

Università degli Studi di Udine

Dottorato di Ricerca in Scienze dell'Ingegneria Energetica e Ambientale



Seminari del Corso di Dottorato

Best practice guidelines for multiphase flow computations

Prof. Berend van Wachem

*Faculty of Engineering, Department of Mechanical Engineering
Imperial College, London (UK)*

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Abstract The simultaneous presence of several different phases in external or internal flows such as gas, liquid and solid is found in daily life, environment and numerous industrial processes. These types of flows are termed multiphase flows, which may exist in different forms depending on the phase distribution. Examples are gas-liquid transportation, crude oil recovery, circulating fluidized beds, sediment transport in rivers, pollutant transport in the atmosphere, cloud formation, fuel injection in engines, bubble column reactors and spray driers for food processing, to name only a few. As a result of the interaction between the different phases such flows are rather complicated and very difficult to describe theoretically. For the design and optimisation of such multiphase systems a detailed understanding of the interfacial transport phenomena is essential. This presentation will give an overview of the various computational methods available to predict the behaviour of multiphase flows. It will discuss shortly the possible choice of models, the assumptions of models, and will give some advice in terms of "Best Practice Guidelines" for the models. The presentation will also contain a few examples of state-of-the-art calculations performed with the models.

CV Berend van Wachem obtained his MSc and PhD degree at Delft University of Technology on the modeling of dense gas-solid flows. After spending a number of years as a lecturer in Sweden, he joined the Department of Mechanical Engineering of Imperial College London in 2008. Prof. van Wachem's research involves multiphase flow modeling, ranging from understanding the behaviour of turbulence on individual particles, to the large-scale modelling of gas-solid and gas-liquid flows. He is one of the editors of the "Best Practice Guidelines for Computational Fluid Dynamics of Dispersed Multiphase Flows", has contributed to the "Multiphase Flow Handbook", and has published a number of review papers on multiphase flow modeling and understanding.

