

KIC 002308761

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})
002308761-01	OBS	No	291.620142	312.365620	905.4	3.155	14.5	6.6	1.00	5780	3.29	1.35
002308761-02	OBS	No	470.700257	508.968275	1767.8	4.720	14.8	9.4	1.00	5780	4.16	0.71
002308761-03	OBS	No	159.607412	207.002511	777.9	2.909	12.2	6.4	1.00	5780	2.83	3.01
002308761-04	OBS	No	431.661160	232.811047	1167.5	4.899	17.0	6.0	1.00	5780	3.47	0.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002308761-01	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—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
002308761-04	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—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

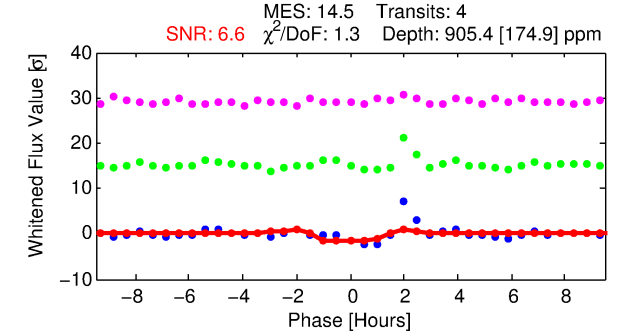
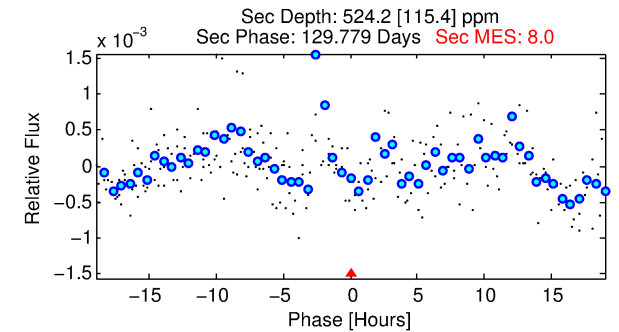
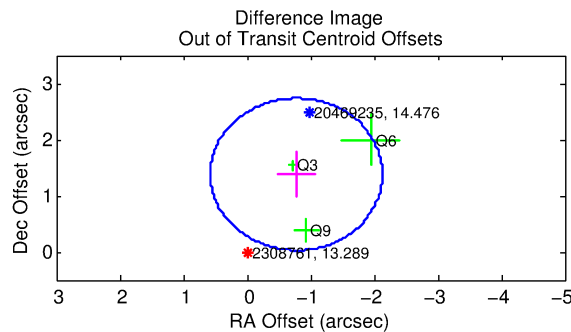
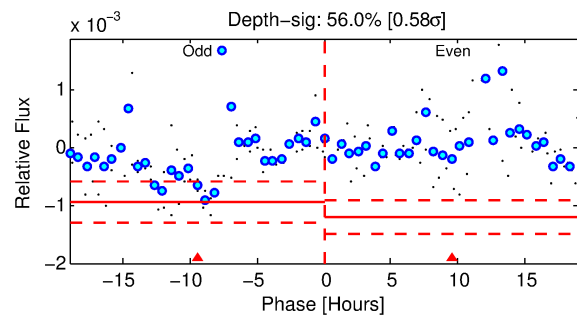
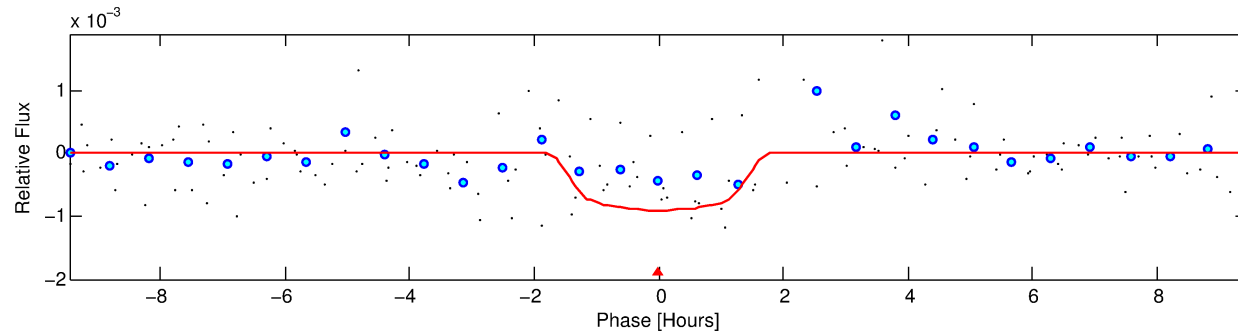
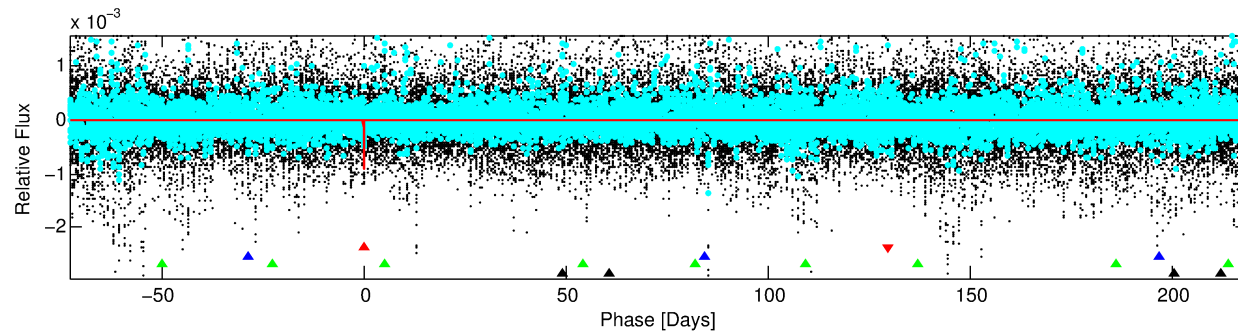
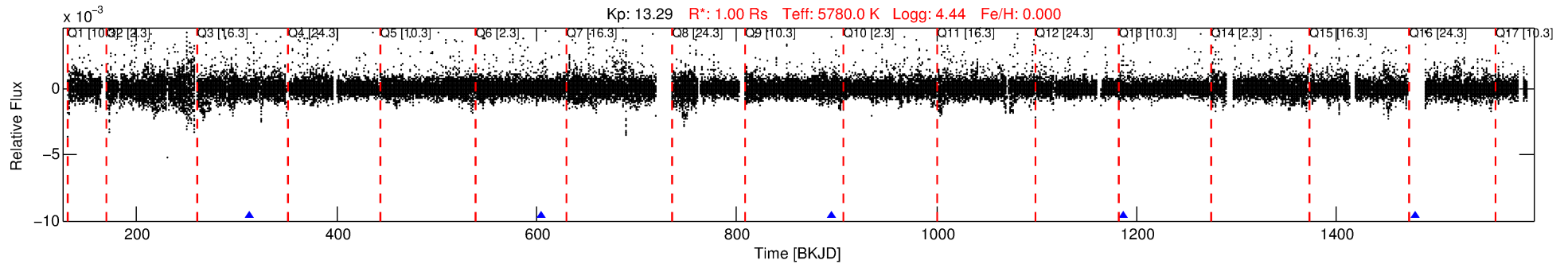
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002308761-01

No Significant Match Found

DV One-Page Summary

KIC: 2308761 Candidate: 1 of 4 Period: 291.620 d



DV Fit Results:

Period = 291.62014 [0.00397] d
Epoch = 312.3656 [0.0079] BKJD
Rp/R* = 0.0302 [0.0975]
a/R* = 486.76 [6992.19]
b = 0.77 [7.91]
Seff = 1.35 [0.00]
Teq = 275 [0] K
Rp = 3.29 [10.64] Re
a = 0.8608 [0.0000] AU
Ag = 19720.51 [127532.57] [0.15 σ]
Teffp = 5035 [8141] K [0.58 σ]

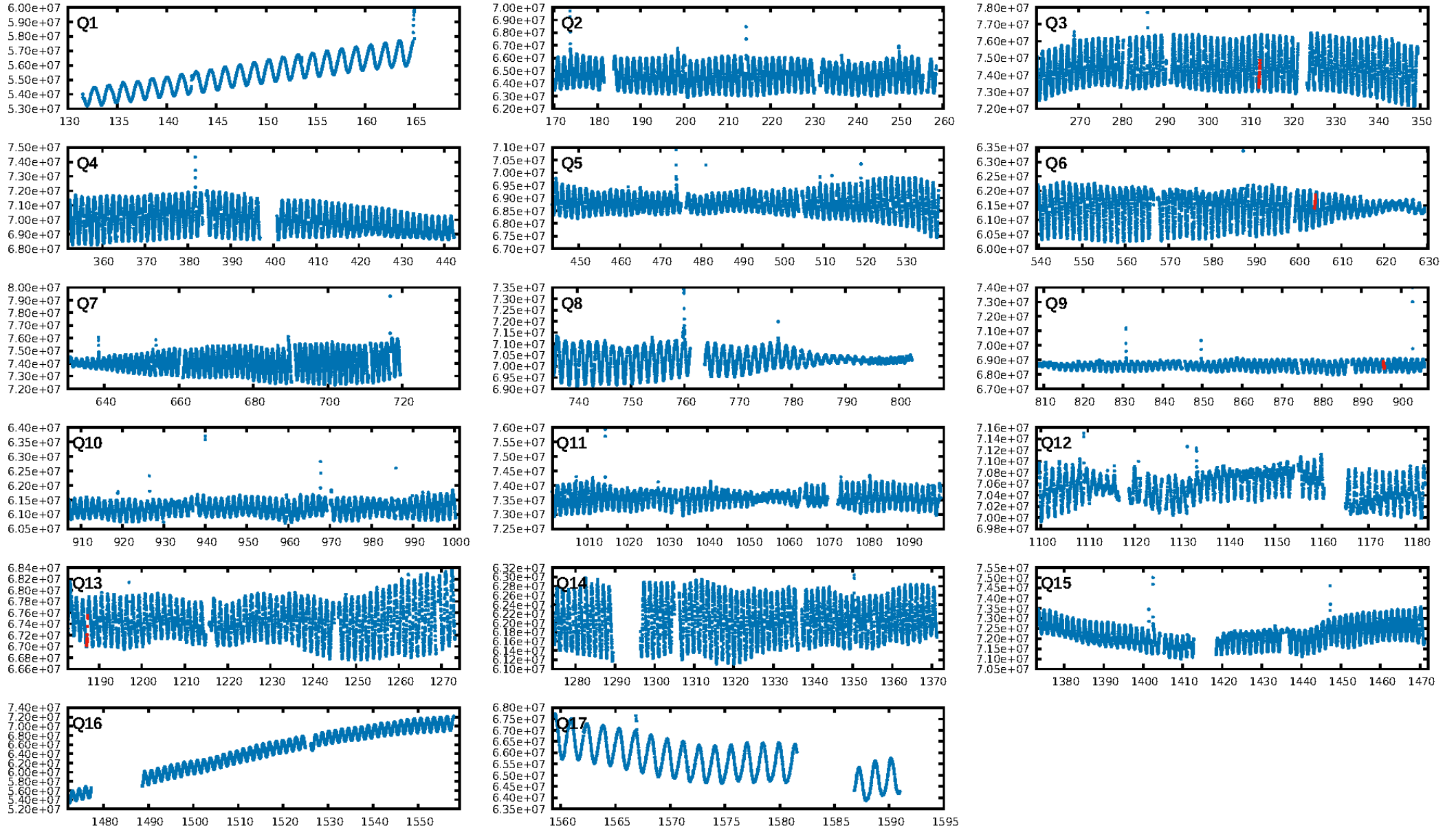
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [738.27 σ]
LongPeriod-sig: 100.0% [576.81 σ]
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 40.4%
Bootstrap-pfa: 9.05e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 3.626
Centroid-sig: N/A
Centroid-so: 0.707 arcsec [0.23 σ]
OotOffset-rm: 1.585 arcsec [3.51 σ]
KicOffset-rm: 2.621 arcsec [7.53 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]

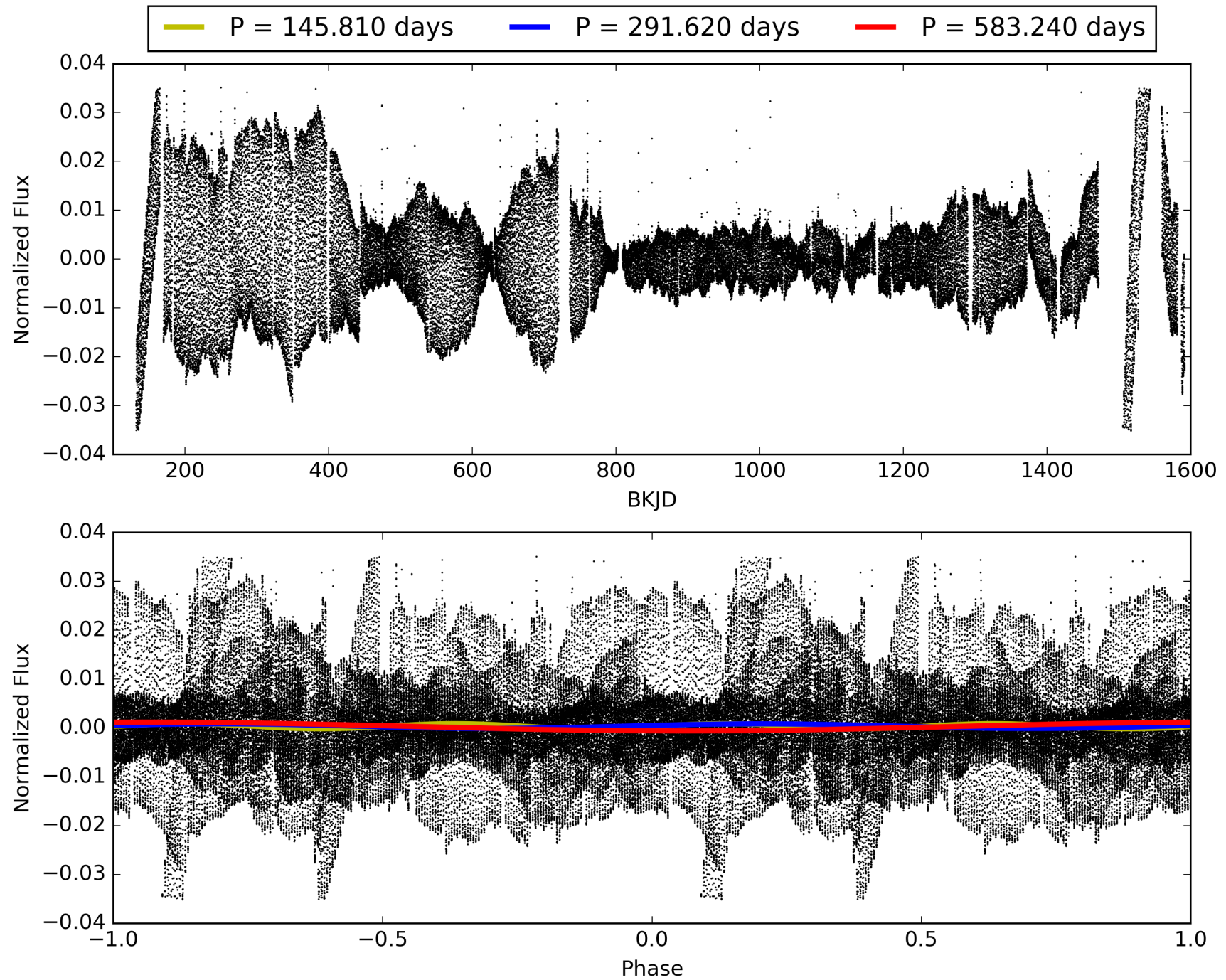
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:03:43 Z

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

TCE 002308761-01, PDC Light Curves

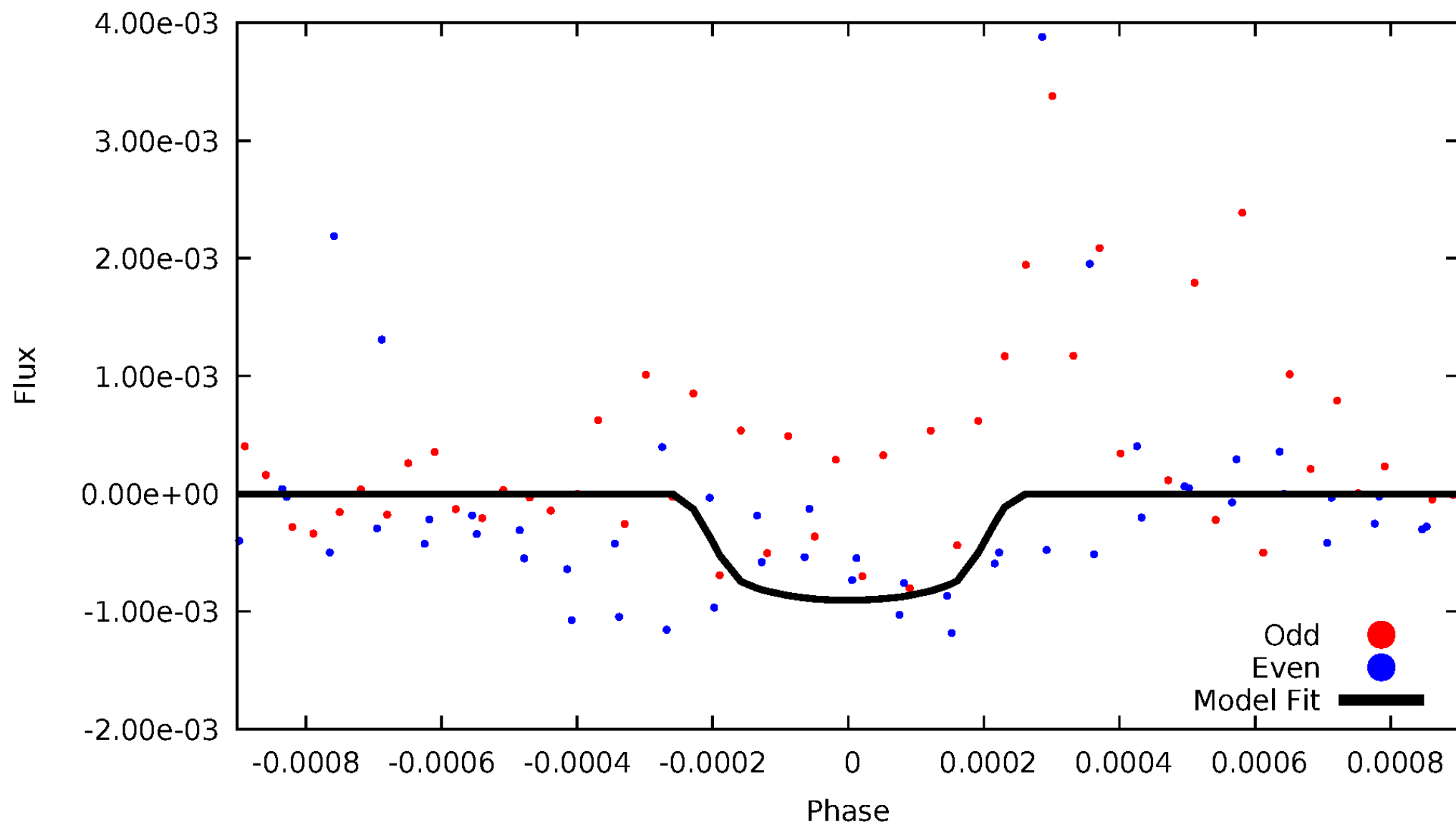


TCE 002308761-01



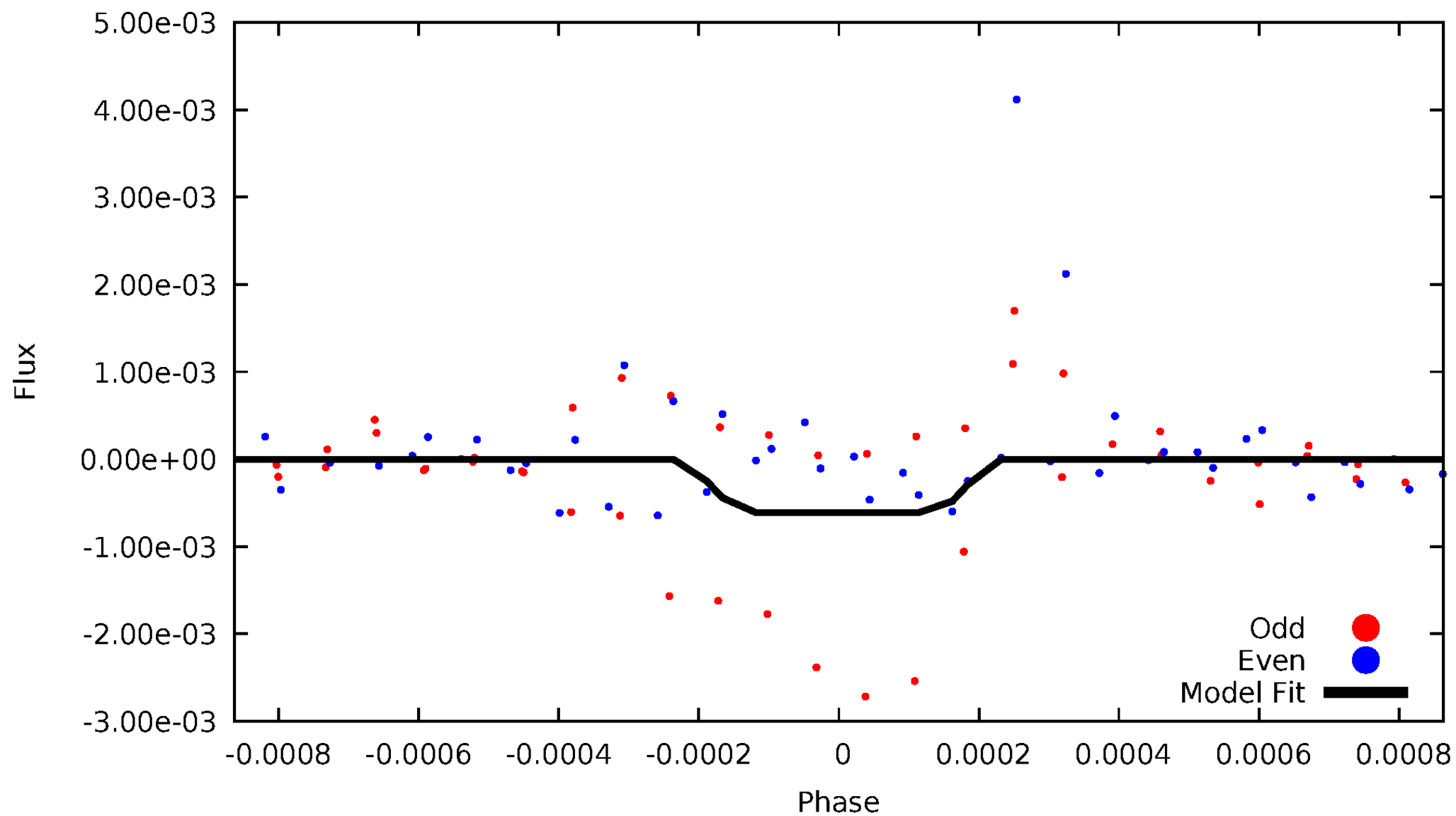
DV Odd/Even

TCE 002308761-01



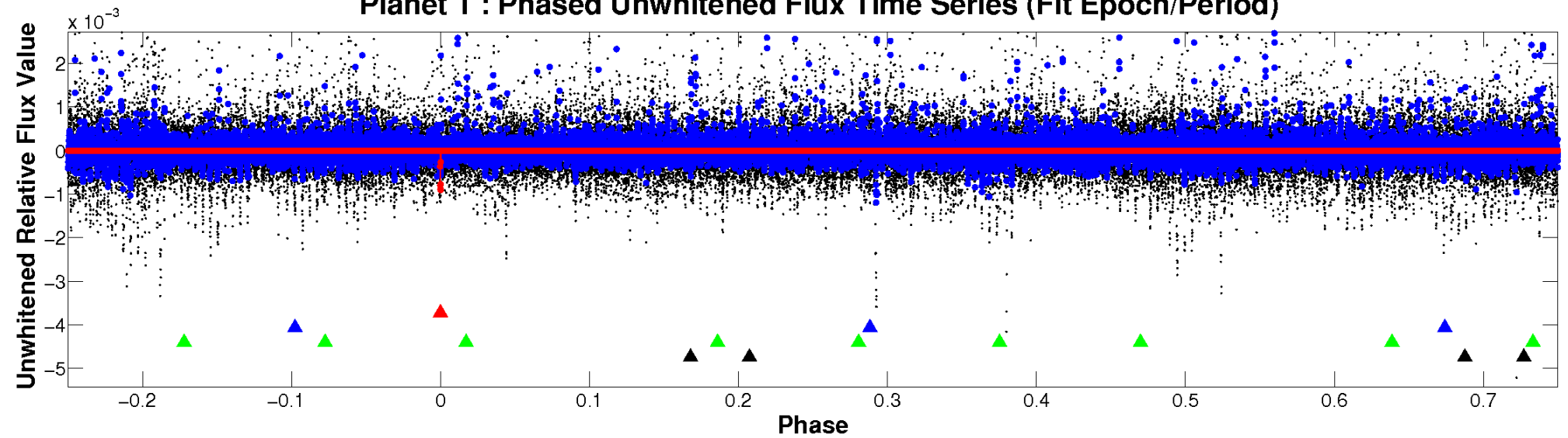
ALT Odd/Even

TCE 002308761-01

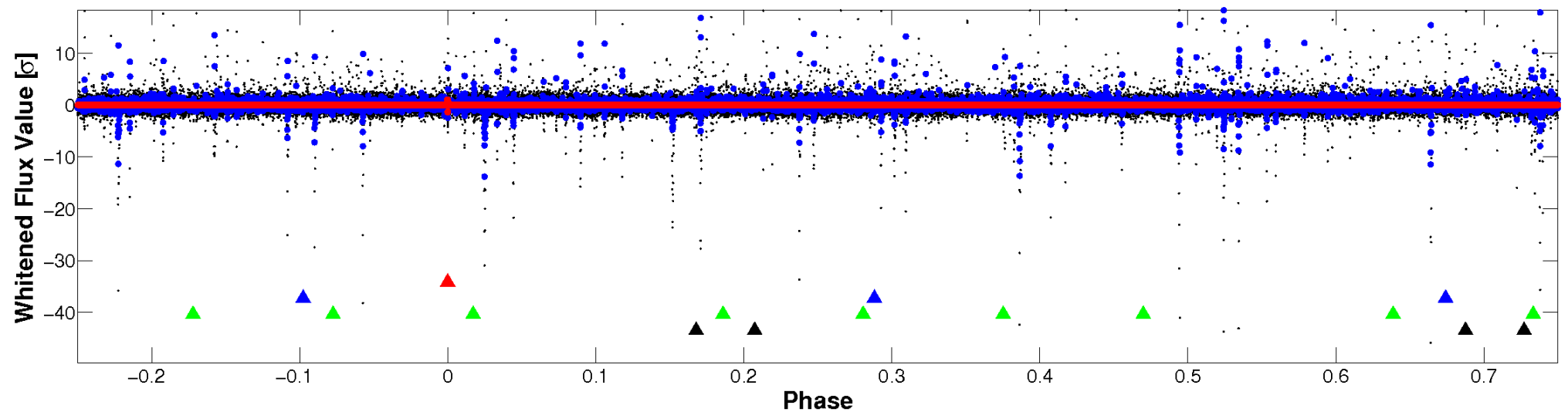


Non-Whitened Vs. Whitened Light Curve

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

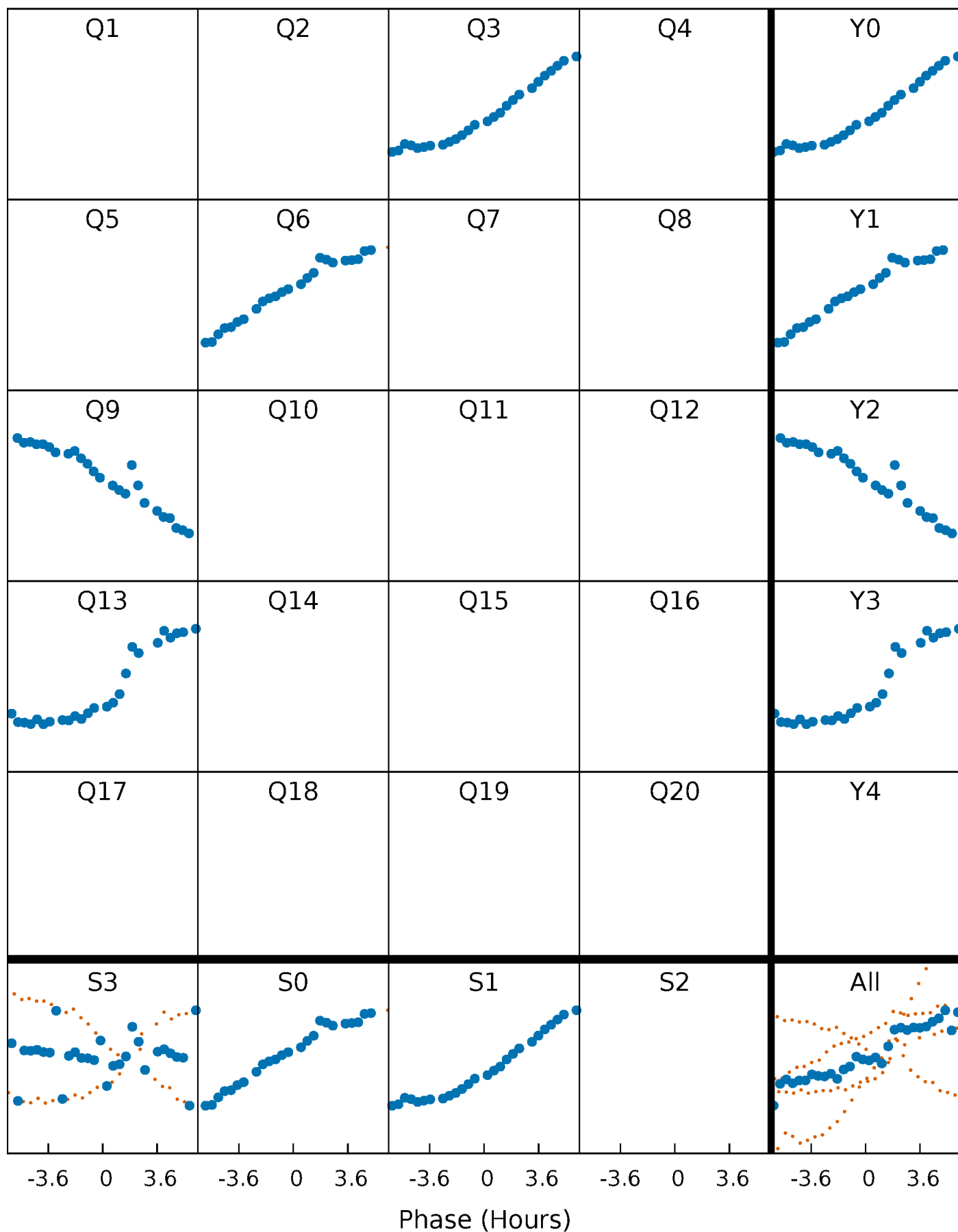


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



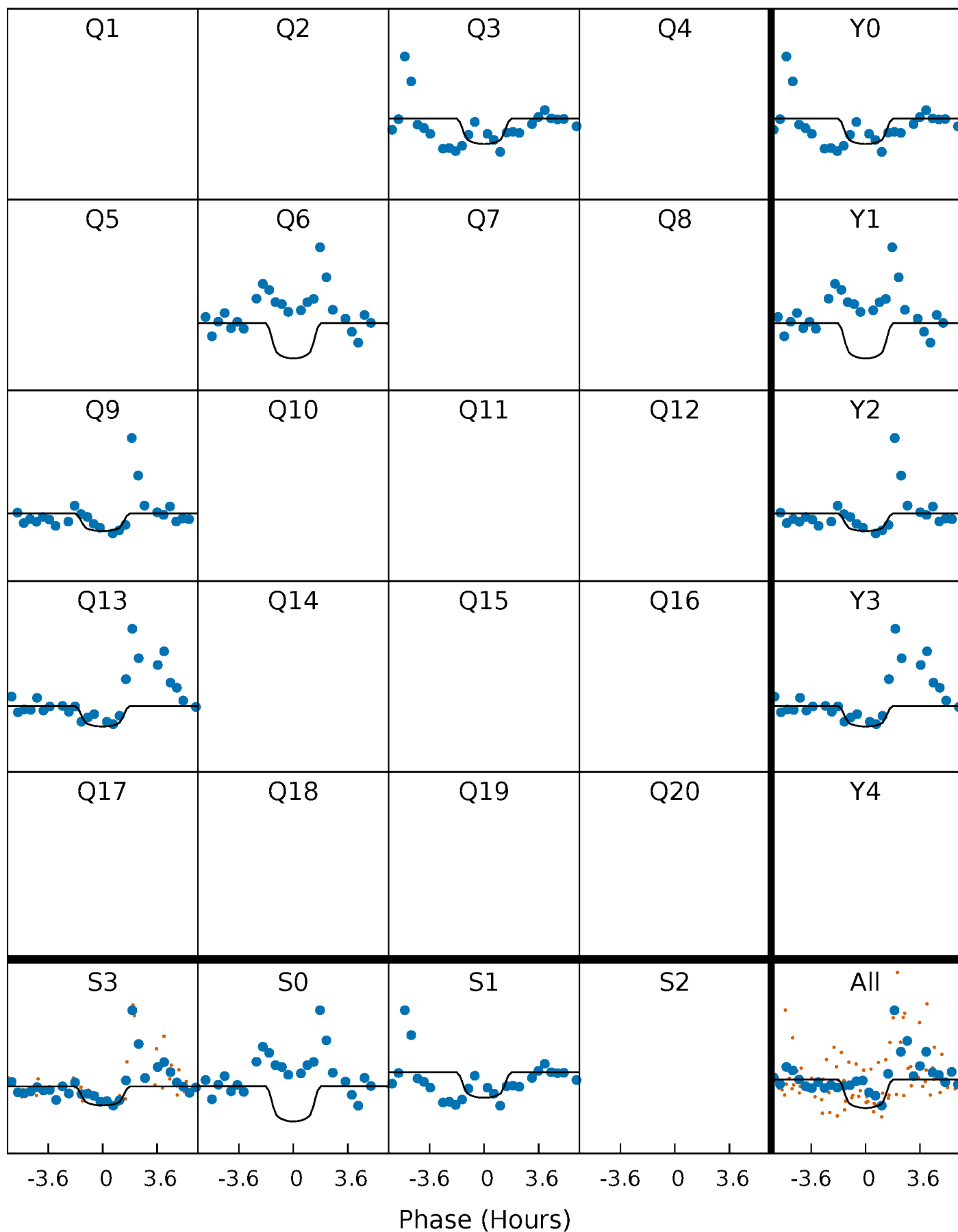
PDC Quarter-Phased Transit Curves

TCE 002308761-01 P=291.620142 Days $T_0=312.365620$ (BKJD)



