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Scaling of granular convective velocity and timescale of asteroidal resurfacing TOMOYA YAMADA, KOUSUKE ANDO, TOMOKATSU MOROTA, HIROAKI KATSURAGI, Department of Earth and Environmental Sciences, Nagoya University — Granular convection is one of the well-known phenomena observed in a vertically vibrated granular bed. Recently, the possbile relation between granular convection and asteroidal surface processes has been discussed. The granular convection on the surface of small asteroids might be induced by seismic vibration resulting from meteorite impacts. To quantitatively evaluate the timescale of asteroidal resurfacing by granular convection, the granular convective velocity under various conditions must be revealed. As a first step to approach this problem, we experimentally study the velocity scaling of granular convection using a vertically vibrated glass-beads layer. By systematic experiments, a scaling form of granular convective velocity has been obtained. The obtained scaling form implies that the granular convective velocity can be written by a power-law product of two characteristic velocity components: vibrational and gravitational velocities. In addition, the system size dependence is also scaled. According to the scaling form, the granular convective velocity is almost proportional to gravitatinal acceleration. Using this scaling form, we have estimated the resurfacing timescale on small asteroid surface.

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