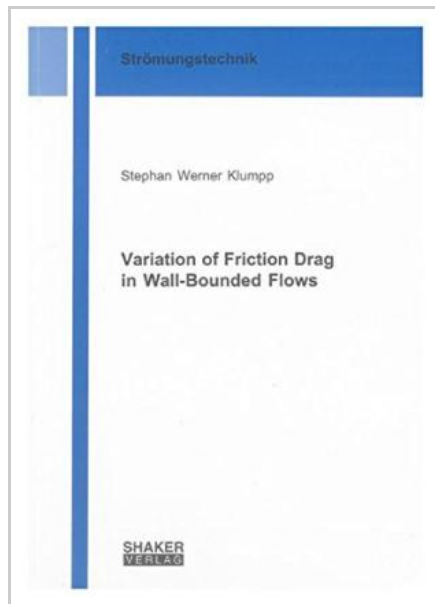



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Variation of Friction Drag in Wall-Bounded Flows

By Stephan W Klumpp

Shaker Verlag Aug 2010, 2010. Taschenbuch. Book Condition: Neu. 208x149x10 mm. Neuware - One of today's major issues in the development of new fluid application, e.g., airplanes, turbo engines, and high speed trains, is to achieve a high efficiency at a low consumption of energy by reducing the fluid dynamical drag. Besides other options, the reduction of wall-shear stress in wall bounded flows, which determines, e.g., about 50% of the total drag of the flow field around aircraft, is a promising approach to increase the overall efficiency. In the current study the application of a surface structure consisting of tiny grooves aligned in the main flow direction, so-called riblets, on technical components such as compressor blades is investigated. Although the basic drag reducing effect of riblets in turbulent flows is well-known the impact of riblets on the skin friction under realistic flow conditions is still unclear. Therefore large-eddy simulations (LES) of riblet covered surfaces in flow states as occurring on technical components, namely turbulent adverse-pressure gradient flow and transitional flow, are performed. Since the drag reducing effect of a certain riblet surface is limited to a narrow range of flow parameters in the second part of the current work an...



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