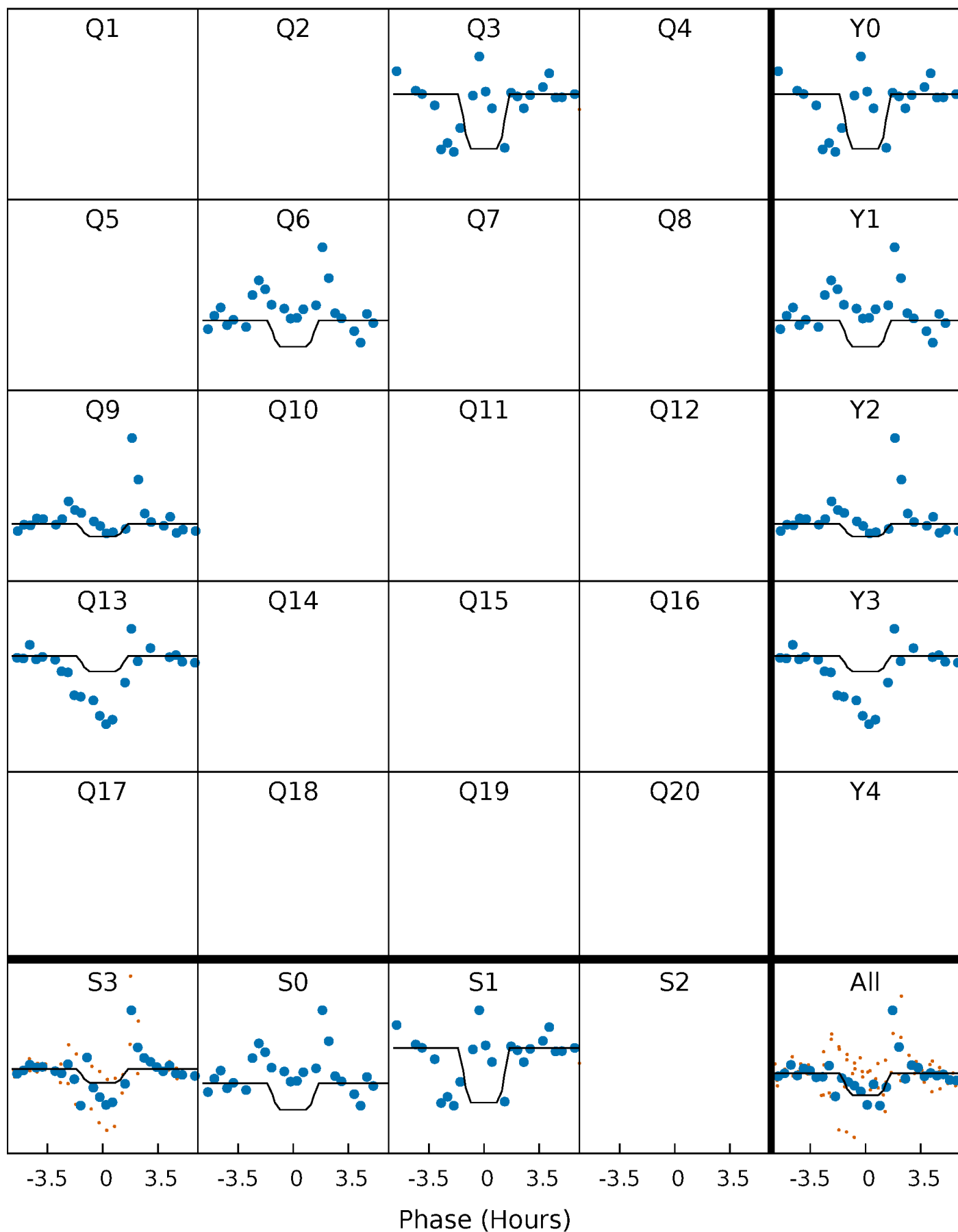
DV Quarter-Phased Transit Curves

TCE 002308761-01 P=291.620142 Days $T_0=312.365620$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

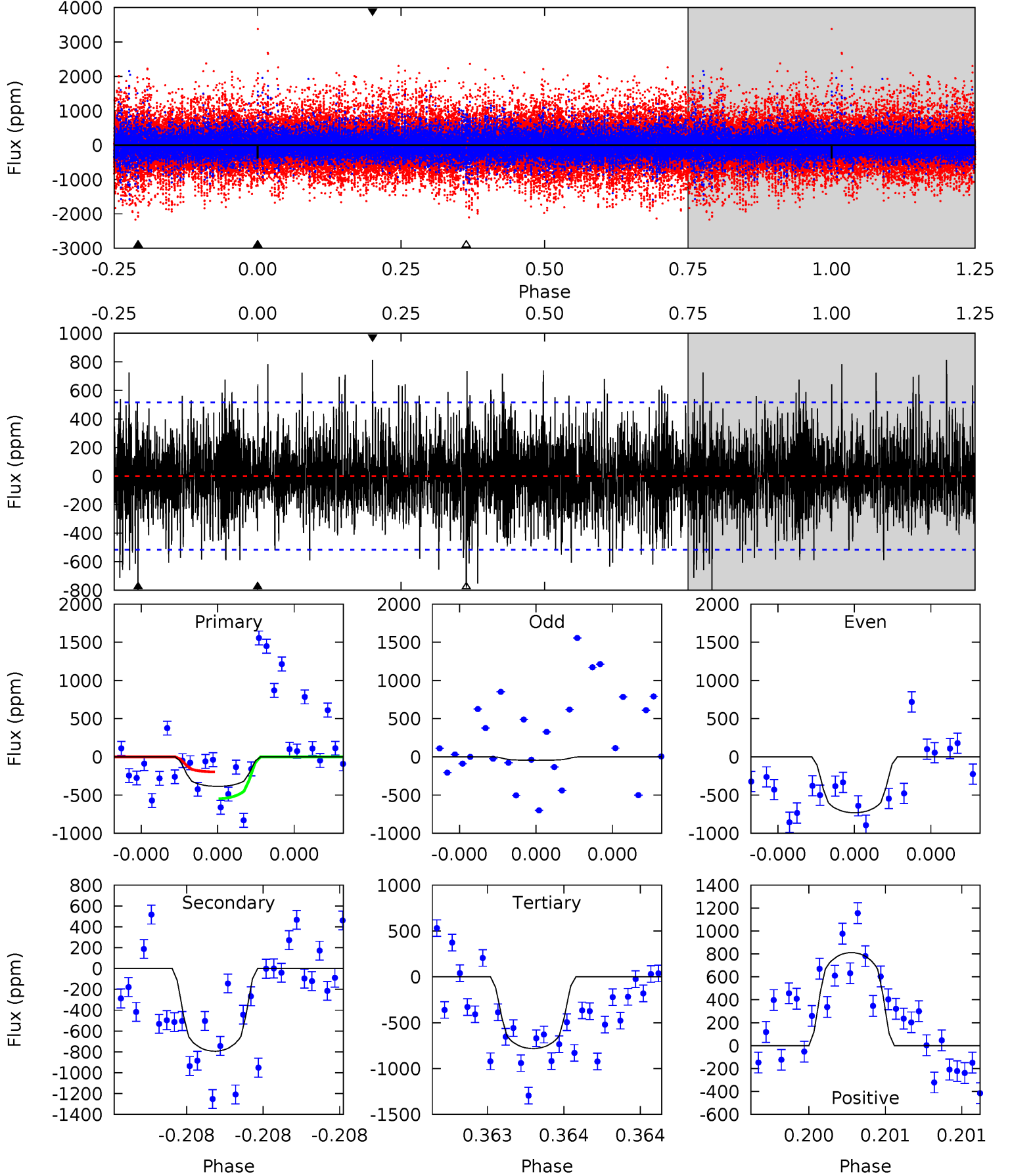
TCE 002308761-01 P=291.626146 Days $T_0=312.362896$ (BKJD)



DV Model-Shift Uniqueness Test

002308761-01, P = 291.620142 Days, E = 20.745478 Days

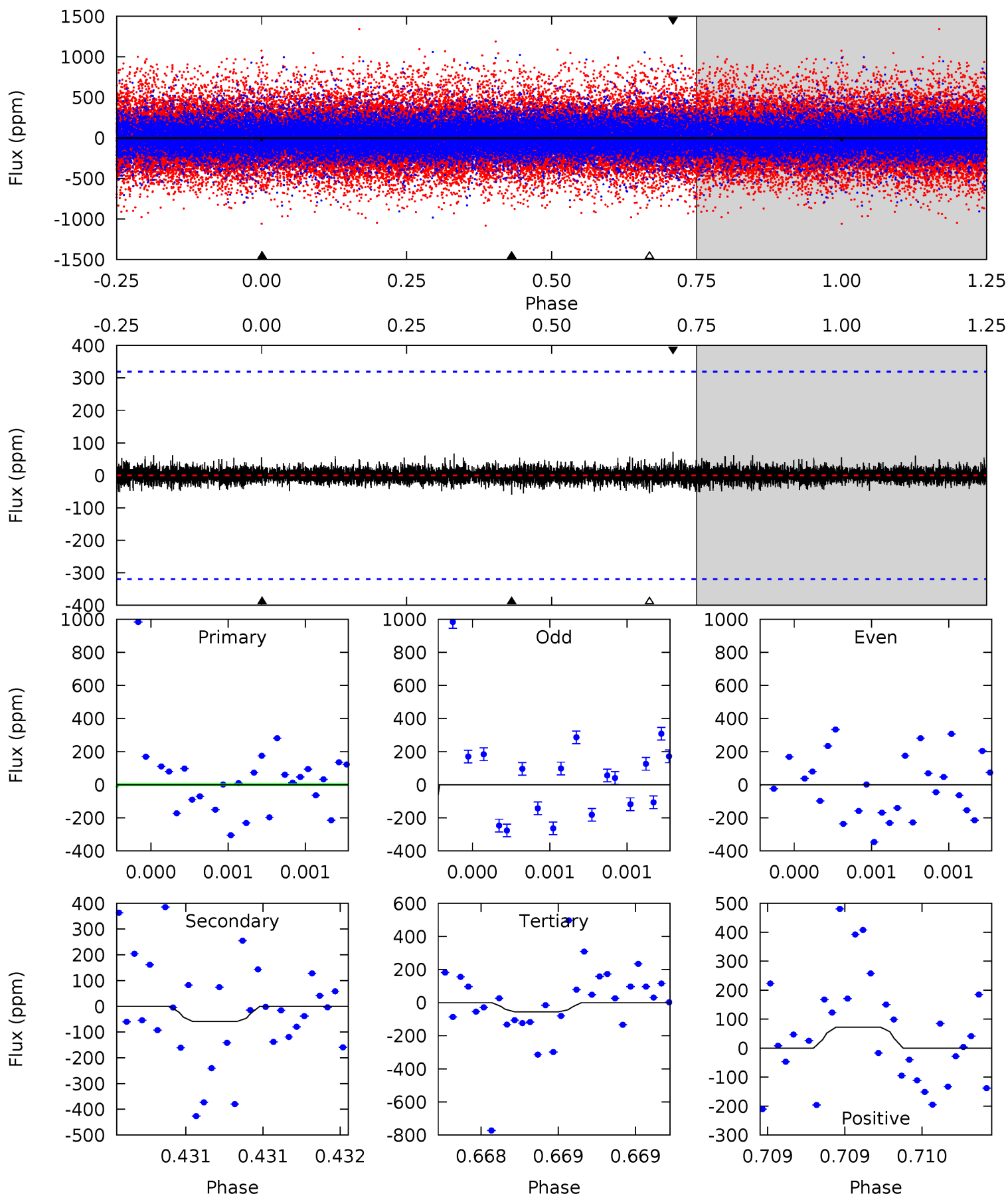
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.18	8.59	8.47	8.78	5.59	3.50	2.19	-4.29	-4.60	0.12	-0.19	3.54	0.58	0.51	1.87



Alt Model-Shift Uniqueness Test

002308761-01, P = 291.626146 Days, E = 20.736750 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.56	1.03	0.97	1.27	5.61	3.54	0.25	-0.41	-0.71	0.06	-0.24	6.77	5.78	0.55	0.50



Stellar Parameters For KIC 002308761

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002308761-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-794 ± 92	$8.83^{+8.04}_{-5.93}$	384^{+18}_{-19}	3804^{+2106}_{-700}	4115^{+32444}_{-2969}
Alt.	-59 ± 57	$8.88^{+7.81}_{-6.05}$	384^{+19}_{-18}	2542^{+1022}_{-717}	260^{+2552}_{-246}

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 $A_{obs} \gg 1.0$

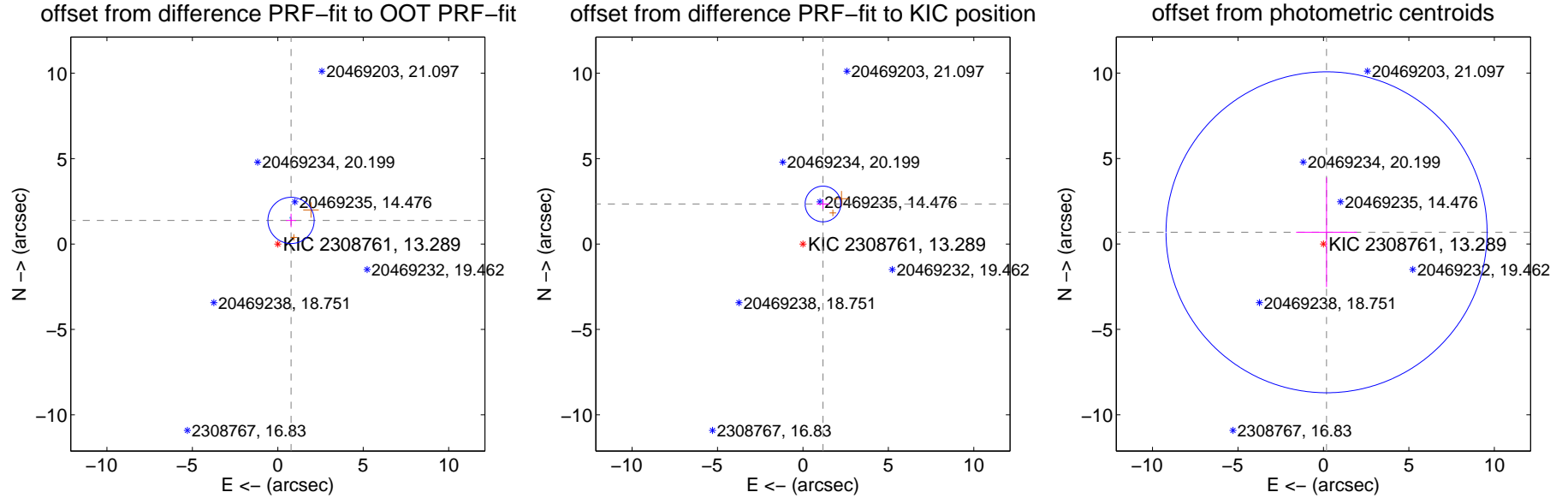
DV Centroid Data

Supplemental centroid analysis for 002308761-01. Kepler magnitude: 13.29. Transit SNR 6.64

There are 1 quarters with good PRF difference image offsets

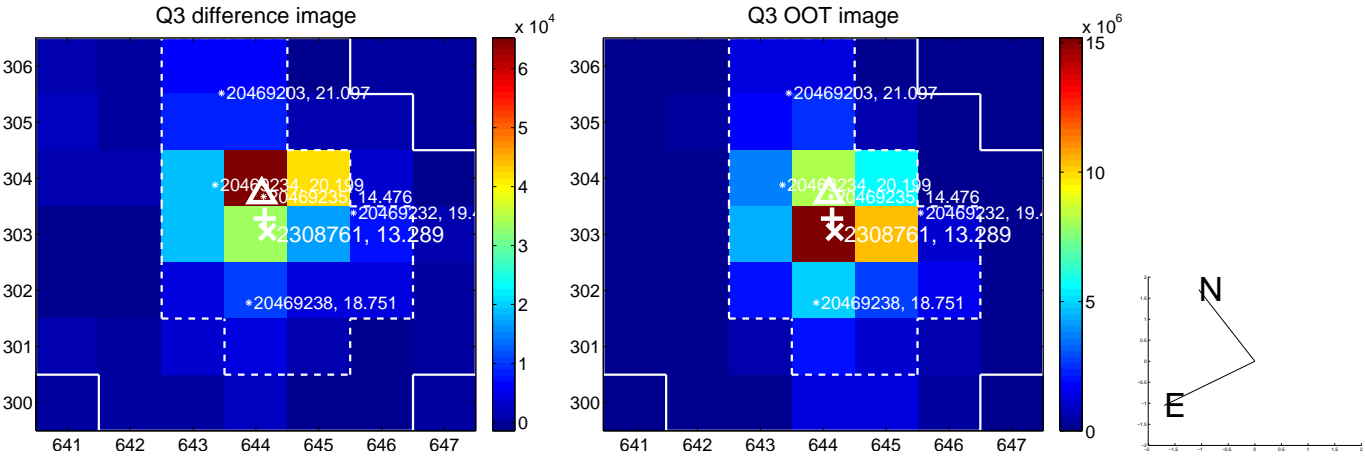
The direct PRF centroid is offset from the target star catalog position by about 1.65 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.585 ± 0.451	3.51	-0.775 ± 0.292	1.382 ± 0.392
PRF-fit source offset from KIC position	2.621 ± 0.348	7.53	-1.172 ± 0.375	2.344 ± 0.283
photometric centroid source offset	0.71 ± 3.13	0.23	-0.18 ± 1.78	0.68 ± 3.21

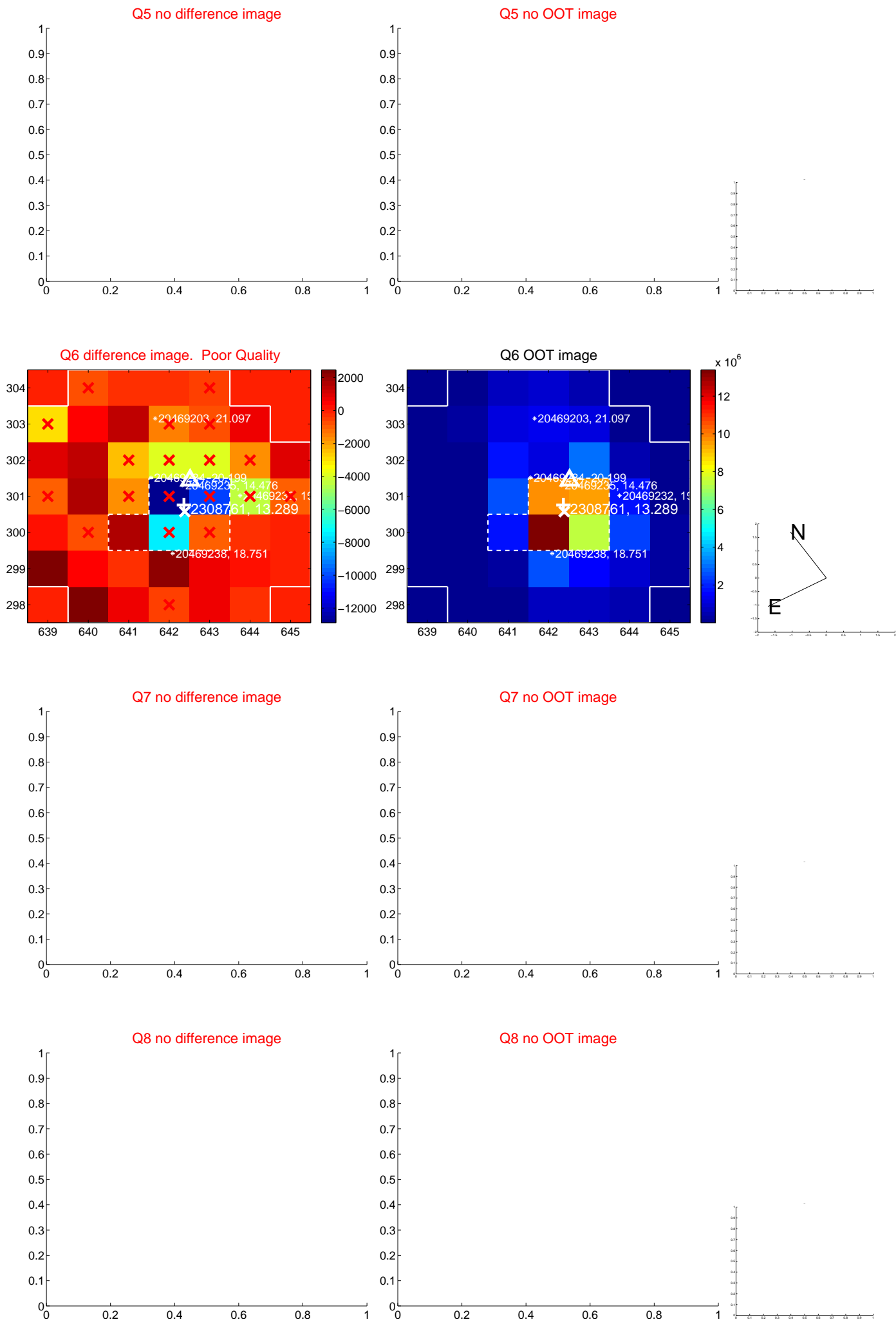


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

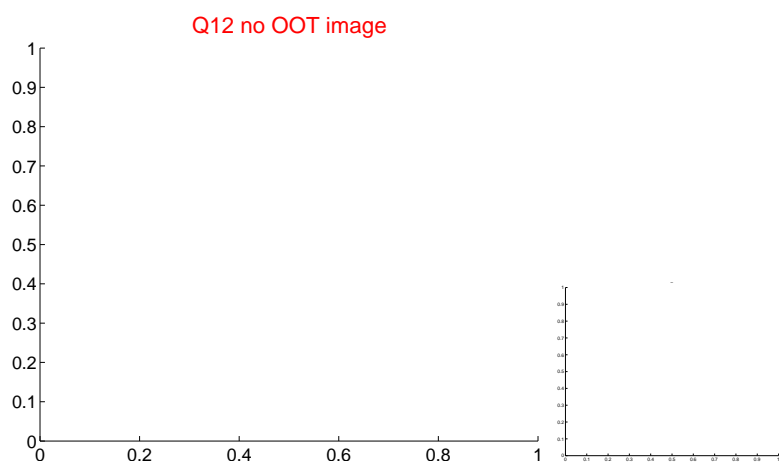
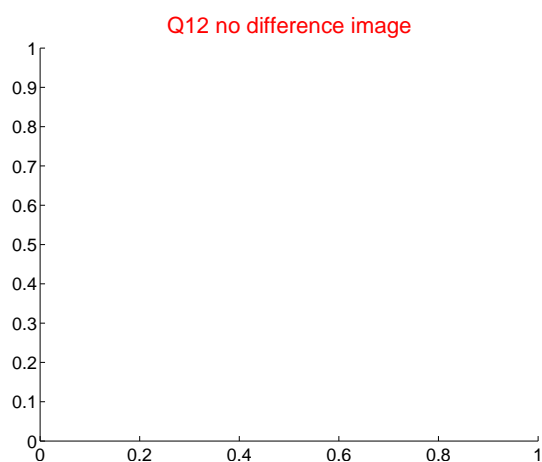
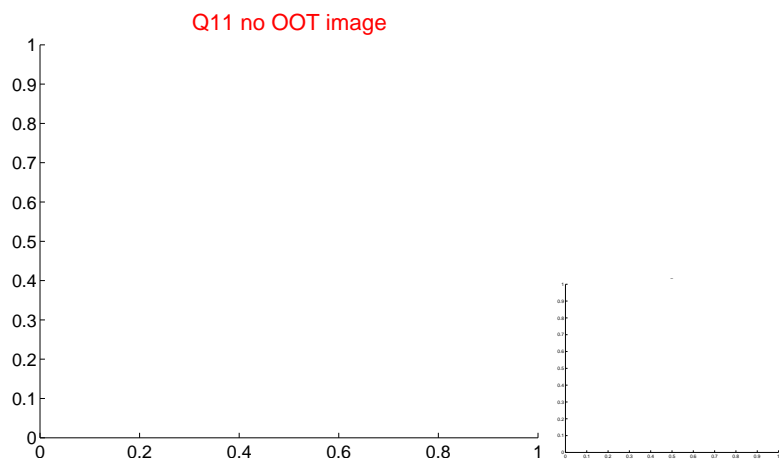
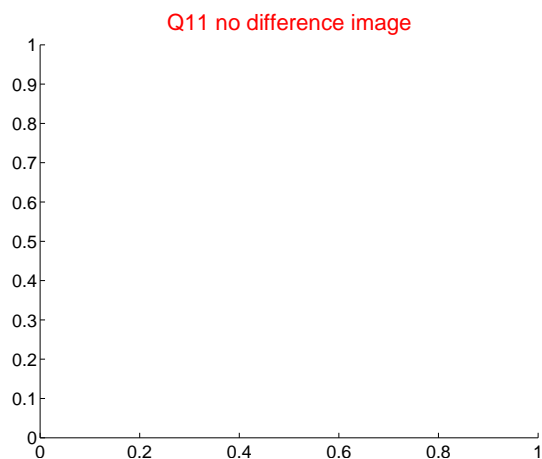
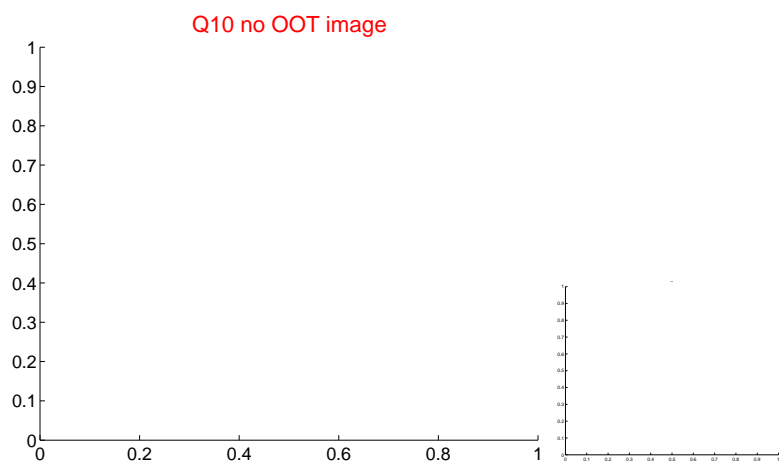
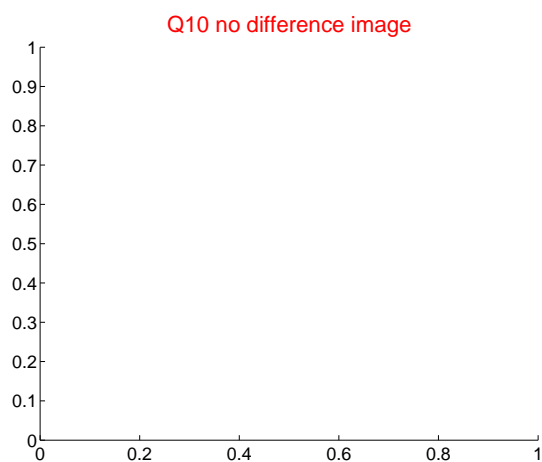
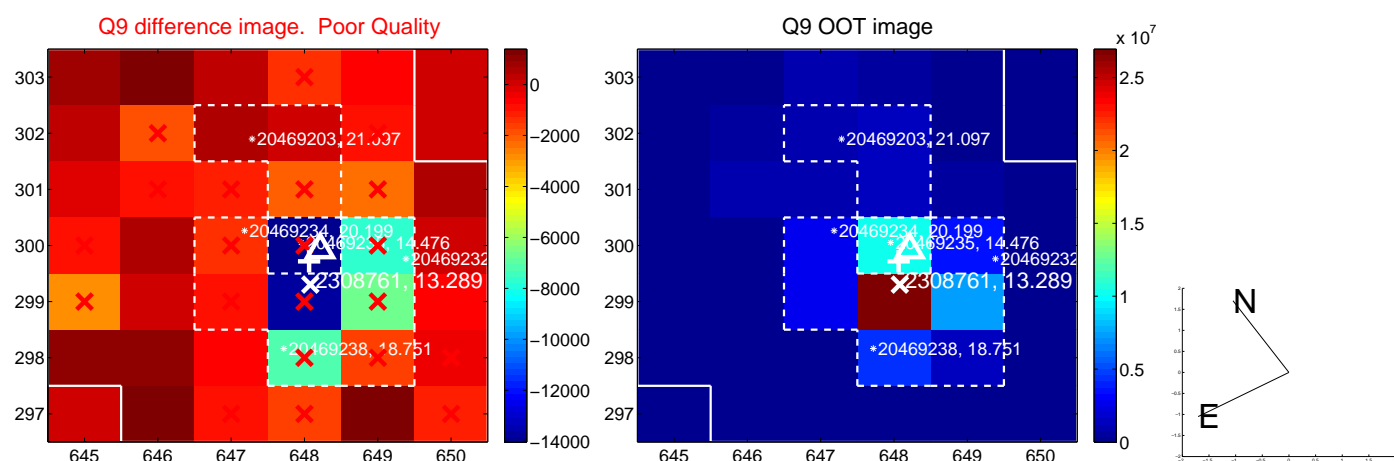
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



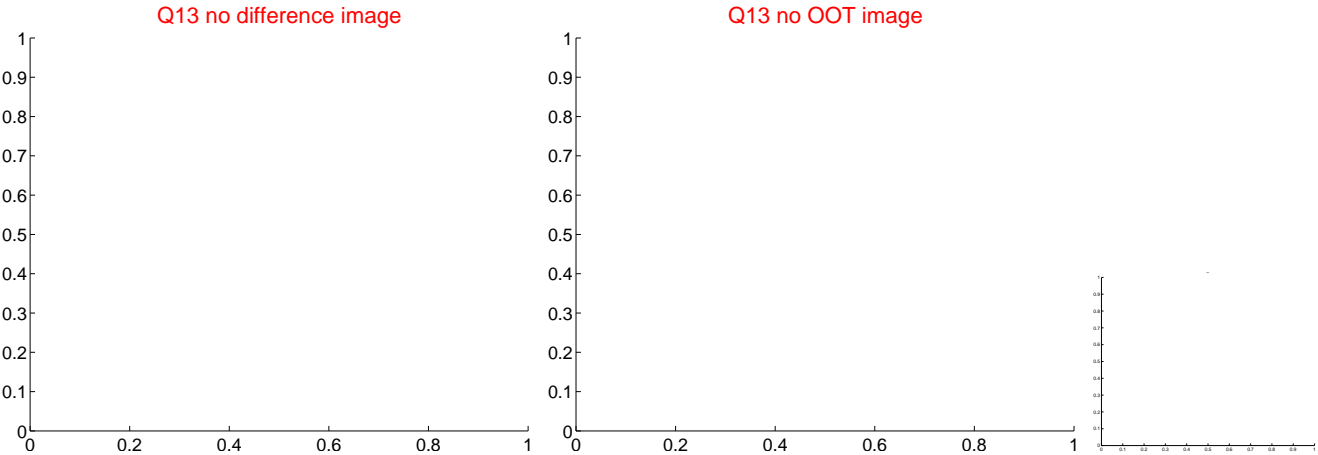
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



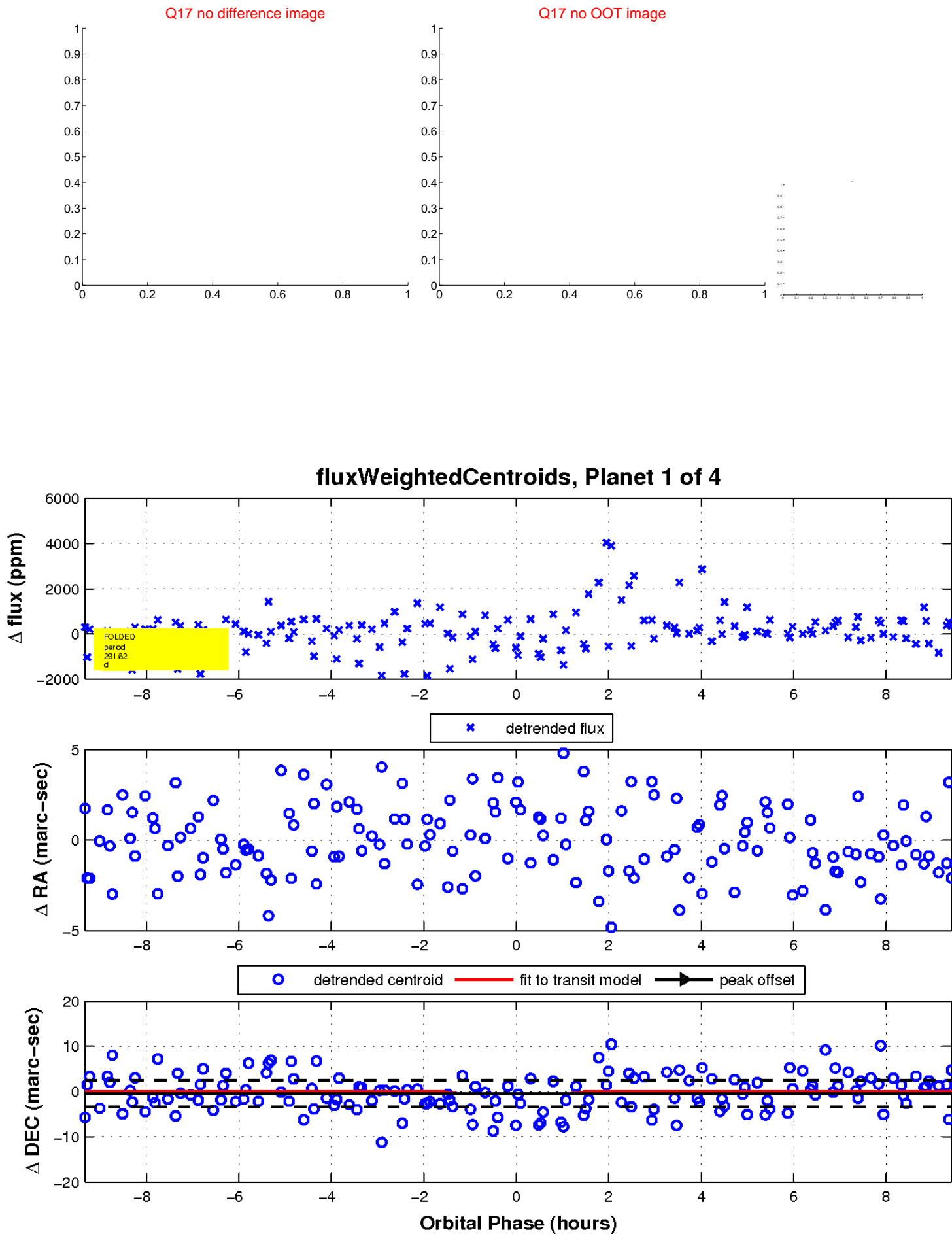
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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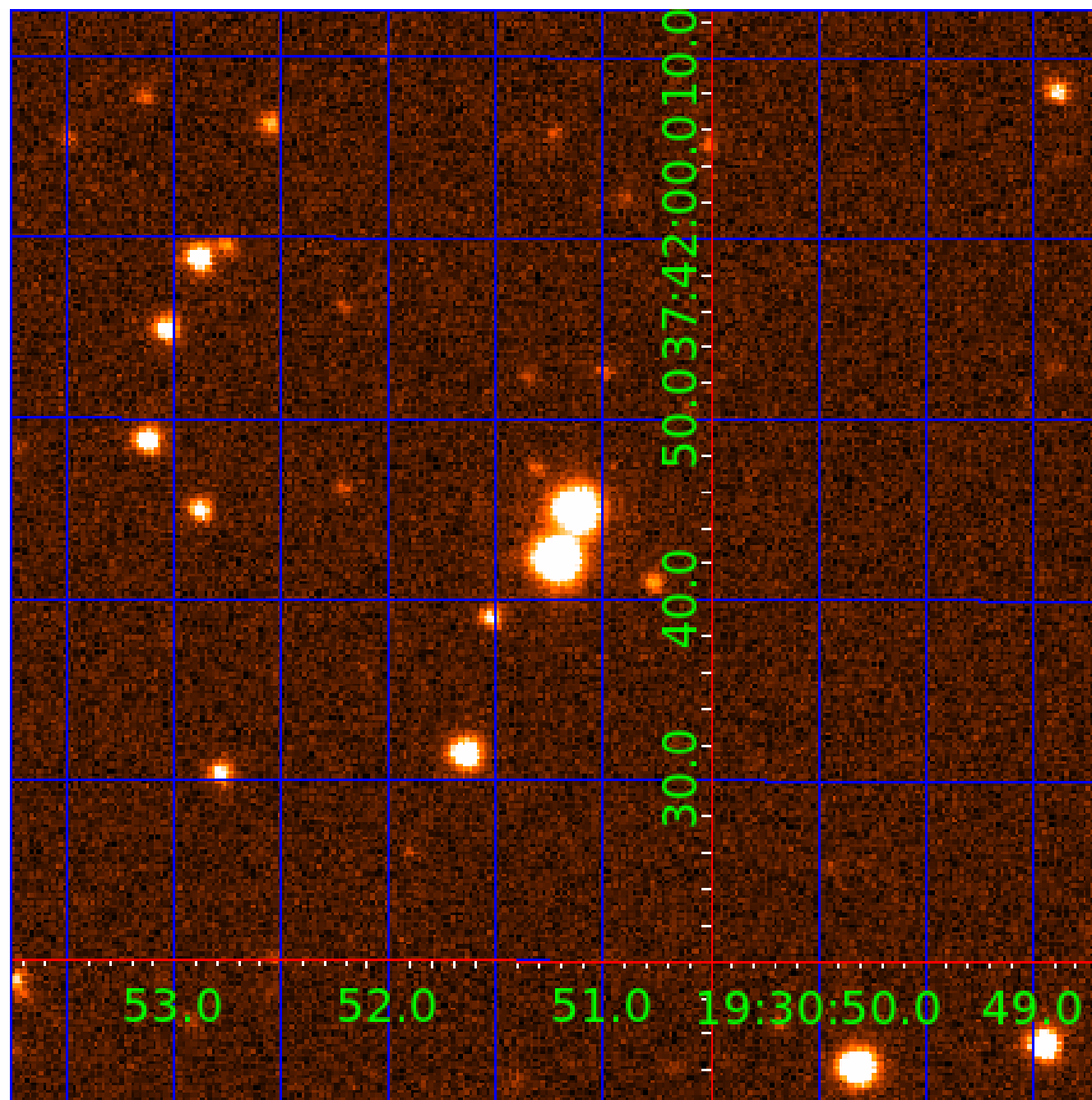


