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Local Rearrangements of Droplets in a Dense Emulsion Under Shear Rearrangements VISHWAS VENKATESH, Georgetown University, SUDEEP DUTTA, University of Maryland, EMANUELA DEL GADO, DANIEL BLAIR, Georgetown University — Jammed suspensions can flow when subjected to shear deformation. The flow properties are complex, depend on shear rates and can be inhomogeneous through the material. The microscopic origin of such flow properties is still a subject of intense research. In this work, we present a study of jammed emulsions under shear deformation, using a combination of experiments and molecular dynamics simulations. In the steady state regime, we investigate the local rearrangement of jammed emulsion droplets at a wide range of shear rates and shear strains and characterise the local rearrangement of droplets in terms of mean square displacement (MSD), displacement maps and displacement correlation function. At small shear strains and high shear rates, we find localised flow events and super diffusive motion of droplets. But at low shear rates, we observe emerging shear localisation from plastic events in an elastic background and avalanches. The characterisation of local rearrangements is also done in the stress over-shoot regime as well in the regime approaching the steady state stress. We observe a transient shear banding that progressively disappears as the pressure reaches a steady state value.

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