Uniqueness in an inverse problem of fractional elasticity

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Abstract

We study an inverse problem for fractional elasticity. In analogy to the classical problem of linear elasticity, we consider the unique recovery of the Lamé parameters associated to a linear, isotropic fractional elasticity operator from fractional Dirichlet-to-Neumann data. In our analysis we make use of a fractional matrix Schrödinger equation via a generalization of the so-called Liouville reduction, a technique classically used in the study of the scalar conductivity equation. We conclude that unique recovery is possible if the Lamé parameters agree and are constant in the exterior, and their Poisson ratios agree everywhere. This is a joint work with Professors Maarten de Hoop and Mikko Salo.