

KIC 009205938

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})
009205938-01	OBS	2162.01	108.593066	173.750434	329.0	8.456	20.2	21.7	0.92	5678	1.96	4.64
009205938-02	OBS	2162.02	199.668291	131.603807	234.5	9.413	11.1	11.8	0.92	5678	1.68	2.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009205938-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009205938-02	OBS	PC	0.92	0	0	0	0	CENT_FEW_DIFFS

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

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

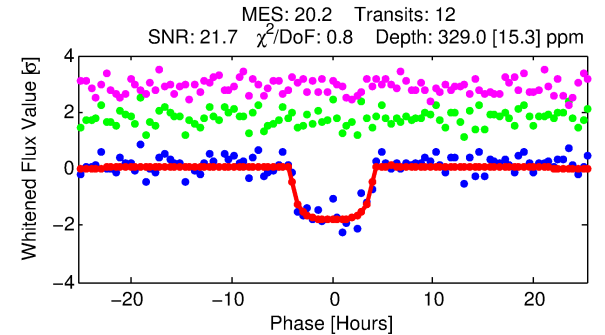
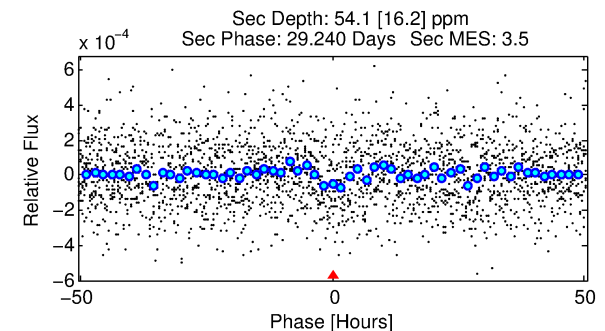
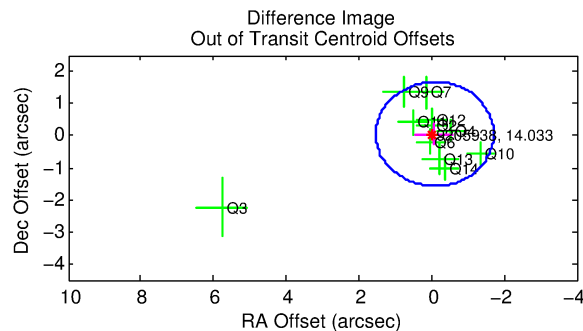
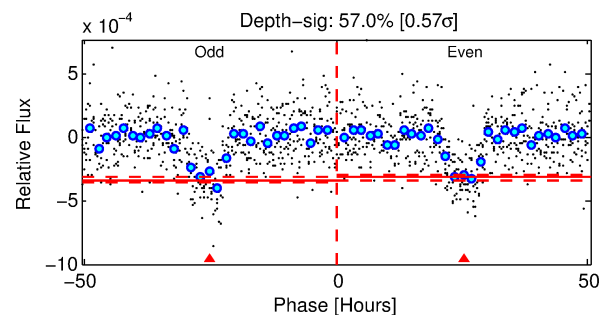
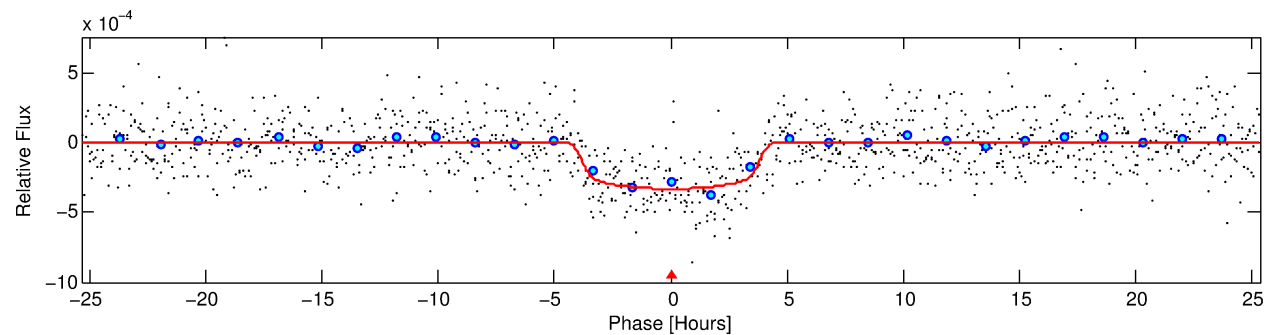
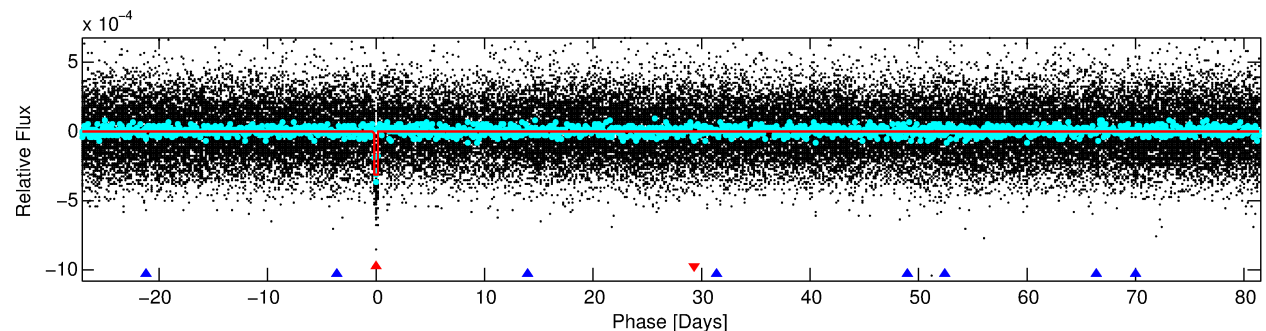
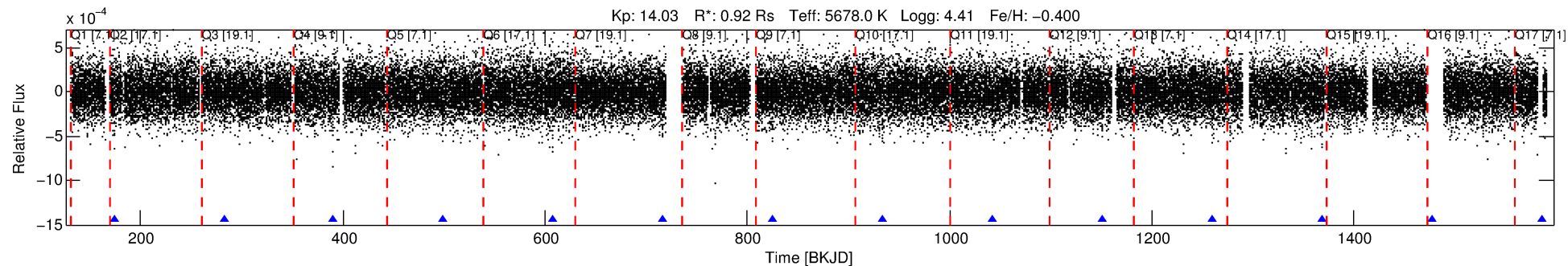
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009205938-01

No Significant Match Found

DV One-Page Summary

KIC: 9205938 Candidate: 1 of 2 Period: 108.593 d
KOI: K02162.01 Corr: 0.973



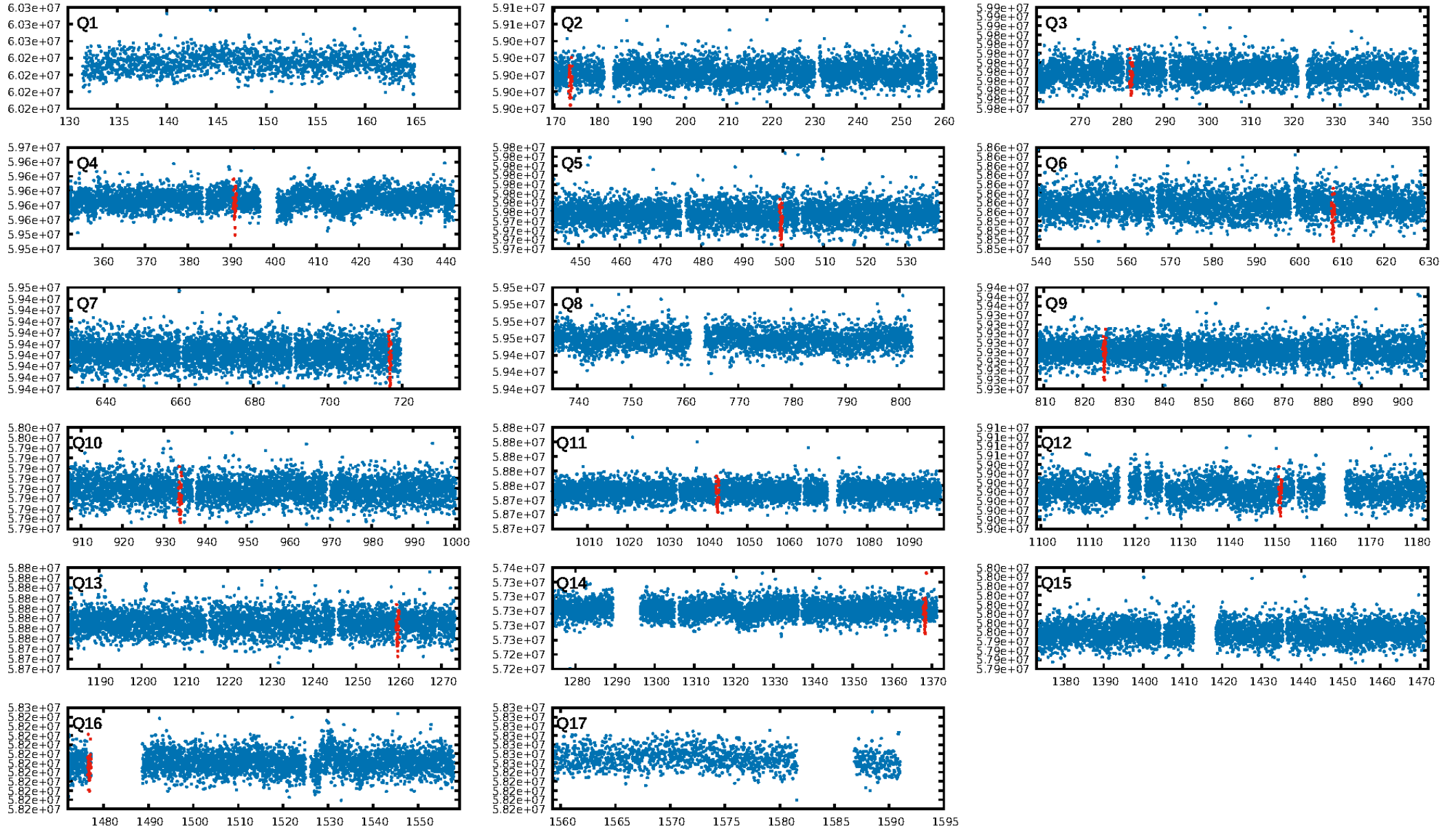
DV Fit Results:

Period = 108.59307 [0.00106] d
Epoch = 173.7504 [0.0072] BKJD
Rp/R* = 0.0195 [0.0016]
a/R* = 48.92 [18.19]
b = 0.89 [0.09]
Seff = 4.64 [1.08]
Teq = 374 [22] K
Rp = 1.96 [0.29] Re
a = 0.4125 [0.0541] AU
Ag = 1318.65 [534.96] [2.46 σ]
Teffp = 3487 [306] K [10.16 σ]

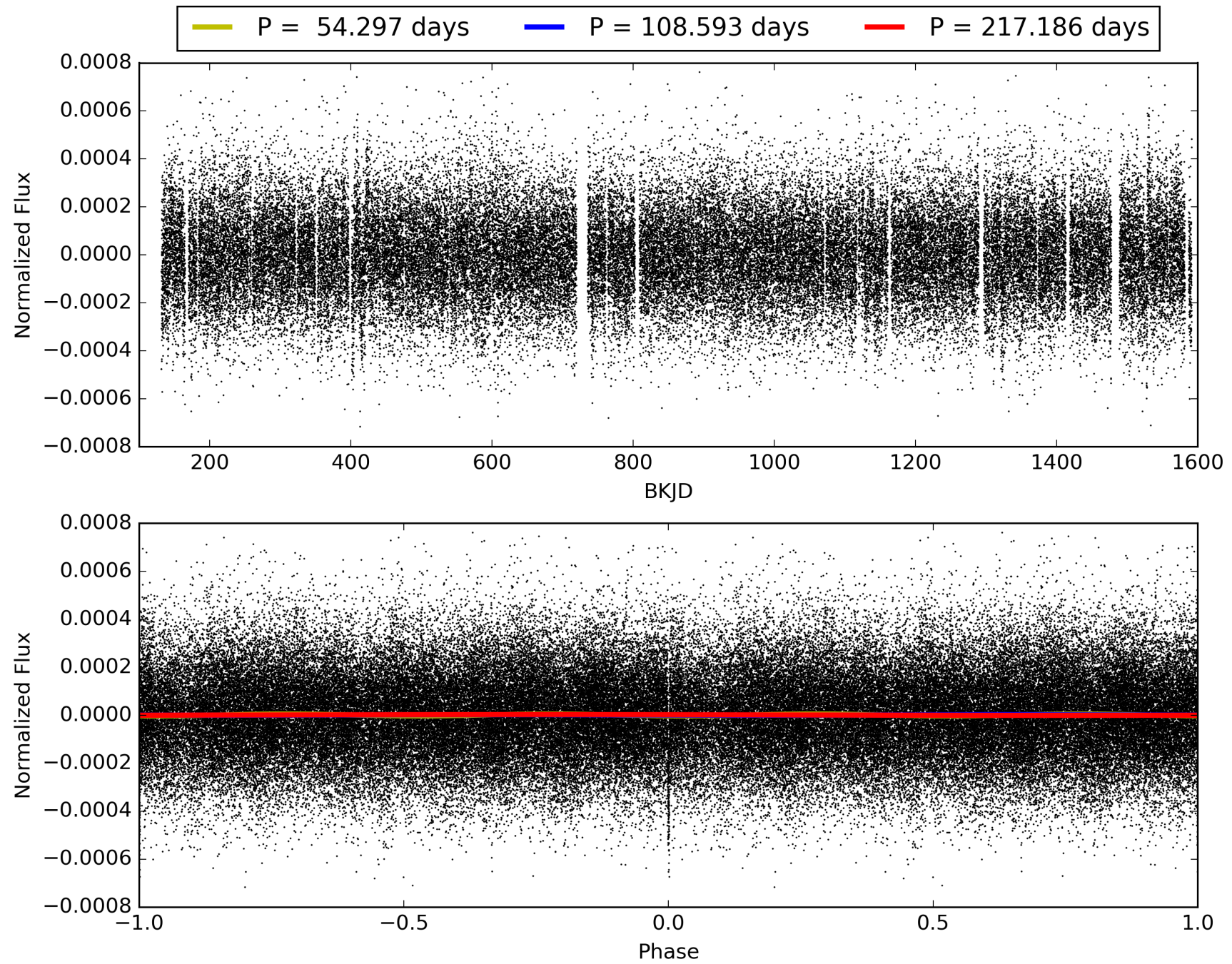
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [172.75 σ]
ModelChiSquare2-sig: 87.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.54e-85
RollingBand-fgt: 1.00 [12/12]
GhostDiagnostic-chr: 8.877
Centroid-sig: 19.6%
Centroid-so: 0.473 arcsec [0.79 σ]
OotOffset-rm: 0.094 arcsec [0.17 σ]
KicOffset-rm: 0.236 arcsec [0.45 σ]
OotOffset-st: 4/3/2/2 [11]
KicOffset-st: 4/3/2/2 [11]
DiffImageQuality-fgm: 0.91 [10/11]
DiffImageOverlap-fno: 1.00 [12/12]

