

KIC 009098590

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})
009098590-01	OBS	7131.01	2.243569	133.731055	65569.9	4.029	3501.2	3116.5	0.80	6081	20.89	820.28
009098590-02	OBS	No	2.243555	132.608868	651.7	3.775	35.6	44.4	0.80	6081	2.39	820.29

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009098590-01	OBS	PC	0.66	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV—HAS_SEC_TCE
009098590-02	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 009098590-01

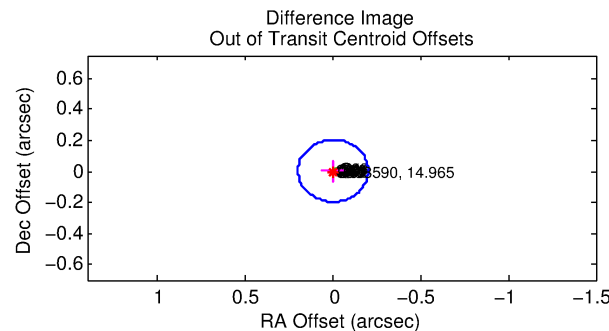
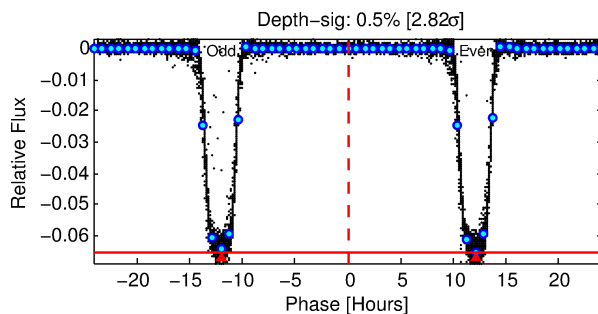
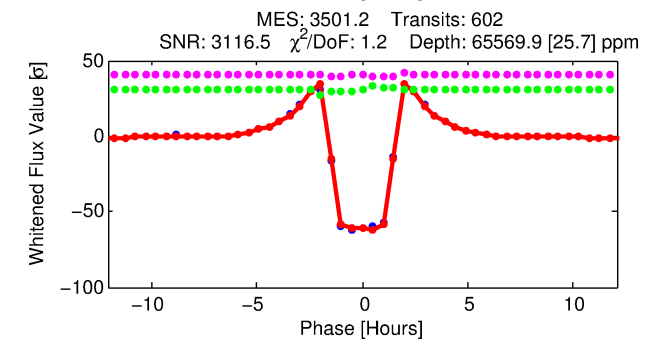
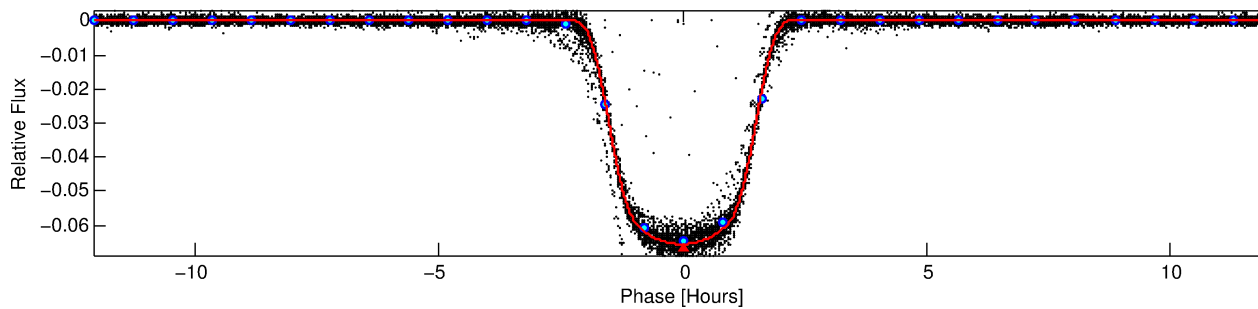
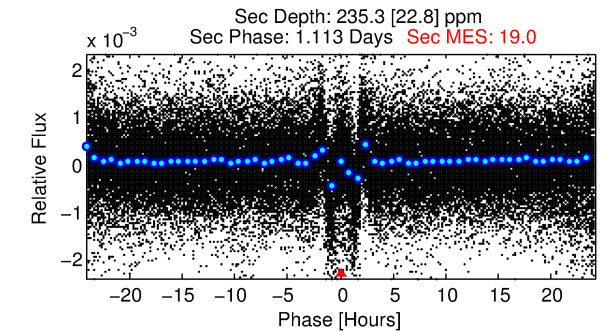
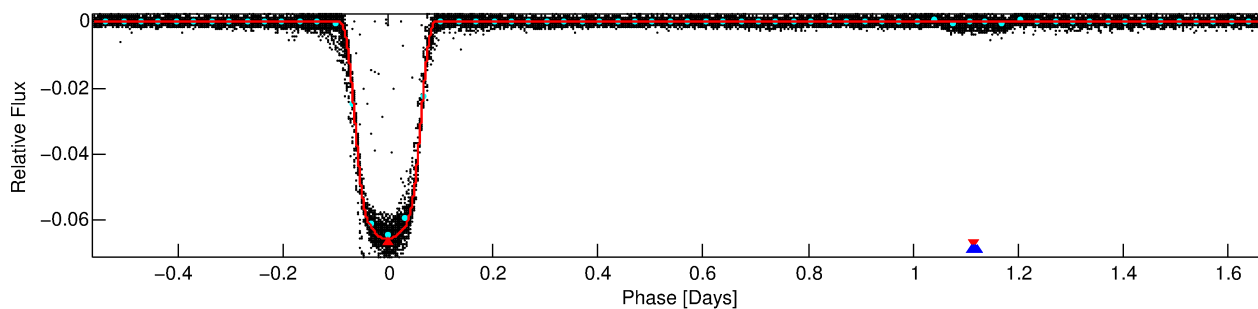
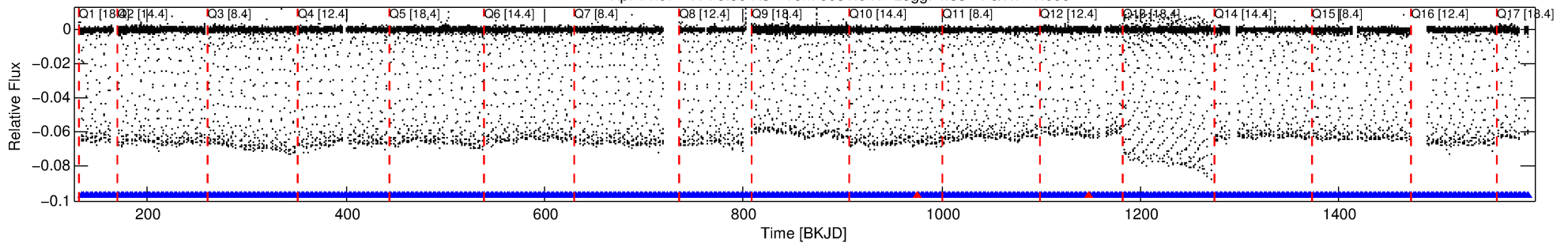
No Significant Match Found

DV One-Page Summary

KIC: 9098590 Candidate: 1 of 2 Period: 2.244 d

KOI: K07131.01 Corr: 0.993

Kp: 14.97 R*: 0.80 Rs Teff: 6081.0 K Logg: 4.53 Fe/H: -1.000



DV Fit Results:

Period = 2.24357 [0.00000] d
Epoch = 133.7311 [0.0000] BKJD
Rp/R* = 0.2390 [0.0001]
a/R* = 5.16 [0.00]
b = 0.31 [0.00]
Seff = 820.28 [242.25]
Teq = 1365 [101] K
Rp = 20.89 [4.43] Re
a = 0.0310 [0.0056] AU
Ag = 0.28 [0.08] [-8.77σ]
Teffp = 1541 [59] K [1.51σ]

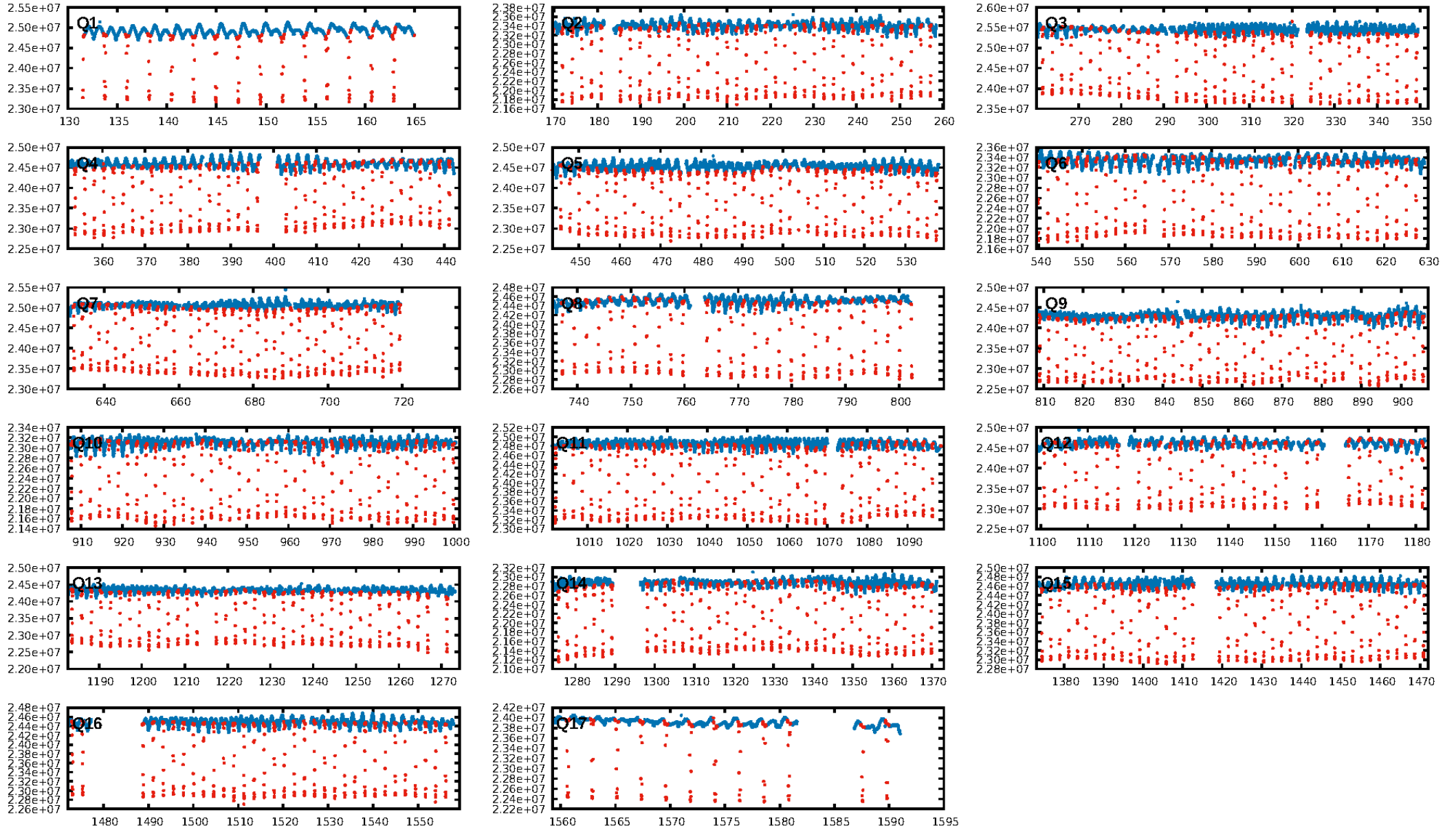
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [573/575]
GhostDiagnostic-chr: 1.924
Centroid-sig: 0.0%
Centroid-so: 0.034 arcsec [22.11σ]
OotOffset-rm: 0.004 arcsec [0.06σ]
KicOffset-rm: 0.124 arcsec [1.81σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

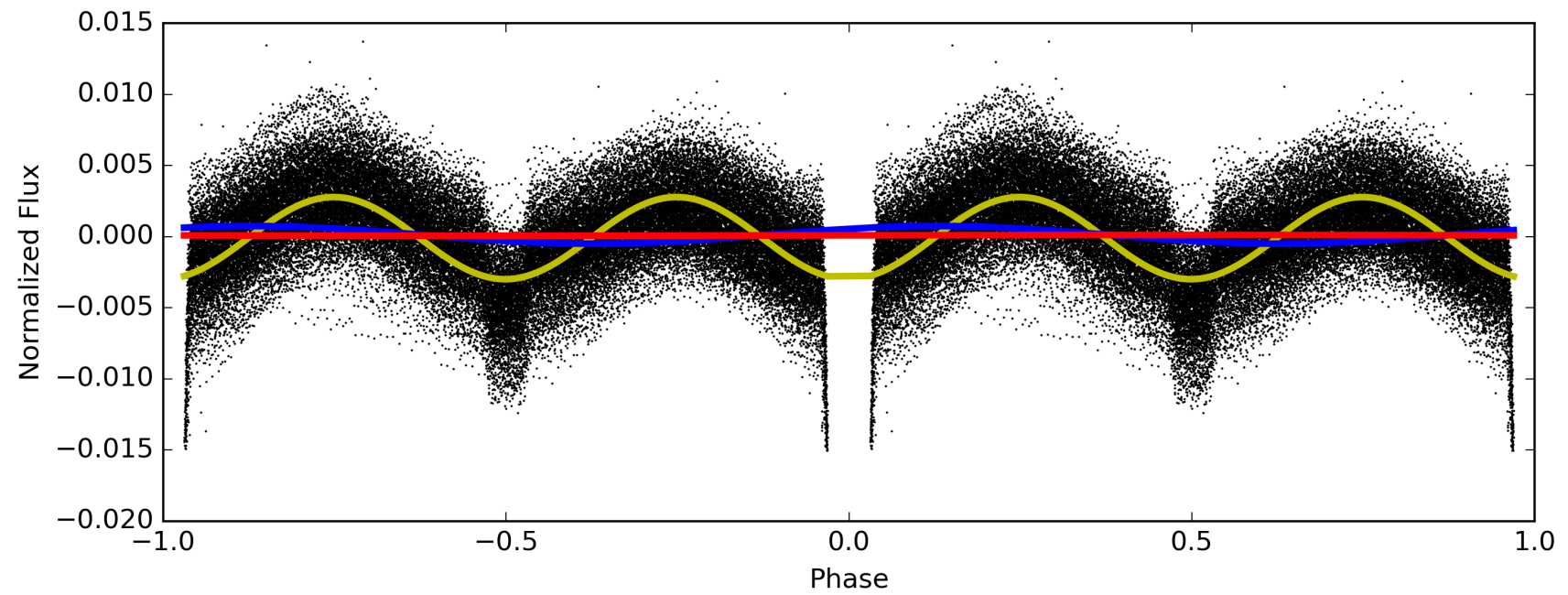
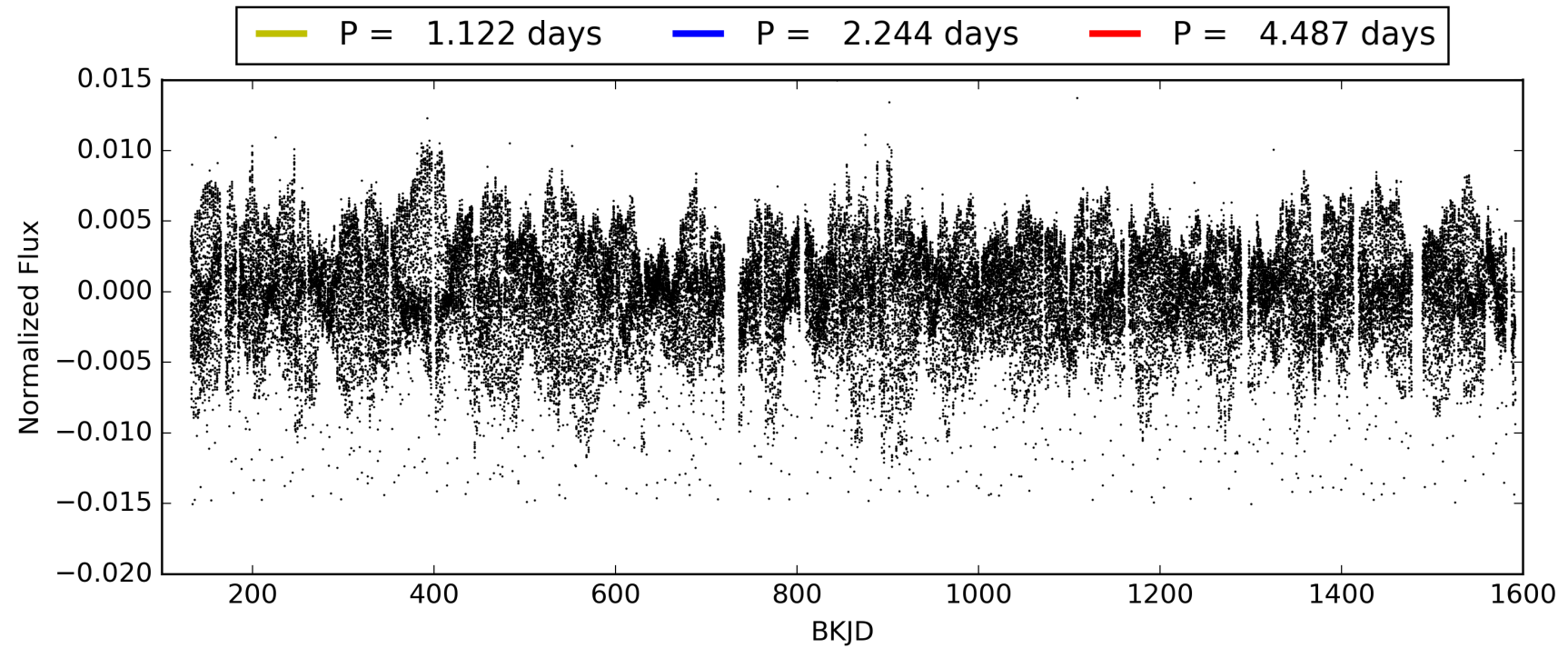
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 02:23:27 Z

