

On the Correlation Functions of the Characteristic Polynomials of Real Random Matrices with Independent Entries

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We consider the correlation functions of the characteristic polynomials of real random matrices which entries are independent identically distributed real random variables with zero mean and unit variance. The study of such correlation functions is motivated by the fact that their asymptotic behaviour and analysis are similar to that of the correlation functions of the eigenvalues. In the same time the analysis of the characteristic polynomials is much more simpler than that of the spectral correlation functions. Besides, the characteristic polynomials are of independent interest.

The asymptotic behavior of the correlation functions is established in the form of a certain integral over unitary self-dual matrices with respect to the invariant measure. The integral is computed in the case of the second order correlation function. From the obtained asymptotics it is clear that the correlation functions behave like that for the Real Ginibre Ensemble up to a factor depending only on the fourth absolute moment of the common probability law of the matrix entries.