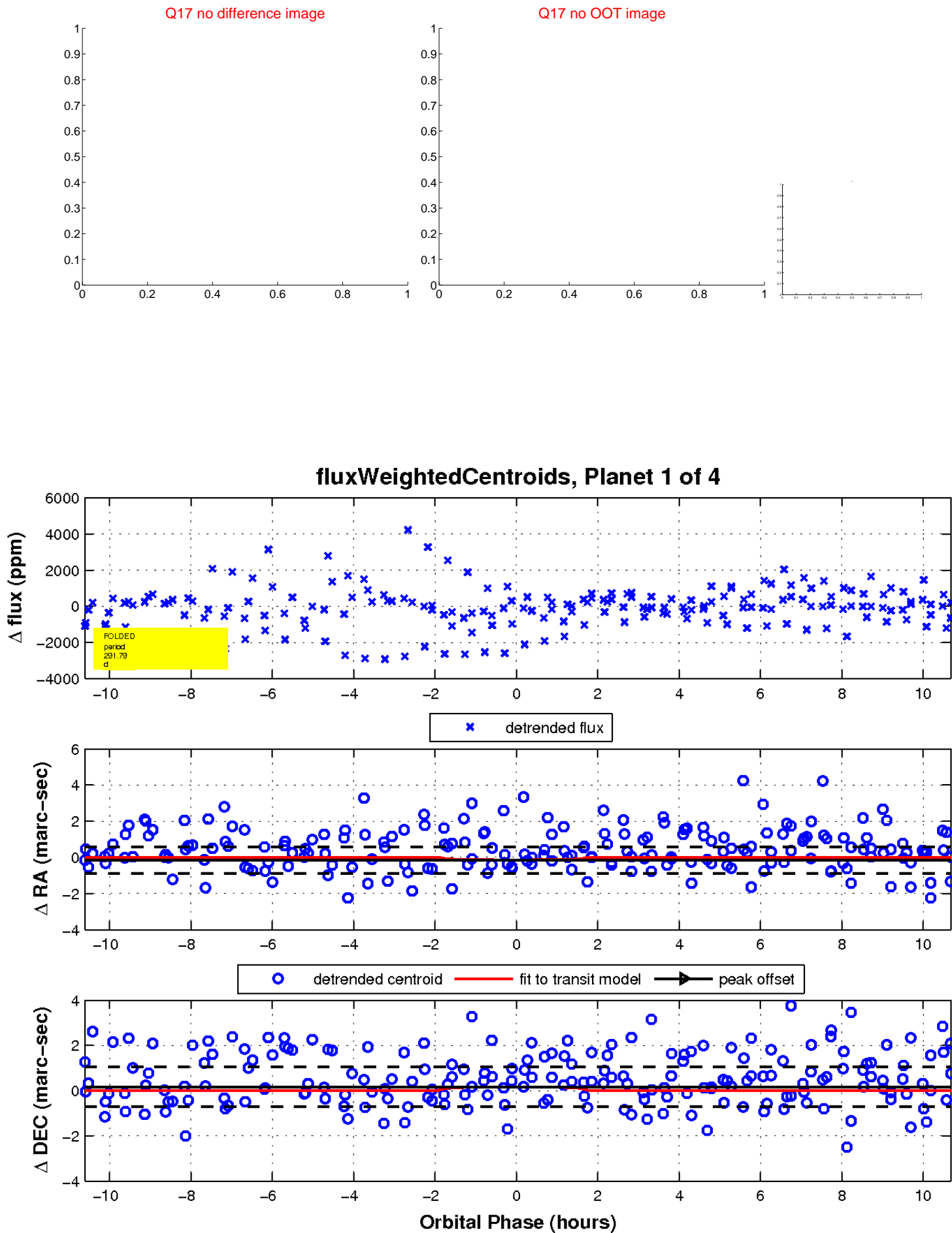
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

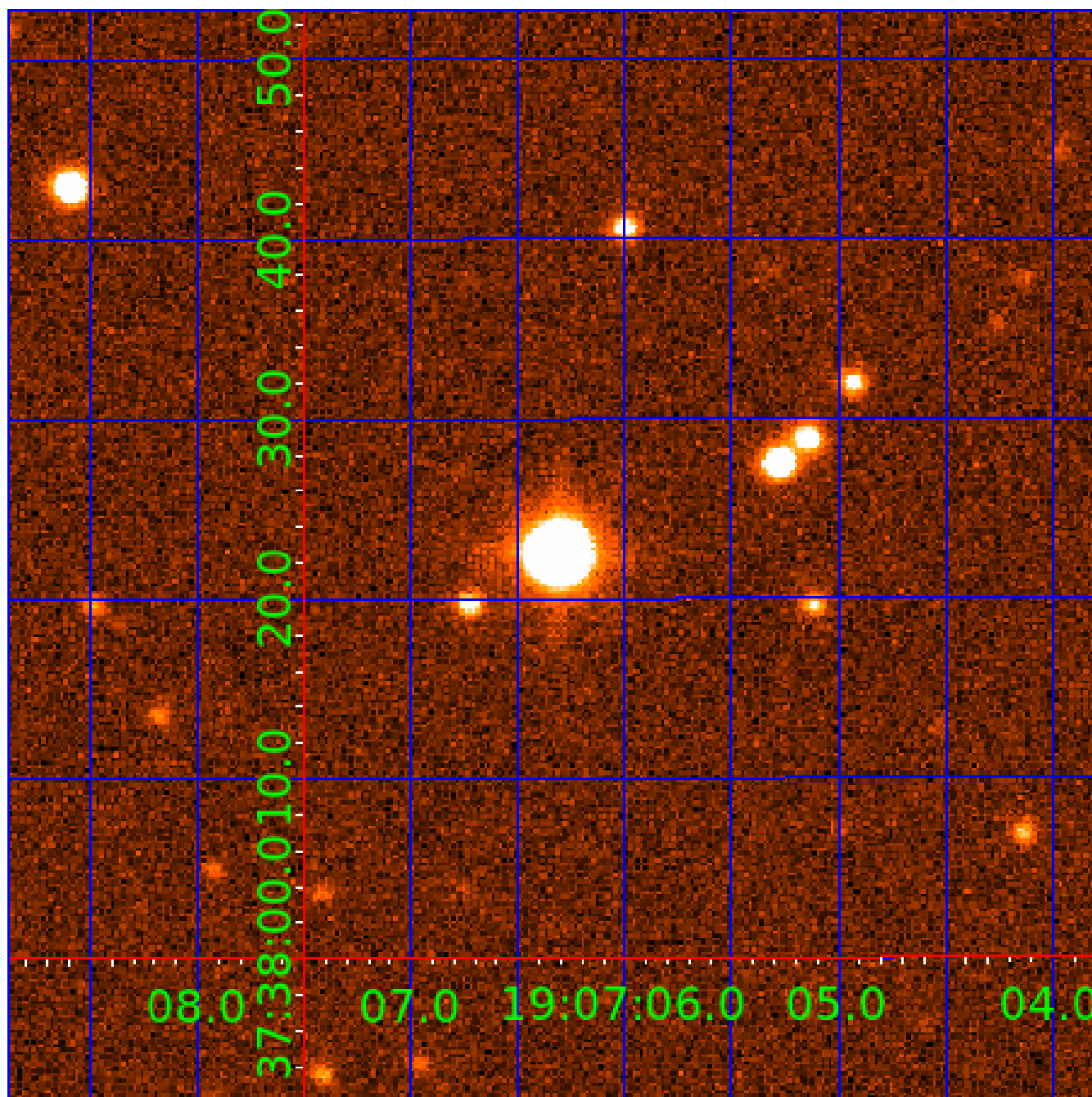


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002285420

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})
002285420-01	OBS	No	291.793017	260.328301	364.1	3.598	12.8	1.9	0.60	4174	1.14	0.19
002285420-02	OBS	No	378.302102	332.345672	1167.9	2.945	14.2	6.0	0.60	4174	2.00	0.13
002285420-03	OBS	No	395.607215	472.087017	2562.3	4.722	12.8	10.2	0.60	4174	2.94	0.12
002285420-04	OBS	No	500.069630	281.798662	1375.9	2.684	12.0	5.6	0.60	4174	2.16	0.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002285420-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_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
002285420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
002285420-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002285420-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_NOFITS

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

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

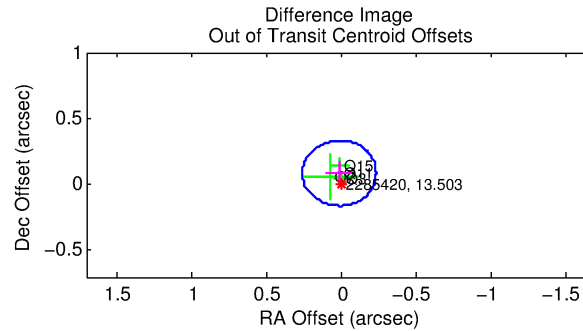
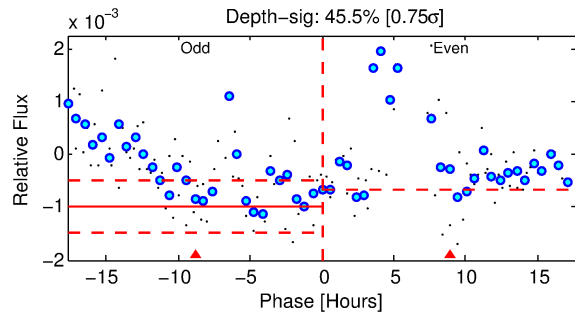
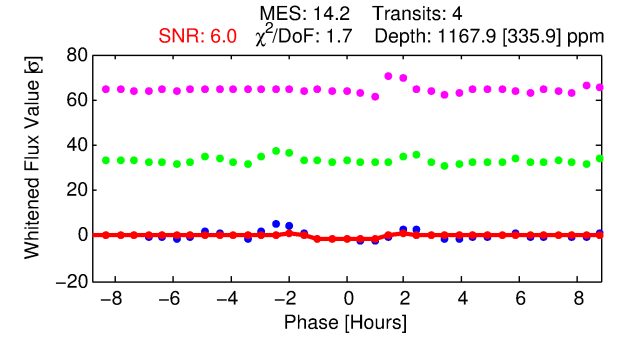
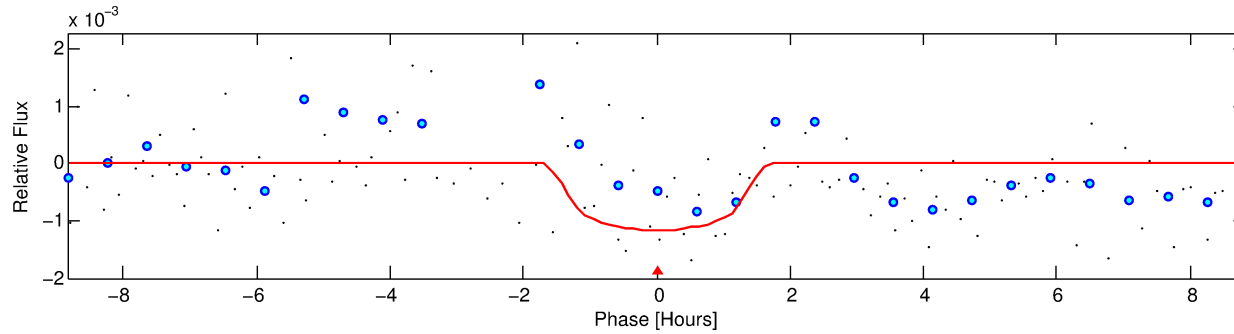
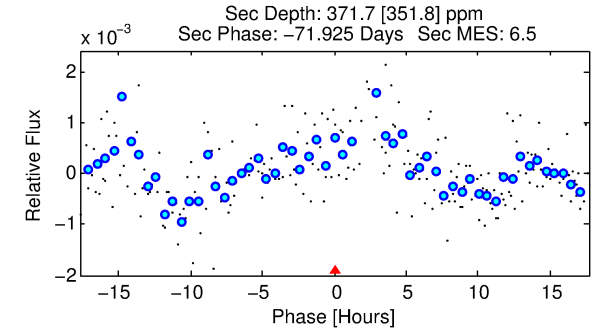
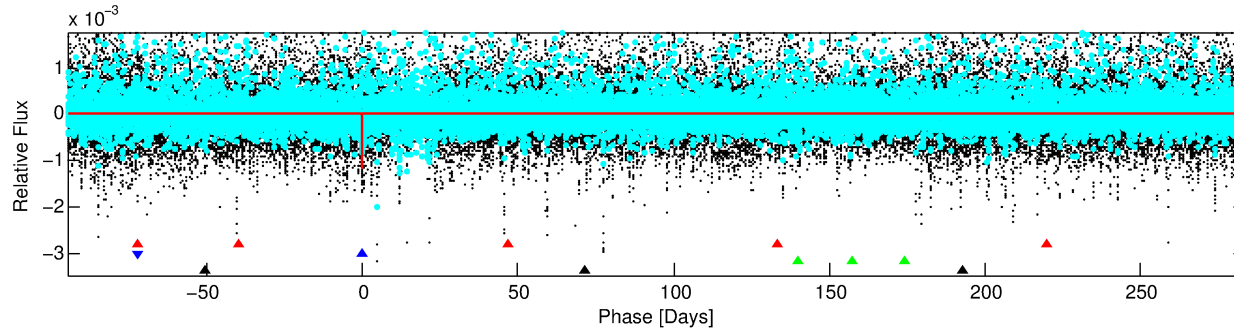
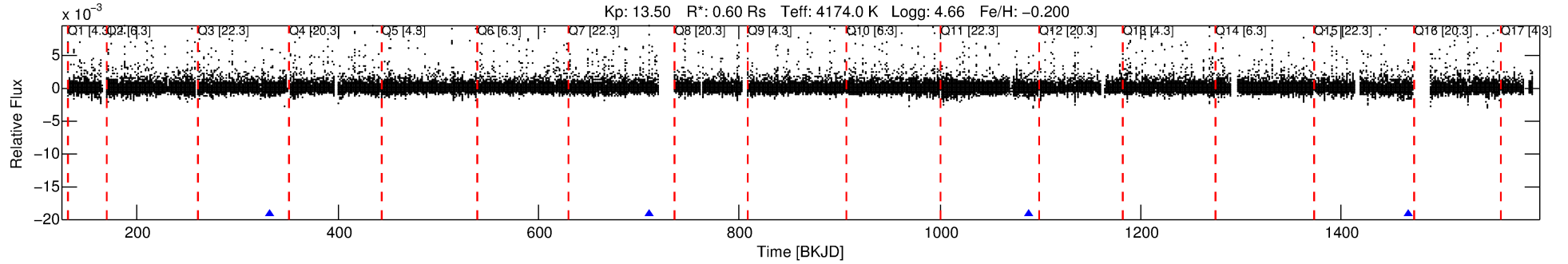
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002285420-02

No Significant Match Found

DV One-Page Summary

KIC: 2285420 Candidate: 2 of 4 Period: 378.302 d



DV Fit Results:

Period = 378.30210 [0.00565] d
Epoch = 332.3457 [0.0102] BKJD
Rp/R* = 0.0306 [0.0596]
a/R* = 984.68 [6437.10]
b = 0.24 [26.80]
Seff = 0.13 [0.03]
Teq = 154 [7] K
Rp = 2.00 [3.91] Re
a = 0.8604 [0.0742] AU
Ag = 37662.23 [151042.52] [0.25 σ]
Teffp = 3312 [3322] K [0.95 σ]

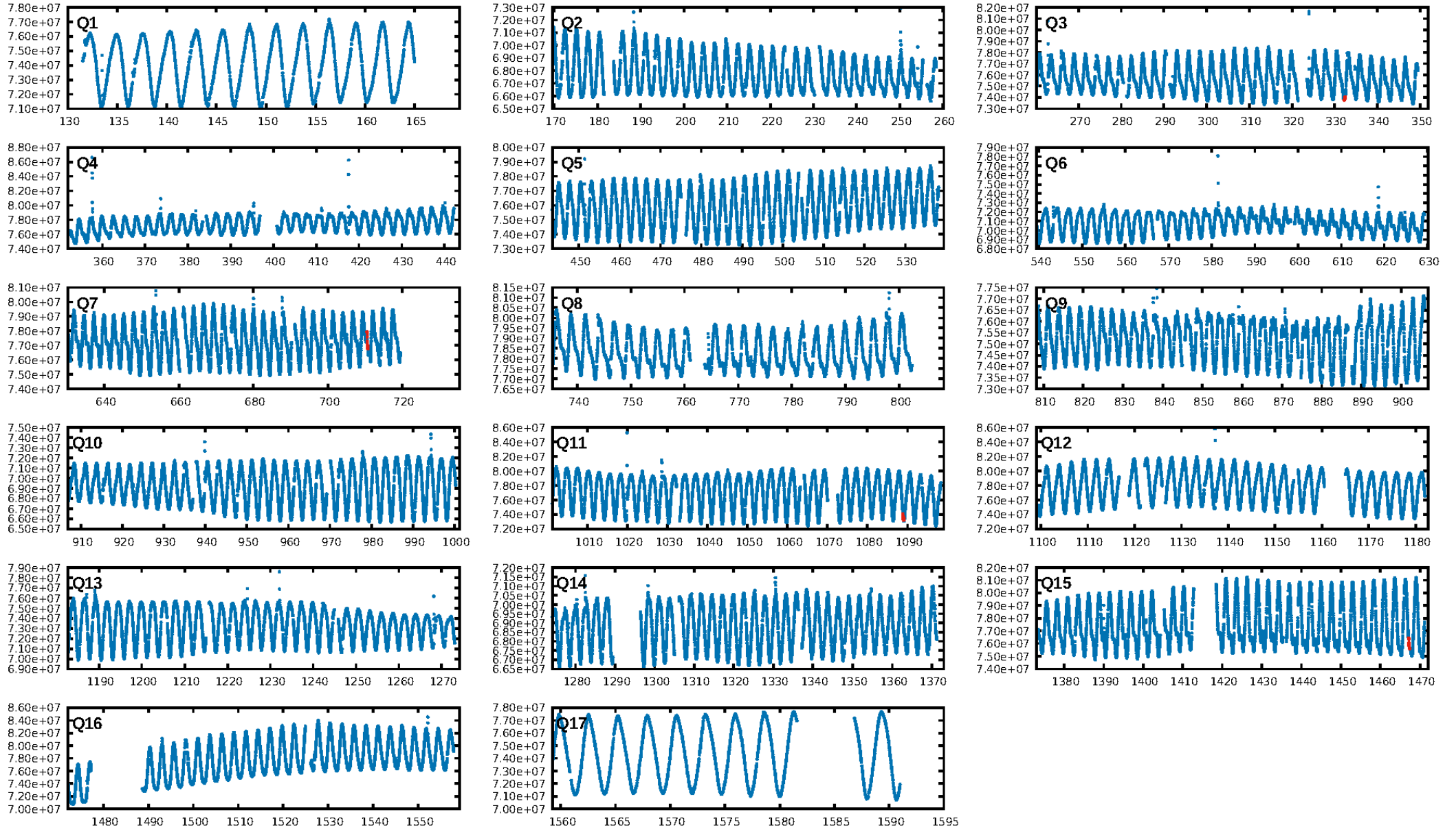
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [446.54 σ]
LongPeriod-sig: 100.0% [74.62 σ]
ModelChiSquare2-sig: 2.4%
ModelChiSquareGof-sig: 23.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.011
Centroid-sig: 15.4%
Centroid-so: 0.653 arcsec [1.32 σ]
OotOffset-rm: 0.086 arcsec [1.04 σ]
OotOffset-st: 0/4/0/0 [4]
KicOffset-rm: 0.328 arcsec [3.90 σ]
KicOffset-st: 0/4/0/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

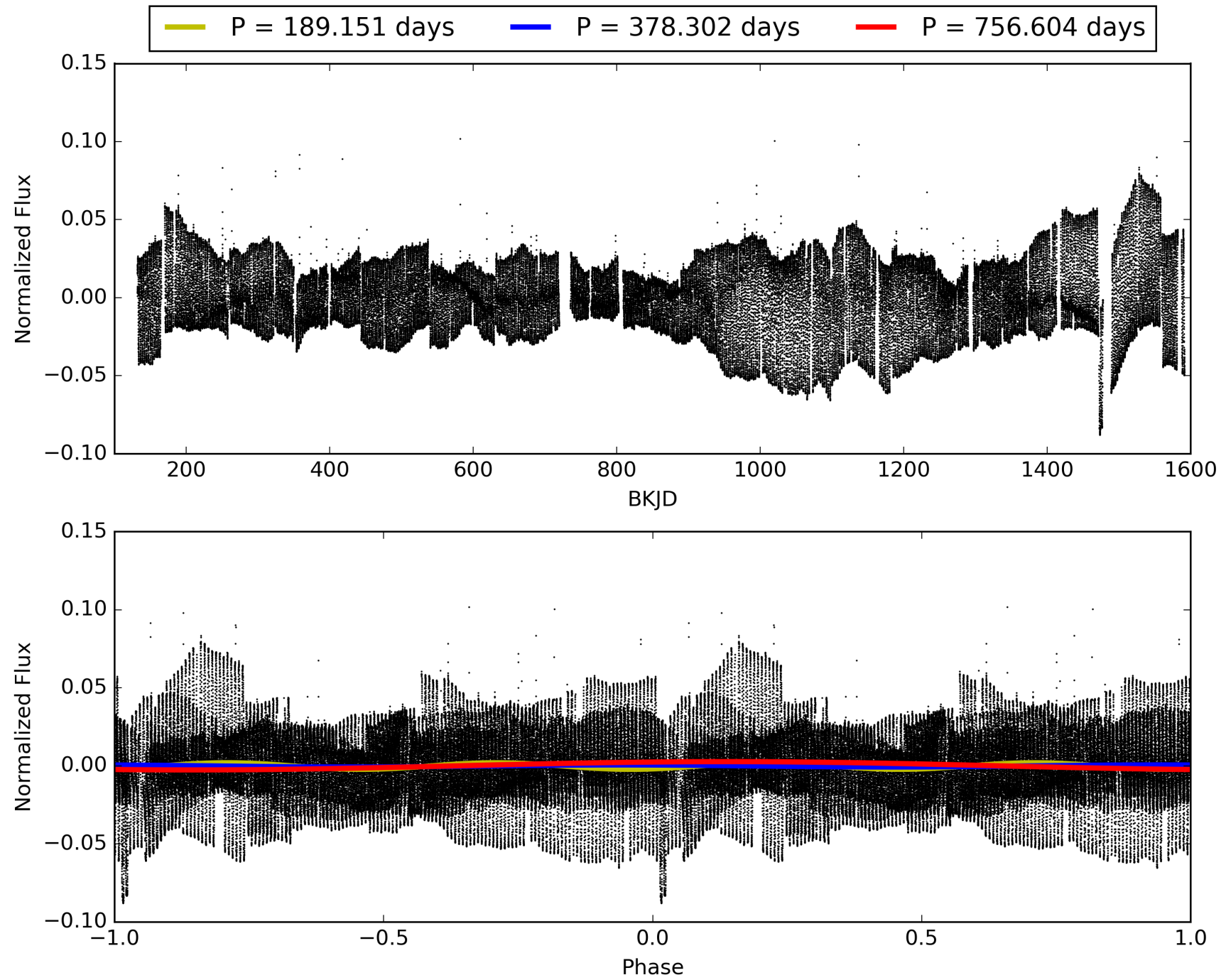
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:50:49 Z

