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Large Deviations for Random Matricial Moment Problems

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We consider the moment space $\mathcal{M}_n^{K}$ corresponding to $p \times p$ complex matrix measures defined on K ($K=[0,1]$ or $K=\D$). We endow this set with the uniform law. We are mainly interested in large deviations principles (LDP) when $n \rightarrow \infty$. First we fix an integer k and study the vector of the first k components of a random element of $\mathcal{M}_n^{K}$. We obtain a LDP in the set of k-arrays of $p\times p$ matrices. Then we lift a random element of $\mathcal{M}_n^{K}$ into a random measure and prove a LDP at the level of random measures. We end with a LDP on Carth\'eodory and Schur random functions. These last functions are well connected to the above random measure. In all these problems, we take advantage of the so-called canonical moments technique by introducing new (matricial) random variables that are independent and have explicit distributions.

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