

KIC 009899410

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})
009899410-01	OBS	7245.01	1.332607	132.051949	81.0	4.747	12.4	8.8	16.49	5154	17.84	0.00
009899410-02	OBS	No	231.336580	216.059590	1936.6	5.794	8.4	11.0	16.49	5154	140.49	162.89
009899410-03	OBS	No	394.428864	269.635463	2272.6	7.143	8.3	8.1	16.49	5154	151.72	79.97
009899410-04	OBS	No	268.756157	283.487561	1651.2	7.215	7.4	8.6	16.49	5154	130.44	133.37

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899410-01	OBS	FP	0.00	0	0	1	1	PLANET_IN_STAR—HALO_GHOST—EPHEM_MATCH
009899410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009899410-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
009899410-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES

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 009899410-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
009899410-01	9899410	BR-Cyg-pri	9899416	1:1	89.5	12	18	10.03	13.51	8257.60	Direct-PRF	0	2.67	0.14

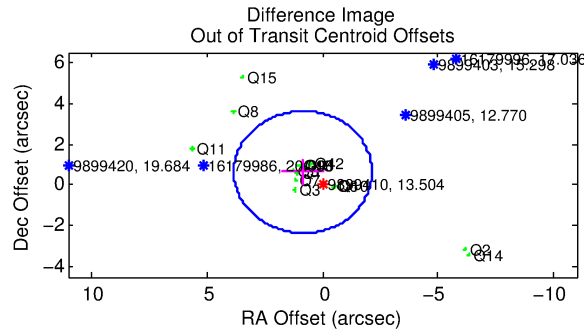
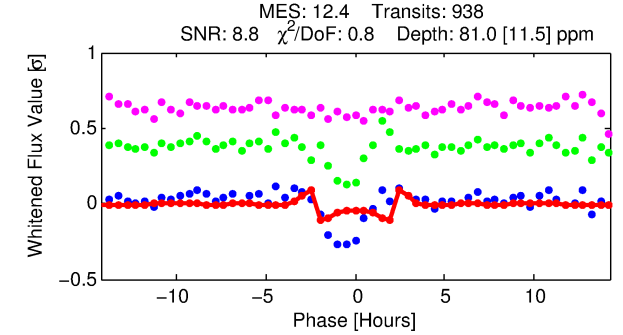
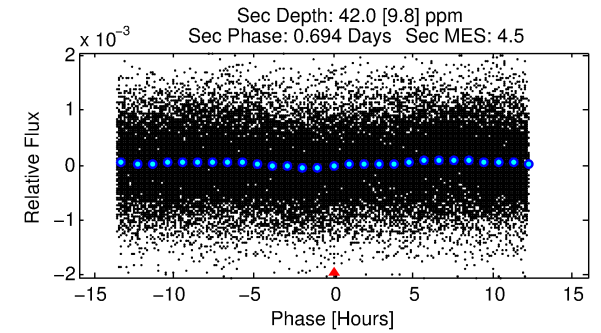
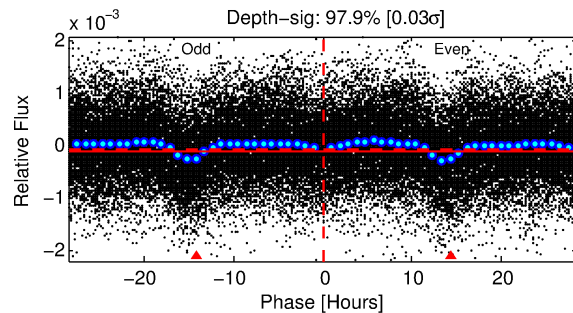
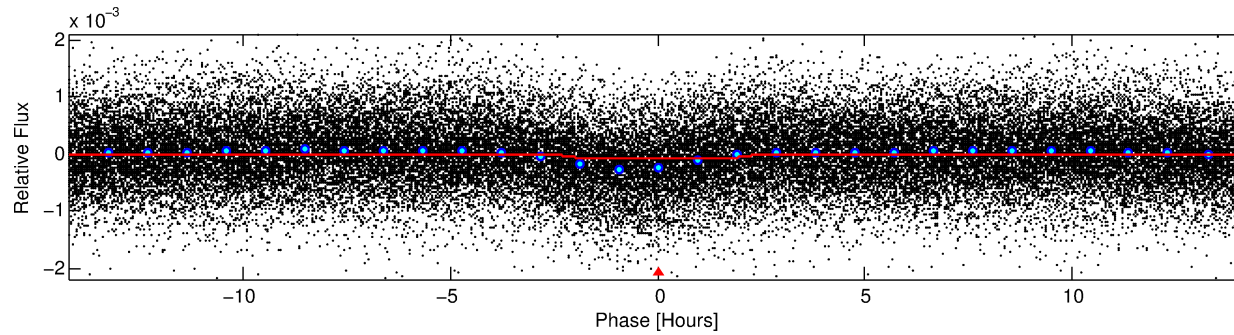
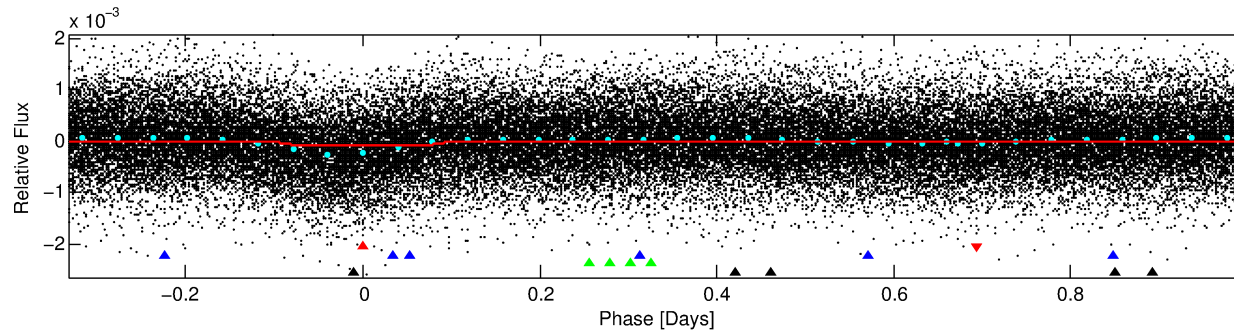
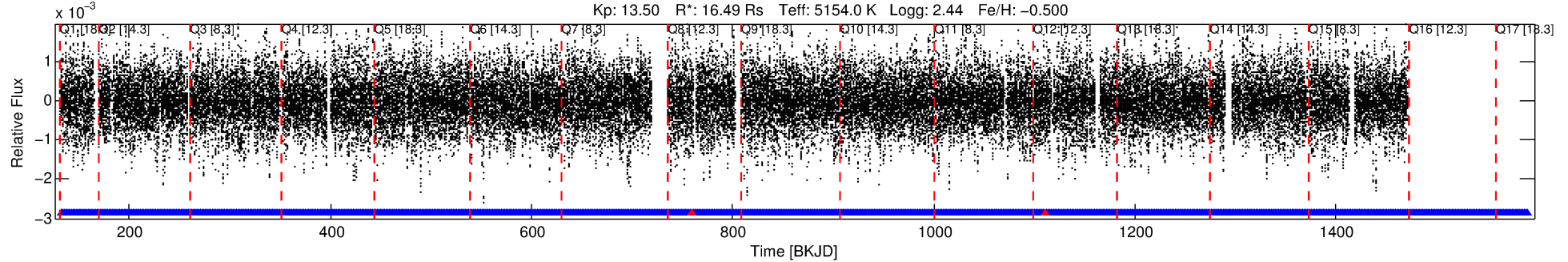
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9899410 Candidate: 1 of 4 Period: 1.333 d

KOI: K07245.01 Corr: 0.837

Kp: 13.50 R*: 16.49 Rs Teff: 5154.0 K Logg: 2.44 Fe/H: -0.500



DV Fit Results:

Period = 1.33261 [0.00001] d
Epoch = 132.0519 [0.0017] BKJD
Rp/R* = 0.0099 [0.0017]
a/R* = 1.35 [0.41]
b = 0.90 [0.14]
Seff = N/A
Teq = N/A
Rp = 17.84 [6.65] Re
a = N/A
Ag = N/A
Teffp = N/A

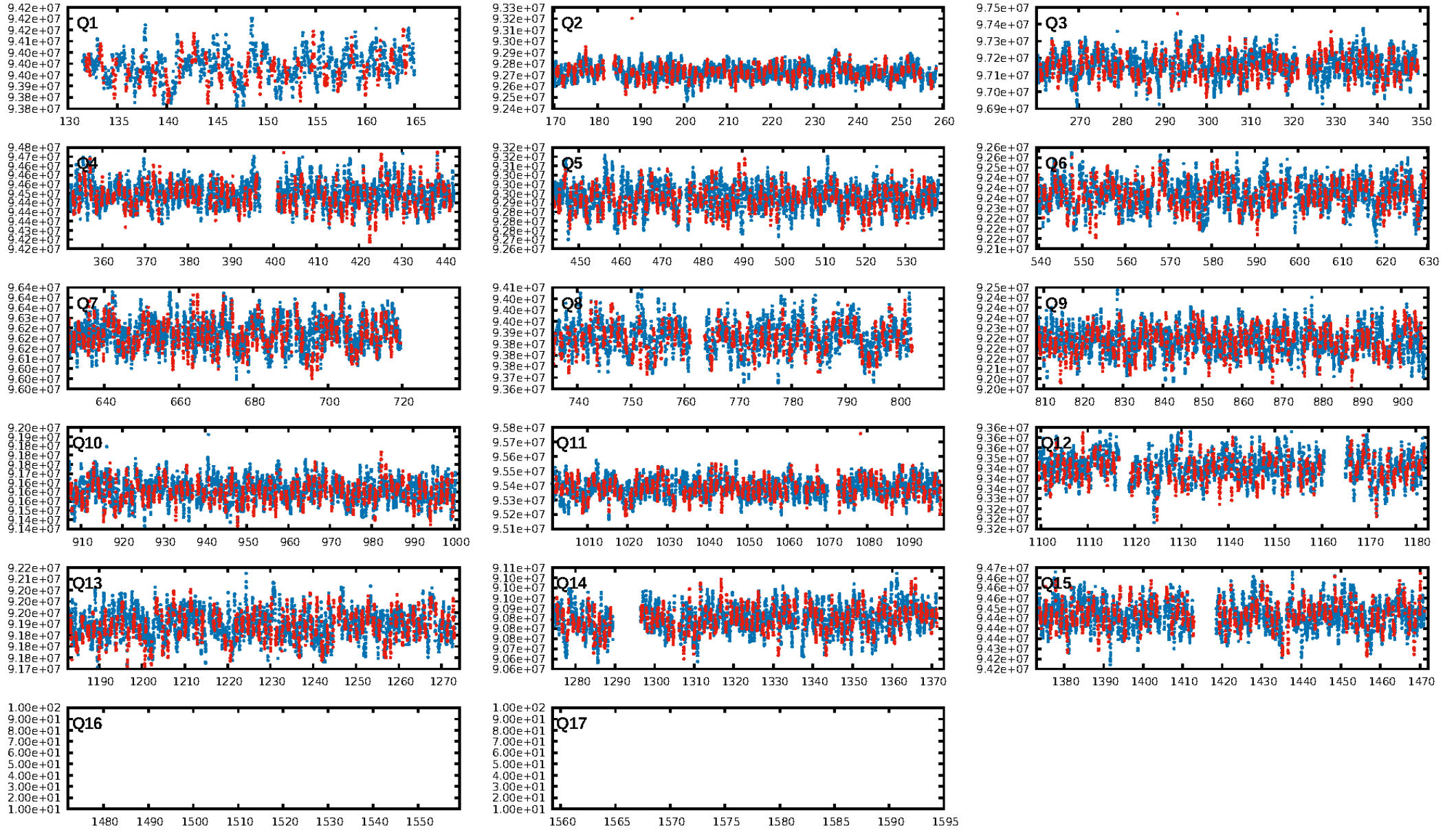
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [736.95σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.92e-26
RollingBand-fgt: 1.00 [911/913]
GhostDiagnostic-chr: 0.006958
Centroid-sig: 0.0%
Centroid-so: 1.439 arcsec [4.46σ]
OotOffset-rm: 1.060 arcsec [1.07σ]
KicOffset-rm: 1.008 arcsec [1.01σ]
OotOffset-st: 4/4/3/4 [15]
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DiffImageQuality-fgm: 0.20 [3/15]
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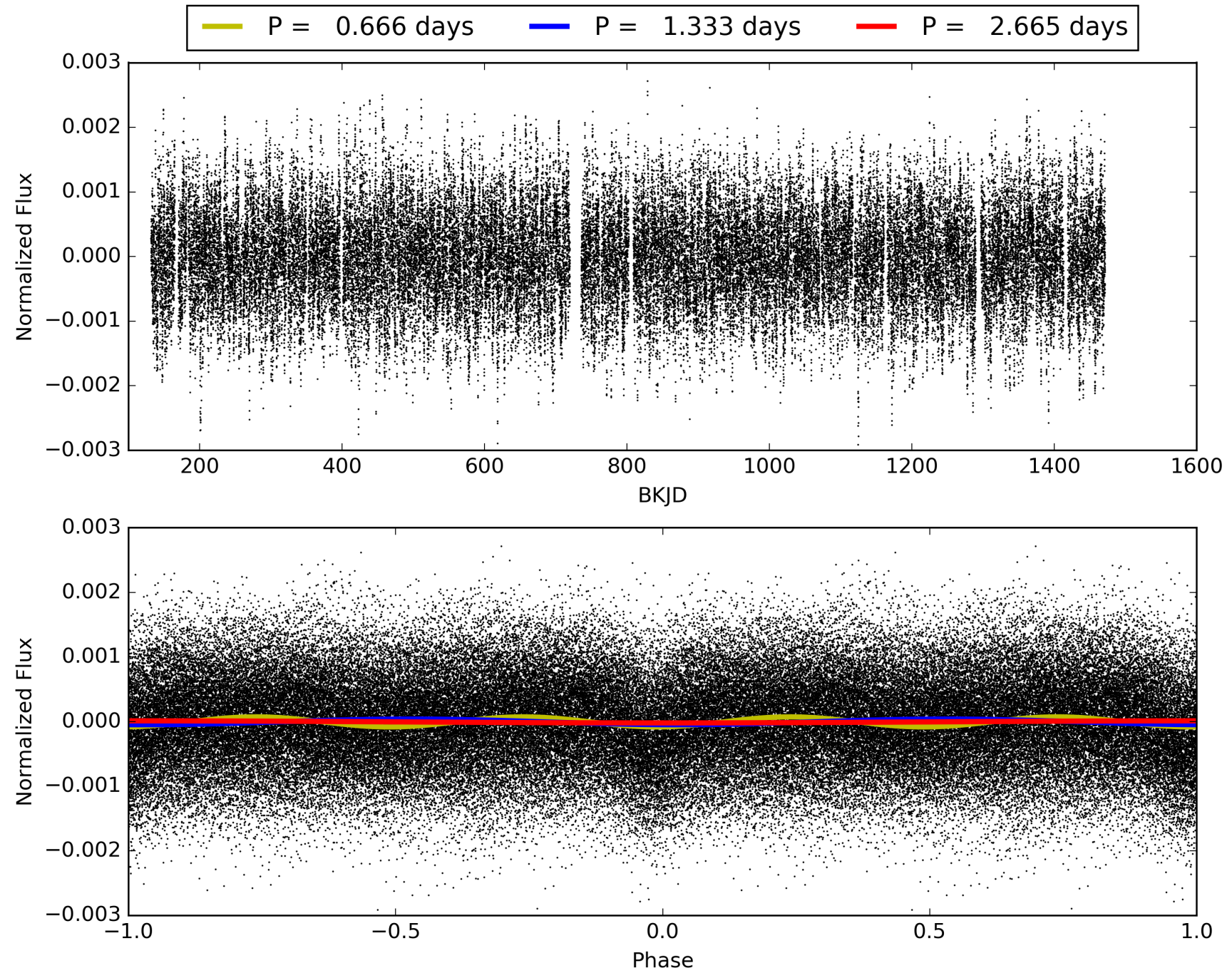
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009899410-01, PDC Light Curves

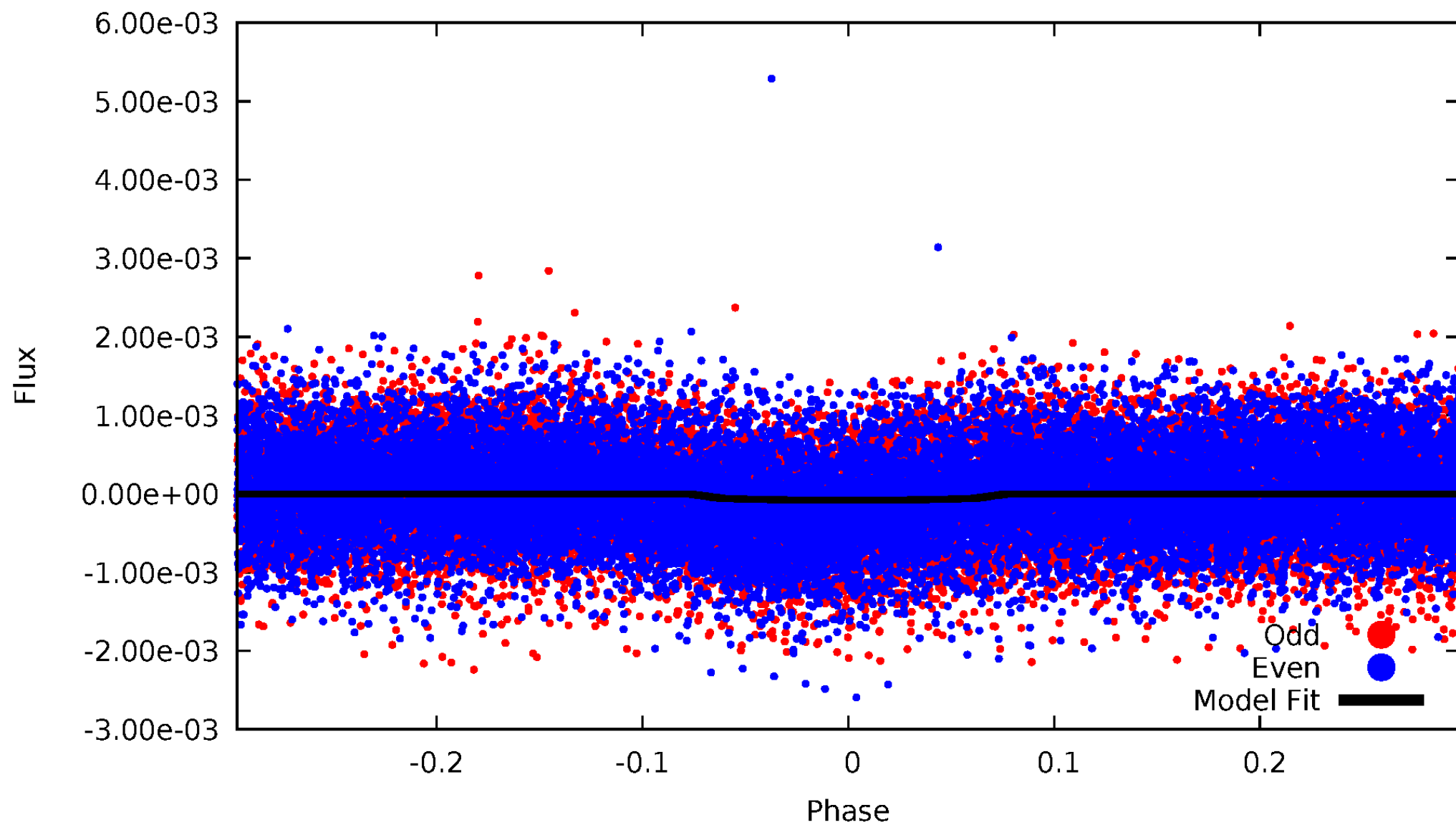


TCE 009899410-01



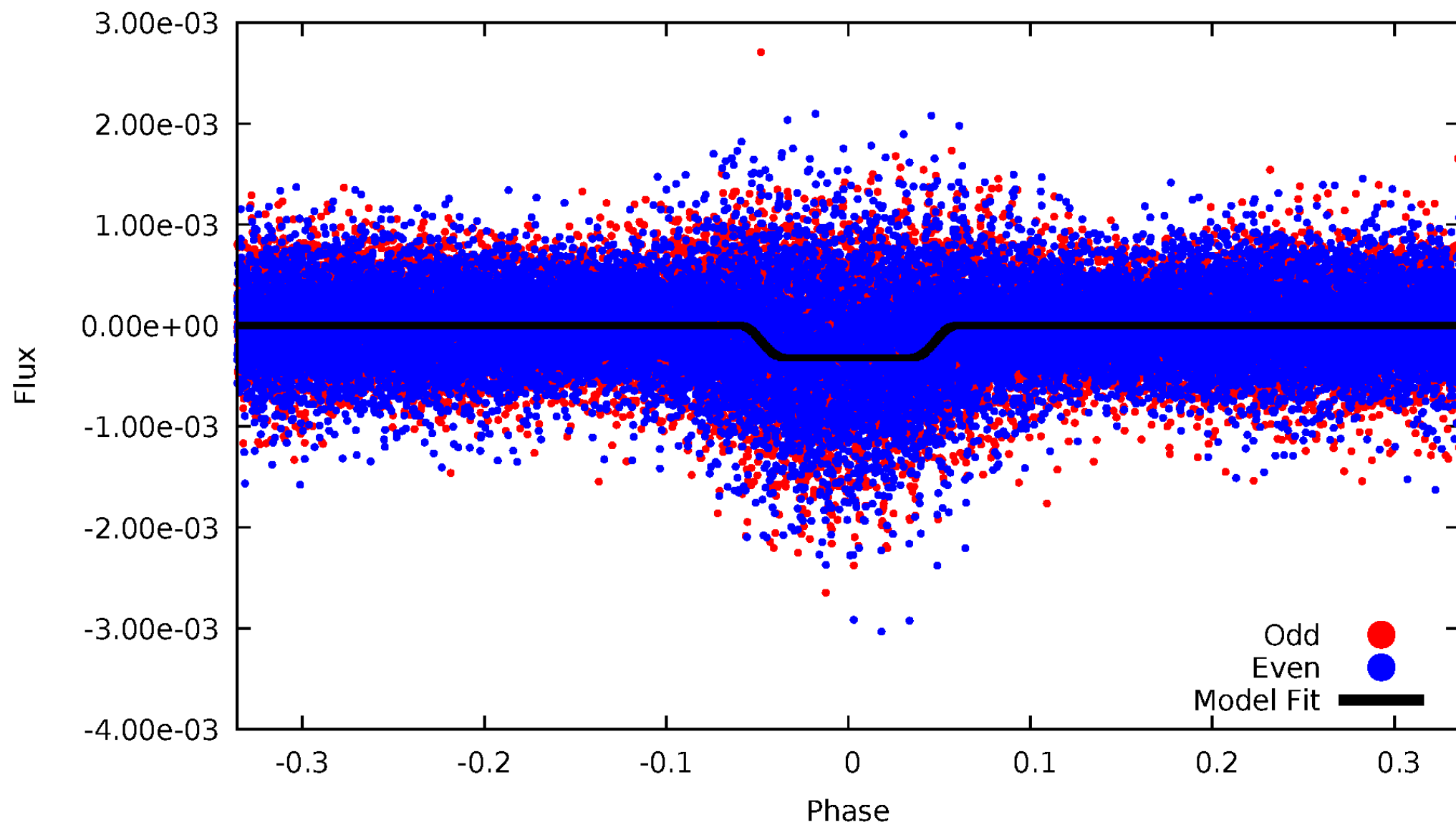
DV Odd/Even

TCE 009899410-01

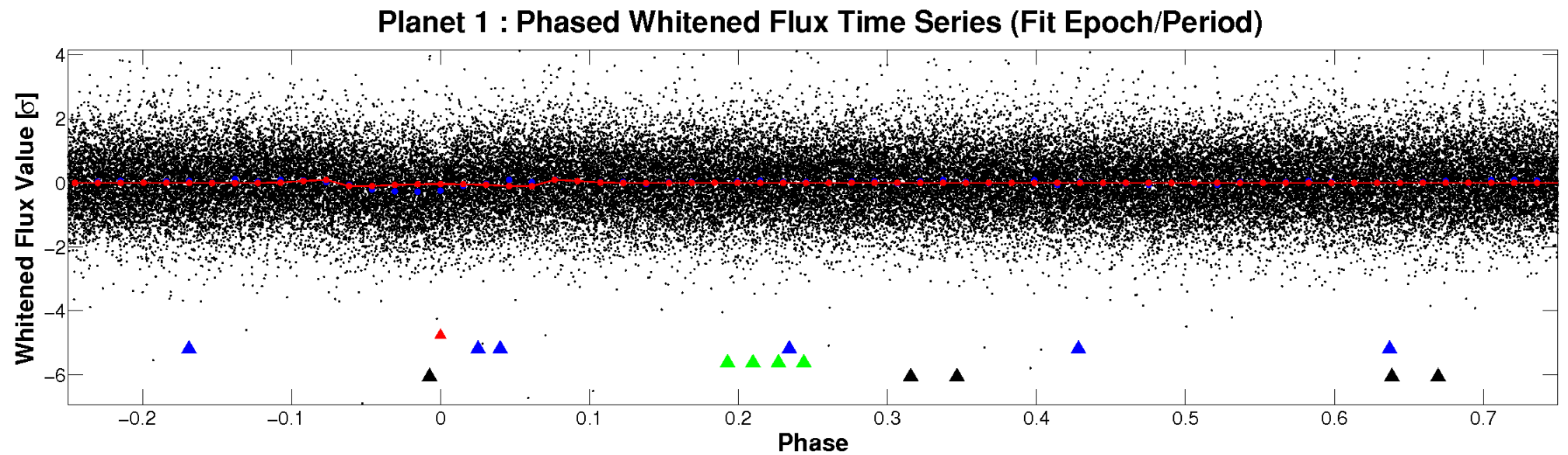
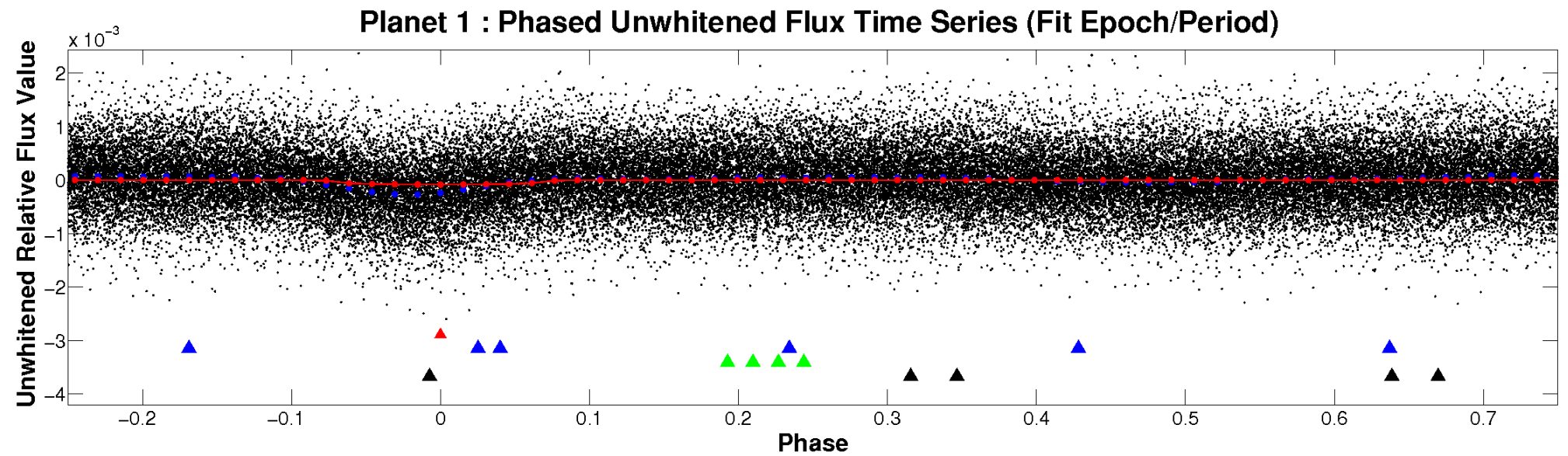


ALT Odd/Even

TCE 009899410-01

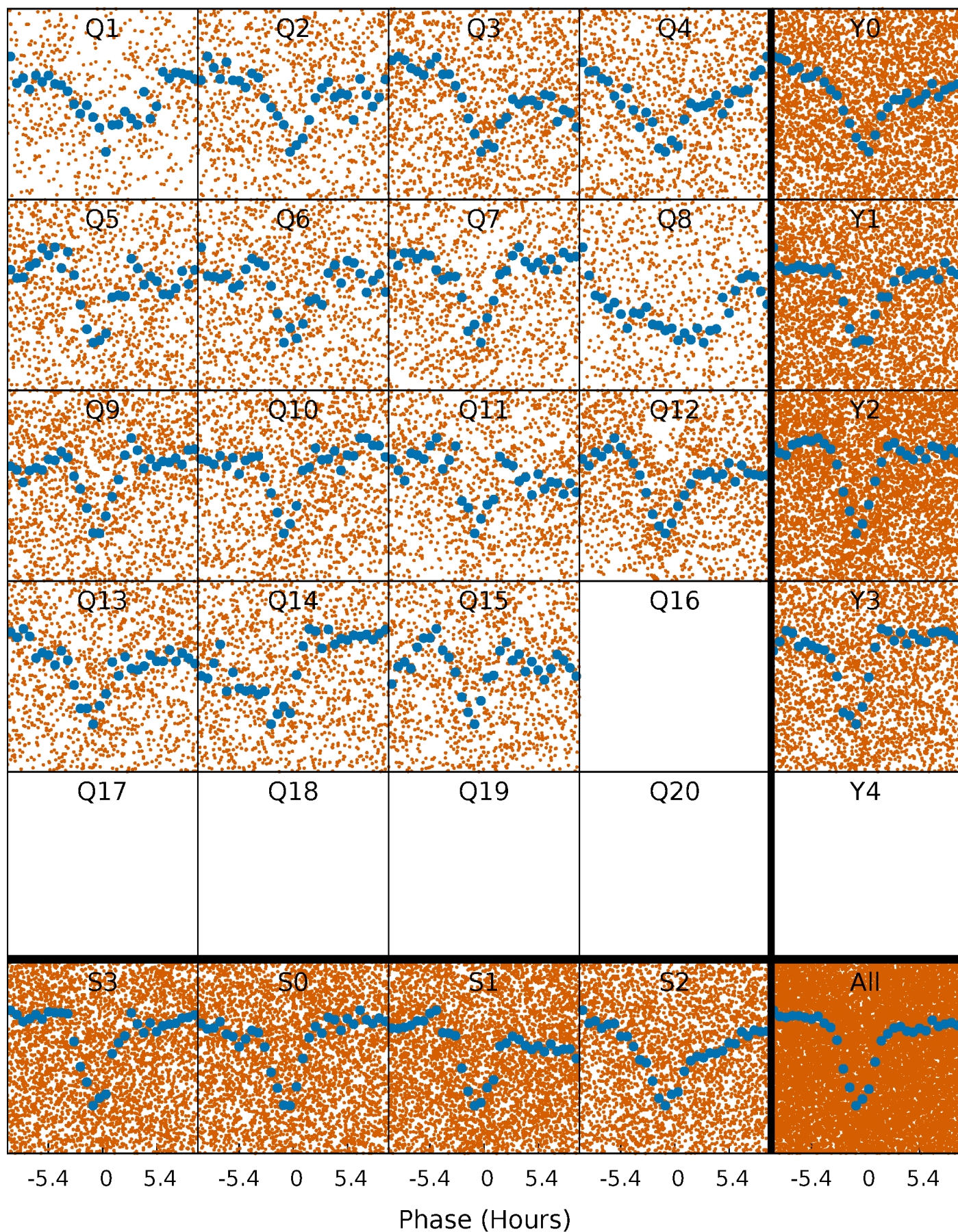


Non-Whitened Vs. Whitened Light Curve



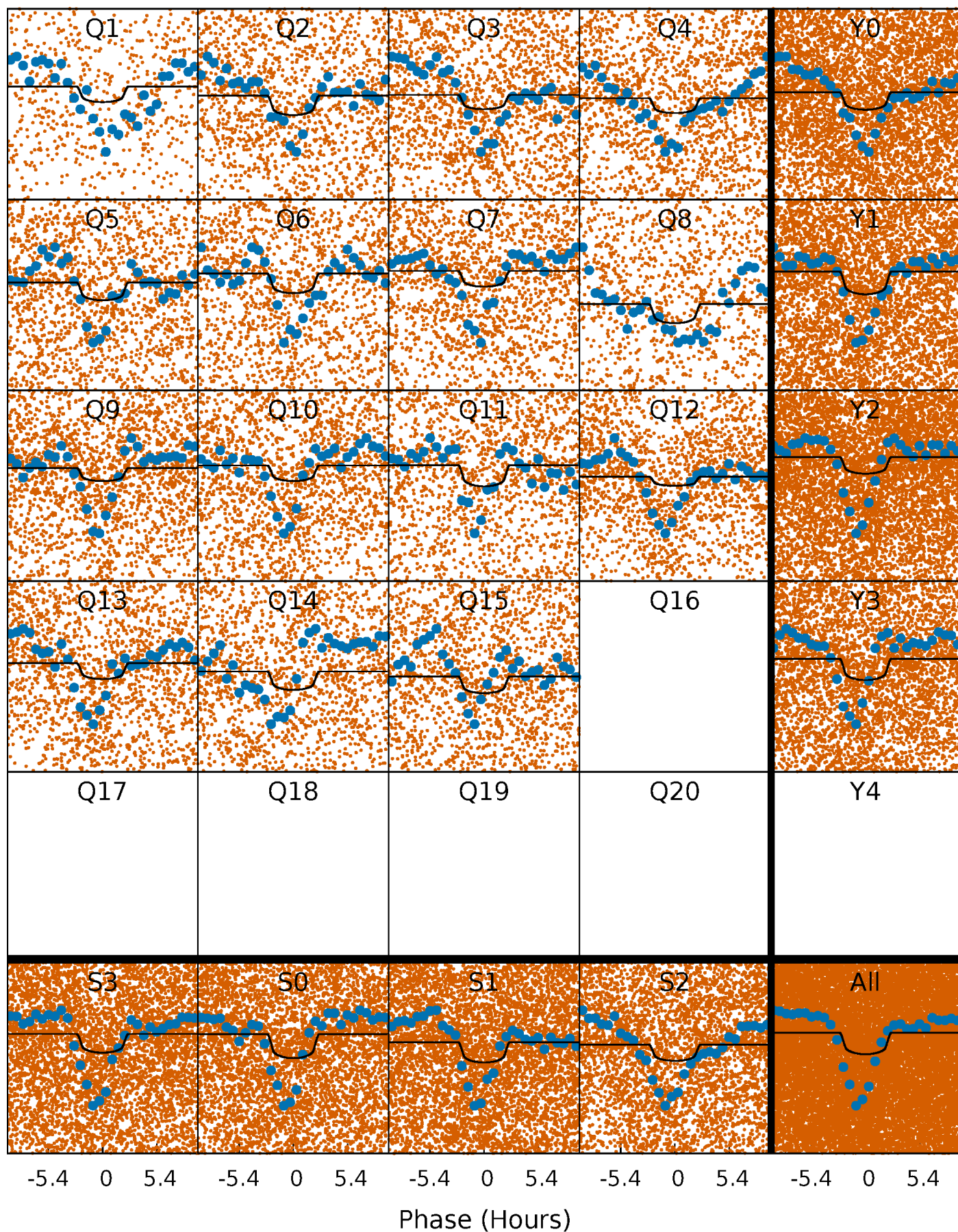
PDC Quarter-Phased Transit Curves

TCE 009899410-01 P= 1.332607 Days $T_0=132.051949$ (BKJD)



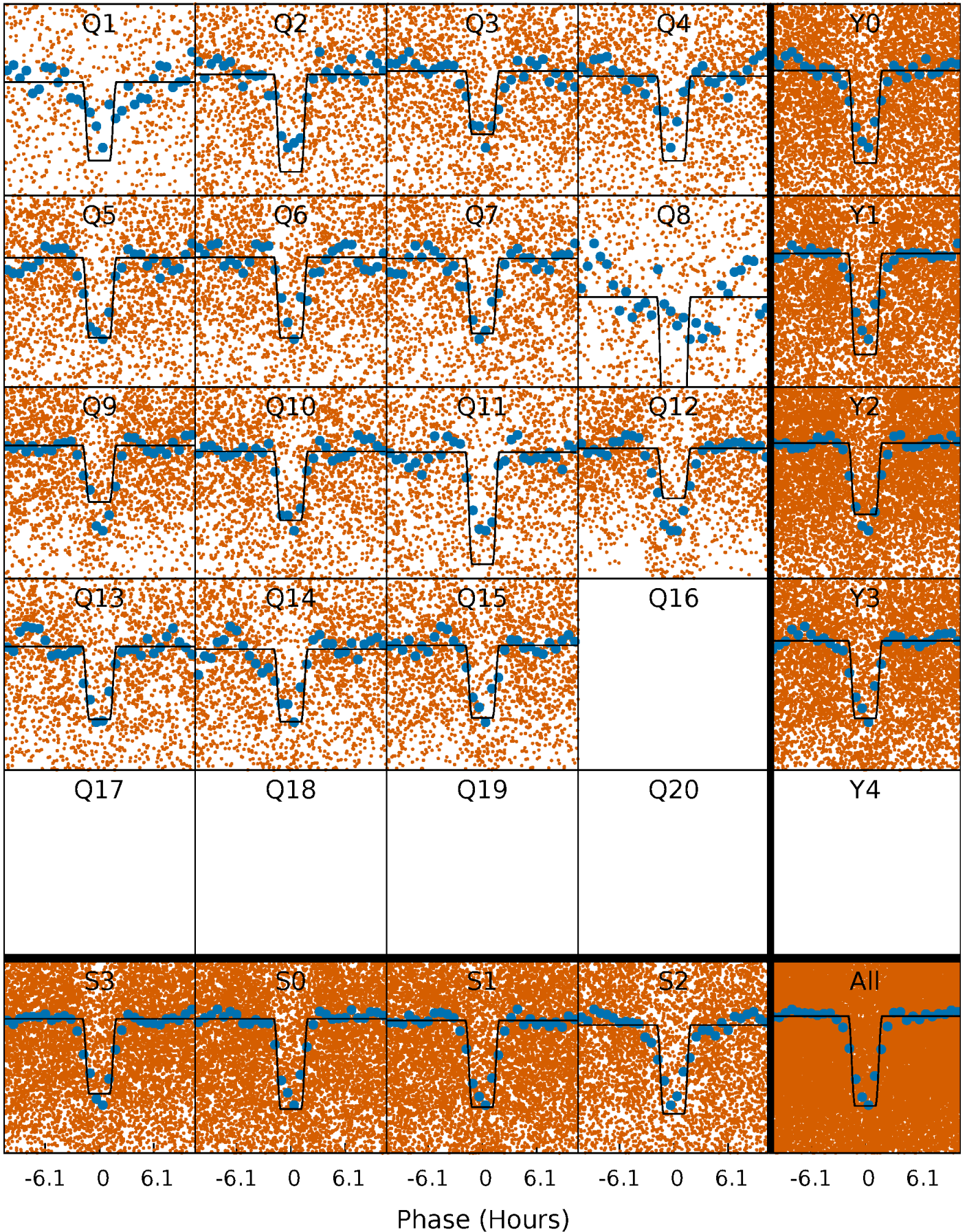
DV Quarter-Phased Transit Curves

TCE 009899410-01 P= 1.332607 Days $T_0=132.051949$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

