

FINITE ELEMENT ANALYSIS OF A TIME HARMONIC MAXWELL PROBLEM WITH AN IMPEDANCE BOUNDARY CONDITION

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ABSTRACT. We consider an electromagnetic scattering problem produced by a perfect conductor. We pose the problem in a bounded region surrounding the obstacle and impose on the exterior boundary of the computational domain an impedance boundary condition inspired from the asymptotic behavior of the scattered field at infinity. The operator associated to our problem belongs to a class of operators for which a suitable decomposition of the energy space plays an essential role in the analysis. This decomposition is performed here through a regularising projector that takes into account the boundary conditions. The discrete version of this projector is the key tool to prove that a Galerkin scheme based on Nédélec's edge elements is well-posed and convergent under general topological assumptions on the scatterer and without assuming special requirements on the triangulations.

Keywords: Maxwell equations, edge finite elements

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