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Reciprocity gap method for an interior inverse scattering problem with a Neumann boundary condition. (Chinese. English summary) [Zbl 1438.74091]

Summary: An interior inverse scattering problem with a Neumann boundary condition is studied by using reciprocity gap method. First, the conclusion that the position and shape of a cavity with a Neumann boundary condition can be uniquely determined by providing measurements of point sources inside the cavity is proven. Next, by following the idea of reciprocity gap method, a numerical algorithm to effectively reconstruct position and shape of an unknown cavity from interior measurements is designed. Finally, some numerical examples to validate the method are presented.

MSC:
74J20 Wave scattering in solid mechanics
74J25 Inverse problems for waves in solid mechanics
78A46 Inverse problems (including inverse scattering) in optics and electromagnetic theory

Keywords:
cavity; interior inverse scattering problem; Neumann boundary condition; reciprocity gap method

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