Two-phase flows with phase changes

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

- **Code:** N9EM16A
- **Open to exchange students:** No

Presentation

Objectives

The aim of this course is to provide future engineers with tools for modeling and sizing thermal-hydraulic installations involving liquid-vapor flows (boiling and condensation). The course focuses on formulating and solving the equations for conservation of mass, momentum and energy for two-phase flows with phase change. Modeling of heat and mass transfer terms in boiling, condensation and evaporation are presented, enabling initial sizing of two-phase heat exchangers in simple geometries.

Description

-Formulation of conservation equations integrated in a pipe section: main variables and closure laws
Adiabatic and mass-transfer flow configurations
-Vase boiling regimes (Nukiyama curve)
-Convective boiling regimes
-Parietal and interfacial friction modeling
-Heat and mass transfer in convective boiling
-Heat and mass transfer in convective condensation
-Study of parametric effects on boiling/condensation transfers (pressure, incondensables, subcooling, etc.)

Pre-requisites

Two-phase flows" course (DIPH)

Two-phase hydraulics" course (HYDI)