

KIC 009963009

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})
009963009-01	OBS	7265.01	40.069618	153.019119	41899.8	9.358	2060.9	1692.3	1.21	5911	27.44	28.24
009963009-02	OBS	No	40.072970	134.142699	11336.2	8.564	485.3	319.3	1.21	5911	23.09	28.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009963009-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
009963009-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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.

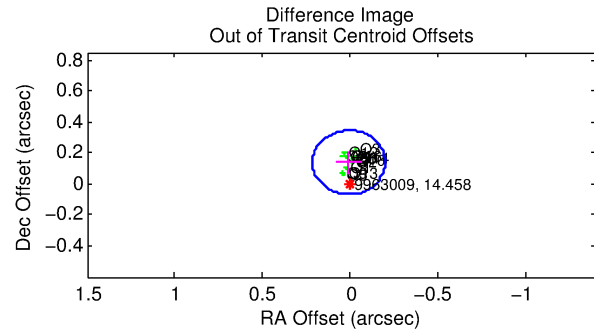
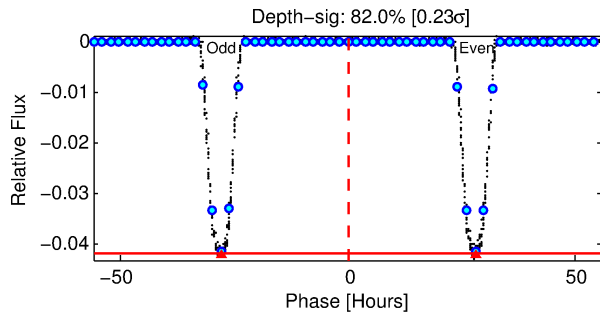
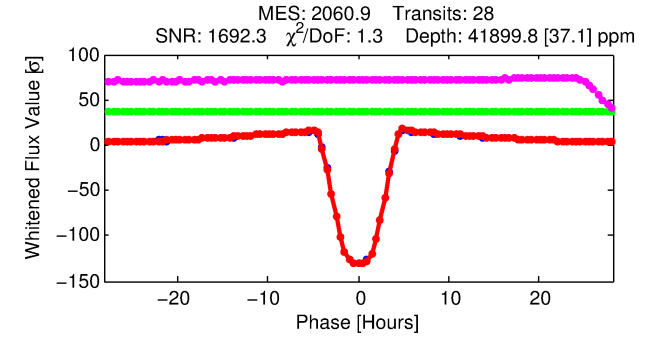
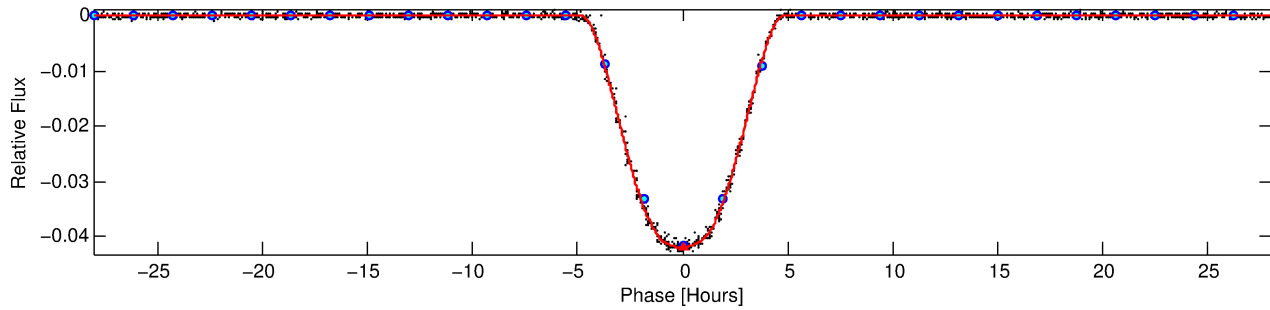
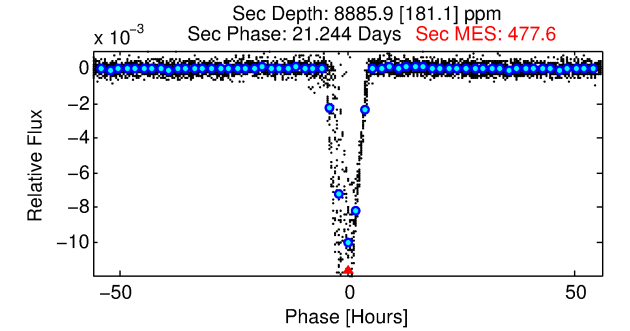
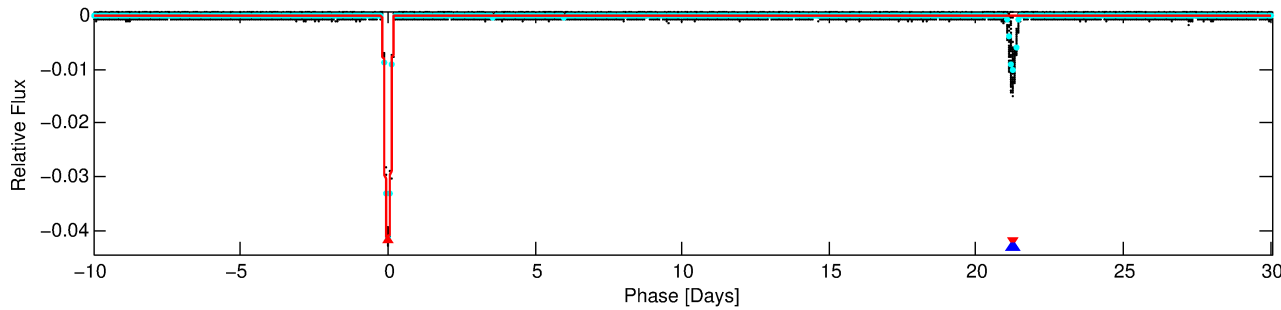
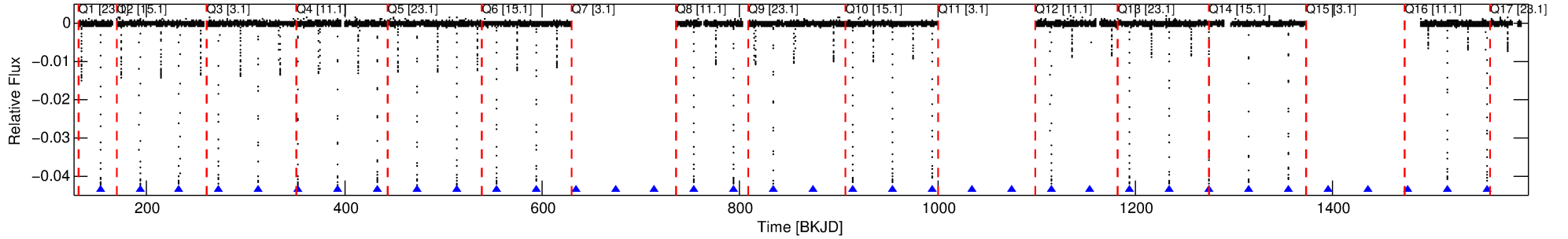
Ephemeris Match Information For 009963009-01

No Significant Match Found

DV One-Page Summary

KIC: 9963009 Candidate: 1 of 2 Period: 40.070 d
KOI: K07265.01 Corr: 0.999

Kp: 14.46 R*: 1.21 Rs Teff: 5911.0 K Logg: 4.32 Fe/H: 0.220



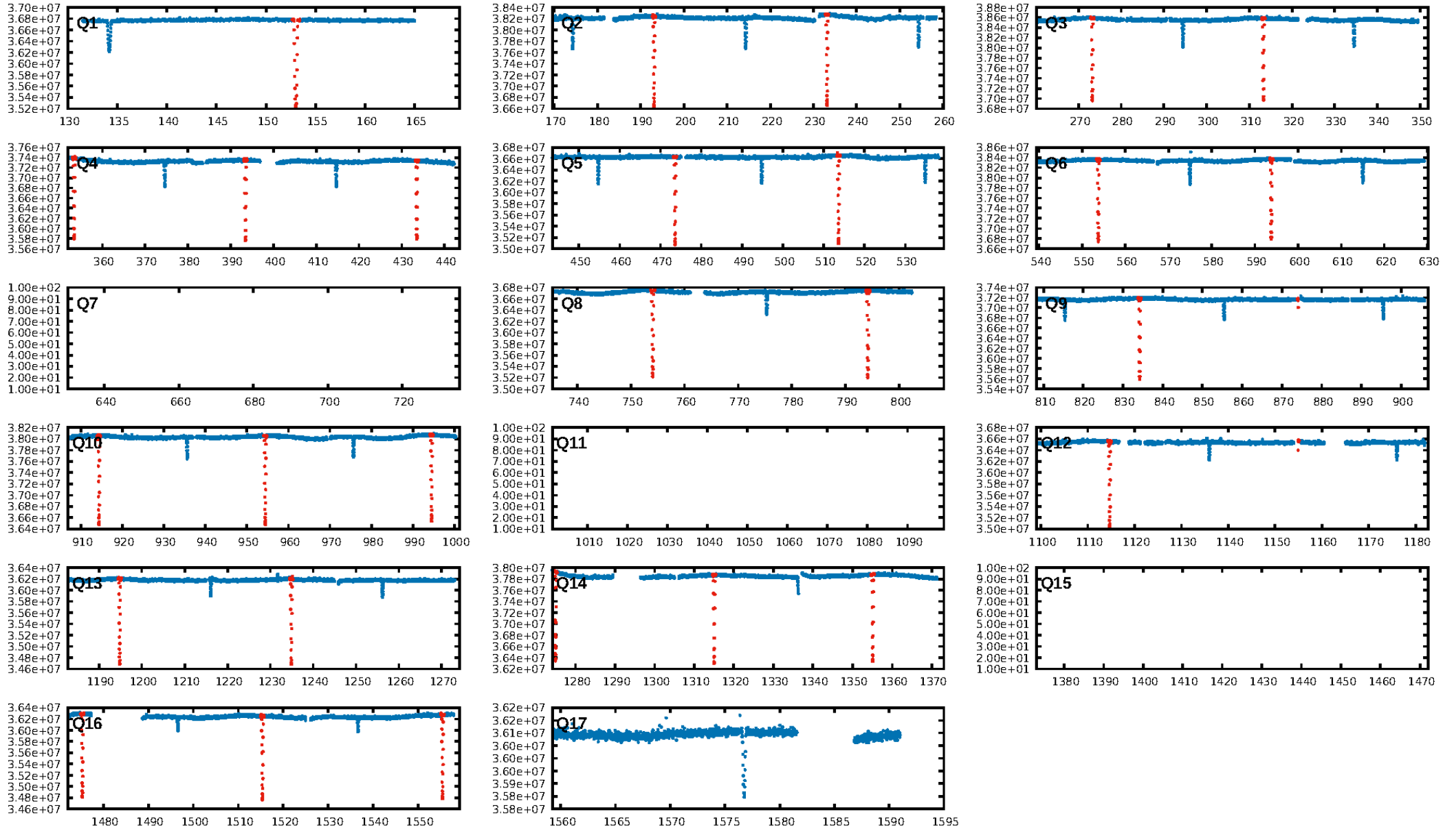
DV Fit Results:

Period = 40.06962 [0.00001] d
Epoch = 153.0191 [0.0001] BKJD
Rp/R* = 0.2083 [0.0002]
a/R* = 30.47 [0.03]
b = 0.77 [0.00]
Seff = 28.24 [10.60]
Teq = 588 [55] K
Rp = 27.44 [8.18] Re
a = 0.2375 [0.0581] AU
Ag = 366.33 [127.68] [2.86σ]
Teffp = 3976 [141] K [22.33σ]

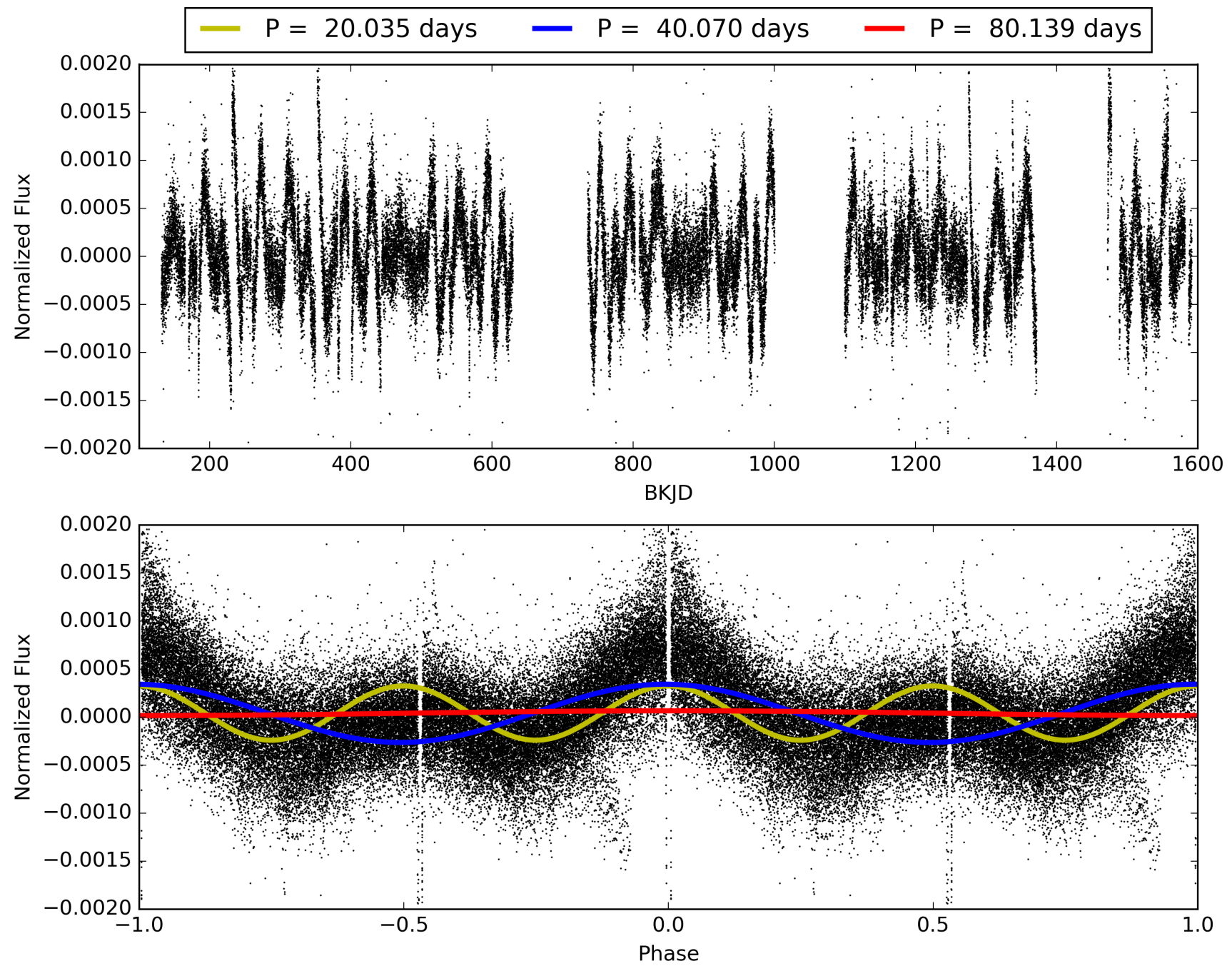
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.5% [0.01σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 16.6%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [27/27]
GhostDiagnostic-chr: 5.722
Centroid-sig: 0.0%
Centroid-so: 0.102 arcsec [18.87σ]
OotOffset-rm: 0.140 arcsec [2.02σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-rm: 0.234 arcsec [3.35σ]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [13/13]

