

Internal Webinar

Interaction of buoyant bubbles with turbulence

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The flows with a suspension of deformable bubbles are omnipresent in a variety of natural and industrial processes. In this talk, I will present the statistical properties of buoyancy-driven bubbly flows in the presence of large-scale driving that generates turbulence. Although the bubbles are weakly buoyant in our study, we show that the statistical properties of the velocity fluctuations are consistent with experiments on air bubbles in the water. We find that the kinetic energy spectrum shows a scaling $E(k) \sim k^{-3}$, for length scales smaller than the bubble diameter and a Kolmogorov scaling $E(k) \sim k^{-5/3}$, for scales larger than the bubble diameter. Finally, we study the scale-by-scale energy budget analysis to understand the scaling behaviour observed in the spectrum.

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10:30 AM