

Radon inversion problem for holomorphic functions - abstract

In this talk we will describe the Radon integral operator and the so called Radon inversion problem for holomorphic functions on some bounded domains in \mathbb{C}^d , where $d \geq 1$. In general, the Radon inversion problem is to reconstruct a holomorphic function on the basis of the values of its integrals over some subset of submanifolds of its domain. The main motivation to study the above problem is [1] which deals with the Radon inversion problem on a bounded, strictly pseudoconvex domain $W \subset \mathbb{C}^d$, $d > 1$. There, the Radon operator is defined as an integral over curves given by boundary points of W that crosses the boundary ∂W non-tangentially. In the same paper a solution to the above problem is found η -almost everywhere on ∂W where η is a given probability measure on ∂W .

The main goal of our talk is to examine solvability of the Radon inversion problem in its full version, i.e. in all boundary points of considered domains. In one-dimensional case we will show how to find a solution to the Radon inversion problem for holomorphic functions on the unit disc. There, the Radon operator is defined as an integral over radii of the disc and curves satisfying some regularity conditions (e.g. non-tangential curves). The second approach will allow us to state the Radon inversion problem on bounded simply connected domains in \mathbb{C} . In multi-dimensional case we will consider bounded strictly convex circular domains and the Radon operator given by a line integral over the intervals $z[0, 1]$ where z belongs to the boundary of the domain. Having solved the problem under consideration on the unit disc, then we will show its solvability also on the unit polidisc.

As it has been shown in [1], solvability of the Radon inversion problem provides significant tools that can be applied in characterizing exceptional sets which are important from the function theory of several complex variables point of view. We will use this fact for bounded strictly convex circular domains in \mathbb{C}^d , $d > 1$. In addition, we will show some examples of constructions of analytic functions with divergent series of Taylor coefficients.

References

- [1] Kot P., *Radon inversion problem for holomorphic functions on strictly pseudoconvex domains*, Bull. Belg. Math. Soc. Simon Stevin 17 (2010), s. 623-640.