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ASAF FERBER* (ferbera@mit.edu), 02139, Cambridge, MA 02139, and **VISHESH JAIN** (ferbera@mit.edu), Cambridge, MA 02139. *ON THE SINGULARITY OF RANDOM SYMMETRIC MATRICES.*

Let M_n be an $n \times n$ symmetric matrix with entries in ± 1 , chosen uniformly at random. It is widely conjectured that M_n is singular with probability at most $(2 + o(1))^{-n}$. On the other hand, the best known upper bound on the singularity probability of M_n , due to Vershynin (2011), is 2^{-n^c} , for some unspecified small constant $c > 0$ (this improves on a polynomial bound due to Costello, Tao, and Vu (2005), and a bound of the form $n^{-\omega(1)}$ due to Nguyen (2011)).

In this talk, using a novel combinatorial approach, we show that the probability of singularity of M_n is at most $2^{-n^{1/4}}$. We also discuss improvements for other models of discrete random matrices.

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