Overview of tutorial#1 - Generation Events

FCCSW Hands-on Tutorial October 2022

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Purpose of the tutorial #1

- Get an overview of the Monte Carlo generators available
- Gets the hands on generating Monte Carlo events
  - And different file formats
- Analyses the outputs
  - To make sure things looks right
  - To compare different generators

Objective

Give users an handle how to run a Monte Carlo generation for personal use (toy MC studies, ...)

Tutorial #1 - What it is about

- **Target data**

  Two samples of 10000 of ditau (e+e- -> tau+tau-) events @ Ecm = 91.2 GeV with two different generators, KKMCee and Pythia8 in DM4hep format

- **Steps**
  - Configure and run KKMCee
  - HepMC to EDM4hep conversion (with k4run/Gaudi)
  - Configure and run Pythia8 (with k4run/Gaudi)
  - Derive a flat Ntuple for comparison (with FCCAnalyses)
  - Use ROOT for comparison

Tutorial #1 - details

- **We learn:**
  - How to configure and run a MC generator
  - How to handle different output files formats
  - How to look at the output files
  - How to make simple checks
- **Technologies used**
  - **Bash:** to handle files, running programs, ...
  - **Gaudi:** adjusting configuration files to needs, ...
  - **ROOT, FCCAnalysis:** looking at the results

Tutorial #1 - On the web site

https://hep-fcc.github.io/fcc-tutorials/fast-sim-and-analysis/FccFastSimGeneration.html#case-study-ditau-events-with-kkmcee-and-pythia8