

Experimental Studies on Characteristics of a Wing Tip Vortex and Reduction with Suction

by

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Abstract

A wing tip vortex occurs in the wing tip neighborhood on an aircraft in flight and induced drag is generated. There are many studies on a wing tip vortex and flow control techniques near the wing tip for the reduction in the wing tip vortex. However, there are few studies on the control of a wing tip vortex by suction. In this study, the characteristics of a wing tip vortex were investigated in detail by low-speed wind tunnel experiments using a two-dimensional hot wire anemometer with a three-dimensional traverse system. The effects of controlling the flow near the wing tip by suction on the reduction in the wing tip vortex were investigated. Suction was carried out at various positions near the wing tip. As the result it was shown that the wing tip vortex is decreased by appropriate suction and the amount of reduction varies according to suction points. The most effective suction point is near the trailing edge of the wing tip.

Keywords: Wing Tip Vortex, Suction, Wind Tunnel Experiment, Hot Wire Anemometer

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