

KIC 006878240

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})
006878240-01	OBS	2681.01	135.497536	233.694322	5071.4	6.604	70.4	69.4	0.76	5307	5.98	1.80
006878240-02	OBS	2681.02	22.250833	149.434117	659.6	1.667	10.5	12.3	0.76	5307	1.93	20.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006878240-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006878240-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT

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.

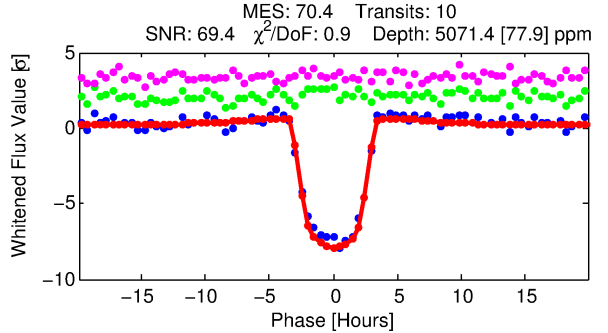
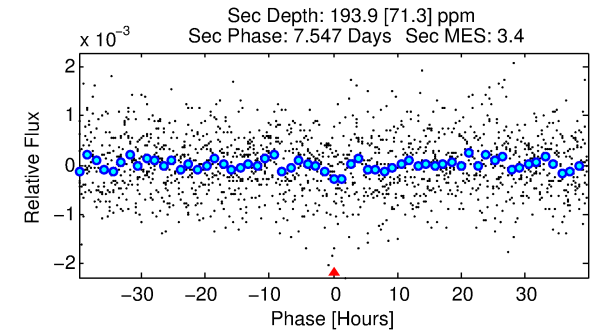
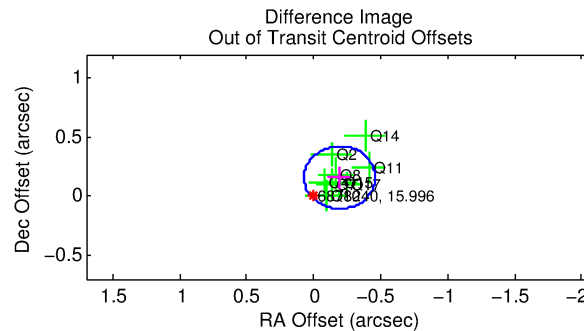
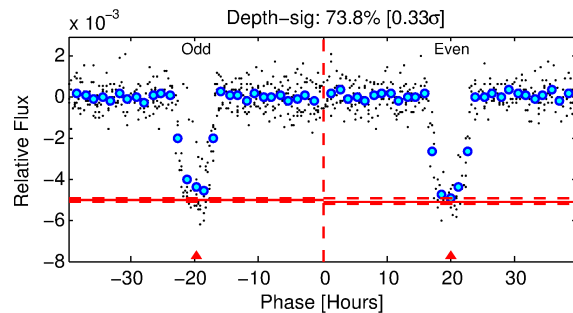
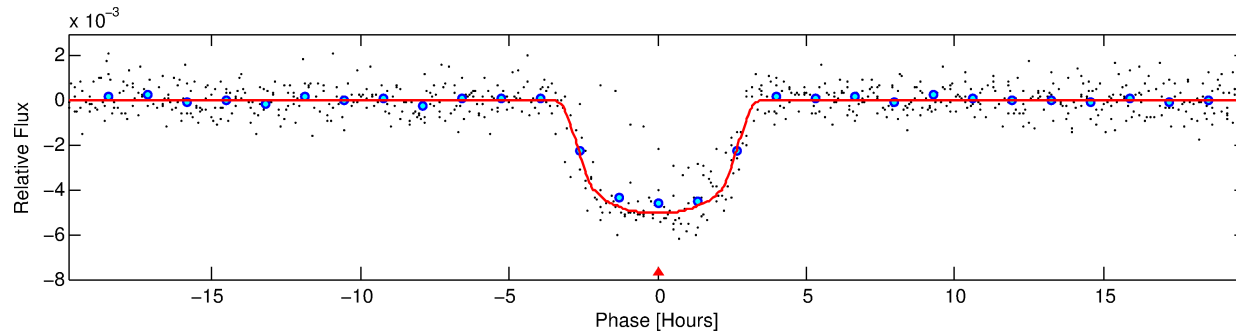
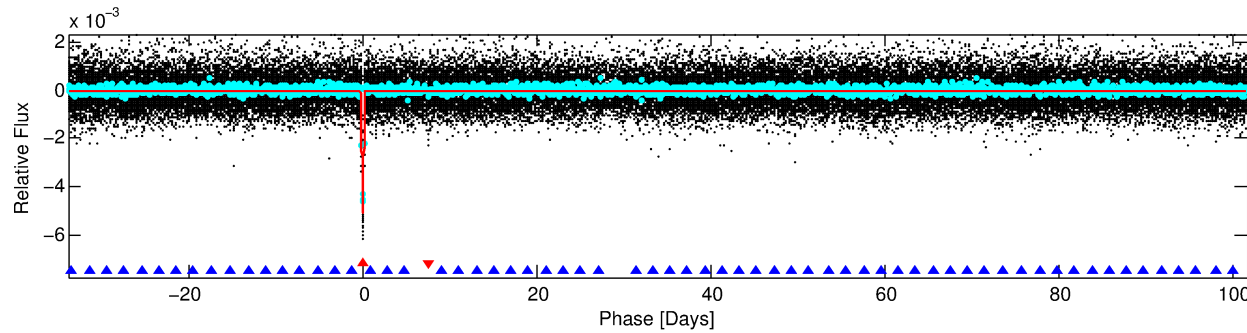
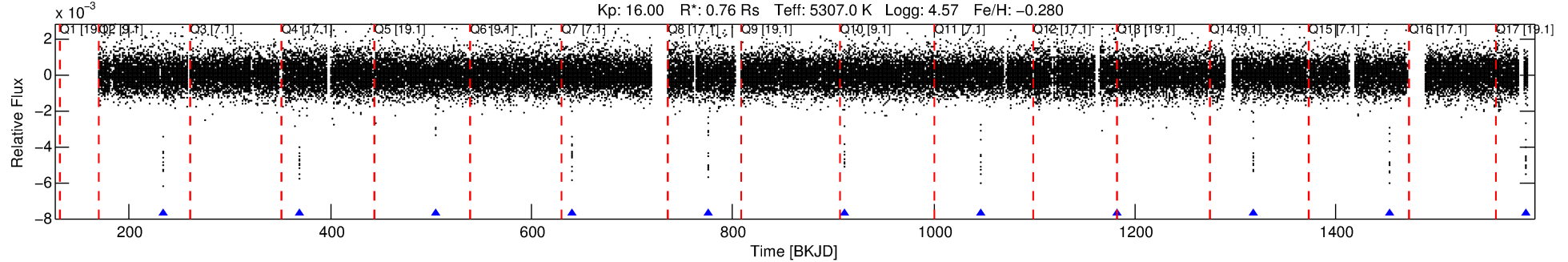
Ephemeris Match Information For 006878240-01

No Significant Match Found

DV One-Page Summary

KIC: 6878240 Candidate: 1 of 2 Period: 135.498 d
KOI: K02681.01 Name: Kepler-397c Corr: 0.987

Kp: 16.00 R*: 0.76 Rs Teff: 5307.0 K Logg: 4.57 Fe/H: -0.280



DV Fit Results:

Period = 135.49754 [0.00031] d
Epoch = 233.6943 [0.0020] BKJD
Rp/R* = 0.0724 [0.0017]
a/R* = 113.84 [9.09]
b = 0.79 [0.04]
Seff = 1.80 [0.22]
Teq = 295 [9] K
Rp = 5.98 [0.43] Re
a = 0.4754 [0.0294] AU
Ag = 674.27 [257.86] [2.61σ]
Teffp = 2328 [220] K [9.21σ]

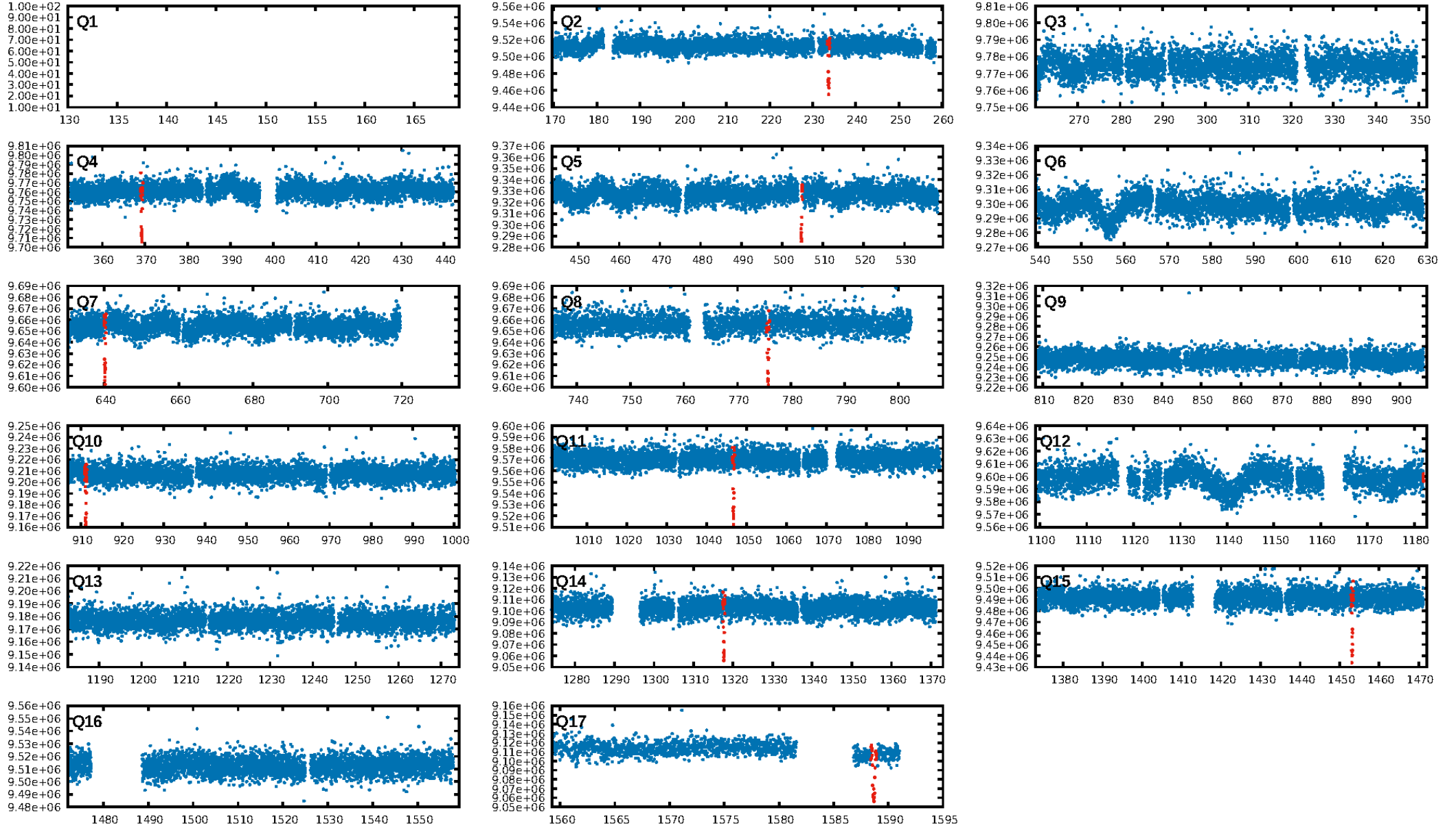
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [399.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 8.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 11.13
Centroid-sig: 0.0%
Centroid-so: 1.239 arcsec [6.36σ]
OotOffset-rm: 0.249 arcsec [2.82σ]
OotOffset-st: 3/3/2/1 [9]
KicOffset-rm: 0.316 arcsec [3.51σ]
KicOffset-st: 3/3/2/1 [9]
DiffImageQuality-fgm: 1.00 [9/9]
DiffImageOverlap-fno: 1.00 [9/9]

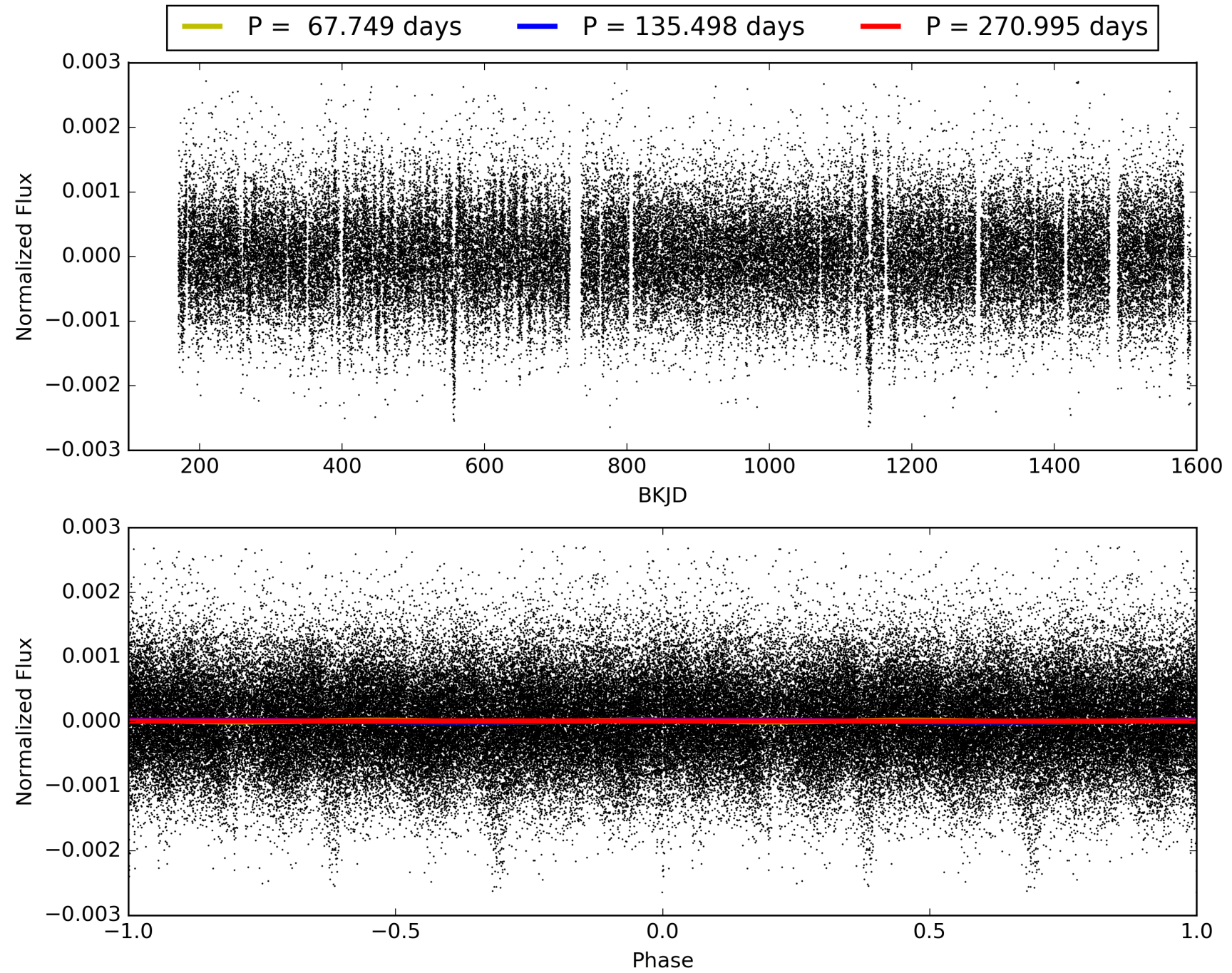
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:50:20 Z

