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Smart panels with active wedges

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This paper presents an experimental study comparing the vibration and sound radiation control performance obtained from six different rectangular panels with various geometries of active wedge. Each panel is equipped with sixteen triangular piezoceramic actuators along the panel border and accelerometer sensors located at the top vertex of the triangular actuators. These sensor-actuator pairs are used to implement decentralized velocity feedback loops that produce active damping on the plate. The primary objective of this paper is to investigate the effect of the size and geometry of the triangular actuators on stability and control performance. Narrow frequency band measurements highlight that vibration reductions at the first few resonant frequencies are significantly improved by increasing the height of the triangular actuators. However, the increase of the height also results in spillover effects at frequencies higher than around 700Hz. In contrast, an increase of the base length of the triangular actuators improves the overall control performance up to 1 kHz without increasing the spillover effect.