

KIC 006020848

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})
006020848-01	OBS	No	554.729874	244.221843	2931.0	9.064	12.6	11.6	0.71	4841	3.75	0.18
006020848-02	OBS	No	402.374396	179.855485	2115.4	9.986	8.8	9.0	0.71	4841	3.21	0.27
006020848-03	OBS	No	339.294757	274.294800	2070.3	12.617	9.2	8.6	0.71	4841	3.35	0.34
006020848-04	OBS	No	4.016242	133.098873	189.5	22.020	7.1	7.3	0.71	4841	0.94	127.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006020848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006020848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—CENT_FEW_DIFFS
006020848-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006020848-04	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_RESOLVED_OFFSET

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

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

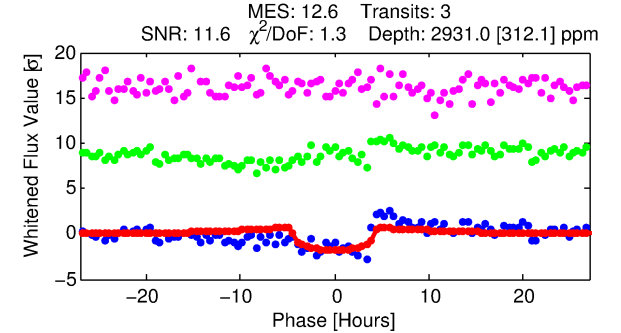
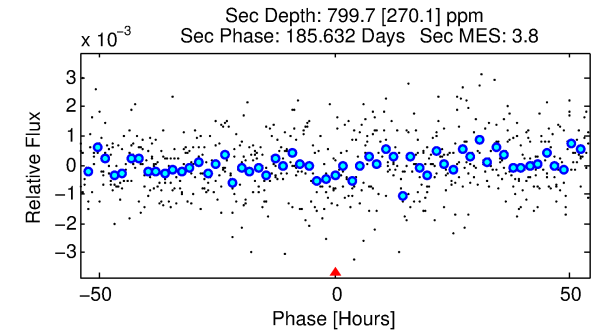
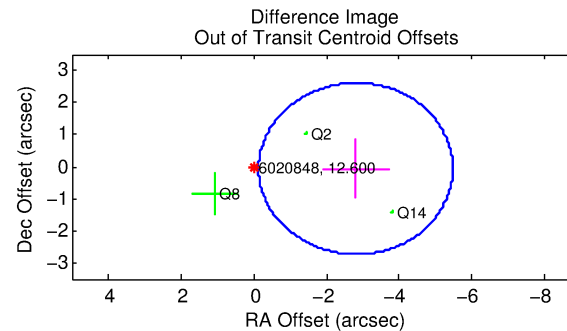
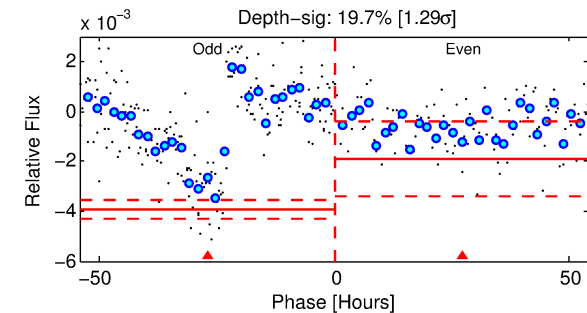
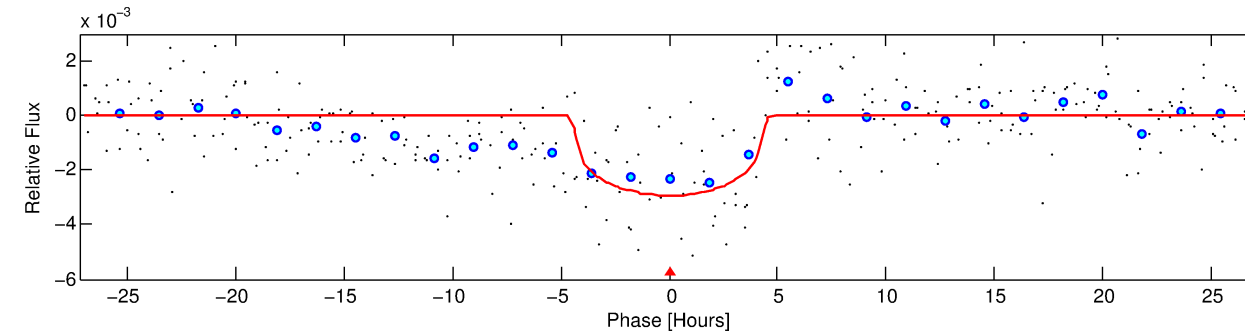
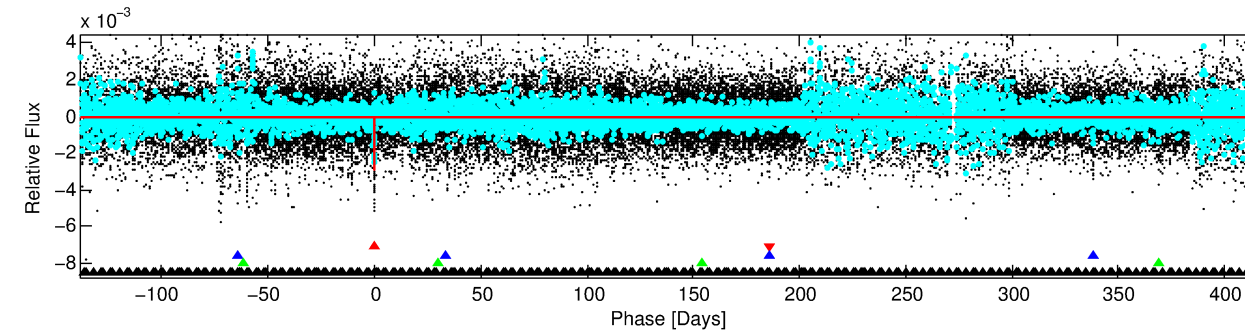
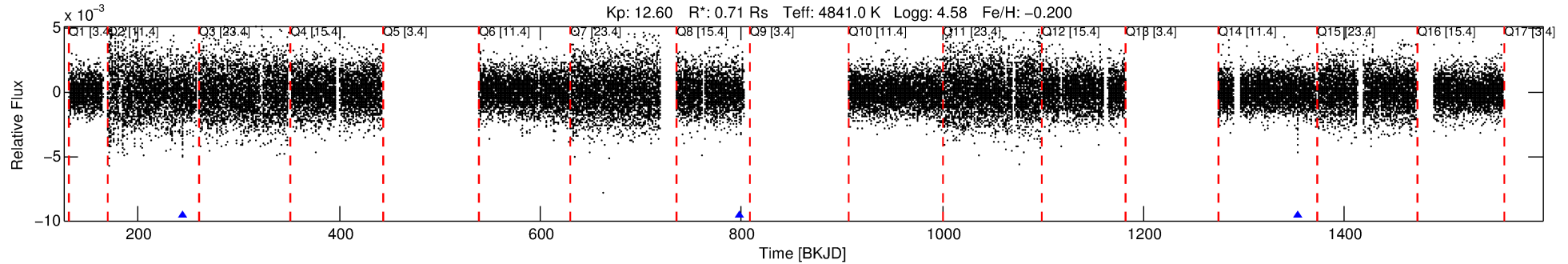
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006020848-01

No Significant Match Found

DV One-Page Summary

KIC: 6020848 Candidate: 1 of 4 Period: 554.730 d



DV Fit Results:

Period = 554.72987 [0.00940] d
Epoch = 244.2218 [0.0142] BKJD
Rp/R* = 0.0485 [0.0341]
a/R* = 469.26 [1065.72]
b = 0.30 [6.92]
Seff = 0.18 [0.03]
Teq = 166 [7] K
Rp = 3.74 [2.65] Re
a = 1.1741 [0.0906] AU
Ag = 43254.20 [62637.63] [0.69 σ]
Teffp = 3695 [1341] K [2.63 σ]

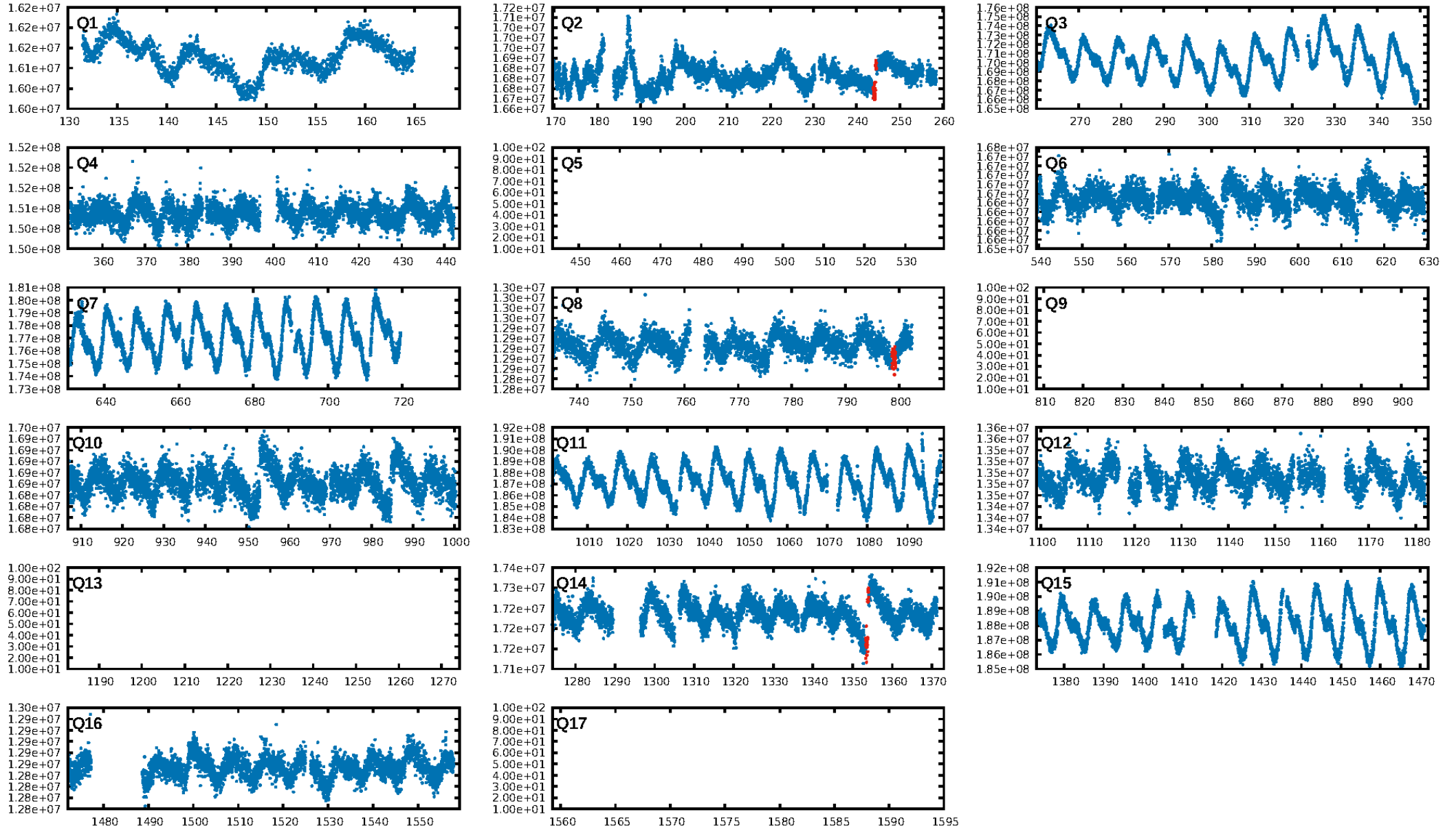
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [271.14 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 30.6%
Bootstrap-pfa: 4.11e-24
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.4581
Centroid-sig: 0.0%
Centroid-so: 4.219 arcsec [147.98 σ]
OotOffset-rm: 2.810 arcsec [3.16 σ]
KicOffset-rm: 7.211 arcsec [7.25 σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

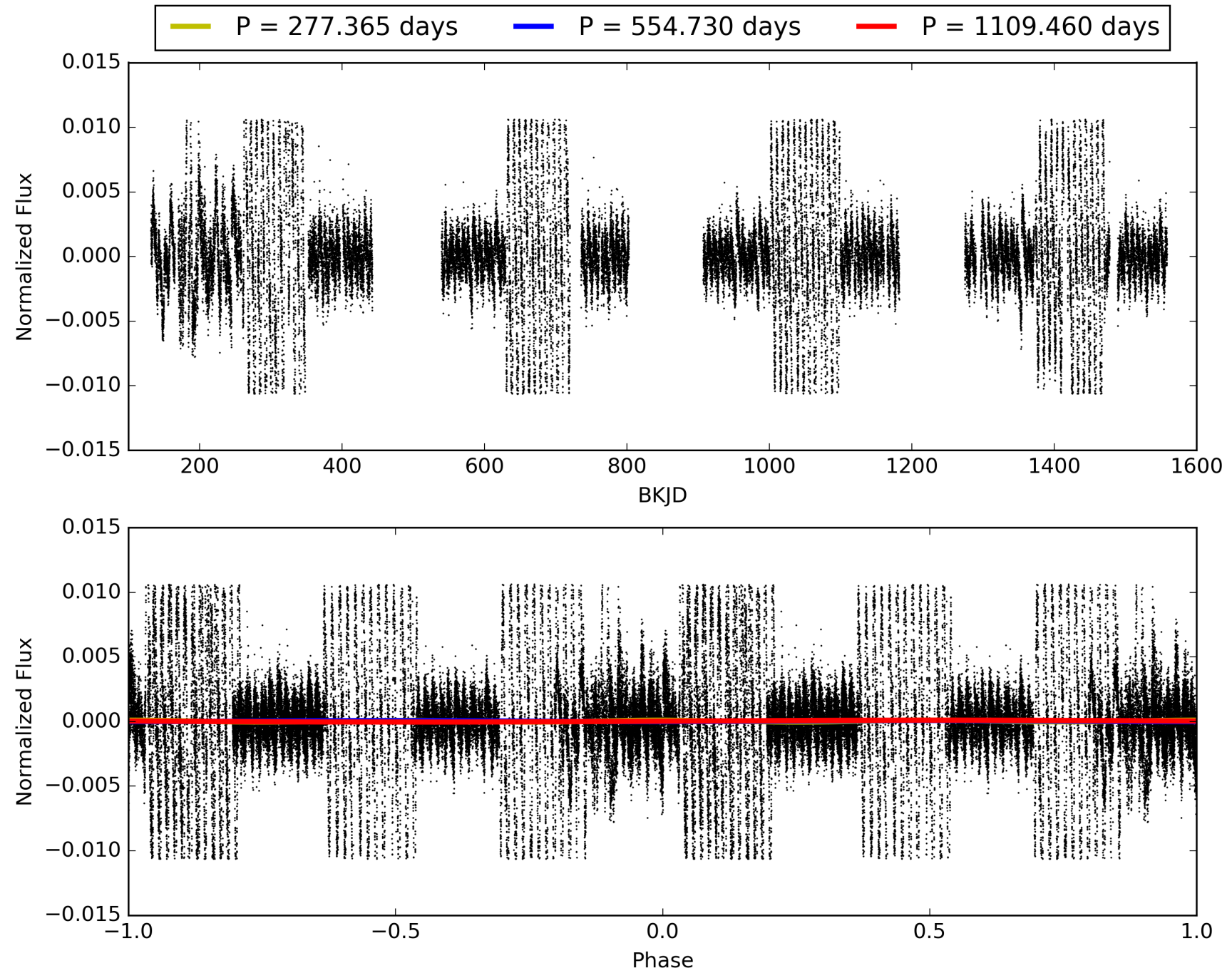
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:00:17 Z

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

TCE 006020848-01, PDC Light Curves

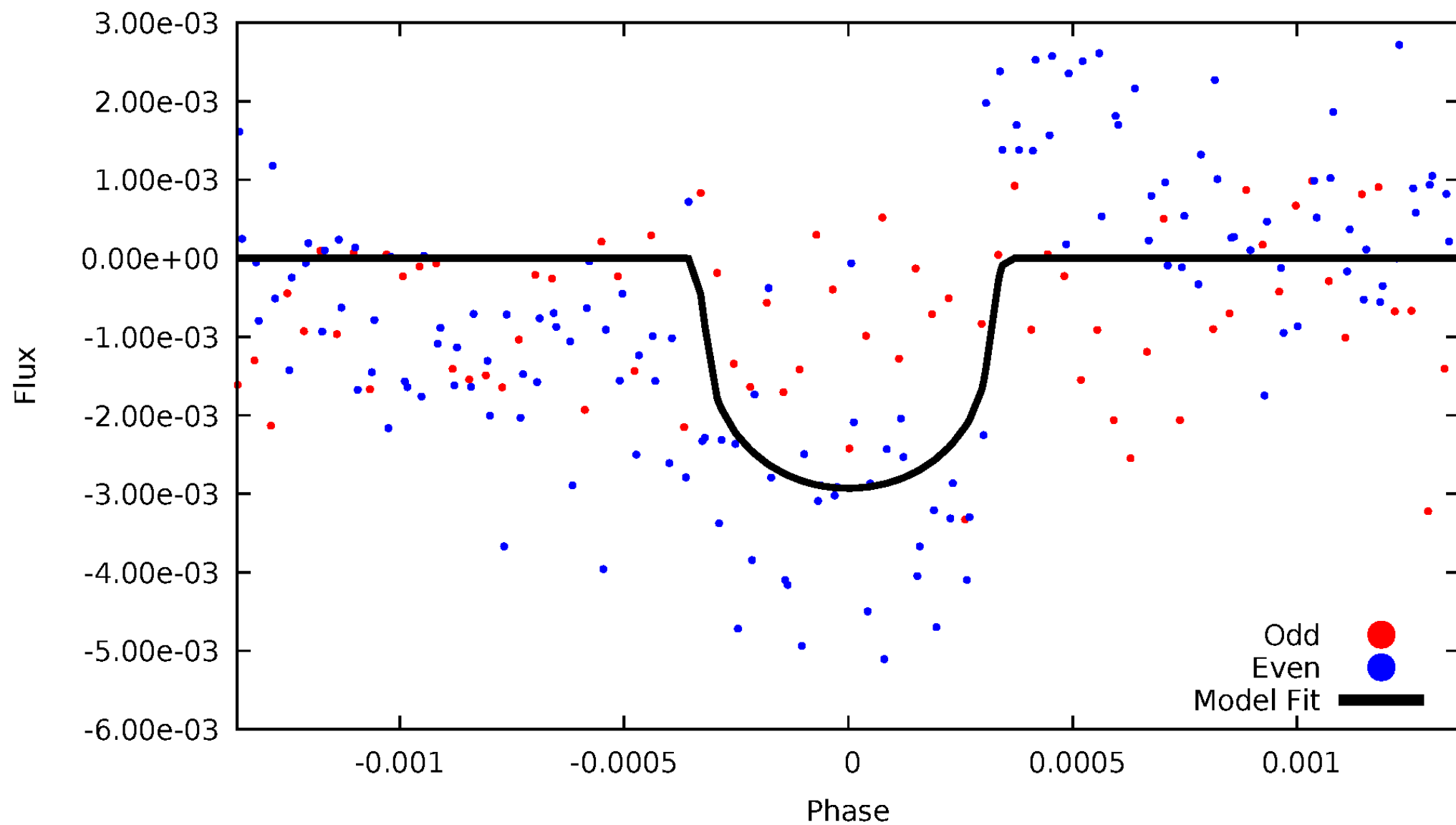


TCE 006020848-01



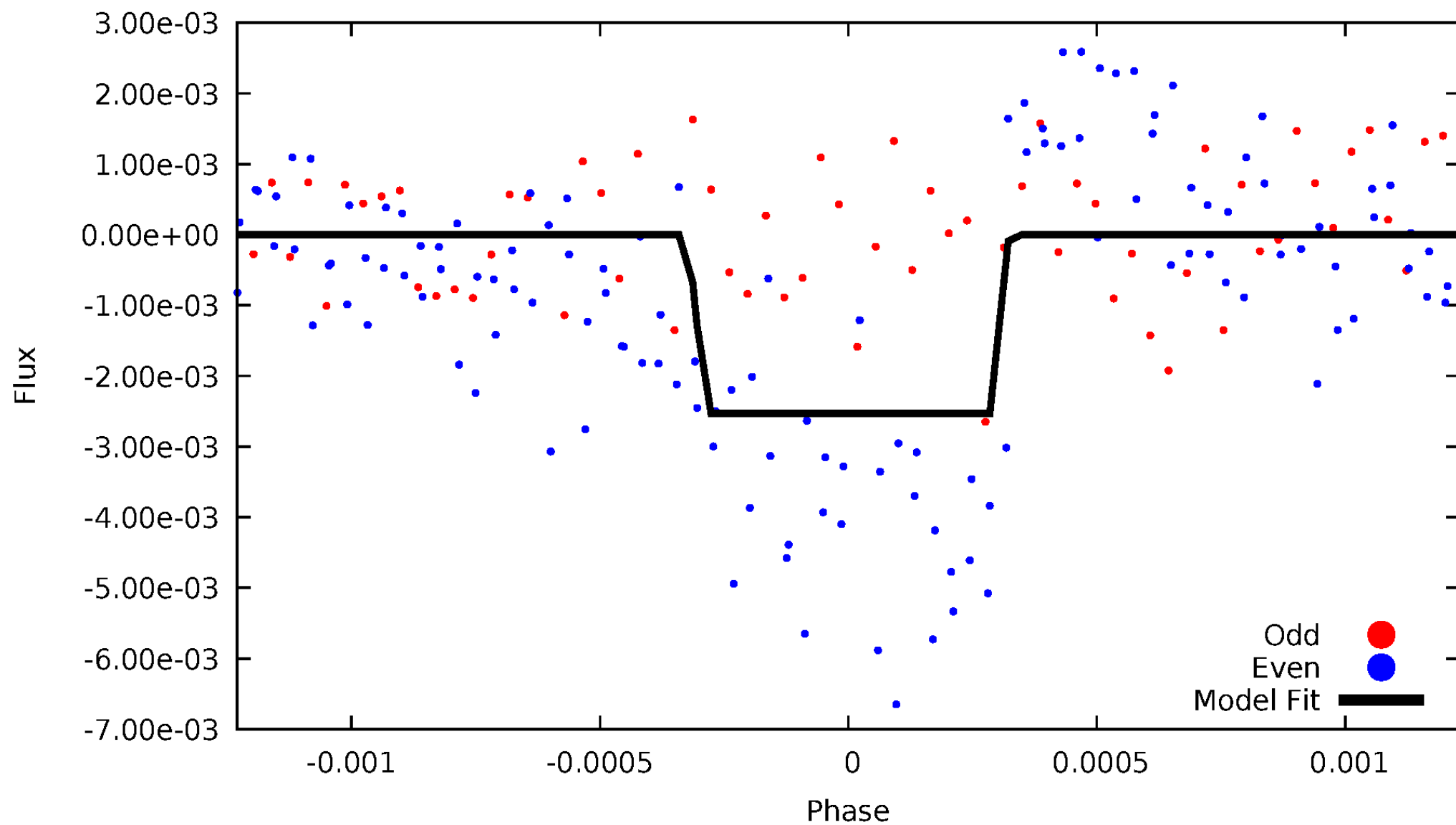
DV Odd/Even

TCE 006020848-01



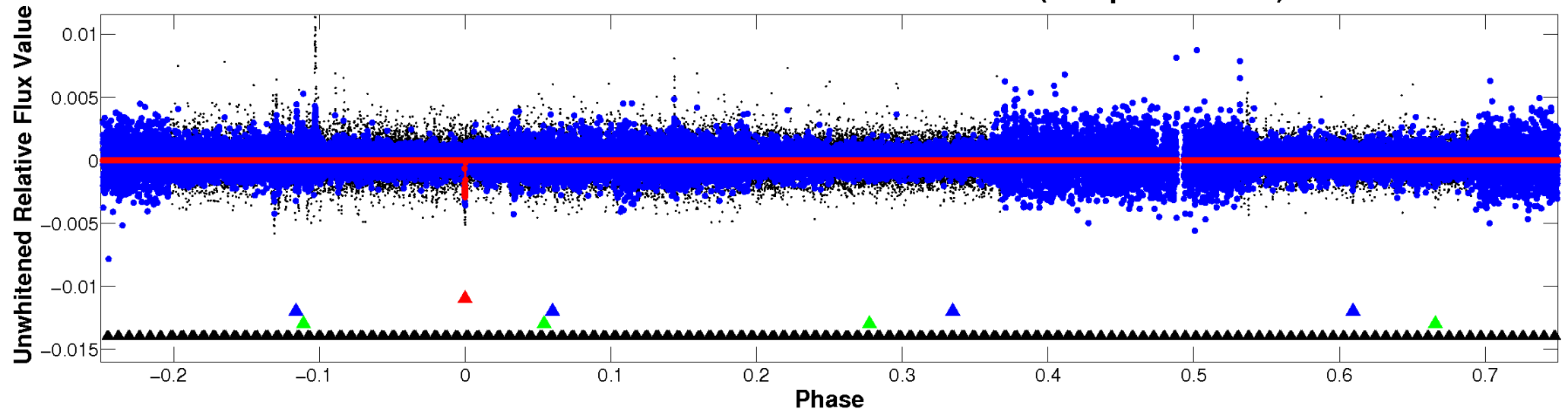
ALT Odd/Even

TCE 006020848-01

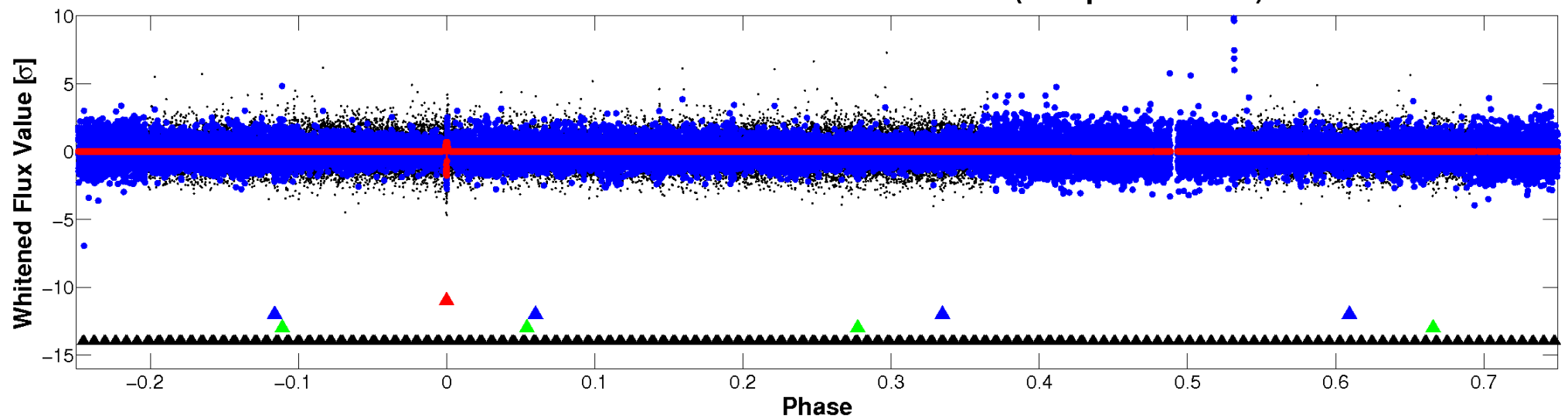


Non-Whitened Vs. Whitened Light Curve

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

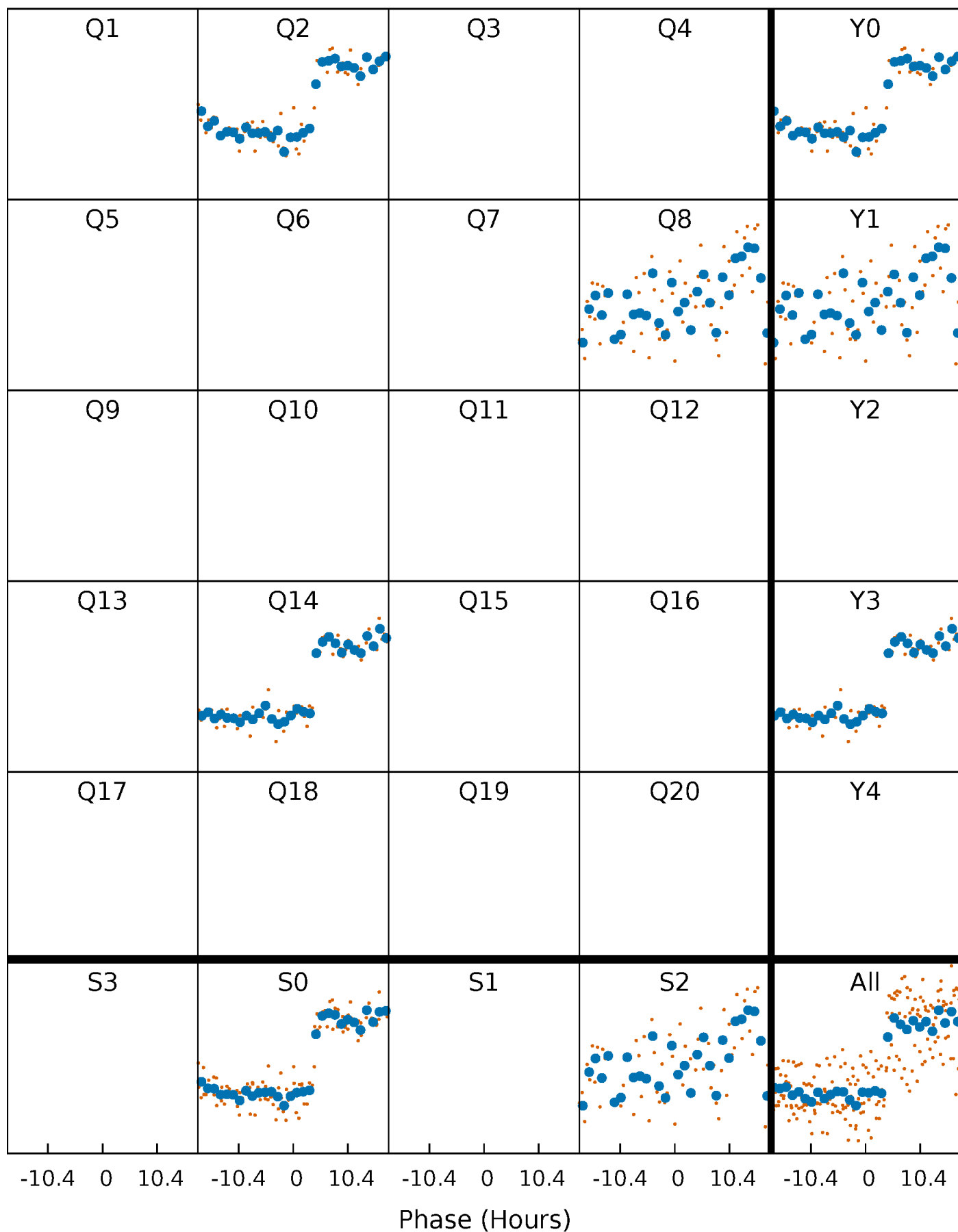


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



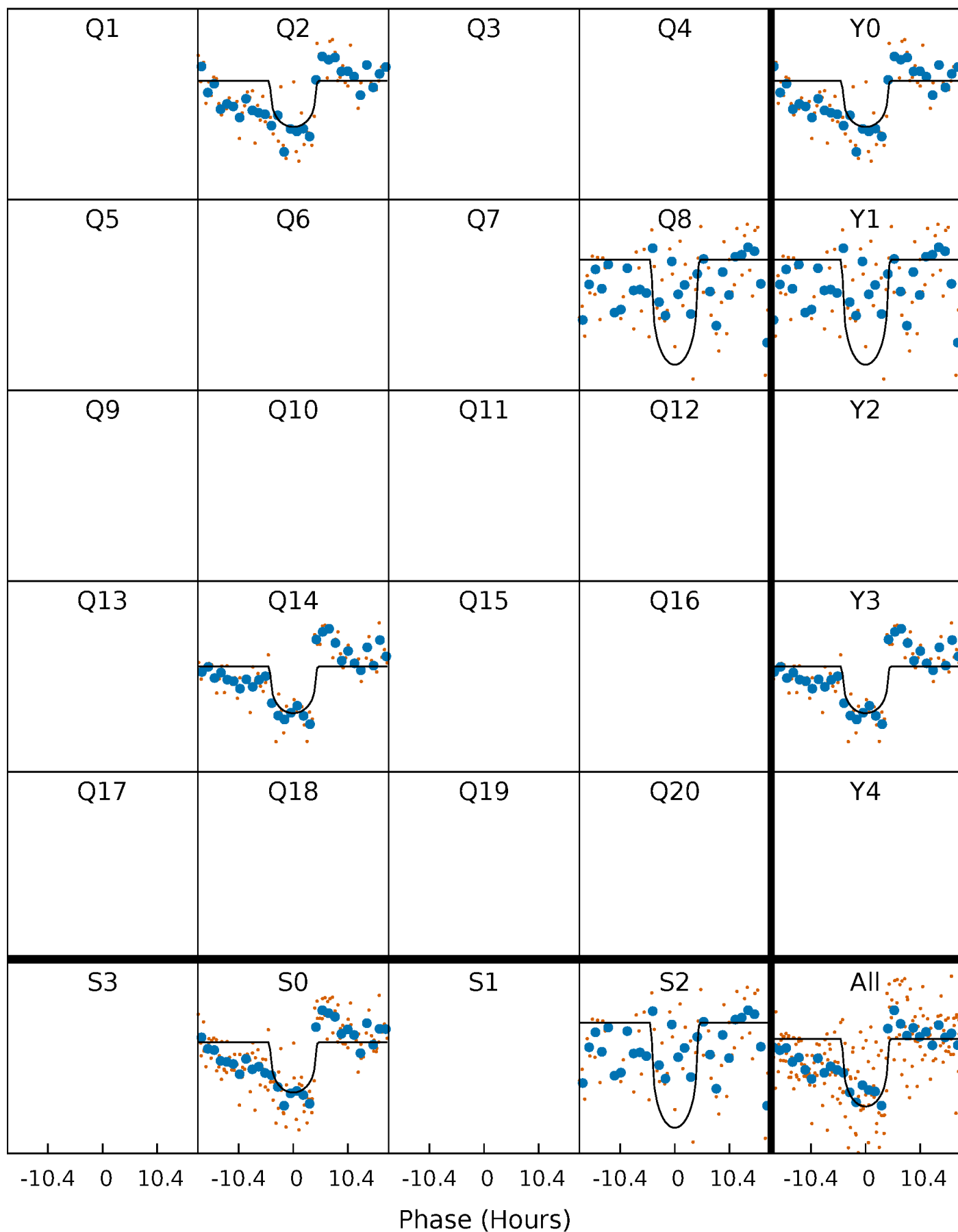
PDC Quarter-Phased Transit Curves

TCE 006020848-01 P=554.729874 Days $T_0=244.221843$ (BKJD)



