Boundary triples and Weyl functions of symmetric operators

Abstract:

Selfadjoint extensions of a closed symmetric operator $A$ in a Hilbert space with equal deficiency indices were described by in the 30's by J. von Neumann. Another approach, based on the notion of abstract boundary triple originates in the work of J.W. Calkin and was developed by M. I. Visik, G. Grubb, F. S. Rofe-Beketov, M. L. Gorbachuck, A. N. Kochubei and others.

By Calkin’s approach, all selfadjoint extensions of the symmetric operator $A$ can be parametrized via "multivalued" selfadjoint operators in an auxiliary Hilbert space. Spectral properties of these extensions can be characterized in terms of the abstract Weyl function, associated to the boundary triple. In the present talk some recent developments in the theory of boundary triples will be presented. Applications to boundary value problems for Laplacian operators in bounded domains with smooth and rough boundaries will be discussed.