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Magneto-Ionization Spacecraft Shield for Interplanetary Travel: Overview TRACE JOHNSON, DAVID ATRI, JUSTIN BRUTGER, KEEGAN FINGER, LUKE HOFMANN, JULIE LAFRANZO, LORIEN MACENULTY, MOLLY MCCORD, GAVIN MENNING, ETHAN MORTON, NOAH PETERSON, ATHANASIOS PETRIDIS[1], AJAL RC, WILL THOMAS, DANIEL VISCARRA, Drake University, MISSFIT COLLABORATION — One of the main issues concerning manned interplanetary travel is intense radiation exposure due to solar wind and cosmic rays. The purpose of this project has two parts: a feasibility study and a conceptual design for radiation shielding utilizing magnetic fields and the ionization of gases. The conceptual design hopes to absorb the energy of low velocity particles and deflect high energy particles. There are many factors that must be addressed in such a design, and subgroups have been assigned various tasks to investigate them. These include the motion of charged particles in complex magnetic fields, the structure of magnetic fields, energy loss due to the ionization of gases, scattering and nuclear interactions, and the composition and spectrum of solar wind and cosmic rays. Exploration into the spectrum of charged particles that will be encountered on the way to Mars will allow for computer simulations that better reflect conditions on the trip to Mars. The collaboration is a student-led project involving students of all academic years that meet weekly to exchange information.

[1]Mentor

Trace Johnson
Drake University

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