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The Calderón problem for local and nonlocal Schrödinger equations

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Resumen

The classical Calderón problem is the inverse problem which the electrical impedance tomography is based on. Equivalently, we may consider the inverse problem of determining the potential of the Schrödinger equation from boundary measurements. Some crucial questions about this kind of problems can be studied by exploiting Runge approximation results for the corresponding operators, which are based on unique continuation or antilocal properties.

In this talk we will see the idea of these arguments in the study of the stability improvements for a Calderón problem for the acoustic Helmholtz equation [2].

We will also compare the classical Calderón problem with its nonlocal counterpart. In particular, we will consider nonlocal operators which "see" conical domains and which are generators of stable processes. We will see the implications of directional antilocality for the approximation theorems and for the associated Calderón problem and we will discuss the new phenomena which arise [1].

Finally, we will talk about further implications of the unique continuation in other inverse problems involving nonlocal operators [3].

These are joint works with Giovanni Covi, Angkana Rüland and Wiktoria Zatoń.

Referencias

[1] G. Covi, M.Á. García-Ferrero, A. Rüland, *The Calderón problem for nonlocal Schrödinger equations with homogeneous, directionally antilocal principal symbols*, arXiv preprint 2109.14976.

[2] M.Á. García-Ferrero, A. Rüland, W. Zatoń, *Runge approximation and stability improvement for a partial data Calderón problem for the acoustic Helmholtz equation*, Inverse Probl. Imaging (2021) 1–31.

[3] M.Á. García-Ferrero, A. Rüland, *On two methods for quantitative unique continuation results for some nonlocal operators*, Commun. Part. Diff. Eq. 45:11 (2020) 1512–1560.