

Analysis of acoustic scattering from fluid cylinders using a multifilament source model

Amir Boag, Yehuda Leviatan, and Alona Boag

Department of Electrical Engineering, Technion, Israel Institute of Technology, Haifa 32000, Israel

(Received 17 June 1987; accepted for publication 16 September 1987)

A solution is presented for the problem of two-dimensional acoustic scattering from homogeneous fluid cylinders. The solution uses fictitious filamentary isotropic sources to simulate both the field scattered by the cylinder and the field inside the cylinder and, in turn, point-matches the continuity conditions for the normal component of the velocity and for the pressure across the cylinder surface. The procedure is simple to execute and is general in that cylinders of arbitrary shape can be handled effectively. Perfectly rigid cylinders are treated as reduced cases of the general procedure. Results are given and compared with available analytic solutions, which demonstrate the very good performance of the procedure.

PACS numbers: 43.20.Fn