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## 涡轮叶冠换热特性实验与数值模拟

### Experiment and numerical simulation of heat transfer characteristics in turbine shroud

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中文关键词: [叶冠](#) [数值模拟](#) [雷诺数](#) [出流比](#) [表面传热系数](#)

英文关键词: [shroud](#) [numerical simulation](#) [Reynolds number](#) [outflow ratio](#) [heat transfer coefficient](#)

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中文摘要:

利用数值模拟及实验方法对涡轮叶冠间隙流场换热特性进行了研究,分析静止状态下叶尖泄漏流雷诺数、前后孔出流比、叶尖间隙等参数对叶冠的表面传热系数的影响.结果表明:叶冠转速的变化对表面传热系数影响较小;随着泄漏流雷诺数的增加,叶冠的平均表面传热系数增大;平均表面传热系数随前、后孔出流比增大而增大,其中前孔出流比的影响较为明显;叶尖间隙减小,平均表面传热系数增大,并且随叶尖间隙的减小,增长越来越快.将计算与实验结果进行了比较,吻合良好,误差小于10%.

英文摘要:

Numerical simulation and experimental methods were used to study the heat transfer characteristics of tip clearance flow in turbine shroud cavity. The impact of tip clearance flow Reynolds, outflow ratio of the front and rear holes and tip clearance on the heat transfer characteristics were simulated. Results show that the shroud rotational speed has little effect on heat transfer coefficient; the shroud heat transfer coefficient increases with the increase of leakage flow Reynolds number; heat transfer coefficient also increases with the increase of the outflow ratio of the front and rear holes, and the impact of the ratio of the front holes is larger; heat transfer coefficient increases with decrease of the tip clearance and the mean heat coefficient, increases faster with the decrease of tip clearance. The results show excellent agreement with the measurements and simulations, the error is less than 10%.

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