

Open Problem 4.2 (Latała-Riemer-Schutt) *Given X a symmetric random matrix with independent gaussian entries, is the following true?*

$$\mathbb{E}\|X\| \lesssim \mathbb{E} \max_k \|Xe_k\|_2.$$

The results in [BvH15] answer this in the positive for a large range of variance profiles, but not in full generality. Recently, van Handel [vH15] proved this conjecture in the positive with an extra factor of $\sqrt{\log \log d}$. More precisely, that

$$\mathbb{E}\|X\| \lesssim \sqrt{\log \log d} \mathbb{E} \max_k \|Xe_k\|_2,$$

where d is the number of rows (and columns) of X .

References

- [BvH15] A. S. Bandeira and R. v. Handel. Sharp nonasymptotic bounds on the norm of random matrices with independent entries. *Annals of Probability, to appear*, 2015.
- [vH15] R. van Handel. On the spectral norm of inhomogeneous random matrices. *Available online at arXiv:1502.05003 [math.PR]*, 2015.

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