

KIC 008873448

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})
008873448-01	OBS	No	577.515355	270.778153	1878.4	2.158	15.1	4.8	0.61	4063	4.72	0.07
008873448-02	OBS	No	632.974013	134.271399	1466.1	10.455	14.9	3.6	0.61	4063	2.53	0.06
008873448-03	OBS	No	483.800646	576.632412	2097.6	4.039	12.9	6.8	0.61	4063	3.09	0.09
008873448-04	OBS	No	484.909494	432.426018	2214.4	5.391	13.5	6.5	0.61	4063	2.81	0.09
008873448-05	OBS	No	450.940038	552.418638	4797.4	9.434	12.5	9.8	0.61	4063	4.08	0.10
008873448-06	OBS	No	417.375897	465.977721	690.2	12.000	12.1	-1.0	0.61	4063	1.55	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008873448-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

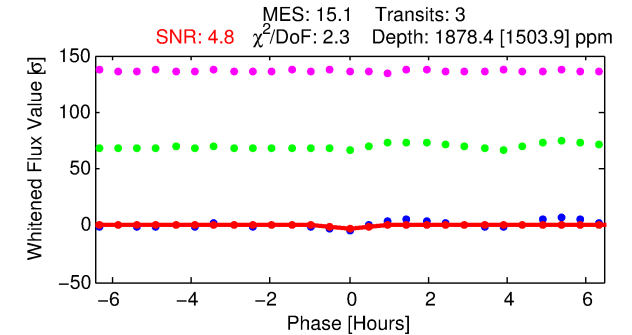
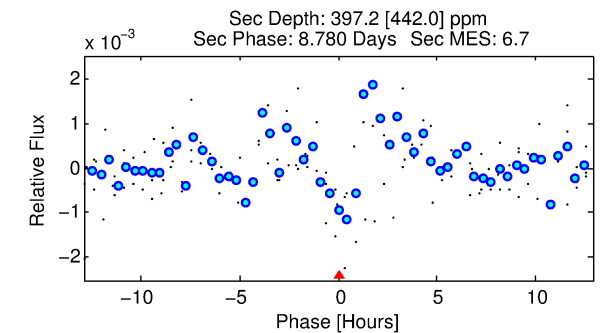
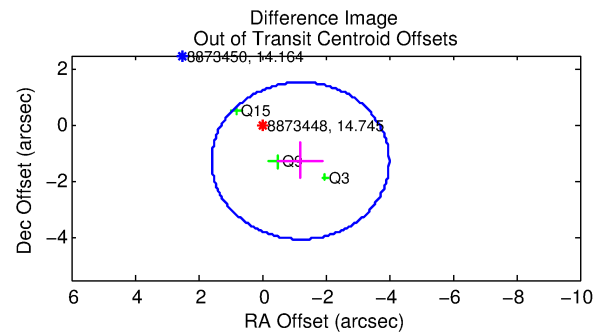
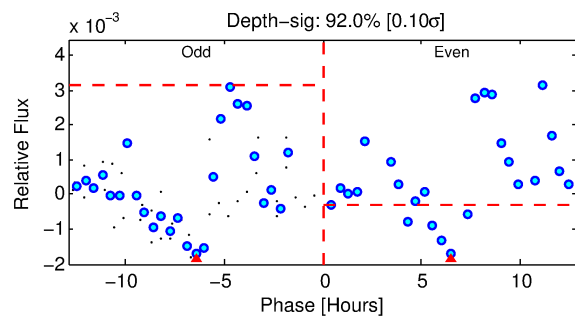
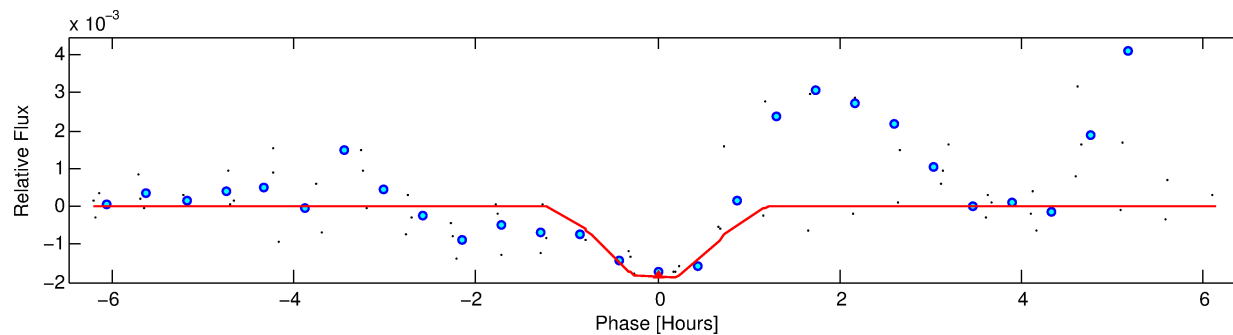
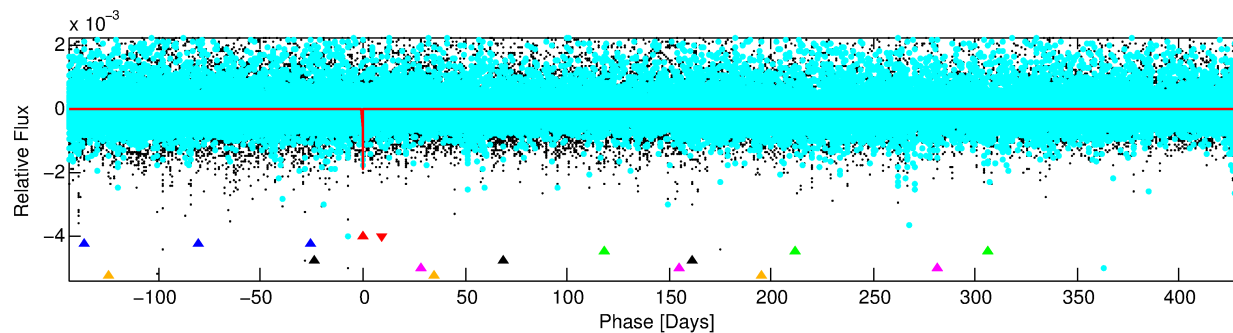
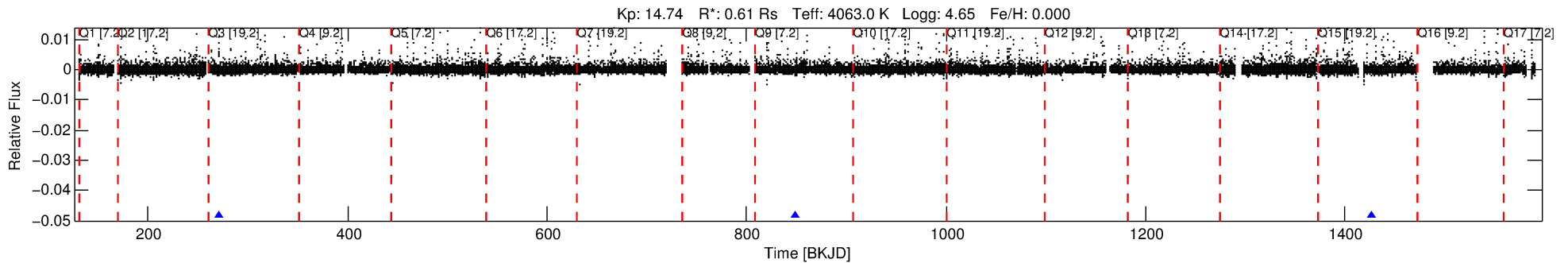
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-01

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 1 of 6 Period: 577.515 d



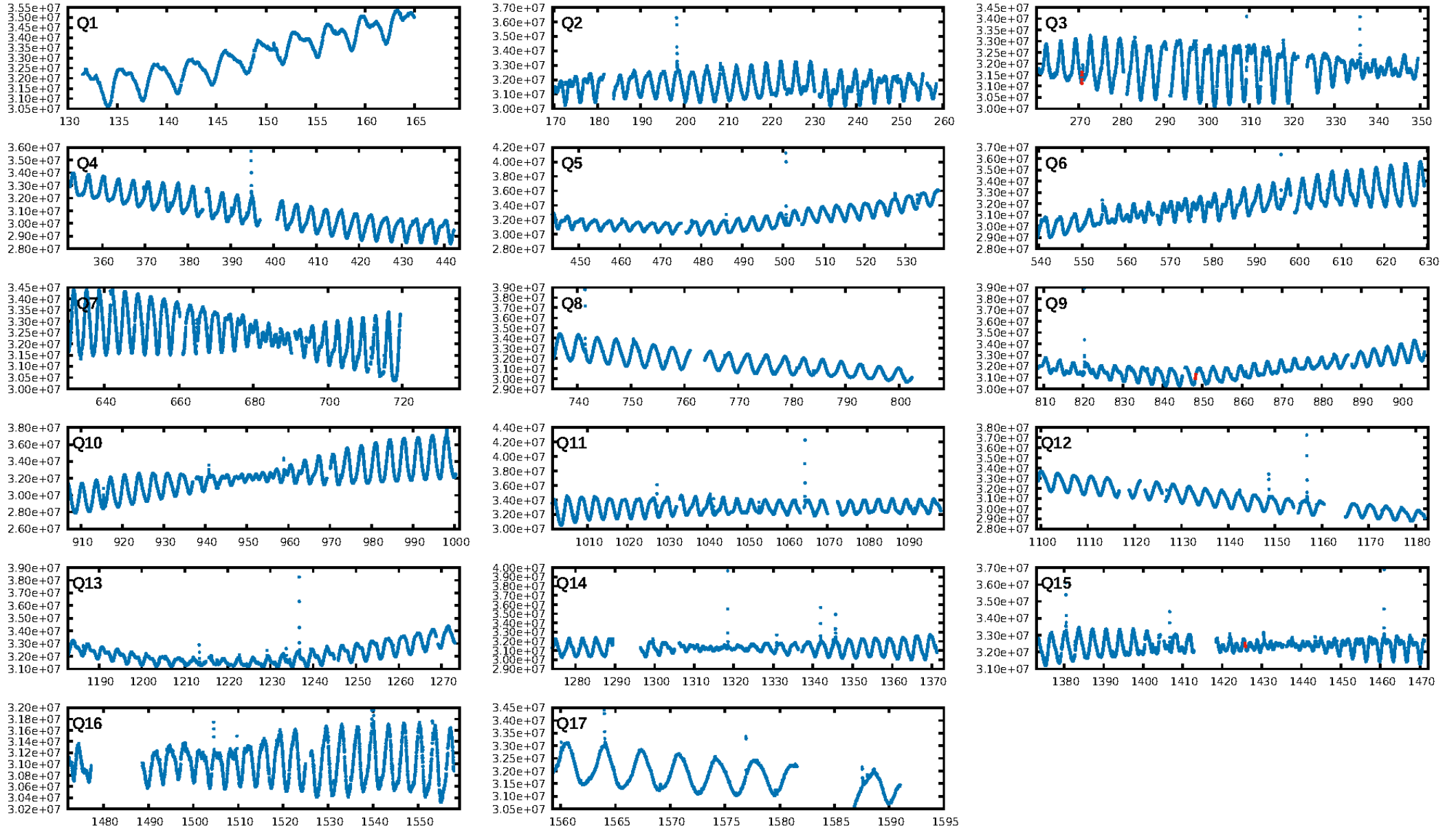
DV Fit Results:

Period = 577.51536 [0.01173] d
Epoch = 270.7782 [0.0140] BKJD
Rp/R* = 0.0710 [1.9819]
a/R* = 863.34 [6491.38]
b = 0.98 [3.21]
Seff = 0.07 [0.01]
Teq = 131 [6] K
Rp = 4.72 [131.71] Re
a = 1.1477 [0.1008] AU
Ag = 12934.31 [722407.69] [0.02 σ]
Teffp = 2153 [30061] K [0.07 σ]

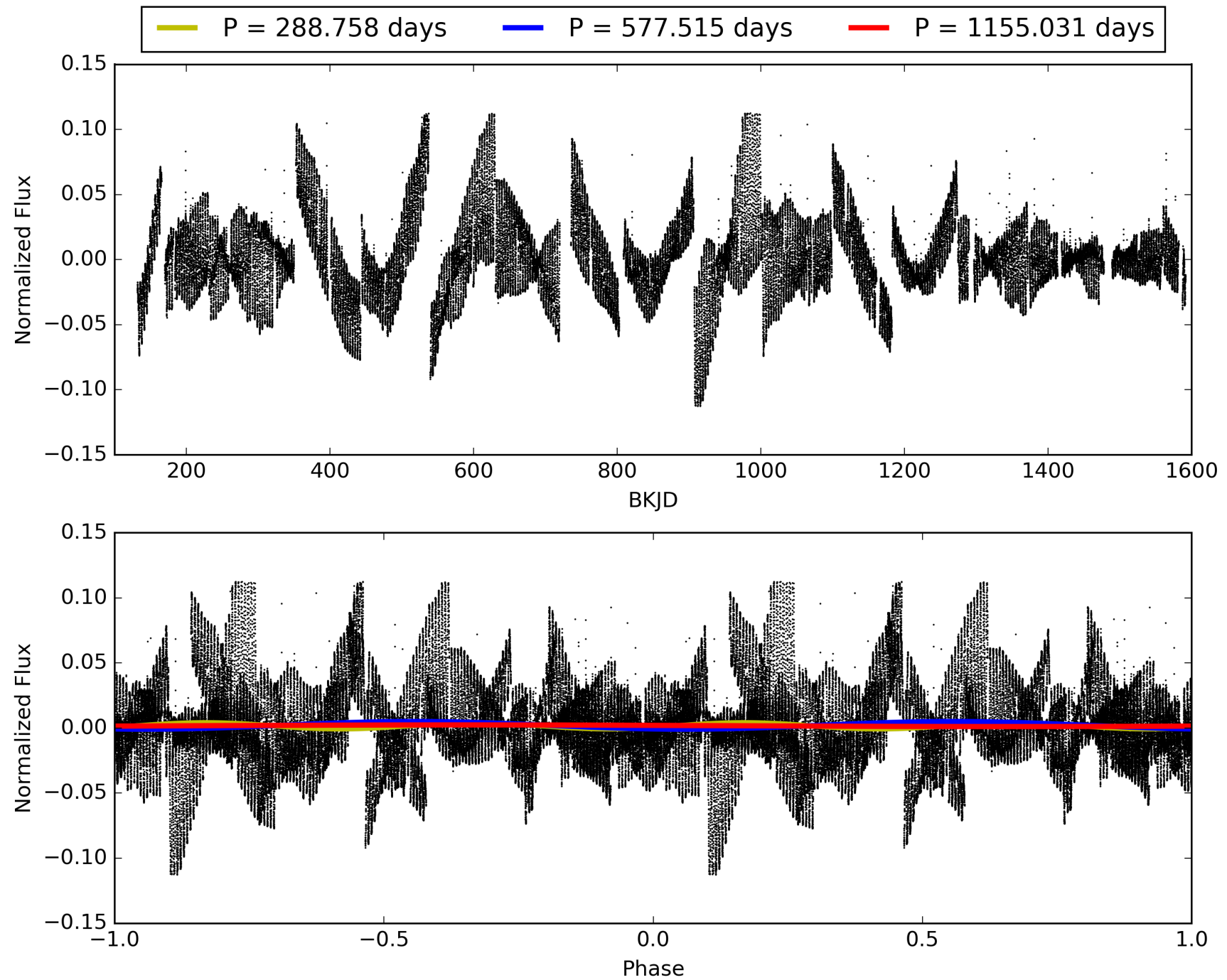
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [382.78 σ]
LongPeriod-sig: 100.0% [124.68 σ]
ModelChiSquare2-sig: 10.4%
ModelChiSquareGof-sig: 66.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 84.01
Centroid-sig: 5.0%
Centroid-so: 0.573 arcsec [0.59 σ]
OotOffset-rm: 1.746 arcsec [1.87 σ]
KicOffset-rm: 0.723 arcsec [0.86 σ]
OotOffset-st: 0/2/0/1 [3]
KicOffset-st: 0/2/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008873448-01, PDC Light Curves

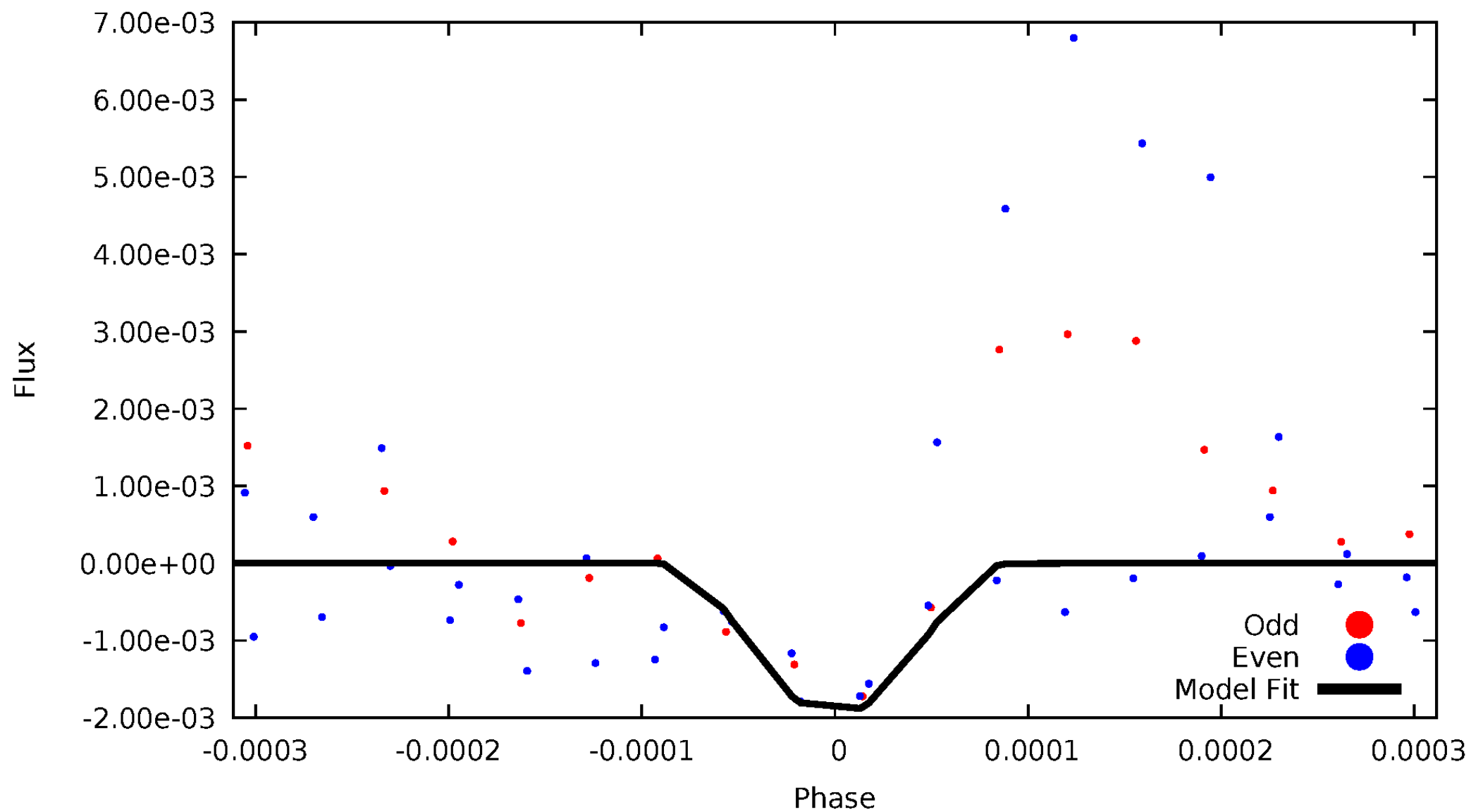


TCE 008873448-01



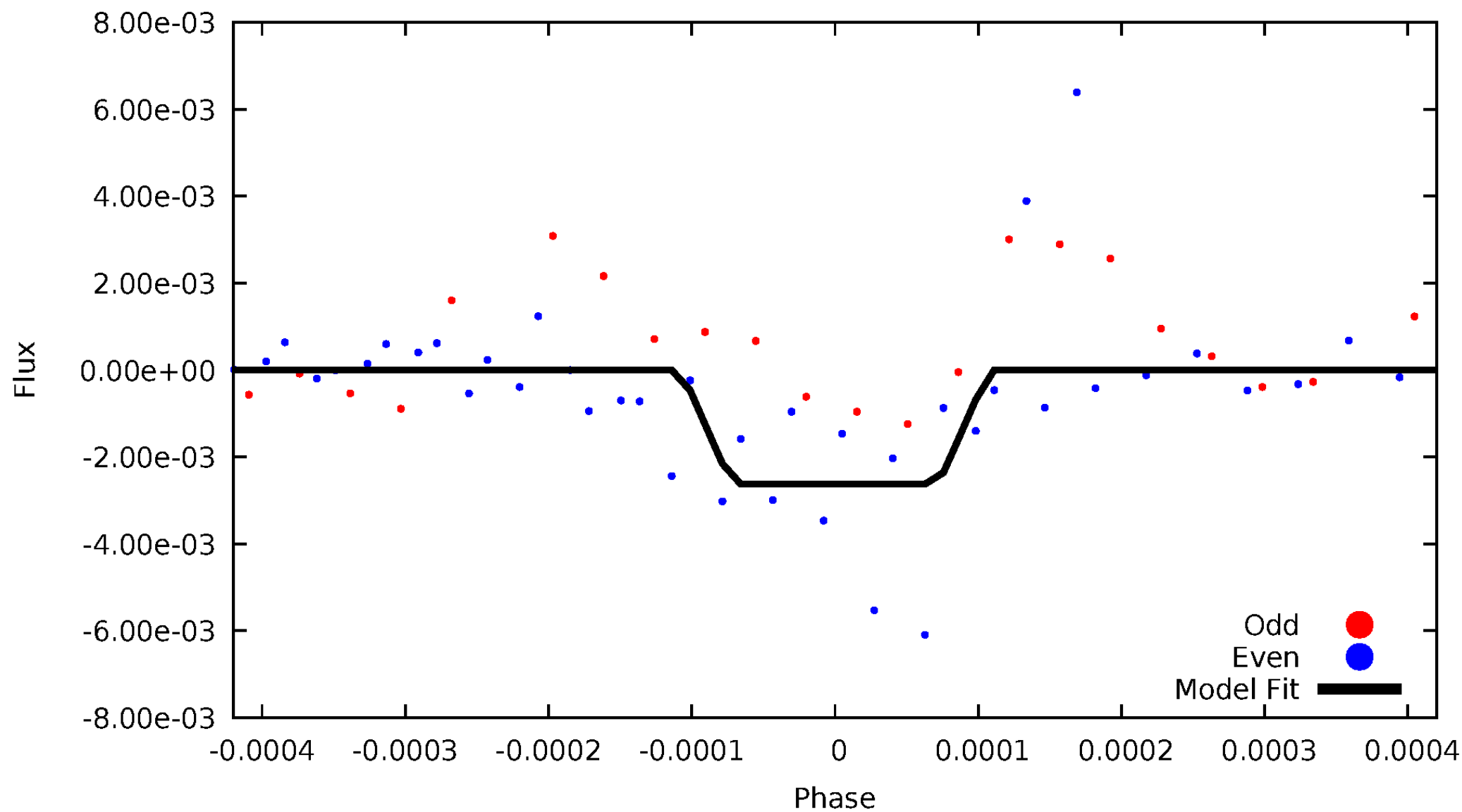
DV Odd/Even

TCE 008873448-01



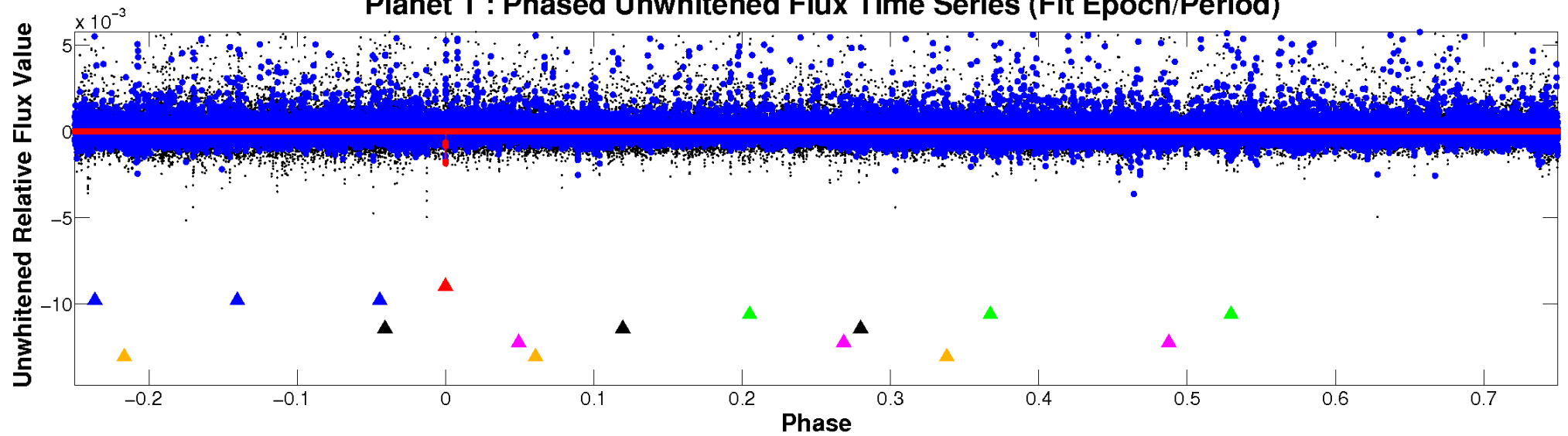
ALT Odd/Even

TCE 008873448-01

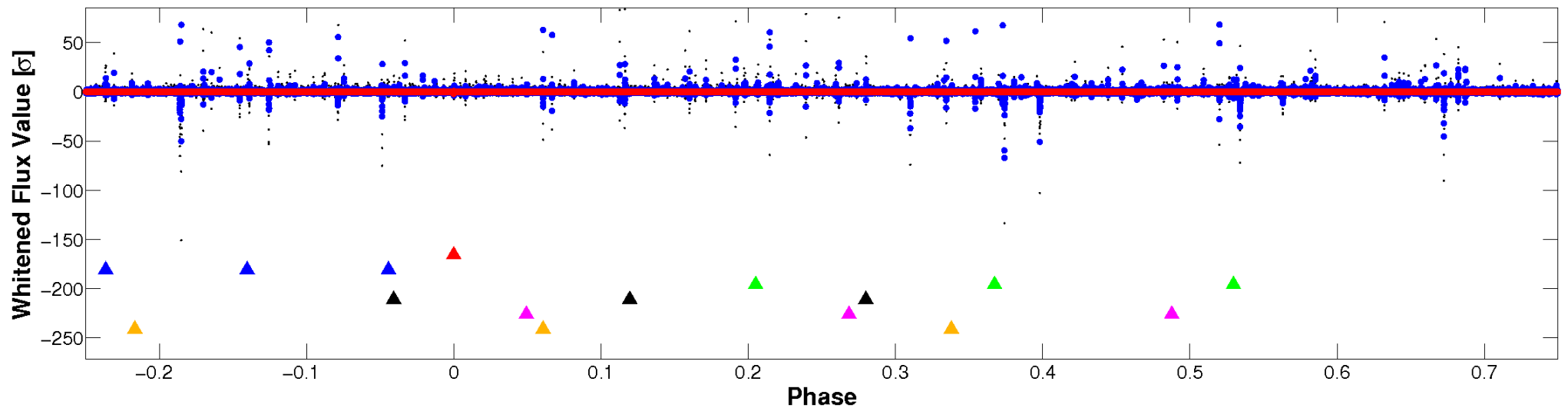


Non-Whitened Vs. Whitened Light Curve

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

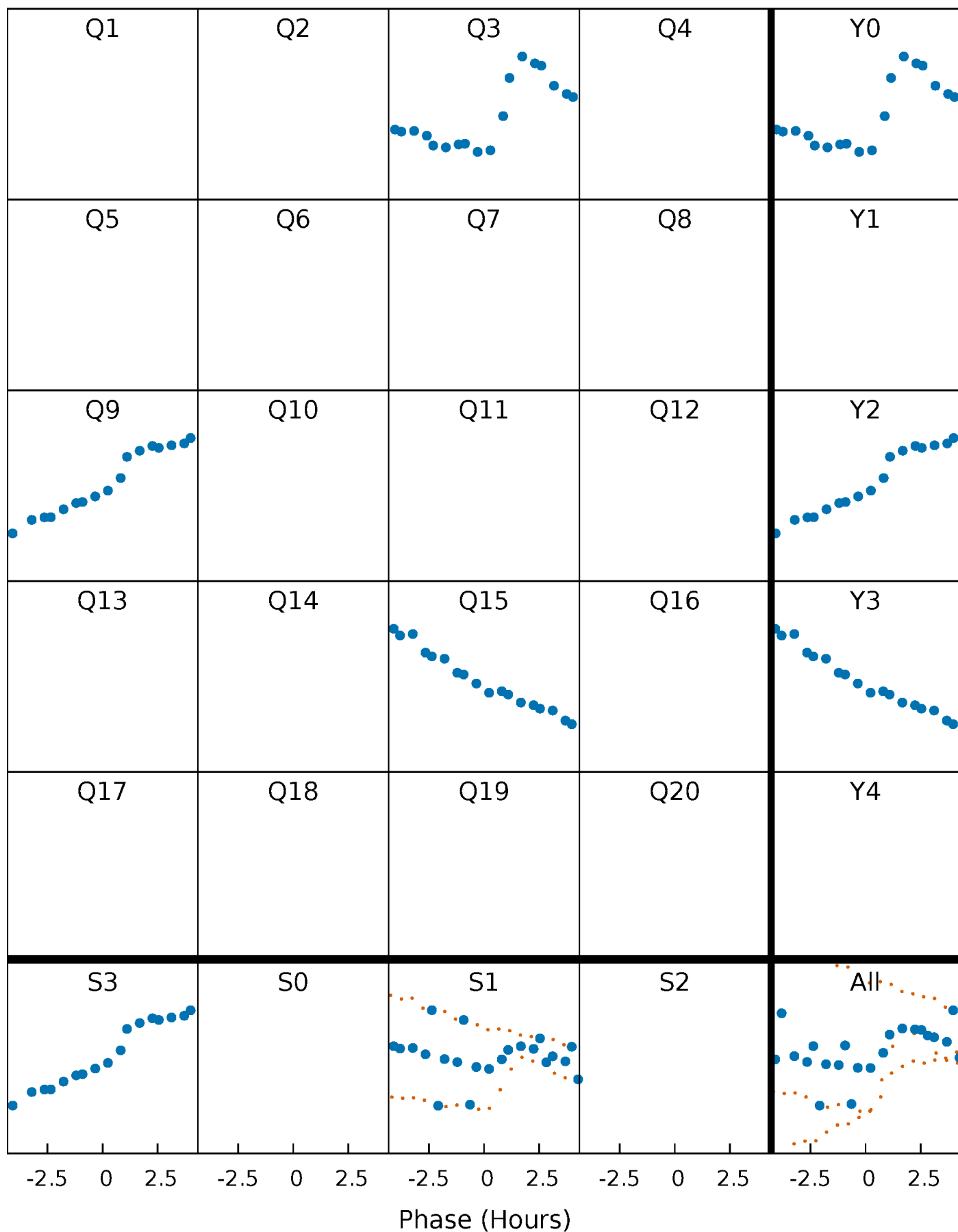


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



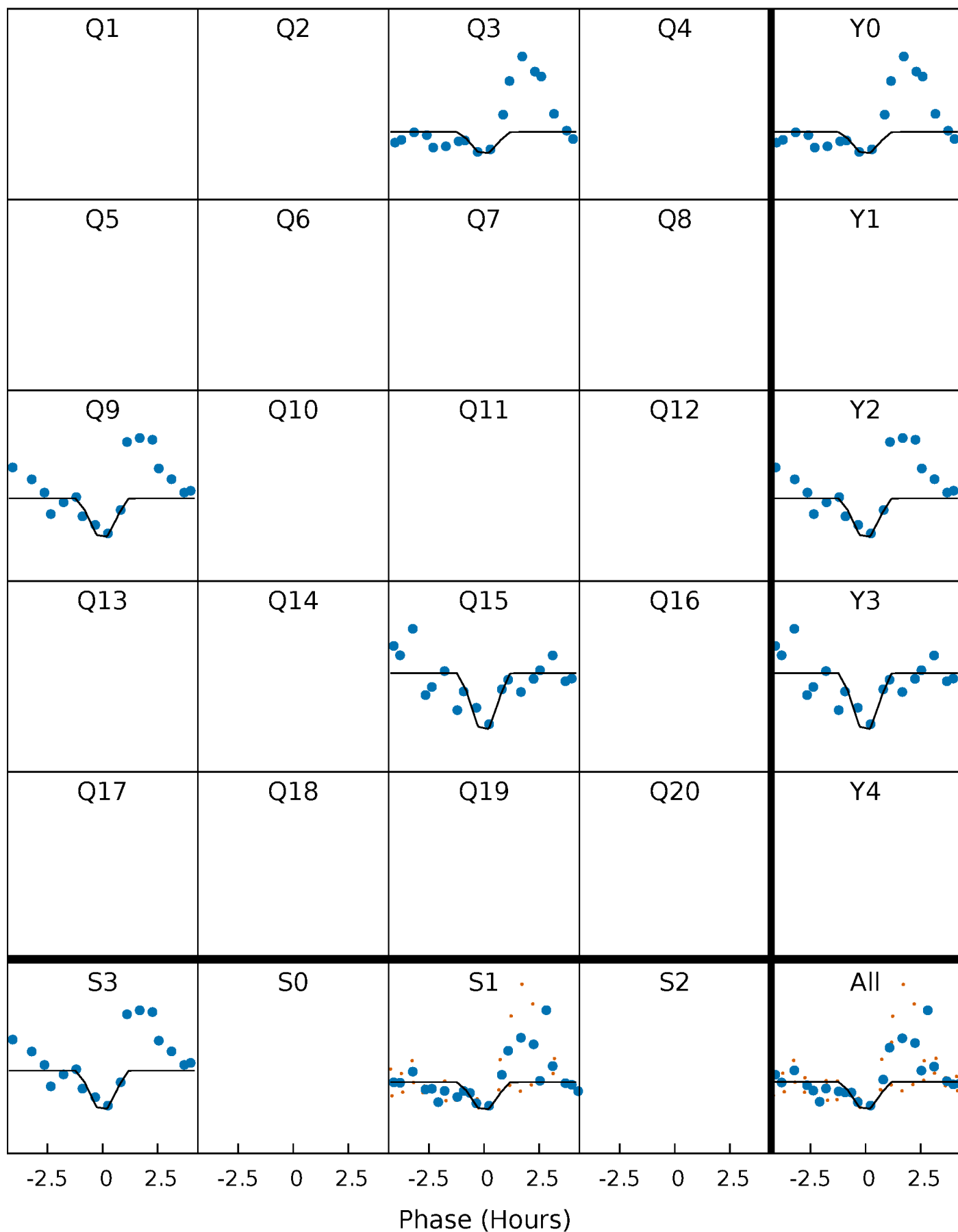
PDC Quarter-Phased Transit Curves

TCE 008873448-01 P=577.515355 Days $T_0=270.778153$ (BKJD)



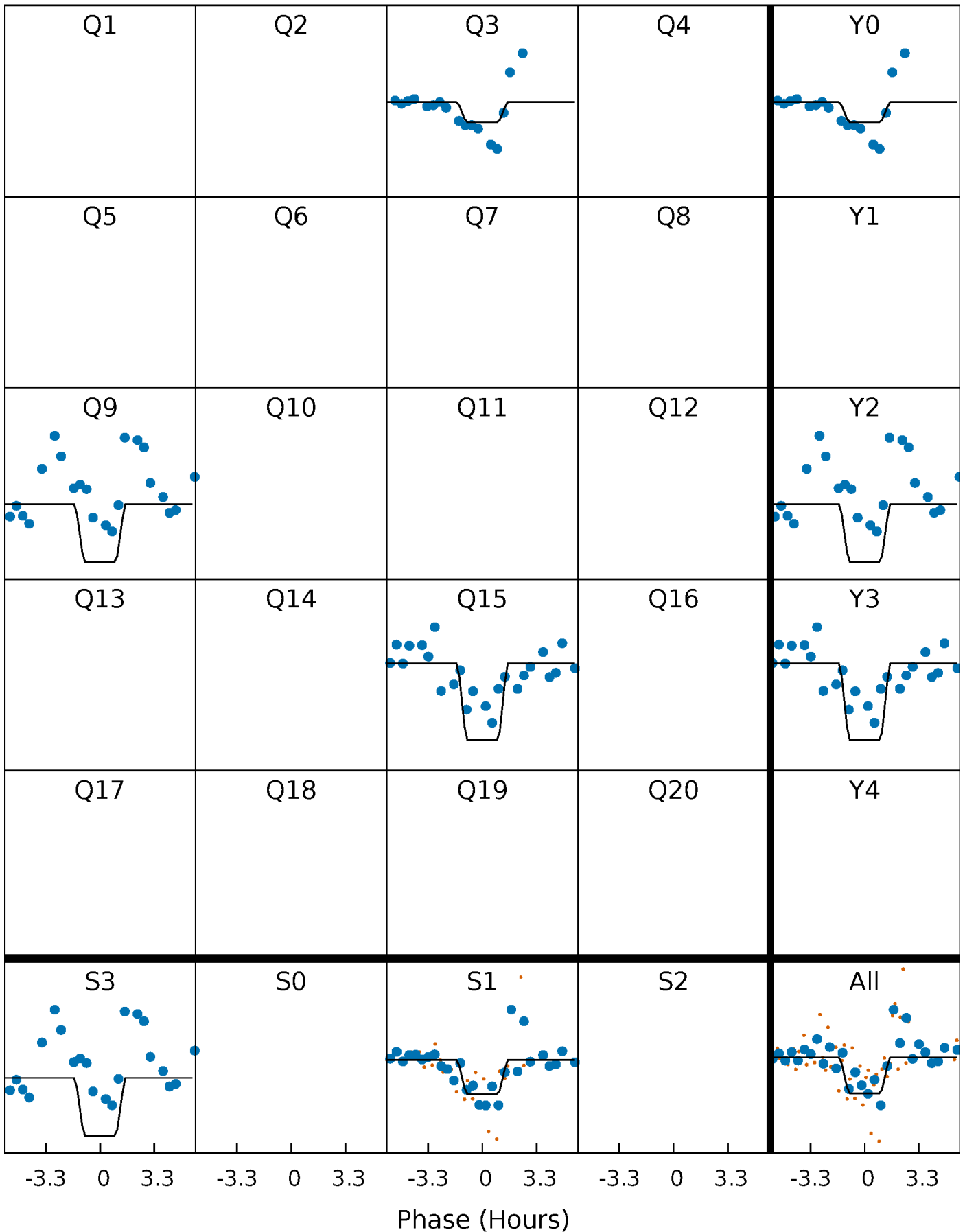
DV Quarter-Phased Transit Curves

TCE 008873448-01 P=577.515355 Days $T_0=270.778153$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

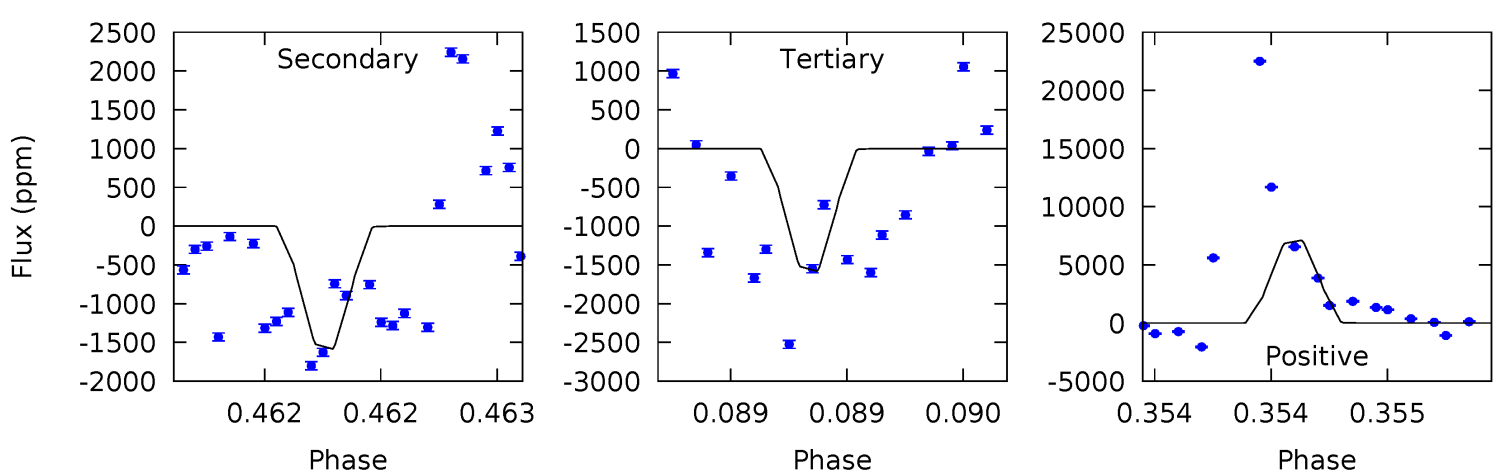
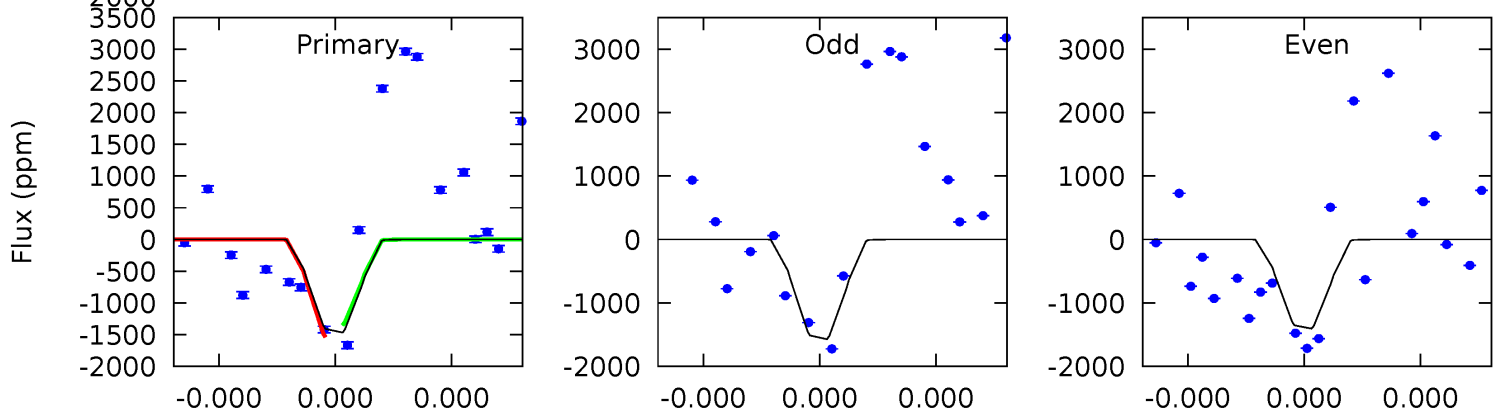
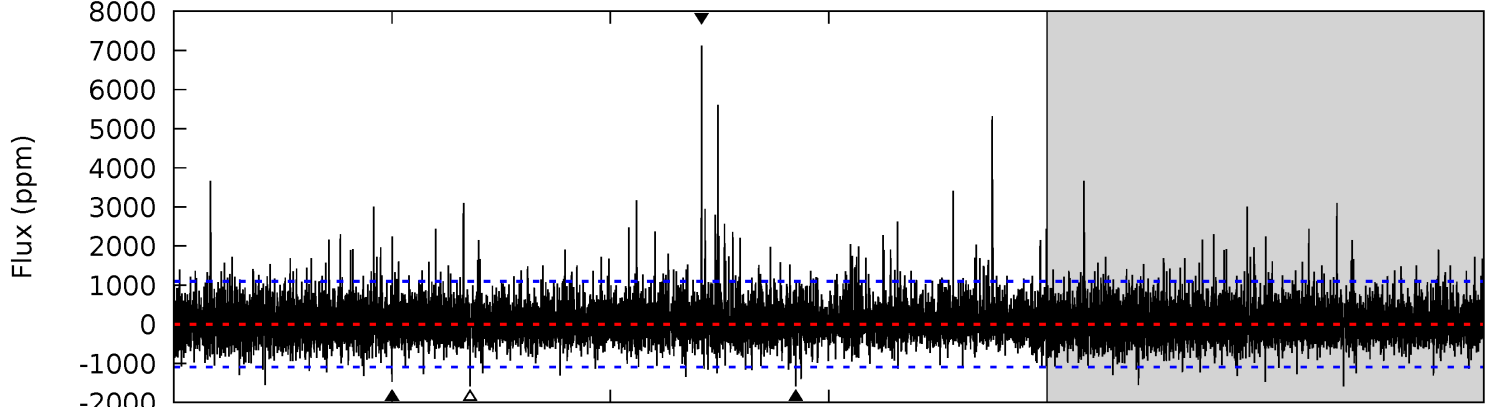
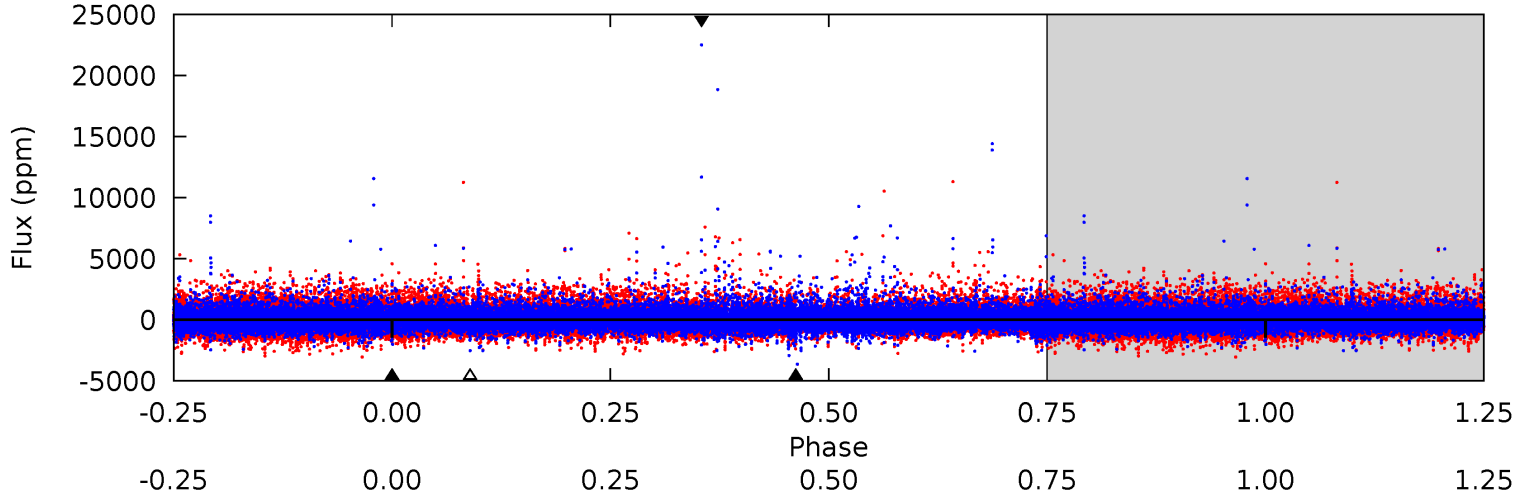
TCE 008873448-01 P=577.520517 Days $T_0=270.751988$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-01, P = 577.515355 Days, E = 270.778153 Days

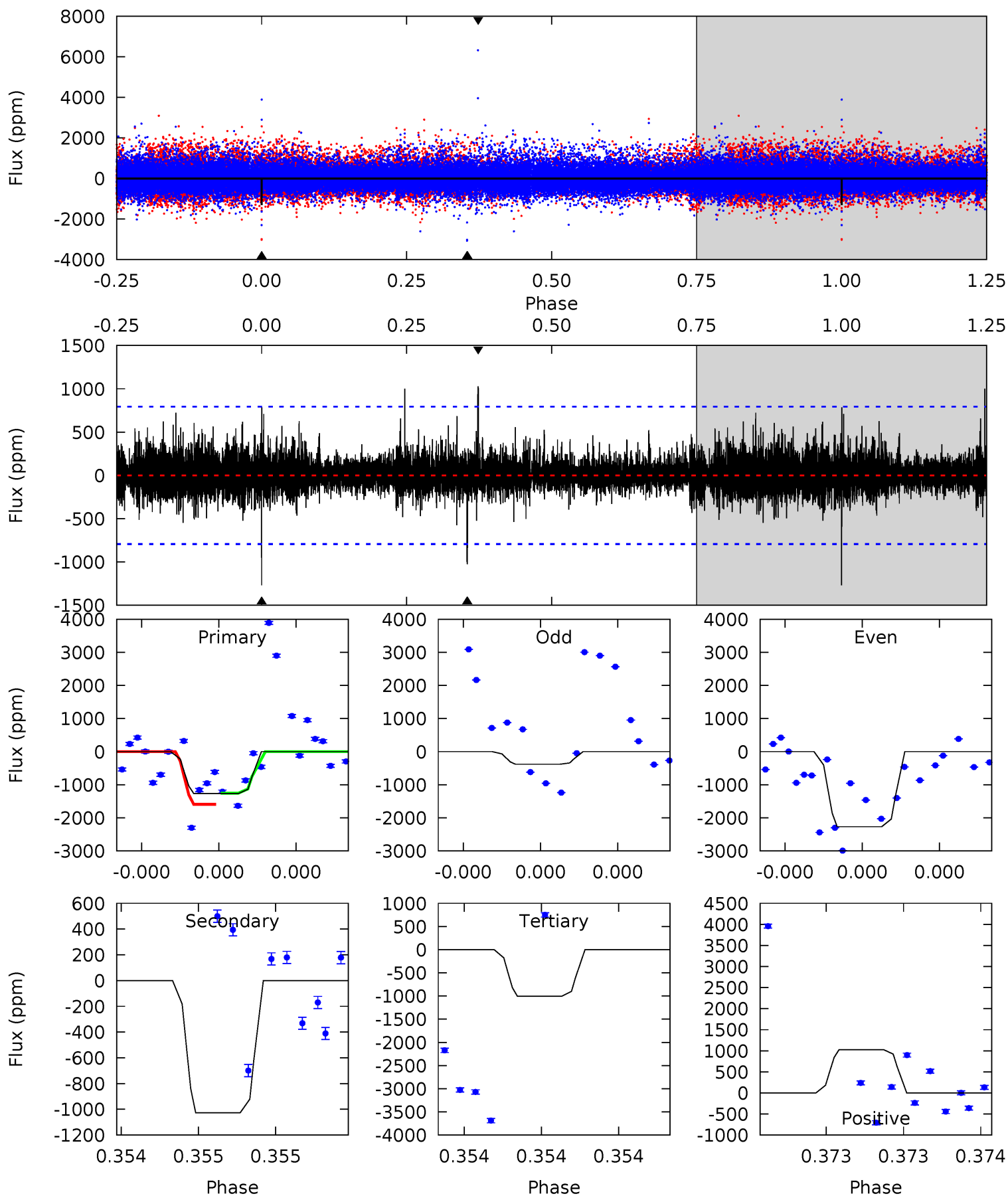
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.66	8.27	8.26	37.2	5.72	3.71	2.16	-0.60	-29.5	0.01	-28.9	0.15	0.98	0.82	0.49



Alt Model-Shift Uniqueness Test

008873448-01, P = 577.520517 Days, E = 270.751988 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.15	7.41	7.24	7.41	5.73	3.72	0.91	1.91	1.74	0.17	-0.00	6.62	1.46	0.45	1.27



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1584 ± 191	$83.44^{+103.30}_{-58.60}$	181^{+7}_{-7}	1721^{+429}_{-228}	173^{+1517}_{-139}
Alt.	-1026 ± 139	$82.78^{+104.84}_{-59.06}$	181^{+7}_{-7}	1644^{+454}_{-206}	107^{+1185}_{-85}

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

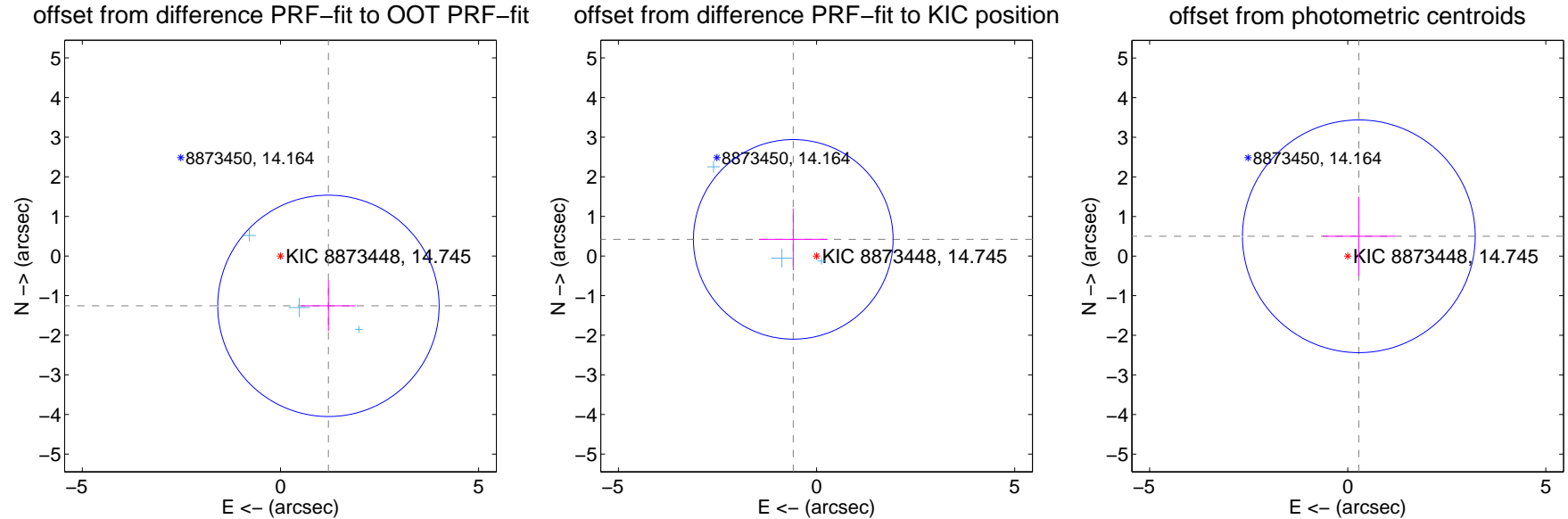
DV Centroid Data

Supplemental centroid analysis for 008873448-01. Kepler magnitude: 14.74. Transit SNR 4.82

There are 3 quarters with good PRF difference image offsets

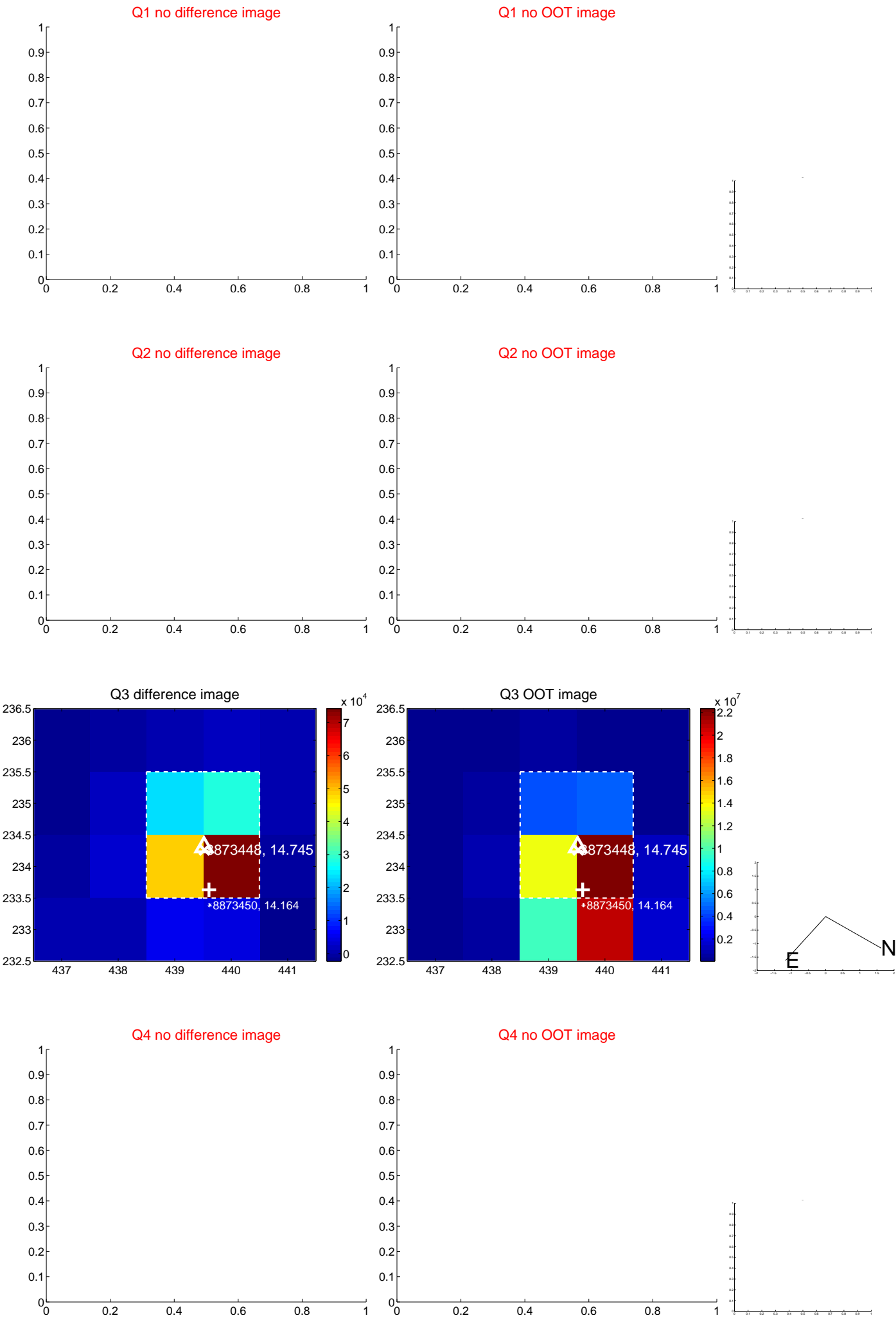
The OOT PRF centroid is offset from the target star catalog position by about 2.51 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.746 ± 0.931	1.87	-1.210 ± 0.687	-1.258 ± 0.639
PRF-fit source offset from KIC position	0.723 ± 0.840	0.86	0.588 ± 0.869	0.420 ± 0.778
photometric centroid source offset	0.57 ± 0.98	0.59	-0.28 ± 0.91	0.50 ± 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.