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

TCE 009098590-01, PDC Light Curves

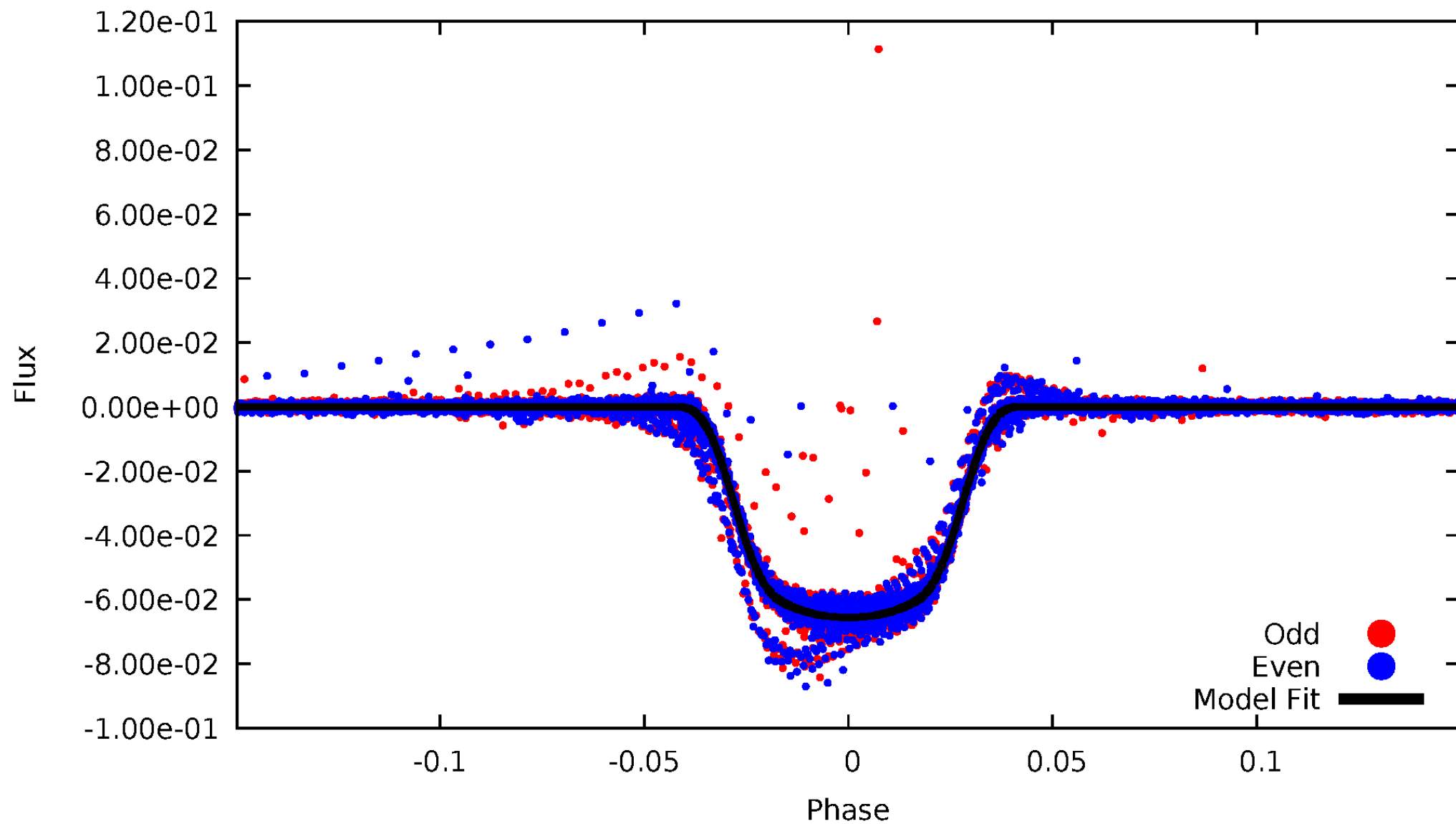


TCE 009098590-01



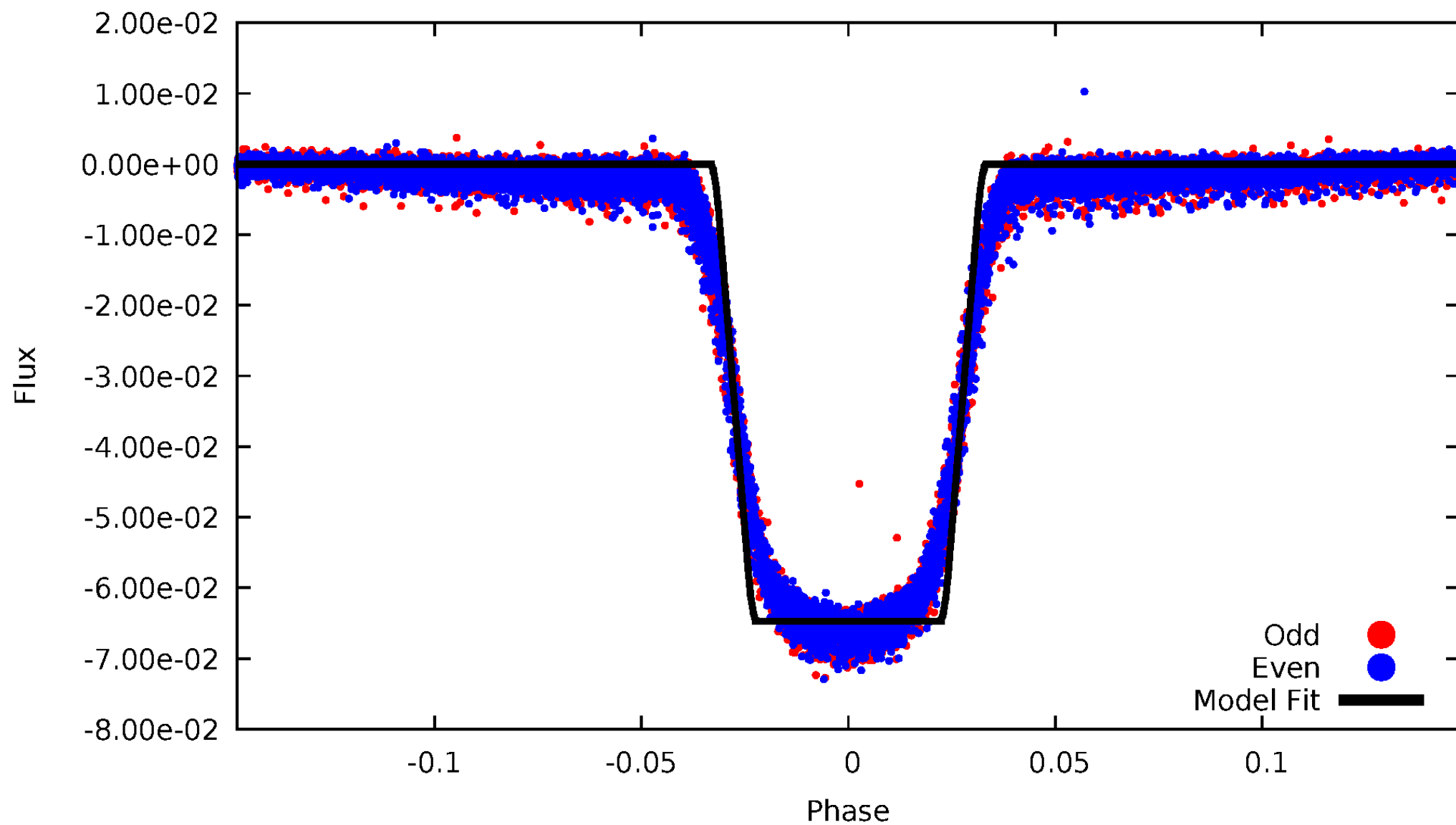
DV Odd/Even

TCE 009098590-01



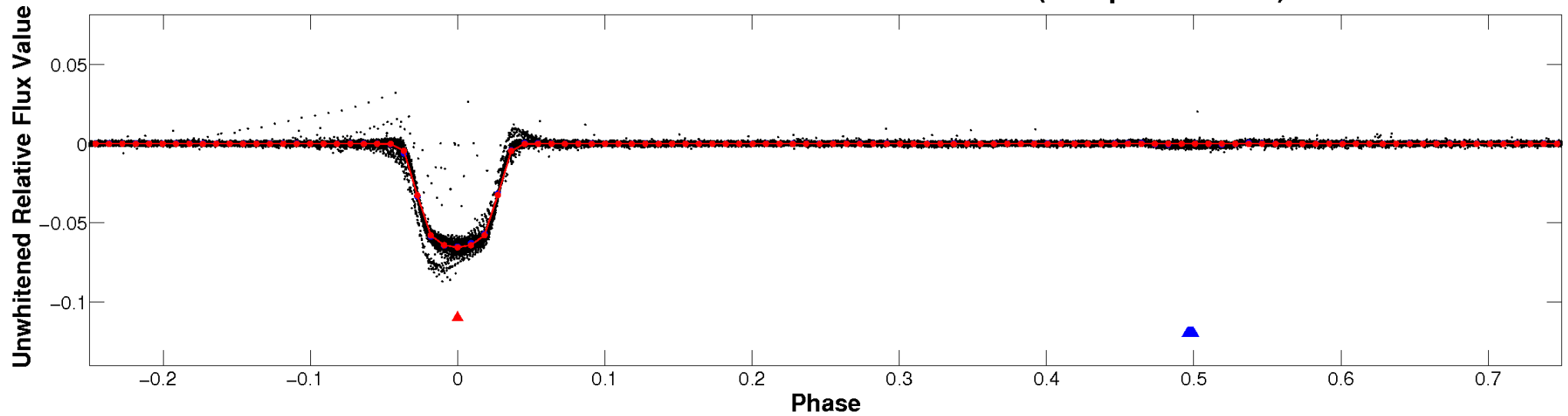
ALT Odd/Even

TCE 009098590-01

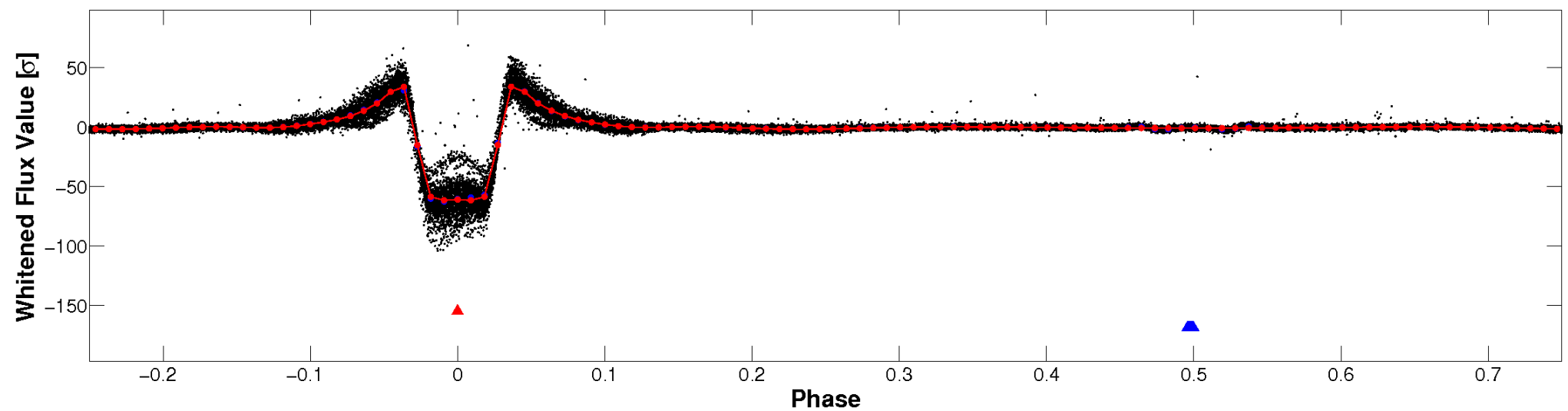


Non-Whitened Vs. Whitened Light Curve

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

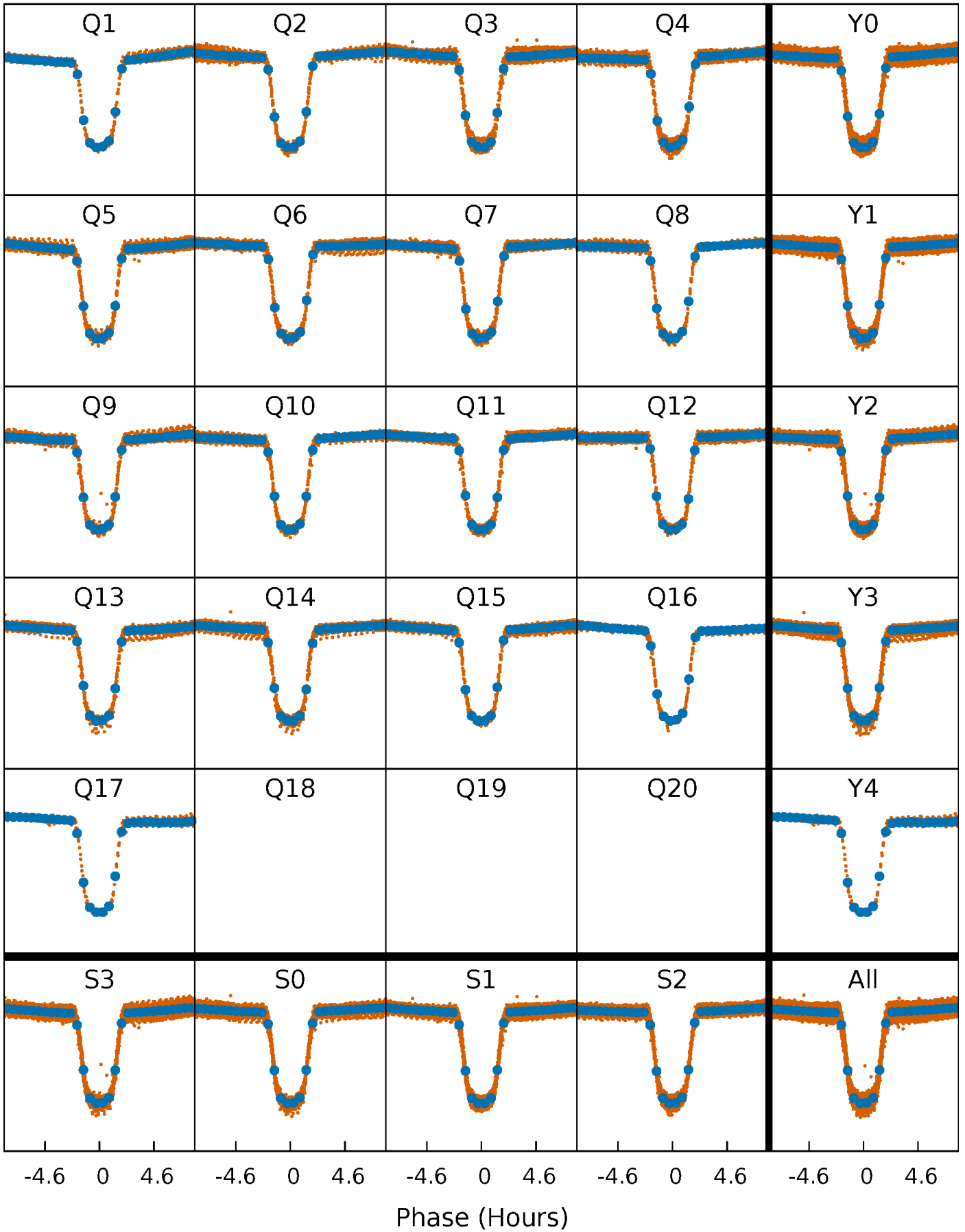


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



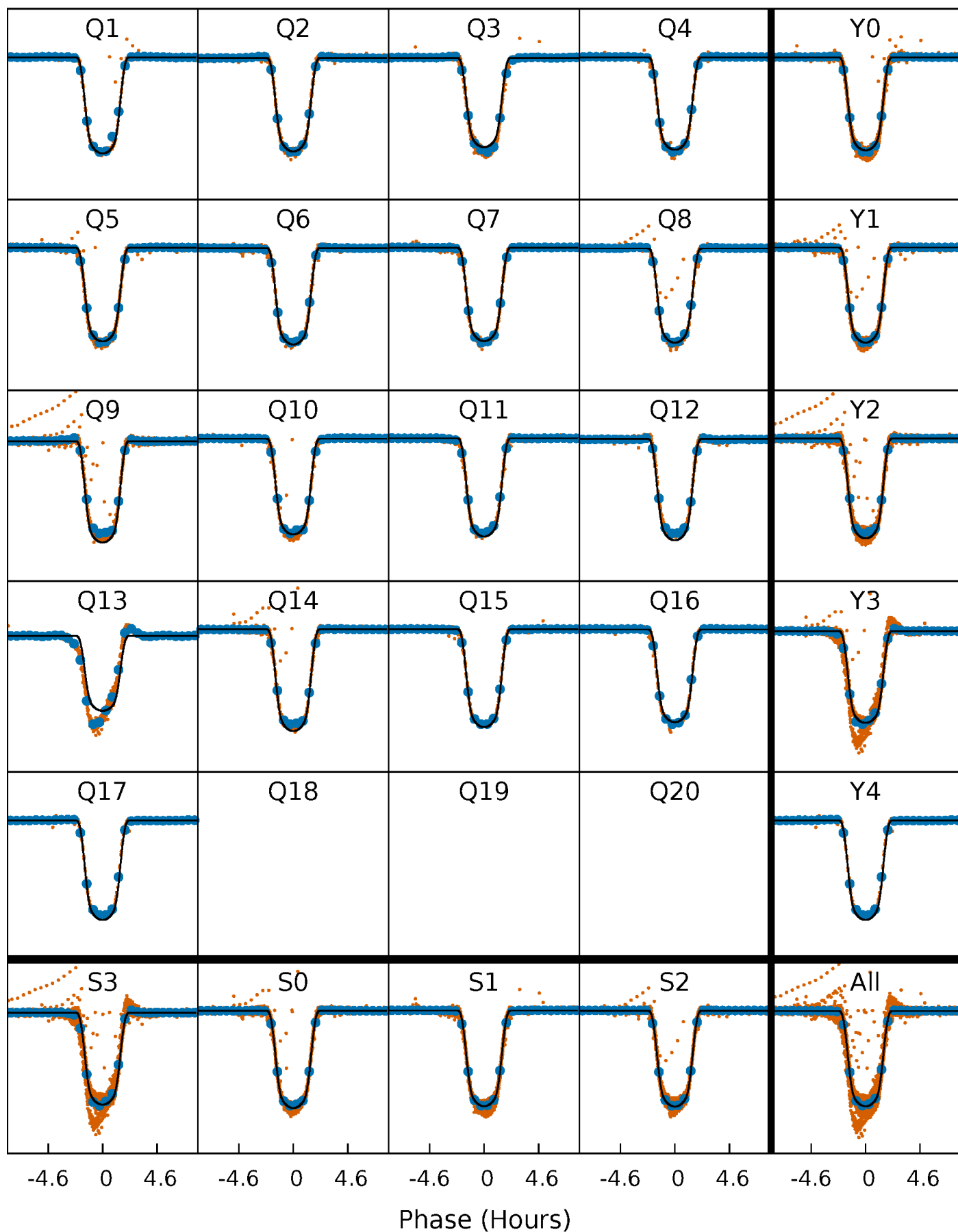
PDC Quarter-Phased Transit Curves

TCE 009098590-01 P= 2.243569 Days $T_0=133.731055$ (BKJD)



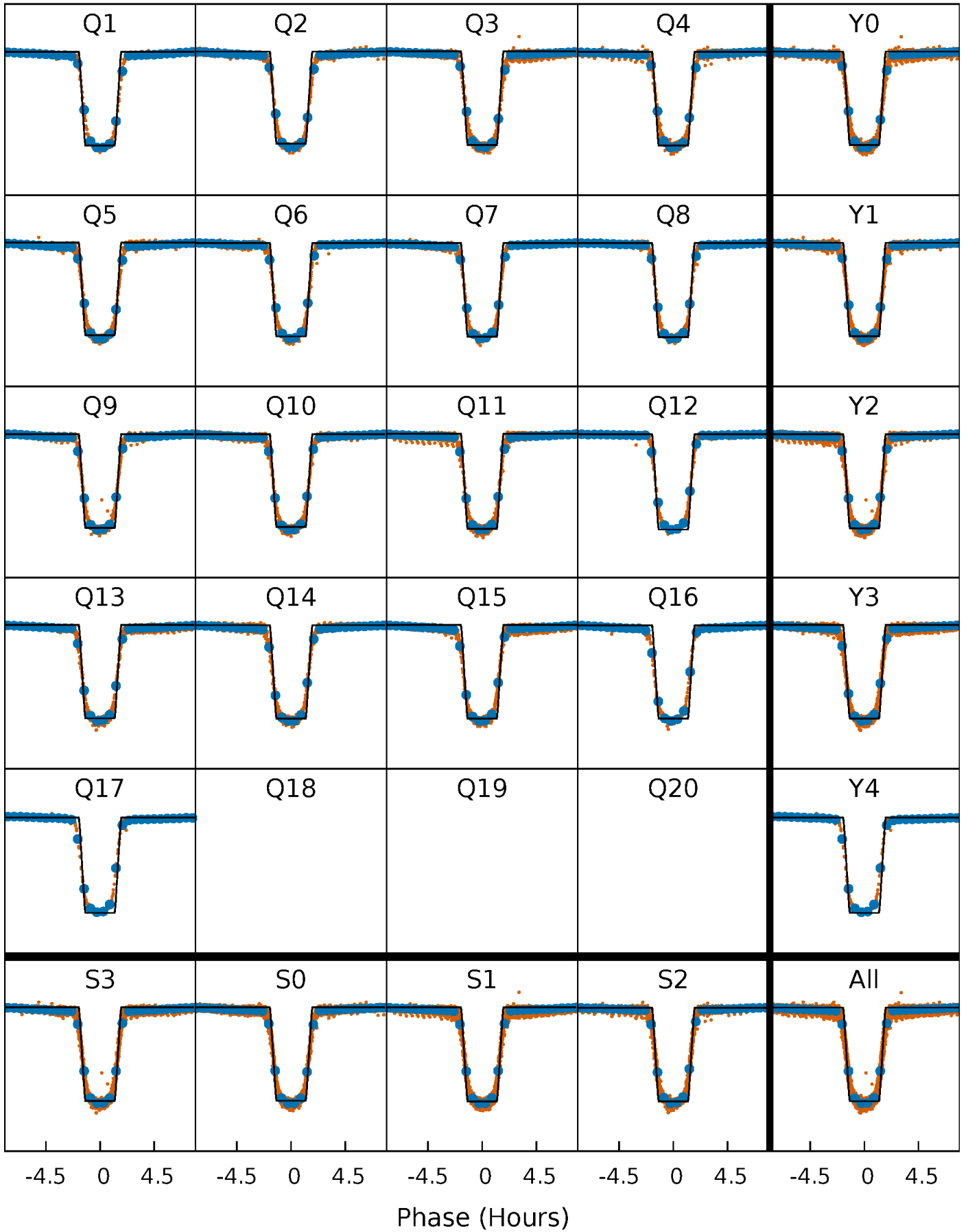
DV Quarter-Phased Transit Curves

TCE 009098590-01 P= 2.243569 Days $T_0=133.731055$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