TCE 009205938-01, PDC Light Curves

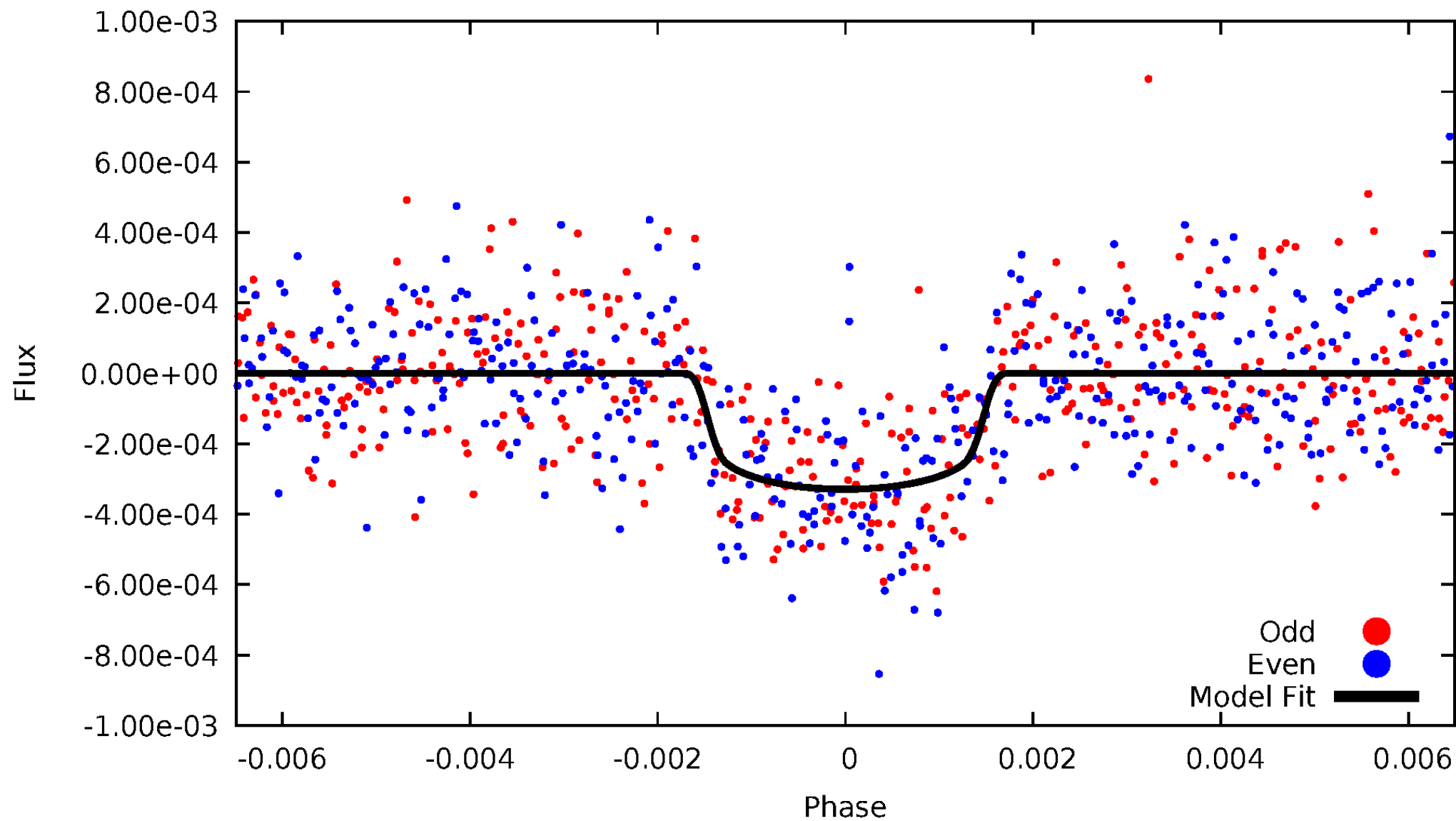


TCE 009205938-01



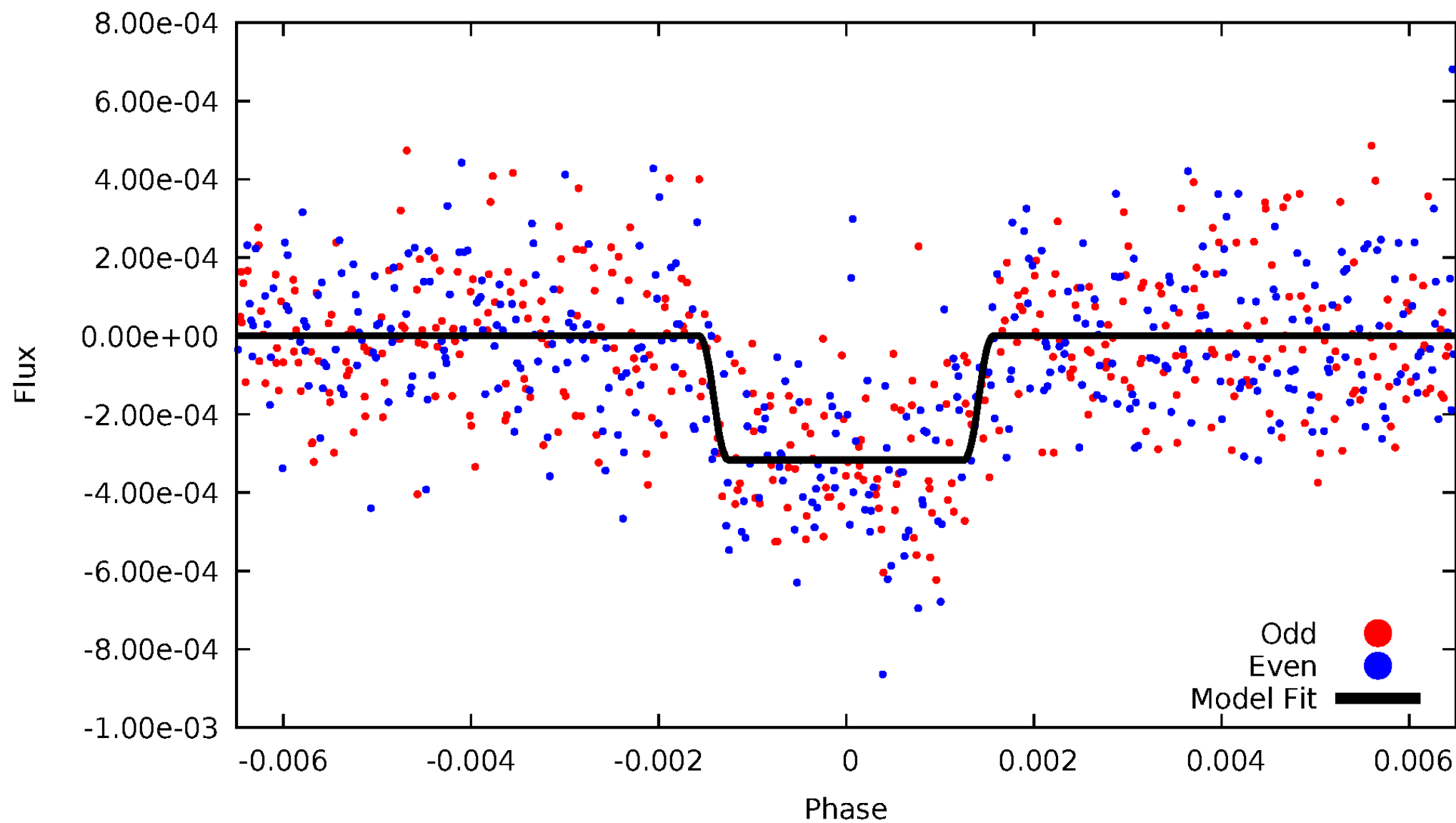
DV Odd/Even

TCE 009205938-01



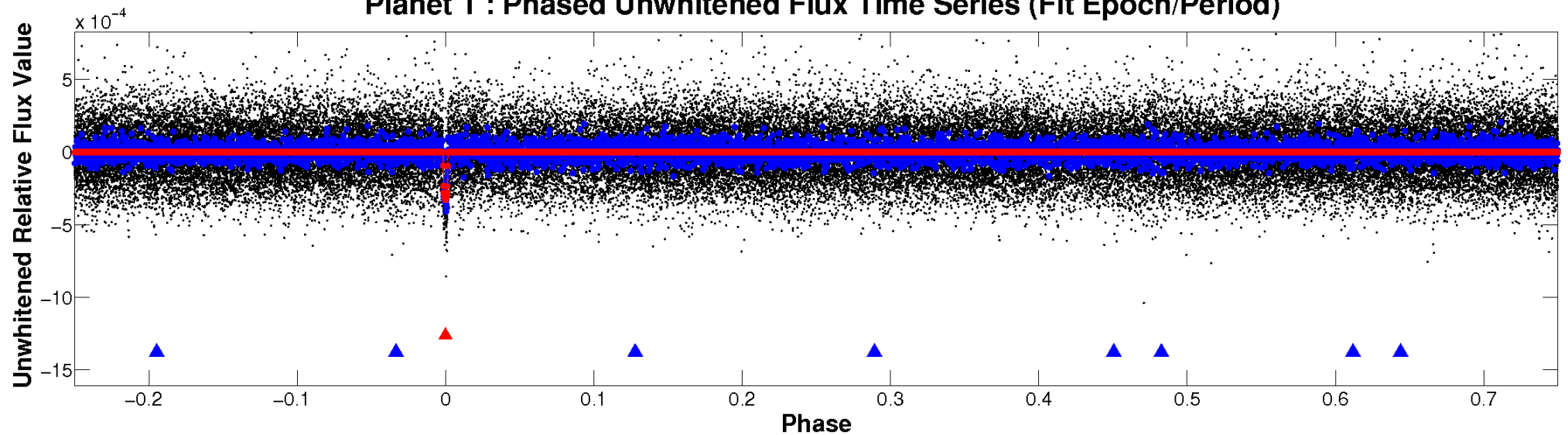
ALT Odd/Even

TCE 009205938-01

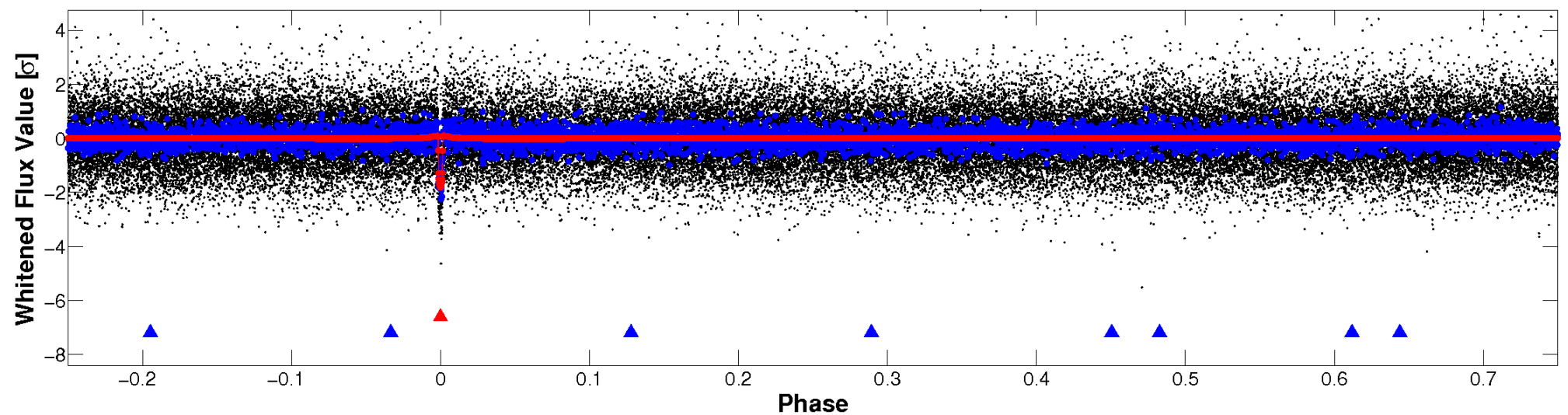


Non-Whitened Vs. Whitened Light Curve

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

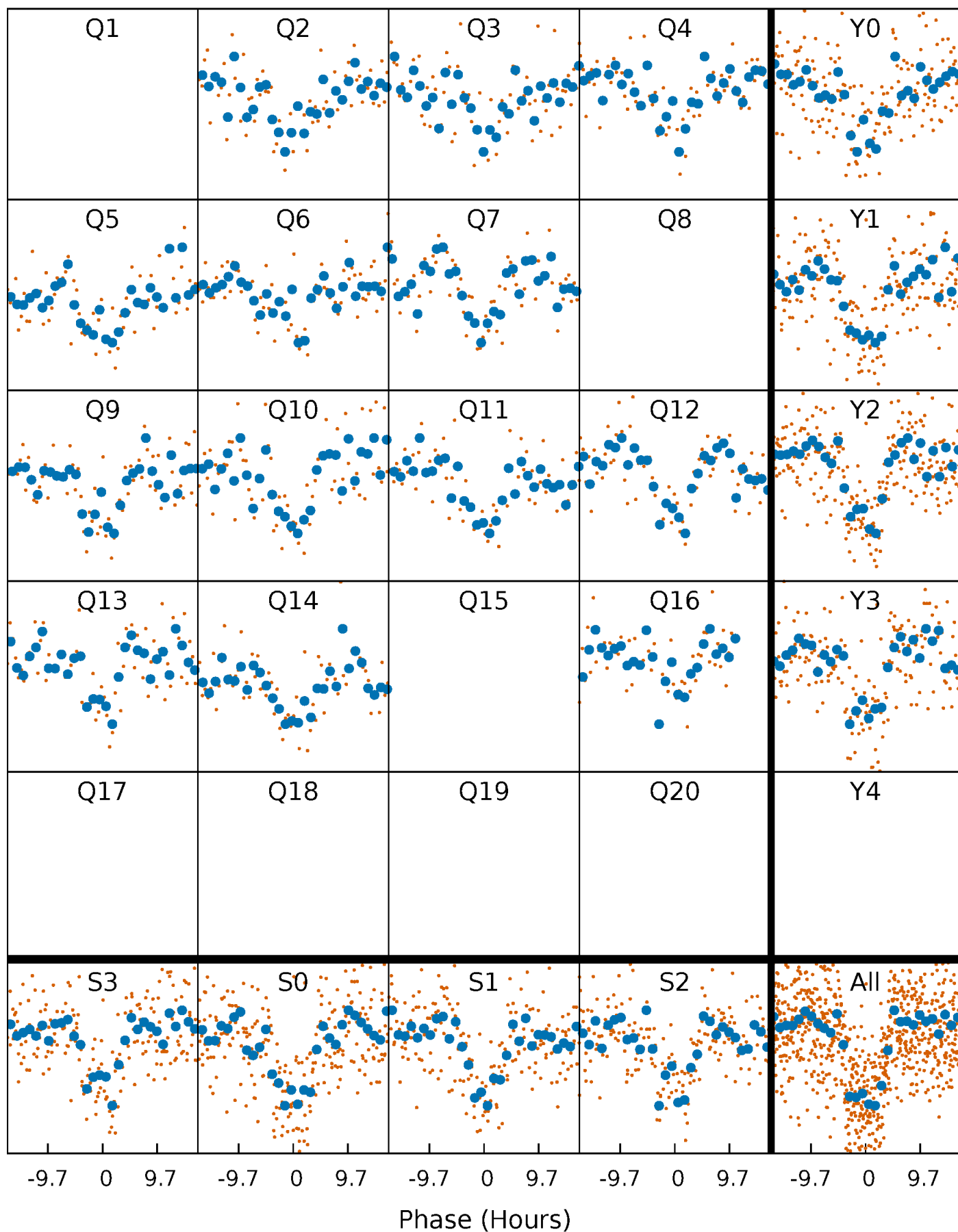


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



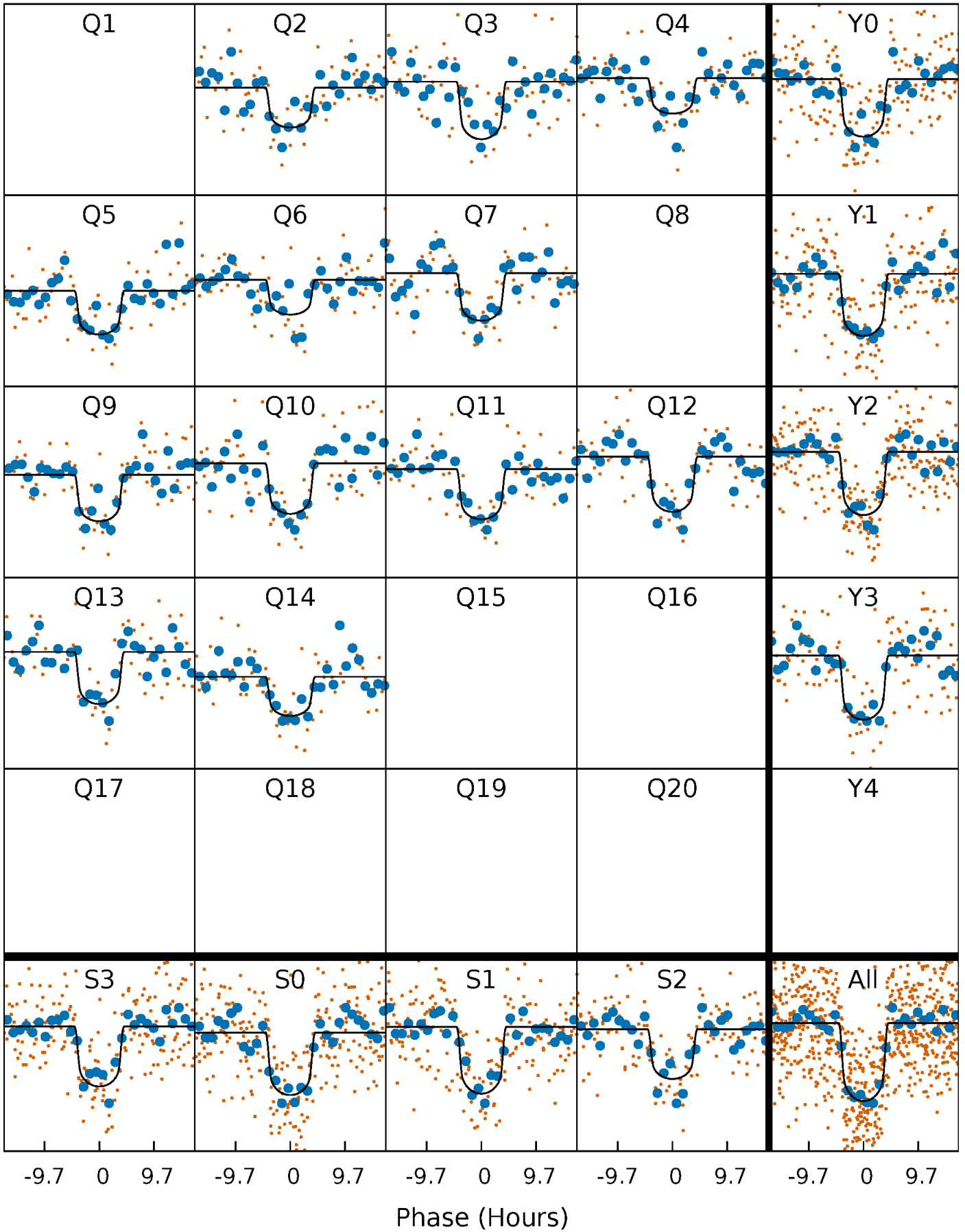
PDC Quarter-Phased Transit Curves

TCE 009205938-01 P=108.593066 Days $T_0=173.750434$ (BKJD)



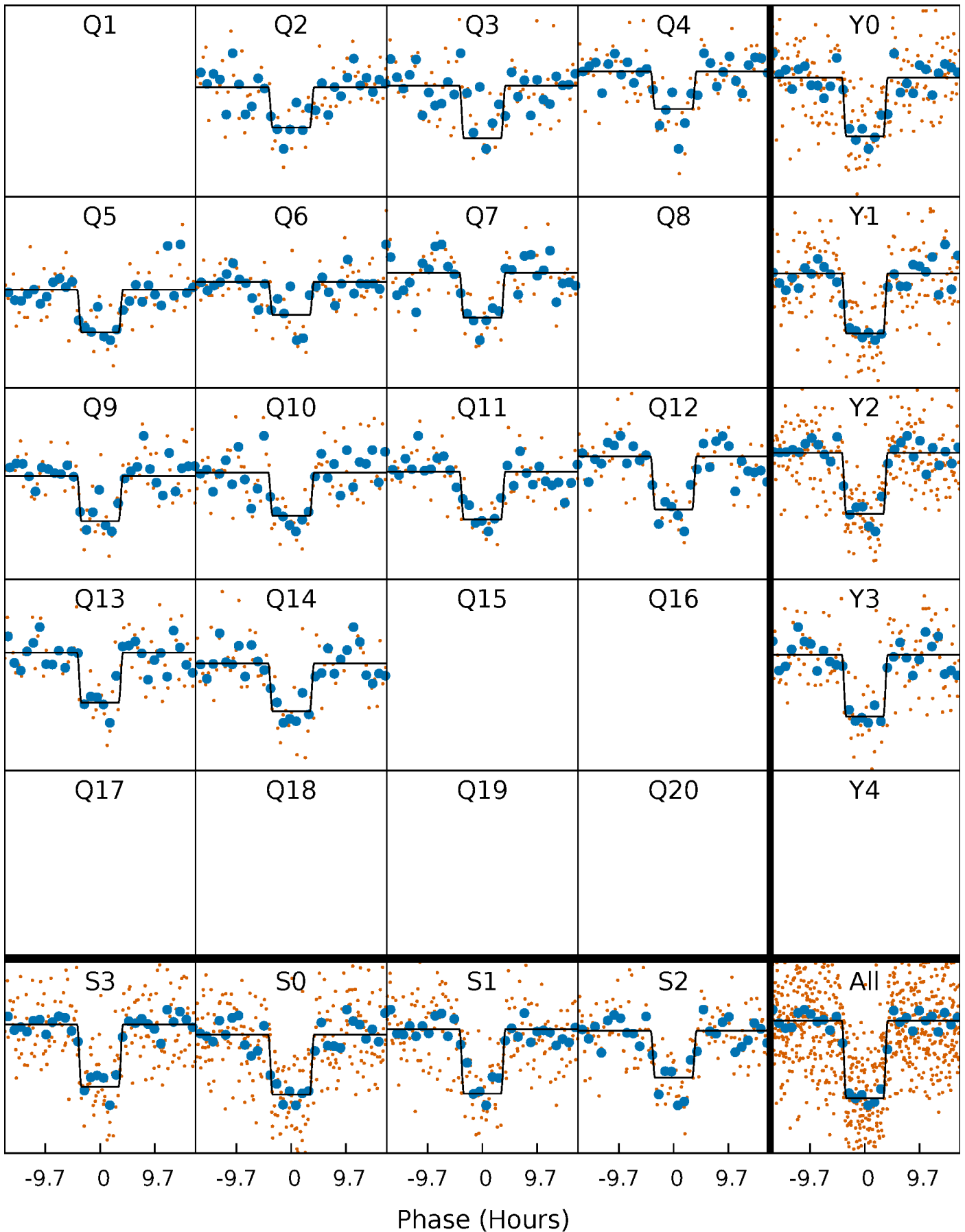
DV Quarter-Phased Transit Curves

TCE 009205938-01 P=108.593066 Days $T_0=173.750434$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

