

Speaker

Khaydar Nurligareev

Workshop

Workshop on Classical and Quantum Integrable Systems

Location and Date

Sirius, Sochi, July 25-31, 2021

Topic

Watermelon correlation functions near the boundary in the Spanning Trees Model

Abstract

Let Λ be a square lattice, I_k and J_k be two segments of length k embedded in Λ . Let μ be a uniform measure on $(k+1)$ -component spanning forests, such that k components are rooted in k sites within I_k and one component is rooted at infinity. k -leg watermelon is a configurations consisting of k non-intersecting paths linking I_k to J_k . The probability of a watermelon connecting sets I_k and J_k separated by a large distance r asymptotically decays as a power law $r^{-\nu}$, with the critical exponent ν being universal function of k characterizing the scaling limit of the theory.

In this work we consider the lattice in the half-plane with the absorbing or reflecting boundary conditions, while I_k and J_k are located near the boundary of Λ . We obtain ν for the cases of isotropic and anisotropic lattices. The former result gives us the lattice proof of theoretical predictions of Coulomb Gas method and $c = -2$ Conformal Field Theory. For the anisotropic case the results belong to the universality class of the model of vicious walker in 1+1 dimension, which in turn is related with the random matrix ensembles.

This is ongoing work joint with Alexander Povolotsky.