

KIC 010330818

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})
010330818-01	OBS	No	539.582904	499.266470	601.2	4.197	14.6	6.8	0.53	4441	1.34	0.09
010330818-02	OBS	No	390.740224	234.906464	611.2	4.496	16.6	8.1	0.53	4441	1.45	0.14
010330818-03	OBS	No	338.175007	146.363128	638.9	2.973	12.5	10.3	0.53	4441	1.50	0.17
010330818-04	OBS	No	685.601189	200.901538	626.1	5.943	10.5	6.0	0.53	4441	1.42	0.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010330818-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

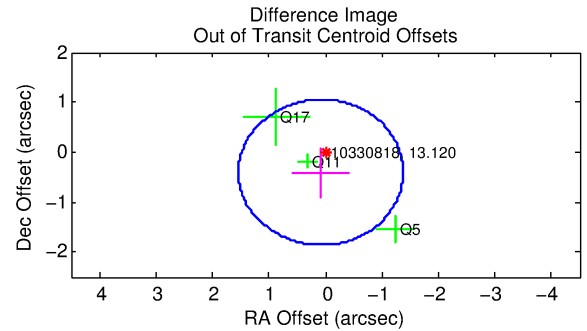
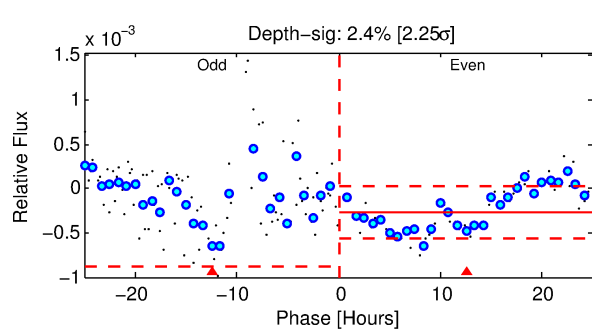
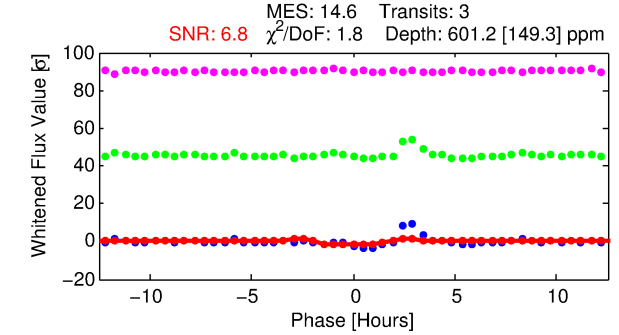
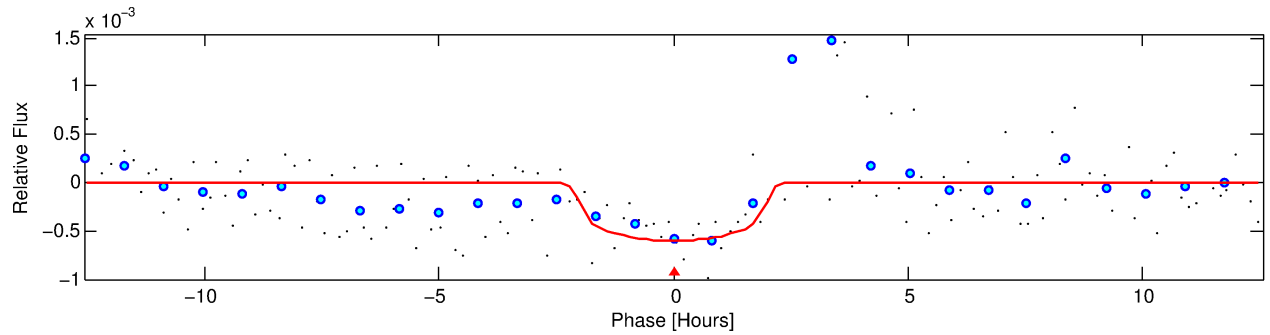
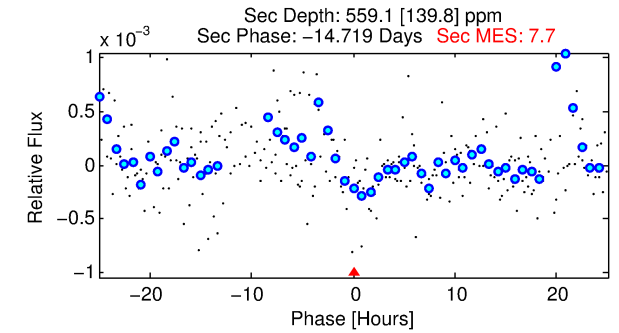
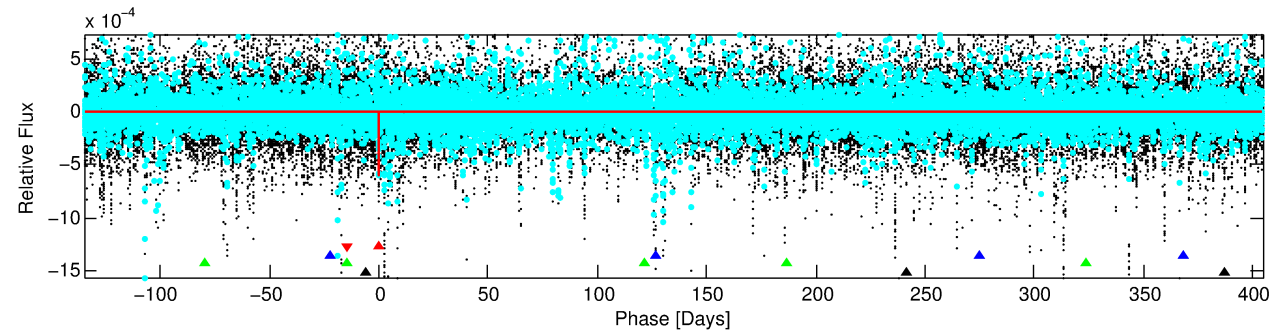
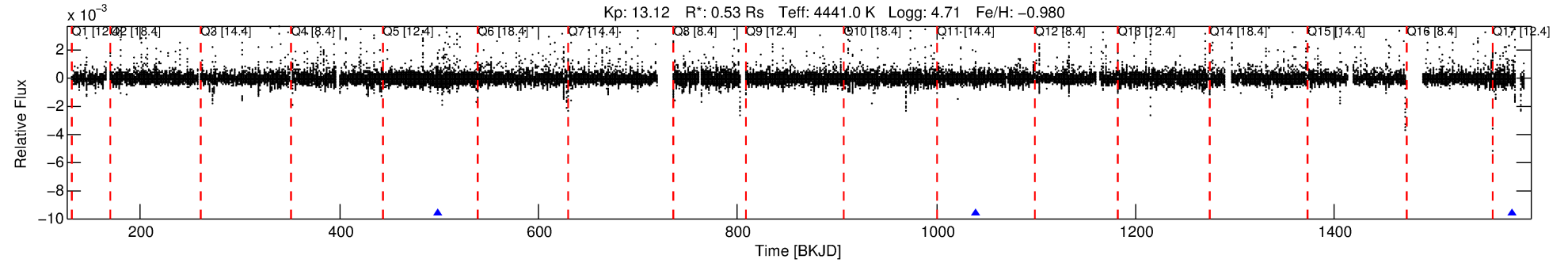
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010330818-01

No Significant Match Found

DV One-Page Summary

KIC: 10330818 Candidate: 1 of 4 Period: 539.583 d



DV Fit Results:

Period = 539.58290 [0.00918] d
Epoch = 499.2665 [0.0134] BKJD
Rp/R* = 0.0231 [0.0473]
a/R* = 833.75 [6438.50]
b = 0.57 [9.26]
Seff = 0.09 [0.01]
Teq = 139 [6] K
Rp = 1.34 [2.74] Re
a = 1.0469 [0.0764] AU
Ag = 188626.70 [773818.27] [0.24σ]
Teffp = 4492 [4607] K [0.94σ]

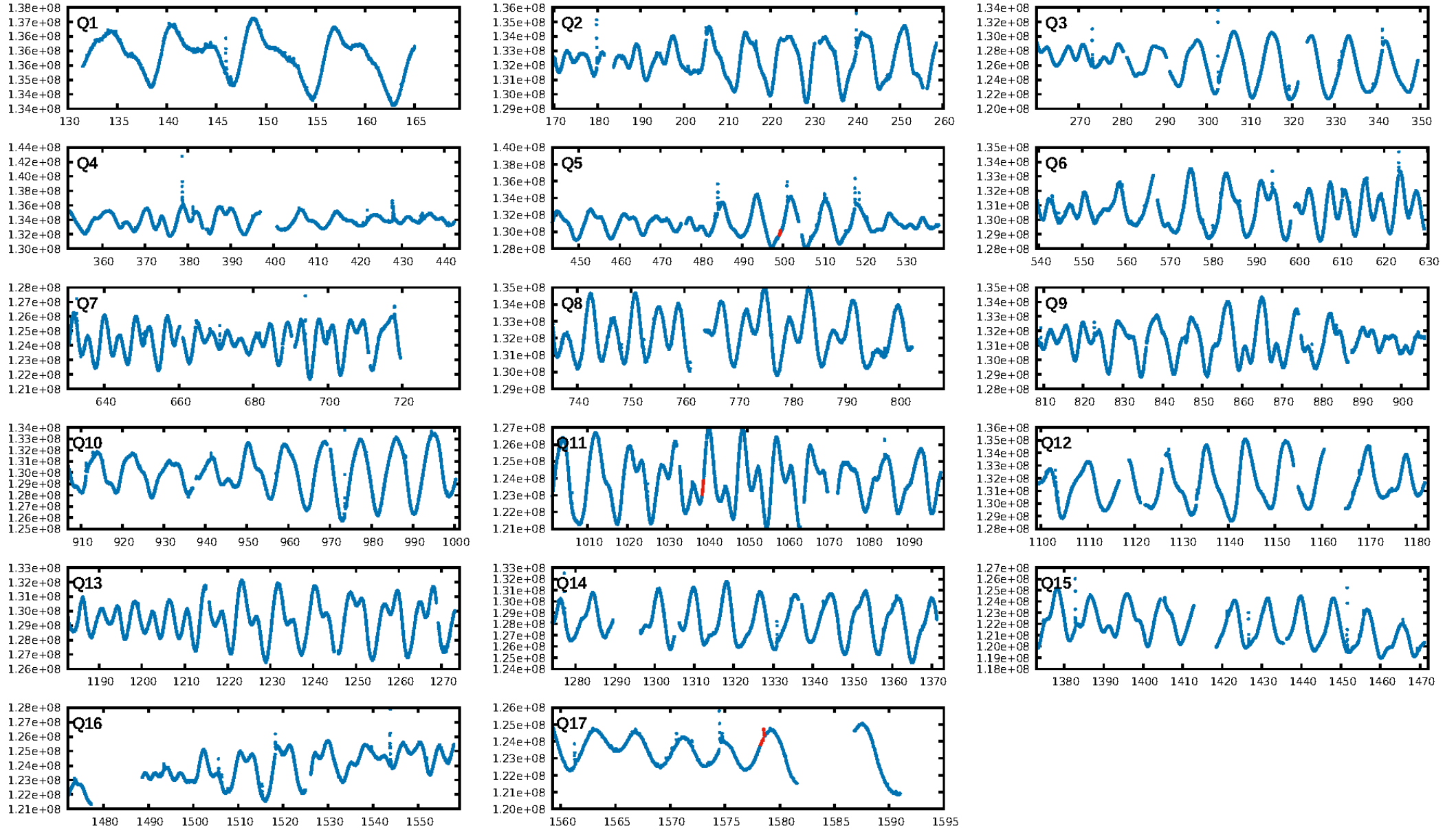
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [580.83σ]
LongPeriod-sig: 100.0% [481.67σ]
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 16.9%
Bootstrap-pfa: 9.06e-11
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 1.071
Centroid-sig: 40.0%
Centroid-so: 0.832 arcsec [1.13σ]
OotOffset-rm: 0.412 arcsec [0.85σ]
KicOffset-rm: 0.074 arcsec [0.15σ]
OotOffset-st: 0/1/0/2 [3]
KicOffset-st: 0/1/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

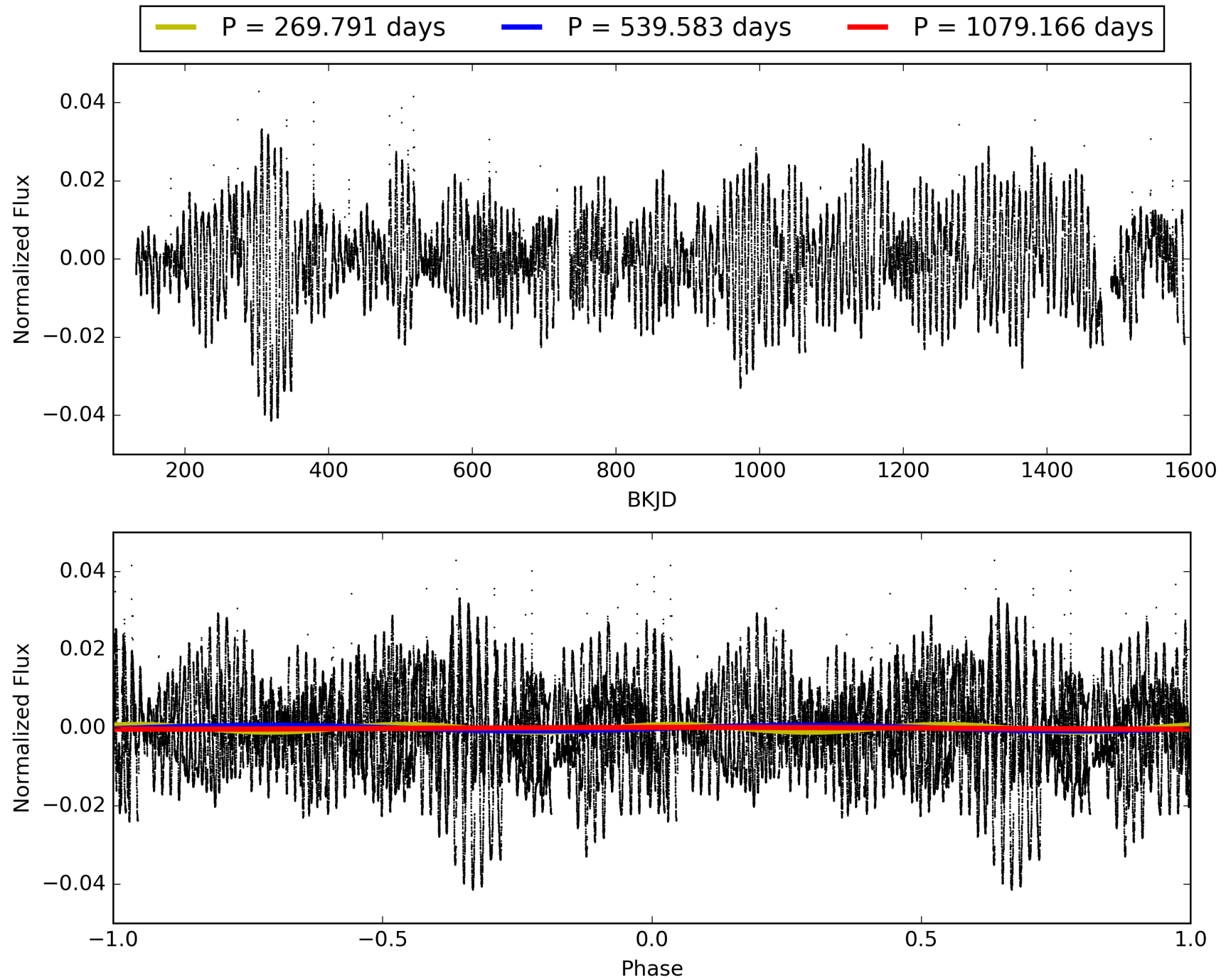
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:01:01 Z

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

TCE 010330818-01, PDC Light Curves

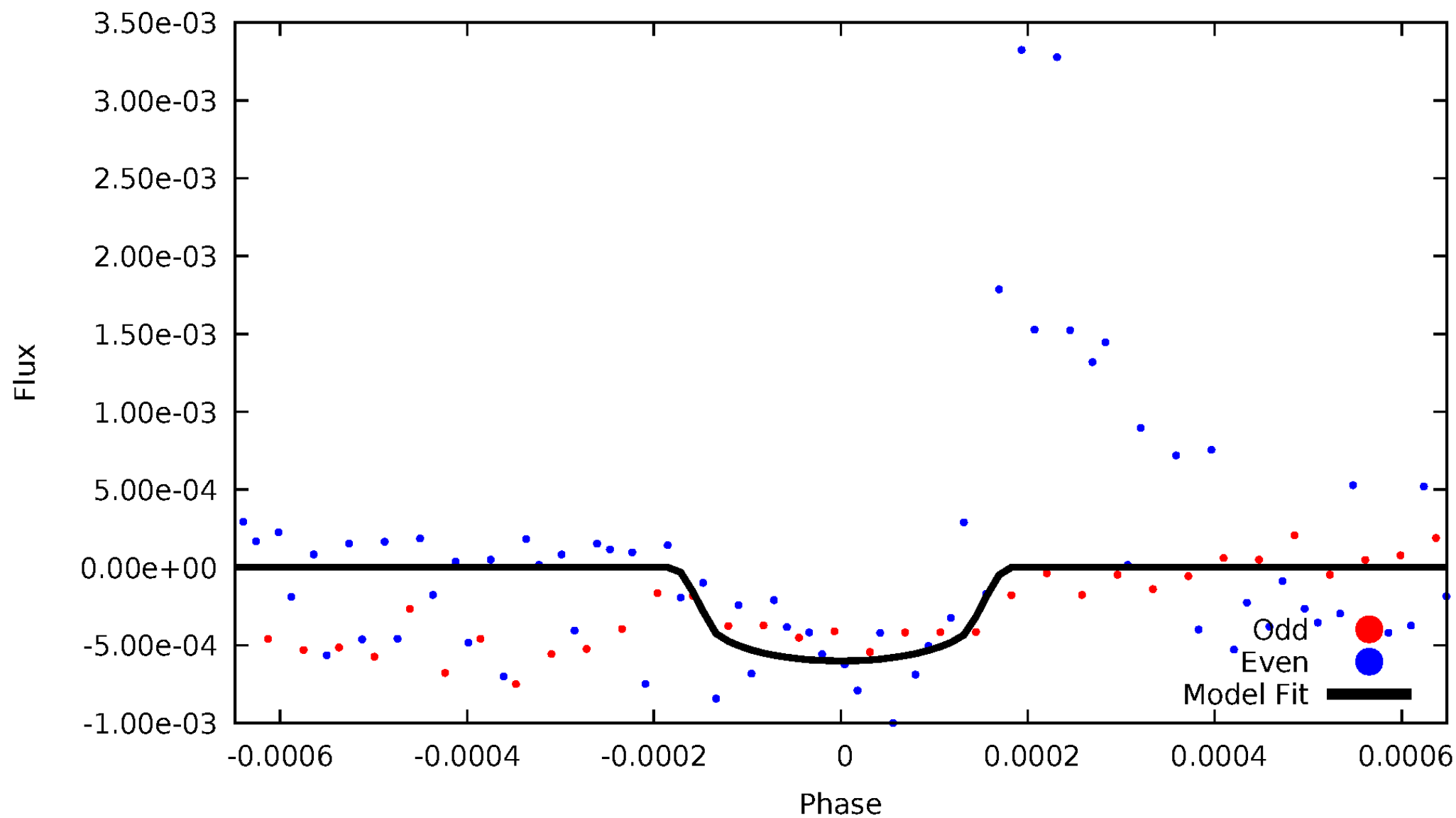


TCE 010330818-01



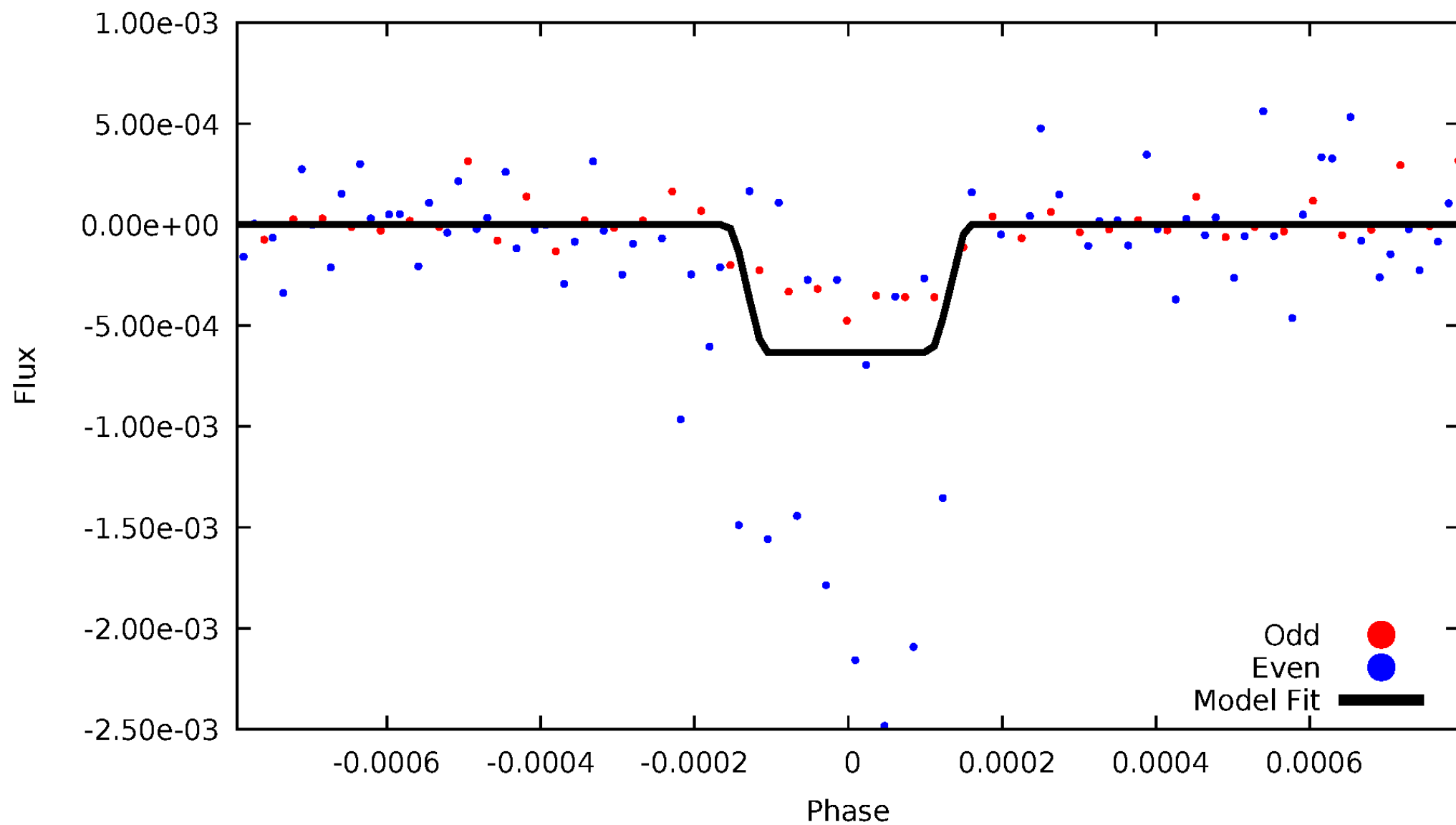
DV Odd/Even

TCE 010330818-01



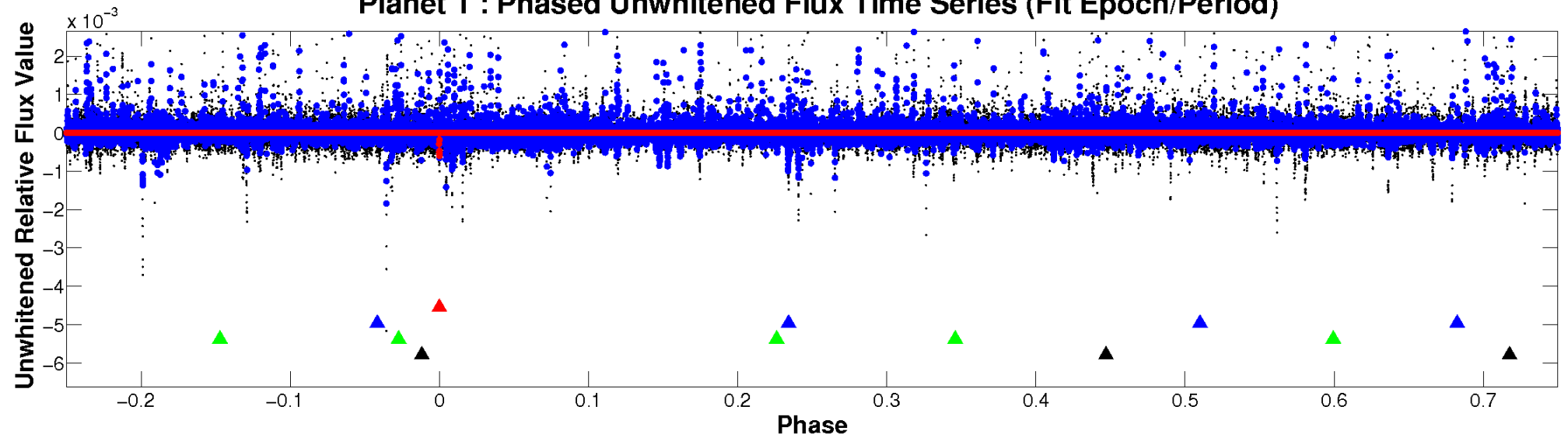
ALT Odd/Even

TCE 010330818-01

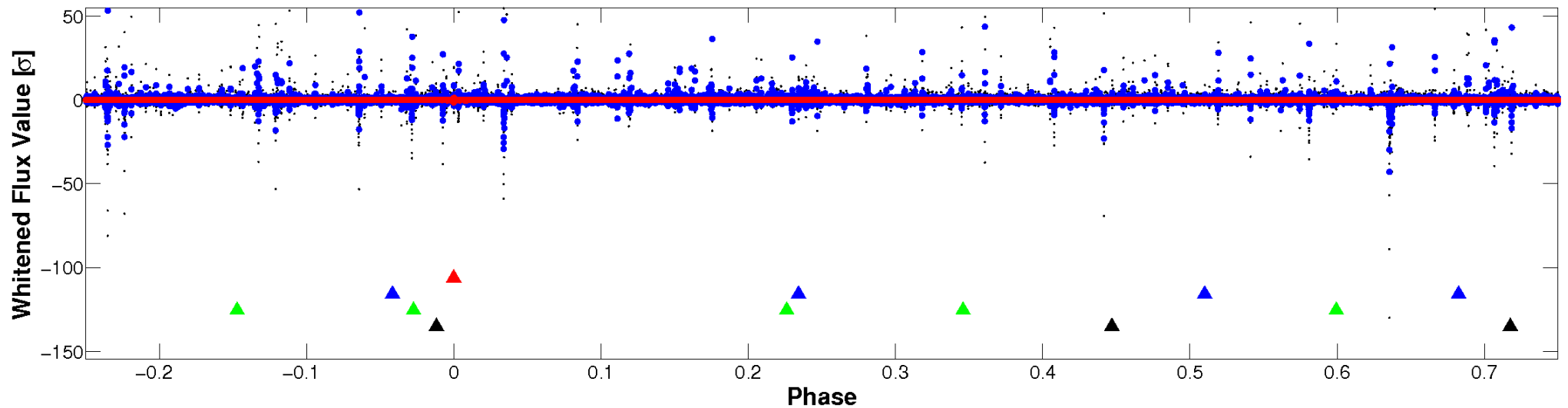


Non-Whitened Vs. Whitened Light Curve

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

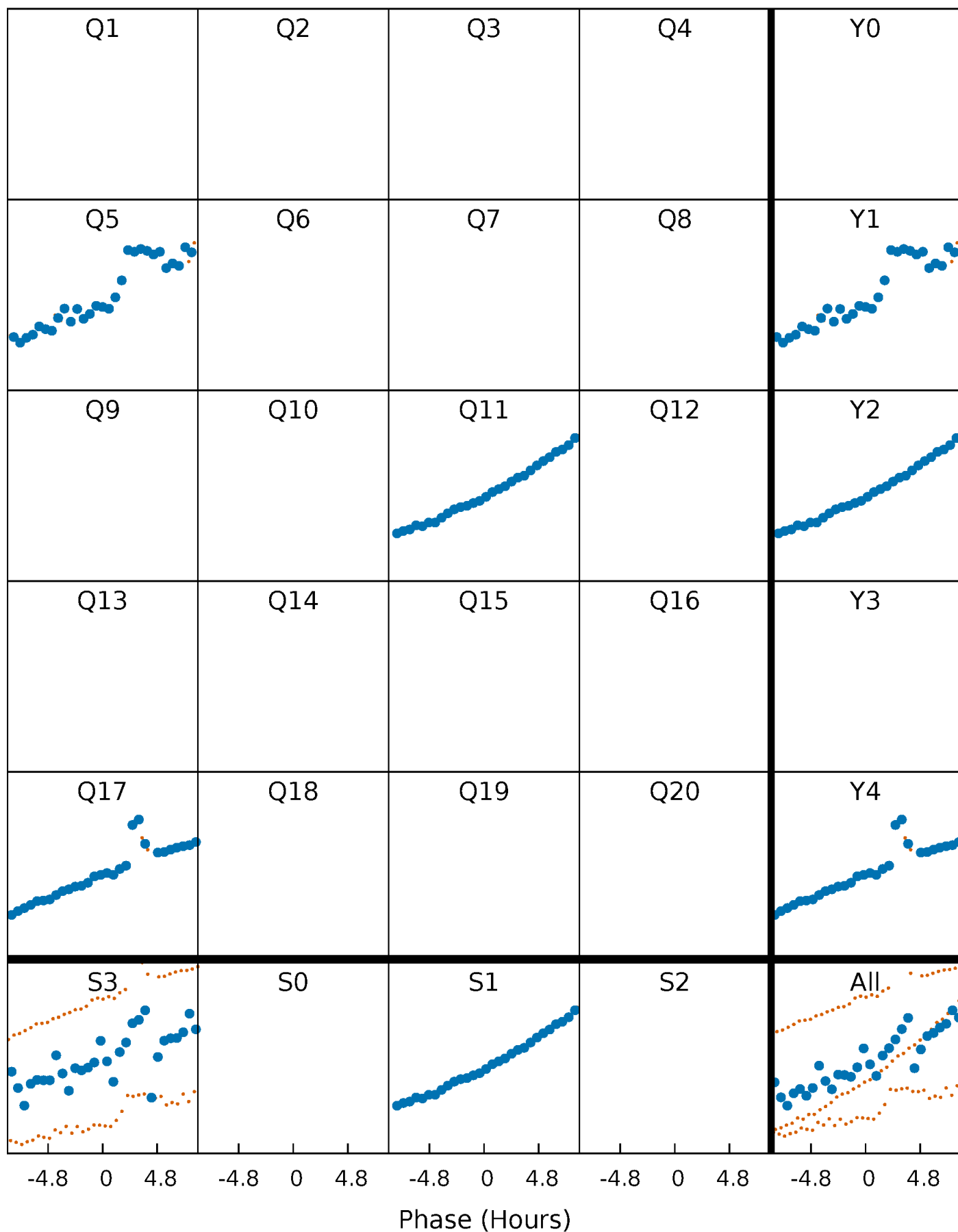


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



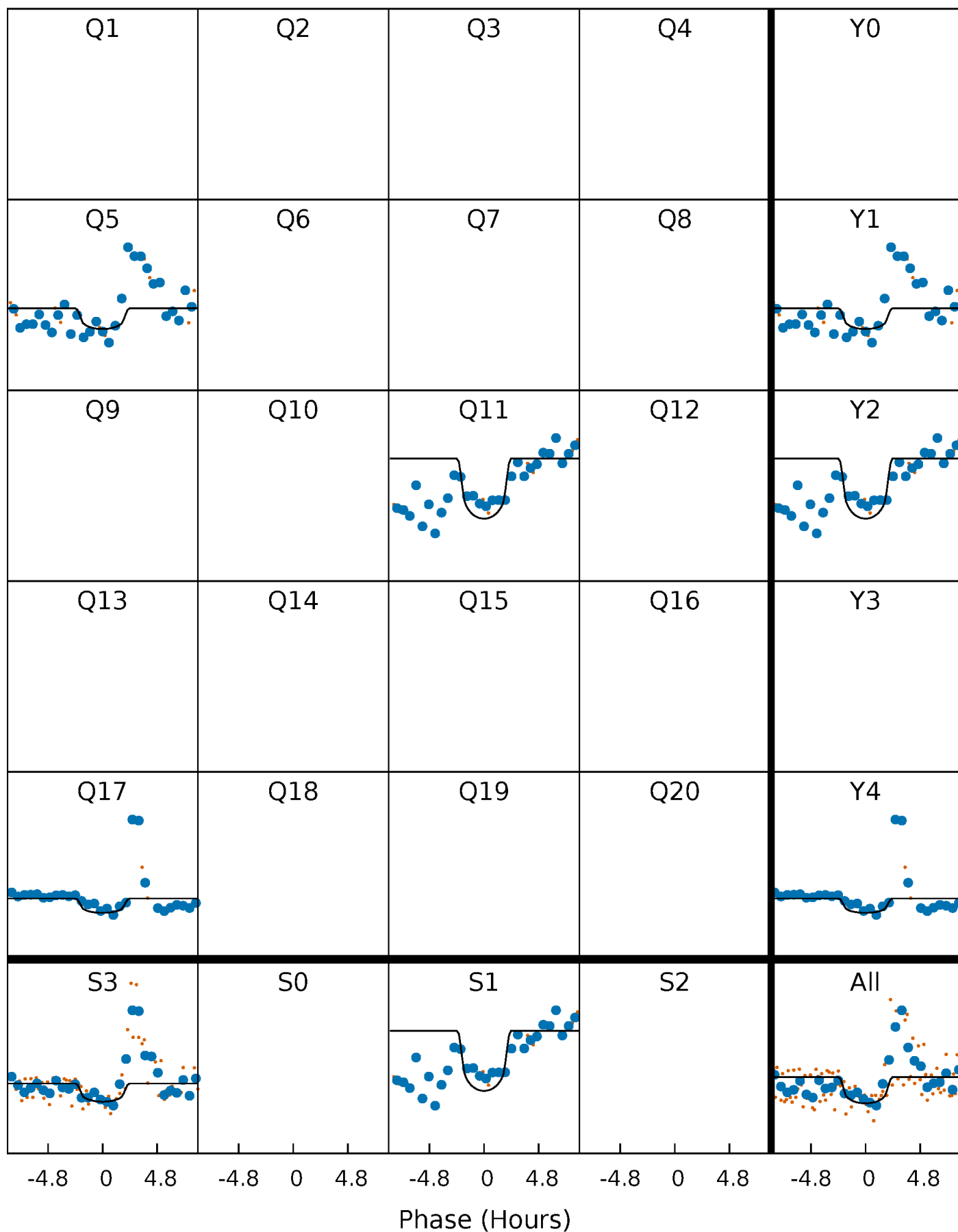
PDC Quarter-Phased Transit Curves

TCE 010330818-01 P=539.582904 Days $T_0=499.266470$ (BKJD)



