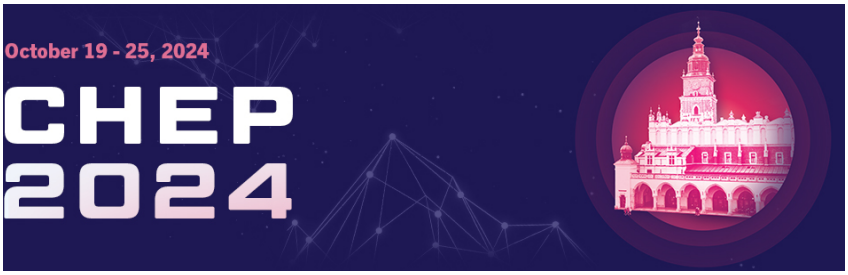

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Using the ATLAS experiment software on heterogeneous resources

Wednesday 23 October 2024 14:24 (18 minutes)

With the large dataset expected from 2029 onwards by the HL-LHC at CERN, the ATLAS experiment is reaching the limits of the current data processing model in terms of traditional CPU resources based on x86_64 architectures and an extensive program for software upgrades towards the HL-LHC has been set up. The ARM CPU architecture is becoming a competitive and energy efficient alternative. Accelerators like GPUs are available in any recent HPC. In the past years ATLAS has successfully ported its full data processing and simulation software framework Athena to ARM and has invested significant effort in porting parts of the reconstruction and simulation algorithms to GPUs.
We report on the successful usage of the ATLAS experiment offline and online software framework Athena on ARM and GPUs through the PanDA workflow management system at various WLCG sites. Furthermore we report on performance optimizations of the builds for ARM CPUs and the GPU integration efforts. We will discuss performance comparisons of different ARM and x86 architectures on WLCG resources and Cloud compute providers like GCP and AWS using ATLAS productions workflows as used in the HepScore23 benchmark suite.

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