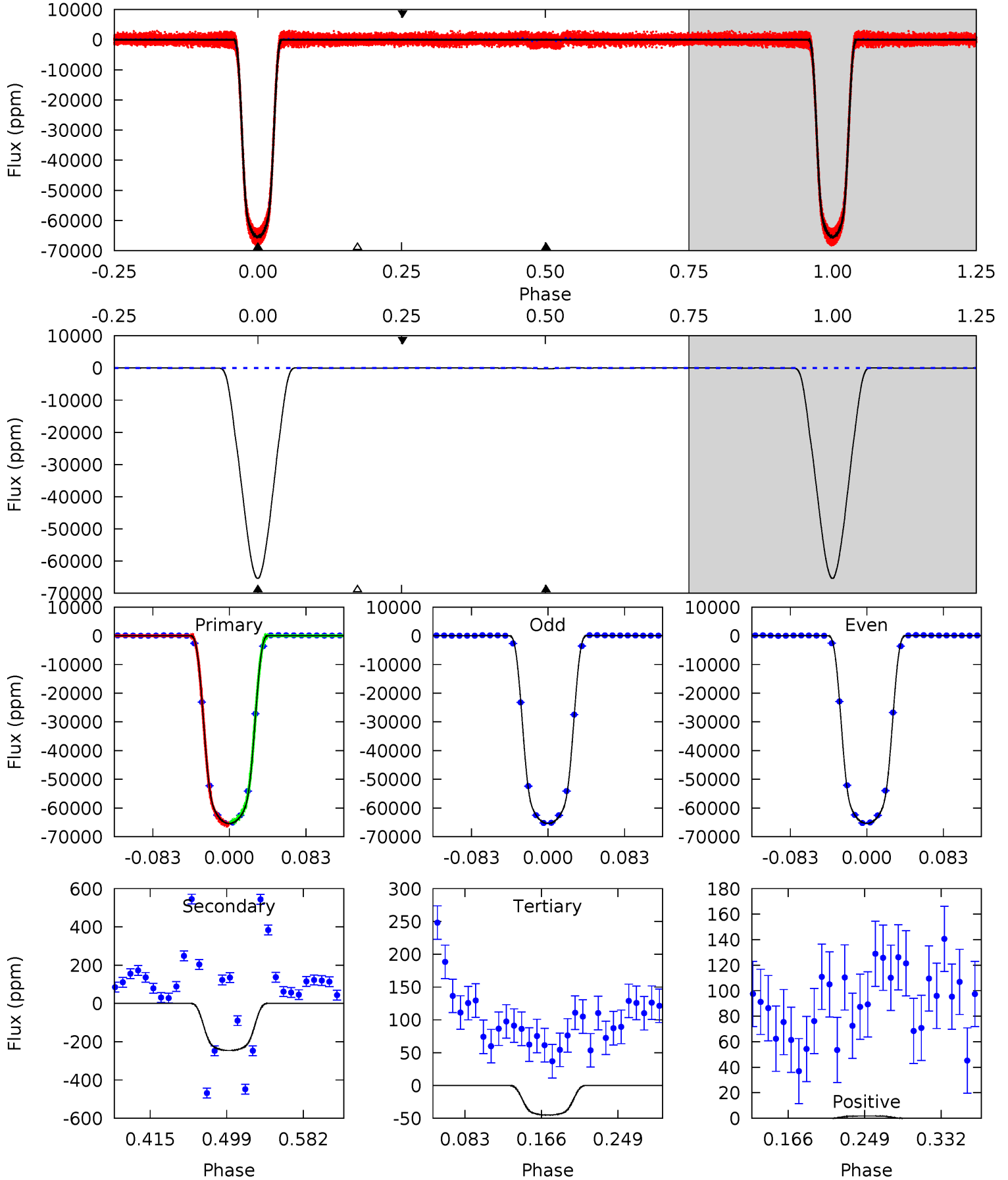
TCE 009098590-01 $P = 2.243579$ Days $T_0 = 133.727727$ (BKJD)



DV Model-Shift Uniqueness Test

009098590-01, P = 2.243569 Days, E = 131.487486 Days

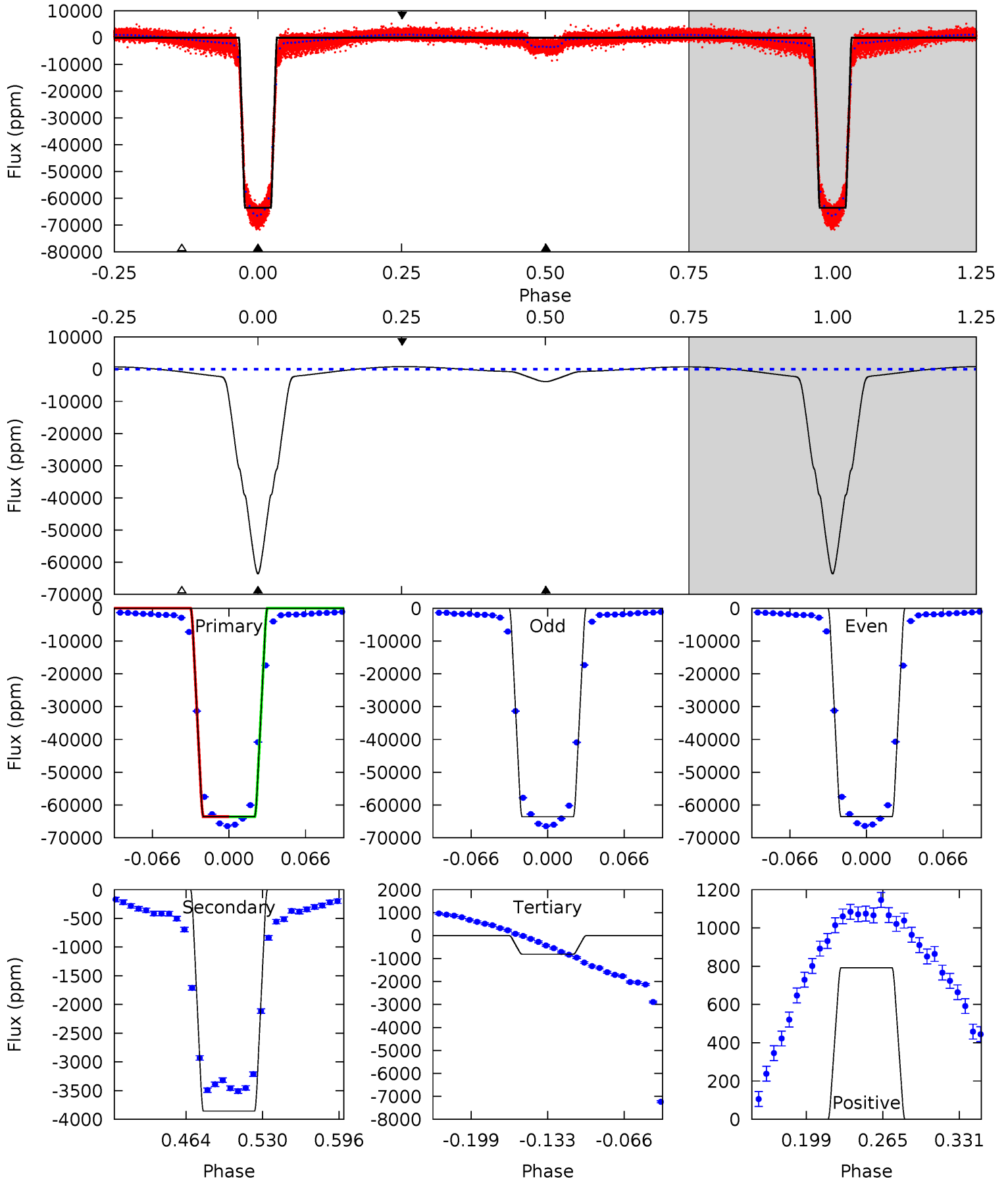
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6652	25.0	4.59	0.19	4.60	1.73	2.69	6647	6651	20.4	24.8	0.56	0.99	0.00	39.9



Alt Model-Shift Uniqueness Test

009098590-01, P = 2.243579 Days, E = 131.484148 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3213	194.9	41.0	40.0	4.65	1.84	40.2	3172	3173	153.9	154.9	0.88	1.00	0.01	1.39



Stellar Parameters For KIC 009098590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6081^{+181}_{-181}	$4.526^{+0.081}_{-0.150}$	$-1.000^{+0.300}_{-0.300}$	$0.801^{+0.170}_{-0.085}$	$0.786^{+0.070}_{-0.049}$	$2.155^{+0.711}_{-0.890}$
	+3%/-3%	+2%/-3%	+30%/-30%	+21%/-11%	+9%/-6%	+33%/-41%
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 009098590-01 / KOI 7131.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-246 ± 10	$21.10^{+2.62}_{-1.30}$	1927^{+106}_{-95}	-1726^{+3611}_{-378}	$0.290^{+0.040}_{-0.057}$
Alt.	-3856 ± 20	$22.33^{+2.74}_{-1.39}$	1918^{+109}_{-85}	3449^{+70}_{-65}	$4.067^{+0.567}_{-0.791}$

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 $A_{obs} \gg 1.0$

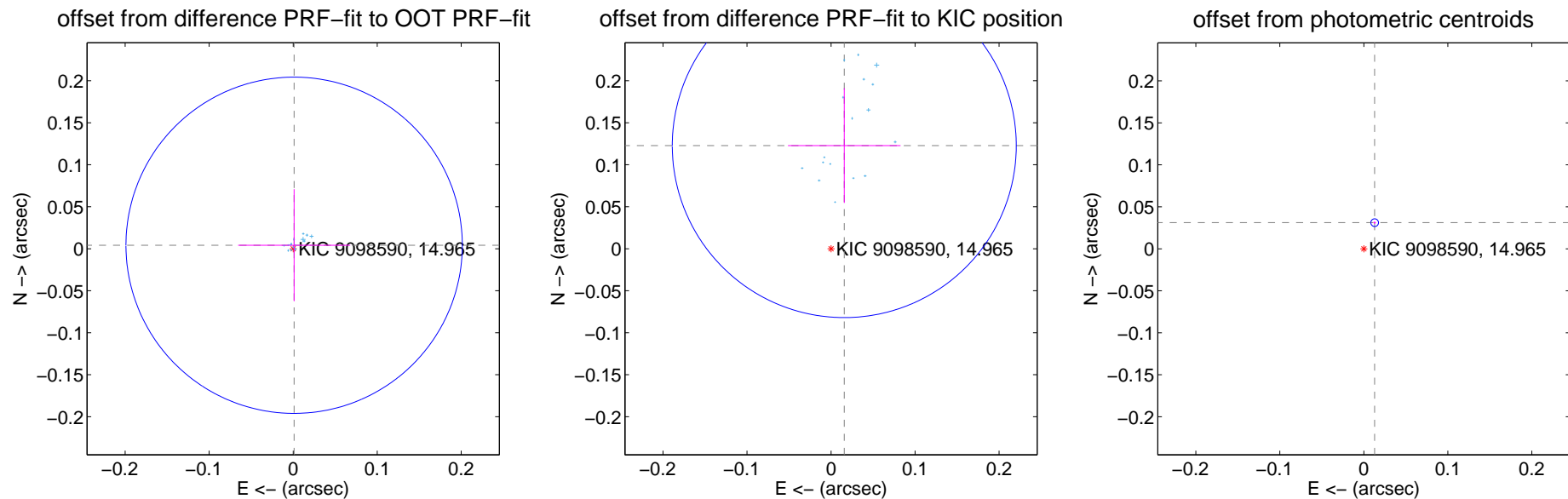
DV Centroid Data

Supplemental centroid analysis for 009098590-01. Kepler magnitude: 14.96. Transit SNR 3116.52

There are 17 quarters with good PRF difference image offsets

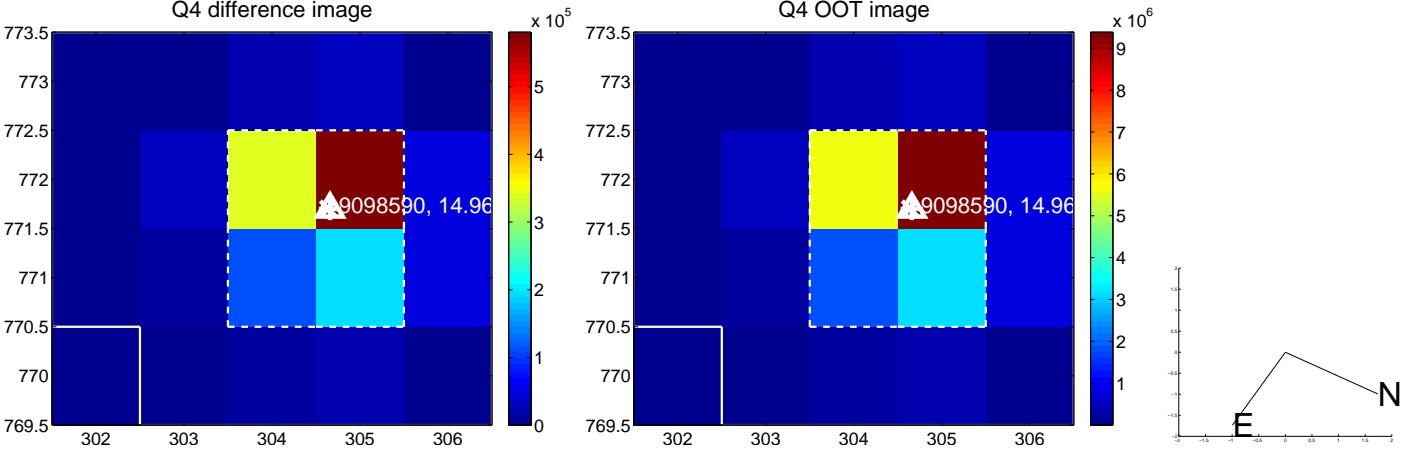
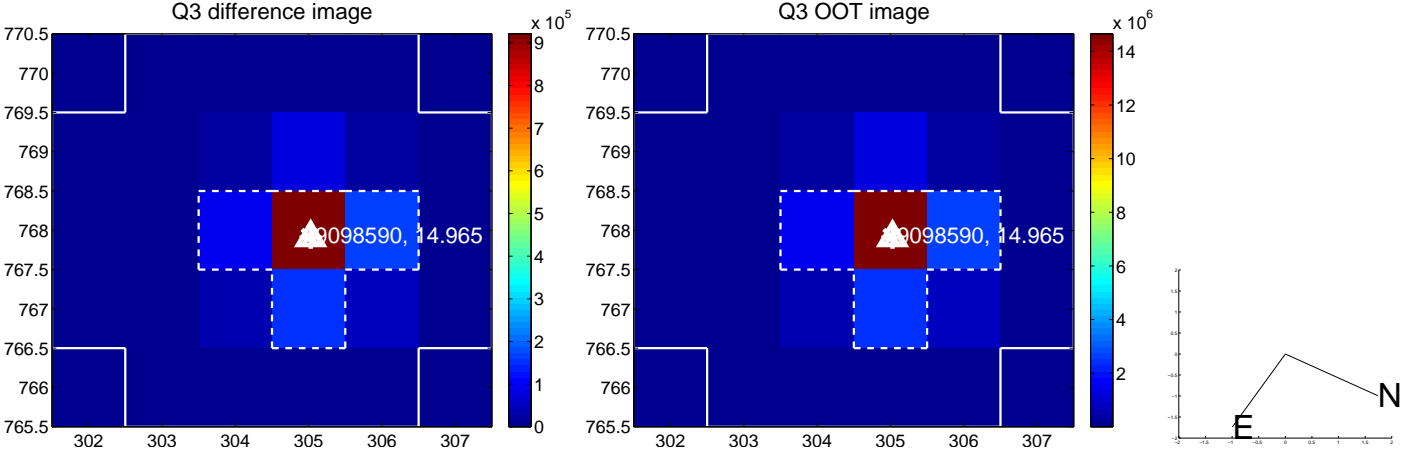
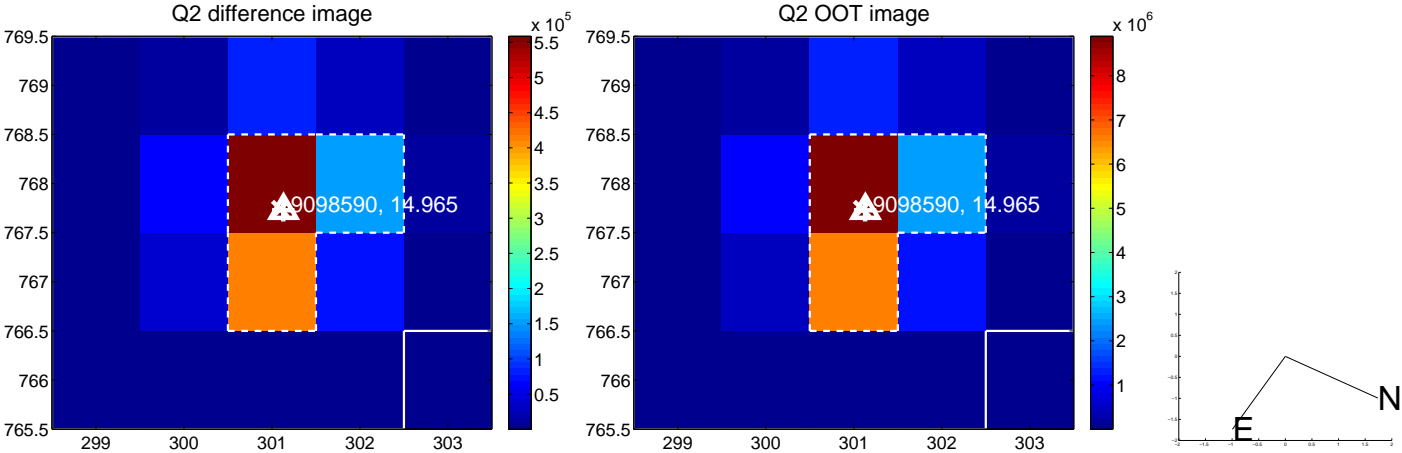
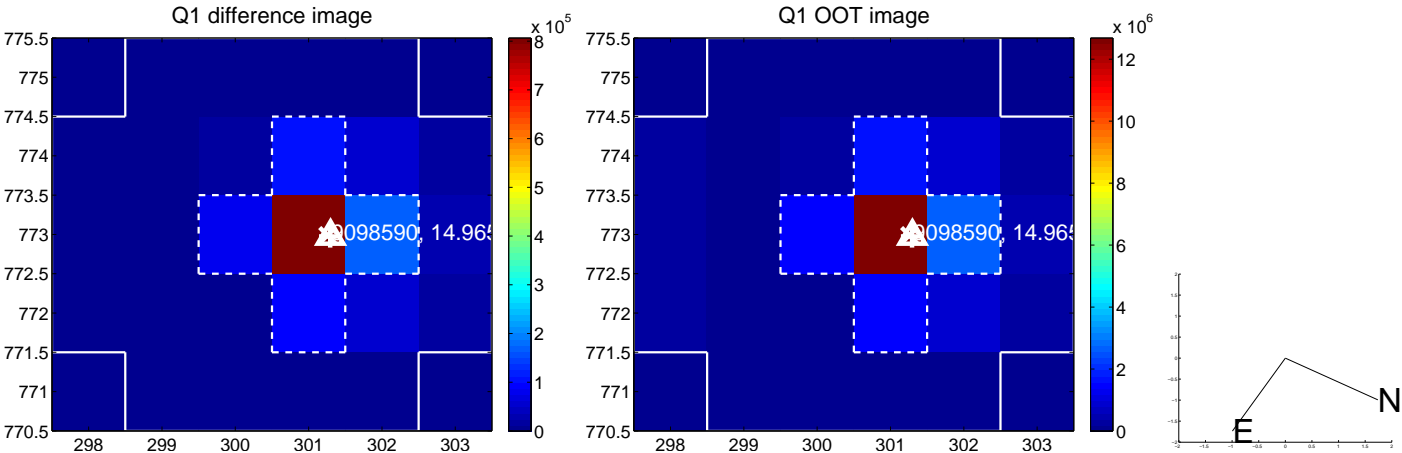
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.004 ± 0.067	0.06	-0.001 ± 0.067	0.004 ± 0.067
PRF-fit source offset from KIC position	0.124 ± 0.068	1.81	-0.016 ± 0.067	0.123 ± 0.068
photometric centroid source offset	0.03 ± 0.00	22.11	-0.01 ± 0.00	0.03 ± 0.00

