**Theoretical and Experimental Study on Heat Transfer Characteristics of Normally Impinging Two Dimensional Jets on a Hot Surface**

Impinging air jets have been used in various industrial applications including the drying of paper, cooling of gas turbine blades and cooling of electronic components. Here, an attempt has been made to propose a theoretical model to predict the heat transfer characteristics of two dimensional impinging jets on a hot surface. Energy integral method is used to obtain the solution. Based on the analysis a generalized expression for Nusselt number is obtained involving various parameters such as: nozzle to plate distance, Prandtl number, Reynolds number and modeling parameter *k.* Tests have been carried out by using a two dimensional nozzle with length to diameter ratio of 70. Here, the Reynolds number and the nozzle to plate distance is varied between 7000 to 17000 and 1 to 10, respectively. A hot foil of 0.15 mm (SS 304) is used as the test specimen and air is used as the working fluid during experiments. The local heat transfer characteristics are estimated from the thermal images obtained from infrared thermal imaging camera (A655sc, FLIR System). The results obtained from the theoretical model are compared with test data obtained during present experimental investigation. Based on the test data, a correlation for Nusselt number is proposed as a function of nozzle to plate distance, Prandtl number, Reynolds number and radial distance.

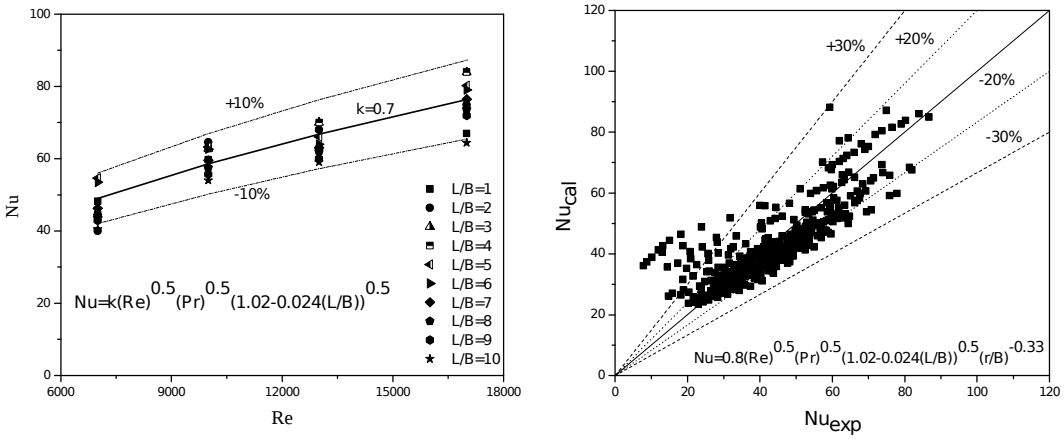


Fig.1: (a) Comparison of present predictions with the present test data (b): Comparison of predicted Nusselt number with experimental local Nusselt number