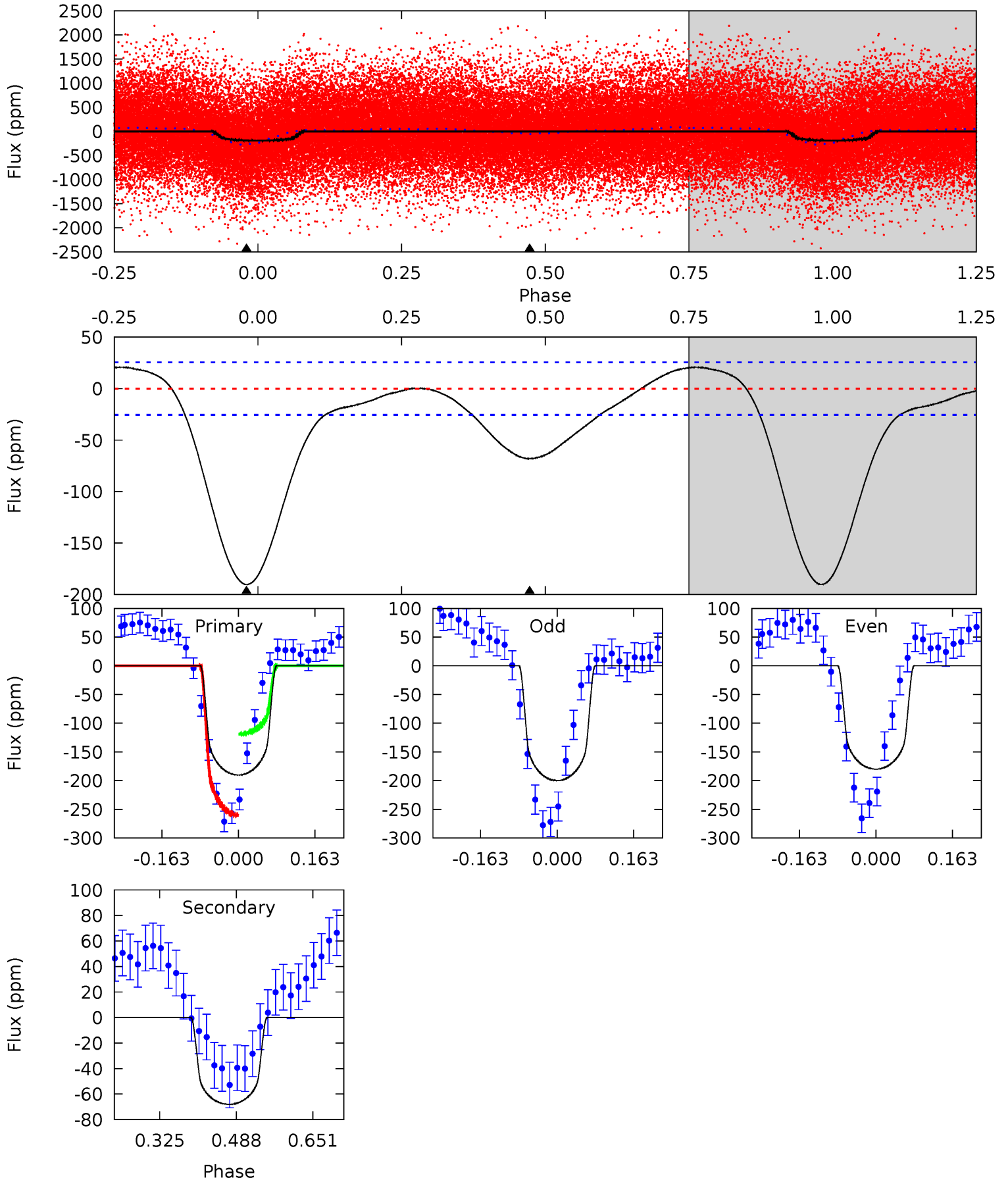
TCE 009899410-01 P= 1.332556 Days $T_0=132.048725$ (BKJD)



DV Model-Shift Uniqueness Test

009899410-01, P = 1.332607 Days, E = 130.719342 Days

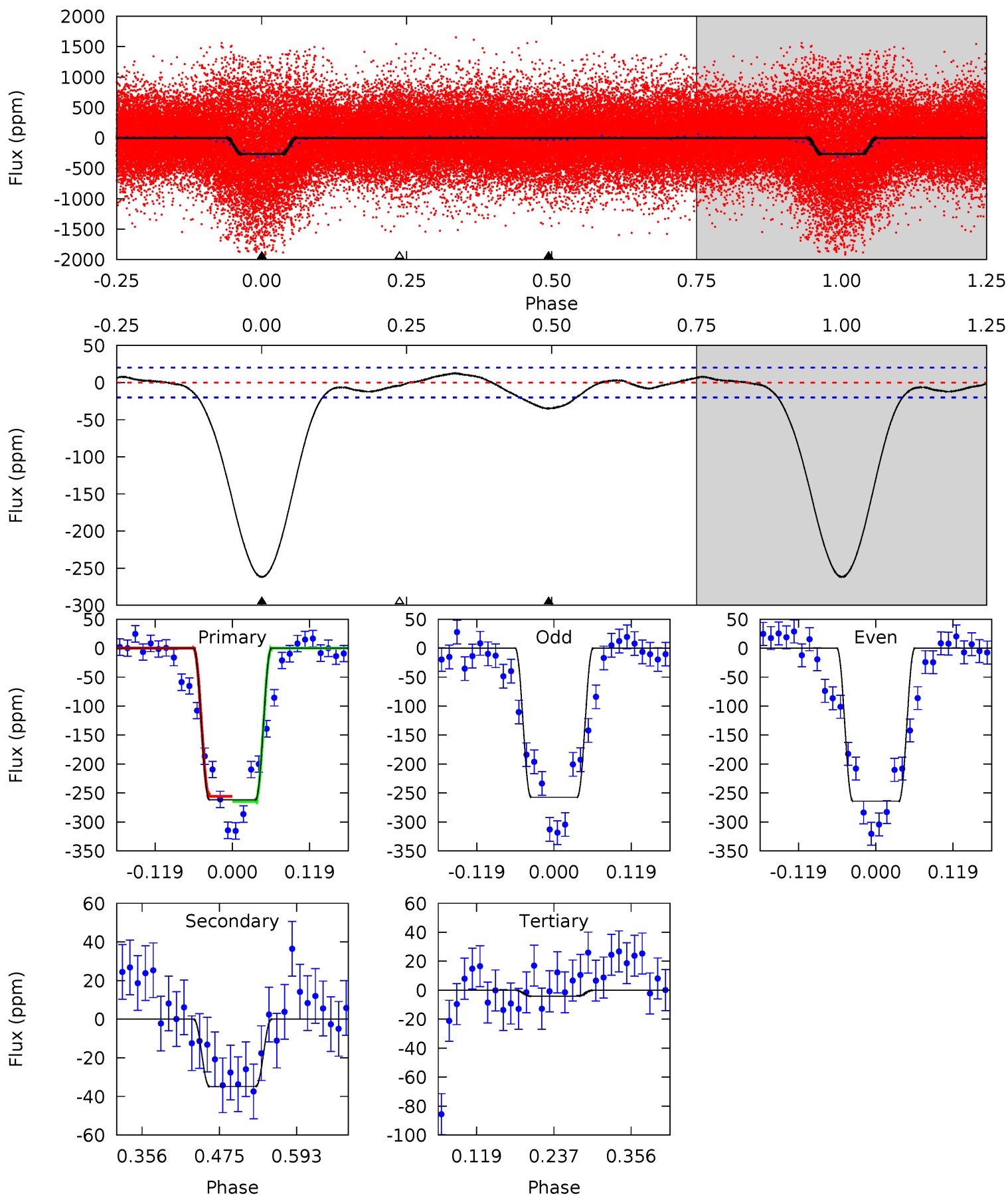
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.3	11.9	0	0	4.46	1.40	2.21	33.3	33.3	11.9	11.9	1.75	1.18	0.10	12.3



Alt Model-Shift Uniqueness Test

009899410-01, P = 1.332556 Days, E = 130.716169 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.1	7.86	0.94	0	4.53	1.56	1.53	58.2	59.1	6.93	7.86	0.78	1.10	0.05	1.03



Stellar Parameters For KIC 009899410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5154^{+153}_{-307}	$2.435^{+0.033}_{-0.030}$	$-0.500^{+0.150}_{-0.300}$	$16.486^{+0.962}_{-5.452}$	$2.700^{+0.250}_{-1.502}$	$0.001^{+0.000}_{-0.000}$
	+3%/-6%	+1%/-1%	+30%/-60%	+6%/-33%	+9%/-56%	+52%/-10%
Source	PHO1	AST9	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009899410-01 / KOI 7245.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-68 ± 6	$18.12^{+3.45}_{-3.21}$	7103^{+253}_{-376}	-5018^{+526}_{-334}	$0.127^{+0.056}_{-0.037}$
Alt.	-35 ± 4	$32.81^{+3.44}_{-3.85}$	7093^{+242}_{-425}	-5644^{+368}_{-206}	$0.020^{+0.006}_{-0.004}$

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 $A_{obs} \gg 1.0$

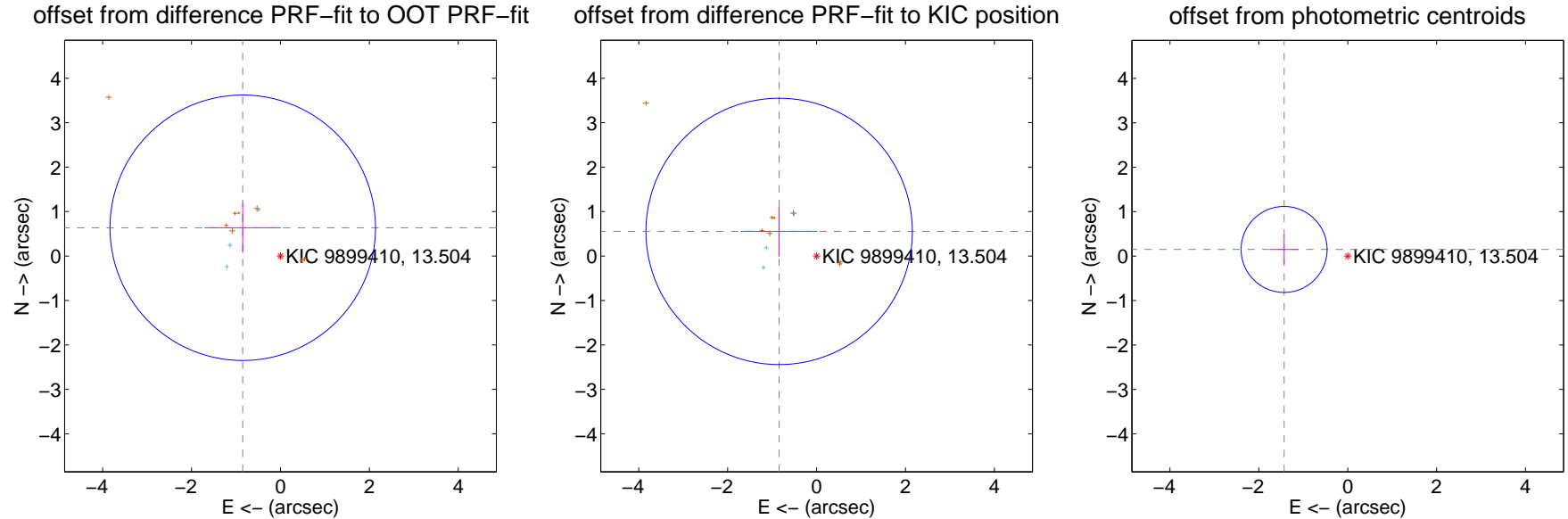
DV Centroid Data

Supplemental centroid analysis for 009899410-01. Kepler magnitude: 13.50. Transit SNR 8.80

There are 3 quarters with good PRF difference image offsets

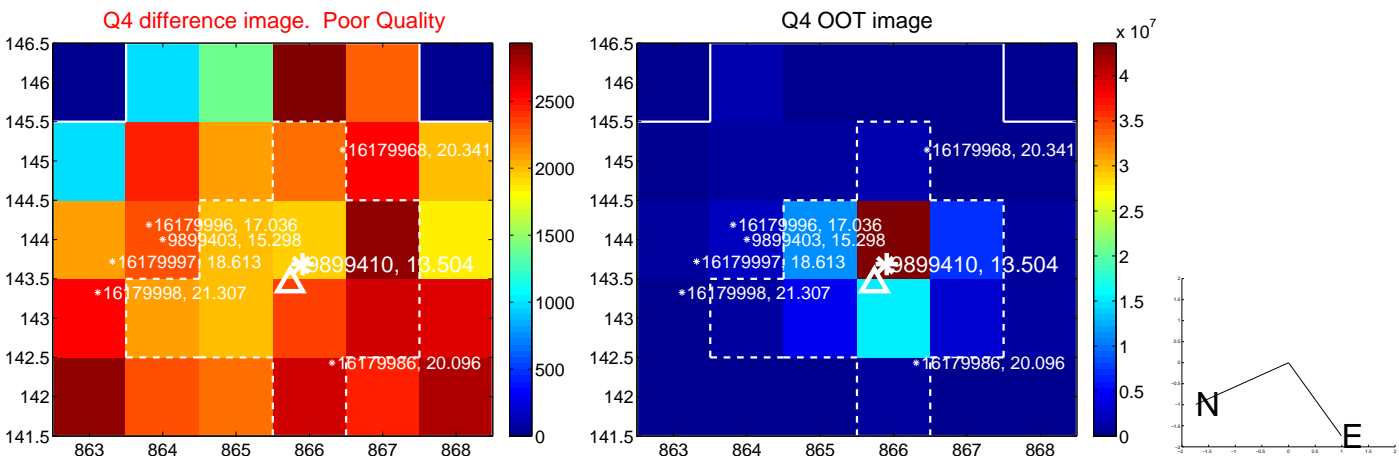
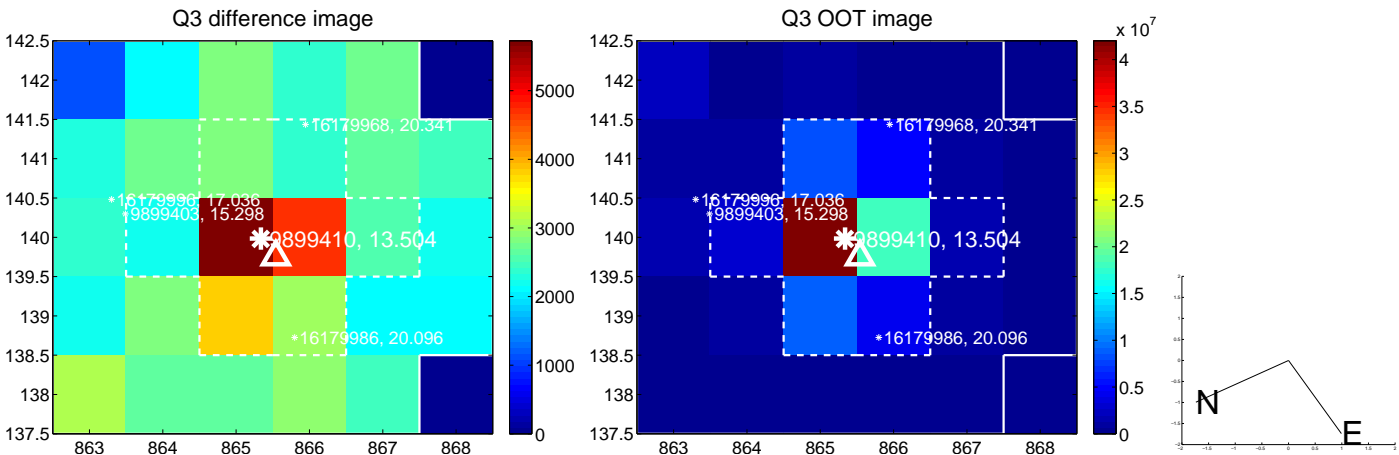
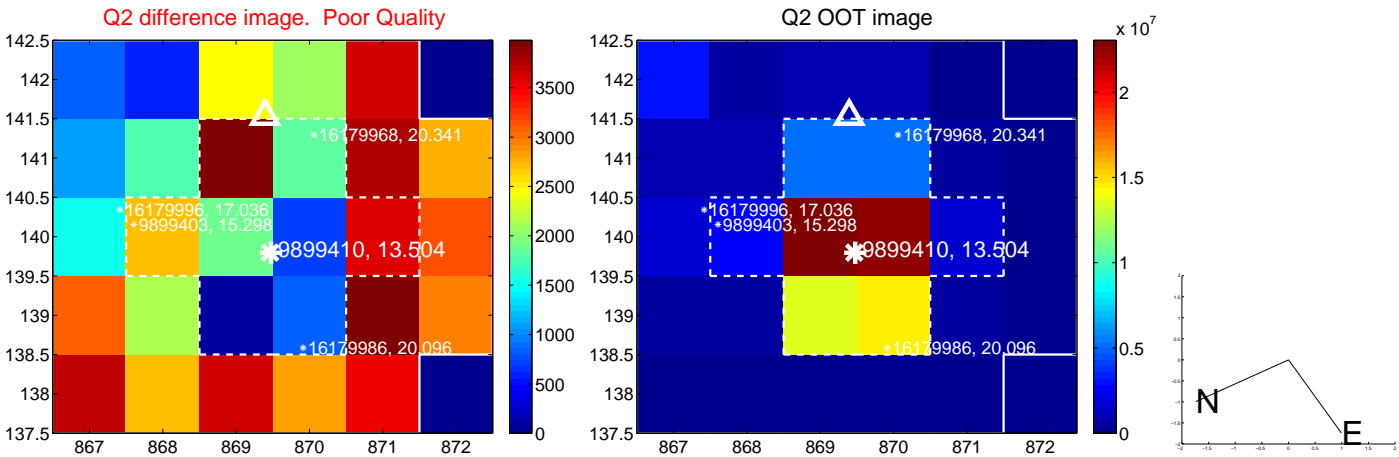
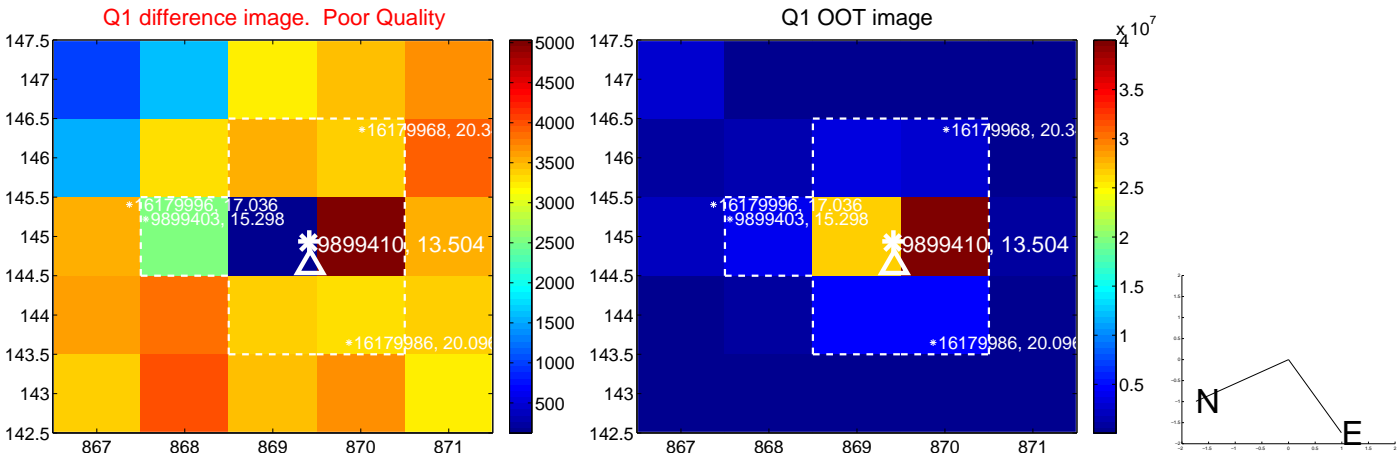
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.060 ± 0.996	1.07	0.848 ± 0.858	0.636 ± 0.566
PRF-fit source offset from KIC position	1.008 ± 0.999	1.01	0.842 ± 0.861	0.554 ± 0.563
photometric centroid source offset	1.44 ± 0.32	4.46	1.43 ± 0.32	0.15 ± 0.33

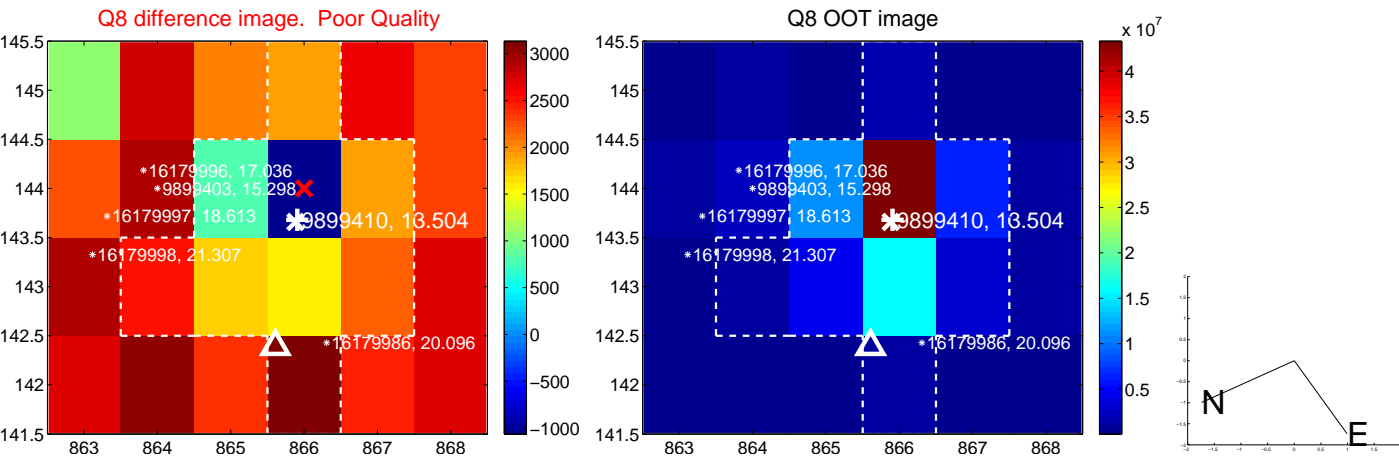
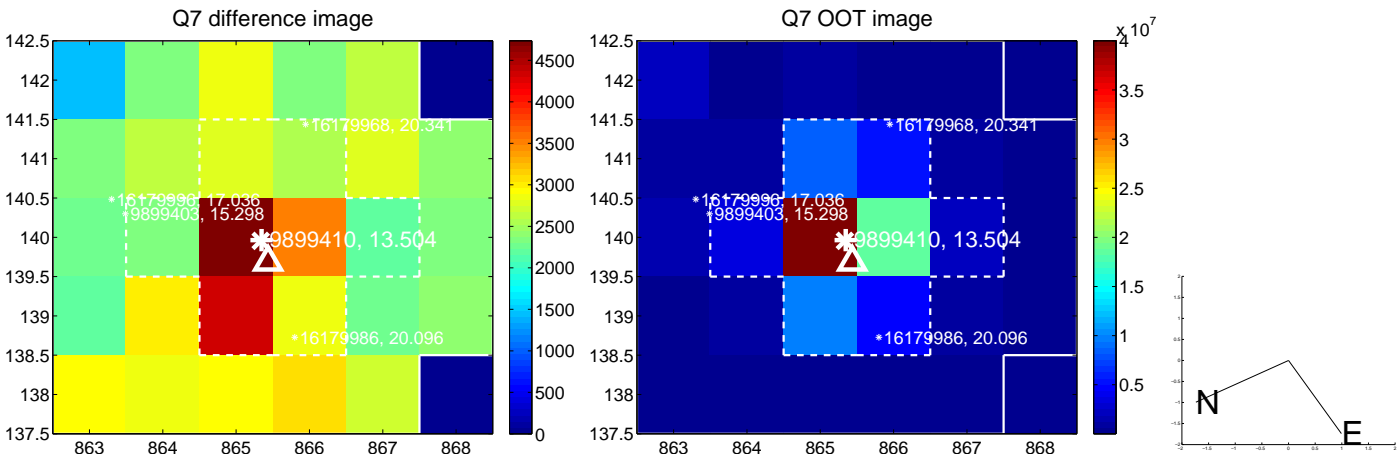
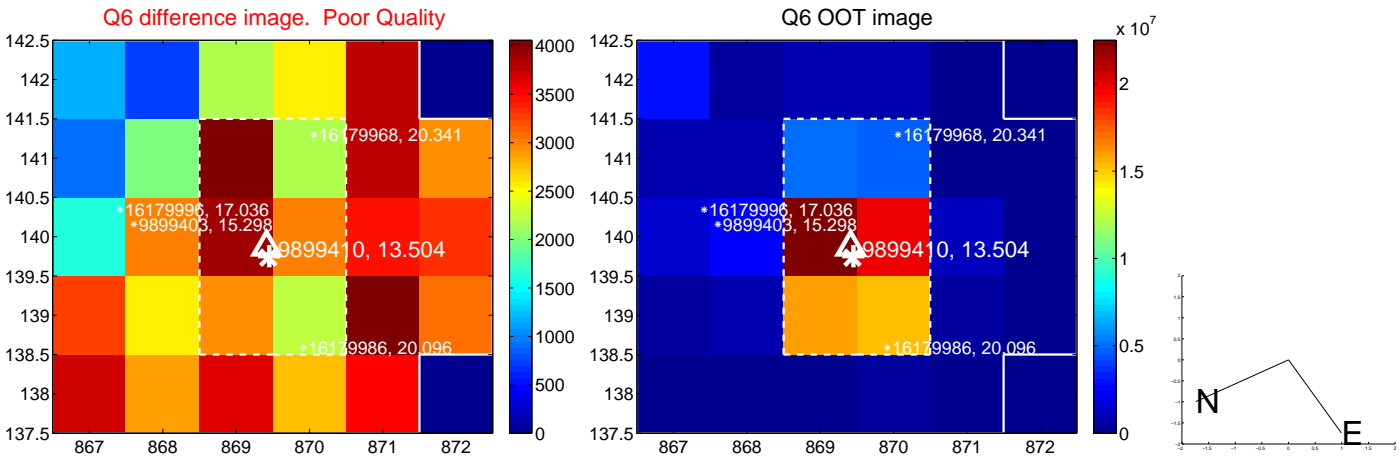
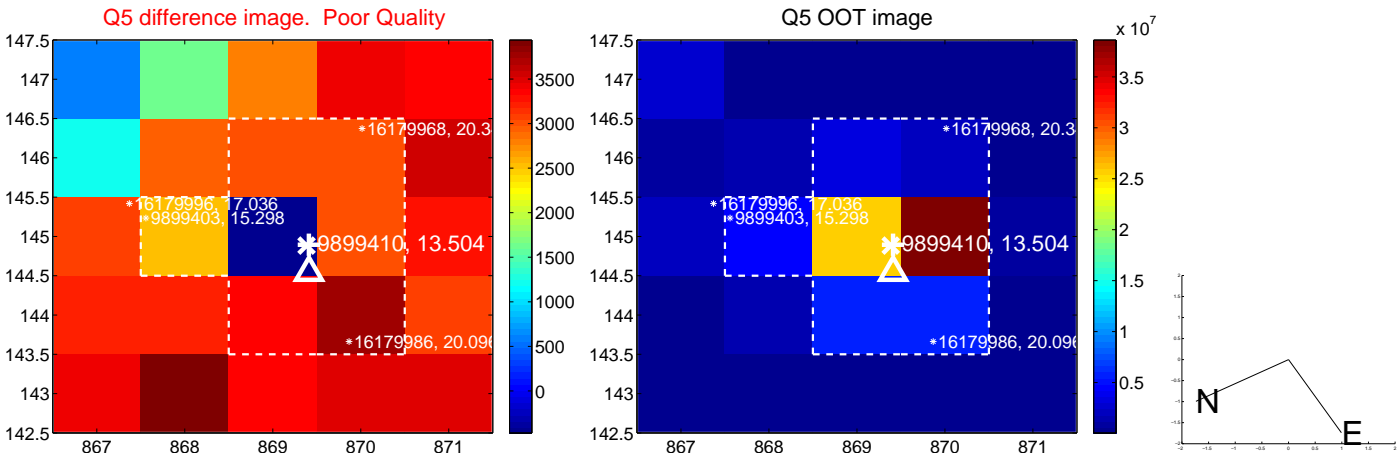


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

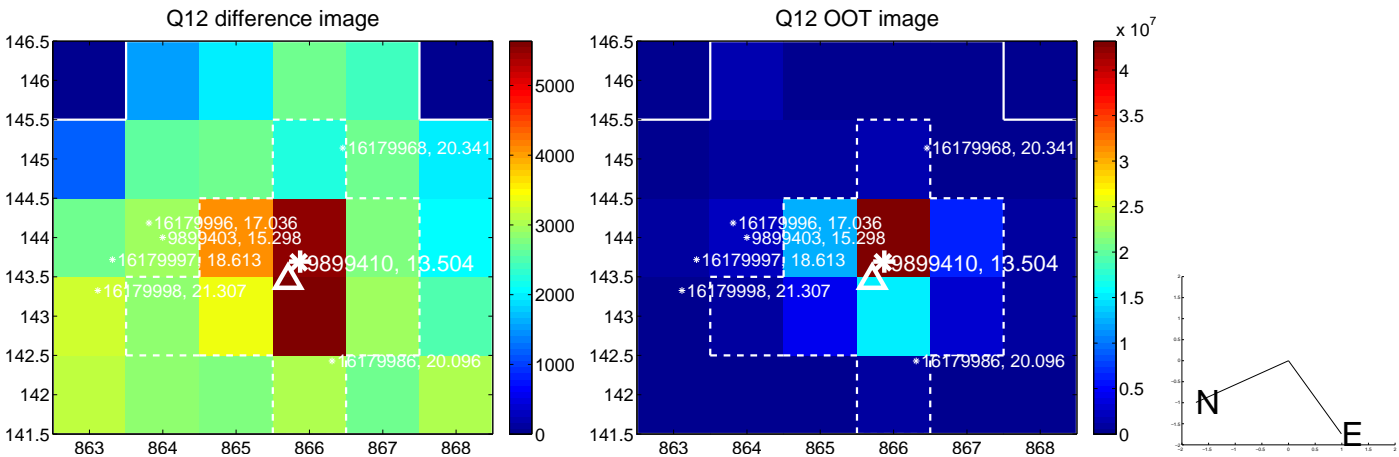
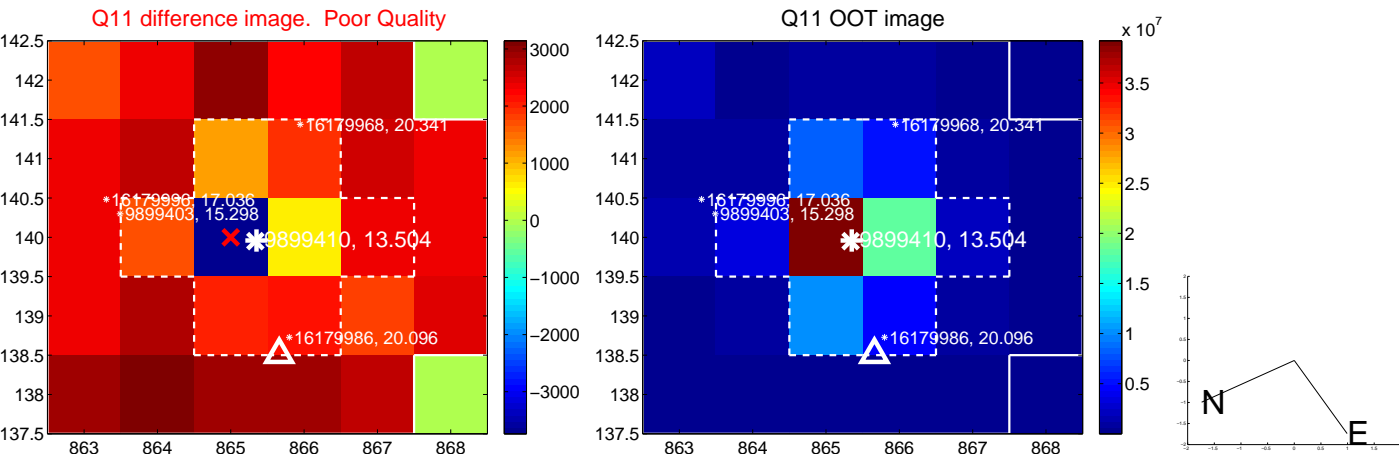
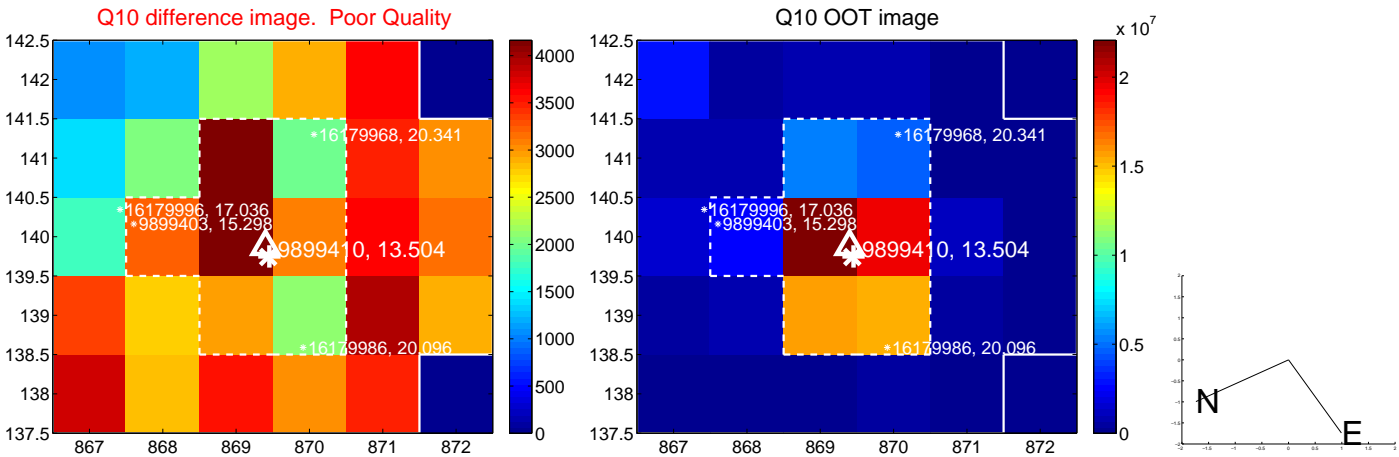
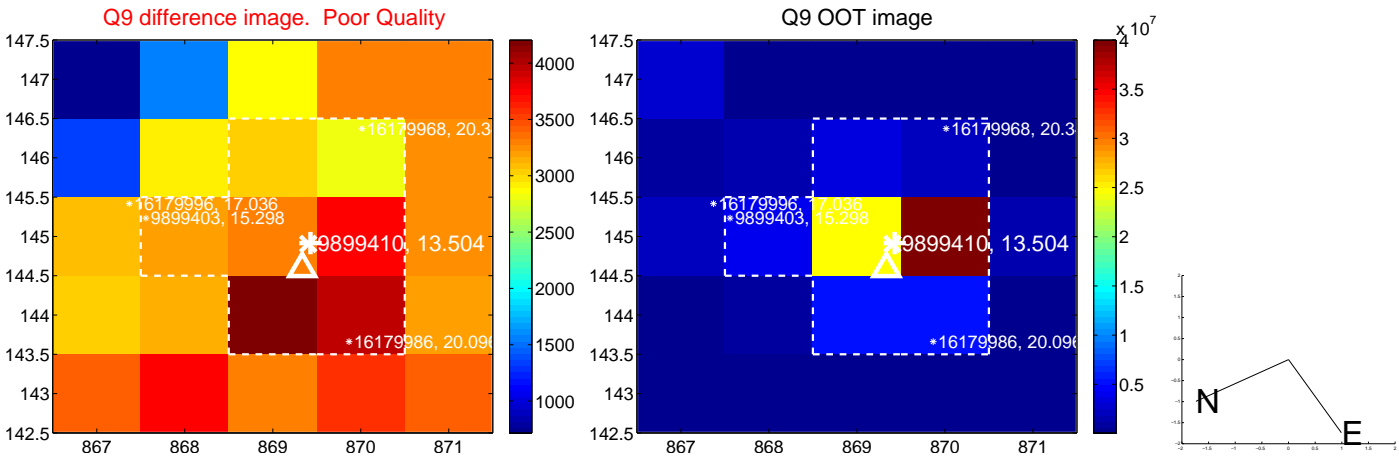
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



