Recent Progress of Laser Ion Acceleration at Peking University

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A proton-type of compact laser driven proton accelerator (CLAPA) has recently been built at Peking University. We present the generation of stable proton beams in the experiments of high intensity (8.3*1019 W/cm2) laser pulses irradiating on home-made sub-micrometer thick plastic targets. The temporal contrast of the laser pulse was 1010 at 100 ps before the main pulse with a cross-polarized wave (XPW) system, and no plasma mirror was used in our system. The maximum proton energy exceeded 15 MeV when using 1.2 m plastic targets. Stable proton beams with energy higher than 8.5 MeV were also detected with 20 nm thick plastic targets. By improving the target surface flatness and the laser-target spatial coupling accuracy, the shot to shot stability of proton cutoff energy was better than 3%.