عنوان مقاله:

Acoustic Design of Buildings Using Mathematical Model Based on Sound Simulation

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خلاصه مقاله:

Proper acoustic design is especially important in some buildings. For example, in concert halls, one of the desirable functional features is the proper transmission of music. In this regard, an indicator that can effectively show the quality of the received sound is the sound intensity, which is the purpose of this study is a way to optimize this indicator. Among the most effective variables that will affect the intensity of the received sound and also the important characteristics of the sound source are the frequency and octave of the sound, as well as the distance between the sound source and the receiver. In this research, a new method was proposed to investigate the effect of these three variables on the received sound intensity. In this regard, ODEON software, one of the most powerful software in acoustic design, was used and data analyses were implemented. Then, using full factorial method (one of the experimental design methods), targeted scenarios based on three independent variables were identified and by using the results of simulated scenarios, the linear relationship between the dependent variable (sound intensity) and independent variables (frequency, octave and distance) were developed. Using this linear relationship, it was found that the octave of sound has the greatest effect on sound intensity, and sound frequency and distance from the sound source were inversely related to the sound intensity.

کلمات کلیدی:

Building acoustic design, Experimental Design, Frequency, Linear Model, Simulation, sound intensity

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