

KIC 009651313

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})
009651313-01	OBS	No	50.911328	135.157008	97.0	3.371	29.0	16.3	12.64	4706	14.99	499.22
009651313-02	OBS	No	67.605717	139.462920	84.4	10.935	16.3	12.7	12.64	4706	13.13	342.03
009651313-03	OBS	No	38.372532	149.088298	55.4	1.617	11.6	16.8	12.64	4706	12.03	727.81
009651313-04	OBS	No	45.937382	172.133985	58.8	1.536	11.3	16.0	12.64	4706	10.66	572.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651313-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
009651313-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED
009651313-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009651313-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

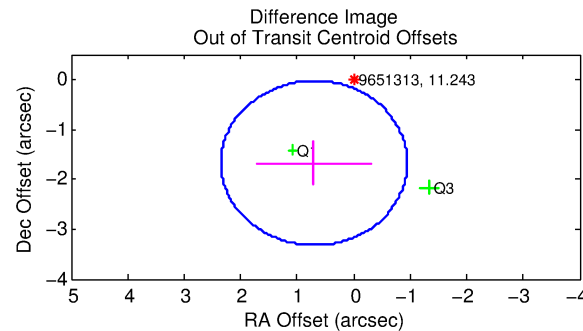
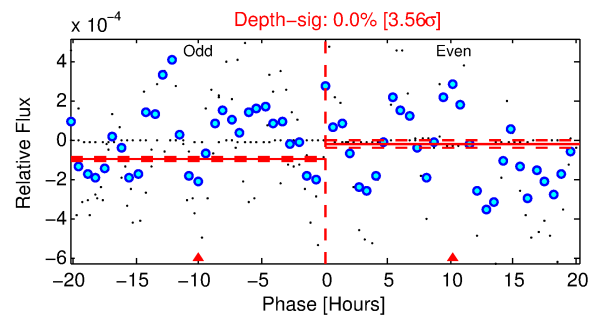
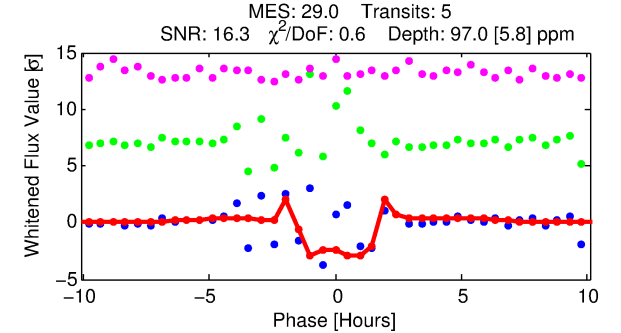
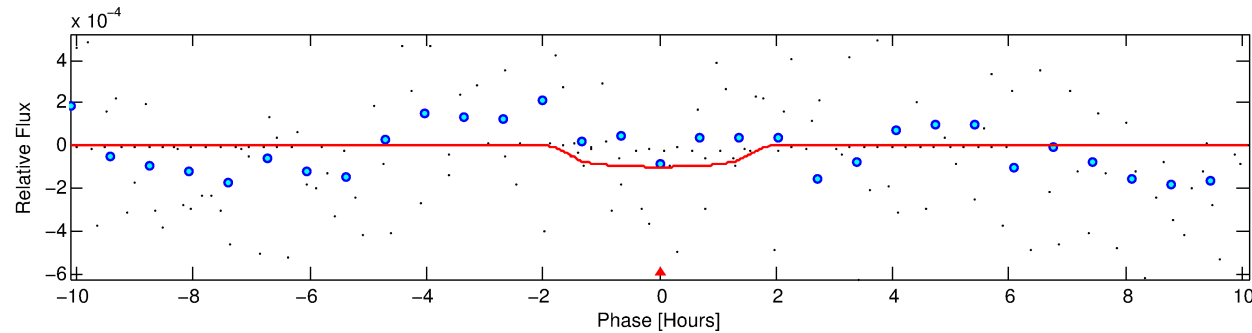
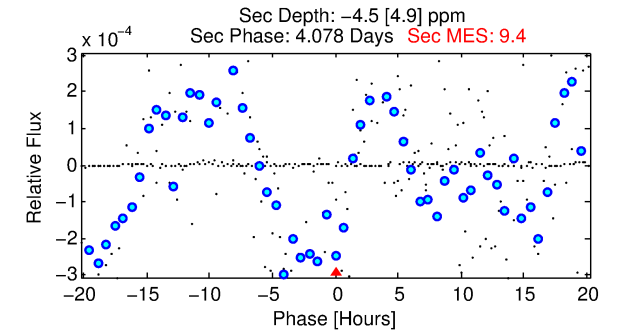
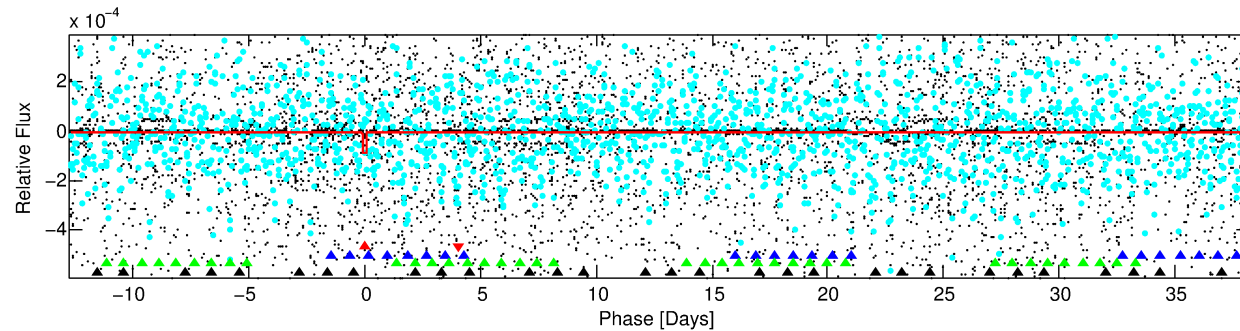
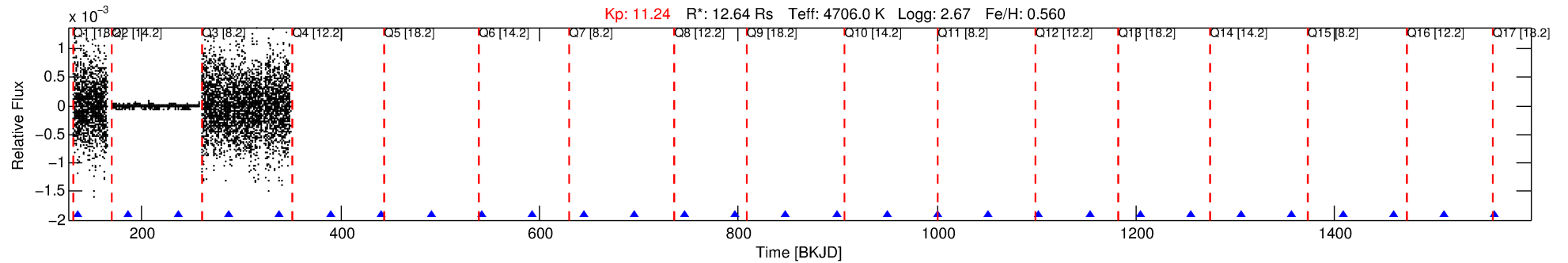
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009651313-01

No Significant Match Found

DV One-Page Summary

KIC: 9651313 Candidate: 1 of 4 Period: 50.911 d



DV Fit Results:

Period = 50.91133 [0.00163] d
Epoch = 135.1570 [0.0027] BKJD
Rp/R* = 0.0109 [0.0025]
a/R* = 57.77 [48.93]
b = 0.88 [0.23]
Seff = 499.22 [138.50]
Teff = 1205 [84] K
Rp = 14.99 [5.95] Re
a = 0.3751 [0.0813] AU
Ag = N/A
Teffp = N/A

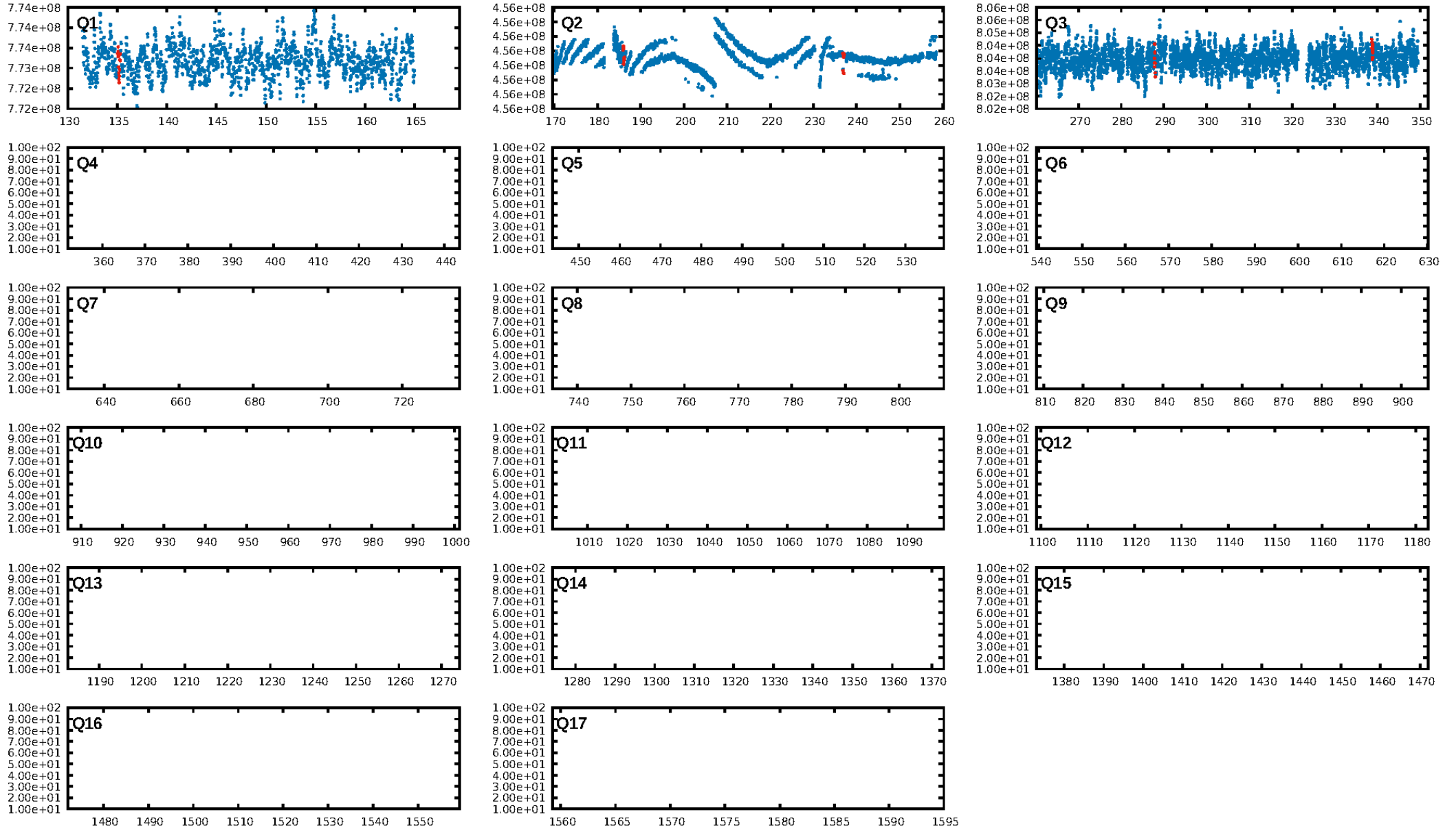
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [32.22 σ]
LongPeriod-sig: 100.0% [35.01 σ]
ModelChiSquare2-sig: 35.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.07e-27
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.1012
Centroid-sig: 4.0%
Centroid-so: 8.744 arcsec [3.59 σ]
OotOffset-rm: 1.818 arcsec [3.31 σ]
KicOffset-rm: 1.869 arcsec [3.48 σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

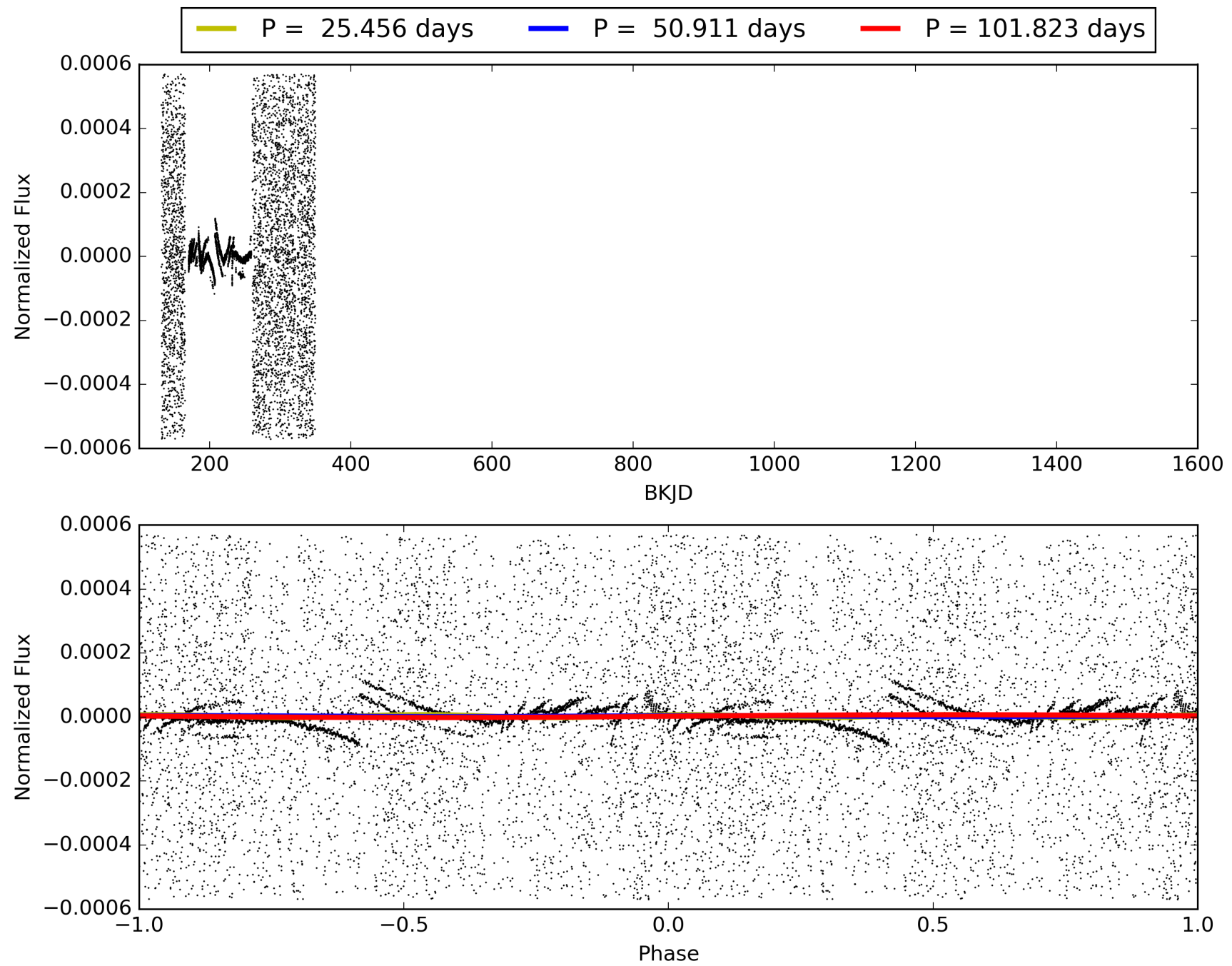
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009651313-01, PDC Light Curves

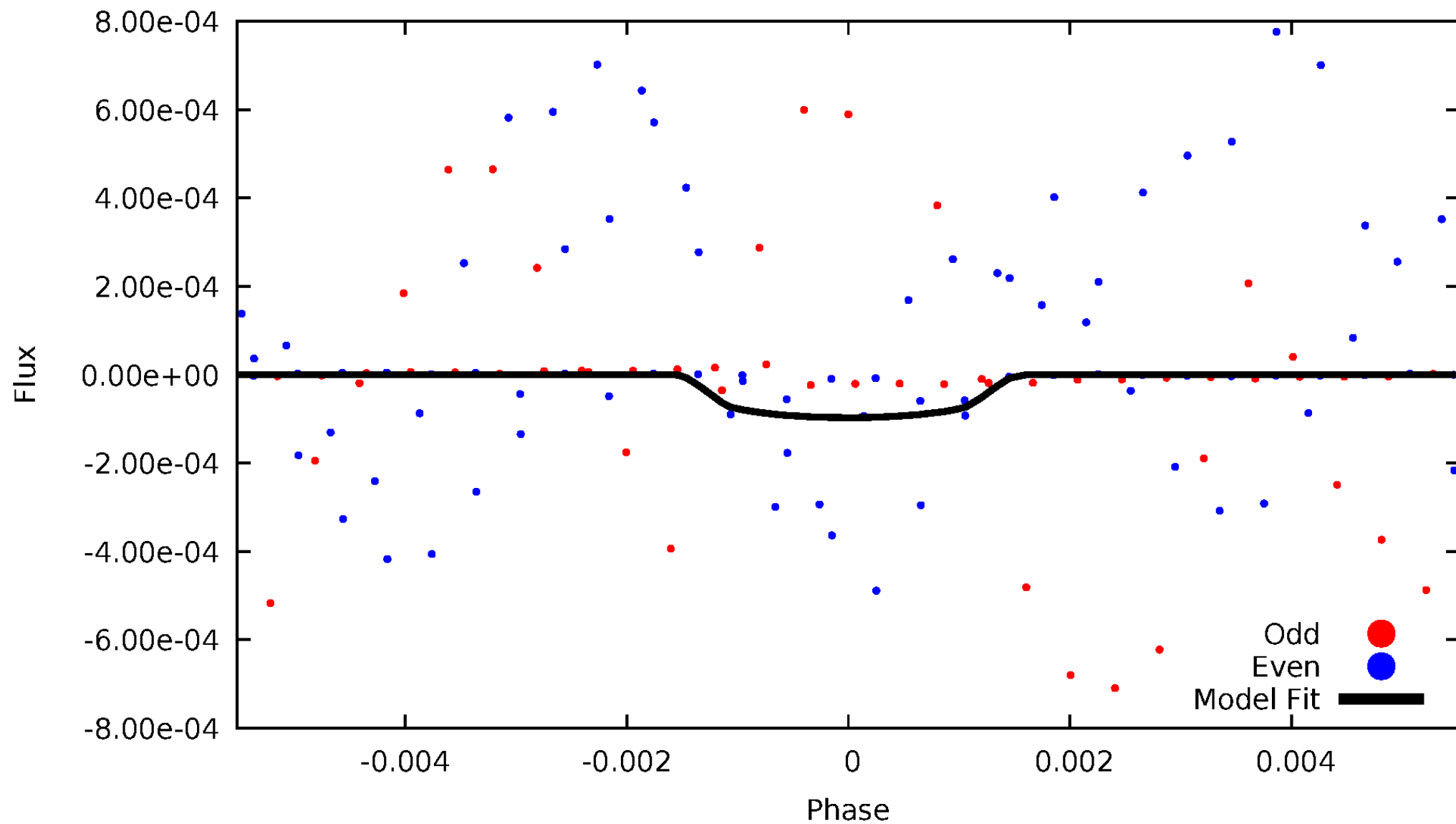


TCE 009651313-01



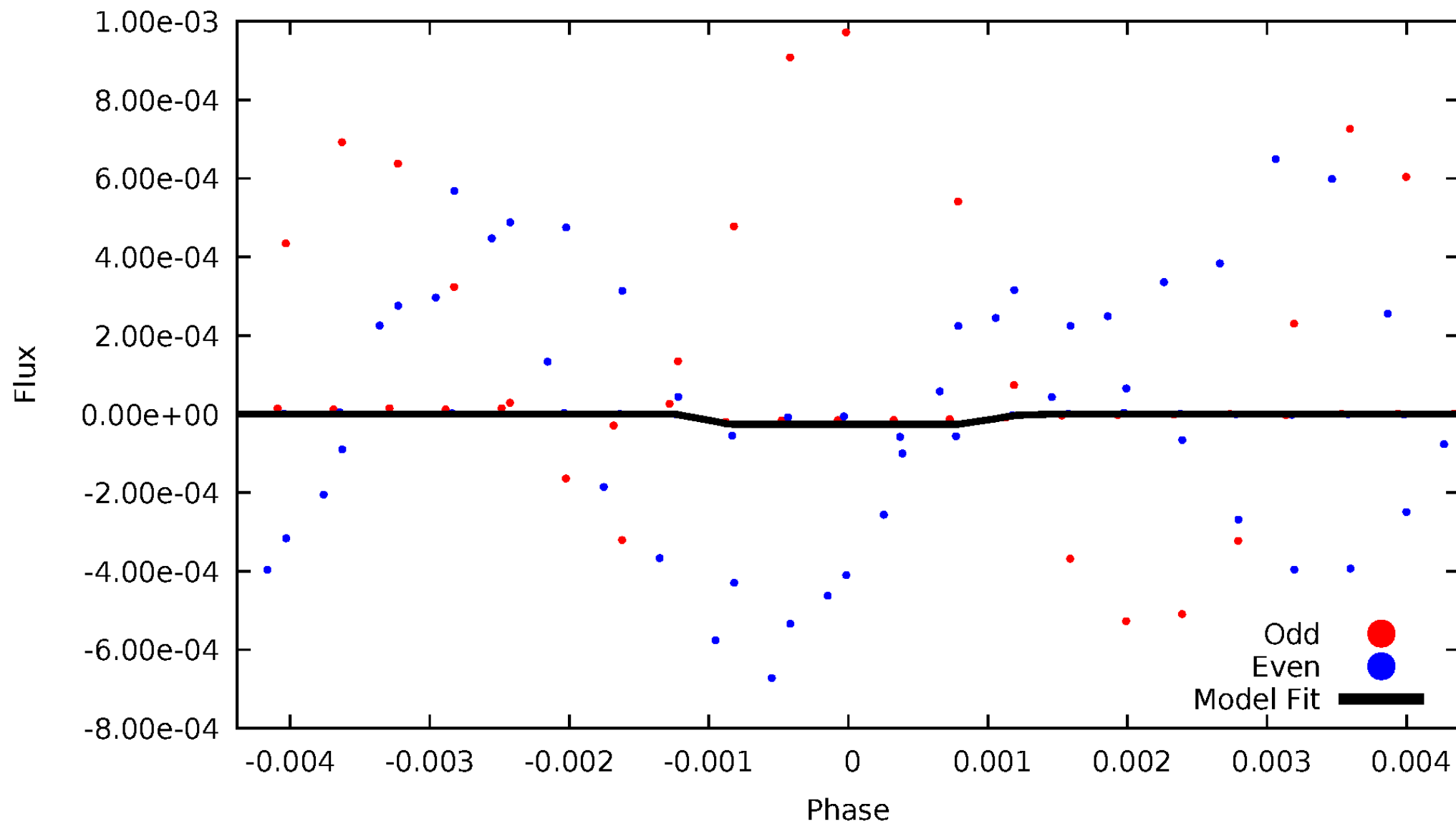
DV Odd/Even

TCE 009651313-01

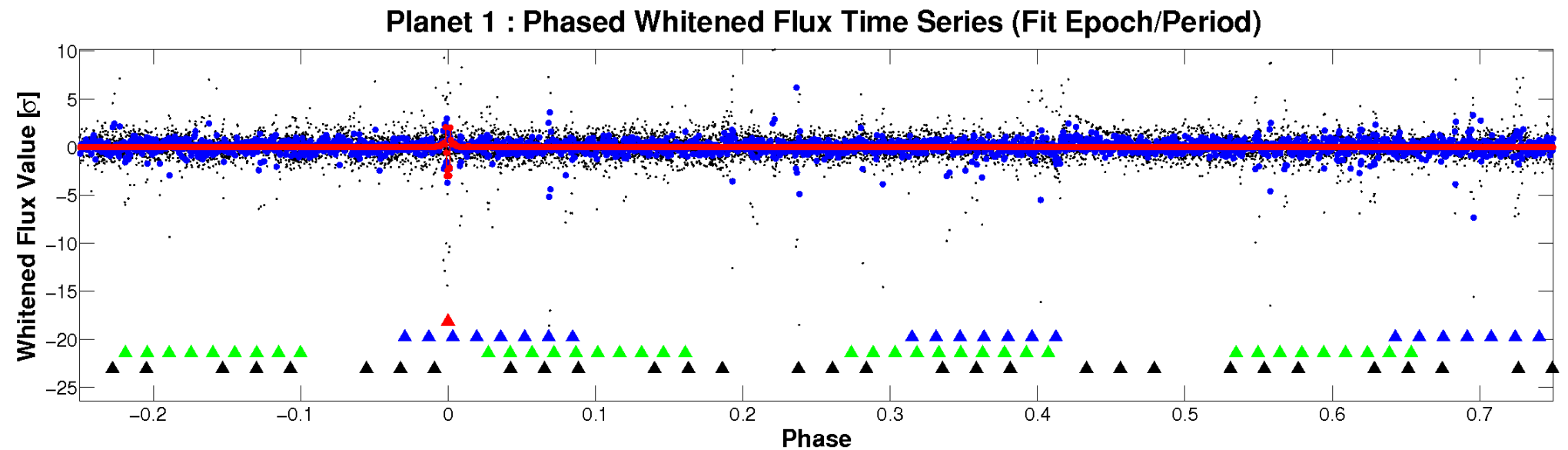
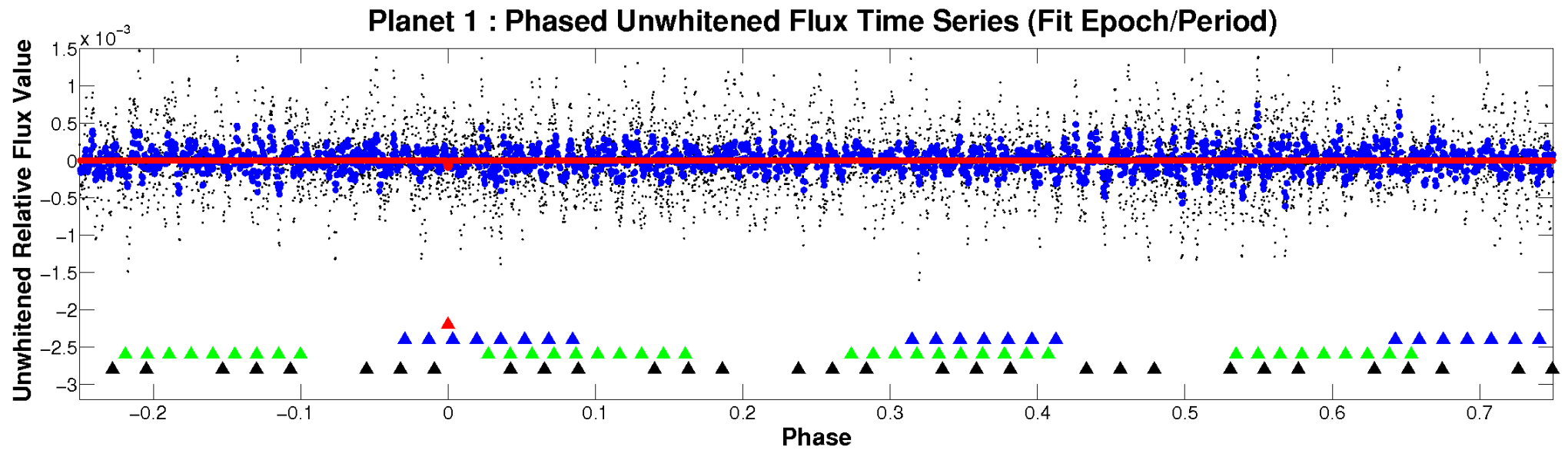


ALT Odd/Even

TCE 009651313-01

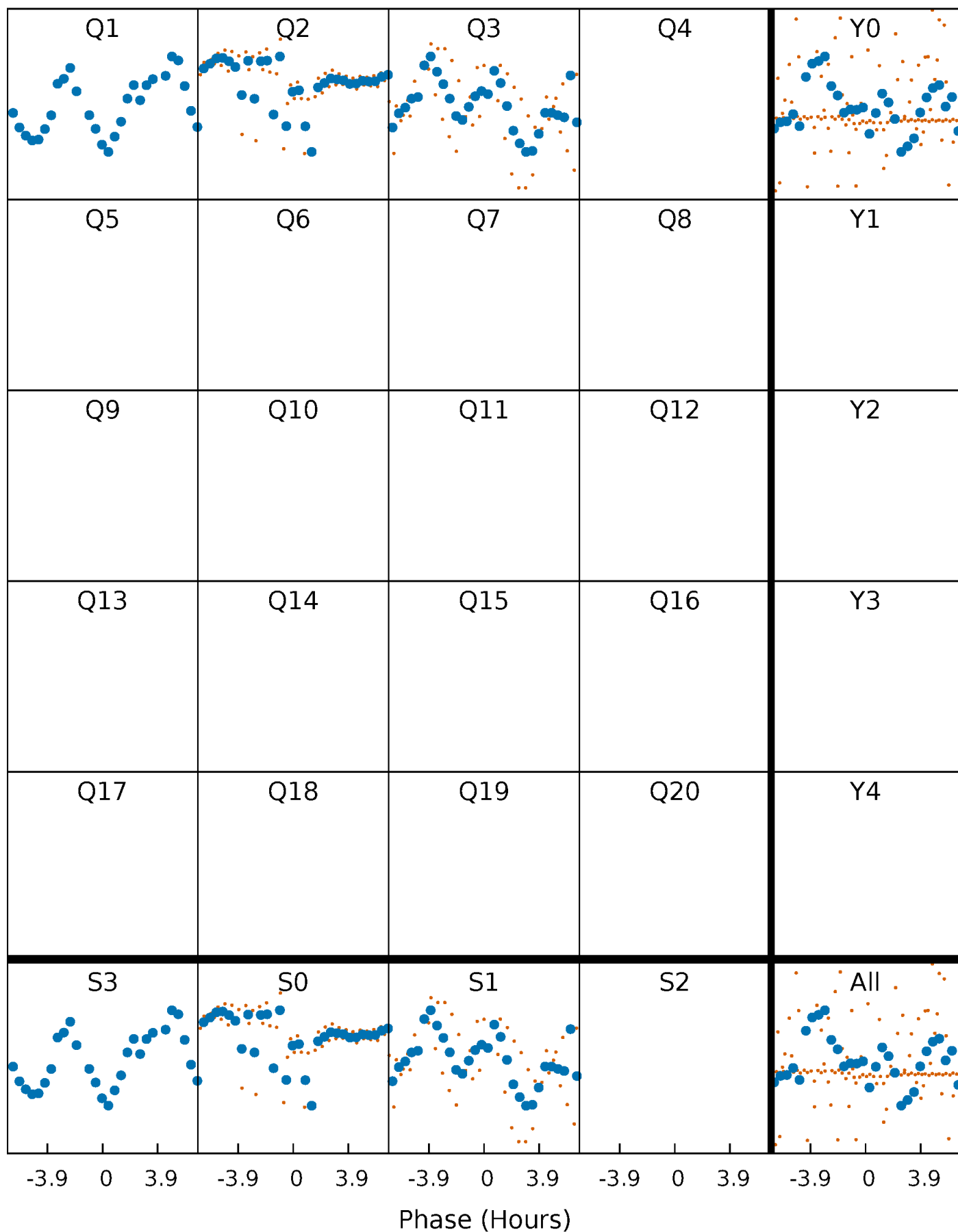


Non-Whitened Vs. Whitened Light Curve



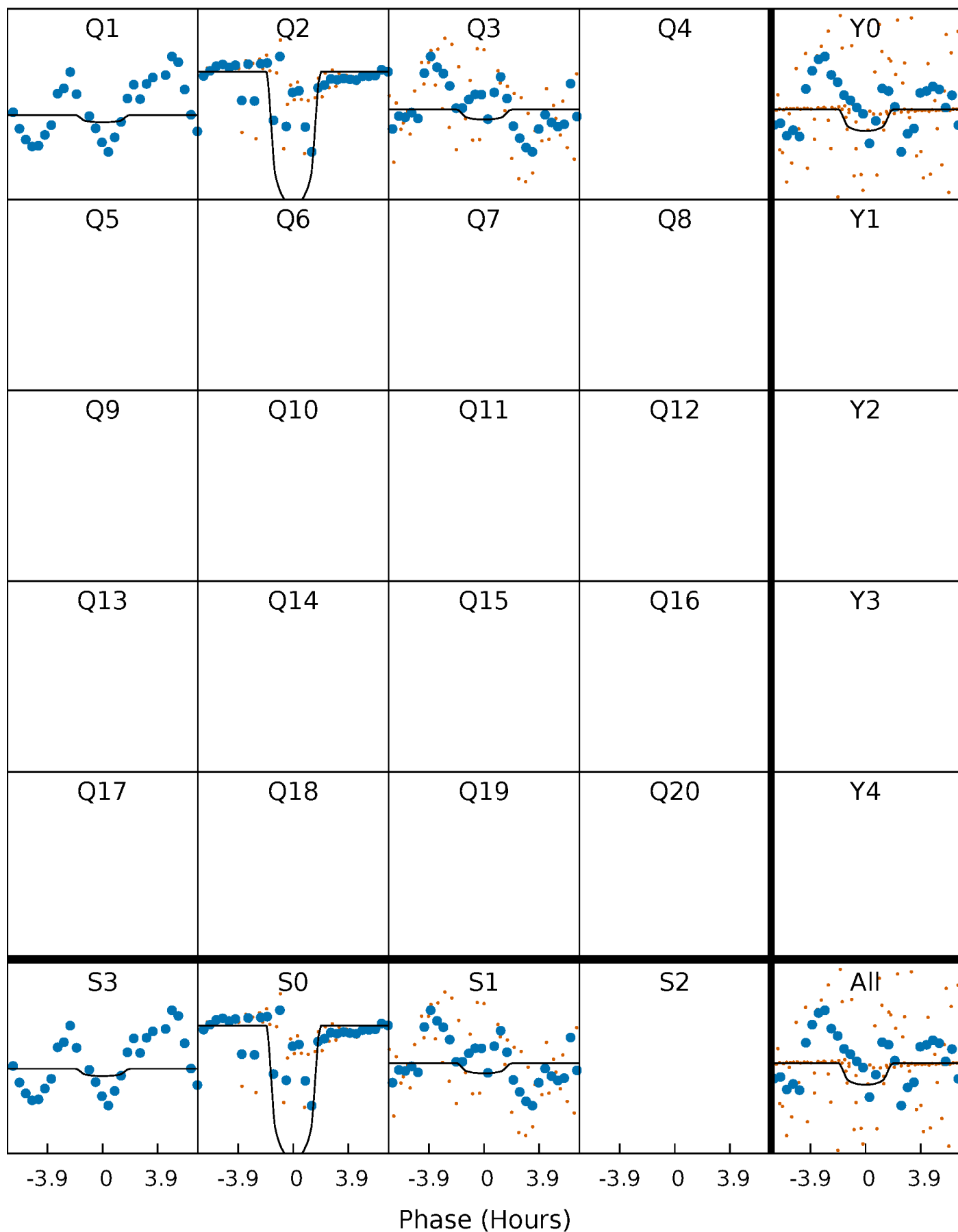
PDC Quarter-Phased Transit Curves

TCE 009651313-01 P= 50.911328 Days $T_0=135.157008$ (BKJD)



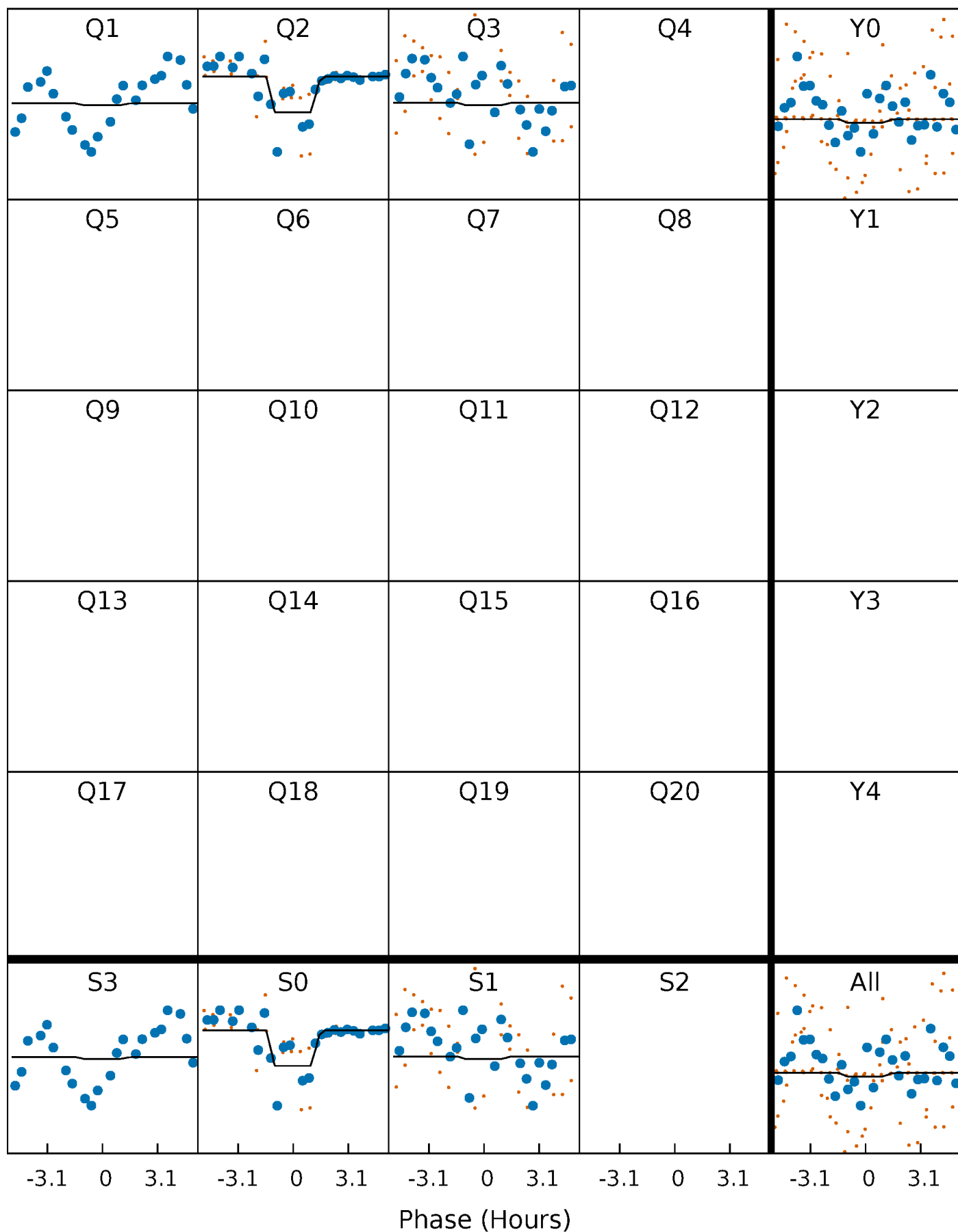
DV Quarter-Phased Transit Curves

TCE 009651313-01 P= 50.911328 Days $T_0=135.157008$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

