

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 8.11.2012, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Prof. Stefan Karsch

LMU München

Electron acceleration / deceleration and hard X-ray generation

An overview of recent MPQ/LMU activities in laser-driven electron acceleration studies for hard X-ray generation will be presented. Prior to the ongoing relocation of the ATLAS laser facility, a broad experimental programme targeted the detailed study of a variety of laser-wakefield electron acceleration scenarios. The primary laser target was a length-variable gas cell that allows to study and optimize the dynamics of the acceleration mechanism. Stable beams with an energy of up to 600 MeV and charge values of 100 pC can be routinely generated from this target. We also studied the shock-front injection mechanism¹ driven with pulses from the ATLAS laser, also reaching 100pC charge at 50 MeV, and a staged combination of shock-front injection and gas cell. The high-energy beams from the gas cell were used to create a betatron radiation source for multi-keV photons. Single-shot, high-resolution X-ray phase contrast (PC) images and multi-shot PC 3D-tomograms of biological samples will be presented. Background-free, monoenergetic electrons in the 15-50 MeV range from shock-front injection were collided with a portion of the drive laser beam to yield an all-optical quasimonochromatic Thomson source in the 10-50 keV range. A characterization of this source will be presented.

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