Shape and Topology Optimization subject to 3D Nonlinear Magnetostatics - Part I: Sensitivity Analysis

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Abstract

We present shape and topological sensitivities for a 3D nonlinear magnetostatic model of an electric motor. In order to derive the sensitivities, we use a Lagrangian approach, which allows us to simplify the derivation under realistic physical assumptions. The topological derivative for this quasilinear problem involves the solution of two transmission problems on the unbounded domain for each point of evaluation.