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**Electron Acceleration Using Hollow Fiber with Table Top Terawatt Laser** YOSHIO MIZUTA, KIMINORI KONDO, CHEN ZHENGLIN, TAKASHI NAKABAYASHI, NOBUHIKO NAKANII, RYOSUKE KODAMA, KUNIOKI MIMA, KAZUO TANAKA, GRADUATE SCHOOL OF ENGINEERING, OSAKA UNIVERSITY COLLABORATION, INSTITUTE OF LASER ENGINEERING, OSAKA UNIVERSITY COLLABORATION — A table top laser system can produce over 10TW laser pulse in present. If we focus these optical pulses to  $\mu\text{m}$  size, the focused intensity can be relativistic for electrons. In such a high field, the electron plasma wave (EPW) can be excited. This EPW is attractive for the accelerating field for charged particles. However, the effective interaction length is only a few hundred micro meters. For GeV electron acceleration, this short interaction length should be overcome. A simple hollow fiber is used for obtaining a longer acceleration distance. The spot diameter and the length of focused area should be  $10\mu\text{m}$  and 10mm, respectively. We used the hollow fiber which has  $20\mu\text{m}$  inner diameter and 10mm length. To fill the fiber with enough density atoms with keeping a good vacuum condition, the differential pumping system was used. Presently, we have succeeded in injecting  $\mu\text{J}$  femtosecond pulses into the fine hollow fiber in the atmosphere. In this propagation, a strong self phase modulation occurred to generate a white light. Our plan for coming experiment and possible limiting factors will be discussed.

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