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Experimental results of the quasi-monoenergetic electron beam generation from the self-modulated laser wakefield acceleration using a pinhole-like collimator HYONG SUK, NASR HAFZ, HYOJAE JANG, CHANGBUM KIM, GUANGHOON KIM, KERI, CENTER FOR ADVANCED ACCELERATORS TEAM

— We report recent results from the self-modulated laser wakefield acceleration experiment that has been carried out at KERI (Korea Electrotechnology Research Institute). For this experiment, we used a 3 TW Nd:glass/Ti:sapphire hybrid laser system that can deliver an energy of 2.1 J with a pulse duration of 700 fs. In the experiment, the high power laser beam is focused to a beam size of ~ 10 microns in the supersonically ejected He gas jet (density $\sim 10^{19}$ cm $^{-3}$) by a parabolic mirror. The strong laser-plasma interaction led to production of MeV-level high energy electrons up to ~ 10 MeV. We used a pinhole-like collimator with a diameter of 1 mm to select only high energy electrons that propagate along the axis. In this way, we could obtain quasi-monoenergetic high-energy electrons. Detailed beam and plasma parameters were measured by using several diagnostic tools including an ICT for charge measurement, dipole magnet/lanex film for energy and energy distribution, spectrometer for plasma density from the Raman scattered laser beam, etc. In this presentation, detailed experimental results are shown.

Prefer Oral Session
 Prefer Poster Session

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