

KIC 009645084

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})
009645084-01	OBS	No	494.851343	190.177670	1216.0	4.456	14.9	9.6	1.82	4848	6.46	1.12
009645084-02	OBS	No	483.364428	295.617791	797.6	4.453	9.8	6.4	1.82	4848	5.81	1.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009645084-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009645084-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

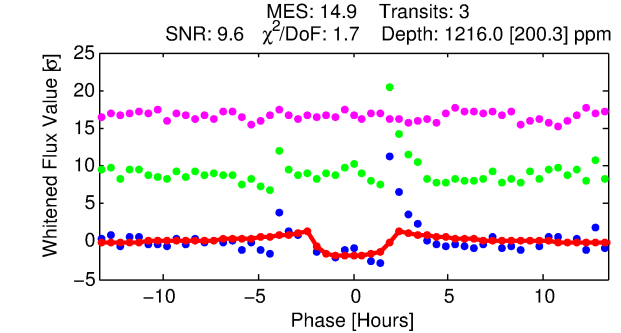
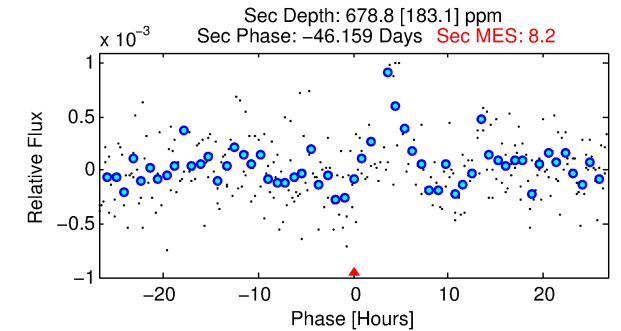
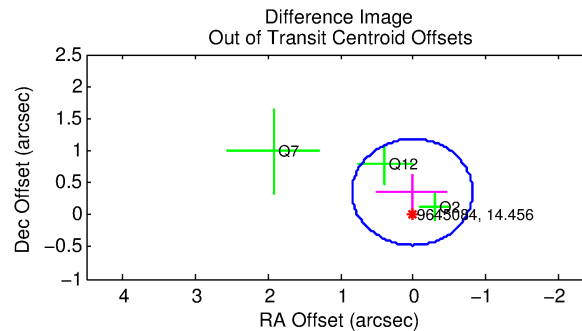
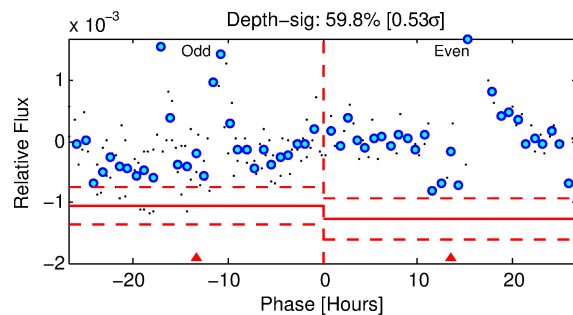
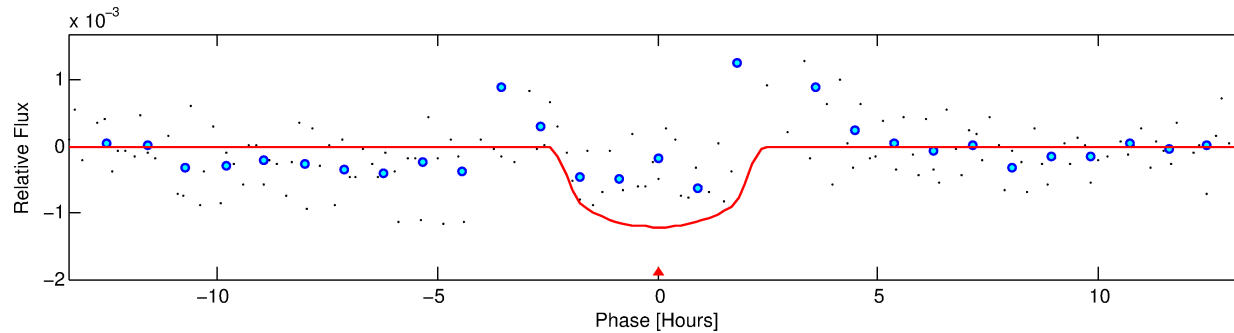
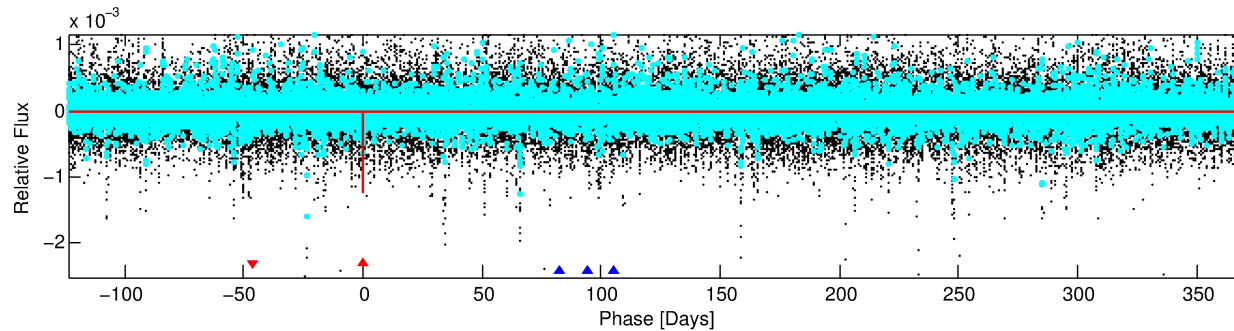
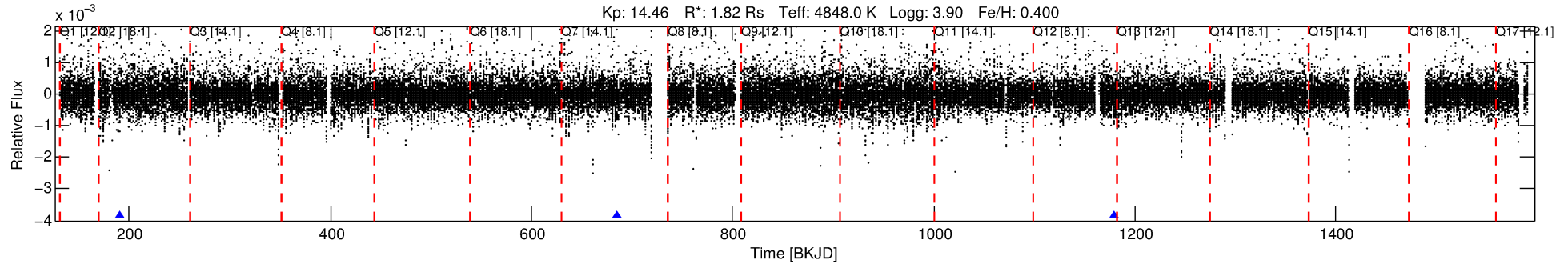
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009645084-01

No Significant Match Found

DV One-Page Summary

KIC: 9645084 Candidate: 1 of 2 Period: 494.851 d



DV Fit Results:

Period = 494.85134 [0.00682] d
Epoch = 190.1777 [0.0100] BKJD
Rp/R* = 0.0325 [0.0425]
a/R* = 738.62 [3010.72]
b = 0.55 [5.21]
Seff = 1.12 [1.31]
Teq = 262 [77] K
Rp = 6.46 [9.27] Re
a = 1.2103 [0.8158] AU
Ag = 13113.06 [37728.52] [0.35 σ]
Teff = 4340 [2858] K [1.43 σ]

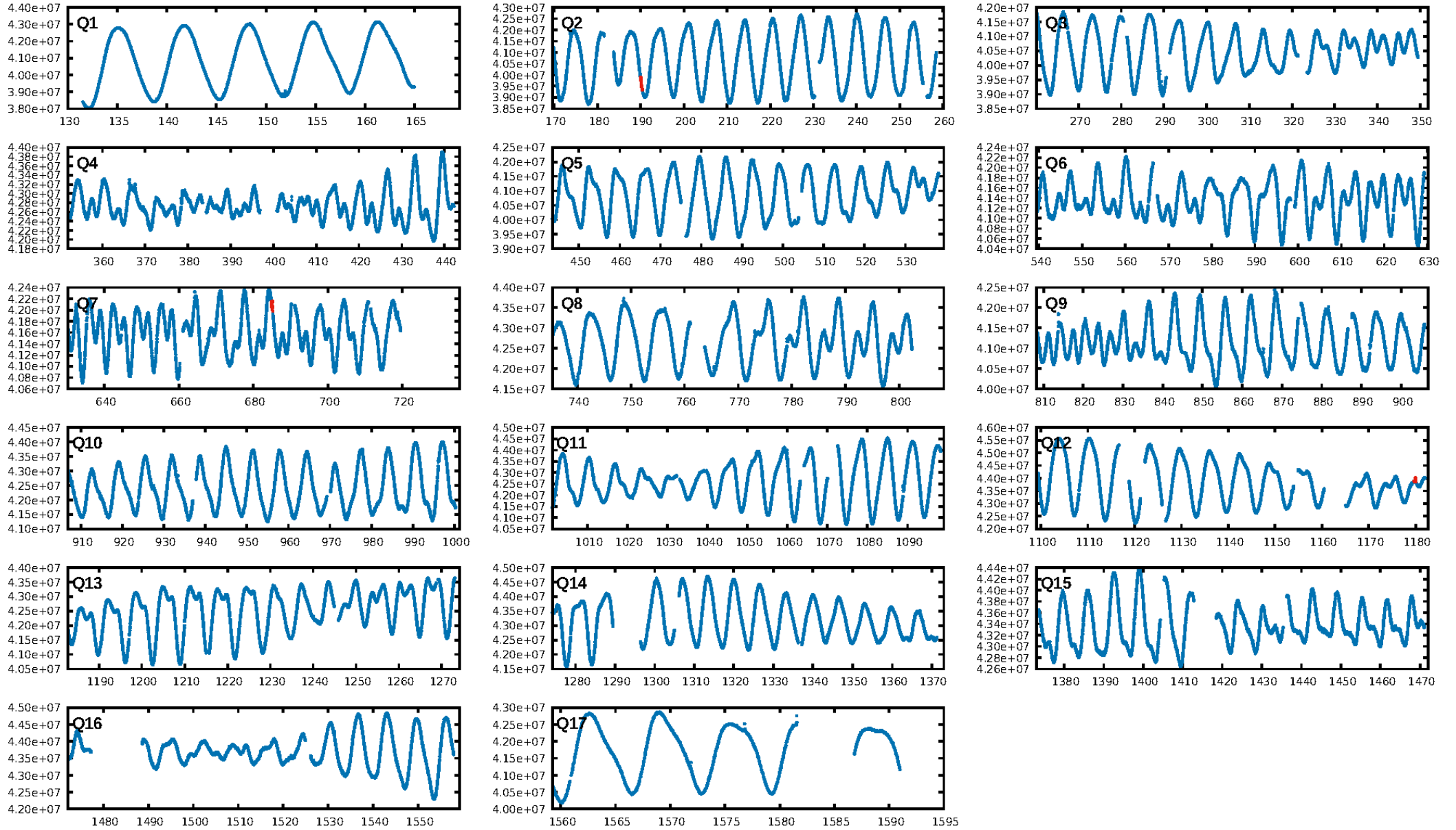
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.76 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 51.6%
ModelChiSquareGof-sig: 42.1%
Bootstrap-pfa: 6.02e-14
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.5302
Centroid-sig: 0.1%
Centroid-so: 1.714 arcsec [2.48 σ]
OotOffset-rm: 0.354 arcsec [1.28 σ]
KicOffset-rm: 0.444 arcsec [1.45 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

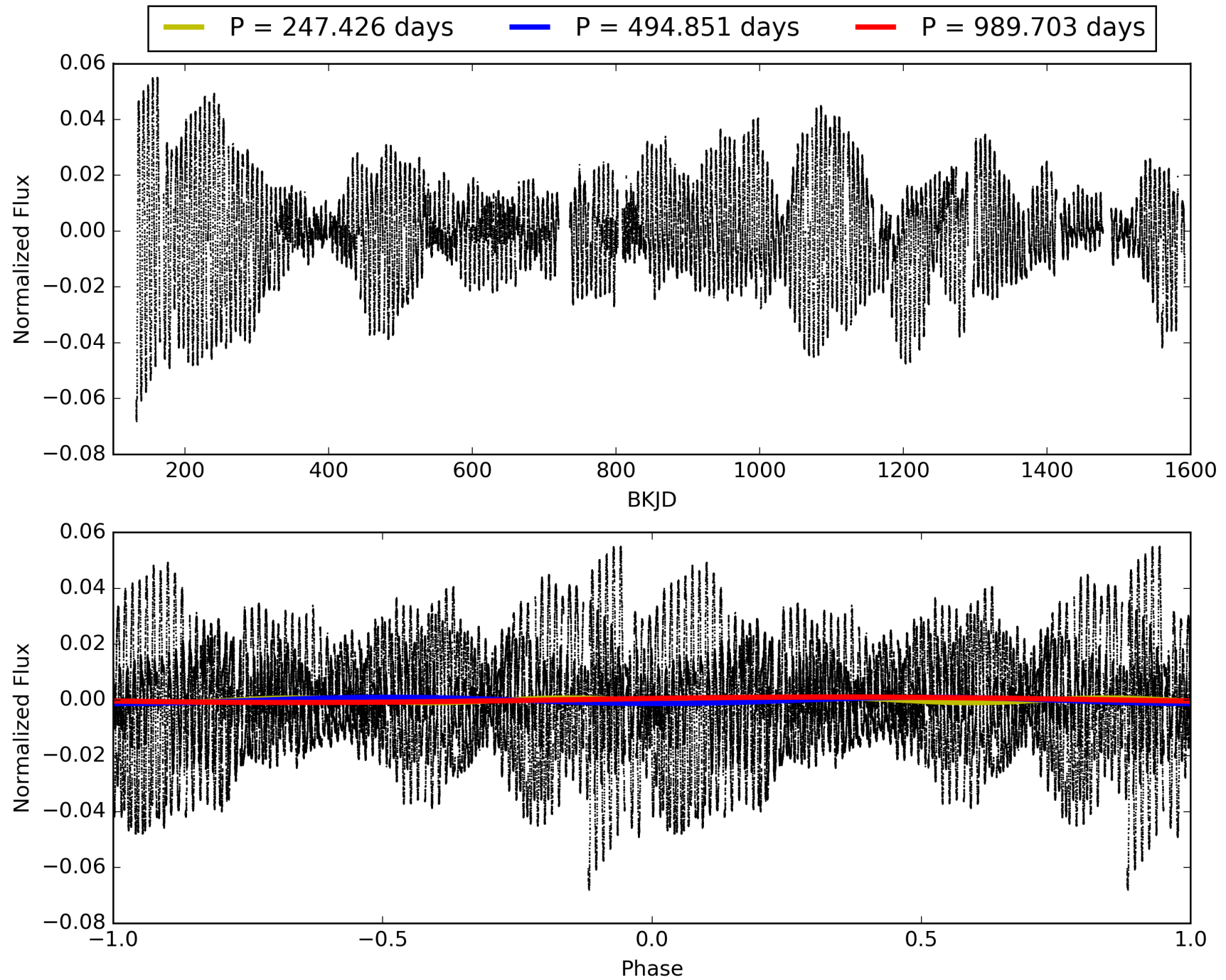
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:16:05 Z

