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Altri autori (Persone)	FerroniF (Fernando) GizziL. A (Leonida Antonio) FacciniR (Riccardo)
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Nota di contenuto	Title Page; INDICE; Preface; Gruppo fotografico dei partecipanti al Corso; Physics of high-intensity laser-plasma interactions; Introduction; Field ionization; Plasma creation and characterization; Nonlinear laser propagation in underdense plasmas; Cold fluid equations; Electromagnetic waves; Electrostatic (Langmuir) waves; Dispersion properties; Relativistic self-focussing; Ponderomotive channel formation; Plasma wave propagation; Wakefield excitation; Electron acceleration; Laser interaction with solids; Collisional heating; Collisional absorption; Collisionless absorption Hot electron generation Ion acceleration; Numerical simulation of laser-plasma interactions; Hydrodynamics; Particle-in-cell codes; Tutorial on particle-in-cell simulation; The PIC code BOPS; Prerequisites; Installation; Running BOPS; Project I: Laser wakefield accelerator;

Project II: Ion acceleration-TNSA vs. RPA; Accelerator physics: Basic principles on beam focusing and transport; Introduction; Laminar and non-laminar beams; The emittance concept; The r.m.s envelope equation; External forces; Space charge forces; Correlated emittance oscillations

Matching conditions in a plasma acceleratorLasers for laser-plasma acceleration; Introduction; Ultrashort laser pulses; Defining an ultrashort laser pulse; Ultrashort-pulse generation; Mode-locking; Maximising the energy; Master Oscillator Power Amplifier; Amplification; Gain saturation; Gain narrowing; Beam quality; Chirped-pulse amplification; Contrast; Laser technologies; Glass laser systems; Titanium-sapphire systems; Diode-pumped systems; Optical parametric chirped-pulse amplification systems; Conclusions; Particle beam diagnostics and control; Introduction; Beam charge measurements

Intercepting measurementsNon-intercepting measurements; Beam position monitors; Broad-band BPM pickups; Resonant BPM pickups; Diagnostics for the transverse phase space; Beam matrix based schemes; Phase space mapping based schemes; Beam profile measurements; Diagnostics for the longitudinal phase space; Bunch length measurements; Energy spread; Beam energy; Beam synchronous timing; Laser plasma diagnostics; Introduction; Basic physical processes; CPA lasers in experiments; Laser-solid interaction; Role of ASE in the interaction with plastic foils; Experimental signatures of preplasma

Propagation in gases and optical probingPropagation of ultraintense laser pulses in gas-jets; Basic spectroscopy techniques; The single-photon detection technique; Energy-resolved imaging; Fast electron transport in multilayer targets; Directional bremsstrahlung; Ion acceleration to study target resistivity; Conclusions; Preliminary results of the self-injection test experiment (SITE) at FLAME; Introduction; FLAME laser system; FLAME target area and main diagnostic; SITE preliminary results; Conclusion; Development of a Multi-GeV spectrometer for laser-plasma experiments at FLAME  
Introduction

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