Joint DESY and University of Hamburg Accelerator Physics Seminar

Thursday, 15.08.2019

(16:00 in Room 459/30b)

Progress on Laser-Driven Plasma Accelerators for High-Energy Physics and Medical Applications

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Abstract

The Berkeley Laboratory Laser Accelerator (BELLA) facility at the Lawrence Berkeley National Laboratory is an experimental facility for further advancing the development of laser-driven plasma acceleration. Laser-driven plasma-based electron and ion accelerators are capable of generating ultra-high accelerating gradients, several orders of magnitude larger than conventional accelerators. These high gradients offer the potential for extremely compact devices delivering high energy particles. Besides the long-term development of plasma accelerators towards future TeV-class lepton colliders, a near-term goal is to develop an experimental platform for investigating FLASH ultra-high dose rate radiobiological effects of laser-accelerated ion beams.

This talk will review recent progress on (i) laser-plasma accelerators, including the generation of electron beams up to 8 GeV energy gain per stage and multistage coupling at low energy, and (ii) implementation of an all-plasma-based proton beamline for Radiobiology including results from a first study with normal and radioresistant prostate cancer cells.

Recently started projects for staging experiments at multi-GeV energies and in-vivo radiobiology with ions at 50 MeV/u will be introduced as well as LaserNetUS.

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NOTE THE UNUSUAL DATE

W.Hillert, (Univ. HH), I.Agapov (MPY) and M.Vogt (MFL).