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## Impact Experiments on High Porosity Sintered Targets: Penetration Depth and Track Morphology

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It is considered that primordial bodies in the solar system, such as planetesimals and comets, have high porosity. When small bodies or dusts impact those primordial bodies, the process of penetration, destruction or compaction should be controlled by the porosity, the strength, and the structure of target bodies.

We prepared high porosity targets, which consists of soda-lime acid silicate hollow glass beads. We sintered this material to get targets with porosity of about 95%. The bulk density is  $\sim 0.14$  g/cm<sup>3</sup>. First, the targets are impacted at low velocity ( $\sim 250$  m/s) using a small light-gas gun at Kobe University. We determined the drag coefficient at low velocity (Okamoto et al. 2010, annual meeting of Japanese Society for Planetary Sciences). Then we conducted impact experiments at high velocity at ISAS using two-stage light-gas gun and high speed cameras. The impact velocities were  $\sim 2.5, 4.0, 7.0$  km/s. The projectiles were glass and titanium spheres.

We examined the penetration depth and track morphology by X-ray micro tomography at Osaka University. We develop a deceleration model of the projectile from both penetration depth data obtained by the tomography and those of the projectile velocity at the rear side of the target obtained by one of the high speed cameras.

Keywords: porosity, sinter, impact experiment