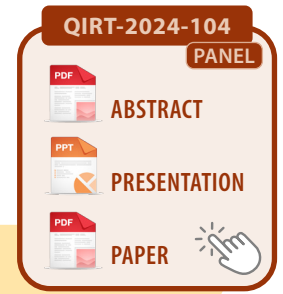




**Antonio MAZZARA**  
University of Naples Federico II  
Via Claudio 21  
I-80 125 Naples  
Italy  
e-mail: ant.mazzara@studenti.unina.it



Antonio Mazzara is a master degree student at the University of Naples Federico II in Naples, Italy.

**Gerardo PAOLILLO**

University of Naples Federico II, Naples, Italy

**Carlo Salvatore GRECO**

University of Naples Federico II, Naples, Italy

**Tommaso ASTARITA**

University of Naples Federico II, Naples, Italy

**Gennaro CARDONE**

University of Naples Federico II, Naples, Italy

## CONVECTIVE HEAT TRANSFER COEFFICIENT REDUCTION IN A TURBULENT BOUNDARY LAYER DEVELOPING ON A RIBLETS SURFACE

An experimental investigation on the effect of the riblets on the skin friction coefficient in a turbulent boundary layer was carried out. Riblets, biologically-inspired by the micro-structures present on the shark skin, are designed to reduce the skin friction drag by manipulating near-wall turbulent structures: in particular the investigated riblets have a non-conventional geometry with a sinusoidal pattern in the streamwise direction, with a fixed amplitude and a fixed wavelength, and a parabolic cross-section shape. The present work aims at comparing the convective heat transfer coefficient induced by a turbulent boundary layer developing

on the riblets surface against that developing on a conventional smooth flat plate. Such a comparison gives indirect information on the skin friction coefficient behaviour through the Reynolds analogy

The experimental evaluation of the convective heat transfer coefficient is performed by means of Infrared Thermography coupled with the Thin Film heat transfer sensor. A series of wind tunnel tests were carried out in which both the riblets and a smooth flat plate are subjected to identical freestream conditions. It is shown that the sinusoidal riblets generally lead to a convective heat transfer reduction of about 10%.