

KIC 006864859

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})
006864859-01	OBS	6782.01	40.878244	158.309608	257460.2	6.000	31312.2	-1.0	2.59	6807	106.51	166.31
006864859-02	OBS	No	40.877884	163.428215	254428.5	7.500	29667.9	-1.0	2.59	6807	92.32	166.31
006864859-03	OBS	No	381.549055	157.345825	7290.2	3.500	415.2	-1.0	2.59	6807	22.32	8.46
006864859-04	OBS	No	246.199052	319.057019	5281.8	3.500	323.4	-1.0	2.59	6807	18.99	15.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864859-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
006864859-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS
006864859-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006864859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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 006864859-01

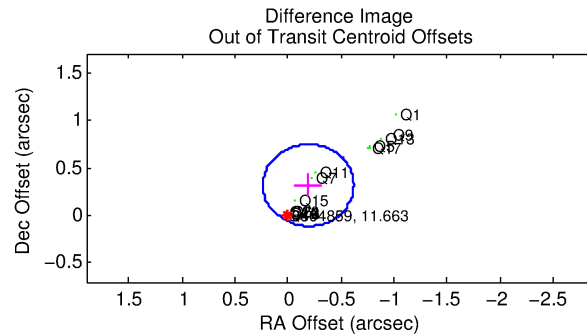
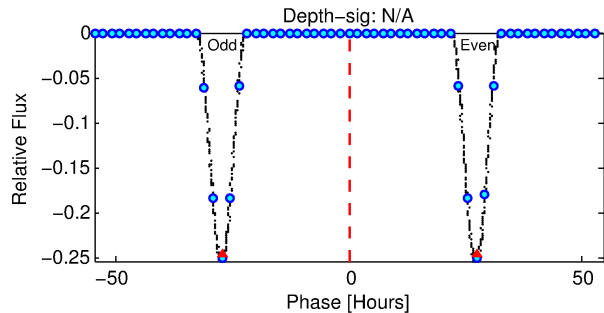
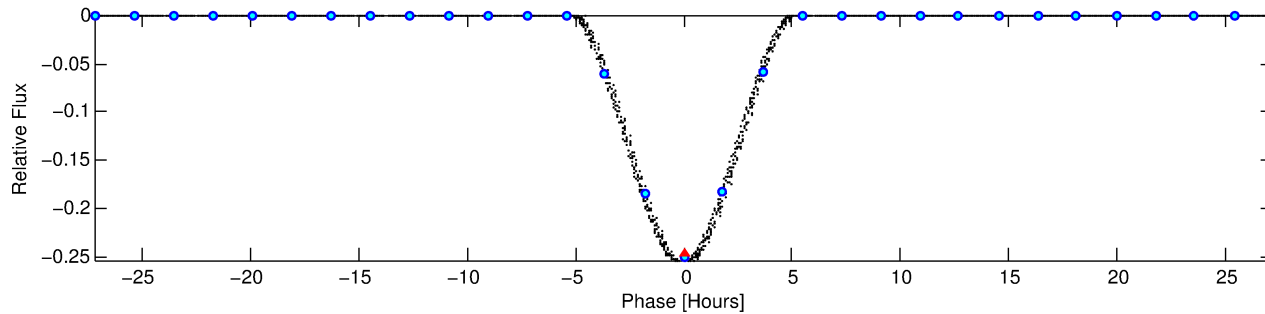
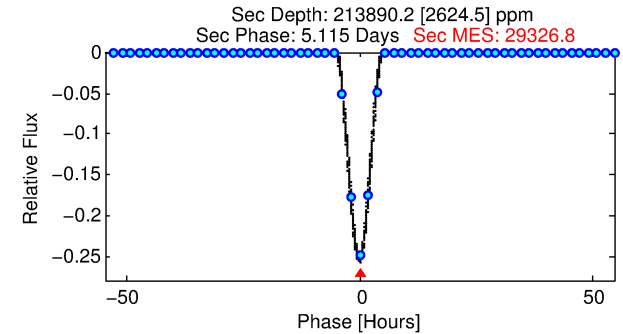
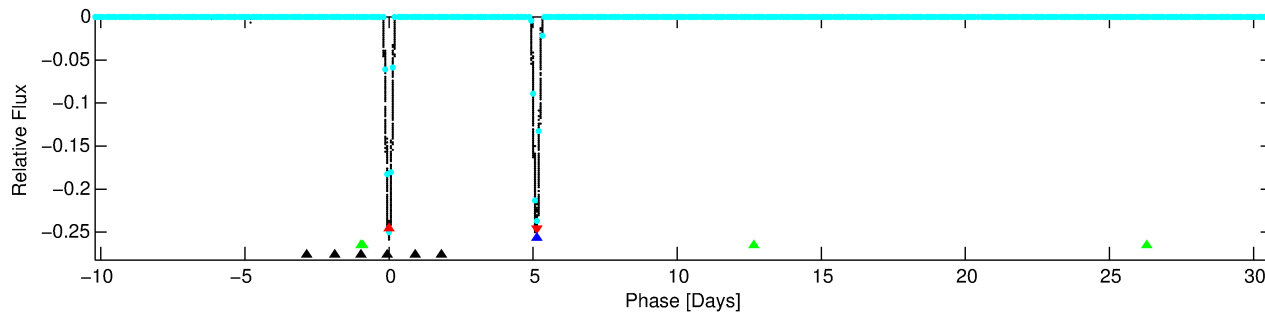
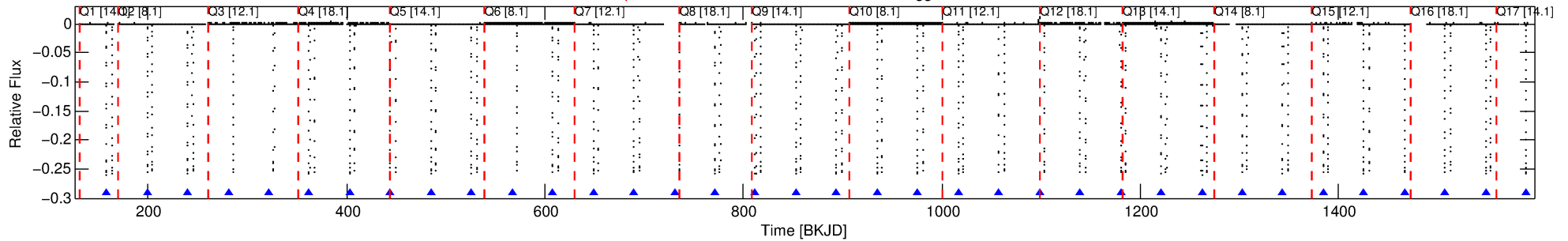
No Significant Match Found

DV One-Page Summary

KIC: 6864859 Candidate: 1 of 4 Period: 40.878 d

KOI: K06782.01 Corr: 0.779

Kp: 11.66 R*: 2.59 Rs Teff: 6807.0 K Logg: 3.85 Fe/H: 0.080



TPS TCE Results:

Period = 40.87824 d
Epoch = 158.3096 BKJD

DV fit results are unavailable

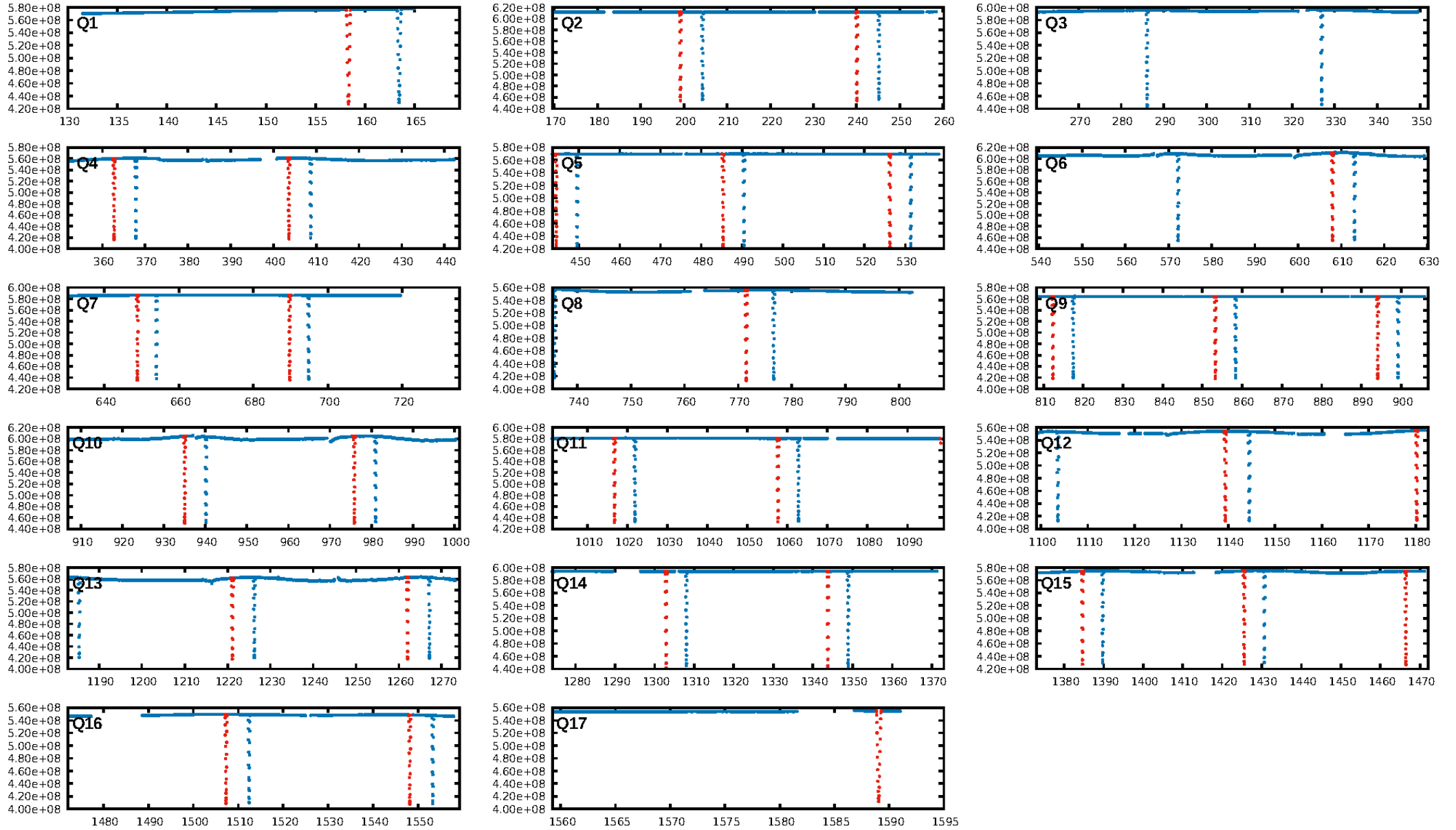
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 σ]
LongPeriod-sig: 100.0% [709.41 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [30/30]
GhostDiagnostic-chr: 9.397
Centroid-sig: N/A
Centroid-so: 0.330 arcsec [1418.95 σ]
OotOffset-rm: 0.372 arcsec [2.60 σ]
KicOffset-rm: 0.590 arcsec [3.40 σ]
OotOffset-st: 4/3/4/5 [16]
KicOffset-st: 4/3/4/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

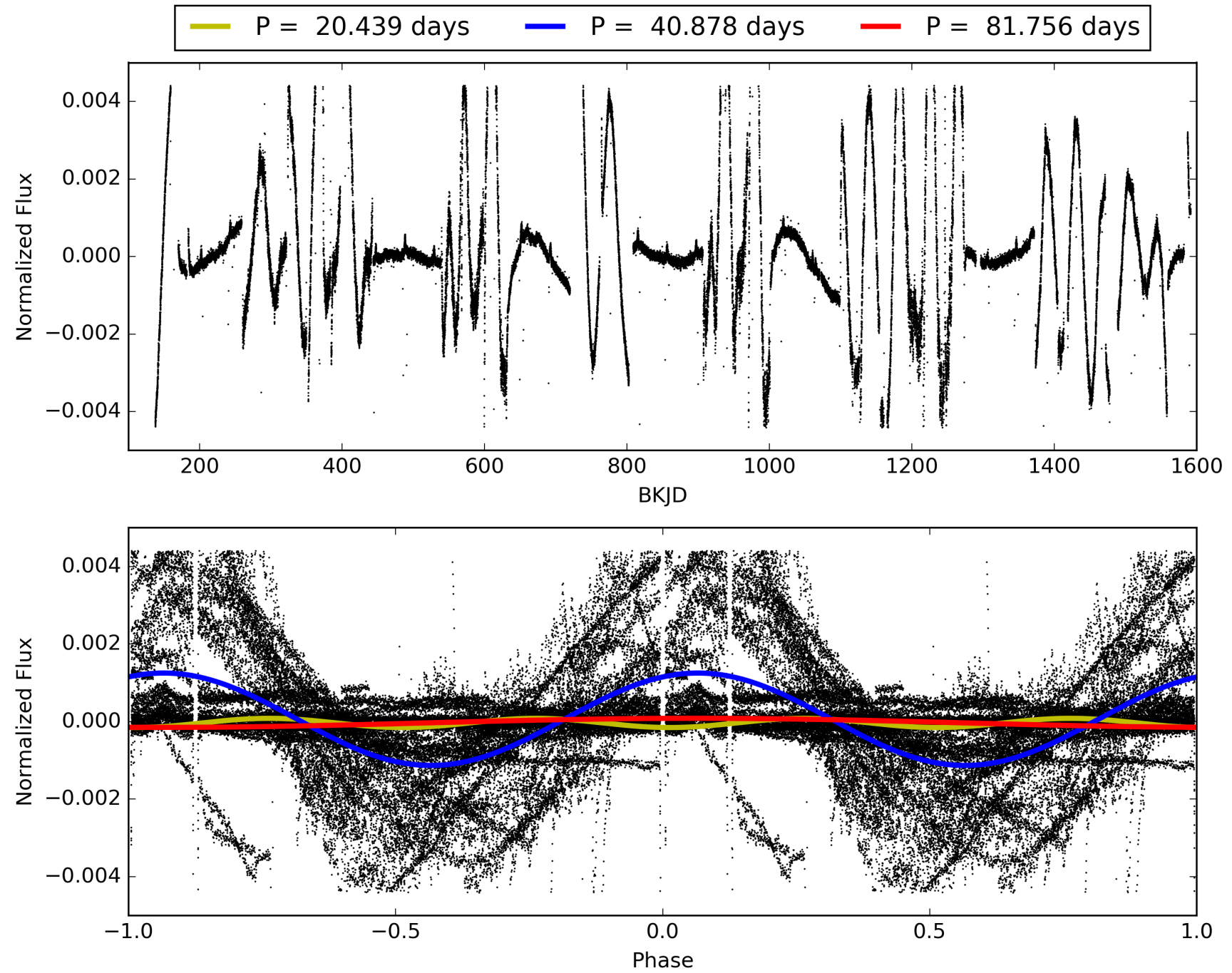
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:24:15 Z

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

TCE 006864859-01, PDC Light Curves

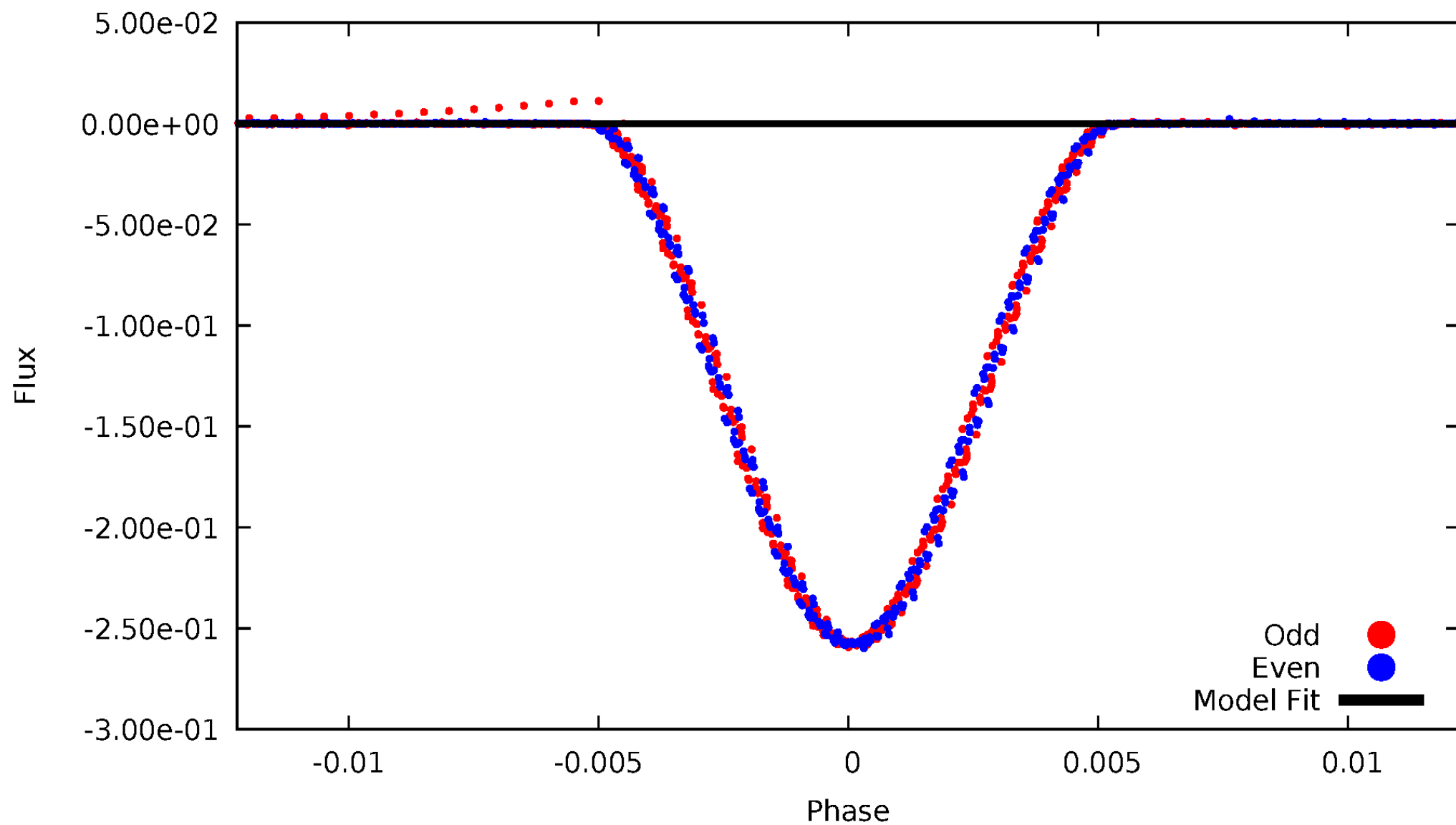


TCE 006864859-01



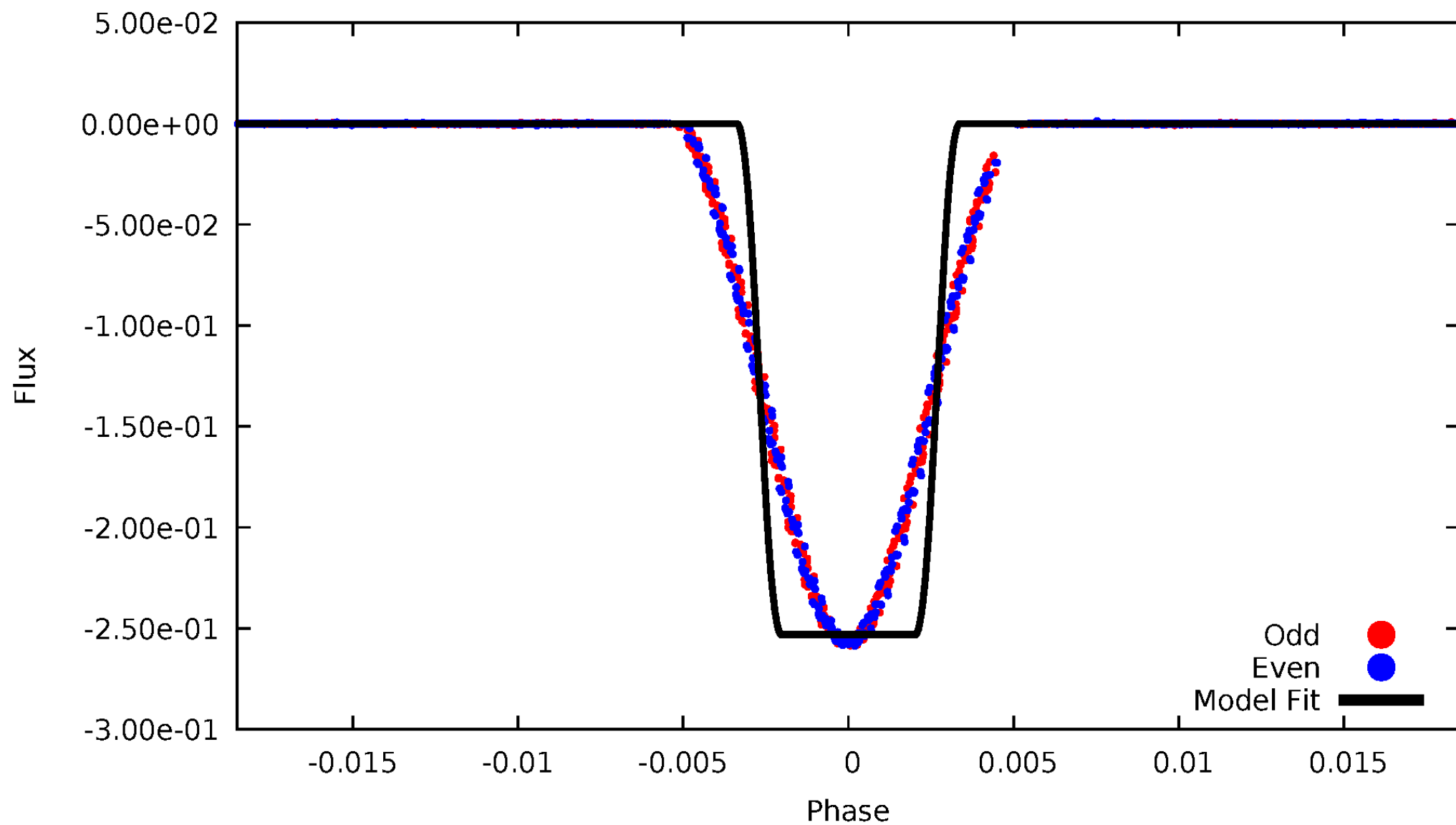
DV Odd/Even

TCE 006864859-01



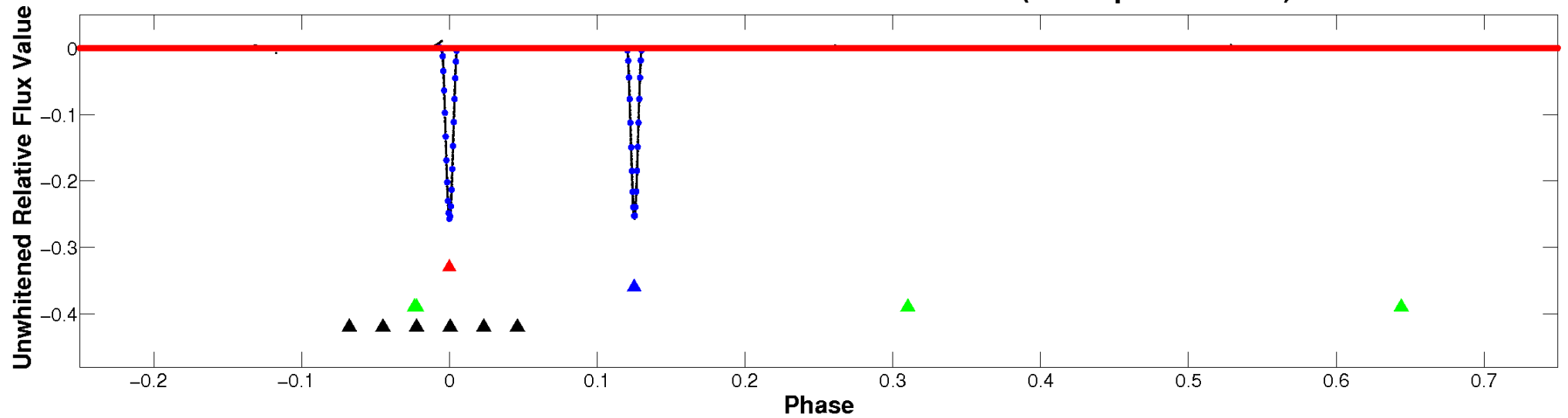
ALT Odd/Even

TCE 006864859-01



Non-Whitened Vs. Whitened Light Curve

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

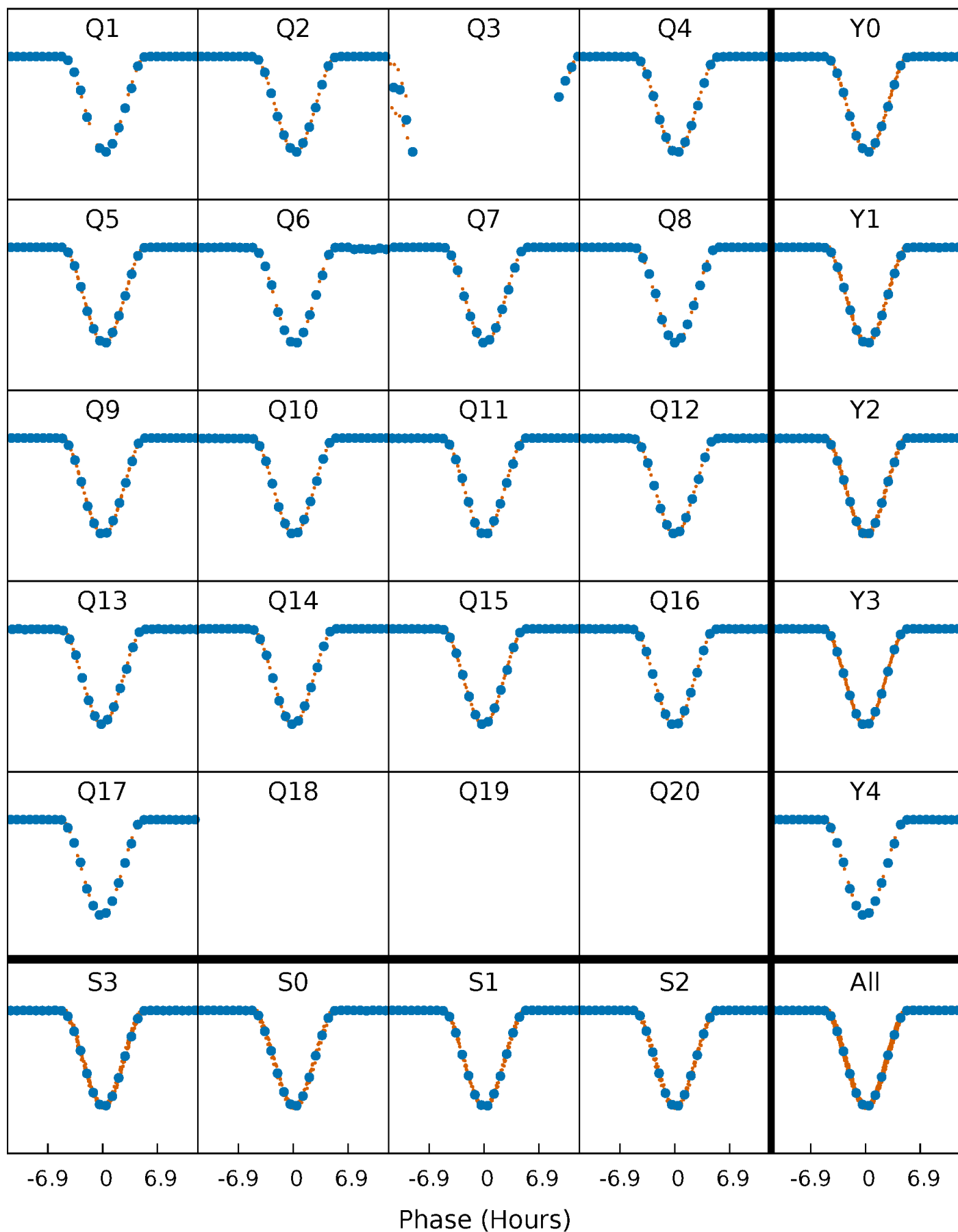


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



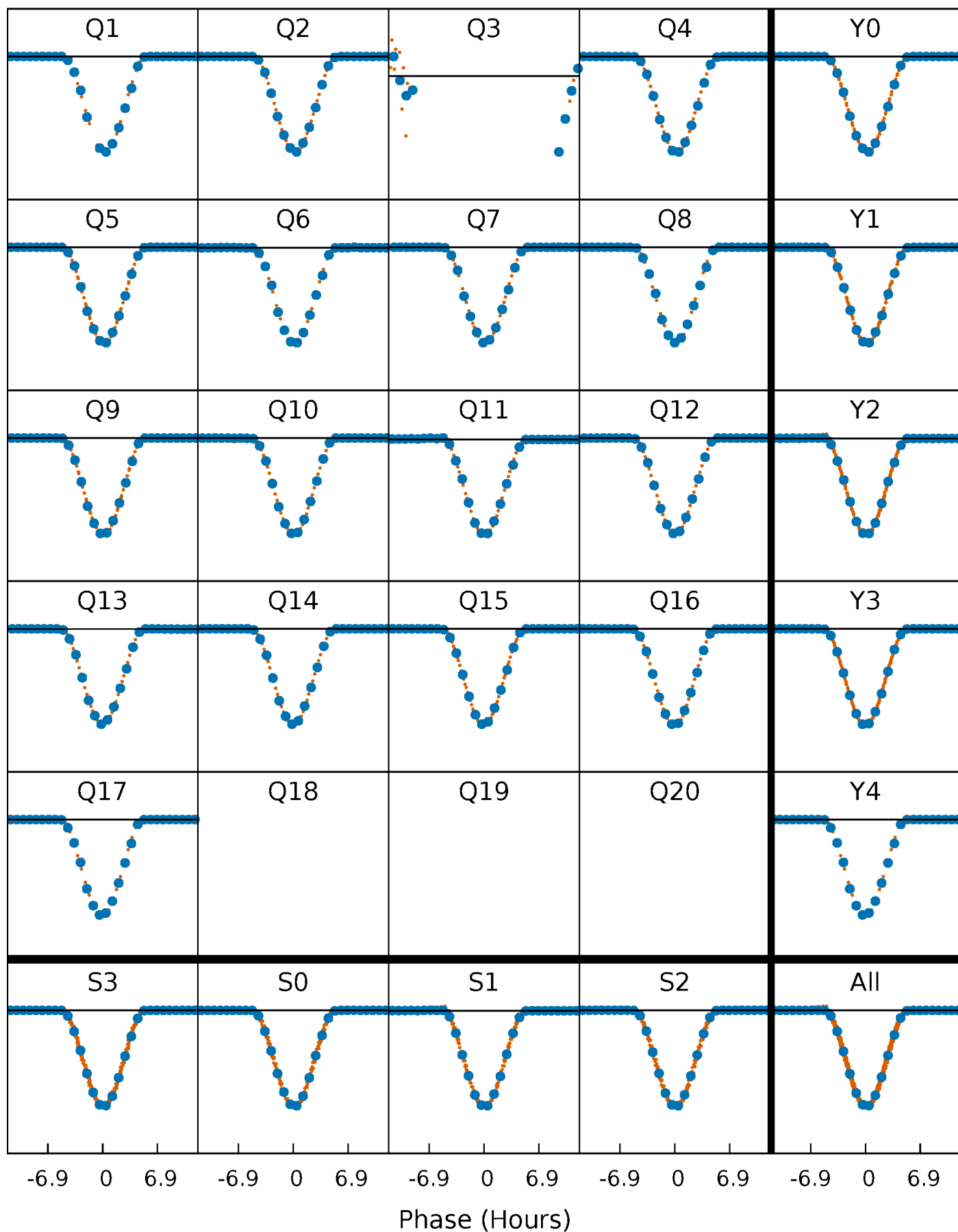
PDC Quarter-Phased Transit Curves

TCE 006864859-01 P= 40.878244 Days $T_0=158.309608$ (BKJD)



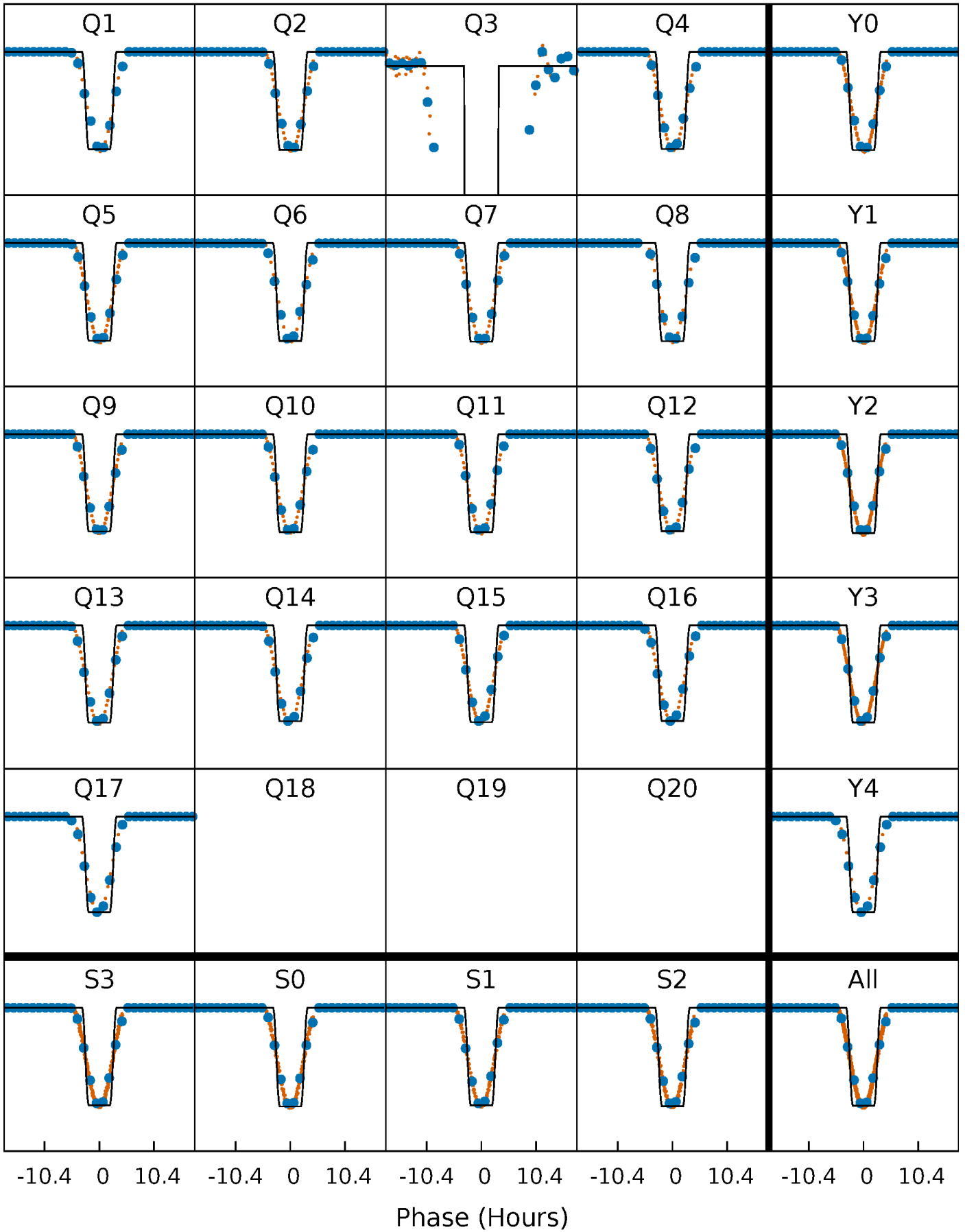
DV Quarter-Phased Transit Curves

TCE 006864859-01 P= 40.878244 Days $T_0=158.309608$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

