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Norms of sub-matrices of a random matrix and applications

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We provide tail estimates for operator norms of random matrices and their sub-matrices in the setting of a log-concave ensemble. More precisely, for every k and m we obtained a uniform bound for norms of sub-matrices consisting of k rows and m columns of a random $n \times N$ matrix, whose columns are isotropic log-concave random vectors. In particular, we establish new uniform estimates for the Euclidean norms of projections of an isotropic log-concave random vector. We show applications of our results to Convex Geometry, Computational Geometry and Compressive Sensing theory.

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