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Fakultät für Mathematik

EINLADUNG

zum

HABILITATIONSVORTRAG

Kamran Sadiq, MSc PhD
(Johann Radon Institute for Computational and Applied Mathematics (RICAM))

"The A-analytic approach to Tomography"

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Abstract: The theory of A-analytic maps was developed in late 1990s to treat planar tomography problems as boundary-value problems for elliptic equation with operator coefficients. The classical Radon problem (1917) on the plane becomes equivalent to the Cauchy problem for a Beltrami-type operator equation with Cauchy data on a closed contour. The classical analytic theory is for complex valued functions, while the A-analytic theory is for a sequence valued map satisfying the Beltrami type operator equation. The solution of the Beltrami-type operator equation have properties very similar with the classical analytic maps. One of them is that if one know the values of the sequence on the closed contour, then one can determine values of the sequence inside the domain via a Cauchy-type integral formula. The A-analytic theory have been successfully applied to investigate various planar inverse problems. In this talk, we will present some tomographic inverse problems and show how the theory of A-analyticity is employed to tackle these problems. In particular, we will present an inverse source problem in the stationary radiating transport through an absorbing and scattering medium. Of specific interest, the exiting radiation is measured on an arc. The attenuation and scattering properties of the medium are assumed known. For scattering kernels dependent on the angle of scattering, we show that a source can be quantitatively recovered in the convex hull of the measuring arc.

Donnerstag, 27. November 2025
15:30 Uhr bis 16:15 Uhr,
Ort: SR 08, 2. OG.
Fakultät für Mathematik,
Oskar-Morgenstern-Platz 1

Bernhard Lamel
Radu Bot