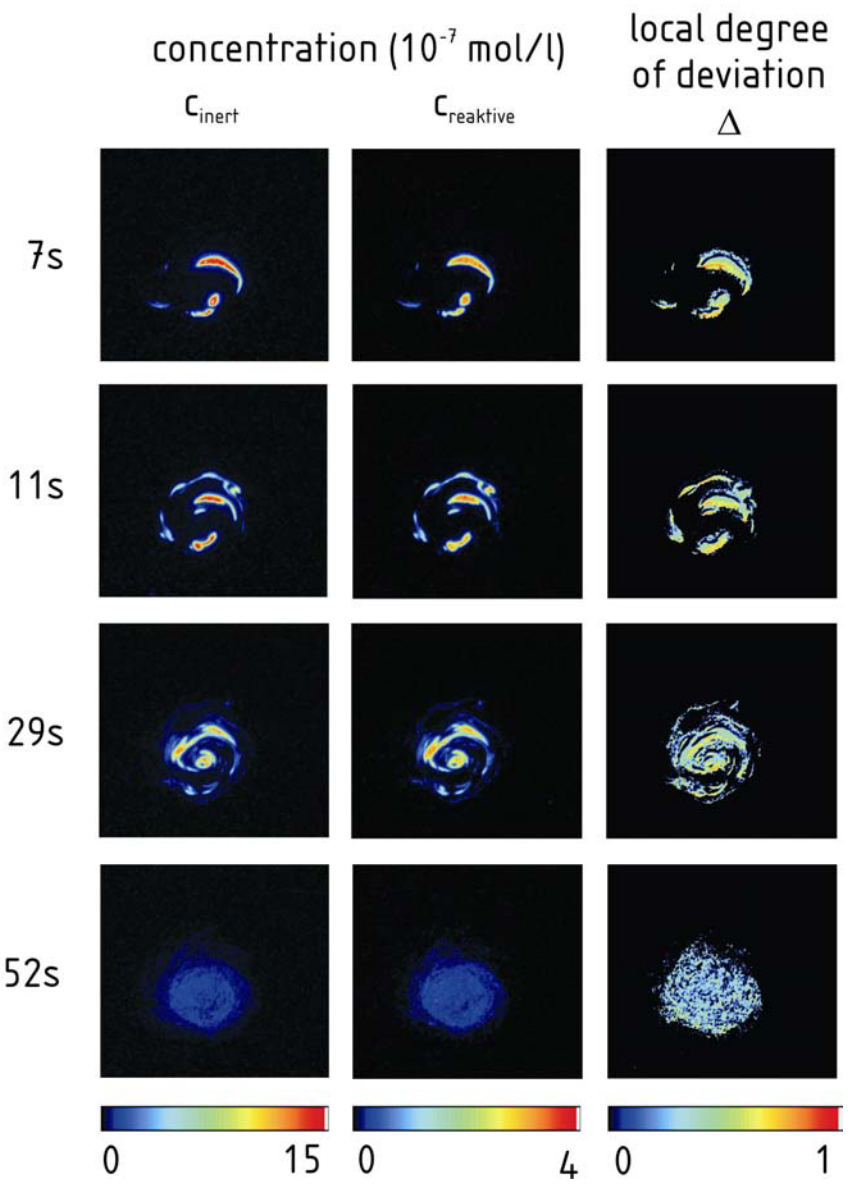
Journal of Visualization, Vol. 6, No. 3 (2003) 208

Quantitative Measurements of Micro- and Macromixing in a Stirred Vessel using Two-color Laser Induced Fluorescence

Kling, K. [1] ***and Mewes, D.*** [1]

1) Institute of Process Engineering, University of Hannover, Callinstr. 36, 30167 Hannover, Germany, E-mail:dms@ifv.uni-hannover.de



The two-color Laser Induced Fluorescence technique (LIF) gives new insight into the mixing process. A mixture of two fluorescent dyes is injected into the vessel. The inert dye serves as a tracer for the convective transport, i.e. the macromixing. The fluorescent chracteristics of the reacting dye change while undergoing a fast chemical reaction with the vessel content and therefore show the micromixing. The concentration fields of the dyes are measured simultaneously. Low Reynolds number measurements in a mixing vessel equipped with a Rushton turbine clearly show the lamellar structure. Areas of micromixing are detected by calculating the local degree of deviation from the concentration fields. These areas are mainly found in the boundary layer of the lamellas.