Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

PIV measurements of the transient fluid flow due to the adsorption of particles[1] NAGA MUSUNURI, PRARTHITH B. SHAH, IAN S. FISCHER, PUSHPENDRA SINGH, New Jersey Institute of Technology — The particle image velocimetry (PIV) technique is used to study the physics of particle adsorption and the spontaneous dispersion of powders that occurs when particles come in contact with a fluid-liquid interface. The dispersion can occur so quickly that it appears explosive, especially for small particles on the surface of mobile liquids like water. The measurements show that the adsorption of a spherical particle causes an axisymmetric streaming flow about the vertical line passing through the center of the particle. The fluid directly below the particle rises upward, and near the surface, it moves away from the particle. The flow, which develops within a fraction of second after the adsorption of the particle, persists for several seconds. The flow strength, and the volume over which it extends, decrease with decreasing particle size. The streaming flow induced by the adsorption of two or more particles is a combination of the flows which they induce individually.

[1]We would like to thank NSF.

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Date submitted: 29 Jul 2013 Electronic form version 1.4