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Radiation Fields, Effects and Risks in Human Space Missions (5)

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CHARACTERIZATION OF BUBBLE DETECTORS USED IN SPACE RADIATION DOSIMETRY:
CHARGED PARTICLE**Abstract**

In order to investigate the sensitivity of neutron bubble detectors used in space to energetic heavy ions, a series of experiments have been conducted at the Heavy Ion Medical Accelerator (HIMAC) in Chiba, Japan. The detectors were exposed to 400 MeV/nucleon carbon and 400 MeV/nucleon oxygen ion beams at different fluences. Different beam energies were obtained by inserting a water equivalent absorber (binary filter) of different thicknesses between the original ion beam and the bubble detectors. Preliminary results have been analyzed and it was observed that bubbles were formed when the linear energy transfer (LET) of each ion surpassed a certain minimum threshold. The LET threshold for carbon ions was found to be less than the LET threshold for oxygen ions. This result is consistent with our previous measurements at HIMAC where the minimum LET threshold for bubble formation of He, Si and Fe ions was found to increase for increasing ion charge. This is also consistent with minimum LET threshold measurements for N ions and Ar ions reported in previous work.