

Effects of Acoustic Scattering on the Active Control of Noise Through Apertures

Lam Bhan¹

¹Nanyang Technological University, Singapore

Abstract

Active noise control systems have recently been proposed and implemented on domestic window apertures. However, their fundamental limits, and performance in the presence of glass windows has not been studied in detail. The passive acoustic attenuation through an aperture covered with different states of glazing is first modeled with the Finite Element Method (FEM) in COMSOL. The performance of the active control system is investigated under the different acoustic scattering conditions due to different states of glazing. 2D simulation results reveal that the active control system with sufficient control sources strategically distributed across a partially-glazed aperture can provide the same level of attenuation as a fully glazed window, under ideal conditions. The active control performance is also robust to different angles of incident primary noise plane waves on the aperture.

Figures used in the abstract

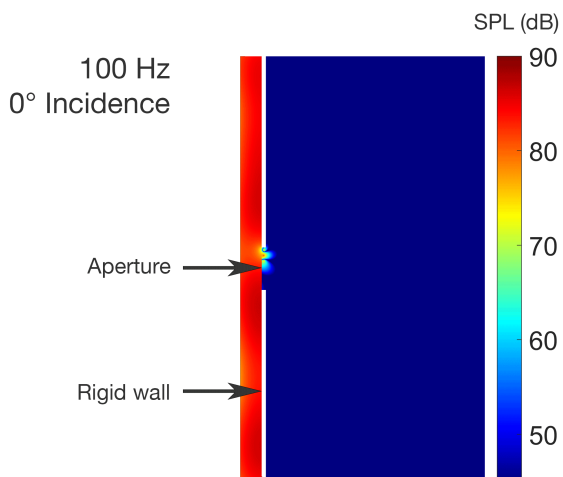


Figure 1: Attenuation performance of three active control sources in a 75% glazed aperture