

Restricted Invertibility and the Banach-Mazur distance to the cube

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We prove a normalized version of the restricted invertibility principle obtained by Spielman-Srivastava. Applying this result, we get a new proof of the proportional Dvoretzky-Rogers factorization theorem recovering the best current estimate. As a consequence, we also recover the best known estimate for the Banach-Mazur distance to the cube: the distance of every n -dimensional normed space from ℓ_{∞}^n is at most $(2n)^{5/6}$. Finally, using tools from the work of Batson-Spielman-Srivastava, we give a new proof for a theorem of Kashin-Tzafriri on the norm of restricted matrices.

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