Erratum: Fluctuation relations for systems in a constant magnetic field **[Phys. Rev. E 102, 030101(R) (2020)]**

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After the publication of this paper, we found an inconsequential mistake in the derivation of the dissipation function for the Nosé-Hoover thermostatted system, Eq. (17) of the original paper. A complete and correct derivation for $\Omega^{(0)}(X)$ is now reported in Appendix B of Ref. [1], where, in particular, it is shown that

$$\nabla_X \ln f_0 \cdot \dot{X} = \beta 2K(\Gamma)\xi - \beta \sum_{i=1}^N q_i \dot{r}_i \cdot E - 2\beta K^* \xi \delta K(\Gamma),$$

instead of the inline equation four lines above Eq. (20), while the compressibility of the (extended) phase space is given by $\Lambda = -\beta 2K^* \xi$. Therefore, Eq. (20) should have been written as

$$\Omega^{(0)}(X) = \beta \mathcal{V} J(\Gamma) \cdot E, \quad (20)$$

where $J(\Gamma) = \mathcal{V}^{-1} \sum_{i=1}^N q_i \dot{r}_i$ is the microscopic estimator of the current and $\mathcal{V}$ is the volume of the system.

The expression of $\Omega^{(0)}$ for isokinetic systems in a magnetic field, also discussed in this paper, equals Eq. (20). Due to the incorrect expression originally presented, in this paper it was argued that averages taken over long times, which are conceptually acceptable, would be needed to make the dissipation function of isokinetic and Nosé-Hoover systems agree. The correct calculation reported in Ref. [1] shows, instead, that the expressions for the dissipation functions for the two thermostatted systems are equal not only on average and for $\tau \gg \tau_{\text{NH}}$, but also instantaneously. The new expression for the dissipation function given in Eq. (20) does not change the behavior, and in particular the odd signature, of $\Omega^{(0)}(X)$ under the time-reversal operations mentioned in this paper, as shown in Fig. 1. This shows that the mistake does not modify any of the conclusions discussed in this paper, with the exception of the already mentioned need of analyzing the long time properties of $\Omega^{(0)}(X)$ to interpret the physical origin and consequences of the two terms of the dissipation. In fact, this result strengthens the view that $\Omega^{(0)}$, and not other quantities, plays the role of the energy dissipation of nonequilibrium particle systems.

FIG. 1. Same as Fig. 1 of the original manuscript, now produced with the corrected expression for $\Omega^{(0)}(X)$ from Eq. (20).

[1] A. Coretti, L. Rondoni, and S. Bonella, *Entropy* **23**, 146 (2021).