



Minisymposium 24 - Probability and Geometry

Beta ensembles, stochastic Airy spectrum, and a diffusion

JOSÉ A. RAMÍREZ (UNIVERSIDAD DE COSTA RICA)

This talk will be about a connection between stochastic differential operators and the standard ensembles of Random Matrix Theory. It is joint work with B. Rider.

Building on earlier work of A. Edelman, I. Dumitriu, and B. Sutton we prove that the largest eigenvalues of the general beta-ensemble of Random Matrix Theory, properly centered and scaled, converge in distribution to the law of the low lying eigenvalues of a random operator of Schrödinger type. The latter is

$$-\frac{d^2}{dx^2} + x + \frac{2}{\sqrt{\beta}} b'(x)$$

acting on $L^2(\mathbb{R}_+)$ with Dirichlet boundary condition at $x = 0$. Here $b'(x)$ denotes a standard White Noise and the $\beta > 0$ is that of the original ensemble. Based on this convergence, we provide a new characterization of the Tracy-Widom type laws (for all β) in terms of the explosion/non-explosion a one-dimensional diffusion.