J Stat Phys (2009) 137: 593–594
DOI 10.1007/s10955-009-9862-6

ERRATUM

# Erratum to: General Non-Existence Theorem for Phase Transitions in One-Dimensional Systems with Short Range Interactions, and Physical Examples of Such Transitions

**José A. Cuesta · Angel Sánchez**

Published online: 7 November 2009


**Erratum to: J Stat Phys (2004) 115: 869–893**
**DOI 10.1023/B:JOSS.0000022373.63640.4e**

We have found an erratum in our non-existence theorem (Theorem 5): There is one hypothesis missing in the text (analyticity) which is needed to apply Theorem 4 in the proof. In addition, we have noticed that, as formulated in the paper, the Theorem is too restrictive, because the positivity hypothesis is needed only on $\mathbb{R}^+$.

Taking these two issues into account, Theorem 5 should read as follows (changes in straight font):

**Theorem 5 (Nonexistence of Phase Transitions)** *Let* $\mathbf{T}(\beta)$ *be a compact, irreducible linear operator on the Banach lattice* $E$ *for all* $\beta \in \Omega$, *a complex neighborhood of* $\mathbb{R}^+$. Assume further that $\mathbf{T}(\beta)$ is analytic in $\Omega$ either in the strong or the weak convergence sense, and positive on $\mathbb{R}^+$. *Let* $\lambda_{\max}(\beta)$ *and* $\mathbf{P}_{\max}(\beta)$ *be, respectively, the maximum eigenvalue of* $\mathbf{T}(\beta)$ *and the projector on its corresponding eigenspace. Let* $\varphi(\cdot)$ *be a real, linear functional on the space of bounded, linear operators on* $E$ *such that* $\varphi(\mathbf{P}_{\max}(\beta)) \neq 0$. *Then*

$$\lim_{N\to\infty} \frac{1}{N} \ln \mathcal{Z}_N = -\ln \lambda_{\max}(\beta)$$

*is an analytic function on* $\mathbb{R}^+$, *where* $\mathcal{Z}_N$ *is given by equation* (25).

The online version of the original article can be found under doi:10.1023/B:JOSS.0000022373.63640.4e.

J.A. Cuesta (✉) · A. Sánchez
Grupo Interdisciplinar de Sistemas Complejos (GISC) and Departamento de Matemáticas, Universidad Carlos III de Madrid, Avenida de la Universidad 30, 28911 Leganés, Madrid, Spain
e-mail: cuesta@math.uc3m.es

A. Sánchez
e-mail: anxo@math.uc3m.es

The proof holds as is in the paper, with a minor modification on the last paragraph, which should read (changes in italics):

Now, $\mathbf{T}(\beta)$ fulfills the hypothesis of Theorem 3, thus *for all* $\beta \in \mathbb{R}^+$, $\lambda_{\max}(\beta) > 0$ has multiplicity one *and is isolated. By continuity, so it is in a complex neighborhood of* $\mathbb{R}^+$. Then taking $\Sigma = \{\lambda_{\max}(\beta)\}$ in Theorem 4 it follows that this eigenvalue is an analytic function in $\beta > 0$ and the proof is complete.

All the conclusions and discussions of the paper are unaffected by these technical points, needed only for mathematical accuracy.