TCE 009963009-01, PDC Light Curves

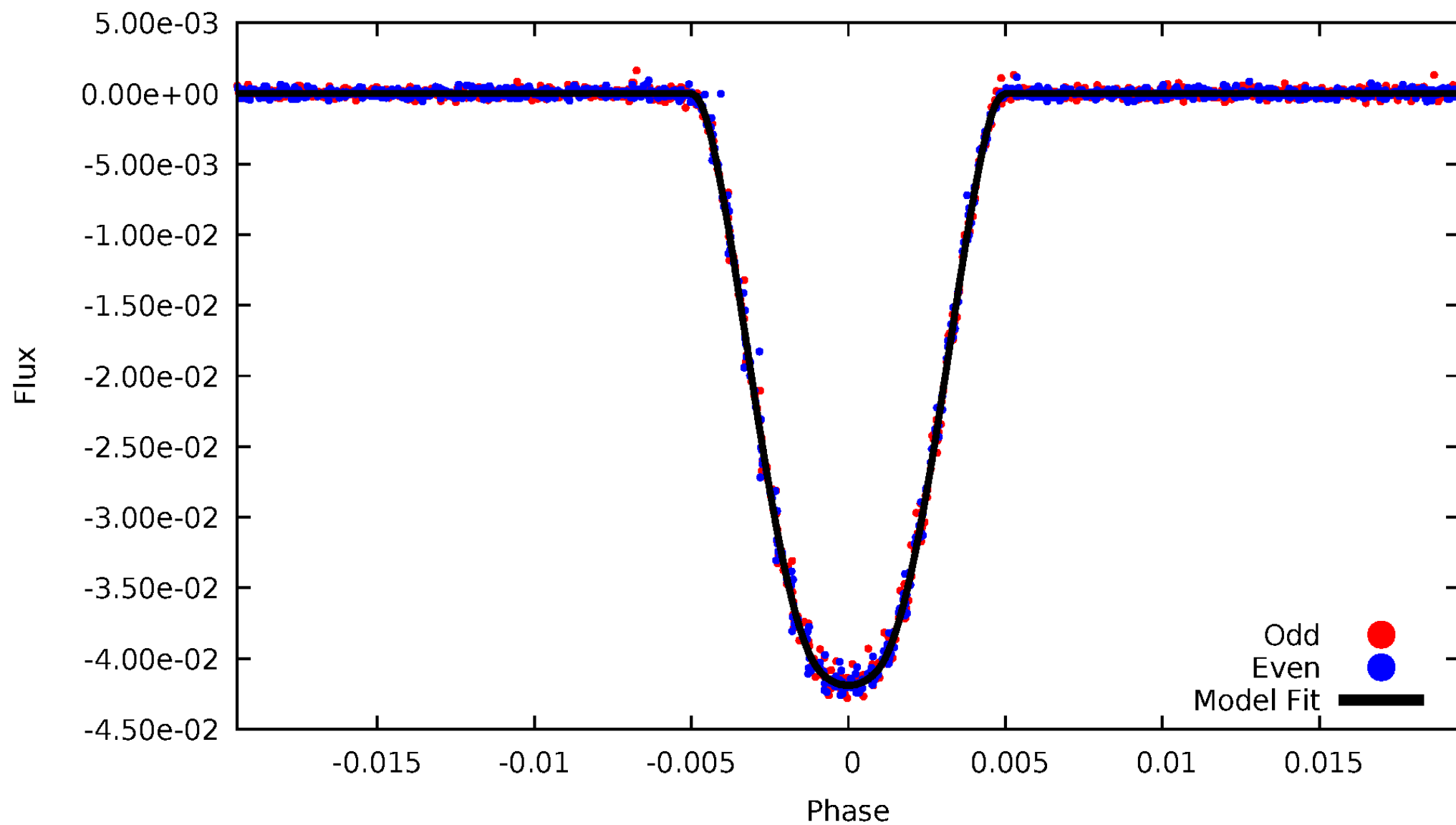


TCE 009963009-01



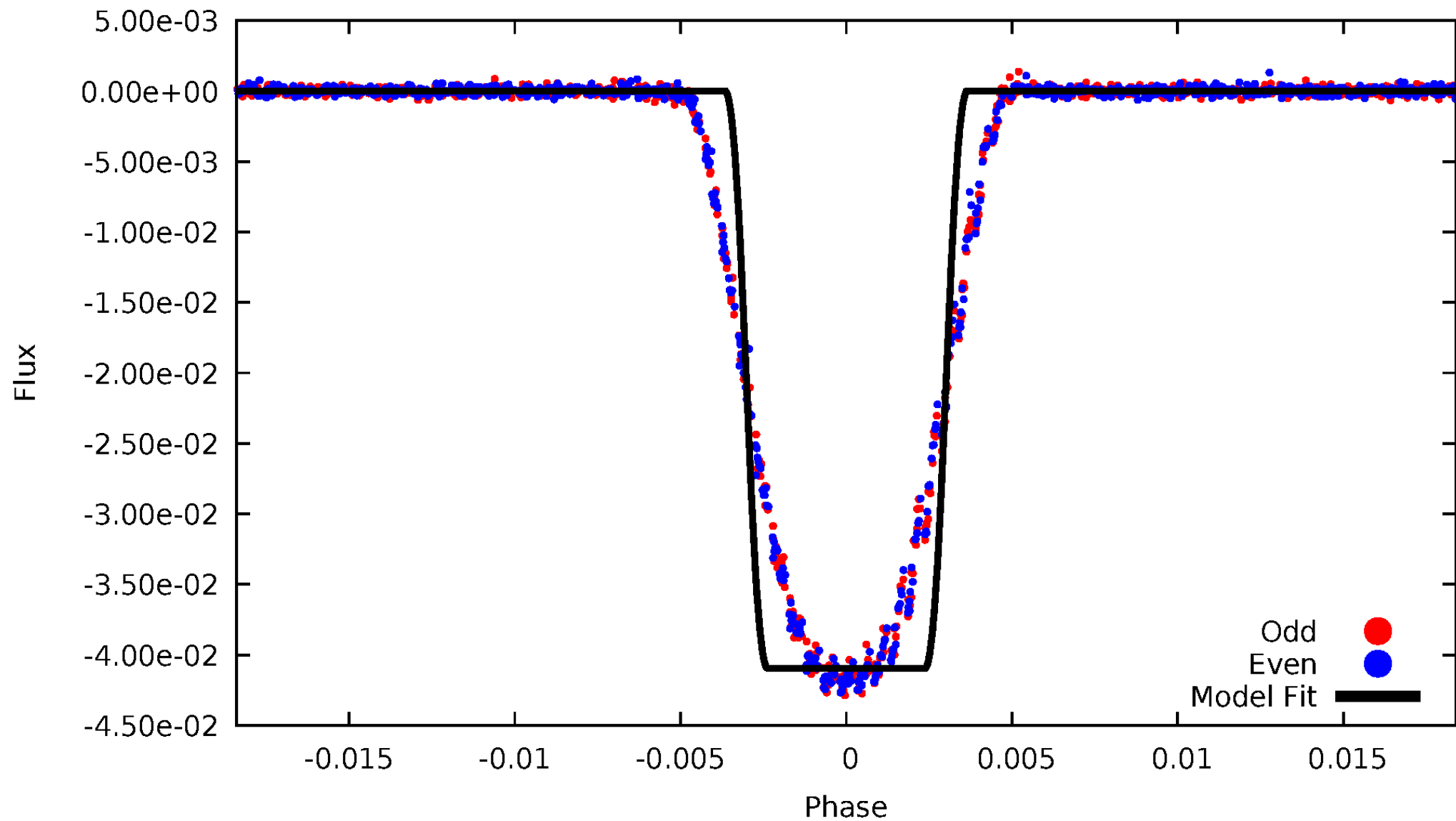
DV Odd/Even

TCE 009963009-01



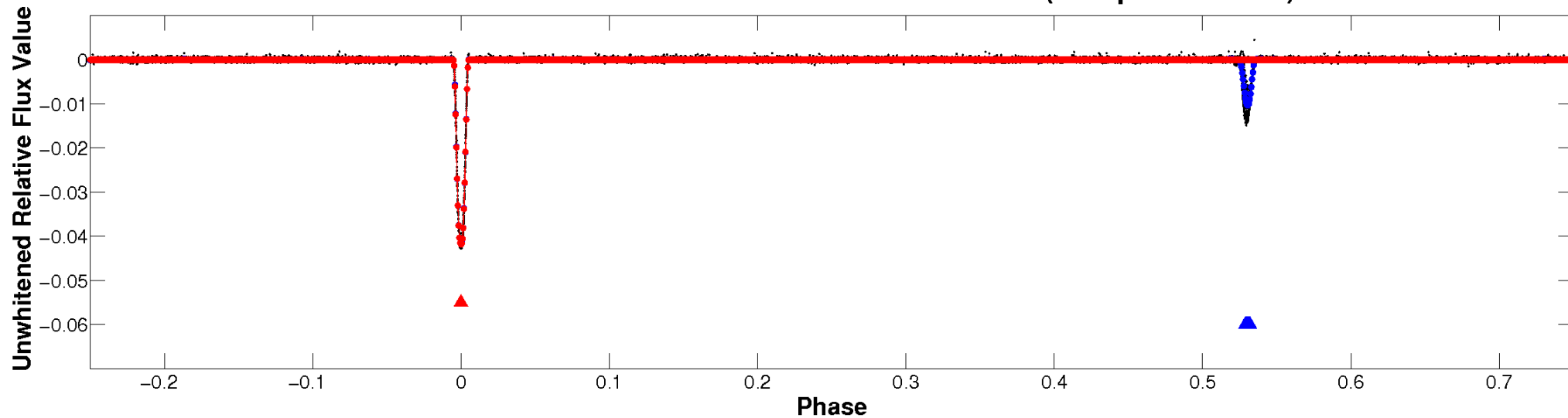
ALT Odd/Even

TCE 009963009-01

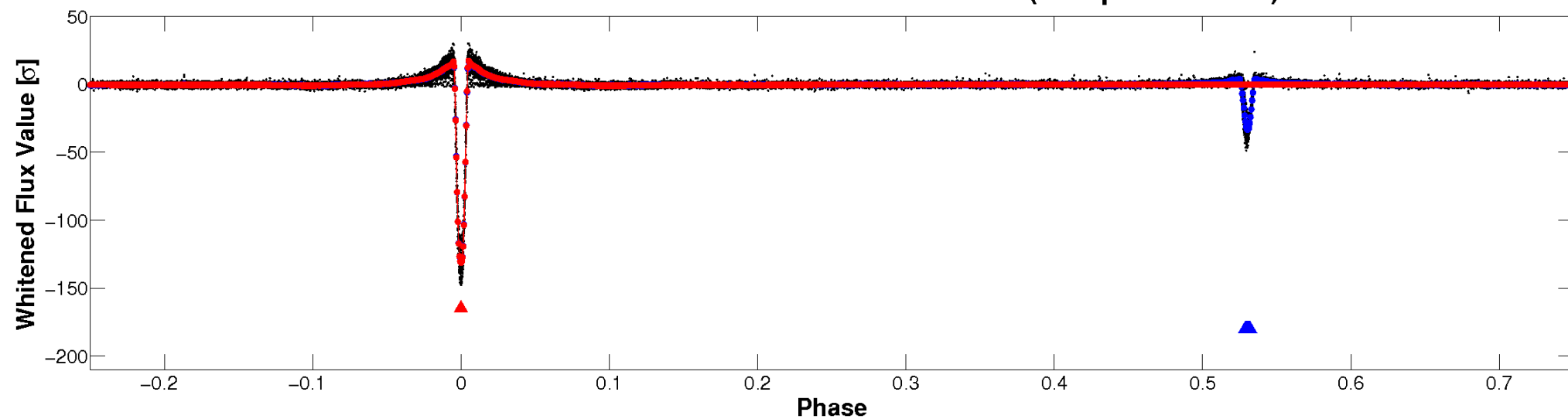


Non-Whitened Vs. Whitened Light Curve

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

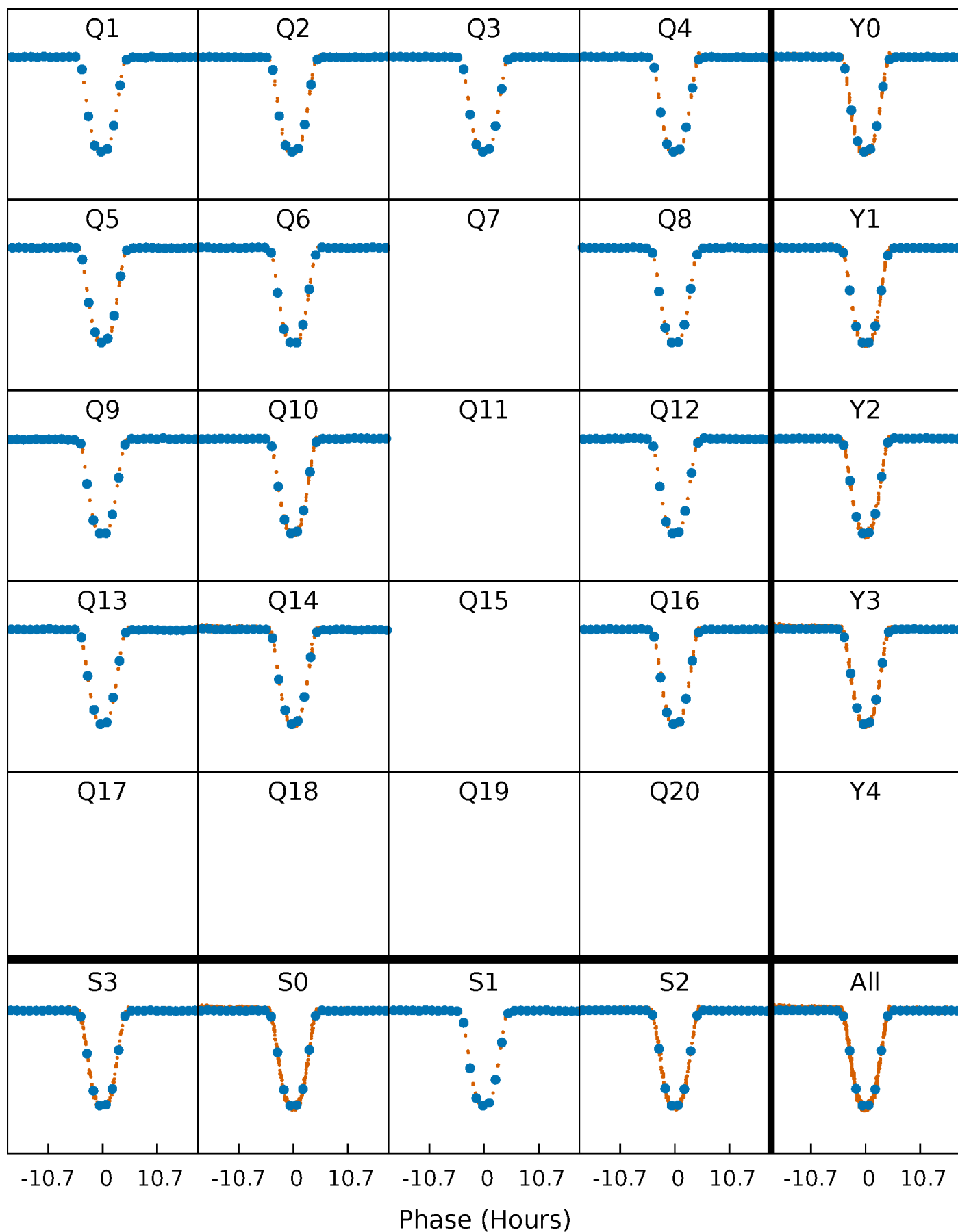


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



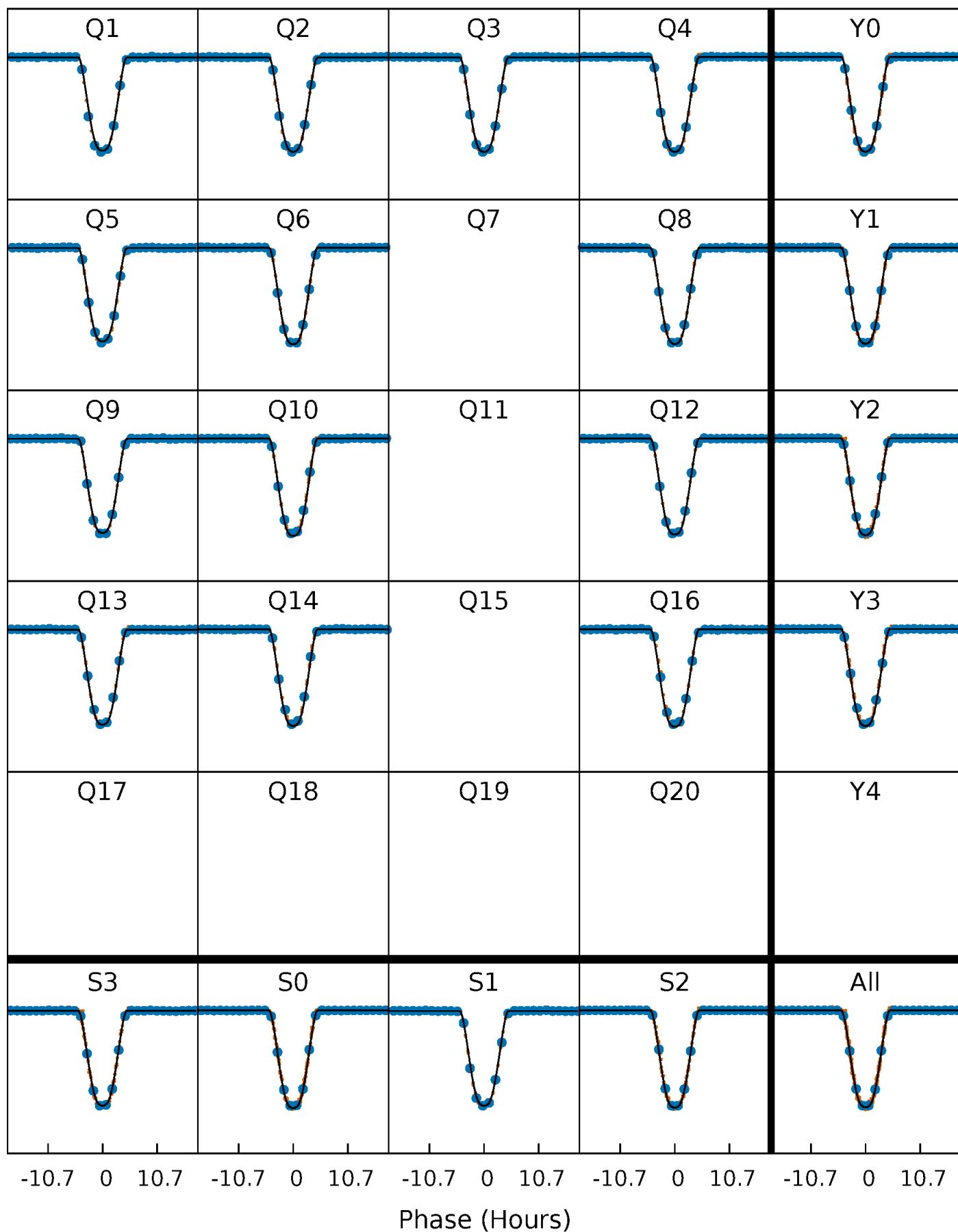
PDC Quarter-Phased Transit Curves

TCE 009963009-01 P= 40.069618 Days $T_0=153.019119$ (BKJD)



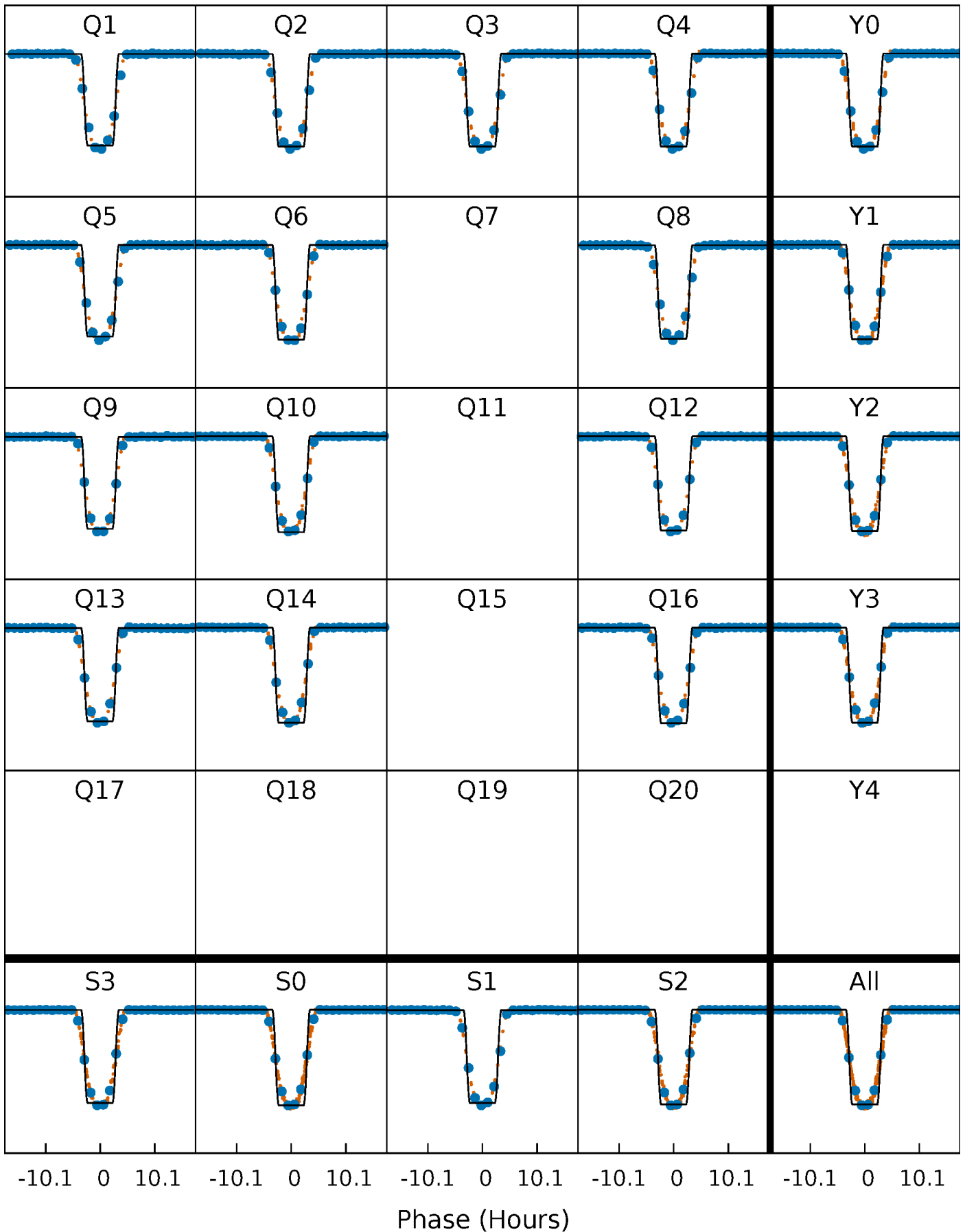
DV Quarter-Phased Transit Curves

TCE 009963009-01 P= 40.069618 Days $T_0=153.019119$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

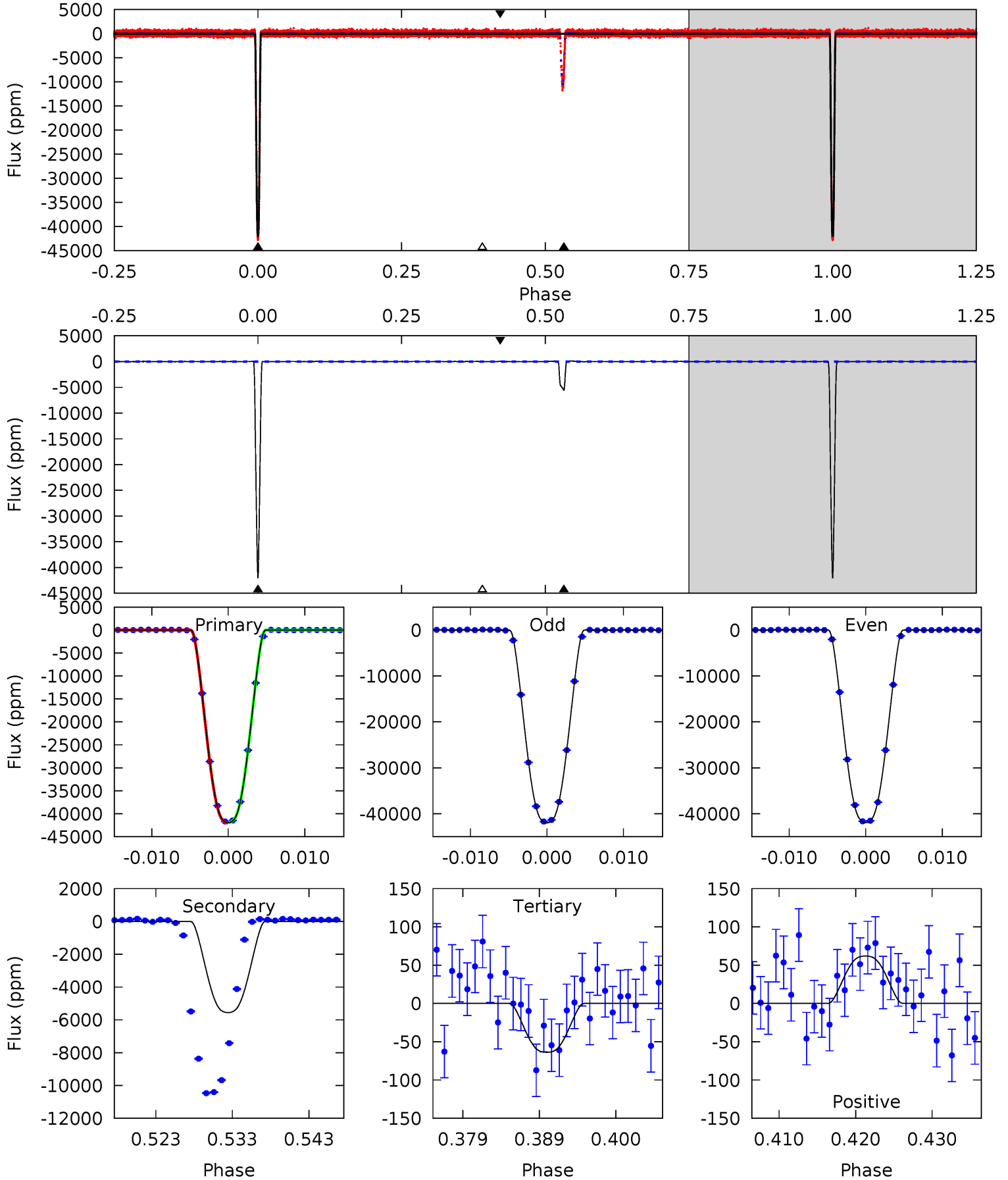
TCE 009963009-01 P= 40.069841 Days $T_0=153.015576$ (BKJD)



