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Algebras of Toeplitz operators on the unit ball

Abstract

One of the common strategies in the study of Toeplitz operators consists in selecting of various special symbol classes $S \subset L_\infty$ so that the properties of both the individual Toeplitz operators T_a , with $a \in S$, and of the algebra generated by such Toeplitz operators can be characterized.

A motivation to study an algebra generated by Toeplitz operators (rather than just Toeplitz operators themselves) lies in a possibility to apply more tools, in particular those coming from the algebraic toolbox, and furthermore the results obtained are applicable not only for generating Toeplitz operators but also for a whole variety of elements of the algebra in question.

To make our approach more transparent we restrict the presentation to the case of the two-dimensional unit ball \mathbb{B}^2 . We consider various sets S of symbols that are invariant under a certain subgroup of biholomorphisms of \mathbb{B}^2 ($\{1\} \times \mathbb{T}$ in the talk). Such an invariance permits us *to lower the problem dimension* and to give a recipe, supplied by various concrete examples, on how the known results for the unit disk \mathbb{D} can be applied to the study of various algebras (both commutative and non-commutative) that are generated by Toeplitz operators on the two-dimensional ball \mathbb{B}^2 .

Although we consider the operators acting on the weighted Bergman space on \mathbb{B}^2 with a *fixed* weight parameter, the Berezin quantization effects (caused by a *growing* weight parameter of the corresponding weighted Bergman spaces on the unit disk \mathbb{D}) have to be taken into account.

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Special Session: Toeplitz operators and related topics. Organized by S. Grudsky and N. Vasilevski.