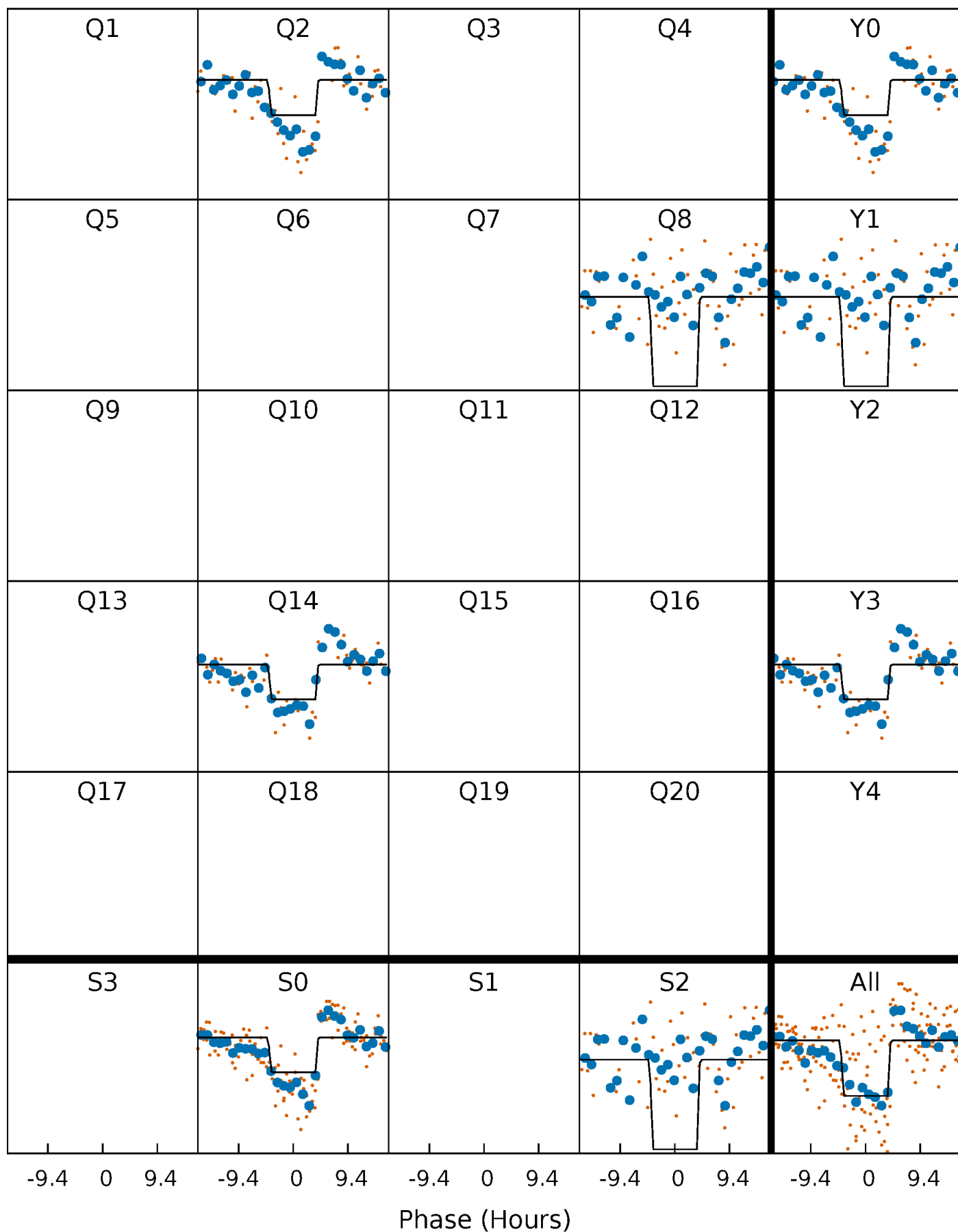
DV Quarter-Phased Transit Curves

TCE 006020848-01 P=554.729874 Days $T_0=244.221843$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

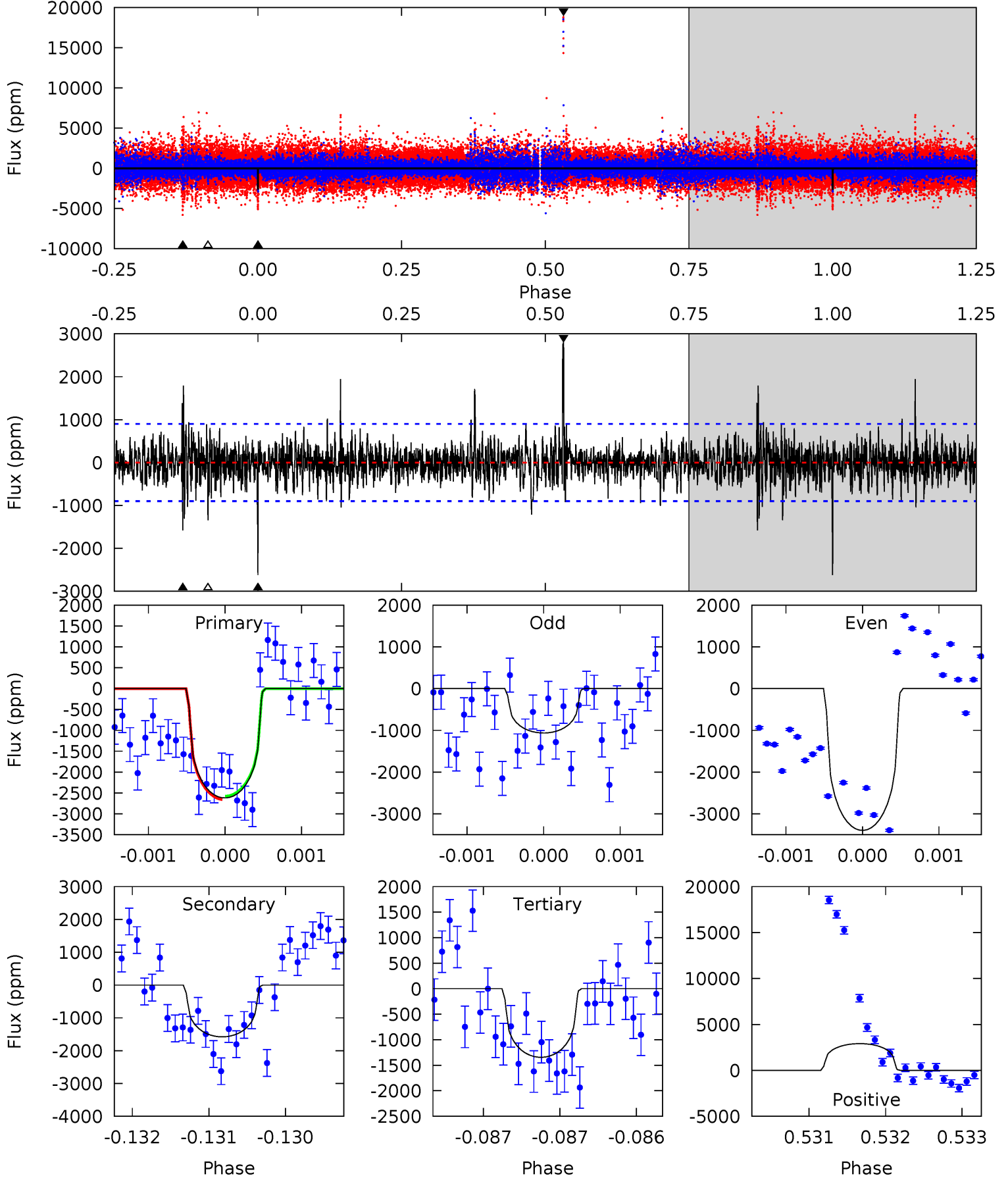
TCE 006020848-01 P=554.730287 Days $T_0=244.212652$ (BKJD)



DV Model-Shift Uniqueness Test

006020848-01, P = 554.729874 Days, E = 244.221843 Days

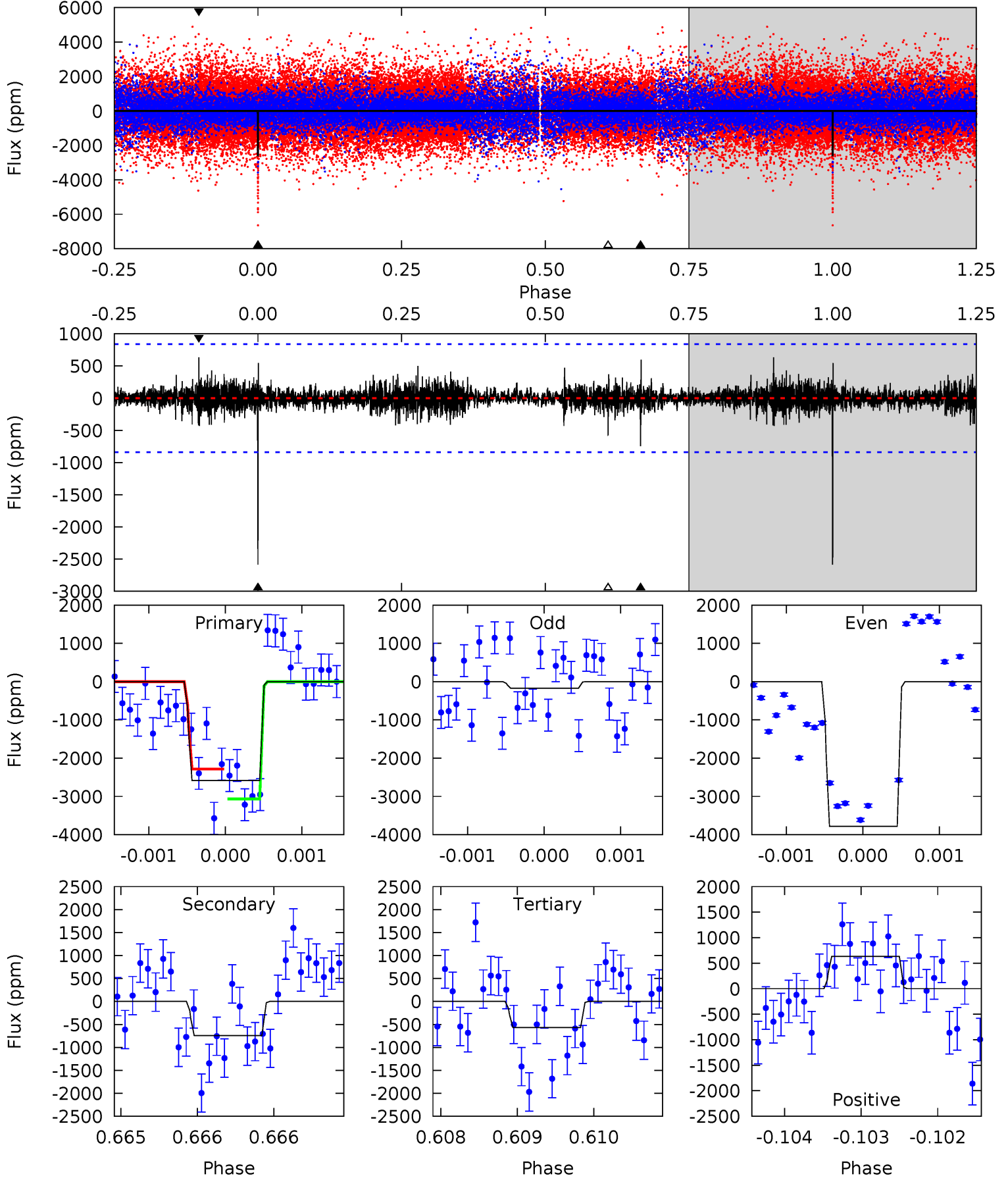
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	9.67	8.23	17.8	5.51	3.39	1.85	7.81	-1.78	1.44	-8.15	6.69	0.81	0.53	0.25



Alt Model-Shift Uniqueness Test

006020848-01, P = 554.730287 Days, E = 244.212652 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	4.91	3.75	4.18	5.53	3.42	0.68	13.3	12.8	1.15	0.73	11.2	0.75	0.20	2.56



Stellar Parameters For KIC 006020848

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4841^{+170}_{-170}	$4.585^{+0.054}_{-0.041}$	$-0.200^{+0.300}_{-0.300}$	$0.707^{+0.062}_{-0.069}$	$0.702^{+0.083}_{-0.053}$	$2.800^{+0.675}_{-0.454}$
	+4%/-4%	+1%/-1%	+150%/-150%	+9%/-10%	+12%/-8%	+24%/-16%
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 006020848-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1579 ± 163	$3.85^{+2.79}_{-2.12}$	231^{+10}_{-9}	4419^{+1805}_{-812}	$81901^{+316403}_{-54513}$
Alt.	-745 ± 152	$4.04^{+2.48}_{-2.25}$	232^{+9}_{-10}	3806^{+1412}_{-592}	$34353^{+151824}_{-21665}$

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

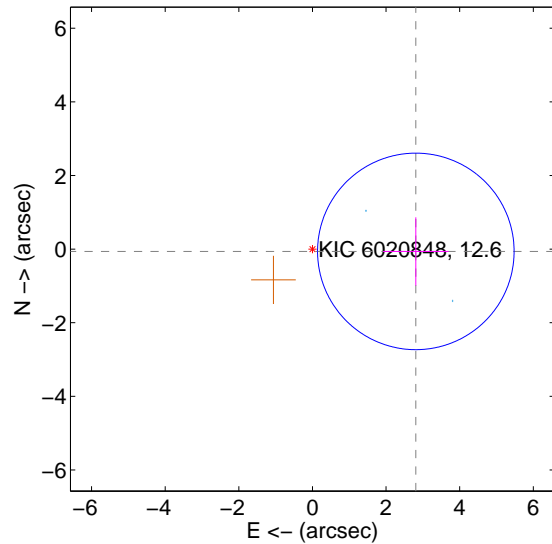
Supplemental centroid analysis for 006020848-01. Kepler magnitude: 12.60. Transit SNR 11.57

There are 2 quarters with good PRF difference image offsets

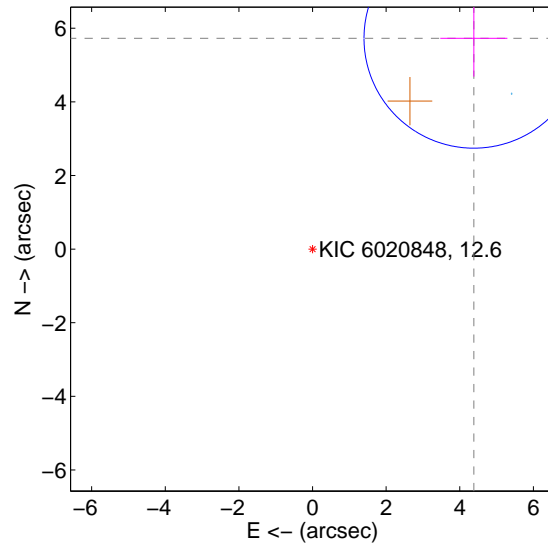
The OOT PRF centroid is offset from the target star catalog position by about 5.85 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.810 ± 0.890	3.16	-2.809 ± 0.890	-0.063 ± 0.928
PRF-fit source offset from KIC position	7.211 ± 0.995	7.25	-4.383 ± 0.913	5.726 ± 1.040
photometric centroid source offset	4.22 ± 0.03	147.98	1.30 ± 0.03	4.01 ± 0.03

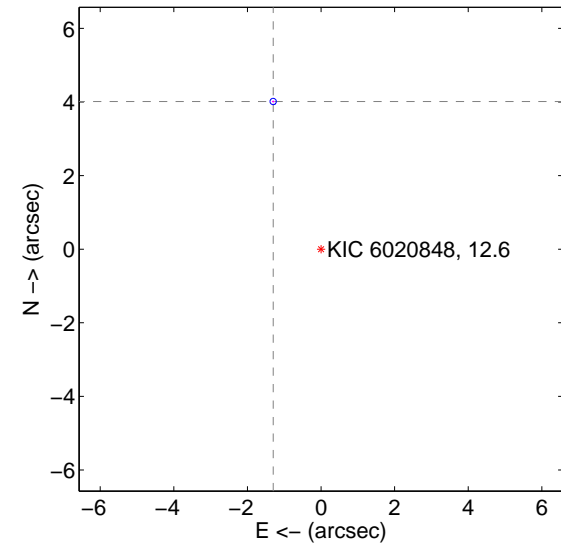
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

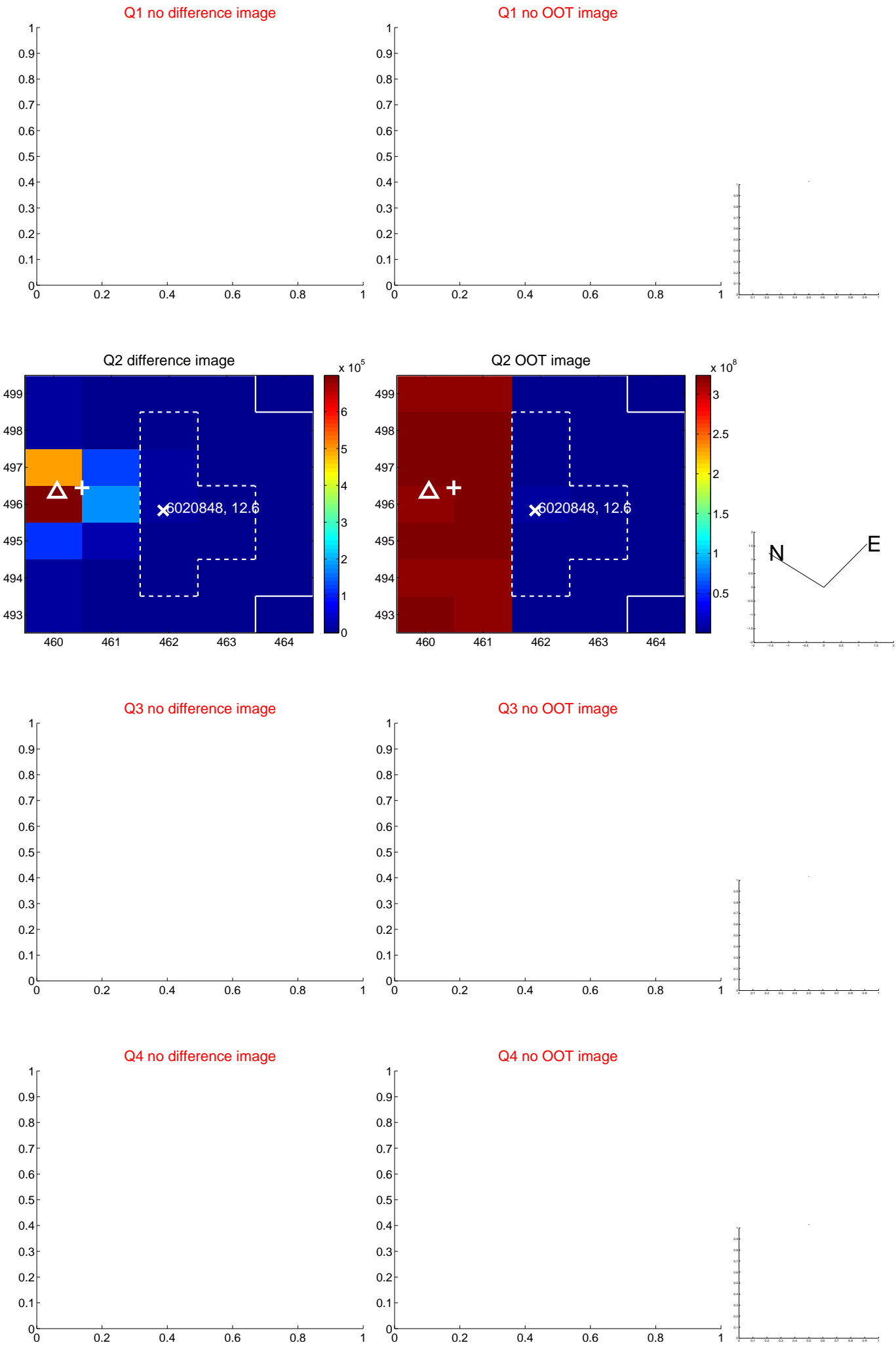


offset from photometric centroids



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 $> 15,000$ 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; Δ : difference centroid. red \times : large negative pixel value.

Q5 no difference image



Q5 no OOT image



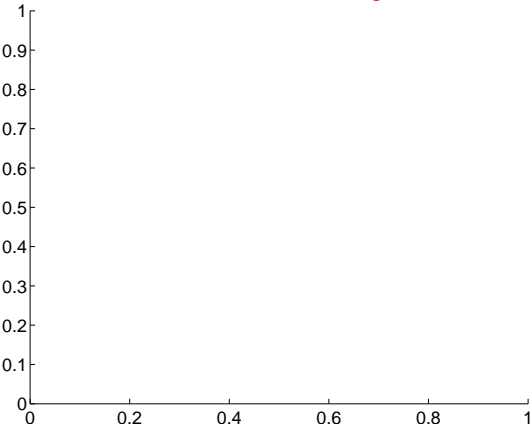
Q6 no difference image



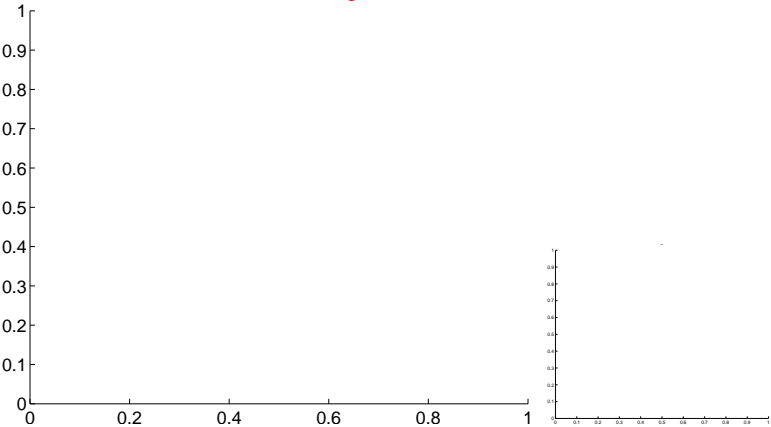
Q6 no OOT image



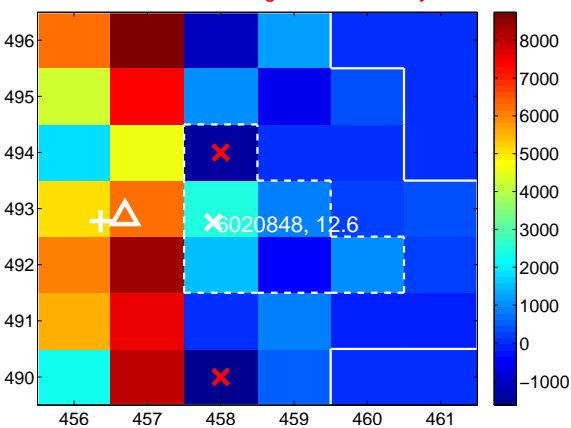
Q7 no difference image



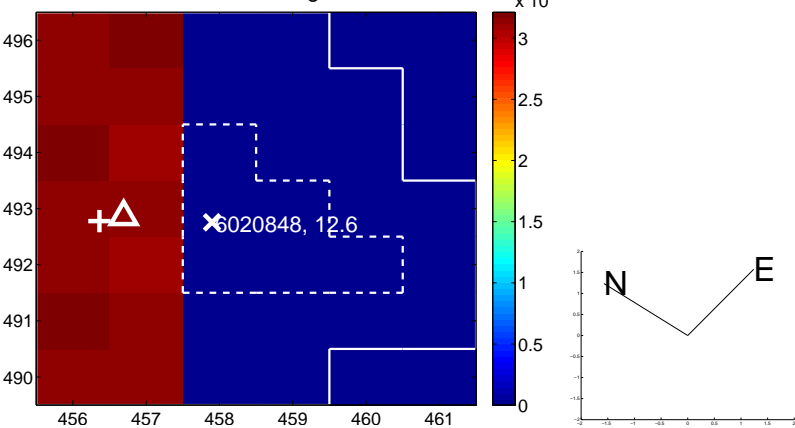
Q7 no OOT image



Q8 difference image. Poor Quality



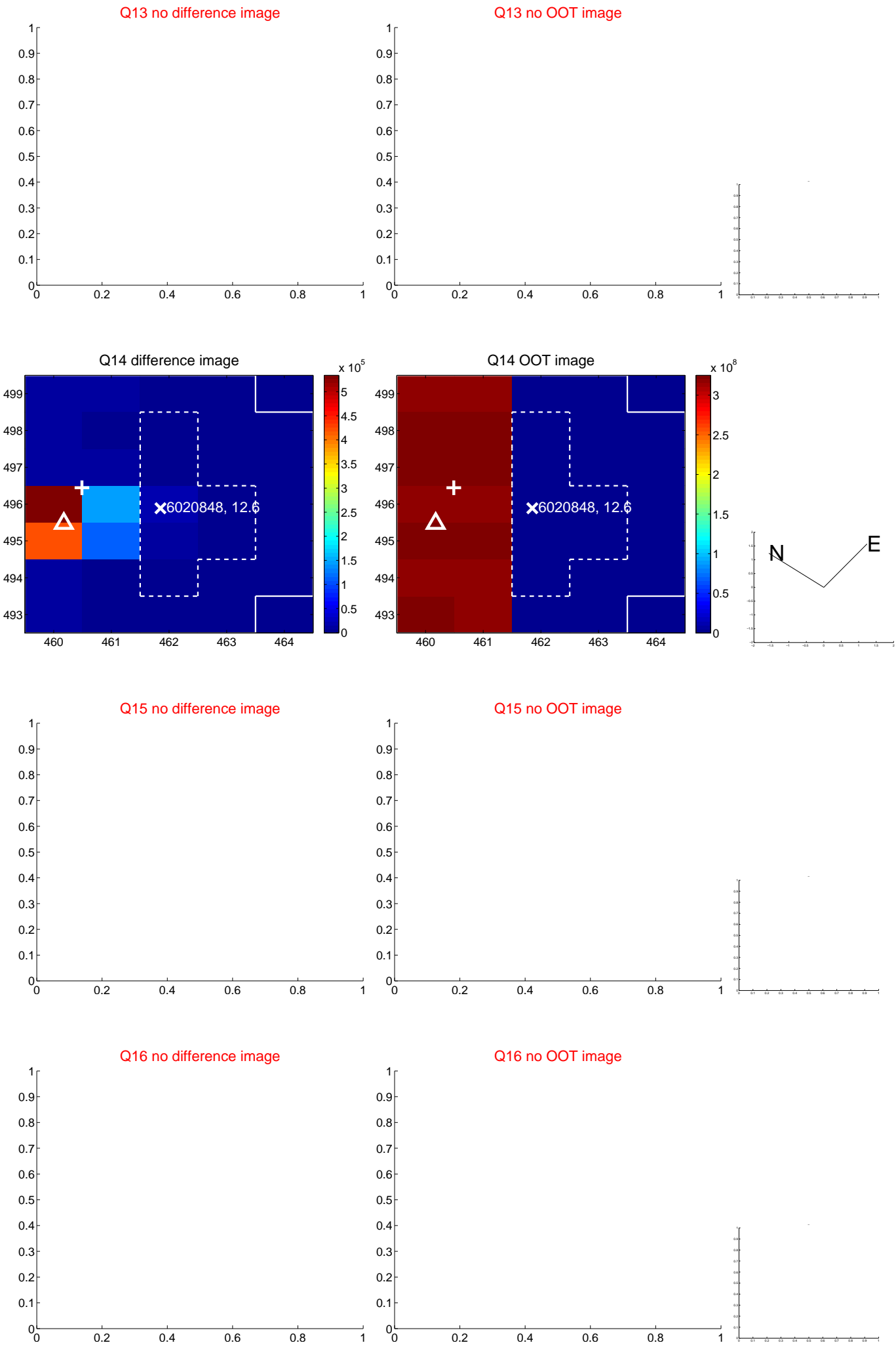
Q8 OOT image



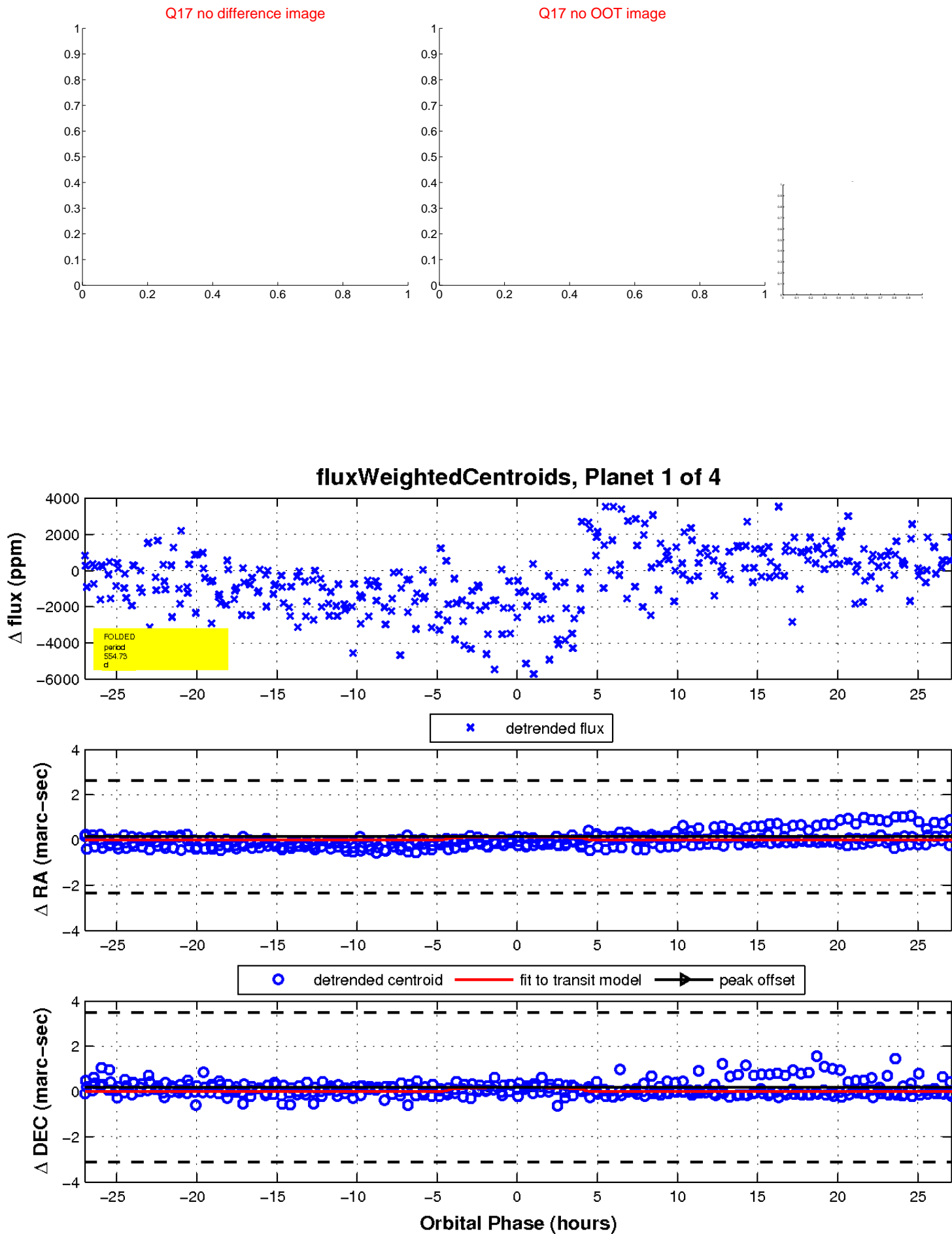
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

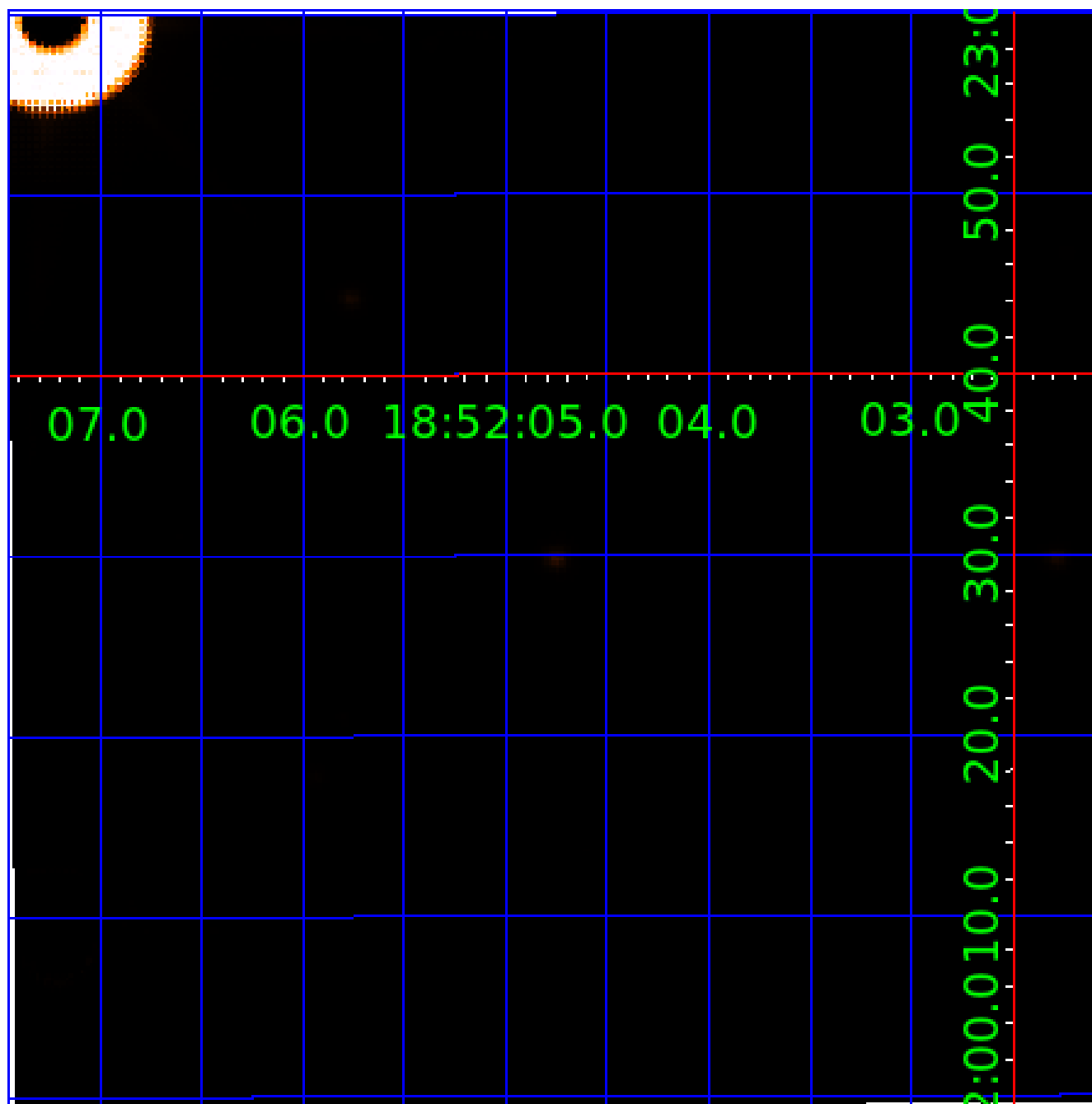


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006020848

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})
006020848-01	OBS	No	554.729874	244.221843	2931.0	9.064	12.6	11.6	0.71	4841	3.75	0.18
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006020848-04	OBS	No	4.016242	133.098873	189.5	22.020	7.1	7.3	0.71	4841	0.94	127.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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006020848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—CENT_FEW_DIFFS
006020848-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006020848-04	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_RESOLVED_OFFSET

