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Multi-plane Particle Shadow Velocimetry to Quantify Integral Length Scales JEFF HARRIS, CHRISTINE TRUONG, STEVEN HINKLE, KYLE SINDING, Pennsylvania State Univ, TIFFANY CAMP, General Electric, ARNIE FONTAINE, MICHAEL KRANE, DAVID DEVILBISS, Pennsylvania State Univ — Multi-plane PIV has been used for several years to assist in quantifying the integral length scales in turbulent flow. Particle shadow velocimetry (PSV) enables illumination of a volume and is an efficient means of obtaining multi-plane illumination. The combination of two colors in the LED backlight and a dichroic mirror makes possible the imaging of two planes in space without the complexity of aligning two different light sources. The velocity fields obtained in these two vector fields are then correlated to obtain length scales using the definitions in the literature. The length scales and multi-plane measurements are compared with previous studies which used proven measurement methods.

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