9th Summer School

Plasmas in super-intense laser fiels

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High power laser technology

This series of lectures aims at presenting the technologies commonly used in plasma physics. In particular, all the parameters intrinsic to the laser source will be defined and discussed. As presented, different technologies may provide different physical beam properties such as for instance pulse duration or contrast. The program is browsed below.

Introduction

- *Physical quantities*
- Gaussian beams
- General laser architectures

Oscillators

- *Optical cavities*
- Laser oscillations and free running laser
- Pulsed regimes: Q-switch and Mode locking
- Carrier Envelop phase

Laser Amplification

- Gain
- Franz et Nodvik equations
- Amplifier architectures
- Chirped pulse amplification
- Examples

Optical parametric amplification

- *Optical parametric amplification*
- Non linear optics
- Parametric processes
- Phase matching
- Examples

Metrology

- Time-frequency
- Temporal diagnostics
- Spatial diagnostics
- Spatio-temporal couplings