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

TCE 006878240-01, PDC Light Curves

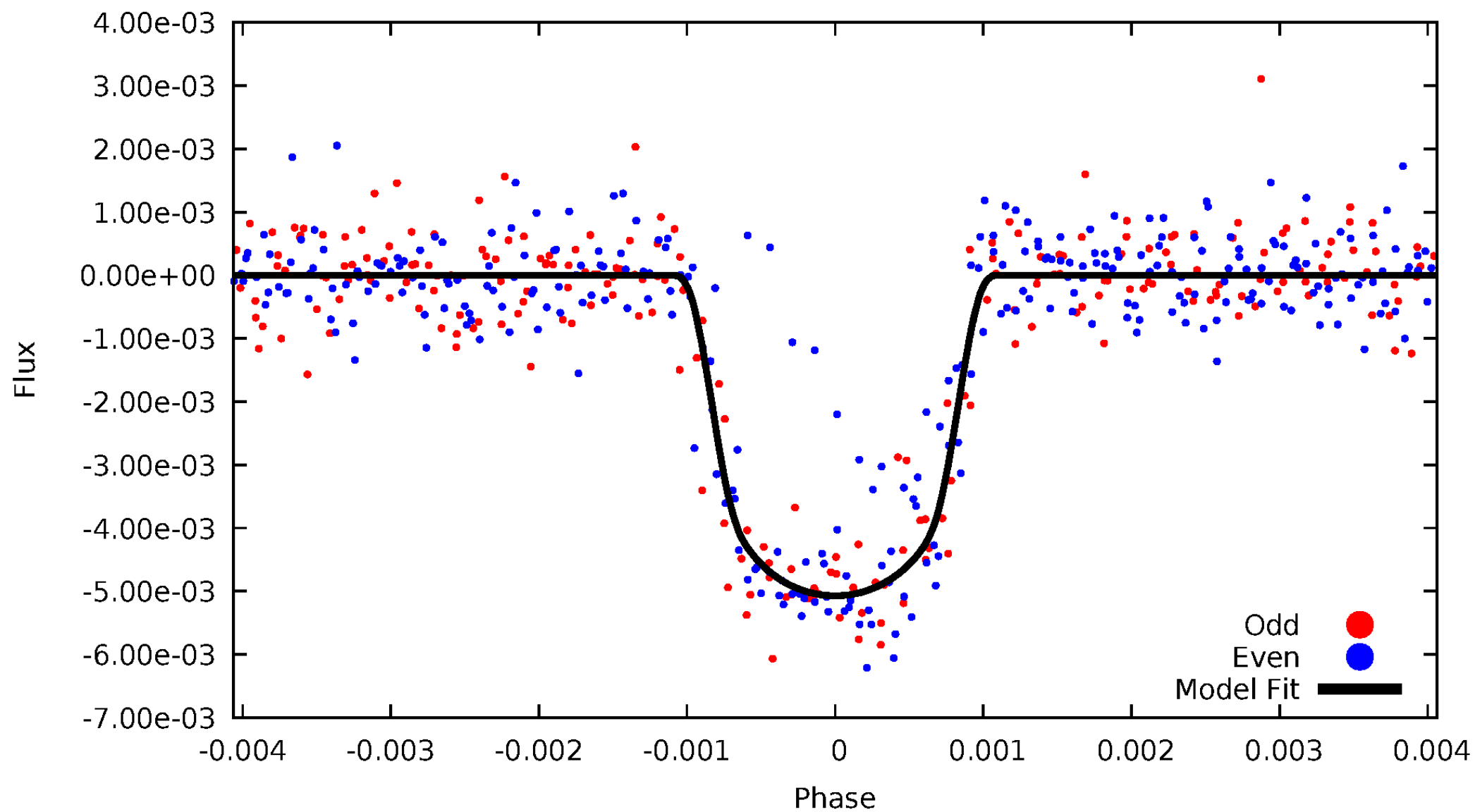


TCE 006878240-01



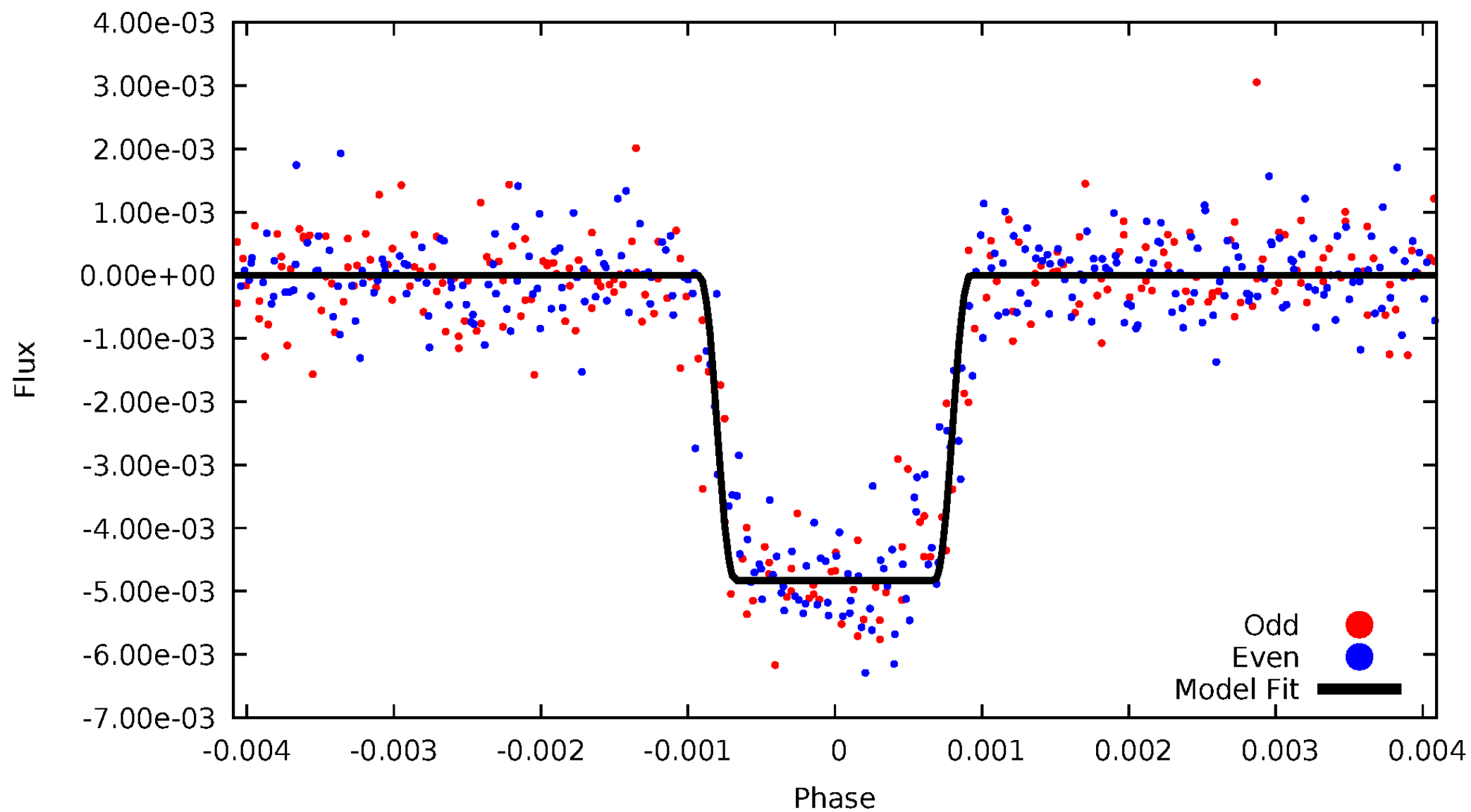
DV Odd/Even

TCE 006878240-01



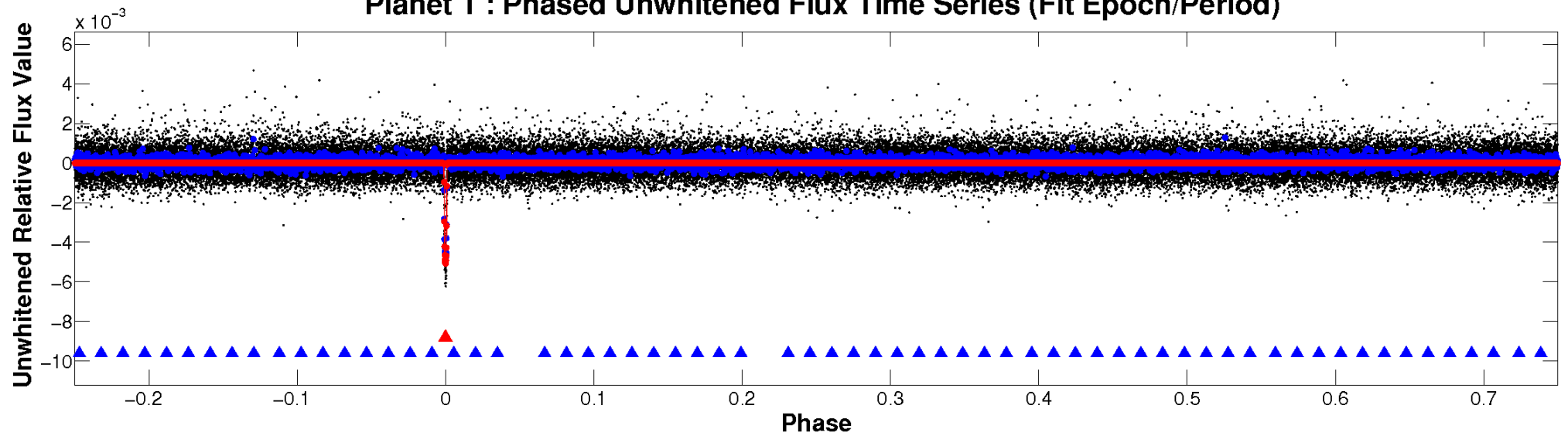
ALT Odd/Even

TCE 006878240-01

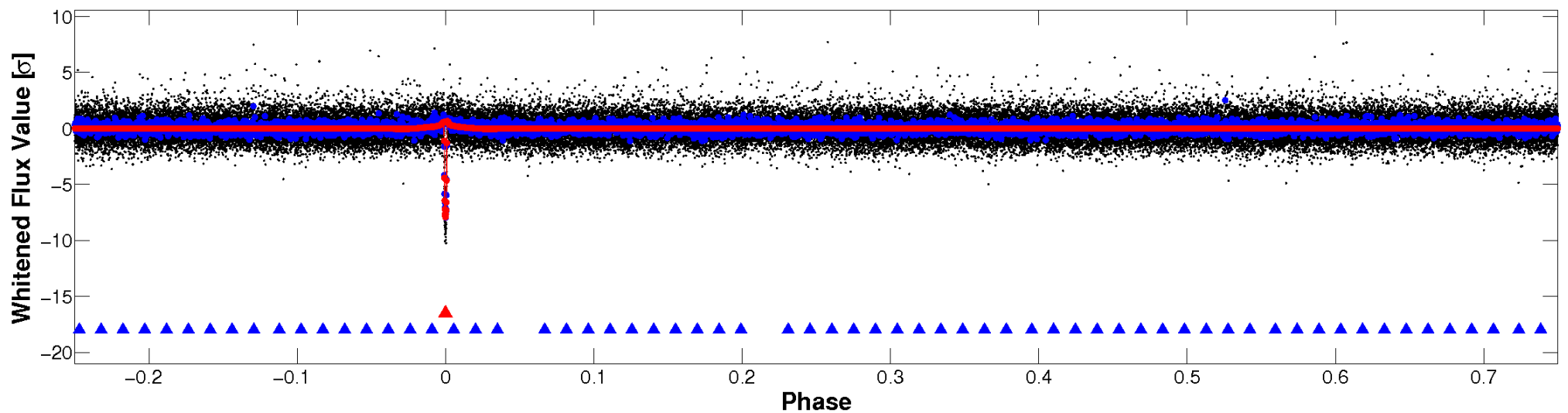


Non-Whitened Vs. Whitened Light Curve

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

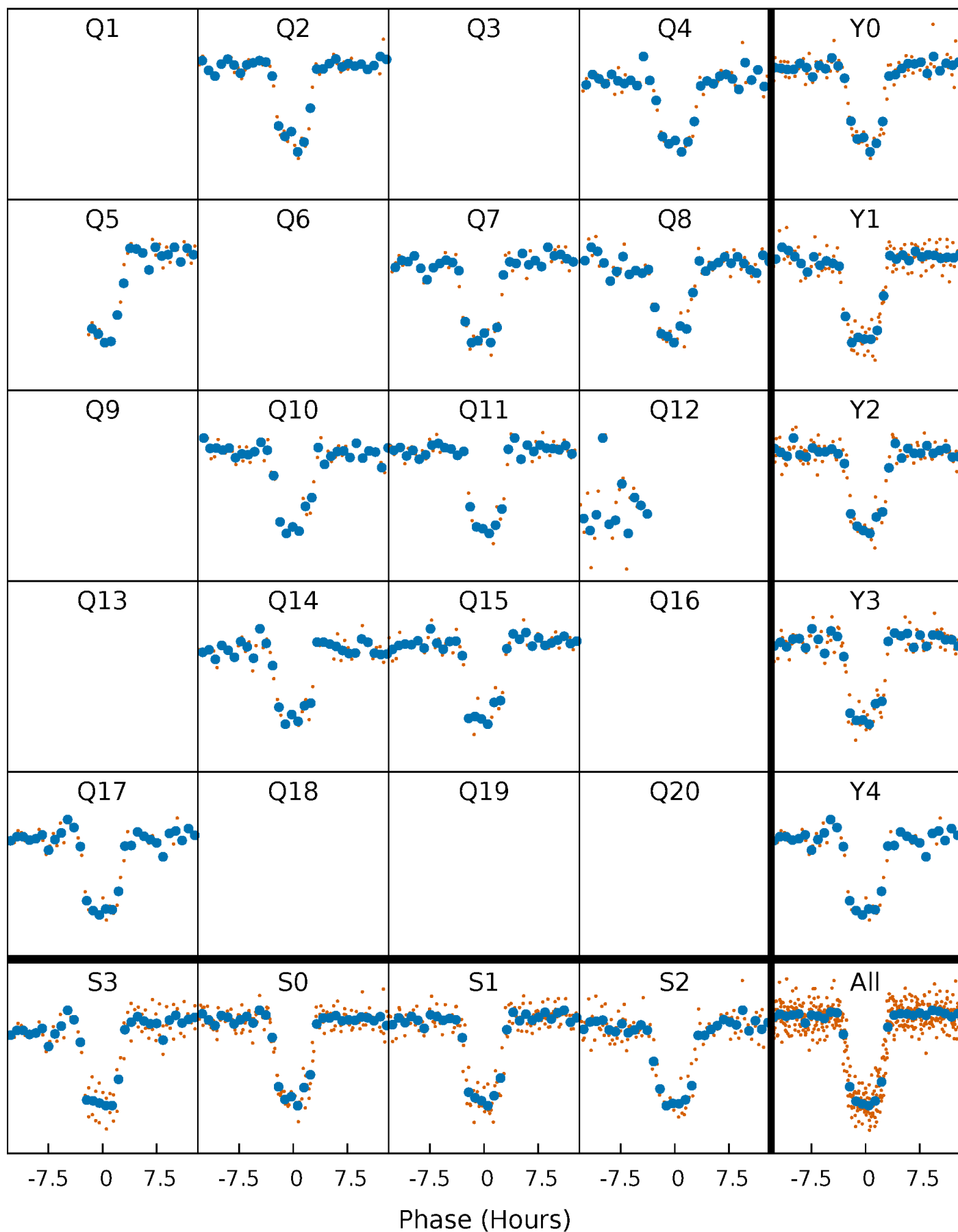


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



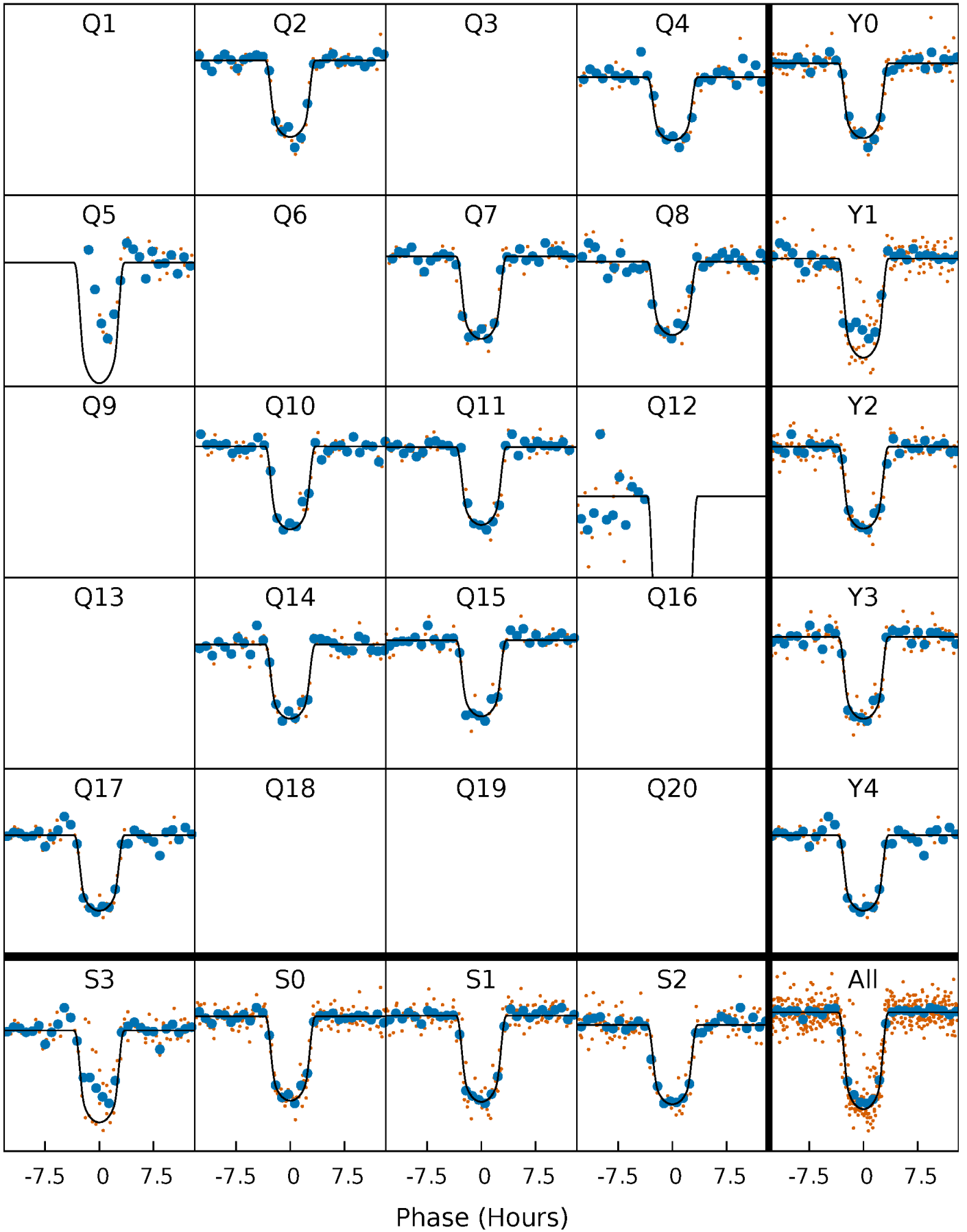
PDC Quarter-Phased Transit Curves

TCE 006878240-01 P=135.497536 Days $T_0=233.694322$ (BKJD)



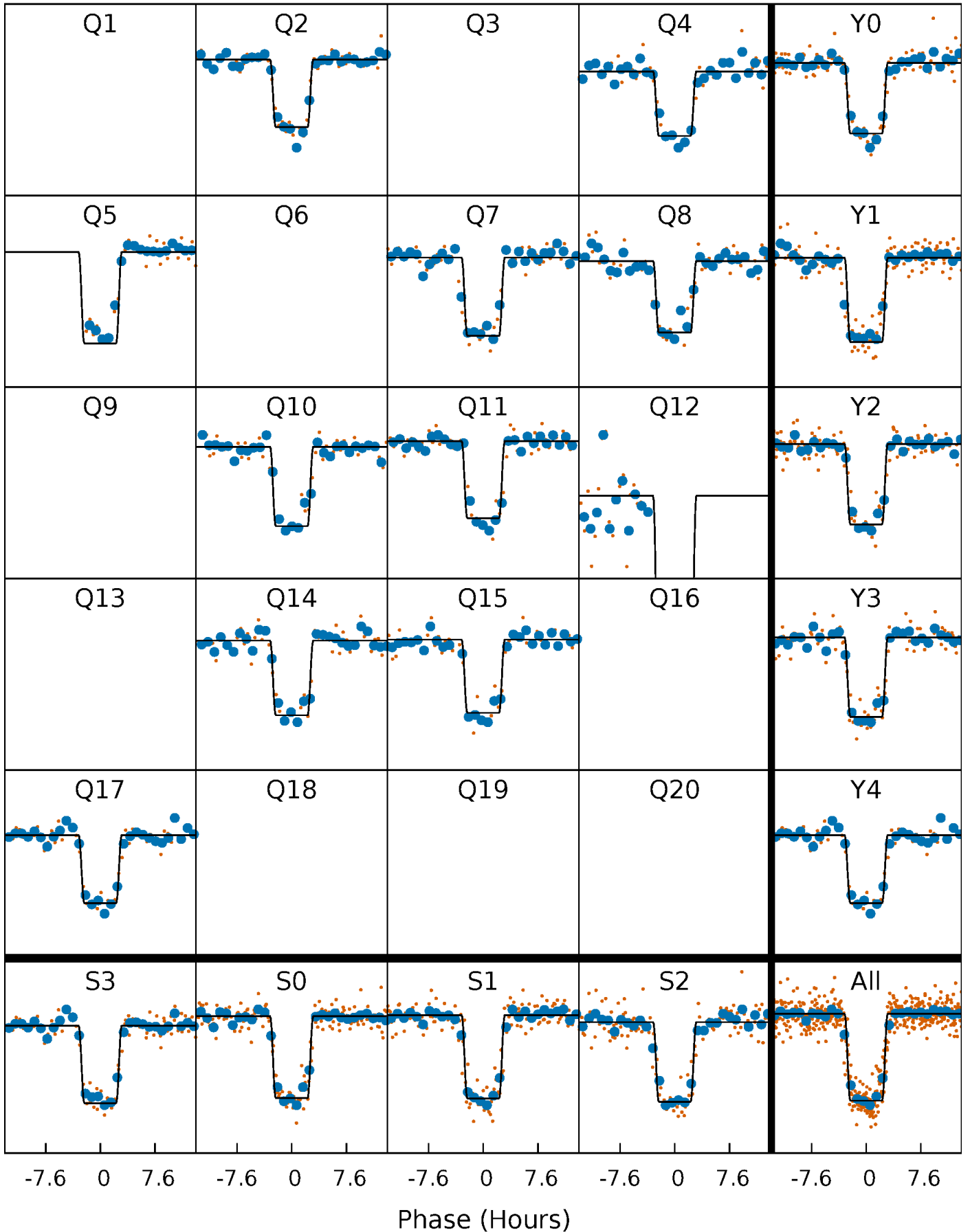
DV Quarter-Phased Transit Curves

TCE 006878240-01 P=135.497536 Days $T_0=233.694322$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

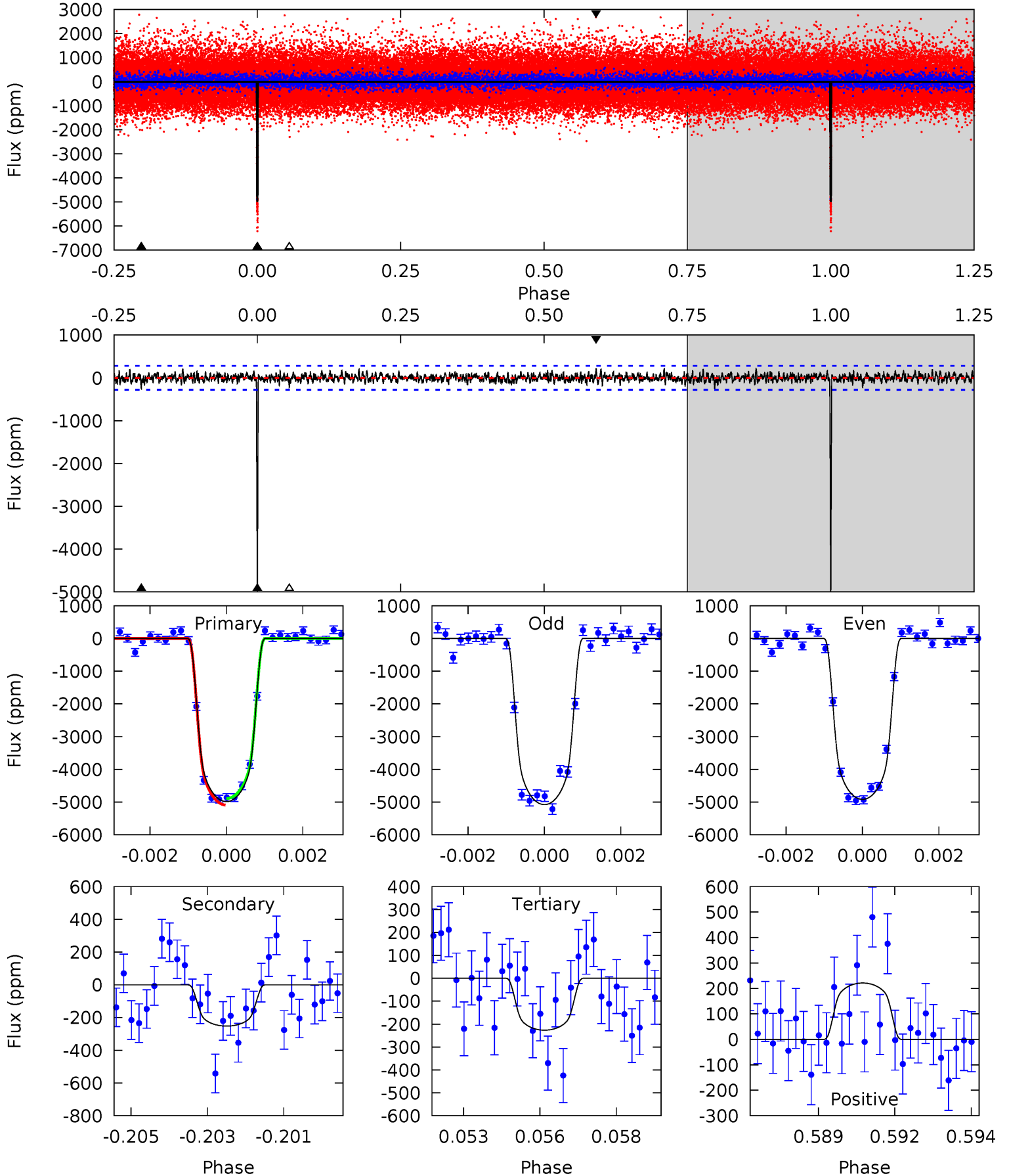
TCE 006878240-01 P=135.497194 Days $T_0=233.695361$ (BKJD)



