

The boundary layer control and its impact on the flow over Airfoil Profile*

Dr. Eng. Hamza Makarem**

Abstract

The pressure graduation affects the formation of boundary layer, especially in the case of increasing pressure, which can cause boundary layer separation.

The boundary layer separation causes a reverse flow, moves opposite its original direction of flow, and as a result of this, localized vortex forms and gathers in an area behind the body called the wake i.e. increasing losses and resistance.

Thus when studying the boundary layer suction method as a method of boundary layer control in order to avoid or at least delay the occurrence of boundary layer separation, This study to be help to get the best designs for the shape of the body, which achieves lower losses and thus reducing the strength of the resistance of the wings so that they are carrying as little as possible (As an example, reduce fuel consumption), and to raise the efficiency of the hydrodynamic lifting force on the wing profile.

Key words: airfoil; boundary layer; separation; suction; pressure.

* For the paper in Arabic see pages (37-47).

** Mechanical Engineering Department - Faculty of Mechanical & Electrical Engineering - Damascus University