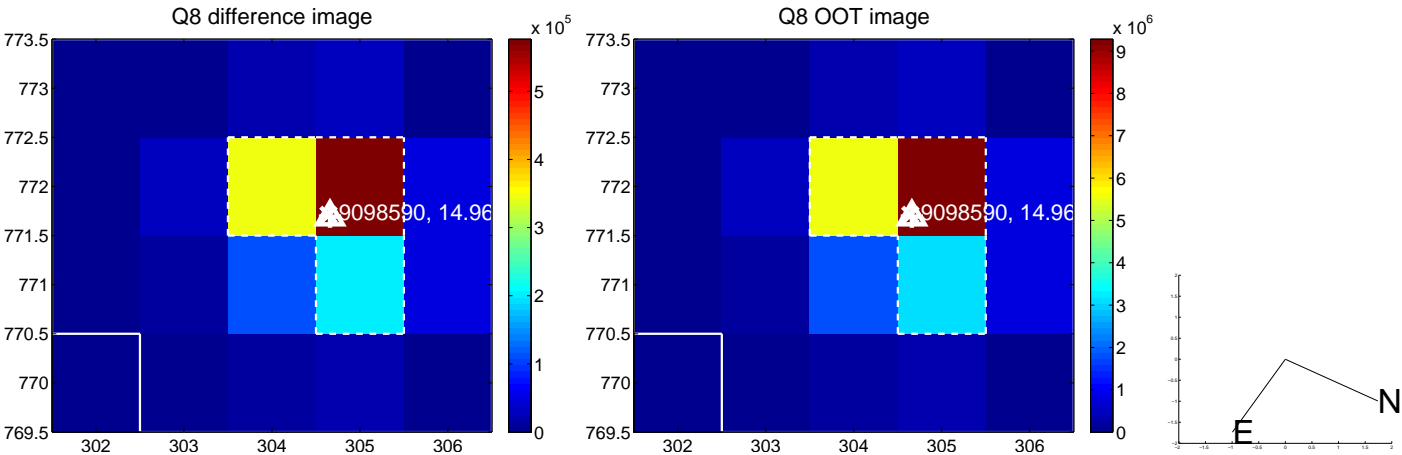
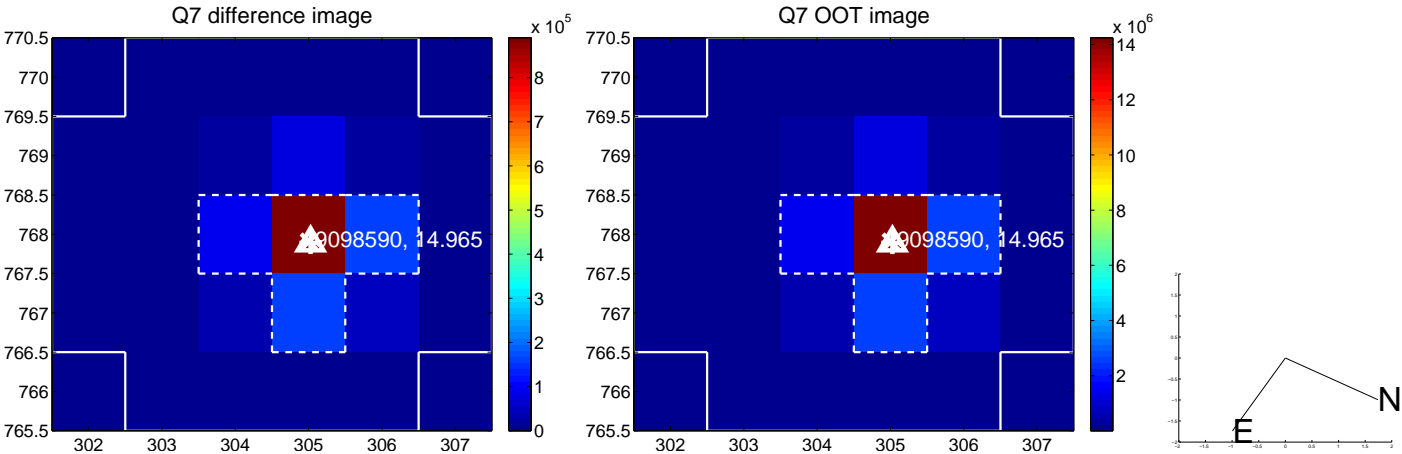
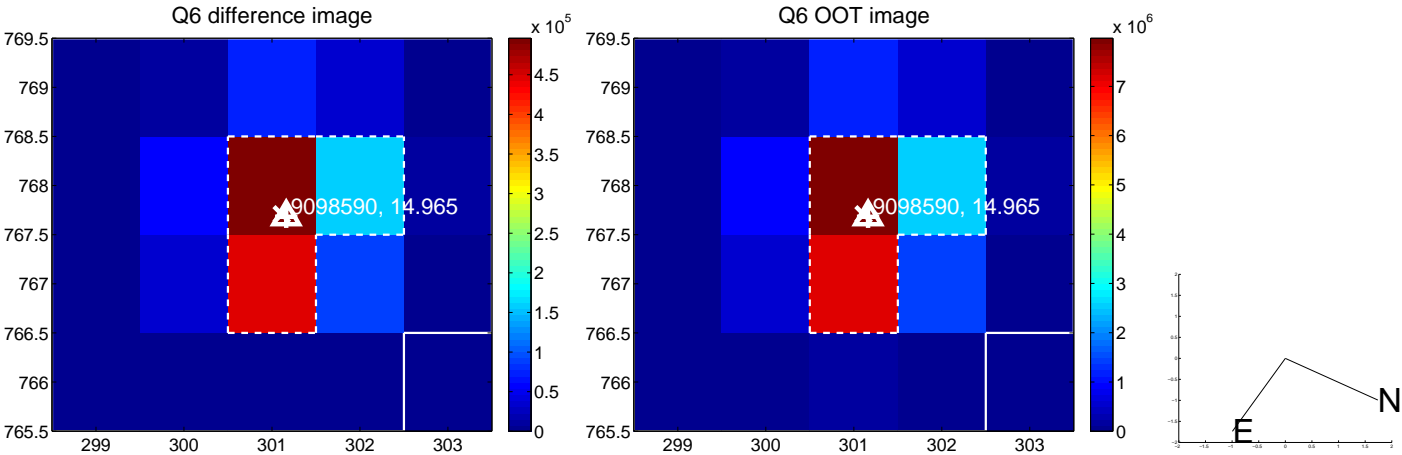
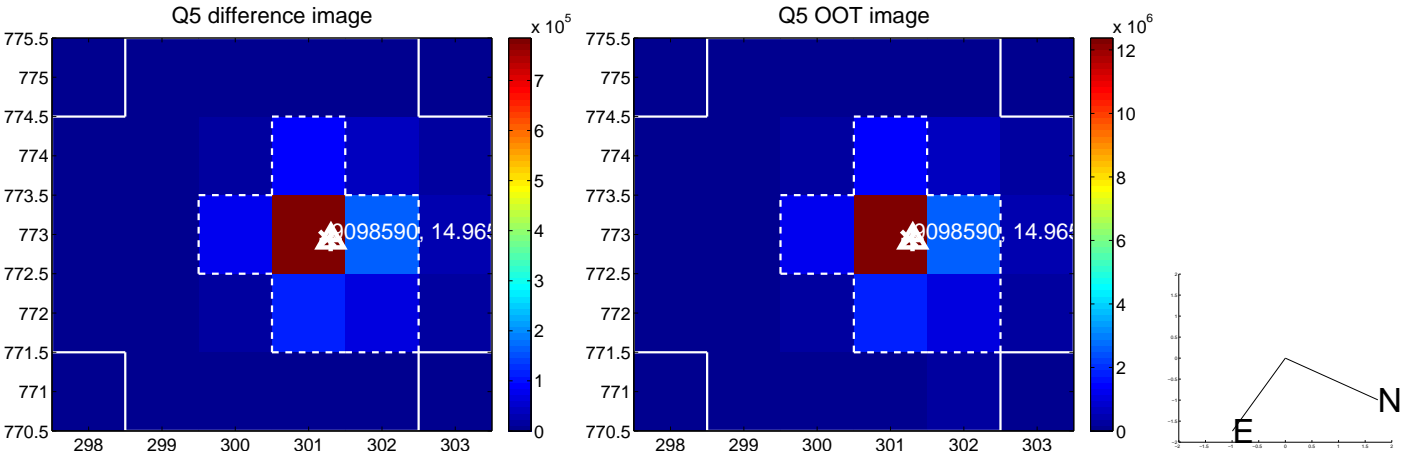


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

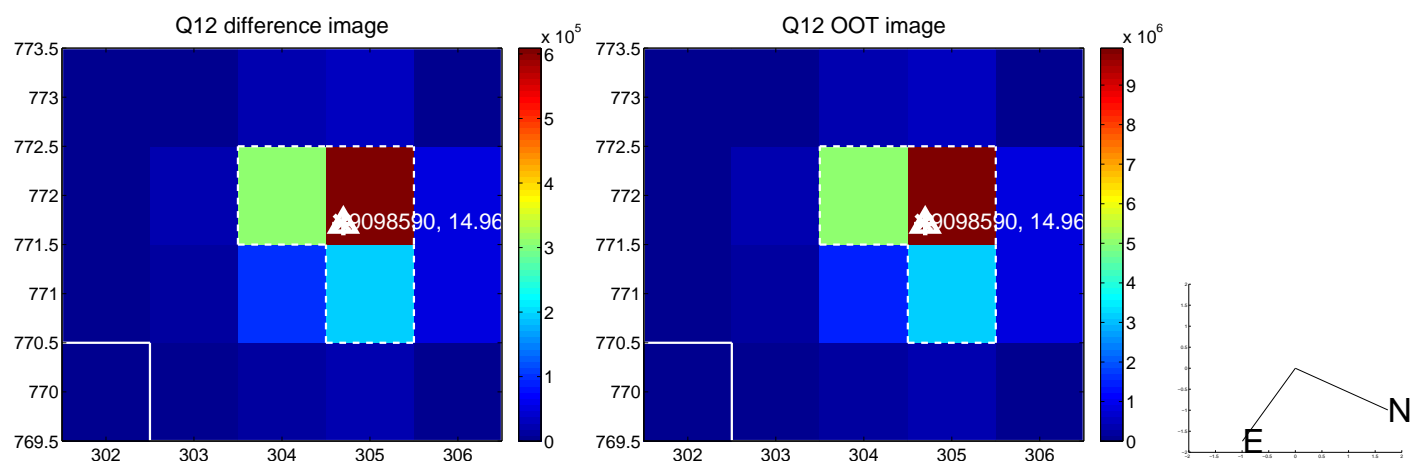
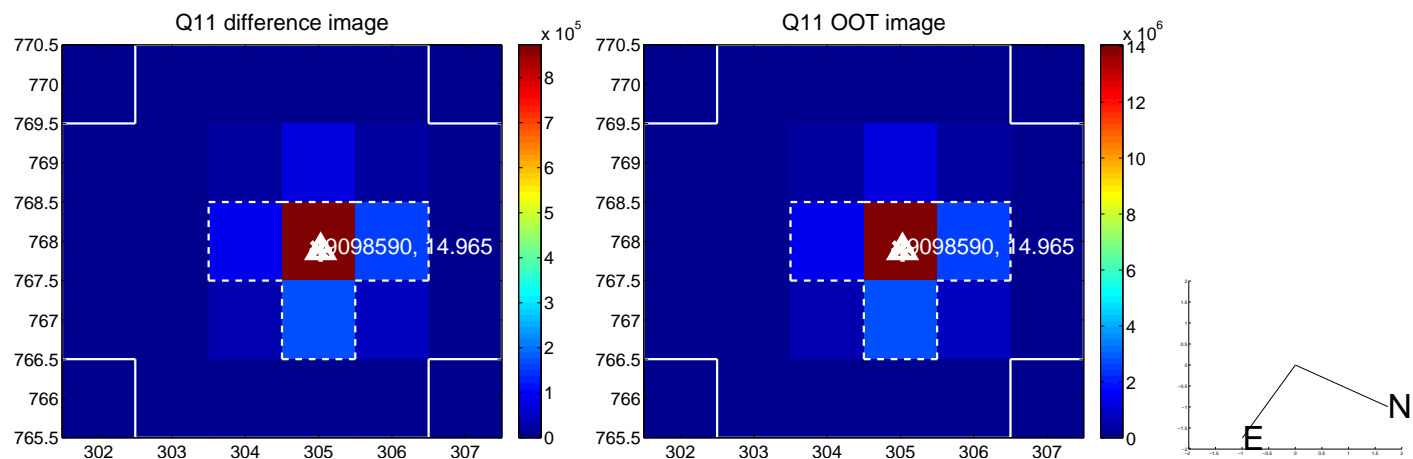
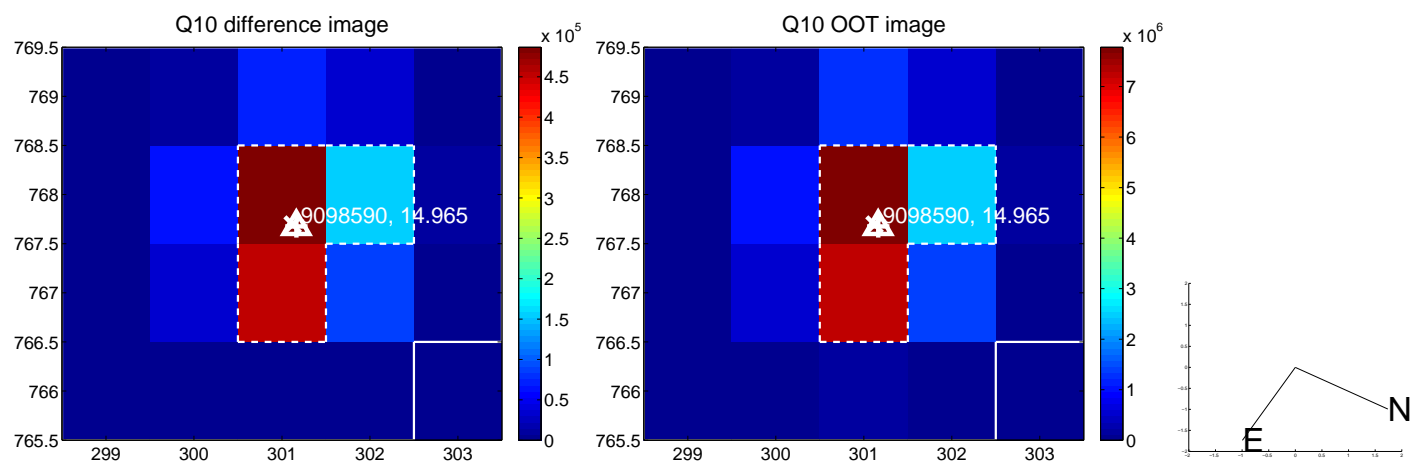
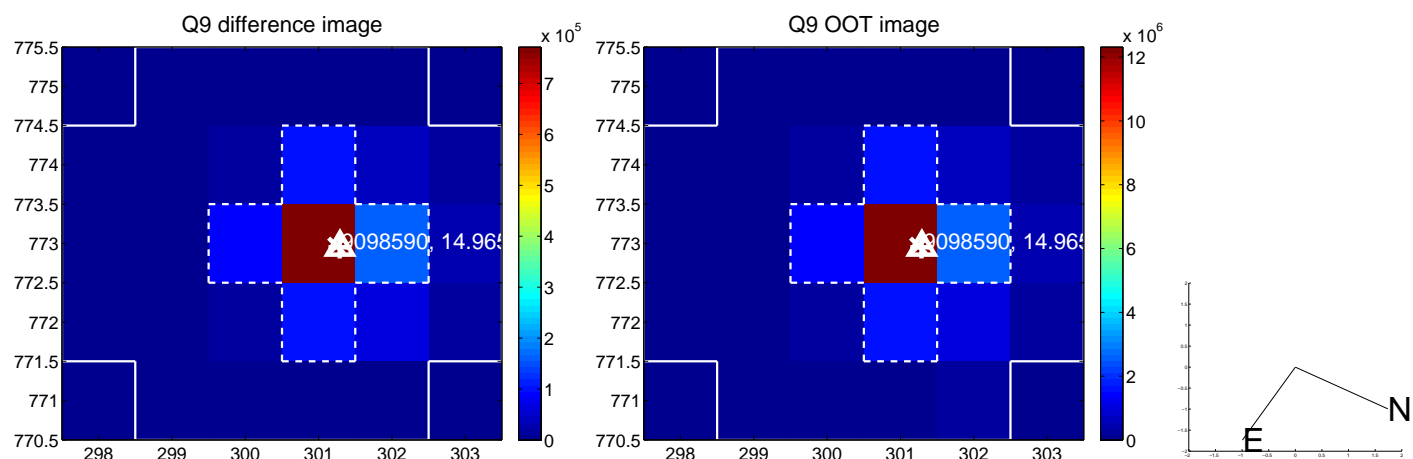
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



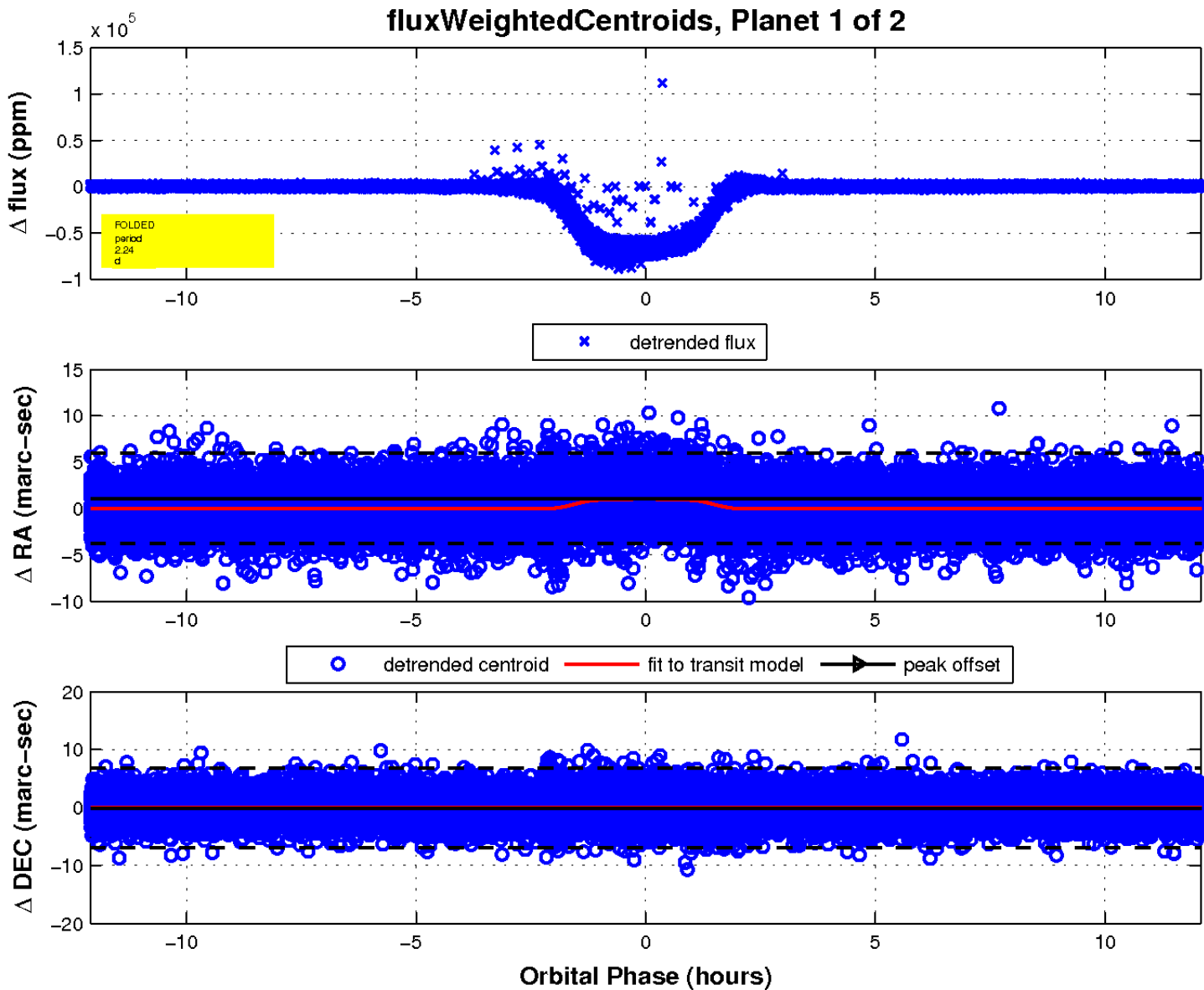
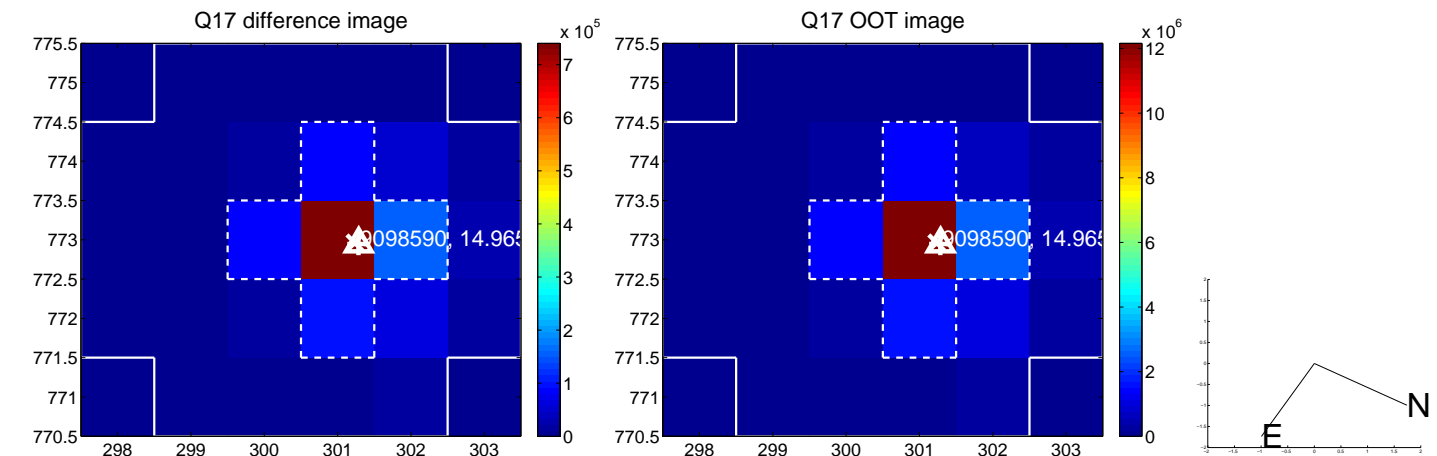
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

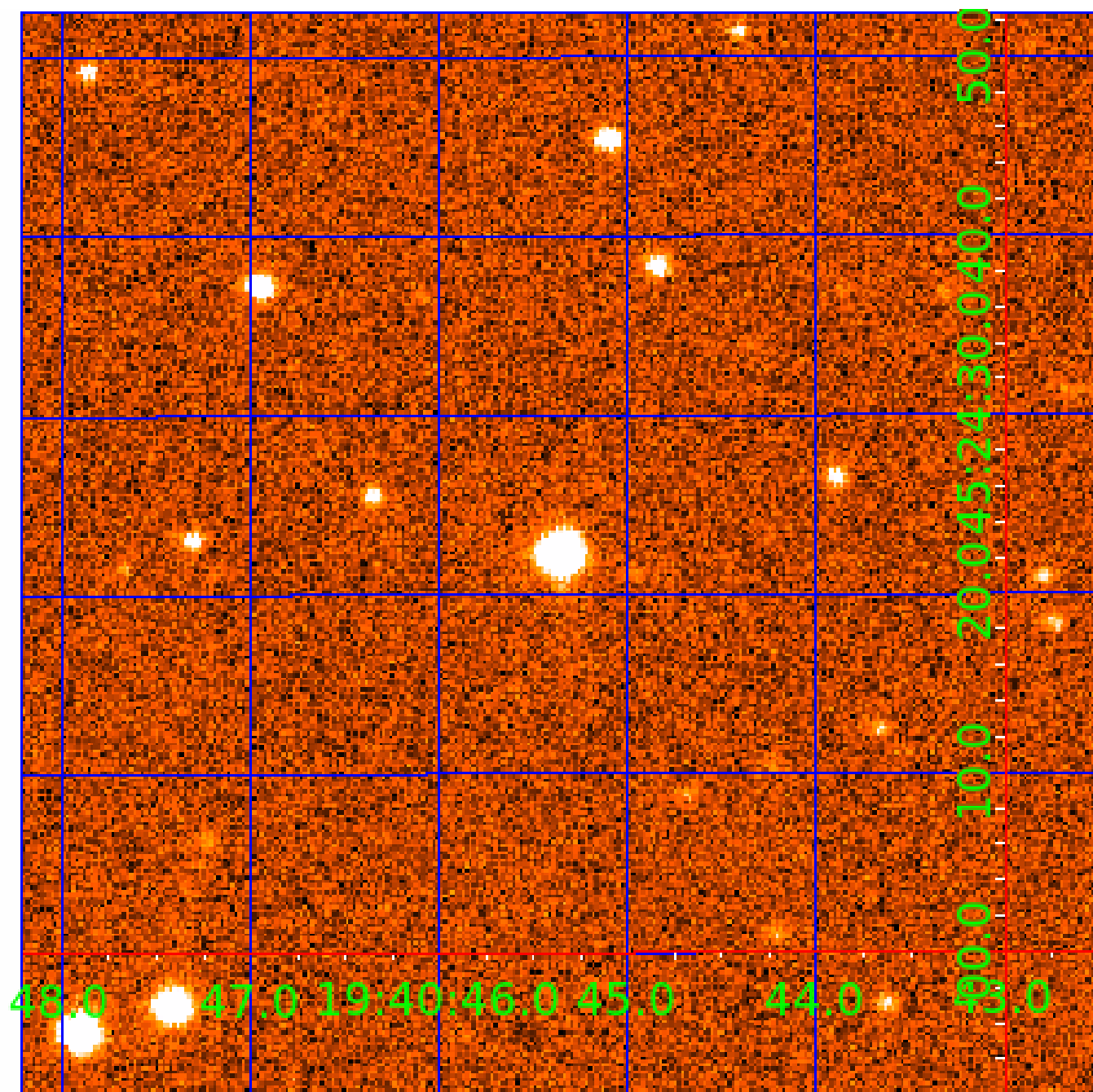


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009098590

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})
009098590-01	OBS	7131.01	2.243569	133.731055	65569.9	4.029	3501.2	3116.5	0.80	6081	20.89	820.28
009098590-02	OBS	No	2.243555	132.608868	651.7	3.775	35.6	44.4	0.80	6081	2.39	820.29

