Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Recent advancements in tracer particle based-interface reconstruction MASSIMILIANO ROSSI, CHRISTIAN CIERPKA, RODRIGO SEGURA, CHRISTIAN J. KÄHLER — Tracer particles are commonly used in experimental fluid dynamics to probe the velocity of a flow. An example are particle tracking velocimetry methods (PTV), in which the velocity field is obtained by tracking the position of individual tracer particles in a control volume at different time instants. It has been recently demonstrated how this approach can be extended to successfully reconstruct the interface between two fluid phases. This procedure has some advantages compared to traditional methods using dye visualization, since the diffusion coefficient of tracer particles is considerably smaller than the one of molecular dyes and the 3D topology of an interface can be obtained from a single recording (using 3D-PTV), with no need of scanning procedures. The main limitation of this approach is clearly due to the resolution of the reconstruction that is constrained to the tracer particle density. In this work, the latest developments of this method are presented, in particular showing the possibility to perform 3D-time-resolved measurements. Results on the shape of droplets and free-surface waves are provided.

Massimiliano Rossi
Bundeswehr University Munich

Date submitted: 15 Aug 2011 Electronic form version 1.4