Multi-plane Particle Shadow Velocimetry for Validation of Turbulence Models
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Time: 9:30 – 10:20 AM
Location: 260 Willard
Coffee and donuts will be provided

Abstract:

Multi-plane particle shadow velocimetry (PSV) is a relatively new variant of standard PSV and dual-plane particle image velocimetry (PIV). With this technique, the simultaneous acquisition of two (or more, potentially) planar velocity fields is accomplished without the expense of a laser. This technique was originally conceived for validation of turbulence models in a test facility not ideally suited for validation, so a short description of how this technique fits into the validation process is described. Results from canonical measurements are compared with proven techniques. One motivation for this measurement technique is to quantify the integral length scale along the optical axis and the method to accomplish this is described. A unique aspect of the uncertainty of this measurement includes the depth of field, which is larger than standard PIV measurements. Efforts to quantify this uncertainty source in relation to the measured velocity is outlined.

Bio:

Jeff R. Harris is a Research Associate in the Fluids Research Department at the Applied Research Laboratory at Penn State and received his Ph.D. from Utah State University in 2014. Dr. Harris has worked with the Idaho National Laboratory, the Department of Energy, the Department of Defense, and several industrial partners on experimental endeavors involving model and design validation. Dr. Harris’s areas of interest include model, design, and CFD validation and the improvement or development of the related measurement techniques; convective flow; nuclear and alternative energy; and heat transport.