

PRESSURE OSCILLATIONS WITHIN A YAWED RECTANGULAR CAVITY IN SUBSONIC FLOW

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Abstract

The effect of cavity depth and yaw angle on flow oscillations of an open rectangular cavity placed within a subsonic turbulent boundary layer has been studied for a Reynolds number range of 3.8×10^4 to 6.2×10^4 based on cavity length. Pressure time histories were acquired for five cavity depths for yaw angles from 0 to 90 degrees using microphone-type pressure transducers. Large changes in the pressure level occur as the Length/Depth varies with yaw angle. Relative sound pressure levels of the energy within the cavity compared with that of the boundary layer increased by approximately 22 percent at $L/D=2.1$, and 2.2 times for yaw angle between 45 and 60 degrees.

Keywords: Cavity Flow, subsonic, turbulent boundary layer, flow oscillations