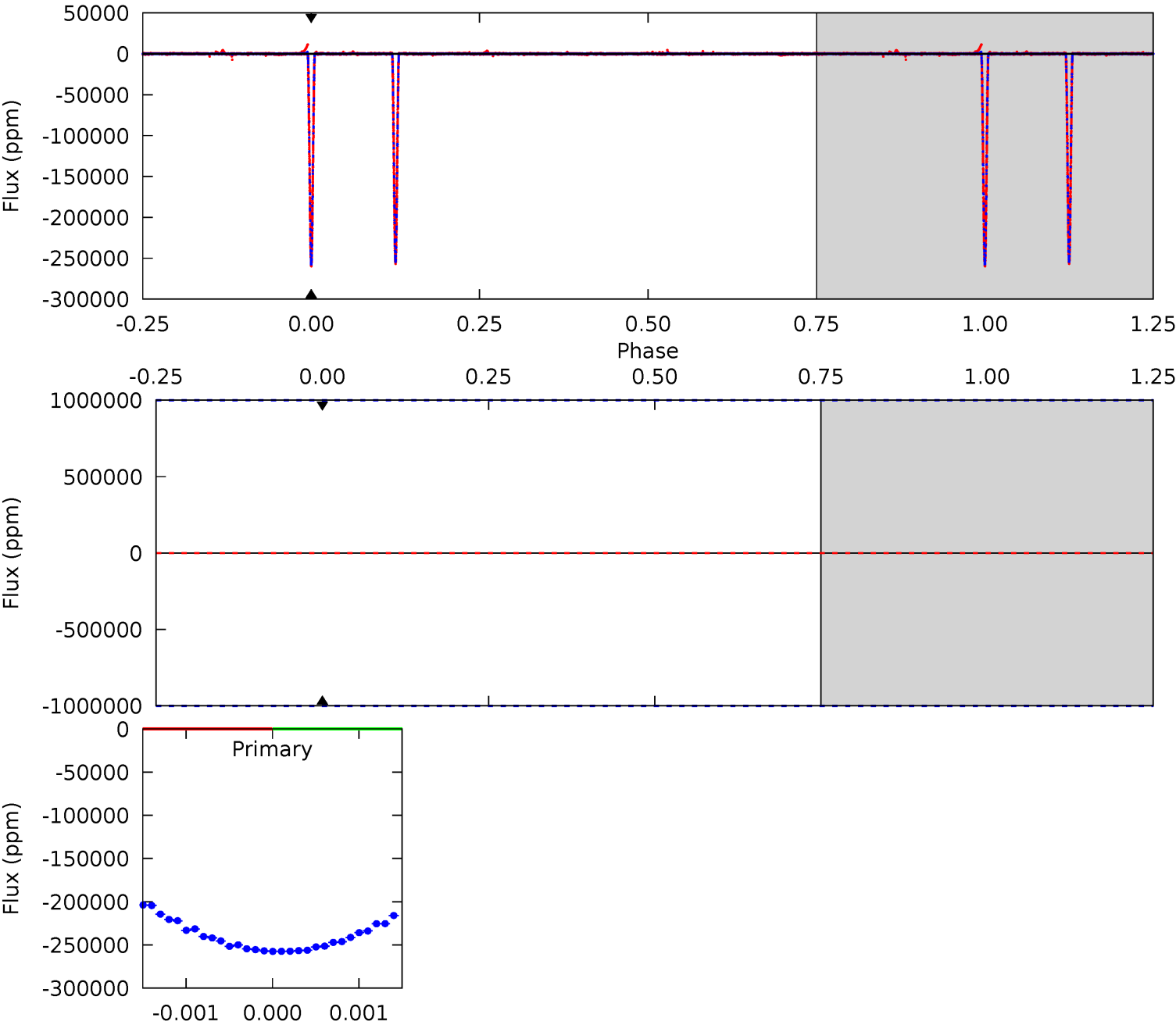
TCE 006864859-01 P= 40.878244 Days $T_0=158.313977$ (BKJD)



DV Model-Shift Uniqueness Test

006864859-01, P = 40.878244 Days, E = 117.431364 Days

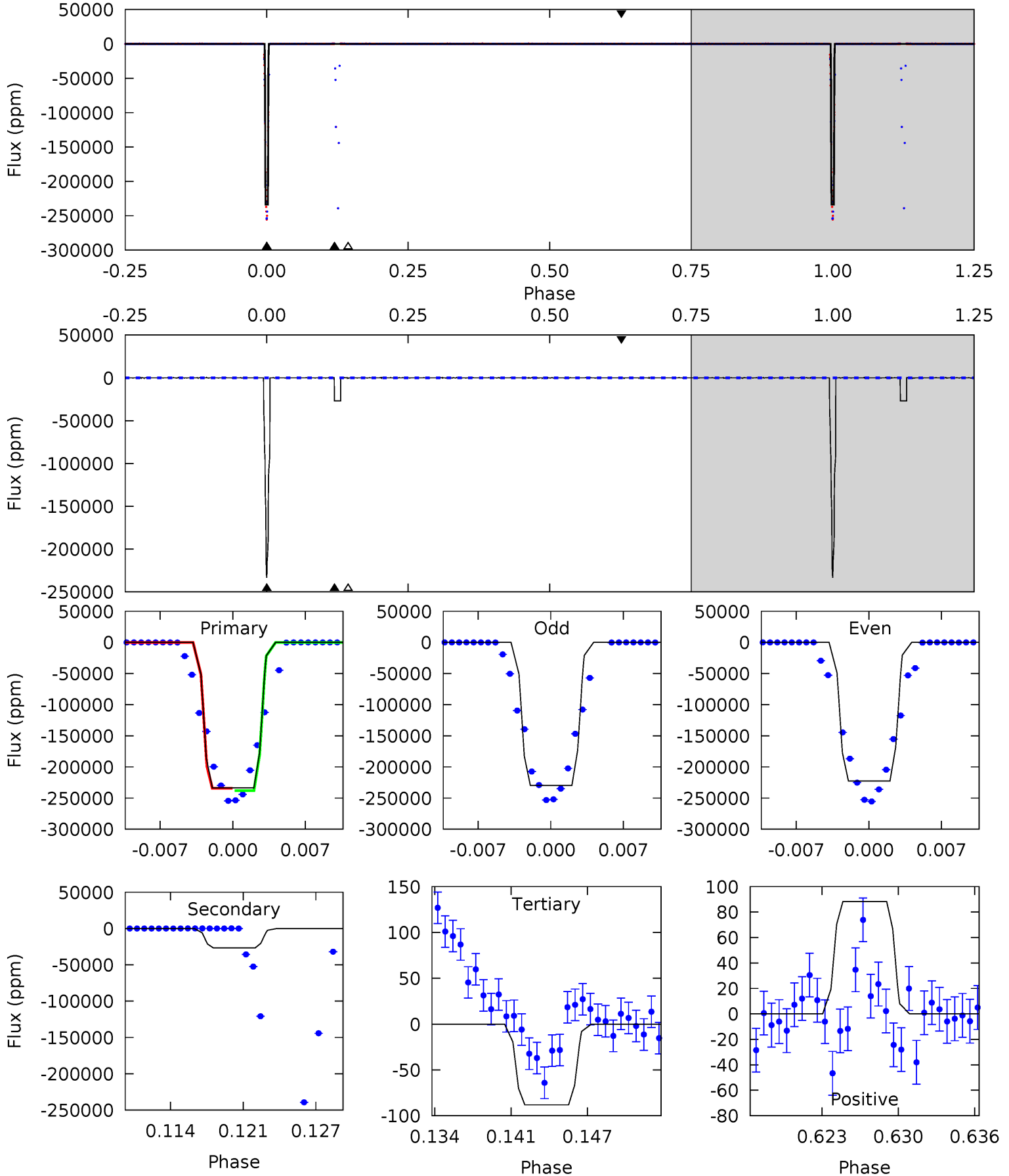
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

006864859-01, P = 40.878244 Days, E = 117.435733 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2196	252.2	0.83	0.83	5.10	2.71	3.69	2195	2195	251.3	251.3	32.4	1.00	0.00	0



Stellar Parameters For KIC 006864859

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6807^{+192}_{-264}	$3.848^{+0.350}_{-0.150}$	$0.080^{+0.200}_{-0.350}$	$2.590^{+0.587}_{-1.091}$	$1.723^{+0.176}_{-0.410}$	$0.140^{+0.390}_{-0.061}$
	+3%/-4%	+9%/-4%	+250%/-438%	+23%/-42%	+10%/-24%	+280%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006864859-01 / KOI 6782.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$100.35^{+32.75}_{-29.89}$	1257^{+98}_{-132}	-3135^{+9728}_{-2935}	$-8.866^{+520.915}_{-389.148}$
Alt.	-26809 ± 106	$134.12^{+37.18}_{-36.48}$	1255^{+106}_{-118}	4156^{+351}_{-278}	64^{+54}_{-24}

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 $A_{obs} \gg 1.0$

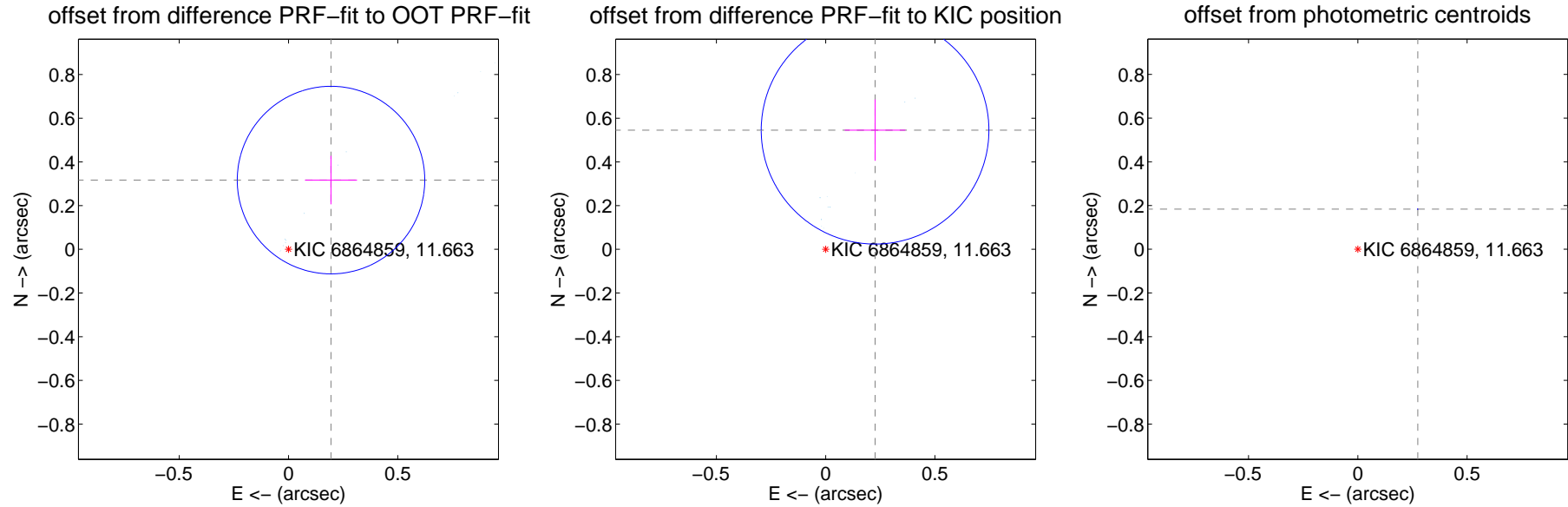
DV Centroid Data

Supplemental centroid analysis for 006864859-01. **Kepler magnitude: 11.66.** Transit SNR -1.00

There are 16 quarters with good PRF difference image offsets

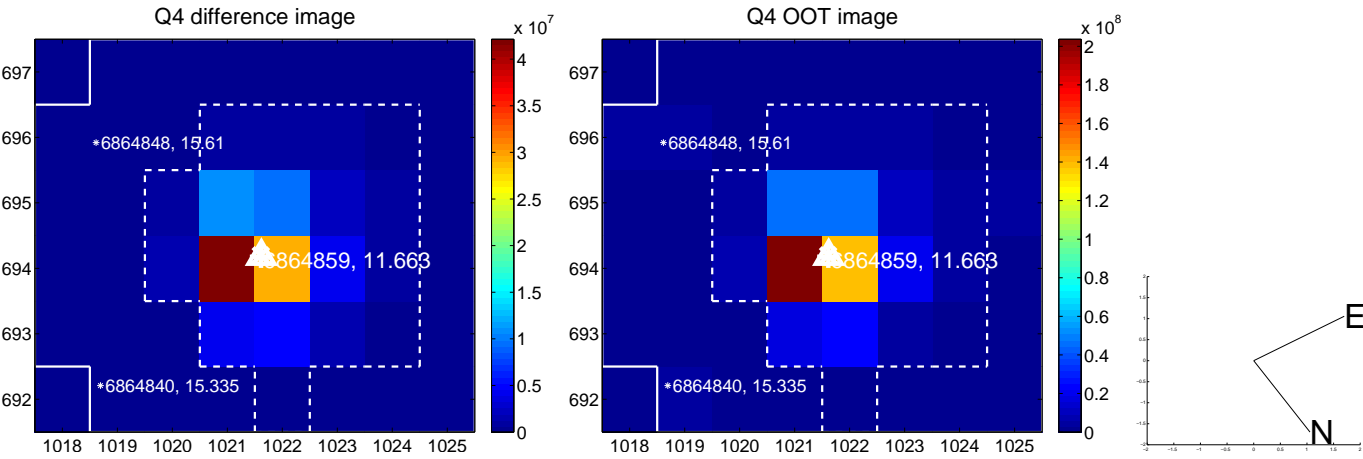
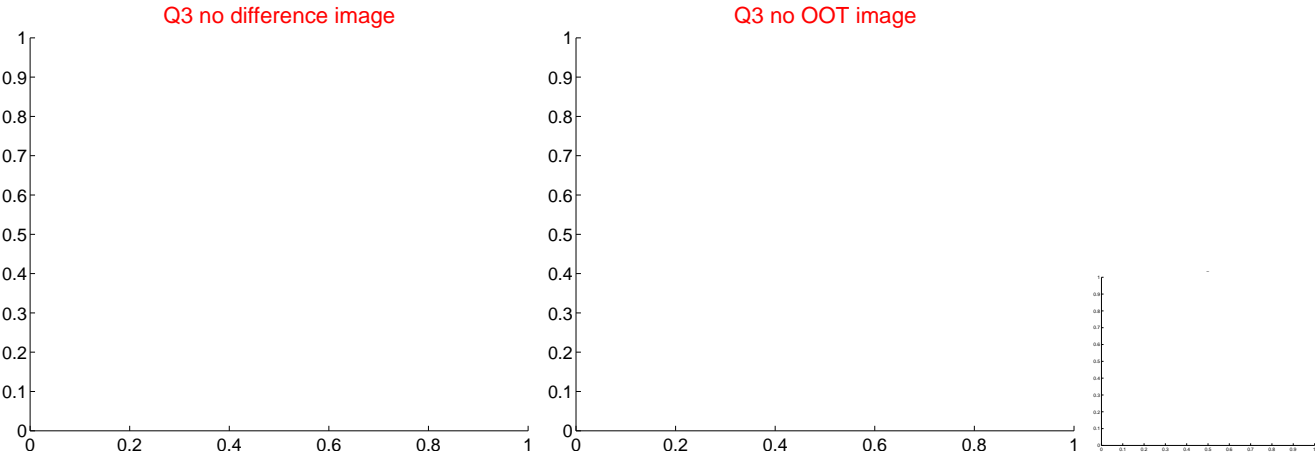
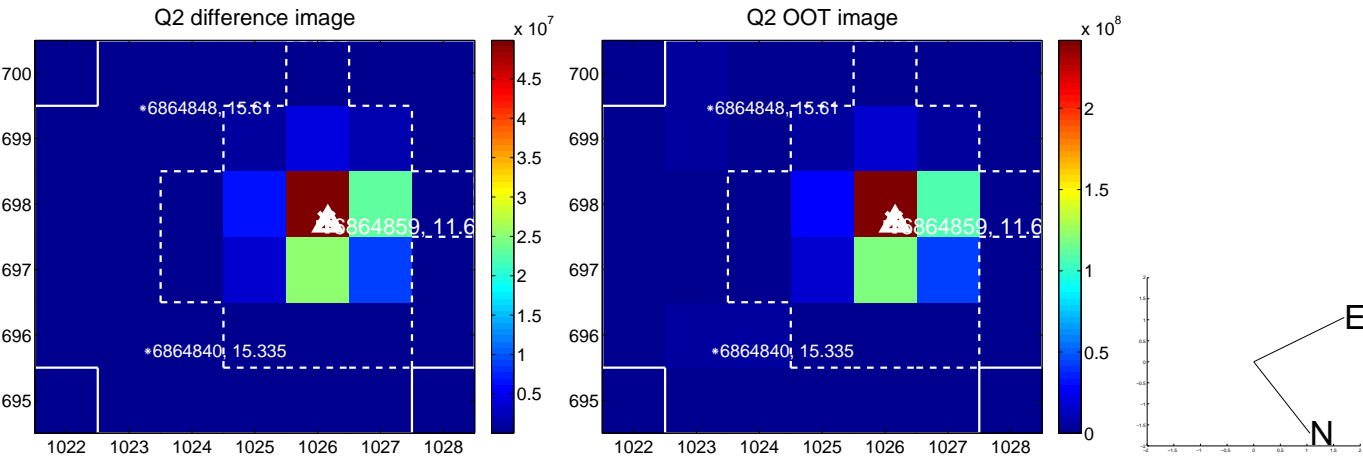
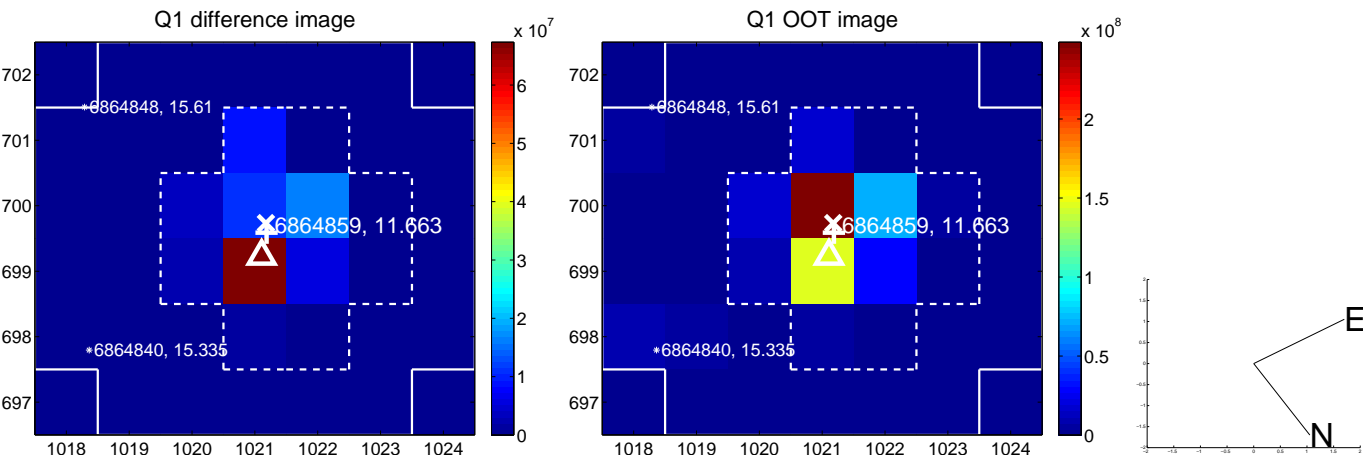
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.372 ± 0.143	2.60	-0.195 ± 0.119	0.317 ± 0.111
PRF-fit source offset from KIC position	0.590 ± 0.174	3.40	-0.226 ± 0.139	0.545 ± 0.140
photometric centroid source offset	0.33 ± 0.00	1418.95	-0.27 ± 0.00	0.18 ± 0.00

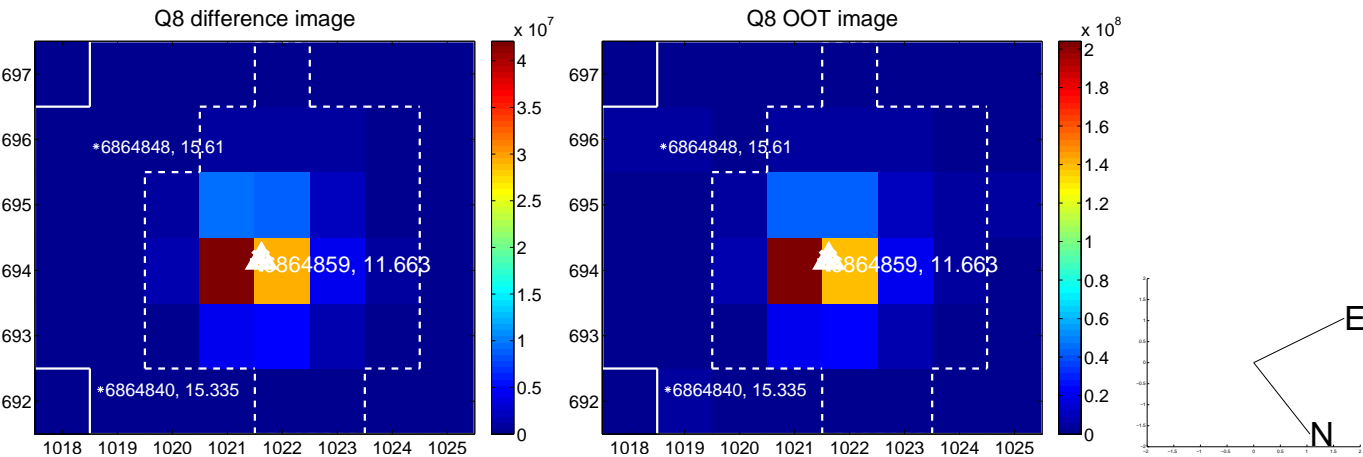
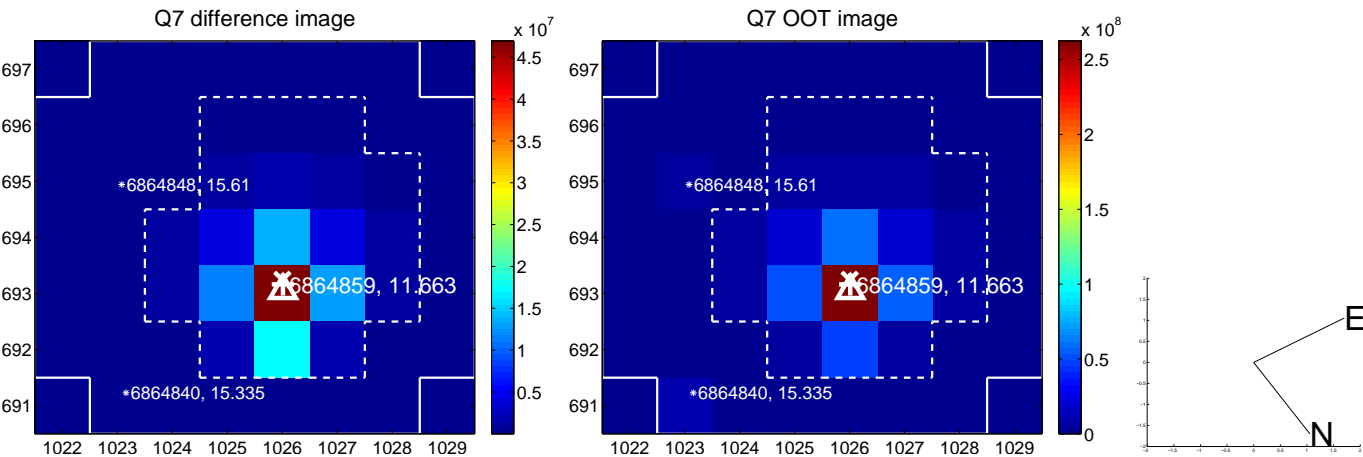
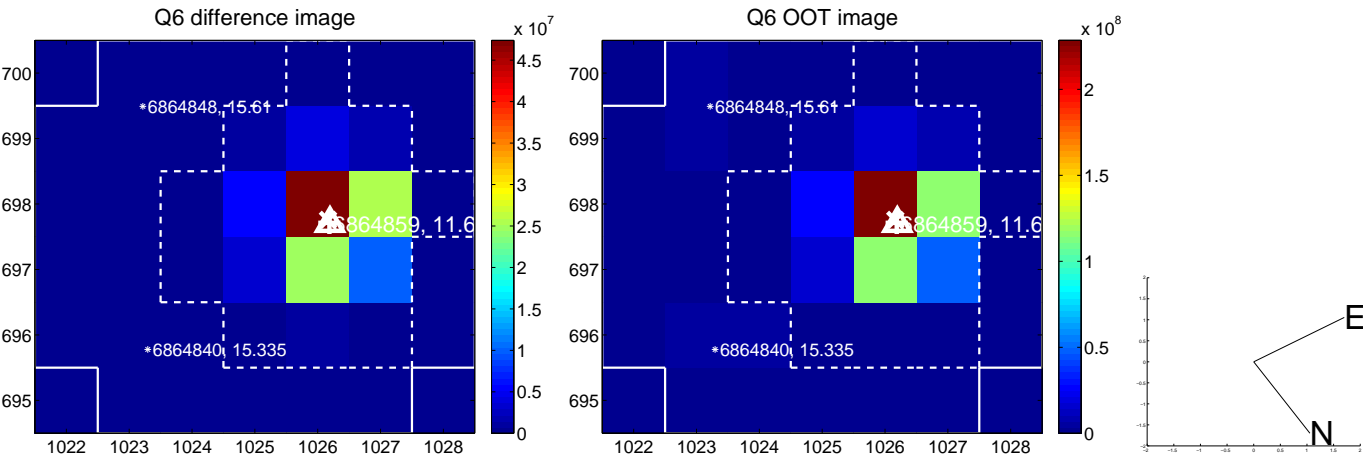
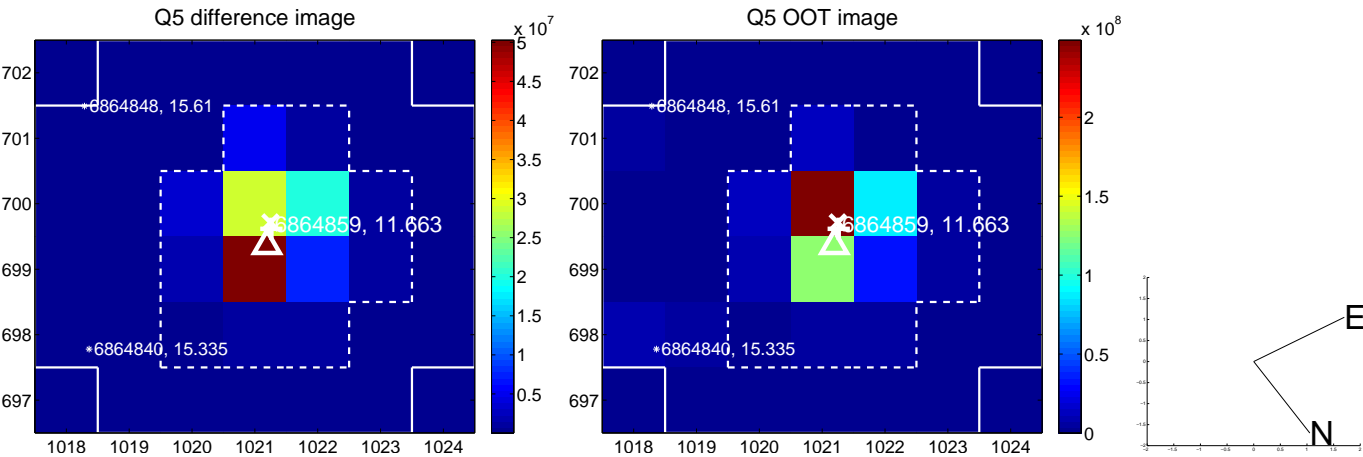


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

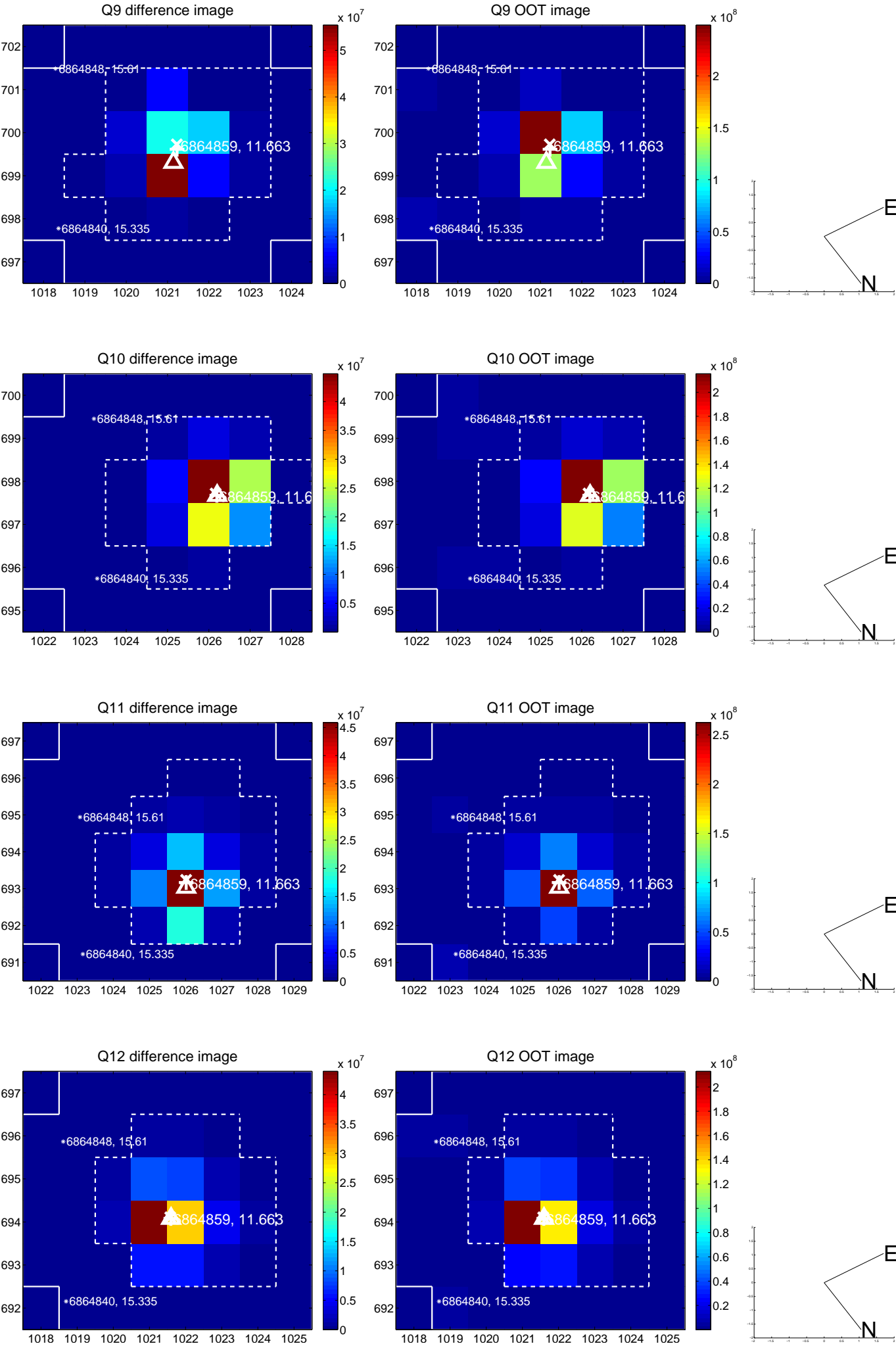
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



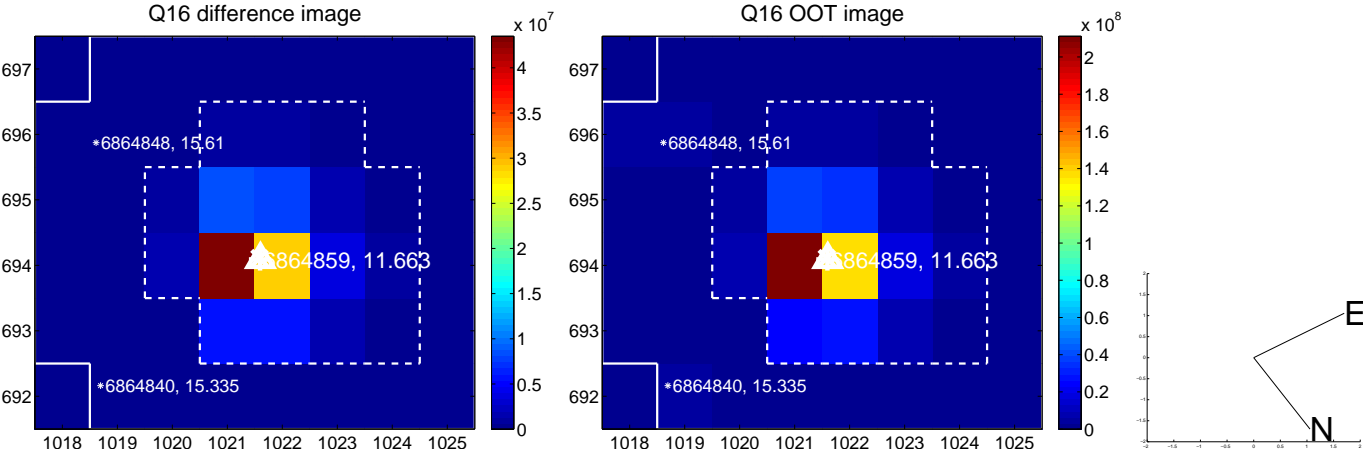
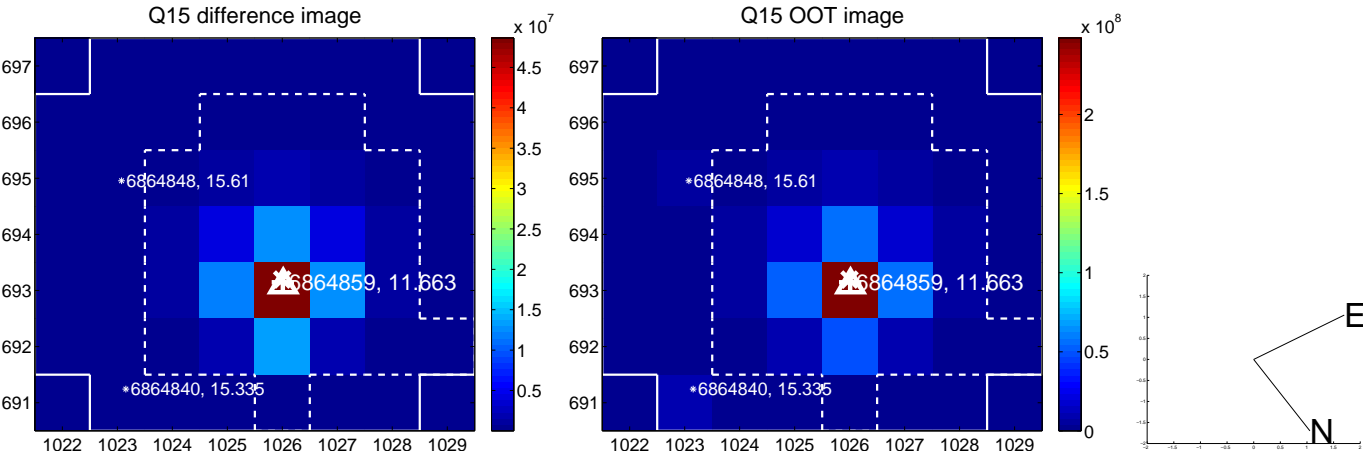
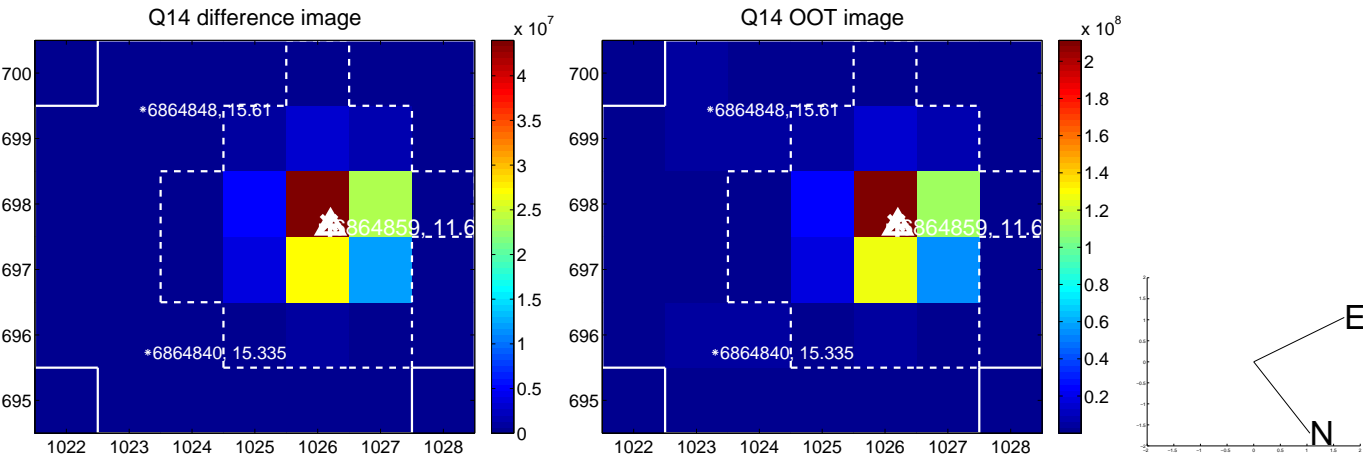
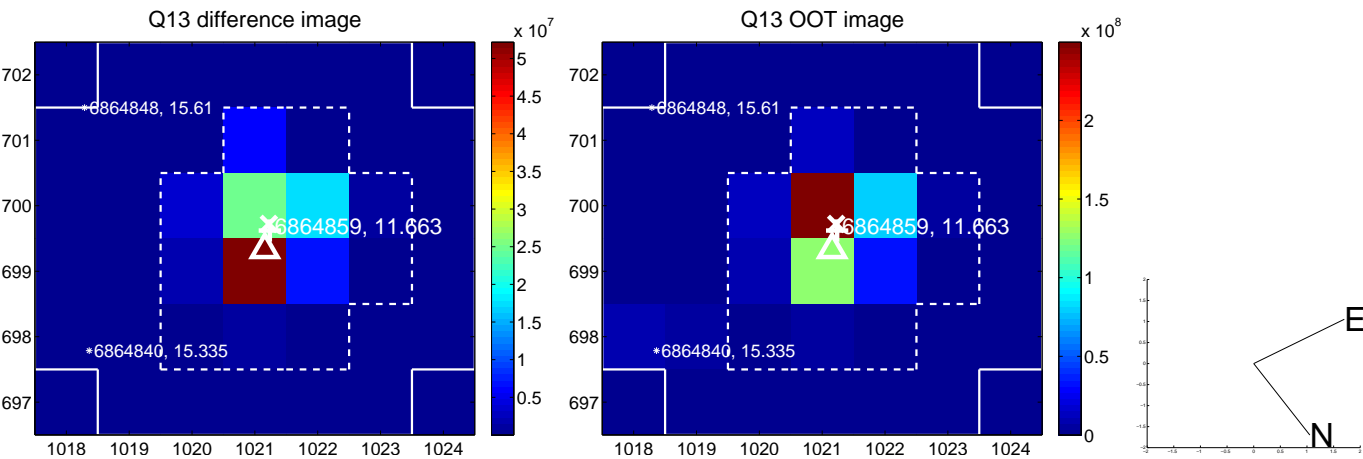
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



