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Steven J Miller (sjm1@williams.edu) and **Wanqiao Xu** (wanqiaox@umich.edu). *Eigenvalue
Distributions of Random Iterated Block Matrices.*

RMT successfully models many properties of L -functions; however, there are situations where it is silent. One instance is the number theory process of Rankin-Selberg convolution, which creates a new L -function from an input pair. Our work investigates a possible RMT analogue of this process through the parallel study of random matrix ensembles constructed from existing families.

Let A be a random symmetric Toeplitz matrix with a palindromic first row and B denote a random real symmetric matrix; it is well-known these ensembles converge to the Gaussian and semi-circle distribution, respectively. We consider the “disco” $\mathcal{D}(A, B) = \begin{bmatrix} A & B \\ B & A \end{bmatrix}$. We adapt Wigner’s method of moments to derive the limiting spectral measure of $\mathcal{D}(A, B)$; the primary obstacle is analysis of non-commutative matrix polynomials, which the method of moments reformulates as a combinatorial problem of independent interest. We prove convergence of the hybrid distribution, show it is sharply bounded away from the constituent distributions, explore generalizations of our construction, and discuss potential applications to open inquiries in number theory. (Received August 07, 2019)