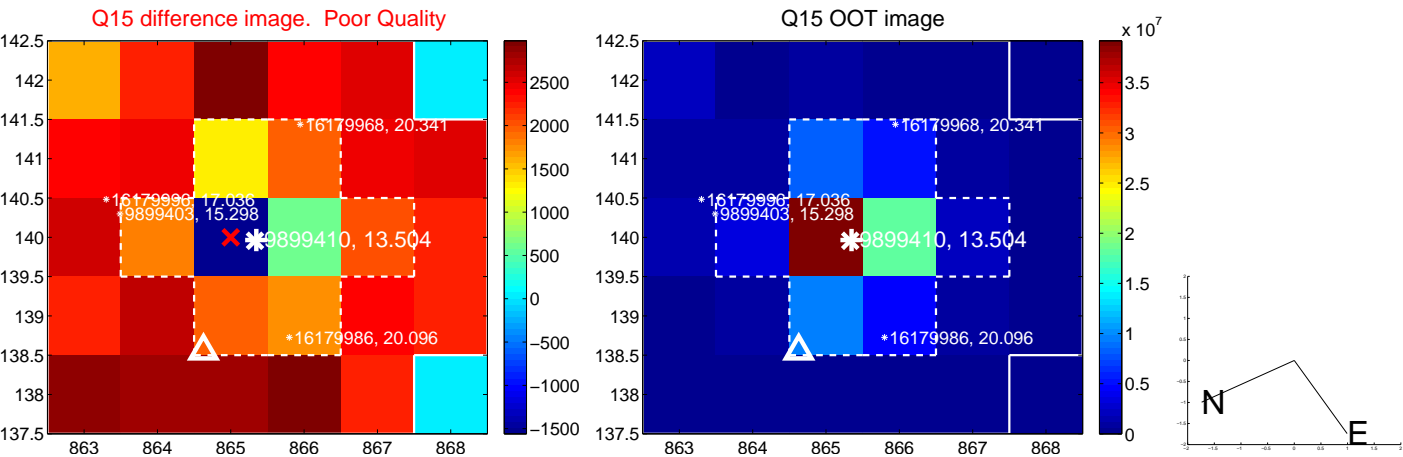
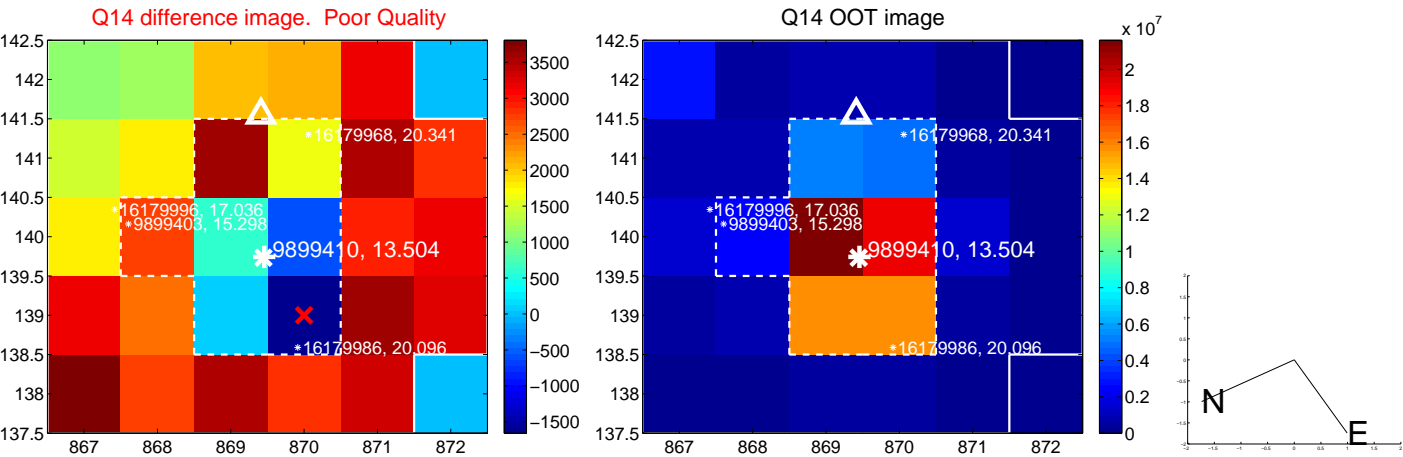
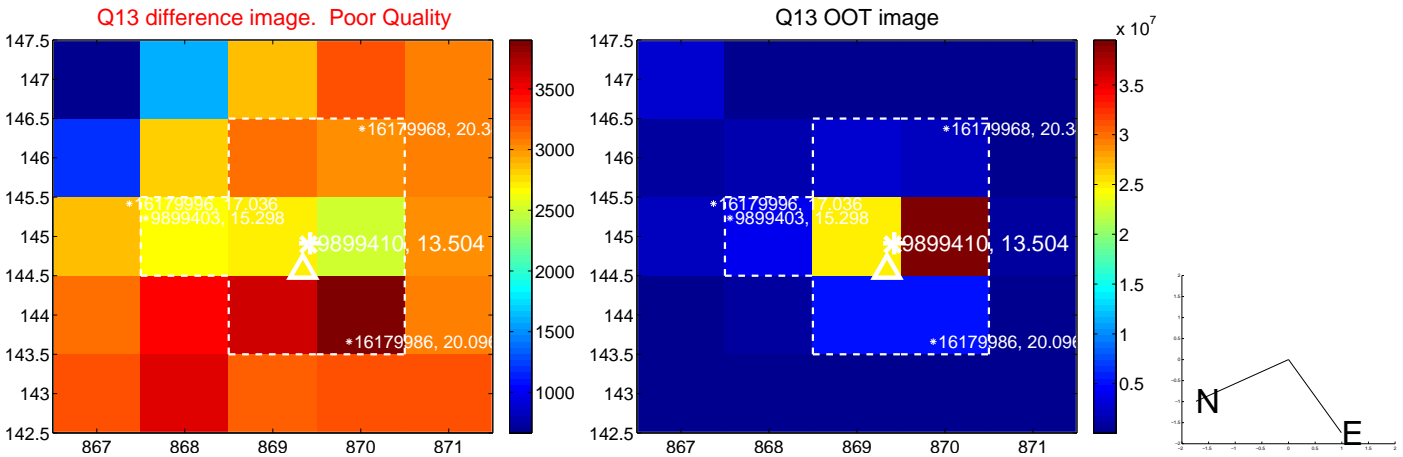
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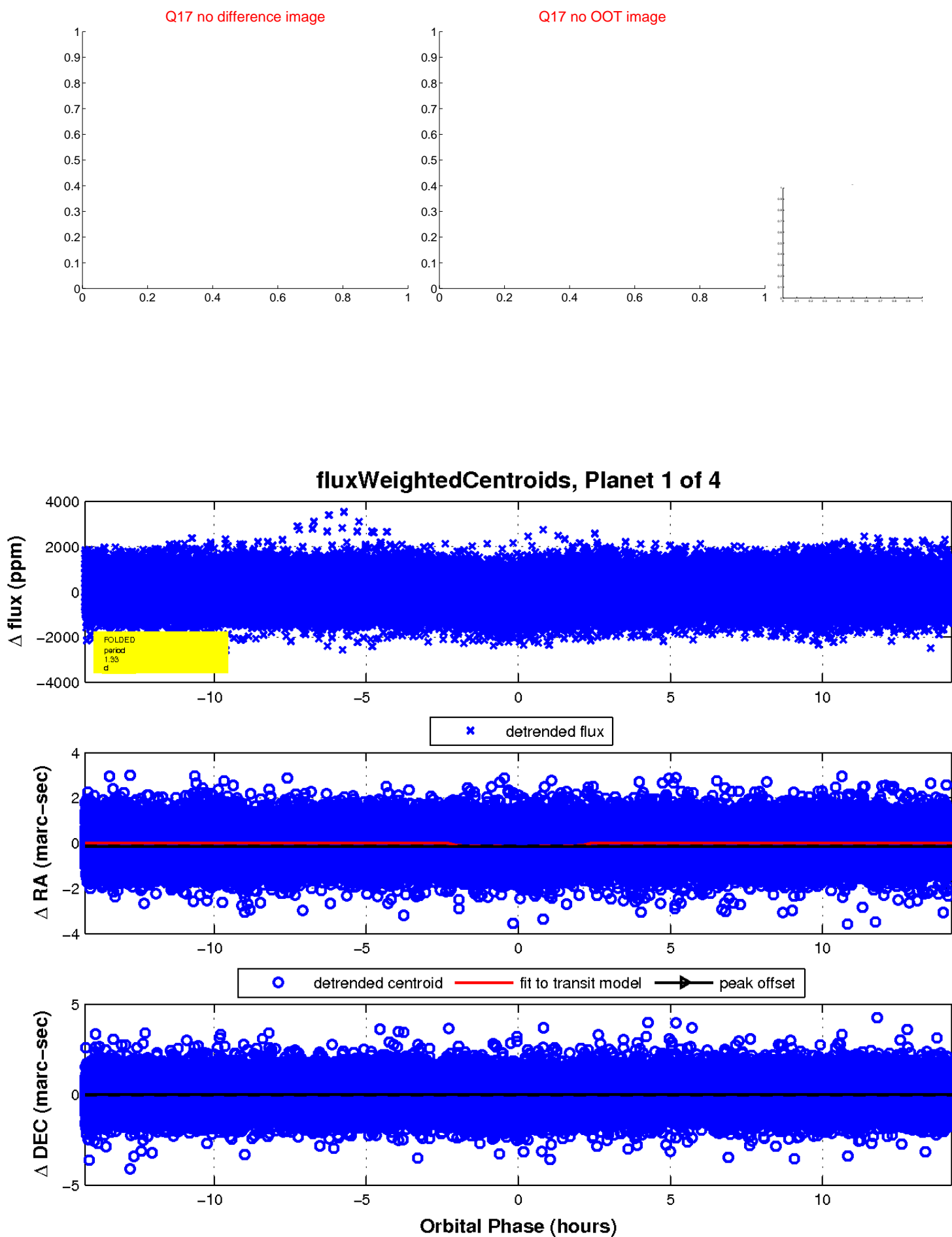
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

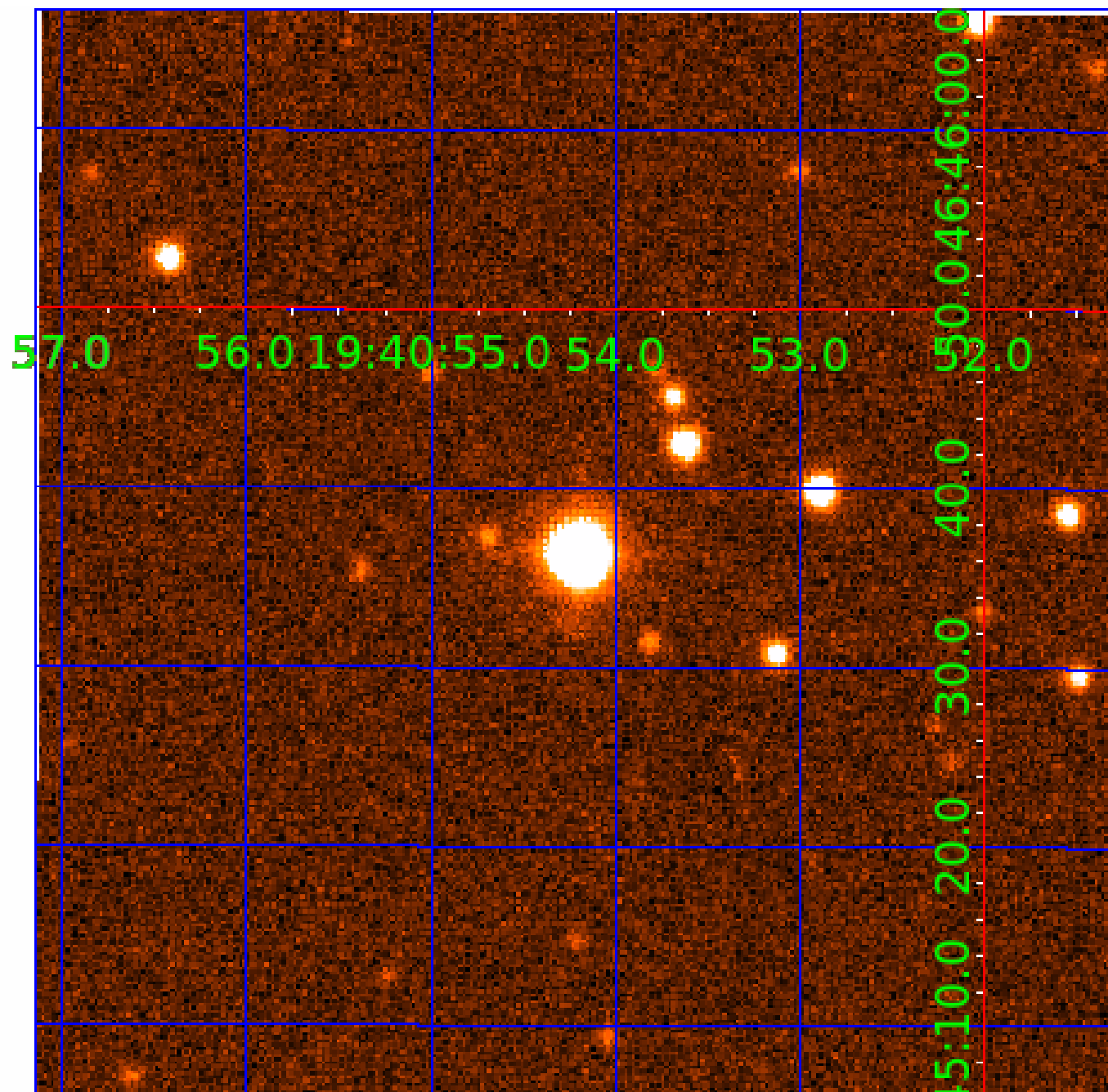


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009899410

Q1-17 DR25 TCE Parameters

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009899410-03	OBS	No	394.428864	269.635463	2272.6	7.143	8.3	8.1	16.49	5154	151.72	79.97
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009899410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009899410-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
009899410-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES

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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.

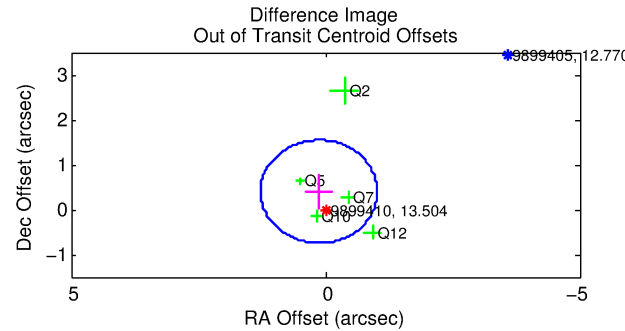
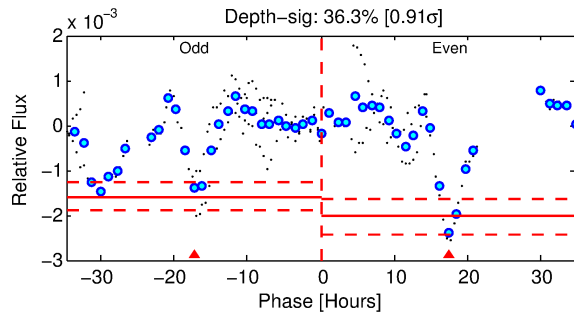
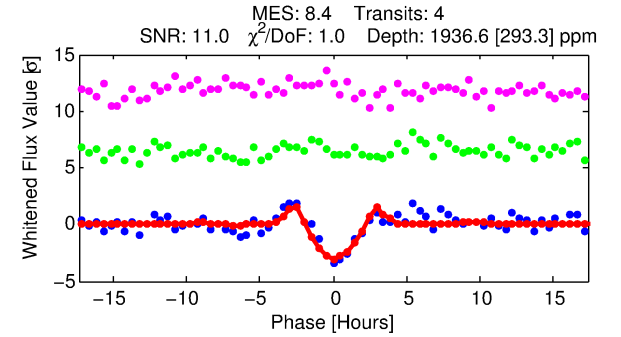
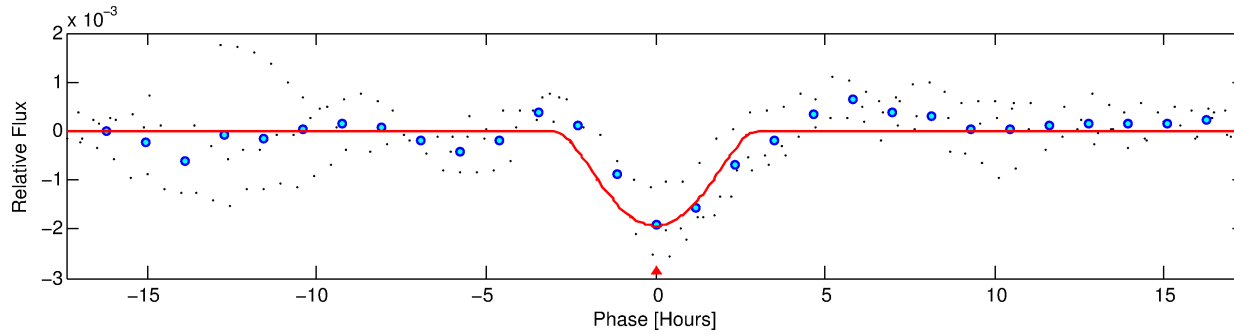
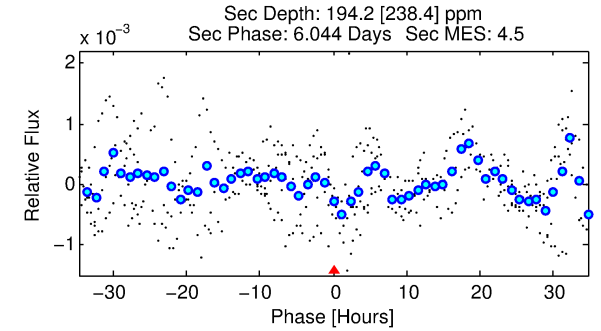
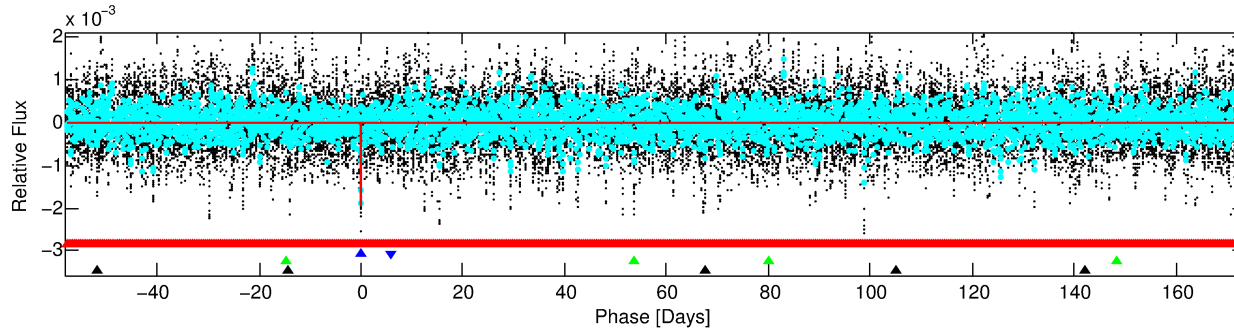
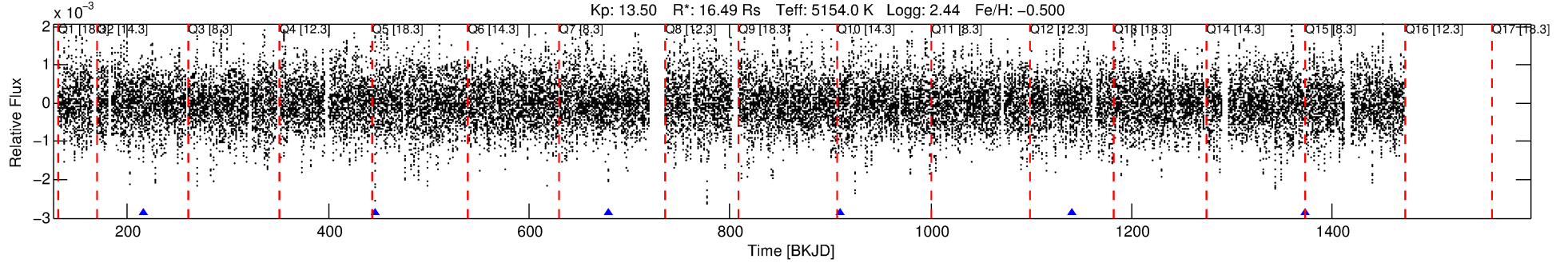
Ephemeris Match Information For 009899410-02

No Significant Match Found

DV One-Page Summary

KIC: 9899410 Candidate: 2 of 4 Period: 231.337 d
KOI: K07245 Corr: No Ephemeris Match

Kp: 13.50 R*: 16.49 Rs Teff: 5154.0 K Logg: 2.44 Fe/H: -0.500



DV Fit Results:

Period = 231.33658 [0.00334] d
Epoch = 216.0596 [0.0073] BKJD
Rp/R* = 0.0781 [0.1257]
a/R* = 122.99 [41.86]
b = 1.00 [0.17]
Seff = 162.89 [53.52]
Teq = 911 [75] K
Rp = 140.49 [230.84] Re
a = 1.0271 [0.2279] AU
Ag = 5.71 [19.71] [0.24σ]
Teffp = 2177 [1880] K [0.67σ]

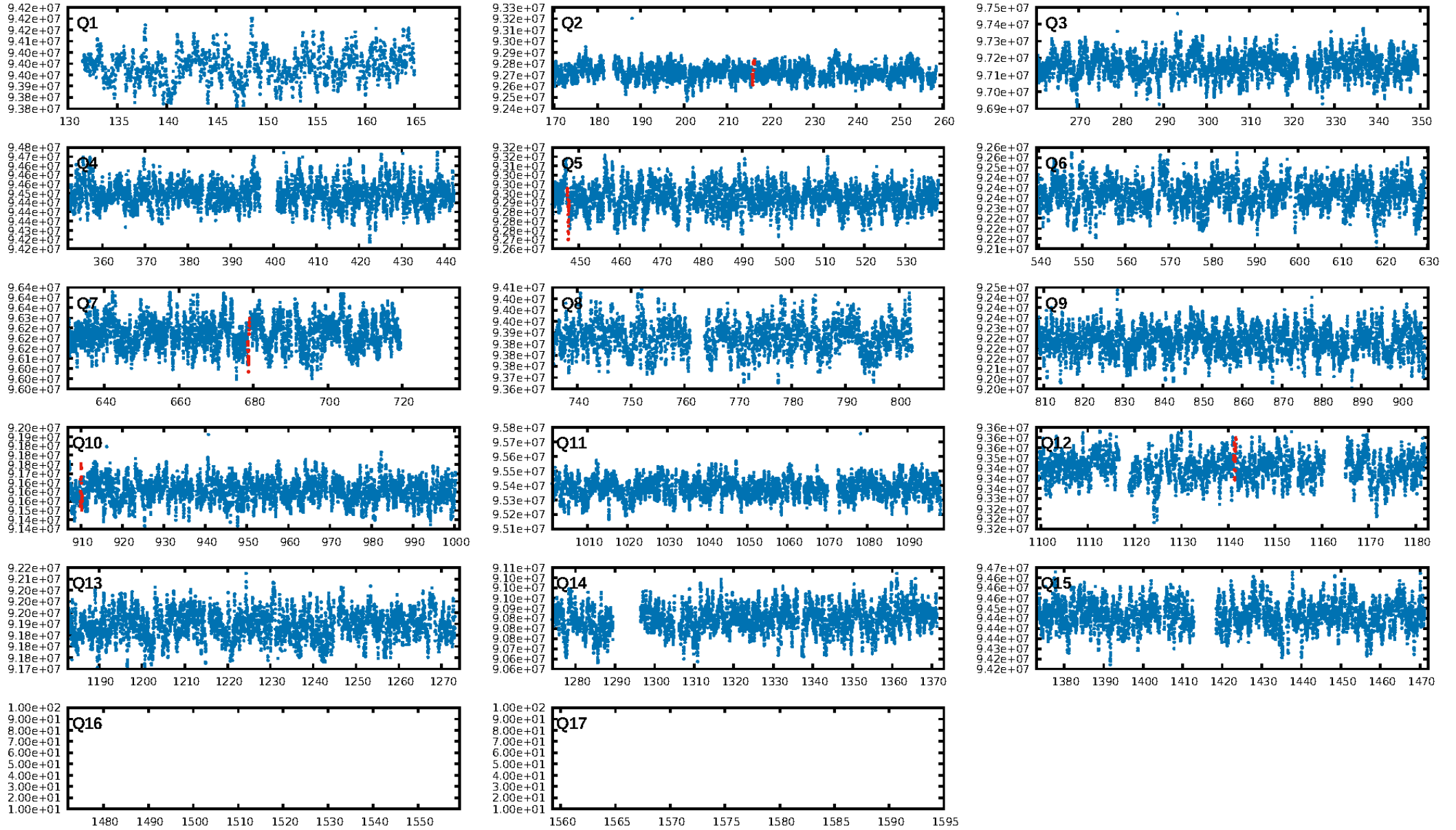
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [736.95σ]
LongPeriod-sig: 100.0% [97.05σ]
ModelChiSquare2-sig: 11.7%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 1.28e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.6834
Centroid-sig: 51.3%
Centroid-so: 0.309 arcsec [1.33σ]
OotOffset-rm: 0.421 arcsec [1.10σ]
OotOffset-st: 2/1/1/1 [5]
KicOffset-rm: 0.316 arcsec [0.66σ]
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DiffImageOverlap-fno: 0.00 [0/5]

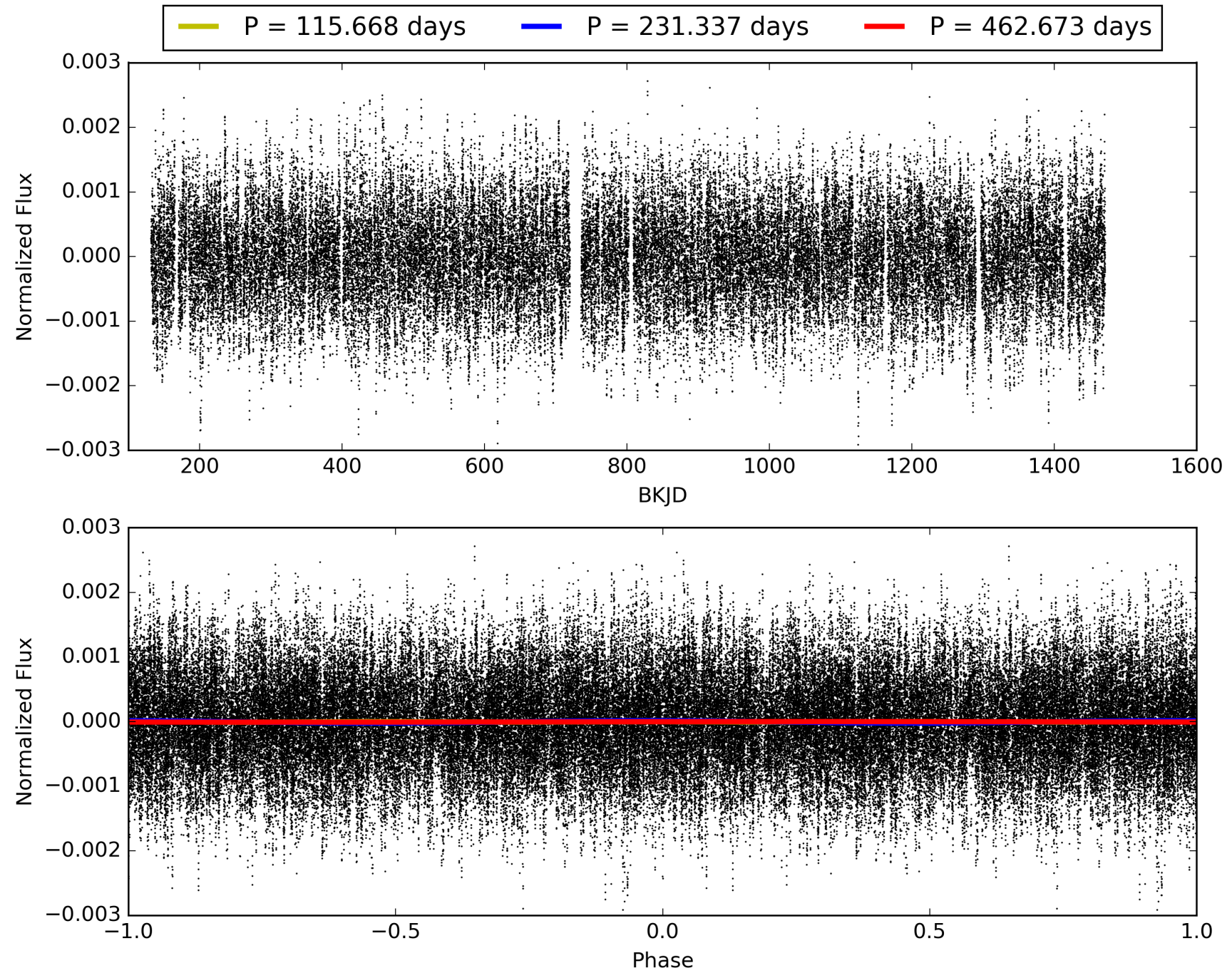
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009899410-02, PDC Light Curves