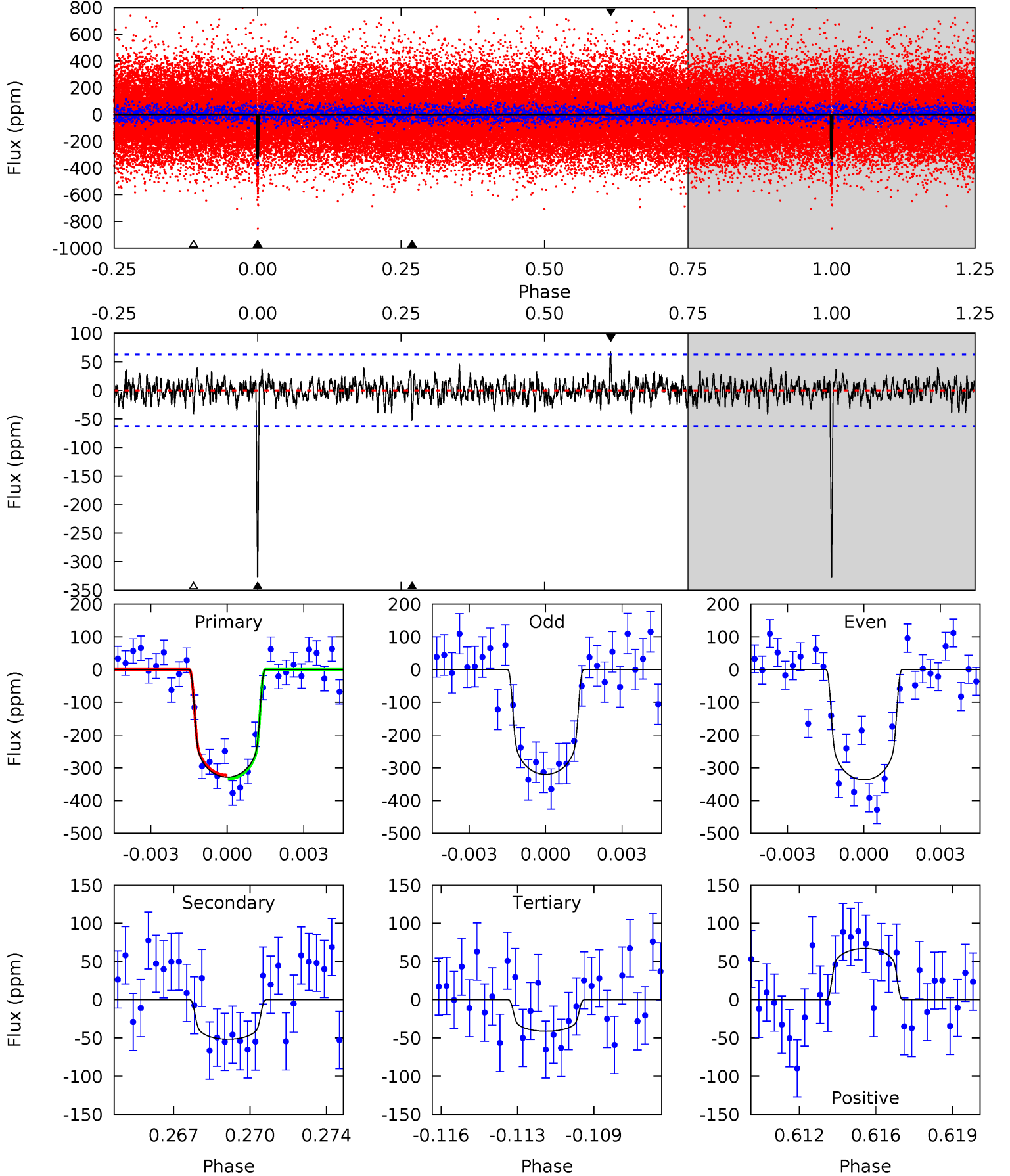
TCE 009205938-01 P=108.593592 Days $T_0=173.745818$ (BKJD)



DV Model-Shift Uniqueness Test

009205938-01, $P = 108.593066$ Days, $E = 65.157368$ Days

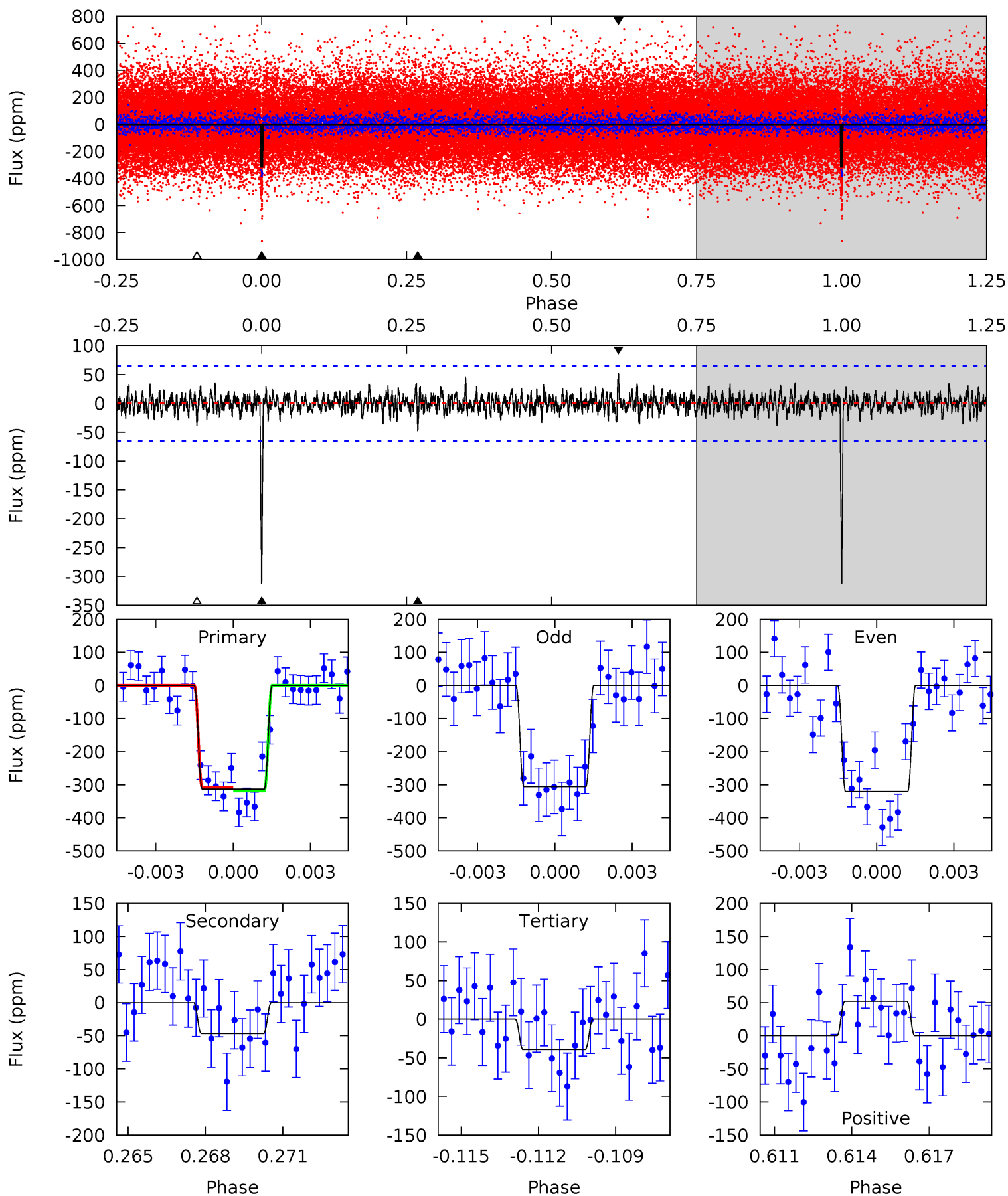
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.4	4.32	3.44	5.60	5.23	2.93	1.15	24.0	21.8	0.88	-1.28	0.70	1.00	0.17	0.52



Alt Model-Shift Uniqueness Test

009205938-01, $P = 108.593592$ Days, $E = 65.152226$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	3.76	3.16	4.18	5.25	2.96	0.94	22.0	21.0	0.60	-0.42	0.60	0.97	0.14	0.48



Stellar Parameters For KIC 009205938

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5678^{+113}_{-102}	$4.409^{+0.132}_{-0.088}$	$-0.400^{+0.150}_{-0.150}$	$0.921^{+0.115}_{-0.115}$	$0.794^{+0.071}_{-0.030}$	$1.432^{+0.740}_{-0.374}$
	+2%/-2%	+3%/-2%	+37%/-37%	+12%/-12%	+9%/-4%	+52%/-26%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009205938-01 / KOI 2162.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-52 ± 12	$1.94^{+0.22}_{-0.20}$	523^{+20}_{-22}	3828^{+212}_{-188}	1290^{+491}_{-346}
Alt.	-47 ± 12	$1.78^{+0.22}_{-0.19}$	521^{+20}_{-22}	3878^{+210}_{-228}	1397^{+540}_{-423}

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

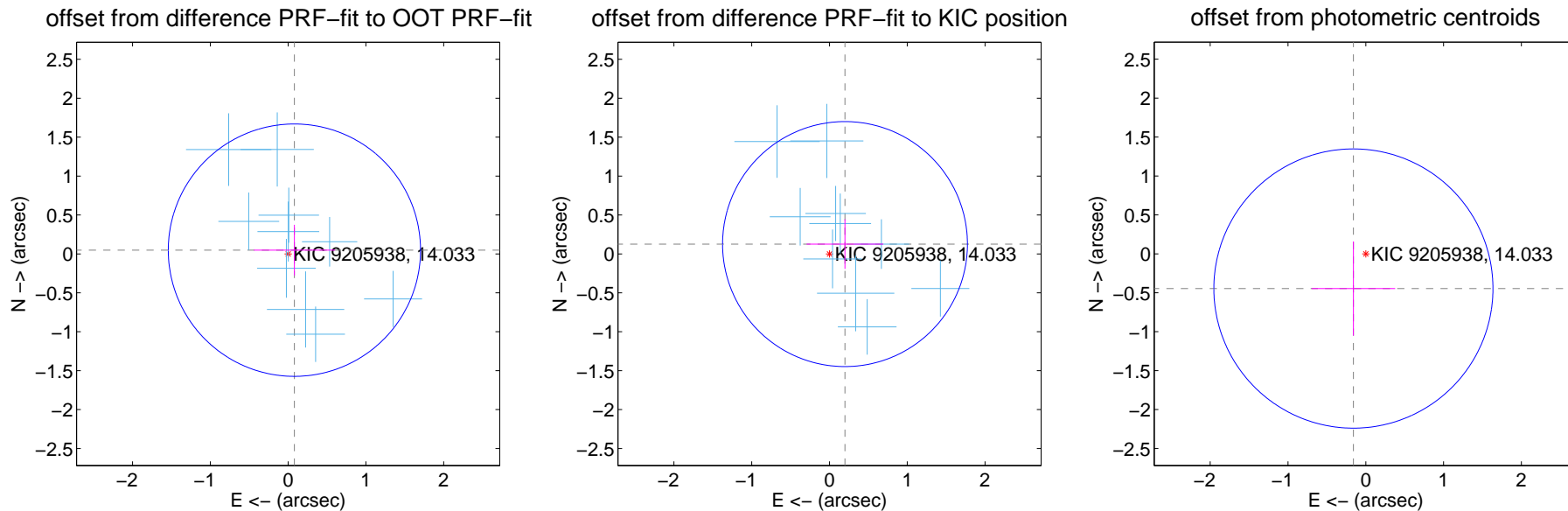
DV Centroid Data

Supplemental centroid analysis for 009205938-01. Kepler magnitude: 14.03. Transit SNR 21.70

There are 10 quarters with good PRF difference image offsets

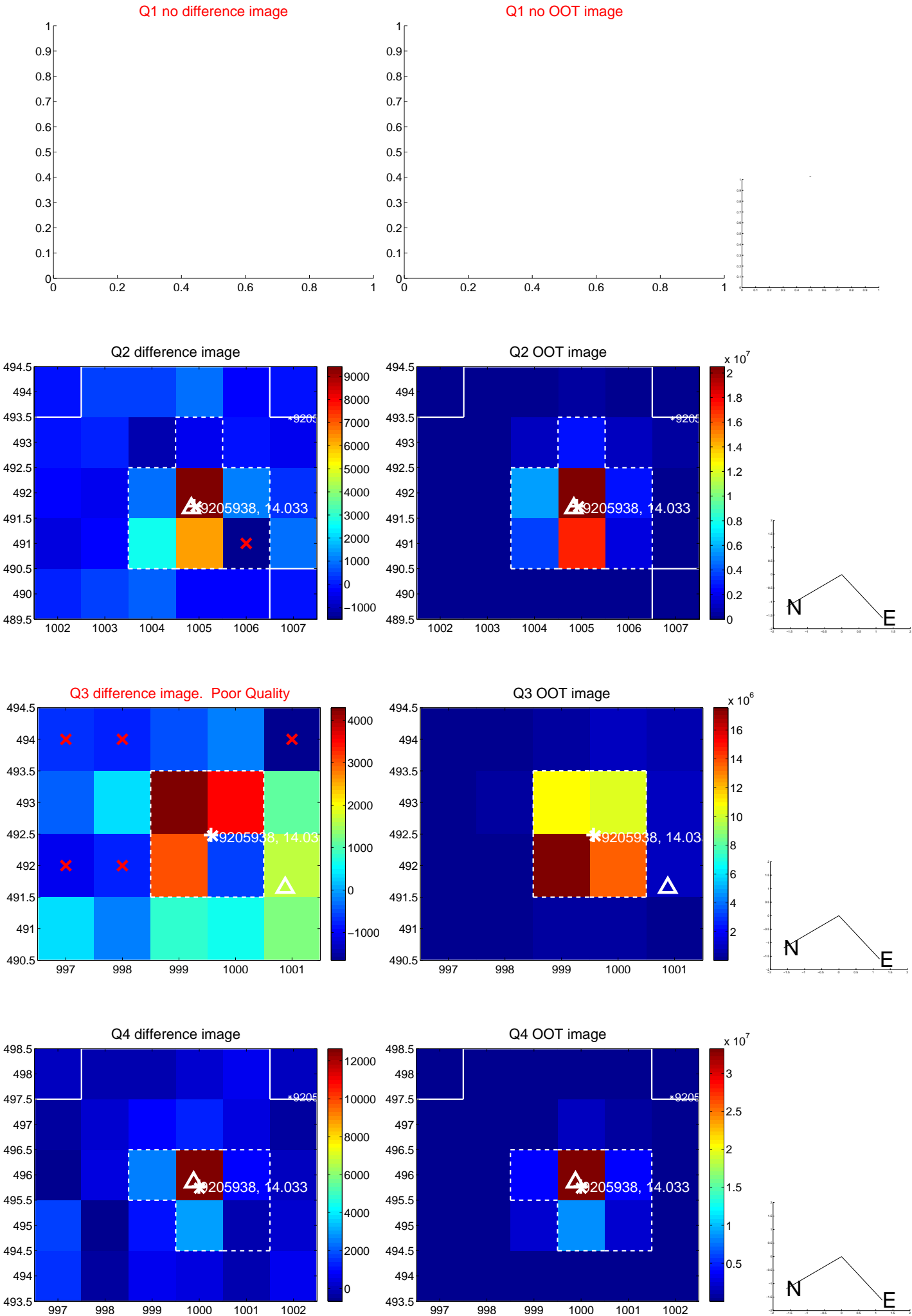
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.094 ± 0.540	0.17	-0.081 ± 0.522	0.048 ± 0.326
PRF-fit source offset from KIC position	0.236 ± 0.525	0.45	-0.199 ± 0.493	0.126 ± 0.318
photometric centroid source offset	0.47 ± 0.60	0.79	0.16 ± 0.54	-0.45 ± 0.61

