ID de Contribution: **90** Type: **Non spécifié**

Mono-energetic ion beam generation in Phase Stable Acceleration (PSA) regime with circularly polarized laser

Ultrahigh-intensity lasers can produce accelerating fields of 10 TV/m, surpassing those in conventional accelerators for ions by six orders of magnitude [1]. Remarkable progress has been made in producing laser-driven ultra-bright MeV proton and ion beams in a very compact fashion compared to conventional RF accelerators. These beams have been produced up to several MeV per nucleon with outstanding properties in terms of transverse emittance and current, but typically suffer from exponential energy distributions. Recently a new ion acceleration method, namely phase-stable acceleration (PSA) [2], is proposed, which uses circularly-polarized laser pulses in order to decrease the energy spread and generate a high-intensity mono-energetic ion beam. In the first experiment the quasi-monoenergetic carbon beams driven by a circularly polarized laser with particle energies of 30MeV and energy spread of 15% were observed [3]. At a laser intensity of 7 × 1021 W/cm2, self-focusing nano-Coulomb GeV proton bunches can be generated from laser foil interaction in PSA regime [4].

Refs:
1. B. M. Hegelich et al., Nature (London) 439, 441 (2006).
2. X. Q. Yan et al., Phys. Rev. Lett. 100, 135003 (2008)
3. A. Henig et al., Phys. Rev. Lett. 103, 245003 (2009)
4. X. Q. Yan et al., Phys. Rev. Lett. 103, 135001 (2009)

Auteurs principaux: Dr YAN, Xueqing (Institute of Heavy Ion Physics, Peking University); Prof. CHEN, jia'er (Institute of Heavy Ion Physics, Peking University)

Co-auteurs: Prof. LU, Yuanrong (Institute of Heavy Ion Physics, Peking University); Prof. LI, Yutong (Institute of physics, CAS)

Orateur: Prof. CHEN, jia'er (Institute of Heavy Ion Physics, Peking University)