DV Model-Shift Uniqueness Test

006878240-01, P = 135.497536 Days, E = 98.196786 Days

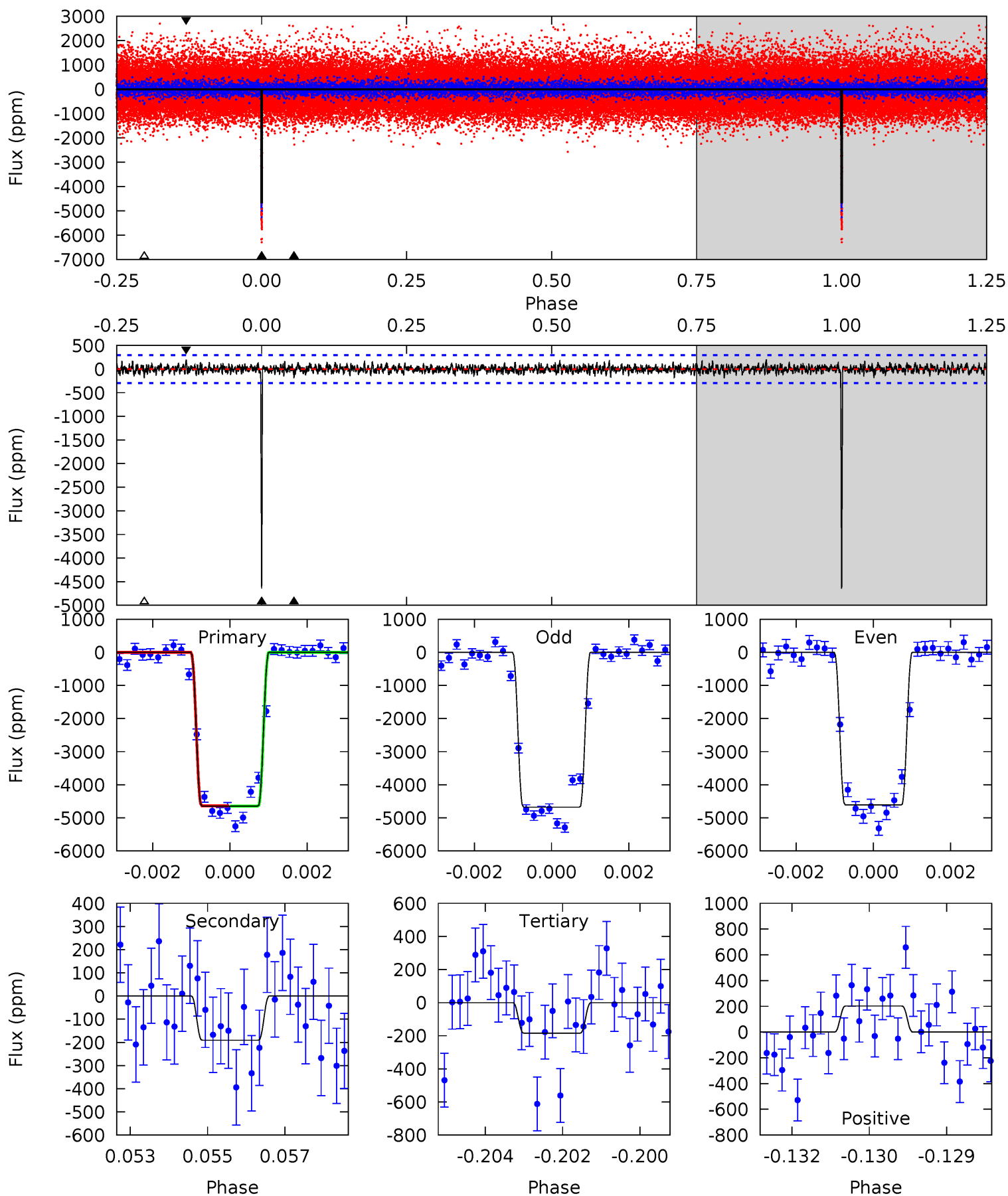
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
94.8	4.80	4.31	4.21	5.31	3.07	1.21	90.5	90.6	0.49	0.59	1.51	0.94	0.04	1.91



Alt Model-Shift Uniqueness Test

006878240-01, P = 135.497194 Days, E = 98.198167 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
83.4	3.43	3.32	3.64	5.34	3.12	0.96	80.1	79.8	0.11	-0.21	0.58	0.99	0.04	0.08



Stellar Parameters For KIC 006878240

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5307^{+105}_{-105}	$4.572^{+0.041}_{-0.054}$	$-0.280^{+0.150}_{-0.150}$	$0.757^{+0.052}_{-0.042}$	$0.782^{+0.047}_{-0.047}$	$2.535^{+0.397}_{-0.448}$
	+2%/-2%	+1%/-1%	+54%/-54%	+7%/-6%	+6%/-6%	+16%/-18%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 006878240-01 / KOI 2681.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-252 ± 53	$6.01^{+0.29}_{-0.27}$	414^{+11}_{-11}	3094^{+100}_{-107}	863^{+217}_{-183}
Alt.	-191 ± 56	$5.78^{+0.27}_{-0.27}$	414^{+11}_{-10}	3001^{+122}_{-135}	700^{+198}_{-210}

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

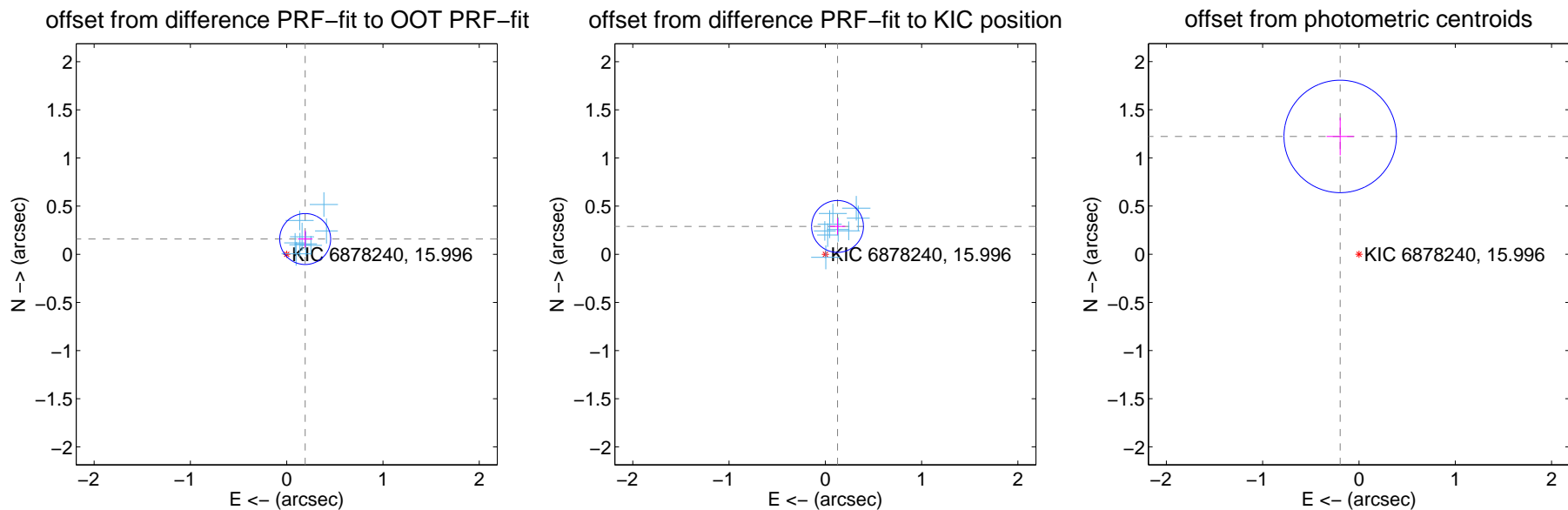
DV Centroid Data

Supplemental centroid analysis for 006878240-01. Kepler magnitude: 16.00. Transit SNR 69.39

There are 9 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	0.249 ± 0.088	2.82	-0.192 ± 0.076	0.159 ± 0.088
PRF-fit source offset from KIC position	0.316 ± 0.090	3.51	-0.126 ± 0.080	0.289 ± 0.085
photometric centroid source offset	1.24 ± 0.19	6.36	0.19 ± 0.14	1.22 ± 0.20



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.

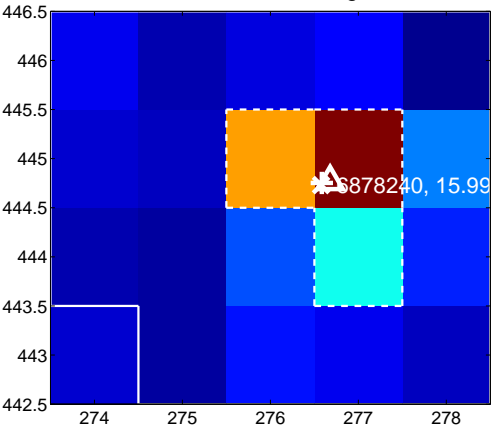
Q1 no difference image



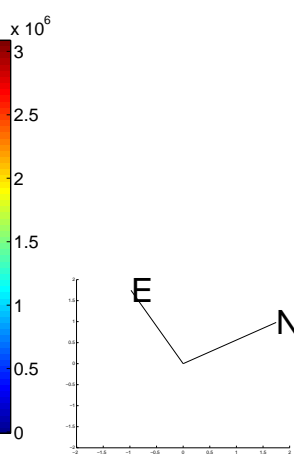
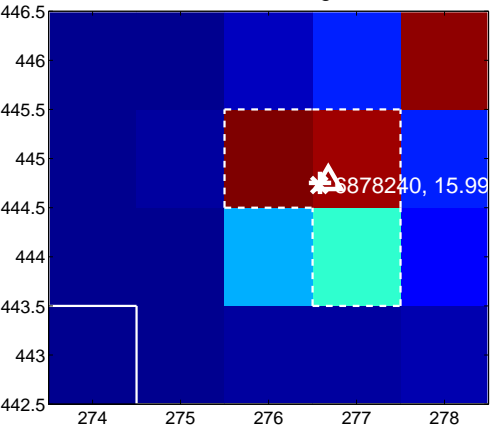
Q1 no OOT image



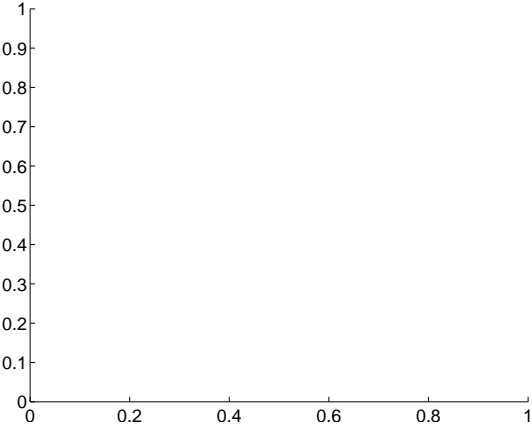
Q2 difference image



Q2 OOT image



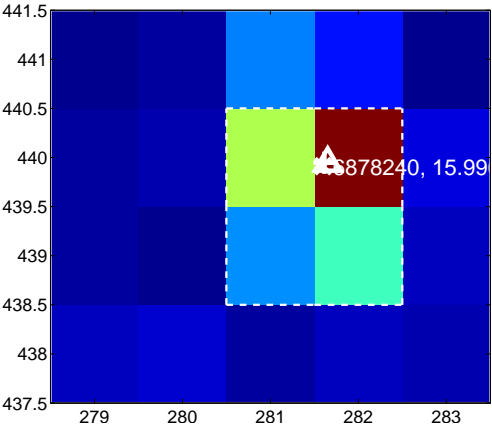
Q3 no difference image



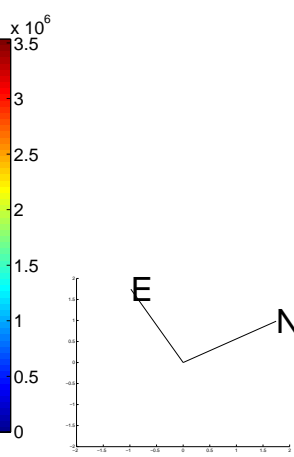
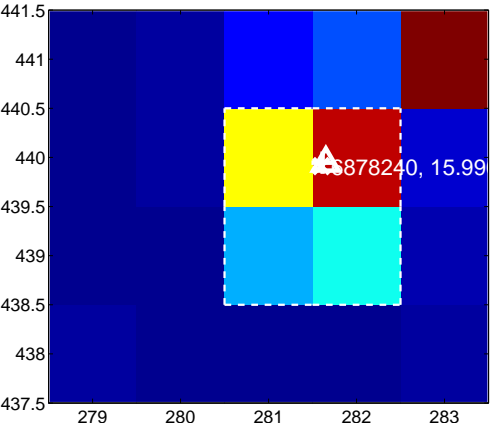
Q3 no OOT image



Q4 difference image



Q4 OOT image



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

Q5 no difference image



Q5 no OOT image



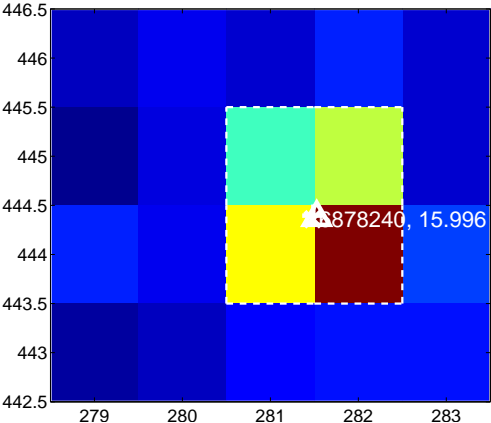
Q6 no difference image



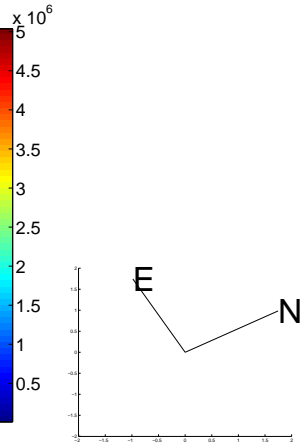
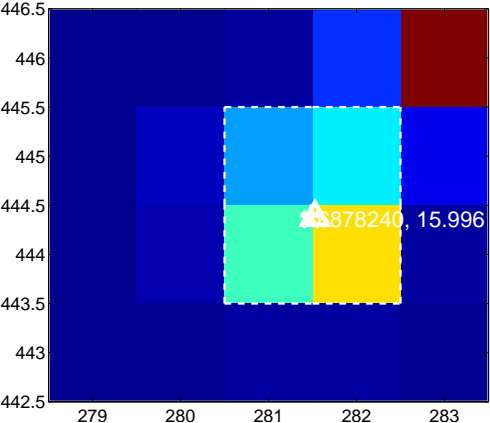
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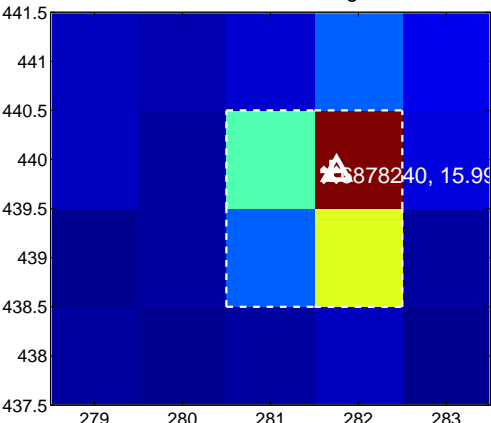
Q7 difference image



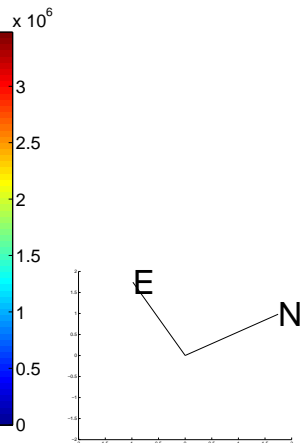
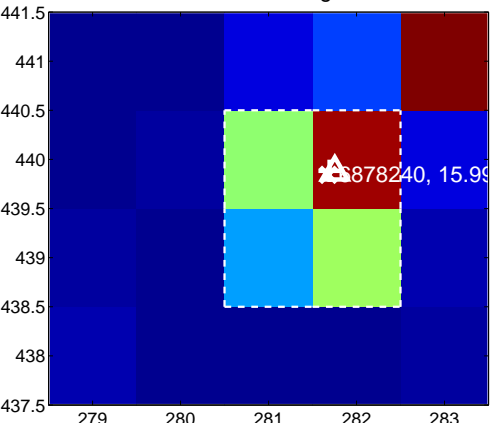
Q7 OOT image



Q8 difference image



Q8 OOT image

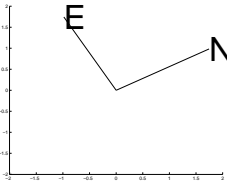
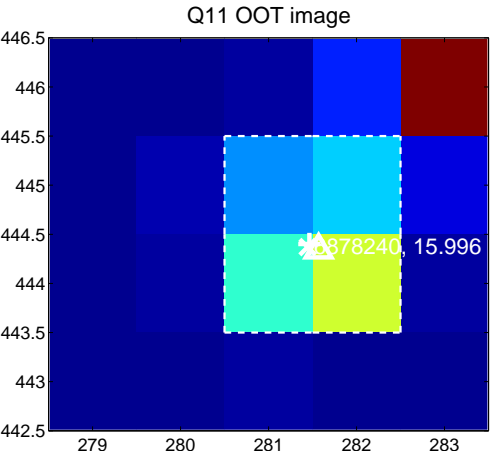
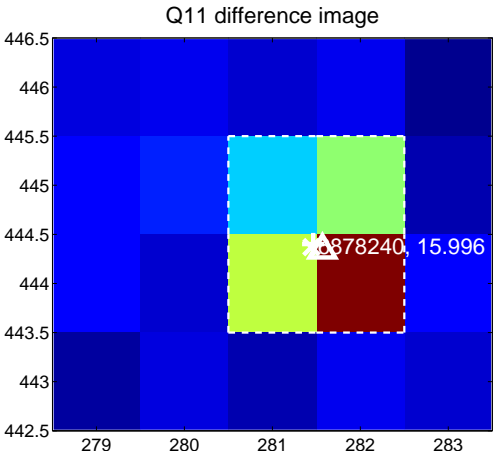
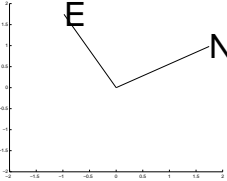
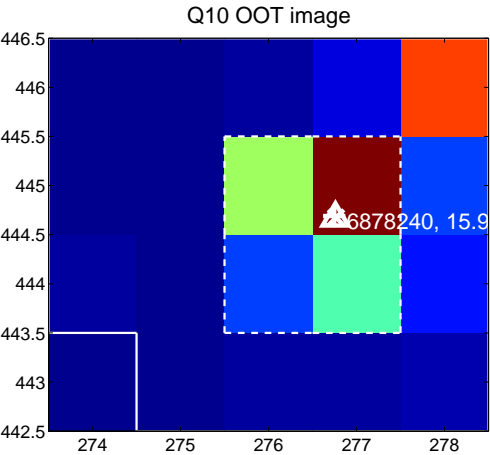
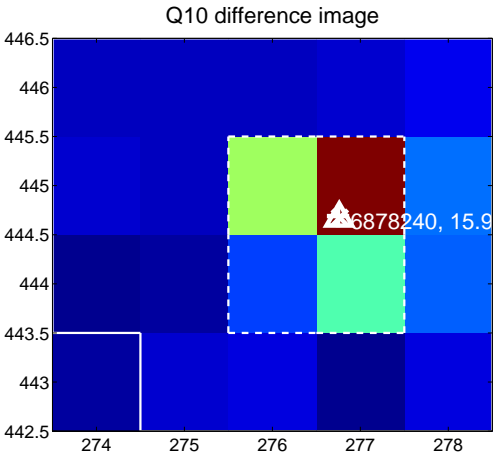
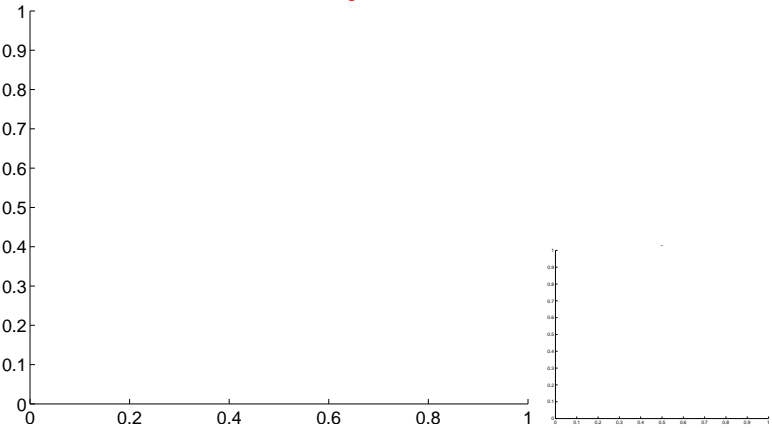


