

Abstract Submitted
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Space and Medical Applications of the Geant4 Simulation Toolkit

JOSEPH PERL, Stanford Linear Accelerator Center — Geant4 is a toolkit to simulate the passage of particles through matter. While Geant4 was developed for High Energy Physics (HEP), applications now include Nuclear, Medical and Space Physics. Medical applications have been increasing rapidly due to the overall growth of Monte Carlo in Medical Physics and the unique qualities of Geant4 as an all-particle code able to handle complex geometry, motion and fields with the flexibility of modern programming and an open free source code. Work has included characterizing beams and sources, treatment planning and imaging. The all-particle nature of Geant4 has made it popular for the newest modes of radiation treatment: Proton and Particle therapy. Geant4 has been used by ESA, NASA and JAXA to study radiation effects to spacecraft and personnel. The flexibility of Geant4 has enabled teams to incorporate it into their own applications (SPENVIS MULASSIS space environment from QinetiQ and ESA, RADSAFE simulation from Vanderbilt University and NASA). We provide an overview of applications and discuss how Geant4 has responded to specific challenges of moving from HEP to Medical and Space Physics, including recent work to extend Geant4's energy range to low dose radiobiology.

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