

Title: Log-gases on a quadratic lattice via discrete loop equations

Abstract: We study a general class of log-gas ensembles on a quadratic lattice. Using a variational principle we prove that the corresponding empirical measures satisfy a law of large numbers and that their global fluctuations are Gaussian with a universal covariance. We apply our general results to analyze the asymptotic behavior of a q -boxed plane partition model introduced by Borodin, Gorin and Rains. In particular, we show that the global fluctuations of the height function on a fixed slice are described by a one-dimensional section of a pullback of the two-dimensional Gaussian free field.

Our approach is based on a q -analogue of the Schwinger-Dyson (or loop) equations, which originate in the work of Nekrasov and his collaborators, and extends the methods developed by Borodin, Gorin and Guionnet to a quadratic lattice.

Based on joint work with Evgeni Dimitrov.

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