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002308761

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})
002308761-01	OBS	No	291.620142	312.365620	905.4	3.155	14.5	6.6	1.00	5780	3.29	1.35
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002308761-03	OBS	No	159.607412	207.002511	777.9	2.909	12.2	6.4	1.00	5780	2.83	3.01
002308761-04	OBS	No	431.661160	232.811047	1167.5	4.899	17.0	6.0	1.00	5780	3.47	0.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002308761-01	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—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
002308761-04	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—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

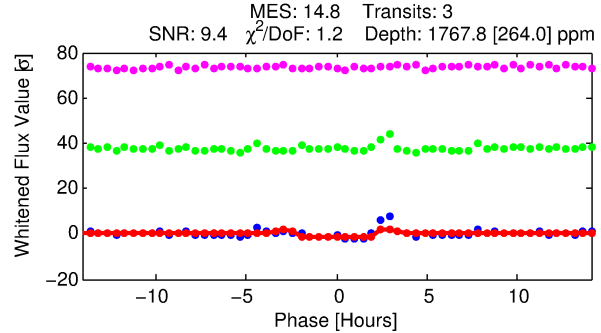
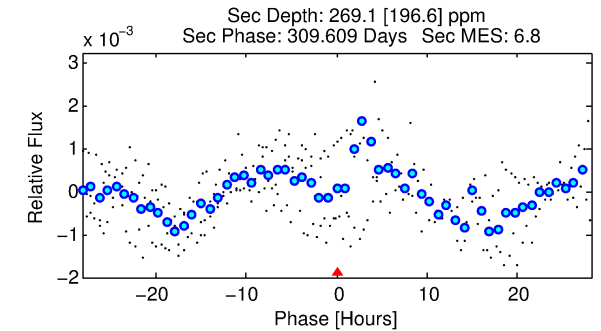
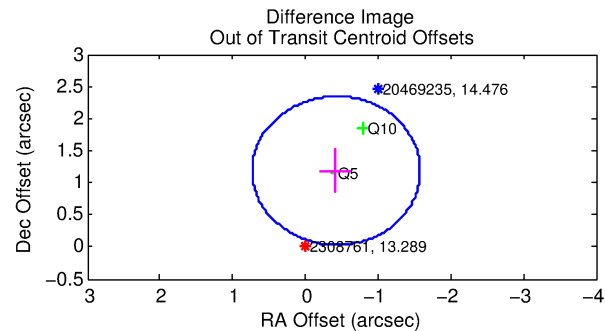
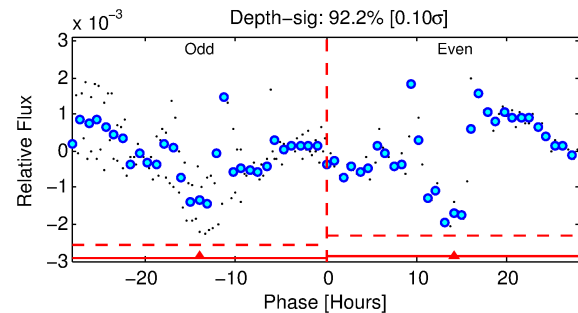
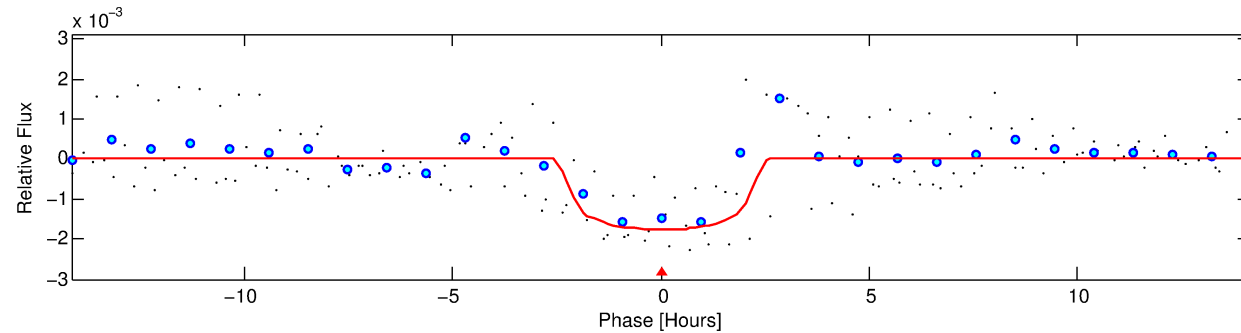
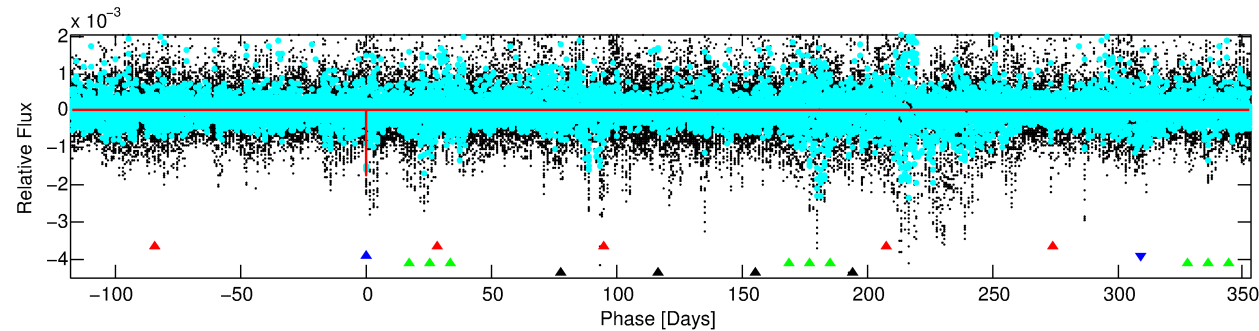
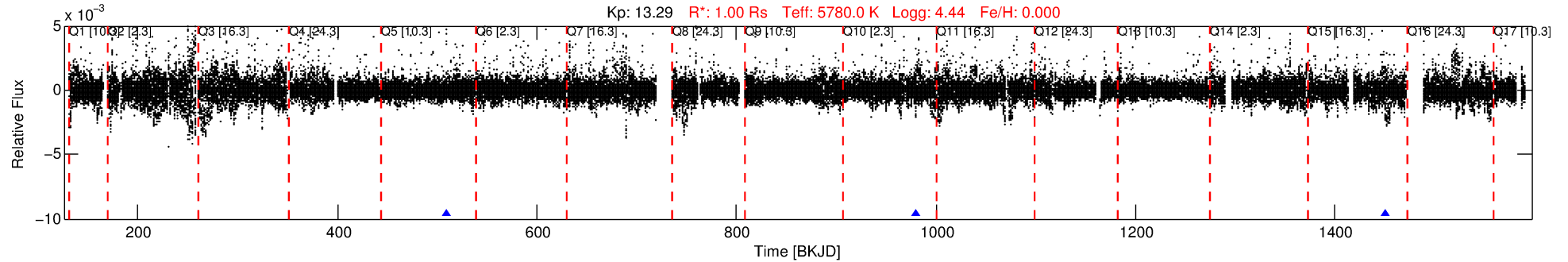
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002308761-02

No Significant Match Found

DV One-Page Summary

KIC: 2308761 Candidate: 2 of 4 Period: 470.700 d



DV Fit Results:

Period = 470.70026 [0.00380] d
Epoch = 508.9683 [0.0051] BKJD
Rp/R* = 0.0381 [0.0532]
a/R* = 790.96 [4779.99]
b = 0.00 [1466.48]
Seff = 0.71 [0.00]
Teq = 234 [0] K
Rp = 4.16 [5.80] Re
a = 1.1845 [0.0000] AU
Ag = 12000.79 [34606.08] [0.35σ]
Teffp = 3791 [2733] K [1.30σ]

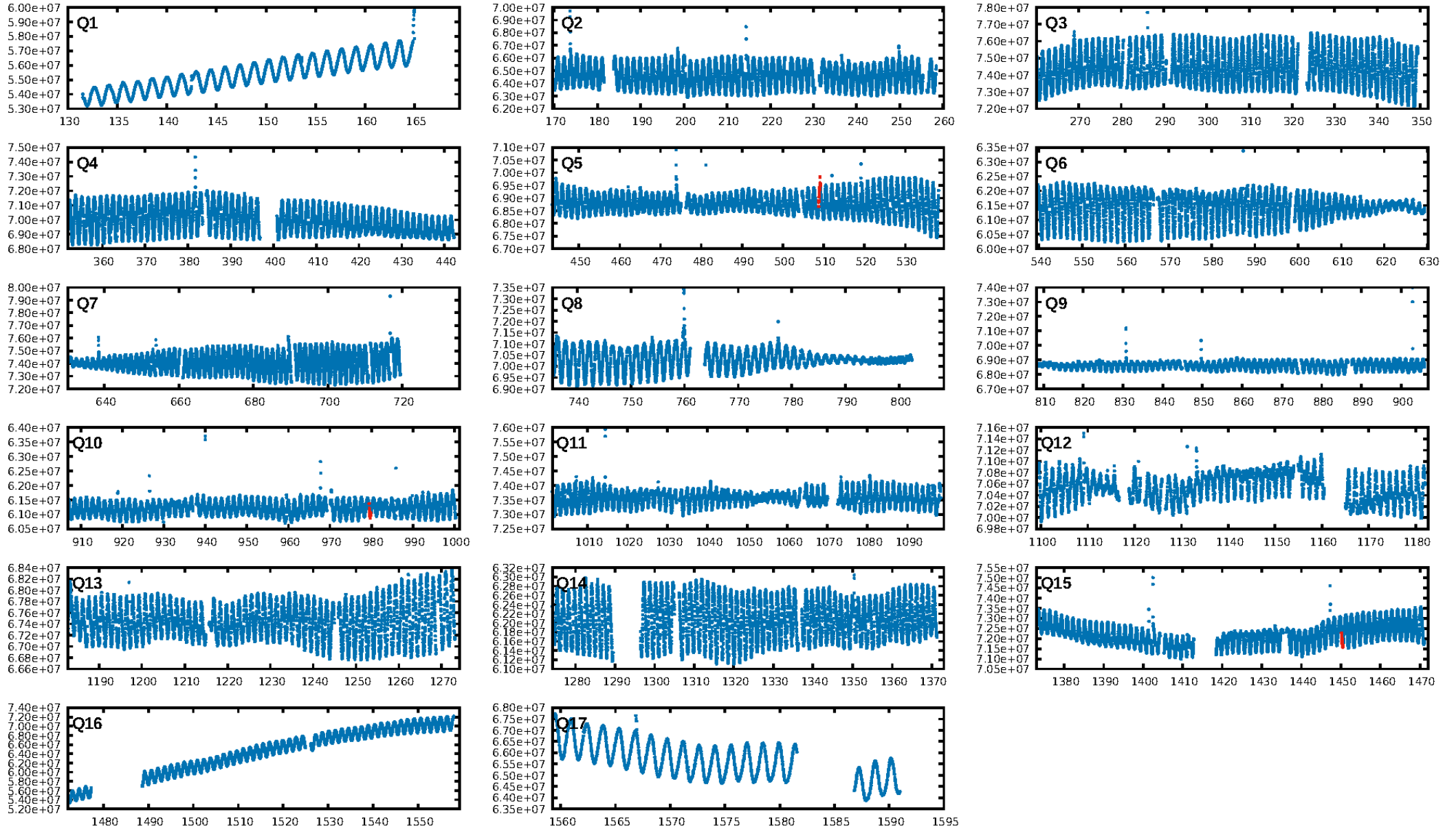
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [137.74σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 18.6%
ModelChiSquareGof-sig: 57.1%
Bootstrap-pfa: 1.62e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.009
Centroid-sig: N/A
Centroid-so: 2.159 arcsec [2.02σ]
OotOffset-rm: 1.260 arcsec [3.27σ]
KicOffset-rm: 2.748 arcsec [31.62σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
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DiffImageOverlap-fno: 1.00 [2/2]

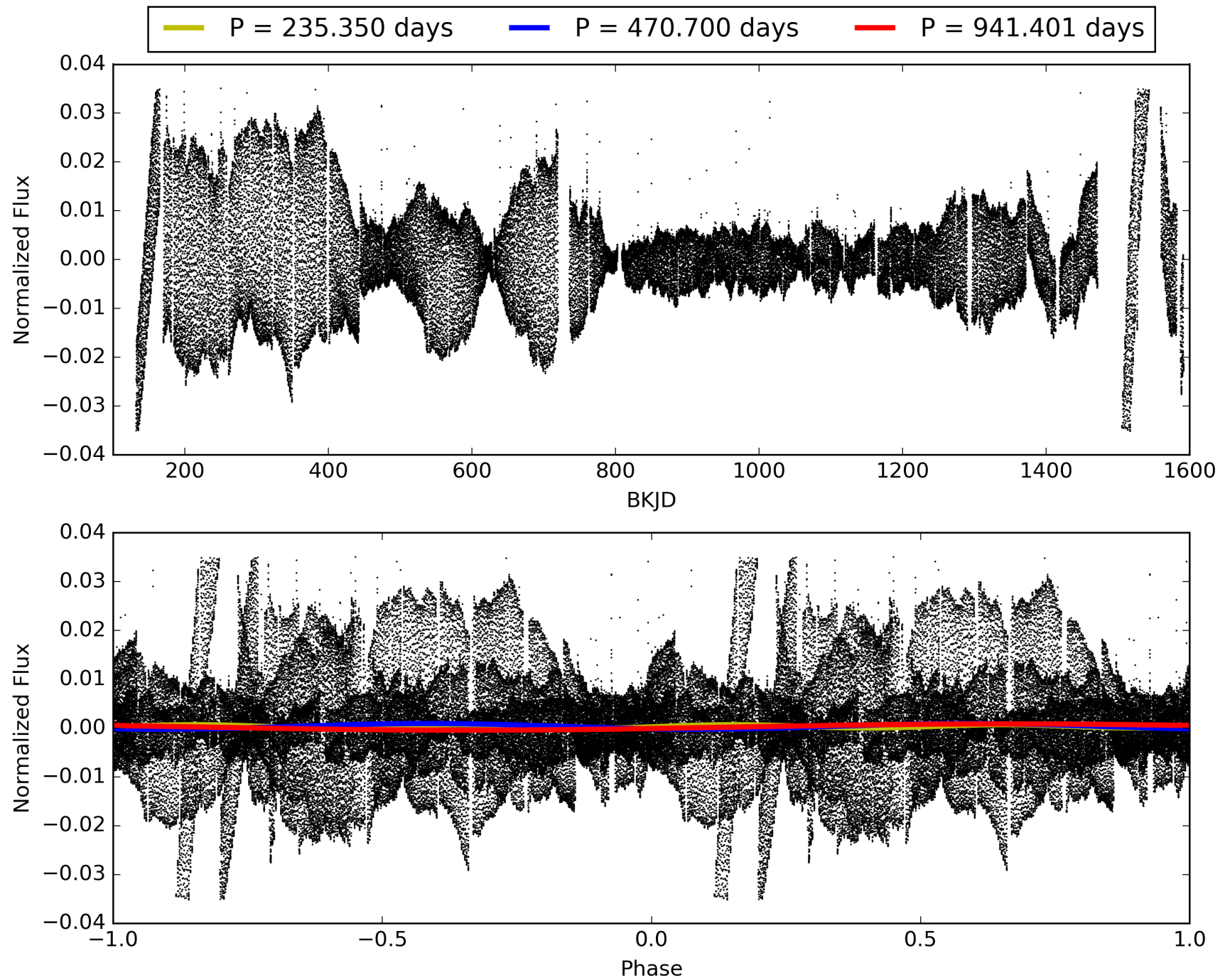
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:03:59 Z

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

TCE 002308761-02, PDC Light Curves

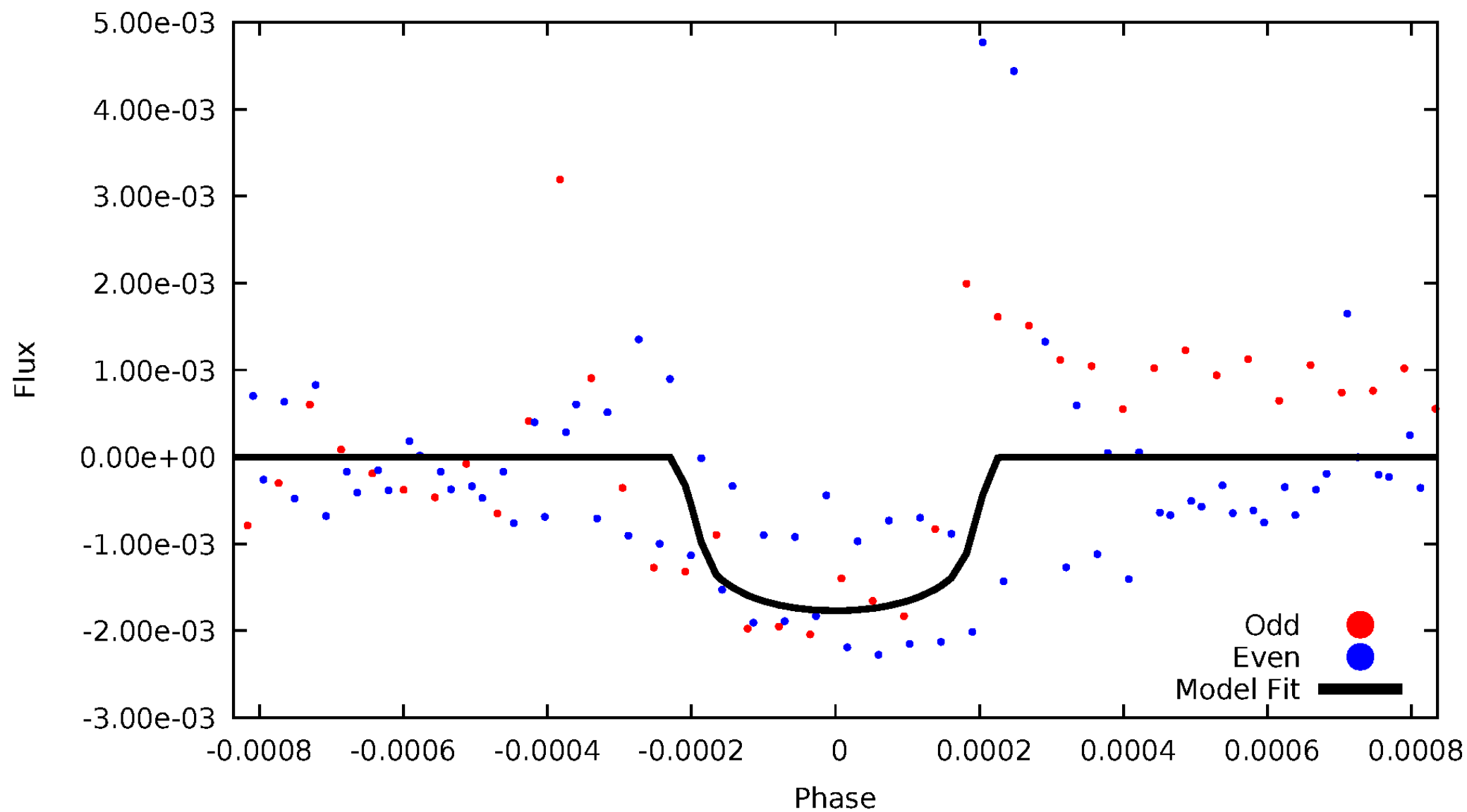


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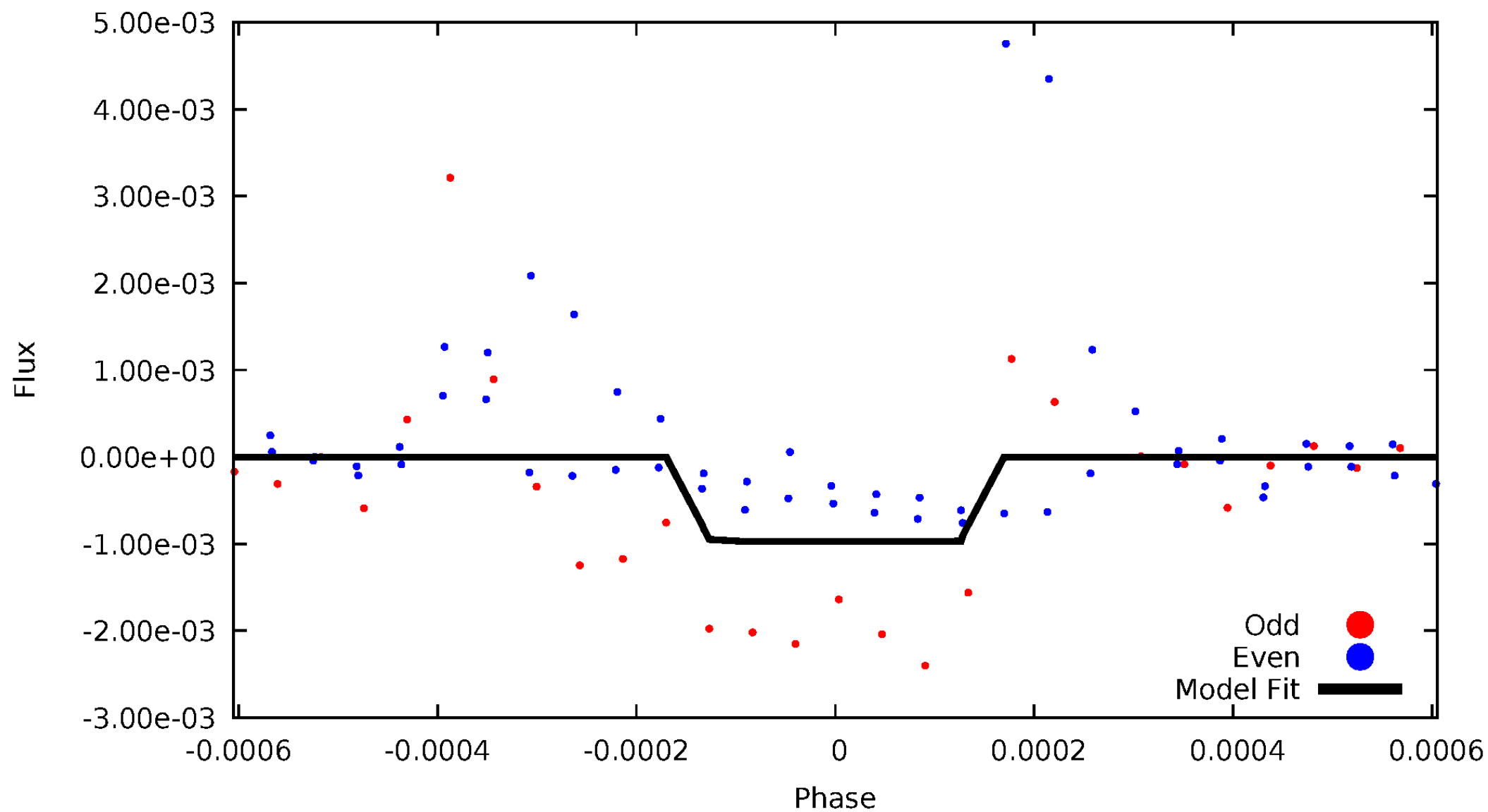
DV Odd/Even

TCE 002308761-02



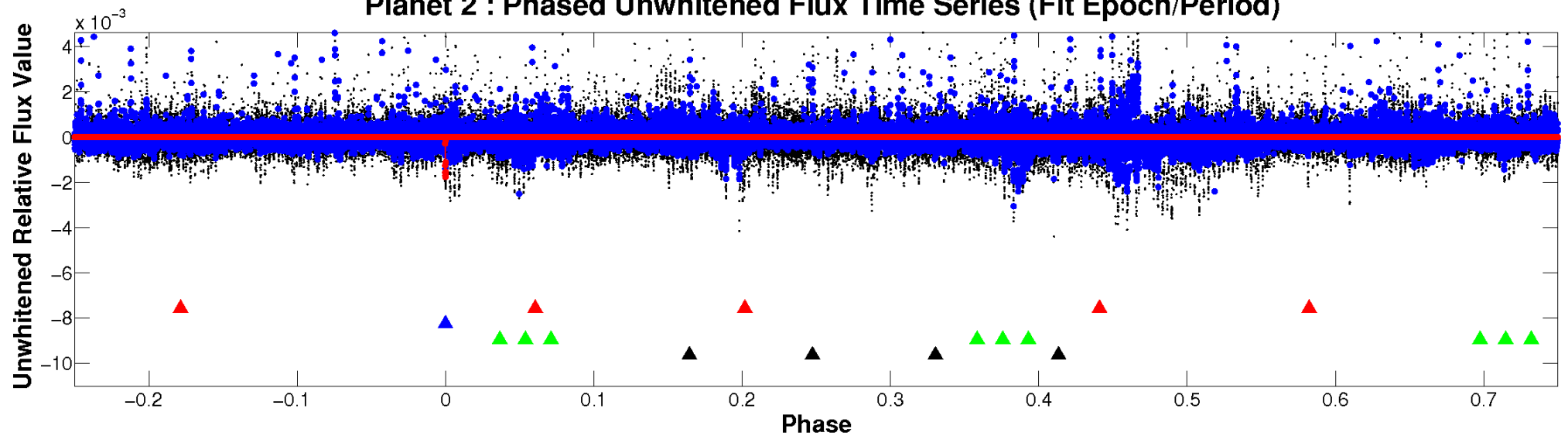
ALT Odd/Even

TCE 002308761-02

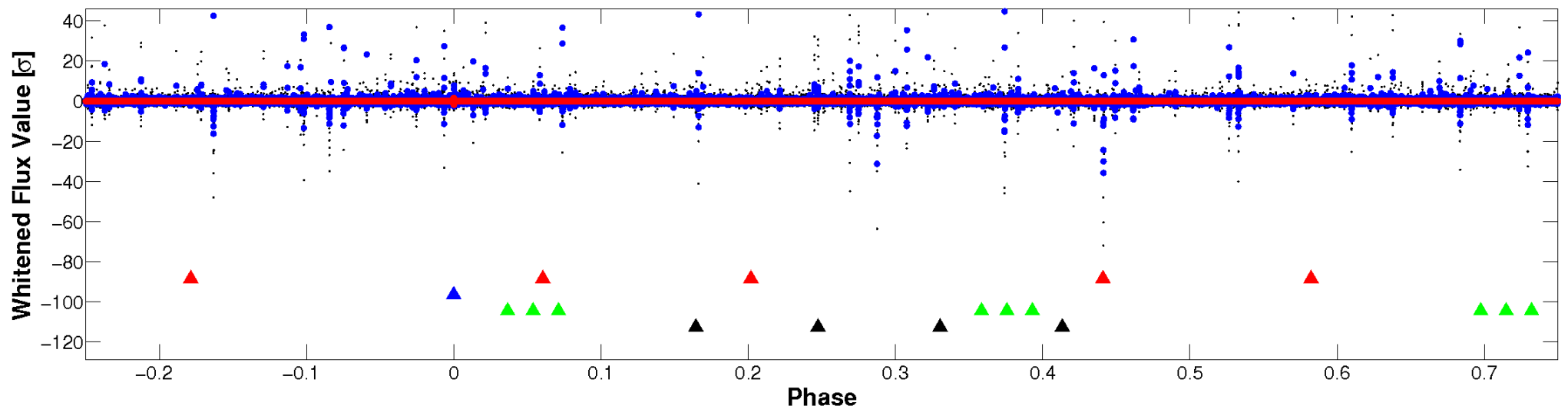


Non-Whitened Vs. Whitened Light Curve

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

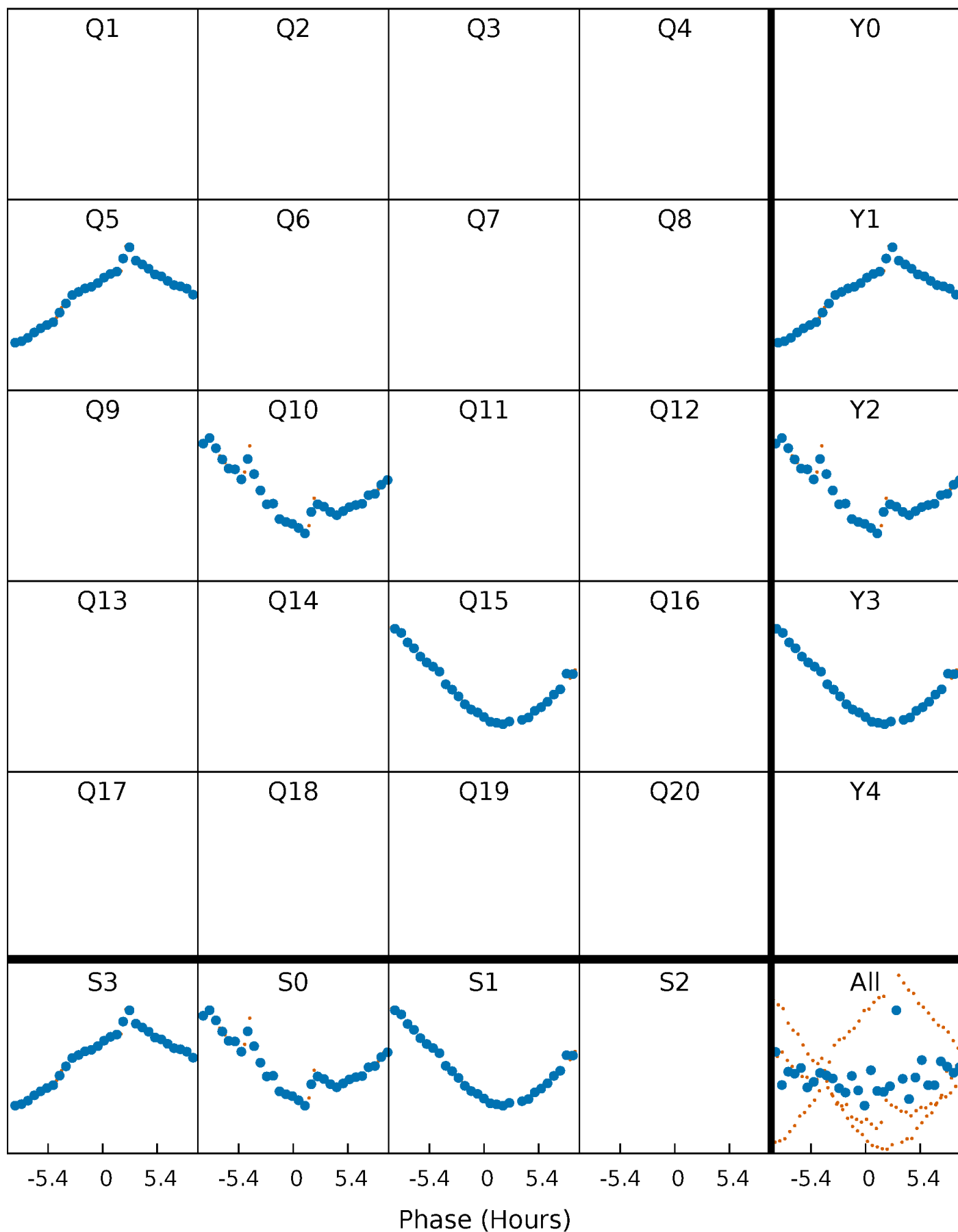


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



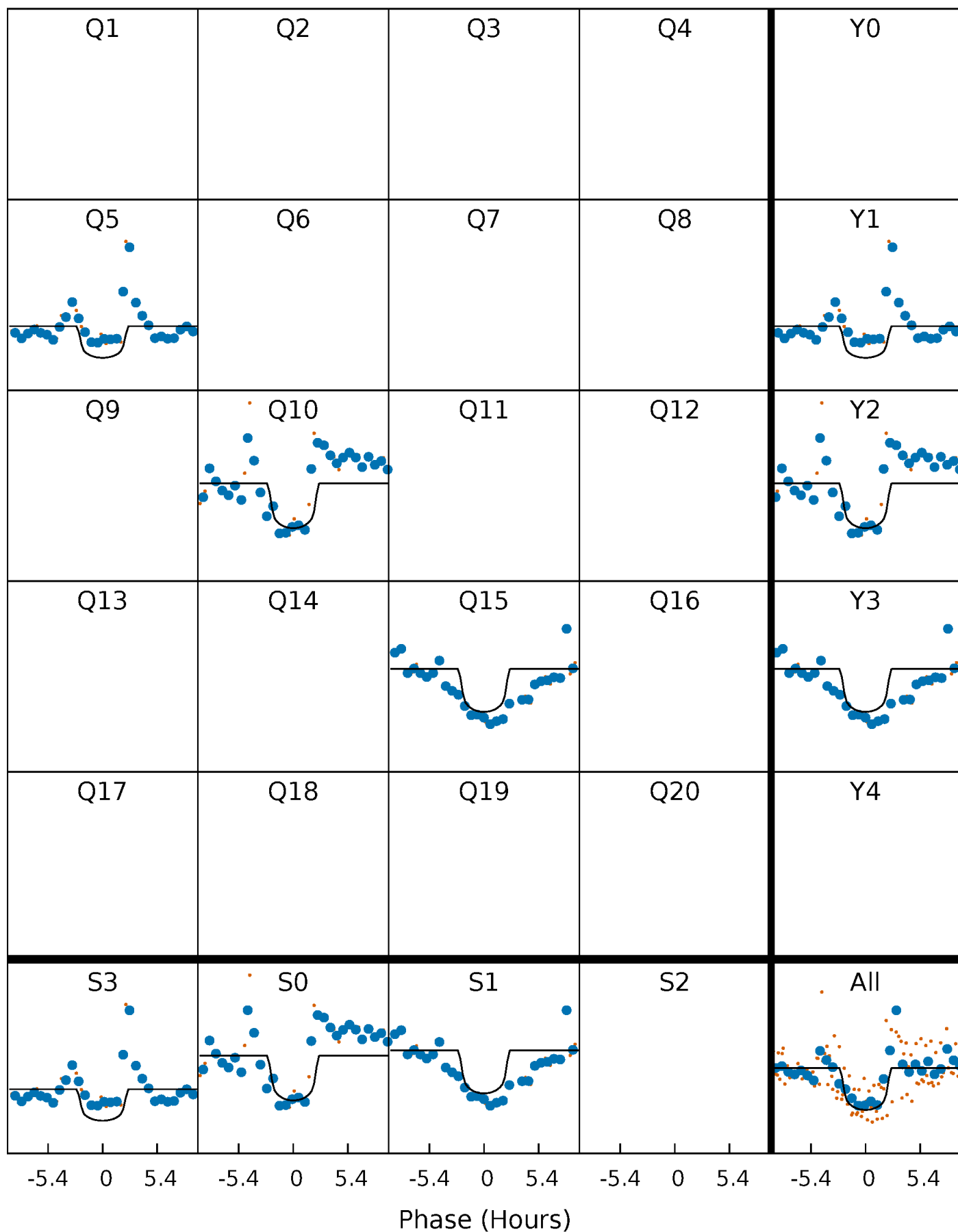
PDC Quarter-Phased Transit Curves

TCE 002308761-02 $P=470.700257$ Days $T_0=508.968275$ (BKJD)