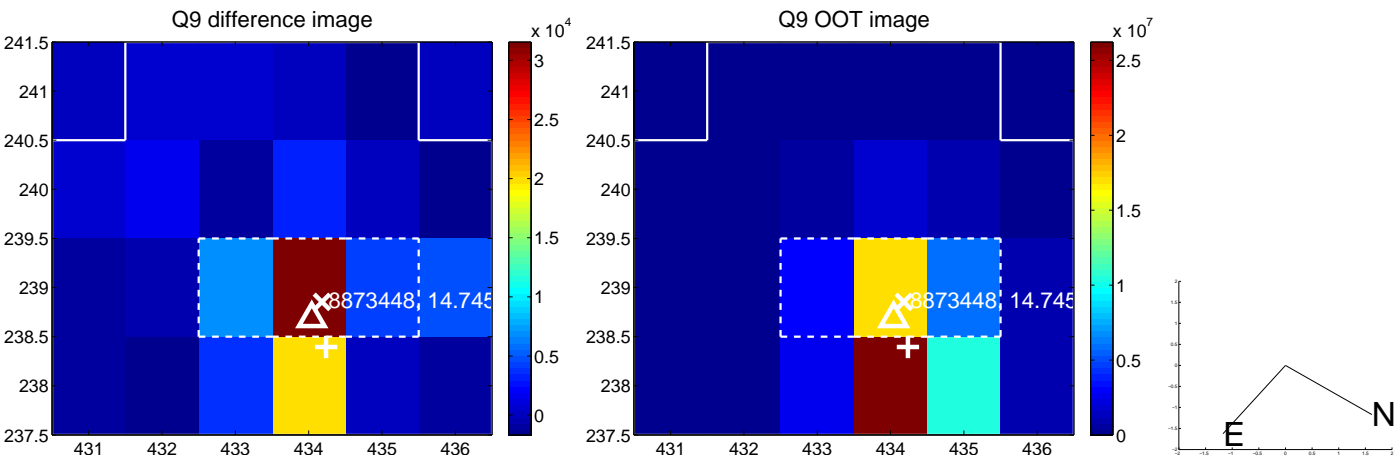
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



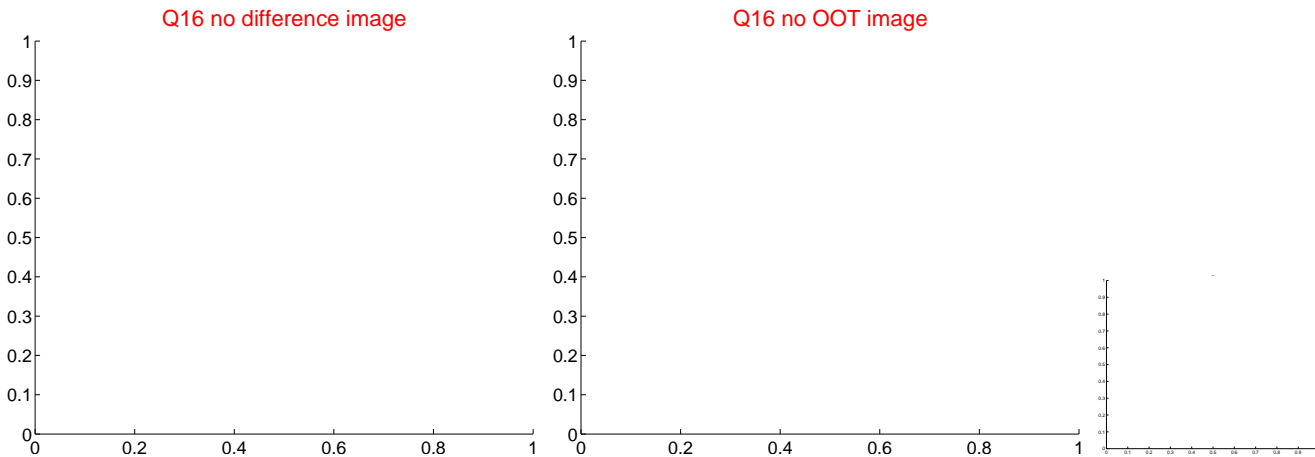
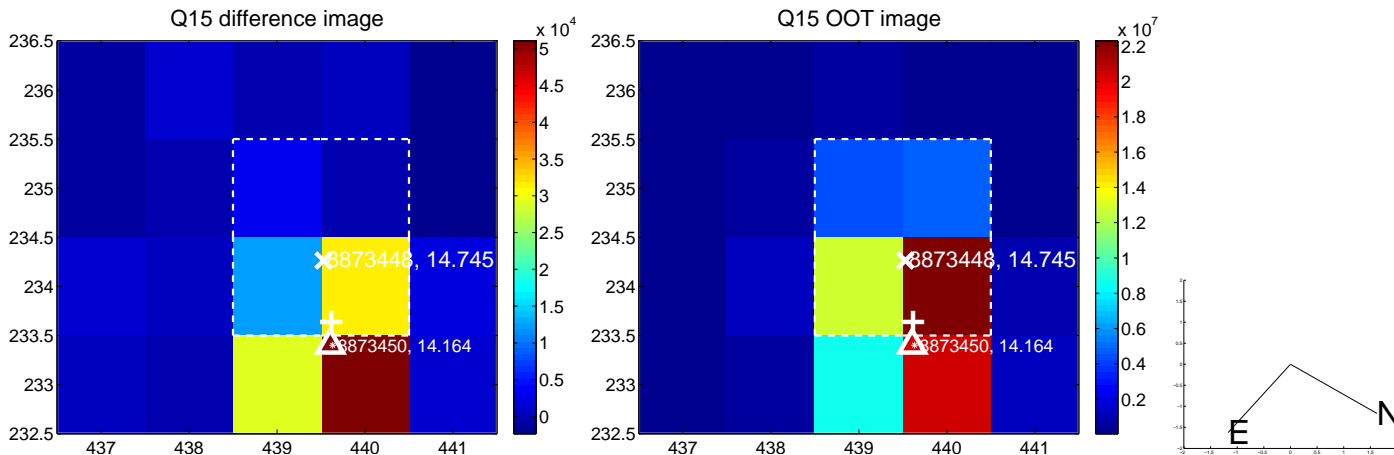
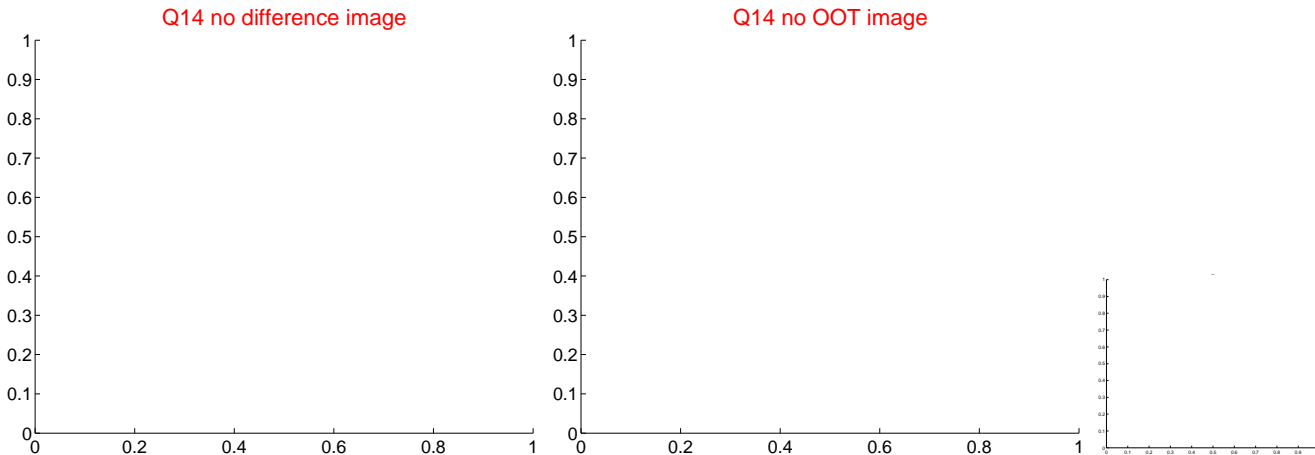
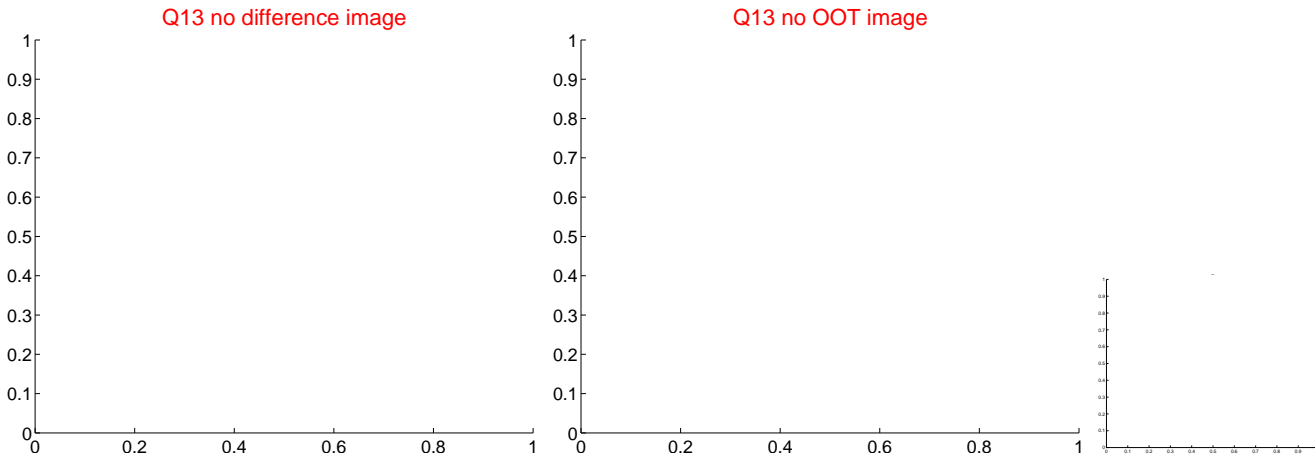
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



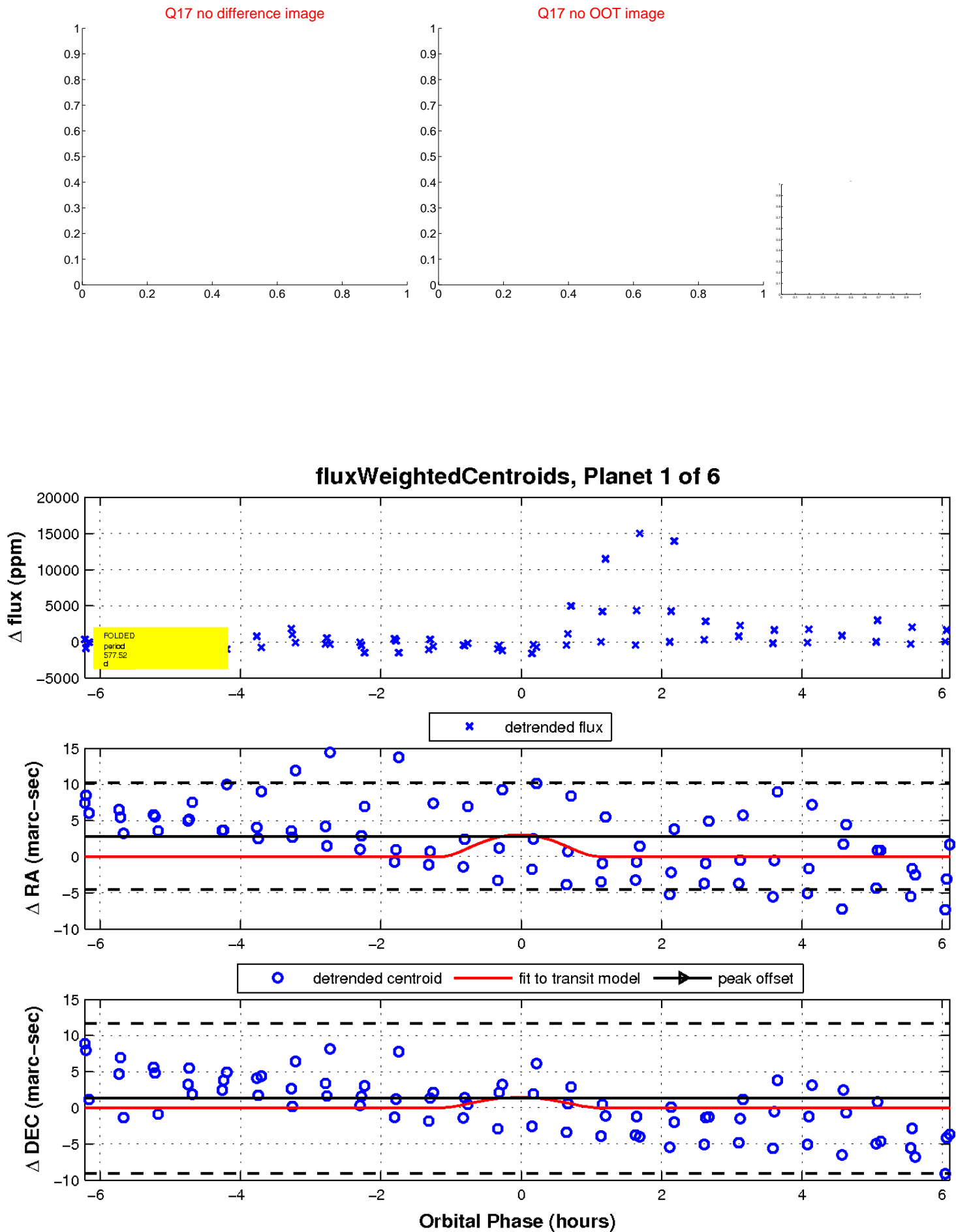
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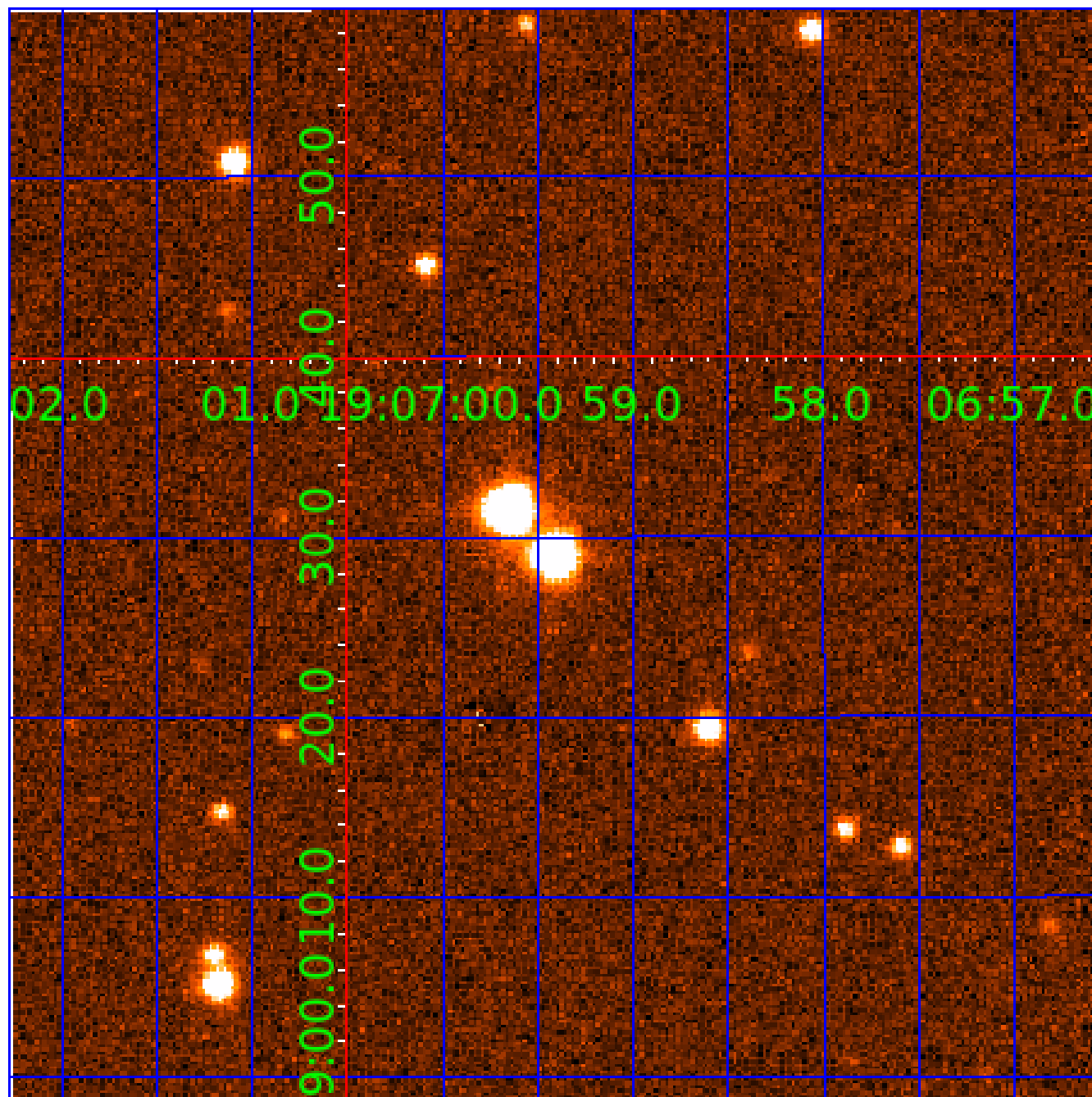


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008873448

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
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008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

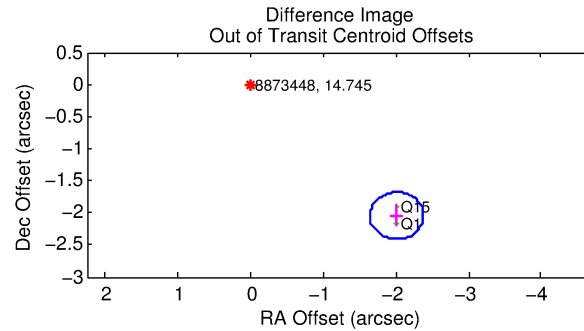
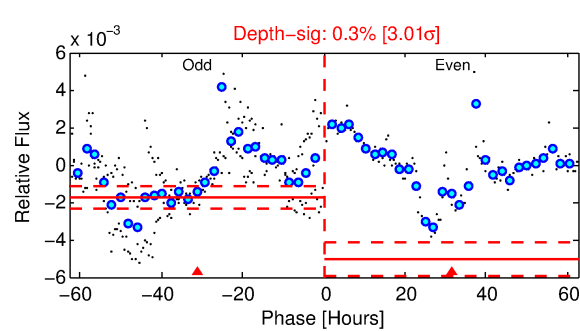
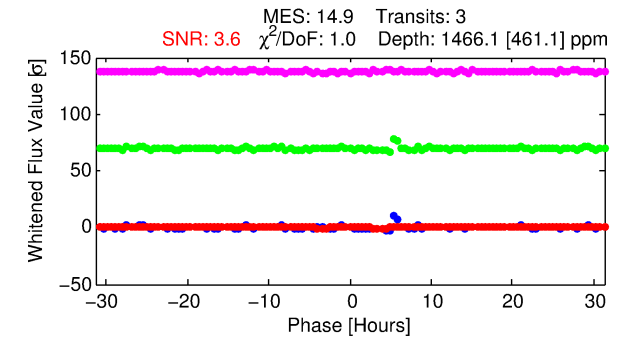
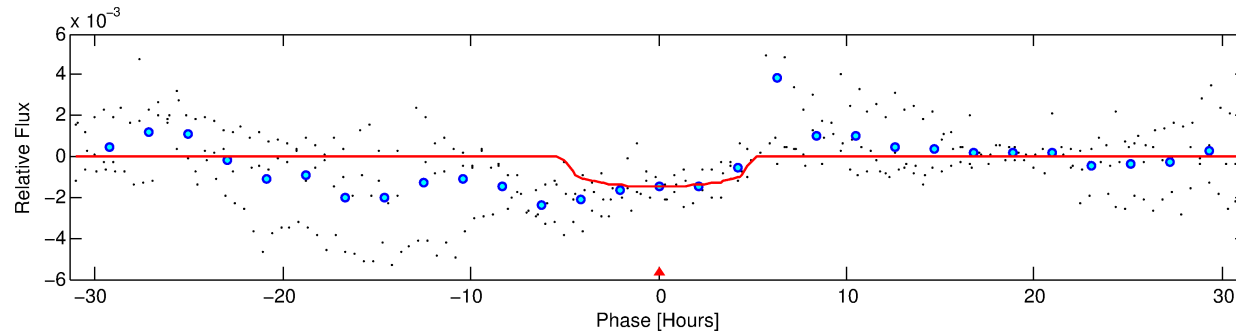
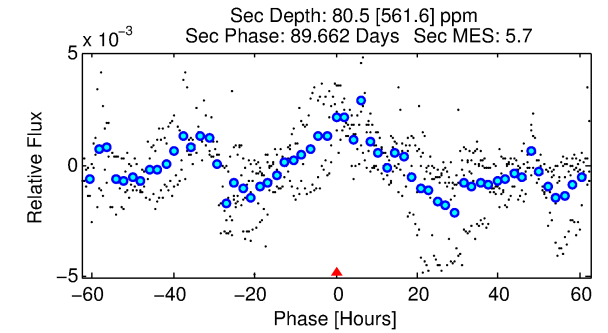
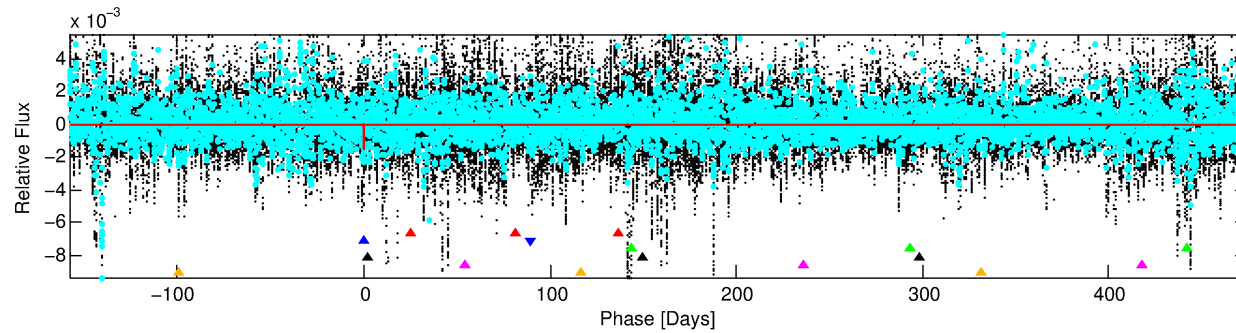
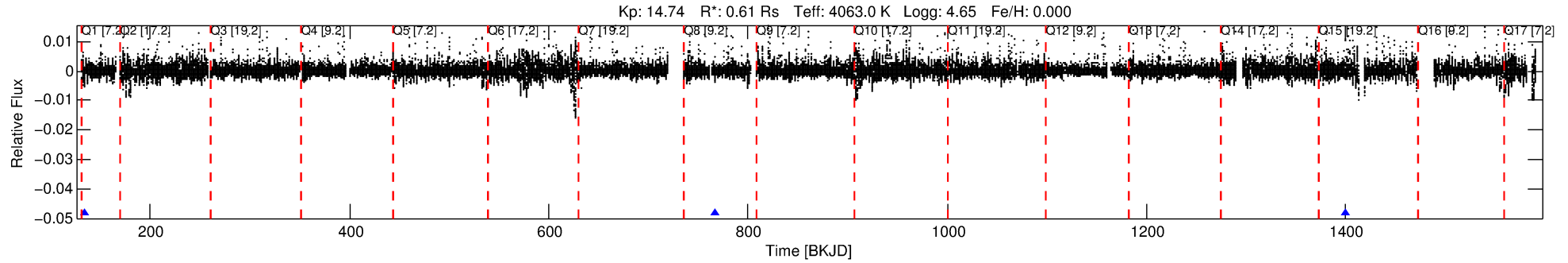
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-02

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 2 of 6 Period: 632.974 d



DV Fit Results:

Period = 632.97401 [0.01211] d
Epoch = 134.2714 [0.0142] BKJD
Rp/R* = 0.0381 [0.0105]
a/R* = 335.08 [234.17]
b = 0.74 [0.43]
Seff = 0.06 [0.01]
Teq = 127 [6] K
Rp = 2.53 [0.76] Re
a = 1.2200 [0.1072] AU
Ag = 10275.38 [71898.24] [0.14σ]
Teffp = 1971 [3449] K [0.53σ]

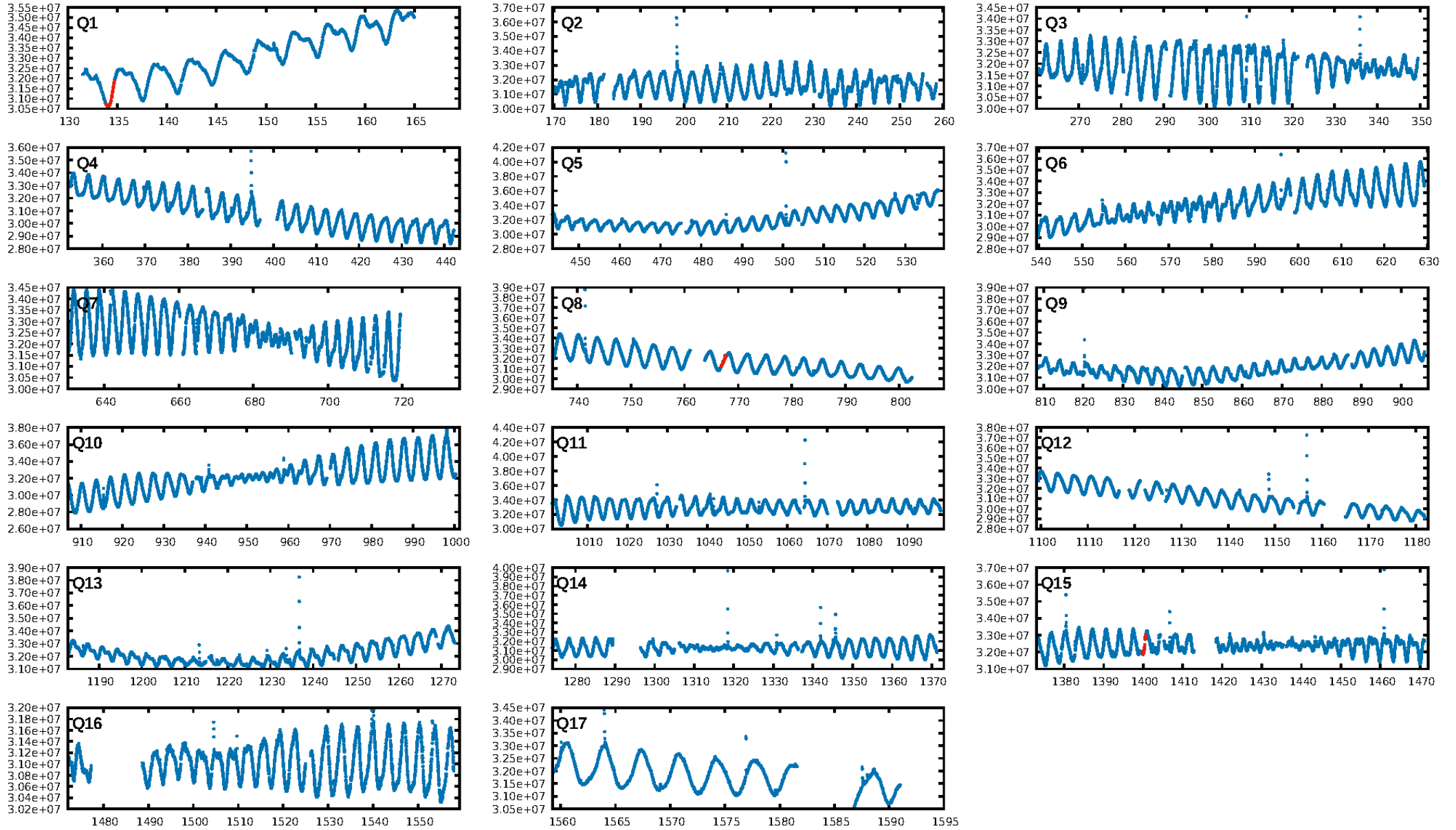
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [124.68σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 36.4%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -0.8506
Centroid-sig: 0.8%
Centroid-so: 2.484 arcsec [1.52σ]
OotOffset-rm: 2.869 arcsec [23.38σ]
KicOffset-rm: 0.716 arcsec [2.08σ]
OotOffset-st: 0.1/0/1 [2]
KicOffset-st: 0.1/0/1 [2]
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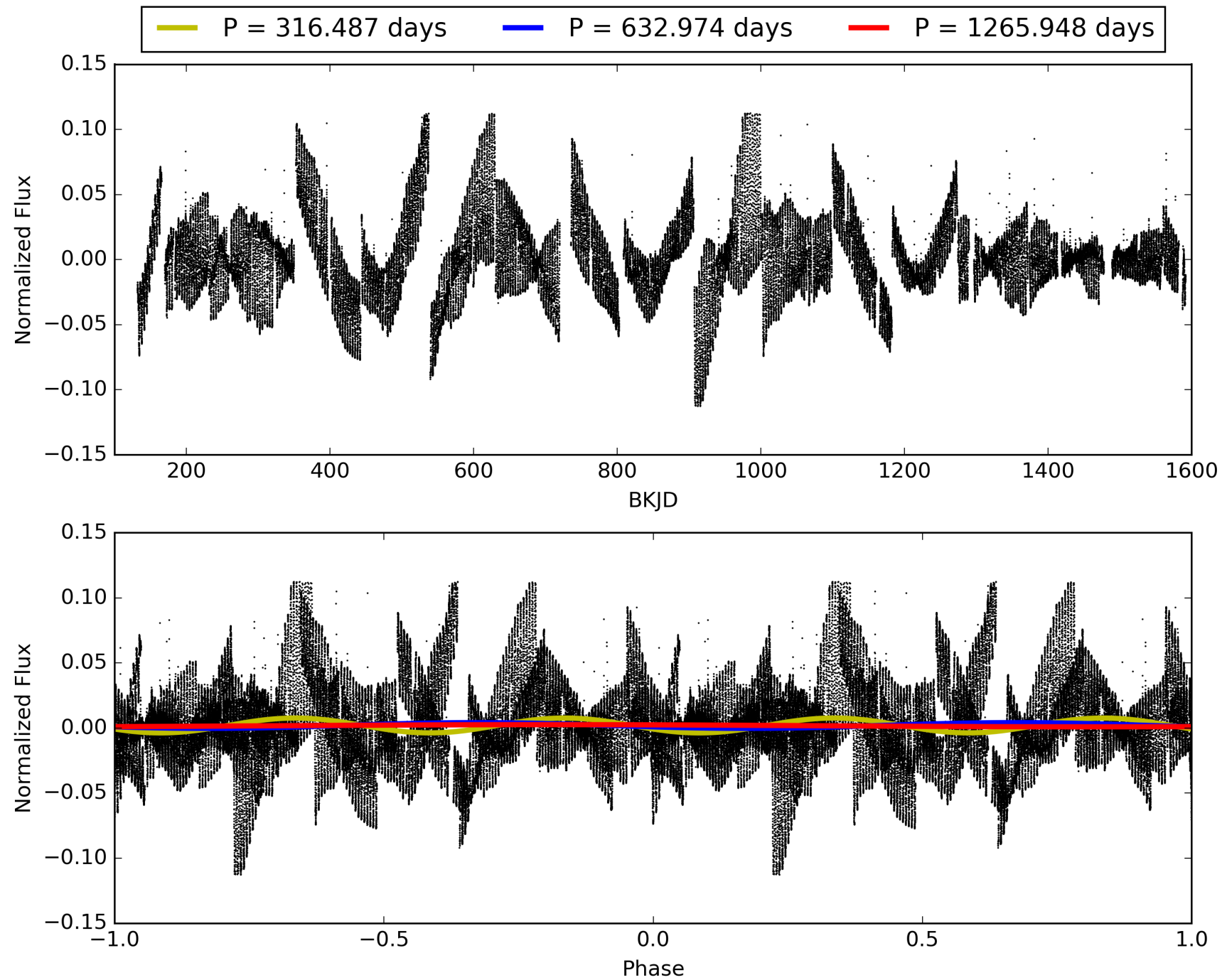
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008873448-02, PDC Light Curves

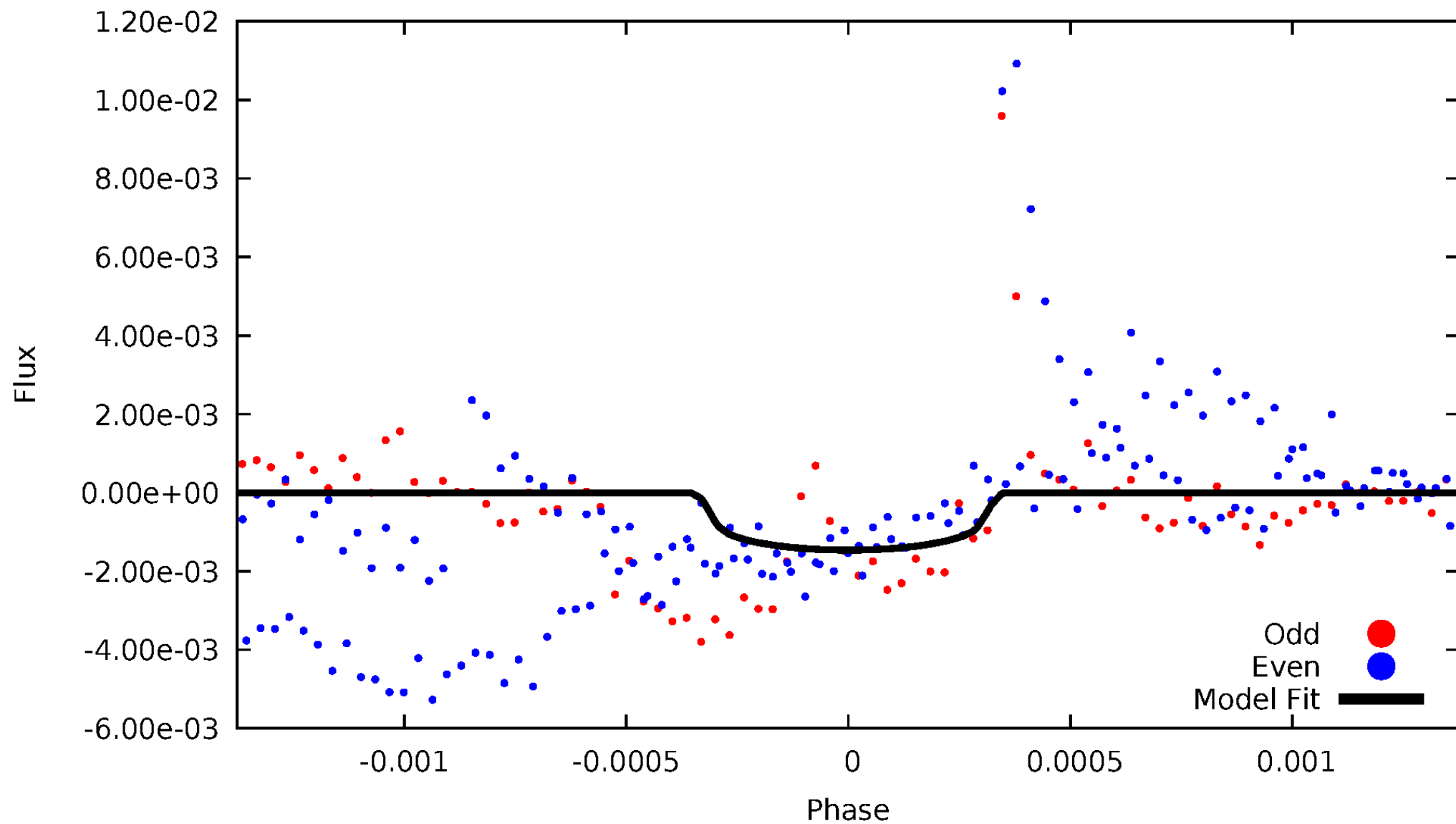


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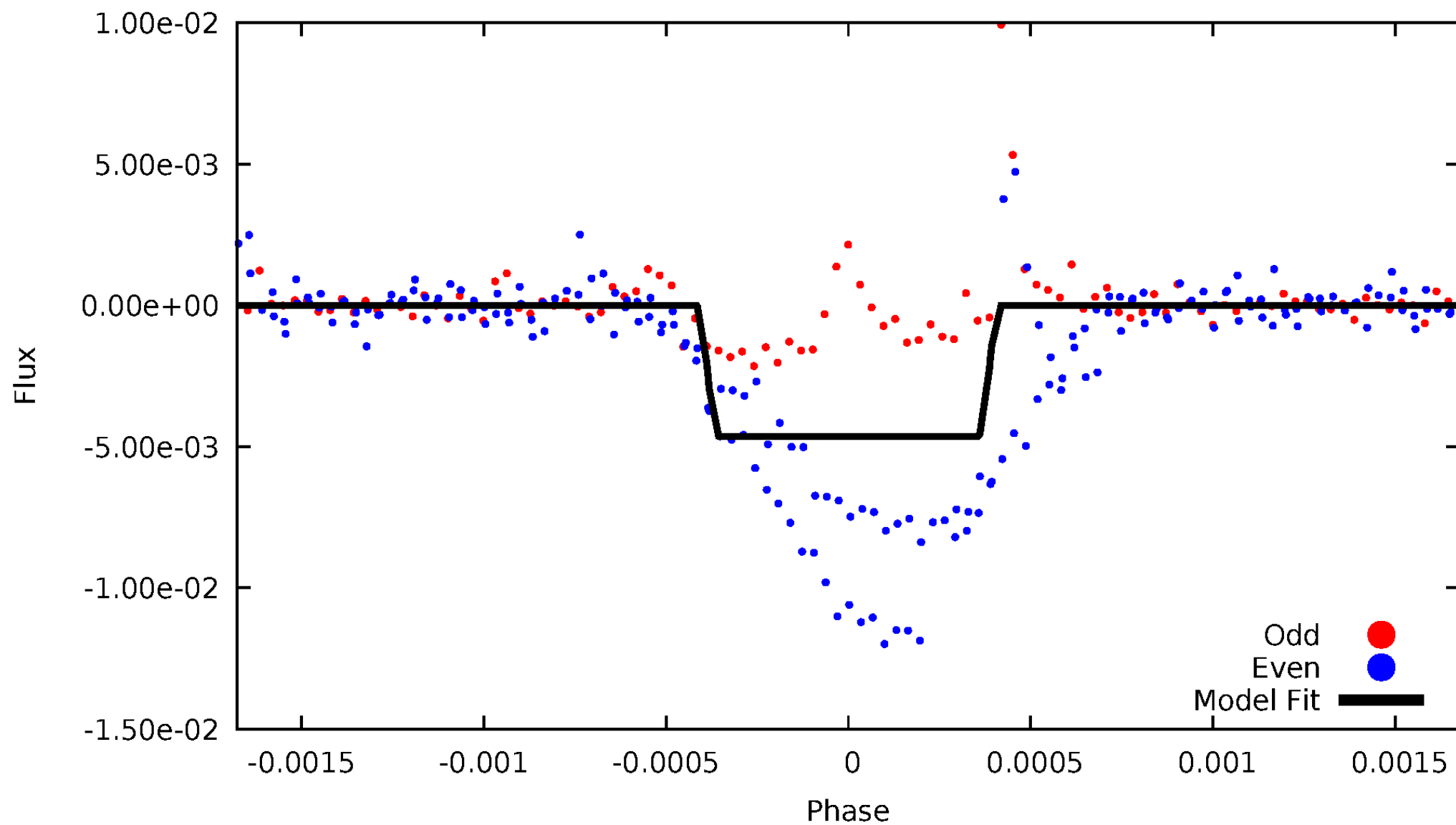
DV Odd/Even

TCE 008873448-02



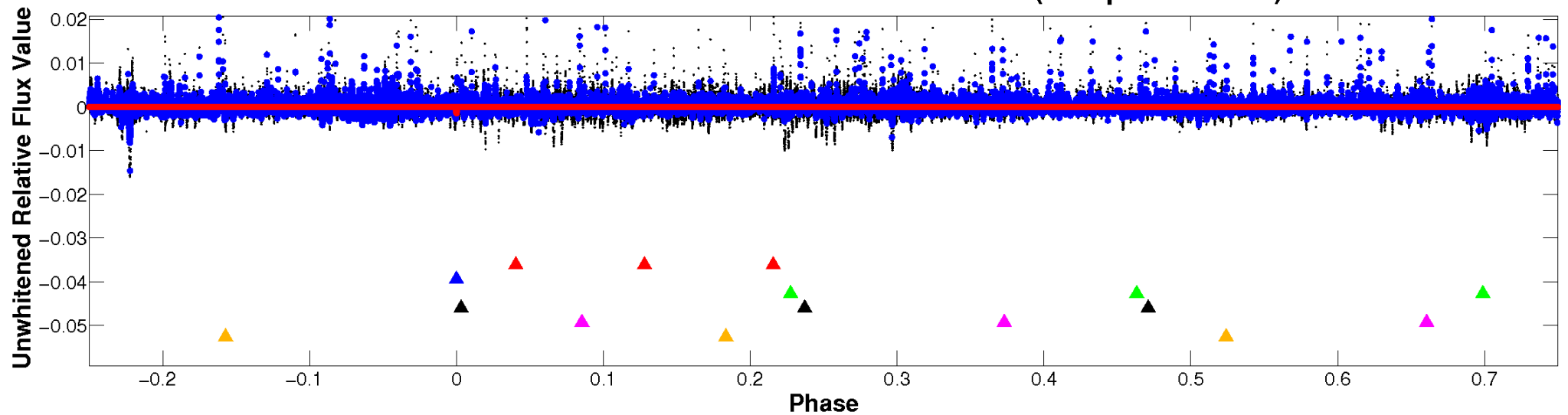
ALT Odd/Even

TCE 008873448-02

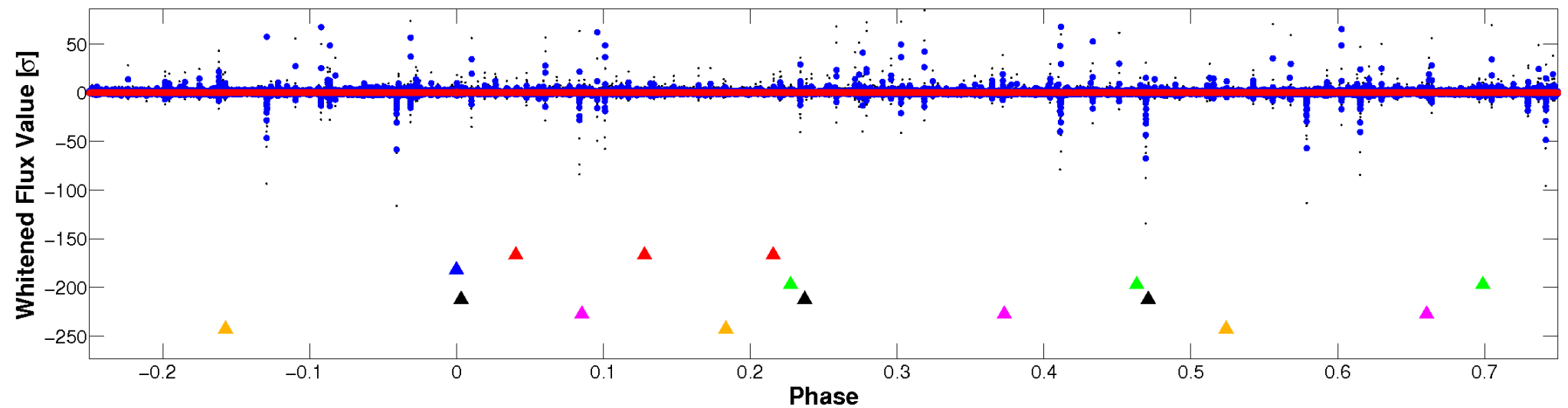


Non-Whitened Vs. Whitened Light Curve

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

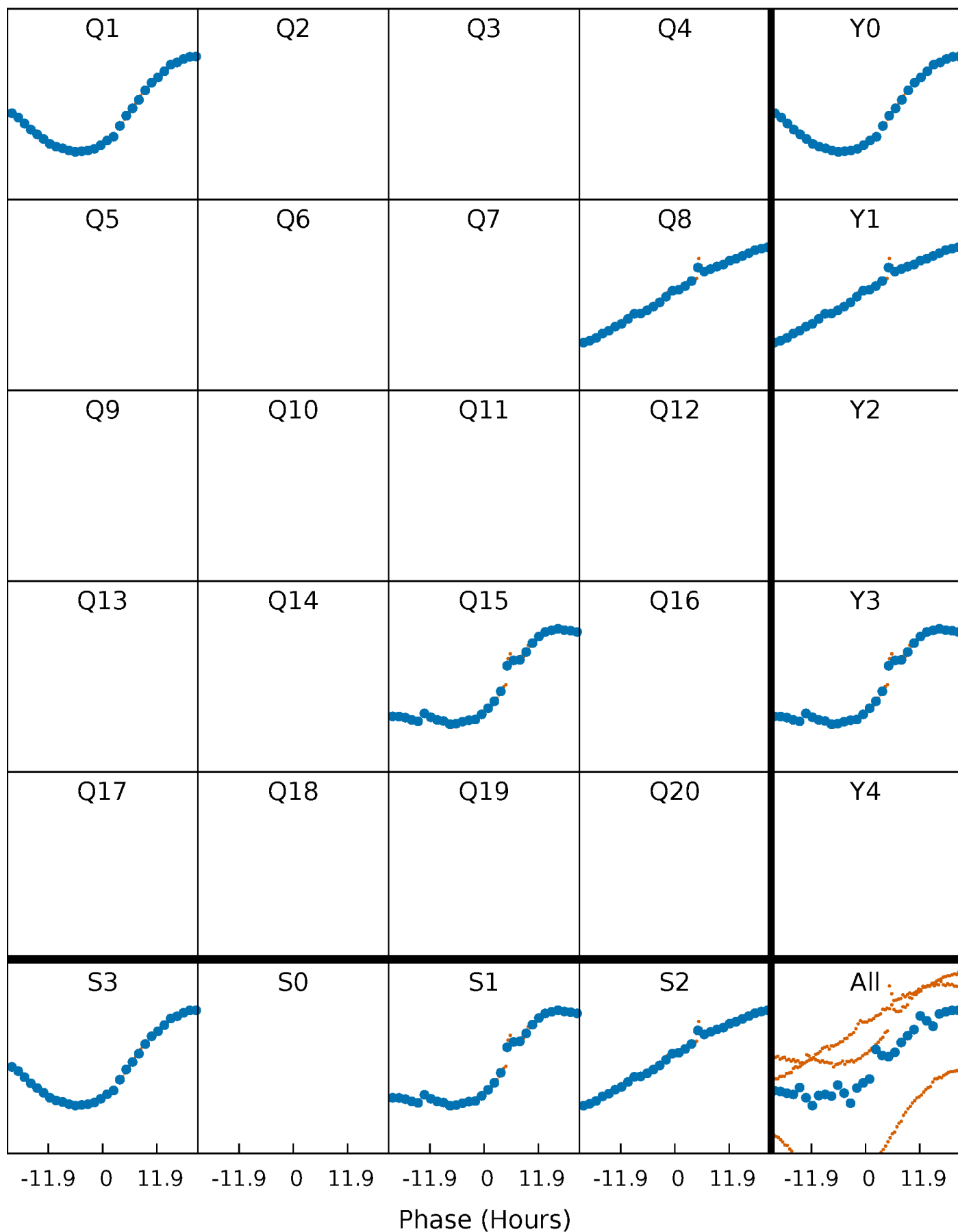


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



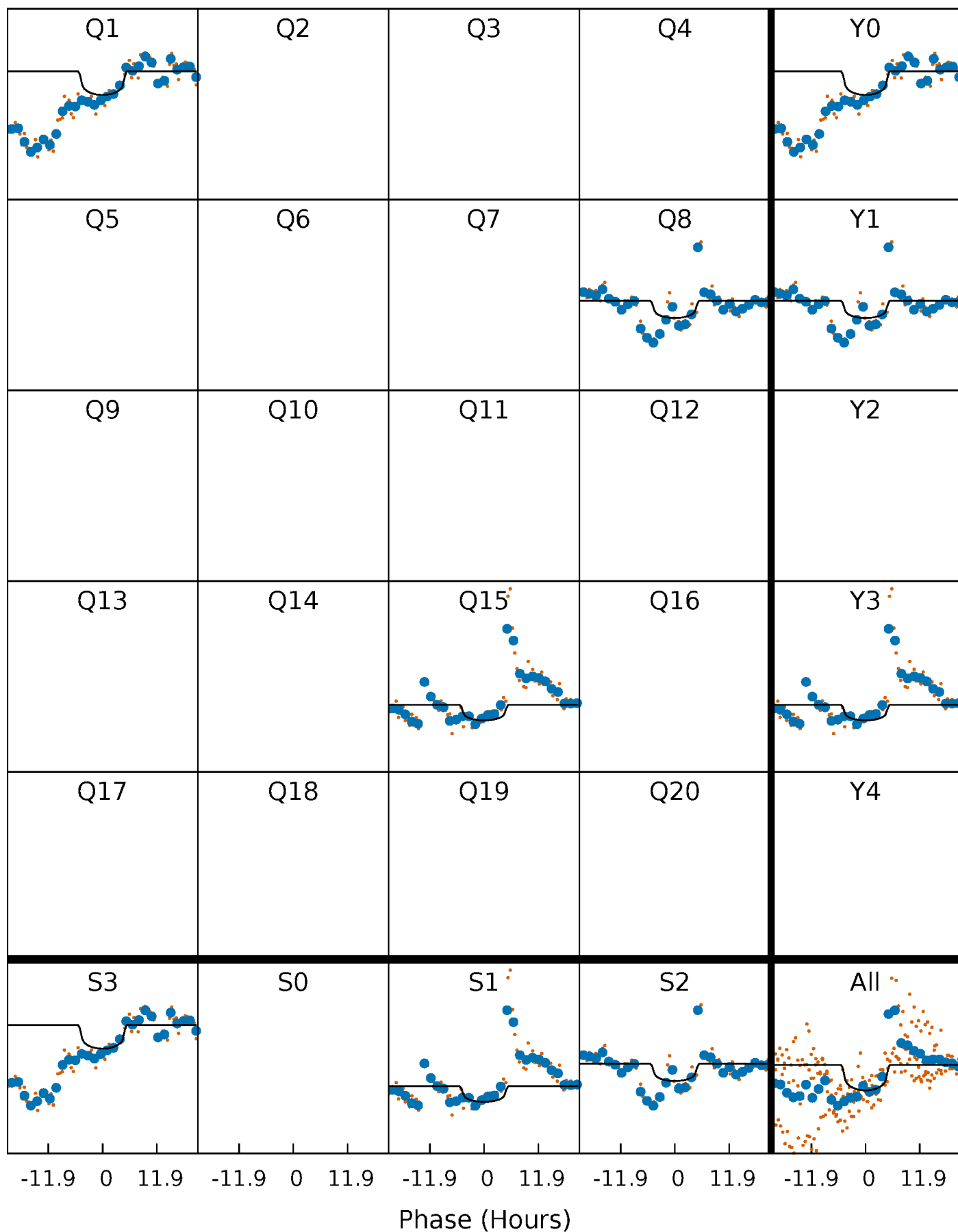
PDC Quarter-Phased Transit Curves

TCE 008873448-02 $P=632.974013$ Days $T_0=134.271399$ (BKJD)



