Abstract Submitted
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Uncertainty in Laser Doppler Velocimetry Measurements

PATRICK YOUNK, Los Alamos National Lab — Laser Doppler velocimetry, also known as photonic Doppler velocimetry (PDV), is a diagnostic commonly used in shock compression experiments. To quantitatively compare experimental results to computational results, the uncertainty in the velocimetry measurements must be well characterized. That is, we must know which features in the experimental data are statistically significant and which are not. In this talk, I will present recent work on understanding the precision, accuracy, and resolution of PDV measurements. I will discuss how the uncertainty is a function of signal strength, signal digitization, noise (both white and structured), sampling frequency, and sampling period, and how the uncertainty is influenced by the analysis method. I will show how a knowledge of uncertainty can be used to rigorously compare experiment with computational predictions.

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Patrick Younk
Los Alamos National Lab

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