Latest developments in GAMOS

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Background: GAMOS is a framework that facilitates the use of Geant4 for applications in the medical field and others. But the main feature that differentiates it from other similar frameworks are the tools that allow a detailed understanding of each part of the simulation by giving the user an easy way (using a few text lines) to know detailed information; for example the fraction of dose that is due to particles created in a given volume, the energy at creation of particles that will reach a target volume, etc. We describe here the main developments of GAMOS during the last few years.

GAMOS new developments:

2D visualization provides measurable dimensions and positions of each volume based on tracking, allowing correction of many mistakes in the geometry, including an incorrect hierarchy of volumes not detected by 3D visualization tools.

GAMOS can use **Geant4 biasing with user commands** and also includes a very flexible **importance sampling technique** and **generator biasing**. There is also a **point detector scoring** technique, of great relevance for radioprotection.

In the field of **protontherapy, a new tutor**ial is available that allows the user to **become self-sufficient**. Also new **LET and RBE scoring** has also been introduced, and users can create with one or a few commands lines their **own definition of these quantities**.

GAMOS has now a **native Windows distribution**, no more need of using a Virtual Machine. A **Graphical User Interface** is provided for Windows and Linux so that GAMOS can be run with a few clicks. There is also another **GUI dedicated to Nuclear Medicine Dosimetry** and with it users can upload their DICOM files and obtain the results in figures or tables.

GAMOS is completely free of charge. This means not only that it can be freely downloaded, but also that users can use any part of it together with their own application. This can be done in two ways: or **porting their application into GAMOS**, which can be done adding a few lines following the User Guide or the example provided, or **porting part of GAMOS code to their application**.

Each **GAMOS release is tested on three different Linux distributions and Windows**. **165 tests** are run to check the stability of results. An active **User Forum** serves to answers questions or requests of the already 3,**000 GAMOS registered users**.

Summary: Some new developments have been added to the extensive functionality of GAMOS (+350k lines of C++ code). They include protontherapy application and new GUIs for Windows and Linux.