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Breakup of particle clumps on liquid surfaces S. GURUPATHAM, M. HOSSAIN, B. DALAL, I. FISCHER, P. SINGH, New Jersey Institute of Technology, D. JOSEPH, University of Minnesota — In this talk we describe the mechanism by which clumps of some powdered materials breakup and disperse on a liquid surface to form a monolayer of particles. We show that a clump breaks up because when particles on its outer periphery come in contact with the liquid surface they are pulled into the interface by the vertical component of capillary force overcoming the cohesive forces which keep them attached, and then these particles move away from the clump. In some cases, the clump itself is broken into smaller pieces and then these smaller pieces break apart by the aforementioned mechanism. The newly-adsorbed particles move away from the clump, and each other, because when particles are adsorbed on a liquid surface they cause a flow on the interface away from themselves. This flow may also cause particles newly-exposed on the outer periphery of the clump to break away. Since millimeter-sized clumps can breakup and spread on a liquid surface within a few seconds, their behavior appears to be similar to that of some liquid drops which can spontaneously disperse on solid surfaces.

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