

Abstract Submitted  
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**DNS of turbulent flows laden with deformable bubbles or droplets: Recent advances** SAID ELGHOBASHI, University of California, Irvine — Turbulent flows laden with liquid droplets or gas/vapor bubbles are ubiquitous in nature and engineering applications. In nature, examples include rain, air bubbles in the upper ocean, and vapor bubbles in geysers. Engineering applications include liquid fuel sprays in all types of combustion engines, paint sprays, spray drying in the pharmaceutical industry as well as food processing, and water vapor bubbles in nuclear reactor cooling systems or those created by cavitation in the wakes of ship propellers, just to list a few. We discuss recent advances in the numerical methods<sup>1</sup> of deformable large spherical bubbles/droplets whose initial sizes are larger than the Kolmogorov length scale,  $\eta$ . The methods include the Conservative Level Set (CLS), Volume of Fluid (VOF), Front Tracking (FT), Phase Field Model (PFM), and Lattice Boltzmann (LB).

<sup>1</sup>Elghobashi, S. “ Direct Numerical Simulation of Turbulent Flows Laden with Droplets or Bubbles”, *Annu. Rev. Fluid Mech.* 2019, 51:217-244.

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