Shape and Topology Optimization subject to 3D Nonlinear Magnetostatics - Part II: Numerics

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We present the application of design optimization algorithms based on the shape and topological derivative for 3D nonlinear magnetostatics to the optimization of an electric motor. The topological derivative for this quasilinear problem involves the solution of two transmission problems on the unbounded domain for each point of evaluation. We present a way to efficiently evaluate this quantity on the whole design domain. Moreover, we present optimization results obtained by a level set algorithm which is based on the topological derivative, as well as shape optimization results.