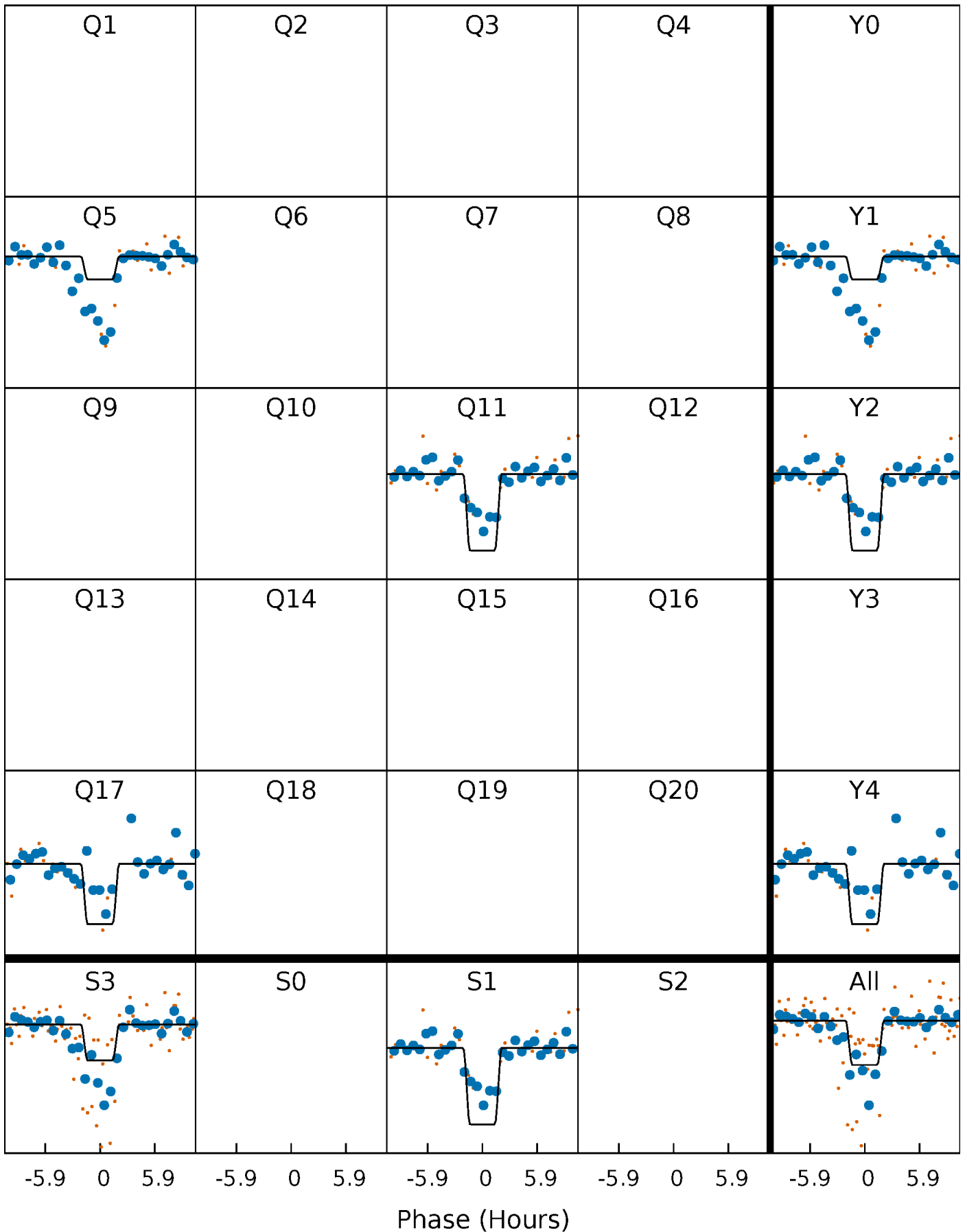
DV Quarter-Phased Transit Curves

TCE 010330818-01 P=539.582904 Days $T_0=499.266470$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

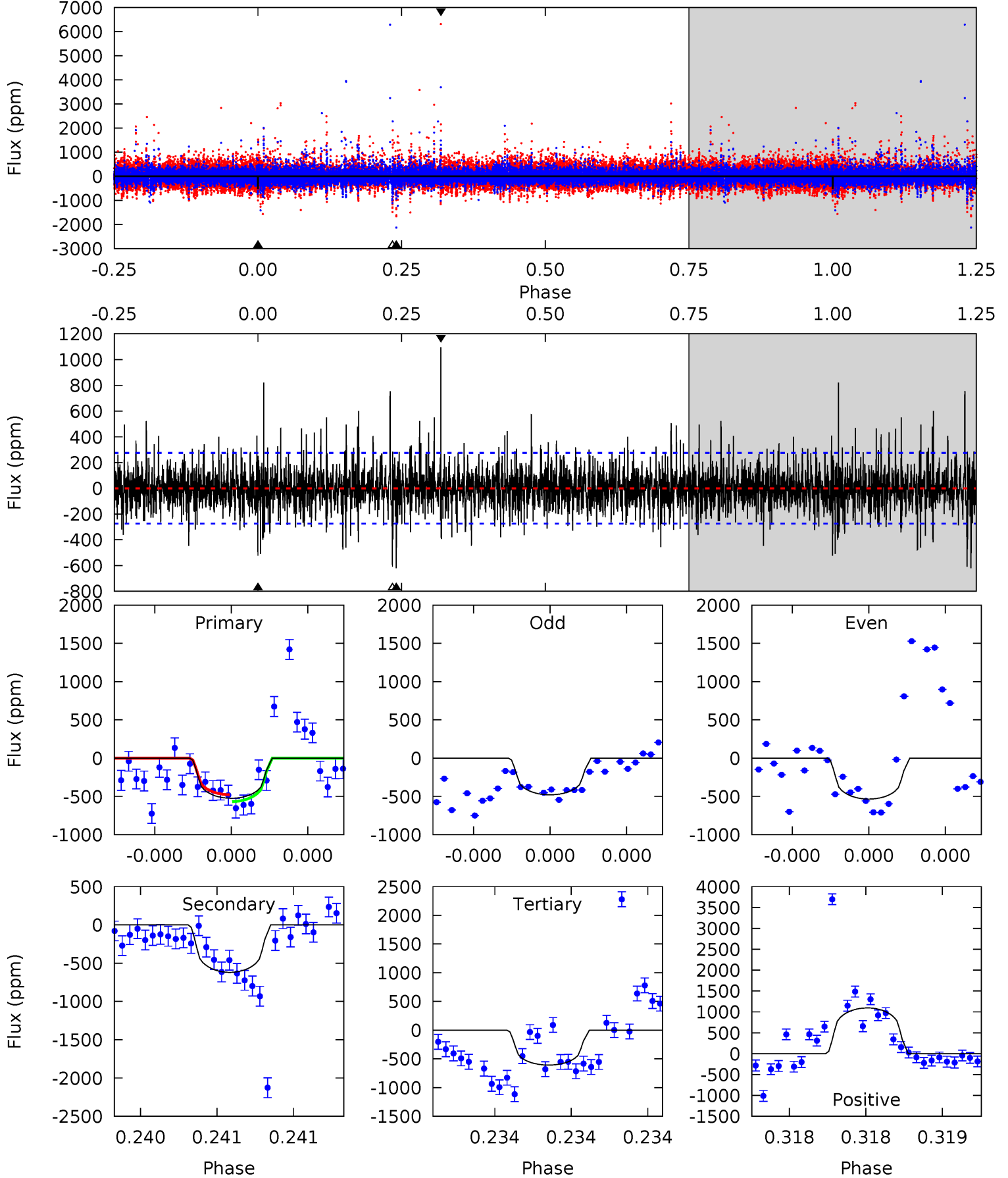
TCE 010330818-01 P=539.595830 Days $T_0=499.271258$ (BKJD)



DV Model-Shift Uniqueness Test

010330818-01, P = 539.582904 Days, E = 499.266470 Days

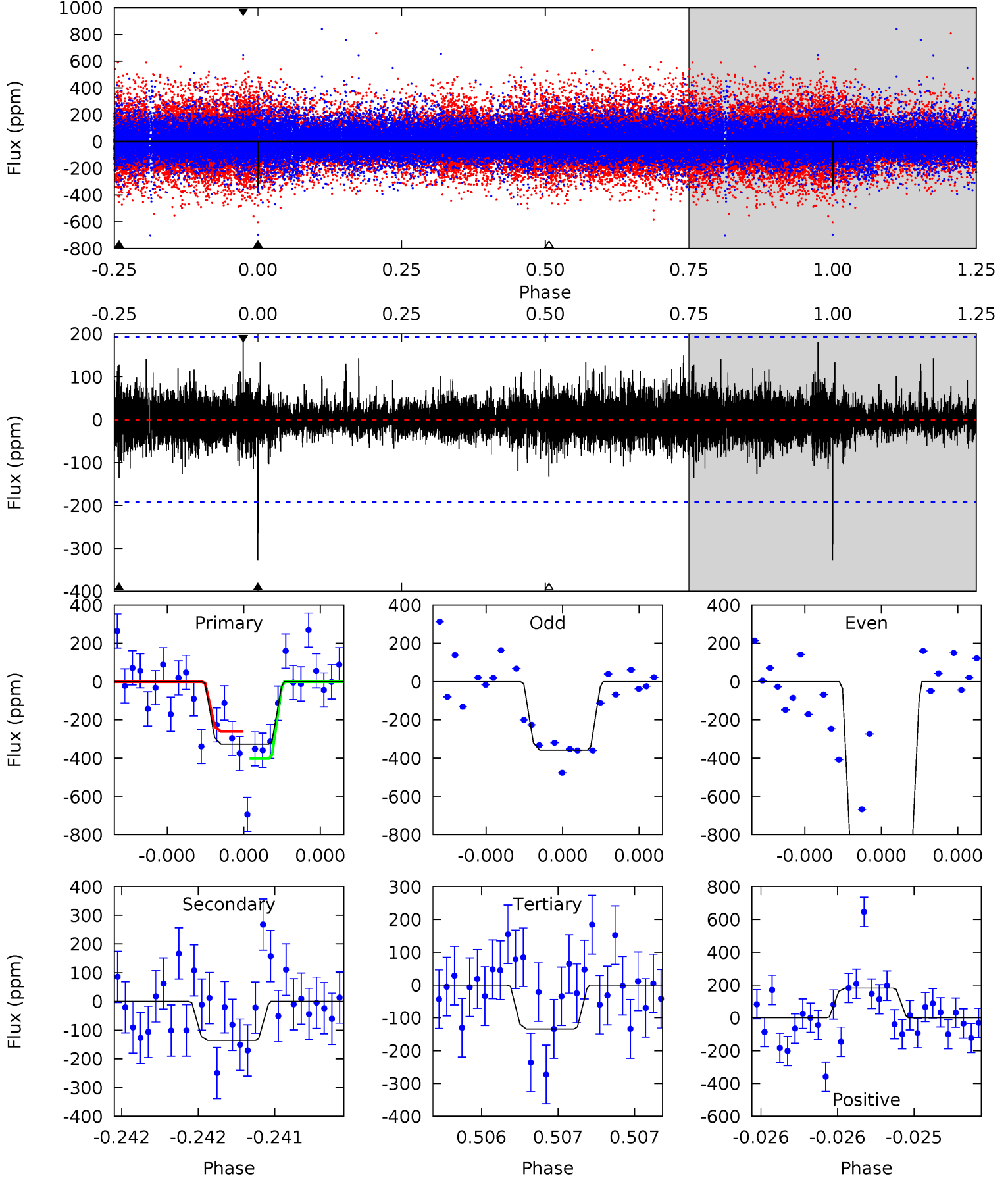
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	12.7	12.5	22.5	5.64	3.58	2.36	-1.73	-11.7	0.24	-9.75	0.37	1.08	0.64	0.92



Alt Model-Shift Uniqueness Test

010330818-01, P = 539.595830 Days, E = 499.271258 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.60	3.99	3.93	5.33	5.66	3.61	0.77	5.67	4.27	0.06	-1.34	14.6	2.40	0.36	2.11



Stellar Parameters For KIC 010330818

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4441^{+120}_{-133}	$4.710^{+0.058}_{-0.031}$	$-0.980^{+0.300}_{-0.300}$	$0.530^{+0.038}_{-0.046}$	$0.526^{+0.040}_{-0.033}$	$4.975^{+1.226}_{-0.599}$
	+3%/-3%	+1%/-1%	+31%/-31%	+7%/-9%	+8%/-6%	+25%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010330818-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-620 ± 49	$2.52^{+2.37}_{-1.66}$	193^{+7}_{-7}	3647^{+1860}_{-692}	$61212^{+462858}_{-45461}$
Alt.	-136 ± 34	$2.40^{+2.14}_{-1.61}$	194^{+6}_{-7}	2907^{+1257}_{-436}	$13422^{+118650}_{-9603}$

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

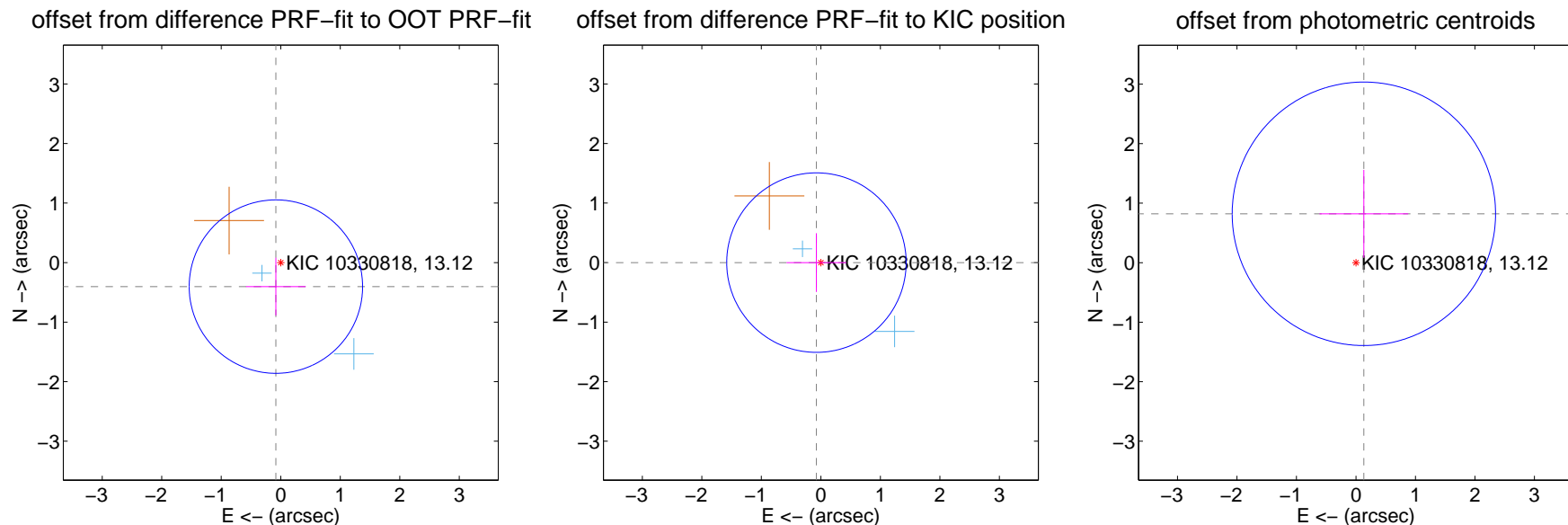
DV Centroid Data

Supplemental centroid analysis for 010330818-01. Kepler magnitude: 13.12. Transit SNR 6.83

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.412 ± 0.486	0.85	0.082 ± 0.501	-0.403 ± 0.485
PRF-fit source offset from KIC position	0.074 ± 0.503	0.15	0.074 ± 0.503	-0.000 ± 0.494
photometric centroid source offset	0.83 ± 0.74	1.13	-0.13 ± 0.75	0.82 ± 0.74

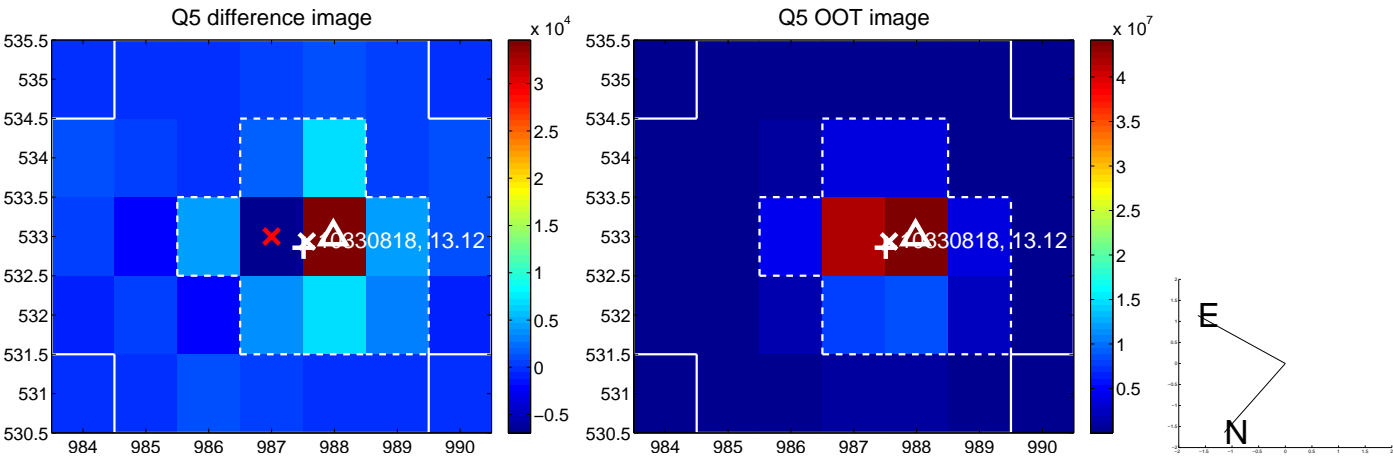


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



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

Q9 no difference image



Q9 no OOT image



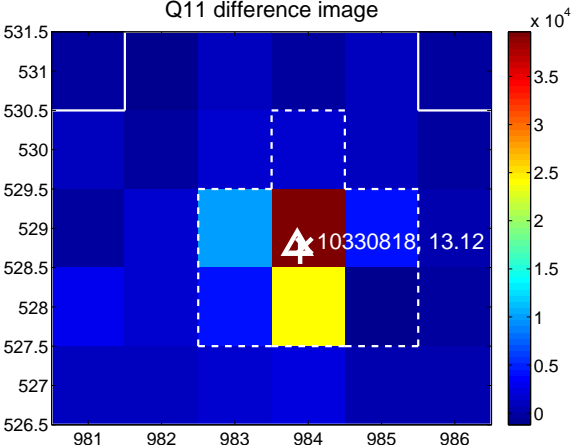
Q10 no difference image



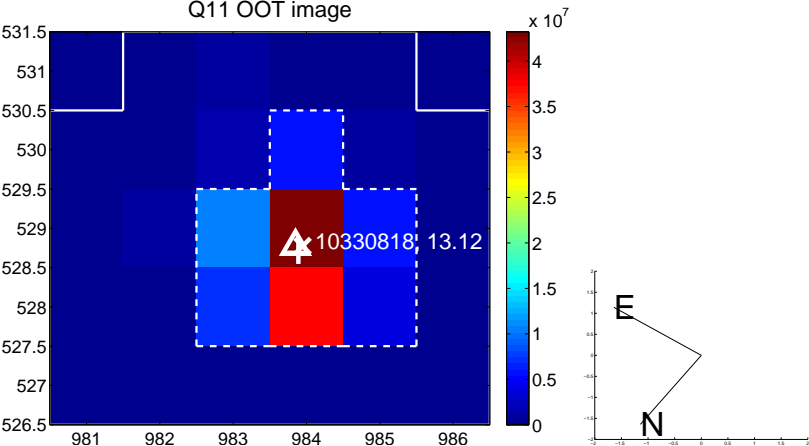
Q10 no OOT image



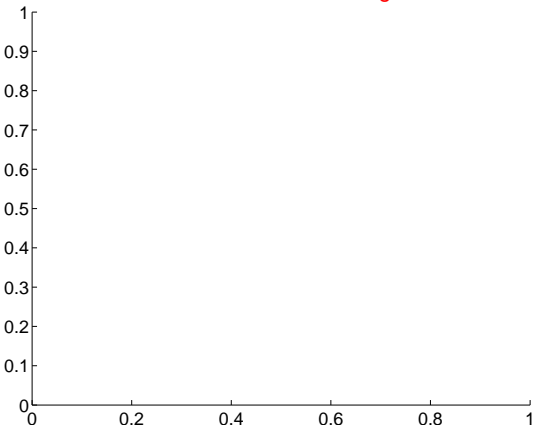
Q11 difference image



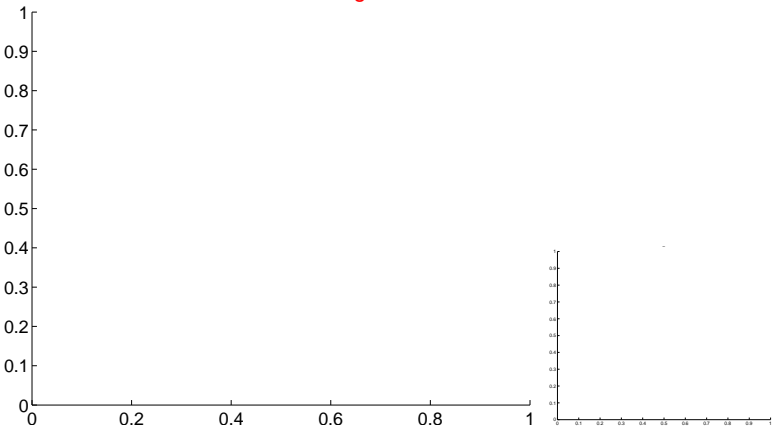
Q11 OOT image



Q12 no difference image



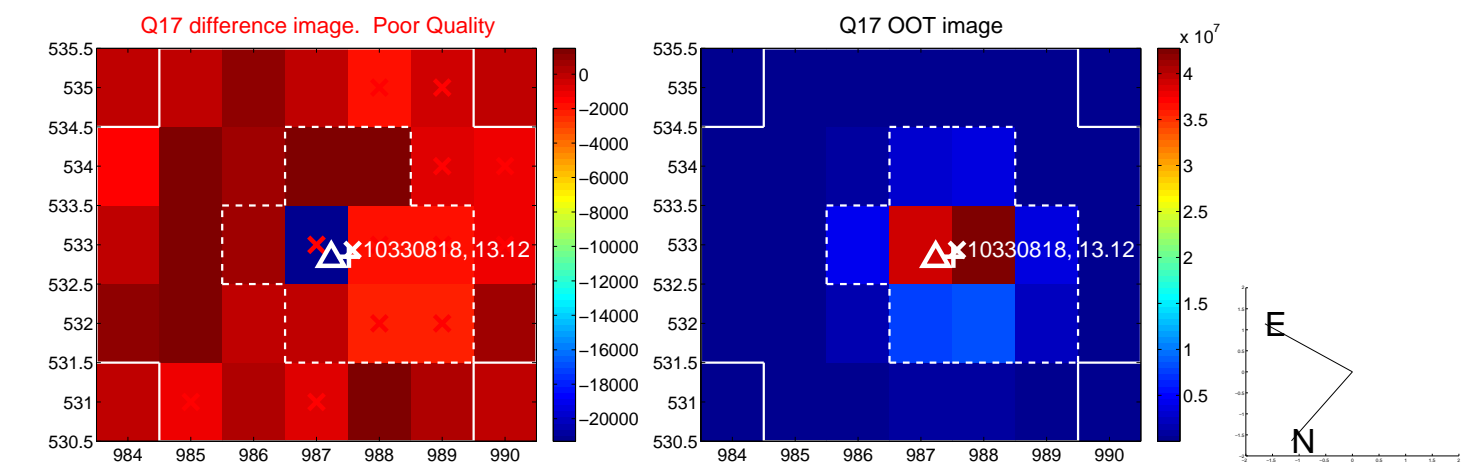
Q12 no OOT image



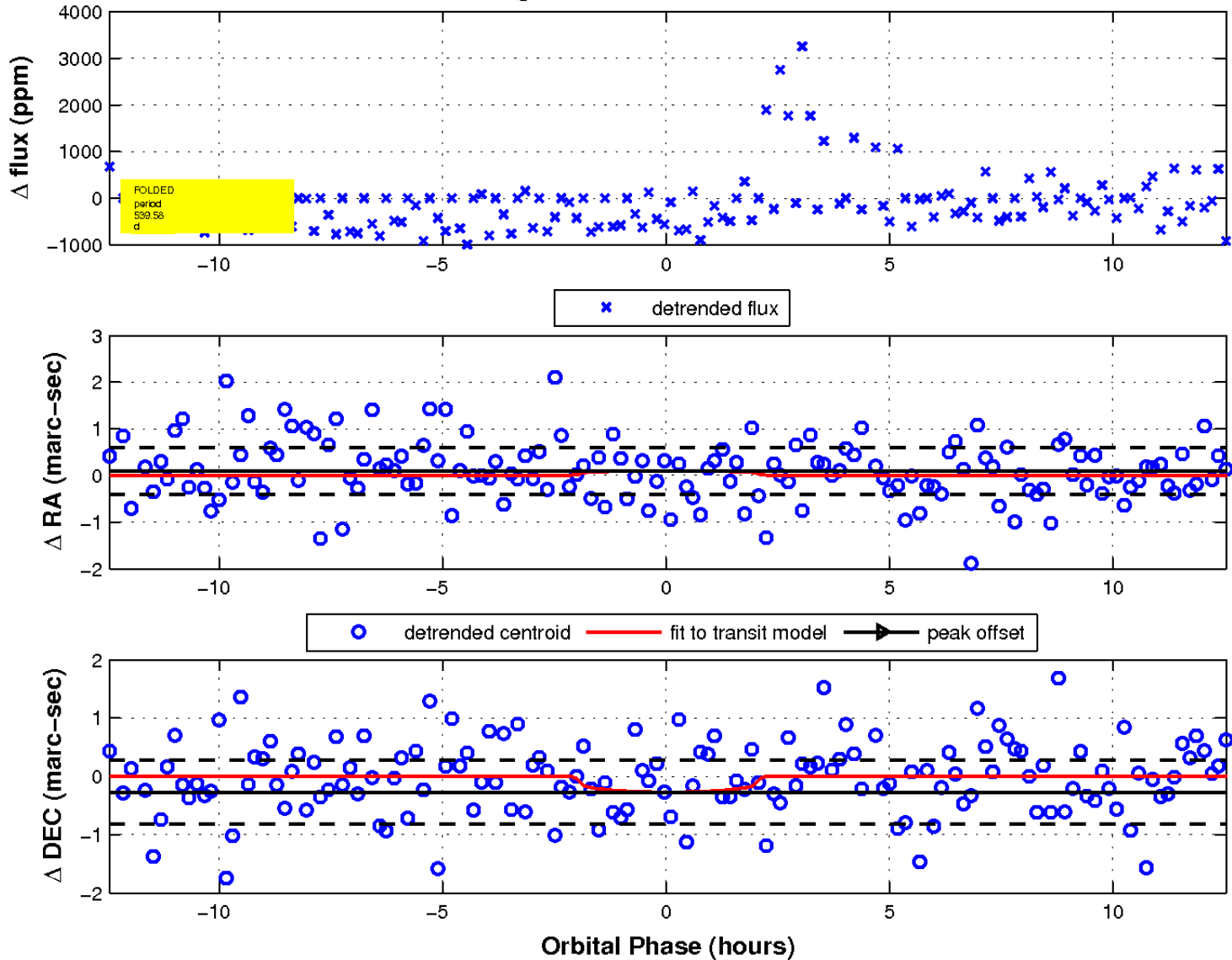
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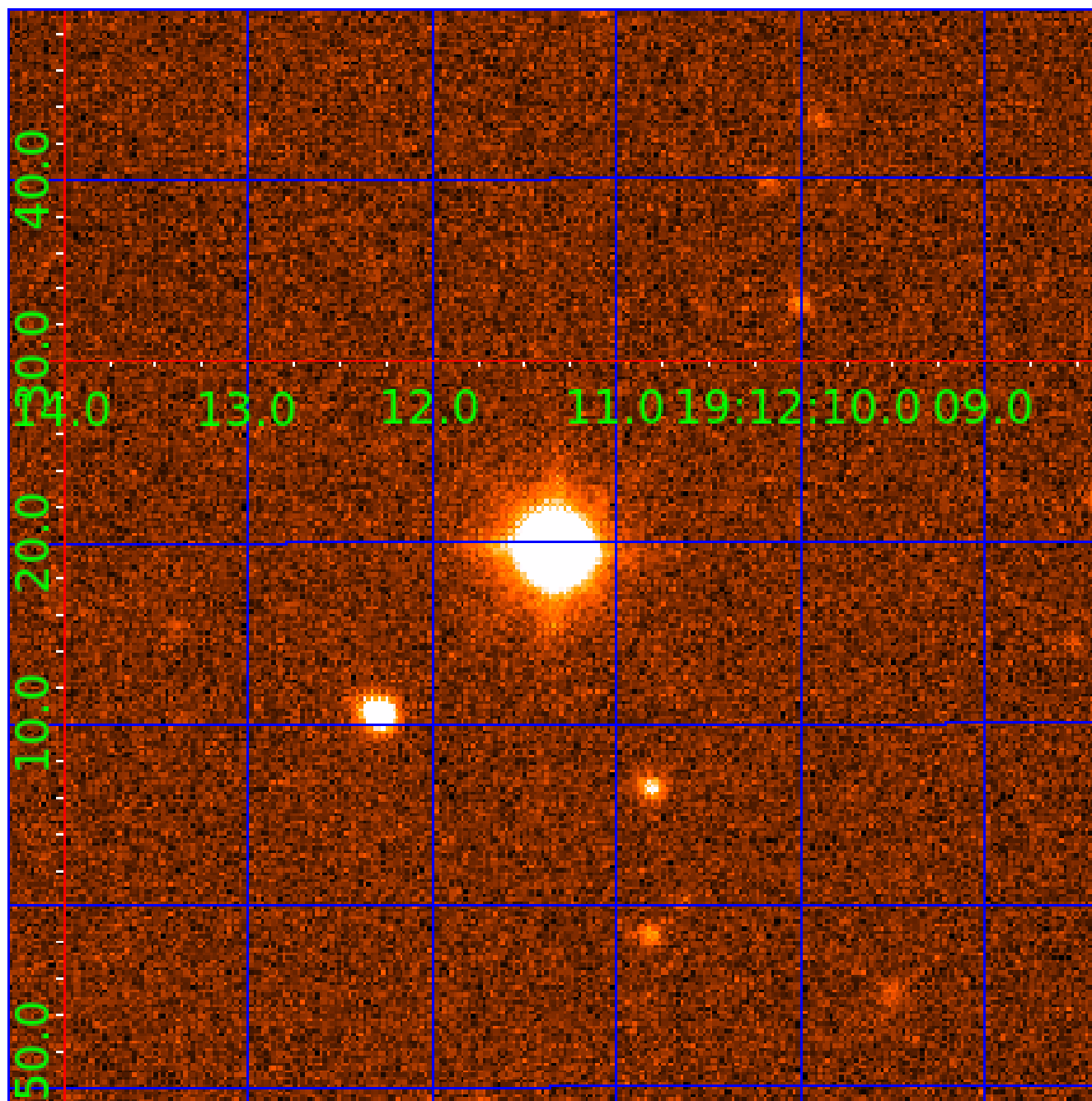


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 010330818

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})
010330818-01	OBS	No	539.582904	499.266470	601.2	4.197	14.6	6.8	0.53	4441	1.34	0.09
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Robovetter Results

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010330818-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

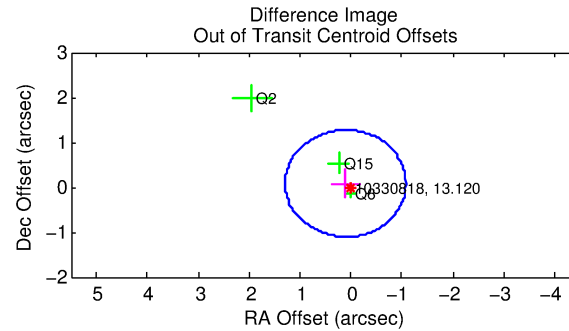
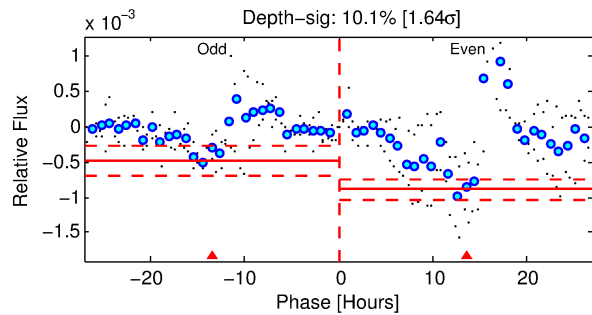
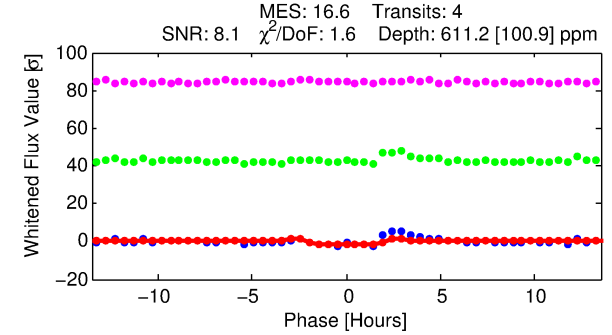
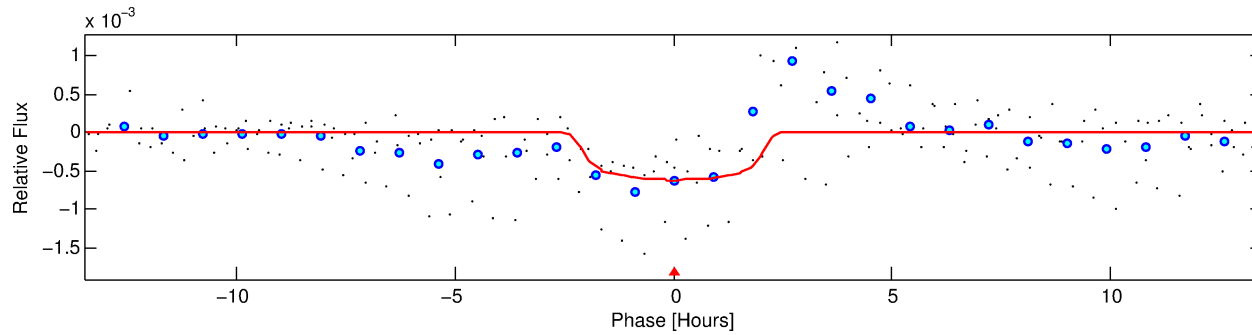
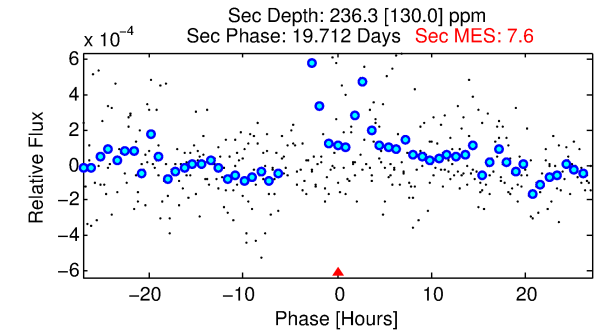
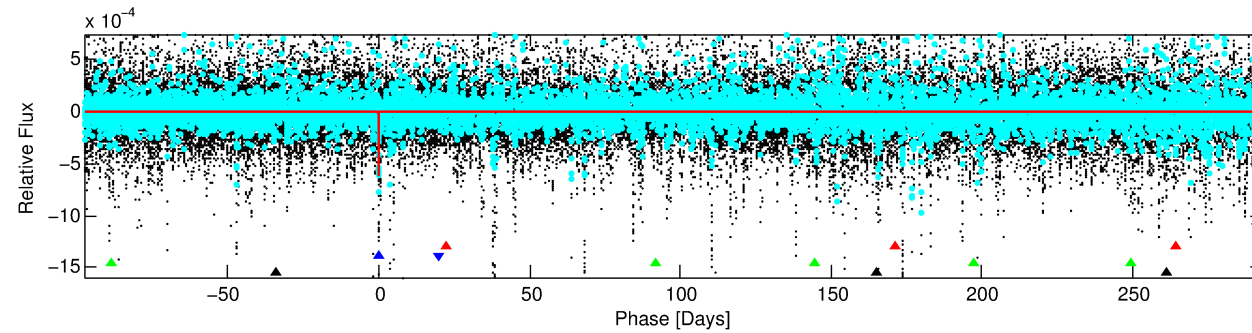
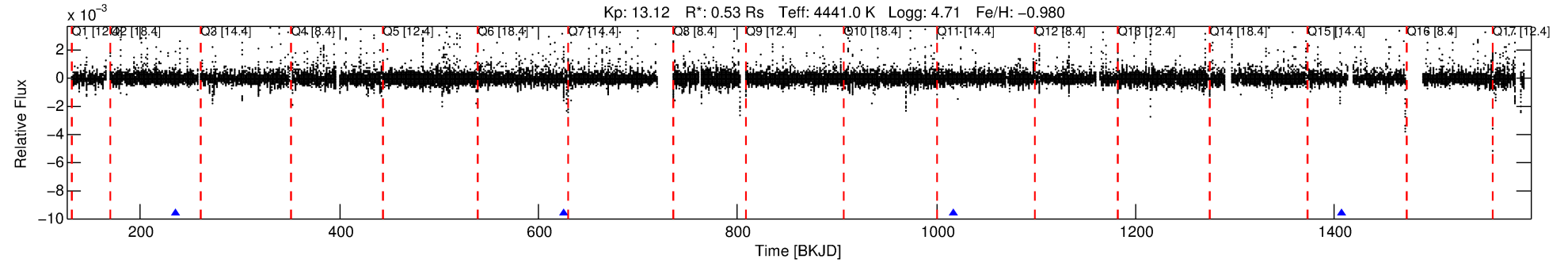
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010330818-02

