# Jet, Heavy Flavor, Electroweak, BSM

- Weekly meetings: Tuesday's starting at 13:30 EDT
- Indico: https://indico.bnl.gov/category/367
- Mailing list: https://lists.bnl.gov/mailman/listinfo/eic-ip6-phys-jet-hq-l
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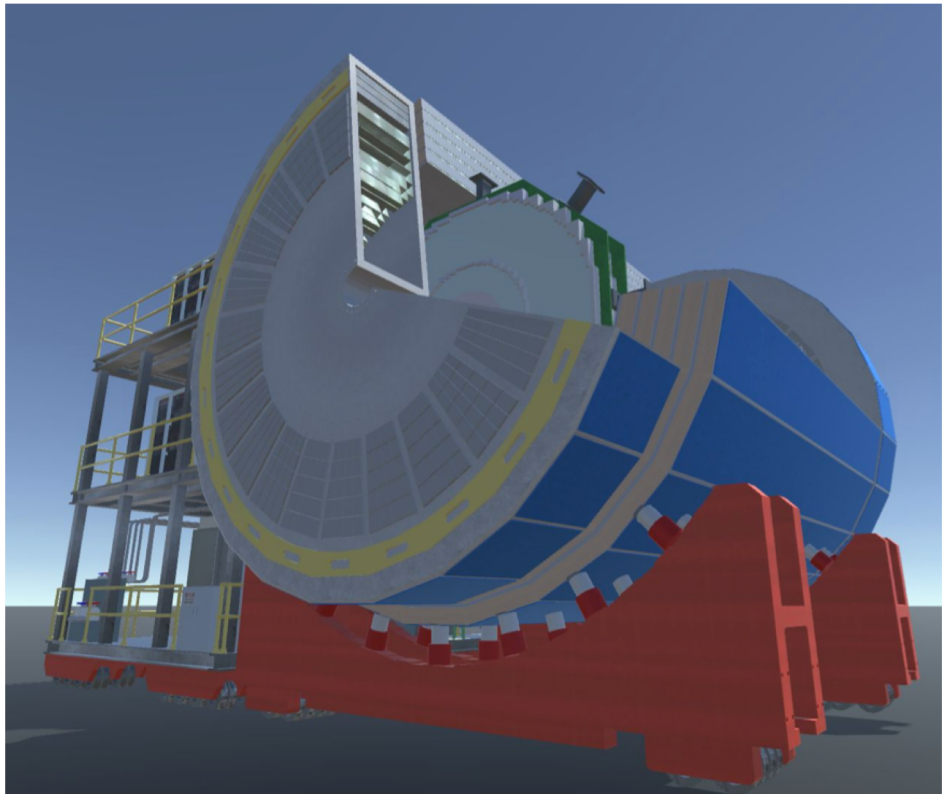


The Proposals should include two parts:

1. A description of the science addressed and performance estimated through simulation including, but not limited to, e/γ, jets, π/K/p separation, vertex, and tracking, and how the simulated performance compares to the requirements detailed in the YR. The realization of the conceptual detector design given the technology choices, the R&D needs, risks, and, if applicable, adoption of emerging new technologies.

- We have identified some of the 'low-level' plots , which seem required by proposal, that are relevant for our group

Performance plots relevant for this group (there is overlap with other groups)

1 Secondary vertex performance (resolution)

2 Hadronic-final-state reconstruction (energy-flow algorithm)

2 Jet performance (resolution and bias)
with energy-flow, calorimetric reco. PID for 4-vectors (?).

3 Charm-jet performance (tagging efficiency/mis-id)

Many of the observables in our WG are *composite* objects; jets, (secondary) vertices, etc.

