

Nuclear Engineering Seminar

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3:30 pm | PHYS 114

Quantitative Validation of Gas-Liquid Annular Flow Regime Simulations using Eulerian-Eulerian CFD Models

Abstract

Quantitative validation of a Computational Fluid Dynamics (CFD) code is about making point-to-point comparisons over fields of data to make statements about predictive fidelity. By the very nature of CFD, these comparisons are high performance computing (HPC) and data intensive. This presentation provides an overview of workflow development toward quantitative validation of two-phase CFD codes. NNL is developing multi-field two-fluid capability in the commercial CFD code ANSYS CFX applicable to boiling gas-liquid two-phase flows. Approaches to validating three-dimensional predictions in the horizontal annular flow regime will be discussed.

Dr. Buchanan is an Advisor Engineer at the Naval Nuclear Laboratory. His expertise is in computational fluid dynamics and validation experiments for single- and two-phase flows. Jack has published research in bio-fluid mechanics, gas-liquid two-phase flows, and boiling heat transfer spanning experimental methods and computational predictions. He serves as a reviewer for Department of Energy research proposals, several journals, as well as ASME and ANS conferences. In his free time, Jack enjoys hiking, music, is a lead mentor for FRC Robotics Team 3260, and watches too much soccer. He holds a B.S. in Mechanical Engineering from Johns Hopkins University, and M.S. and Ph.D. in Mechanical Engineering from North Carolina State University with a Computational Engineering and Sciences minor.