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Imaging Applications of the Geant4 Simulation Toolkit JOSEPH PERL, Stanford Linear Accelerator Center — Geant4 is a toolkit for the simulation of the passage of particles through matter. While Geant4 was originally developed for High Energy Physics (HEP), applications now include Nuclear, Space and Medical Physics. Medical applications of Geant4 in North America and throughout the world have been increasing rapidly due to the overall growth of Monte Carlo use 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 and free source code. Many developers of imaging technology use Geant4 by way of GATE, the Geant4 Application for Emission Tomography, which wraps around Geant4 to simplify use and add imaging features, while other imaging developers use Geant4 directly. This talk will provide an overview of these applications, with a focus on how Geant4's unique qualities, such as its support for moving geometries and electric and magnetic fields, are applied to medical imaging.

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