



## **Projectile acceleration using a high-power laser to a velocity larger than 10 km/s**

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We accelerate glass and aluminum spheres with a diameter of 0.1 - 0.3 mm to a velocity higher than 10 km/s,  $\sim 60$  km/s, using a high-power laser, GEKKO XII - HIPER at Institute of Laser Engineering, Osaka University. The velocity of the projectiles is estimated using a high-speed streak camera. Also, the shapes of the projectiles in the flight can be observed by a framing camera. The projectiles are finally collided to copper or LiF plate targets. The copper plates are recovered and craters are observed. Also, a tantalum plate as a witness plate is recovered and a large number of craters caused by ejecta impacts are observed. In the case of the impact of the LiF window, we observe some lines of Li gas using a spectrometer with a streak camera, when an aluminum projectile collides the LiF window with an impact velocity of  $\sim 20$  km/s. Thus, we can simulate the hypervelocity impacts with a velocity over 10 km/s in the laboratory