Heinz' s theorem on definitizable selfadjoint operators on Krein spaces and beyond

Michael Kaltenbäck

The Spectral Theorem for selfadjoint operators on Hilbert spaces nowadays is one of the cornerstones of operator theory. In the situation of a selfadjoint operator A on a Krein space $(K, [.,.])$ there is no analogue of this resut in general. Nevertheless assuming the existence of a definitizing polynomial p, which means $[p(A)x, x] \geq 0$ for all $x \in K$, Heinz found a way to construct spectral projections related to A by using the Riesz-Dunford functional calculus.

In the talk I am going to deliver I will recall some of Heinz's methods in proofing his 'Spectral Theorem for definitizable selfadjoint operators on Krein spaces'. Moreover, I will give an overview of the results that we achieved for definitizable operators by putting focus more on the functional calculus coming along with the spectral theorem and less on the spectral projections. With this approach also a spectral theorem for normal definitizable operators could be found.