Abstract: Eddy current nondestructive evaluation (NDE) involves the detection of electromagnetic field irregularities due to non-conducting inhomogeneities in an electrically conducting material such as cracks, fasteners, sharp corners/edges, multi-layered structures, etc. In this webinar, we will give an introduction first on eddy current NDE at Iowa State University, including measurement capabilities, the eddy-current NDE course, and modeling and simulations. Then we will focus on applying boundary element method (BEM) in the modeling and simulations. The eddy-current problem is formulated by the boundary integral equations (BIE) and discretized into matrix equations by the BEM or the method of moments (MoM). The solutions of the matrix equations are accelerated using fast algorithms such as adaptive cross approximation (ACA) to reduce the memory and CPU time requirements. Finally, several benchmark cases in NDE applications are will be presented to demonstrate the accuracy and capability of the BEM for three-dimensional structures described by a number of triangular patches.
Eddy Current Nondestructive Evaluations
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