

Abstract

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Numerical Simulation of Turbulent Heat Transfer in Turbine Blades

Abstract: This paper presents a numerical simulation of turbulent heat transfer in turbine blades. The study is conducted using a finite volume method (FVM) with a turbulence model. The results show that the heat transfer coefficient is significantly higher in the turbulent flow regime compared to the laminar flow regime. The maximum heat transfer coefficient is observed at the leading edge of the blade, where the flow is highly turbulent. The results are compared with experimental data, and the simulation results are found to be in good agreement with the experimental data. The study also shows that the heat transfer coefficient is highly sensitive to the turbulence model used. The results indicate that the use of a more advanced turbulence model can lead to more accurate predictions of heat transfer in turbine blades. The study is a valuable contribution to the understanding of turbulent heat transfer in turbine blades and can be used to optimize the design of turbine blades for improved performance.