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On Toeplitz products on Bergman space

In the early 90's, D. Sarason posed conjectures on the characterization of the boundedness of Toeplitz products on Hardy and Bergman spaces. The Hardy space case attracted much attention because of its close relation to the joint A_2 conjecture for the famous two-weight problem for the Hilbert transform in Real Analysis, pointed out by Cruz-Urbe in [1], but both conjectures, the Sarason conjecture for Toeplitz products on Hardy space and the joint A_2 conjecture, were shown to be false by F. Nazarov around 2000 [2].

The Bergman space case of Sarason's conjecture is still open, and is likewise connected to two-weighted inequalities on Bergman space.

In the talk, I will present a dyadic model for Toeplitz products on Bergman space, give necessary and sufficient conditions in this case, and also comment on necessary and sufficient conditions for the Toeplitz products.

This is joint work with Alexandru Aleman and Maria Carmen Reguera (both Lund).

References

- [1] D.Cruz-Urbe, *The invertibility of the product of unbounded Toeplitz operators*, Integral Equations Operator Theory 20 (1994), no. 2, 231 – 237
- [2] F. Nazarov, unpublished manuscript
- [3] D. Sarason, *Products of Toeplitz operators*, in: Linear and complex analysis. Problem book 3, Part I. Edited by V. P. Havin and N. K. Nikolski, Lecture Notes in Mathematics, 1573. Springer-Verlag, Berlin, 1994