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009098590-01	OBS	PC	0.66	0	1	0	0	MOD_SEC_DV—PLANET_OCCULT_DV—HAS_SEC_TCE
009098590-02	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 009098590-02

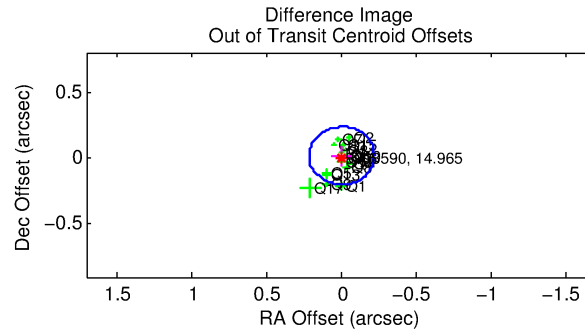
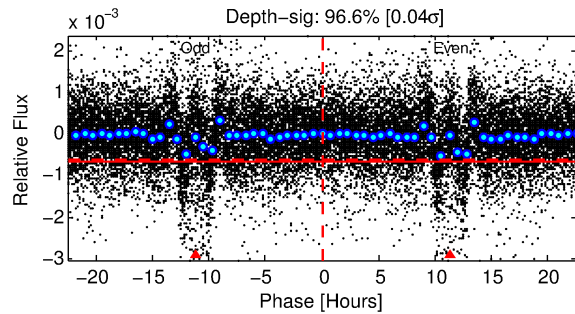
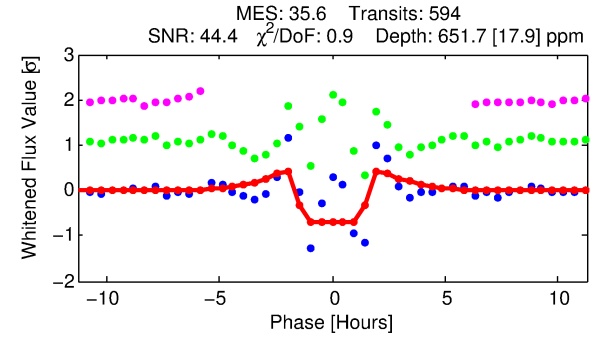
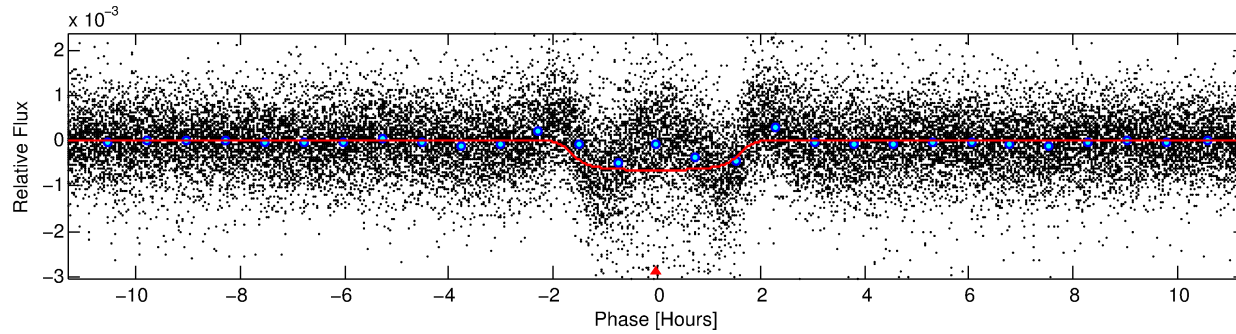
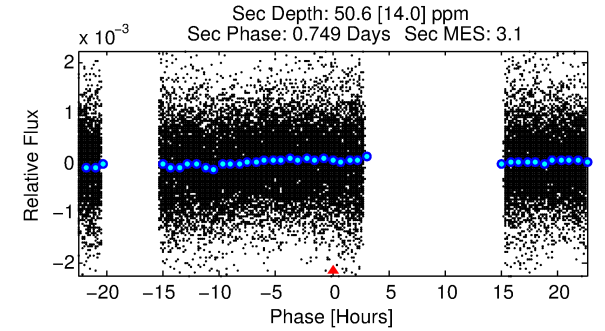
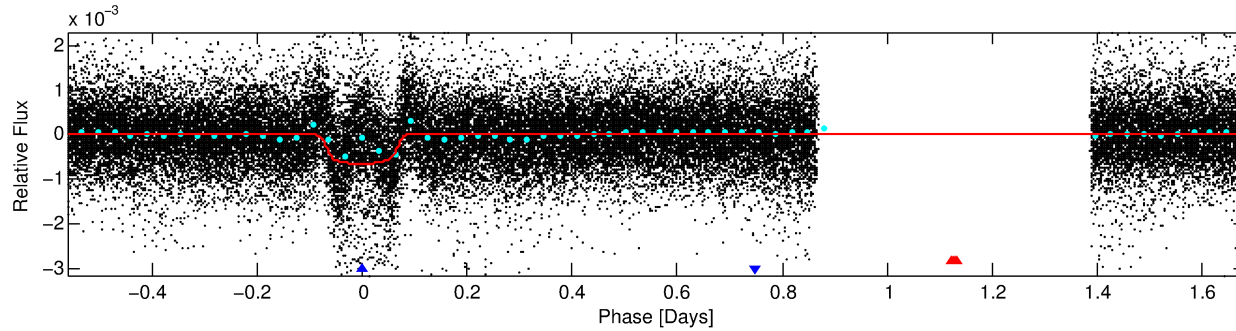
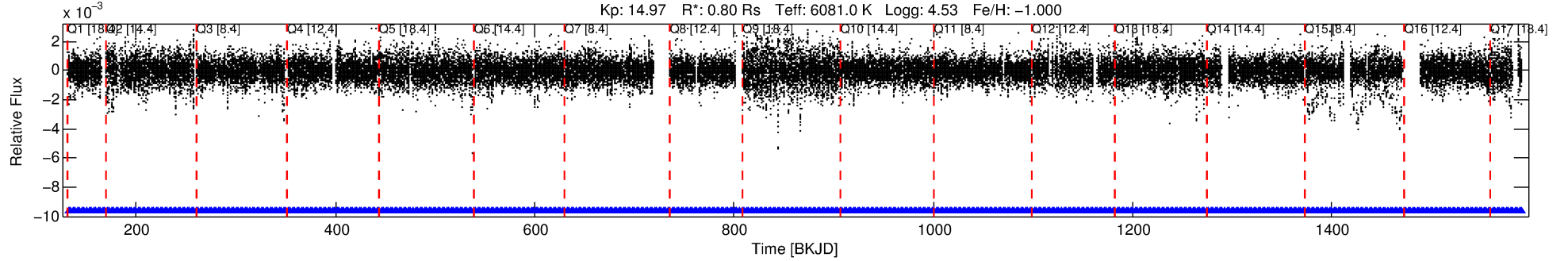
No Significant Match Found

DV One-Page Summary

KIC: 9098590 Candidate: 2 of 2 Period: 2.244 d

KOI: K07131 Corr: No Ephemeris Match

Kp: 14.97 R*: 0.80 Rs Teff: 6081.0 K Logg: 4.53 Fe/H: -1.000



DV Fit Results:

Period = 2.24355 [0.00000] d
Epoch = 132.6089 [0.0007] BKJD
Rp/R* = 0.0274 [0.0008]
a/R* = 2.44 [0.26]
b = 0.90 [0.03]
Seff = 820.29 [242.25]
Teff = 1365 [101] K
Rp = 2.39 [0.51] Re
a = 0.0310 [0.0056] AU
Ag = 4.67 [1.82] [2.01σ]
Teffp = 3102 [237] K [6.74σ]

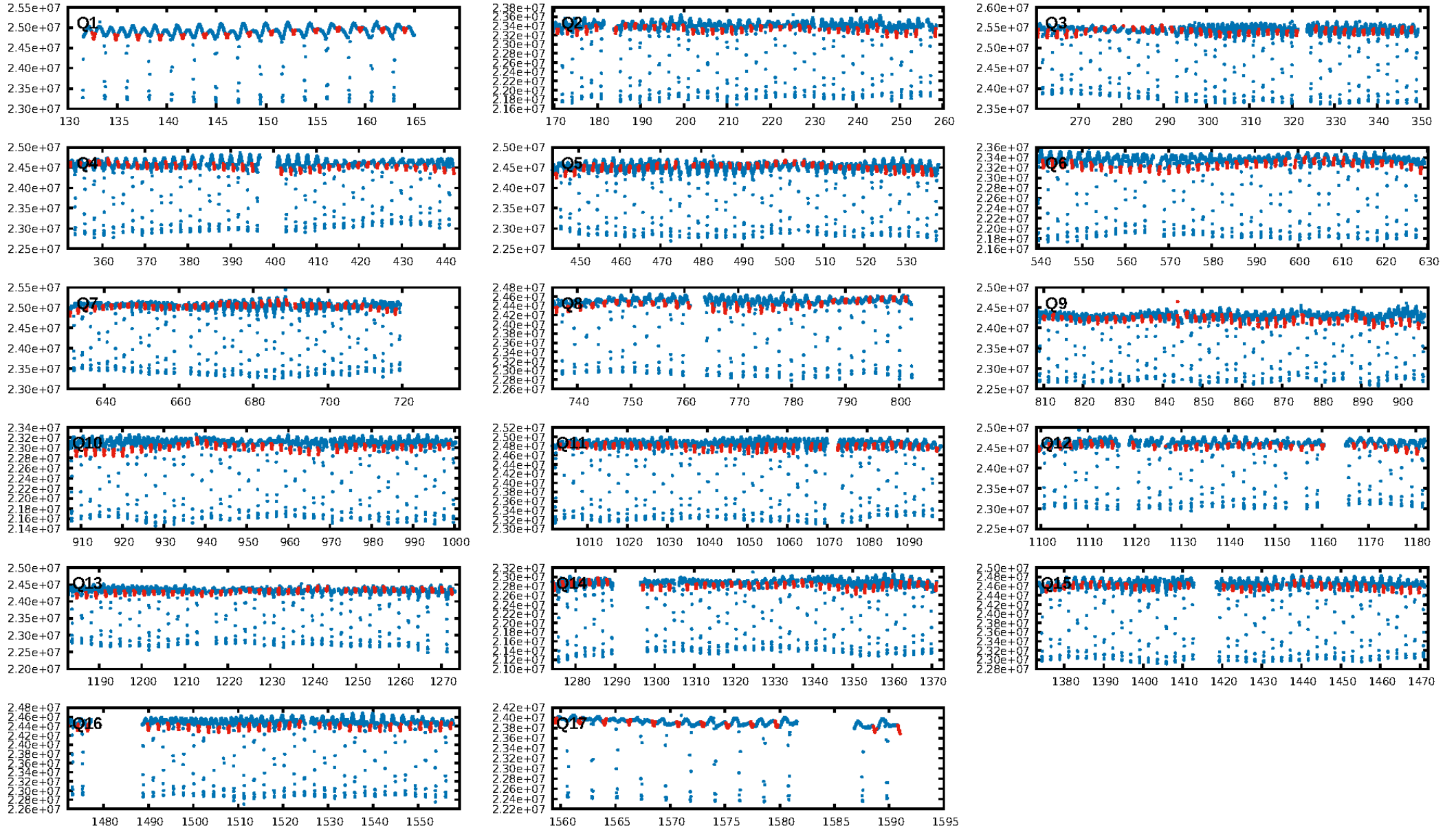
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 2.58e-236
RollingBand-fgt: 1.00 [567/567]
GhostDiagnostic-chr: 0.6358
Centroid-sig: 2.7%
Centroid-so: 0.204 arcsec [1.44σ]
OotOffset-rm: 0.019 arcsec [0.25σ]
KicOffset-rm: 0.138 arcsec [1.87σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

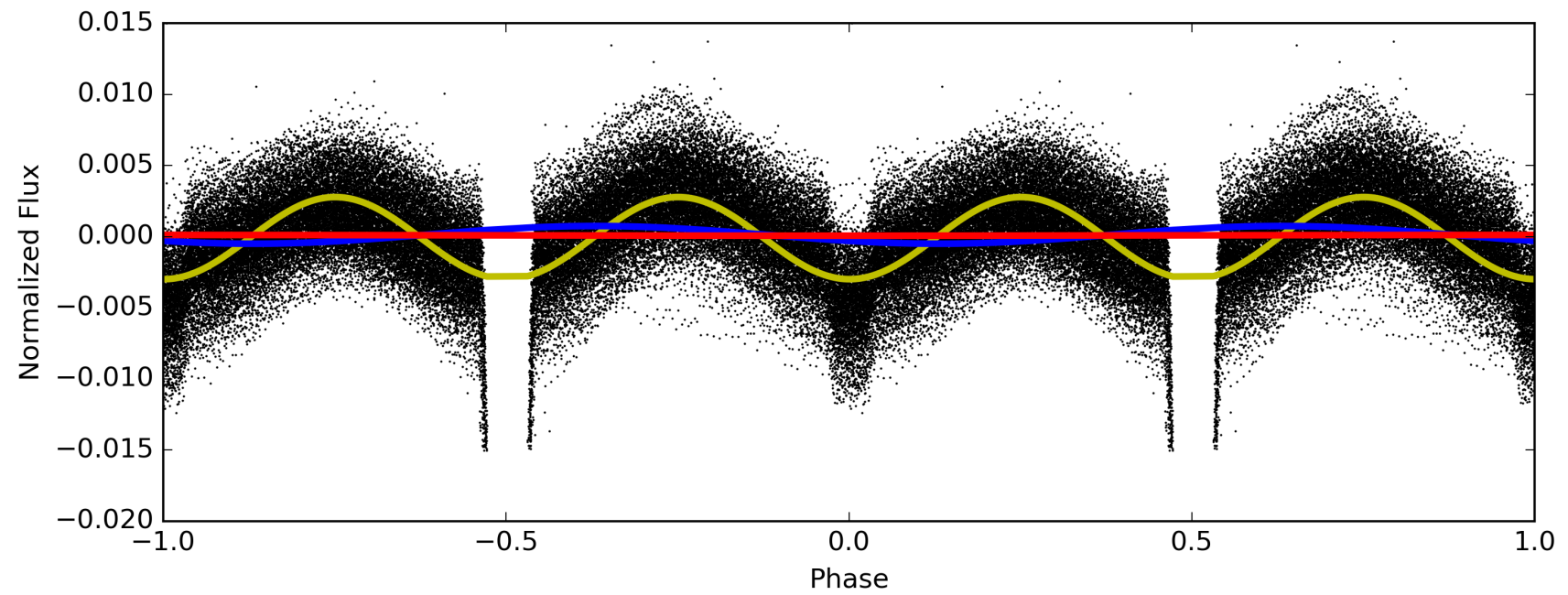
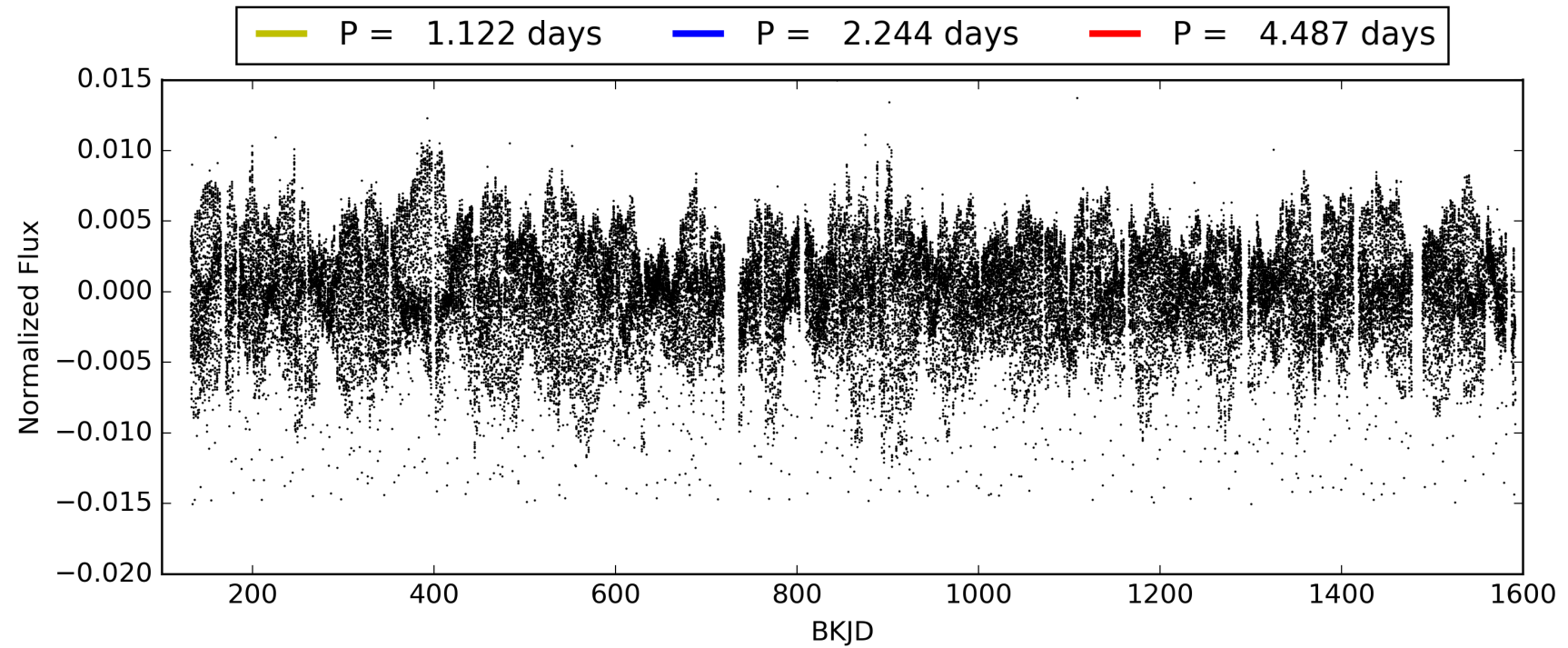
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 02:23:35 Z

