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Enhanced electron acceleration with wide-spot picosecond pulse relativistic laser YASUHIKO SENTOKU, NATSUMI IWATA, TAKAYOSHI SANO, Institute of Laser Engineering, Osaka University, KUNIOKI MIMA, GPI, Hamamatsu — High power lasers with relativistic intensities with wide focal spot and picosecond (ps) pulse lengths are available in recent years. In over-ps relativistic laser-plasma interaction, both energy and number of hot electrons become higher than those predicted by the scaling used in the sub-ps regime. The electron energy spectrum changes from the thermal distribution to the nonthermal one, and the accelerated ion energy becomes much higher than the energy predicted by the isothermal model [1]. One of the key mechanisms of such the super-thermal electron generation is the stochastic heating in laser-foil plasma interaction, where hot electrons recirculate around the plasma and suffer multiple kicks from the laser field during the interaction [2]. The blowout of plasma towards the laser [3] enhances the stochasticity in the laser-plasma interaction. Two-dimensional PIC (PICLS) simulations demonstrate the significant enhancement of the electron heating with a large focal spot laser light over ps interaction, while a laser with small focal spot produces thermal hot electrons with the ponderomotive temperature. [1] N. Iwata et al, Phys. Plasmas **24**, 073111 (2017). [2] Y. Sentoku et al., Appl. Phys. B **74**, 207 (2002). [3] N. Iwata et al., Nat. Commun. **9**, 623 (2018).

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