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Conical electron seeding mechanism for the low density capillary-guiding electron laser acceleration YOSHITAKA MORI, YONEYOSHI KITAGAWA, Graduate School for the Creation of New Photonics Industries, KIMINORI KONDO, KAZUKI TSUJI, NOBUHIKO NAKANII, SYUJI FUKUMUCHI, MAMORU KASHIHARA, KAZUYA KIMURA, TSUYOSHI TANIMOTO, HIROTAKA NAKAMURA, MOTONOBU TAMPO, KAZUO A. TANAKA, TAKAYOSHI NORIMATSU, RYOSUKE KODAMA, KUNIOKI MIMA, Institute of Laser Engineering, Osaka University, YASUHIKO SENTOKU, Department of Physics, University of Nevada, Reno — The low density laser electron acceleration was examined for a conical-guiding glass capillary target with sub ps pulse duration 200 TW laser system toward electron energy gain improvement. Dedicated experiments reveals that conical-tip glass capillary contributed relativistic electron beams generation unless no detectable high energy electrons were observed for a glass capillary target without any kind of guiding or seeding schemes. 1D-PIC simulation also reveals that hot electrons components were necessary to be trapped by laser-driven wake field for the presented experiments case. The conical target provided sufficient number of MeV order energy electrons and then the existence of glass capillary contributes to an extension of such electron energy spectrum up-to 50 MeV.

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