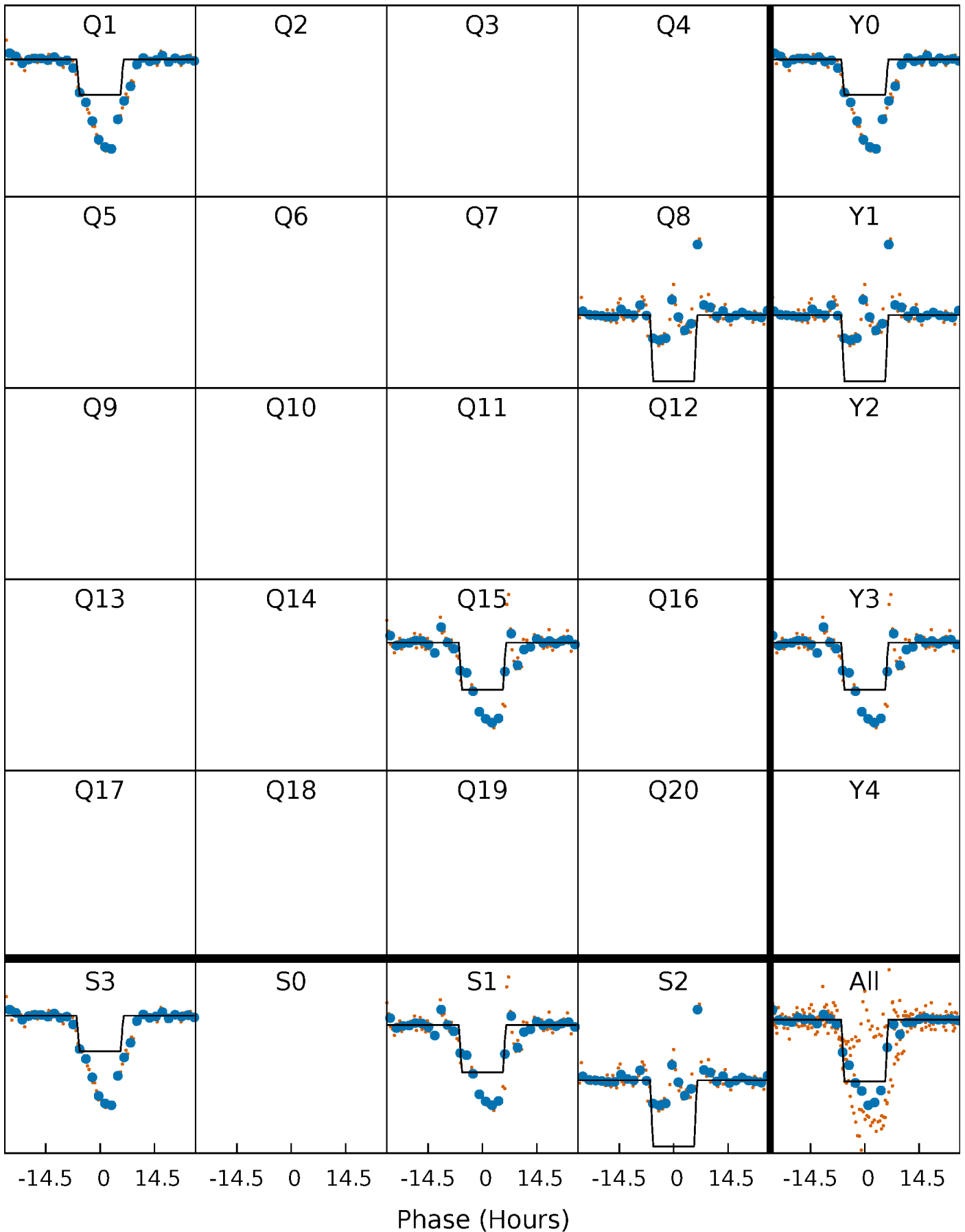
DV Quarter-Phased Transit Curves

TCE 008873448-02 $P=632.974013$ Days $T_0=134.271399$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

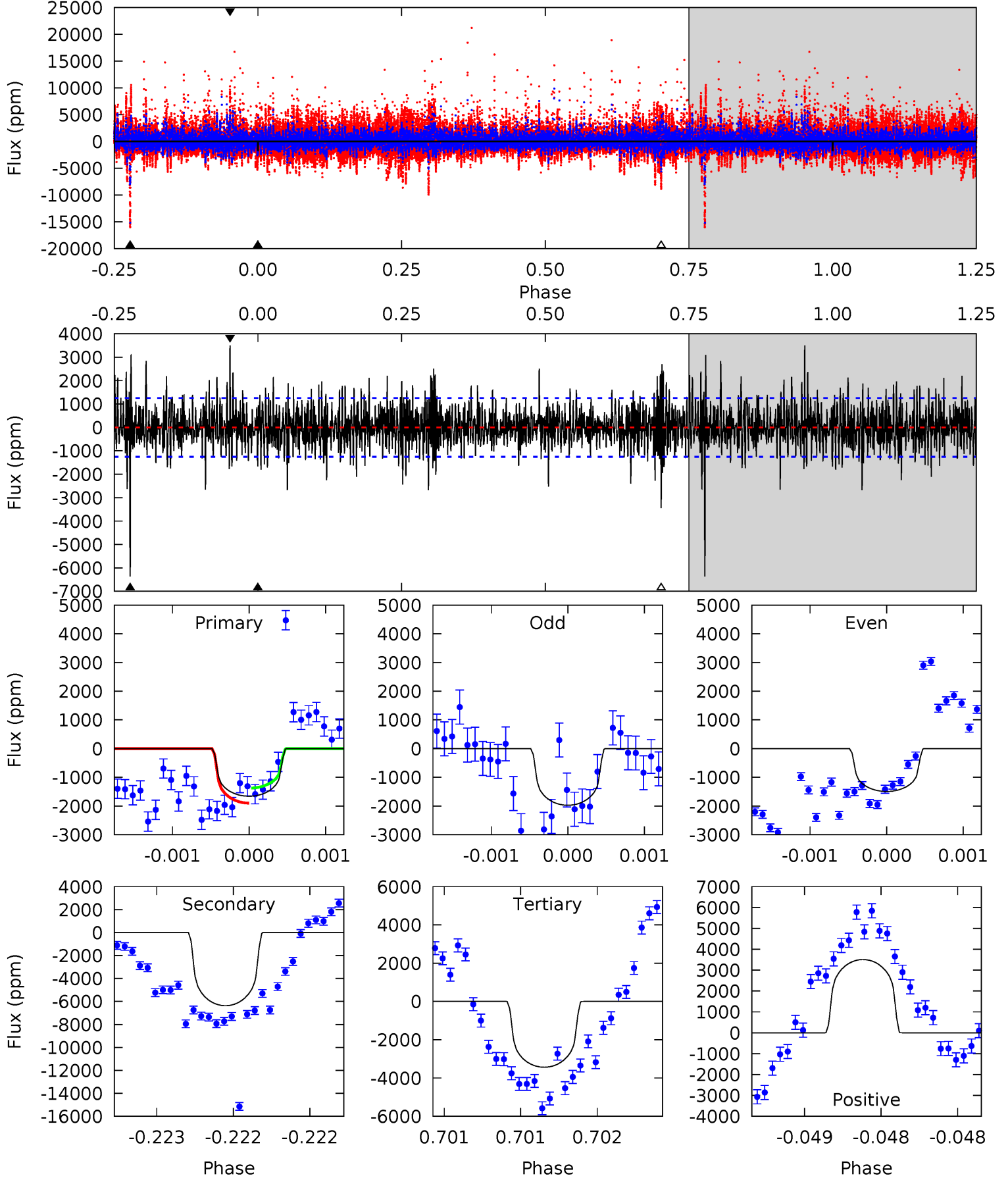
TCE 008873448-02 P=632.970388 Days $T_0=134.228758$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-02, P = 632.974013 Days, E = 134.271399 Days

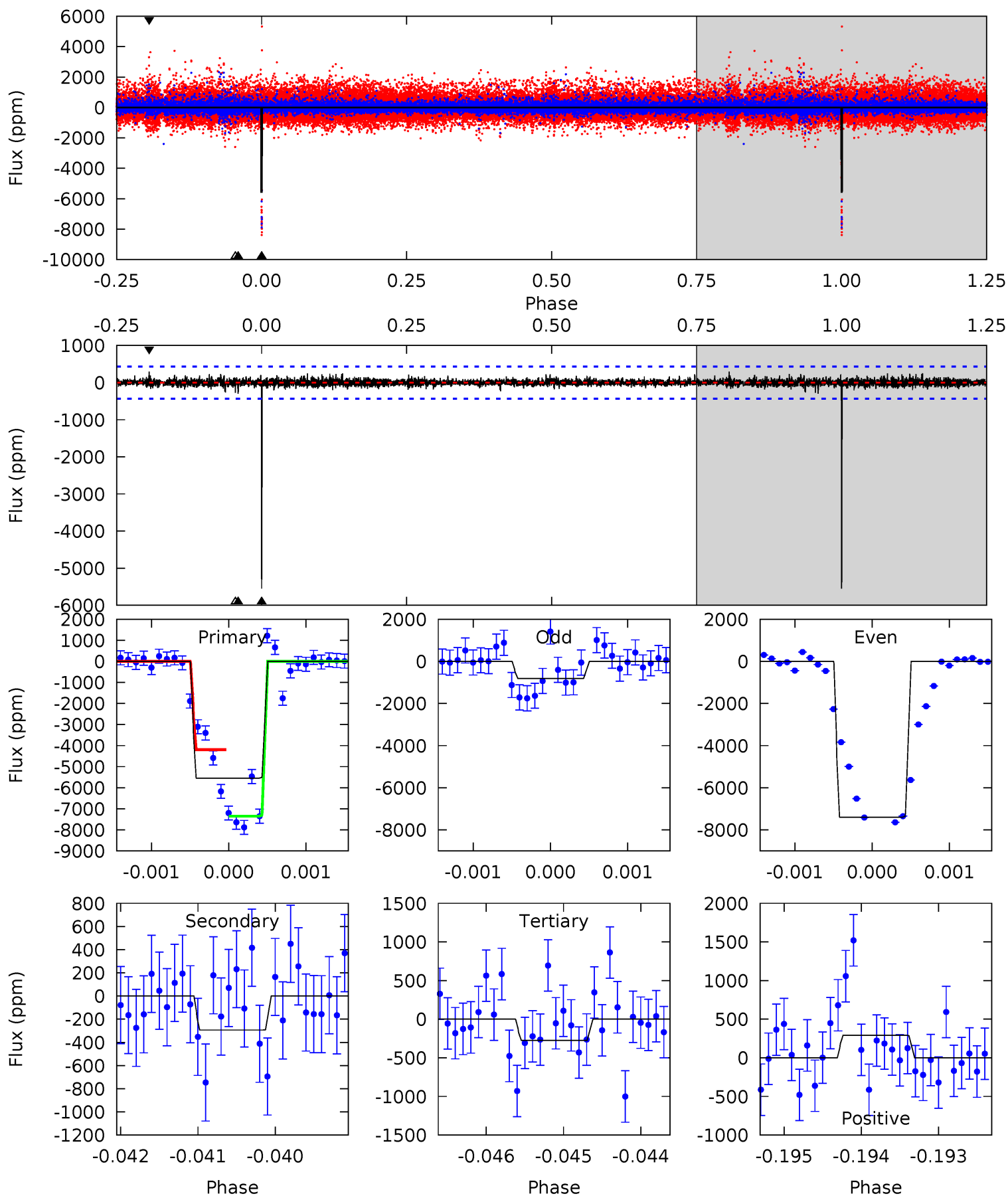
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.29	28.0	15.1	15.4	5.51	3.38	3.17	-7.80	-8.10	12.9	12.6	0.59	0.90	0.36	1.15



Alt Model-Shift Uniqueness Test

008873448-02, P = 632.970388 Days, E = 134.228758 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
70.5	3.73	3.50	3.71	5.48	3.34	0.63	67.0	66.8	0.23	0.03	48.3	0.85	0.05	0



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-6370 ± 228	$2.51^{+0.71}_{-0.73}$	176^{+7}_{-8}	5485^{+990}_{-609}	$841775^{+759239}_{-339351}$
Alt.	-294 ± 79	$4.56^{+0.76}_{-0.80}$	175^{+7}_{-7}	2659^{+174}_{-145}	11451^{+6483}_{-3621}

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

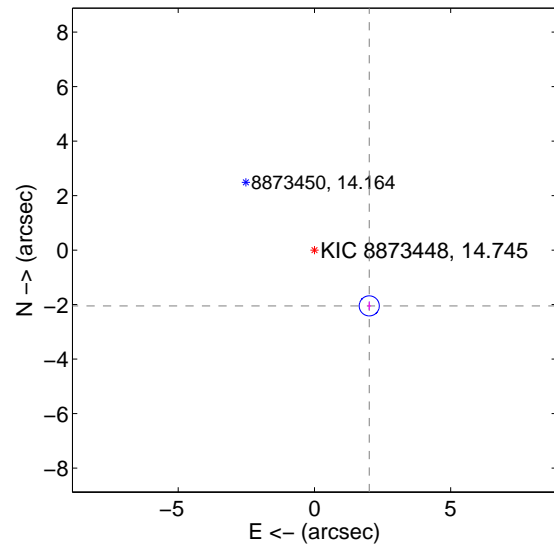
Supplemental centroid analysis for 008873448-02. Kepler magnitude: 14.74. Transit SNR 3.58

There are 2 quarters with good PRF difference image offsets

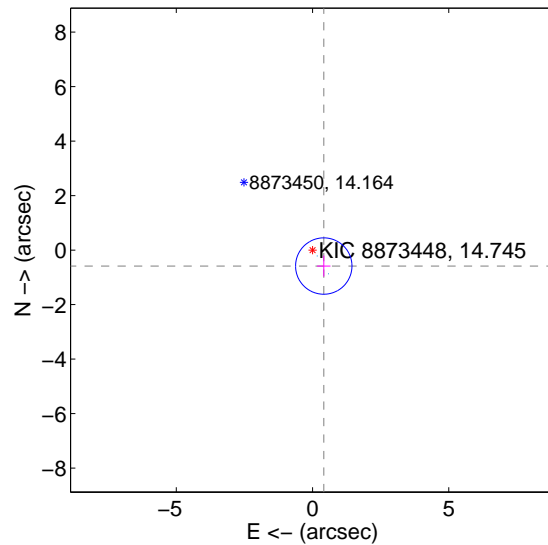
The OOT PRF centroid is offset from the target star catalog position by about 2.50 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.869 ± 0.123	23.38	-2.011 ± 0.067	-2.047 ± 0.159
PRF-fit source offset from KIC position	0.716 ± 0.345	2.08	-0.413 ± 0.246	-0.585 ± 0.384
photometric centroid source offset	2.48 ± 1.64	1.52	-2.40 ± 1.62	-0.63 ± 1.88

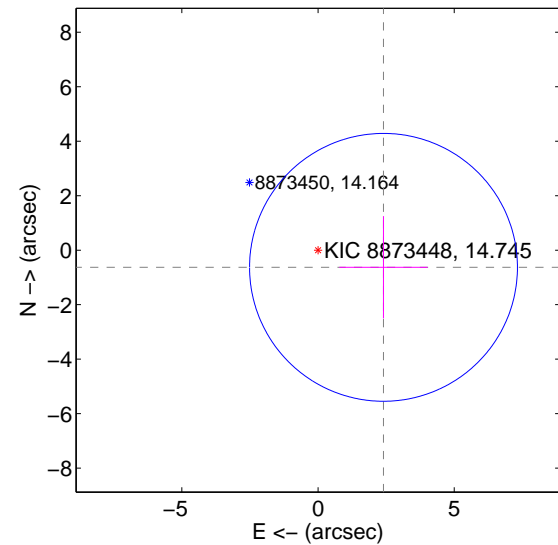
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

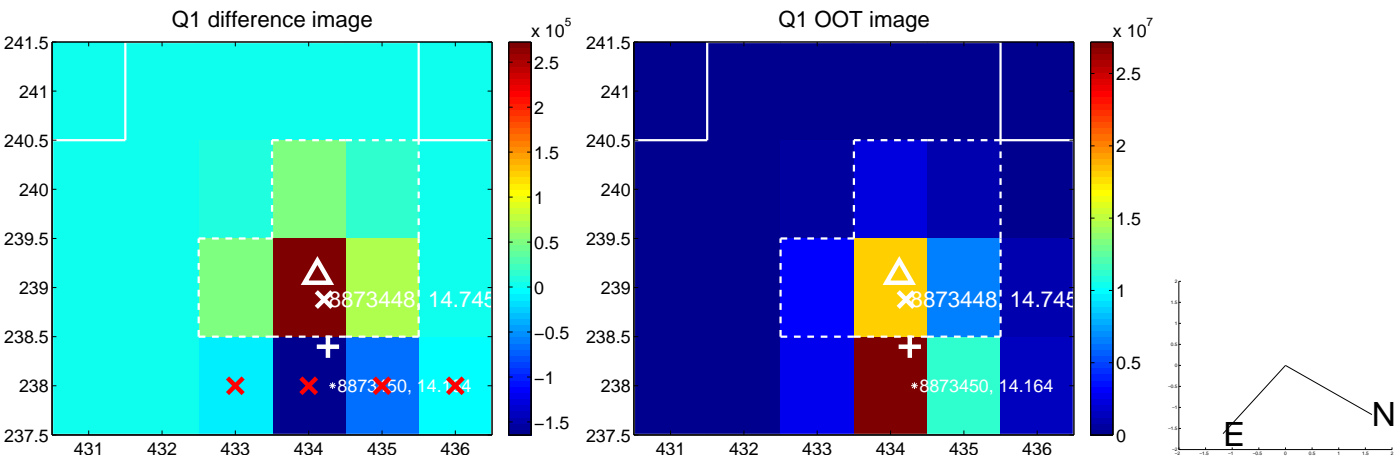


offset from photometric centroids

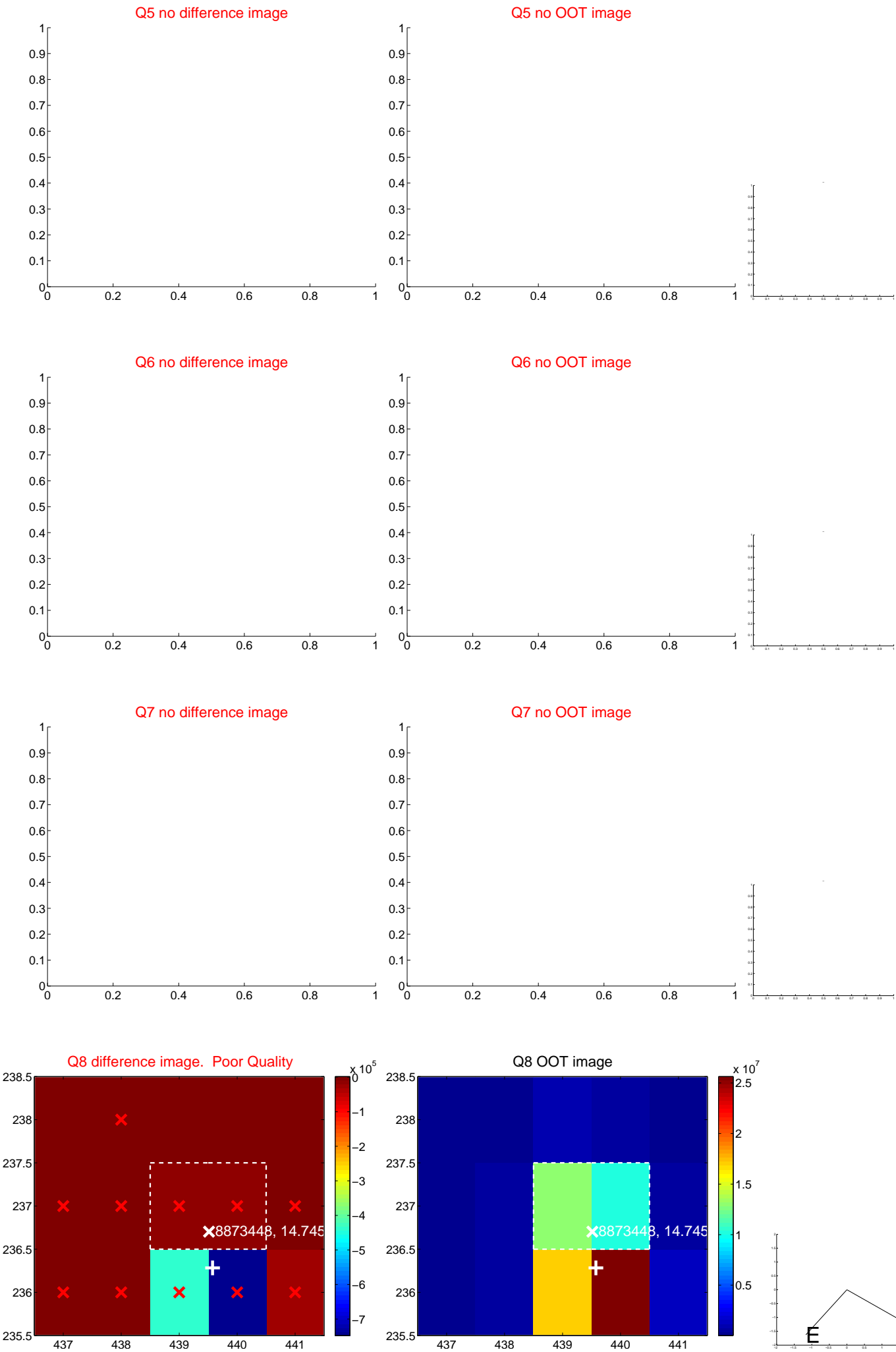


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



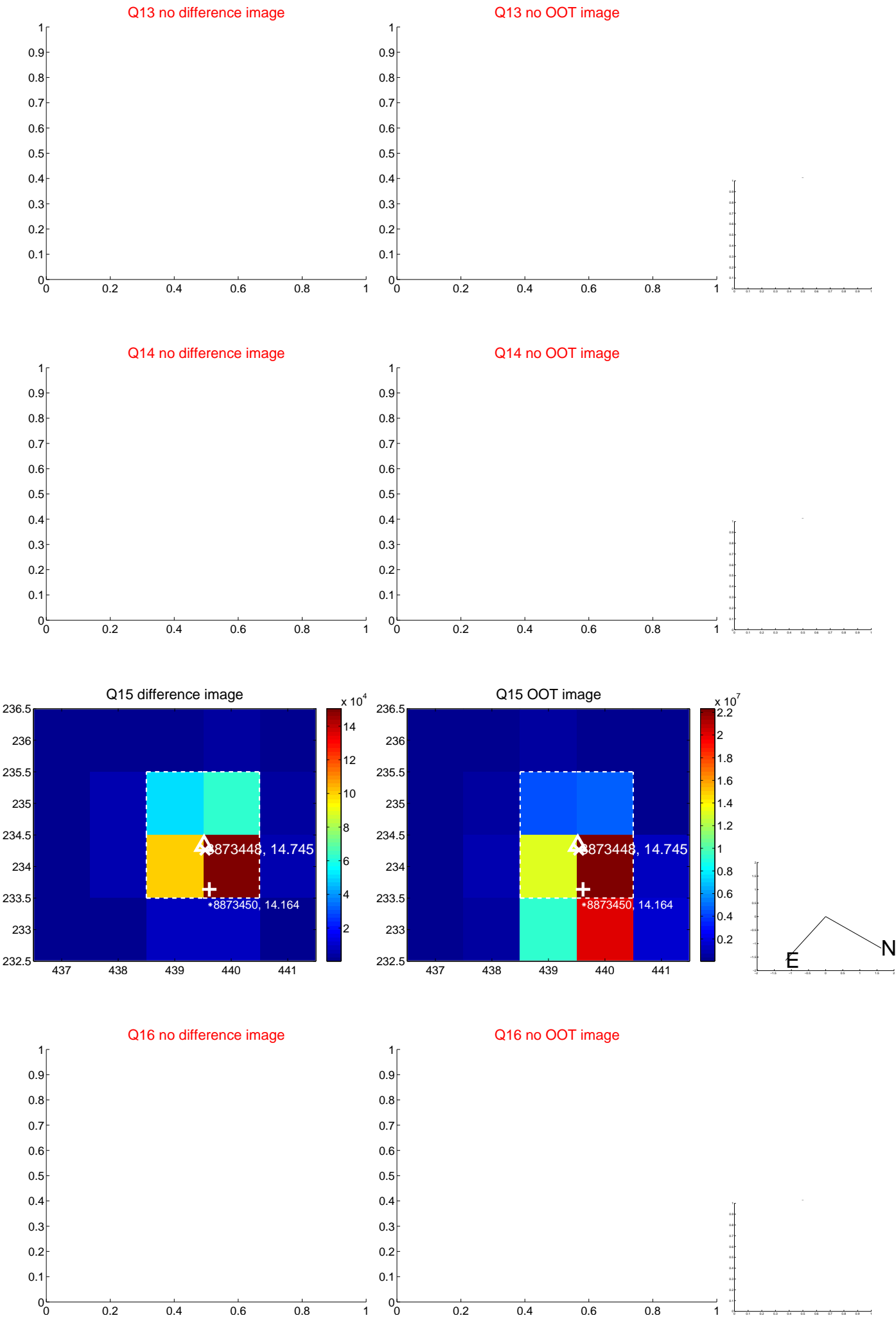
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



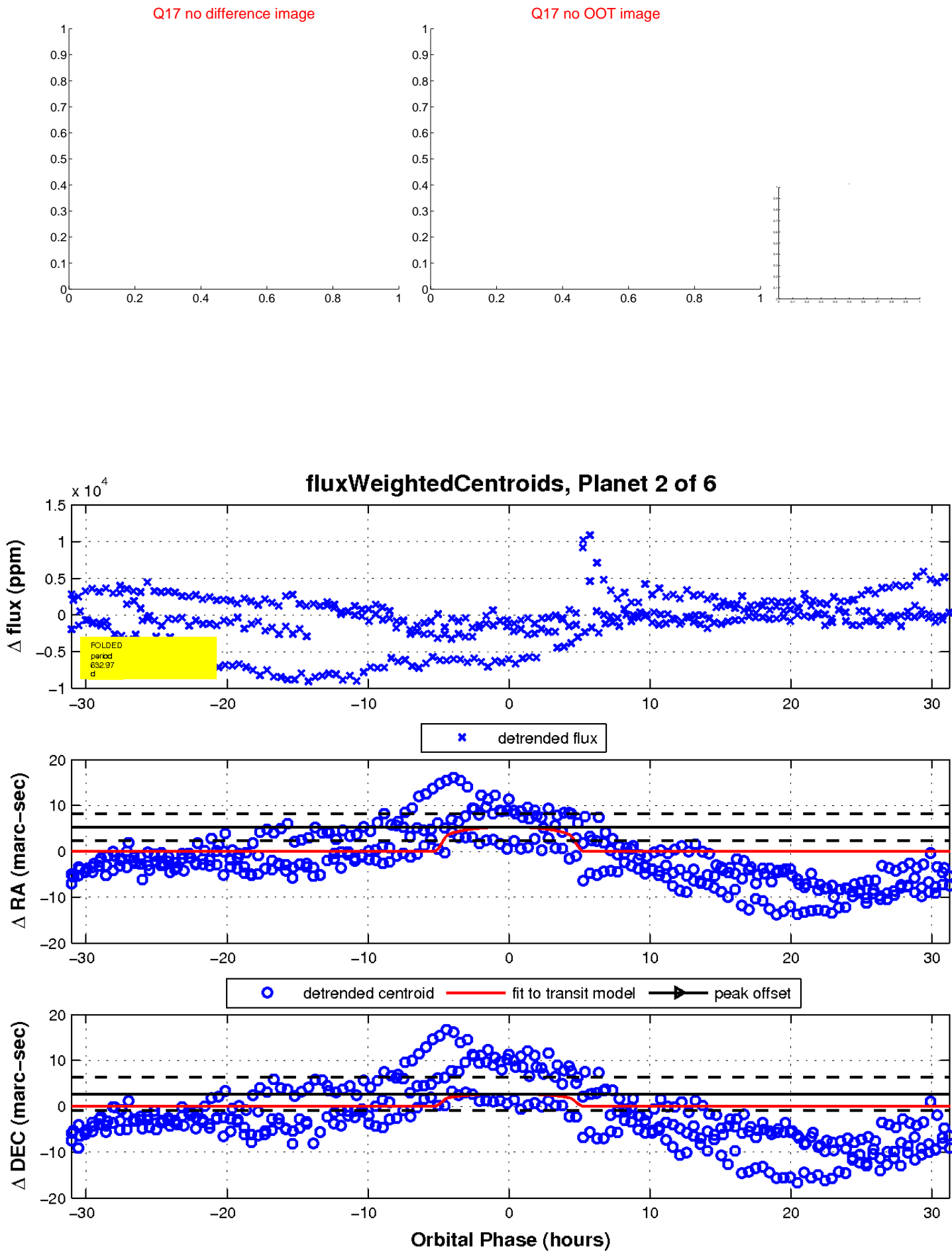
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

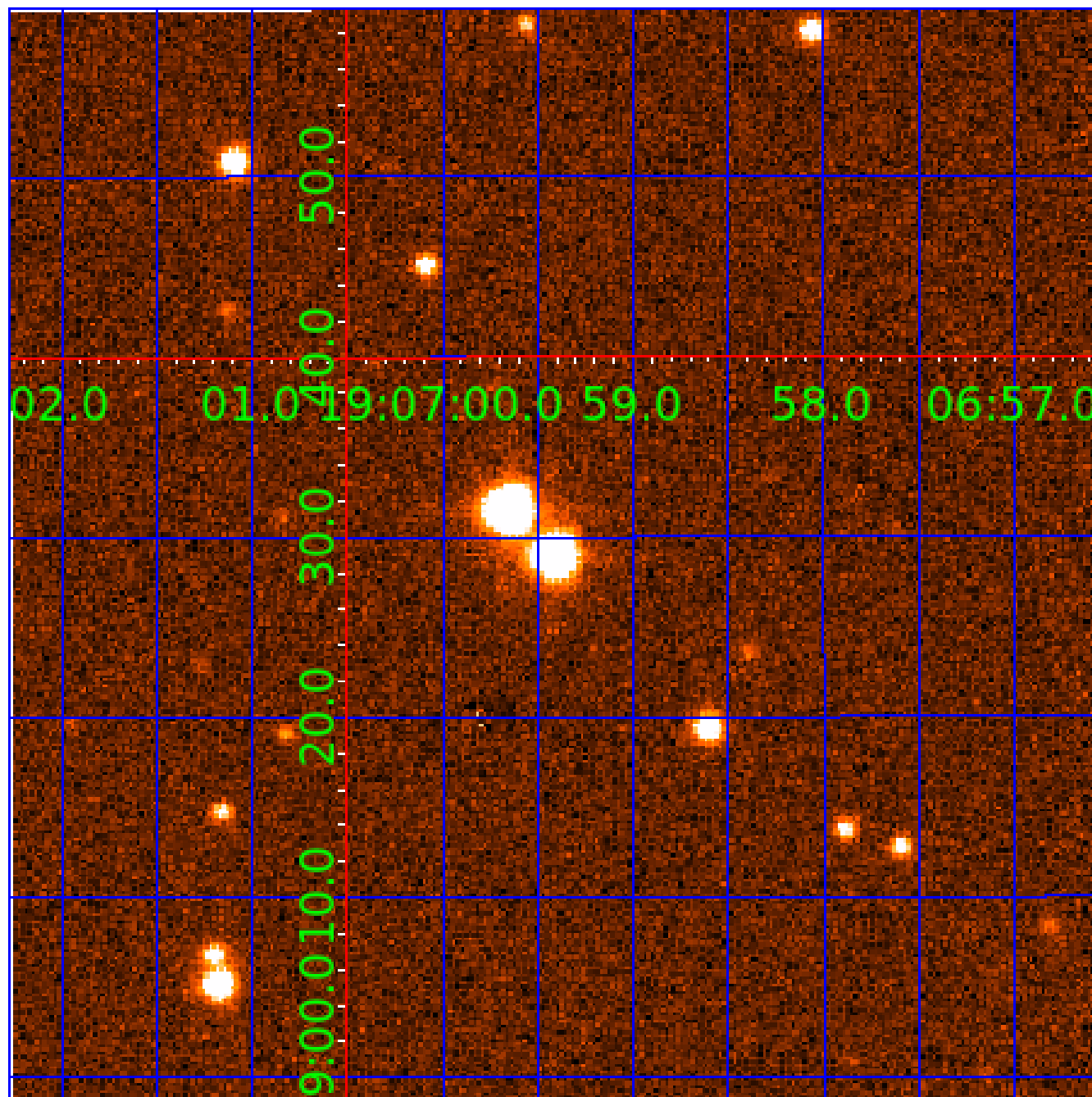


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008873448

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})
008873448-01	OBS	No	577.515355	270.778153	1878.4	2.158	15.1	4.8	0.61	4063	4.72	0.07
008873448-02	OBS	No	632.974013	134.271399	1466.1	10.455	14.9	3.6	0.61	4063	2.53	0.06
008873448-03	OBS	No	483.800646	576.632412	2097.6	4.039	12.9	6.8	0.61	4063	3.09	0.09
008873448-04	OBS	No	484.909494	432.426018	2214.4	5.391	13.5	6.5	0.61	4063	2.81	0.09
008873448-05	OBS	No	450.940038	552.418638	4797.4	9.434	12.5	9.8	0.61	4063	4.08	0.10
008873448-06	OBS	No	417.375897	465.977721	690.2	12.000	12.1	-1.0	0.61	4063	1.55	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008873448-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

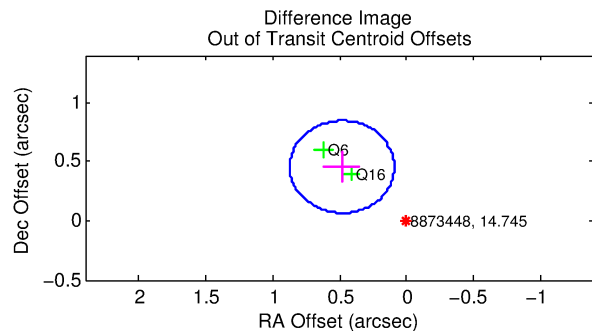
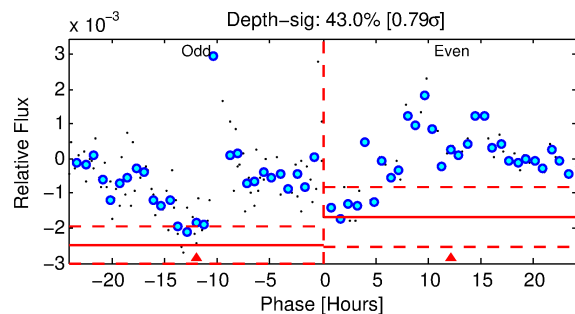
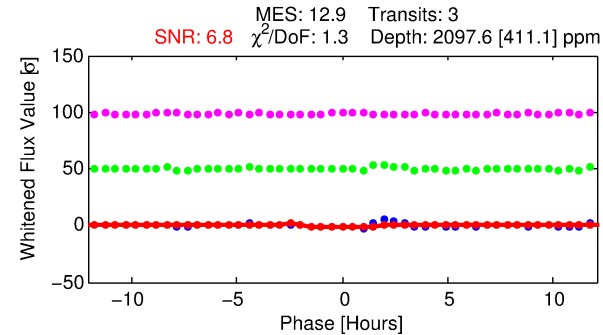
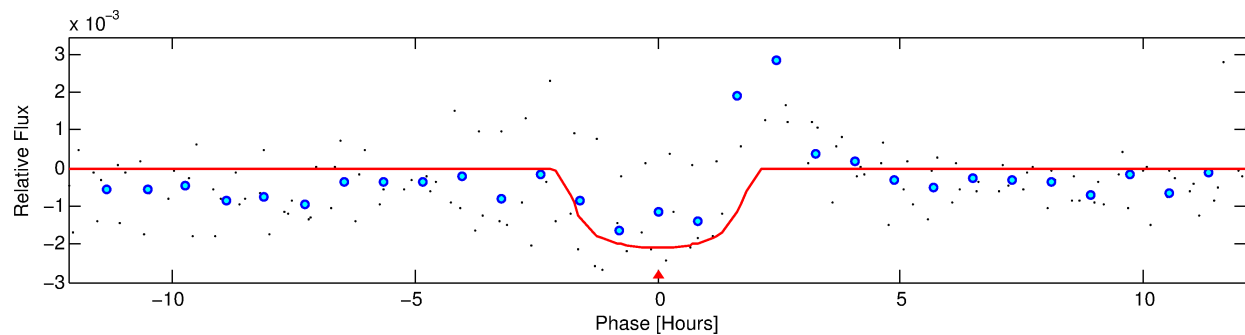
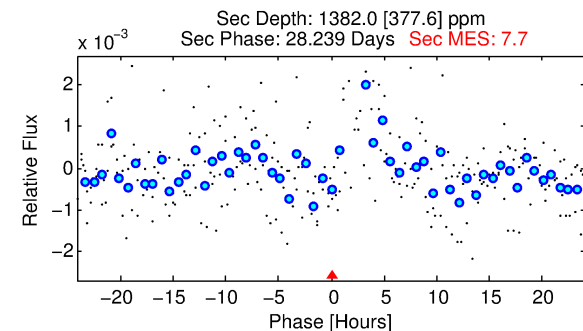
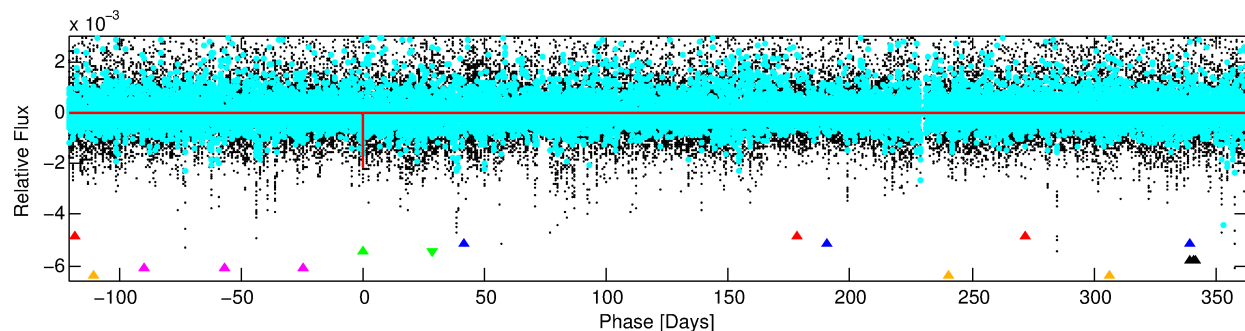
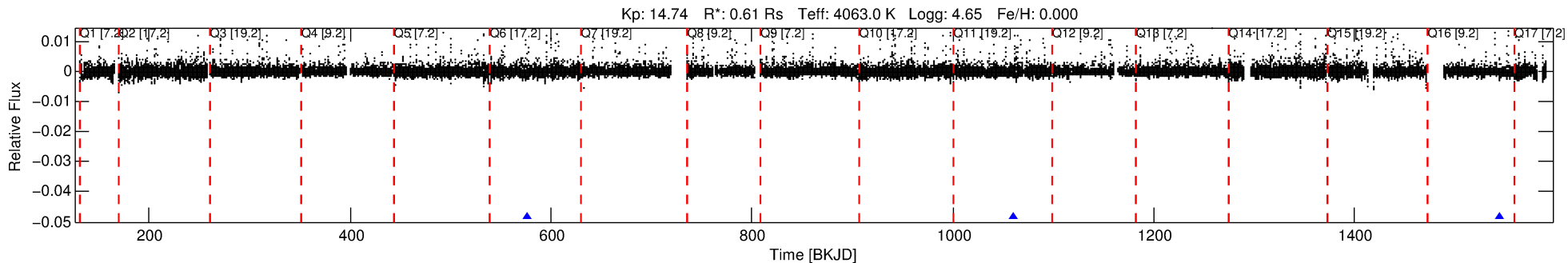
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-03

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 3 of 6 Period: 483.801 d



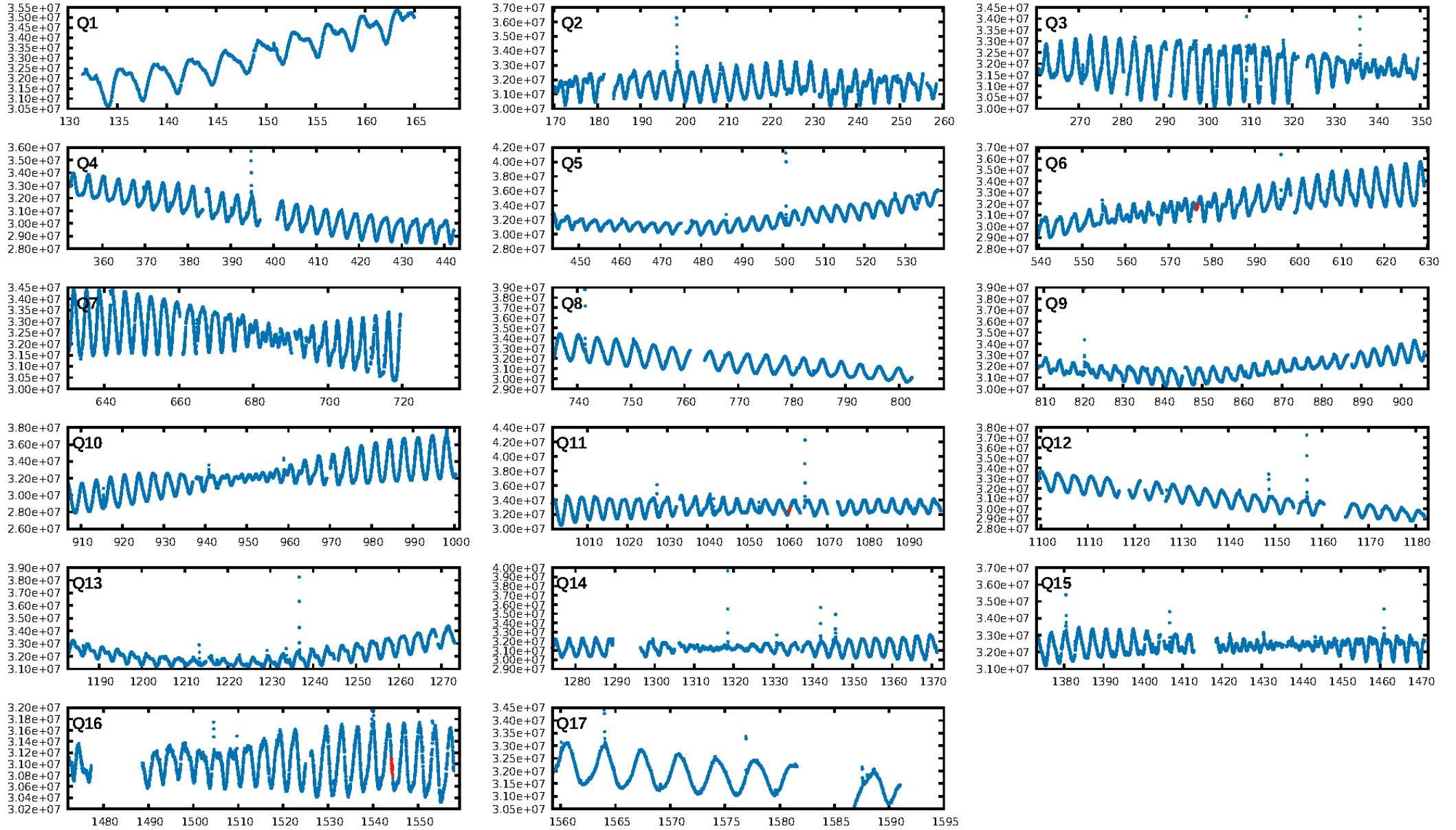
DV Fit Results:

Period = 483.80065 [0.00606] d
Epoch = 576.6324 [0.0073] BKJD
Rp/R* = 0.0465 [0.0242]
a/R* = 638.84 [1151.00]
b = 0.78 [0.91]
Seff = 0.09 [0.02]
Teq = 139 [7] K
Rp = 3.09 [1.65] Re
a = 1.0199 [0.0896] AU
Ag = 82815.21 [89735.60] [0.92σ]
Teffp = 3633 [988] K [3.54σ]

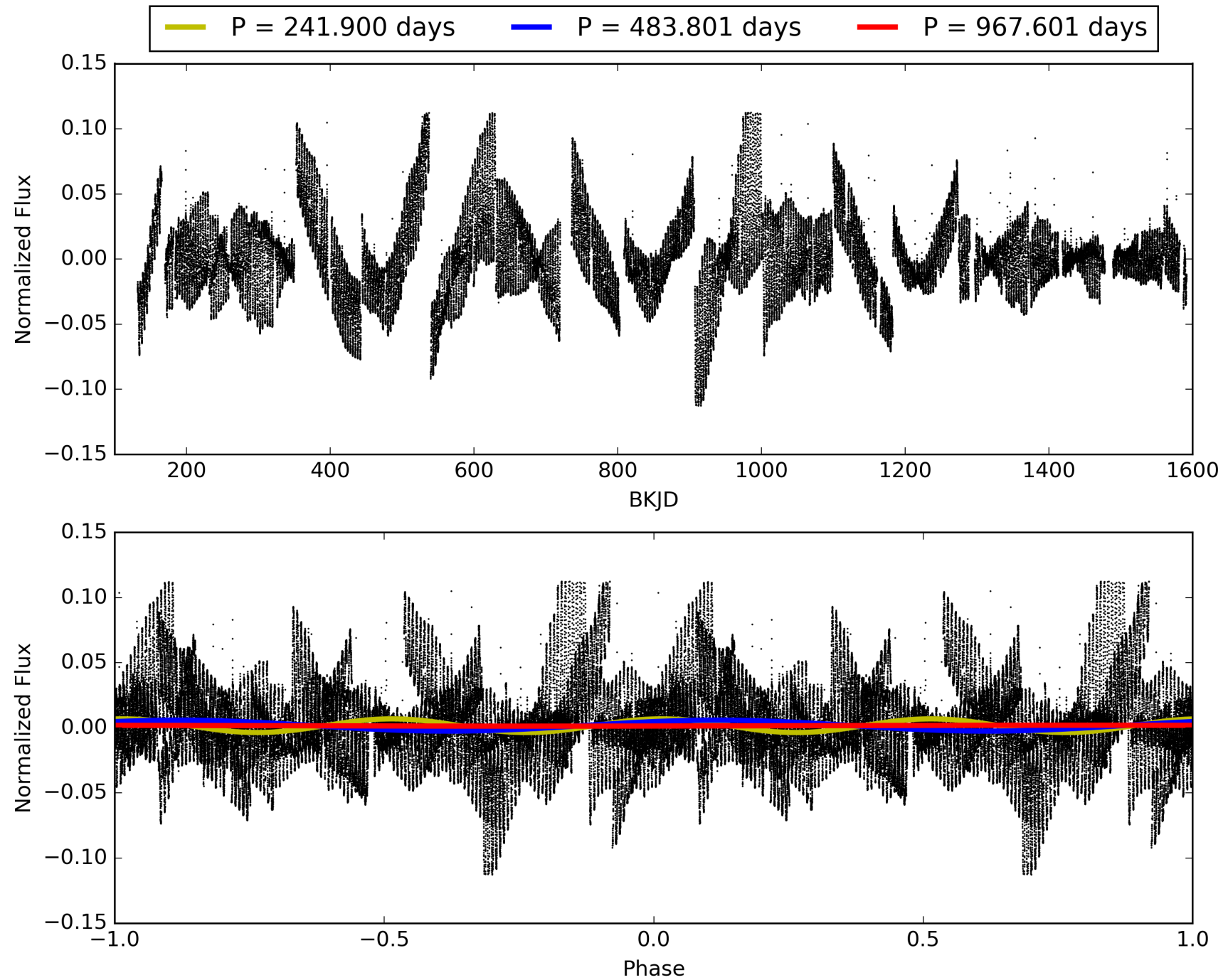
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.85σ]
LongPeriod-sig: 100.0% [3.95σ]
ModelChiSquare2-sig: 4.8%
ModelChiSquareGof-sig: 56.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 2.222
Centroid-sig: 28.4%
Centroid-so: 2.527 arcsec [2.95σ]
OotOffset-rm: 0.664 arcsec [5.10σ]
KicOffset-rm: 2.617 arcsec [5.02σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008873448-03, PDC Light Curves

