Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Gravity Effects on Pool Boiling[1] AKASH DHRUV, ELIAS BALARAS, George Washington Univ, AMIR RIAZ, JUNGHO KIM, University of Maryland, College Park — Nucleate pool boiling simulations are carried out to study the effect of variable gravity on the dynamics of bubble formation, bubble departure and bubble interaction. The focus is on identifying dominant trends in flow and thermal behavior at different gravity levels at fixed values of wall superheat and liquid subcooling. From the characterization of turbulence intensity and time averaged fluctuations of velocity and heat flux it is found that the wall heat flux conditioned by the wetted surface area - the liquid heat flux - provides a useful indication of high heat flux hot spots. The significance of near-wall, small scale bubble dynamics is reflected in the transition of vorticity structures from hairpin type vortices in the near-wall region to vortex ring patterns away from the wall. Our observations reveal the significance of small scale dynamics at low gravity levels that were previously thought to be dominated mostly by large bubbles.

[1]NASA Grant NNX16AQ77G

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Date submitted: 03 Aug 2020 Electronic form version 1.4