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

TCE 002285420-02, PDC Light Curves

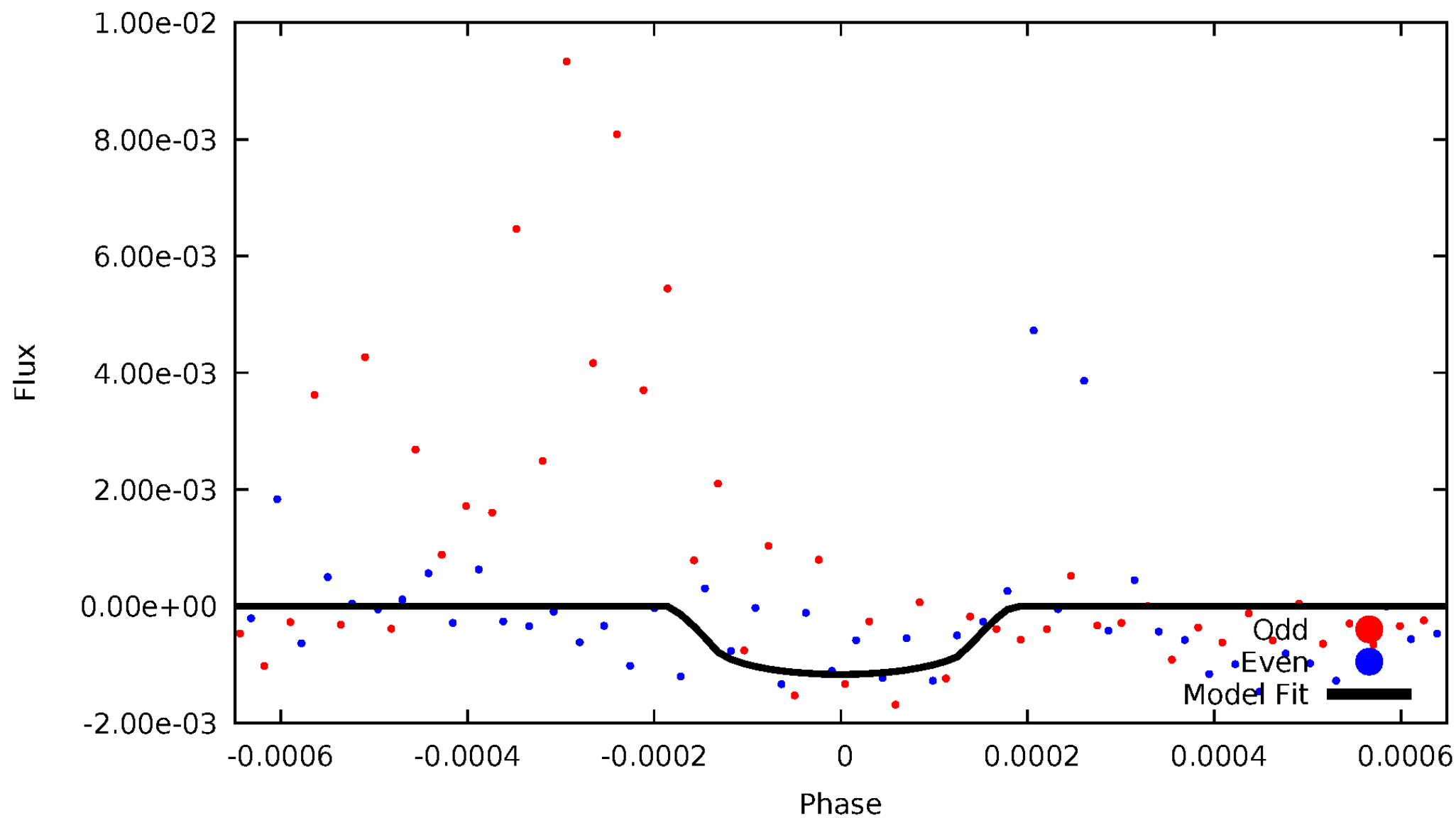


TCE 002285420-02



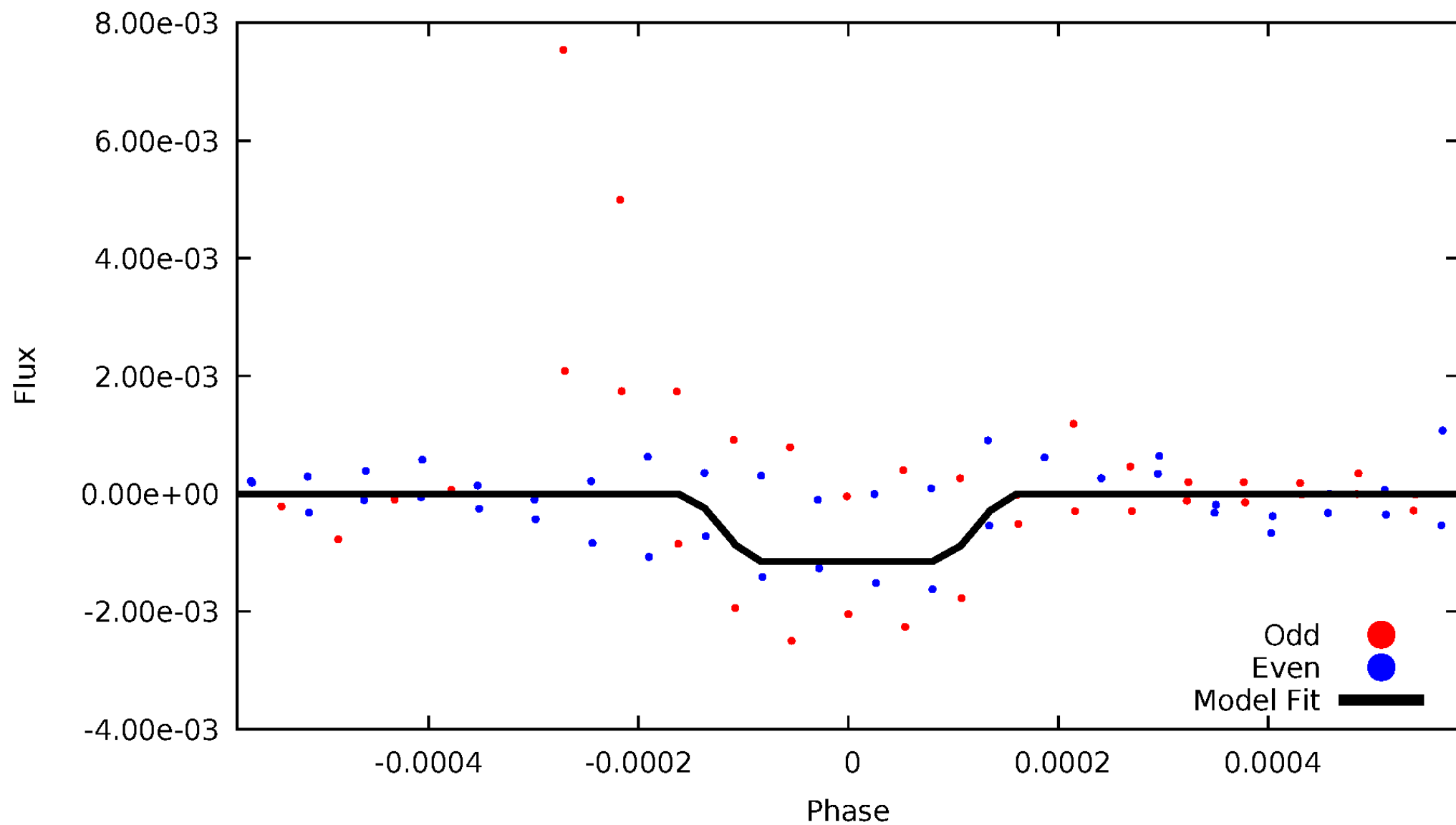
DV Odd/Even

TCE 002285420-02



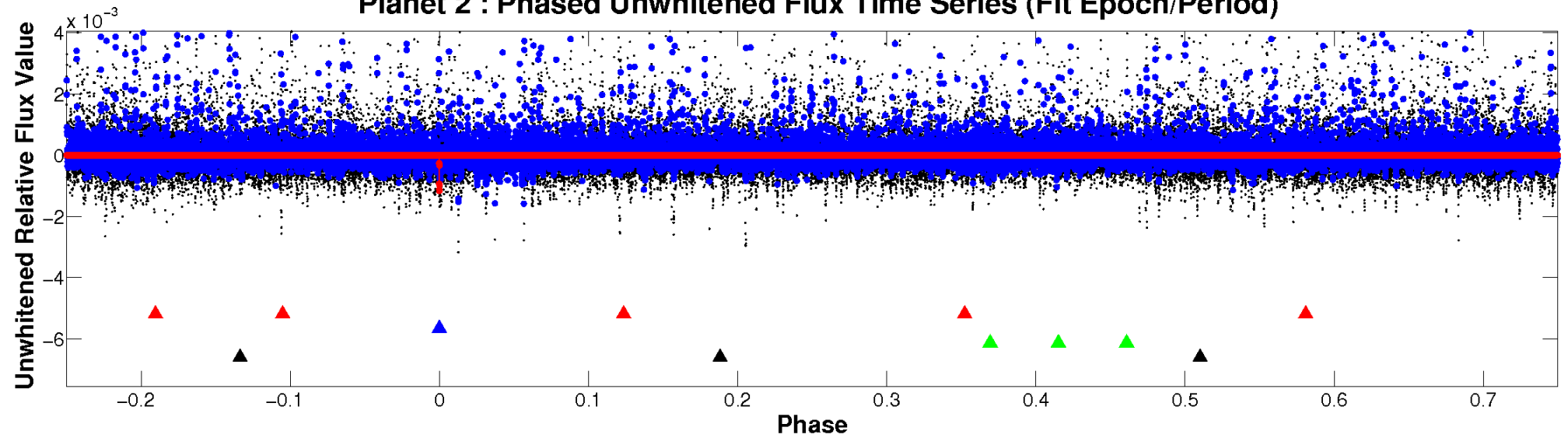
ALT Odd/Even

TCE 002285420-02

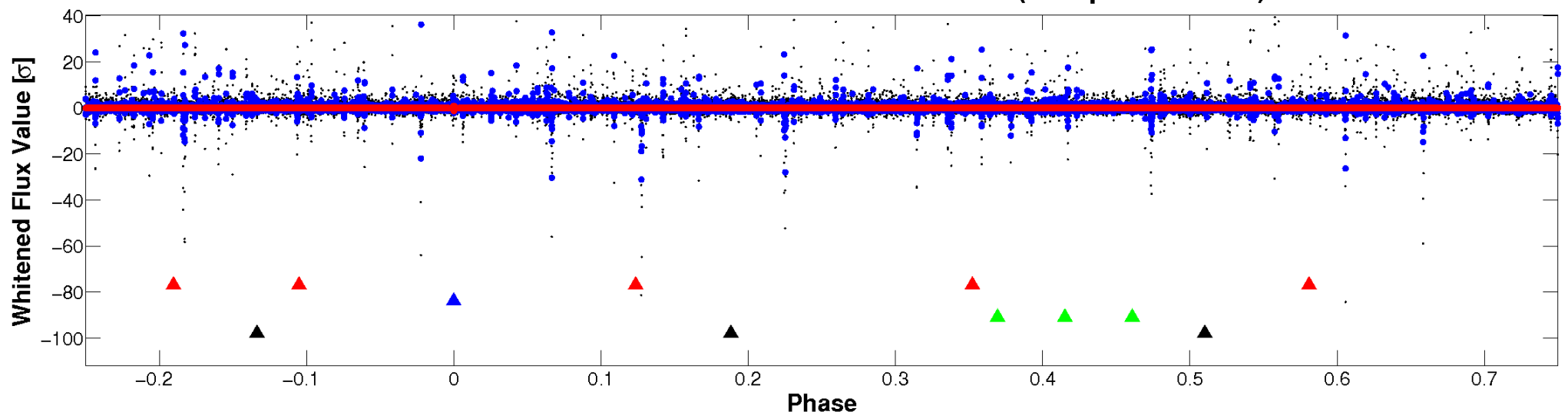


Non-Whitened Vs. Whitened Light Curve

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

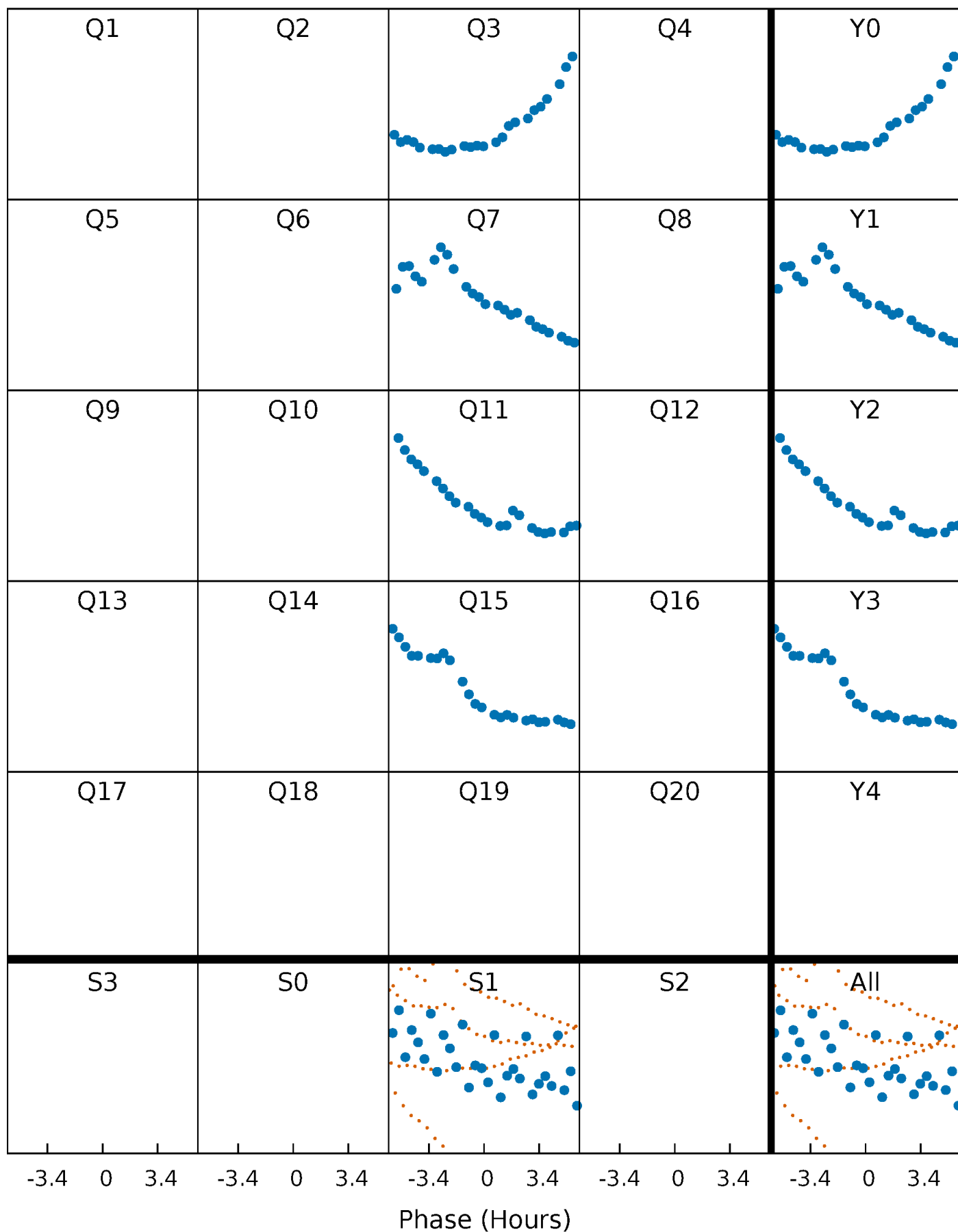


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



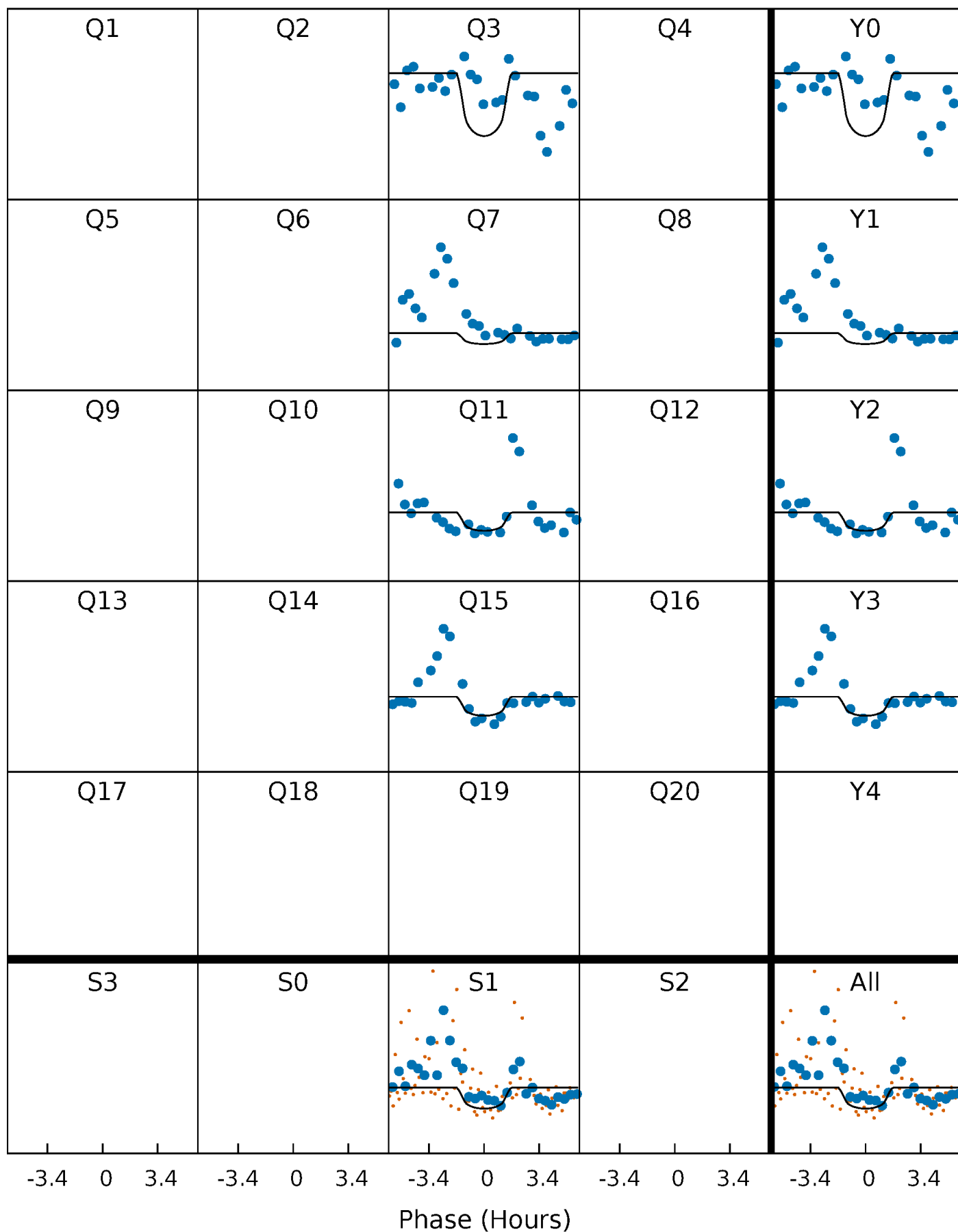
PDC Quarter-Phased Transit Curves

TCE 002285420-02 $P=378.302102$ Days $T_0=332.345672$ (BKJD)



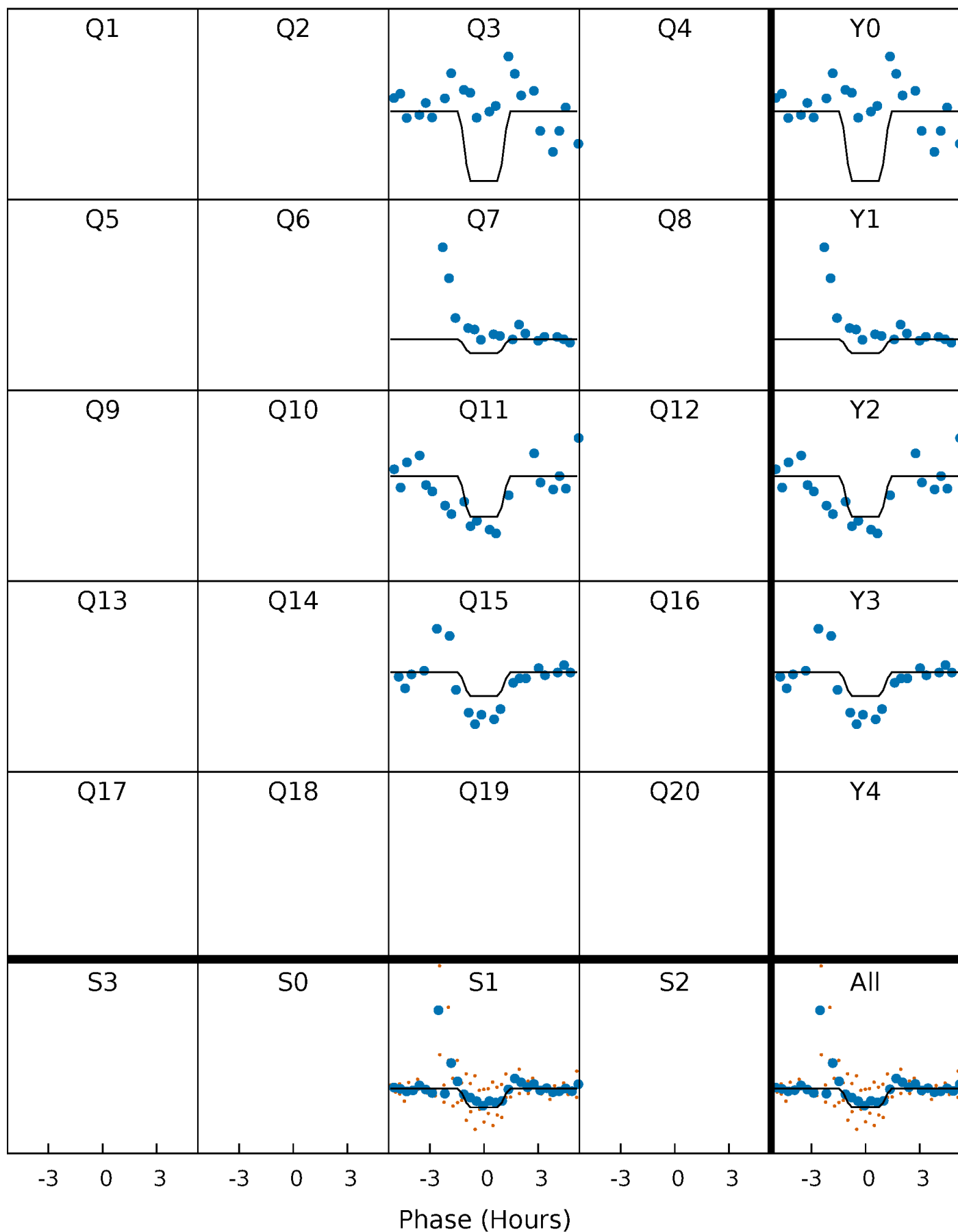
DV Quarter-Phased Transit Curves

TCE 002285420-02 $P=378.302102$ Days $T_0=332.345672$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

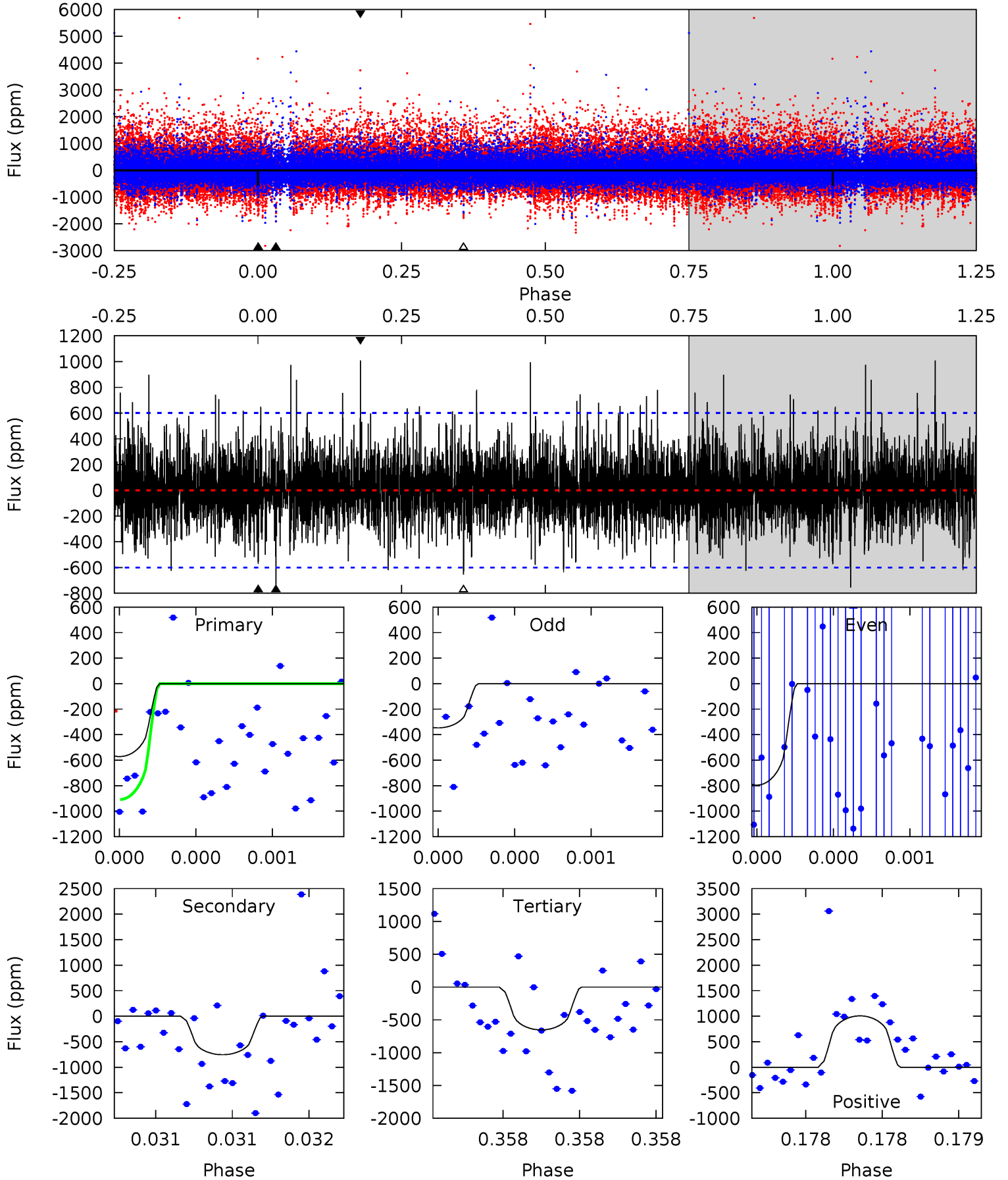
TCE 002285420-02 $P=378.296940$ Days $T_0=332.362879$ (BKJD)



DV Model-Shift Uniqueness Test

002285420-02, P = 378.302102 Days, E = 332.345672 Days

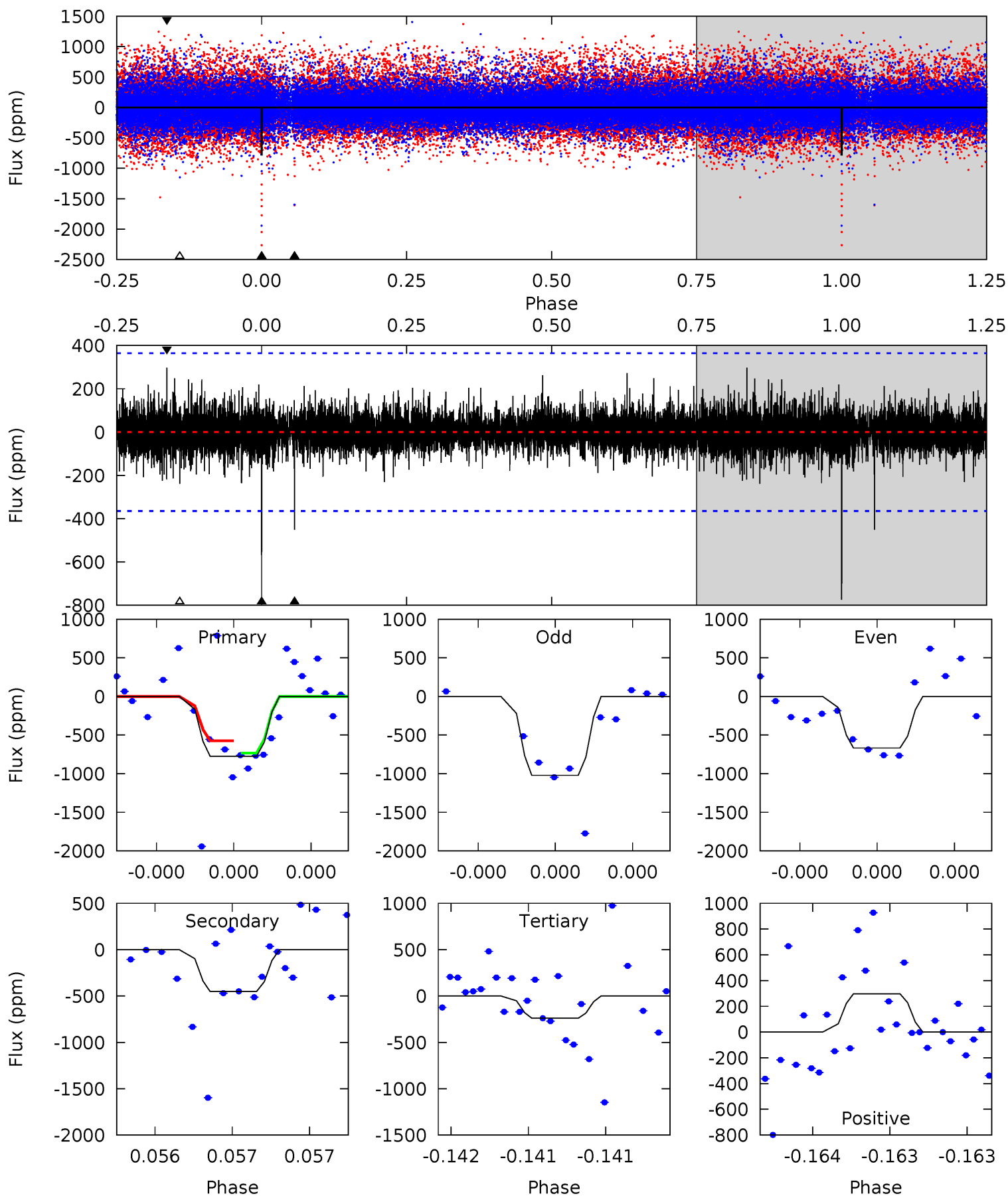
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.36	7.06	6.11	9.43	5.63	3.56	1.77	-0.76	-4.07	0.95	-2.37	1.63	0.72	0.57	3.26



Alt Model-Shift Uniqueness Test

002285420-02, P = 378.296940 Days, E = 332.362879 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	7.03	3.73	4.63	5.68	3.64	0.84	8.33	7.43	3.30	2.39	2.71	1.19	0.28	1.20