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

TCE 009098590-02, PDC Light Curves

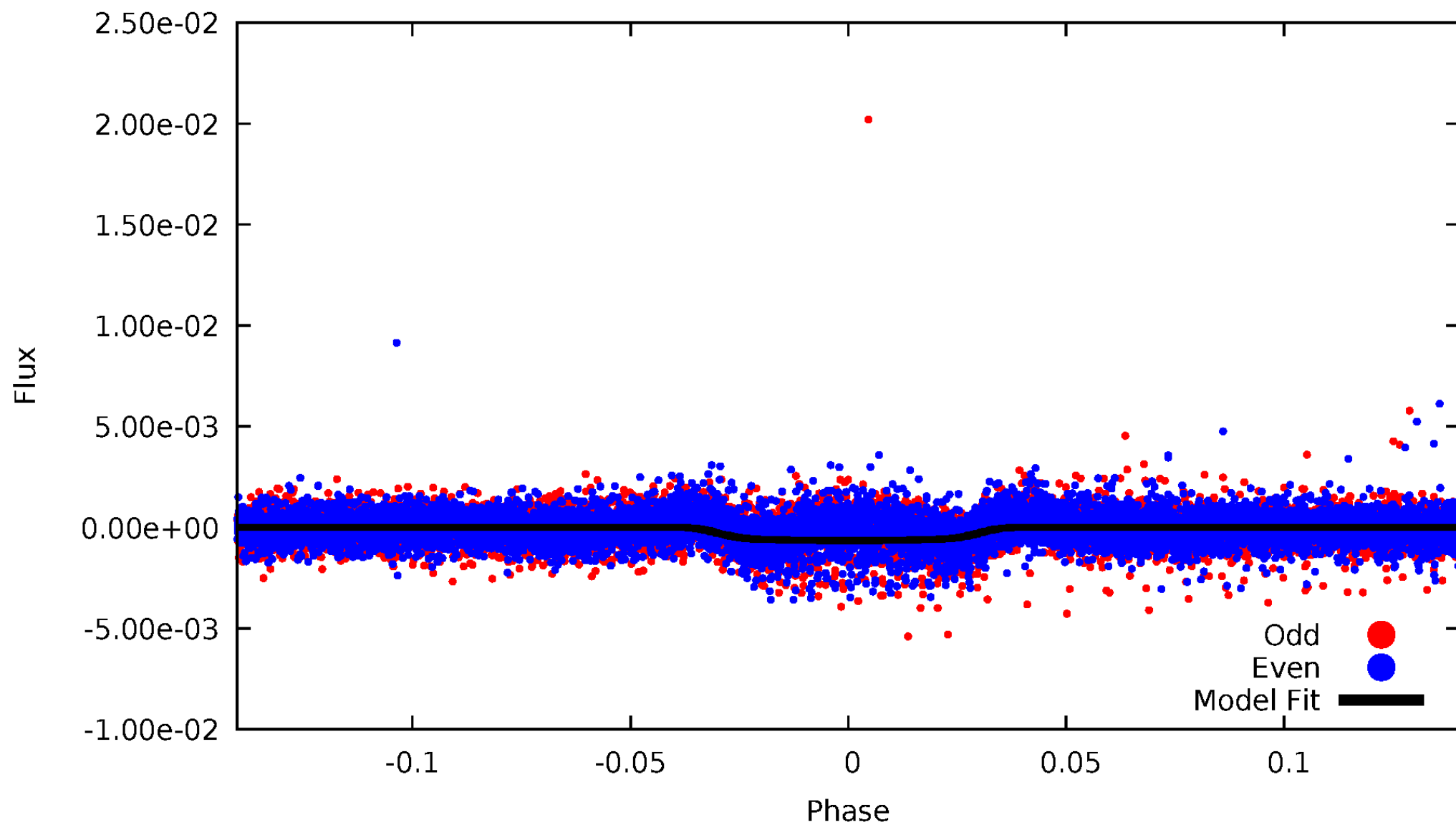


TCE 009098590-02



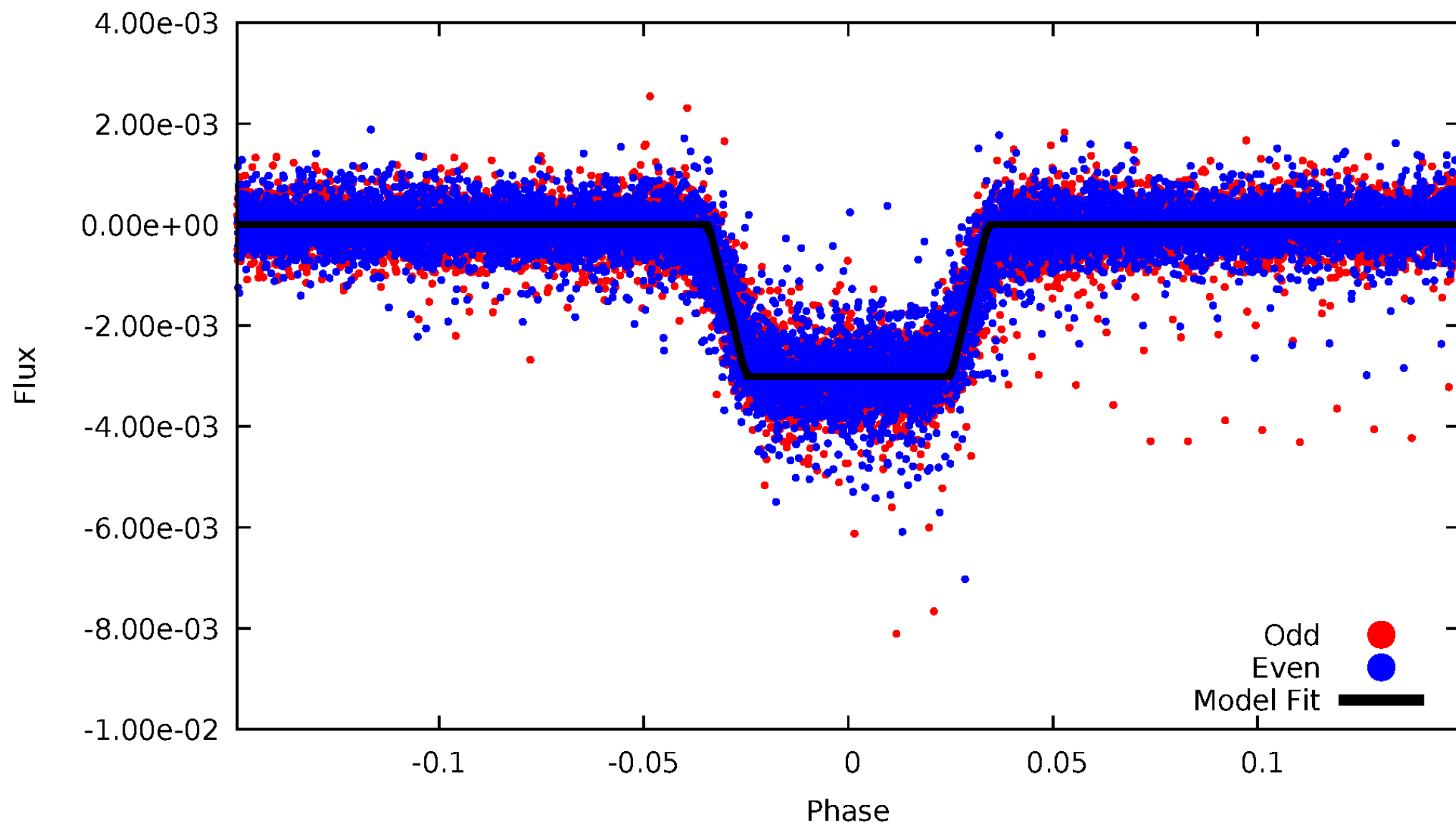
DV Odd/Even

TCE 009098590-02



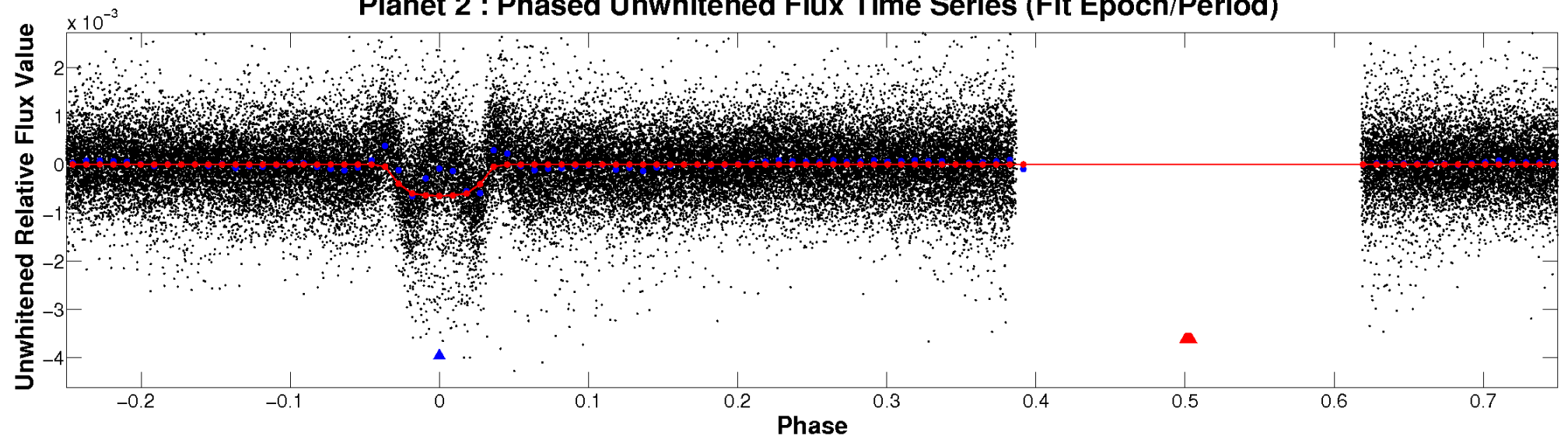
ALT Odd/Even

TCE 009098590-02

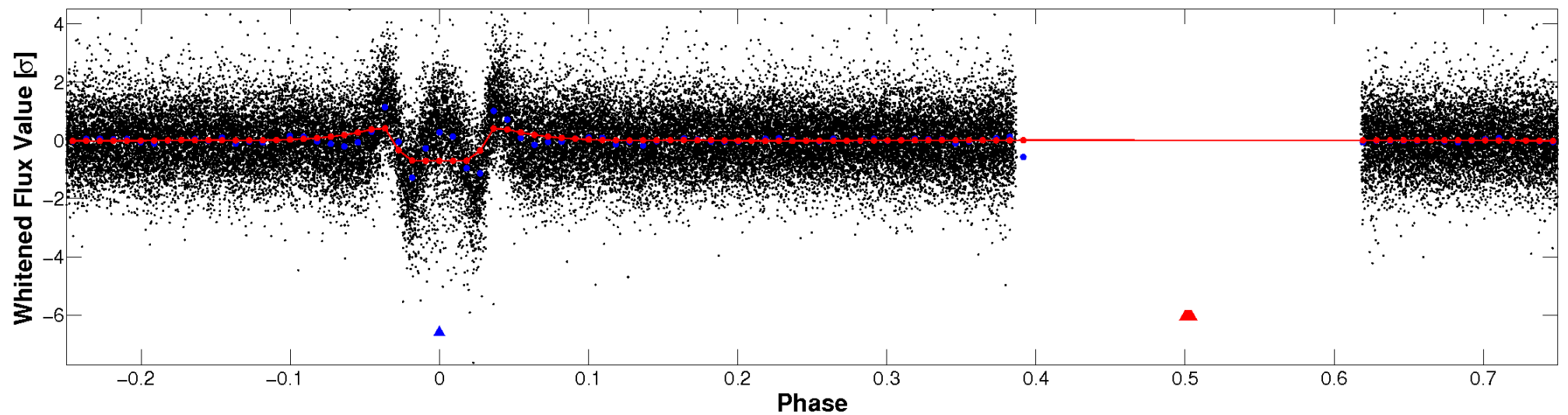


Non-Whitened Vs. Whitened Light Curve

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

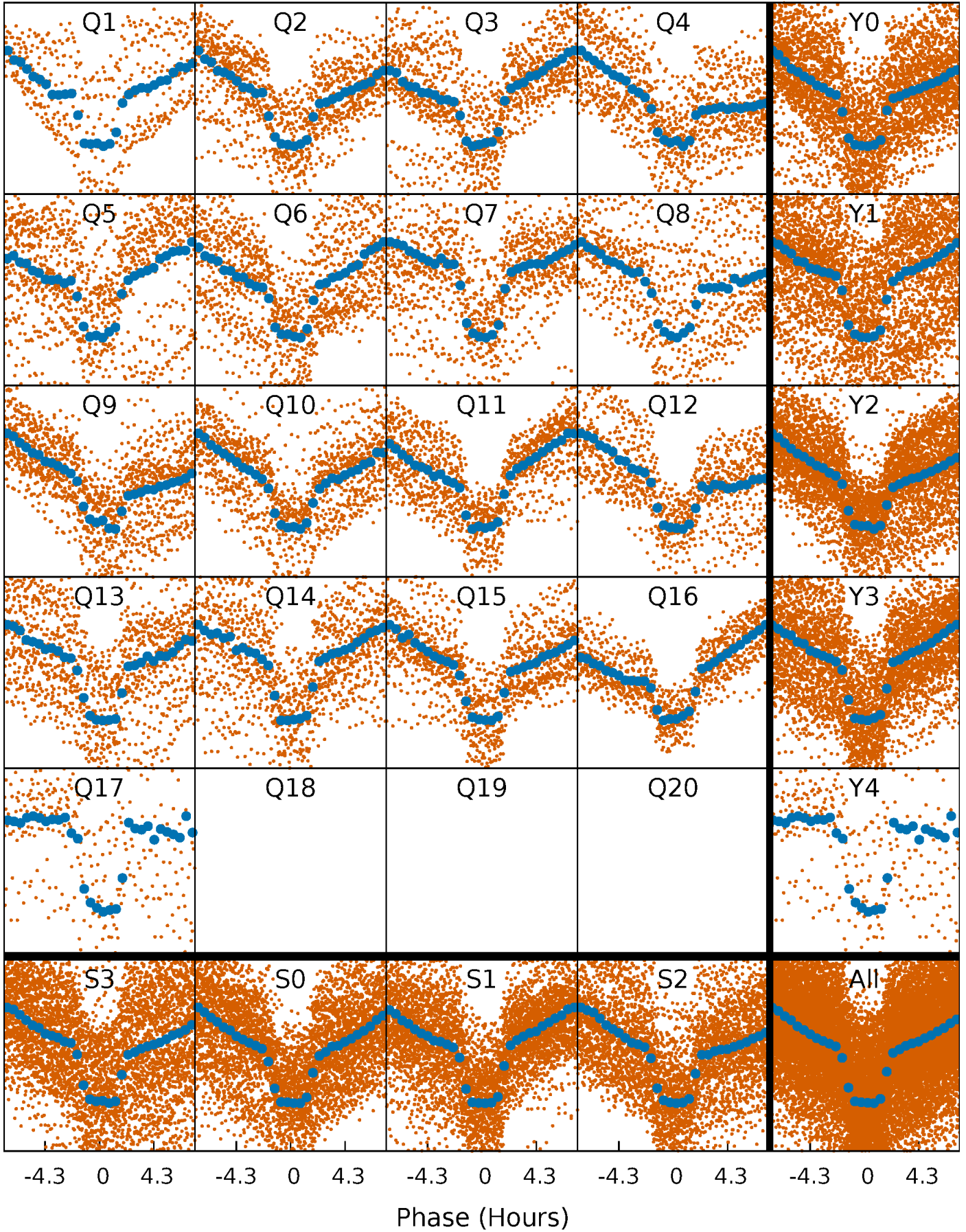


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



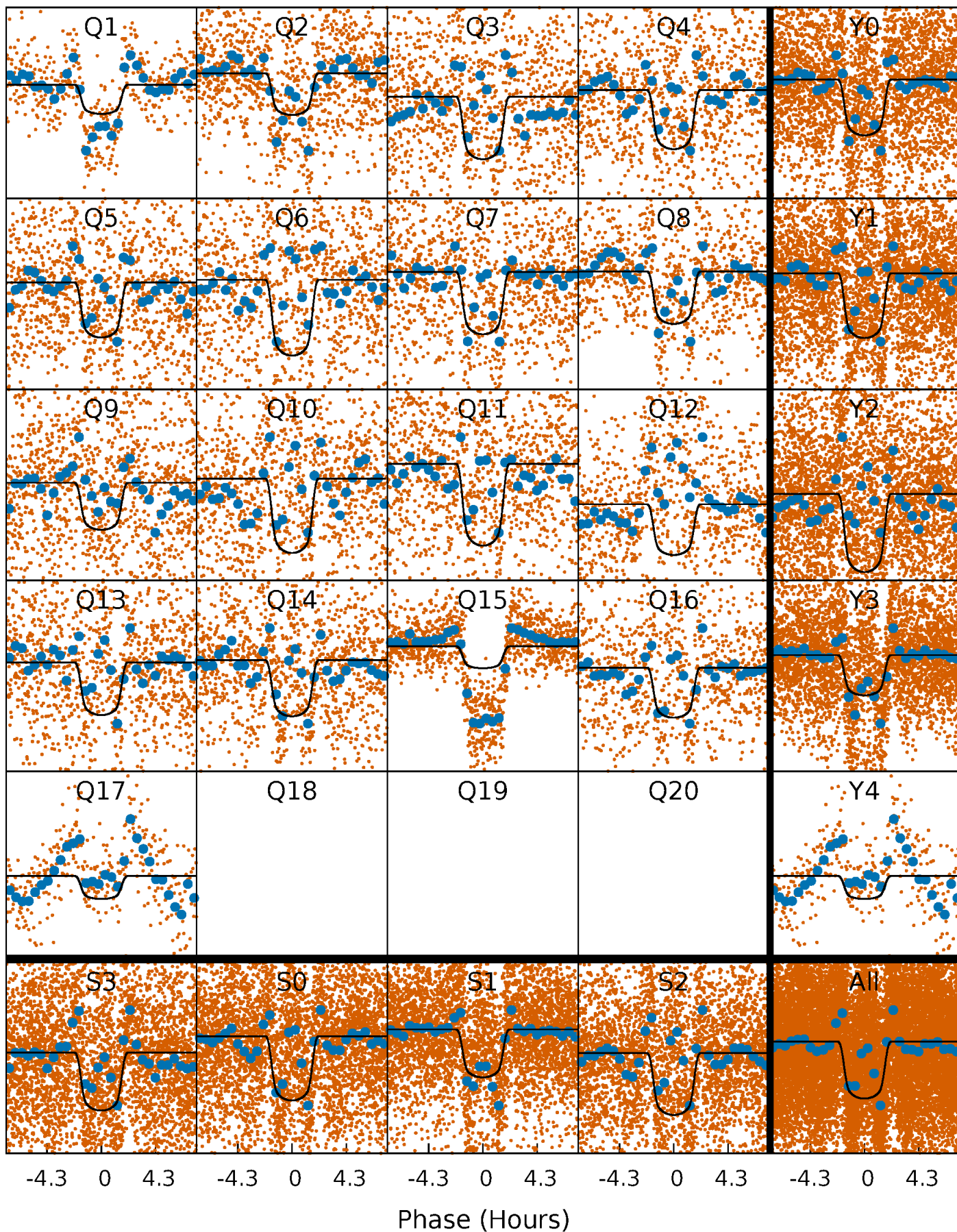
PDC Quarter-Phased Transit Curves

TCE 009098590-02 P= 2.243555 Days $T_0=132.608868$ (BKJD)



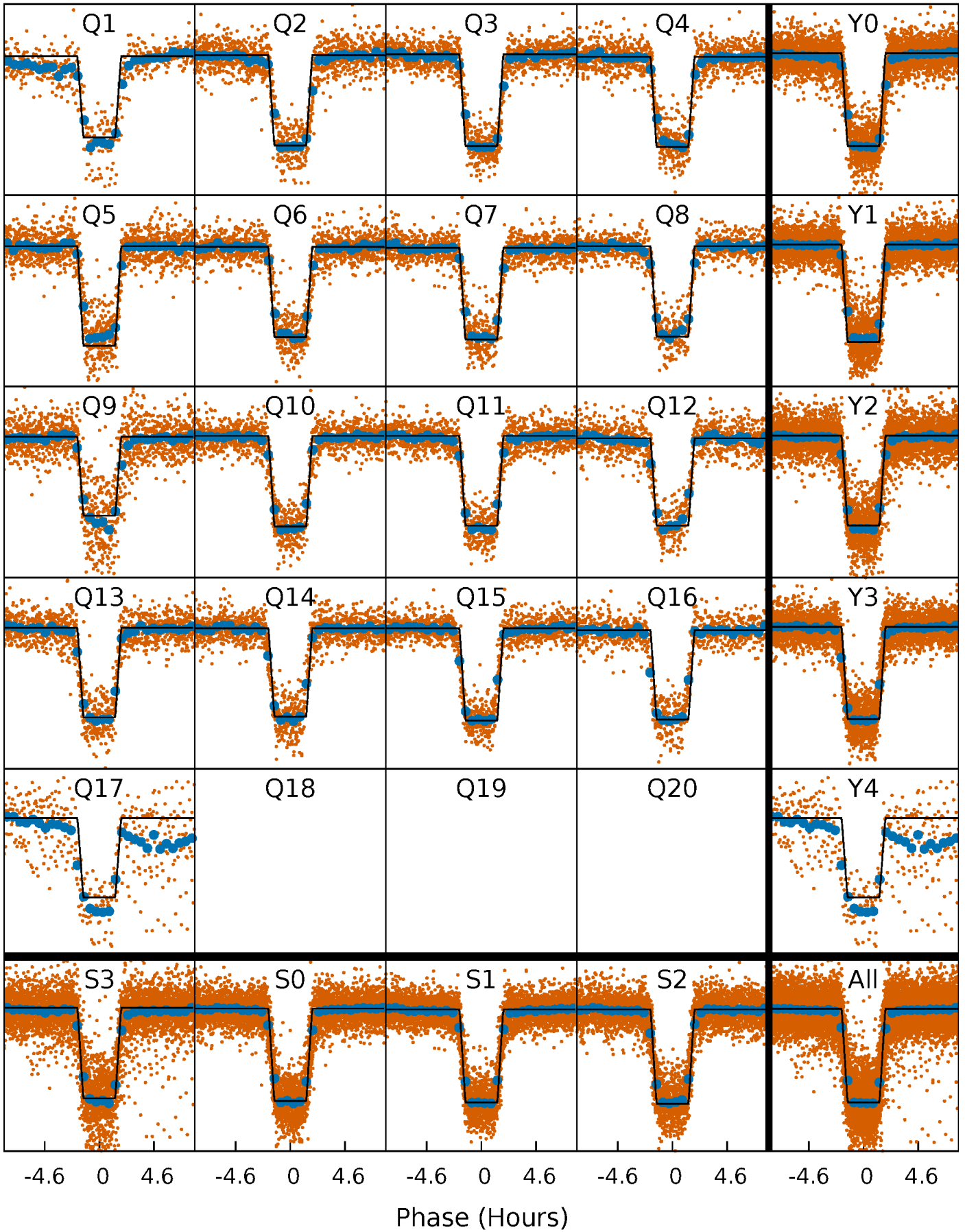
DV Quarter-Phased Transit Curves

TCE 009098590-02 P= 2.243555 Days $T_0=132.608868$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

