

THE BOUNDARY ELEMENT METHOD IN NONLINEAR MECHANICS

APPLICATIONS IN FLAW IDENTIFICATION AND IN DAMAGE MECHANICS

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**Přednáška v rámci semináře katedry stavební mechaniky
ve čtvrtek 16. června 2005 od 10 hodin v B 366**

Engineering problems are commonly described by physical laws which can be mathematically represented in terms of partial differential equations. In many cases an alternative (and equivalent) mathematical representation of the problem can be found in terms of integral equations. With advances in numerical modelling and ever increasing computer power, modelling techniques based on integral equations can now be used in the actual simulation of many practical engineering problems. The most general and effective numerical technique for solving integral equations is the Boundary Element Method (BEM).

The seminar will be divided into two parts:

- In the first one the basic integral equations in elasticity, plasticity and damage are introduced, discussed and compared. Attention will be paid to the discretisation procedure and to the evaluation of the singular integrals.
- In the second part, the integral equations will be used to cope with two topics: the flaw identification problem and the damage mechanics. First, a formulation to identify internal cavities and cracks will be proposed; some numerical examples in fluid-solid problems and in the identification of frictionless unilateral cracks will show the capability of the technique. Afterwards, an attempt to couple the BEM with the nonlocal approach in damage mechanics will be presented. Numerical aspects such as application of the arc-length procedure in the context of BEM will be discussed.

*Přednáška v **angličtině** se koná v zasedací síni katedry stavební mechaniky (místnost B 366) v budově Stavební fakulty ČVUT v Praze, Thákurova 7, Dejvice. **Všichni zájemci jsou srdečně zváni.***

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