

Evaluation of Parametric Effects of Microstructural Riblets on the Boundary Layer Flow over Flat Plate

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This study aims to realize the effect of riblets on the flow over a flat plate. The empirical relations developed for boundary layer flow over the flat plate can be used to approximate the flow parameters in various applications involving a viscous flow regime over an unbounded wall boundary. Different devices and techniques for manipulating the flow over flat plates have been developed. Riblets, which can be thought of as passive flow actuators, are inspired by the dendrites found in shark skins and the grooved structures in some birds. They have been found to reduce skin friction drag by a significant amount and are being tested for use in aircraft wings and empennage, turbo-machinery blades, automotive bodies, etc. In the current study, we aim to delve into the flow patterns in the boundary layer flow over a flat plate with riblet section and compare flow properties with base configuration of a flat plate. Also, the effect of variations in the yaw angles of the riblets has been studied. Since the flow regime in our study is laminar, a steady-state solver, **simpleFoam** was chosen for computation.

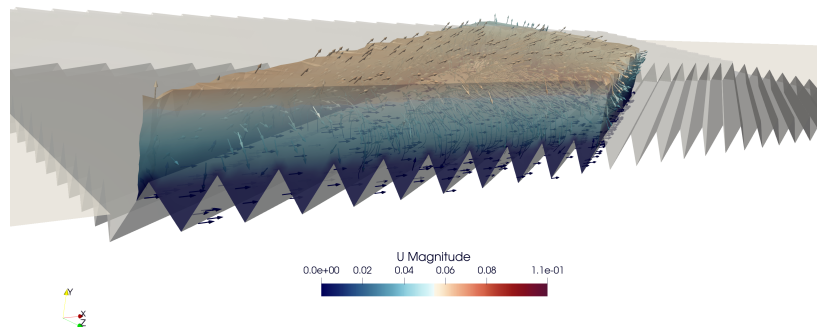


Figure 1: Sectional view of the fluid film trapped in riblet grooves.