No Significant Match Found

DV One-Page Summary

KIC: 10330818 Candidate: 2 of 4 Period: 390.740 d



DV Fit Results:

Period = 390.74022 [0.00430] d
Epoch = 234.9065 [0.0087] BKJD
 R_p/R^* = 0.0251 [0.0150]
 a/R^* = 437.07 [1007.15]
 b = 0.79 [1.14]
 Seff = 0.14 [0.02]
 T_{eq} = 155 [6] K
 R_p = 1.45 [0.88] R_e
 a = 0.8443 [0.0616] AU
 A_g = 43999.72 [58193.73] [0.76 σ]
 T_{eff} = 3476 [1150] K [2.89 σ]

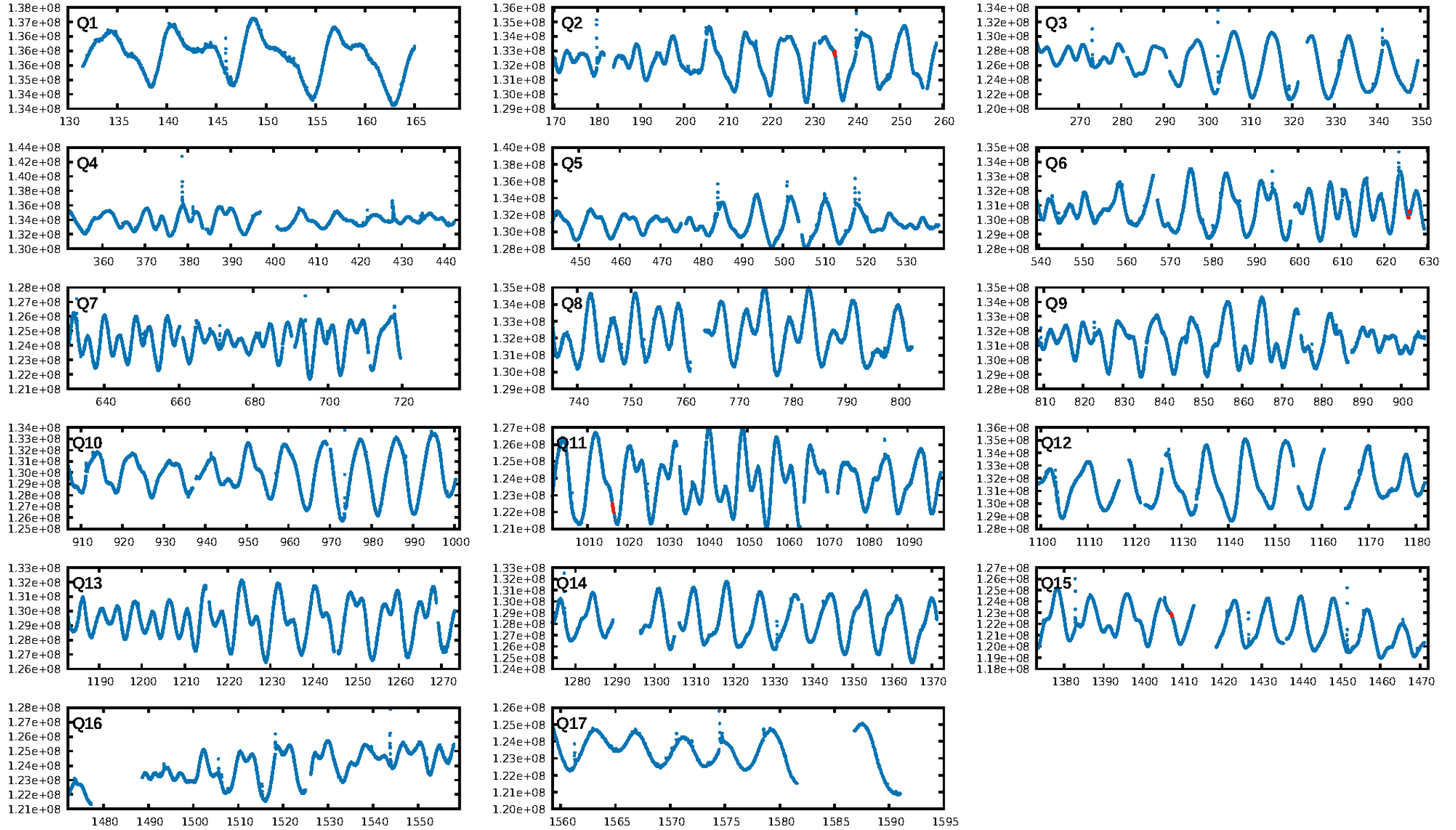
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [234.07 σ]
LongPeriod-sig: 100.0% [580.83 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 38.6%
Bootstrap-pfa: 5.21e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.054
Centroid-sig: 76.0%
Centroid-so: 0.549 arcsec [0.94 σ]
OotOffset-rm: 0.133 arcsec [0.34 σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-rm: 0.564 arcsec [0.79 σ]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [4/4]

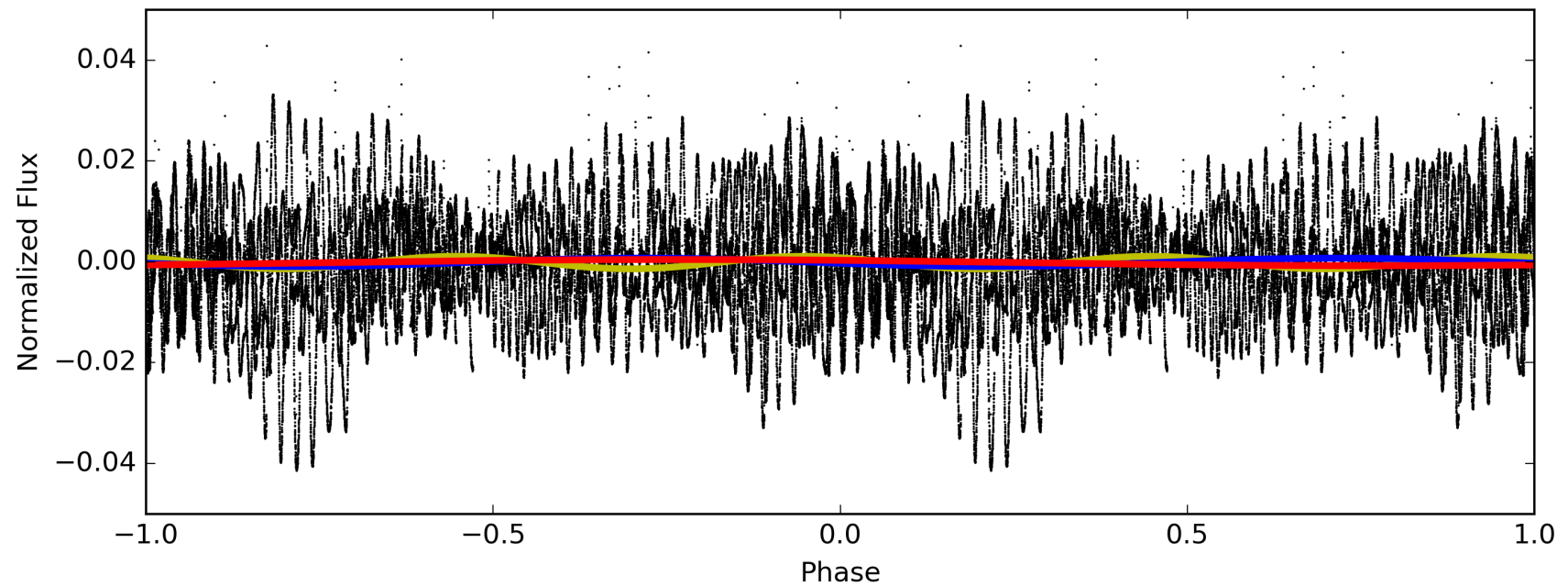
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:01:15 Z

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TCE 010330818-02, PDC Light Curves

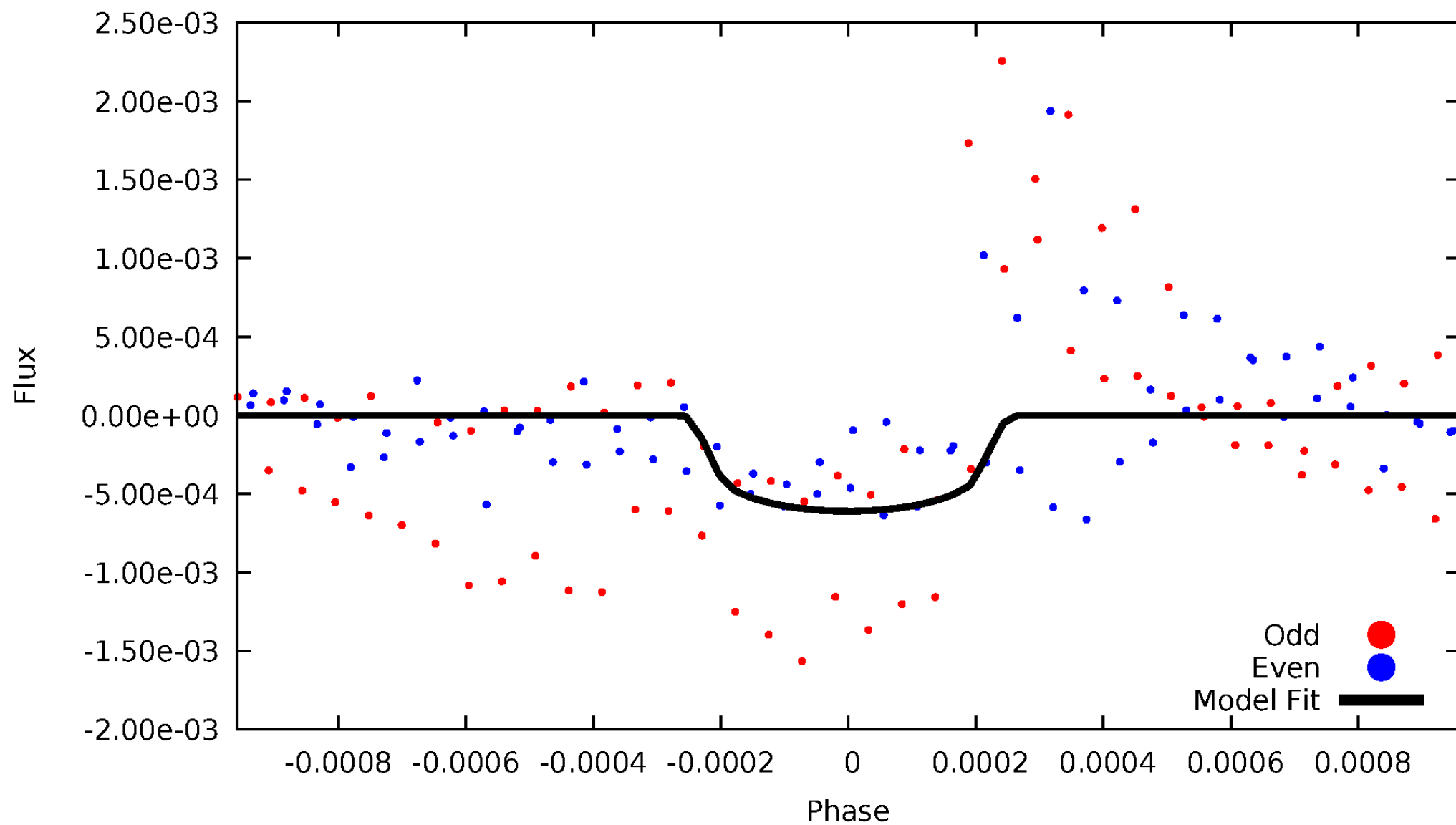


— P = 195.370 days — P = 390.740 days — P = 781.480 days



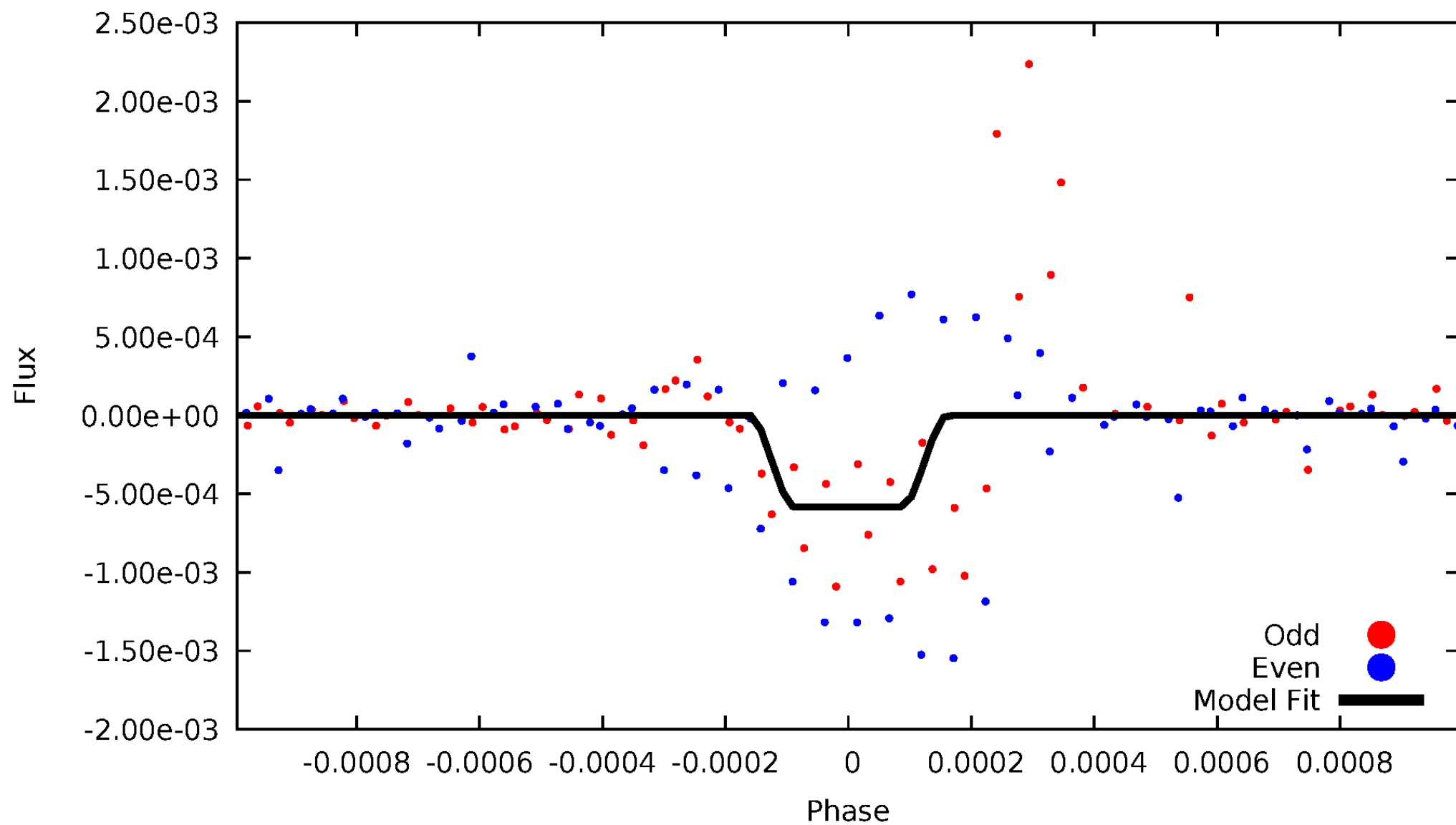
DV Odd/Even

TCE 010330818-02



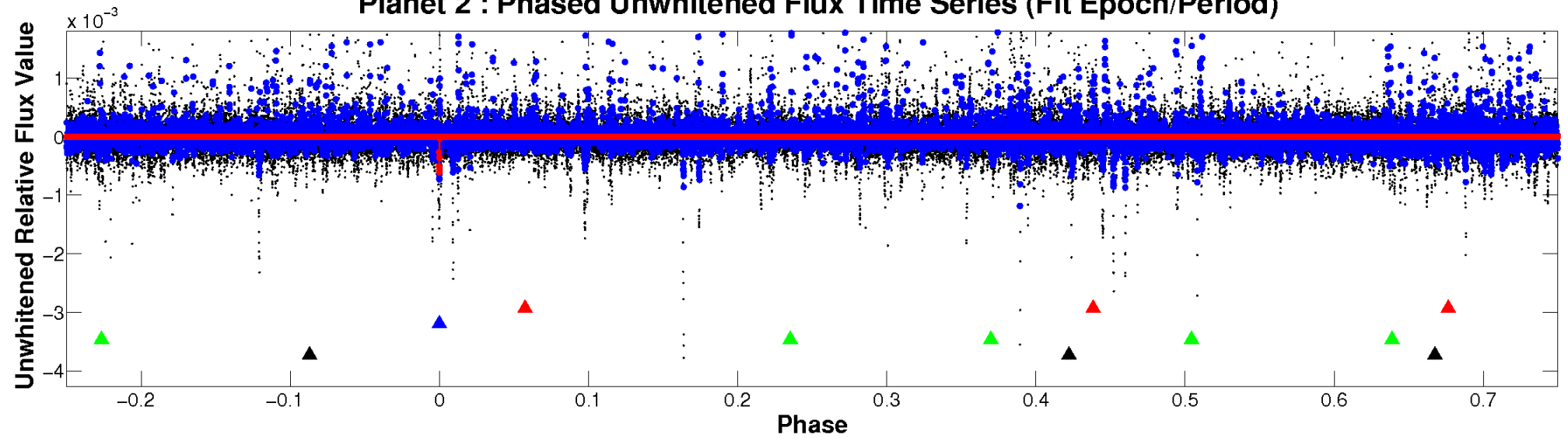
ALT Odd/Even

TCE 010330818-02

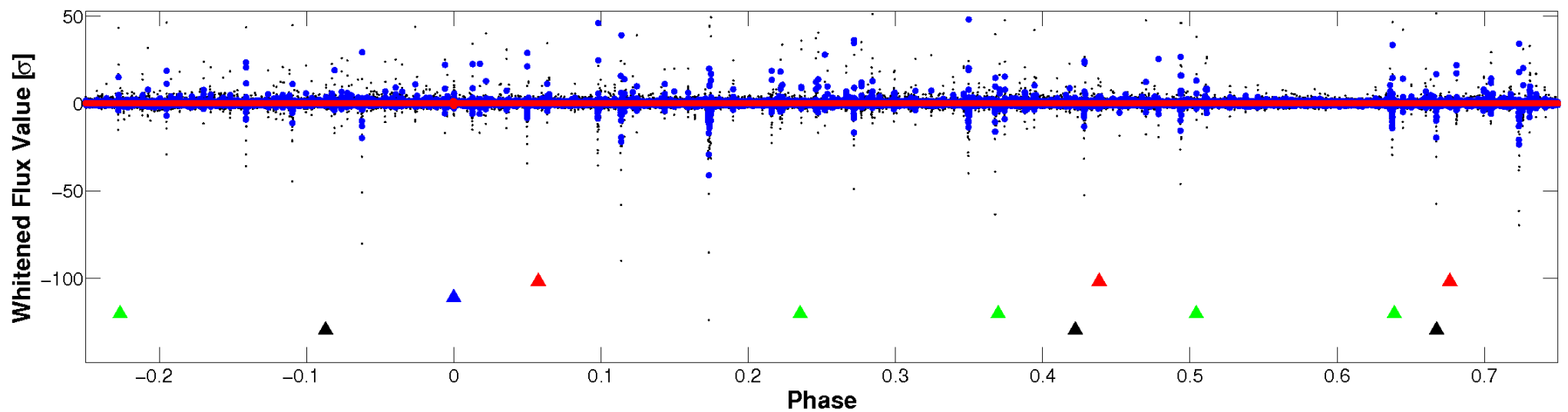


Non-Whitened Vs. Whitened Light Curve

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

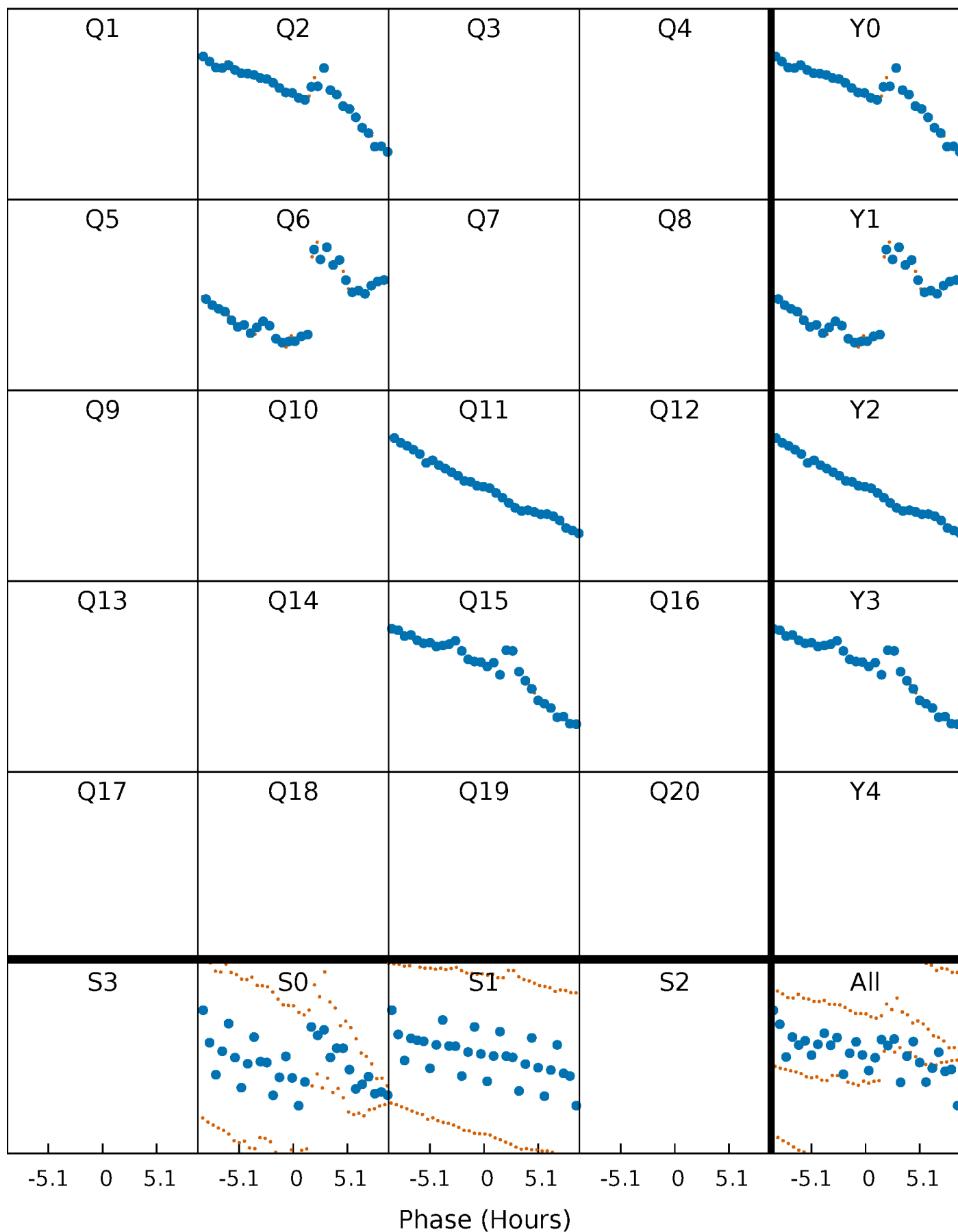


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



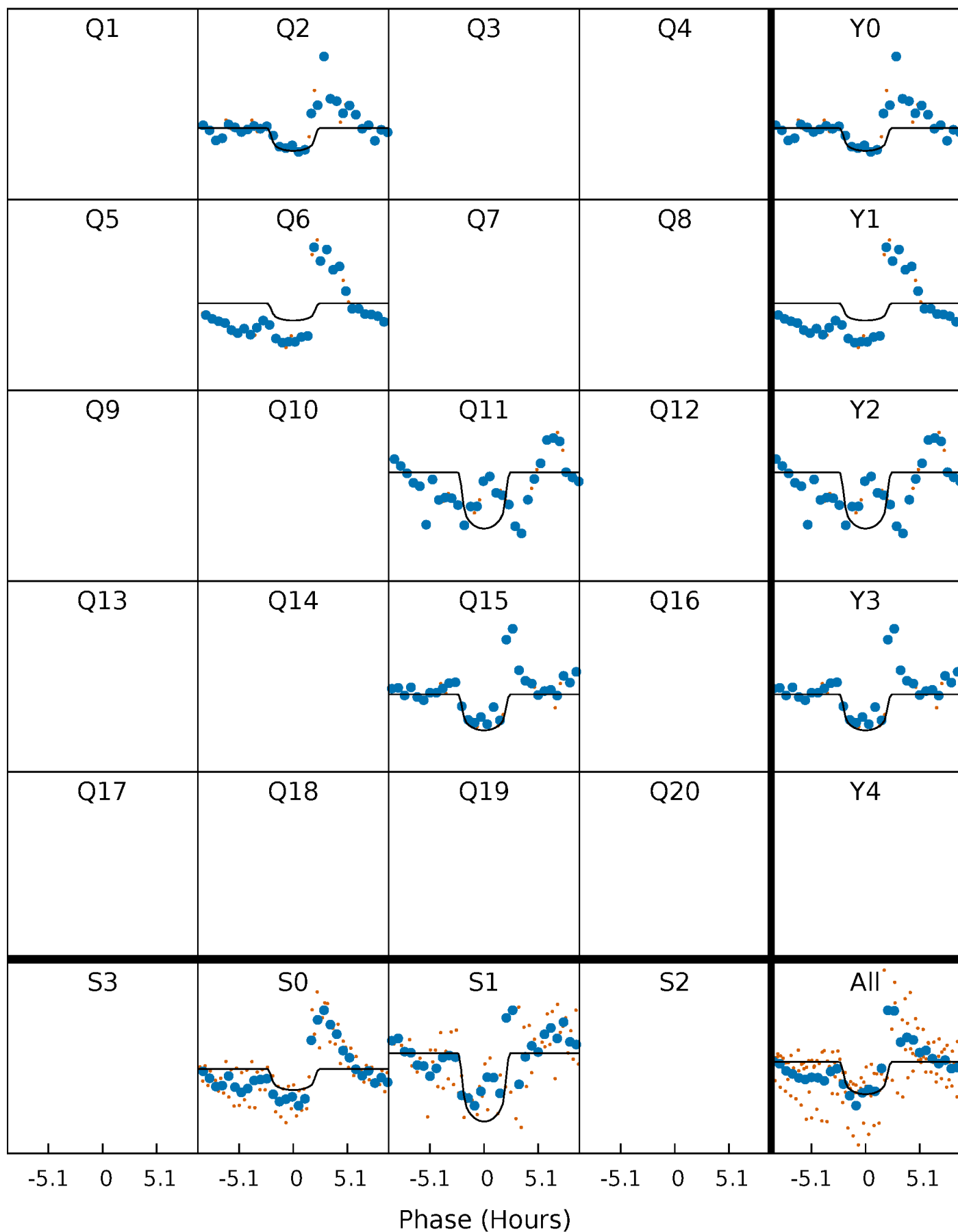
PDC Quarter-Phased Transit Curves

TCE 010330818-02 $P=390.740224$ Days $T_0=234.906464$ (BKJD)



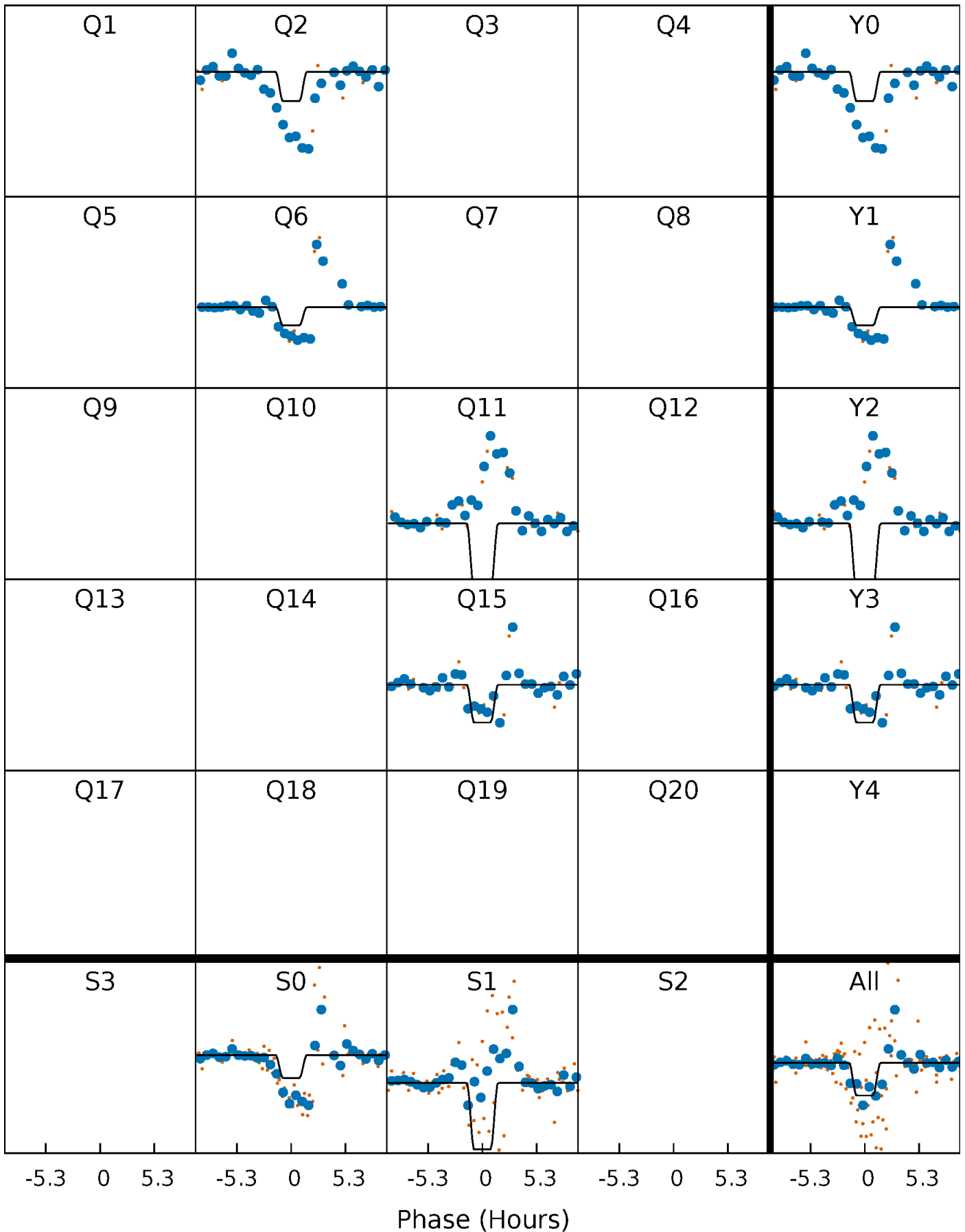
DV Quarter-Phased Transit Curves

TCE 010330818-02 P=390.740224 Days $T_0=234.906464$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

