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Statistical model with a standard Gamma distribution ANIRBAN CHAKRABORTI, Department of Physics, Brookhaven National Laboratory, Upton, New York 11973, USA, MARCO PATRIARCA, KIMMO KASKI, Laboratory of Computational Engineering, Helsinki University of Technology, P.O. Box 9203, 02015 HUT, Finland — We study a statistical model consisting of N basic units which interact with each other by exchanging a physical entity, according to a given microscopic random law, depending on a parameter λ . We focus on the equilibrium or stationary distribution of the entity exchanged and verify through numerical fitting of the simulation data that the final form of the equilibrium distribution is that of a standard Gamma distribution. The model can be interpreted as a simple closed economy in which economic agents trade money and a saving criterion is fixed by the saving propensity λ . Alternatively, from the nature of the equilibrium distribution, we show that the model can also be interpreted as a perfect gas at an effective temperature $T(\lambda)$, where particles exchange energy in a space with an effective dimension $D(\lambda)$.

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