<u>PROCEEDINGS</u>

Acoustic Topology Optimization of Sound Absorbing Materials Directly from Subdivision Surfaces with IGA-FEM/BEM

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ABSTRACT

An isogeometric coupling algorithm based on the finite element method and the boundary element method (IGA-FEM/BEM) is proposed for the simulation of acoustic fluid-structure interaction and structural-acoustic topology optimization using the direct differentiation method. The geometries are constructed from triangular control meshes through Loop subdivision scheme. The effect of sound-absorbing materials on the acoustic response is characterized by acoustic impedance boundary conditions. The optimization problem is formulated in the framework of Solid Isotropic Material with Penalization methods and the sound absorption coefficients on elements are selected as design variables. Numerical examples are presented to demonstrate the validity and efficiency of the proposed algorithm.

KEYWORDS

Topology optimization; isogeometric analysis; subdivision surface; boundary element method

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.