

Numerical methods for perturbed saddle-point formulations arising in coupled problems and applications to poromechanics

Organizers: Lothar Banz¹, Fleurianne Bertrand², Daniele Boffi³, and Jakub Both⁴

¹University of Salzburg, Austria, lothar@banz.de

²University of Twente, The Netherlands, f.bertrand@utwente.nl

³King Abdullah University of Science and Technology, Saudi-Arabia,
daniele.boffi@kaust.edu.sa

⁴University of Bergen, Norway, Jakub.Both@uib.no

Short Description

The multiphysics coupling is an indispensable component of various applications and this is particularly true for the coupling of fluid flow and elastic deformation in porous materials. Poromechanics models, typically written as perturbed saddle-point formulations, usually have a strongly coupled, potentially highly nonlinear character, often with different scales required to be considered. The robustness and reliability of the corresponding numerical approximations as well as efficient solver technologies are therefore essential and recently received increased attention. The purpose of this minisymposium is to gather recent contributions to this topic and in particular will focus on reliable and efficient a posteriori error estimates, parameter robust approximation and preconditioning, robust and efficient iterative decoupling.