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

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

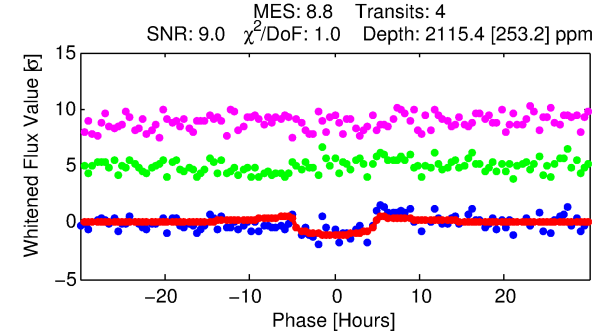
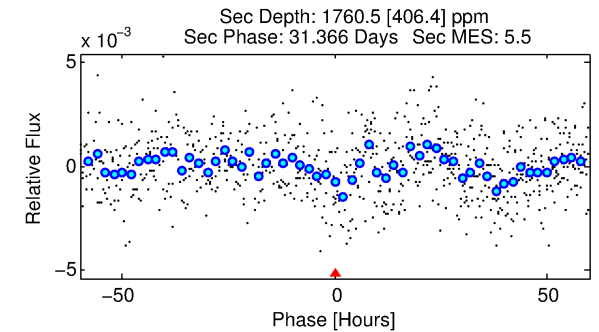
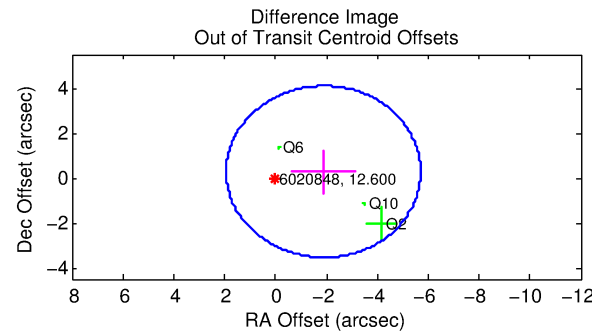
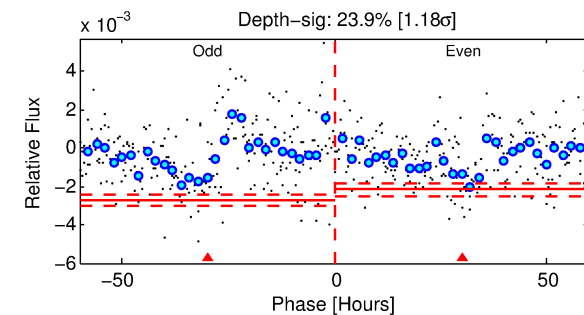
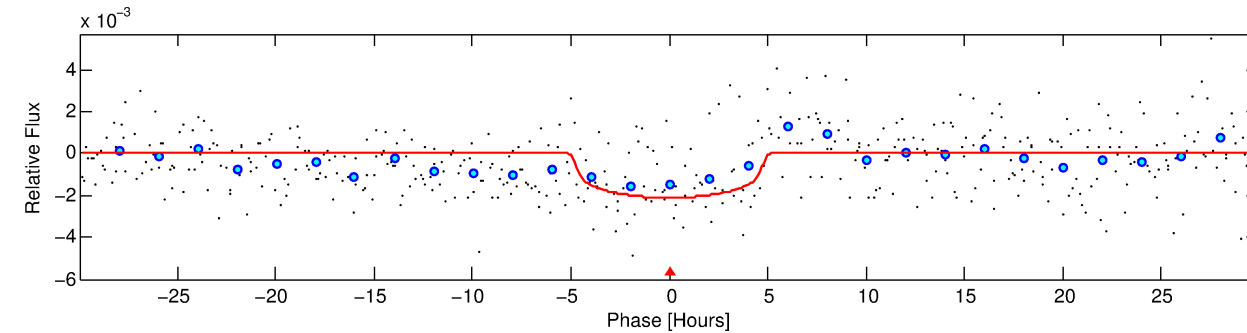
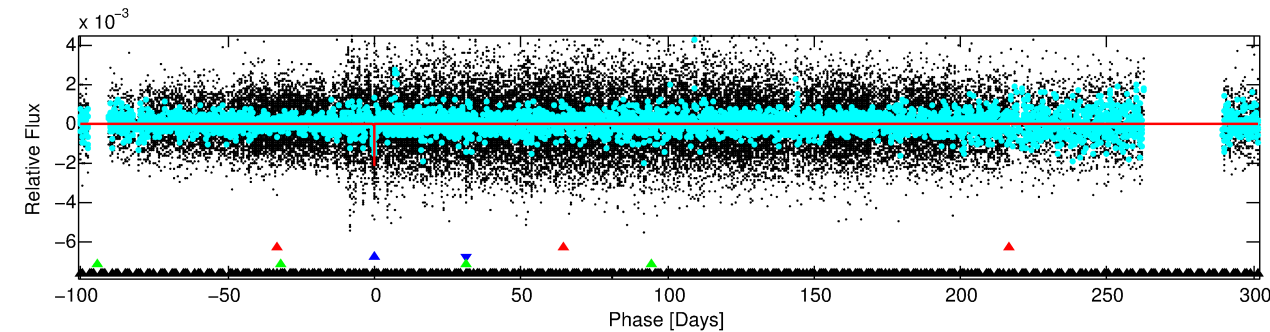
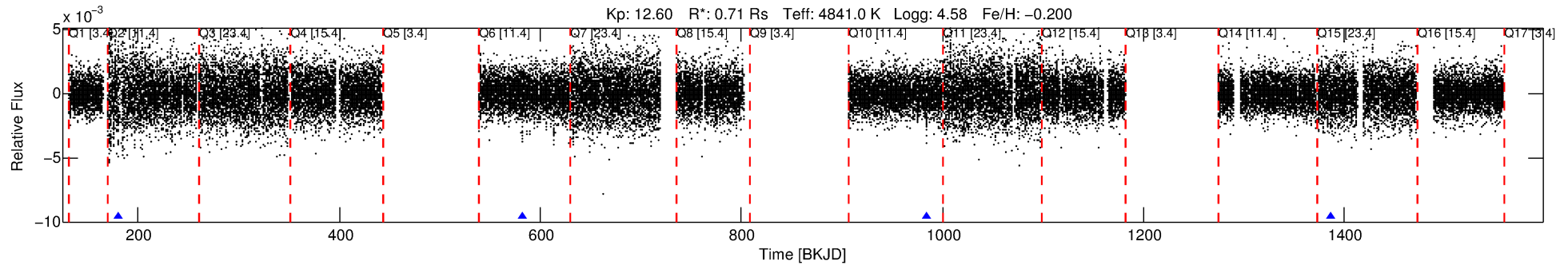
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006020848-02

No Significant Match Found

DV One-Page Summary

KIC: 6020848 Candidate: 2 of 4 Period: 402.374 d



DV Fit Results:

Period = 402.37440 [0.00945] d
Epoch = 179.8555 [0.0181] BKJD
Rp/R* = 0.0416 [0.0360]
a/R* = 298.09 [845.47]
b = 0.38 [6.38]
Seff = 0.27 [0.05]
Teq = 184 [8] K
Rp = 3.21 [2.80] Re
a = 0.9478 [0.0731] AU
Ag = 84375.57 [147704.12] [0.57 σ]
Teffp = 4860 [2130] K [2.20 σ]

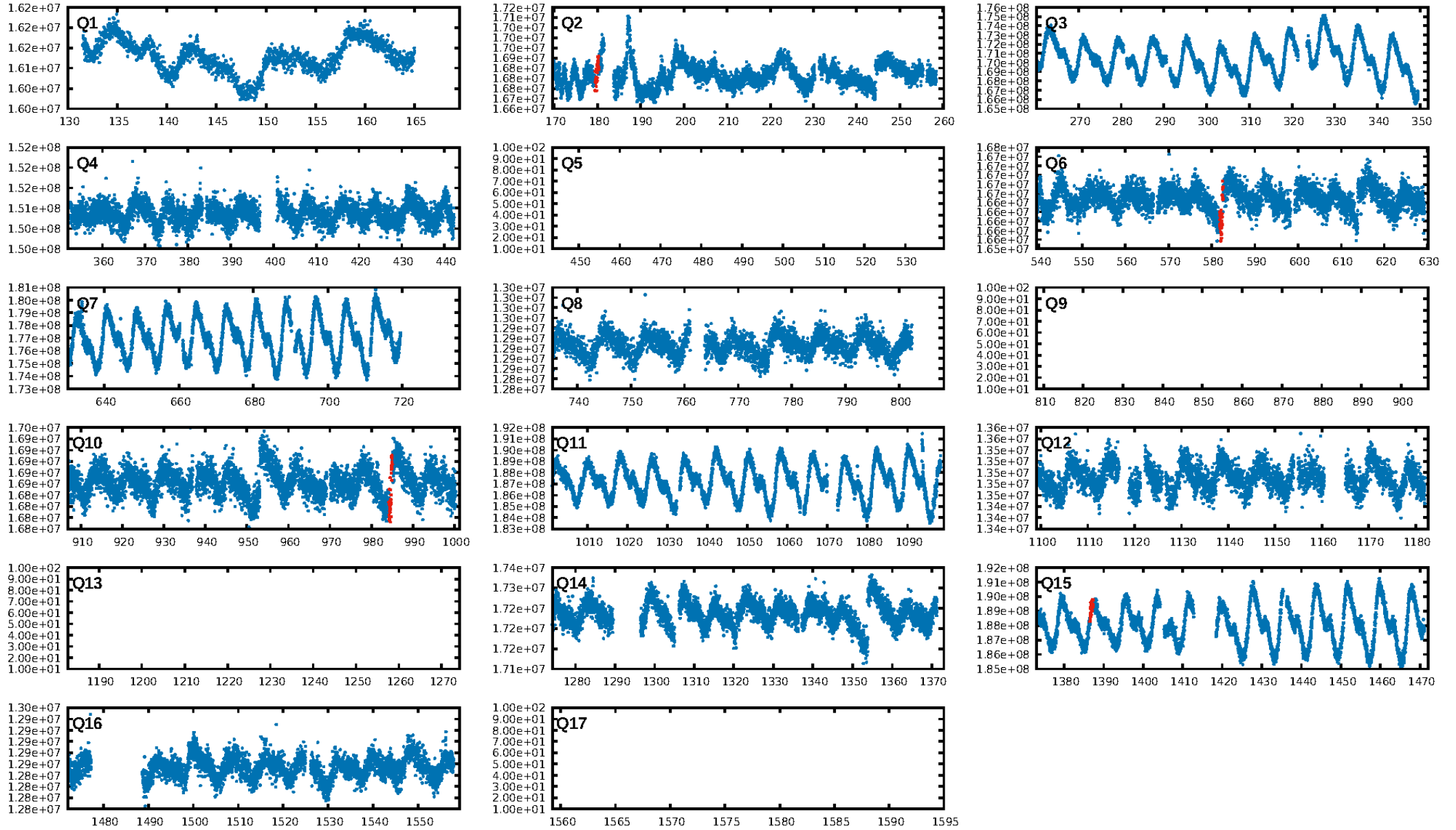
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [94.09 σ]
LongPeriod-sig: 100.0% [271.14 σ]
ModelChiSquare2-sig: 12.9%
ModelChiSquareGof-sig: 96.4%
Bootstrap-pfa: 4.28e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.3099
Centroid-sig: 82.6%
Centroid-so: 4.294 arcsec [109.38 σ]
OotOffset-rm: 1.904 arcsec [1.50 σ]
KicOffset-rm: 6.879 arcsec [7.29 σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

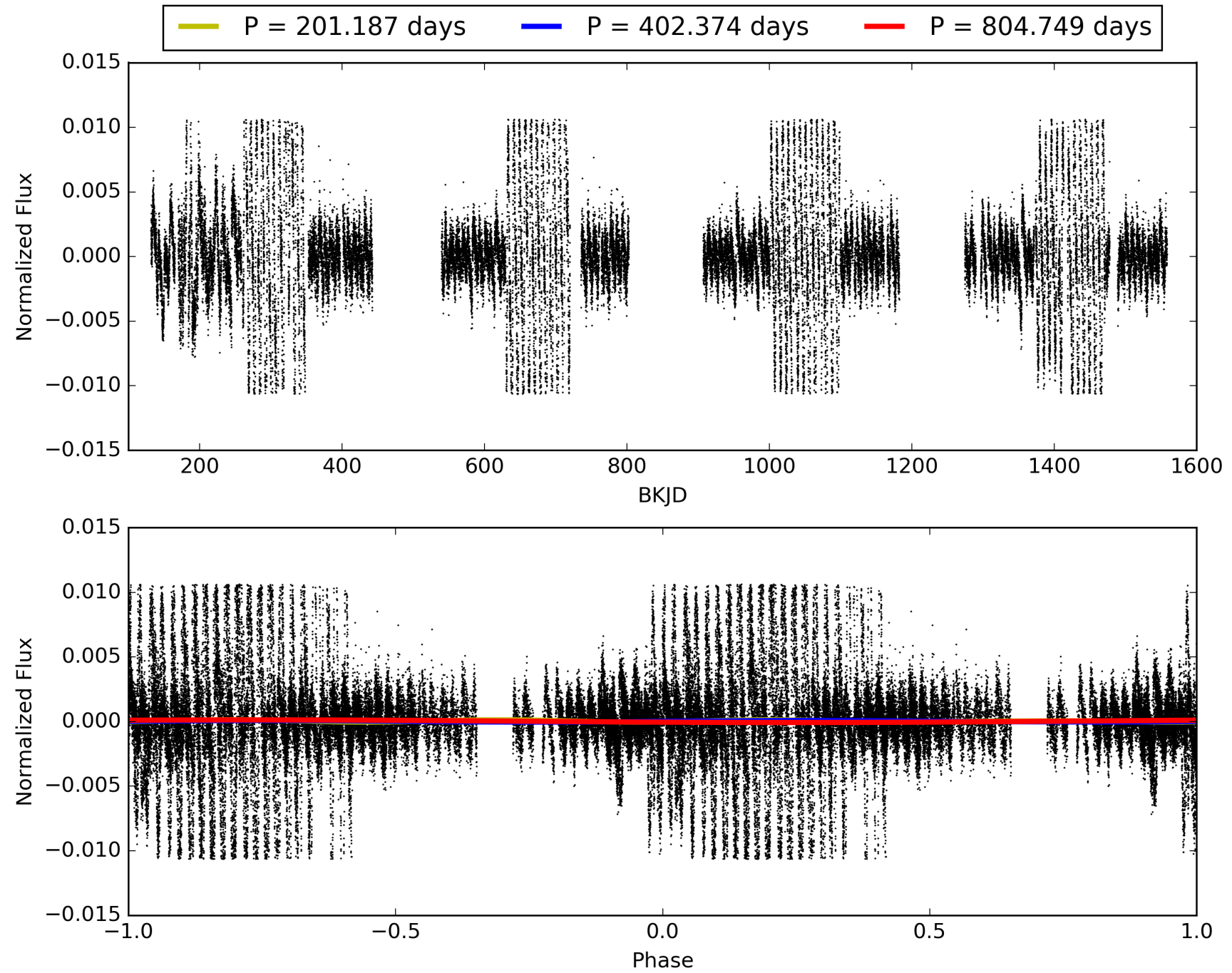
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:00:25 Z

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

TCE 006020848-02, PDC Light Curves

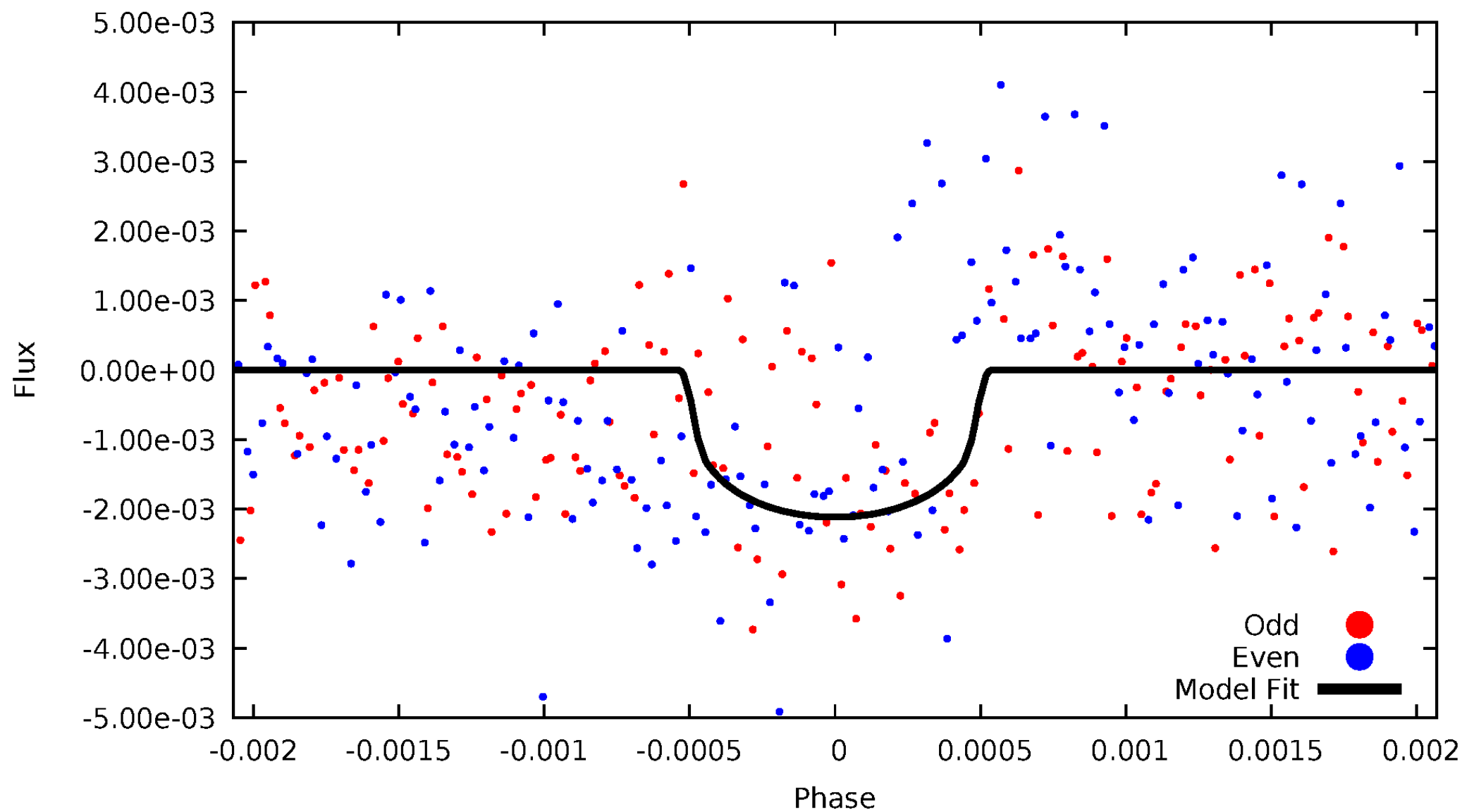


TCE 006020848-02



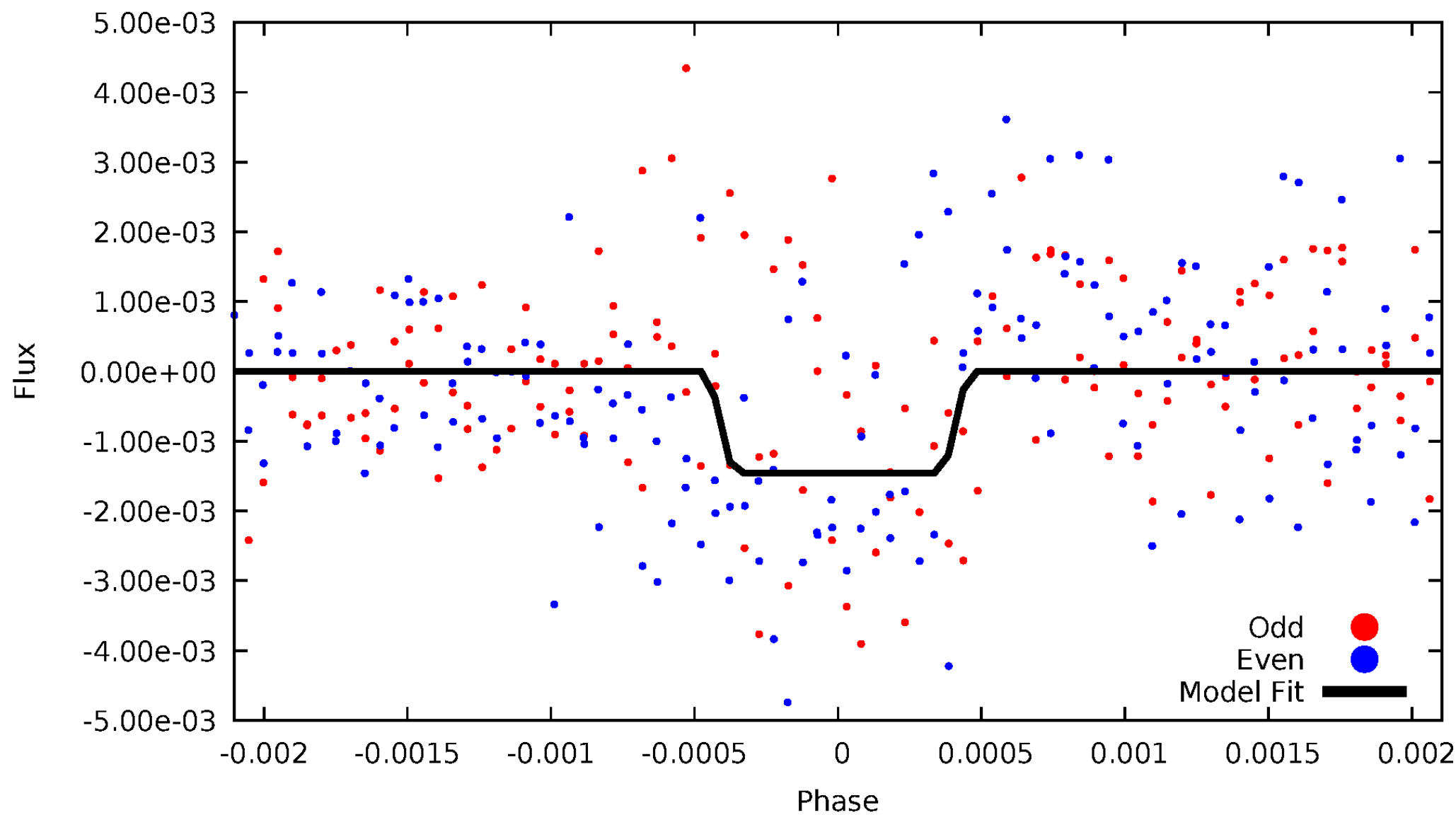
DV Odd/Even

TCE 006020848-02



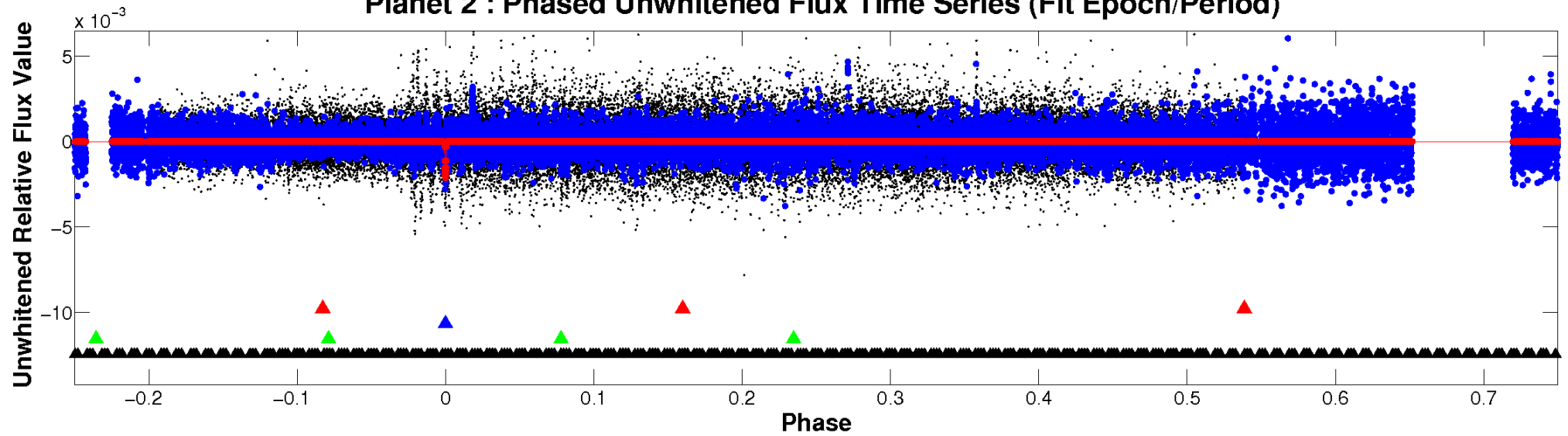
ALT Odd/Even

TCE 006020848-02

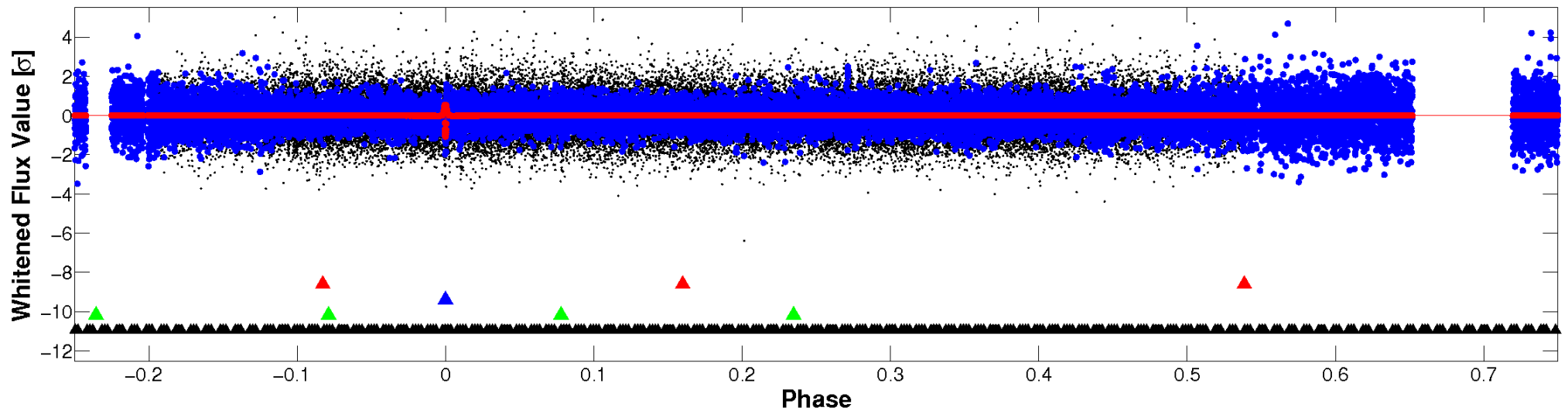


Non-Whitened Vs. Whitened Light Curve

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

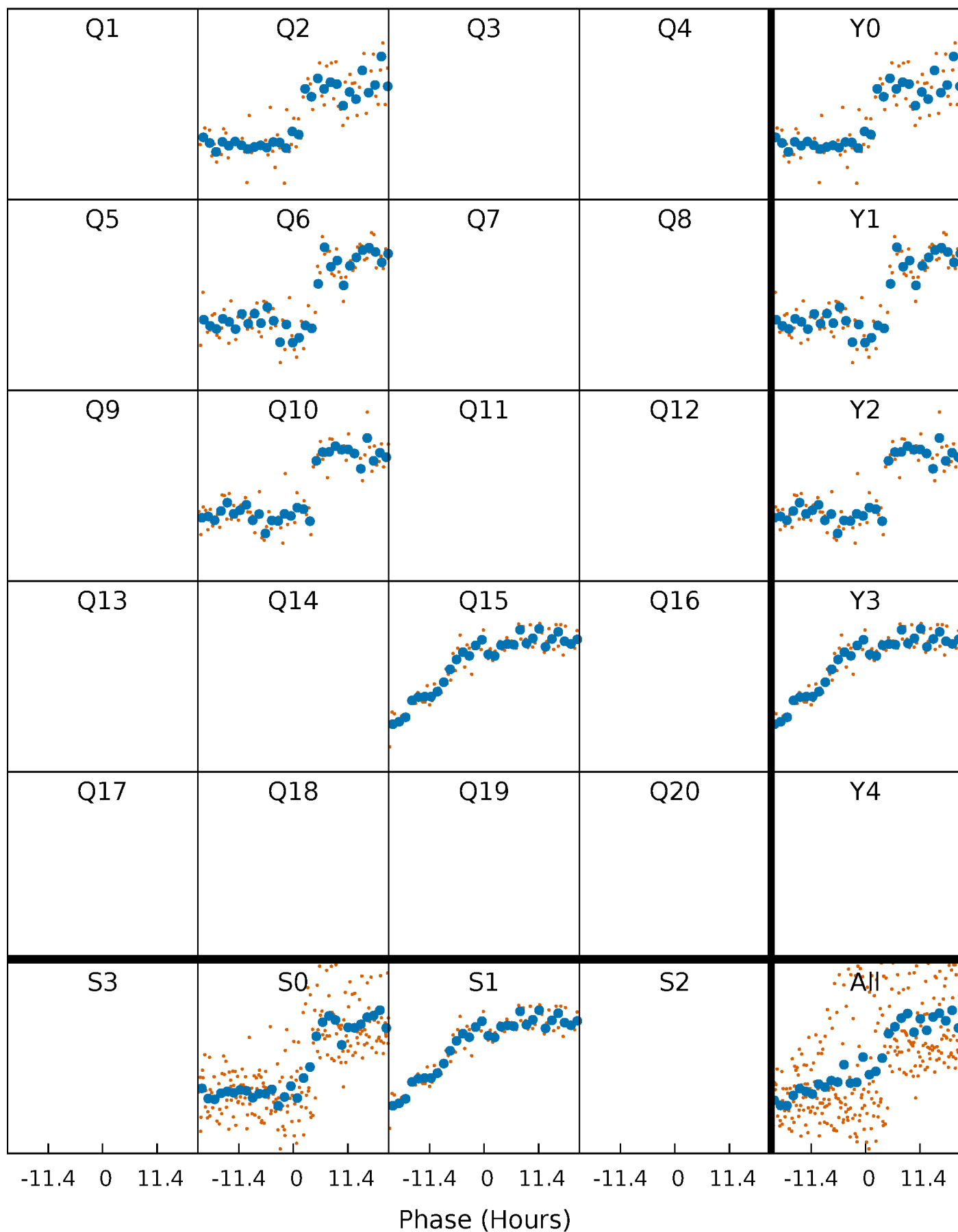


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 006020848-02 P=402.374396 Days $T_0=179.855485$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006020848-02 P=402.374396 Days $T_0=179.855485$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

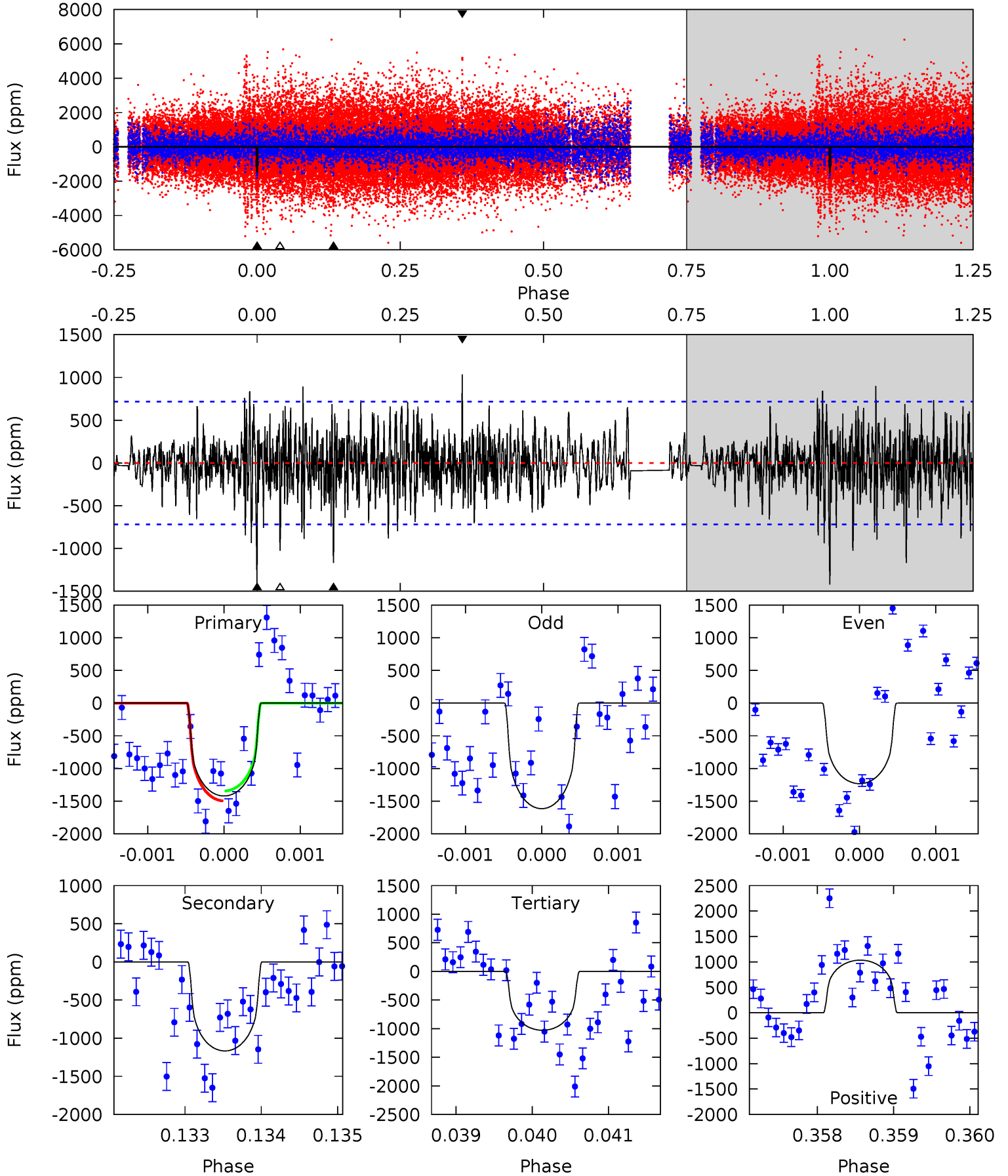
TCE 006020848-02 P=402.377663 Days $T_0=179.848992$ (BKJD)



