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Droplet dynamics in homogeneous isotropic turbulence DANIEL ALBERNAZ, MINH DO-QUANG, GUSTAV AMBERG, Kungliga Tek Hogskolan KTH — This study investigates the droplet dynamics in homogeneous isotropic turbulence using a lattice Boltzmann model for multiphase flows. The thermodynamics is taken into account with a non-ideal equation of state allowing phase change and by solving a scalar transport energy equation. The system is considered close to the critical point, where a saturated hydrocarbon droplet is surrounded by vapor. The droplet deformation and frequency spectra are analyzed in detail, where the surface tension and local temperature gradients play a major role. The effects of the turbulence intensity and droplet size are also discussed. The droplet behavior under turbulent flows is essential to gain in-depth insight into the different physical phenomena taking place inside sprays and liquid jets.

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