Contribution ID: **497**   Type: **Plenary**

Best Track 1 poster: Physics and computing performance of reconstruction algorithms for the GPU High Level Trigger 1 of LHCb

Friday 15 March 2019 11:00 (10 minutes)

Beginning in 2021, the upgraded LHCb experiment will use a triggerless readout system collecting data at an event rate of 30 MHz. A software-only High Level Trigger will enable unprecedented flexibility for trigger selections. During the first stage (HLT1), a sub-set of the full offline track reconstruction for charged particles is run to select particles of interest based on single or two-track selections. After this first stage, the event rate is reduced by at least a factor 30. Track reconstruction at 30 MHz represents a significant computing challenge, requiring a renovation of current algorithms and the underlying hardware. In this talk we present work based on an R&D project in the context of the LHCb Upgrade I exploring the approach of executing the full HLT1 chain on GPUs. This includes decoding the raw data, clustering of hits, pattern recognition, as well as track fitting. We will discuss the development of algorithms optimized for many-core architectures. Both the computing and physics performance of the full HLT1 chain will be presented.

Author: MUELLER, Katharina (Universitaet Zuerich (CH))

Presenter: VOM BRUCH, Dorothea (LPNHE Paris, CNRS)

Session Classification: Plenary

Track Classification: Track 1: Computing Technology for Physics Research