Master Physique fondamentale et applications
Modern lasers and laser-matter interaction

Responsables

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Descriptions

Code : SPFCU44

Nature : Unité d'enseignement

Domaines : Sciences et Technologies

Informations

Composante : Faculté des Sciences

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LANGUE(S) D'ENSEIGNEMENT

Anglais

CONTENU

Part 1: Modern laser sources
- Nanosecond lasers and thermal problems in lasers (rate equations; spiking; q-switching; MOPA architecture; q-switch devices; injection seeding; beam quality of Gauss. Beams; peak fluence measurement; thermal lenses in lasers: rod laser, slab laser, thin disc laser, fiber laser)
- Ultrashort lasers (Definitions and timescales, Building a femtosecond oscillator, Amplifying a femtosecond pulse, Measuring a femtosecond pulse)

Part 2: Ultrafast laser-matter interaction
Interests of ultrashort pulses (intense and short), Mechanisms of interaction (from energy absorption to ablation), Ultrafast measurements (pump-probe), Optical breakdown, low-density plasma and microexplosion applications - Lab work

Part 3: Laser-matter interaction from ns to ms regime
A long pulse laser as heat source; thermal diffusion; heat affected zone;

Part 4: Some applications of laser-matter interaction
laser cutting; reactive cutting, drilling, welding; Laser damage measurements and models; "fatigue" effect; fusion class lasers.

COMPÉTENCES À ACQUÉRIR

Learn the physics and practical aspects of today's lasers and their application in material science.

MODALITÉS D'ORGANISATION

This course is a classical lecture with some excercises.

PRÉ-REQUIS OBLIGATOIRES

Basic knowledge on lasers and solid state physics

VOLUME HORAIRE

- Volume total: 32 heures
- Cours magistraux: 32 heures

CODES APOGÉE

- SPFCU44J [ELP]

M3C

Aucune donnée M3C trouvée

POUR PLUS D'INFORMATIONS

Aller sur le site de l'offre de formation...