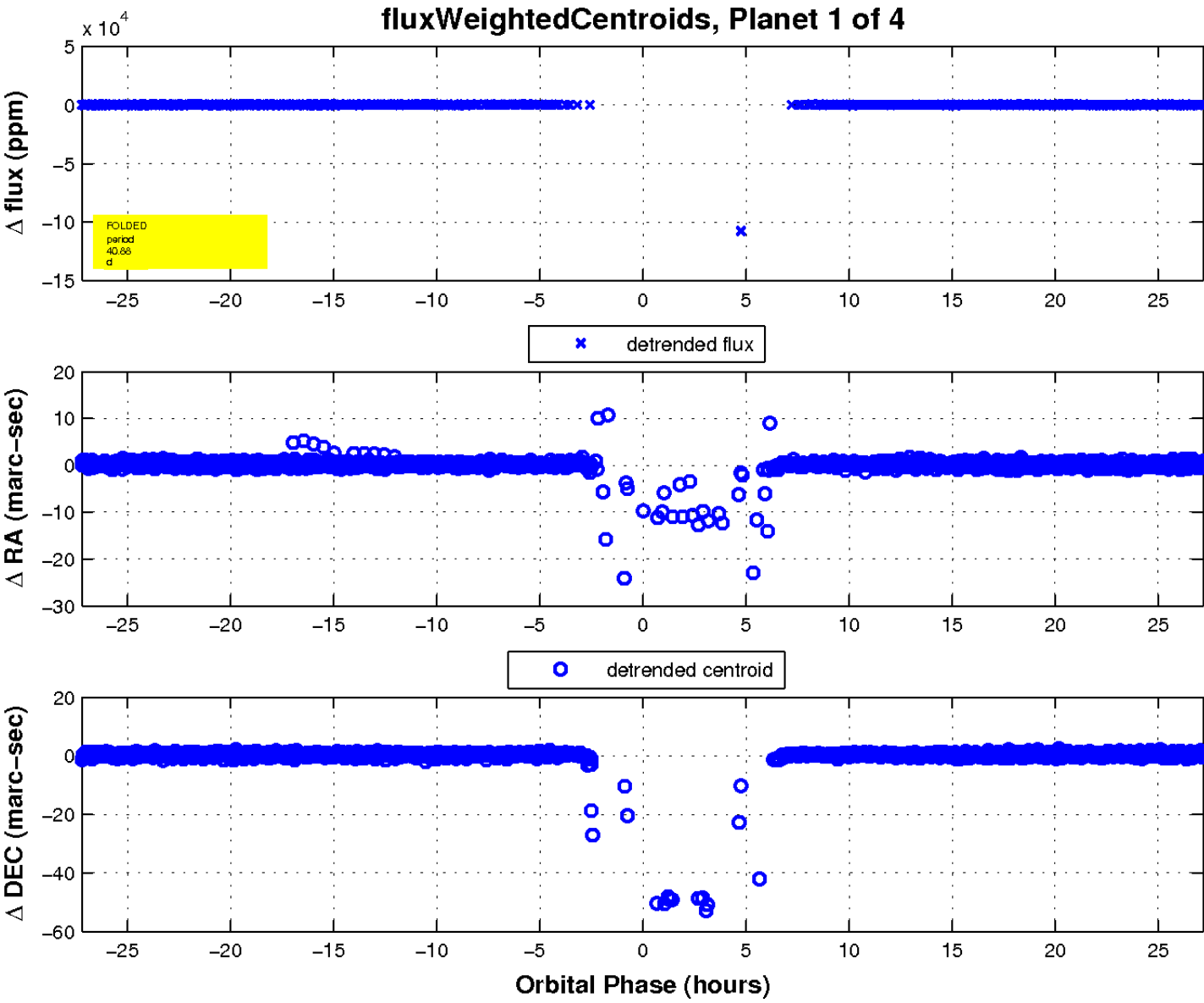
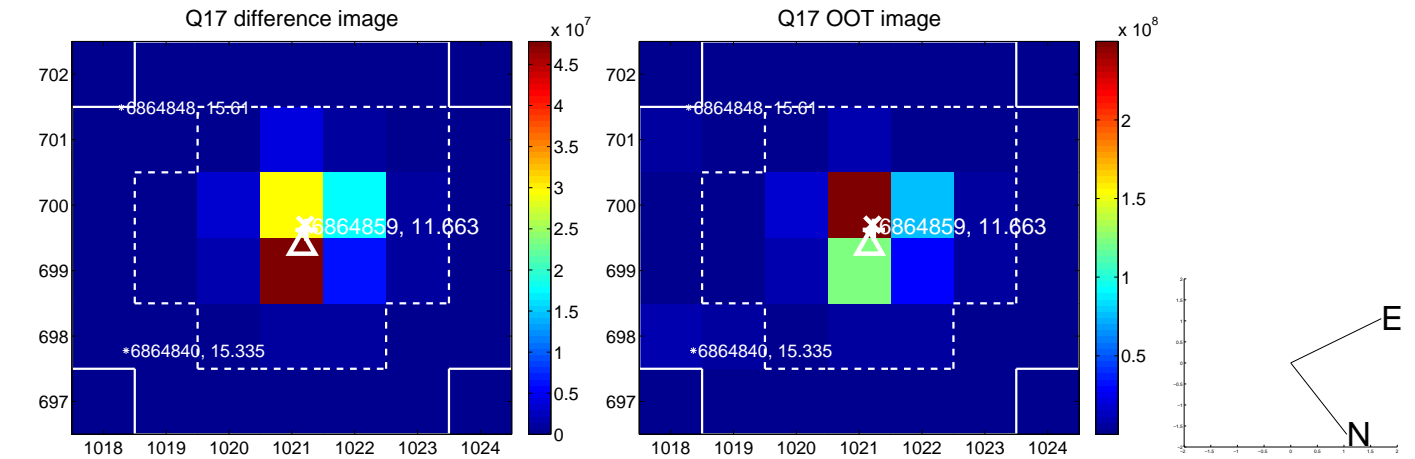
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

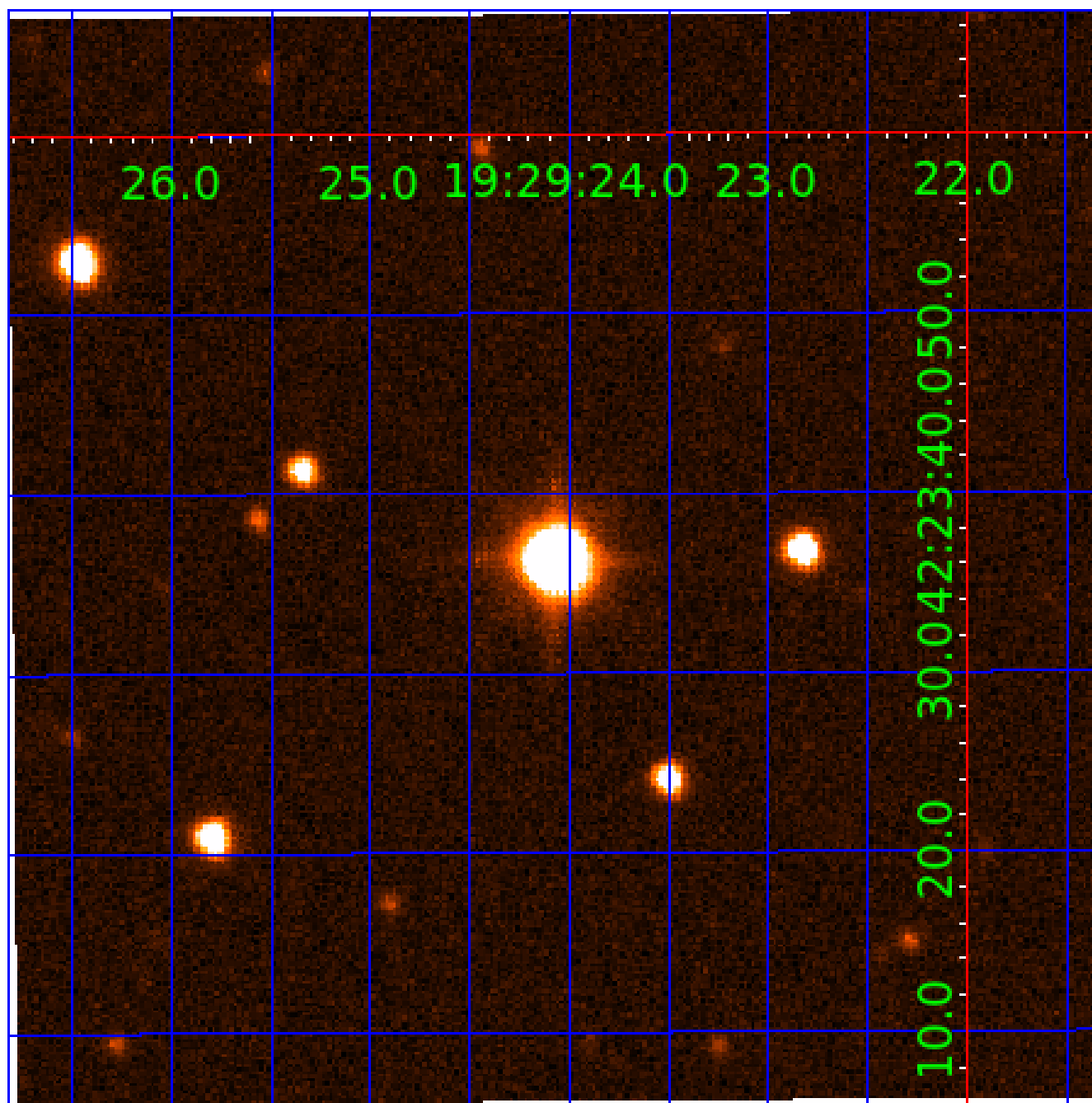


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006864859

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})
006864859-01	OBS	6782.01	40.878244	158.309608	257460.2	6.000	31312.2	-1.0	2.59	6807	106.51	166.31
006864859-02	OBS	No	40.877884	163.428215	254428.5	7.500	29667.9	-1.0	2.59	6807	92.32	166.31
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864859-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
006864859-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS
006864859-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006864859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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 006864859-02

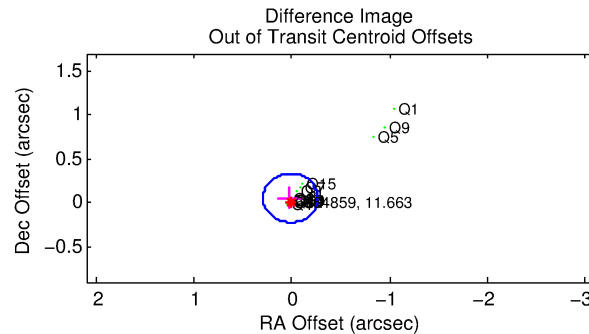
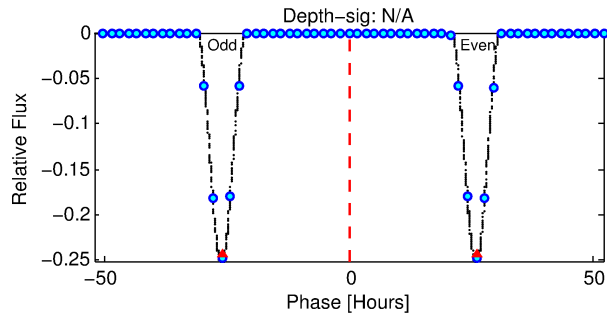
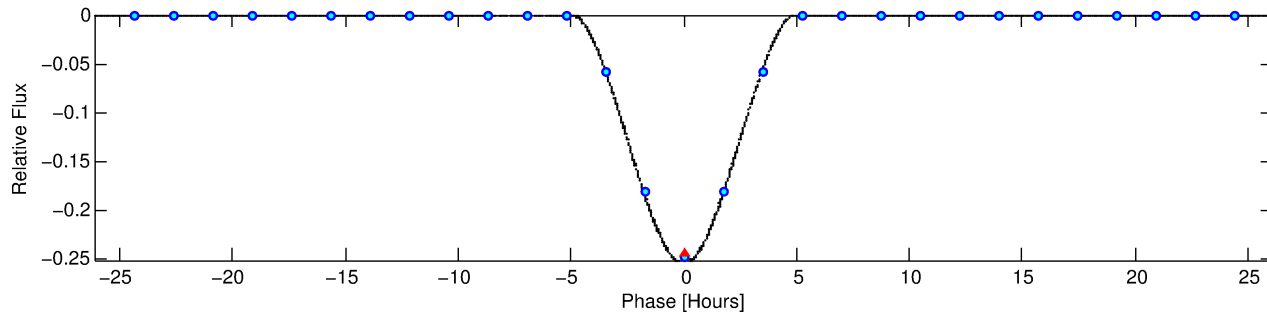
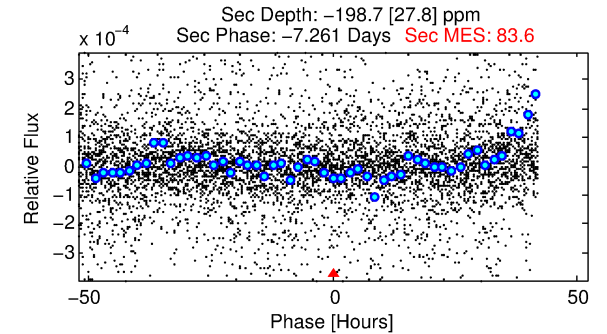
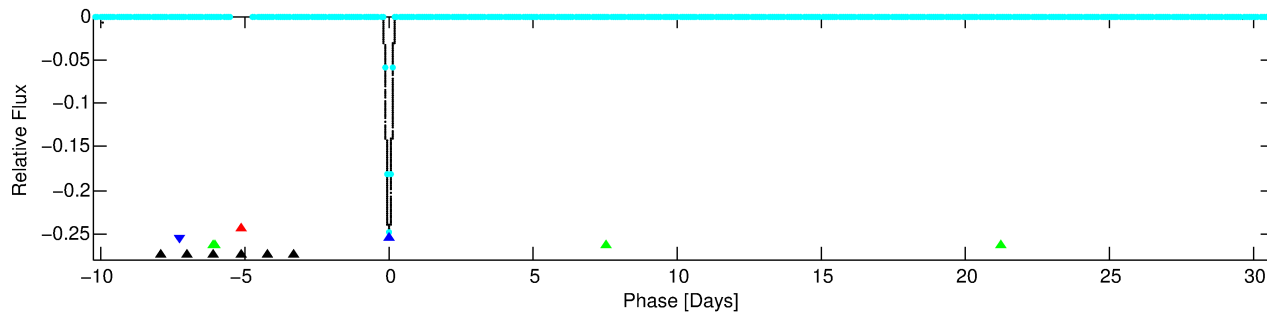
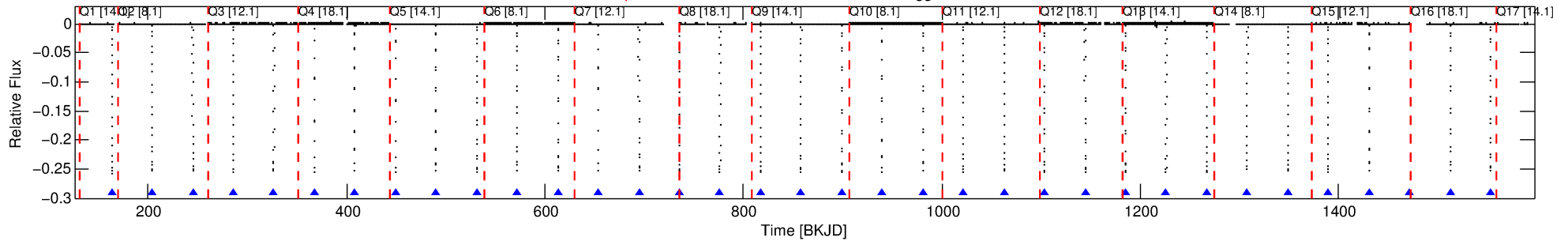
No Significant Match Found

DV One-Page Summary

KIC: 6864859 Candidate: 2 of 4 Period: 40.878 d

KOI: K06782 Corr: No Ephemeris Match

Kp: 11.66 R*: 2.59 Rs Teff: 6807.0 K Logg: 3.85 Fe/H: 0.080



TPS TCE Results:

Period = 40.87788 d
Epoch = 163.4282 BKJD

DV fit results are unavailable

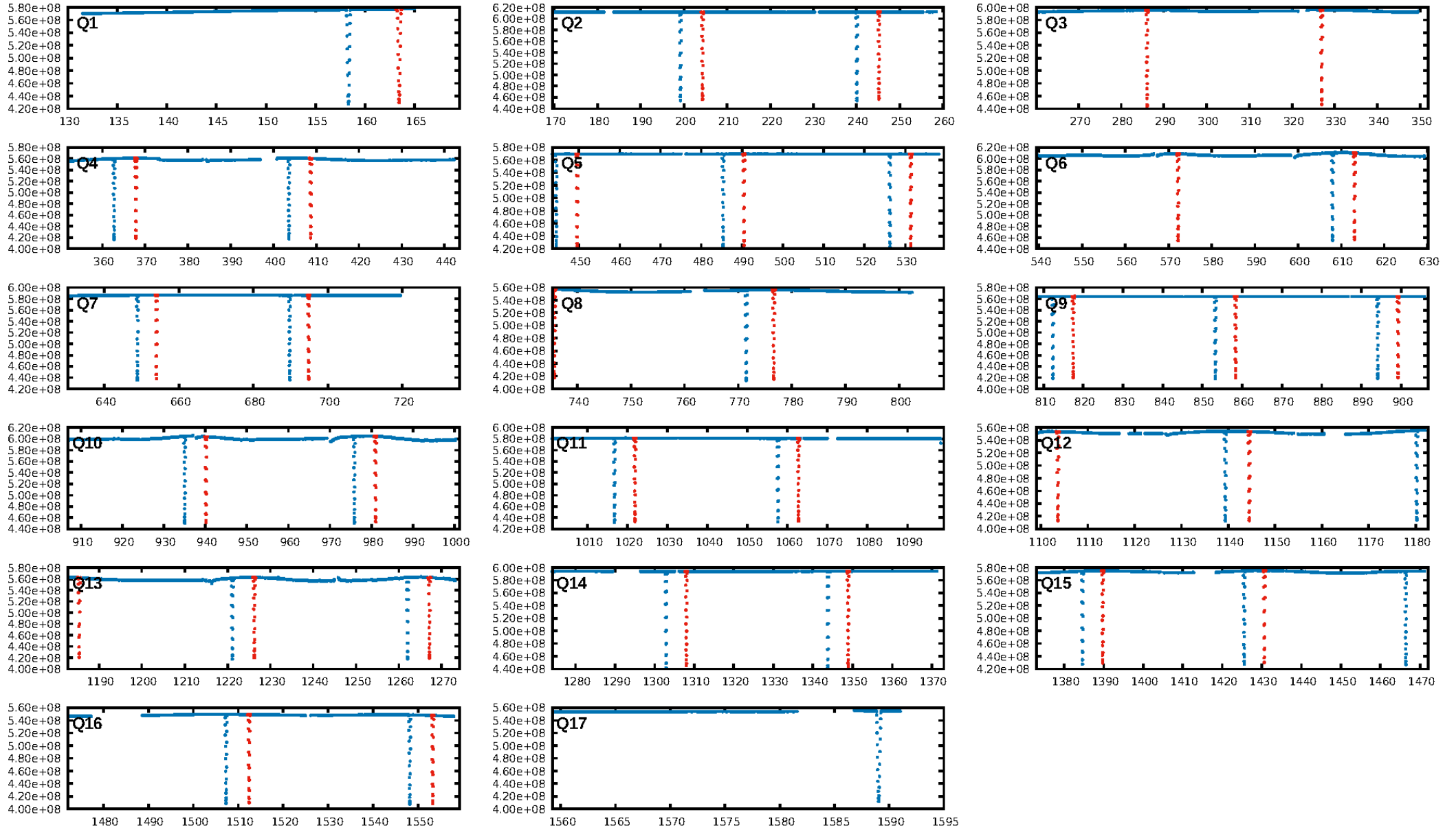
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [33/33]
GhostDiagnostic-chr: 13.69
Centroid-sig: N/A
Centroid-so: 0.310 arcsec [1334.50σ]
OotOffset-rm: 0.058 arcsec [0.63σ]
KicOffset-rm: 0.223 arcsec [1.43σ]
OotOffset-st: 4/3/4/3 [14]
KicOffset-st: 4/3/4/3 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

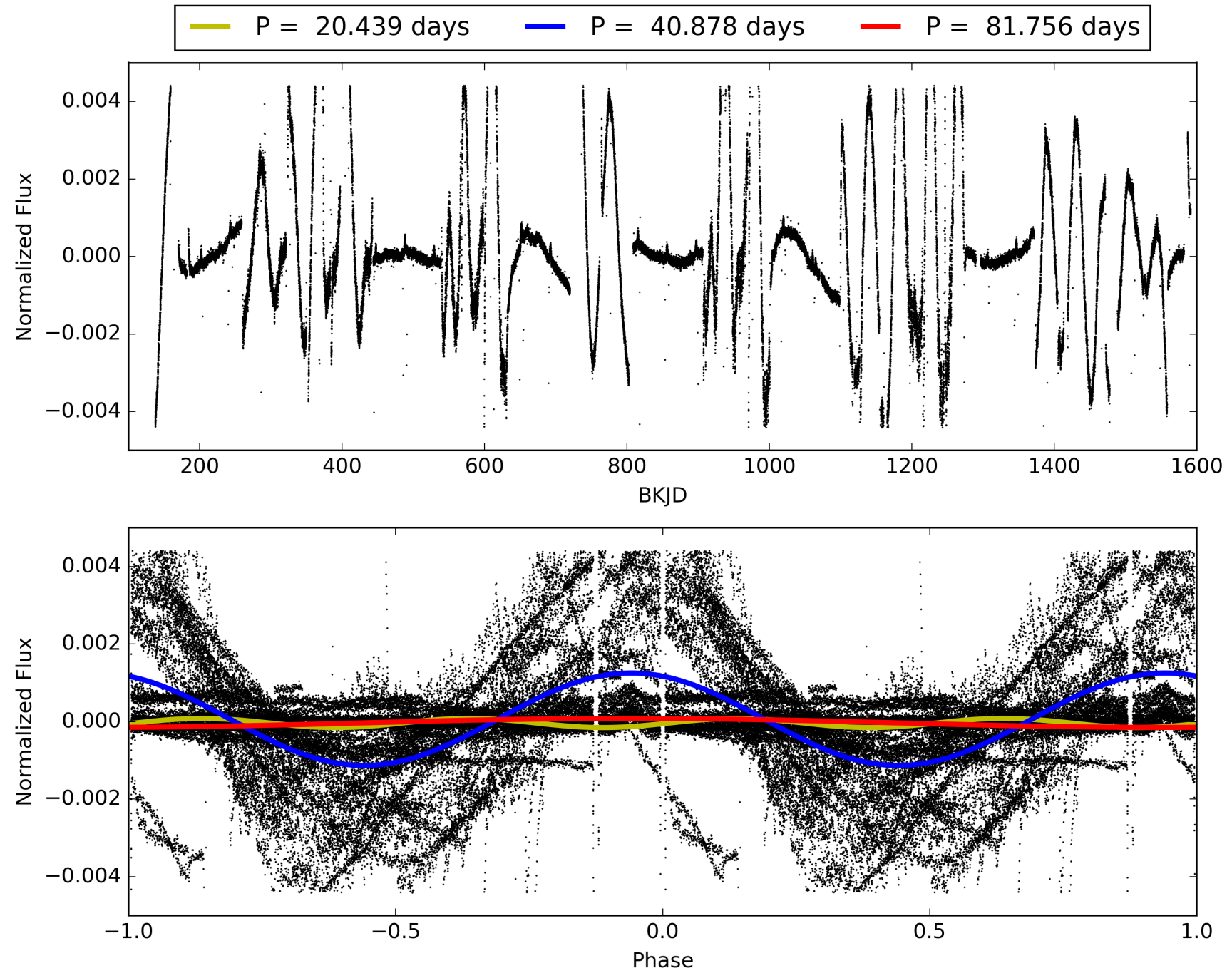
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:24:18 Z

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

TCE 006864859-02, PDC Light Curves

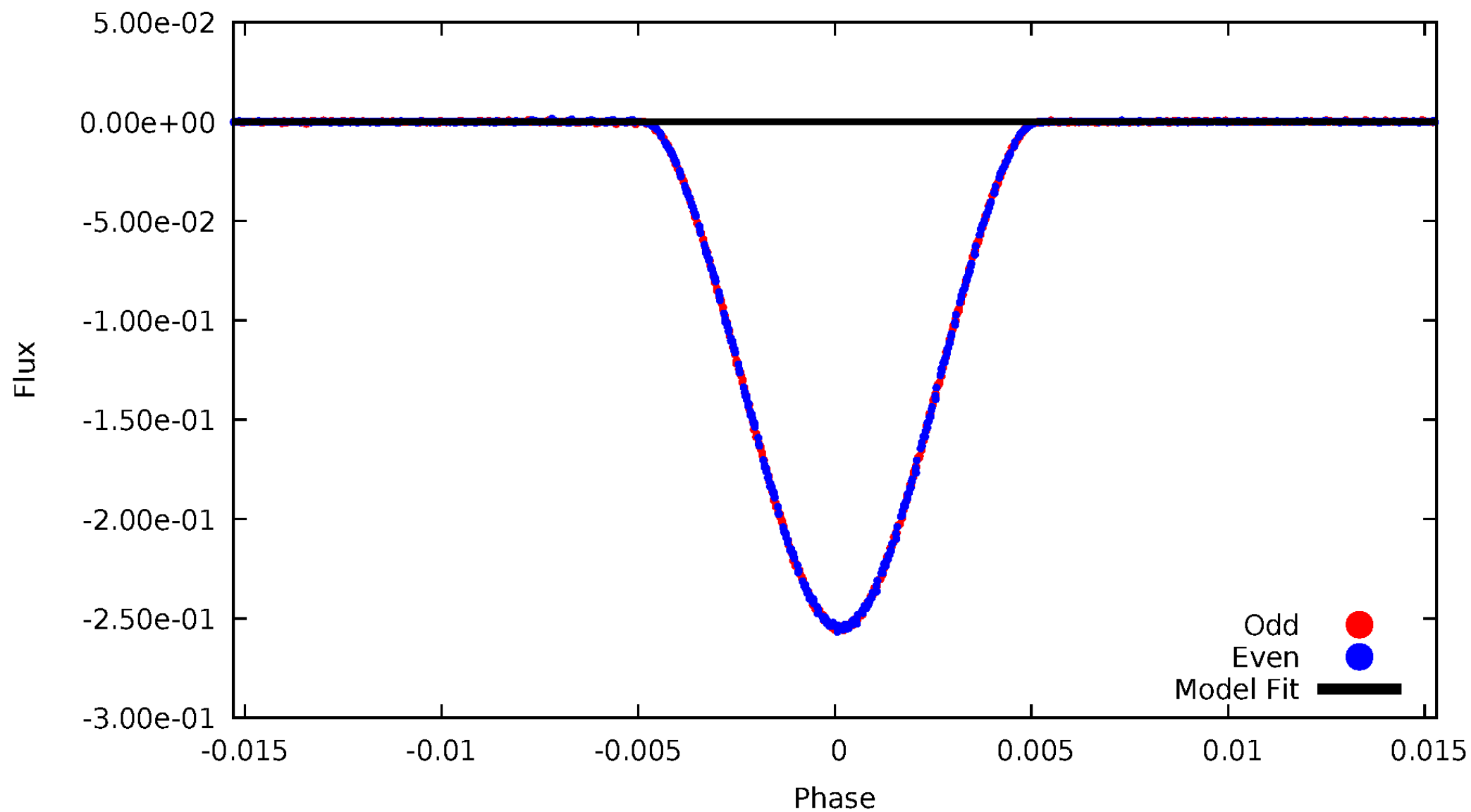


TCE 006864859-02



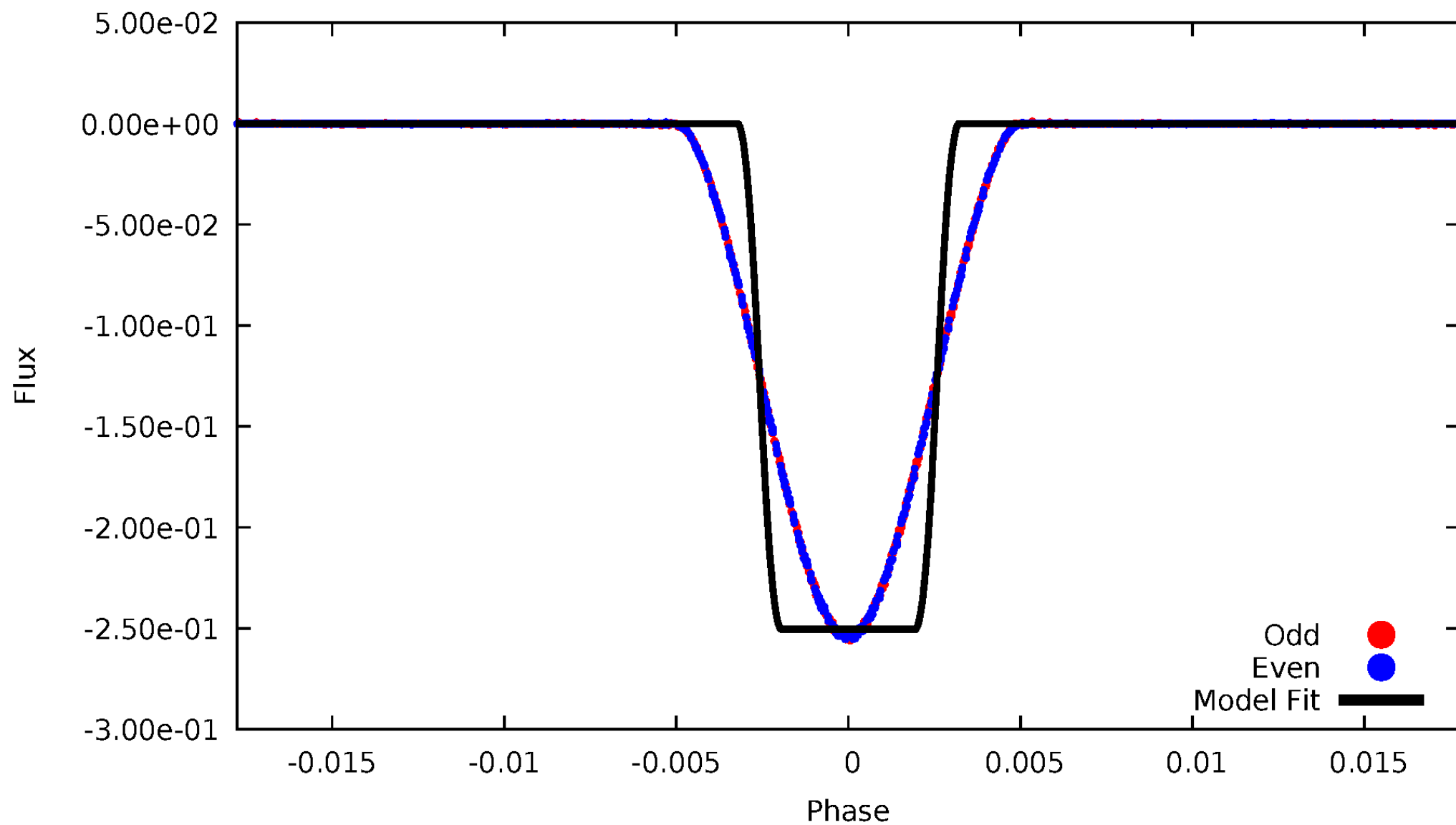
DV Odd/Even

TCE 006864859-02



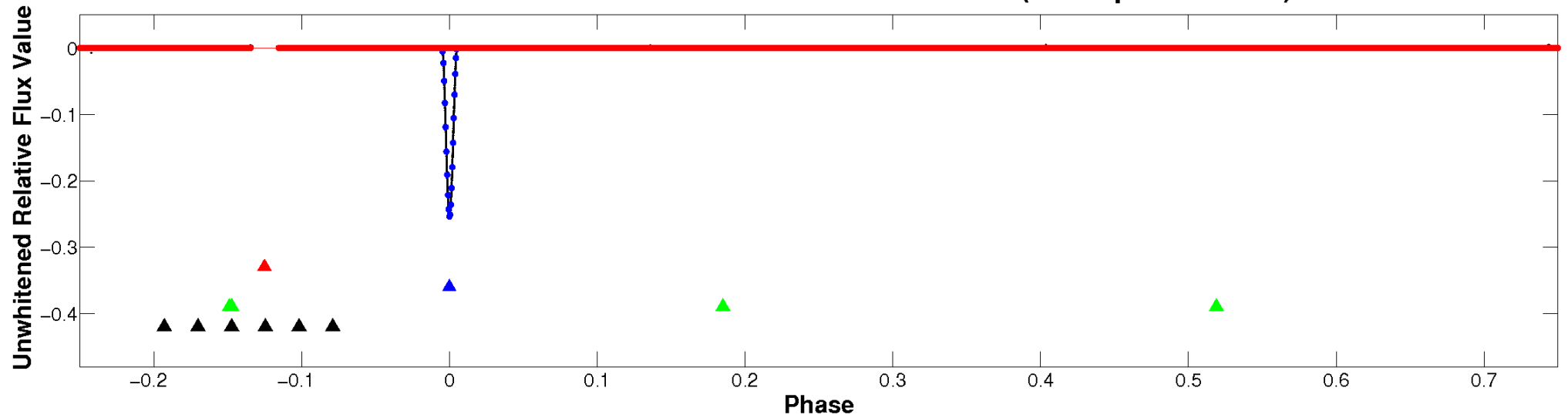
ALT Odd/Even

TCE 006864859-02



Non-Whitened Vs. Whitened Light Curve

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

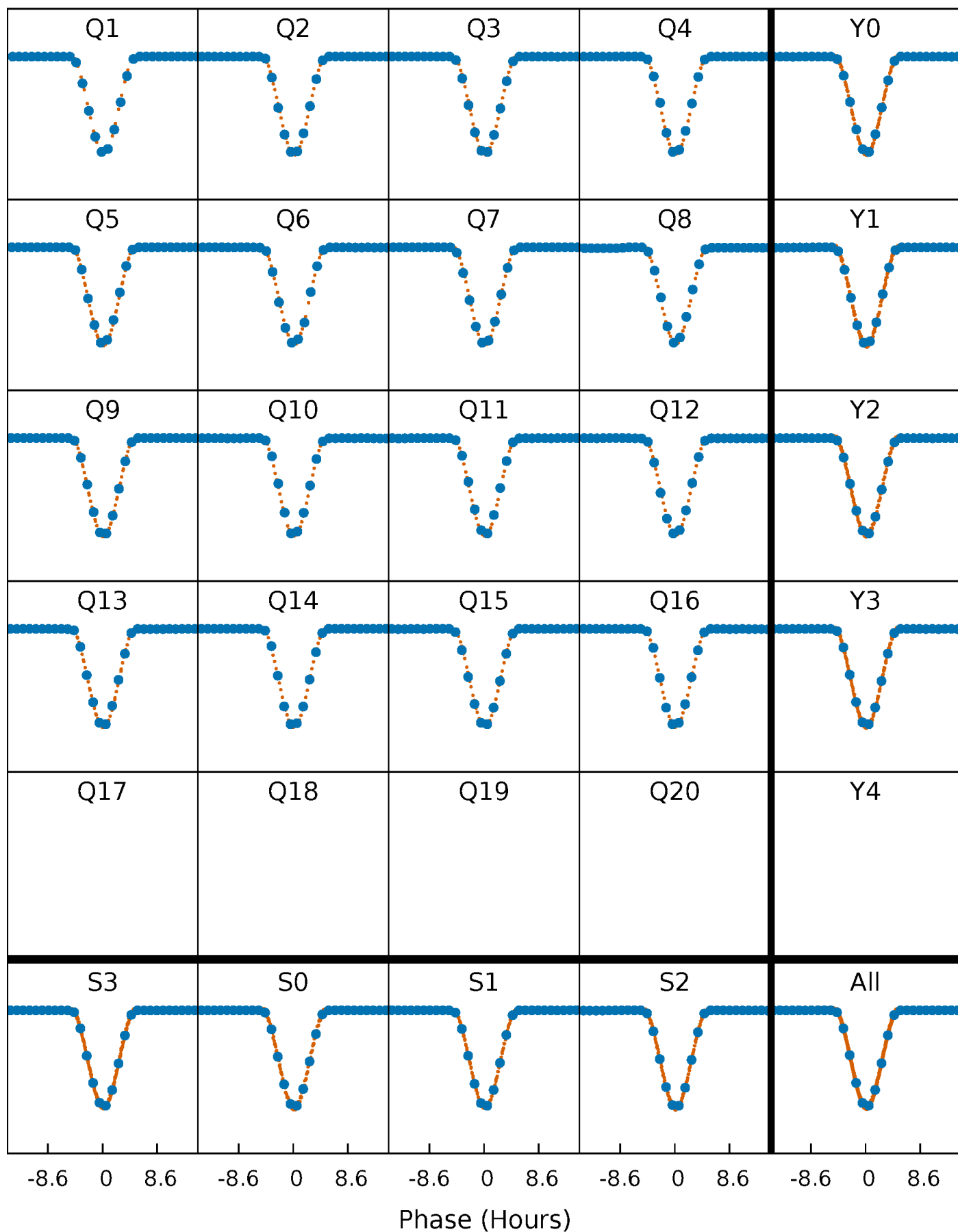


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



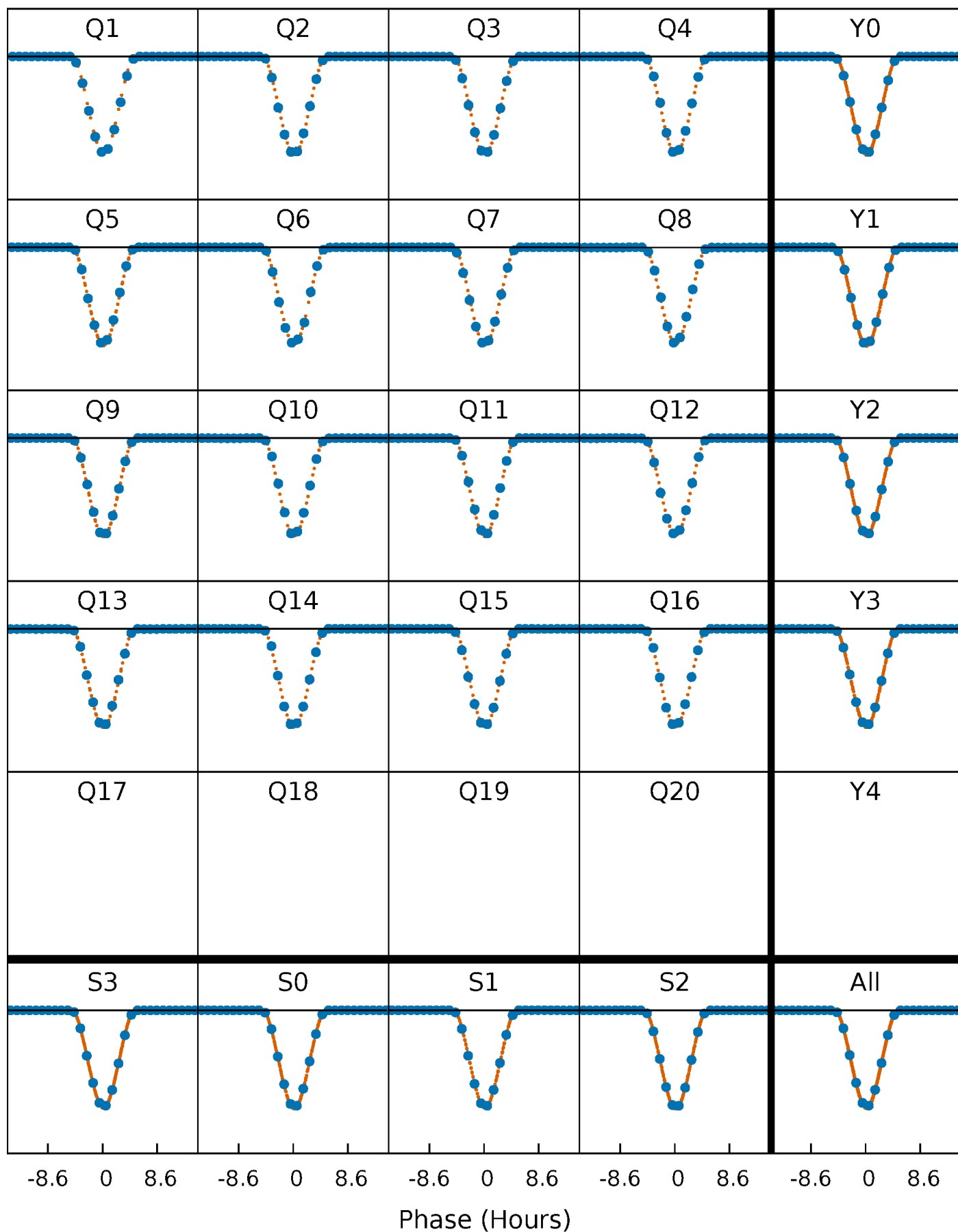
PDC Quarter-Phased Transit Curves

TCE 006864859-02 P= 40.877884 Days $T_0=163.428214$ (BKJD)



