

IPwin2021: Geometric inverse problems

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In a medium with inhomogeneity described e.g. by a nonconstant sound speed or electrical conductivity, it is often possible to formulate inverse problems in a geometric way. A typical geometric setting is that of a Riemannian manifold. In this minicourse we will introduce three geometric inverse problems: inversion of the geodesic X-ray transform, an inverse boundary value problem for the wave equation, and the Calderón problem of determining coefficients in elliptic equations from boundary measurements. We will discuss both classical and recent results and related methods.

References

- [1] G. Uhlmann G. Paternain, M. Salo. *Geometric inverse problems in two dimensions*. Textbook in preparation.
- [2] Mikko Salo. The Calderón problem on Riemannian manifolds. In *Inverse problems and applications: inside out. II*, volume 60 of *Math. Sci. Res. Inst. Publ.*, pages 167–247. Cambridge Univ. Press, Cambridge, 2013.
- [3] Mikko Salo. Applications of microlocal analysis in inverse problems. *Mathematics*, 8(7):1184, 2020.