

Design and Evaluation on Sierpinski-Triangle Acoustic Diffusers Based on Fractal Theory

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Abstract : Acoustic diffusers are important components in enhancing the quality of room acoustics. This paper provides a type of modular diffuser based on the Sierpinski Triangle of the plane and combines it with fractal theory to expand the effective frequency range. In numerical calculations and full-scale model experiments, the effect of fractal design elements on normal-incidence diffusion coefficients is examined. It is demonstrated the reasonable times of iteration of modules is three, and the coverage density is 58.4% in the design frequency from 125Hz to 4kHz.

Keywords : acoustic diffuser, fractal, Sierpinski-triangle, diffusion coefficient

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