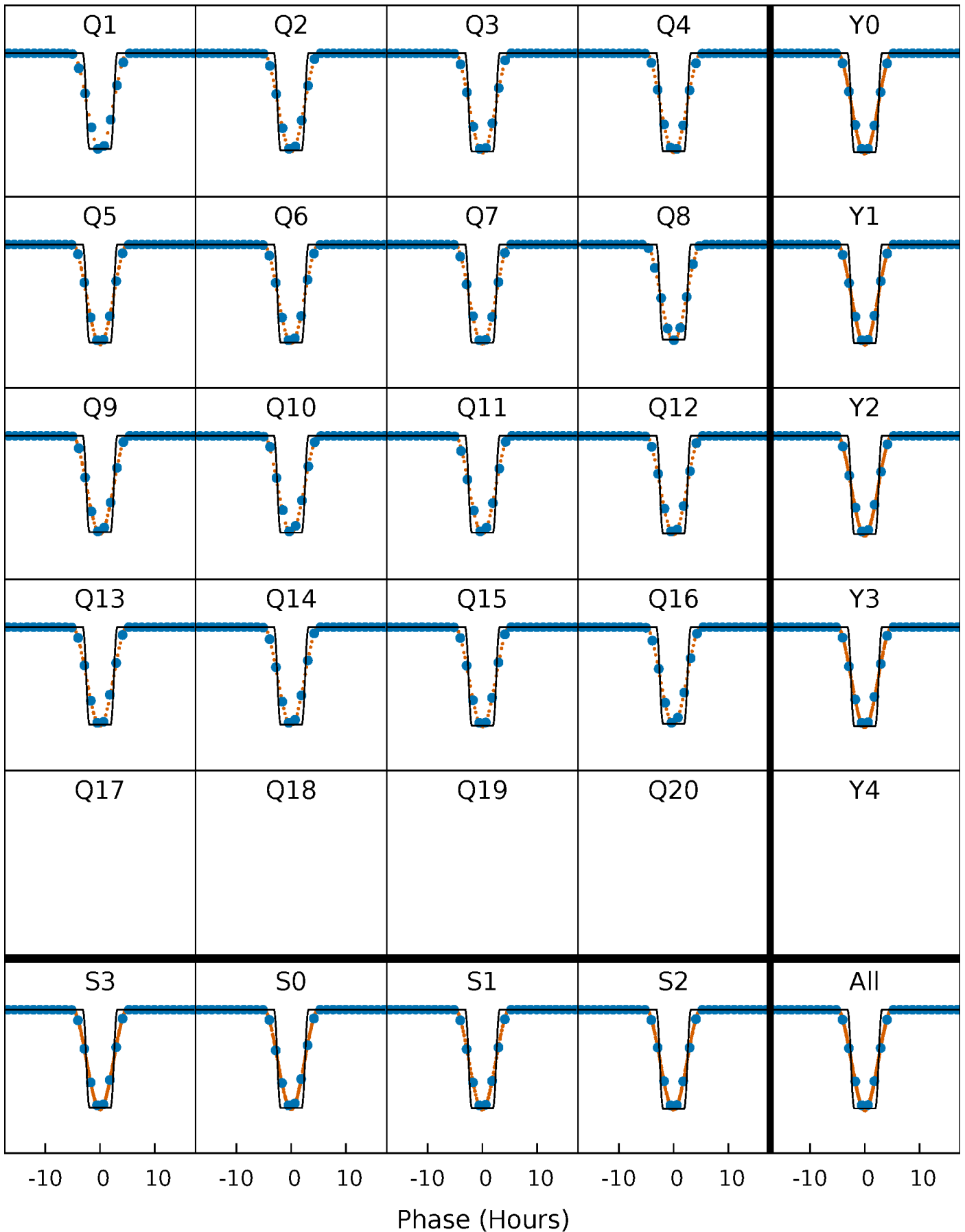
DV Quarter-Phased Transit Curves

TCE 006864859-02 P= 40.877884 Days $T_0=163.428214$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

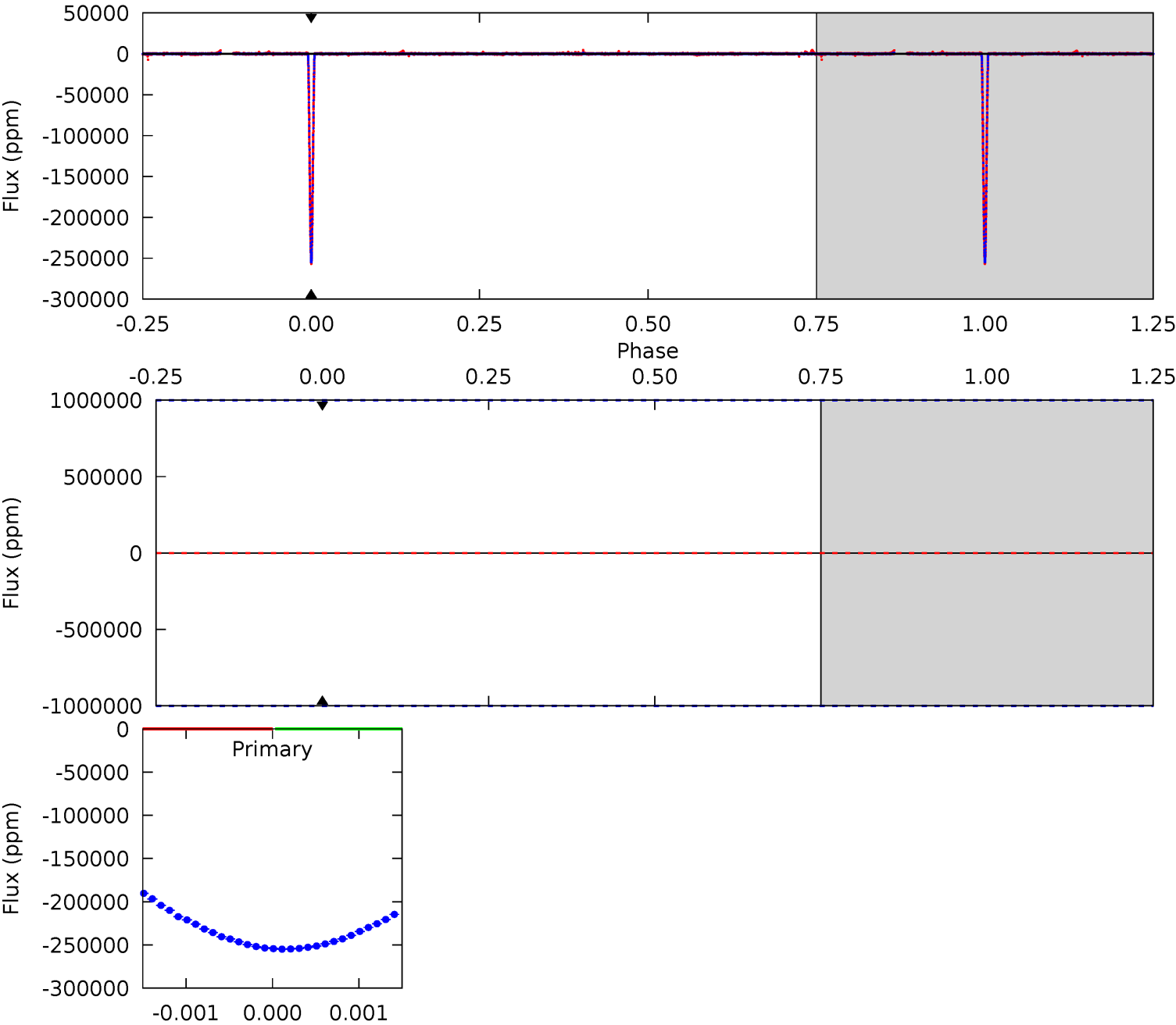
TCE 006864859-02 P= 40.877884 Days $T_0=163.434308$ (BKJD)



DV Model-Shift Uniqueness Test

006864859-02, P = 40.877884 Days, E = 122.550330 Days

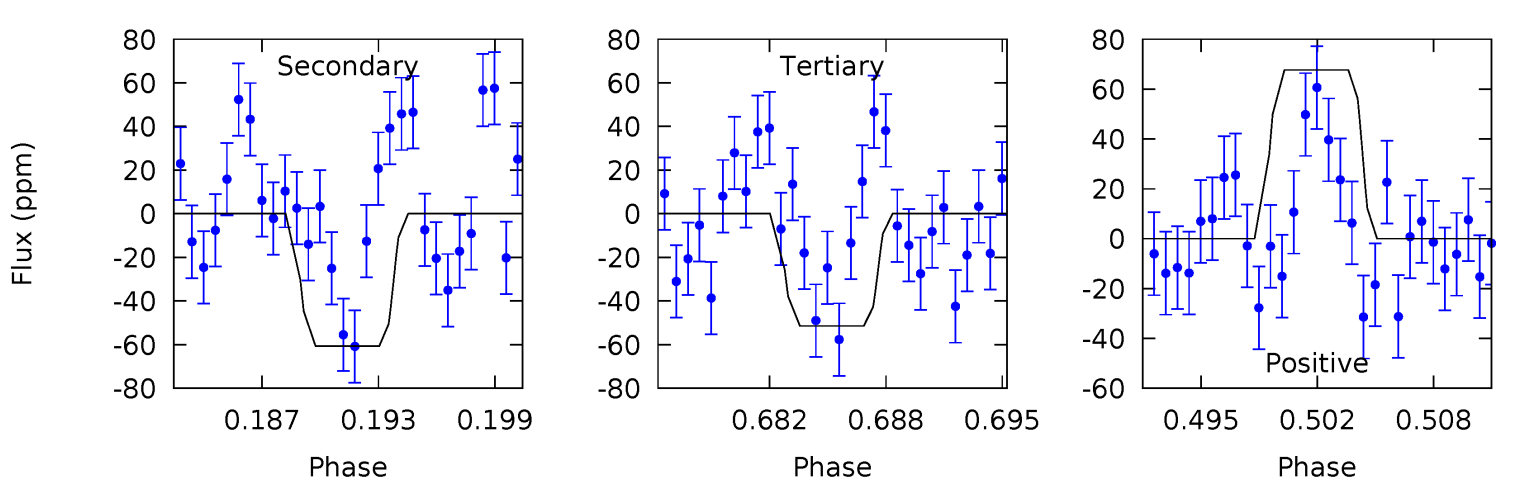
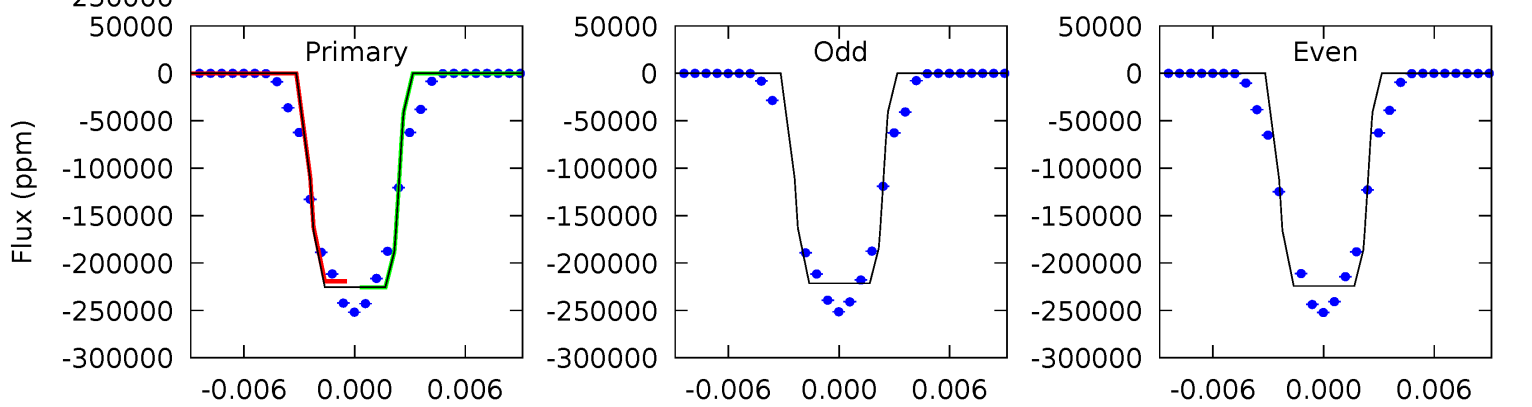
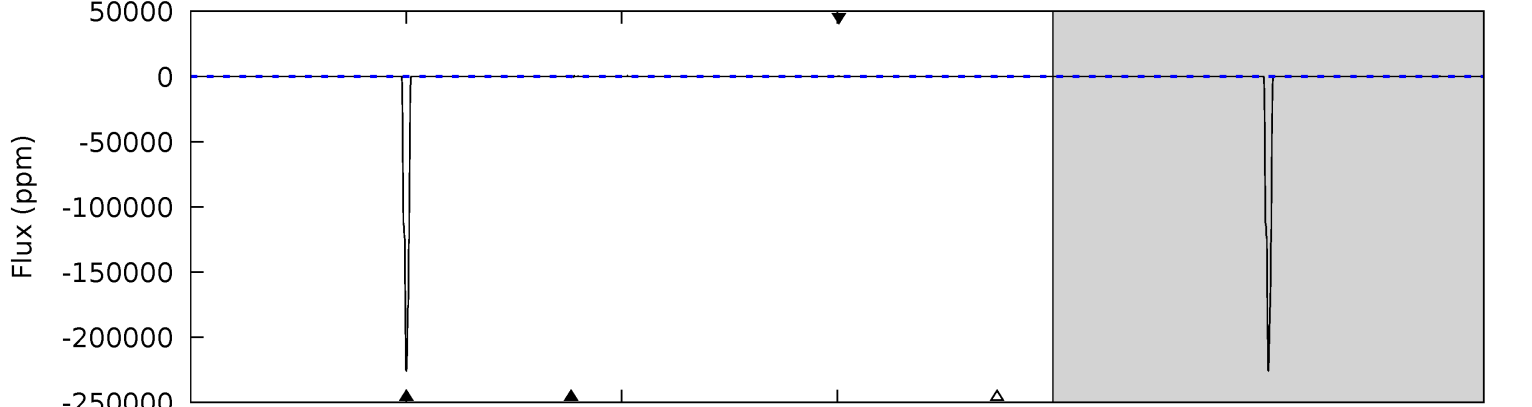
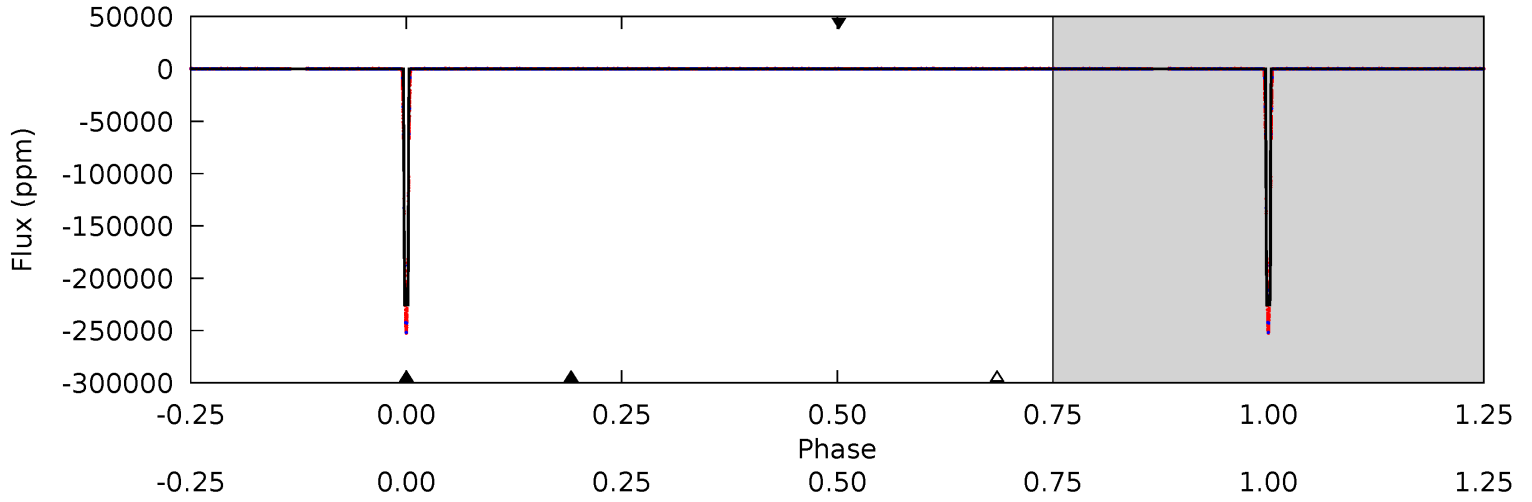
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

006864859-02, P = 40.877884 Days, E = 122.556424 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20174	5.42	4.60	6.05	5.11	2.72	1.51	20170	20168	0.82	-0.63	161.8	1.00	0.00	0



Stellar Parameters For KIC 006864859

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6807^{+192}_{-264}	$3.848^{+0.350}_{-0.150}$	$0.080^{+0.200}_{-0.350}$	$2.590^{+0.587}_{-1.091}$	$1.723^{+0.176}_{-0.410}$	$0.140^{+0.390}_{-0.061}$
	+3%/-4%	+9%/-4%	+250%/-438%	+23%/-42%	+10%/-24%	+280%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006864859-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$84.04^{+33.30}_{-28.72}$	1258^{+95}_{-136}	2996^{+4126}_{-9771}	$6.734^{+716.536}_{-618.029}$
Alt.	-61 ± 11	$133.44^{+36.76}_{-35.75}$	1255^{+96}_{-123}	-1888^{+262}_{-113}	$0.139^{+0.121}_{-0.055}$

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

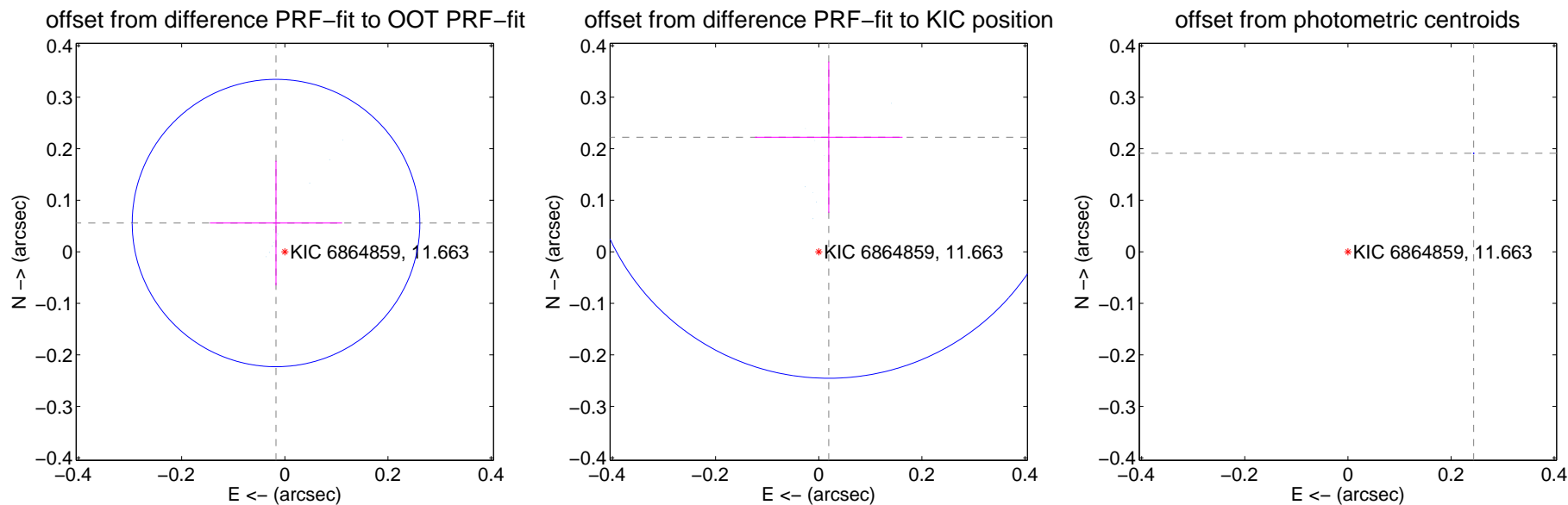
DV Centroid Data

Supplemental centroid analysis for 006864859-02. **Kepler magnitude: 11.66.** Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

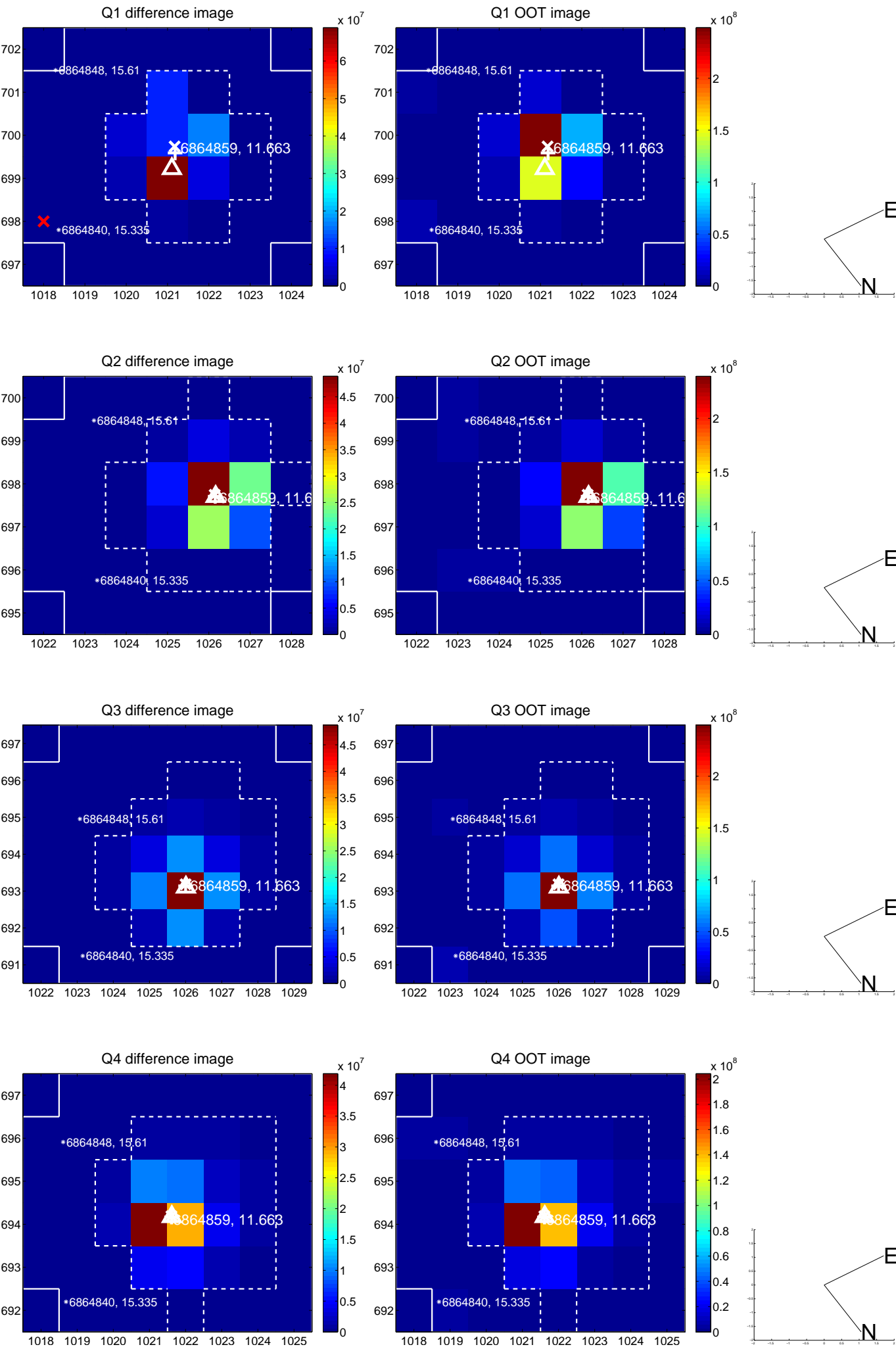
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.058 ± 0.093	0.63	0.017 ± 0.128	0.056 ± 0.121
PRF-fit source offset from KIC position	0.223 ± 0.156	1.43	-0.019 ± 0.143	0.222 ± 0.147
photometric centroid source offset	0.31 ± 0.00	1334.50	-0.24 ± 0.00	0.19 ± 0.00

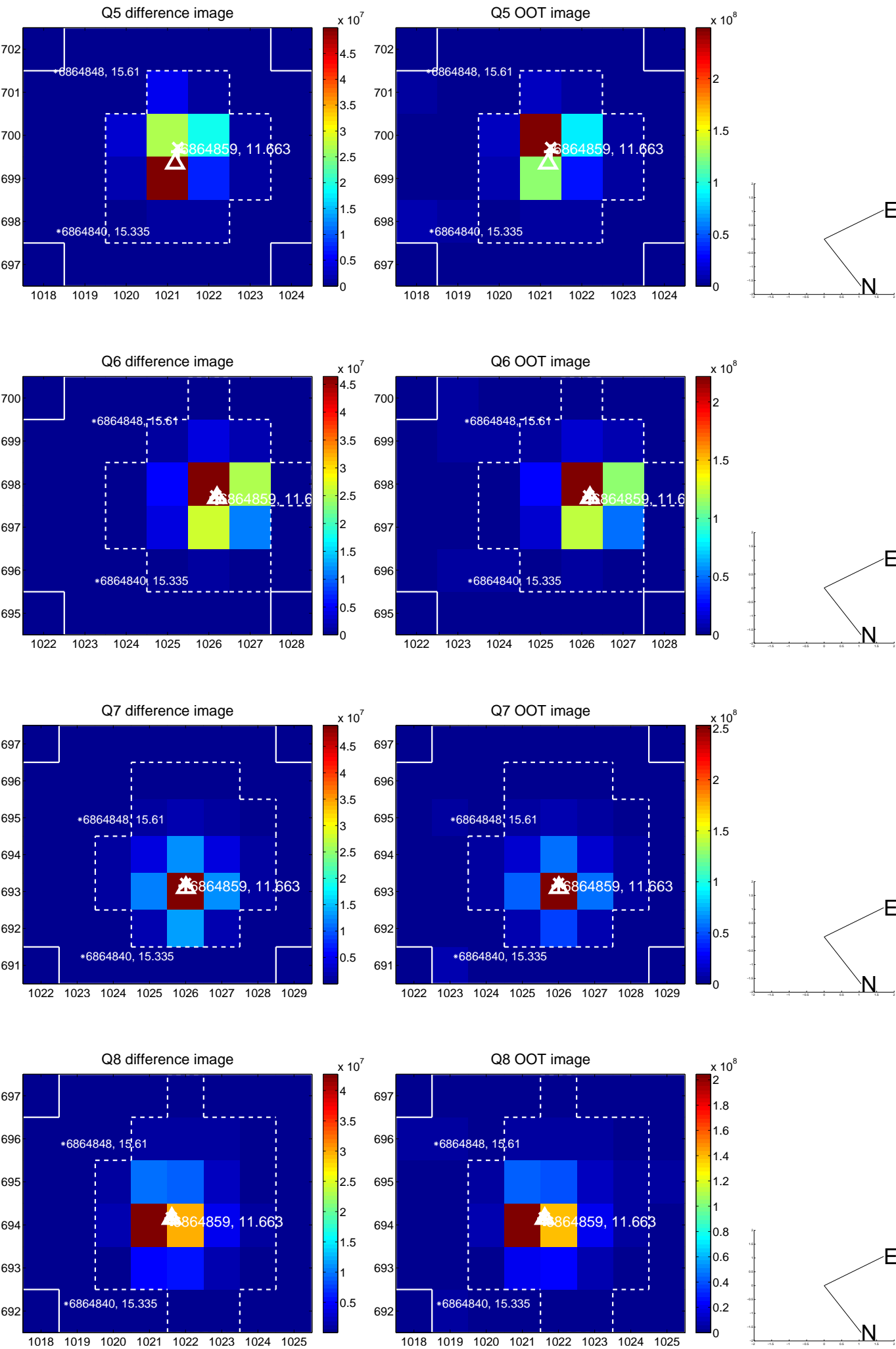


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

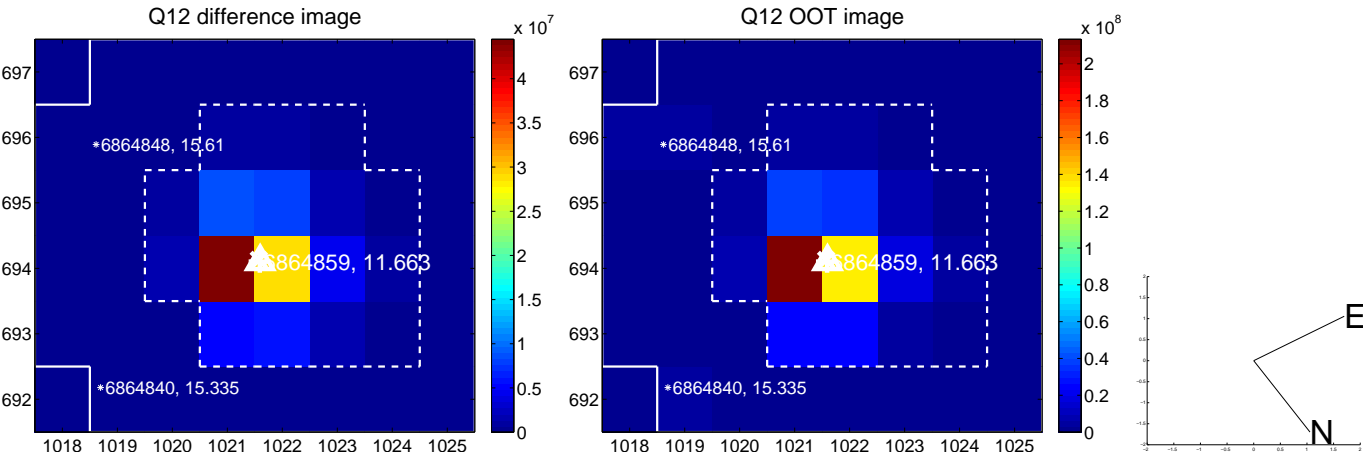
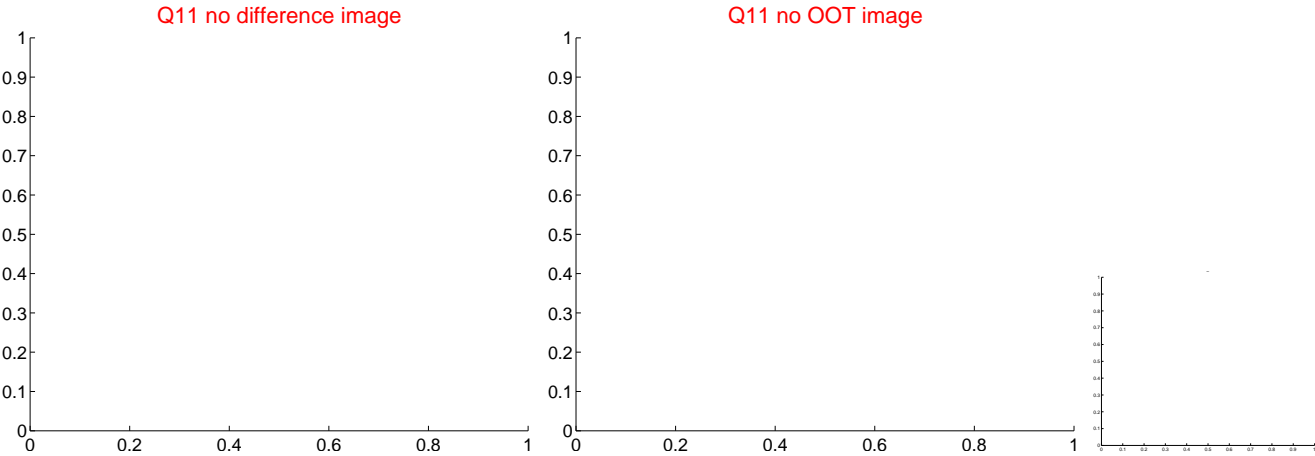
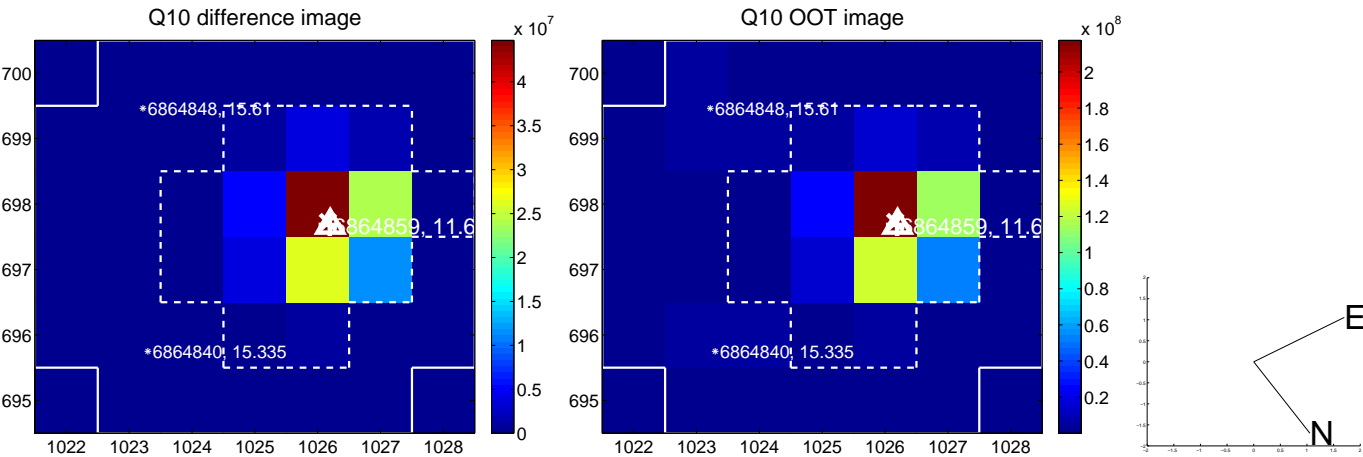
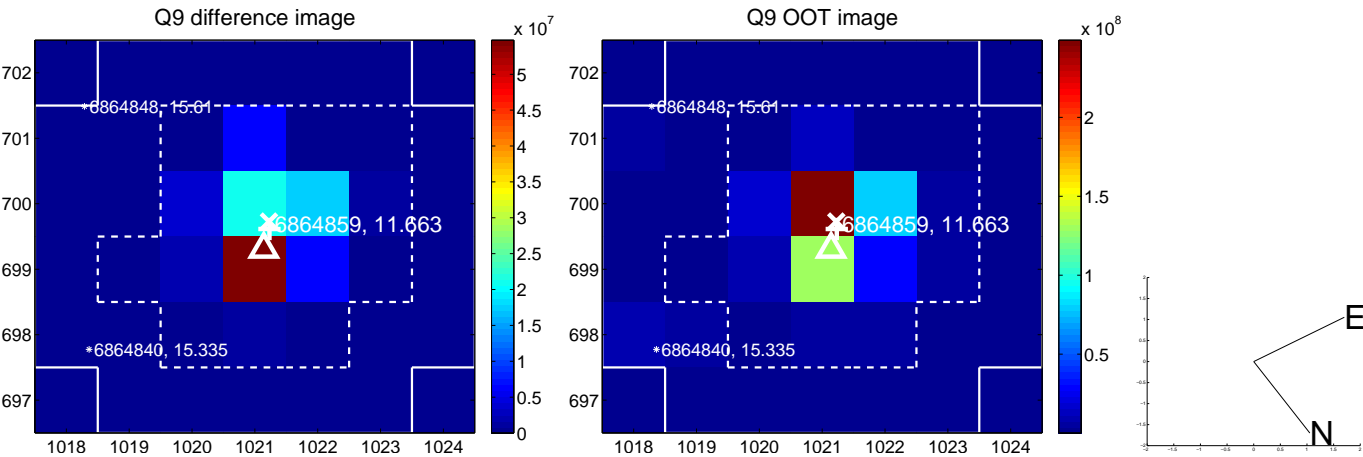
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



