

Control of Cavity Acoustics by Surface Waviness In Landing Configurations

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Abstract

The aviation industry's interest towards cavity control methods rose accordingly due to the acoustic attenuation potential of such methods. However cost effective control devices which are also efficient over a wide range aircraft operations are yet to be developed. This paper investigates the use of a sinusoidal surface modification application upstream of a cavity as a passive acoustics control device in approach conditions. Optimum sinusoidal amplitude and frequency were previously determined by the means of a two-dimensional computational fluid dynamics analysis for a cavity with a length to depth ratio of 4. A complete three-dimensional CFD analysis of this configuration as well as a base-line case without control device was carried out in this study. The overall sound pressure level was reduced with the surface modification at the majority of the points investigated.