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2D Ising model: correlation functions at criticality via Riemann-type boundary value problems. (English) Zbl 1402.82005

Summary: In this note we overview recent convergence results for correlations in the critical planar nearest-neighbor Ising model. We start with a short discussion of the combinatorics of the model and a definition of fermionic and spinor observables. After that, we illustrate our approach to spin correlations by a derivation of two classical explicit formulae in the infinite-volume limit. Then we describe the convergence results (as the mesh size tends to zero, in arbitrary planar domains) for fermionic correlators [the first author and S. Smirnov, Invent. Math. 189, No. 3, 515–580 (2012; Zbl 1257.82020)], energy-density [C. Hongler and S. Smirnov, Acta Math. 211, No. 2, 191–225 (2013; Zbl 1287.82007)] and spin expectations [the first author et al., Ann. Math. (2) 181, No. 3, 1087–1138 (2015; Zbl 1318.82006)]. Finally, we discuss scaling limits of mixed correlators involving spins, disorders and fermions, and the classical fusion rules for them.

MSC:
82B20 Lattice systems (Ising, dimer, Potts, etc.) and systems on graphs arising in equilibrium statistical mechanics

Full Text: DOI arXiv

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