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Combined Regularization and Discretization of Equilibrium Problems and Primal-Dual Gap Estimators

Friday, August 16, 2024 10:00 AM (30 minutes)

The present work aims at the application of finite element discretizations to a class of equilibrium problems involving moving constraints. Therefore, a Moreau–Yosida based regularization technique, controlled by a parameter, is discussed. Using an extended Γ-convergence, a priori convergence is derived. This technique is applied to the discretization of the regularized problems. The convergence of the surrogate problems is shown, when regularization and discretization are applied simultaneously. A primal-dual gap technique is used for the derivation of error estimators suitable for adaptive mesh refinement. In addition, a strategy for balancing between a refinement of the mesh and an update of the regularization parameter is established. The theoretical findings are illustrated for the obstacle problem. Numerical experiments are performed for two quasi-variational inequalities with application to thermoforming and biomedicine, respectively.

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