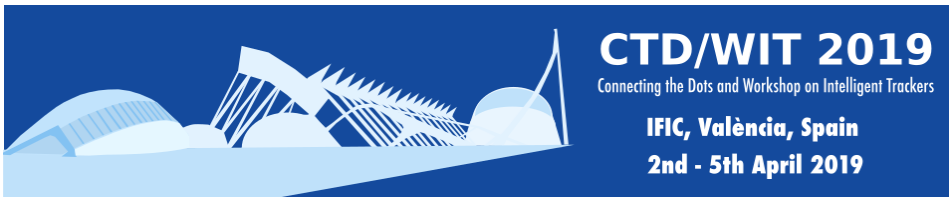

Contribution ID: **13** Type: **Talk**

Global Track Reconstruction and Data Compression Strategy in ALICE for LHC Run 3

Thursday, April 4, 2019 10:30 AM (25 minutes)

In LHC Run 3, ALICE will increase the data taking rate significantly to 50 kHz continuous readout of minimum bias Pb-Pb collisions instead of around 1 kHz triggered readout..
The reconstruction strategy of the online offline computing upgrade foresees a first synchronous online reconstruction stage during data taking enabling detector calibration, and a posterior calibrated asynchronous reconstruction stage.
The huge amount of data requires a significant compression to store all recorded events.
We are aiming for a factor of 20 for the TPC, which is one of the main challenges during synchronous reconstruction.
In addition, the reconstruction will run online, processing 50 times more collisions than at present, while thereby yielding results comparable to current offline reconstruction.
All this poses new challenges for the tracking, including the continuous TPC readout, more overlapping collisions, no a priori knowledge of the primary vertex position and of location-dependent calibration during the synchronous phase, identification of low-momentum looping tracks, and a distorted refit to improve track model entropy coding.
At the last workshop, we presented the fast new TPC tracking for Run 3, which matches the physics performance of the current Run 2 offline tracking.
It leverages the potential of hardware accelerators via the OpenCL and CUDA APIs in a shared source code for CPUs and GPUs for both reconstruction stages.
Porting more reconstruction steps like the remainder of the TPC reconstruction and tracking for other detectors to GPU will shift the computing balance from traditional processors towards GPUs.
This presentation will focus on the global tracking strategy, including the ITS and TRD detectors, on offloading more reconstruction steps onto GPU, and on our approaches to achieving the necessary data compression.

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