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Analysis Tools in Geant4 10.2

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A new analysis category based on g4tools was added in Geant4 release 9.5 with the aim of providing users with a lightweight analysis tool available as part of the Geant4 installation without the need to link to an external analysis package. It has progressively replaced the usage of external tools based on AIDA (Abstract Interfaces for Data Analysis) in all Geant4 examples. Frequent questions in the Geant4 users forum show its increasing popularity in the Geant4 users community.

The analysis category consists of the analysis manager classes and the g4tools package.

g4tools, originally part of the inlib and exlib packages, provides a very light and easy to install set of C++ classes that can be used to perform analysis in a Geant4 batch program. It allows to create and manipulate histograms, profiles and ntuples, write them in several supported file formats (ROOT, CSV, AIDA XML, and HBOOK) and, when needed, also read them back from the files. Since the last Geant4 release, 10.2, it has been enhanced with functions for batch plotting and MPI messaging.

Analysis manager classes provide a uniform interface to the g4tools objects and also hide the differences between the classes for different supported output formats. They take care of higher level management of the g4tools objects, handle allocation and removal of the objects in memory and provide the methods to access them via indexes. In addition, various features specific to Geant4 applications are implemented in the analysis classes following users requests, such as for example the g4tools objects activation, support for Geant4 units or a rich set of Geant4 user interface commands.

In this presentation, we will give a brief overview of the category, then report on new developments since our CHEP 2013 contribution and on upcoming new features.

Tertiary Keyword (Optional)

Software development process and tools

Primary Keyword (Mandatory)

Analysis tools and techniques

Secondary Keyword (Optional)

Simulation

Primary authors: BARRAND, Guy (Laboratoire de l'Accélérateur Linéaire (LAL), Université Paris-Sud, CNRS-IN2P3, France); HRIVNACOVA, Ivana (Institut de Physique Nucléaire (IPNO), Université Paris-Sud, CNRS-IN2P3, France)

Presenter: HRIVNACOVA, Ivana (Institut de Physique Nucléaire (IPNO), Université Paris-Sud, CNRS-IN2P3, France)

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