

Theoretical Approach on the Study of Turbulent Water Flow over Smooth and L-shaped Riblets Surfaces

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Abstract

A very important research effort has been developed at many world laboratories these last years in order to reduce the friction drag. For the aircraft and the submarine applications, friction contributes respectively for about 50% and 70% of the total resistance. The use of surface modifications riblets as a means of reducing viscous drag on a body has potential aerodynamic and hydrodynamic applications. In the present study, the theoretical approach allow to determine the velocity field, the wall shear stress, the local skin friction, the boundary layer thickness, the laminar sub layer thickness and the dimensionless drag coefficient. The results found, indicate that the presence of L-shaped riblets surfaces provide changes in the characteristics of the turbulent boundary layer, which are in favor of wall skin friction.

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