Joint DESY and University of Hamburg Accelerator Physics Seminar

Tuesday, 30.11.2010

(16:00 in Room 459/30b)

Laser Driven Ion Acceleration:
In the Search for an Ion Beam Suitable for Hadron Therapy

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Abstract

The acceleration of proton and heavier ion beams is of great interest due to the large number of potential applications, including hadron therapy. While beams with the high energy (100s MeV) and narrow energy spread ($< 1\%$) required for hadron therapy are easily produced using conventional accelerators such facilities are extremely expensive and therefore access is limited. A key aim of research into laser driven ion acceleration is to seek a mechanism which will allow the acceleration of treatment–suitable beams at reduced cost making this much praised therapy more widely available. During this seminar I will explain the difference between two acceleration mechanisms, Sheath acceleration and Radiation pressure acceleration (RPA), currently under investigation with this goal in mind. Recent experiments using several high intensity laser systems have illustrated the differences between these processes. I will present data highlighting the positive and negative aspects of each together with the results of simulations illuminating exciting avenues for future exploration which will hopefully lead to a suitable energetic ion source while simultaneously revealing the fundamentals of the interaction between light and matter.

J.Roßbach (Univ. HH) and M.Vogt (MFL).

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