

Master Physique fondamentale et applications

Optics and photonics lab

Informations

Composante : Faculté des Sciences

Responsable

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Langue(s) d'enseignement

Anglais

Contenu

The students from different backgrounds refresh and elaborate their knowledge of basic fields of optics and some other useful neighboring fields: Ray optics, interferences, diffraction, spectroscopy, metrology and electronics, data analysis by computer.

The objective to the Lab practice is to given them skills, reflex, automatism in manipulating experimental optical devices.

1. Geometrical optics
2. Monochromator
3. Fourier optics
4. Polarization I
5. Polarization II
6. Michelson interferometer I
7. Michelson interferometer II
8. Spectroscopy
9. Photodetectors
10. Holography

Compétences à acquérir

The students

- can align the different setups
- can carry out a measurement and evaluate its statistical uncertainties
- can write a scientific report
- can communicate precisely on complex experimental setups
- understand how interferometers work and what they can be used for
- understand how spectrometers work and what they can be used for
- understand basic optical instruments and the aberrations therein
- realized a precise alignment of the Michelson interferometer
- realized holograms and used them in applications
- know the different electronic circuits used in combination with photodiodes
- know how to characterize the polarization of light.

Modalités d'organisation

We apply a working methodology which is close to the one used in research or in industrial R&D. First all experiments are carried out and notes are taken in a lab book. Quantitative measurements are performed, supplemented by comments on the methodology as well as on the measurement errors.

Experimental work is done in teams of 2 students. There is one setup for each experiment, so everybody does a different experiment and the group rotates for the next session.

Bibliographie, lectures recommandées

"Laser fundamentals", W. Silfvast, Cambridge University Press

"Lasers", A.E. Siegman, Science Books

Pré-requis obligatoires

Basic knowledge in physics / optics / electronics / programming

VOLUME HORAIRE

- Volume total: 50 heures
- Travaux pratiques: 50 heures

Codes Apogée

- SPFAU23J [ELP]

Pour plus d'informations

[Aller sur le site de l'offre de formation...](#)



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