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

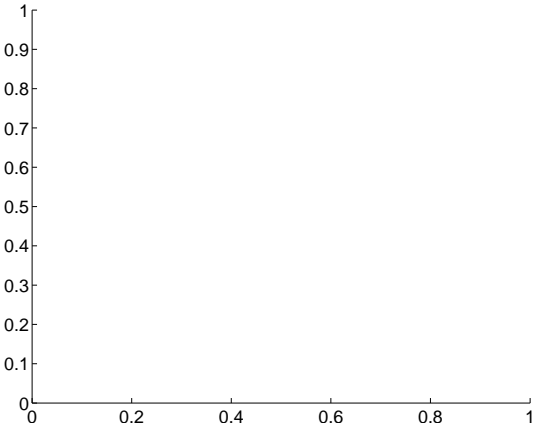
Q9 no difference image



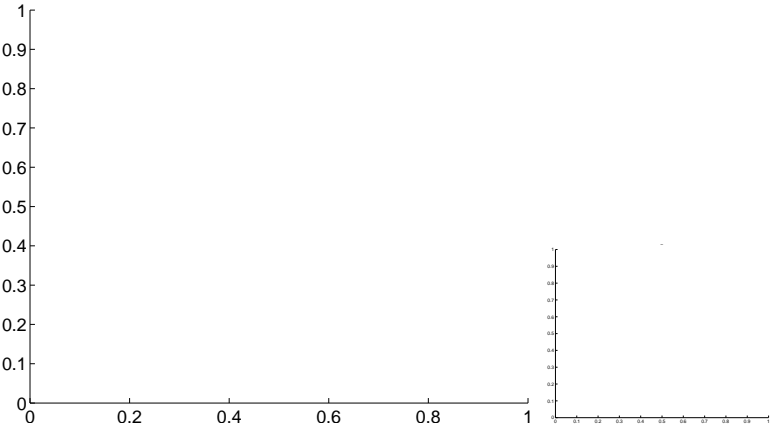
Q9 no OOT image



Q12 no difference image



Q12 no OOT image

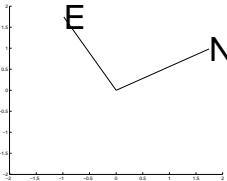
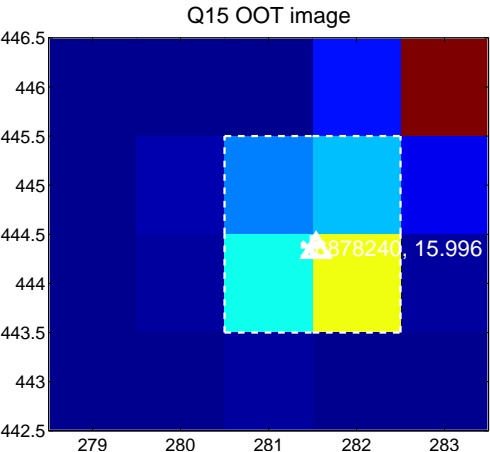
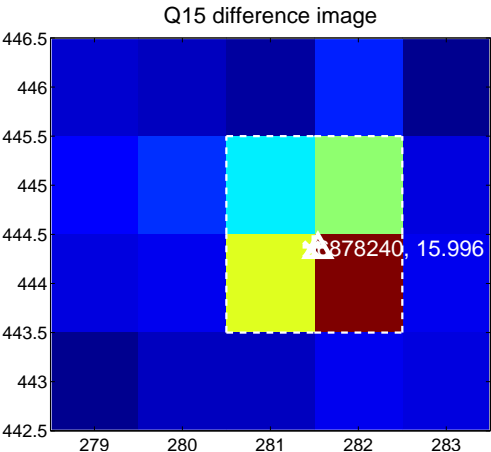
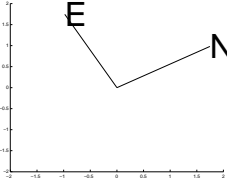
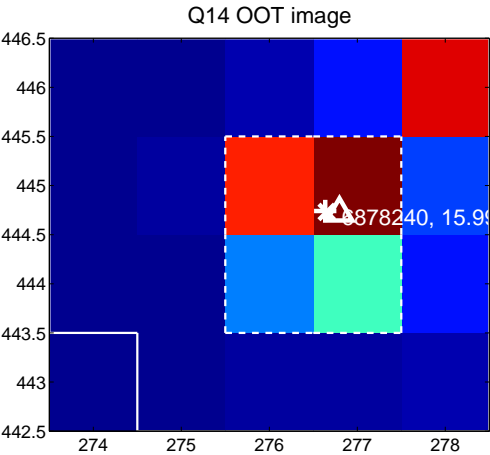
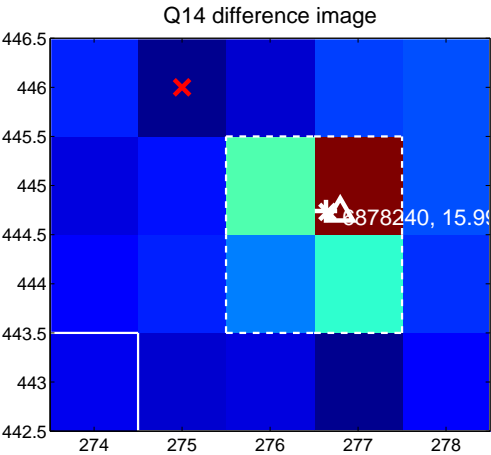


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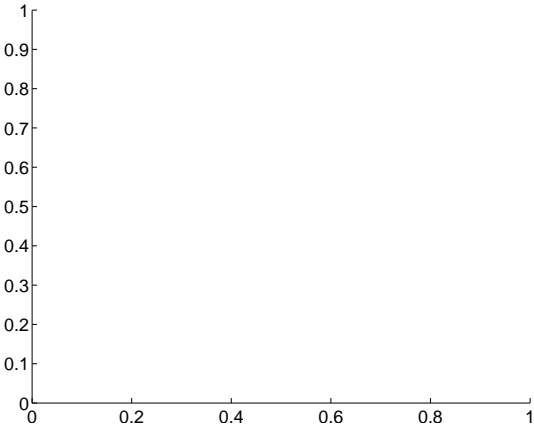
Q13 no difference image



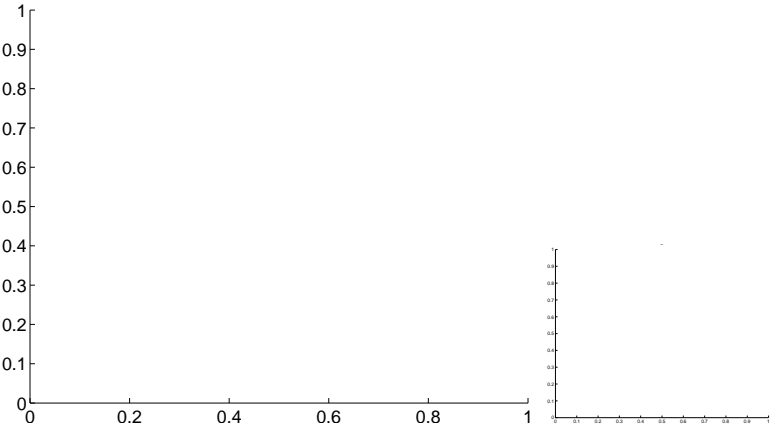
Q13 no OOT image



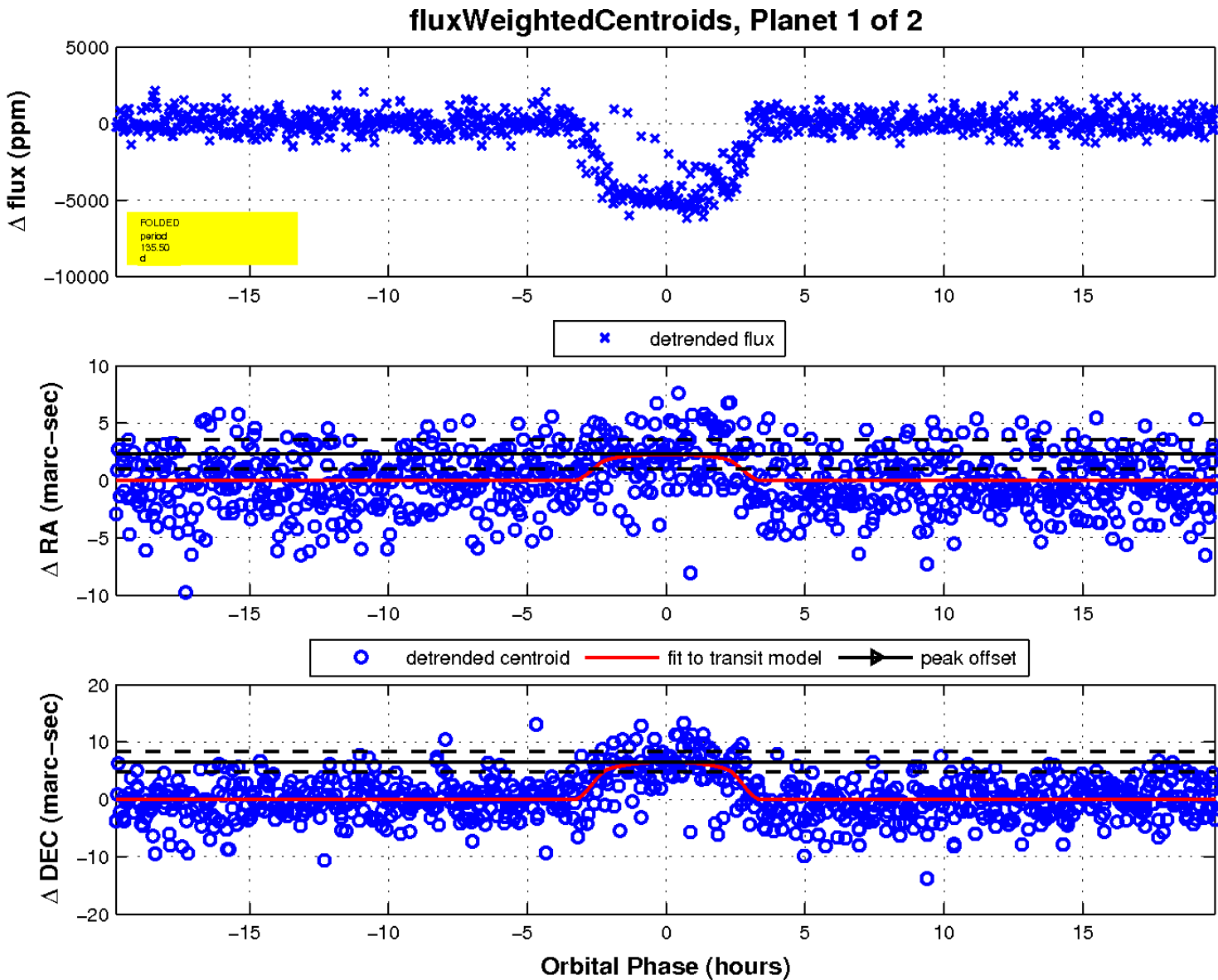
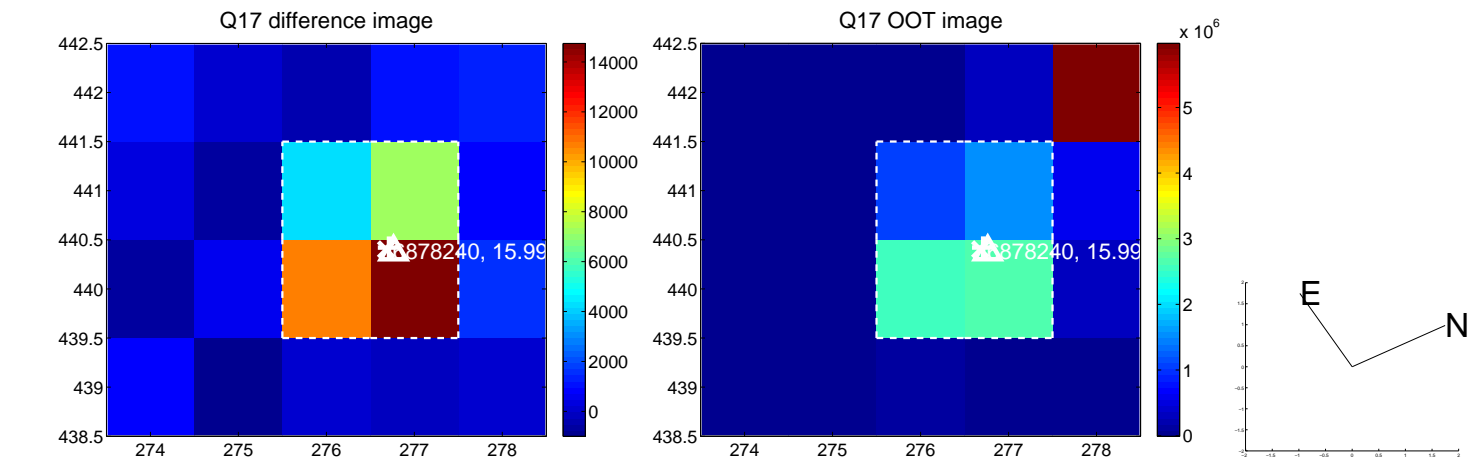
Q16 no difference image



Q16 no OOT image

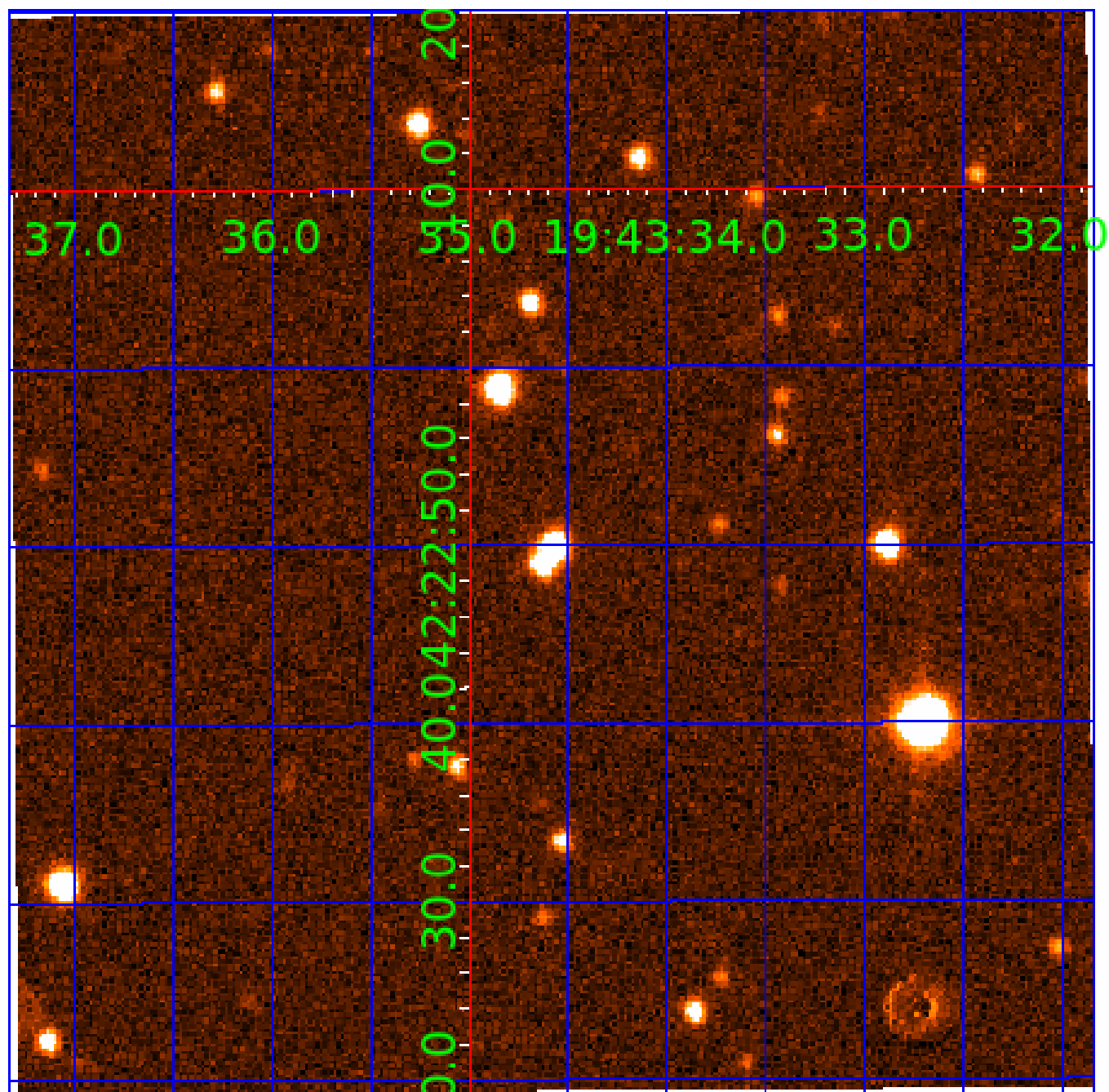


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UKIRT Image

Declination



KIC 006878240

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006878240-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006878240-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT

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.

