

Wall temperature fluctuations measurements downstream a hydraulic pipe junction using infrared thermography

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Abstract

Thermal fatigue issue is of concern when two flows with large temperature differences are mixing. In this study, a cylindrical pipe flow comes out in a main straight channel flow through an orthogonal junction. The aim of this work is to experimentally investigate temperature fields for turbulent water flows mixing in such configurations at low velocity ratios (i.e. secondary pipe flow velocity to main flow velocity ratio). As infrared measurements are difficult to perform because of the semi-transparent properties of liquid water, we focus on the development of a specific infrared thermography procedure to get wall temperature fields in a water flow downstream the mixing region.

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