

Waves and propagation

Introducing

Description

Program (detailed content):

Electromagnetism in dielectric, conductive, and magnetic media. Propagation of electromagnetic waves in linear, homogeneous, and isotropic media. Continuity relations. Application to reflection and refraction. Propagation in rectangular metallic waveguides and optical fibers.

Objectives

At the end of this module, the student should have understood and be able to explain (main concepts):

The fundamental concepts related to the propagation of electromagnetic waves in simple media (linear, homogeneous, isotropic, as well as dielectric, magnetic, or conductive). Reflection and refraction at the interface between two media, the functioning of metallic and dielectric waveguides (optical fibers), and the associated energy transfer.

The student should be able to:

Waves and Propagation: Use Maxwell's equations generalized for different media to determine the nature of the electromagnetic waves present in a simple system (L.H.I. medium, interface between two media, confined space between two plates of a good conductor). The student should be able to determine

the conditions and characteristics of the modes that lead to the propagation of electromagnetic waves in various waveguides.

Necessary prerequisites

Electromagnetism in a vacuum

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse