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A PRELIMINARY STUDY OF LUNAR 3D PRINTING ROVER USING REGOLITH

Abstract

For space development, the technology is requires to manufacture in the infrastructure and construction as impossible to supply all objects from the Earth. 3D printing technology is being rapid developing recently and it have been attempts to apply in space construction. Lunar space construction by Earth's cement is not cost-effective as supply problem. A technology to utilize regolith, an abundant resource of the Moon, is required for a long-term lunar exploration activity. This paper describes an 3D printing and in-situ integrated system for rover with the overall goal of in-situ of regolith, manufacturing of regolith and polymer mixture, and 3D printed objects. The reasons for using the rover are as follows: (1) Mobility without limitations of in-situ of regolith, (2) The advantage of manufacturing objects in the rover and delivering. The rover specification and 3D printing for regolith-polymer mixture will be discussed. The prototype of 3D printed regolith-polymer mixture brick which has radioactive shielding properties is manufactured. The value of this property stated a potential opportunity in 3D printing lunar surface construction industry.