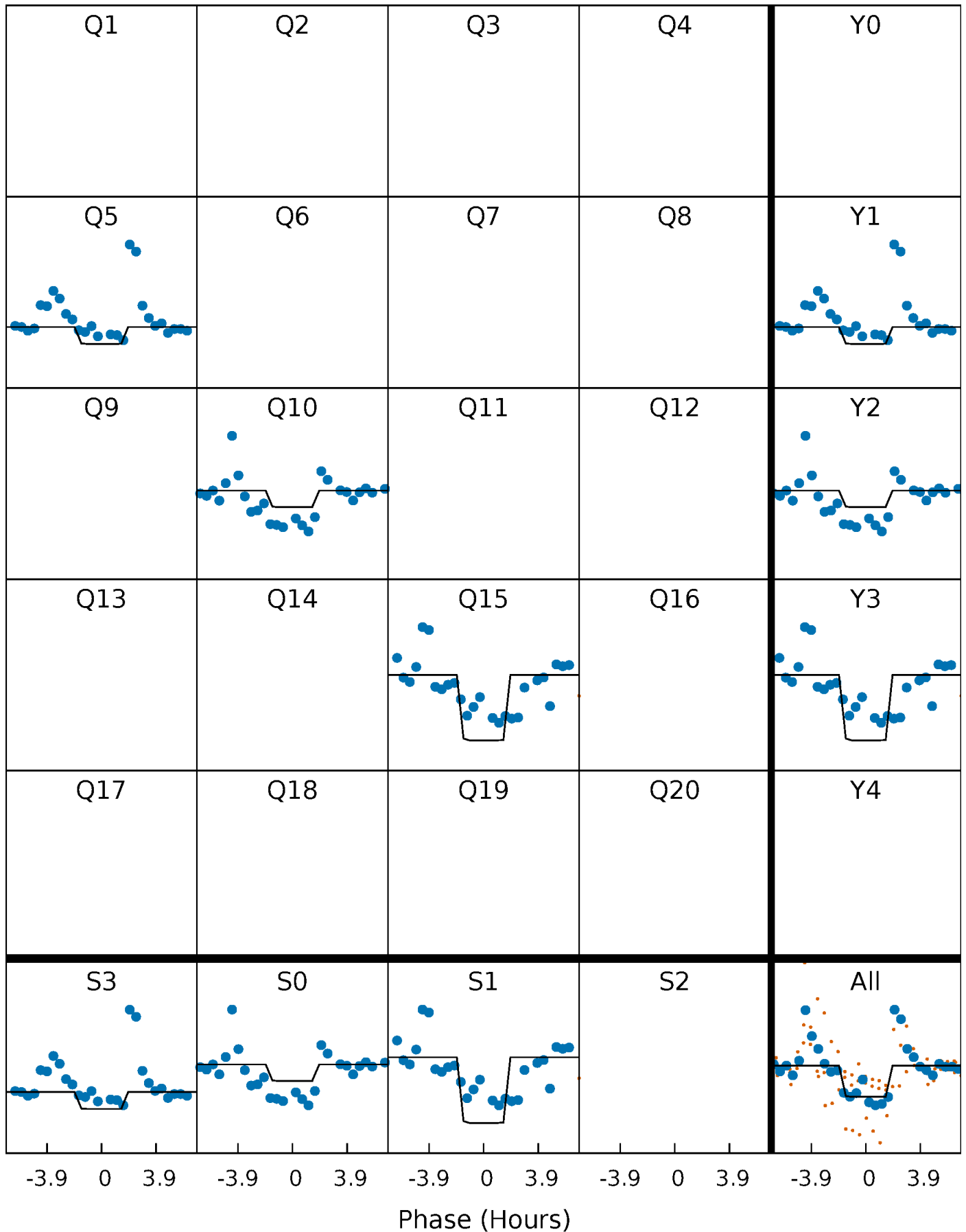
DV Quarter-Phased Transit Curves

TCE 002308761-02 $P=470.700257$ Days $T_0=508.968275$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

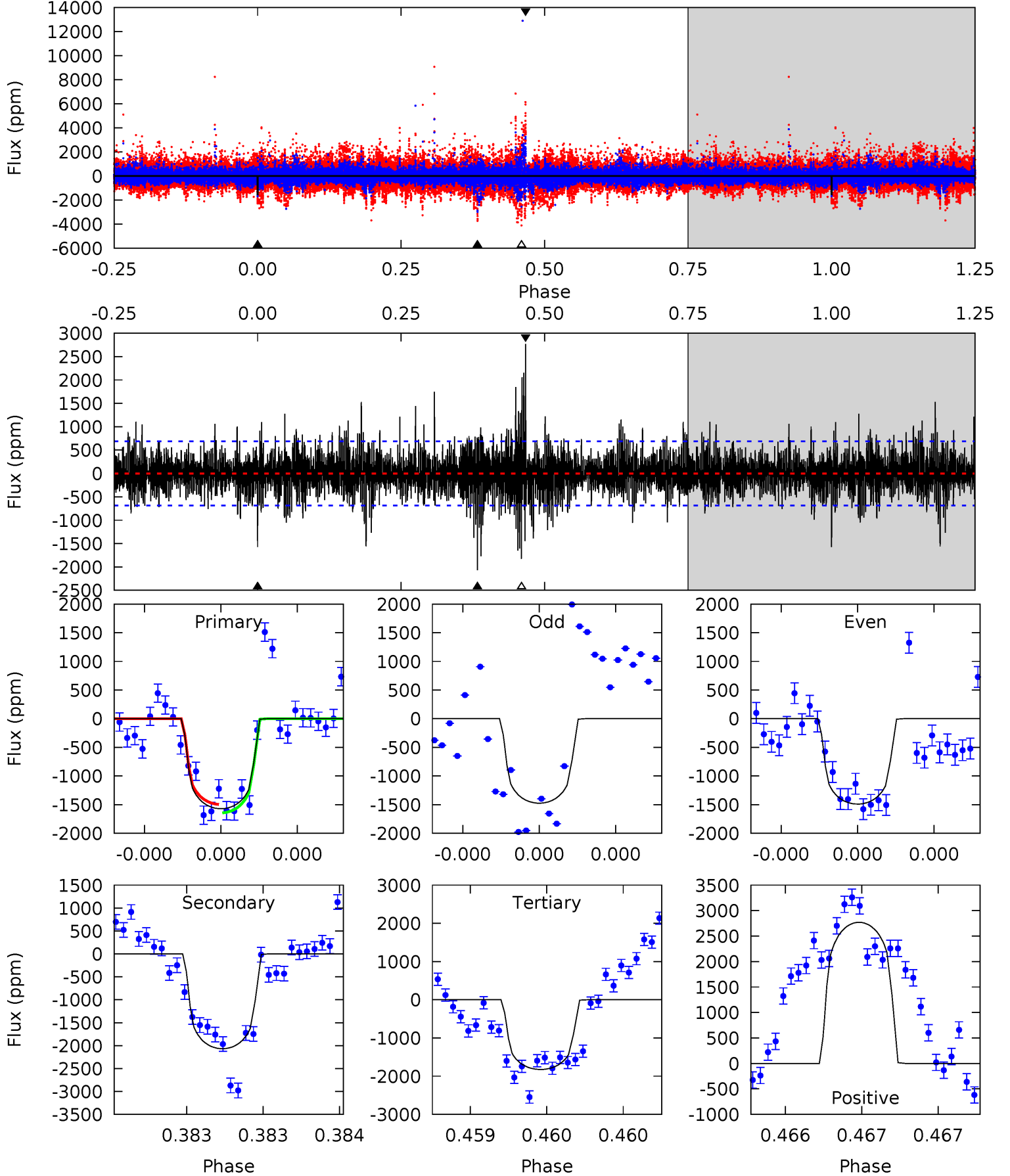
TCE 002308761-02 P=470.687055 Days $T_0=508.983761$ (BKJD)



DV Model-Shift Uniqueness Test

002308761-02, $P = 470.700257$ Days, $E = 38.268018$ Days

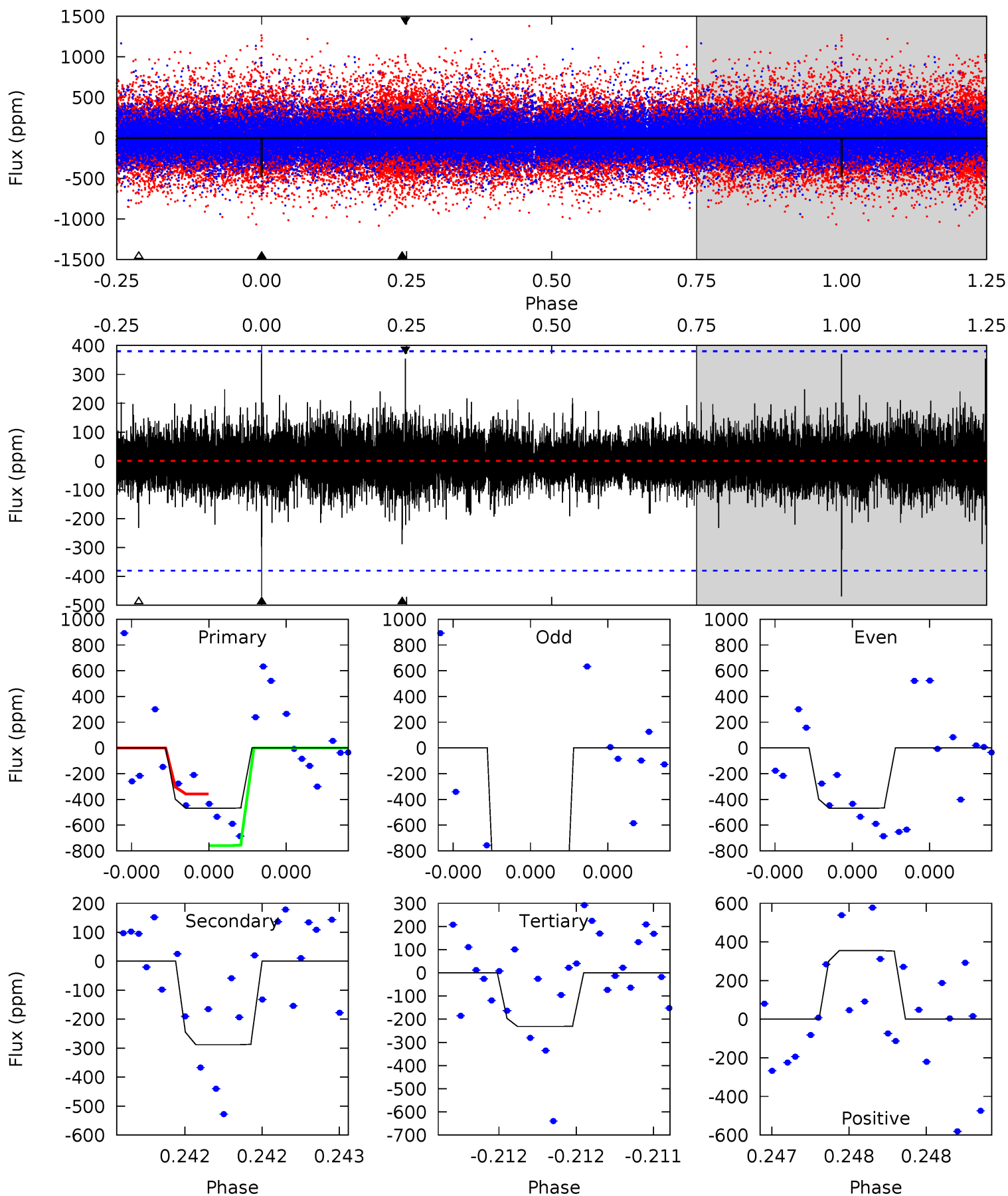
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	16.9	14.9	22.6	5.59	3.51	2.83	-2.07	-9.78	1.98	-5.73	0.04	0.97	0.57	0.60



Alt Model-Shift Uniqueness Test

002308761-02, P = 470.687055 Days, E = 38.296706 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.98	4.29	3.45	5.28	5.66	3.61	0.77	3.54	1.70	0.84	-0.99	13.2	1.79	0.44	3.11



Stellar Parameters For KIC 002308761

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002308761-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2067 ± 123	$6.13^{+5.04}_{-3.98}$	327^{+16}_{-15}	5239^{+3907}_{-1087}	$43026^{+307474}_{-30054}$
Alt.	-288 ± 67	$5.53^{+4.80}_{-3.69}$	328^{+17}_{-15}	3746^{+2028}_{-686}	7304^{+60907}_{-5313}

T_{max} = Theoretical Maximum Planetary Temperature
 T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
 A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

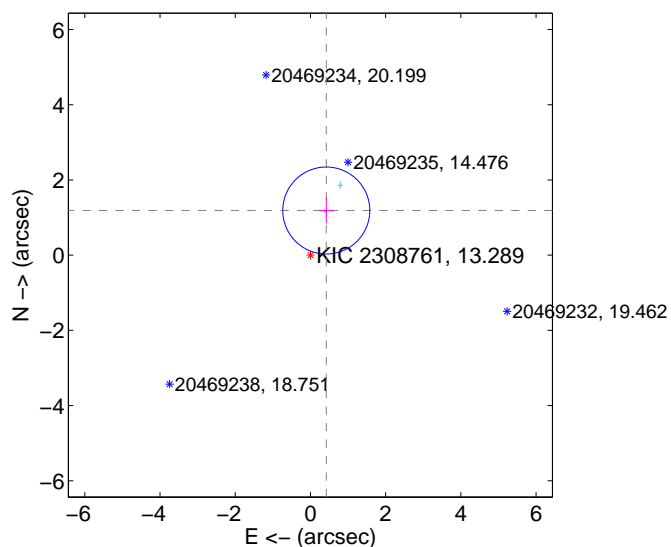
Supplemental centroid analysis for 002308761-02. Kepler magnitude: 13.29. Transit SNR 9.38

There are 1 quarters with good PRF difference image offsets

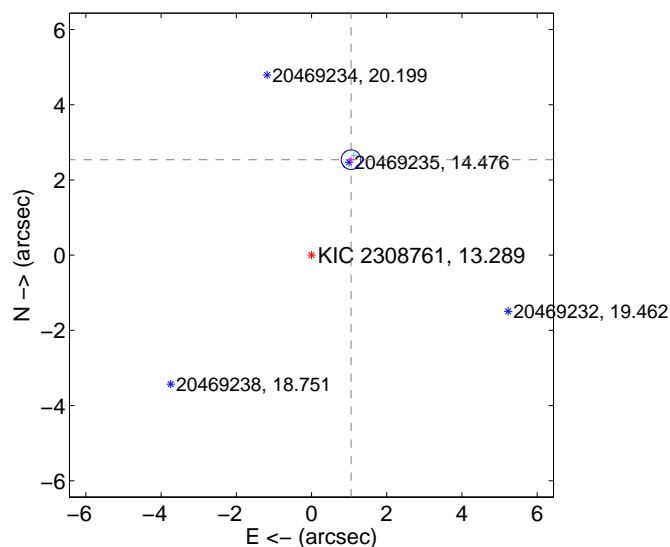
The direct PRF centroid is offset from the target star catalog position by about 0.86 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.260 ± 0.385	3.27	-0.421 ± 0.205	1.187 ± 0.341
PRF-fit source offset from KIC position	2.748 ± 0.087	31.62	-1.051 ± 0.074	2.539 ± 0.082
photometric centroid source offset	2.16 ± 1.07	2.02	-1.44 ± 0.72	1.61 ± 1.28

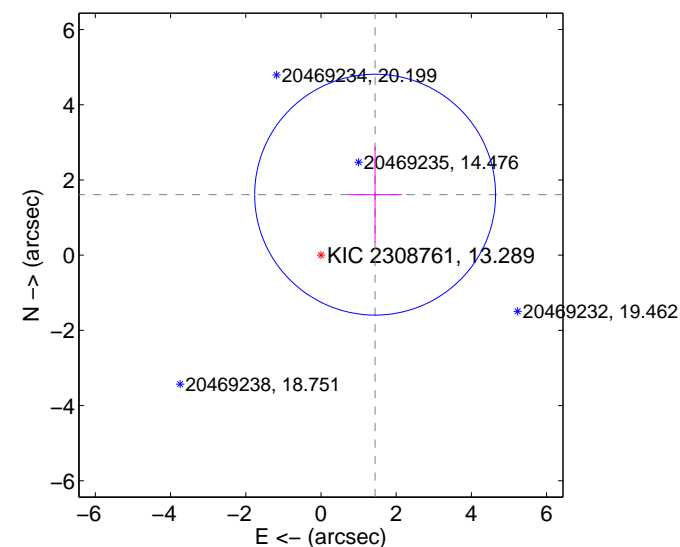
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

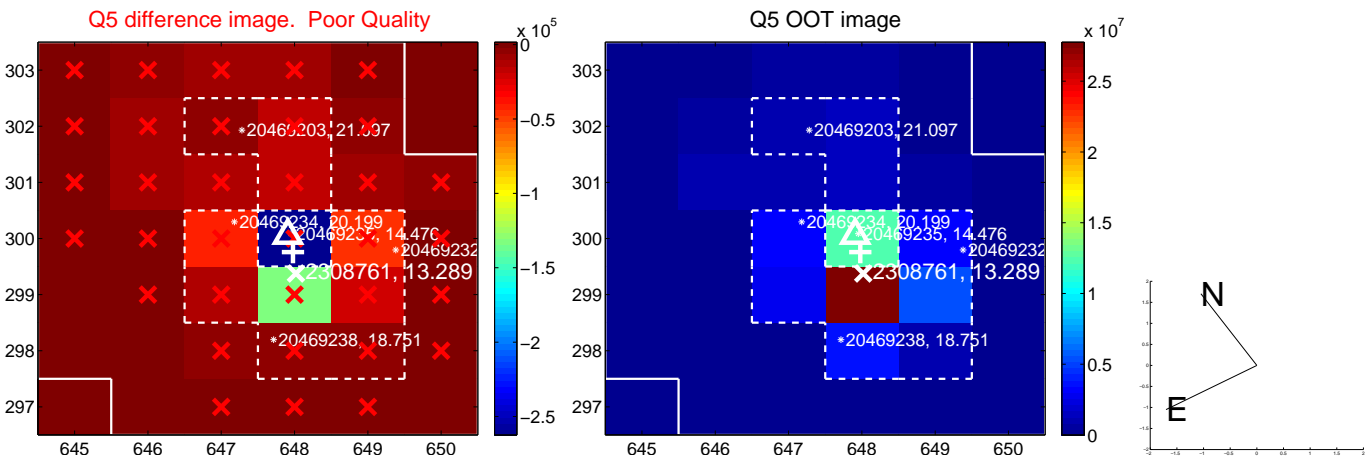


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

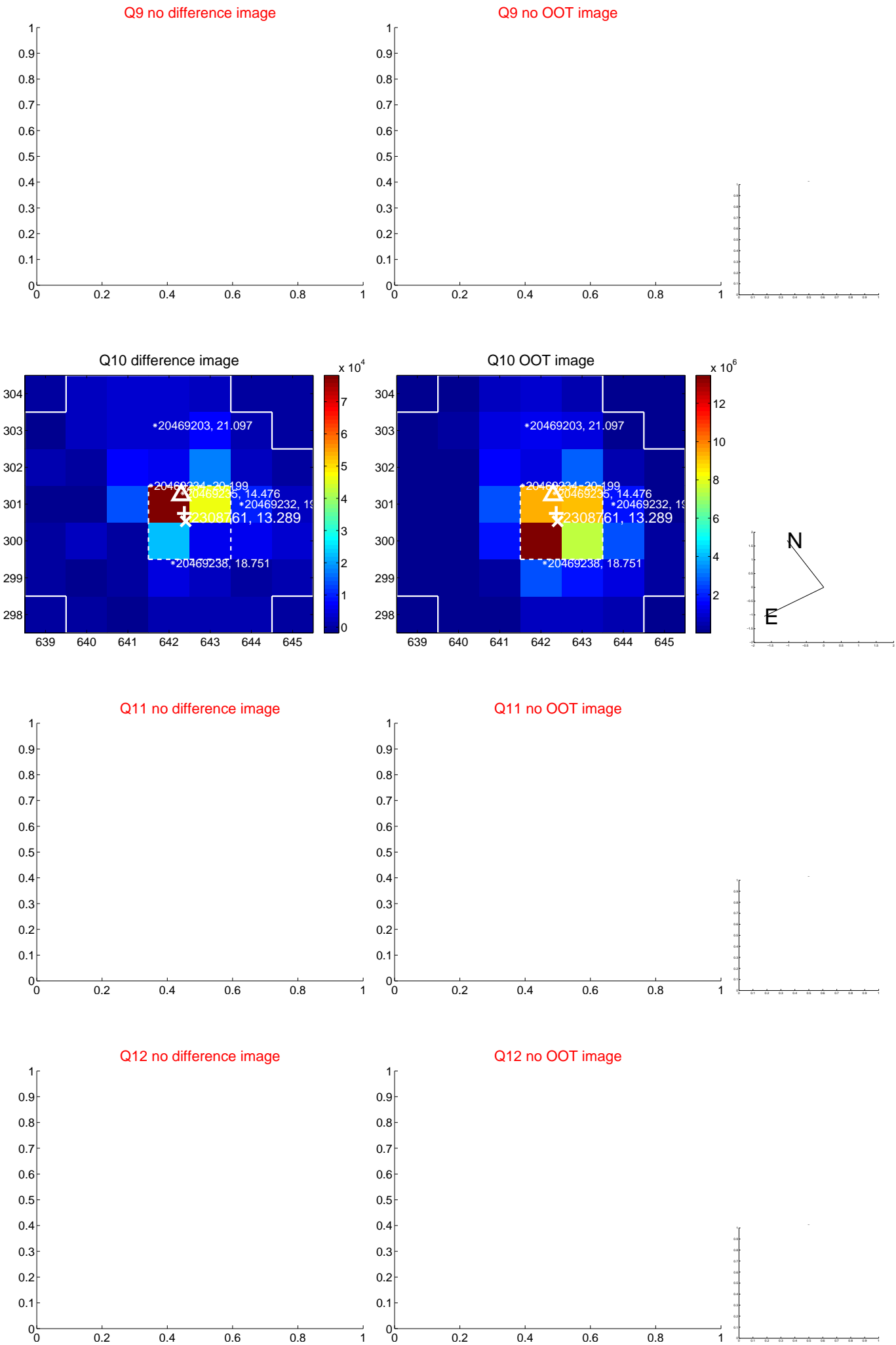
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



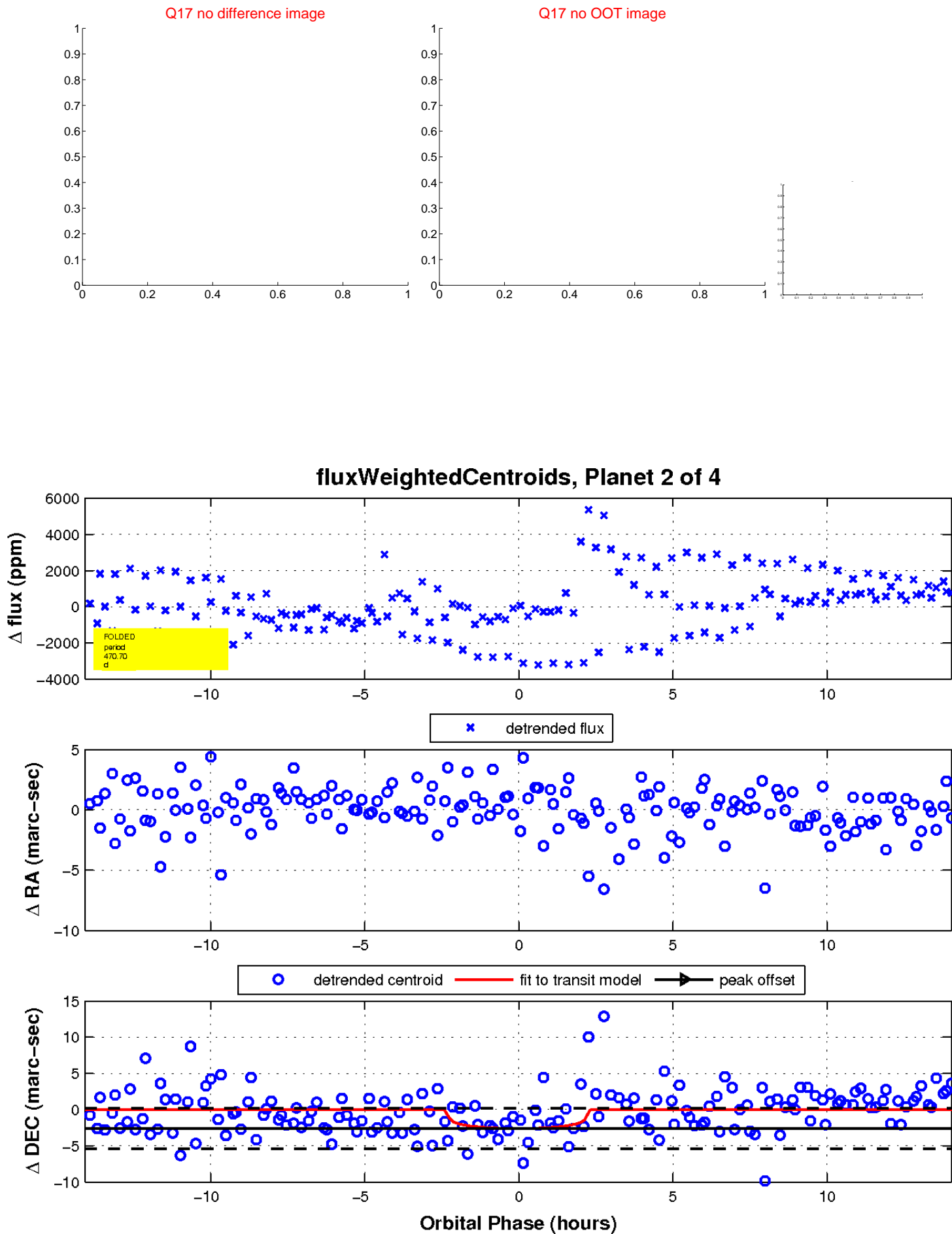
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

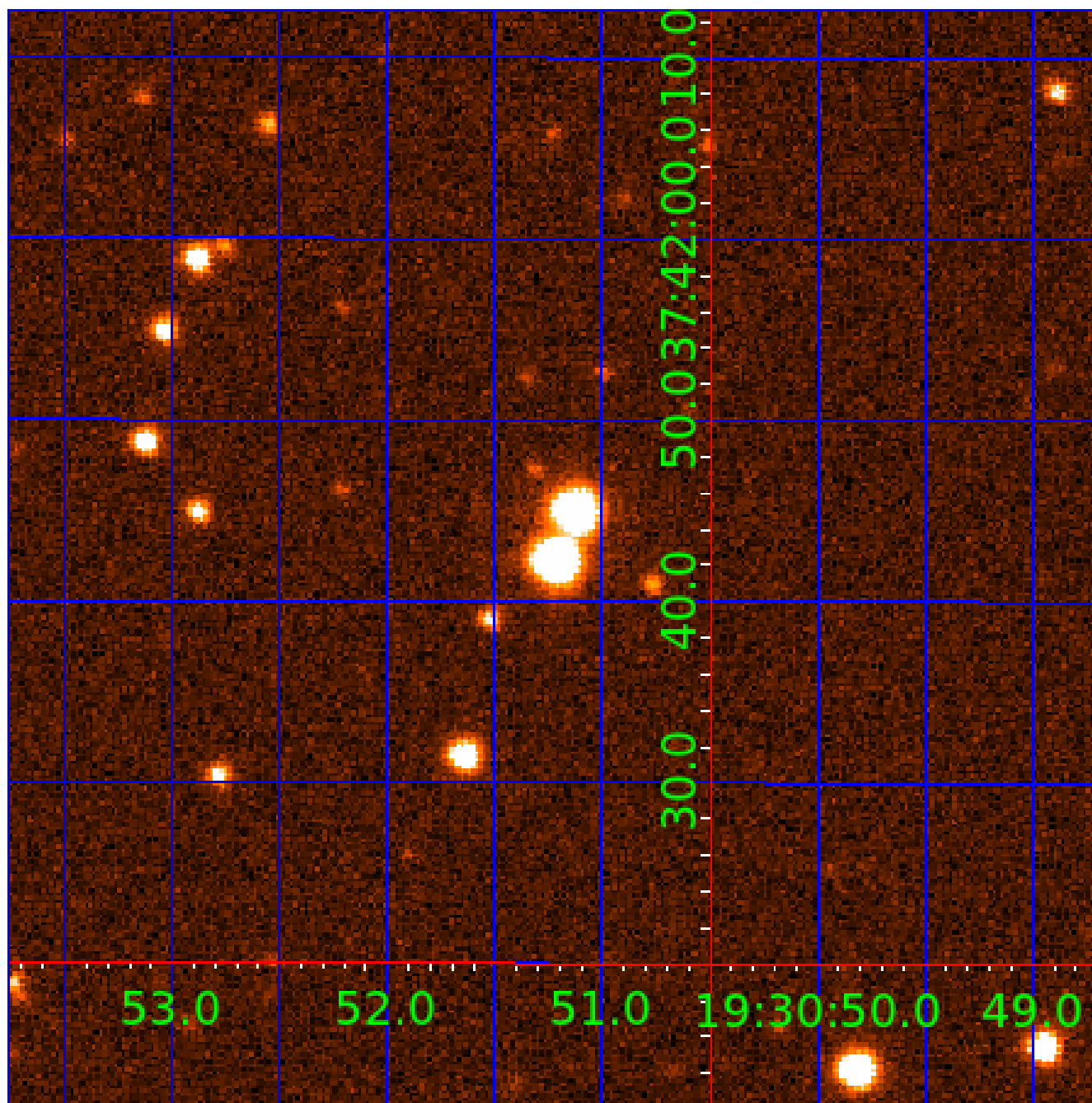


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002308761

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})
002308761-01	OBS	No	291.620142	312.365620	905.4	3.155	14.5	6.6	1.00	5780	3.29	1.35
002308761-02	OBS	No	470.700257	508.968275	1767.8	4.720	14.8	9.4	1.00	5780	4.16	0.71
002308761-03	OBS	No	159.607412	207.002511	777.9	2.909	12.2	6.4	1.00	5780	2.83	3.01
002308761-04	OBS	No	431.661160	232.811047	1167.5	4.899	17.0	6.0	1.00	5780	3.47	0.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002308761-01	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—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
002308761-04	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—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

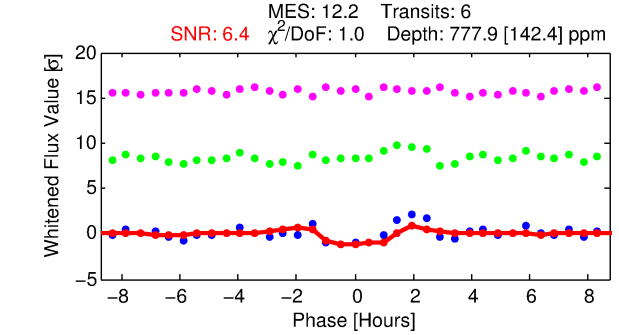
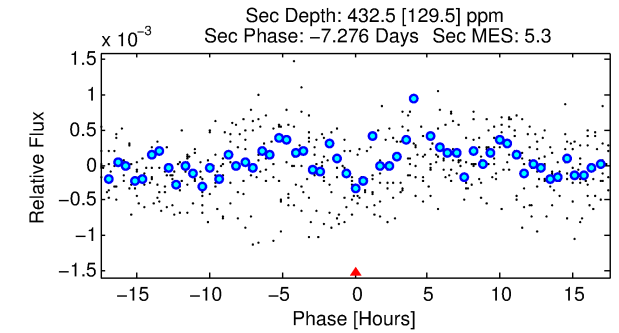
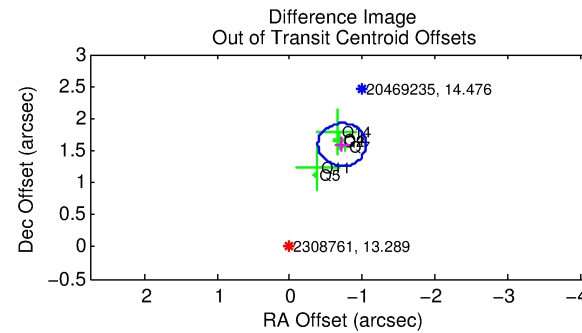
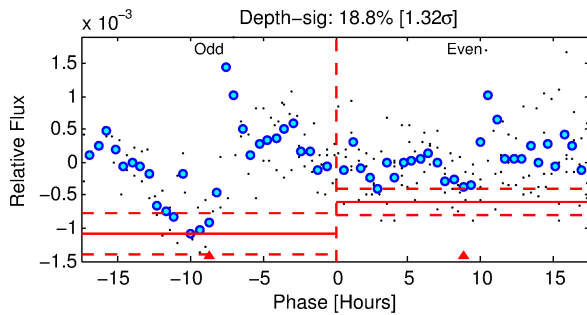
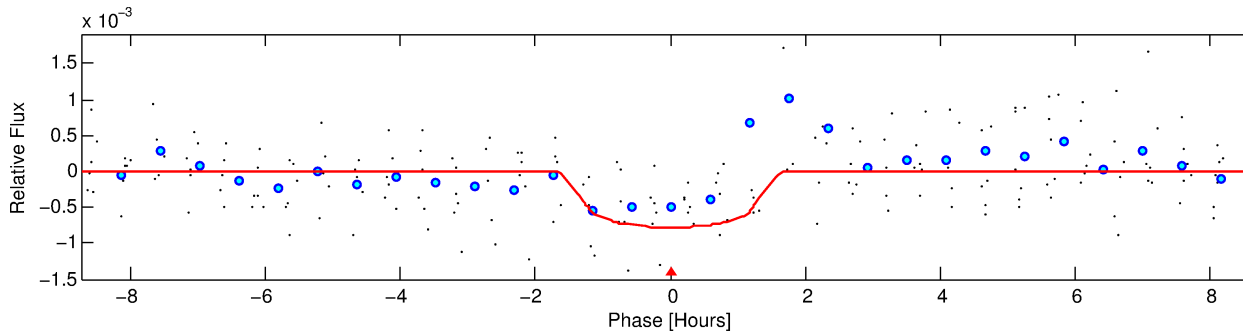
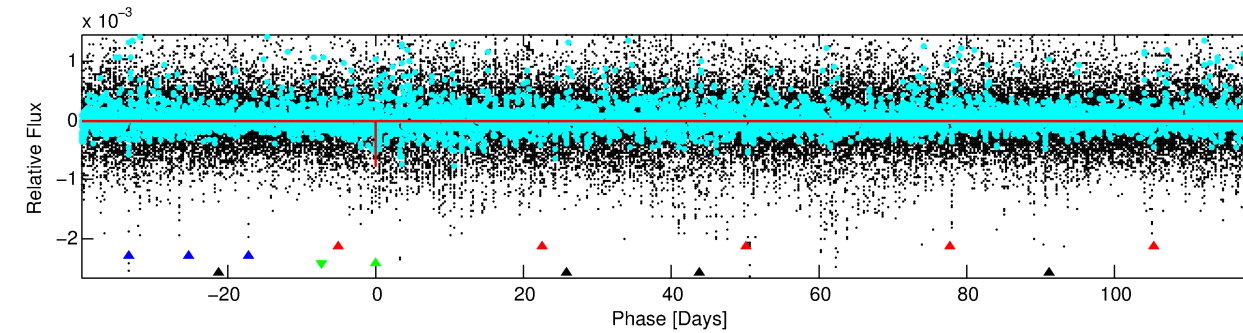
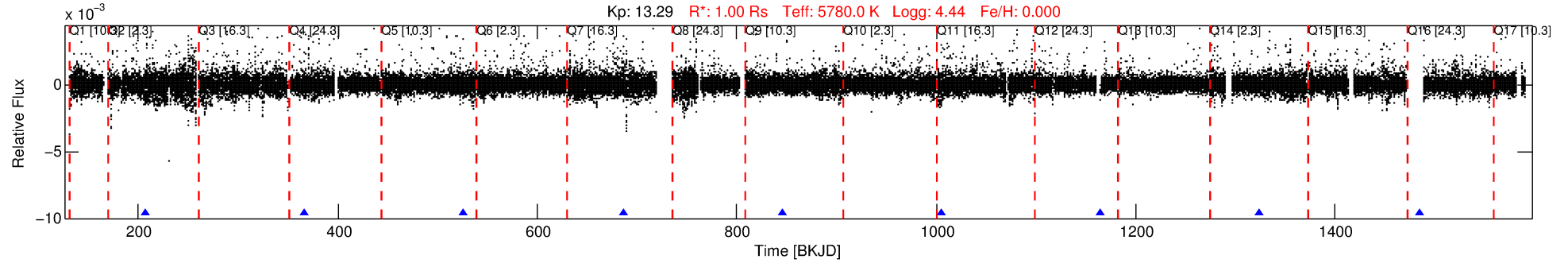
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002308761-03

