
First-order ODEs based Time-domain Finite Element Method for Room Acoustics Simulation—Application of Higher-order Time Integration Methods—

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This article presents a first-order ordinary differential equations based time-domain finite element method (TDFEM) using higher-order time integration methods for room acoustics simulation with irregular shaped finite elements. Dispersion error analyses and room acoustics simulation with square elements were performed for a validation of the present TDFEM. Moreover, a sound field with acoustic diffusers was analyzed using the present TDFEM with irregular shaped finite elements. The result showed applicability of present TDFEM to sound field analyses with irregular shaped finite elements.