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Linear Collider Software and Computing (15' + 5')

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The ILC/CLIC linear collider community has for many years followed a strategy of developing common and generic software tools for studying the physics potential as well as continuously optimizing their detector concepts. The basis of the software framework is formed by the common event data model LCIO and the detector description toolkit DD4hep. DD4hep is a recently developed, generic detector description toolkit that allows to provide all aspects of detector geometry, materials and physics properties of the detector as needed for simulation, reconstruction and analysis from one single source of information. It offers an application framework for running full simulations with Geant4 as well as interfaces for handling conditions data and simulating mis-alignment of detector components. DD4hep has also been adopted by detector projects at FCC and CEPC. The proposed detectors for ILC and CLIC combine unprecedented momentum and impact parameter resolution with very high jet energy resolution, achieved with highly granular calorimeters and the application of particle flow reconstruction algorithms (PFA). The reconstruction algorithms for tracking and PFA are written as much as possible in a detector independent way, which on the one hand facilitates common software developments and on the other hand simplifies the comparison of different detector variants. For large scale Monte Carlo production and physics analyses the iLCDIRAC system provides a unified interface to the distributed computing resources used by the LC community. A simplified API allows to transparently submit jobs running all of the LC software to a large number of different batch and Grid-resources that are either directly provided or opportunistically available for the VO ILC. In this talk we will present the complete LC software for simulation and reconstruction with a focus on recent developments and application to ILD and the new CLIC detector model.

Presenter: NIKIFOROU, Nikiforos (CERN)

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