Parallel Simulation Program for Dosimetry Based in PENELOPE Monte Carlo Model

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PENELOPE is a computer code system for electrons, photons and positrons transport simulations in complex geometries for arbitrary materials and with a wide energy range. The user of this code should write a main program that, among other things, need define the radiation source and the tallies for the simulation. This work presents a new general main program for PENELOPE, MCGridMain, which is part of MCGrid project, a new infrastructure for the development and distributed execution of radiation transport simulation and dosimetry. MCGridMain was designed with three main goals: pre-define mostly used radiation sources and tallies, simulation parameters configured on a file in XML format through a graphical user interface and parallel execution in heterogeneous computational environments. In this version, the original PENELOPE version 2008 was used as the kernel and routines were incorporated into the system to permit the parallelization. MCGridMan is written in C/C++, with distributed execution and multiplatform concerns, using the GNU Compiler Collection (GCC) as the preferable set of compilers. This new software, like PENELOPE, will be release as a Free Software. A simulation of x-ray spectrum was realized accordingly with the configuration published in the IPEN Report 78 database.

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