

Impact Crater Studies for Mid-Velocity Micro Particles

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Abstract

Micron-sized olivine and iron particles have been accelerated in order to characterize their impact crates. The experiments were carried out at the 2MV Van de Graff accelerator at the Max Institute for Nuclear Physics (MPIK) in Heidelberg. The particle diameters and velocities were 0.3~1.2µm and 3~7km/s, respectively. The targets were polished Aluminum surfaces. After impact, Scanning Electron Microscope images were used to characterize the impact craters. Based on the experimental results, still some fragments were found in craters induced by 3km/s iron particles, and the crater diameters are almost equal to the particle diameters (about 0.5µm). For higher velocity impacts (4.5~7km/s), the crater diameters are about 2 times bigger than particle diameters (both olivine and iron). At the same time, the ratio of crater diameter to depth is about 1.9.