

RIGIDITY OF COMPOSITION OPERATORS ON H^p -SPACES

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I will discuss some structural rigidity properties related to the strict singularity of the composition operators $f \mapsto C_\phi(f) = f \circ \phi$ on the Hardy spaces H^p for $p \neq 2$, where $\phi : \mathbb{D} \rightarrow \mathbb{D}$ is a given analytic map and \mathbb{D} is the open unit disk in \mathbb{C} . In particular, I will outline the background and the proof of the following result, which is part of joint work with Jussi Laitila and Pekka Nieminen (Helsinki).

Theorem. Suppose that $1 \leq p < \infty$ and $p \neq 2$. Then for any $\phi : \mathbb{D} \rightarrow \mathbb{D}$ one has the following dichotomy: either

(1) C_ϕ is compact $H^p \rightarrow H^p$, or

(2) there is a subspace $M \subset H^p$ such that $M \approx \ell^p$, the restriction $C_{\phi|_M}$ is an isomorphism $M \rightarrow C_\phi(M)$, and $C_\phi(M) \subset H^p$ is complemented (that is, $C_\phi : H^p \rightarrow H^p$ is not an ℓ^p -singular operator).

Above the case $p = 2$ is well-known and $p = 1$ follows from the work of Sarason (1992).

* Aula, hora, día y fecha no habituales