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Numerical modeling of flowing soft materials FEDERICO TOSCHI, Eindhoven University of Technology, The Netherlands, ROBERTO BENZI, University of Rome Tor Vergata, Italy, MASSIMO BERNASCHI, IAC-CNR, Rome, Italy, PRASAD PERLEKAR, Eindhoven University of Technology, The Netherlands, MAURO SBRAGAGLIA, University of Rome Tor Vergata, Italy, SAURO SUCCI, IAC-CNR, Rome, Italy — The structural properties of soft-flowing and non-ergodic materials, such as emulsions, foams and gels shares similarities with the three basic states of matter (solid, liquid and gas). The macroscopic properties are characterized by non-standard features such as non-Newtonian rheology, long-time relaxation, caging effects, enhanced viscosity, structural arrest, hysteresis, dynamic disorder, aging and related phenomena. Large scale non-homogeneities can develop, even under simple shear conditions, by means of the formation of macroscopic bands of widely different viscosities ("shear banding" phenomena). We employ a numerical model based on the Lattice Boltzmann method to perform numerical simulations of soft-matter under flowing conditions. Results of 3d simulations are presented and compared to previous 2d investigations.

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