No Significant Match Found

DV One-Page Summary

KIC: 2308761 Candidate: 3 of 4 Period: 159.607 d



DV Fit Results:

Period = 159.60741 [0.00144] d
Epoch = 207.0025 [0.0056] BKJD
Rp/R* = 0.0259 [0.0509]
a/R* = 391.06 [3323.63]
b = 0.43 [16.48]
Seff = 3.01 [0.00]
Teq = 336 [0] K
Rp = 2.83 [5.56] Re
a = 0.5760 [0.0000] AU
Ag = 9882.18 [38993.42] [0.25σ]
Teffp = 5179 [5109] K [0.95σ]

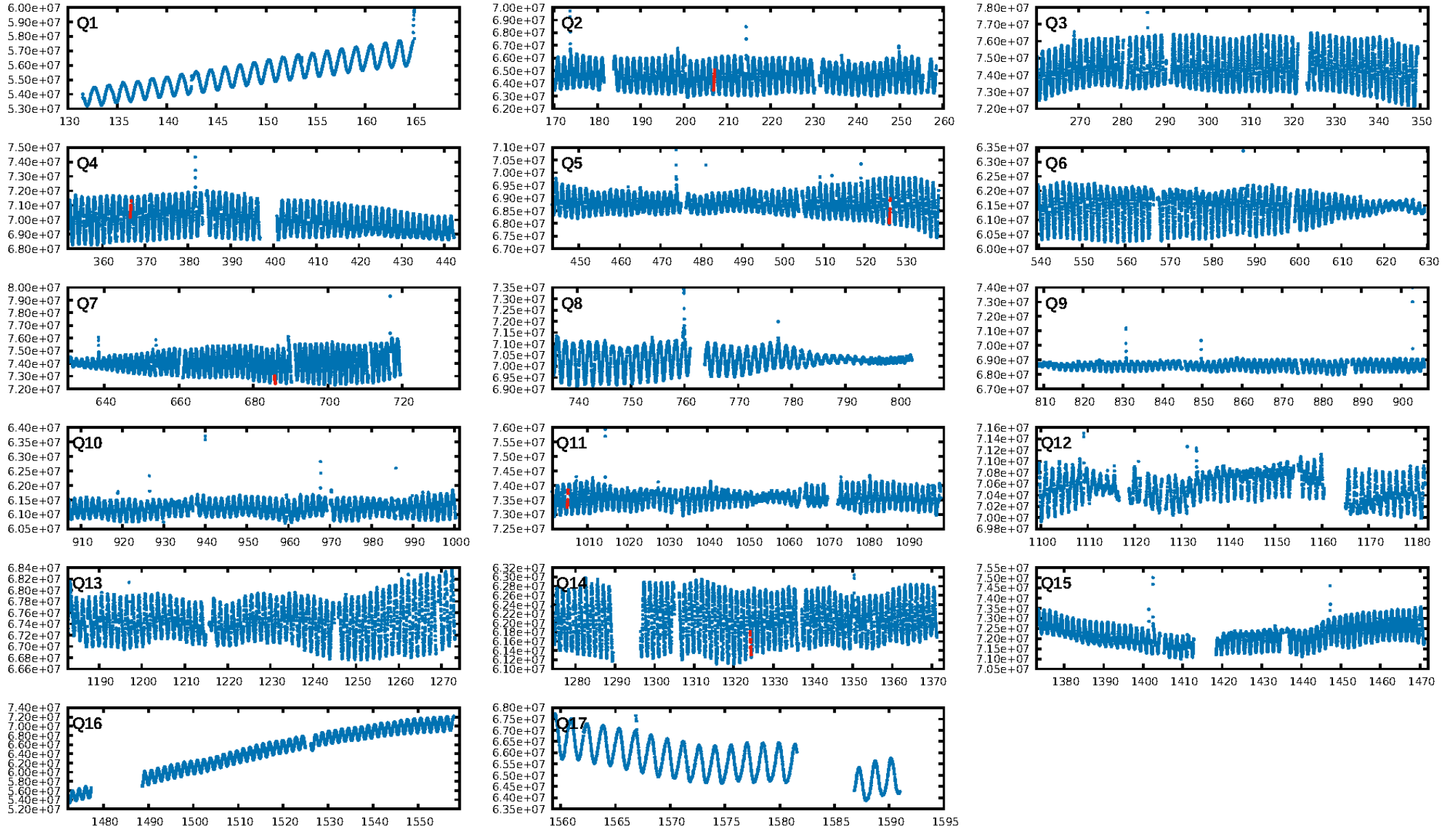
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [738.27σ]
ModelChiSquare2-sig: 10.0%
ModelChiSquareGof-sig: 96.6%
Bootstrap-pfa: 2.25e-13
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -11.53
Centroid-sig: N/A
Centroid-so: 1.356 arcsec [0.63σ]
OotOffset-rm: 1.747 arcsec [15.79σ]
KicOffset-rm: 2.711 arcsec [24.24σ]
OotOffset-st: 2/2/1/1 [6]
KicOffset-st: 2/2/1/1 [6]
DiffImageQuality-fgm: 0.83 [5/6]
DiffImageOverlap-fno: 1.00 [6/6]

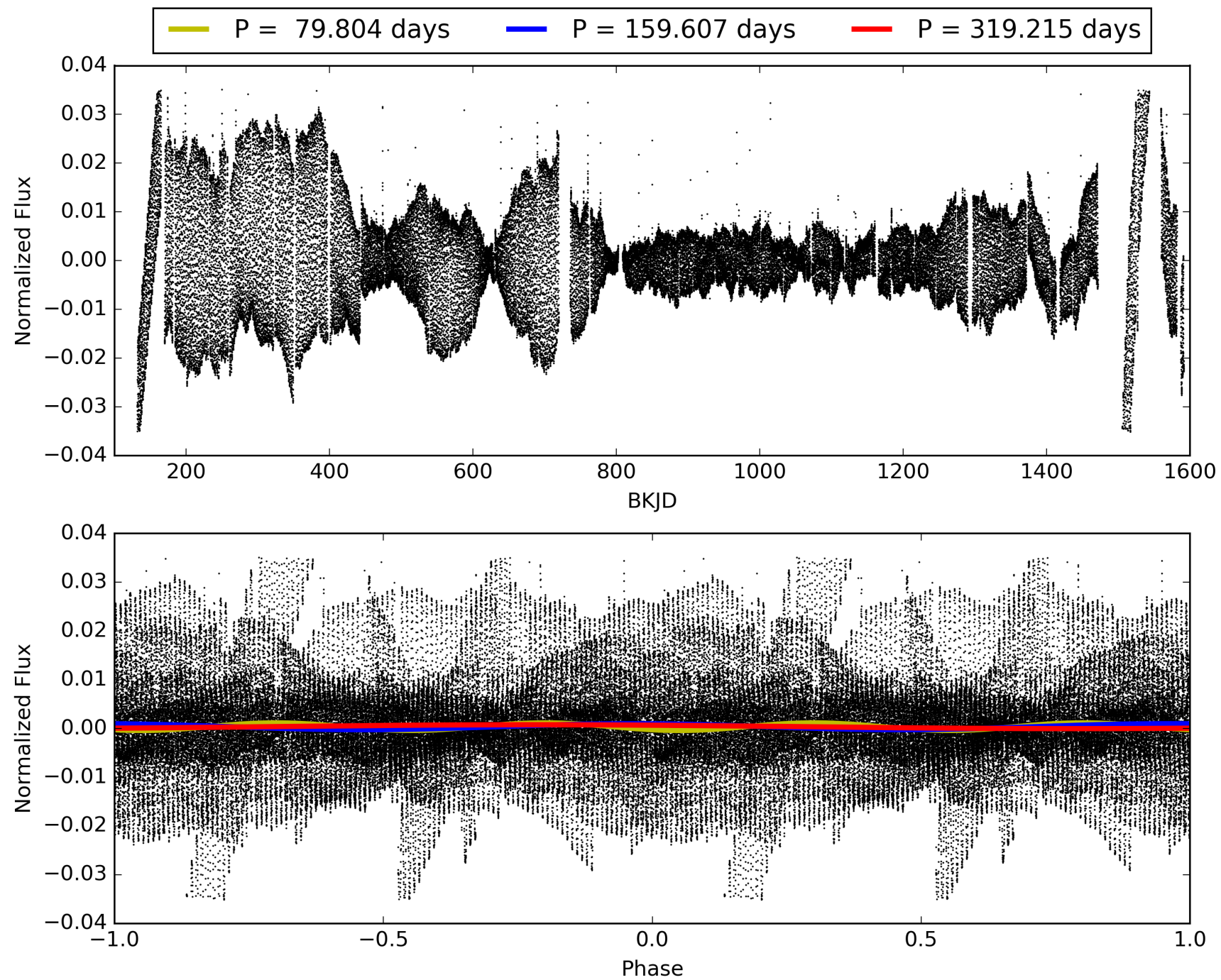
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:04:11 Z

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

TCE 002308761-03, PDC Light Curves

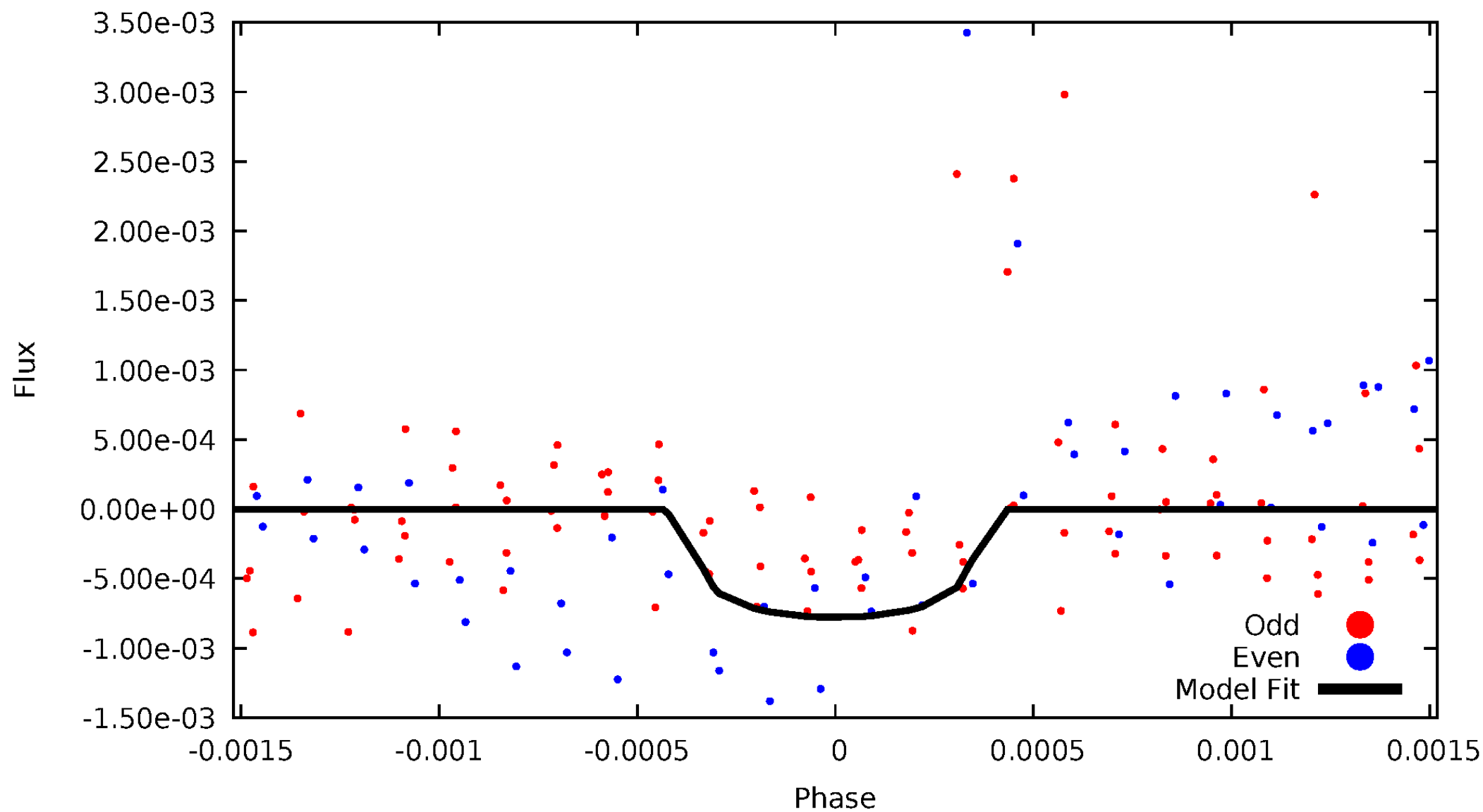


TCE 002308761-03



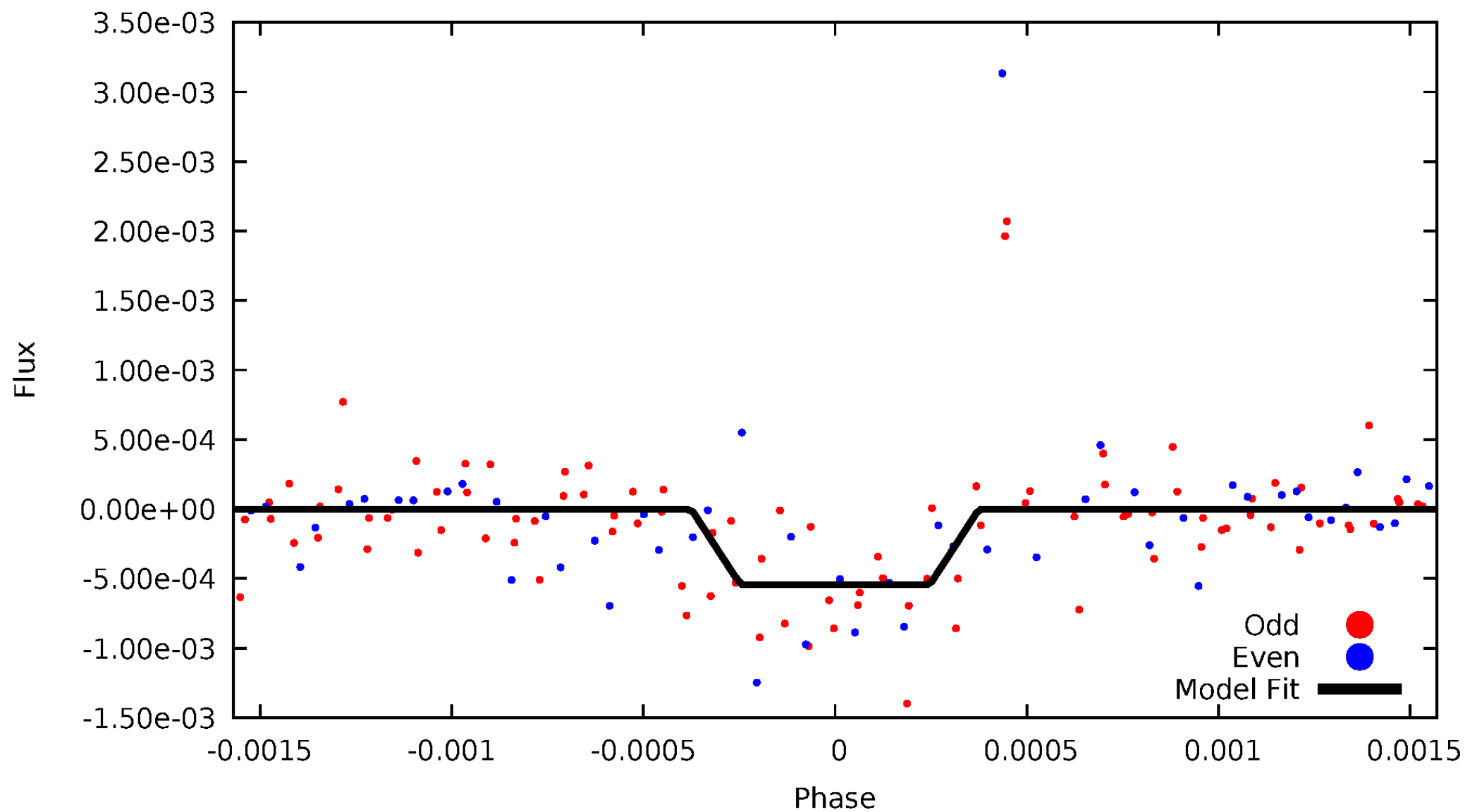
DV Odd/Even

TCE 002308761-03



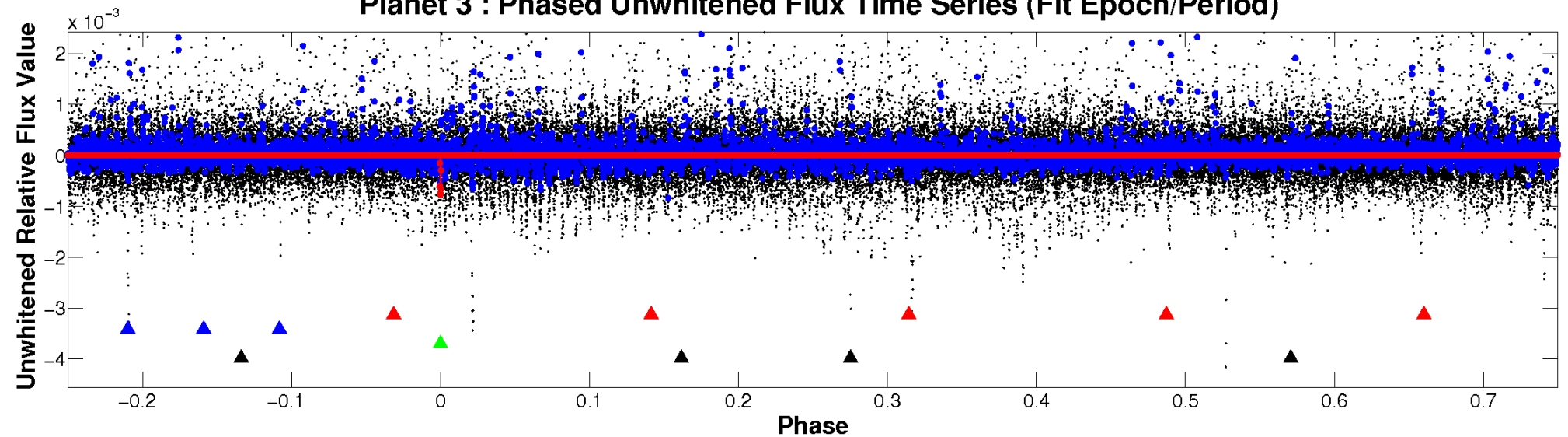
ALT Odd/Even

TCE 002308761-03

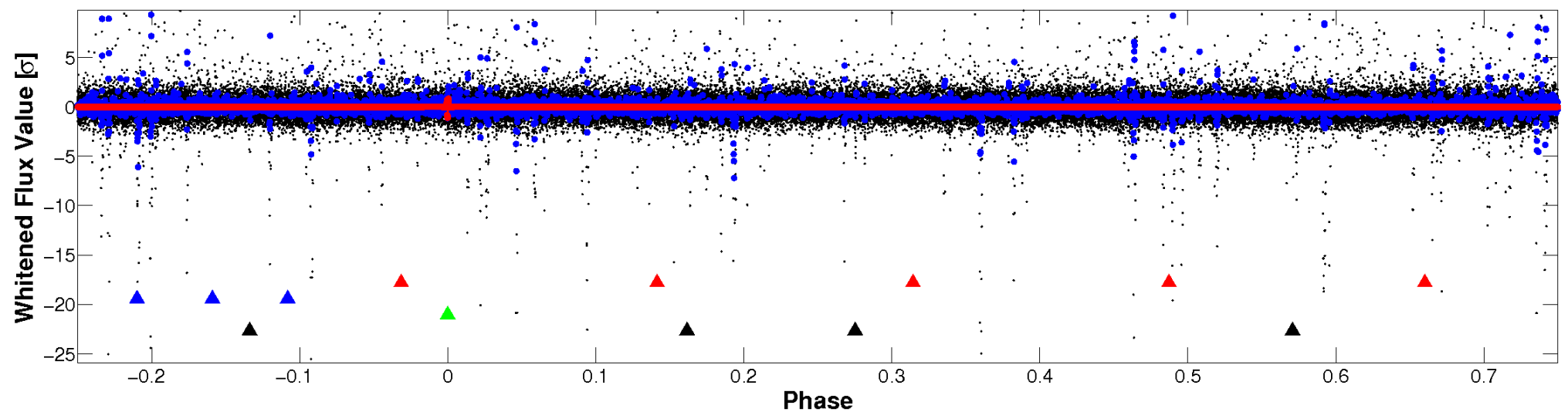


Non-Whitened Vs. Whitened Light Curve

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

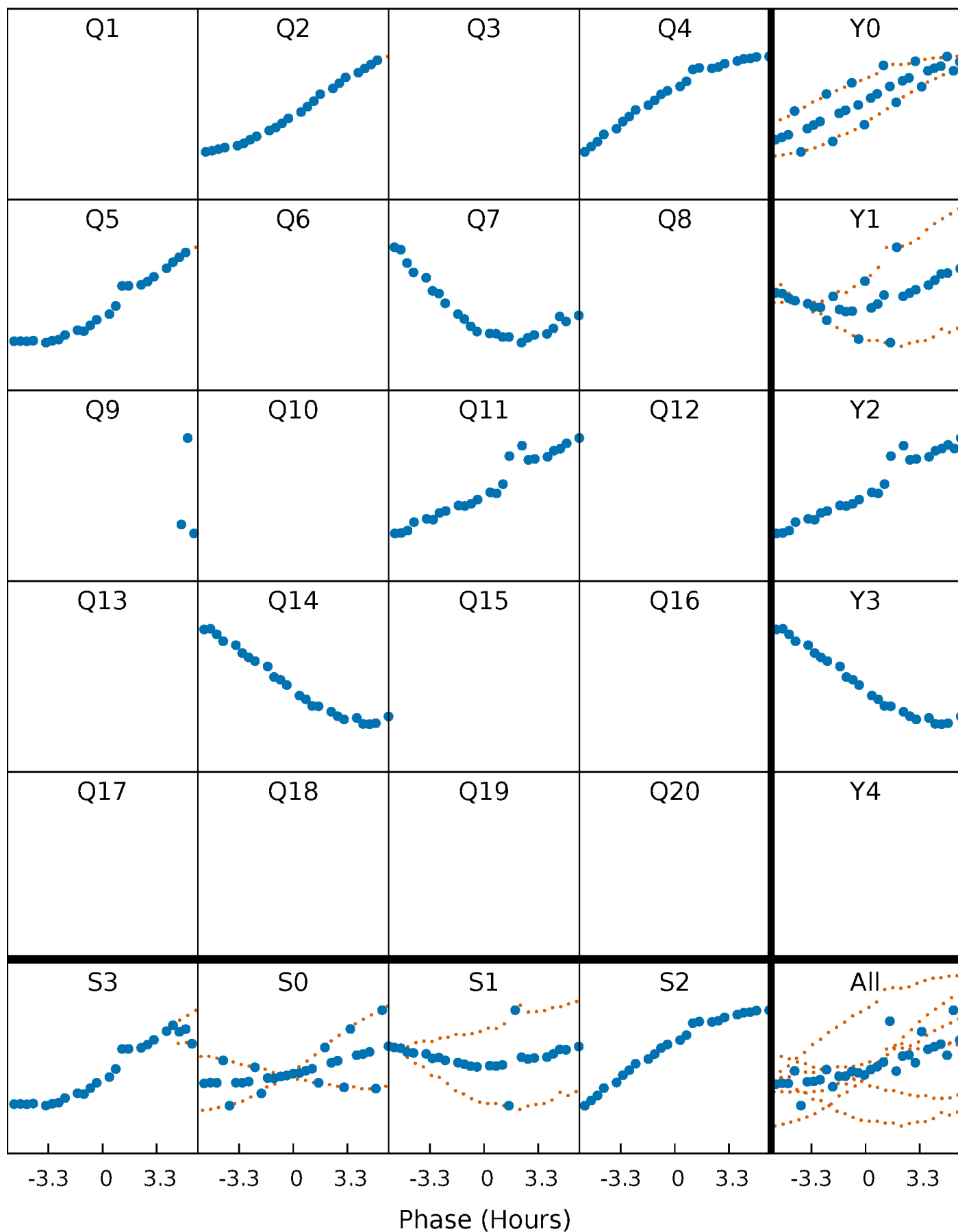


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



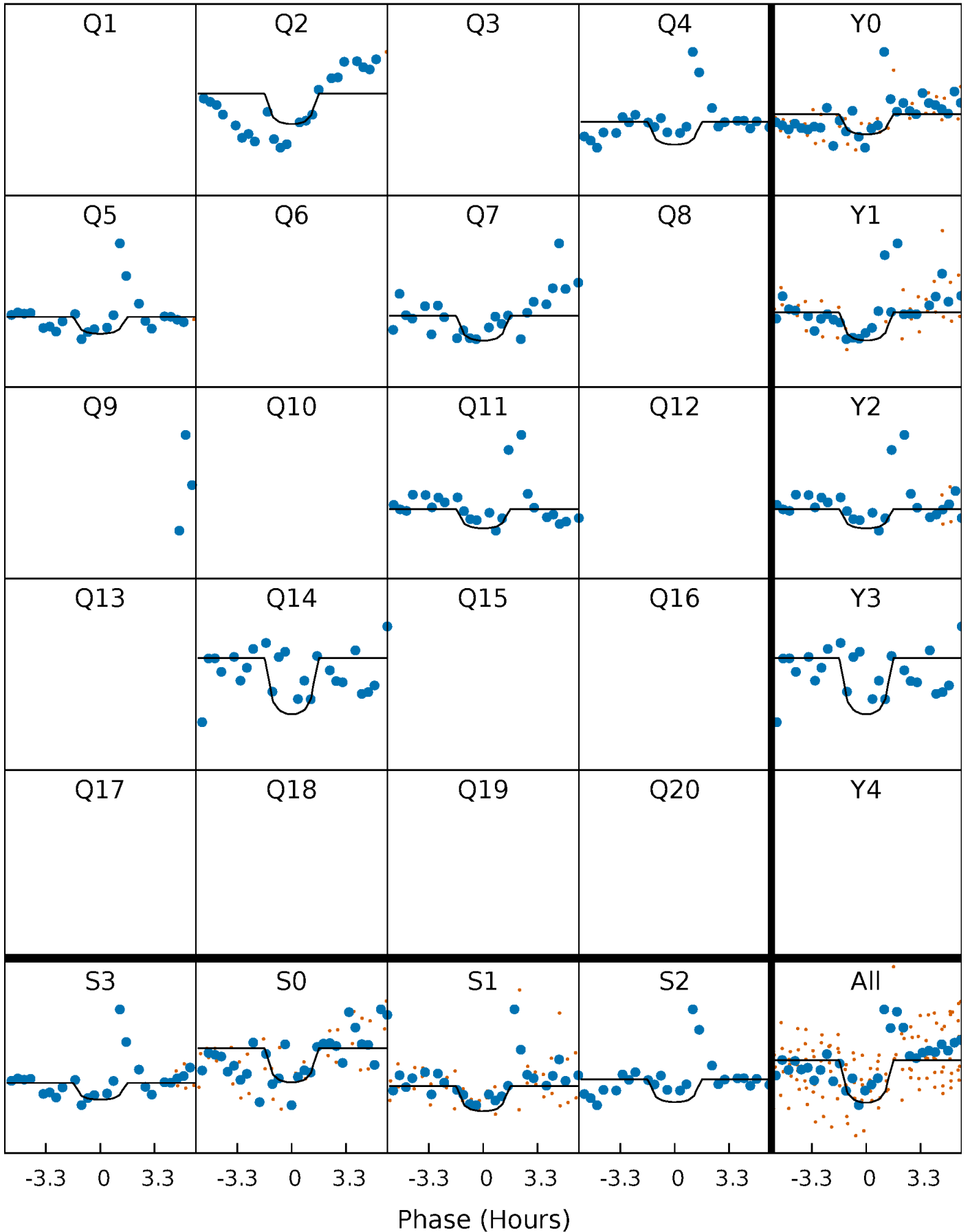
PDC Quarter-Phased Transit Curves

TCE 002308761-03 P=159.607412 Days $T_0=207.002511$ (BKJD)



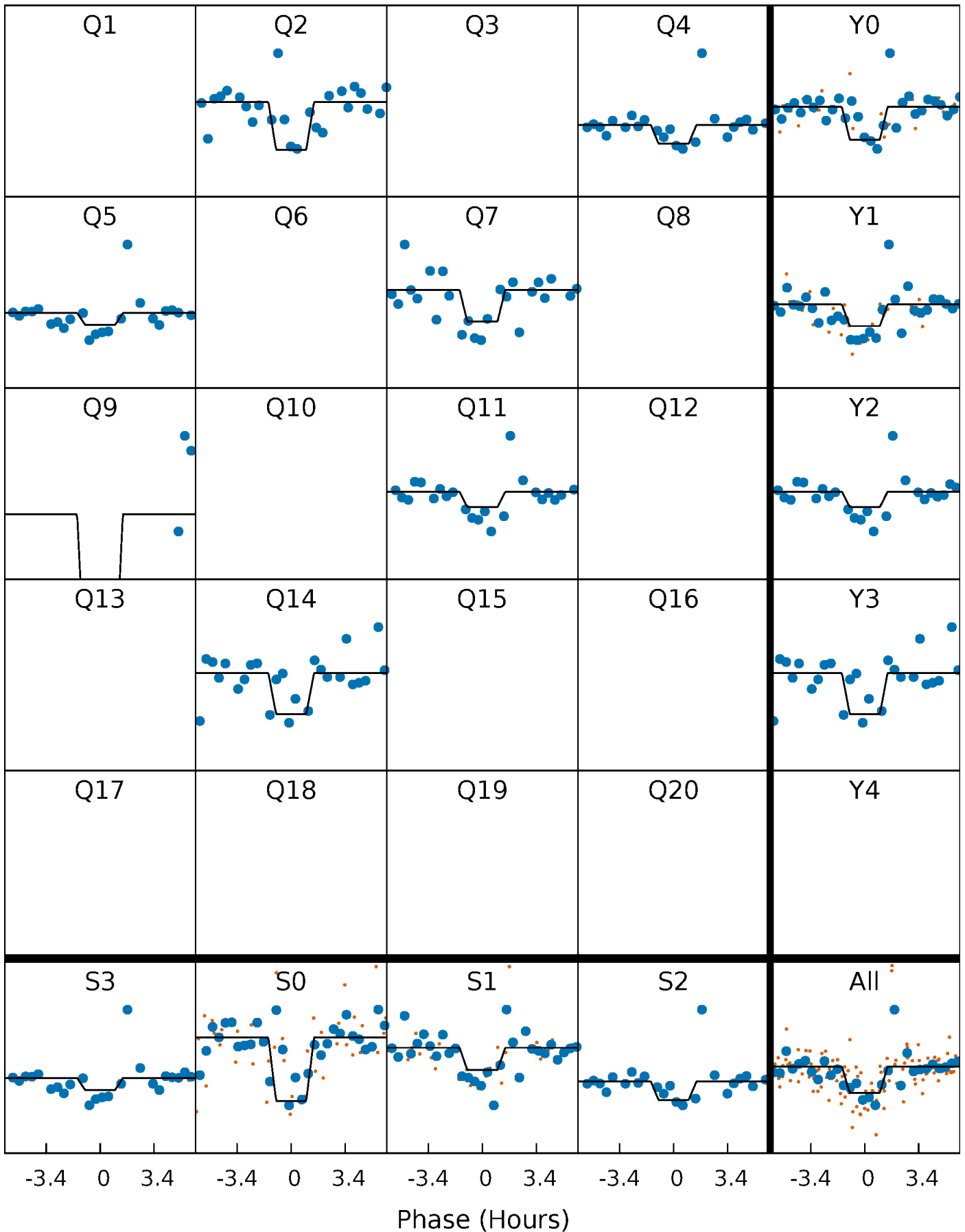
DV Quarter-Phased Transit Curves

TCE 002308761-03 P=159.607412 Days $T_0=207.002511$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

