WEIGHTED COMPOSITION OPERATORS BETWEEN MöBIUS-INVARIA NT ANALYTIC FUNCTION SPACES

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An interesting question in operator theory is:

Given two Banach spaces of analytic functions $X$ and $Y$ on the open unit disk $\mathbb{D}$ in the complex plane and a linear operator $T : X \rightarrow Y$, what is a minimal collection of functions in the range of $T$ whose boundedness (respectively, convergence to 0) in norm in $Y$ guarantees the boundedness (respective, the compactness) of $T$?

For the case of the composition operator $C_\varphi : f \mapsto f \circ \varphi$ (where $\varphi$ is a fixed analytic self-map of $\mathbb{D}$), Tjani proved that for several analytic function spaces, a class of functions of this type is $\{C_\varphi S : S \text{ conformal automorphism of } \mathbb{D}\}$.

In this talk, we study this problem in the case of the weighted composition operator $W_{\psi, \varphi} : f \mapsto \psi(f \circ \varphi)$ (where $\psi, \varphi$ are fixed analytic functions on $\mathbb{D}$, and $\varphi(\mathbb{D}) \subseteq \mathbb{D}$) between several Möbius-invariant spaces of analytic functions defined on the open unit disk $\mathbb{D}$ in the complex plane.