DV Model-Shift Uniqueness Test

009963009-01, P = 40.069618 Days, E = 112.949501 Days

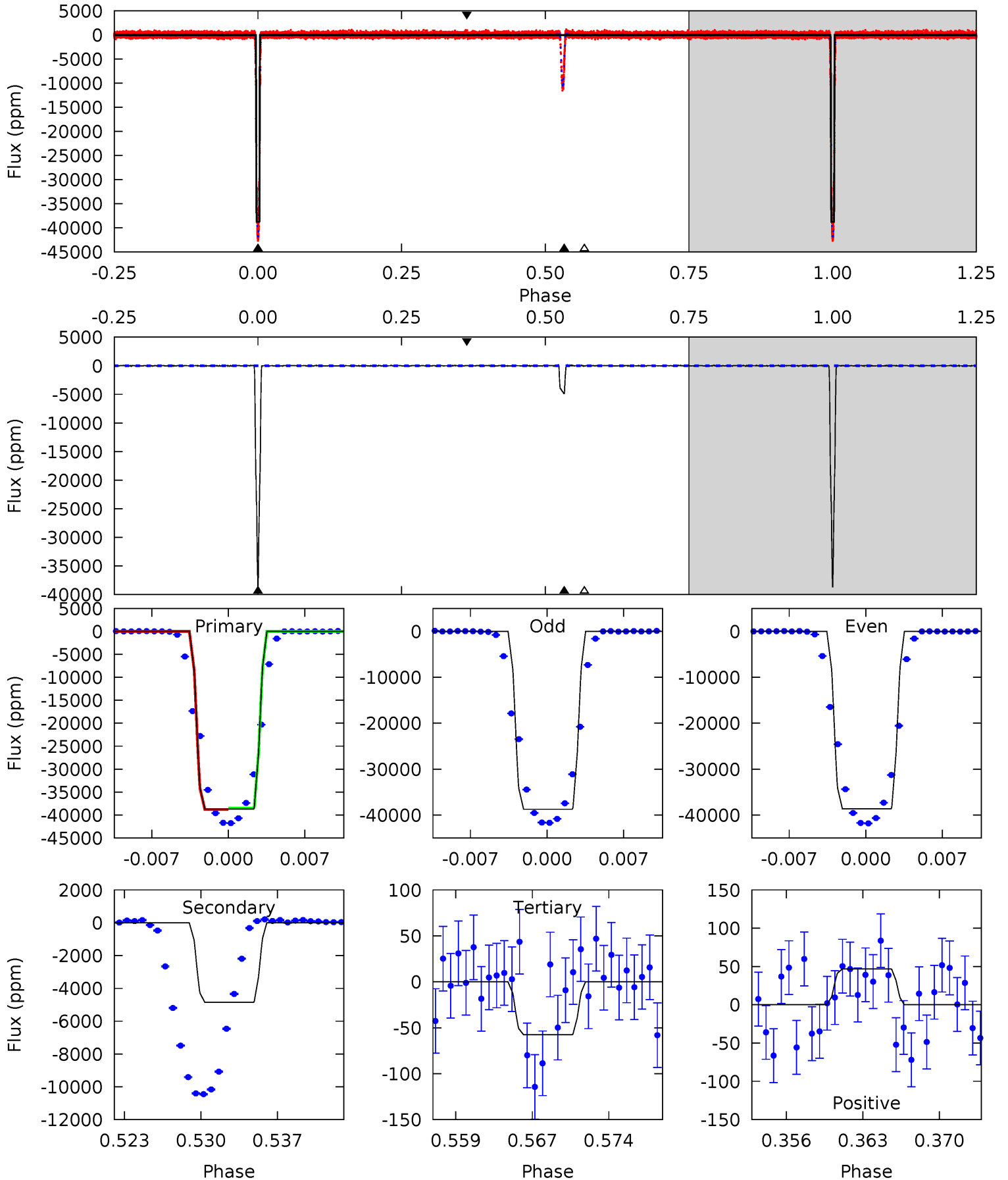
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3502	463.9	5.33	5.17	5.02	2.57	2.01	3496	3497	458.5	458.7	2.69	0.96	0.00	2.28



Alt Model-Shift Uniqueness Test

009963009-01, P = 40.069841 Days, E = 112.945735 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2495	313.0	3.71	3.01	5.09	2.68	6.33	2491	2492	309.3	310.0	3.04	1.00	0.00	5.17



Stellar Parameters For KIC 009963009

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5911^{+166}_{-208}	$4.321^{+0.124}_{-0.186}$	$0.220^{+0.200}_{-0.300}$	$1.207^{+0.360}_{-0.194}$	$1.112^{+0.136}_{-0.136}$	$0.891^{+0.529}_{-0.447}$
	+3%/-4%	+3%/-4%	+91%/-136%	+30%/-16%	+12%/-12%	+59%/-50%
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 009963009-01 / KOI 7265.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5559 ± 12	$27.34^{+4.54}_{-2.47}$	823^{+66}_{-48}	3890^{+77}_{-95}	226^{+48}_{-52}
Alt.	-4855 ± 16	$26.72^{+3.92}_{-2.42}$	823^{+60}_{-48}	3842^{+78}_{-99}	211^{+39}_{-48}

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 $A_{obs} \gg 1.0$

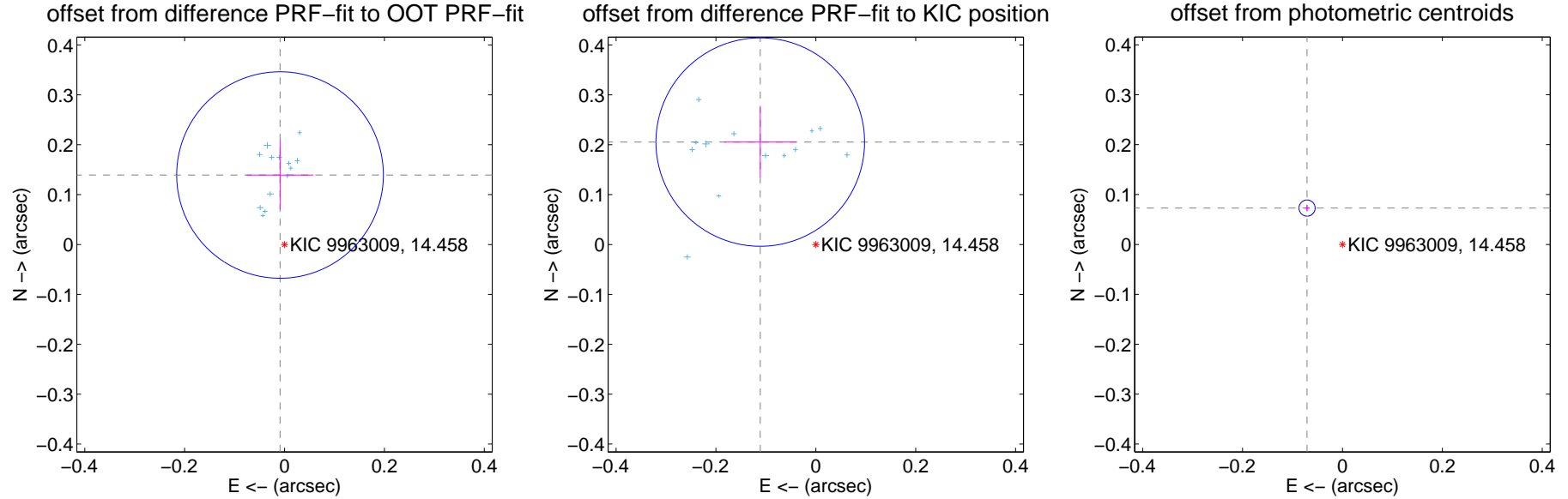
DV Centroid Data

Supplemental centroid analysis for 009963009-01. Kepler magnitude: 14.46. Transit SNR 1692.34

There are 13 quarters with good PRF difference image offsets

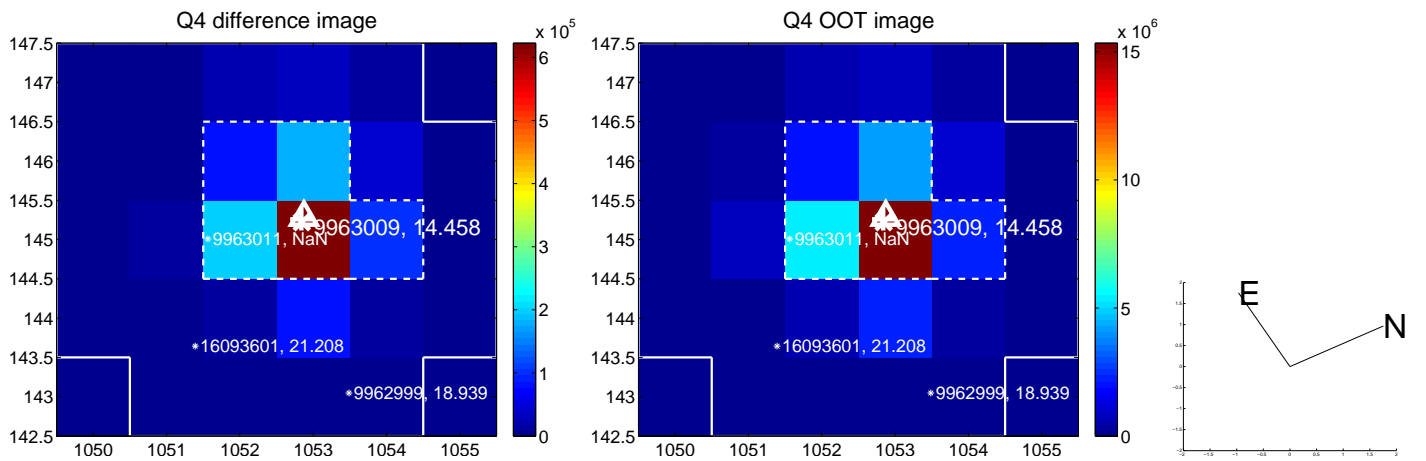
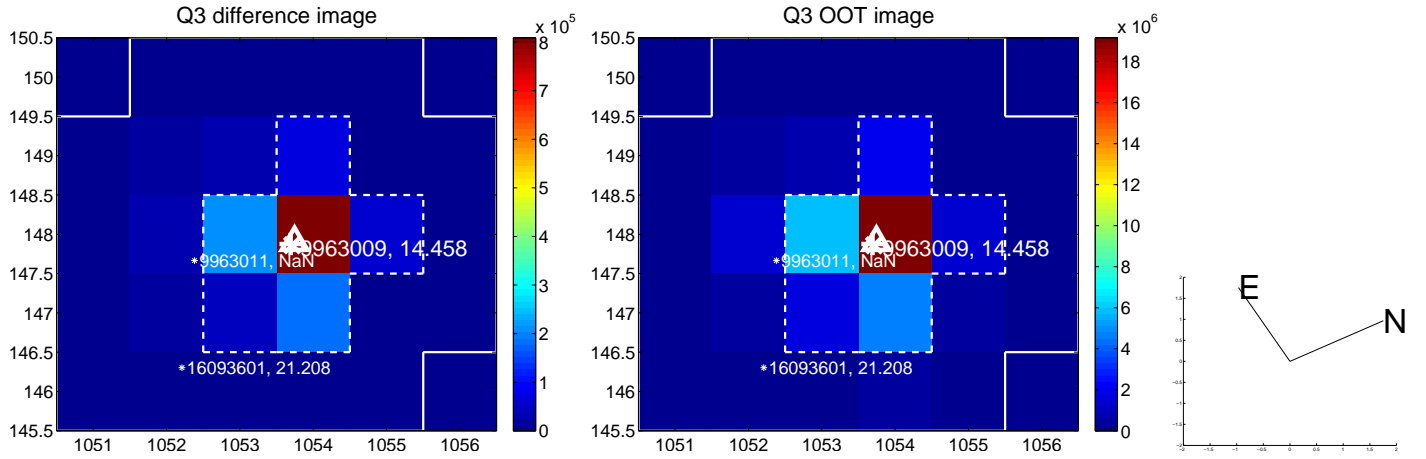
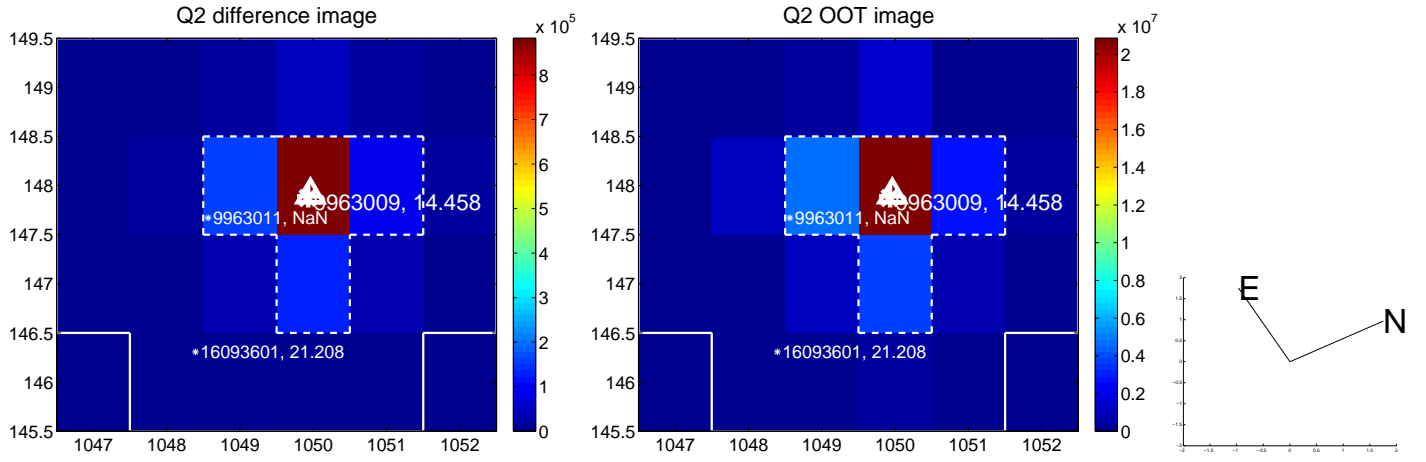
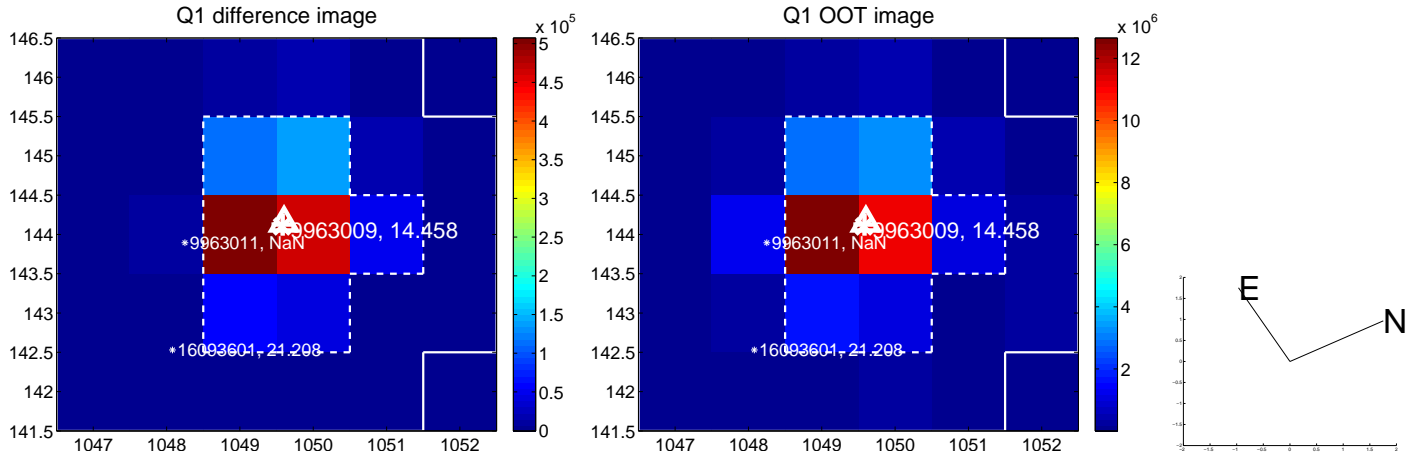
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.140 ± 0.069	2.02	0.009 ± 0.067	0.139 ± 0.069
PRF-fit source offset from KIC position	0.234 ± 0.070	3.35	0.111 ± 0.072	0.205 ± 0.070
photometric centroid source offset	0.10 ± 0.01	18.87	0.07 ± 0.01	0.07 ± 0.01

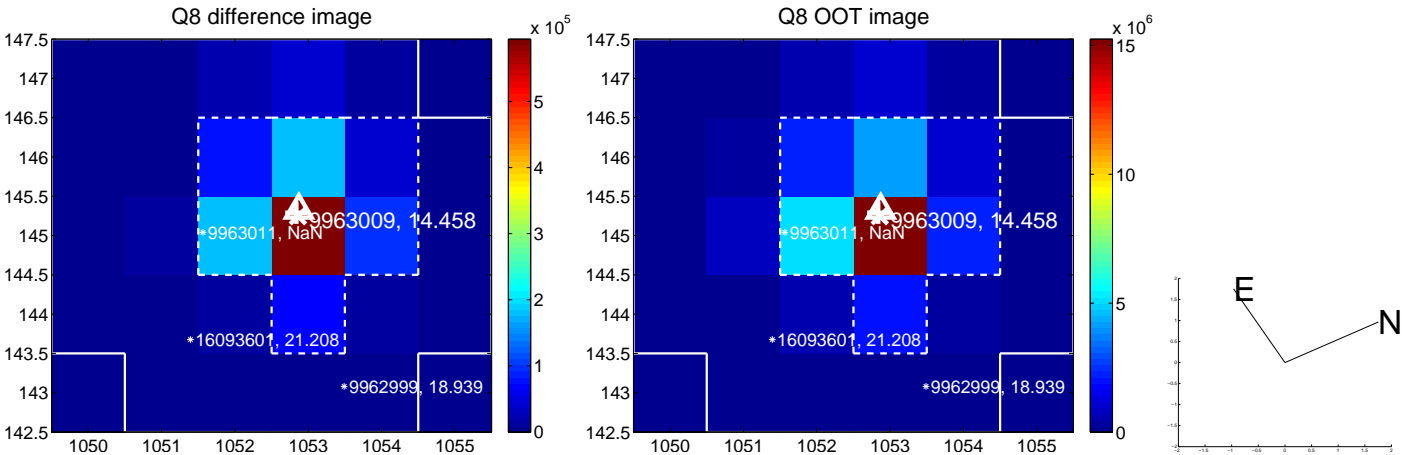
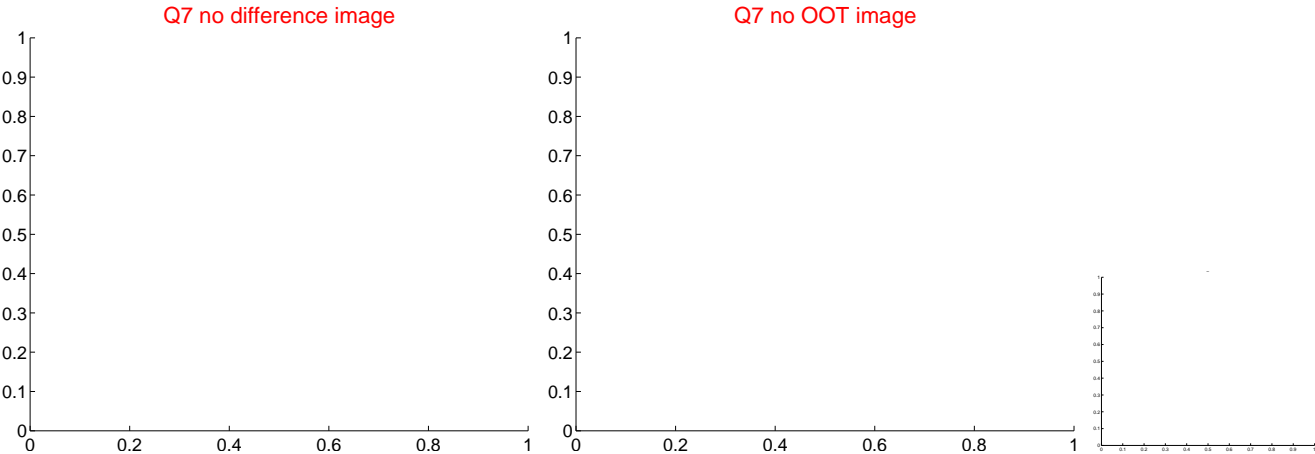
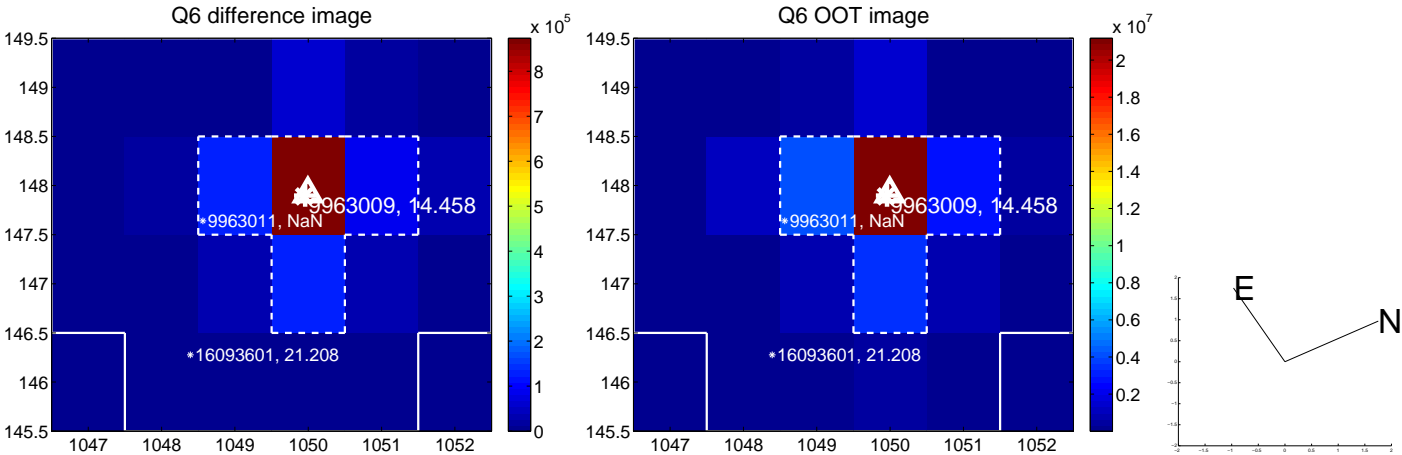
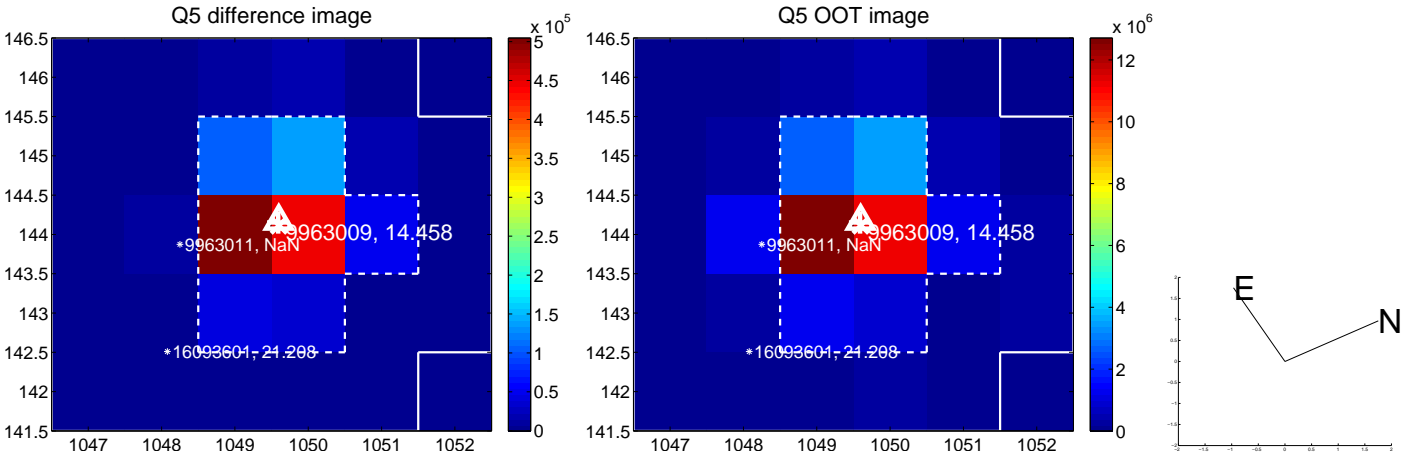


