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A formation condition on the reticular pattern of ejecta curtain through the impact on the bed of fine glass beads.

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Many impressive rayed craters are observed on Moon, Mercury, and Mars. Although the origin or lifetime of the prominent rays have been examined [e.g., Shoemaker, 1962; Hawke et al., 2004], the works on the formation conditions and/or on the horizontal patterns of ejecta are limited [Barnouin-Jha and Schultz, 1998; Schultz et al., 2009].

With the laboratory experiments, reticular patterns are observed in the ejecta curtain in impacting on the bed of fine glass beads.

Emplacement of such reticulate ejecta curtain represents the similar pattern as crater rays on Moon and Mercury.

Here, we assume that the reticular pattern in the ejecta curtain are associated with the crater rays on Moon and Mercury.

We have conducted the impact experiments with single stage light gas guns in Kobe and Nagoya Universities, in order to investigate the conditions where the reticular pattern is developed in the ejecta curtain.

The impact velocity of the nylon projectile (a few - 150 m/s), the mean diameter of target particles (20 - 175 microns), and the initial target porosity (high porosity / low porosity) are varied.

We find that reticular patterns are developed only when the target consists of 50 or 100 microns diameter particles with low porosity condition. Within the investigated range, the formation of the reticular pattern does not depend on impact velocity of the projectile.

Keywords: crater rays, impact experiments, particle