ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Long-Range Order in the Monomer Double-Dimer Model with Long-Range Interactions"

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Abstract

The dimer model and its associated double-dimer model are fundamental objects in probability theory, statistical mechanics, and combinatorics. While their behavior in planar settings is by now well understood, much less is known in higher dimensions and in the presence of a positive density of monomers, leading to the so-called monomer double-dimer model.

We study these models on Zd-like graphs ($d \geq 1$) that allow long-range edges whose weights decay with distance. For a large class of such interactions, we prove that the monomer double-dimer model exhibits long-range order. As a consequence, monomer correlations in the dimer model remain uniformly positive, and loops in the double-dimer model become macroscopic.

In this talk, I will introduce the models and outline the main ideas of the proof. We will see that the model admits a natural correspondence with a spin system, which allows us to transfer results obtained via reflection positivity and thereby establish long-range order. This is joint work with Lorenzo Taggi and Wei Wu.

Quirin Thomas Simon Vogel and the Department of Statistics look forward to seeing you at the talk!