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

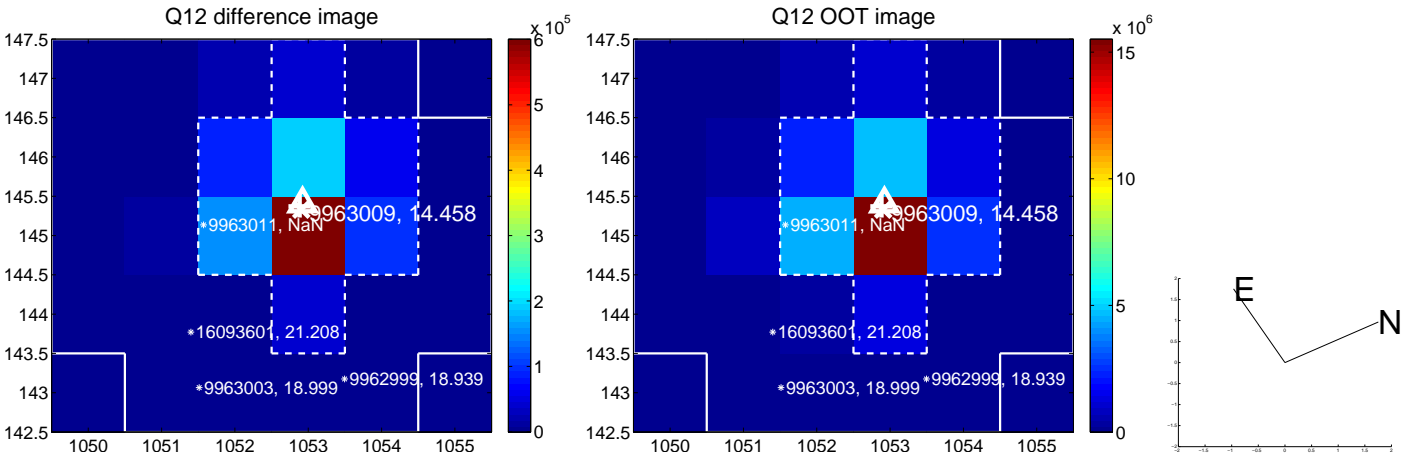
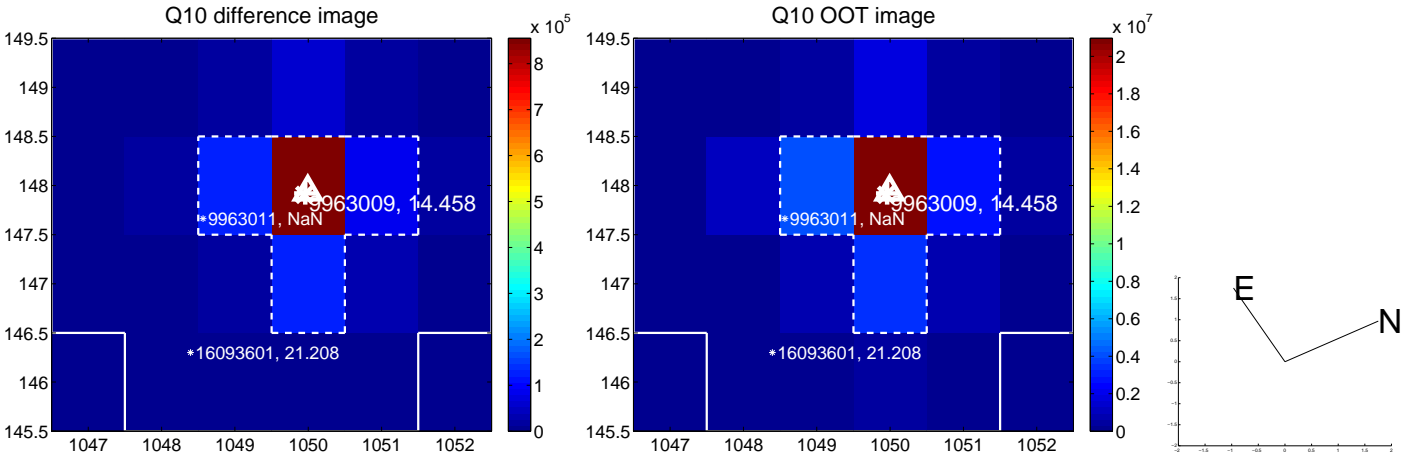
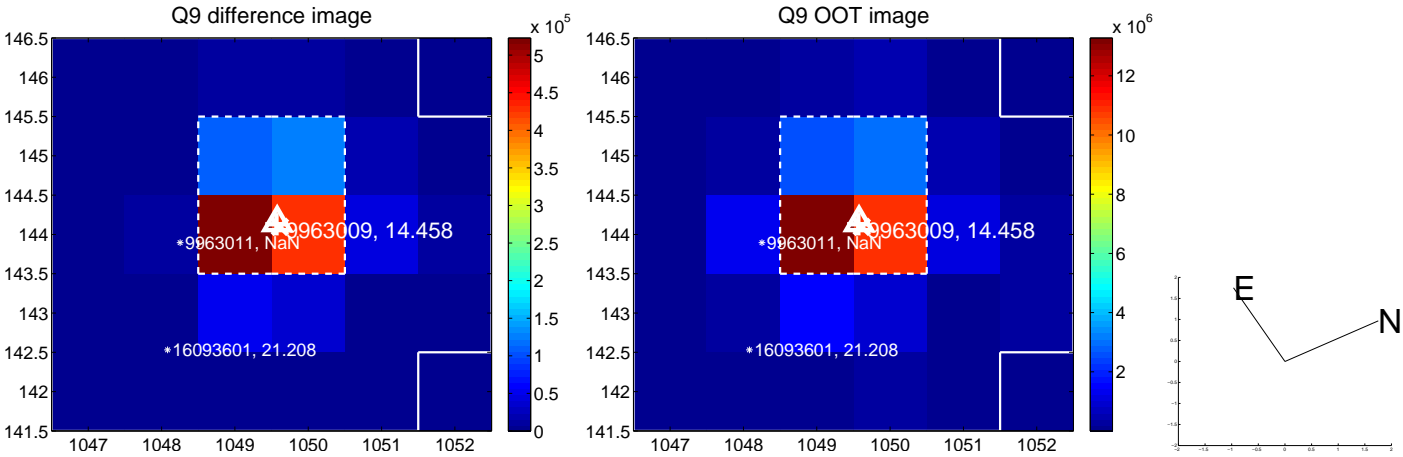
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



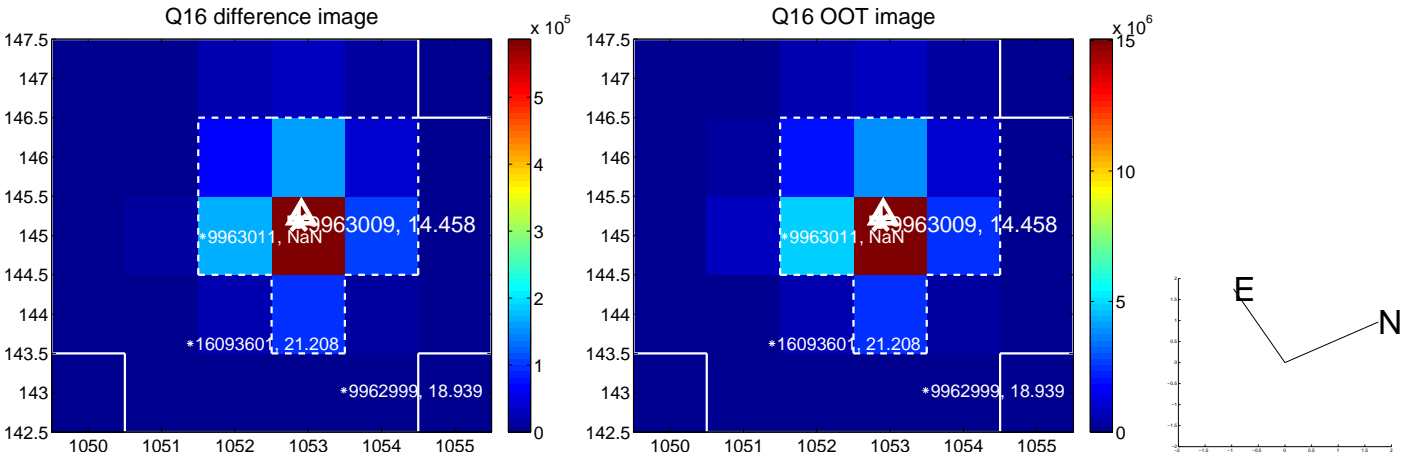
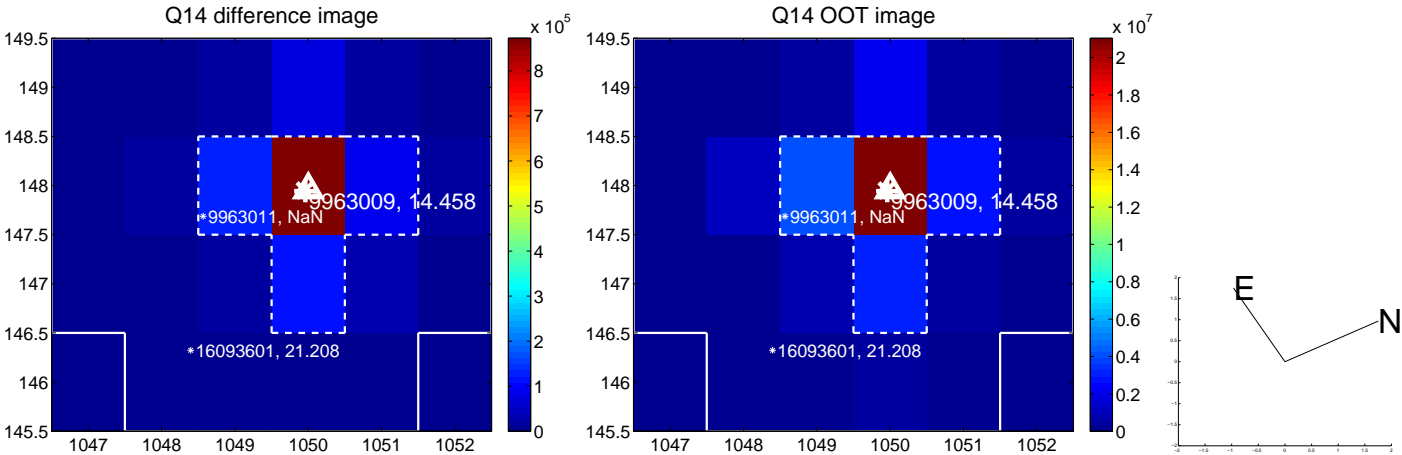
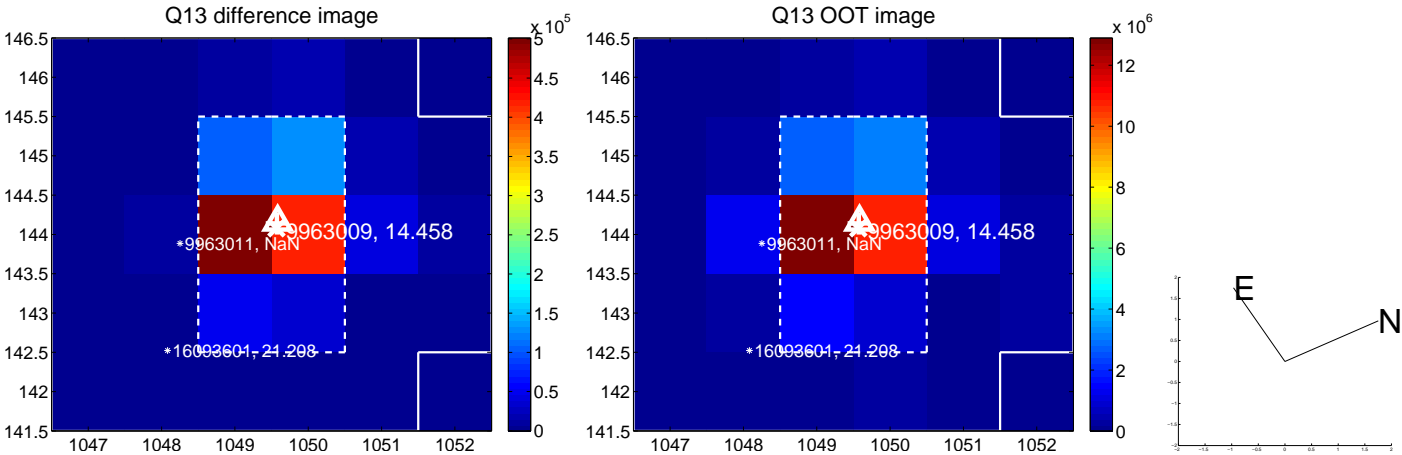
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



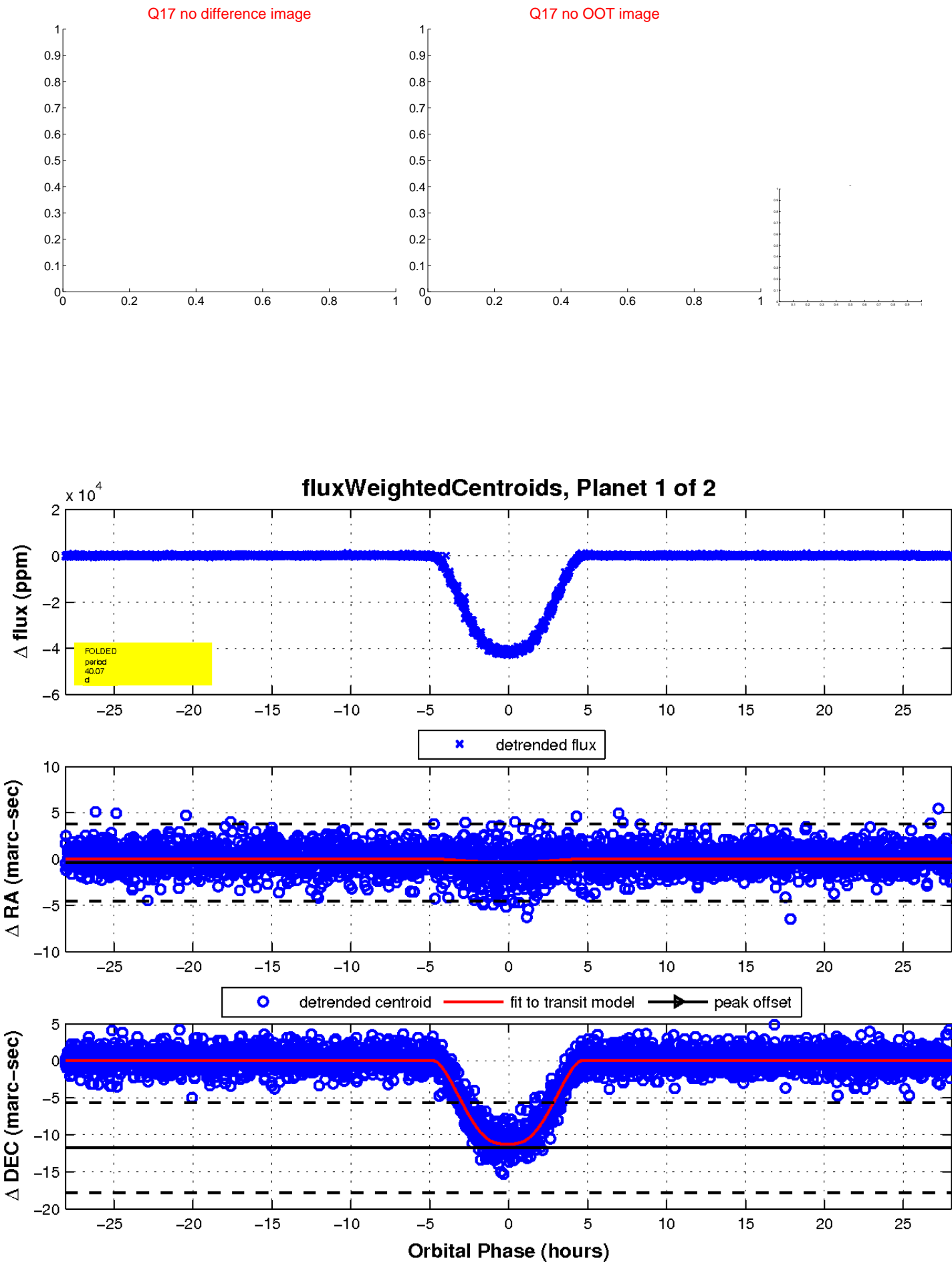
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