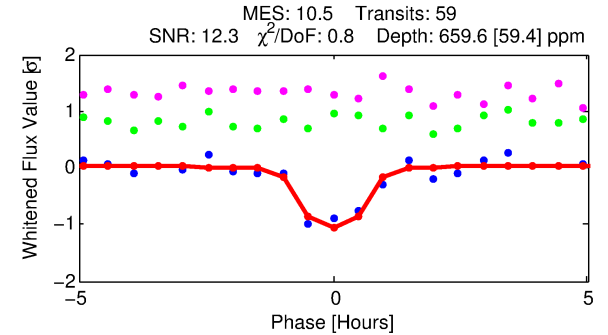
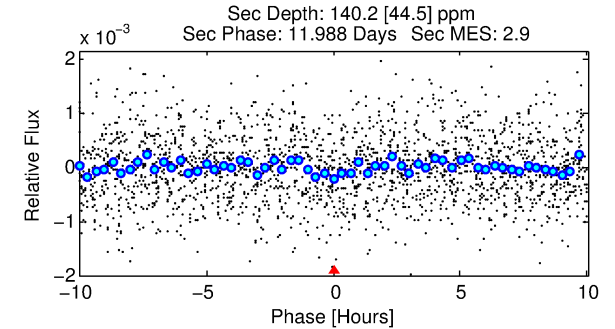
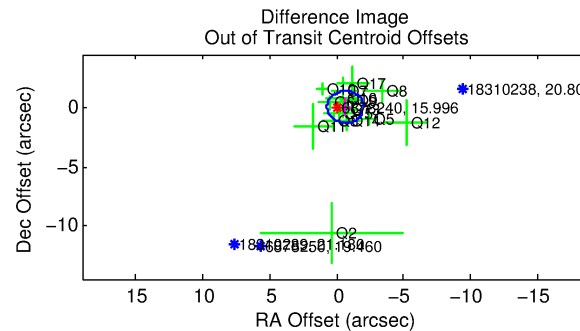
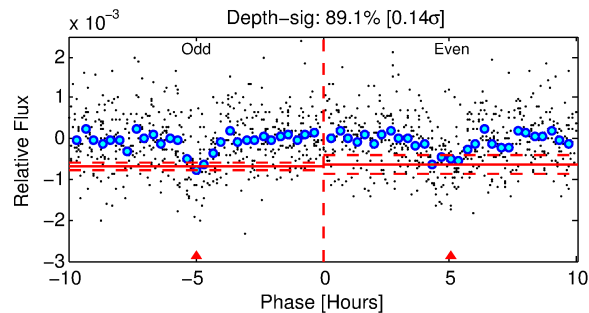
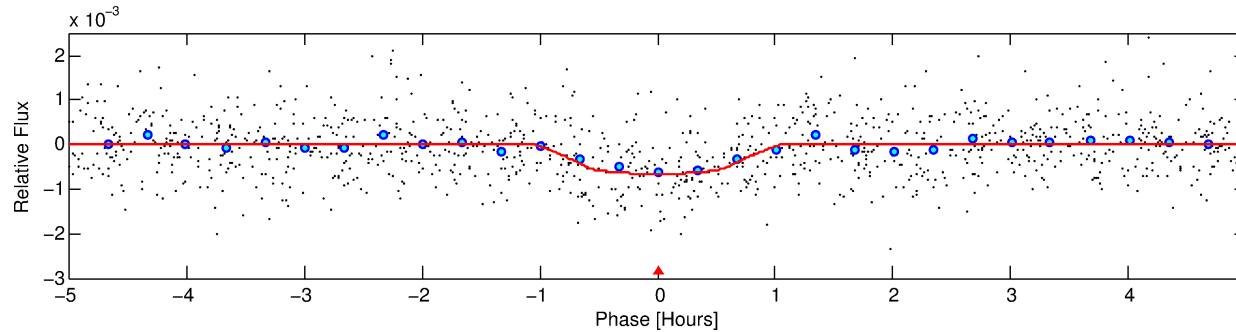
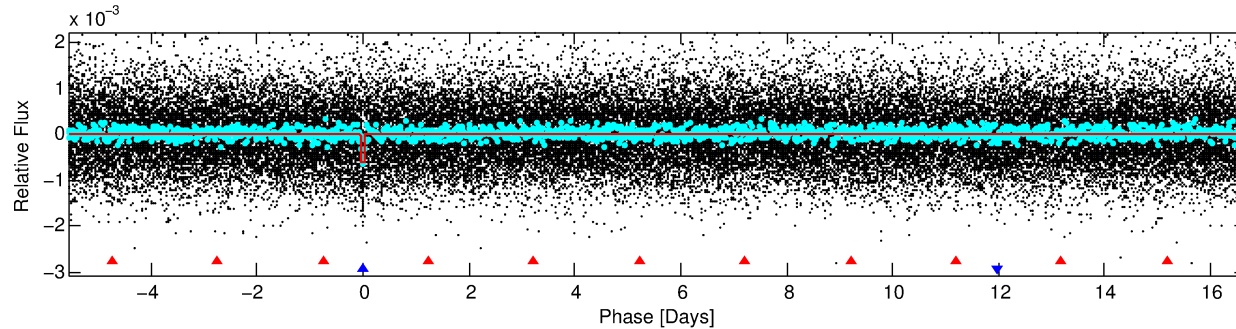
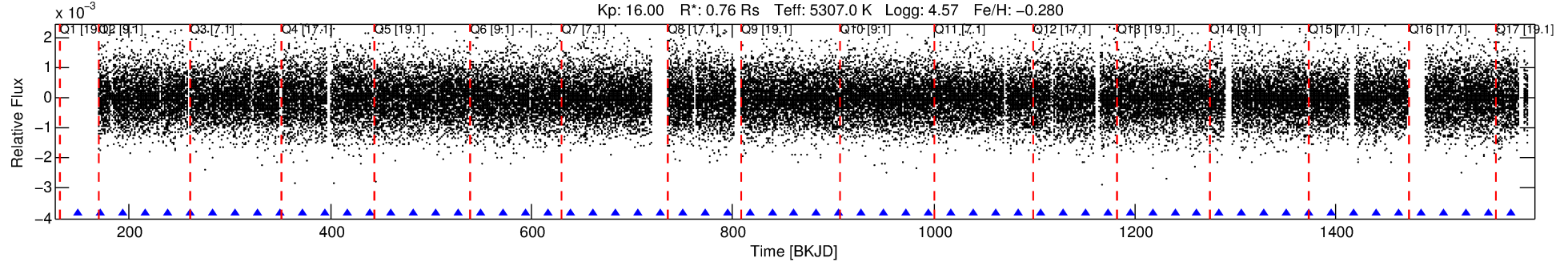
Ephemeris Match Information For 006878240-02

No Significant Match Found

DV One-Page Summary

KIC: 6878240 Candidate: 2 of 2 Period: 22.251 d
KOI: K02681.02 Name: Kepler-397b Corr: 0.988

Kp: 16.00 R*: 0.76 Rs Teff: 5307.0 K Logg: 4.57 Fe/H: -0.280



DV Fit Results:

Period = 22.25083 [0.00012] d
Epoch = 149.4341 [0.0044] BKJD
Rp/R* = 0.0233 [0.0276]
a/R* = 101.25 [470.43]
b = 0.25 [17.84]
Seff = 20.04 [2.47]
Teq = 540 [17] K
Rp = 1.93 [2.28] Re
a = 0.1426 [0.0088] AU
Ag = 422.20 [1007.96] [0.42σ]
Teffp = 3781 [2256] K [1.44σ]

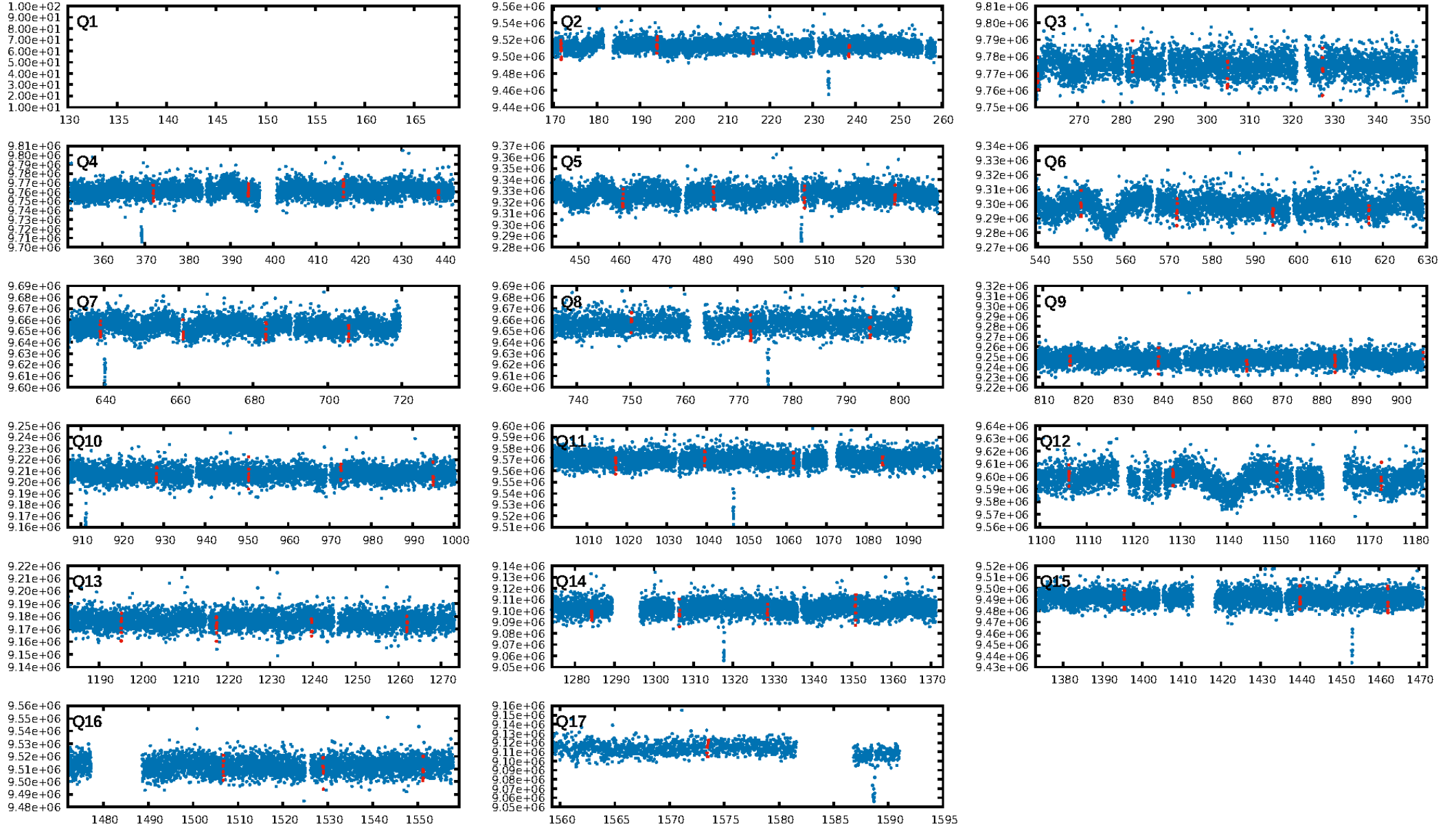
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [399.05σ]
ModelChiSquare2-sig: 95.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.72e-26
RollingBand-fgt: 1.00 [58/58]
GhostDiagnostic-chr: 8.56
Centroid-sig: 0.3%
Centroid-so: 0.617 arcsec [0.64σ]
OotOffset-rm: 0.641 arcsec [1.43σ]
KicOffset-rm: 0.587 arcsec [1.20σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.53 [8/15]
DiffImageOverlap-fno: 1.00 [16/16]

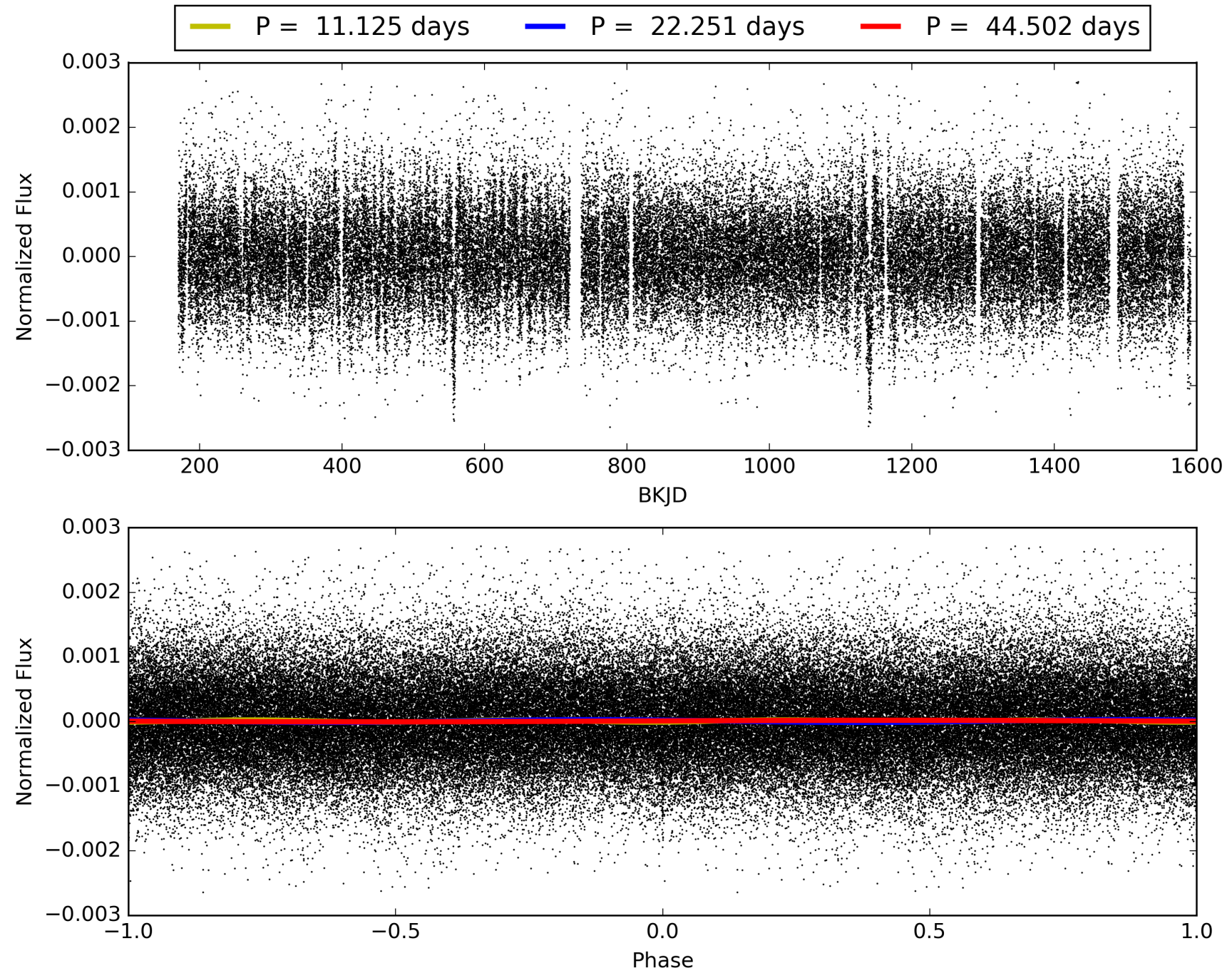
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 15:50:31 Z

