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Identification of the thickness of a thin layer with boundary measurements

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ABSTRACT

Let be a material covered with a protecting thin layer on one of its faces. The aim of this works is to present a non destructive method to identify the damage of this thin layer. The method consists in imposing a current flux data on another face and in measuring the boundary voltage potential. From the boundary voltage and the current data, we reconstruct the thin layer. The modelization of the stiff transmission between the material and the thin layer, is carried out with an elliptic partial differential equation with Ventcel boundary condition. A mathematical study of the elliptic equation is proposed, the identifiability is proved and numerical experiments are presented.

Keywords: *inverse problem, Ventcel problem, Partial differential equation, identification parameter*

Mathematics Subject Classification: *35A01, 65K, 49B*

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