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**Experimental investigation of particle dynamics and blockage at microchannel inlet** EIICHIRO YAMAGUCHI, University of illinois at Urbana-Champaign, RONALD ADRIAN, Arizona State University — Experimental investigation and visualization of particle motion around microchannel inlet have been conducted over range of $0.2 \leq R \leq 0.67$ and $0.32 \leq Re \leq 14.43$, where R is ratio of particle and channel hydraulic diameter. The experimental results indicate that probability of channel blockage by the particles depends largely on the inlet configuration and flow condition. Especially for shear-induced blockage formation with relatively large R, flow condition and particle dynamics in developing flow region around the channel inlet is responsible for maximum 70% of total blockage occurrence. Optical measurement of flow and particles support the experimental data, and indicate that collision of particle against the channel wall around inlet increases collision rate between particles. The collision rate of particle and the inlet is defined by R, relative motion of flow and particle at developing region and approaching velocity toward the wall can be characterized by particle/fluid density ratio and Re, and geometrical configuration of inlet defines how all parameters are combined. Flow visualization of inlet with various shapes and experimental results of the blockage probability will be presented.

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