

Lubinsky's Dirichlet orthogonal polynomials and the zeros of the Riemann zeta function

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The density criteria of Nyman-Beurling and Báez-Duarte for location of zeros of Dirichlet L -functions will be discussed. In particular, these criteria provide necessary and sufficient conditions for the truth of the Riemann hypothesis. We analyse a finite dimensional extremal problem inspired by the Báez-Duarte criterion. The solution of the problem uses a sequence of Dirichlet orthogonal polynomials constructed recently by Doron Lubinsky. This is a joint work with Willian D. Oliveira. Then we pose further open problems about certain determinants composed by Lubinsky's Dirichlet orthogonal polynomials and the corresponding kernel polynomials. These determinants resemble very much those in the analysis of correlations of eigenvalues of random matrices and therefore might be related to the Montgomery-Dyson pair correlation conjecture.