(Short) status report on Event Generator LOI(s)

S. Mrenna (FNAL) speaking for various people

Backstory

The Standard Model Lagrangian is known

    It is not trivial and discoveries of its subtleties are still being discovered

    Its non-perturbative implications are an open research topic

    However, theoretical advancements are NOT the focus of this group

Implementation of Ideas in Event Generators is often hard, tedious, unrewarded

    Our focus is to identify those **hard** problems and **brainstorm**/share knowledge on how to solve them

    Both **hardware** and **software** (algorithms) developments are needed

    Suggest teams with different specialties to attack problems (SciDAC model)

EG LOI charge (our definition)

Coordinate discussion of computational goals for EGs to enable future Particle Physics Program

Create opportunities to share/discuss common problems/solutions

Reach out to those communities that are usually NOT part of the conversation:
- This is not an LHC only issue
    - Neutrinos, EIC, etc.
- This is not a CMS/ATLAS only issue
    - HSF report good, but lacks LHCb perspective, for example

One or many LOIs?

Overlap is better than non-representation: individual reports from communities:
Neutrino LOI -- Steve Dytman (today)
EIC community already has an EG effort (we will coordinate)

However, emphasize common problems/solutions:
Role of facilities/hardware: HPCs, GPUs, etc.
Tuning and uncertainty estimates
Non-perturbative physics
Rare/forced processes/decays
Theory interfaces
Any updates to HSF EG report: "Challenges in Monte Carlo event generator software for High-Luminosity LHC," [arXiv:2004.13687 [hep-ph]]

Plan:

Organize community contacts:

    Yes: EIC, NA62 and NA64, Nus, LHC, CODEX-b

    No: SeaQuest/DarkQuest, MATHSULA, FASER, Belle II

    Ask you who have we overlooked?

To do:

    Dedicated meeting for just EGs where everyone gives a short talk, and we organize the writing from there.

    Date: TBD

Identify WG overlaps and, at least, provide mutual pointers

People involved in organization of LOI(s)

S. Dytman (Genie, neutrino expts)
H. Gallagher (Genie, neutrino expts)
S. Gardiner (Genie, neutrino expts)
S. Mrenna (Pythia, CMS)
P. Ilten (Pythia, LHCb, CODEX-b)

("too many Steves")

plus a cast of dozens