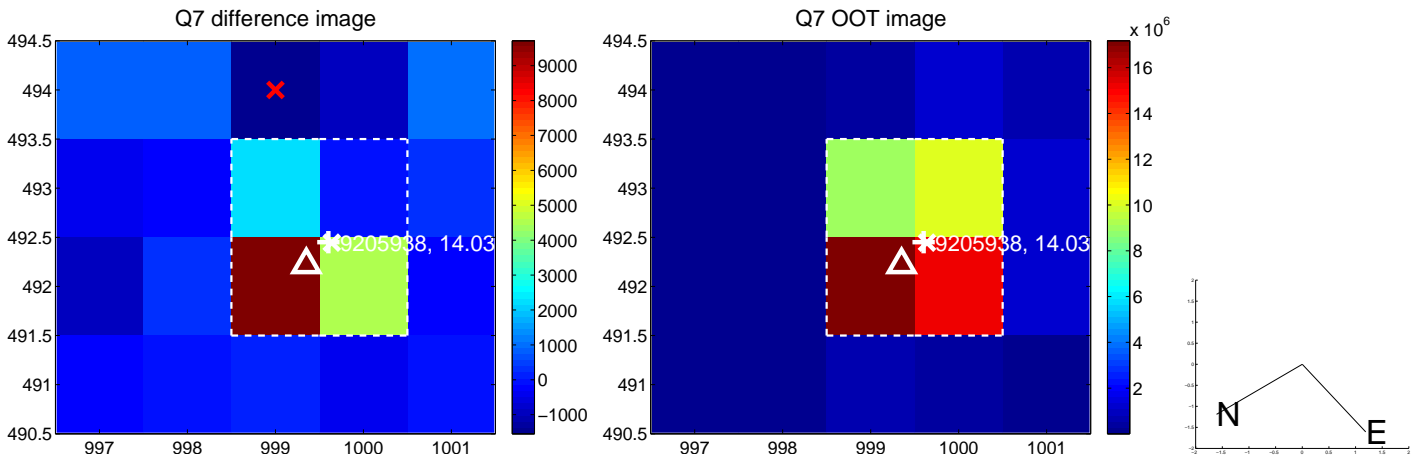
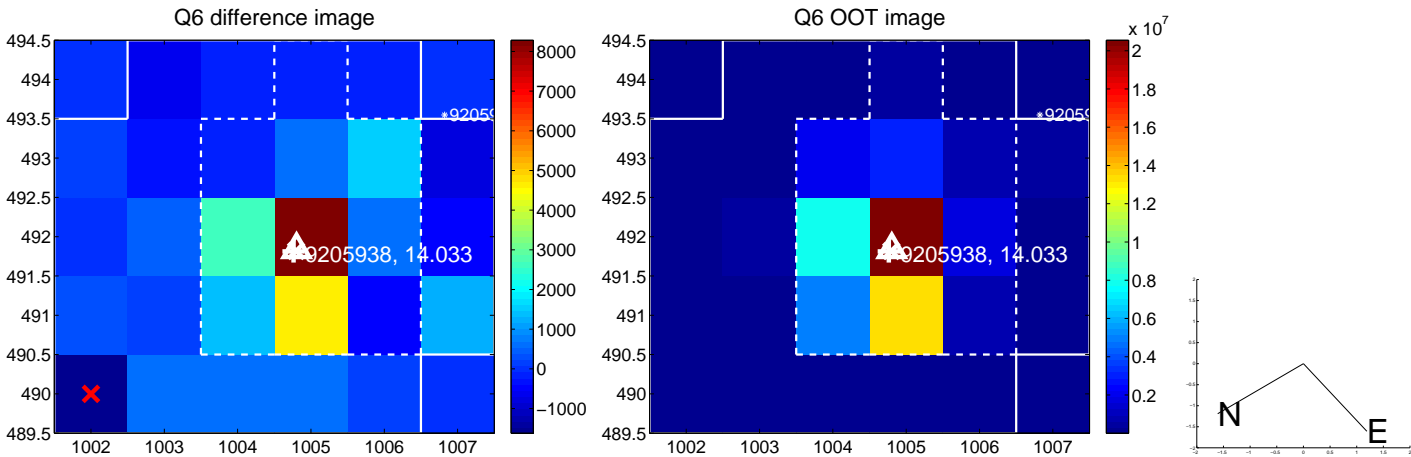
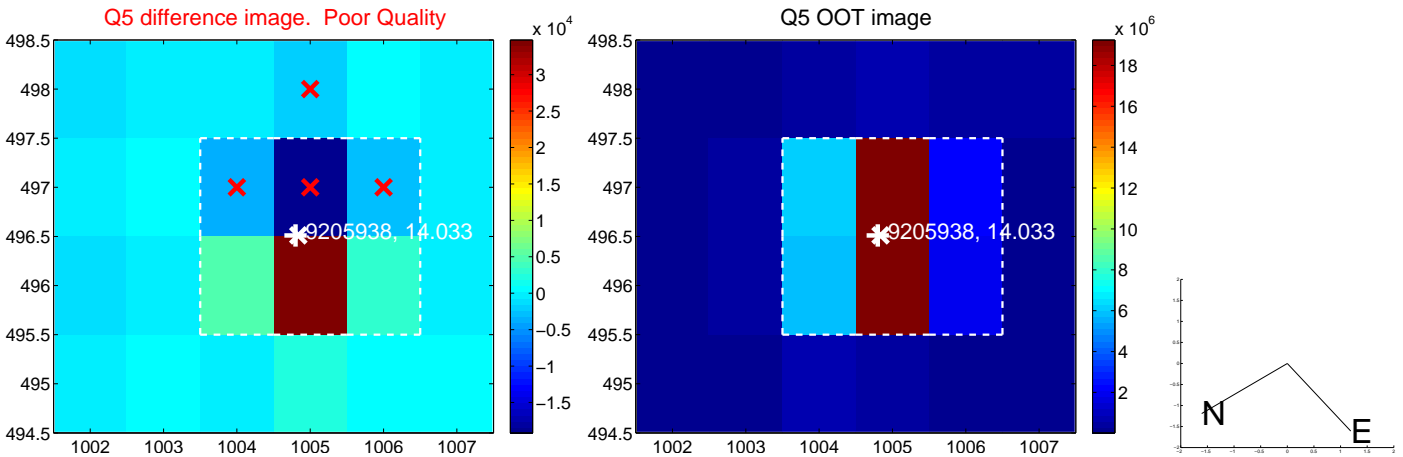


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

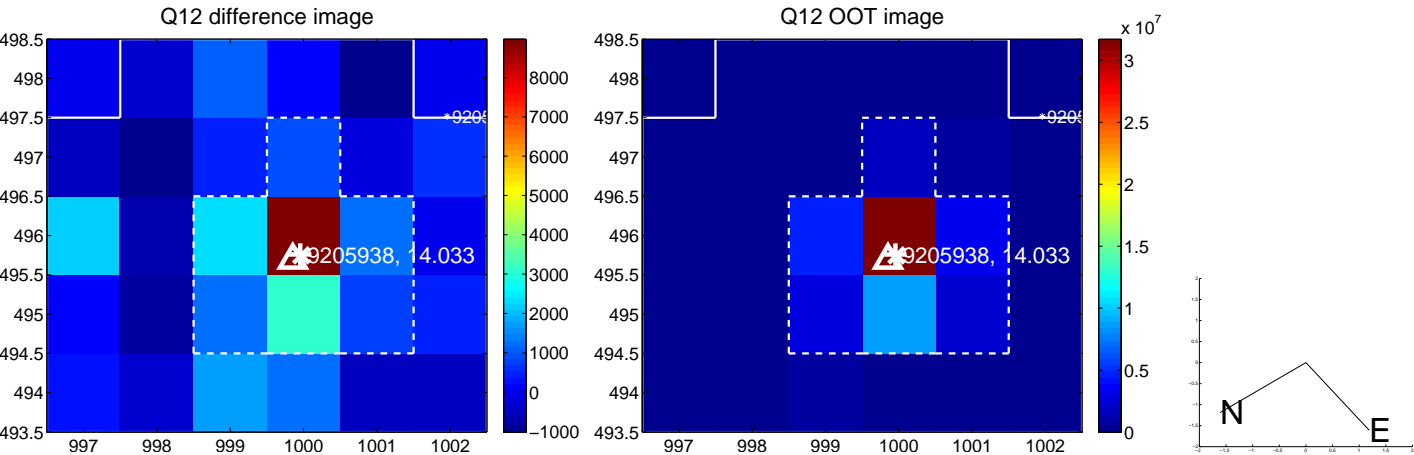
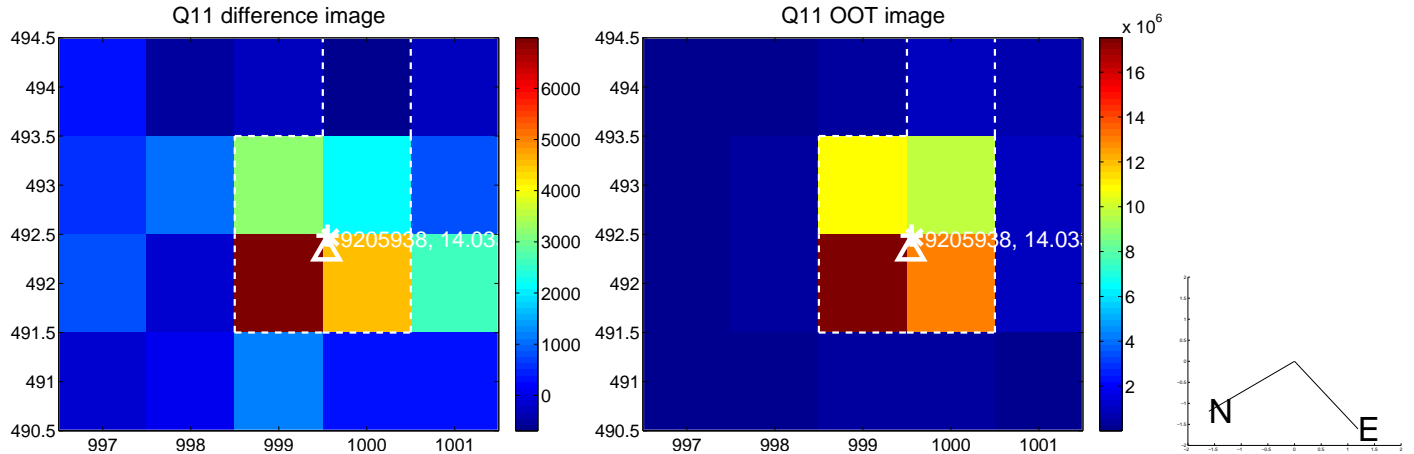
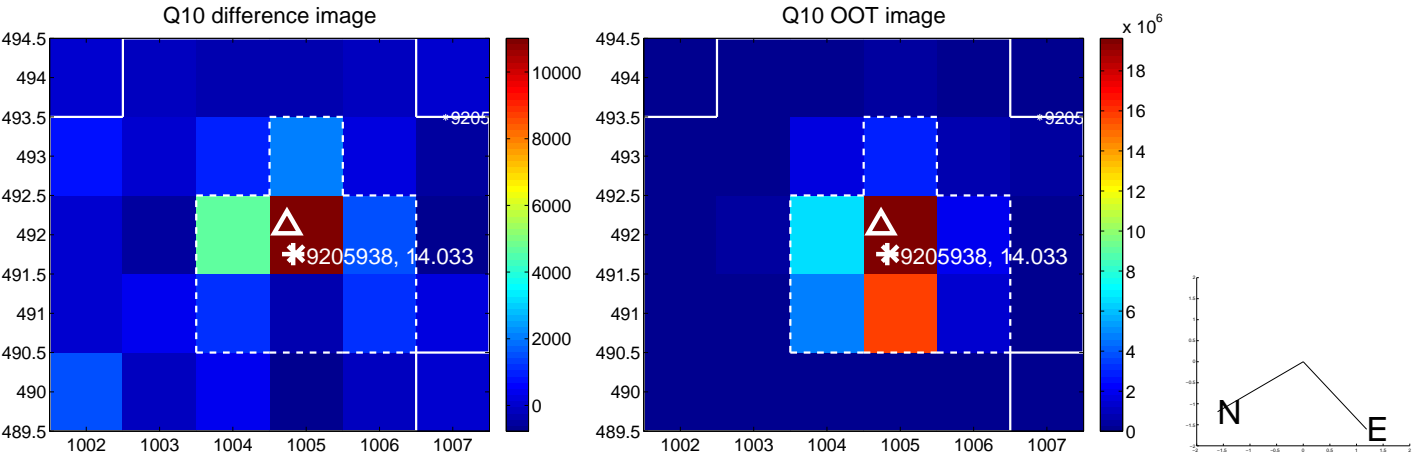
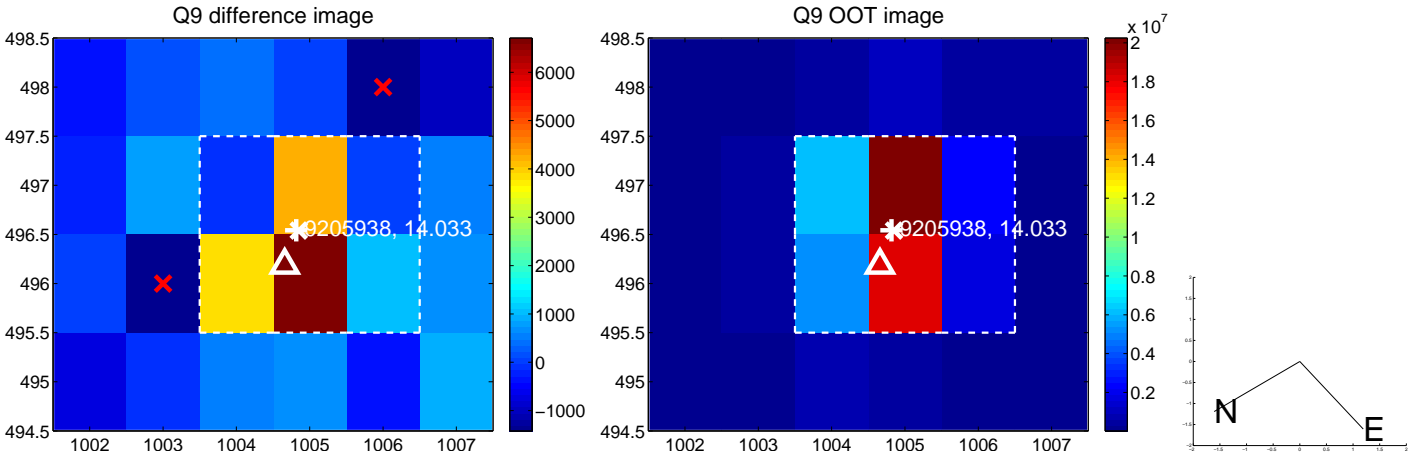
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



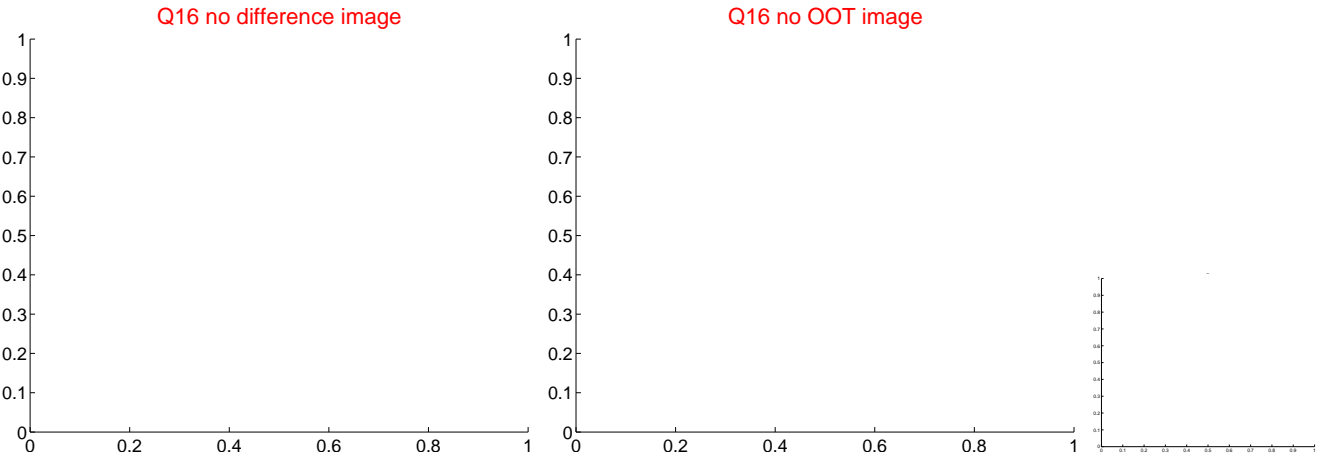
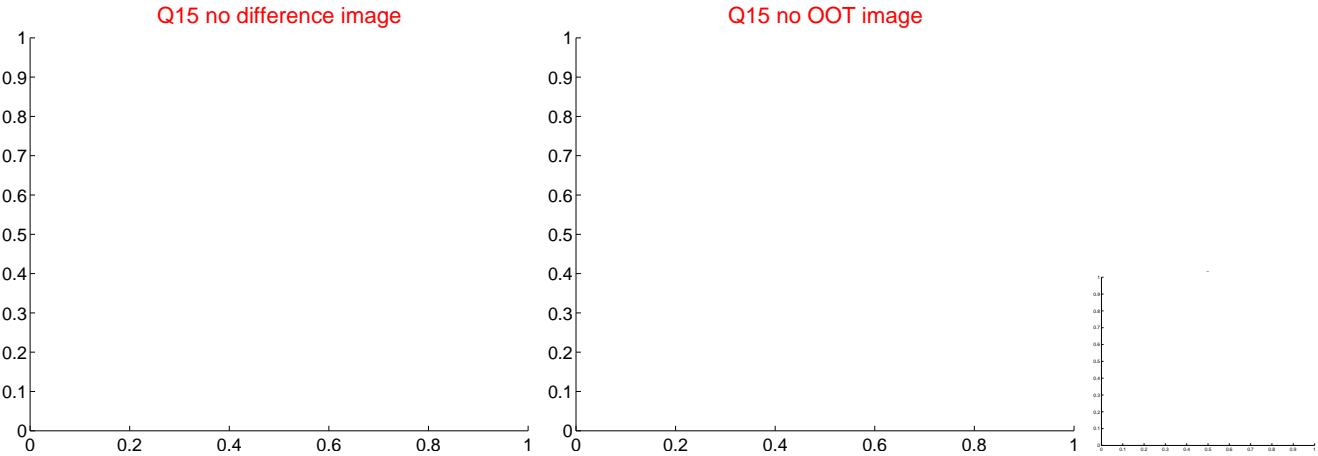
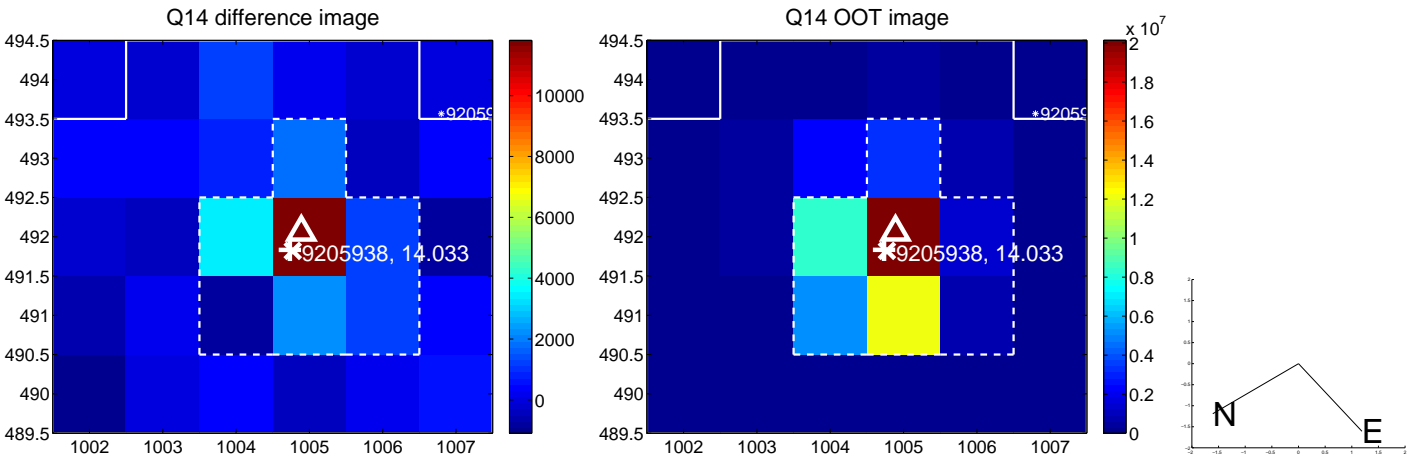
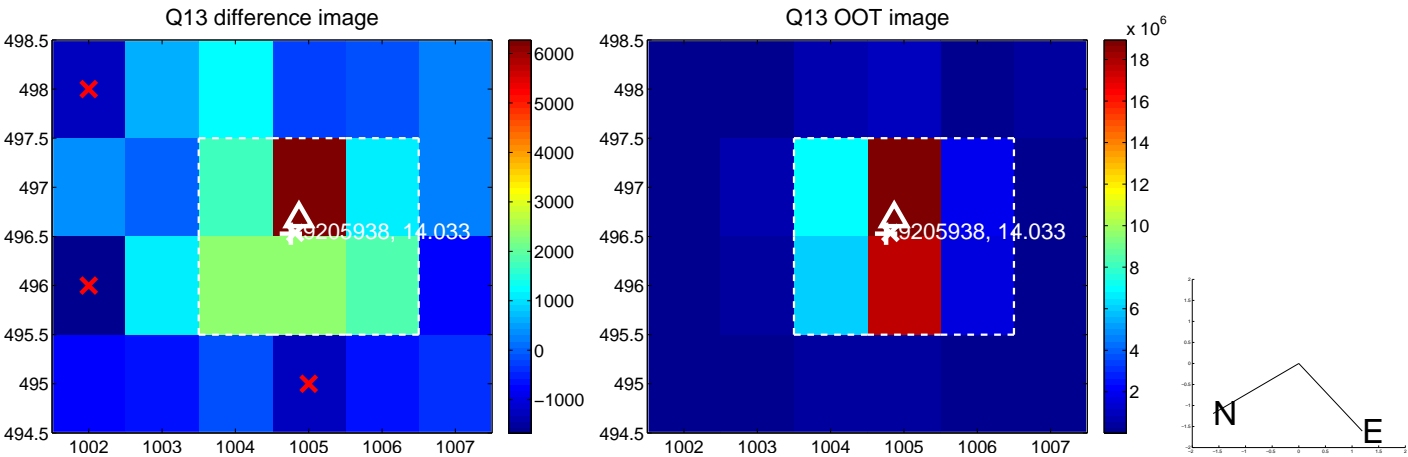
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



