

Convergence of Gibbs Measures Associated with Simulated Annealing

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The motivating application for this research concerns modeling the equilibrium properties of functional materials including shape memory alloys. This leads one to seek solutions of *differential inclusions*: find a function satisfying given boundary conditions whose derivative is allowed to take on values from a set of allowed values corresponding to allowable crystalline configurations of the material. There are corresponding variational problems, but the practical solution of these has proven notoriously difficult. One promising approach is Simulated Annealing, a stochastic optimization algorithm, but computational experience suggests that it has major problems. We present here an analysis of the probability measures of the simulated annealing algorithm that shows they can converge to an incorrect result.