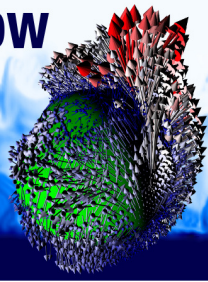


Multiphase Flow Laboratory



University of Udine



LABORATORY FOR ENVIRONMENTAL & PROCESS FLUID MECHANICS

MULTIPHASE FLOW LABORATORY

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Modeling of Turbulent Dispersed Flows

Doctoral Course - EPFL (Lausanne)

Instructor: Alfredo Soldati

Handouts:

[Course syllabus](#) in pdf format (30Kb)

[Notes on diffusion into a falling film](#) in pdf format (1.5Mb)

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[Lessons 1 and 2](#) in pdf format (3.5Mb)

[Paper by Marchioli et al., Phys. Fluids \(2006\)](#) in pdf format (2.1Mb)

[Lesson 3](#) in pdf format (2.6Mb)

[Paper by Marchioli et al., Phys. Fluids \(2008\)](#) in pdf format (0.4Mb)

[Paper by Guha, Ann. Rev. Fluid Mech. \(2008\)](#) in pdf format (0.6Mb)

[Paper by Soldati, ZAMM \(2005\)](#) in pdf format (3.4Mb)

[Paper by Lumley and Yaglom, Flow Turb. Combustion \(2001\)](#) in pdf format (0.25Mb)

[Paper by Hussain, Phys. Fluids \(1983\)](#) in pdf format (3.7Mb)

[Lesson 4 \(by Dr. Abdel Dehbi, PSI\)](#) in pdf format (1.2Mb)

[Particles dispersion in synthetic turbulence](#) in .avi format (27.6Mb)

[Lesson 5](#) in pdf format (4.0Mb)

[Paper by Sbrizzai et al., Flow Turb. Combustion \(2008\)](#) in pdf format (1.5Mb)

[Lesson 6](#) in pdf format (1Mb)

[Prof. Serizawa: Reduction of wall friction with microbubbles, Tokyo \(2005\)](#) in pdf format (0.5Mb)

[Mechanism for microbubble transfer in the near-wall region of turbulent boundary layer \(2005\)](#) in pdf format (4.2Mb)

[Paper by Lu and Tryggvason, Chem. Eng. Science \(2007\)](#) in pdf format (2.2Mb)

[Paper by Tomyama et al., Chem. Eng. Science \(2002\)](#) in pdf format (0.5Mb)

[Paper by Milenkovic et al. \(Part 1\), Int. J. Multiphase Flow \(2007\)](#) in pdf format (0.9Mb)

[Paper by Milenkovic et al. \(Part 2\), Int. J. Multiphase Flow \(2007\)](#) in pdf format (3.0Mb)

[Paper by Versluis et al., Science \(2000\)](#) in pdf format (0.4Mb)

Multimedia

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Homeworks

1) Creeping flow around a sphere: computation of the forces

2) Diffusion into falling liquid film: computation of the rate of dispersion and the flux at the interface

[Exercise 17.5-1 \(pag 541\)](#) .pdf format(1.5Mb)

3) Calculation of added mass and Basset force expression

[Guidelines for added mass and Basset force calculation](#) .pdf format(1.2Mb)

Final Assignment: Lagrangian particle tracking in cellular flow

[Class notes](#) in pdf format (1.7Mb)

[Paper by Maxey, Physics of Fluids \(1987\)](#) in pdf format (1.3Mb)

[Paper by Marchioli et al., Physics of Fluids \(2007\)](#) in pdf format (5.9Mb)

[Tutorial on numerical methods for particle tracking](#) in pdf format

[Animation 1 \(8.2 Mb\): Aerosols \(R=0\)](#) in cellular flow

[Animation 2 \(6.7 Mb\): Bubbles \(R=2\)](#) in cellular flow



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