

The Essential Spectrum of the Essentially Isometric Operator

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Abstract. Let T be a contraction on a complex, separable, infinite dimensional Hilbert space and let $\sigma(T)$ (resp. $\sigma_e(T)$) be its spectrum (resp. essential spectrum). We assume that T is an essentially isometric operator, that is $I_H - T^*T$ is compact. We show that if $D \setminus \sigma(T) \neq \emptyset$, then for every f from the disc-algebra,

$$\sigma_e(f(T)) = f(\sigma_e(T)),$$

where D is the open unit disc. In addition, if T lies in the class $C_0 \cup C_{.0}$, then

$$\sigma_e(f(T)) = f(\sigma(T) \cap \Gamma),$$

where Γ is the unit circle. Some related problems are also discussed.