

Adaptive mesh refinement for eddy current testing finite element computations

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Abstract

This paper deals with an adaptive mesh refinement method applied to 3D eddy current non-destructive testing (ECNDT) computations by finite element method. In ECNDT finite element simulation having a “good mesh” is particularly crucial since the geometry can be complex and abrupt field variations can be encountered. This appropriate mesh allows to obtain accurate solution with a reduced number of elements and so a reasonable computational time. Creating such a mesh is delicate and could necessitate a prohibitive development time for a numerical software user. An approach to overcome this problem is to use an adaptive meshing technique. In this paper the principle of Ligurian is used as error estimator and applied in a general computation processing loop. An example based on a benchmark is presented. This work takes place within the framework of the development of an ECNDT numerical simulation environment for computer-aided design.

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