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

TCE 006878240-02, PDC Light Curves

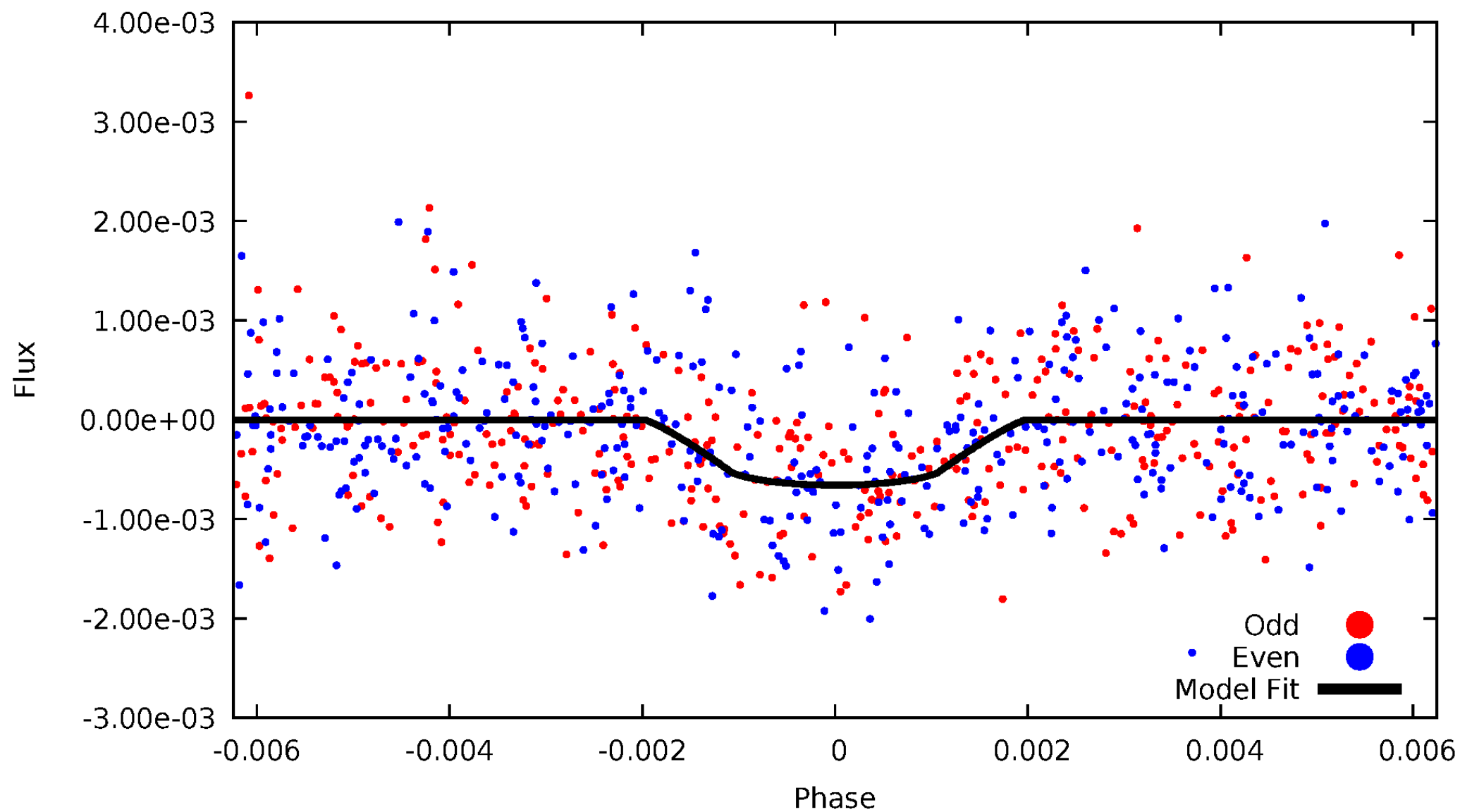


TCE 006878240-02



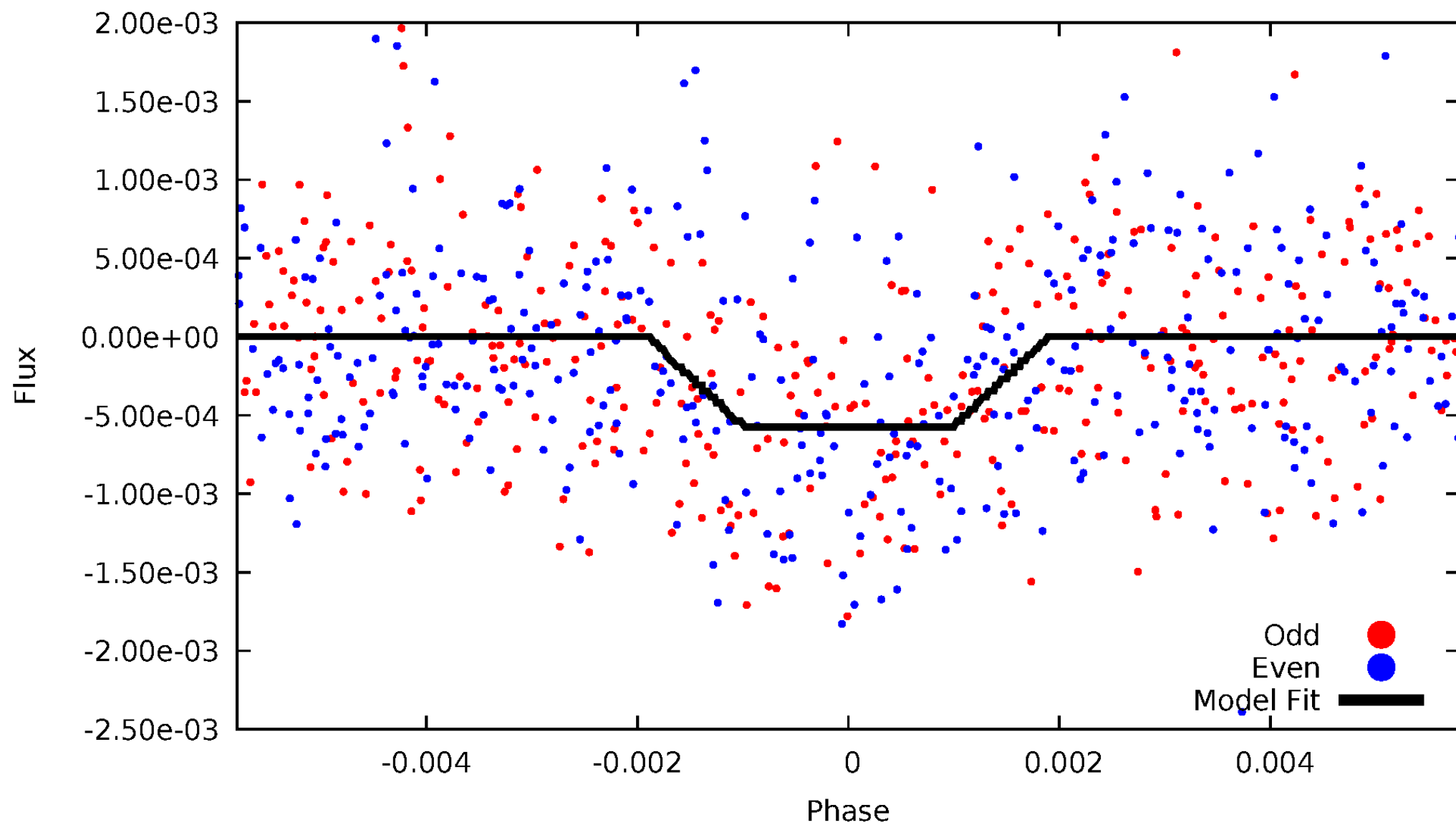
DV Odd/Even

TCE 006878240-02



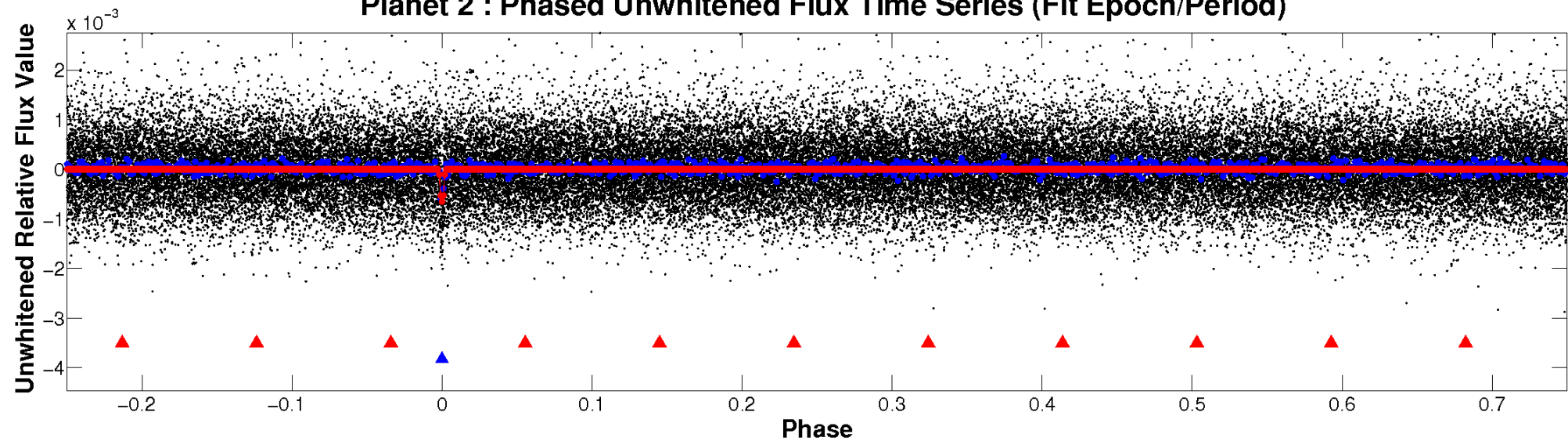
ALT Odd/Even

TCE 006878240-02

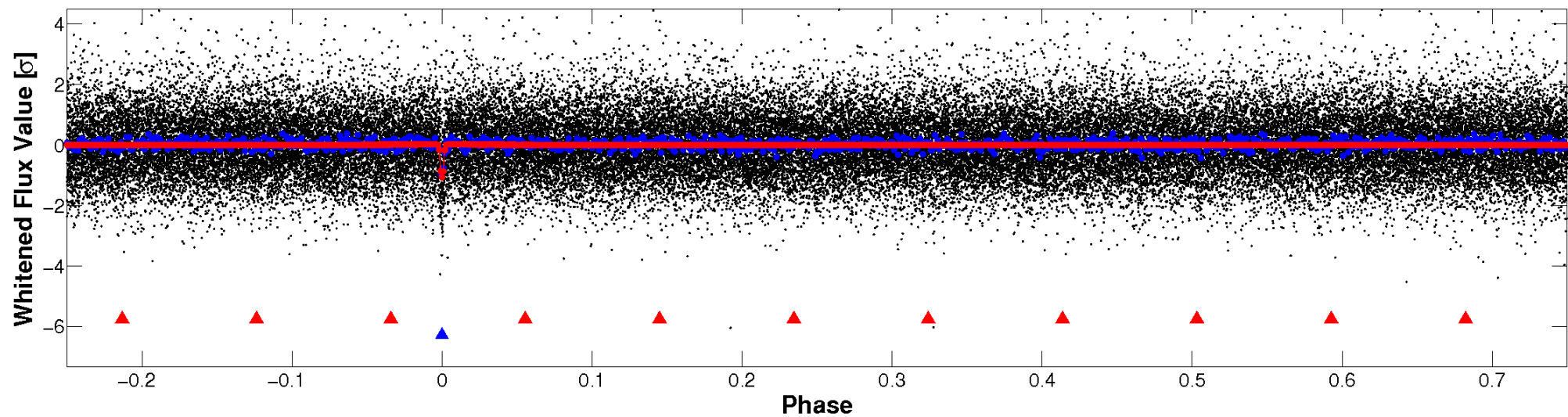


Non-Whitened Vs. Whitened Light Curve

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

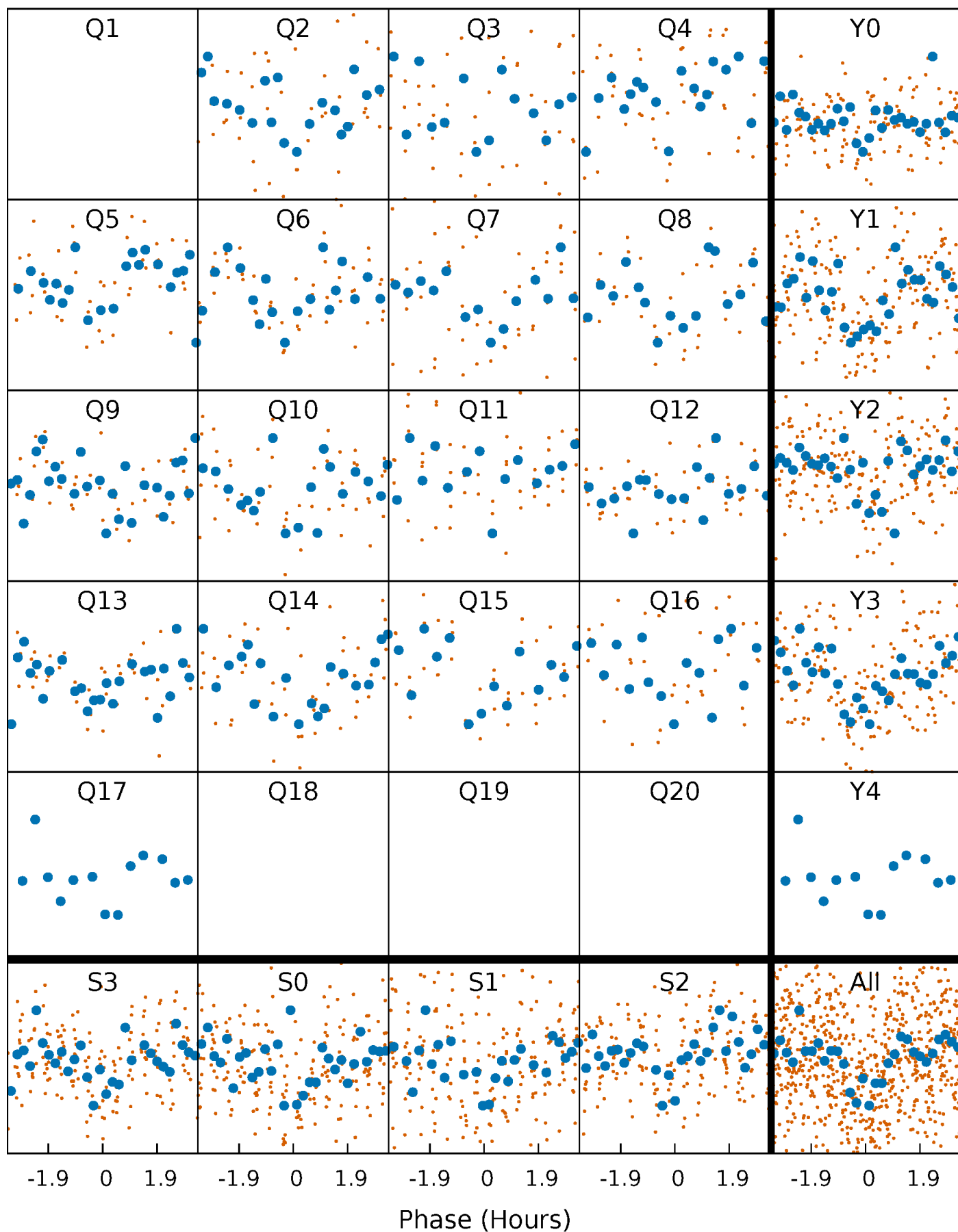


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



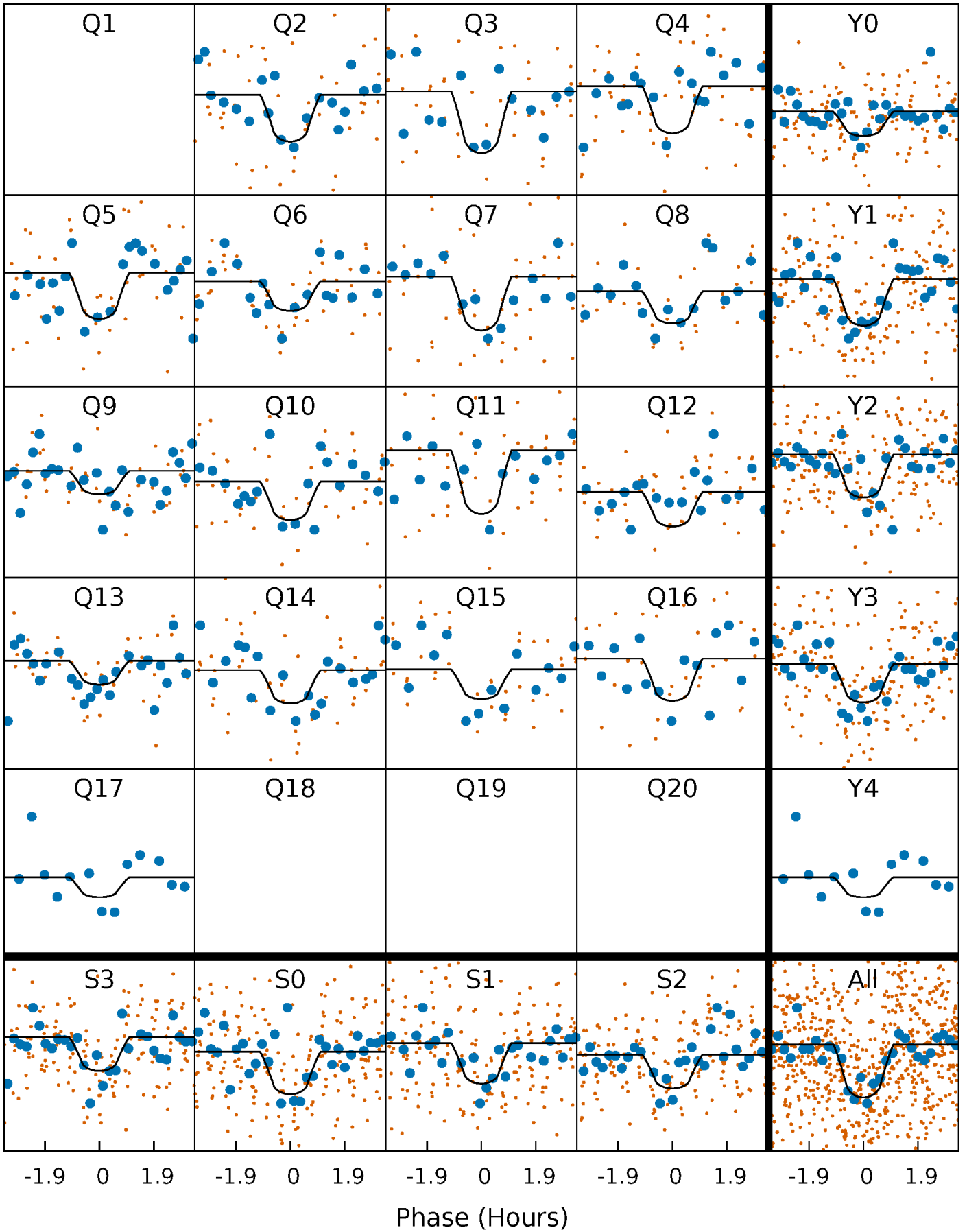
PDC Quarter-Phased Transit Curves

TCE 006878240-02 P= 22.250833 Days $T_0=149.434117$ (BKJD)



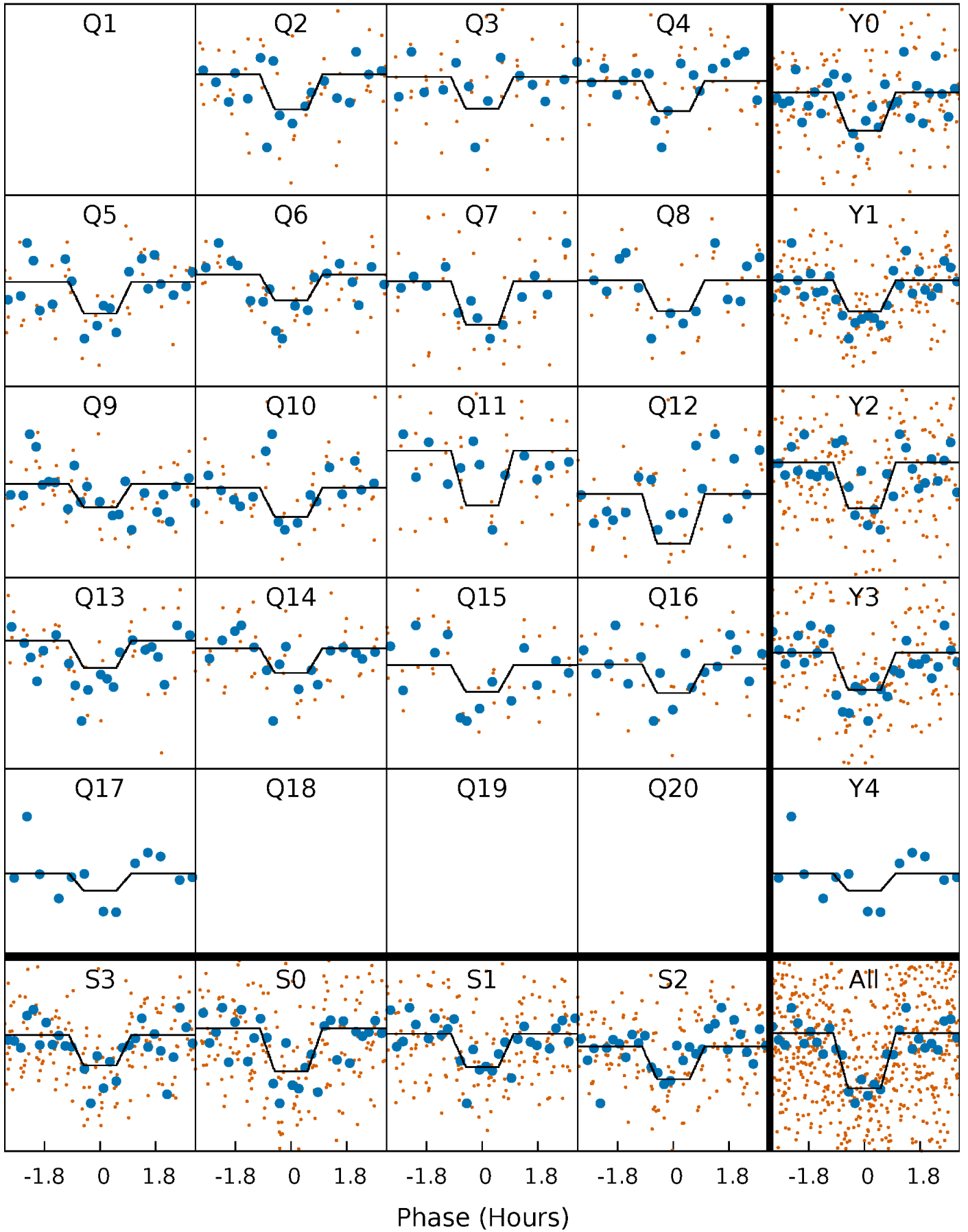
DV Quarter-Phased Transit Curves

TCE 006878240-02 P= 22.250833 Days $T_0=149.434117$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

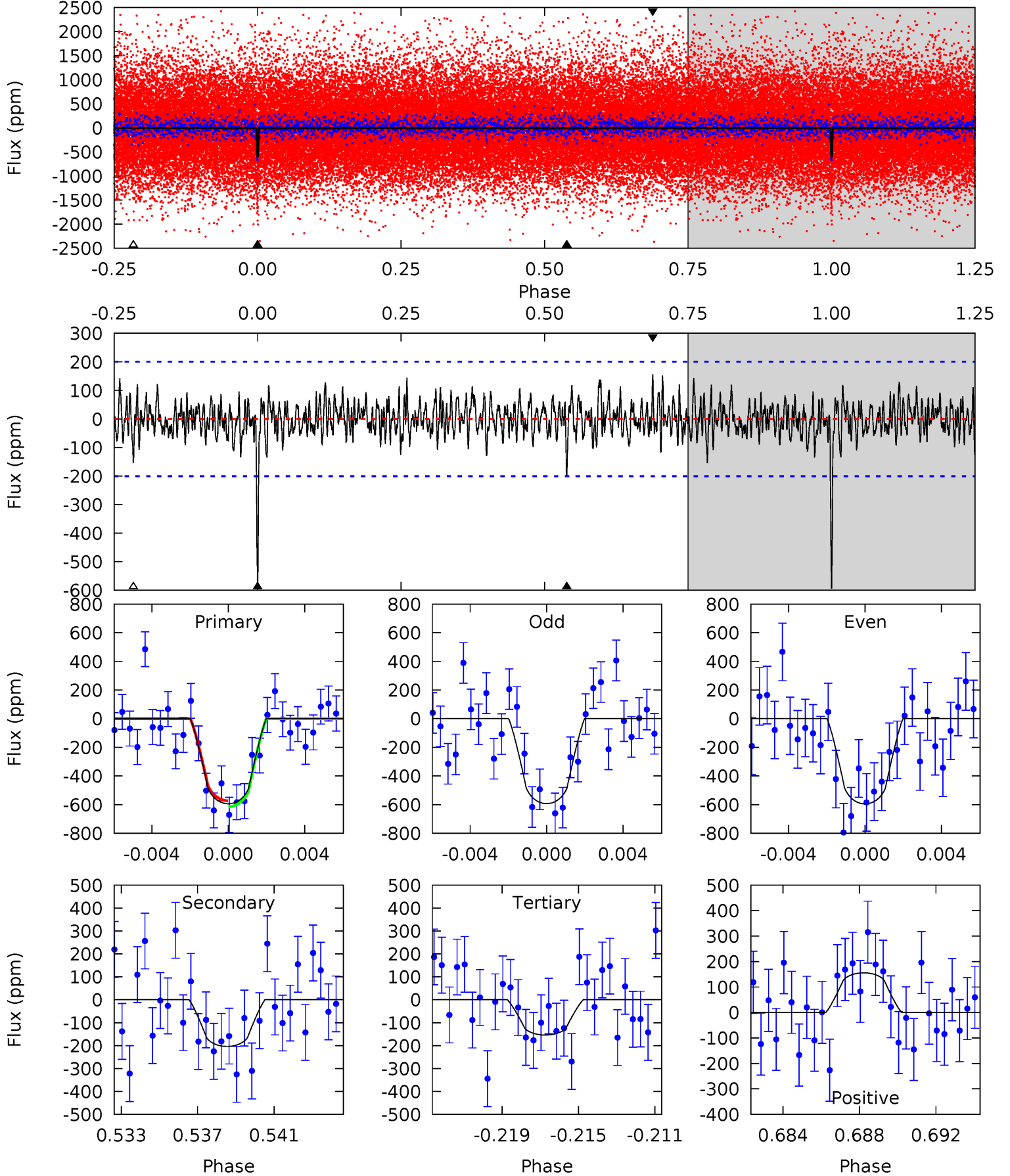
TCE 006878240-02 P= 22.250792 Days $T_0=149.435544$ (BKJD)



