

Characterizations of Bergman space Toeplitz operators with harmonic symbols

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Abstract

It is well-known that Toeplitz operators on the Hardy space of the unit disc are characterized by the equality

$$S_1^* T S_1 = T,$$

where S_1 is the Hardy shift operator. In this talk we present a generalized equality of this type which characterizes Toeplitz operators with harmonic symbols in a class of standard weighted Bergman spaces of the unit disc containing the Hardy space and the unweighted Bergman space. The operators satisfying this equality are also naturally described using a slightly extended form of the Sz.-Nagy-Foias functional calculus for contractions. This leads us to consider Toeplitz operators as integrals of naturally associated positive operator measures in order to take properties of balayage into account.

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