

Consiglio Nazionale delle Ricerche

Istituto per i Processi Chimico- Fisici

Area della Ricerca di Pisa

Avviso di Seminario

Martedì 25 Novembre 2003

ore 11:30

Aula 28

Dr. Sophie Baton

Chargée de Recherche CNRS

Laboratoire pour l'Utilisation des Lasers Intenses

Palaiseau - France

terrà un seminario su

***Generation and transport of fast electrons
in laser-matter interaction
at relativistic intensities***

Abstract. The transport of relativistic electrons in solid targets irradiated by a short laser pulse at relativistic intensities has been studied both experimentally and numerically. A Monte-Carlo collision code takes into account individual collisions with the ions and electrons in the target. A 3D-hybrid code takes into account these collisions as well as the generation of electric and magnetic fields and self-consistent motion of the electrons in these fields. It predicts a magnetic guiding of the fraction of the fast electron current over long distances and a localized heating of the material along the propagation axis.

In experiments performed at LULI on the 100 TW laser facility, several diagnostics have been implemented to diagnose the geometry of the fast electron transport and the target heating. The typical conditions were : $E_L = 20$ J, $\lambda = 1$ μ m, $\tau \sim 300$ fs, $I \sim 10^{18} - 5 \cdot 10^{19}$ W/cm². The results indicate a modest heating of the target (typically 50 eV over 20 μ m to 50 μ m), consistent with an acceleration of the electrons inside a wide aperture cone along the laser axis.

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