



ÉCOULEMENT DIPHASIQUE ET SYSTÈMES ÉNERGÉTIQUES

TWO-PHASE FLOW IN ENGINEERING SYSTEMS RELATED TO ENERGY

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| Lecturers : 24.0 | TC : 8.0 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : MI

Objectives

To understand the fundamental physics of a two-phase flow, including interface instability, droplets breakup, dispersion, evaporation, droplets or coal particles combustion. To introduce the modeling of such flows and to consider numerous applications in energy production processes.

Keywords : Two-phase flows, interface and instabilities, atomization and spray formation, particle-fluid interactions and dynamics, spray combustion, coal and biomass combustion

Programme

This course is an attempt to provide the essential physics of two-phase flows in the context of energy production processes.

Scope :

- i) Spray production and dispersion of particles. The gas-liquid interface. Evaporation.
- ii) Combustion in two-phase flows (coal particles and sprays) ; industrial burners.
- iii) Heat-and-mass transfert in the presence of phase transition ; water-cooled reactors and boilers

Learning outcomes

- To introduce the role of two-phase flows, its specifics in the domain of fluid mechanics, and its applicability in the industry
- To come up with understanding of fundamentals of two-phase flows, and consequently, with understanding of different regimes of such flows.
- To characterize sprays, including atomization, particles dispersion and the combustion processes.
- To develop the ability of using the numerical models of two-phase flows which are implemented into industrial codes.

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

exam, 2 hours