Using the FLUKA Monte Carlo code to simulate the interactions of ionizing radiation with matter to assist and aid our understanding of ground based accelerator testing, space hardware design, and secondary space radiation environments

Designing hardware to operate in the space radiation environment is a very difficult and costly activity. Ground based particle accelerators can be used to test for exposure to the radiation environment, one species at a time, however, the actual space environment cannot be duplicated because of the range of energies and isotropic nature of space radiation. The FLUKA Monte Carlo code is an integrated physics package based at CERN that has been under development for the last 40+ years and includes the most up-to-date fundamental physics theory and particle physics data. This work presents an overview of FLUKA and how it has been used in conjunction with ground based radiation testing for NASA and improve our understanding of secondary particle environments resulting from the interaction of space radiation with matter.