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Dispersed Microbubble-Laden Turbulent Flow Based on High-Order Euler-Lagrange Approach

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To resolve multiphase flow, specifically dispersed phase flow, tracking the dispersed phase's trajectory is crucial. The Euler-Lagrange approach is adopted to predict the interaction between the dispersed phase (microbubble) and the continuous phase (turbulence). The Lagrangian tracking code, ppiclF (parallel particle-in-cell library written in Fortran), and the spectral element method code, Nek5000, are combined to simulate microbubble-laden turbulent flows. In this presentation, the developed microbubble models and microbubble dynamics in the turbulent channel flow will be introduced. Turbulent quantities such as turbulent boundary layer and Reynolds stresses are compared with respect to the size and number of bubbles. Additionally the drag reduction mechanism by microbubbles is analyzed.

Relevance for Nek [100 words max]

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