

عنوان مقاله:

Optimization of Synthetic Jet Position for Heat Transfer Enhancement and Temperature Uniformity of a Heated Wall in Micro-Channels

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خلاصه مقاله:

In this study, the synthetic jet position was optimized to obtain the maximum rate of heat transfer and the best state of temperature uniformity on a heated surface in micro-channels. Based on micro-channel length, several cases were simulated to investigate the effects of synthetic jet position on the heat transfer rate and temperature uniformity. After that, the synthetic jet position was optimized using the CFD results and the GMDH-MOGA optimization code. The obtained results show that the synthetic jet placement in all longitudinal positions of micro-channel increases the heat transfer rate, although the improvement of temperature uniformity of heated surface decreases at some positions as compared to the micro-channel without synthetic jet. The optimization results show that for obtaining the maximum value of heat transfer and the best state of temperature uniformity on the heated surface, the dimensionless longitudinal position of synthetic should be between 0.45 and 0.65. The maximum rate of heat transfer and the best state of temperature uniformity have been observed in the vicinity of lower and upper bounds of this range, respectively.

کلمات کلیدی:

channel, Micro, Position, Synthetic jet, Optimization

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