Short Course

14.04.2015-24.4.2014
Vienna University of Technology
First Lecture on 14.04, 14:00-15:30, Seminar room 138C
Additional appointments while be set with respect to the participants

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Numerical methods for time-domain boundary integral equations

This short course aimed at graduate students will give an introduction to numerical methods for time-domain boundary integral equations(TDBIE). We will cover the discretization, analysis, and implementation in most basic cases of acoustic scattering of waves. One or two advanced topics will also be addressed. Prerequisites are a basic knowledge of elliptic and (linear) hyperbolic PDE theory and of the finite element method. Knowledge of boundary element methods is not assumed, but a number of results will be stated without proof.

Content:

(1) Introducing TDBIEs and their discretizations
(2) Convolution quadrature and a typical analysis of the time-discretization
(3) Implementation: Use of lower triangular Toeplitz matrices
(4) Advanced topics (unlikely to cover all): higher-order methods, FEM-BEM coupling, non-linearities