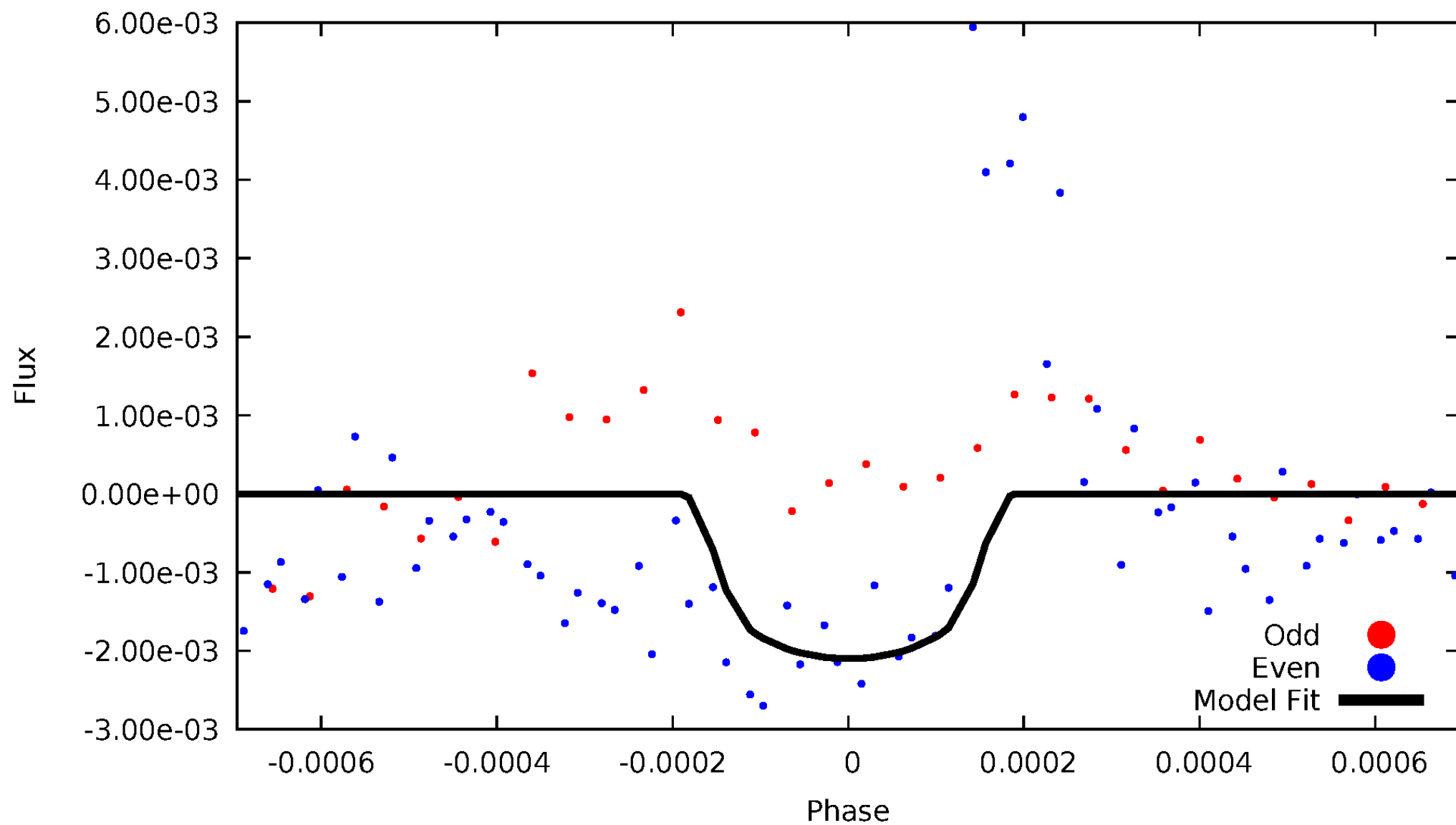


TCE 008873448-03



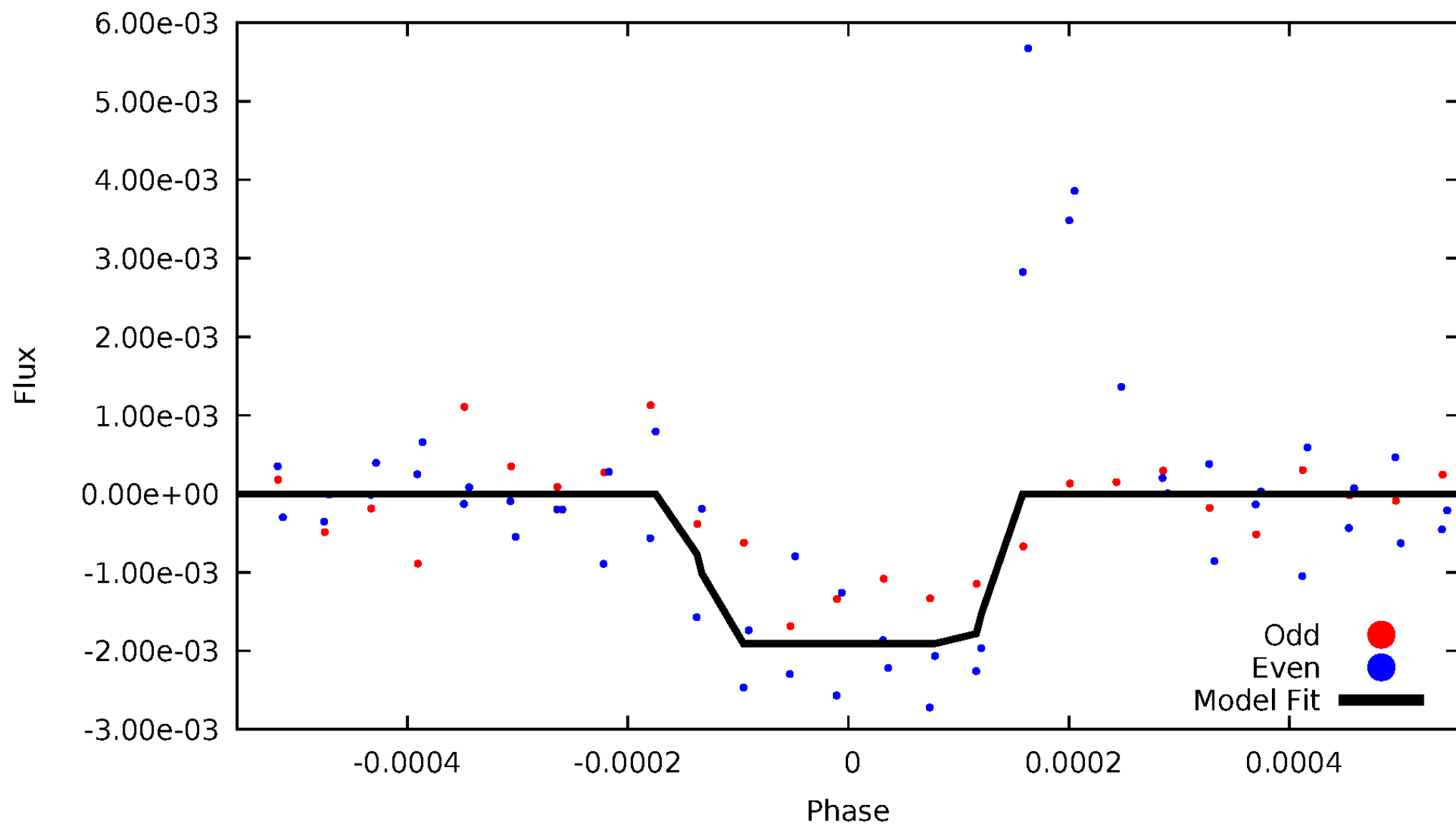
DV Odd/Even

TCE 008873448-03



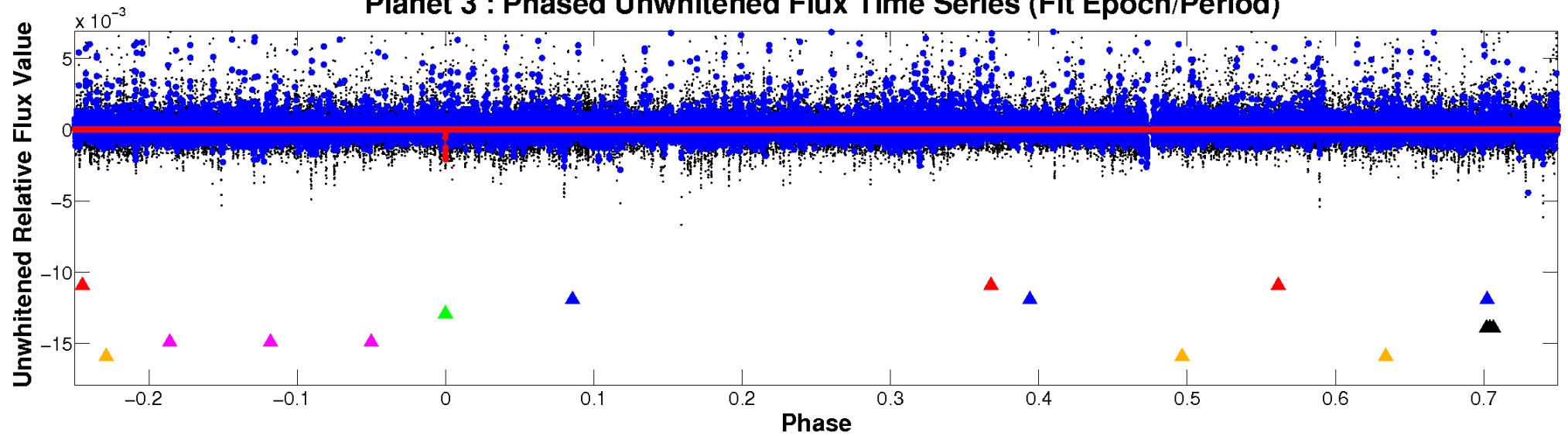
ALT Odd/Even

TCE 008873448-03

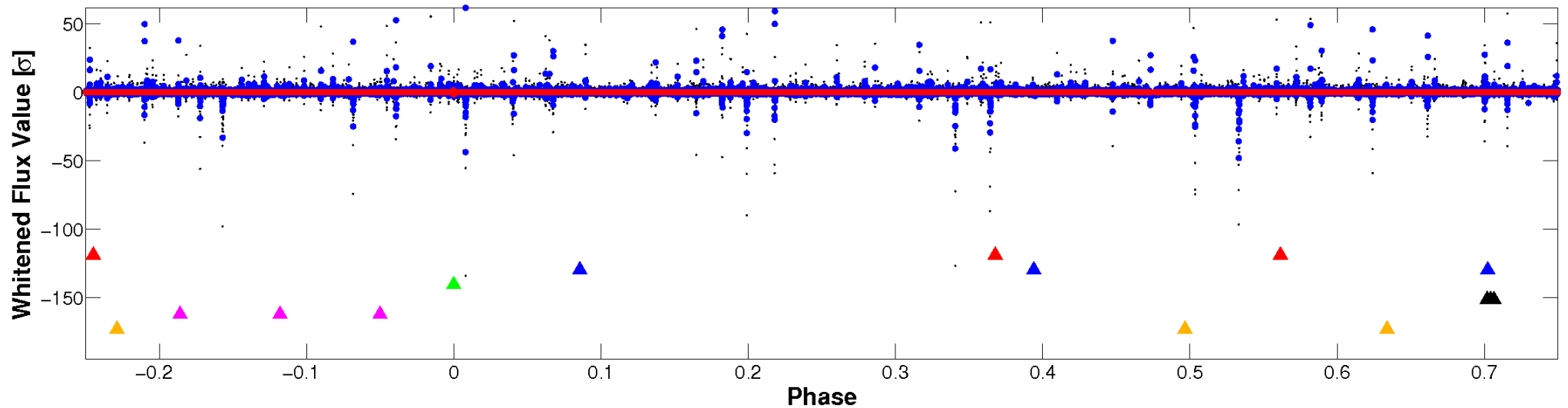


Non-Whitened Vs. Whitened Light Curve

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

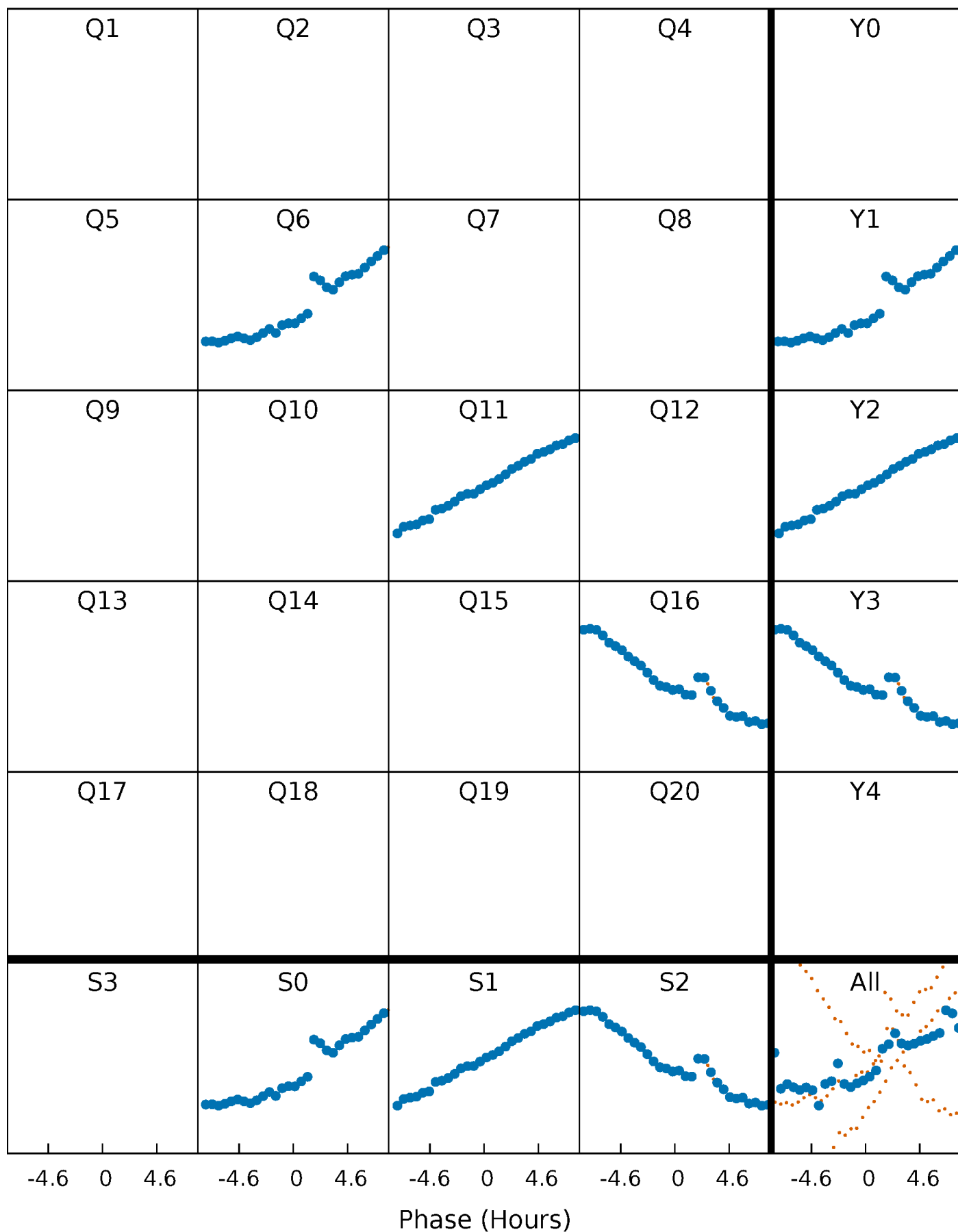


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



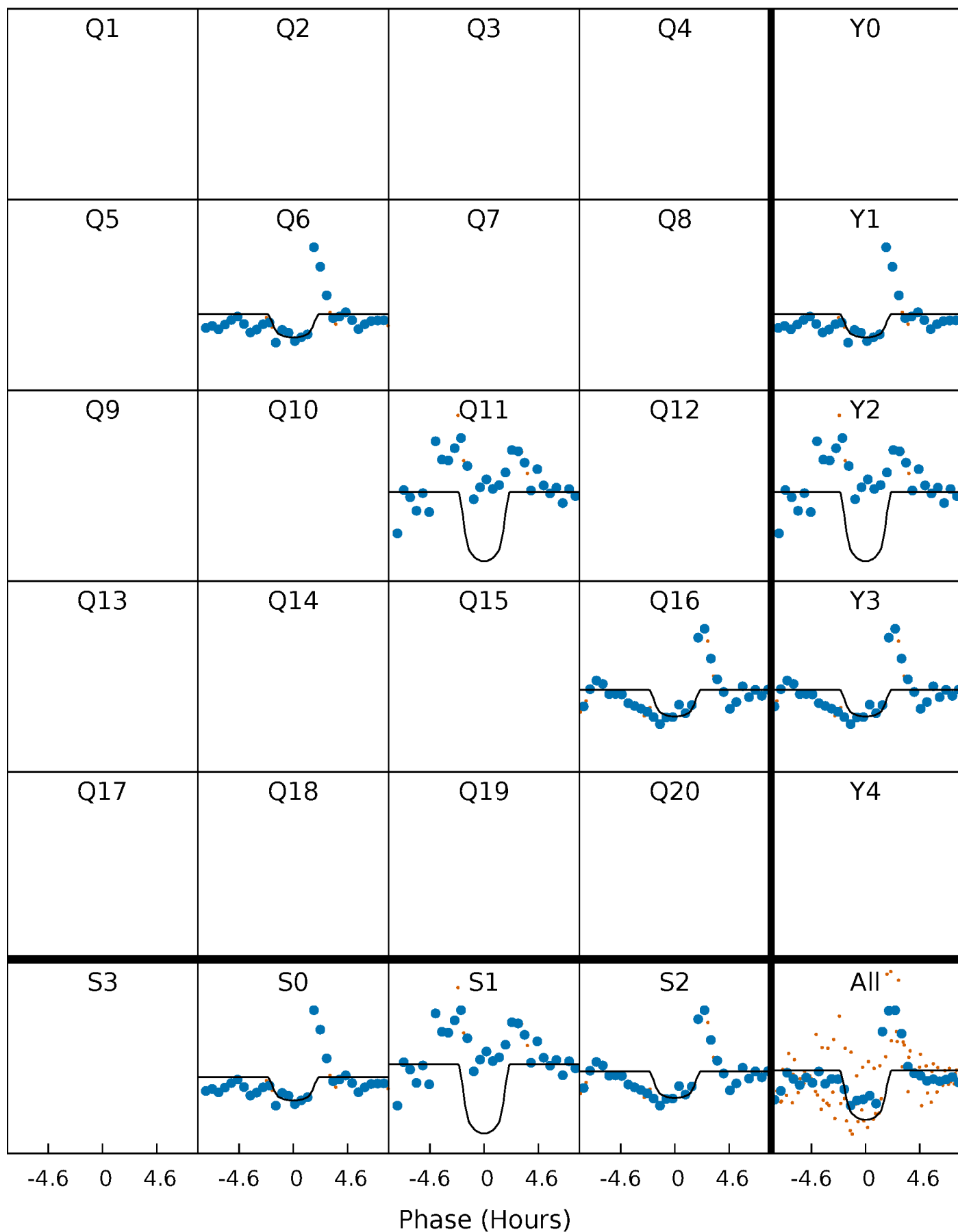
PDC Quarter-Phased Transit Curves

TCE 008873448-03 $P=483.800646$ Days $T_0=576.632411$ (BKJD)



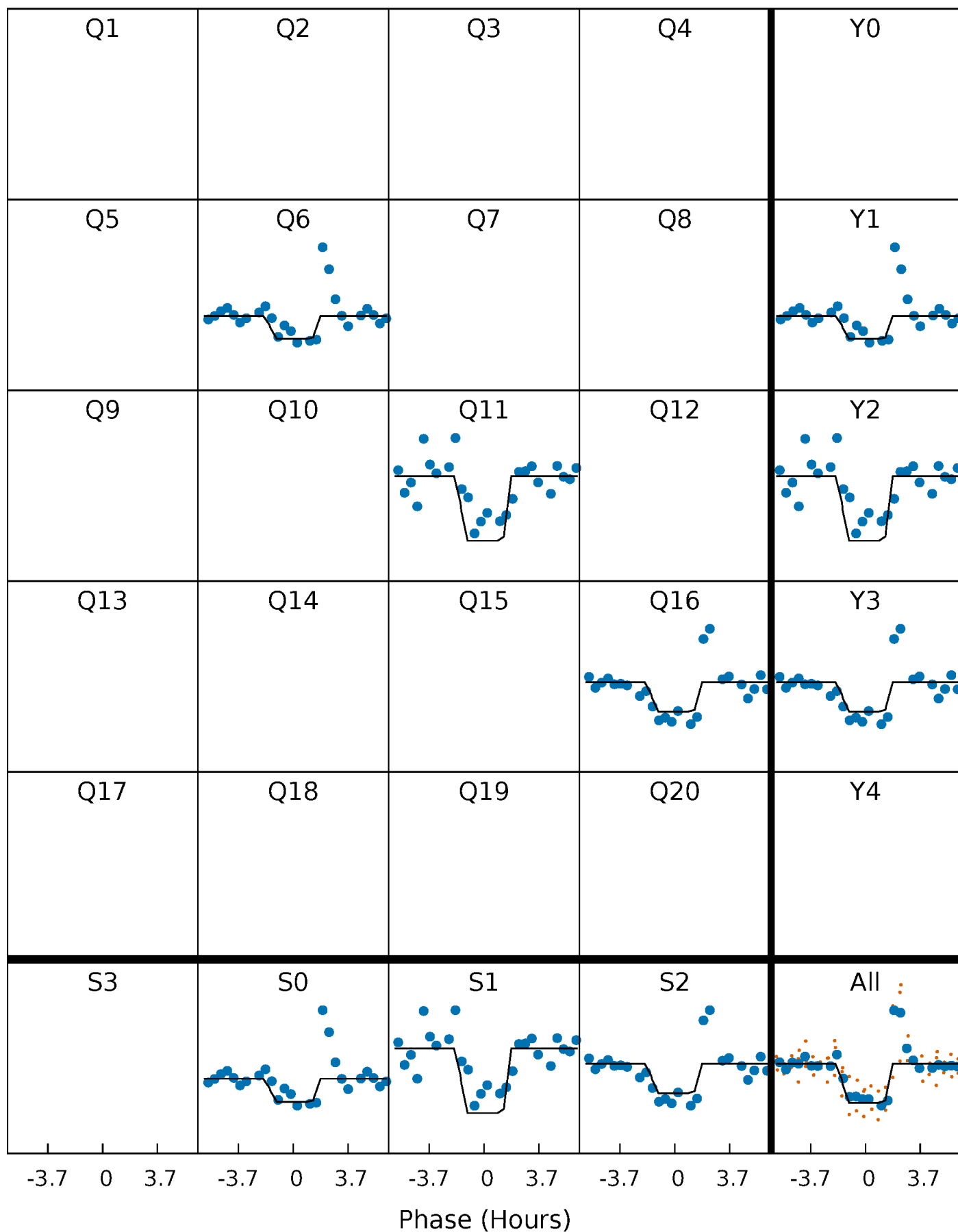
DV Quarter-Phased Transit Curves

TCE 008873448-03 P=483.800646 Days $T_0=576.632411$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

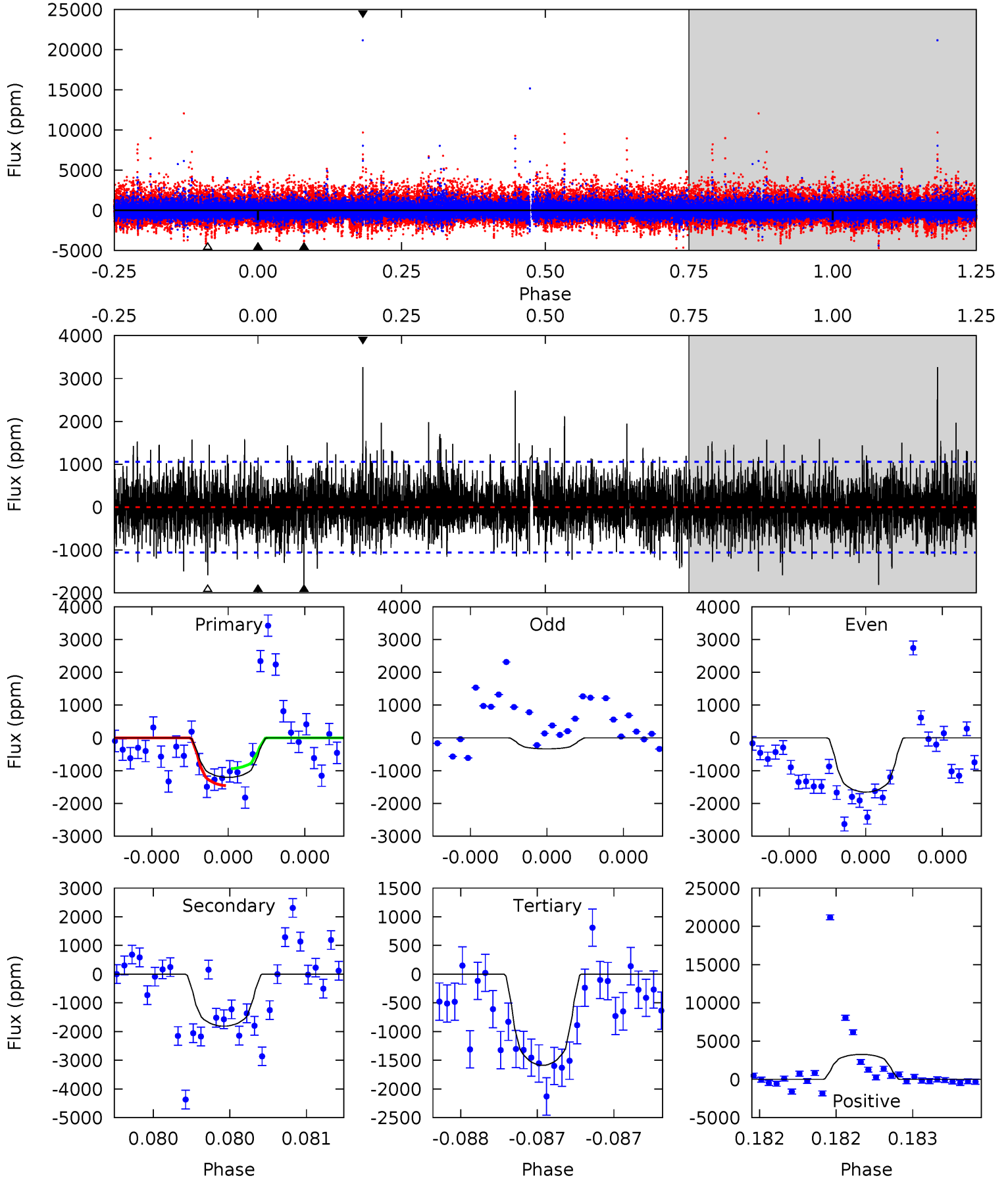
TCE 008873448-03 P=483.805400 Days $T_0=576.622050$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-03, P = 483.800646 Days, E = 92.831765 Days

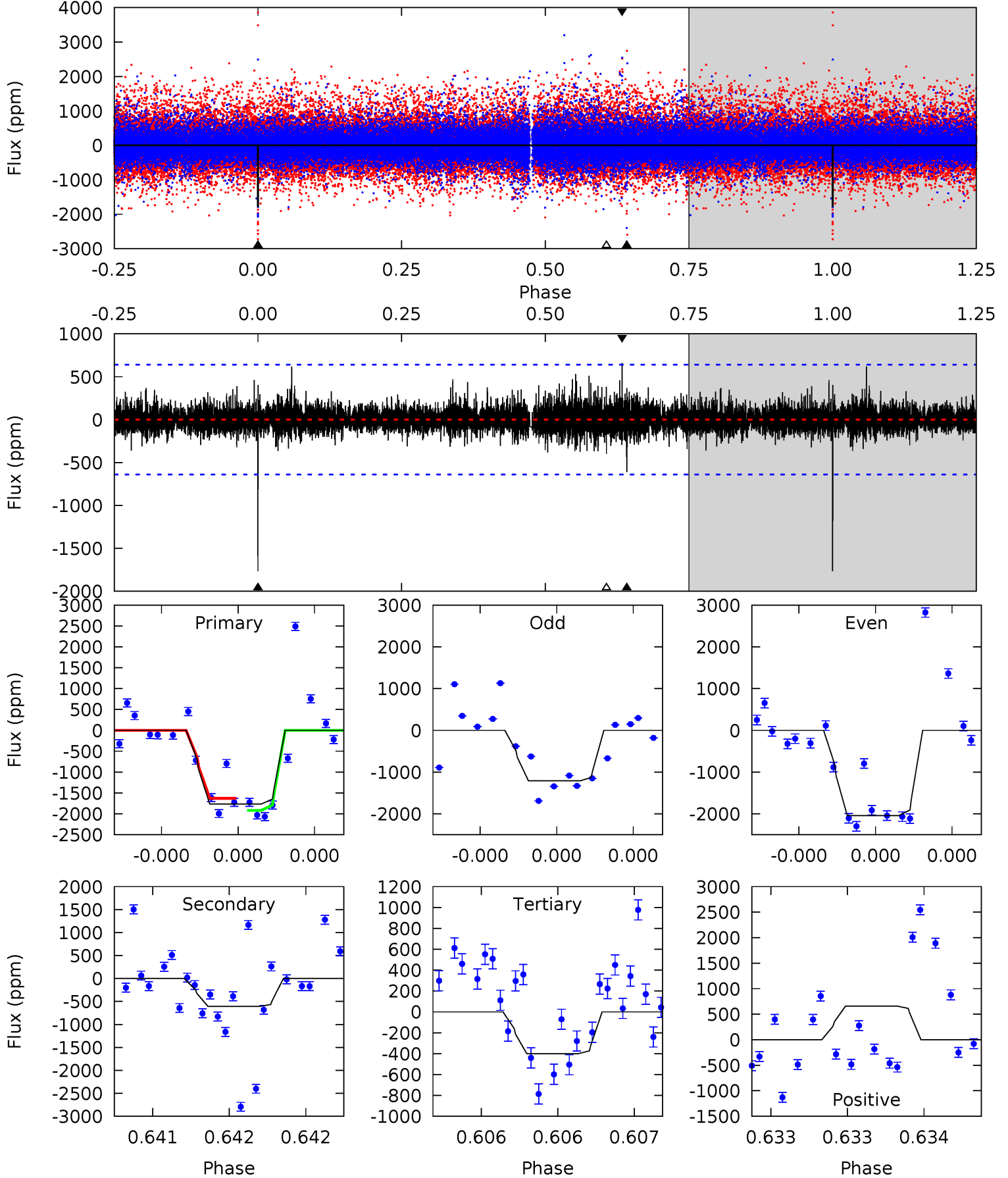
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.40	9.61	8.43	17.3	5.62	3.55	2.20	-2.03	-10.9	1.19	-7.72	2.04	0.68	0.64	1.39



Alt Model-Shift Uniqueness Test

008873448-03, P = 483.805400 Days, E = 92.816650 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.7	5.40	3.55	5.85	5.69	3.65	0.84	12.1	9.83	1.85	-0.45	3.21	1.07	0.27	1.28



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1809±188	$3.00^{+1.61}_{-1.51}$	192^{+8}_{-8}	3986^{+1263}_{-588}	$119444^{+355504}_{-71043}$
Alt.	-608±113	$2.95^{+1.58}_{-1.57}$	192^{+7}_{-7}	3348^{+905}_{-434}	$41507^{+139429}_{-24830}$

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

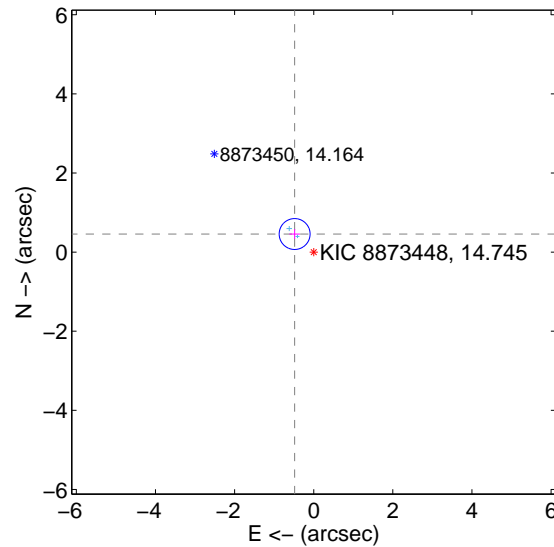
Supplemental centroid analysis for 008873448-03. Kepler magnitude: 14.74. Transit SNR 6.82

There are 2 quarters with good PRF difference image offsets

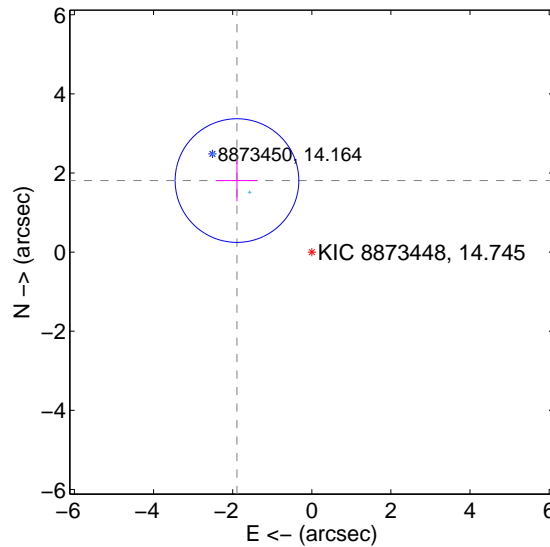
The direct PRF centroid is offset from the target star catalog position by about 1.61 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.664 ± 0.130	5.10	0.482 ± 0.133	0.457 ± 0.126
PRF-fit source offset from KIC position	2.617 ± 0.521	5.02	1.891 ± 0.519	1.808 ± 0.523
photometric centroid source offset	2.53 ± 0.86	2.95	1.62 ± 0.80	1.94 ± 0.90

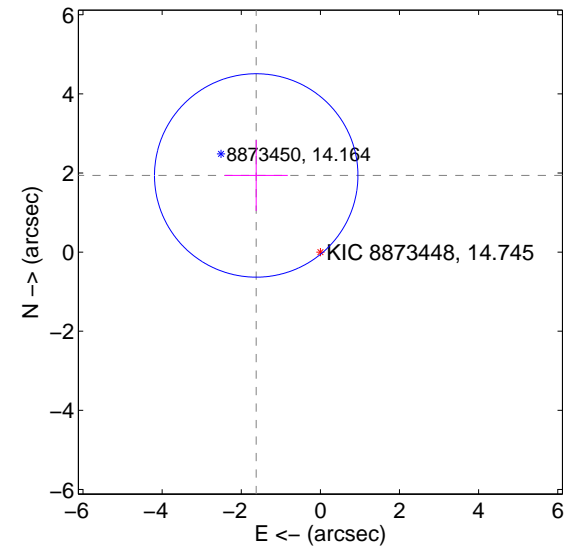
offset from difference PRF-fit to OOT PRF-fit



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.

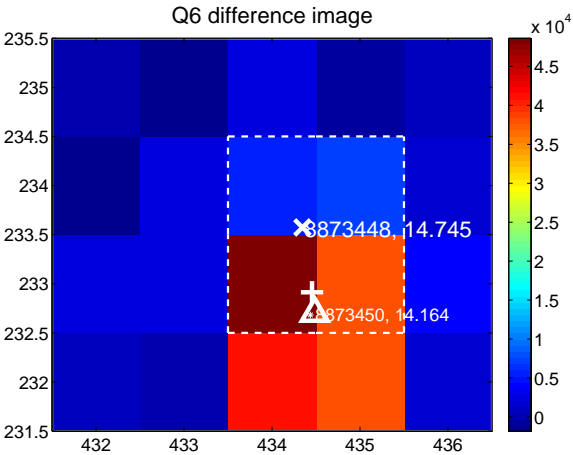
Q5 no difference image



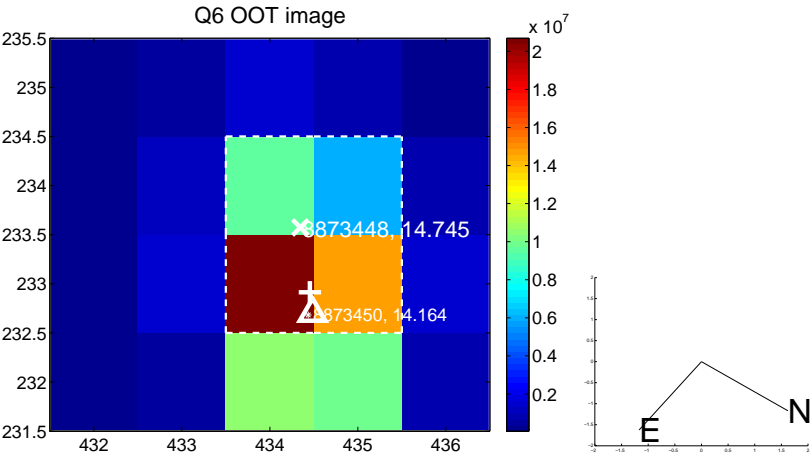
Q5 no OOT image



Q6 difference image



Q6 OOT image



Q7 no difference image



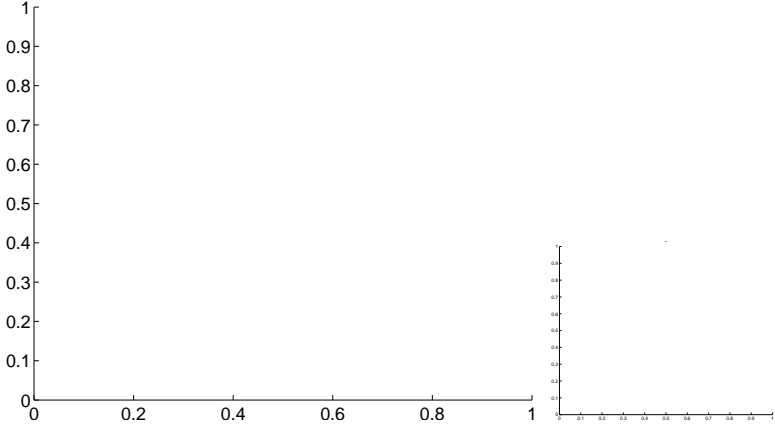
Q7 no OOT image



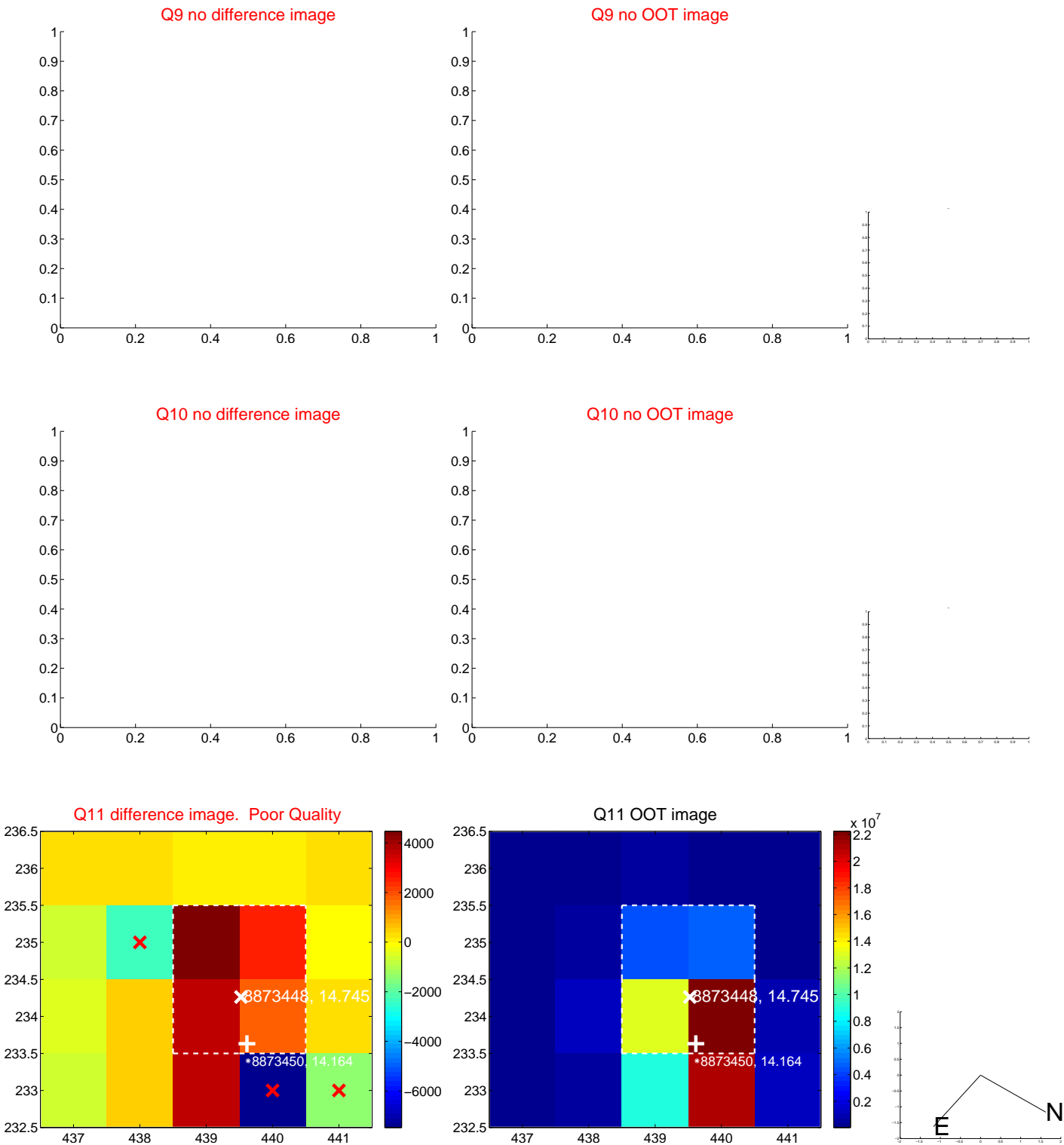
Q8 no difference image



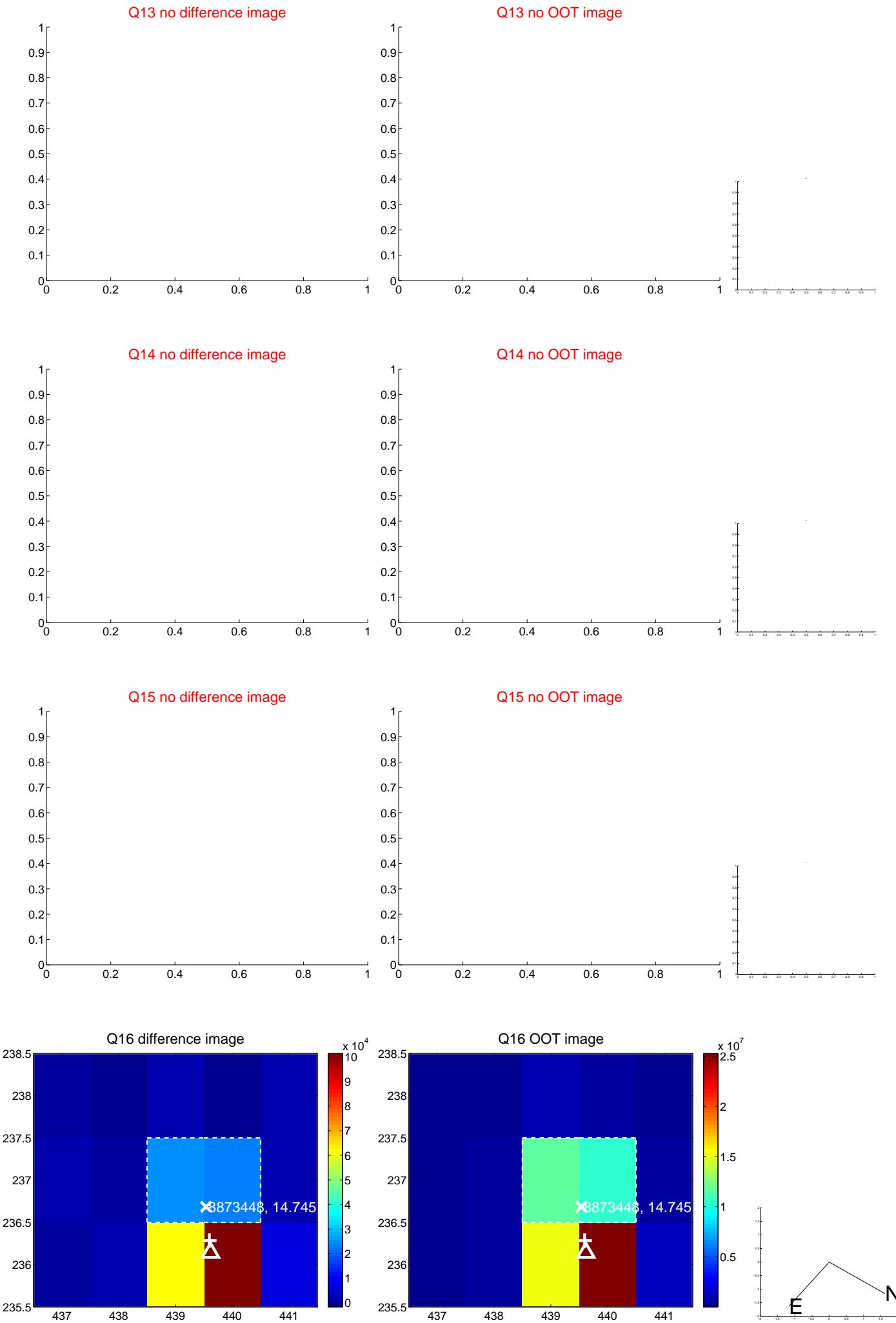
Q8 no OOT image



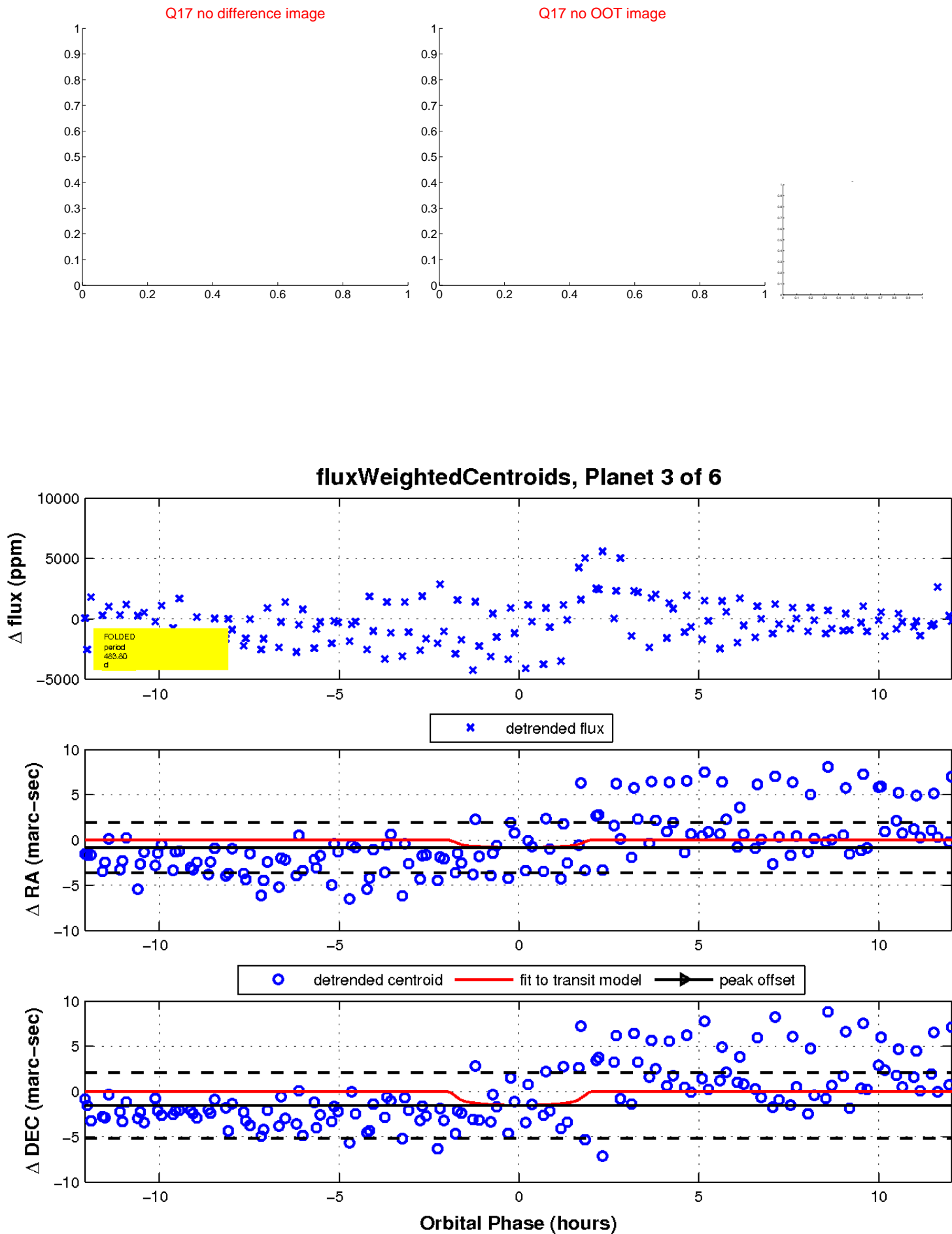
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

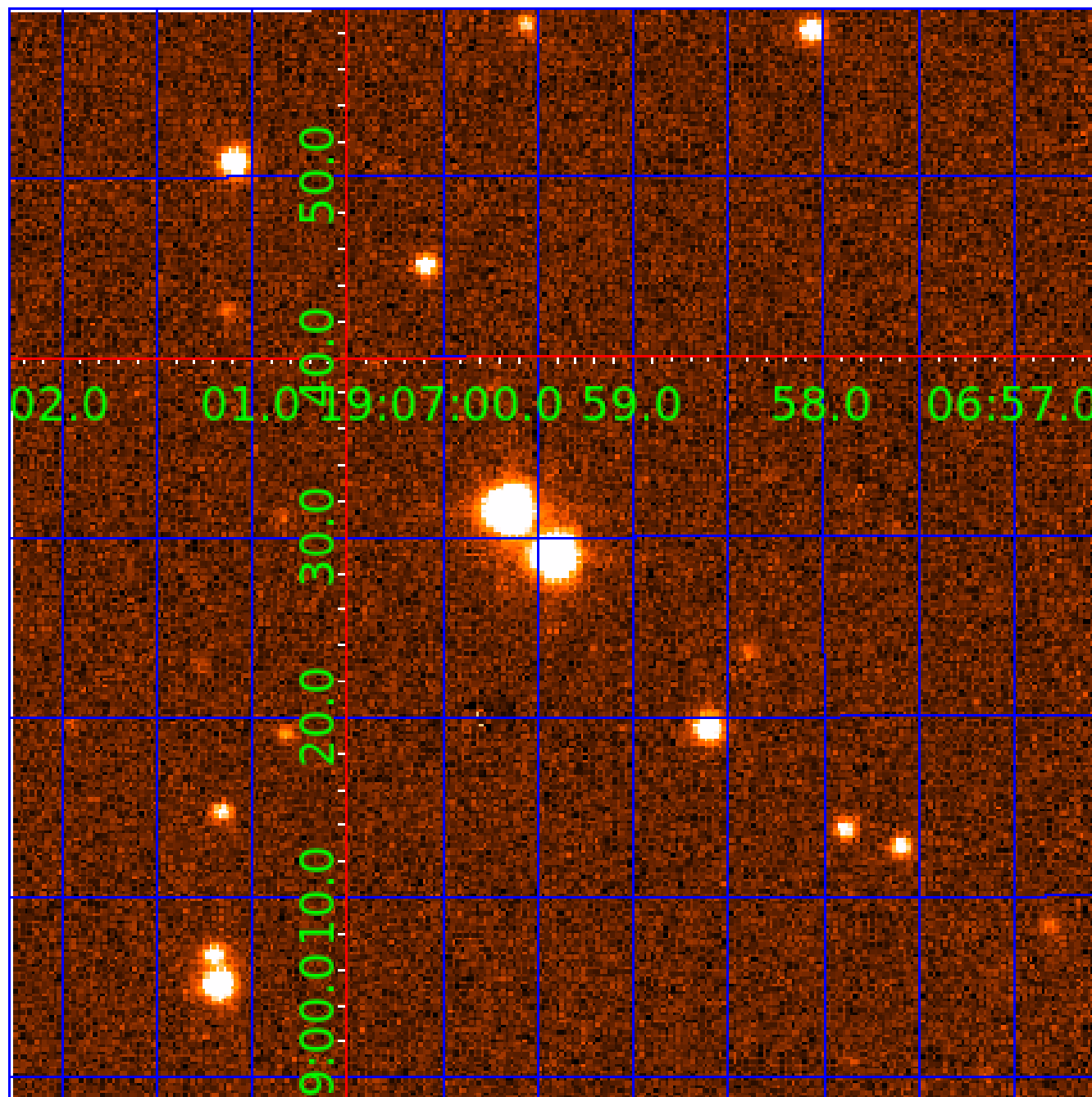


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008873448

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})
008873448-01	OBS	No	577.515355	270.778153	1878.4	2.158	15.1	4.8	0.61	4063	4.72	0.07
008873448-02	OBS	No	632.974013	134.271399	1466.1	10.455	14.9	3.6	0.61	4063	2.53	0.06
008873448-03	OBS	No	483.800646	576.632412	2097.6	4.039	12.9	6.8	0.61	4063	3.09	0.09
008873448-04	OBS	No	484.909494	432.426018	2214.4	5.391	13.5	6.5	0.61	4063	2.81	0.09
008873448-05	OBS	No	450.940038	552.418638	4797.4	9.434	12.5	9.8	0.61	4063	4.08	0.10
008873448-06	OBS	No	417.375897	465.977721	690.2	12.000	12.1	-1.0	0.61	4063	1.55	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008873448-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

