

Recent Results on the Quantum Sherrington-Kirkpatrick Model

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The quantum Sherrington-Kirkpatrick model extends the classical SK model by a transversal magnetic field and, therefore, it serves as a model for a quantum spin glass. In this talk I will present some recent results on the quantum SK model. First, I will discuss the Poisson-Feynman-Kac representation for the partition function of quantum mean-field models, which allows one to express the quantum SK-model as a modified classical model whose configuration space is given by the set of piecewise constant function. Then, I will consider the recent work by Leschke et al. (<https://arxiv.org/abs/1912.06633>). In particular, I will discuss their result on the absence of a spin-glass phase for weak disorder, which is an extension of the work by Aizeman, Lebowitz and Ruelle on the classical SK-model. Afterwards, I will turn to the paper by Adhikari and Brennecke, which contains a characterization of the quenched free energy as a limit of the free energy of certain d-dimensional vector spin glasses (<https://arxiv.org/abs/1912.13041>).