Parallel Schur complements for solution of fracture flow problem using PETSc library

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A mixed-hybrid formulation of the water flow problem in a saturated porous medium with fractures results in a linear system with a symmetric indefinite matrix. Particular pattern of the matrix allows two successive constructions of a Schur complement, which leads to a positive-definite matrix with significantly reduced size and condition number. We present how to use the PETSc library to compute the Schur complements and to solve the resulting system in parallel.

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