Summary
In this lecture, we will describe the theoretical models and computational methods for the analysis of wave propagation along transmission lines.

Content
1. Transmission Line Theory
Hypotheses, overview of models, Transmission Line and Antenna Mode Responses, derivation of telegrapher’s equations

2. Transient analysis for lumped source excitation
Transmission of a pulse on an ideal line, multiple reflections, Bergeron diagram, reflections for different types of loads

3. Wave propagation on multiconductor systems
Determination of line inductance parameters, determination of line capacitance parameters, incorporation of losses. Modal analysis.

4. Transient analysis for distributed source excitation: field-to-transmission line coupling

Learning Prerequisites
Recommended courses
Electromagnetics I, II

Learning Outcomes
By the end of the course, the student must be able to:
• Analyze transmission lines in the frequency domain
• Analyze transmission lines in the time domain
• Be able to match a multiconductor transmission lines
• Analyze transmission lines excited by external electromagnetic fields
• Compute/measure parameters of a transmission line

Teaching methods
Ex cathedra and integrated exercises

Assessment methods
Resources

Bibliography

Ressources en bibliothèque
• Analysis of multiconductor transmission lines / Paul