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Generation of 600 MeV carbon ions with composite ultrathin targets

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Here we report recent experimental results on ion acceleration with high-contrast femtosecond Petawatt laser and novel composite targets. Linearly-polarized, 30-fs, 9.2 J, high-contrast laser pulses were focused onto double-layer targets composed of nanofoams and nanofoils. It was found that ion energy strongly depends on the thickness of nanofoam layer. At optical thickness, 58 MeV protons and 600 MeV carbon ions were generated, which is 1.7 and 3.5 times of that from single-layer nanofoil targets correspondingly.

Primary author: Dr MA, wenjun (Faculty of Physics, Ludwig-Maximilians University (LMU))

Co-authors: Dr KIM, I Jong (APRI, GIST, Gwangju, Korea); Dr CHOI, Il Woo (GIST, Korea); Dr BIN, Jianhui (LMU); Prof. SCHREIBER, Joerg (LMU & MPQ); Prof. ZEPF, Matt (QUB & Jena); Prof. NAM, chang Hee (GIST, Korea); Dr LIN, chen (Beijing University); Dr WANG, hongyong (Jena Helmholtz Institute); Prof. YAN, xueqing (Beijing University)

Presenter: Dr MA, wenjun (Faculty of Physics, Ludwig-Maximilians University (LMU))

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