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Key4hep: a Turnkey Software Framework for Future Accelerator Experiments

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Key4hep is a software framework designed to facilitate the design, optimization and data analysis of detectors for future accelerator experiments. With the goal of fostering collaboration and resource sharing, the Key4hep community has been growing and now includes the FCC, CLIC, ILC, EIC and other experiments. Thanks to reusing developments across experiments, Key4hep significantly reduces duplication efforts and helps to improve the quality of the software, as many users with various needs work on its development or use it.

In this poster, the components of Key4hep are explained. Key4hep integrates all the steps in the typical offline pipeline: generation, simulation, reconstruction and analysis. The central component is a common event data model, called EDM4hep. There are also interfaces to existing tools; for example, for reconstruction, Key4hep leverages Gaudi, a proven framework already in use by several experiments at the LHC, to orchestrate configuration and execution of reconstruction algorithms. The list of components also includes interfaces to Monte Carlo generators and other tools for simulation, as well as analysis facilities. The interplay between the different components, interfaces and the usage and development in Key4hep are explained.

Primary author: CARCELLER ON BEHALF OF THE KEY4HEP AUTHORS, Juan Miguel (CERN)

Presenter: CARCELLER ON BEHALF OF THE KEY4HEP AUTHORS, Juan Miguel (CERN)

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