Optically–Sectioned Micro PIV Measurements Using CLSM*

- Full-field flow mapping at the bubble front advancing in a rectangular cross-sectioned microchannel -

J. S. Park, C. K. Choi and K. D. Khim
Texas A&M University, College Station, Texas

J. S. Allen
NASA Glenn Research Center, Cleveland, Ohio

The Confocal Laser Scanning Microscope* (CLSM) enables optically sectioned μ-PIV measurements with extremely shallow field-of-depth of 1.0-μm and a lateral resolution better than 0.5-μm. Hollow sphere, 200-μm fluorescent particles are used as tracers to achieve a full-field, optically sectioned flow velocity vector mapping, for the region at the gas bubble front, advancing in two different microchannels of 500-μm by 500-μm (Capillary number = 6.11x10^{-6}), and 100-μm by 100-μm (Ca = 1.39x10^{-6}) square cross-sections. This work is supported by the NASA OBPR-Fluid Physics Research Grant (NAG3-2712) and the CLSM was purchased by the Permanent University Facility Award from Texas A&M University.