EPIC far forward electron beam gas simulation

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General overview

- Far forward electron beamline now working (based on athena)
  - Possible to perform simulations using electron beam gas
    - `/star/u/ceskajak/eic/simulation/beam_gas_ep_10GeV_foam_emin10keV_10Mevt.hepmc`
- Simulation performed and the hits can be read, *however...*
  - Monte Carlo vertex position **NOT** filled in - all 0
    - should be included from hepMC
    - `/star/u/ceskajak/eic/simulation/beam_gas_2Mevt.edm4hep.root`
  - Only pixel tracker readers implemented at the moment
    - Reimplementation of other detector readers in progress - based on code for athena

General overview

- Simulation performed using **epic-22.12.0** (latest stable) with included far forward electron beamline
- Beam gas simulation compared to DIS PYTHIA8 sample
  - Input hepMC: `S3/eictest/EPIC/Tutorials/pythia8NCDIS_10x100_minQ2=1_beamEffects_xAngle=-0.025_hiDiv.hepmc`
- Both hepMC files contain vertex position data
  - after running `ddsim` the output files show all vertex coordinates to be 0
- Far forward electron beamline being incorporated into epic source
  - For now dependent on athena_particle_counter
  - Standalone implementation into epic being worked on

Electron beam gas simulation

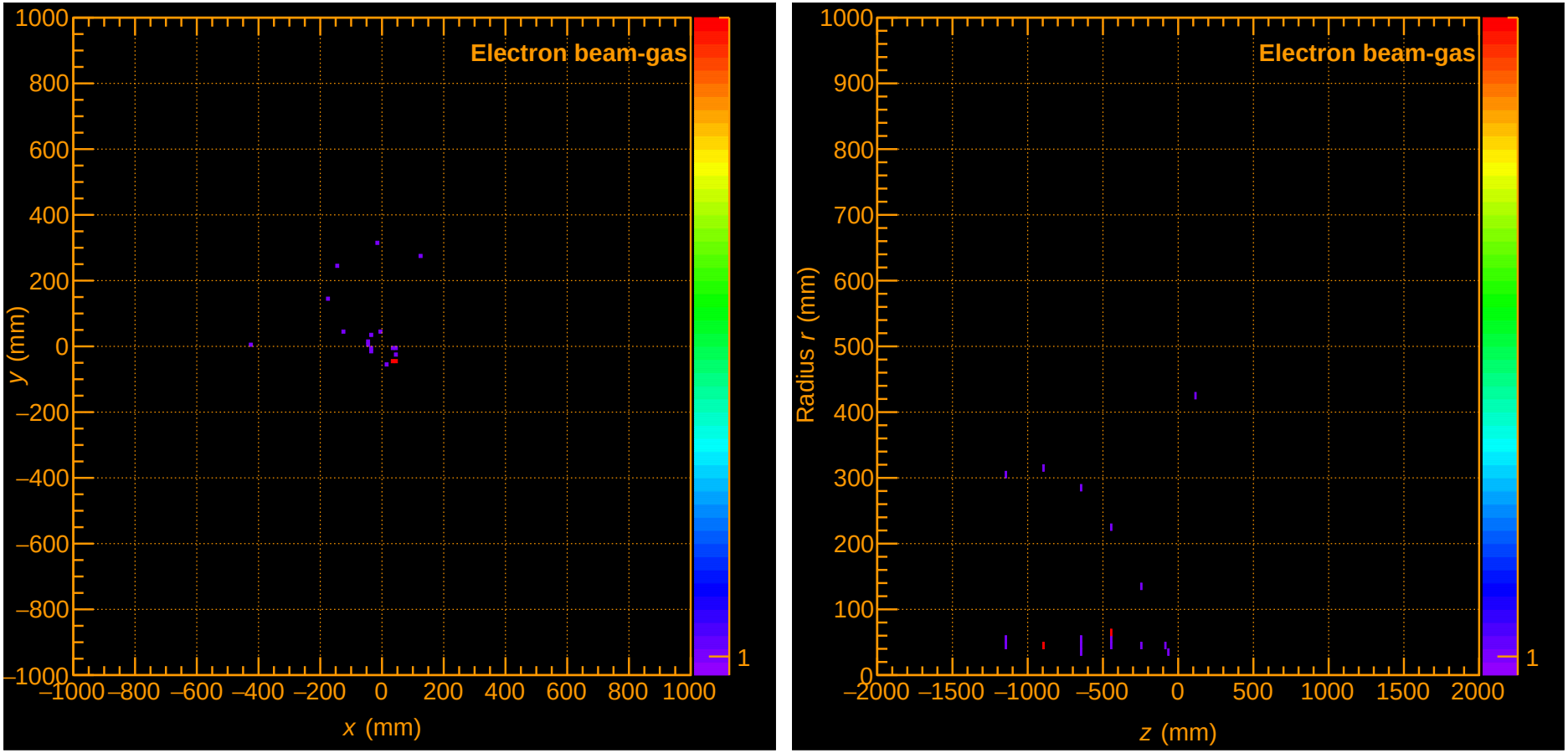

Figure 1: *xy* (left) and *rz* (right) view of the hits in the electron beam gas simulation. Simulated 2M evts.