DV Model-Shift Uniqueness Test

006020848-02, P = 402.374396 Days, E = 179.855485 Days

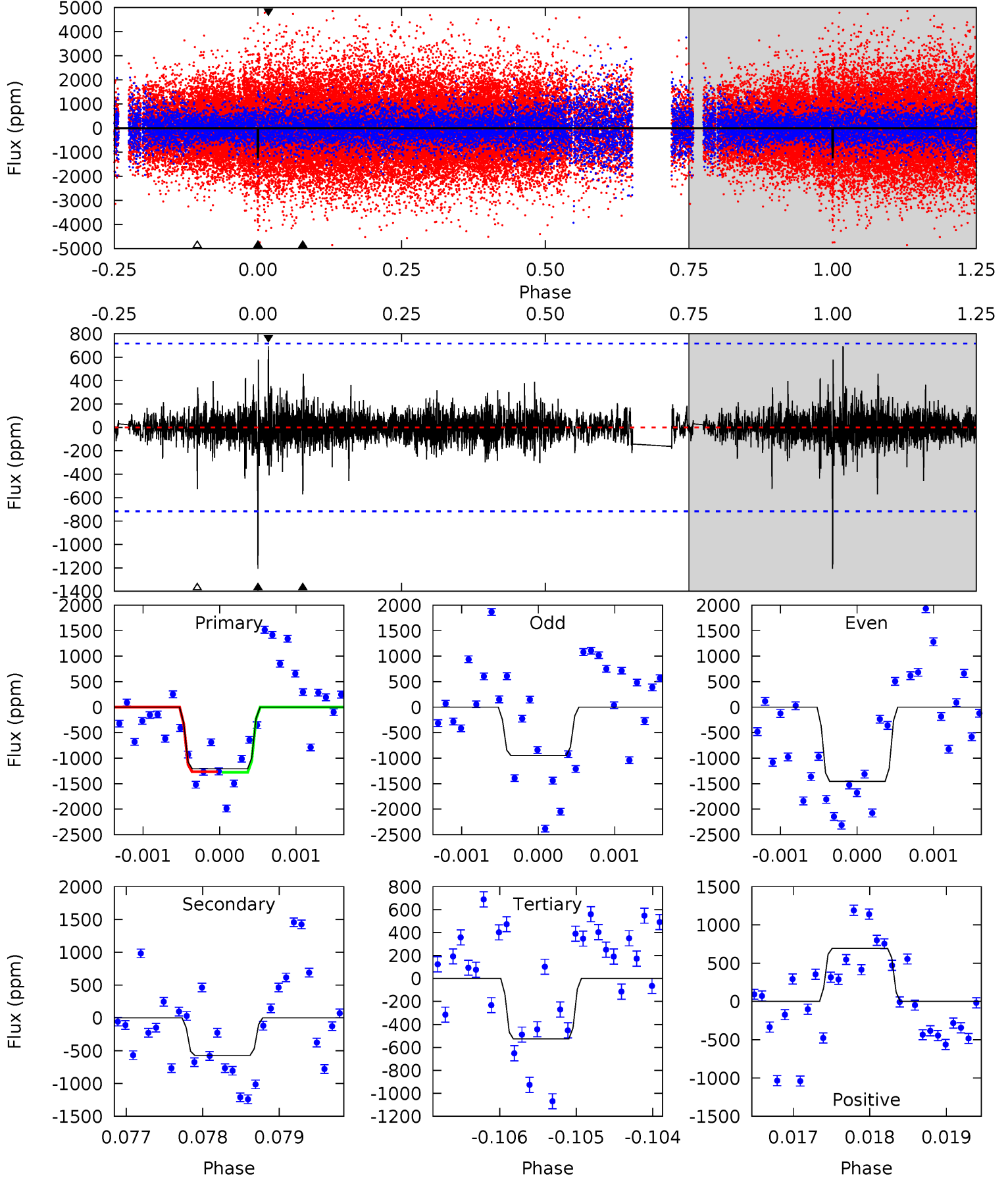
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	8.83	7.78	7.83	5.43	3.26	1.92	2.98	2.93	1.05	1.00	1.41	1.02	0.42	0.60



Alt Model-Shift Uniqueness Test

006020848-02, P = 402.377663 Days, E = 179.848992 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.20	4.36	4.01	5.29	5.47	3.32	0.74	5.19	3.91	0.34	-0.93	1.94	0.81	0.36	0.04



Stellar Parameters For KIC 006020848

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4841^{+170}_{-170}	$4.585^{+0.054}_{-0.041}$	$-0.200^{+0.300}_{-0.300}$	$0.707^{+0.062}_{-0.069}$	$0.702^{+0.083}_{-0.053}$	$2.800^{+0.675}_{-0.454}$
	+4%/-4%	+1%/-1%	+150%/-150%	+9%/-10%	+12%/-8%	+24%/-16%
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 006020848-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1167 ± 132	$3.76^{+2.64}_{-2.24}$	257^{+10}_{-10}	4231^{+2013}_{-721}	$41377^{+214058}_{-26801}$
Alt.	-571 ± 131	$3.60^{+2.46}_{-2.24}$	258^{+10}_{-10}	3779^{+1863}_{-605}	$22248^{+143697}_{-14771}$

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

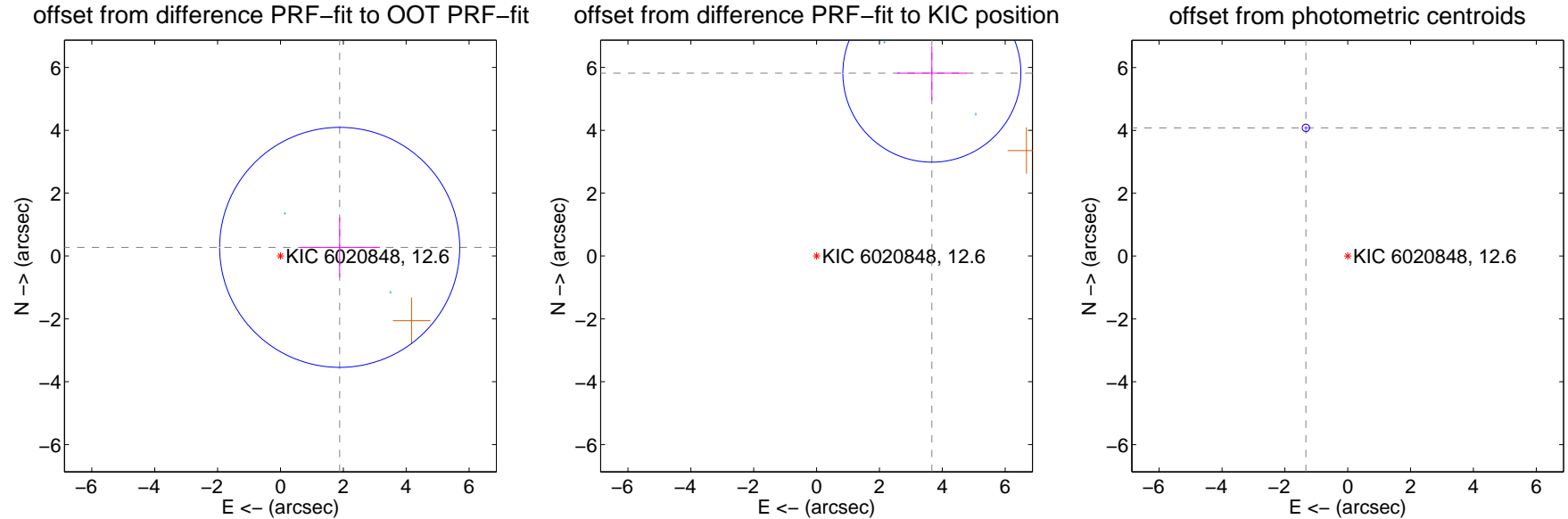
DV Centroid Data

Supplemental centroid analysis for 006020848-02. Kepler magnitude: 12.60. Transit SNR 8.96

There are 2 quarters with good PRF difference image offsets

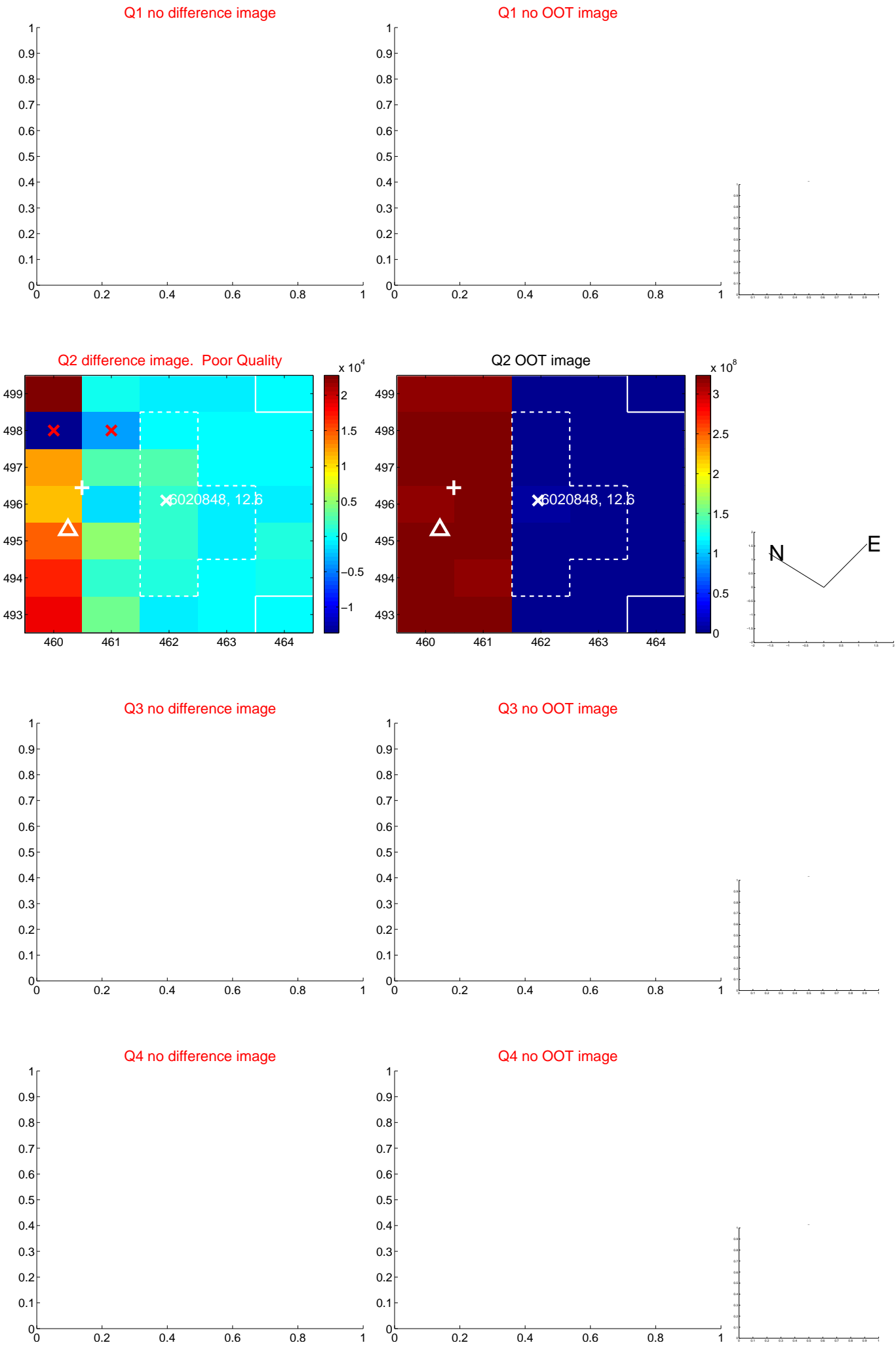
The OOT PRF centroid is offset from the target star catalog position by about 5.88 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.904 ± 1.273	1.50	-1.884 ± 1.279	0.275 ± 0.951
PRF-fit source offset from KIC position	6.879 ± 0.944	7.29	-3.669 ± 1.110	5.819 ± 0.869
photometric centroid source offset	4.29 ± 0.04	109.38	1.33 ± 0.05	4.08 ± 0.04

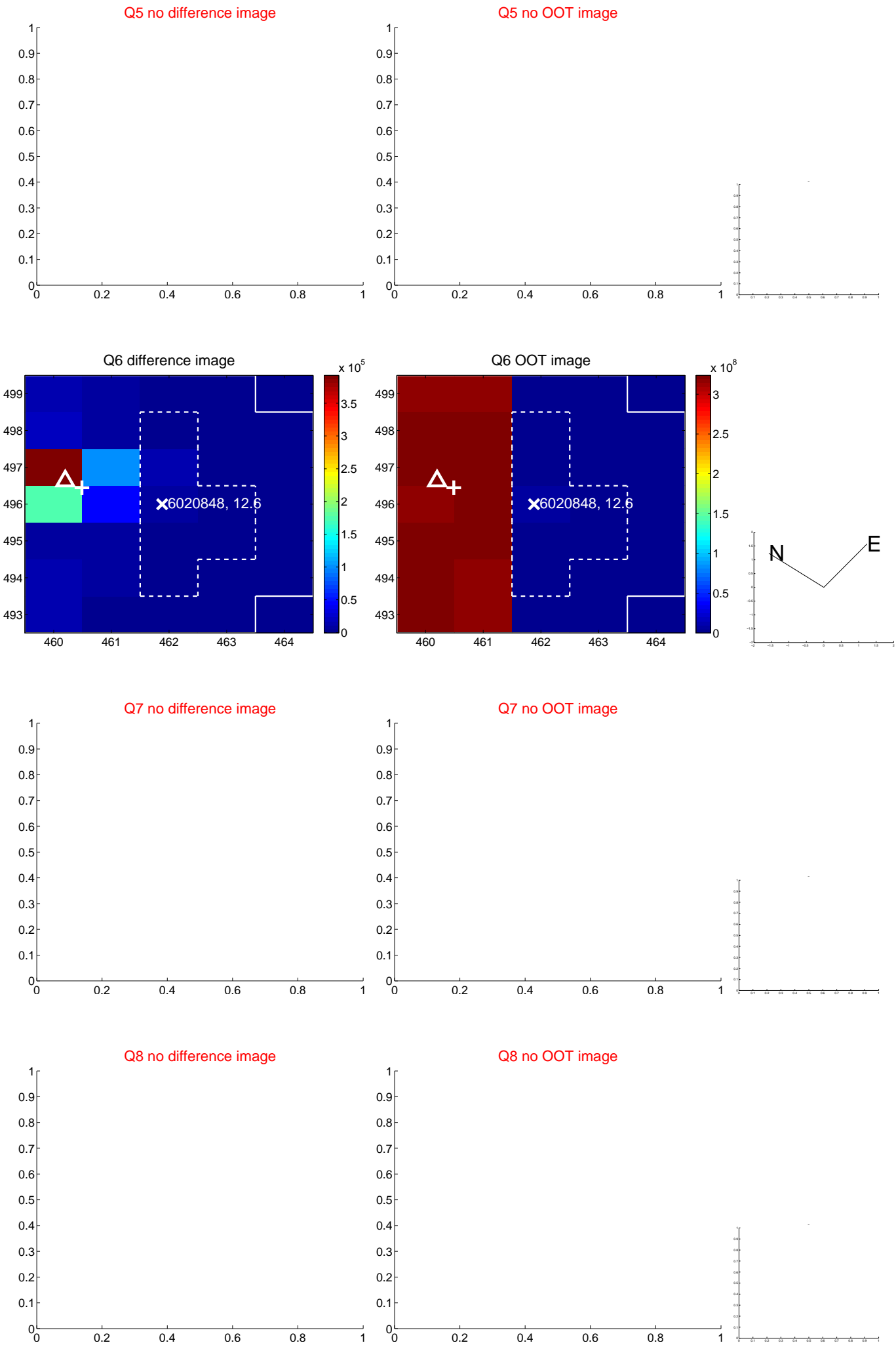


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

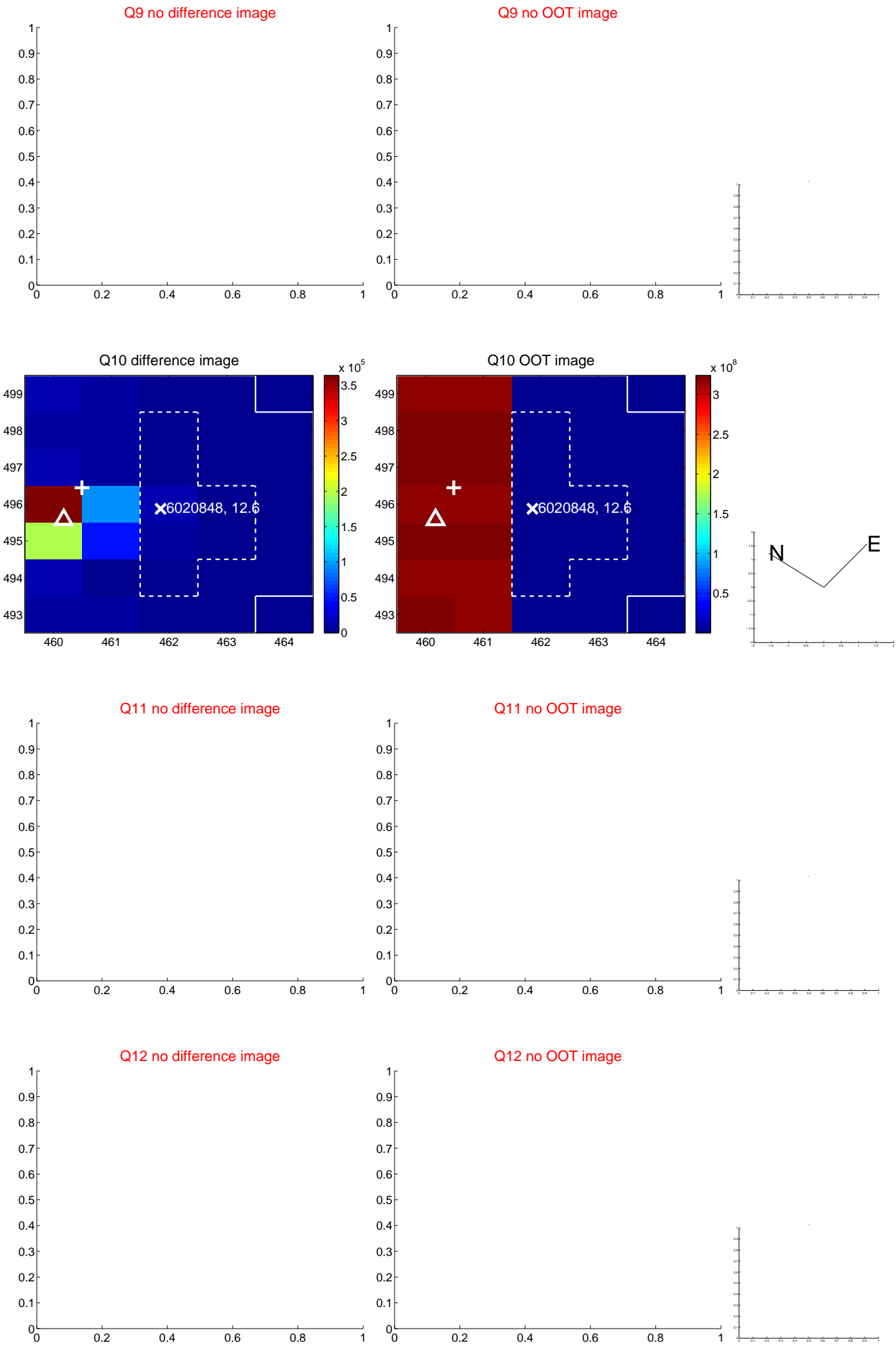
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



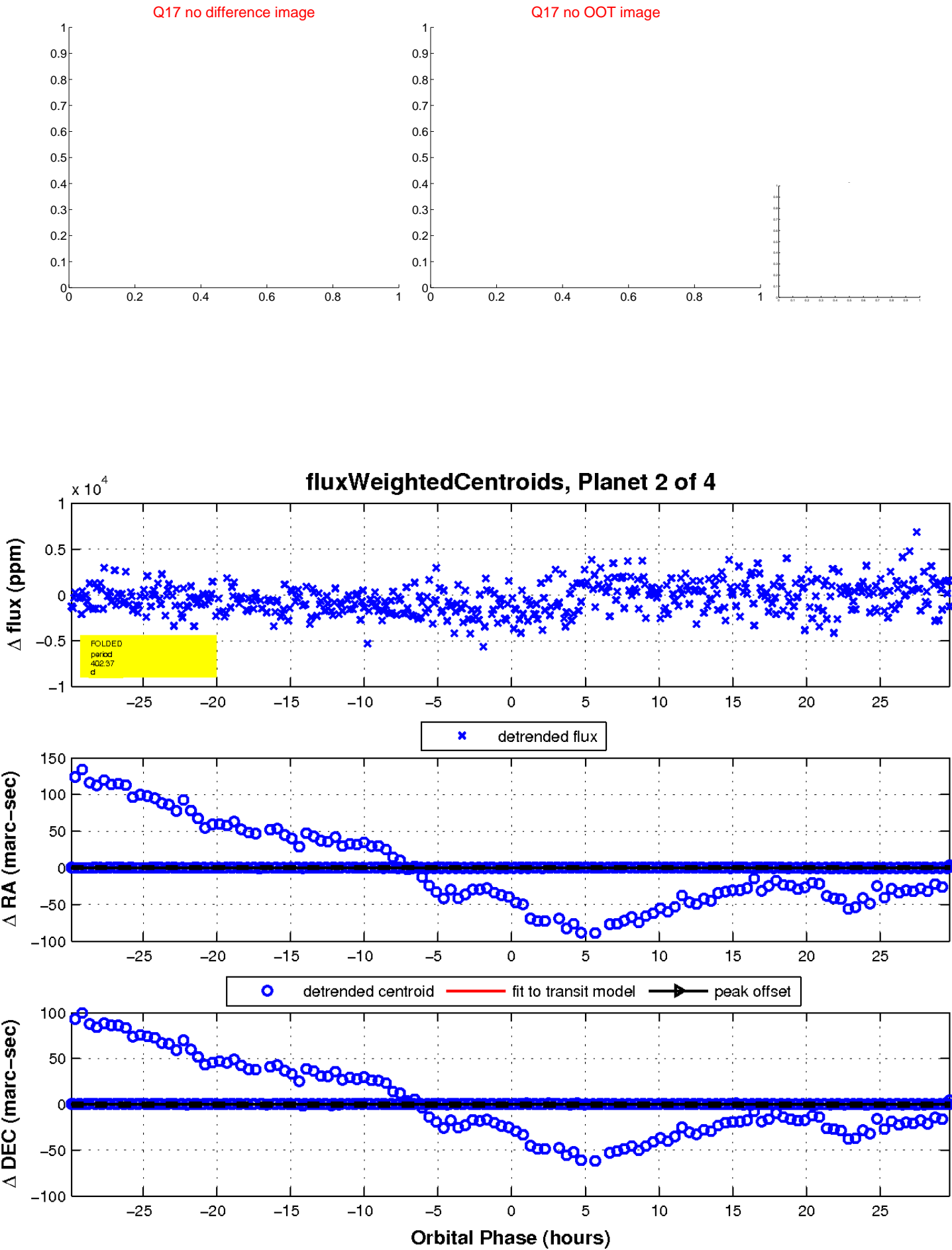
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



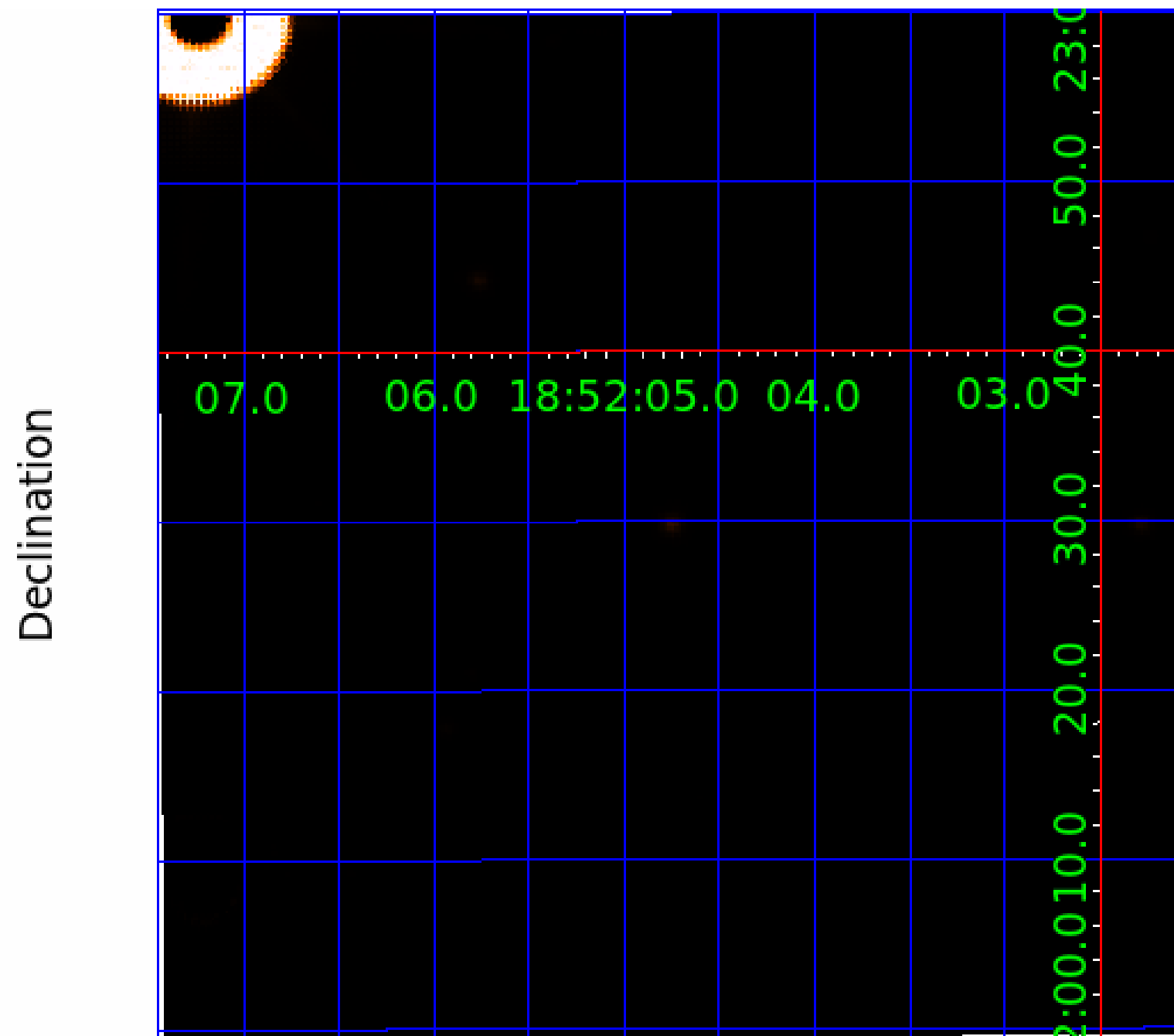
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 006020848

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})
006020848-01	OBS	No	554.729874	244.221843	2931.0	9.064	12.6	11.6	0.71	4841	3.75	0.18
006020848-02	OBS	No	402.374396	179.855485	2115.4	9.986	8.8	9.0	0.71	4841	3.21	0.27
006020848-03	OBS	No	339.294757	274.294800	2070.3	12.617	9.2	8.6	0.71	4841	3.35	0.34
006020848-04	OBS	No	4.016242	133.098873	189.5	22.020	7.1	7.3	0.71	4841	0.94	127.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006020848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006020848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—CENT_FEW_DIFFS
006020848-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006020848-04	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_RESOLVED_OFFSET

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

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

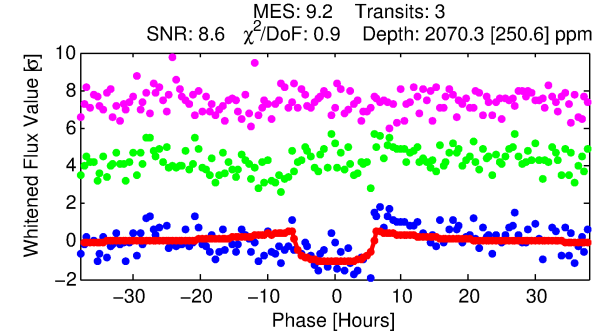
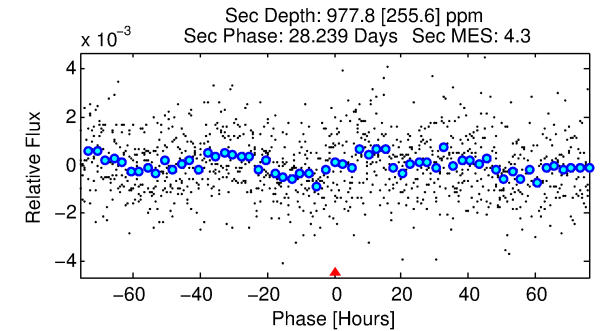
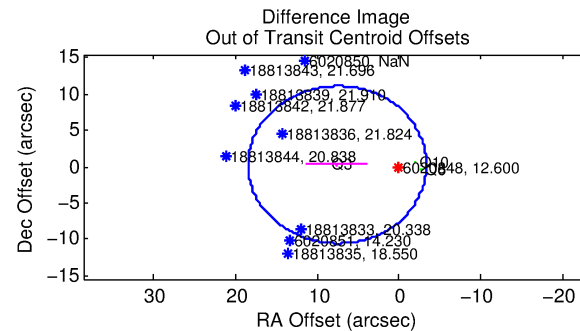
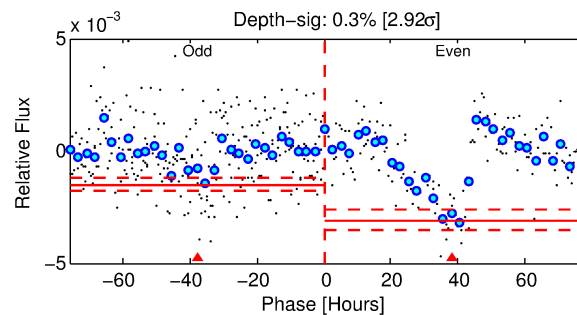
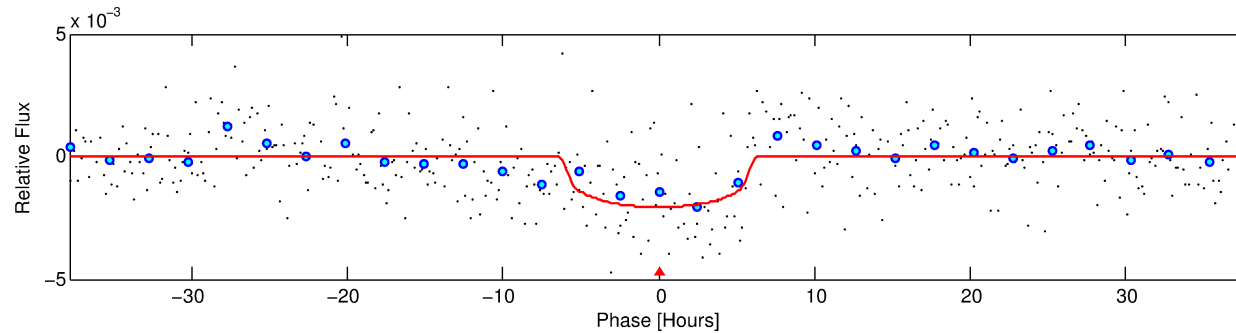
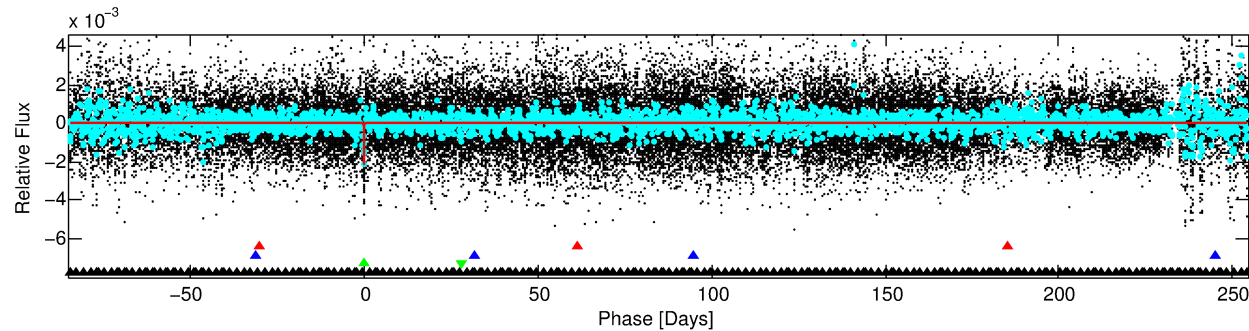
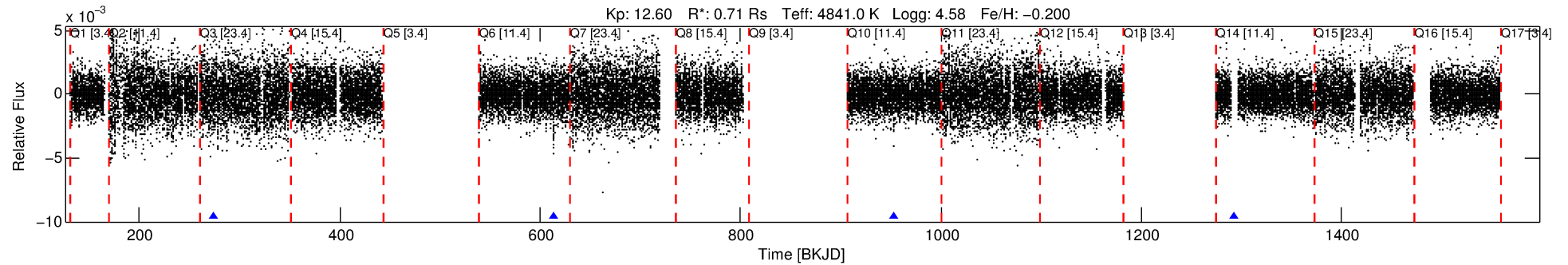
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006020848-03

No Significant Match Found

DV One-Page Summary

KIC: 6020848 Candidate: 3 of 4 Period: 339.295 d



DV Fit Results:

Period = 339.29476 [0.01460] d
Epoch = 274.2948 [0.0217] BKJD
Rp/R* = 0.0435 [0.0140]
a/R* = 169.88 [177.11]
b = 0.64 [0.99]
Seff = 0.34 [0.06]
Teq = 195 [9] K
Rp = 3.35 [1.13] Re
a = 0.8460 [0.0653] AU
Ag = 34245.56 [24153.39] [1.42 σ]
Teffp = 4106 [730] K [5.36 σ]

