

Abstract Submitted  
for the DPP12 Meeting of  
The American Physical Society

**Laser wakefield acceleration research by using a tapered capillary waveguide at GIST** MINSEOK KIM, DONGGYU JANG, INHYUK NAM, TAEHEE LEE, HYYONG SUK, Gwangju Institute of Science and Technology — The tapered plasma density in a gas-filled capillary waveguide can suppress the dephasing problem in laser wakefield acceleration (LWFA). As a result, the acceleration distance and the gained electron energy are expected to be increased significantly. For this purpose, we recently developed a tapered capillary waveguide, which can produce a plasma density of  $10^{18} \text{ cm}^{-3}$ . This capillary plasma waveguide will be used for high-energy electron generation experiment together with a 20 TW/35 fs Ti:sapphire laser system that will be completed by this summer. In this presentation, the ongoing experiments will be reported.

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Date submitted: 16 Jul 2012

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