Stellar Parameters For KIC 002285420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4174^{+145}_{-160}	$4.655^{+0.059}_{-0.027}$	$-0.200^{+0.300}_{-0.300}$	$0.600^{+0.042}_{-0.066}$	$0.593^{+0.059}_{-0.059}$	$3.873^{+1.049}_{-0.469}$
	+3%/-4%	+1%/-1%	+150%/-150%	+7%/-11%	+10%/-10%	+27%/-12%
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 002285420-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-754 ± 107	$3.29^{+3.56}_{-2.03}$	213^{+9}_{-8}	3390^{+1412}_{-647}	$28887^{+163189}_{-22342}$
Alt.	-451 ± 64	$3.55^{+3.44}_{-2.42}$	214^{+8}_{-9}	3065^{+1417}_{-508}	$14452^{+121873}_{-10649}$

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

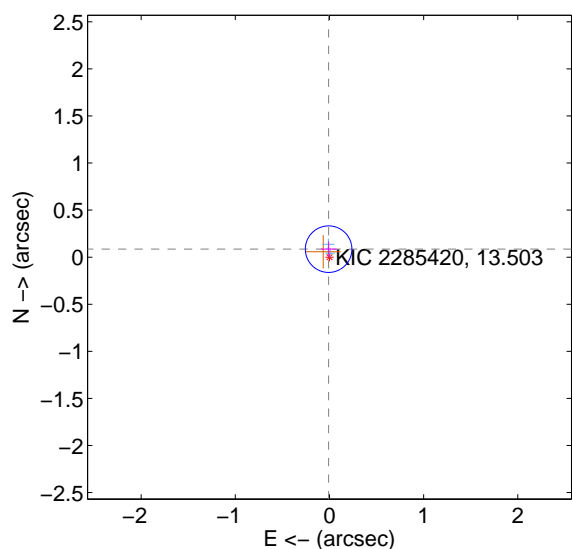
Supplemental centroid analysis for 002285420-02. Kepler magnitude: 13.50. Transit SNR 6.02

There are 3 quarters with good PRF difference image offsets

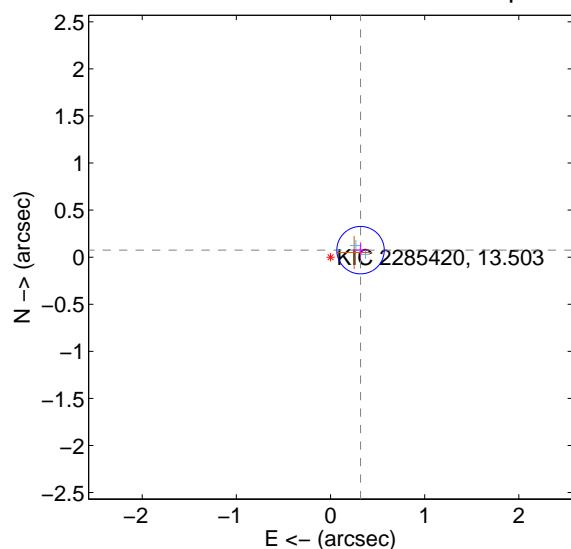
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.086 ± 0.082	1.04	0.009 ± 0.084	0.085 ± 0.082
PRF-fit source offset from KIC position	0.328 ± 0.084	3.90	-0.319 ± 0.084	0.074 ± 0.082
photometric centroid source offset	0.65 ± 0.50	1.32	-0.59 ± 0.45	0.28 ± 0.66

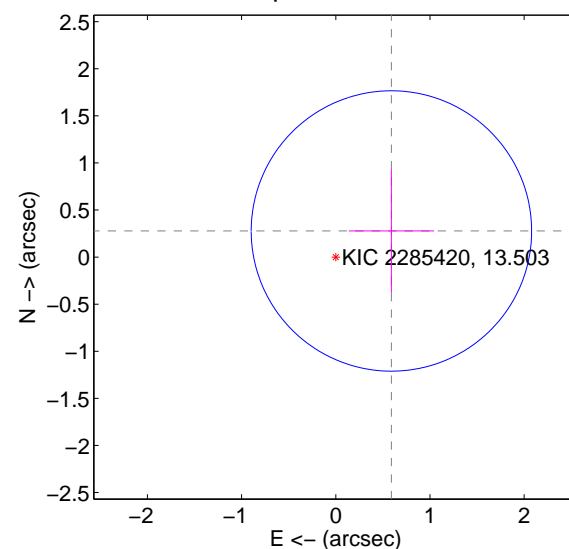
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

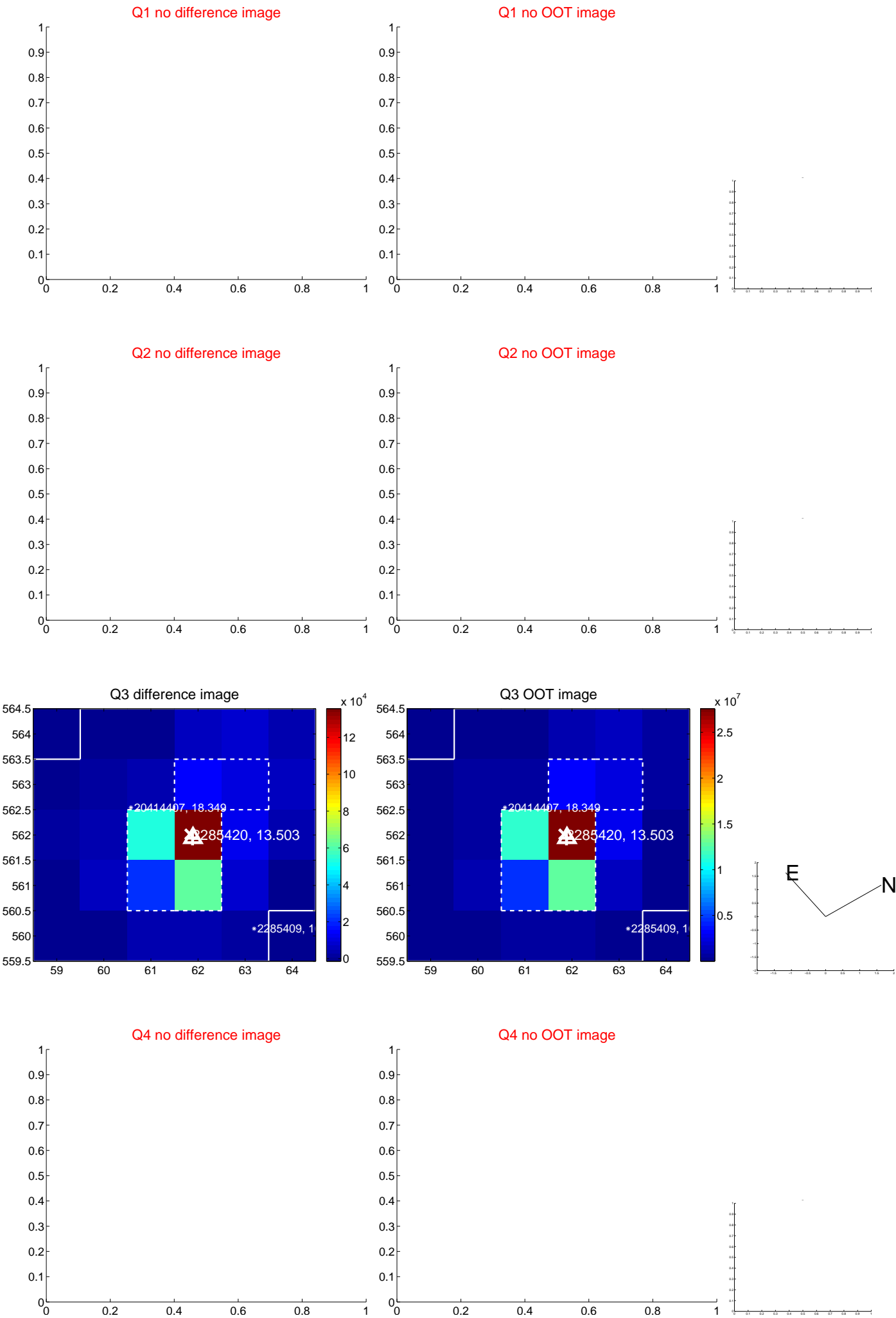


offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



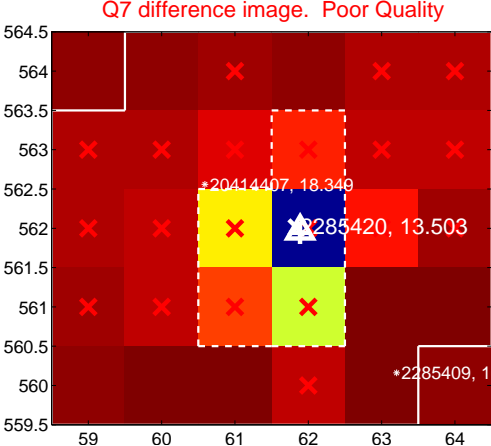
Q6 no difference image



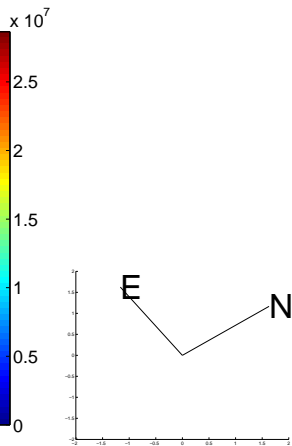
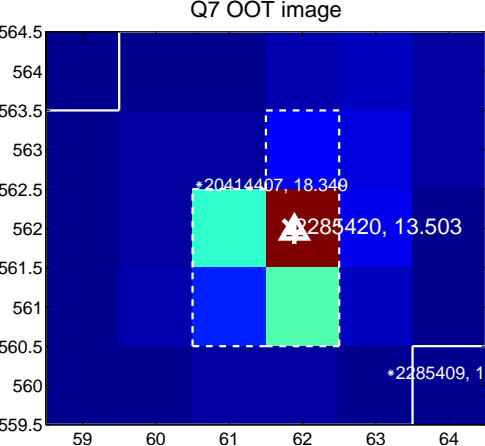
Q6 no OOT image



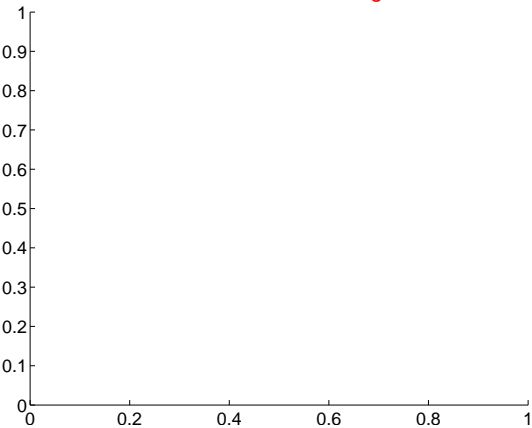
Q7 difference image. Poor Quality



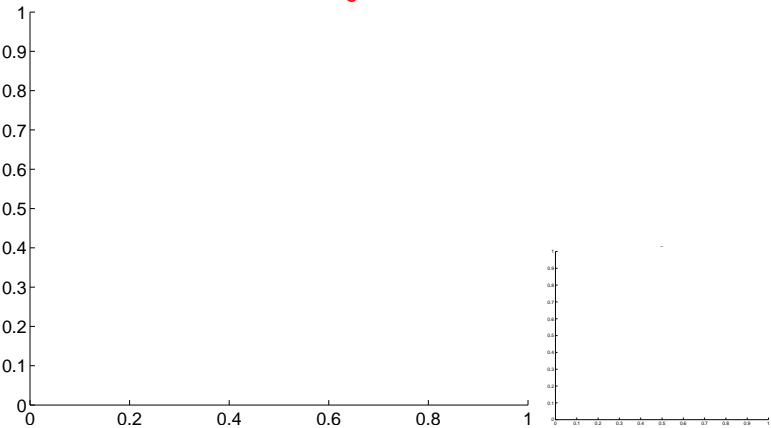
Q7 OOT image



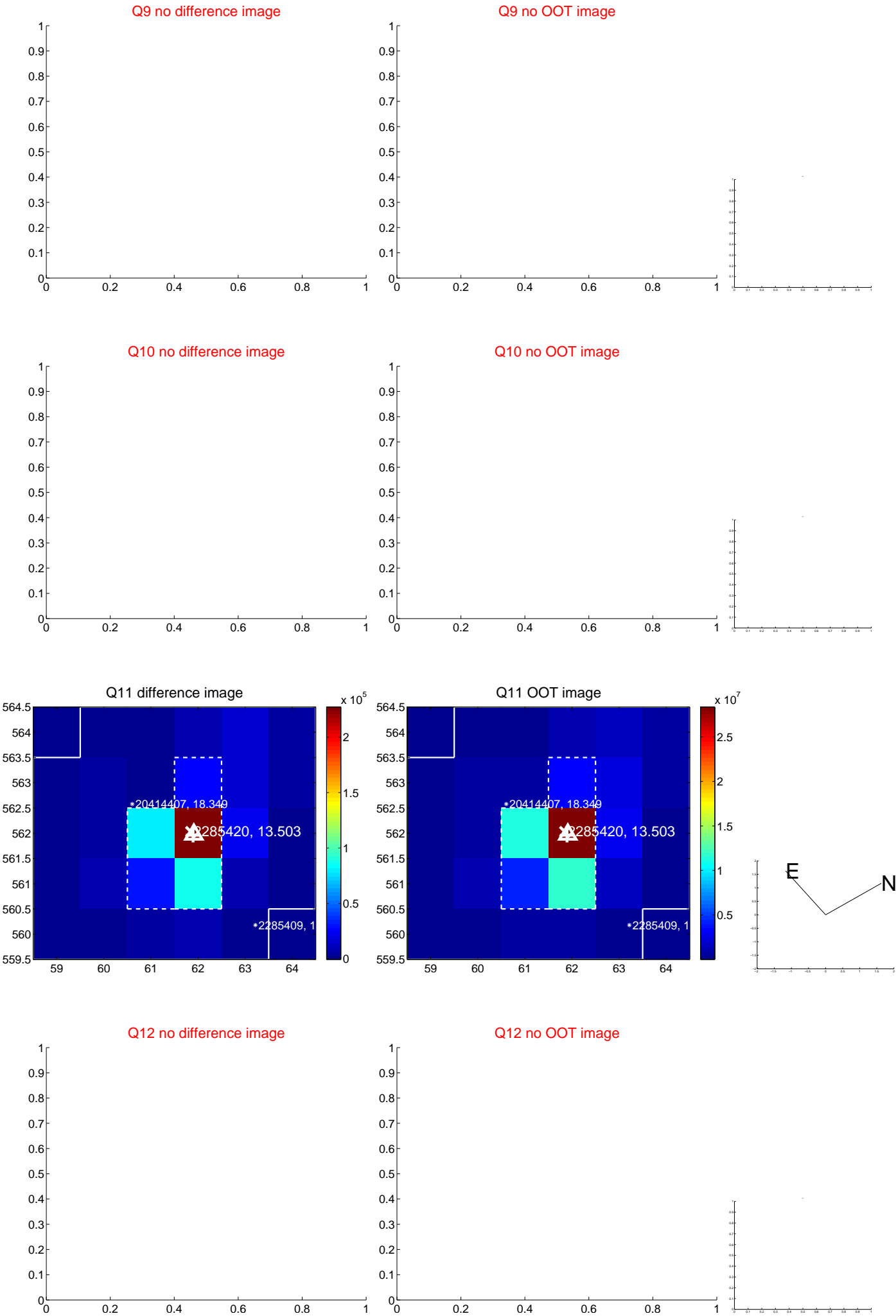
Q8 no difference image



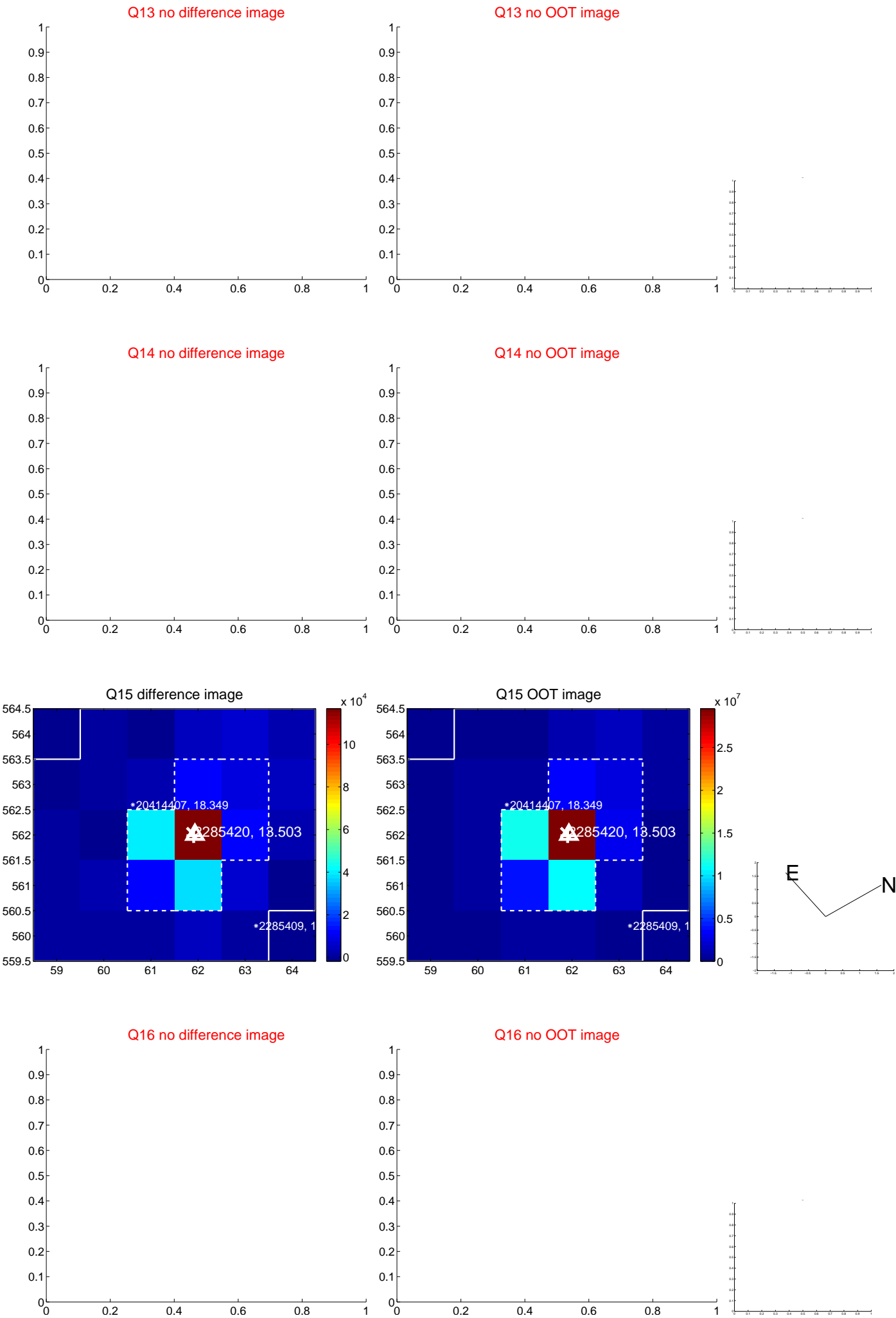
Q8 no OOT image



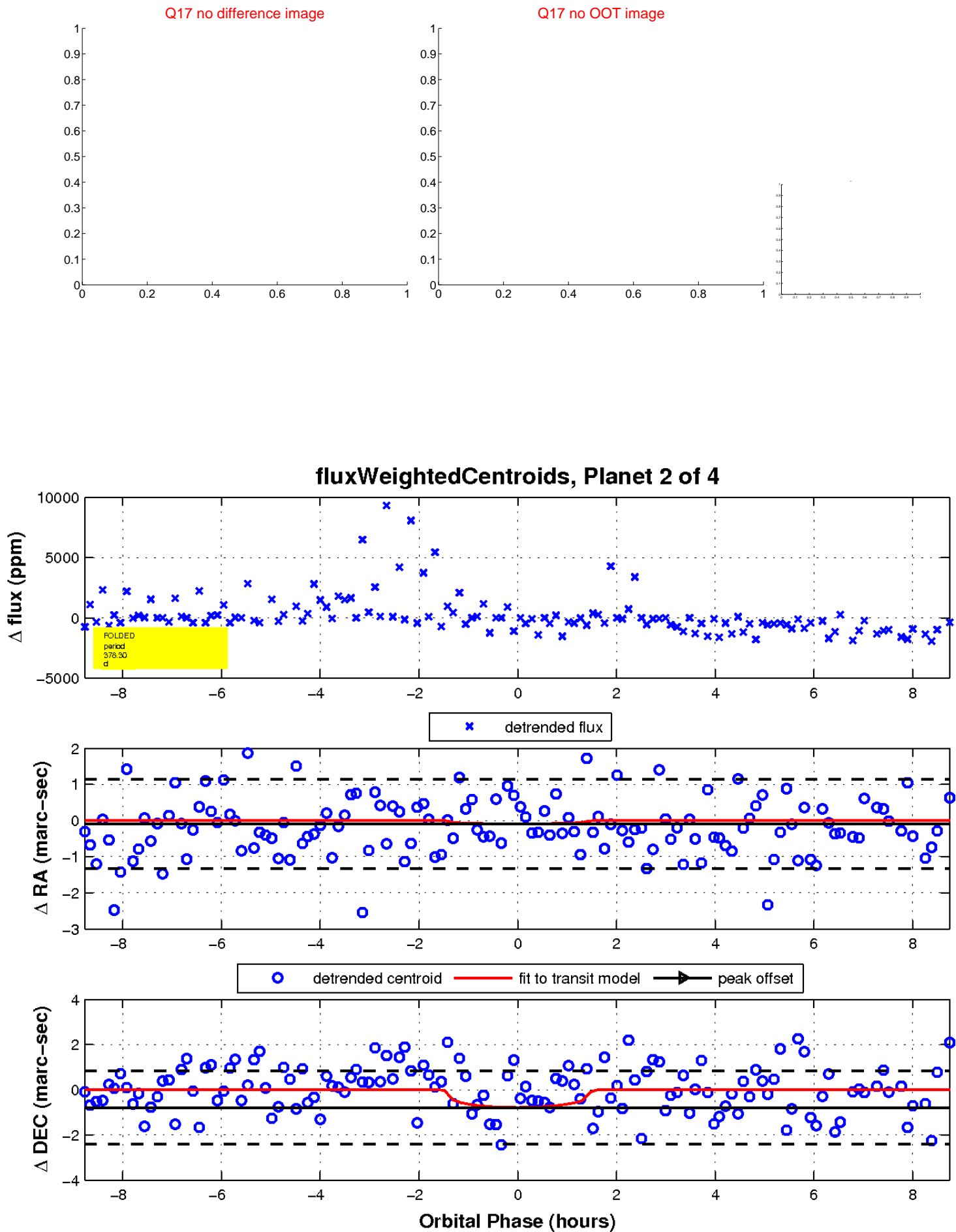
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

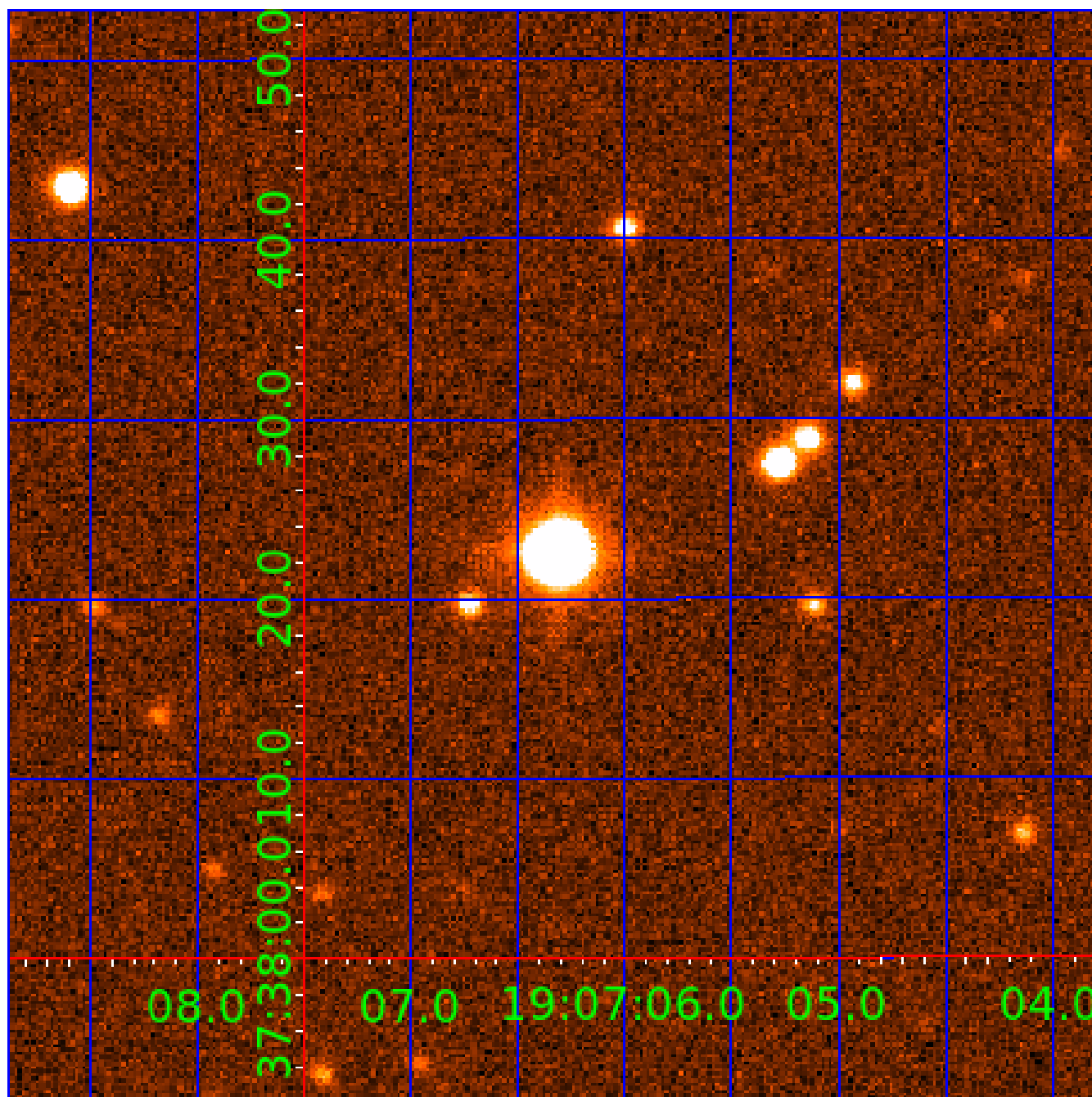


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002285420

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})
002285420-01	OBS	No	291.793017	260.328301	364.1	3.598	12.8	1.9	0.60	4174	1.14	0.19
002285420-02	OBS	No	378.302102	332.345672	1167.9	2.945	14.2	6.0	0.60	4174	2.00	0.13
002285420-03	OBS	No	395.607215	472.087017	2562.3	4.722	12.8	10.2	0.60	4174	2.94	0.12
002285420-04	OBS	No	500.069630	281.798662	1375.9	2.684	12.0	5.6	0.60	4174	2.16	0.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002285420-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_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
002285420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
002285420-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002285420-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_NOFITS