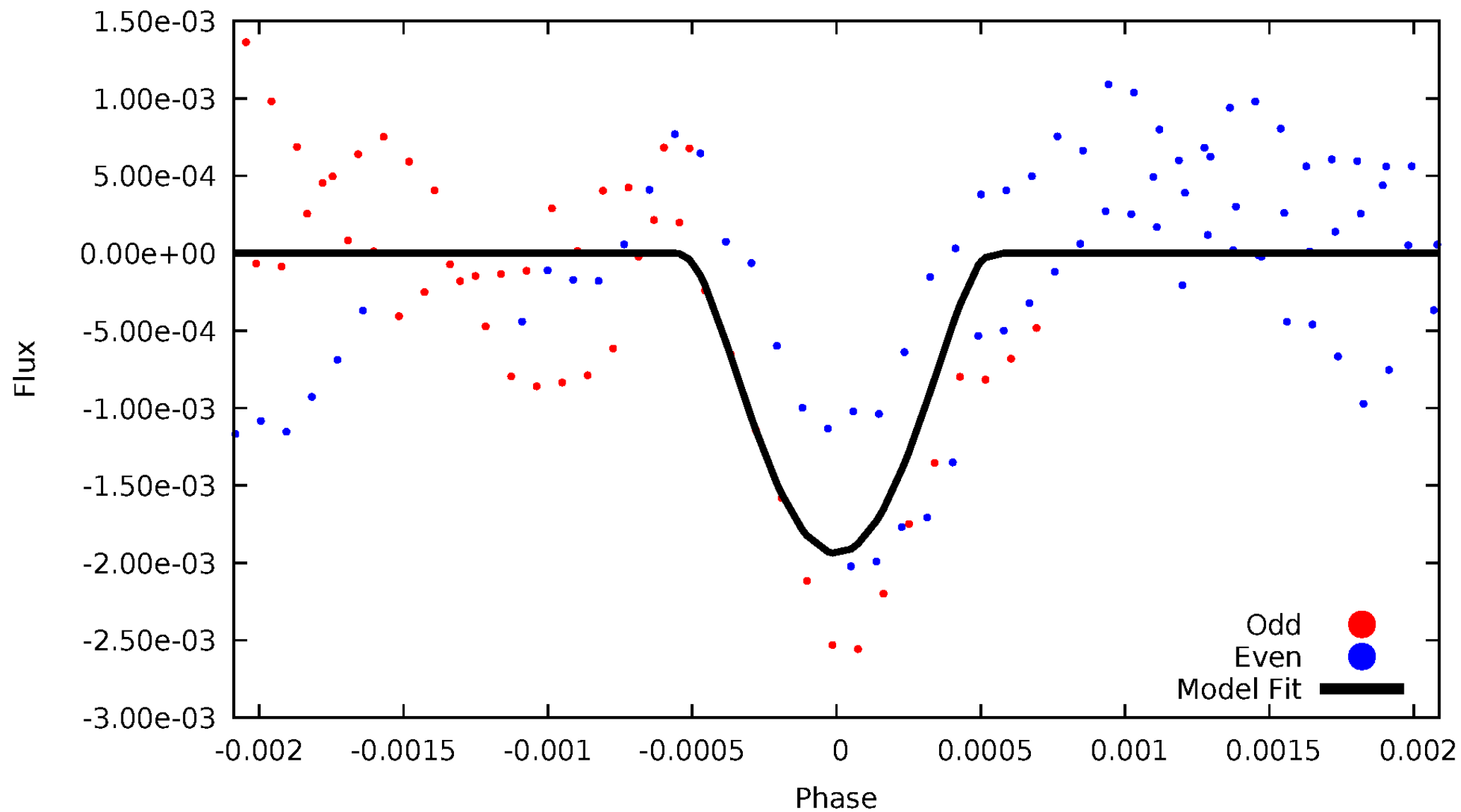


TCE 009899410-02



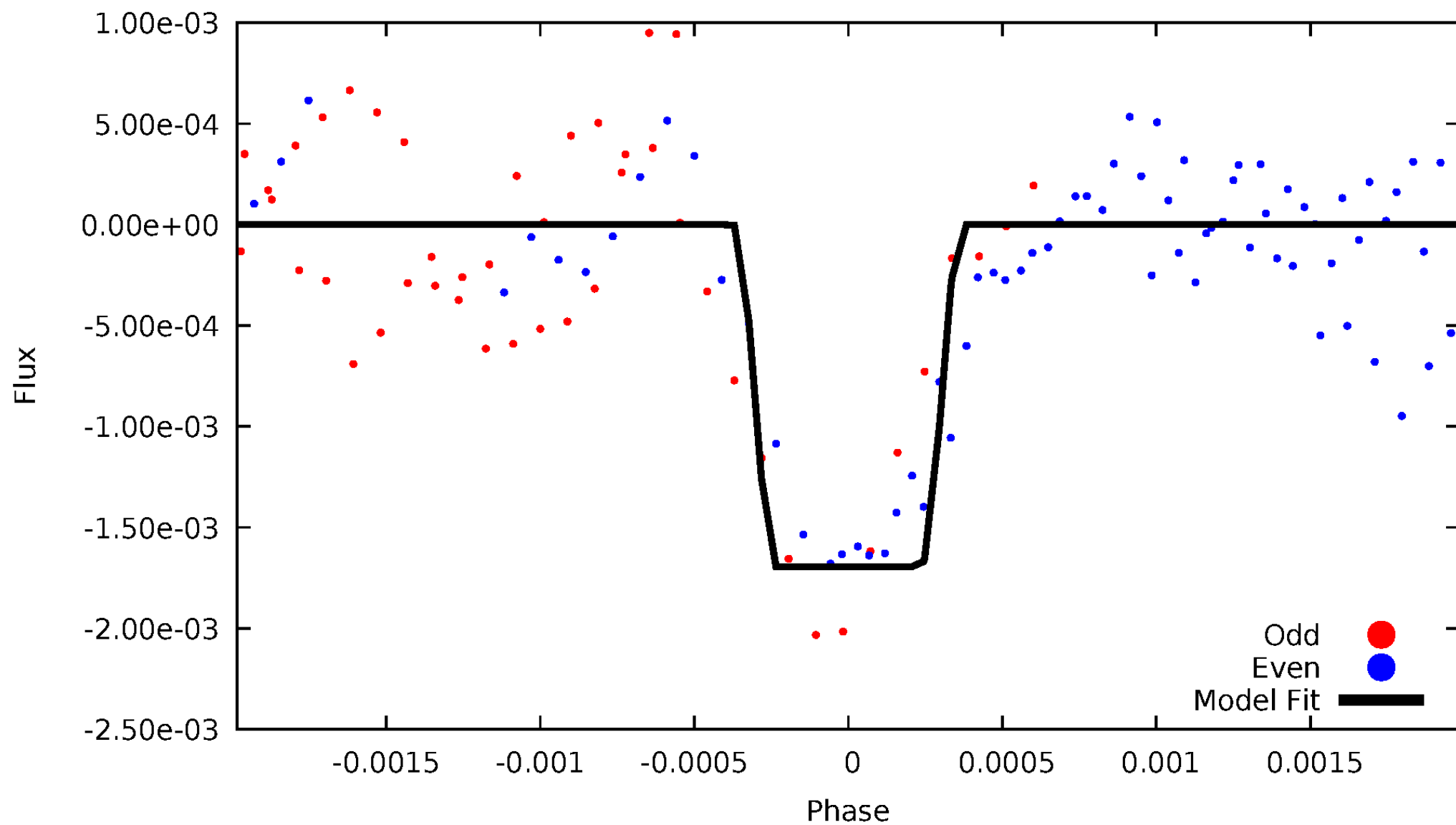
DV Odd/Even

TCE 009899410-02



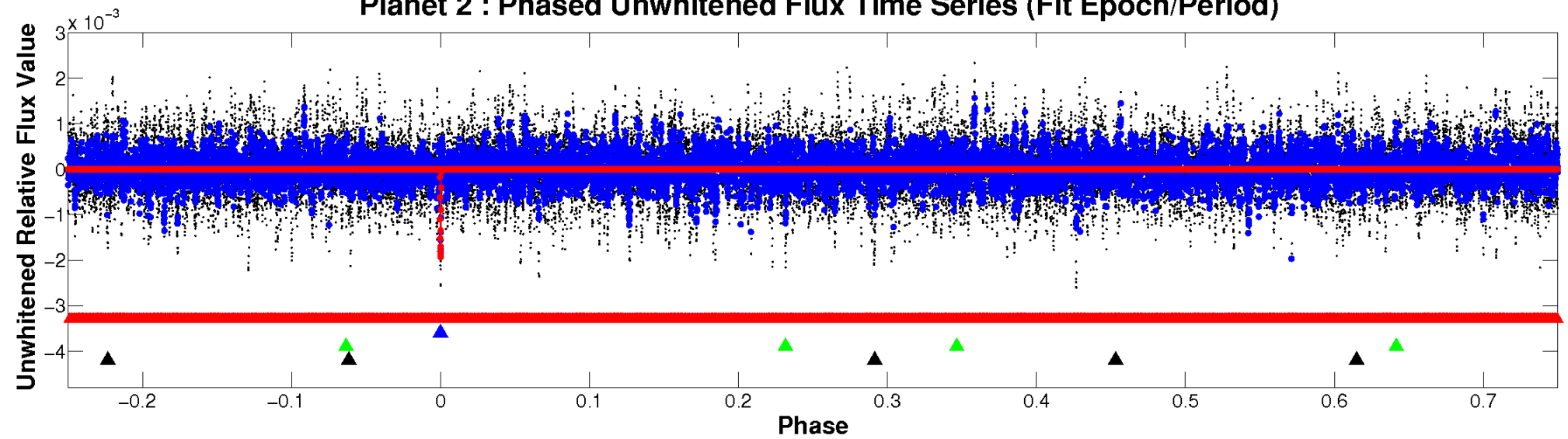
ALT Odd/Even

TCE 009899410-02

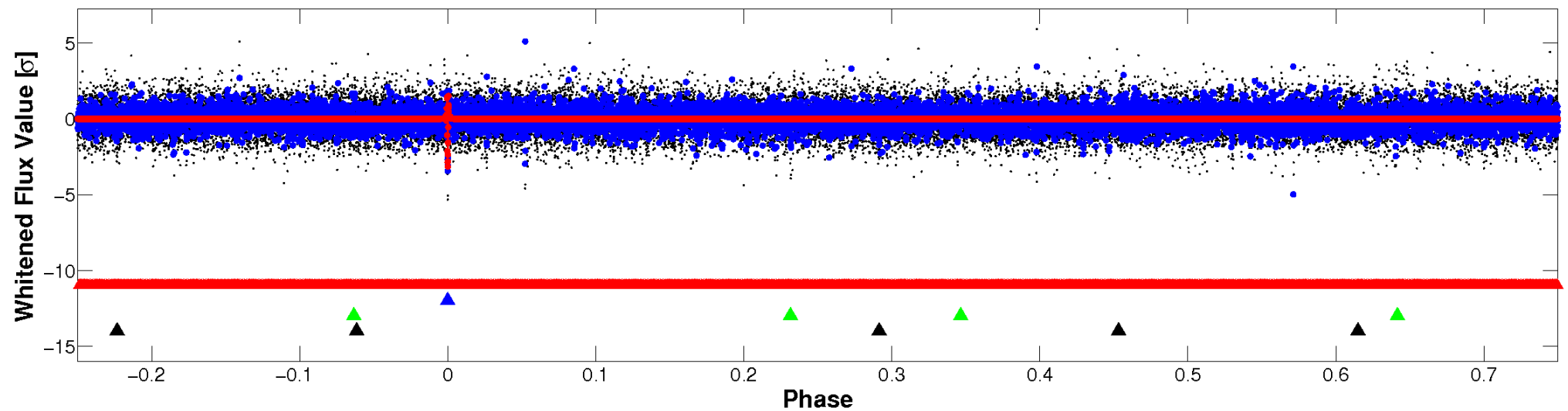


Non-Whitened Vs. Whitened Light Curve

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

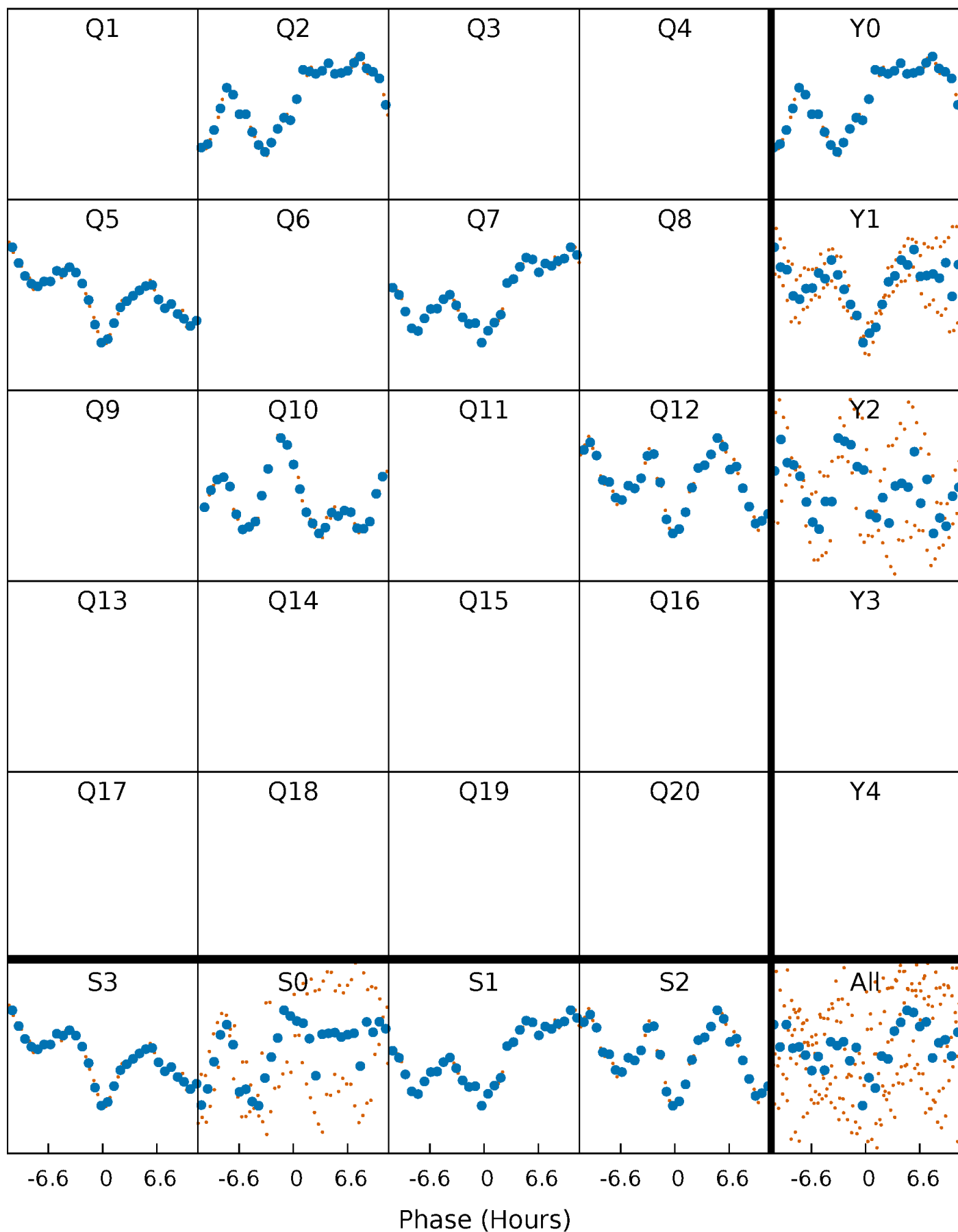


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



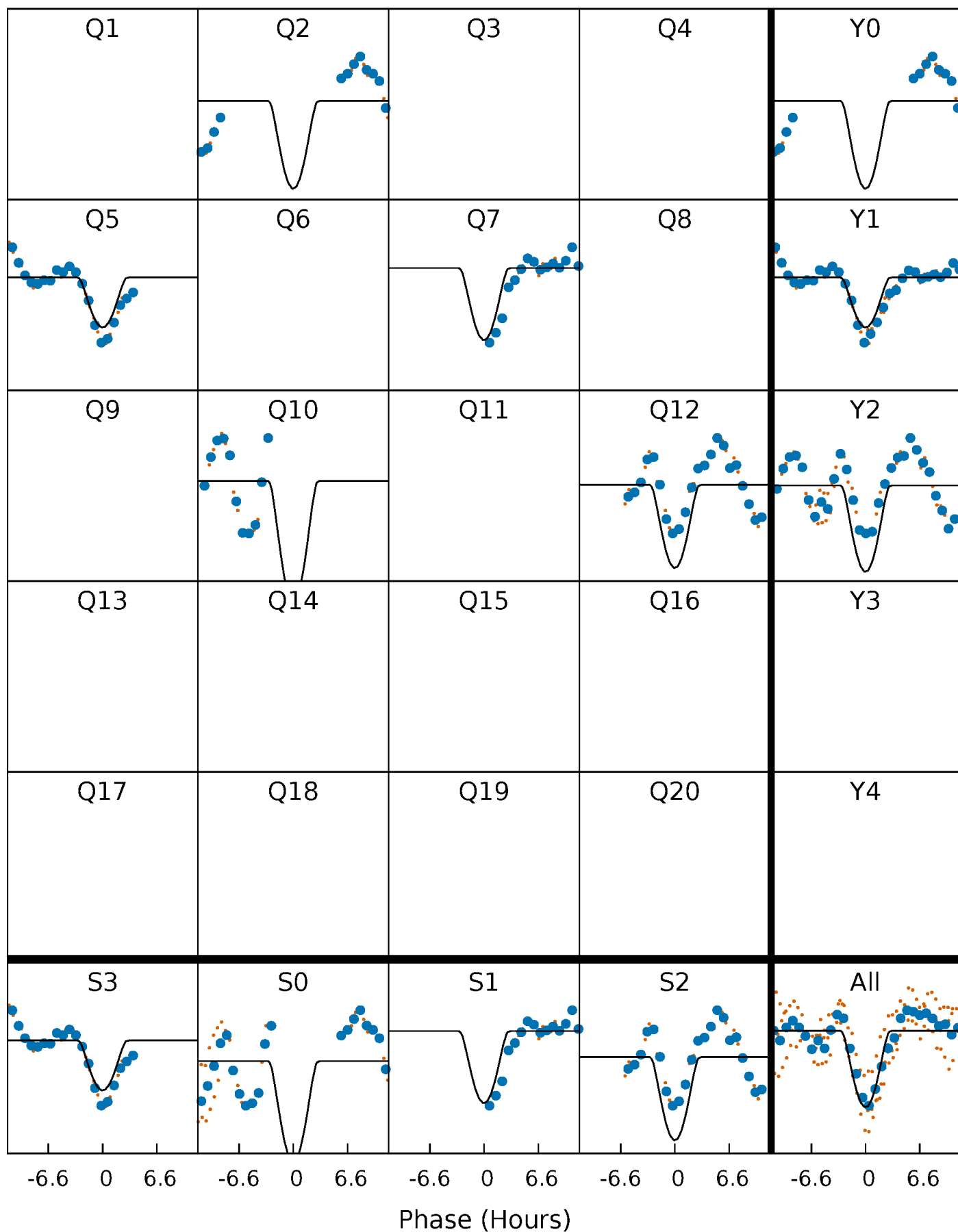
PDC Quarter-Phased Transit Curves

TCE 009899410-02 P=231.336580 Days $T_0=216.059590$ (BKJD)



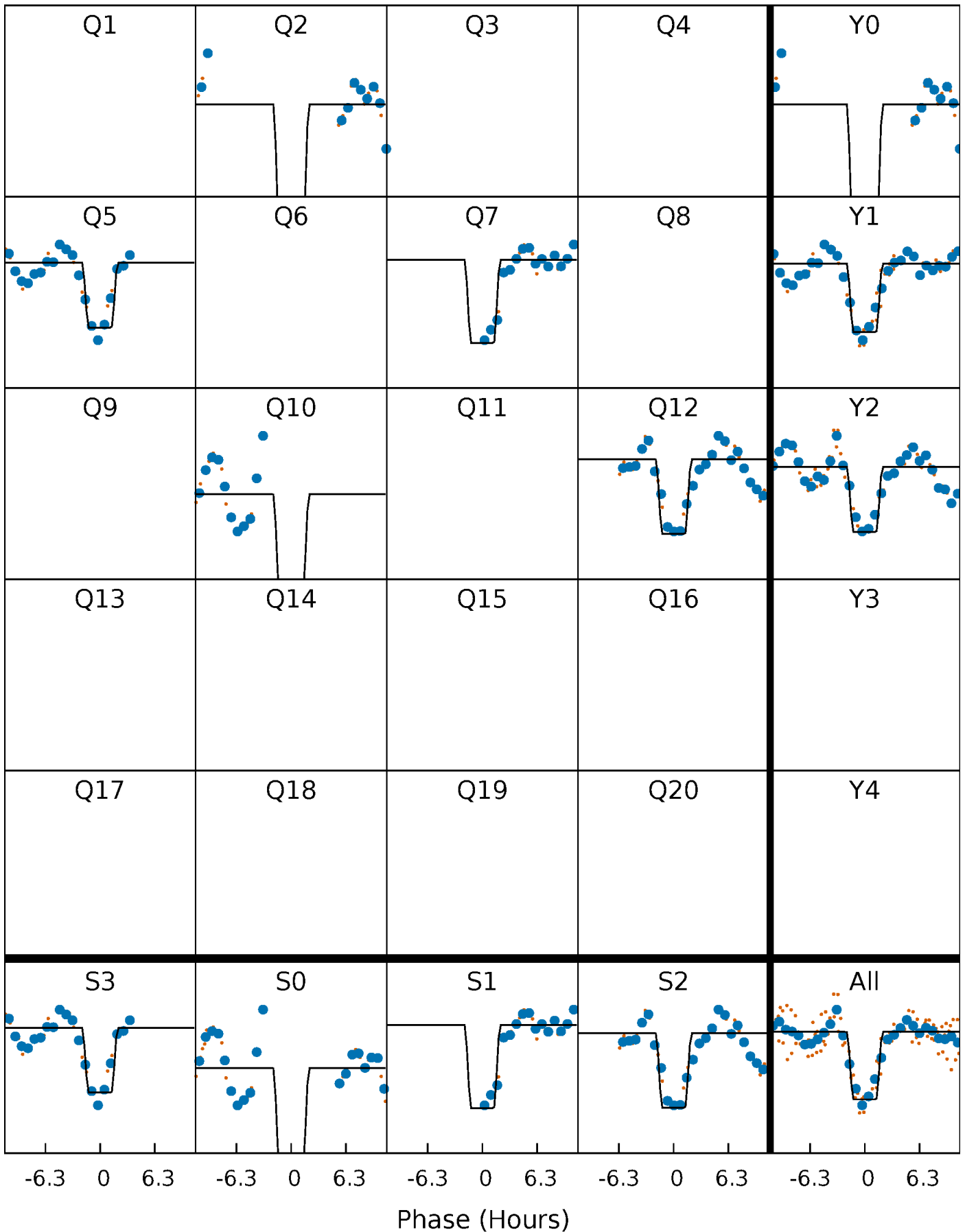
DV Quarter-Phased Transit Curves

TCE 009899410-02 P=231.336580 Days $T_0=216.059590$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

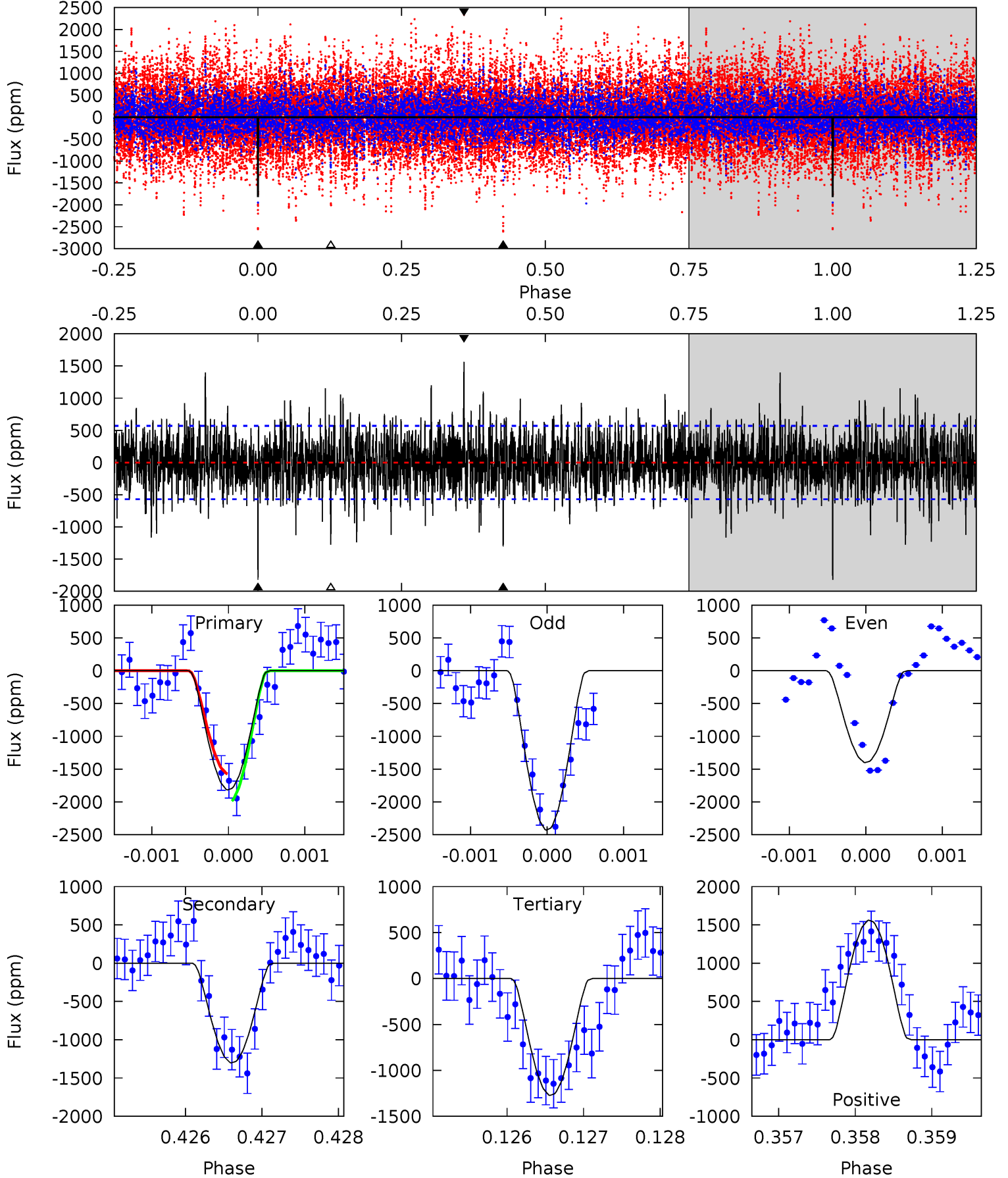
TCE 009899410-02 P=231.331726 Days $T_0=216.085641$ (BKJD)



DV Model-Shift Uniqueness Test

009899410-02, P = 231.336580 Days, E = 216.059590 Days

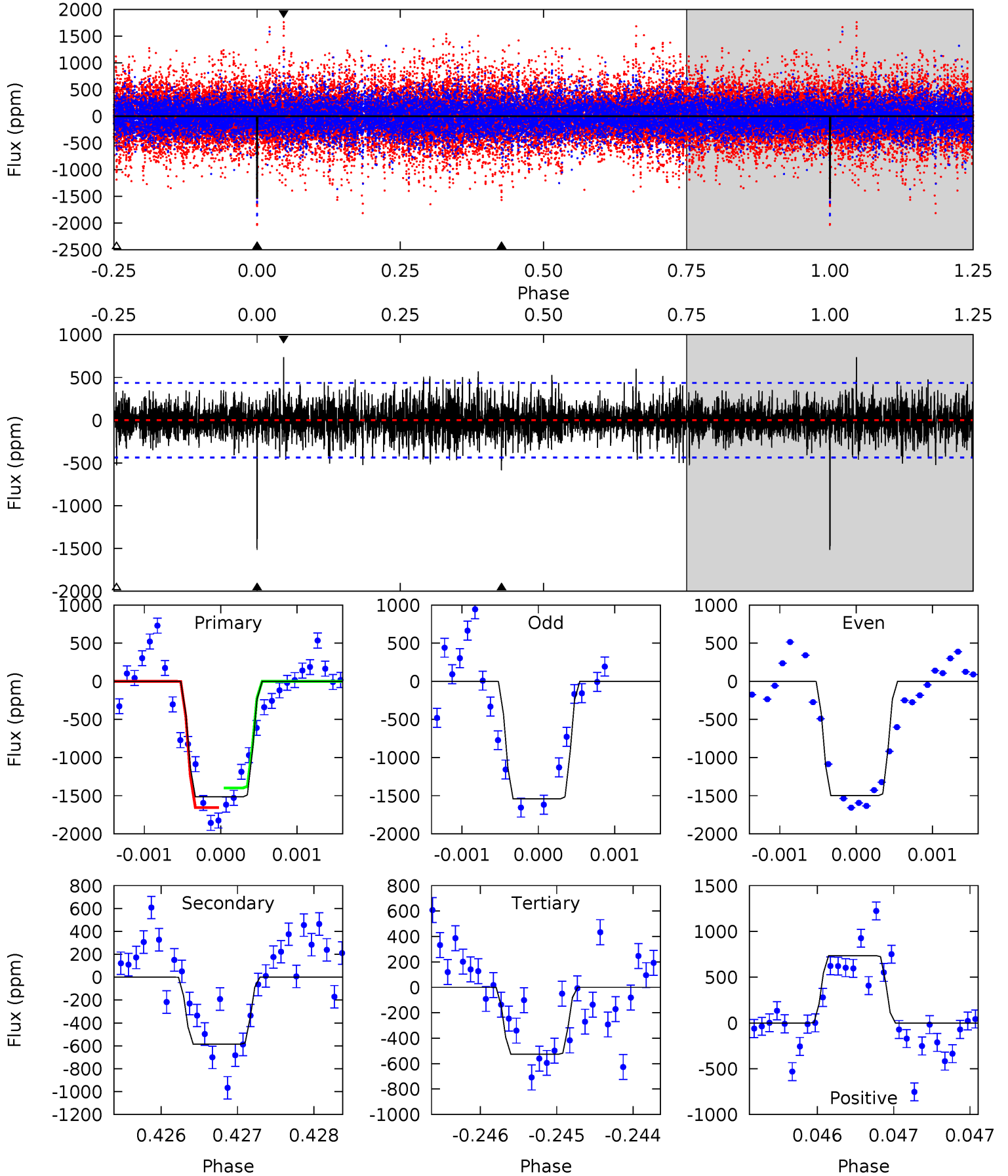
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	12.4	12.2	14.9	5.44	3.27	3.12	5.21	2.45	0.28	-2.47	4.81	0.80	0.46	1.96



Alt Model-Shift Uniqueness Test

009899410-02, P = 231.331726 Days, E = 216.085641 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	7.38	6.65	9.28	5.51	3.39	1.85	12.5	9.85	0.73	-1.90	0.25	0.99	0.33	1.61



Stellar Parameters For KIC 009899410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5154^{+153}_{-307}	$2.435^{+0.033}_{-0.030}$	$-0.500^{+0.150}_{-0.300}$	$16.486^{+0.962}_{-5.452}$	$2.700^{+0.250}_{-1.502}$	$0.001^{+0.000}_{-0.000}$
	+3%/-6%	+1%/-1%	+30%/-60%	+6%/-33%	+9%/-56%	+52%/-10%
Source	PHO1	AST9	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009899410-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1302 ± 105	$214.31^{+200.65}_{-141.46}$	1271^{+46}_{-77}	3309^{+1526}_{-592}	17^{+128}_{-12}
Alt.	-584 ± 79	$174.99^{+183.79}_{-116.29}$	1268^{+49}_{-76}	3104^{+1399}_{-595}	11^{+85}_{-8}

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 $A_{obs} \gg 1.0$

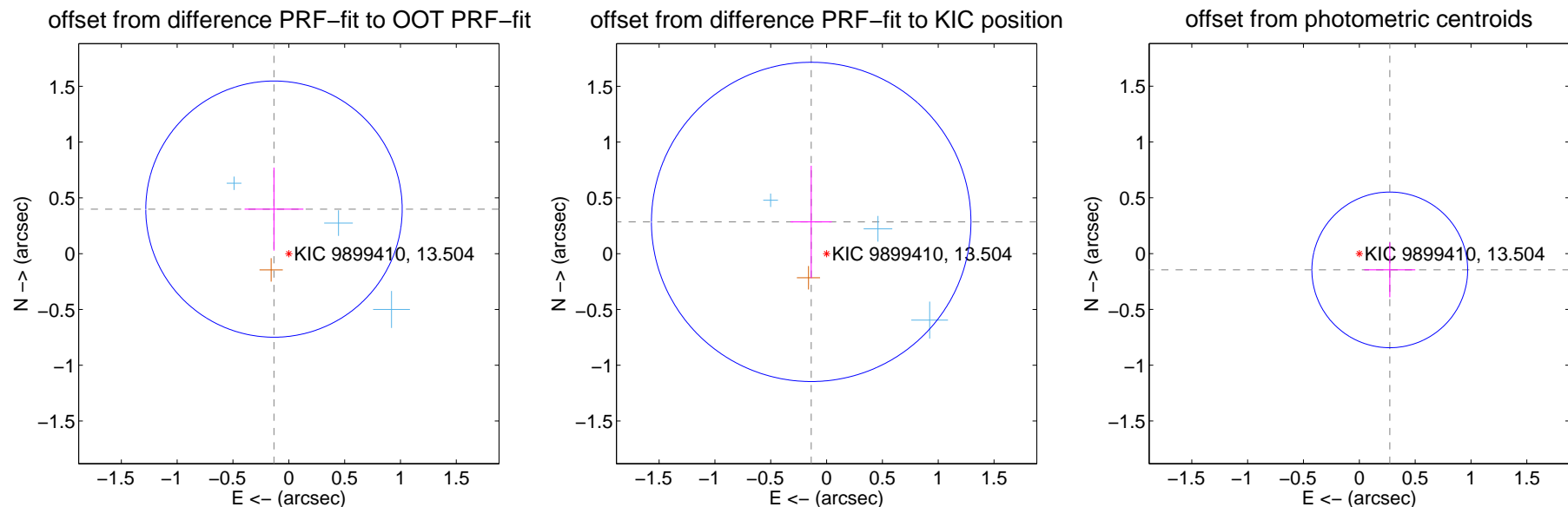
DV Centroid Data

Supplemental centroid analysis for 009899410-02. Kepler magnitude: 13.50. Transit SNR 11.03

There are 4 quarters with good PRF difference image offsets

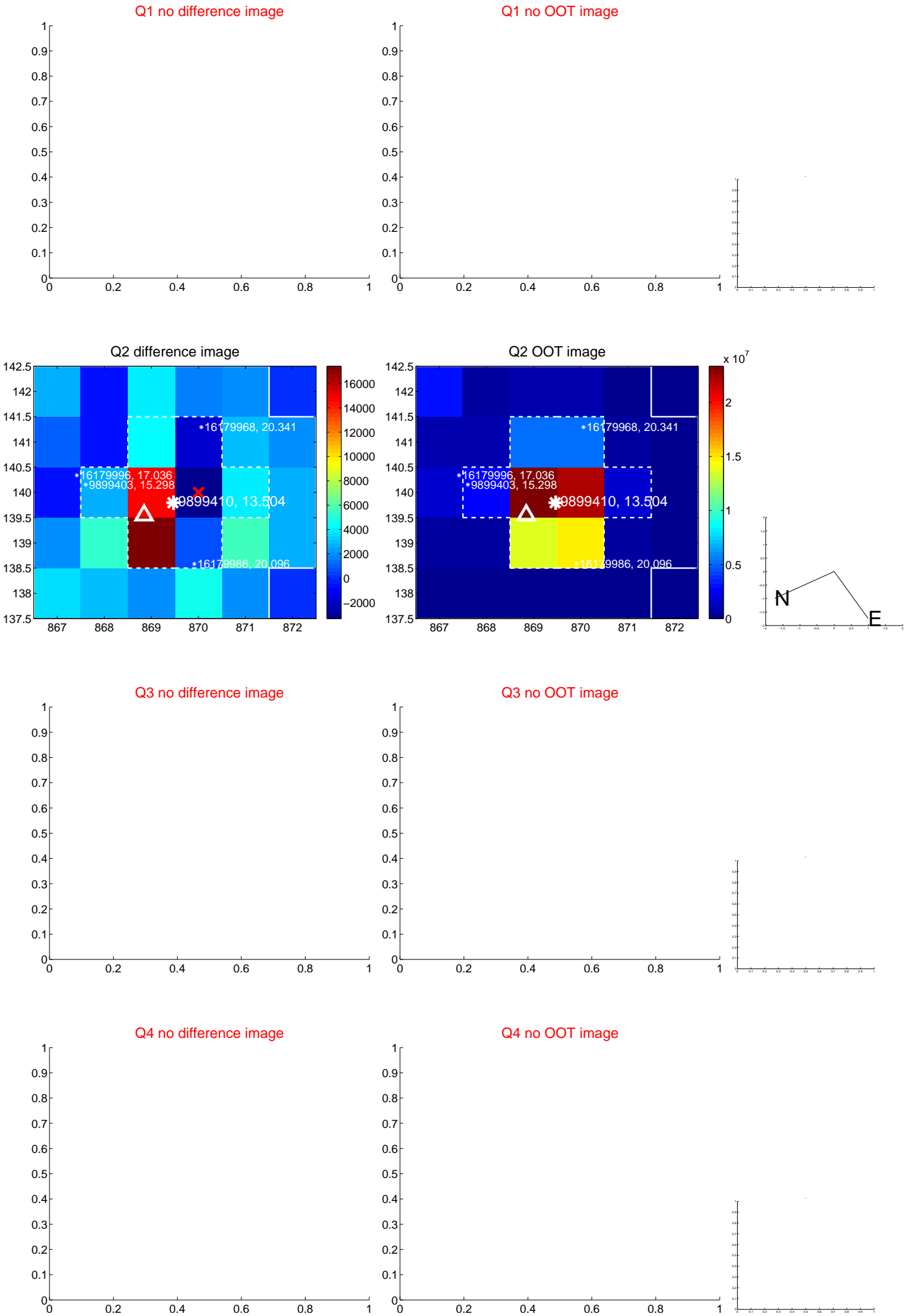
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.421 ± 0.383	1.10	0.133 ± 0.263	0.399 ± 0.372
PRF-fit source offset from KIC position	0.316 ± 0.477	0.66	0.138 ± 0.185	0.285 ± 0.503
photometric centroid source offset	0.31 ± 0.23	1.33	-0.27 ± 0.23	-0.15 ± 0.25

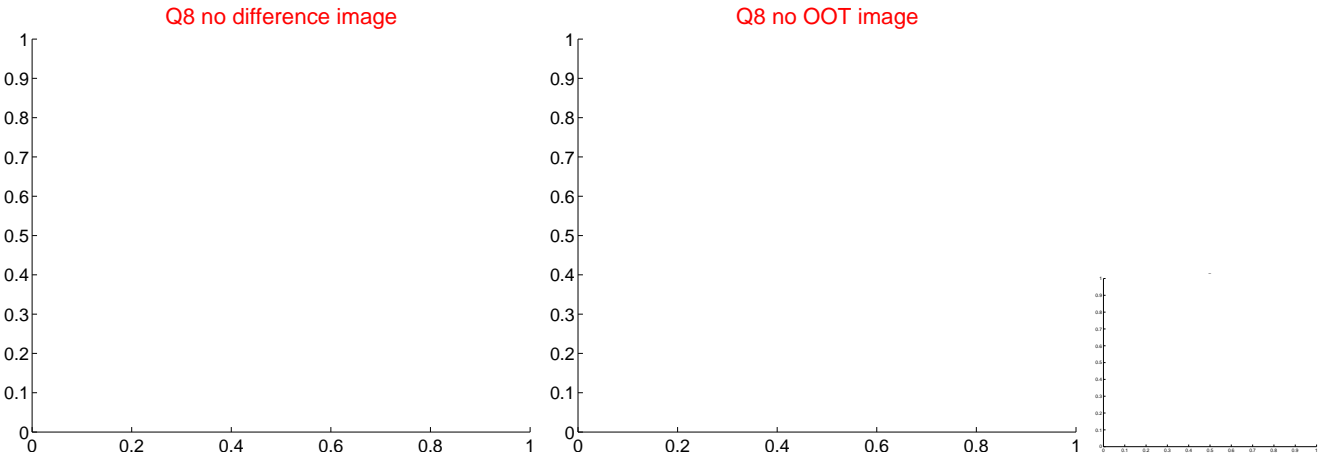
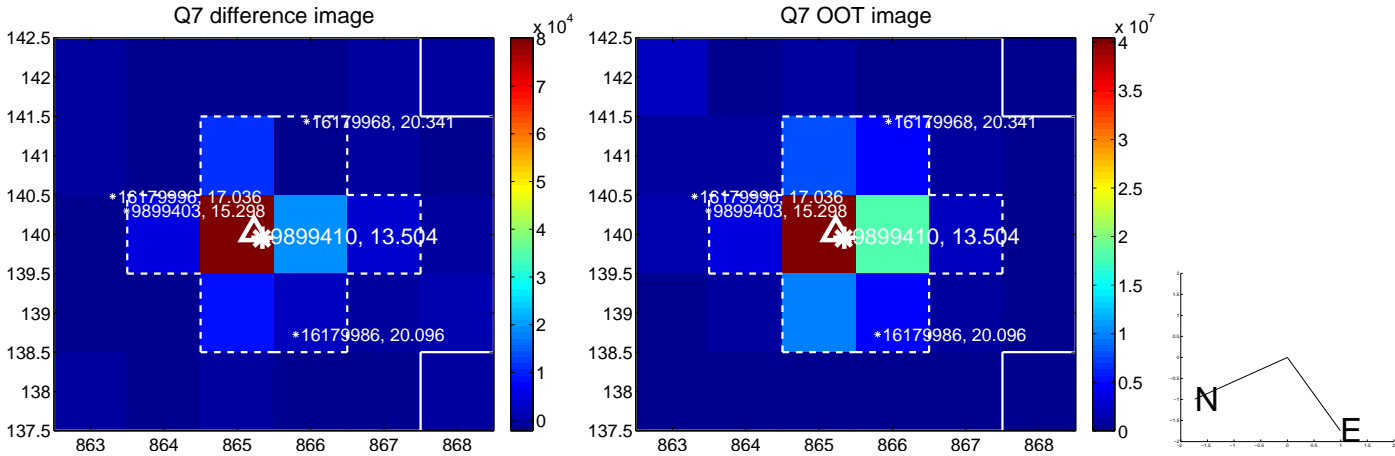
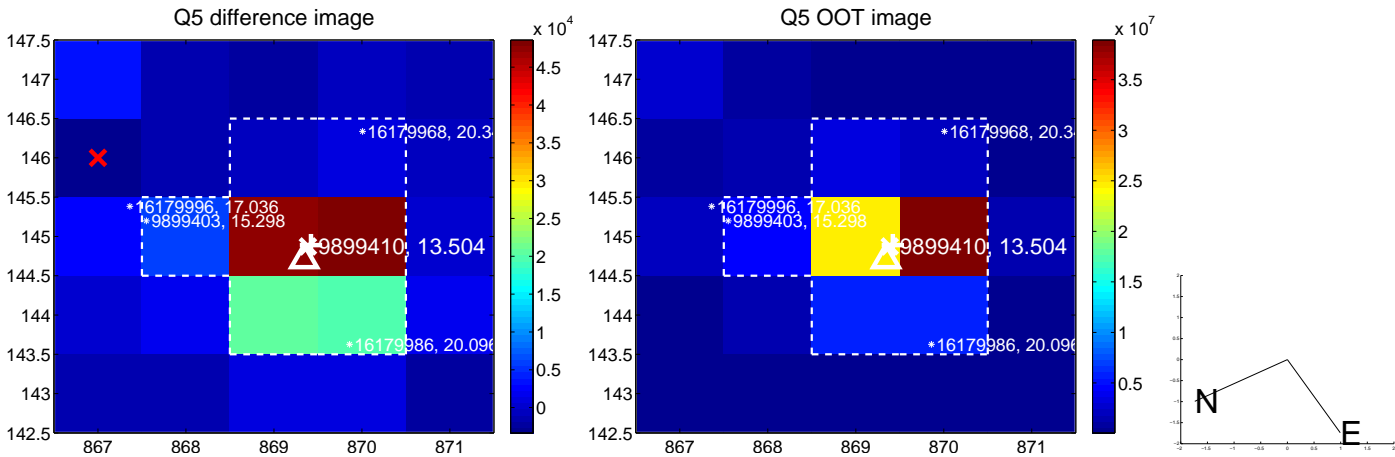


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

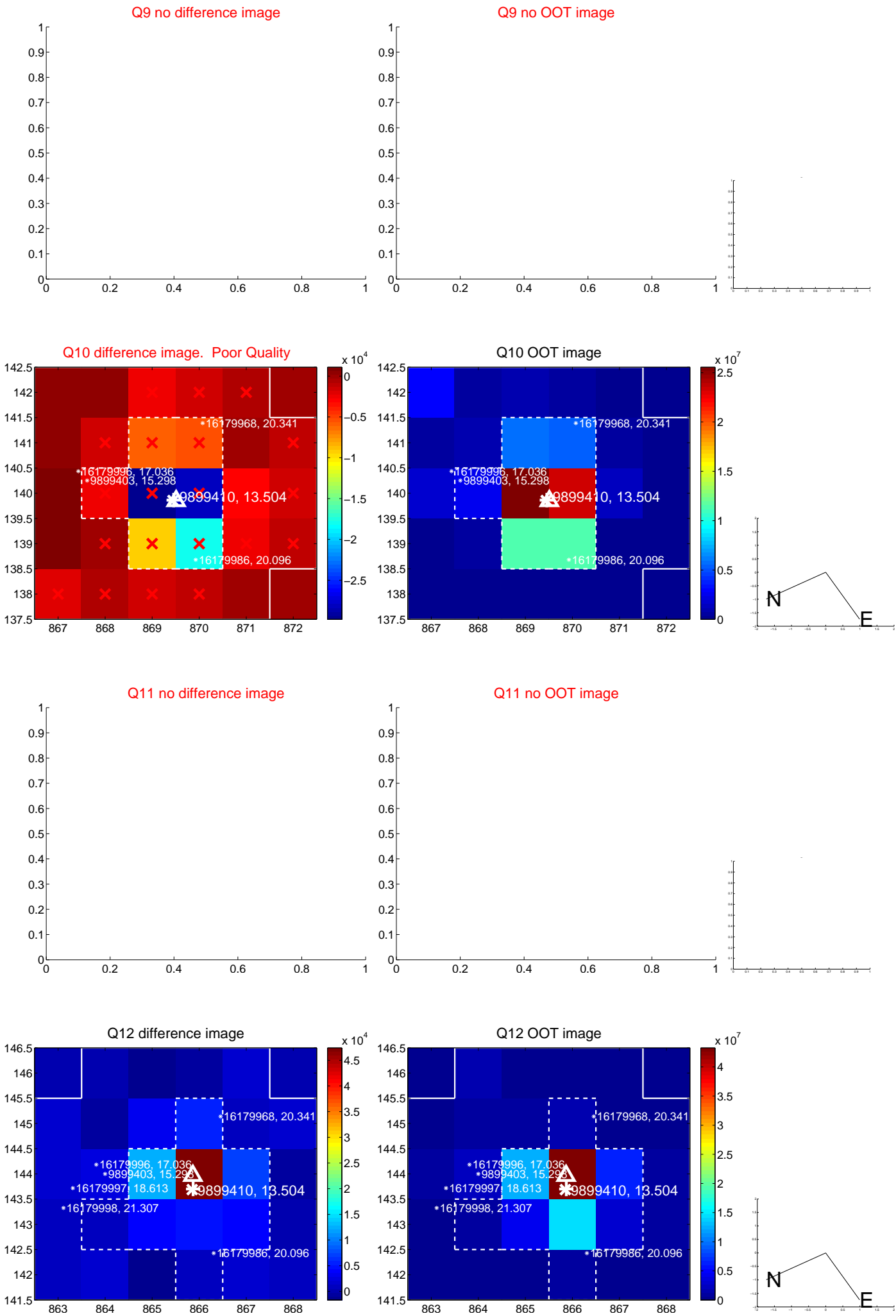
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