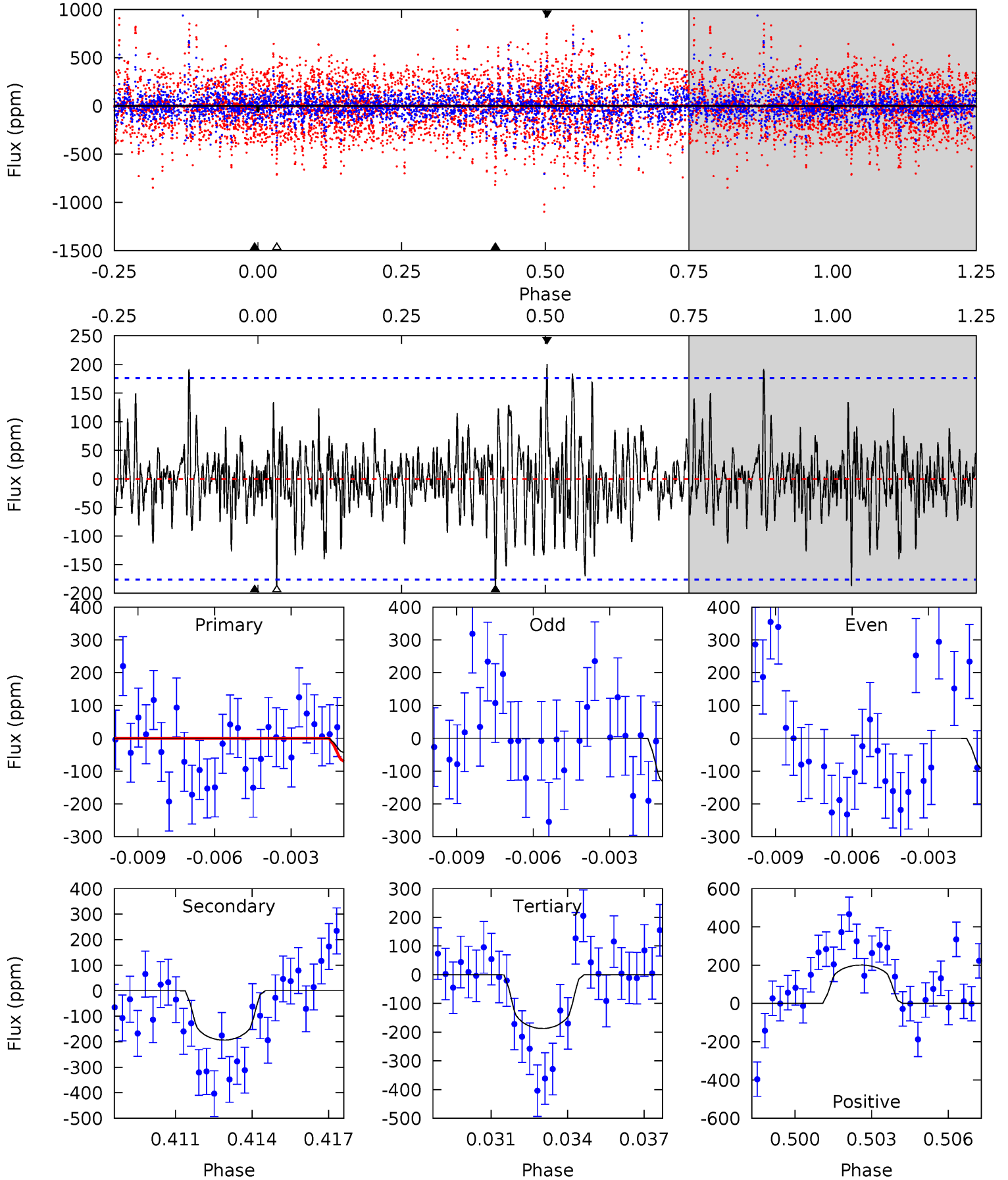
TCE 009651313-01 P= 50.898007 Days $T_0=135.197812$ (BKJD)



DV Model-Shift Uniqueness Test

009651313-01, P = 50.911328 Days, E = 84.245680 Days

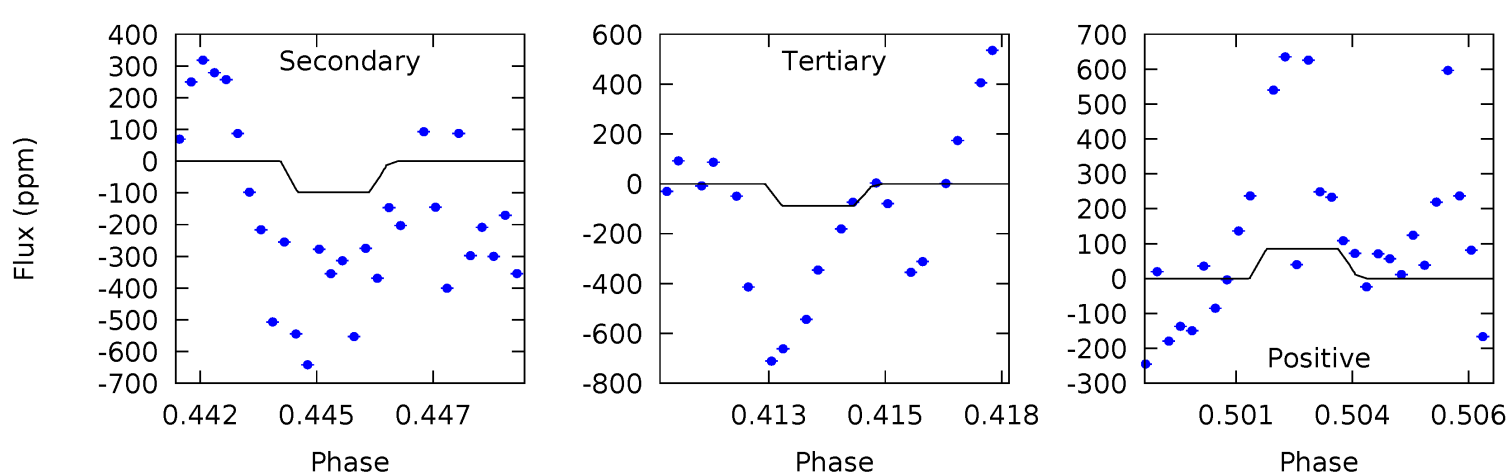
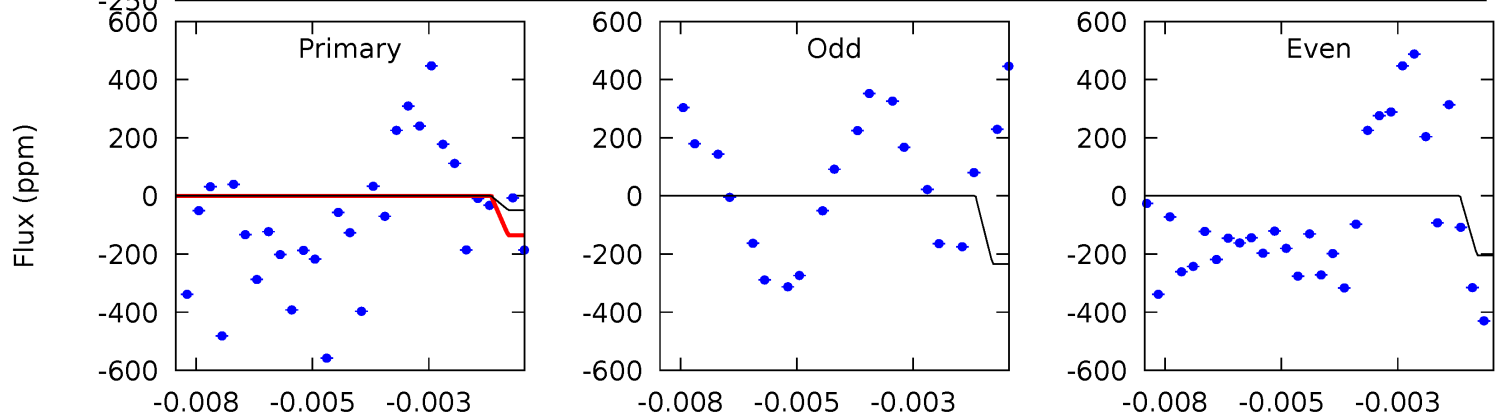
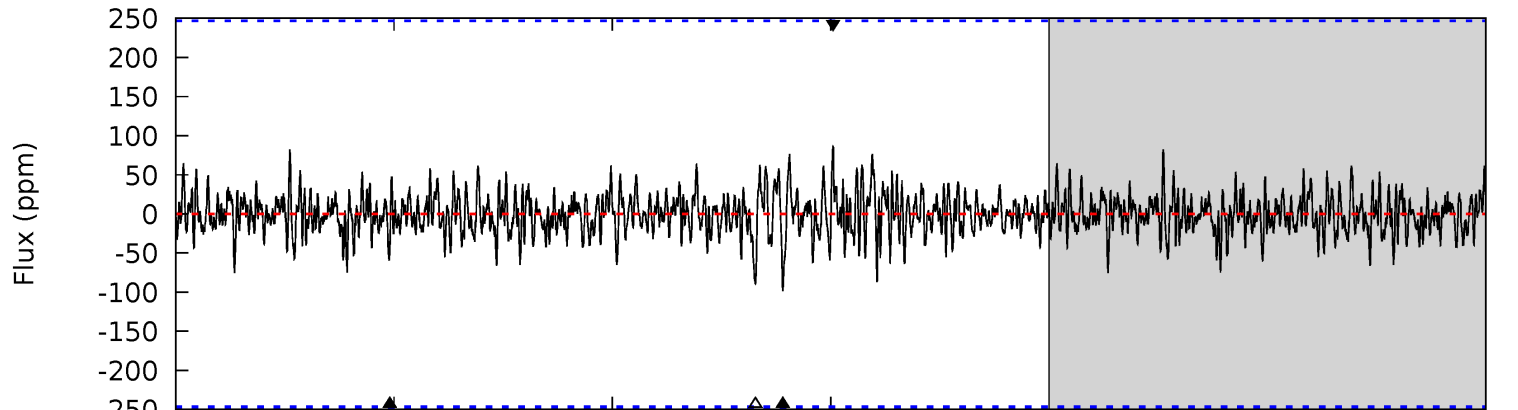
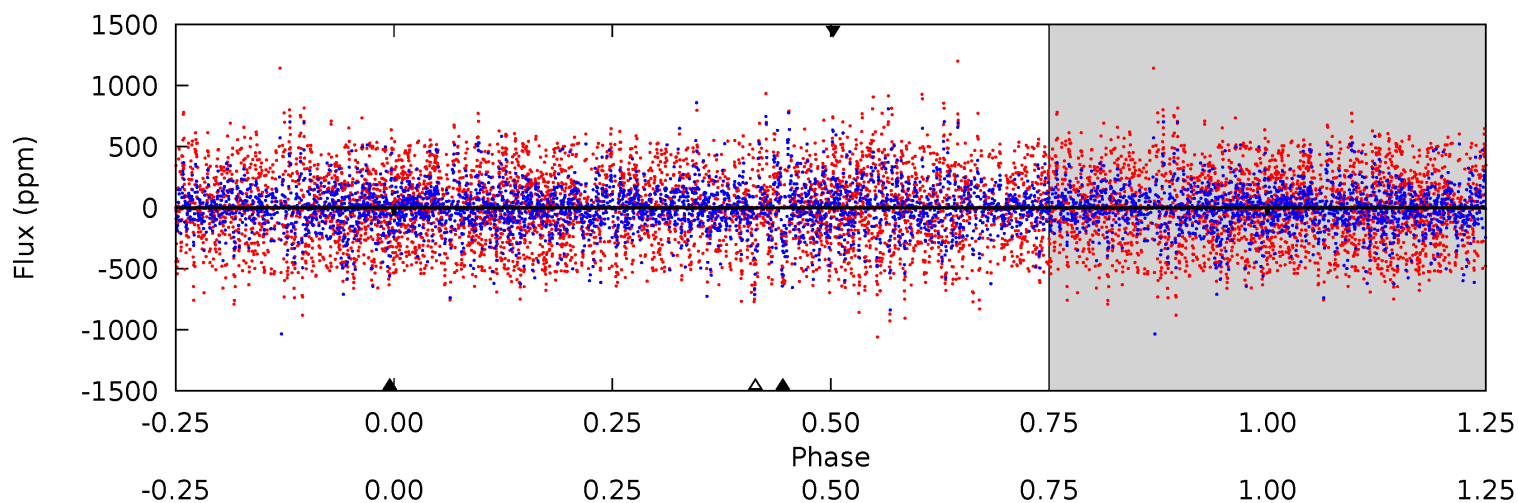
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.59	5.77	5.58	5.98	5.25	2.96	1.51	-3.99	-4.39	0.19	-0.21	0.48	-0.46	0.51	1.04



Alt Model-Shift Uniqueness Test

009651313-01, P = 50.898007 Days, E = 84.299805 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.04	2.11	1.91	1.83	5.27	3.00	0.51	-0.87	-0.79	0.20	0.28	0.26	-0.47	0.46	1.38



Stellar Parameters For KIC 009651313

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4706^{+112}_{-197}	$2.668^{+0.030}_{-0.033}$	$0.560^{+0.050}_{-0.400}$	$12.642^{+0.721}_{-4.083}$	$2.712^{+0.163}_{-1.464}$	$0.002^{+0.001}_{-0.000}$
	+2%/-4%	+1%/-1%	+9%/-71%	+6%/-32%	+6%/-54%	+49%/-10%
Source	PHO1	AST9	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 009651313-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-194 ± 34	$15.15^{+3.94}_{-3.45}$	1686^{+50}_{-72}	5157^{+676}_{-490}	66^{+43}_{-25}
Alt.	-98 ± 47	$7.39^{+3.43}_{-3.30}$	1688^{+47}_{-73}	6046^{+2395}_{-1211}	129^{+289}_{-80}

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 $A_{obs} \gg 1.0$

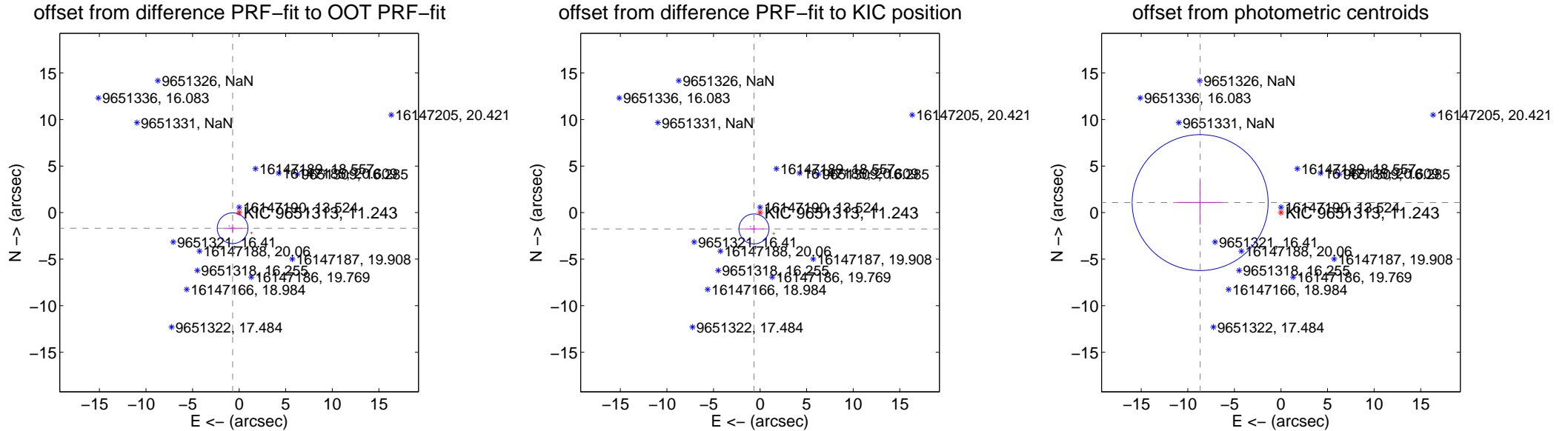
DV Centroid Data

Supplemental centroid analysis for 009651313-01. **Kepler magnitude: 11.24.** Transit SNR 16.27

There are 1 quarters with good PRF difference image offsets

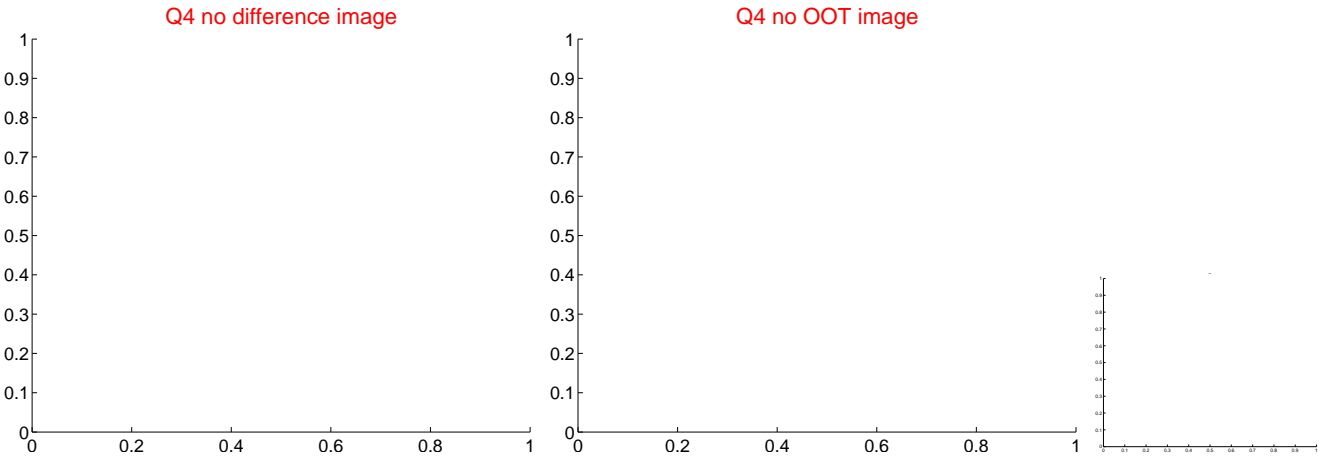
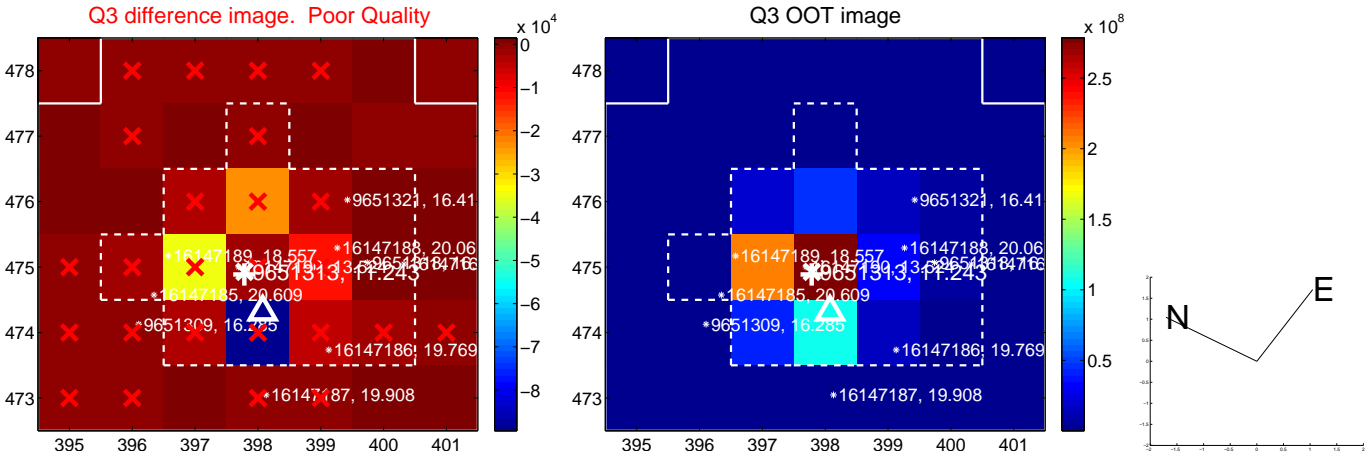
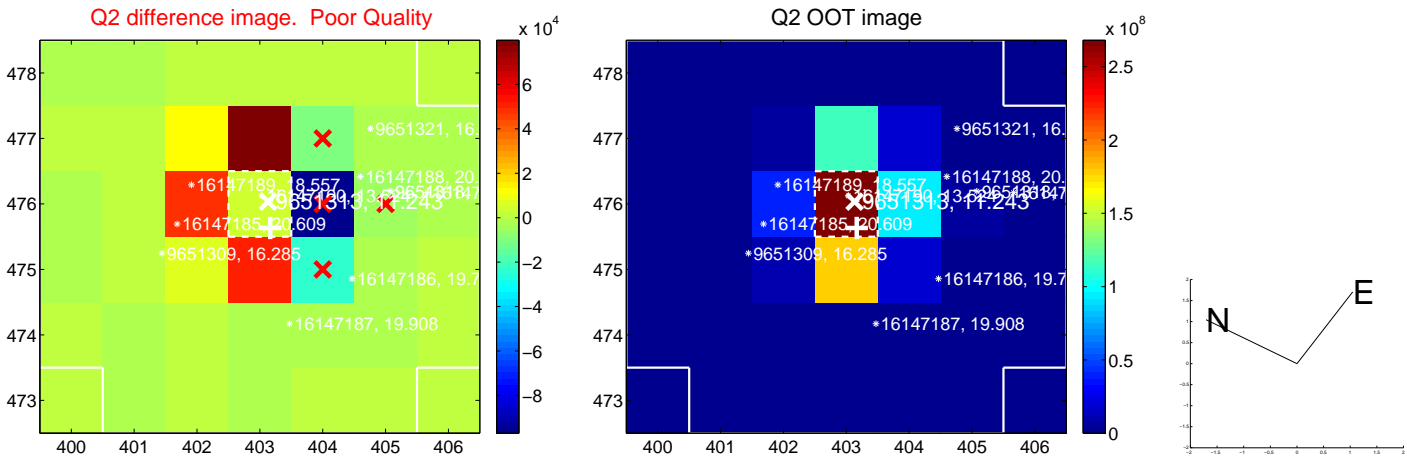
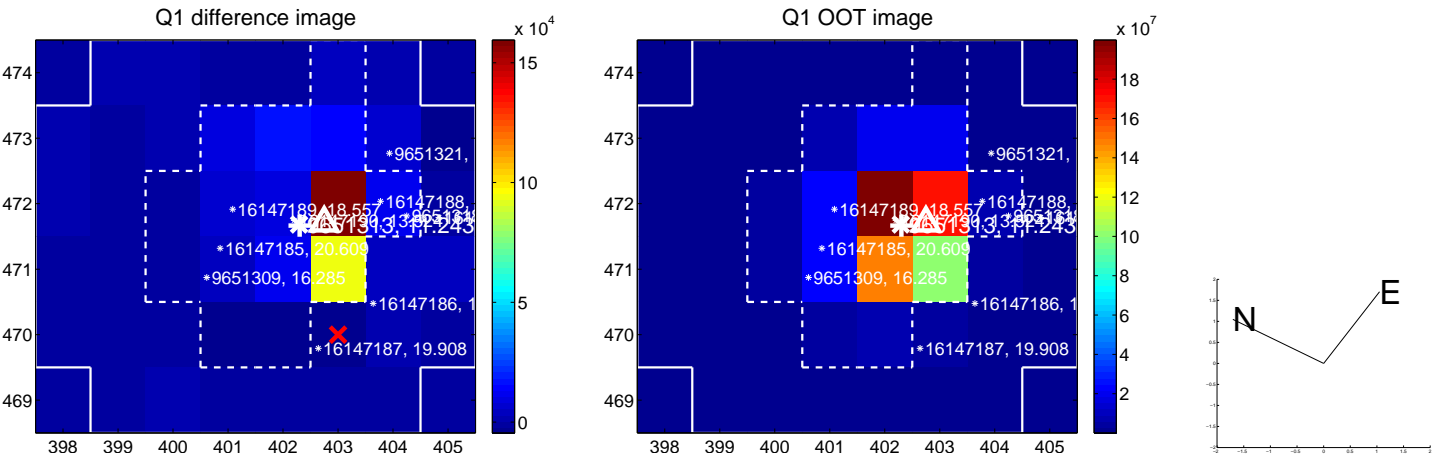
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.818 ± 0.549	3.31	0.701 ± 1.008	-1.677 ± 0.421
PRF-fit source offset from KIC position	1.869 ± 0.537	3.48	0.651 ± 1.051	-1.751 ± 0.420
photometric centroid source offset	8.74 ± 2.43	3.59	8.68 ± 2.43	1.08 ± 2.37

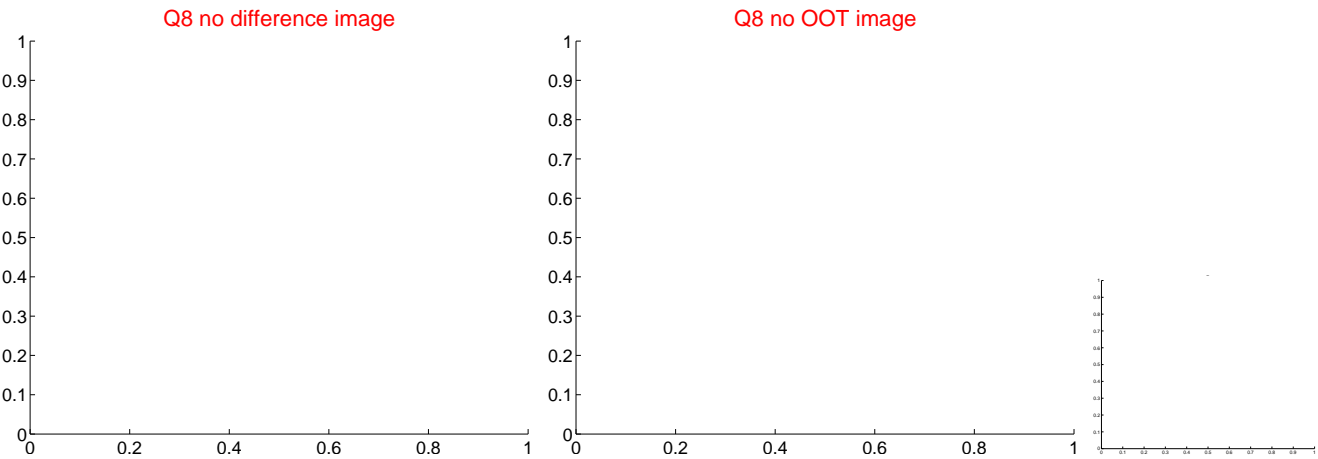
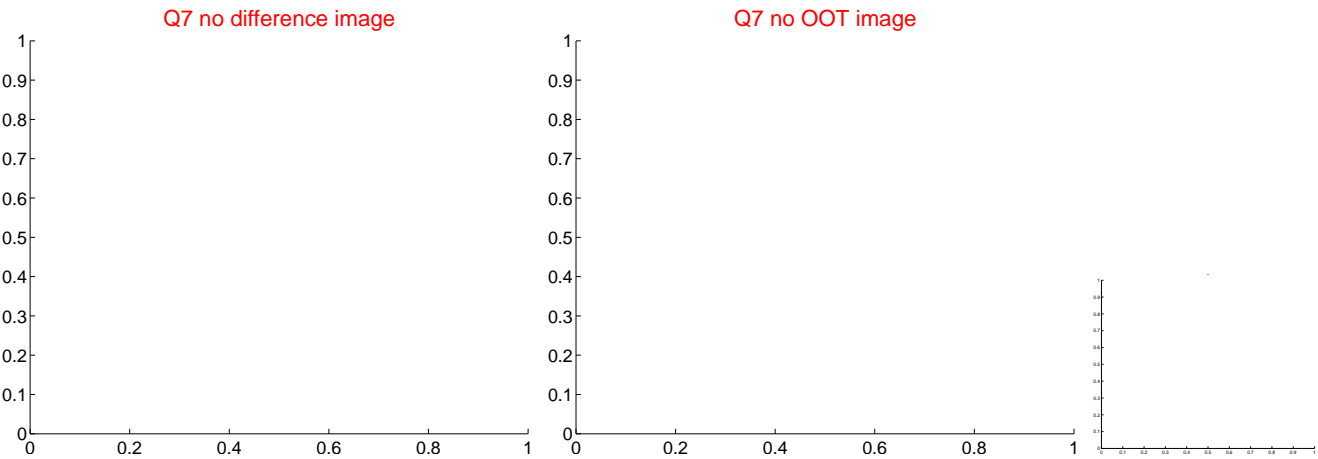
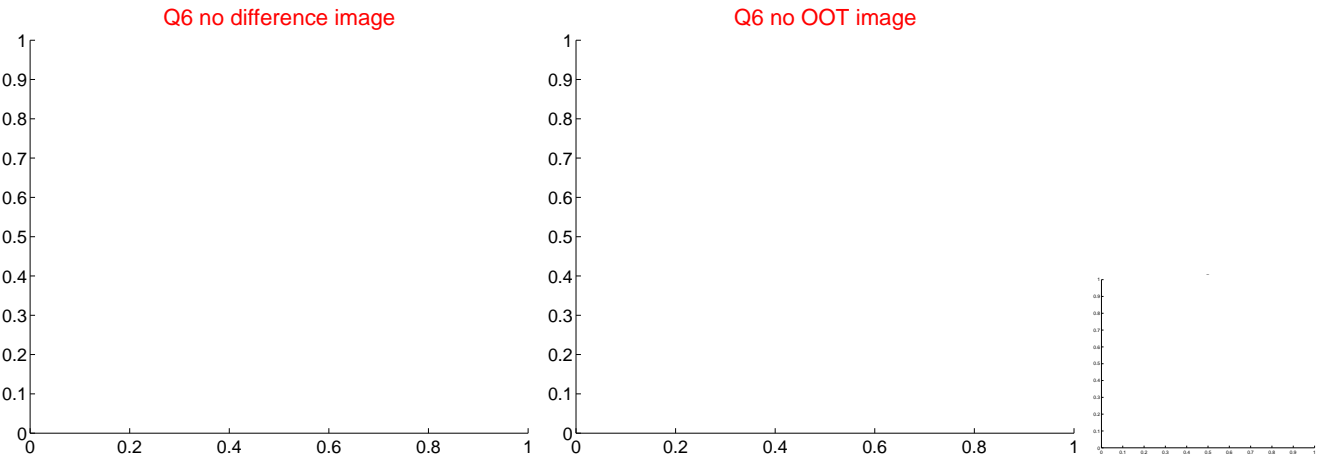
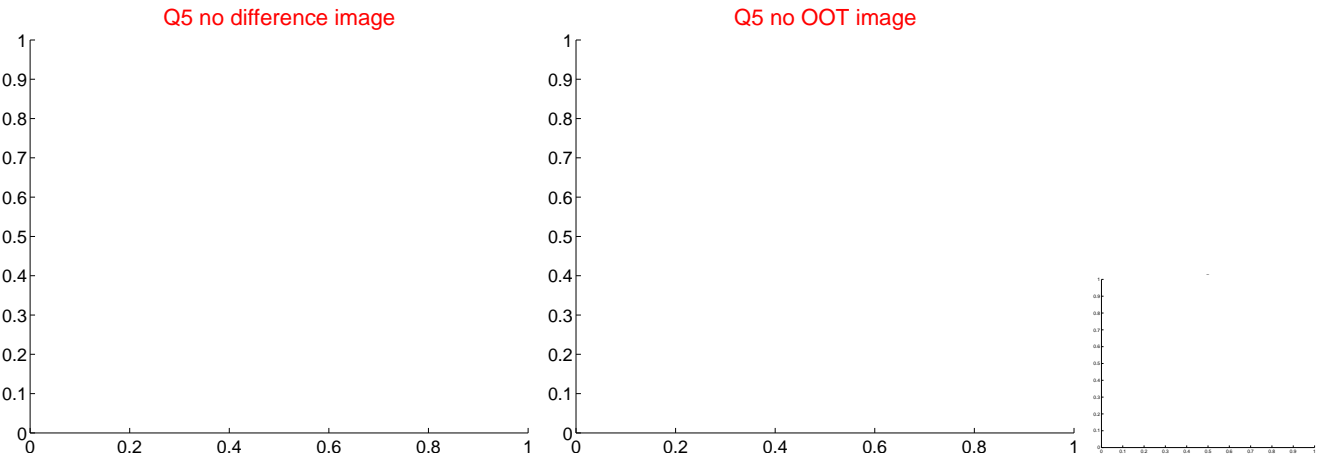


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



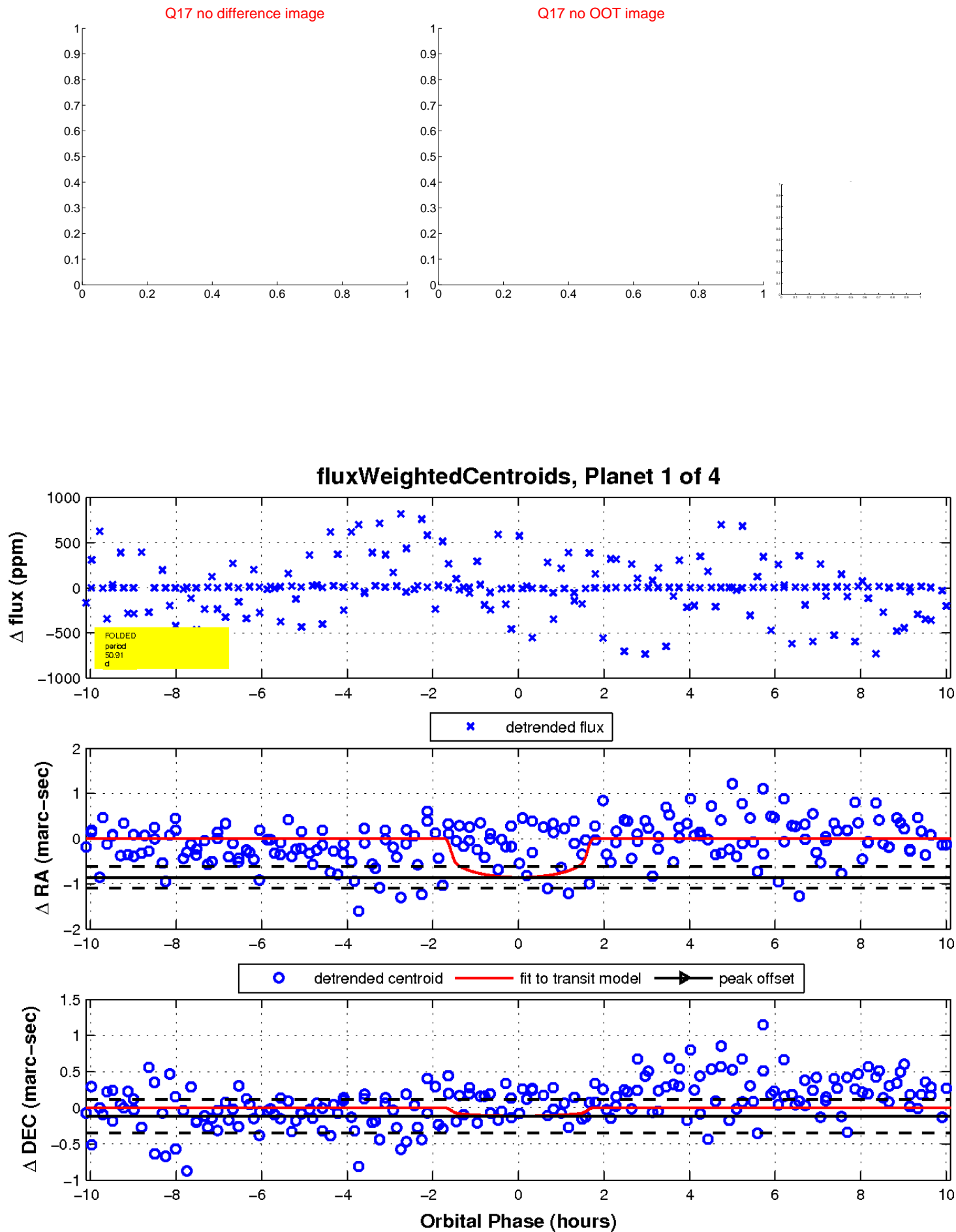
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



