Abstract Submitted
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Coalescence and Break-up of large, deformable droplets with different viscoties in turbulent channel flow[1] ALESSIO ROCCON, University of Udine, FRANCESCO ZONTA, TU Wien, ALFREDO SOLDATI, Tu Wien,University of Udine — The dynamics of large, deformable droplets released in a turbulent channel flow is numerically analyzed. Pseudo-Spectral direct numerical simulations are based on the resolution of the coupled Navier-Stokes and Cahn-Hiliard equations (Phase-Field Model). The droplets have the same density but different viscosity compared to the surrounding fluid. We first focus on droplets coalescence and break-up rate. Two different dynamic are observed, depending on the Weber number We, (which measures the ratio between the inertial forces and the surface tension forces) and the viscosity ratio λ, (ratio between the viscosity of the drop and the continuous phase). For small We, droplets are only slightly deformed and their viscosity does not influence much the coalescence/break-up rate. For larger We, droplets are deformable and their viscosity can significantly alter the coalescence and break-up dynamics.

[1]PAR FSC 2007-2013, Regione FVG Underwater Blue Efficiency

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