Event generators' and N(n)LO codes' acceleration

📅 13 Nov 2023, 09:00 → 14 Nov 2023, 18:45 Europe/Zurich

📍 4/3-006 - TH Conference Room (CERN)

Organization committee:

- Bugra Bilin
- Philip Ilten
- Leif Lonnblad
- Michelangelo Mangano
- Olivier Mattelaer
- Josh McFayden
- Stefan Roiser
- Andrea Valassi

Introduction

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- **maximize precision and control of systematics**, incorporating in event generators the state-of-the-art knowledge of each individual component of event generation: PDFs, matrix elements at large perturbative order, higher-order resummations, beyond-leading-log parton shower evolution, non-perturbative phase and underlying event, …

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- **maximize event-generation efficiency**: improved unweighting, pre-filtering w.r.t. analysis selection criteria, reduced negative-weight contributions, streamlined evaluation of systematics, …

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➡️   the role of CERN TH, EP, IT in providing support ?

Agenda

MONDAY:

1. The perspective of the experiments (ATLAS, CMS)

2. The experience of the MC developers (Pythia, Herwig, Sherpa, Madgraph)

3. The HPC landscape and the coding challenges/opportunties provided by new hardware

4. The MG5 -> GPU project experience

6:30pm Welcome drink (Salle des Pas Perdues)

TUESDAY

1. Phase space sampling and more

2. Matrix element calculations, LO & NLO, acceleration techniques, GPU porting, negative weight reduction

3. PDFs and hadronization

4. NNLO and beyond

5. Discussion, the next steps forward