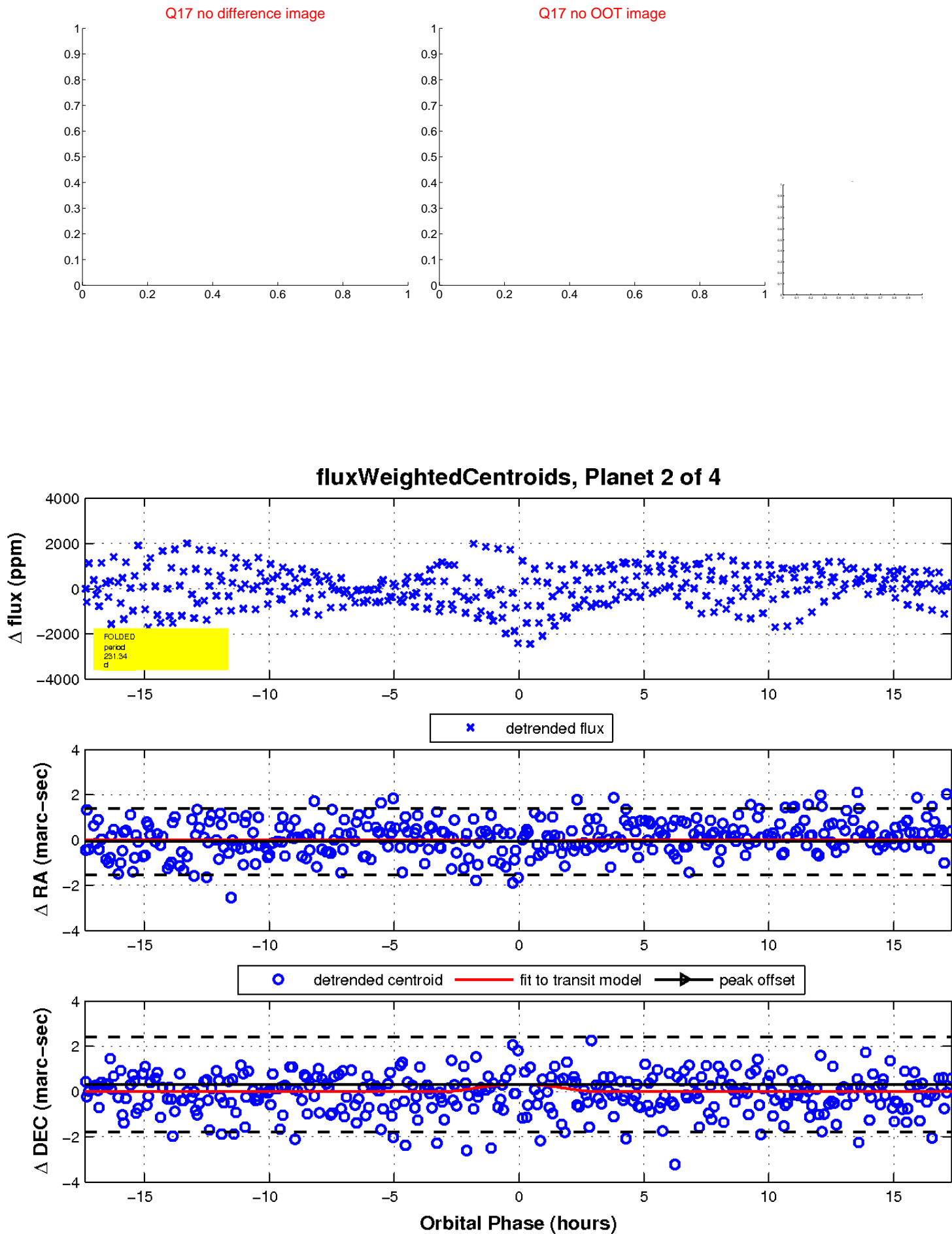
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

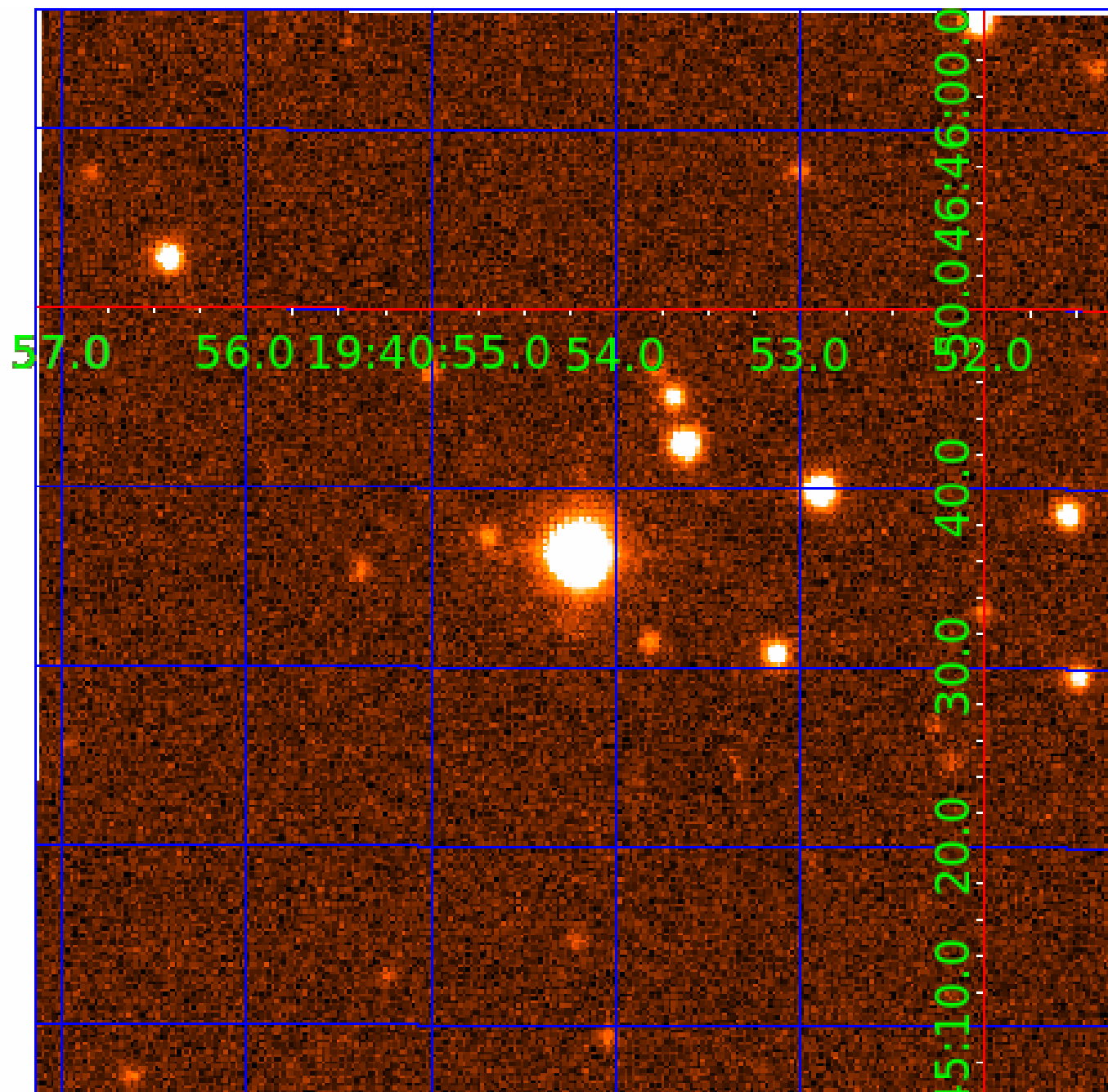


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009899410

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})
009899410-01	OBS	7245.01	1.332607	132.051949	81.0	4.747	12.4	8.8	16.49	5154	17.84	0.00
009899410-02	OBS	No	231.336580	216.059590	1936.6	5.794	8.4	11.0	16.49	5154	140.49	162.89
009899410-03	OBS	No	394.428864	269.635463	2272.6	7.143	8.3	8.1	16.49	5154	151.72	79.97
009899410-04	OBS	No	268.756157	283.487561	1651.2	7.215	7.4	8.6	16.49	5154	130.44	133.37

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899410-01	OBS	FP	0.00	0	0	1	1	PLANET_IN_STAR—HALO_GHOST—EPHEM_MATCH
009899410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009899410-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
009899410-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES

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.

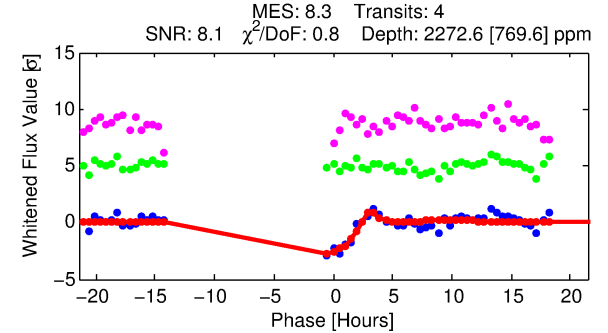
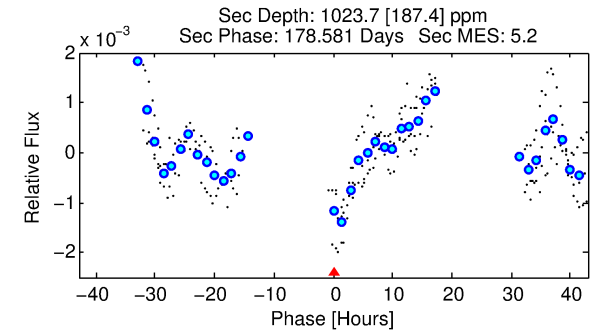
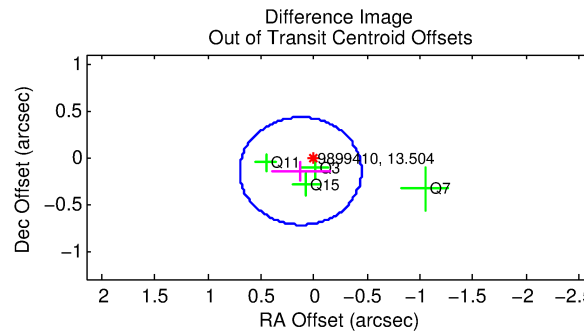
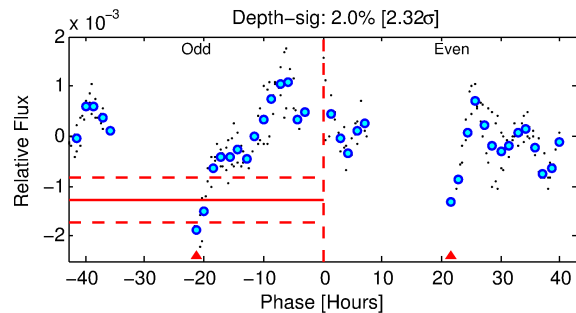
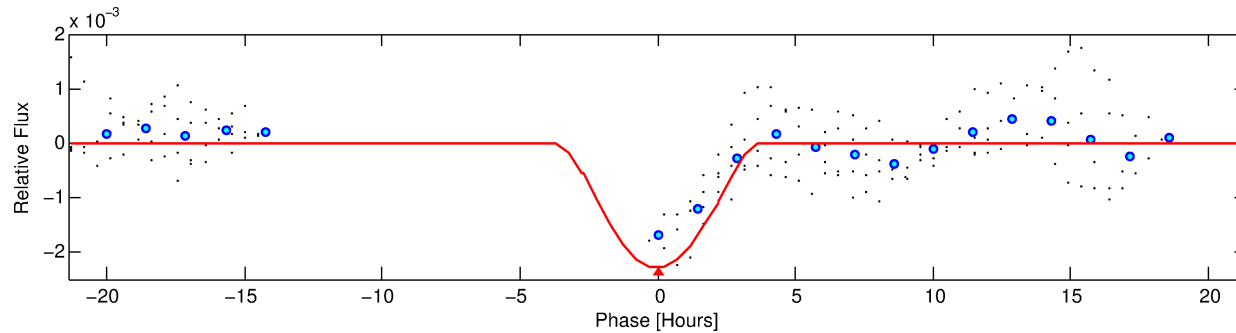
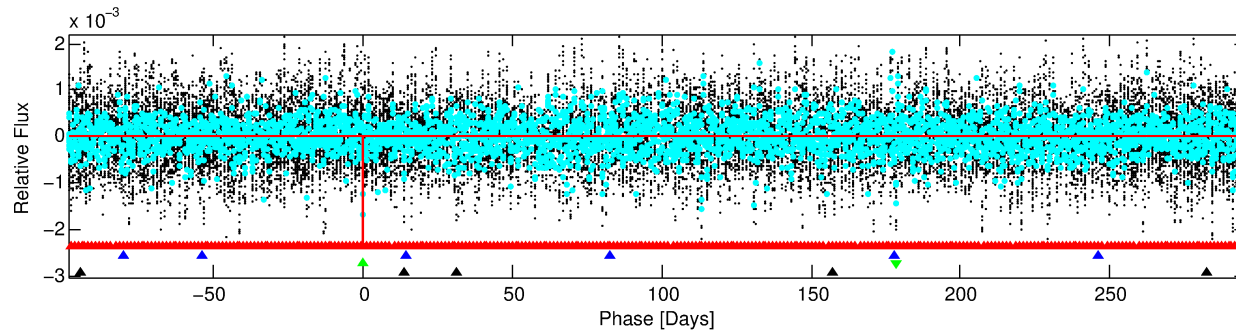
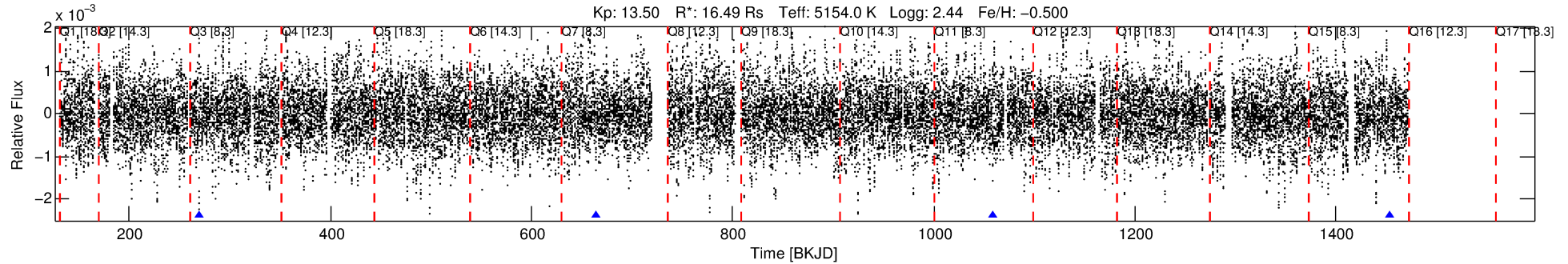
Ephemeris Match Information For 009899410-03

No Significant Match Found

DV One-Page Summary

KIC: 9899410 Candidate: 3 of 4 Period: 394.429 d

KOI: K07245 Corr: No Ephemeris Match



DV Fit Results:

Period = 394.42886 [0.00545] d
Epoch = 269.6355 [0.0318] BKJD
Rp/R* = 0.0843 [0.1427]
a/R* = 176.90 [53.25]
b = 1.00 [0.19]
Seff = 79.97 [26.27]
Teq = 763 [63] K
Rp = 151.72 [261.61] Re
a = 1.4658 [0.3253] AU
Ag = 52.57 [178.59] [0.29σ]
Teffp = 3175 [2697] K [0.89σ]

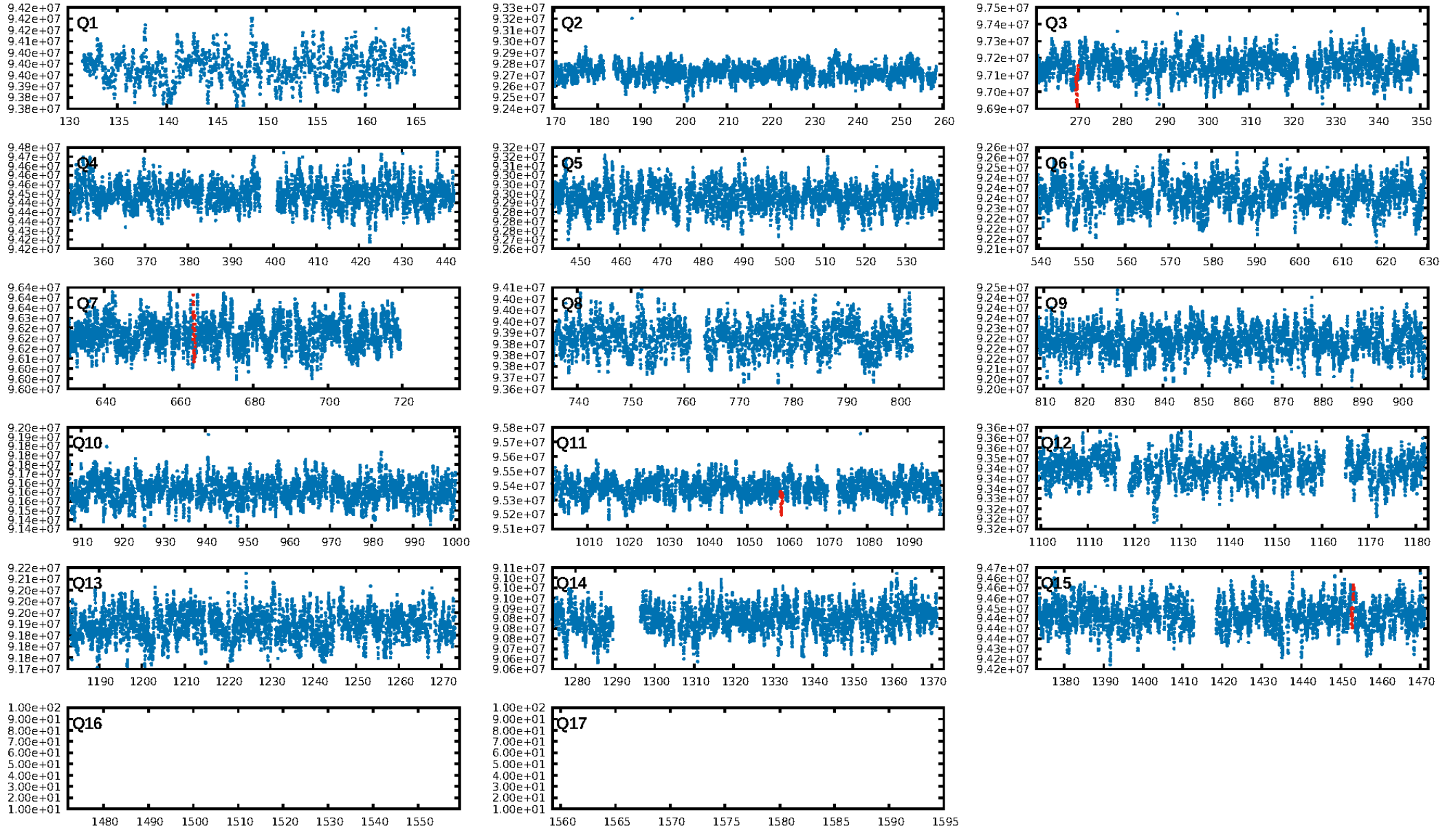
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [297.08σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 83.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.06e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.464
Centroid-sig: 56.2%
Centroid-so: 0.468 arcsec [2.50σ]
OotOffset-rm: 0.195 arcsec [1.02σ]
KicOffset-rm: 0.232 arcsec [1.47σ]
OotOffset-st: 0/4/0/0 [4]
KicOffset-st: 0/4/0/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 0.00 [0/4]

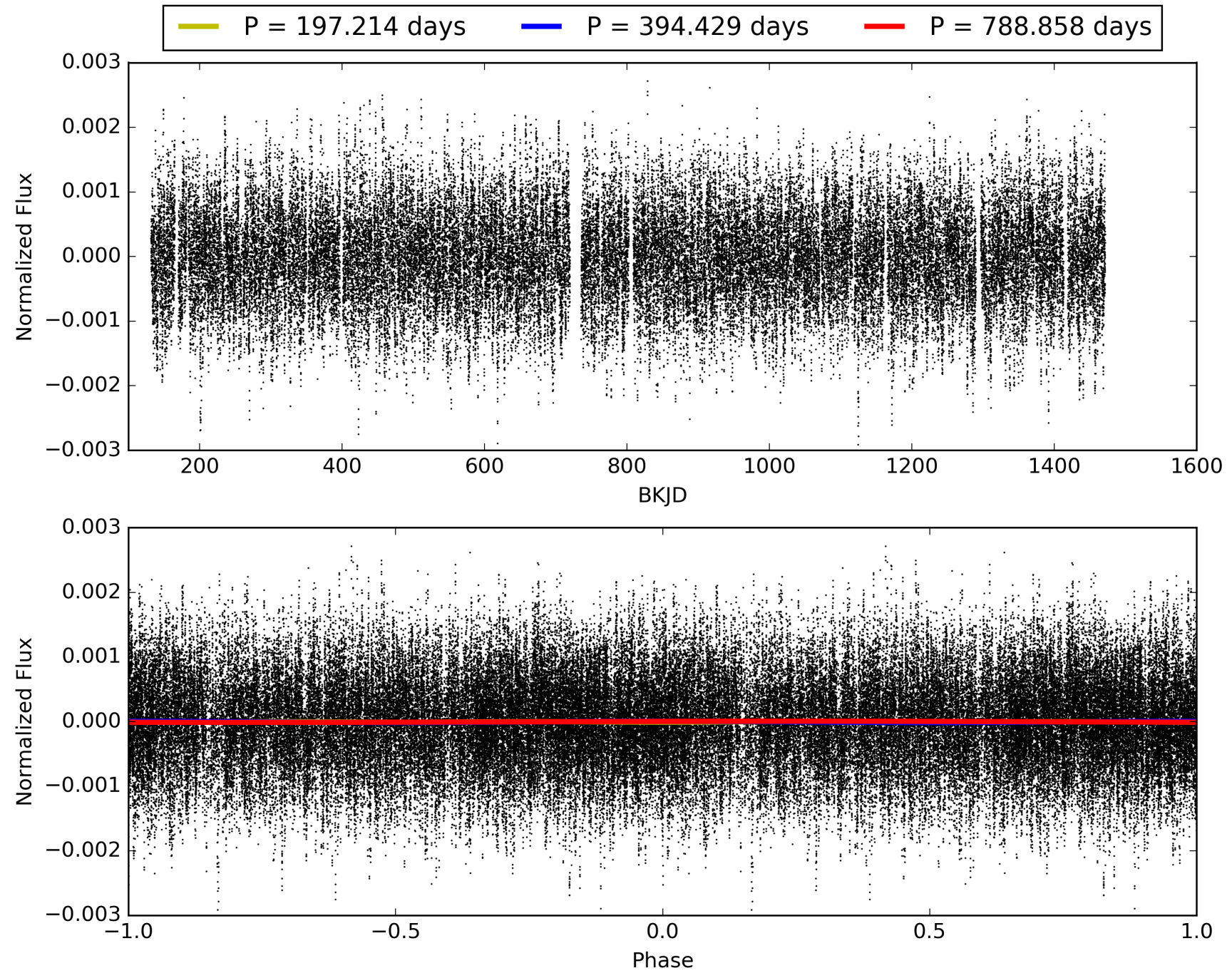
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:26:57 Z

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

TCE 009899410-03, PDC Light Curves

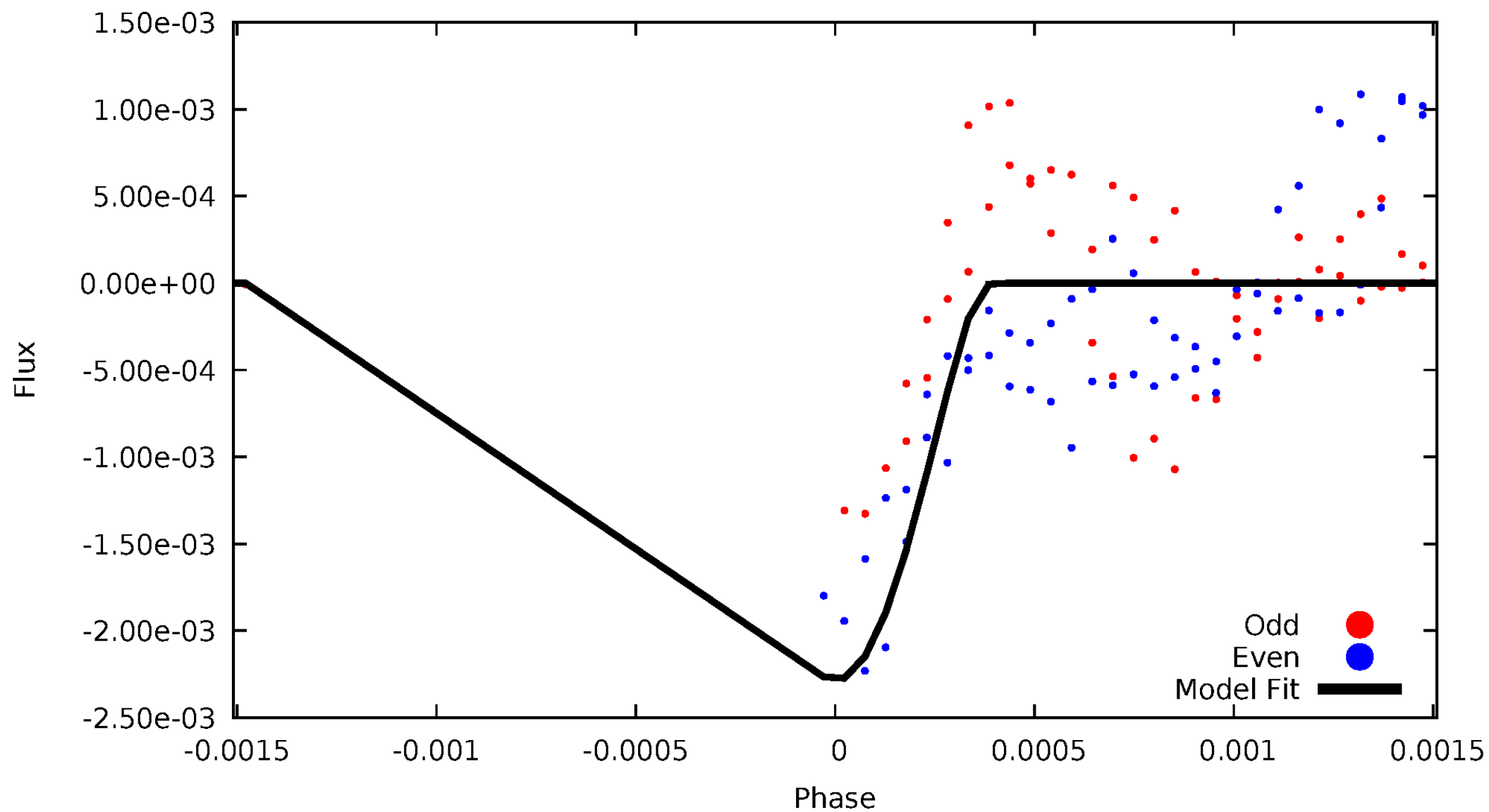


TCE 009899410-03



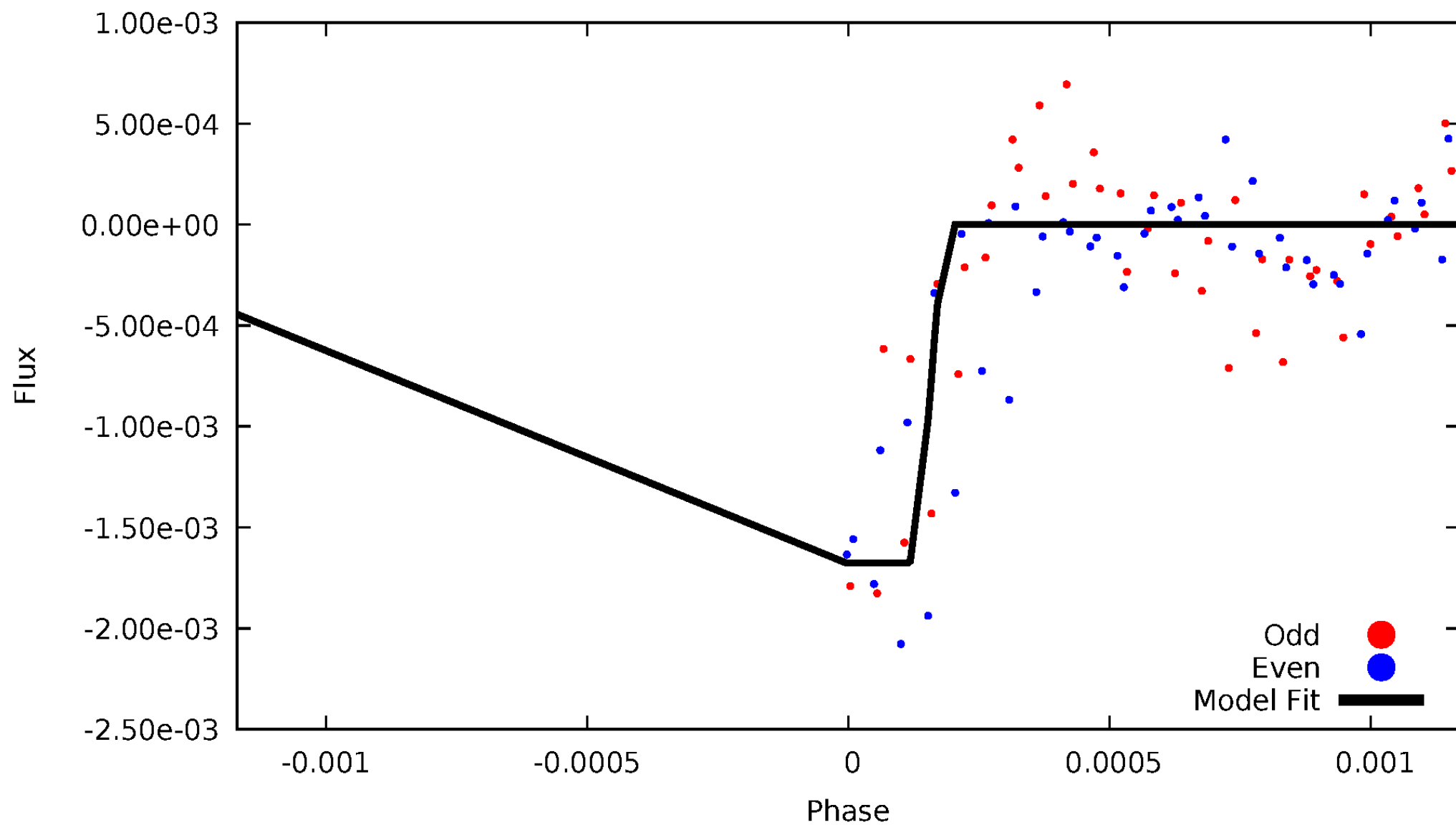
DV Odd/Even

TCE 009899410-03



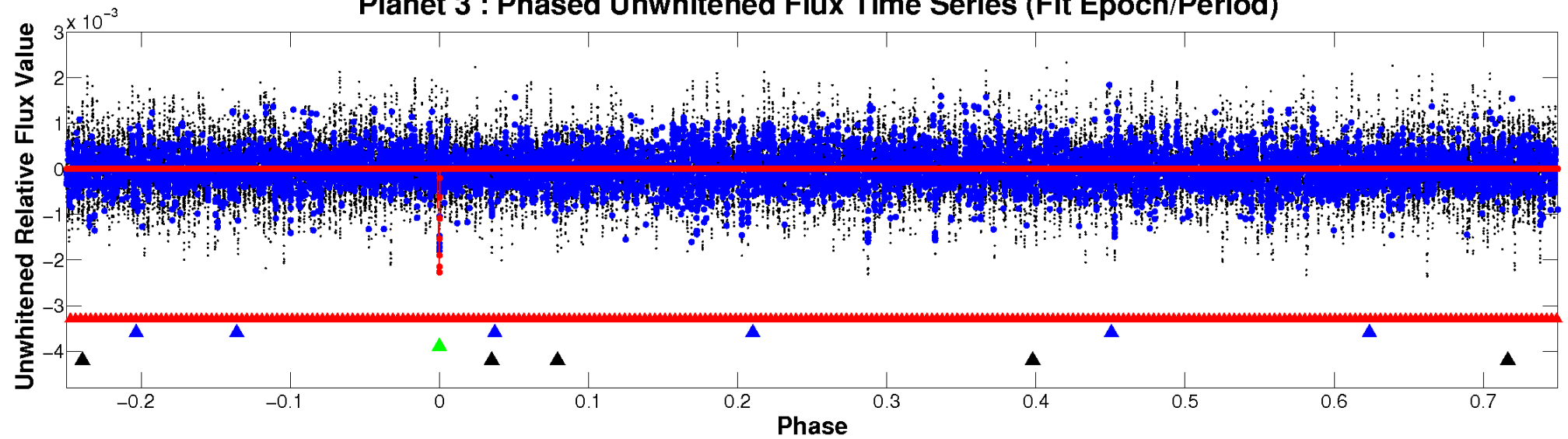
ALT Odd/Even

TCE 009899410-03

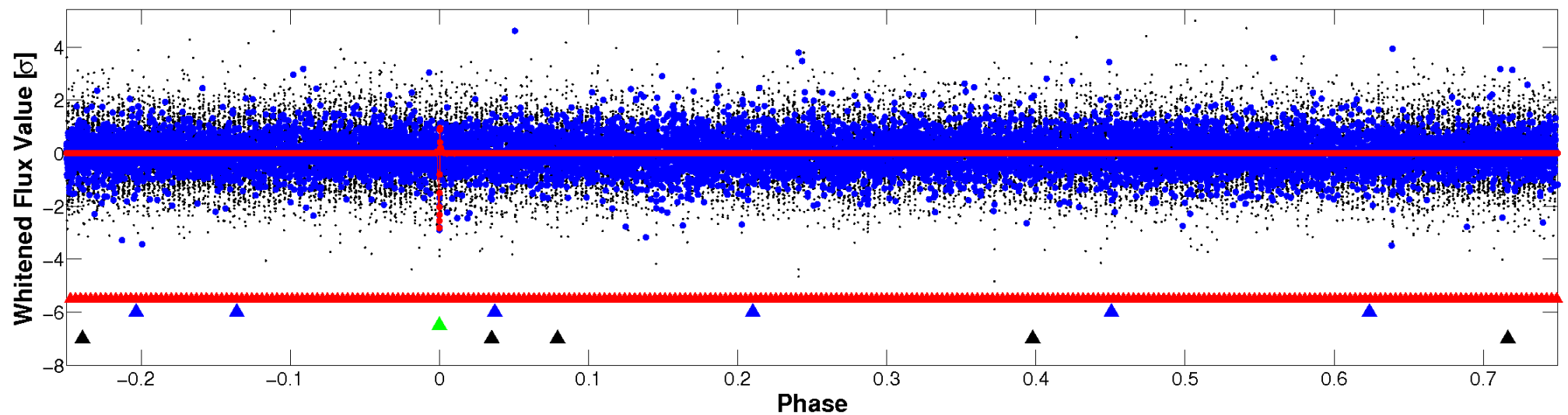


Non-Whitened Vs. Whitened Light Curve

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

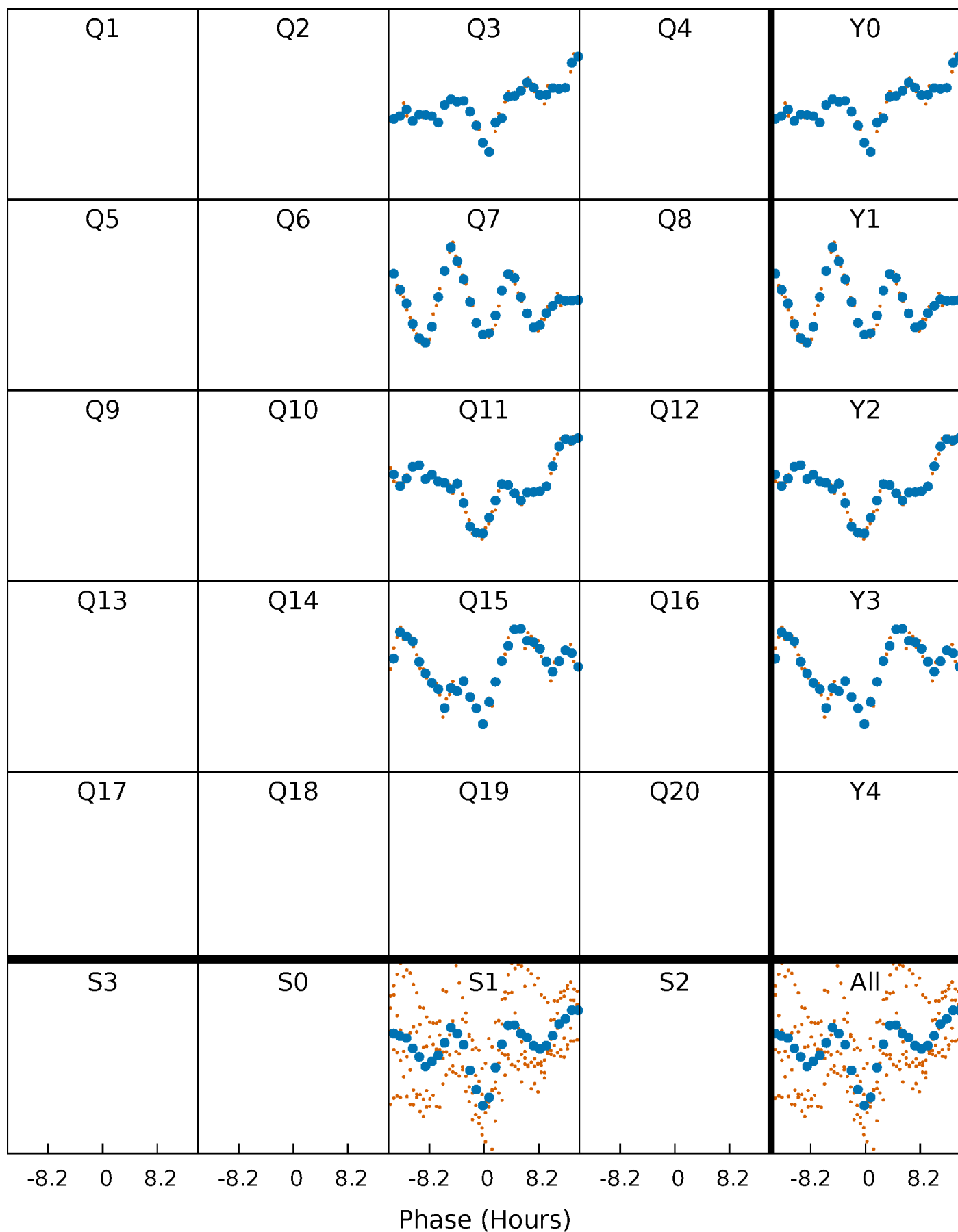


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



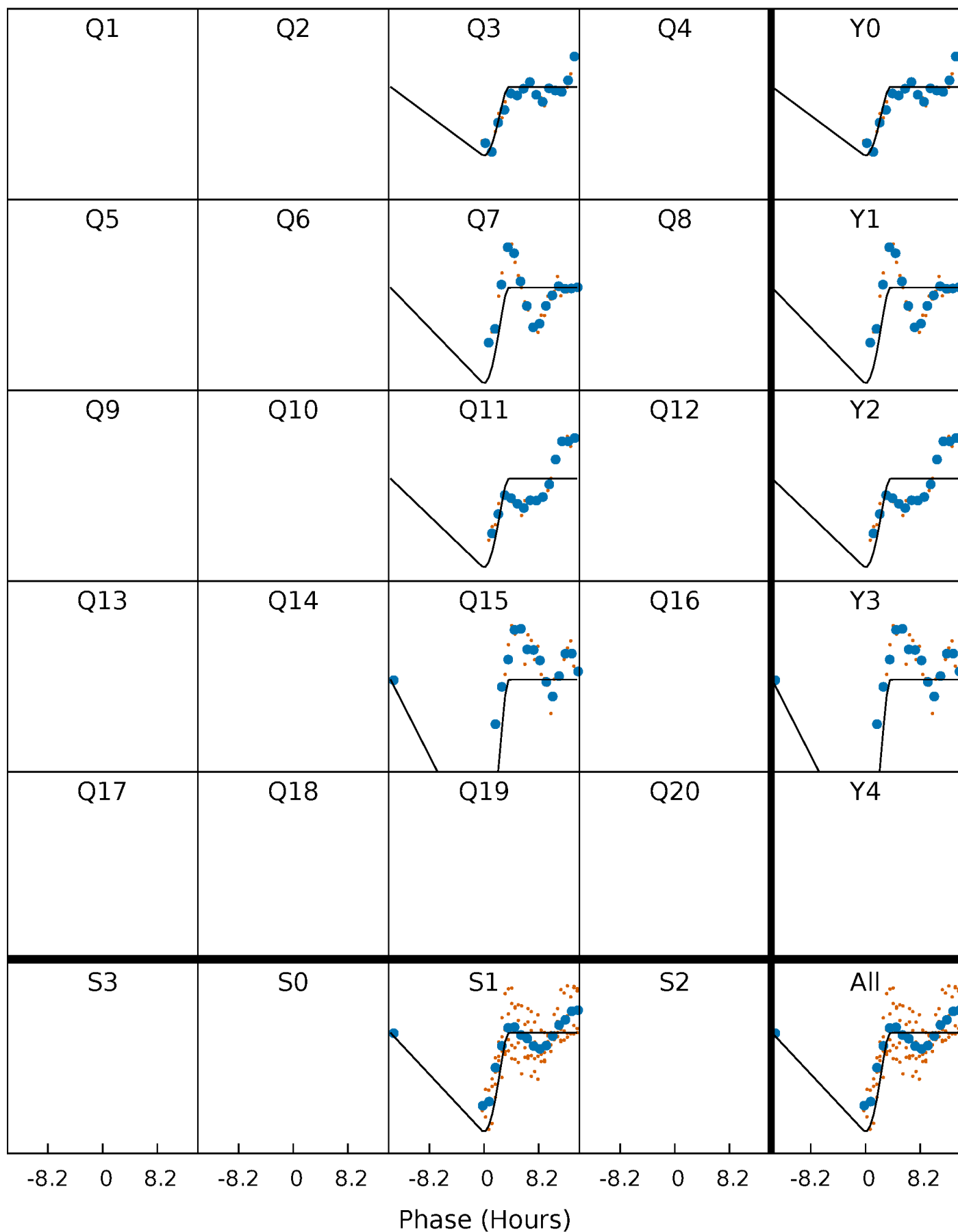
PDC Quarter-Phased Transit Curves

TCE 009899410-03 $P=394.428864$ Days $T_0=269.635463$ (BKJD)



