**A B S T R A C T**

Air Impinging Jet is an effective cooling method for various applications, ensuring optimal performance and reliability of heat-generation systems. In the present work, a novel technique of cooling discrete protruding heat sources mounted in a rectangular channel by using a double air jet is introduced experimentally. A constant and uniform heat flux is produced from protruding heat source surfaces where the bottom and the upper channel walls are insulated. The effects of various parameters on the heat source cooling performance such as the Nusselt number for single and double air jets are obtained. Various parameters such as the air Reynolds number, aspect ratio, double jet position ratio, and jet inclination angle are investigated. The results show that those parameters effectively affect the average temperatures and the standard deviation of all protruding heat sources. It is indicated that the maximum value of the average *Nu* number occurs at the heat source just underneath the impinging air jet compared to other downstream heat sources. The highest average *Nu* is achieved at a position ratio of 3/7 and an inclination angle of $10^{o}$. The cooling system accomplishes an acceptable *Nu* and temperature uniform distribution for a position ratio of 4/7 compared to the other position ratios. The improved performance and longevity of heat sources are achieved by the innovative double-air jet method, which archives a consistent temperature distribution for all projecting heat sources.