Determination of scattering frequencies for 2D acoustic problem using

boundary element method

H. F. Gao¹, C.J. Zheng

¹ College of Mathematics, Taiyuan University of Technology, Taiyuan, 030000, PR China ² Institute of Sound and Vibration Research, Hefei University of Technology, Heifei, Anhui, 230009, PR China.

Abstract

The study investigates the scattering frequencies in a 2D acoustic problem using the boundary element method. The scattering frequencies imply the resonance of the scattering wave on the surfaces of scatterers embedded in a different medium and usually appears in complex form. To solve the scattering frequencies with a boundary-only discretization mode provided by the boundary element method, the contour integral method is adopted to extract the complex eigenvalues and a rectangular path is developed to obtain the complex results. Eigenmodes are also presented by recovering the reduced eigenspace and the amplitude of the exterior domain is computed using integral equations. Numerical examples demonstrate the effectiveness of the proposed integration path.

Keywords: boundary element method; scattering frequencies; contour integral method; acoustic problems