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

TCE 009645084-01, PDC Light Curves

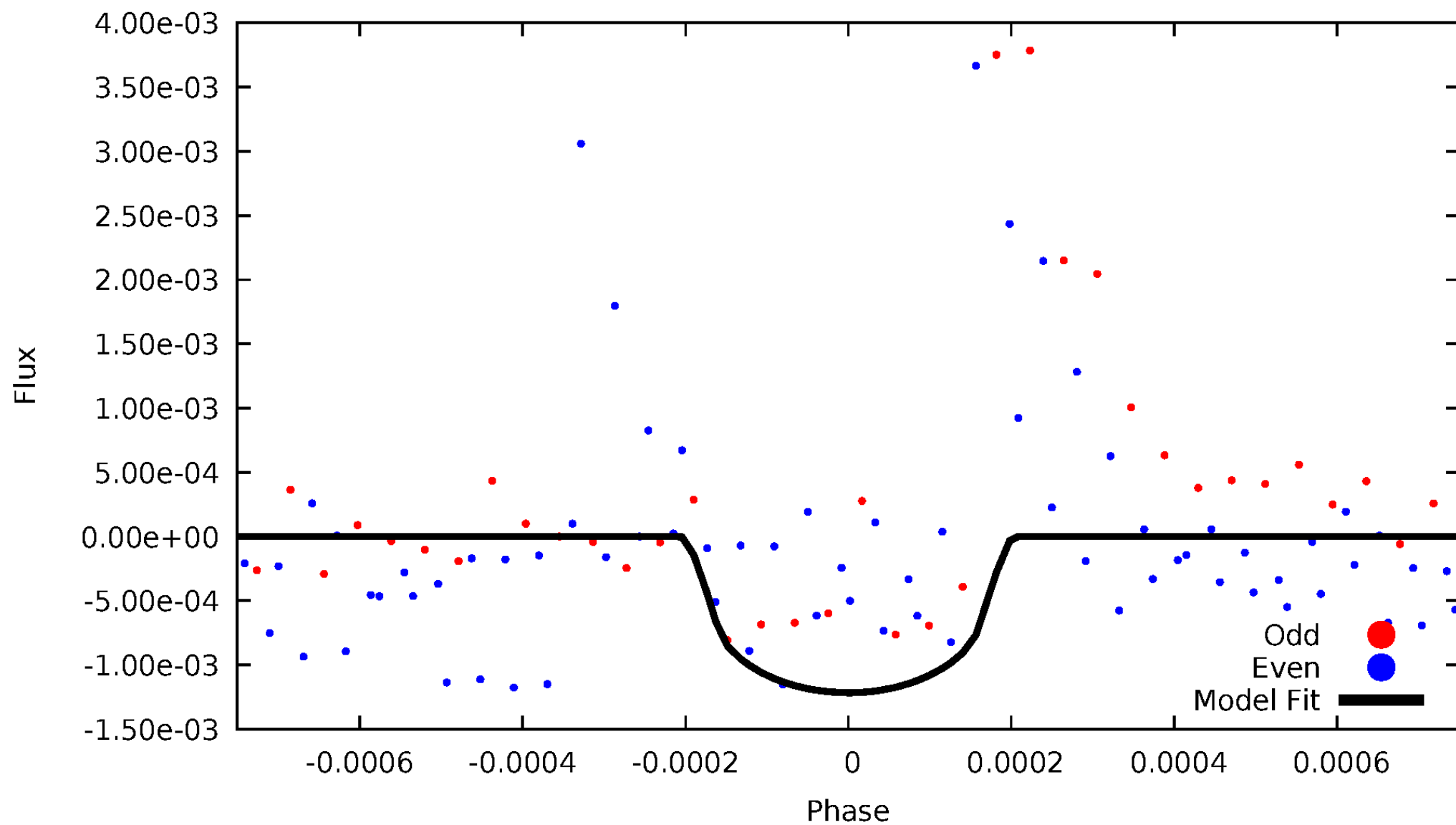


TCE 009645084-01



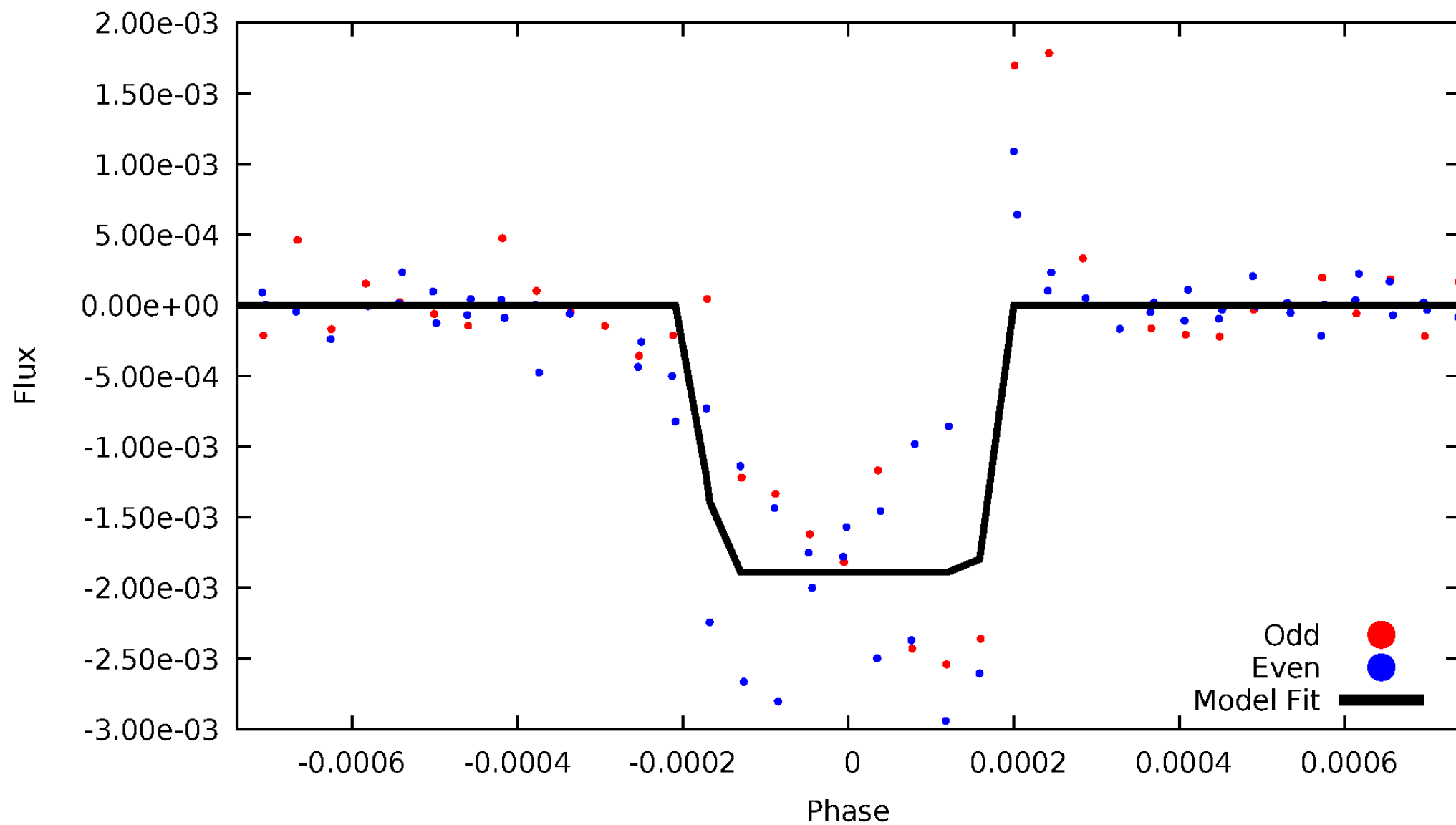
DV Odd/Even

TCE 009645084-01



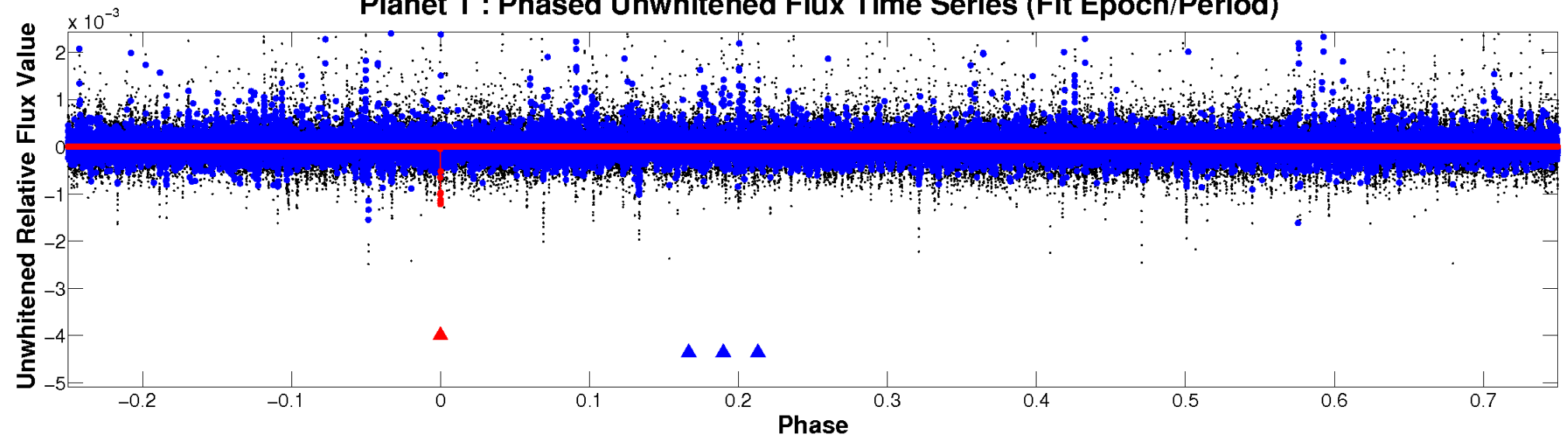
ALT Odd/Even

TCE 009645084-01

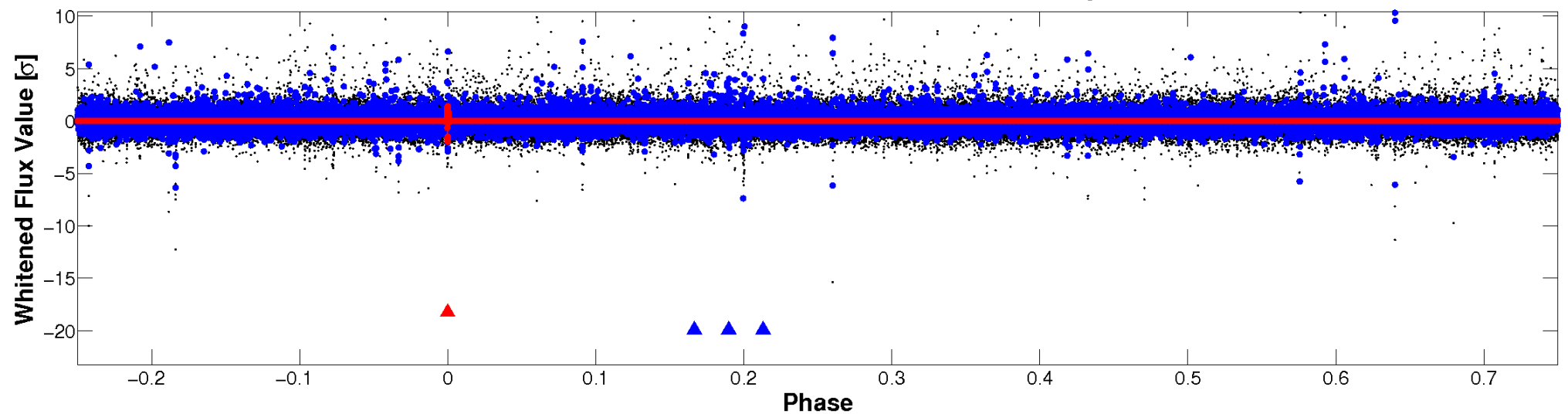


Non-Whitened Vs. Whitened Light Curve

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

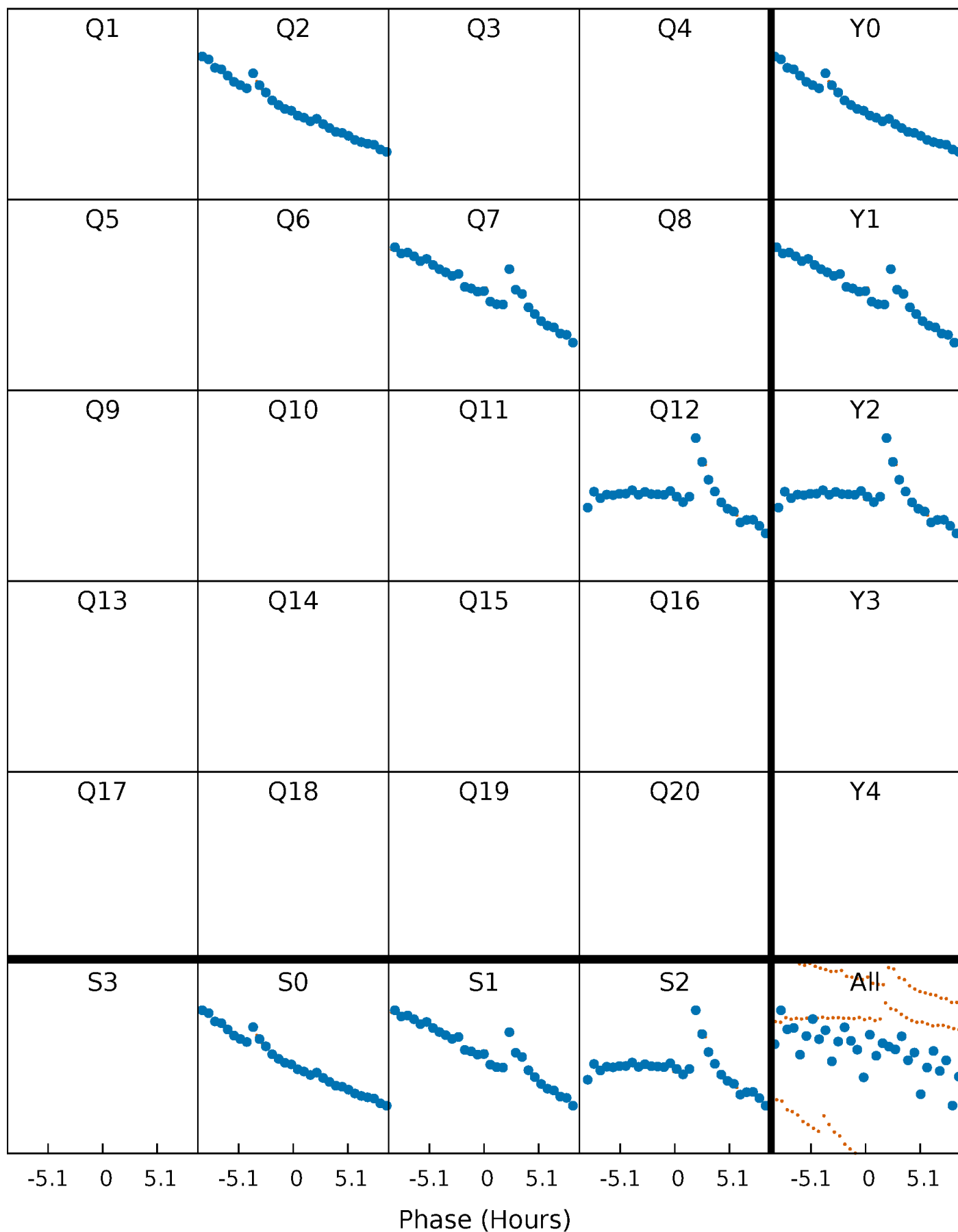


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



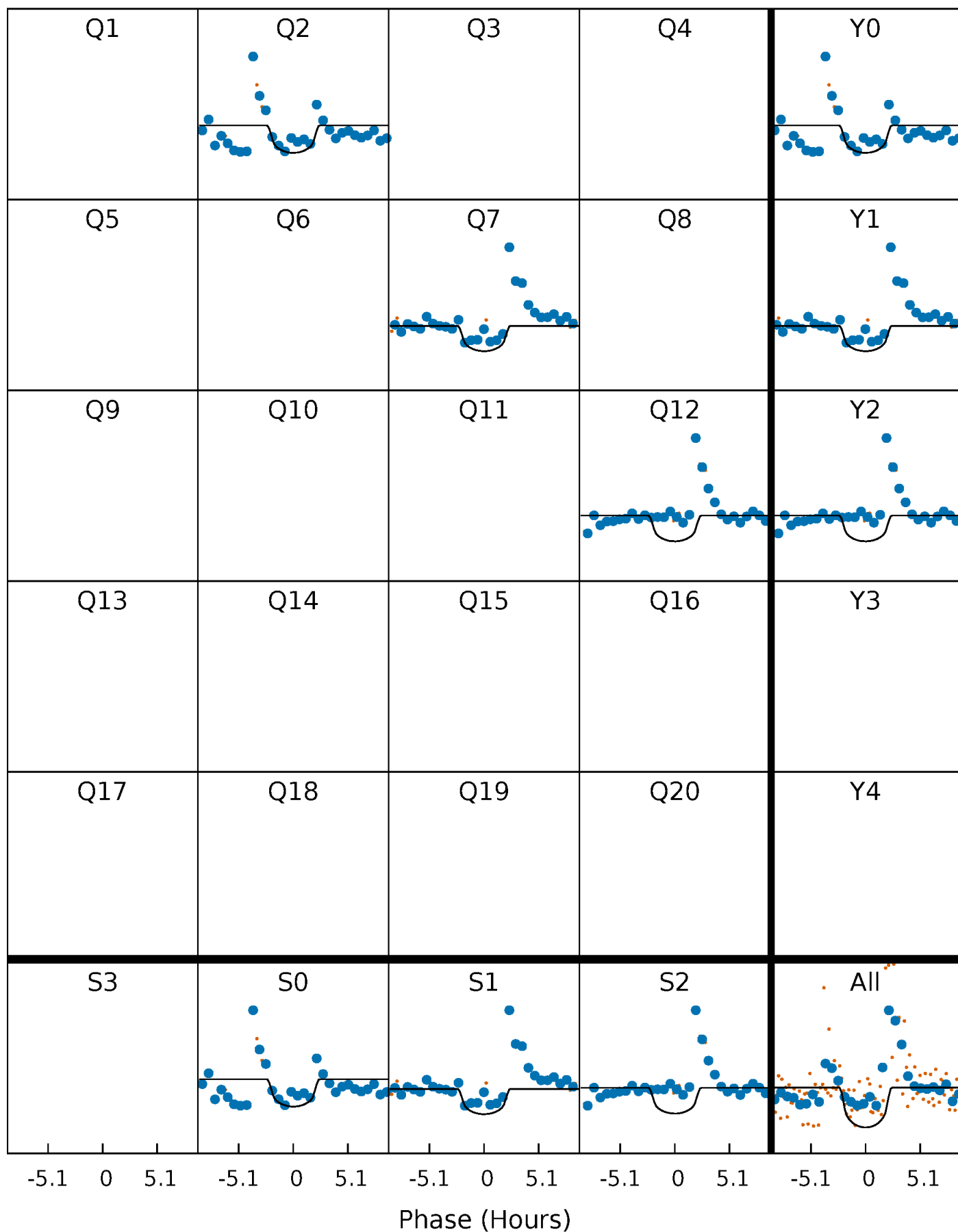
PDC Quarter-Phased Transit Curves

TCE 009645084-01 P=494.851343 Days $T_0=190.177670$ (BKJD)



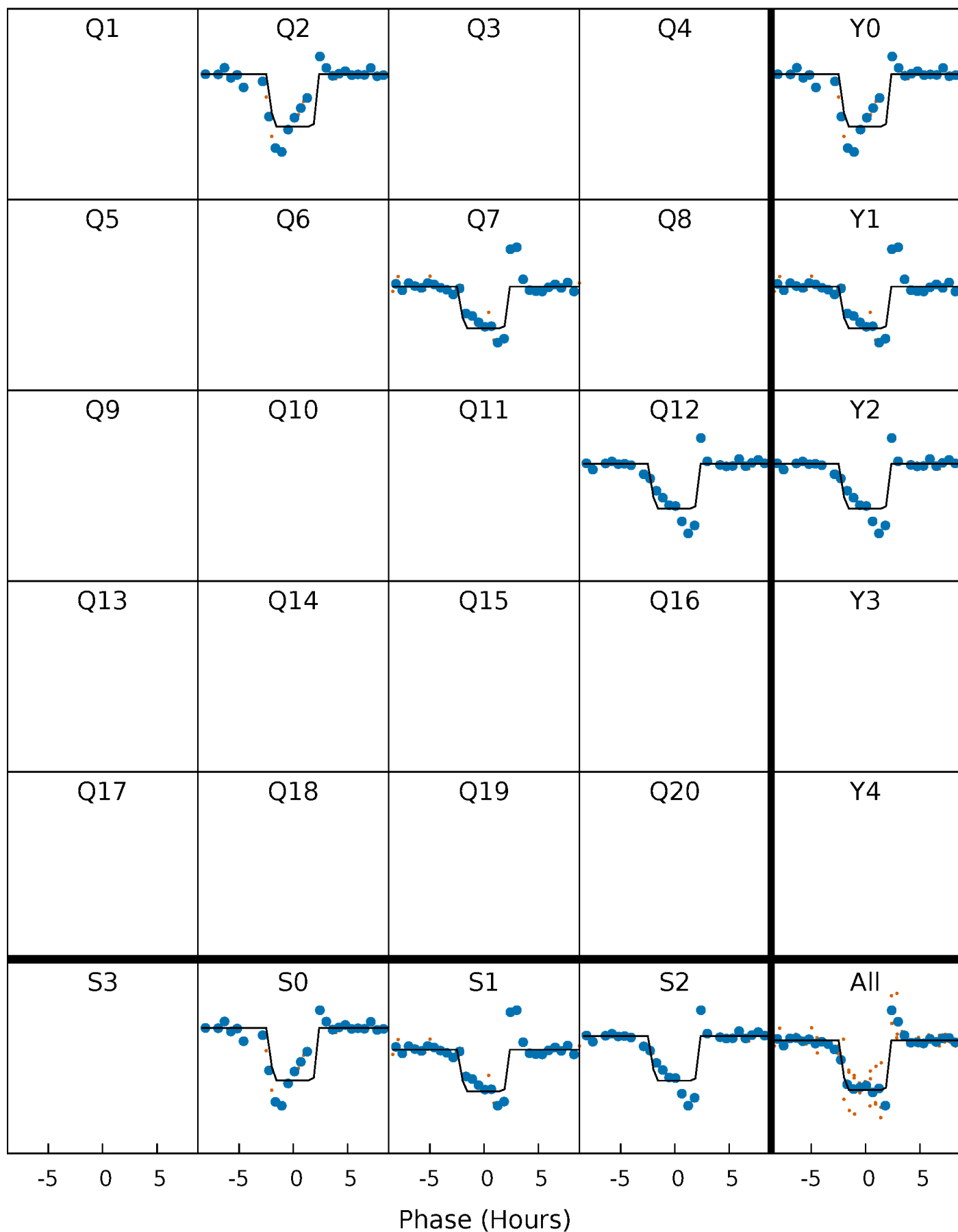
DV Quarter-Phased Transit Curves

TCE 009645084-01 P=494.851343 Days $T_0=190.177670$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

