

Influence of Propeller Blade Lift Distribution on Whirl Flutter Stability Characteristics

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Abstract : This paper deals with the whirl flutter of the turboprop aircraft structures. It is focused on the influence of the blade lift span-wise distribution on the whirl flutter stability. Firstly it gives the overall theoretical background of the whirl flutter phenomenon. After that the propeller blade forces solution and the options of the blade lift modelling are described. The problem is demonstrated on the example of a twin turboprop aircraft structure. There are evaluated the influences with respect to the propeller aerodynamic derivatives and finally the influences to the whirl flutter speed and the whirl flutter margin respectively.

Keywords : aeroelasticity, flutter, propeller blade force, whirl flutter

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