

Toeplitz operators, integral geometry and dynamics of spectra

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Abstract. We present classical and recent results for weighted spaces of analytic functions in the unit disc and upper half-plane, as well as Toeplitz operators in these spaces, with special symbols associated with three types of hyperbolic geometry in the unit disc. The study focuses on the change in the properties of Toeplitz operators with varying weight parameters. In particular, an interesting question is the limit behavior of the spectrum as the weight parameter tends to infinity. This relates the theory to the correspondence principle in Berezin's second quantization. We also discuss generalizations— the mixed norm spaces defined in terms of Fourier images.

Keywords: Toeplitz operators; Bergman-Jrbashyan spaces; Mixed norm spaces; Spaces of analytic functions.

References

- [1] **Z. G. Avetisyan, A. N. Karapetyants, I. Smirnova.** Mixed Fourier norm spaces of analytic functions on the upper half-plane and Toeplitz operators. *Math. Notes*, 2025, 117, 345-356.
- [2] **N.L.Vasilevski** Commutative Algebras of Toeplitz Operators on the Bergman Space. In: *Operator Theory: Advances and Applications*. Birkhäuser, 2008. – Vol. 185, 417 pp.