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SEMINAR ZAVODA ZA TEORIJSKU FIZIKU

Factorization and Criticality in Spin Systems

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Abstract:

The exact ground state (GS) of interacting spin systems in an external magnetic field is typically an entangled state. However, under certain conditions these systems can possess a completely separable GS, i.e., a factorized GS which can be expressed as the product of single spin states. In this talk I'll go trough some well known results for factorization in spin systems, then I present general conditions for the existence of non-transverse factorizing magnetic fields in general spin arrays with anisotropic couplings of arbitrary range. Finally, I'll review some interesting cases in which the study of factorization has allowed us to determine novel critical phenomena and has enabled us to introduce the idea of "separable ground state" engineering (i.e., separable states which can be useful for quantum information and quantum computation applications).

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