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Inverse source problems for eddy current equations *

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Abstract

We study the inverse source problem for the eddy current approximation of Maxwell equations. As for the full system of Maxwell equations, ([1, 2, 3]) we show that a volume current source cannot be uniquely identified by the knowledge of the tangential components of the electromagnetic fields on the boundary, and we characterize the space of non-radiating sources. On the other hand, we prove that the inverse source problem has a unique solution if the source is supported on the boundary of a subdomain or if it is the sum of a finite number of dipoles. We address the applicability of this result for the localization of brain activity from electroencephalography and magnetoencephalography measurements.

Key words: eddy current problem, inverse problem.

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