

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Simultaneous Measurements of Pressure and Velocity in Gas Phase Flows via Pressure-Sensitive Microspheres¹ FLETCHER KIMURA, DANA DABIRI, GAMAL KHALIL, YOUNAN XIA, JAMES B. CALLIS, University of Washington — Airborne, pressure-sensitive polystyrene microspheres (PS-Beads) were used to obtain simultaneous pressure and velocity measurements of gas phase flows. The PSBeads, 2.5 μm in diameter, contained a pressure-sensitive luminophor (platinum octaethylporphyrin) that was incorporated into the polymer microspheres during the polymerization process. Pressure measurements of airborne PSBeads were made using the modified Rapid Lifetime Determination method, a technique that allows for simultaneous velocity measurements using a single CCD. Work will be presented showing the titration of airborne PSBeads in gases ranging from 0 to 21% oxygen. In addition, pressure and velocity measurements of the gas phase flow within sealed syringe will also be shown. Initial studies suggest that pressure variations as small as 10% can be detected by the airborne PSBeads without the benefit of signal averaging.

¹This work is supported by the NSF (0517782), AFOSR STTR AF04-T001, ISSI., and the UW RRF (65-1295).

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Date submitted: 09 Dec 2008

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