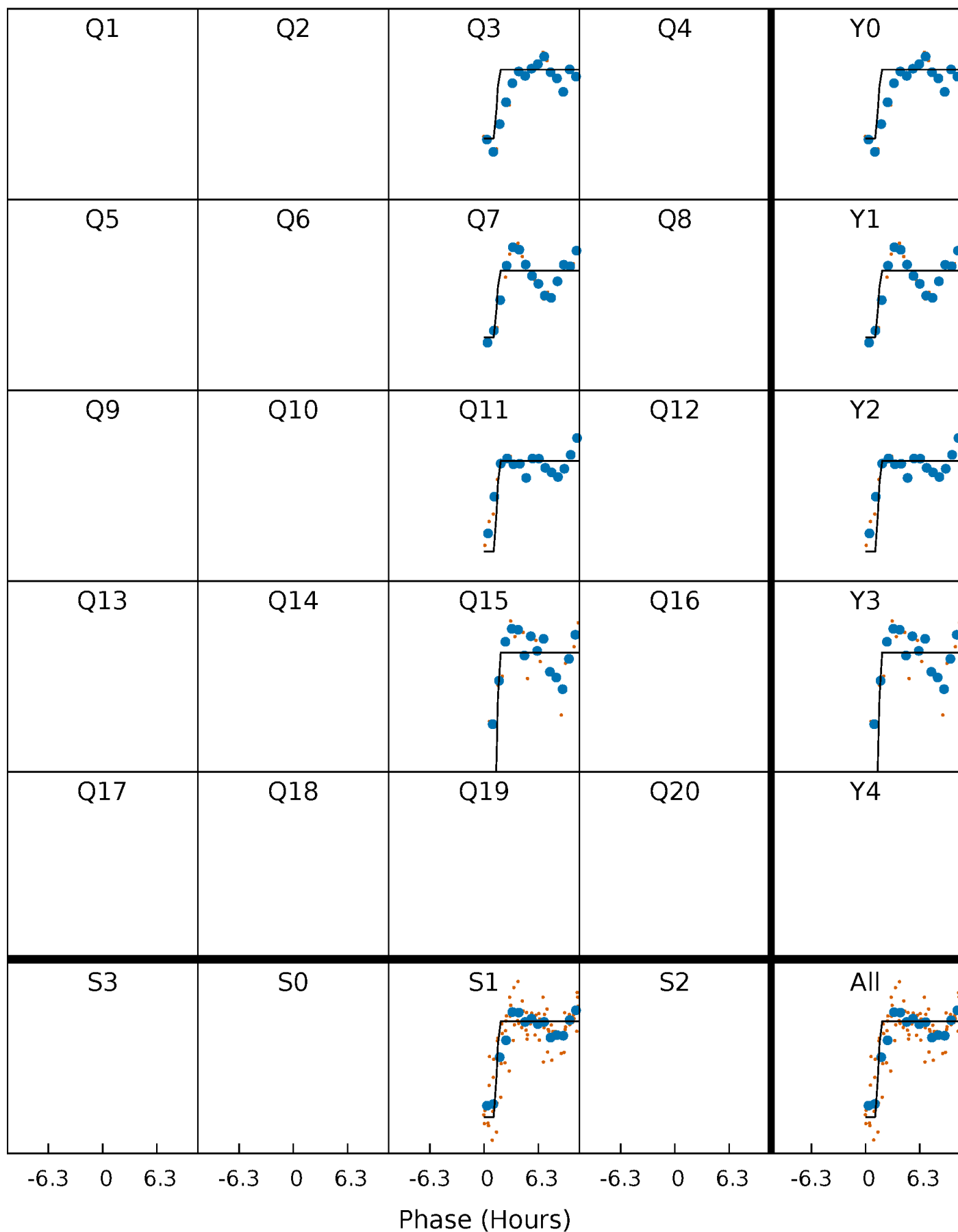
DV Quarter-Phased Transit Curves

TCE 009899410-03 $P=394.428864$ Days $T_0=269.635463$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

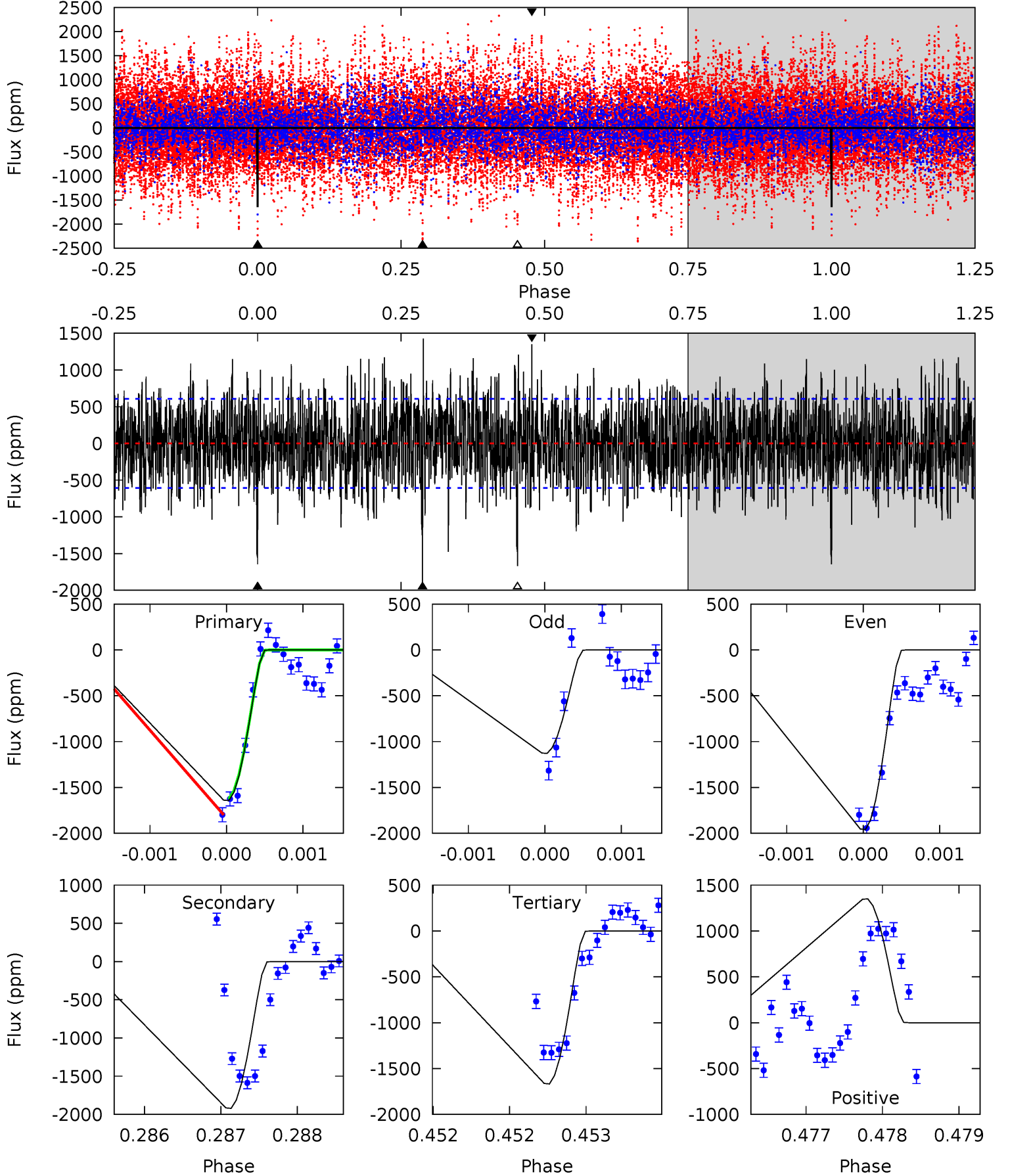
TCE 009899410-03 $P=394.446944$ Days $T_0=269.625251$ (BKJD)



DV Model-Shift Uniqueness Test

009899410-03, P = 394.428864 Days, E = 269.635463 Days

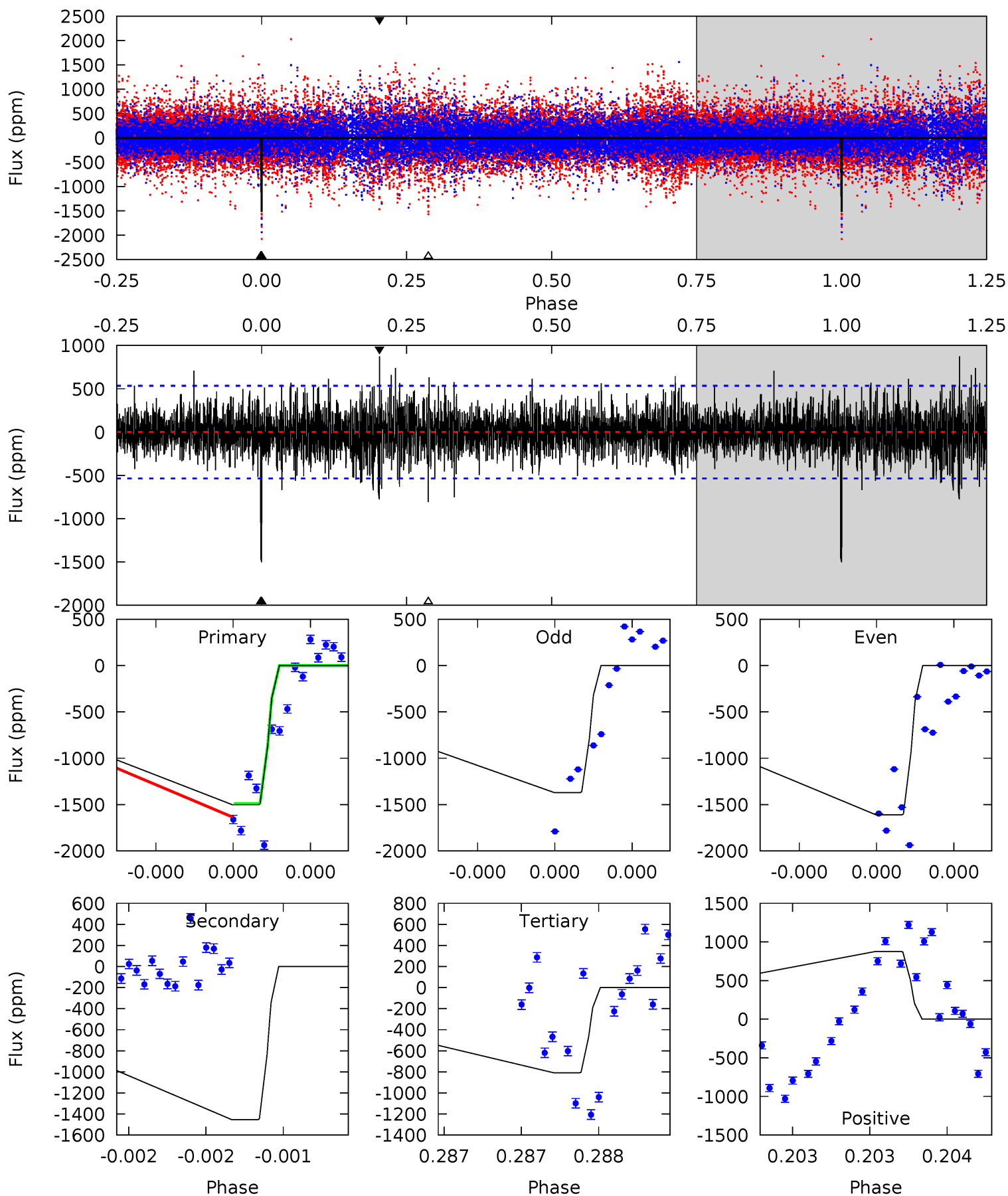
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	17.4	15.1	12.2	5.50	3.36	3.30	-0.22	2.65	2.29	5.17	3.74	1.04	0.43	0.29



Alt Model-Shift Uniqueness Test

009899410-03, P = 394.446944 Days, E = 269.625251 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.8	15.3	8.51	9.23	5.64	3.58	1.82	7.31	6.59	6.81	6.09	1.24	0.94	0.37	0.41



Stellar Parameters For KIC 009899410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5154^{+153}_{-307}	$2.435^{+0.033}_{-0.030}$	$-0.500^{+0.150}_{-0.300}$	$16.486^{+0.962}_{-5.452}$	$2.700^{+0.250}_{-1.502}$	$0.001^{+0.000}_{-0.000}$
	+3%/-6%	+1%/-1%	+30%/-60%	+6%/-33%	+9%/-56%	+52%/-10%
Source	PHO1	AST9	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009899410-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1921 \pm 111	$251.43^{+244.74}_{-174.55}$	1063^{+36}_{-61}	3361^{+1625}_{-601}	35^{+330}_{-25}
Alt.	-1455 \pm 95	$201.22^{+193.65}_{-141.86}$	1060^{+46}_{-60}	3424^{+1950}_{-624}	43^{+417}_{-32}

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

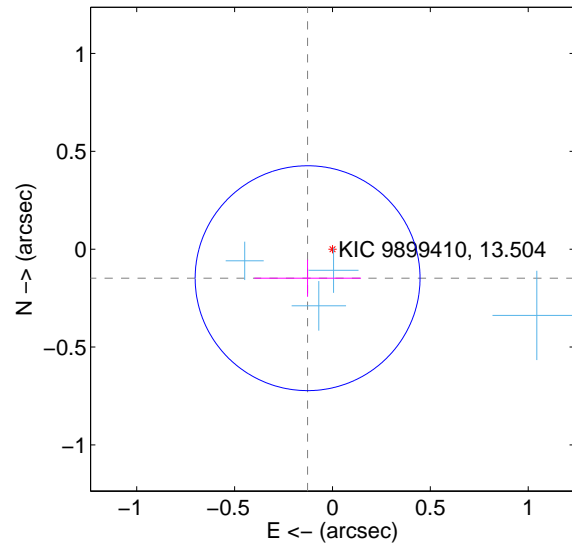
Supplemental centroid analysis for 009899410-03. Kepler magnitude: 13.50. Transit SNR 8.13

There are 4 quarters with good PRF difference image offsets

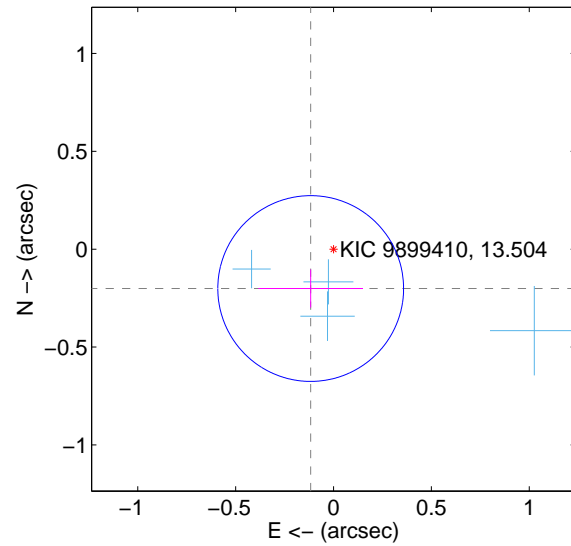
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.195 ± 0.192	1.02	0.127 ± 0.273	-0.148 ± 0.095
PRF-fit source offset from KIC position	0.232 ± 0.158	1.47	0.117 ± 0.267	-0.201 ± 0.097
photometric centroid source offset	0.47 ± 0.19	2.50	-0.46 ± 0.19	0.05 ± 0.21

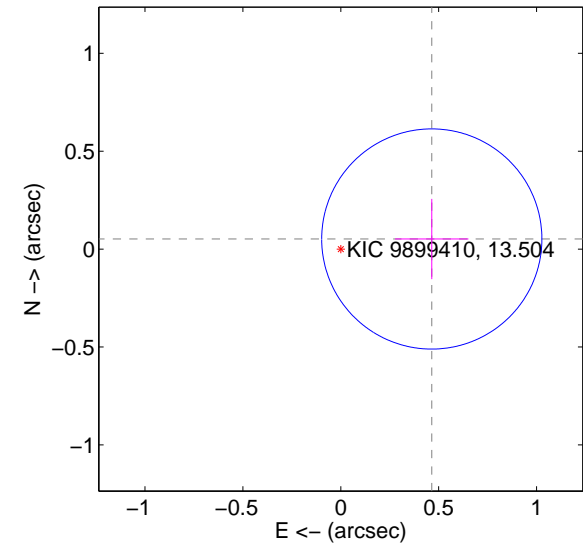
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



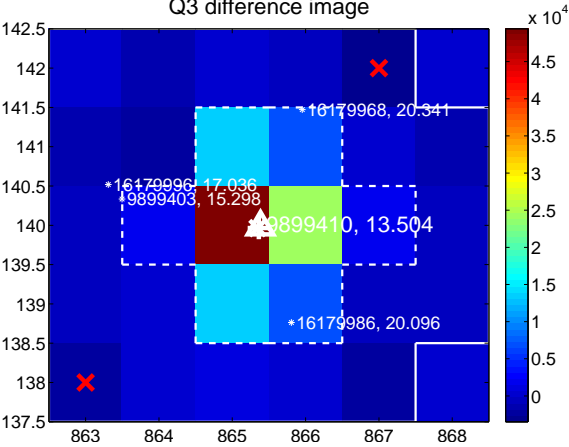
Q2 no difference image



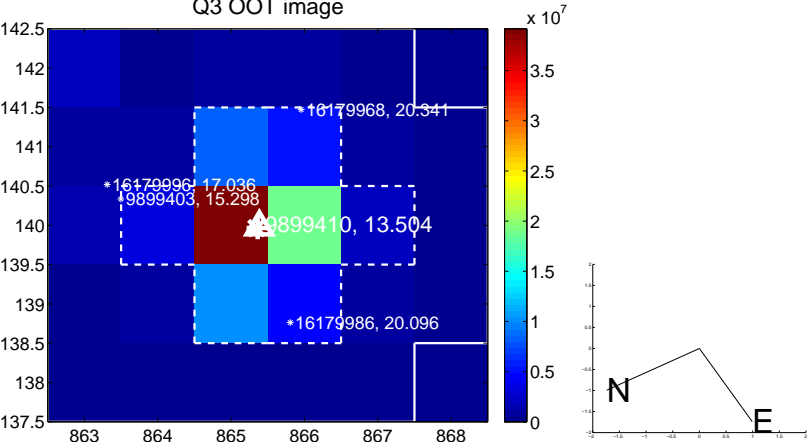
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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

Q5 no difference image



Q5 no OOT image



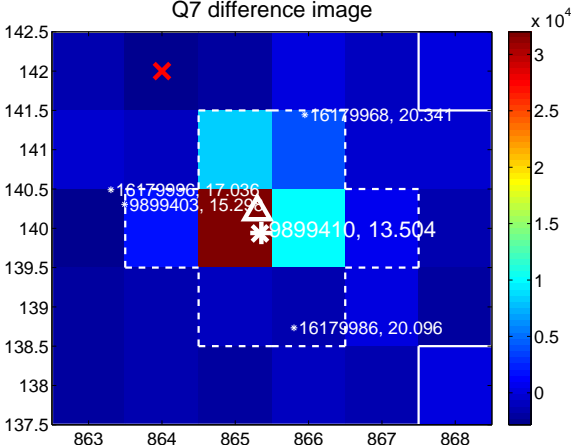
Q6 no difference image



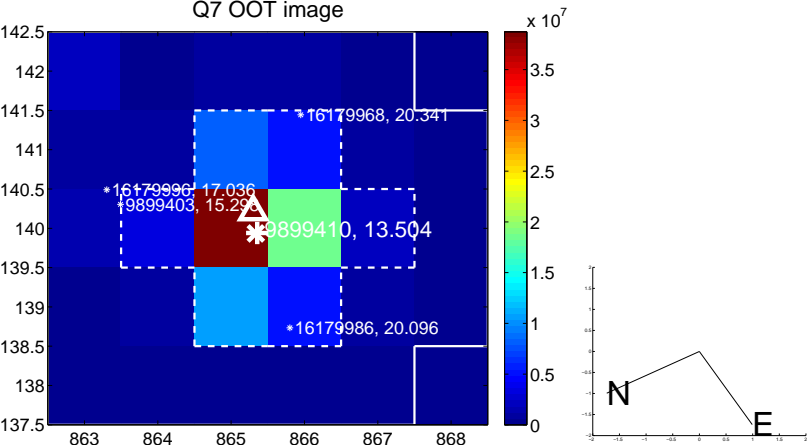
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image



Q8 no OOT image



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

Q9 no difference image



Q9 no OOT image



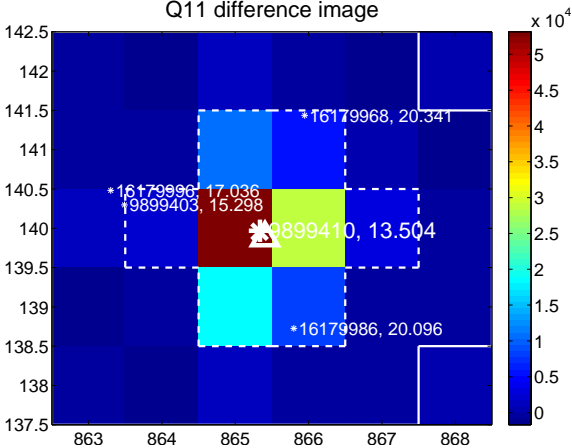
Q10 no difference image



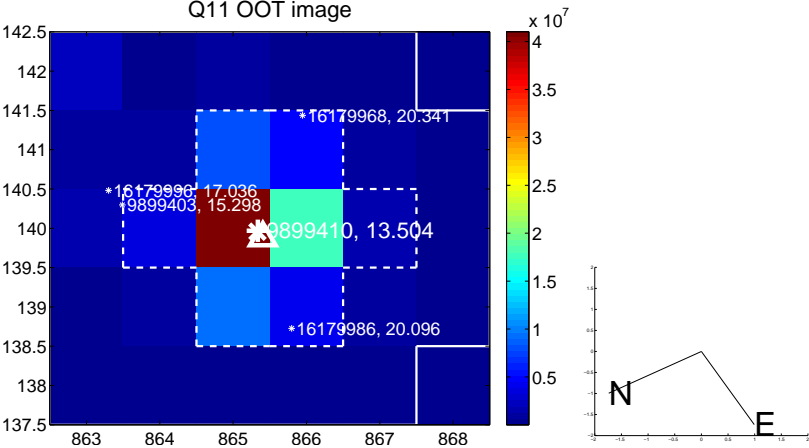
Q10 no OOT image



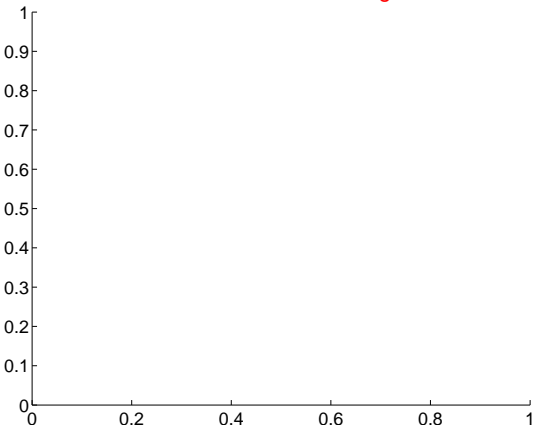
Q11 difference image



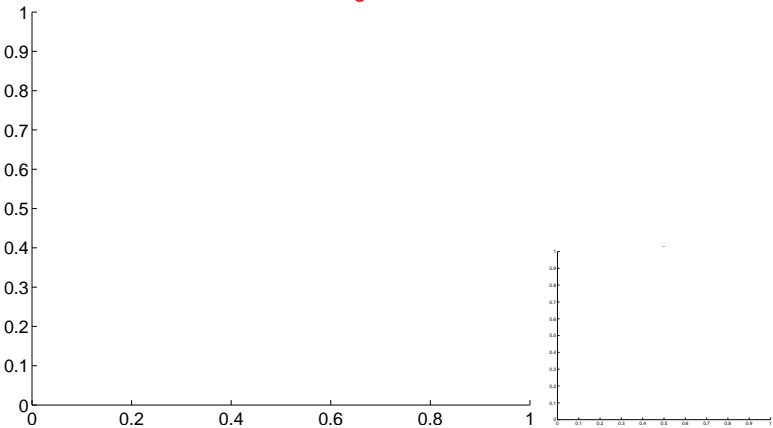
Q11 OOT image



Q12 no difference image



Q12 no OOT image



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

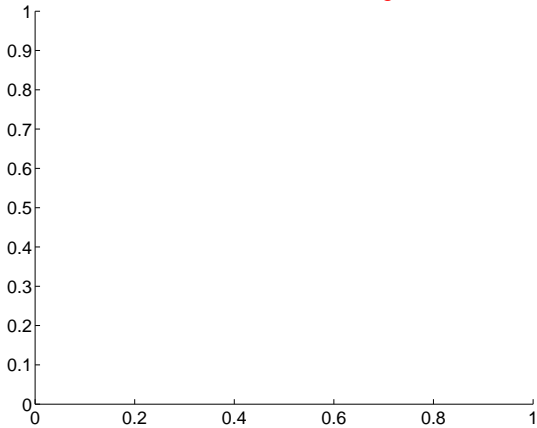
Q13 no difference image



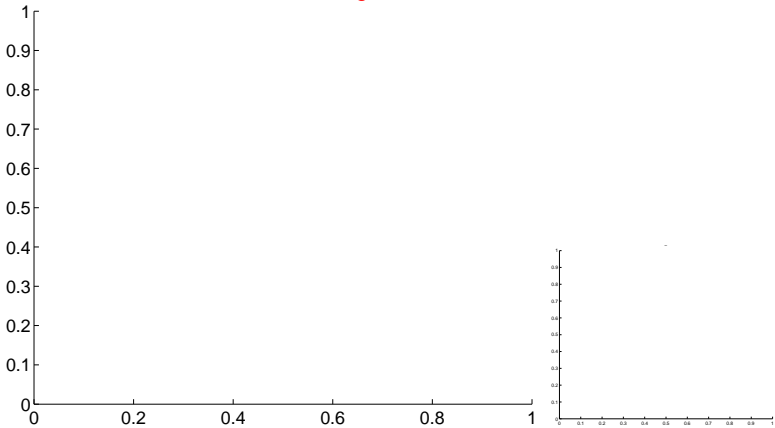
Q13 no OOT image



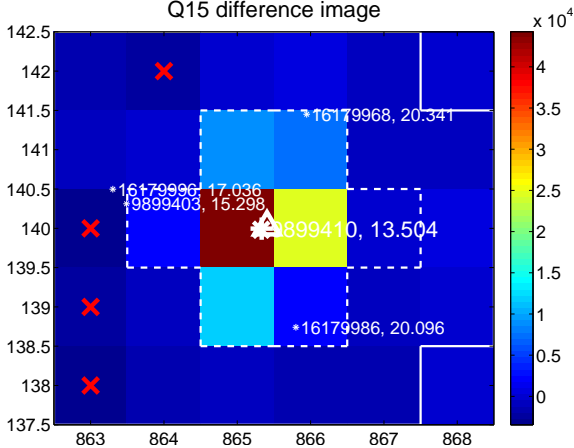
Q14 no difference image



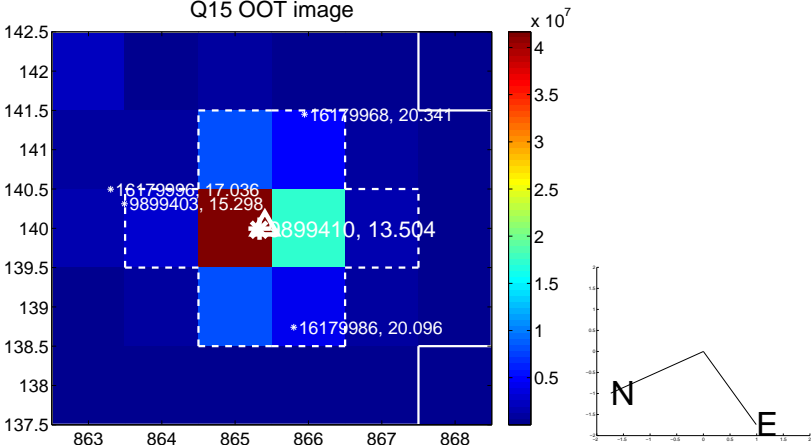
Q14 no OOT image



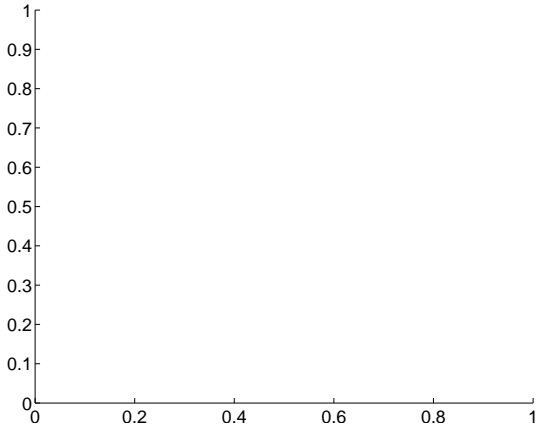
Q15 difference image



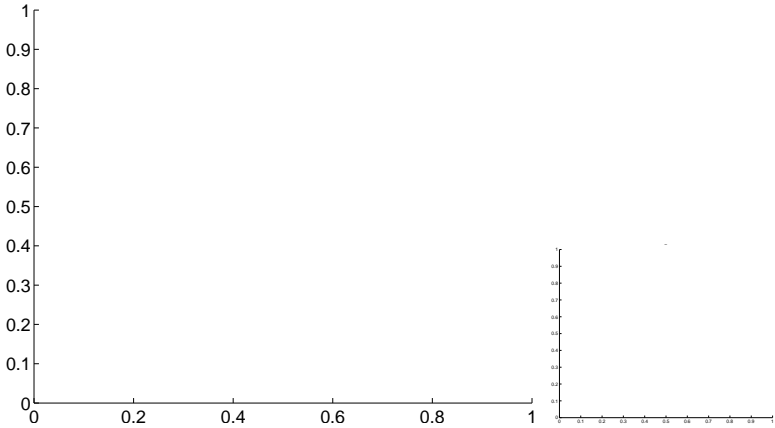
Q15 OOT image



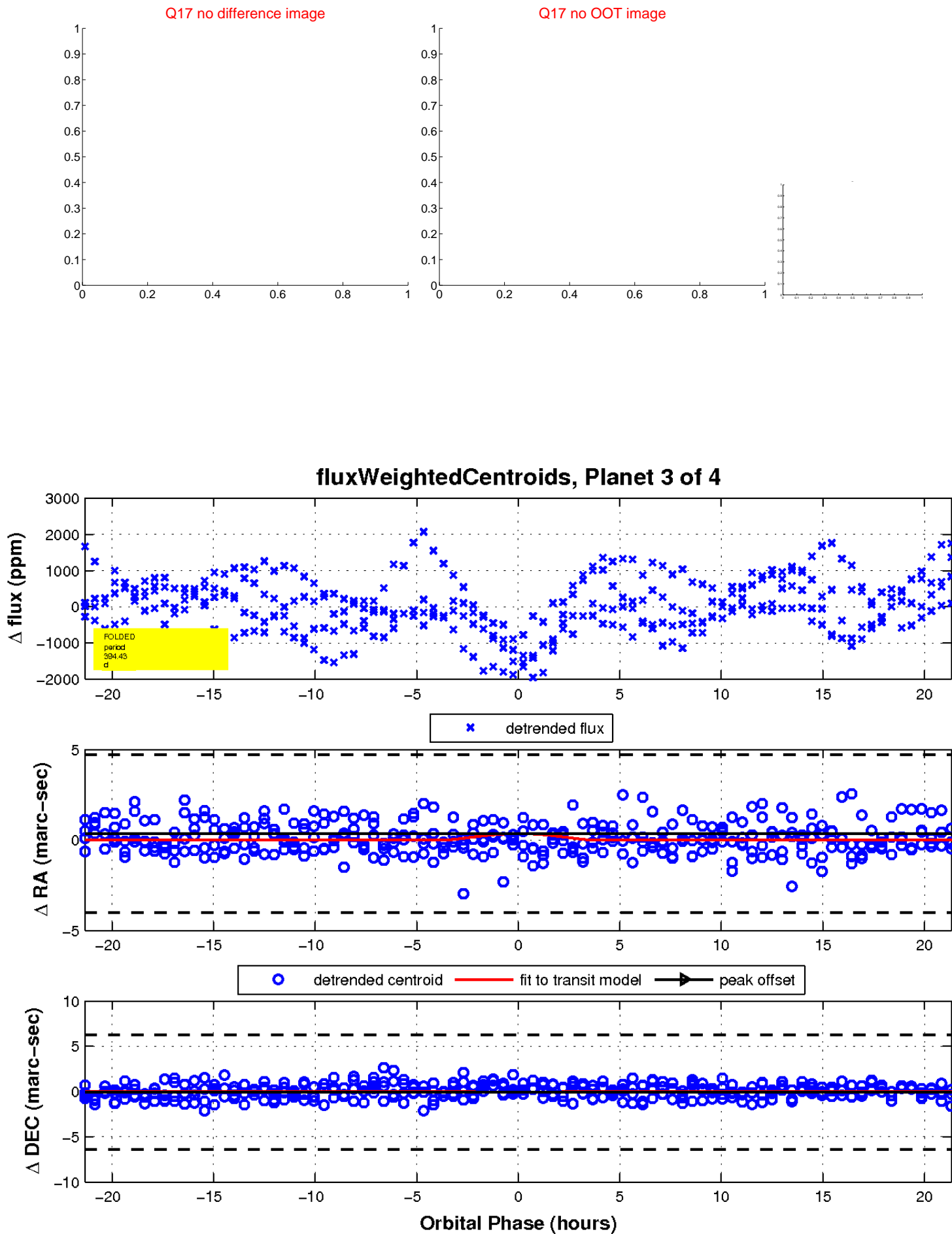
Q16 no difference image



Q16 no OOT image

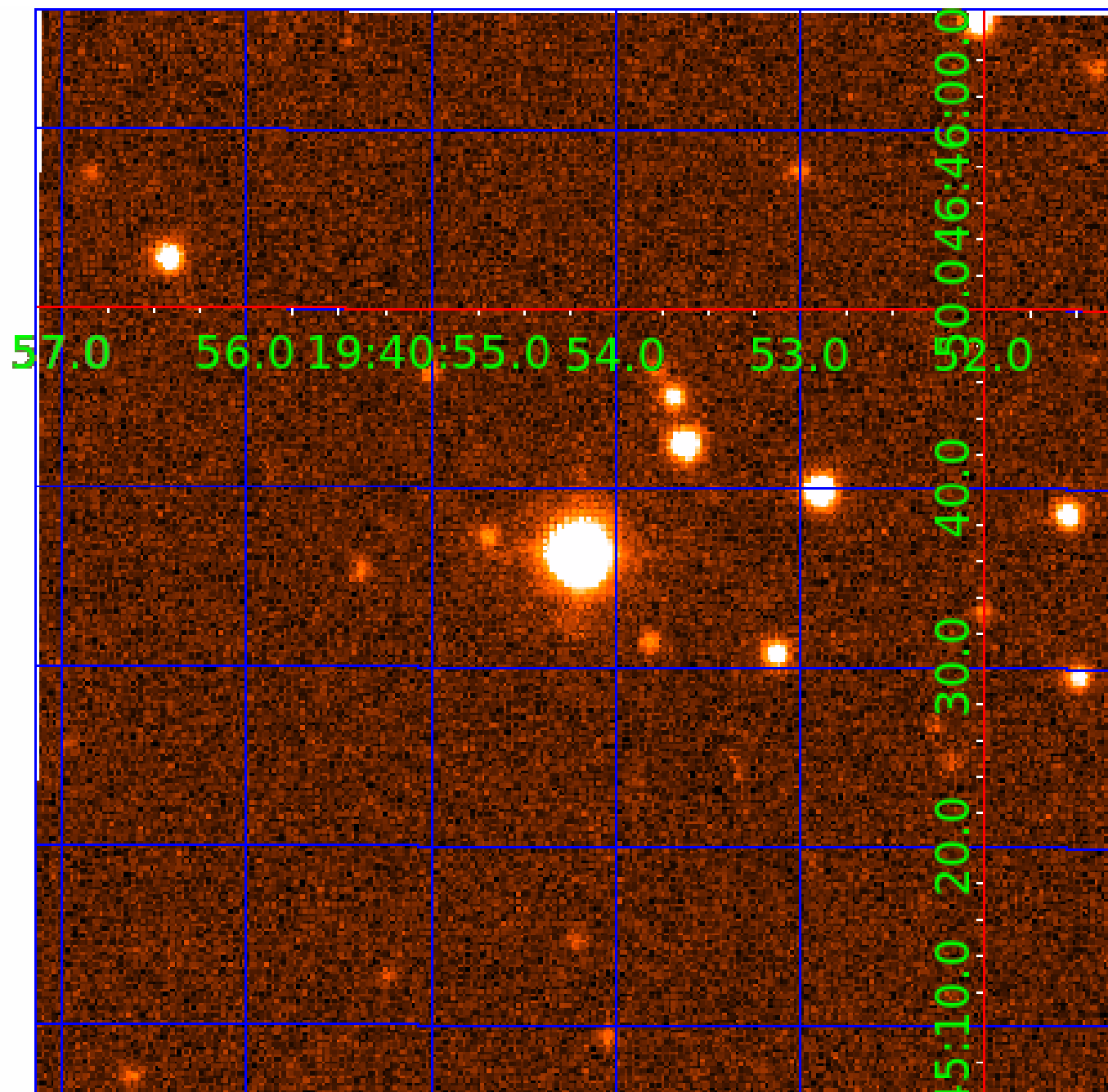


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009899410

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})
009899410-01	OBS	7245.01	1.332607	132.051949	81.0	4.747	12.4	8.8	16.49	5154	17.84	0.00
009899410-02	OBS	No	231.336580	216.059590	1936.6	5.794	8.4	11.0	16.49	5154	140.49	162.89
009899410-03	OBS	No	394.428864	269.635463	2272.6	7.143	8.3	8.1	16.49	5154	151.72	79.97
009899410-04	OBS	No	268.756157	283.487561	1651.2	7.215	7.4	8.6	16.49	5154	130.44	133.37