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

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

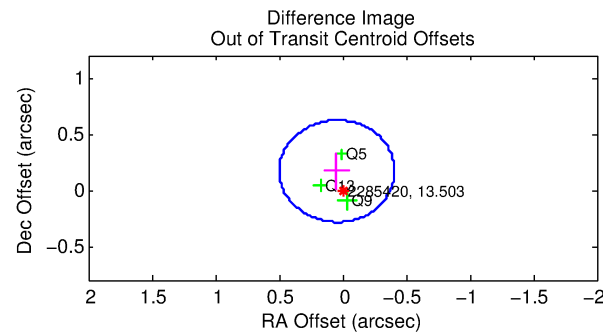
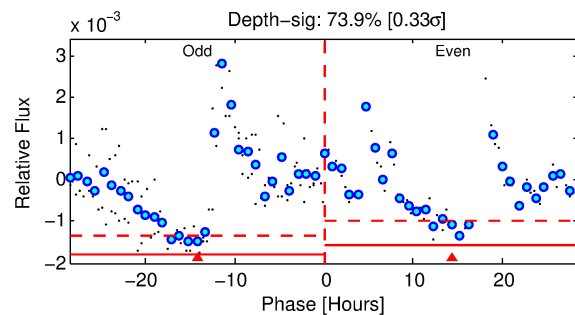
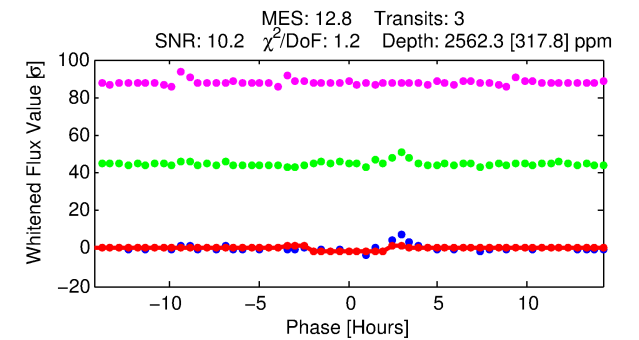
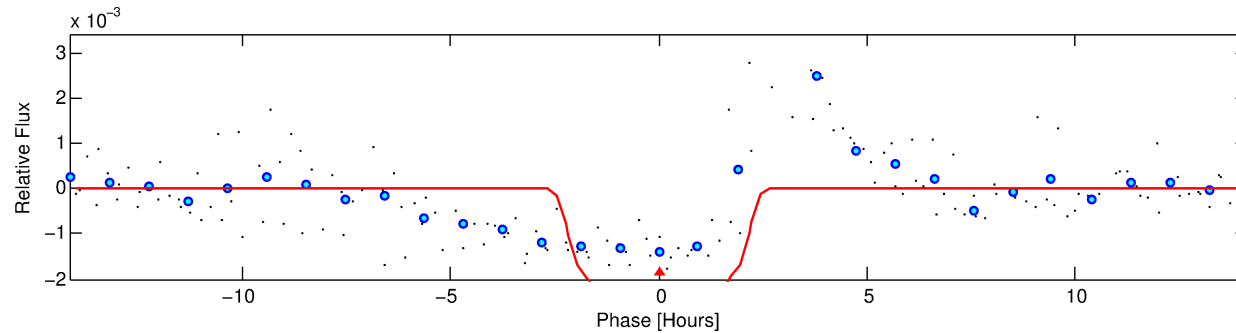
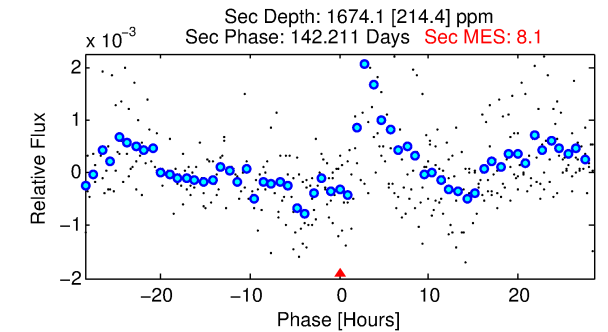
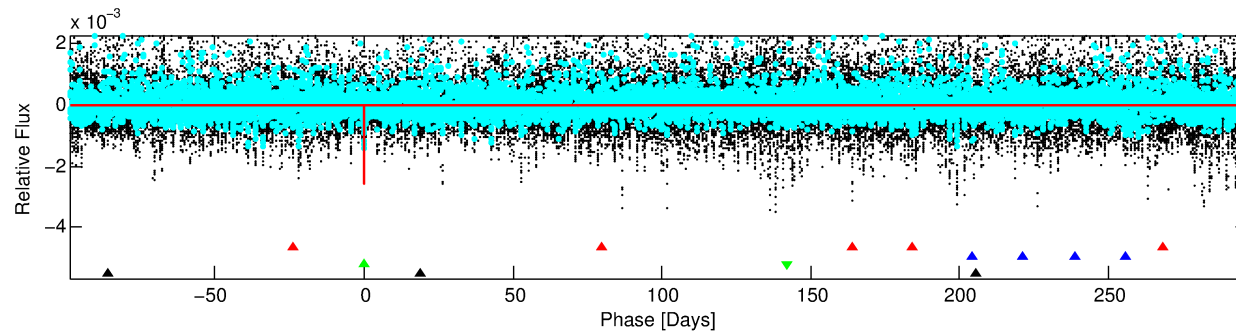
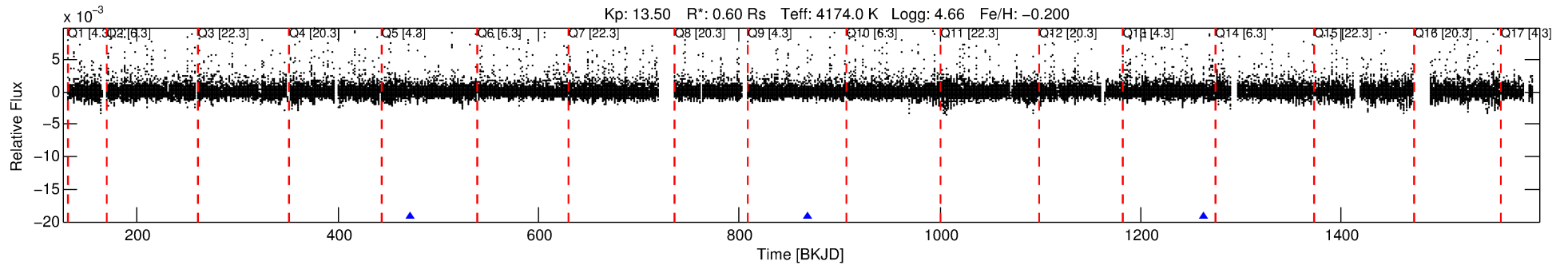
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002285420-03

No Significant Match Found

DV One-Page Summary

KIC: 2285420 Candidate: 3 of 4 Period: 395.607 d



DV Fit Results:

Period = 395.60721 [0.00290] d
Epoch = 472.0870 [0.0046] BKJD
Rp/R* = 0.0449 [0.0349]
a/R* = 668.73 [1740.53]
b = 0.00 [3233.81]
Seff = 0.12 [0.02]
Teq = 151 [7] K
Rp = 2.94 [2.31] Re
a = 0.8864 [0.0764] AU
Ag = 83634.47 [130901.07] [0.64 σ]
Teffp = 3983 [1562] K [2.45 σ]

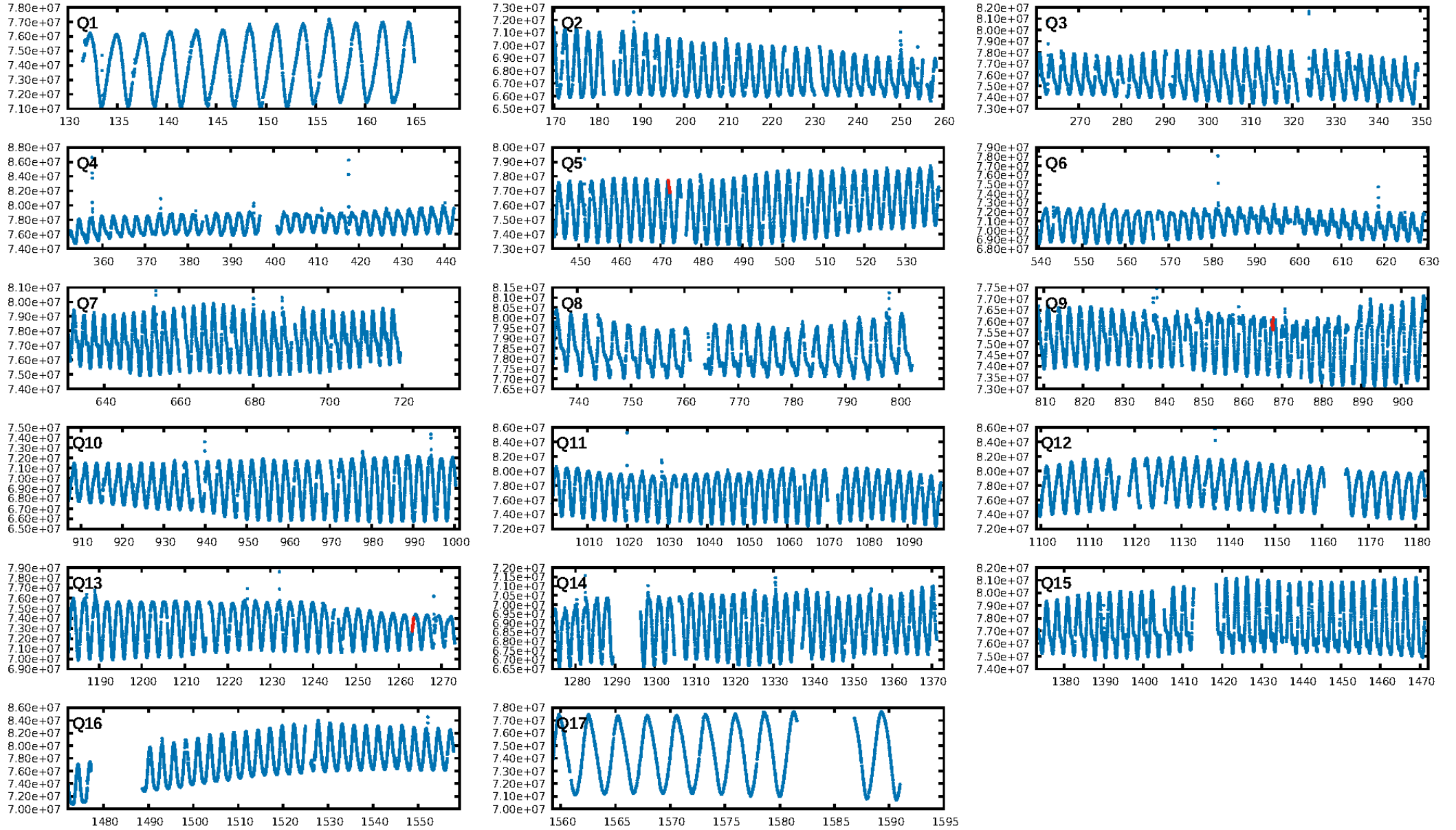
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [74.62 σ]
LongPeriod-sig: 100.0% [461.56 σ]
ModelChiSquare2-sig: 90.8%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -1.077
Centroid-sig: 21.6%
Centroid-so: 1.124 arcsec [3.31 σ]
OotOffset-rm: 0.175 arcsec [1.16 σ]
KicOffset-rm: 0.345 arcsec [2.70 σ]
OotOffset-st: 0/0/3 [3]
KicOffset-st: 0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

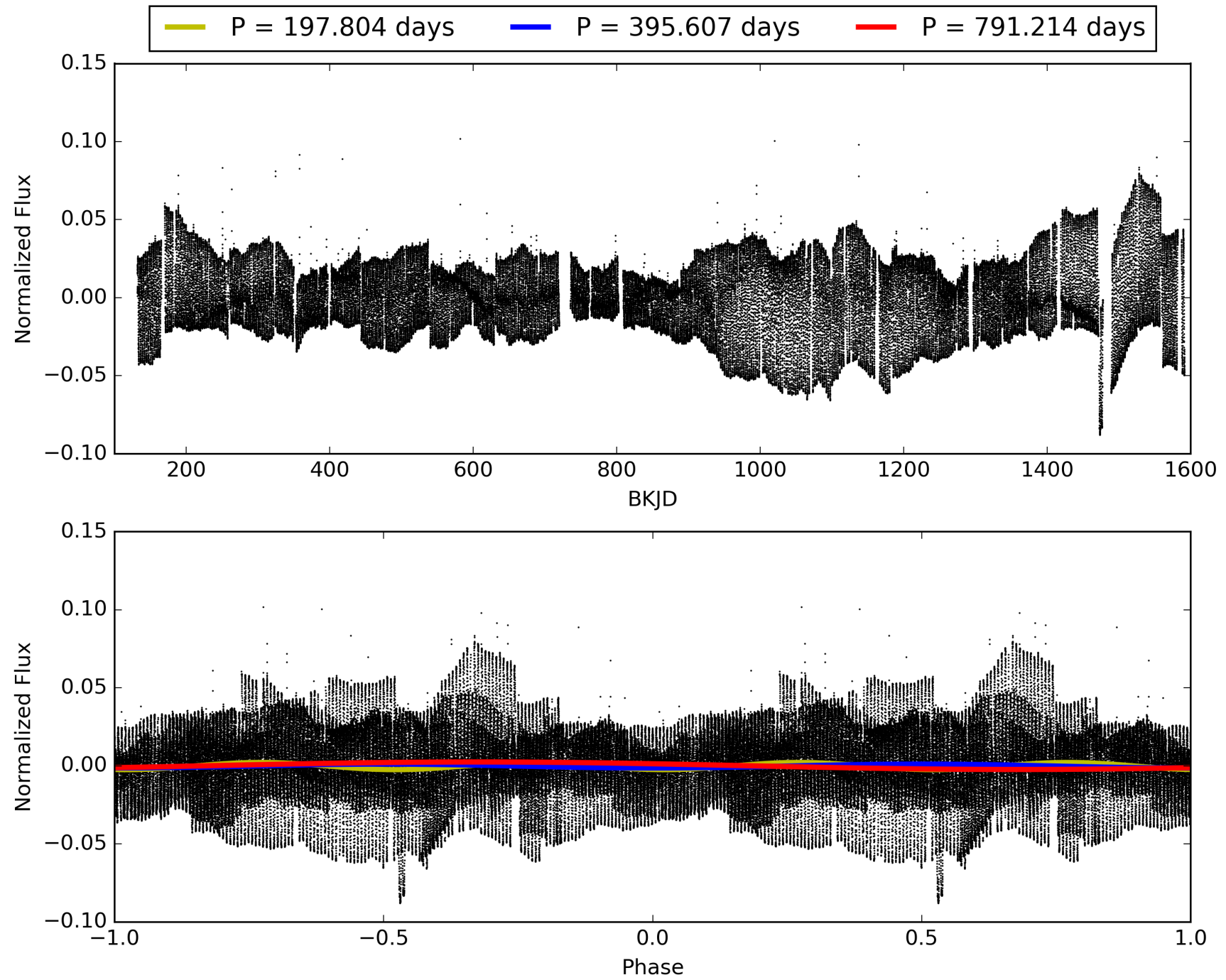
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:51:04 Z