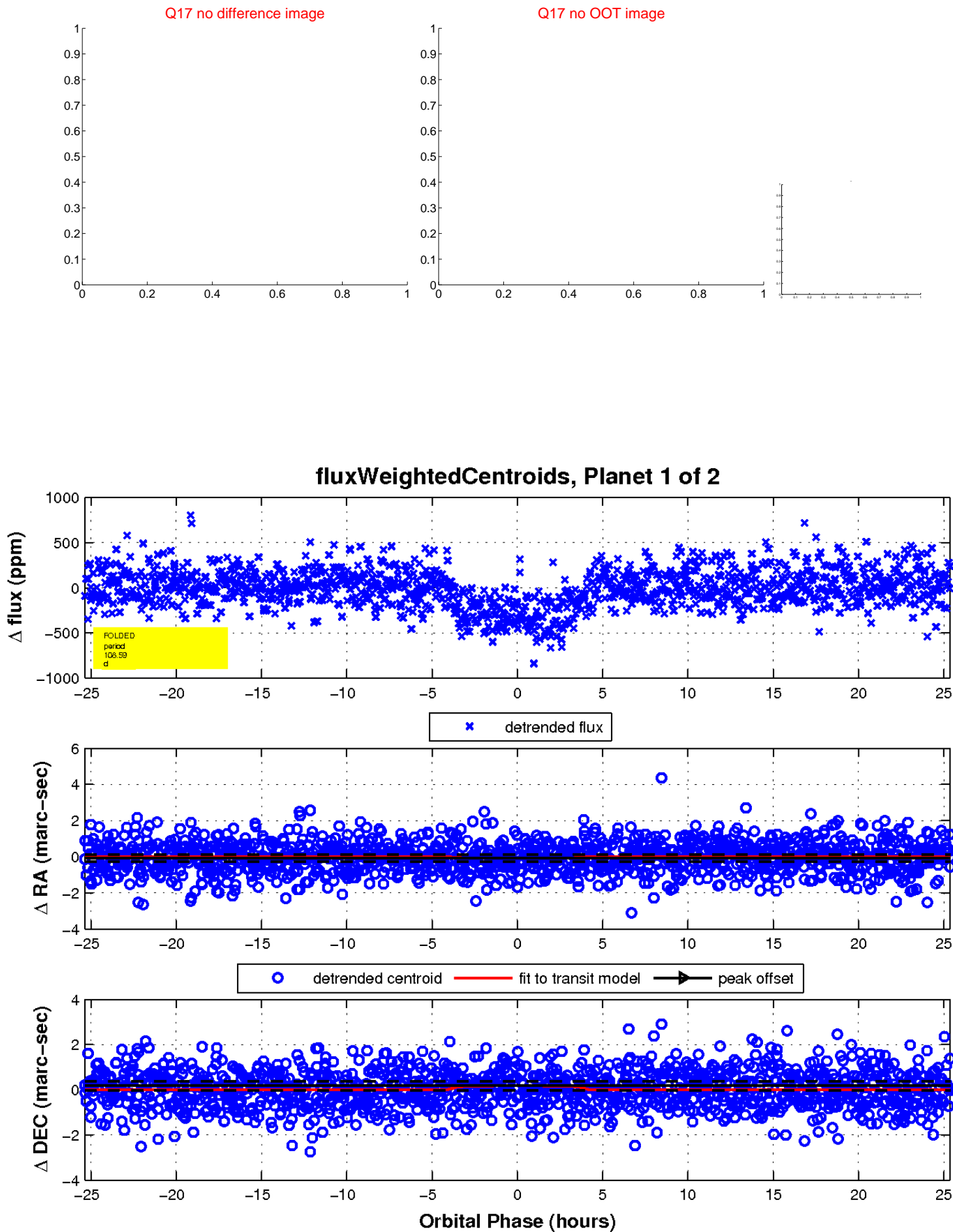
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

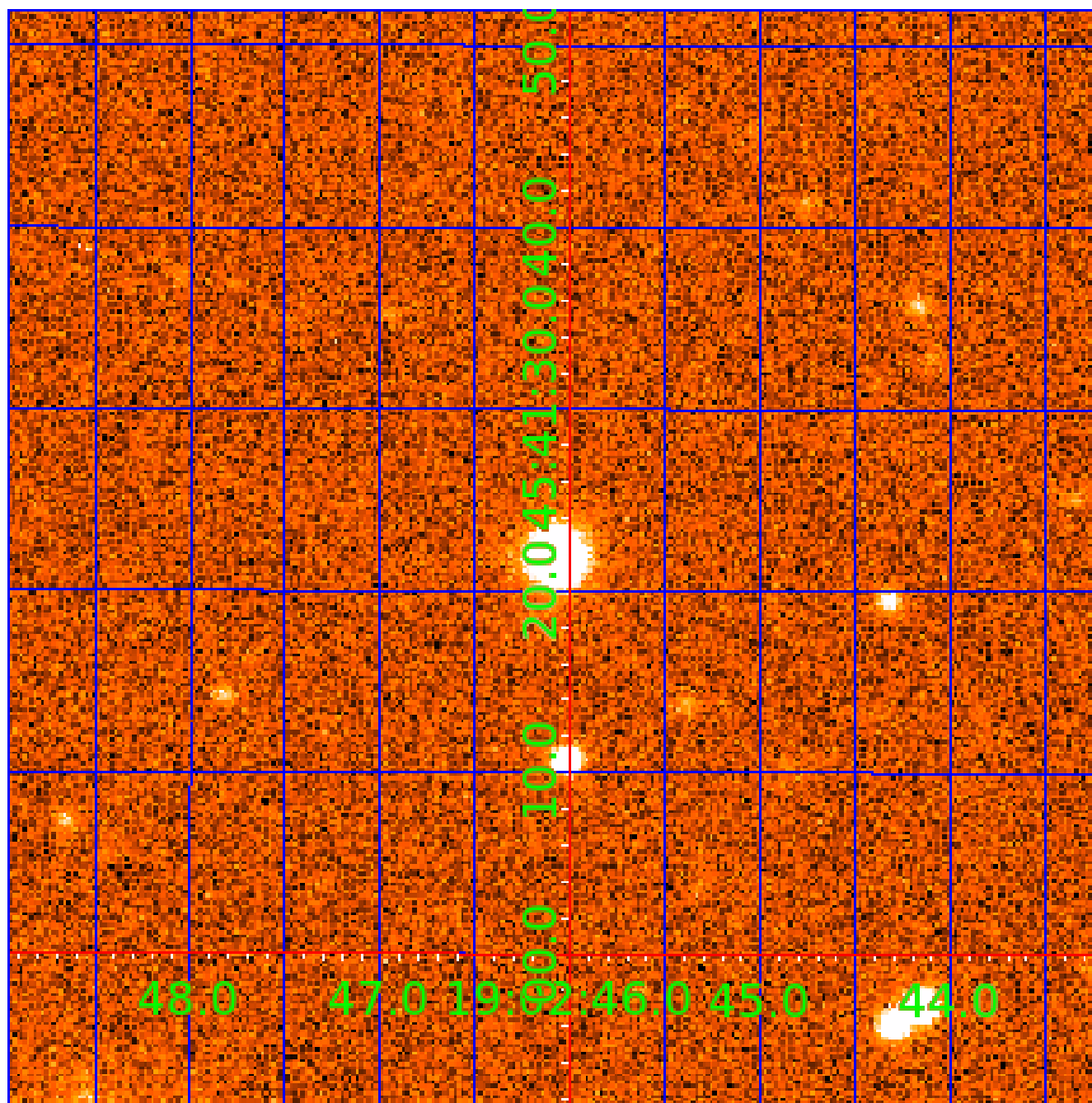


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009205938

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})
009205938-01	OBS	2162.01	108.593066	173.750434	329.0	8.456	20.2	21.7	0.92	5678	1.96	4.64
009205938-02	OBS	2162.02	199.668291	131.603807	234.5	9.413	11.1	11.8	0.92	5678	1.68	2.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009205938-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009205938-02	OBS	PC	0.92	0	0	0	0	CENT_FEW_DIFFS

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

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

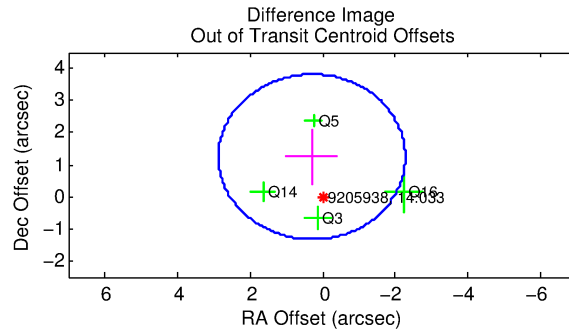
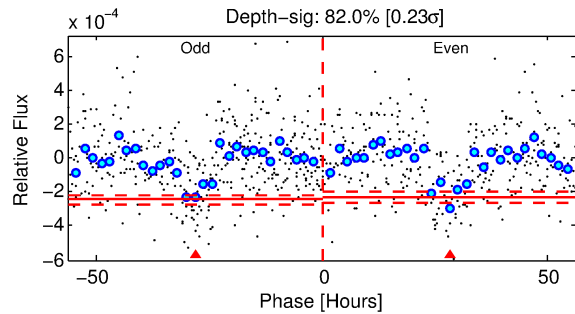
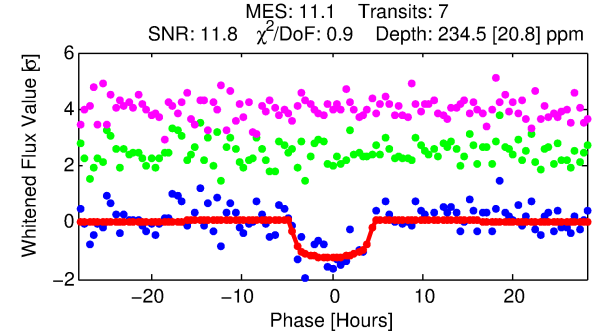
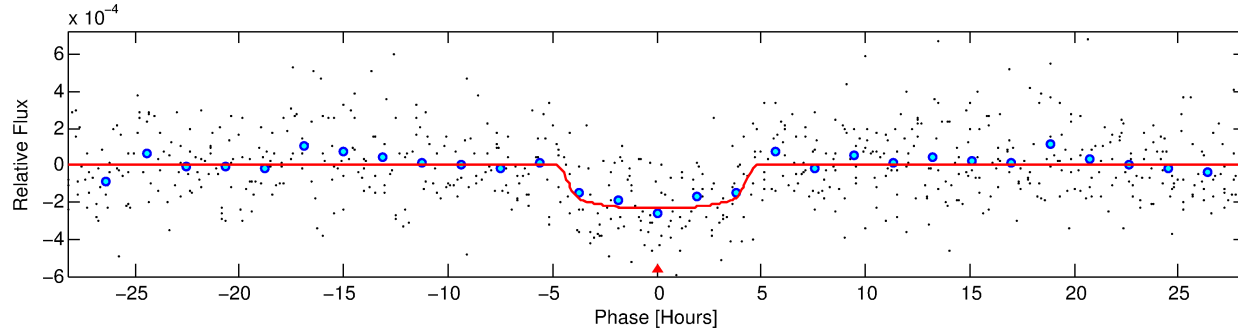
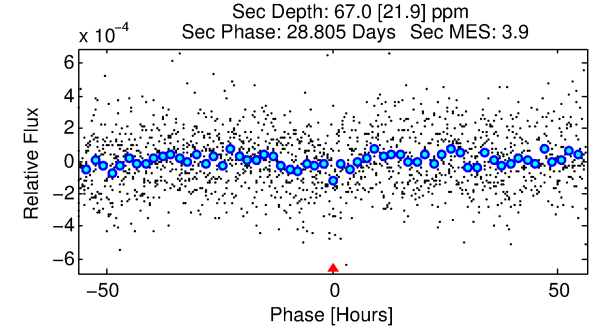
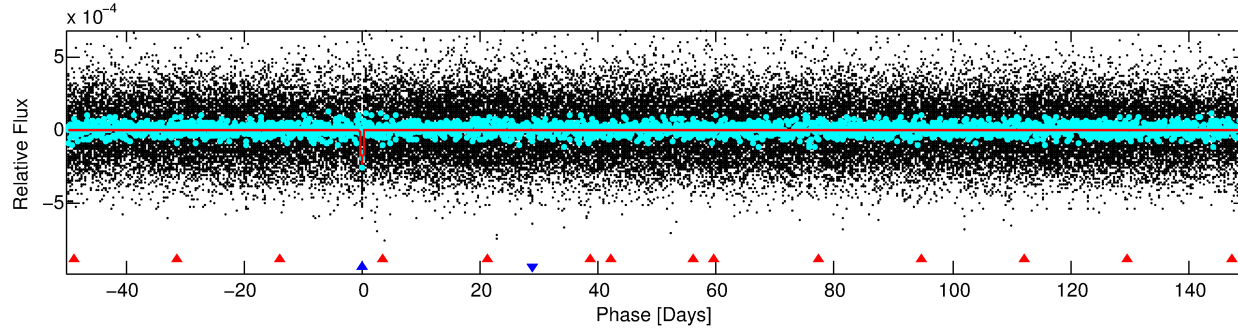
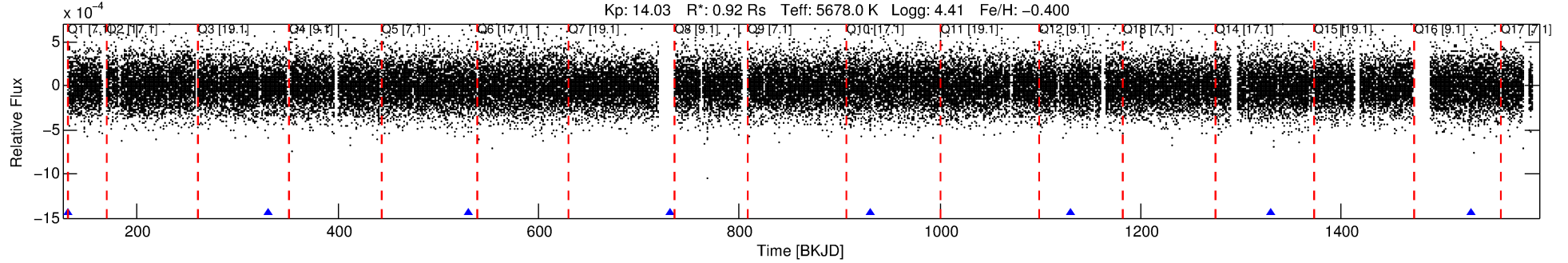
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009205938-02

No Significant Match Found

DV One-Page Summary

KIC: 9205938 Candidate: 2 of 2 Period: 199.668 d
KOI: K02162.02 Corr: 0.959



DV Fit Results:

Period = 199.66829 [0.00363] d
Epoch = 131.6038 [0.0163] BKJD
Rp/R* = 0.0167 [0.0025]
a/R* = 74.49 [53.23]
b = 0.91 [0.14]
Seff = 2.06 [0.48]
Teq = 306 [18] K
Rp = 1.68 [0.33] Re
a = 0.6191 [0.0812] AU
Ag = 4993.23 [2482.34] [2.01σ]
Teffp = 3971 [450] K [8.14σ]

