

Overhead stage canopies in a coupled volume theatre: effects on the sound energy distribution and on the secondary reverberation

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ABSTRACT

Nowadays, opera houses are often used for symphonic music, even though the intrinsic characteristics of these theatres are not suited for this purpose, due to their coupled volumes and high absorption of the fly tower. When symphonic music is performed in these halls an overhead stage canopy is often used to enhance the orchestral performance. In the present work, the effects of a canopy array in a coupled volume theatre were studied. The array canopy was designed and installed based on Geometric Acoustic (GA) simulations calibrated with in-situ measurements. Results showed peculiar effects on the sound energy distribution through space: the sound strength values depends on the “effective” volume of the theatre, varying with the sound source position. Moreover, when the stage is covered by the canopy array, the sound strength depends on the distance from the aperture instead of the distance from the sound source position. In other words, the decay curve is “tilt” by “effective volume” and “shifted” by the canopy array. Furthermore, the changes in sound behaviour due to the canopy array may be considered as a switch-off of the secondary reverberation effect.

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