Abstract Submitted
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Entropic sampling without windows[1] RONALD DICKMAN, ANTÔNIO CUNHA-NETTO, UFMG — We describe an entropic sampling method that permits estimation of the number of configurations over the full range of energies, with dividing the latter into subsets or "windows." Our method involves progressive refinement of an initial approximation for the density of states, using a set of random walks that span the energy range. Applied to the two-dimensional Ising model the method yields the critical temperature to an accuracy of about 0.01%, and critical exponents to 0.5% or better. Predictions for system sizes $L = 10$ - 160, for the temperature of the specific heat maximum, and the specific heat at the critical temperature, are in very good agreement with exact results. The antiferromagnetic transition is well represented. Excellent results are also obtained for the three-dimensional Ising model (simple cubic lattice) and the lattice gas with nearest-neighbor exclusion. We observe that attempts to restrict the sampling to a subset of the full energy range lead to distortions in the density of states, even if the restriction is imposed in a smooth manner, rather than with a sharp barrier.

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