Microbubble clustering in turbulent flow ENRICO CALZAVARINI, THOMAS H. VAN DEN BERG, University of Twente (The Netherlands), STEFAN LUTHER, CORNELL , (USA), FEDERICO TOSCHI, IAC - CNR and INFN (Italy), DETLEF LOHSE, University of Twente (The Netherlands) — Single-point hot-wire measurements in the bulk of a turbulent channel have been performed in order to detect and quantify the phenomenon of bubble preferential accumulation. We show that statistical analysis of the bubble-probe colliding-times series can give a robust method for investigation of clustering in the bulk regions of a turbulent flow where, due to the opacity of the flow, no imaging technique can be employed. We demonstrate that micro-bubbles $(R_0 \simeq 100 \ \mu m)$ in a developed turbulent flow, where the Kolmogorov length-scale is $\eta \simeq R_0$, display preferential concentration in small scale structures. In particular, it is found that the clustering process is enhanced by increasing the turbulence intensity. A comparison with Eulerian-Lagrangian numerical simulations has also been performed and arising similarities and differences will be discussed.

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