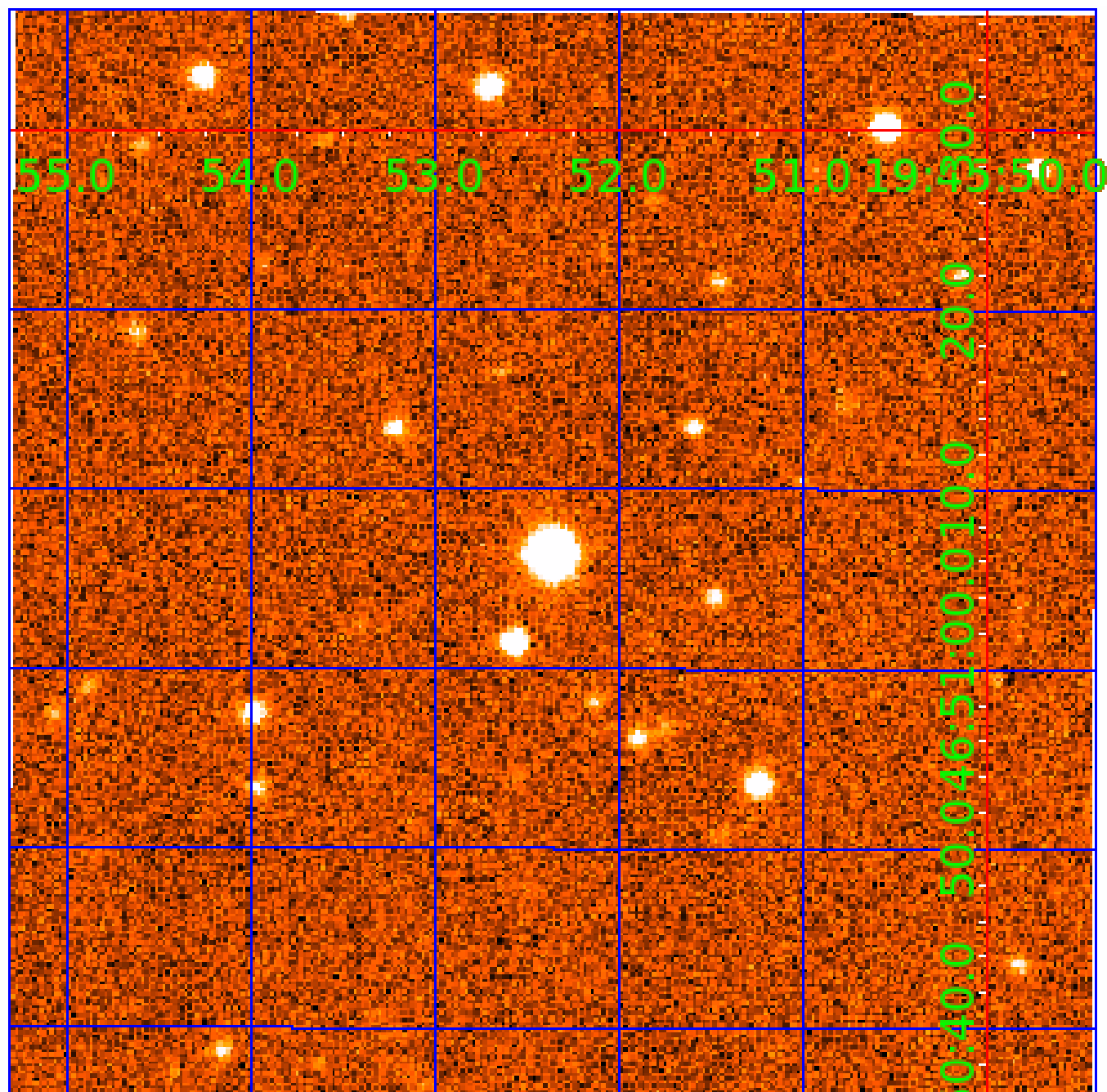


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009963009

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})
009963009-01	OBS	7265.01	40.069618	153.019119	41899.8	9.358	2060.9	1692.3	1.21	5911	27.44	28.24
009963009-02	OBS	No	40.072970	134.142699	11336.2	8.564	485.3	319.3	1.21	5911	23.09	28.24

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009963009-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
009963009-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

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 009963009-02

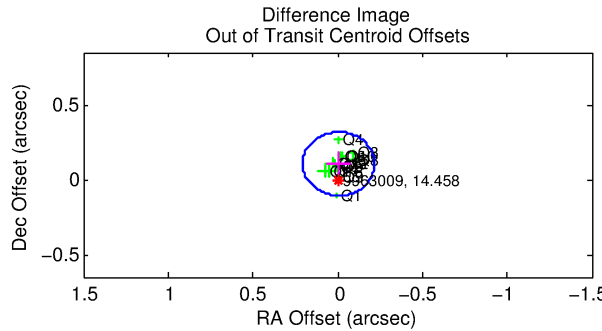
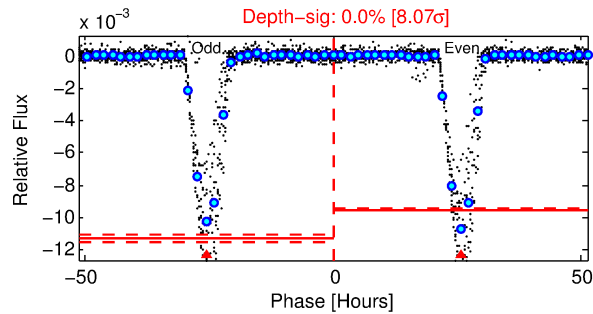
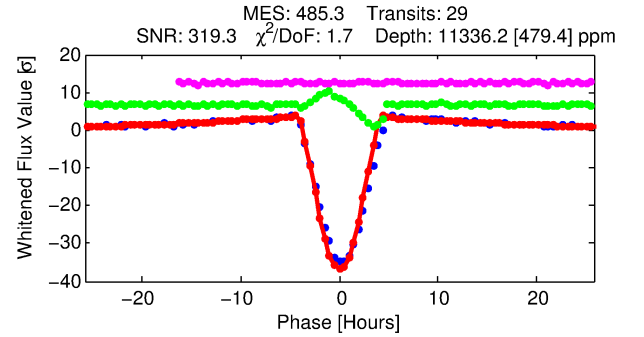
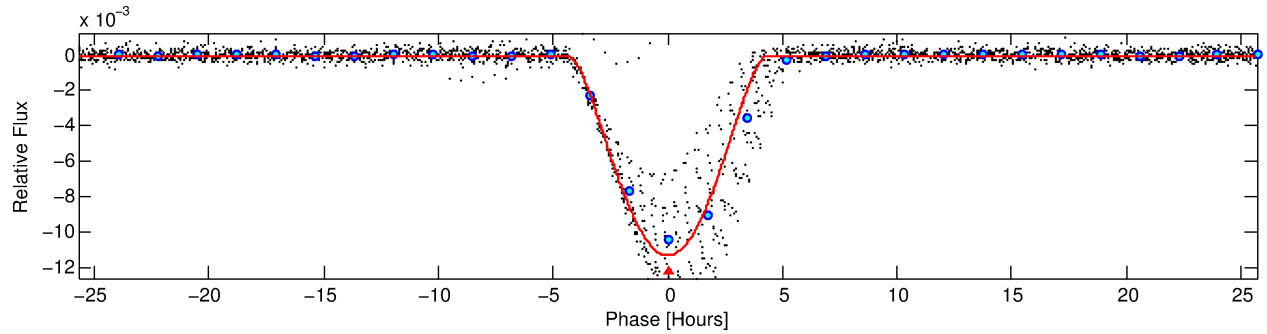
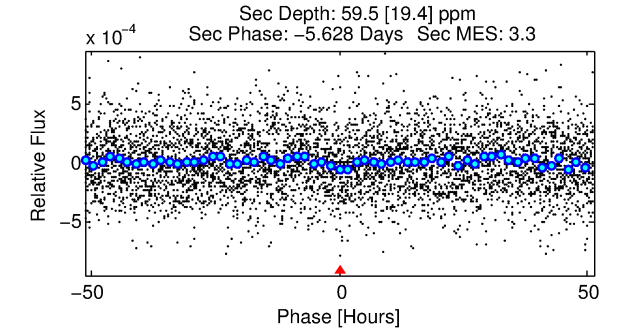
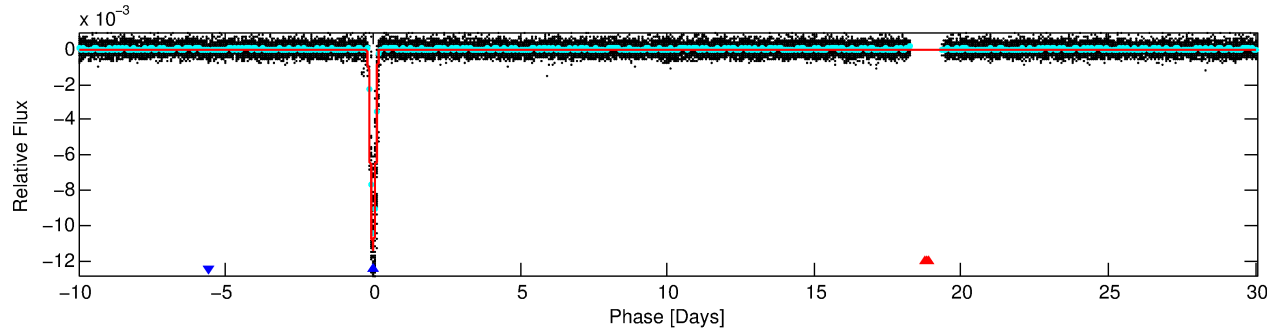
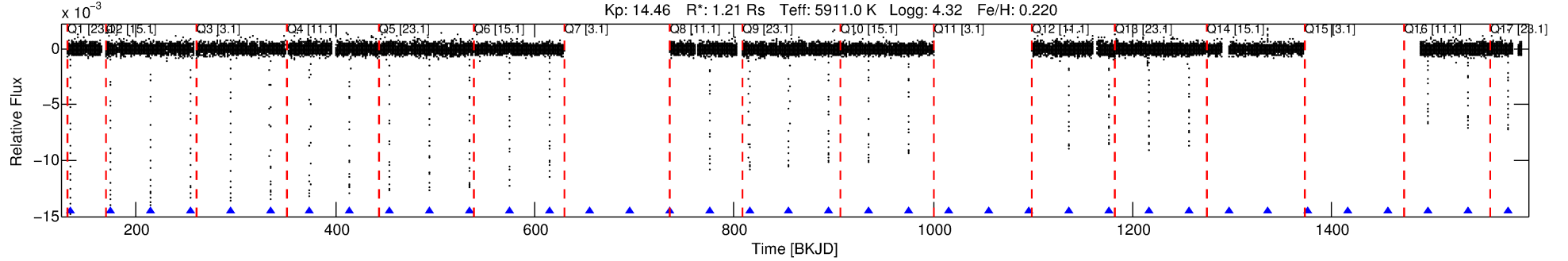
No Significant Match Found

DV One-Page Summary

KIC: 9963009 Candidate: 2 of 2 Period: 40.073 d

KOI: K07265 Corr: No Ephemeris Match

Kp: 14.46 R*: 1.21 Rs Teff: 5911.0 K Logg: 4.32 Fe/H: 0.220



DV Fit Results:

Period = 40.07297 [0.00003] d
Epoch = 134.1427 [0.0005] BKJD
Rp/R* = 0.1753 [0.0262]
a/R* = 22.10 [0.45]
b = 1.00 [0.03]
Seff = 28.24 [10.60]
Teff = 588 [55] K
Rp = 23.09 [7.70] Re
a = 0.2375 [0.0581] AU
Ag = 3.46 [1.95] [1.26σ]
Teffp = 1240 [144] K [4.23σ]

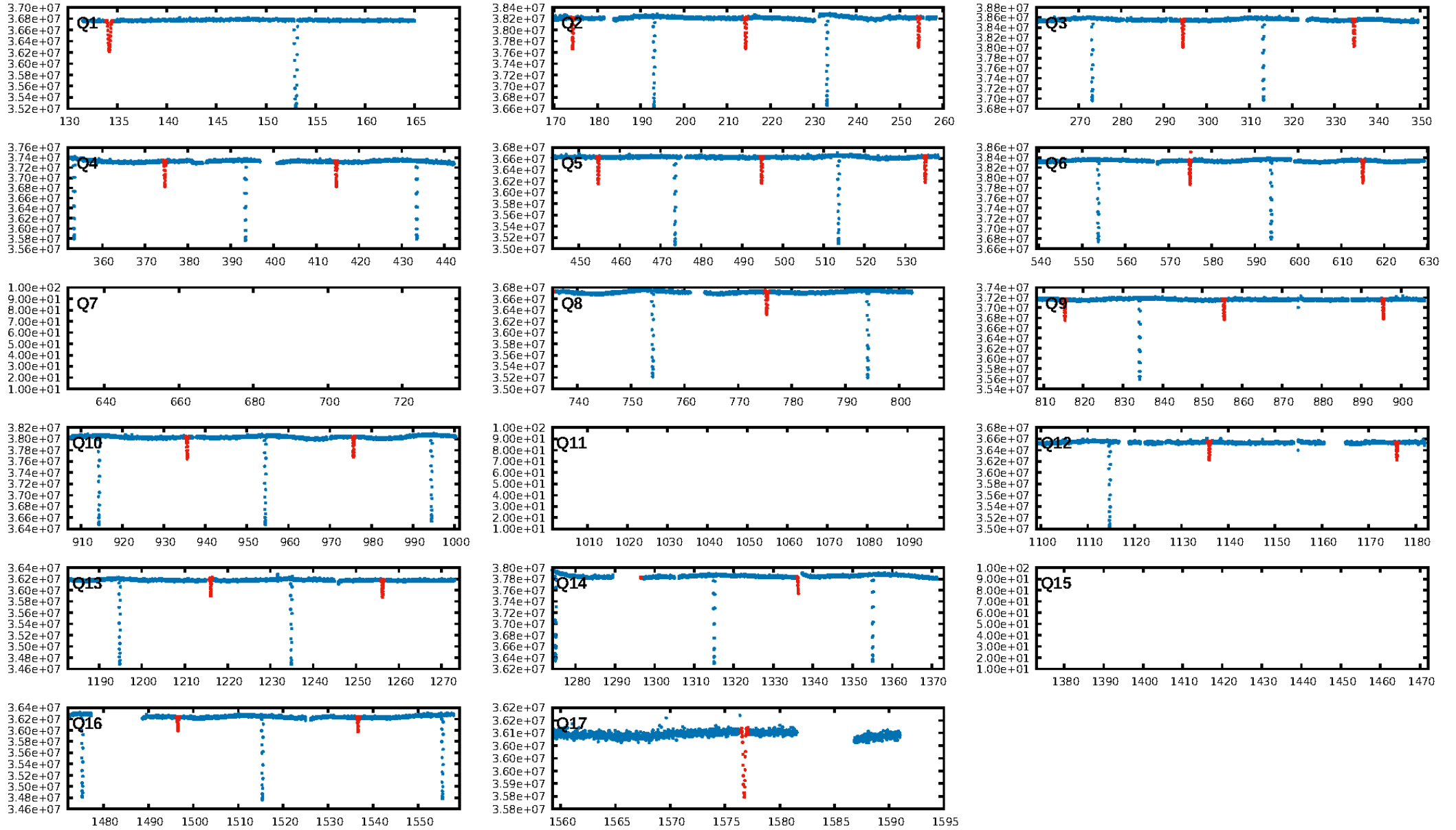
DV Diagnostic Results:

ShortPeriod-sig: 0.5% [0.01σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 47.3%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [27/27]
GhostDiagnostic-chr: 5.068
Centroid-sig: 0.0%
Centroid-so: 0.127 arcsec [5.91σ]
OotOffset-rm: 0.105 arcsec [1.49σ]
KicOffset-rm: 0.165 arcsec [2.29σ]
OotOffset-st: 3/1/4/5 [13]
KicOffset-st: 3/1/4/5 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [13/13]

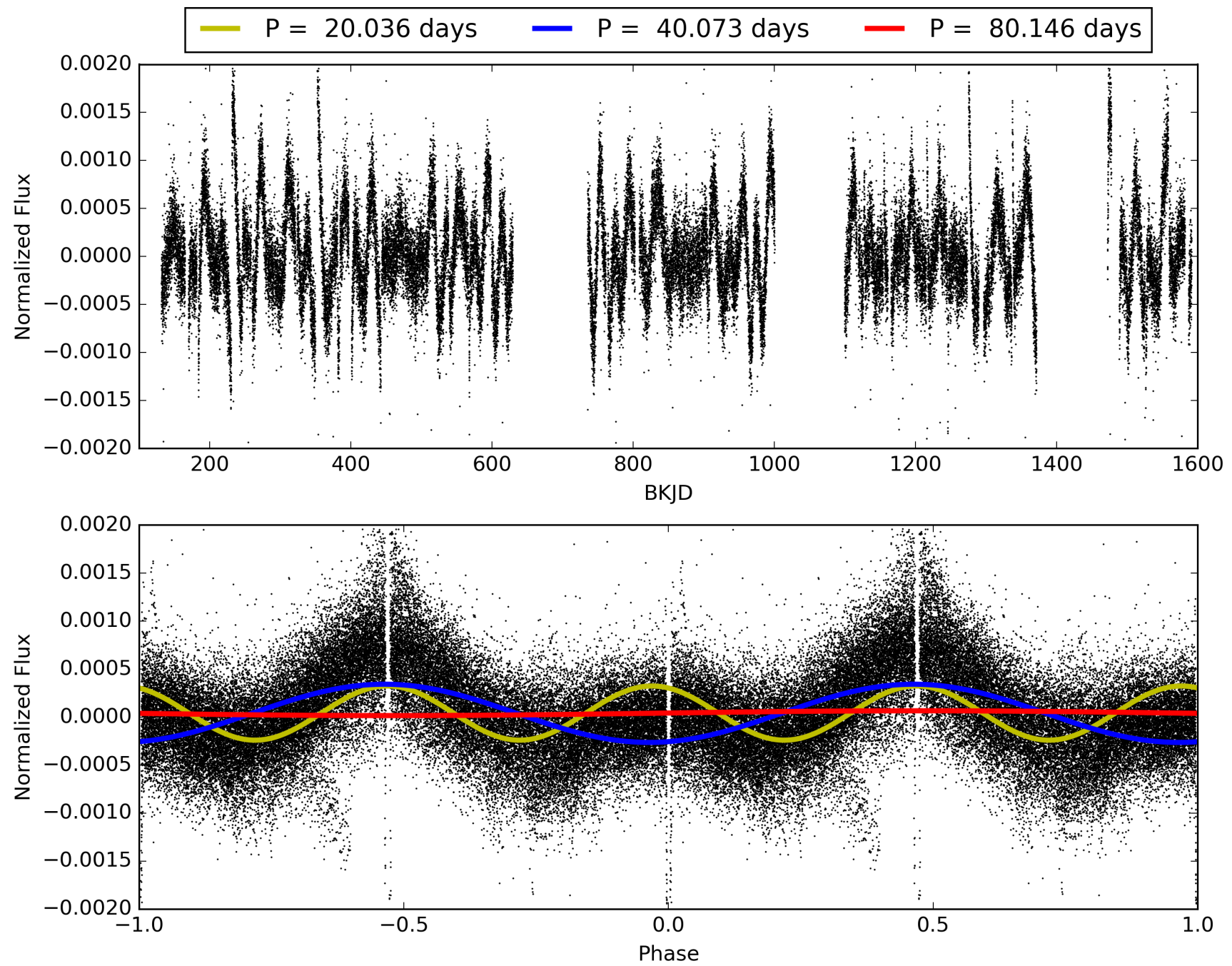
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:49:41 Z

