

A target fabrication and characterization network for advanced laser light sources

Friday, 9 September 2016 10:45 (25 minutes)

The application of laser-driven proton beams to cancer therapy requires proton energy up to 250 MeV and delivered dose of a few Gy/min, i.e. a substantial enhancement of the current acceleration performances and operation in a repetitive regime (1-10 Hz). These requirements could be met by adopting advanced target configurations and PW-class CPA laser systems. However, thousands of targets per day would be required for high repetition rate experiments. The production and characterization of such a massive amount of solid targets would require resources and competencies not easily accessible to most research groups. Therefore, target availability could likely become a limiting factor preventing to exploit the full potential of upcoming advanced laser light user facilities, which promise major breakthroughs in the investigation of laser-driven particle sources, as well as laser-plasma interaction processes, isochoric heating and shock-compression physics.

In this frame, we invited the community to discuss the construction of a target fabrication and characterization network for advanced laser light sources to ensure the availability of state of the art targets and to promote the formulation of common strategies to address issues related to target delivery and irradiation at high repetition rates. The synergy between partners will be developed along different strategic paths, depending on the commitment of the partners: from “know-how” sharing and target bartering to user-consortium contributes, to an integrated network which would provide coordination between target fabrication laboratories with complementary specific expertise.

The EUCALL Satellite Meeting held in Dresden (August 29-31 2016) represents the first step towards the construction of a target fabrication and characterization network. Here we present the outcome of the meeting: the assessment of current target needs and available production capabilities, the possible funding strategies and the actions planned in view of an EU proposal aimed at the construction of a European target network.

Primary author: Dr PRENCIPE, Irene (Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf)

Co-authors: Dr MIHAIL, Cernaianu (Extreme Light Infrastructure –Nuclear Physics, Bucharest, Romania); Dr MARGARONE, Daniele (ELI-Beamlines, IoP-ASCR); Prof. FIQUET, Guillaume (Institut de Minéralogie, de Physique des Matériaux et de Cosmochimie, Paris, France); TOLLEY, Martin (Central Laser Facility, Rutherford Appleton Laboratory, Didcot, United Kingdom); Mr LUTOSLAWSKI, Piotr (Extreme Light Infrastructure –Beamlines, IoP-ASCR, Prague, Czech Republic); Dr PASCARELLI, Sakura (European Synchrotron Radiation Facility, Grenoble, France); Prof. COWAN, Thomas (Forschungszentrum Dresden-Rossendorf); Dr KONOPKOVA, Zuzana (European XFEL, Hamburg, Germany)

Presenter: Dr PRENCIPE, Irene (Institute of Radiation Physics, Helmholtz-Zentrum Dresden-Rossendorf)

Session Classification: Targetry, Diagnostics and Dosimetry