Robust subspace correction methods for primal plasticity

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In small-strain plasticity, the underlying variational inequality becomes ill-posed in H_0^1 for the limit of vanishing hardening. In practice, this leads to a severe deterioration of the convergence rate of standard domain decomposition iterative solvers. Our goal is to develop a robust nonlinear preconditioner for this nonlinear limit problem. Inspired by nonlinear multigrid methods and nonlinear multilevel Schwarz methods, we discuss a coarse space correction that exploits the structure of the kernel of the limit problem. The coarse space will be designed to capture global couplings within the model that otherwise lead to the decline of the rate of convergence.

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