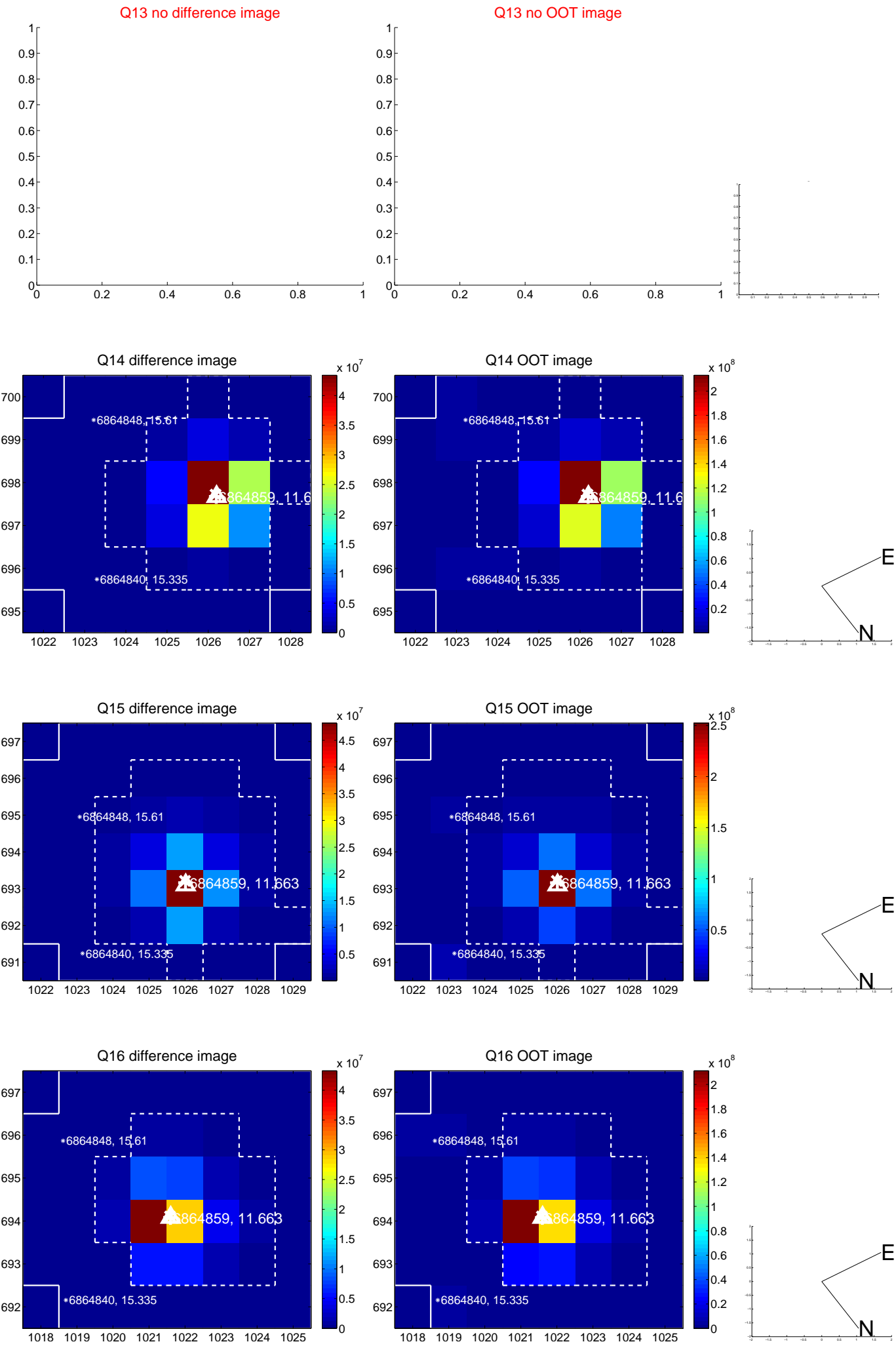
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



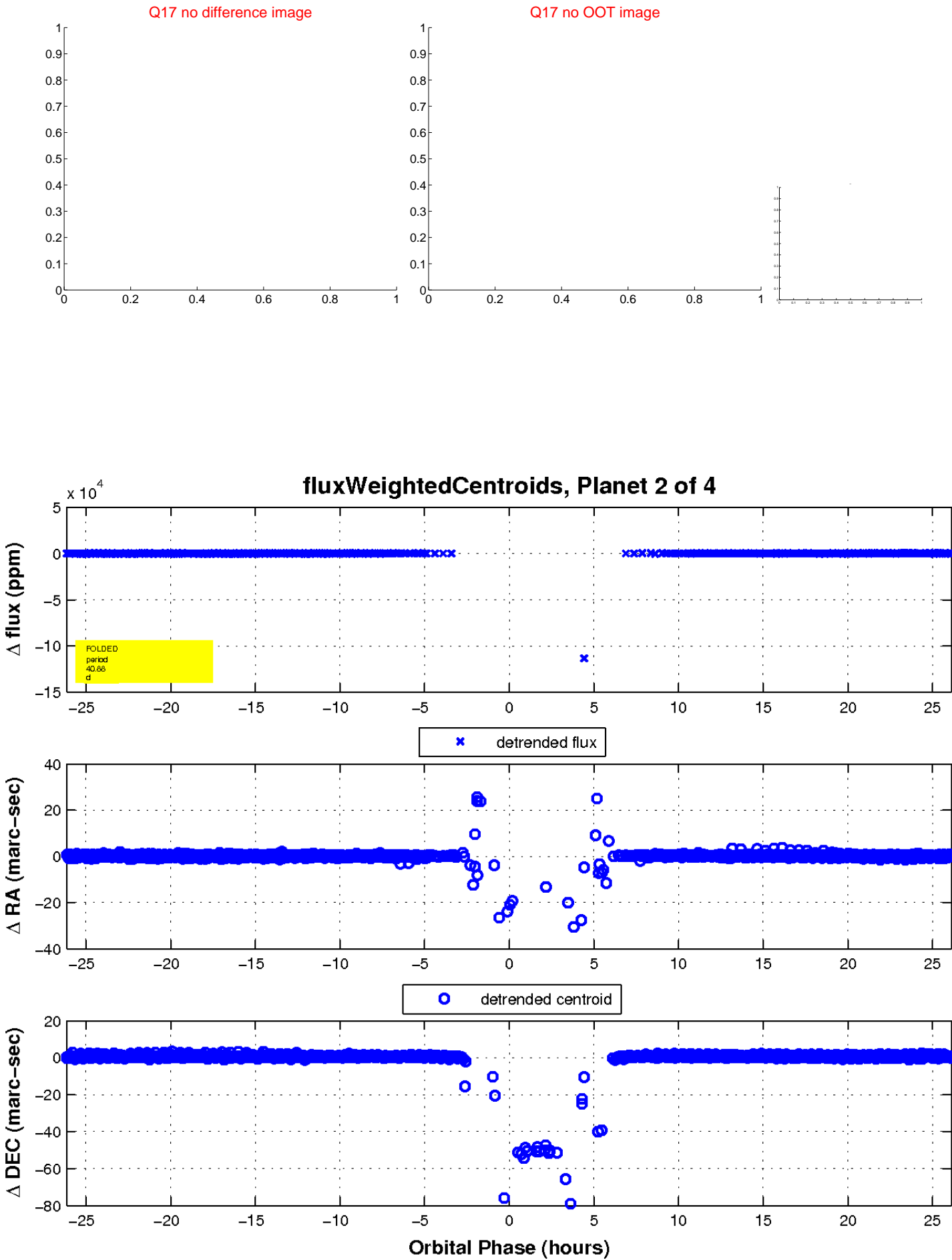
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

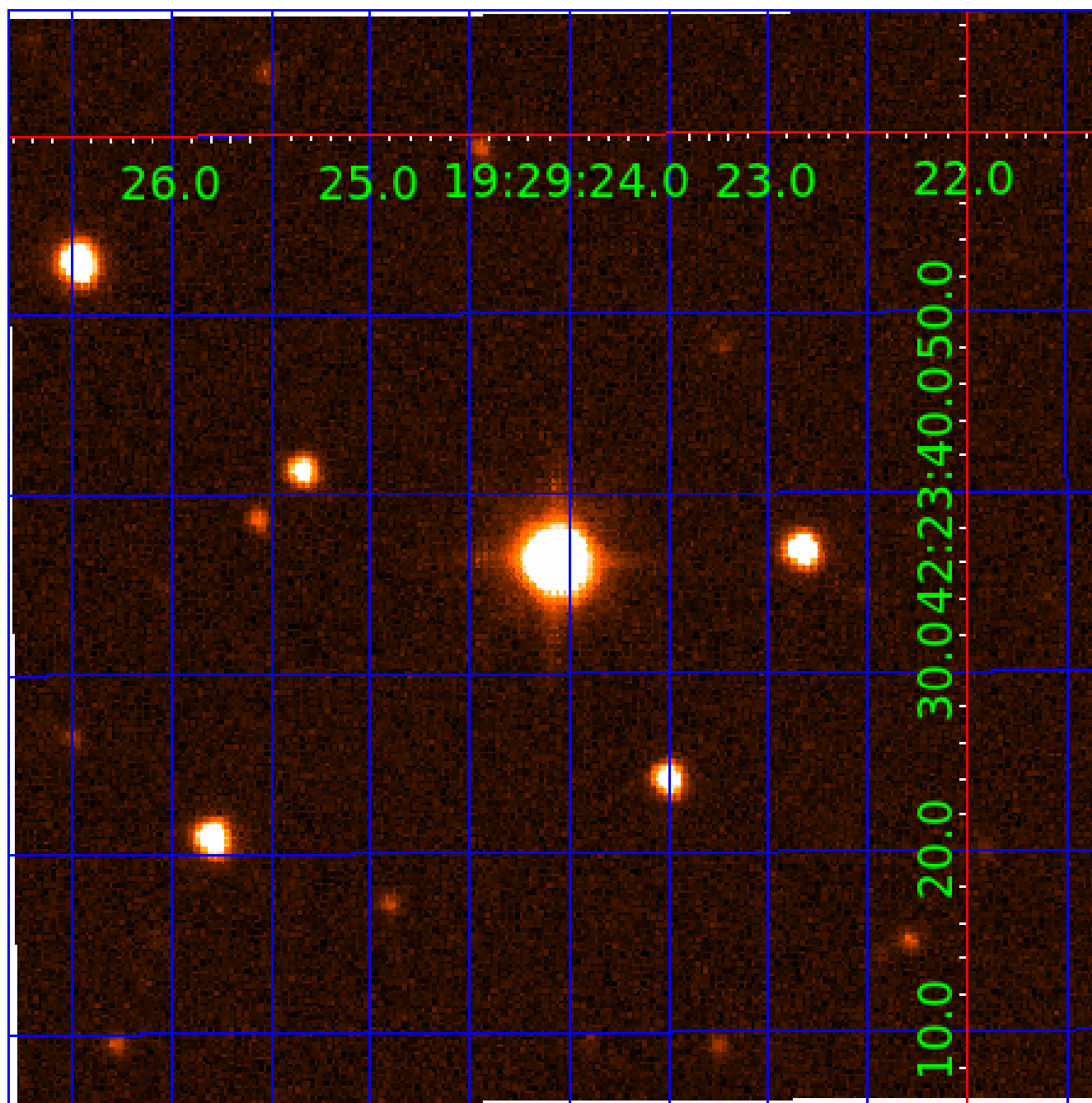


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006864859

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})
006864859-01	OBS	6782.01	40.878244	158.309608	257460.2	6.000	31312.2	-1.0	2.59	6807	106.51	166.31
006864859-02	OBS	No	40.877884	163.428215	254428.5	7.500	29667.9	-1.0	2.59	6807	92.32	166.31
006864859-03	OBS	No	381.549055	157.345825	7290.2	3.500	415.2	-1.0	2.59	6807	22.32	8.46
006864859-04	OBS	No	246.199052	319.057019	5281.8	3.500	323.4	-1.0	2.59	6807	18.99	15.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864859-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
006864859-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS
006864859-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006864859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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 006864859-03

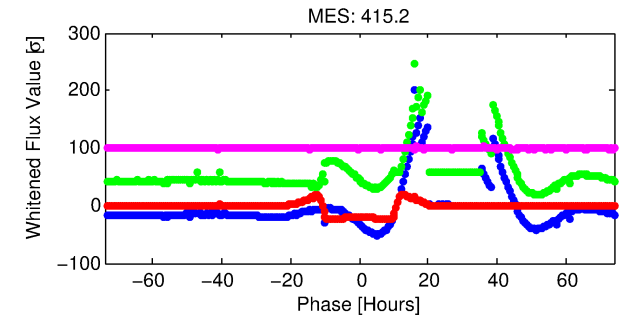
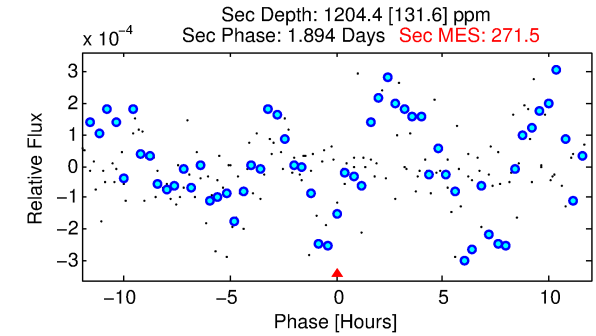
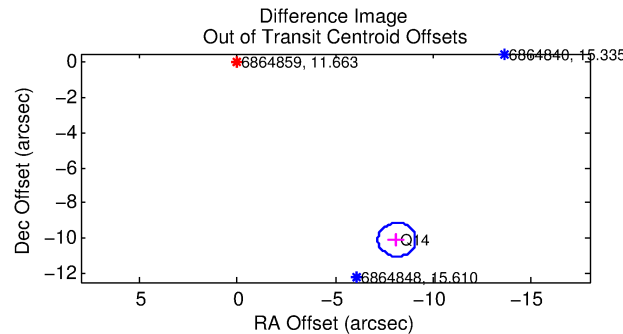
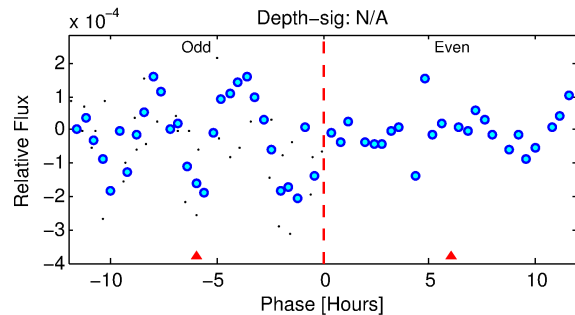
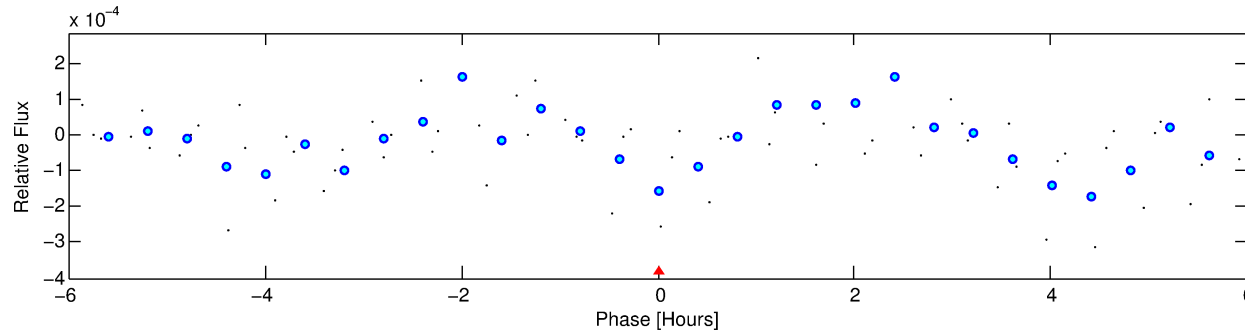
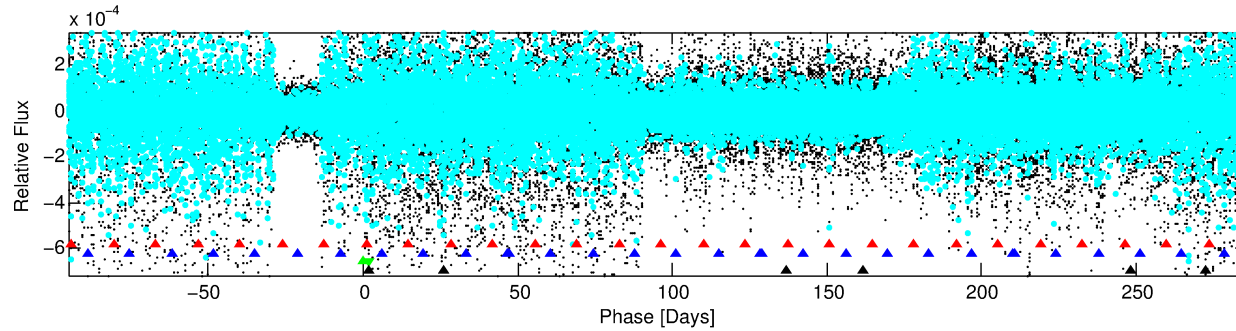
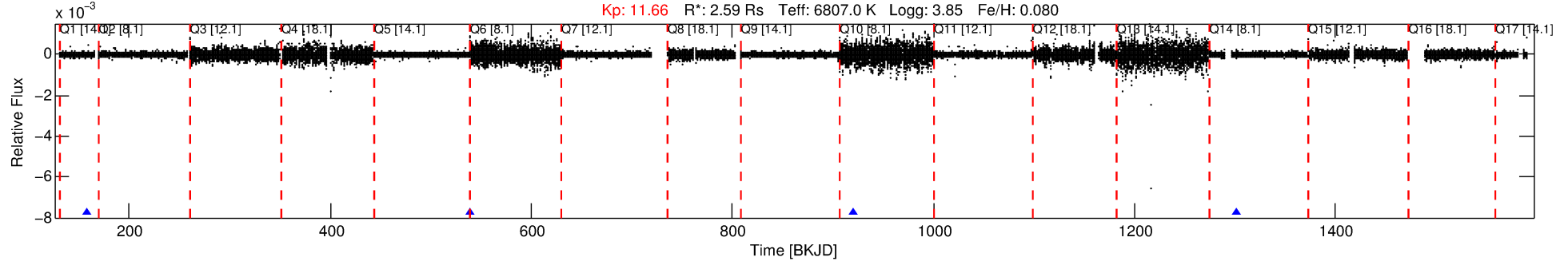
No Significant Match Found

DV One-Page Summary

KIC: 6864859 Candidate: 3 of 4 Period: 381.549 d

KOI: K06782 Corr: No Ephemeris Match

Kp: 11.66 R*: 2.59 Rs Teff: 6807.0 K Logg: 3.85 Fe/H: 0.080



TPS TCE Results:

Period = 381.54905 d

Epoch = 157.3458 BKJD

DV fit results are unavailable

DV Diagnostic Results:

ShortPeriod-sig: 100.0% [656.28σ]

LongPeriod-sig: N/A

ModelChiSquare2-sig: N/A

ModelChiSquareGof-sig: N/A

Bootstrap-pfa: N/A

RollingBand-fgt: 1.00 [2/2]

GhostDiagnostic-chr: 1.272

Centroid-sig: N/A

Centroid-so: 16.810 arcsec [15.48σ]

OotOffset-rm: 12.961 arcsec [40.46σ]

KicOffset-rm: 12.851 arcsec [40.03σ]

OotOffset-st: 1/0/0/0 [1]

KicOffset-st: 1/0/0/0 [1]

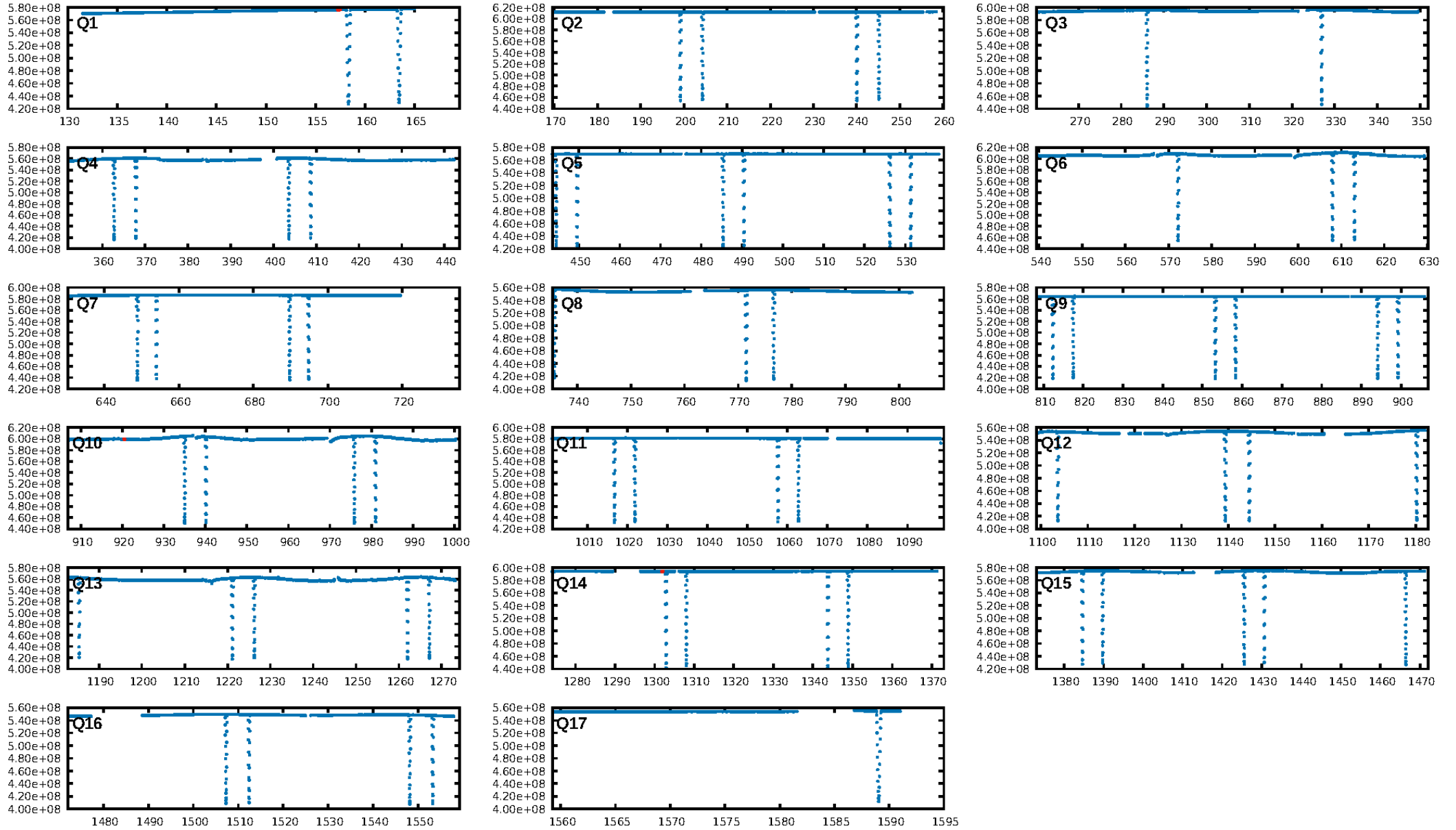
DiffImageQuality-fgm: 0.00 [0/1]

DiffImageOverlap-fno: 1.00 [3/3]

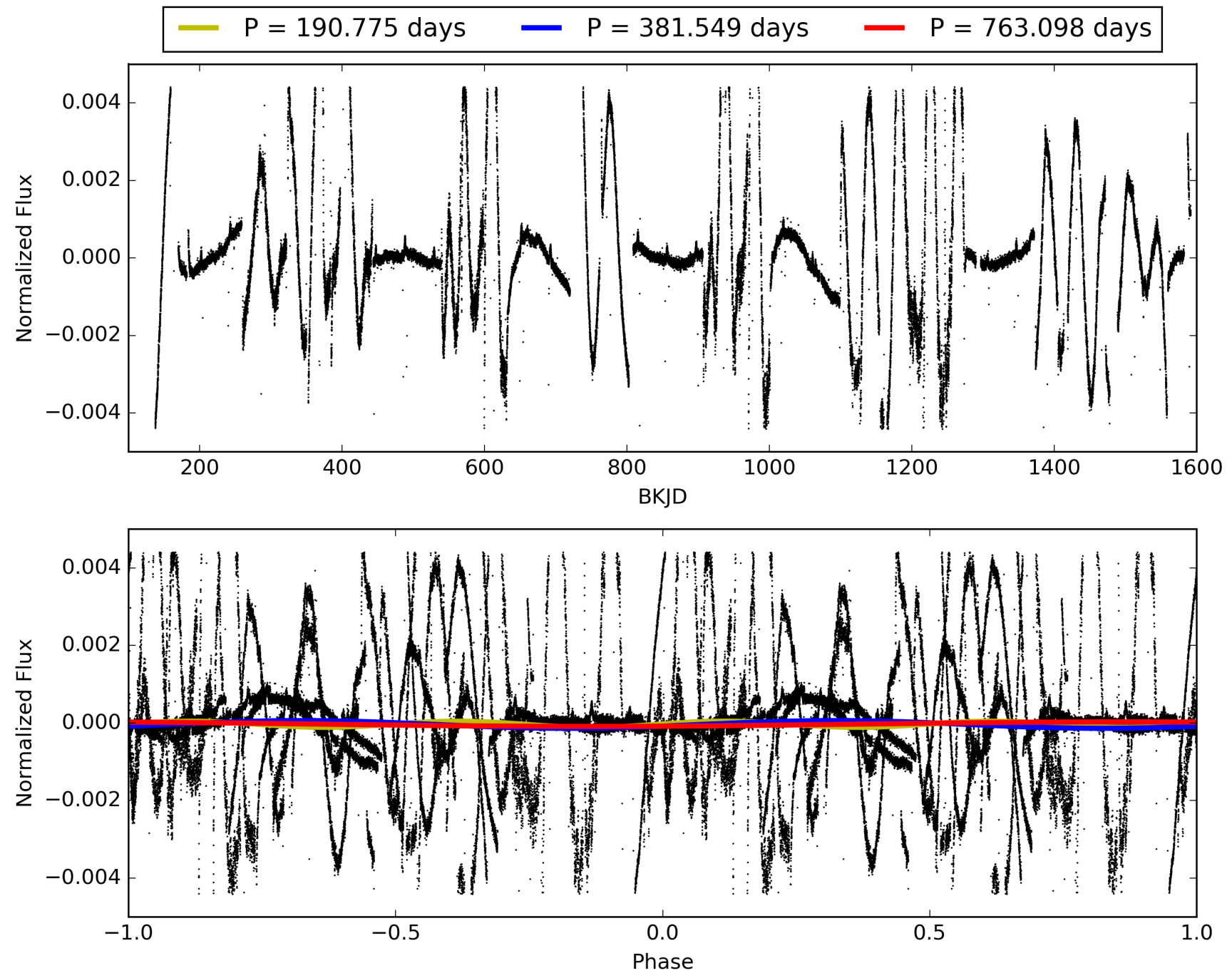
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:24:39 Z

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

TCE 006864859-03, PDC Light Curves

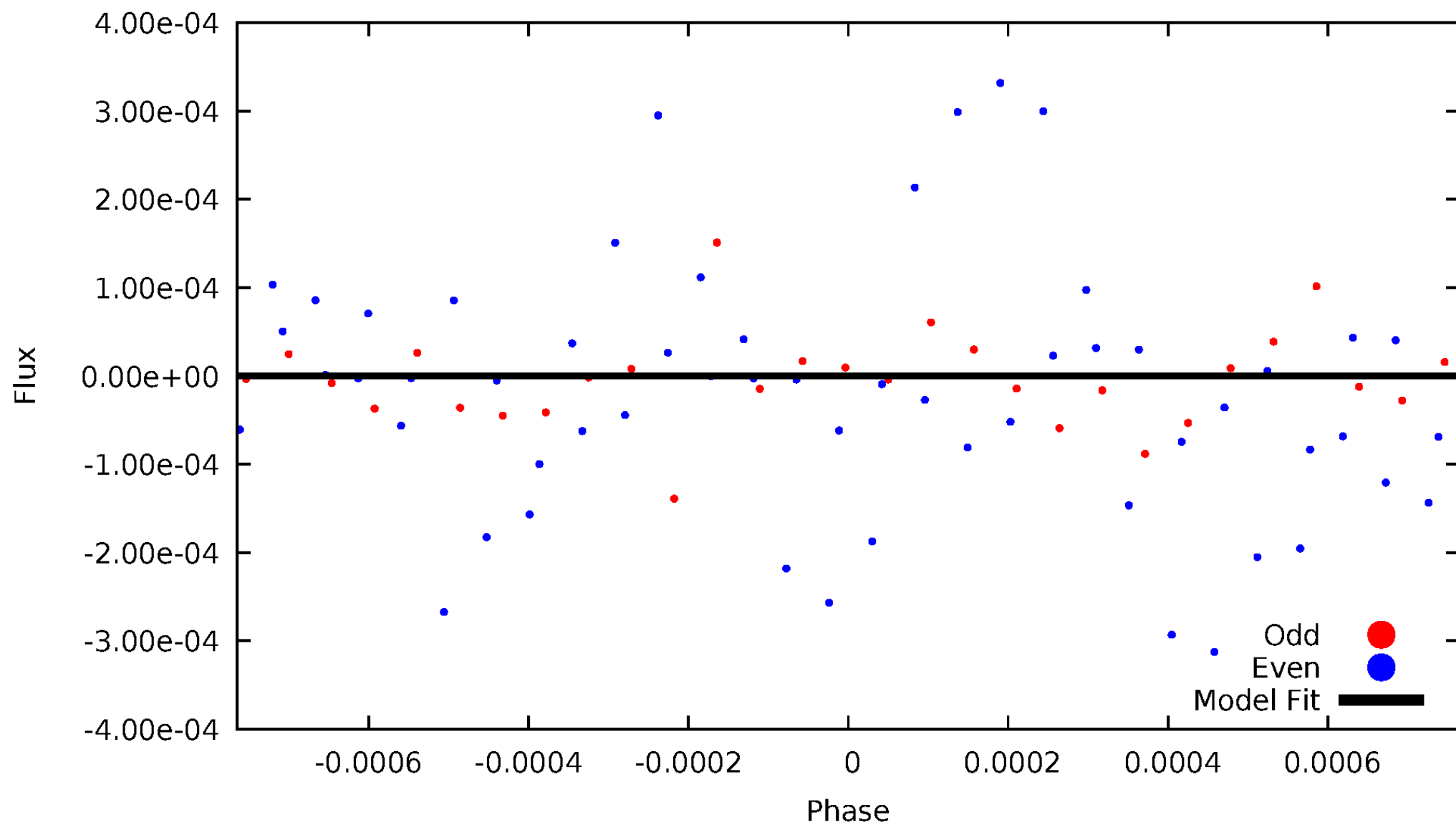


TCE 006864859-03



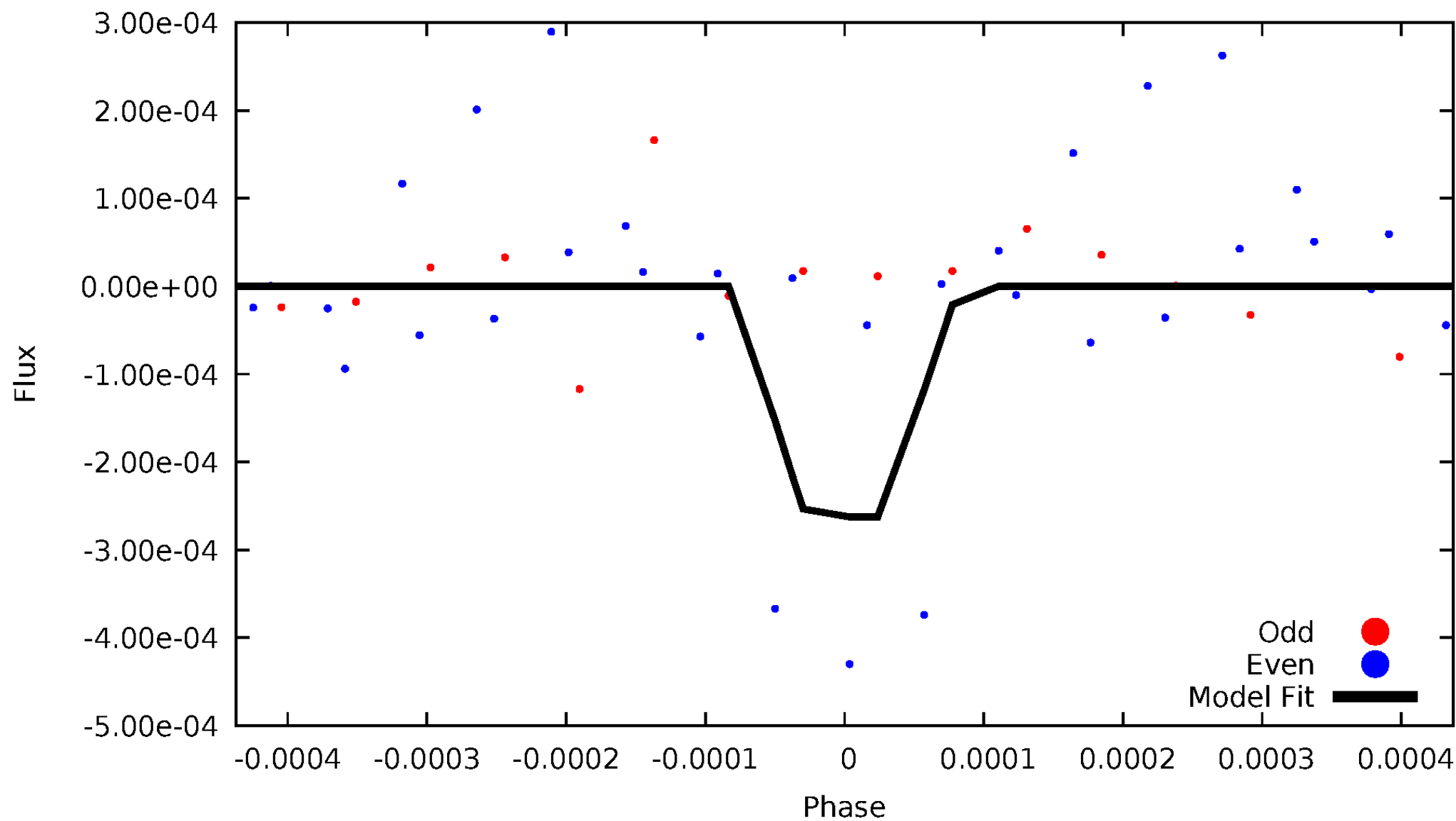
DV Odd/Even

TCE 006864859-03



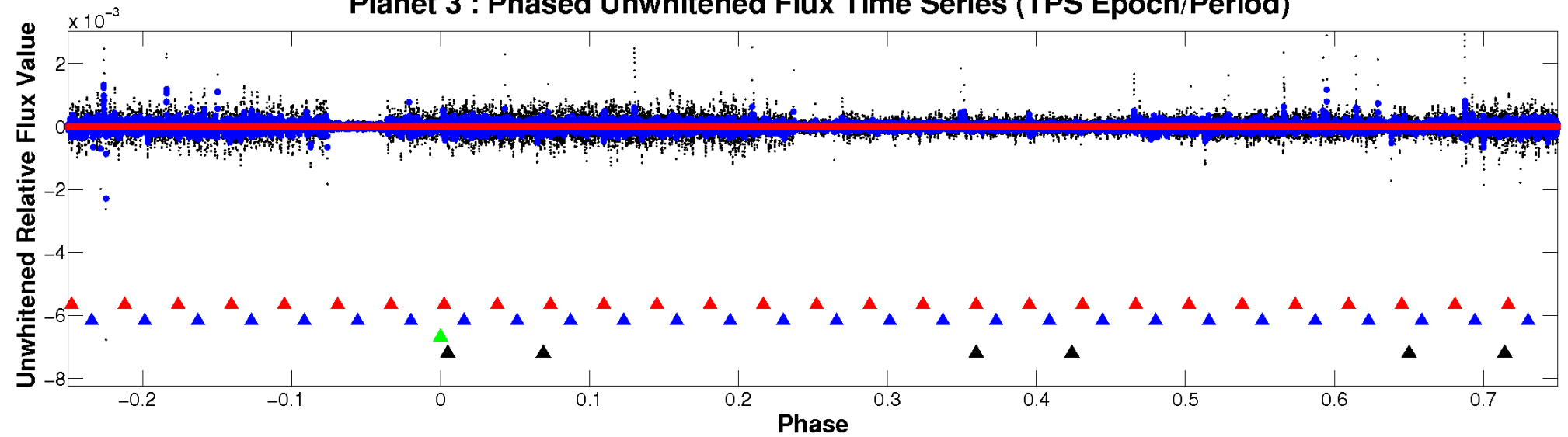
ALT Odd/Even

TCE 006864859-03



Non-Whitened Vs. Whitened Light Curve

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

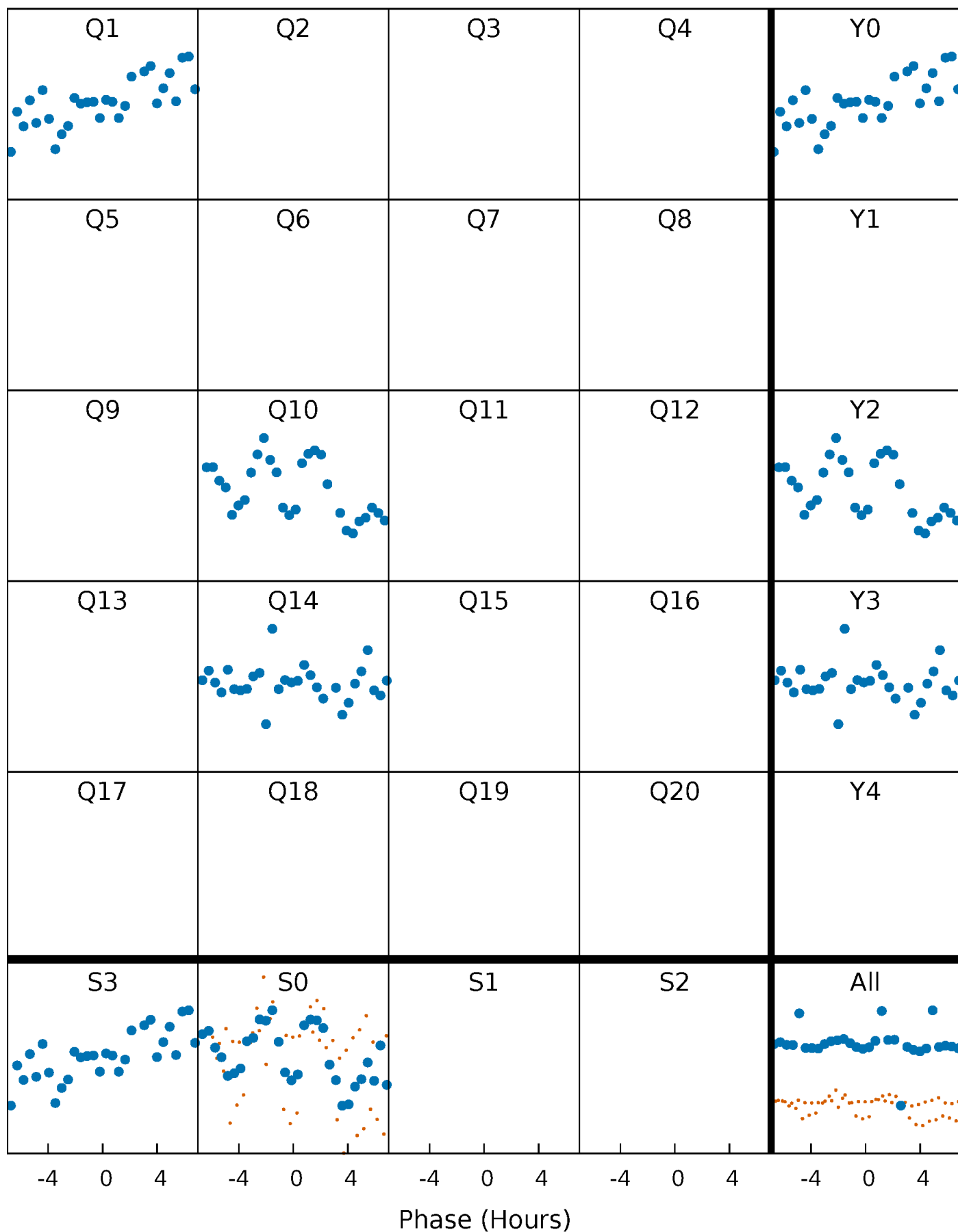


Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 006864859-03 P=381.549055 Days $T_0=157.345825$ (BKJD)



