

Effect of Exciting position on Sound Field in Cylindrical Enclosure with End Plates

by

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Abstract

This paper describes the coupled vibration of circular end plates and the sound field in a cylindrical enclosure by exciting on one side of the plates. Coupled vibration analysis is carried out for shifts of the exciting position. The dominant acoustic mode and the relationship between plate motion and sound field are investigated based on the analytical results which are expressed as distributions of the sound pressure level within the cylindrical cavity. It is shown that the exciting plate motion is prevented by closeness between its node and the exciting position, and then the coupled vibration with the sound field is weakened. Furthermore, the weakness of the exciting plate motion causes the other resonance mode in the cavity or the coupled vibration with three components including the other side plate.

Keywords: *Coupled vibration, Circular end plates, Cylindrical cavity, Sound field, Exciting position*

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