Droplets dynamics and breakup in turbulent flows FEDERICO TOSCHI, Eindhoven University of Technology, The Netherlands, LUCA BIFERALE, University of Tor Vergata, Roma, Italy, PRASAD PERLEKAR, Eindhoven University of Technology, The Netherlands, MAURO SBRAGAGLIA, University of Tor Vergata, Roma, Italy — Turbulent emulsions are of relevance to many Natural and industrial flows alike. In order to study the statistical properties of droplets deformation and breakup in turbulence we perform high resolution numerical simulations of a multicomponent flow composed by two fluid with equal density. We aim at investigating the interplay between turbulent fluctuations and surface tension. The flow is solved in a cubic periodic box with a stirring at the largest scales in order to realize an homogeneous and isotropic turbulent flow field. The numerical simulations are performed by means of a fully-parallel Lattice Boltzmann code where the two fluid components are described by means of a Shan-Chen model without need for explicit interface tracking. Our numerical experiment allow to investigate e.g. the probability distribution function of droplet radii and the physics of the exchange of energy between surface and fluid fluctuations. We present preliminary results for a selected number of problem parameters.

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