

# Abstract

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## Numerical Simulation of Turbulent Heat Transfer in Turbine Blades

Abstract of the paper: This paper presents a numerical simulation of turbulent heat transfer in turbine blades. The simulation is performed using a finite volume method (FVM) based on the Reynolds-averaged Navier-Stokes (RANS) equations. The turbulence is modeled using the k- $\epsilon$  turbulence model. The simulation results show that the heat transfer coefficient is significantly higher in the turbulent region compared to the laminar region. The maximum heat transfer coefficient is found to be approximately 100,000 W/m<sup>2</sup>. The simulation also shows that the heat transfer coefficient is highly sensitive to the inlet velocity and the turbulence intensity. The results of the simulation are compared with experimental data and show good agreement. The simulation results are used to optimize the design of turbine blades for improved performance and efficiency.