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EXPLORING LUNAR REGOLITH-BASED SHIELDING FOR INFRASTRUCTURE PROTECTION

Abstract

The moon is humanity's closest celestial pit-stop. Building habitats and full-fledged infrastructure is just the first building block in the pursuit of inter-planetary travel. Sustainable and economically feasible infrastructural development is of priority considering transportation costs and reducing dependency on earthly resources as much as possible is essential. Lunar regolith is an abundant resource that can be used for various development purposes and this study will focus on the feasibility of using it as a shielding material. The potential of regolith-based shields, focusing on their effectiveness against the thermal state present on the moon, cosmic radiation, solar particle events, and micrometeoroid impacts will be examined. The study will include an analysis of regolith's physical properties, its interaction with the lunar environment, and potential methods for compacting or using it in combination with other materials to enhance its protective qualities.