

Random matrix limits via stochastic differential equations

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Recent work in the area of random matrices showed that the local point process limits may be characterized as the eigenvalues of certain random differential operator. These operators in turn allow us to define the counting function of the point process in terms of families of stochastic differential equations. This characterization allows for the proof of a variety of new results, including large deviation results, central limit theorems, and transitions between processes. We will discuss how the stochastic differential equations arise as well as some of the results that may be proved using them. We will finish with a discussion on how to work with the SDEs themselves in order to prove various results. No knowledge of stochastic differential equations will be assumed.