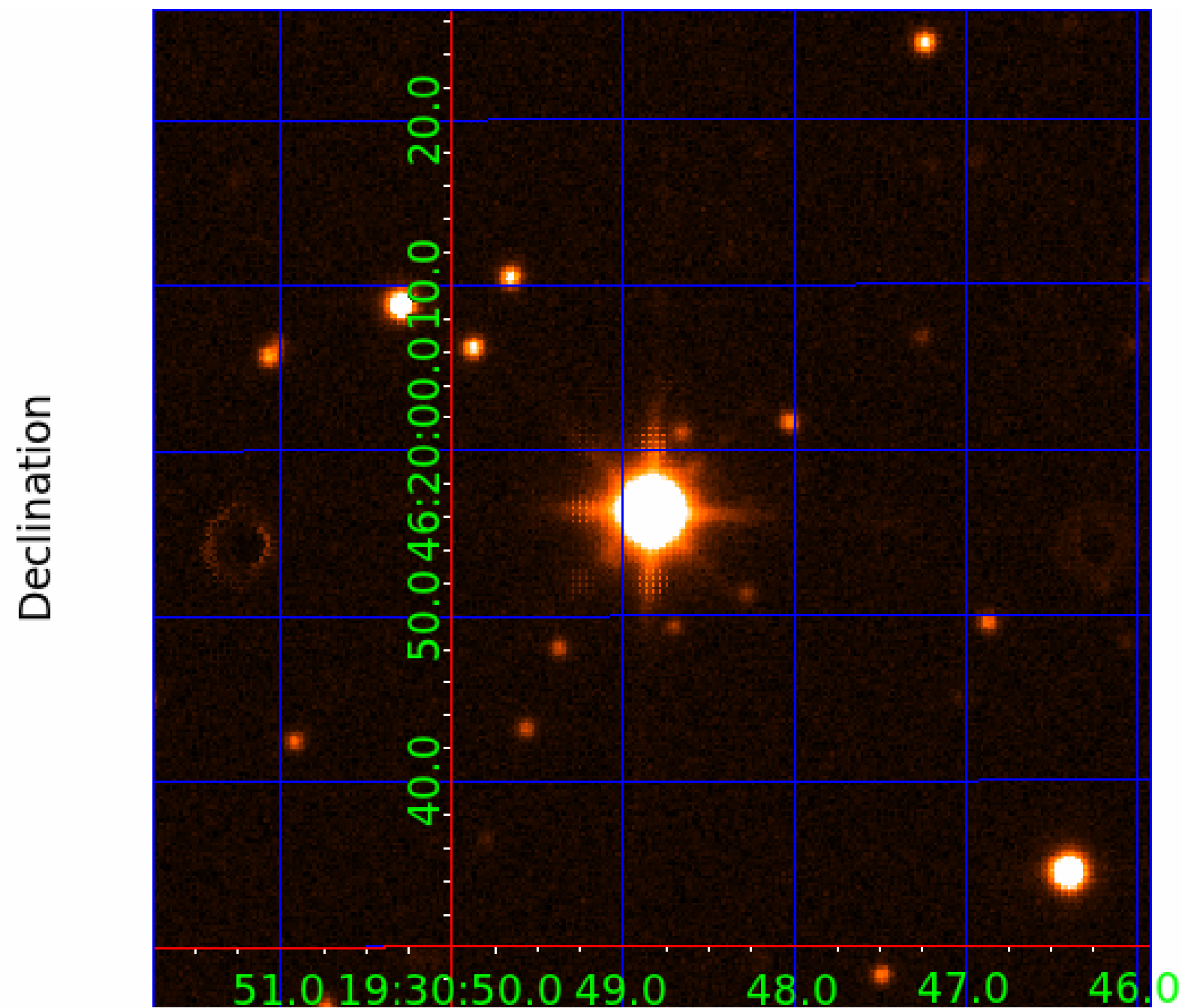
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009651313

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})
009651313-01	OBS	No	50.911328	135.157008	97.0	3.371	29.0	16.3	12.64	4706	14.99	499.22
009651313-02	OBS	No	67.605717	139.462920	84.4	10.935	16.3	12.7	12.64	4706	13.13	342.03
009651313-03	OBS	No	38.372532	149.088298	55.4	1.617	11.6	16.8	12.64	4706	12.03	727.81
009651313-04	OBS	No	45.937382	172.133985	58.8	1.536	11.3	16.0	12.64	4706	10.66	572.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651313-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
009651313-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED
009651313-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009651313-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

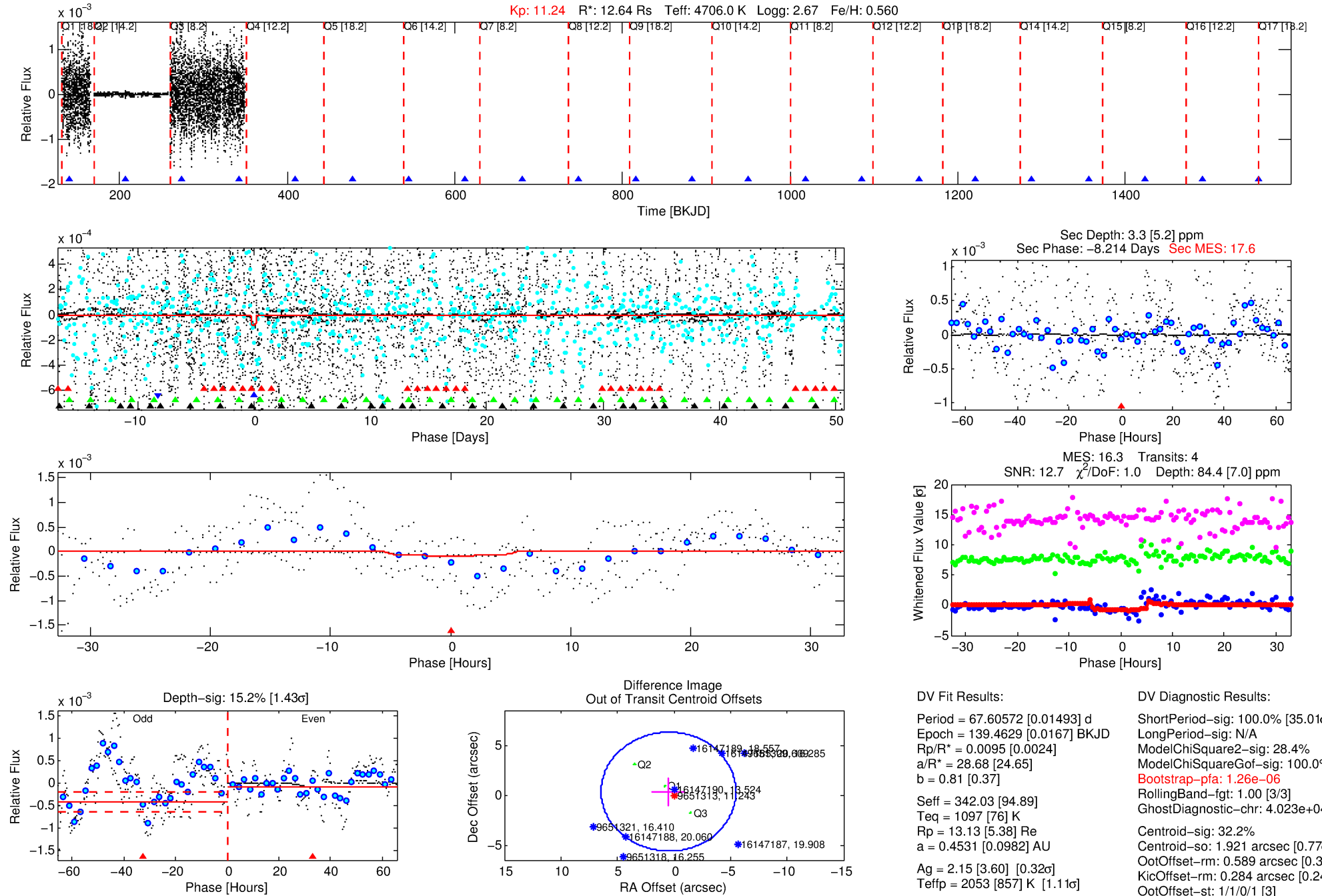
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009651313-02

No Significant Match Found

DV One-Page Summary

KIC: 9651313 Candidate: 2 of 4 Period: 67.606 d



DV Fit Results:

Period = 67.60572 [0.01493] d
Epoch = 139.4629 [0.0167] BKJD
Rp/R* = 0.0095 [0.0024]
a/R* = 28.68 [24.65]
b = 0.81 [0.37]
Seff = 342.03 [94.89]
Teq = 1097 [76] K
Rp = 13.13 [5.38] Re
a = 0.4531 [0.0982] AU
Ag = 2.15 [3.60] [0.32 σ]
Teffp = 2053 [857] K [1.11 σ]

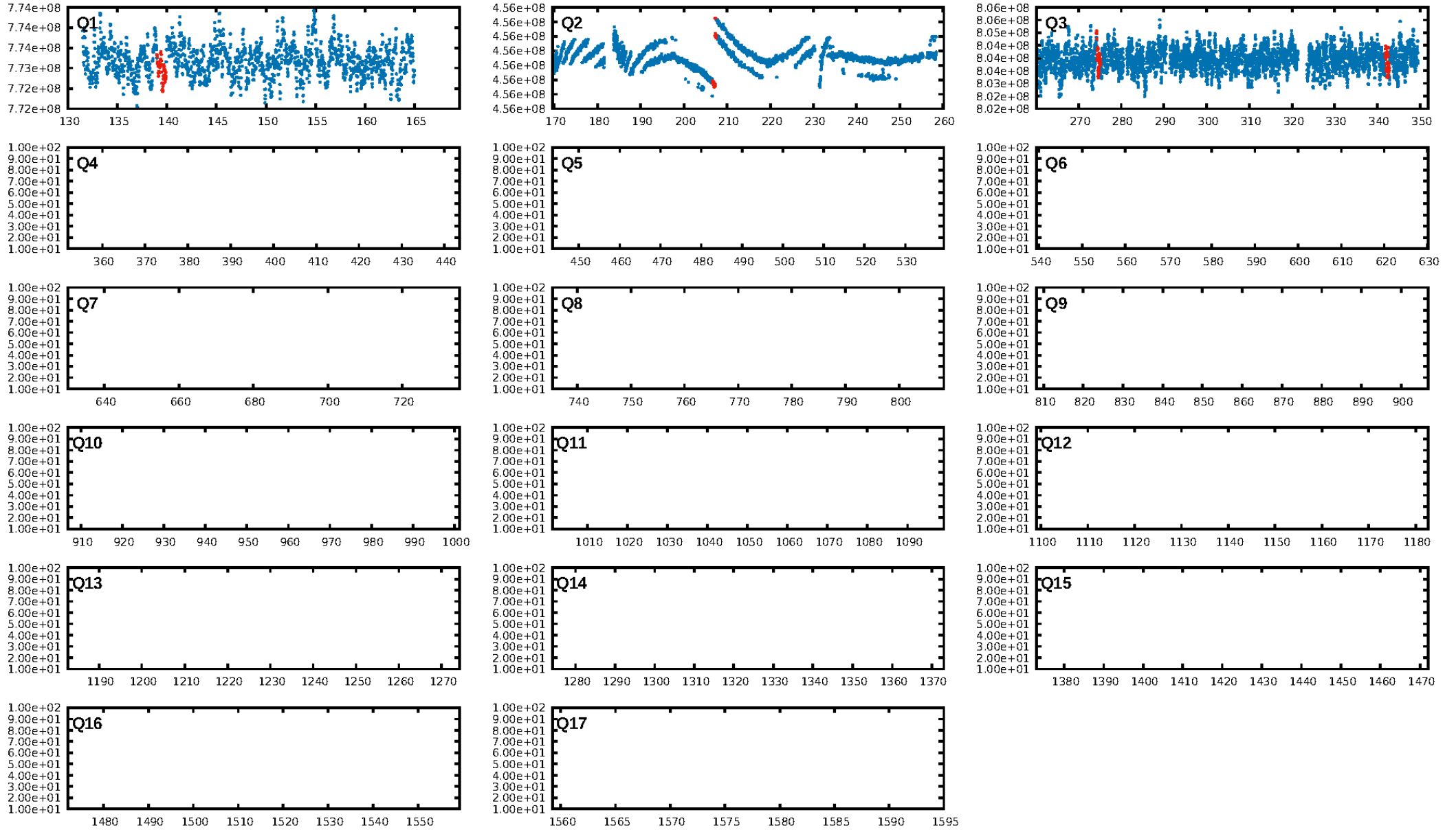
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.01 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 28.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.26e-06
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.023e+04
Centroid-sig: 32.2%
Centroid-so: 1.921 arcsec [0.77 σ]
OotOffset-rm: 0.589 arcsec [0.30 σ]
KicOffset-rm: 0.284 arcsec [0.24 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
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DiffImageOverlap-fno: 1.00 [3/3]

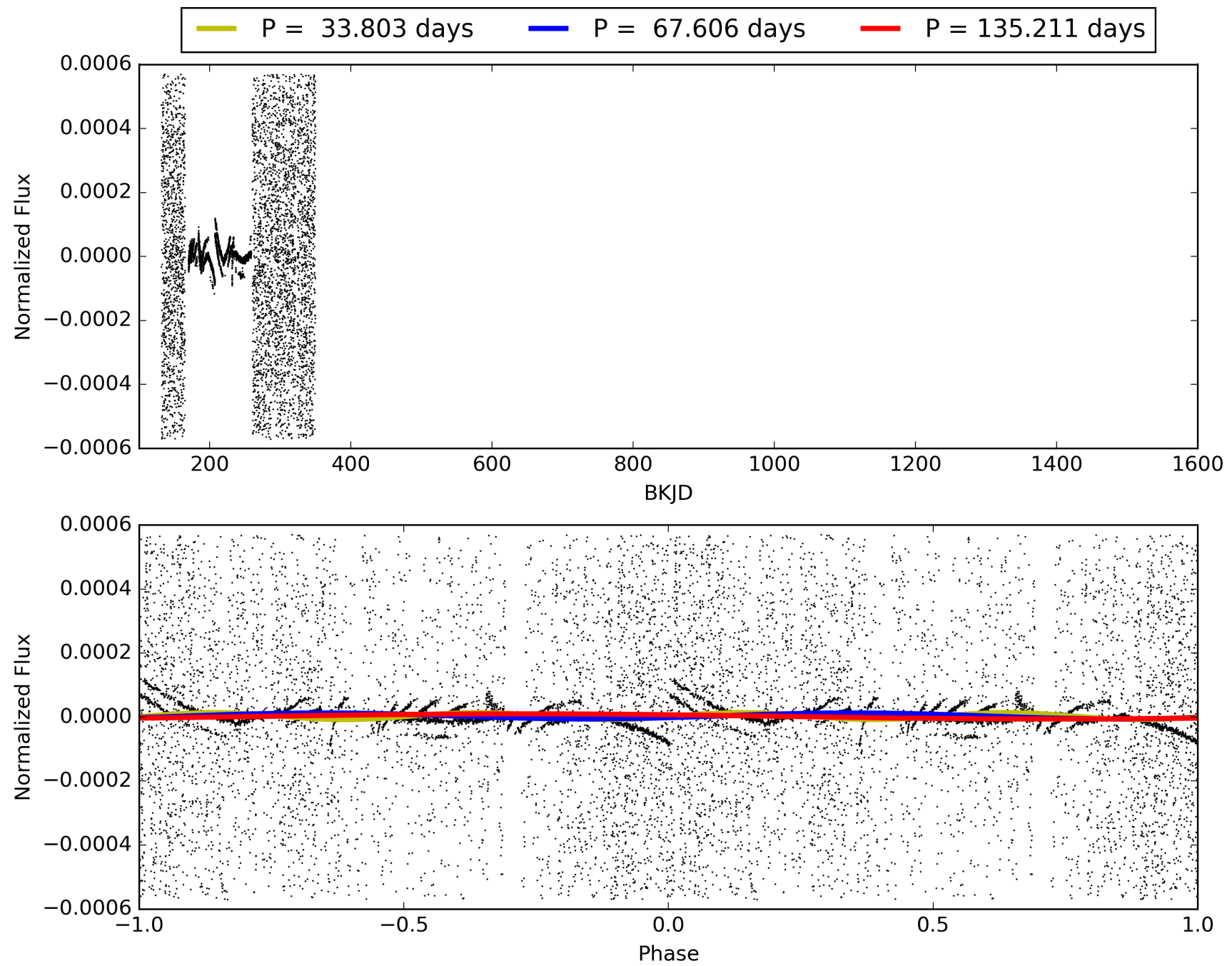
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:22:16 Z

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

TCE 009651313-02, PDC Light Curves

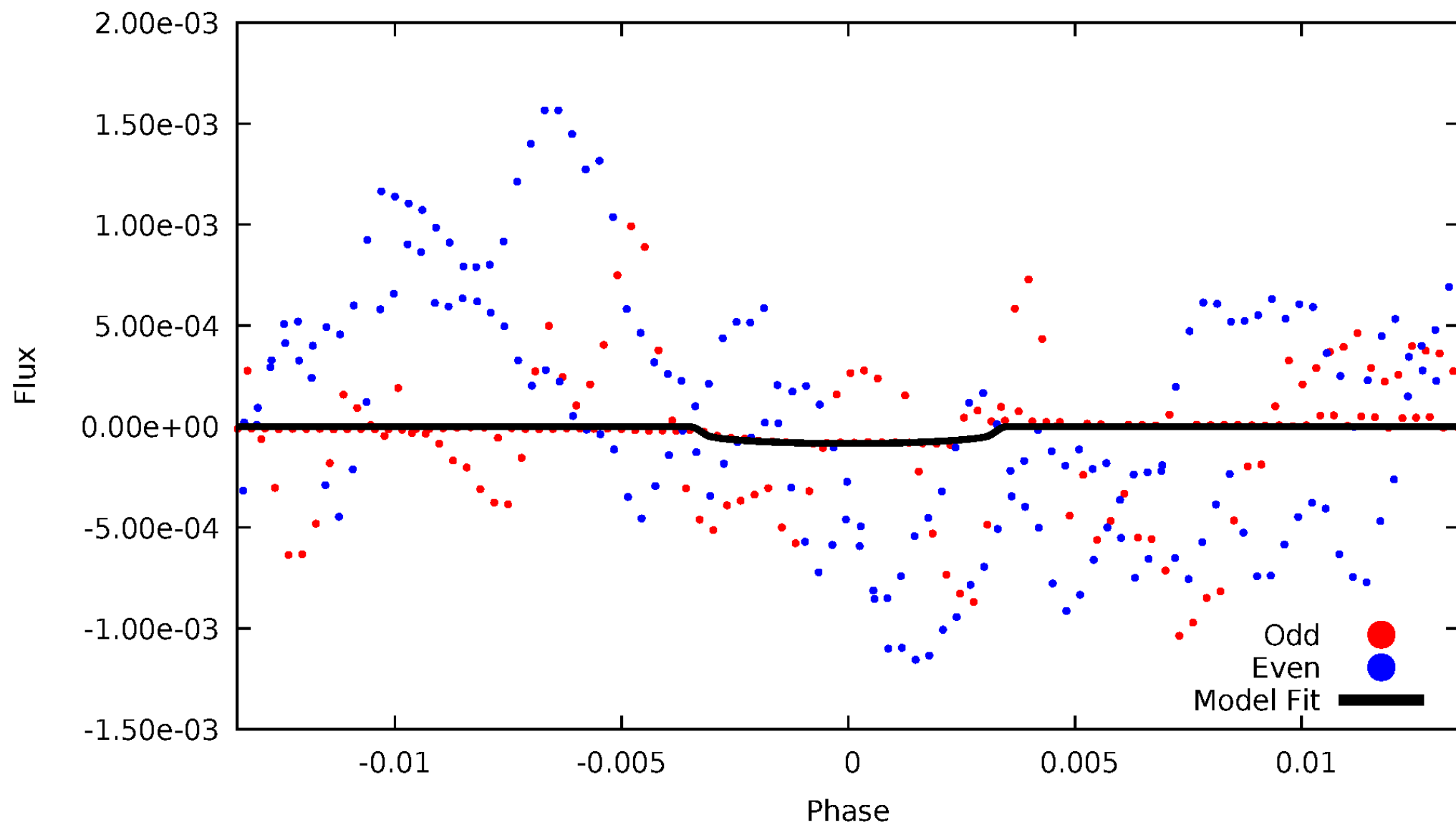


TCE 009651313-02



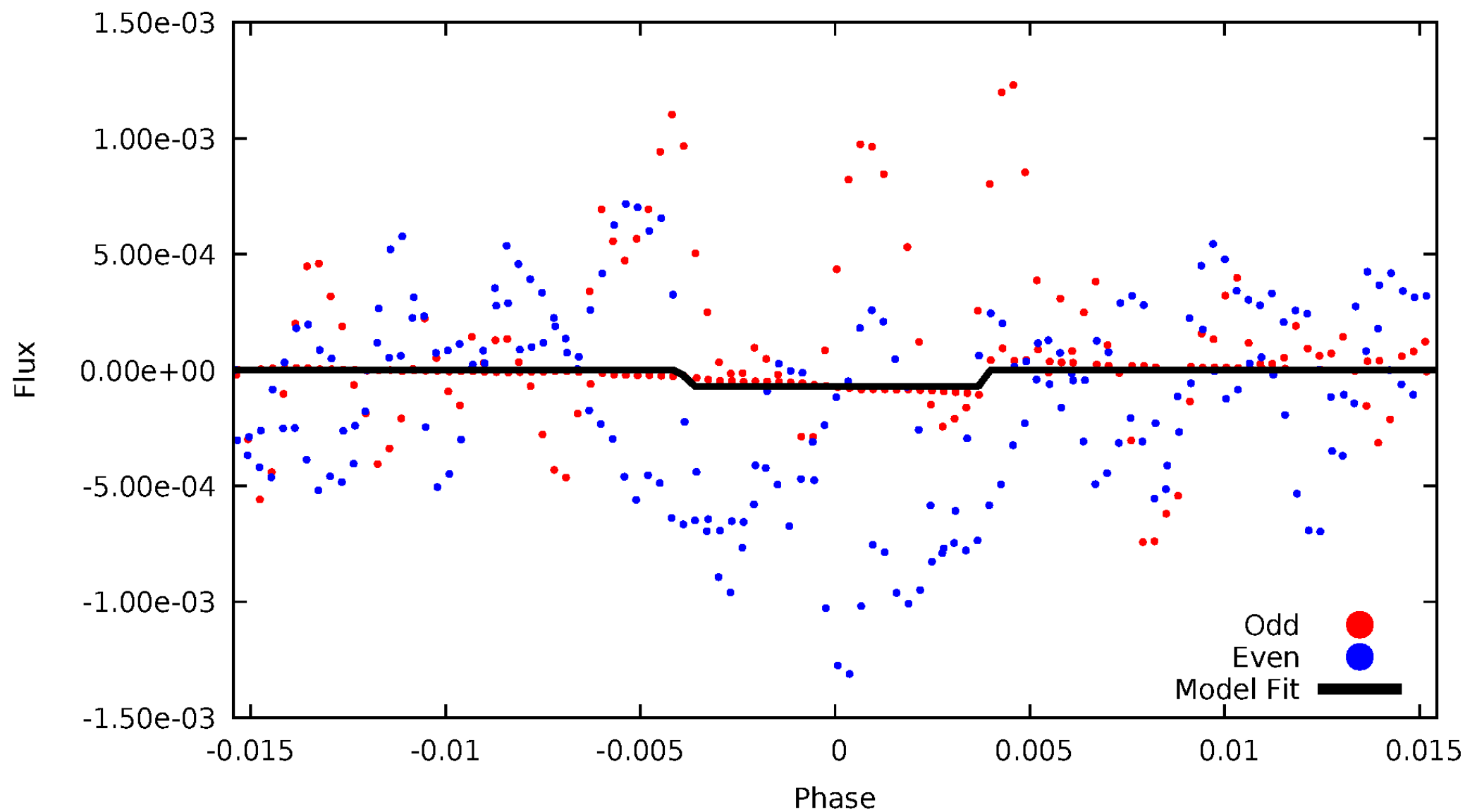
DV Odd/Even

TCE 009651313-02



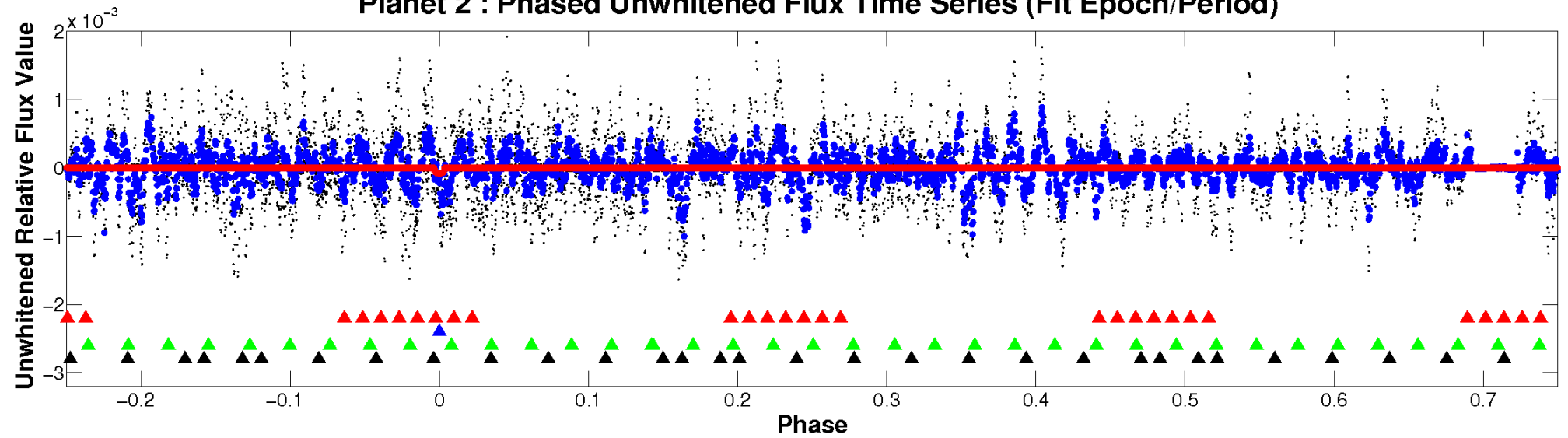
ALT Odd/Even

TCE 009651313-02

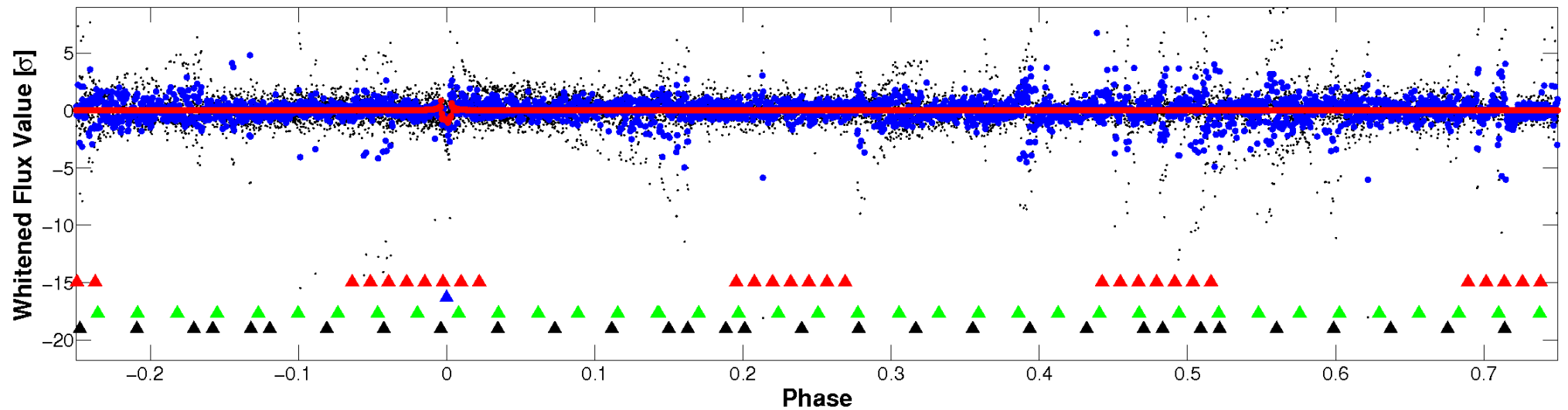


Non-Whitened Vs. Whitened Light Curve

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

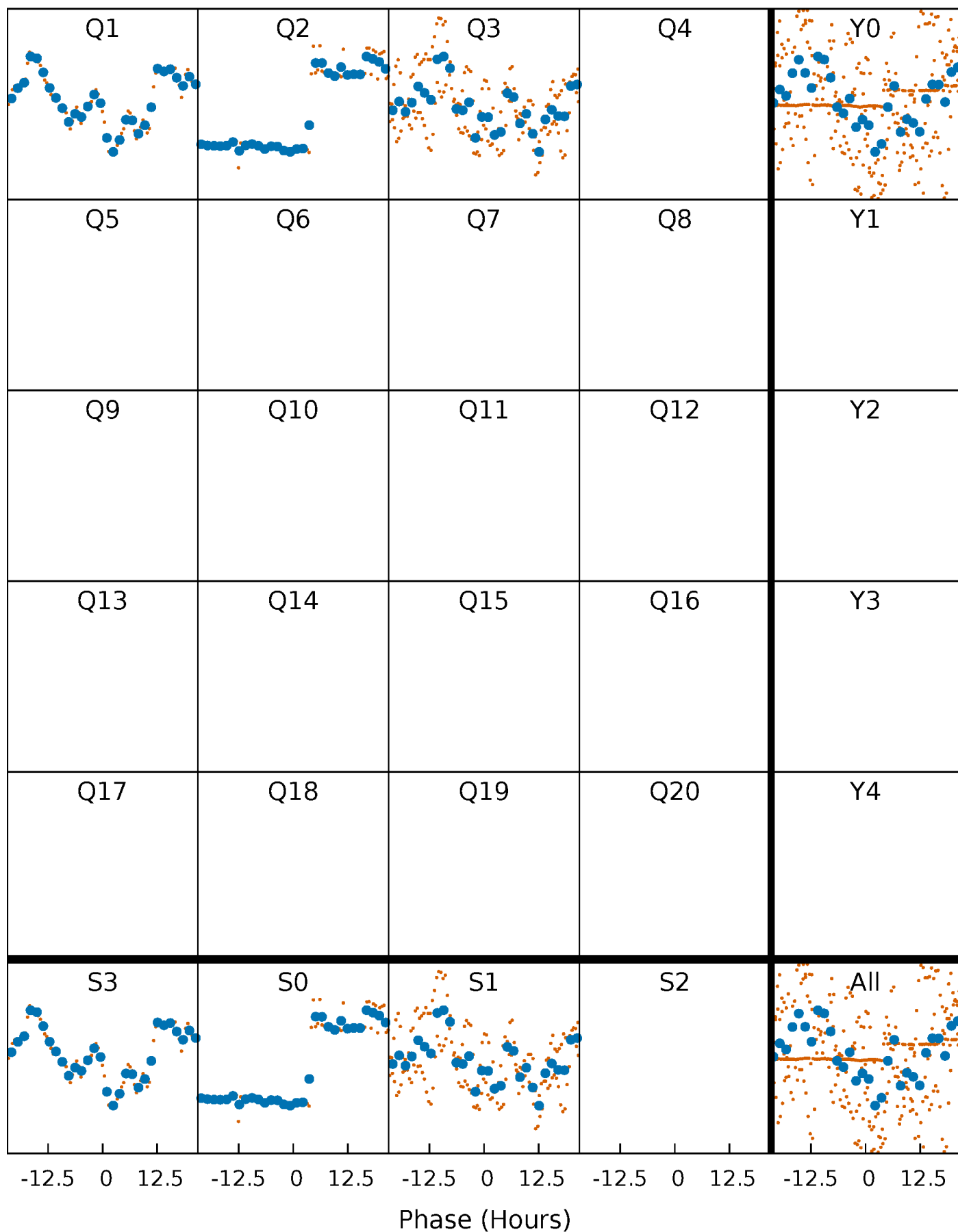


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



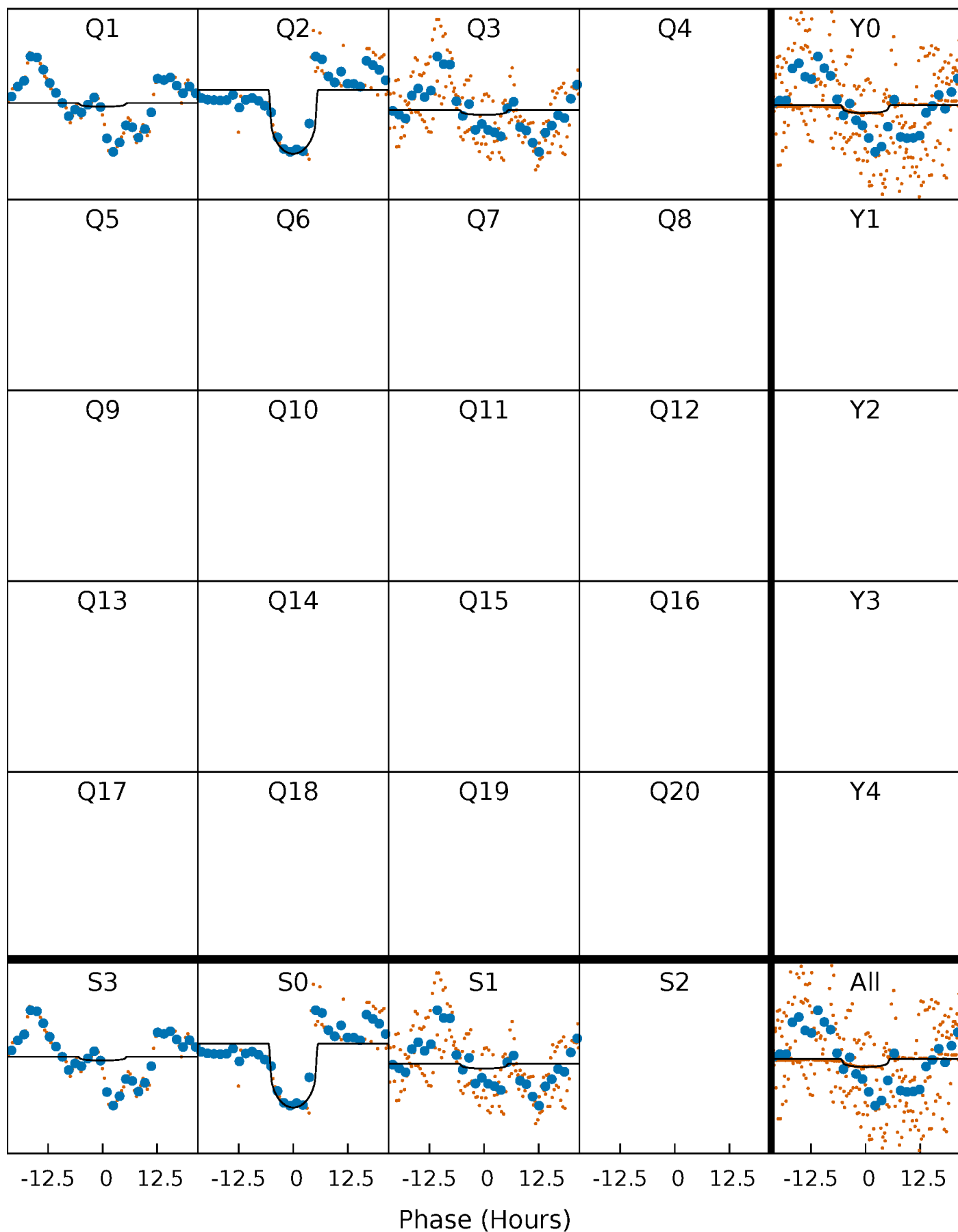
PDC Quarter-Phased Transit Curves

TCE 009651313-02 P= 67.605717 Days $T_0=139.462920$ (BKJD)



