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Type: **Oral**

A vendor-agnostic, single code-based GPU tracking for the Inner Tracking System of the ALICE experiment

Wednesday, 1 December 2021 17:40 (20 minutes)

During the LHC Run 3 the ALICE online computing farm will process up to 50 times more Pb-Pb events per second than in Run 2. The implied computing resource scaling requires a shift in the approach that comprises the extensive usage of Graphics Processing Units (GPU) for the processing. We will give an overview of the state of the art for the data reconstruction on GPUs in ALICE, with additional focus on the Inner Tracking System detector. A detailed teardown of adopted techniques, implemented algorithms and approaches and performance report will be shown. Additionally, we will show how we support different GPUs brands (Nvidia and AMD) with a single codebase using an automatic code translation and generation for different target architectures. Strengths and possible weaknesses of this approach will be discussed. Finally, an overview of the next steps towards an even more comprehensive usage of GPUs in ALICE software will be illustrated.

Significance

Main novel contents:

- ITS reconstruction algorithms using GPU for Run 3 + performance
- Innovative and lightweight approach in supporting different GPU vendors with single code (no external libraries/meta programming)

References

Speaker time zone

Compatible with Europe

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Session Classification: Track 2: Data Analysis - Algorithms and Tools

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