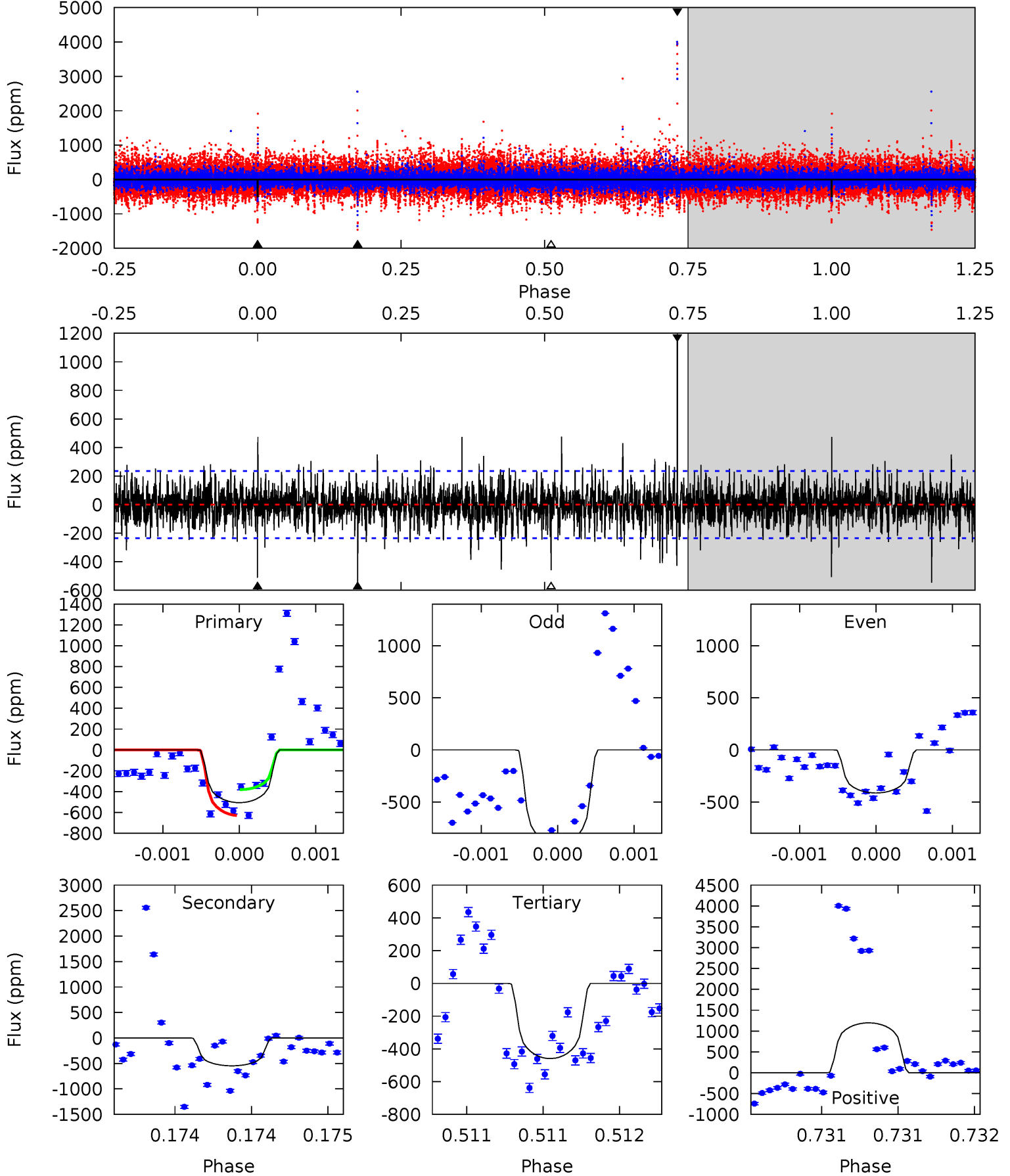
TCE 010330818-02 P=390.744157 Days $T_0=234.881830$ (BKJD)



DV Model-Shift Uniqueness Test

010330818-02, P = 390.740224 Days, E = 234.906464 Days

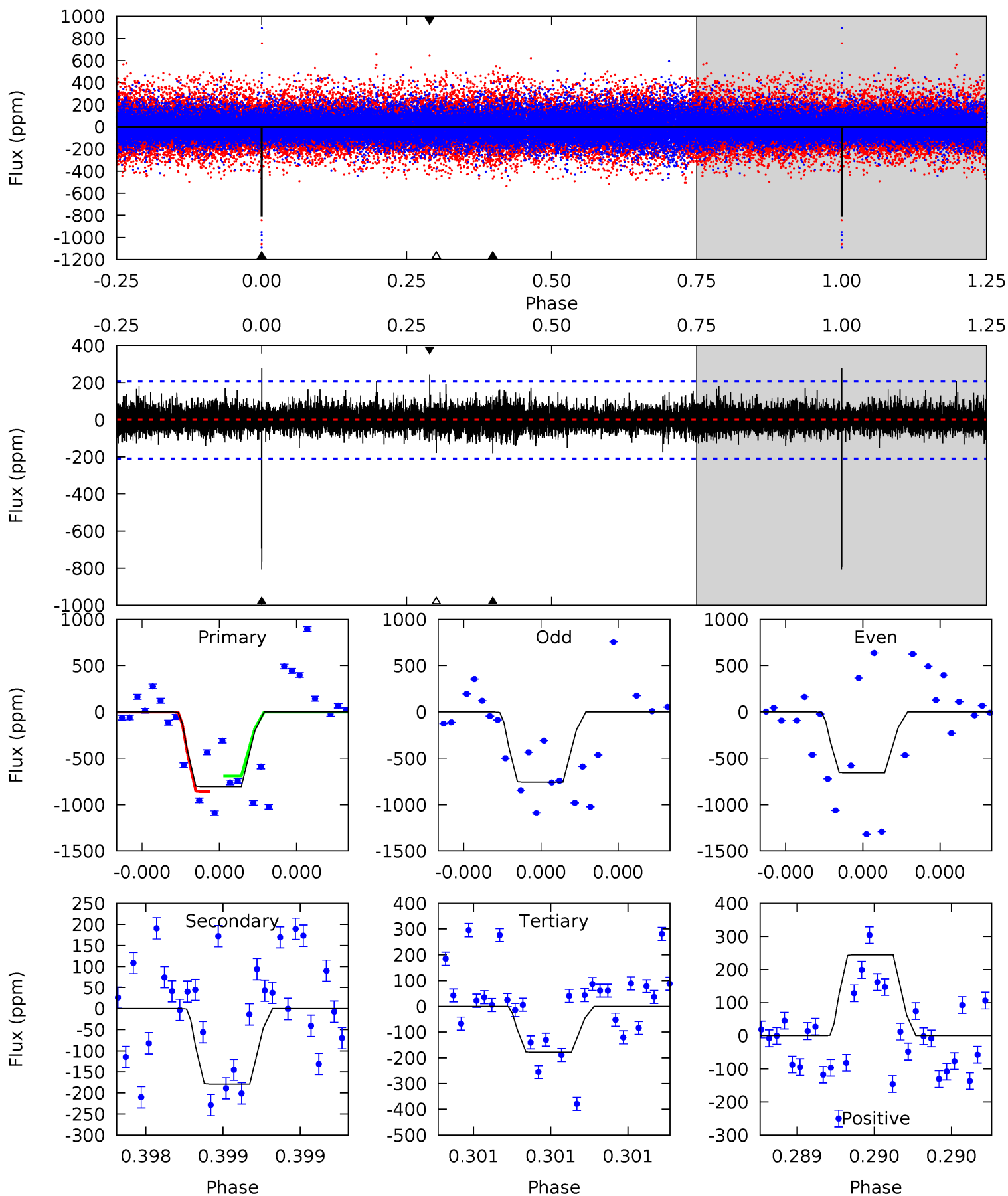
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	13.0	10.9	28.4	5.57	3.48	2.21	1.11	-16.4	2.08	-15.4	4.47	1.27	0.69	2.92



Alt Model-Shift Uniqueness Test

010330818-02, P = 390.744157 Days, E = 234.881830 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	4.86	4.83	6.64	5.66	3.62	1.01	17.0	15.2	0.03	-1.78	1.75	0.83	0.26	0



Stellar Parameters For KIC 010330818

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4441^{+120}_{-133}	$4.710^{+0.058}_{-0.031}$	$-0.980^{+0.300}_{-0.300}$	$0.530^{+0.038}_{-0.046}$	$0.526^{+0.040}_{-0.033}$	$4.975^{+1.226}_{-0.599}$
	+3%/-3%	+1%/-1%	+31%/-31%	+7%/-9%	+8%/-6%	+25%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010330818-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-547 ± 42	$1.55^{+0.86}_{-0.87}$	216^{+7}_{-8}	4222^{+1670}_{-618}	$90973^{+373847}_{-53468}$
Alt.	-179 ± 37	$1.44^{+0.82}_{-0.74}$	216^{+7}_{-8}	3534^{+1073}_{-449}	$32773^{+102103}_{-19390}$

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 $A_{obs} \gg 1.0$

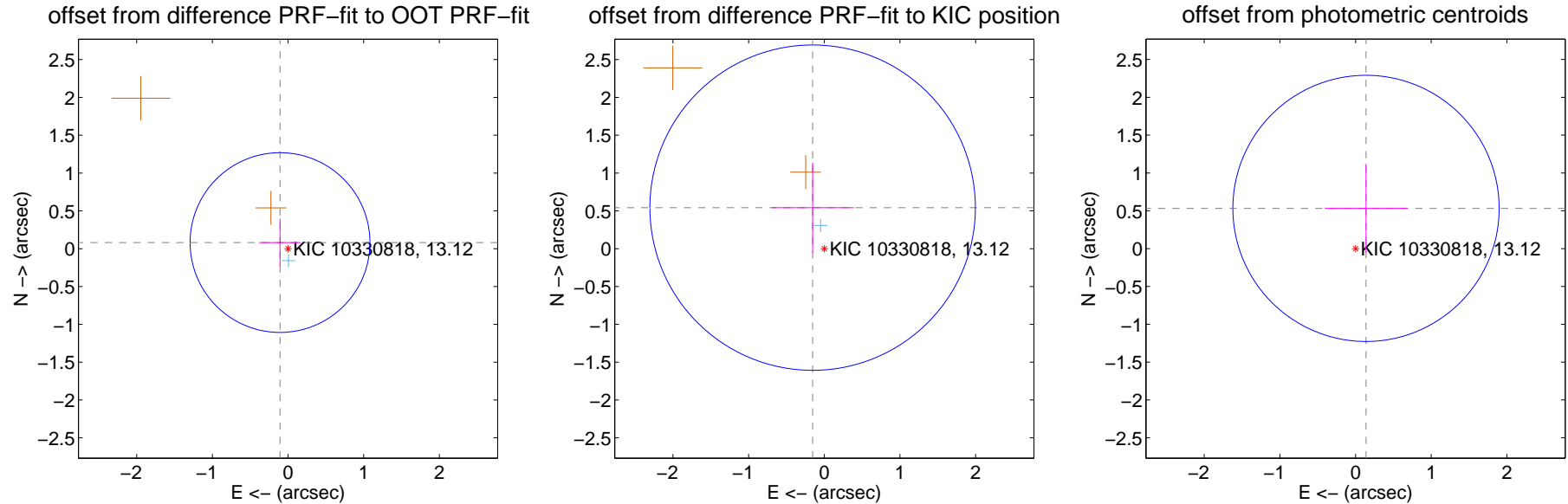
DV Centroid Data

Supplemental centroid analysis for 010330818-02. Kepler magnitude: 13.12. Transit SNR 8.10

There are 1 quarters with good PRF difference image offsets

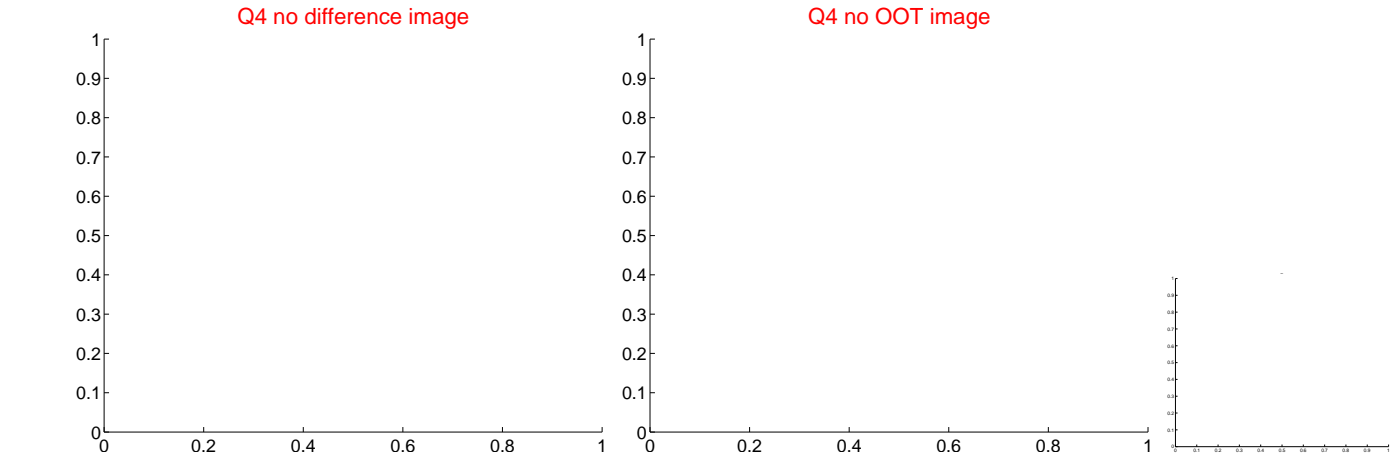
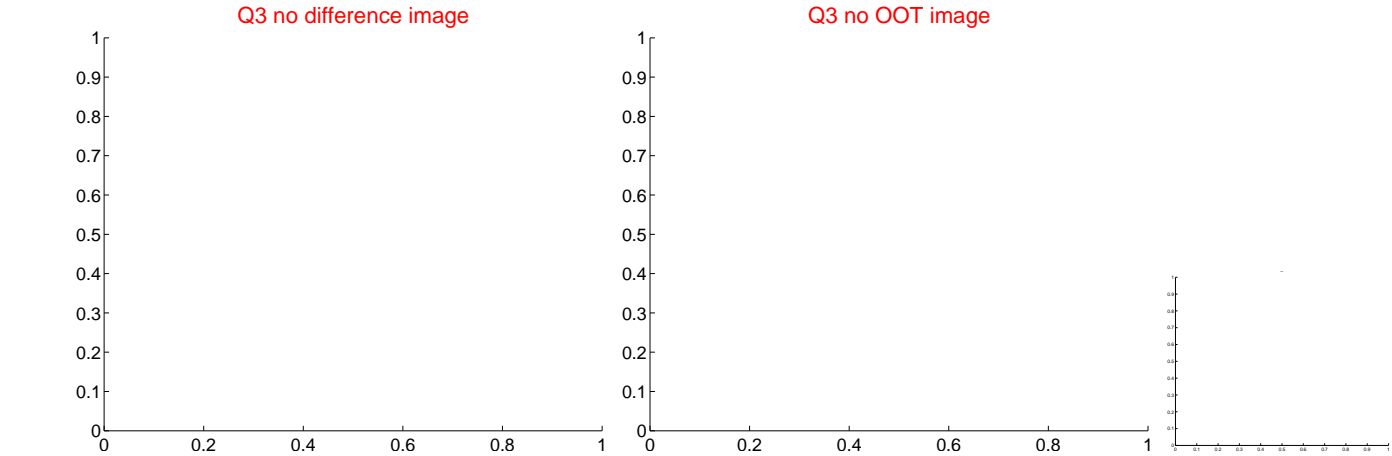
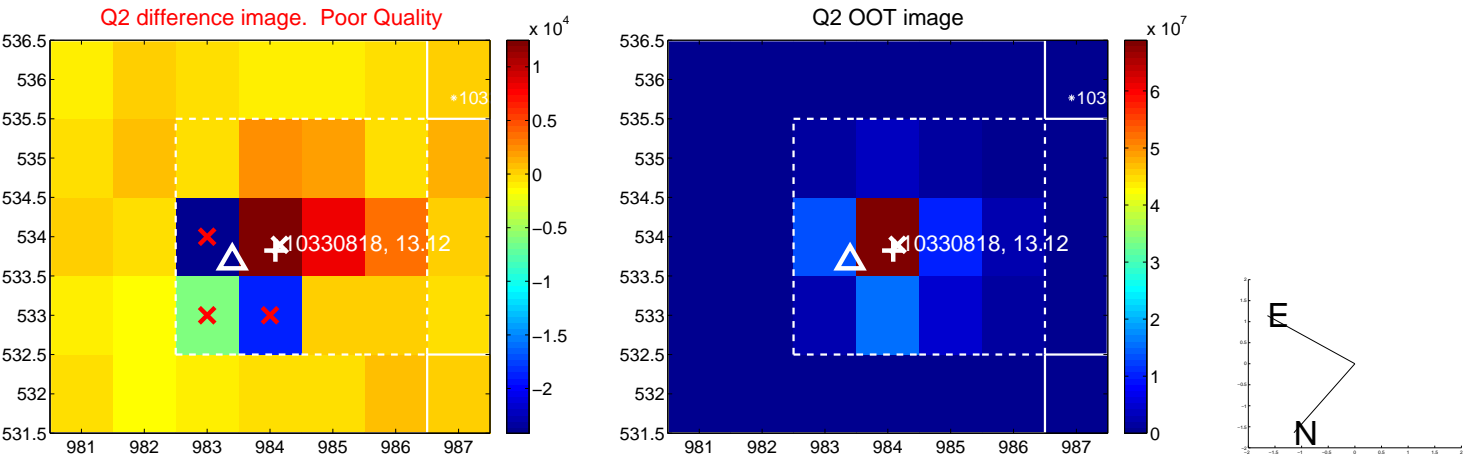
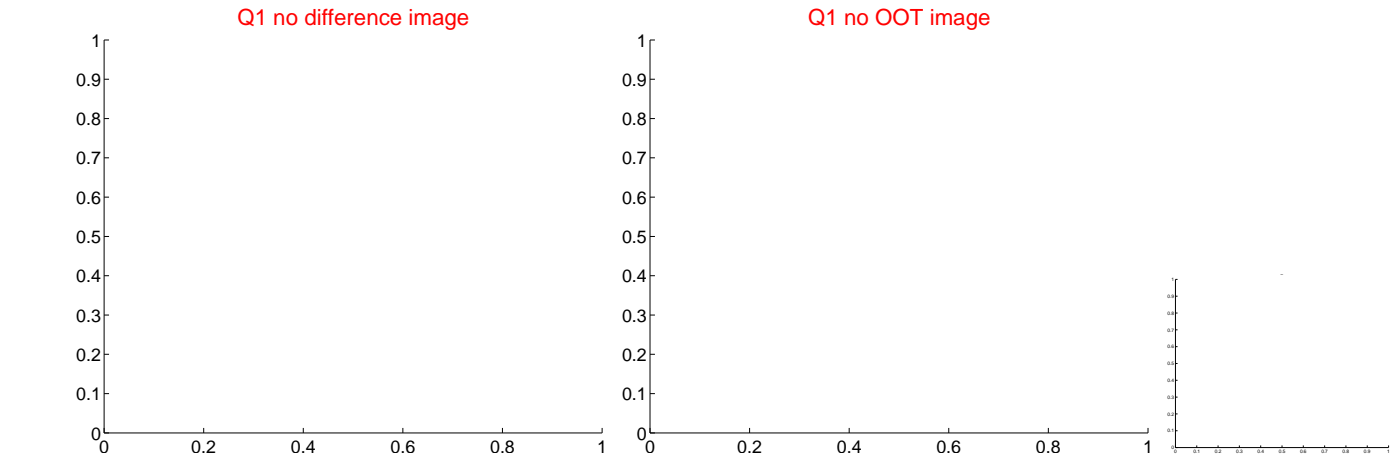
The direct PRF centroid is offset from the target star catalog position by about 0.47 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.133 ± 0.396	0.34	0.106 ± 0.276	0.081 ± 0.316
PRF-fit source offset from KIC position	0.564 ± 0.717	0.79	0.154 ± 0.545	0.542 ± 0.594
photometric centroid source offset	0.55 ± 0.59	0.94	-0.14 ± 0.55	0.53 ± 0.59



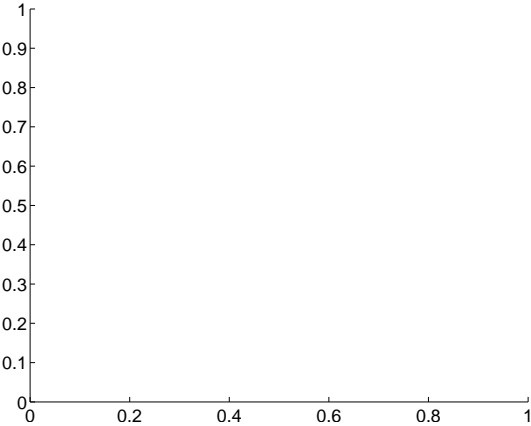
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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

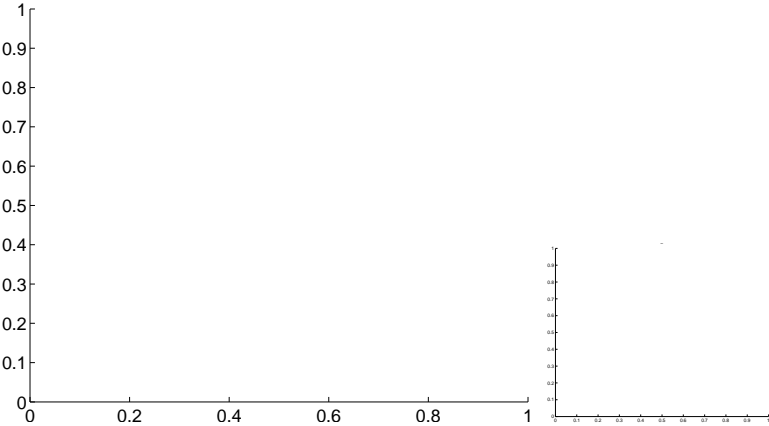


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

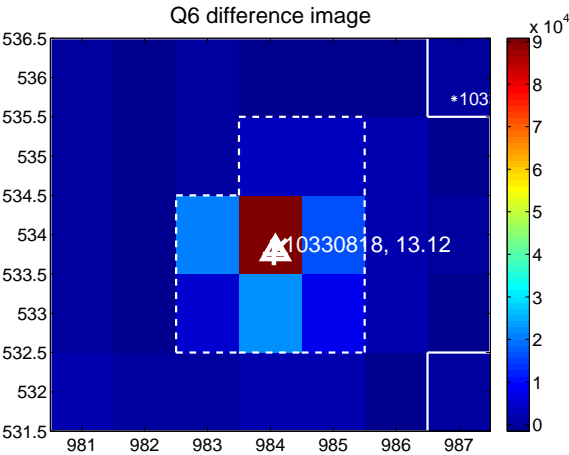
Q5 no difference image



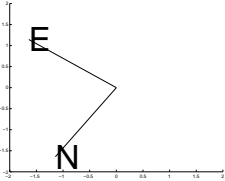
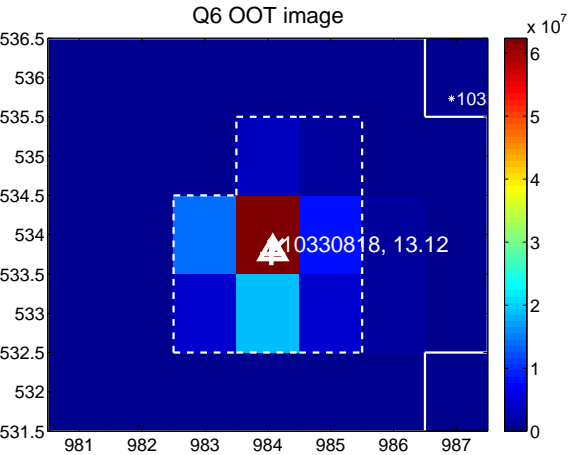
Q5 no OOT image