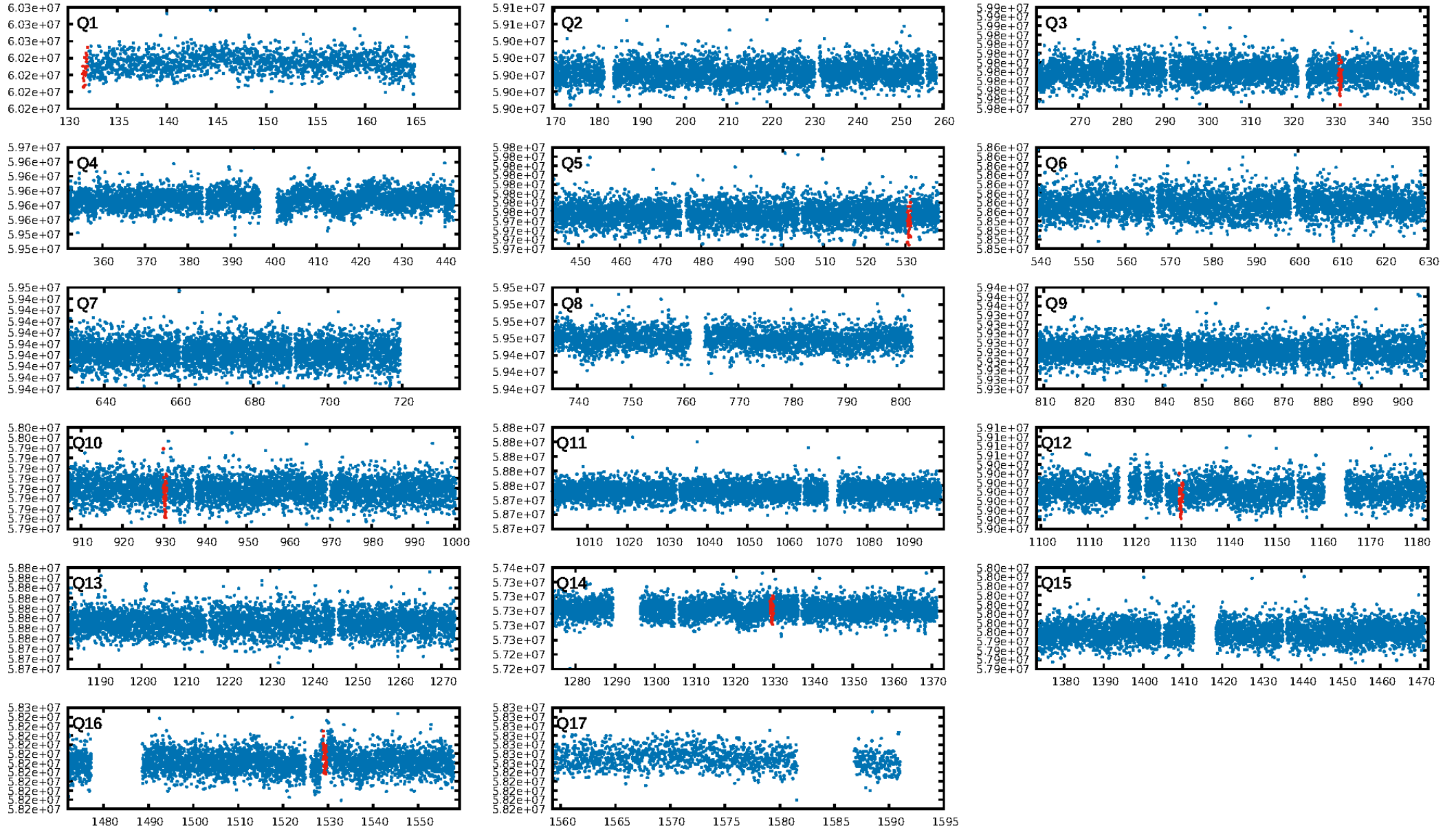
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [172.75σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 49.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.30e-26
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 6.577
Centroid-sig: 27.3%
Centroid-so: 1.153 arcsec [1.15σ]
OotOffset-rm: 1.277 arcsec [1.49σ]
KicOffset-rm: 1.416 arcsec [1.57σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
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DiffImageOverlap-fno: 1.00 [4/4]

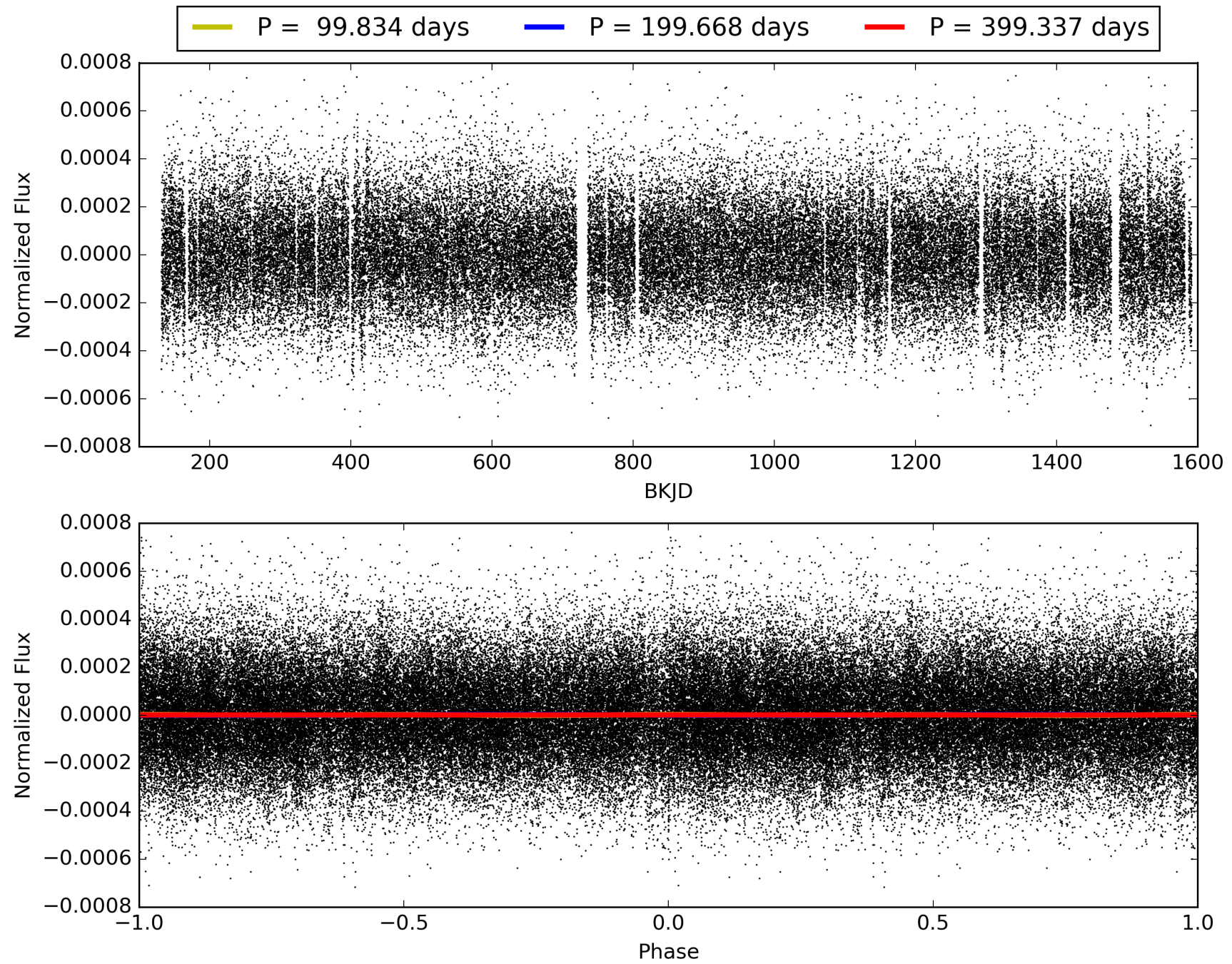
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:46:57 Z

