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"Spherical Sherrington-Kirkpatrick model and random matrix"

Abstract:

The Spherical Sherrington-Kirkpatrick (SSK) model is defined by the Gibbs measure on a high-dimensional sphere with a random Hamiltonian given by a symmetric quadratic function. The free energy at the zero temperature is the same as the largest eigenvalue of the random matrix associated with the quadratic function. Even for the finite temperature, there is a simple relationship between the free energy and the eigenvalues. We will discuss how one can study the fluctuations of the free energy using this relationship and results from random matrix theory. We will also discuss the distribution of the spin sampled from the Gibbs measure.