

Supplementary Material

Numerical Modeling and Analysis of Porous Surface-Enhanced Jet Cooling using Copper Inverse Opals in Single-Phase Flow

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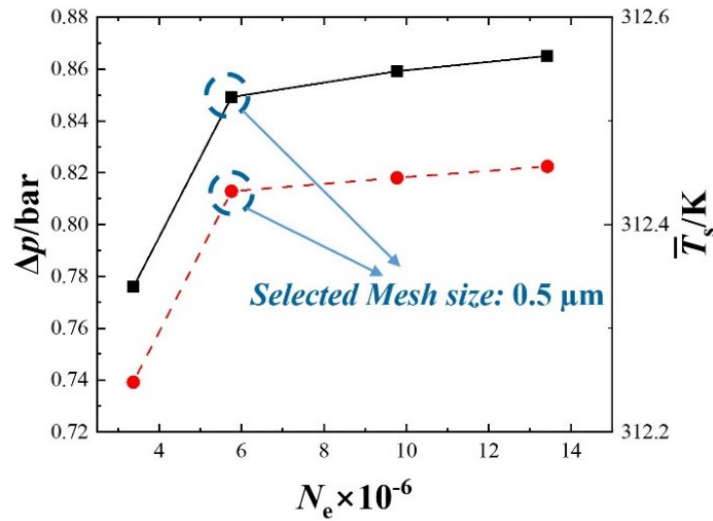


Figure S1. Mesh sensitivity analysis. The pressure drop of the cooler and average temperature of the chip interface are evaluated at different numbers of mesh cells (N_c) to check the mesh convergence. The black solid line represents the pressure drop and the red dotted line represents the average temperature. As the results only show a minimal variation after the mesh size reaches 0.5 μm , a maximum mesh size of 0.5 μm is selected.

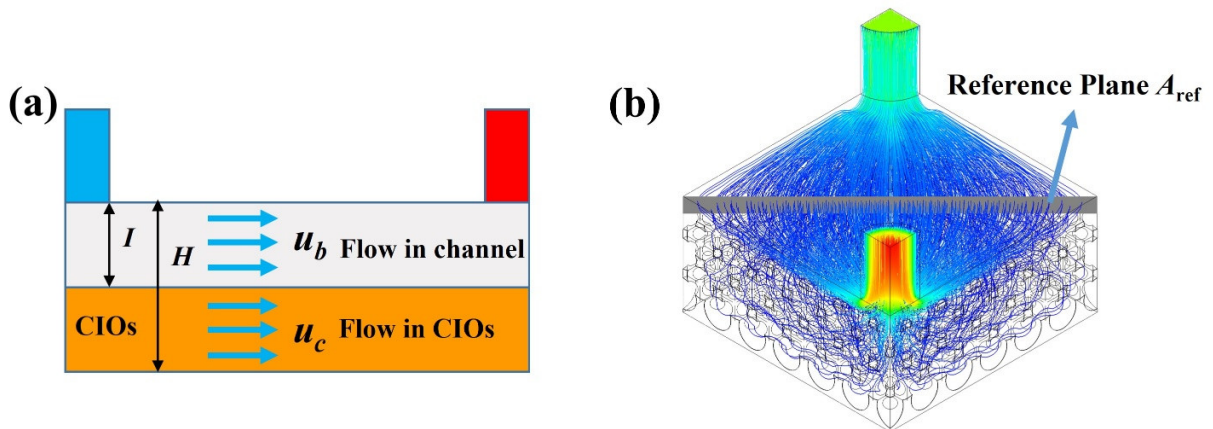


Figure S2. Assessment of flow bypass. (a) The inlet flow is divided into two parts, including the bypass flow in the microchannel over the CIOs and the flow in the CIOs. (b) A diagonal plane at the midpoint of the microchannel is set as a reference plane for defining and calculating the bypass ratio.