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

TCE 009205938-02, PDC Light Curves

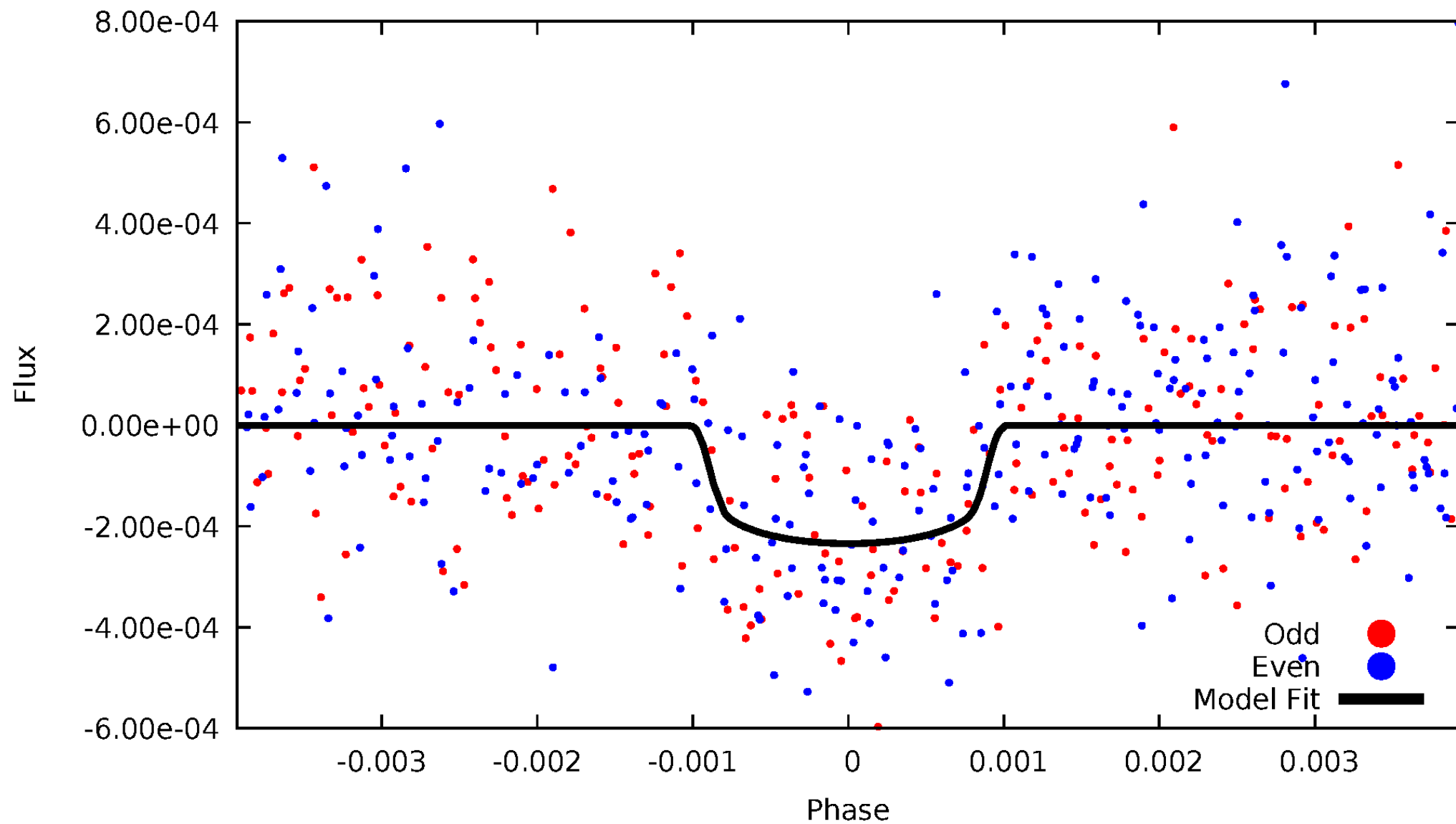


TCE 009205938-02



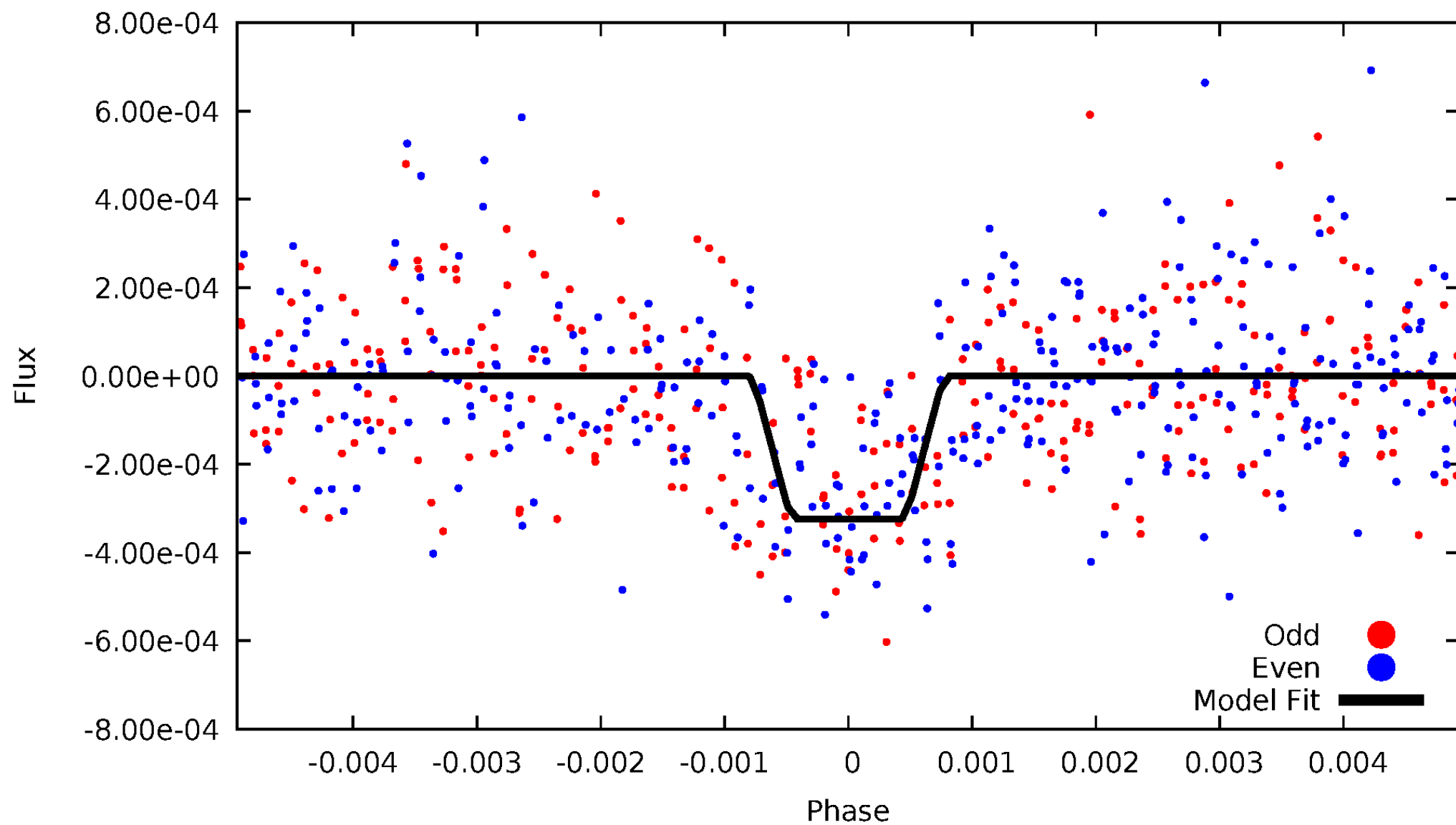
DV Odd/Even

TCE 009205938-02



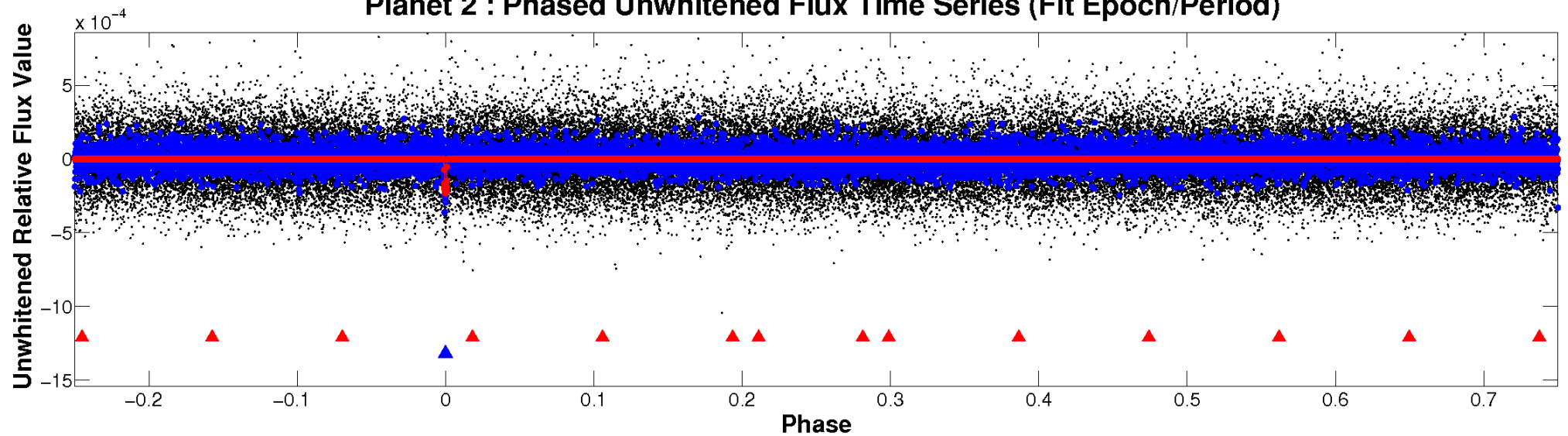
ALT Odd/Even

TCE 009205938-02

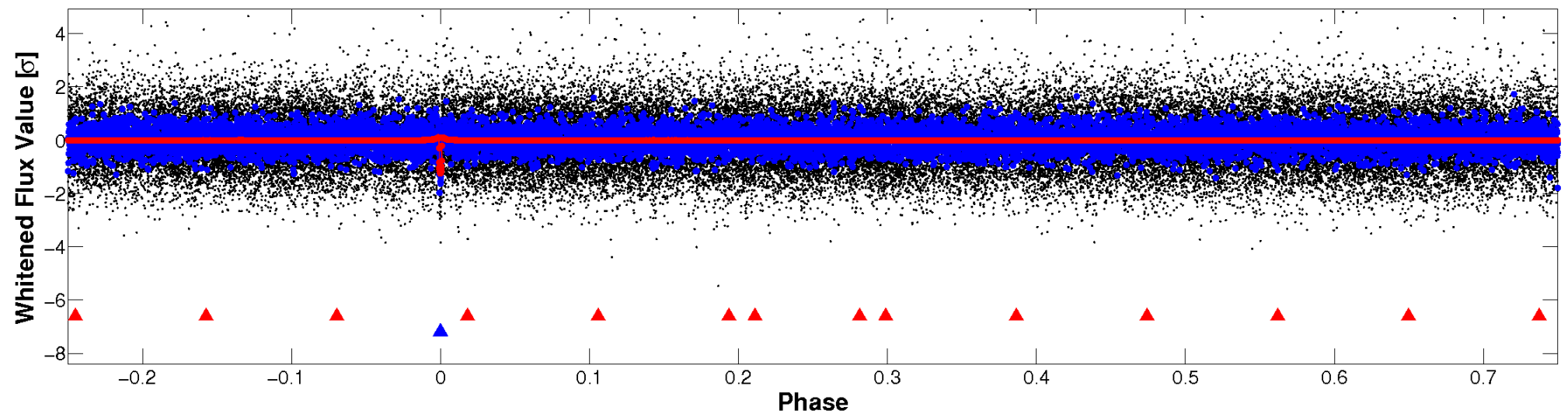


Non-Whitened Vs. Whitened Light Curve

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

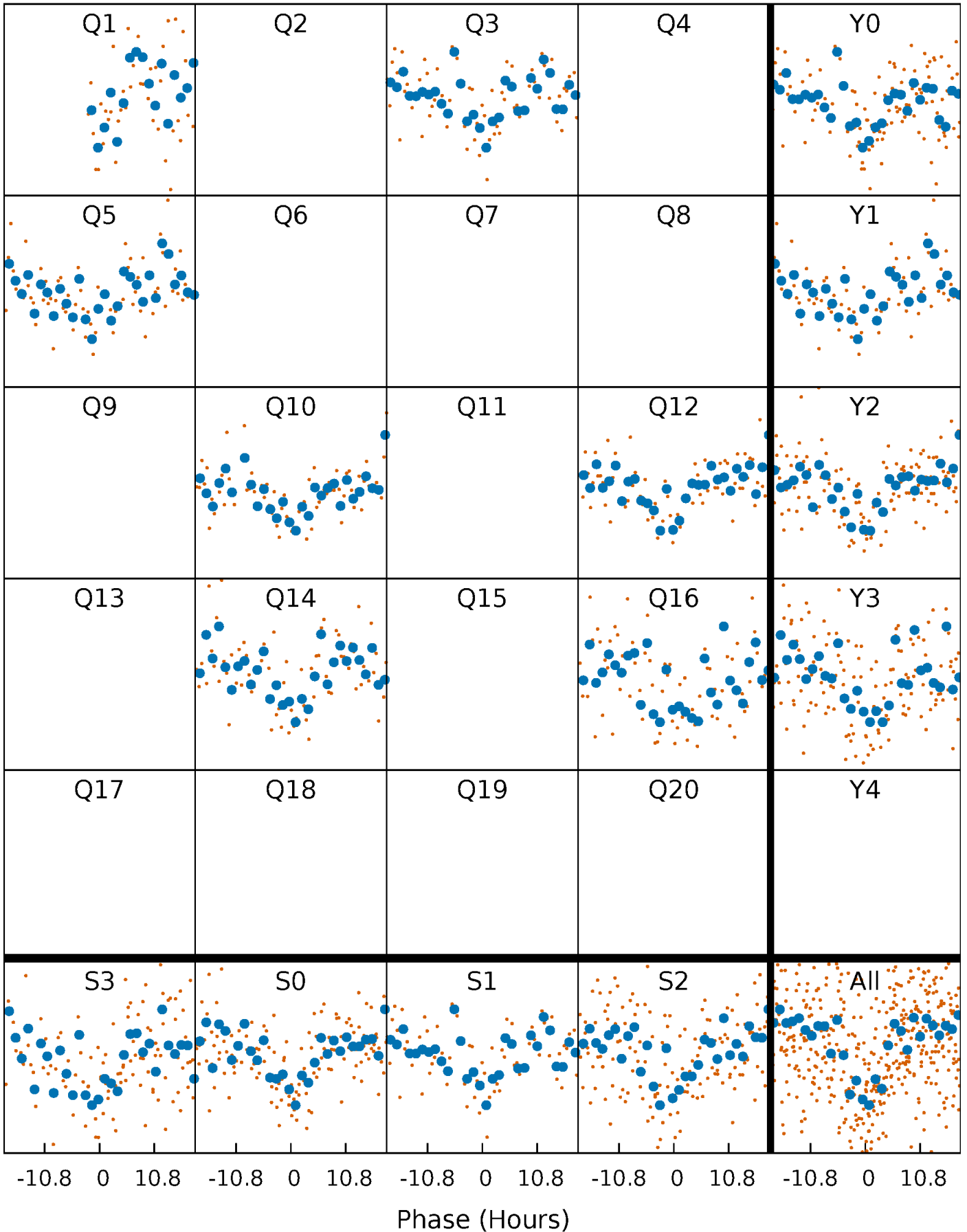


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



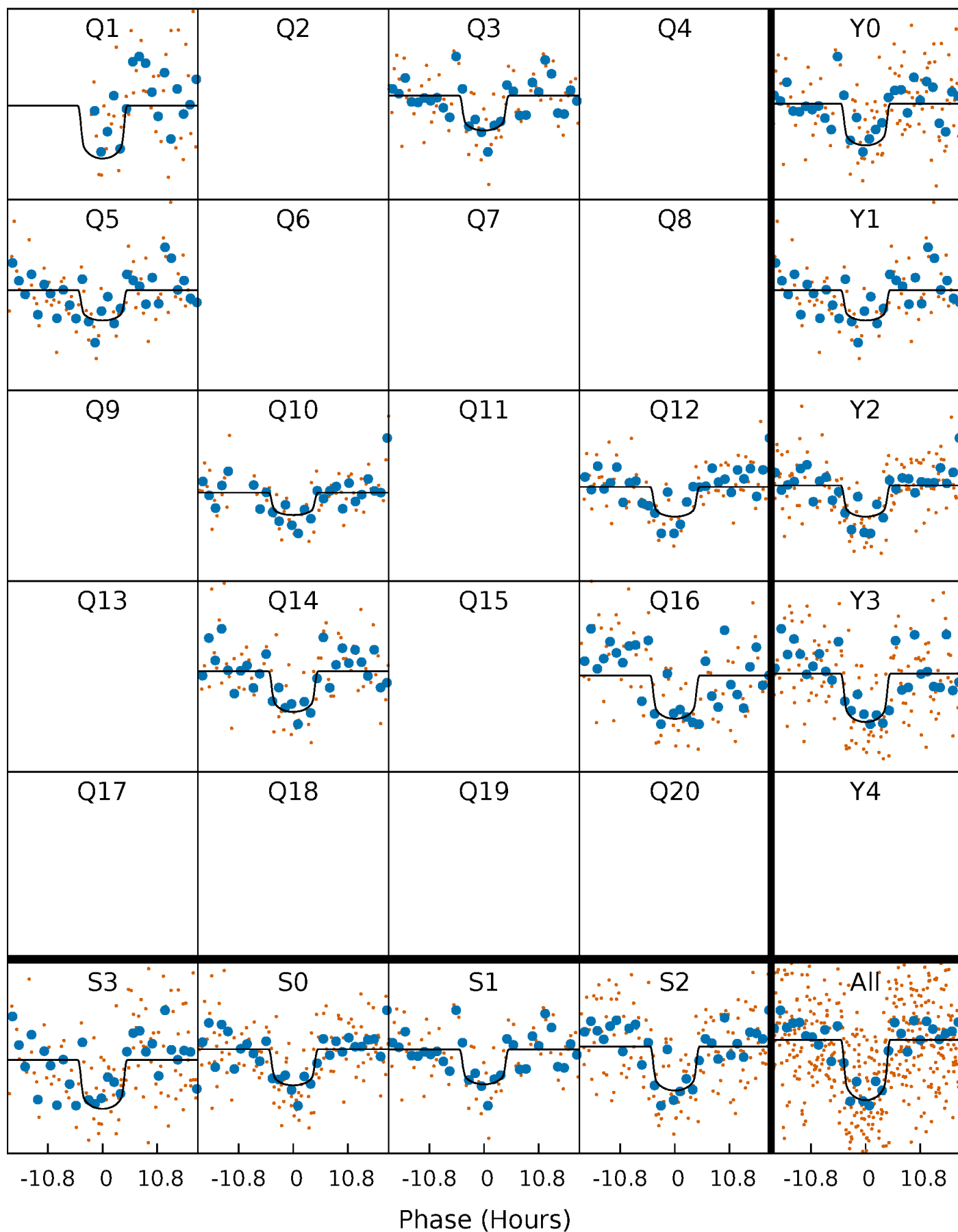
PDC Quarter-Phased Transit Curves

TCE 009205938-02 P=199.668291 Days $T_0=131.603807$ (BKJD)



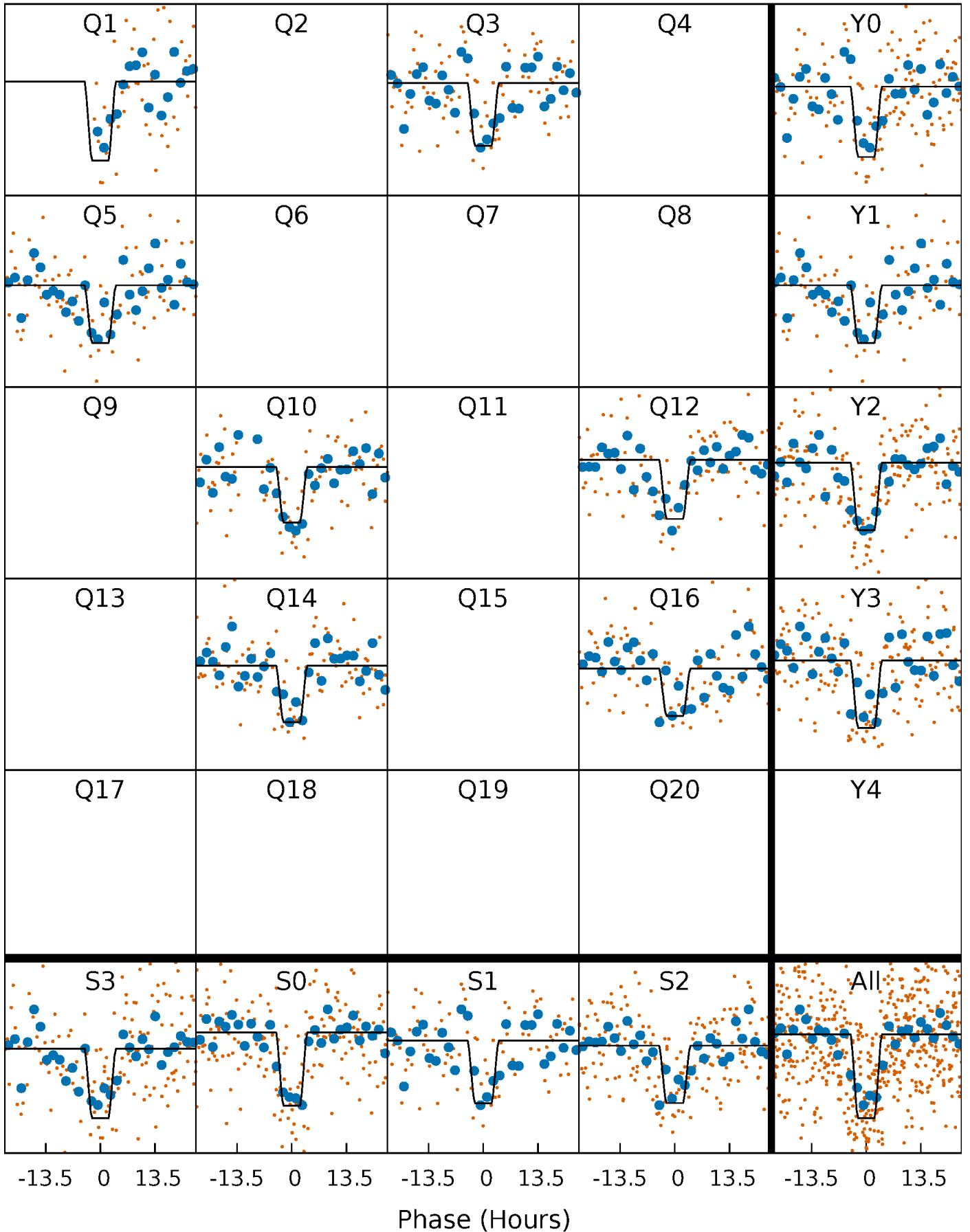
DV Quarter-Phased Transit Curves

TCE 009205938-02 P=199.668291 Days $T_0=131.603807$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

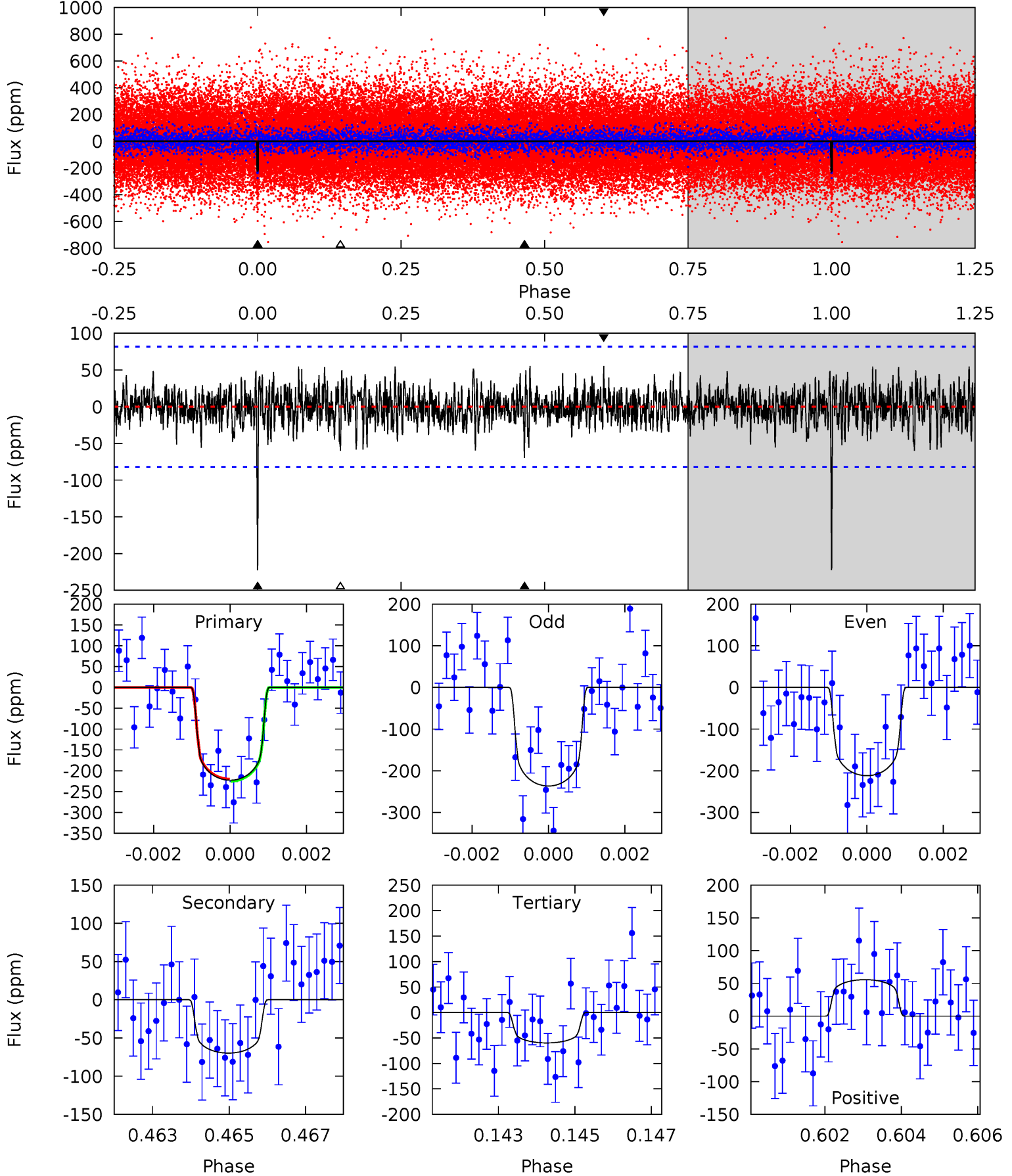
TCE 009205938-02 P=199.676748 Days $T_0=131.572195$ (BKJD)



DV Model-Shift Uniqueness Test

009205938-02, P = 199.668291 Days, E = 131.603807 Days

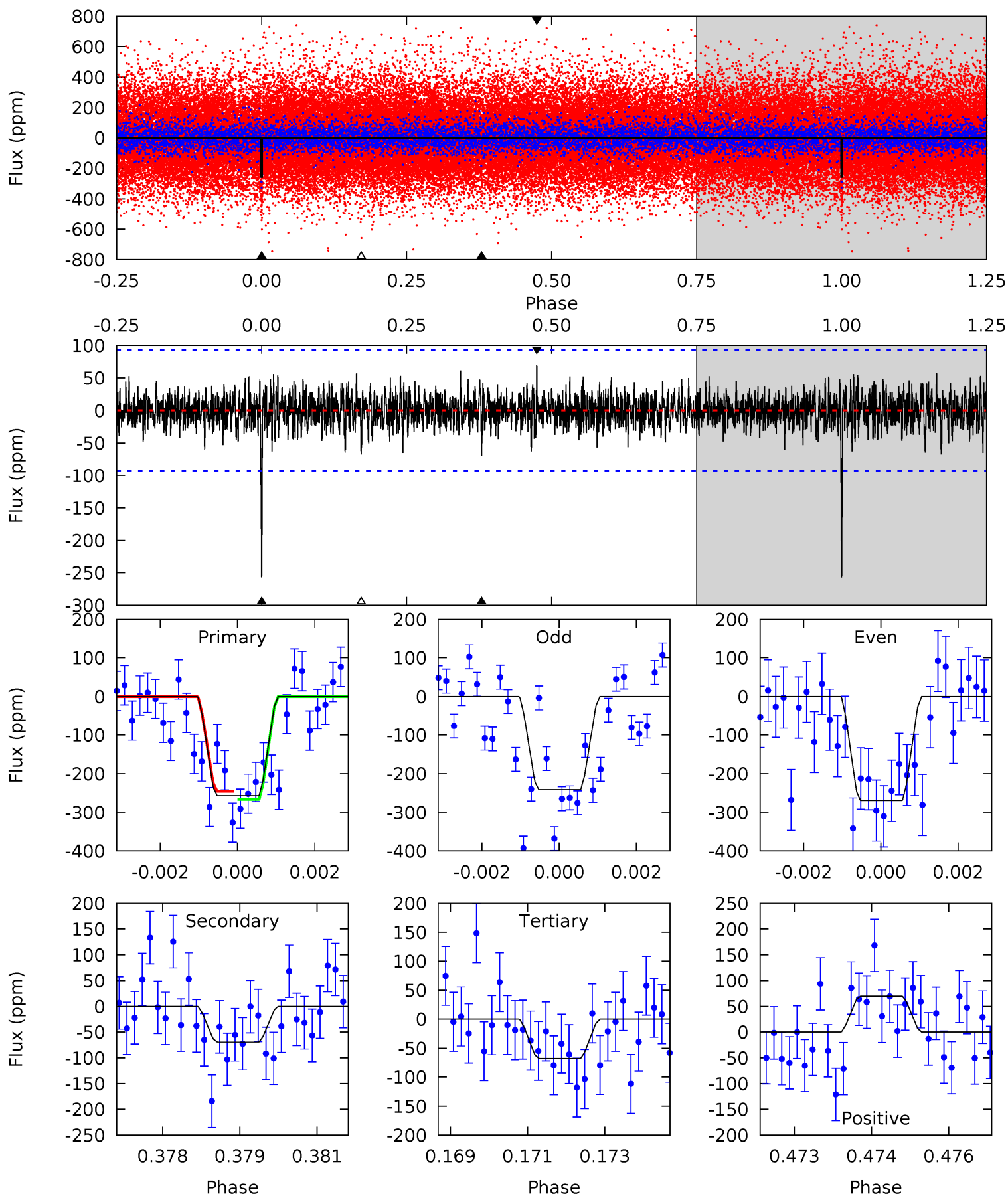
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	4.54	3.89	3.62	5.33	3.09	1.16	10.6	10.9	0.65	0.92	0.80	0.98	0.20	0.16



Alt Model-Shift Uniqueness Test

009205938-02, P = 199.676748 Days, E = 131.572195 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	3.99	3.88	4.01	5.37	3.16	1.08	10.9	10.8	0.12	-0.02	0.80	1.00	0.21	0.61



Stellar Parameters For KIC 009205938

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5678^{+113}_{-102}	$4.409^{+0.132}_{-0.088}$	$-0.400^{+0.150}_{-0.150}$	$0.921^{+0.115}_{-0.115}$	$0.794^{+0.071}_{-0.030}$	$1.432^{+0.740}_{-0.374}$
	+2%/-2%	+3%/-2%	+37%/-37%	+12%/-12%	+9%/-4%	+52%/-26%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009205938-02 / KOI 2162.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-70 ± 15	$1.65^{+0.30}_{-0.27}$	425^{+17}_{-19}	4264^{+333}_{-285}	5519^{+2827}_{-1887}
Alt.	-69 ± 17	$1.81^{+0.32}_{-0.28}$	426^{+17}_{-18}	4135^{+302}_{-287}	4511^{+2122}_{-1554}

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

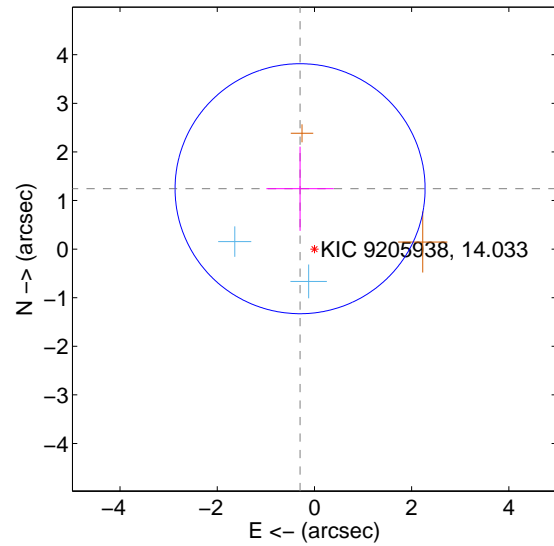
Supplemental centroid analysis for 009205938-02. Kepler magnitude: 14.03. Transit SNR 11.75

There are 2 quarters with good PRF difference image offsets

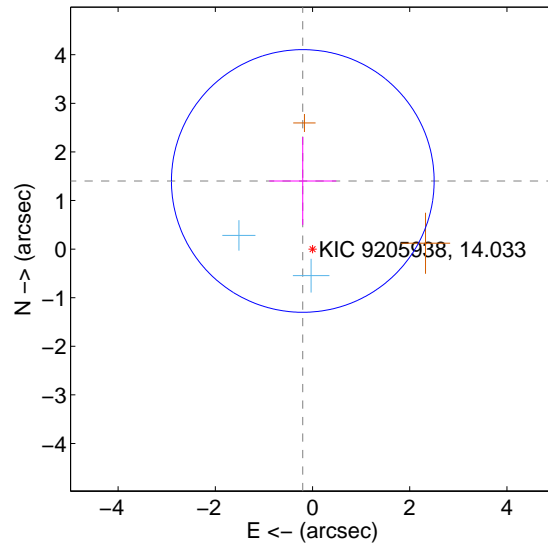
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.277 ± 0.857	1.49	0.296 ± 0.694	1.242 ± 0.866
PRF-fit source offset from KIC position	1.416 ± 0.901	1.57	0.200 ± 0.690	1.402 ± 0.905
photometric centroid source offset	1.15 ± 1.00	1.15	-1.05 ± 0.98	-0.48 ± 1.10

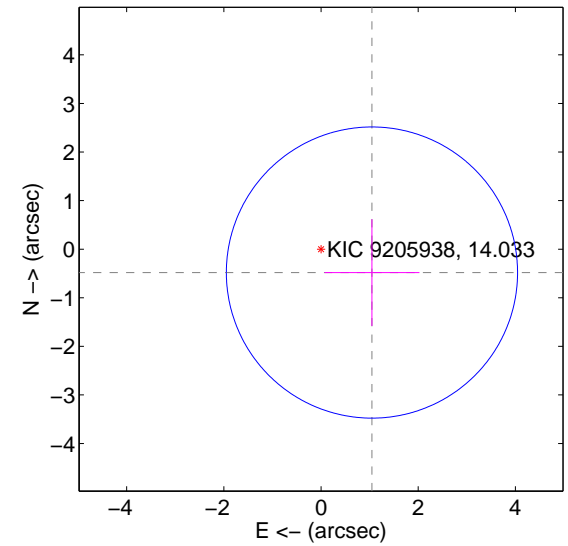
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

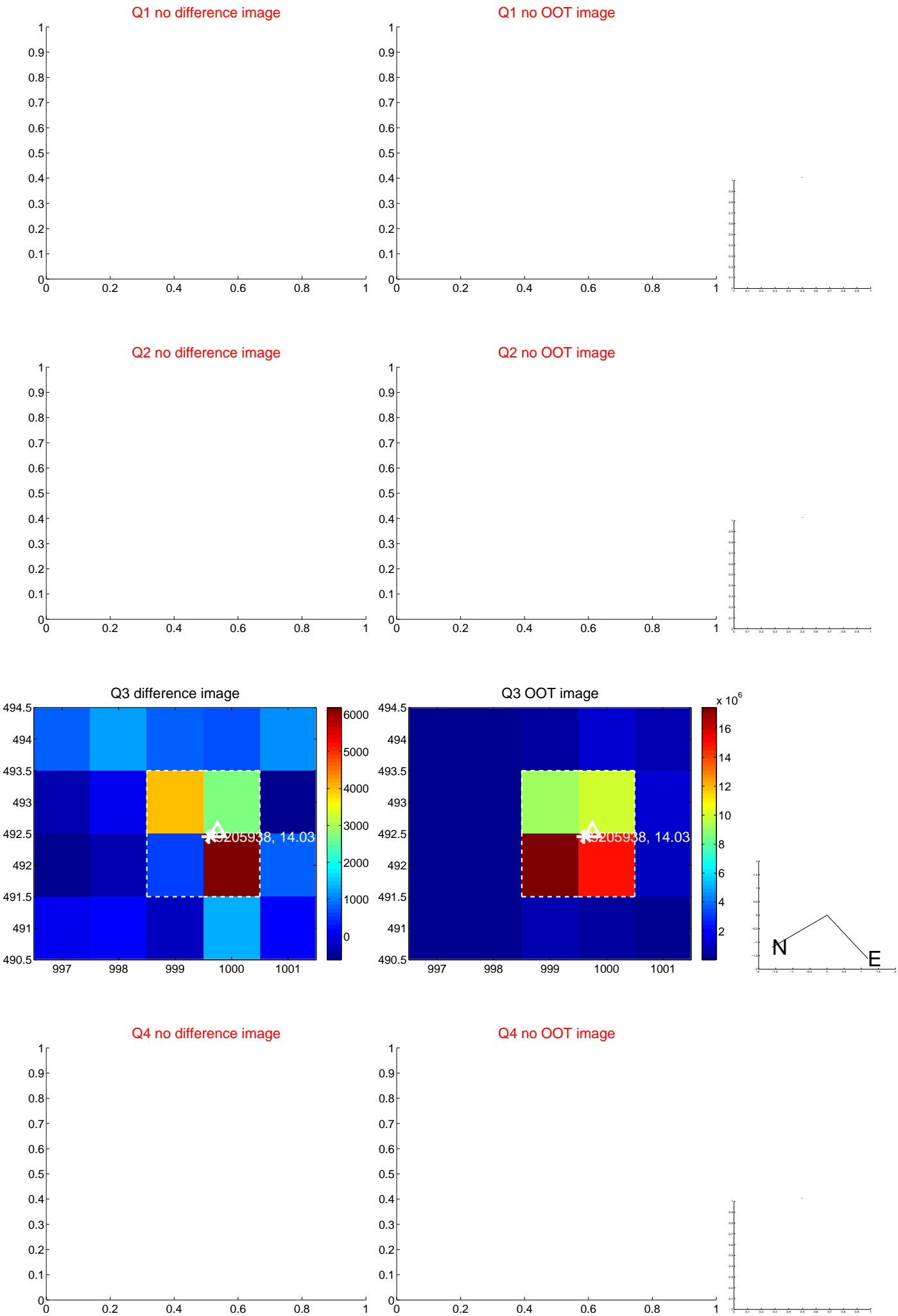


offset from photometric centroids

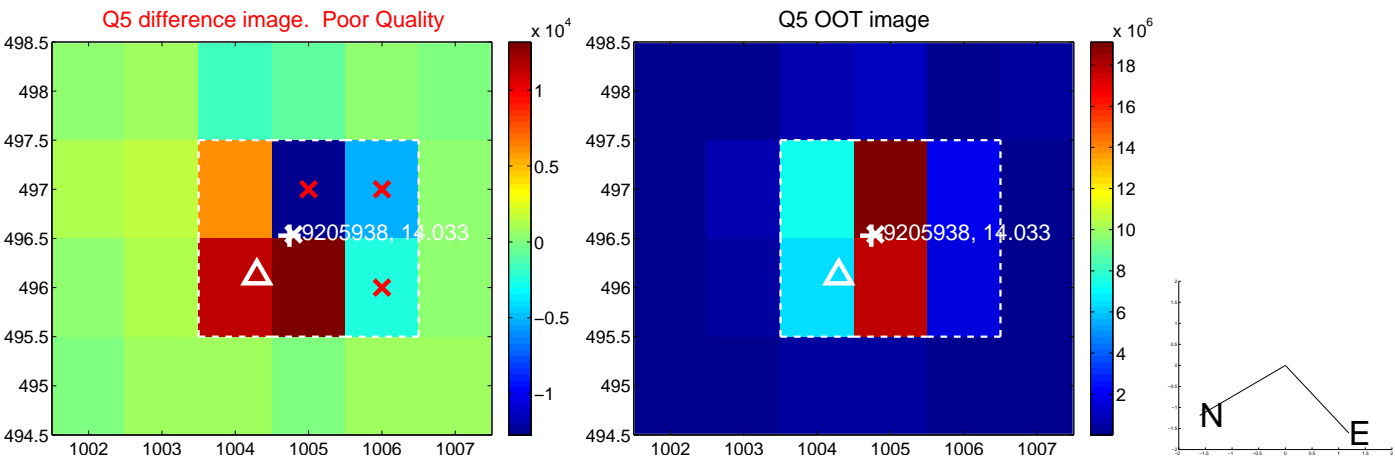


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



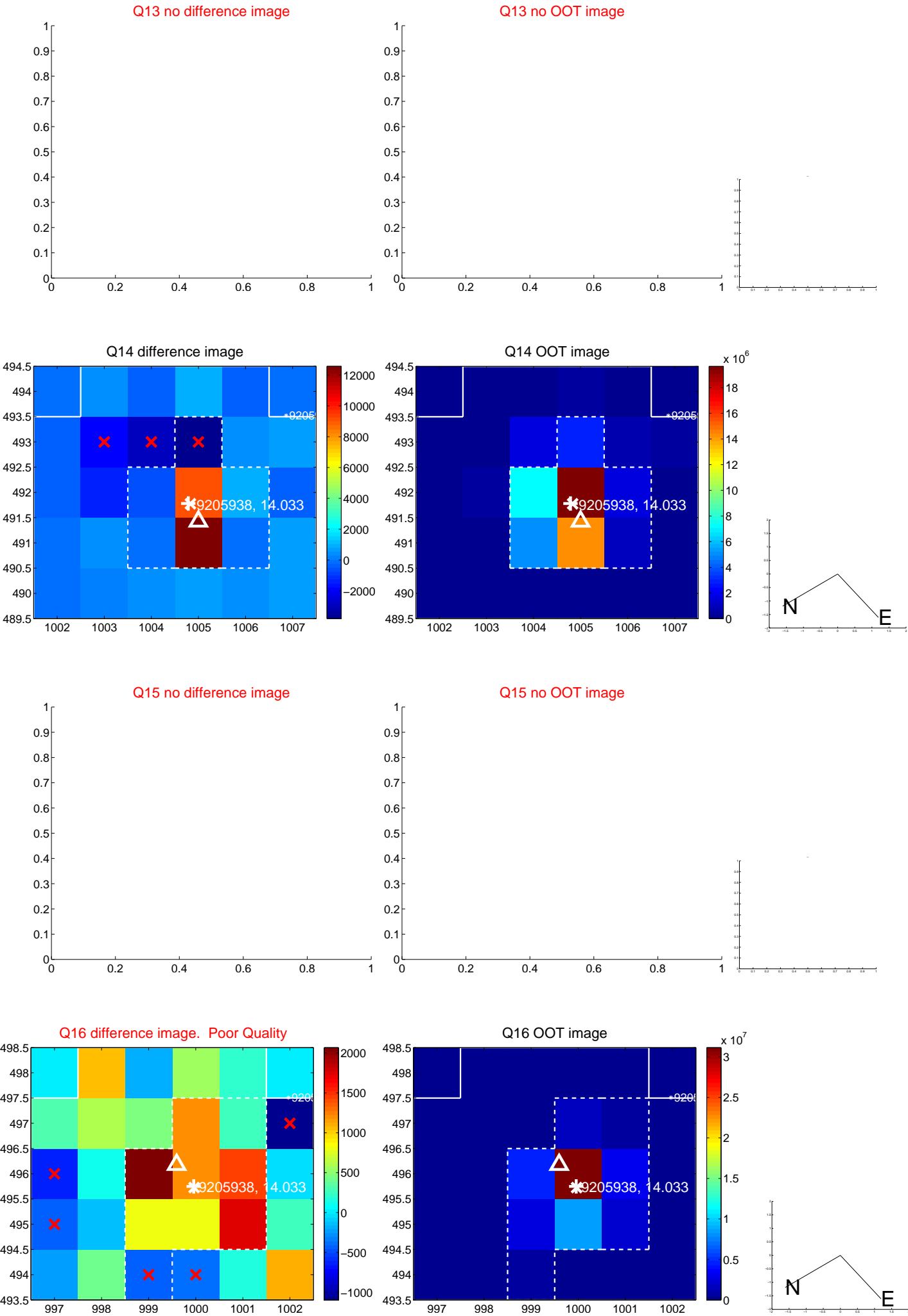
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



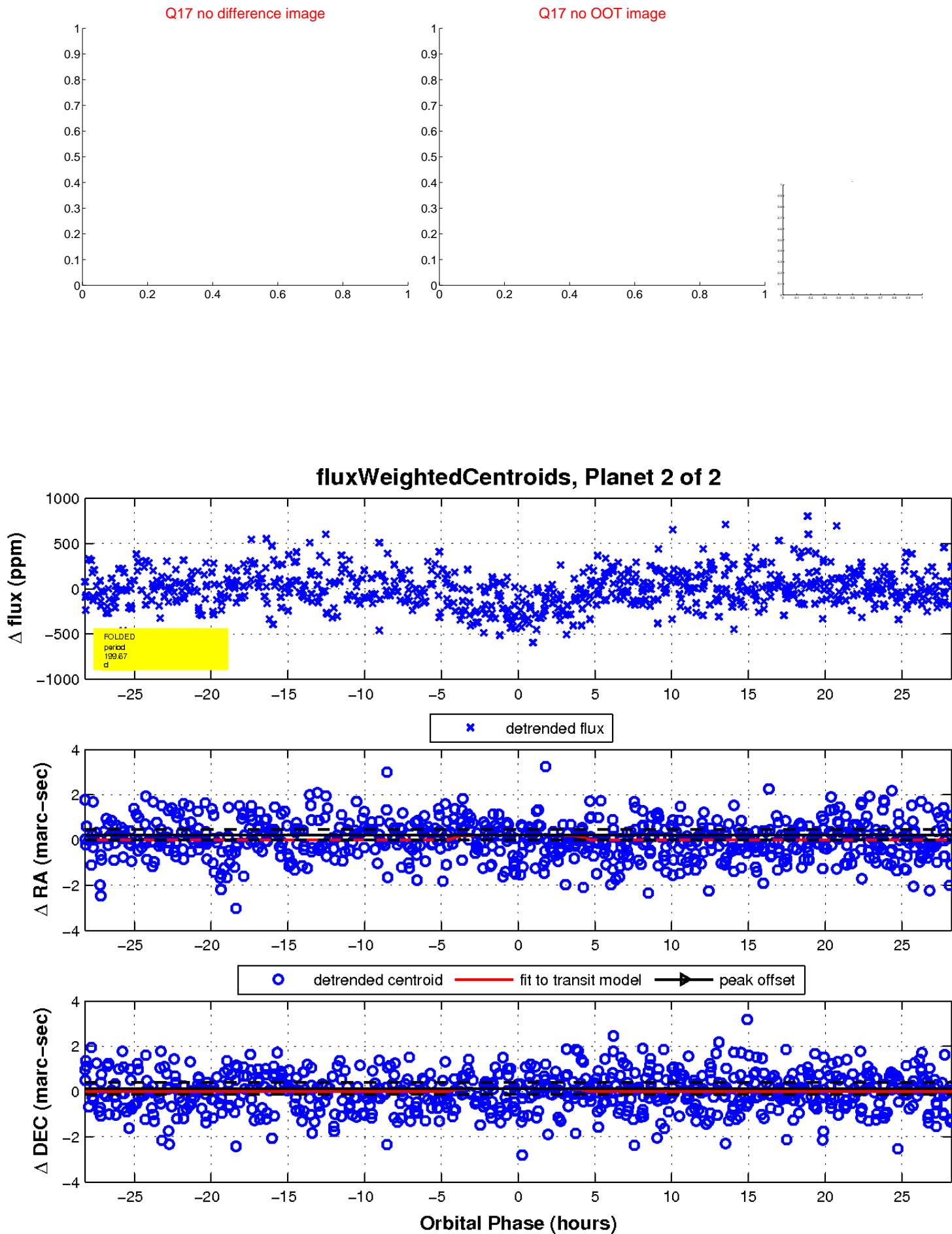
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

