

Entire functions and gap theorems

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Abstract

Several classical problems of Analysis can be translated into a universal language based on Hilbert spaces of entire functions and kernels of Toeplitz operators. Problems that can be treated this way include completeness/minimality problems for systems of exponentials or special functions in L^2 and spectral problems for second order differential operators. This approach was used to solve some of such problems in our recent papers with Nikolai Makarov.

In this talk I will show how the Toeplitz approach can be used to extend the so-called Beurling's Gap Theorem on the existence of gaps in the Fourier transform of a measure and to solve the Polya-Levinson problem on sampling sets for entire functions of exponential type zero. This part is based on a joint paper with my student Misko Mitkovski.