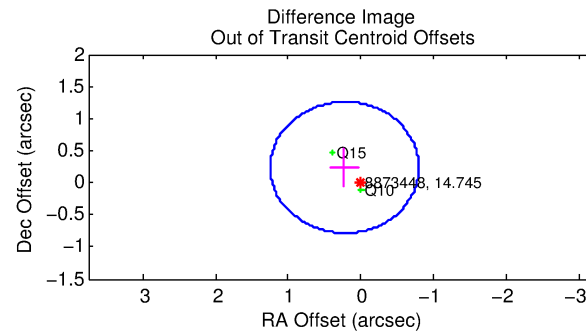
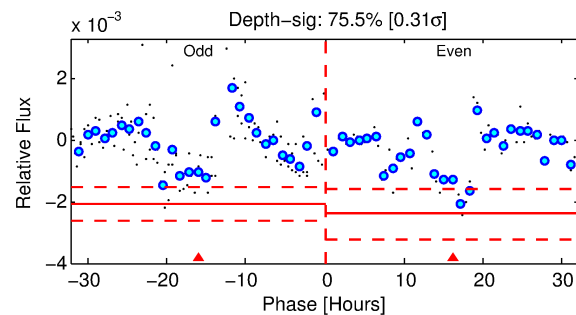
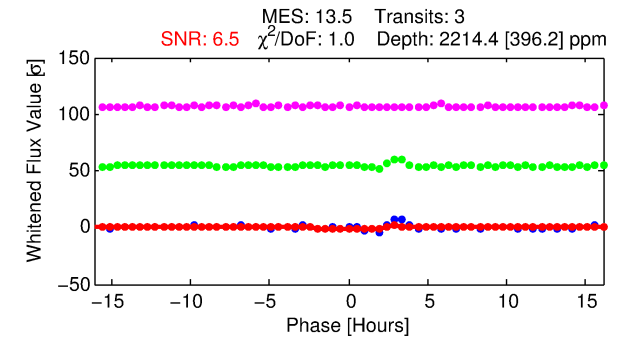
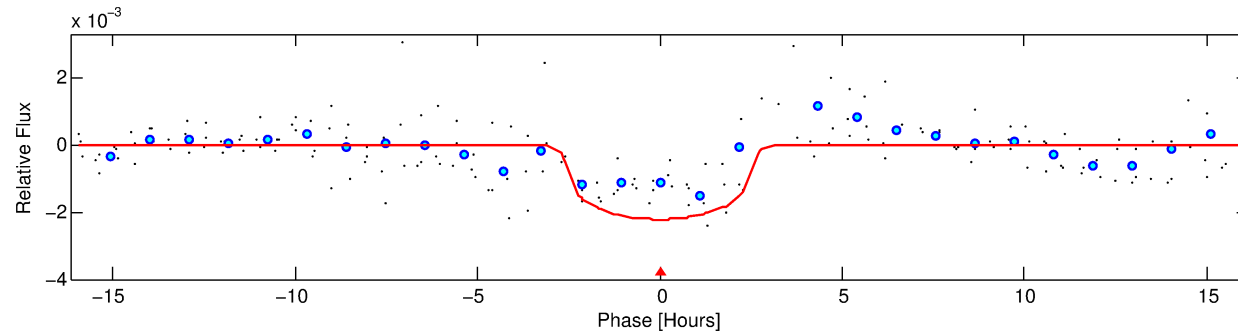
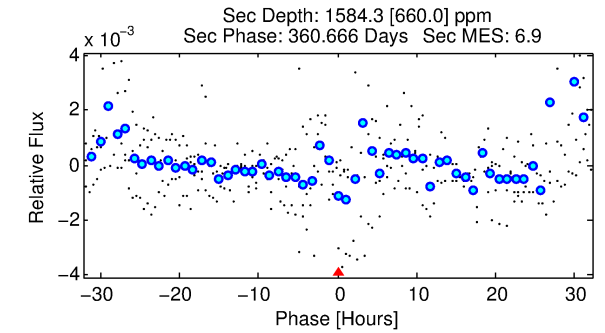
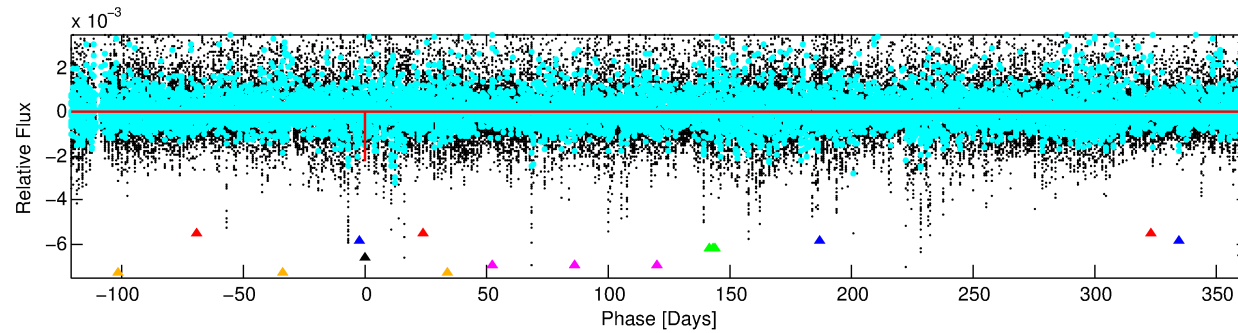
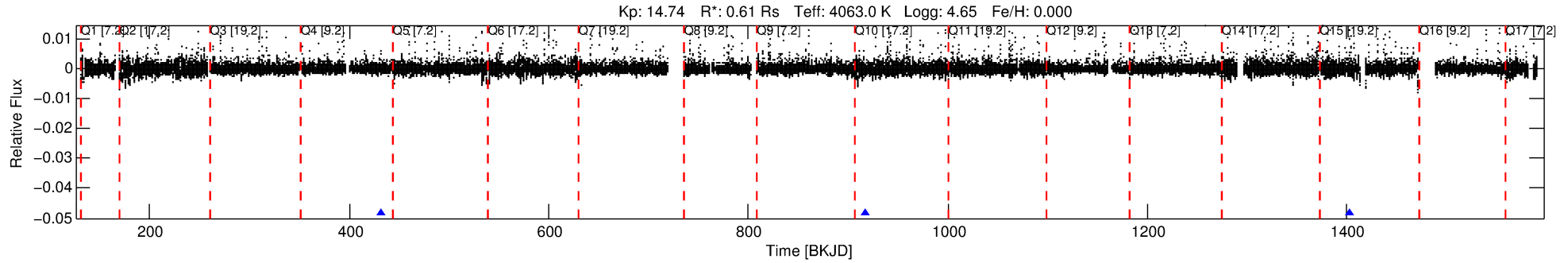
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-04

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 4 of 6 Period: 484.909 d



DV Fit Results:

Period = 484.90949 [0.00593] d
Epoch = 432.4260 [0.0062] BKJD
Rp/R* = 0.0422 [0.0333]
a/R* = 691.32 [1844.22]
b = 0.27 [9.18]
Seff = 0.09 [0.02]
Teq = 138 [7] K
Rp = 2.81 [2.24] Re
a = 1.0214 [0.0897] AU
Ag = 115400.83 [188710.41] [0.61σ]
Teffp = 3944 [1615] K [2.36σ]

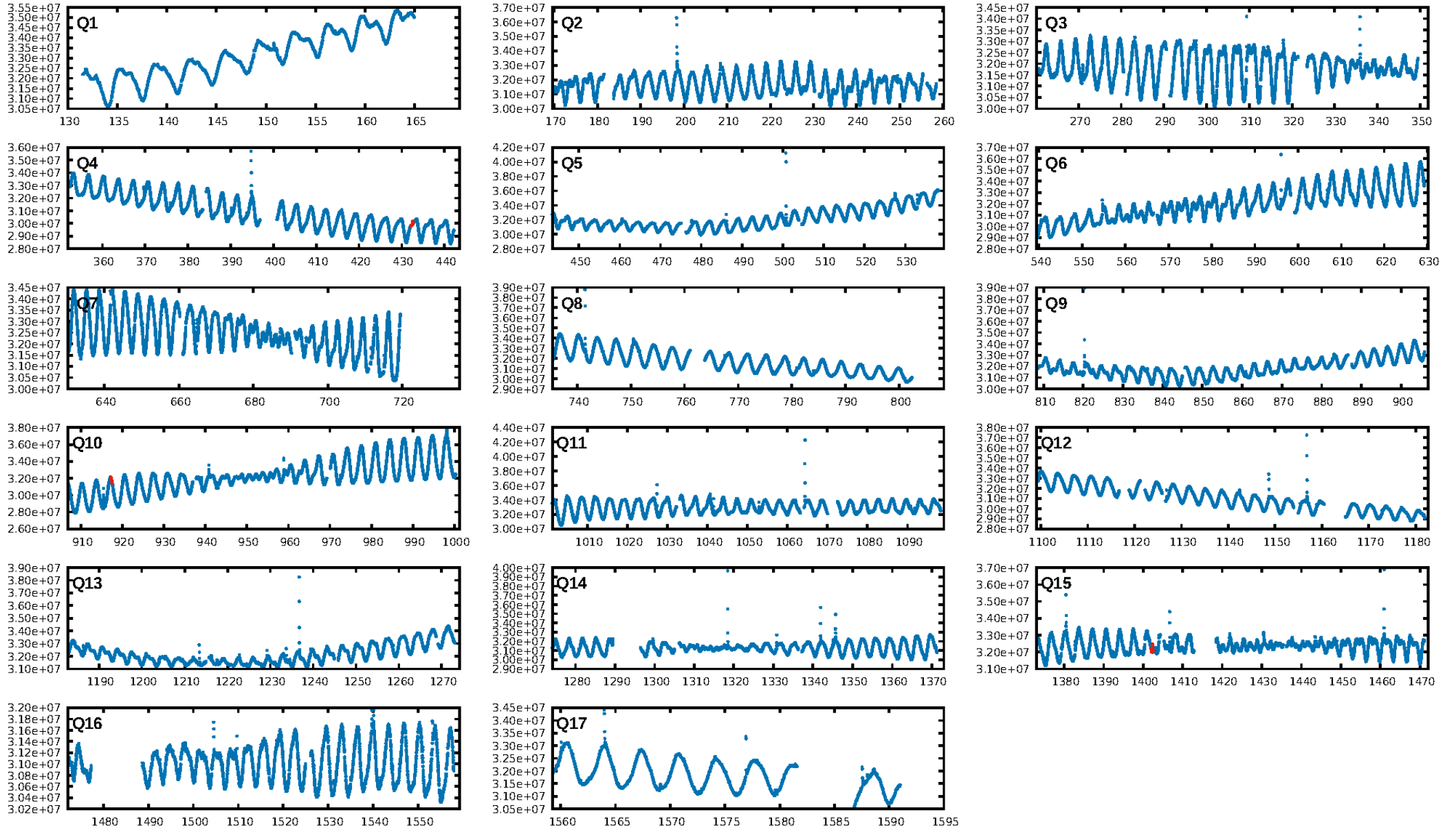
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3.95σ]
LongPeriod-sig: 100.0% [382.78σ]
ModelChiSquare2-sig: 23.9%
ModelChiSquareGof-sig: 95.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.6456
Centroid-sig: 31.5%
Centroid-so: 2.659 arcsec [2.95σ]
OotOffset-rm: 0.327 arcsec [0.96σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-rm: 2.873 arcsec [10.67σ]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

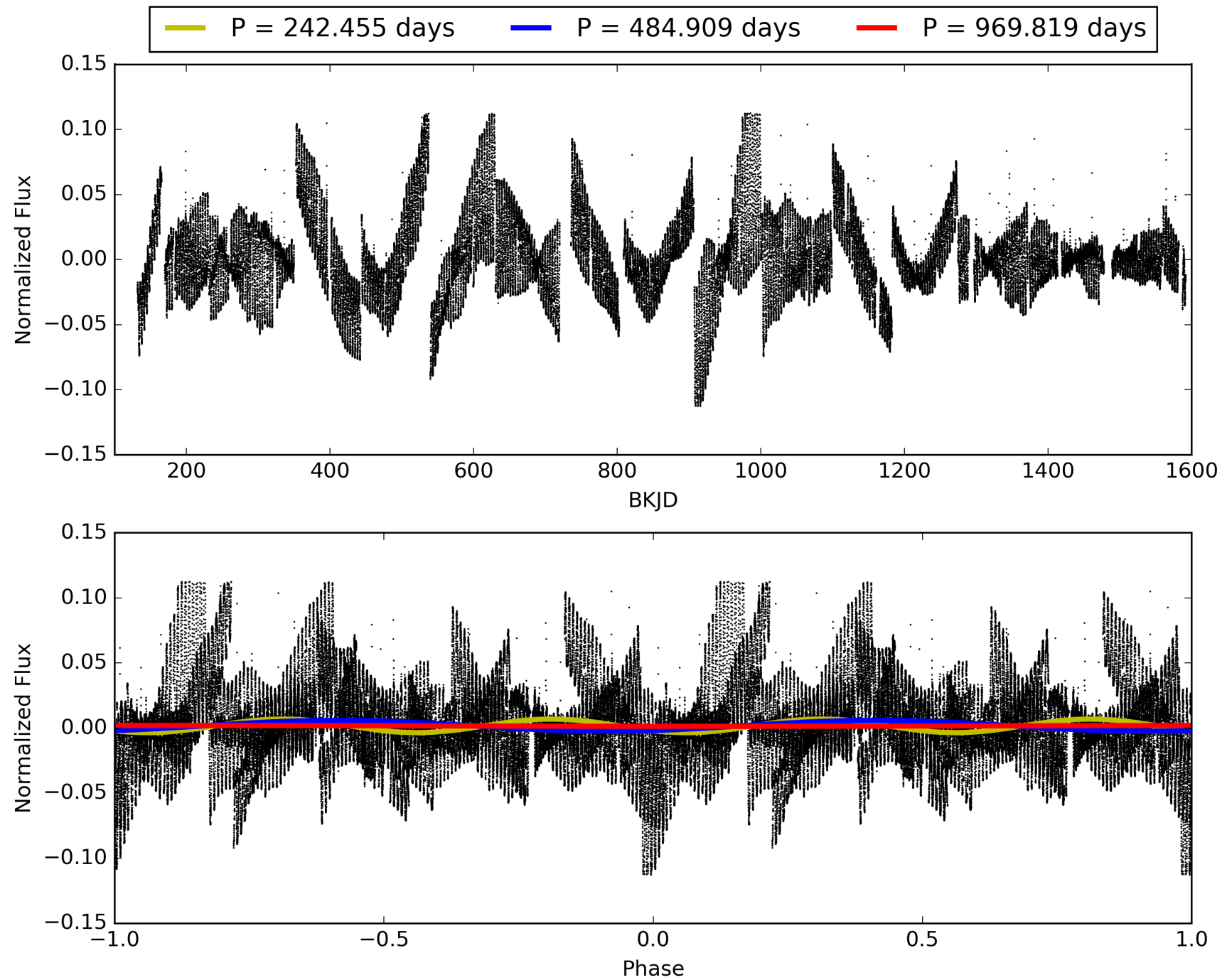
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:13:41 Z

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

TCE 008873448-04, PDC Light Curves

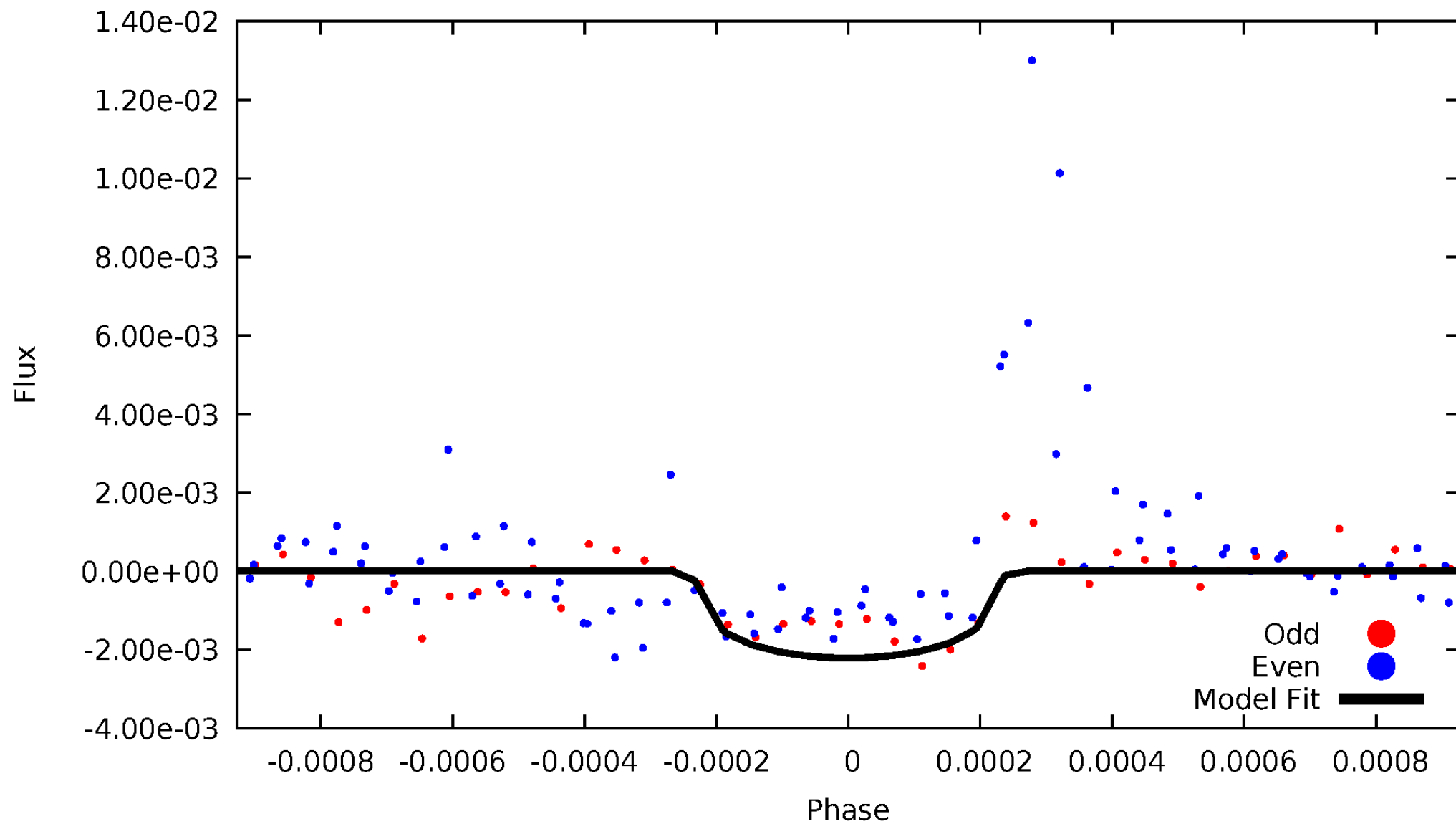


TCE 008873448-04



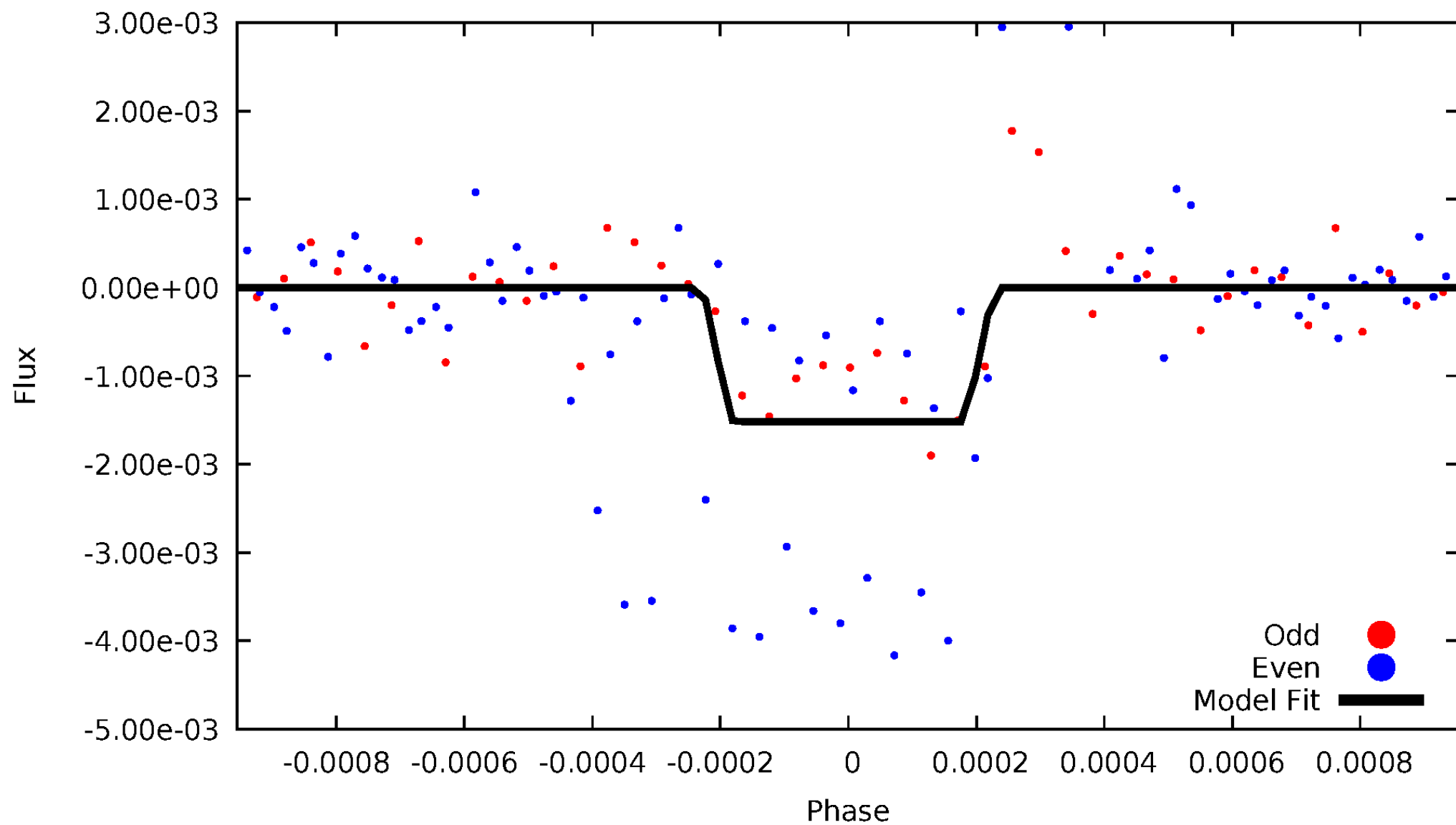
DV Odd/Even

TCE 008873448-04



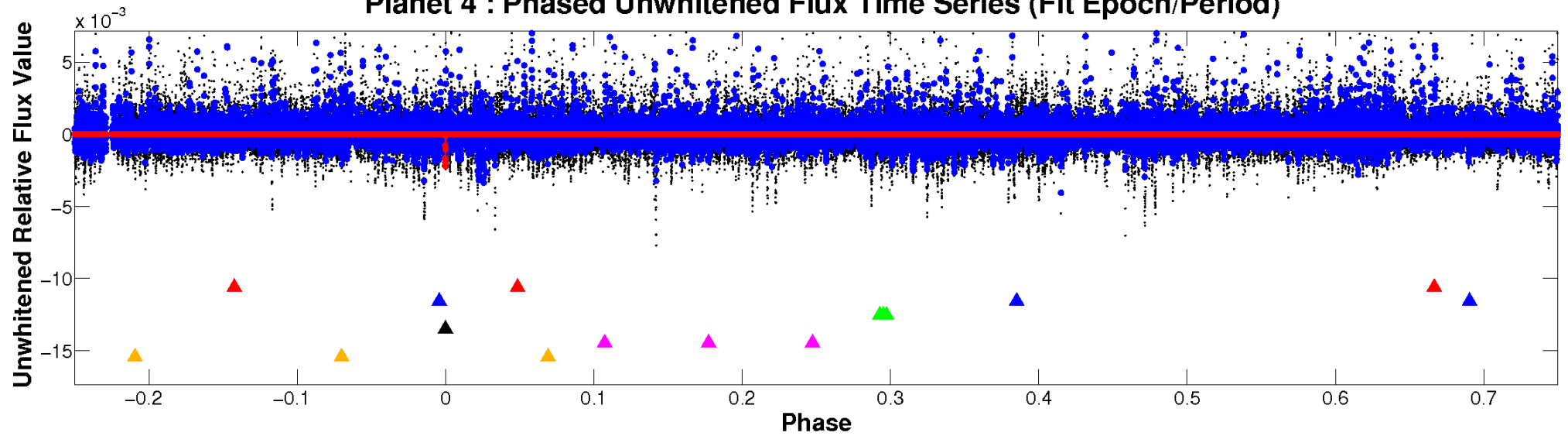
ALT Odd/Even

TCE 008873448-04

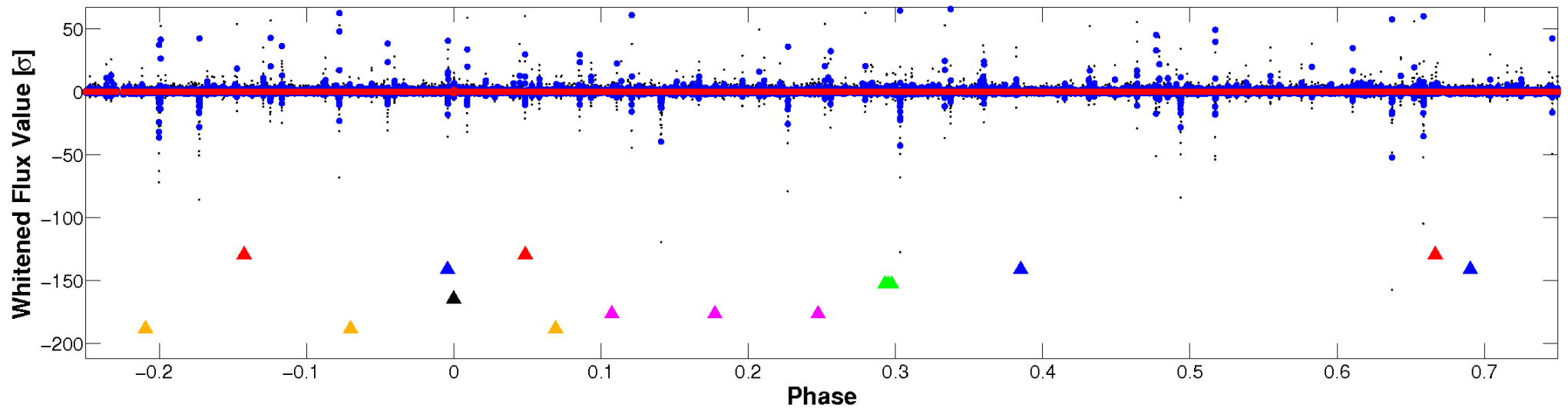


Non-Whitened Vs. Whitened Light Curve

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

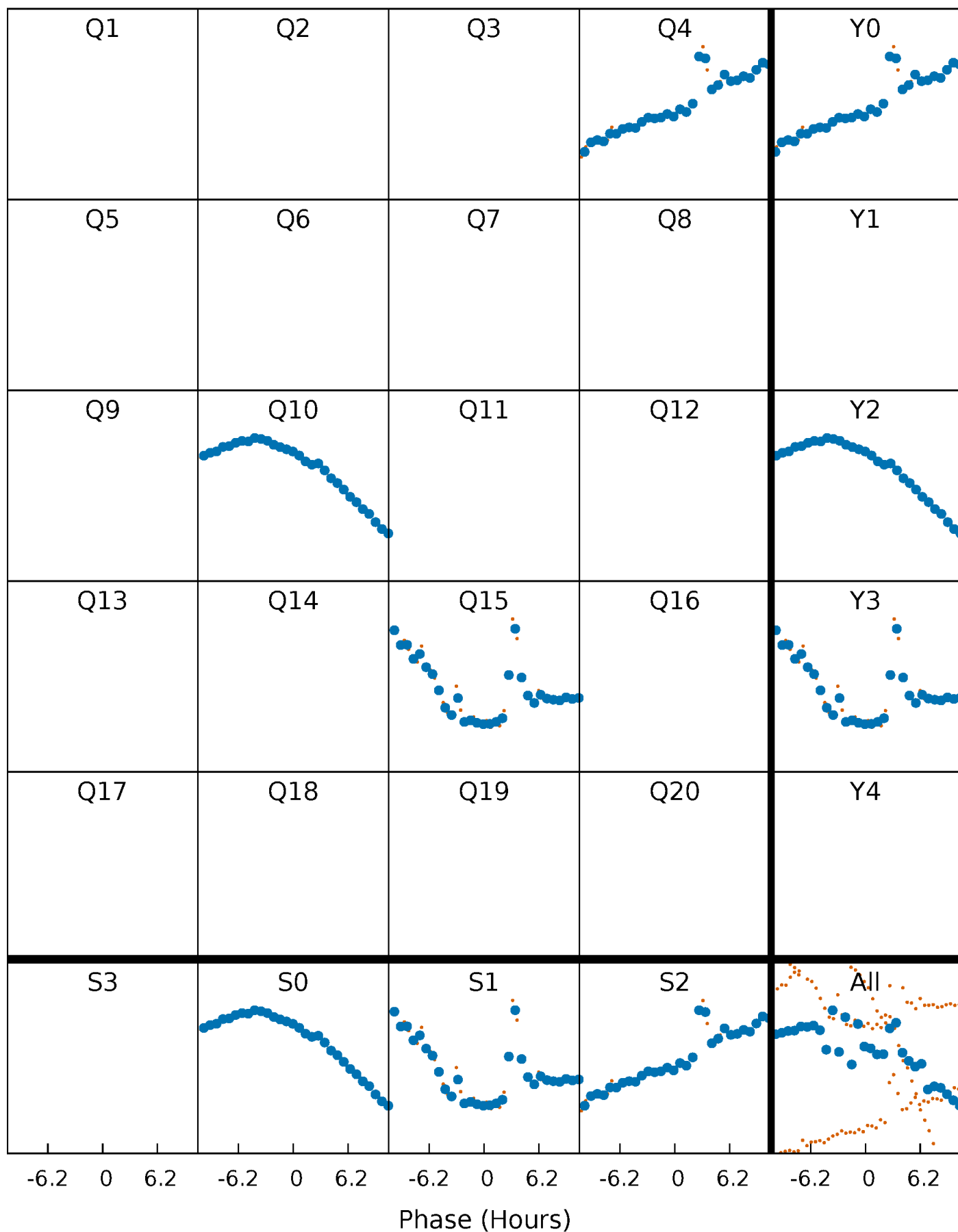


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



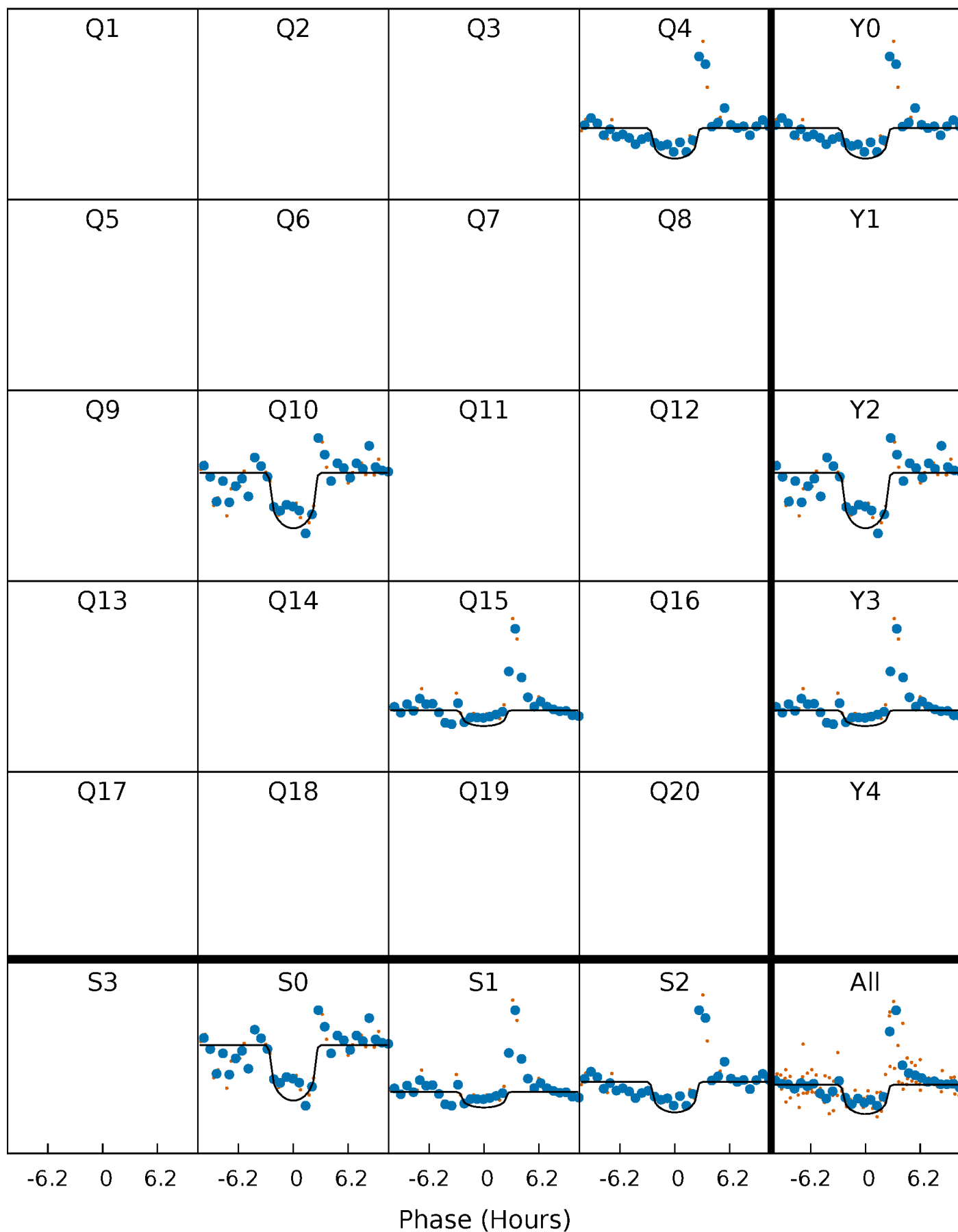
PDC Quarter-Phased Transit Curves

TCE 008873448-04 $P=484.909494$ Days $T_0=432.426018$ (BKJD)



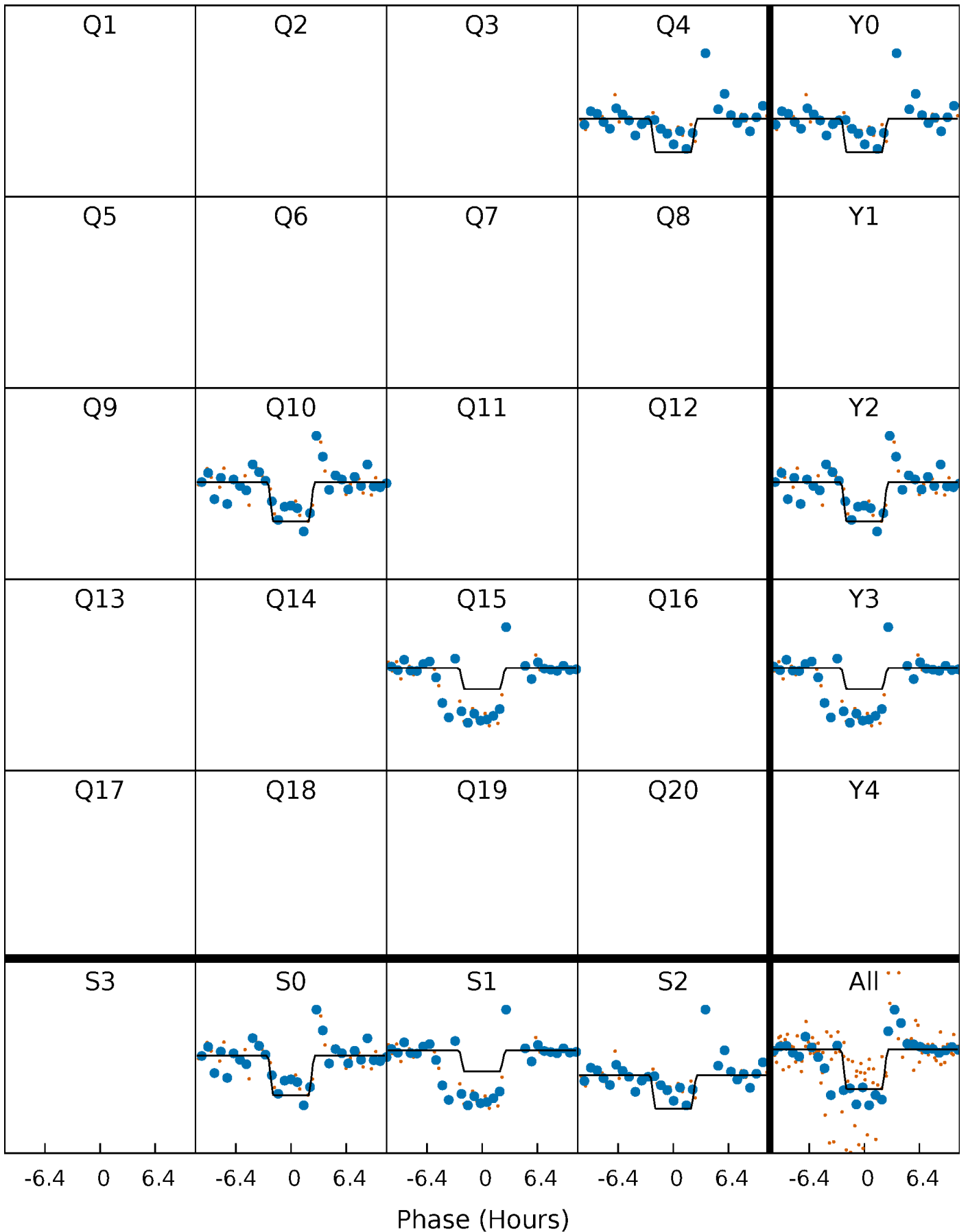
DV Quarter-Phased Transit Curves

TCE 008873448-04 $P=484.909494$ Days $T_0=432.426018$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

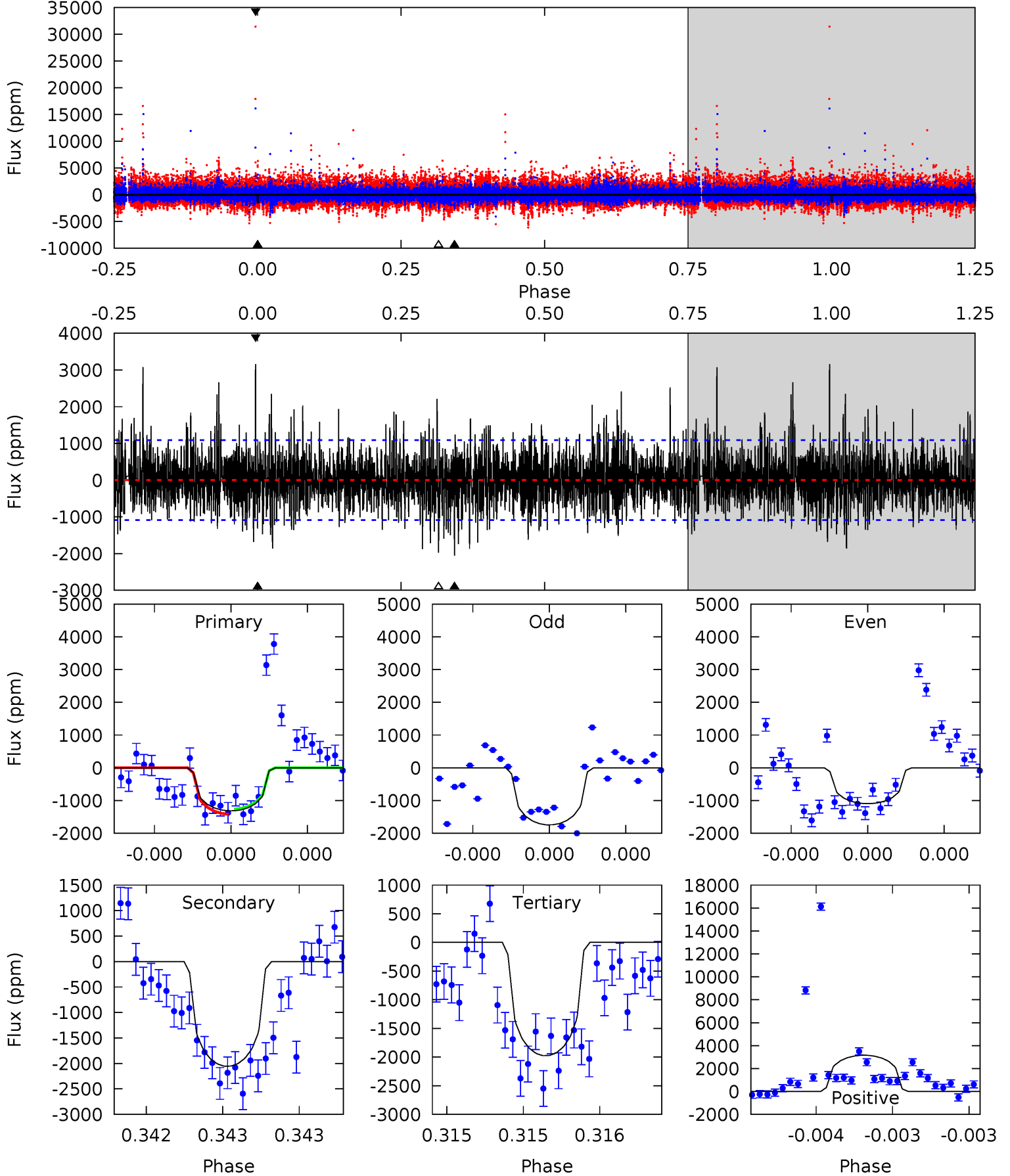
TCE 008873448-04 $P=484.915623$ Days $T_0=432.411728$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-04, P = 484.909494 Days, E = 432.426018 Days

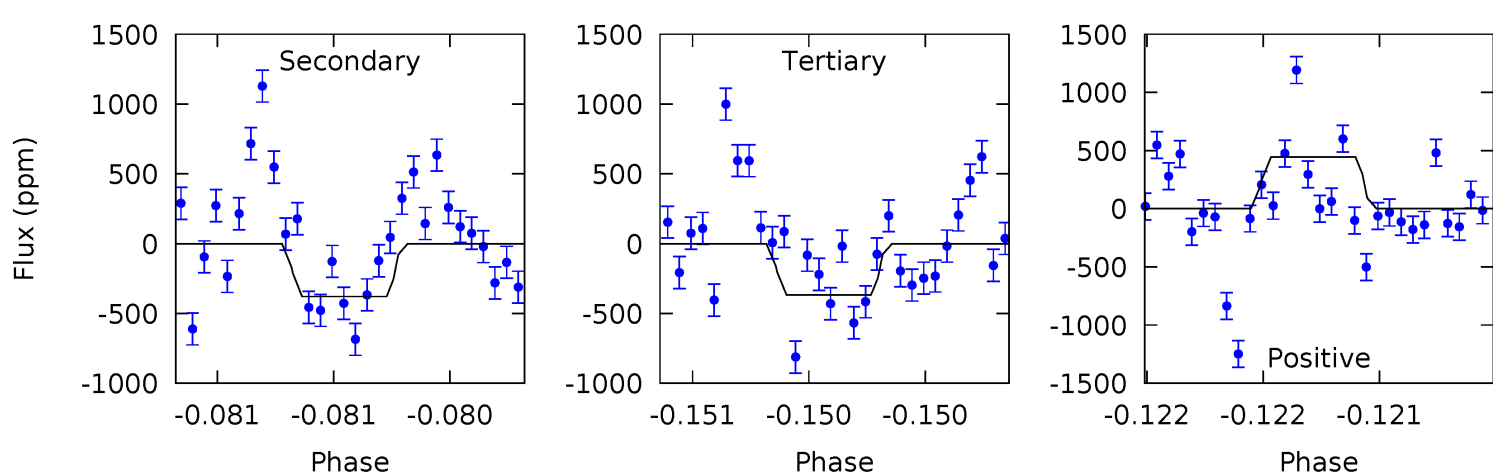
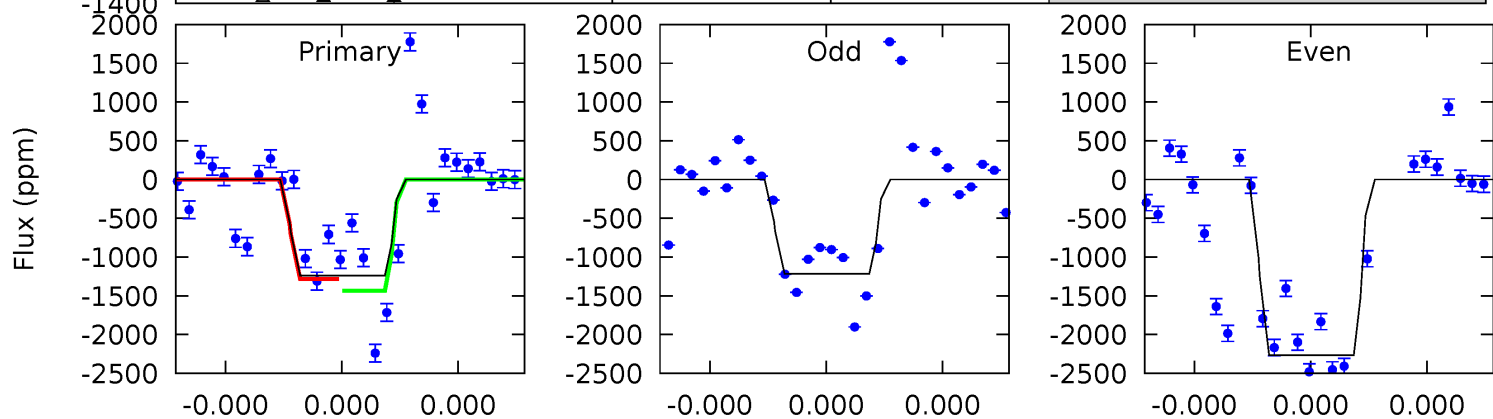
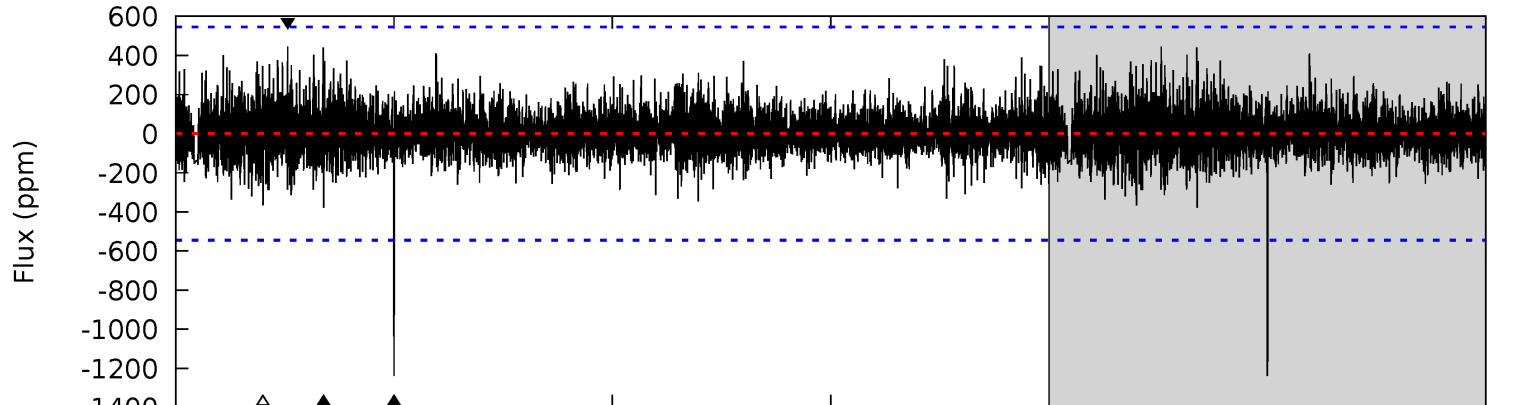
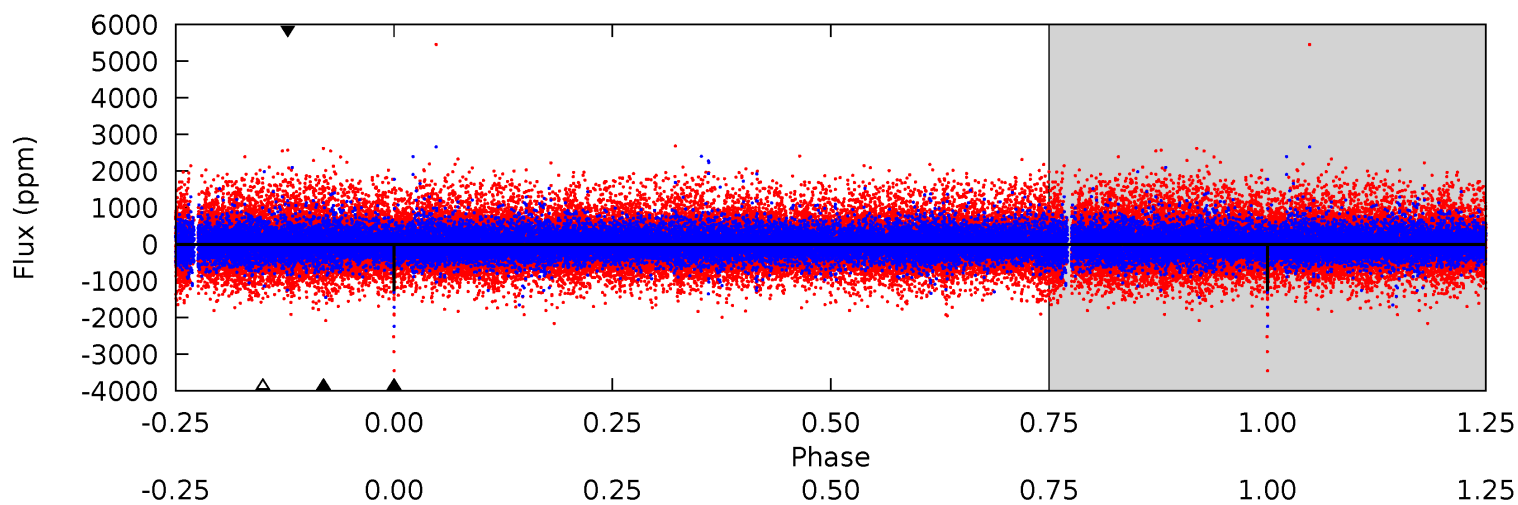
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.73	10.5	10.1	16.2	5.58	3.50	2.82	-3.39	-9.45	0.40	-5.66	0.82	1.03	0.61	0.40



Alt Model-Shift Uniqueness Test

008873448-04, P = 484.915623 Days, E = 432.411728 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	3.88	3.76	4.55	5.59	3.50	0.85	8.95	8.15	0.12	-0.67	5.15	1.52	0.26	0.79



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2054 ± 195	$3.02^{+1.97}_{-1.76}$	192^{+8}_{-8}	4045^{+1760}_{-643}	$130225^{+634092}_{-82023}$
Alt.	-379 ± 98	$2.90^{+1.98}_{-1.71}$	192^{+7}_{-8}	3093^{+1113}_{-409}	$25247^{+130596}_{-16591}$

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

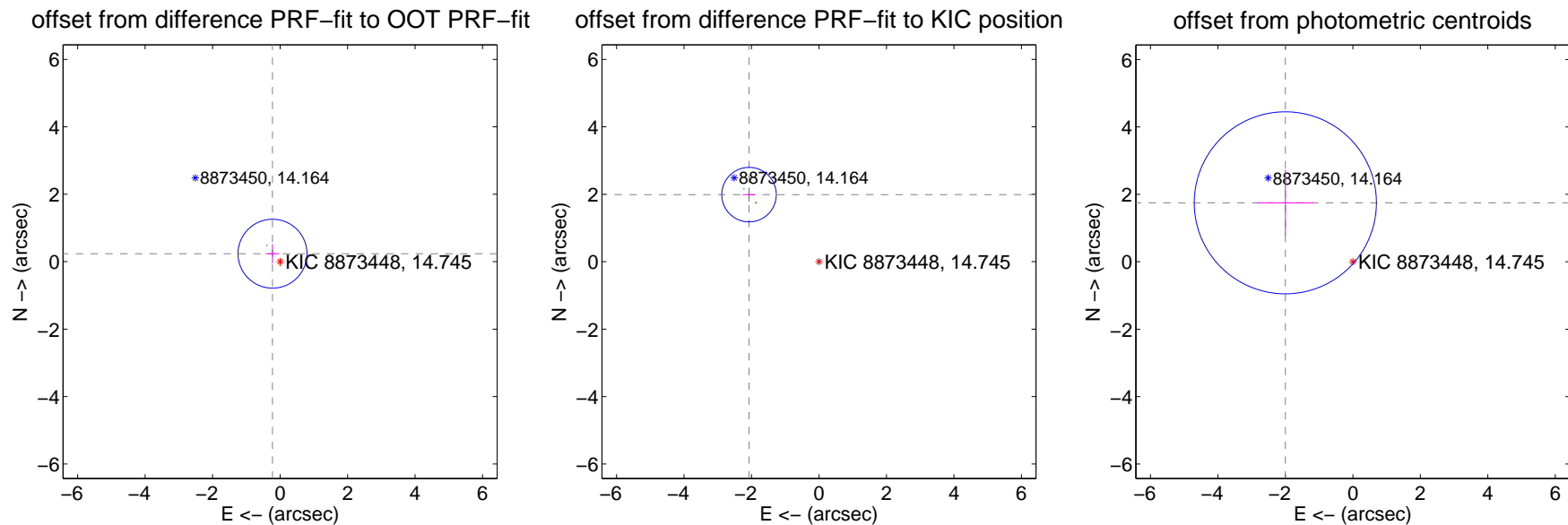
DV Centroid Data

Supplemental centroid analysis for 008873448-04. Kepler magnitude: 14.74. Transit SNR 6.55

There are 1 quarters with good PRF difference image offsets

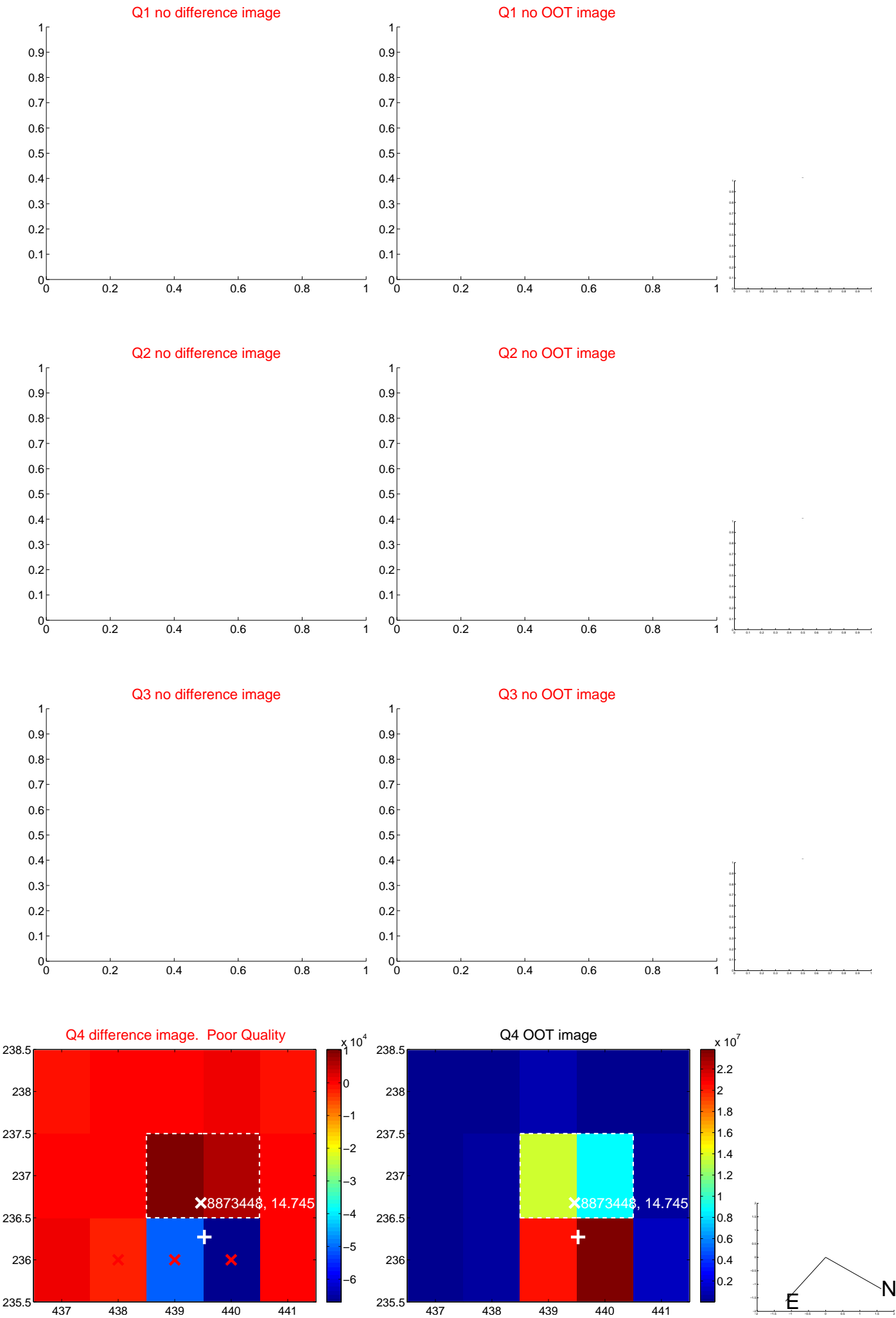
The OOT PRF centroid is offset from the target star catalog position by about 2.49 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.327 ± 0.341	0.96	0.226 ± 0.202	0.237 ± 0.287
PRF-fit source offset from KIC position	2.873 \pm 0.269	10.67	2.074 ± 0.185	1.989 ± 0.208
photometric centroid source offset	2.66 ± 0.90	2.95	2.00 ± 0.83	1.75 ± 0.98



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.

