

1125-15-2934

Chung Y Wong* (wong24@tcnj.edu), 2000 Pennington Road, Department of Mathematics and Statistics, Science Complex SCP 231, Ewing, NJ 08628, and **Hugo J Woerdeman** (hugo@math.drexel.edu), Drexel University, Department of Mathematics, 15 S. 33rd Street, Philadelphia, PA 19104. *Related problems to the Bernstein-Szegő moment problem in two variables.*

The Bernstein-Szegő measure moment problem asks when a given finite list of complex numbers form the Fourier coefficients of the spectral density function of a stable polynomial in the one-variable case. Szegő proved in 1919 that it is possible if and only if the Toeplitz matrix form by these numbers is positive definite. Bernstein later proved in 1930 a real line analog of the problem.

The question remained open in two variables until Geronimo and Woerdeman stated and proved the necessary and sufficient condition in 2004. Unlike the solution in one variable, it does not suffice to write down a single matrix and check whether it is positive definite. A positive definite completion condition is also required.

We further pursue the moment problem in two variables and beyond. We first enhance the two-variable results by identifying the eigenstructure of matrices that arise from the theory. We then create a method that allows us to compute the Fourier coefficients in a given infinite region by using a finite portion of the coefficients. In addition, we compute the asymptotics for the Fourier coefficients and later generalize the result to higher dimensions. (Received September 20, 2016)