ON SPECTRA OF COMPOSITION OPERATORS

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Abstract. In this paper we consider composition operators $C_\phi$ on the Hilbert Hardy space over the unit disc, induced by analytic selfmaps $\phi$. We use the fact that the operator $C_\phi^* C_\phi$ is asymptotically Toeplitz to obtain information on the essential spectrum and spectrum of $C_\phi$, which we are able to describe in select cases (including the case of some hypercyclic composition operators or that of composition operators with the property that the asymptotic symbol of $C_\phi^* C_\phi$ is constant a.e.). One of our tools is the Nikodym derivative of the pull-back measure induced by $\phi$. An alternative formula for the essential norm of a composition operator (valid in select cases), in terms of the aforementioned Nikodym derivative, is established. Estimates of the spectra of adjoints of composition operators are obtained. Based on them, we describe the spectrum of composition operators induced by maps fixing a point, whose iterates exhibit a strong form of attractiveness to that point.


Keywords and phrases: Composition operator, spectrum.

REFERENCES