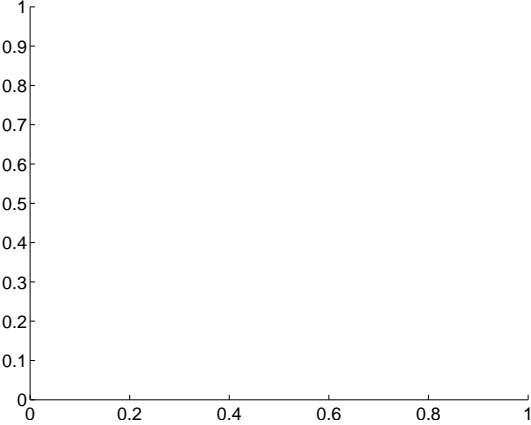
Q6 difference image



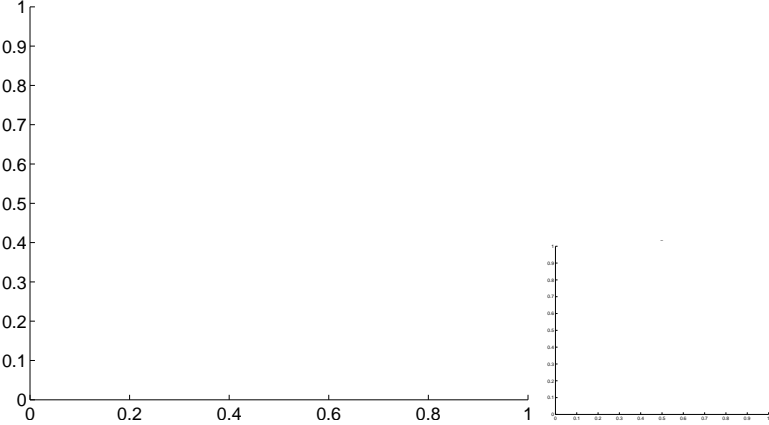
Q6 OOT image



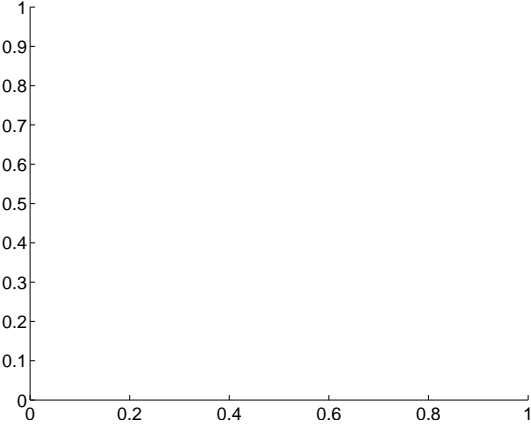
Q7 no difference image



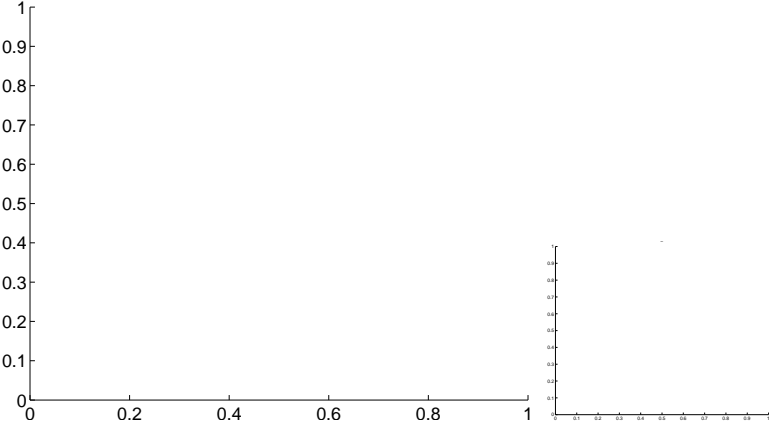
Q7 no OOT image



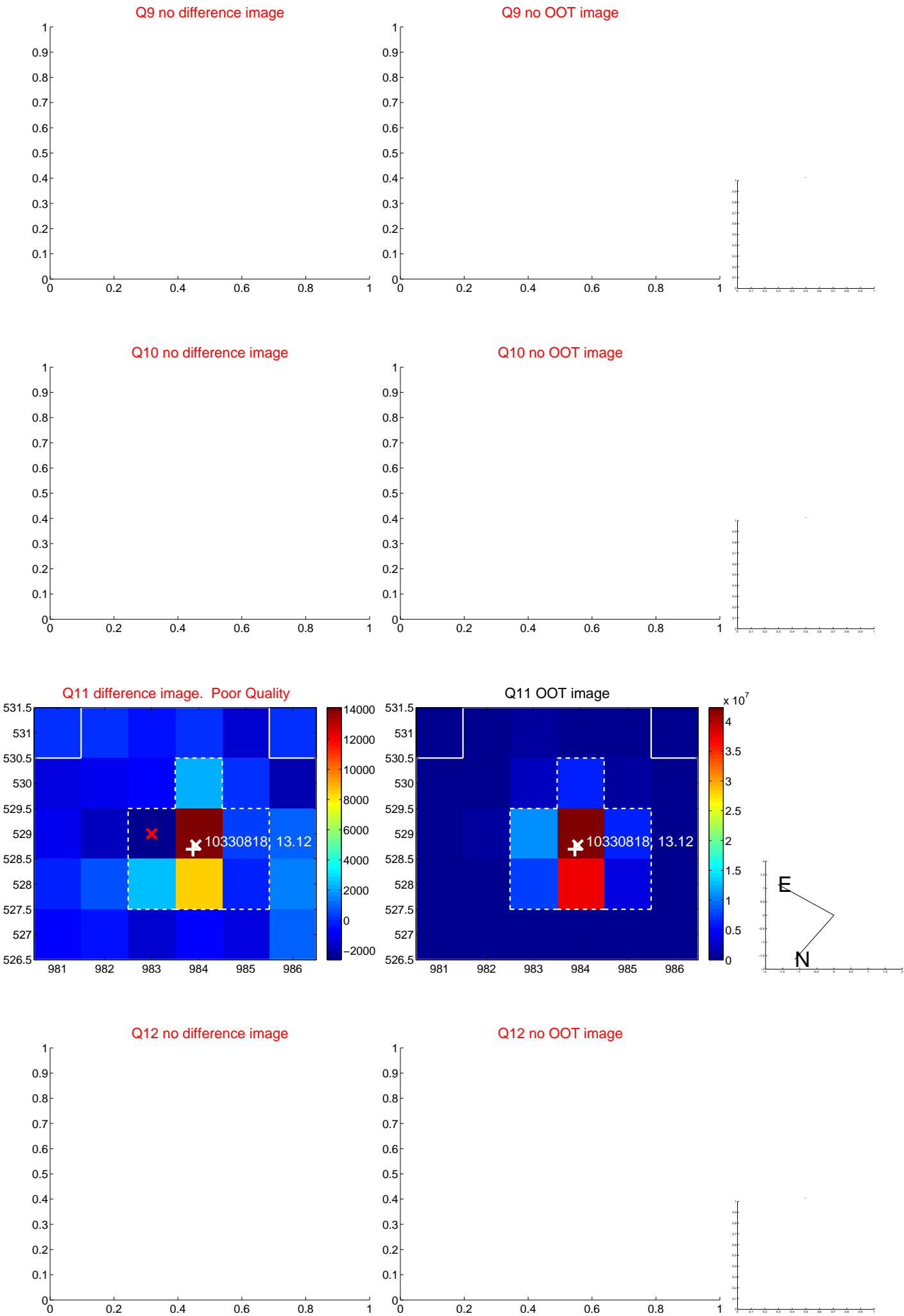
Q8 no difference image



Q8 no OOT image



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



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

Q13 no difference image



Q13 no OOT image



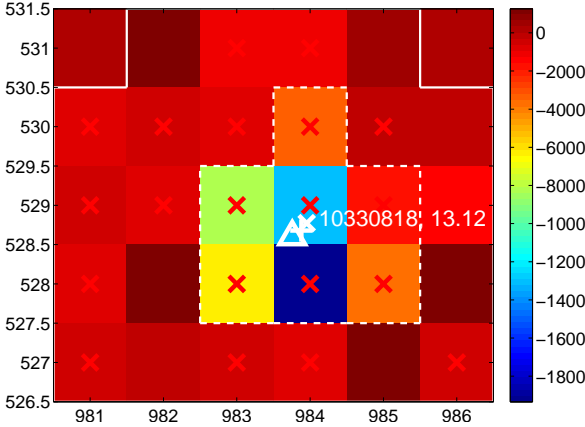
Q14 no difference image



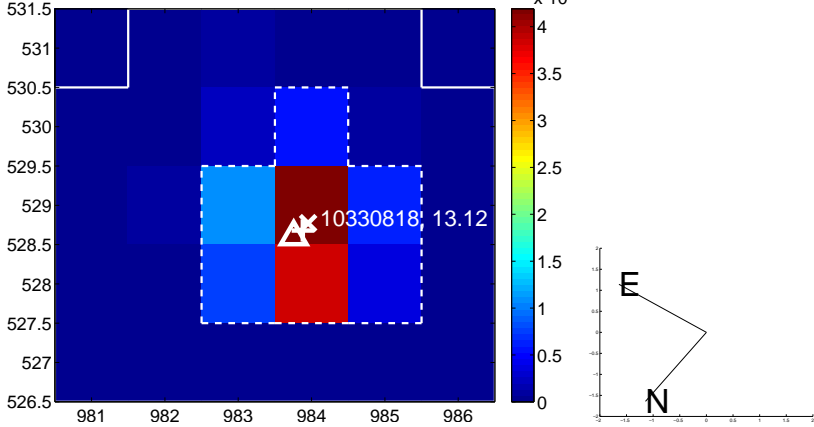
Q14 no OOT image



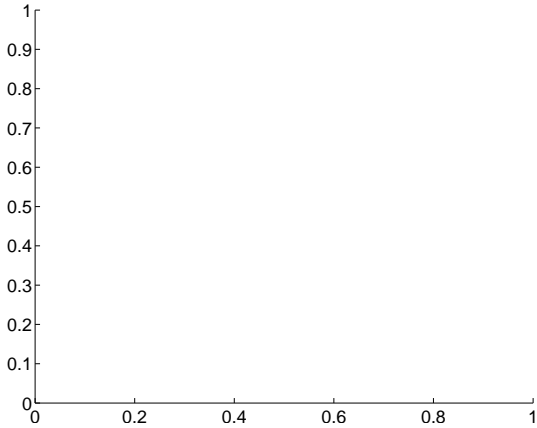
Q15 difference image. Poor Quality



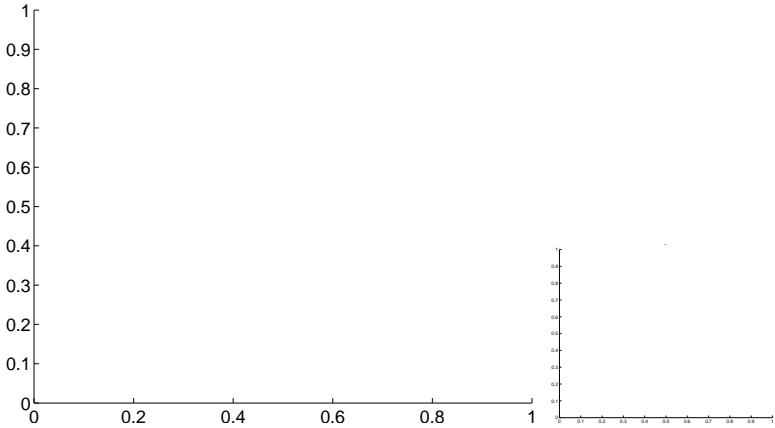
Q15 OOT image



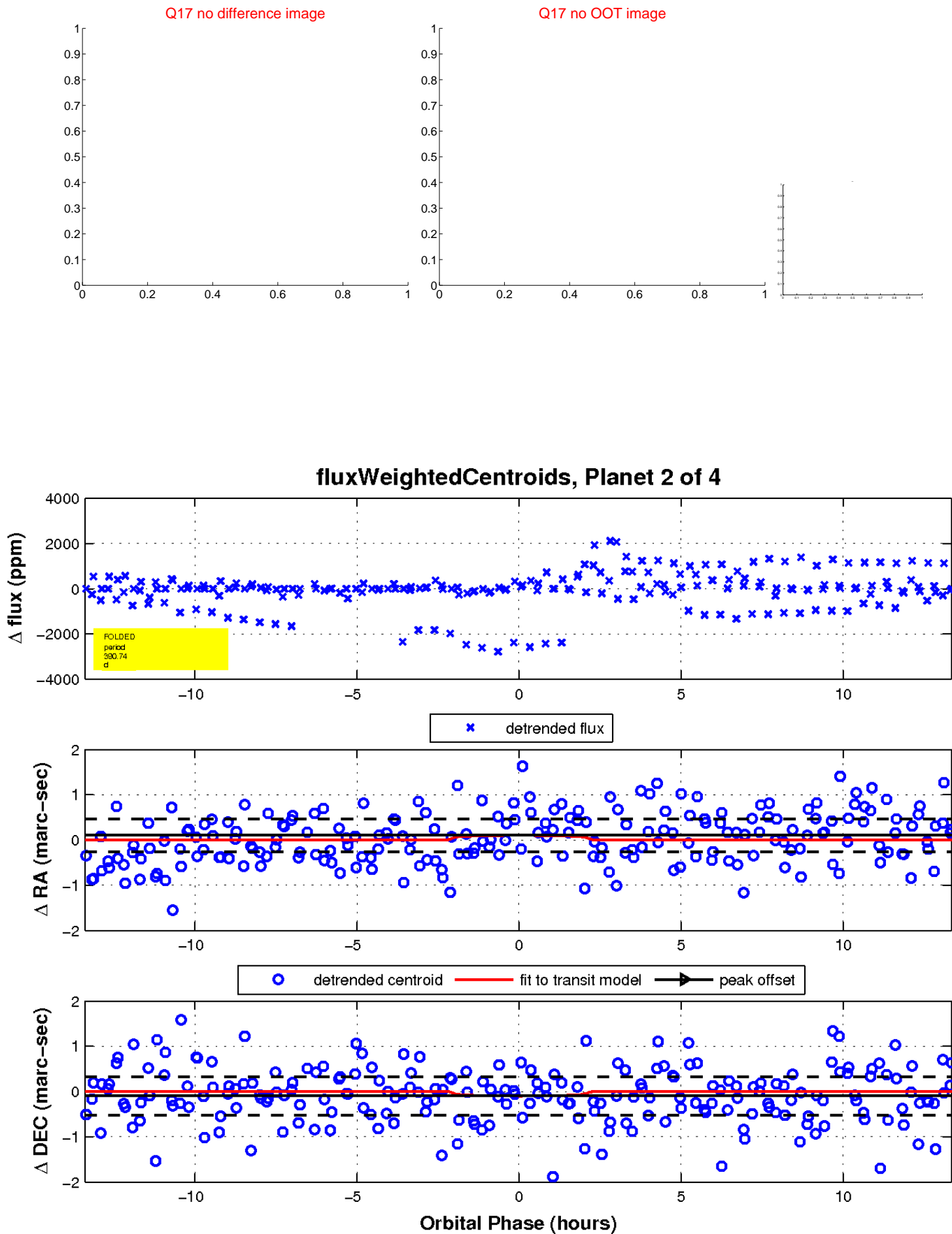
Q16 no difference image



Q16 no OOT image

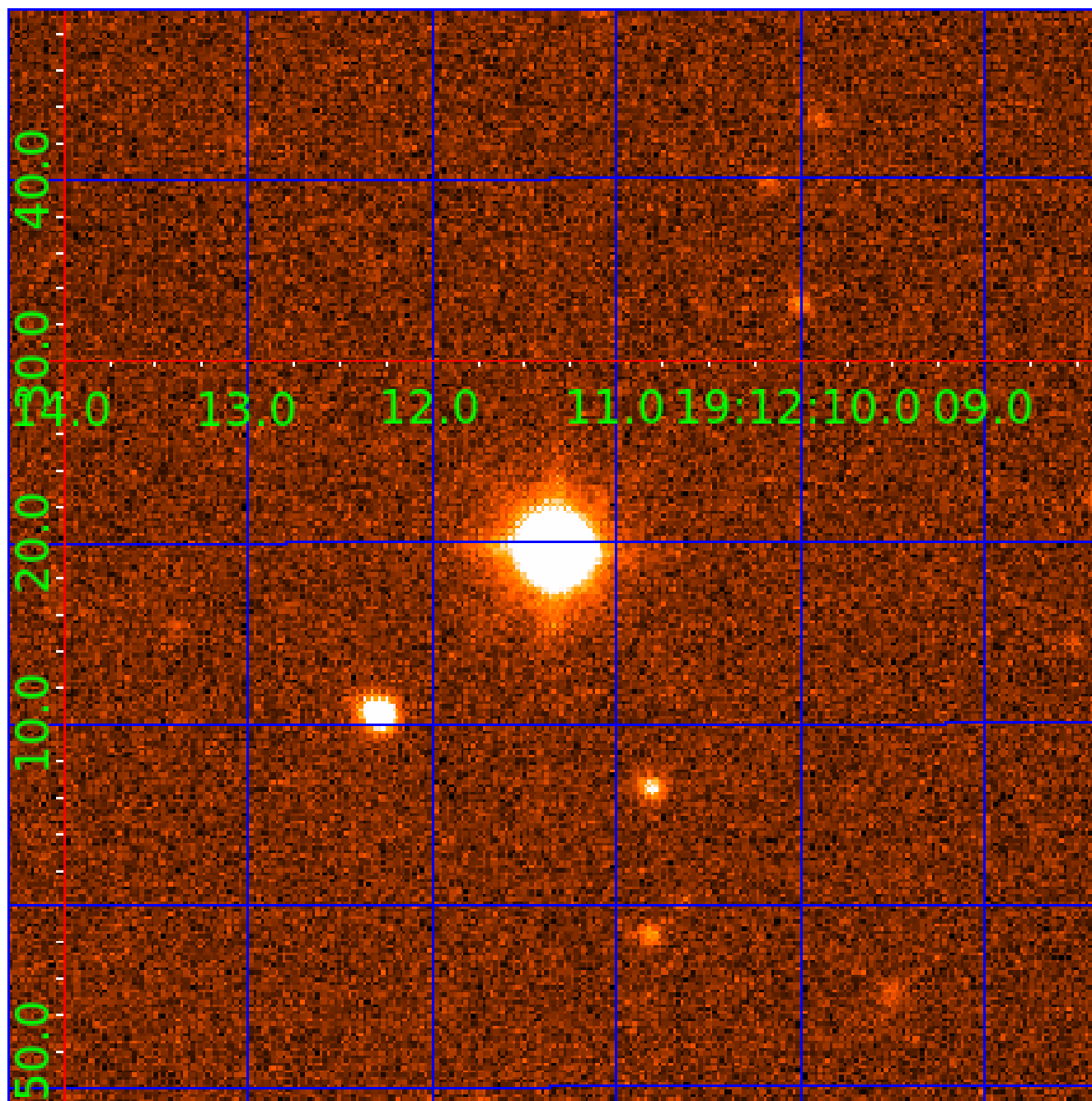


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010330818

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})
010330818-01	OBS	No	539.582904	499.266470	601.2	4.197	14.6	6.8	0.53	4441	1.34	0.09
010330818-02	OBS	No	390.740224	234.906464	611.2	4.496	16.6	8.1	0.53	4441	1.45	0.14
010330818-03	OBS	No	338.175007	146.363128	638.9	2.973	12.5	10.3	0.53	4441	1.50	0.17
010330818-04	OBS	No	685.601189	200.901538	626.1	5.943	10.5	6.0	0.53	4441	1.42	0.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010330818-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

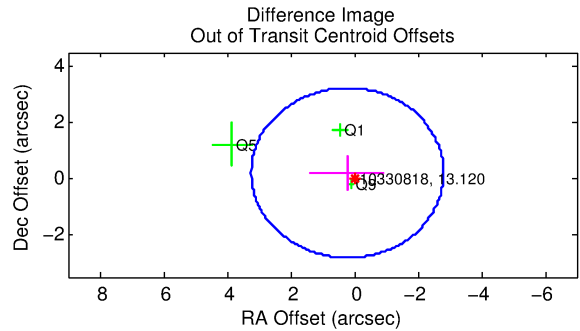
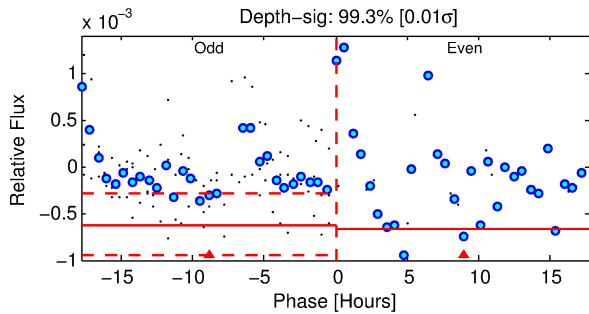
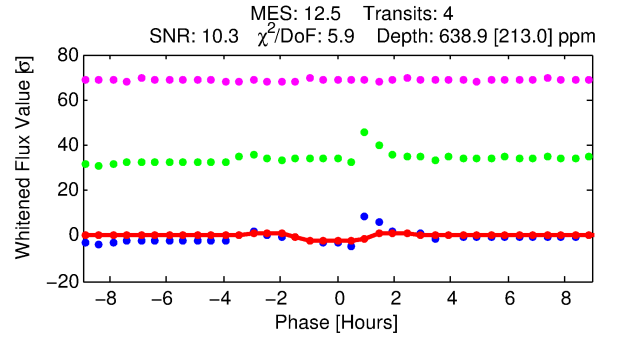
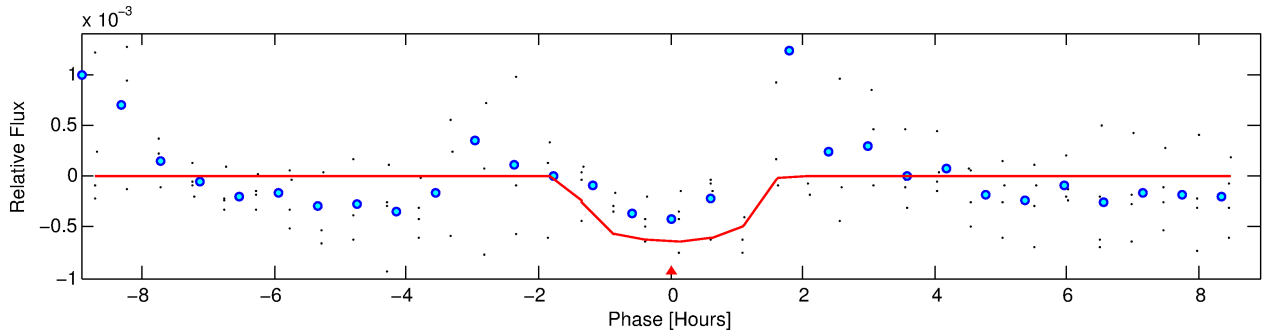
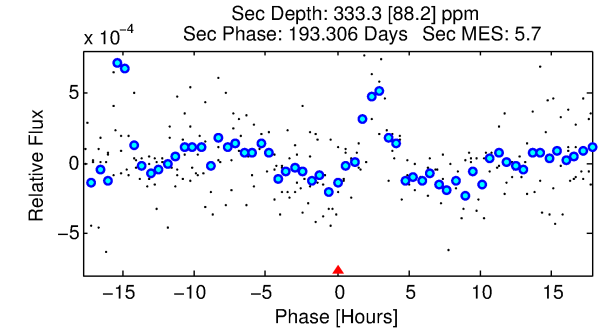
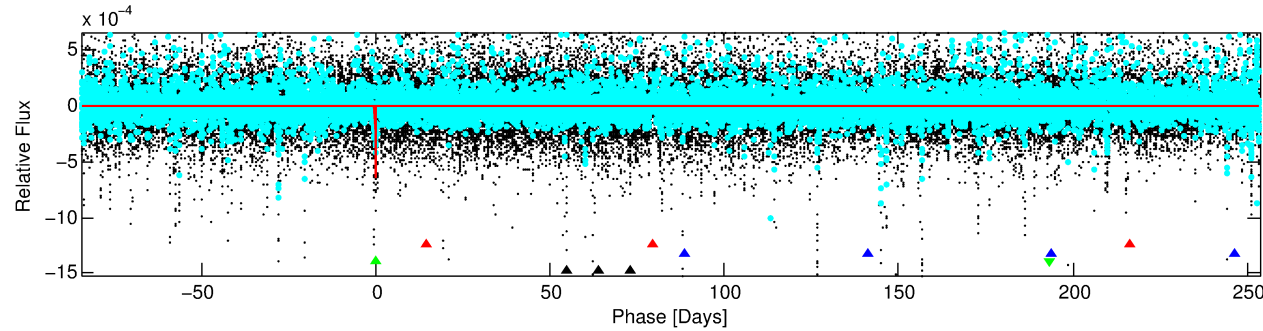
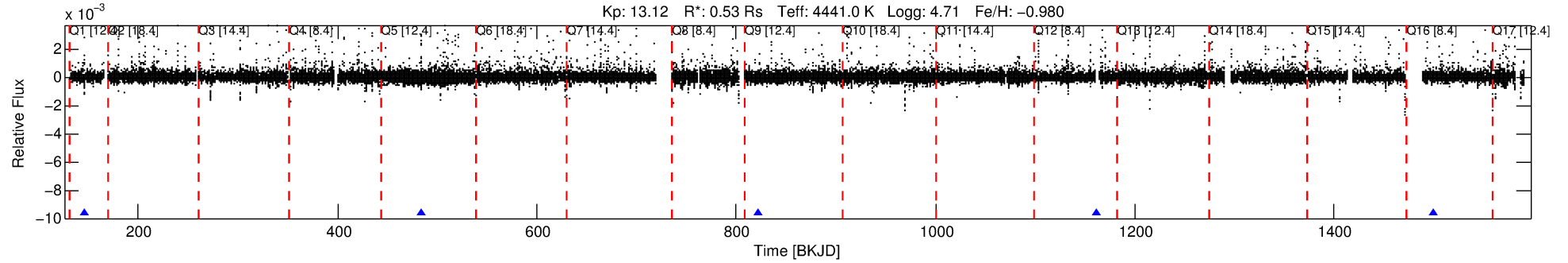
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010330818-03

No Significant Match Found

DV One-Page Summary

KIC: 10330818 Candidate: 3 of 4 Period: 338.175 d



DV Fit Results:

Period = 338.17501 [0.00594] d
Epoch = 146.3631 [0.0144] BKJD
Rp/R* = 0.0260 [0.0535]
a/R* = 550.06 [4333.67]
b = 0.81 [3.49]
Seff = 0.17 [0.03]
Teq = 163 [7] K
Rp = 1.50 [3.10] Re
a = 0.7667 [0.0560] AU
Ag = 47656.93 [196506.89] [0.24σ]
Teffp = 3721 [3836] K [0.93σ]

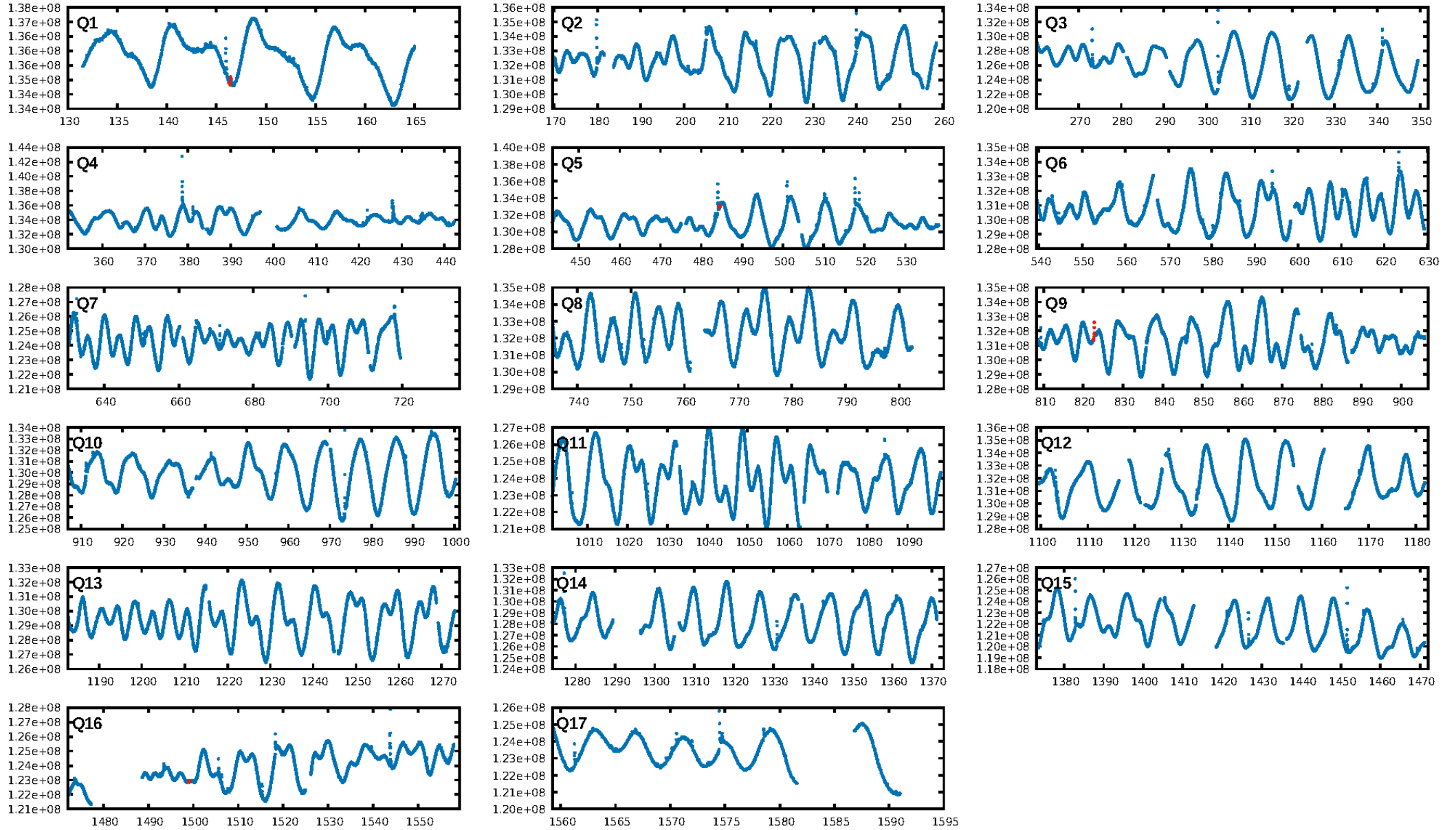
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [234.07σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 4.55e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.333
Centroid-sig: 24.8%
Centroid-so: 0.387 arcsec [0.66σ]
OotOffset-rm: 0.297 arcsec [0.29σ]
KicOffset-rm: 0.635 arcsec [0.90σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

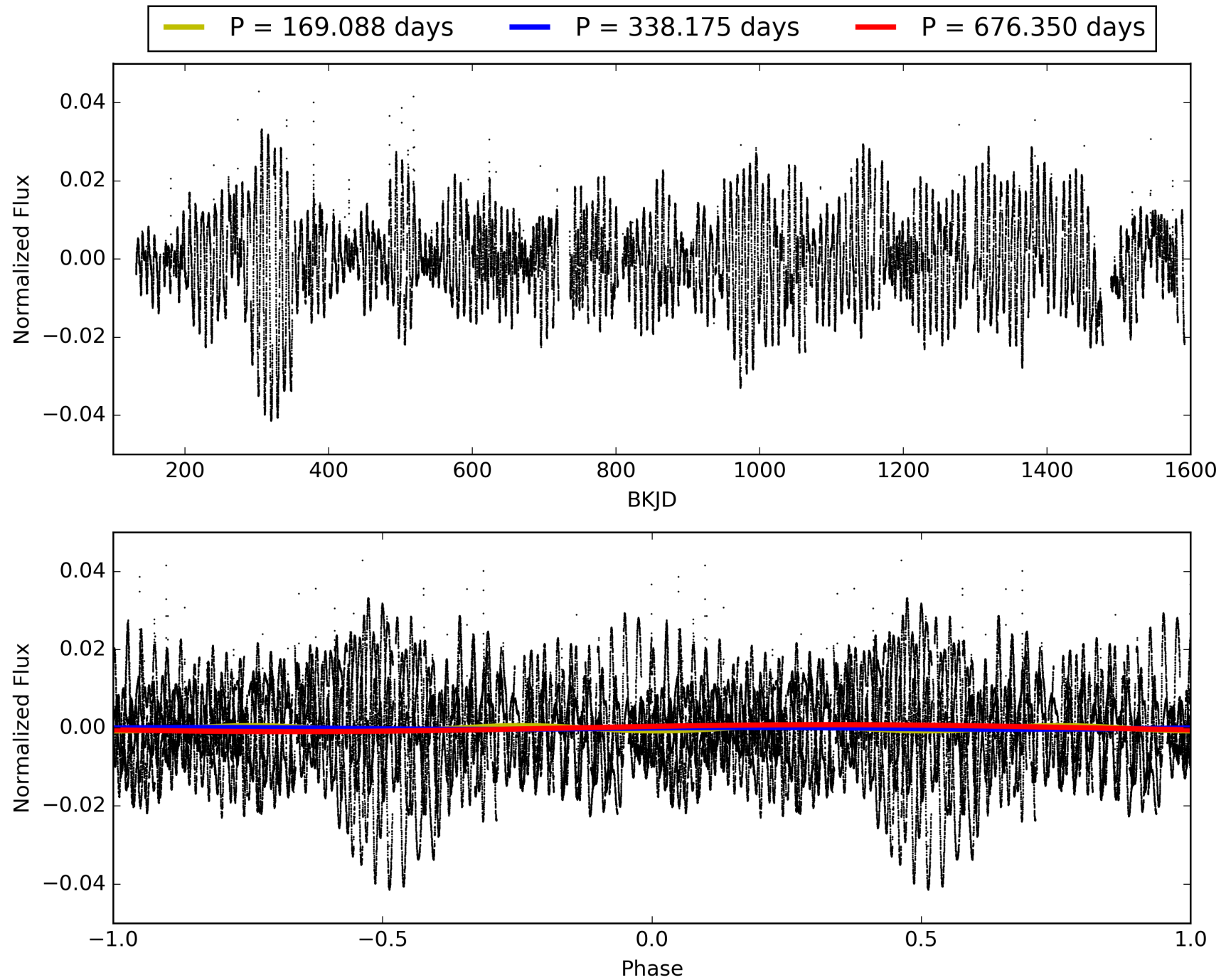
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:01:32 Z

