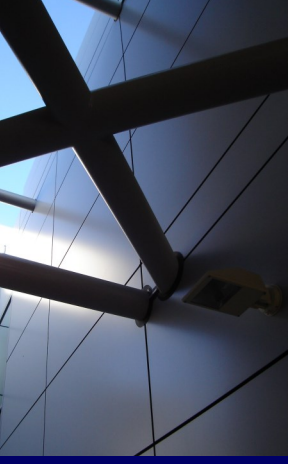

MECHANICAL ENGINEERING

The Department of Mechanical Engineering presents:

The Master's Dissertation Defense of:

Sainan Lu

Monday, December 7, 2015
2PM, Bourns Hall A265

A Comparative Analysis of Innovative Microchannel Heat Sinks for Electronic Cooling

Master of Science, Graduate Program in Mechanical Engineering
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Dr. Kambiz Vafai, Chairperson

In this work, a comparative analysis of innovative microchannel heat sinks such as two layered and multilayered microchannel heat sinks (MCHS), or thin films within flexible complex seals and cooling augmentation using microchannels with rotatable separating plates, is presented. A compilation of the numbers of layers, main characteristics, setups, advantages and disadvantages, thermal resistance, pumping power in double-layer (DL-MCHS) and multi-layer MCHS (ML-MCHS) is presented. In addition, the thermal resistance is analyzed in order to present a comparison between the single-layer MCHS (SL-MCHS) and multi-layer microchannels. The results of comparison indicates that double-layer and multi-layer MCHS have lower thermal resistance and require smaller pumping power and they resolve the high streamwise temperature rise problem of SL-MCHS.