Abstract Submitted
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Speckle Visibility Spectroscopy and Bubble Rearrangements A. S. GITTINGS, UCLA, D. J. 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. Bubble rearrangement velocity is determined from the variance of intensity across pixels vs. exposure time. The duration of bubble rearrangements is easily found from a picture plot of pixel visibility as the 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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