A VARIATIONAL METHOD FOR MULTI-DIMENSIONAL LINEAR INVERSE HEAT CONDUCTION PROBLEMS[1]

Dinh Nho Hào[2]
Politecnico di Milano
Milano, Italy

Hans–Jürgen Reinhardt
Universität–GH Siegen
Siegen, Germany

Yvon Jarny
ISITEM, Université de Nantes
Nantes, France

Abstract

In this paper we present a general setting of linear multi–dimensional inverse heat conduction problems (IHCPs) and suggest a variational method for solving them. The idea of the method is to minimize a defect functional with respect to the *unknown* initial temperature and the *unknown* heat flux at the inaccessible surface. We prove the Fréchet differentiability of the functional, give the formulas for the gradient, and, as a consequence, we can apply gradient methods for solving IHCPs in a stable way.

[1]In: Navarro, M. P. et al. (eds.), Inverse Problems and Applications, Intern. Conf. (Manila, 1998).

[2]On leave from Hanoi Institute of Mathematics supported in part by the Deutsche Forschungsgemeinschaft (DFG) and the Consiglio Nazionale delle Ricerche (CNR).