Contribution ID: **31** Type: **Talk**

Fast event generation on GPU

Wednesday, 10 September 2014 11:35 (30 minutes)

We use a graphics processing unit (GPU) for fast event generation of general Standard Model (SM) processes. The event generation system on GPU is developed based on the Monte Carlo integration and generation program BASES/SPRING in FORTRAN.
For computations of cross sections of physics processes all SM interactions are included in the helicity amplitude computation package on GPU (HEGET) and phase space generation codes are developed for efficient generation of jet associated processes.
For the GPU version of BASES/SPRING new algorithm is introduced in order to fully exploit the ability of GPU performance and the improvement of performance in nearly two orders of magnitude is achieved.

The generation system is tested for general SM processes by comparing with the MadGraph, which is widely used in HEP experiments, and integrated cross sections and distributions of generated events are found to be consistent.
In order to realize smooth migration to the GPU environment, a program that automatically converts FORTRAN amplitude programs generated by the MadGraph into CUDA programs is developed.

Primary author: Dr KANZAKI, Junichi (KEK)

Presenter: Dr KANZAKI, Junichi (KEK)

Session Classification: GPU in Offline, Montecarlo and Analysis (1/3)