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

TCE 002285420-03, PDC Light Curves

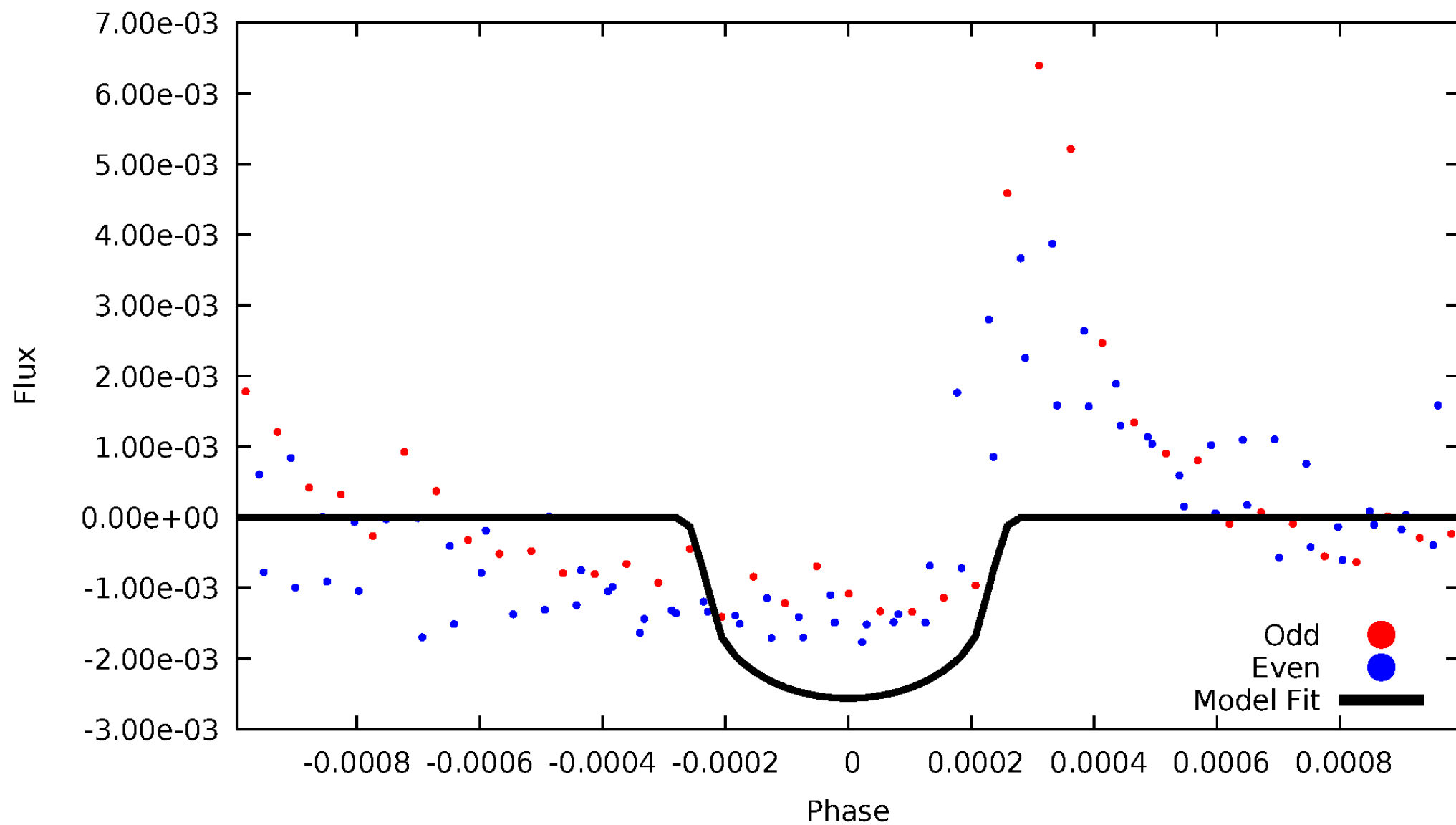


TCE 002285420-03



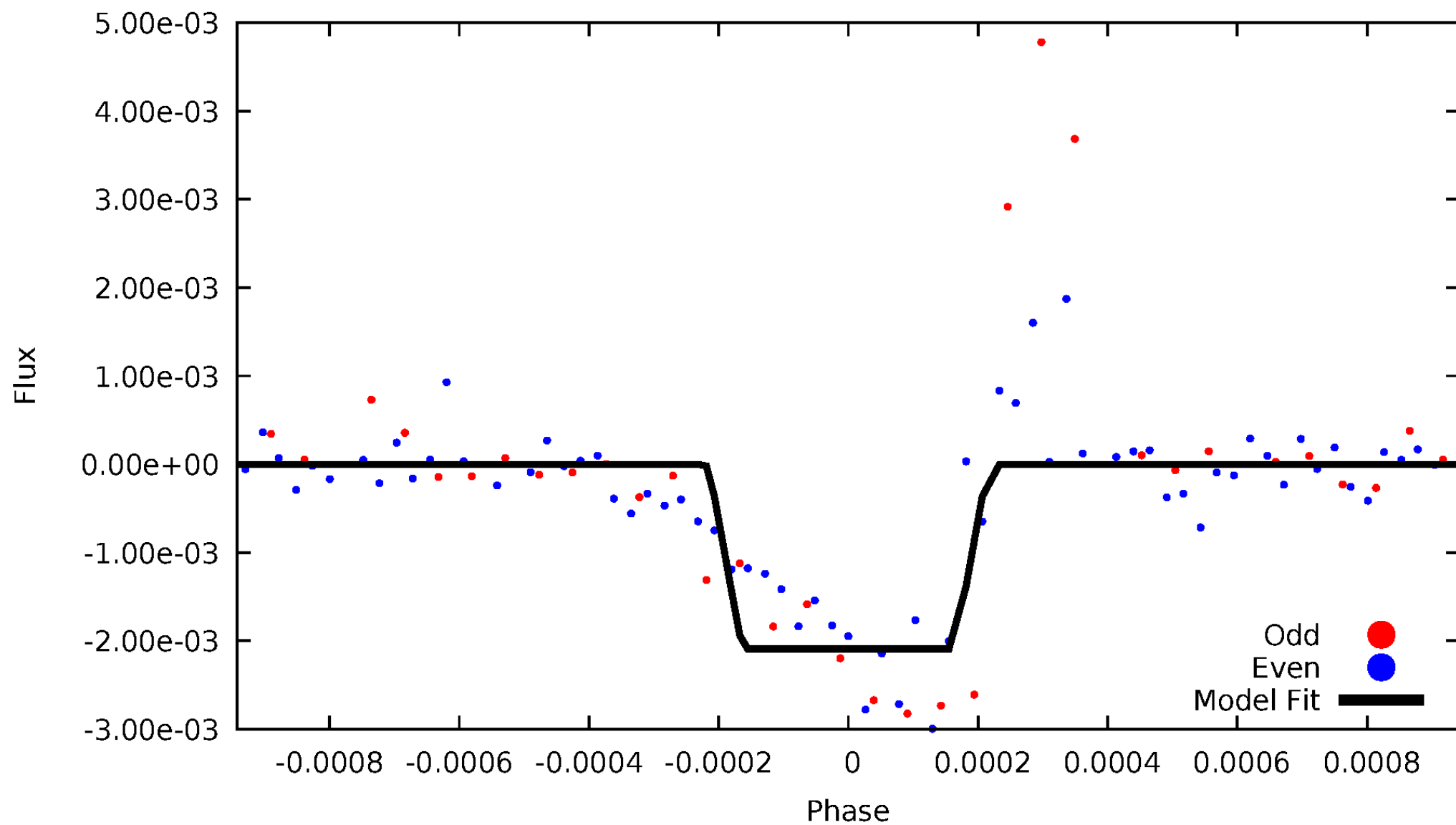
DV Odd/Even

TCE 002285420-03



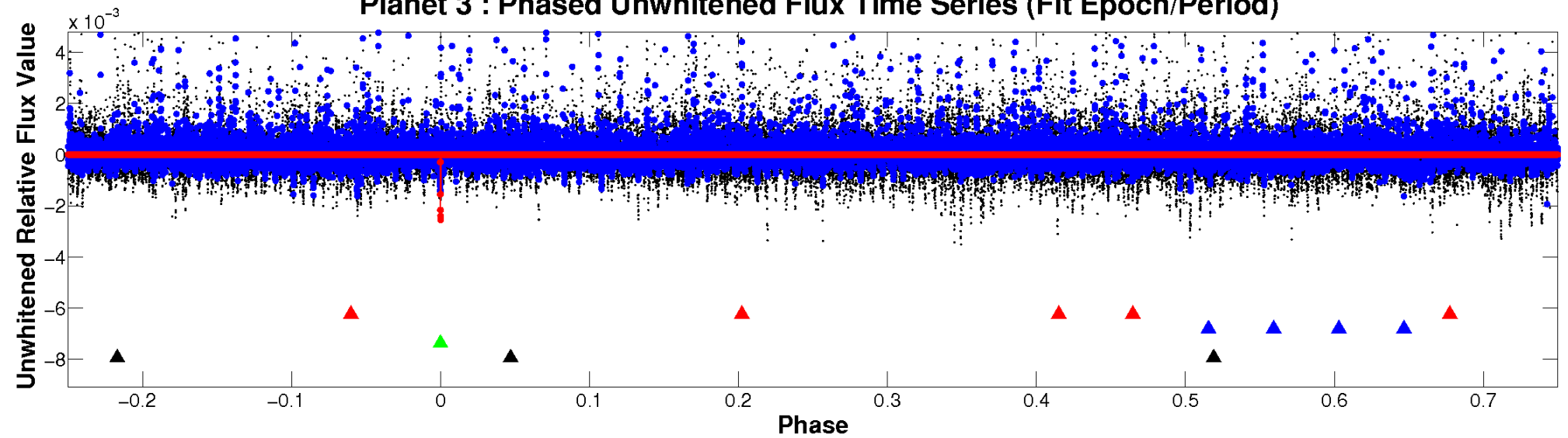
ALT Odd/Even

TCE 002285420-03

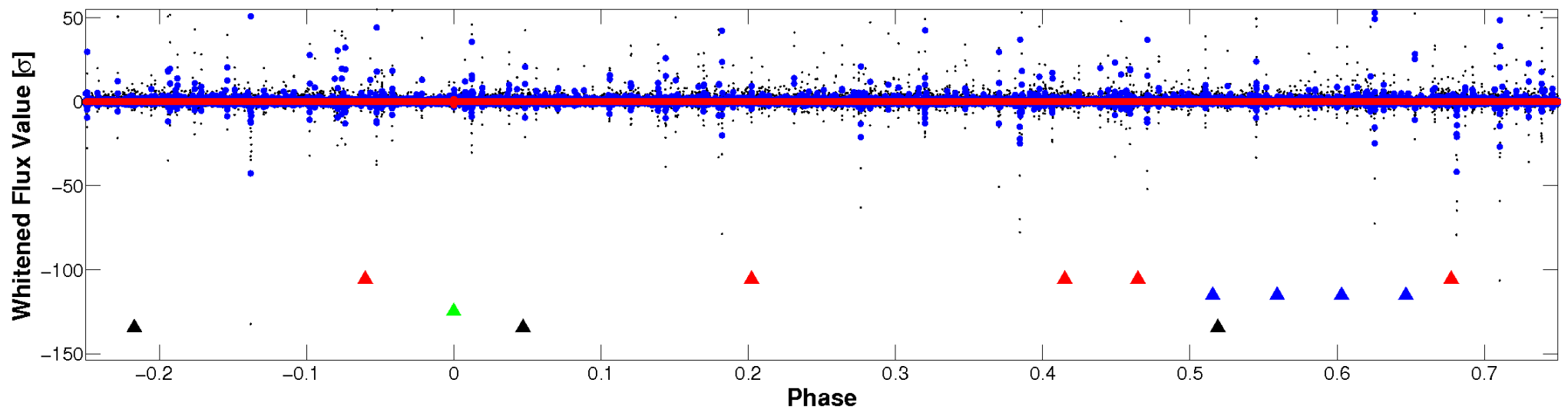


Non-Whitened Vs. Whitened Light Curve

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

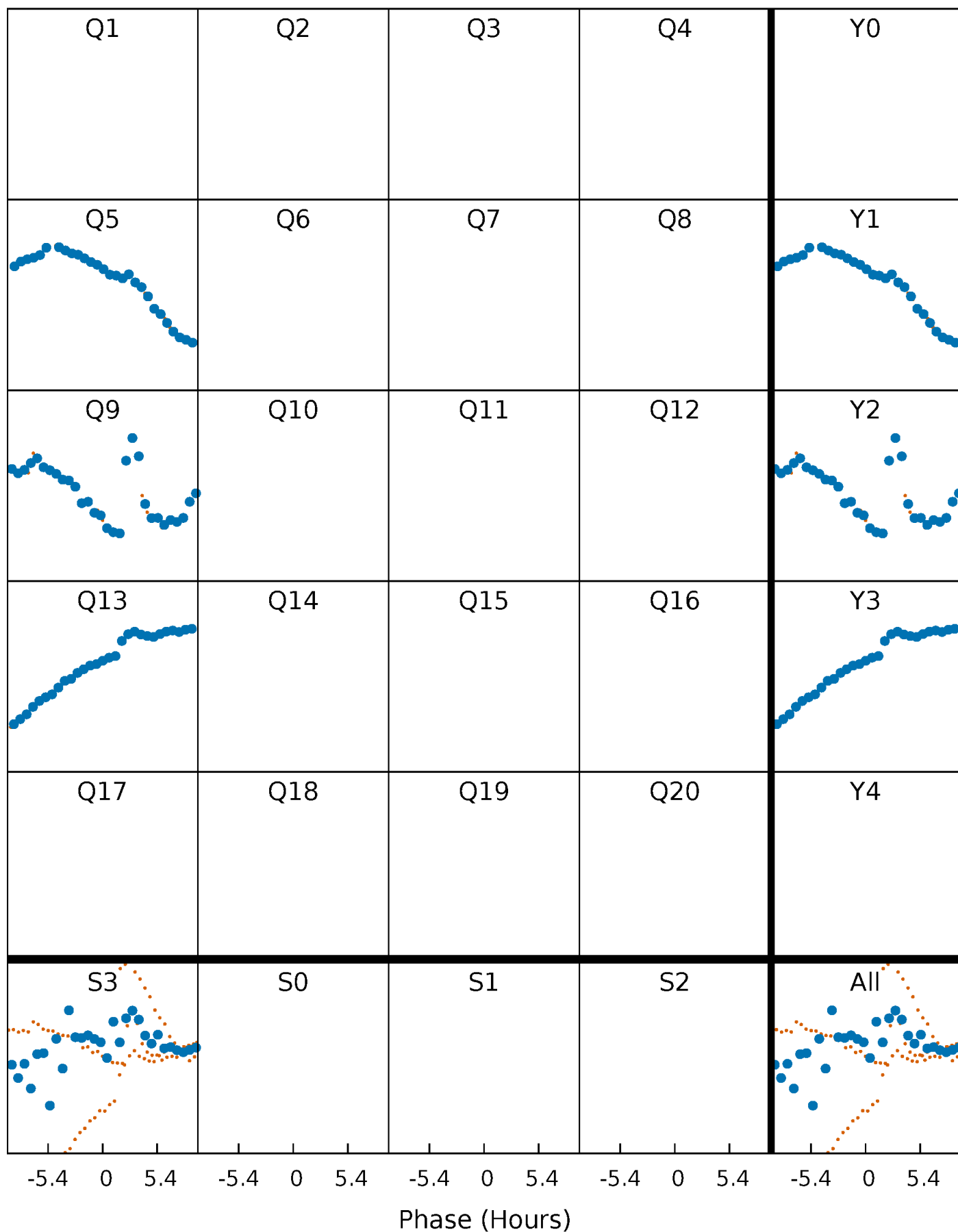


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



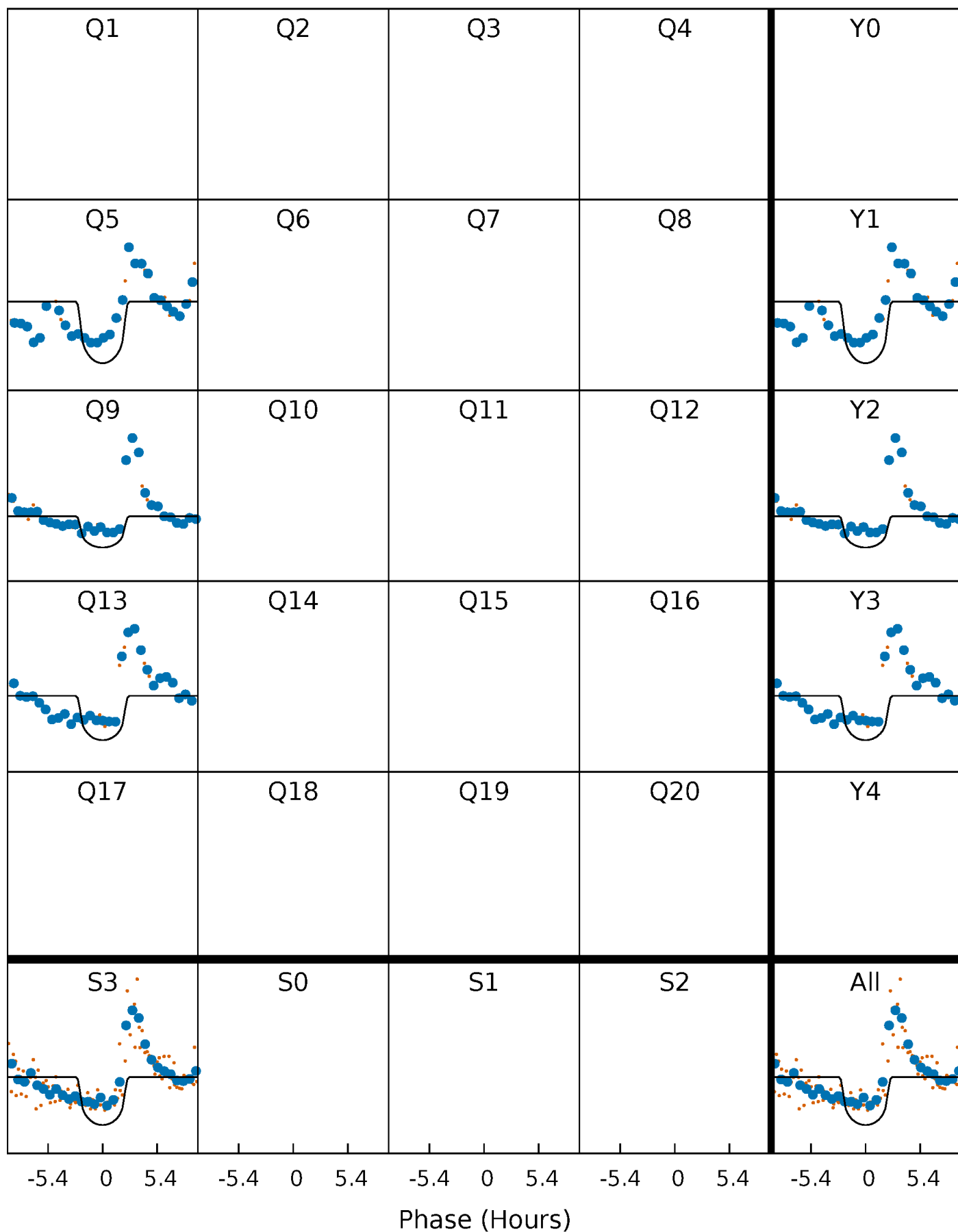
PDC Quarter-Phased Transit Curves

TCE 002285420-03 $P=395.607215$ Days $T_0=472.087017$ (BKJD)



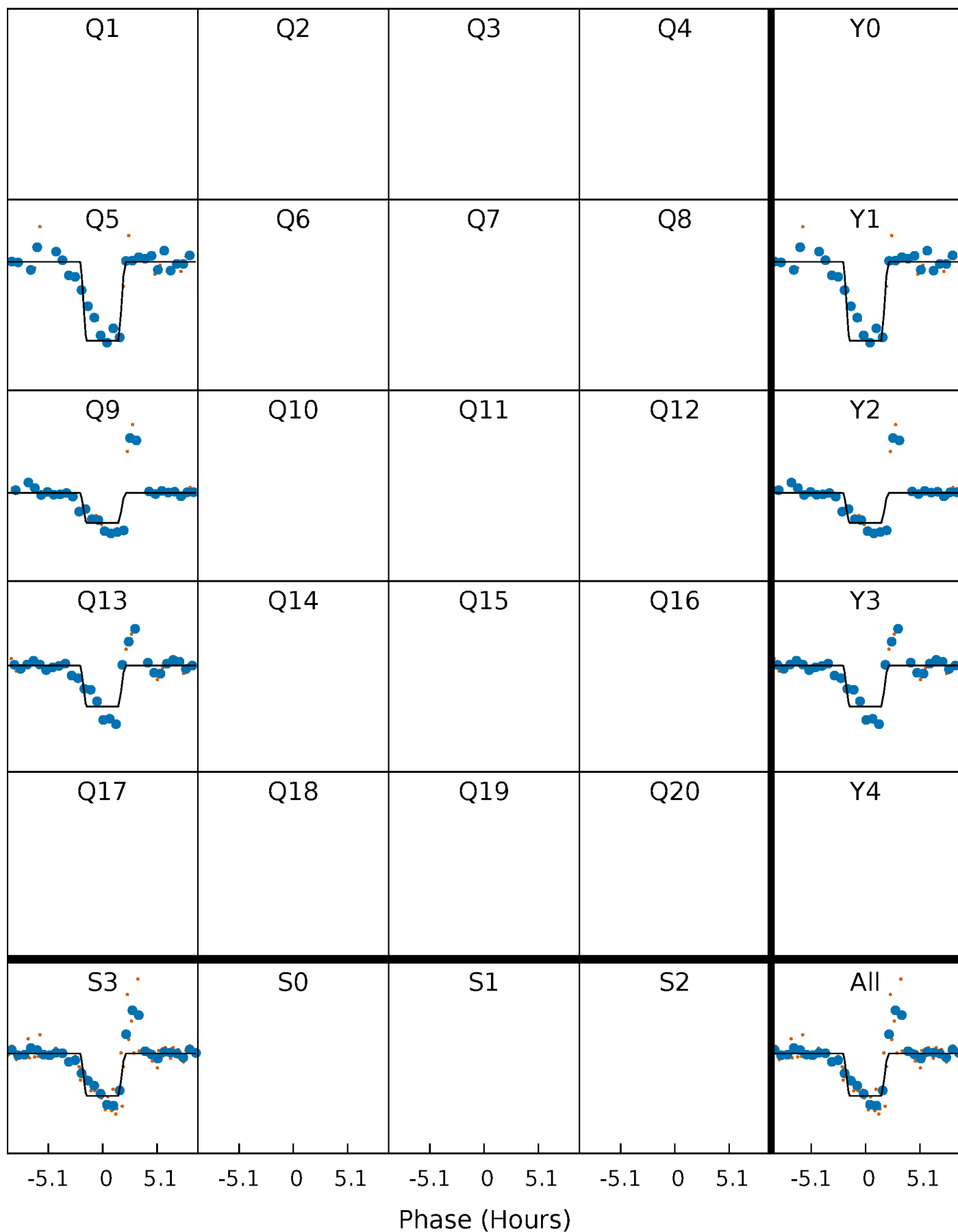
DV Quarter-Phased Transit Curves

TCE 002285420-03 $P=395.607215$ Days $T_0=472.087017$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

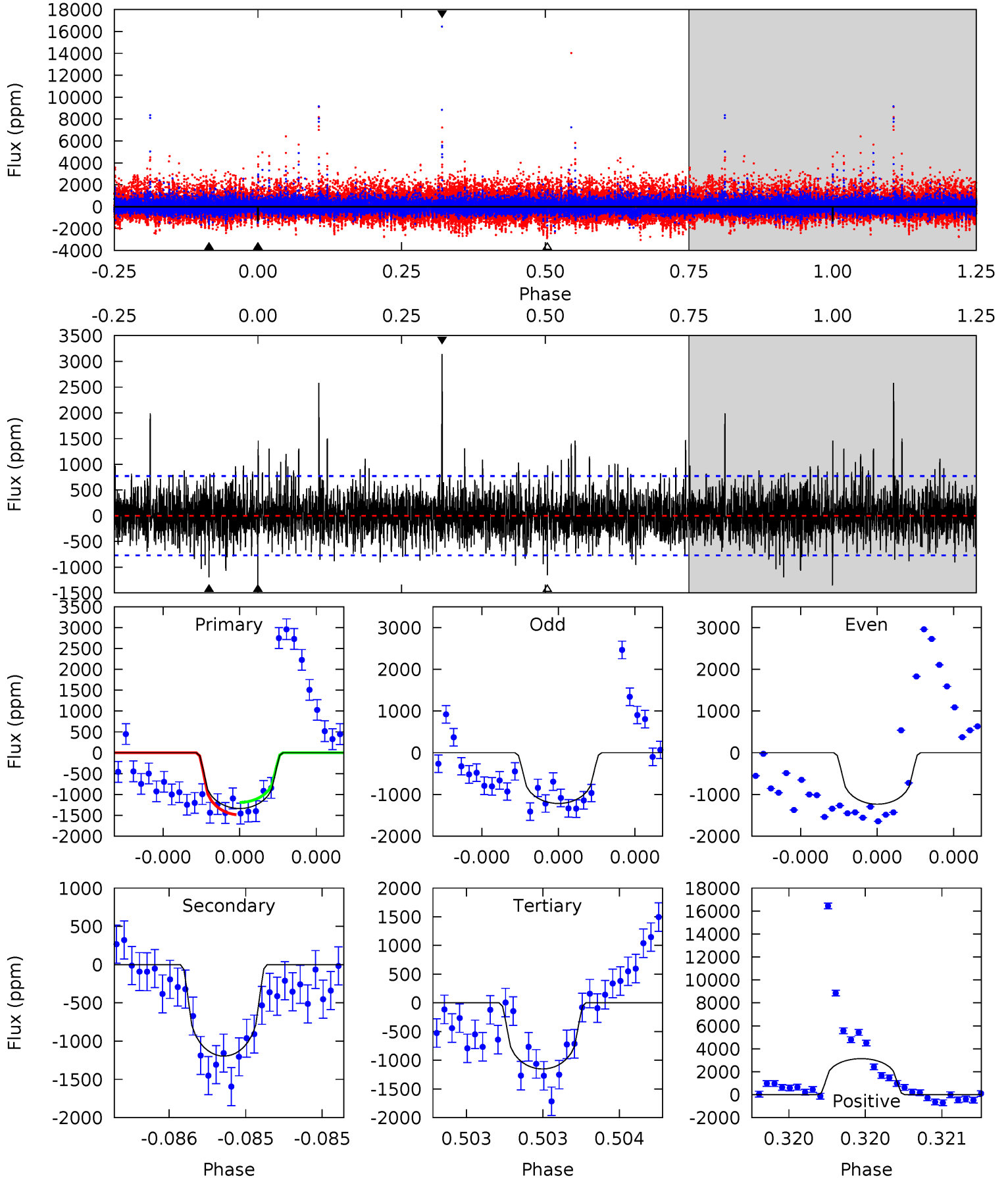
TCE 002285420-03 $P=395.600533$ Days $T_0=472.098746$ (BKJD)



DV Model-Shift Uniqueness Test

002285420-03, P = 395.607215 Days, E = 76.479802 Days

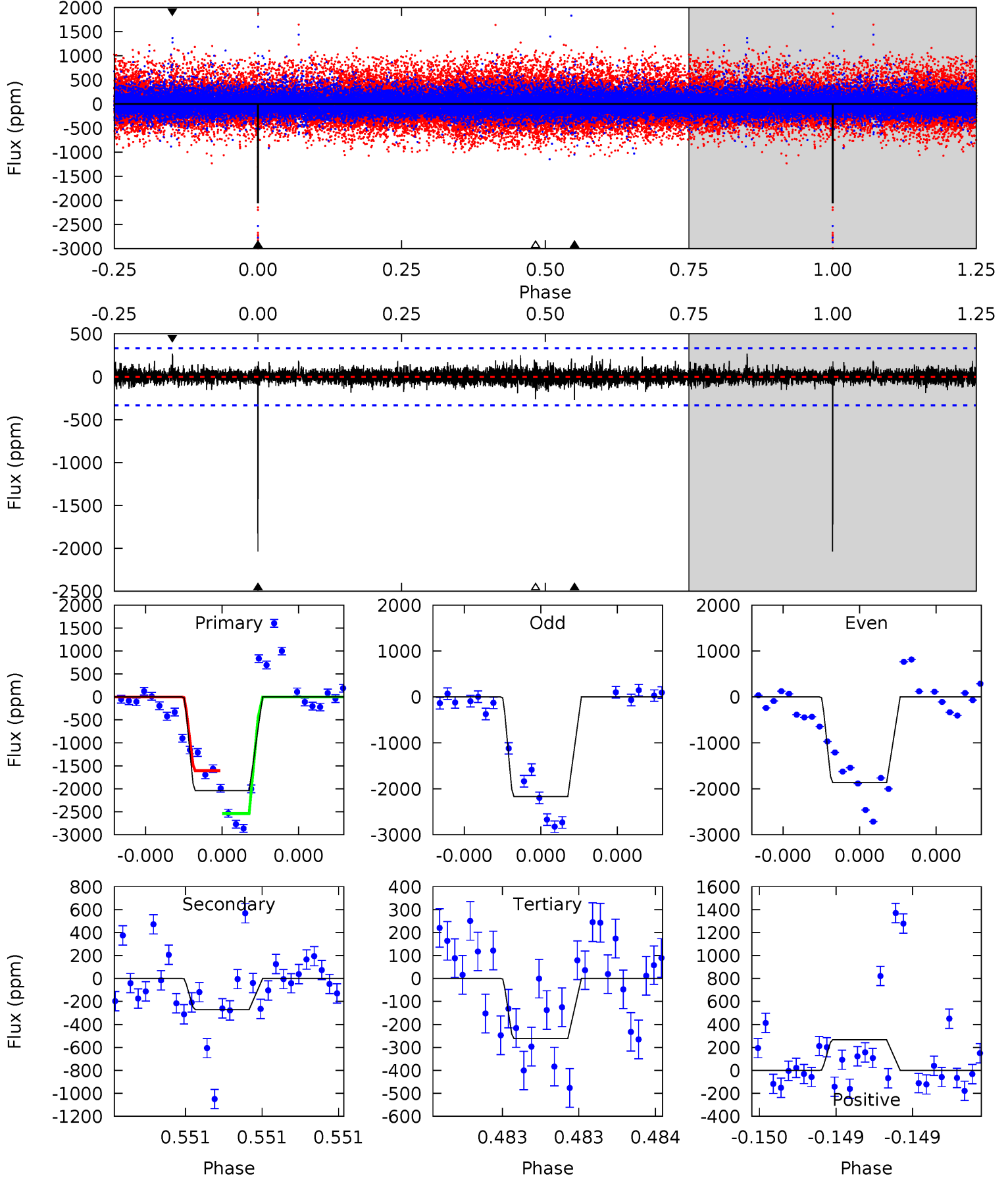
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.65	8.64	8.32	22.7	5.58	3.48	2.31	1.33	-13.0	0.32	-14.1	0.05	1.01	0.70	1.07



Alt Model-Shift Uniqueness Test

002285420-03, P = 395.600533 Days, E = 76.498213 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.3	4.55	4.39	4.47	5.60	3.51	0.75	29.9	29.8	0.16	0.09	2.37	0.98	0.12	8.08



Stellar Parameters For KIC 002285420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4174^{+145}_{-160}	$4.655^{+0.059}_{-0.027}$	$-0.200^{+0.300}_{-0.300}$	$0.600^{+0.042}_{-0.066}$	$0.593^{+0.059}_{-0.059}$	$3.873^{+1.049}_{-0.469}$
	+3%/-4%	+1%/-1%	+150%/-150%	+7%/-11%	+10%/-10%	+27%/-12%
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 002285420-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1196 ± 138	$3.28^{+2.06}_{-1.85}$	210^{+9}_{-9}	3656^{+1310}_{-522}	$47563^{+211418}_{-29518}$
Alt.	-271 ± 59	$3.15^{+2.22}_{-1.90}$	211^{+9}_{-10}	2949^{+991}_{-395}	11907^{+60302}_{-8104}

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 $A_{obs} \gg 1.0$

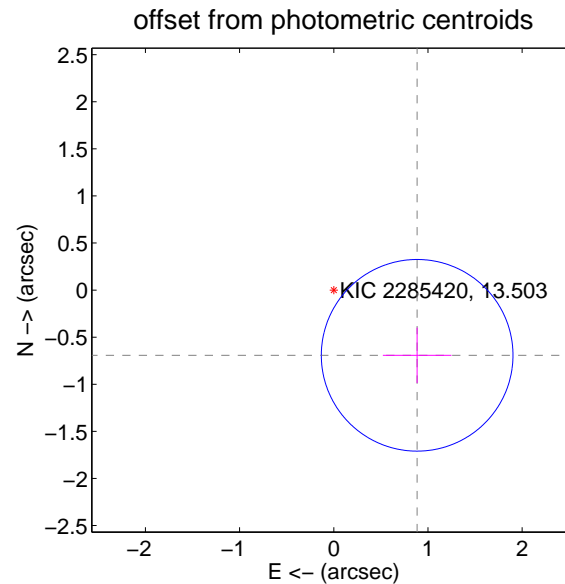
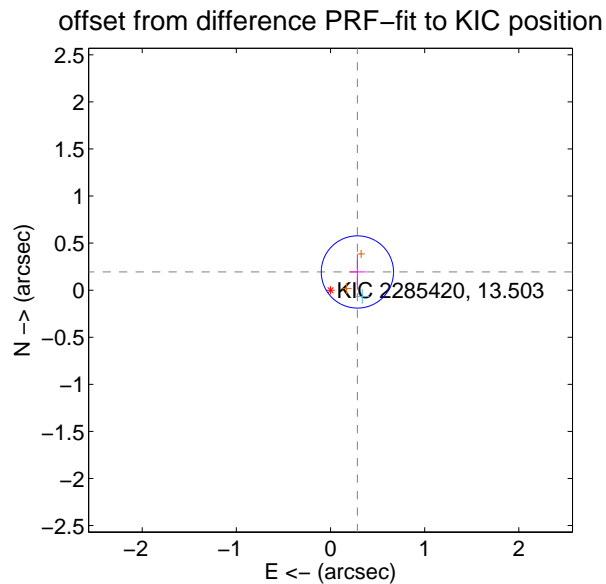
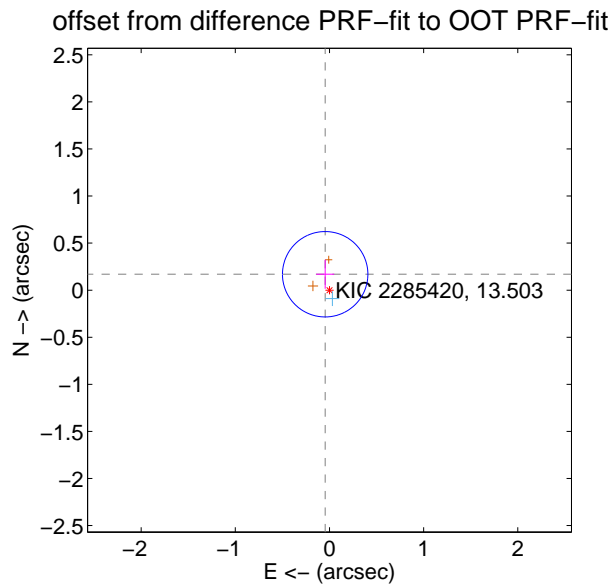
DV Centroid Data

Supplemental centroid analysis for 002285420-03. Kepler magnitude: 13.50. Transit SNR 10.20

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.175 ± 0.151	1.16	0.046 ± 0.096	0.169 ± 0.154
PRF-fit source offset from KIC position	0.345 ± 0.128	2.70	-0.285 ± 0.088	0.193 ± 0.187
photometric centroid source offset	1.12 ± 0.34	3.31	-0.89 ± 0.36	-0.69 ± 0.29

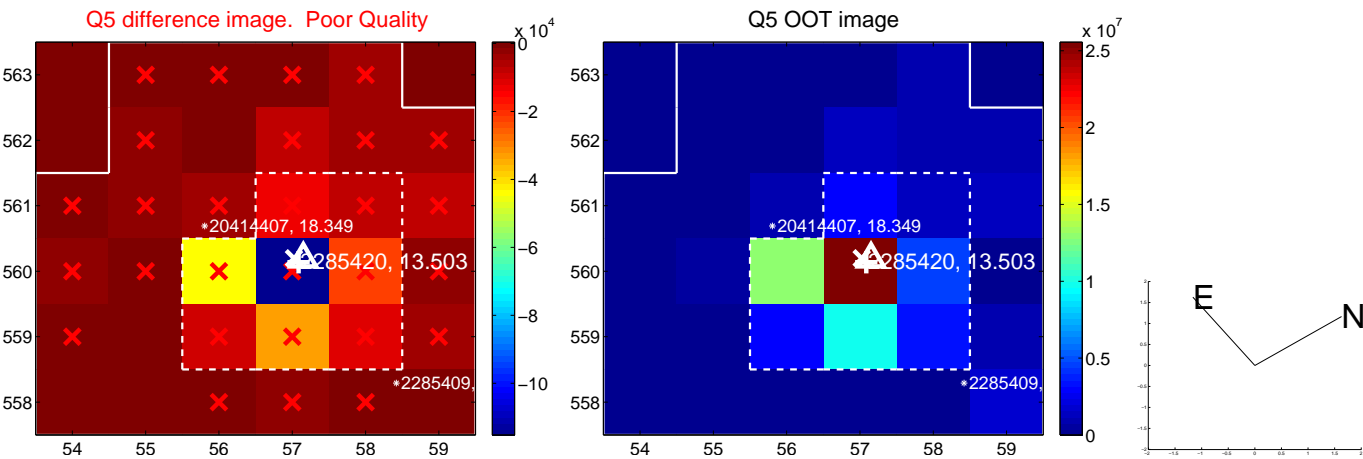


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

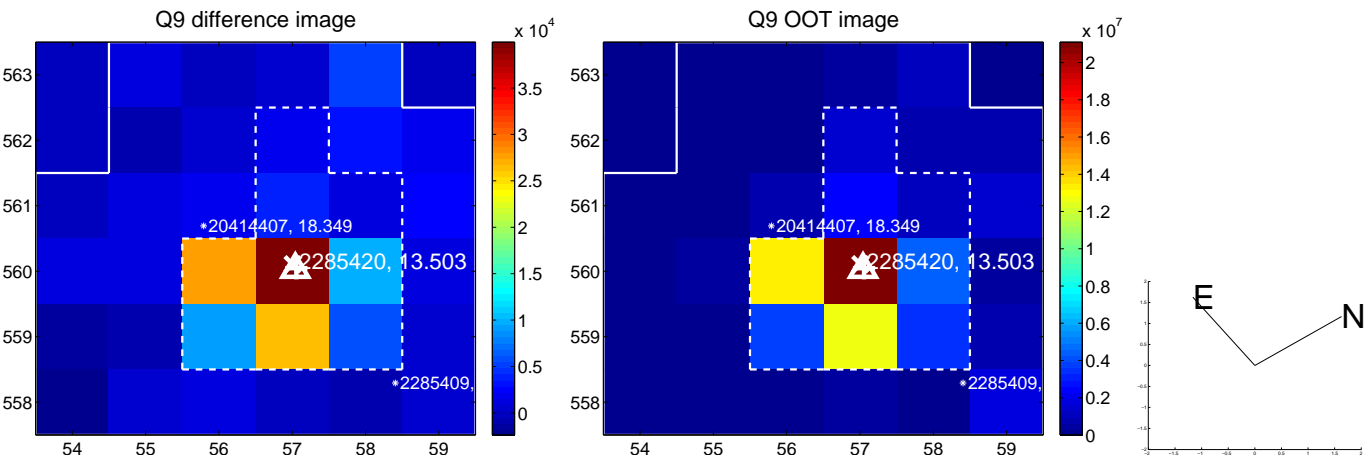
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



