Couches limites, jets et sillages laminaires

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

In brief

Code: N7EM01B

Presentation

Objectives

Presentation of asymptotic calculation methods (perfect fluid, boundary layers) and analytical resolution of simple problems in laminar flow. Analysis of wall transfers (momentum, heat flow, mass transfer)

Description

Reminders about the perfect fluid flows.

Dynamic, massic and thermal laminar boundary layers

- Localization of viscous effects in real fluid flows with large Reynolds number: advection-diffusion report

- Characteristic parameters of the boundary layers: thicknesses, wall transfers

- Local equations of the isovolume dynamic boundary layer: Prandtl model

- detachments

- Integral equations and global balances in evolution isovolume: von Karman equations Methods and examples for calculating boundary layer flows

- Resolution of local equations

- Calculation by integral method: von Karman-Polhausen equations

- Examples of calculations: flat plate, impacting jet

Title Associated TP (s): Limit layer on flat plate at ENSICA