STUDENT SEMINAR

Toeplitz operators on the Bergman space of the unit disk

Dondjio Kenfack Carnot

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Abstract

The aim of this seminar is to introduce Toeplitz operators on the Bergman space of unit the disk. We start by recalling some properties of reproducing kernels for general Hilbert spaces. Then, we will focus on the Hilbert space of square integrable holomorphic functions on a bounded domain $\Omega \subseteq \mathbb{C}$. This is called Bergman space and denoted $A^2(\Omega)$. It is a closed subset of $L^2(\Omega)$ and we will show that it has a reproducing kernel, called the Bergman kernel. In particular, we will compute it in the case $\Omega = \mathbb{D}$, the unit disk of $\mathbb{C}$. The orthogonal projection, called Bergman projector and denoted P_B, from L^2 onto A^2 it is then used to define the Toeplitz operators on $A^2(\mathbb{D})$. Finally, we will give some properties of the Toeplitz operators.

Key words: Bergman space, Bergman kernel, Toeplitz operators.

References

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