Abstracts

Construction of solutions to electromagnetic problems in terms of two collinear vector potentials

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In this work, the construction of solutions to general transient EM problems in terms of two collinear vector potentials (VPs) is subjected to a careful theoretical study and numerical verification. The problems are considered to be general in the sense that the medium can be inhomogeneous, lossy and may contain sources. Anisotropy is not considered in this paper. First, the completeness of the solution in terms of the two VPs is addressed. Second, the behavior of the VPs at interfaces and edges is investigated. Finally, a number of simple but relevant numerical tests are performed to verify the theoretical model. This work is part of the effort to establish the solid theoretical background of a novel efficient method for the analysis of transient EM propagation.

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