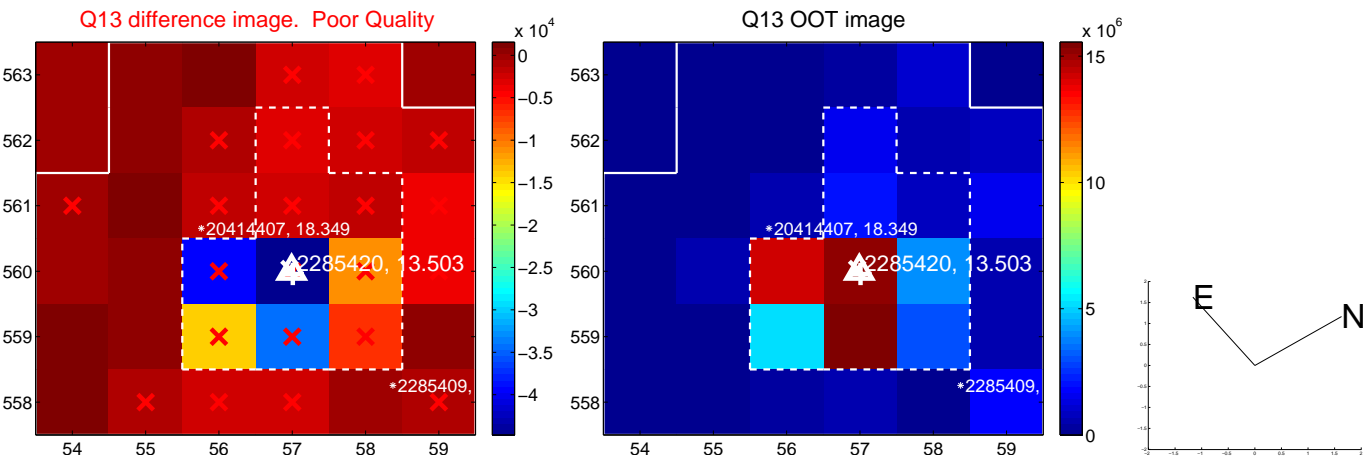
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



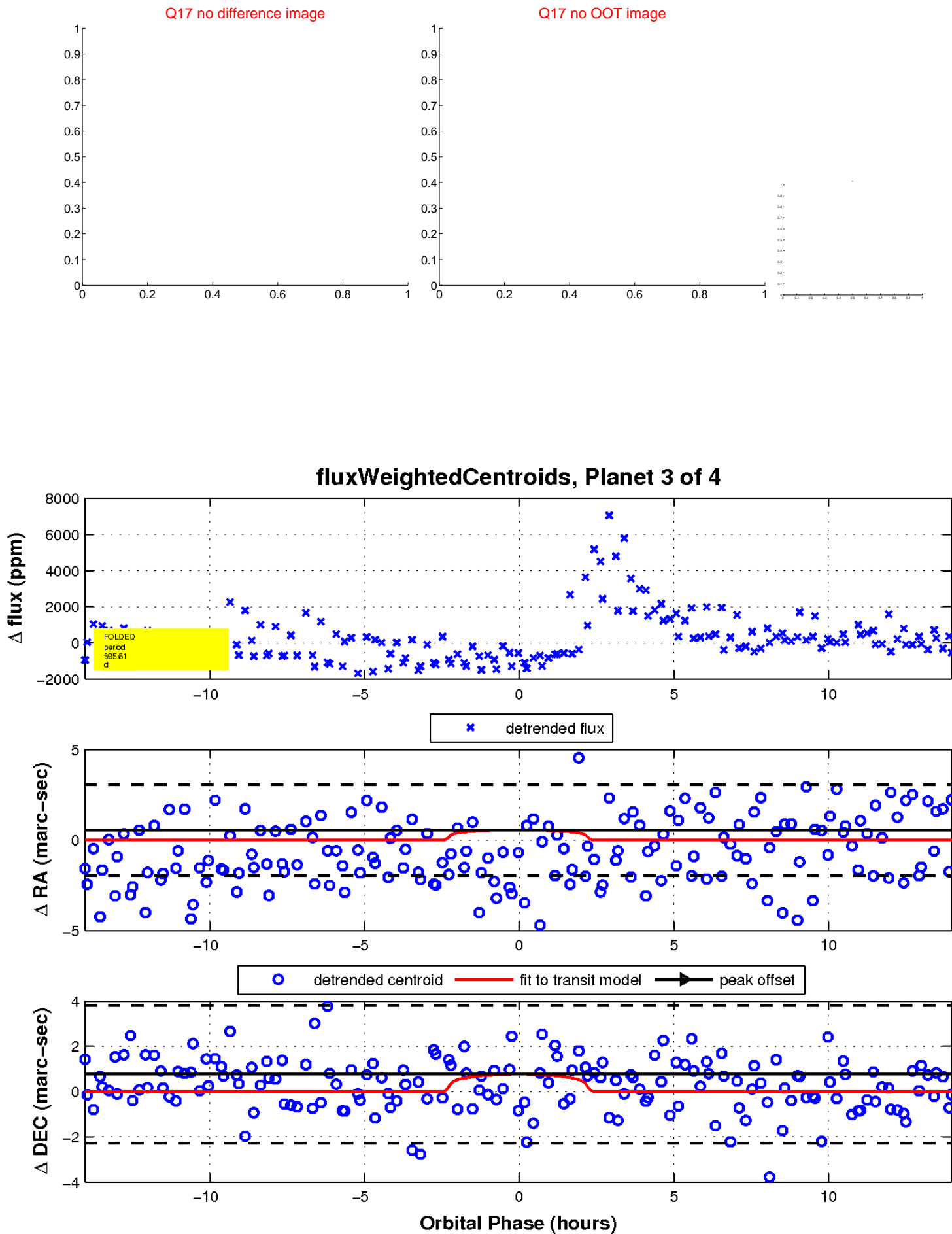
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

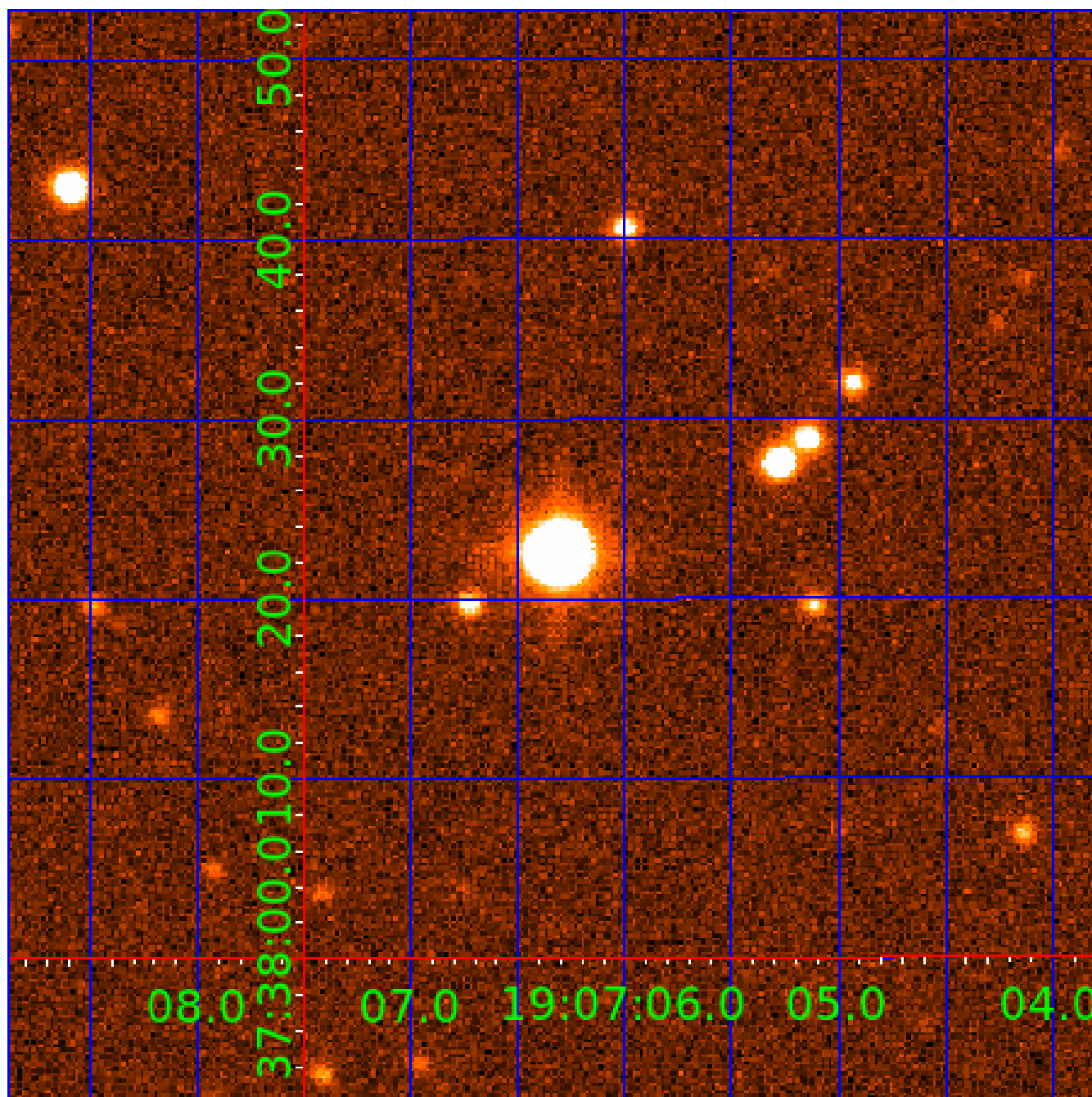


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002285420

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})
002285420-01	OBS	No	291.793017	260.328301	364.1	3.598	12.8	1.9	0.60	4174	1.14	0.19
002285420-02	OBS	No	378.302102	332.345672	1167.9	2.945	14.2	6.0	0.60	4174	2.00	0.13
002285420-03	OBS	No	395.607215	472.087017	2562.3	4.722	12.8	10.2	0.60	4174	2.94	0.12
002285420-04	OBS	No	500.069630	281.798662	1375.9	2.684	12.0	5.6	0.60	4174	2.16	0.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002285420-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_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
002285420-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV
002285420-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002285420-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_NOFITS

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

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

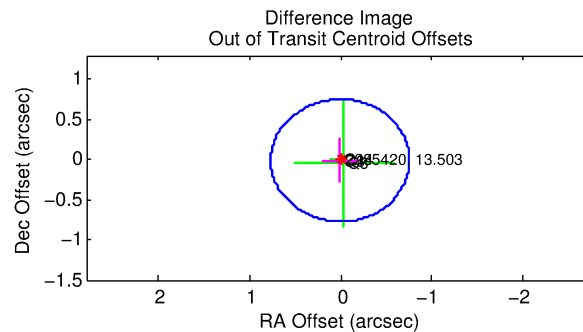
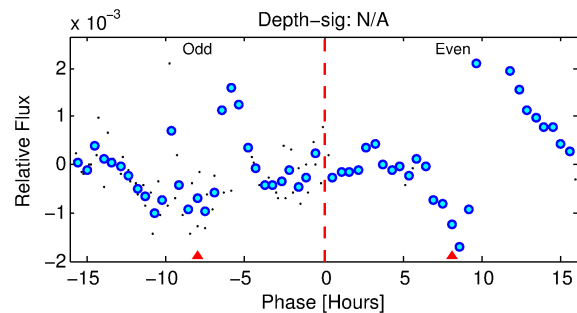
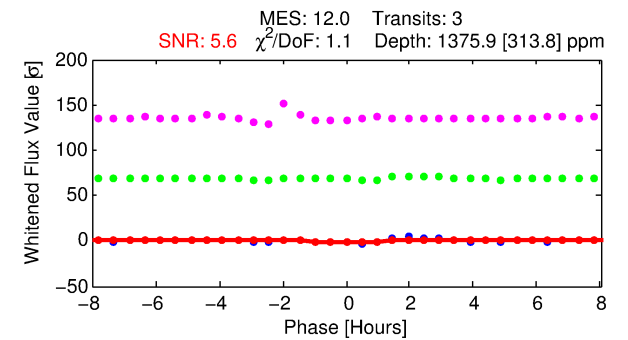
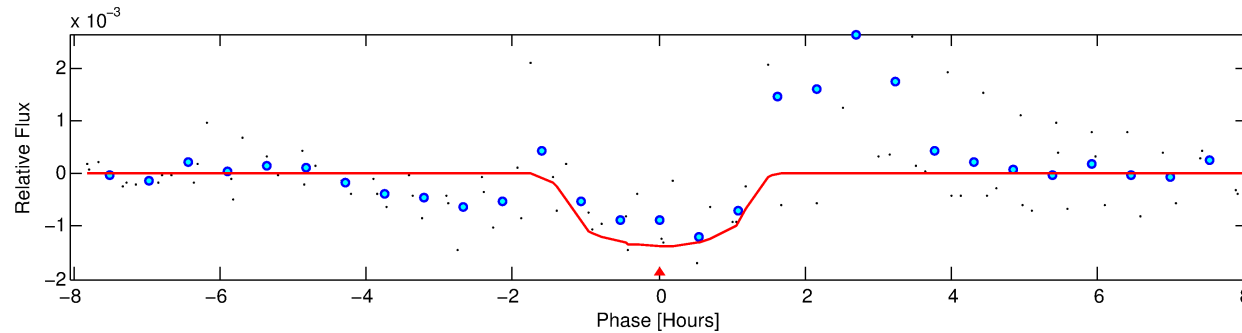
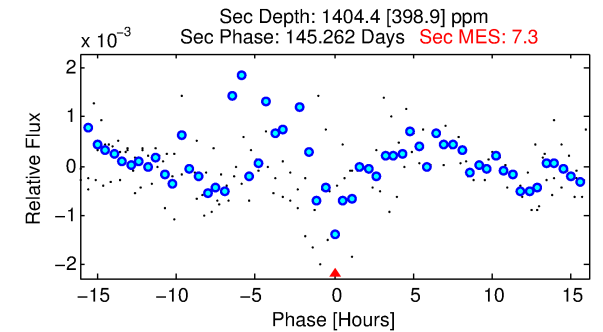
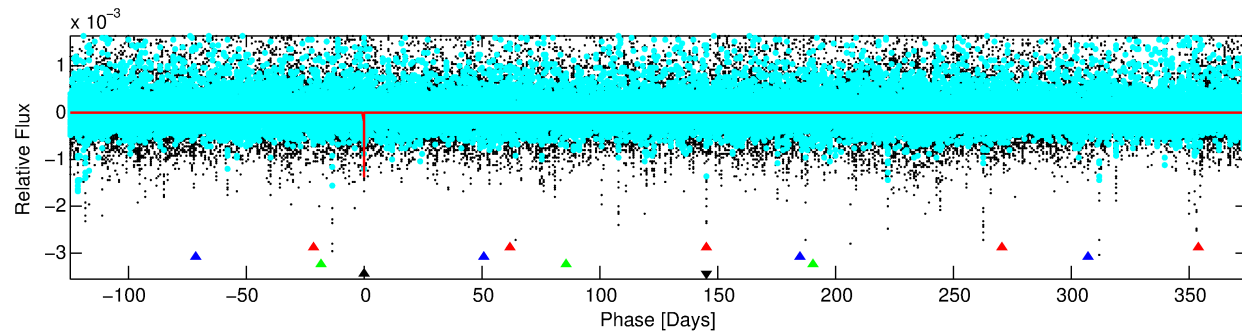
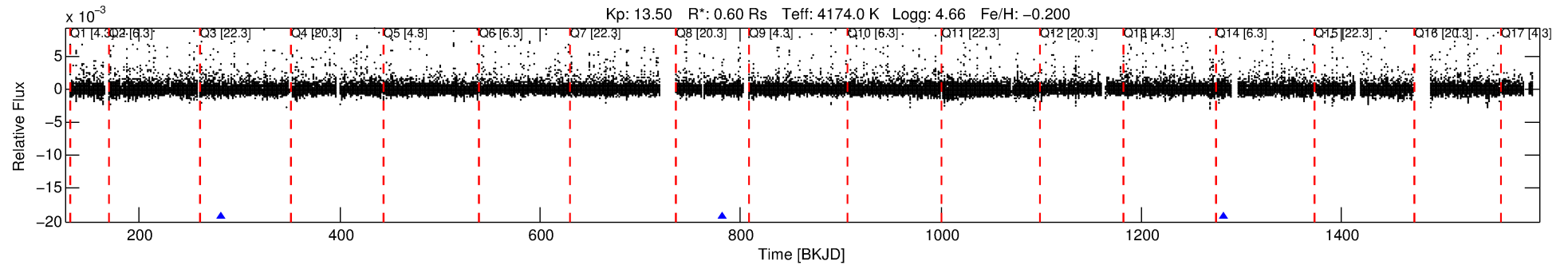
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002285420-04

No Significant Match Found

DV One-Page Summary

KIC: 2285420 Candidate: 4 of 4 Period: 500.070 d



DV Fit Results:

Period = 500.06963 [0.00589] d
Epoch = 281.7987 [0.0085] BKJD
Rp/R* = 0.0331 [0.0491]
a/R* = 1458.29 [7283.25]
b = 0.13 [37.71]
Seff = 0.09 [0.02]
Teq = 140 [7] K
Rp = 2.16 [3.23] Re
a = 1.0363 [0.0893] AU
Ag = 177184.24 [529639.93] [0.33]
Teffp = 4445 [3323] K [1.30 σ]

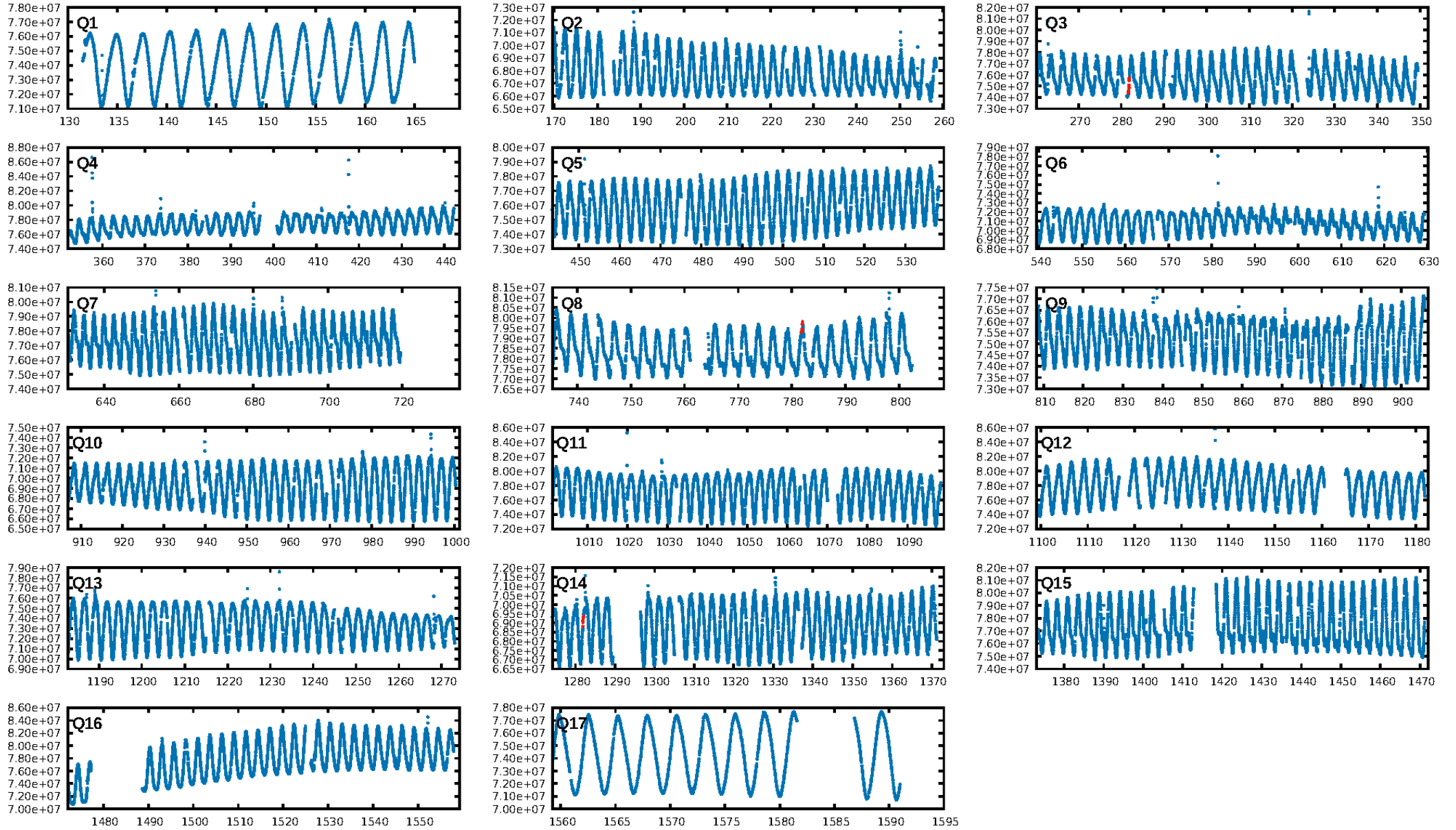
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [461.56 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.9%
ModelChiSquareGof-sig: 44.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8905
Centroid-sig: 64.4%
Centroid-so: 1.069 arcsec [1.82 σ]
OotOffset-rm: 0.012 arcsec [0.05 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.368 arcsec [1.77 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

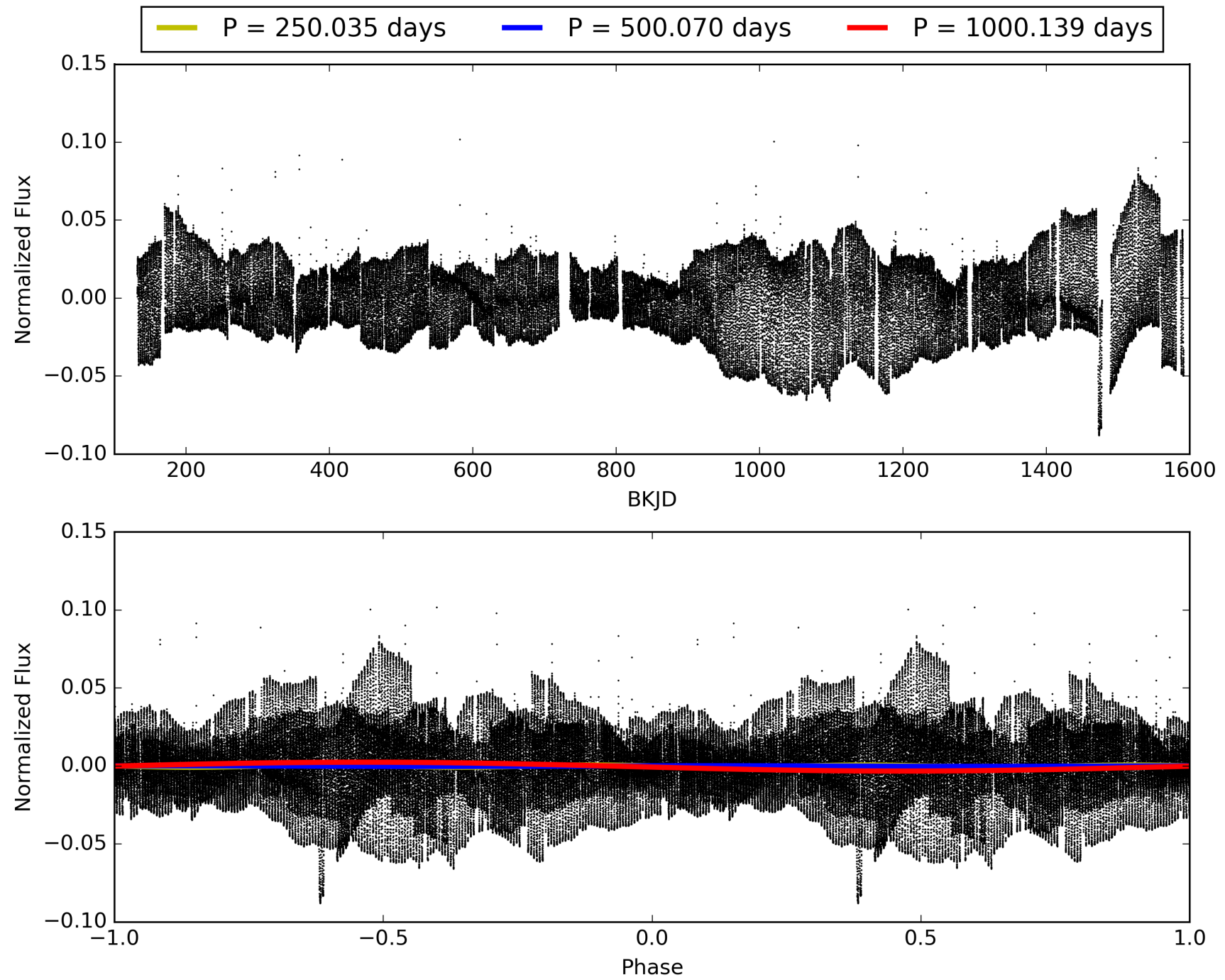
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:51:28 Z

