Department of Statistics

SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

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Adaptive Time Discretization for Retarded Potentials

THURSDAY, January 22, 2015 at 4:30 PM
133 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

We consider retarded boundary integral formulations of the three-dimensional wave equation in unbounded domains. Our goal is to apply a Galerkin method in space and time in order to solve these problems numerically. In this approach, the accurate computation of the system matrix entries is the major bottleneck. In order to simplify the arising quadrature problem, we use globally smooth and compactly supported basis functions for the time discretization. This furthermore easily allows the use of a variable time-stepping and a variable order of the approximation in time. In order to obtain a scheme that automatically adapts the time grid to local irregularities in the solution we use suitable a posteriori error estimators. Various numerical experiments show the behavior of the adaptive algorithm.

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