
ALESSANDRO GIULIANI, Università degli Studi Roma Tre

Universal fluctuations in interacting dimers

In the last few years, the methods of constructive Fermionic Renormalization Group have successfully been applied to the study of the scaling limit of several two-dimensional statistical mechanics models at the critical point, including: weakly non-planar 2D Ising models, Ashkin-Teller, 8-Vertex, and close-packed interacting dimer models.

In this talk, I will focus on the illustrative example of the interacting dimer model and review some of the universality results derived in this context. In particular, I will discuss a proof of the massless Gaussian free field (GFF) behavior of the height fluctuations. It turns out that GFF behavior is connected with a remarkable identity ('Haldane relation') between an amplitude and an anomalous critical exponent, characterizing the large distance behavior of the dimer-dimer correlations.

Based on joint works with V. Mastropietro and F. Toninelli.