

Inverse Problems for Third-Order Nonlinear Perturbations of Biharmonic Operators

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We shall discuss inverse boundary problems for third-order nonlinear tensorial perturbations of biharmonic operators on bounded domains in the Euclidean space of dimensions three and higher. By imposing appropriate assumptions on the nonlinearity, we show that the Dirichlet-to-Neumann map, known on the boundary of the domain, uniquely determines the genuinely nonlinear tensorial third-order perturbations of the biharmonic operator. The proof relies on the inversion of certain generalized momentum ray transforms on symmetric tensor fields. Notably, the corresponding inverse boundary problem for linear tensorial third-order perturbations of the biharmonic operator remains an open question. This is joint work with Sombuddha Bhattacharyya, Suman Kumar Sahoo, and Gunther Uhlmann.