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**Interactions between floor and ceiling panels in presence of a
fibrous material in the cavity**

Thomas Scelo
Marshall Day Acoustics LTD, P O Box 5811, Wellesley St., 1000 Auckland, New Zealand

The mechanisms governing the acoustic transmission through building elements such as floor/ceiling assemblies are complex. The vibroacoustic interactions between the finite size structure and the enclosed volume are, in particular, rendered more complex at low frequencies when the finite dimensions of the building are taken into consideration. A model developed to predict the low frequencies vibroacoustics response of mutli-plates systems offers the opportunity to explore, amongst other geometrical and material parameters, the effects of a fibrous material in the ceiling plenum on the acoustics behaviour of the whole structure. This paper presents the theoretical approach employed to predict the interactions between the floor, the ceiling panel and the enclosed volume. It also explores the effects of varying the material characteristics and overall thickness on these interactions.