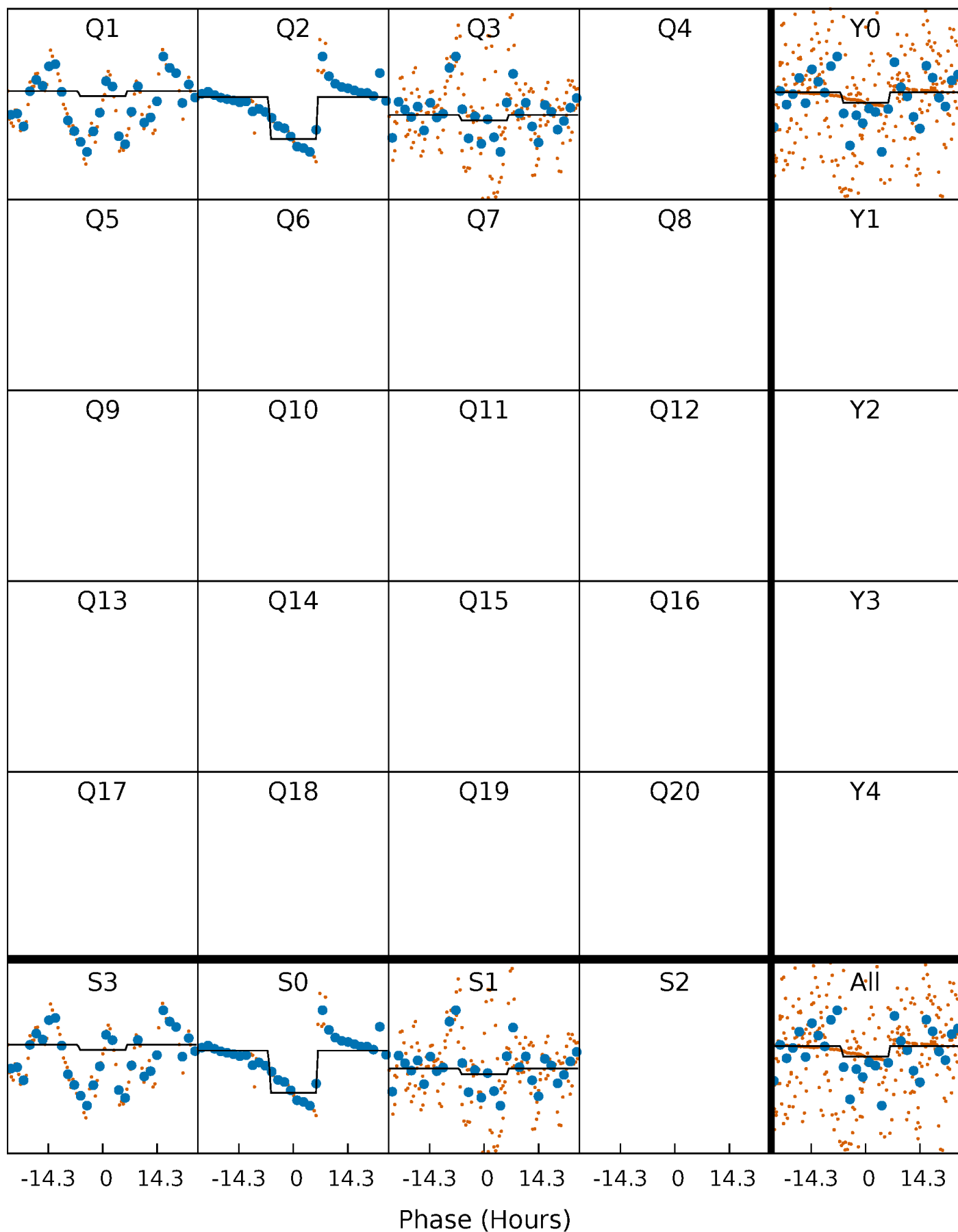
DV Quarter-Phased Transit Curves

TCE 009651313-02 P= 67.605717 Days $T_0=139.462920$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

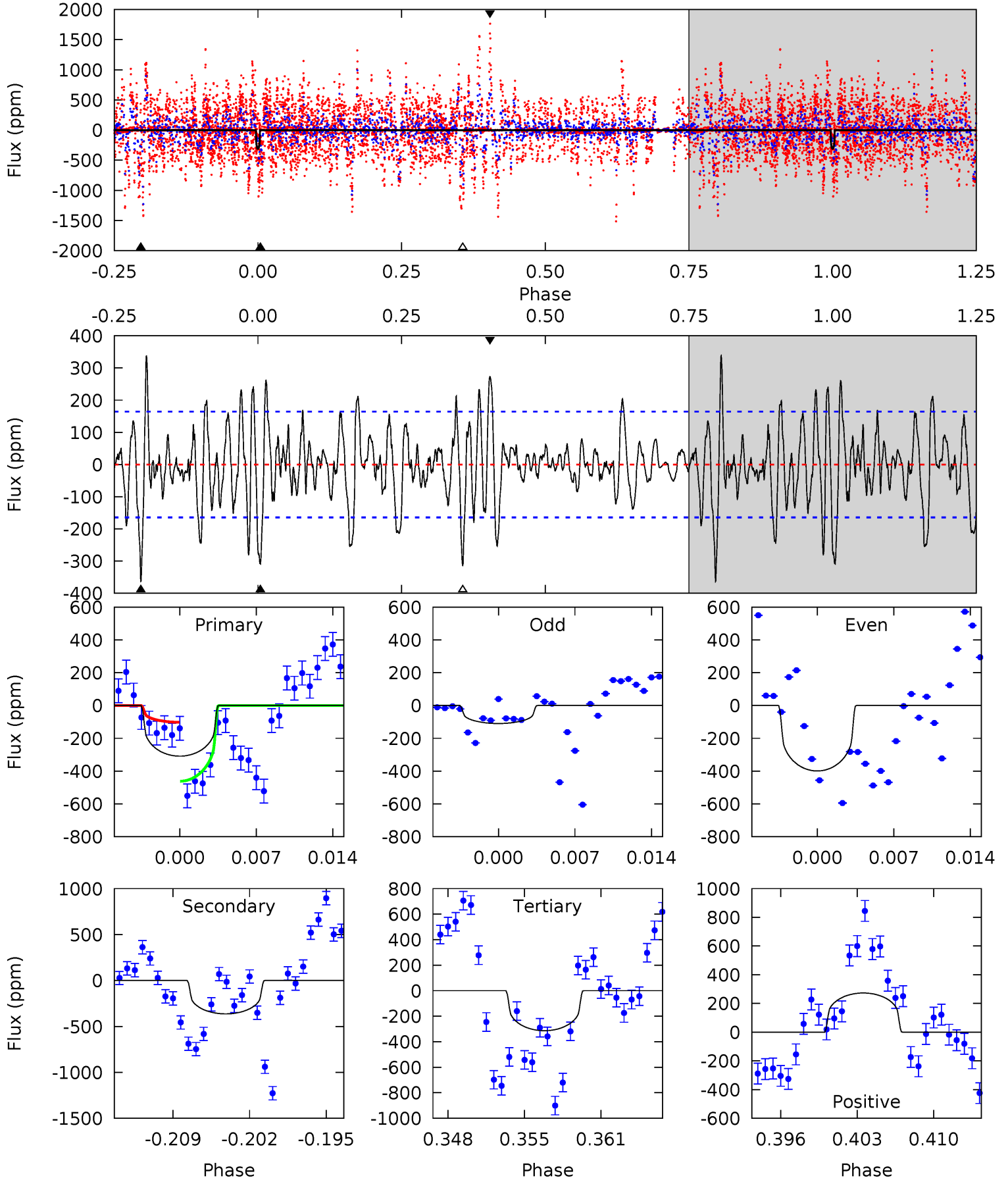
TCE 009651313-02 P= 67.634340 Days $T_0=139.336360$ (BKJD)



DV Model-Shift Uniqueness Test

009651313-02, P = 67.605717 Days, E = 71.857203 Days

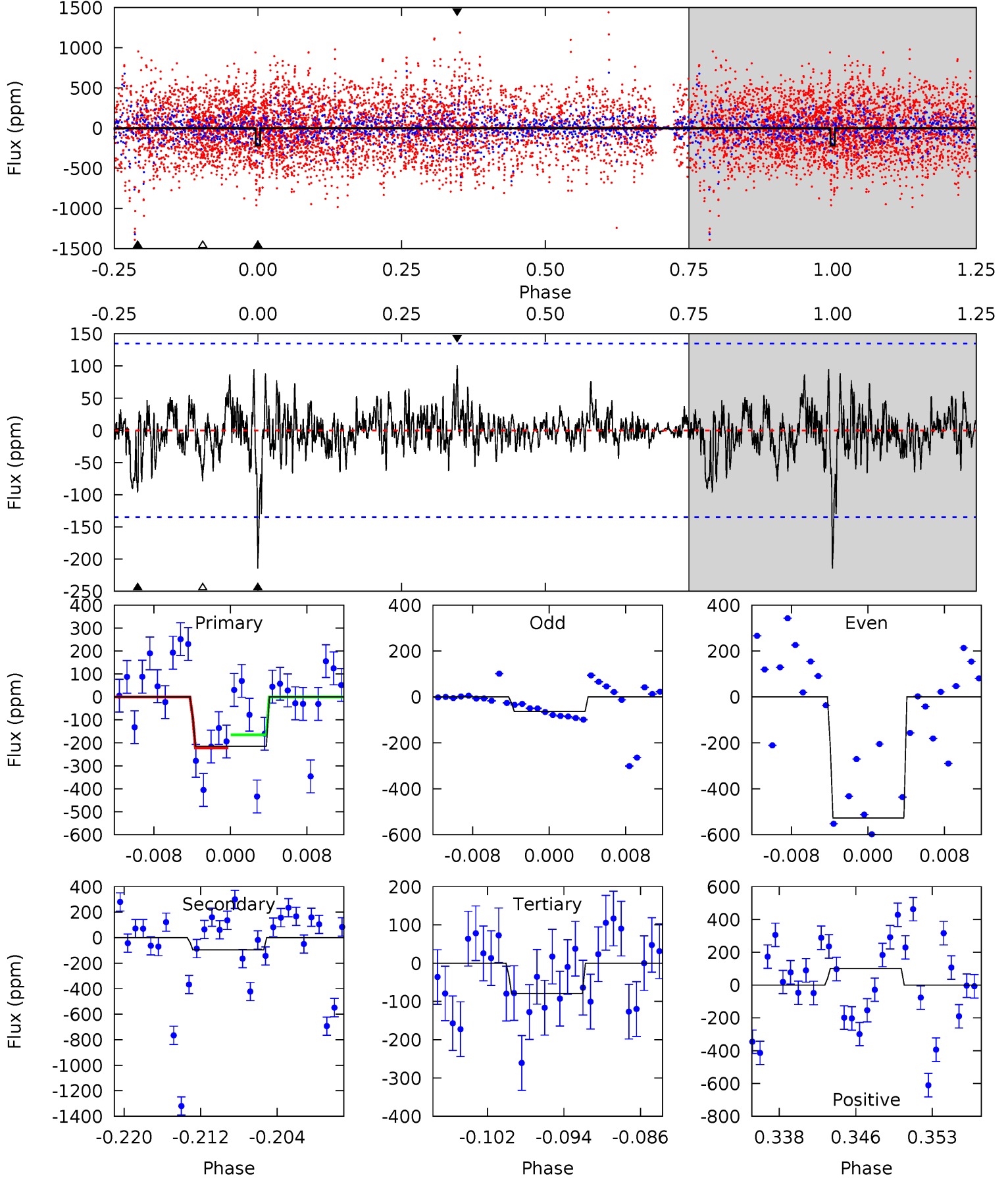
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.58	11.3	9.72	8.46	5.10	2.70	2.85	-0.14	1.12	1.55	2.81	3.91	1.01	0.48	5.59



Alt Model-Shift Uniqueness Test

009651313-02, P = 67.634340 Days, E = 71.702020 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.07	3.57	2.97	3.80	5.07	2.66	0.93	5.10	4.28	0.60	-0.22	9.26	0.92	0.32	1.10



Stellar Parameters For KIC 009651313

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4706^{+112}_{-197}	$2.668^{+0.030}_{-0.033}$	$0.560^{+0.050}_{-0.400}$	$12.642^{+0.721}_{-4.083}$	$2.712^{+0.163}_{-1.464}$	$0.002^{+0.001}_{-0.000}$
	+2%/-4%	+1%/-1%	+9%/-71%	+6%/-32%	+6%/-54%	+49%/-10%
Source	PHO1	AST9	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 009651313-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-363 ± 32	$13.55^{+3.31}_{-3.61}$	1533^{+49}_{-64}	6327^{+1076}_{-672}	226^{+180}_{-81}
Alt.	-95 ± 27	$11.69^{+3.63}_{-3.24}$	1533^{+47}_{-66}	4964^{+786}_{-617}	79^{+73}_{-37}

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 $A_{obs} \gg 1.0$

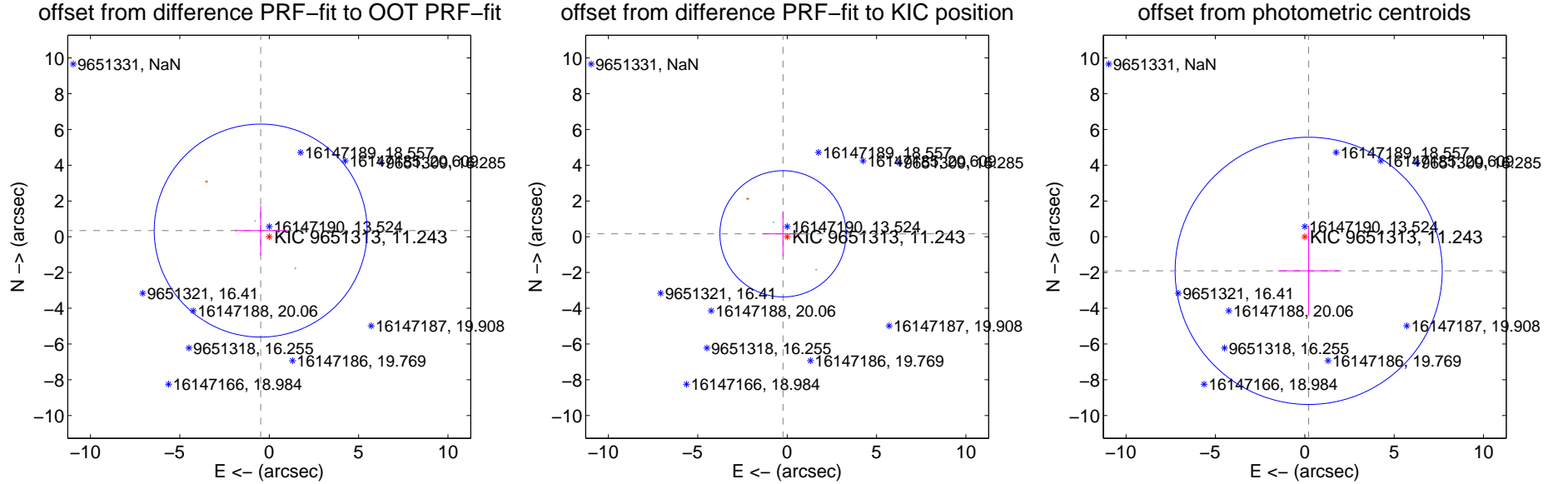
DV Centroid Data

Supplemental centroid analysis for 009651313-02. **Kepler magnitude: 11.24.** Transit SNR 12.70

There are 2 quarters with good PRF difference image offsets

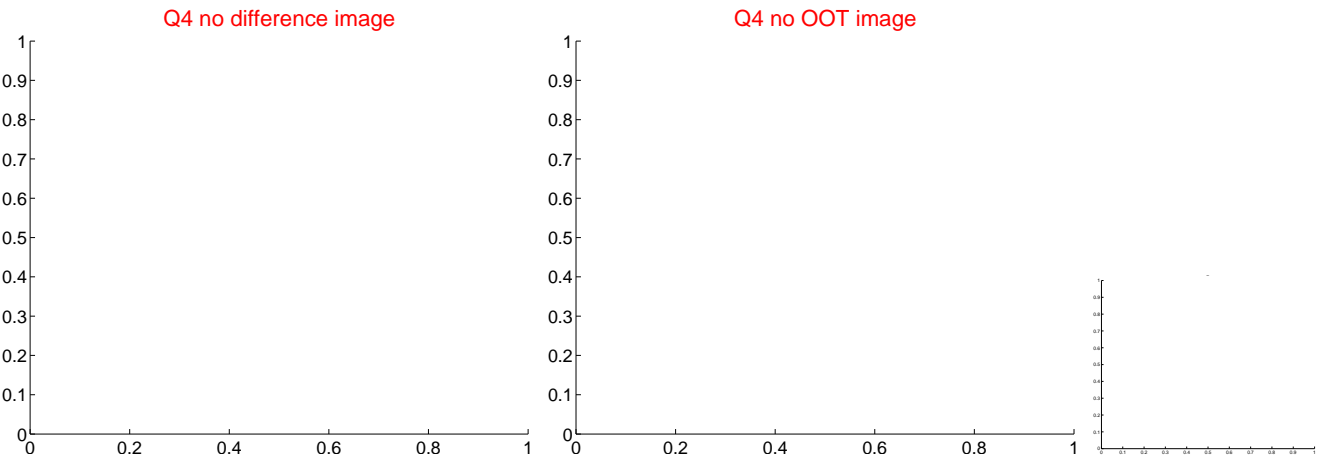
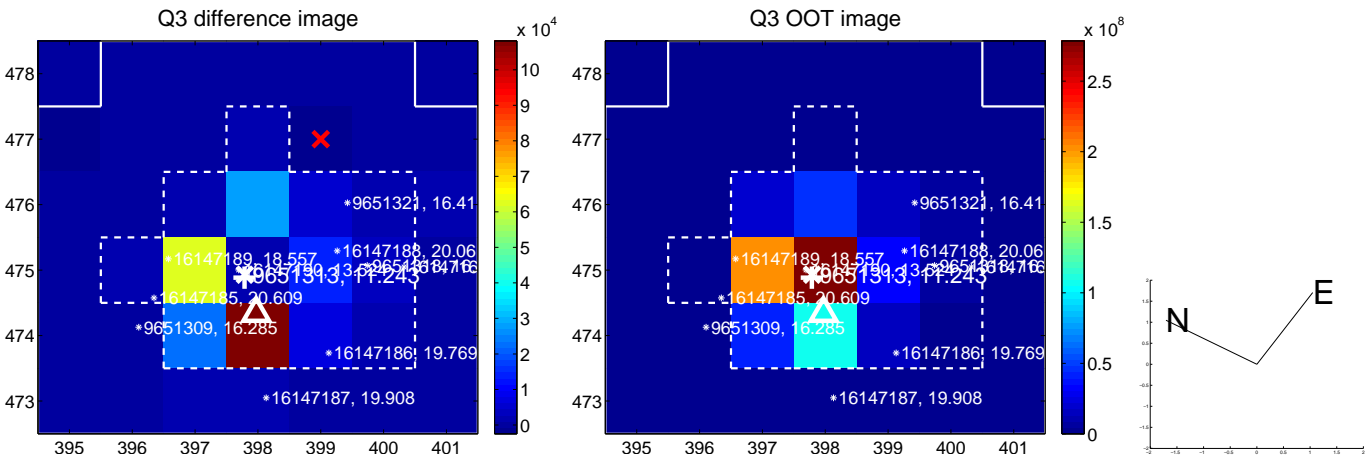
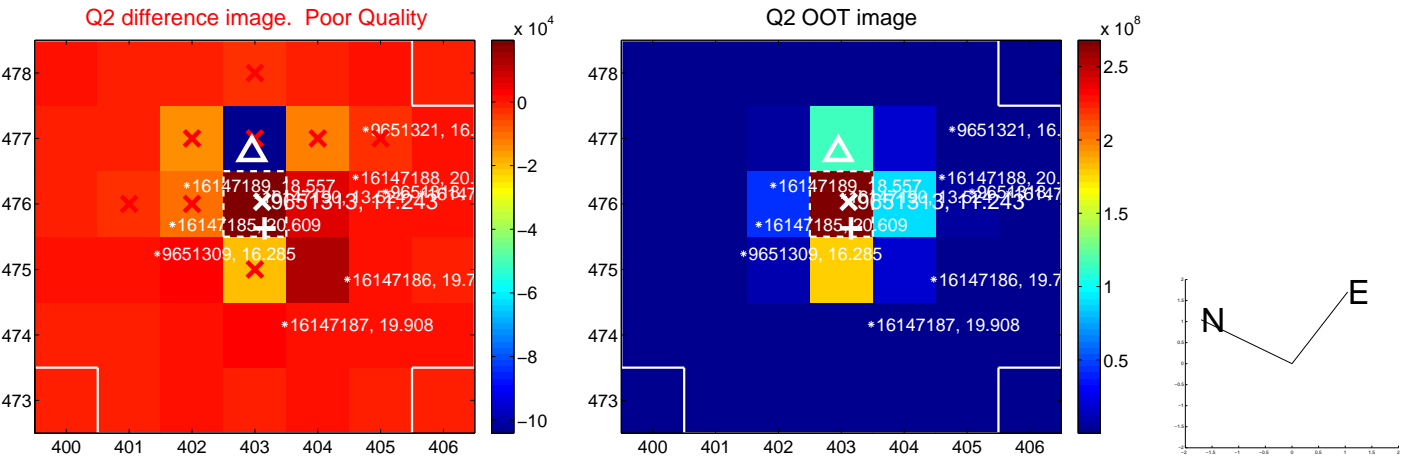
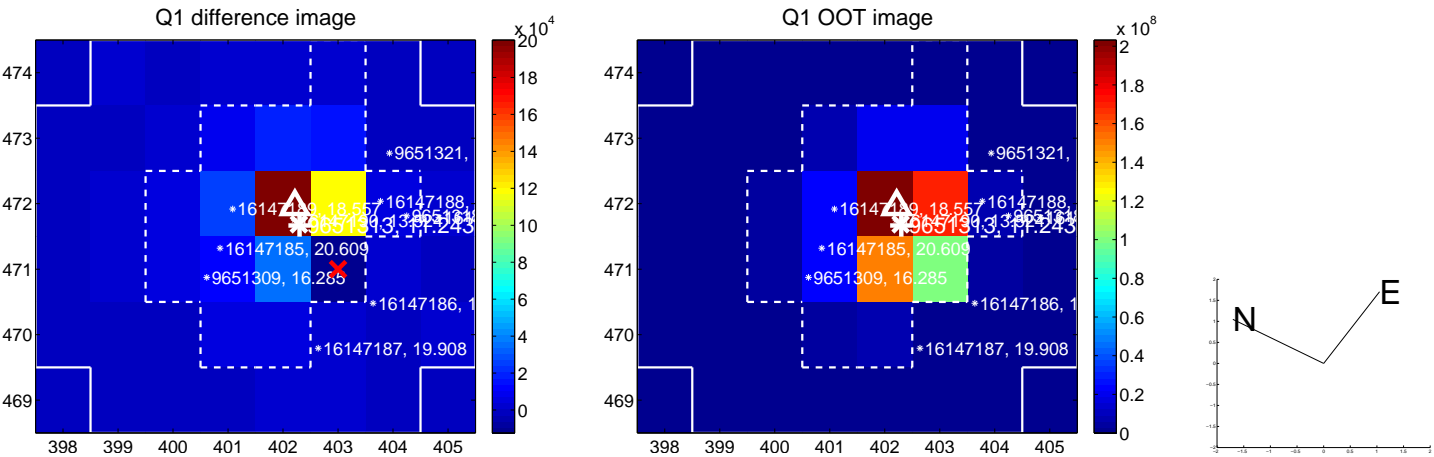
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.589 ± 1.985	0.30	0.479 ± 1.447	0.344 ± 1.391
PRF-fit source offset from KIC position	0.284 ± 1.177	0.24	0.232 ± 1.136	0.164 ± 1.254
photometric centroid source offset	1.92 ± 2.49	0.77	-0.22 ± 1.72	-1.91 ± 2.50

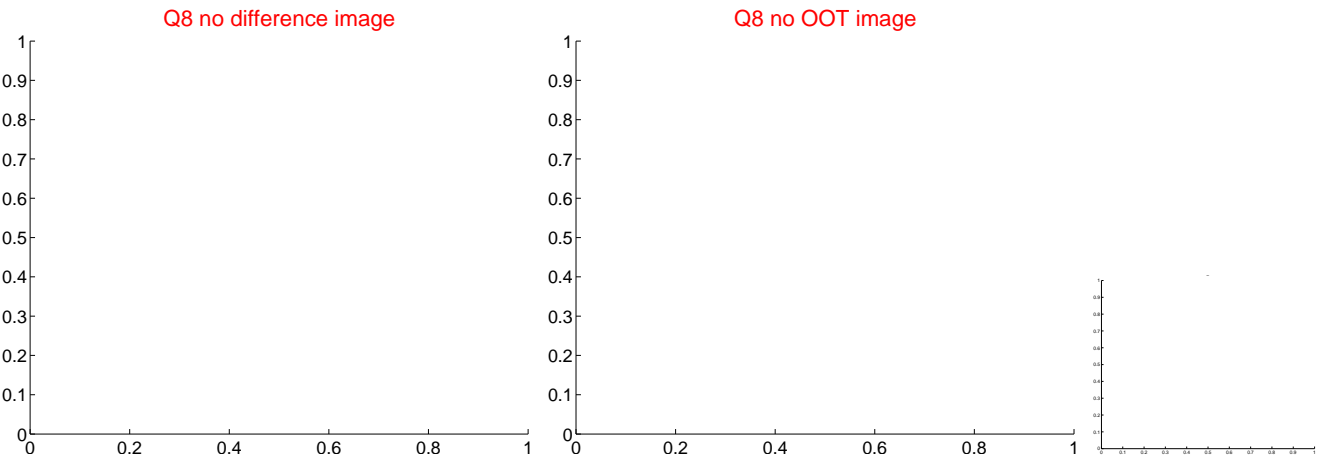
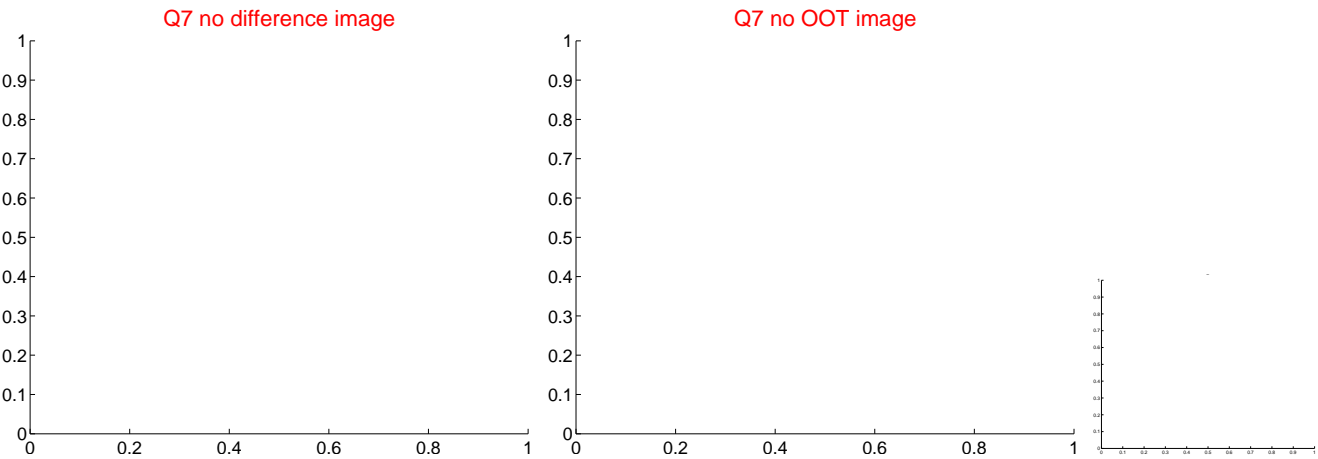
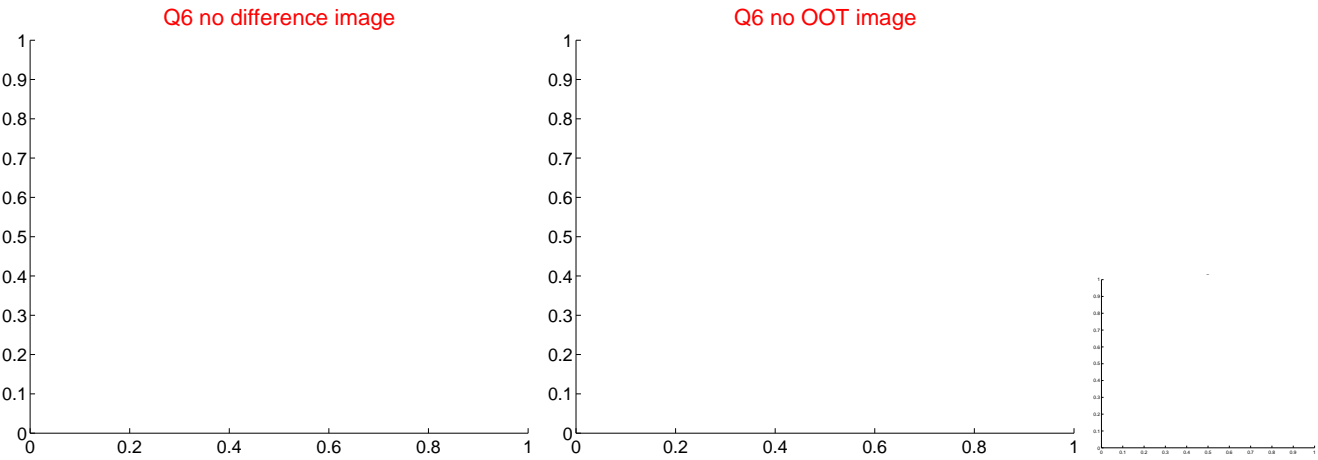
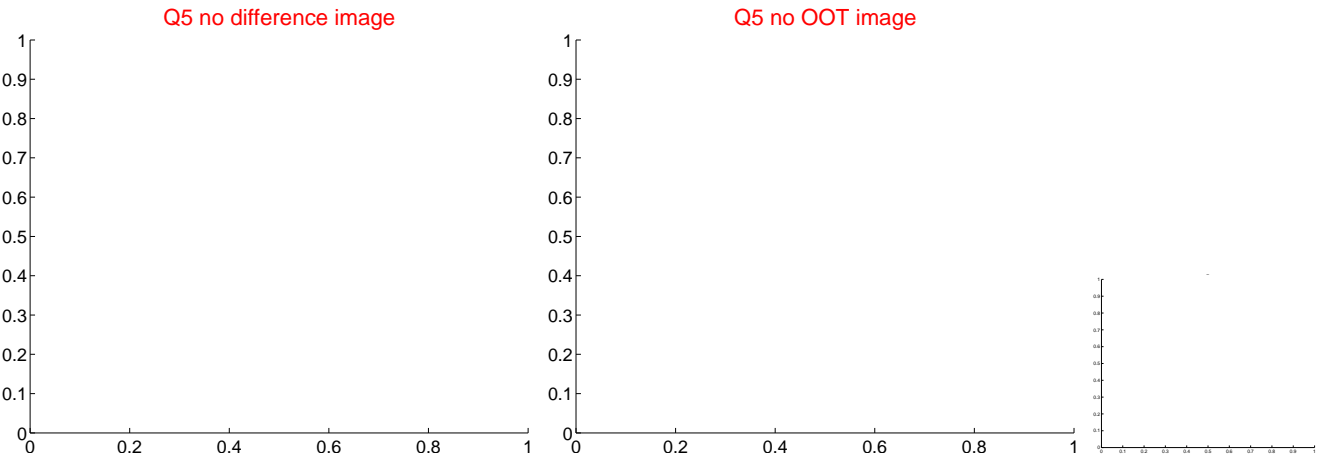


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

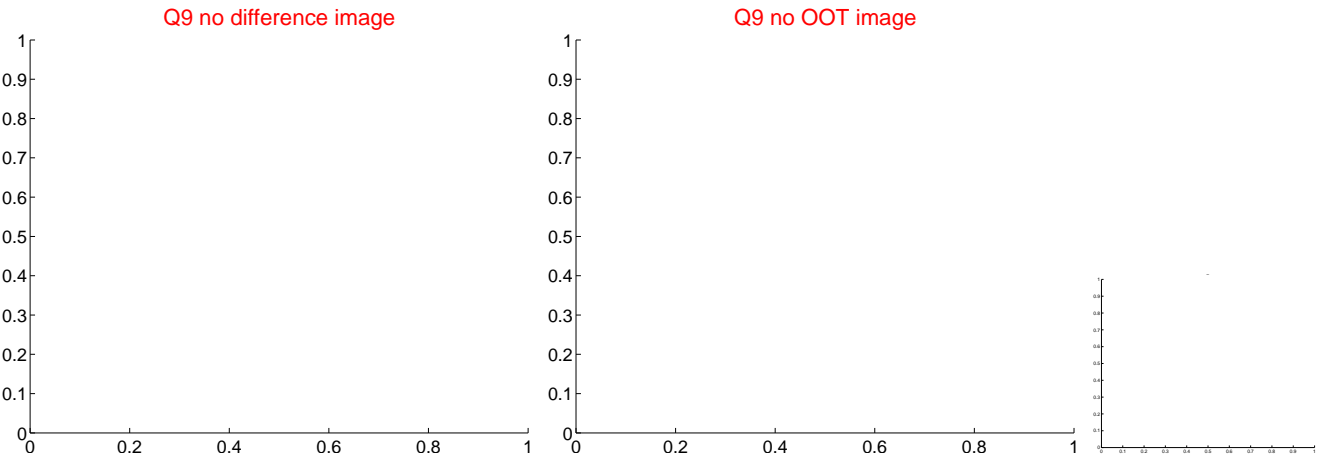
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



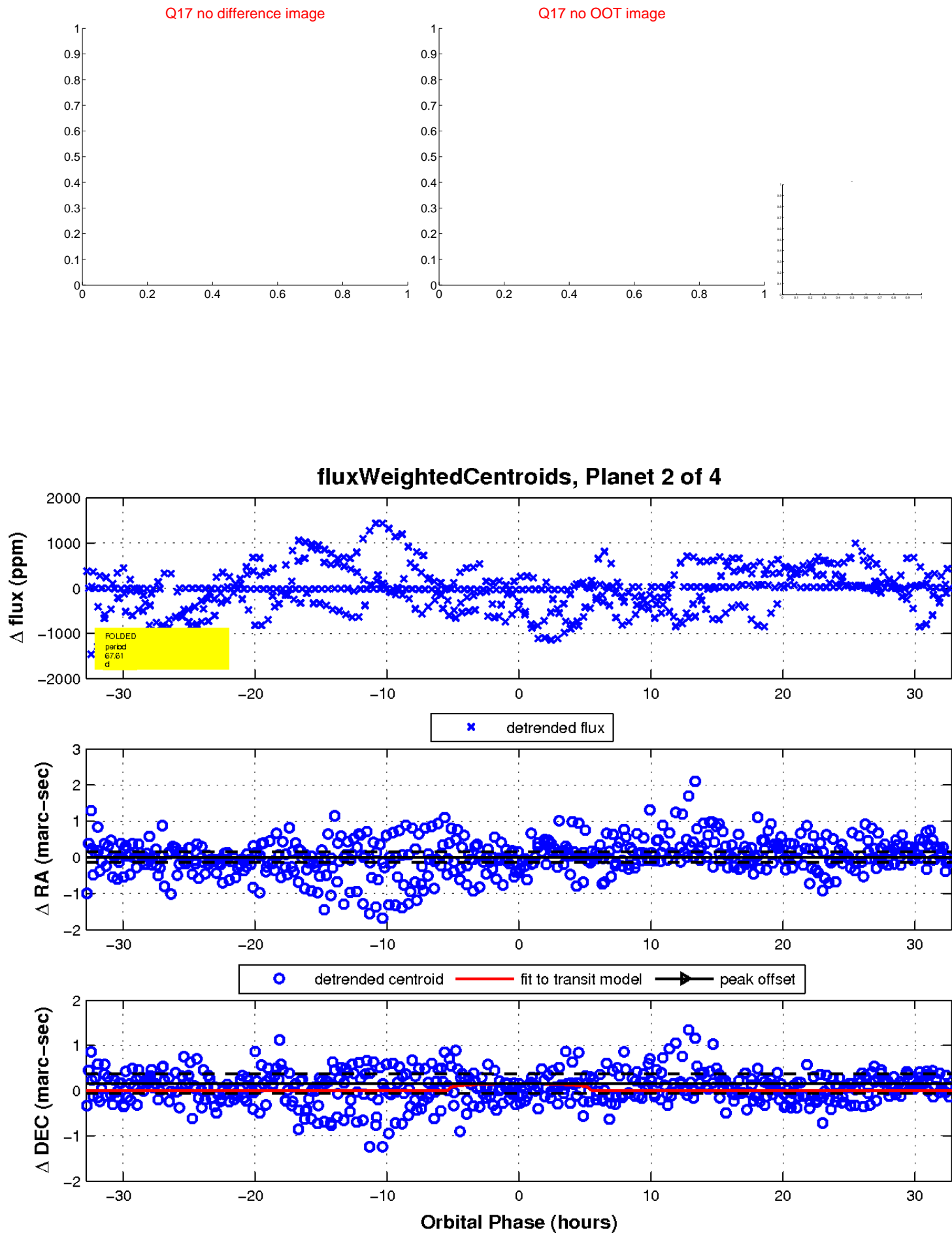
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



