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Performance study of the CLUE algorithm with the alpaka library

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CLUE (CLUsters of Energy) is a fast, fully-parallelizable clustering algorithm developed to optimize such a crucial step in the event reconstruction chain of future high granularity calorimeters. The main drawback of having an unprecedentedly high segmentation in this kind of detectors is a huge computation load that, in case of the CMS, must be reduced to fit the harsh requirements of the Phase-2 High Level Trigger.

With the adoption of alpaka as performance portability library in CMSSW, the CLUE algorithm has been tested on multiple accelerators and hybrid platforms. This work presents the latest results obtained with the alpaka implementation of CLUE, which can fully exploit the available hardware on each machine and fulfill the task with high performance.

Significance

This talk will show how the alpaka performance portability library, the software technology chosen by CMS for hardware accelerators, can mantain the high performance for novel algorithms, developed with throughput and efficiency in mind for the new generation of detectors and Phase-2 upgrades at the experiment.

References

https://doi.org/10.3389/fdata.2020.591315

Experiment context, if any

CMS

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