Shape optimization subject to H(curl)-elliptic variational inequalities in superconductivity

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We want to discuss a shape optimization problem stemming from the type-II (HTS) superconductivity. Therefore, we introduce our mathematical model which is based on Bean's critical state law and comes in form of an elliptic curl-curl variational inequality of the second kind. By employing a Moreau-Yosida-type regularization to its dual formulation, we obtain the sufficient differentiablity property to apply the averaged adjoint method. By means of this, we compute the shape derivative of the regularized problem and prove its stability with respect to the regularization parameter. A strong convergence result for the optimal shapes and the solutions concludes the analysis. We finish this talk by presenting some numerical results.