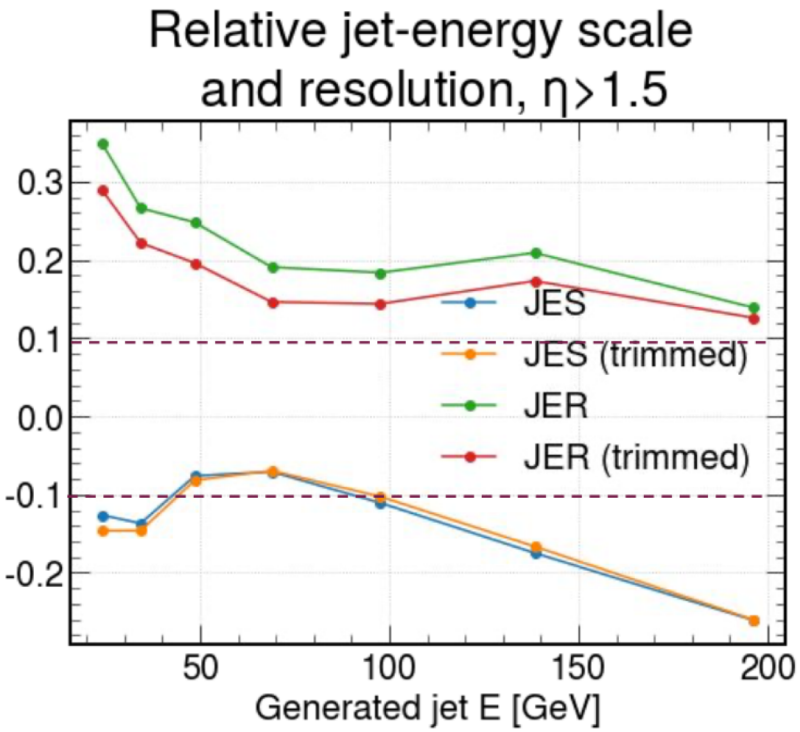
S. Sekula, M. Arratia, et al.

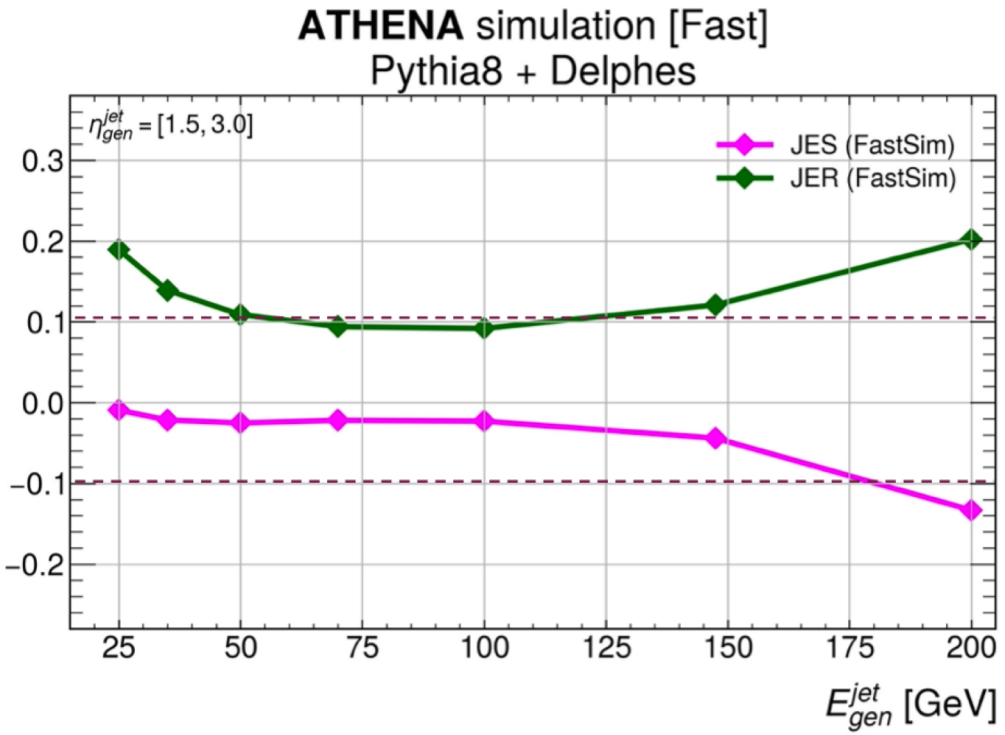
# Jets: composite objects – even w. only Ecal/Hcal

## Fast (1M events) Compared to Full Simulation

In Delphes, the JES is closer to zero and the JER closer to 10% - in both cases better than in full simulation.

***NOTE: In Delphes, the calorimeters extend only to $|\eta|=3.5$, whereas in full simulation they go to 4.0. All jets are R=1 jets.***



