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Colloquium

Efficient Preconditioning of hp-FEM Matrices by Hierarchical Low-rank Approximations

Professor Jan Hesthaven

Ecole Polytechnique Fédérale de Lausanne (EPFL)

Abstract: During the last decade, substantial advances have enabled the efficient construction and application of low-rank approximations to large matrices. Among many examples, matrices arising as discretizations of compact operators such a boundary integral operators, have been shown to enable very efficient compression, thus allowing for both compression and solution in linear complexity. However, for matrices arising from unbounded operators, e.g., finite element discretizations of differential operators, progress has been slower and is often more challenging. In this talk, we shall discuss two different attempts to take advantage of low rank approximations to develop efficient preconditioners for a variety of problems arising as (hp-)finite element discretizations of linear problems, including highly anisotropic problems and the wave Helmholtz problem and, time permitting, for the use in the context of topology optimization.

Date: 19 January 2017 (Thursday)
Time: 2:00 p.m. – 3:00 p.m.
Venue: C5, Lady Shaw Building,
The Chinese University of Hong Kong, Shatin

All are Welcome!