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## Portable HCAL reconstruction in the CMS detector using the Alpaka library

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CMS has deployed a number of different GPU algorithms at the High-Level Trigger (HLT) in Run 3. As the code base for GPU algorithms continues to grow, the burden for developing and maintaining separate implementations for GPU and CPU becomes increasingly challenging. To mitigate this, CMS has adopted the Alpaka (Abstraction Library for Parallel Kernel Acceleration) library as the performance portability solution to provide a single-code base for parallel execution on both GPUs and CPUs in CMS software (CMSSW).

A direct CUDA version of HCAL energy reconstruction, called Minimization At Hcal, Iteratively (MAHI), has been deployed at the HLT in the 2022-2023 data taking period. This contribution will describe how the CUDA version is converted into a portable implementation using the Alpaka library. We will discuss the porting experience from CUDA to Alpaka, the validation process and the performance of the Alpaka version in CPU and GPU.

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