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Corrigendum to Self-Synchronization of Populations of Nonlinear Oscillators in the Thermodynamic Limit[1]

L. L. Bonilla,[2] J. M. Casado,[2] and M. Morillo[2]

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1. Due to a numerical instability, the true linear stability line for the stationary solution (2.3) differs near the A axis from the dashed curve in Fig. 1. For small θ, (2.6a) is approximately given by $A+1=\theta^2-\frac{1}{2}\theta^4+O(\theta^6)$. This implies that the dashed and solid lines in Fig. 1 should confound each other near the minimum $A=-1$, $\theta=0$. All phase transitions in the paper are thus second order.

2. The Liapunov functional for the time-periodic probability density $p_0(t, \mathbf{x})$ can be constructed by using Shiino's results.[1] Instead of the relative entropy $H(p, p_0)$ as in Eq. (2.29), the Liapunov functional is $H(p, Q)$, where

$$Q(t, \mathbf{x})=\exp\{-\phi(\mathbf{x})+JF^{-1}[2\mathbf{x}\cdot\langle\mathbf{x}(t)\rangle-\langle\mathbf{x}(t)\rangle^2]\}$$

Here $\langle\mathbf{x}(t)\rangle$ is the mean value corresponding to $p(t, \mathbf{x})$, the solution of Eq. (1.2). The term $H(p, Q)$ is a constant for $p=p_s, p_0$ and it satisfies

$$H(p, Q)\leqslant\int\exp[(\alpha-\mathbf{x}^2/2)\,\mathbf{x}^2/F]\,d\mathbf{x}-1$$

$$dH(p, Q)/dt=\frac{1}{2}F\int p(\nabla\ln p/Q)^2\,d\mathbf{x}\geqslant 0$$

3. Minor corrections are: In Eq. (2.6a) replace θ by $|\theta|$. In Eq. (2.28) replace ψ_1 by ϕ.

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[2] Departamento de Física Teórica, Universidad de Sevilla, 41080 Sevilla, Spain.

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References 2 and 3 also deal with mean-field models having stable time-periodic probability densities. Shiino[2] also studies our Eq. (1.3), while Schentzow[3] analyzes the case of a mean-field Brusselator with additive white noise. We are grateful to Prof. D. Dawson for bringing these works to our attention.

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