

Preface

This work is a fruit of the lectures given at the Institute of Fundamental Technological Research of the Polish Academy of Sciences (IFTR PAS) in November 2001. Its purpose is to present an introduction to inverse and identification problems in solid mechanics which are ones of the fast growing areas in this engineering field with applications in both other sciences and in industry. It presents a short overview of the field and methods, without pretending to cover the field. The contents is based on classical and recent results from the literature and some results of the author and of his coworker.

A certain number of aspects are discussed here:

- reciprocity gap,
- gradient computations: direct differentiation and the adjoint state method,
- crack identification,
- identification of material parameters, .
- errors functionals: least squares, error on the constitutive law, etc.

Aspects like ill-posedness and regularization, minimization algorithms, numerical implementation details, etc., have been left aside. I hope that indicating some references for further reading will help the reader and will prove enough precise for an introduction to this subject.

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