

Abstract Submitted
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Projectile acceleration to a velocity over the Earth's escape velocity and application in planetary science. T. KADONO, K. SHIGEMORI, S. FUJIOKA, K. OTANI, T. SANO, A. SHIROSHITA, Y. HIRONAKA, Y. SAKAWA, ILE, Osaka university, N. OZAKI, T. KIMURA, K. MIYANISHI, T. ENDO, Graduate School of Engineering, Osaka university, M. ARAKAWA, Nagoya University, A. NAKAMURA, Kobe University, S. SUGITA, T. MATSUI, University of Tokyo — Impact velocity of meteorites on Earth at the final stage of planetary accretion becomes more than 10 km/s. However, macroscopic (larger than 0.1 mm) projectiles are not easily accelerated to more than 10 km/s by two-stage light-gas guns. One possible method to a velocity larger than 10 km/s is the irradiation of high-intensity lasers. Here, we describe the first results of projectile (glass spheres) acceleration experiments to a velocity higher than 10 km/s using GEKKO XII laser at Institute of Laser Engineering. Glass spheres are accelerated to a velocity of 15 km/s. This is enough to simulate hypervelocity impacts on the surface of the proto-planets and investigate various phenomena caused by the impacts such as impact vaporization of silicate rocks, crater formation on rocks, and metamorphism due to high pressure.

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