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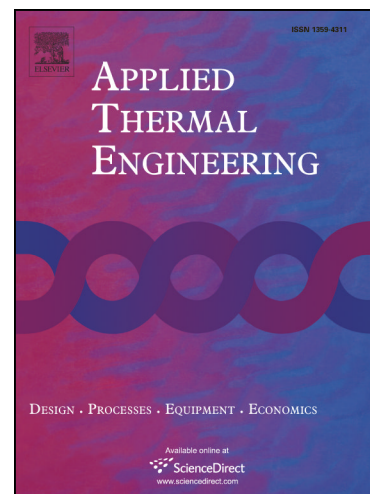
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# **Aerodynamic design method of micro-scale radial turbines considering the effect of wall heat transfer**

**Zhenpeng Li, Zhengping Zou<sup>\*</sup>, Lichao Yao, Chao Fu, Lei Bian,  
Weihao Zhang**

*National Key Laboratory of Science and Technology on Aero-Engine Aero-thermodynamics;  
Collaborative Innovation Center of Advanced Aero-Engine; aircraft/Engine Integrated System  
Safety Beijing Key Laboratory; School of Energy & Power Engineering, Beihang University,  
Beijing 100191, China*

**Abstract:** It is important to consider the effect of wall heat transfer in the one-dimensional design of a micro-scale radial turbine as wall heat transfer significantly affects the micro-turbine performance. A thermodynamic analytical model for a micro-turbine that considers the effect of wall heat transfer was developed based on theoretical analysis and empirical correlations, and was validated through numerical simulation. With this thermodynamic analytical model, the sensitivity and influence of the parameters on the micro-scale radial turbine aerodynamic performance were analyzed. The results show that, compared to other parameters, wall heat transfer is one of the most crucial factors affecting the aerodynamic performance of the micro-turbine, which cannot be neglected in the design process of the micro-scale radial turbine. On the basis of the analytical results above, a velocity triangle analytical model considering the effect of wall heat transfer was further proposed to benefit the improvement of a one-dimensional aerodynamic design

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<sup>\*</sup>Corresponding author.

*E-mail:* zouzhengping@buaa.edu.cn (Zhengping Zou)

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