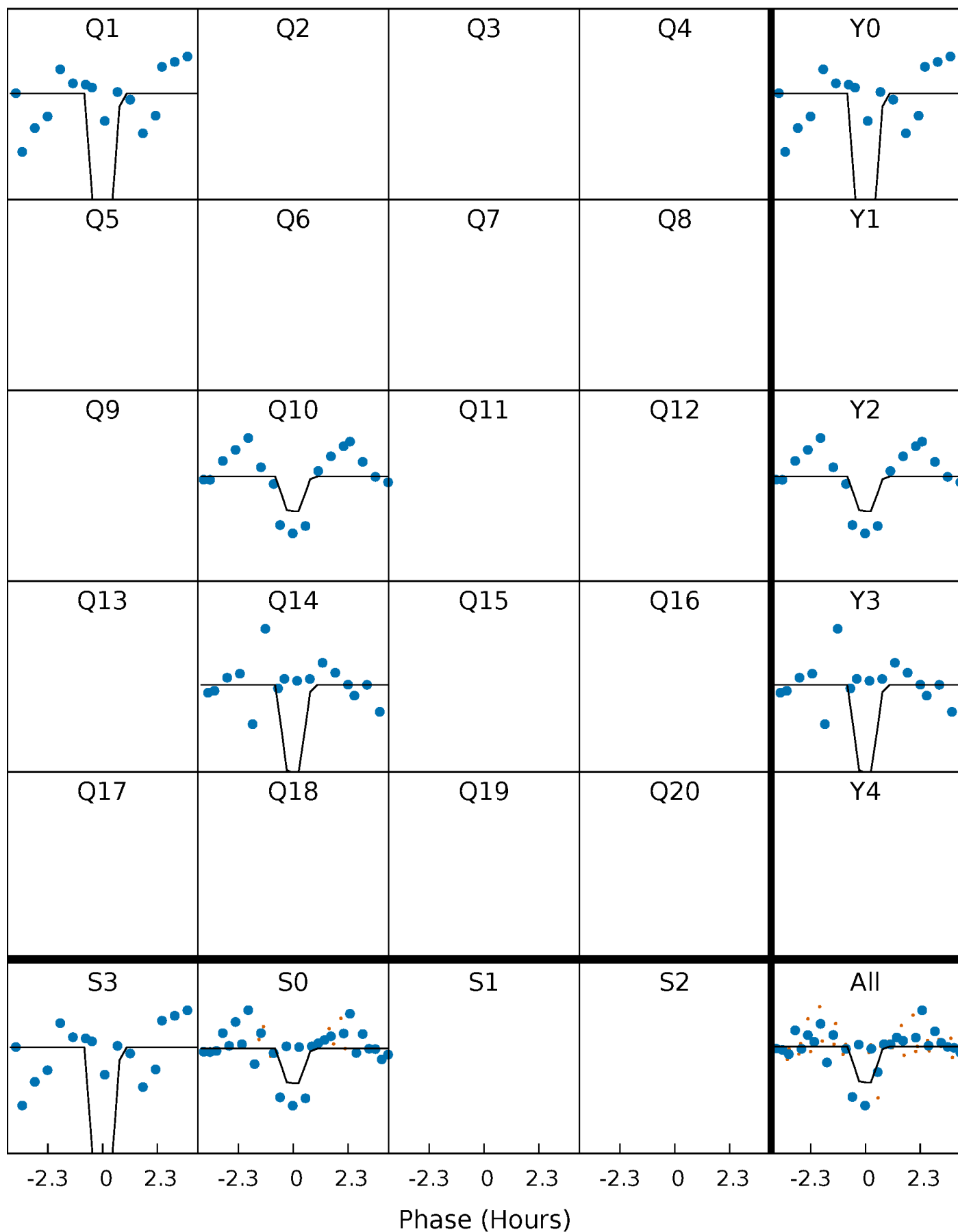
DV Quarter-Phased Transit Curves

TCE 006864859-03 P=381.549055 Days $T_0=157.345825$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

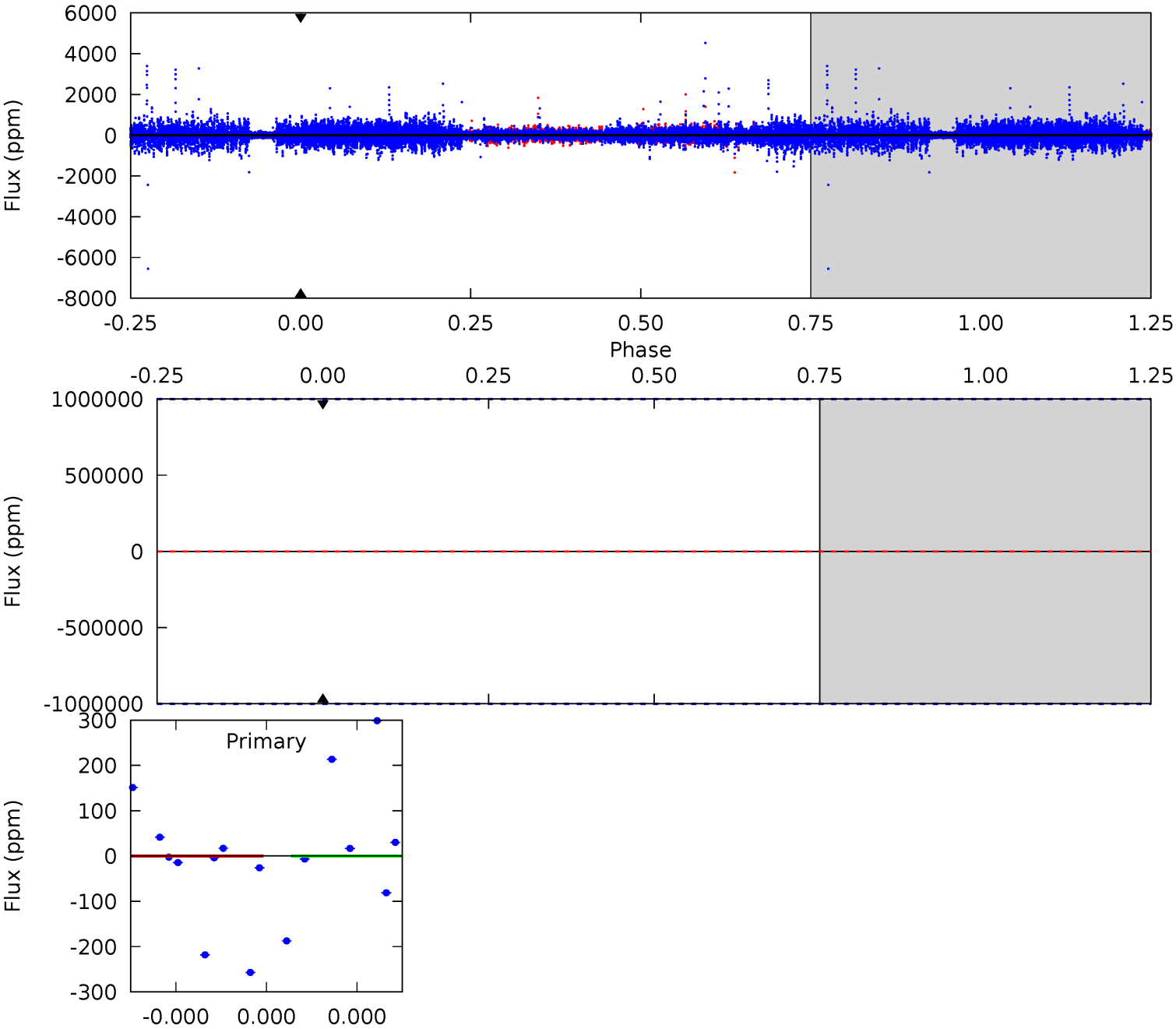
TCE 006864859-03 P=381.549055 Days $T_0=157.335333$ (BKJD)



DV Model-Shift Uniqueness Test

006864859-03, P = 381.549055 Days, E = 157.345825 Days

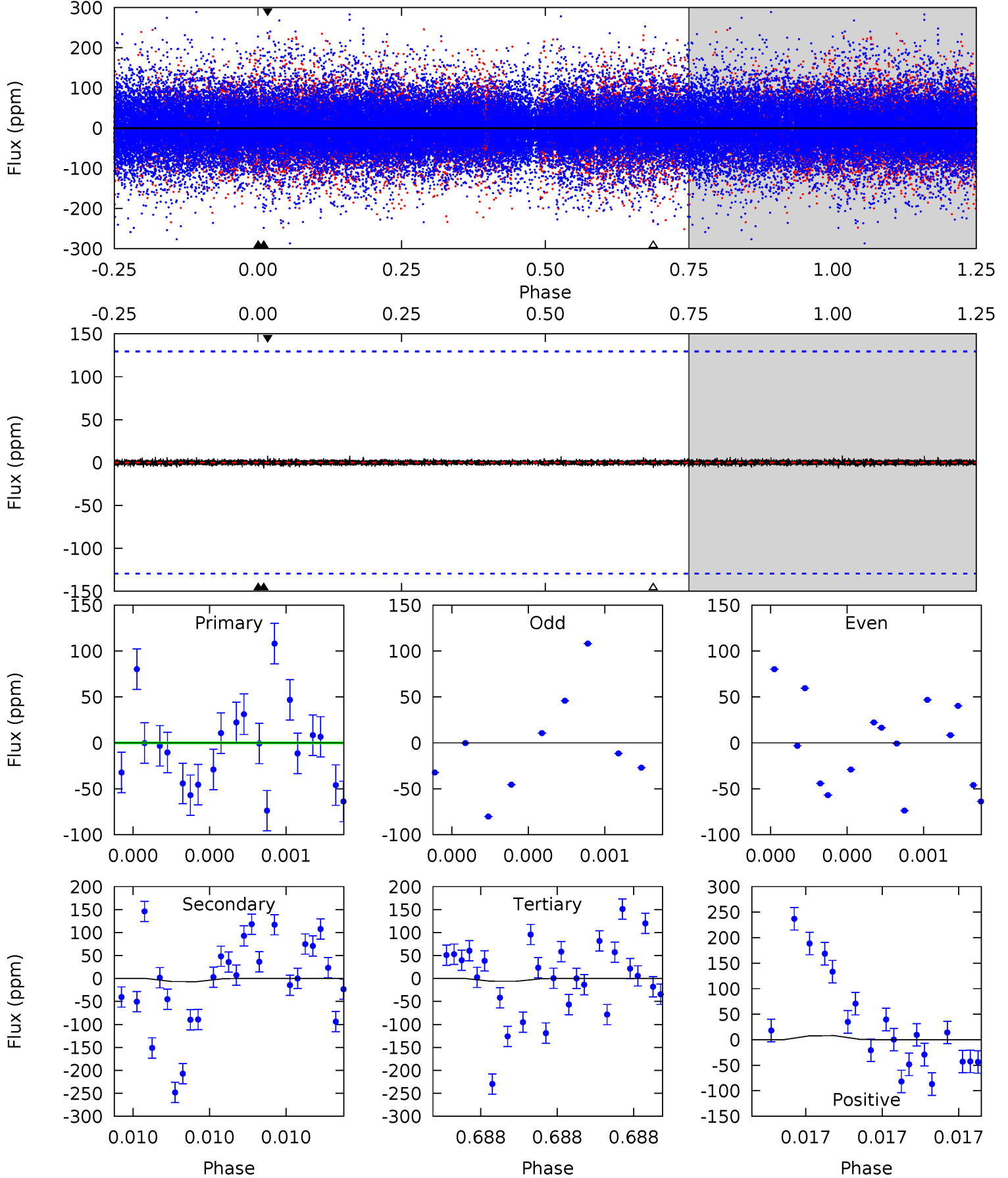
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

006864859-03, P = 381.549055 Days, E = 157.335333 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.07	0.30	0.27	0.35	5.77	3.77	0.05	-0.20	-0.28	0.03	-0.05	5.99	8.52	0.54	2.94



Stellar Parameters For KIC 006864859

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6807^{+192}_{-264}	$3.848^{+0.350}_{-0.150}$	$0.080^{+0.200}_{-0.350}$	$2.590^{+0.587}_{-1.091}$	$1.723^{+0.176}_{-0.410}$	$0.140^{+0.390}_{-0.061}$
	+3%/-4%	+9%/-4%	+250%/-438%	+23%/-42%	+10%/-24%	+280%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006864859-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$27.34^{+25.47}_{-18.14}$	598^{+50}_{-61}	5389^{+18494}_{-23497}	$4382^{+253473}_{-157094}$
Alt.	-7 ± 22	$19.71^{+21.95}_{-13.92}$	603^{+45}_{-66}	2075^{+943}_{-4550}	$8.072^{+178.345}_{-45.904}$

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

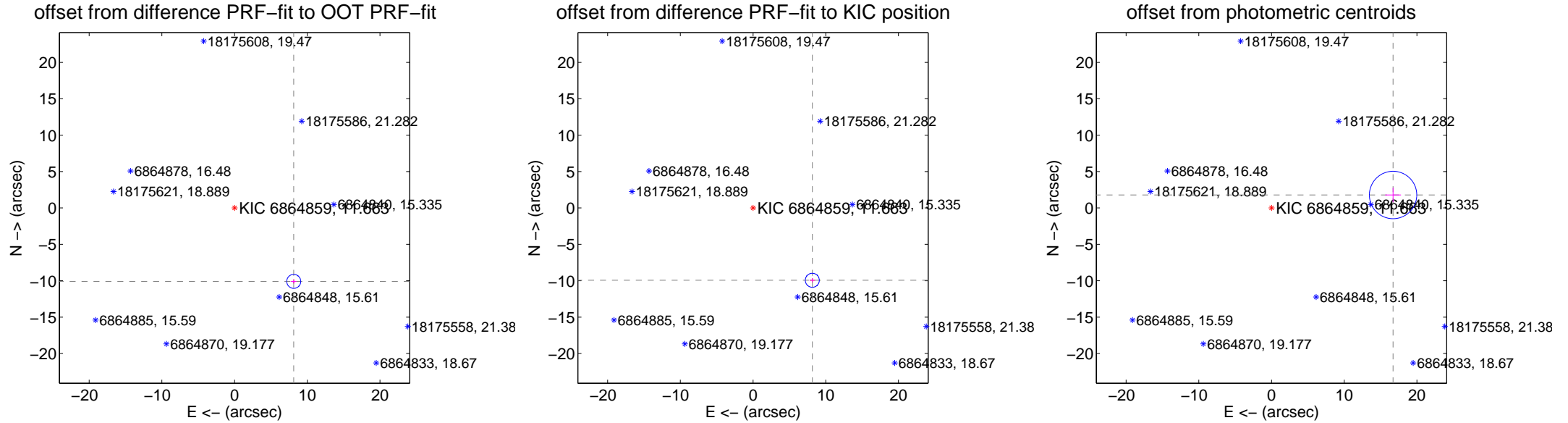
DV Centroid Data

Supplemental centroid analysis for 006864859-03. **Kepler magnitude: 11.66.** Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

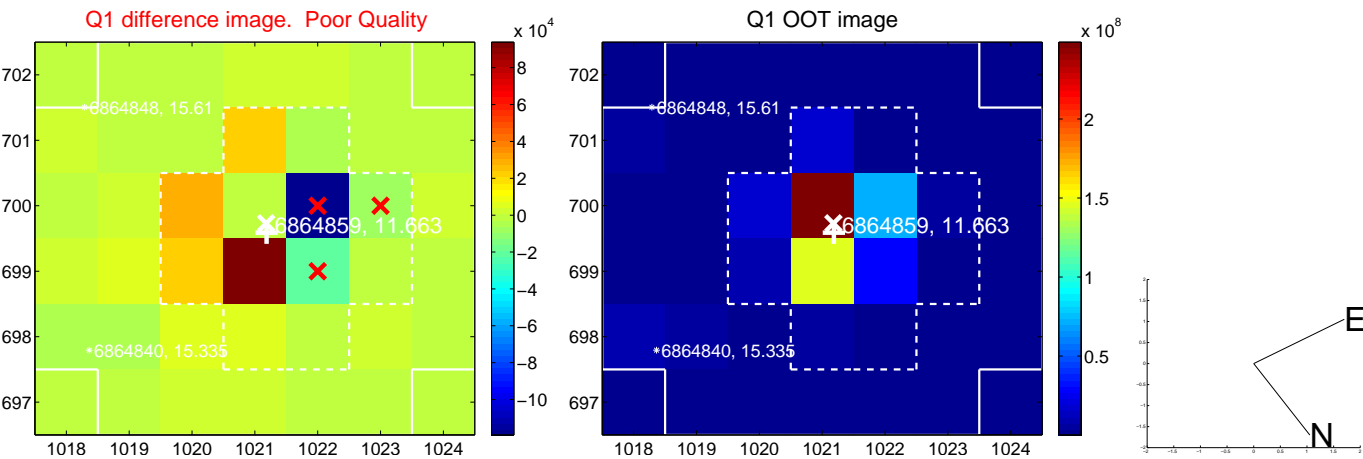
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	12.961 \pm 0.320	40.46	-8.137 \pm 0.369	-10.088 \pm 0.284
PRF-fit source offset from KIC position	12.851 \pm 0.321	40.03	-8.150 \pm 0.369	-9.935 \pm 0.284
photometric centroid source offset	16.81 \pm 1.09	15.48	-16.72 \pm 1.09	1.78 \pm 1.00



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.

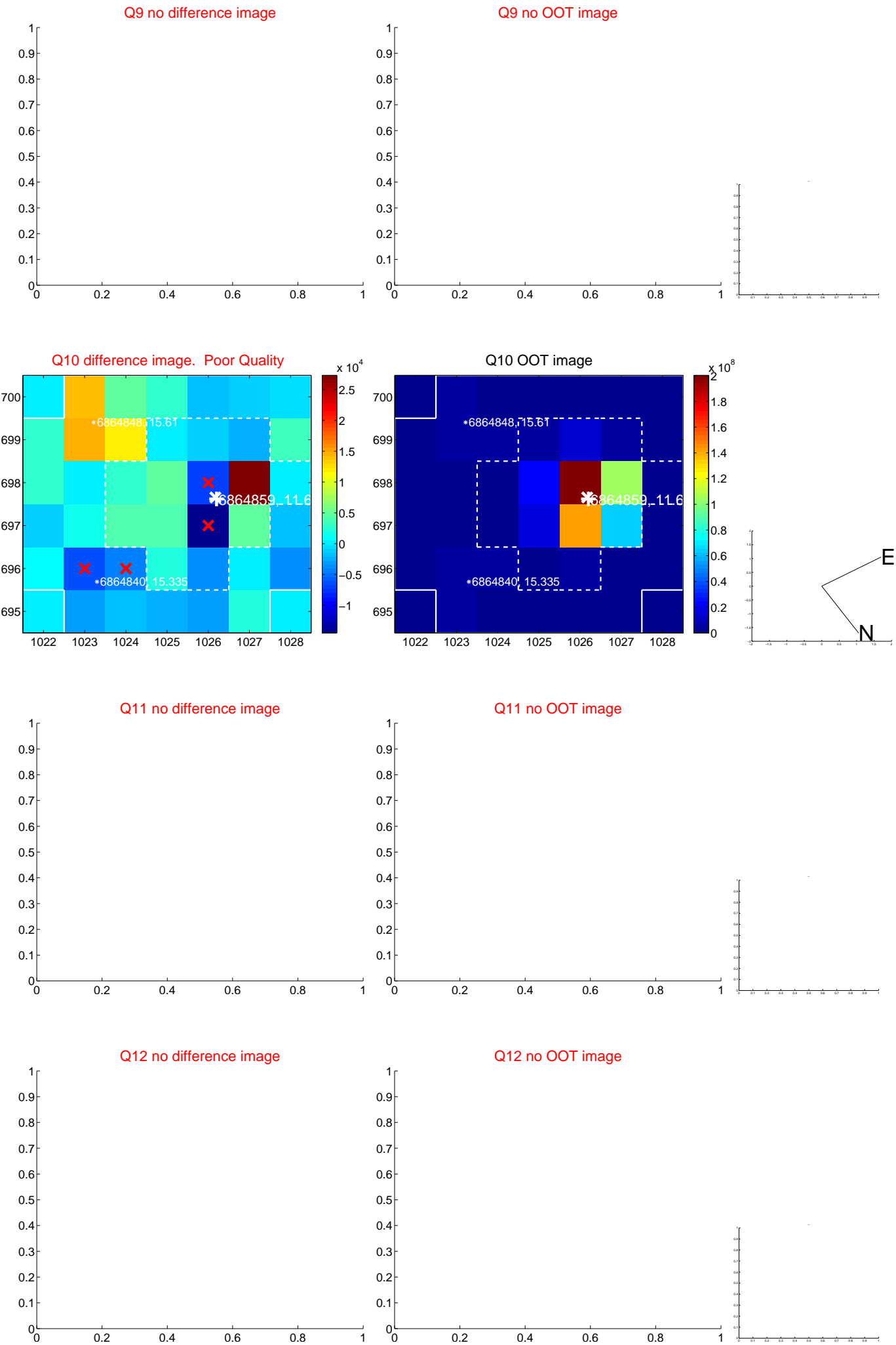
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



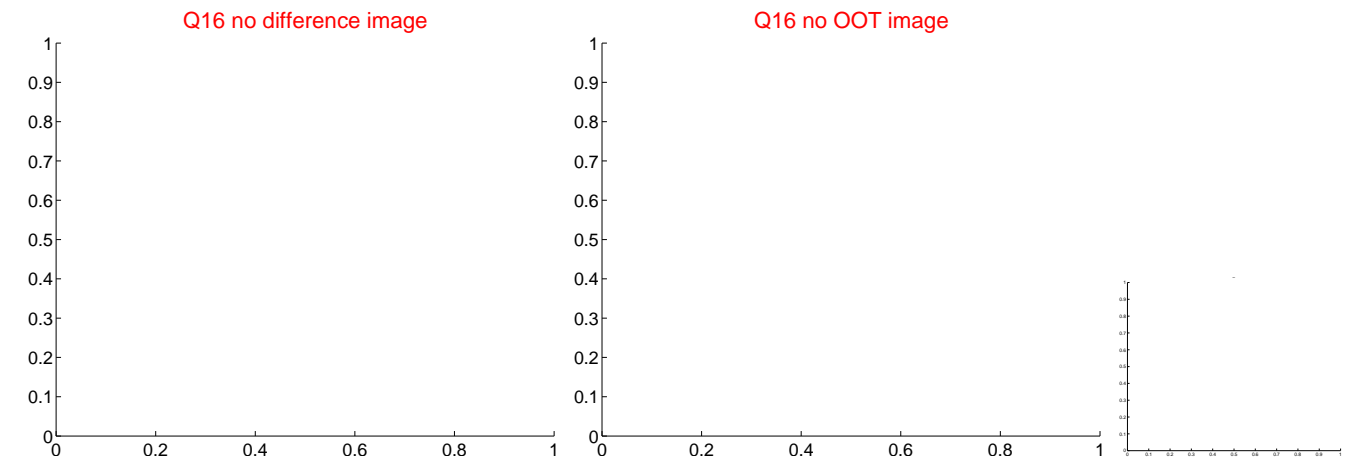
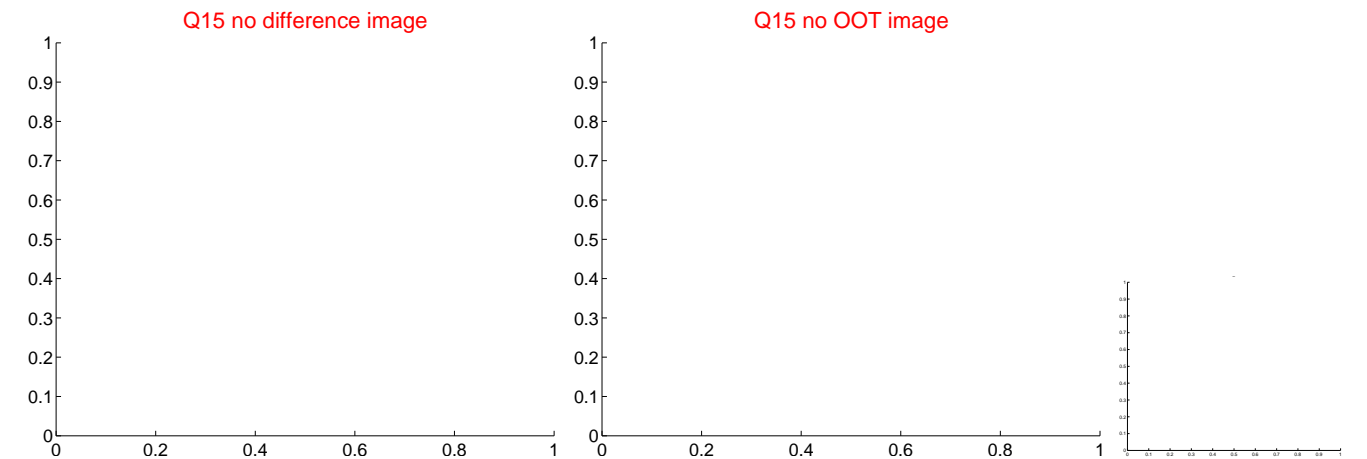
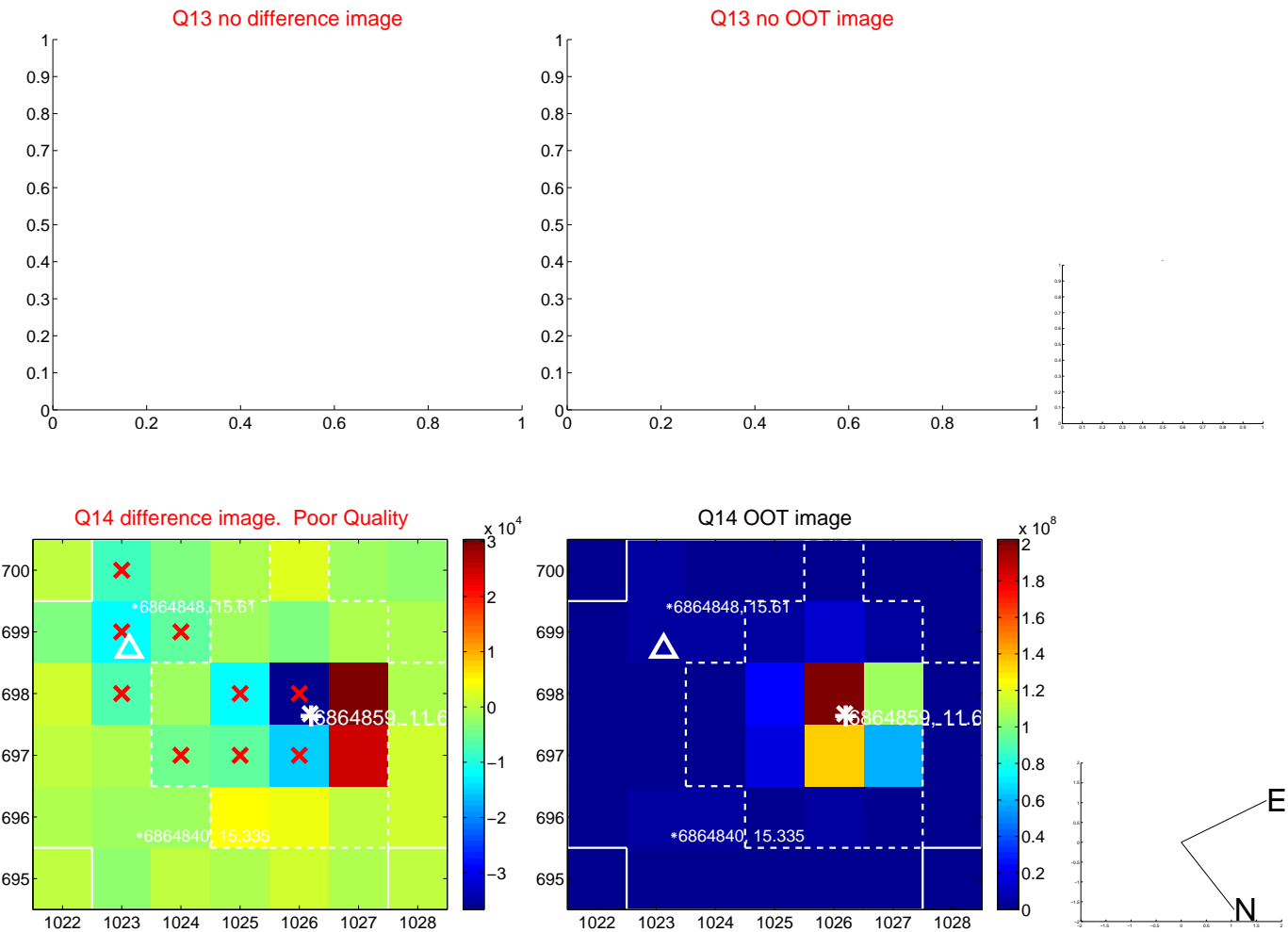
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



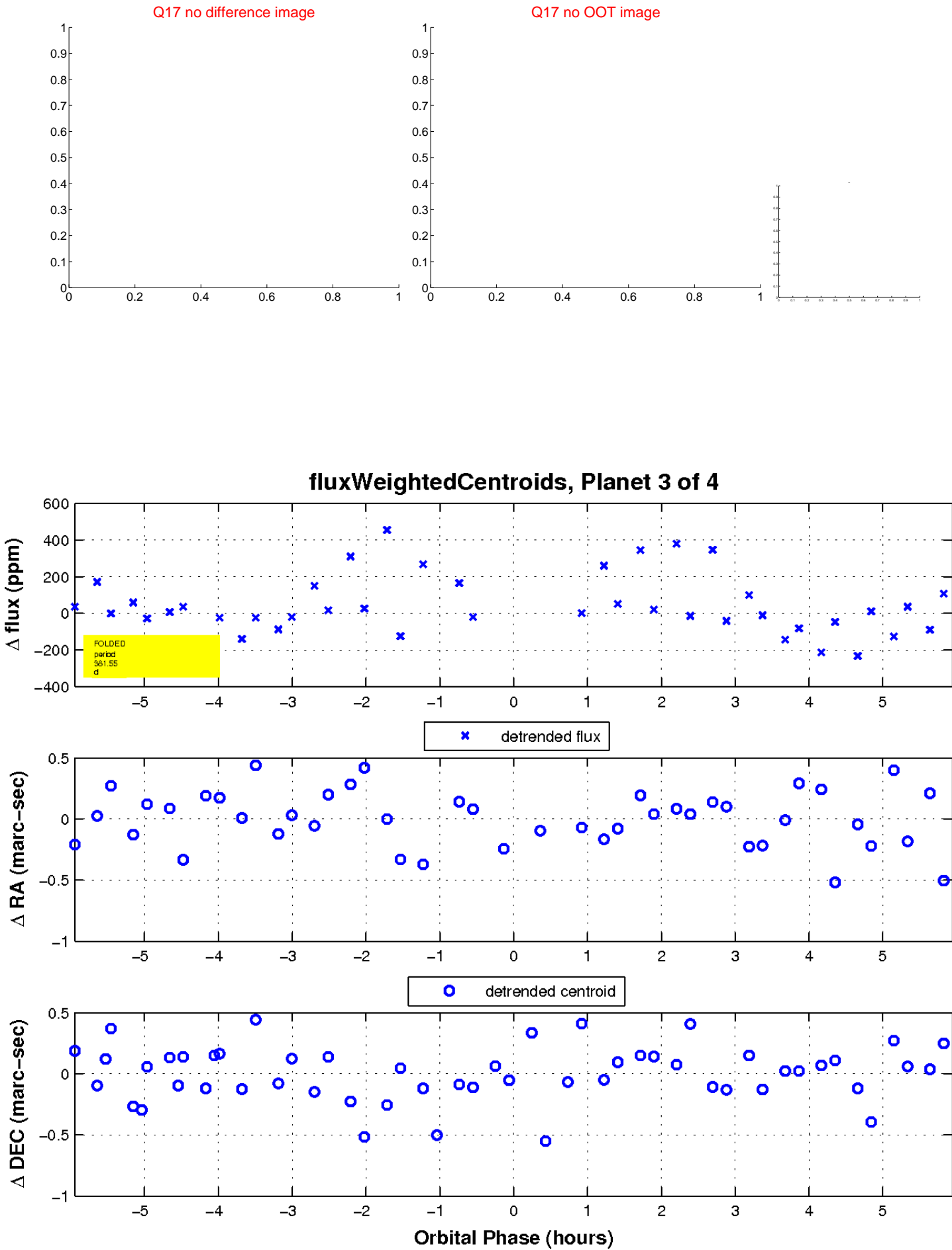
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

