Report from Les Houches

Josh McFayden

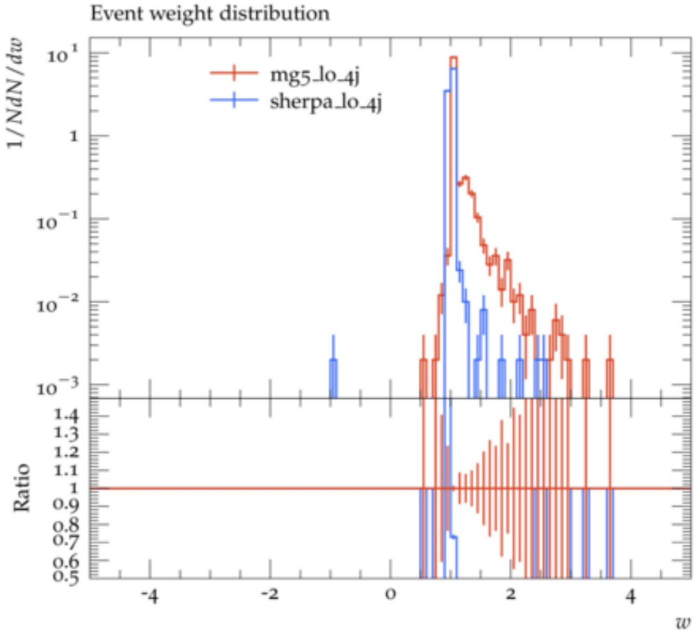
Overview

- Les Houches is an excellent forum to reach community-wide agreement
    - Where previous accords on e.g. event file formats were agreed.
    - Projects have included generator benchmarking but more on the physics side!
- Most discussions relevant to this group were held in the “Tools and Monte Carlo” Working group: https://phystev.cnrs.fr/wiki/2019:groups:tools:start

- Caveats:
    - I will not cover any of the Physics discussions
    - Most of what I will cover here is very preliminary and all my own interpretation

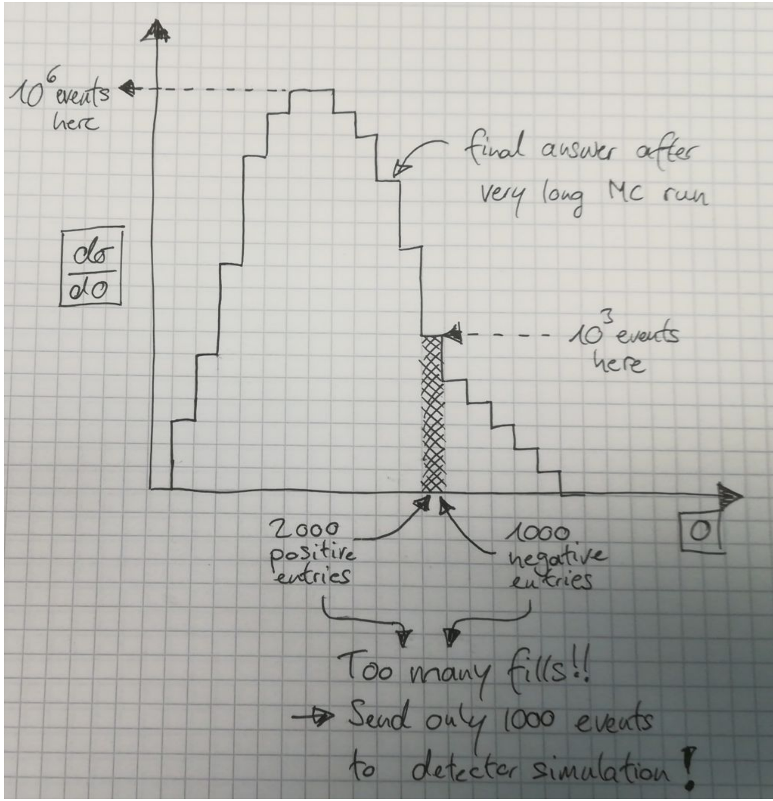
Event of weights

- Discussed possible Rivet-based tool to aid benchmarking
- Rivet routine where a weight distribution is stored for the inclusive sample and e.g. in pT(Z) or Njets bins
- Allows to see fraction of negative weights and to extract statistical dilution from weight spread
- Can be used to combine with other metrics such as CPU time/disk space
- Would help to see which phase spaces are most strongly affected



Negative weights & a-posteriori importance sampling

- Discussed improving negative weight situation
- “a-posteriori importance sampling” promising:
  - Pass only subset of events to detector simulation.
  - Choose this sample based on binned (multi-dimensional, maybe unphysical) distribution, keeping statistical power
- Would be hard for final state observable(s)
  - A multi-purpose sample would be hard to validate
- Might be possible for low-dimensionality of real-emission
- Next step is to look at the concrete (but transferrable) example
  - Starting from subtracted LO events in UNLOPS



Miscellaneous

- Standard test configurations
  - Generators Docker image
  - Samples split by N additional jets?
    - Not too long to run but still get to see areas we are interested in
- Output formats - HDF5
  - Is an industry standard, used elsewhere in e.g. Astro-physics
  - HDF5 converter for LHE already written, could also write for HepMC relatively simply.
  - Not yet a standard… but could be?
- GPU
  - Not a huge amount of positivity…
  - Write code to interface with more generic libraries like TensorFlow where the GPU integration is done for you?
  - Write down what won’t work on GPU