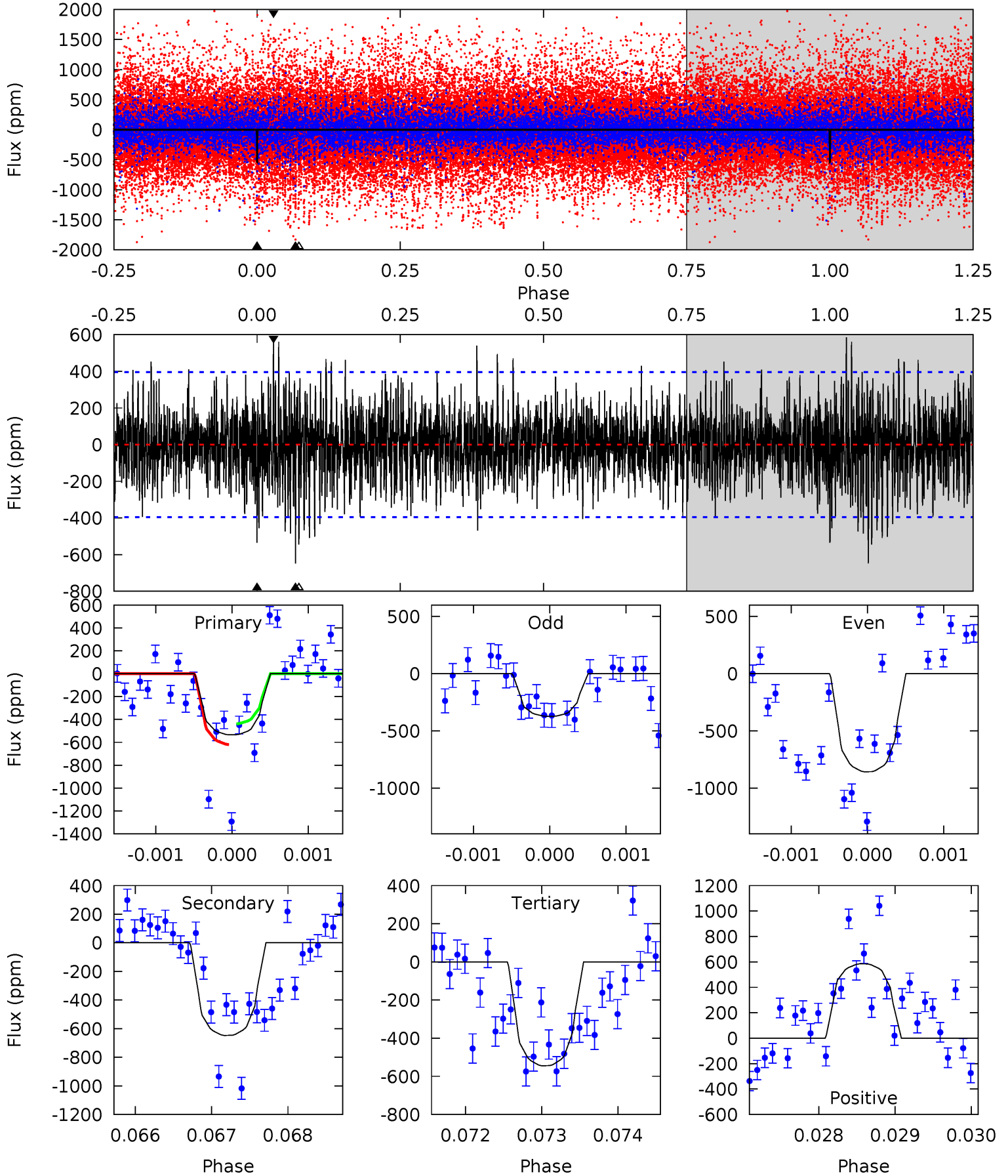
TCE 002308761-03 P=159.613336 Days $T_0=206.974057$ (BKJD)



DV Model-Shift Uniqueness Test

002308761-03, P = 159.607412 Days, E = 47.395099 Days

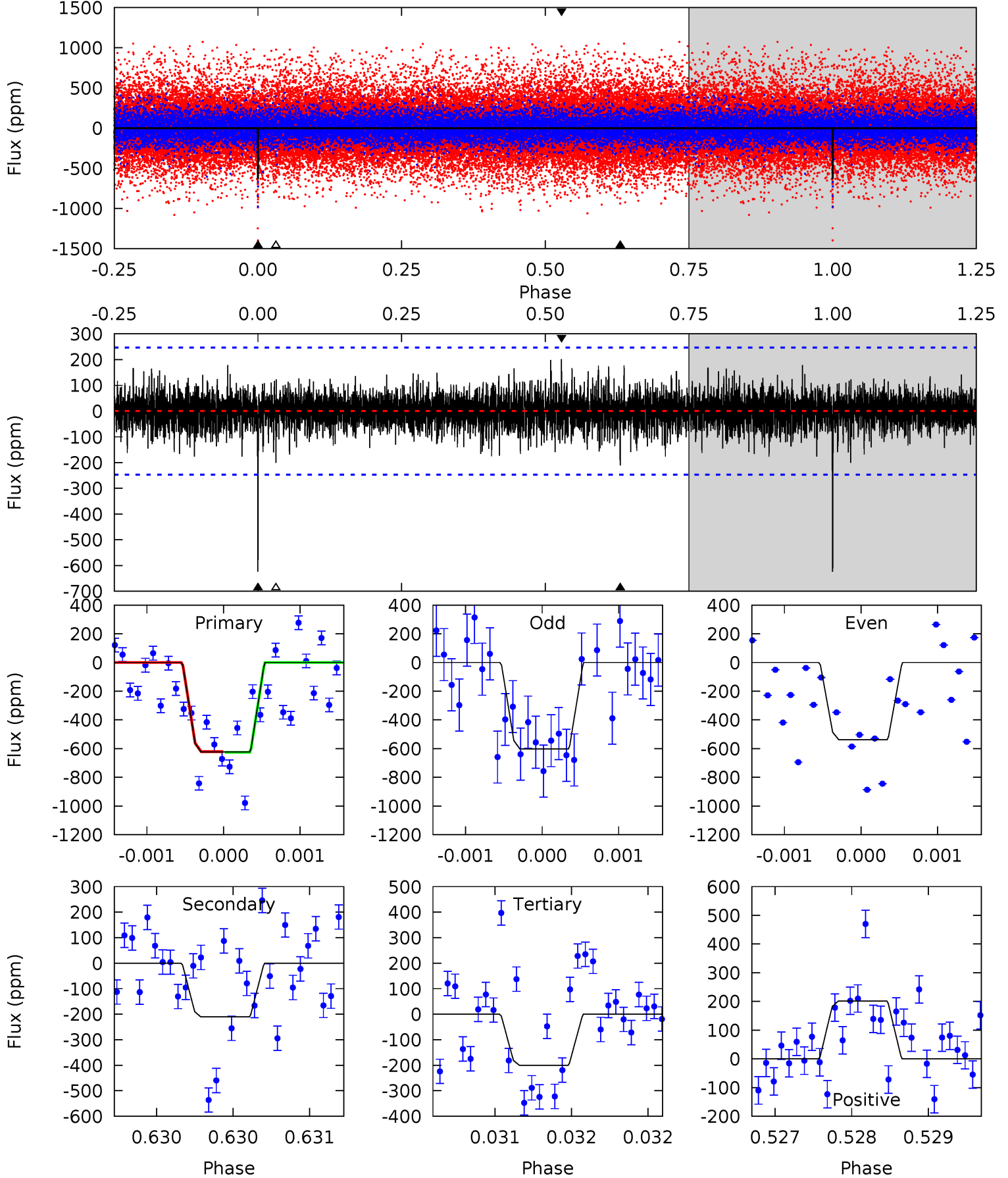
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.40	8.96	7.54	8.10	5.47	3.33	1.96	-0.14	-0.70	1.42	0.86	3.20	0.99	0.47	1.25



Alt Model-Shift Uniqueness Test

002308761-03, P = 159.613336 Days, E = 47.360721 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	4.70	4.49	4.51	5.51	3.39	1.08	9.45	9.43	0.22	0.19	0.68	1.14	0.24	0.06



Stellar Parameters For KIC 002308761

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002308761-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-647 ± 72	$4.63^{+4.54}_{-3.21}$	469^{+25}_{-22}	4633^{+3699}_{-1025}	5385^{+54737}_{-3997}
Alt.	-210 ± 45	$4.76^{+4.51}_{-3.32}$	470^{+23}_{-23}	3689^{+2418}_{-671}	1631^{+17362}_{-1228}

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

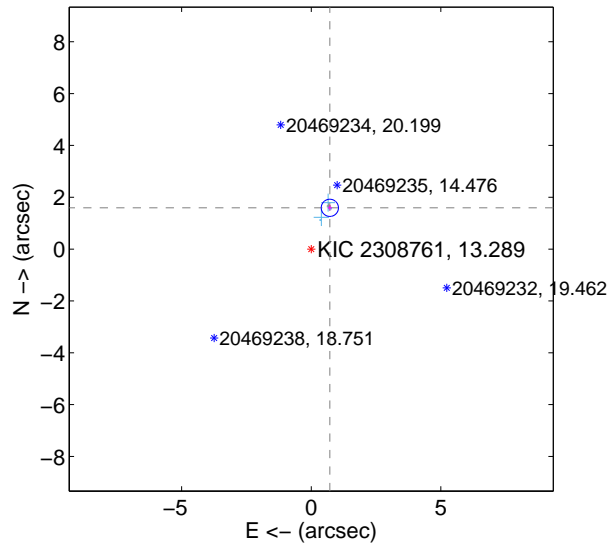
Supplemental centroid analysis for 002308761-03. Kepler magnitude: 13.29. Transit SNR 6.41

There are 5 quarters with good PRF difference image offsets

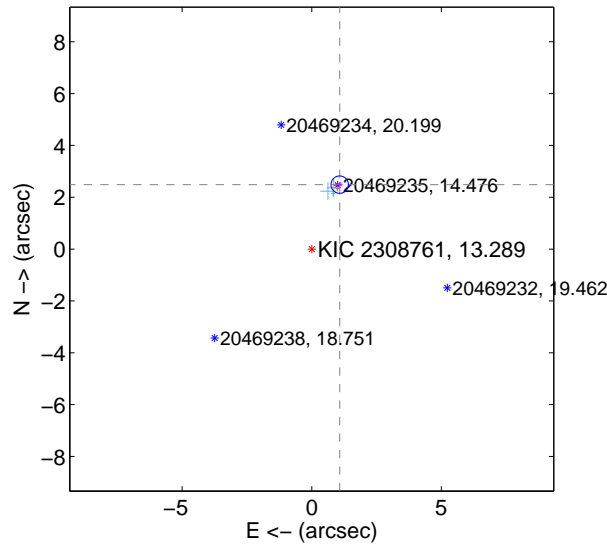
The direct PRF centroid is offset from the target star catalog position by about 0.60 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.747 ± 0.111	15.79	-0.718 ± 0.085	1.592 ± 0.101
PRF-fit source offset from KIC position	2.711 ± 0.112	24.24	-1.078 ± 0.110	2.487 ± 0.091
photometric centroid source offset	1.36 ± 2.14	0.63	0.94 ± 1.58	0.98 ± 2.55

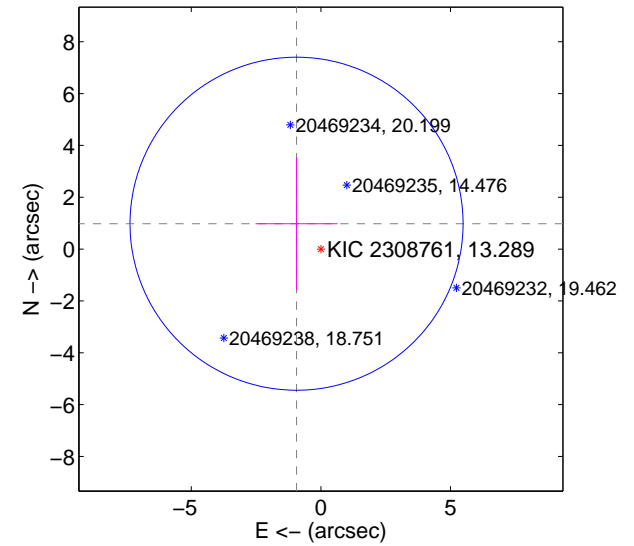
offset from difference PRF-fit to OOT PRF-fit



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 $> 15,000$, are from the UKIRT catalog.

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

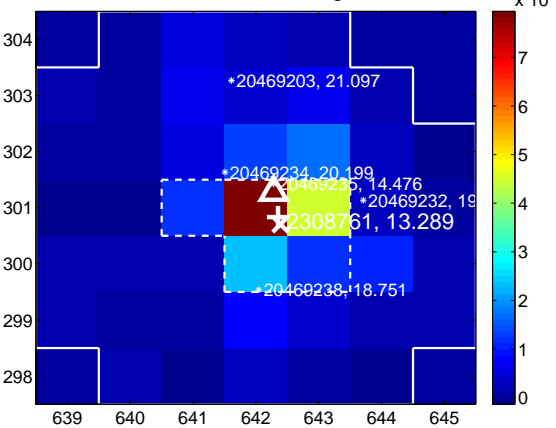
Q1 no difference image



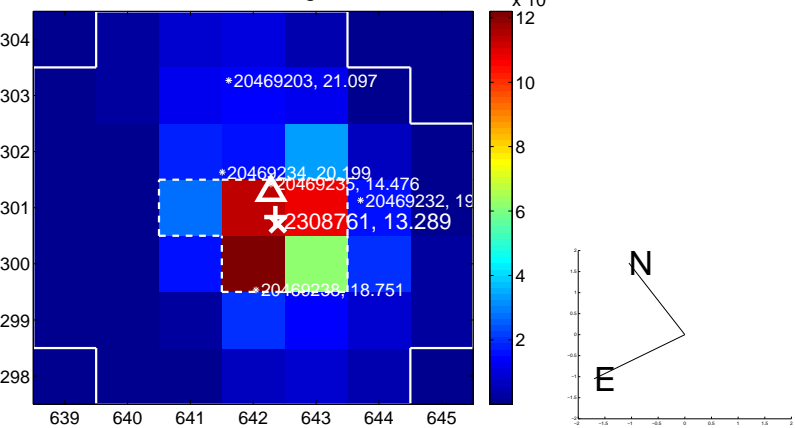
Q1 no OOT image



Q2 difference image



Q2 OOT image



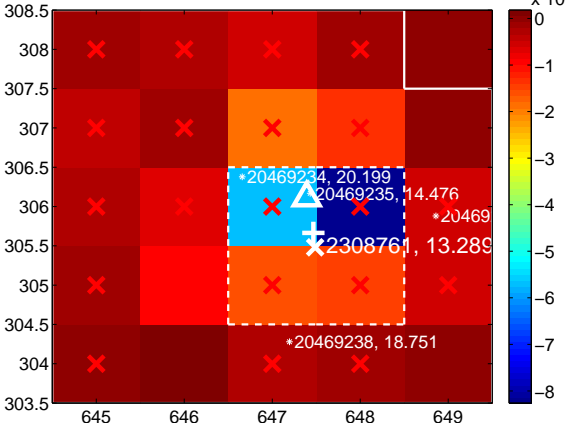
Q3 no difference image



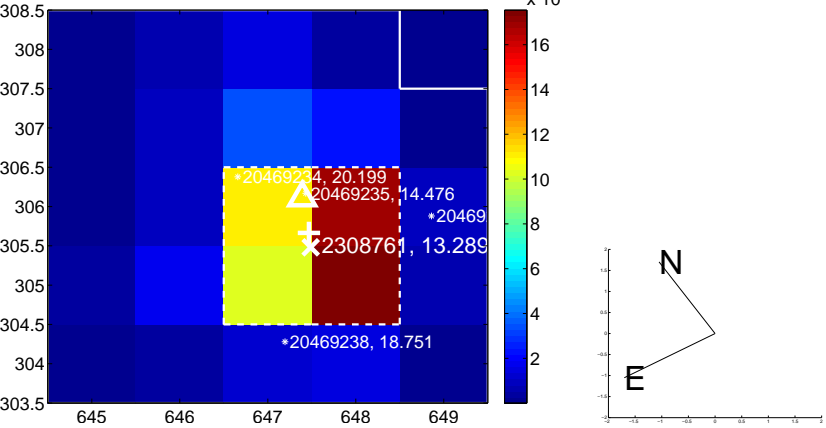
Q3 no OOT image



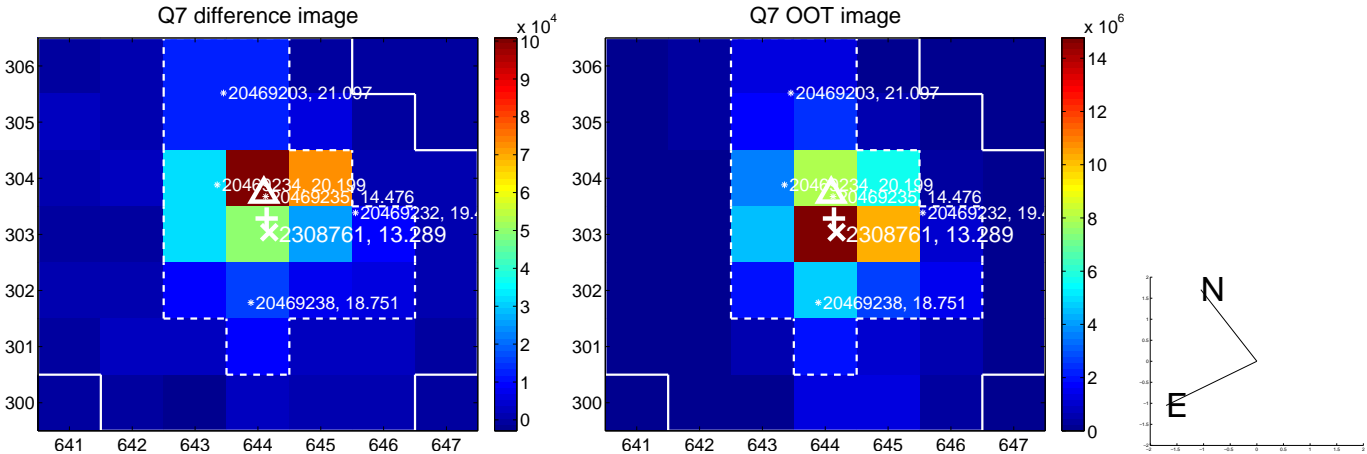
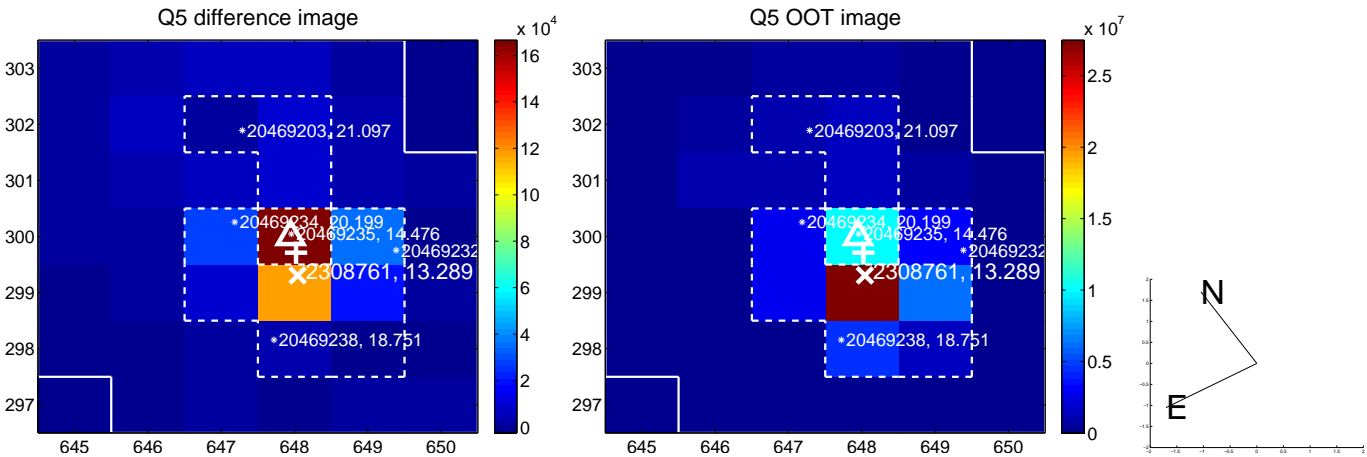
Q4 difference image. Poor Quality



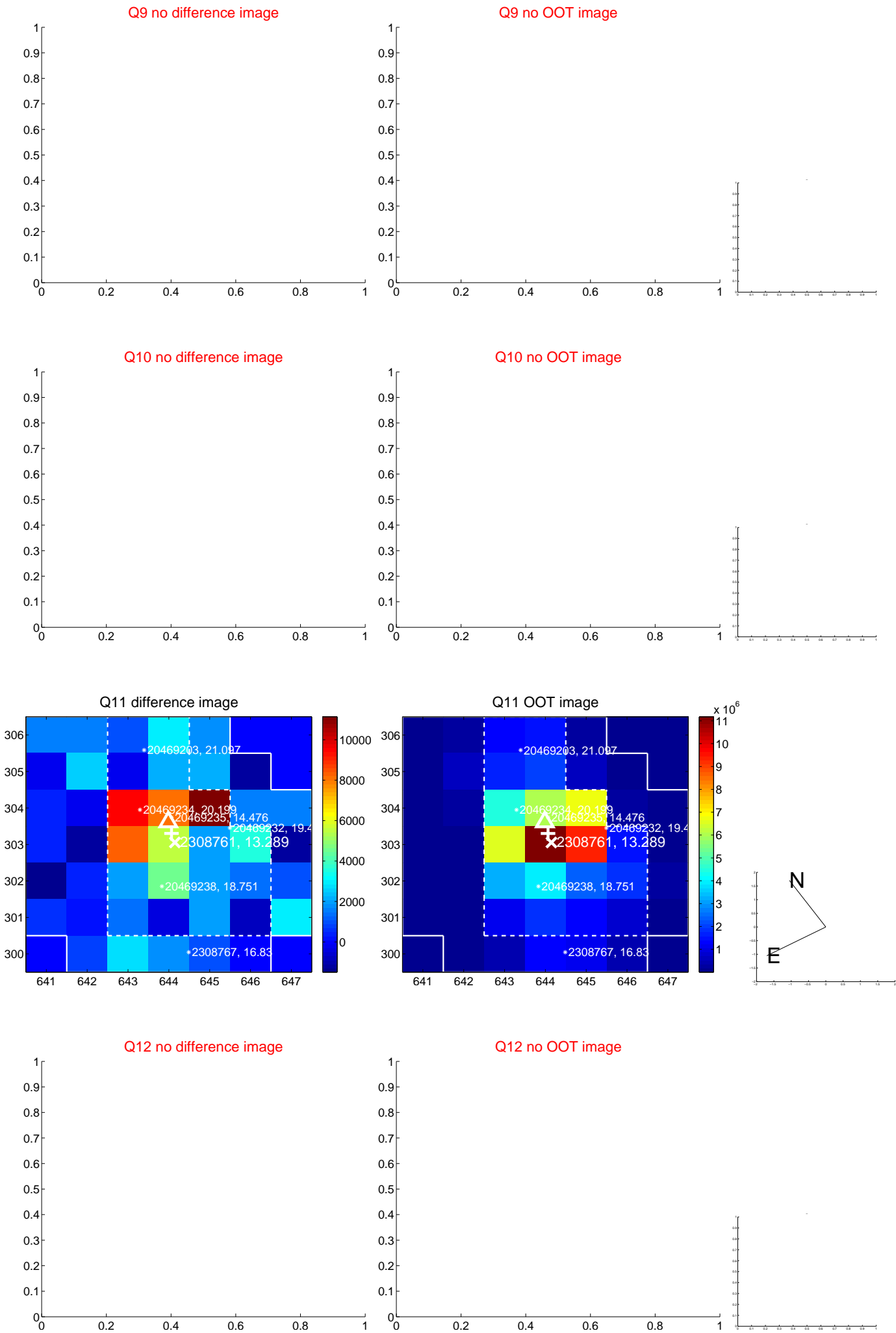
Q4 OOT image



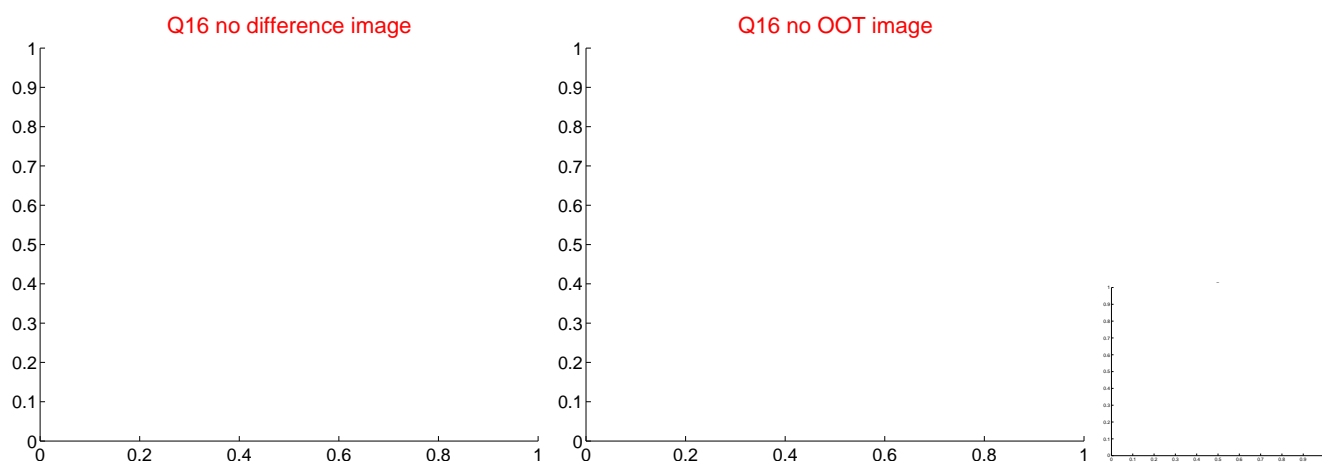
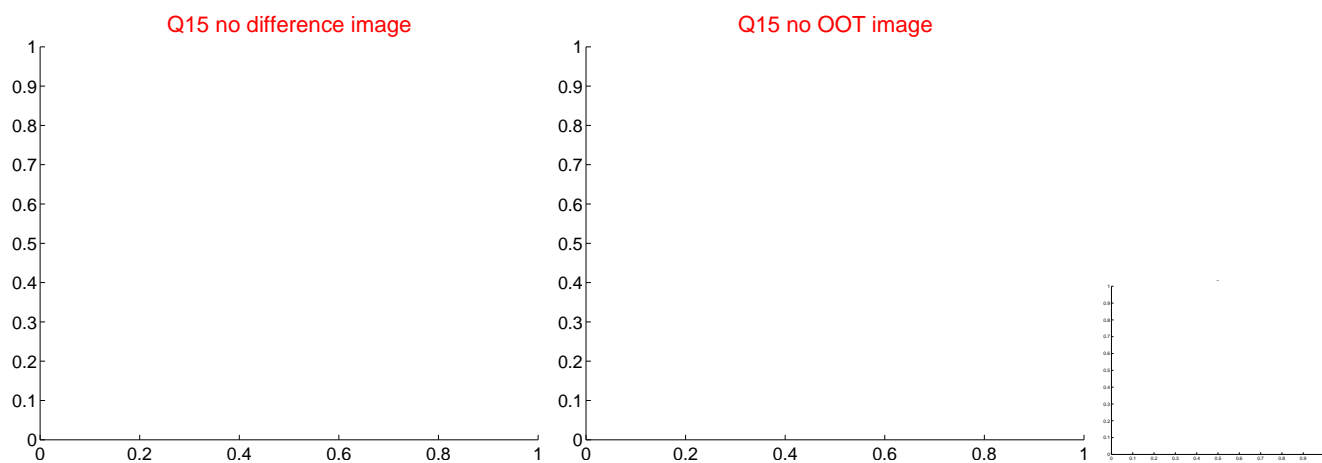
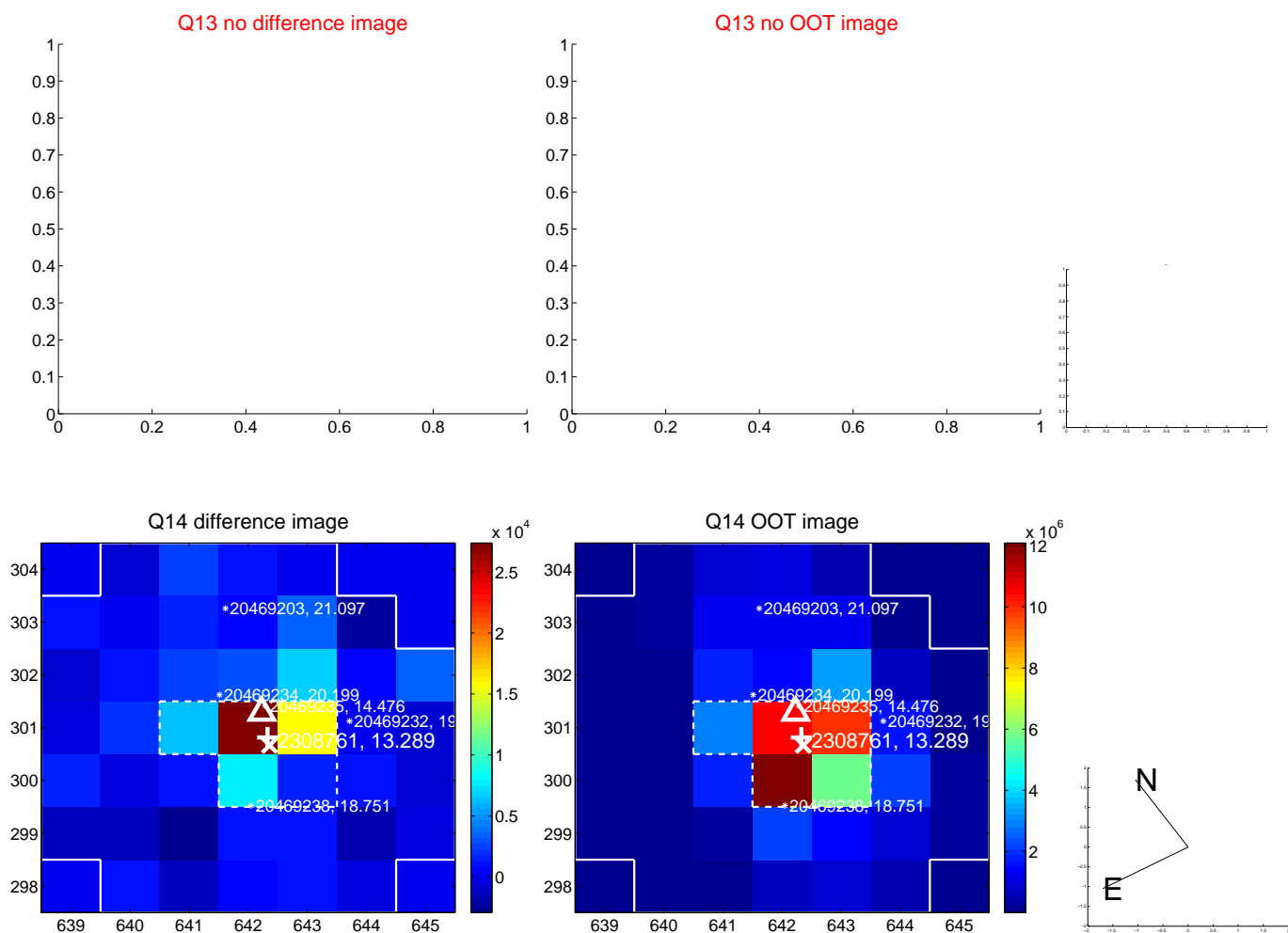
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



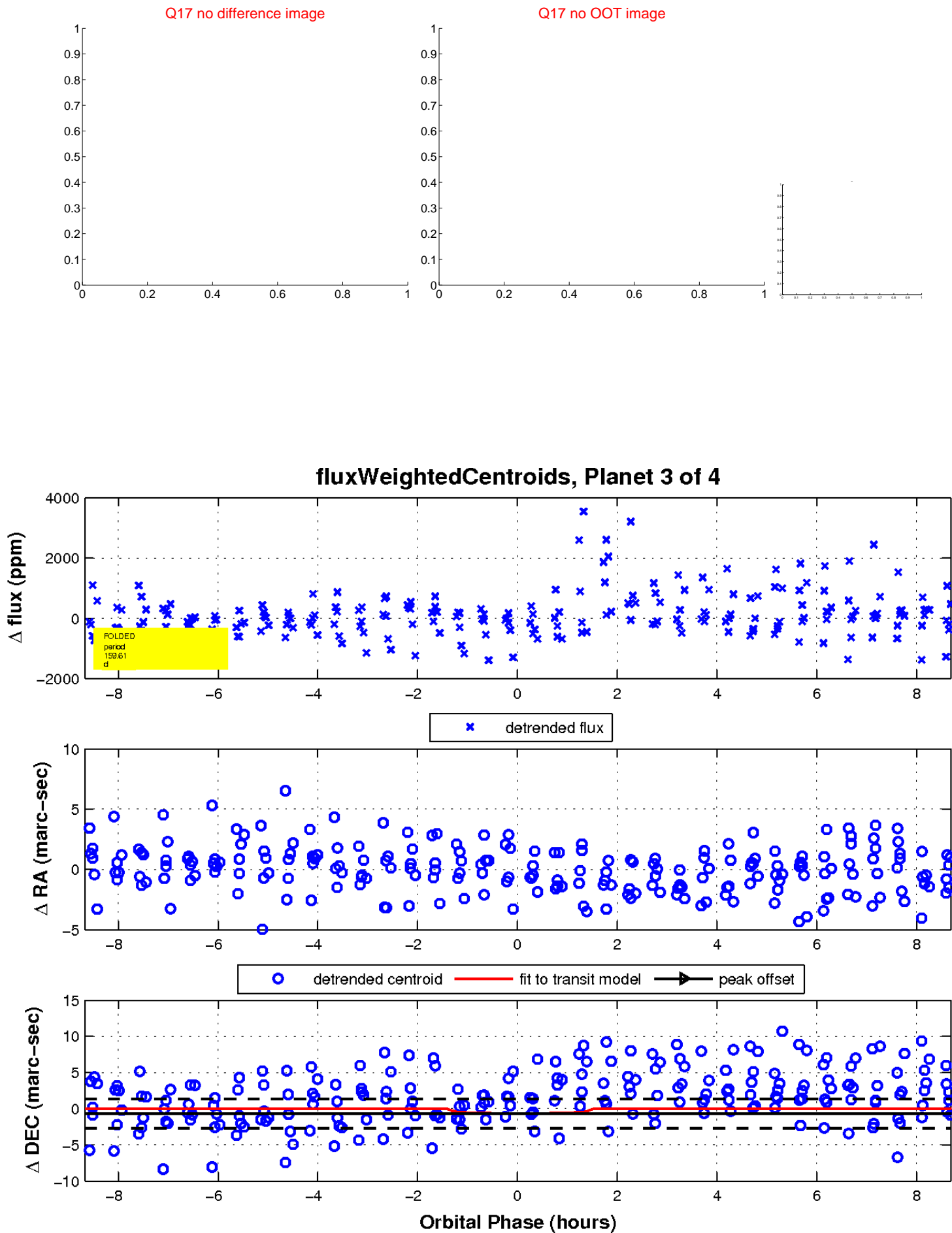
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