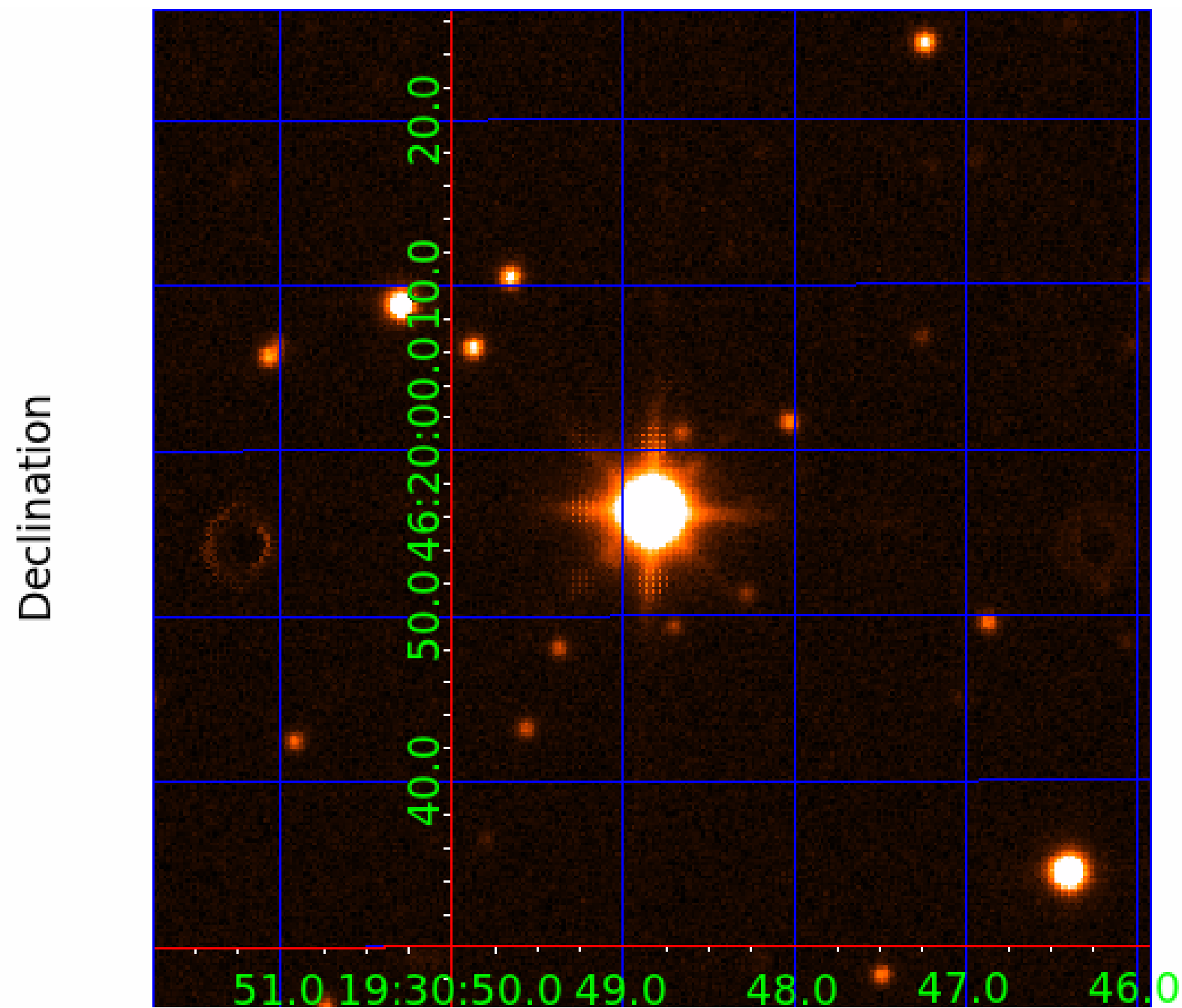
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009651313

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})
009651313-01	OBS	No	50.911328	135.157008	97.0	3.371	29.0	16.3	12.64	4706	14.99	499.22
009651313-02	OBS	No	67.605717	139.462920	84.4	10.935	16.3	12.7	12.64	4706	13.13	342.03
009651313-03	OBS	No	38.372532	149.088298	55.4	1.617	11.6	16.8	12.64	4706	12.03	727.81
009651313-04	OBS	No	45.937382	172.133985	58.8	1.536	11.3	16.0	12.64	4706	10.66	572.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651313-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
009651313-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED
009651313-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009651313-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

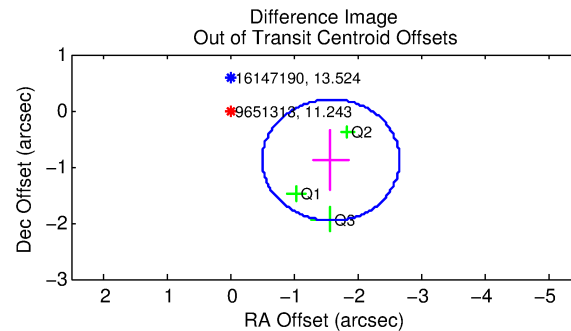
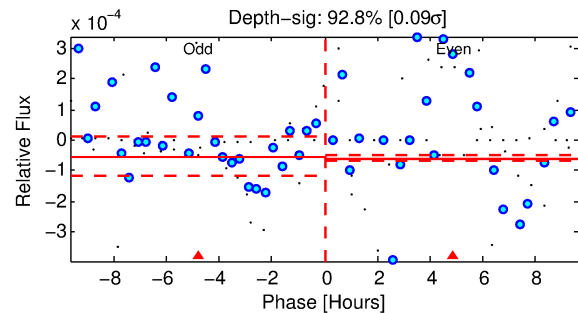
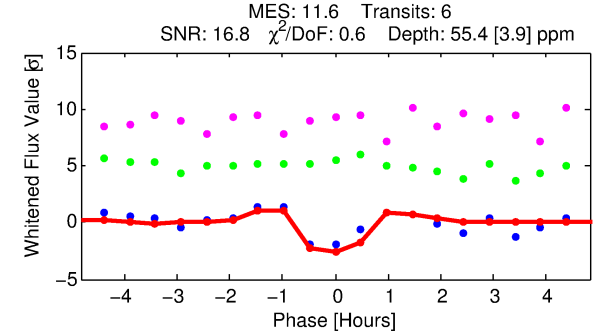
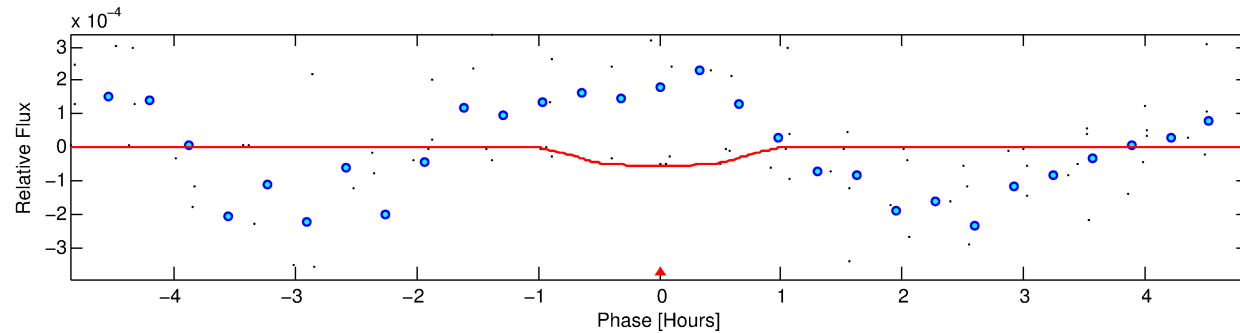
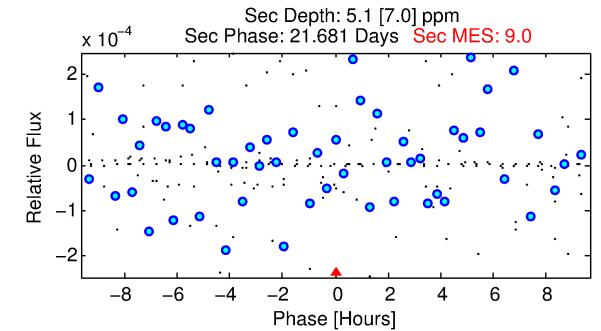
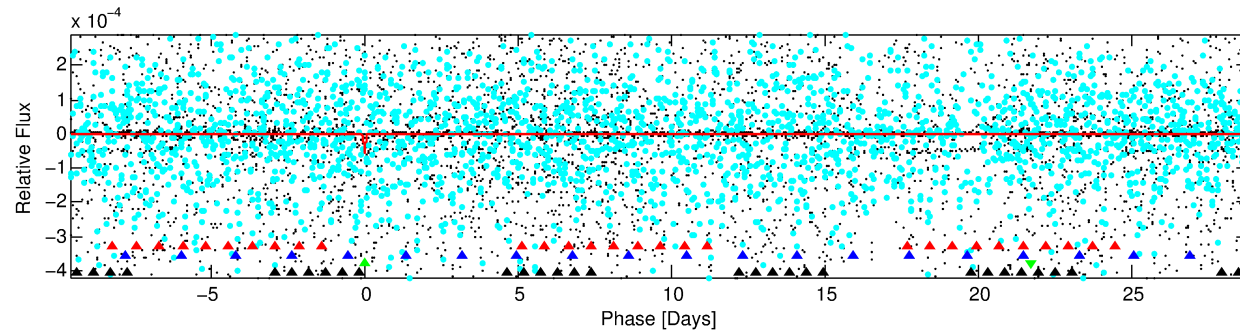
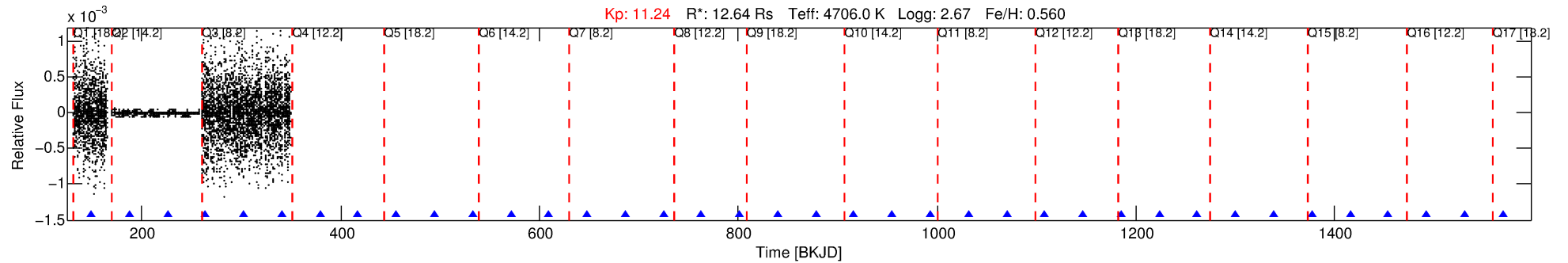
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009651313-03

No Significant Match Found

DV One-Page Summary

KIC: 9651313 Candidate: 3 of 4 Period: 38.373 d



DV Fit Results:

Period = 38.37253 [0.00164] d
Epoch = 149.0883 [0.0023] BKJD
Rp/R* = 0.0087 [0.0035]
a/R* = 74.28 [111.43]
b = 0.92 [0.26]
Seff = 727.81 [201.91]
Teq = 1324 [92] K
Rp = 12.03 [6.24] Re
a = 0.3106 [0.0673] AU
Ag = 1.86 [3.00] [0.29 σ]
Teffp = 2390 [962] K [1.10 σ]

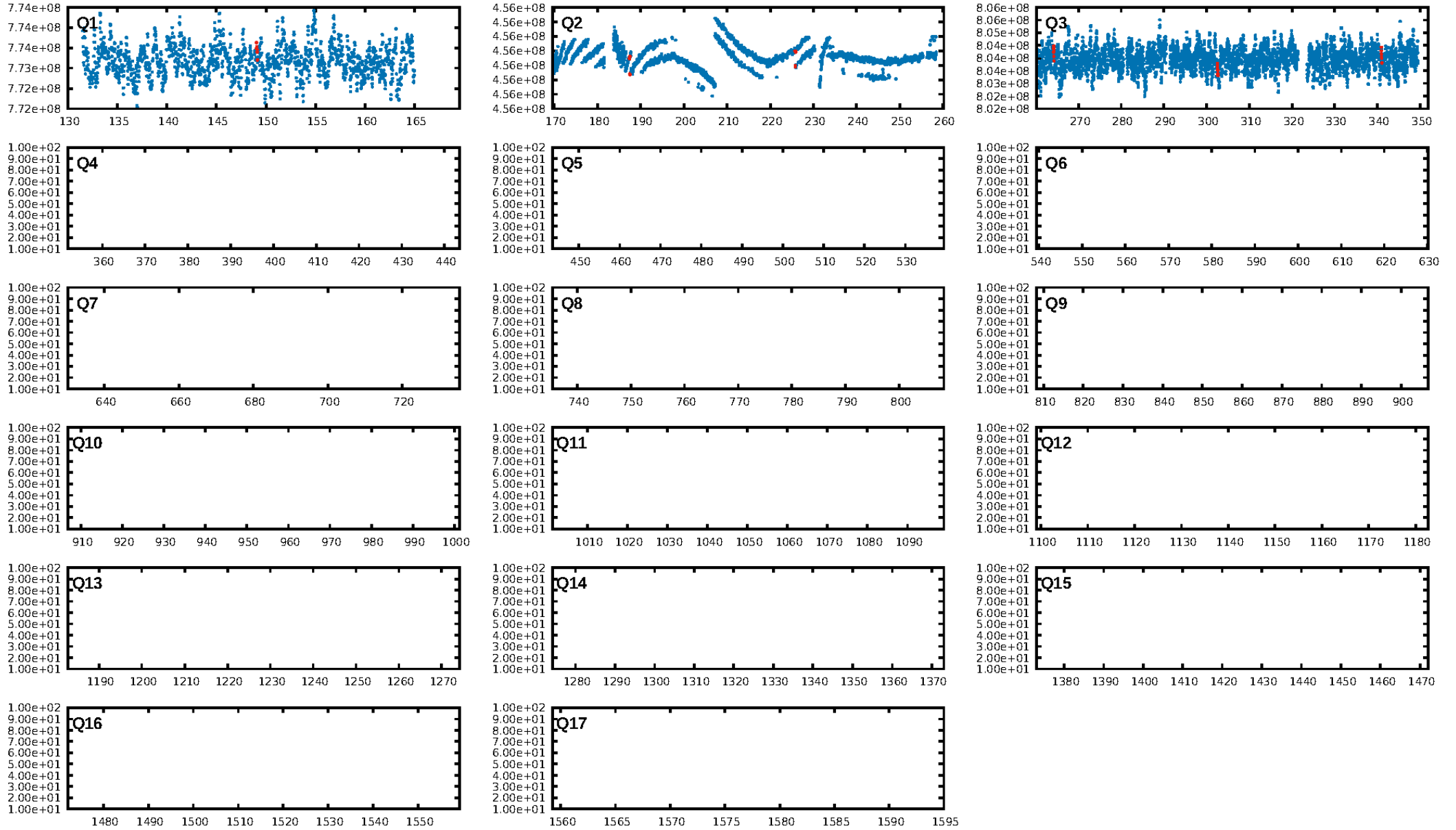
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [81.38 σ]
ModelChiSquare2-sig: 53.5%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 4.57e-12
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.218
Centroid-sig: 98.7%
Centroid-so: 0.764 arcsec [0.17 σ]
OotOffset-rm: 1.817 arcsec [5.04 σ]
KicOffset-rm: 2.804 arcsec [4.50 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

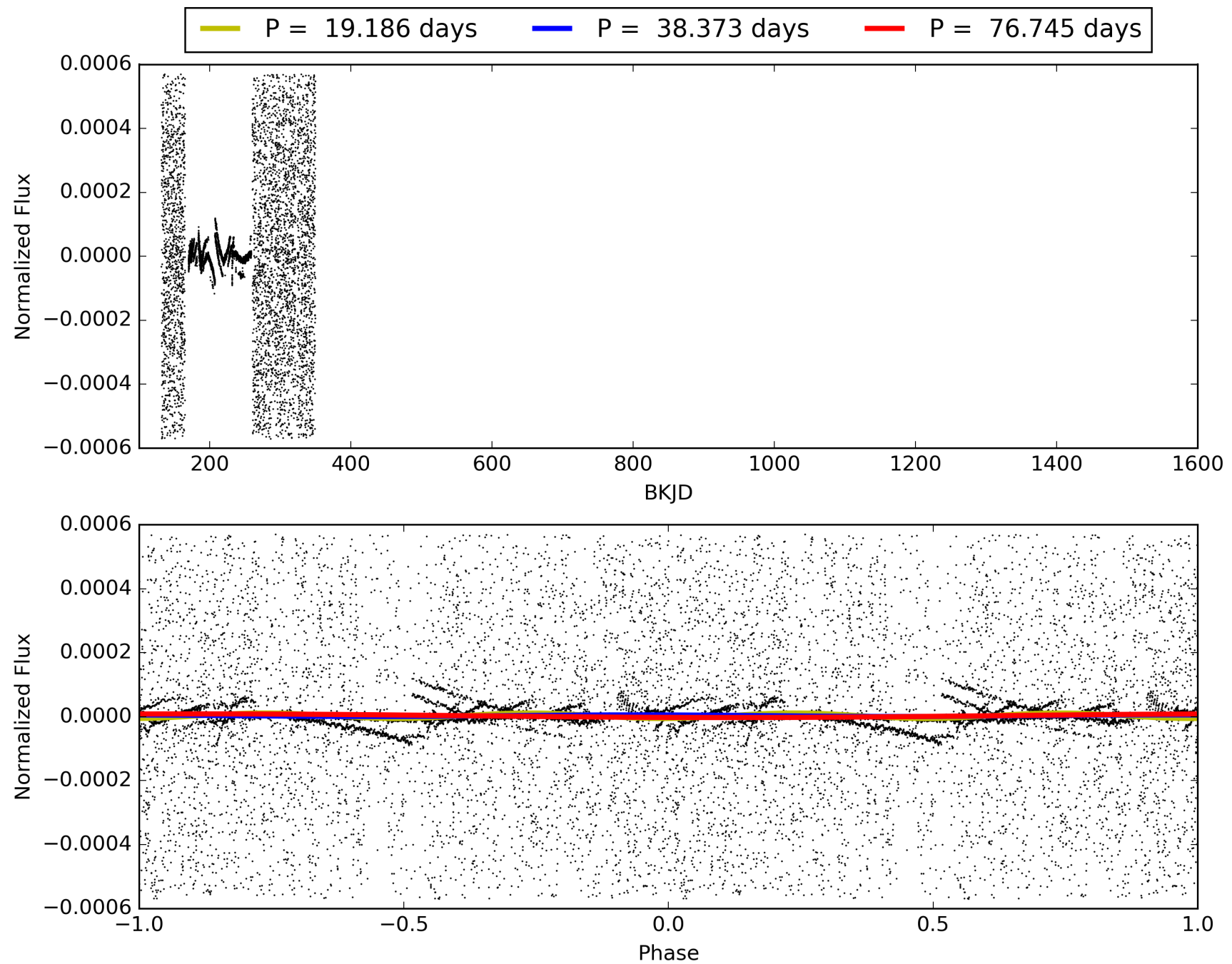
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:22:19 Z

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

TCE 009651313-03, PDC Light Curves

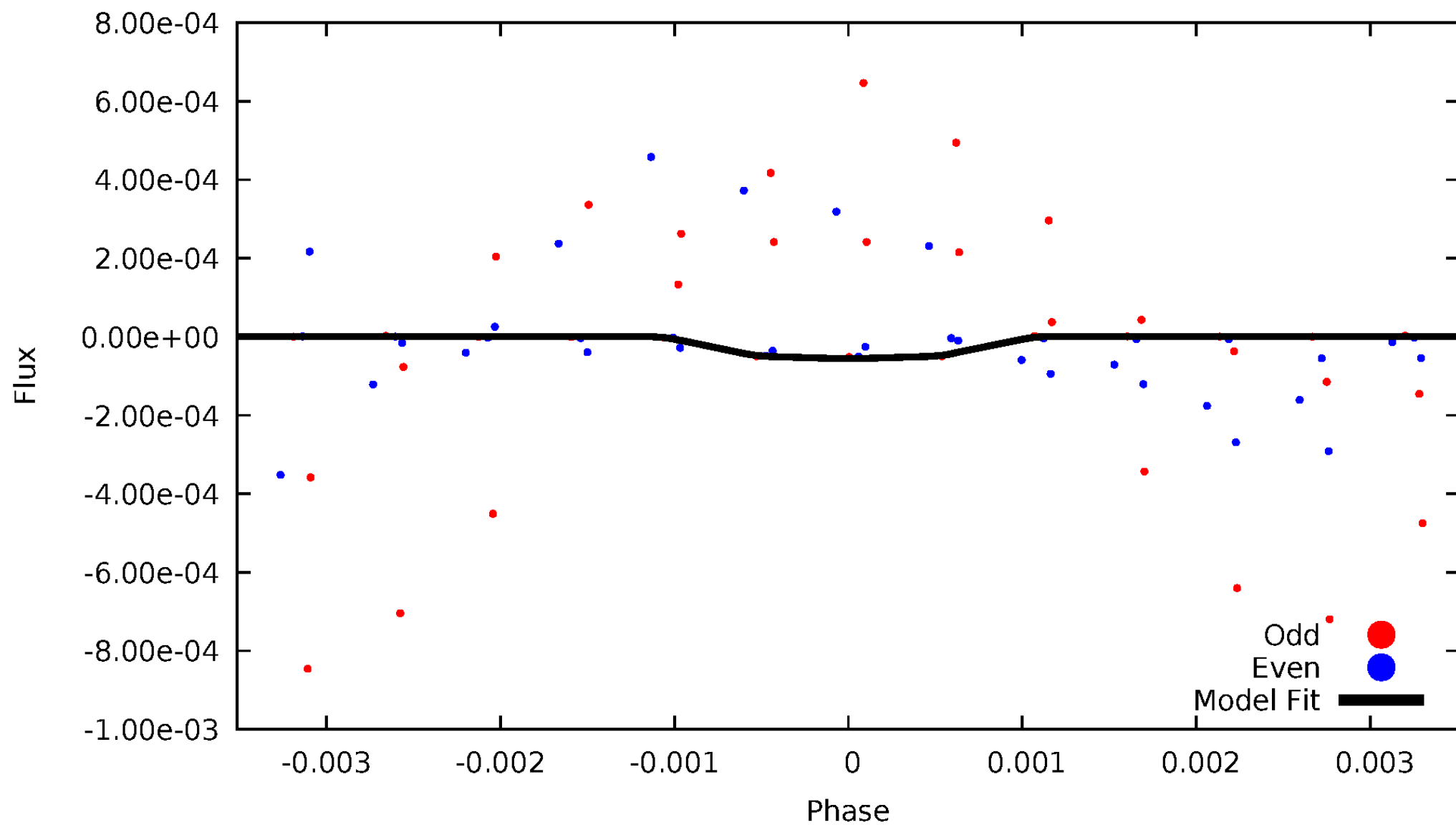


TCE 009651313-03



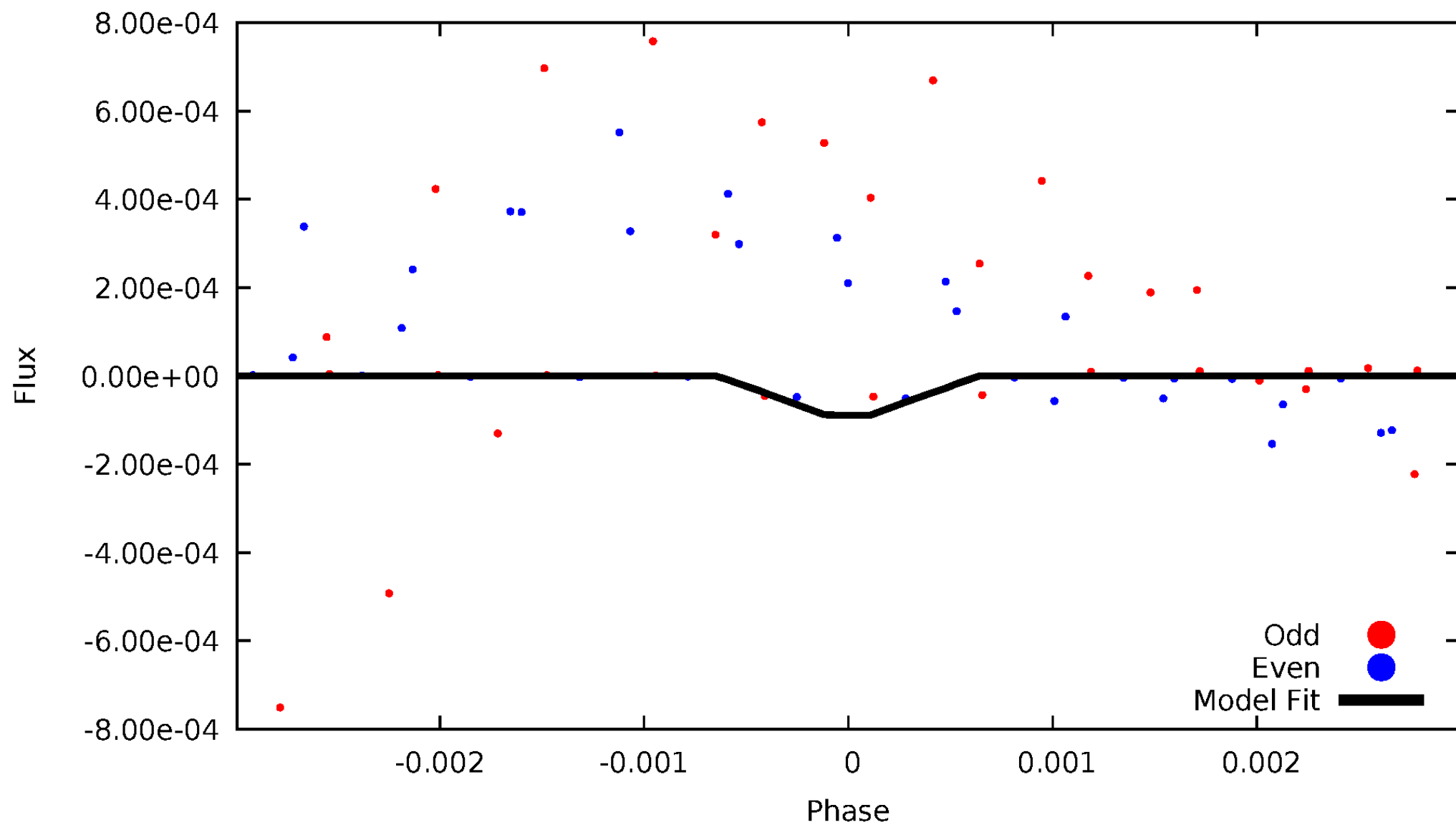
DV Odd/Even

TCE 009651313-03

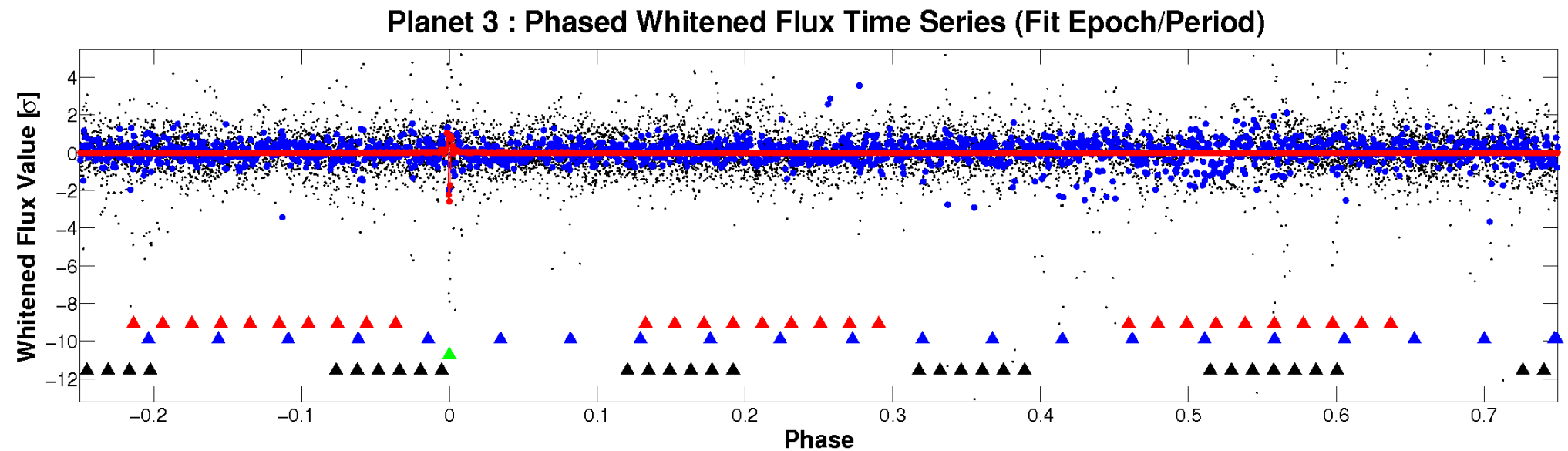
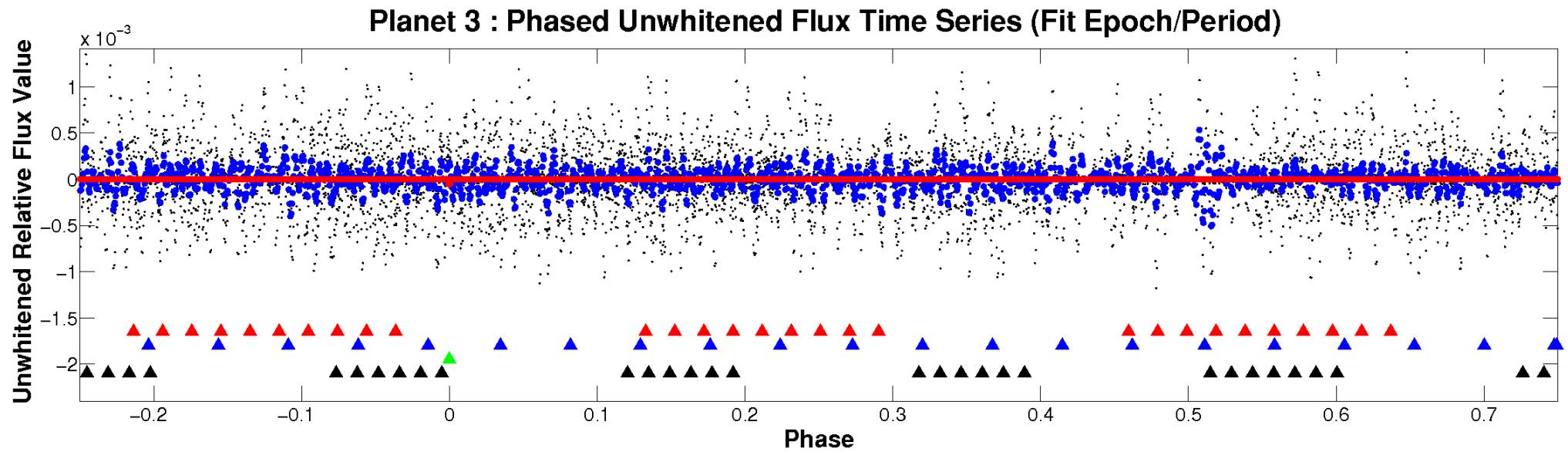


ALT Odd/Even

TCE 009651313-03

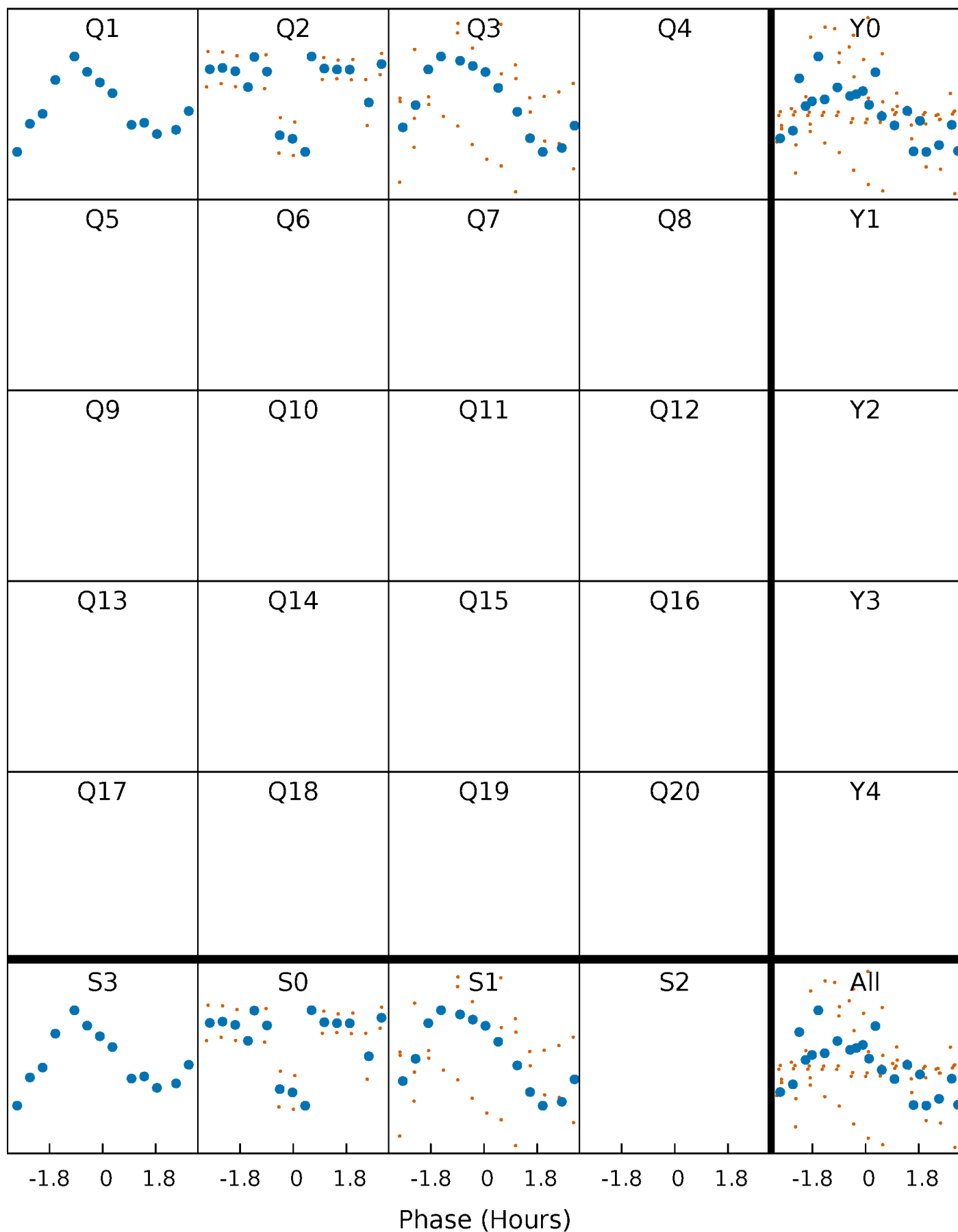


Non-Whitened Vs. Whitened Light Curve



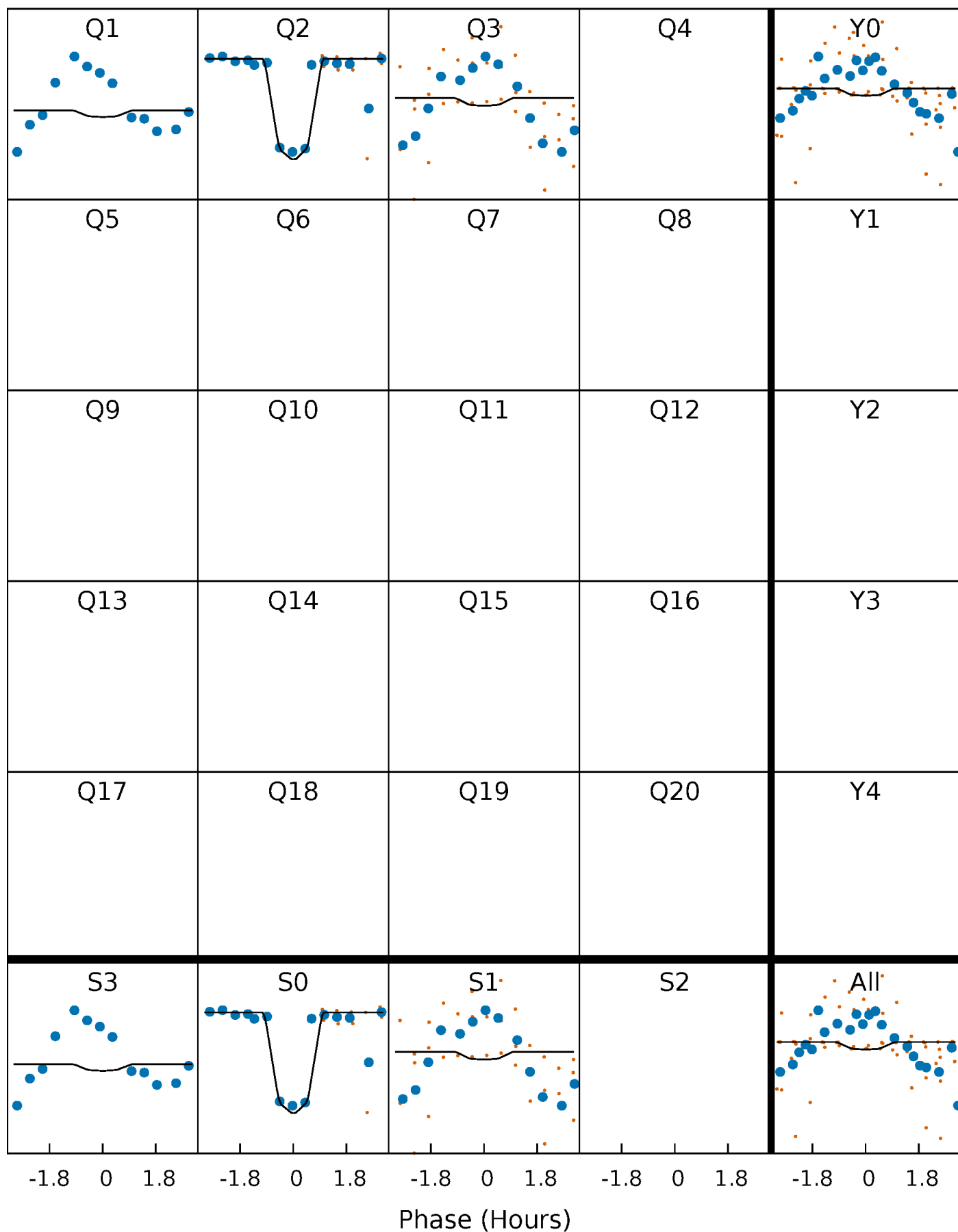
PDC Quarter-Phased Transit Curves

TCE 009651313-03 $P = 38.372532$ Days $T_0 = 149.088298$ (BKJD)