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

TCE 002285420-04, PDC Light Curves

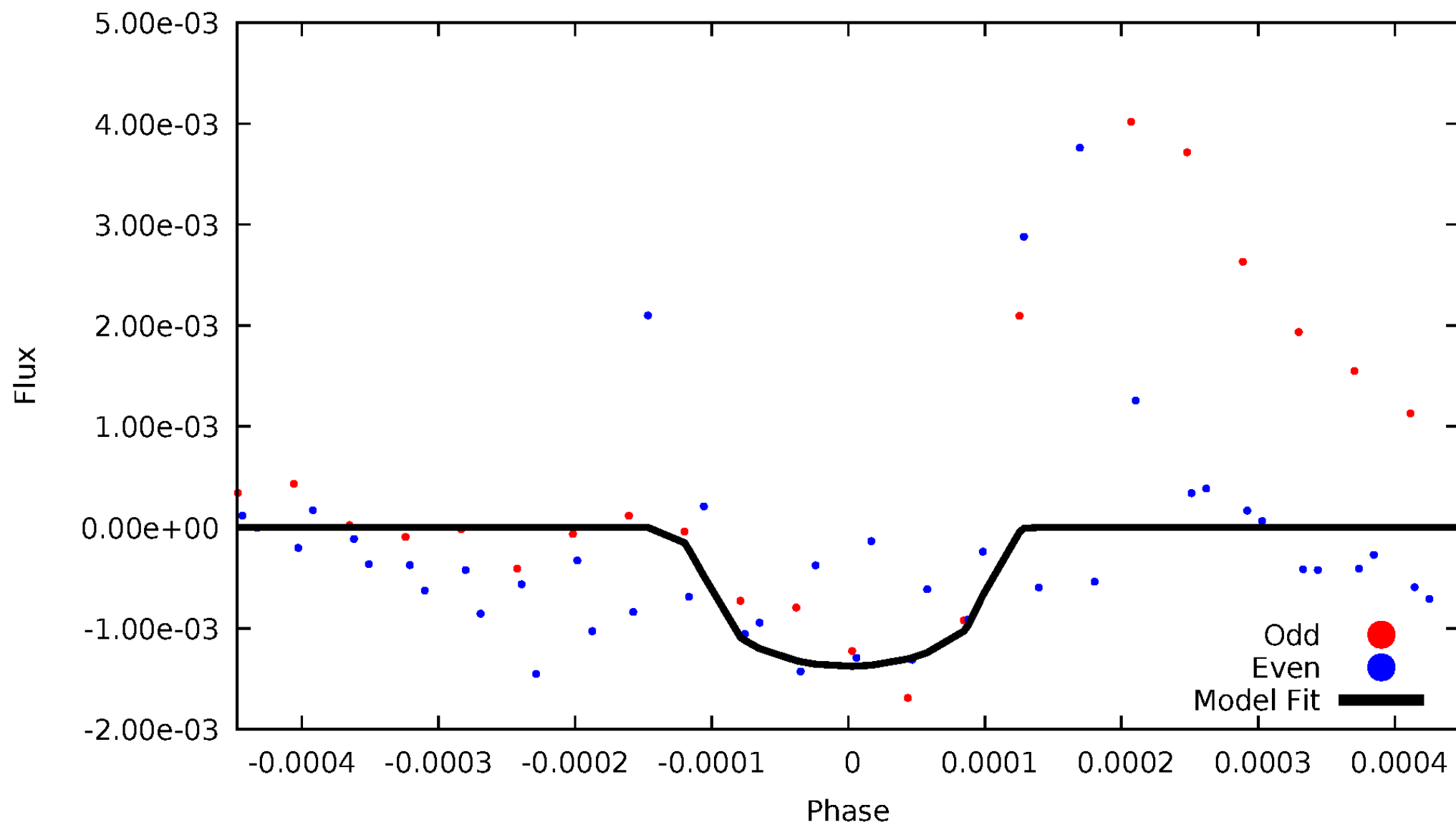


TCE 002285420-04



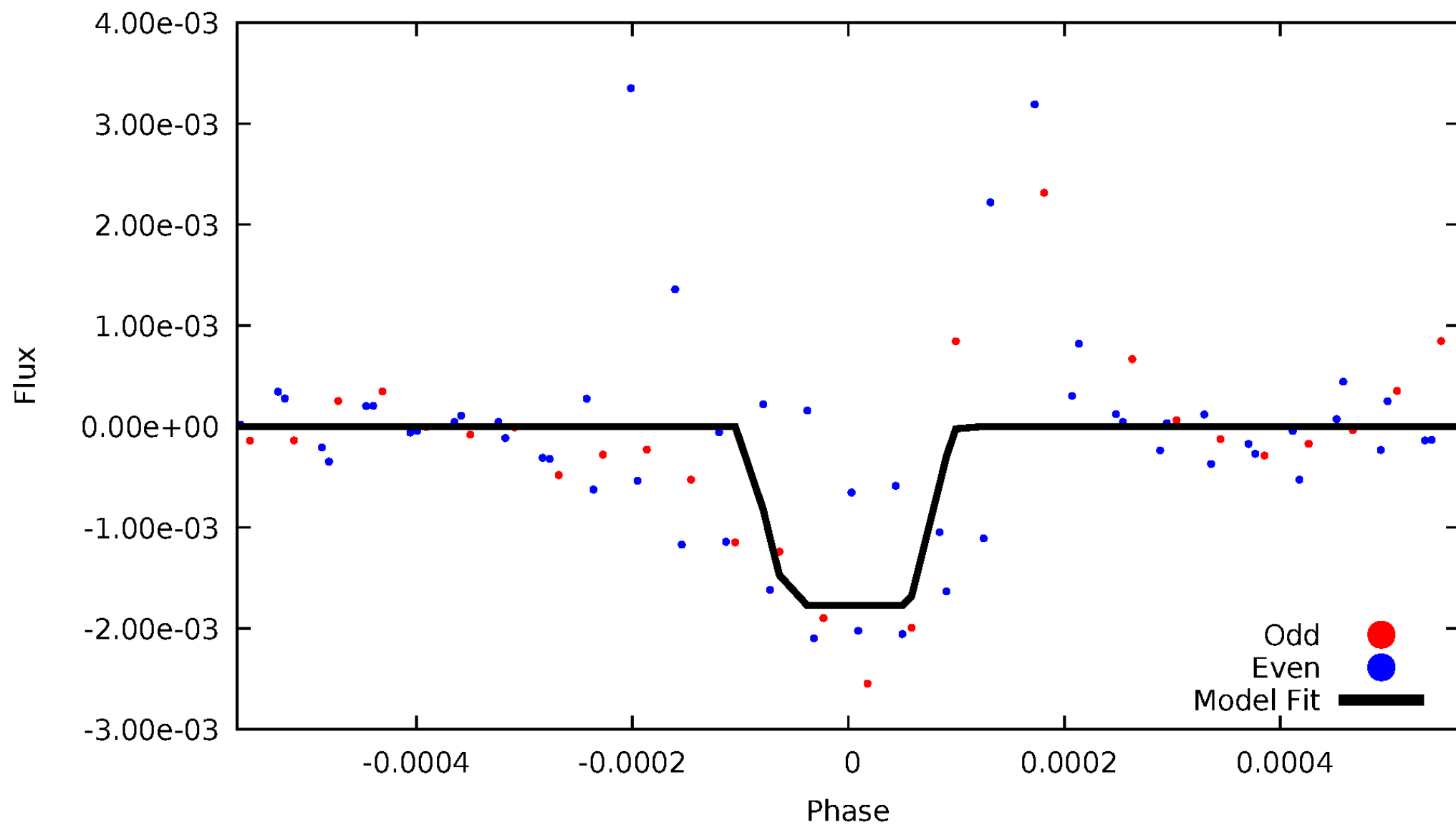
DV Odd/Even

TCE 002285420-04



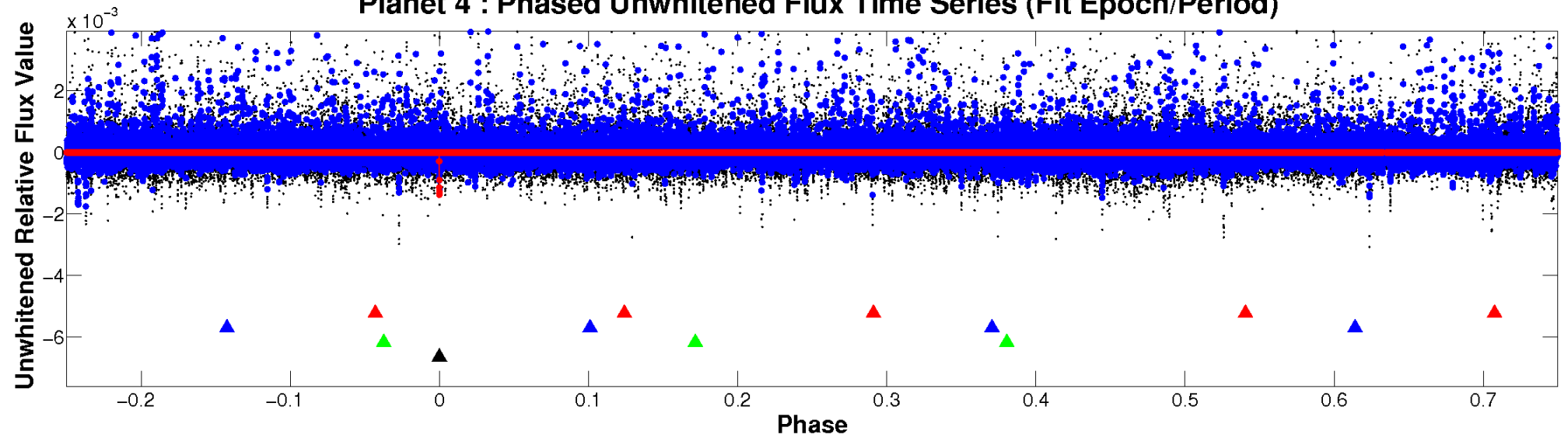
ALT Odd/Even

TCE 002285420-04

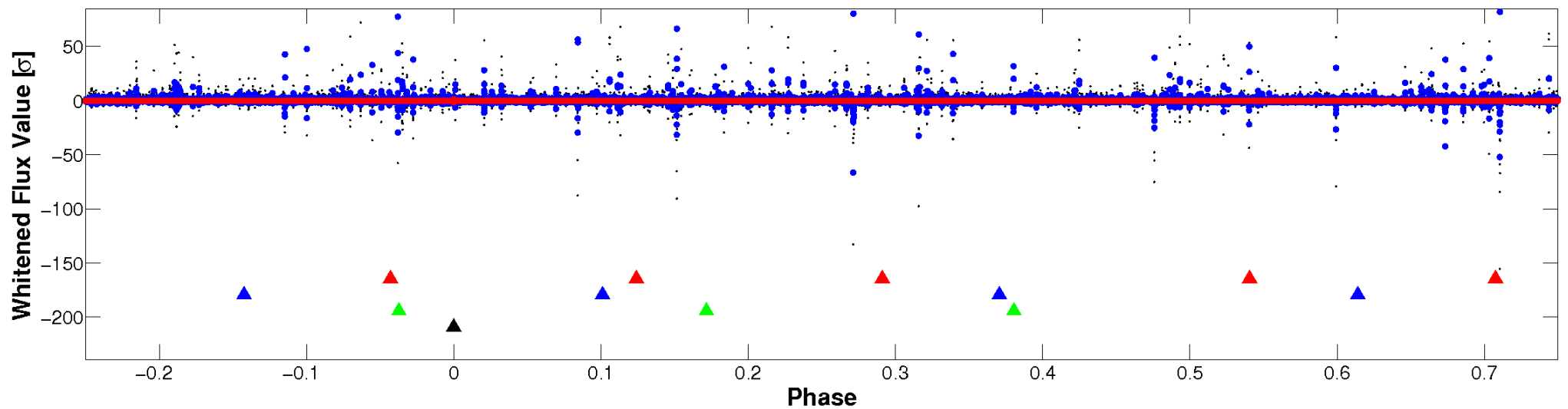


Non-Whitened Vs. Whitened Light Curve

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

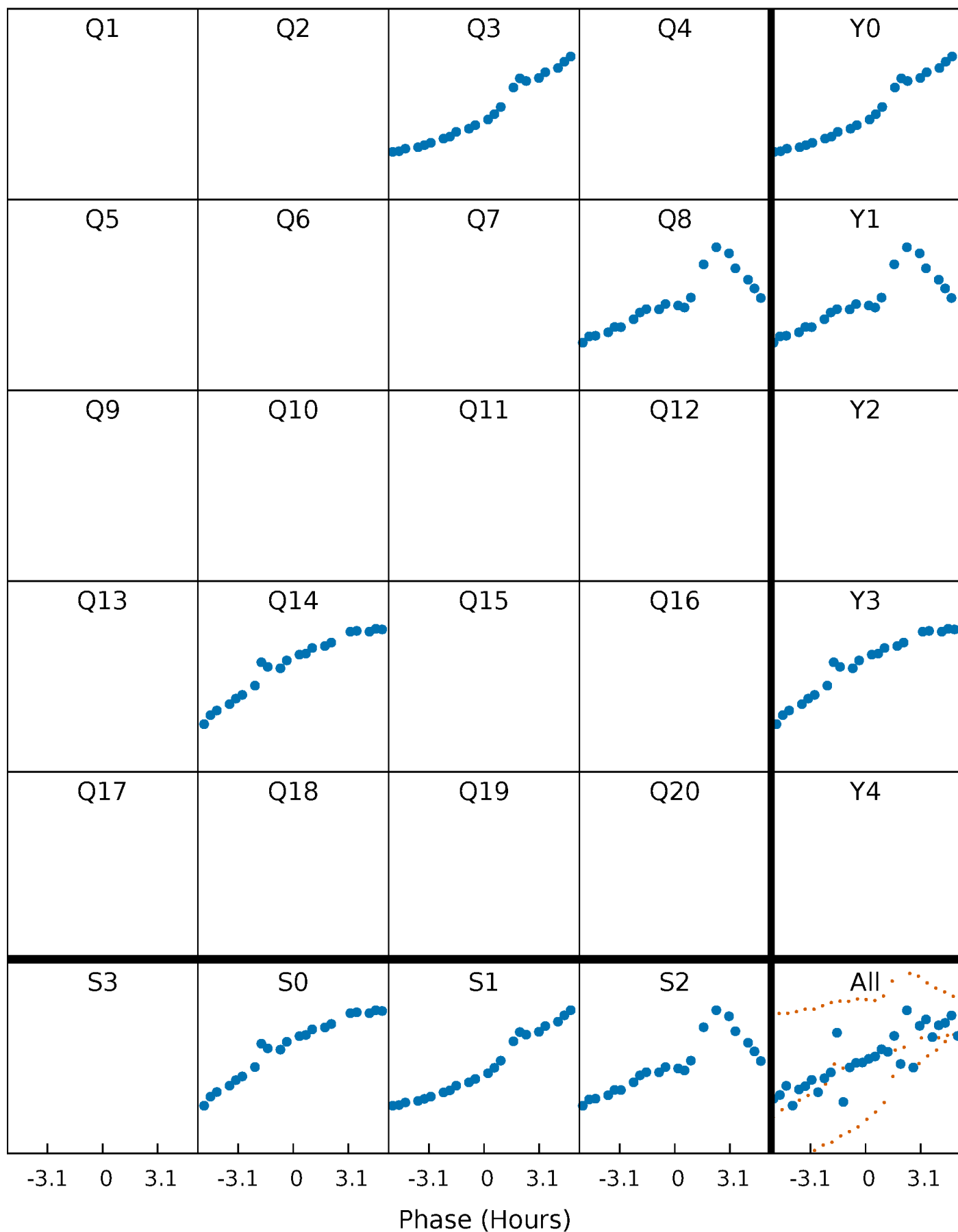


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



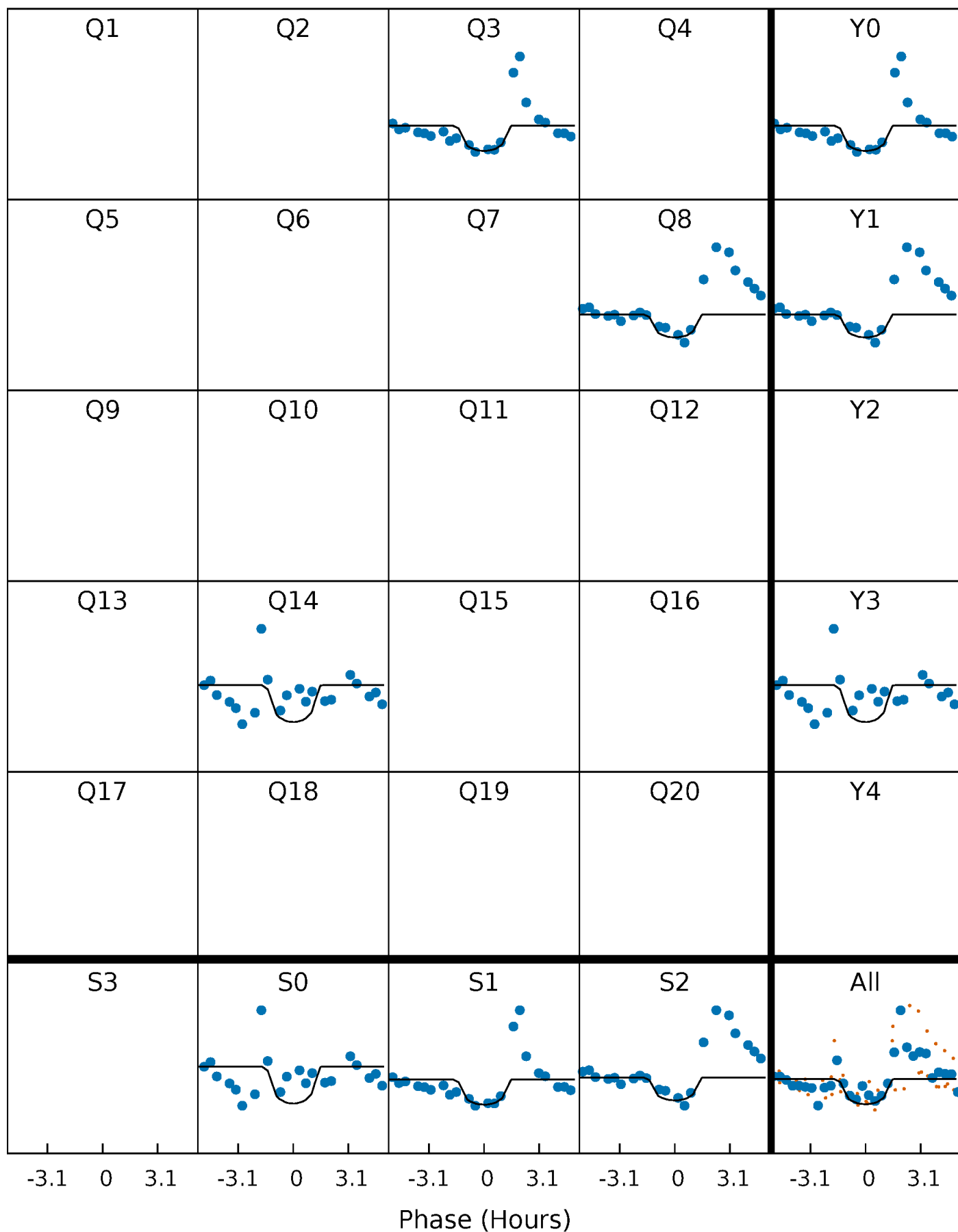
PDC Quarter-Phased Transit Curves

TCE 002285420-04 $P=500.069630$ Days $T_0=281.798662$ (BKJD)



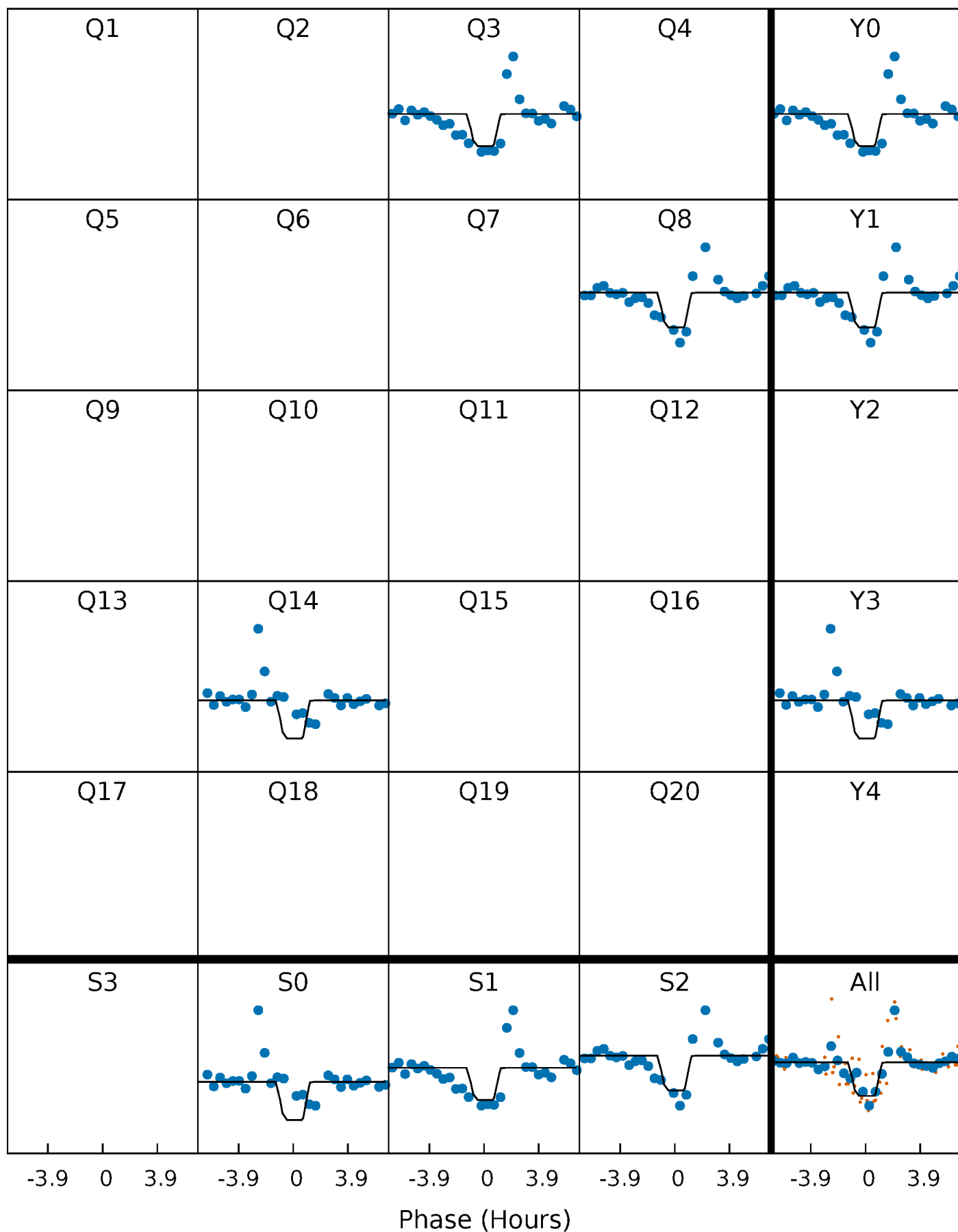
DV Quarter-Phased Transit Curves

TCE 002285420-04 $P=500.069630$ Days $T_0=281.798662$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

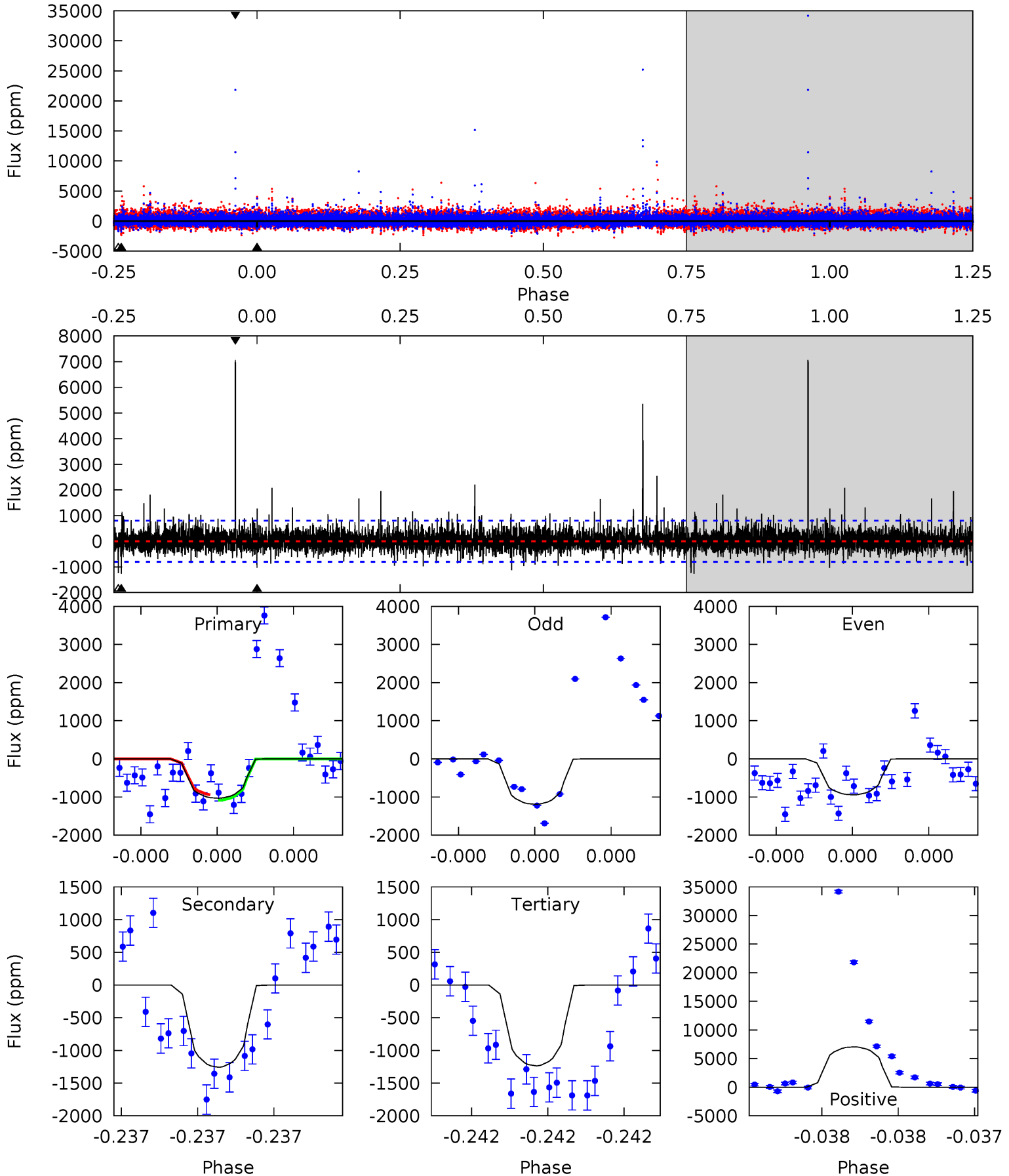
TCE 002285420-04 $P=500.084136$ Days $T_0=281.797062$ (BKJD)



