

# ITERATIVE SOLUTION TECHNIQUES FOR THE COUPLED STOKES–DARCY PROBLEM

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The Stokes–Darcy problem is a coupled system of partial differential equations that arises in fluid mechanics. Discretization of the weak form of these equations by finite element methods leads to large, sparse linear systems with a double (or nested) saddle-point structure. In this talk I will discuss the iterative solution of these linear systems by preconditioned Krylov subspace methods. New block preconditioners will be introduced, analyzed, and compared with existing solvers. The effectiveness of the proposed preconditioners will be demonstrated both theoretically and numerically.

This is joint work with Fatemeh Panjeh Ali Beik (Valie-e-Asr University of Rafsanjan, Iran).