

Numerical Study of 2D Spin Models via Tensor Product States

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We used the recently proposed algorithm based on the tensor product states to study the magnetization process of various 2D spin-1/2 models on a square lattice. We find that for first order transition the critical field and the discrete jumps in the local order parameters are in good agreement with the quantum Monte Carlo results in the literature. For second order phase transition the results are not as accurate as QMC when one approaches the critical field, but the qualitative behavior is always correct.