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β–bounded/compact and Hilbert–Schmidt Composition operators. Preliminary report.

In this paper, we investigate compact composition operators which are not Hilbert–Schmidt. We consider the class of examples (B.A.Lotto,1998) of composition operators C_ϕ whose symbol ϕ are Riemann maps from the unit disk D onto the semi–disk with center (1/2,0), radius 1/2 and, in general,onto a "crescent" shaped regions constructed based on this semi–disk.

We use the R.Riedel(1994) characterization of β–boundedness/compactness on H^2 to determine the range of values of $\beta \in \mathbb{R}$ for which C_ϕ is β–bounded/compact.Similar results also extend to composition operators acting on the weighted Bergmann spaces A^2_α ($\alpha > -1$) based on W.Smith's(1996) characterization of β–boundedness/compactness on these spaces. In particular, as our first result, we show that the class of Riemann maps under consideration gives example(s) of β–bounded composition operators C_ϕ which fails to be β compact$(0 < \beta < \infty)$.This was an open question in Hunziker and Jarchaw(1991). Our second result arises from our attempt to generalize these observations to relate Hilbert–Schmidt Class with β–bounded/compact operators. We prove a neccessary condition for C_ϕ to be Hilbert–Schmidt. (Received September 29, 2004)