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Quasi-monoenergetic electron beam generation from laser wakefield acceleration with tapered capillary gas cell INHYUK NAM, MINSEOK KIM, SEUNG-WOO LEE, TAE-HEE LEE, HYYONG SUK, Gwangju Institute of Science and Technology (GIST), LASER PLASMA ACCELERATION LABORATORY TEAM — In this presentation, we experimentally investigated the enhancement of energy of electron beams with the untapered/tapered capillary gas cell. The energy of electron beams from the laser wakefield acceleration is mainly limited by the laser diffraction and the dephasing length. In order to overcome the dephasing the tapered plasma can increase the dephasing length which results in enhancement of the energy of electron beams. We have developed a tapered capillary gas cell with the variable gas pressure gradients by changing gas-feed line cross-sections. The capillary gas cell with untapered/tapered pressure will be used for high-energy electron acceleration experiments together with the 20 TW/40 fs laser system. We observed enhancement of the energy of electron beams with the tapered capillary gas cell.

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