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# Numerical Computations of 3-D Eddy Current Problems by Iterative Domain Decomposition Method

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**Abstract:** We have considered computations of 3-D eddy current problems by an iterative domain decomposition method, where the magnetic vector potential is only used as an unknown function. While this method may be able to analyze larger scale problems, it takes much CPU time of those computations. In this paper, the change of its formulation is considered as a strategy for reducing the CPU time, that is, both the magnetic vector potential and the electric scalar potential are considered as unknown functions. Although the number of the degrees of freedom increases, it is known that the convergence property is improved and the CPU time is shortened in the case of the conventional finite element method. Numerical results show that such improvement occurs also in the case of the iterative domain decomposition method: the CPU time is reduced by half.

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