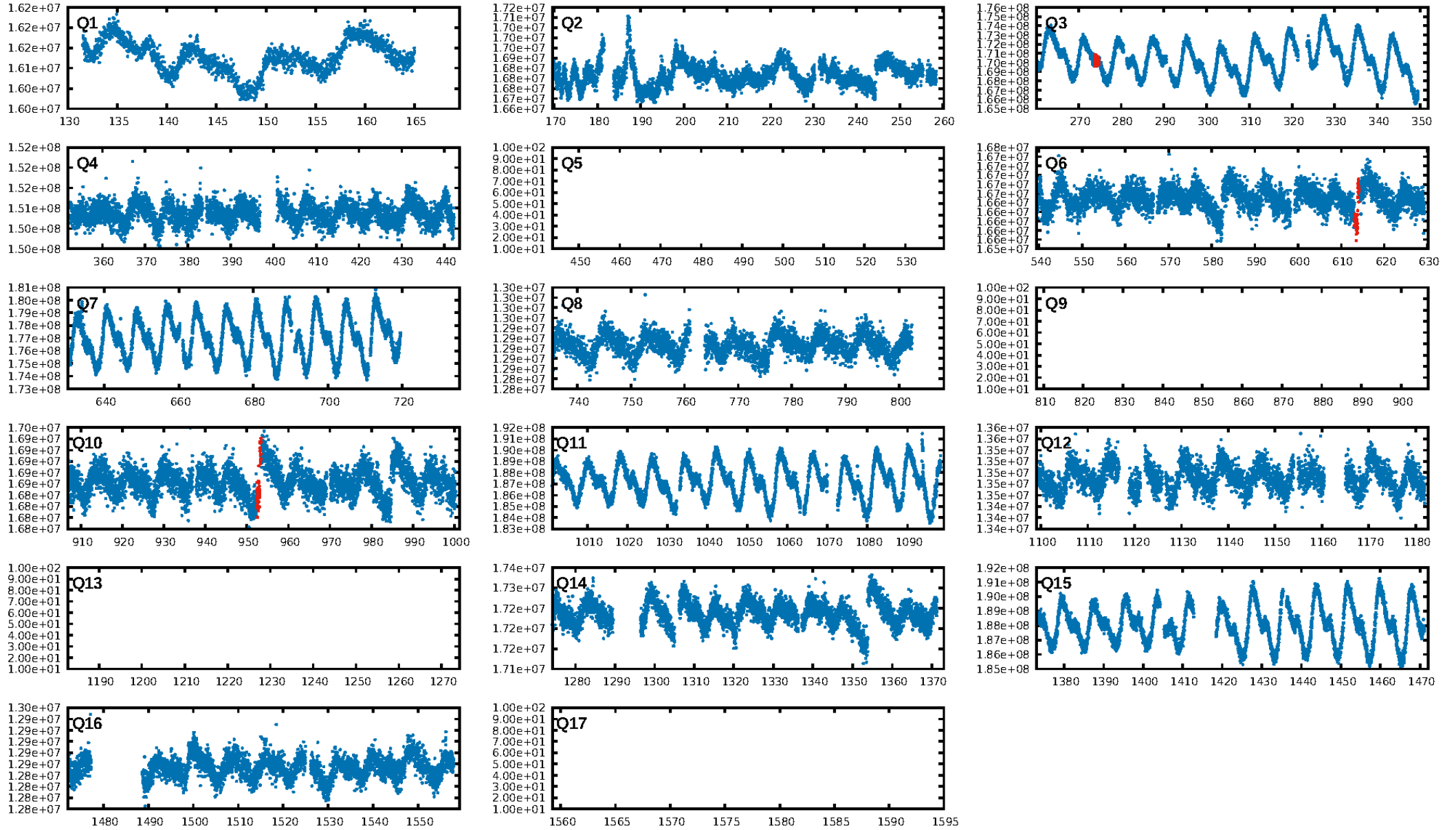
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [317.06 σ]
LongPeriod-sig: 100.0% [94.09 σ]
ModelChiSquare2-sig: 0.8%
ModelChiSquareGof-sig: 96.7%
Bootstrap-pfa: 3.37e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.1228
Centroid-sig: 0.2%
Centroid-so: 4.259 arcsec [99.76 σ]
OotOffset-rm: 7.540 arcsec [2.08 σ]
KicOffset-rm: 8.869 arcsec [4.37 σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-st: 2/1/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

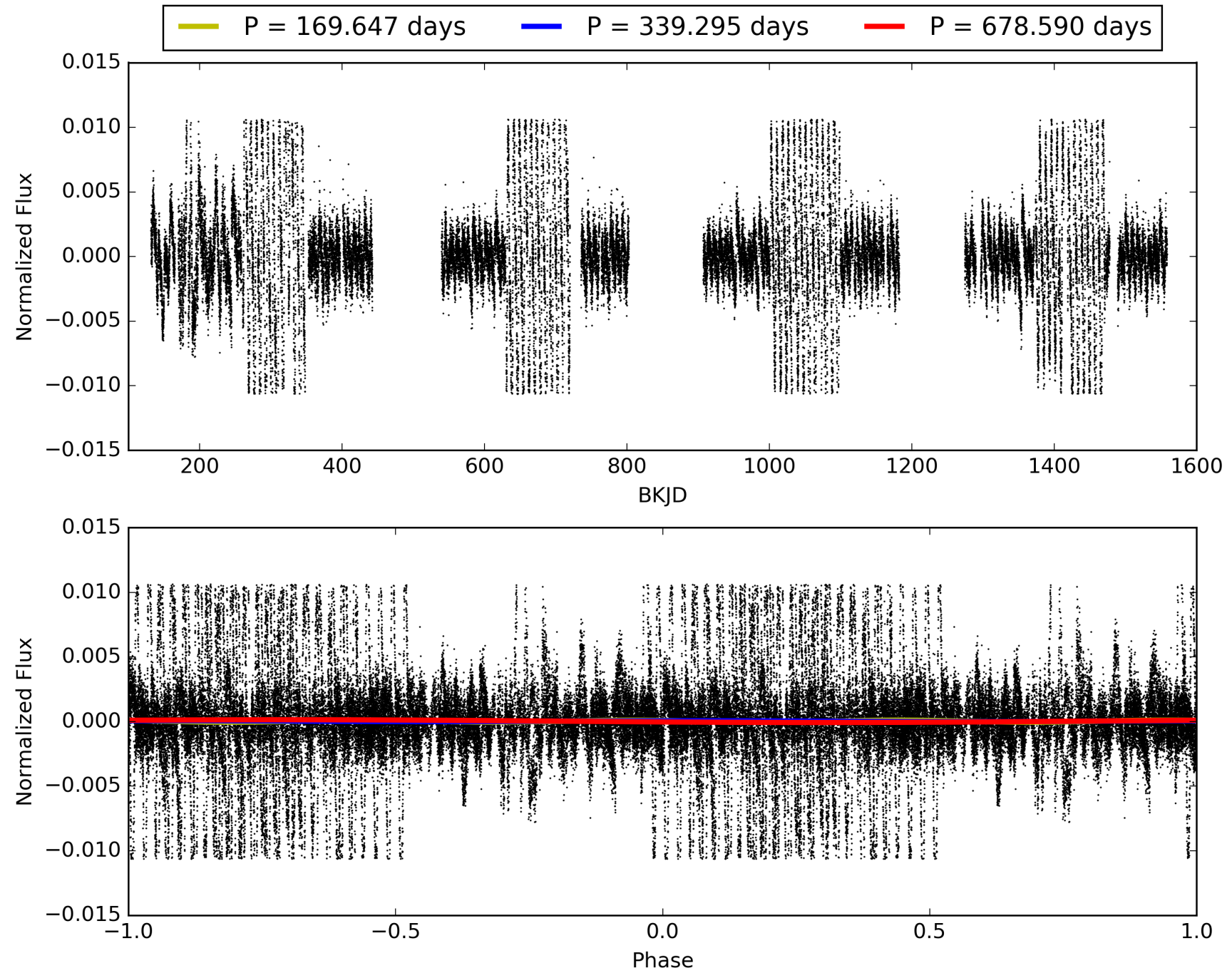
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:00:33 Z

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

TCE 006020848-03, PDC Light Curves

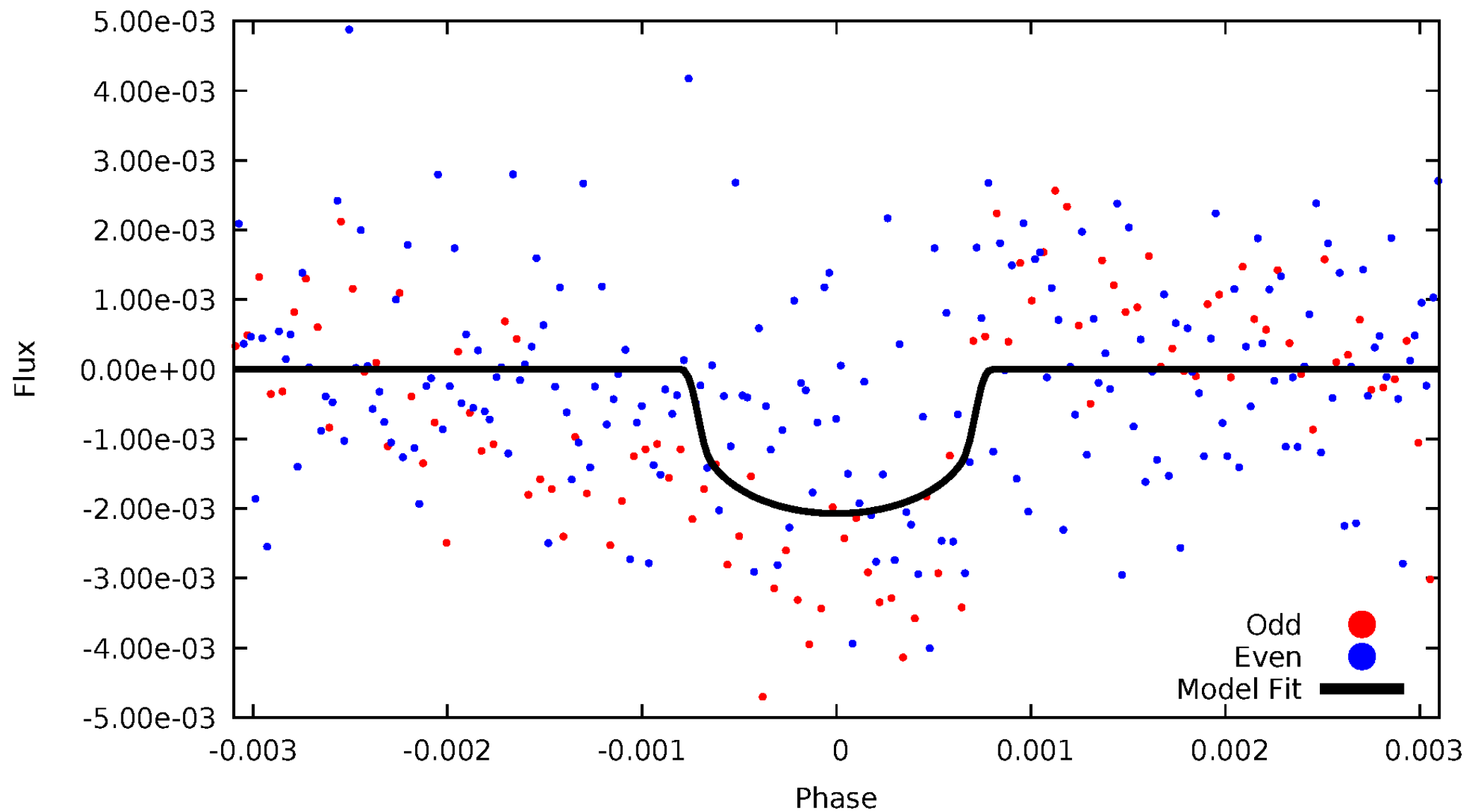


TCE 006020848-03



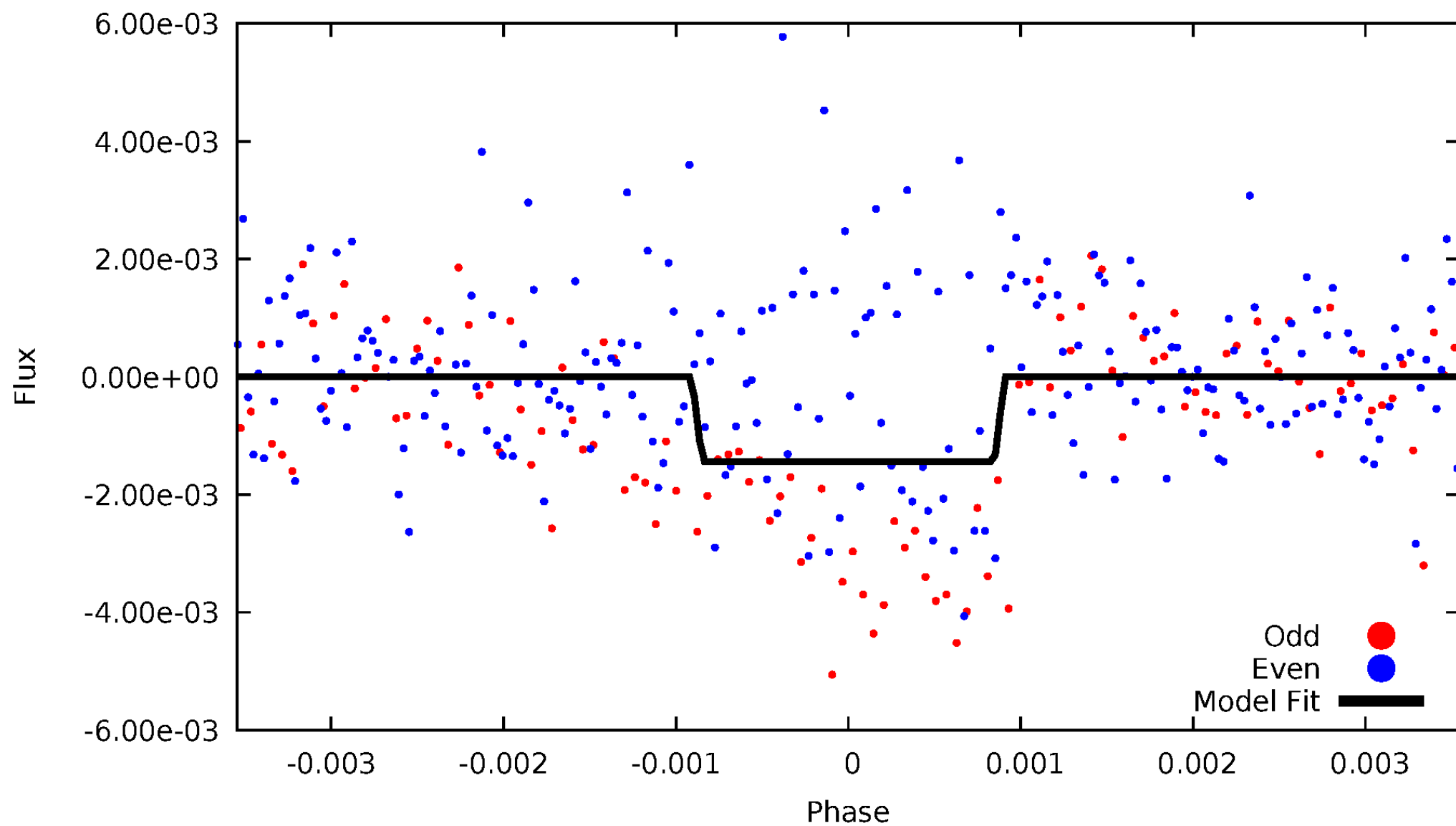
DV Odd/Even

TCE 006020848-03

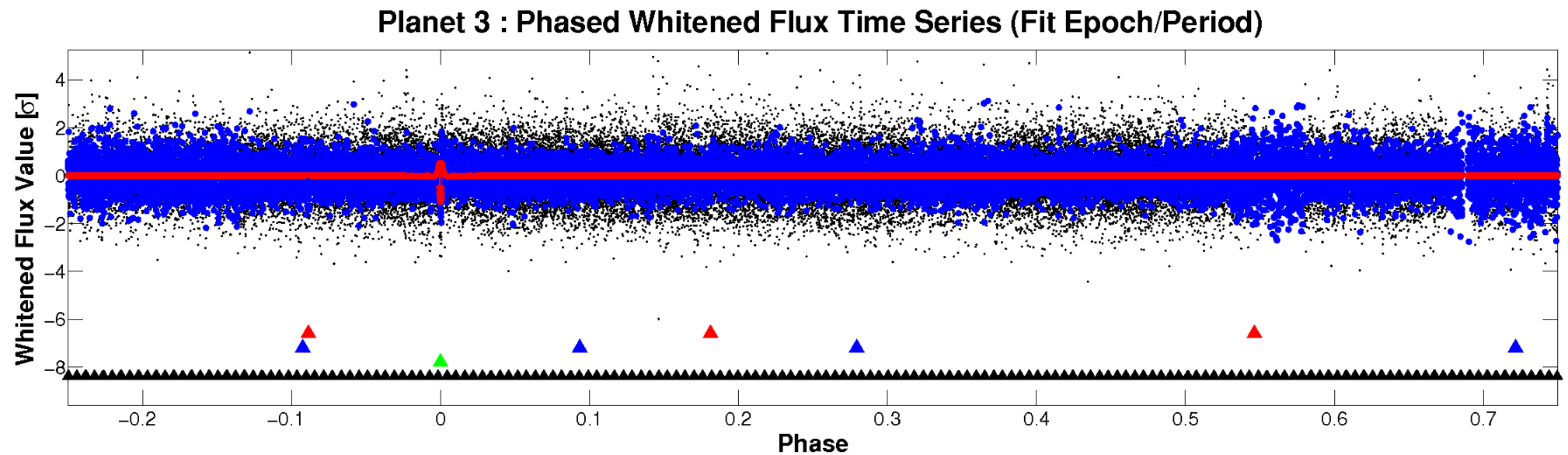
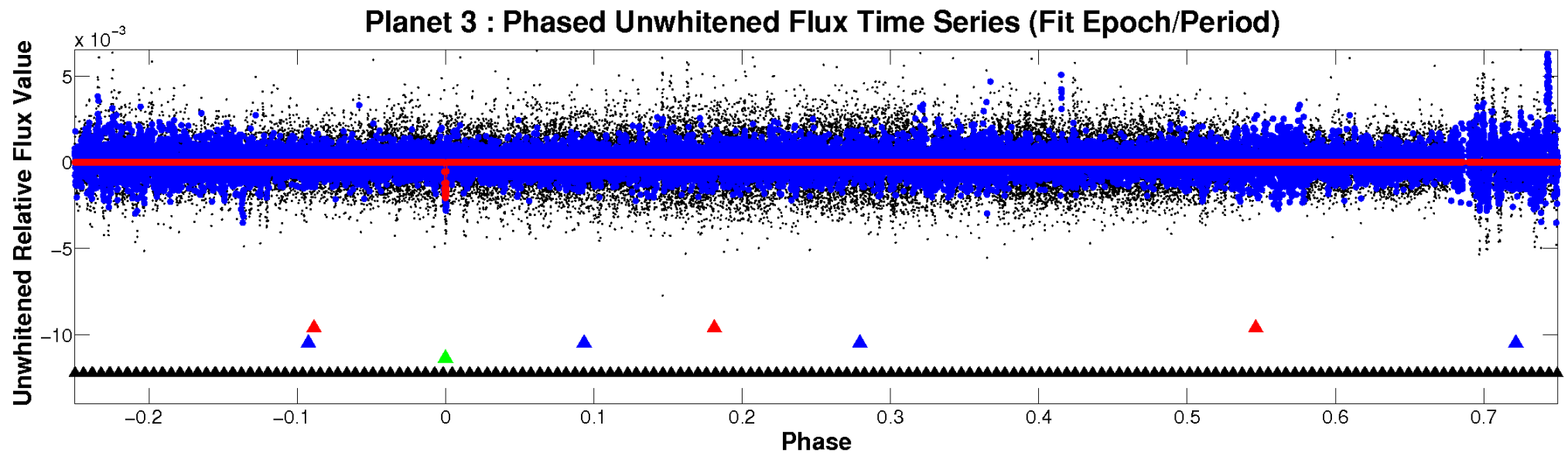


ALT Odd/Even

TCE 006020848-03

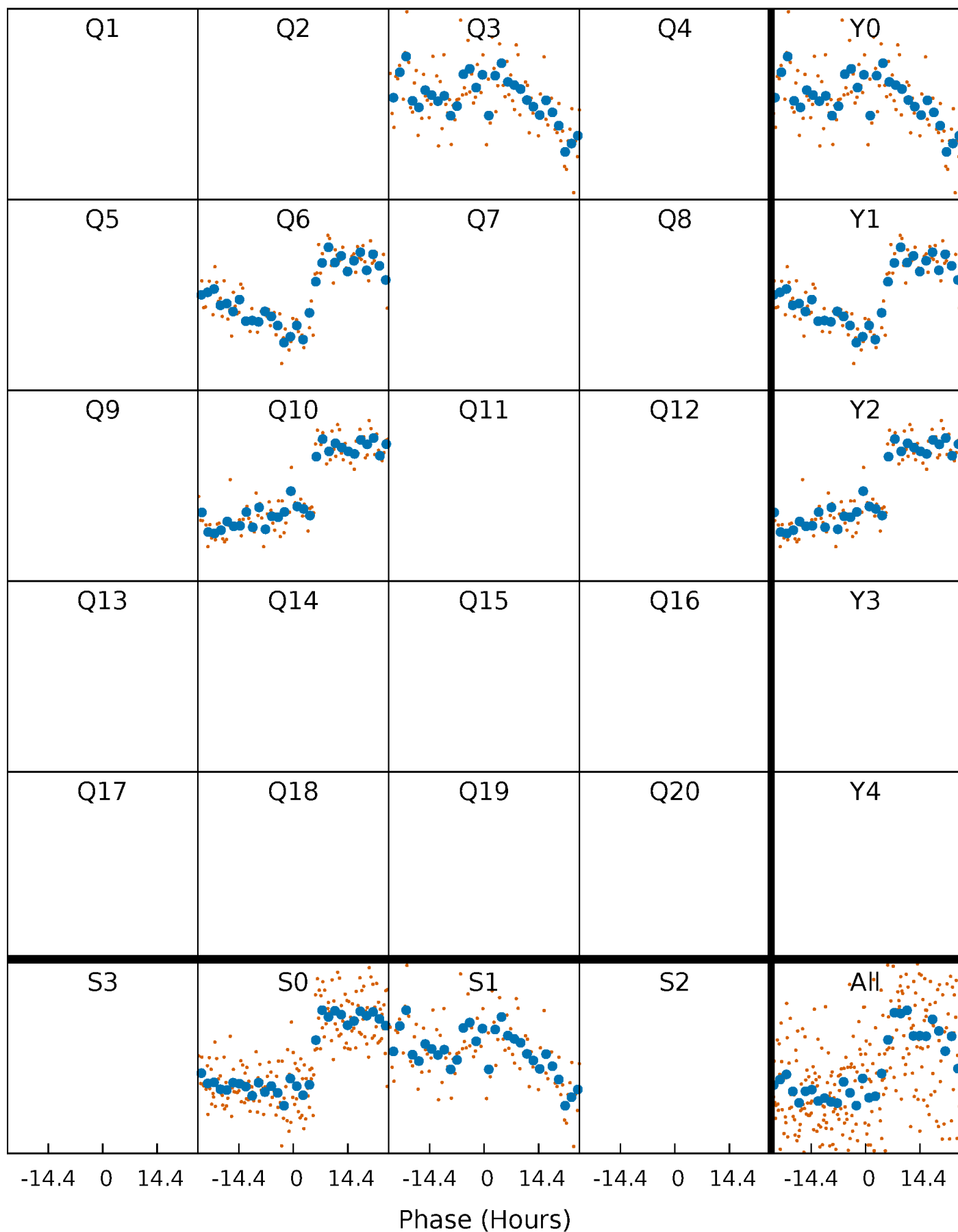


Non-Whitened Vs. Whitened Light Curve



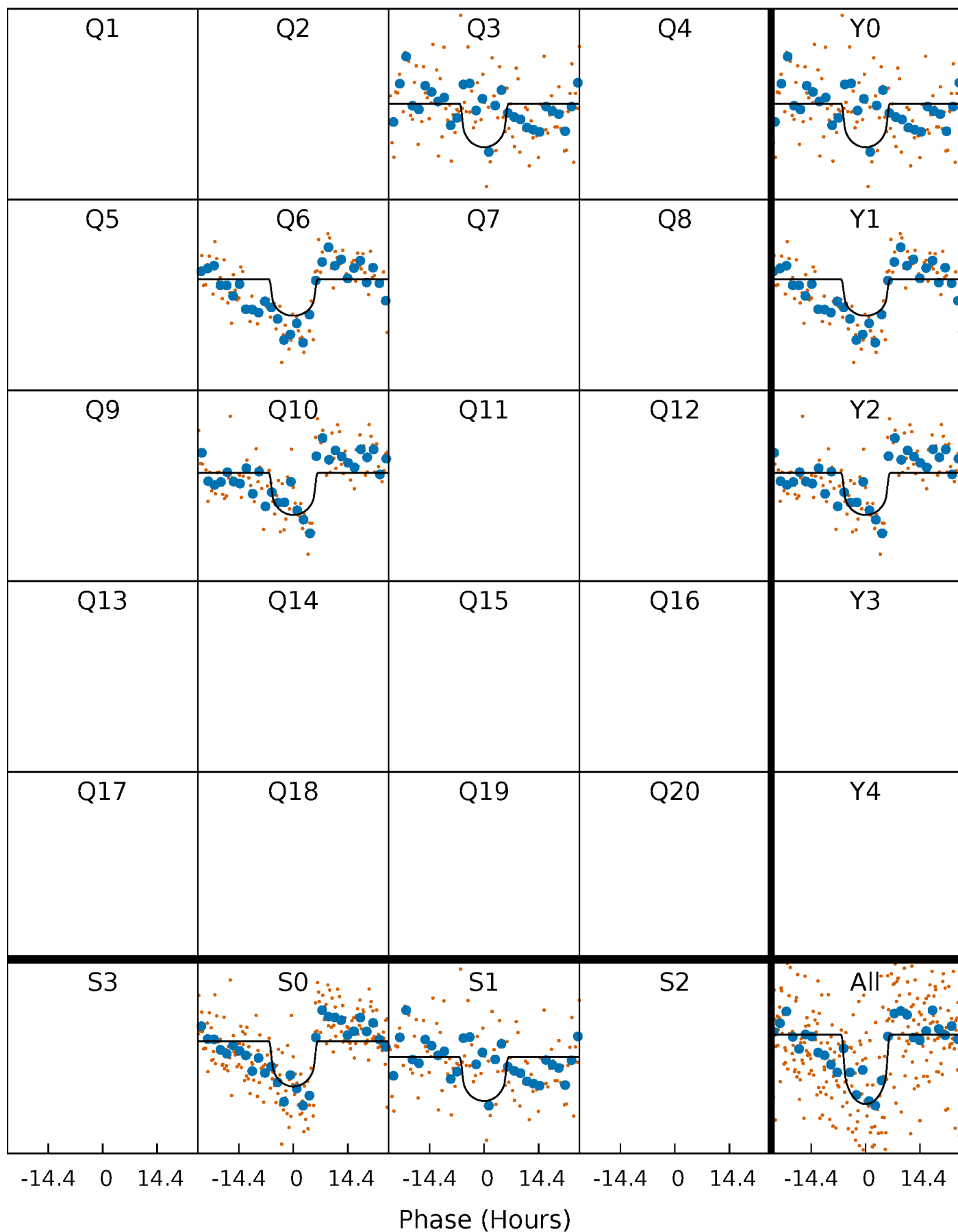
PDC Quarter-Phased Transit Curves

TCE 006020848-03 P=339.294757 Days $T_0=274.294800$ (BKJD)



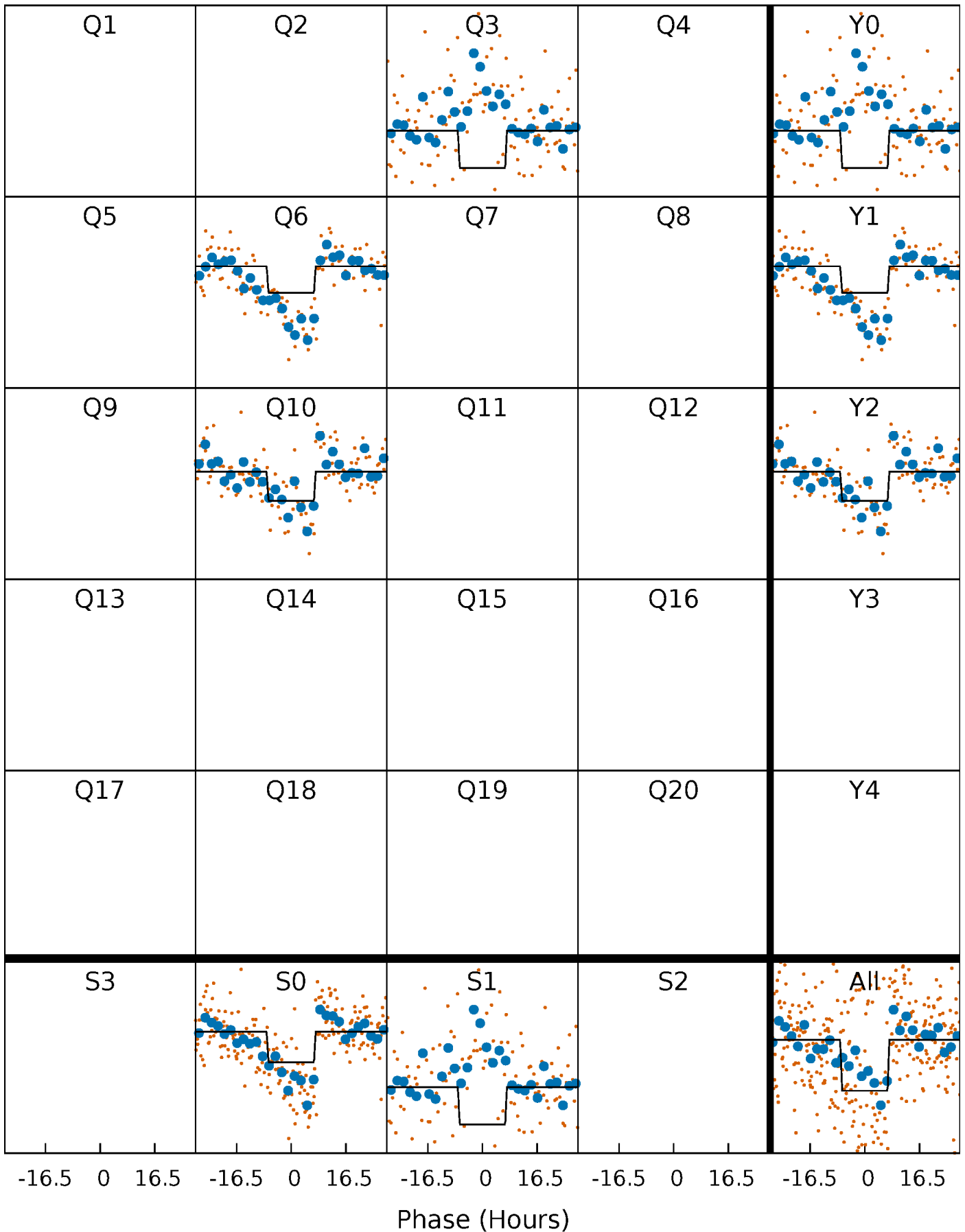
DV Quarter-Phased Transit Curves

TCE 006020848-03 P=339.294757 Days $T_0=274.294800$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

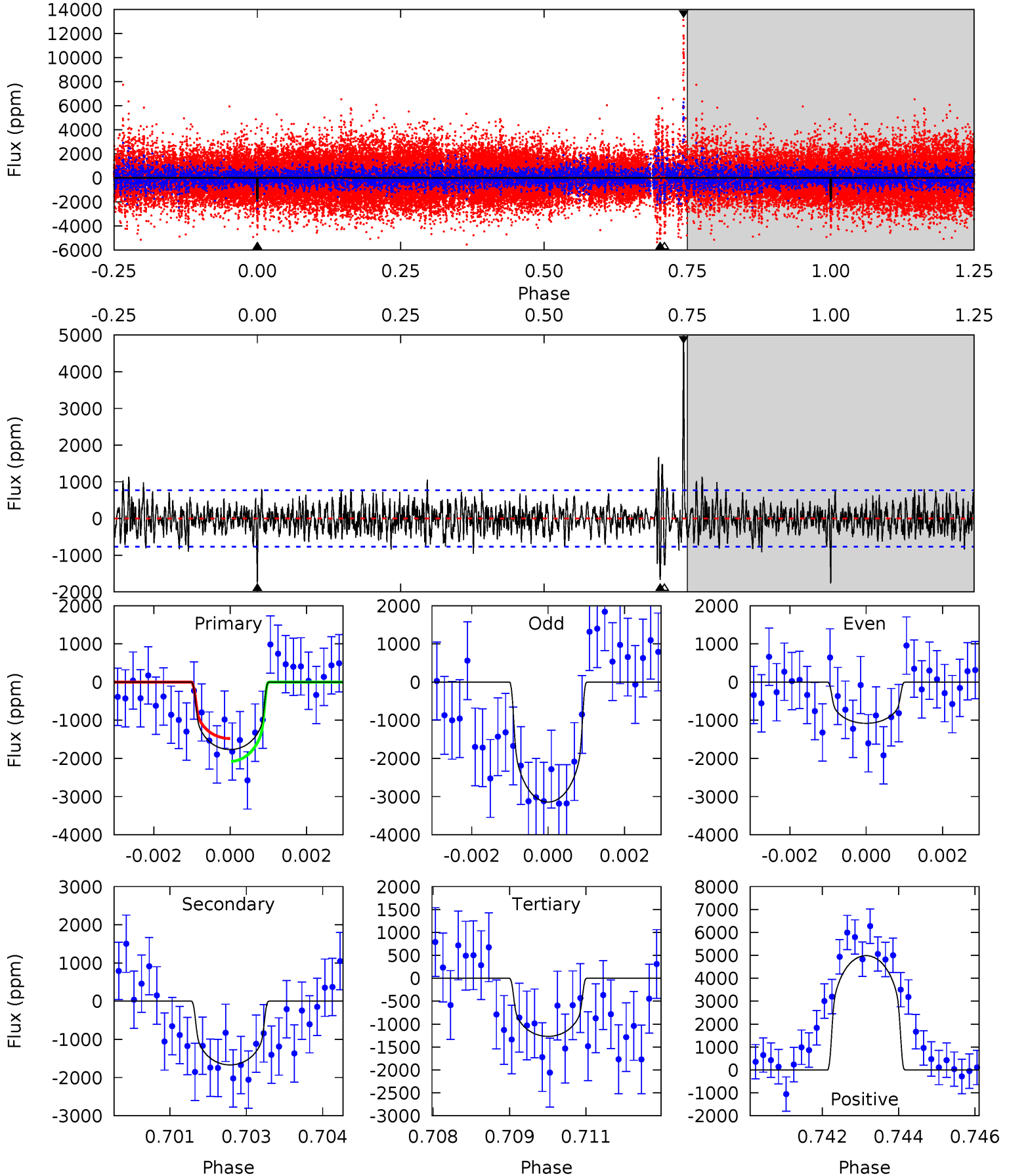
TCE 006020848-03 P=339.326508 Days $T_0=274.166092$ (BKJD)



