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Noise sensitivity of the top eigenvector of a Wigner matrix

Abstract

We investigate the noise sensitivity of the top eigenvector of a Wigner matrix in the following sense. Let v be the top eigenvector of an NÃ—N Wigner matrix. Suppose that k randomly chosen entries of the matrix are resampled, resulting in another realization of the Wigner matrix with top eigenvector v[k]. With high probability, when k <= N^{5/3âˆ’o(1)}, then v and v[k] are almost colinear and when kâ‰«N^{5/3} then v[k] is almost orthogonal to v.

This is a joint work with GÃ¡bor Lugosi and Nikita Zhivotovskiy.