

On the local discontinuous Galerkin method for a class of nonlinear problems in elasticity *

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Abstract

In this paper we apply the local discontinuous Galerkin method to a class of nonlinear elasticity problems in the plane with Dirichlet or mixed boundary conditions. Our approach follows previous dual-mixed methods and introduces the stress and strain tensors, and the rotation, as auxiliary unknowns. Next, we use suitable lifting operators to eliminate part of the unknowns of the corresponding discrete system, and obtain an equivalent primal variational formulation. Finally, we prove the unique solvability with respect to a suitable mesh-dependent norm, for both problems, and derive the corresponding a-priori error estimates for the first one.

References

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