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Improving Geant4 multi-core's performance and usability

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We report on the progress of the multi-core versions of Geant4, including multi-process and multi-threaded Geant4.

The performance of the multi-threaded version of Geant4 has been measured, identifying an overhead compared with the sequential version of 20-30%. We explain the reasons, and the improvements introduced to reduce this overhead.

In addition we have improved the design of a few key classes of Geant4 were revised in order to simplify the design and improve the implementation of multi-threaded and reduce the memory footprint of multi-process Geant4.

The process for adapting user applications to Geant4 multi-threaded has been documented and streamlined. Most applications can be adapted within 1-2 working days. Tools to verify that the results of a multi-threaded application are exactly equal to the sequential version are under development.

In addition we present an overview of the test coverage undertaken to ensure that the Geant4 multi-threaded are fully compatible with the sequential version.

Student? Enter 'yes'. See http://goo.gl/MVv53

No

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