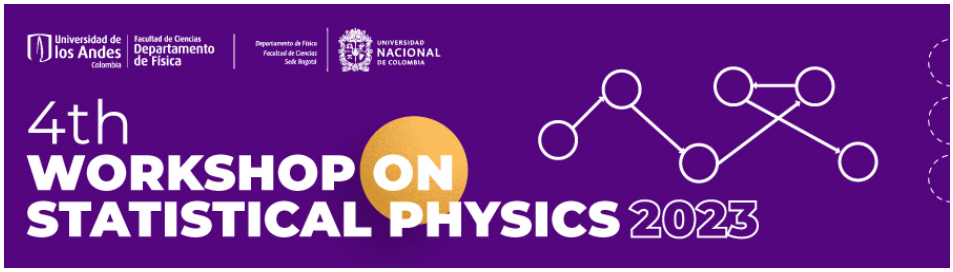


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# Statistical mechanics of the exchange kinetic models associated with additive and multiplicative stochastic processes

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In this work we present a statistical mechanics perspective for two simple kinetic models in which the exchange rules between an agent pair selected stochastically differ in which, for the first model, the quantity conserved in the exchange is the sum of the respective quantities that the two agents have before and after the exchange, and for the second model the quantity conserved is the product of the quantities of the two agents. For the first kinetic model, the distribution patterns obtained by numerical simulations are normals, while for the second kinetic model the distributions are lognormals. If a lower boundary condition is imposed on the underlying additive stochastic process of the first model, a Boltzmann exponential distribution is obtained. Analogously, if a lower boundary
condition is imposed on the underlying multiplicative stochastic process of the second model, a power-law distribution is obtained. For both models without boundary conditions, we show how the fit parameters depend on the number of time steps of the simulations and the exogen parameters involved in the exchange rules.

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