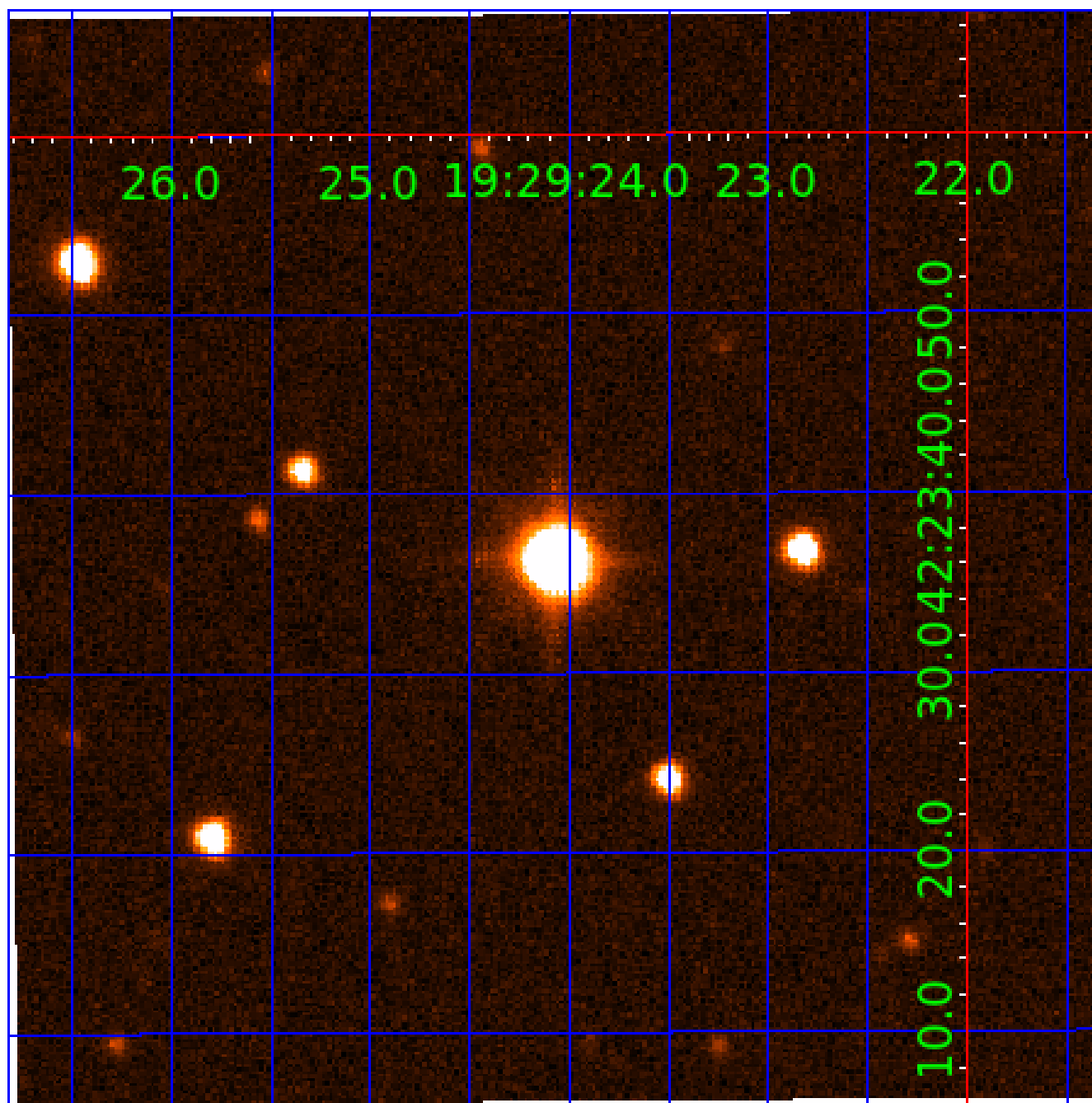


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006864859

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})
006864859-01	OBS	6782.01	40.878244	158.309608	257460.2	6.000	31312.2	-1.0	2.59	6807	106.51	166.31
006864859-02	OBS	No	40.877884	163.428215	254428.5	7.500	29667.9	-1.0	2.59	6807	92.32	166.31
006864859-03	OBS	No	381.549055	157.345825	7290.2	3.500	415.2	-1.0	2.59	6807	22.32	8.46
006864859-04	OBS	No	246.199052	319.057019	5281.8	3.500	323.4	-1.0	2.59	6807	18.99	15.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006864859-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
006864859-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_NOFITS
006864859-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006864859-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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 006864859-04

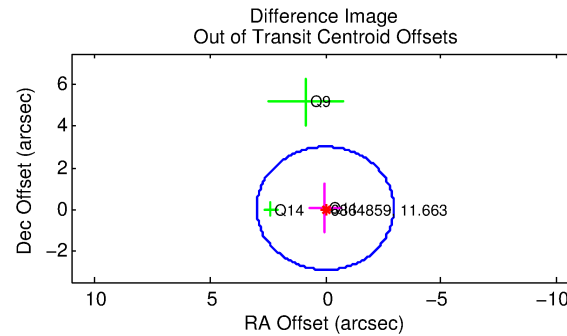
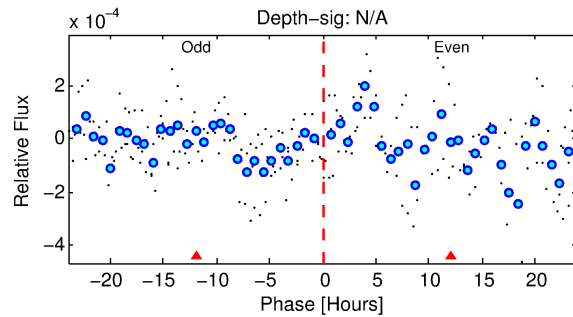
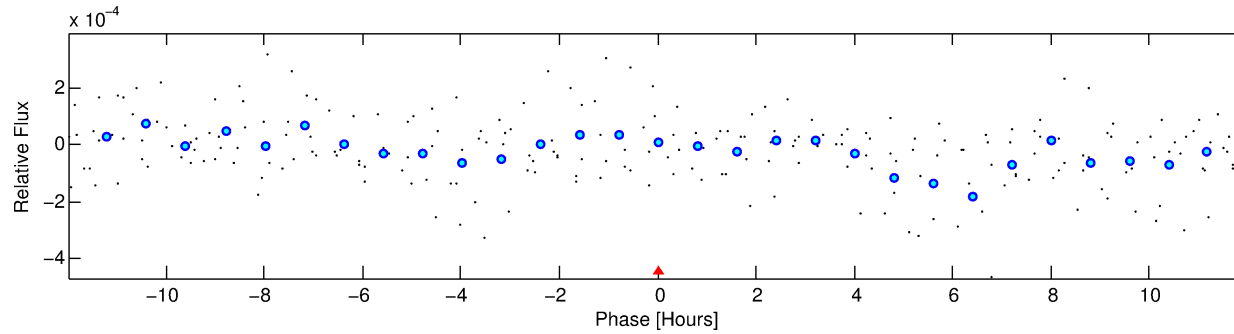
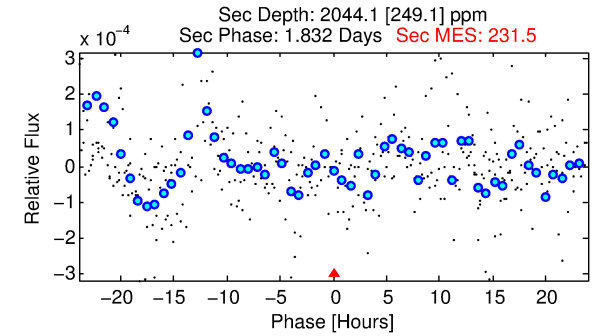
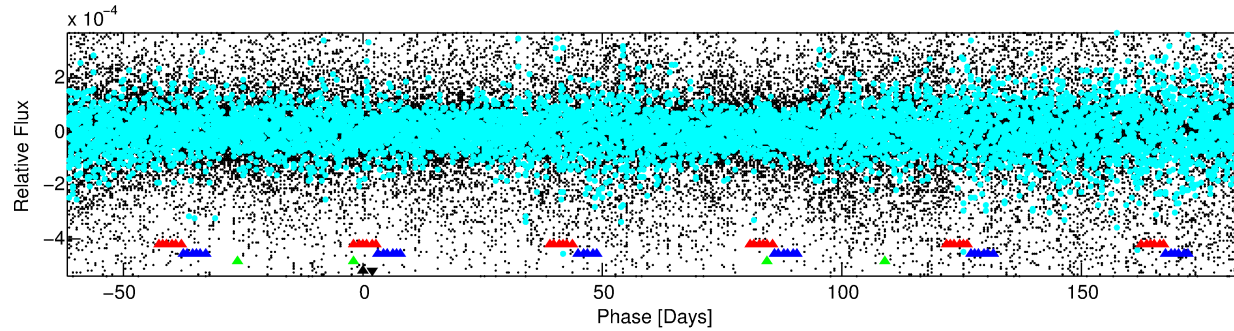
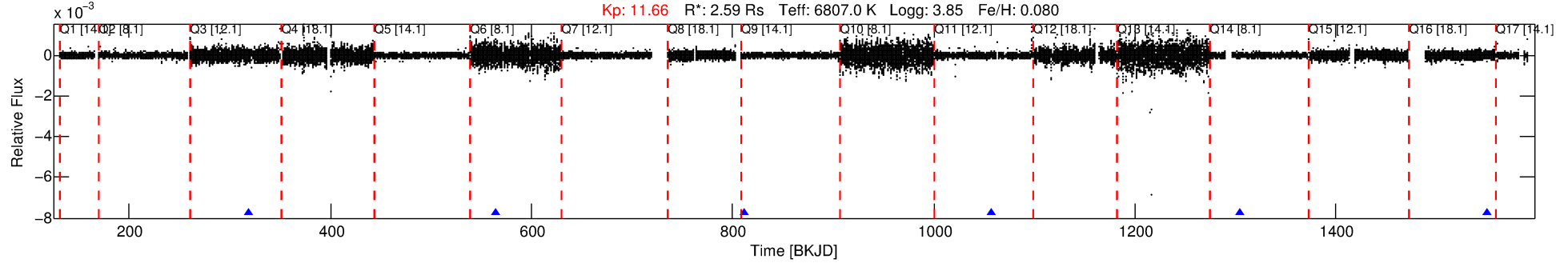
No Significant Match Found

DV One-Page Summary

KIC: 6864859 Candidate: 4 of 4 Period: 246.199 d

KOI: K06782 Corr: No Ephemeris Match

Kp: 11.66 R*: 2.59 Rs Teff: 6807.0 K Logg: 3.85 Fe/H: 0.080



TPS TCE Results:

Period = 246.19905 d
Epoch = 319.0570 BKJD

DV fit results are unavailable

DV Diagnostic Results:

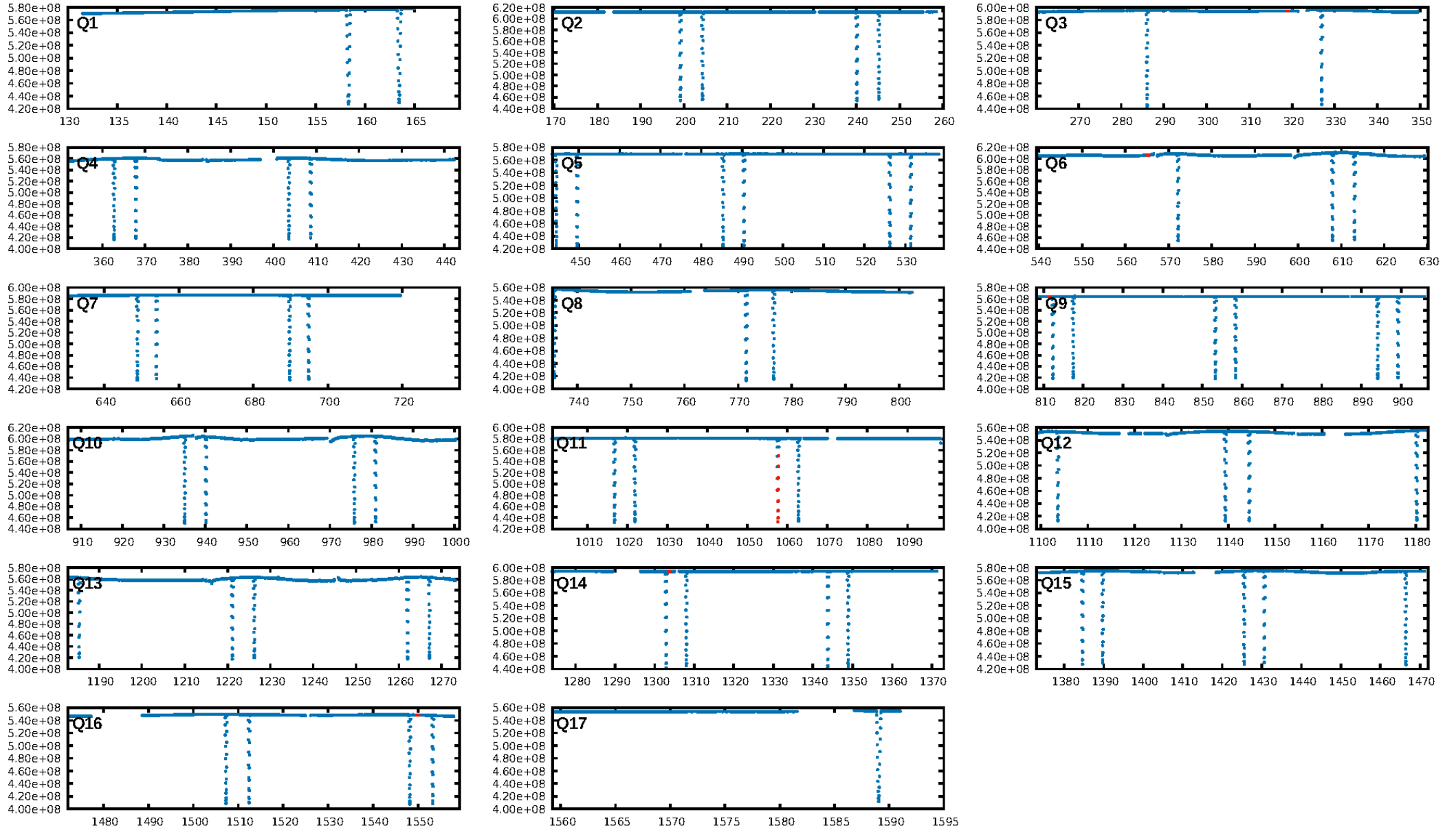
ShortPeriod-sig: 100.0% [709.41σ]
LongPeriod-sig: 100.0% [656.28σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 3.611

Centroid-sig: N/A
Centroid-so: 10.966 arcsec [5.17σ]
OotOffset-rm: 0.048 arcsec [0.05σ]
KicOffset-rm: 0.194 arcsec [0.14σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.83 [5/6]

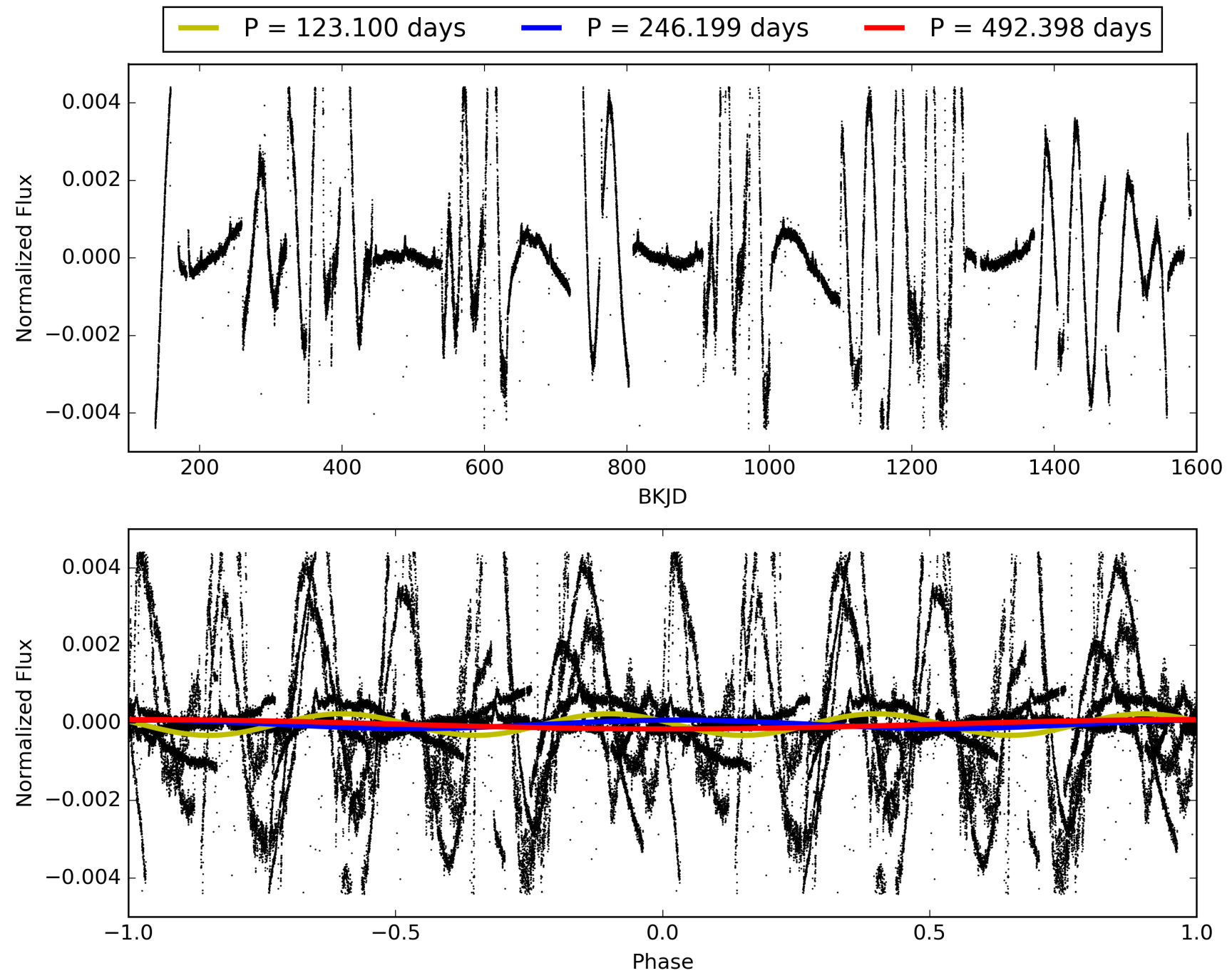
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 14:24:50 Z

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

TCE 006864859-04, PDC Light Curves

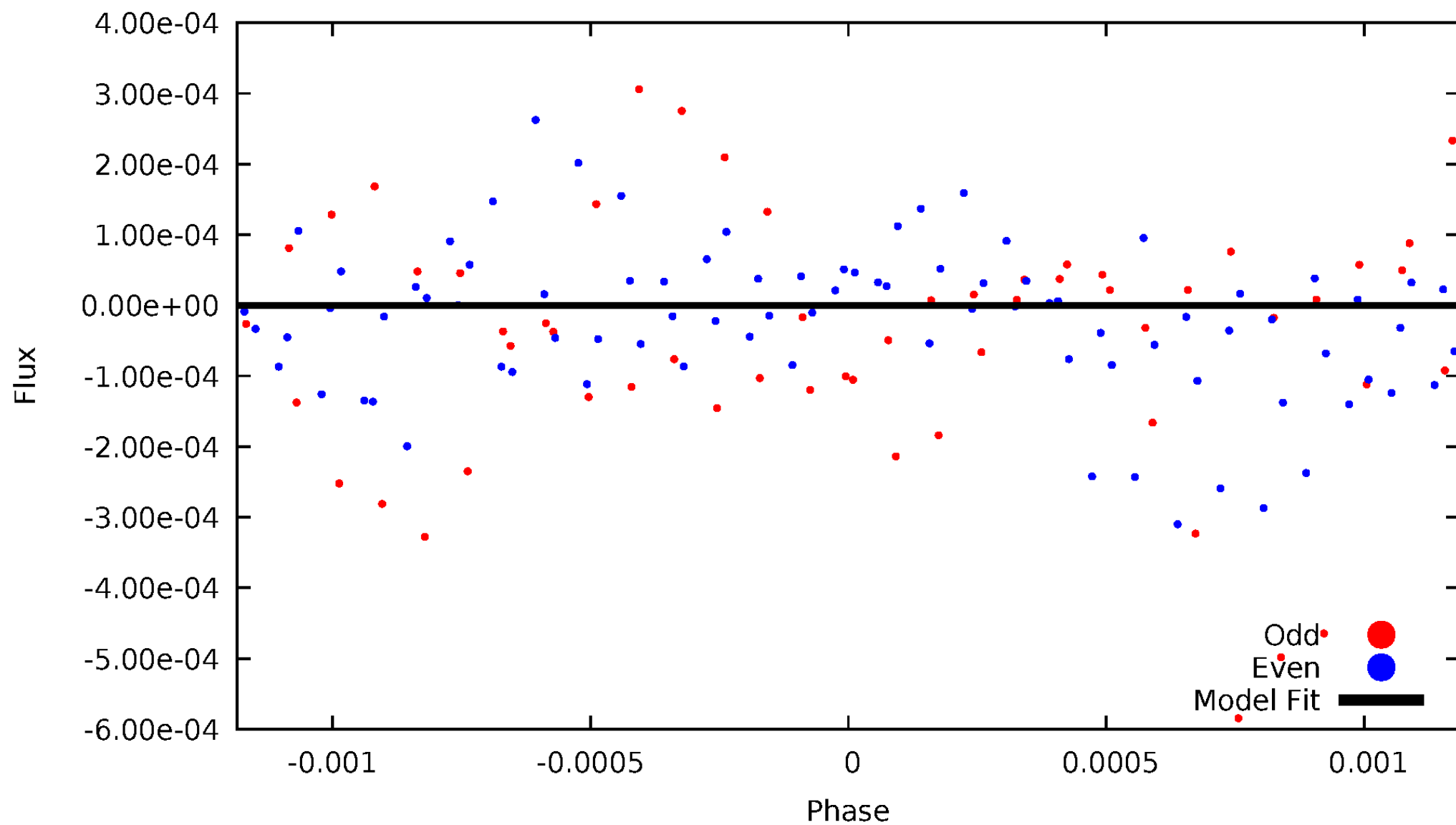


TCE 006864859-04



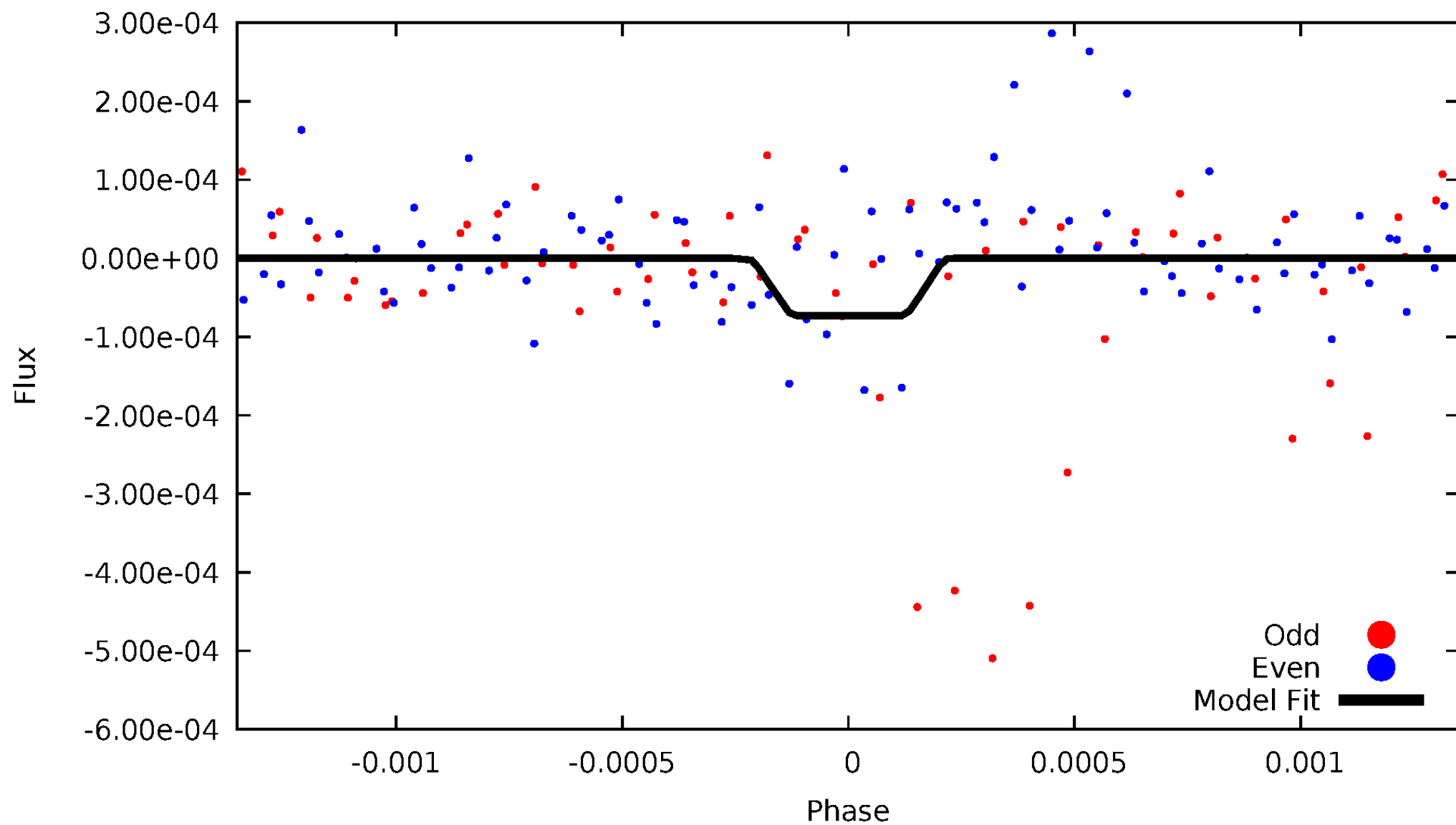
DV Odd/Even

TCE 006864859-04



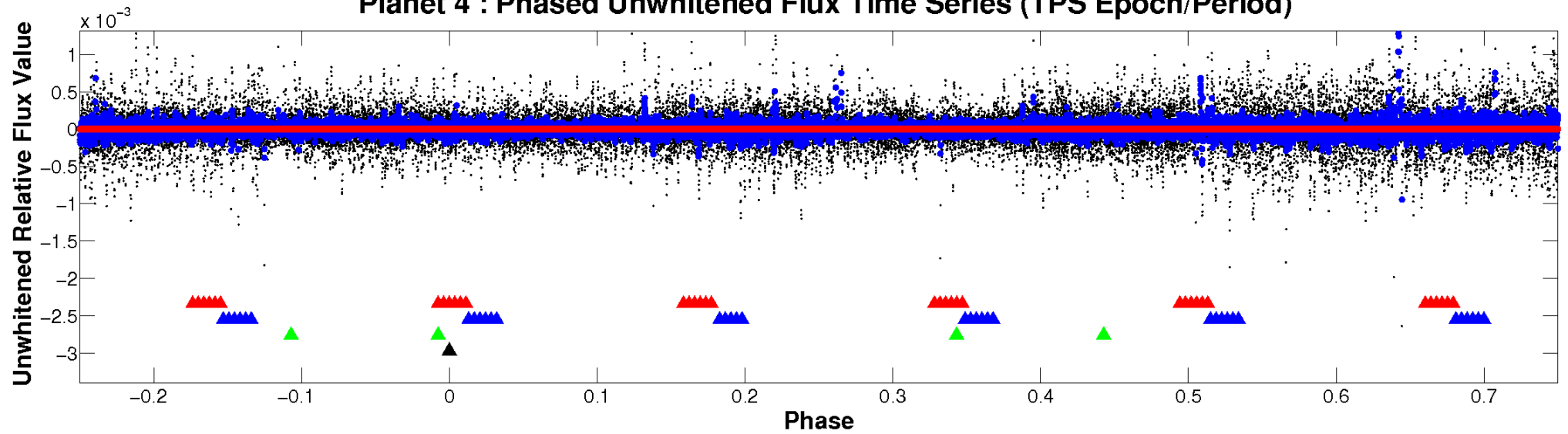
ALT Odd/Even

TCE 006864859-04



Non-Whitened Vs. Whitened Light Curve

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

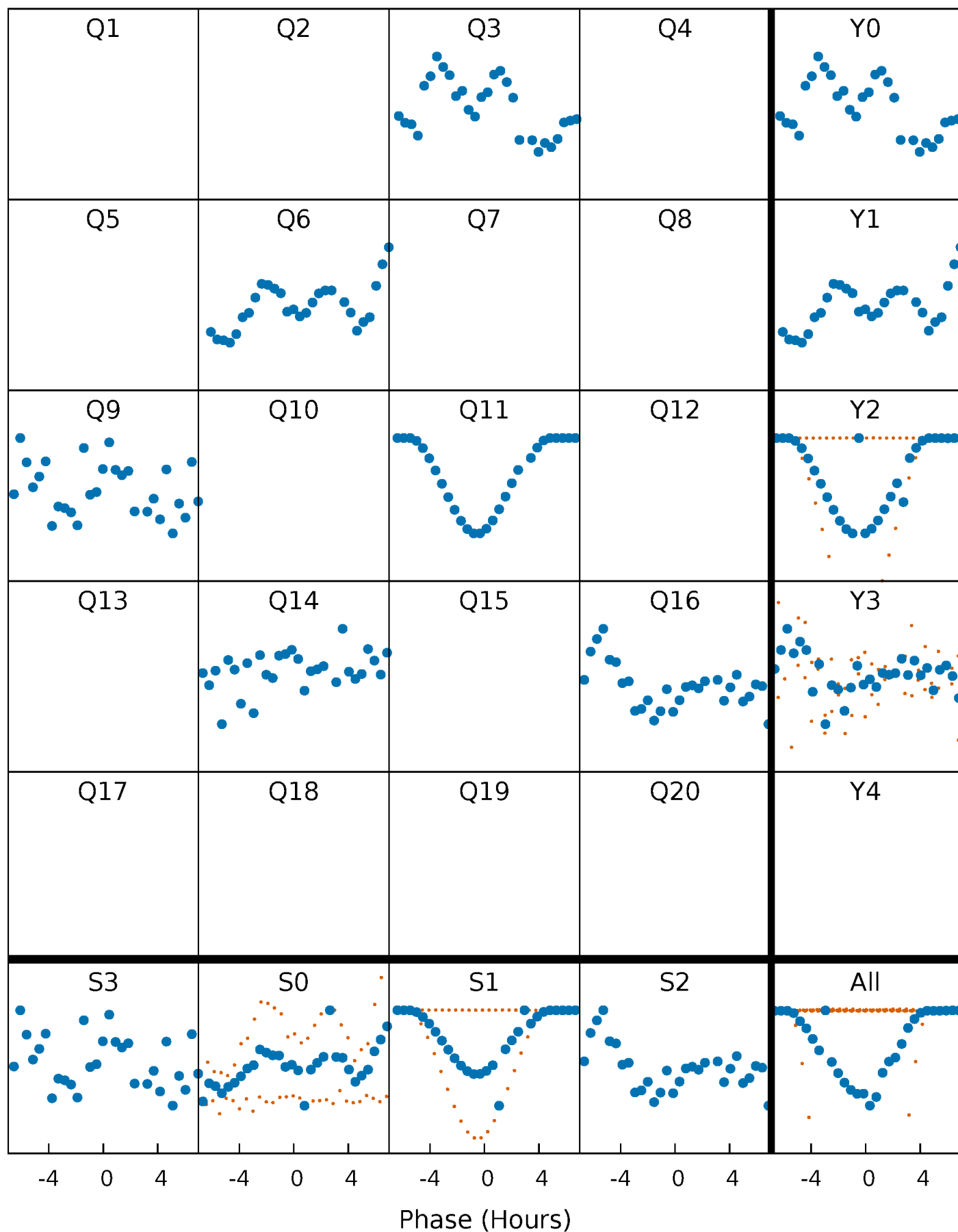


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



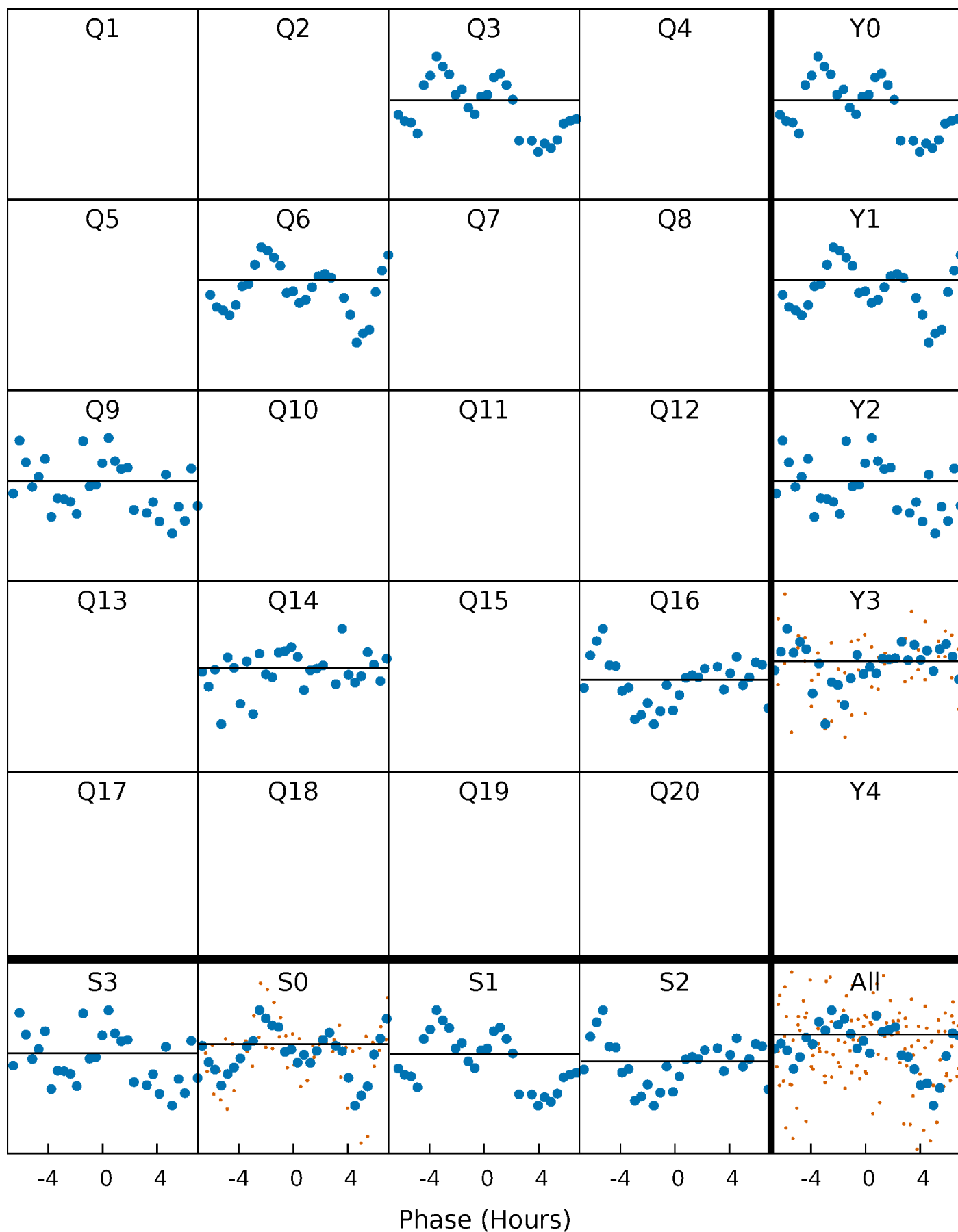
PDC Quarter-Phased Transit Curves

TCE 006864859-04 P=246.199052 Days $T_0=319.057019$ (BKJD)



