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Strict singularity of a Volterra-type integral operator on H^p

Abstract

We consider a Volterra-type integral operator

$$T_g f(z) = \int_0^z f(\zeta) g'(\zeta) d\zeta,$$

acting on the Hardy spaces H^p of the unit disc. The operator T_g was introduced by Ch. Pommerenke and it has been studied systematically by several people including A. Aleman, A.G. Siskakis and R. Zhao among others. From a functional analytic point of view, one interesting notion is the strict singularity of a linear operator between Banach spaces. An operator is strictly singular if its restriction to any infinite-dimensional subspace is not an isomorphism onto its range. We discuss our recent result, which states that a non-compact T_g fixes an isomorphic copy of the sequence space l^p . In particular, the strict singularity of T_g coincides with its compactness on spaces H^p .

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