

Determination of the Conjugate Heat Transfer Performance of a Turbine Blade Cooling Channel

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Abstract

This contribution presents the experimental investigation of the conjugate thermal behaviour of a rib-roughened cooling channel. Previous investigations were mainly focused on the convective aspects of the heat transfer and the channels' models were made out of low conductive materials. To reproduce heat conduction conditions closer to the ones of a real metallic airfoil, a facility with a metallic ribbed wall was designed. The infrared thermography was used to measure the temperature distribution on the wetted surface. The convection coefficient was calculated as a function of the measured wall temperature and computed wall heat flux. FLUENT® was used to numerically solve the energy conservation equation into the metallic wall, providing the surface heat flux.

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