Contribution ID: **118** Type: **Short Talk**

Porting CMS Heterogeneous Pixel Reconstruction to Kokkos

Tuesday 18 May 2021 15:39 (13 minutes)

Programming for a diverse set of compute accelerators in addition to the CPU is a challenge. Maintaining separate source code for each architecture would require lots of effort, and development of new algorithms would be daunting if it had to be repeated many times. Fortunately there are several portability technologies on the market such as Alpaka, Kokkos, and SYCL. These technologies aim to improve the developer productivity by making it possible to use the same source code for many different architectures. In this paper we use heterogeneous pixel reconstruction code from the CMS experiment at the CERNL LHC as a realistic use case of a GPU-targeting HEP reconstruction software, and report experience from prototyping a portable version of it using Kokkos. The development was done in a standalone program that attempts to model many of the complexities of a HEP data processing framework such as CMSSW. We also compare the achieved event processing throughput to the original CUDA code and a CPU version of it.

Primary authors: CHILDERS, Taylor (Argonne National Laboratory (US)); KORTELAINEN, Matti (Fermi National Accelerator Lab. (US)); KWOK, Ka Hei Martin (Fermi National Accelerator Lab. (US)); STRELCHENKO, Alexei (F); WANG, Yunsong (Lawrence Berkeley National Laboratory)

Presenter: KORTELAINEN, Matti (Fermi National Accelerator Lab. (US))

Session Classification: Accelerators

Track Classification: Offline Computing