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Two-dimensional plastic flow of foams and emulsions in a channel: experiments and simulations[1] MAURO SBRAGAGLIA, University of Rome "Tor Vergata," via della ricerca scientifica 1, 00133 Roma (Italy), ANDREA SCAGLIARINI COLLABORATION, BENJAMIN DOLLET COLLABORATION — In order to understand the flow profiles of complex fluids, a crucial issue concerns the emergence of spatial correlations among plastic rearrangements exhibiting cooperativity flow behaviour at the macroscopic level. In this paper, the rate of plastic events in a Poiseuille flow is experimentally measured on a confined foam in a Hele-Shaw geometry. The correlation with independently measured velocity profiles is quantified by looking at the relationship between the localisation length of the velocity profiles and the localisation length of the spatial distribution of plastic events. To complement the cooperativity mechanisms studied in foam with those of other soft glassy systems, we compare the experiments with simulations of dense emulsions based on the lattice Boltzmann method, which are performed both with and without wall friction. Finally, unprecedented results on the distribution of the orientation of plastic events show that there is a non-trivial correlation with the underlying local shear strain. These features, not previously reported for a confined foam, lend further support to the idea that cooperativity mechanisms, originally invoked for concentrated emulsions (Goyon et al., Nature, vol. 454, 2008, pp. 8487), have parallels in the behaviour of other soft glassy ma

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