

# Classes of operators in a Krein space: relations

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This talk is based on a joint work with T. Azizov and V. Strauss.

Let  $\mathcal{K} = \mathcal{K}^+ \oplus \mathcal{K}^-$  be a Krein space, let

$$A = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$$

be a bounded selfadjoint operator in  $\mathcal{K}$ .

- (i) We denote by  $\mathfrak{S}_{\infty,12}$  the operators  $A$  with a compact component  $A_{12}$ .
- (ii) the operator  $A$  is called definitizable if there exists a polynomial  $p$  such that  $p(A)$  is a nonnegative operator.
- (iii) the operator  $A$  belongs by definition to the class **(H)** if it has a maximal nonnegative invariant subspace and each of such subspaces is a direct sum of the finite dimensional isotropic part and a uniformly positive subspace. We say that  $A \in \mathbf{K(H)}$  if  $A$  commutes with an operator of the class **(H)**.
- (iv) if  $A$  has a maximal nonnegative invariant subspace as in (iii) we say that  $A \in D_{\kappa}^+$ .

The aim of this talk is to show relations between operator classes (i)–(iv).

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