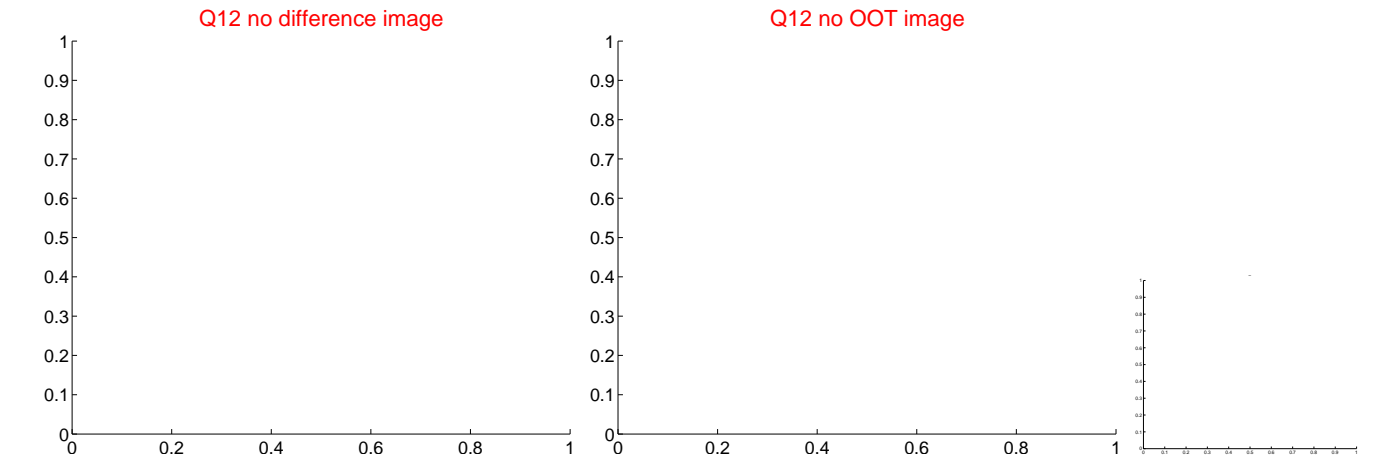
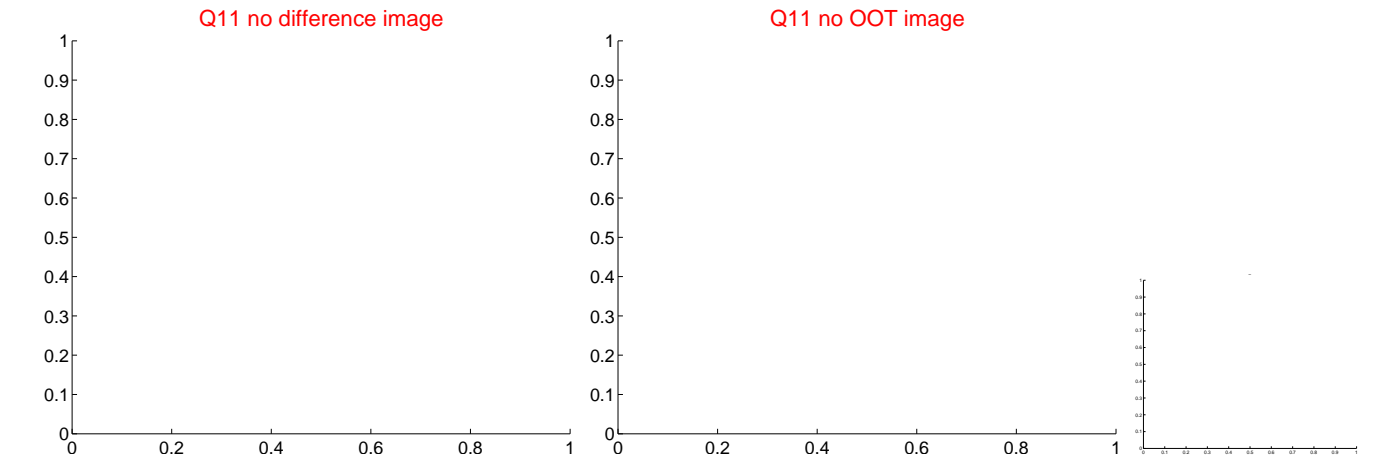
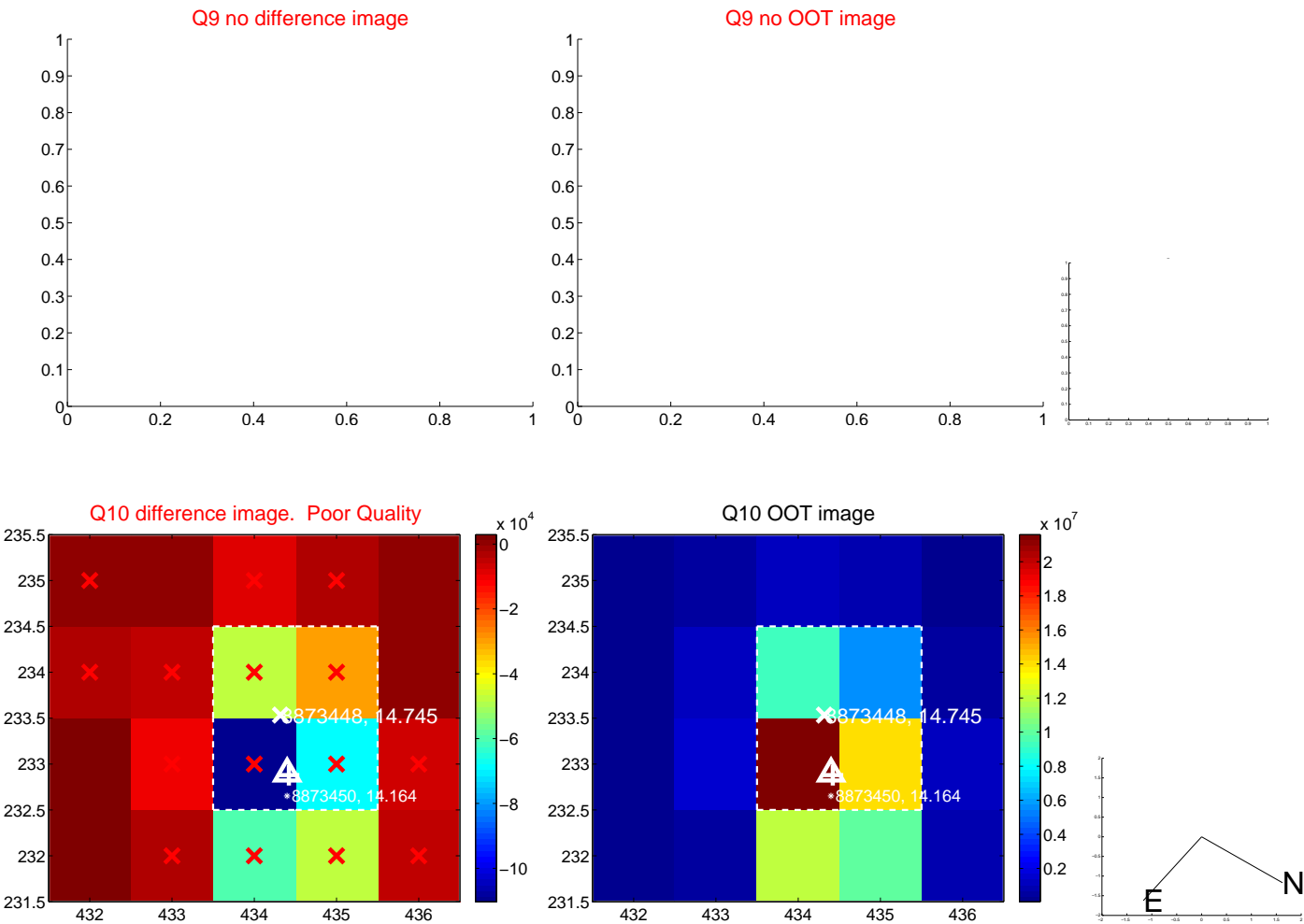
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



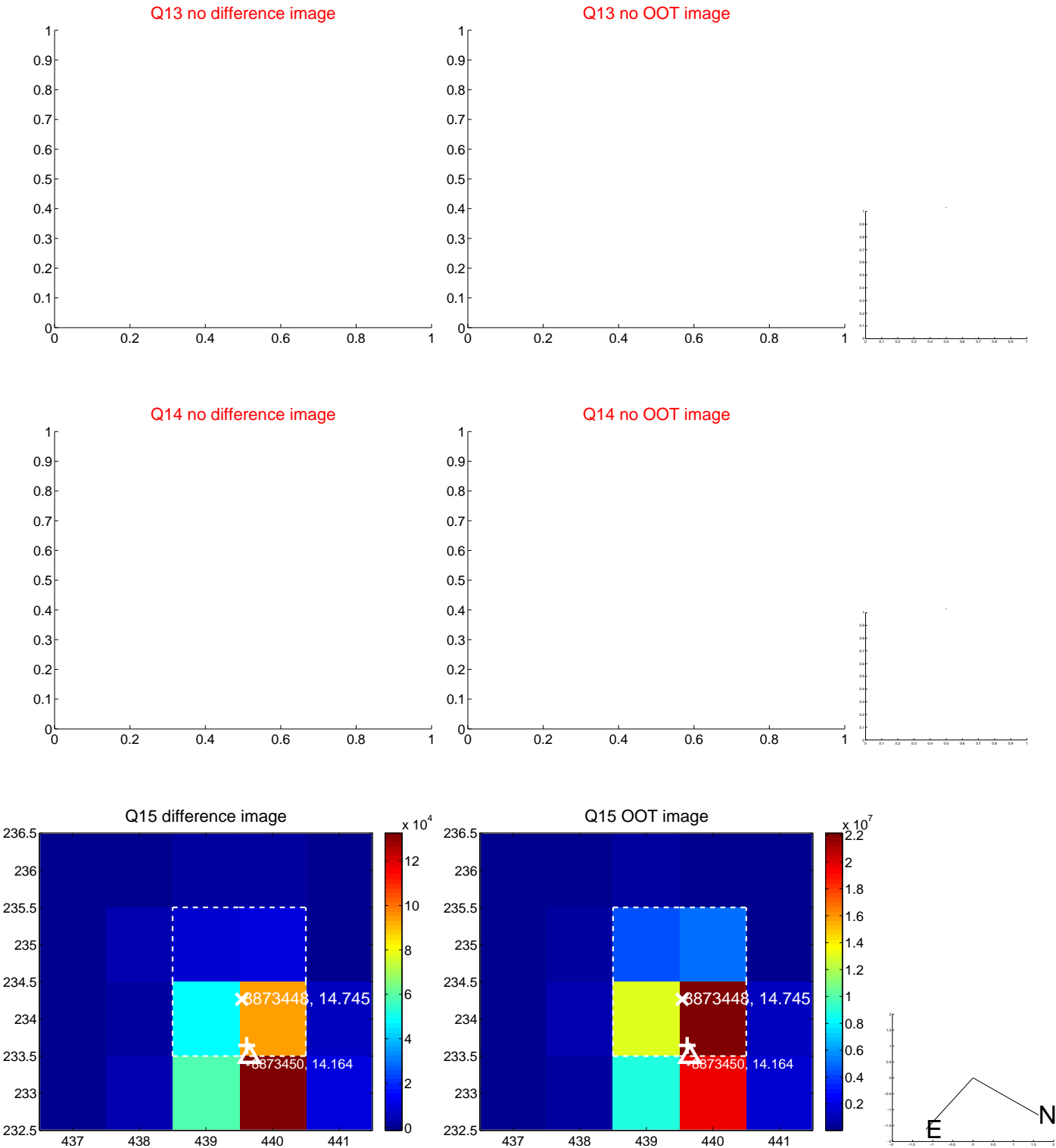
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



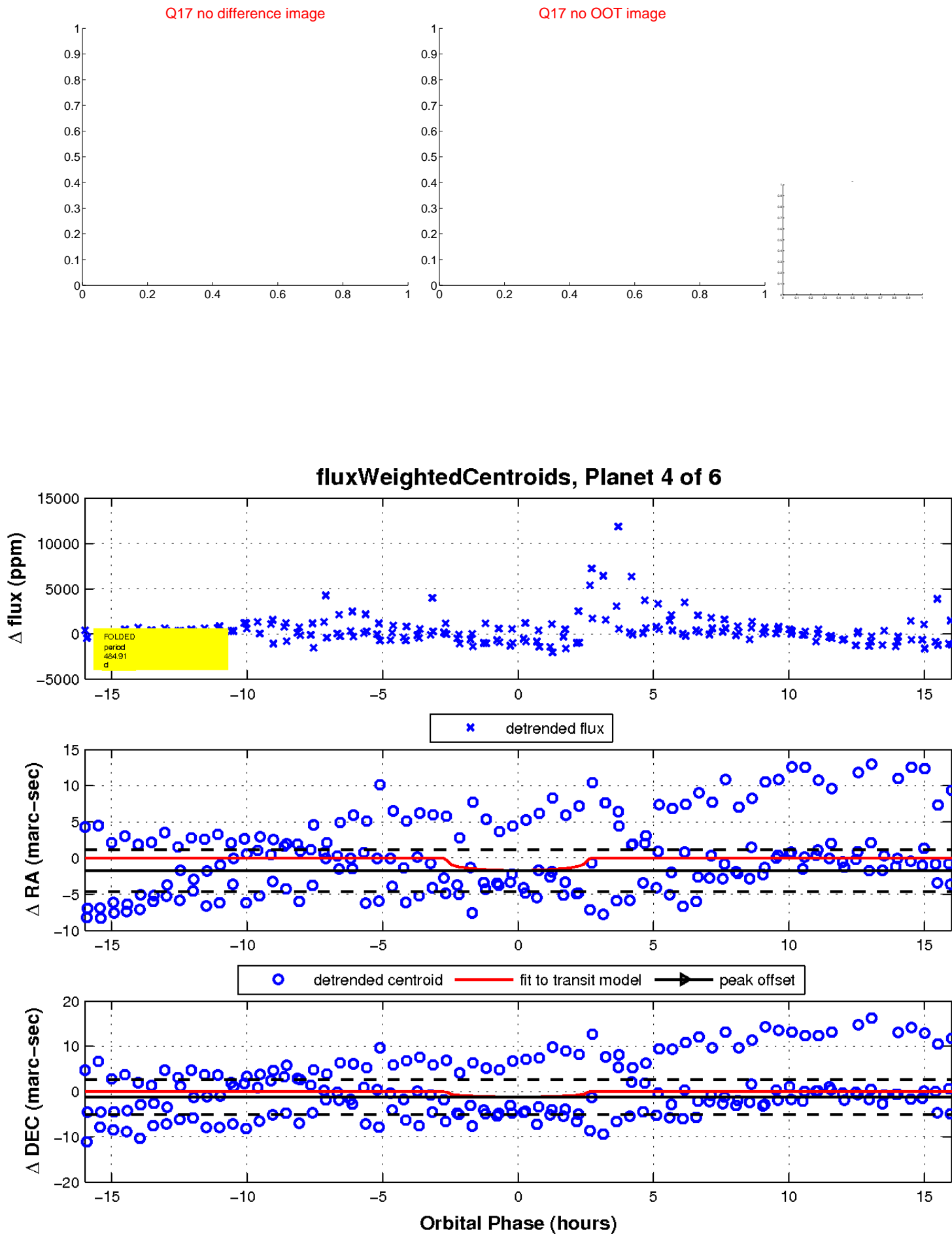
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

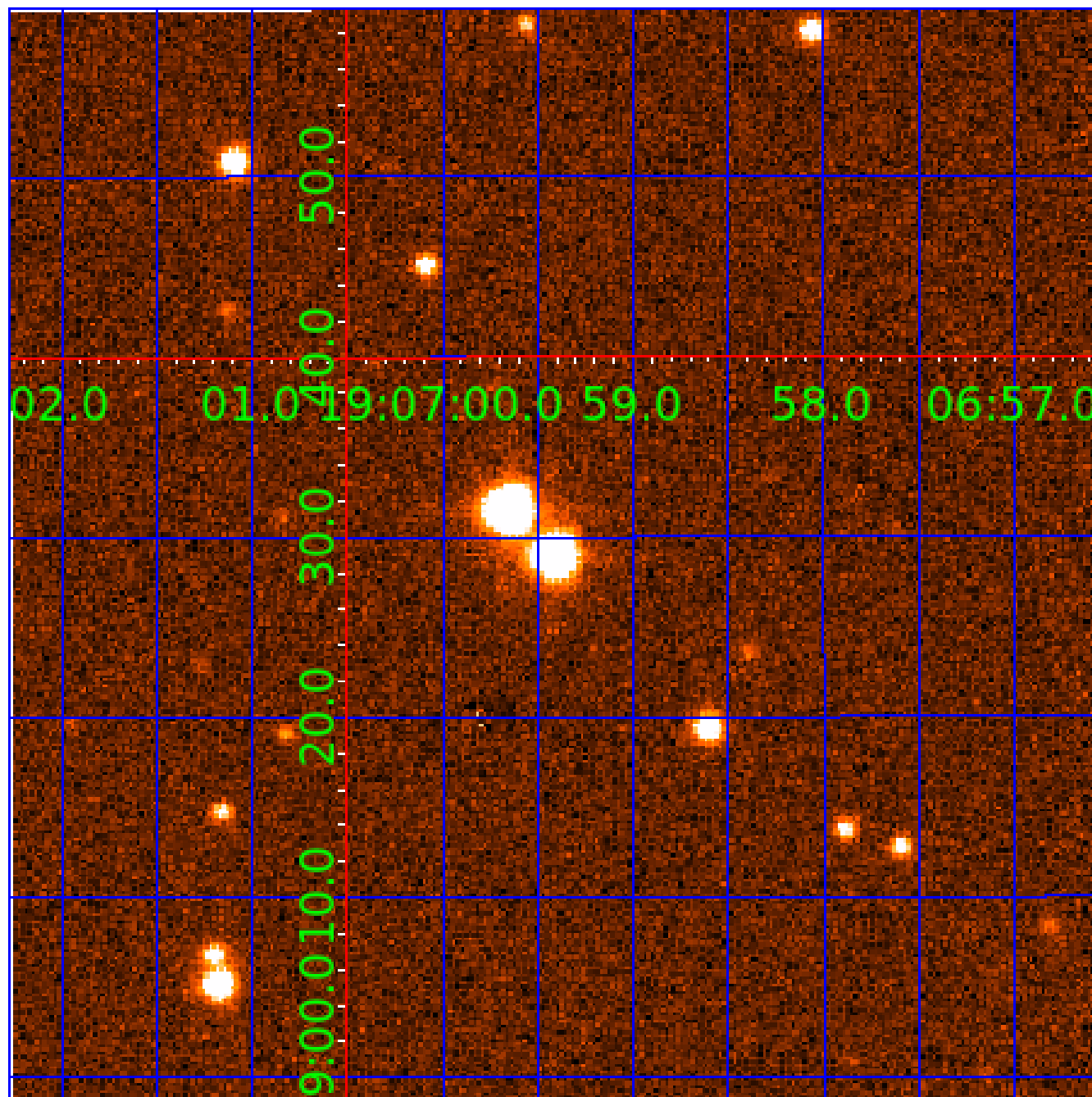


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008873448

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})
008873448-01	OBS	No	577.515355	270.778153	1878.4	2.158	15.1	4.8	0.61	4063	4.72	0.07
008873448-02	OBS	No	632.974013	134.271399	1466.1	10.455	14.9	3.6	0.61	4063	2.53	0.06
008873448-03	OBS	No	483.800646	576.632412	2097.6	4.039	12.9	6.8	0.61	4063	3.09	0.09
008873448-04	OBS	No	484.909494	432.426018	2214.4	5.391	13.5	6.5	0.61	4063	2.81	0.09
008873448-05	OBS	No	450.940038	552.418638	4797.4	9.434	12.5	9.8	0.61	4063	4.08	0.10
008873448-06	OBS	No	417.375897	465.977721	690.2	12.000	12.1	-1.0	0.61	4063	1.55	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008873448-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

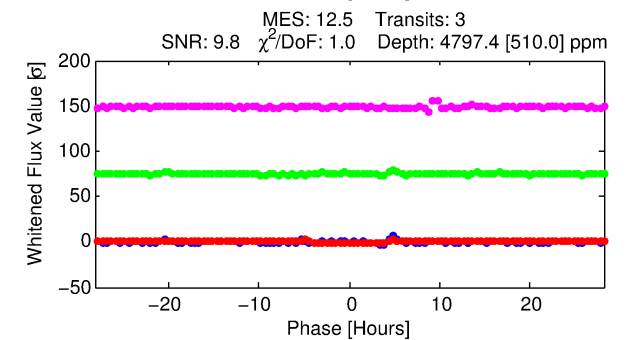
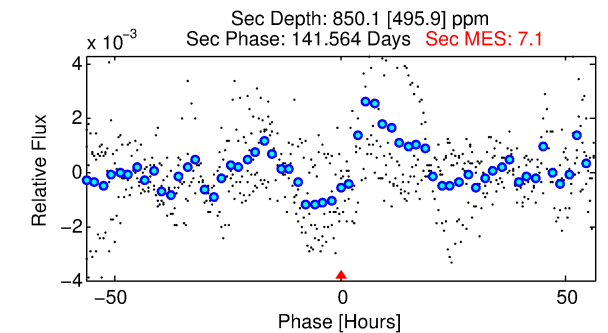
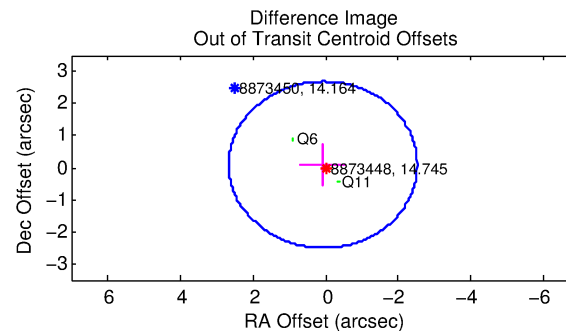
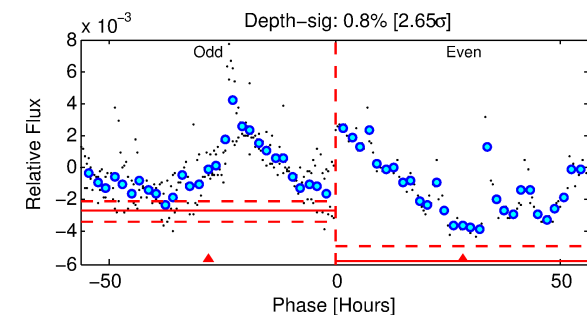
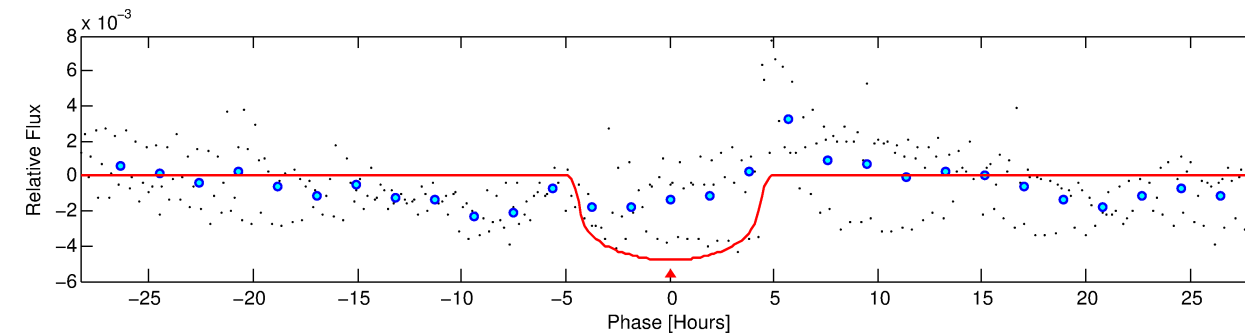
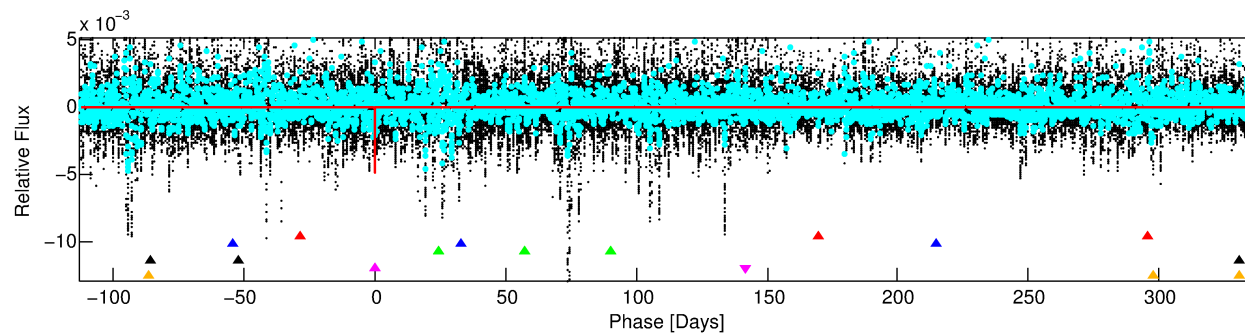
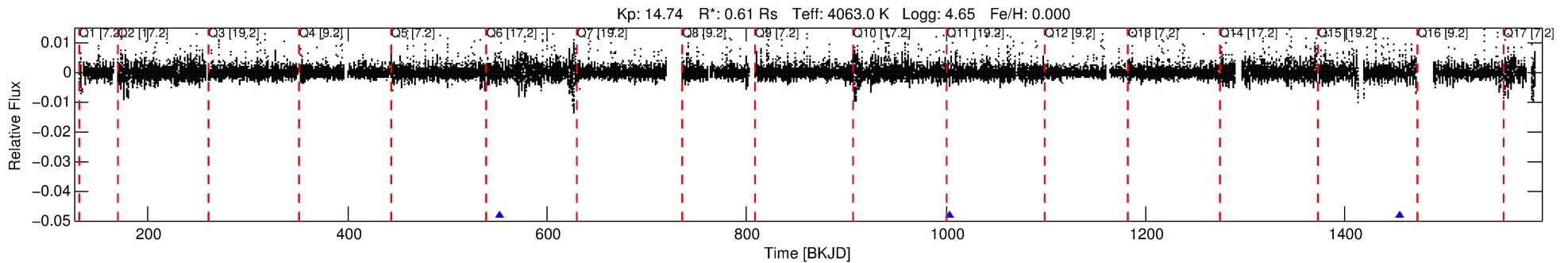
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-05

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 5 of 6 Period: 450.940 d



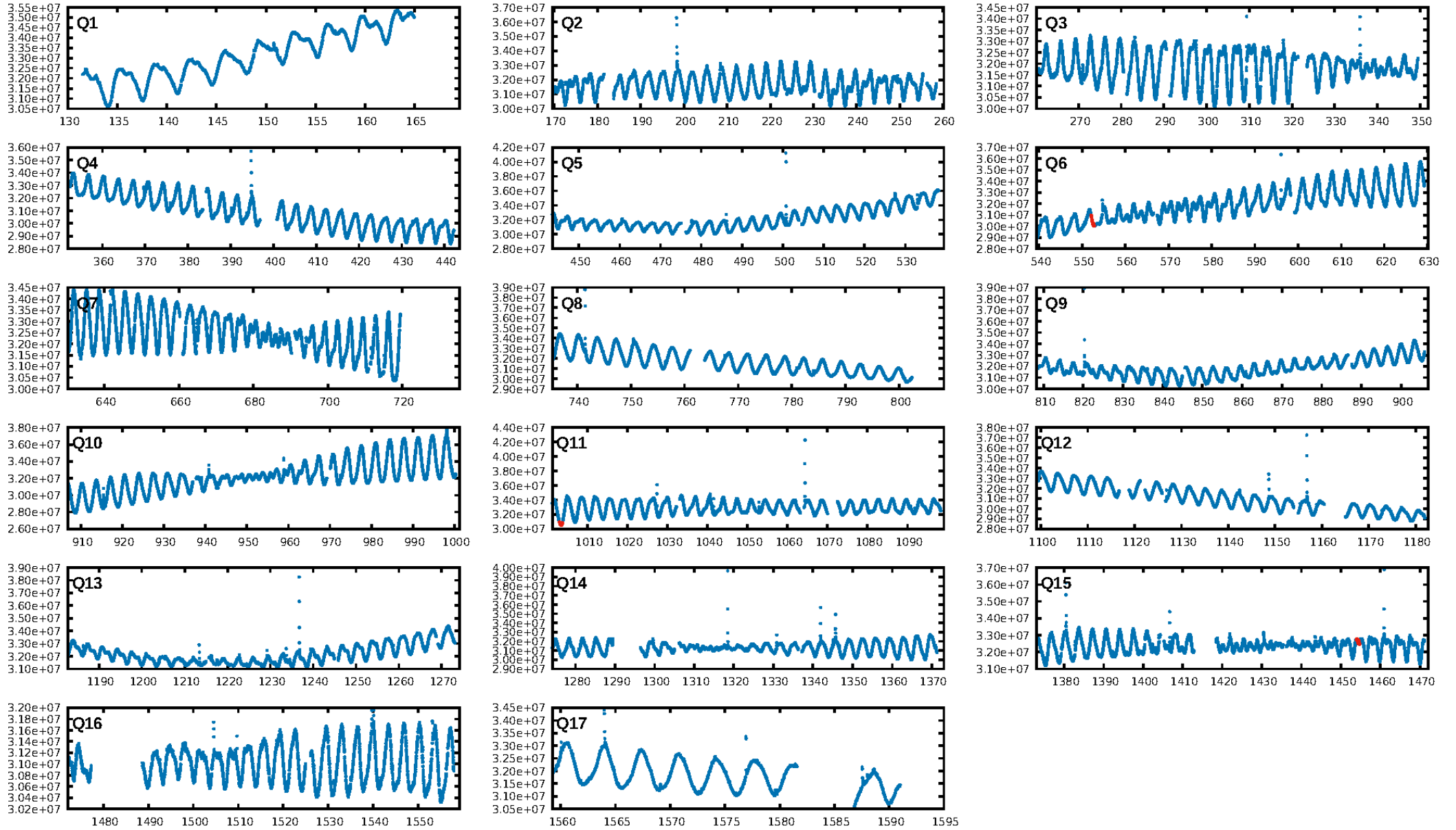
DV Fit Results:

Period = 450.94004 [0.00303] d
Epoch = 552.4186 [0.0045] BKJD
Rp/R* = 0.0614 [0.0103]
a/R* = 387.57 [193.96]
b = 0.00 [264.65]
Seff = 0.10 [0.02]
Teq = 142 [7] K
Rp = 4.08 [0.83] Re
a = 0.9732 [0.0855] AU
Ag = 26593.28 [18158.46] [1.46 σ]
Teffp = 2800 [483] K [5.50 σ]

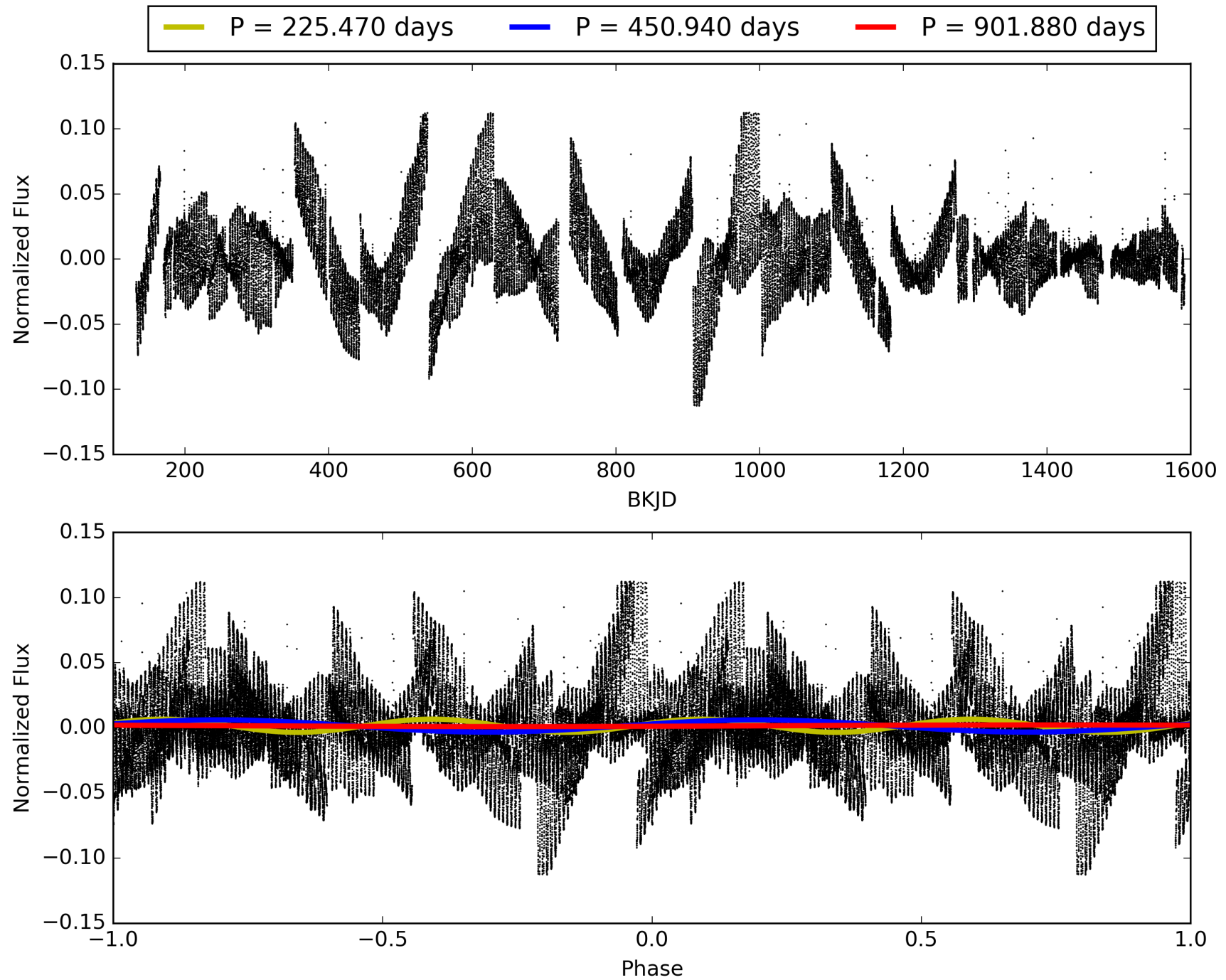
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [52.77 σ]
LongPeriod-sig: 100.0% [76.85 σ]
ModelChiSquare2-sig: 6.5%
ModelChiSquareGof-sig: 99.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -11.17
Centroid-sig: 12.2%
Centroid-so: 2.516 arcsec [5.16 σ]
OotOffset-rm: 0.113 arcsec [0.13 σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-rm: 2.633 arcsec [3.21 σ]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 008873448-05, PDC Light Curves

