SPECTRALLY INVARIANT SUBSPACES OF A BOUNDED LINEAR OPERATOR

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A proper lattices of X is a pair (A, L) composed by a bounded linear operator A on X and its invariant finite-dimensional subspace L. The set of all proper lattices of X we denote $Pl(X)$. For $(A, L) \in Pl(X)$, the operator A induces two operators, the restriction operator $A_{|L}$ and the operator $\widehat{A_L}$ from the quotient X/L into itself, i.e. $\widehat{A_L}(\pi(y)) = \pi(A(y))$, where π is the natural homoeomorphism between X and the quotient space X/L.

In this note its shown that (A, L) is a proper lattices if and only if there are the finite sequence of eigenvalues $\{\lambda_1, \dots, \lambda_n\} \in \sigma_p(A)$ and the appropriate set of linear independent eigenvectors $\{x_1, \dots, x_n\}$ such that $L = \mathcal{L}(x_1, \dots, x_n)$. Moreover, λ_i is a simple pole of A if and only if $\lambda_i \notin \sigma(\widehat{A_L})$.

Follow this concept we can define spectrally invariant (finite dimensional) subspaces of linear operator T like invariant subspace E such that $\sigma(T_{|E}) \cap \sigma(\widehat{T_E}) = \emptyset$. Also, we gave it some properties of stability of spectrally invariant subspaces.

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