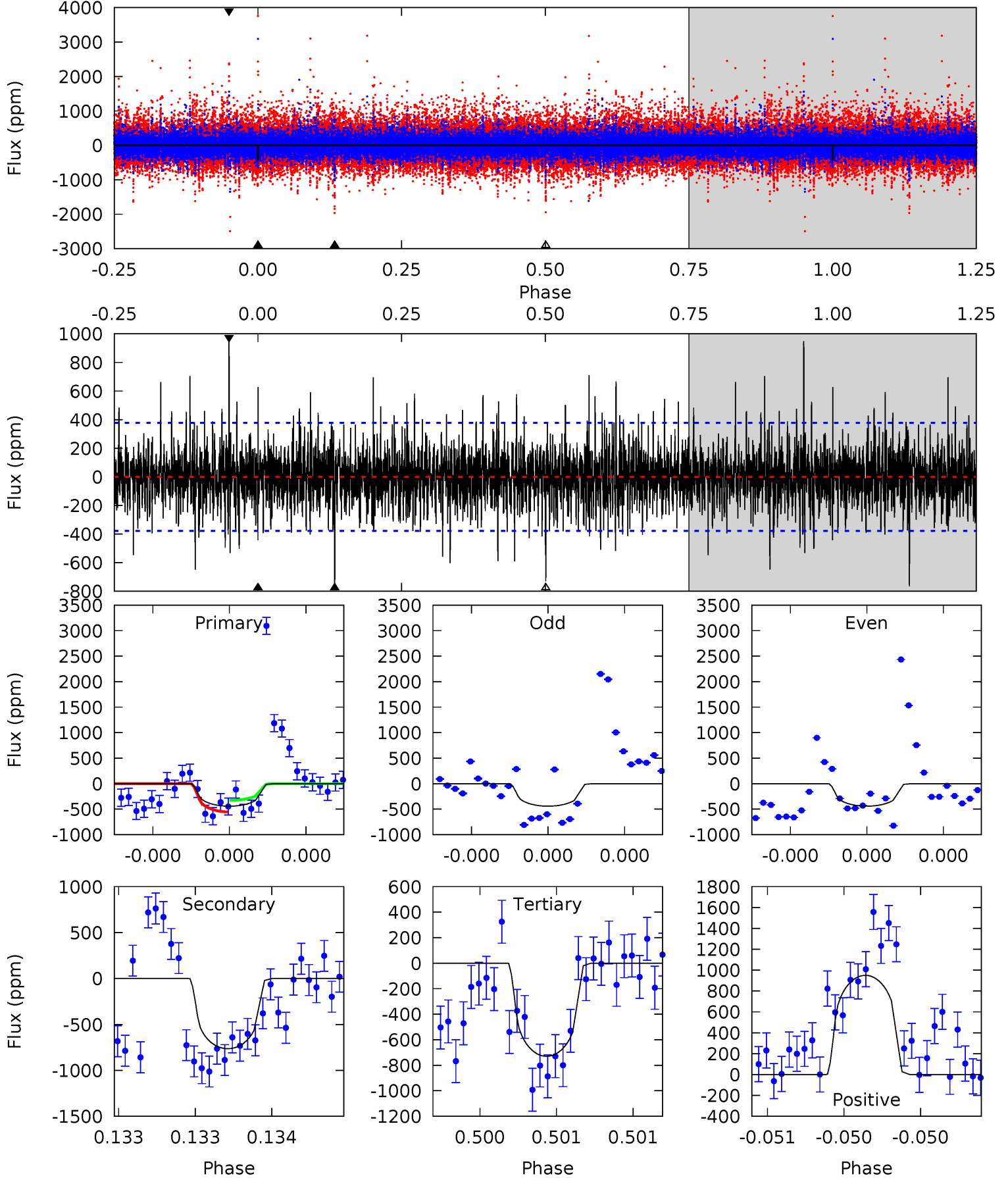
TCE 009645084-01 P=494.839522 Days $T_0=190.179934$ (BKJD)



DV Model-Shift Uniqueness Test

009645084-01, P = 494.851343 Days, E = 190.177670 Days

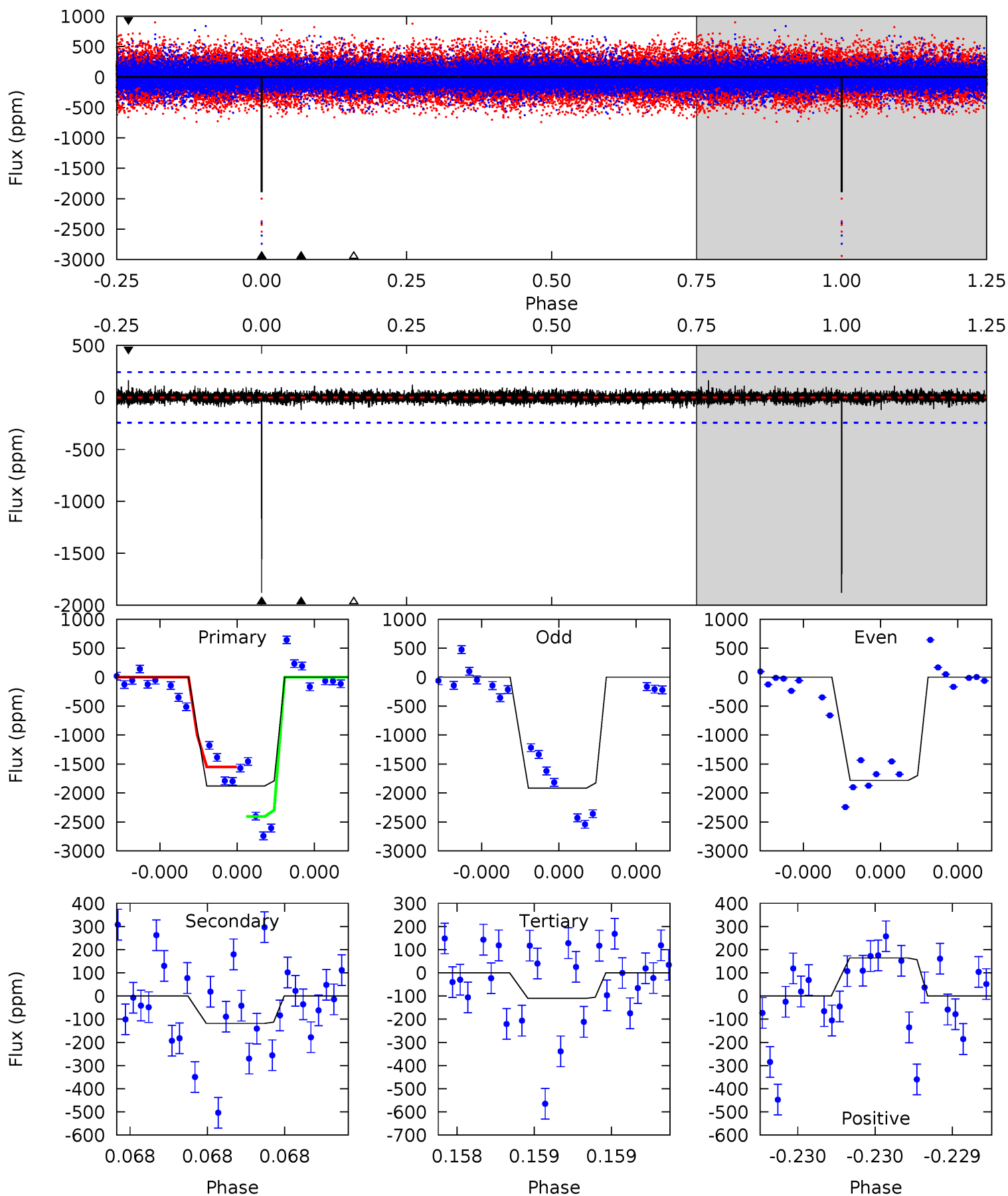
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.56	11.4	10.8	14.1	5.61	3.53	2.16	-4.28	-7.56	0.51	-2.77	0.00	0.72	0.55	1.70



Alt Model-Shift Uniqueness Test

009645084-01, P = 494.839522 Days, E = 190.179934 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.6	2.75	2.57	3.82	5.64	3.59	0.58	41.1	39.8	0.19	-1.06	1.50	1.01	0.08	9.81



Stellar Parameters For KIC 009645084

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4848^{+145}_{-121}	$3.902^{+0.714}_{-0.306}$	$0.400^{+0.050}_{-0.250}$	$1.821^{+1.072}_{-1.072}$	$0.966^{+0.200}_{-0.163}$	$0.225^{+2.252}_{-0.166}$
	+3%/-2%	+18%/-8%	+12%/-62%	+59%/-59%	+21%/-17%	+1000%/-74%
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 009645084-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-764 ± 67	$7.95^{+7.67}_{-5.11}$	358^{+55}_{-59}	4037^{+2037}_{-714}	9606^{+67551}_{-7108}
Alt.	-118 ± 43	$8.95^{+9.37}_{-5.82}$	356^{+54}_{-59}	2903^{+1002}_{-451}	1194^{+8595}_{-944}

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 $A_{obs} \gg 1.0$

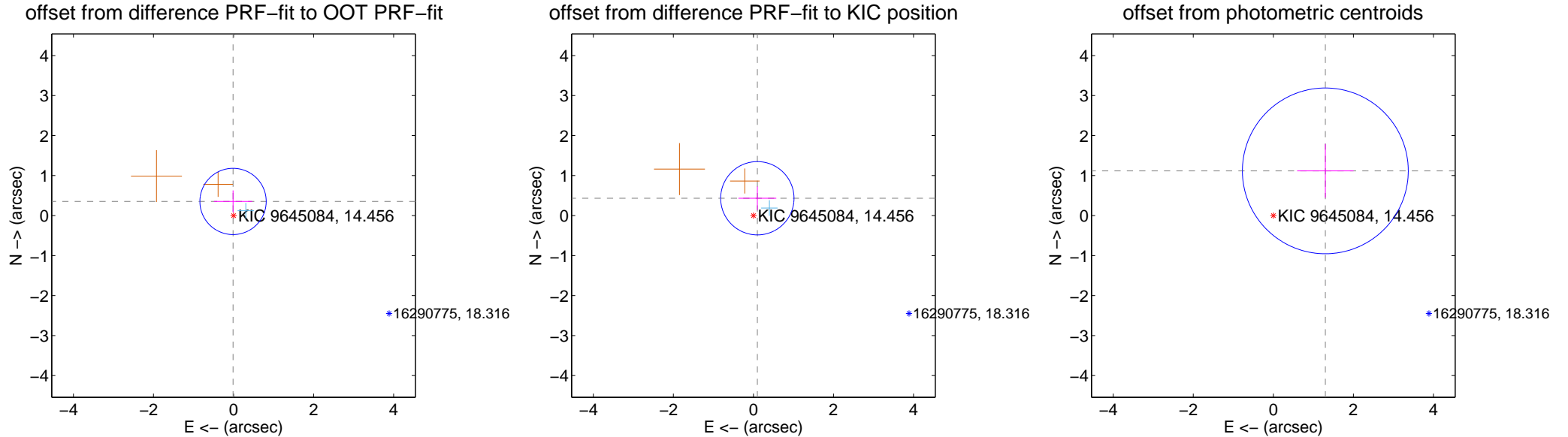
DV Centroid Data

Supplemental centroid analysis for 009645084-01. Kepler magnitude: 14.46. Transit SNR 9.61

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

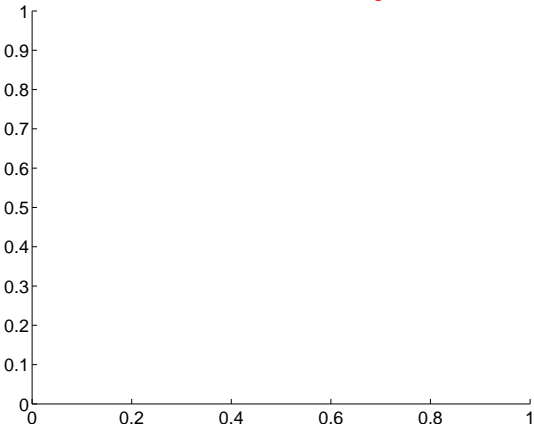
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.354 ± 0.276	1.28	0.012 ± 0.477	0.353 ± 0.276
PRF-fit source offset from KIC position	0.444 ± 0.306	1.45	-0.097 ± 0.473	0.433 ± 0.295
photometric centroid source offset	1.71 ± 0.69	2.48	-1.30 ± 0.70	1.12 ± 0.67



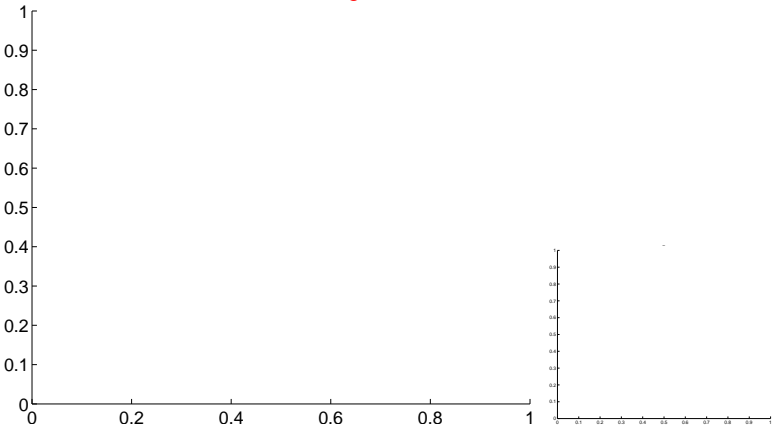
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

