Applications of the Front-Tracking algorithm of TrioCFD to turbulent bubbly flows in plane channels.

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Description:

The Front-Tracking method has been implemented in TrioCFD and improved over the last decade. It has been widely used on large parallel architectures to study incompressible two-phase flows. The permanent increase in computing capabilities allows to perform simulations of fully turbulent bubbly flows in relatively small periodic domains. This talk will be organized in two parts. The numerical method used to perform Front-Tracking simulations will be presented. The code is capable to deal with phase change and specific Ghost-Fluid Methods have been implemented to guarantee a great accuracy of the solution, even in the presence of large jumps and phase change.

Then, recent calculations on adiabatic two-phase turbulent bubbly flows will be presented. Averaged results are analyzed in great details in order to better understand the dominant processes in the exchange mechanisms at the interface and in the modulation of turbulence by the vapor inclusions and their wakes. Preliminary results and suggestions for the two-fluid model will conclude the presentation.