

A Multi-Stage Numerical Procedure for Computing all the Parameters of Elastic scatterers from its FFP measurements

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A new computational strategy is proposed for determining all elastic scatterer characteristics including the shape, the material properties (Lamé coefficients and density), and the location from the knowledge of far-field pattern (FFP) measurements. The proposed numerical approach is a multi-stage procedure in which a carefully designed regularized iterative method plays a central role. The adopted approach is critical for recognizing that the different nature and scales of the sought-after parameters as well as the frequency regime have different effects on the scattering observability. Identification results for two-dimensional elastic configurations highlight the performance of the designed solution methodology.