DV Model-Shift Uniqueness Test

006878240-02, P = 22.250833 Days, E = 149.434117 Days

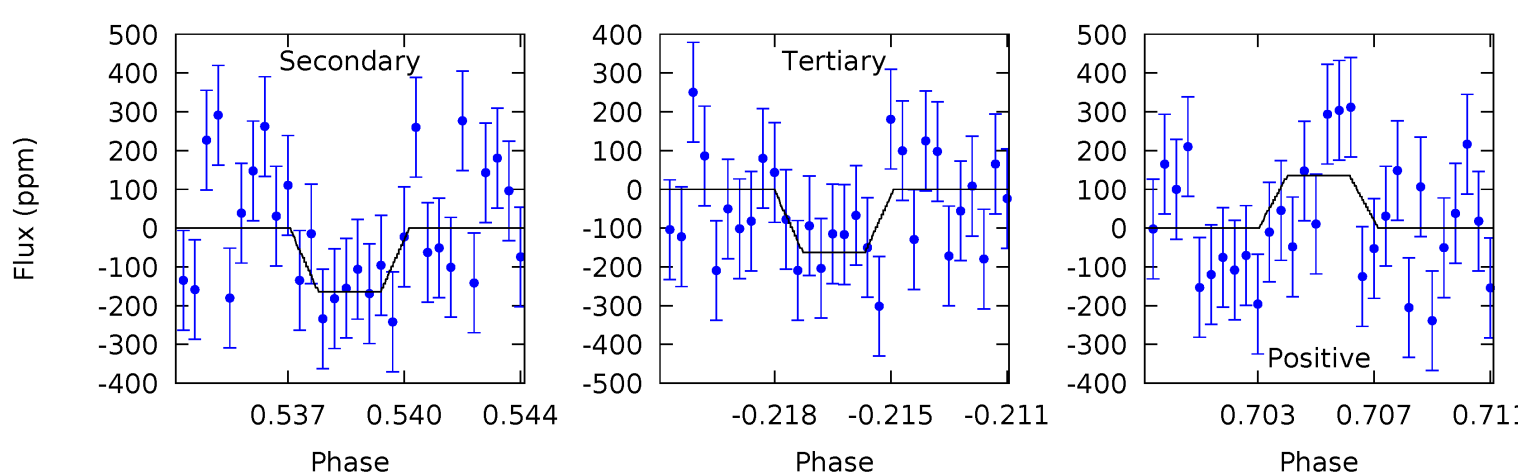
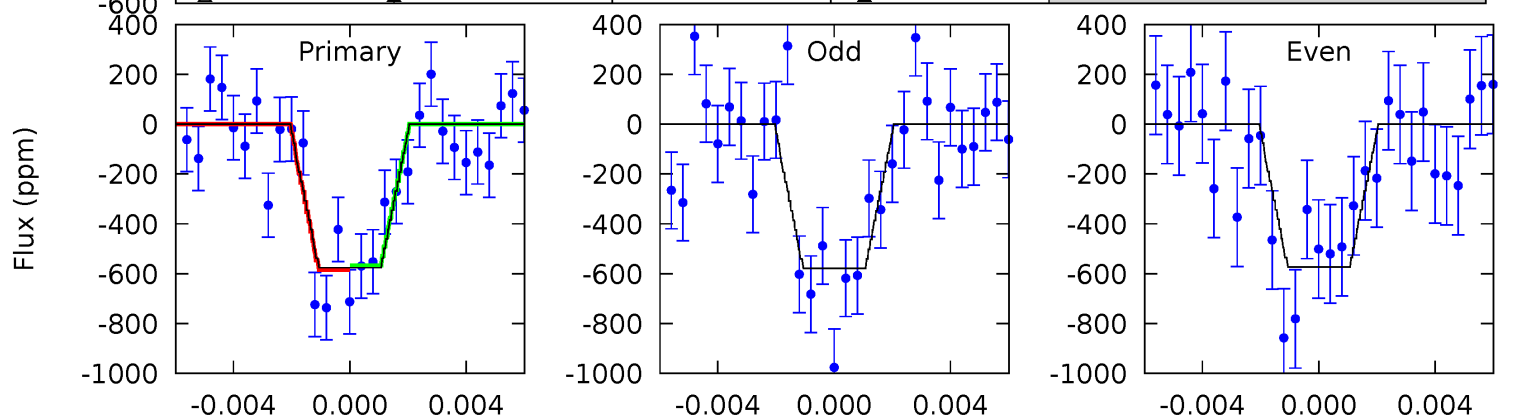
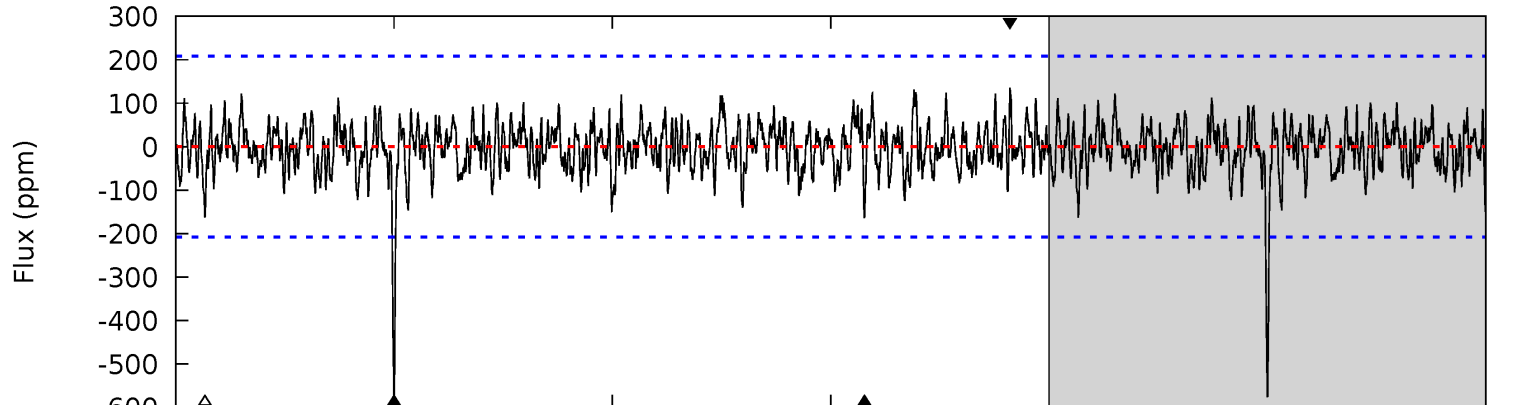
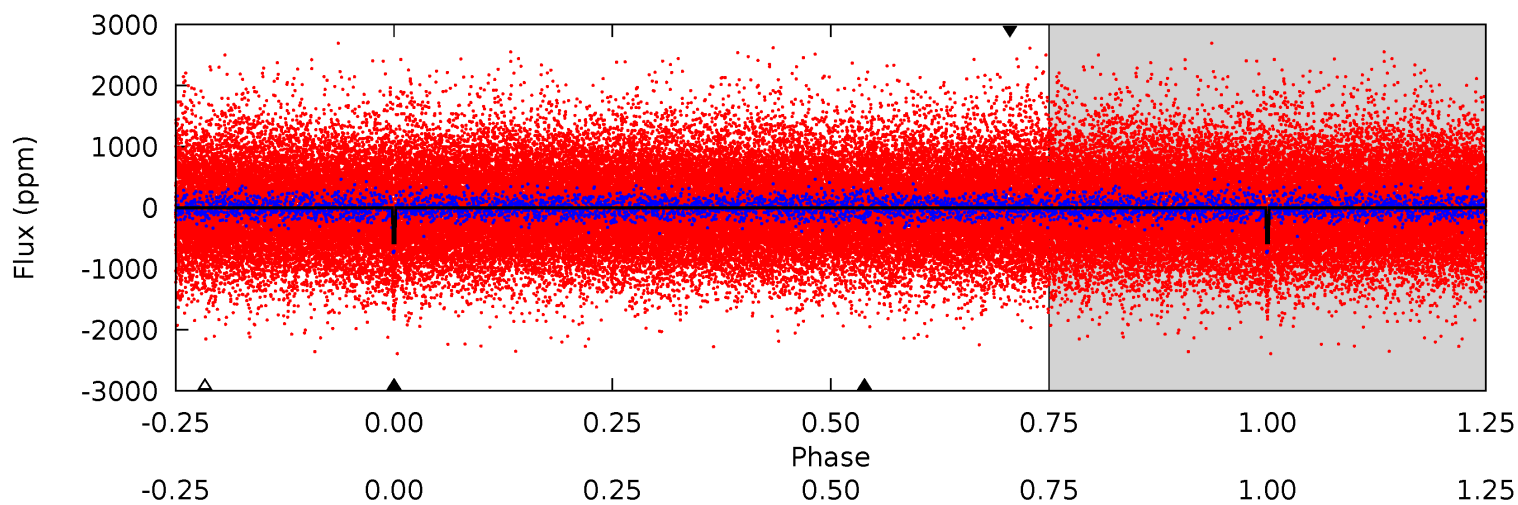
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.4	5.28	3.98	4.04	5.20	2.88	1.26	11.4	11.4	1.29	1.24	0.02	0.86	0.21	0.54



Alt Model-Shift Uniqueness Test

006878240-02, $P = 22.250792$ Days, $E = 149.435544$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.4	4.12	4.07	3.39	5.21	2.90	1.20	10.4	11.0	0.05	0.73	0.08	0.88	0.19	0.24



Stellar Parameters For KIC 006878240

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5307^{+105}_{-105}	$4.572^{+0.041}_{-0.054}$	$-0.280^{+0.150}_{-0.150}$	$0.757^{+0.052}_{-0.042}$	$0.782^{+0.047}_{-0.047}$	$2.535^{+0.397}_{-0.448}$
	+2%/-2%	+1%/-1%	+54%/-54%	+7%/-6%	+6%/-6%	+16%/-18%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 006878240-02 / KOI 2681.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-204 ± 39	$2.50^{+1.95}_{-1.62}$	755^{+20}_{-18}	3932^{+2211}_{-659}	353^{+2634}_{-239}
Alt.	-165 ± 40	$2.38^{+2.12}_{-1.51}$	755^{+21}_{-18}	3866^{+2049}_{-734}	312^{+2160}_{-227}

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

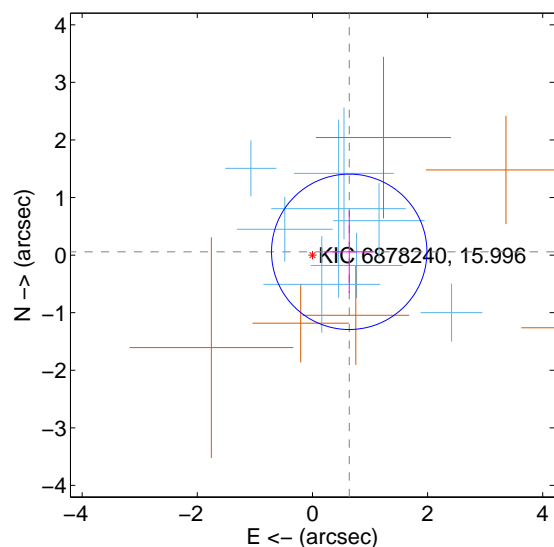
Supplemental centroid analysis for 006878240-02. Kepler magnitude: 16.00. Transit SNR 12.26

There are 8 quarters with good PRF difference image offsets

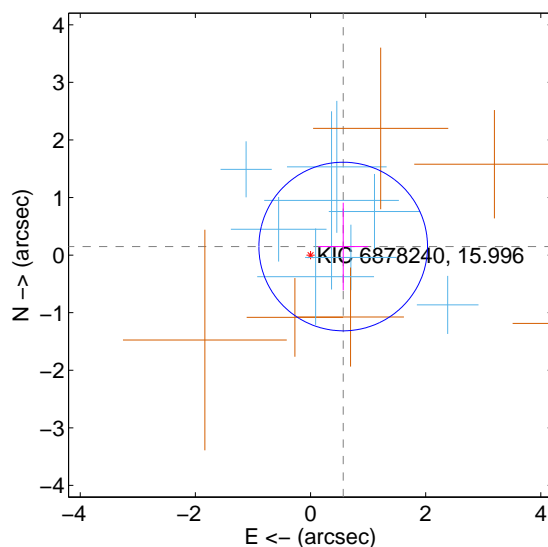
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.641 ± 0.450	1.43	-0.639 ± 0.434	0.057 ± 0.715
PRF-fit source offset from KIC position	0.587 ± 0.488	1.20	-0.568 ± 0.434	0.149 ± 0.762
photometric centroid source offset	0.62 ± 0.96	0.64	0.52 ± 0.87	0.33 ± 1.15

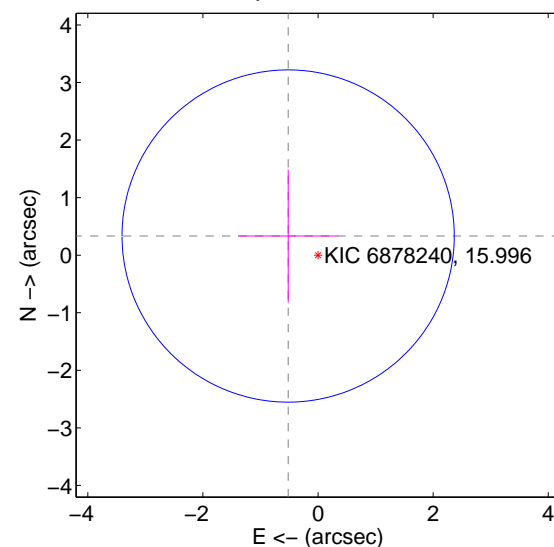
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

