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DISCRETE ELEMENT MODELING OF PARTICLE ATTRITION THROUGH THE CONVEYING OF
LUNAR REGOLITH

Abstract

Particle attrition plays a key role in the efficiency and reliable operation of many industrial processes on Earth. Future lunar in-situ resource utilization (ISRU), mining, site preparation and construction operations will require an understanding of lunar regolith particle attrition to design and operate conveying, size sorting, beneficiation, and other processing systems. A shift in the particle size distribution of regolith within a system or the accumulation of residual fines within a system after an extended period of operation could reduce process efficiency or cause blockages. This paper describes research at NASA's Swamp Works Electrostatics and Surface Physics Laboratory (ESPL) to develop discrete element models of maria and highlands region regolith particle attrition in lunar gravity across a range of relevant geometry and operating parameters of several conveyor technologies.