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009899410-01	OBS	FP	0.00	0	0	1	1	PLANET_IN_STAR—HALO_GHOST—EPHEM_MATCH
009899410-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—INCONSISTENT_TRANS
009899410-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS
009899410-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES

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 009899410-04

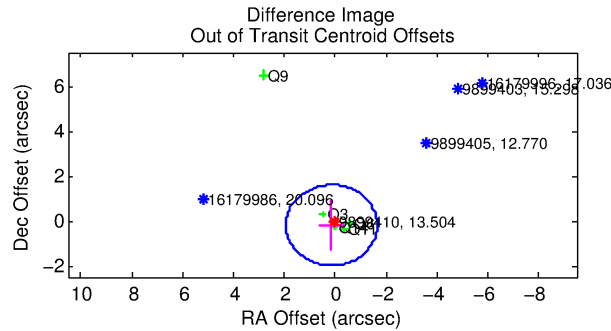
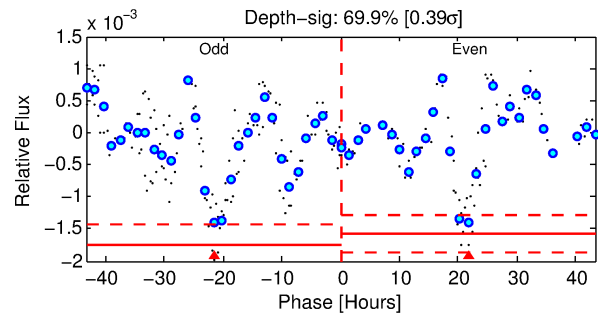
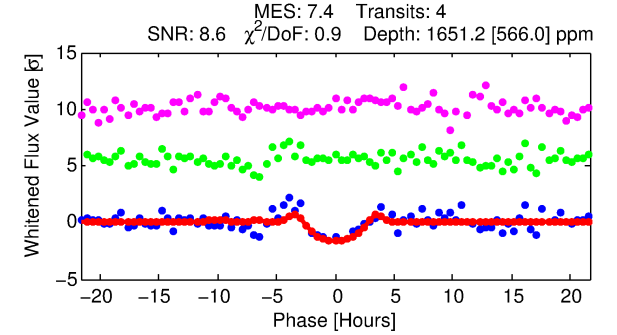
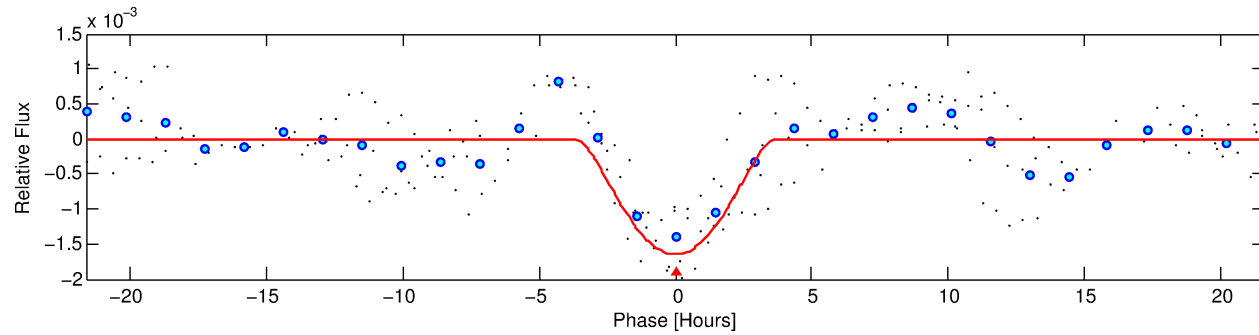
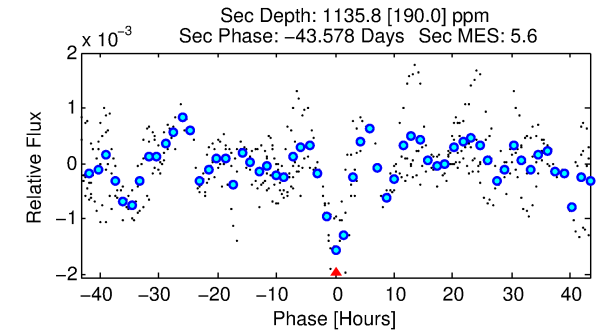
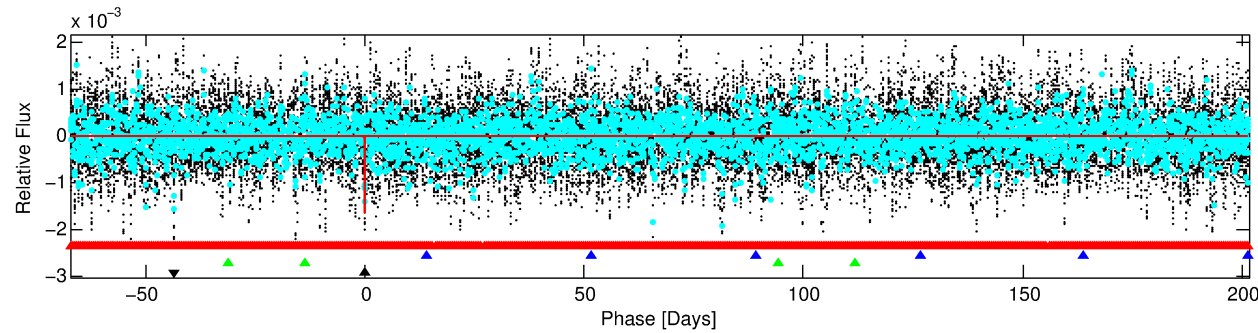
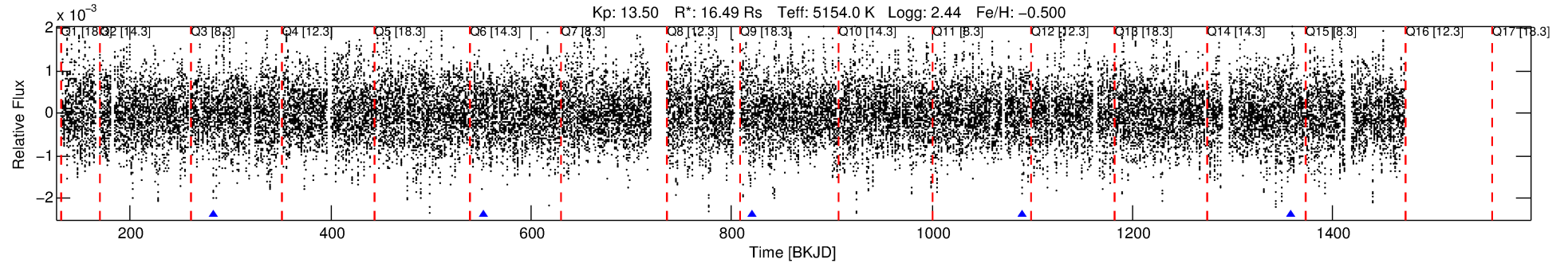
No Significant Match Found

DV One-Page Summary

KIC: 9899410 Candidate: 4 of 4 Period: 268.756 d

KOI: K07245 Corr: No Ephemeris Match

Kp: 13.50 R*: 16.49 Rs Teff: 5154.0 K Logg: 2.44 Fe/H: -0.500



DV Fit Results:

Period = 268.75616 [0.00432] d
Epoch = 283.4876 [0.0102] BKJD
Rp/R* = 0.0725 [0.1102]
a/R* = 110.35 [35.41]
b = 1.00 [0.17]
Seff = 133.37 [43.82]
Req = 867 [71] K
Rp = 130.44 [202.88] Re
a = 1.1350 [0.2519] AU
Ag = 47.31 [144.41] [0.32σ]
Teffp = 3514 [2682] K [0.99σ]

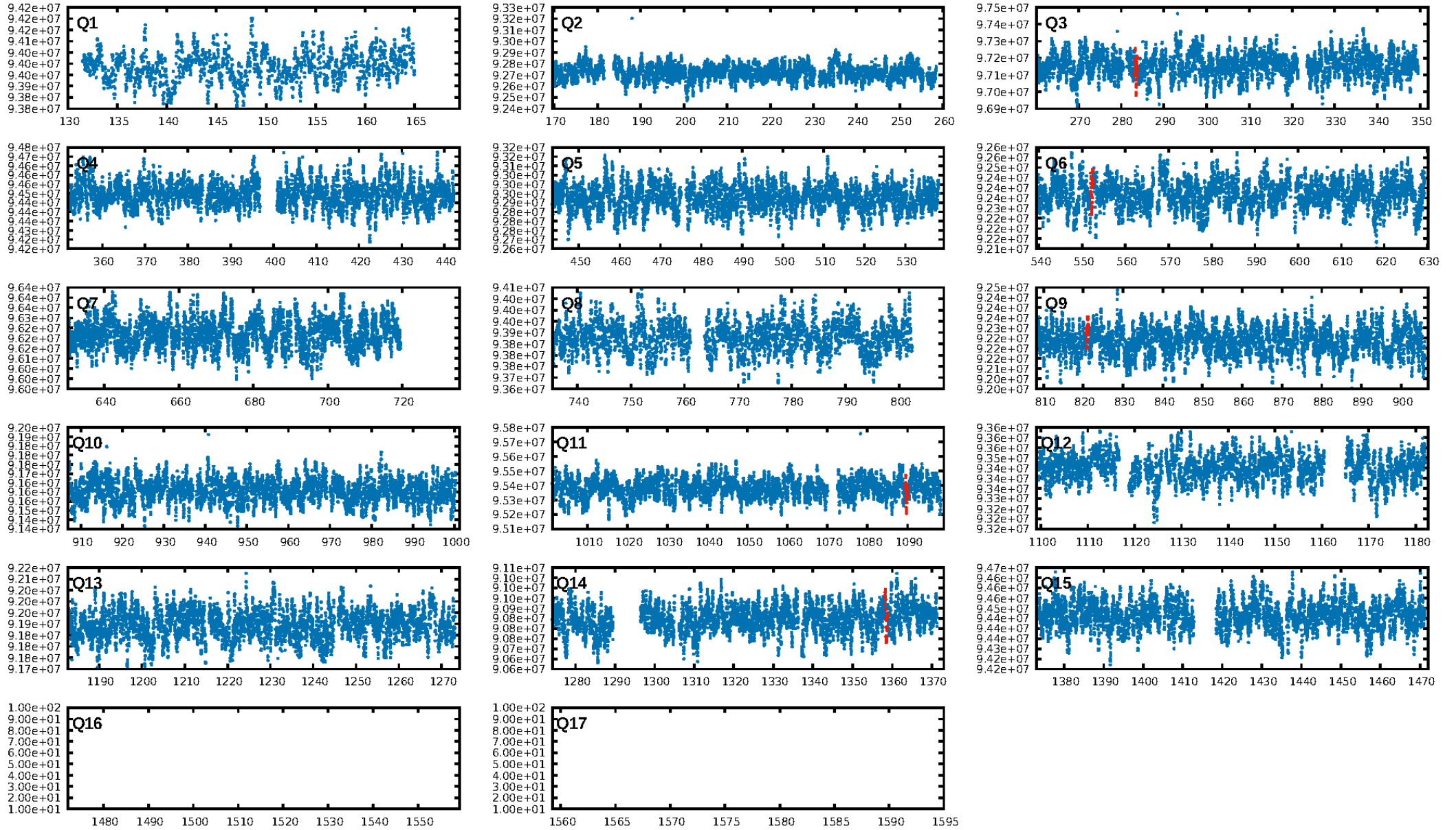
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [97.05σ]
LongPeriod-sig: 100.0% [297.08σ]
ModelChiSquare2-sig: 37.0%
ModelChiSquareGof-sig: 99.1%
Bootstrap-pfa: 2.71e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.9782
Centroid-sig: 12.9%
Centroid-so: 0.572 arcsec [2.35σ]
OotOffset-rm: 0.244 arcsec [0.41σ]
KicOffset-rm: 0.291 arcsec [0.38σ]
OotOffset-st: 2/2/0/1 [5]
KicOffset-st: 2/2/0/1 [5]
DiffImageQuality-fgm: 0.80 [4/5]
DiffImageOverlap-fno: 0.00 [0/5]

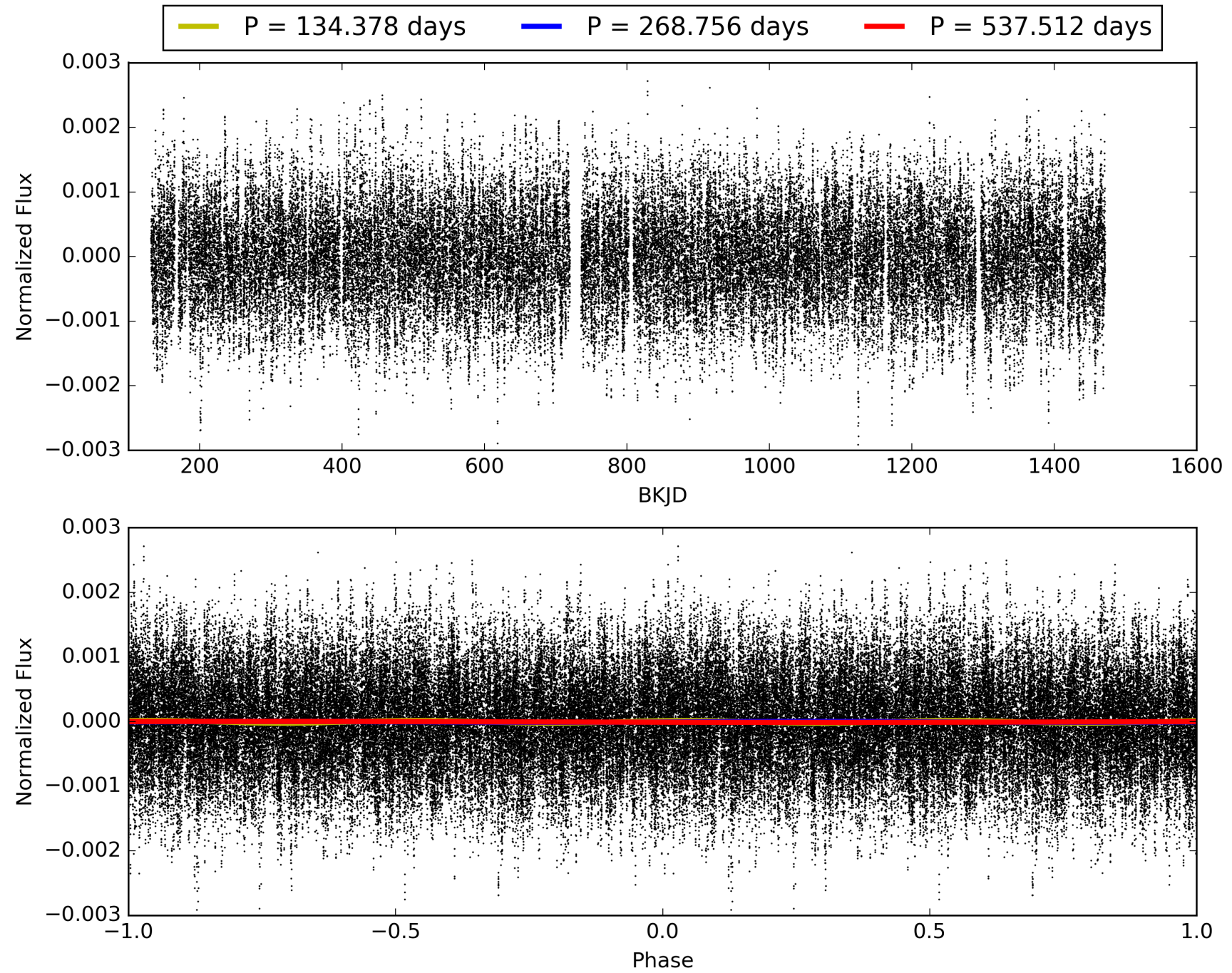
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:27:03 Z

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

TCE 009899410-04, PDC Light Curves

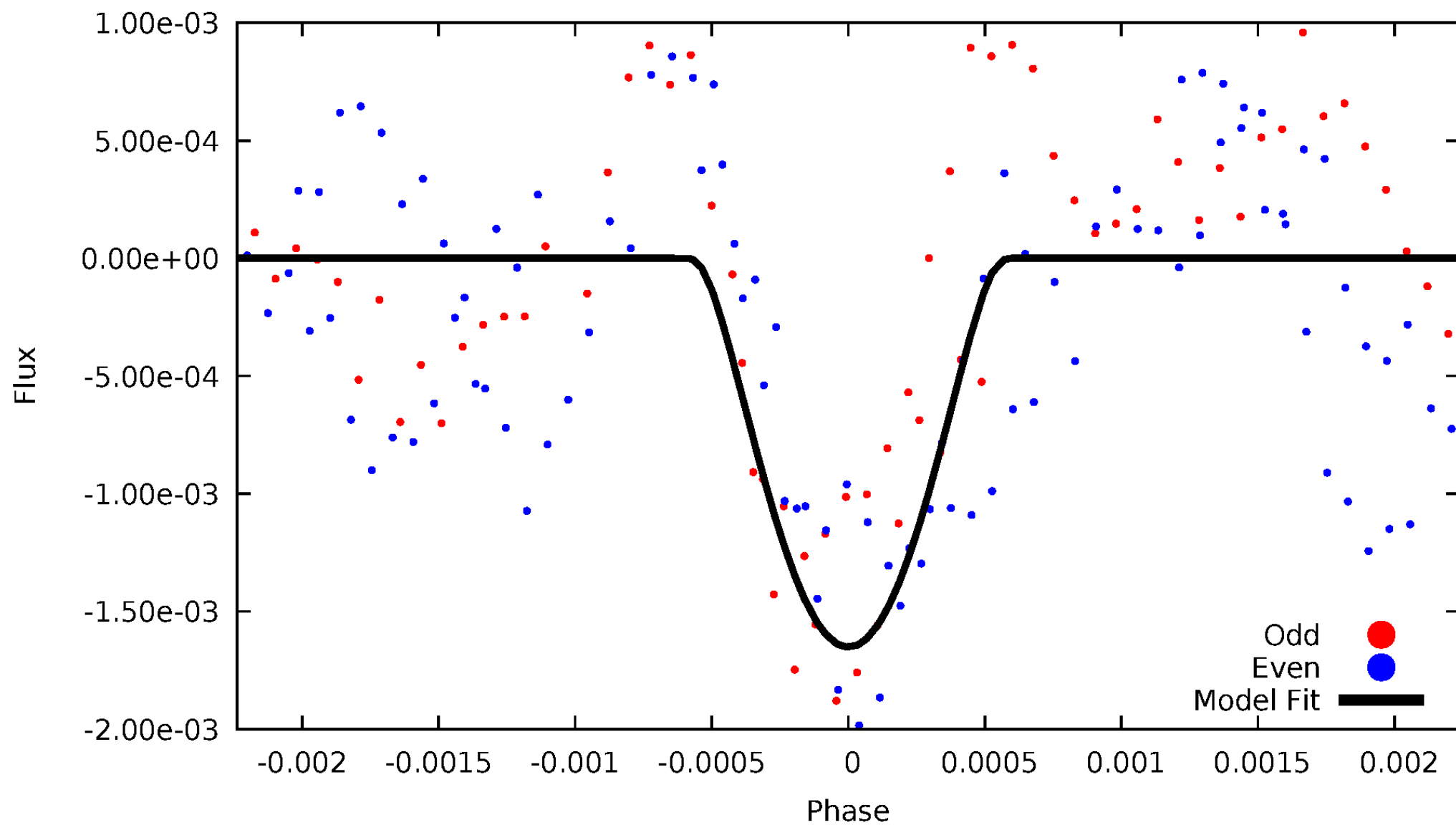


TCE 009899410-04



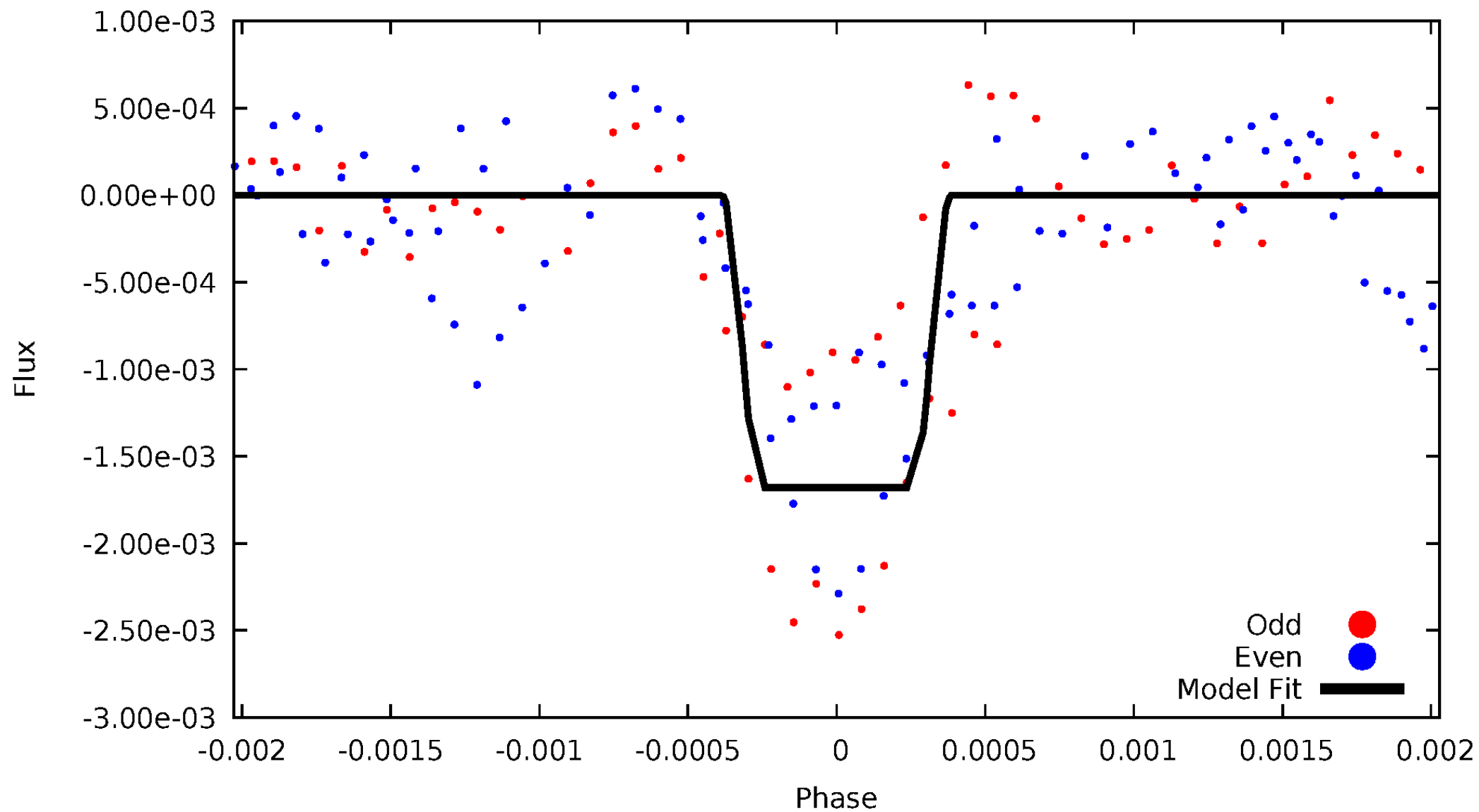
DV Odd/Even

TCE 009899410-04



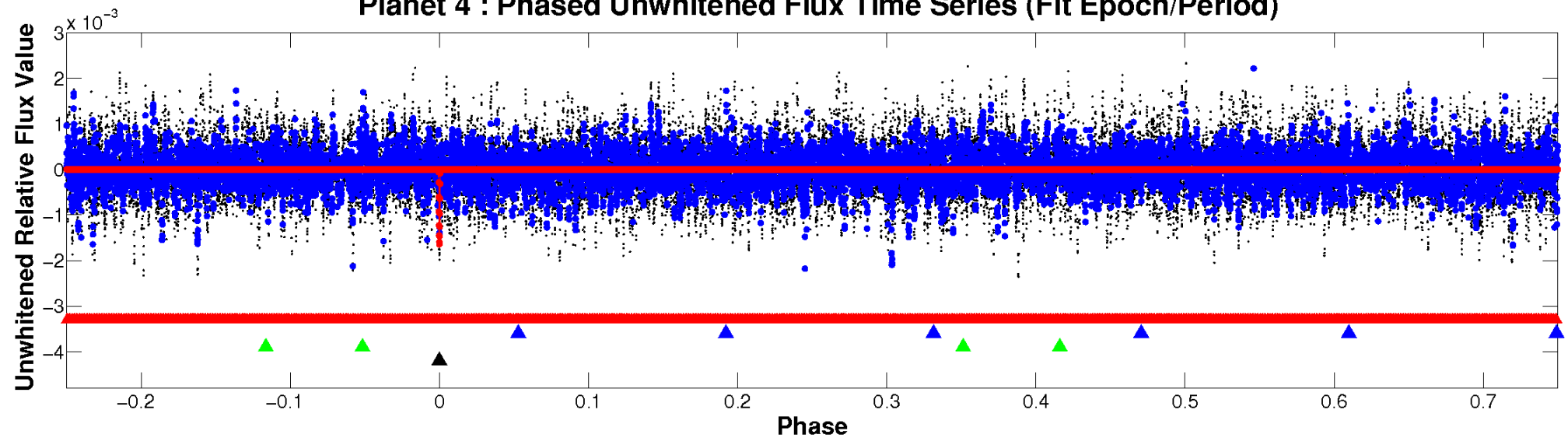
ALT Odd/Even

TCE 009899410-04

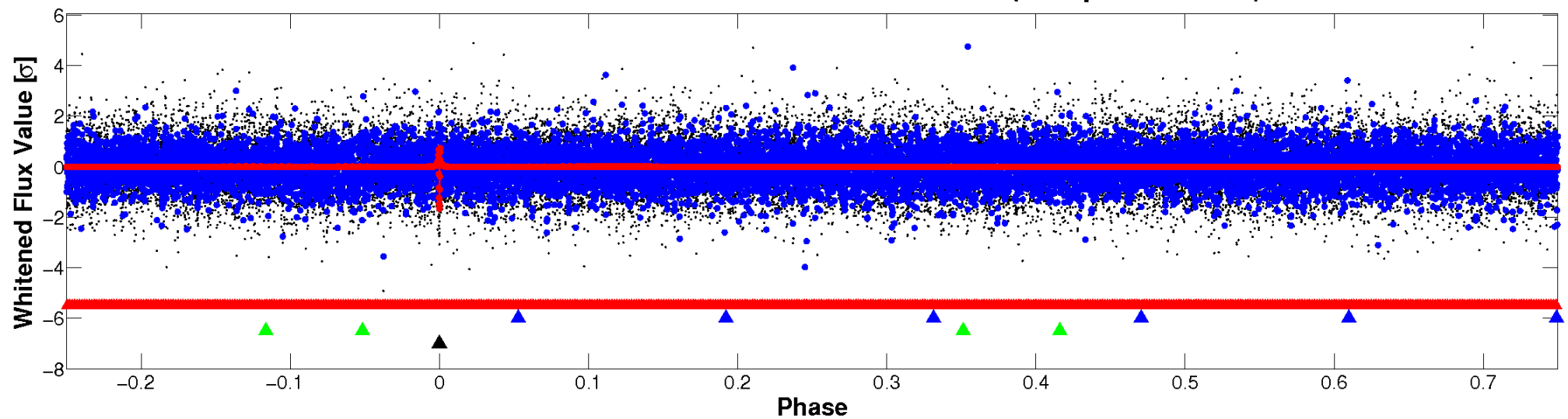


Non-Whitened Vs. Whitened Light Curve

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

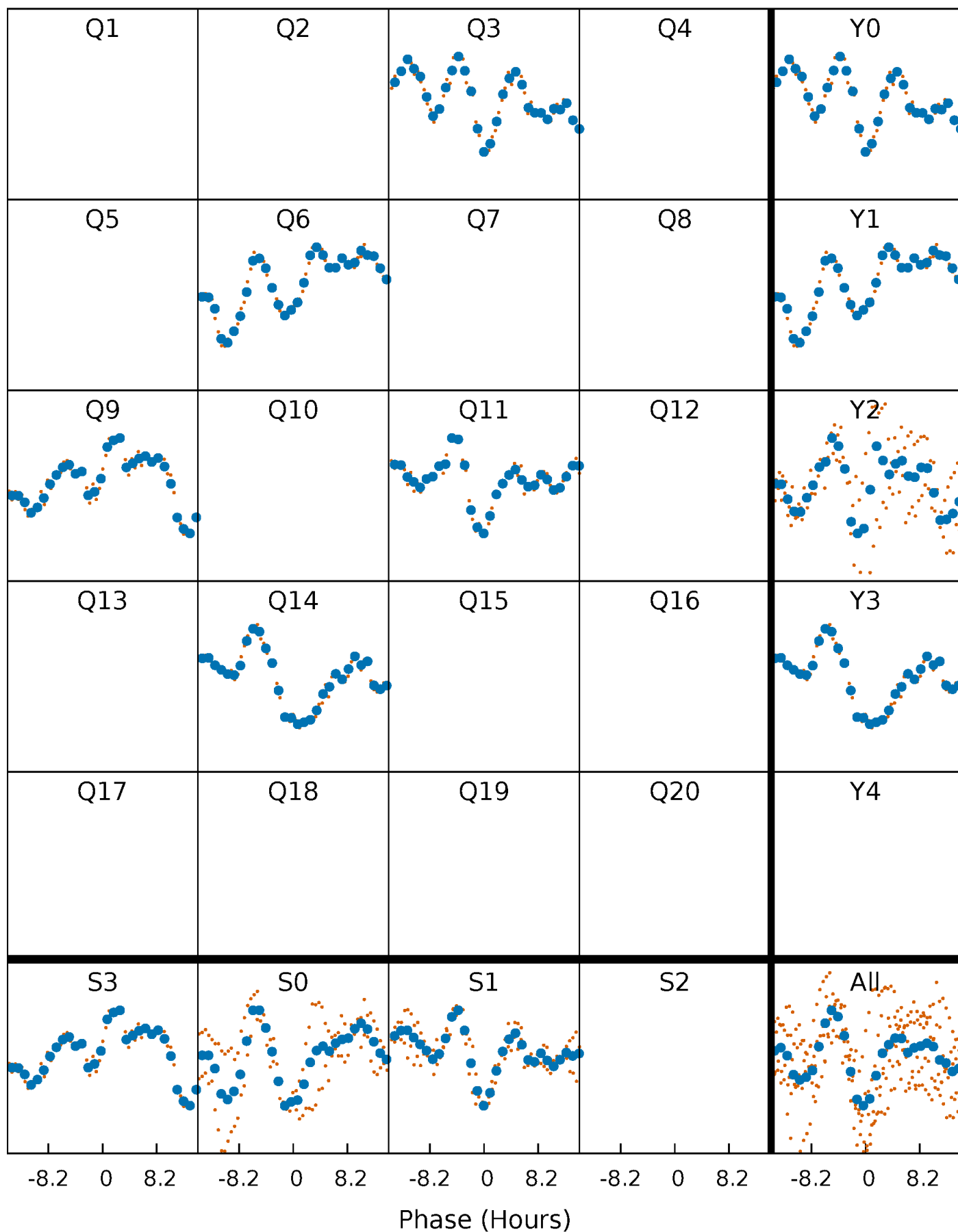


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



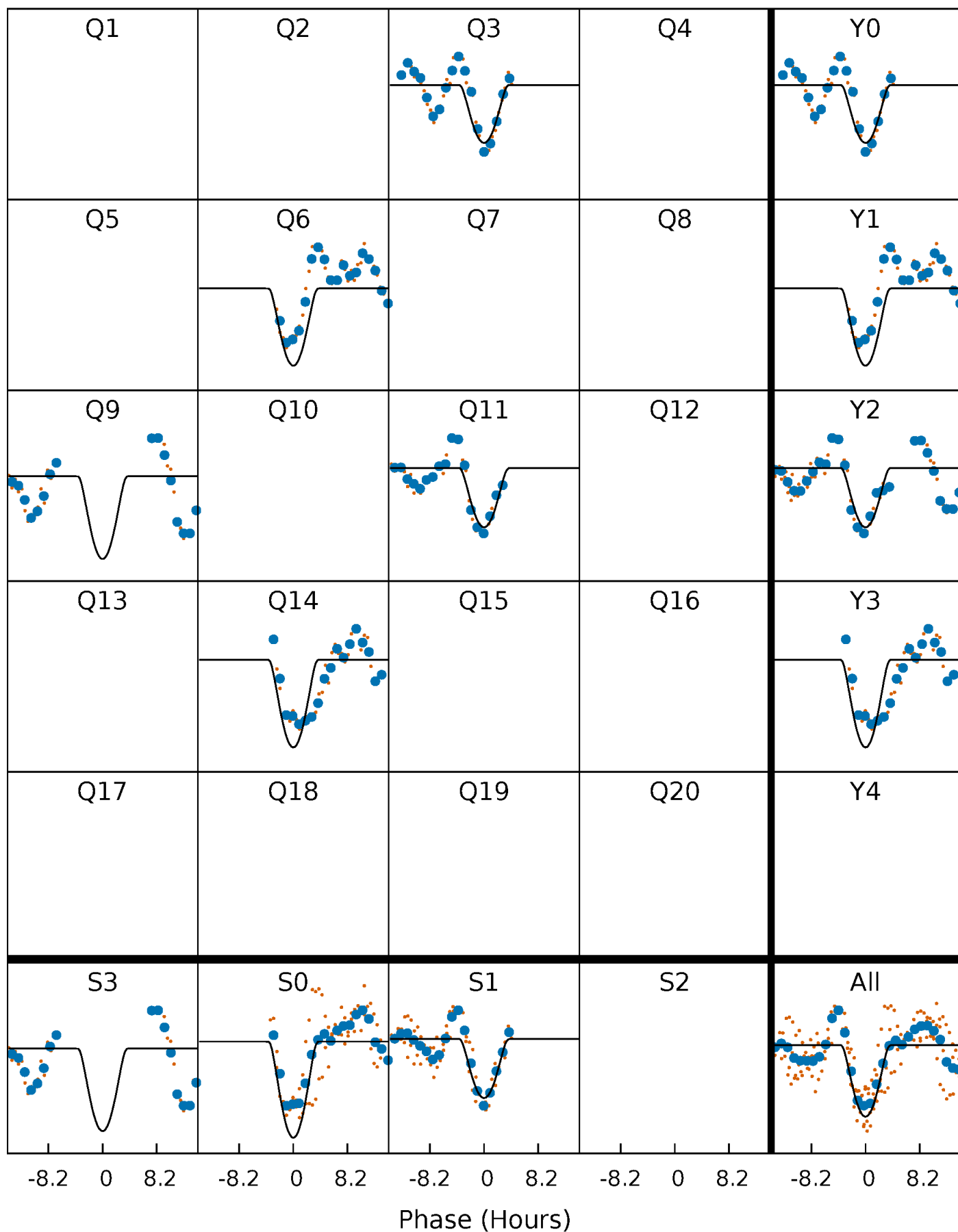
PDC Quarter-Phased Transit Curves

TCE 009899410-04 P=268.756157 Days $T_0=283.487562$ (BKJD)



