Normal projections in Krein Spaces

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Given a complex Krein space \(\mathcal{H}\) with fundamental symmetry \(J\), \([1]\), \([3]\), our aim is to characterize the set of \(J\)-normal projections acting on \(\mathcal{H}\), i.e. the set

\[ Q = \{ Q \in L(\mathcal{H}) : Q^2 = Q \text{ and } Q^\# Q = QQ^\# \}. \]

A projection \(Q\) is normal if and only if \(Q = E + F\), where \(E\) is a regular projection and \(F\) is a normal projection with neutral range. The ranges of the projections in \(Q\) are exactly those closed subspace of \(\mathcal{H}\) which are pseudo-regular, \([2]\). For a fixed pseudo-regular subspace \(S\), there are infinitely many \(J\)-normal projections onto it, unless \(S\) is regular. We present a parametrization of the set of \(J\)-normal projections onto a fixed pseudo-regular subspace \(S\).

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References


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