DV Model-Shift Uniqueness Test

002285420-04, P = 500.069630 Days, E = 281.798662 Days

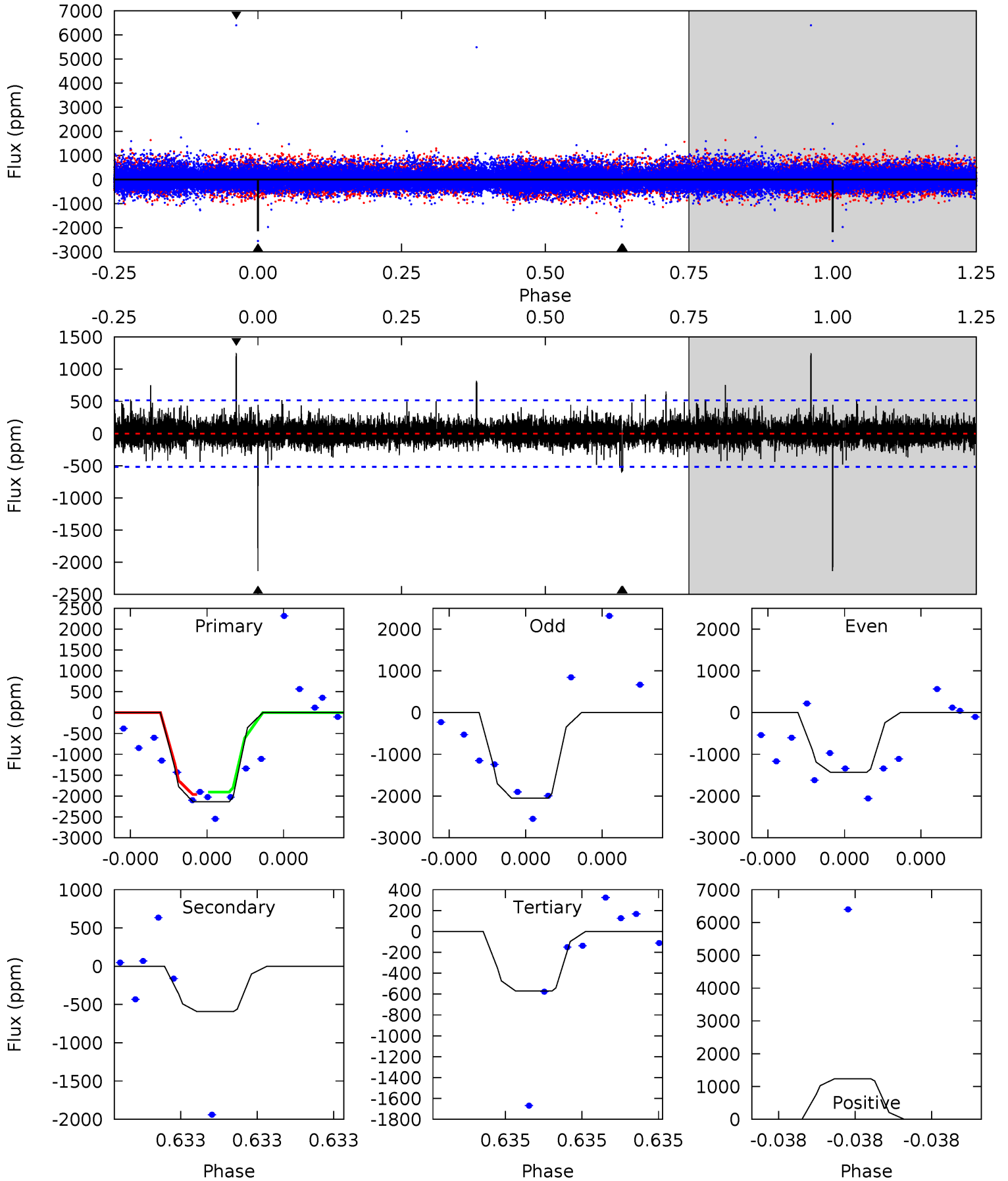
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.33	8.93	8.78	50.1	5.69	3.66	2.08	-1.45	-42.8	0.15	-41.2	0.44	0.86	0.85	0.50



Alt Model-Shift Uniqueness Test

002285420-04, P = 500.084136 Days, E = 281.797062 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.7	6.60	6.35	13.7	5.76	3.76	1.08	17.4	10.0	0.25	-7.14	3.44	0.75	0.37	0.32



Stellar Parameters For KIC 002285420

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4174^{+145}_{-160}	$4.655^{+0.059}_{-0.027}$	$-0.200^{+0.300}_{-0.300}$	$0.600^{+0.042}_{-0.066}$	$0.593^{+0.059}_{-0.059}$	$3.873^{+1.049}_{-0.469}$
	+3%/-4%	+1%/-1%	+150%/-150%	+7%/-11%	+10%/-10%	+27%/-12%
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 002285420-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1257 ± 141	$2.96^{+2.97}_{-2.00}$	194^{+8}_{-9}	3801^{+2275}_{-730}	$83894^{+737567}_{-62416}$
Alt.	-593 ± 90	$3.80^{+2.94}_{-2.30}$	195^{+7}_{-8}	3123^{+1116}_{-440}	$24317^{+128099}_{-16421}$

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 $A_{obs} \gg 1.0$

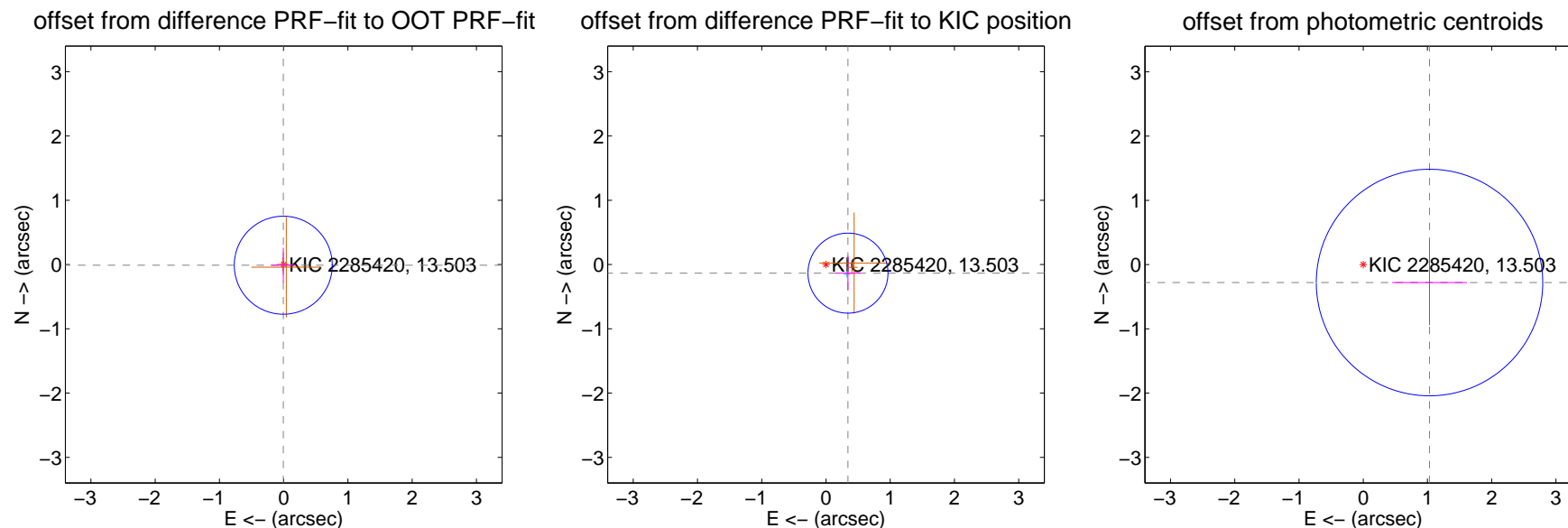
DV Centroid Data

Supplemental centroid analysis for 002285420-04. Kepler magnitude: 13.50. Transit SNR 5.64

There are 1 quarters with good PRF difference image offsets

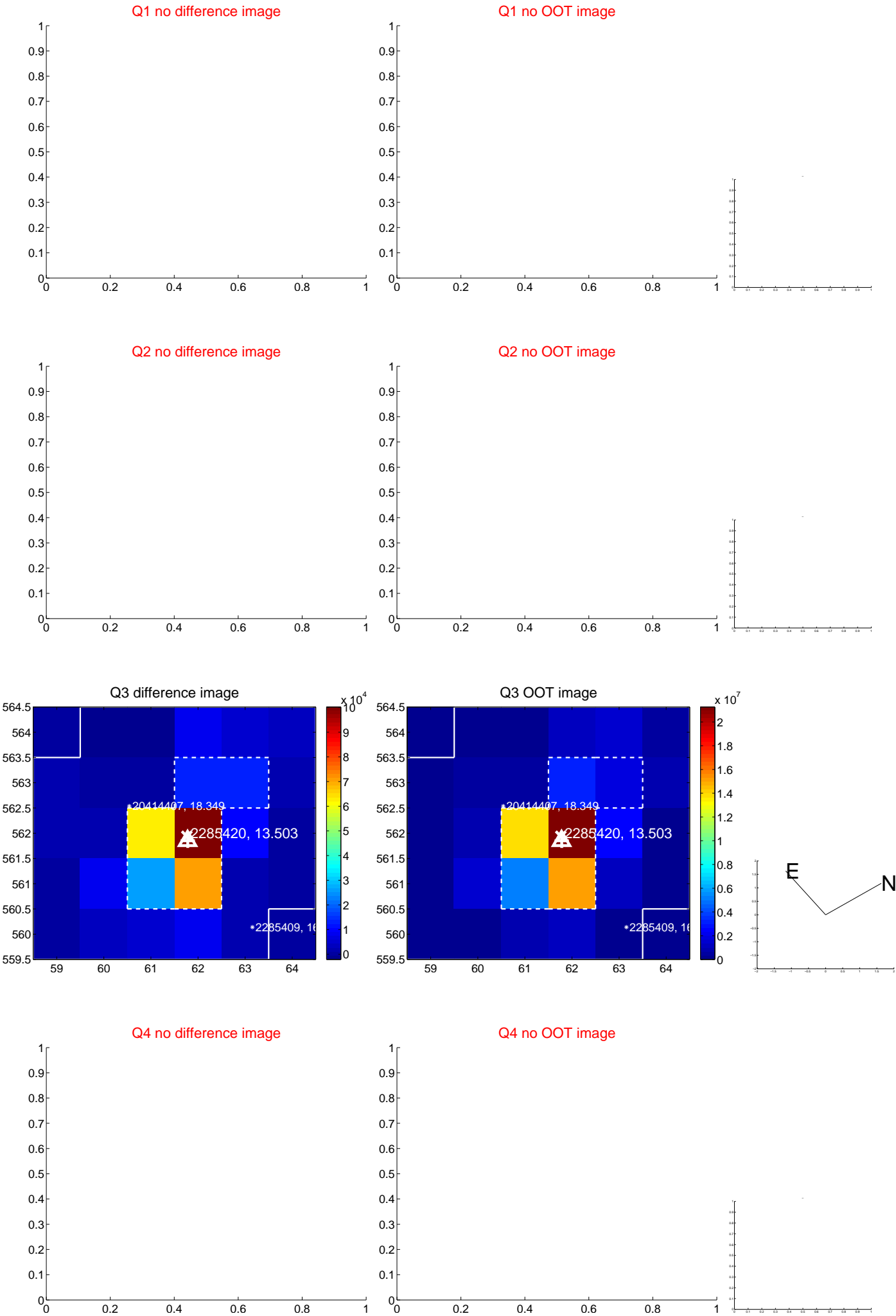
The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.012 ± 0.254	0.05	0.006 ± 0.196	-0.011 ± 0.272
PRF-fit source offset from KIC position	0.368 ± 0.208	1.77	-0.343 ± 0.196	-0.134 ± 0.272
photometric centroid source offset	1.07 ± 0.59	1.82	-1.03 ± 0.58	-0.28 ± 0.66

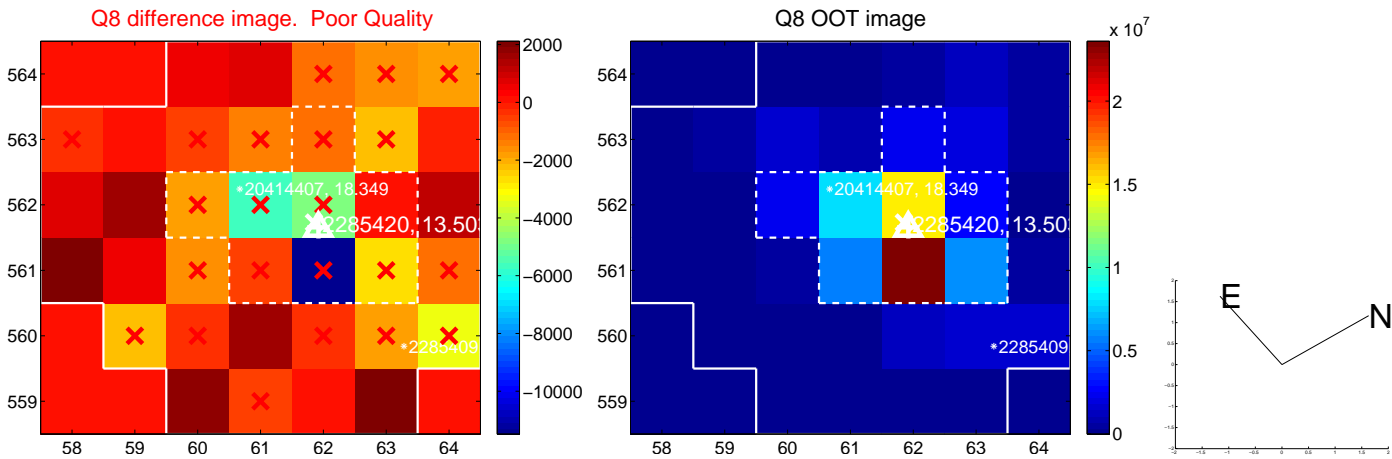
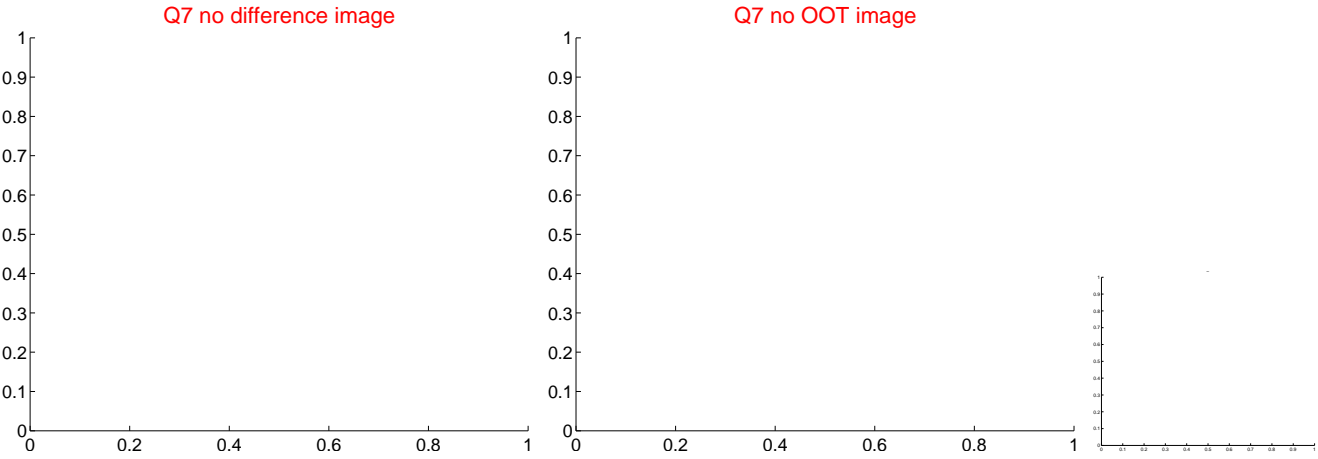
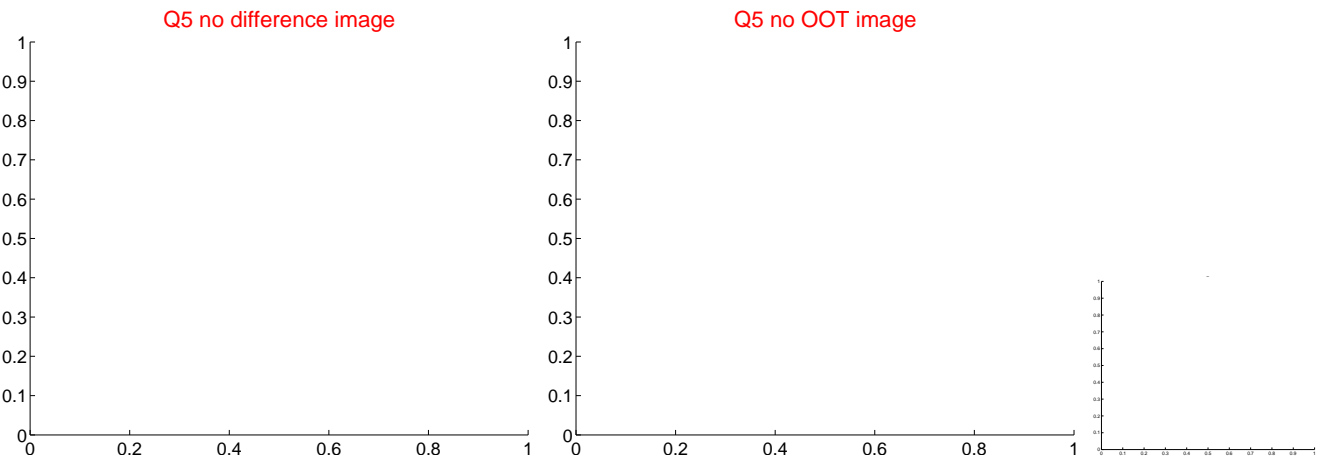


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



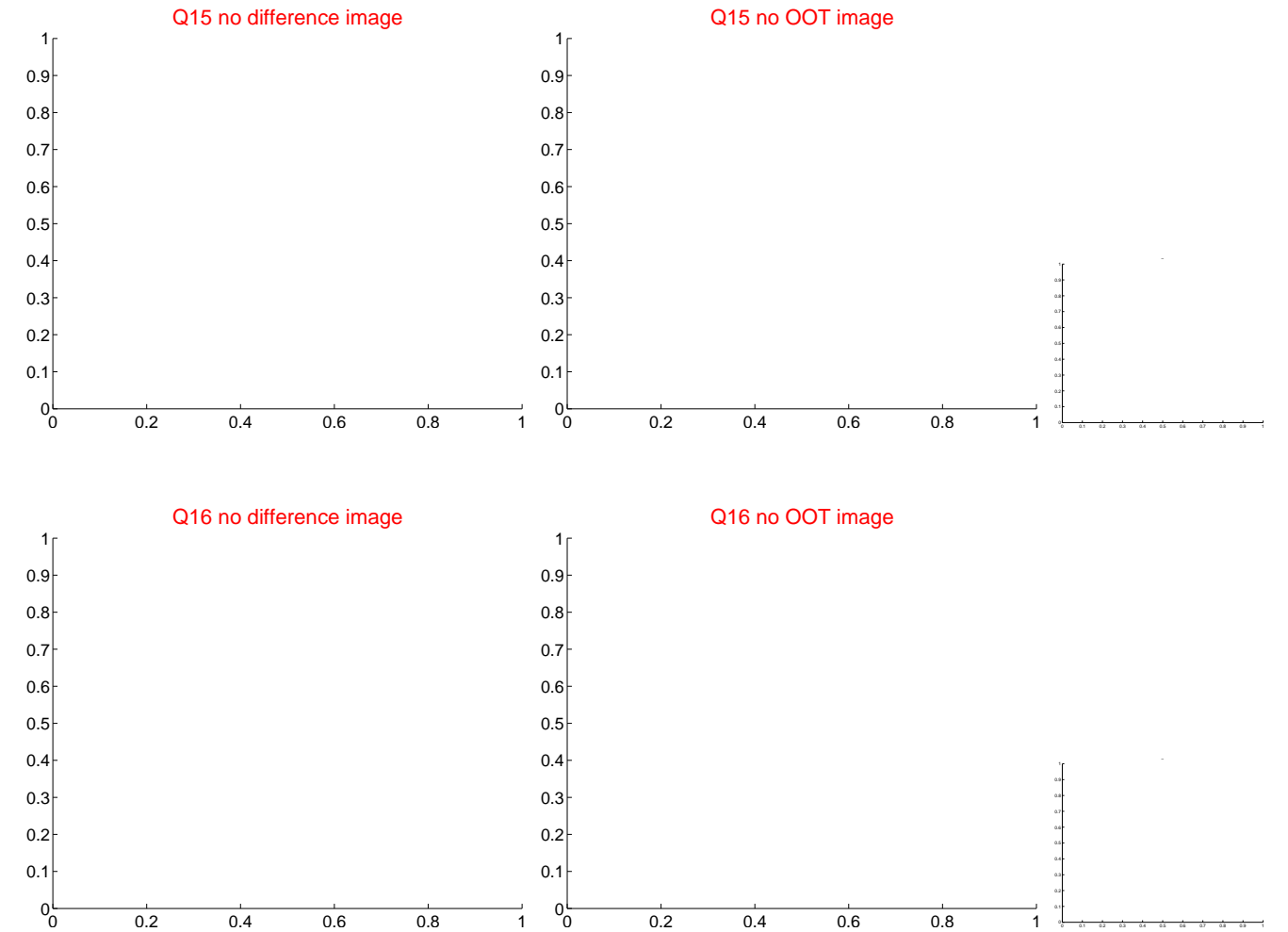
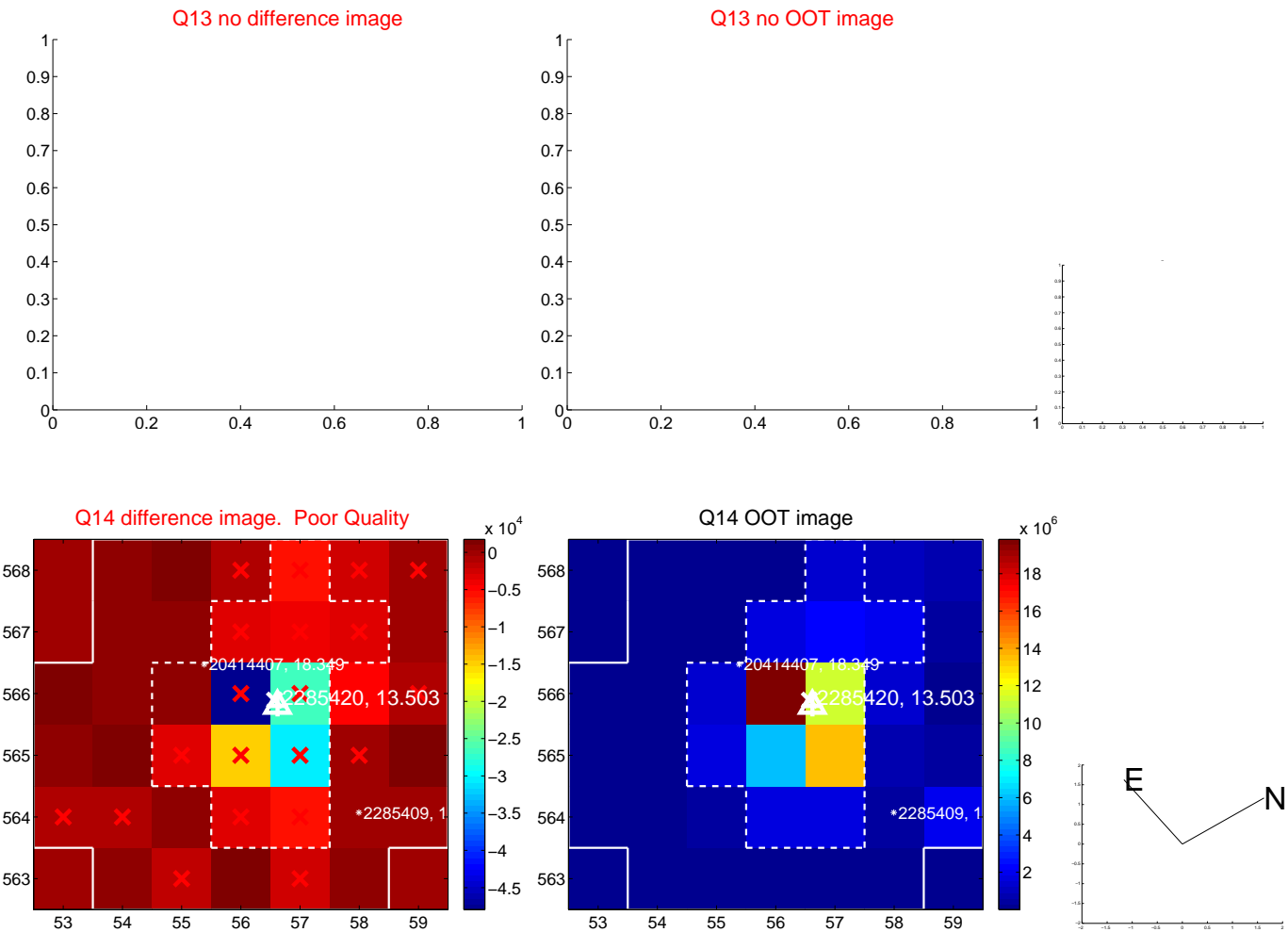
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



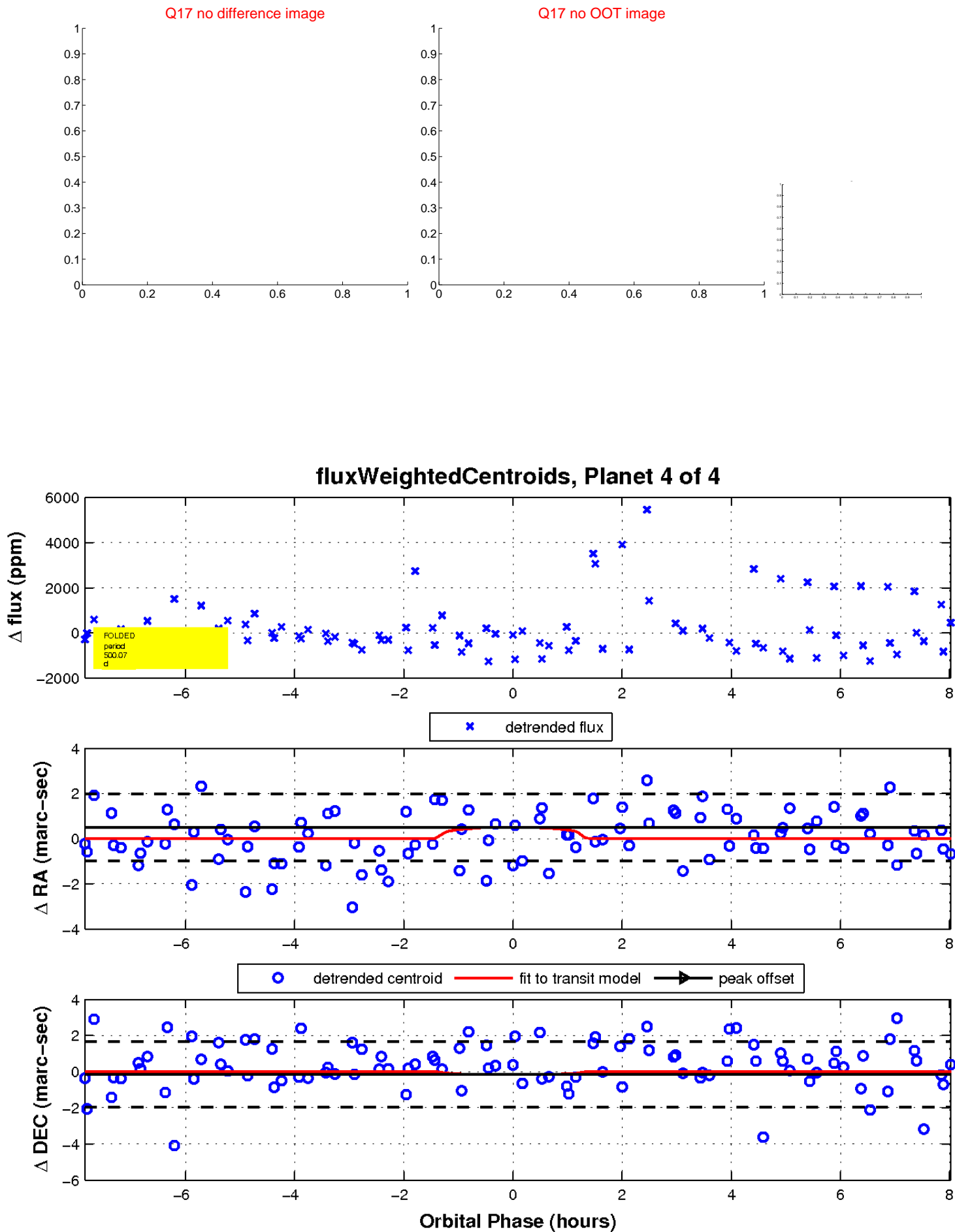
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \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