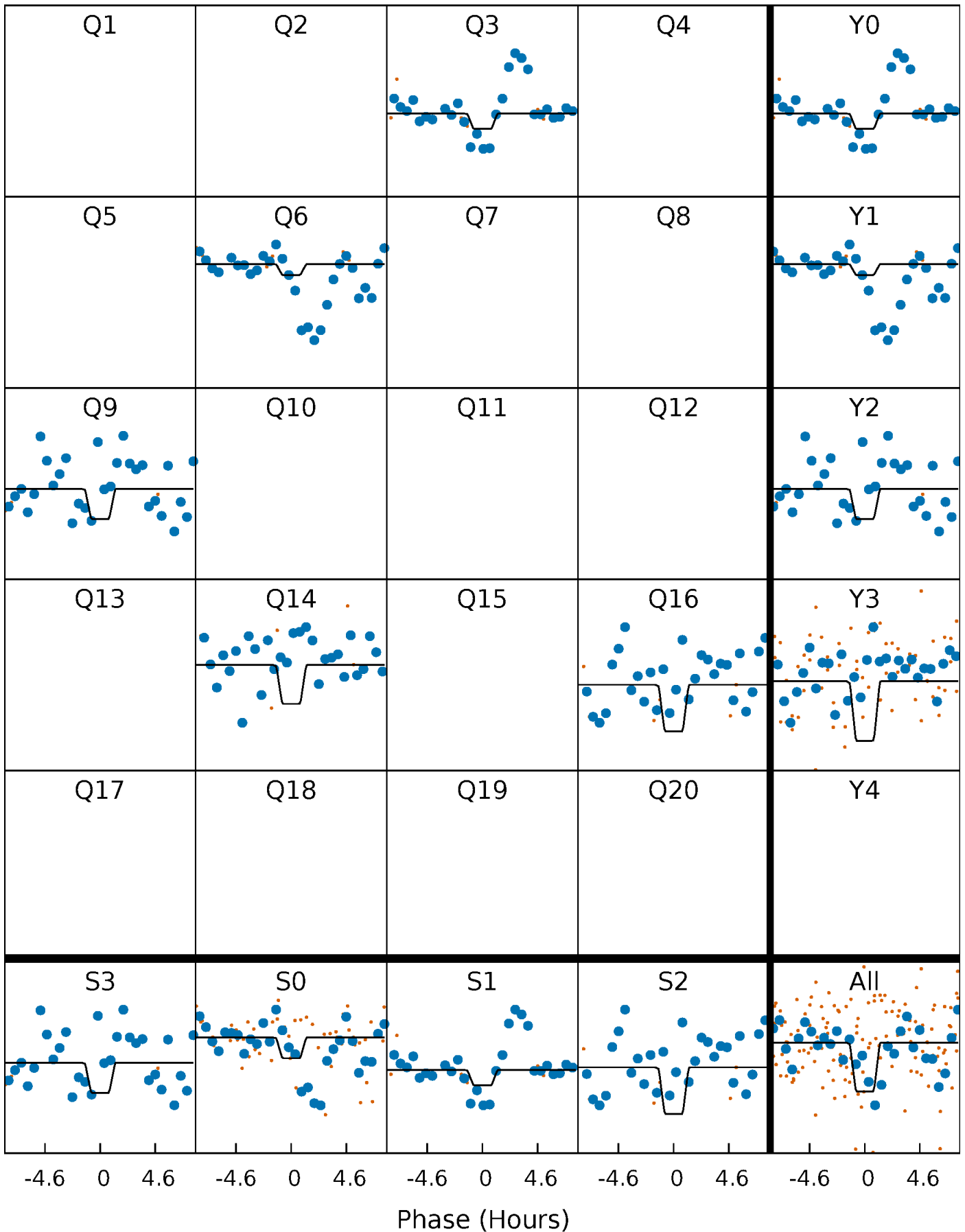
DV Quarter-Phased Transit Curves

TCE 006864859-04 P=246.199052 Days $T_0=319.057019$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

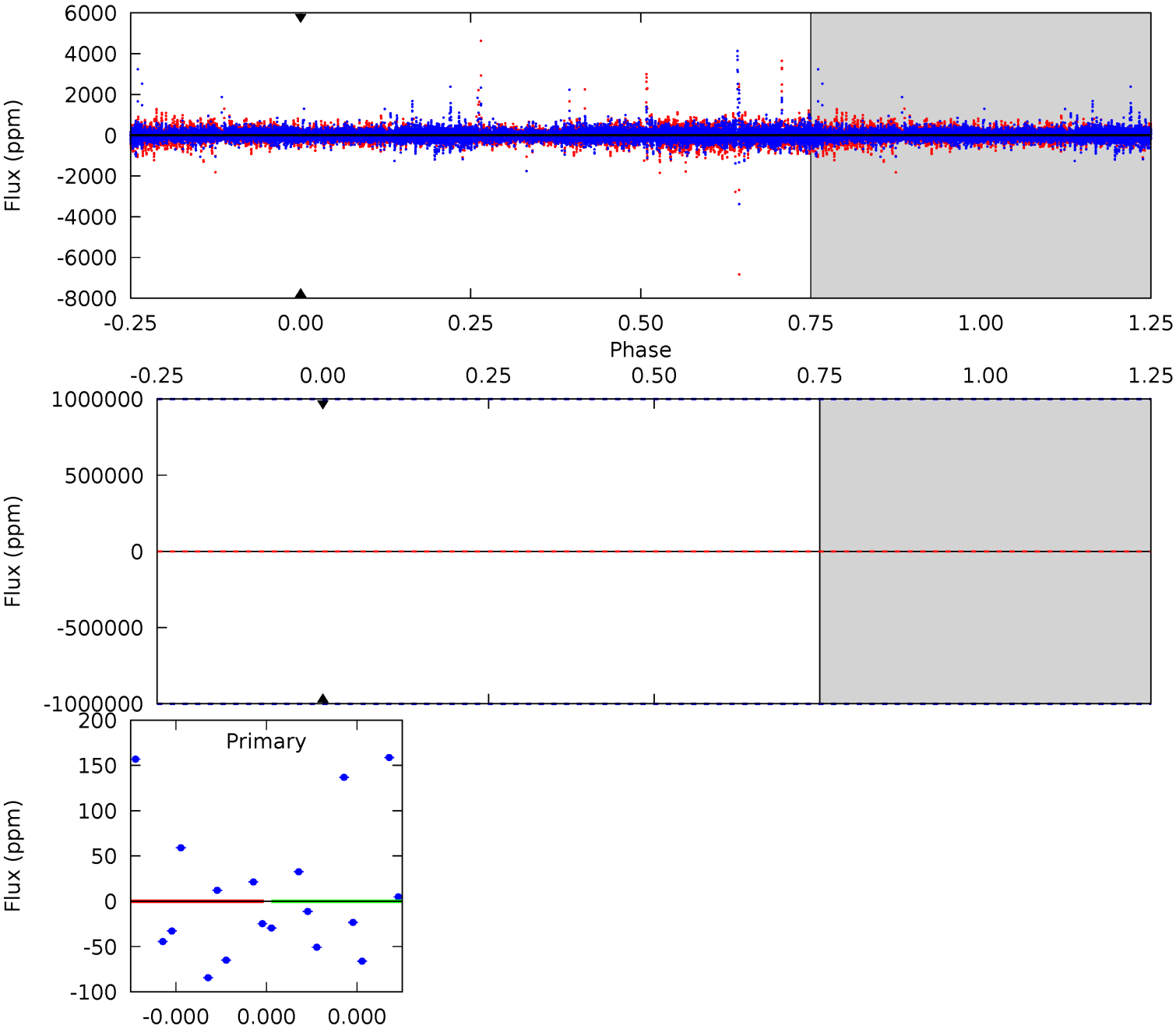
TCE 006864859-04 $P=246.199052$ Days $T_0=319.001252$ (BKJD)



DV Model-Shift Uniqueness Test

006864859-04, P = 246.199052 Days, E = 72.857967 Days

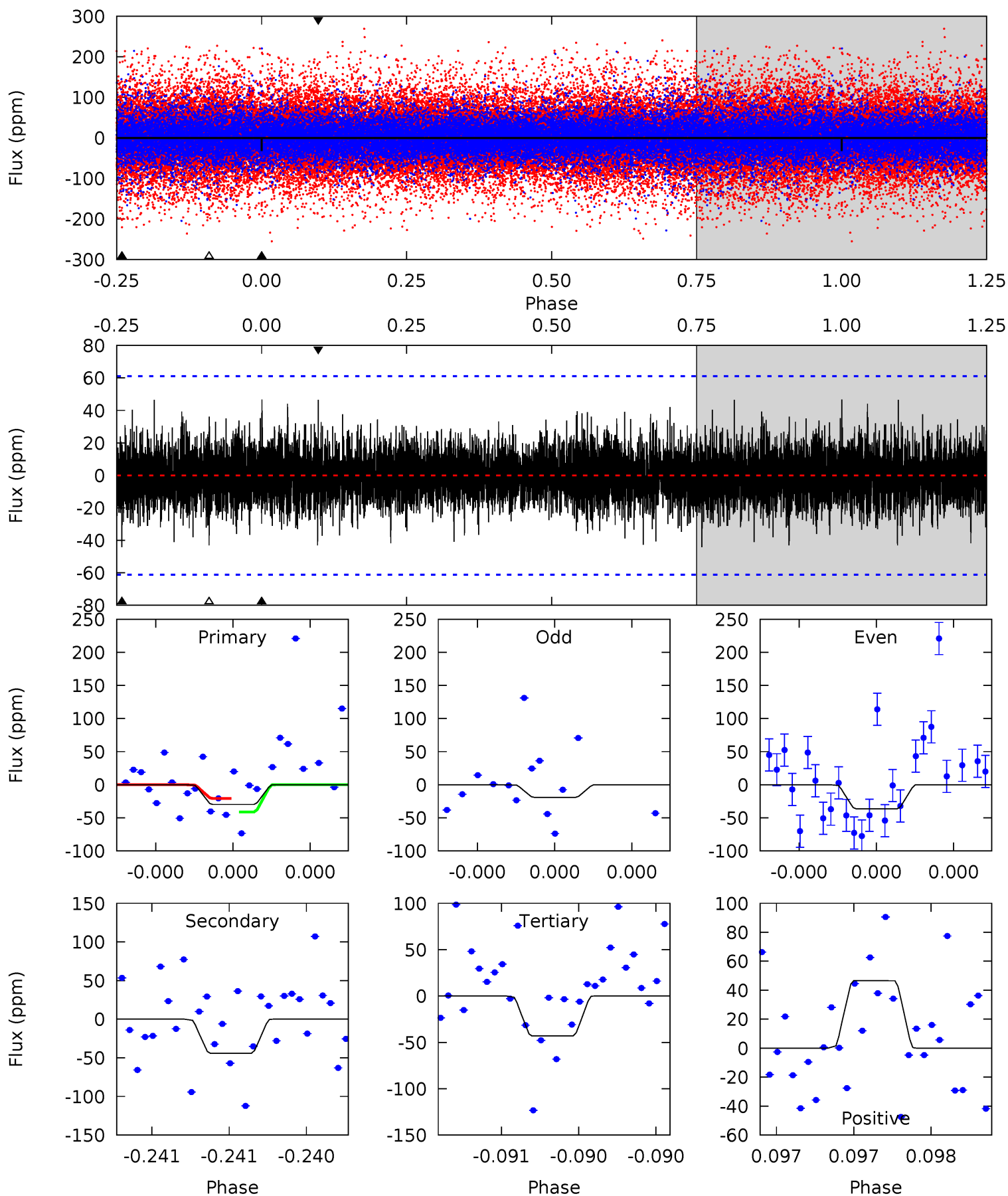
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

006864859-04, P = 246.199052 Days, E = 72.802200 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.73	4.04	3.95	4.26	5.60	3.52	1.03	-1.21	-1.53	0.09	-0.23	0.75	-8.87	0.51	0.94



Stellar Parameters For KIC 006864859

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6807^{+192}_{-264}	$3.848^{+0.350}_{-0.150}$	$0.080^{+0.200}_{-0.350}$	$2.590^{+0.587}_{-1.091}$	$1.723^{+0.176}_{-0.410}$	$0.140^{+0.390}_{-0.061}$
	+3%/-4%	+9%/-4%	+250%/-438%	+23%/-42%	+10%/-24%	+280%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006864859-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$25.99^{+24.45}_{-17.76}$	693^{+51}_{-71}	3464^{+19091}_{-24785}	$153^{+117573}_{-119342}$
Alt.	-44 ± 11	$18.55^{+22.17}_{-13.48}$	693^{+51}_{-75}	2815^{+1340}_{-486}	58^{+767}_{-47}

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

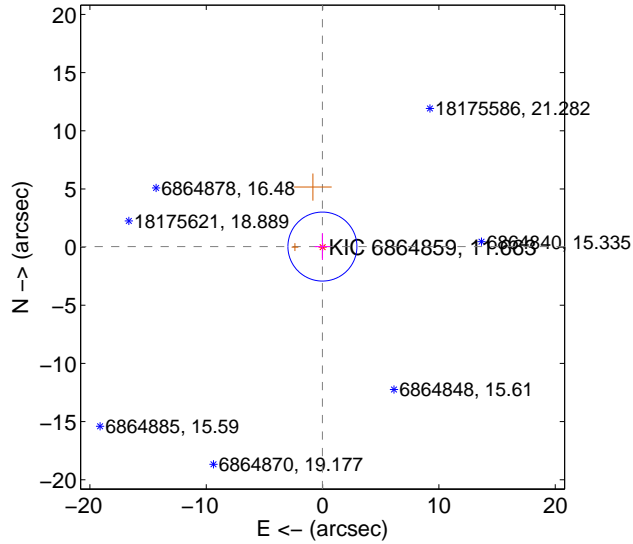
Supplemental centroid analysis for 006864859-04. **Kepler magnitude: 11.66.** Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

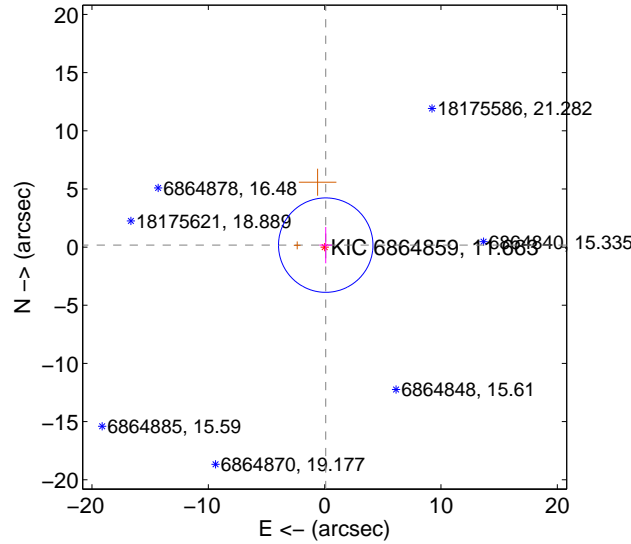
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.048 ± 0.988	0.05	0.014 ± 0.674	0.046 ± 1.150
PRF-fit source offset from KIC position	0.194 ± 1.353	0.14	-0.094 ± 0.543	0.170 ± 1.562
photometric centroid source offset	10.97 ± 2.12	5.17	6.24 ± 2.26	-9.02 ± 2.06

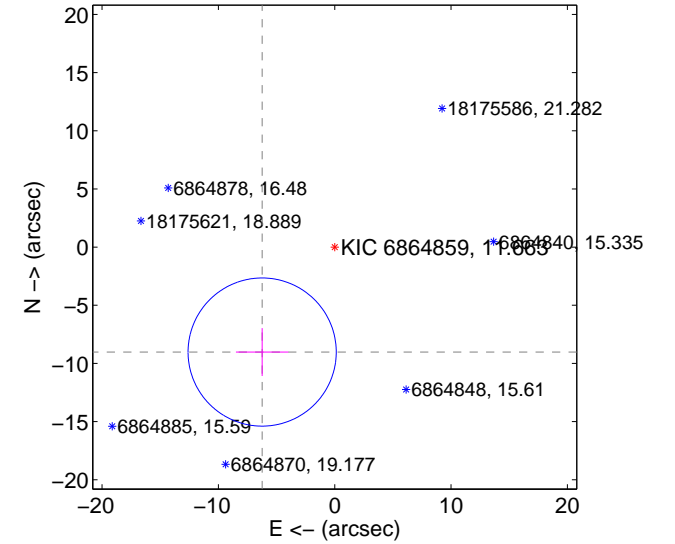
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

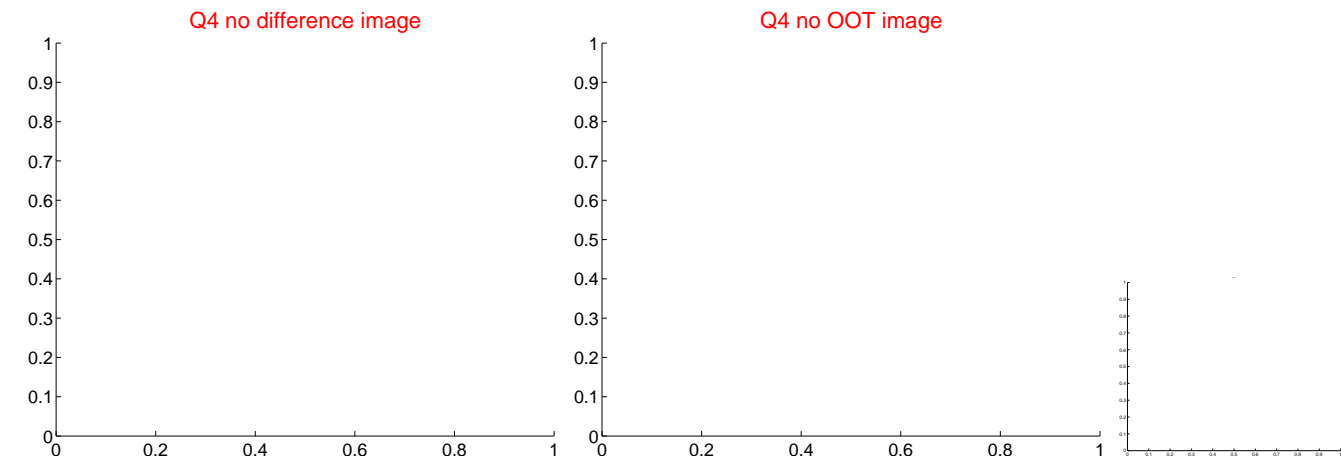
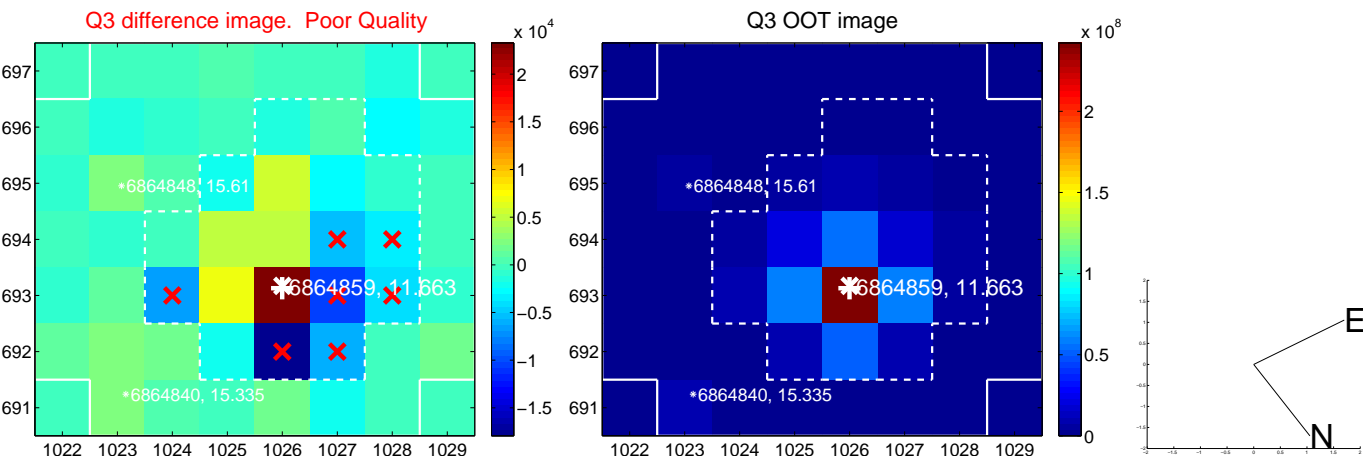


offset from photometric centroids

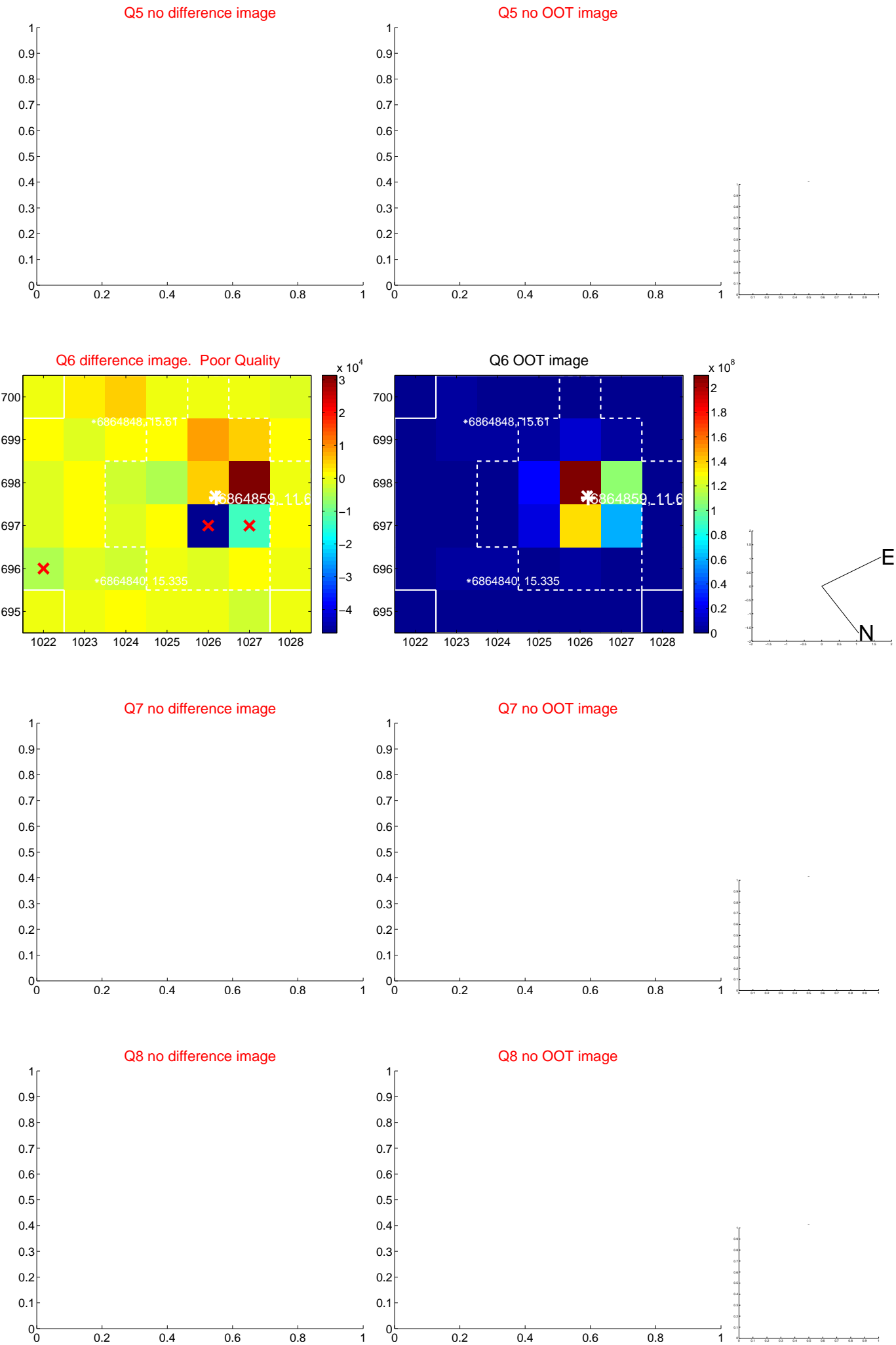


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

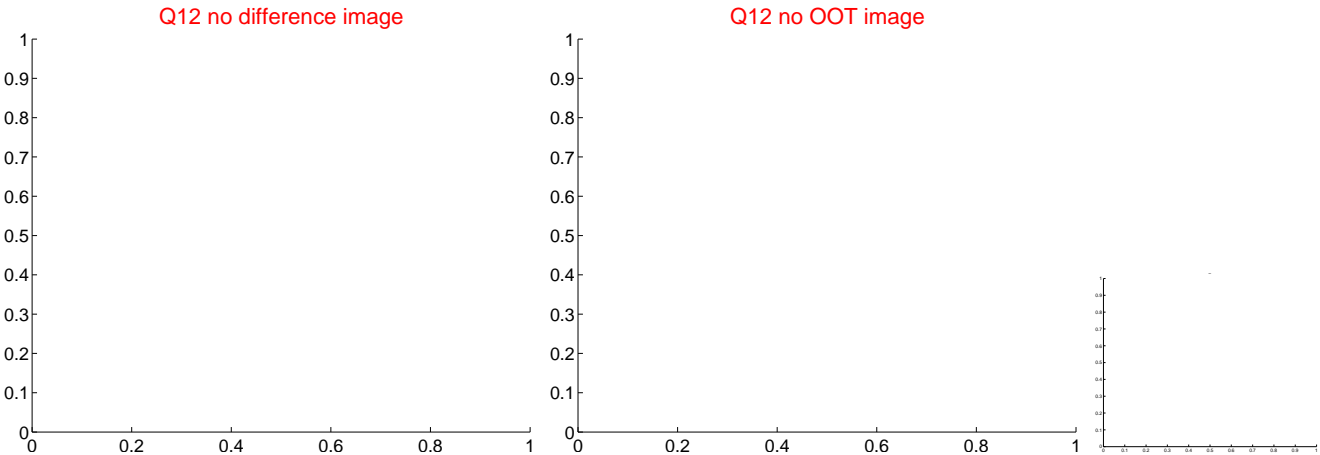
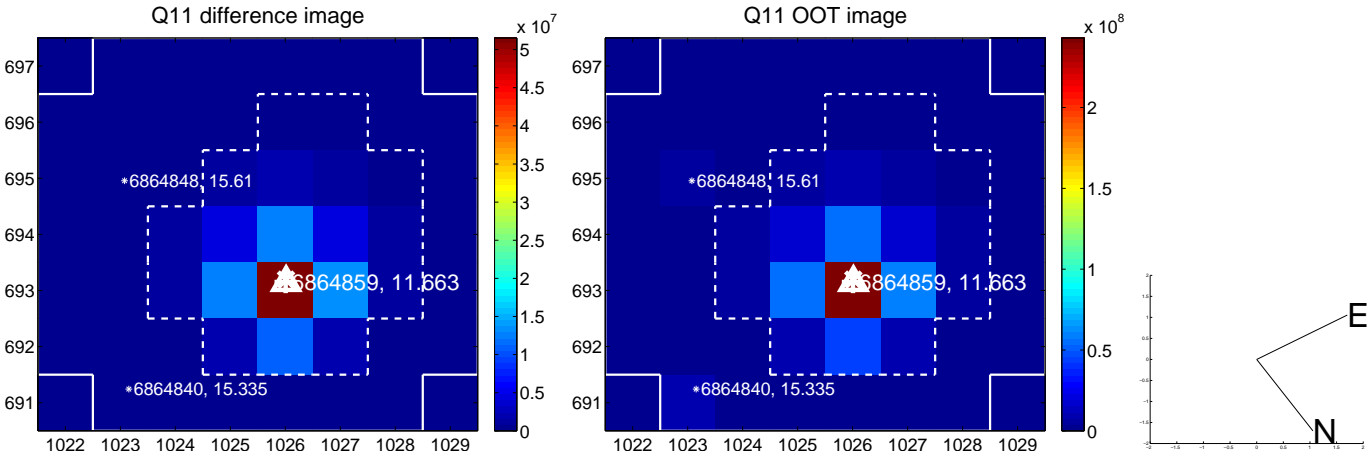
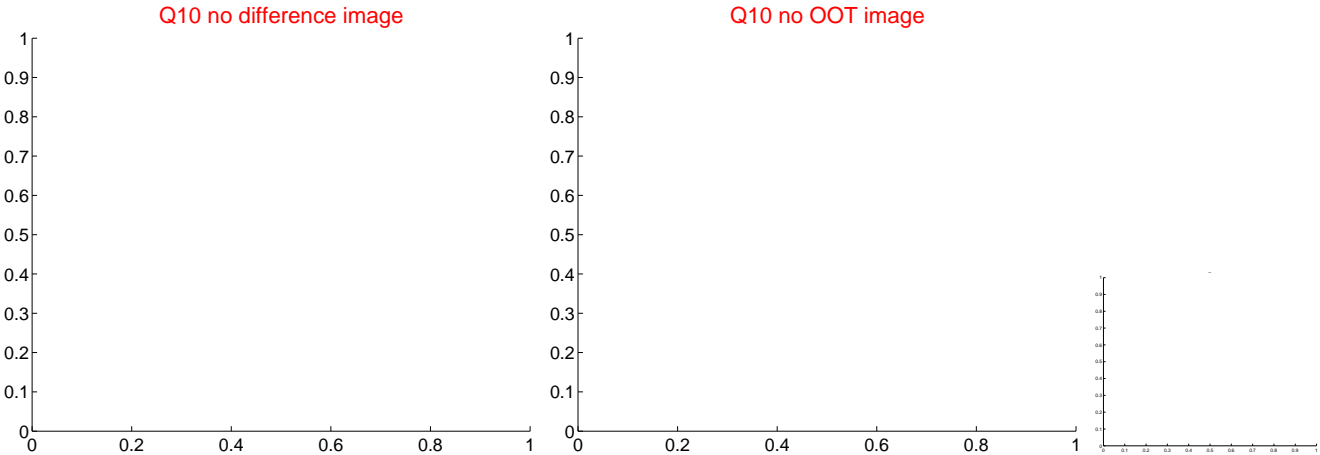
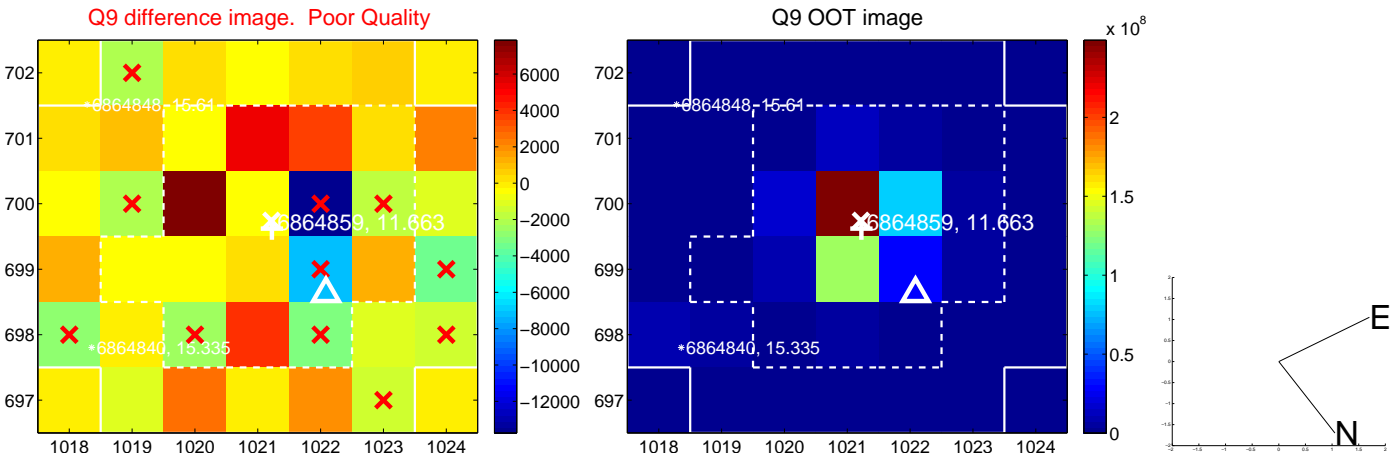
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



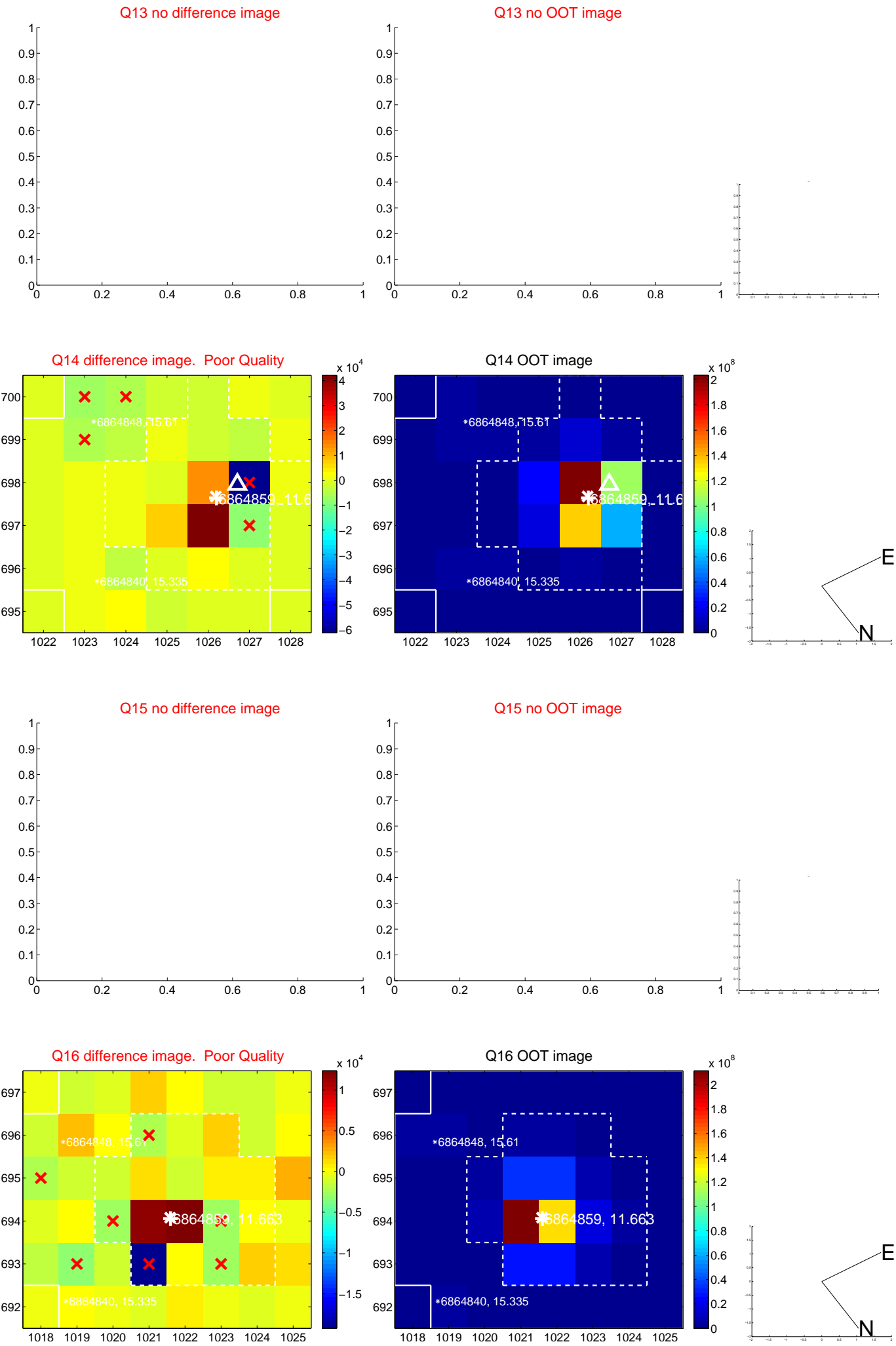
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



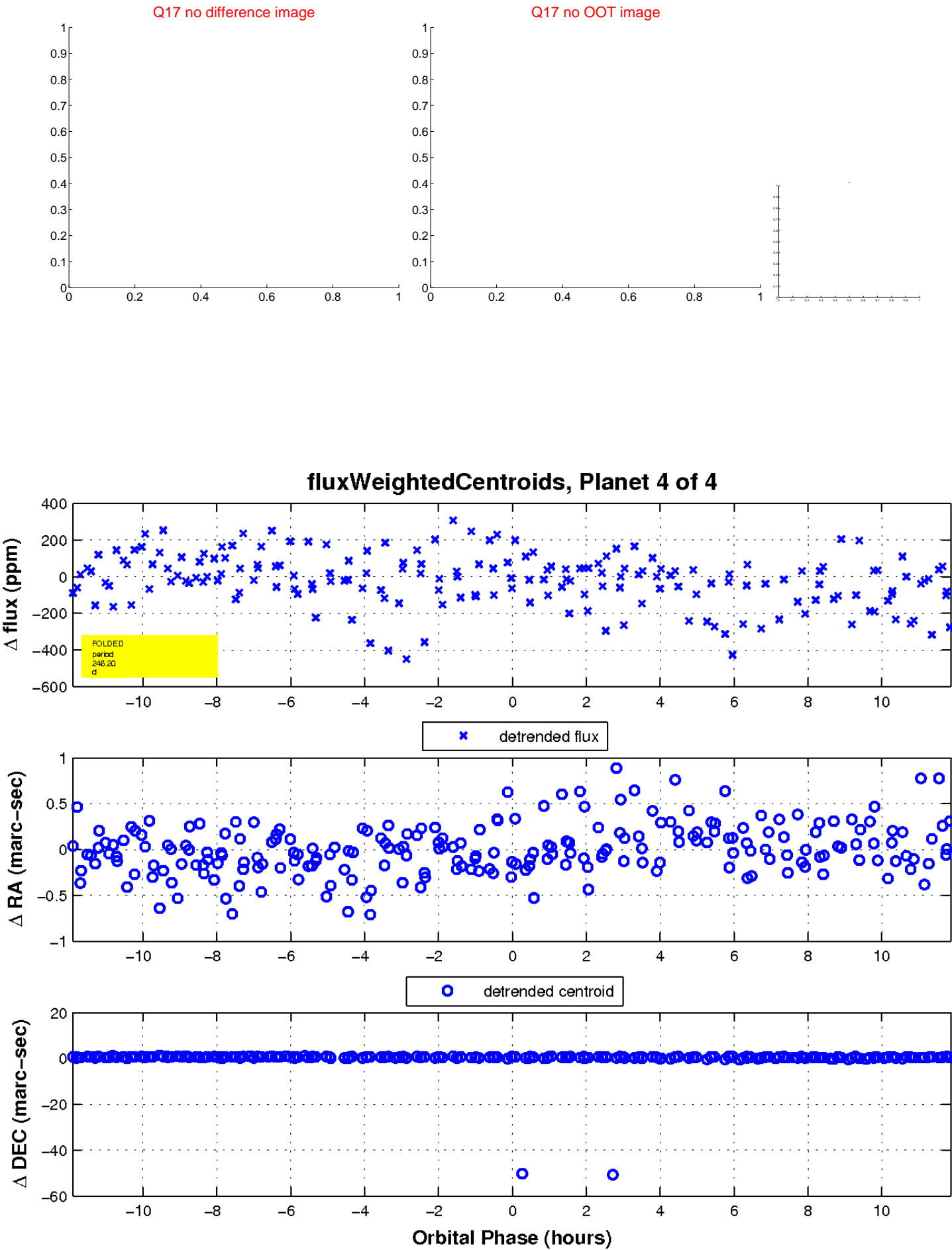
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

