

Seminar

Stress banding in compressed quasi-two-dimensional aqueous foams

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We present results from a study of the compression of a quasi-two-dimensional aqueous foam in a Hele-Shaw cell. Our results show that during compression, the (spatially-averaged) normal-stress difference localizes in bands with a wavelength of the order of the mean diameter of a bubble. Stress field colormaps are constructed by image analysis and used to visualize the bands. We investigate the phenomenon by varying the mean bubble diameter and polydispersity. We quantify the extent of (global) compression by measuring the average of an anisotropy ratio for the strain eigenvalues, and find the probability distribution of the angle between corresponding eigenvectors of the stress and strain tensors. We show that these stress bands are ruptured in regions in which avalanches of neighbour-switching T1 events occur, which suggests local stress relaxation in these regions.

Thursday, May 2nd 2019

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H