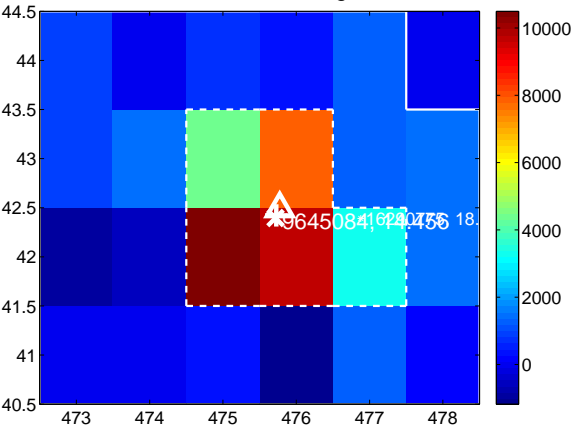
Q1 no difference image



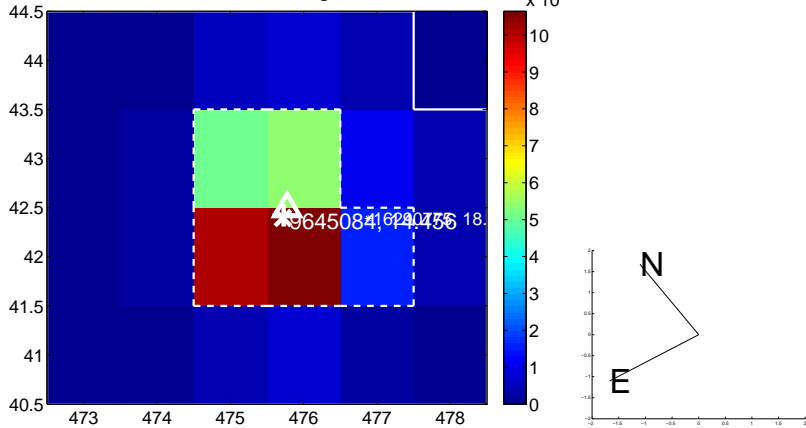
Q1 no OOT image



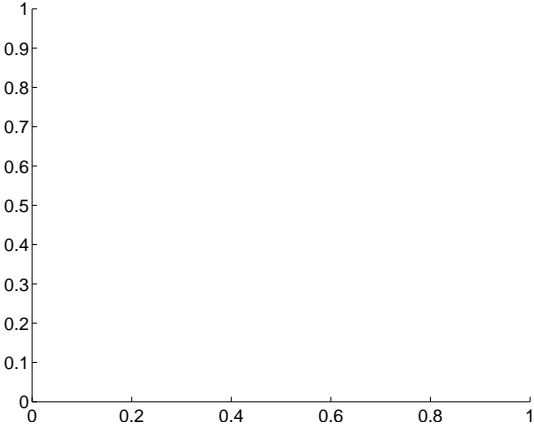
Q2 difference image



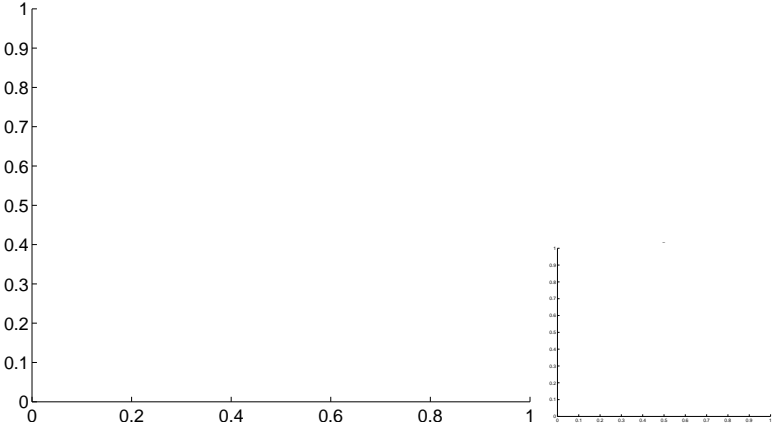
Q2 OOT image



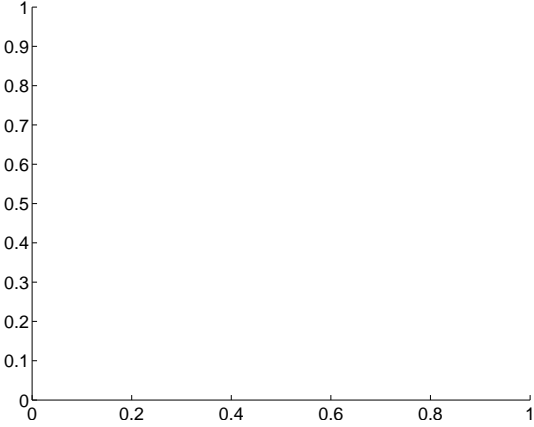
Q3 no difference image



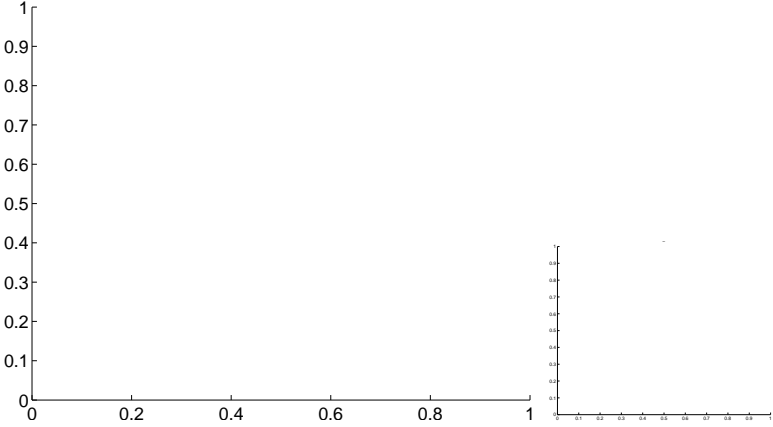
Q3 no OOT image



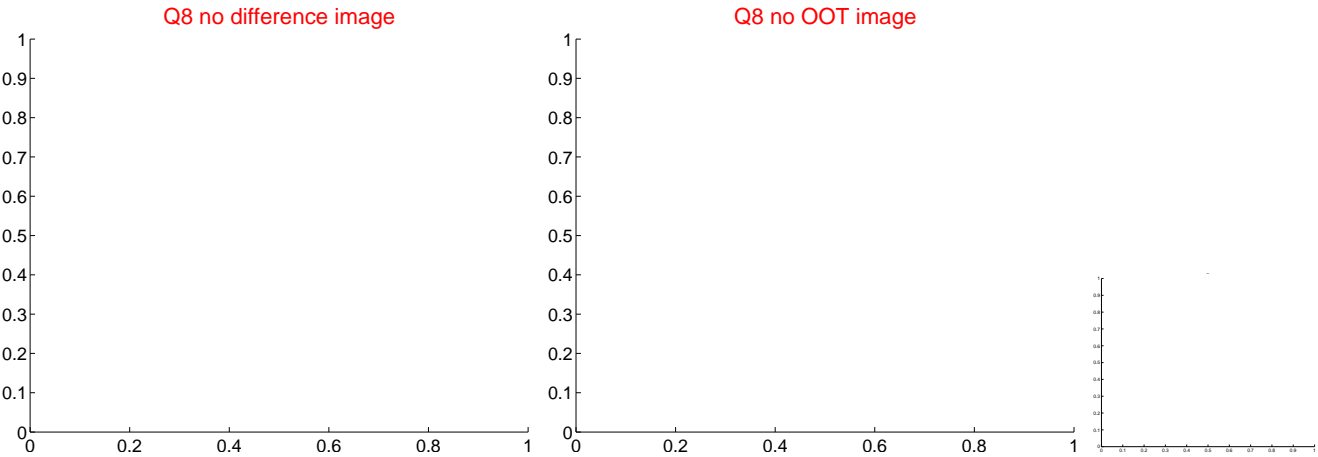
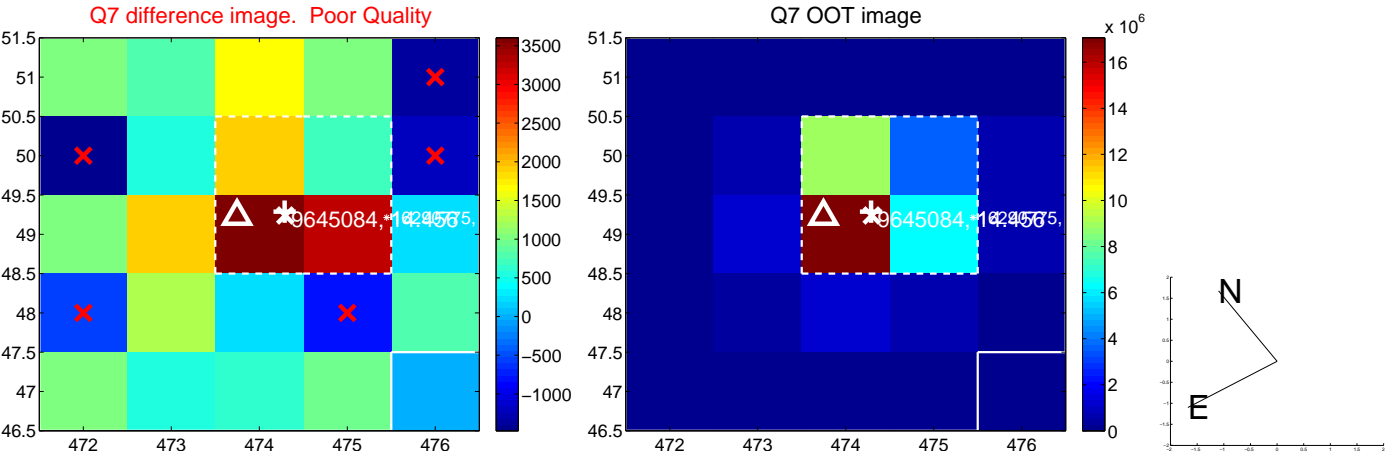
Q4 no difference image



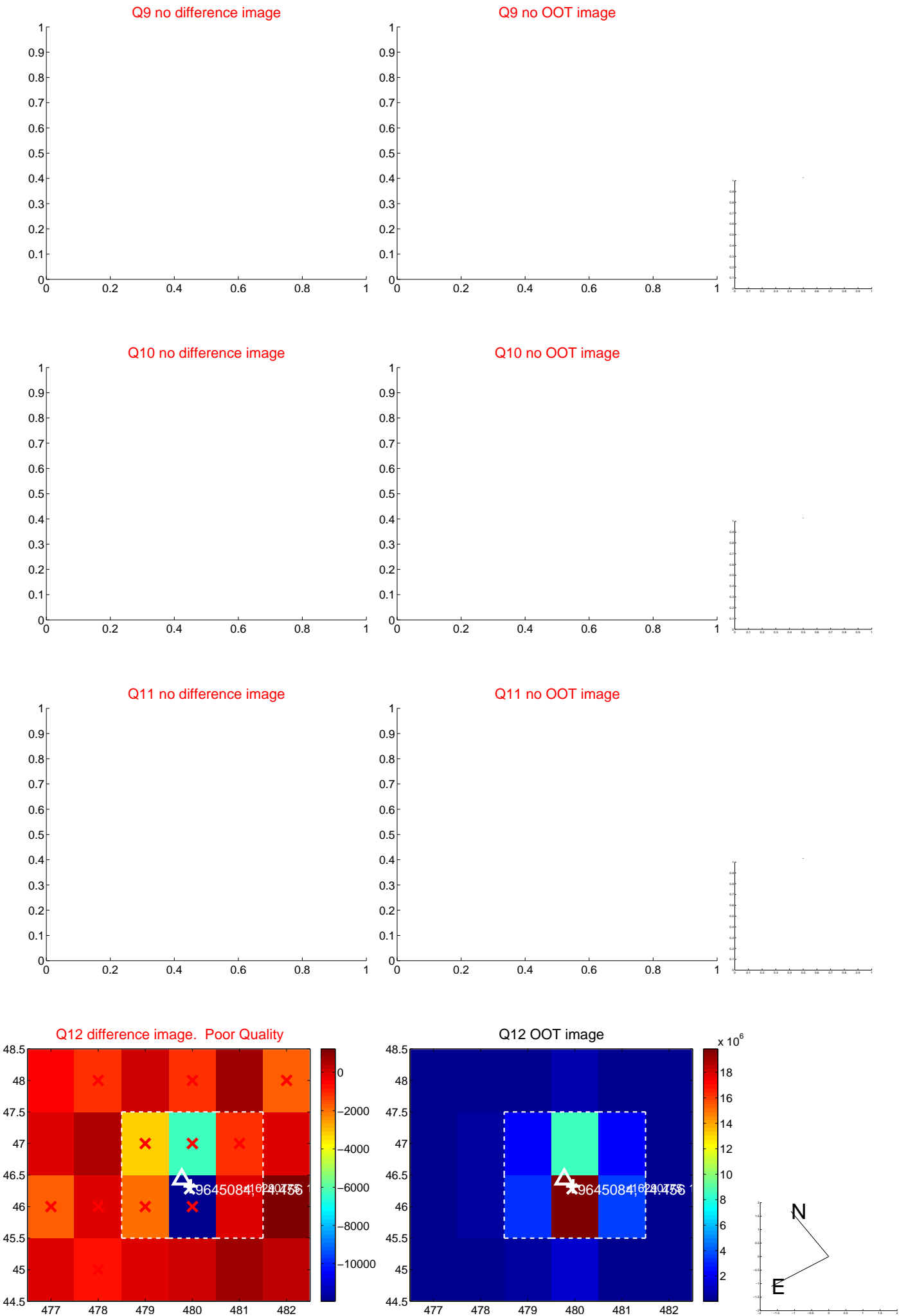
Q4 no OOT image



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



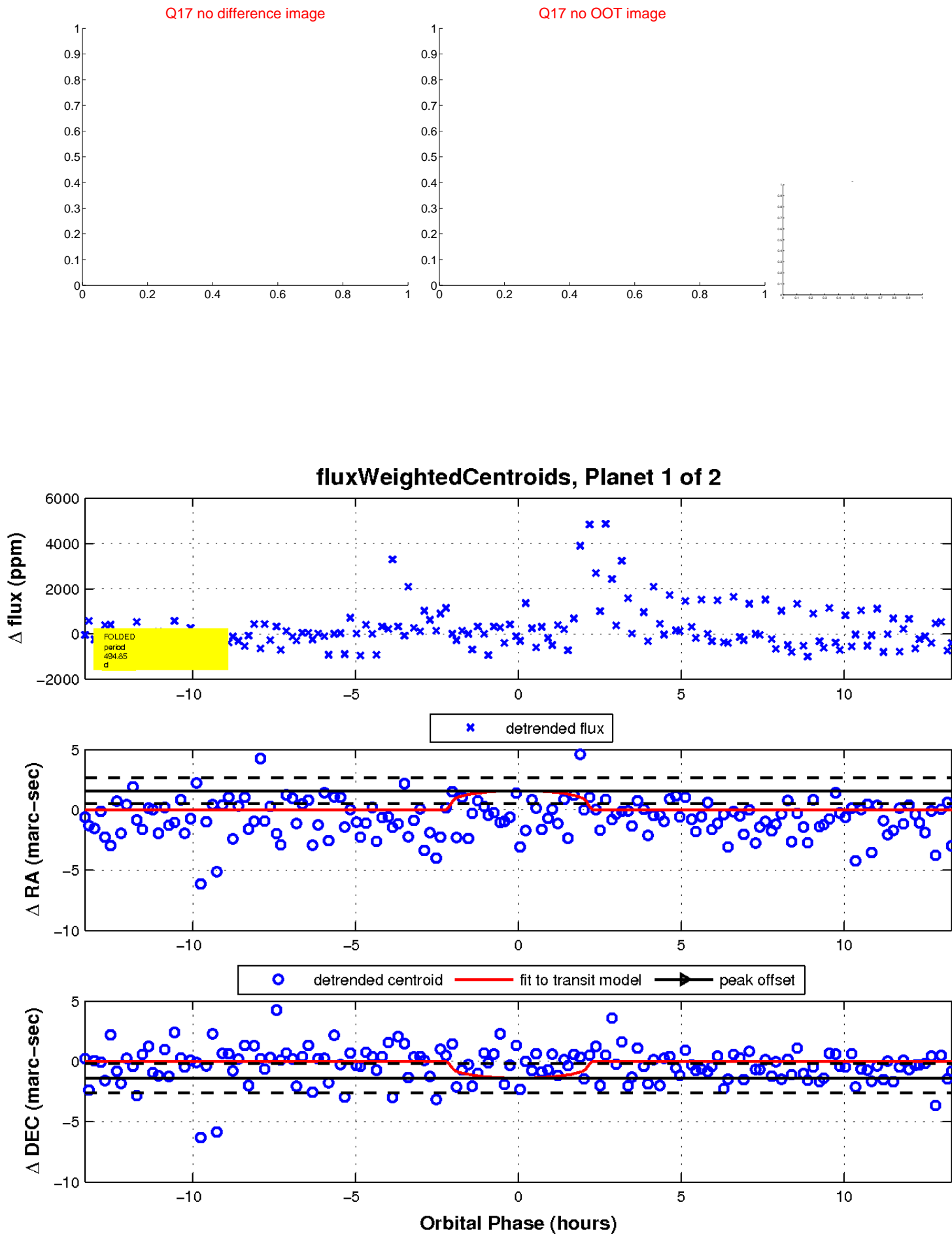
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

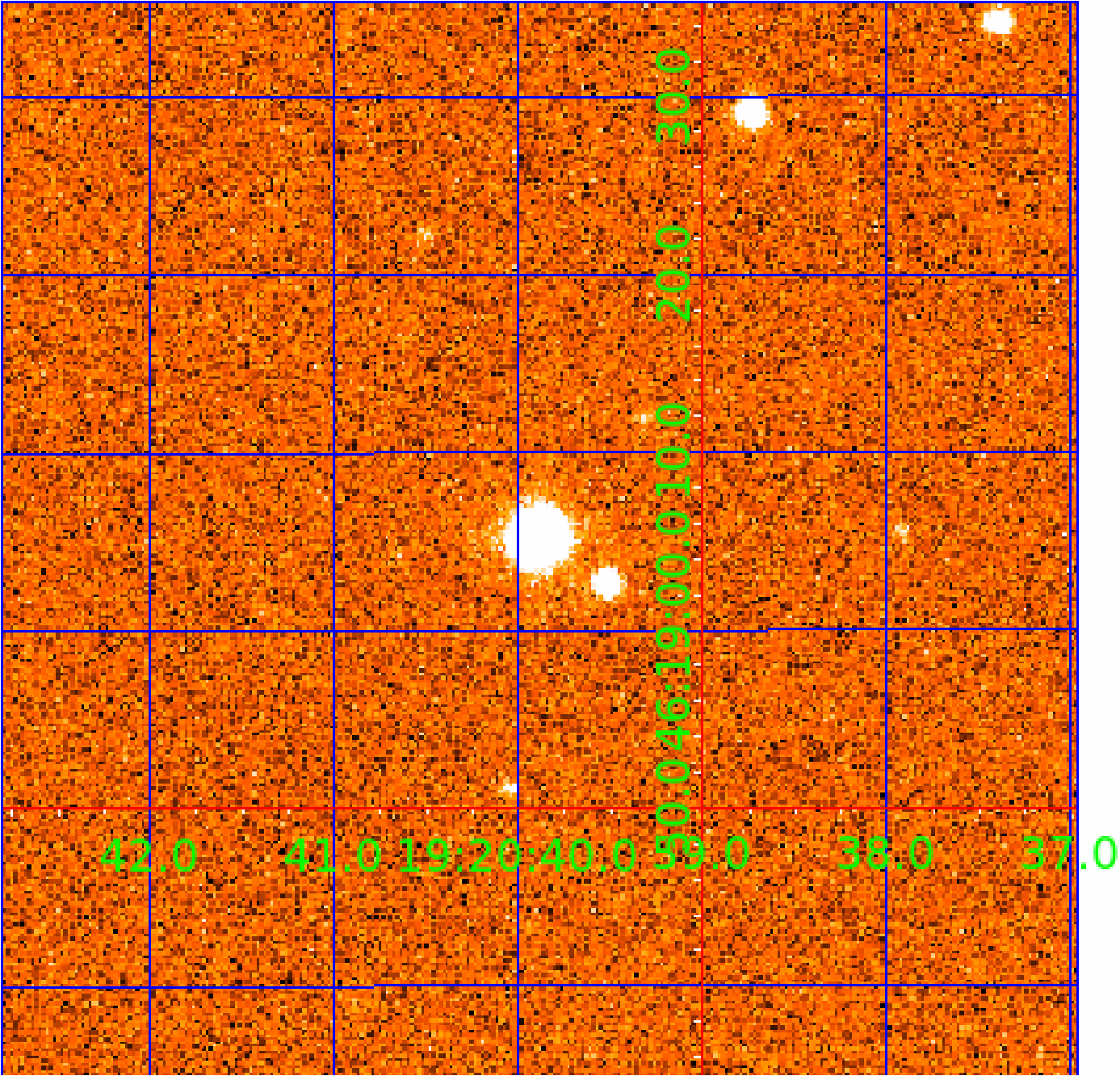


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009645084

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})
009645084-01	OBS	No	494.851343	190.177670	1216.0	4.456	14.9	9.6	1.82	4848	6.46	1.12
009645084-02	OBS	No	483.364428	295.617791	797.6	4.453	9.8	6.4	1.82	4848	5.81	1.16

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009645084-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009645084-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

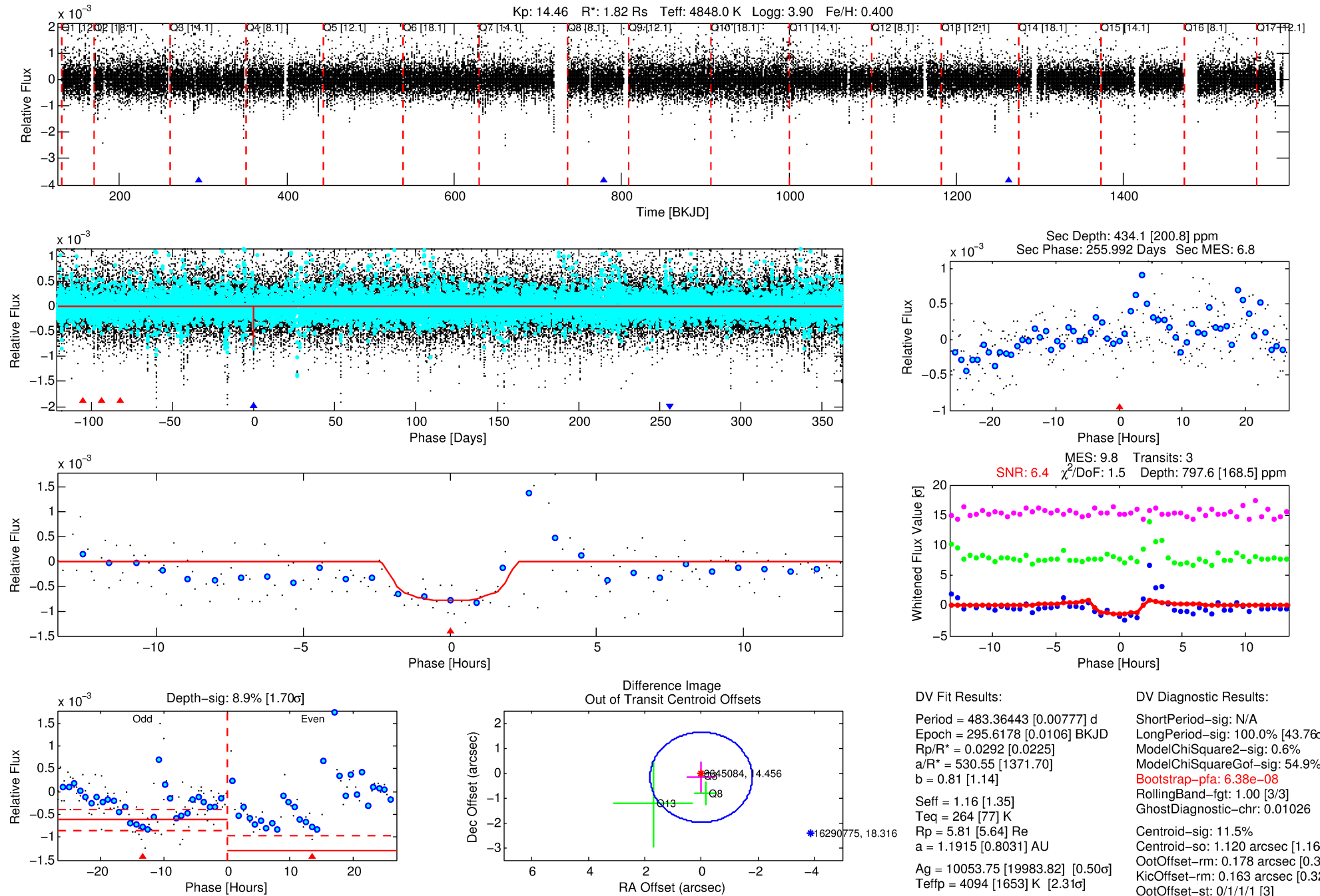
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009645084-02

