

Invited: QMBS-I-05

Sign-free Quantum Monte Carlo simulation of certain frustrated quantum magnets.

Kedar Damle

Tata Institute of Fundamental Research, Mumbai 400005, India.

We introduce a stochastic-series expansion Quantum Monte Carlo (QMC) scheme that works in an alternate basis of total spin eigenstates to efficiently simulate in a sign free way a broad class of frustrated $S=1/2$ models with competing antiferromagnetic interactions which lead to a severe sign problem in standard methods used thus far. We also flag important limitations of the new method, and comment on possibilities for further progress. [collaborators: F. Alet (Toulouse), S. Pujari (Kentucky)]