

Bangalore Probability Seminar

Title : Fluctuation of the free energy of Sherrington-Kirkpatrick model with Curie-Weiss interaction: the paramagnetic regime

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Time : 2:30 pm

Venue : Emmy Noether Seminar Hall, ICTS Campus, Bangalore

Abstract : We consider a spin system containing pure two spin Sherrington-Kirkpatrick Hamiltonian with Curie-Weiss interaction. The model where the spins are spherically symmetric was considered by Baik and Lee and Baik et al. which shows a two dimensional phase transition with respect to temperature and the coupling constant. In this paper we prove a result analogous to Baik and Lee in the “paramagnetic regime” when the spins are i.i.d. Rademacher. We prove the free energy in this case is asymptotically Gaussian and can be approximated by a suitable linear spectral statistics. Unlike the spherical symmetric case the free energy here can not be written as a function of the eigenvalues of the corresponding interaction matrix. The method in this paper relies on a dense sub-graph conditioning technique introduced by Banerjee . The proof of the approximation by the linear spectral statistics part is close to Banerjee and Ma.