No Significant Match Found

DV One-Page Summary

KIC: 9645084 Candidate: 2 of 2 Period: 483.364 d



DV Fit Results:

Period = 483.36443 [0.00777] d
Epoch = 295.6178 [0.0106] BKJD
Rp/R* = 0.0292 [0.0225]
a/R* = 530.55 [1371.70]
b = 0.81 [1.14]
Seff = 1.16 [1.35]
Teff = 264 [77] K
Rp = 5.81 [5.64] Re
a = 1.1915 [0.8031] AU
Ag = 10053.75 [19983.82] [0.50 σ]
Teffp = 4094 [1653] K [2.31 σ]

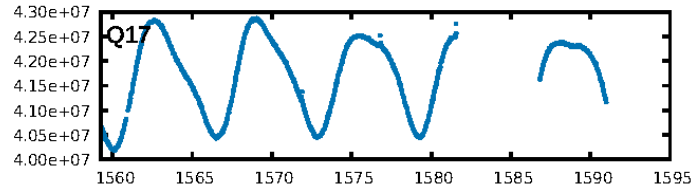
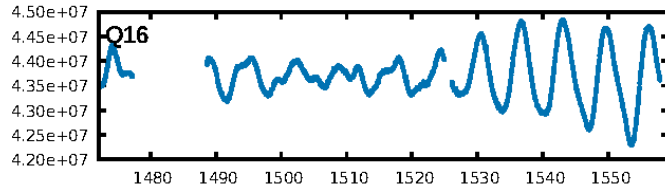
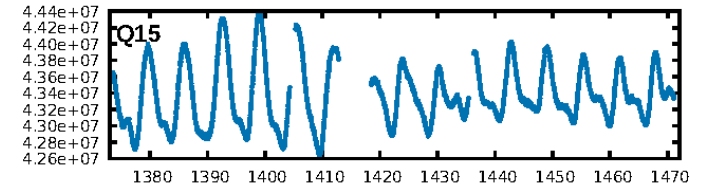
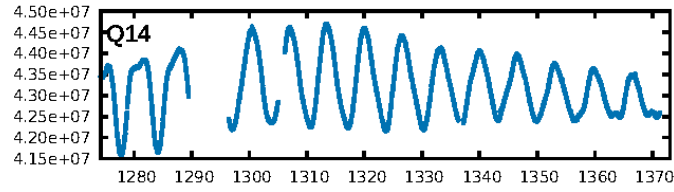
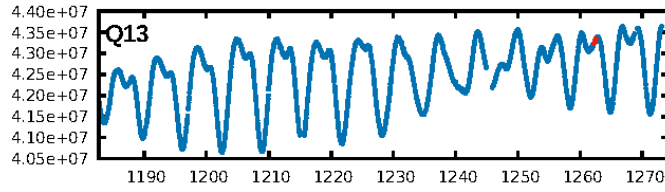
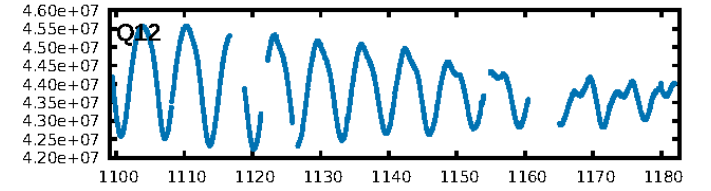
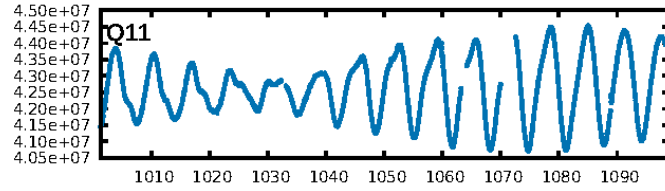
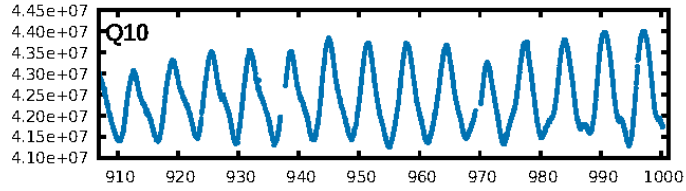
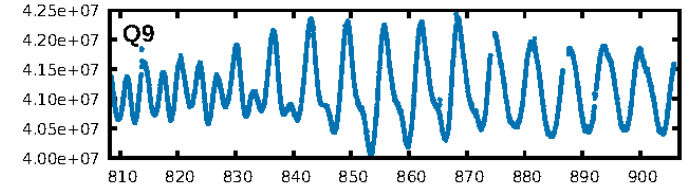
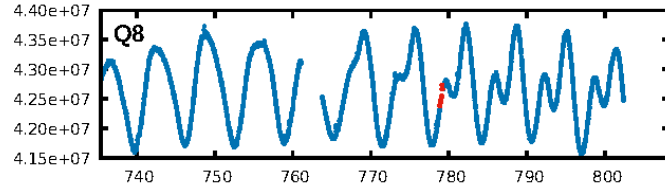
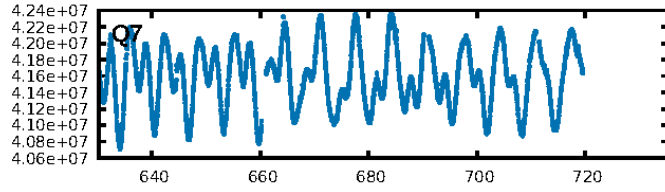
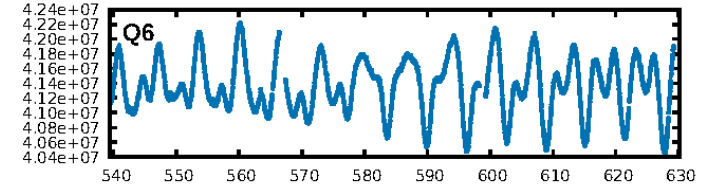
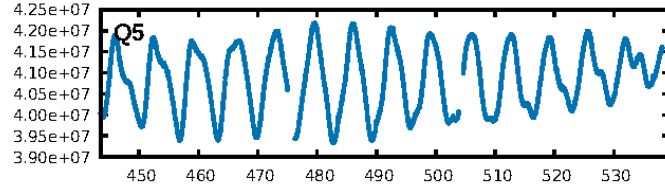
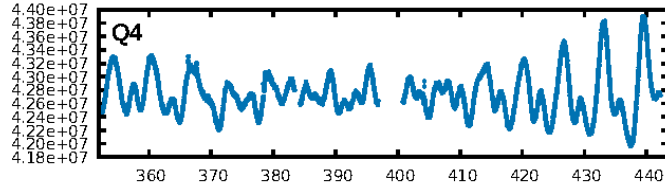
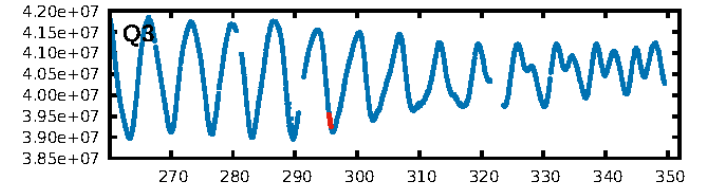
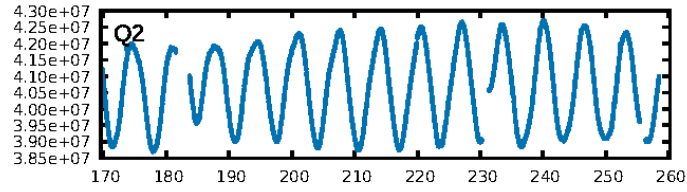
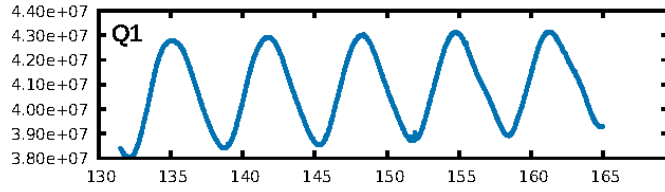
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [43.76 σ]
ModelChiSquare2-sig: 0.6%
ModelChiSquareGof-sig: 54.9%
Bootstrap-pfa: 6.38e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.01026
Centroid-sig: 11.5%
Centroid-so: 1.120 arcsec [1.16 σ]
OotOffset-rm: 0.178 arcsec [0.30 σ]
KicOffset-rm: 0.163 arcsec [0.32 σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

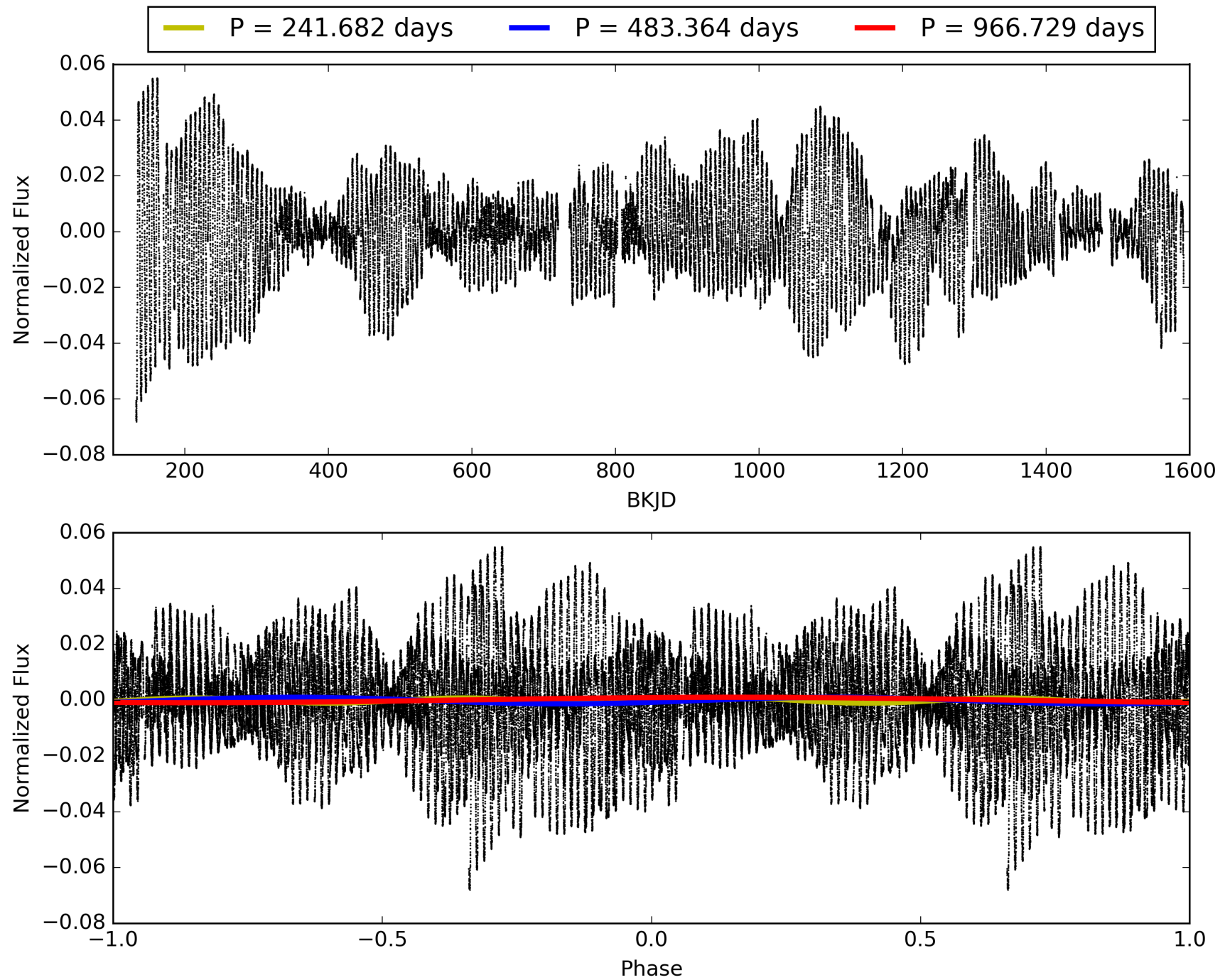
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 11:16:22 Z

