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Study of the feasibility of accelerating MC generation with FPGAs

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Monte Carlo (MC) event generation is a crucial component of high-energy physics simulations, yet its computational cost poses significant challenges, particularly in the era of increasing data volumes. Recently, new solutions are being explored by developers of MC generators, that aim to accelerate the process of integrating matrix elements in GPU architechtures. These solutions achived great performance and speedups, with a non negligible cost on consumption power. A solution based on Field Programmable Gate Arrays (FPGAs) could benefit from the inherent parallelism and low-latency of FPGAs, with an expected gain in power consumption cost. This talk explores the feasibility of accelerating MC generation using We discuss key implementation strategies, performance benchmarks, and the implications of FPGA-accelerated MC generation for future experiments and large-scale simulations.

Autores: VICO, Carlos (Universidad de Oviedo); Sr. LEGUINA LÓPEZ, Pelayo (ICTEA- Universidad de Oviedo); FOLGUERAS, Santiago (Universidad de Oviedo)

Presentador: VICO, Carlos (Universidad de Oviedo)

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