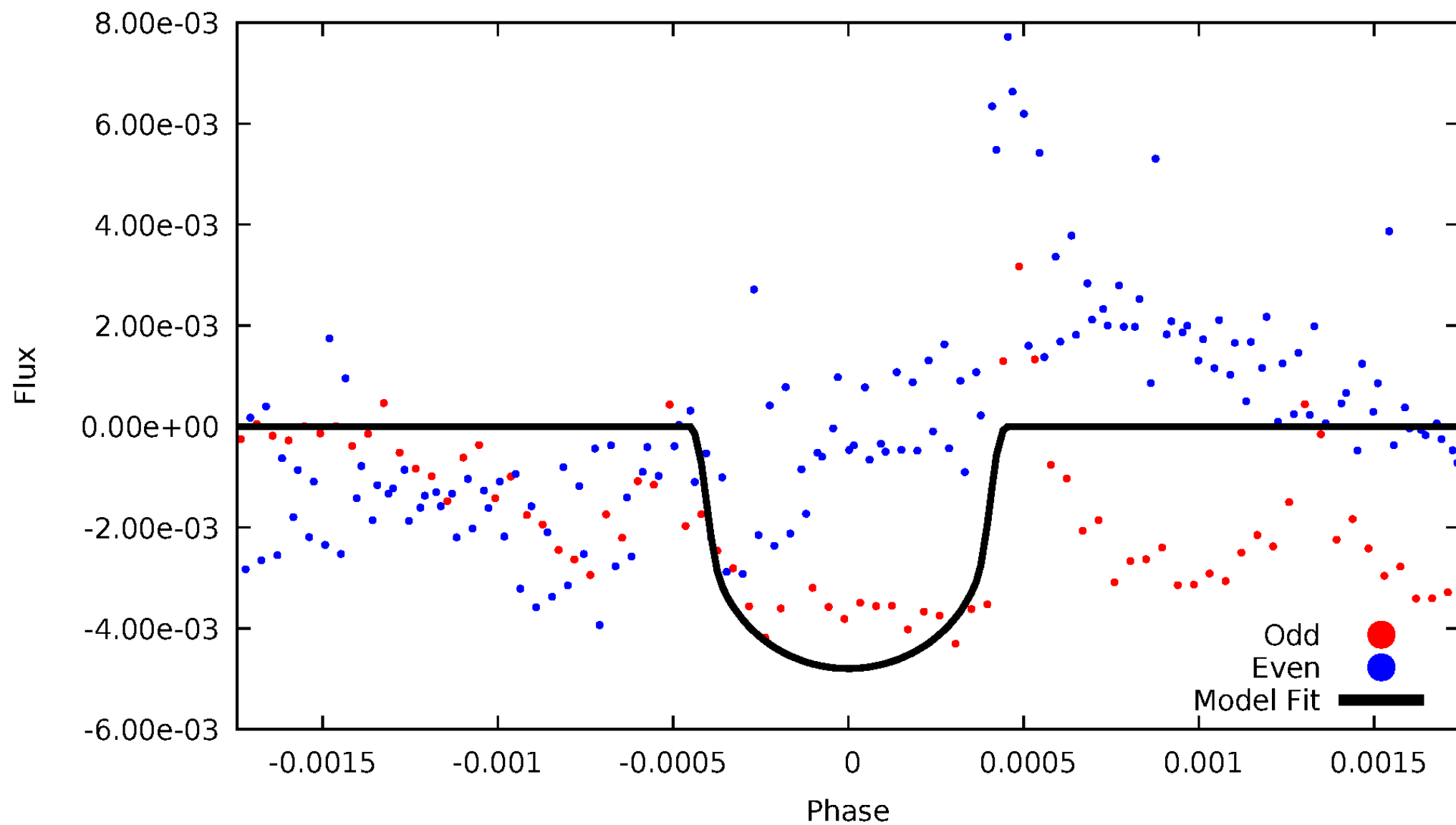


TCE 008873448-05



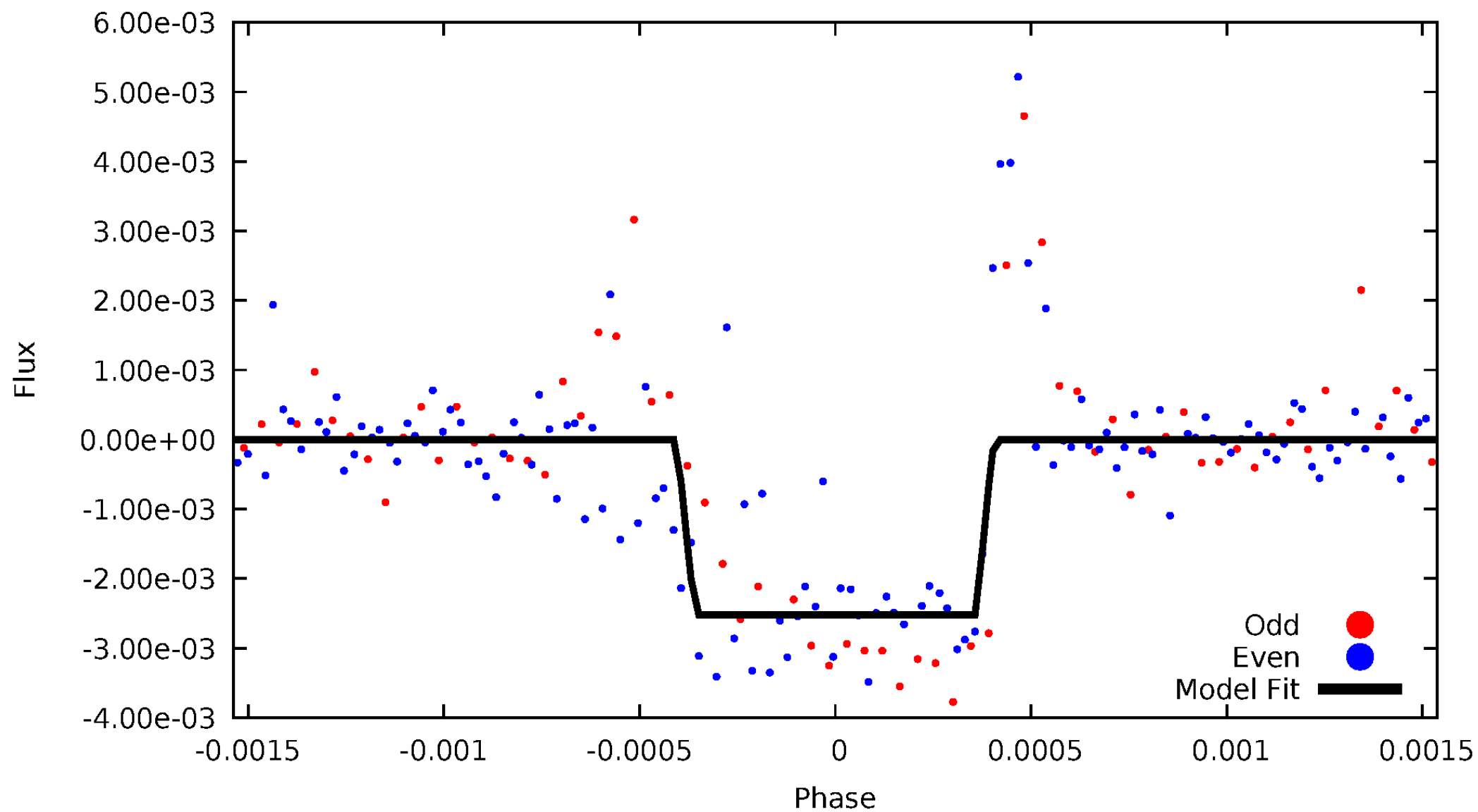
DV Odd/Even

TCE 008873448-05



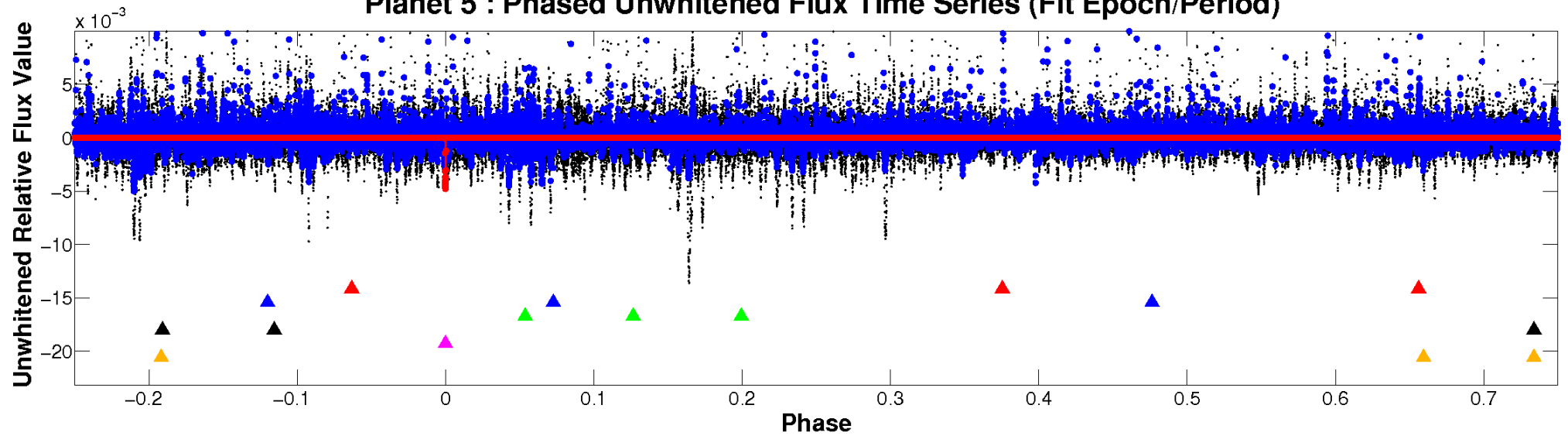
ALT Odd/Even

TCE 008873448-05

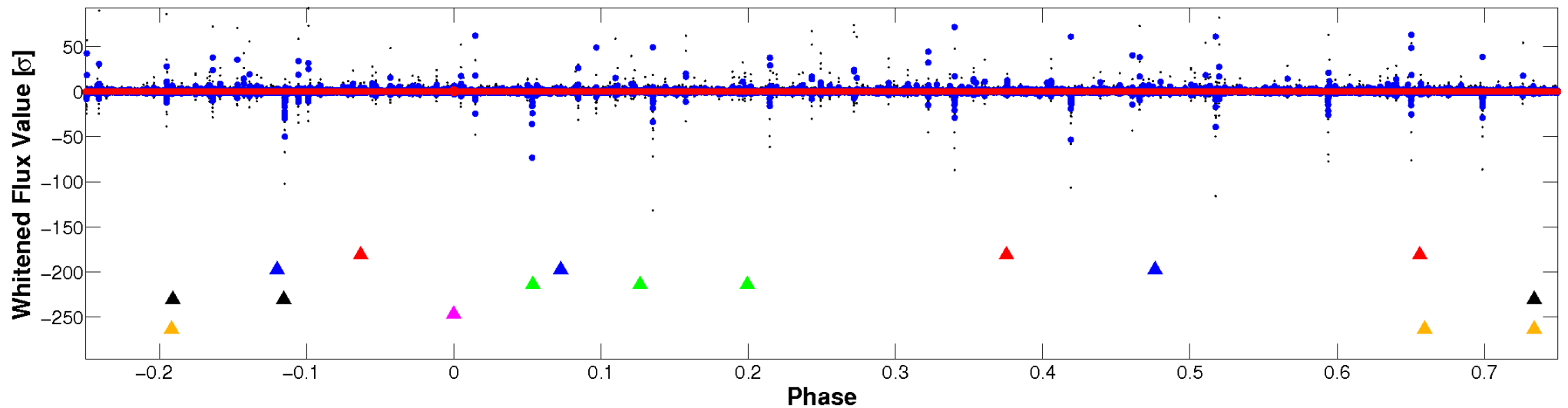


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

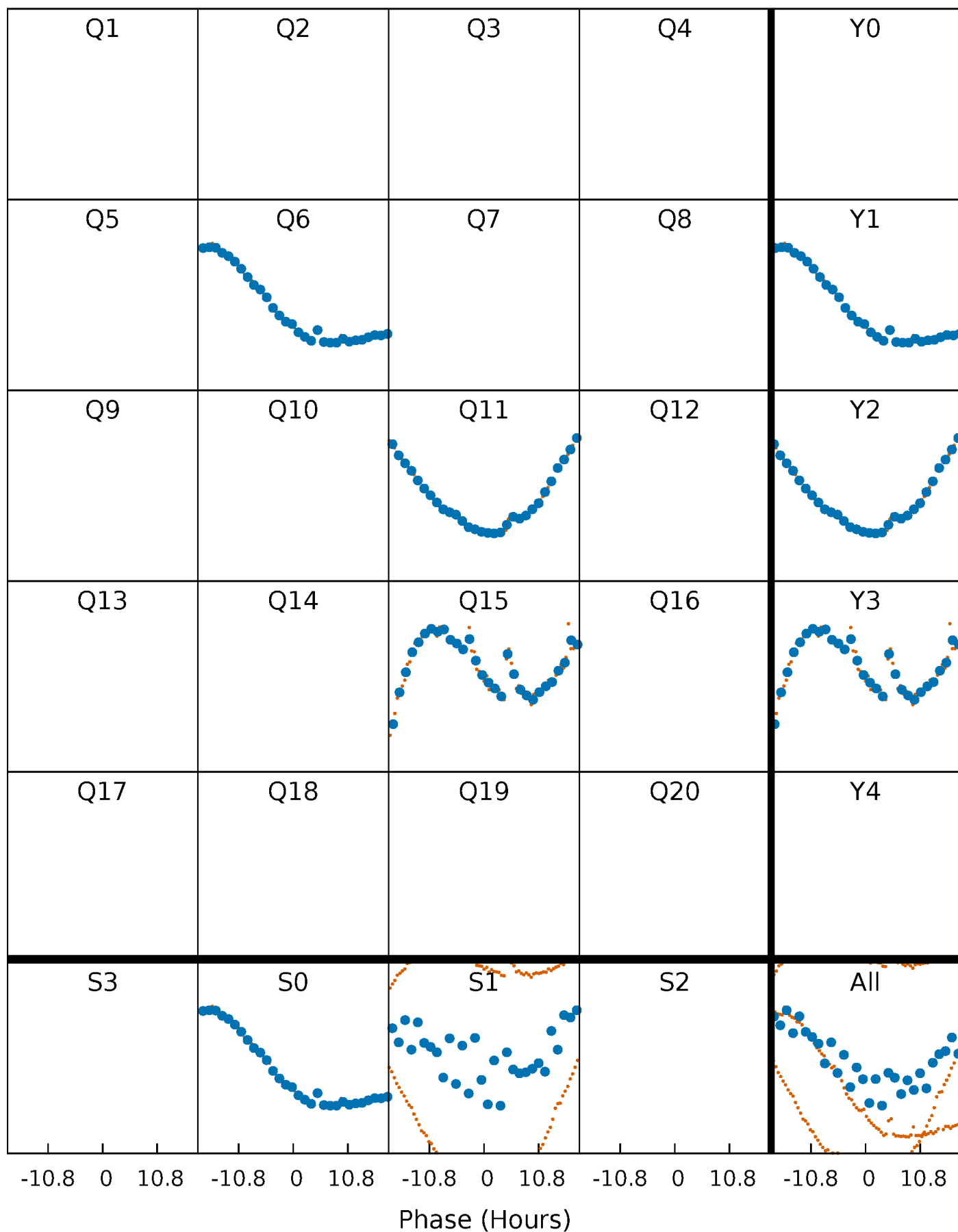


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



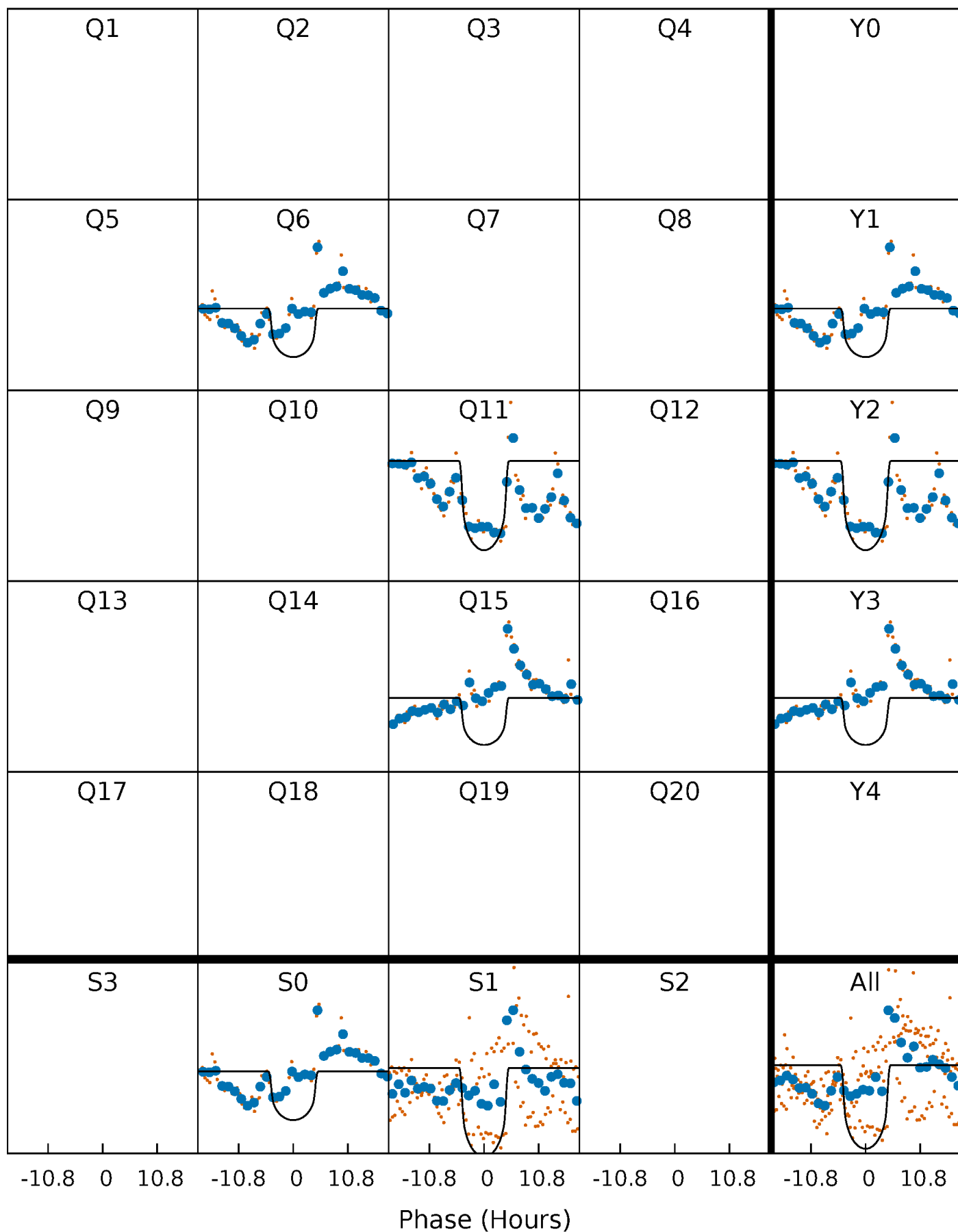
PDC Quarter-Phased Transit Curves

TCE 008873448-05 $P=450.940038$ Days $T_0=552.418638$ (BKJD)



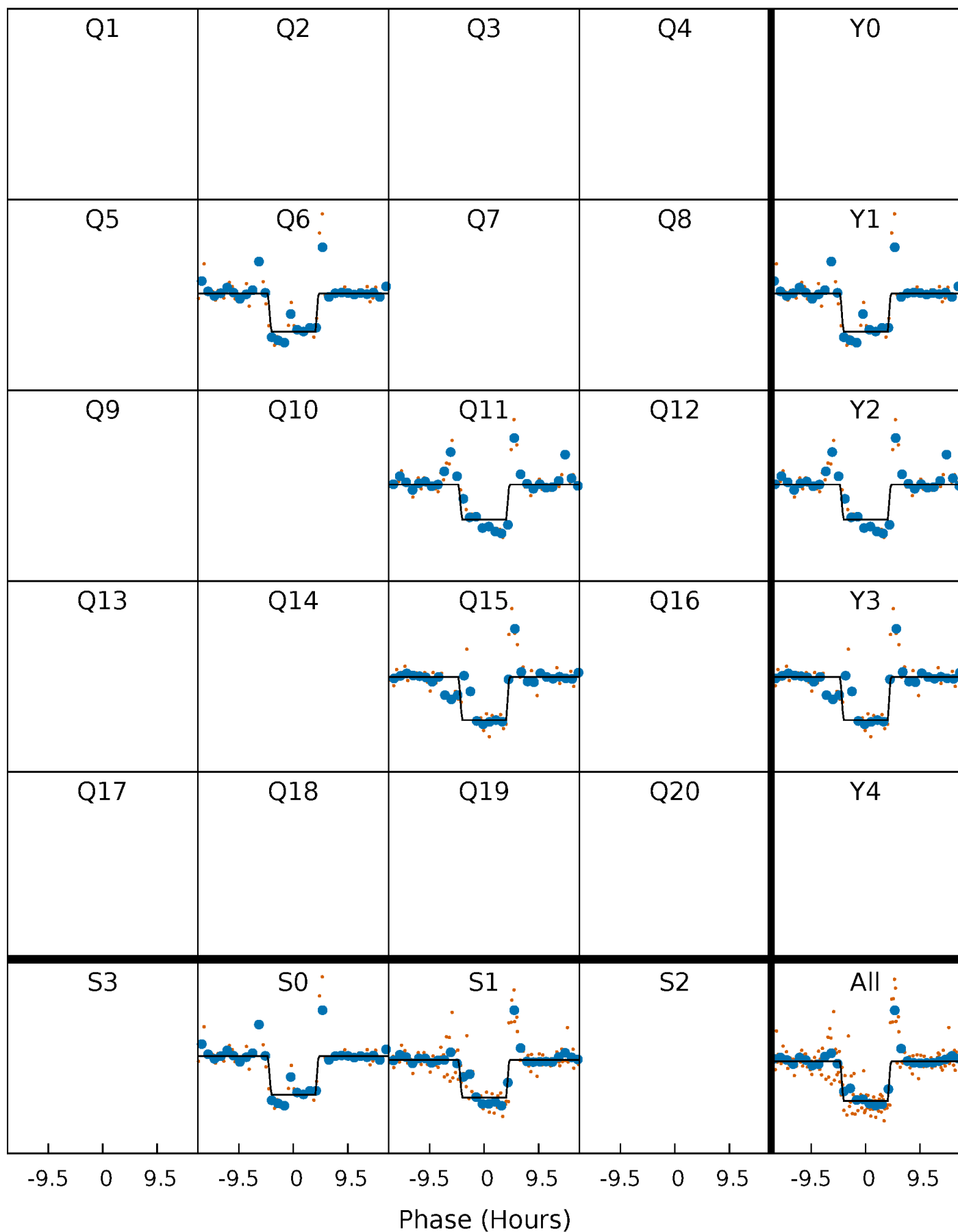
DV Quarter-Phased Transit Curves

TCE 008873448-05 $P=450.940038$ Days $T_0=552.418638$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

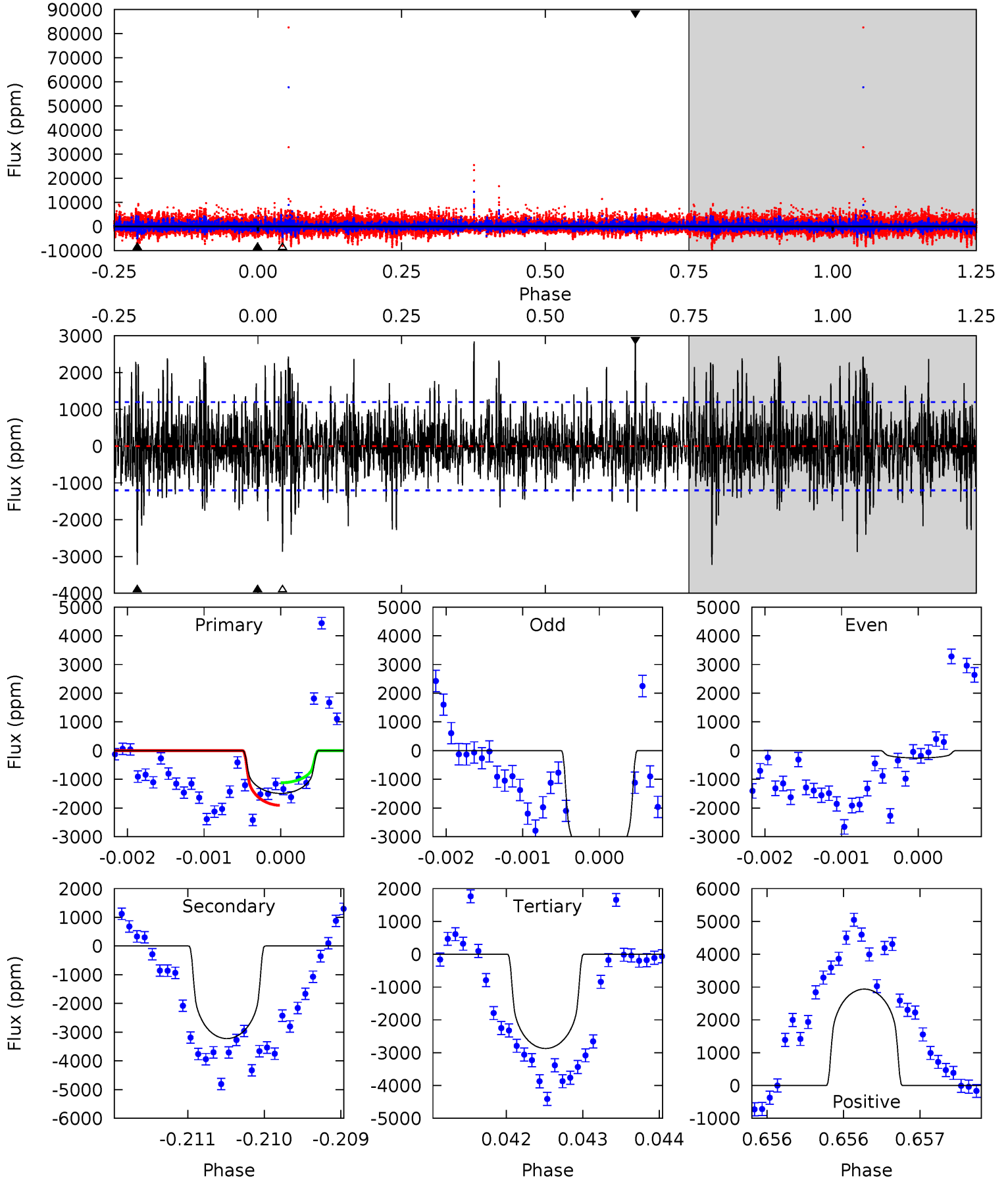
TCE 008873448-05 $P=450.941424$ Days $T_0=552.419353$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-05, P = 450.940038 Days, E = 101.478600 Days

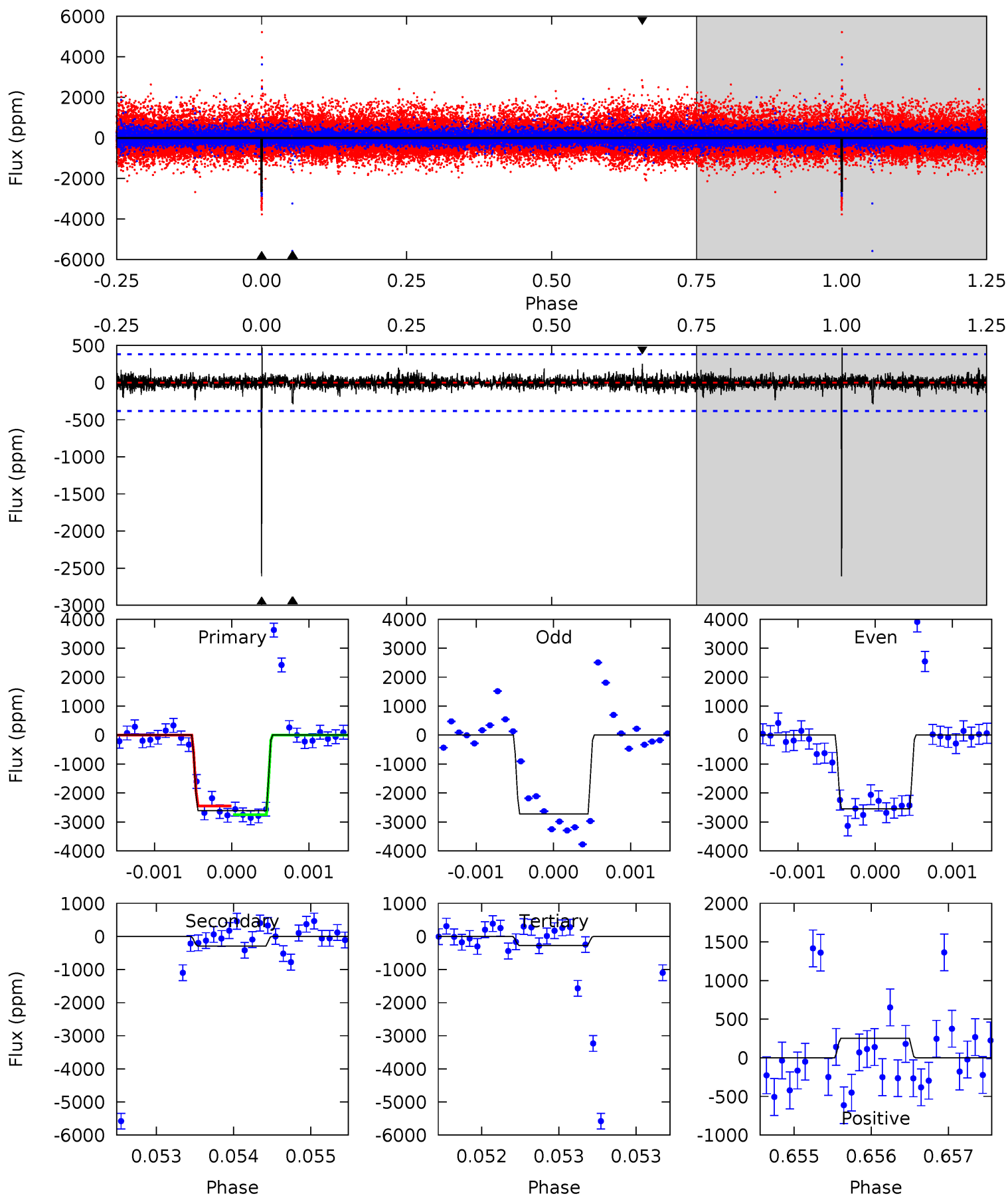
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.80	14.7	13.1	13.4	5.47	3.31	2.96	-6.29	-6.58	1.60	1.30	6.61	1.35	0.48	1.81



Alt Model-Shift Uniqueness Test

008873448-05, P = 450.941424 Days, E = 101.477929 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.5	4.15	3.91	3.62	5.49	3.35	0.61	33.6	33.8	0.24	0.53	1.12	0.95	0.15	2.16



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-3224 ± 219	$4.00^{+0.75}_{-0.70}$	197^{+8}_{-9}	3950^{+307}_{-267}	104715^{+46535}_{-29212}
Alt.	-289 ± 70	$3.28^{+0.72}_{-0.71}$	197^{+8}_{-8}	2898^{+225}_{-183}	13984^{+9540}_{-5111}

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 $A_{obs} \gg 1.0$

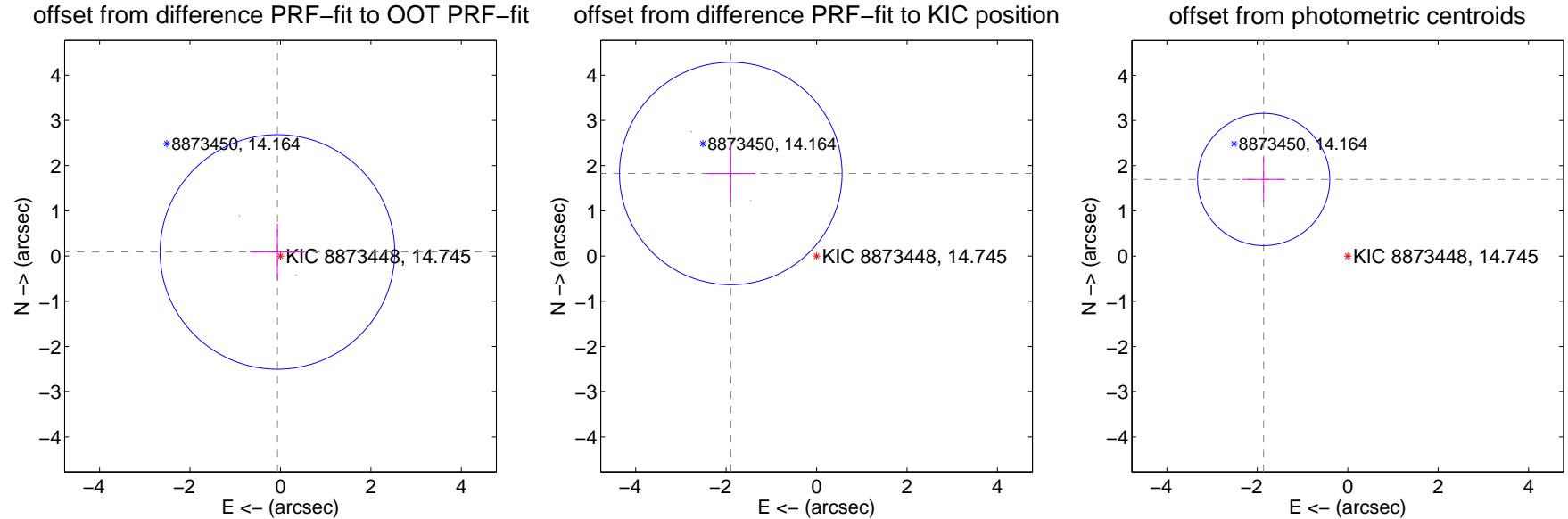
DV Centroid Data

Supplemental centroid analysis for 008873448-05. Kepler magnitude: 14.74. Transit SNR 9.84

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 2.45 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	0.113 ± 0.865	0.13	0.068 ± 0.607	0.090 ± 0.629
PRF-fit source offset from KIC position	2.633 ± 0.820	3.21	1.897 ± 0.540	1.825 ± 0.626
photometric centroid source offset	2.52 ± 0.49	5.16	1.86 ± 0.48	1.69 ± 0.49

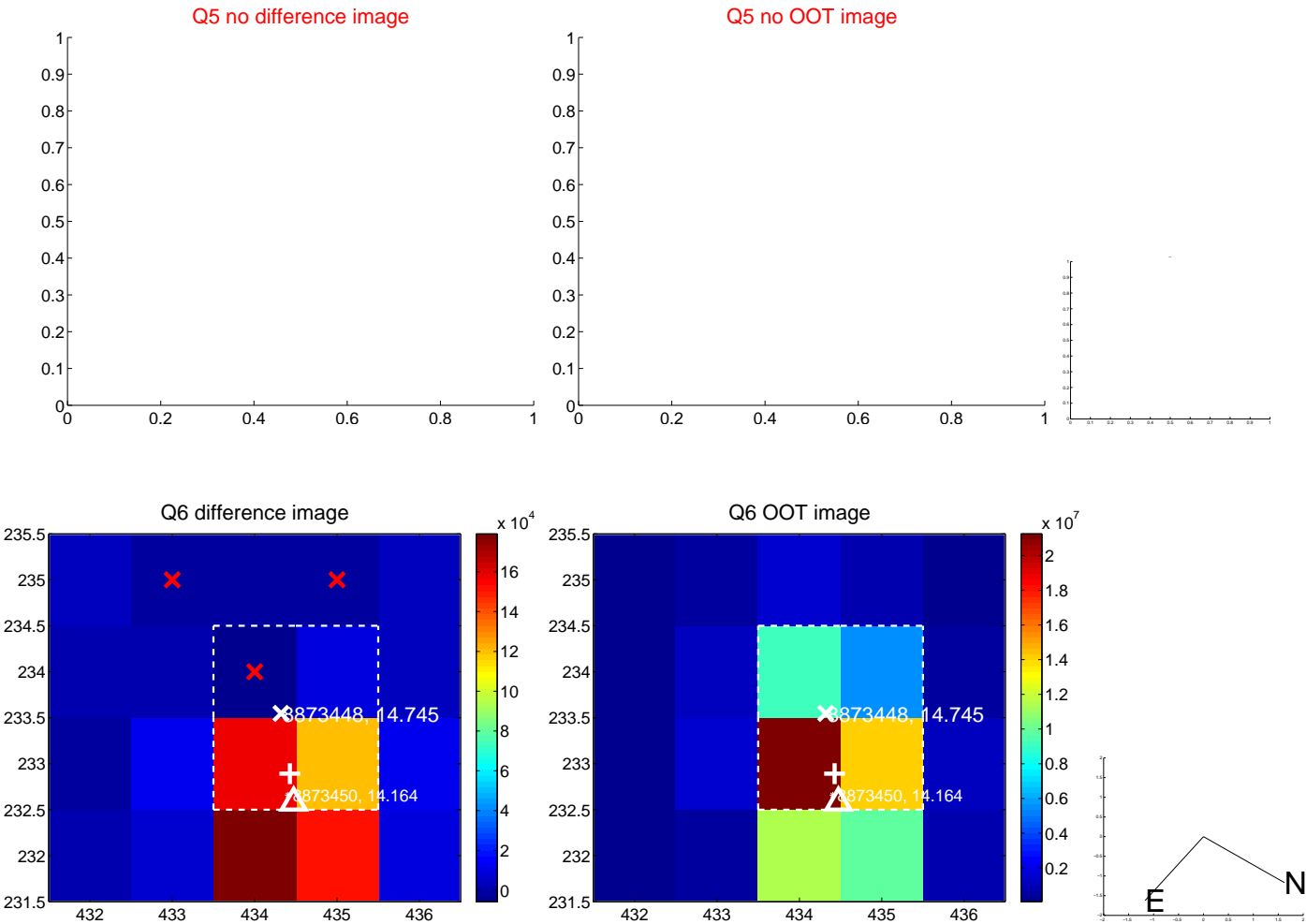


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

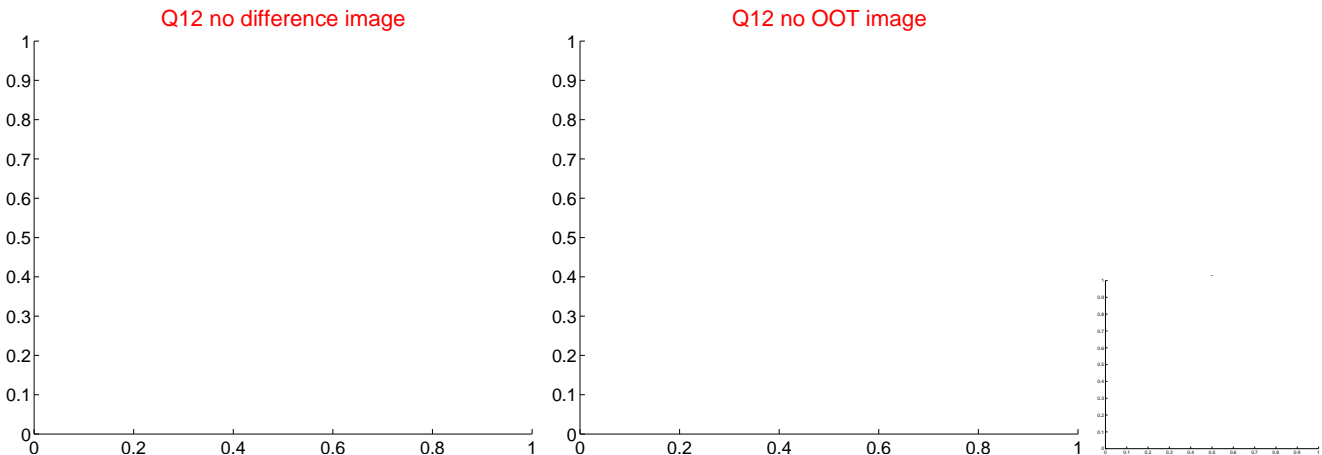
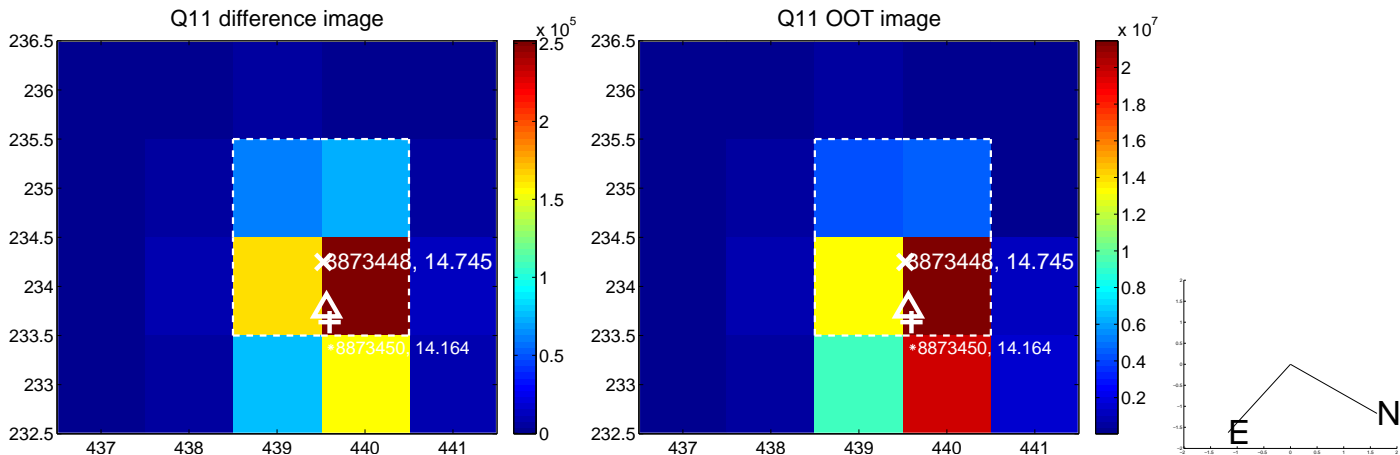
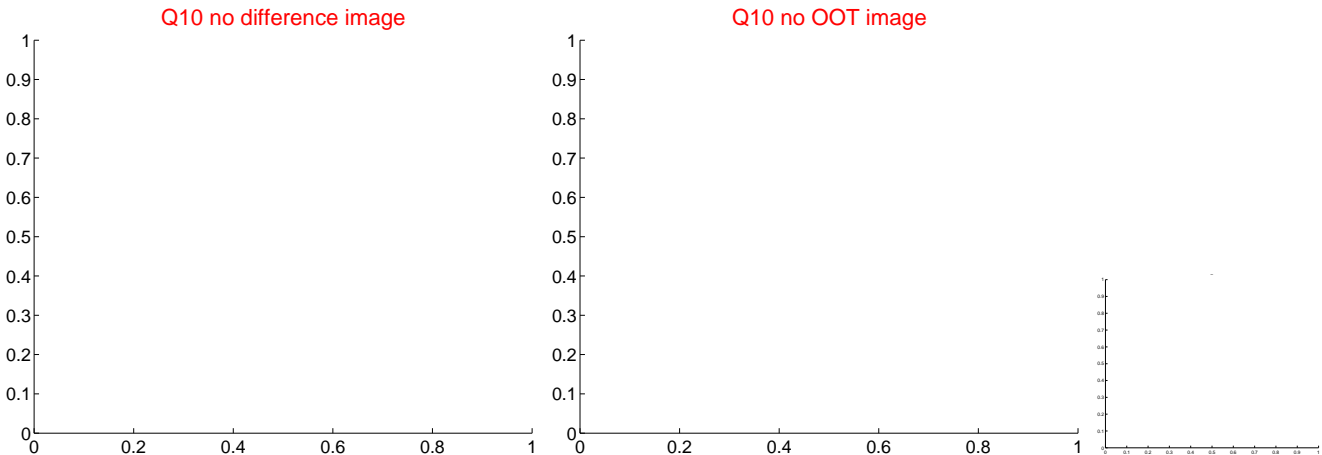
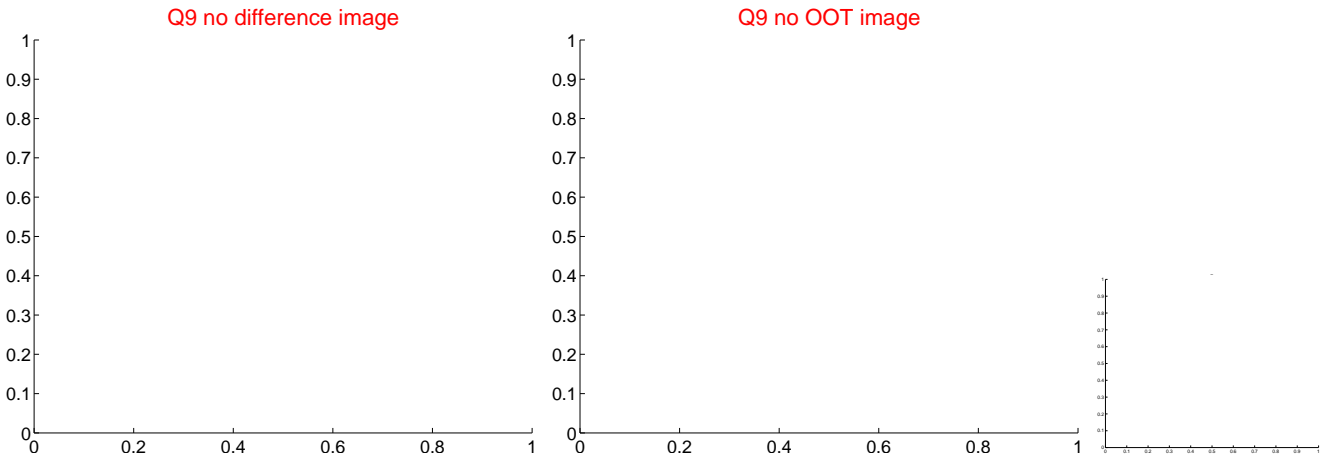
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



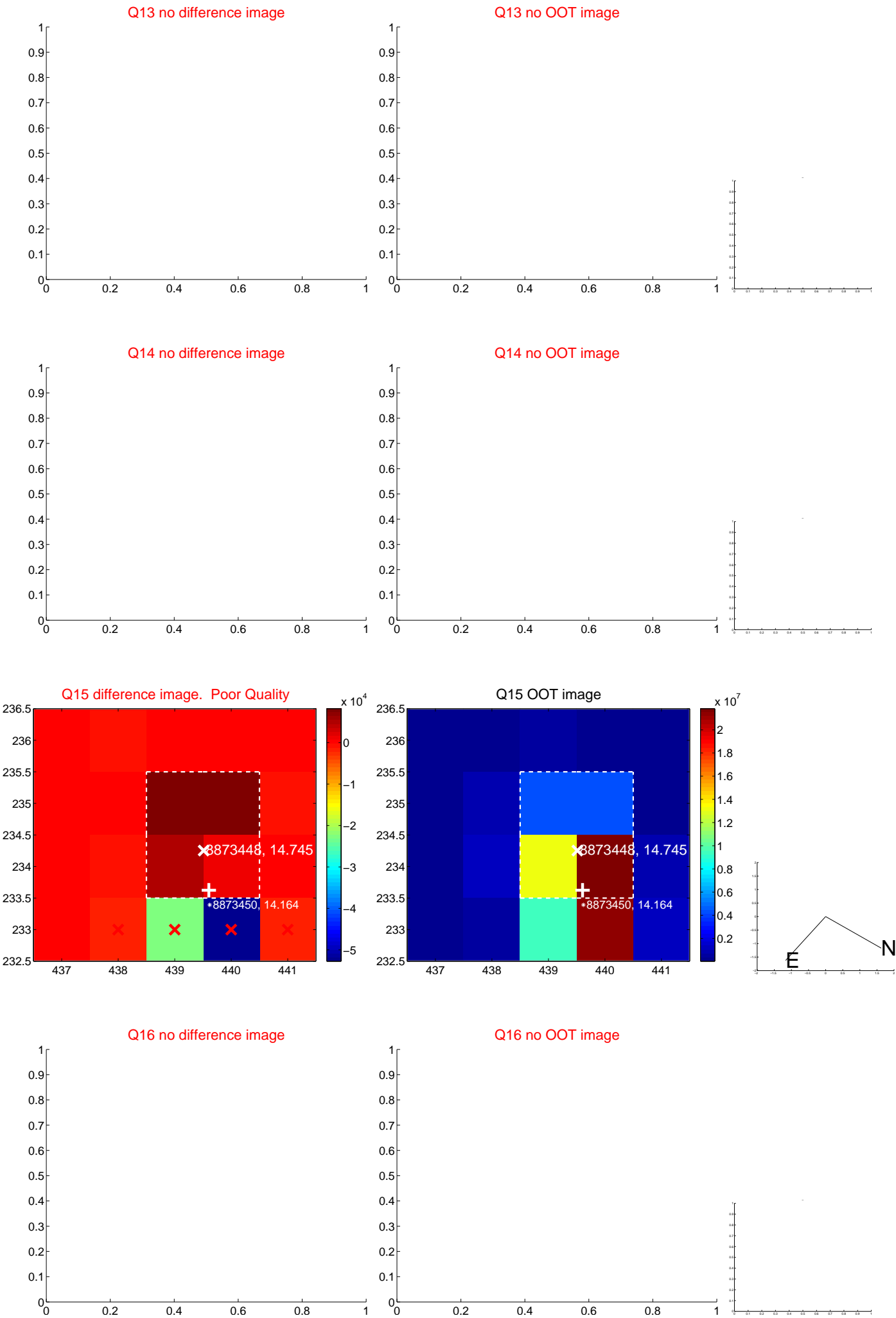
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



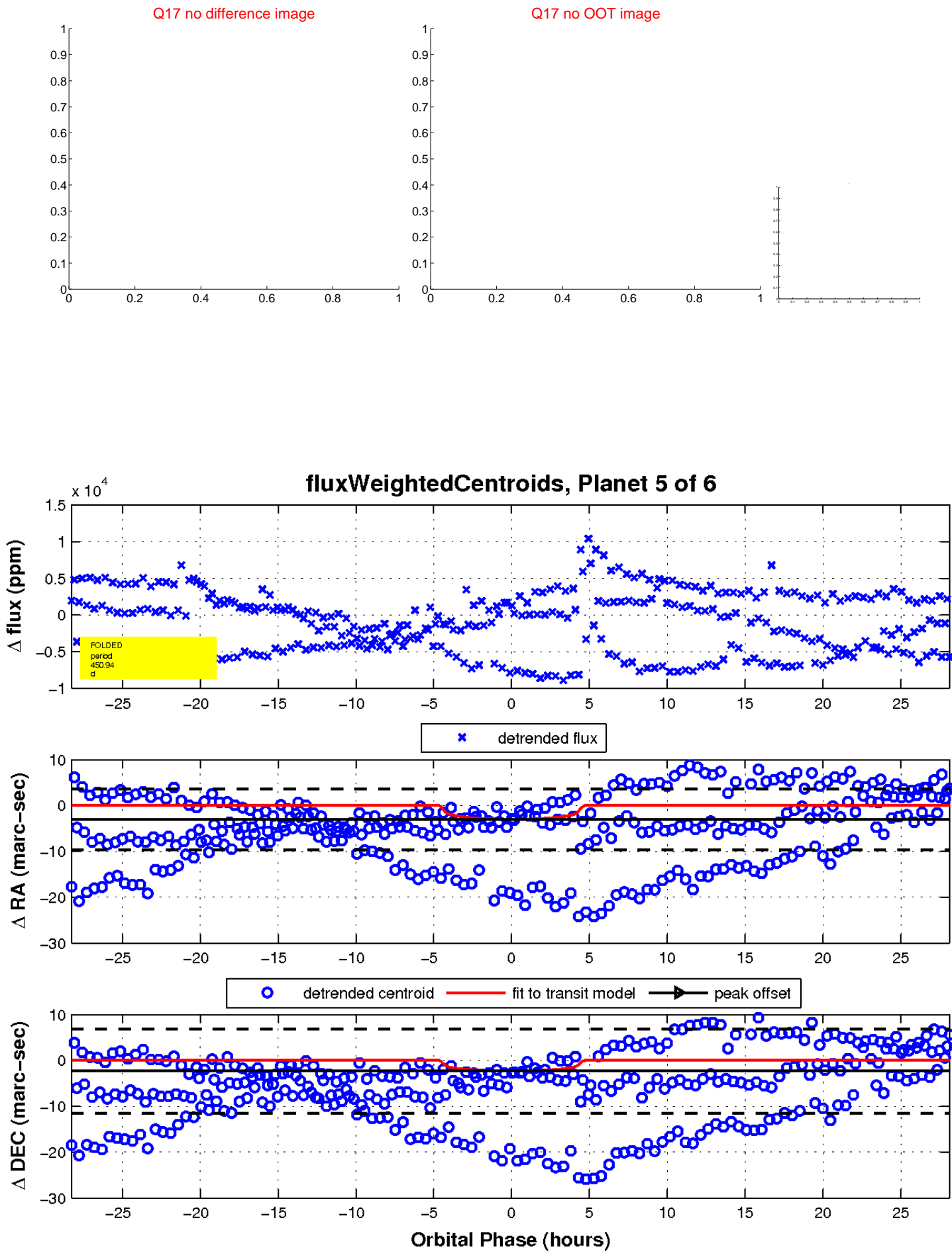
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

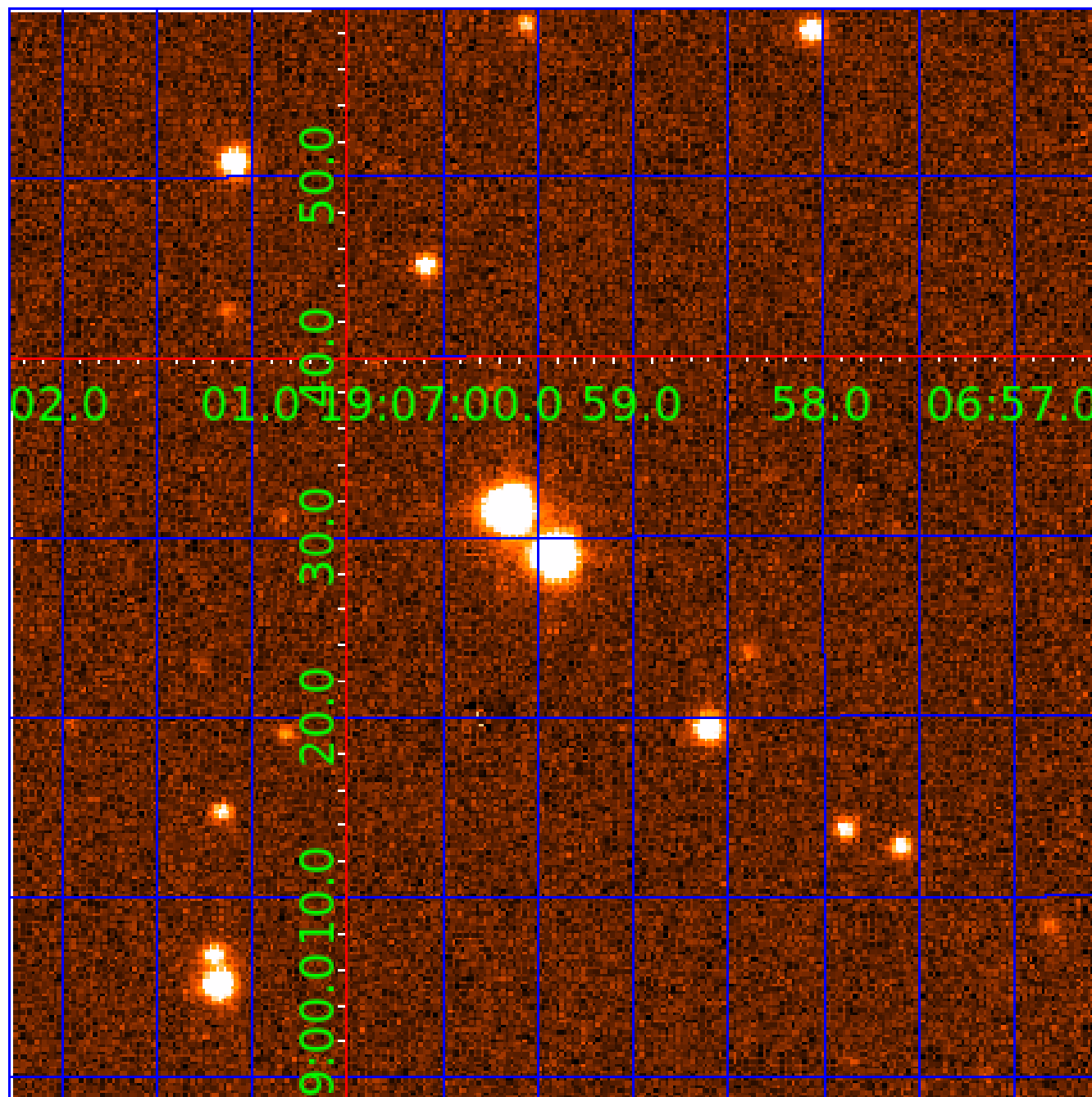


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008873448

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})
008873448-01	OBS	No	577.515355	270.778153	1878.4	2.158	15.1	4.8	0.61	4063	4.72	0.07
008873448-02	OBS	No	632.974013	134.271399	1466.1	10.455	14.9	3.6	0.61	4063	2.53	0.06
008873448-03	OBS	No	483.800646	576.632412	2097.6	4.039	12.9	6.8	0.61	4063	3.09	0.09
008873448-04	OBS	No	484.909494	432.426018	2214.4	5.391	13.5	6.5	0.61	4063	2.81	0.09
008873448-05	OBS	No	450.940038	552.418638	4797.4	9.434	12.5	9.8	0.61	4063	4.08	0.10
008873448-06	OBS	No	417.375897	465.977721	690.2	12.000	12.1	-1.0	0.61	4063	1.55	0.11

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008873448-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008873448-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
008873448-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—LPP_ALT—CENT_NOFITS

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

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

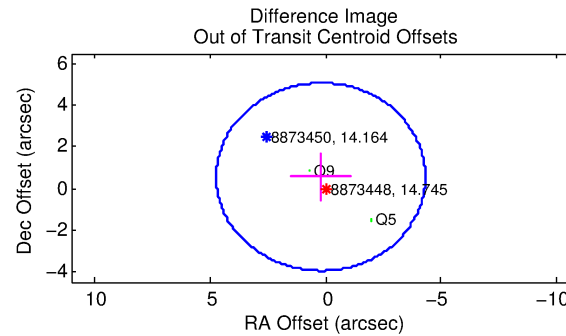
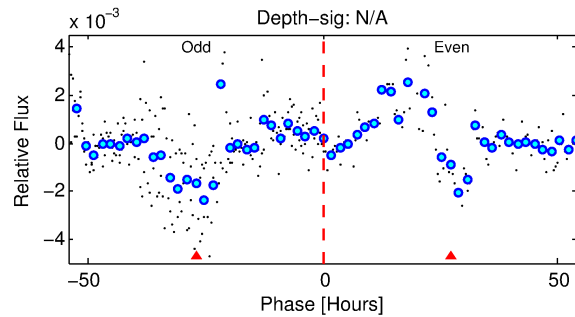
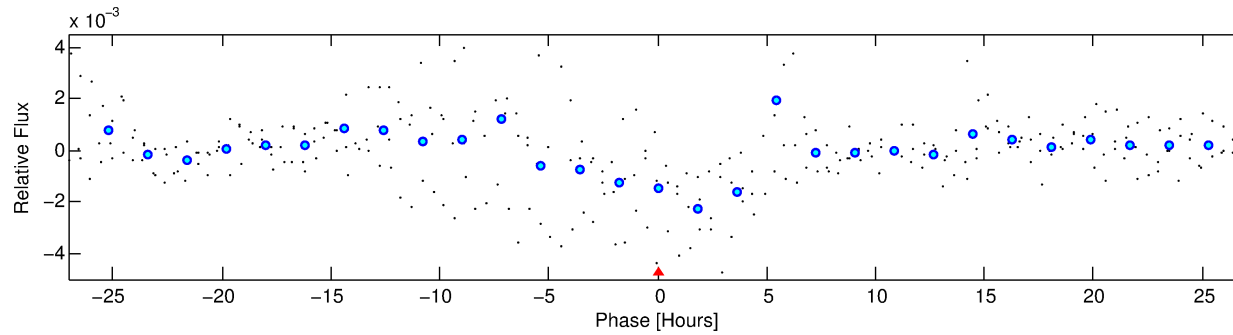
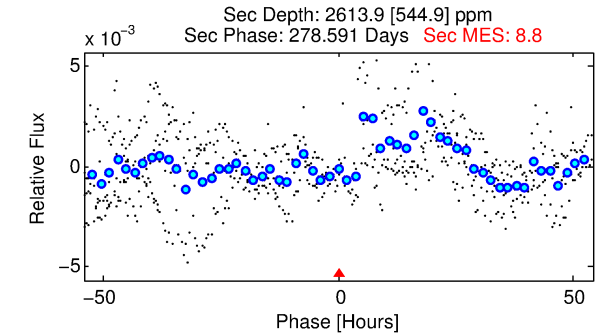
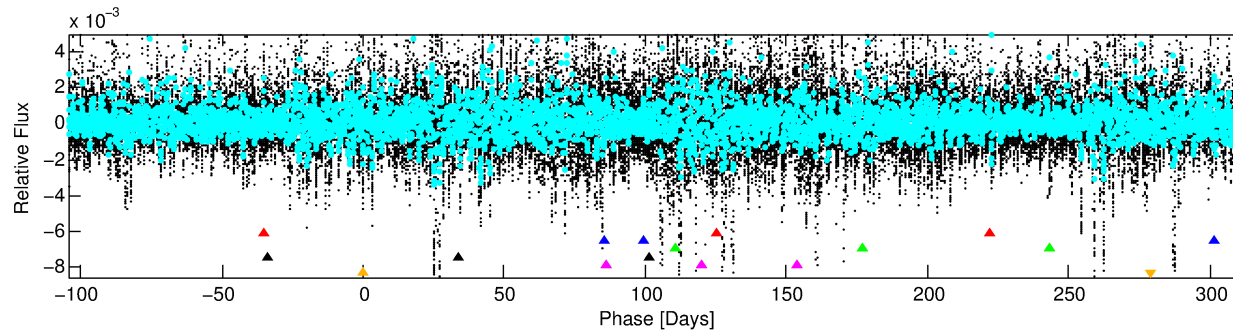
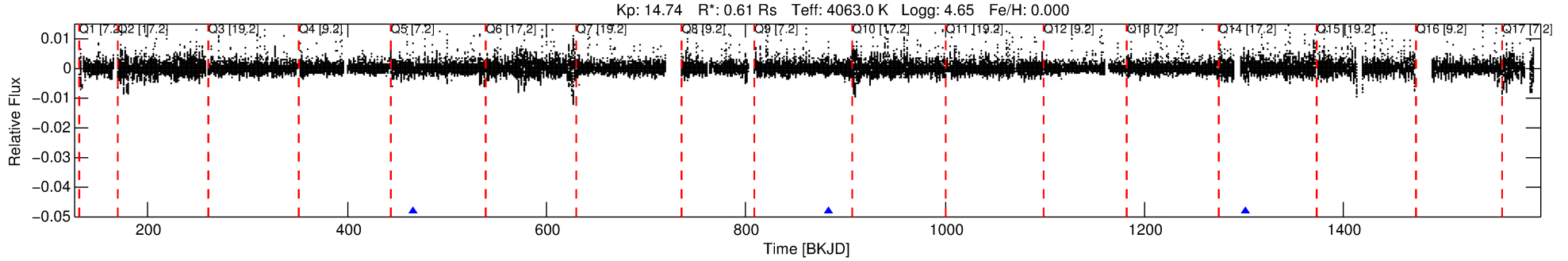
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008873448-06

