

Abstract Submitted  
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**Speckle Visibility Spectroscopy and Bubble Rearrangements**

ALEX GITTINGS, UCLA, DOUGLAS DURIAN, Penn — We use Speckle Visibility Spectroscopy (SVS) to study bubble rearrangements in aqueous foams. SVS is a new dynamic light scattering technique based upon the visibility of a speckle pattern for a given exposure time [1]. Unlike more traditional dynamic light scattering, such as diffusing wave spectroscopy, the dynamics are determined from an ensemble average over camera pixels. This allows resolution of motion that changes systematically and rapidly with time. Our foam sample is contained within a thick glass cell, one face of which is entirely covered with absorbing black tape. Laser light is both introduced and collected at a 1-mm diameter hole punched in the tape. We use a 50 kHz line scan camera and image several speckles per pixel. Probability distributions are determined for the bubble velocity, duration, and time between rearrangements events for several foam ages.

[1] Speckle Visibility Spectroscopy and Variable Granular Fluidization P. K. Dixon and D. J. Durian, Phys. Rev. Lett. 90, 184302 (2003).

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