Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Flow field and heat transfer characteristics in a model solar PV farm[1] JAMES MCNEAL, ANDREW GLICK, NASEEM ALI, JULIAAN BOSSUYT, GERALD RECKTENWALD, Portland State University, Maseeh College Of Engineering,, MARC CALAF, The University of Utah, Department of Mechanical Engineering, RAL BAYON CAL, Portland State University, Maseeh College Of Engineering, — Large scale solar farms supply an increasing amount of the world's electricity supply. However, high operation temperatures can strongly reduce efficiency and panel lifetime, negatively affecting the levelized cost of energy. In this work, the convective heat transfer coefficient for a utility-scale solar farm is studied using thermal and particle image velocimetry measurements in a scaled wind tunnel experiment. The results confirm the applicability of the scaled experimental setup to studies of large solar arrays. Further, the velocity measurements indicate the complex flow structure within the solar array, governed by wakes directed upwards due to the orientation of the solar panels.

[1]This work is funded by the US Department of Energy (DOE) PVRD2 program under award number DE-EE0008168.

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Date submitted: 02 Aug 2019 Electronic form version 1.4