

The Medical Physics Simulation with Grid

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A new project for advanced simulation technology in radiotherapy was launched on Oct. 2003 with funding of JST (Japan Science and Technology Agency) in Japan. The project aim is to develop an ample set of simulation package for radiotherapy based on Geant4 in collaboration between Geant4 developers and medical users. They need much more computing power and strong security for accurate and high-speed dose calculation and therefore parallelism and gridify of Geant4 applications is an important issue for our project. Some of LCG (LHC Computing Grid) middlewares were actually deployed and enabled to share the computing resources and to control job between KEK and ICEPP. A class library was developed for parallelization of existent Geant4-based application as a part of Geant4 framework. One of our practical application was accelerated by 30 times under 40 CPUs and then parallel efficiency is 67%. In this paper, we will describe how to design and implement parallelization of Geant4 medical applications and interface between our applications and Grid environment.

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