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

TCE 010330818-03, PDC Light Curves

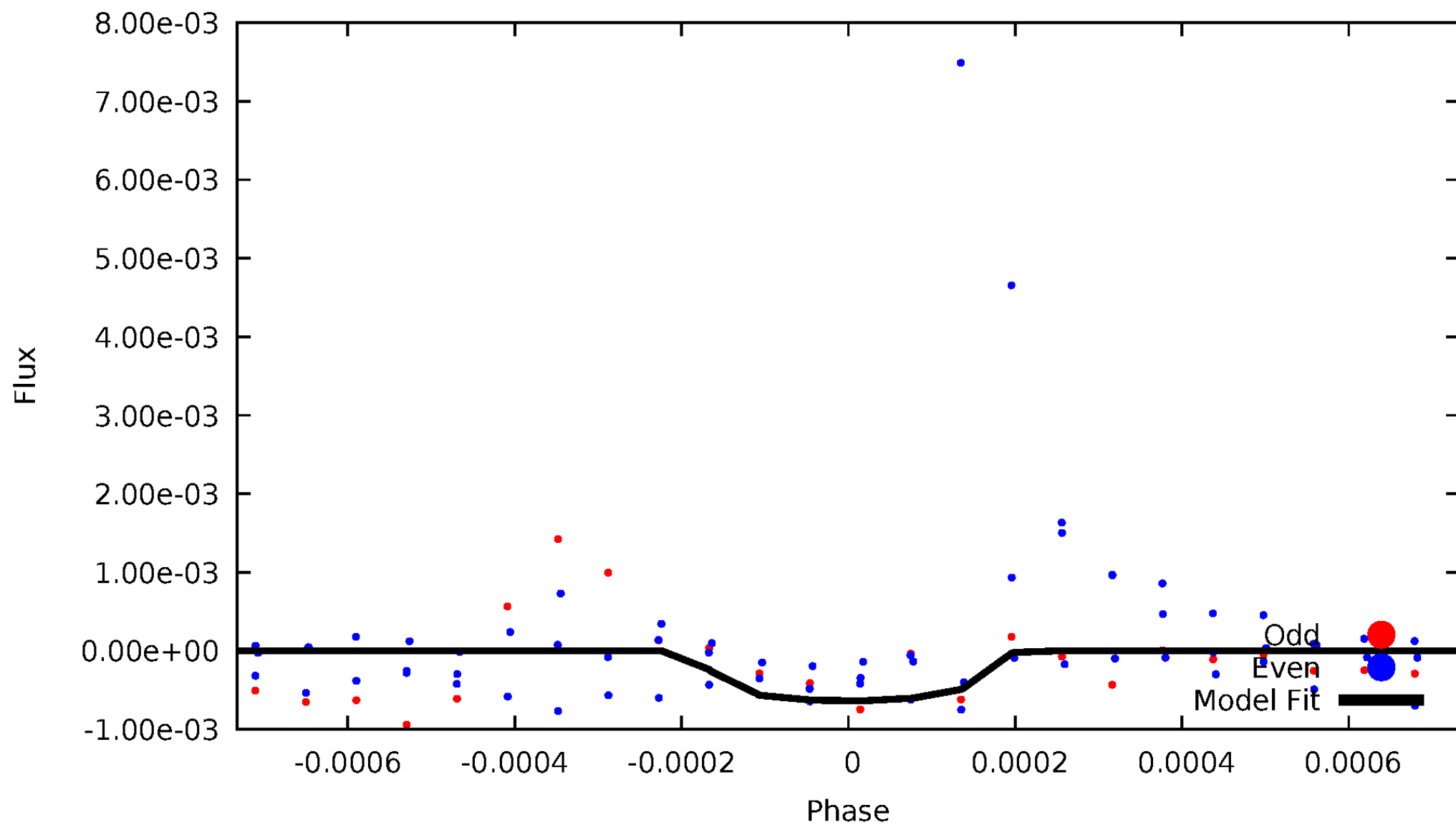


TCE 010330818-03



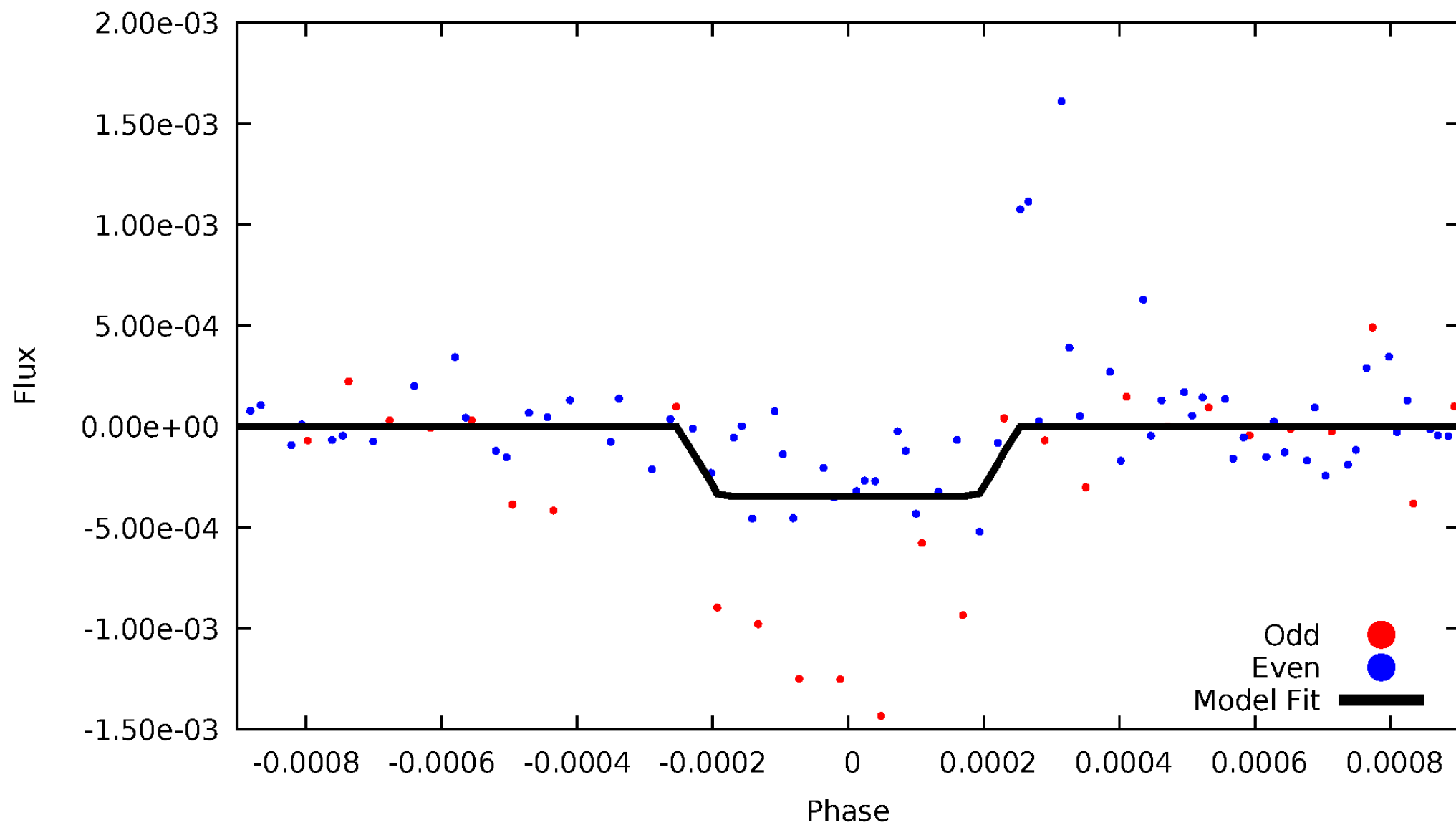
DV Odd/Even

TCE 010330818-03



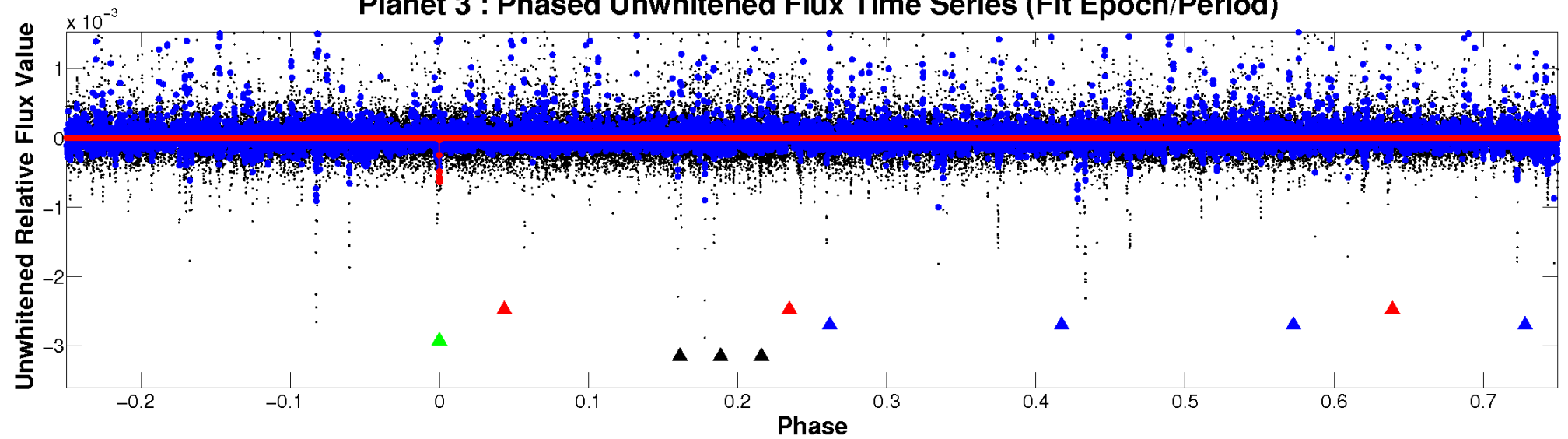
ALT Odd/Even

TCE 010330818-03

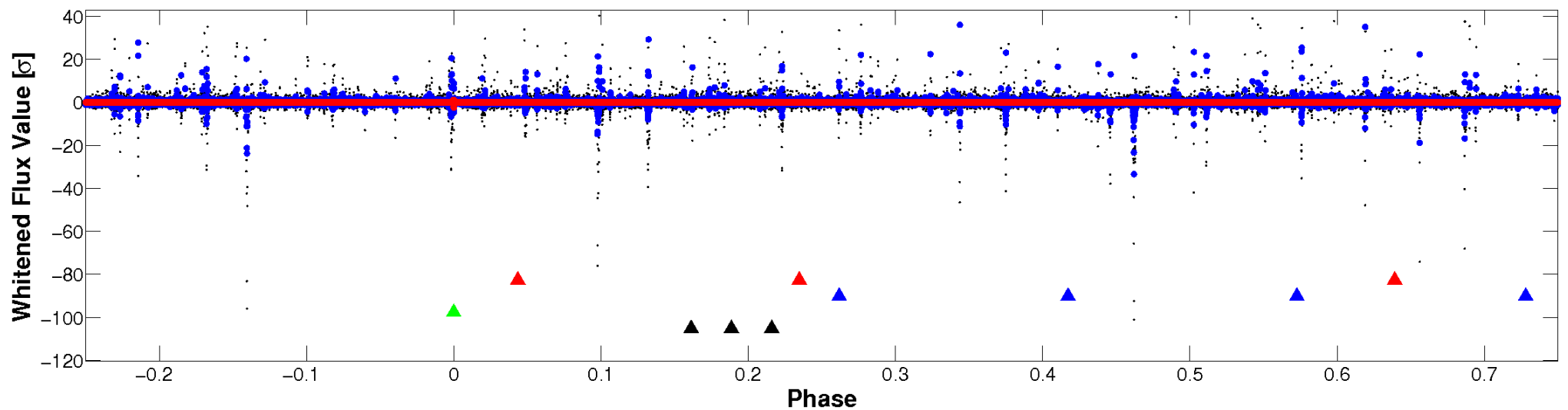


Non-Whitened Vs. Whitened Light Curve

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

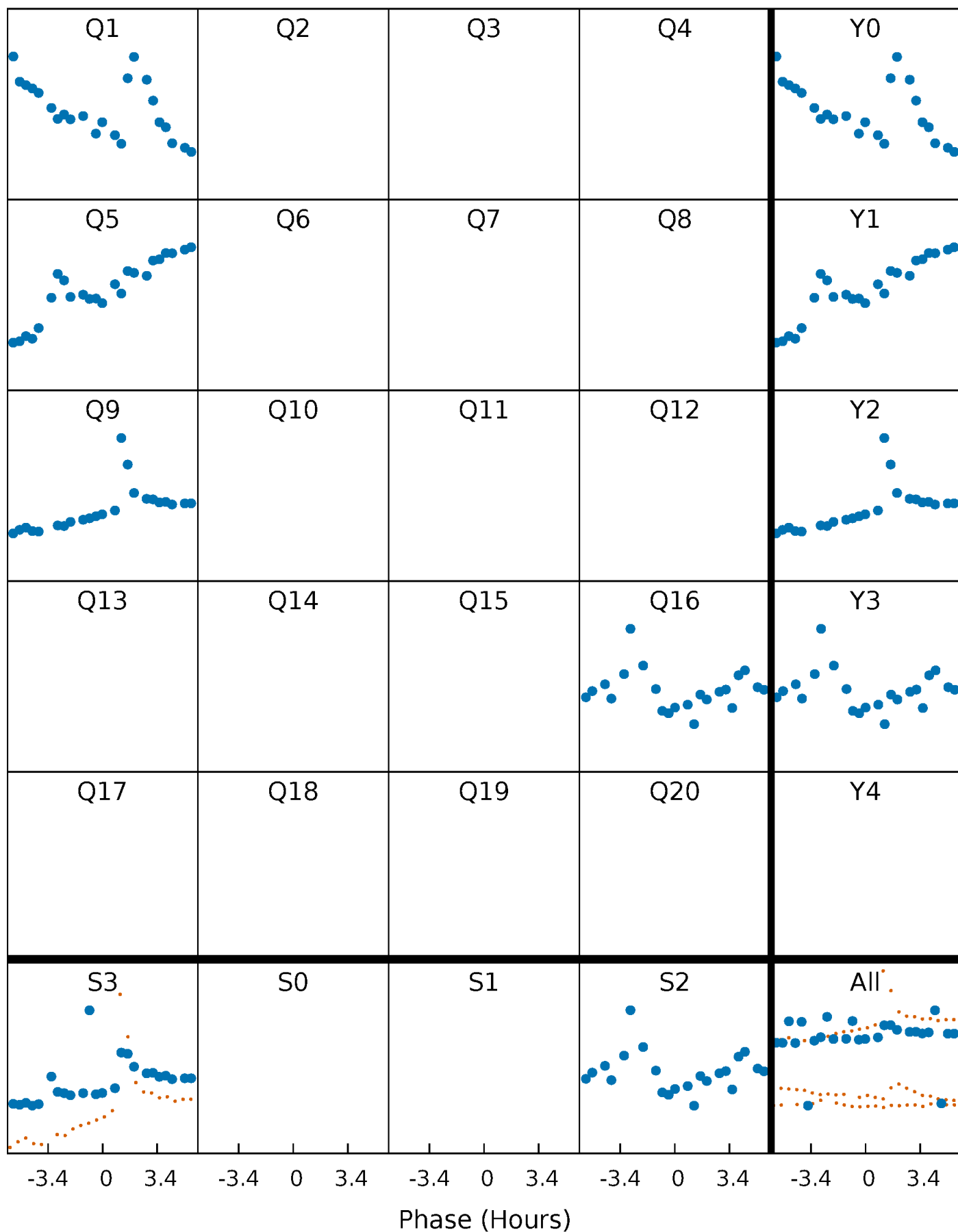


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



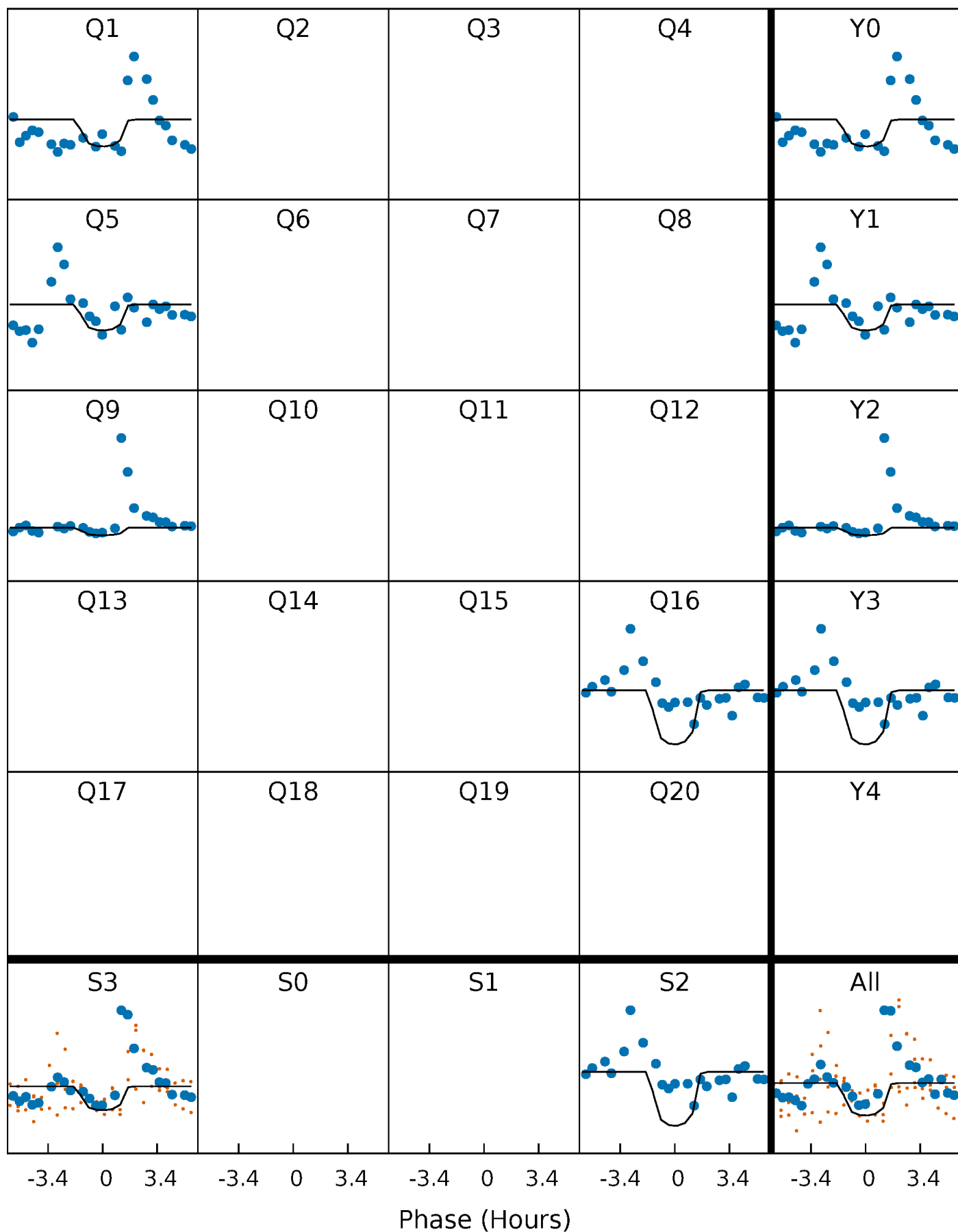
PDC Quarter-Phased Transit Curves

TCE 010330818-03 P=338.175007 Days $T_0=146.363128$ (BKJD)



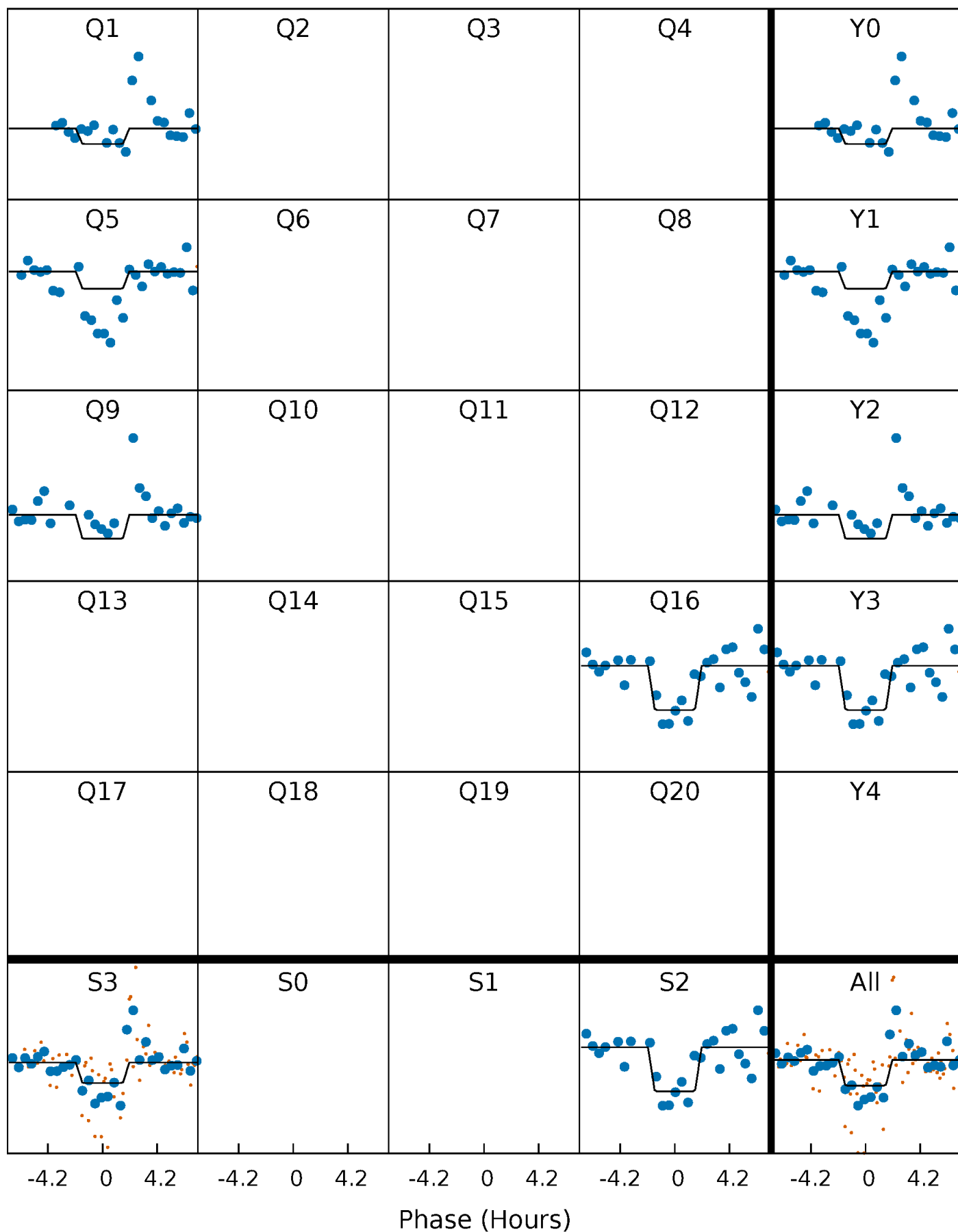
DV Quarter-Phased Transit Curves

TCE 010330818-03 P=338.175007 Days $T_0=146.363128$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

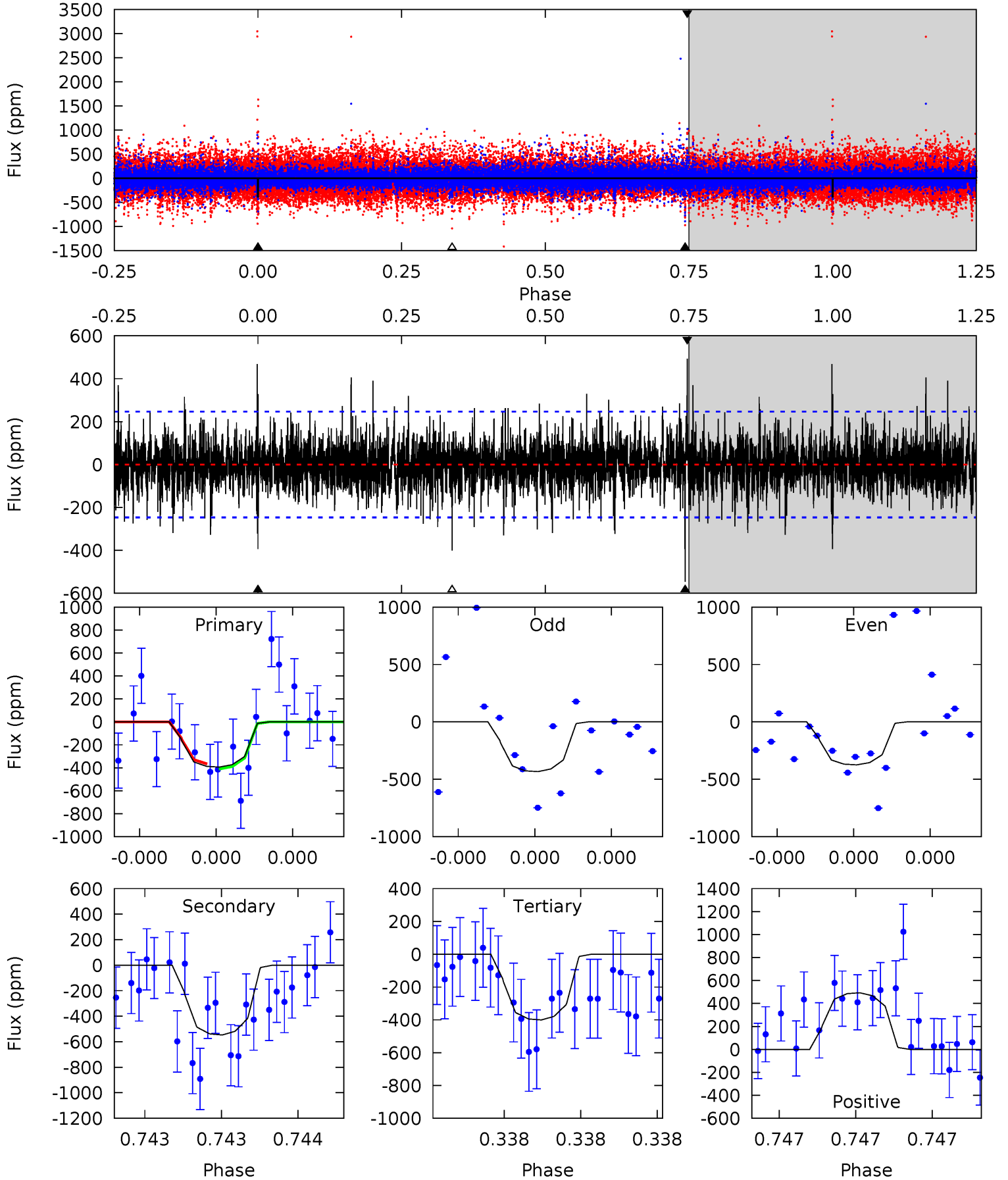
TCE 010330818-03 P=338.183180 Days $T_0=146.343469$ (BKJD)



DV Model-Shift Uniqueness Test

010330818-03, P = 338.175007 Days, E = 146.363128 Days

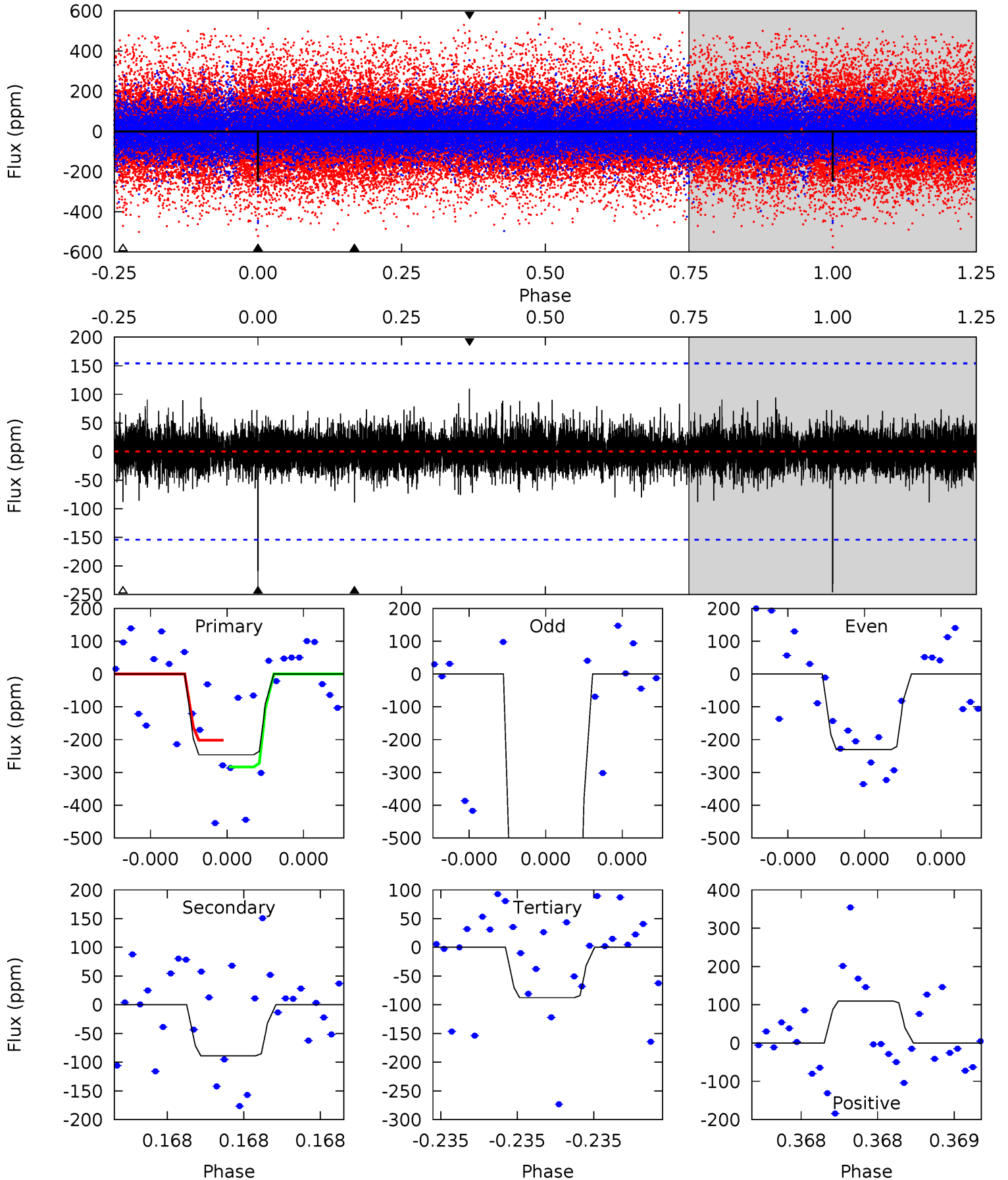
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.98	12.5	9.14	11.2	5.63	3.56	1.76	-0.16	-2.27	3.34	1.23	0.52	0.14	0.47	0.51



Alt Model-Shift Uniqueness Test

010330818-03, P = 338.183180 Days, E = 146.343469 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.93	3.22	3.18	3.98	5.59	3.50	0.73	5.75	4.95	0.04	-0.75	14.7	1.64	0.31	0



Stellar Parameters For KIC 010330818

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4441^{+120}_{-133}	$4.710^{+0.058}_{-0.031}$	$-0.980^{+0.300}_{-0.300}$	$0.530^{+0.038}_{-0.046}$	$0.526^{+0.040}_{-0.033}$	$4.975^{+1.226}_{-0.599}$
	+3%/-3%	+1%/-1%	+31%/-31%	+7%/-9%	+8%/-6%	+25%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010330818-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-547 ± 44	$2.86^{+2.38}_{-2.00}$	226^{+7}_{-8}	3408^{+1895}_{-566}	$22037^{+223613}_{-15594}$
Alt.	-89 ± 28	$2.50^{+2.49}_{-1.70}$	226^{+8}_{-8}	2731^{+1078}_{-437}	4532^{+38787}_{-3455}

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

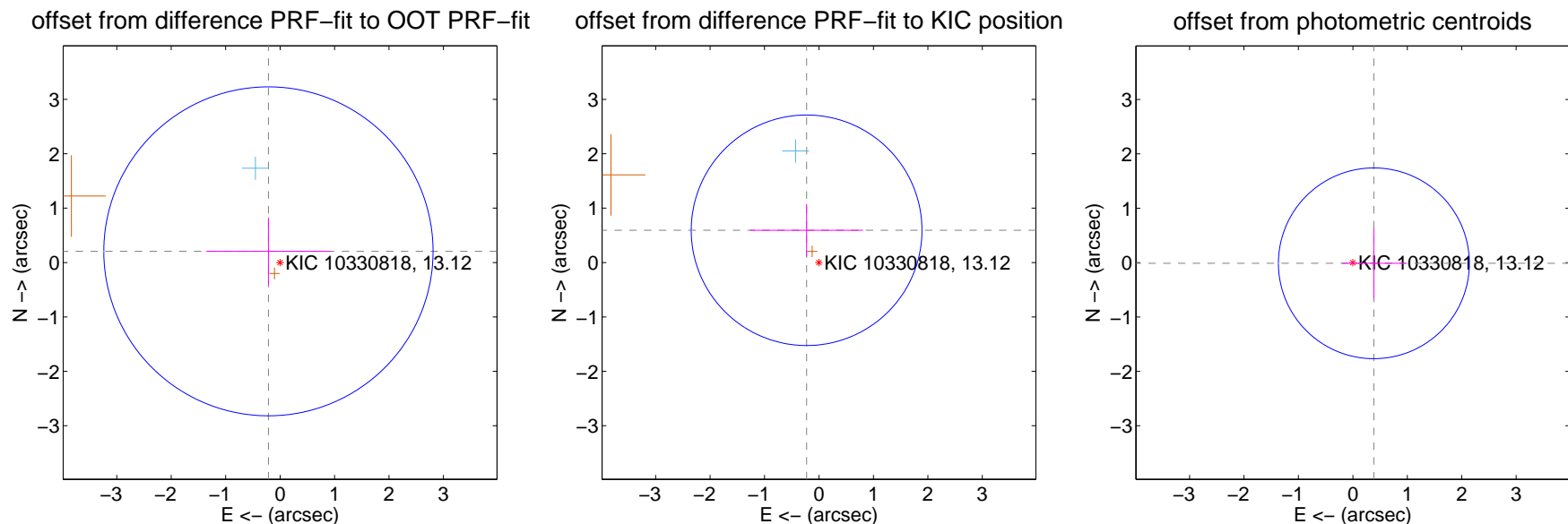
DV Centroid Data

Supplemental centroid analysis for 010330818-03. Kepler magnitude: 13.12. Transit SNR 10.32

There are 1 quarters with good PRF difference image offsets

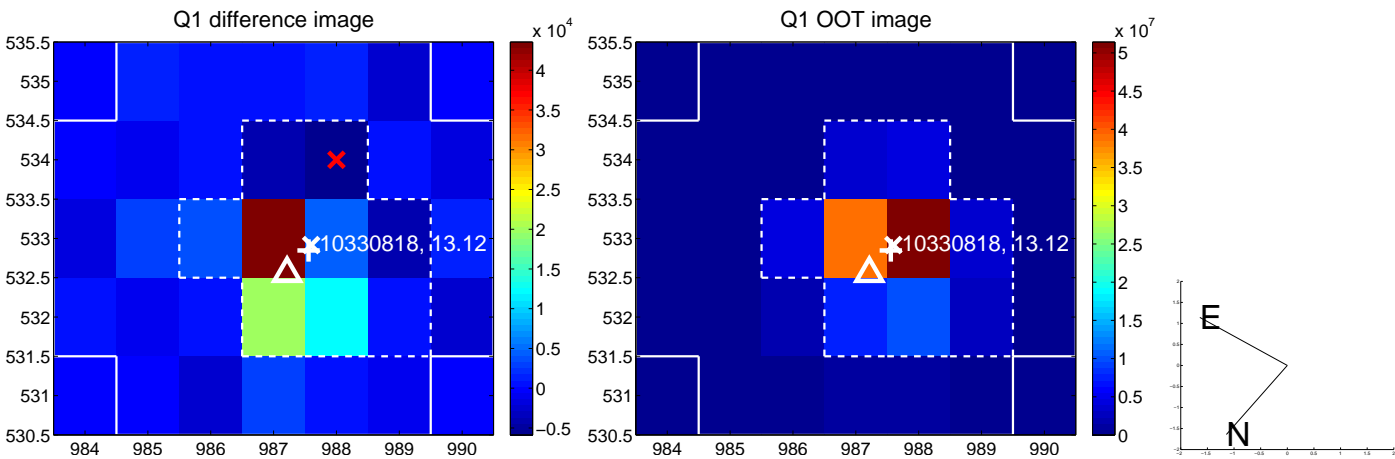
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.297 ± 1.008	0.29	0.214 ± 1.145	0.206 ± 0.616
PRF-fit source offset from KIC position	0.635 ± 0.706	0.90	0.228 ± 1.037	0.593 ± 0.482
photometric centroid source offset	0.39 ± 0.58	0.66	-0.39 ± 0.58	-0.01 ± 0.65

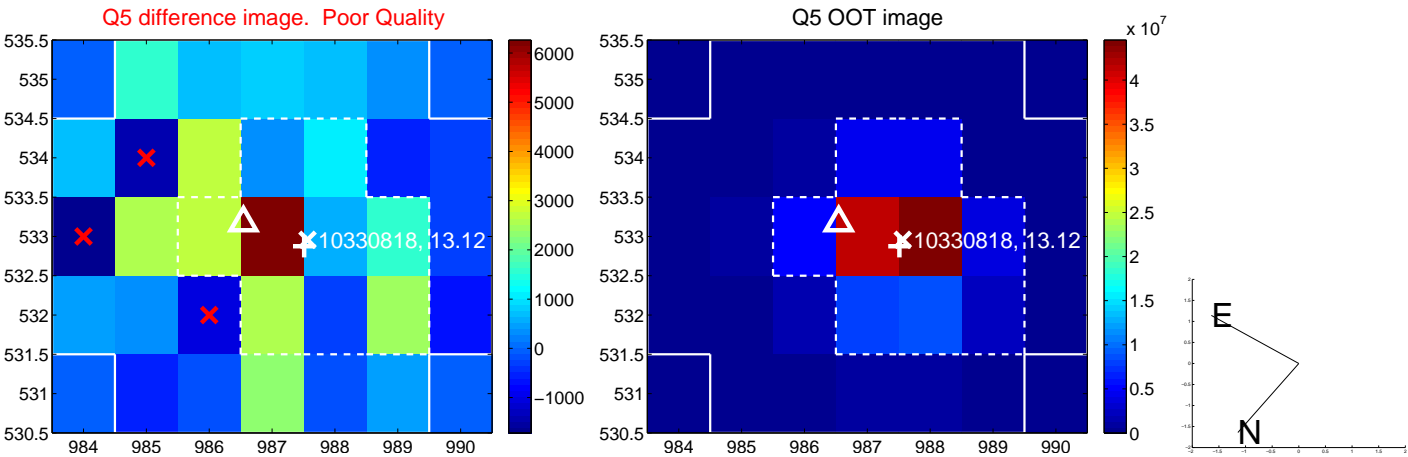


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

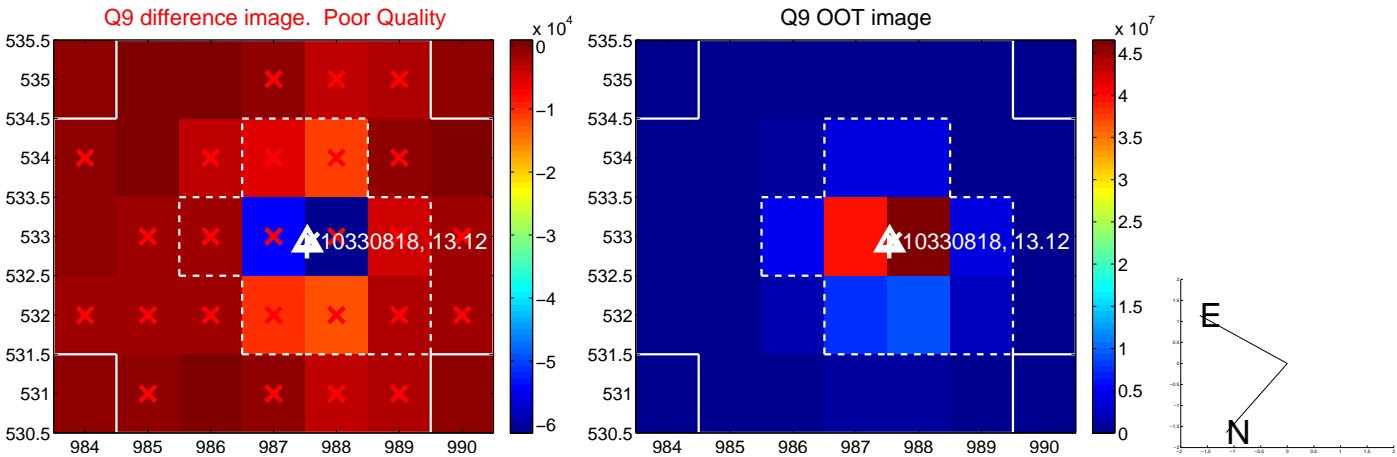
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



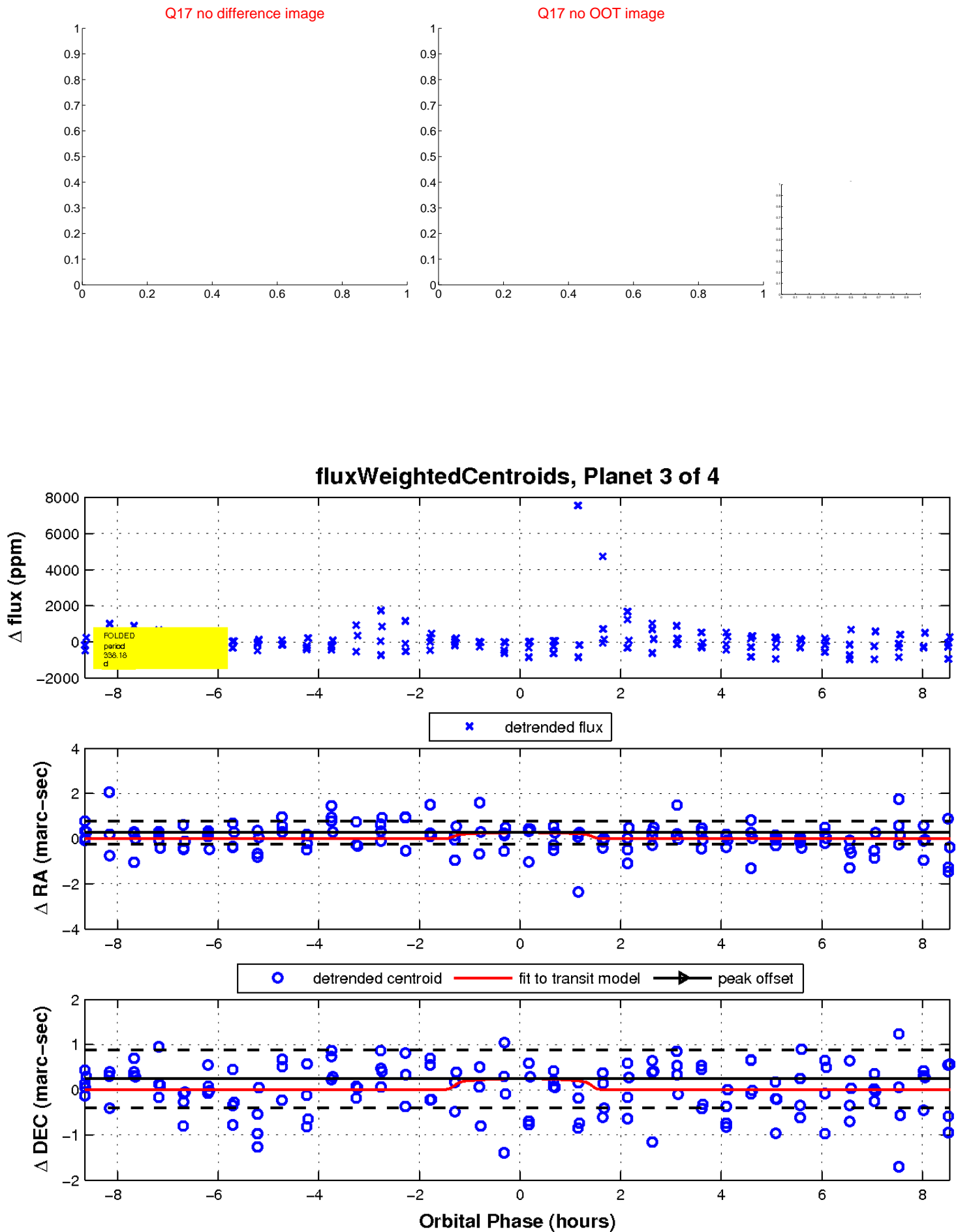
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

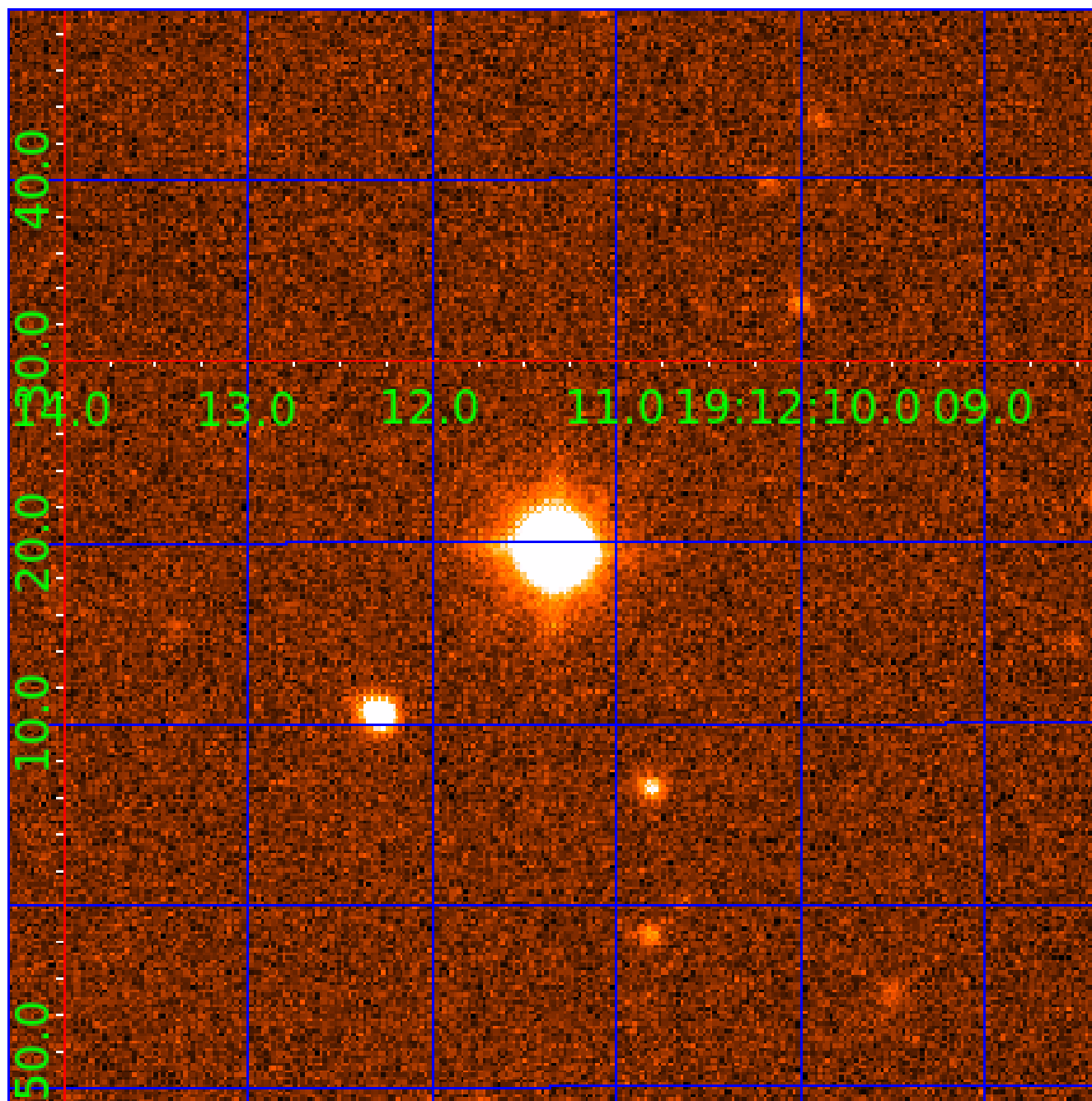


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010330818

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})
010330818-01	OBS	No	539.582904	499.266470	601.2	4.197	14.6	6.8	0.53	4441	1.34	0.09
010330818-02	OBS	No	390.740224	234.906464	611.2	4.496	16.6	8.1	0.53	4441	1.45	0.14
010330818-03	OBS	No	338.175007	146.363128	638.9	2.973	12.5	10.3	0.53	4441	1.50	0.17
010330818-04	OBS	No	685.601189	200.901538	626.1	5.943	10.5	6.0	0.53	4441	1.42	0.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010330818-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010330818-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST