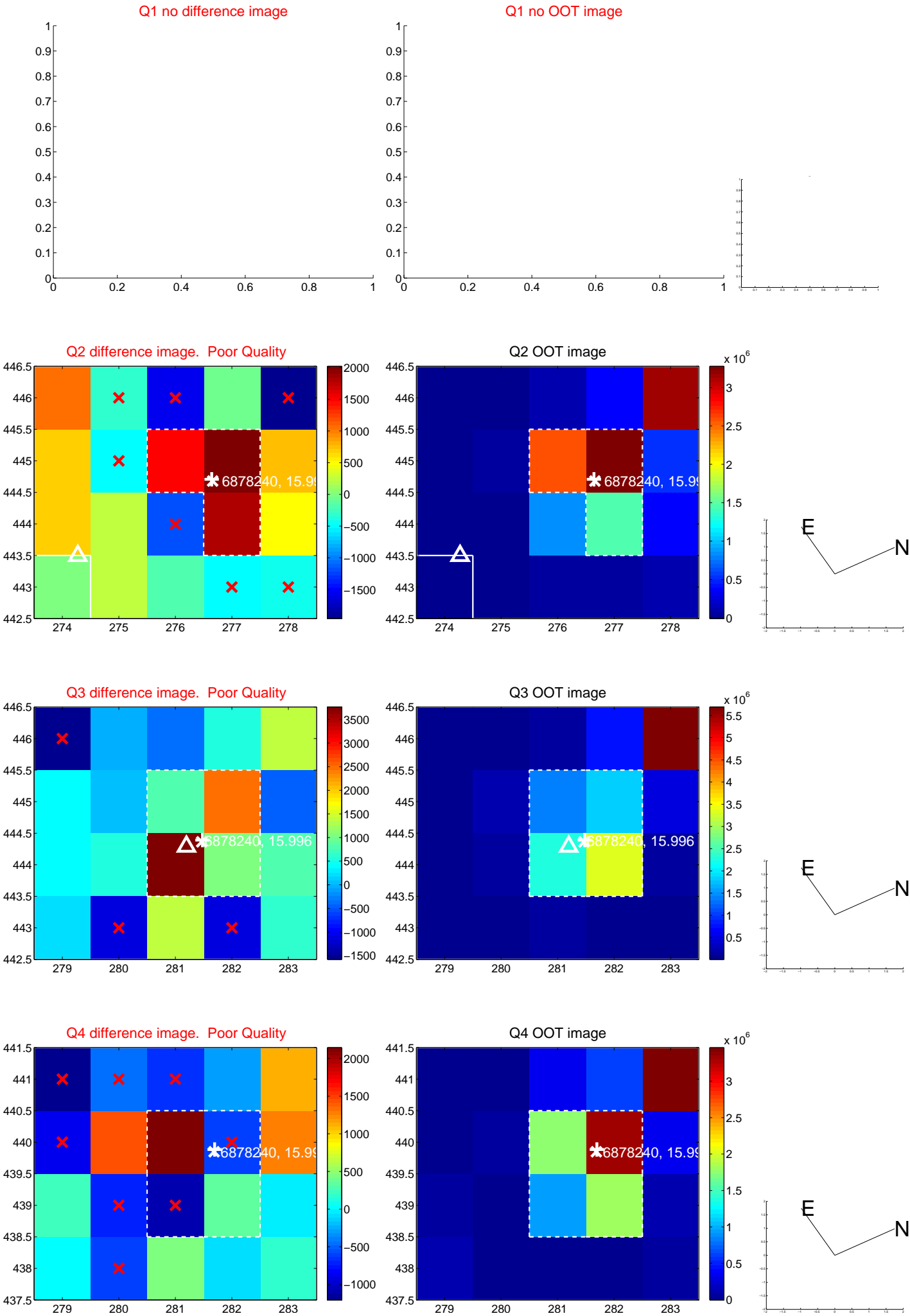


offset from photometric centroids

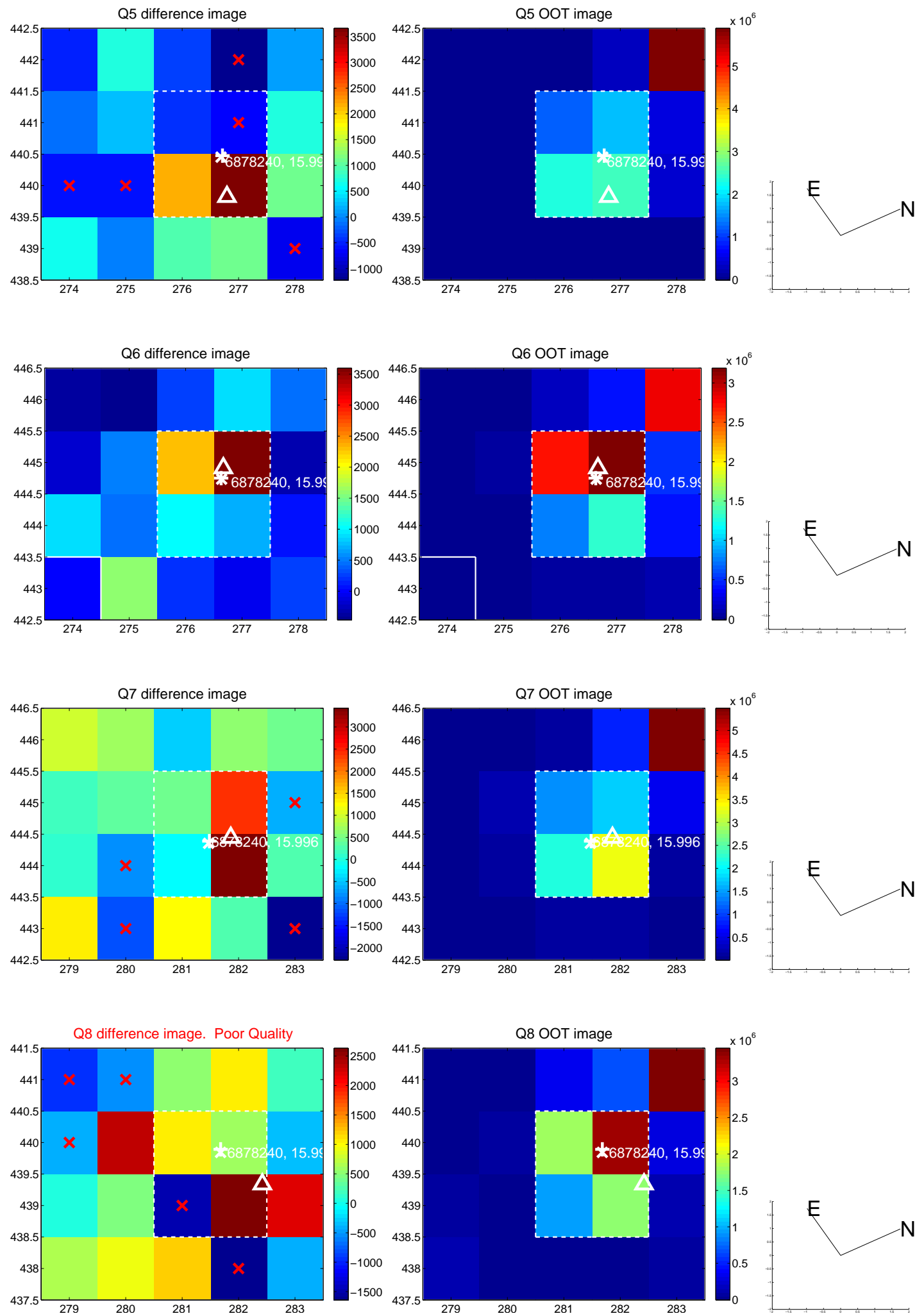


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

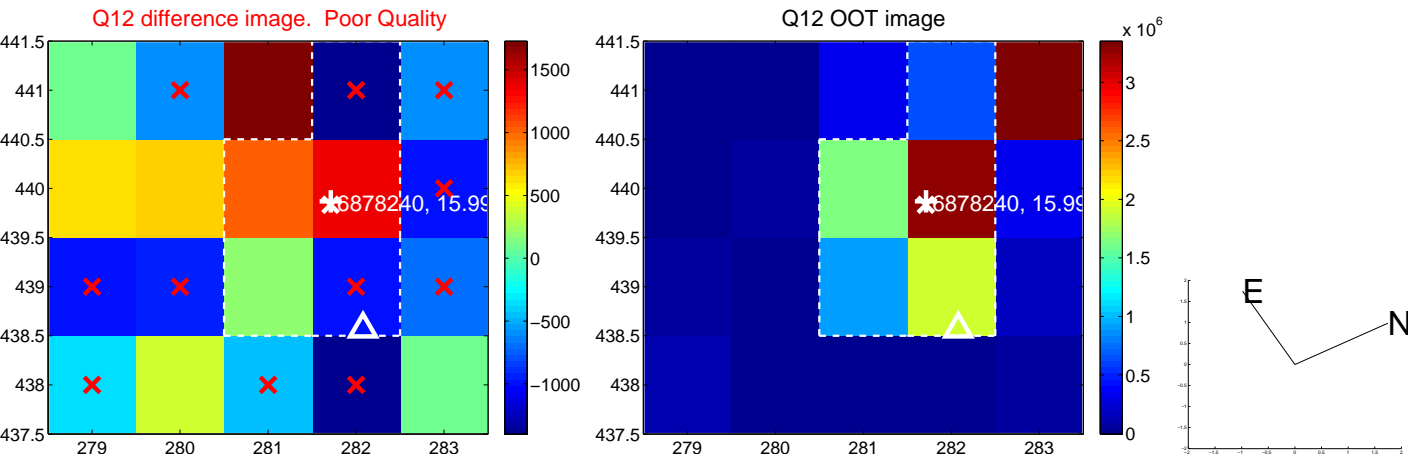
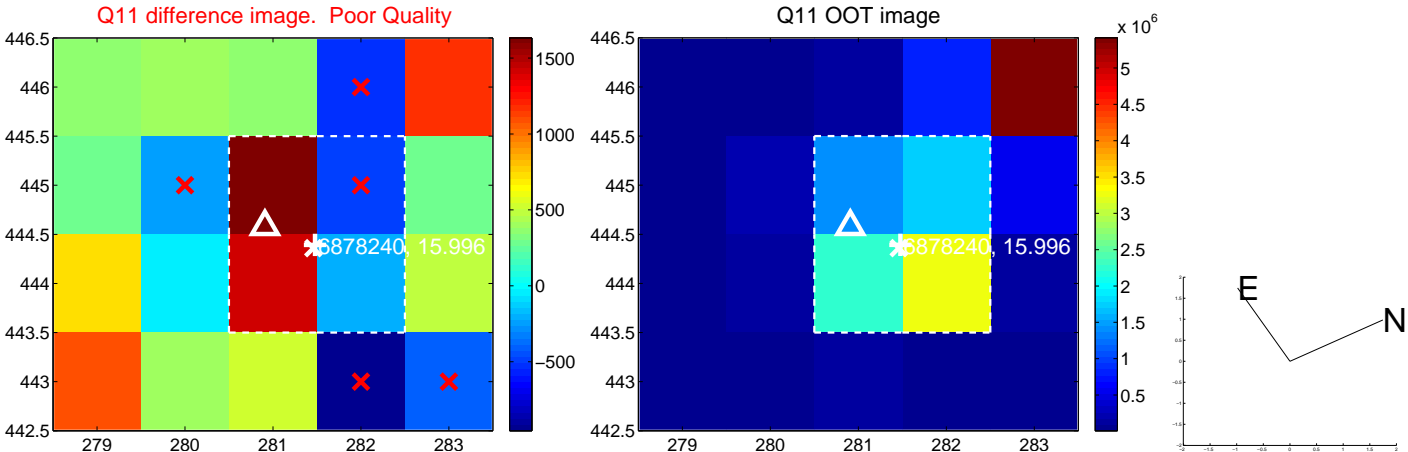
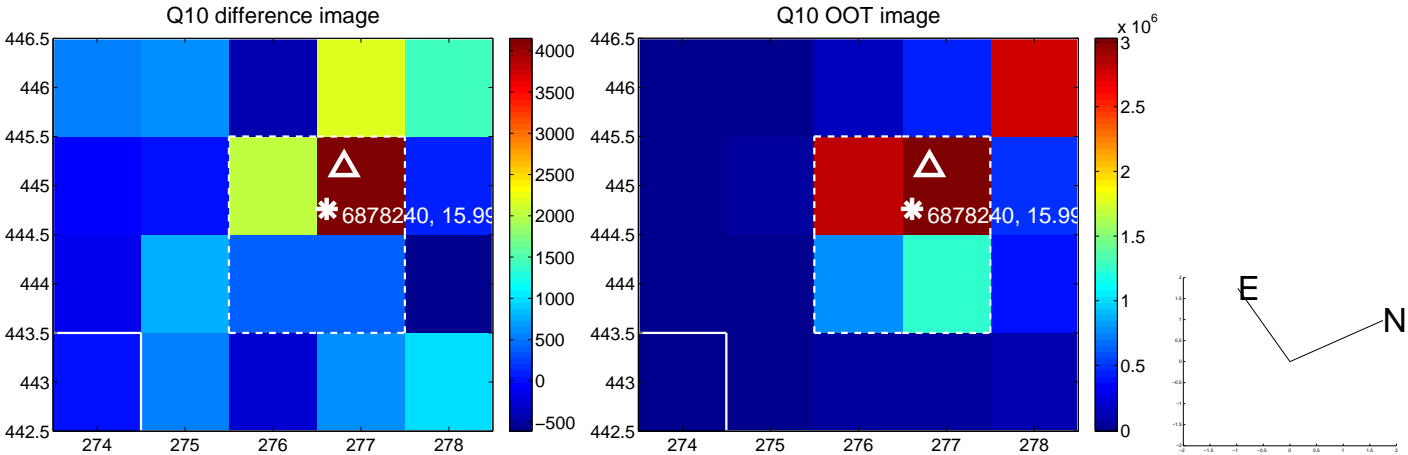
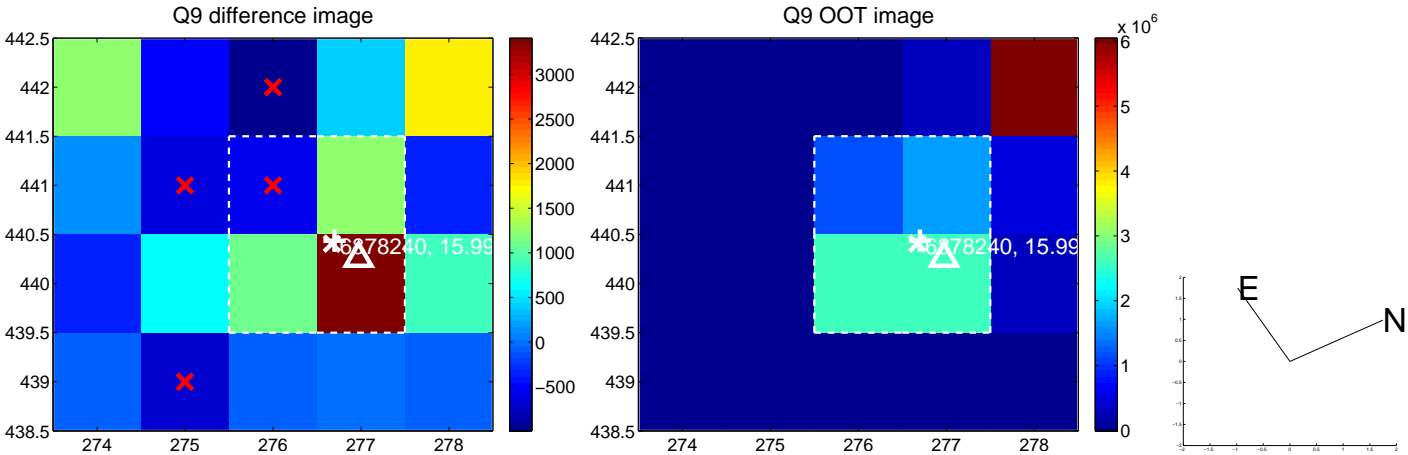
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



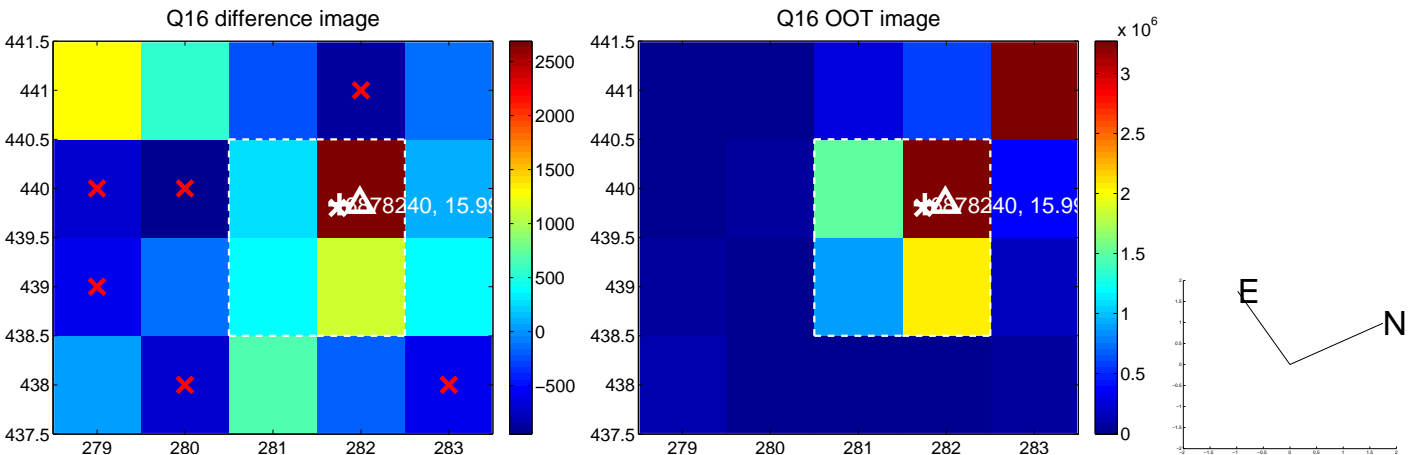
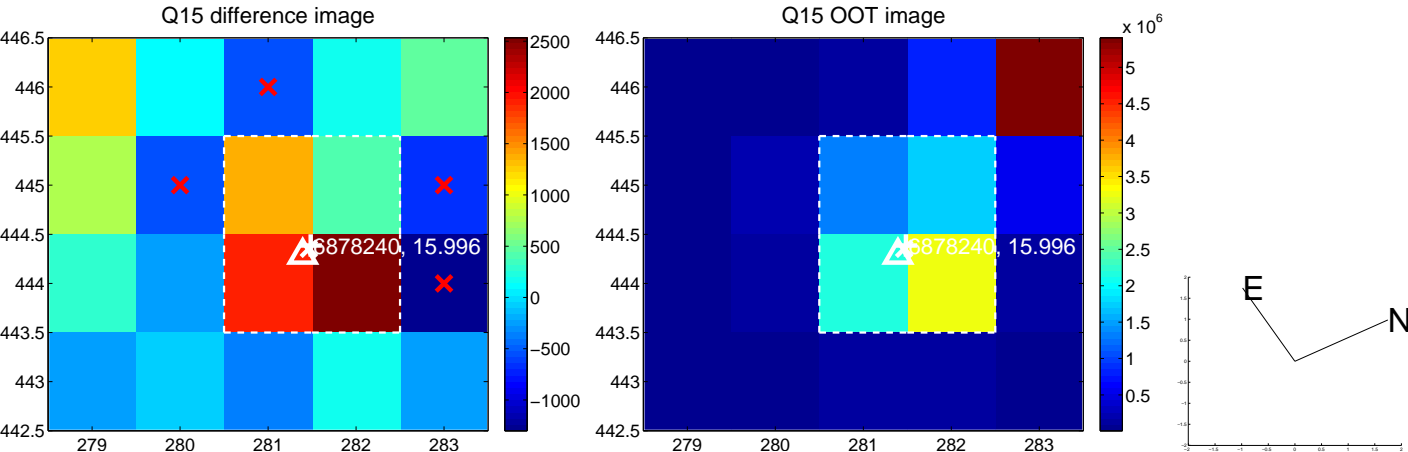
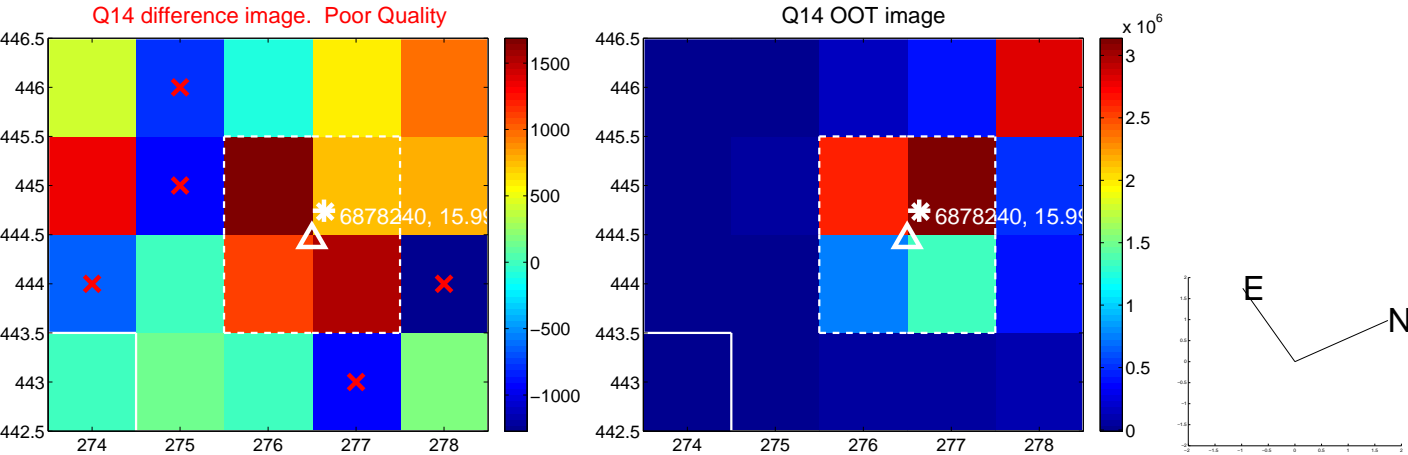
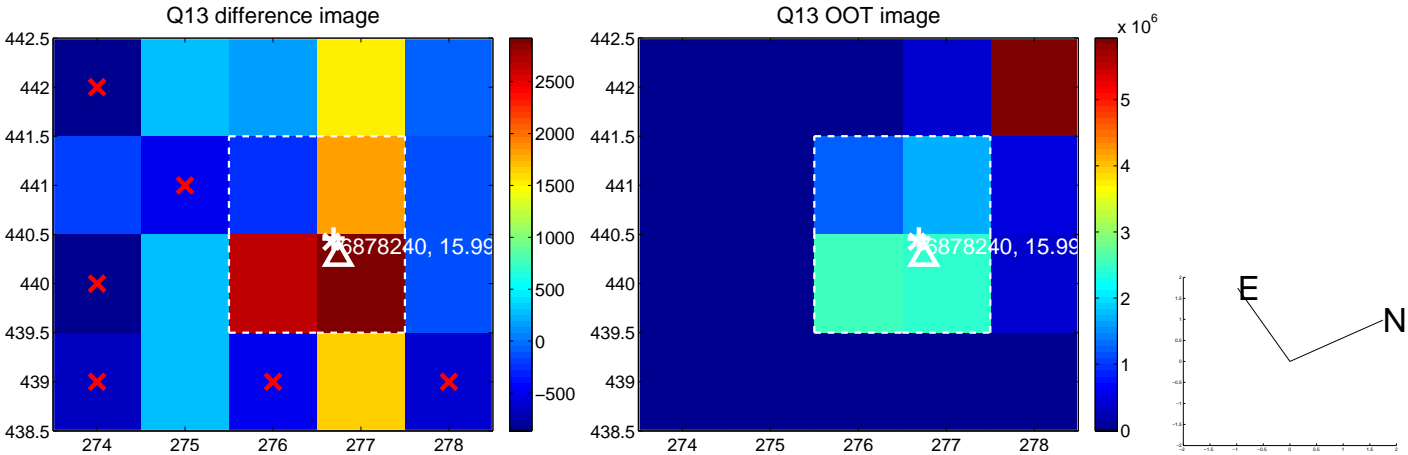
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



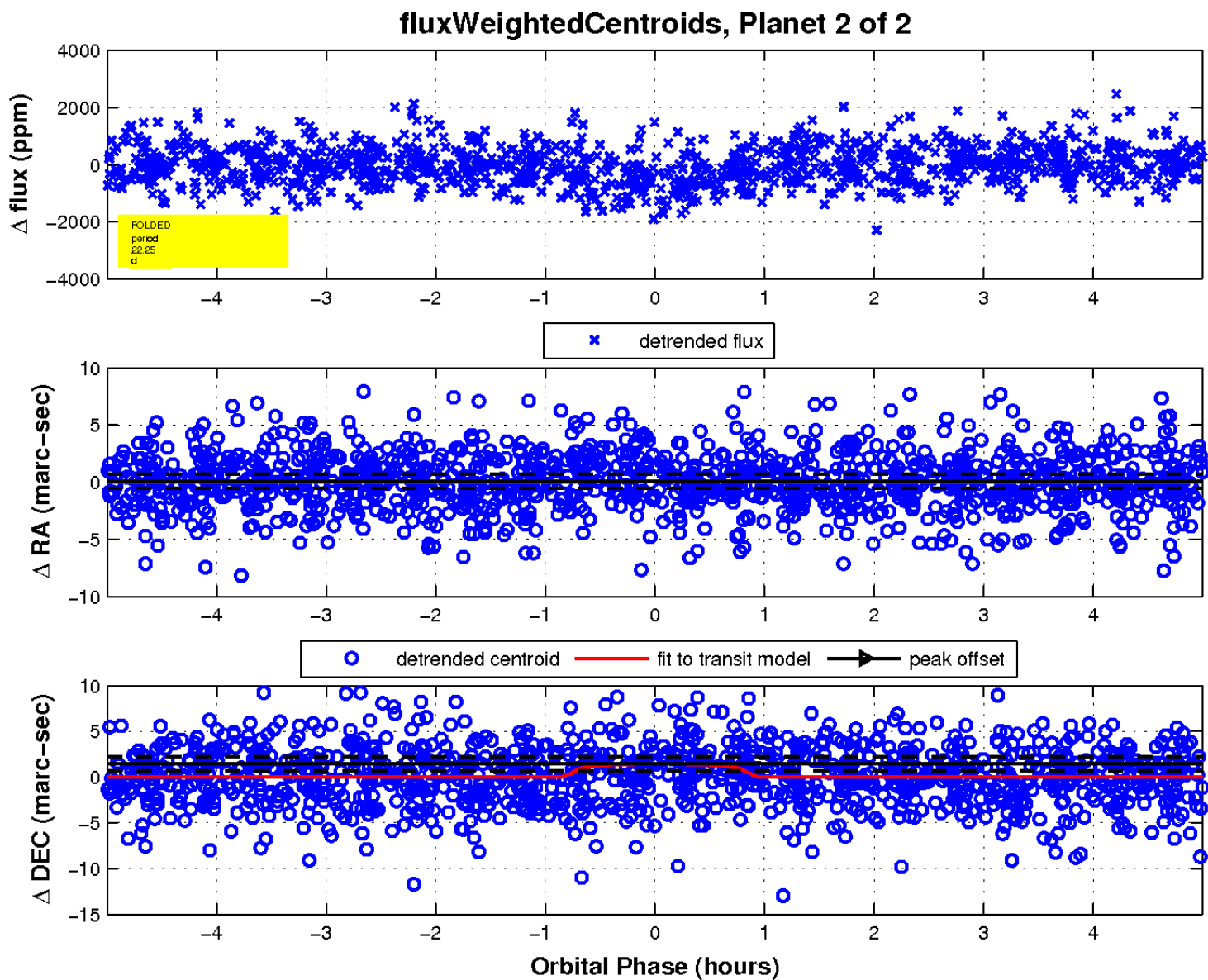
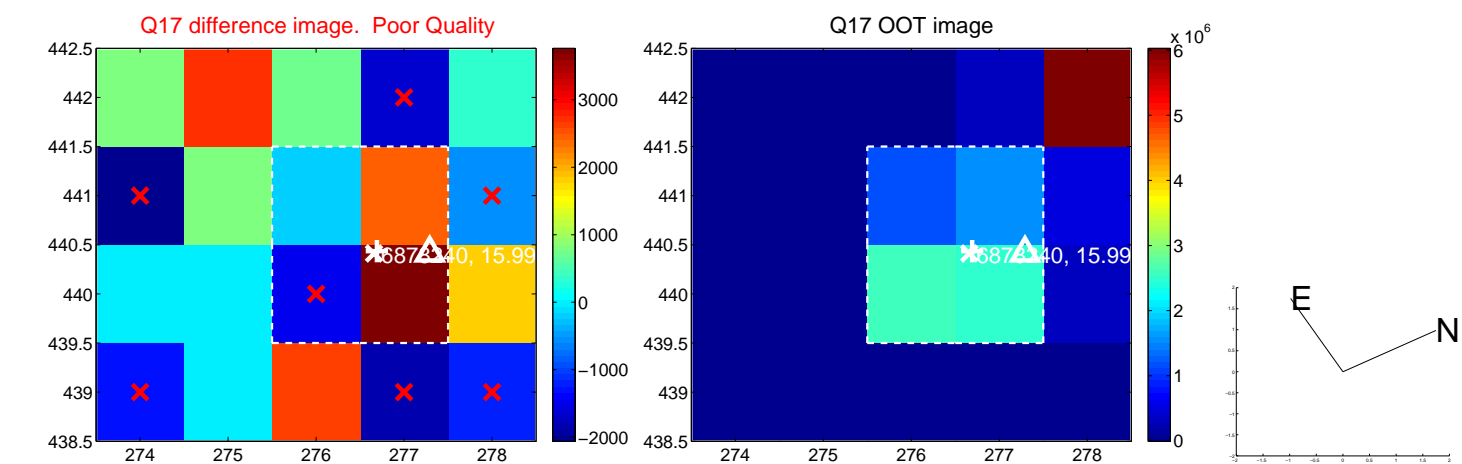
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

