M A T H E M A T I C A L P H Y S I C S S E M I N A R

Rutgers University
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Conformal Invariance and Central Charge In Non-Solvable Ising Models

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Abstract

We investigate a non-solvable ferromagnetic two-dimensional Ising modeXSl with nearest neighbor plus weak finite range interactions. We rigorously establish two properties of the critical theory:

(1) We prove and compute the existence of a scaling limit for the multipoint energy correlations, as the lattice spacing "a" goes to zero and the temperature goes to the critical one, with explicit bounds on the finite-"a" corrections.

(2) We prove that at the critical temperature the finite size corrections to the free energy are universal, in the sense that they are exactly independent of the interaction. The corresponding central charge, defined in terms of the coefficient of the first subleading term to the free energy, as proposed by Affleck and Blote-Cardy-Nightingale, is constant and equal to 1/2.

These are two of the very few cases where the predictions of conformal field theory can be rigorously verified starting from a microscopic non solvable statistical model. Joint work with R. Greenblatt and V. Mastropietro.