

BOULDER PROBABILITY SEMINAR

ON THE ASYMPTOTICS OF CERTAIN GAP PROBABILITIES ARISING IN RANDOM MATRIX THEORY

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A “gap probability” is the probability that no eigenvalue of a random matrix lies in an interval of specific length. One can consider different types of random matrix ensembles and place the interval at the hard/soft edge or bulk. After taking the large N limit (N being the matrix size), this gives rise to different quantities containing the (rescaled) length s of the interval as a parameter and which for many Random Matrix Ensembles can be expressed in terms of Fredholm determinants of certain integral operators. One major problem was (and is) the asymptotics of these determinants with respect to s (e.g., s large). I will discuss how (in some instances) one can solve these problems by operator theoretic methods. The idea is that the determinants involve operators of certain types of structure operators, which in the end allow a deeper analysis. The talk will give an overview of these ideas and techniques.