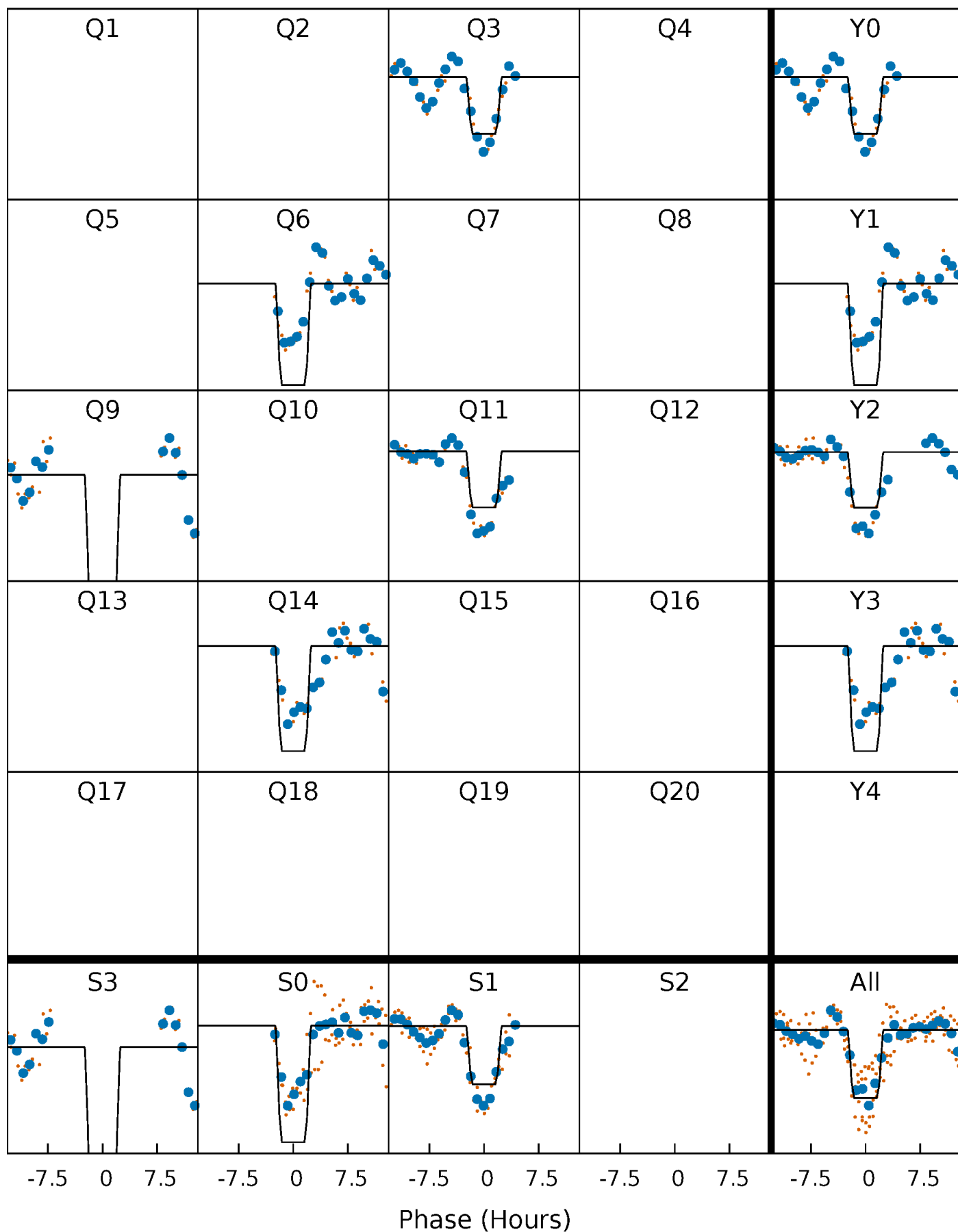
DV Quarter-Phased Transit Curves

TCE 009899410-04 P=268.756157 Days $T_0=283.487562$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

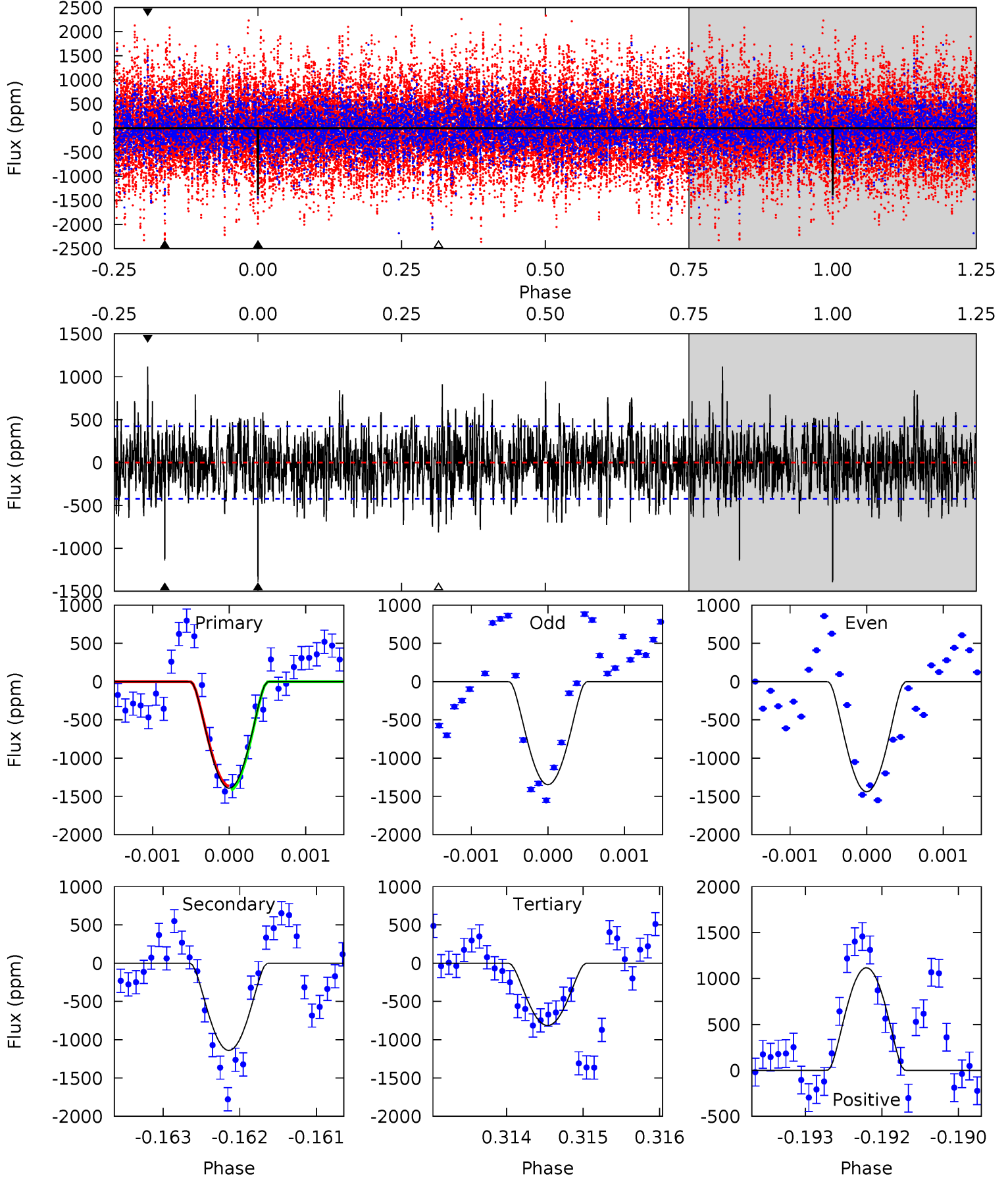
TCE 009899410-04 P=268.748550 Days $T_0=283.496377$ (BKJD)



DV Model-Shift Uniqueness Test

009899410-04, P = 268.756157 Days, E = 14.731405 Days

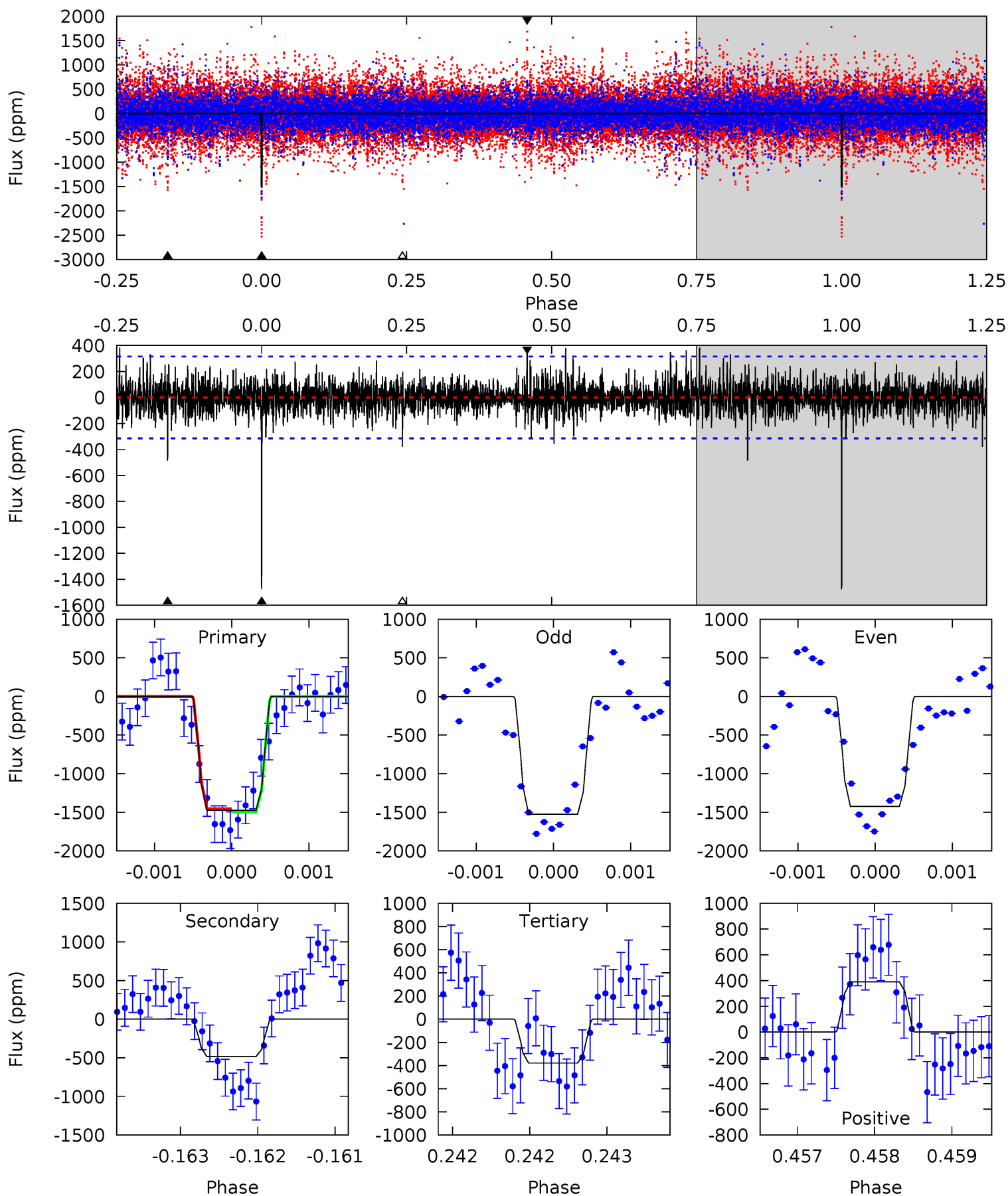
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.9	14.6	10.4	14.3	5.43	3.25	3.36	7.42	3.54	4.17	0.29	0.60	0.97	0.45	0.34



Alt Model-Shift Uniqueness Test

009899410-04, P = 268.748550 Days, E = 14.747827 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.7	8.49	6.60	6.82	5.50	3.37	1.53	19.1	18.9	1.88	1.67	0.88	1.04	0.21	0.36



Stellar Parameters For KIC 009899410

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5154^{+153}_{-307}	$2.435^{+0.033}_{-0.030}$	$-0.500^{+0.150}_{-0.300}$	$16.486^{+0.962}_{-5.452}$	$2.700^{+0.250}_{-1.502}$	$0.001^{+0.000}_{-0.000}$
	+3%/-6%	+1%/-1%	+30%/-60%	+6%/-33%	+9%/-56%	+52%/-10%
Source	PHO1	AST9	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009899410-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1140 ± 78	$194.83^{+172.59}_{-129.63}$	1211^{+45}_{-72}	3324^{+1674}_{-556}	21^{+173}_{-15}
Alt.	-486 ± 57	$160.96^{+171.71}_{-110.11}$	1205^{+45}_{-76}	3113^{+1434}_{-580}	13^{+111}_{-10}

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

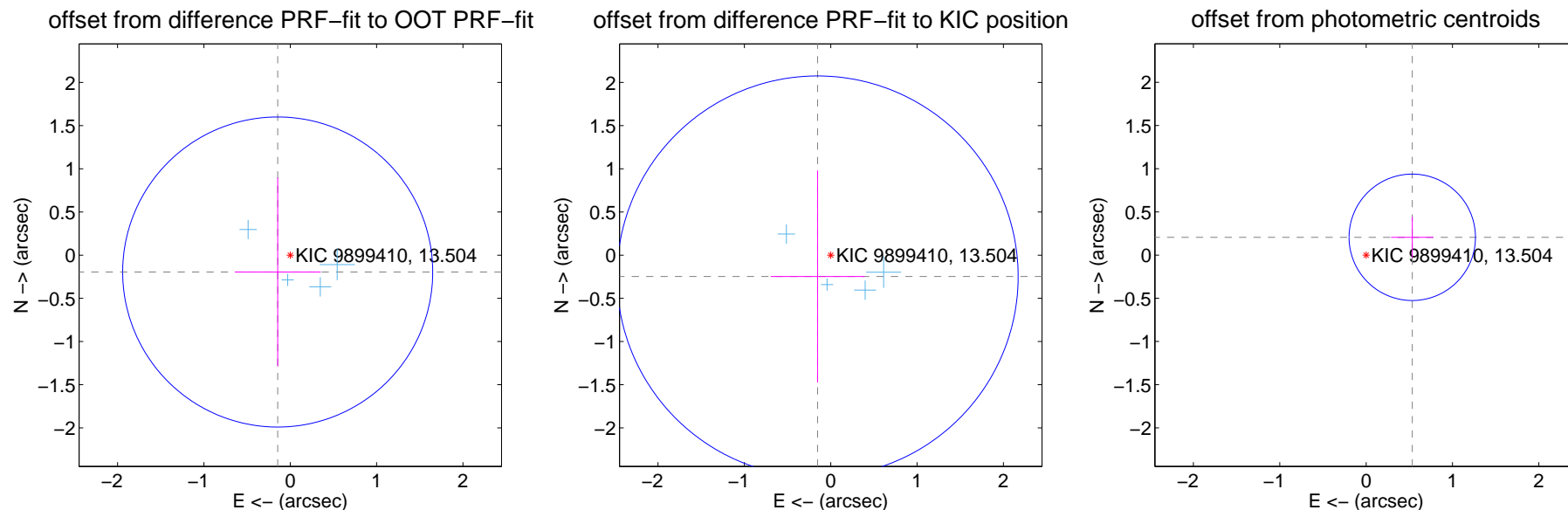
DV Centroid Data

Supplemental centroid analysis for 009899410-04. Kepler magnitude: 13.50. Transit SNR 8.58

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.244 ± 0.598	0.41	0.146 ± 0.497	-0.195 ± 1.094
PRF-fit source offset from KIC position	0.291 ± 0.774	0.38	0.152 ± 0.544	-0.248 ± 1.228
photometric centroid source offset	0.57 ± 0.24	2.35	-0.53 ± 0.25	0.21 ± 0.24



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.

Q1 no difference image



Q1 no OOT image



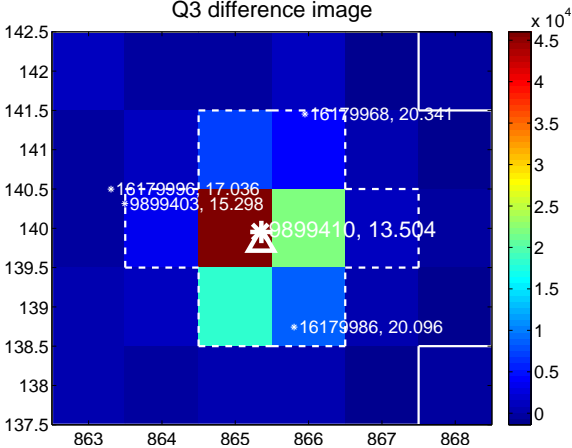
Q2 no difference image



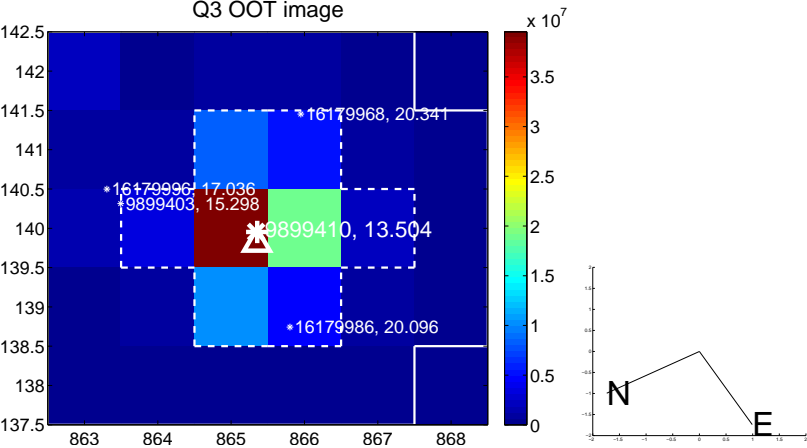
Q2 no OOT image



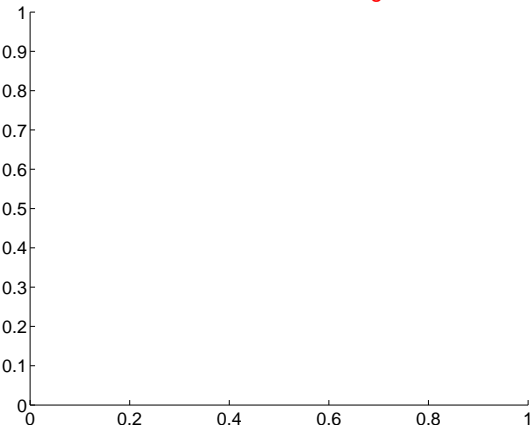
Q3 difference image



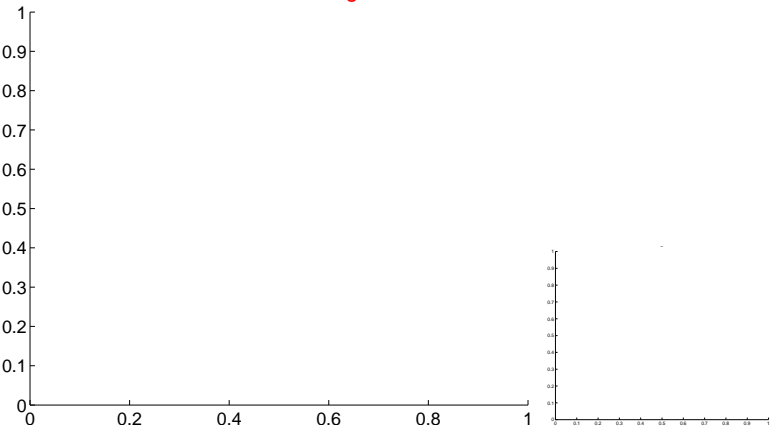
Q3 OOT image



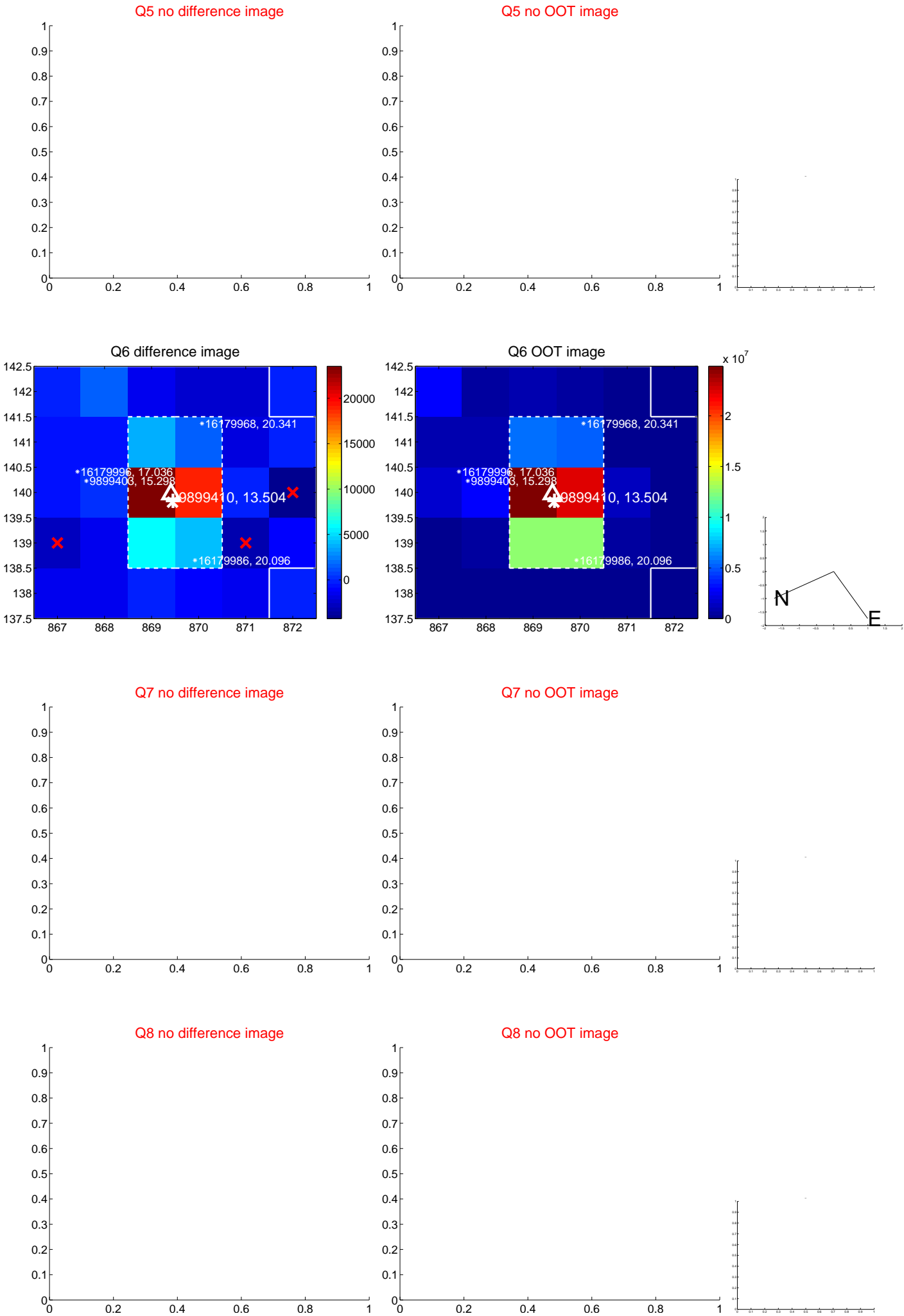
Q4 no difference image



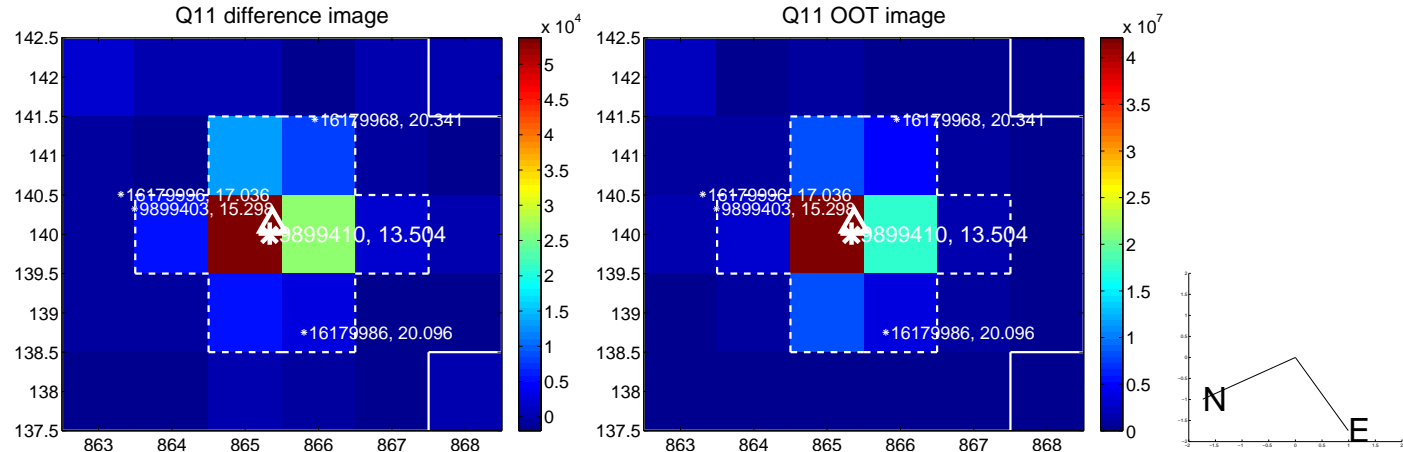
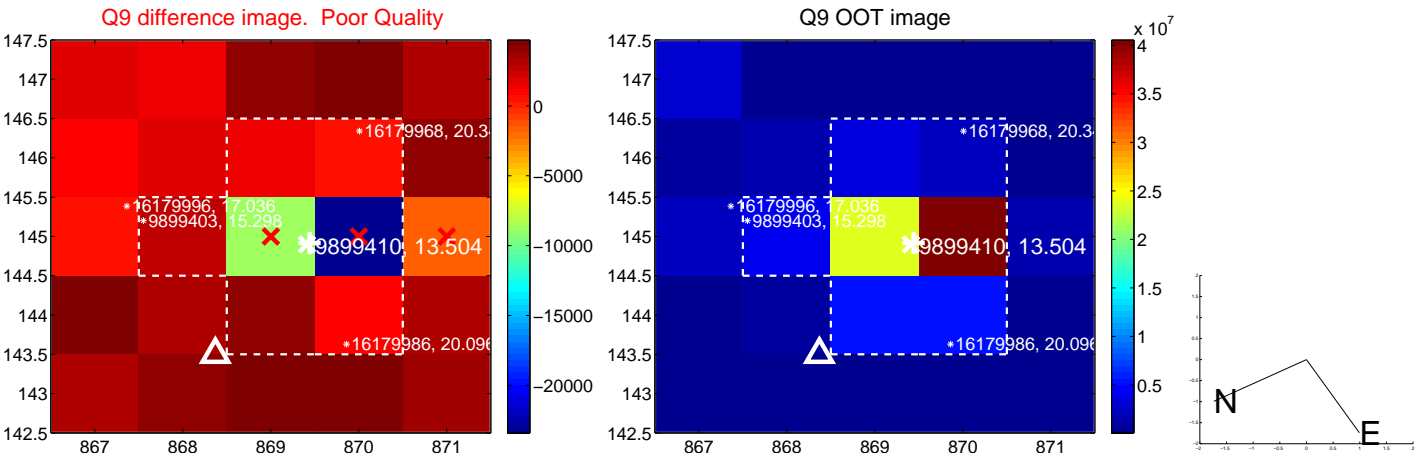
Q4 no OOT image



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



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

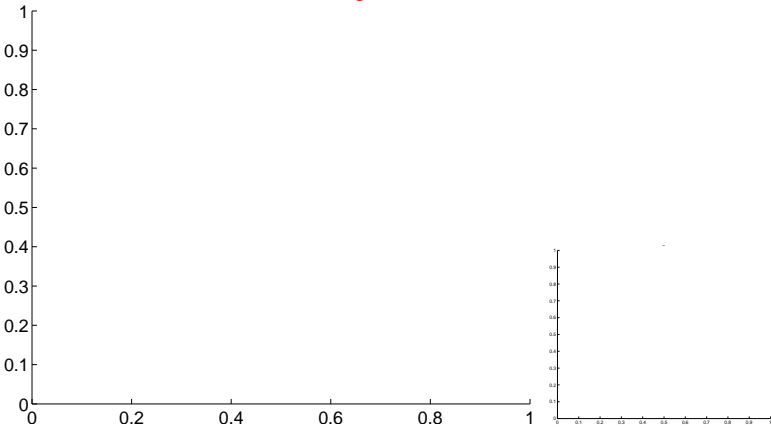


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

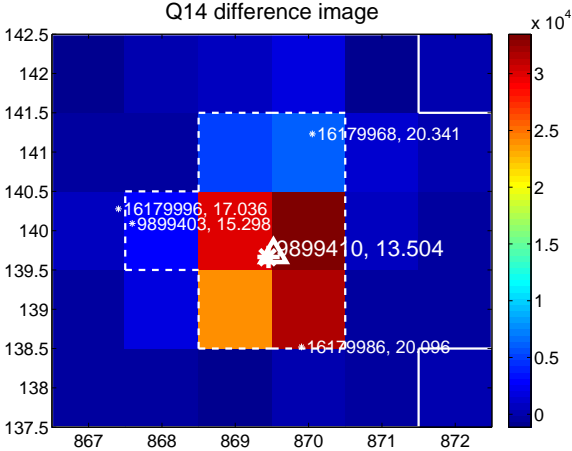
Q13 no difference image



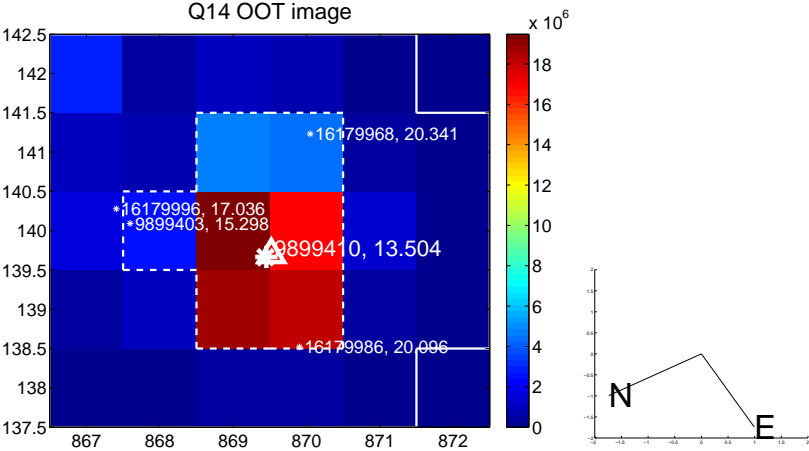
Q13 no OOT image



Q14 difference image



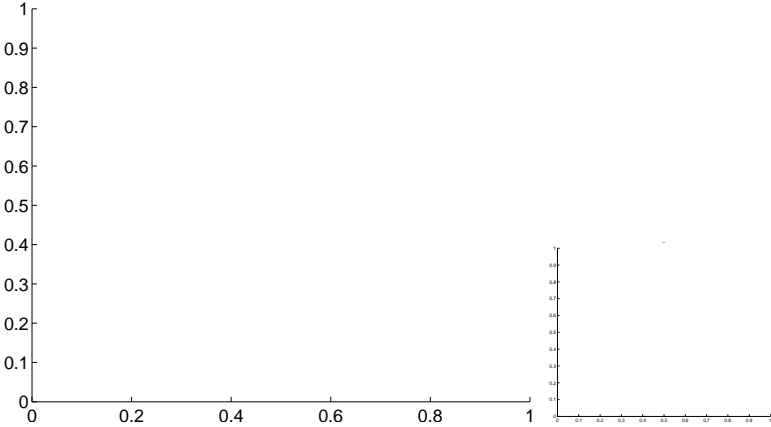
Q14 OOT image



Q15 no difference image



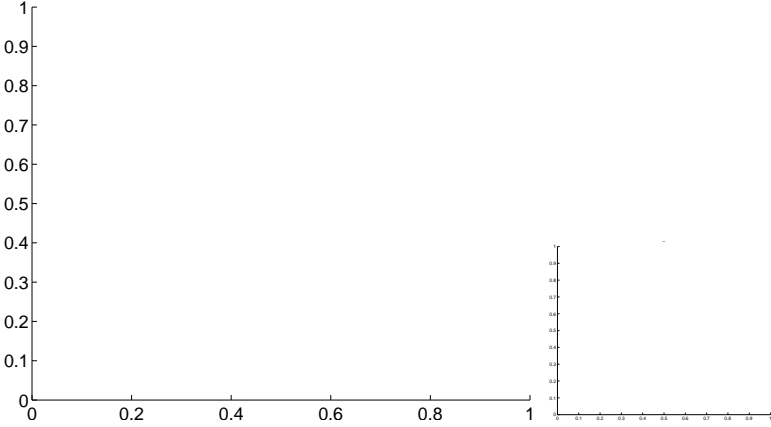
Q15 no OOT image



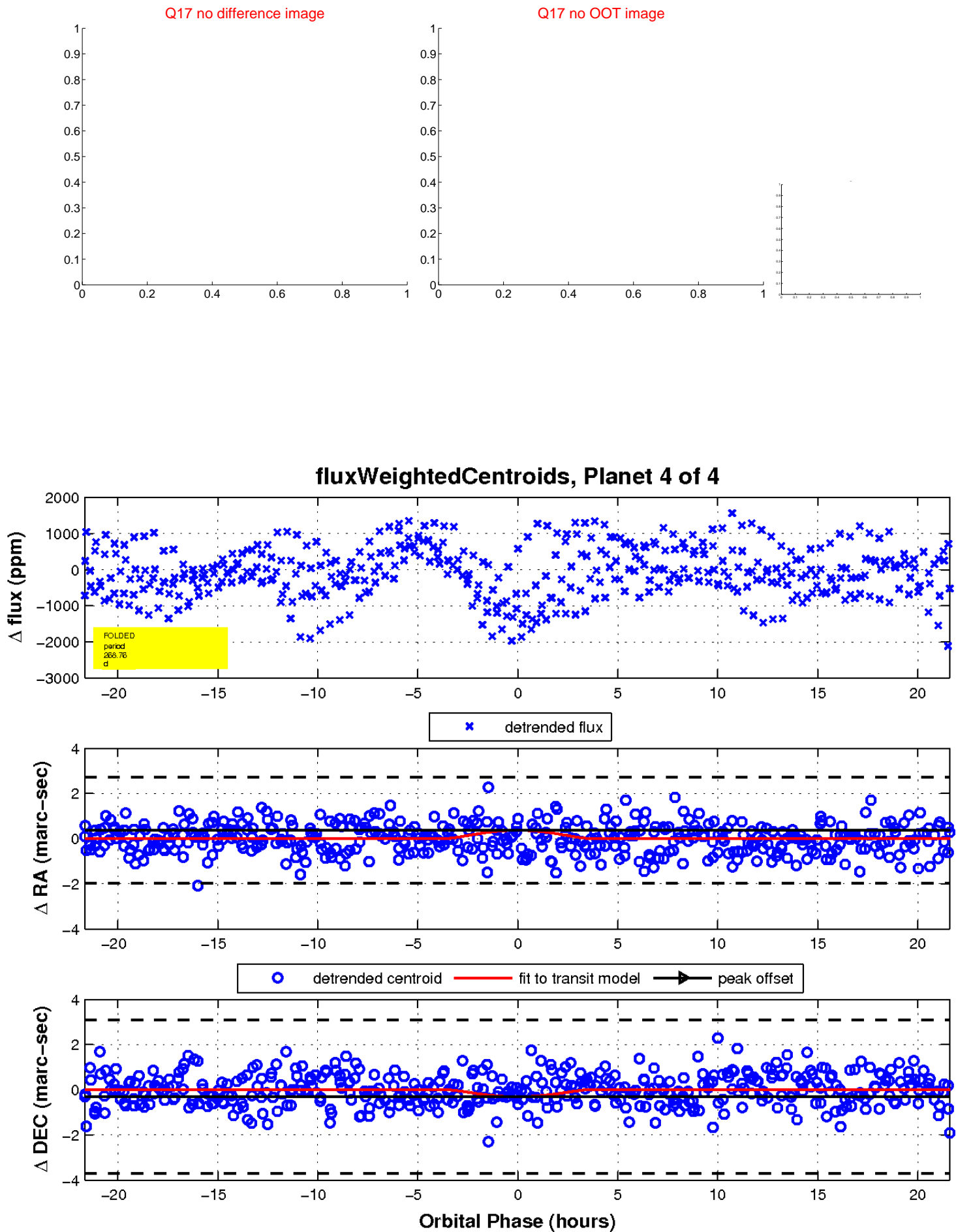
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

