Abstract Submitted
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Control of electron cloud in laser foil interaction and suppression of proton beam divergence[1] SHIGEO KAWATA, RYO SONOBE, SHUJI MIYAZAKI, MASAKI NAKAMURA, TAKASHI KIKUCHI, Graduate School of Engineering, Utsunomiya University — In recent years, a high energy ion is observed in experimental and numerical researches. We focus on a suppression of transverse proton beam divergence by a controlled electron cloud in laser-plasma interaction. When an intense laser pulse illuminates a thin foil plasma, first electrons are accelerated and form a strong electrostatic field at the target surface. Then protons are accelerated by the strong field. When a target has an appropriate hole at the opposite side of the laser illumination, an electron cloud is limited in transverse by the neutral plasma at the protuberant part [1]. By the protuberant part of the foil target the electron cloud shape is controlled transversely. The protons are accelerated and also controlled transversely by the electron cloud shaped, and consequently the transverse divergence of the proton beam is suppressed. In our 2.5-dimensional particle-in-cell simulations, the shape of the electron cloud is controlled well, and the transverse proton beam divergence is suppressed successfully without a significant energy loss. [1] R. Sonobe, et al., Phys. Plasmas, 12 (2005) 073104.

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