Contribution ID: **24** Type: **Poster**

A novel standalone track reconstruction algorithm for the LHCb upgrade

Tuesday, 20 March 2018 16:30 (15 minutes)

During the LHC Run III, starting in 2020, the instantaneous luminosity of LHCb will be increased up to 2×10^{33} cm^{-2} s^{-1}, five times larger than in Run II. The LHCb detector will then have to be upgraded in 2019. In fact, a full software event reconstruction will be performed at the full bunch crossing rate by the trigger, in order to profit of the higher instantaneous luminosity provided by the accelerator. In addition, all the tracking devices will be replaced and, in particular, a scintillating fiber tracker (SciFi) will be installed after the magnet, allowing to cope with the higher occupancy. The new running conditions, and the tighter timing constraints in the software trigger, represent a big challenge for the track reconstruction.
This talk presents the design and performance of a novel algorithm that has been developed to reconstruct track segments using solely hits from the SciFi. This algorithm is crucial for the reconstruction of tracks originating from long-lived particles such as K_S and Λ. The implementation strategy is based on a progressive cleaning of the tracking environment and on an active use of the information from the stereo hits in order to select tracks. It also profit from the definition of an improved track parameterization. When compared to its previous implementation, the new algorithm has significantly higher performances in terms of efficiency, number of fake tracks and timing, allowing to enhance the physics potential and capabilities of the LHCb upgrade.

Primary author: Mr QUAGLIANI, Renato (Centre National de la Recherche Scientifique (FR))

Co-author: DE CIAN, Michel (Ruprecht Karls Universitaet Heidelberg (DE))

Presenter: Mr QUAGLIANI, Renato (Centre National de la Recherche Scientifique (FR))

Session Classification: Poster

Track Classification: 2: Real-time pattern recognition and fast tracking