Contribution ID: **54**   Type: **Plenary**

Tracking performance with ACTS

Wednesday 22 April 2020 21:40 (25 minutes)

The reconstruction of charged particles'trajectories is one of the most complex and CPU consuming parts of event processing in high energy experiments, in particular at future hadron colliders such as the High-Luminosity Large Hadron Collider (HL-LHC). Highly-performant tracking software exploiting both innovative tracking algorithms and modern computing architectures with many cores and accelerators are necessary to maintain and improve the tracking performance.

Based on the tracking experience at LHC, the ACTS project encapsulates the current ATLAS software into an experiment-independent and framework-independent software designed for modern computing architectures. It provides a set of high-level track reconstruction tools which are agnostic to the details of the detection technologies and magnetic field configuration and tested for strict thread-safety to support multi-threaded event processing. It supports contextual detector conditions, which can include having multiple detector alignments or calibrations in memory with a minimal memory footprint. Tracking infrastructures such as tracking geometry, Event Data Model, and propagator are well developed and validated in ACTS. The prototype of tracking algorithms for tracking fitting, track seeding and vertex reconstruction are available with the performance currently underin validation.

In this talk, I will introduce the available tracking features in ACTS software and focus on the implemented track fitting using a full-resolution Kalman Fitter and track finding which is based on the sequential Kalman filtering. The tracking performance will be highlighted with prototype detectors. An early study of using ACTS for the Belle experiment will be shown as well. I'll also talk about the thoughts about achieving possible speed-up of those algorithms by implementing them on accelerators.

Consider for young scientist forum (Student or postdoc speaker)

Yes

Second most appropriate track (if necessary)

Architectures and techniques for real-time tracking and fast track reconstruction

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Session Classification: Recording sessions