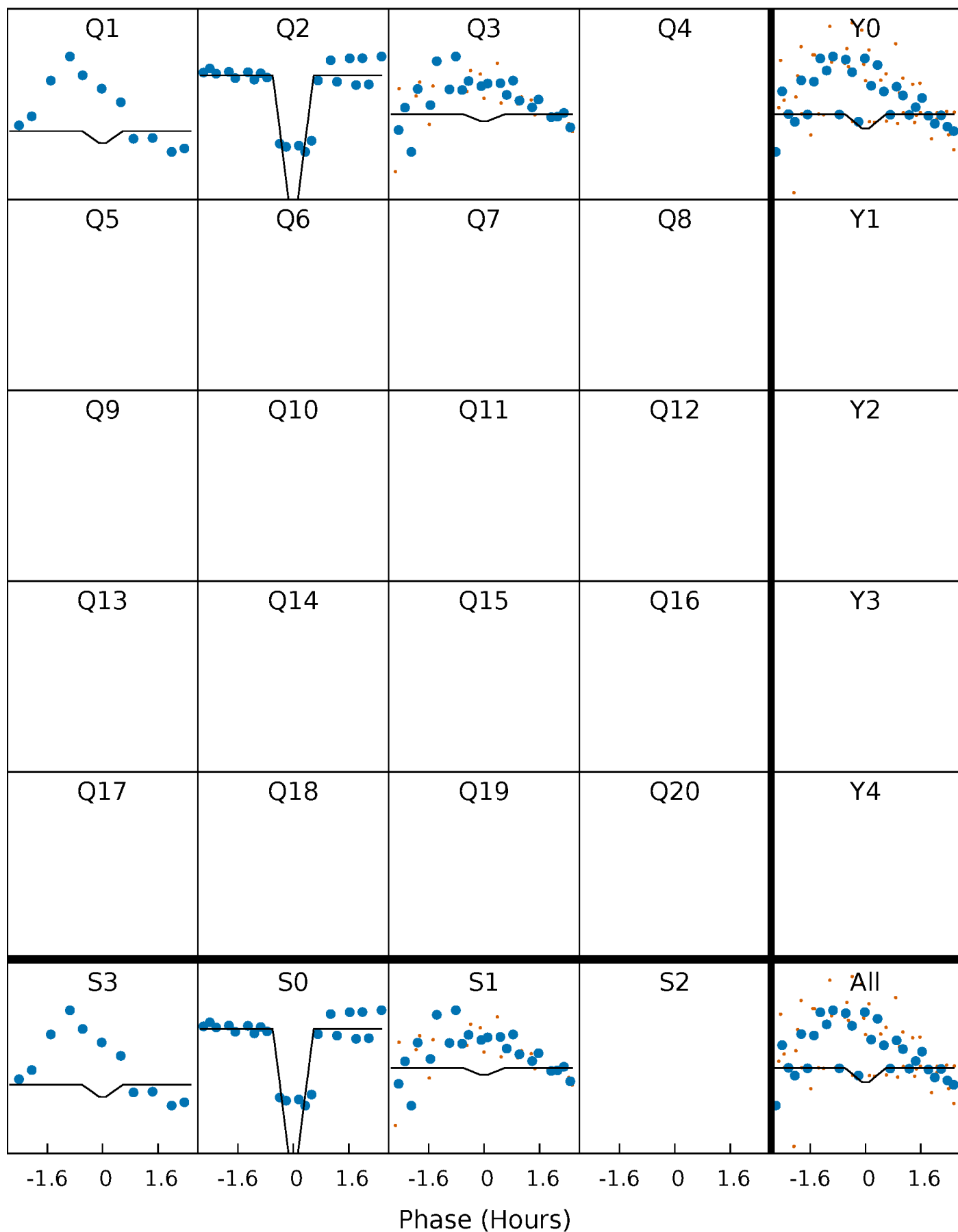
DV Quarter-Phased Transit Curves

TCE 009651313-03 P= 38.372532 Days $T_0=149.088298$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

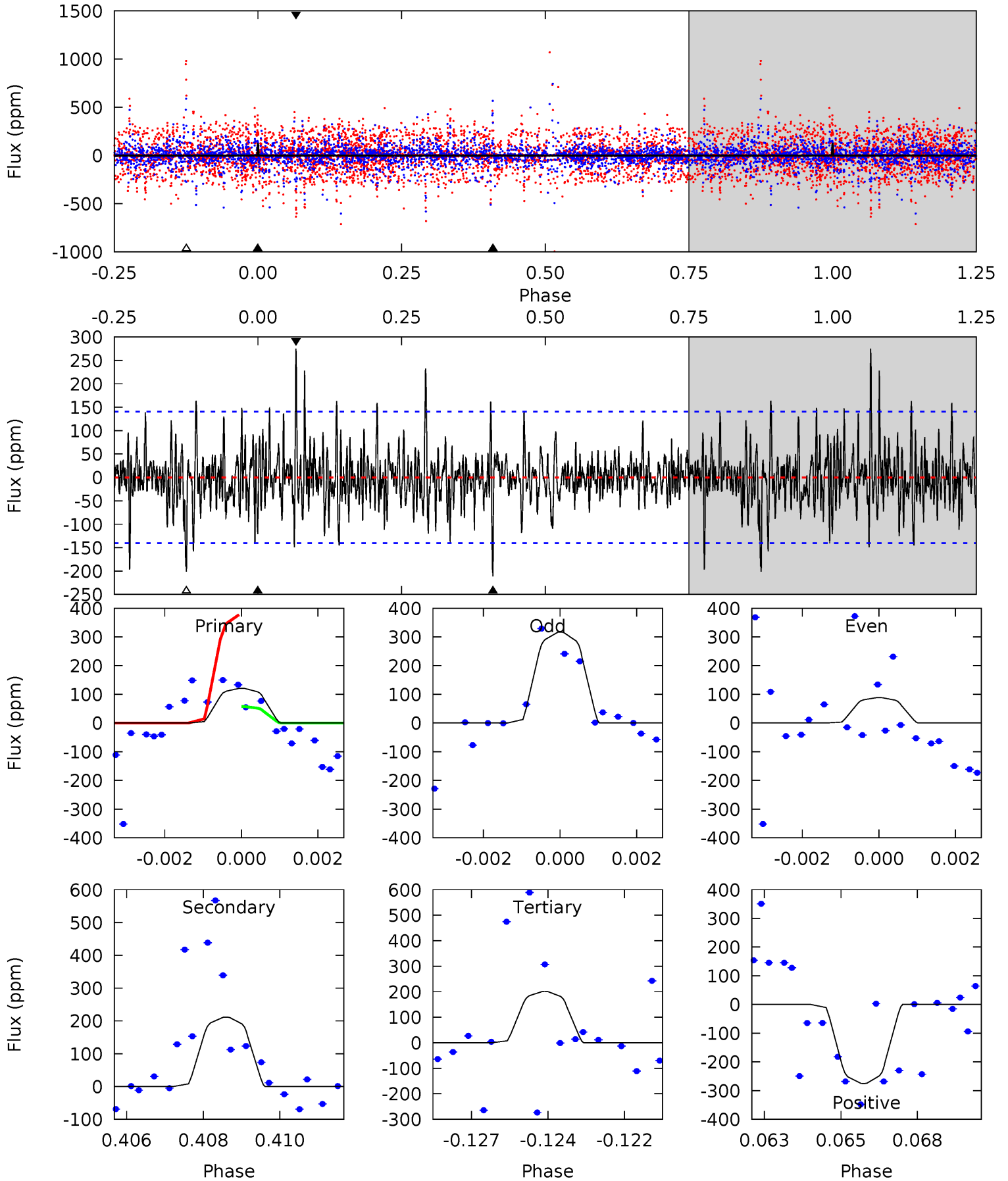
TCE 009651313-03 P= 38.368505 Days $T_0=149.087816$ (BKJD)



DV Model-Shift Uniqueness Test

009651313-03, P = 38.372532 Days, E = 110.715766 Days

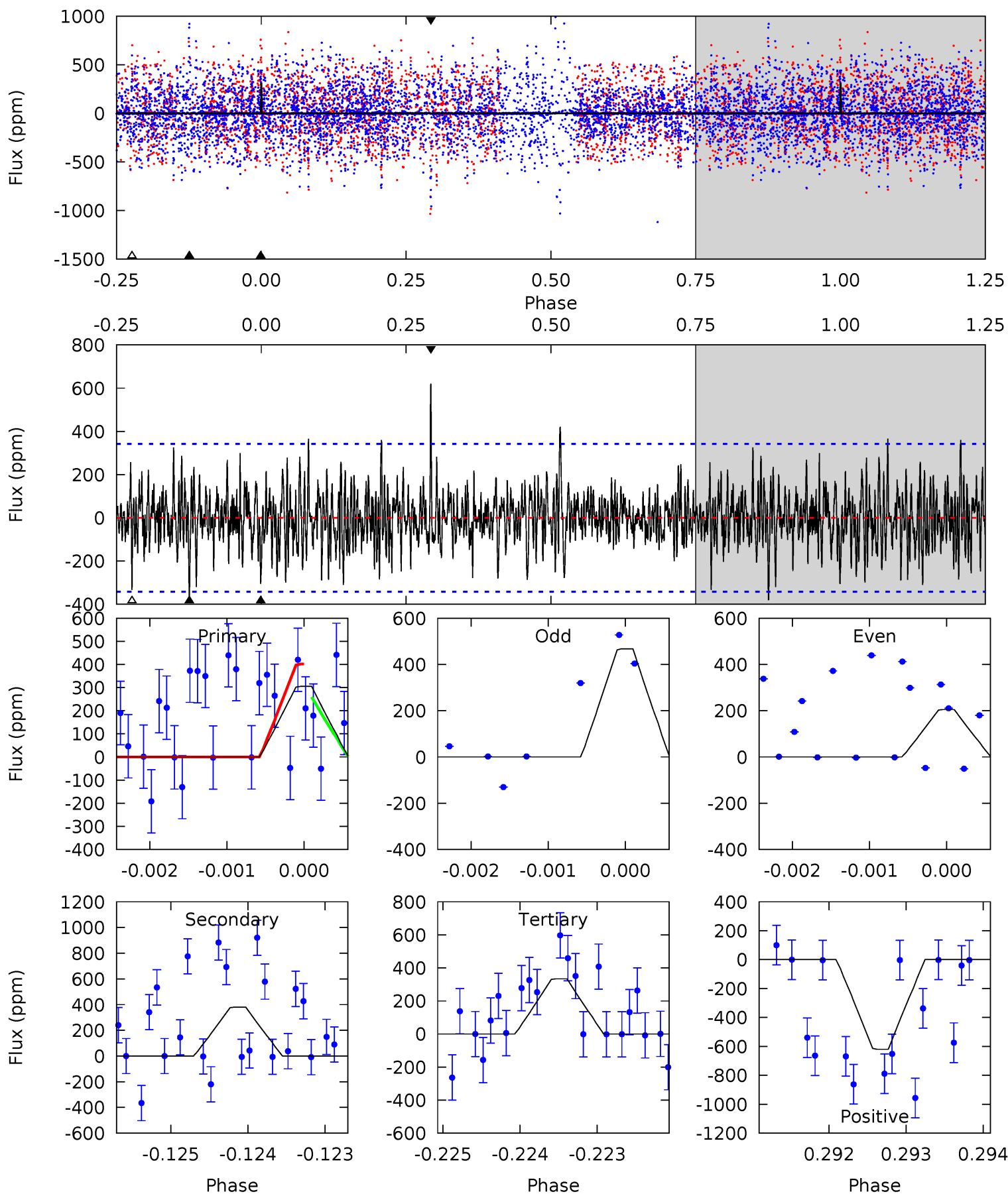
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.57	8.00	7.60	10.4	5.31	3.06	1.79	-3.04	-5.84	0.40	-2.41	2.99	1.44	0.57	5.78



Alt Model-Shift Uniqueness Test

009651313-03, P = 38.368505 Days, E = 110.719311 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.85	6.04	5.31	9.86	5.43	3.26	1.63	-0.46	-5.01	0.74	-3.81	1.70	0.90	0.62	1.11



Stellar Parameters For KIC 009651313

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4706^{+112}_{-197}	$2.668^{+0.030}_{-0.033}$	$0.560^{+0.050}_{-0.400}$	$12.642^{+0.721}_{-4.083}$	$2.712^{+0.163}_{-1.464}$	$0.002^{+0.001}_{-0.000}$
	+2%/-4%	+1%/-1%	+9%/-71%	+6%/-32%	+6%/-54%	+49%/-10%
Source	PHO1	AST9	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 009651313-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-212 ± 26	$12.19^{+4.94}_{-4.72}$	1858^{+52}_{-89}	5793^{+1784}_{-799}	74^{+120}_{-36}
Alt.	-380 ± 63	$12.85^{+5.52}_{-4.91}$	1847^{+57}_{-83}	6536^{+1996}_{-1071}	122^{+182}_{-63}

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 $A_{obs} \gg 1.0$

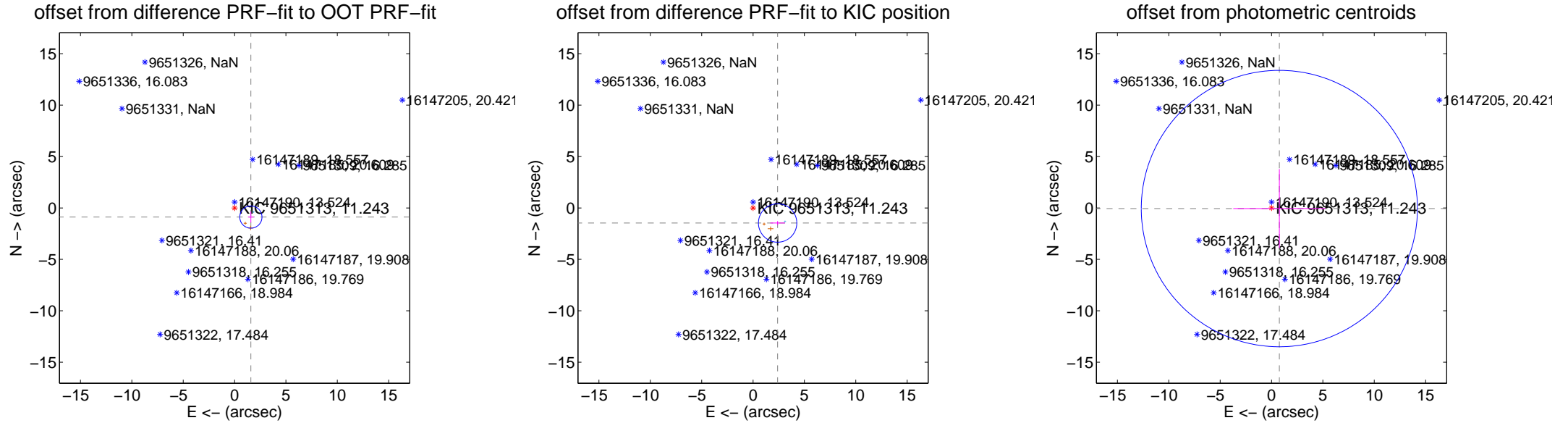
DV Centroid Data

Supplemental centroid analysis for 009651313-03. **Kepler magnitude: 11.24.** Transit SNR 16.76

There are 1 quarters with good PRF difference image offsets

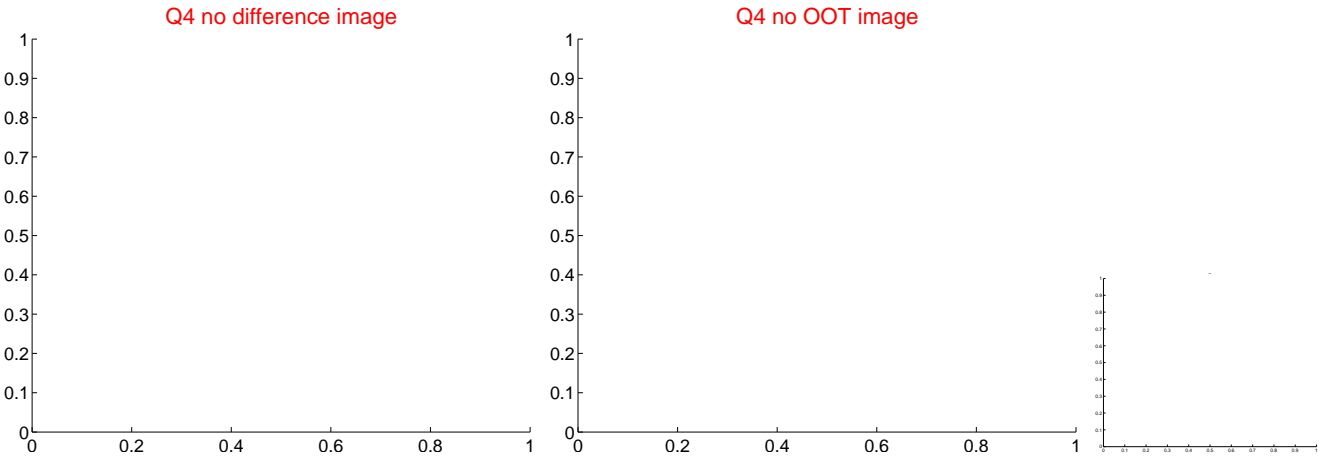
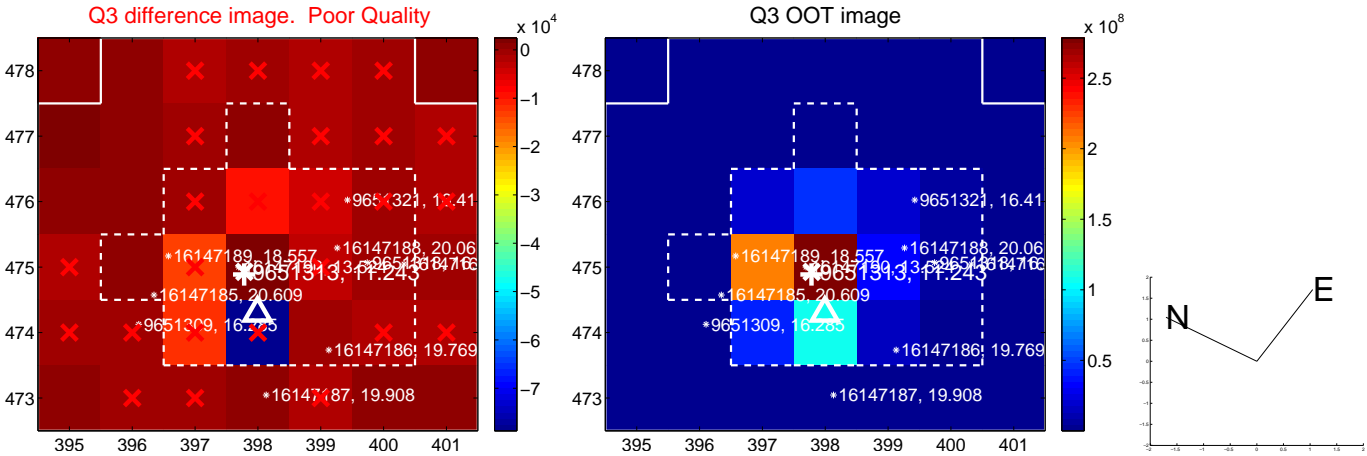
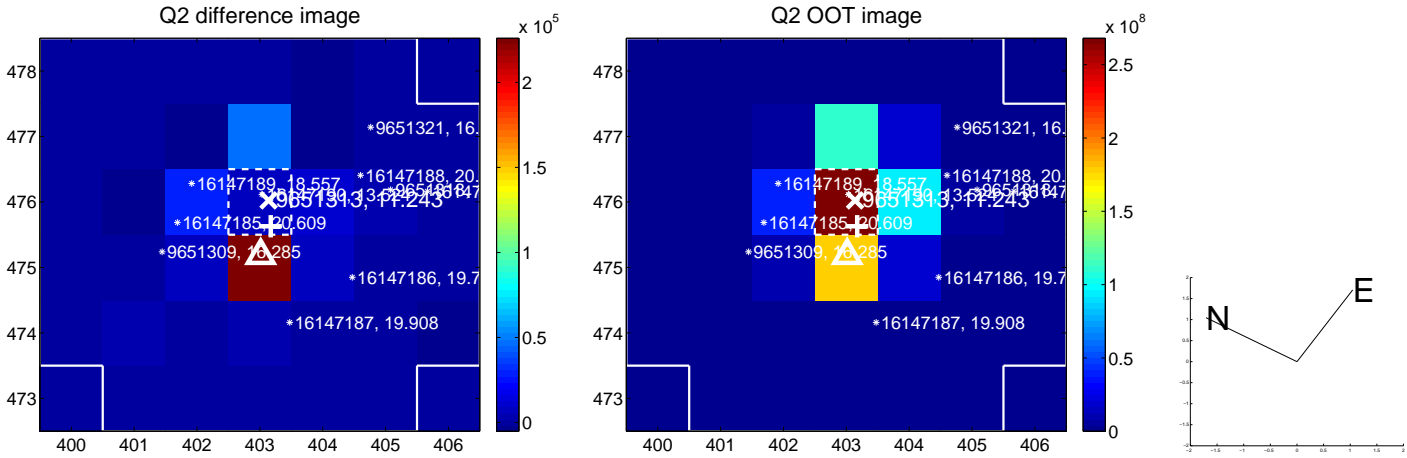
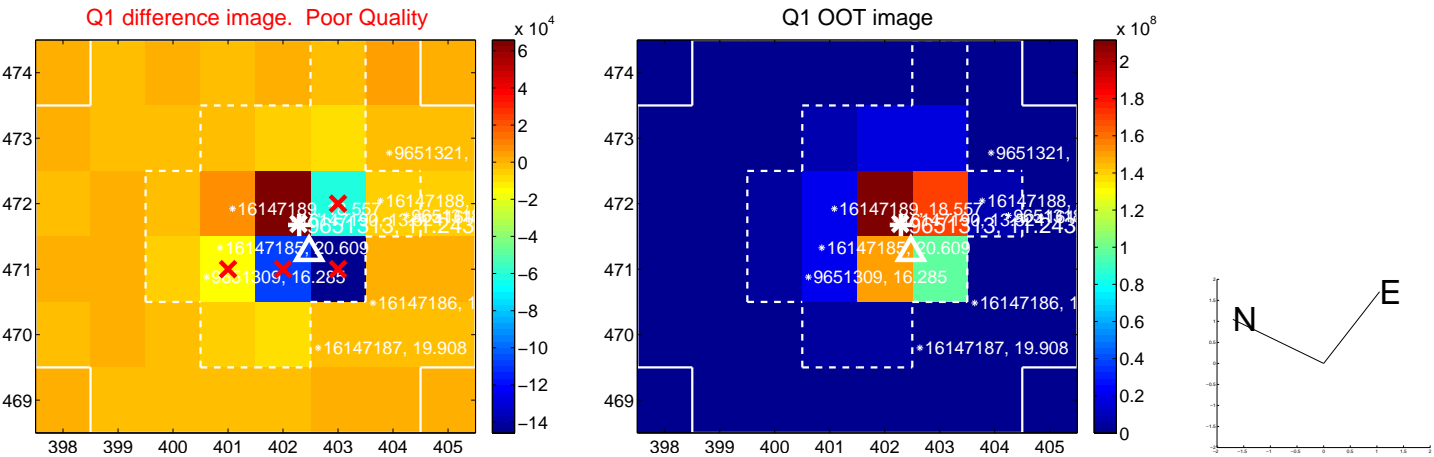
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.817 ± 0.360	5.04	-1.586 ± 0.282	-0.885 ± 0.539
PRF-fit source offset from KIC position	2.804 ± 0.623	4.50	-2.392 ± 0.721	-1.463 ± 0.182
photometric centroid source offset	0.76 ± 4.48	0.17	-0.76 ± 4.48	-0.06 ± 3.84

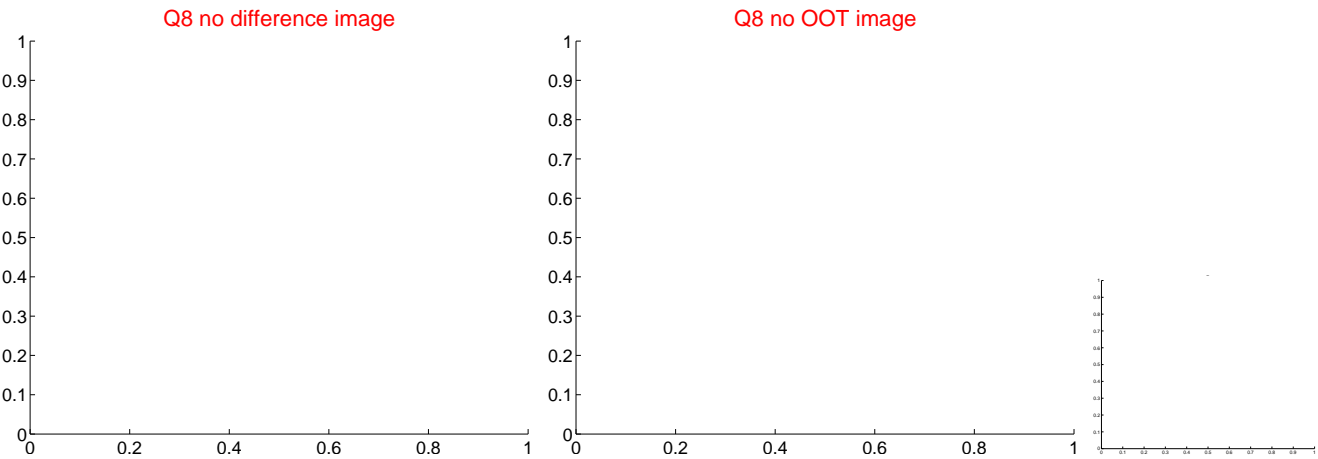
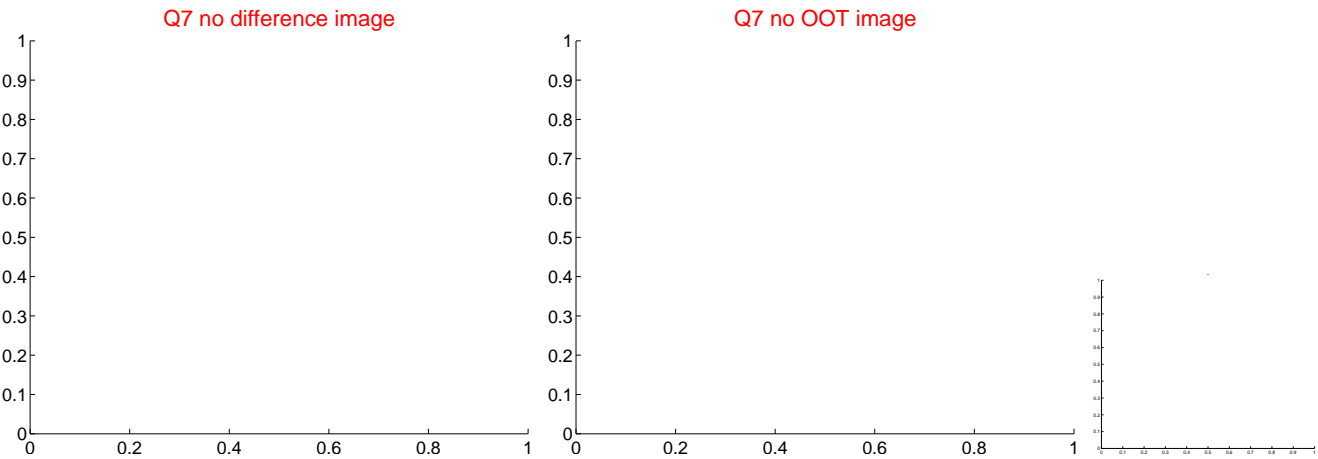
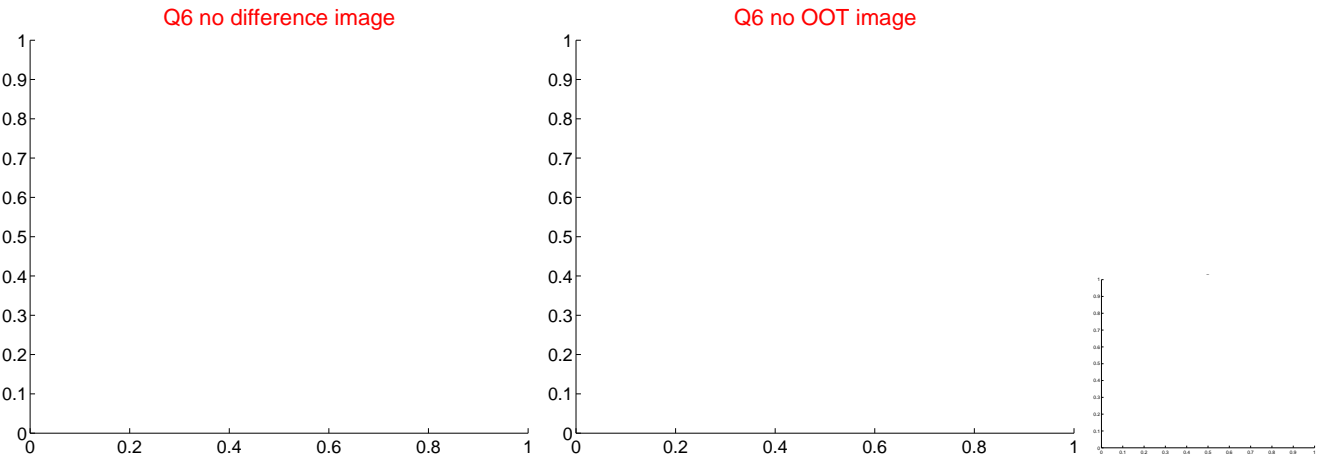
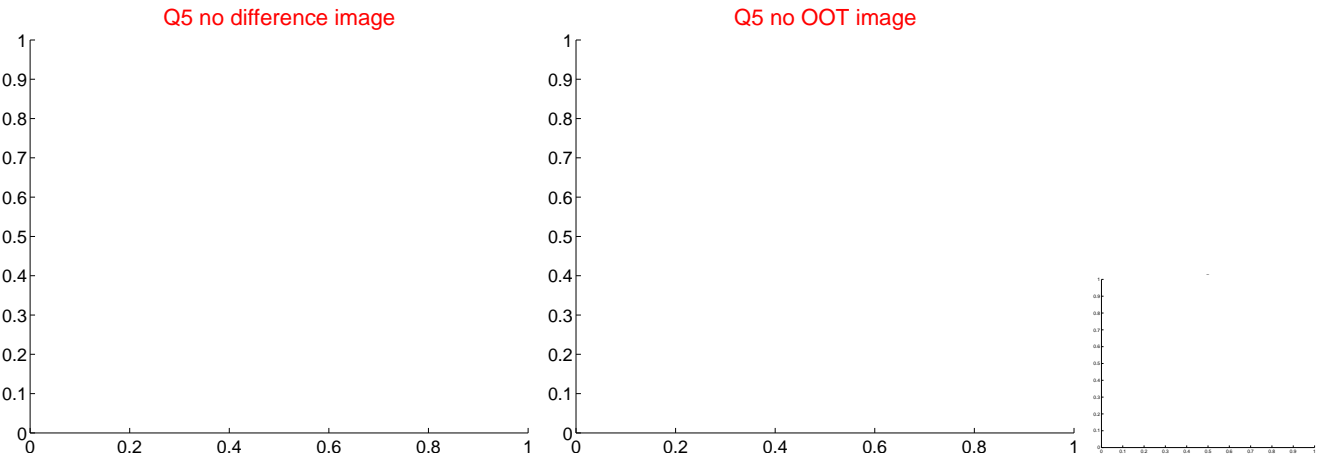


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



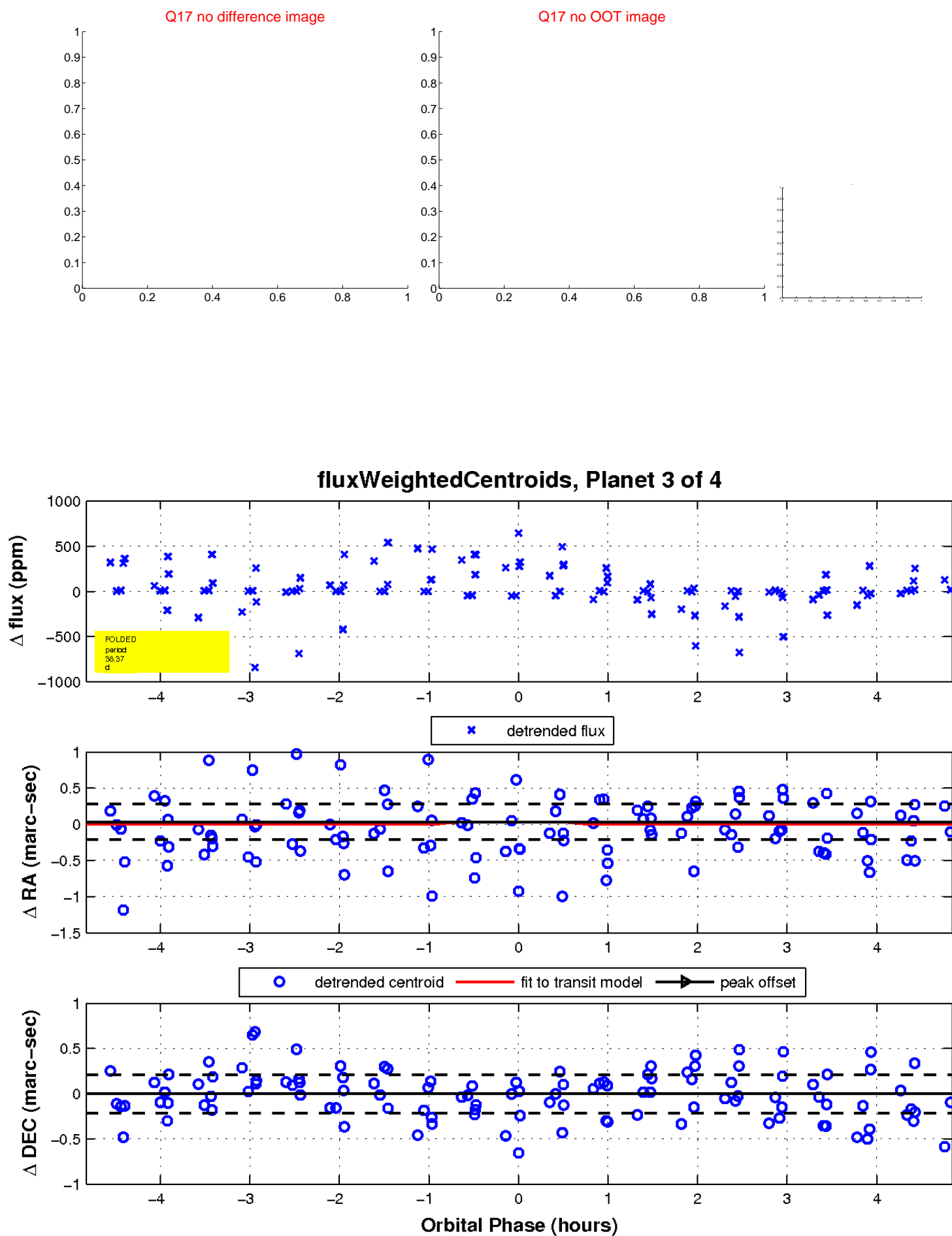
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



