

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Sweeping jet for convective heat transfer of a flat plate TONGIL PARK, KAIST , KURSAT KARA, Khalifa University, DAEGYOUM KIM, KAIST — A fluidic oscillator, which generates unsteady sweeping jet without any actuator and moving parts, has received much attention due to its attractive features: high durability to shock and vibration and no electromagnetic interference. In this work, we apply the fluidic oscillator to improve the performance of convective heat transfer. The sweeping jet impinges vertically on a heated flat plate. By varying Reynolds number and nozzle-to-plate spacing, we experimentally investigate the characteristics of a heat transfer rate of the plate and examine flow fields to find the flow characteristics responsible for enhancing heat transfer. Temperature on the plate was measured with thermocouples, and flow fields were obtained with planar particle image velocimetry. From the flow fields, dominant flow structure is extracted using proper orthogonal decomposition.

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Date submitted: 31 Jul 2017

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