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Title: Patterned random matrices, moment method and joint convergence

Abstract: In this talk, we first discuss an approach to find limiting spectral distribution (LSD) of patterned random matrices using moment method. This method is flexible enough to be applicable to matrices with appropriate dependent entries, banded matrices and matrices of the form XX' . Then we show how this approach can be generalized to define (joint) convergence of independent copies of a class of patterned random matrices. It is known that independent copies of the Wigner matrix converge, and the limiting joint distribution satisfies freeness. We shall show that independent copies of other patterned matrices also converge, and the limits exhibit a different type of independence. In particular, the matricial limits of symmetric circulants and reverse circulants satisfy the classical independence and the half independence, respectively. The matricial limits of Toeplitz and Hankel matrices do not seem to submit to any easy or explicit independence/dependence notions.