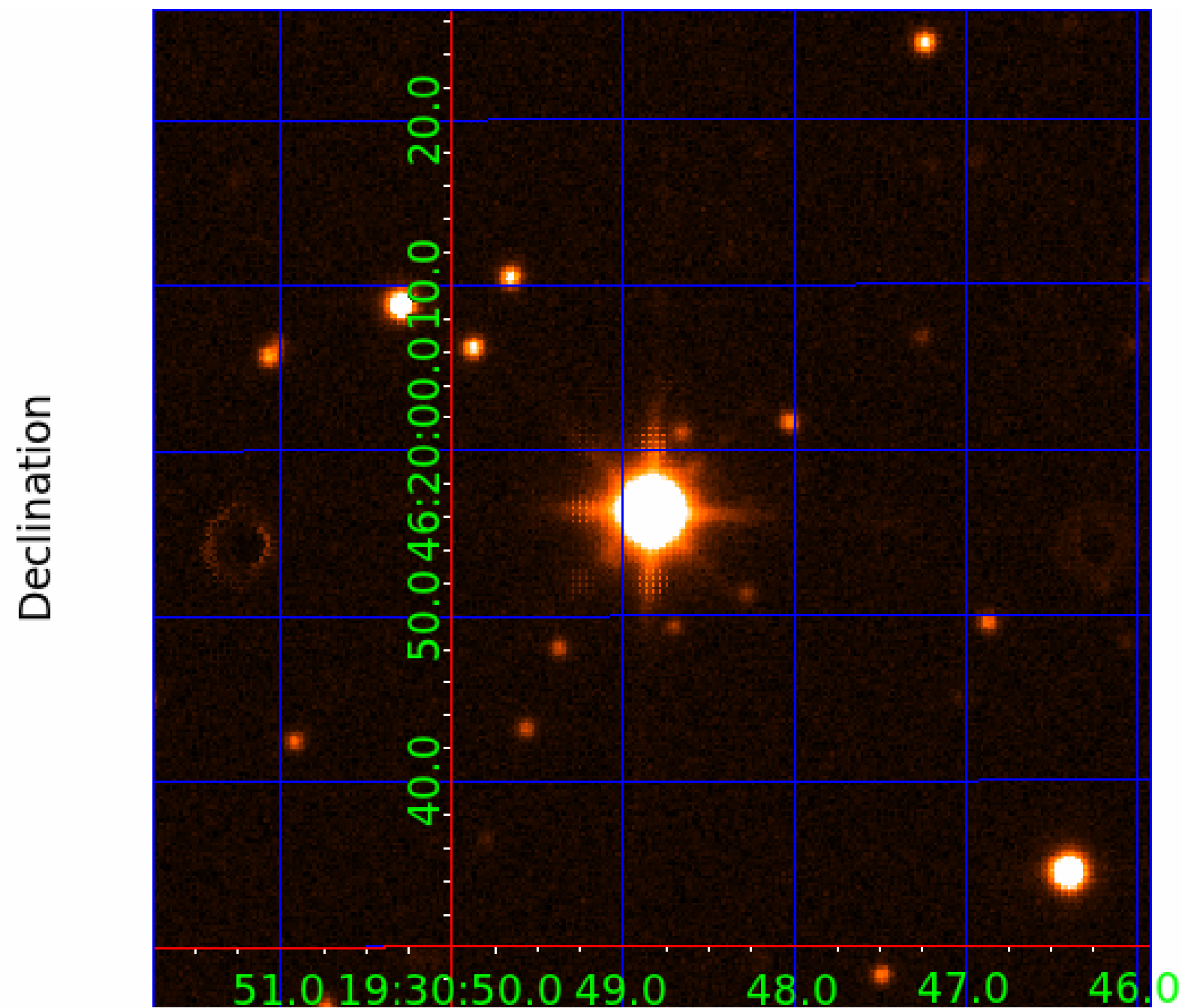
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009651313

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})
009651313-01	OBS	No	50.911328	135.157008	97.0	3.371	29.0	16.3	12.64	4706	14.99	499.22
009651313-02	OBS	No	67.605717	139.462920	84.4	10.935	16.3	12.7	12.64	4706	13.13	342.03
009651313-03	OBS	No	38.372532	149.088298	55.4	1.617	11.6	16.8	12.64	4706	12.03	727.81
009651313-04	OBS	No	45.937382	172.133985	58.8	1.536	11.3	16.0	12.64	4706	10.66	572.56

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651313-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED—HALO_GHOST
009651313-02	OBS	FP	0.00	1	0	0	0	LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED
009651313-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009651313-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

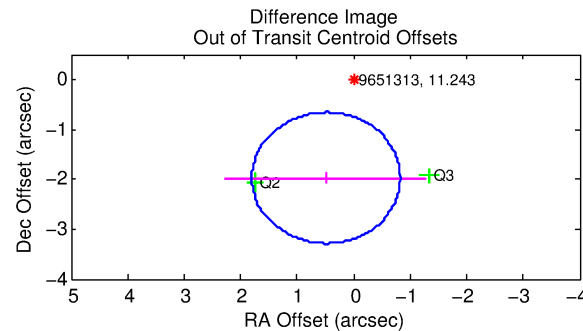
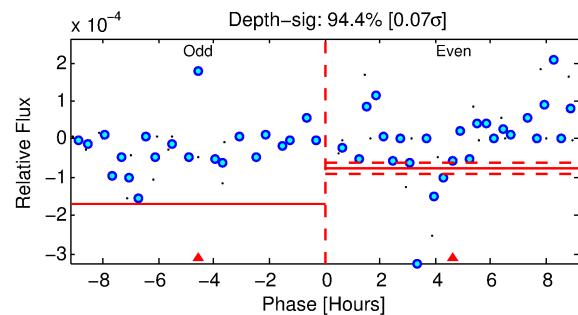
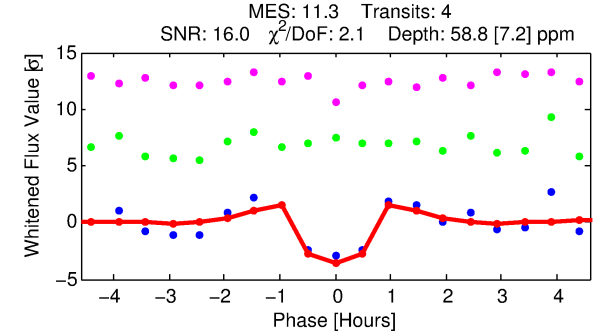
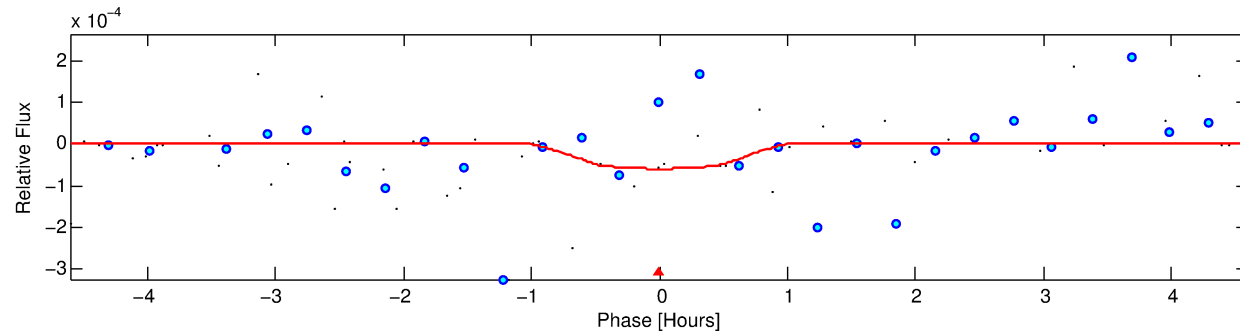
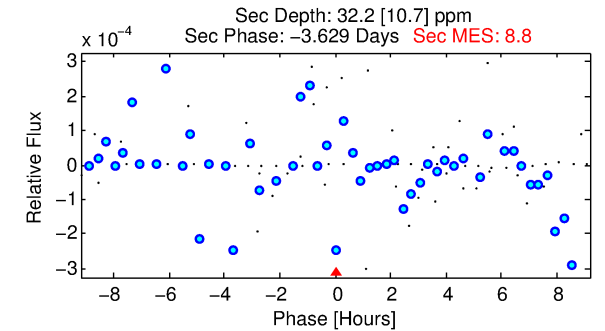
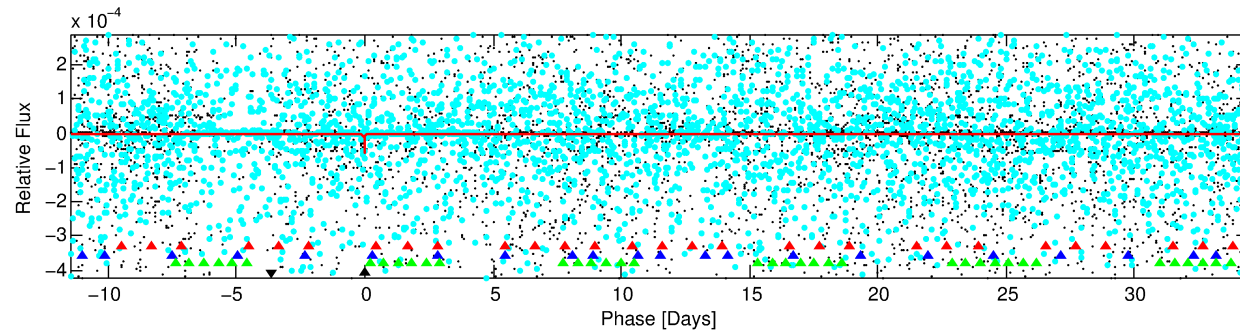
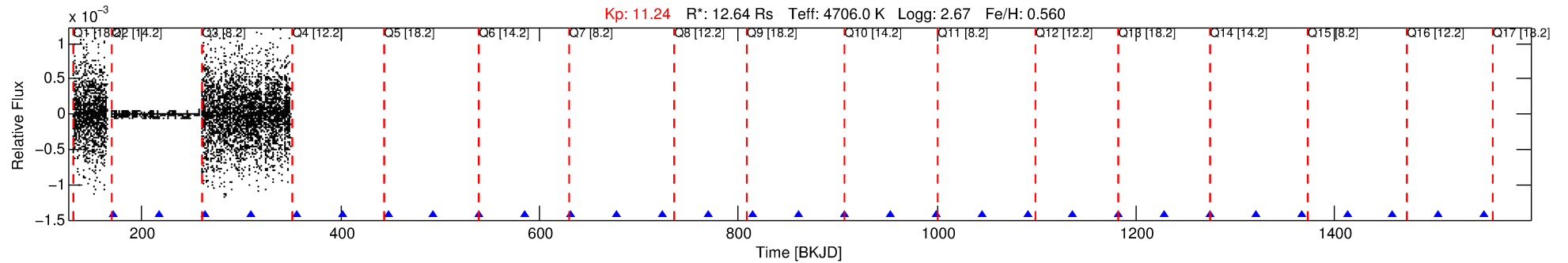
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009651313-04

No Significant Match Found

DV One-Page Summary

KIC: 9651313 Candidate: 4 of 4 Period: 45.937 d



DV Fit Results:

Period = 45.93738 [0.00532] d
Epoch = 172.1340 [0.0038] BKJD
Rp/R* = 0.0077 [0.0040]
a/R* = 152.91 [258.38]
b = 0.75 [0.97]
Seff = 572.56 [158.84]
Teq = 1247 [87] K
Rp = 10.66 [6.55] Re
a = 0.3502 [0.0759] AU
Ag = 19.09 [21.36] [0.85 σ]
Teffp = 4031 [1118] K [2.48 σ]

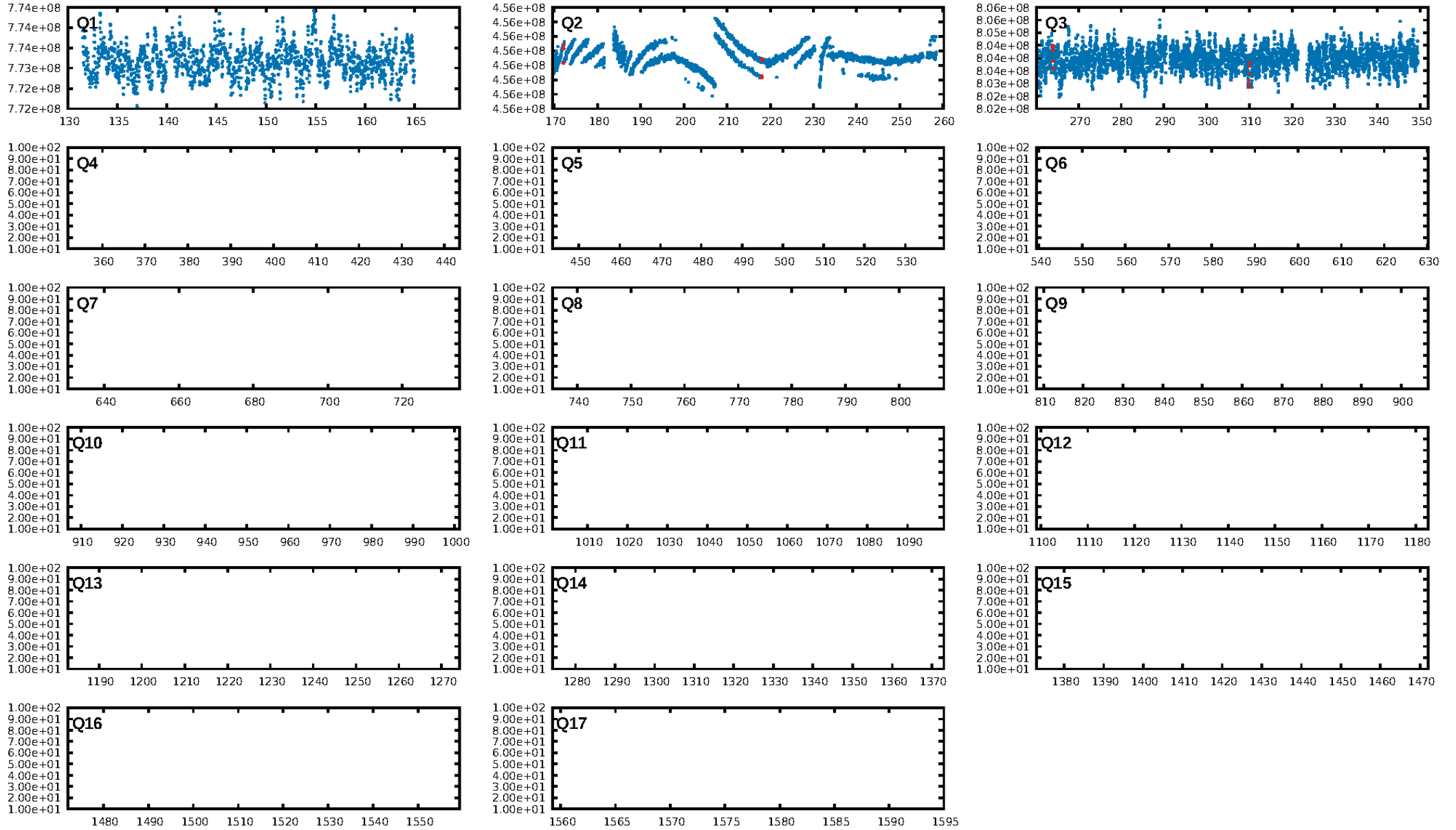
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [81.38 σ]
LongPeriod-sig: 100.0% [32.22 σ]
ModelChiSquare2-sig: 33.6%
ModelChiSquareGof-sig: 67.1%
Bootstrap-pfa: 2.43e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.2852
Centroid-sig: 53.7%
Centroid-so: 5.025 arcsec [0.78 σ]
OotOffset-rm: 2.035 arcsec [4.65 σ]
KicOffset-rm: 2.364 arcsec [4.11 σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

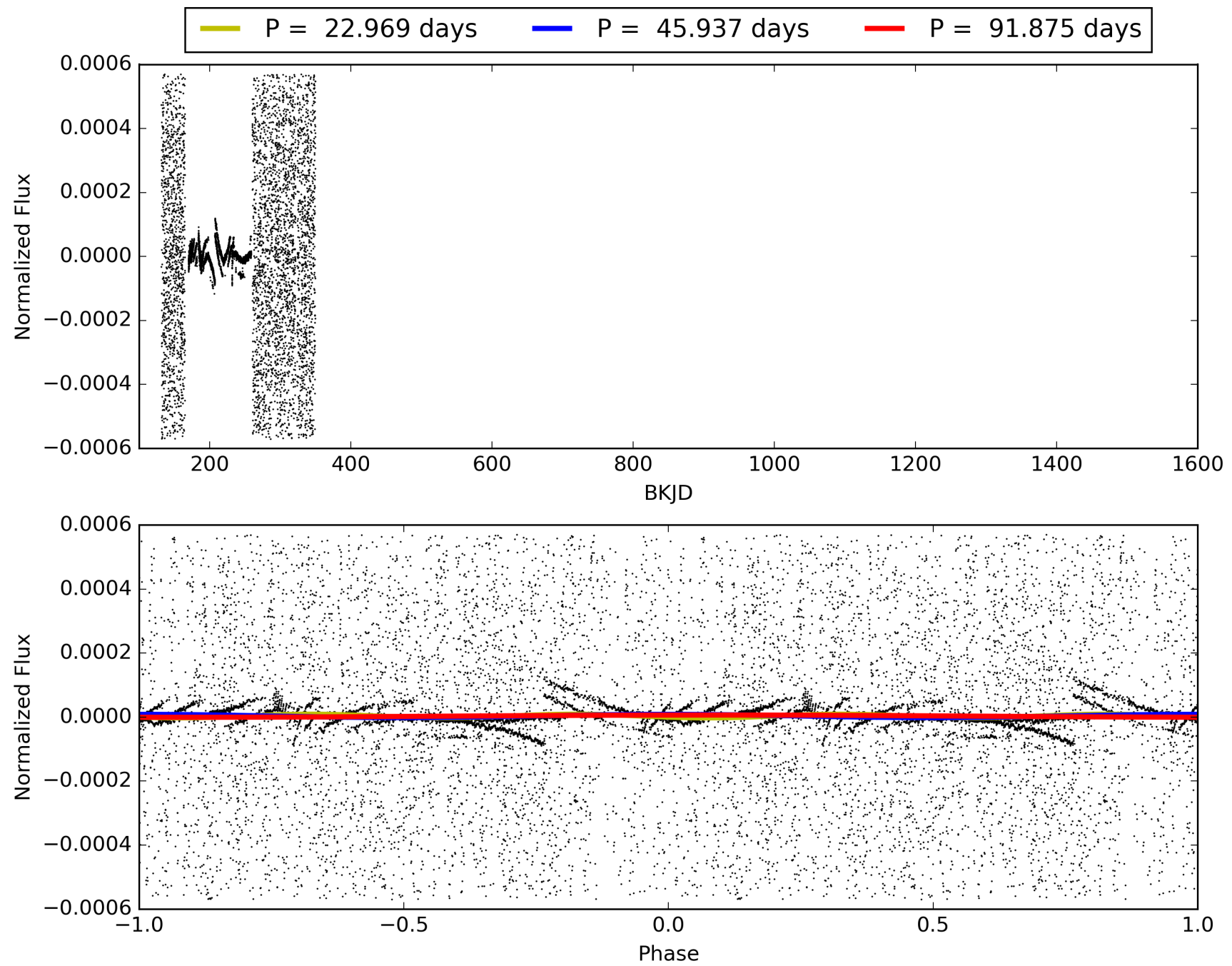
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:22:23 Z

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

TCE 009651313-04, PDC Light Curves

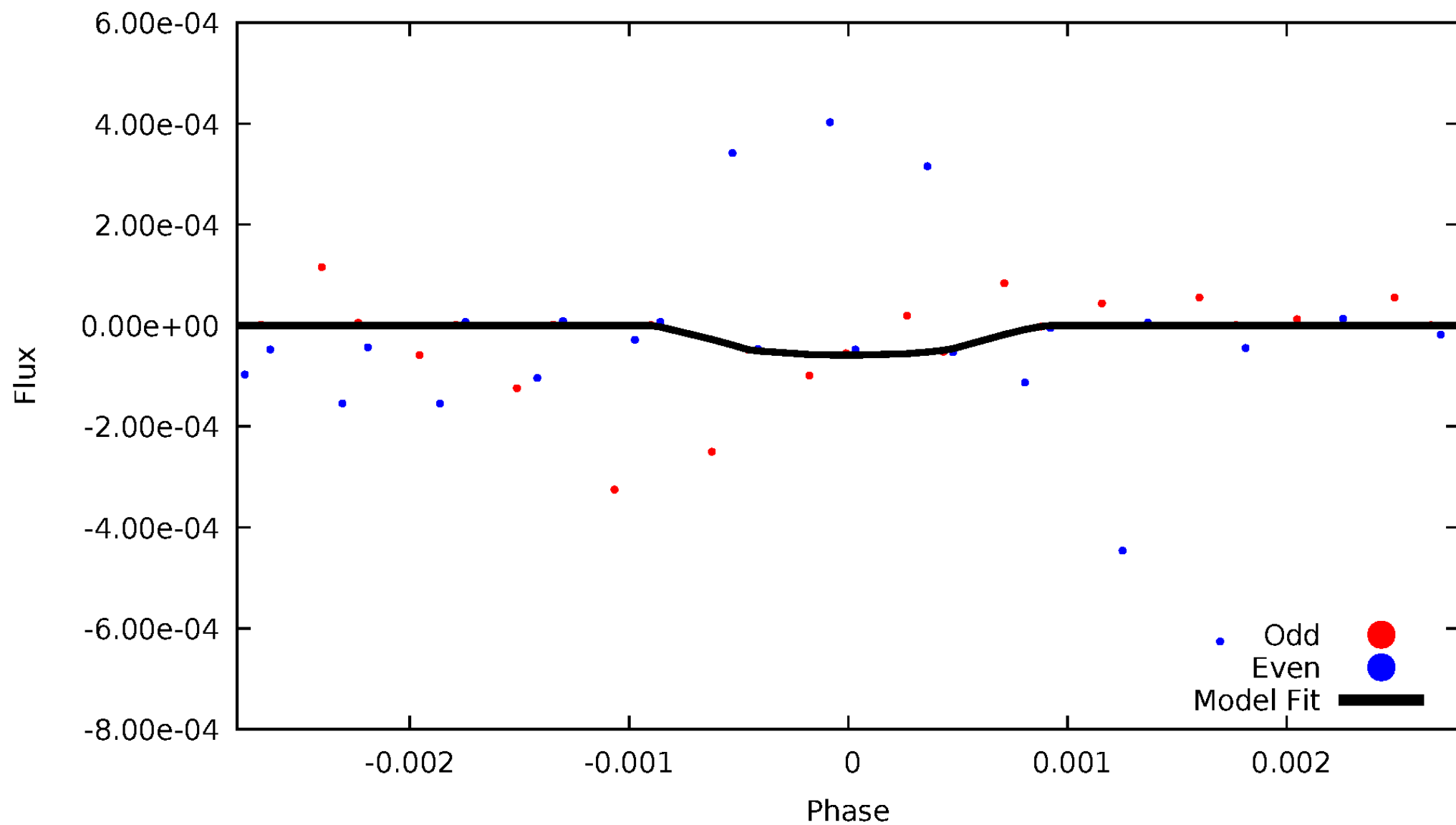


TCE 009651313-04



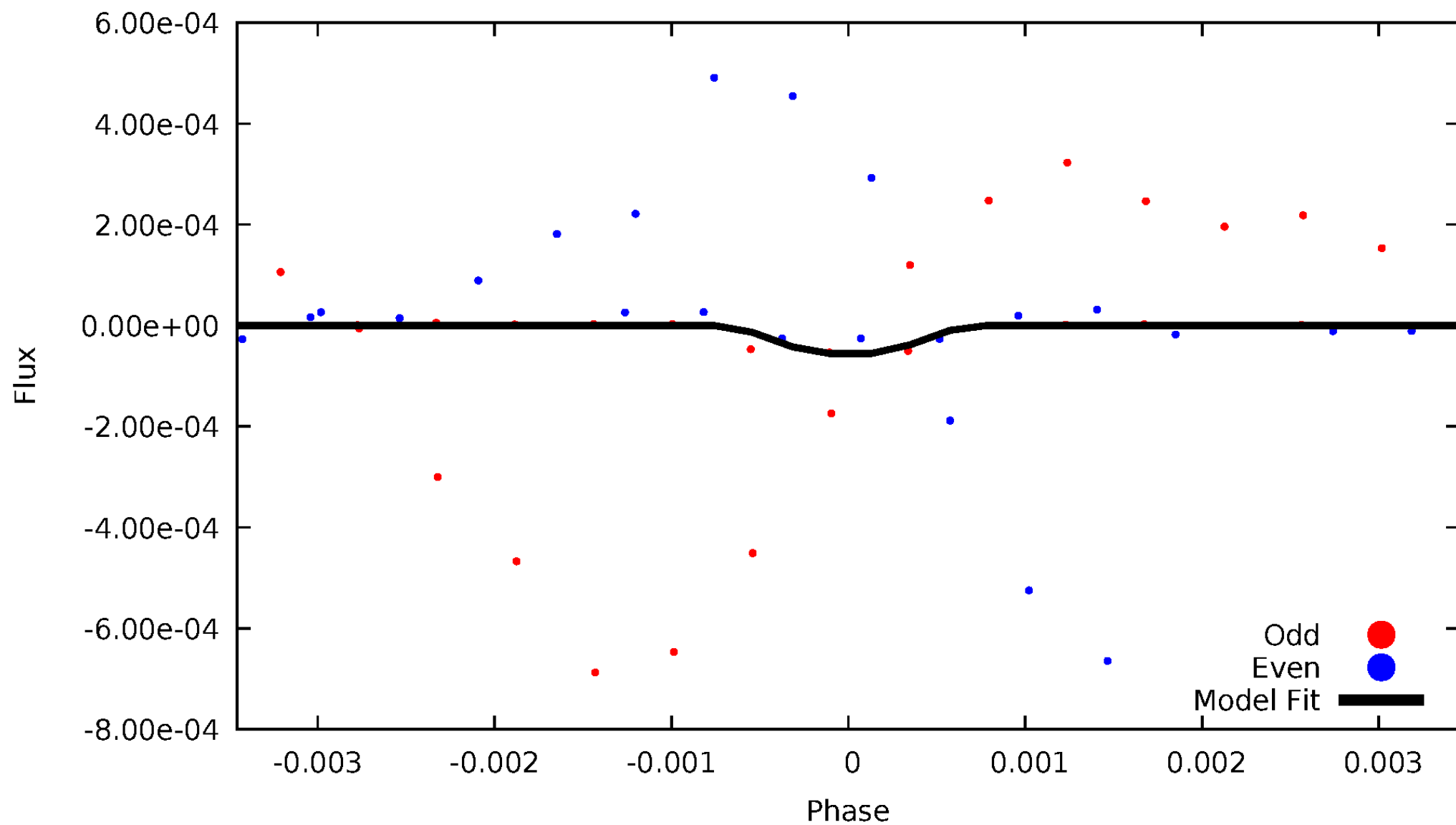
DV Odd/Even

TCE 009651313-04



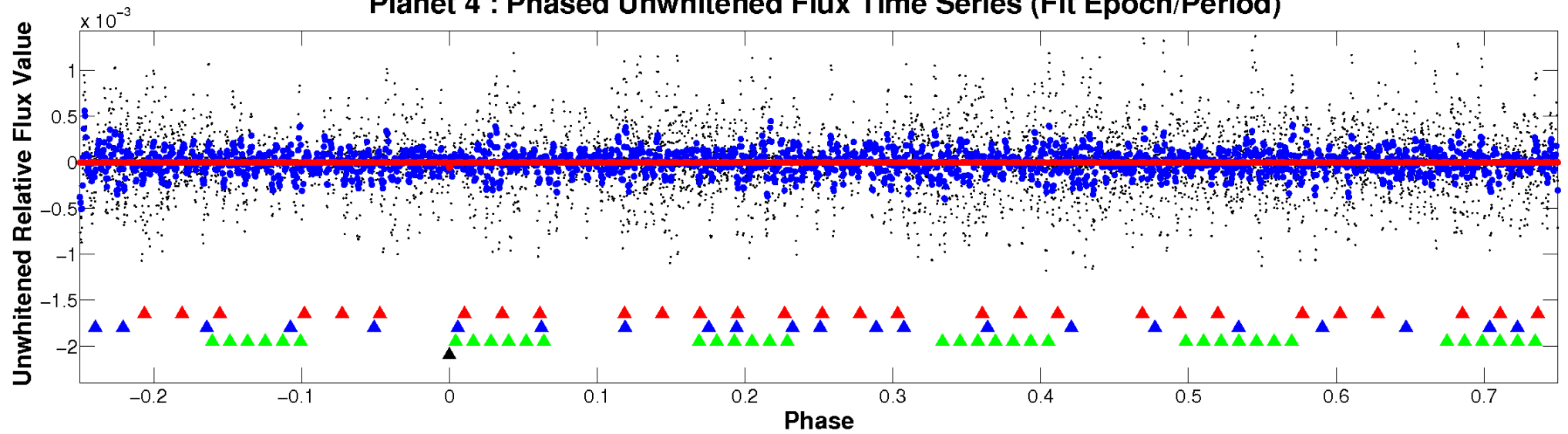
ALT Odd/Even

TCE 009651313-04

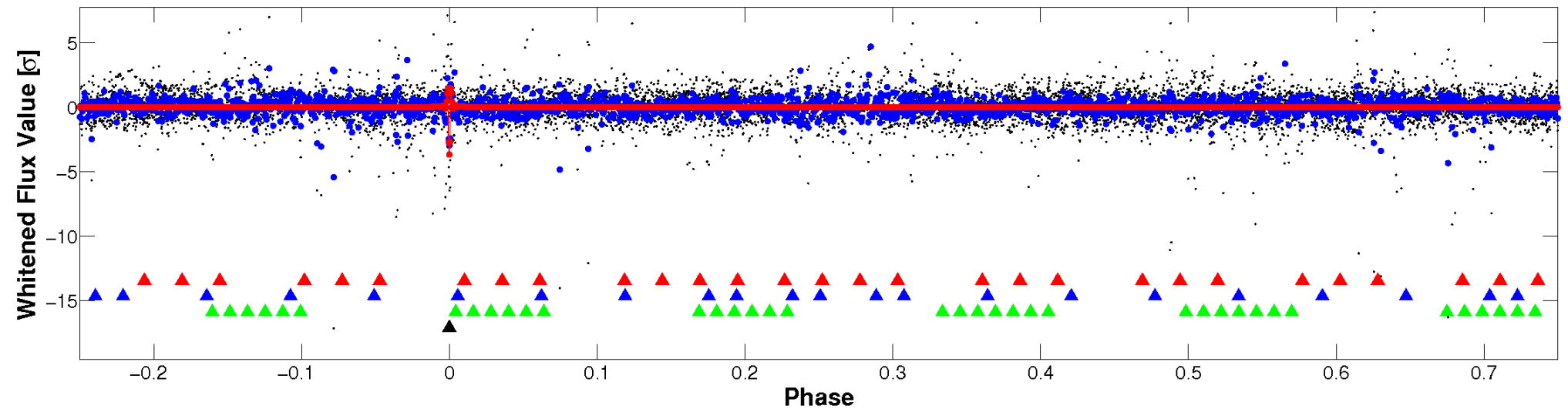


Non-Whitened Vs. Whitened Light Curve

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

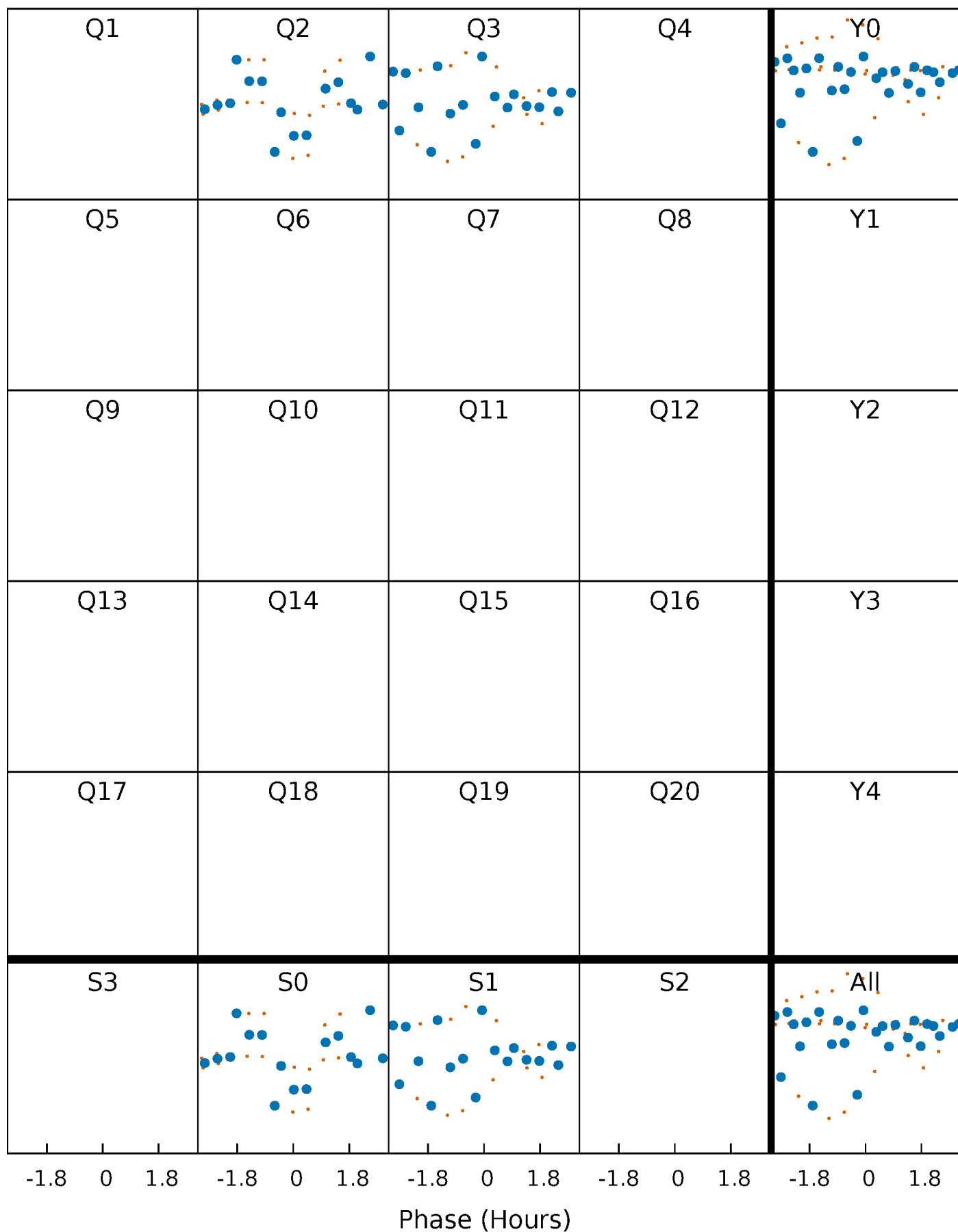


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



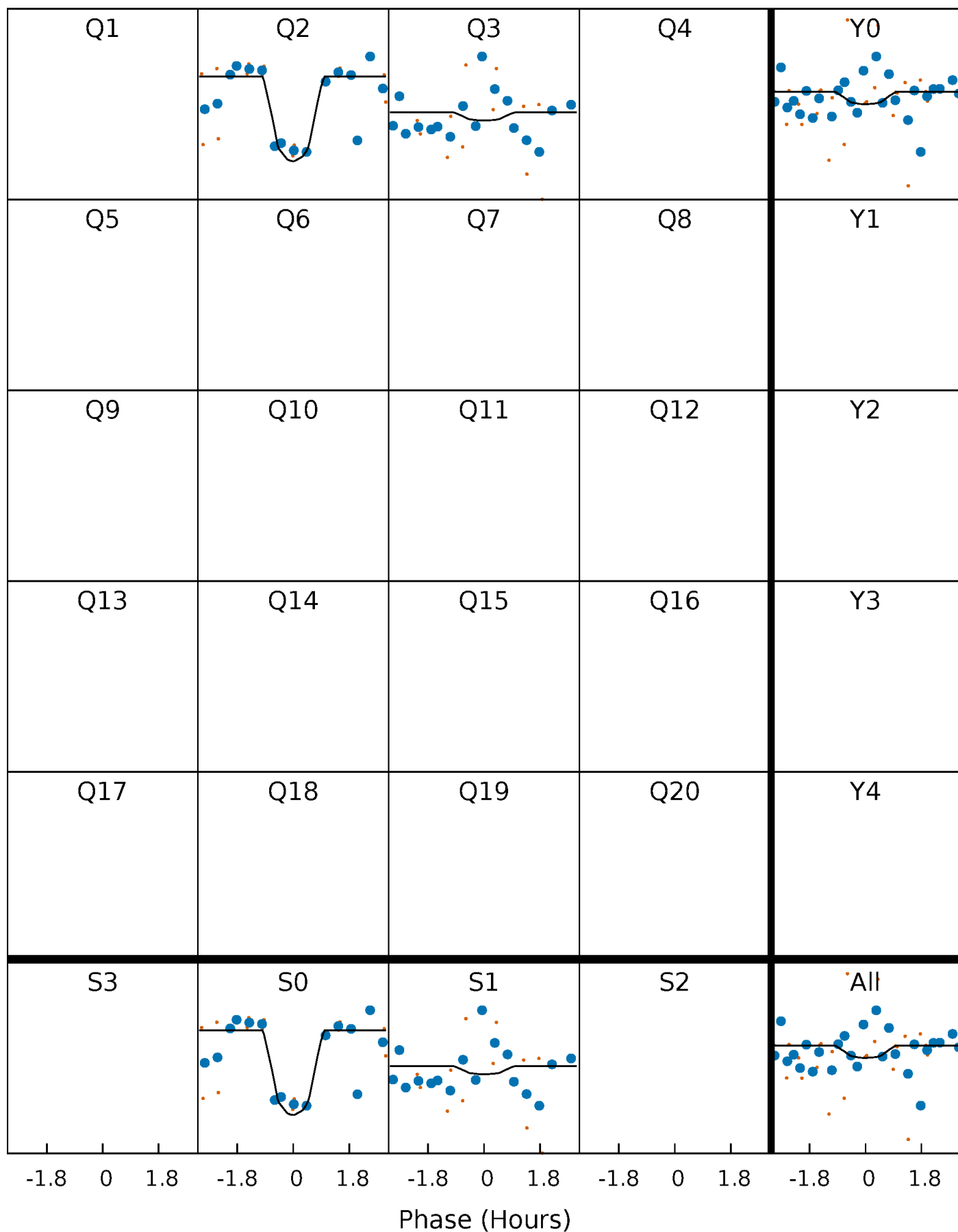
PDC Quarter-Phased Transit Curves

TCE 009651313-04 P= 45.937382 Days $T_0=172.133985$ (BKJD)



