

Optical thin-films: design, fabrication and characterization

OBJECTIVES

- To know the design methods of a filter based on optical thin films
- To know the fabrication methods of optical interference filters
- To know how to characterize an optical interference filter
- To know how to define needs in terms of optical filtering components for the design of optical systems

PUBLIC

Engineers and researchers in charge of defining the needs during the design of an optical system requiring the use of optical filtering components.

PREREQUISITES

Knowledge of physical optics, in particular on multi-wave interference and experience in optical metrology. No prerequisites on thin films and vacuum technology are required.

PROGRAM

- Introduction to optical thin films
- Presentation of filtering functions in optical thin films
- Calculation methods for optical thin film stacks
- Methods for synthesizing optical thin film filters and demonstration on commercial software
- Presentation of physical deposition methods based on optical thin films
- Presentation of control methods for optical thin film filters
- Demonstration of the deposition of interferential optical filters in the framework of the Espace Photonique technology platform
- Presentation of characterization methods for optical thin film filters
- Demonstration of the characterization of optical filters in the context of the Espace Photonique technology platform
- Demonstration of the characterization of optical interference filters in the framework of the Espace Photonique platform

- Presentation of the information necessary for the definition of the performance of a filter based on optical thin films
- Case studies submitted by the trainees to the scientific leader of the course one week before the beginning of the training (subject to the prior agreement of the leader) and analysis of possible solutions

Alternate lectures (50%) and practical and directed work (50%)

EQUIPMENT

Vacuum deposition machines (plasma assisted evaporation and/or magnetron sputtering), spectrophotometer, optical profilometer

See the Institut Fresnel Photonic Space website for a detailed description of the equipment

