

Seminario nell'ambito del progetto Visiting Professor 2016-2017 Lunedì 3 Aprile 2017 ore 9:30 Campus di Ingegneria (Edificio B, Aula B001)

Gas Turbine Cooling

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Flow Field in a Swirl Cooling Tube

Abstract

Major goals for industrial gas turbines and gas turbines used for propulsion are to reduce the fuel consumption and the pollutant emissions. This can be achieved by increasing the thermal efficiency of the gas turbine operating at increasingly higher temperatures. These temperatures are well above e.g. the melting temperature of the blade material, which requires the development of more efficient internal turbine blade cooling strategies. Currently different cooling techniques are investigated like rib turbulators, pin fins, jet impingement, swirl tubes and dimples. Here, swirl cooling is a promising cooling method as it promotes a high turbulent mixing in the near wall region and provides high heat transfer enhancement capabilities. The current lecture will show results from investigations on different cooling methods, which have been done at the Institute of Aerospace Thermodynamics (ITLR) at the University of Stuttgart.

The presentation will show numerical as well as experimental investigations. By comparing the experimental results with numerical studies, the prediction quality of current numerical methods are demonstrated.

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