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SOLVING AN EDDY CURRENT PROBLEM USING HDG METHOD

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Abstract. We present a new hybridizable discontinuous Galerkin (HDG) method for the numerical solution of an eddy current problem, considering no trivial domains and heterogeneous media, containing insulate and conductor material. For these domains, it is necessary to impose the divergence-free condition explicitly in the insulator, which is achieved by a Lagrange multiplier in that materials. The HDG method for this problem consists on a scheme whose unknowns are the approximations of the vector field tangential trace and the Lagrange multiplier trace, which represents a reduction in the number of unknowns with respect to classical discontinuous Galerkin methods. For this scheme, we conduct a consistency and conservativity analysis as well as an existence and uniqueness analysis of its solution.