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# Investigation on turbulent flow and heat transfer characteristics and technical economy of corrugated tube

Ming Sun<sup>1</sup>, Min Zeng<sup>2\*</sup>

<sup>1</sup>School of Economics and Management, Chang'an University, Xi'an Shaanxi 710064, China

<sup>2</sup>Key Laboratory of Thermo-Fluid Science and Engineering, Ministry of Education, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, China

**Abstract** In this work, experimental and numerical study was performed to determine the heat transfer and pressure drop characteristics of corrugated tubes. Measurement and simulation are conducted for three kinds of corrugated tubes. The corresponding plain tubes were simulated at the same time. In the numerical simulation the flow is modeled as being axisymmetric and fully elliptic by using body-fitted finite volume method and the Low-Re  $k-\varepsilon$  turbulent model. The uniform heat flux boundary condition is specified to simulate the electrical heat using in the experiments. The heat transfer performance of the corrugated tubes is compared with plain tubes under three constraints (identical mass flow rate, identical pumping power and identical pressure drop). The experimental results and numerical results are in good agreement. It was found that the corrugated tubes have a good synergy than plain tubes and an appreciable increase in heat transfer performance. The corrugated tube possesses a large market potential.

**Keywords:** Corrugated tube; Numerical simulation; Heat transfer; Turbulent flow

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\* Corresponding authors: zengmin@mail.xjtu.edu.cn (M. Zeng)

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