DV Model-Shift Uniqueness Test

006020848-03, P = 339.294757 Days, E = 274.294800 Days

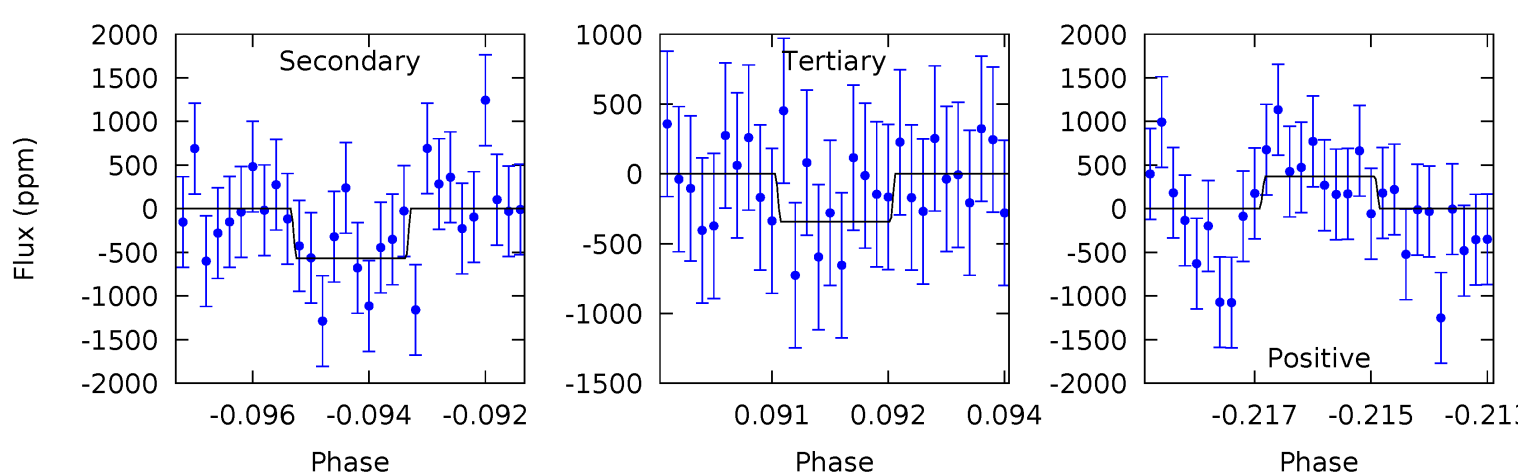
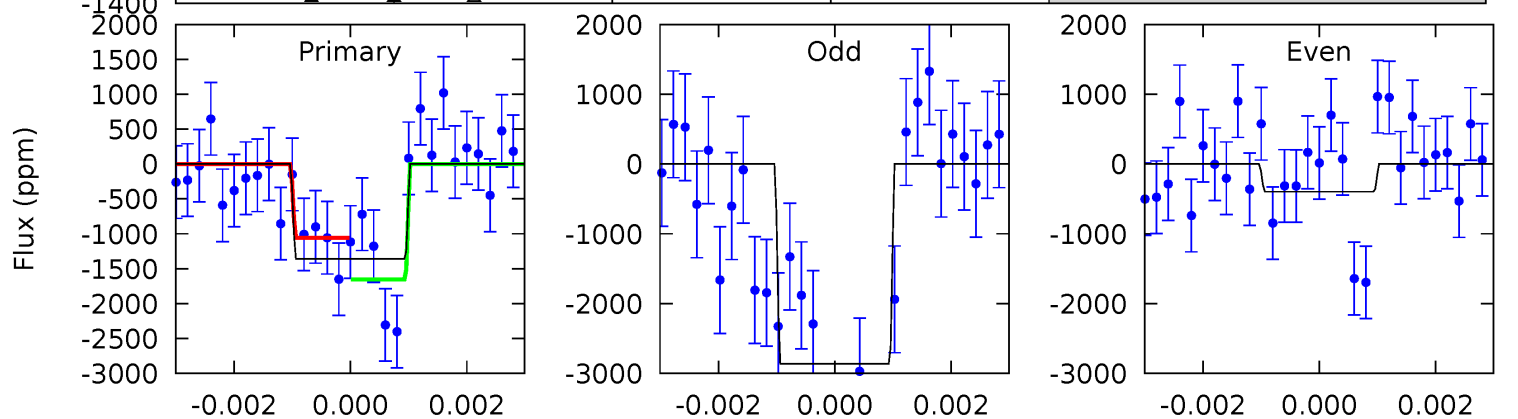
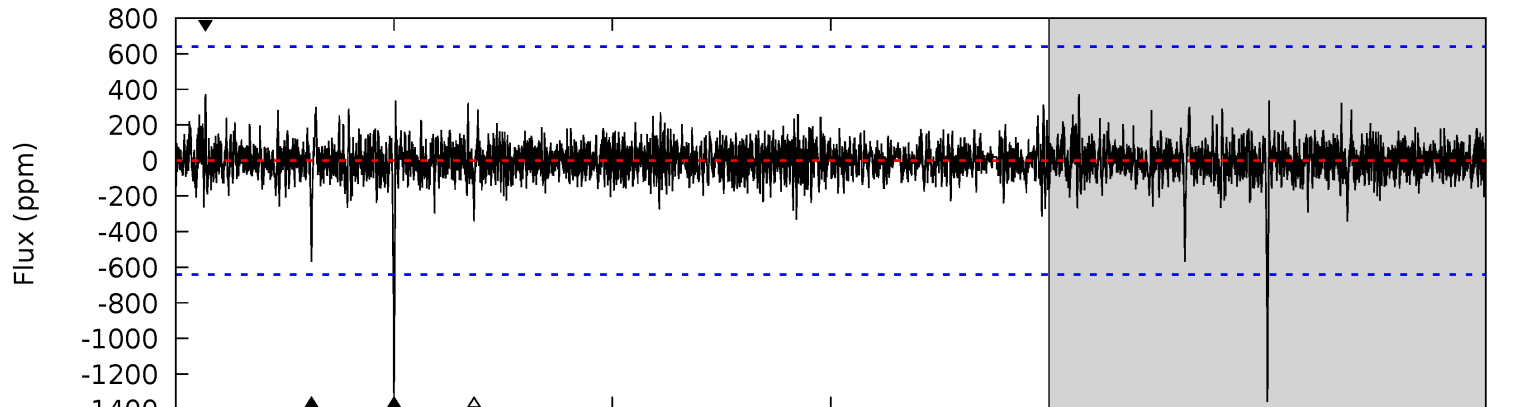
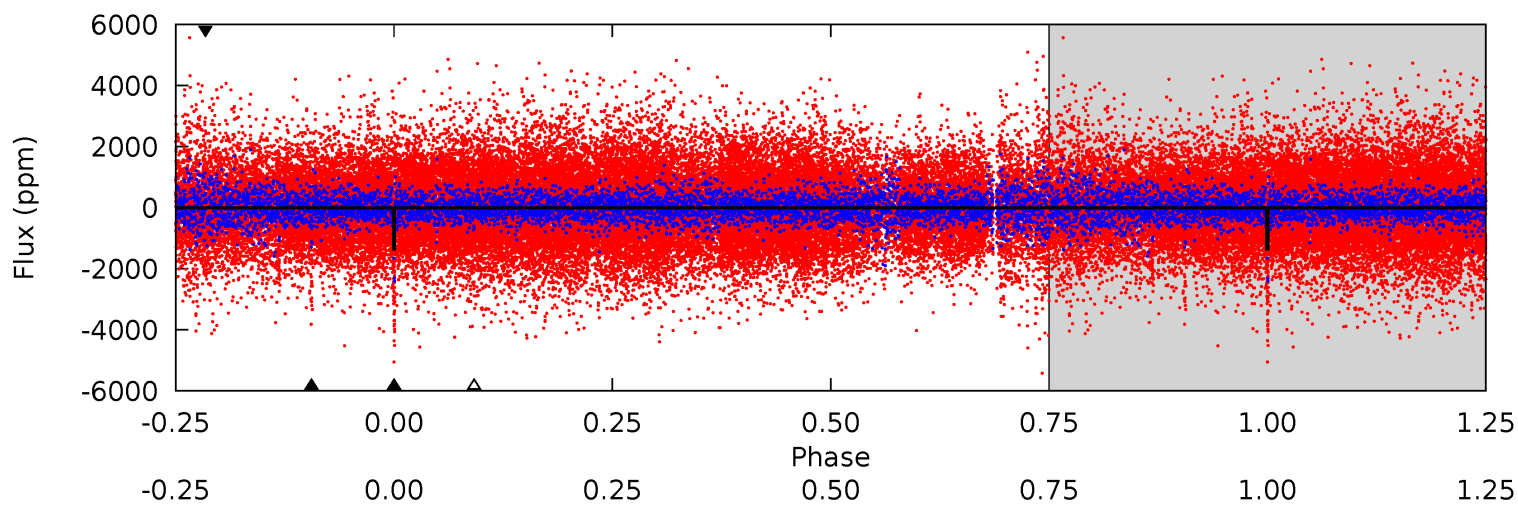
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	11.7	8.86	34.8	5.37	3.16	2.38	3.49	-22.5	2.80	-23.2	7.00	0.92	0.74	2.09



Alt Model-Shift Uniqueness Test

006020848-03, P = 339.326508 Days, E = 274.166092 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	4.74	2.86	3.10	5.35	3.13	0.64	8.47	8.23	1.88	1.64	10.1	0.62	0.21	2.52



Stellar Parameters For KIC 006020848

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4841^{+170}_{-170}	$4.585^{+0.054}_{-0.041}$	$-0.200^{+0.300}_{-0.300}$	$0.707^{+0.062}_{-0.069}$	$0.702^{+0.083}_{-0.053}$	$2.800^{+0.675}_{-0.454}$
	+4%/-4%	+1%/-1%	+150%/-150%	+9%/-10%	+12%/-8%	+24%/-16%
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 006020848-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1669 ± 143	$3.38^{+1.12}_{-1.07}$	272^{+11}_{-11}	4722^{+897}_{-531}	57855^{+65369}_{-25274}
Alt.	-568 ± 120	$2.91^{+1.11}_{-1.06}$	272^{+11}_{-11}	4059^{+791}_{-487}	26443^{+40570}_{-13330}

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

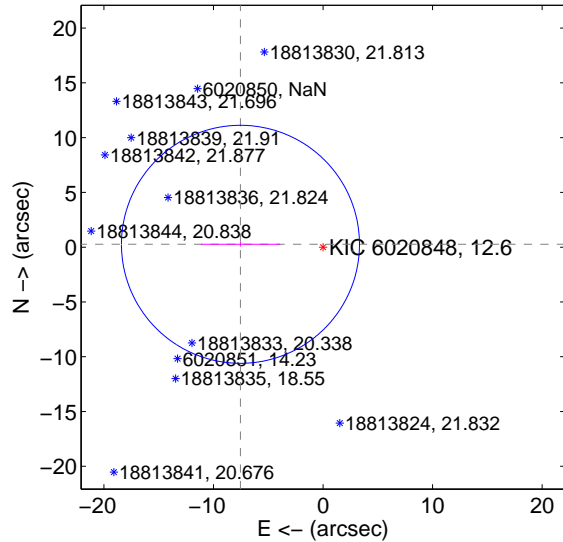
Supplemental centroid analysis for 006020848-03. Kepler magnitude: 12.60. Transit SNR 8.56

There are 2 quarters with good PRF difference image offsets

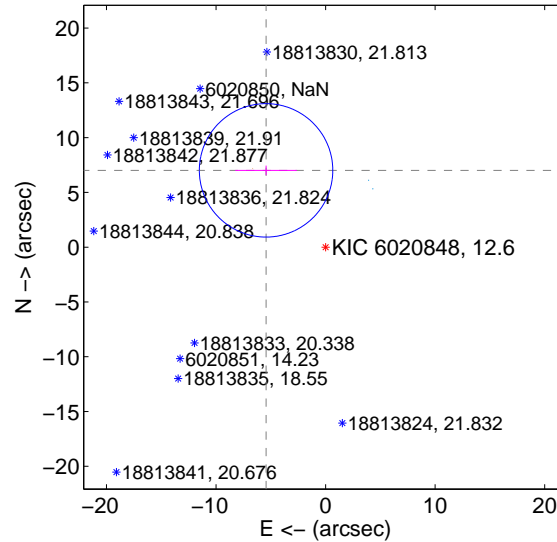
The OOT PRF centroid is offset from the target star catalog position by about 5.81 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	7.540 ± 3.620	2.08	7.535 ± 3.620	0.261 ± 0.206
PRF-fit source offset from KIC position	8.869 ± 2.030	4.37	5.432 ± 2.806	7.010 ± 0.434
photometric centroid source offset	4.26 ± 0.04	99.76	1.43 ± 0.06	4.01 ± 0.04

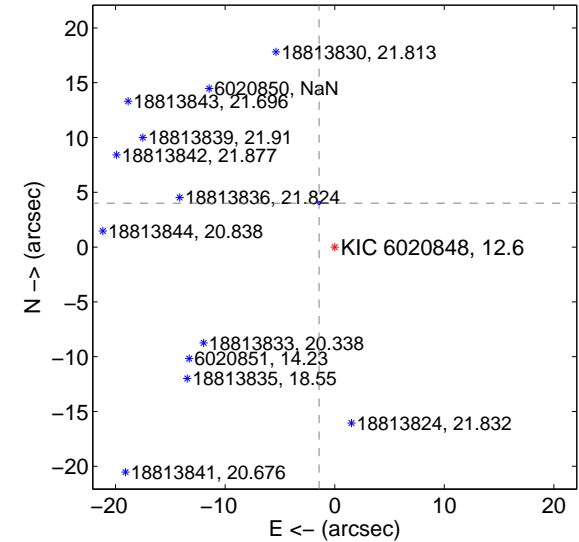
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

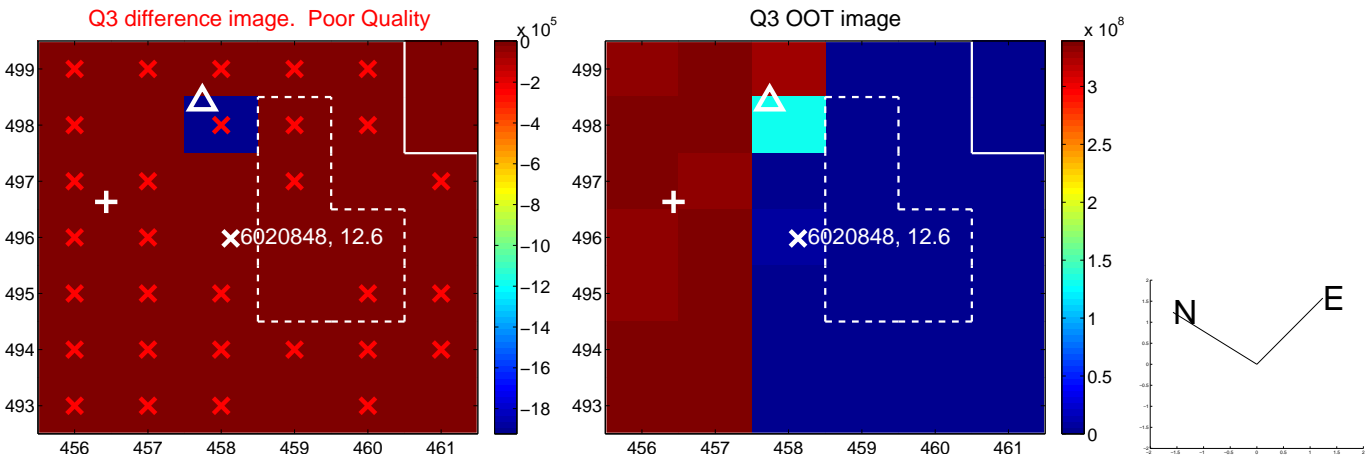


offset from photometric centroids

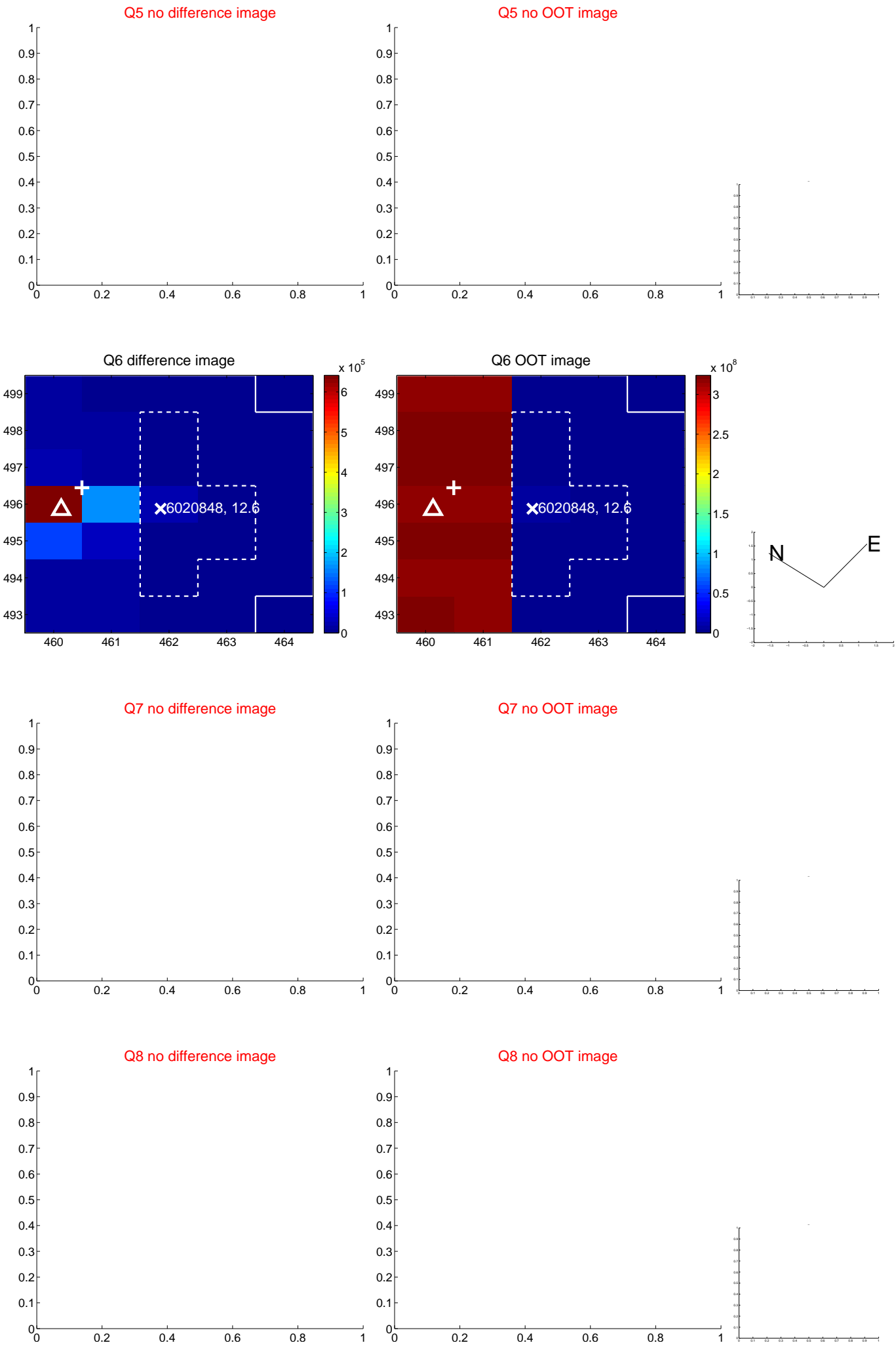


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

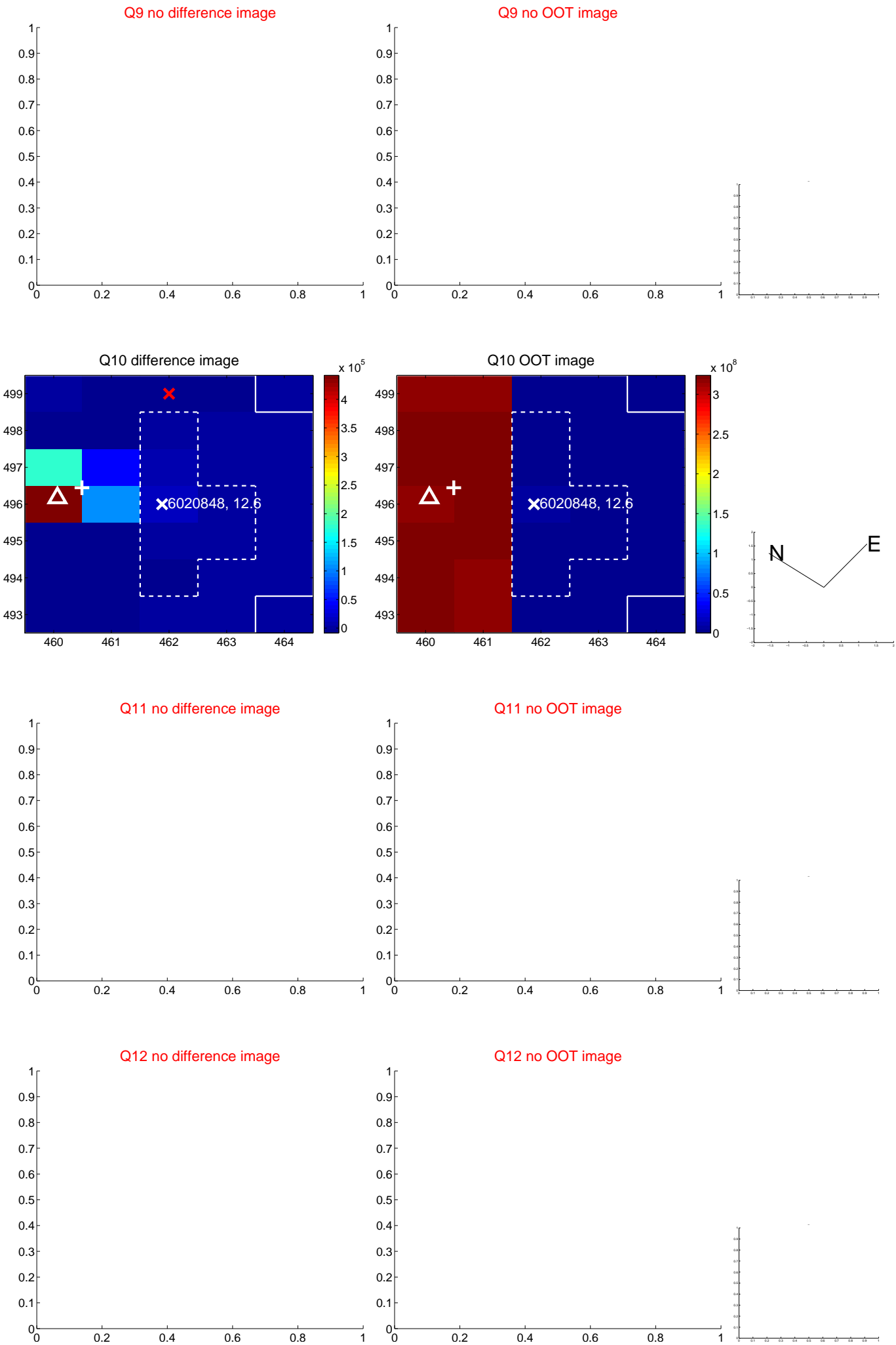
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



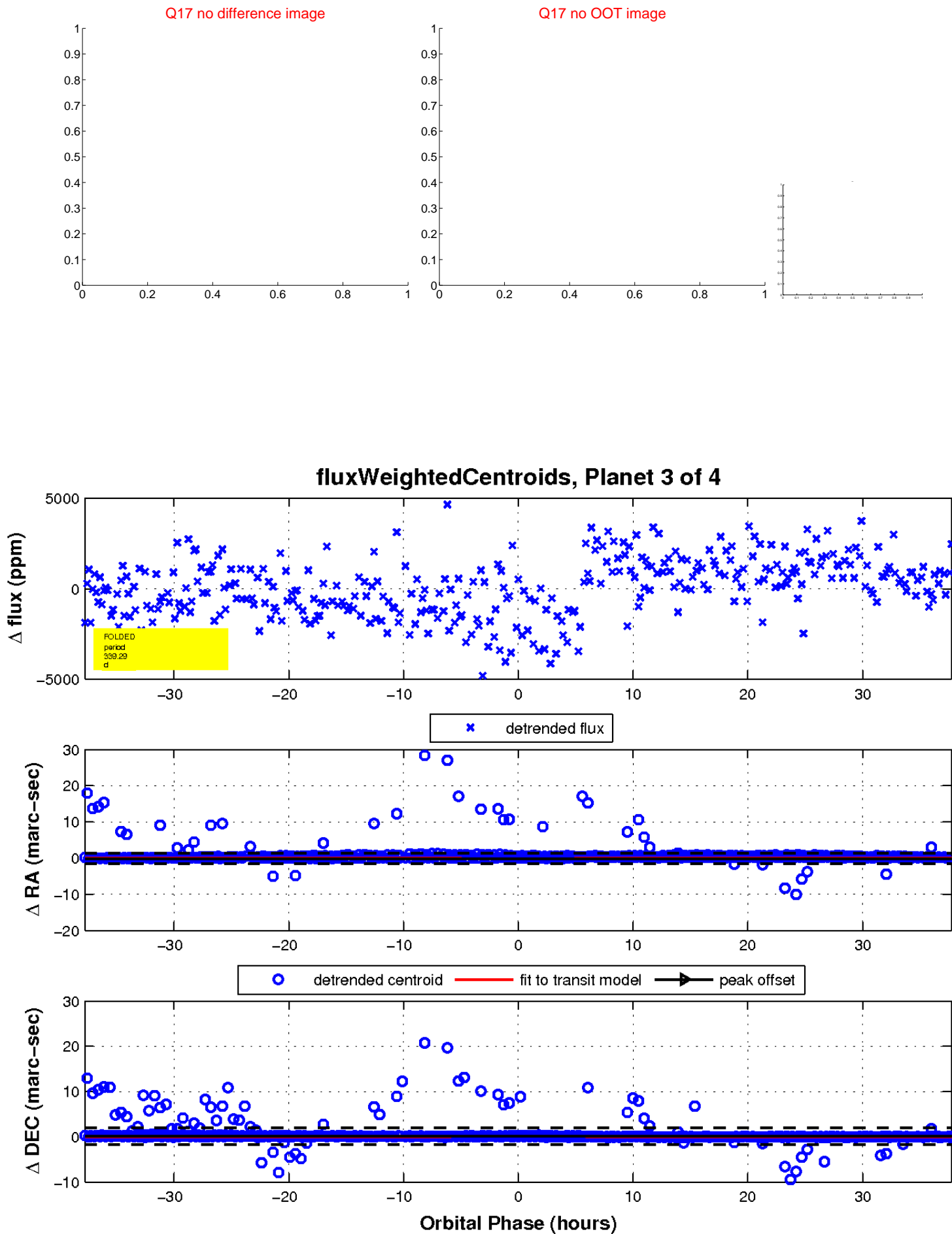
white \times : KIC target position; $+$: OOT centroid; Δ : difference centroid. red \times : large negative pixel value.



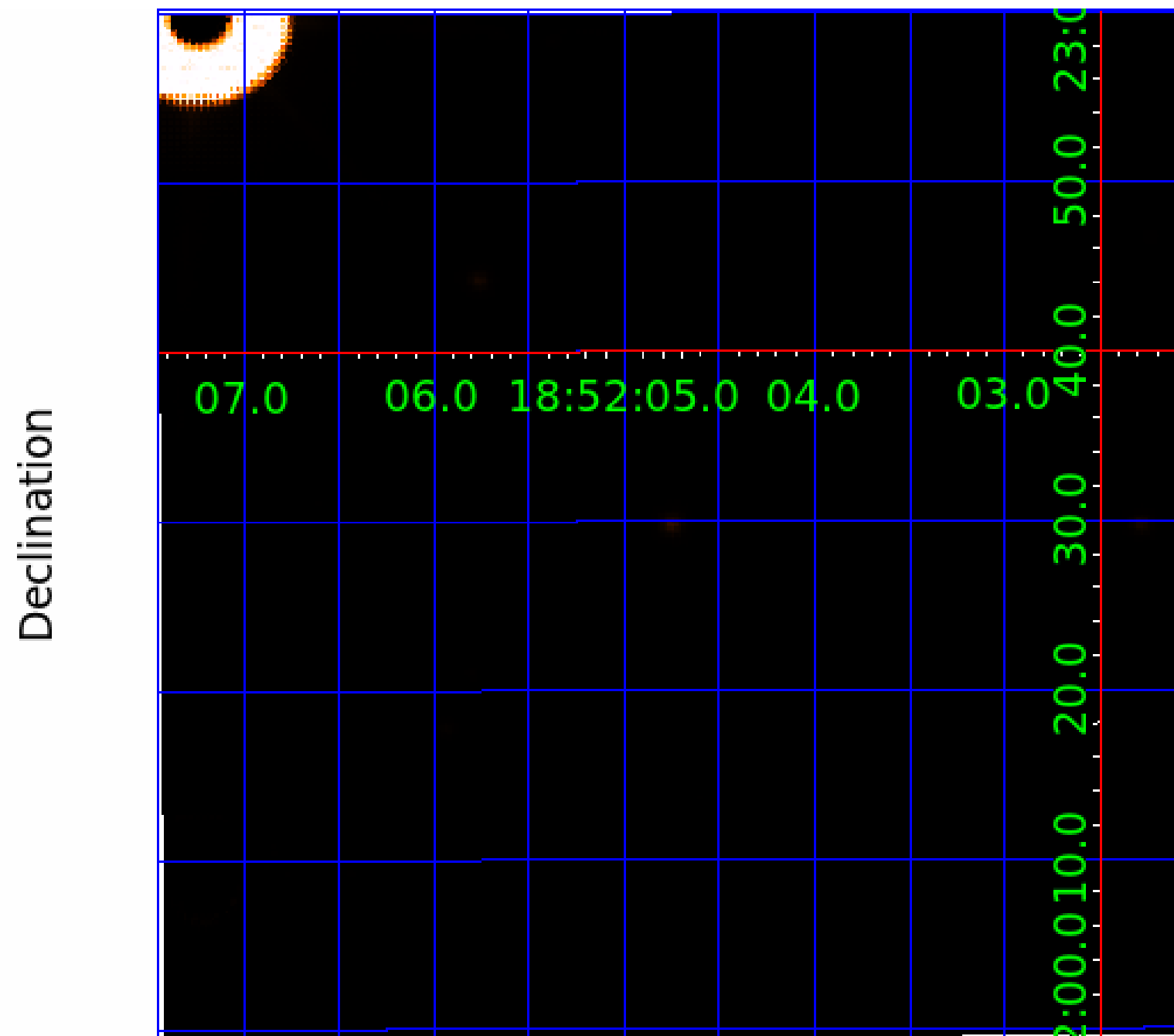
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 006020848

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})
006020848-01	OBS	No	554.729874	244.221843	2931.0	9.064	12.6	11.6	0.71	4841	3.75	0.18
006020848-02	OBS	No	402.374396	179.855485	2115.4	9.986	8.8	9.0	0.71	4841	3.21	0.27
006020848-03	OBS	No	339.294757	274.294800	2070.3	12.617	9.2	8.6	0.71	4841	3.35	0.34
006020848-04	OBS	No	4.016242	133.098873	189.5	22.020	7.1	7.3	0.71	4841	0.94	127.40

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006020848-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006020848-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—CENT_FEW_DIFFS
006020848-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
006020848-04	OBS	FP	0.00	1	0	1	0	SWEET_NTL—LPP_DV—CENT_RESOLVED_OFFSET

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

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

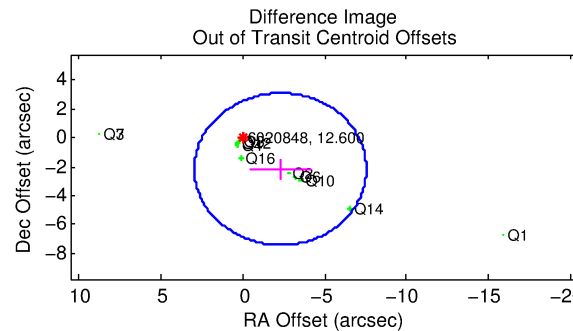
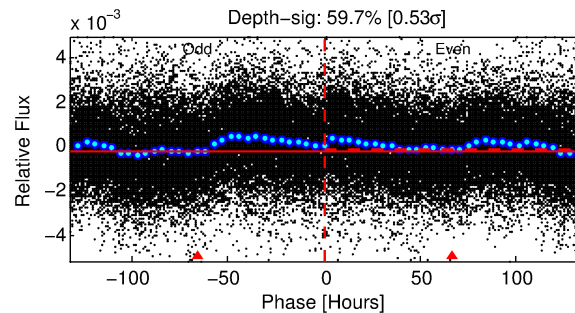
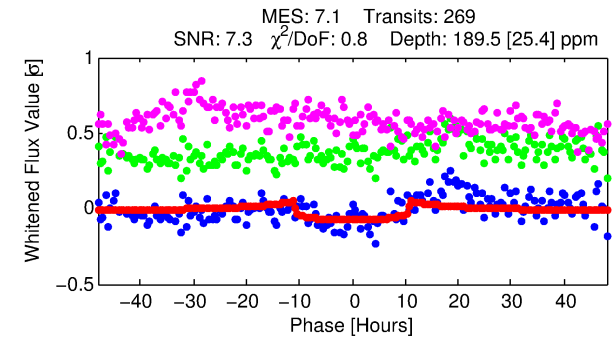
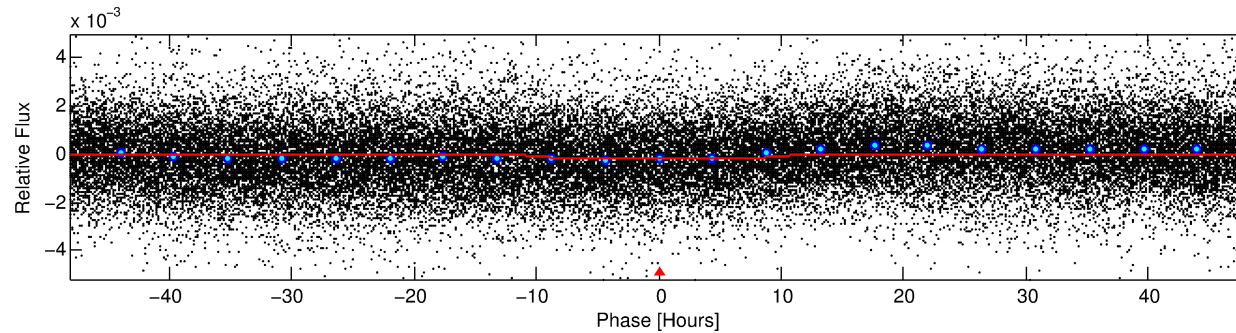
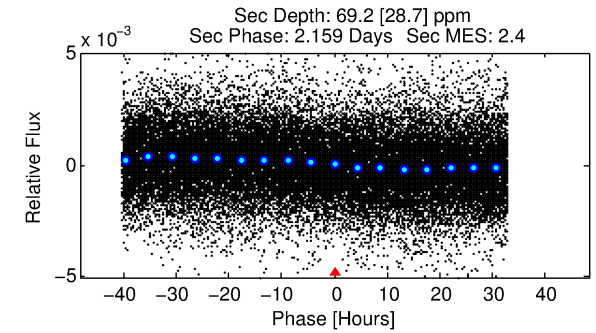
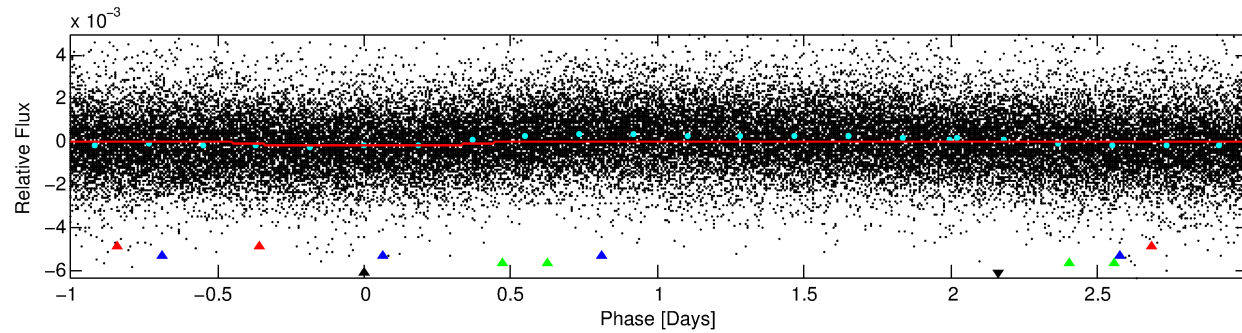
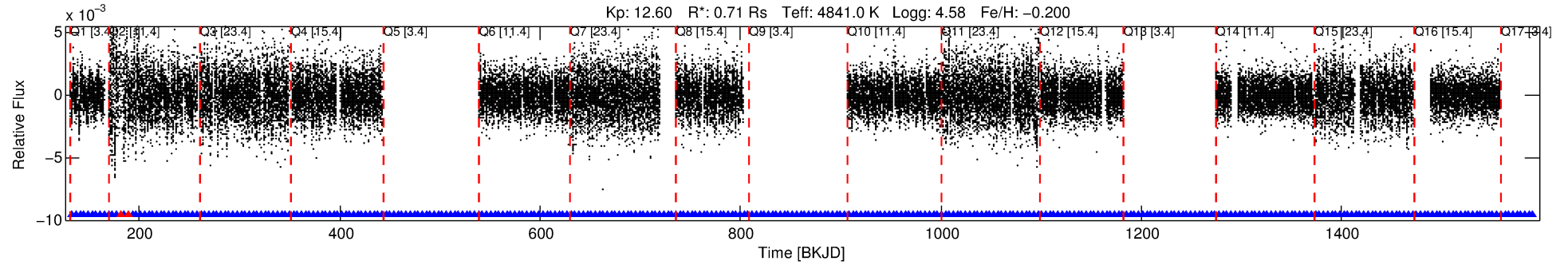
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006020848-04

