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Spectral Picture for Some Composition Operators

If ϕ is an analytic map of the disk into itself and H is a Hilbert space of analytic functions on the disk, the composition operator C_ϕ is the operator given by $C_\phi f = f \circ \phi$ for f in H . In this talk, we will discuss the point spectrum of C_ϕ^* on H^2 when $\phi(0) = \phi'(0) = 0$ or more generally, when ϕ has a fixed point in the open disk, but ϕ is not locally univalent there. The (power-)compact case is easy:

$$\sigma(C_\phi^*) = \sigma_p(C_\phi^*) = \{0, 1\}$$

In her recent thesis, Maria Neophytou used work of Poggi-Corradini and the speaker to show that for a broad class of such composition operators, the point spectrum of C_ϕ^* is an open disk centered at the origin with radius $1/\sqrt{\phi'(b)}$ where b is a fixed point of ϕ on the unit circle such that

$$\phi'(b) = \min\{\phi'(c) : c \text{ is a fixed point of } \phi \text{ with } |c| = 1\}$$

Her proof will be outlined and a conjecture will be offered.