Abstract Submitted
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Flat-histogram Monte Carlo in the Classical Antiferromagnetic Ising Model[1] G. BROWN, P.A. RIKVOLD, Florida State U, D.M. NICHOLSON, KH. ODBADRAKH, J.-Q. YIN, M. EISENBACH, Oak Ridge National Laboratory, S. MIYASHITA, U of Tokyo — Flat-histogram Monte Carlo methods, such as Wang-Landau and multicanonical sampling, are extremely useful in numerical studies of frustrated magnetic systems. Numerical tools such as windowing and discrete histograms introduce discontinuities along the continuous energy variable, which in turn introduce artifacts into the calculated density of states. We demonstrate these effects and introduce practical solutions, including "guard regions" with biased walks for windowing and analytic representations for histograms. The classical Ising antiferromagnet supplemented by a mean-field interaction is considered. In zero field, the allowed energies are discrete and the artifacts can be avoided in small systems by not binning. For large systems, or cases where non-zero fields are used to break the degeneracy between local energy minima, the energy becomes continuous and these artifacts must be taken into account.

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