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Geant4 Version 10 Series

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The Geant4 Collaboration released a new generation of the Geant4 simulation toolkit (version 10.0) in December 2013, and continues to improve its physics, computing performance and usability. This presentation will cover the major improvements made since version 10.0. The physics evolutions include improvement of the Fritiof hadronics model, extension of the INCL++ model to higher energy, extension of the data-driven low-energy neutron model approach to proton and light ions, extension of radioactive decay modes to include proton emission and double beta decay, introduction of phonon physics, a first implementation of particle-matter interactions dealing with crystal lattice structure, improvements of multiple-scattering for displacement at volume boundary, and extension of low energy electromagnetic processes in DNA scale. Extension and improvement of the unified solid library will provide more functionality and better computing performance. The continued effort to reduce memory consumption per thread allows for massive parallelism of large applications in the multithreaded mode. Toolkit usability is improved with an evolved real-time visualization in multithreaded mode, a new web-based visualization driver, enhancements in histogramming tool in particular in multithreaded mode, and additional APIs for easier integration with Intel TBB and MPI. In addition, the Collaboration has extended its platform support to the Xeon Phi coprocessors. A redesigned physics validation tool based on modern web technologies will ease users' access to routinely performed validations. We will also discuss our short and long term development perspectives.

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