Numerical Homogenization for the Wave Equation

Patrick Henning[1] Assyr Abdulle[2]

In this talk we discuss the issues arising for the wave equation with a continuum of scales and why it is challenging to construct suitable Finite Element spaces for solving it efficiently. In this talk we propose a corresponding multiscale method which is capable of constructing accurate L2-approximations. The proposed method does not require any assumptions on space regularity or scale-separation and it is formulated in the framework of the Localized Orthogonal Decomposition (LOD). The convergence rates vary between linear convergence and third order convergence depending on the considered initial values.

References:

[1] Localized orthogonal decomposition method for the wave equation with a continuum of scales, Assyr Abdulle and Patrick Henning, arXiv Preprint 1406.6325, http://arxiv.org/abs/1406.6325

[1] Universität Münster, Institut für Numerische und Angewandte Mathematik, Münster,
patrick.henning@wwu.de

[2] EPFL Lausanne,
assyr.abdulle@epfl.ch