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**Novel Volumetric Size and Velocity Measurement of Particles Using Interferometric Laser Imaging** R. GUNAWARDANA, M. ZARZECKI, F.J. DIEZ, Rutgers University — Global Sizing Velocimetry (GSV) is a recently developed technique for characterizing the particle size distribution and flow velocity in a plane and in this research we extend this measurement to a volume through a laser scanning system. In GSV, a LASER sheet is used to illuminate translucent particles in a spray or flow field and the camera image is de-focused a known distance to create interference patterns. The diameters of the particles in the flow field are calculated by measuring the inter-fringe spacing in the resulting interferogram. Particle Imaging Velocimetry (PIV) techniques are used to compute velocity by measuring the particle displacement over a known short time interval. Researchers have recently begun applying GSV techniques to characterize sprays in a plane as it offers a larger area of investigation than other well known techniques such as Phase Doppler Anemometry (PDA). In this paper we extend GSA techniques from the current planar measurements to a volumetric measurement. The approach uses a high speed camera to acquire GSA images by scanning multiple planes in a volume of the flow field within a short period of time and obtain particle size distribution and velocity measurements in the entire volume.

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