Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Magneto-Ionization Spacecraft Shield For Interpanetary Travel: Radiation Absorbtion Experiments[1] TRACE JOHNSON, LORIEN MACENULTY, SEAN CUSICK, WILLIAM THOMAS, DAVID ATRI-SCHULLER, MELANIE SCHNURR, JULIE LAFRANZO, ATHANASIOS PETRIDIS, DOUG DRAKE, KEEGAN FINGER, DANIEL MADISON, GAVIN MENNING, MOLLY MCCORD, LUKE HOFMANN, Drake University, MISSFIT TEAM — An important consideration when humans make the journey to Mars is exposure to high radiation levels. Our conceptual design for a spacecraft radiation shield consists of two parts. The active shield is a magnetic field capable of deflecting or funneling the charged particles to areas of strong field. The passive shield consists of gas-filled bubbles placed at strong-field regions that absorb energy from funneled particles by ionization and scattering. An important feature of our groups work are experiments conducted to determine the ability of various materials to block radiation. We tested the materials Demron and Vectran which will hold the ionization gases. Our experiments consisted of capturing a radiation absorption spectrum at various material thicknesses. Materials were exposed to radiation from several sources at varying energies. Each X-ray and gamma-ray peak from the spectrum of charged particles was fit with a Gaussian and the attenuation length was determined. The materials showed promise for blocking X-rays, but had difficulty stopping Gamma-rays.

[1]This research is supported by the NASA Iowa Space Grant under Award No. NNX16AL88H.

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Date submitted: 08 Jul 2019 Electronic form version 1.4