SEMINARIO DE OPERADORES Y FÍSICA–MATEMÁTICA

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ON A PROBLEM IN EIGENVALUE PERTURBATION PROBLEM
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Abstract

We consider additive perturbations of the type $H_t = H_0 + tV$, $t \in [0, 1]$, where H_0 and V are self-adjoint operators in a separable Hilbert space $\mathcal{H}$ and V is bounded. In addition, we assume that the range of V is a generating (i.e., cyclic) subspace for H_0. If λ_0 is an eigenvalue of H_0, then under the additional assumption that V is nonnegative, the Lebesgue measure of the set of all $t \in [0, 1]$ for which λ_0 is an eigenvalue of H_t is known to be zero. We recall this result with its proof and show by explicit counterexample that the nonnegativity assumption $V \geq 0$ cannot be removed. The results presented in this talk were obtained in collaboration with Fritz Gesztesy and Rogers Nichols.

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