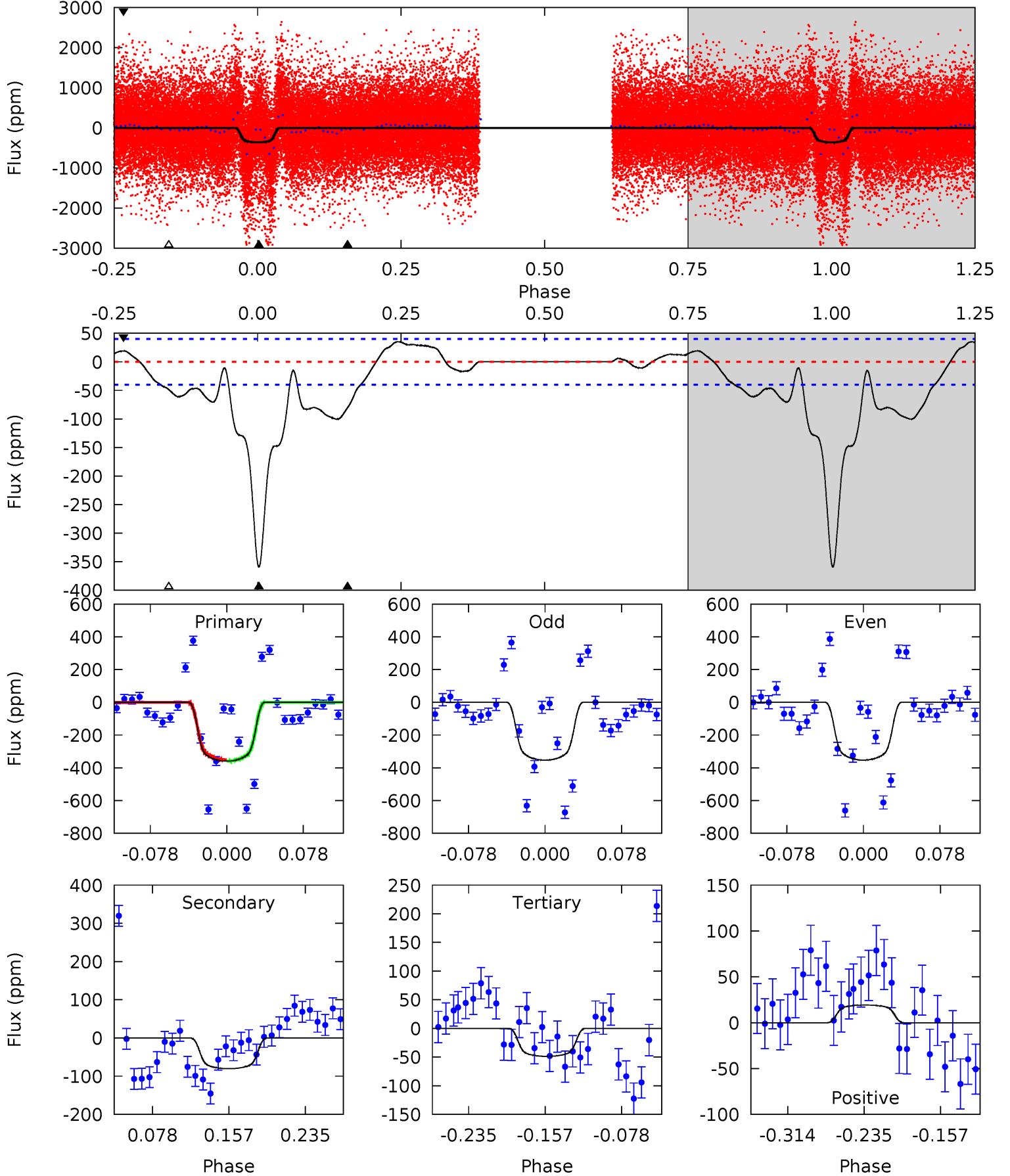
TCE 009098590-02 $P = 2.243595$ Days $T_0 = 132.600499$ (BKJD)



DV Model-Shift Uniqueness Test

009098590-02, P = 2.243555 Days, E = 130.365313 Days

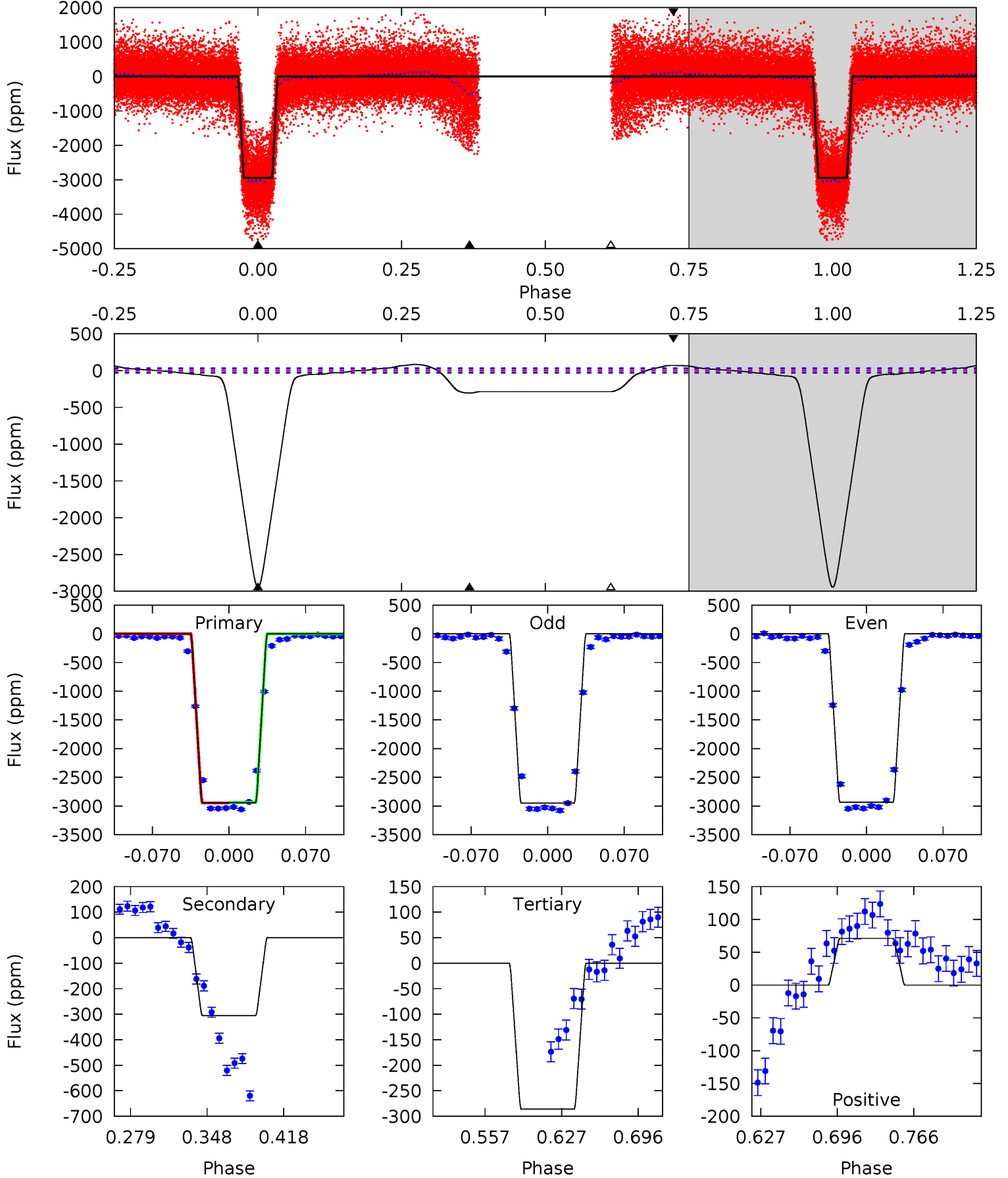
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.2	9.23	5.60	2.21	4.62	1.76	3.33	35.6	39.0	3.63	7.02	0.01	1.12	0.09	0.53



Alt Model-Shift Uniqueness Test

009098590-02, P = 2.243595 Days, E = 130.356904 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
462.0	47.9	44.9	11.2	4.64	1.81	10.4	417.1	450.8	3.02	36.7	1.01	1.01	0.03	0.57



Stellar Parameters For KIC 009098590

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6081^{+181}_{-181}	$4.526^{+0.081}_{-0.150}$	$-1.000^{+0.300}_{-0.300}$	$0.801^{+0.170}_{-0.085}$	$0.786^{+0.070}_{-0.049}$	$2.155^{+0.711}_{-0.890}$
	+3%/-3%	+2%/-3%	+30%/-30%	+21%/-11%	+9%/-6%	+33%/-41%
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 009098590-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-80 ± 9	$2.42^{+0.28}_{-0.17}$	1924^{+110}_{-88}	3820^{+105}_{-115}	$7.030^{+1.579}_{-1.391}$
Alt.	-305 ± 6	$4.85^{+0.57}_{-0.32}$	1923^{+110}_{-88}	3785^{+81}_{-86}	$6.851^{+0.972}_{-1.317}$

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

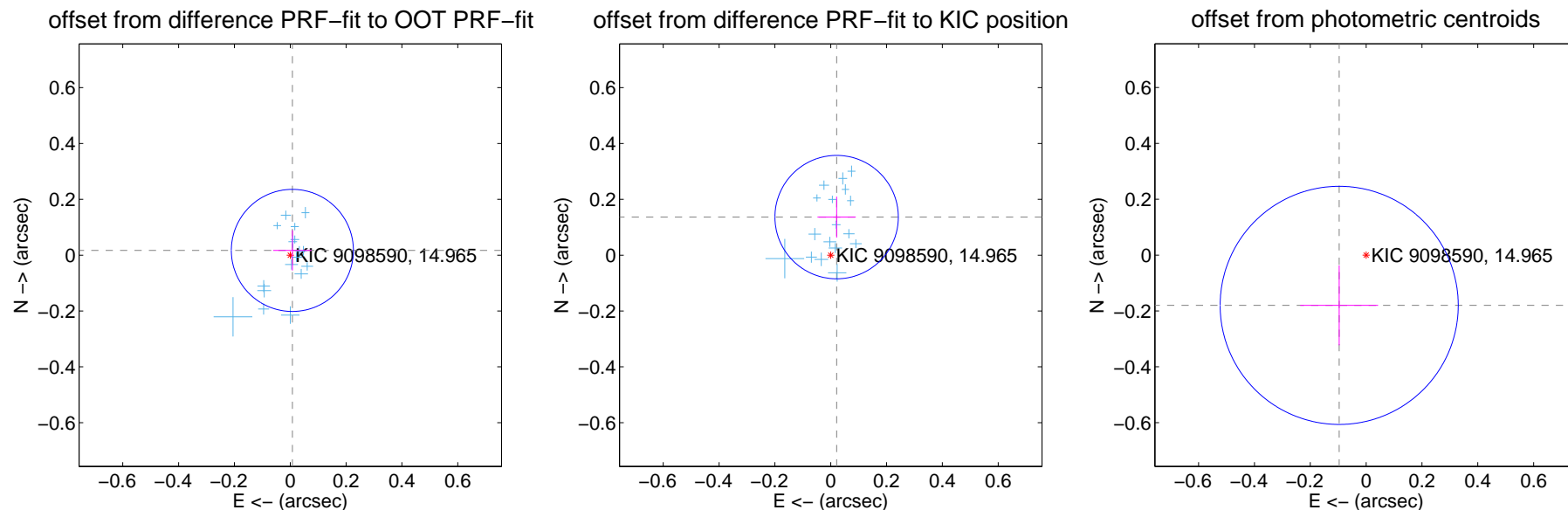
DV Centroid Data

Supplemental centroid analysis for 009098590-02. Kepler magnitude: 14.96. Transit SNR 44.37

There are 17 quarters with good PRF difference image offsets

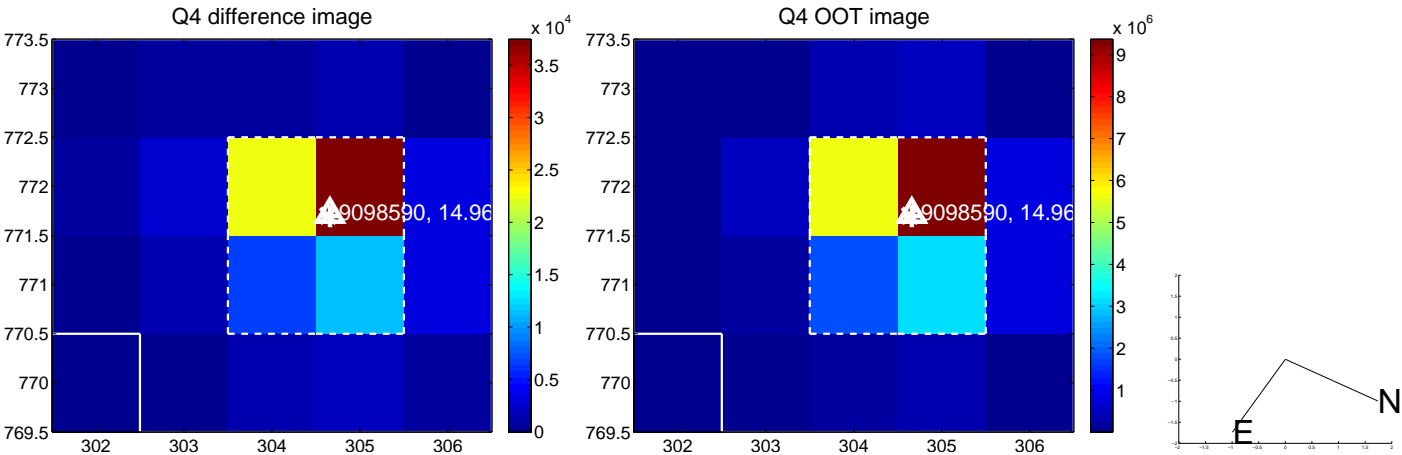
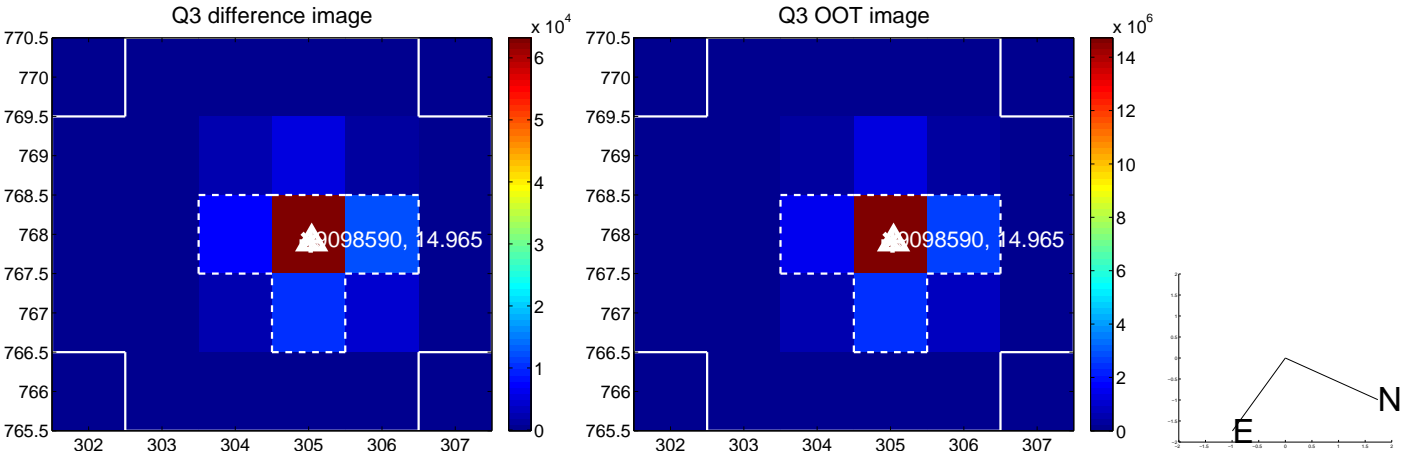
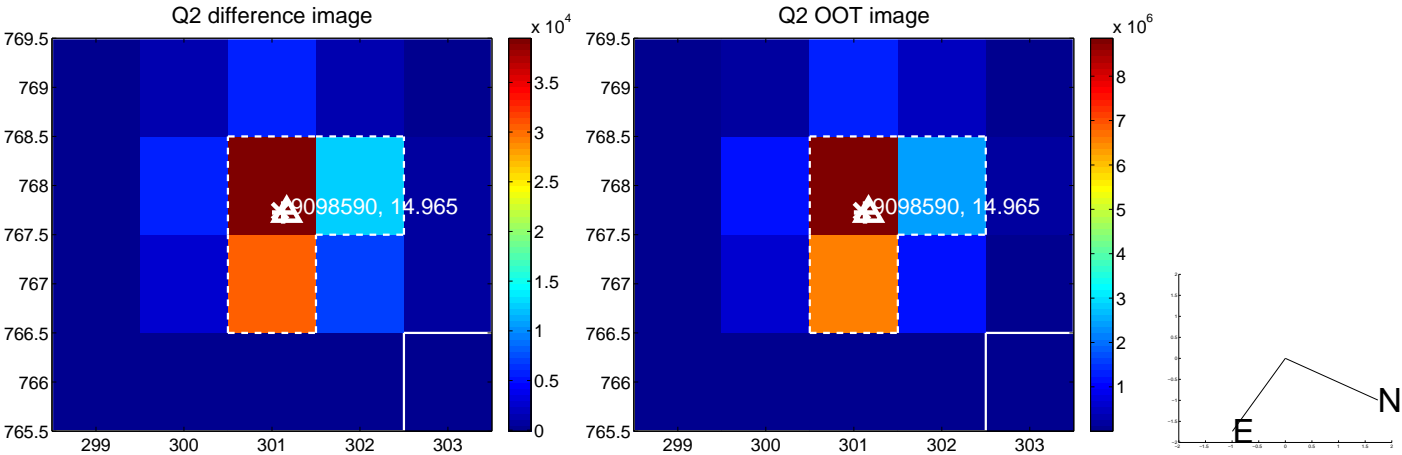
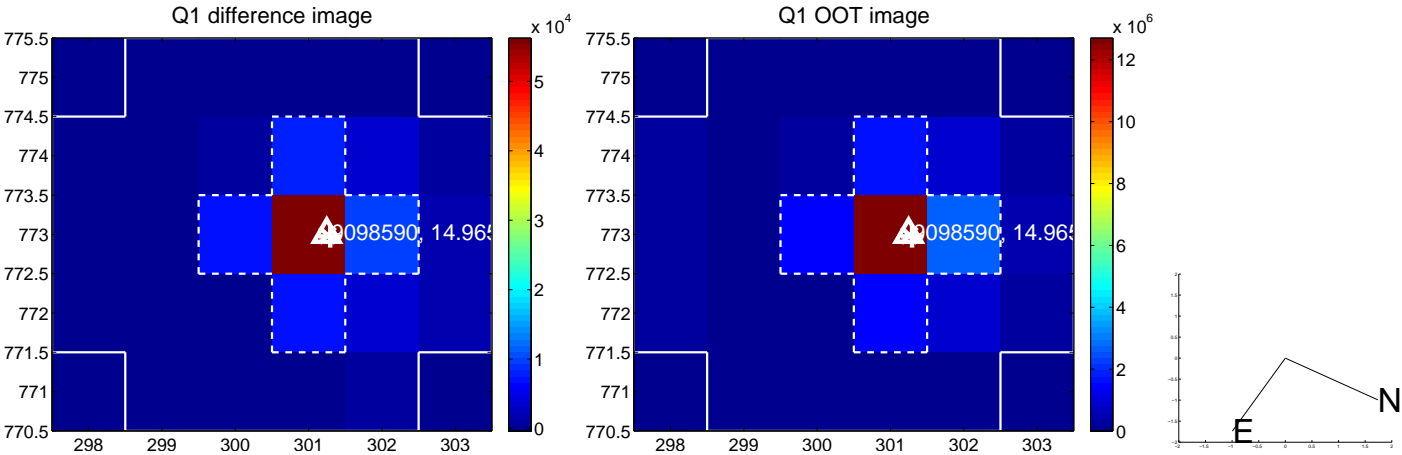
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.019 ± 0.073	0.25	-0.008 ± 0.068	0.017 ± 0.072
PRF-fit source offset from KIC position	0.138 ± 0.074	1.87	-0.021 ± 0.069	0.136 ± 0.073
photometric centroid source offset	0.20 ± 0.14	1.44	0.10 ± 0.14	-0.18 ± 0.14