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

TCE 009645084-02, PDC Light Curves

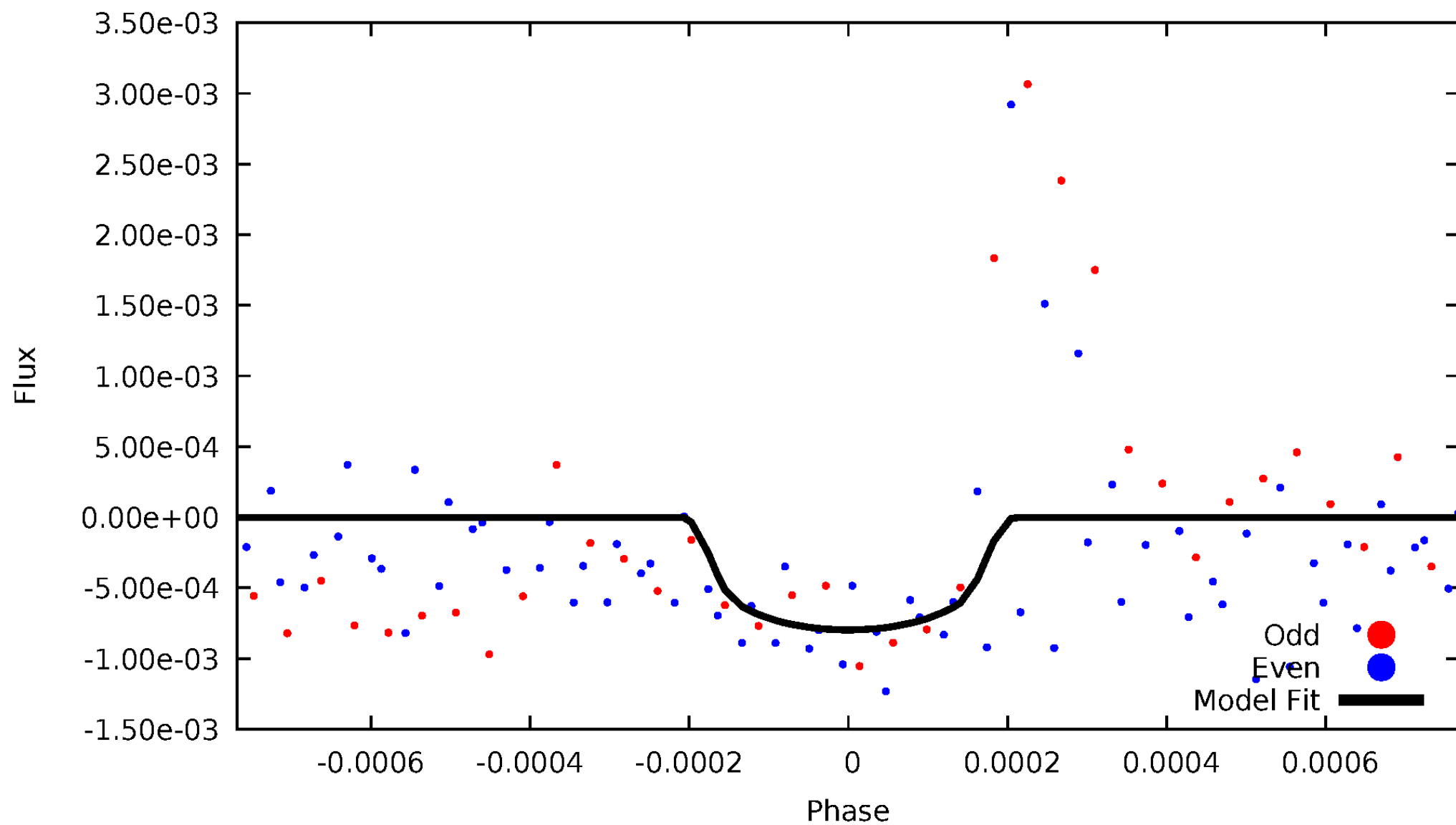


TCE 009645084-02



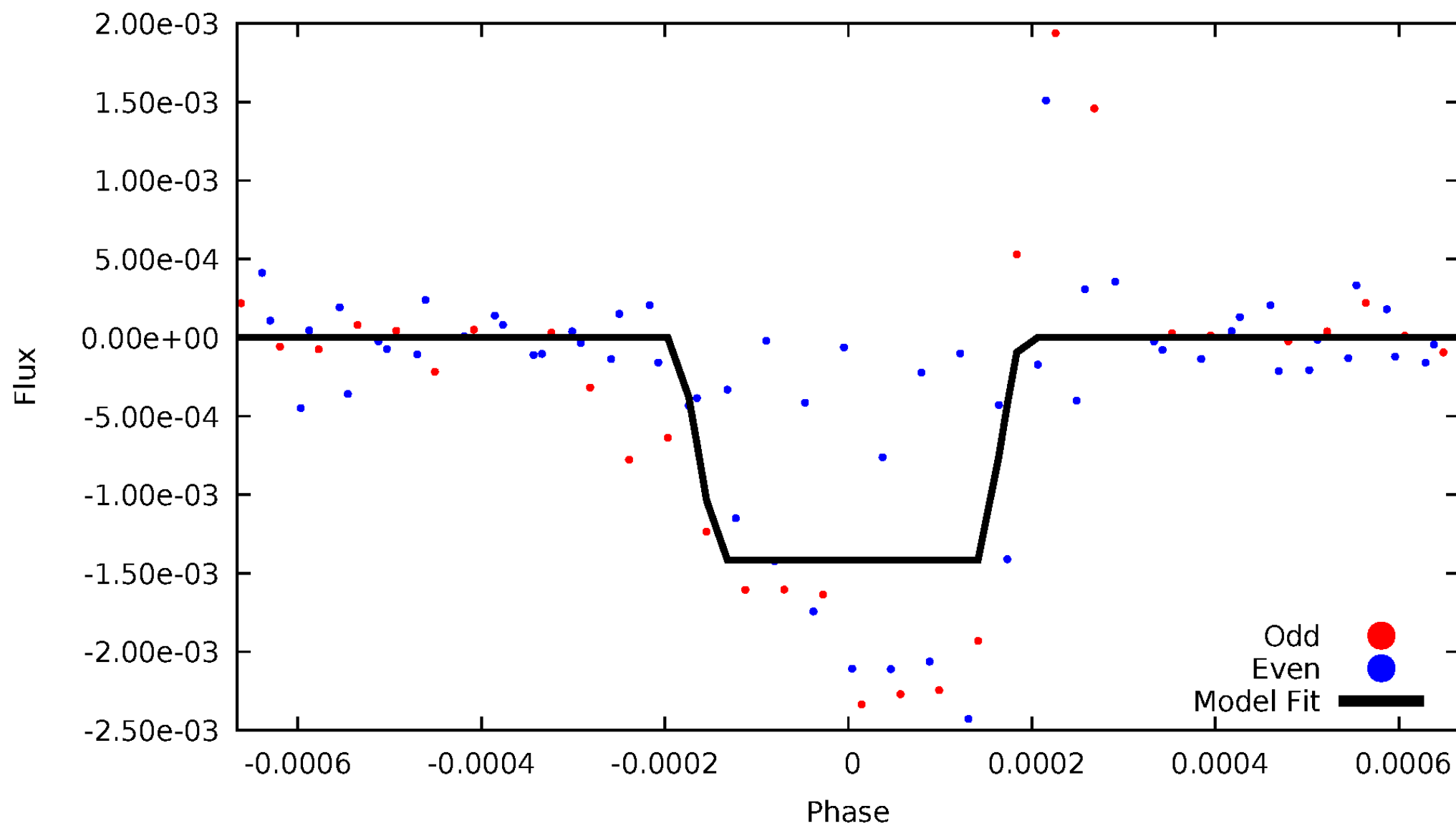
DV Odd/Even

TCE 009645084-02



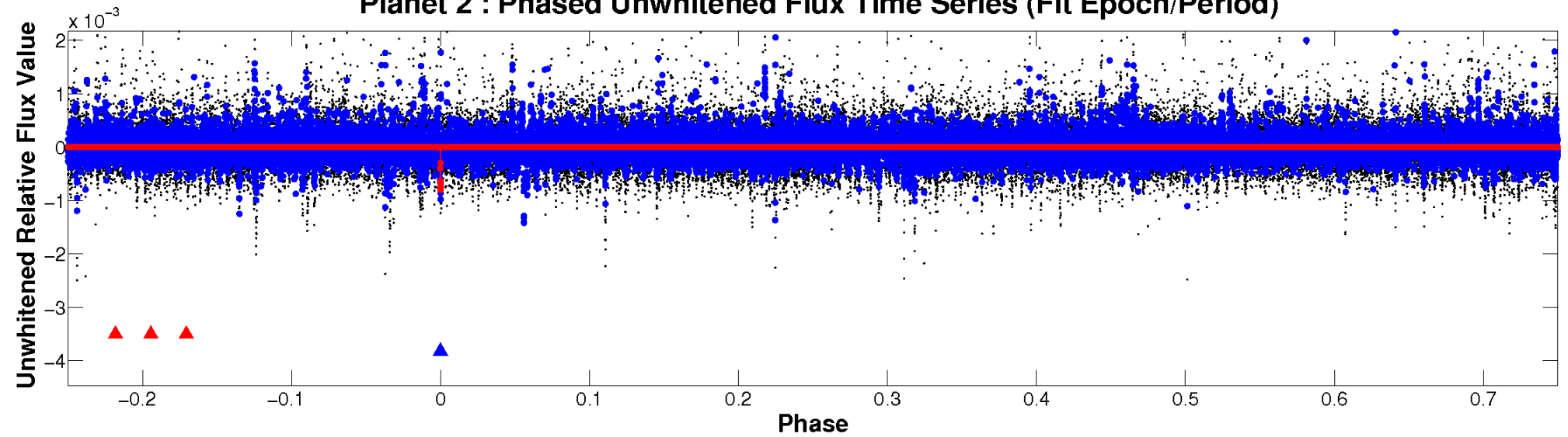
ALT Odd/Even

TCE 009645084-02

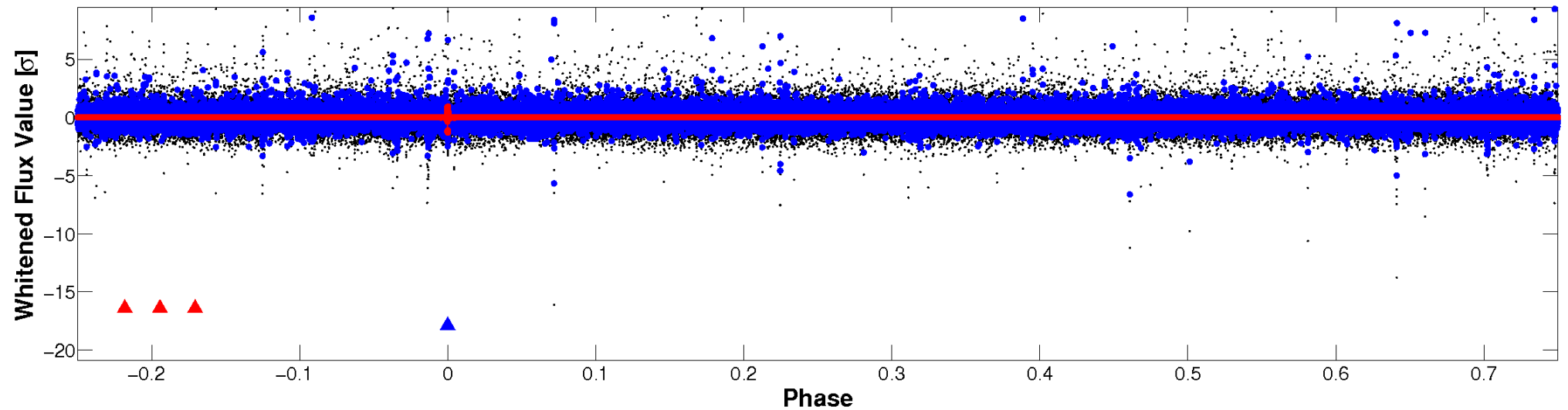


Non-Whitened Vs. Whitened Light Curve

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

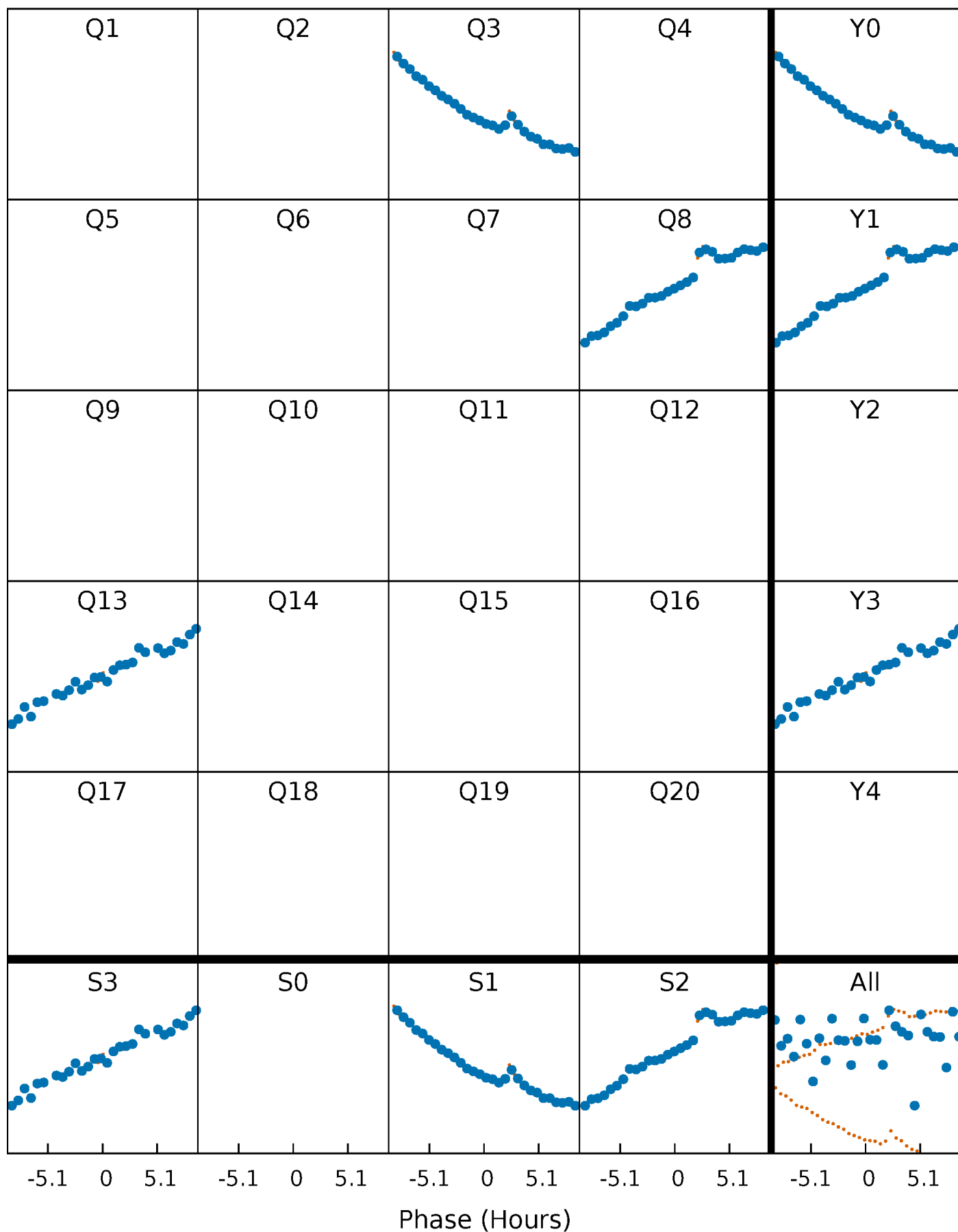


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



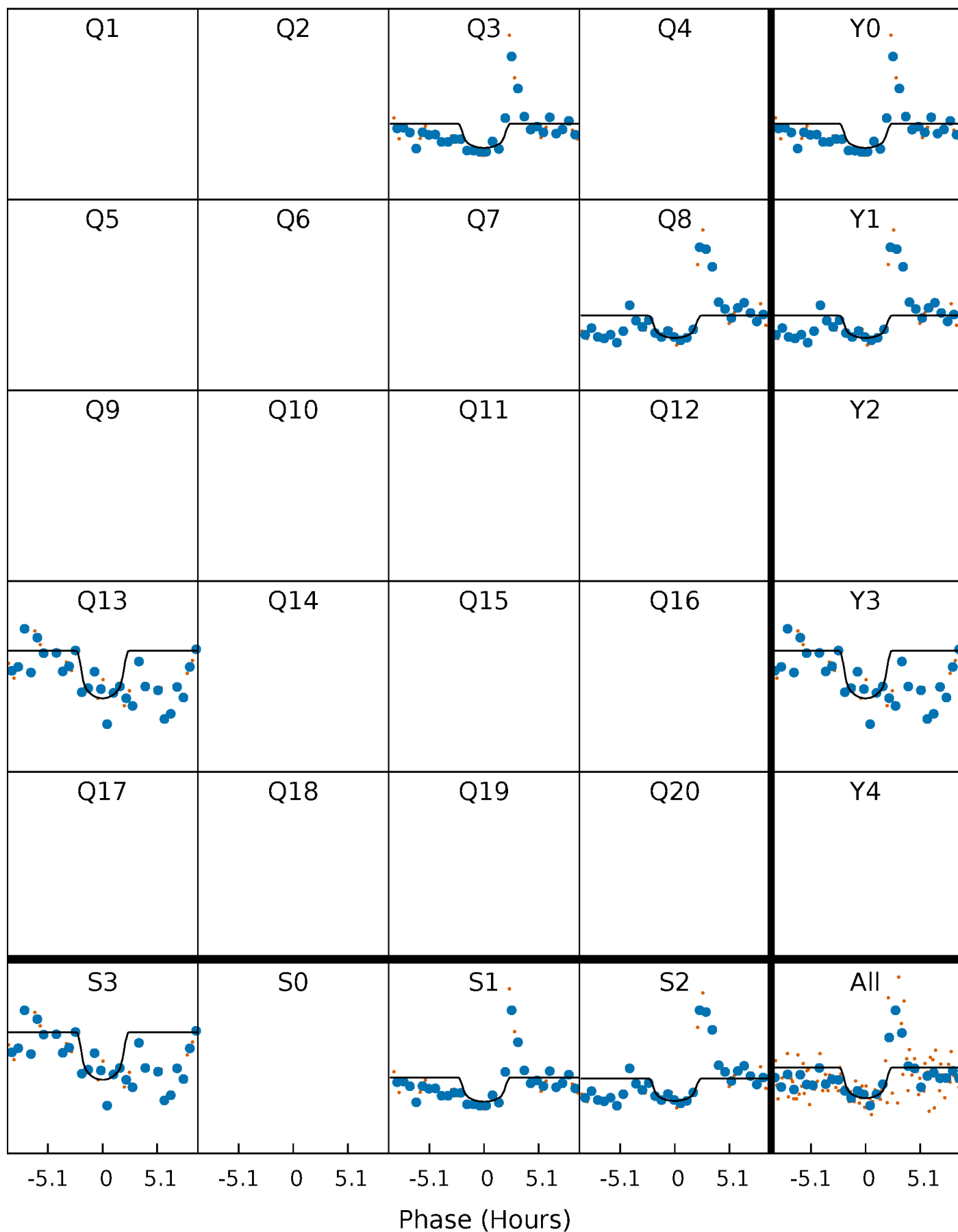
PDC Quarter-Phased Transit Curves

TCE 009645084-02 $P=483.364428$ Days $T_0=295.617791$ (BKJD)



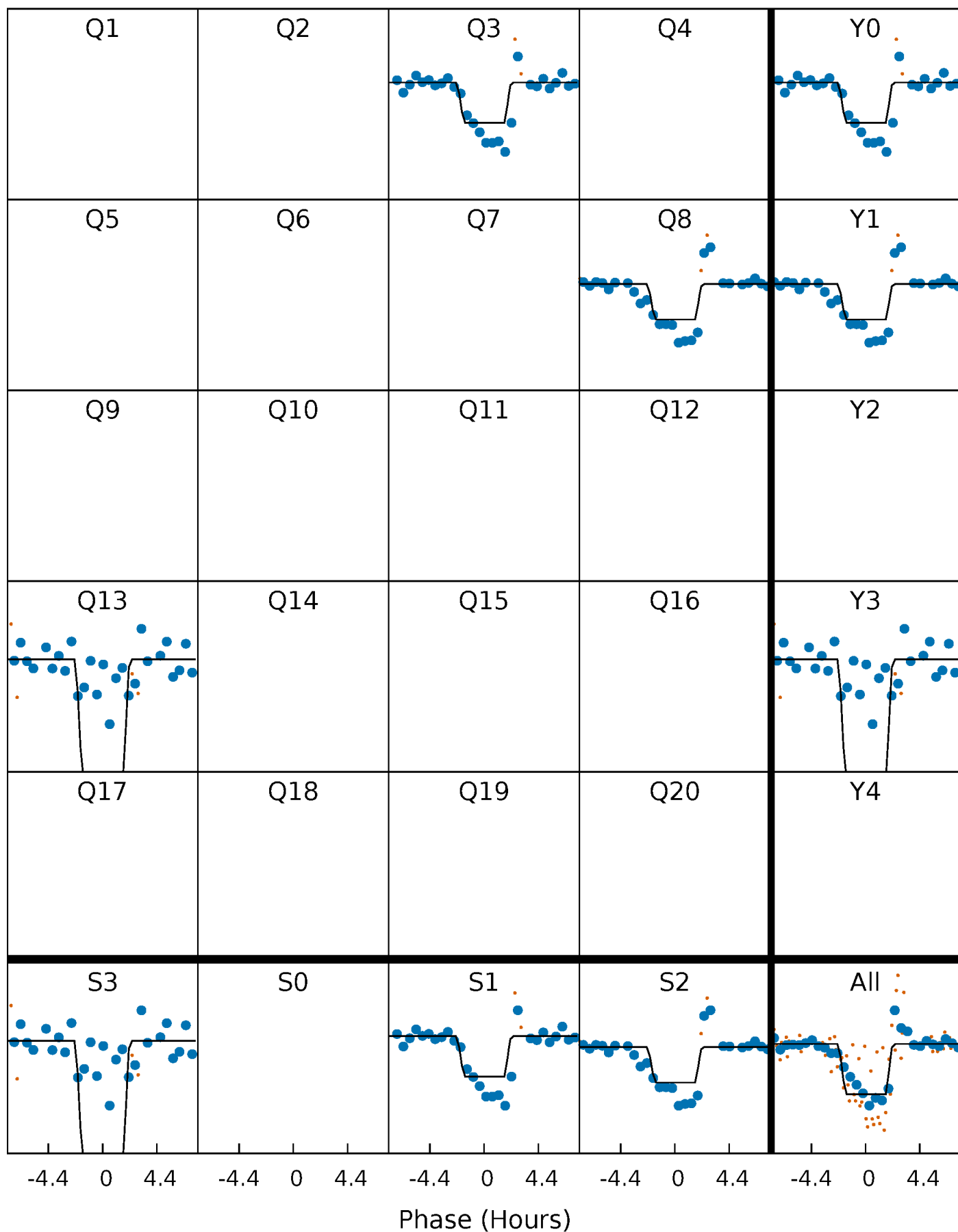
DV Quarter-Phased Transit Curves

TCE 009645084-02 $P=483.364428$ Days $T_0=295.617791$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

