Multiscale Mixed Finite Elements

Fredrik Hellman[1] Patrick Henning[2] Axel Målqvist[3]

In this talk, we propose a mixed finite element method for solving elliptic multiscale problems. It does not rely on structural assumptions of the problem (e.g., periodicity) and converges independently of the regularity of the solutions. A low dimensional multiscale mixed finite element space with high approximation properties based on the Raviart–Thomas finite element spaces is constructed. This space can be used to solve the original saddle point problem efficiently. The method requires to solve many local problems in patches around the elements of a coarse grid. These computations can be perfectly parallelized and are cheap to perform. The applicability of the method is verified by a variety of numerical experiments.

References:

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[1] Department of Information Technology, Uppsala University, Uppsala, Sweden,
fredrik.hellman@it.uu.se
[2] Institute for Computational and Applied Mathematics, University of Münster, Münster, Germany,
patrick.henning@uni-muenster.de
[3] Department of Mathematical Sciences, University of Gothenburg, Göteborg, Sweden,
axel@chalmers.se