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Monoenergetic electron beam generation from a plasma produced by an intense laser pulse EISUKE MIURA, KAZUYOSHI KOYAMA, SUSUMU KATO, NAOAKI SAITO, National Institute of Advanced Industrial Science and Technology (AIST), SHIN-ICH MASUDA, National Institute of Radiological Sciences (NIRS), MASAHIRO ADACHI, Hiroshima University, TAKAYUKI WATANABE, Utsunomiya University, MITSUMORI TANIMOTO, Meisei University — We have so far reported the generation of a monoenergetic electron beam with an energy of 7 MeV by laser-driven plasma acceleration.[1] The monoenergetic beam generation was observed only in the narrow electron density range around 1.5×10^{20} cm^{-3}. To obtain a monoenergetic beam with higher energy, it is necessary to make the acceleration length longer in the lower density plasma. To achieve the longer acceleration length, that is the longer interaction length, the experiment was conducted using an off-axis parabolic mirror with the longer focal length of 300 mm. A 3-TW, 50-fs laser pulse was focused on a He gas jet. At the electron density of $\sim 5 \times 10^{19}$ cm^{-3}, a monoenergetic electron beam with an energy of 25 MeV was observed. The number of electrons of the monoenergetic beam was estimated to be 10^5. This work is supported by the Budget for Nuclear Research of the MEXT and the Advanced Compact Accelerator Project of the MEXT.

[1] E. Miura et al., Appl. Phys. Lett. 86 251501(2005).

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