

Abstract Submitted
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PIV measurements of the streaming fluid flow due to the adsorption of particles¹ HARSH PATEL, NAGA MUSUNURI, EDISON AMAH, IAN FISCHER, PUSHPENDRA SINGH, NJIT — The particle image velocimetry (PIV) technique is used to study the streaming flow that is induced when a spherical particle is adsorbed at a liquid surface. The flow causes powders sprinkled on a liquid surface to disperse on the surface. 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, decreases 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.

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