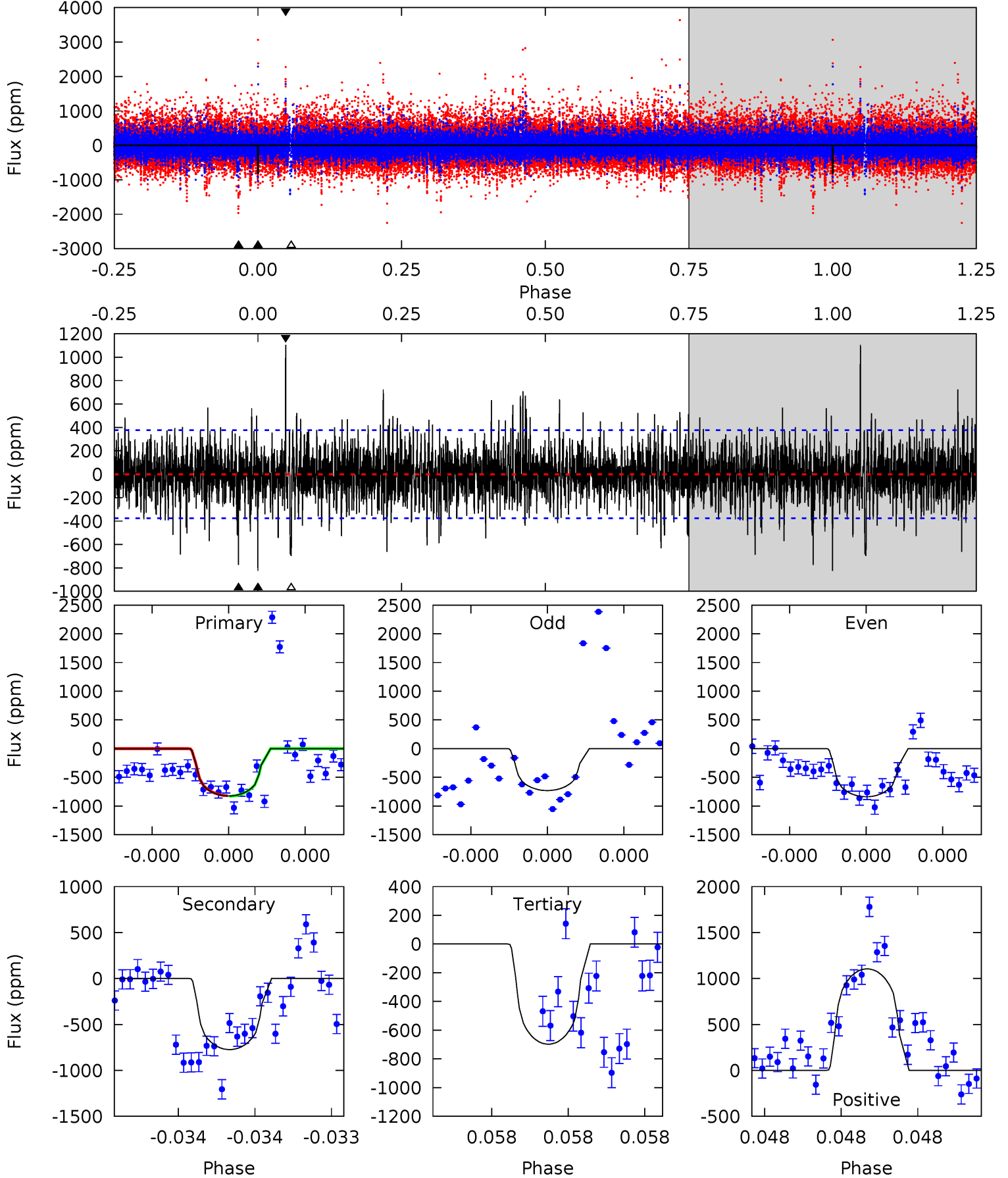
TCE 009645084-02 P=483.369484 Days $T_0=295.612455$ (BKJD)



DV Model-Shift Uniqueness Test

009645084-02, P = 483.364428 Days, E = 295.617791 Days

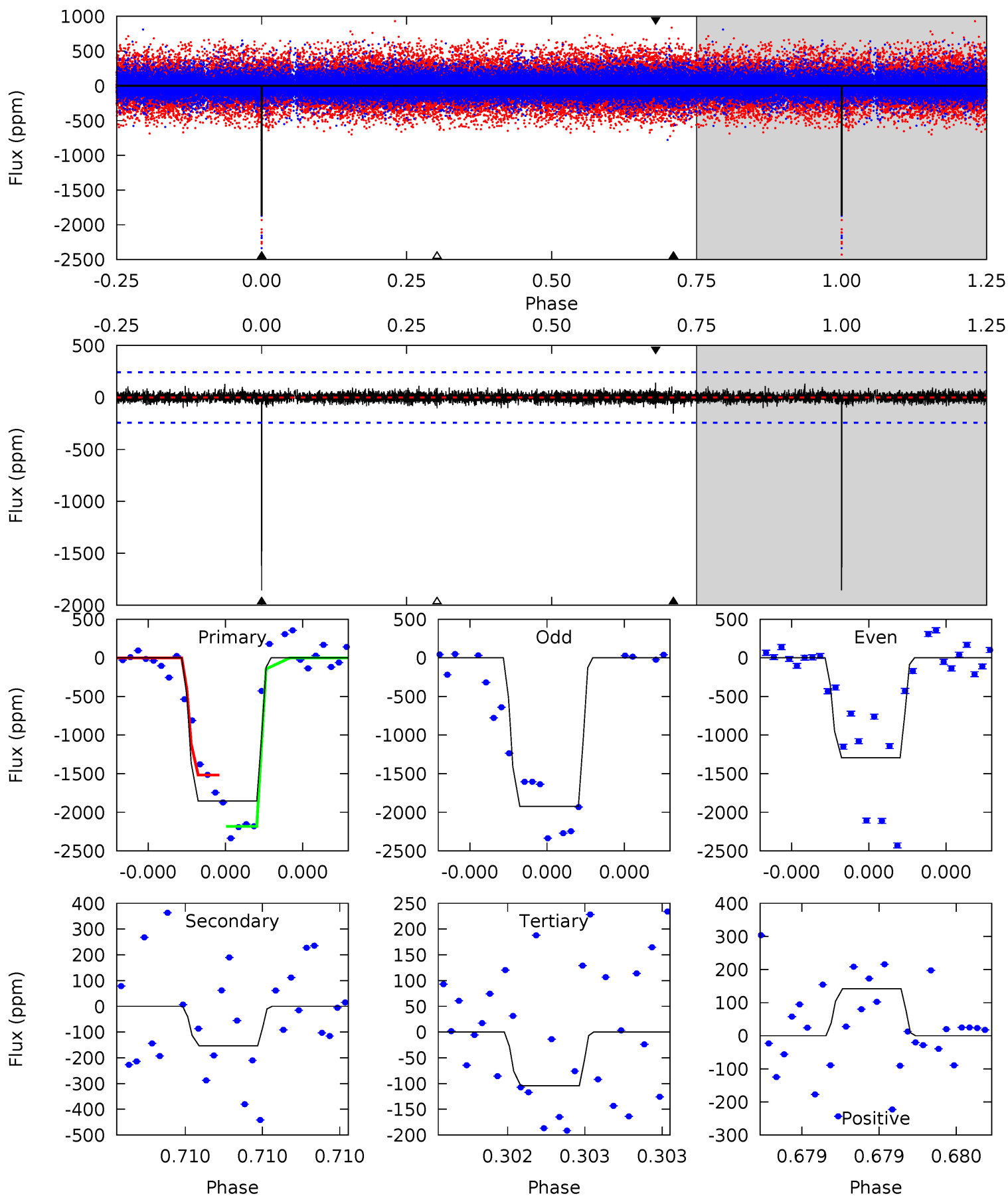
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	11.5	10.4	16.5	5.61	3.53	2.33	1.91	-4.16	1.14	-4.93	0.70	1.00	0.57	0.07



Alt Model-Shift Uniqueness Test

009645084-02, P = 483.369484 Days, E = 295.612455 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.1	3.57	2.42	3.30	5.64	3.58	0.55	40.7	39.8	1.15	0.27	7.83	0.73	0.07	0



Stellar Parameters For KIC 009645084

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4848^{+145}_{-121}	$3.902^{+0.714}_{-0.306}$	$0.400^{+0.050}_{-0.250}$	$1.821^{+1.072}_{-1.072}$	$0.966^{+0.200}_{-0.163}$	$0.225^{+2.252}_{-0.166}$
	+3%/-2%	+18%/-8%	+12%/-62%	+59%/-59%	+21%/-17%	+1000%/-74%
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 009645084-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-774 ± 67	$5.66^{+4.91}_{-3.70}$	360^{+57}_{-62}	4598^{+2633}_{-807}	$18791^{+151014}_{-13517}$
Alt.	-154 ± 43	$6.95^{+4.79}_{-4.07}$	360^{+53}_{-57}	3251^{+880}_{-405}	2510^{+11236}_{-1706}

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

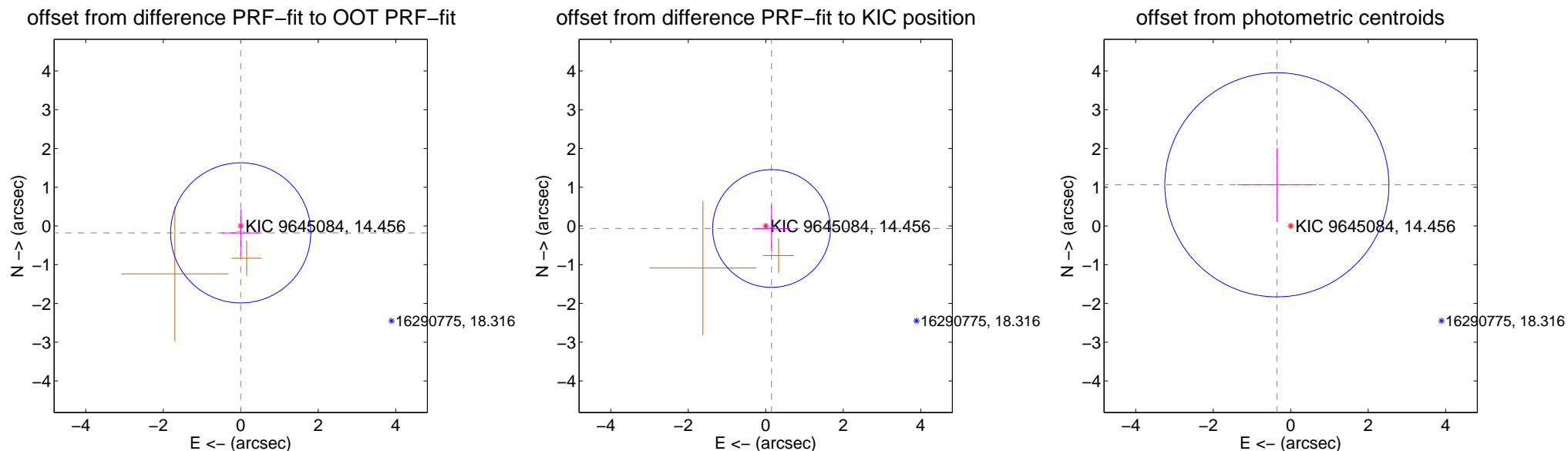
DV Centroid Data

Supplemental centroid analysis for 009645084-02. Kepler magnitude: 14.46. Transit SNR 6.39

There are 1 quarters with good PRF difference image offsets

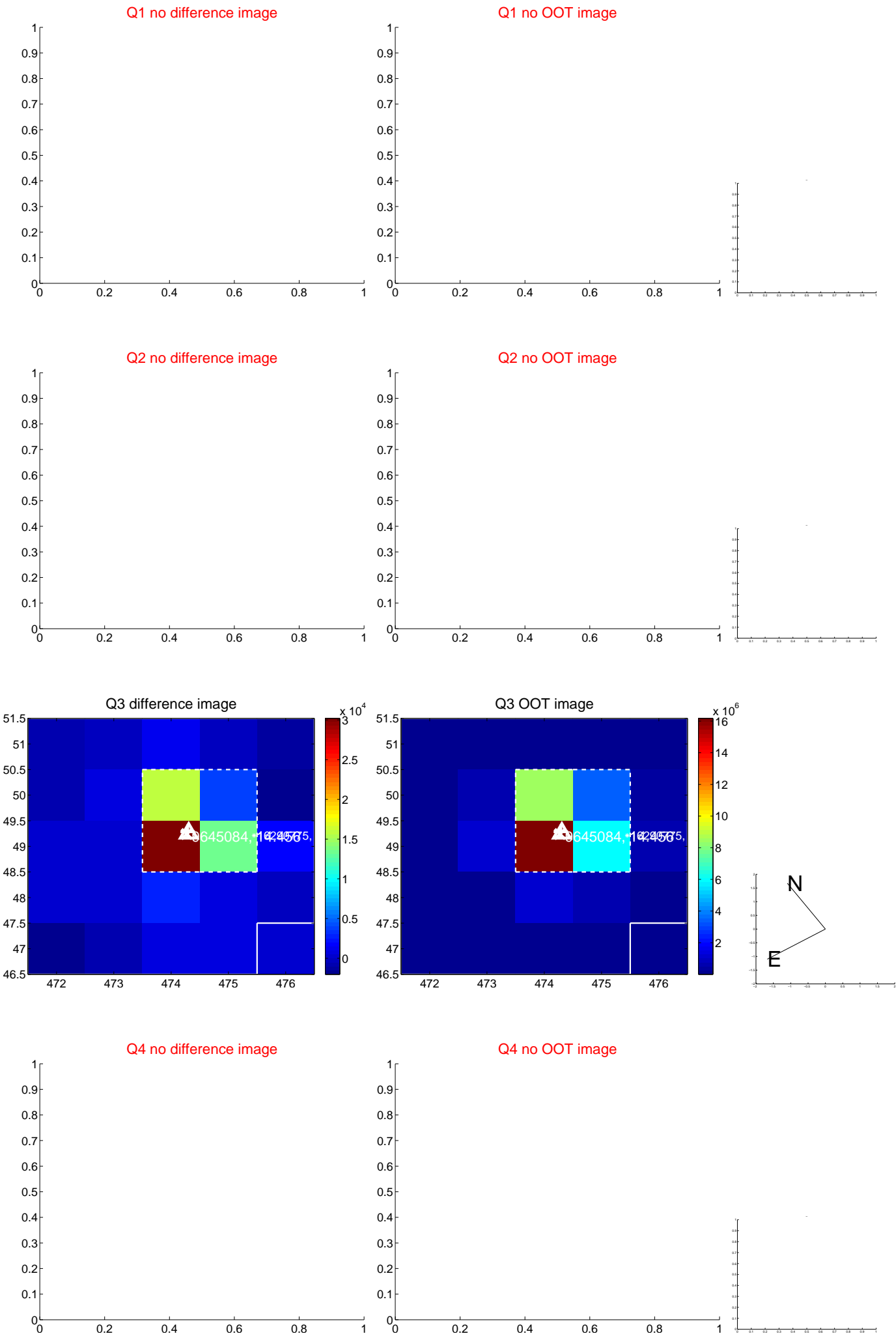
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.178 ± 0.602	0.30	0.002 ± 0.486	-0.178 ± 0.603
PRF-fit source offset from KIC position	0.163 ± 0.507	0.32	-0.149 ± 0.486	-0.065 ± 0.603
photometric centroid source offset	1.12 ± 0.96	1.16	0.36 ± 1.03	1.06 ± 0.96