No Significant Match Found

DV One-Page Summary

KIC: 6020848 Candidate: 4 of 4 Period: 4.016 d



DV Fit Results:

Period = 4.01624 [0.00010] d
Epoch = 133.0989 [0.0178] BKJD
Rp/R* = 0.0122 [0.0099]
a/R* = 1.54 [2.40]
b = 0.07 [39.28]
Seff = 127.40 [22.37]
Teq = 857 [38] K
Rp = 0.94 [0.77] Re
a = 0.0439 [0.0034] AU
Ag = 83.46 [140.52] [0.59σ]
Teffp = 4003 [1688] K [1.86σ]

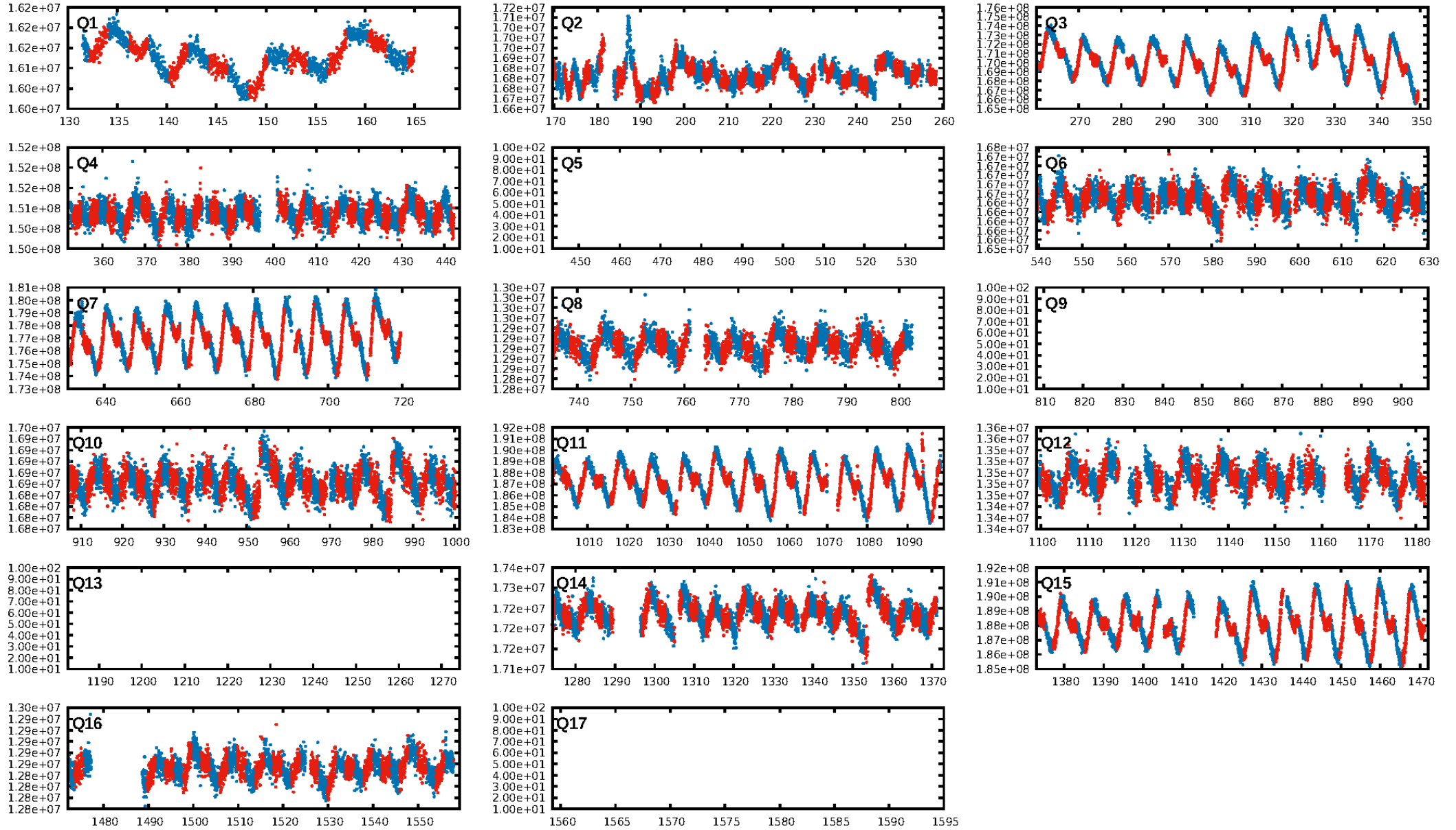
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [317.06σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.29e-16
RollingBand-fgt: 0.99 [258/260]
GhostDiagnostic-chr: -0.4706
Centroid-sig: 0.0%
Centroid-so: 4.252 arcsec [79.53σ]
OotOffset-rm: 3.165 arcsec [1.81σ]
KicOffset-rm: 5.578 arcsec [5.68σ]
OotOffset-st: 4/2/4/1 [11]
KicOffset-st: 4/4/4/1 [13]
DiffImageQuality-fgm: 0.38 [5/13]
DiffImageOverlap-fno: 1.00 [13/13]

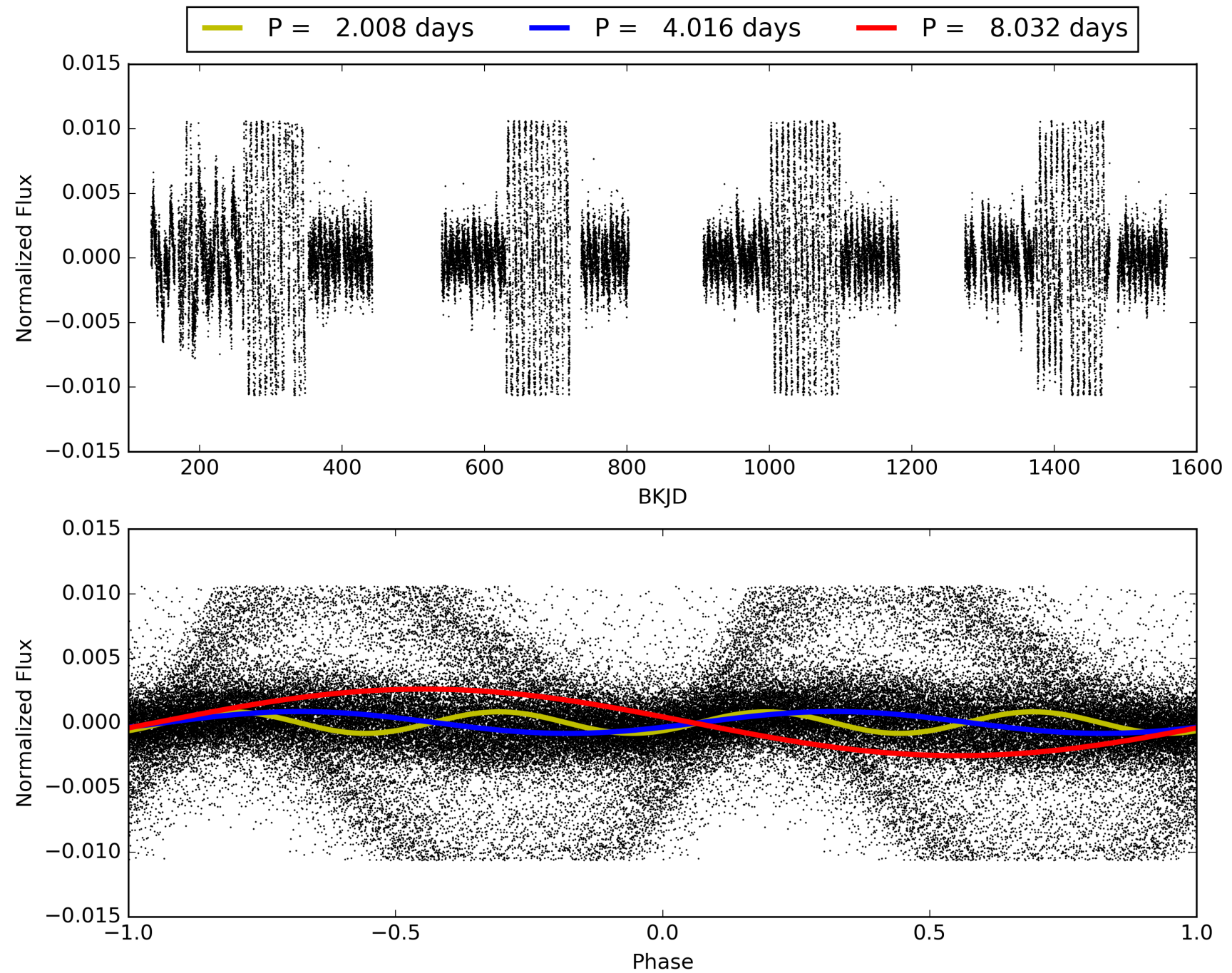
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 17:00:42 Z

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

TCE 006020848-04, PDC Light Curves

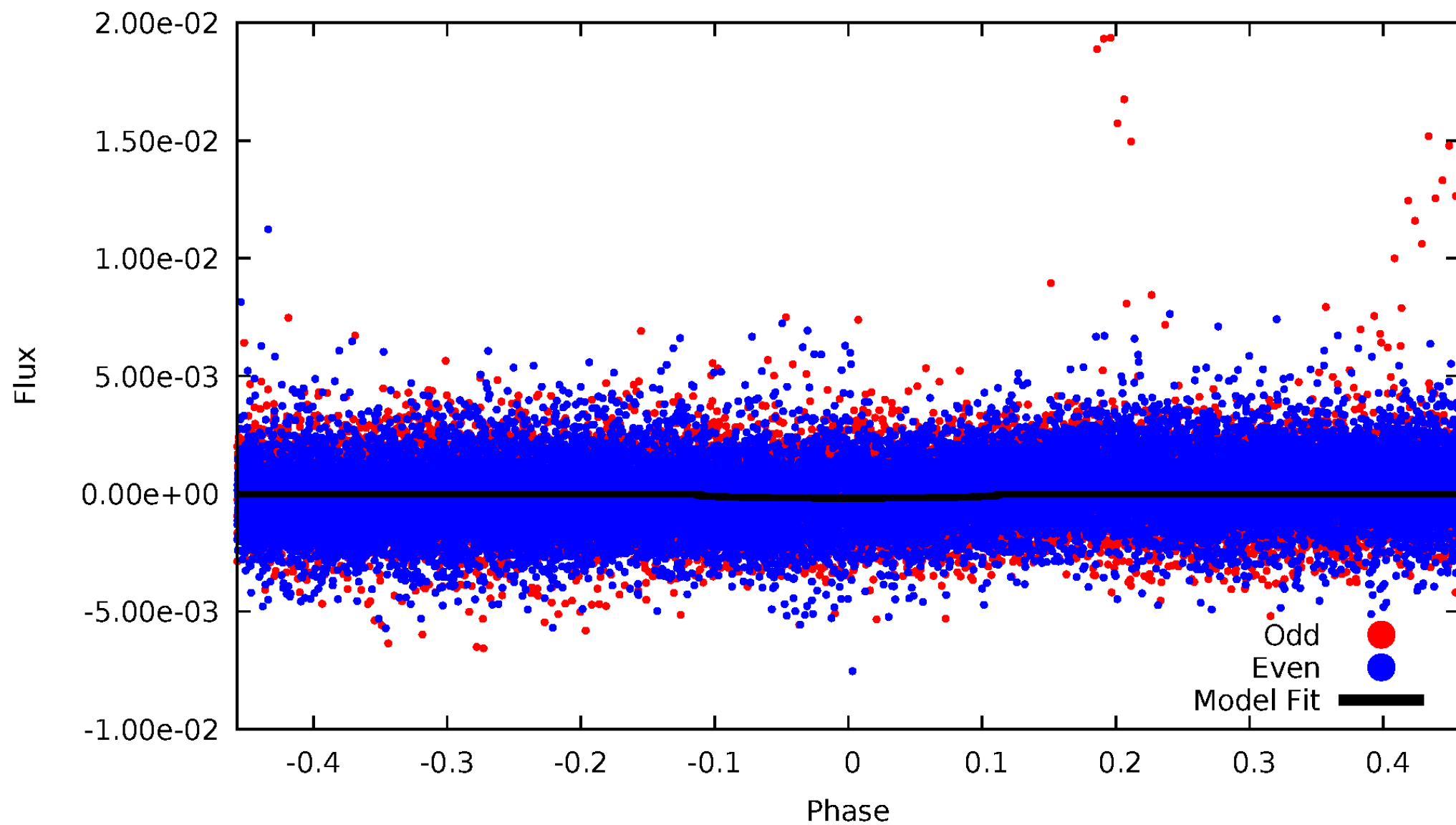


TCE 006020848-04



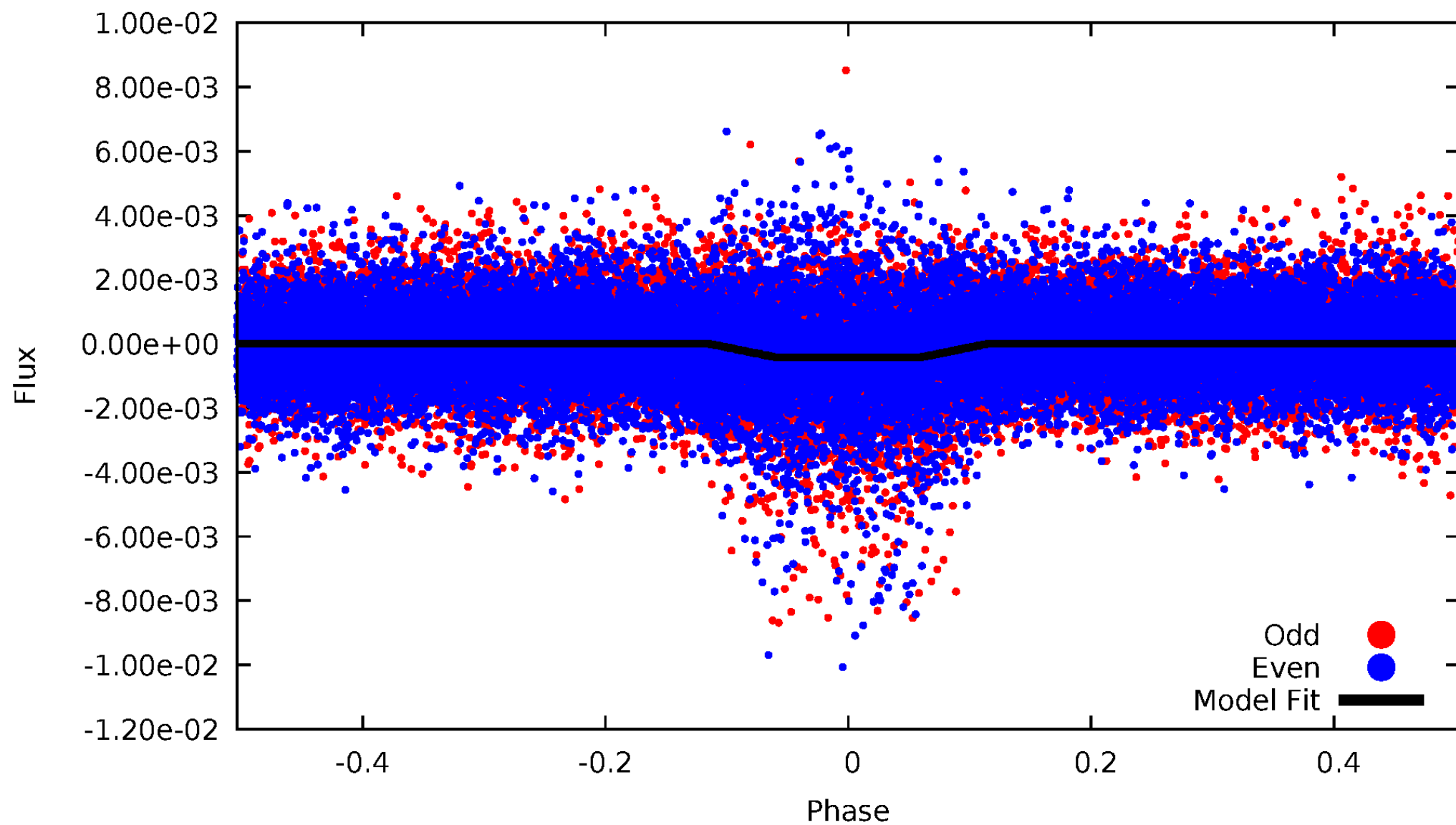
DV Odd/Even

TCE 006020848-04



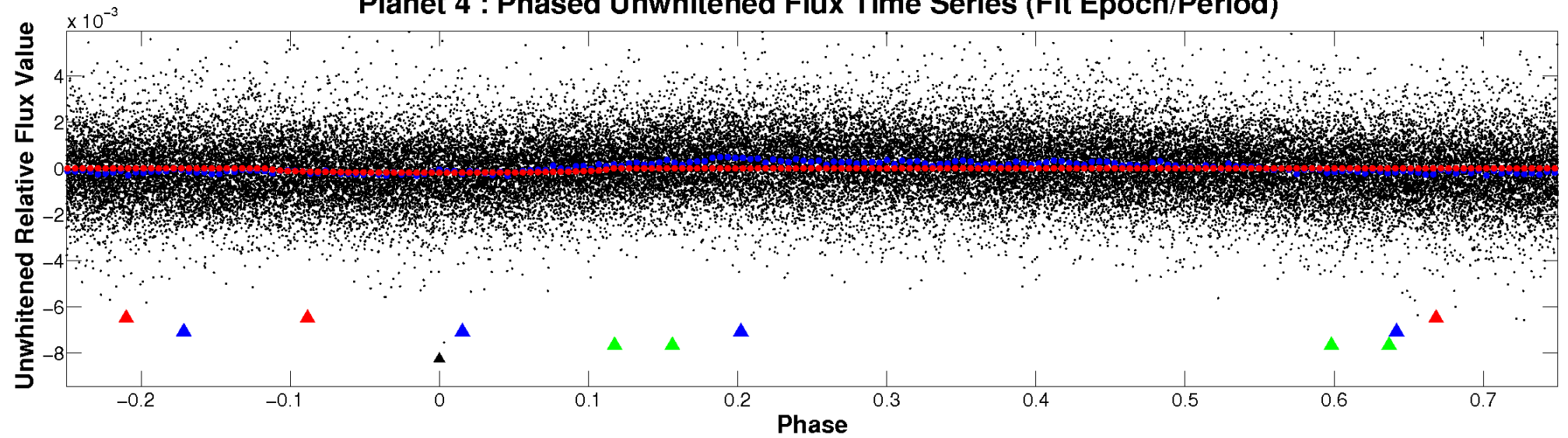
ALT Odd/Even

TCE 006020848-04

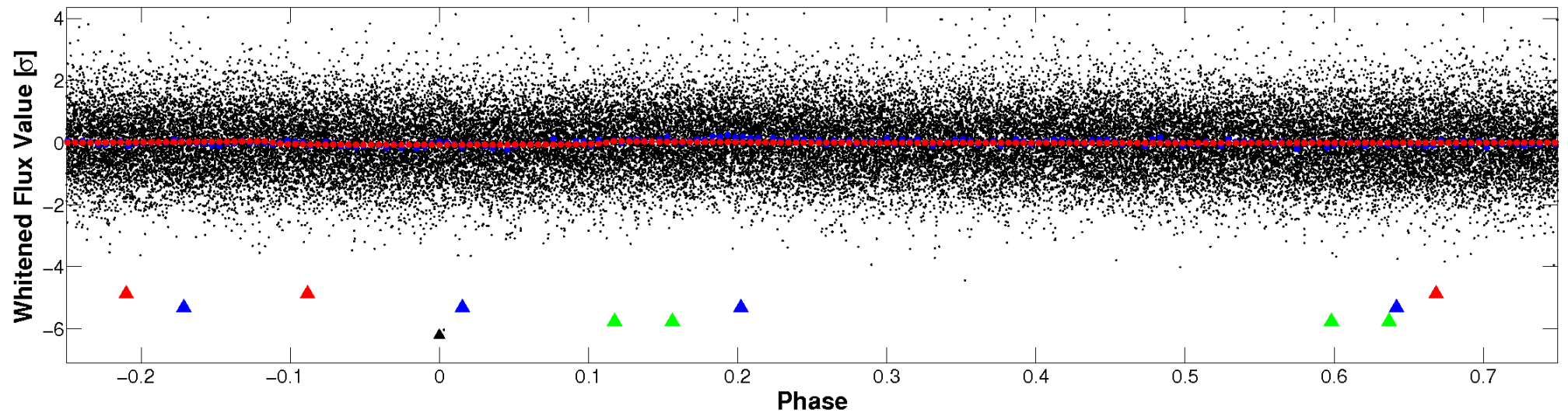


Non-Whitened Vs. Whitened Light Curve

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

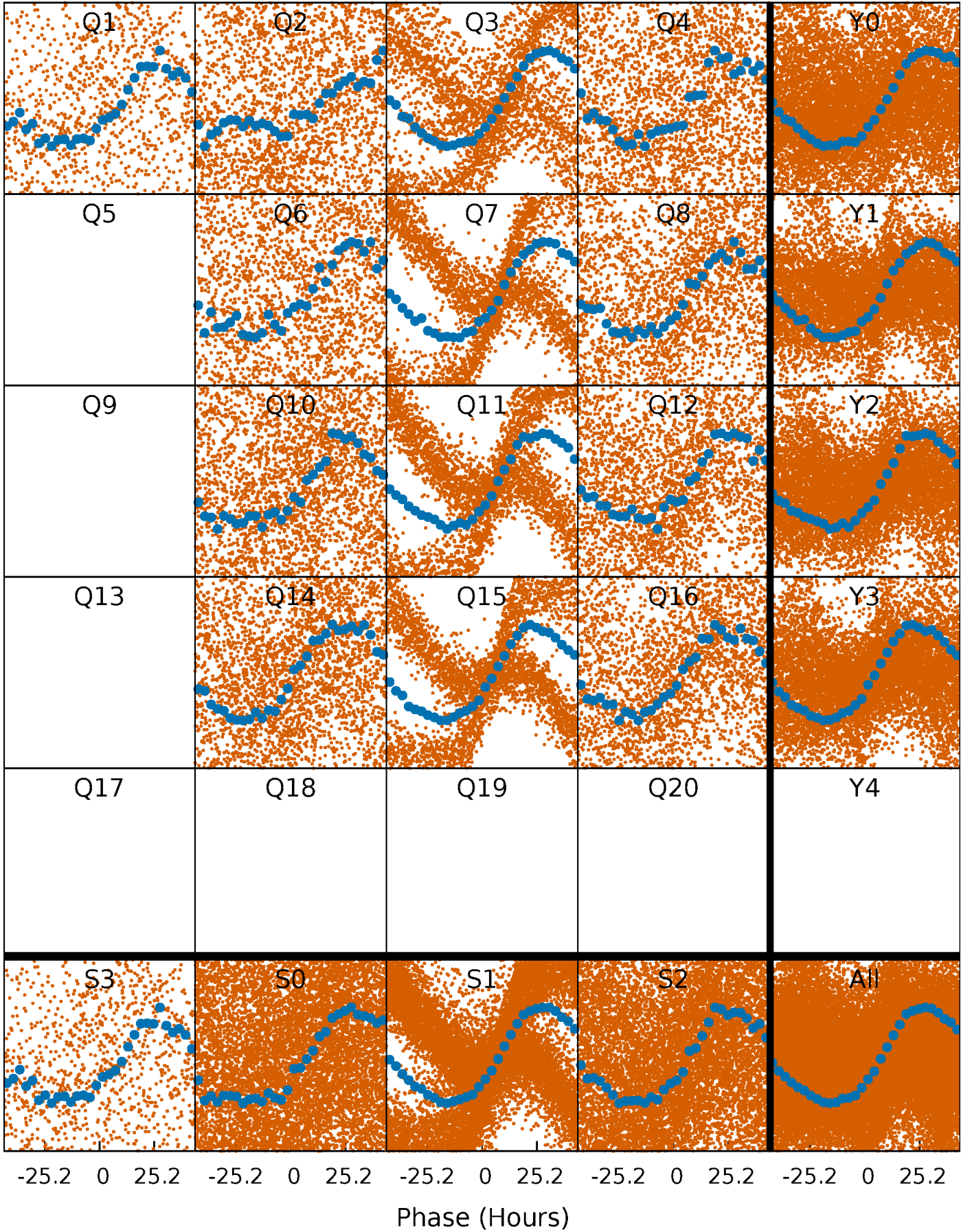


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



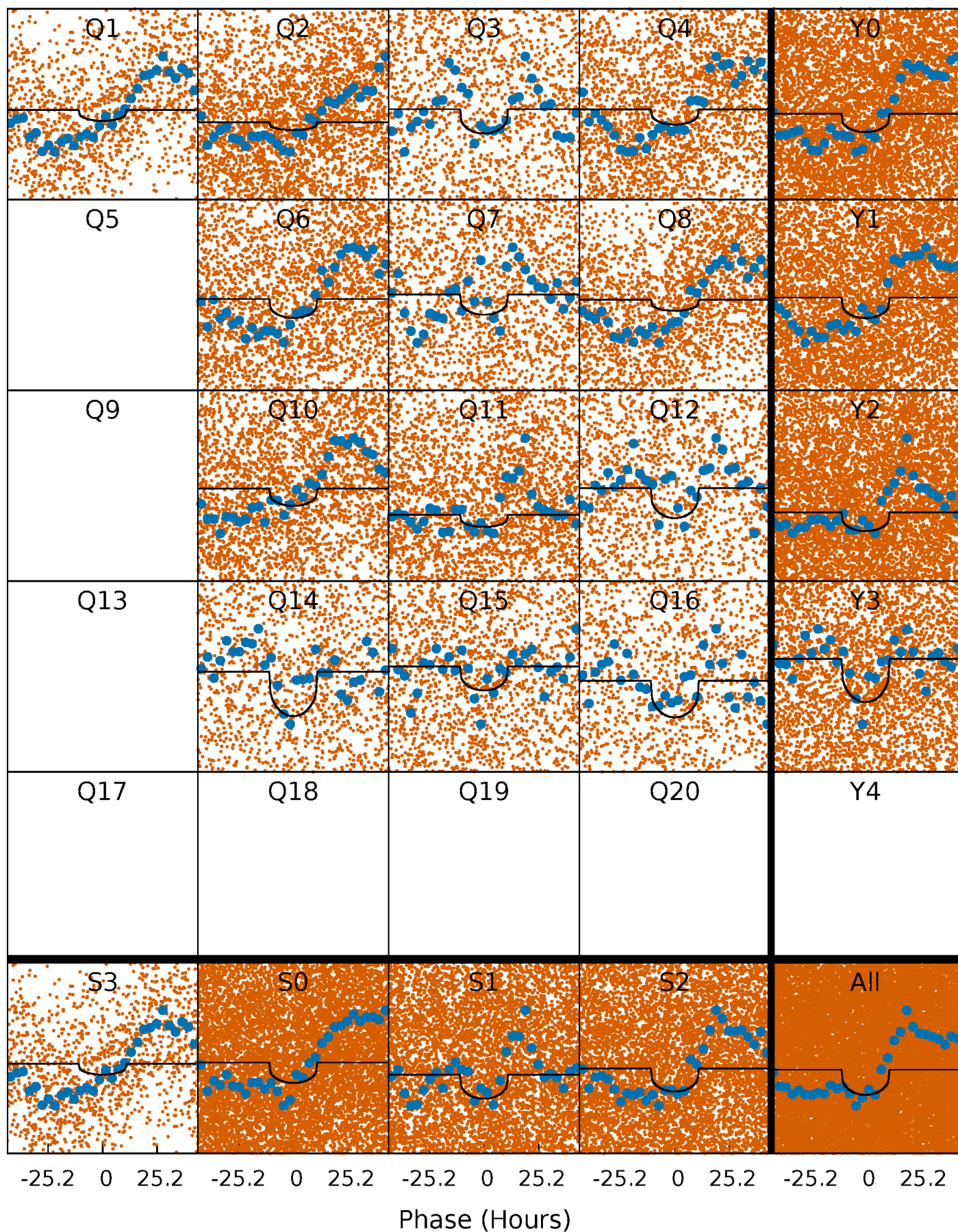
PDC Quarter-Phased Transit Curves

TCE 006020848-04 P= 4.016242 Days $T_0=133.098873$ (BKJD)



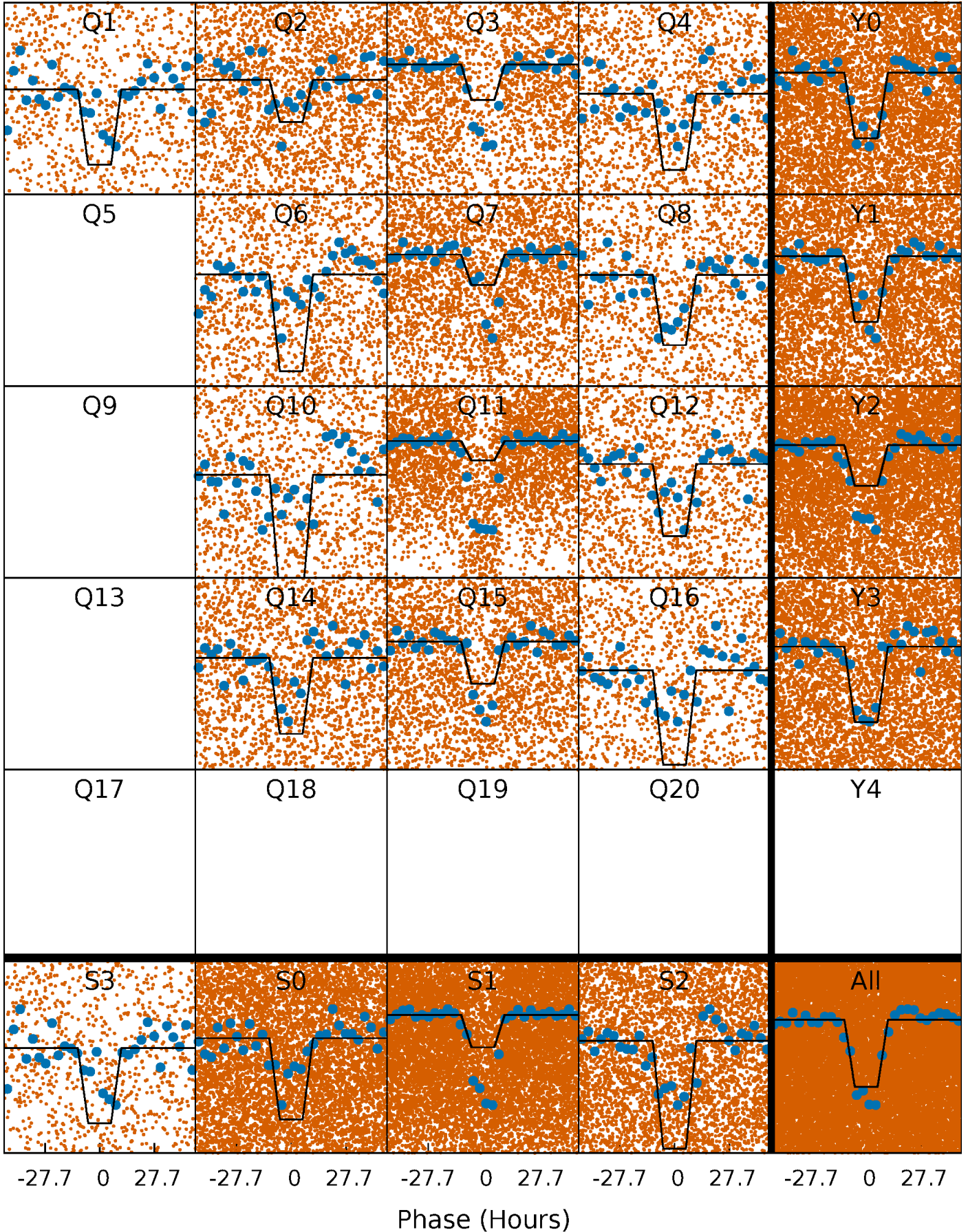
DV Quarter-Phased Transit Curves

TCE 006020848-04 P= 4.016242 Days $T_0=133.098873$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