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

TCE 009963009-02, PDC Light Curves

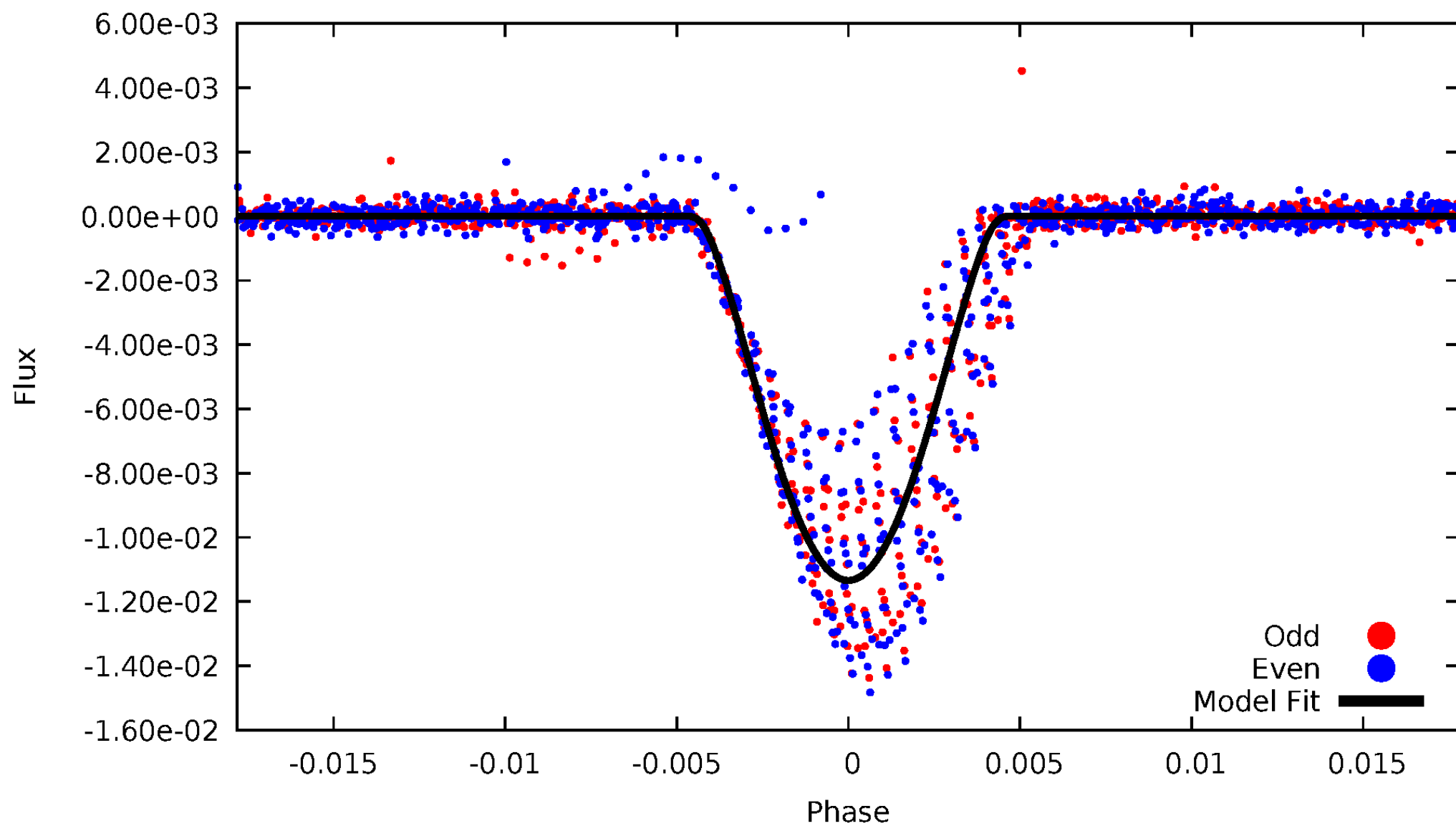


TCE 009963009-02



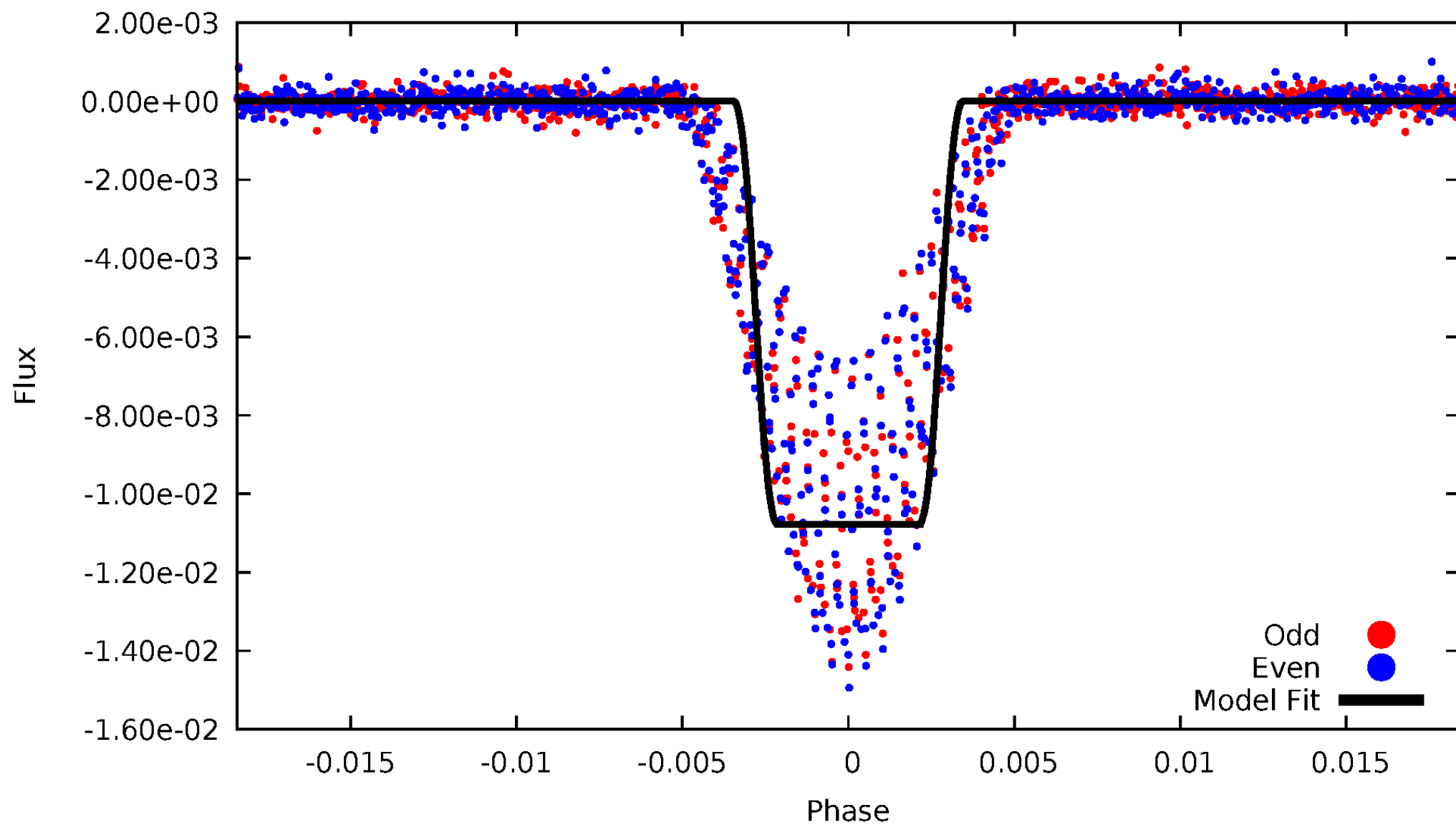
DV Odd/Even

TCE 009963009-02



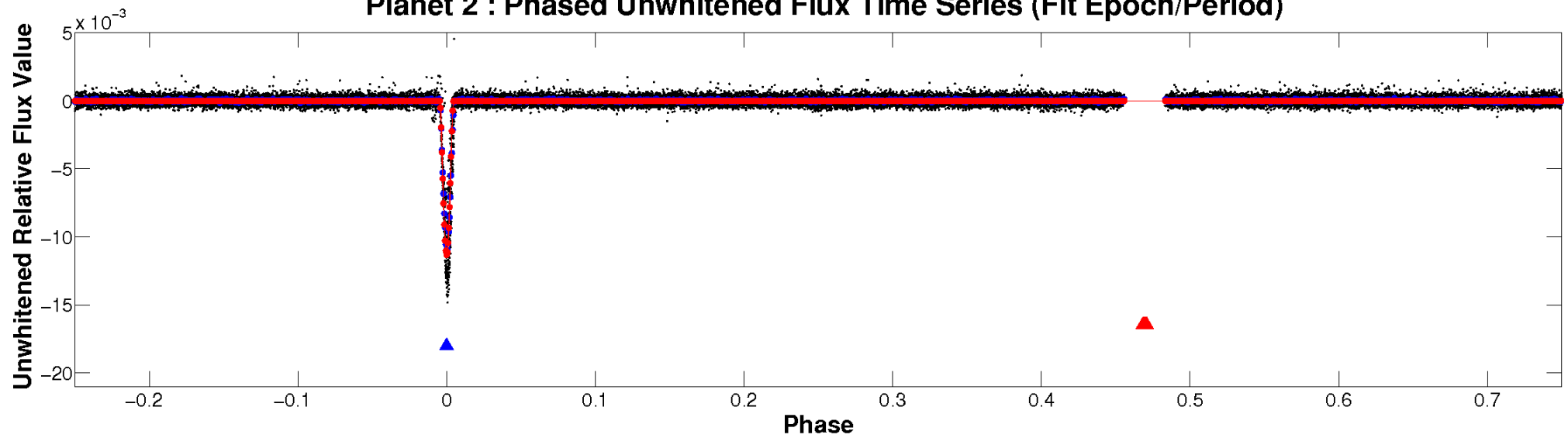
ALT Odd/Even

TCE 009963009-02

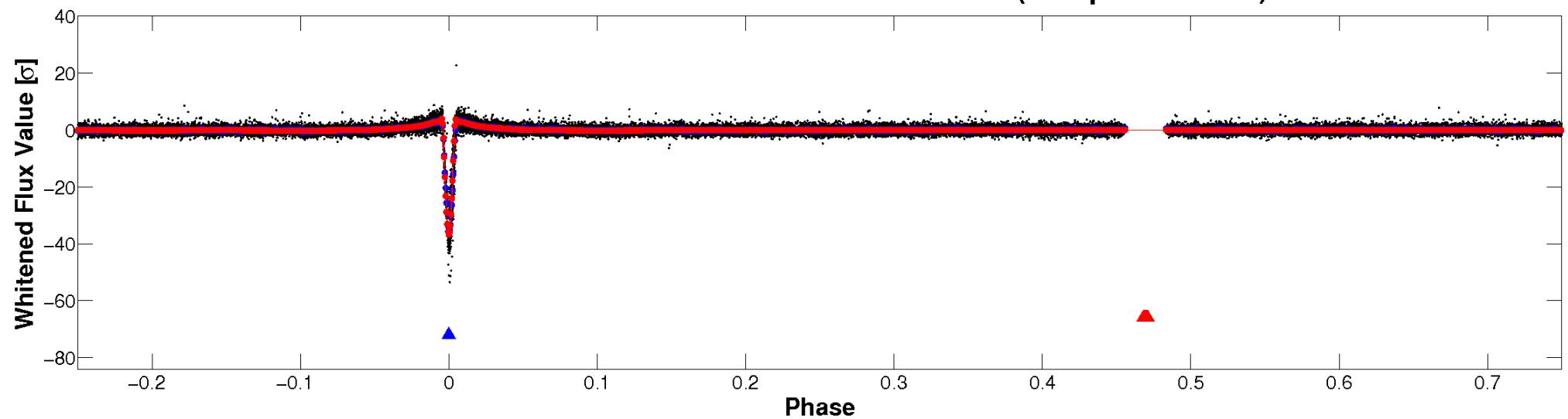


Non-Whitened Vs. Whitened Light Curve

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

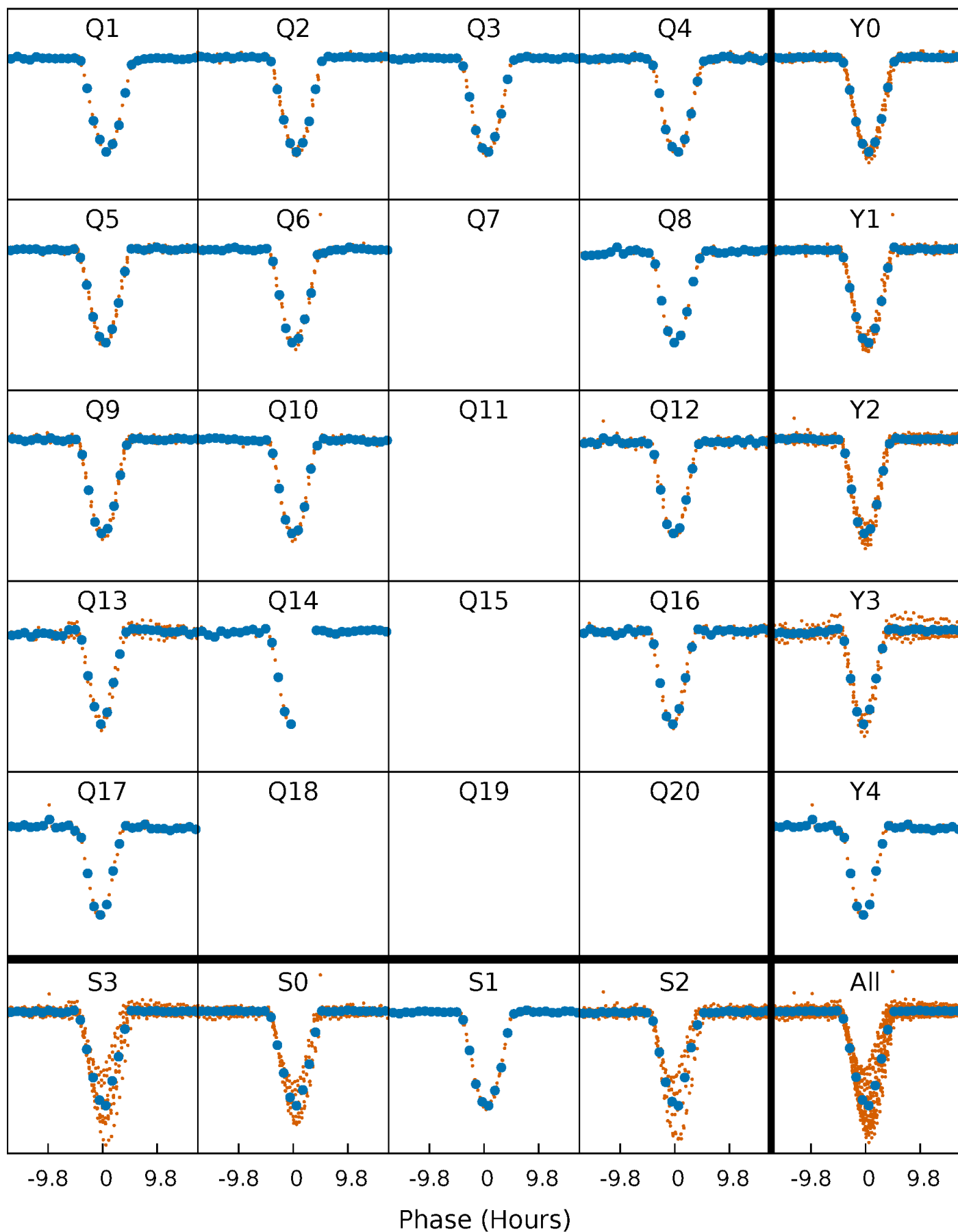


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



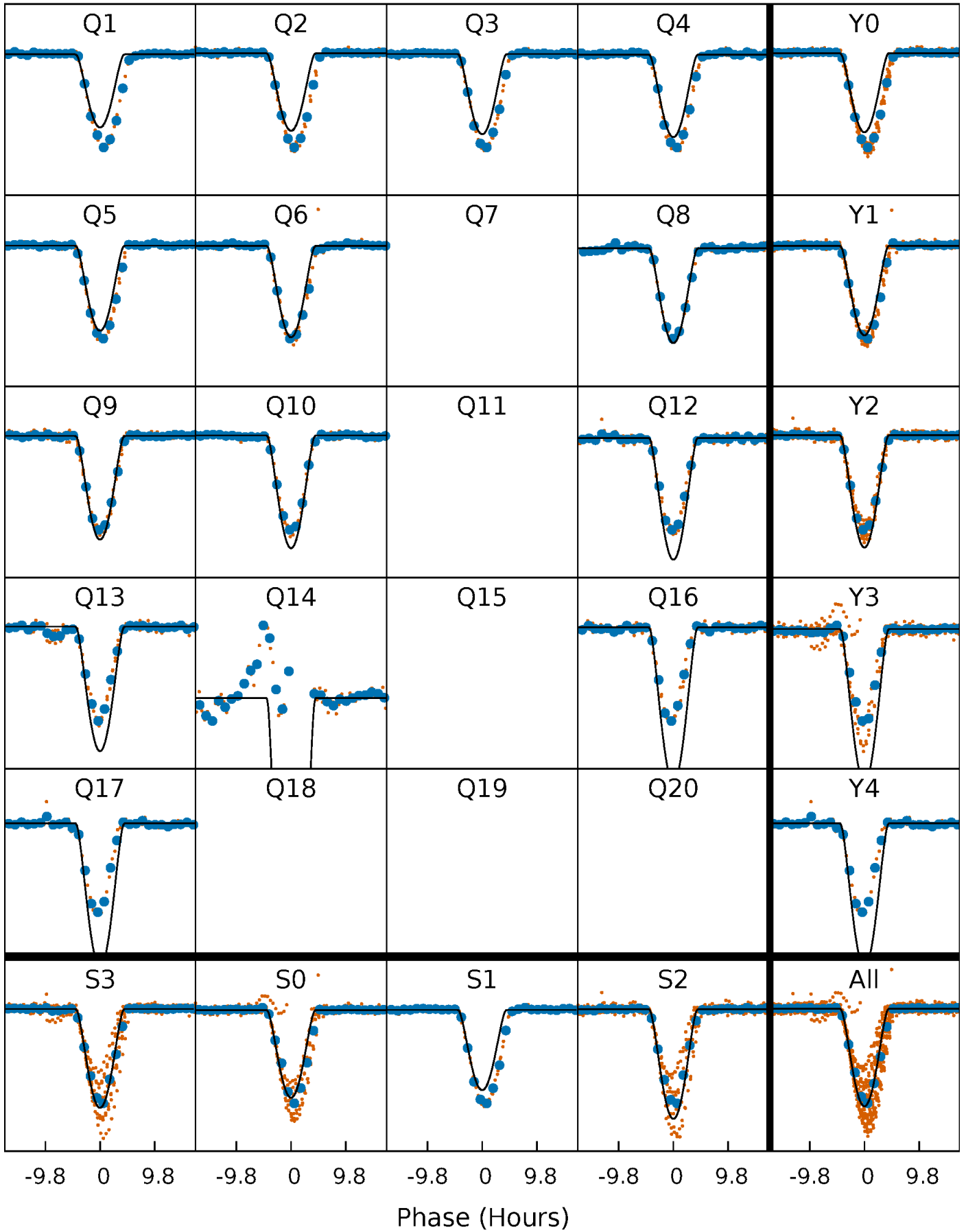
PDC Quarter-Phased Transit Curves

TCE 009963009-02 P= 40.072970 Days $T_0=134.142699$ (BKJD)



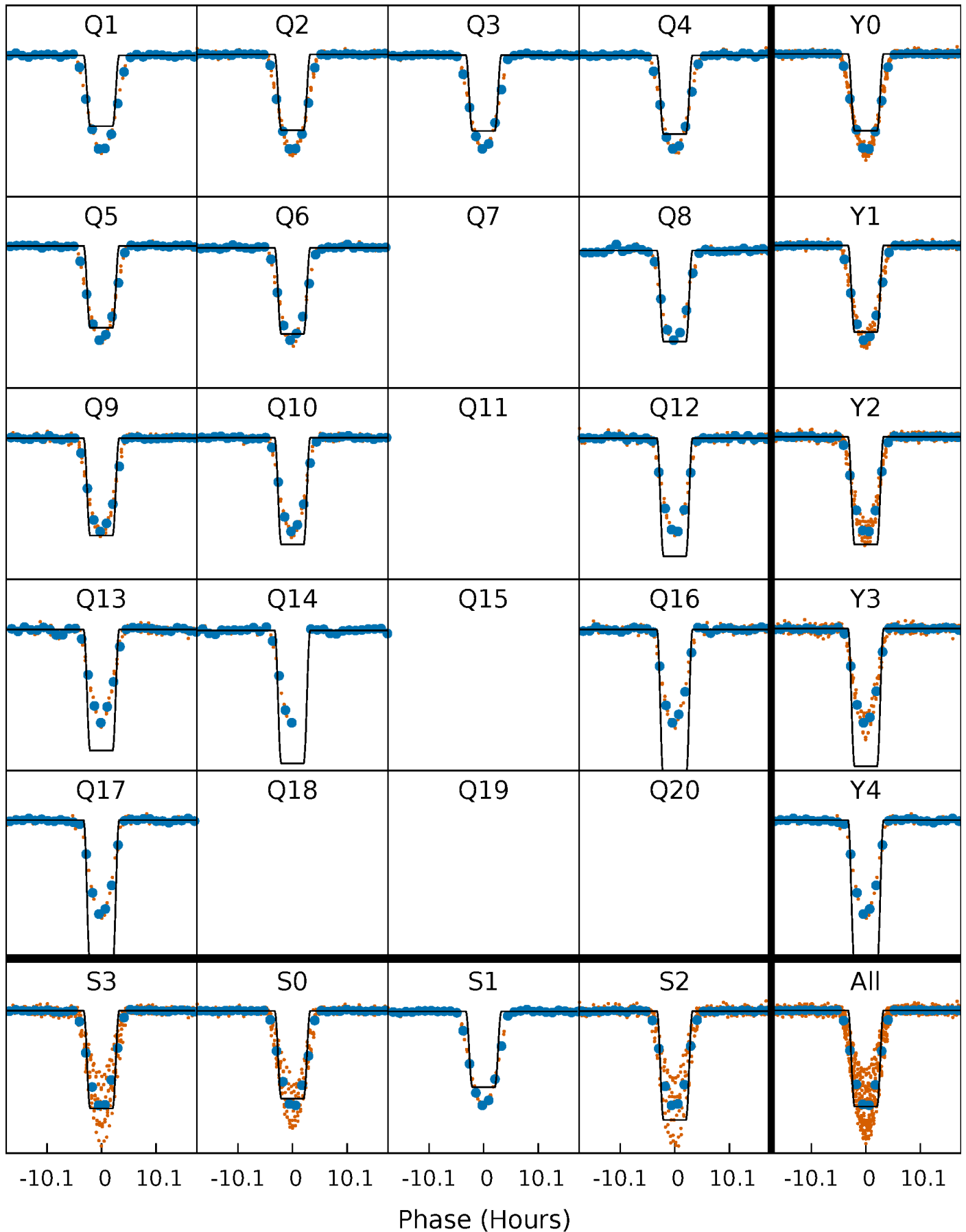
DV Quarter-Phased Transit Curves

TCE 009963009-02 P= 40.072970 Days $T_0=134.142699$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

