Joint DESY and University of Hamburg Accelerator Physics Seminar

Tuesday, 15.01.2013

(16:00 in Room 459/30b)

Particle Acceleration in Laser-Induced Relativistic Plasmas — A Novel Approach for Polarized Sources?

Markus Büscher

FZ Jülich

Abstract

Polarized particle beams are of outstanding importance for fundamental research at particle accelerators. For laser–induced particle acceleration, however, it is unclear whether this technique can be used to realize polarized particle sources. That seems feasible, in principle, due to the huge magnetic fields which are present in the laser-induced plasmas. These fields may couple to the magnetic moments of the accelerated particles and thus align or select certain spin states.

The talk will begin with a general introduction into the physics of laser–induced particle acceleration. Results of experiments at the 300-TW Darcturus laser facility at Düsseldorf University will be presented, where laser accelerated few–MeV protons have been used for the first time to measure the differential cross section of a hadronic scattering reaction. This also yields information about the degree of polarization of the laser-accelerated protons. Finally, the prospects to build polarized laser–based ion sources will be discussed.

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