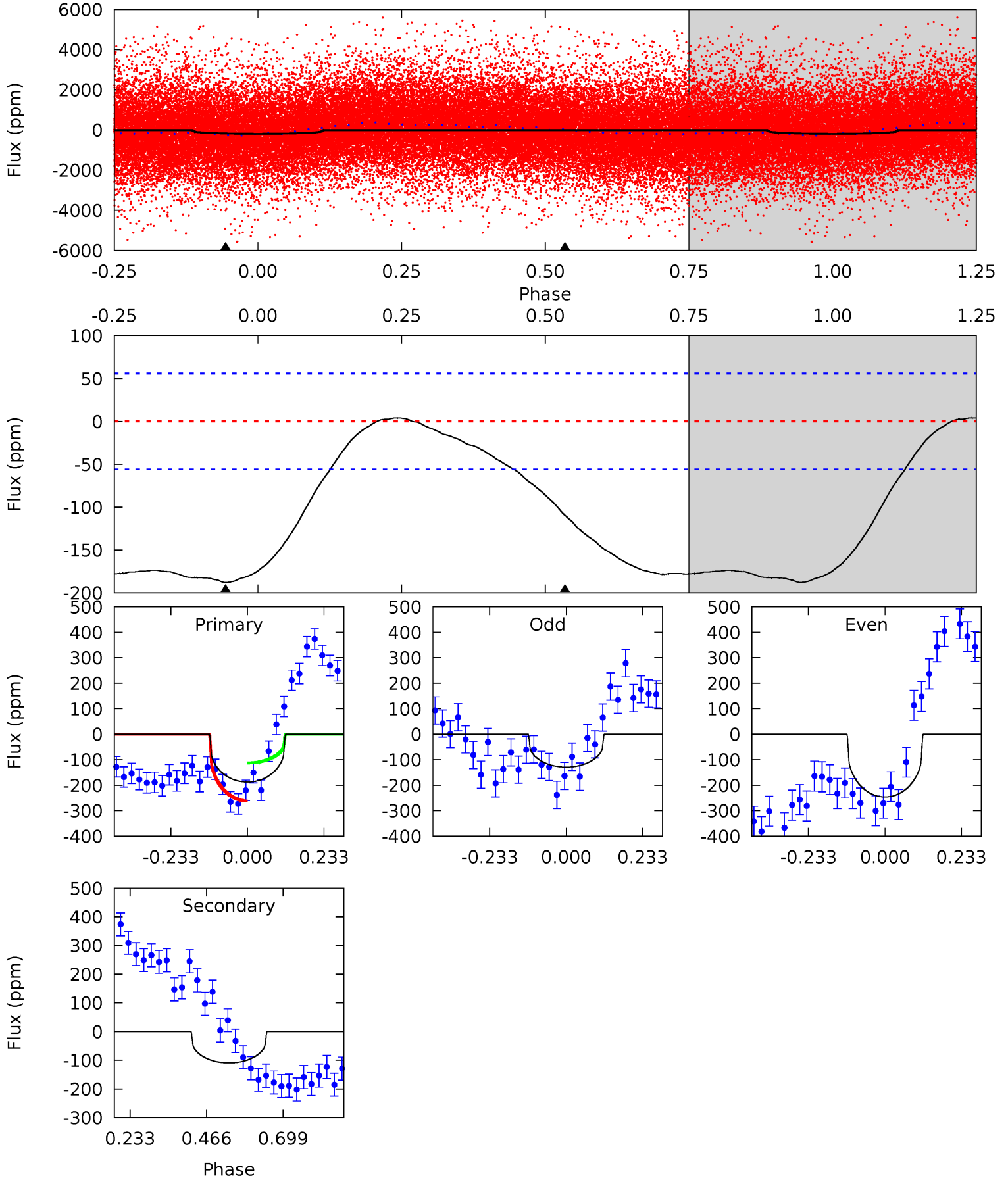
TCE 006020848-04 $P = 4.015664$ Days $T_0 = 133.219211$ (BKJD)



DV Model-Shift Uniqueness Test

006020848-04, P = 4.016242 Days, E = 129.082631 Days

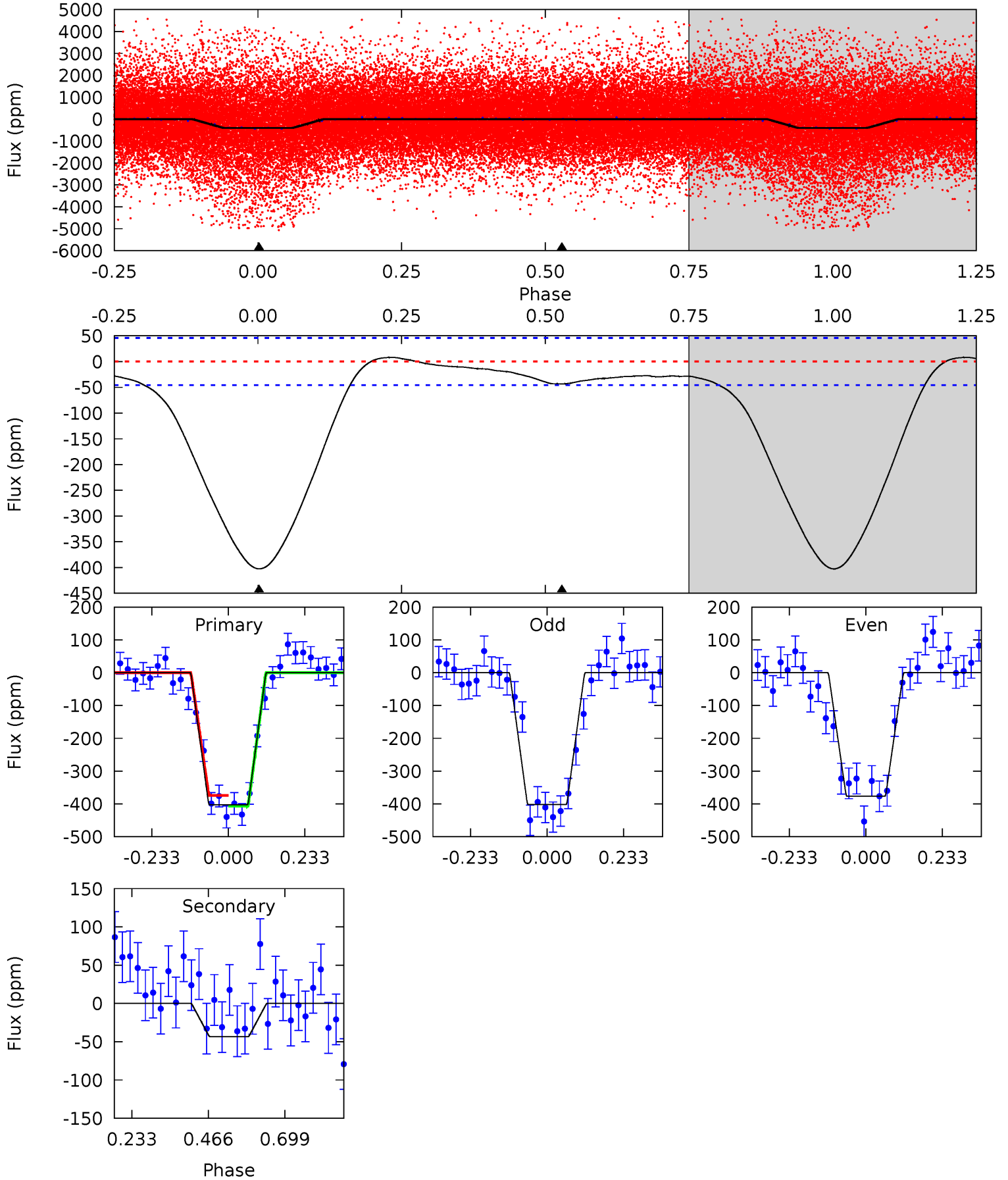
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	8.58	0	0	4.38	1.19	0.36	14.7	14.7	8.58	8.58	4.73	0.83	0.02	5.80



Alt Model-Shift Uniqueness Test

006020848-04, P = 4.015664 Days, E = 129.203547 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.5	4.14	0	0	4.38	1.19	1.43	38.5	38.5	4.14	4.14	1.22	1.38	0.02	1.58



Stellar Parameters For KIC 006020848

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4841^{+170}_{-170}	$4.585^{+0.054}_{-0.041}$	$-0.200^{+0.300}_{-0.300}$	$0.707^{+0.062}_{-0.069}$	$0.702^{+0.083}_{-0.053}$	$2.800^{+0.675}_{-0.454}$
	+4%/-4%	+1%/-1%	+150%/-150%	+9%/-10%	+12%/-8%	+24%/-16%
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 006020848-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-109 ± 13	$1.04^{+0.81}_{-0.56}$	1194^{+47}_{-51}	4400^{+1767}_{-830}	108^{+418}_{-74}
Alt.	-43 ± 10	$1.60^{+0.75}_{-0.73}$	1194^{+50}_{-47}	3219^{+785}_{-359}	18^{+51}_{-10}

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

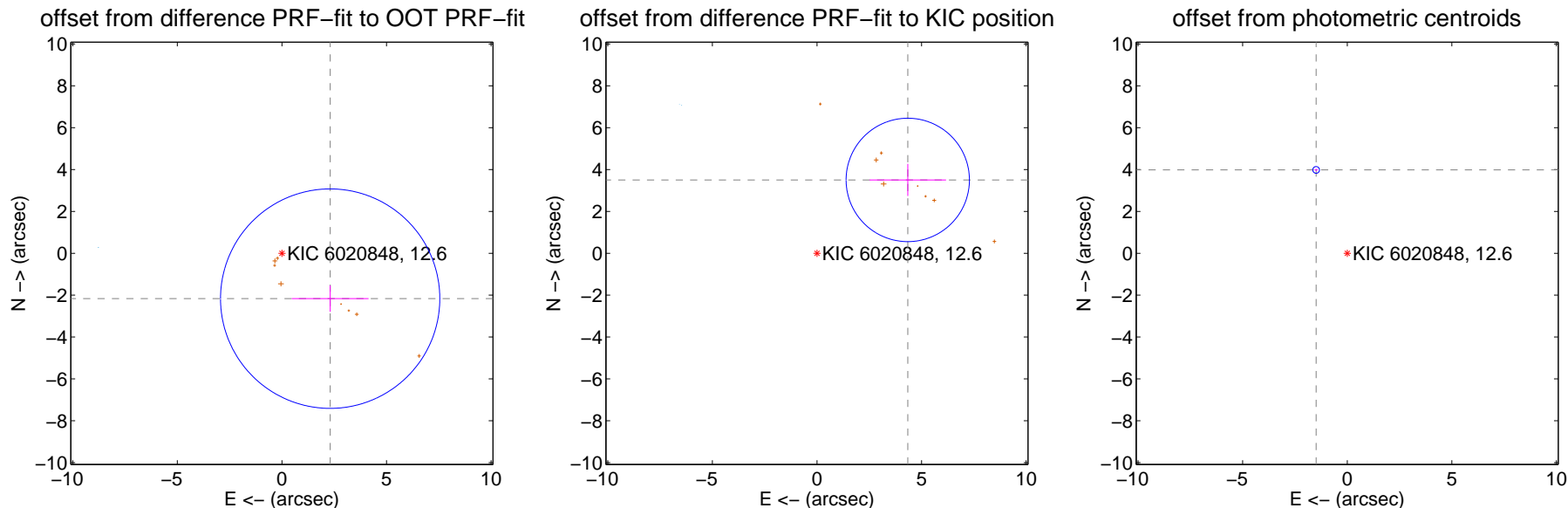
DV Centroid Data

Supplemental centroid analysis for 006020848-04. Kepler magnitude: 12.60. Transit SNR 7.32

There are 5 quarters with good PRF difference image offsets

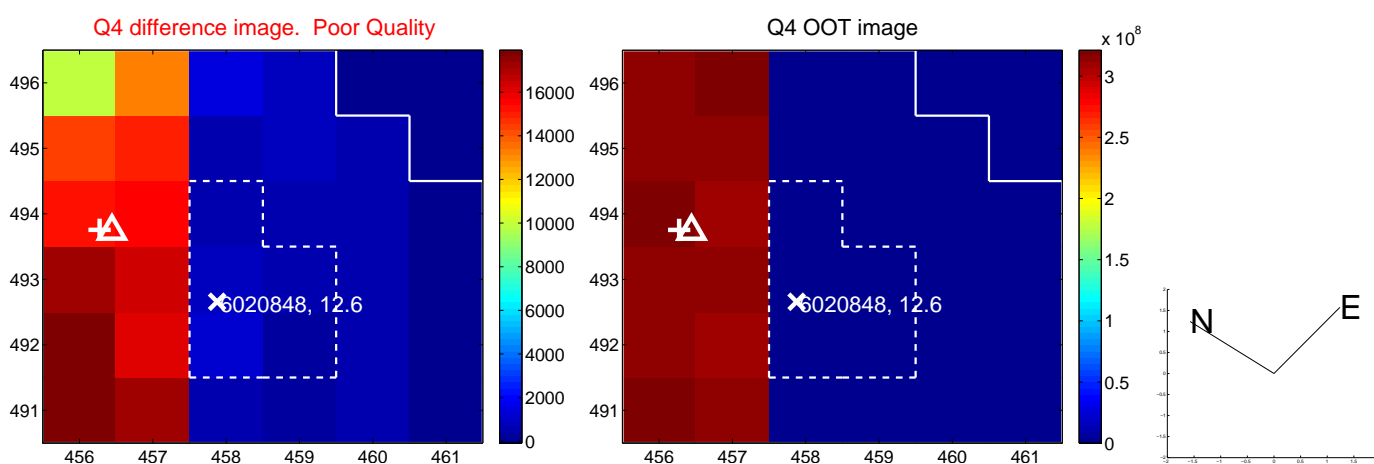
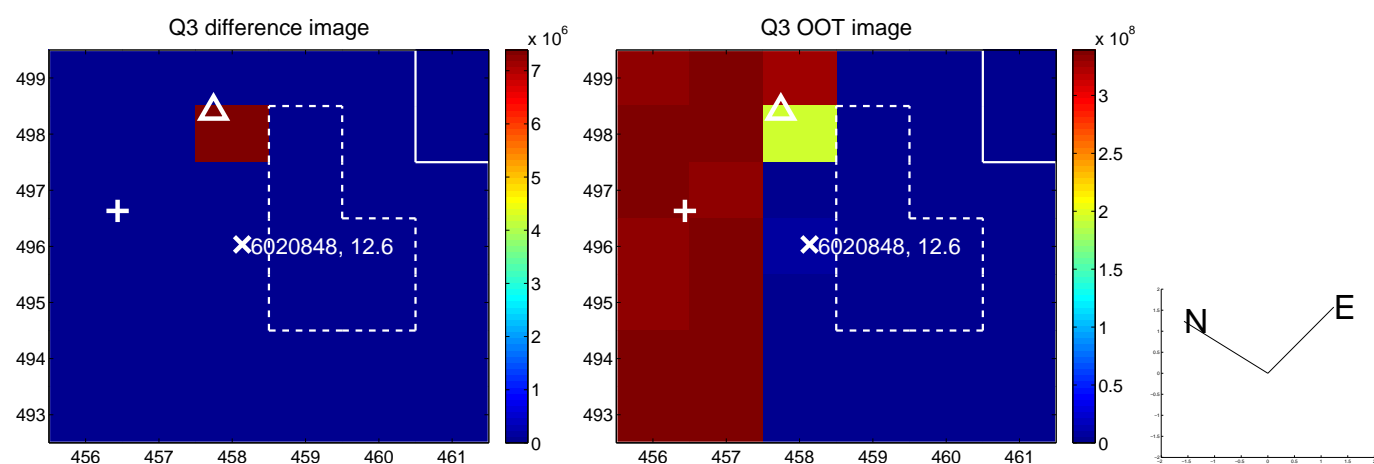
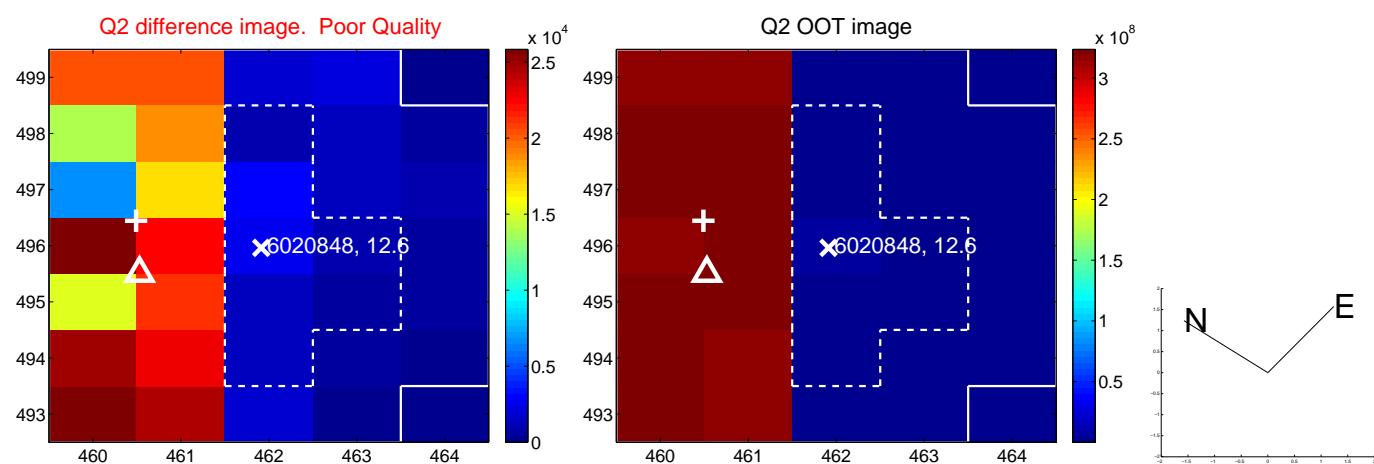
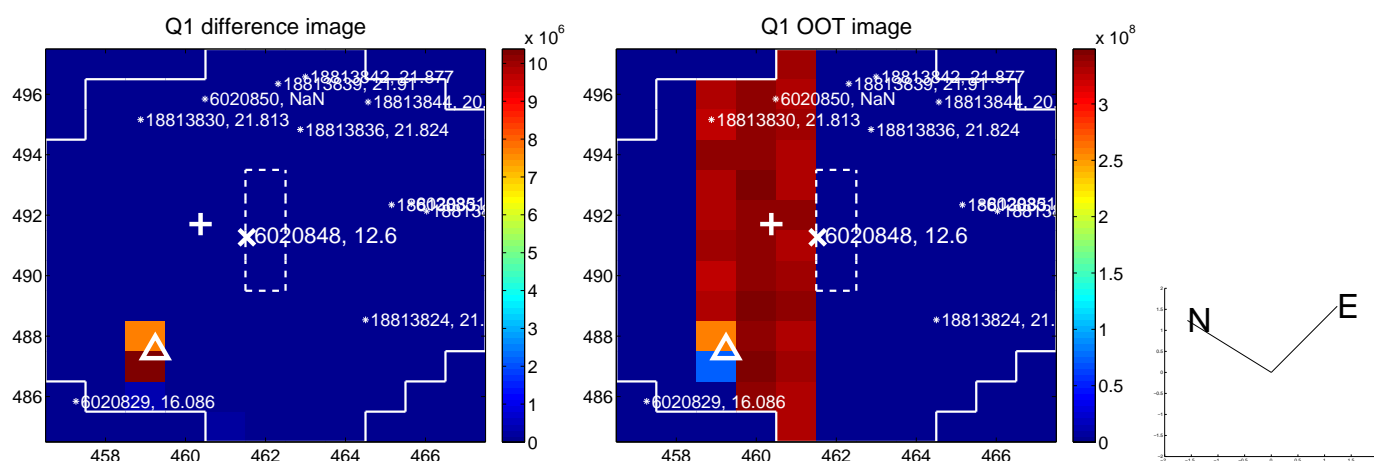
The OOT PRF centroid is offset from the target star catalog position by about 5.76 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.165 ± 1.747	1.81	-2.306 ± 1.838	-2.167 ± 0.629
PRF-fit source offset from KIC position	5.578 ± 0.982	5.68	-4.340 ± 1.830	3.504 ± 0.766
photometric centroid source offset	4.25 ± 0.05	79.53	1.49 ± 0.07	3.98 ± 0.05

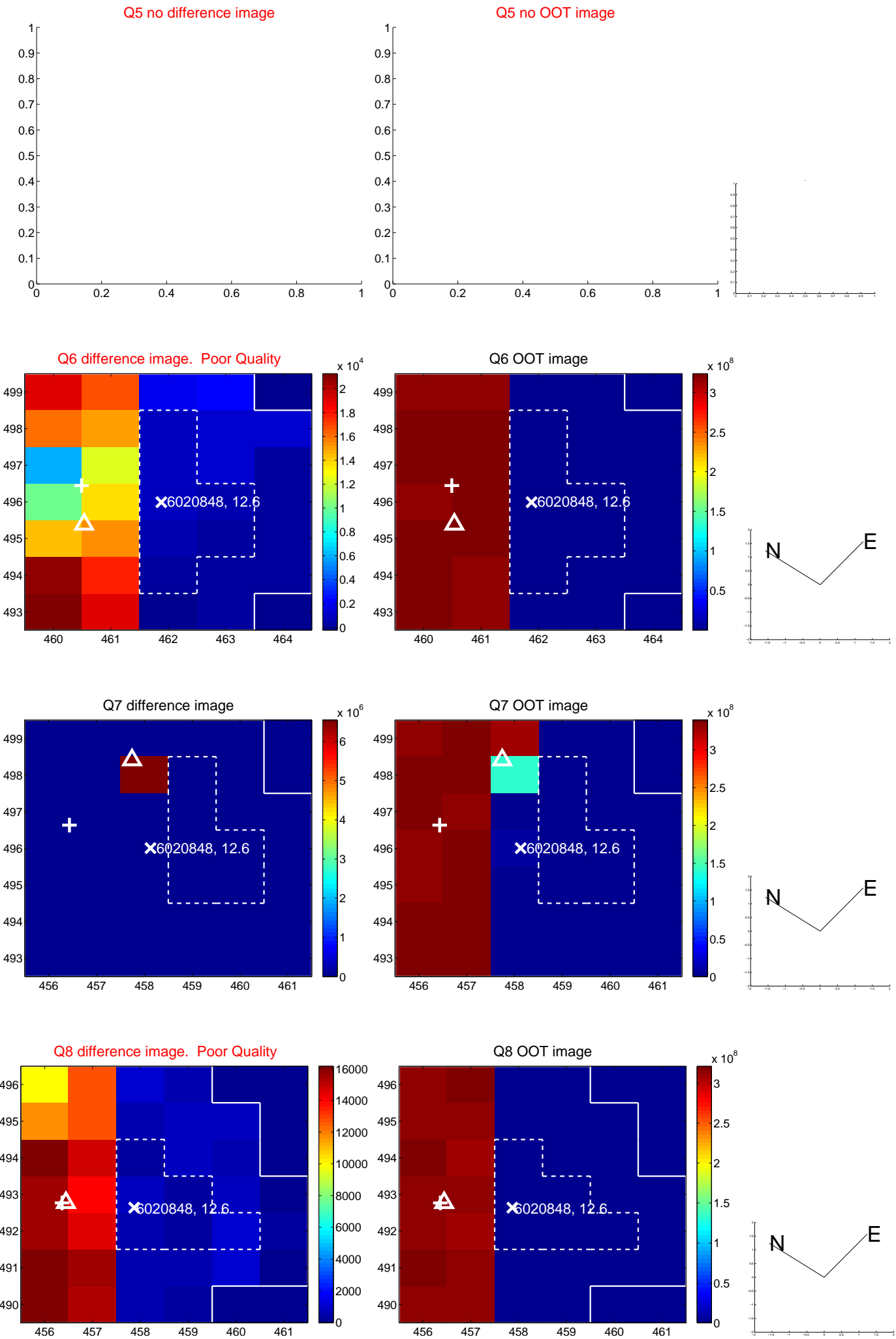


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

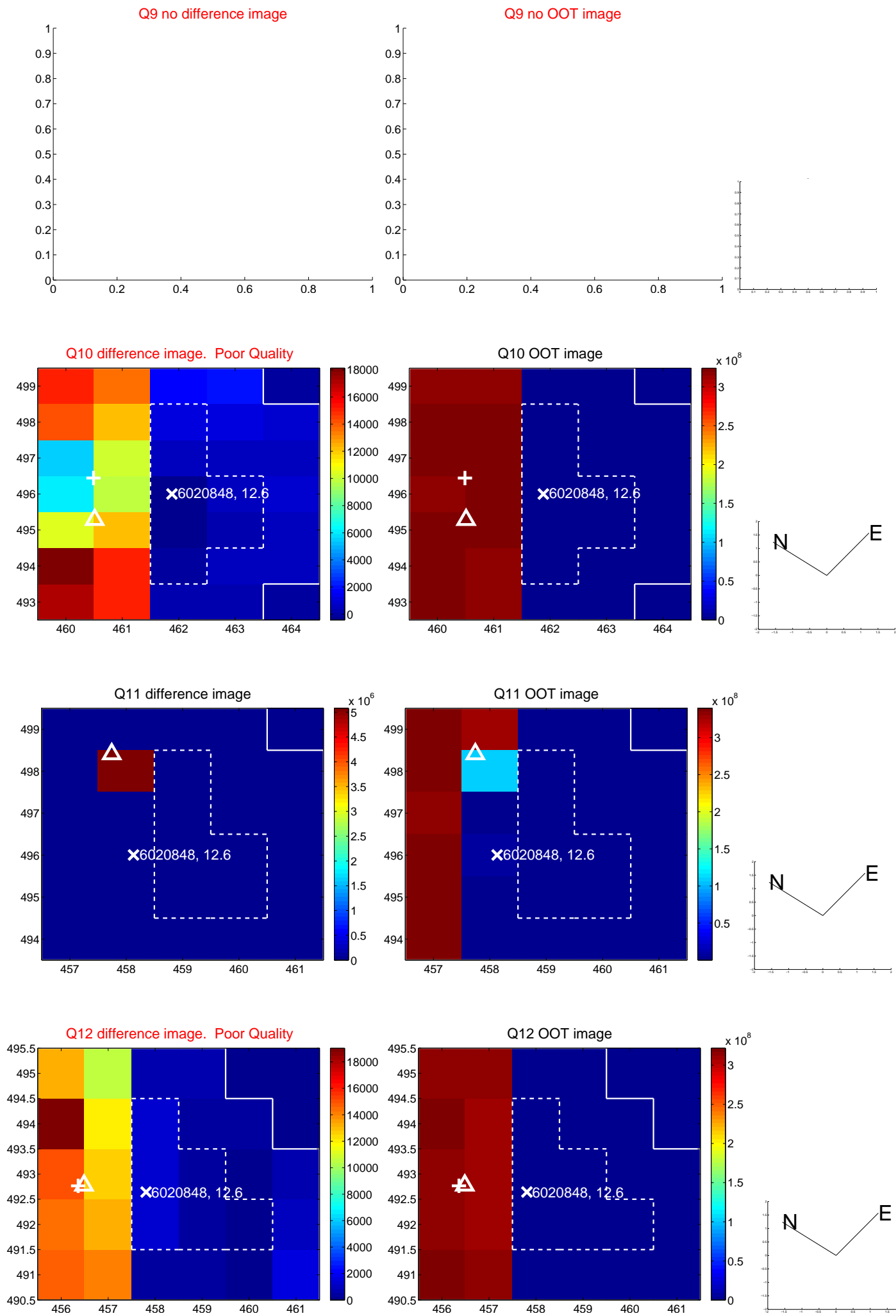
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



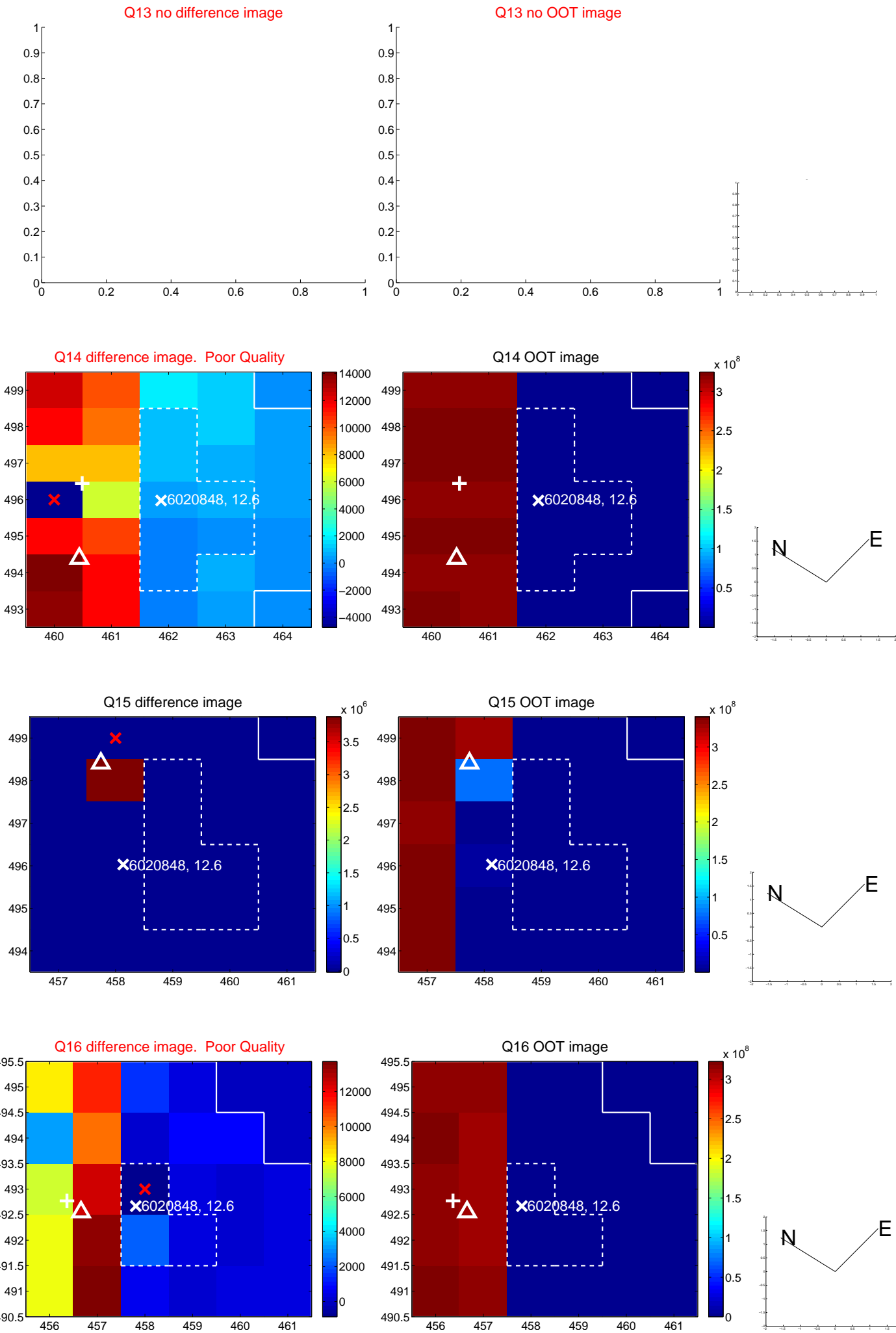
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



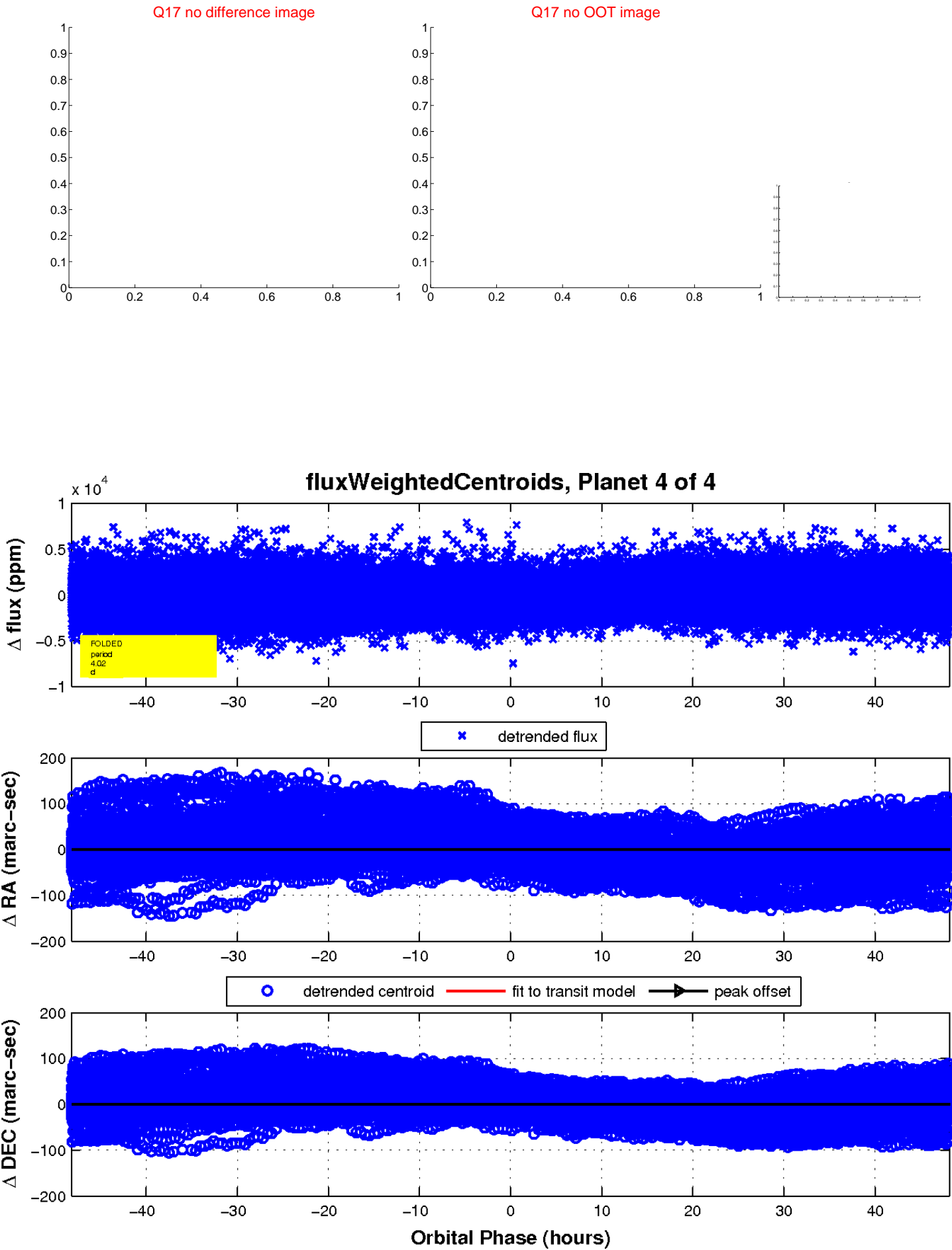
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

