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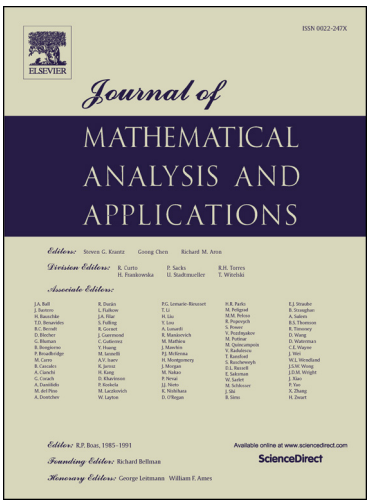

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Limiting Distributions of Spectral Radii for Product of Matrices from the Spherical Ensemble

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Abstract. Consider the product of m independent $n \times n$ random matrices from the spherical ensemble for $m \geq 1$. The spectral radius is defined as the maximum absolute value of the n eigenvalues of the product matrix. When $m = 1$, the limiting distribution for the spectral radii has been obtained by Jiang and Qi (2017). In this paper, we investigate the limiting distributions for the spectral radii in general. When m is a fixed integer, we show that the spectral radii converge weakly to distributions of functions of independent Gamma random variables. When $m = m_n$ tends to infinity as n goes to infinity, we show that the logarithmic spectral radii have a normal limit.

Keywords: limiting distribution, spectral radius, spherical ensemble, product ensemble, random matrix

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