

A LOCAL DISCONTINUOUS GALERKIN METHOD FOR A CLASS OF NONLINEAR ELLIPTIC PROBLEMS WITH SIGNORINI TYPE BOUNDARY CONDITIONS

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Abstract. In this talk we discuss the applicability of discontinuous Galerkin methods to a class of variational inequalities arising from free boundary problems. In particular, we center our attention in the local discontinuous Galerkin (LDG) method of (Cockburn and Shu, *SIAM J. Numer. Anal.*, 35(5): 2440–2463 (1998)) applied to a class of nonlinear elliptic equation in divergence form with Signorini-type (also called frictional) boundary conditions in part of the boundary and homogeneous Dirichlet condition on the remaining part. We derive a local description of the LDG method for this problem and write an equivalent reduced formulation, that is equivalent to a minimization problem in a space of discontinuous piecewise polynomial functions with a discrete version of the positivity condition on the boundary. Based on this reduced formulation, we will discuss convergence and stability issues for the method.

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