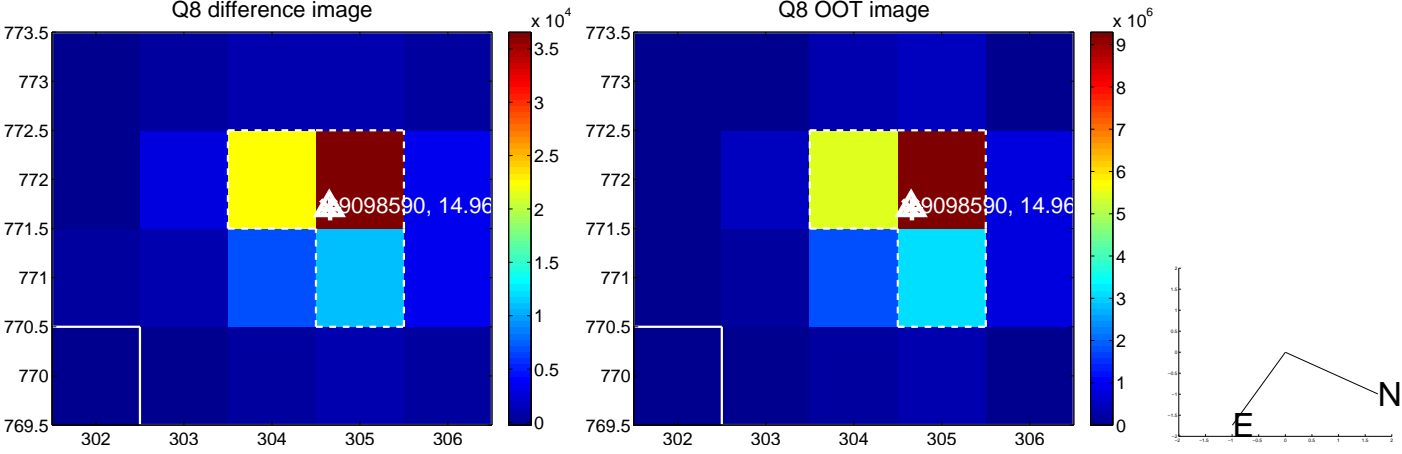
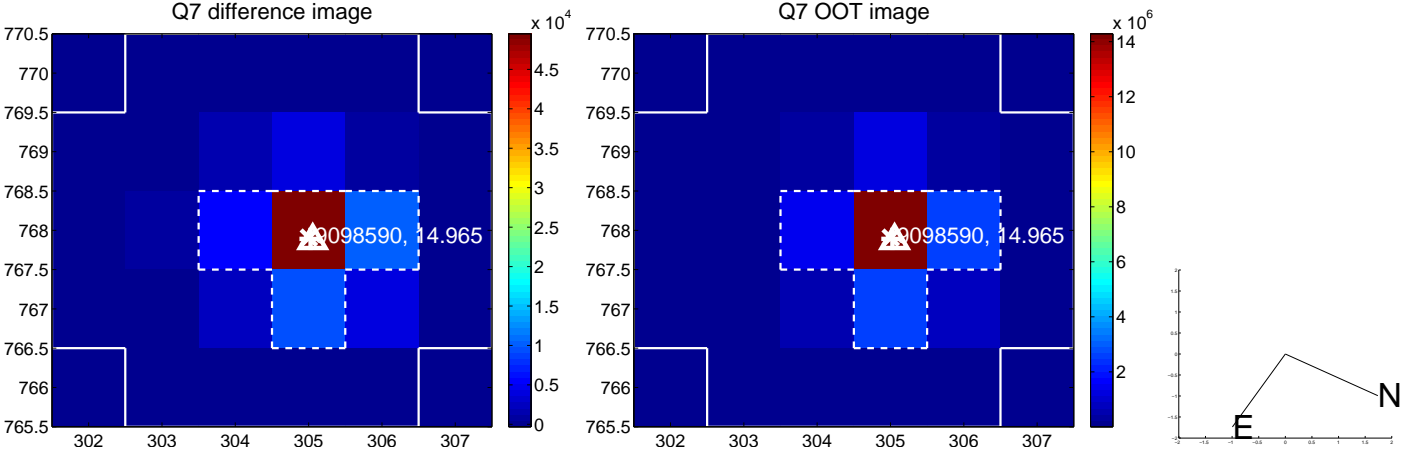
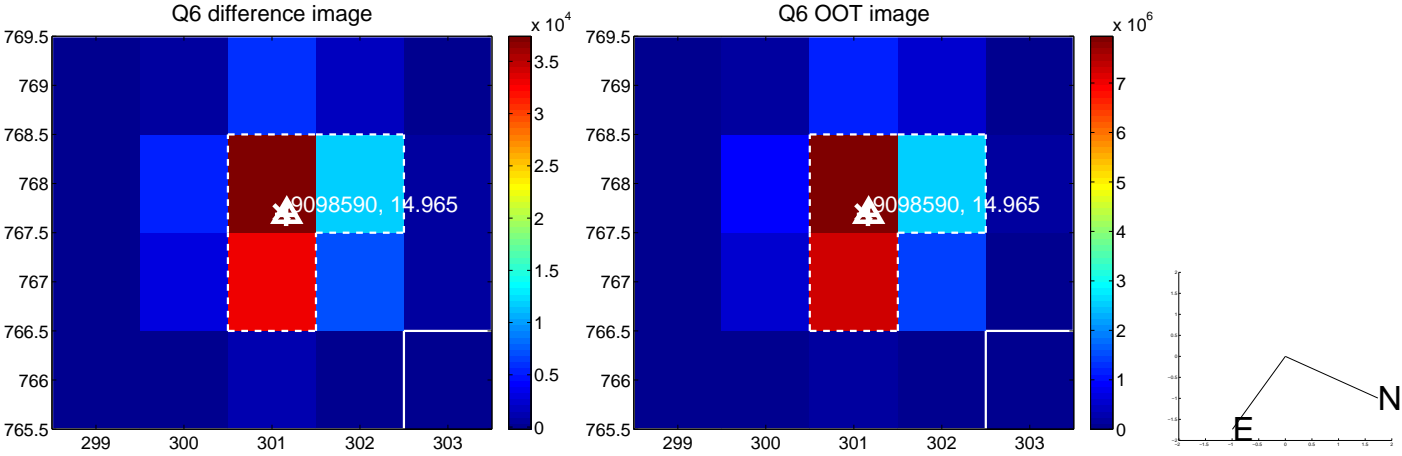
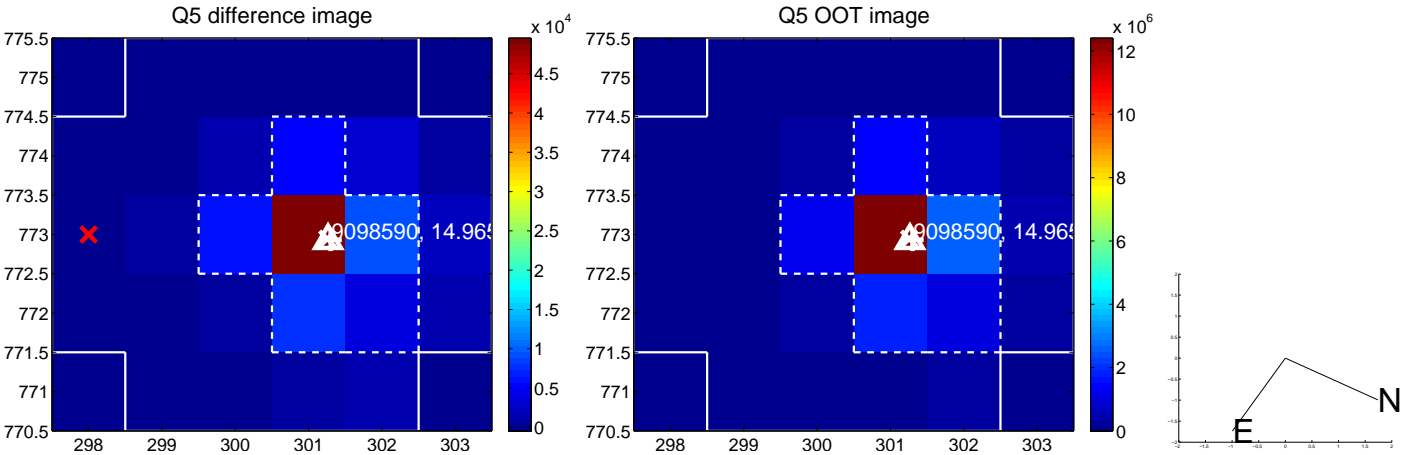


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

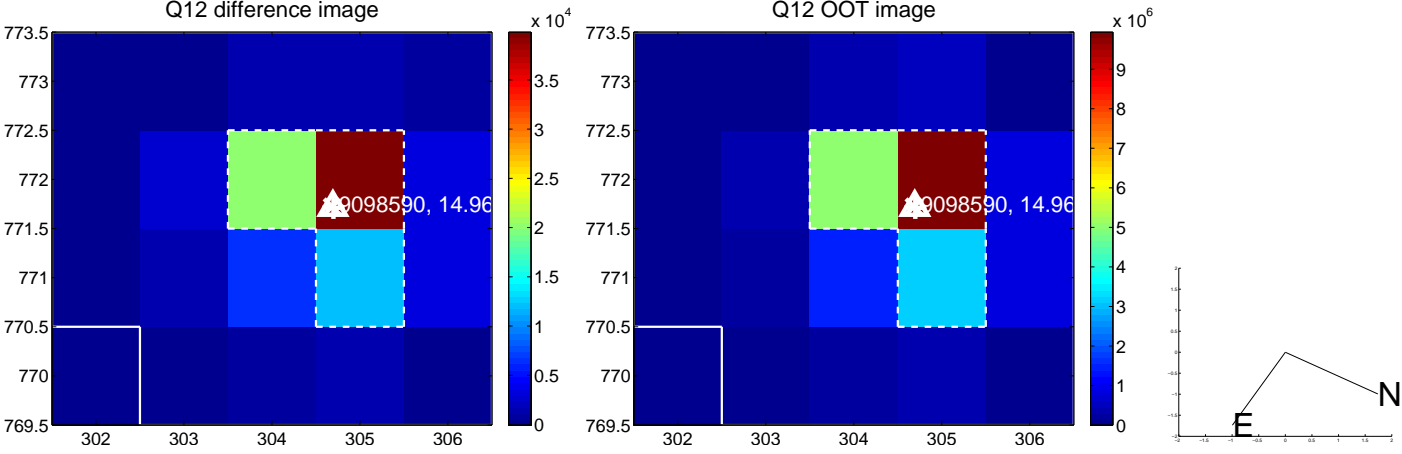
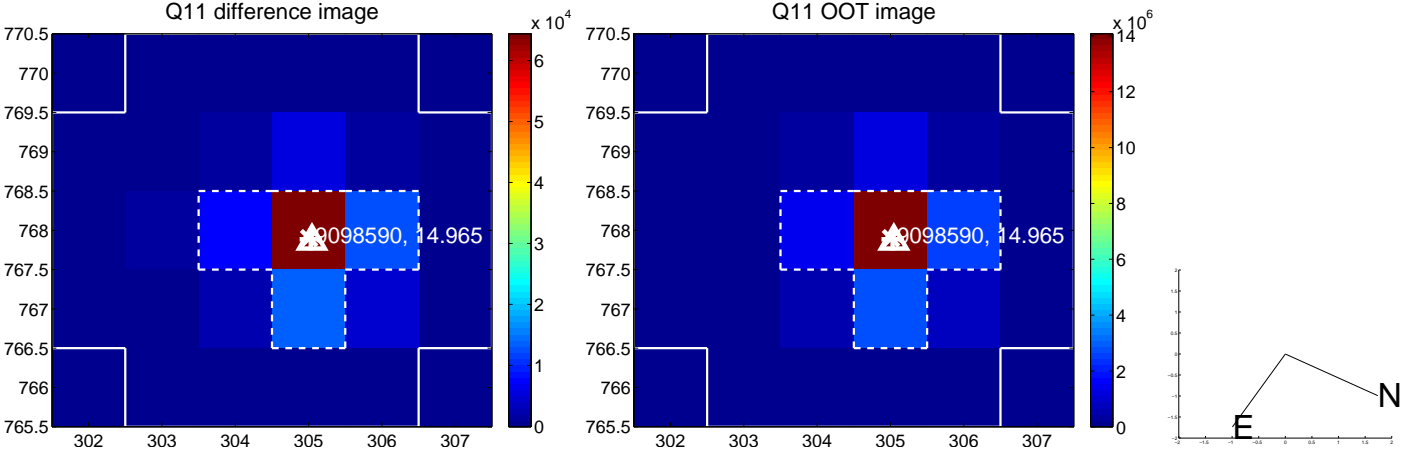
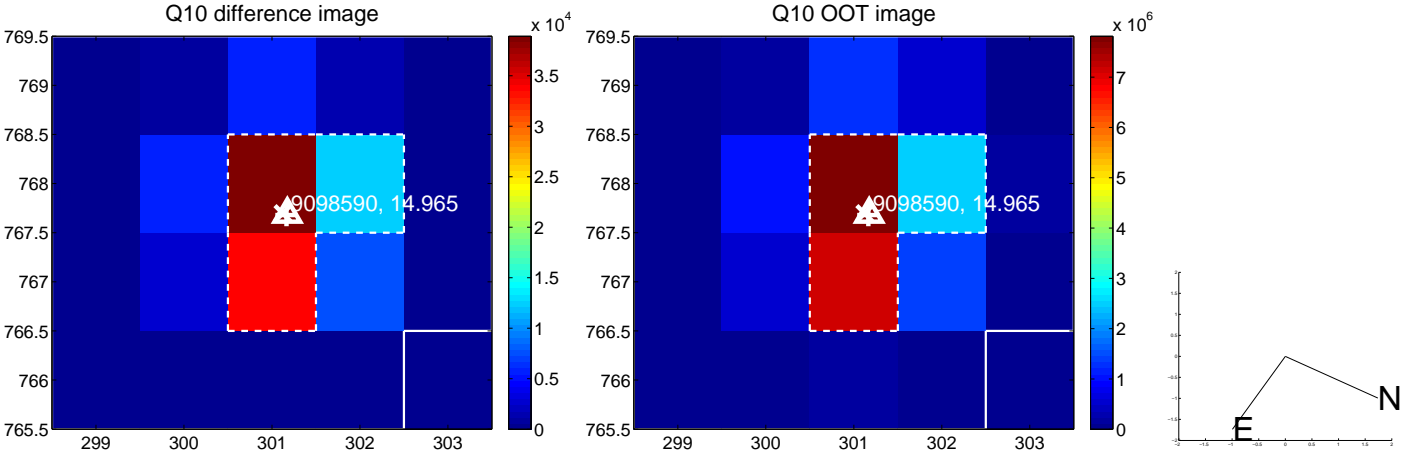
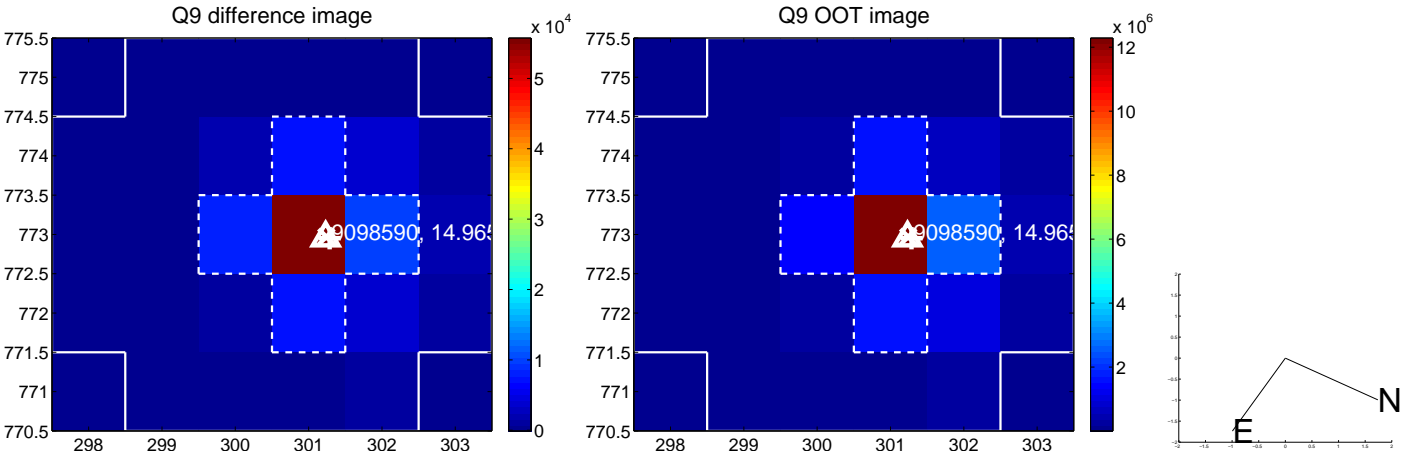
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



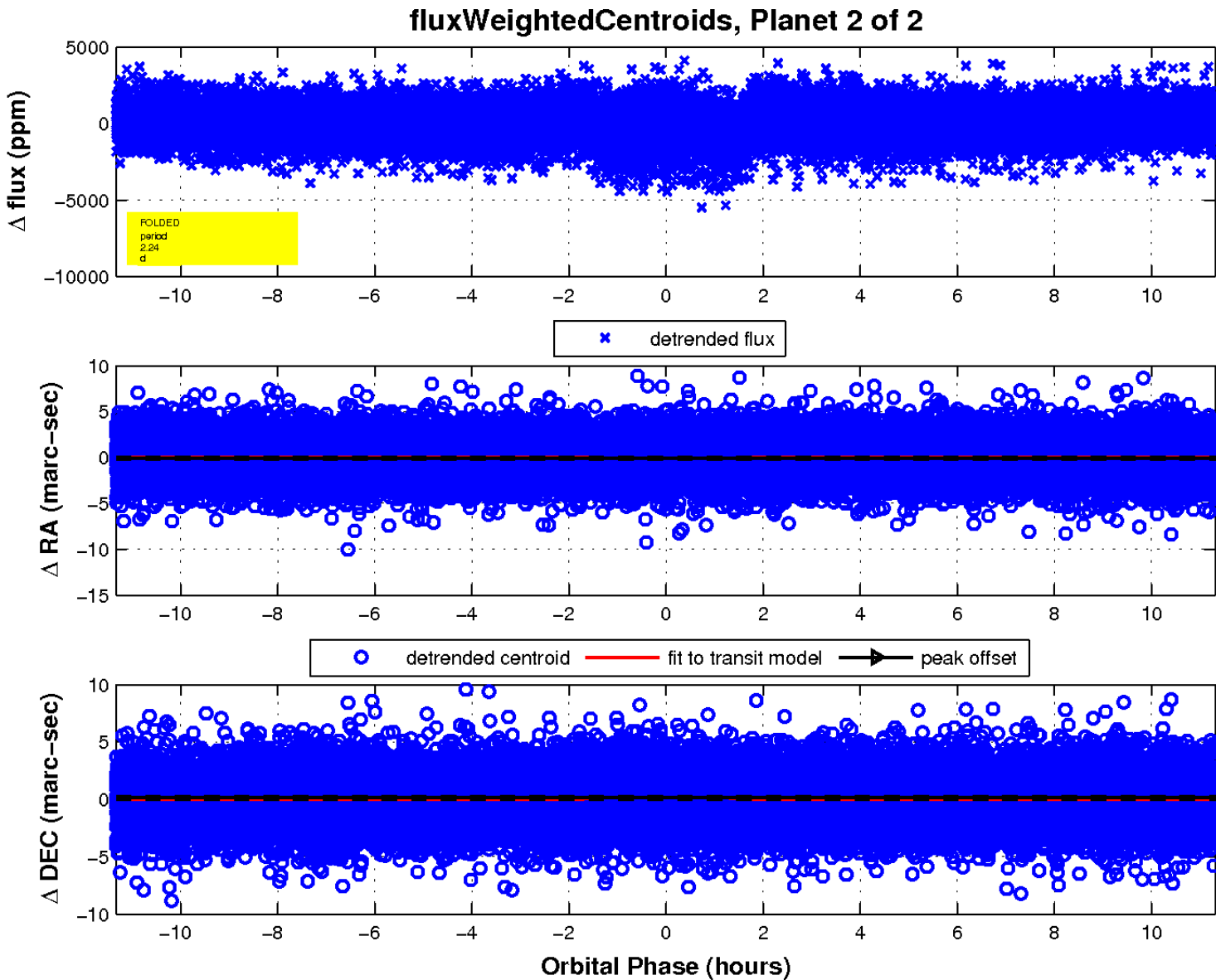
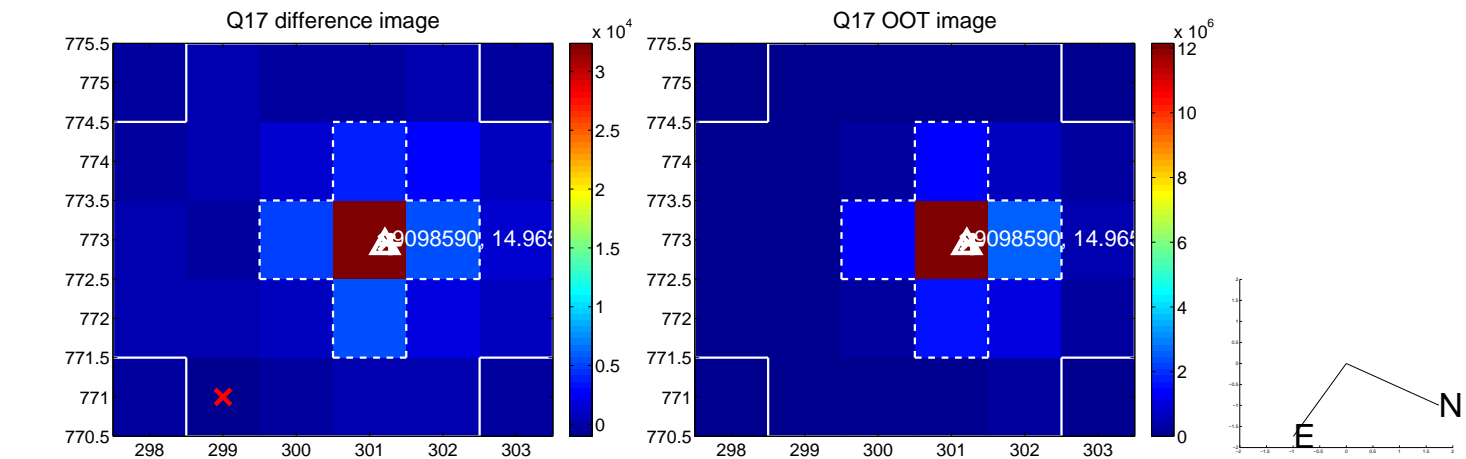
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

