

Karlstad Applied Analysis Seminar (2019)

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Iterative Solvers for Poromechanics

Abstract

This talk concerns iterative solvers for poromechanics problems. The problems in the studies have involved linear poromechanics, non-linear poromechanics, and poromechanics under large deformation. We included high order discretizations, applied linearization techniques and splitting methods to develop new solvers. We studied the robustness and convergence of these solvers.

By studying the fixed stress method as an iterative solver for poromechanics, we developed an optimized version of it. Furthermore, by extending the convergence analysis in the time domain, we developed a new version of the fixed stress method that is partially parallelized. This splitting method was combined with linearization techniques to develop solvers for non-linear poromechanics. By studying the convergence of the linearisation schemes, we developed new solvers and extended the applicability to more complex phenomena, for instance poromechanics with large deformation.