

RADIATION TRANSPORT PROPERTIES OF POLYETHYLENE-FIBER COMPOSITES

ABSTRACT

Composite materials that can both serve as effective shielding materials against cosmic-ray and energetic solar particles in deep space as well as structural materials for habitat and spacecraft remain a critical and mission enabling piece in mission planning and exploration. Polyethylene is known to have excellent shielding properties due to its low density coupled with high hydrogen content. Polyethylene-fiber reinforced composites promise to combine this shielding effectiveness with the required mechanical properties of structural materials. Samples of Polyethylene-fiber reinforced epoxy matrix composite 1-5 cm thick were prepared at NASA's Marshall Space Flight Center and tested against 500 MeV/nucleon Fe beam at the HIMAC facility of NIRS in Chiba, Japan. This paper presents measured and calculated results for the radiation transport properties of these samples.