

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.

Joint work with Issam Louhichi.