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**Identification and stability of small-sized dislocations using a direct algorithm.** (English)

Zbl 1481.35388

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Summary: This paper considers the problem of identifying dislocation lines of curvilinear form in three-dimensional materials from boundary measurements, when the areas surrounded by the dislocation lines are assumed to be small-sized. The objective of this inverse problem is to reconstruct the number, the initial position and certain characteristics of these dislocations and establish, using certain test functions, a Hölder stability of the centers. This paper can be considered as a generalization of [A. El Badia and A. El Hajj, SIAM J. Appl. Math. 73, No. 1, 84–103 (2013; Zbl 1267.35252)], where instead of reconstructing point-wise dislocations, as done in the latter paper, our aim is to recover the parameters of line dislocations by employing a direct algebraic algorithm.

**MSC:**

35R30 Inverse problems for PDEs

35Q70 PDEs in connection with mechanics of particles and systems of particles

74G75 Inverse problems in equilibrium solid mechanics

74B05 Classical linear elasticity

74B10 Linear elasticity with initial stresses

74C10 Small-strain, rate-dependent theories of plasticity (including theories of viscoplasticity)

**Keywords:**

dislocations; inverse source problems; elasticity system; plasticity; algebraic method

**Full Text:** DOI

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