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Radiation Fields, Effects and Risks in Human Space Missions (5)

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ARTIFICIAL RADIATION SHIELDING FOR SPACECRAFT - USING REBCO SUPERCONDUCTIVE  
MATERIAL**Abstract**

Radiation is one of the major hazardous threads faced by astronauts during space exploration which has a potential impact on health and can cause critical damage to the electronic systems of a spacecraft. This paper provides an overview of the shielding effect in a spacecraft that can help us out from radiation effects. Here, the radiation shielding in spacecraft will be provided with a superconductive material that involves generating a magnetic field that can potentially acts as a shield which will deflect the charged particles away from the spacecraft. Here we are proposing a novel ideology by using Rare-earth barium copper oxide (ReBCO)- a flexible high temperature superconductive material which can operate at higher temperature that can provide higher shielding effects against the cosmic radiations and CME than conventional superconductors. This superconductor is designed to generate a strong uniform magnetic field that is perpendicular to the direction of the charged particle flow and then cooled to their operating temperature using a cryogenic cooling system to maintain their superconducting properties at regular intervals. The main objective of our research is to provide the results of the simulation that demonstrates the magnetic field approach is effective in reducing radiation exposure levels and has the potential to significantly enhance the safety of astronauts during longer-space missions.