

High efficiency fiber laser systems for wake-field particle accelerators

martedì 4 giugno 2013 16:18 (15 minuti)

An important driver of scientific progress has always been the envisioning of applications far beyond existing technological capabilities. In the case of laser physics, one of these applications is laser wake-field particle acceleration and possible future uses thereof, such as in collider experiments, or for medical applications such as cancer treatment. To accelerate electrons and positrons to multi-GeV energies, a laser architecture is required that allows for the combination of high efficiency, Petawatt peak powers, and Megawatt average powers. Developing such a laser system would be a challenging task that might take decades of aggressive research, development, and, most important, revolutionary approaches and innovative ideas.

In the presentation we will present rare-earth-doped fiber laser based systems for a compact, efficient, scalable, and cost-effective high-average and high-peak power ultra-short pulse laser concept. The proposed approach relies on the spatially and temporally separated amplification of ultrashort laser pulses in waveguide structures, followed by coherent combination into a single train of pulses (or into a programmable multi-pulse structure) and into a single beam with increased average power and pulse energy.

Autore principale: Prof. LIMPERT, Jens Limpert (FSU Jena)

Coautore: Prof. TUENNERMANN, Andreas (FSU Jena, IAP); Sig. KLENKE, Arno (FSU Jena, IAP); Sig. KIENEL, Marco (FSU Jena, IAP); Sig. BREITKOPF, Sven (FSU Jena, IAP); Dr. EIDAM, Tino (FSU Jena, IAP)

Relatore: Prof. LIMPERT, Jens Limpert (FSU Jena)

Classifica Sessioni: WG1+4