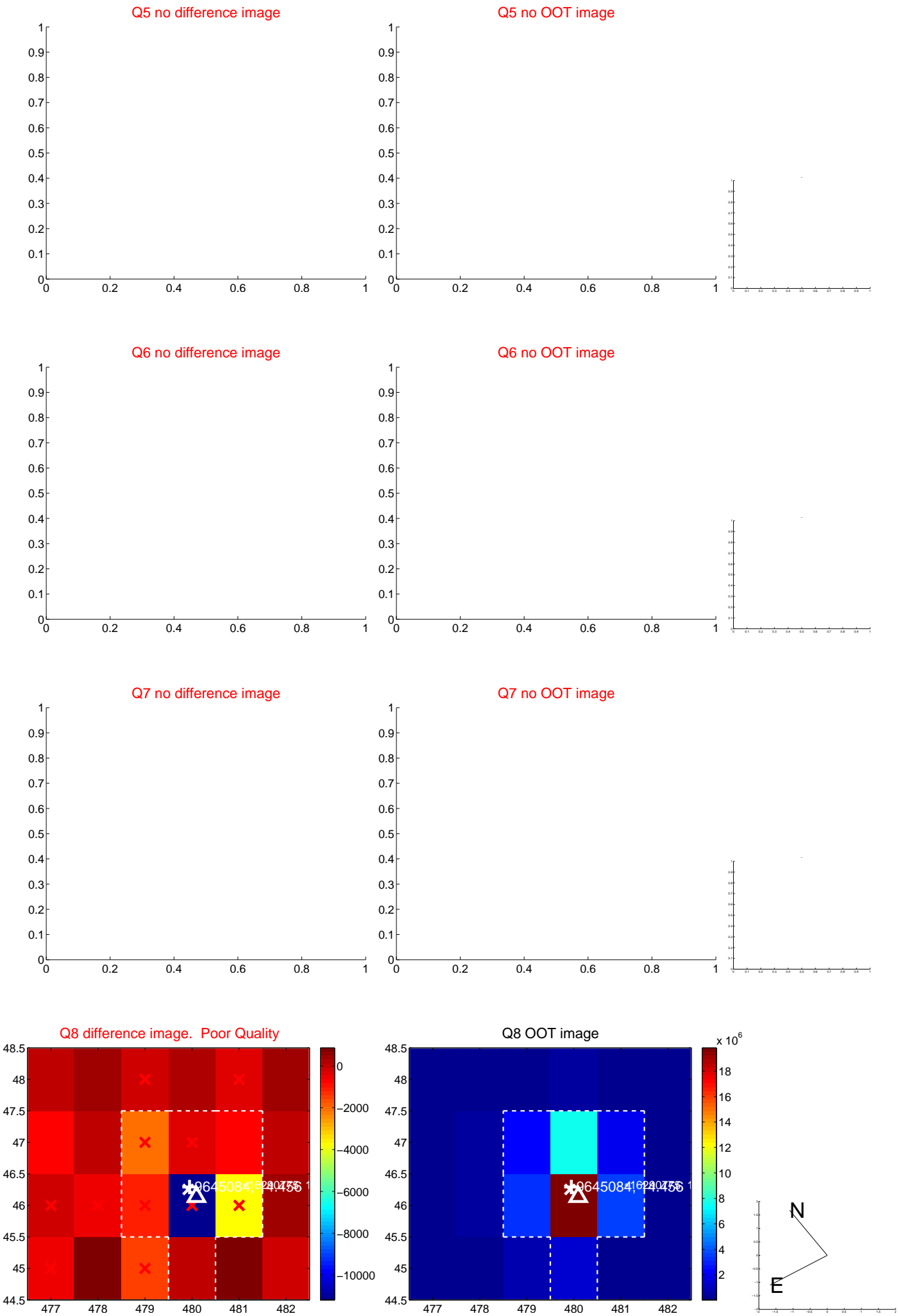


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

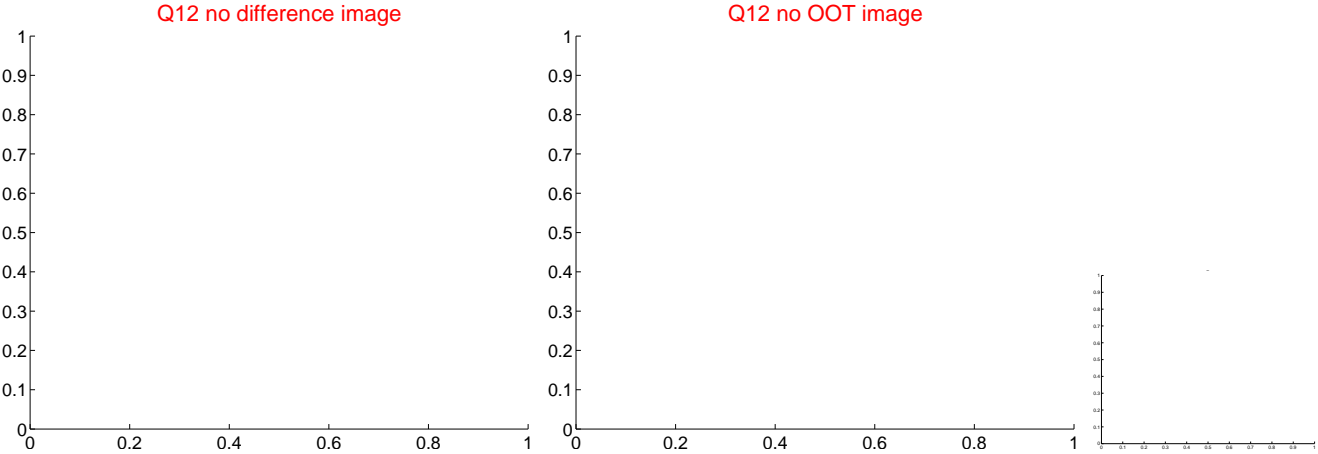
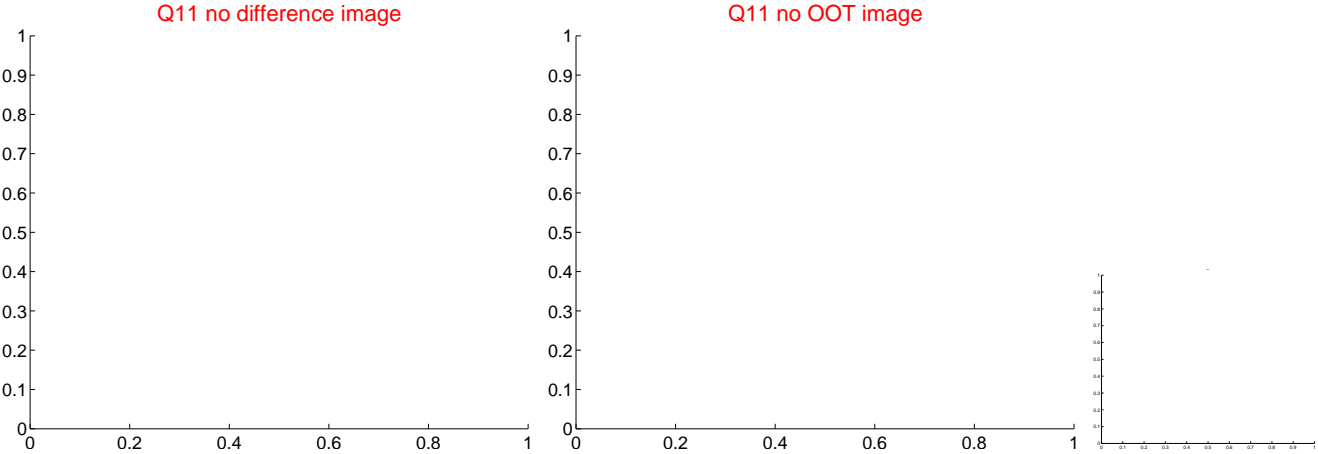
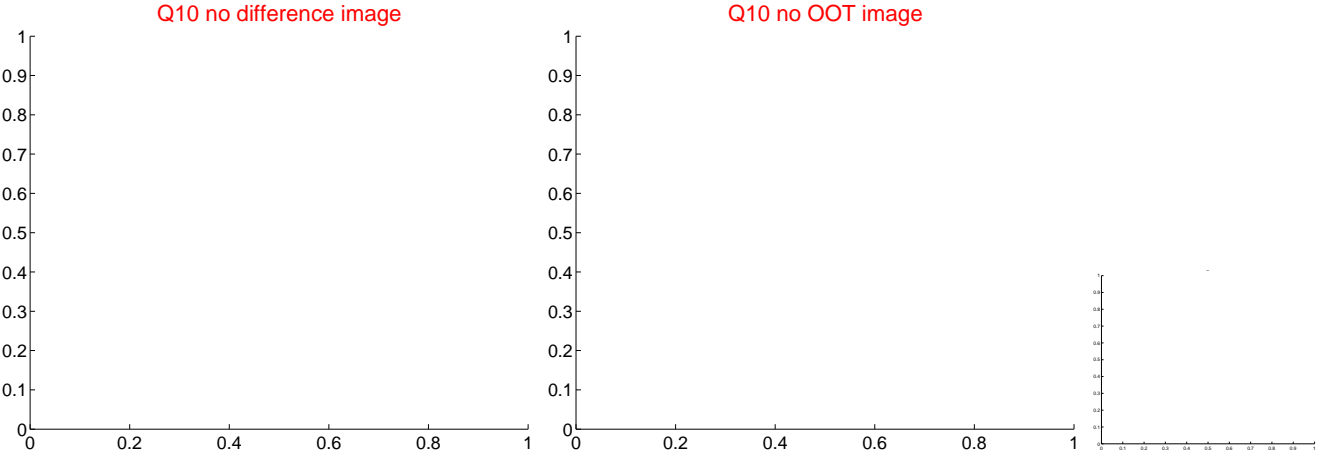
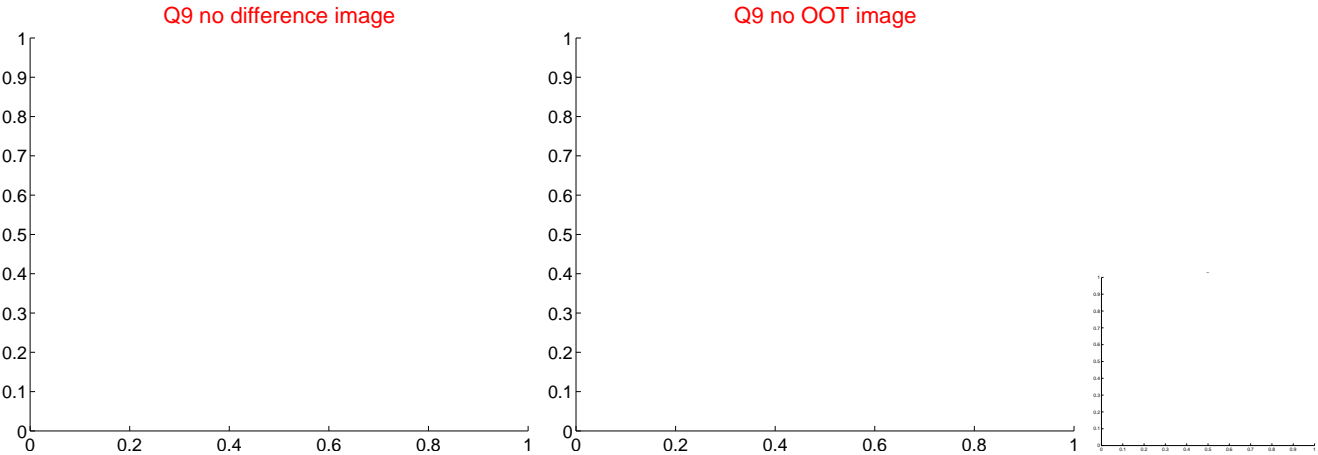
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



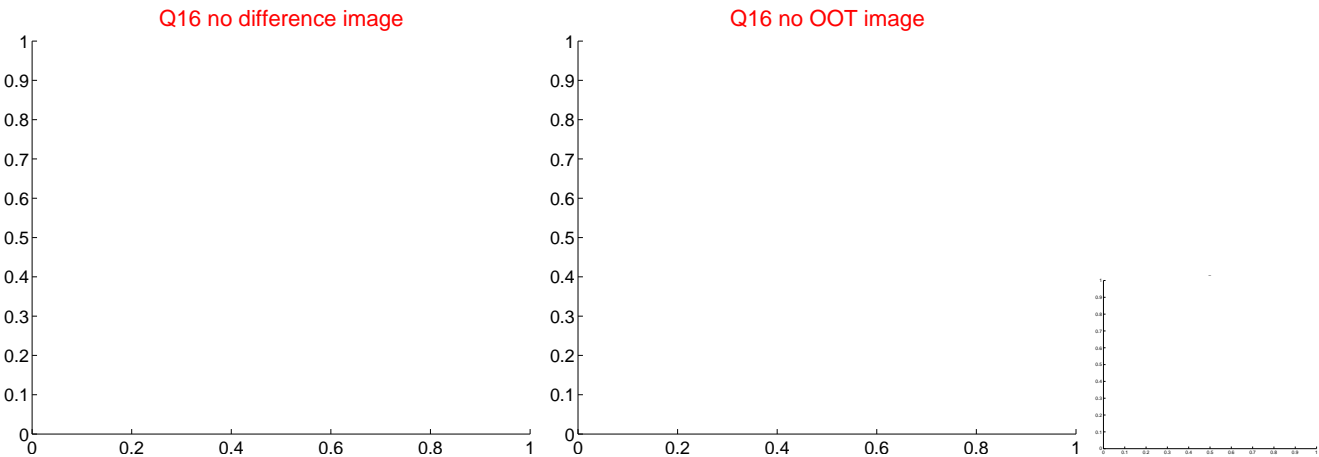
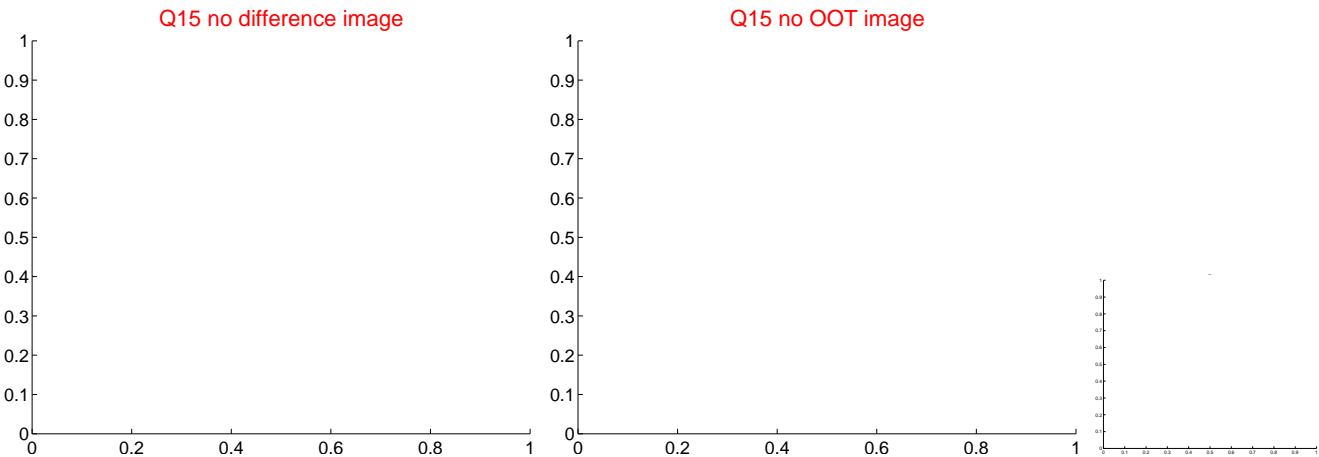
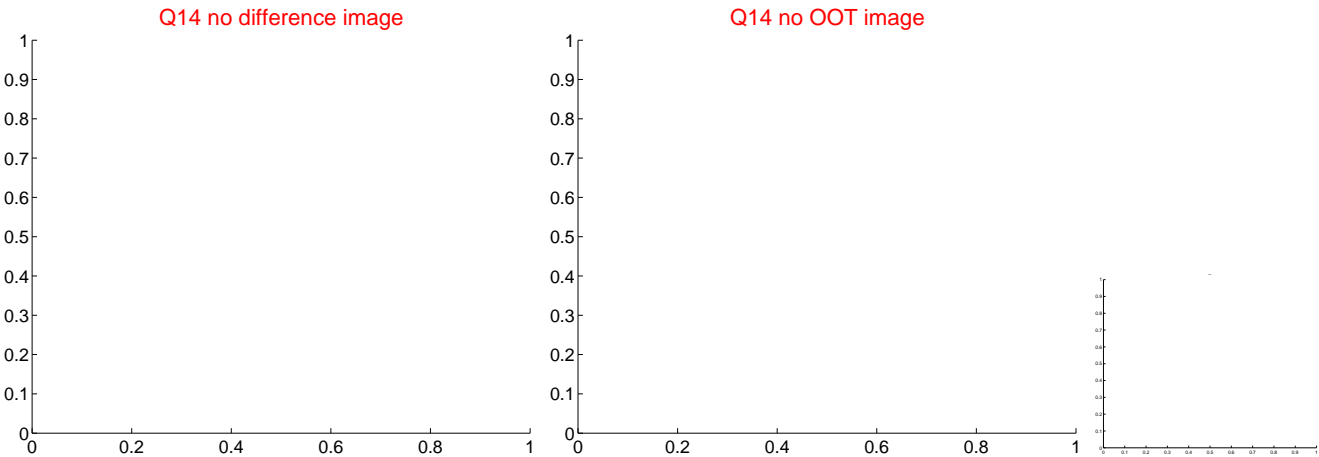
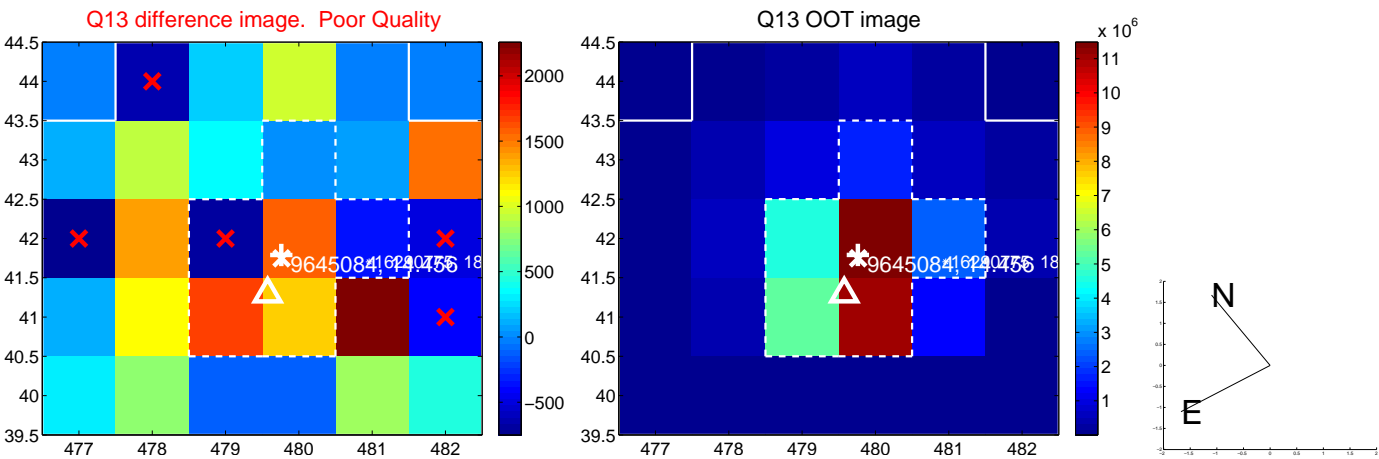
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



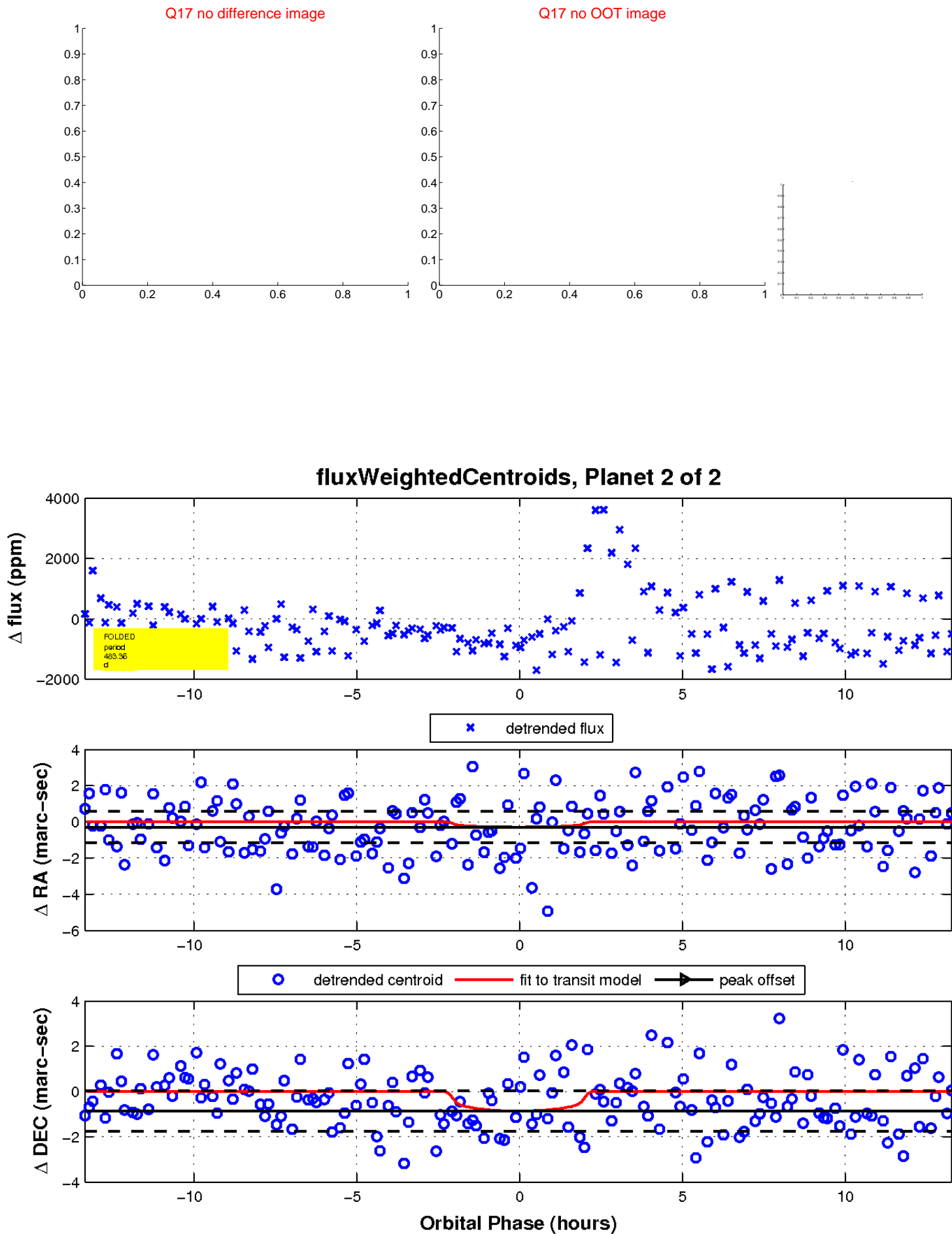
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

