Paper ID: 78968
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IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Space Environmental Effects and Spacecraft Protection (6)

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RADIATION SHIELDING TECHNOLOGIES FOR DEEP SPACE EXPLORATION DEVELOPMENT AND ASSESSMENT OF ADVANCED COMPOSITE MATERIALS AND THEIR EFFECTIVENESS IN REDUCING SPACE RADIATION EXPOSURE

Abstract

Radiation exposure is one of the major hazards associated with deep space exploration. The high-energy particles from cosmic rays and solar flares can cause damage to the DNA and other biological systems of astronauts, which can lead to serious health issues. Therefore, it is crucial to develop effective radiation shielding technologies to protect astronauts during long-duration space missions.In this project, we aim to develop and assess advanced composite materials for radiation shielding in deep space exploration. We will investigate the effectiveness of these materials in reducing the exposure to space radiation by conducting experiments with simulated space radiation sources. The materials will be fabricated using various techniques, such as electrospinning, polymerization, and composite lamination.We will also evaluate the structural and mechanical properties of the developed materials to ensure their feasibility for space applications. The assessment will include tests for tensile strength, impact resistance, and thermal stability. In addition, we will analyze the cost-effectiveness of the proposed materials in comparison to existing radiation shielding technologies.The results of this project will contribute to the development of effective radiation shielding technologies for deep space exploration, which will ensure the safety and well-being of astronauts during long-duration space missions.