

The Application of the Dual Surface Method to Treat the Nonuniqueness in Solving Acoustic Exterior Problems

Mohsen, A.; Piscoya, R.; Ochmann, M.

Abstract

The problem of nonuniqueness (NU) of the solution of exterior acoustic problems via boundary integral equations (BIEs) is studied. The application of the dual surface method, used in electromagnetic problems, to exterior acoustic problems is studied. The dual surface integral equations, although identical in form and comparable in complexity to the original surface integral equations, provide a unique solution at all real frequencies. The conditions and the proof of uniqueness are outlined. Applications of the method are given for the scattering as well as the radiation from three different structures. We consider normalized frequencies up to $ka \sim 22$, where “a” is a typical dimension of the structure.

Published In: Acta Acustica united with Acustica, Volume 97, Number 4, July/August 2011 , pp. 699-707(9)