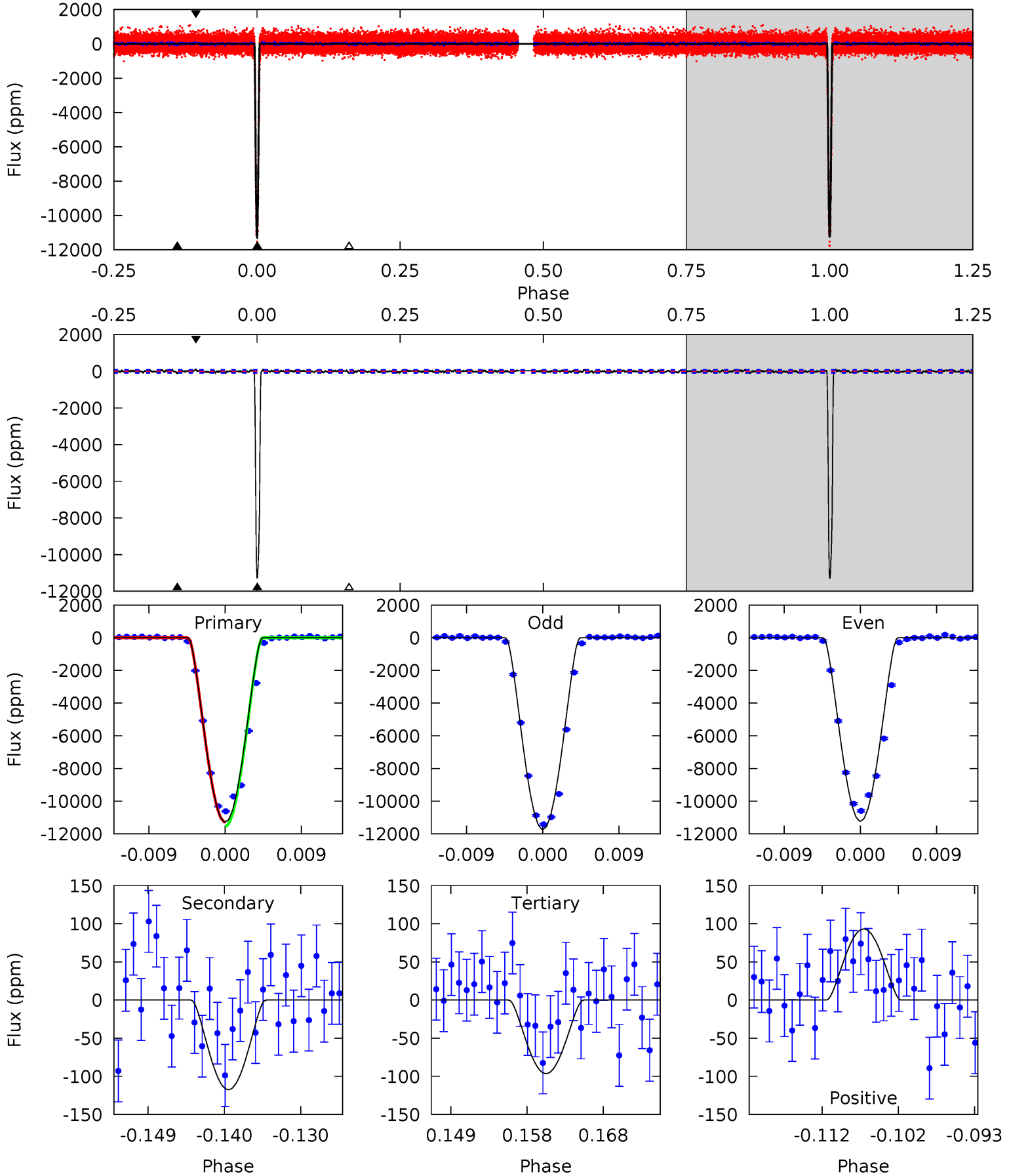
TCE 009963009-02 P= 40.071863 Days $T_0=134.167405$ (BKJD)



DV Model-Shift Uniqueness Test

009963009-02, P = 40.072970 Days, E = 94.069729 Days

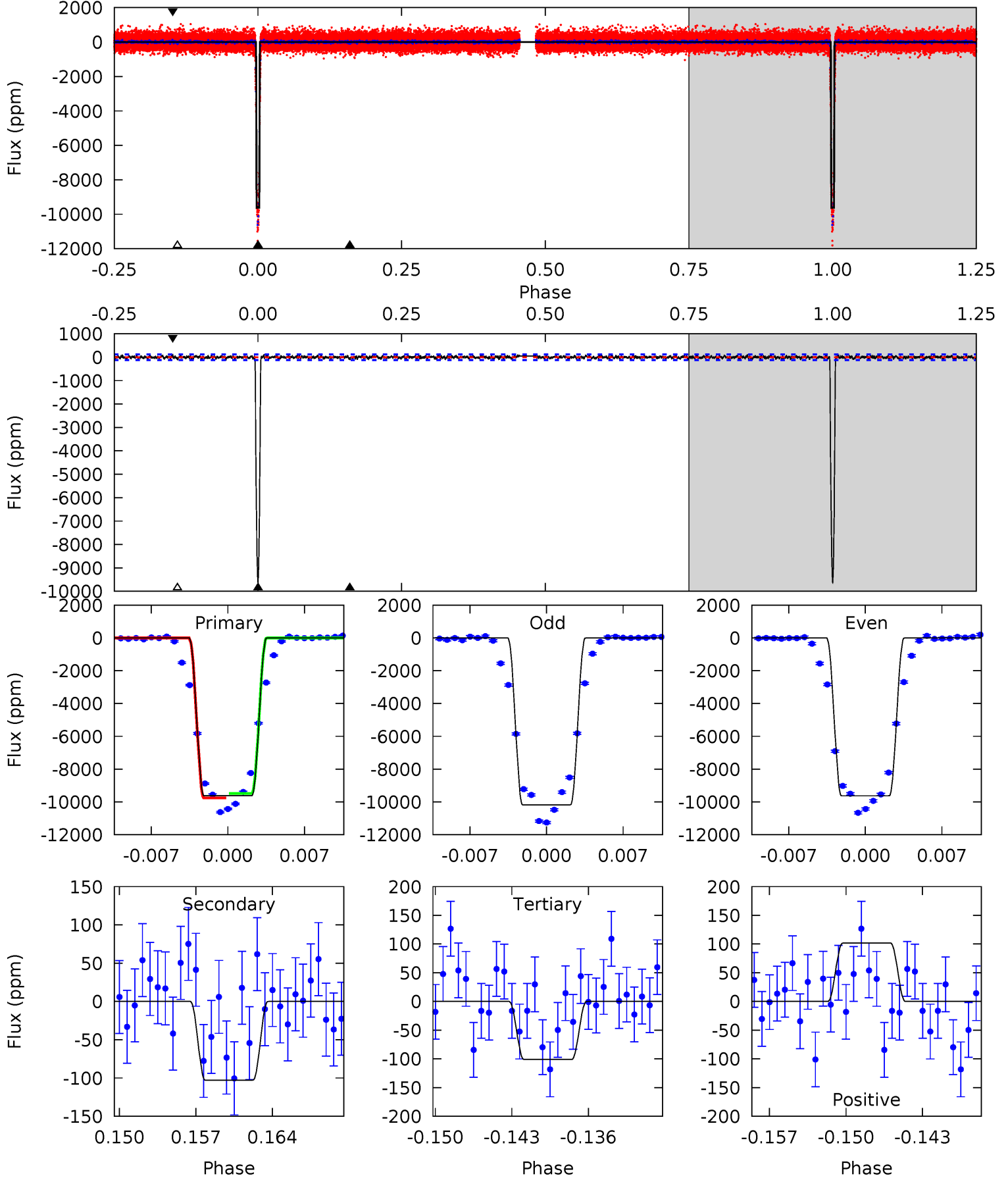
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
698.2	7.27	5.97	5.77	5.04	2.60	1.94	692.2	692.4	1.30	1.50	16.2	0.94	0.01	7.07



Alt Model-Shift Uniqueness Test

009963009-02, P = 40.071863 Days, E = 94.095542 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
396.3	4.23	4.16	4.18	5.10	2.71	1.18	392.1	392.1	0.07	0.05	11.5	1.02	0.01	0



Stellar Parameters For KIC 009963009

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5911^{+166}_{-208}	$4.321^{+0.124}_{-0.186}$	$0.220^{+0.200}_{-0.300}$	$1.207^{+0.360}_{-0.194}$	$1.112^{+0.136}_{-0.136}$	$0.891^{+0.529}_{-0.447}$
	+3%/-4%	+3%/-4%	+91%/-136%	+30%/-16%	+12%/-12%	+59%/-50%
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 009963009-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-118 ± 16	$23.39^{+5.18}_{-4.32}$	823^{+61}_{-45}	2353^{+101}_{-98}	$6.517^{+3.313}_{-2.069}$
Alt.	-103 ± 24	$13.85^{+3.63}_{-3.62}$	820^{+63}_{-45}	2639^{+227}_{-183}	17^{+15}_{-7}

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 $A_{obs} \gg 1.0$

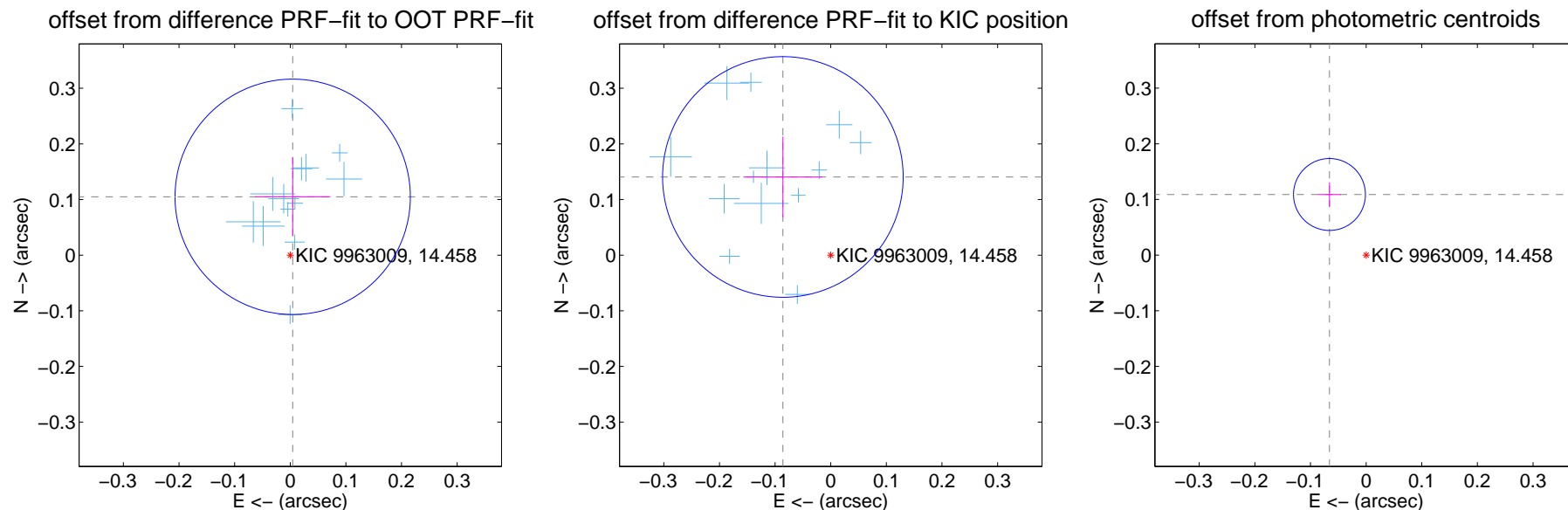
DV Centroid Data

Supplemental centroid analysis for 009963009-02. Kepler magnitude: 14.46. Transit SNR 319.30

There are 13 quarters with good PRF difference image offsets

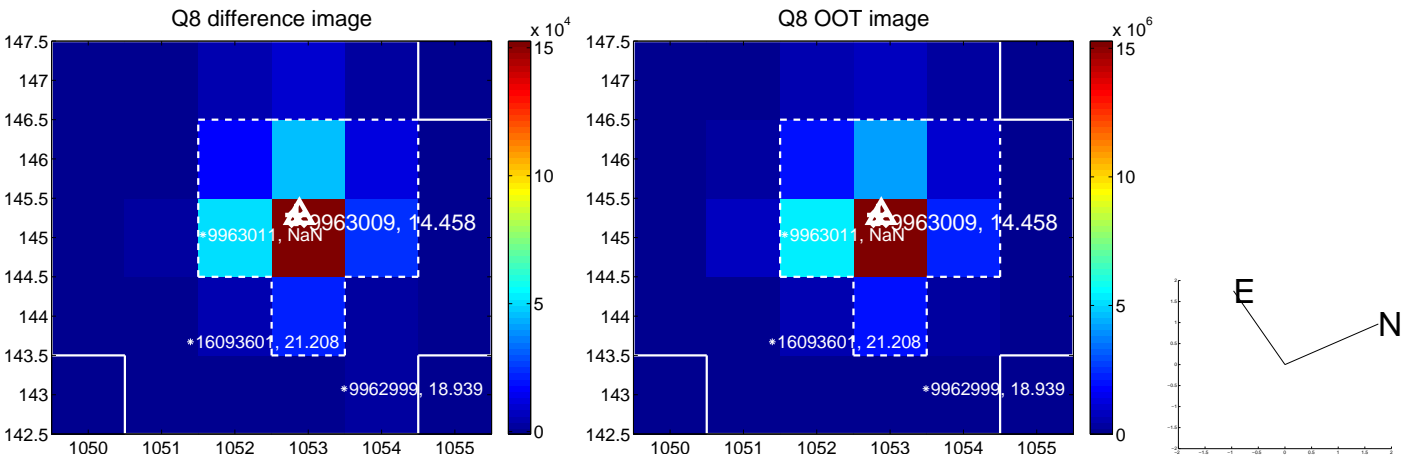
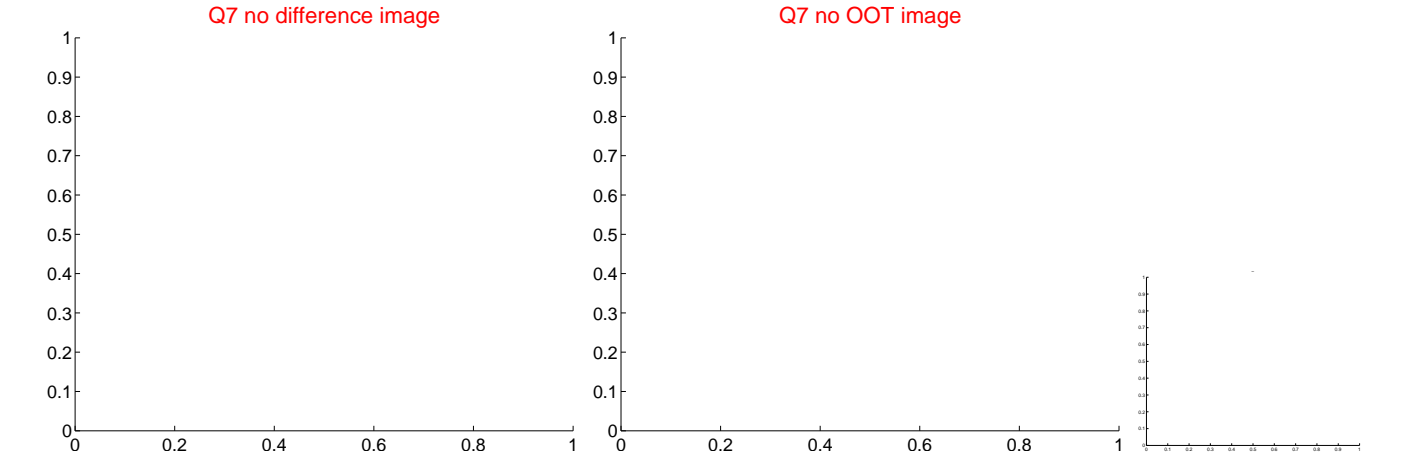
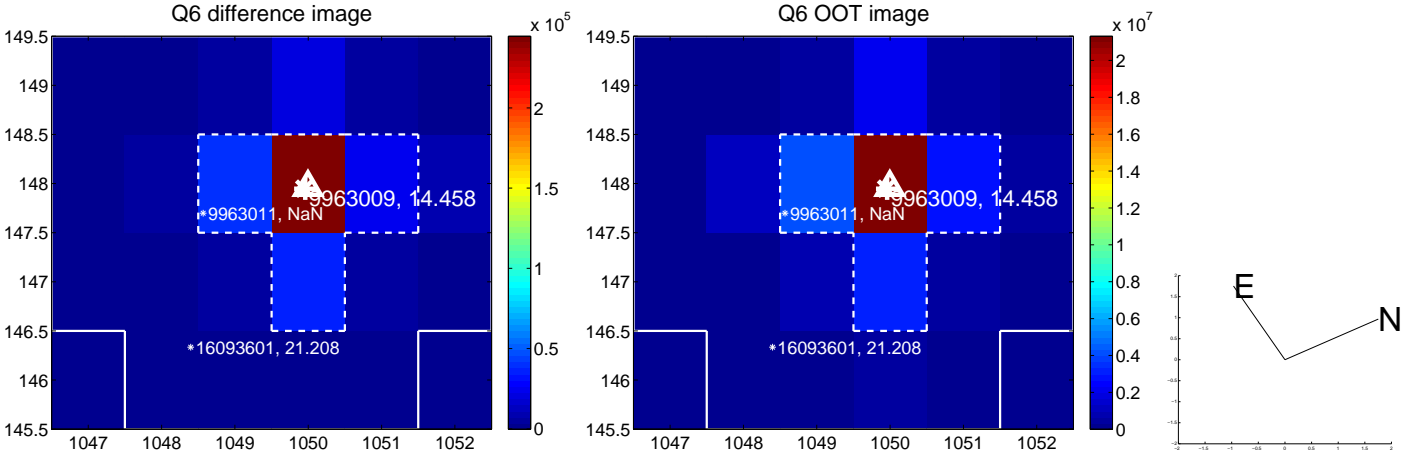
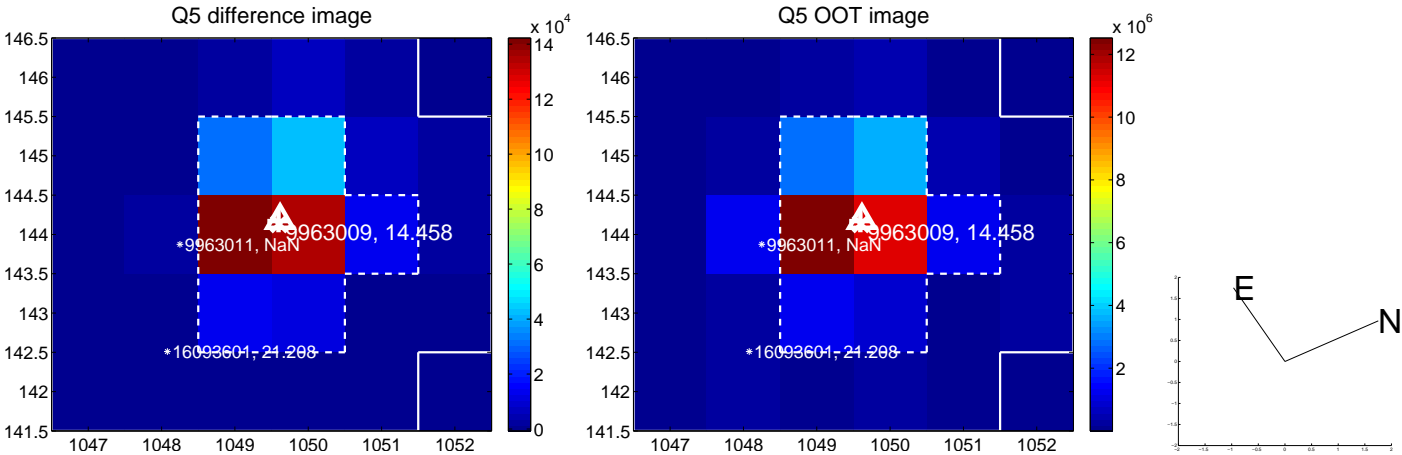
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.105 ± 0.071	1.49	-0.004 ± 0.068	0.105 ± 0.070
PRF-fit source offset from KIC position	0.165 ± 0.072	2.29	0.086 ± 0.071	0.141 ± 0.072
photometric centroid source offset	0.13 ± 0.02	5.91	0.07 ± 0.02	0.11 ± 0.02