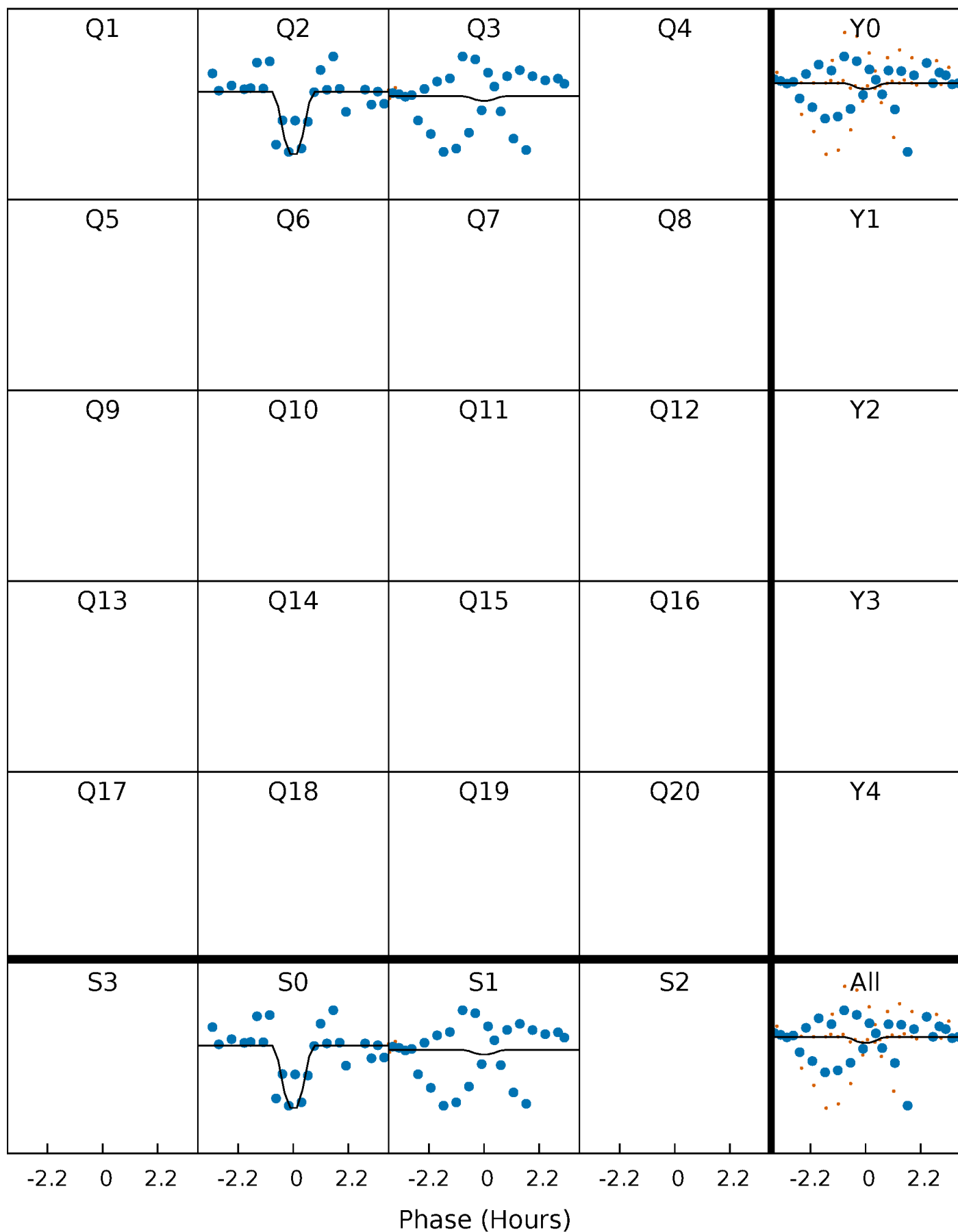
DV Quarter-Phased Transit Curves

TCE 009651313-04 P= 45.937382 Days $T_0=172.133985$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

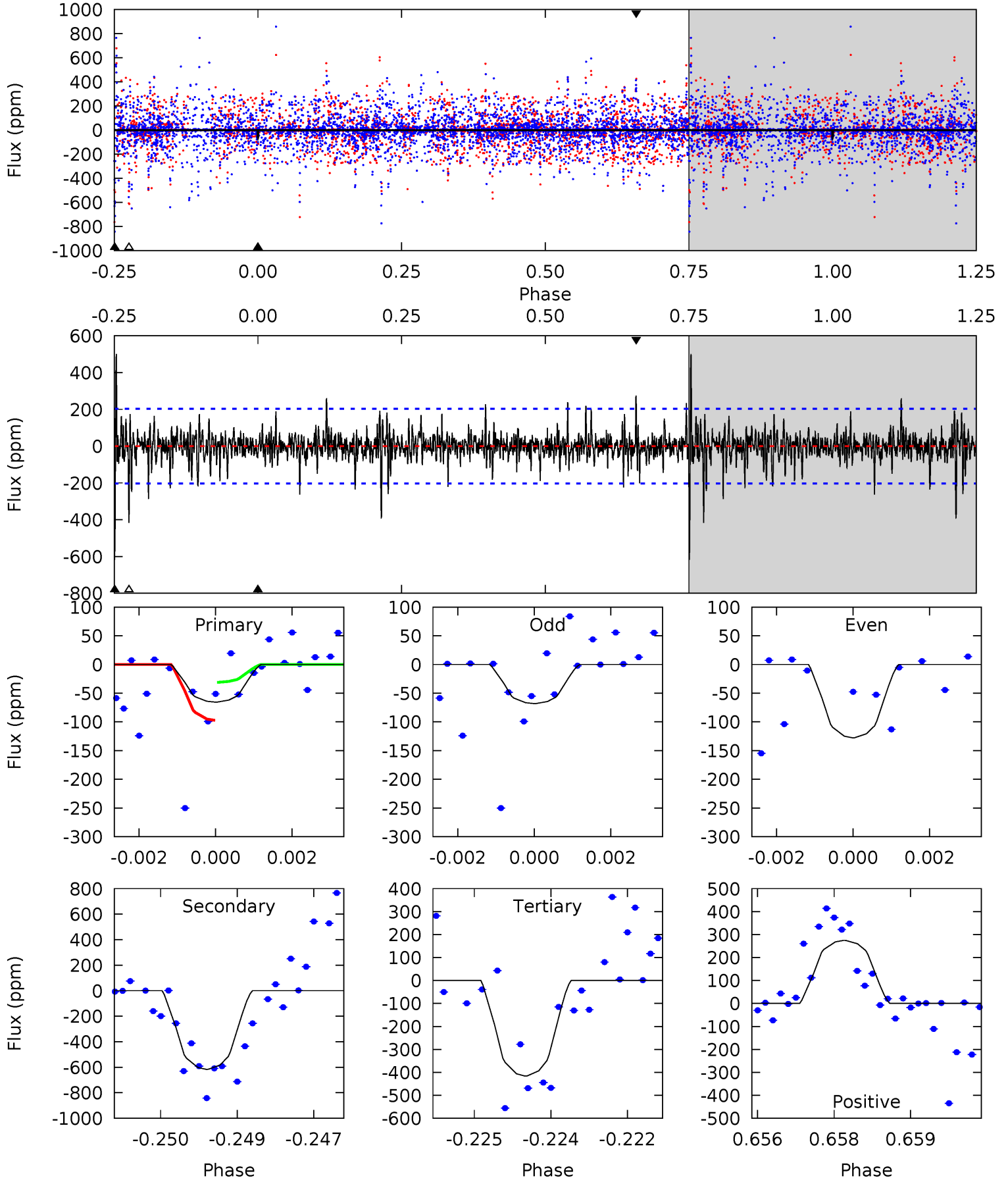
TCE 009651313-04 P= 45.943557 Days $T_0=172.132192$ (BKJD)



DV Model-Shift Uniqueness Test

009651313-04, P = 45.937382 Days, E = 126.196603 Days

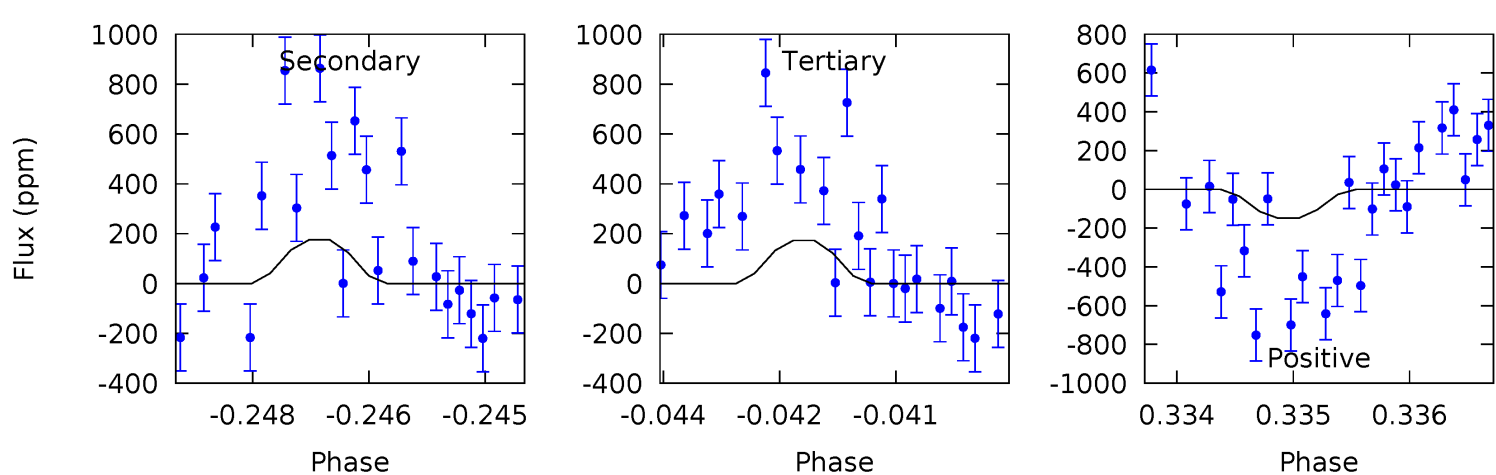
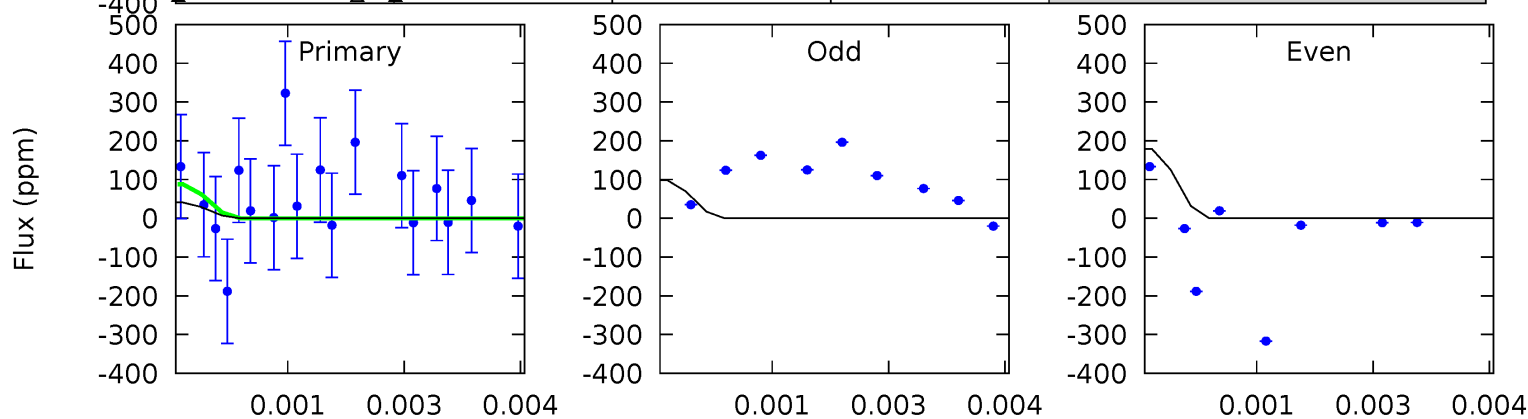
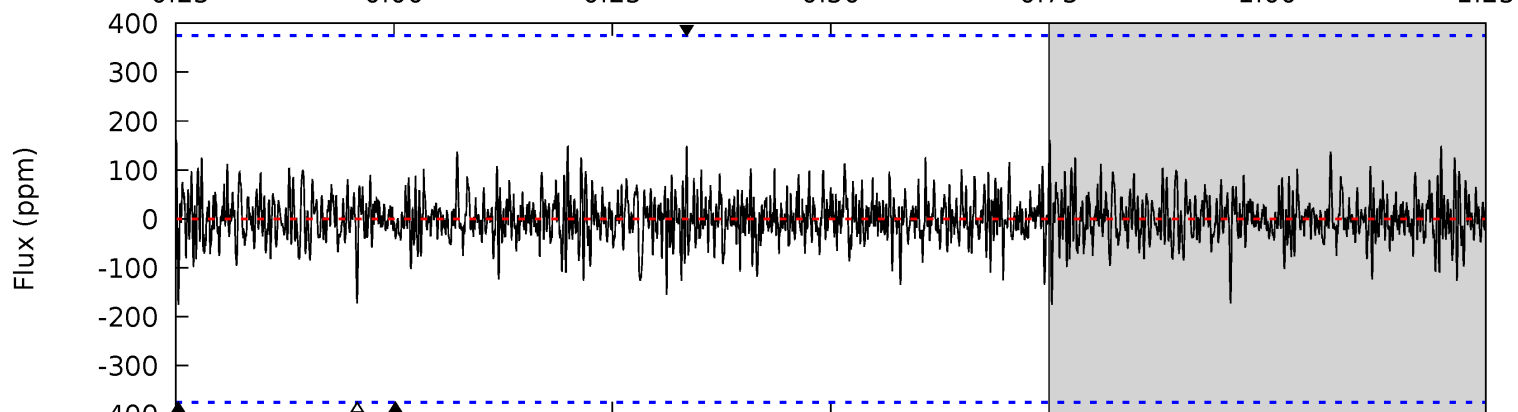
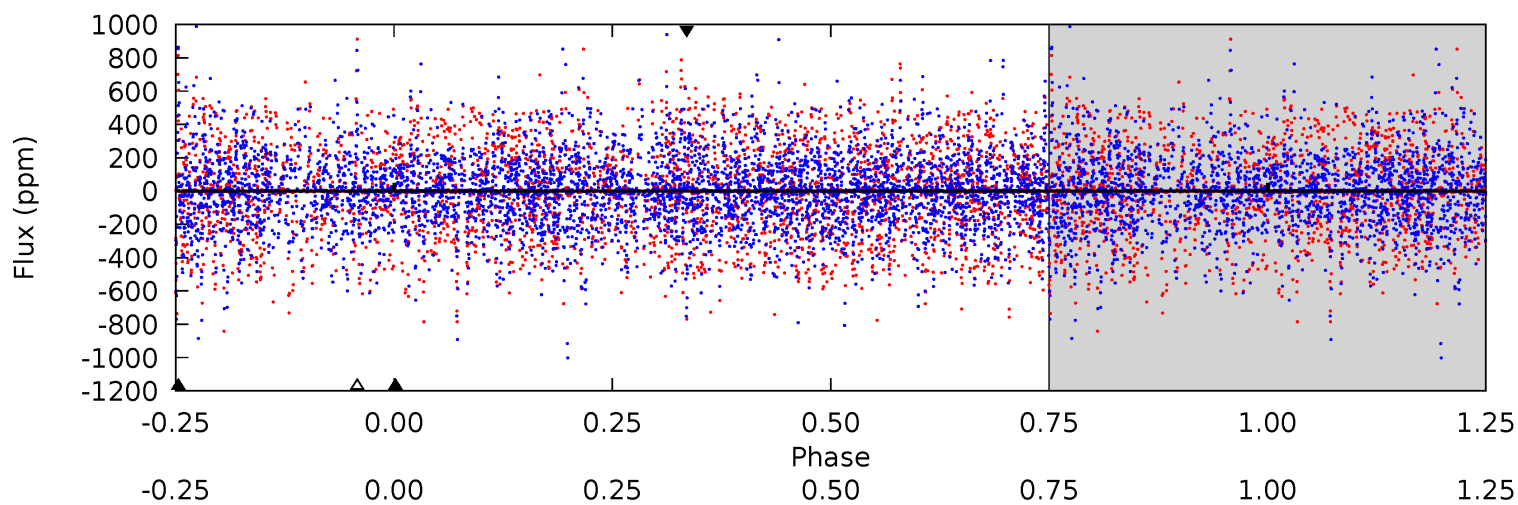
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.73	16.3	11.0	7.26	5.37	3.17	1.66	-9.27	-5.53	5.30	9.04	0.60	-0.92	0.45	0.87



Alt Model-Shift Uniqueness Test

009651313-04, P = 45.943557 Days, E = 126.188635 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.59	2.52	2.49	2.14	5.40	3.21	0.59	-1.90	-1.55	0.03	0.38	0.48	-0.75	0.48	0.39



Stellar Parameters For KIC 009651313

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4706^{+112}_{-197}	$2.668^{+0.030}_{-0.033}$	$0.560^{+0.050}_{-0.400}$	$12.642^{+0.721}_{-4.083}$	$2.712^{+0.163}_{-1.464}$	$0.002^{+0.001}_{-0.000}$
	+2%/-4%	+1%/-1%	+9%/-71%	+6%/-32%	+6%/-54%	+49%/-10%
Source	PHO1	AST9	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 009651313-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-616 ± 38	$11.02^{+5.42}_{-5.48}$	1741^{+53}_{-79}	8218^{+5475}_{-1638}	334^{+1008}_{-181}
Alt.	-175 ± 69	$10.64^{+5.40}_{-5.22}$	1740^{+56}_{-72}	5868^{+2794}_{-1171}	102^{+288}_{-63}

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 $A_{obs} \gg 1.0$

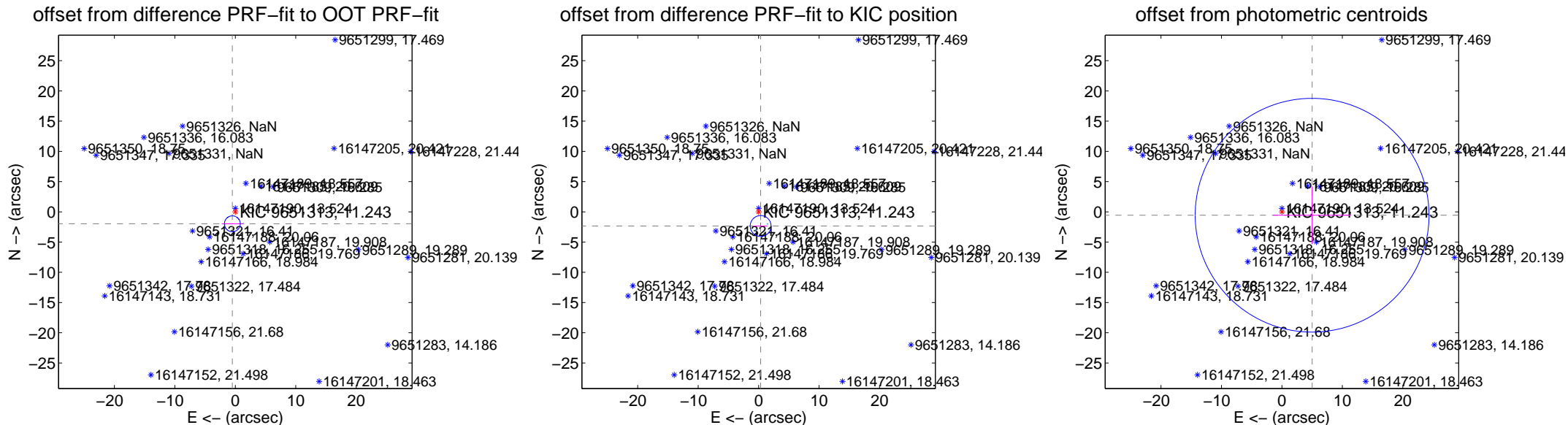
DV Centroid Data

Supplemental centroid analysis for 009651313-04. **Kepler magnitude: 11.24.** Transit SNR 15.99

There are 2 quarters with good PRF difference image offsets

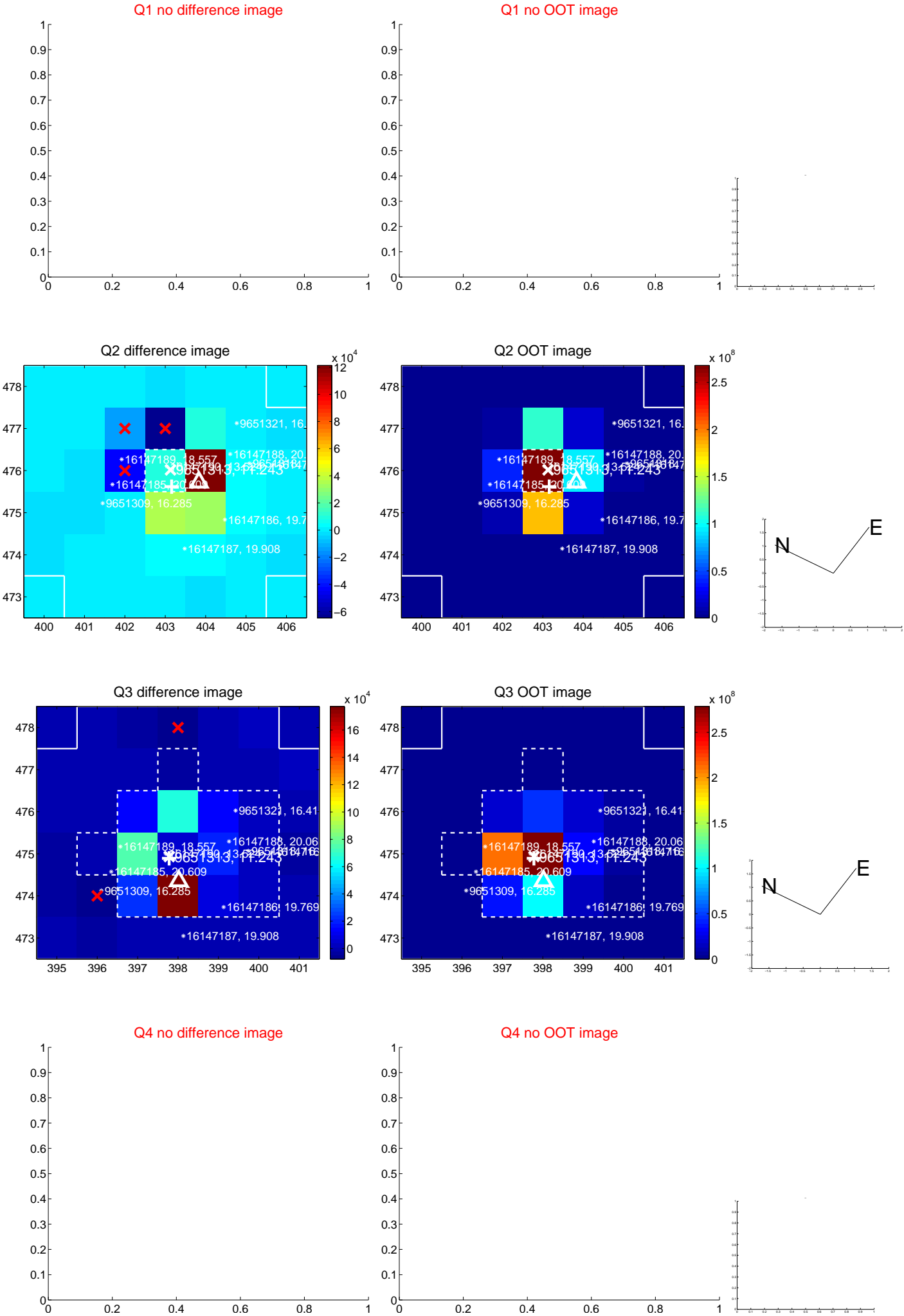
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.035 \pm 0.438	4.65	0.488 \pm 1.774	-1.975 \pm 0.106
PRF-fit source offset from KIC position	2.364 \pm 0.575	4.11	-0.337 \pm 1.117	-2.340 \pm 0.558
photometric centroid source offset	5.03 \pm 6.44	0.78	-4.99 \pm 6.46	-0.56 \pm 4.76

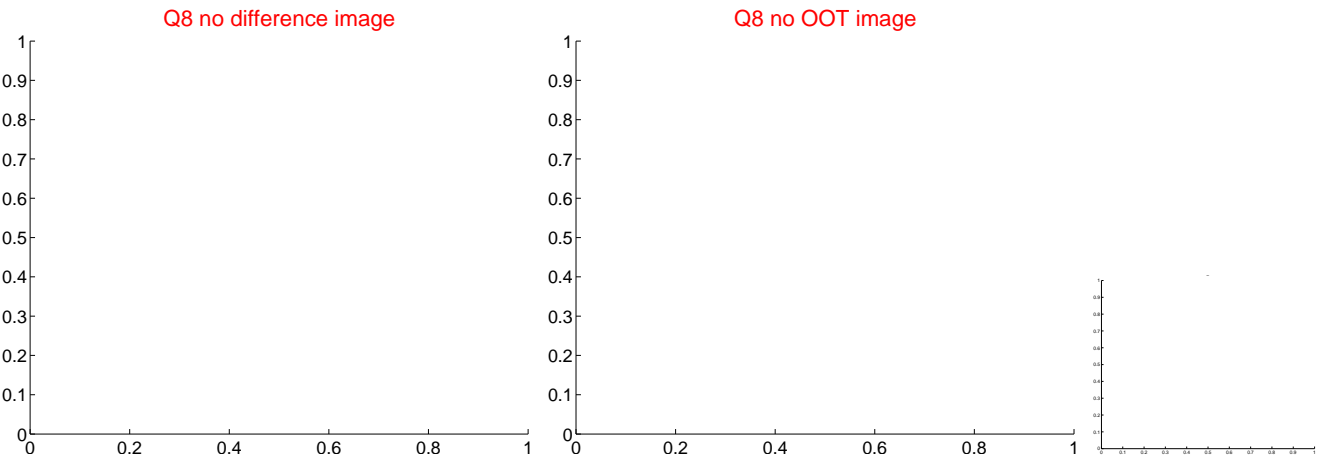
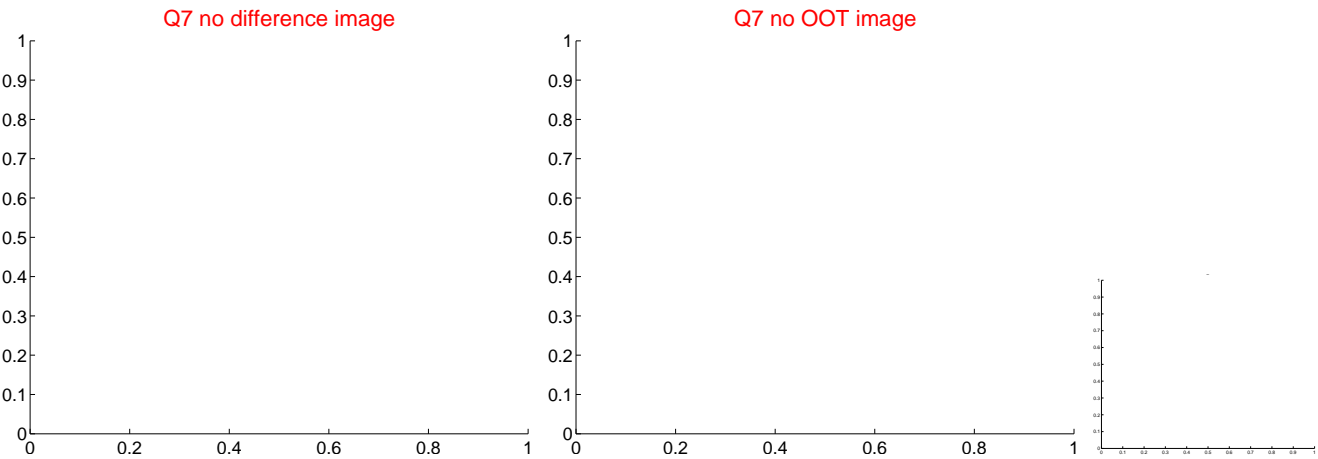
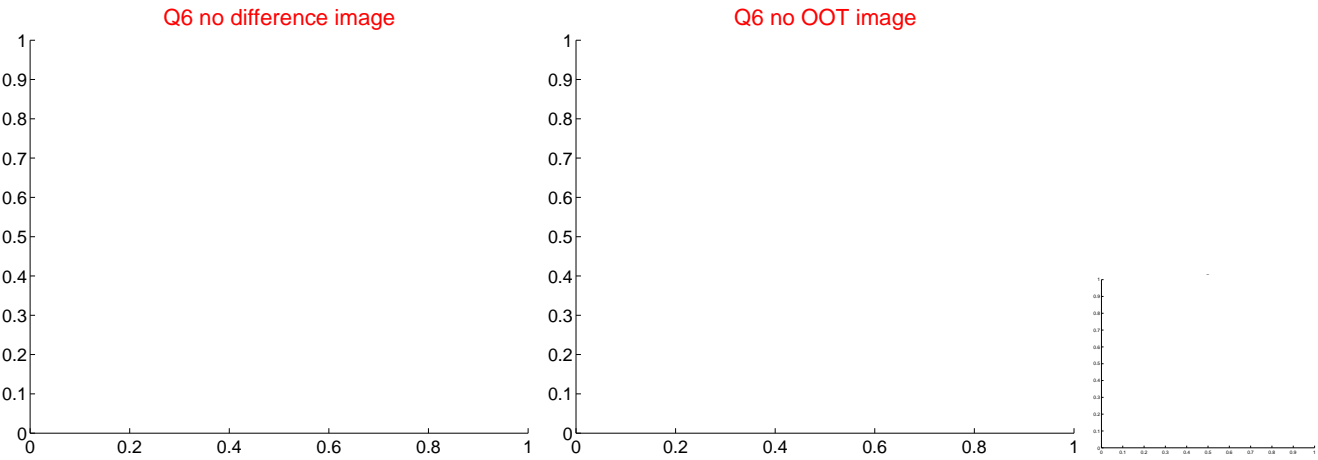
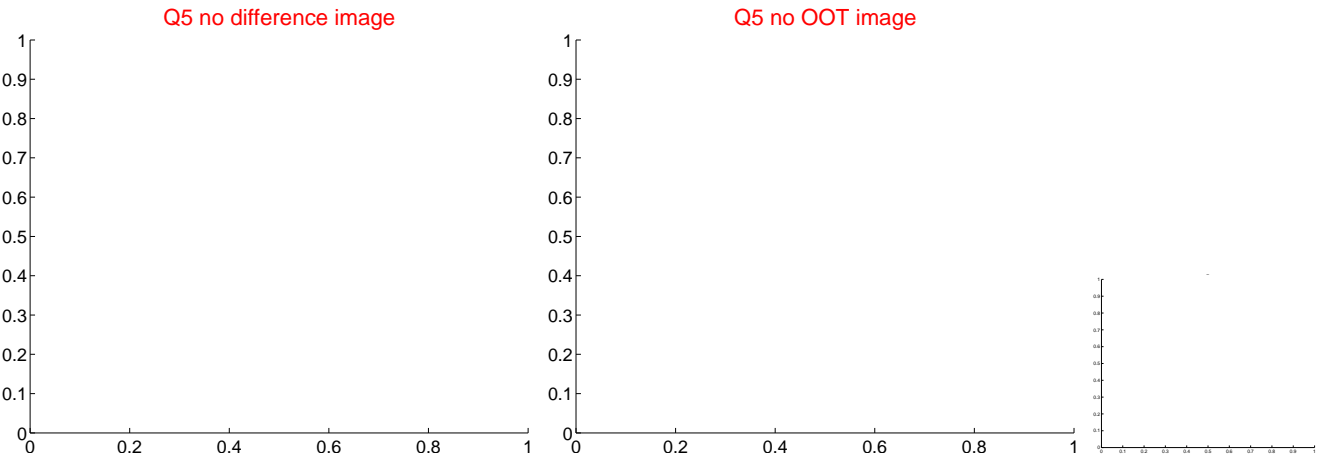


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

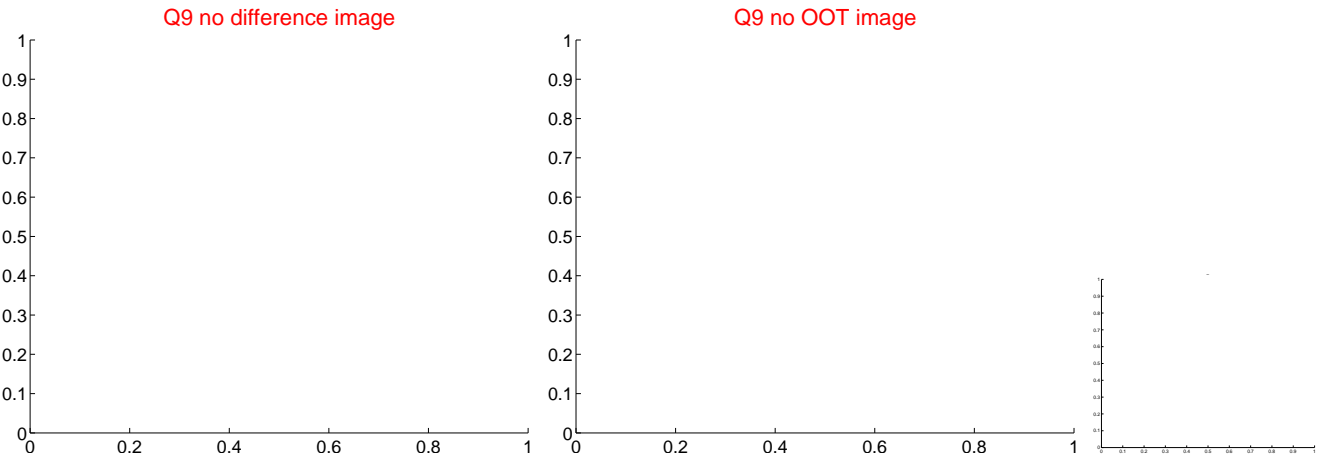
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



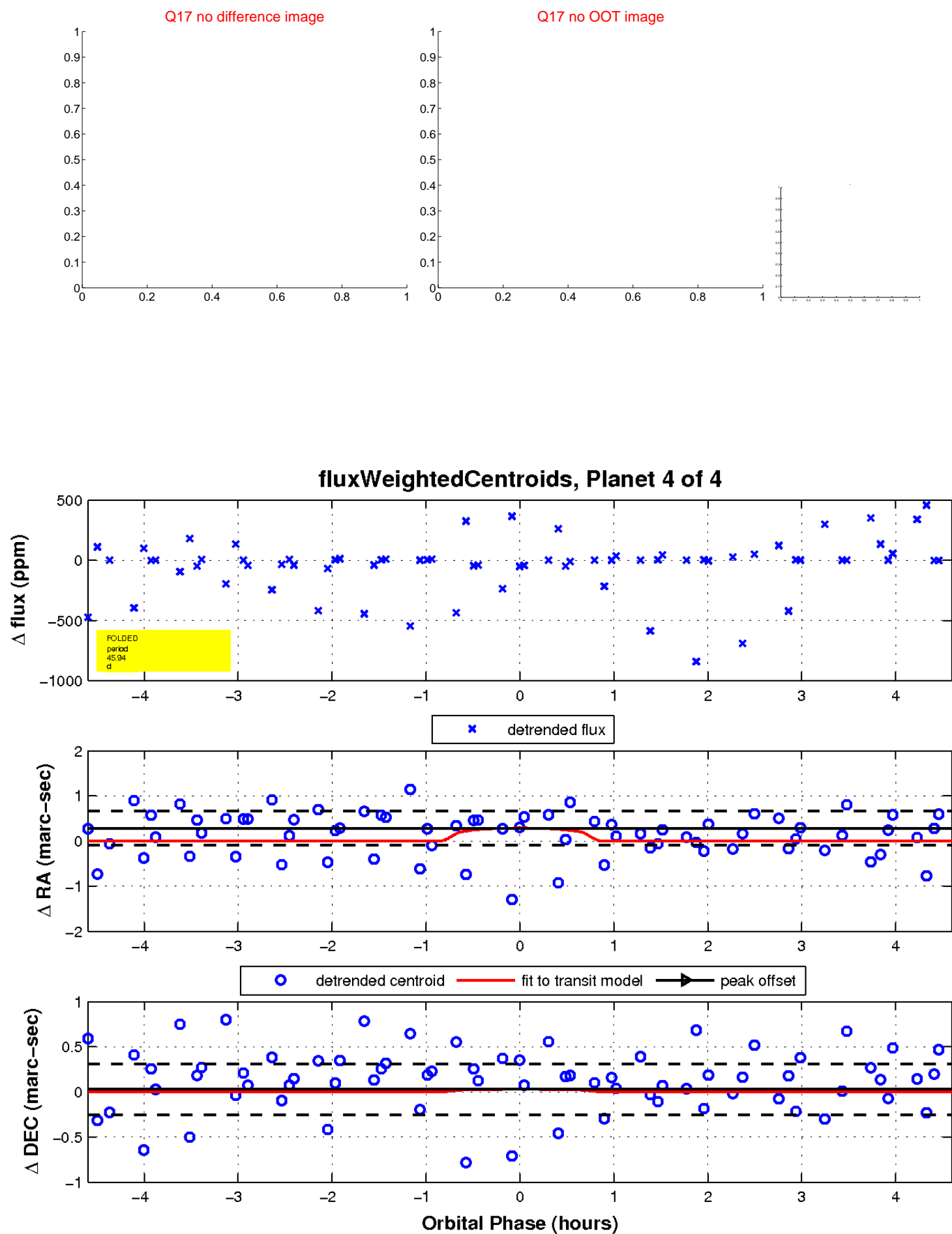
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

