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IAF SPACE OPERATIONS SYMPOSIUM (B6)
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ANTI-LUNAR DUST SYSTEM FOR LUNAR HABITATS

Abstract

When astronauts return from the lunar surface, their spacesuits are invariably coated with a layer of fine lunar dust, known as regolith. Tribocharged lunar particles are dust particles on the surface of the moon that become electrically charged as a result of rubbing against each other or the lunar surface. It is important to remove these particles from astronauts' spacesuits because the electrical charges can cause various problems, including damage to equipment, electrostatic discharge, and potential harm to the astronauts themselves

The abrasive nature of lunar dust can cause severe damage to cameras, instruments, and communication devices, while also posing respiratory issues and other health problems for astronauts if it penetrates their spacesuits. In this regard, electrostatic cleaning represents a highly efficacious method for removing lunar dust from spacesuits and preventing its deleterious accumulation.

Electrostatic cleaning entails the use of a specialized fabric that generates an electric charge when rubbed against the spacesuit, thereby attracting and removing the lunar dust particles from the surface of the suit. The fabric, constructed from lightweight materials, is easily transportable, thus rendering it a viable option for utilization in future lunar missions.

Electrostatic cleaning is an outstanding method for removing lunar dust from spacesuits due to its exceptional efficacy, swiftness, and non-destructive nature. This method surpasses alternative methods, such as the use of brushes or vacuum cleaners, by obviating the risk of damage to the spacesuit or other equipment used in the cleaning process.

In conclusion, the utilization of electrostatic cleaning represents a fundamental method for removing lunar dust from spacesuits following the return of astronauts from the moon. This method possesses exceptional efficiency and non-invasiveness, rendering it a vital component in future lunar exploration endeavors. As we continue to venture into the cosmos and expand our knowledge of the universe, the development and refinement of techniques for removing lunar dust from spacesuits will continue to be an imperative in ensuring the safety of astronauts and the success of our missions