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Accelerating MC simulations using FPGAs and ACAPs

The ever-increasing need of event generation in particle physics that is required by physics analysis of the LHC data requires innovative techniques to reduce both time and power consumption. We present a study to demonstrate the use of FPGAs and ACAPs to accelerate event generation using MadGraph. We evaluate the performance in terms of the execution time and the power consumption, as the tested devices have a potential of reducing both when compared to other acceleration hardware such as GPUs. The inherent complexity of high-precision event generation suggests that not all the acceleration is well-suited for FPGAs, however certain calculations may benefit from the use of these technologies. Experimental evaluation is ongoing, but preliminary assessments suggest a promising results compared to CPU/GPUs implementations. This potential improvement could enable the execution of more complex simulations within shorter time frames.

Secondary track

T13 - Accelerators for HEP

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