

The Effects of Tree Leaves on the Vertical Transmission of Sounds

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Abstract

While most studies on forests and sounds are about the effects of tree leaves on the horizontal transmission of sounds from the viewpoint of noise reduction, few researches are about the effects of tree leaves on the vertical transmission of sounds. The main object of this study is to characterize how different sizes and masses of tree leaves influence the vertical transmission of sounds. To evaluate the extent of sound reduction, the prerecorded white noise was projected vertically from the speaker on the floor upwardly, and the attenuated sound was measured behind the layers of tree leaves (4m²) at three heights in the anechoic chamber. Then to evaluate the effects of litter layers on sound reflection, Leaves were spread on the Styrofoam floor (2.25m²). The same white noise was projected vertically from the speaker downwardly at 2.16m height, and the sound was measured at two heights. The measured sounds were analyzed by using 1/3 octave band analysis.

Keywords: vertical transmission of sound, sound reflection, anechoic chamber, 1/3 octave band analysis