Contribution ID : **171** Type : **Poster**

Radiation monitor for astronaut safety and prediction of electronic failure in the space mission

Thursday, 25 November 2021 18:16 (1)

Astronauts travelling through space are at risk of exposure to radiation arising from Galactic Cosmic Rays (GCRs) and Solar particle events (SPE) which possess a significant radiobiological effect. GCR is mostly made up of protons with a small proportion of GCR being high atomic number energetic particles, which are difficult to shield while SPEs are events which occasionally eject large number of protons on top of a steady stream of photons and electrons. The composition of GCRs and SPE creates a complex radiation field which becomes difficult to characterize in real time due to the large variety of ions and radiation types. The ability to measure the dose equivalent in real time received by astronauts with high efficiency and accuracy is of great importance, as the risk of excessive exposure can be monitored and minimized. A novel large area microdosimeter has been developed at the Centre for Medical Radiation Physics, University of Wollongong – named the Octobox, for monitoring the dose equivalent and radiobiological risk to astronauts in a mixed radiation field environment, typical to the one encountered in space. The Octobox's response to 290 MeV/u 12C ion, 230 and 490 MeV/u 28Si, 400 MeV/u 20Ne at the Heavy Ion Medical Accelerator in Chiba (HIMAC), Japan was studied. Both experimental and GEANT4 simulation data are showing that the Octobox is suitable for mixed radiation field monitoring for space application with real-time readout of dose equivalent values aiding in protection of astronauts on space missions.

Level of Expertise

Student

Presenter Gender

Man

Pronouns

He/Him

Which facility did you use for your research

Centre for Accelerator Science

Students Only - Are you interested in AINSE student funding

Yes

Do you wish to take part in the Student Poster Slam

No

Condition of submission

Yes

Primary author(s) : PAN, Vladimir (University of Wollongong); Mr FEDERICO, Pagani (University of Wollongong); JAMES, Benjamin (UOW - CMRP); Dr BOLST, David (University of Wollongong); PERACCHI, Stefania (University of Wollongong); Mr VOHRADKSY, James (University of Wollongong); PASTUOVIC, Zeljko (Centre for Accelerator Science of ANSTO); Dr POGOSSOV, Alex (University of Wollongong); GUATELLI, Susanna (University of Wollongong); Prof. PETASSECA, Marco (University of Wollongong); LERCH, Michael (University of Wollongong); Prof. PROKOPOVICH, Dale (ANSTO); Dr PEREVERTAYLO, Vladimir (SPA-BIT); Prof. INANIWA, Taku (National Institute for Quantum and Radiological Science and Technology); Prof. MATSUFUJI, Naruhiro (National Institute for Quantum and Radiological Science and Technology); Dr BRENNER, Ceri (ANSTO); Prof. JACKSON, Michael (University of New South Wales); TRAN, Linh (Centre for Medical Radiation Physics, University of Wollongong); ROSENFELD, Anatoly (University of Wollongong)

Presenter(s) : PAN, Vladimir (University of Wollongong)

Session Classification : Poster Session

Track Classification : Physics, Surface & Condensed Matter