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Plasma acceleration based space radiation reproduction and hardness assurance

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Space radiation is a major obstacle for space exploration and makes radiation hardness assurance (RHA) an essential part of any space mission. The broadband nature of the radiations energy profile is a particularly challenging characteristic to recreate in the laboratory environment. Current testing relies on monoenergetic sources and so is unable to recreate all relevant conditions for RHA. Plasma acceleration provides the solution to this issue, the inherently broadband energy profile can be tuned to match a diverse range of radiation profiles creating an excellent tool for RHA .

The novel application of these accelerators to the field of space radiation testing will be presented with both experimental and 3D PIC simulations presented. The various methods of plasma acceleration , underdense and overdense , provide a platform for the first accurate recreation of the space radiation profile on earth

[1]B. Hidding et al. Laser-plasma-based Space Radiation Reproduction in the Laboratory, Scientific Reports (2017)

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