1161-60-144 **Souvik Dhara***, sdhara@mit.edu, and **Debankur Mukherjee** and **Kavita Ramanan**. *The r-to-p norm of non-negative random matrices.*

For an $n \times n$ matrix A_n, the $r \to p$ operator norm is defined as

$$\|A_n\|_{r\to p} := \sup_{x\in\mathbb{R}^n:\|x\|_r\leq 1} \|A_n x\|_p \quad \text{for} \quad r,p \geq 1.$$

This talk considers $r \to p$ norms of symmetric random matrices with nonnegative entries, including adjacency matrices of Erdős-Rényi random graphs, matrices with positive sub-Gaussian entries, and certain sparse matrices. For $1 < p \leq r < \infty$, the asymptotic normality of the appropriately centered and scaled norm $\|A_n\|_{r\to p}$ is established. Furthermore, a sharp ℓ_∞-approximation for the unique maximizing vector in the definition of $\|A_n\|_{r\to p}$ is obtained, which may be of independent interest.

The results obtained can be viewed as a generalization of the seminal results of Füredi and Komlós (1981) on asymptotic normality of the largest singular value. In the general case with $1 < p \leq r < \infty$, the spectral methods are no longer applicable, which requires a new approach, involving a refined convergence analysis of a nonlinear power method and establishing a perturbation bound on the maximizing vector. (Received August 15, 2020)