

Operator Theory and Analytic Function Spaces

Singular numbers of composition operators on Hardy or Bergman spaces of the polydisk

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Let \mathbb{D} be the unit disk, and $\Omega = \mathbb{D}^d$ or $\mathbb{D}^\infty \cap \ell^1$, and let $\varphi : \Omega \rightarrow \Omega$ be an analytic map, inducing a composition operator C_φ , formally

$$C_\varphi(f) = f \circ \varphi.$$

We are interested in the action of C_φ on Hardy or Bergman spaces $H^2(\Omega)$ or $B^2(\Omega)$, in particular in its compactness, its membership in Schatten classes, its singular (or approximation) numbers. The case $d = 1$ begins to be pretty well understood. We will present the first results obtained in the multivariate case $d \geq 2$; we will show in particular that the decay of approximation numbers becomes slower and slower when d increases. The infinite-dimensional case will also be touched.

This is joint work with F. Bayart, D. Li, and L. Rodriguez-Piazza.