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Development of Pressure Sensitive MicroBeads for the Simultaneous Measurements of Pressure and Velocity[1] FLETCHER KIMURA, MIGUEL RODRIGUEZ, JESSE MCCANN, University of Washington, DANA DABIRI, University of Washington.edu, GAMAL KHALIL, JAMES CALLIS, YOUNAN XIA, MARTIN GOUTERMAN, BRENDEN CARLSON, University of Washington — We have recently synthesized pressure sensitive microbeads (PSBeads) consisting of a platinum octaethylporphryin luminophore in a polystyrene matrix, and a novel osmium-based luminophore in a silicon dioxide matrix. Since these PSBeads are to provide simultaneous measurements of pressure and velocity in turbulent and/or high speed flows, their response times must be sufficiently fast. A shock tube was constructed to provide a test facility where the response time of the microspheres could be reliably measured. Initial studies showed response times are on the order of 20 μs – 2 ms when exposed to shock strengths of $\sim$1.07 M ($\Delta P \approx$ 10-12 kPa). We further use this facility to obtain preliminary simultaneous pressure and velocity measurements before and after a shock wave.

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