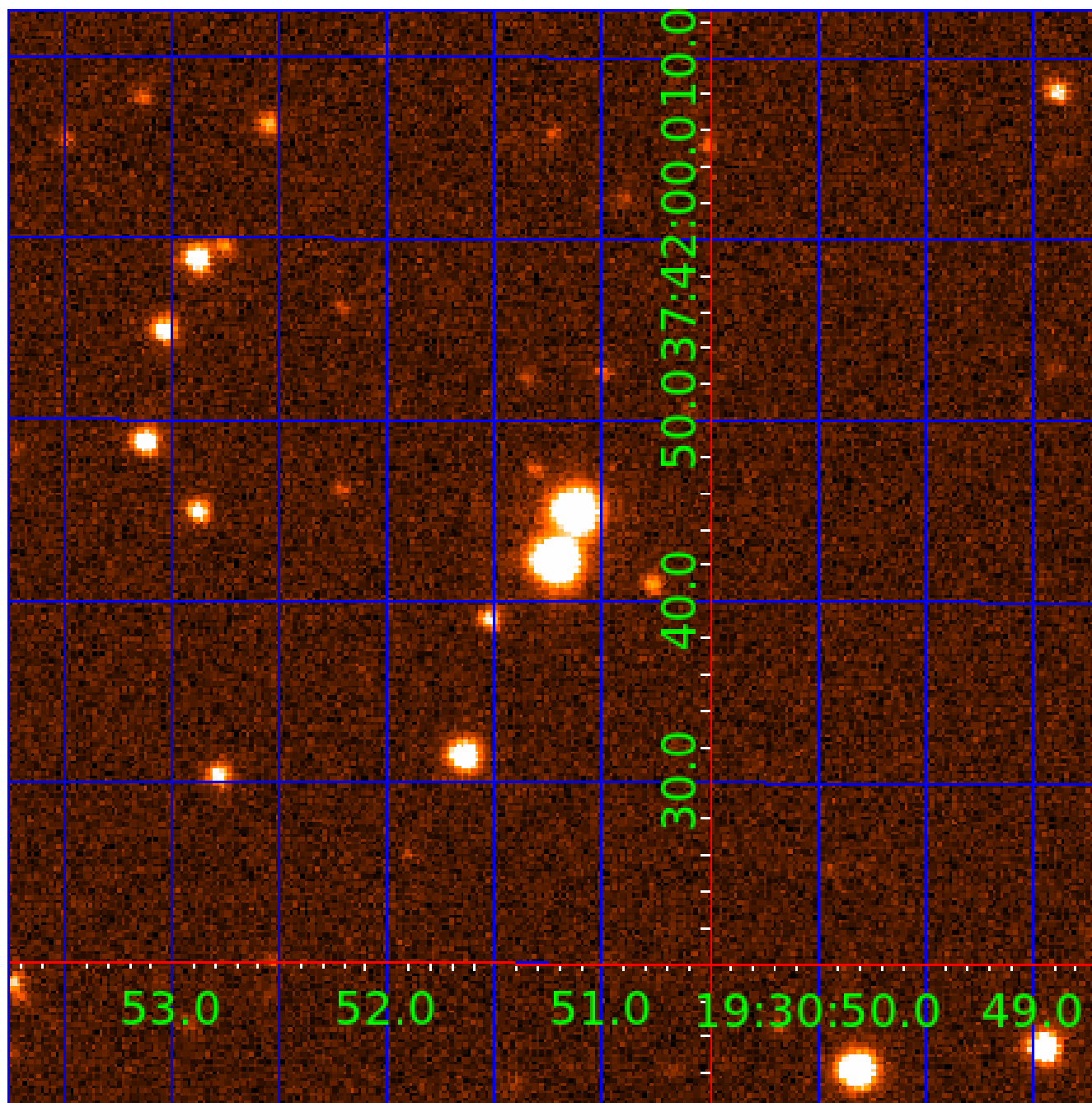


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002308761

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})
002308761-01	OBS	No	291.620142	312.365620	905.4	3.155	14.5	6.6	1.00	5780	3.29	1.35
002308761-02	OBS	No	470.700257	508.968275	1767.8	4.720	14.8	9.4	1.00	5780	4.16	0.71
002308761-03	OBS	No	159.607412	207.002511	777.9	2.909	12.2	6.4	1.00	5780	2.83	3.01
002308761-04	OBS	No	431.661160	232.811047	1167.5	4.899	17.0	6.0	1.00	5780	3.47	0.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002308761-01	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—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
002308761-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS
002308761-04	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—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

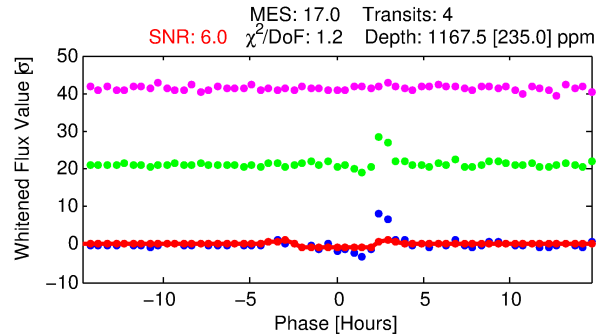
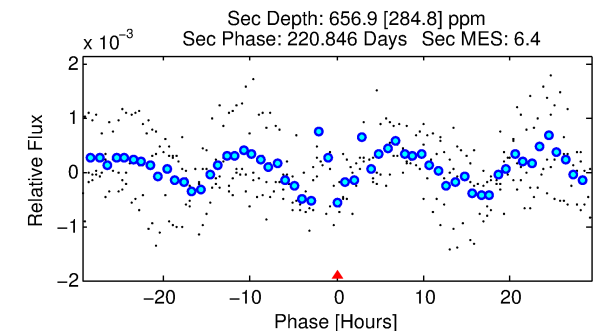
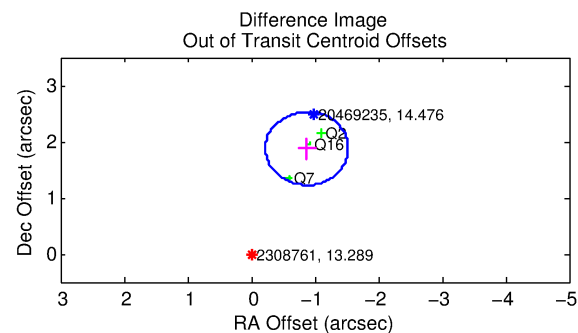
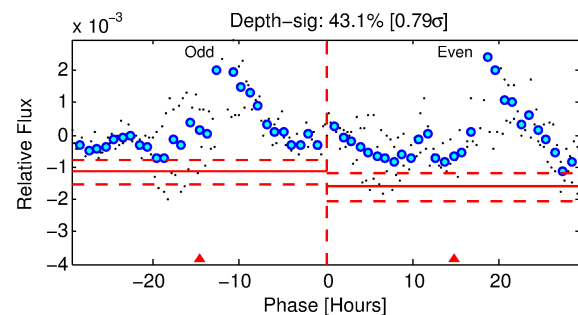
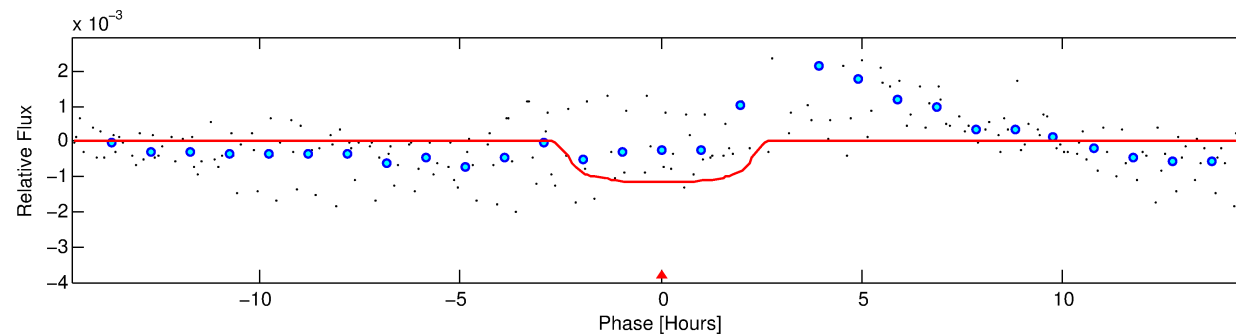
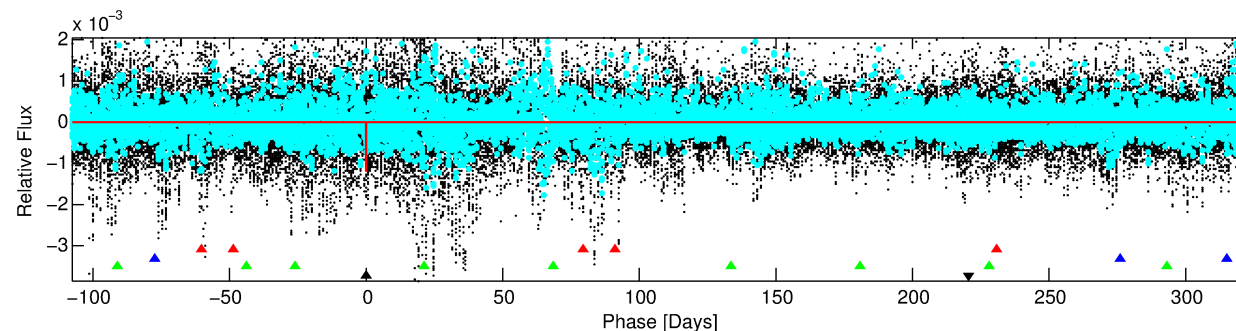
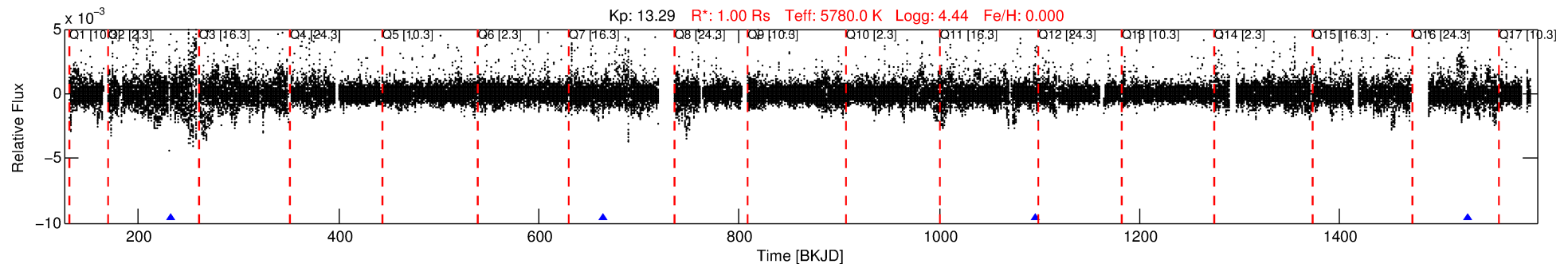
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002308761-04

No Significant Match Found

DV One-Page Summary

KIC: 2308761 Candidate: 4 of 4 Period: 431.661 d



DV Fit Results:

Period = 431.66116 [0.00459] d
Epoch = 232.8110 [0.0081] BKJD
Rp/R* = 0.0318 [0.0337]
a/R* = 623.28 [2815.48]
b = 0.46 [7.92]
Seff = 0.80 [0.00]
Teq = 241 [0] K
Rp = 3.47 [3.67] Re
a = 1.1180 [0.0000] AU
Ag = 37504.28 [81049.52] [0.46 σ]
Teffp = 5189 [2803] K [1.76 σ]

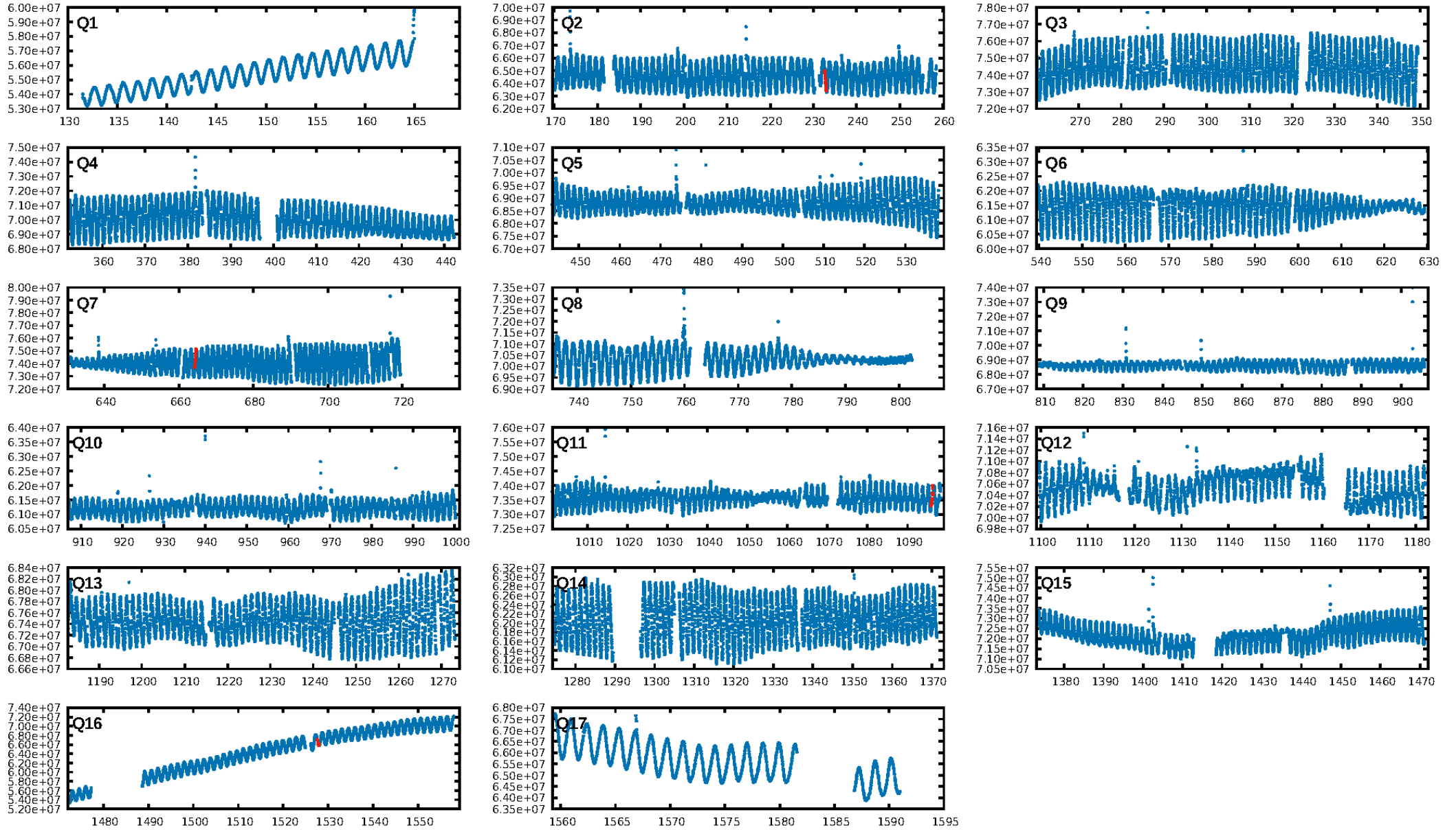
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [576.81 σ]
LongPeriod-sig: 100.0% [137.74 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 48.5%
Bootstrap-pfa: 2.80e-16
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -596.6
Centroid-sig: N/A
Centroid-so: 4.197 arcsec [1.87 σ]
OotOffset-rm: 2.070 arcsec [9.53 σ]
KicOffset-rm: 2.674 arcsec [17.00 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

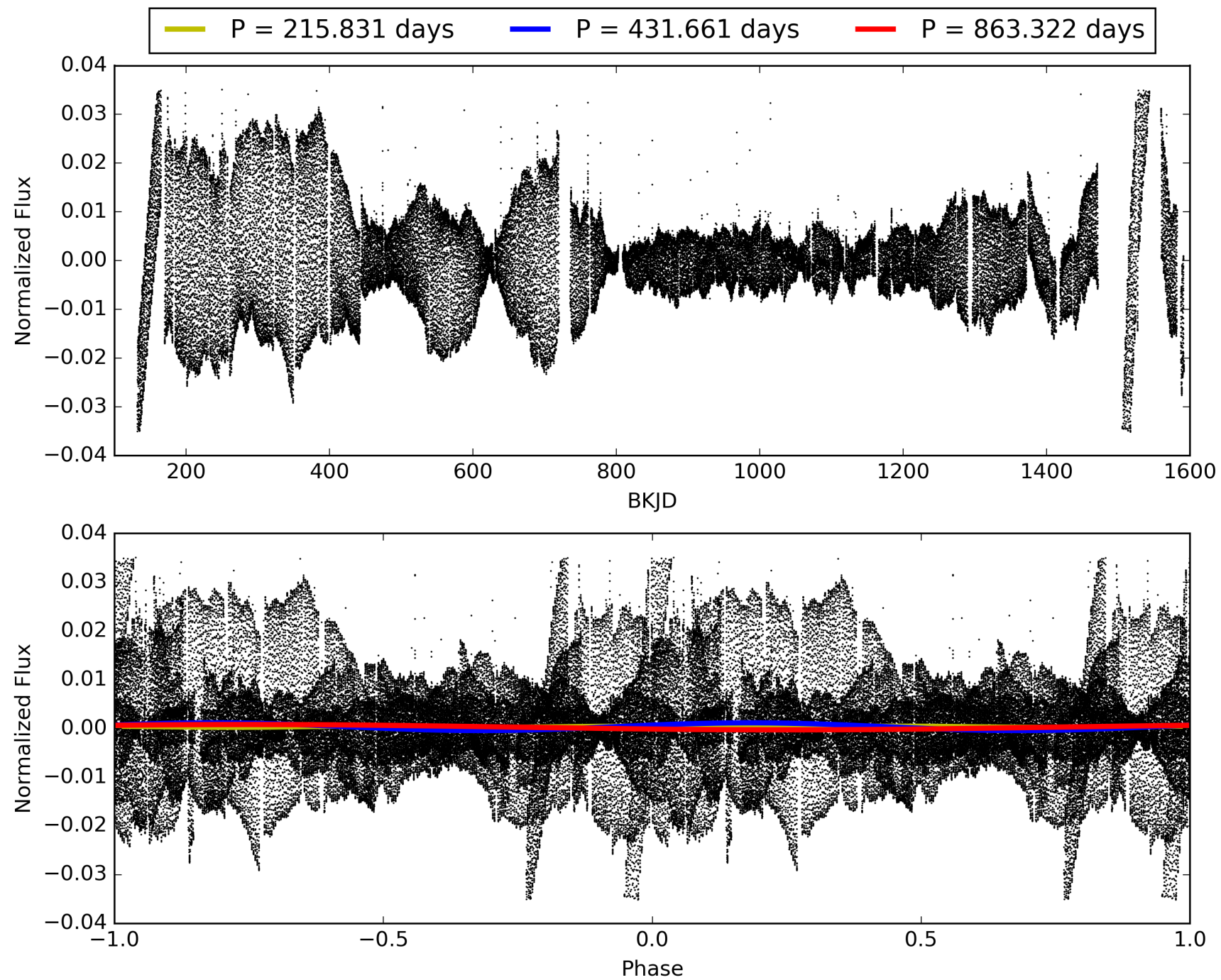
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:04:25 Z

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

TCE 002308761-04, PDC Light Curves

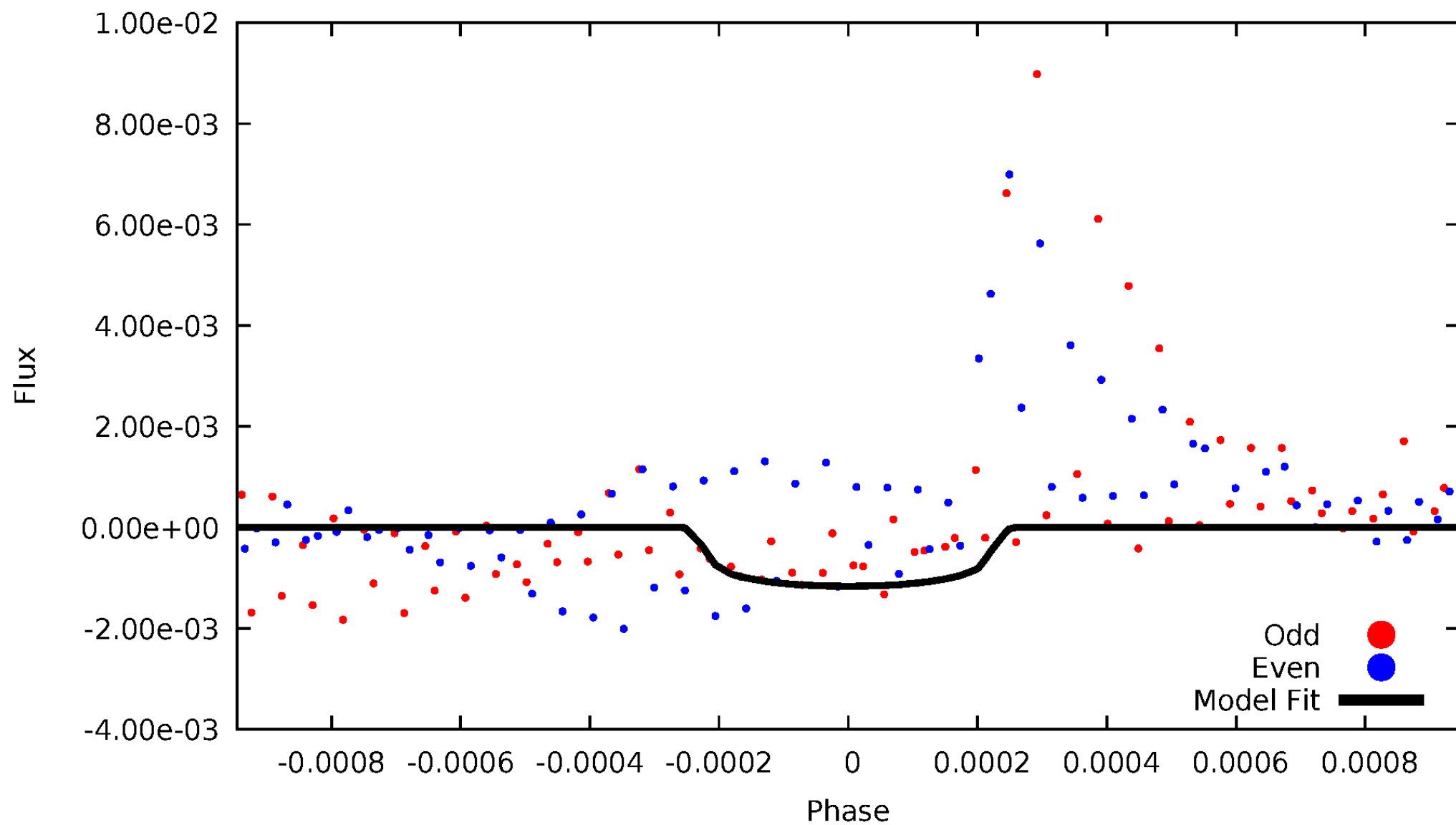


TCE 002308761-04



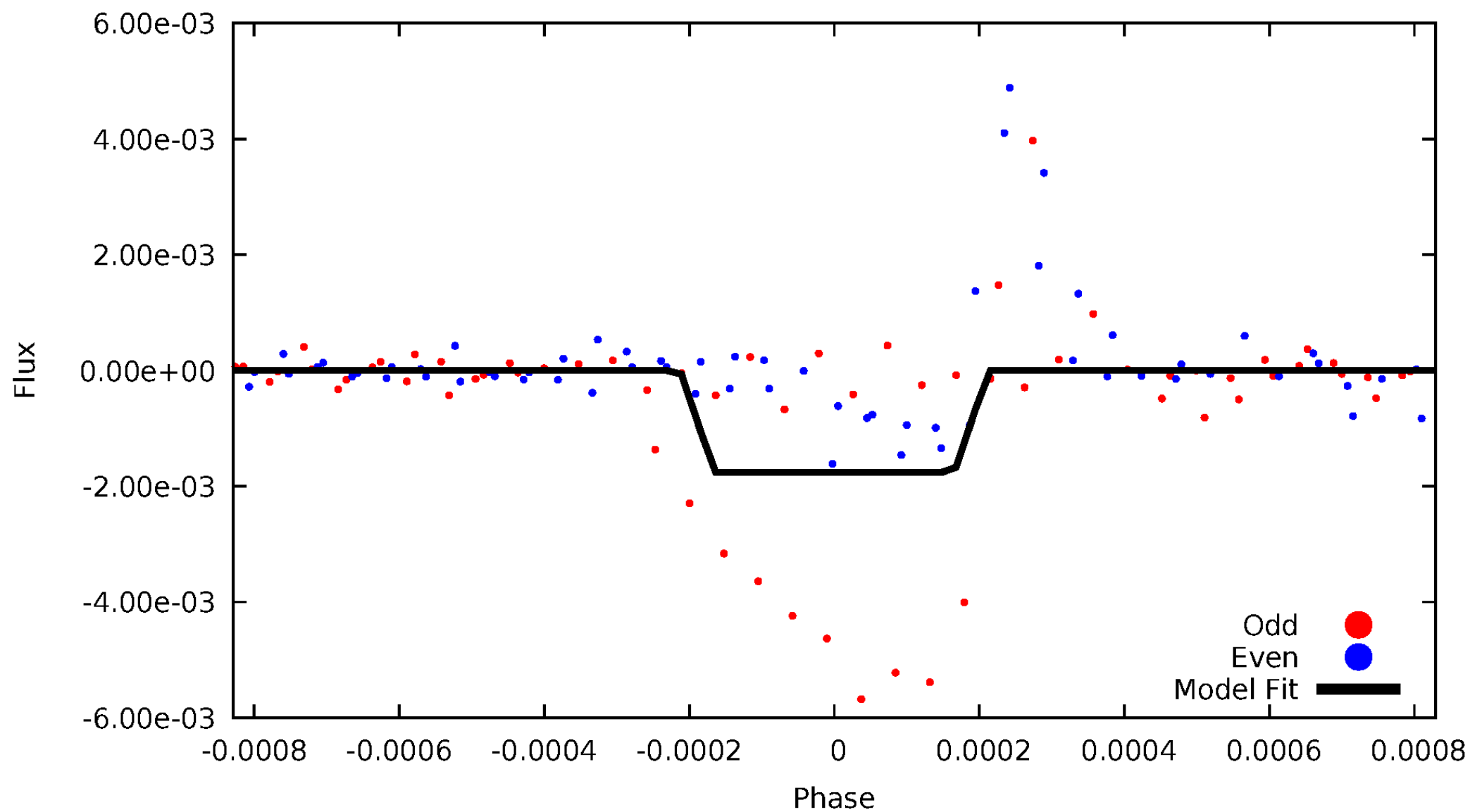
DV Odd/Even

TCE 002308761-04



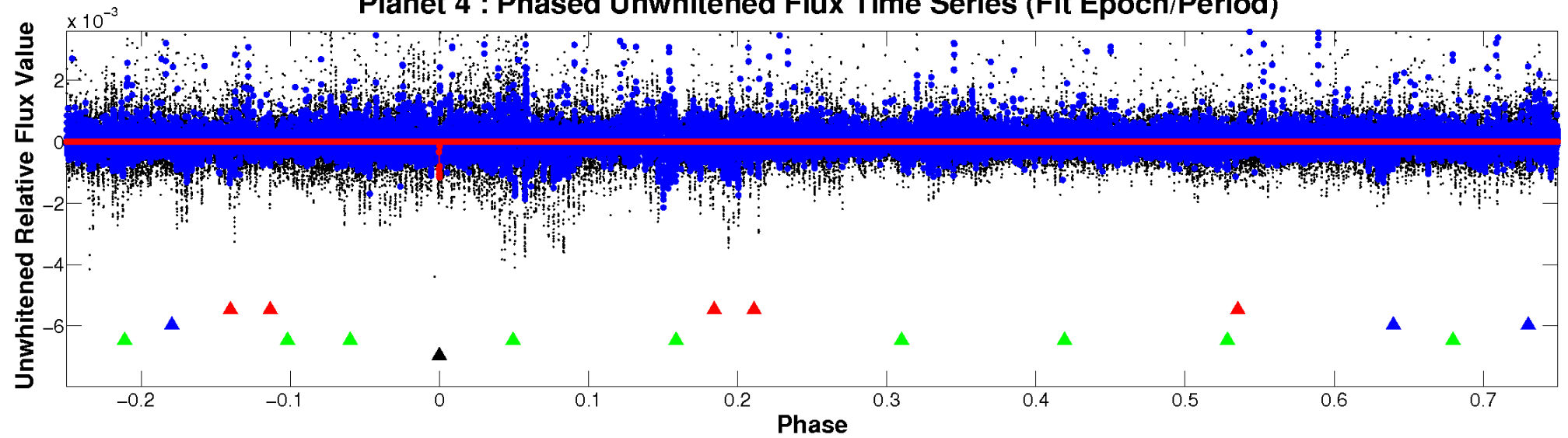
ALT Odd/Even

TCE 002308761-04

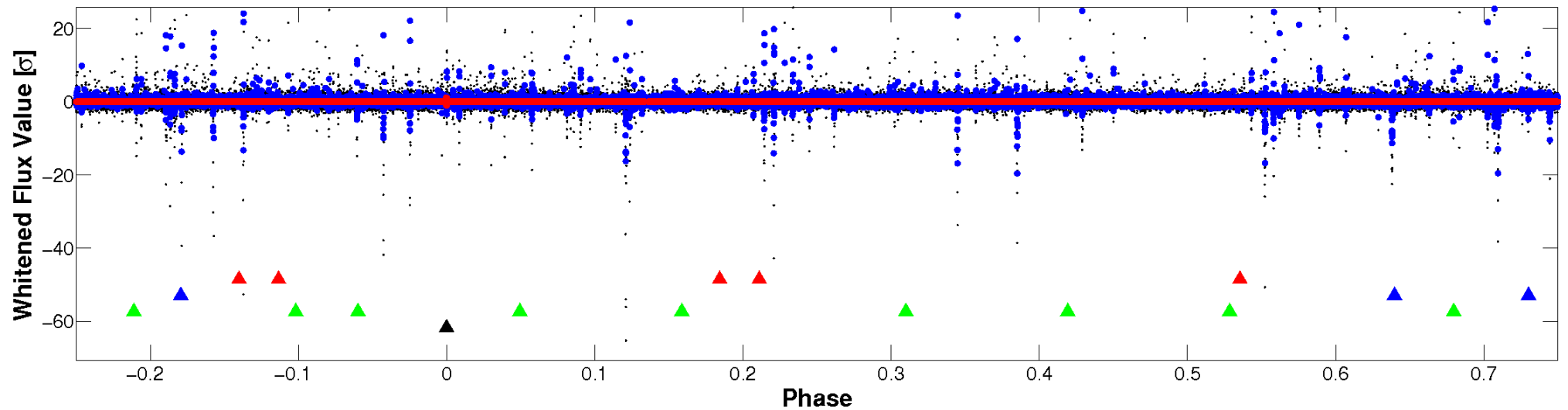


Non-Whitened Vs. Whitened Light Curve

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

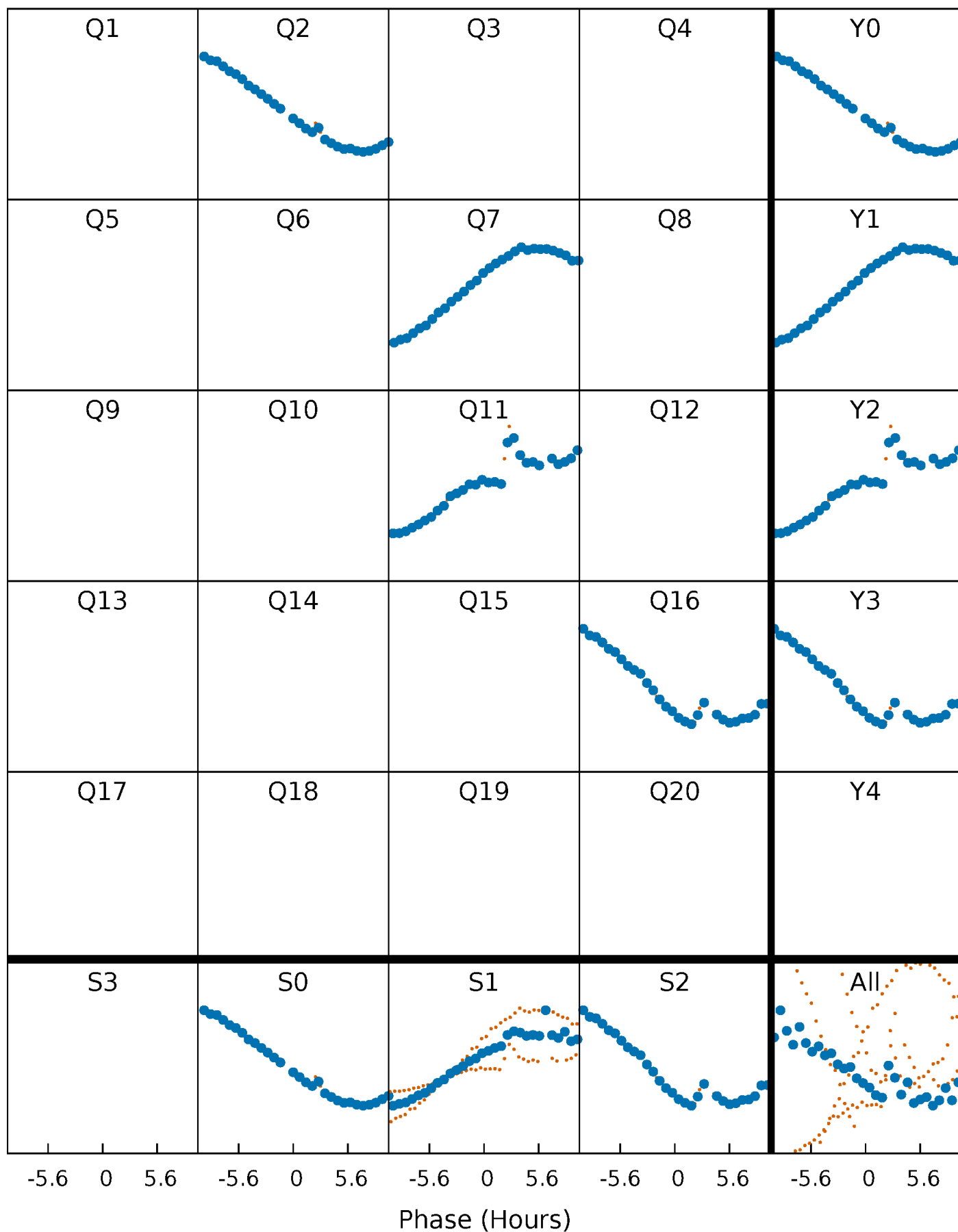


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



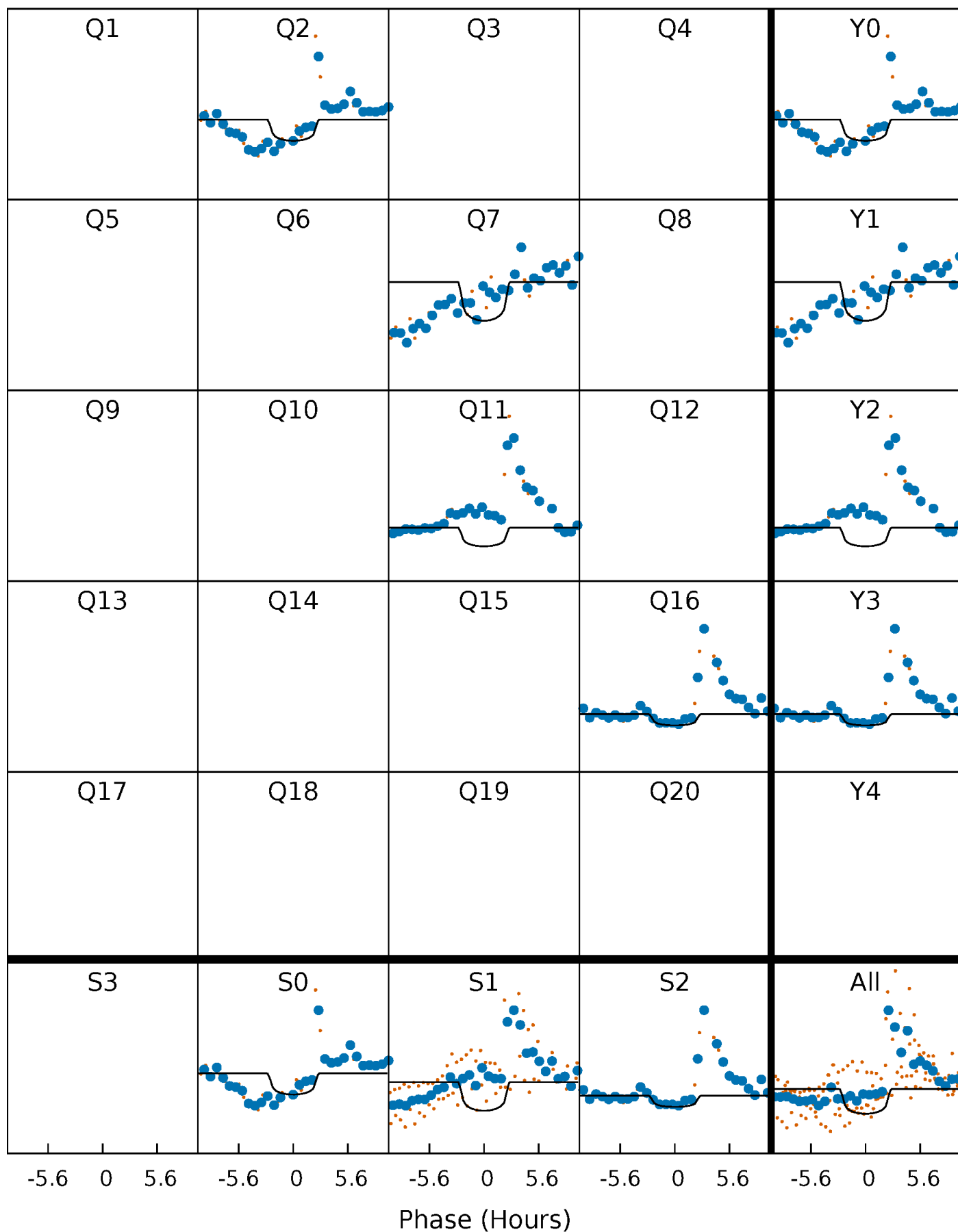
PDC Quarter-Phased Transit Curves

TCE 002308761-04 P=431.661160 Days $T_0=232.811047$ (BKJD)