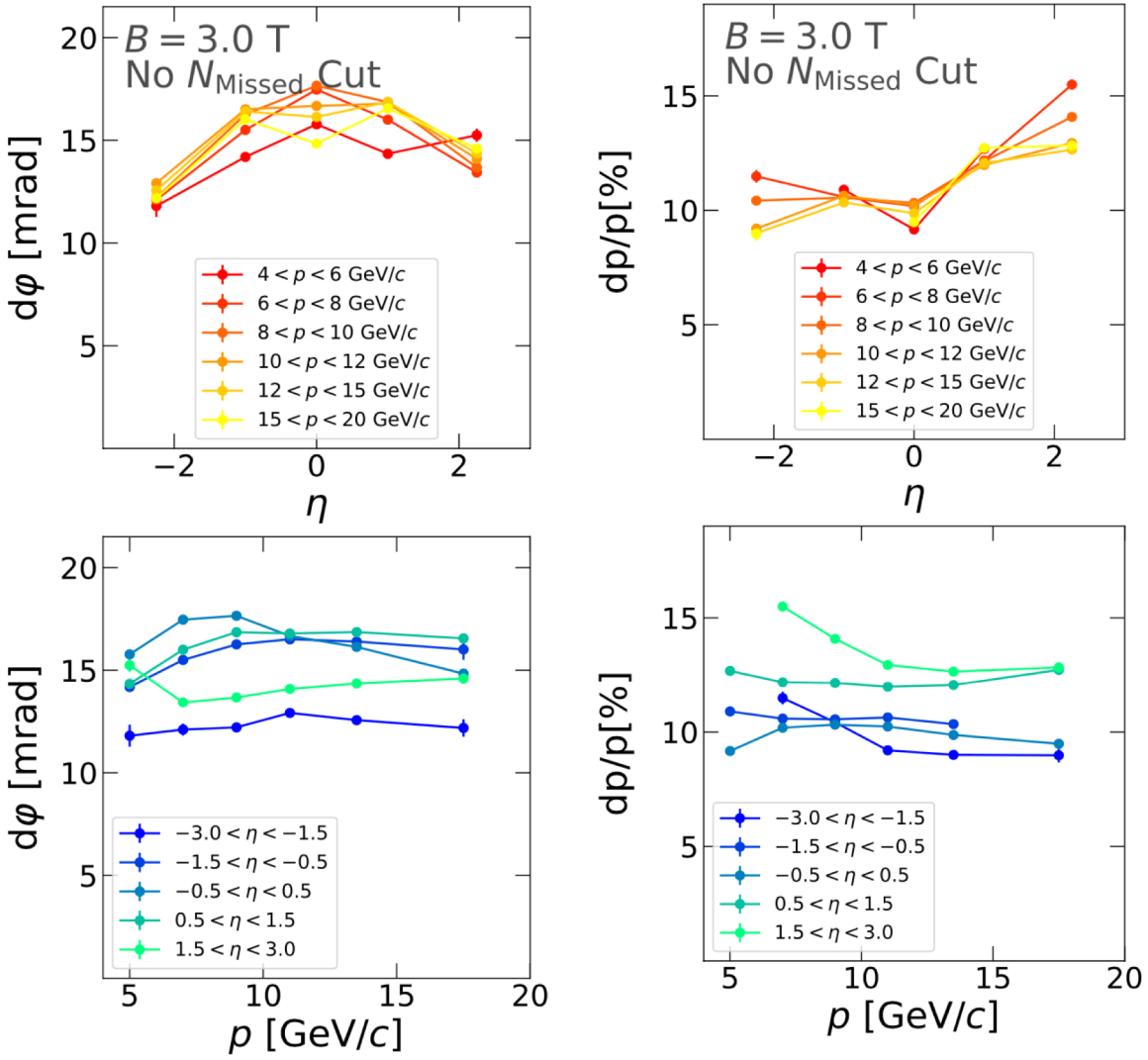




±10% lines indicated on vertical axes for comparison. Calorimeter model in fast simulation comes from YR, with ECAL (HCAL) constant resolution terms of 2% (10%) in the forward direction.

Starting discussion on physics analysis aspects, e.g. unfolding, for the purpose of the December proposal.

F. Torales-Acosta et al.

# Jets: composite objects – track only




“Full” tracking simulation currently Fun4All-based;

Tracking w. DD4hep-based framework being worked on; current timeline end of the month,

Obviously feeds into full jet reconstruction; requires careful consideration of Ecal – Hcal – tracking, as well as full vs. fast simulations,

Timelines are a concern, as are bifurcations.

# Golden channels
**(candidates)**

- **Heavy-flavour channels**
  - $F_2^c$
  - $A_{LL}$ heavy quark
  - charm meson and charm-jet $R_{eA}$.
- **Lepton-jet and dijet correlations:**
  - quark-Sivers and gluon-Sivers [DIS]
  - low-x, Wigner function [diffractive DIS]
  - $\Delta G$, photon structure [photo-production, DIS]
  - Cold-nuclear matter [(n)DIS]
- **Jet substructure and event-shapes**
  - Hadron-in-jet Collins [DIS].
  - Hadronization studies with angularities, correlations. [(n)DIS]
- **Electroweak/BSM**
  - EW Structure functions [CC DIS].

# Summary (some of our golden channels)