Interfacing EGS4 with Geant4
- An Example of Virtual Monte Carlo Approach

Koichi Murakami (KEK)

Abstract:

The idea of Virtual Monte Carlo is that to run different Monte Carlo codes without changing user codes, such as input and output format as well as geometry and detector response. There are several well-known and widely-used simulation packages. However, comparing between different simulation tools often raises controversial issues in geometry description, cut values and so on. In this sense, the approach of Virtual Monte Carlo could be useful to settle down this kind of problems.

Geant4 has rich flexibility and expansibility brought by its Object-Oriented approach, especially in adding physics processes. We can use Geant4 as a framework of Virtual Monte Carlo system and plug-in the part of physics processes of other packages as Geant4 modules. In this paper, we especially focused on interfacing EGS4, which is one of the most well-known simulation packages, with Geant4. Taking advantage of the capability of Geant4 as a framework, we developed a plug-in interface for using EGS4 as a module of Geant4 physics process. By means of this interface, users can make applications on which the two different simulation systems can co-work in an easy and proper way. This is useful and important for making comparisons between EGS4 and Geant4, especially in users' application level. In addition, EGS4 users can share Geant4 powerful resources, such as geometry description, tracking etc.

In this paper, we describe our approach of design and implementation of the interface. And also, through some basic comparison tests, the feasibility and usefulness of Virtual Monte Carlo approach can be shown.