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Title: Nodal length of random eigenfunctions of the Laplacian on the 2-d torus.

Abstract: We consider Gaussian linear combinations of eigenfunctions of the Laplacian on the 2-dimensional torus for a given eigenvalue. The mean of the length of the nodal set is easy to compute. As the dimension of the eigenspace goes to infinity, we find asymptotics of the variance of the nodal length. The proof has two main steps. First, the Kac-Rice formulas from probability give a formula for the variance in terms of the covariance kernel of the Gaussian random function. The covariance kernel is of an arithmetic nature and is analyzed using tools from additive combinatorics. This is joint work with Igor Wigman and PÅr Kurlberg.