# Boundary Layers, Jet and laminar wakes

Component
École Nationale Supérieure d'Électrotechnique d'Électronique

## In brief

**Code ELP:** 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


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- 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



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