Abstracts

A new edge element for the modeling of field singularities in transmission lines and waveguides

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Edge finite elements are widely used in the analysis of waveguides and transmission lines. They have tangential continuity and they do not produce spurious modes. However, they cannot model the singular behavior of the transverse fields in the neighborhood of sharp edges. This fact limits the accuracy of the representation of the fields and the order of convergence of the method. In this paper, we present a new edge element in which the singular approximation of the three fields components and the correct modeling of the curl is incorporated. The development of the basis functions is described. Some numerical results for waveguides with sharp metal edges are shown in order to validate this theory.

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