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

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

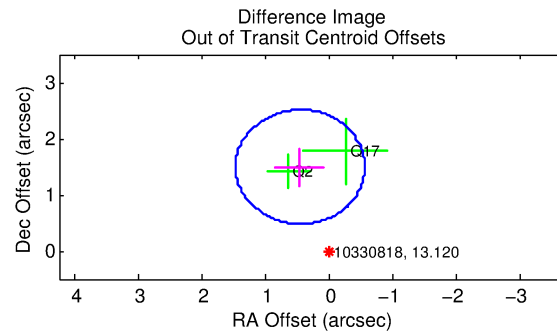
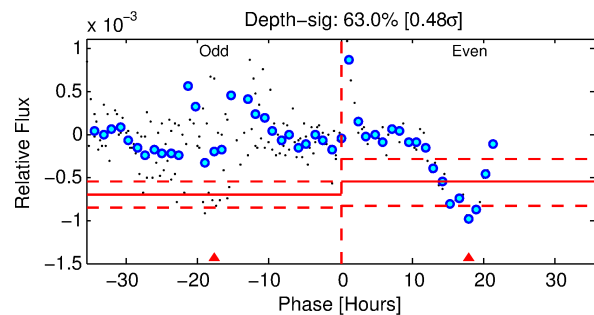
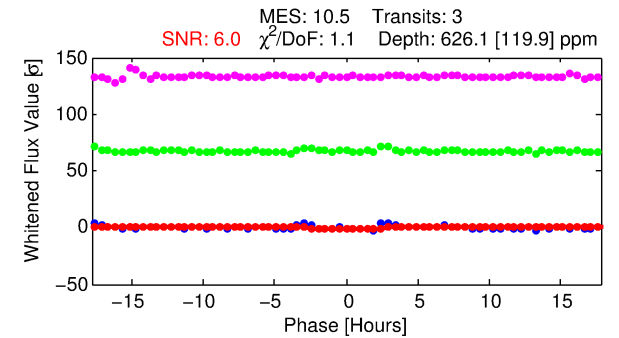
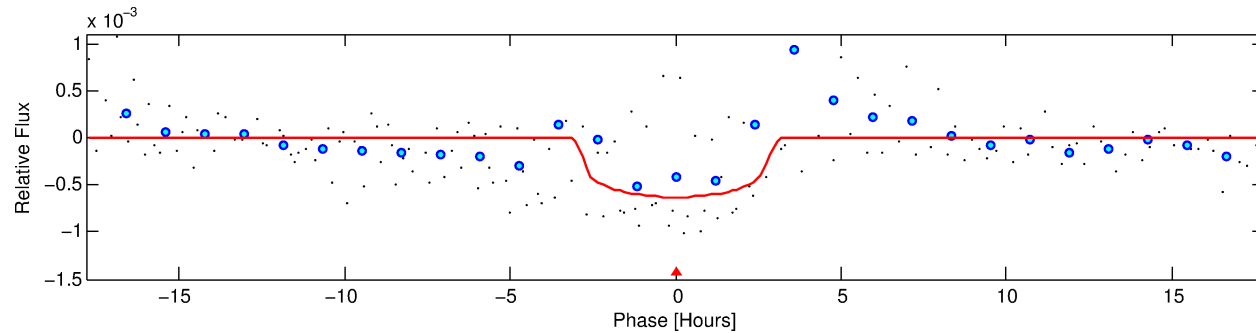
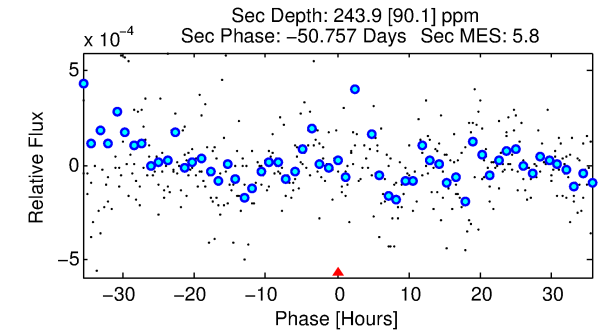
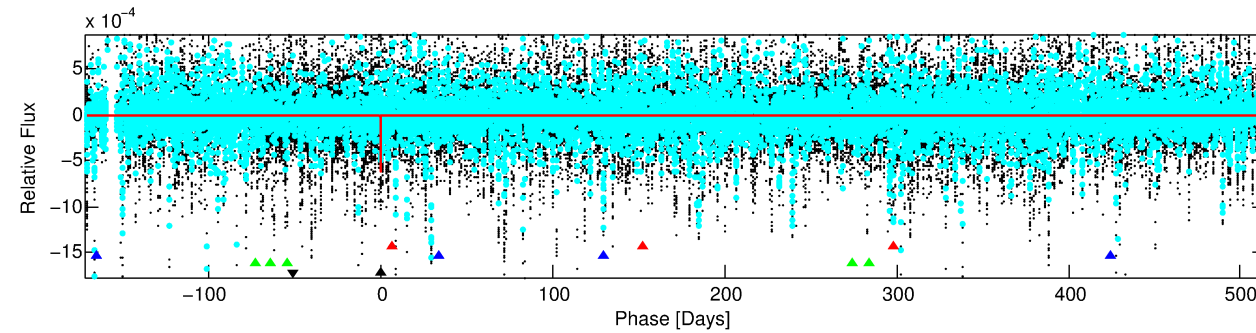
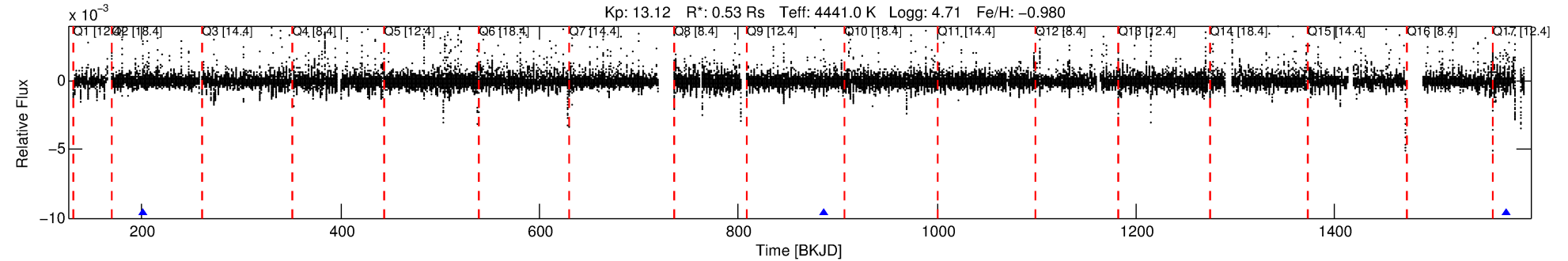
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010330818-04

No Significant Match Found

DV One-Page Summary

KIC: 10330818 Candidate: 4 of 4 Period: 685.601 d



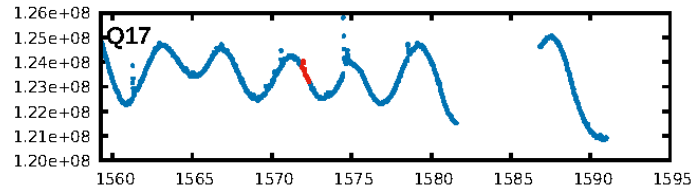
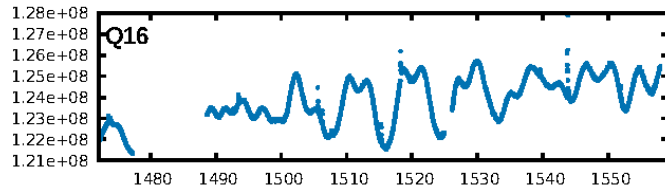
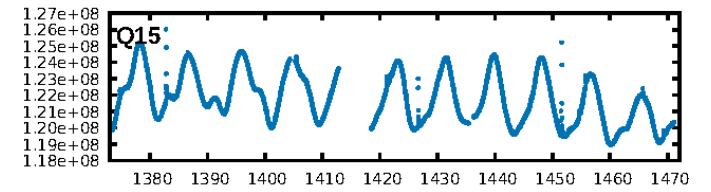
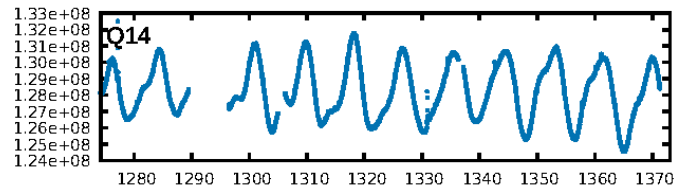
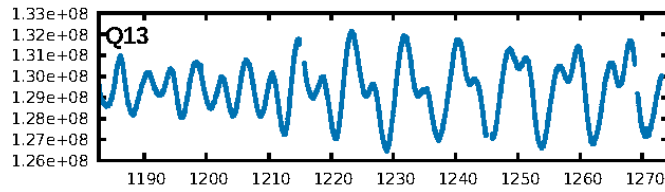
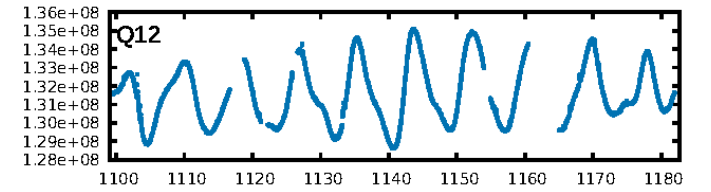
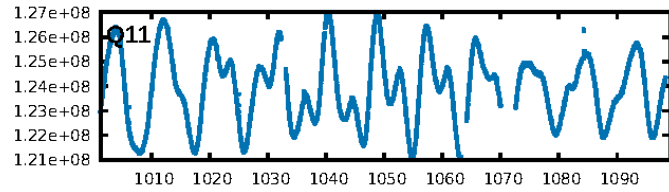
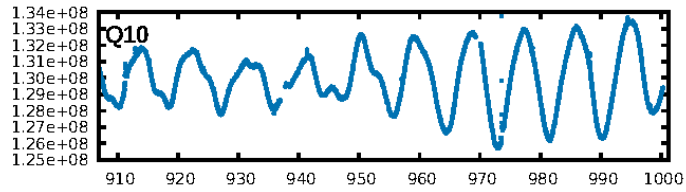
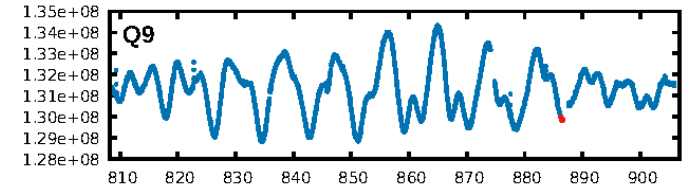
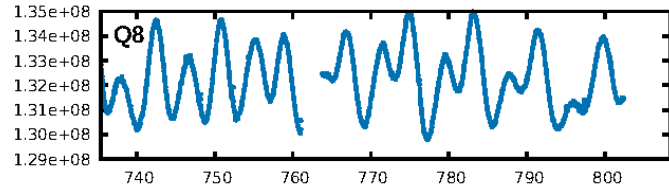
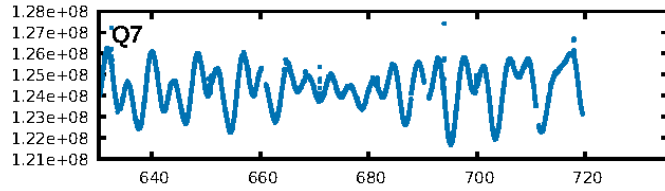
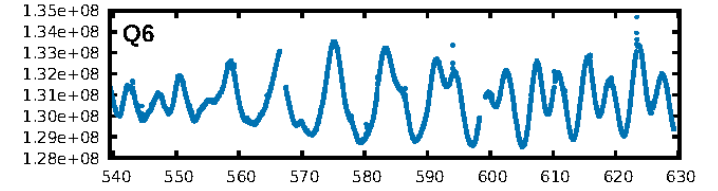
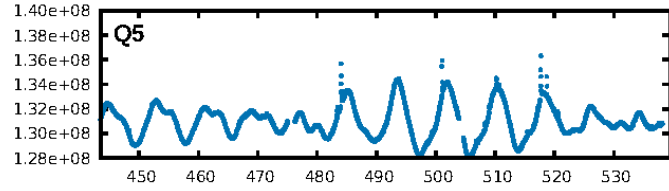
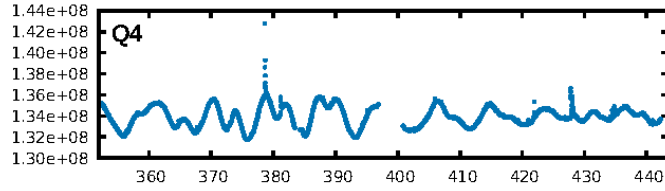
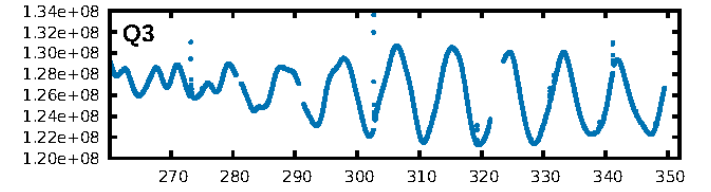
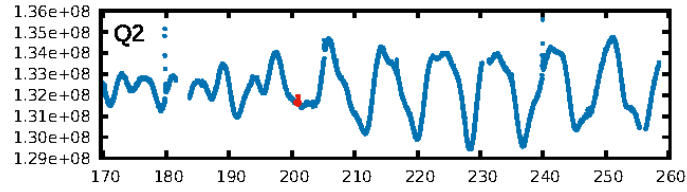
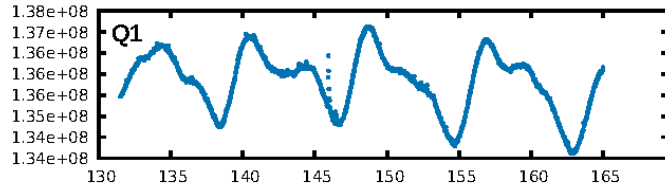
DV Fit Results:

Period = 685.60119 [0.00914] d
Epoch = 200.9015 [0.0096] BKJD
Rp/R* = 0.0246 [0.0158]
a/R* = 648.41 [1561.44]
b = 0.71 [1.68]
Seff = 0.06 [0.01]
Teq = 129 [5] K
Rp = 1.42 [0.92] Re
a = 1.2282 [0.0897] AU
Ag = 100080.48 [134362.20] [0.74σ]
Teffp = 3539 [1189] K [2.87σ]

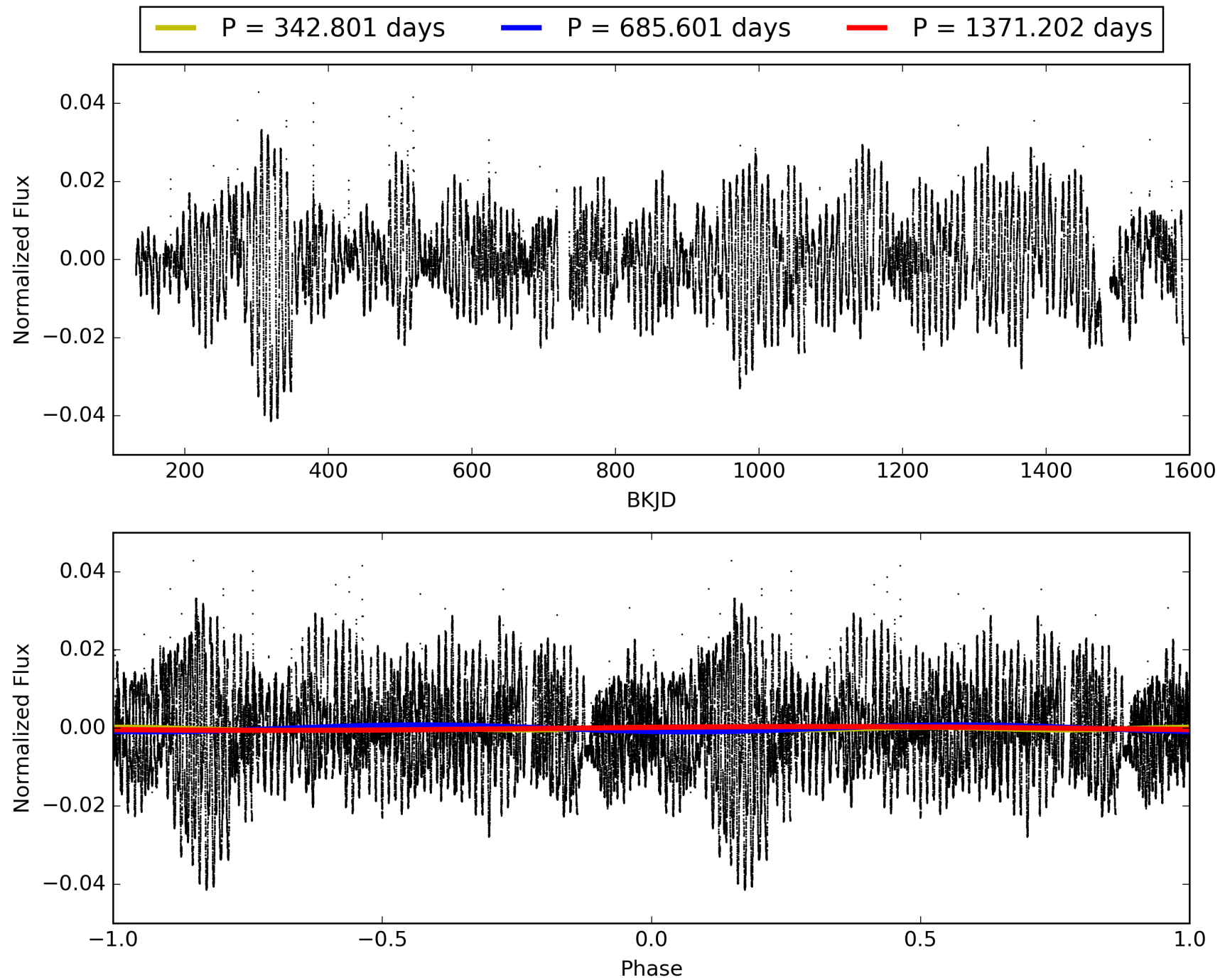
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [481.67σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 45.2%
ModelChiSquareGof-sig: 95.5%
Bootstrap-pfa: 2.89e-07
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.06771
Centroid-sig: 1.7%
Centroid-so: 0.623 arcsec [1.07σ]
OotOffset-rm: 1.565 arcsec [4.62σ]
KicOffset-rm: 1.969 arcsec [5.83σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 010330818-04, PDC Light Curves

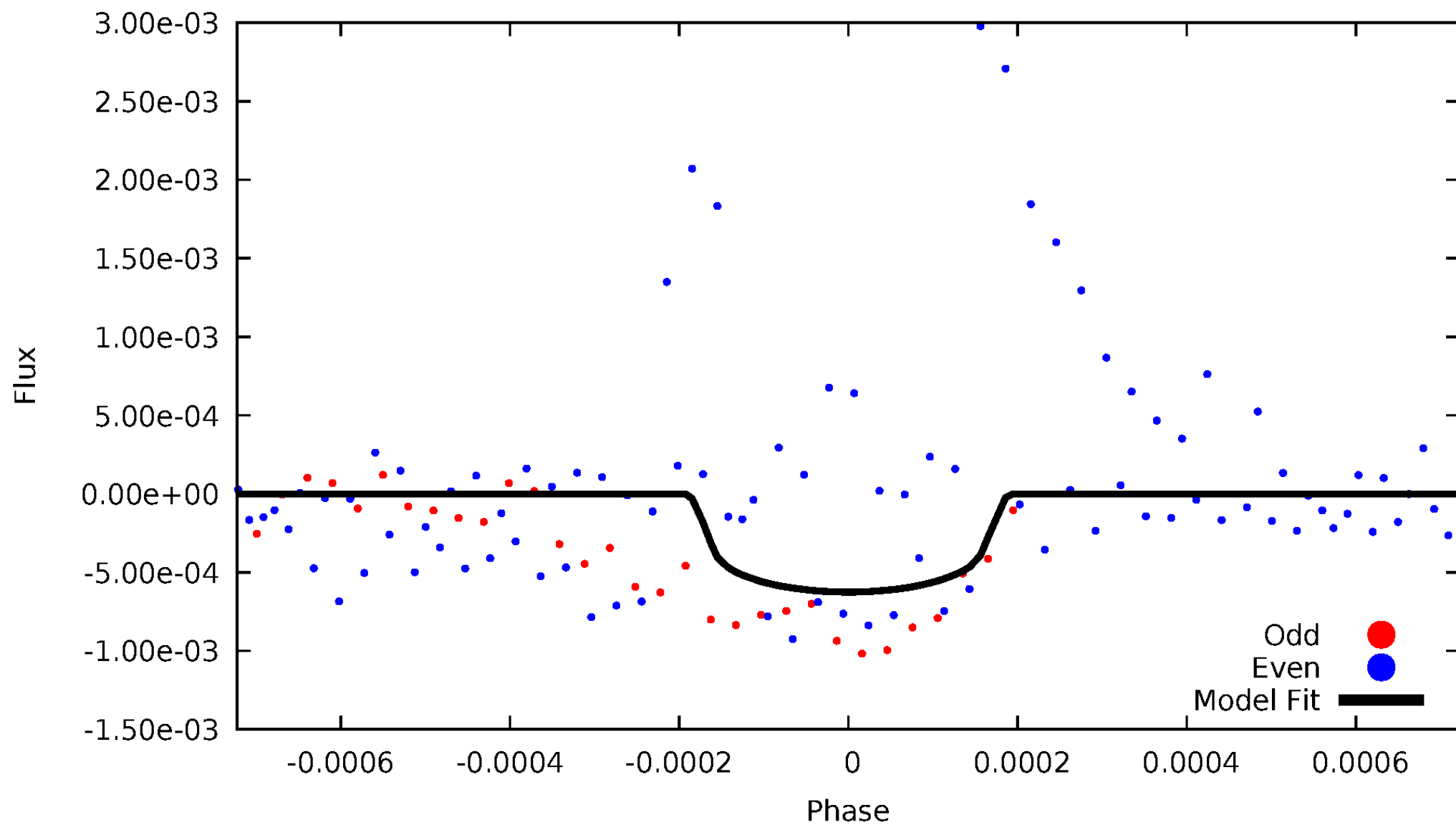


TCE 010330818-04



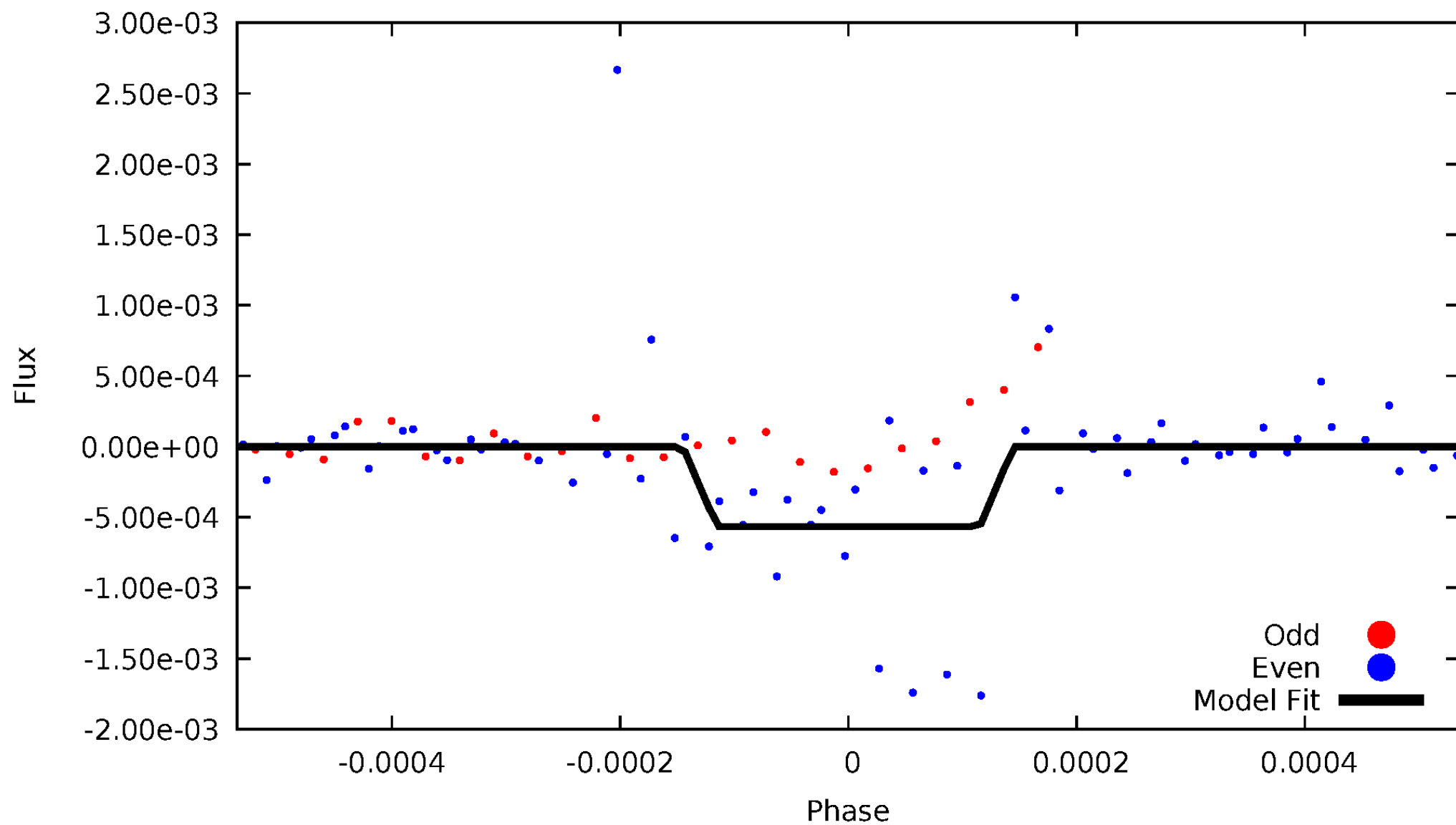
DV Odd/Even

TCE 010330818-04



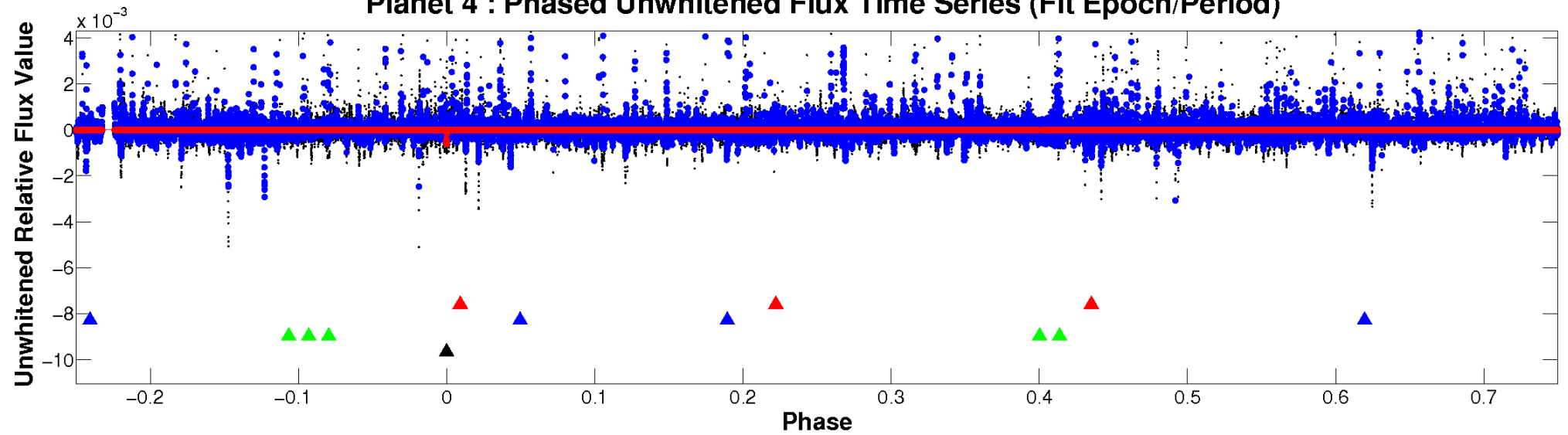
ALT Odd/Even

TCE 010330818-04

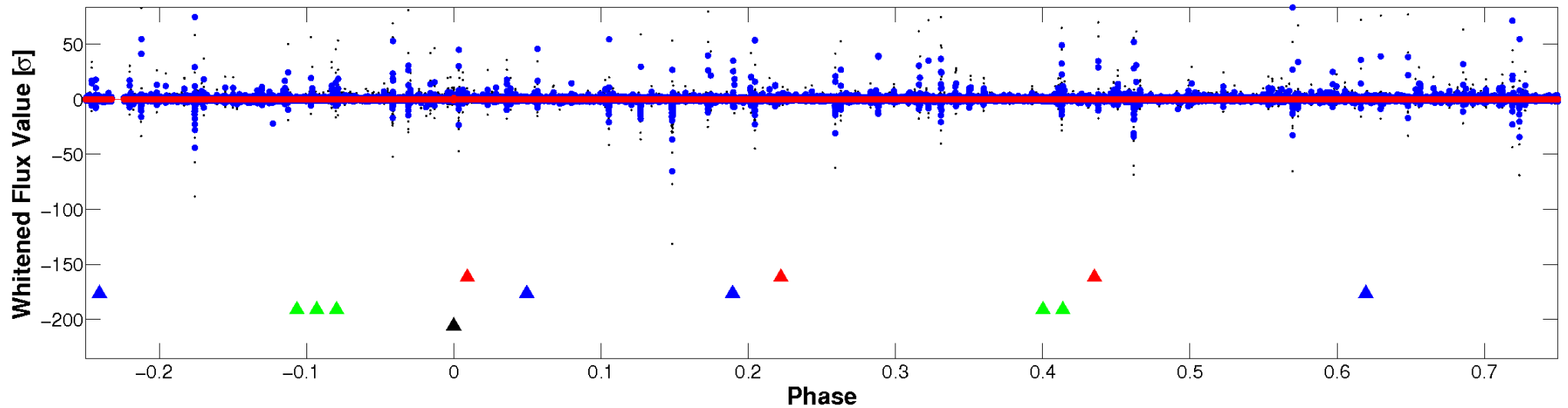


Non-Whitened Vs. Whitened Light Curve

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

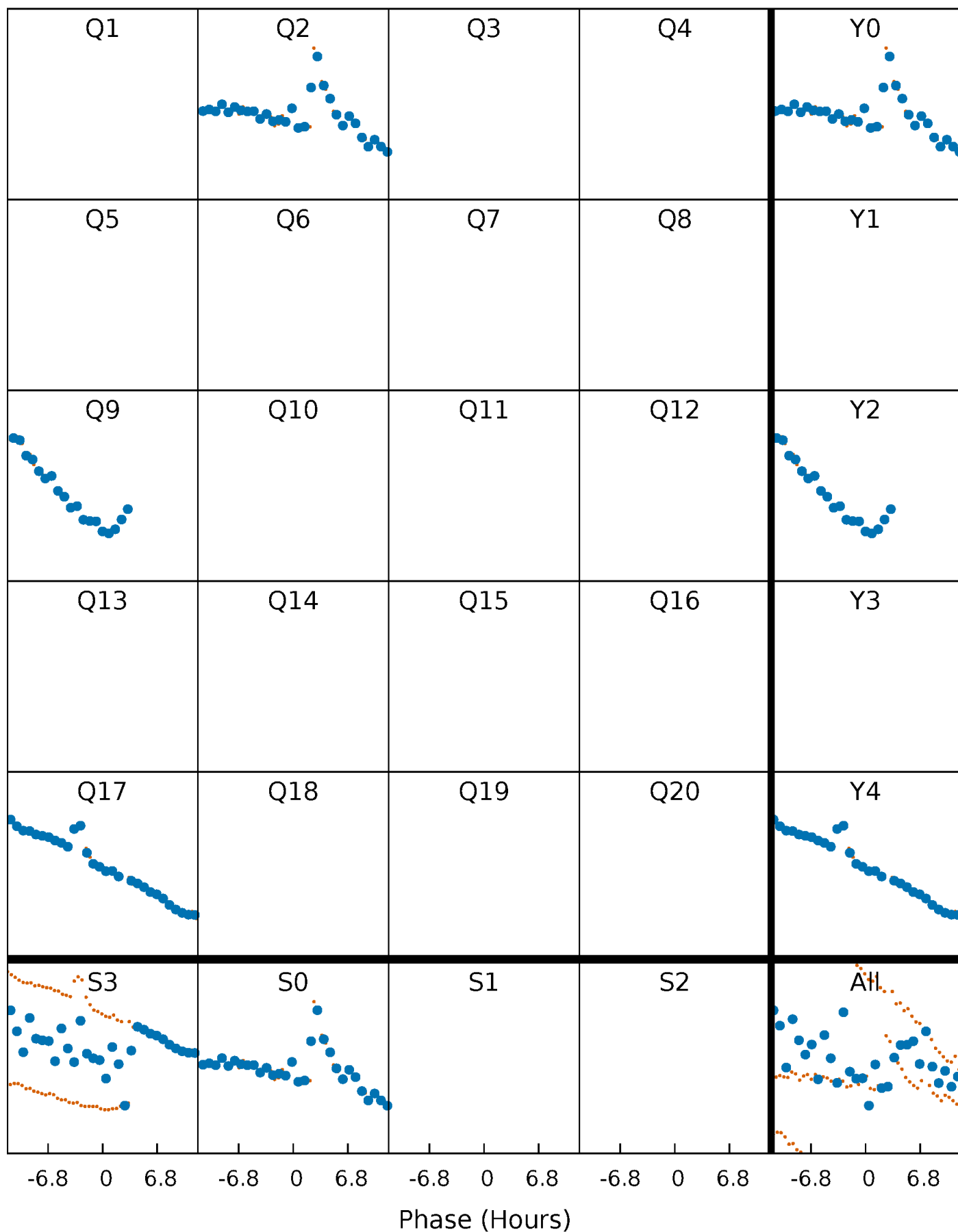


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



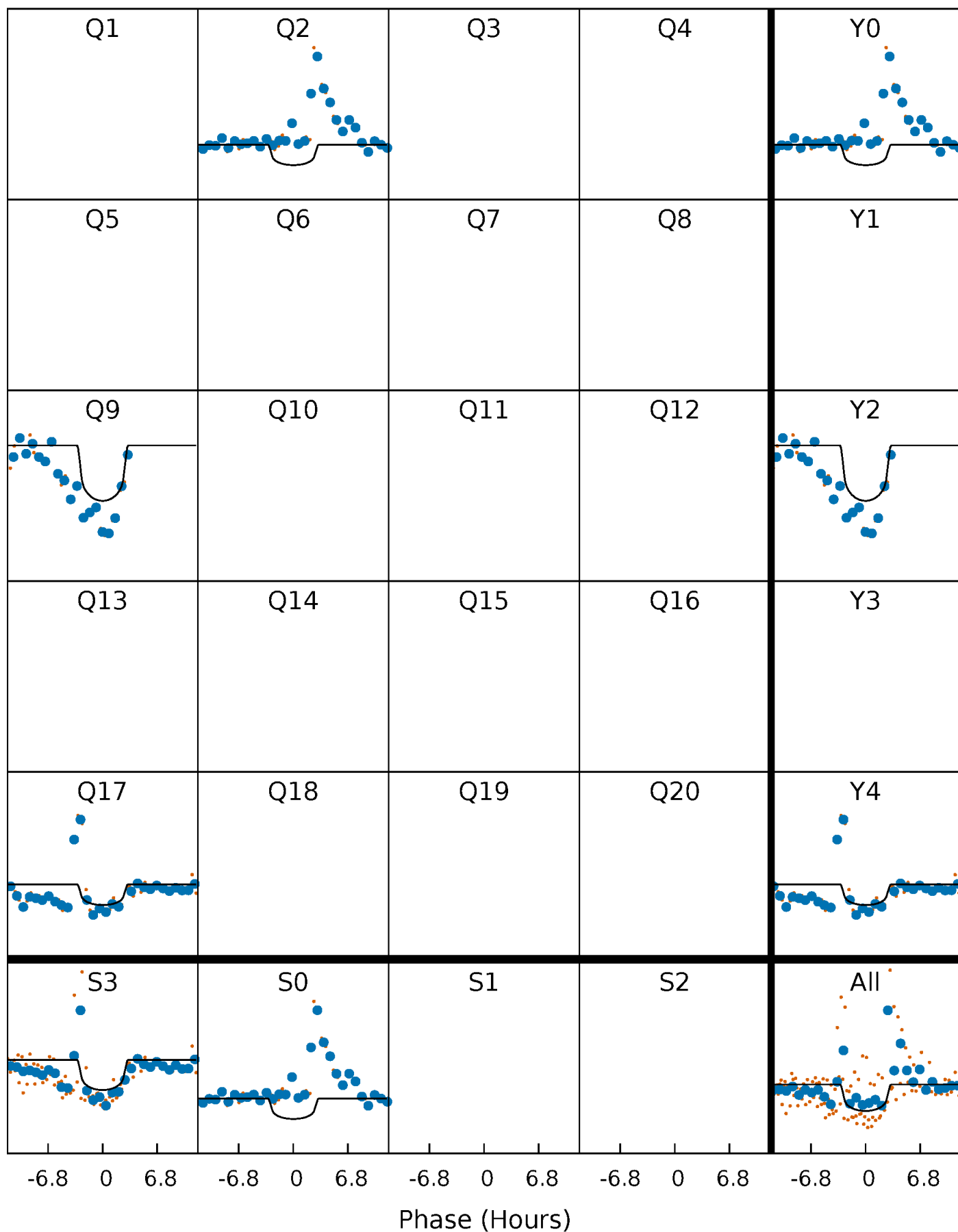
PDC Quarter-Phased Transit Curves

TCE 010330818-04 P=685.601189 Days $T_0=200.901538$ (BKJD)