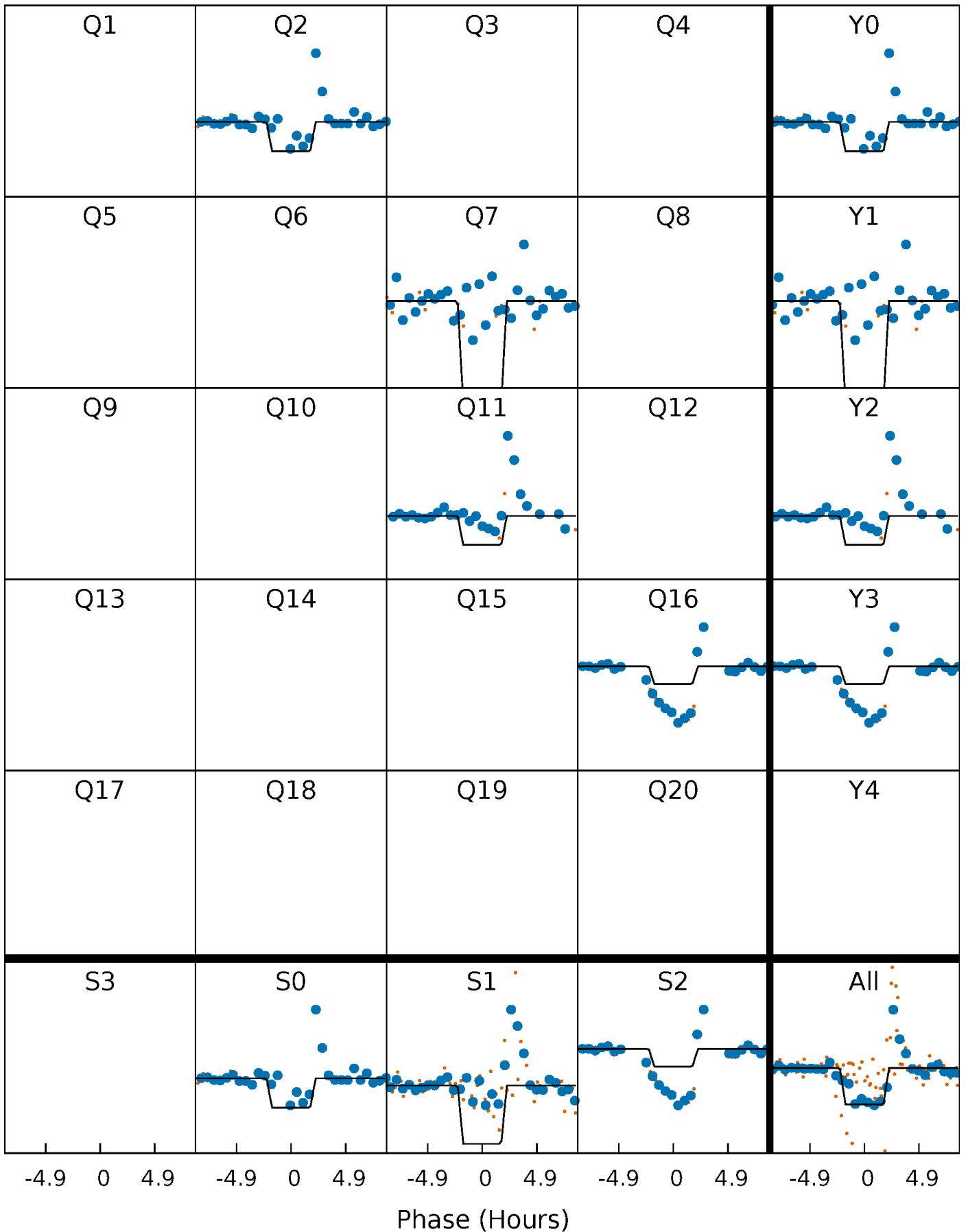
DV Quarter-Phased Transit Curves

TCE 002308761-04 P=431.661160 Days $T_0=232.811047$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

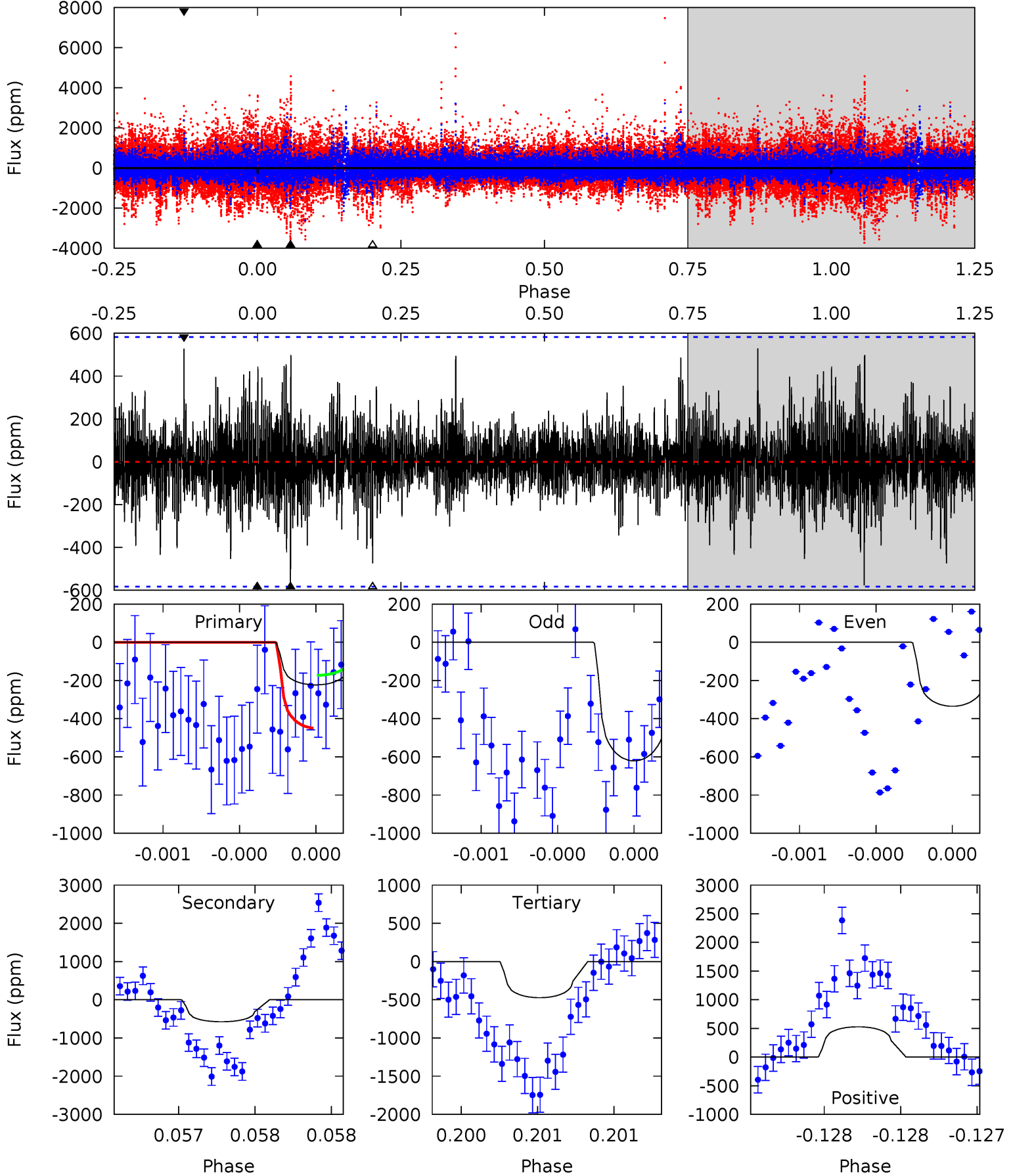
TCE 002308761-04 P=431.665766 Days $T_0=232.805077$ (BKJD)



DV Model-Shift Uniqueness Test

002308761-04, P = 431.661160 Days, E = 232.811047 Days

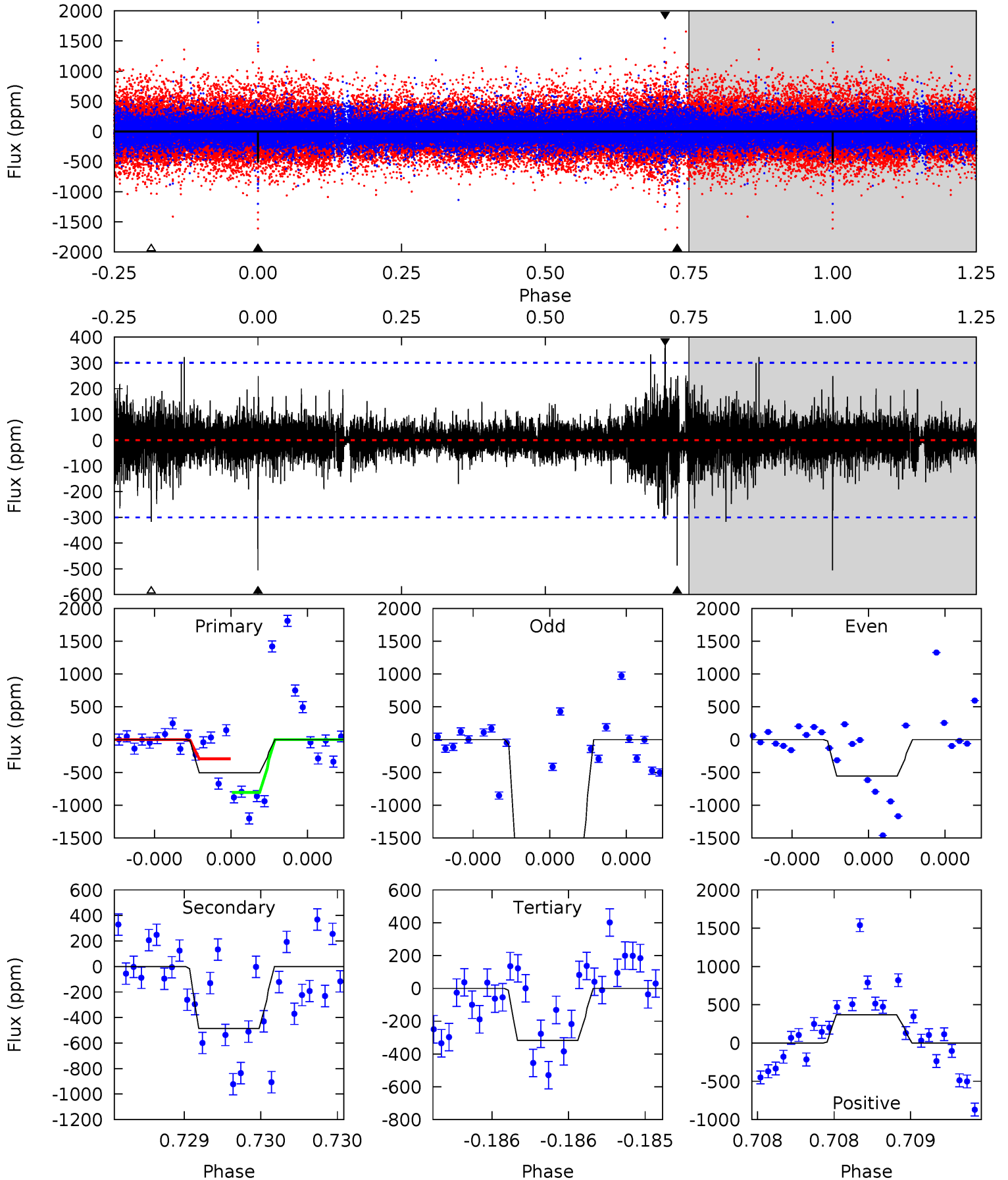
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.14	5.52	4.53	5.06	5.58	3.49	1.11	-2.40	-2.92	0.98	0.46	1.00	0.26	0.48	1.32



Alt Model-Shift Uniqueness Test

002308761-04, P = 431.665766 Days, E = 232.805077 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.45	9.10	5.93	6.90	5.61	3.54	0.97	3.53	2.55	3.17	2.20	16.1	2.34	0.42	4.72



Stellar Parameters For KIC 002308761

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5780^{+1}_{-1}	$4.438^{+1.000}_{-1.000}$	$0.000^{+1.000}_{-1.000}$	$1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$	$-1.000^{+1.000}_{-1.000}$
	+0%/-0%	+23%/-23%	+inf%/-inf%	+100%/-100%	+100%/-100%	+100%/-100%
Source	Solar	Solar	Solar	Solar		

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

Secondary Eclipse Parameters for KIC 002308761-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-576 ± 104	$4.42^{+3.43}_{-2.60}$	338^{+16}_{-17}	4623^{+2350}_{-904}	20847^{+97846}_{-14710}
Alt.	-486 ± 53	$4.97^{+3.49}_{-2.97}$	337^{+16}_{-16}	4269^{+2062}_{-728}	13599^{+70742}_{-8978}

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 $A_{obs} \gg 1.0$

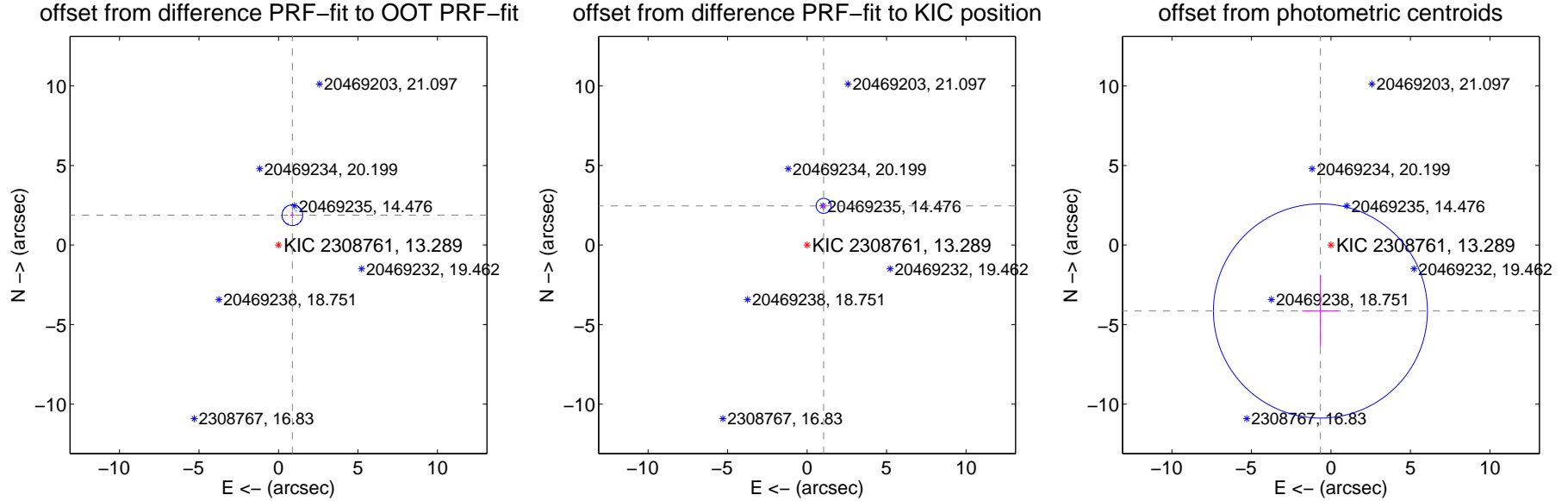
DV Centroid Data

Supplemental centroid analysis for 002308761-04. Kepler magnitude: 13.29. Transit SNR 6.02

There are 2 quarters with good PRF difference image offsets

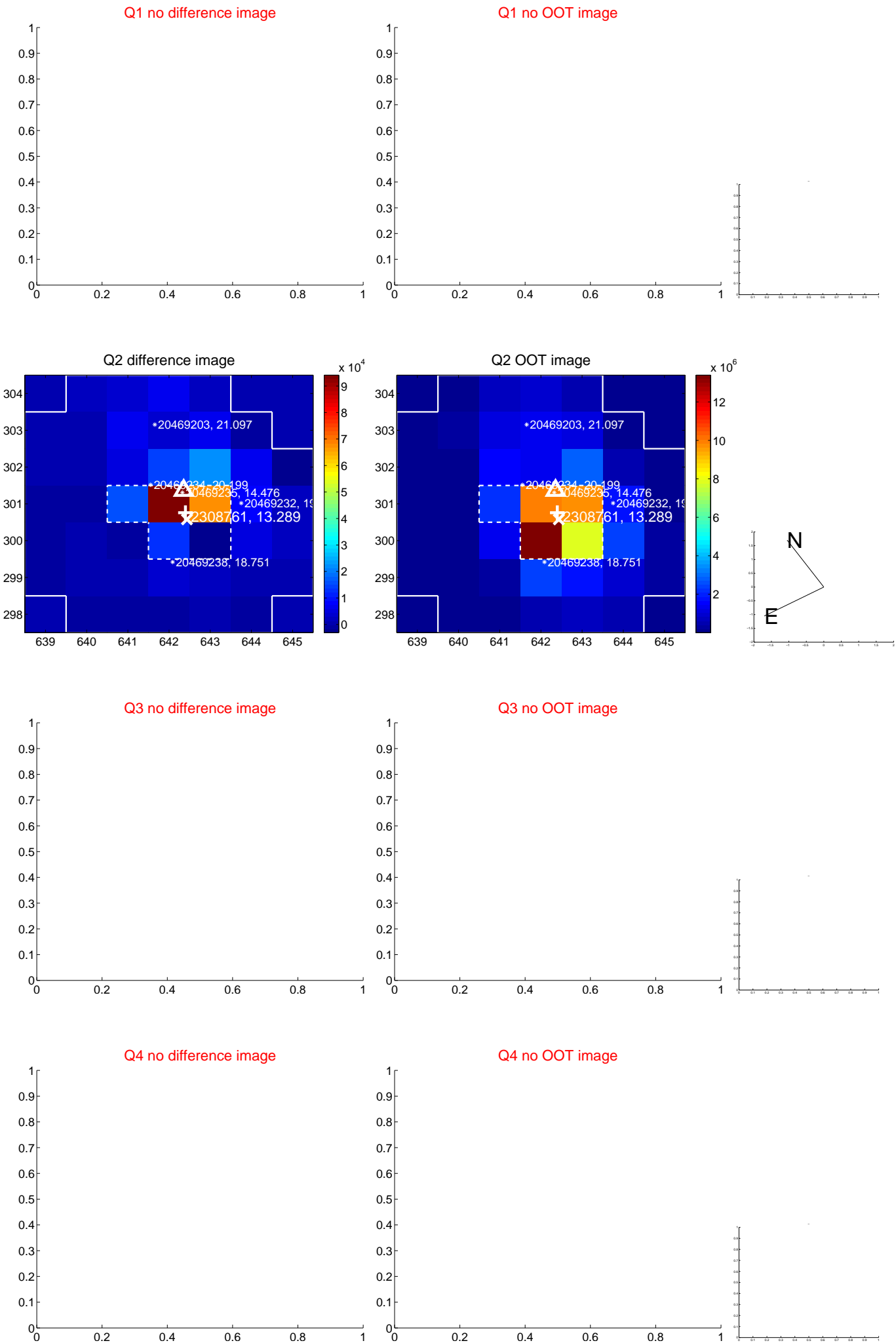
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.070 ± 0.217	9.53	-0.873 ± 0.135	1.877 ± 0.187
PRF-fit source offset from KIC position	2.674 ± 0.157	17.00	-1.042 ± 0.120	2.463 ± 0.131
photometric centroid source offset	4.20 ± 2.24	1.87	0.66 ± 1.15	-4.14 ± 2.26

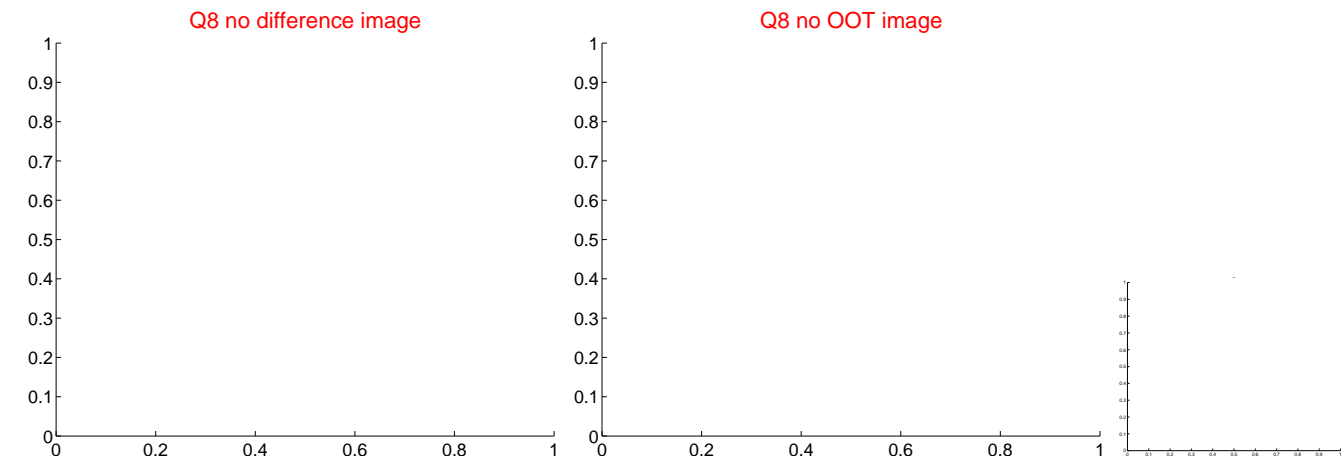
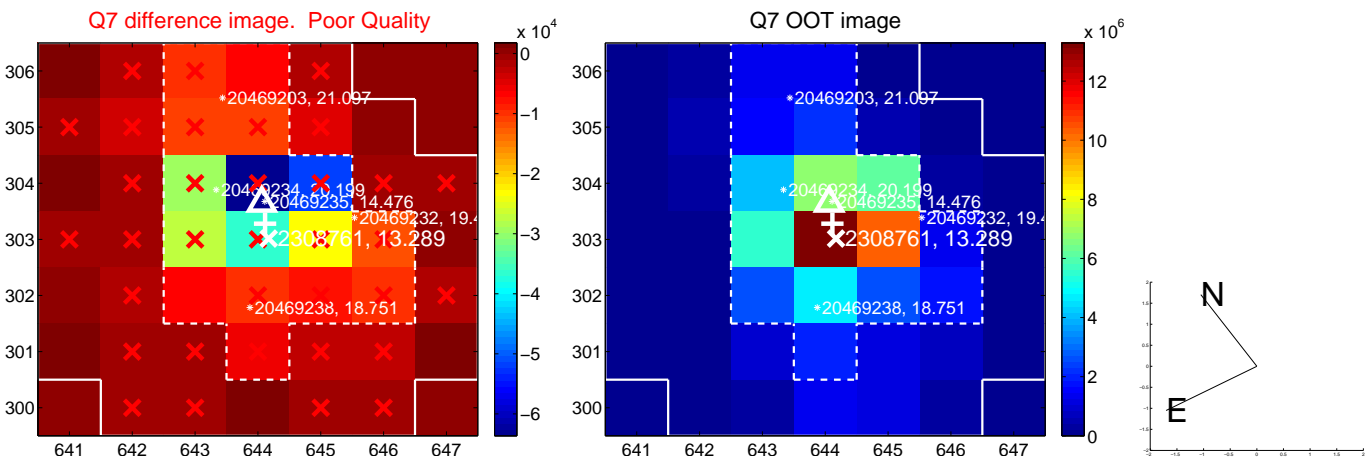
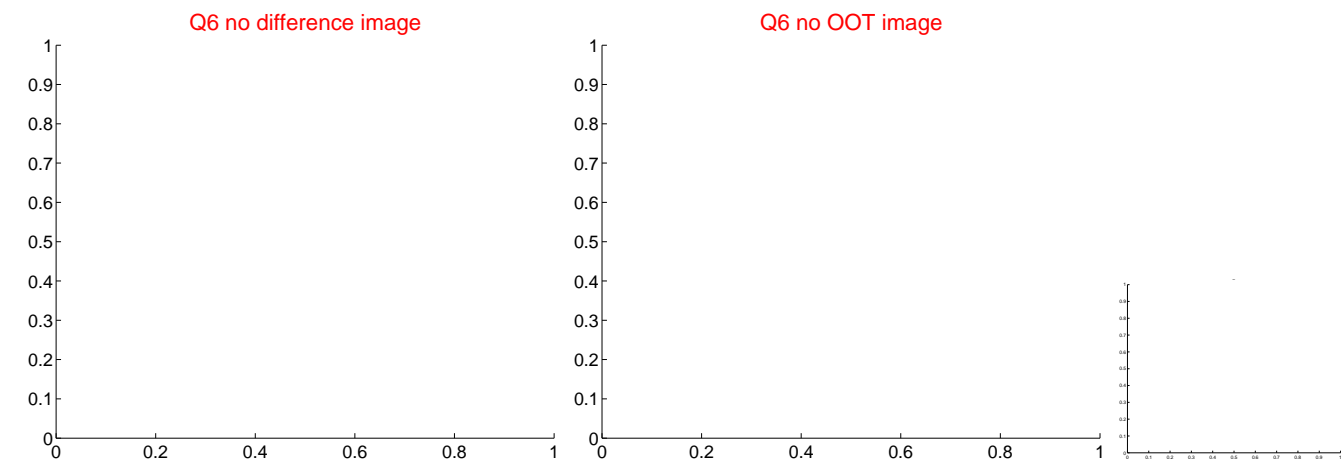
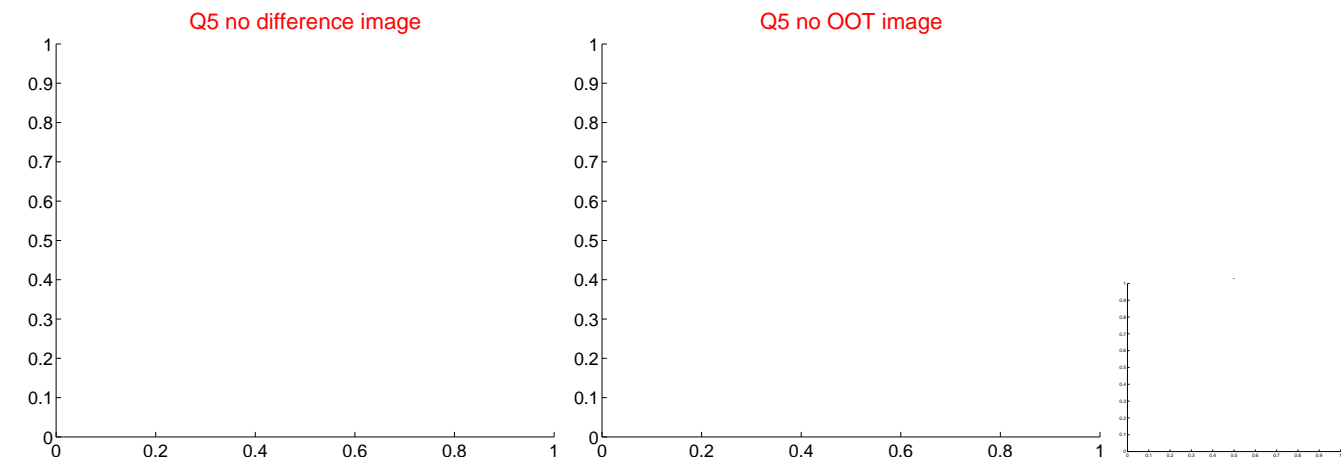


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



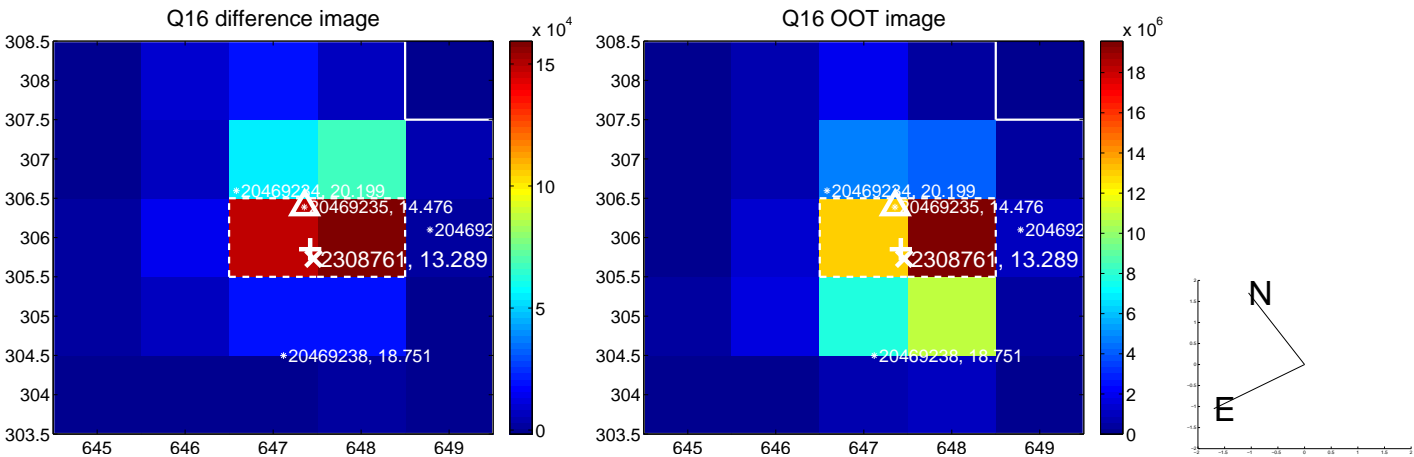
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



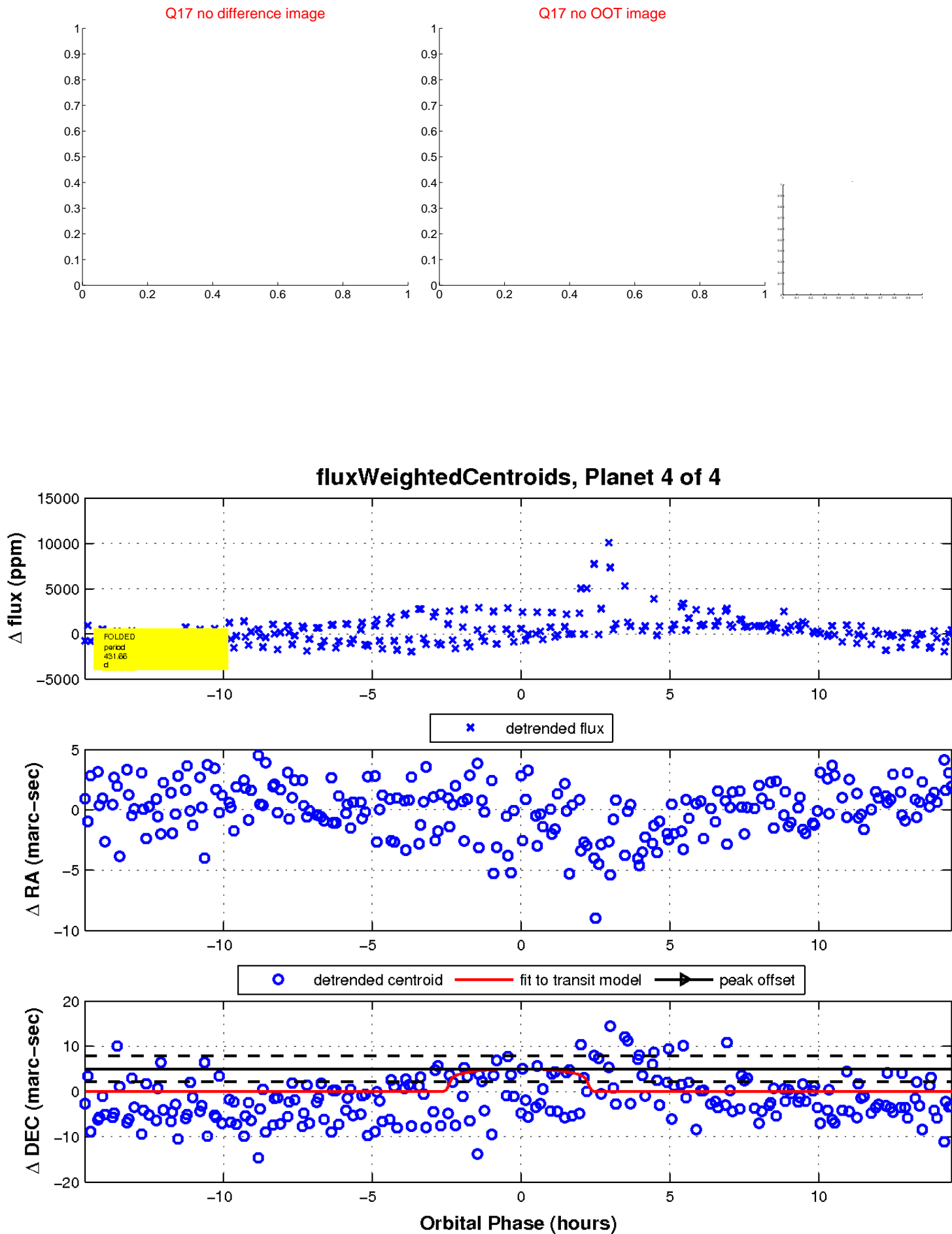
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

