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Energy control of monoenergetic electron beams in laser-driven plasma acceleration E. MIURA, S. MASUDA, K. KOYAMA, S. KATO, N. SAITO, National Institute of Advanced Industrial Science and Technology (AIST), M. TANIMOTO, Meisei University — Monoenergetic electron beams with the energy of up to 25 MeV have been obtained in laser-driven plasma acceleration. A monoenergetic electron beam of 7 MeV was generated from a plasma with the electron density of 1.5×10^{20} cm^{-3} produced by a 2 TW, 50 fs laser pulse.[1] On the other hand, a monoenergetic electron beam of 25 MeV was generated from a plasma with the electron density of 4×10^{19} cm^{-3} produced by a 3-5 TW, 50 fs laser pulse using the focusing optics with the longer focal length.[2] The monoenergetic beams were obtained only in the narrow electron density range according to the irradiation conditions. The energy of the monoenergetic beams can be controlled by the plasma density, the laser power, and the laser focusing condition.[2] Our Ti:sapphire laser system is upgraded to obtain more than 10 TW. Experiments to obtain a monoenergetic electron beam with higher energy (> 50 MeV) are carried out. A part of this work is supported by the Budget for Nuclear Research of the MEXT.

[1] E. Miura et al., Appl. Phys. Lett. 86 251501(2005).
[2] S. Masuda et al., submitted to Phys. Plasma.

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