Abstracts

Hierarchical tangential vector finite elements for tetrahedra

L.S. Andersen and J.L. Volakis. "Hierarchical tangential vector finite elements for tetrahedra." 1998 Microwave and Guided Wave Letters 8.3 (Mar. 1998 [MGWL]): 127-129.

Tangential vector finite elements (TVFEs) overcome most of the shortcomings of node-based finite elements for electromagnetic simulations. Hierarchical TVFEs are of considerable practical interest since they allow use of effective selective field expansions where different order TVFEs are combined within a computational domain. For a tetrahedral element, this letter proposes a set of hierarchical mixed-order TVFEs up to and including order 2.5 that differ from previously presented TVFEs. The hierarchical mixed-order TVFEs are constructed as the three-dimensional equivalent of hierarchical mixed-order TVFEs for a triangular element. They can be formulated for higher orders than 2.5, and the generalization to curved tetrahedral elements is straightforward.

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