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Elastic properties of compressed emulsions IVANE JORJADZE, JASNA BRUJIC, NYU — Visualizing the packing of a dense emulsion in 3D as a function of the external pressure allows us to characterize the geometry and the local stress distribution inside this jammed system. We first test the scaling laws of the pressure and average coordination number over two orders of magnitude in density. We find deviations from theoretical exponents due to the non-affine motion of the particles. Second, we observe that the distribution of forces changes from a broad exponential at the jamming point to a narrower Gaussian-like distribution under high compression. Finally, we calculate the density of states from the measured force network in the approximation of a harmonic potential. Close to jamming, the number of low frequency modes is high, while the application of pressure shifts the distribution to higher frequencies, indicative of a rigid network. The confocal images reveal the structural features associated with the low frequency modes, as well as their localization within the packing. These data are then compared with published results from numerical simulations.

[X] Prefer Oral Session
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