

## Design and Analysis of Shielding Magnetic Field for Active Space Radiation Protection

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**Abstract :** For deep space exploration and long duration interplanetary manned missions, protection of astronauts from cosmic radiation is an unavoidable problem. However, passive shielding can be little effective for protecting particles which energies are greater than 1GeV/nucleon. In this study, active magnetic protection method is adopted. Taking into account the structure and size of the end-cap, eight shielding magnetic field configurations are designed based on the Hoffman configuration. The shielding effect of shielding magnetic field structure, intensity B and thickness L on H particles with 2GeV energy is compared by test particle simulation. The result shows that the shielding effect is better with the linear type magnetic field structure in the end-cap region. Furthermore, two magnetic field configurations with better shielding effect are investigated through H and He galactic cosmic spectra. And the shielding effect of the linear type configuration adopted in the barrel and end-cap regions is best.

**Keywords :** galactic cosmic rays, active protection, shielding magnetic field configuration, shielding effect

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