Abstract Submitted
for the TSF07 Meeting of
The American Physical Society

Save the Crew: A Superconducting Toroid Shield for Deep-Space Manned Missions RYAN ROMERO, AKHDIOR SATTAROV, PETER MCINTYRE, Texas A&M — Without proper shielding, astronauts traveling beyond the Earth's magnetosphere would be exposed to lethal doses of radiation. Passive shielding is not adequate to protect astronauts from either high-energy galactic cosmic rays or the intense bursts of energetic protons from solar flares. A more effective way is to create a magnetosphere on the spacecraft using a superconducting toroid that surrounds the crew compartment. The optimal geometry of the toroid, computed mechanical stresses, and results of radiation dose calculations are presented and compared with the passive shielding scenario.

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Date submitted: 05 Oct 2007 Electronic form version 1.4