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Banach-Mazur distances and projections on random subgaussian polytopes. (English)

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Cited from the abstract: We consider polytopes in $\mathbb{R}^n$ that are generated by $N$ vectors in $\mathbb{R}^n$ whose coordinates are independent subgaussian random variables. (A particular case of such polytopes are symmetric random $\pm 1$ polytopes generated by $N$ independent vertices of the unit cube.) We show that for a random pair of such polytopes the Banach-Mazur distance between them is essentially of a maximal order $n$. This result is an analogue of the well-known Gluskin’s result for spherical vectors. We also study the norms of projections on such polytopes and prove an analogue of Gluskin’s and Szarek’s results on basis constants. The proofs are based on a version of ”small ball” estimates for linear images of random subgaussian vectors.

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