Large deviations for the real Ginbre random matrix ensemble

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Abstract

It is known that a typical NXN random matrix with independent normal entris has about sqrt(N) real eigenvalues for N> > 1. What is the probability that such a random matrix has NO real eigenvalues? The logarithm of the answer turns out to scale as sqrt(N) with the proportionality coefficient expressed in terms of Riemann's zeta function. We explain how this answer arised from the analysis of the Pfaffian point process governing the law of real eigenvalues for such an ensemble of real random matrices.

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