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Intelligent Design

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The International Linear Collider (ILC) promises to provide electron-positron collisions at unprecedented energy and luminosities. Designing the detectors to extract the physics from these events requires efficient tools to simulate the detector response and reconstruct the events.

The detector response package, slic, is based on the Geant4 toolkit and adds a thin layer of C++ code. This allows the end user to fully describe the detector geometry and readout at runtime using a plain text file in an xml format which extends GDML. It also supports reading in simulated events in stdhep format, and writing out events in the ILC-standard LCIO format.

We then describe org.lcsim, a Java toolkit for full event reconstruction and analysis. The components are fully modular and are available for tasks from digitization of tracking detector signals through to cluster finding, pattern recognition, track fitting, jetfinding, and analysis. The code can be run standalone, for batch or Grid computing, or from within JAS3, which then provides access to the WIRED event display and the AIDA-compliant analysis capabilities.

We present the architecture as well as the implementation for several candidate detector designs, demonstrating both the flexibility and the power of the system.

Summary

We present an integrated detector response simulation and event reconstruction environment being used to study detector concepts for the International Linear Collider.

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