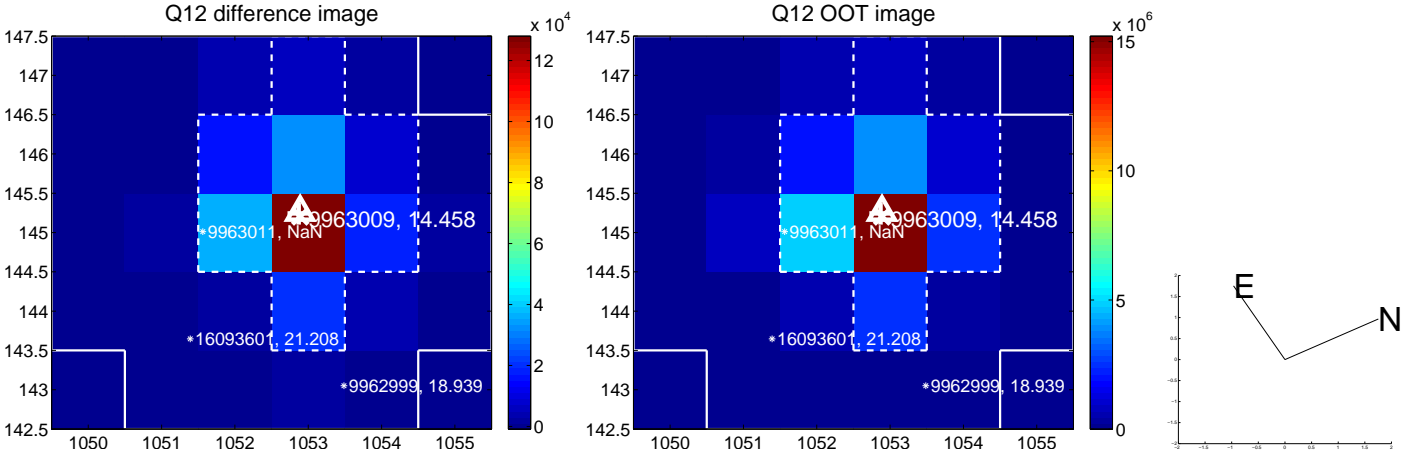
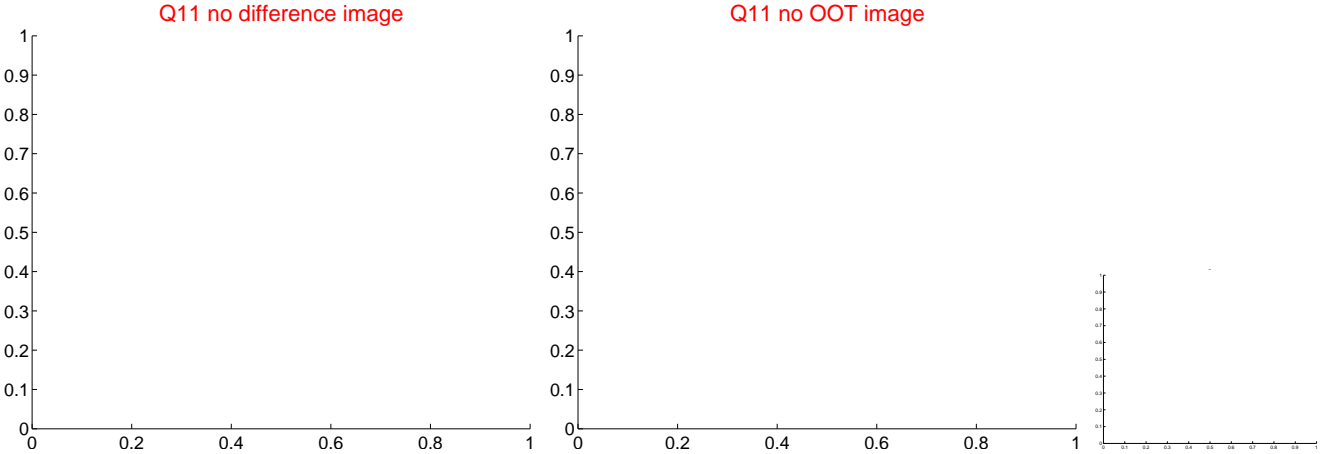
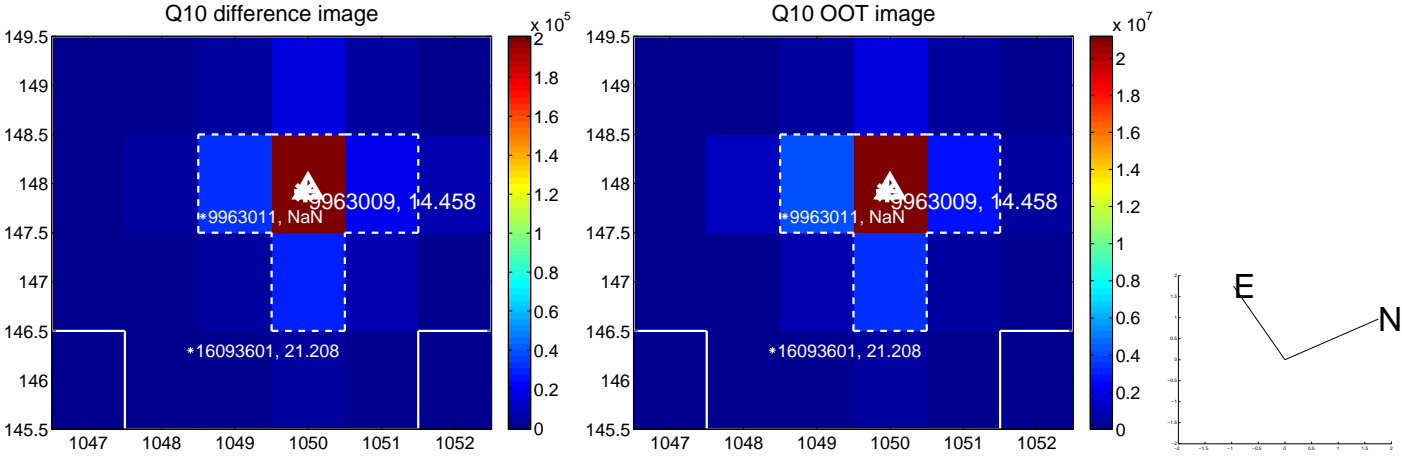
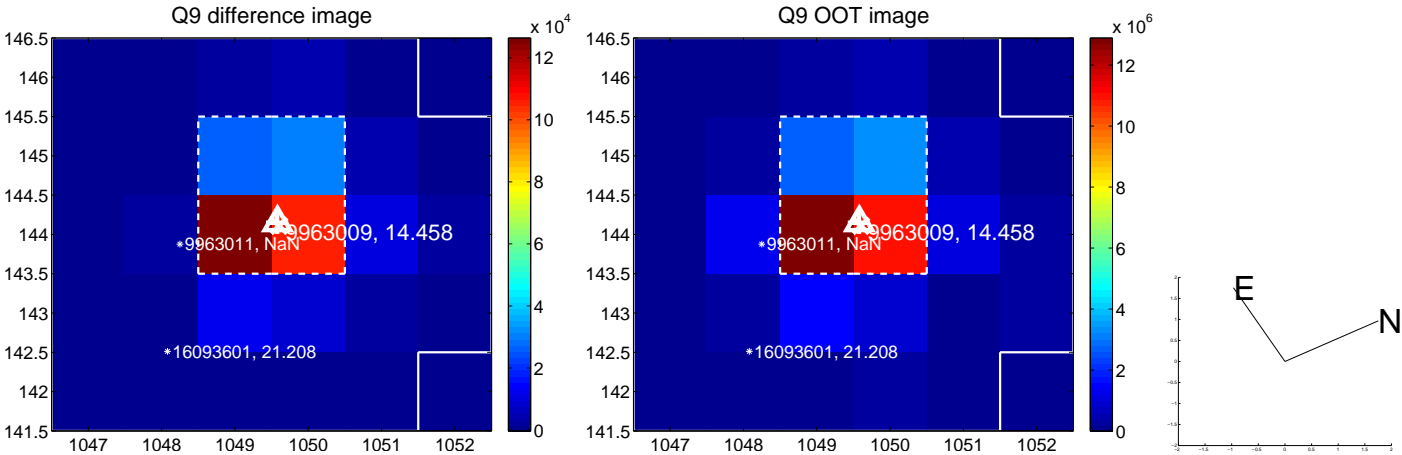


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

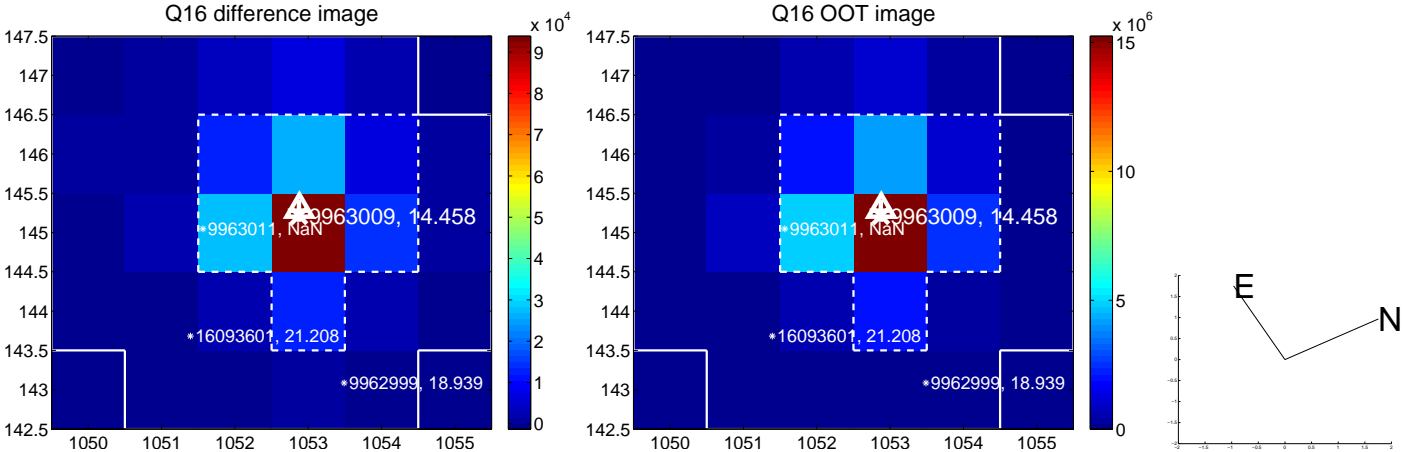
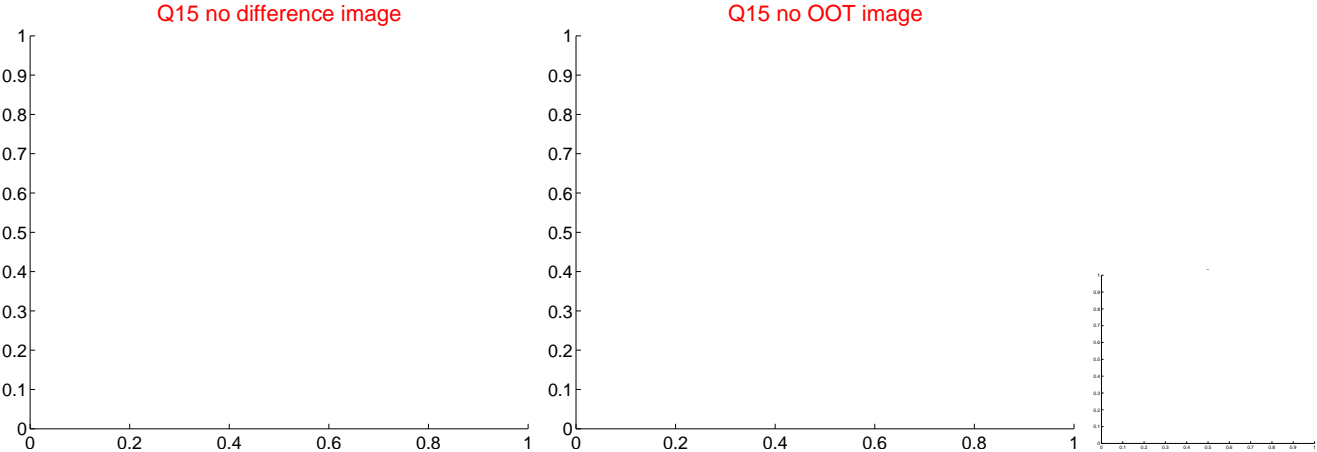
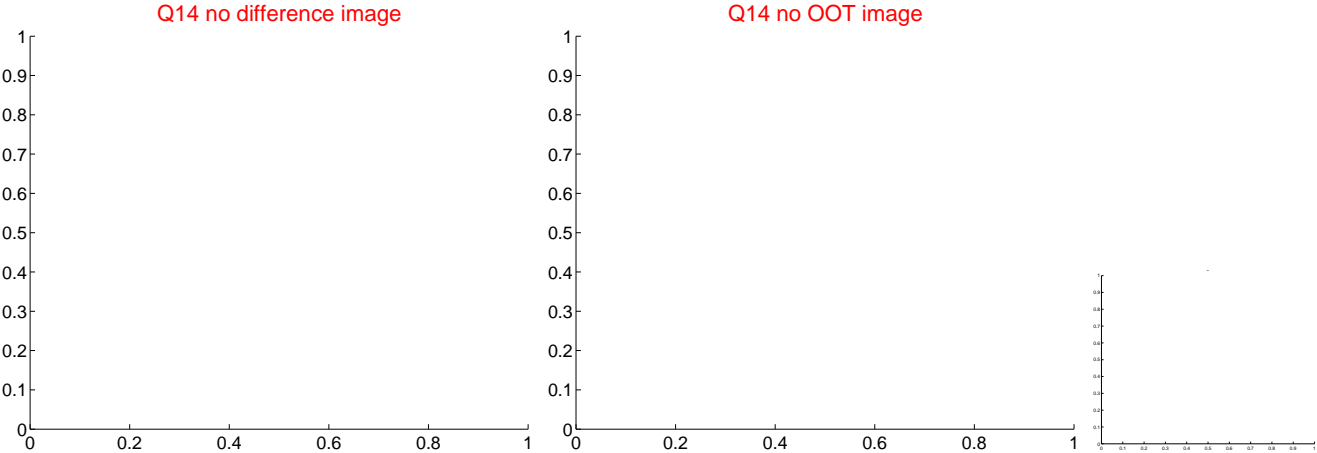
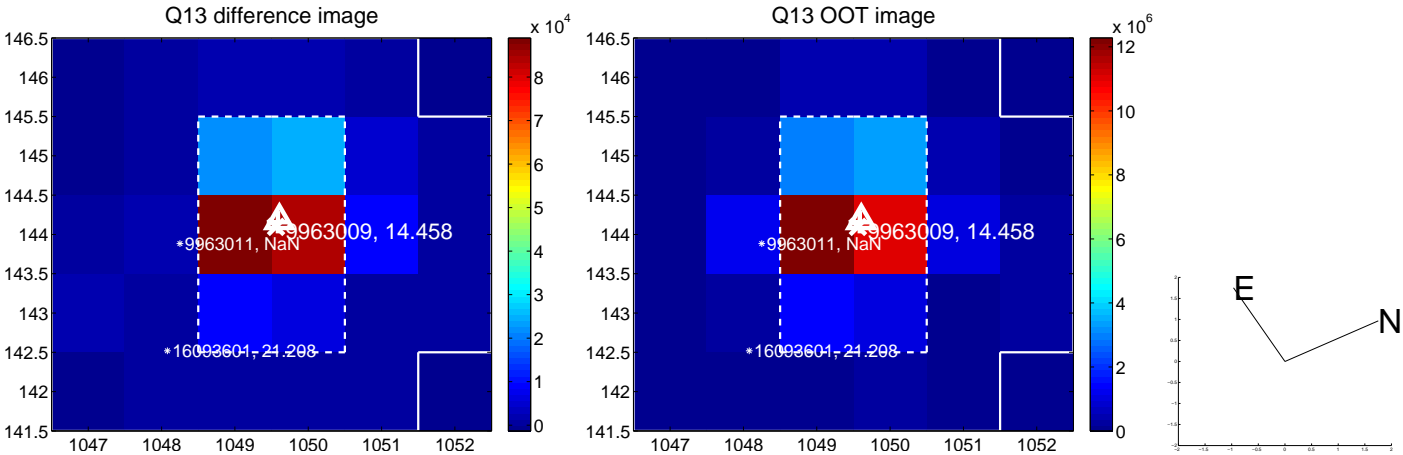
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



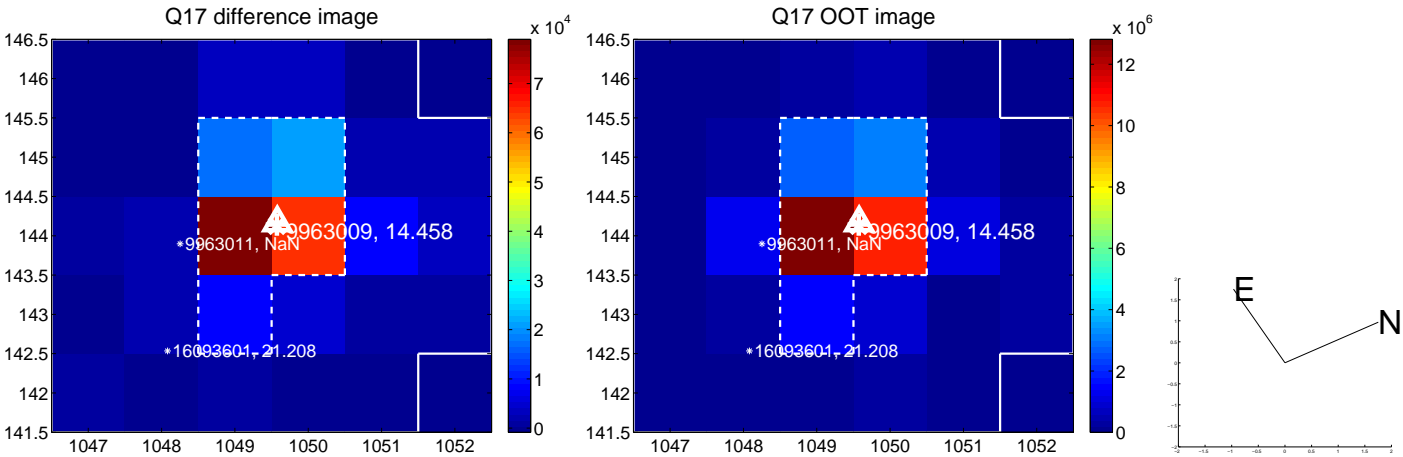
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



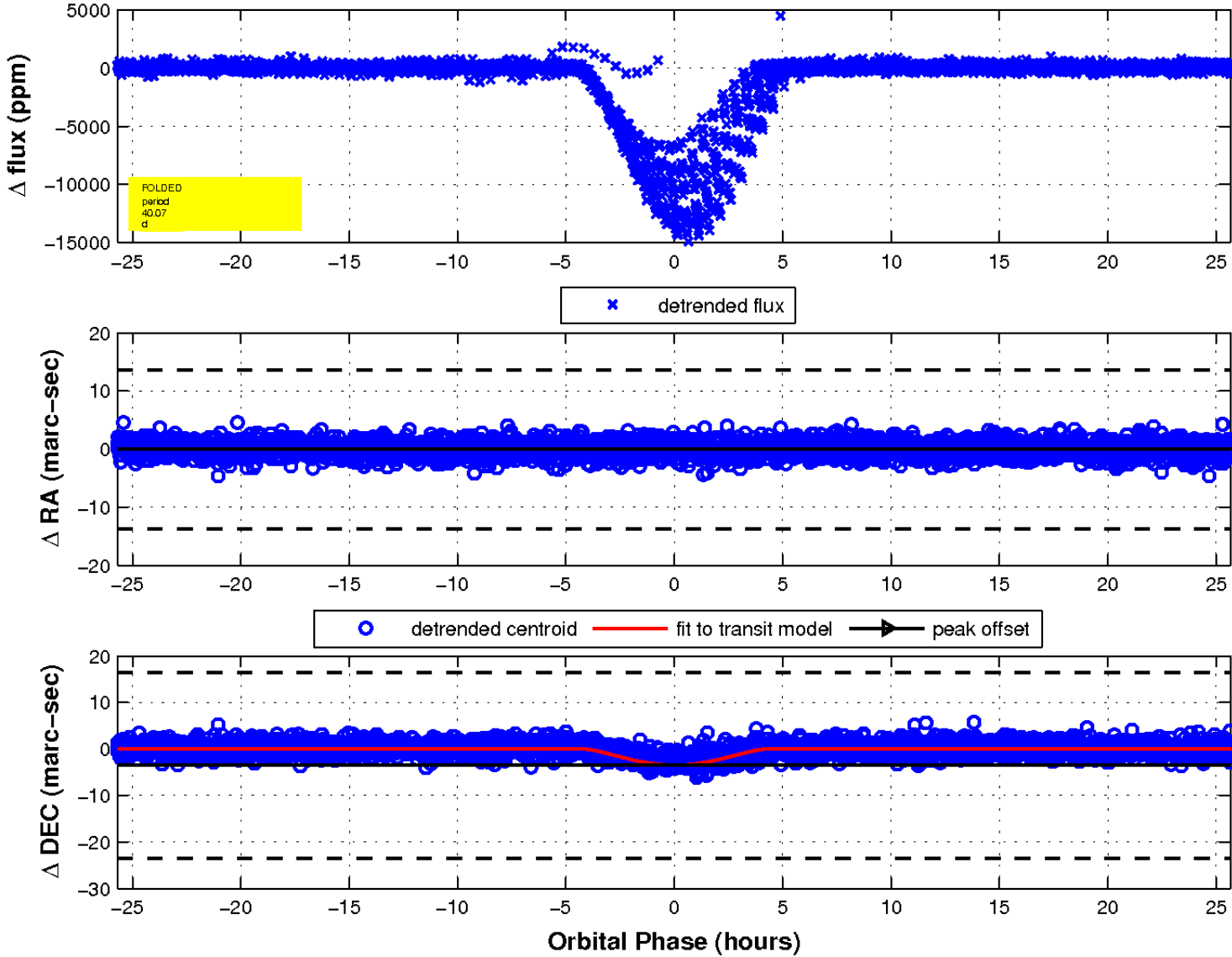
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