No Significant Match Found

DV One-Page Summary

KIC: 8873448 Candidate: 6 of 6 Period: 417.376 d



TPS TCE Results:

Period = 417.37590 d
Epoch = 465.9777 BKJD

DV fit results are unavailable

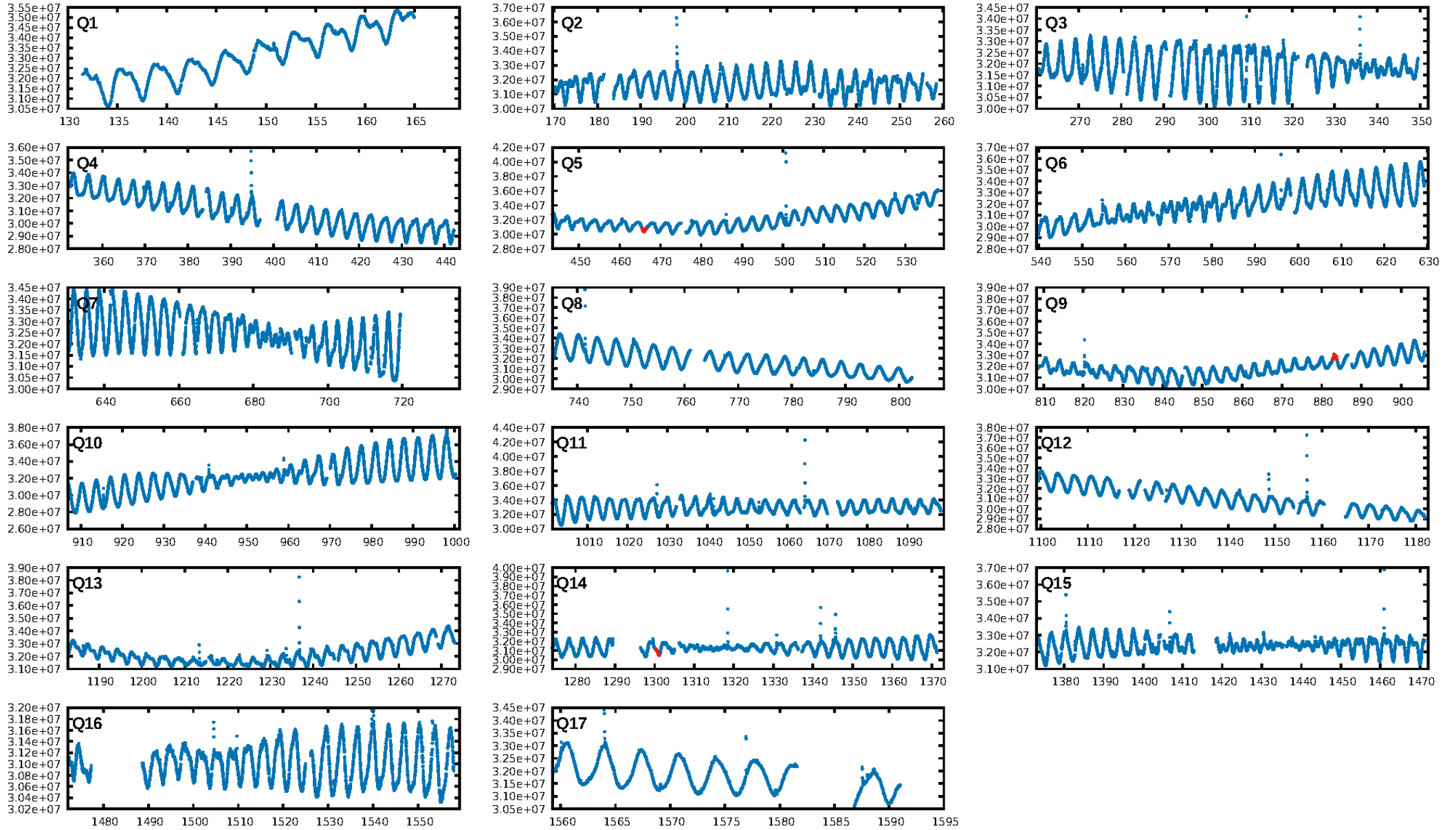
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [52.77σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.252
Centroid-sig: 12.0%
Centroid-so: 0.416 arcsec [0.45σ]
OotOffset-rm: 0.598 arcsec [0.40σ]
KicOffset-rm: 2.427 arcsec [1.68σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

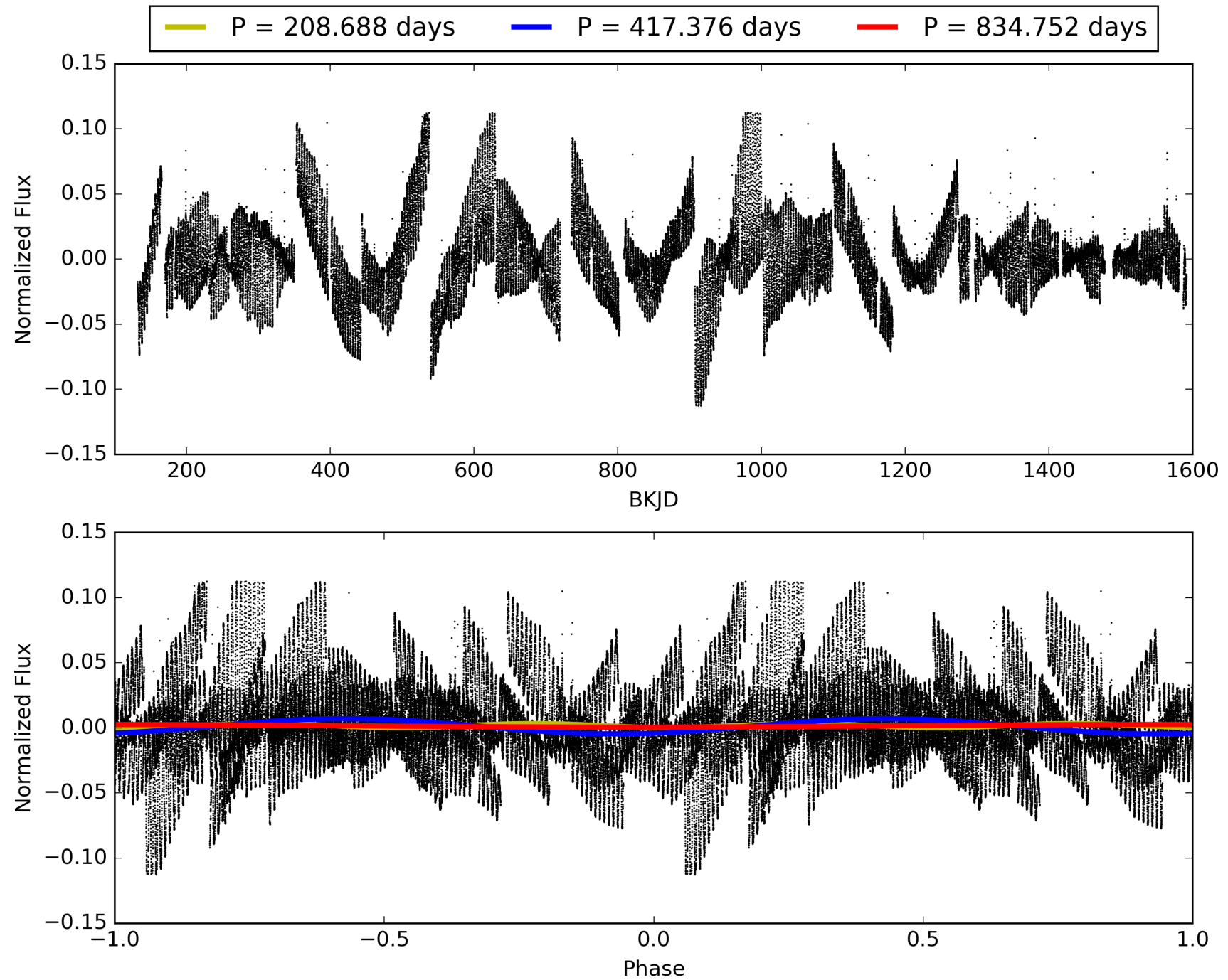
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:14:02 Z

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

TCE 008873448-06, PDC Light Curves

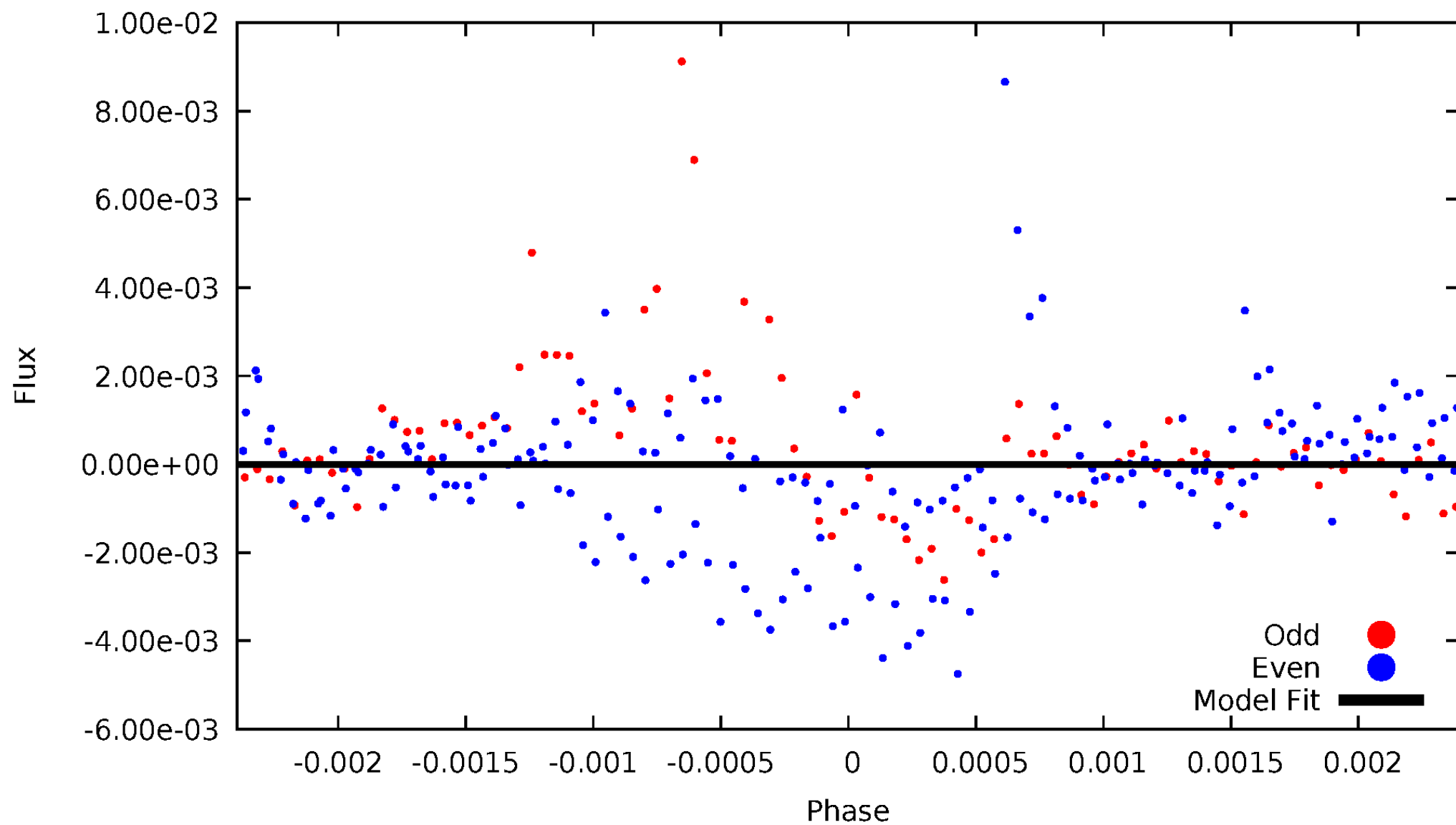


TCE 008873448-06



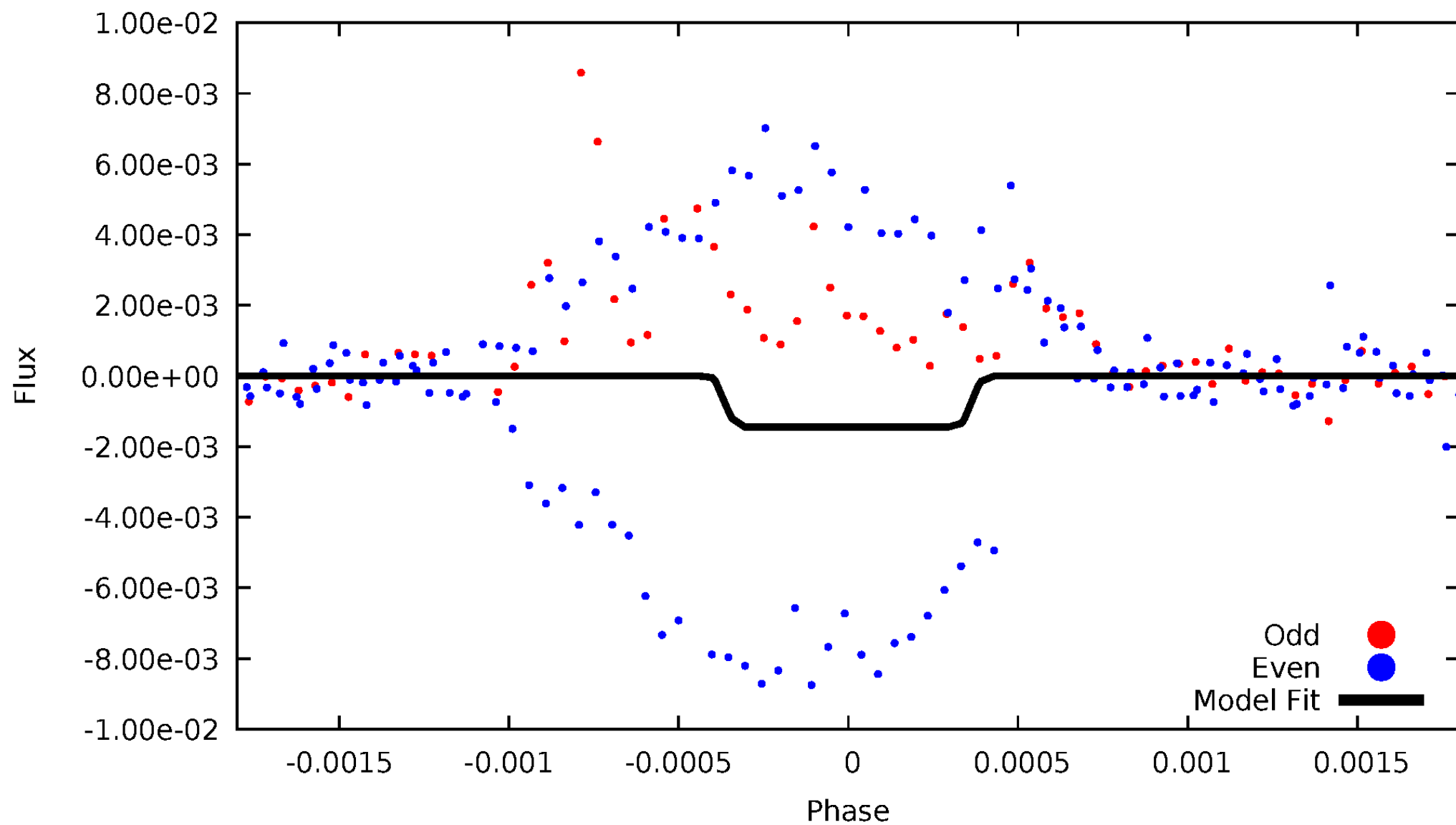
DV Odd/Even

TCE 008873448-06



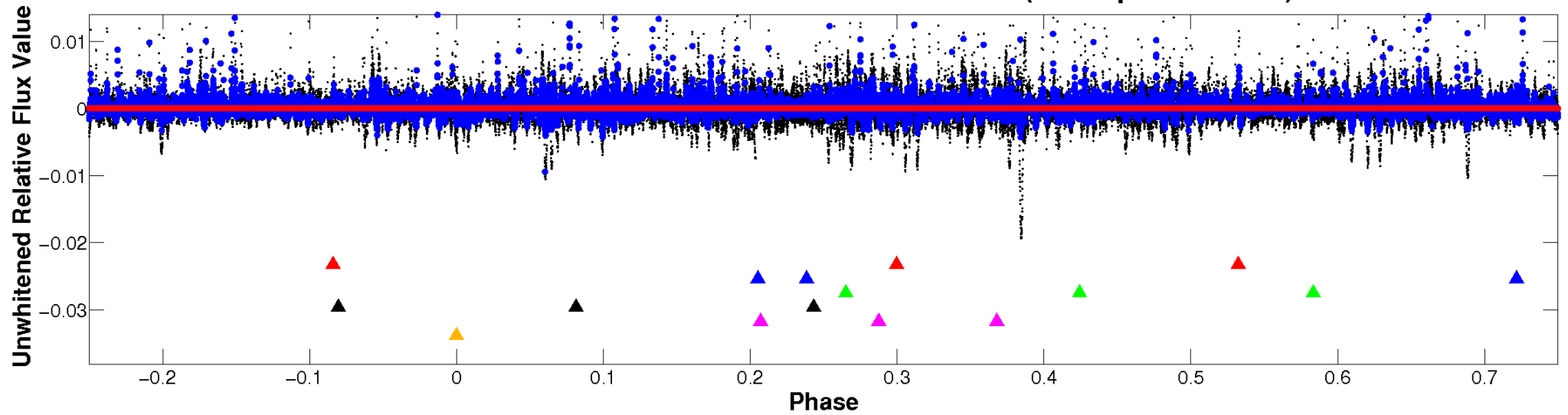
ALT Odd/Even

TCE 008873448-06



Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

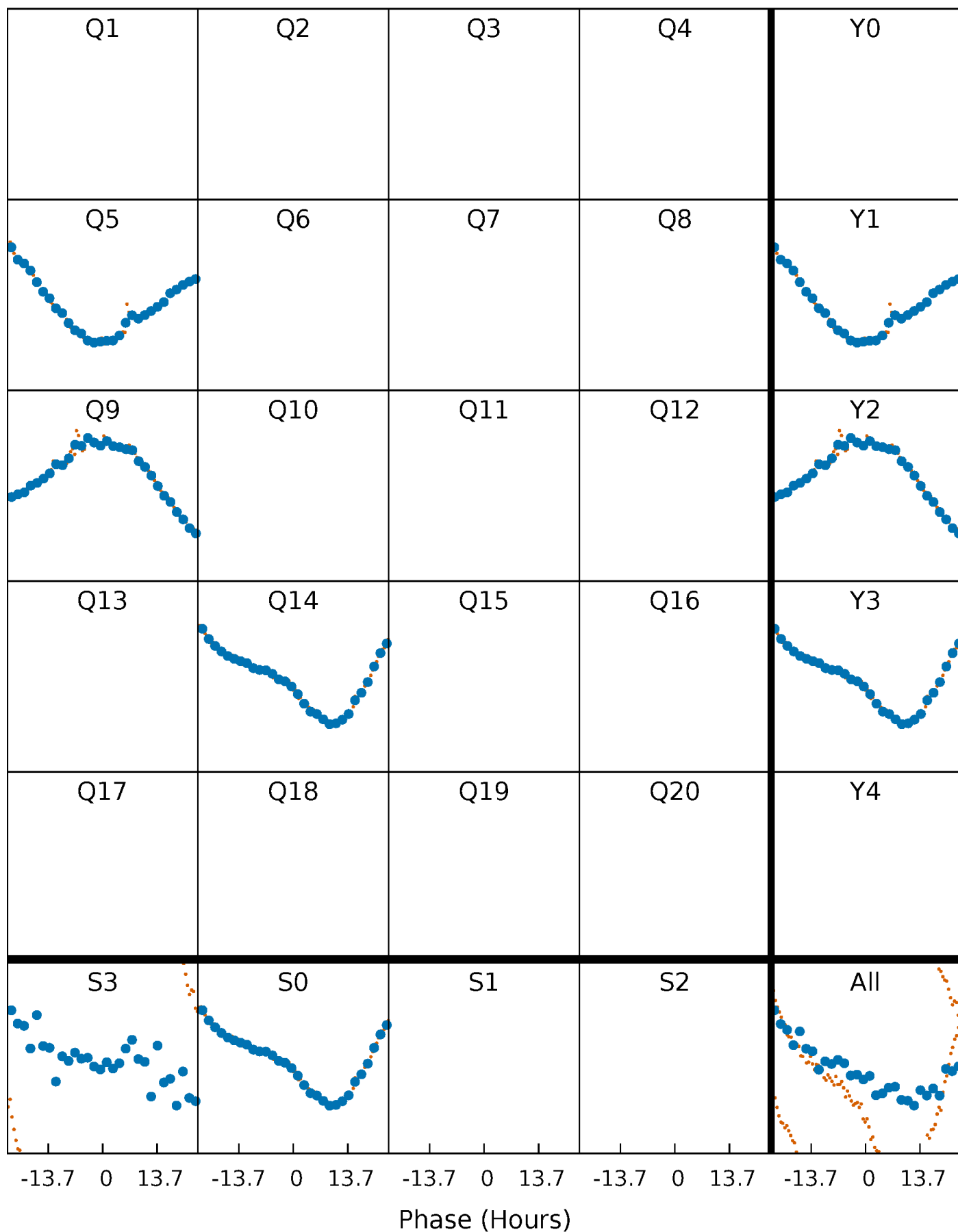


Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)



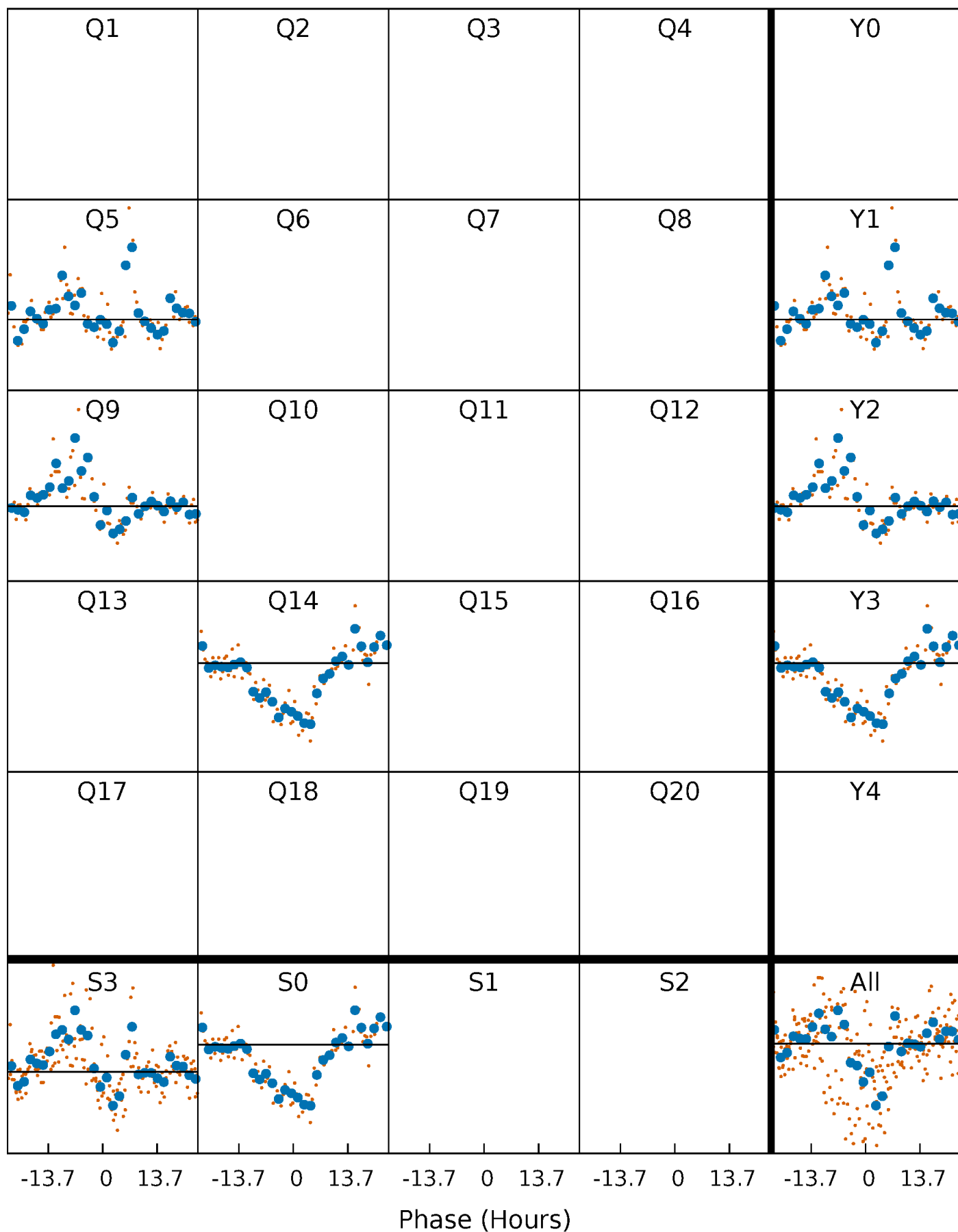
PDC Quarter-Phased Transit Curves

TCE 008873448-06 $P=417.375897$ Days $T_0=465.977721$ (BKJD)



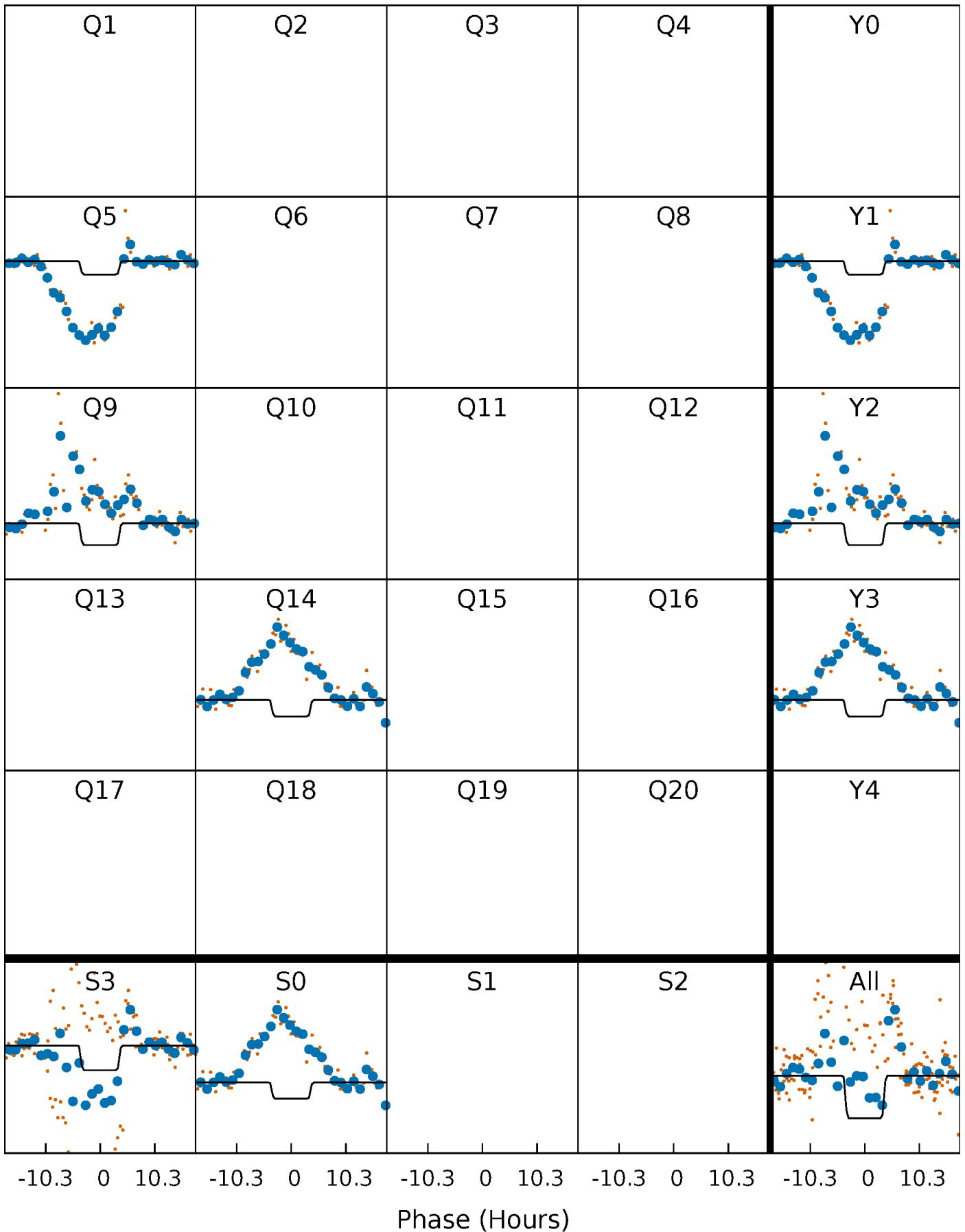
DV Quarter-Phased Transit Curves

TCE 008873448-06 $P=417.375897$ Days $T_0=465.977721$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

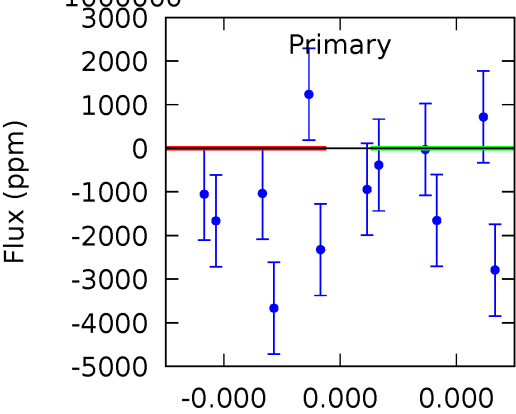
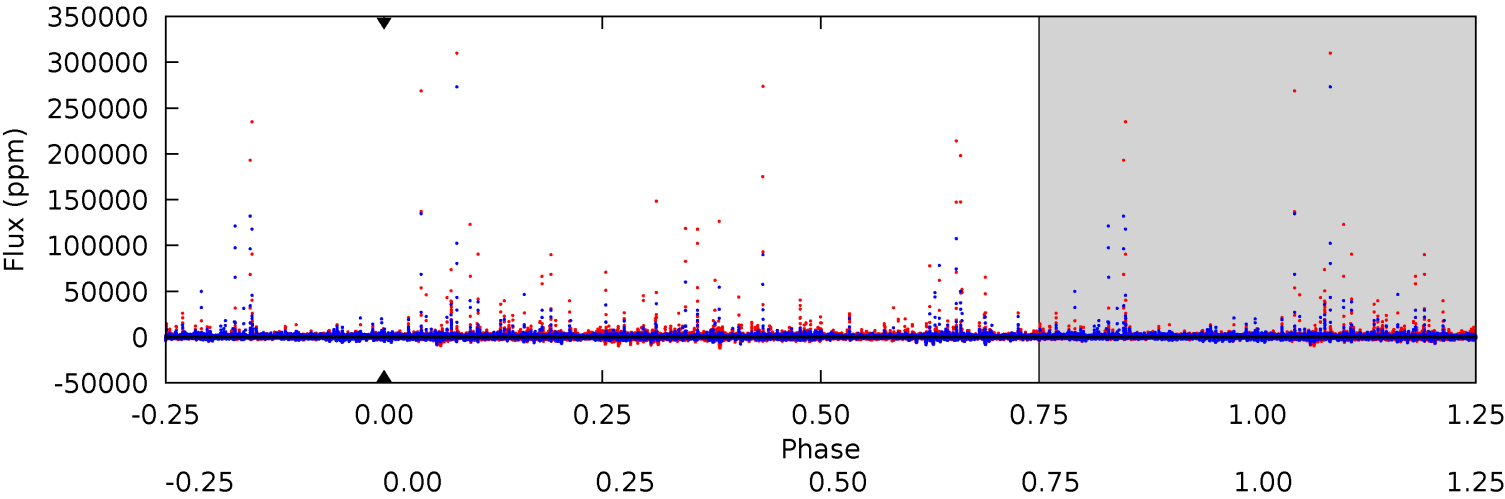
TCE 008873448-06 $P=417.375897$ Days $T_0=466.034035$ (BKJD)



DV Model-Shift Uniqueness Test

008873448-06, P = 417.375897 Days, E = 48.601824 Days

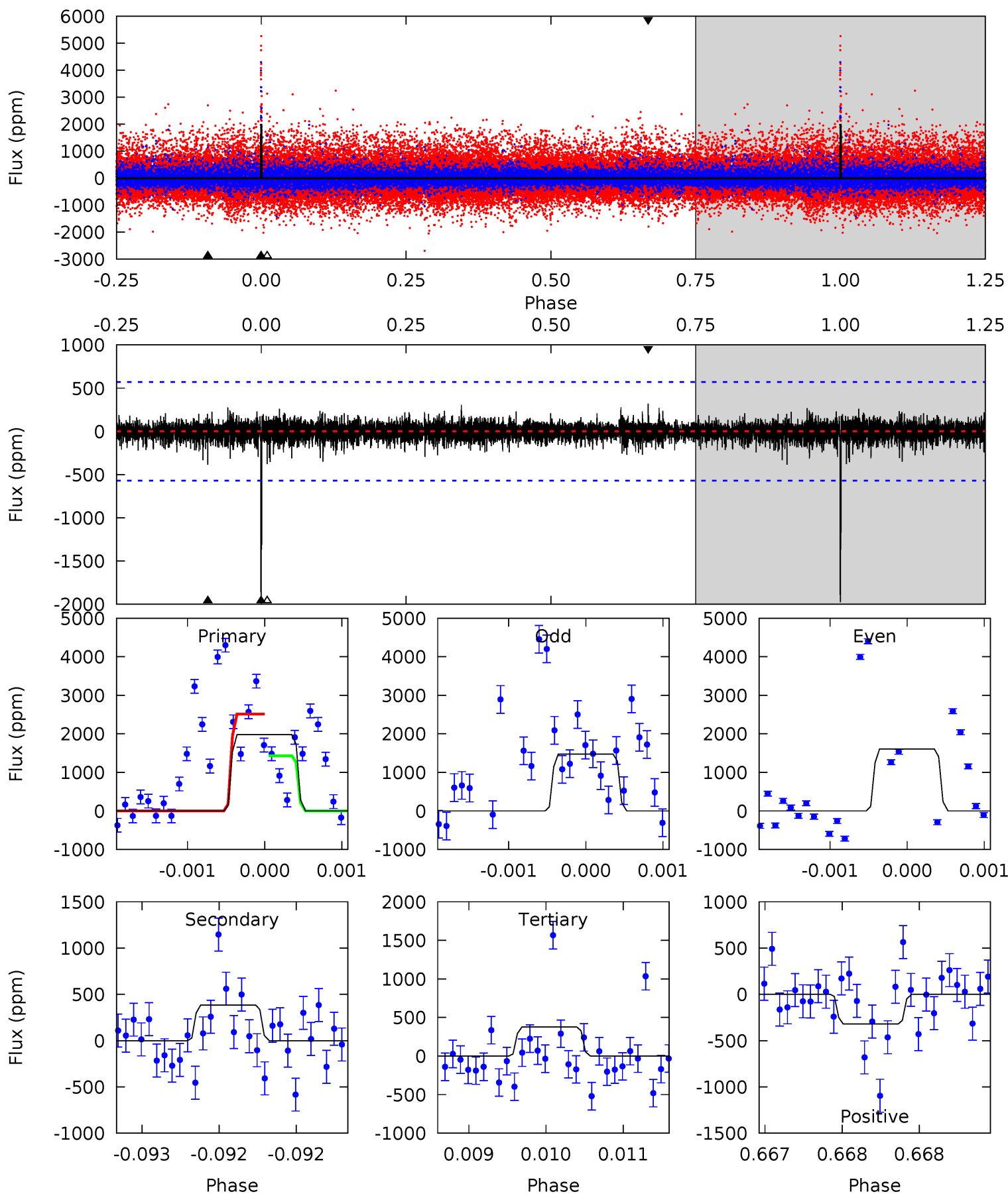
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008873448-06, P = 417.375897 Days, E = 48.658138 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	3.69	3.62	3.09	5.48	3.34	0.65	15.4	15.9	0.08	0.61	0.83	-0.22	0.14	5.20



Stellar Parameters For KIC 008873448

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4063^{+141}_{-155}	$4.650^{+0.056}_{-0.024}$	$0.000^{+0.250}_{-0.300}$	$0.609^{+0.038}_{-0.070}$	$0.602^{+0.057}_{-0.063}$	$3.765^{+1.099}_{-0.391}$
	+3%/-4%	+1%/-1%	+inf%/-inf%	+6%/-11%	+9%/-10%	+29%/-10%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 008873448-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$5.13^{+5.09}_{-3.78}$	202^{+8}_{-9}	3180^{+7250}_{-11960}	$22983^{+4294596}_{-2922443}$
Alt.	-384 ± 104	$5.72^{+5.13}_{-3.81}$	202^{+8}_{-8}	2591^{+927}_{-379}	5158^{+42145}_{-3735}

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

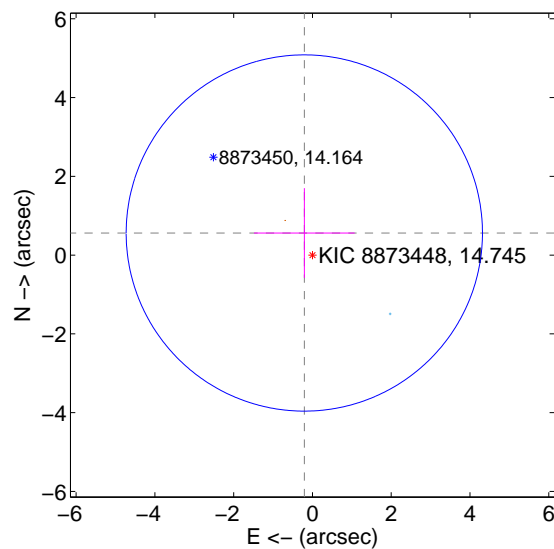
Supplemental centroid analysis for 008873448-06. Kepler magnitude: 14.74. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

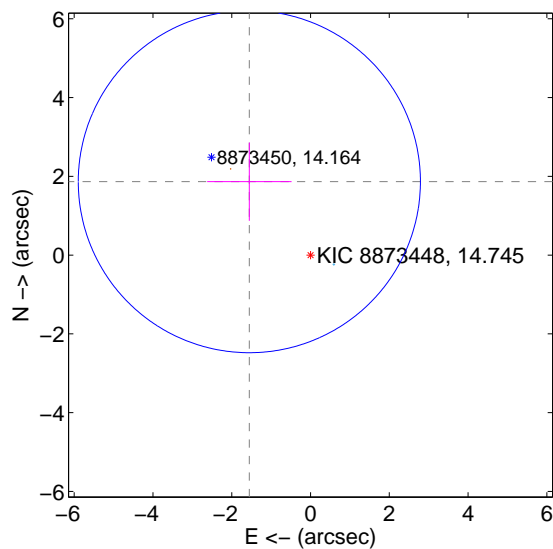
The direct PRF centroid is offset from the target star catalog position by about 1.87 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.598 ± 1.507	0.40	0.206 ± 1.277	0.561 ± 1.138
PRF-fit source offset from KIC position	2.427 ± 1.448	1.68	1.553 ± 1.072	1.865 ± 0.993
photometric centroid source offset	0.42 ± 0.92	0.45	0.12 ± 0.90	0.40 ± 0.92

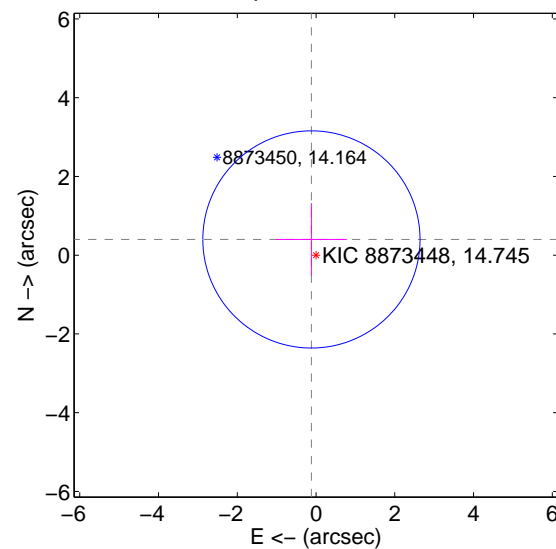
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

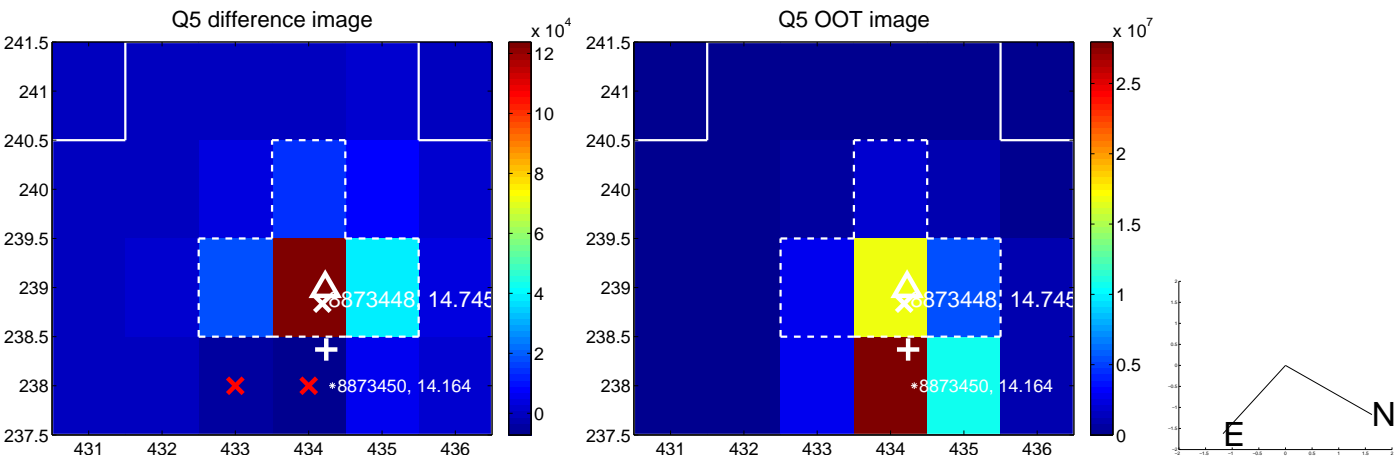


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

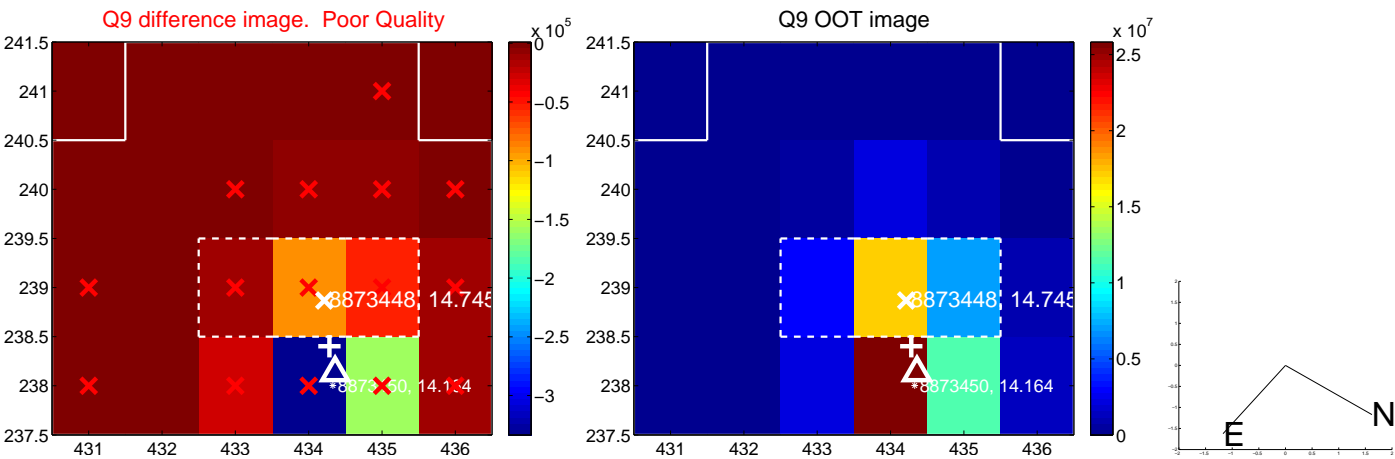
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



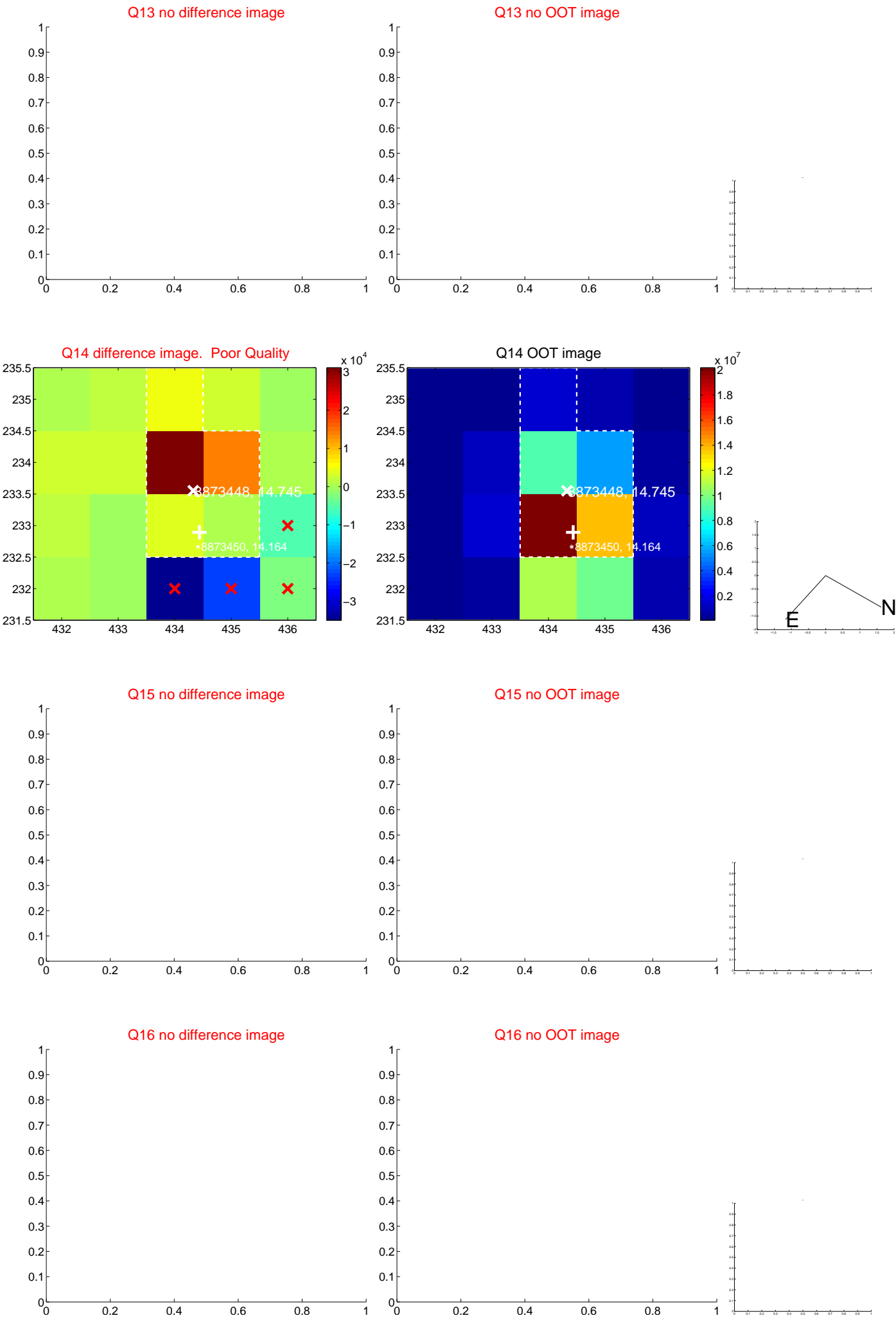
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



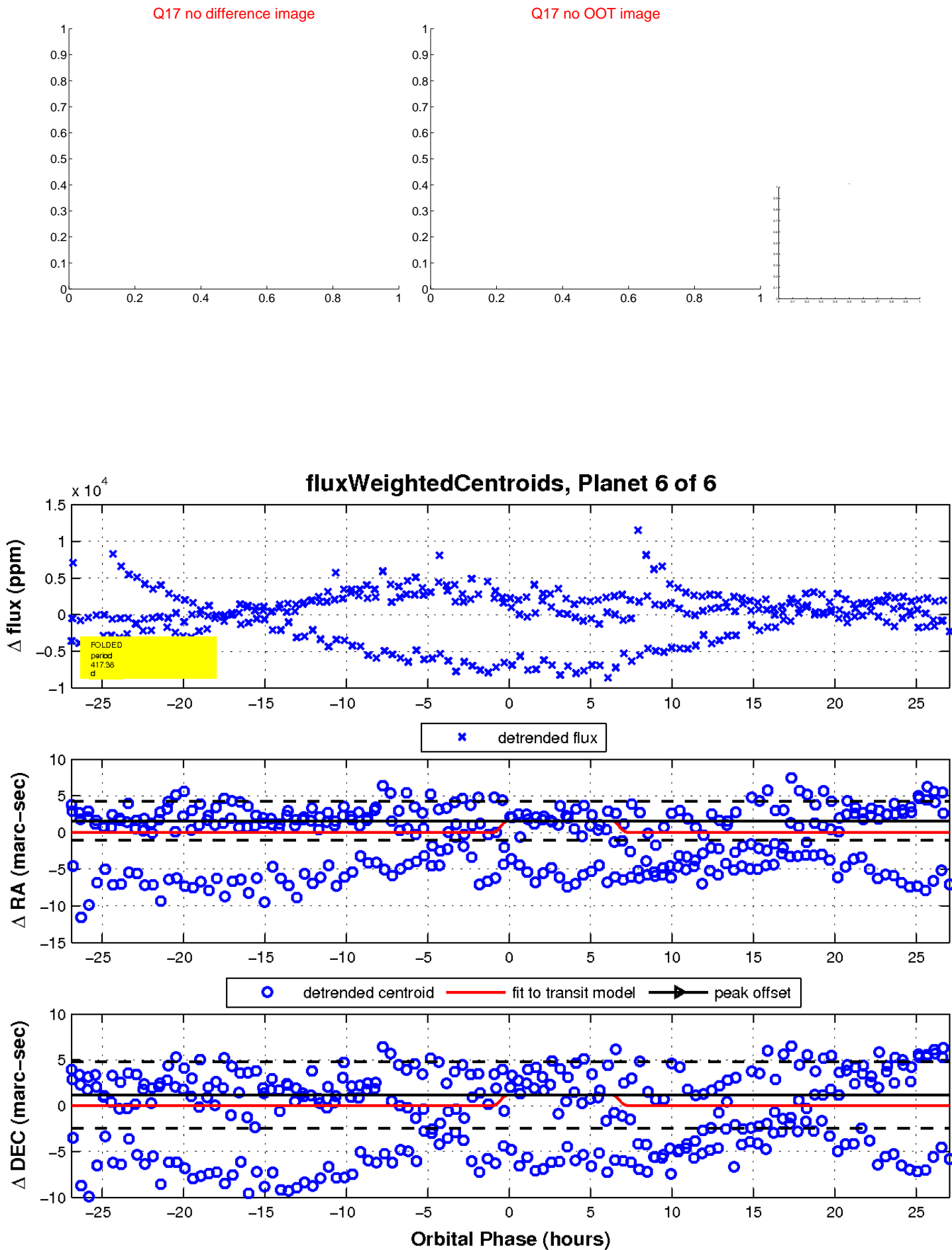
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