DIS PYTHIA8 simulation

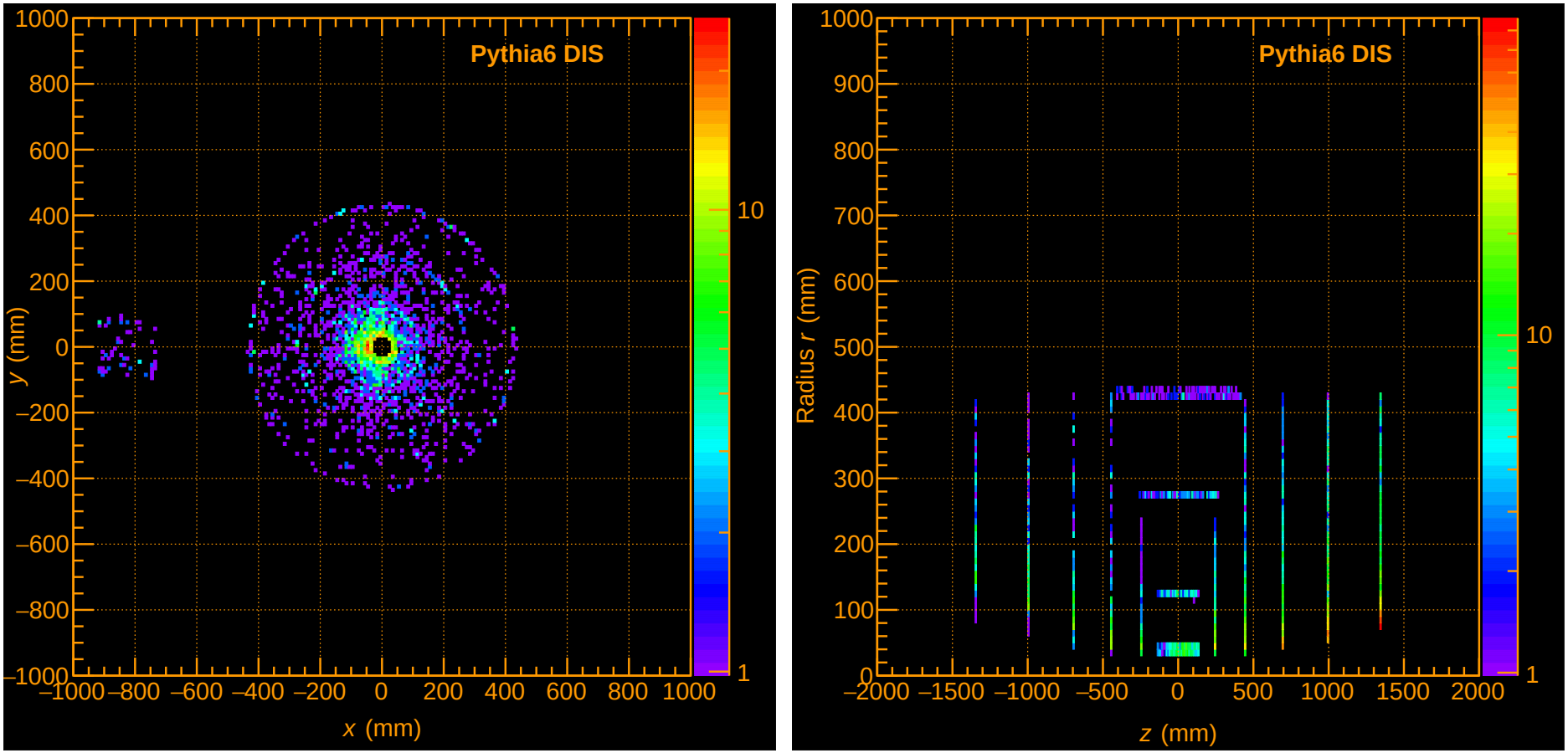

Figure 2: *xy* (left) and *rz* (right) view of the hits in the DIS PYTHIA8 (please disregard the legend, it is incorrect). Simulated 100 evts.