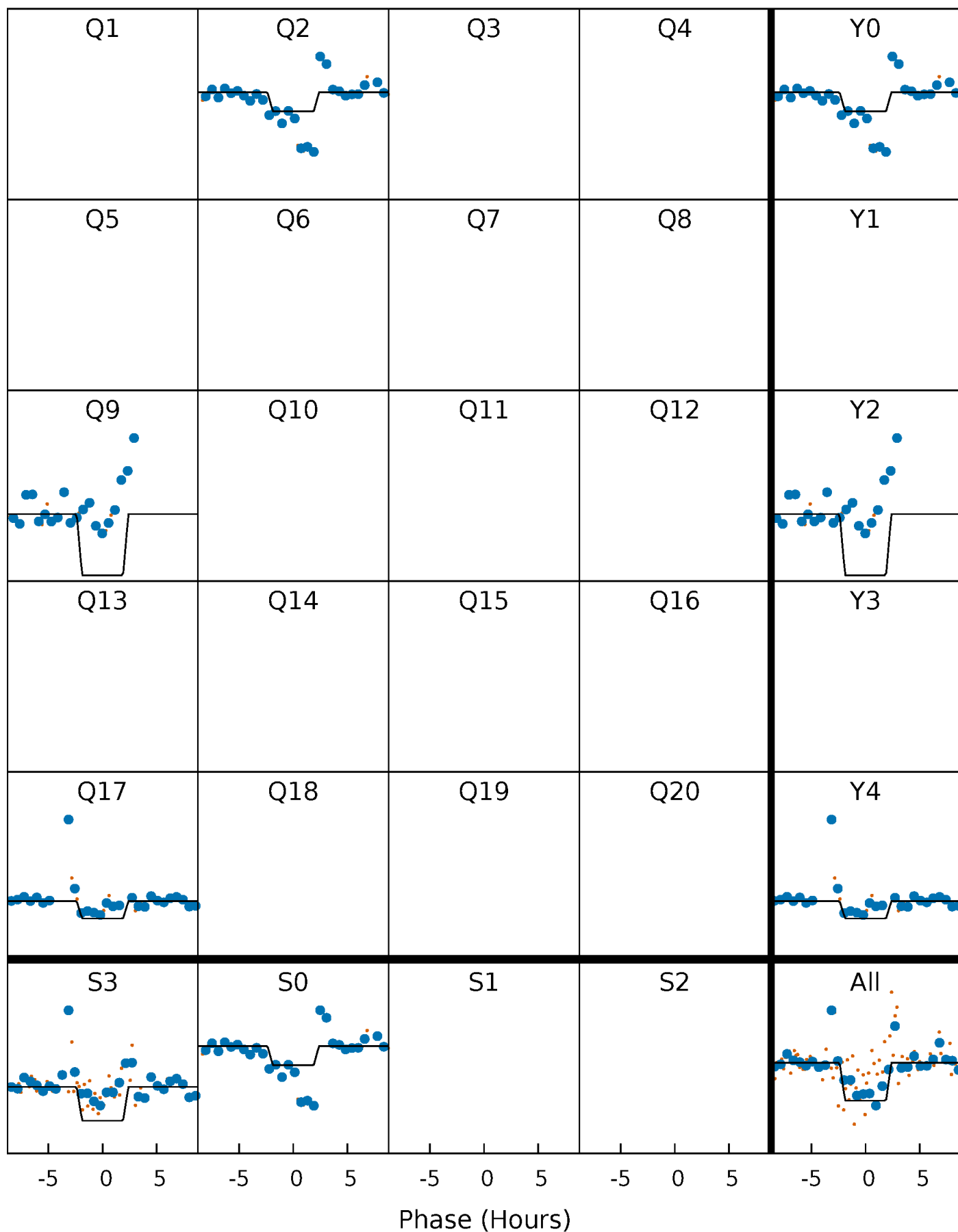
DV Quarter-Phased Transit Curves

TCE 010330818-04 P=685.601189 Days $T_0=200.901538$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

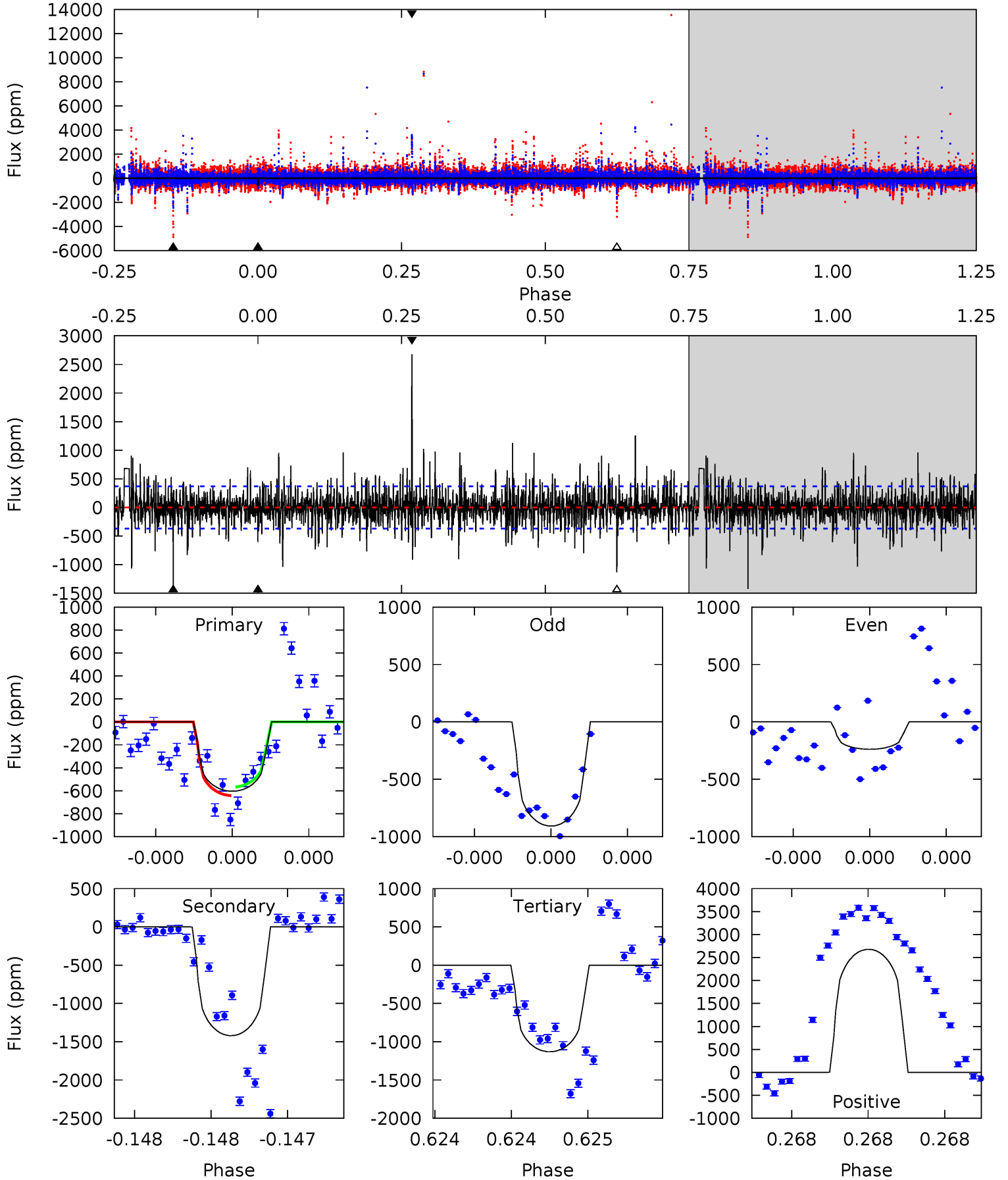
TCE 010330818-04 P=685.614050 Days $T_0=200.908426$ (BKJD)



DV Model-Shift Uniqueness Test

010330818-04, P = 685.601189 Days, E = 200.901538 Days

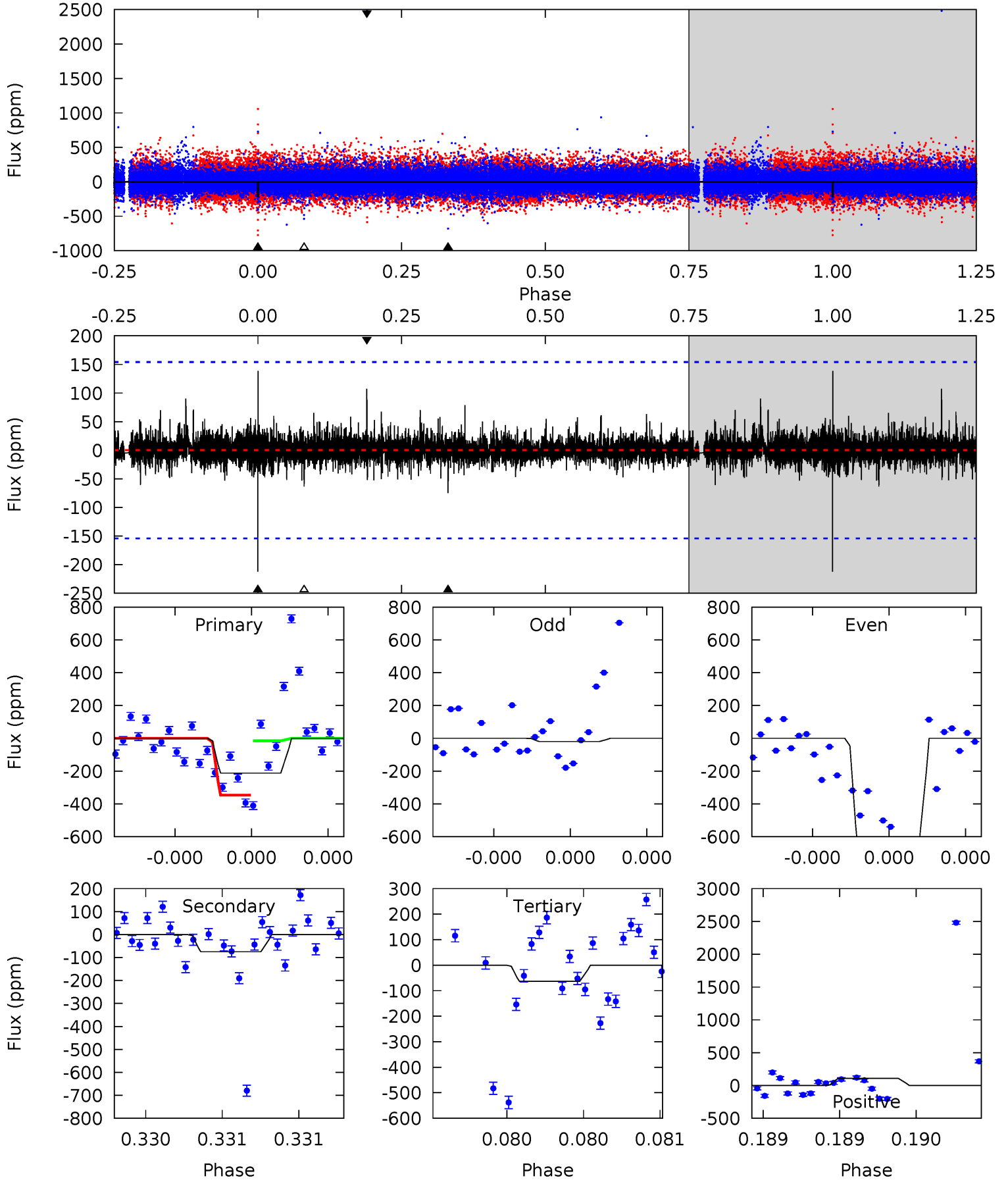
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.20	21.6	17.2	40.8	5.62	3.55	3.13	-8.02	-31.6	4.42	-19.2	3.15	0.62	0.65	0.57



Alt Model-Shift Uniqueness Test

010330818-04, P = 685.614050 Days, E = 200.908426 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.81	2.75	2.33	3.96	5.67	3.63	0.48	5.47	3.85	0.42	-1.20	12.1	1.90	0.40	5.86



Stellar Parameters For KIC 010330818

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4441^{+120}_{-133}	$4.710^{+0.058}_{-0.031}$	$-0.980^{+0.300}_{-0.300}$	$0.530^{+0.038}_{-0.046}$	$0.526^{+0.040}_{-0.033}$	$4.975^{+1.226}_{-0.599}$
	+3%/-3%	+1%/-1%	+31%/-31%	+7%/-9%	+8%/-6%	+25%/-12%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010330818-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1421 ± 66	$1.53^{+0.86}_{-0.85}$	179^{+6}_{-6}	5120^{+2586}_{-848}	$518933^{+2054922}_{-313444}$
Alt.	-75 ± 27	$1.49^{+0.84}_{-0.82}$	179^{+5}_{-6}	3058^{+821}_{-387}	$25953^{+101320}_{-16022}$

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

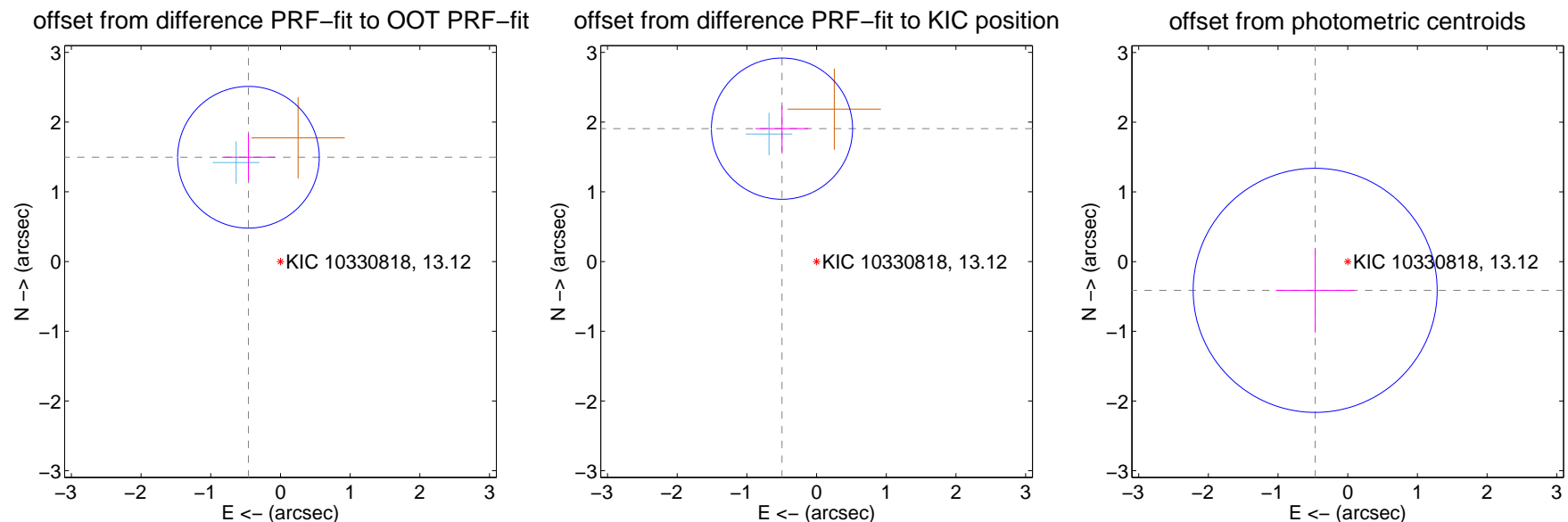
DV Centroid Data

Supplemental centroid analysis for 010330818-04. Kepler magnitude: 13.12. Transit SNR 6.04

There are 1 quarters with good PRF difference image offsets

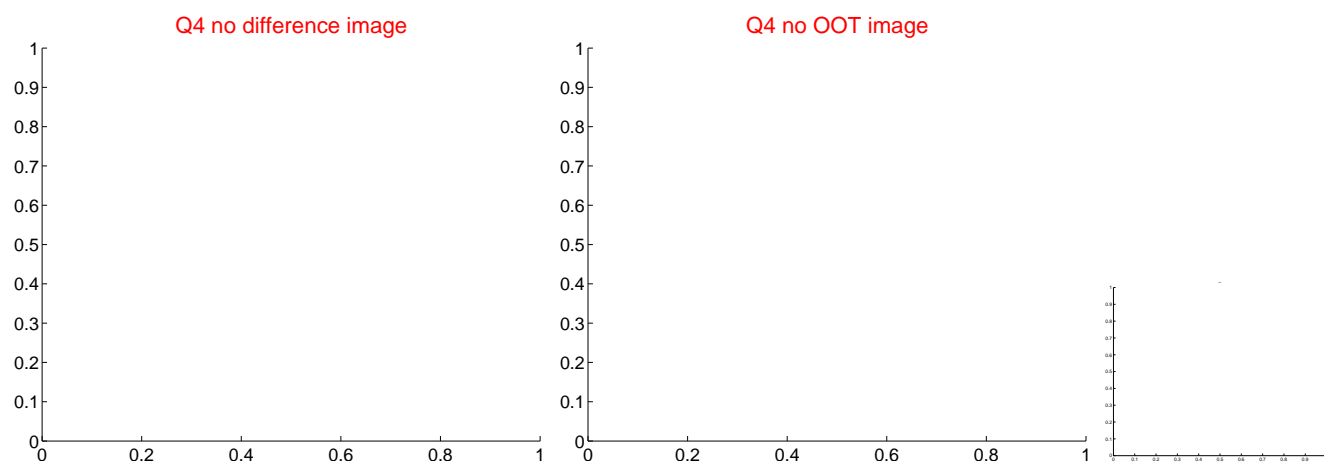
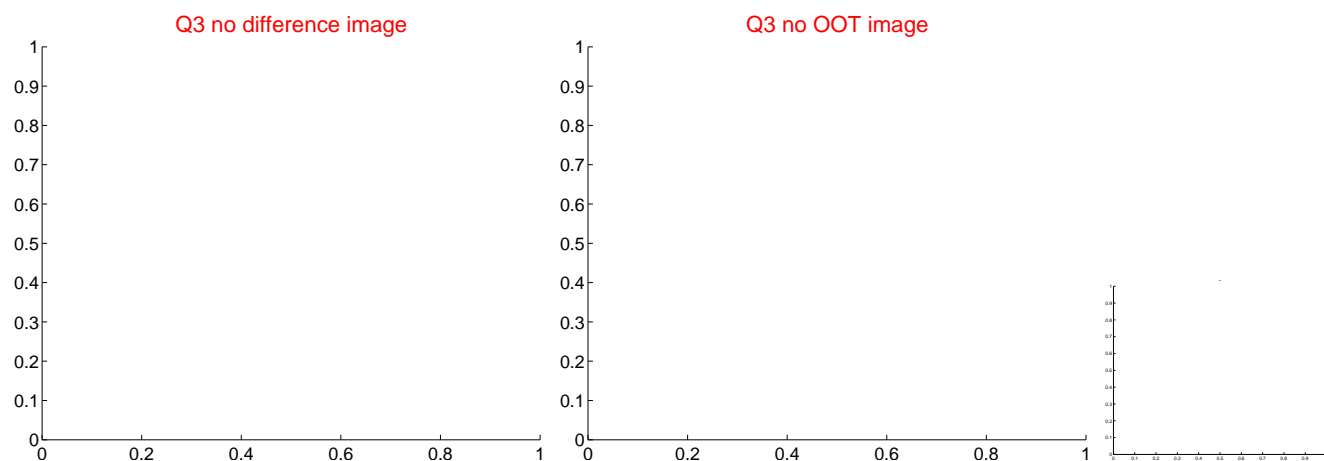
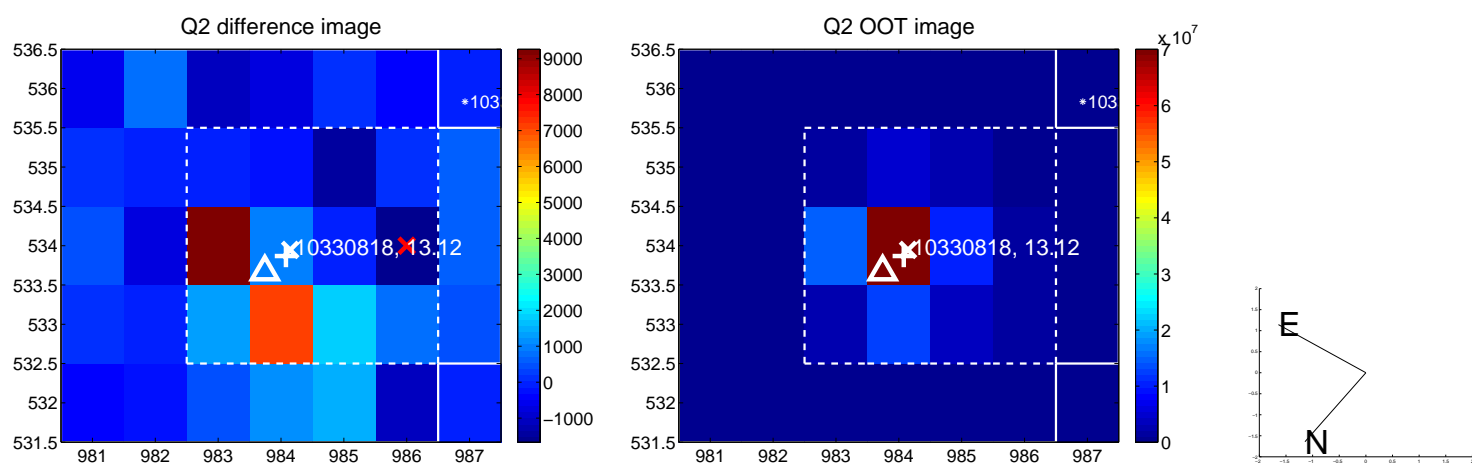
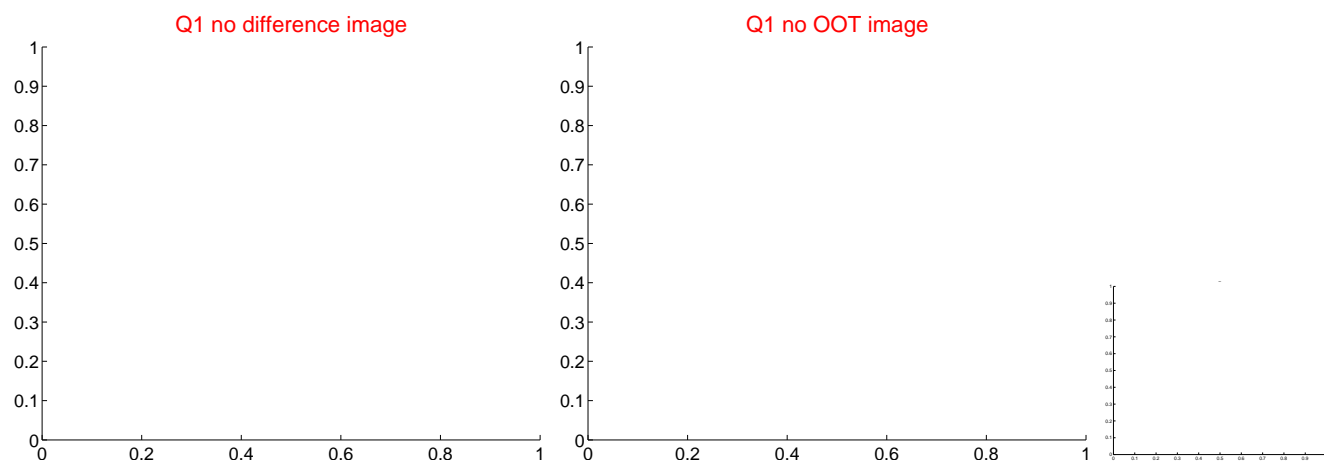
The direct PRF centroid is offset from the target star catalog position by about 0.41 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.565 ± 0.339	4.62	0.459 ± 0.380	1.496 ± 0.335
PRF-fit source offset from KIC position	1.969 ± 0.338	5.83	0.496 ± 0.380	1.906 ± 0.335
photometric centroid source offset	0.62 ± 0.58	1.07	0.47 ± 0.56	-0.41 ± 0.61



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.

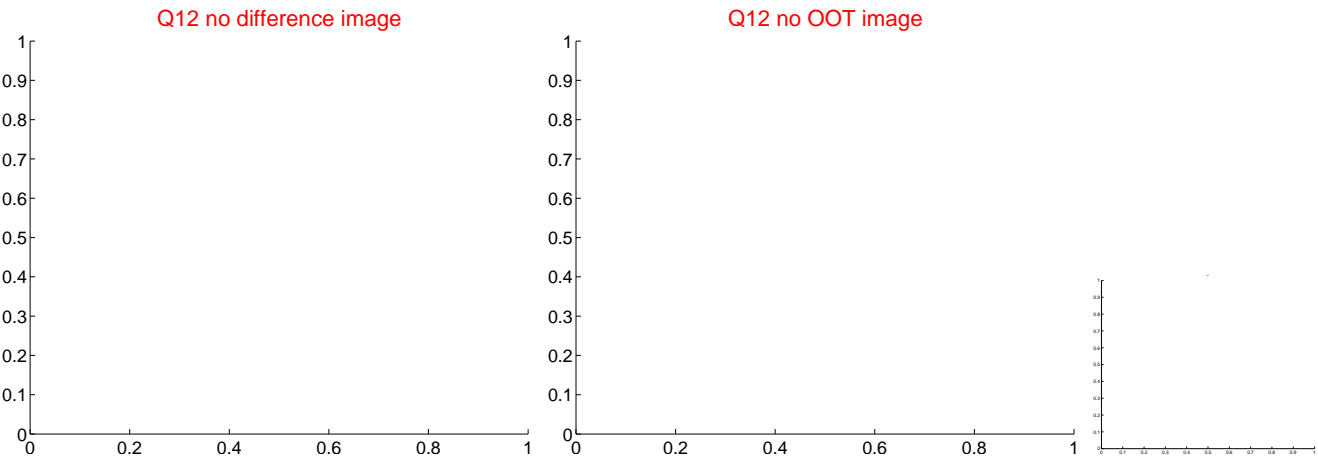
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



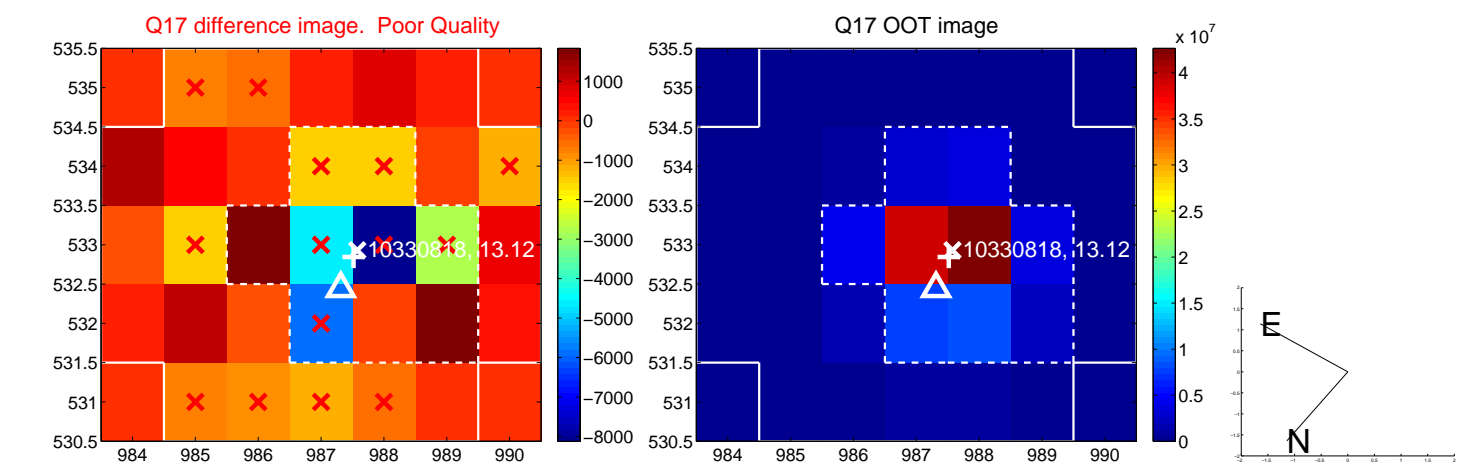
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



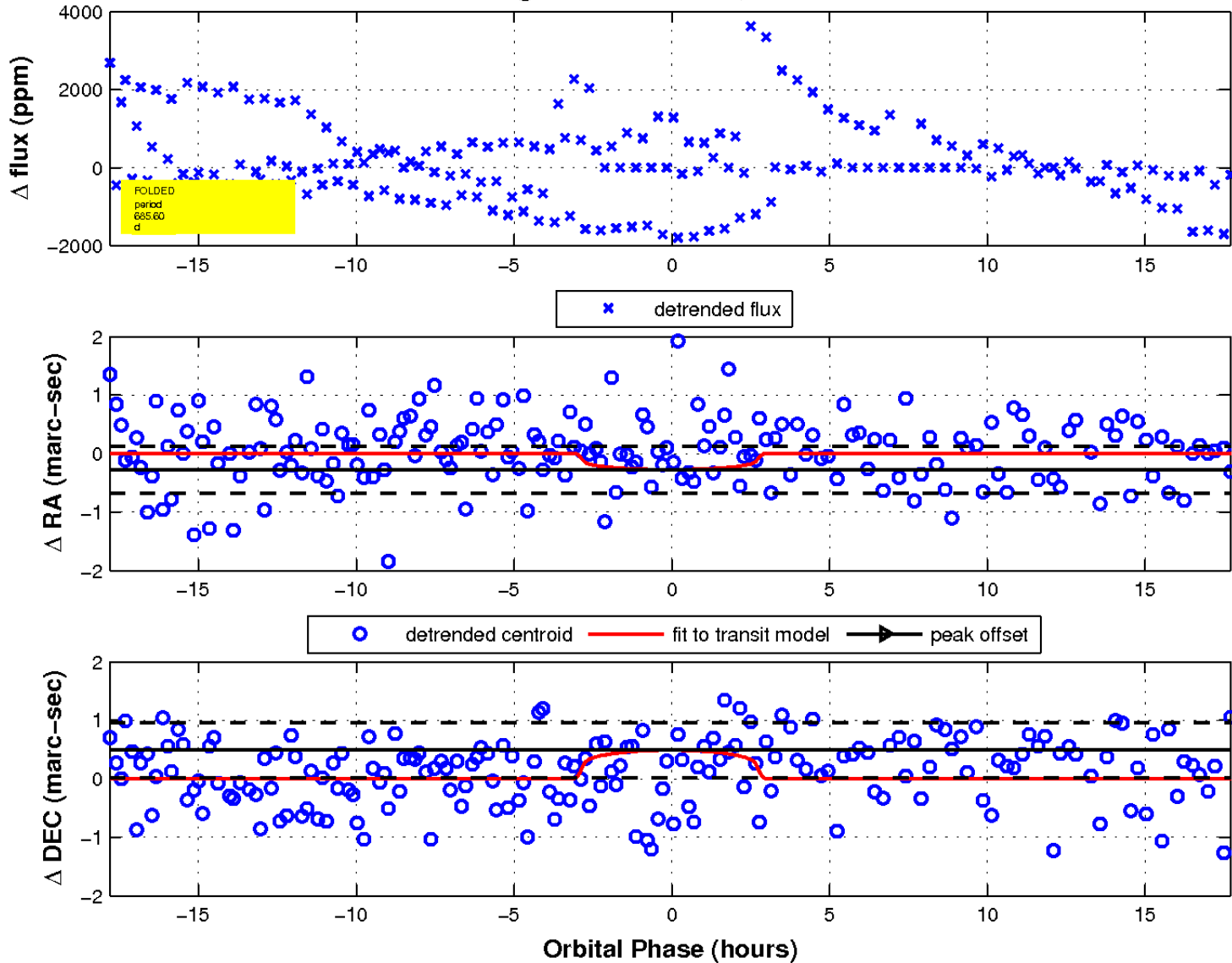
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

