Experimental Study on Effect of Vibratory Flap Position on Dynamic Response of Clamped Rectangular Plate with Cut-out

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Abstract.

In structural applications, plates with cut-out or holes are commonly used. The structure will deteriorate dynamically due to presence of cut-out and experiences amplification in vibrations. This paper presents an experimental study on effect of position of vibratory flap on dynamic response of a clamped rectangular plate with cut-out subjected to harmonic excitation. Vibratory flap is an auxiliary plate attached on the main plate as a cantilever plate and acts as a dynamic vibration absorber, which is used to reduce the vibration of the plate at first and second frequencies. Investigation has been carried out for different combinations of flap location and orientation through experimental sine sweep test. From the test it is found that, there is an optimum position where vibration suppression is more effective with improved dynamic response of the plate with cut-out in the presence of flap. The experimental results have shown good agreement with the published finite element analysis results

Keywords:

Vibration,
Plate with cutout,
Optimization,
Vibratory flap,
Flap position.