PREDICTION OF SOUND PRESSURE AND INTENSITY FIELDS IN ROOMS AND NEAR SURFACES BY RAY TRACING

PACS: 43.55.Ka

Cousins, Owen¹; Hodgson, Murray¹; Valeau, Vincent²
SOEH-MECH, University of British Columbia, 3rd Floor, 2206 East Mall, Vancouver, BC, Canada V6T 1Z3; murray.hodgson@ubc.ca
² LEA UMR CNRS 6609, 22 av. du Recteur Pineau, 86022 Poitiers cedex, France

ABSTRACT
This paper discusses the prediction of sound pressure and intensity fields in rooms of varying geometries, with an emphasis placed on predictions near surfaces, using a modified ray-tracing model. The model was modified to account for phase effects due to path-length differences between received rays, and phase changes upon reflection from surfaces with complex impedance, to calculate the total received pressure and intensity at a receiver position, and to track the change in pressure and intensity levels with time. Results of the modified prediction model were compared with predictions by other models, including an image-phase model, as well as with sound fields measured in situ. This paper outlines the modifications made to the existing ray-tracing model, and summarizes the results of comparison to other models, and measured sound fields.