

## عنوان مقاله:

Compound Cooling by Impingement Jet and Rib on a Gas Turbine Vane Using Conjugate Heat Transfer Analysis

## محل انتشار:

هجدهمین کنفرانس انجمن هوافضای ایران (سال: 1398)

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## خلاصه مقاله:

Numerical simulation of an internally cooled turbine vane were carried out using conjugate heat transfer approach. An impingement cooling configuration was designed in order to enhance cooling effectiveness on the leading edge of the internally cooled C3X vane. In an attempt to further improvement, two rows of ribs were added on the regions where impingement jets did not covered. The effect of internal cooling configuration on the external surface temperature was assessed by comparing overall cooling effectiveness of the internally cooled vane with the impingement cooled case. The SST turbulence model together with the  $\gamma$ -transition model was employed to resolve laminar as well as turbulent boundary layer. Numerical results were in reasonable agreement with the available experimental data for the primary internally cooled vane. The effect of rib configuration on the cooling performance of the impingement cooled channel were investigated. Overall cooling effectiveness was generally enhanced using impingement cooling configuration. Furthermore, span-wise distribution of overall cooling effectiveness became uniform in the leading edge of the vane. Local overall cooling effectiveness was enhanced in regions where ribs were install. Although the radial channel coolant flow rate remained constant, overall cooling effectiveness was improved in regions corresponded to radial channel on pressure side.

## کلمات کلیدی:

Conjugate heat transfer- Gas turbine vane - Impingement cooling- Rib

## لینک ثابت مقاله در پایگاه سیویلیکا:

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