

GEANT4 simulation of NA61/SHINE CERN experiment

- we have a sampling lead/scintillator hadron calorimeter downstream

<http://shine.web.cern.ch/content/projectile-spectator-detector-psd>

<https://arxiv.org/pdf/1205.4864v2.pdf>

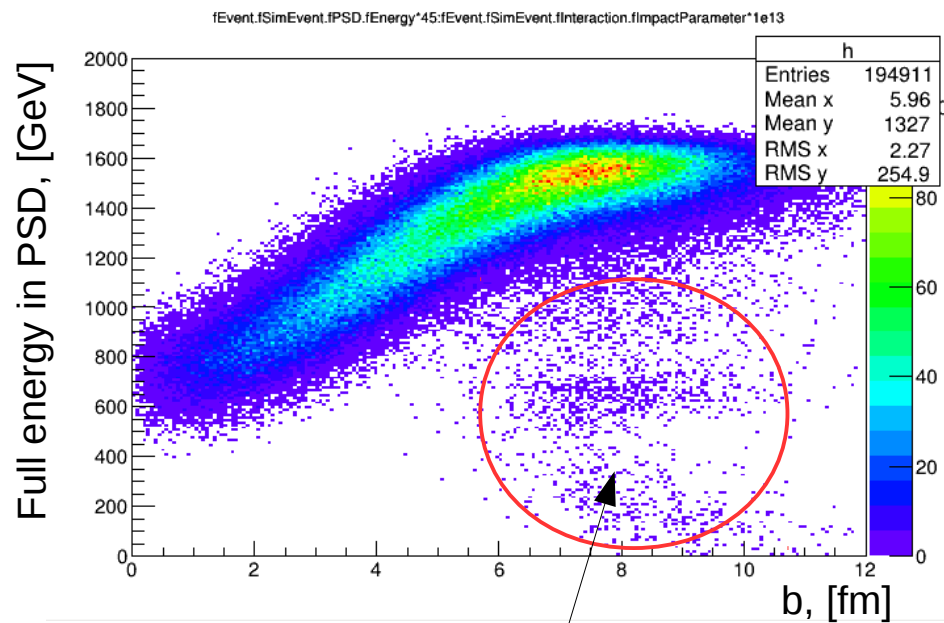
<https://iopscience.iop.org/article/10.1088/1742-6596/798/1/012073/pdf>

<http://inspirehep.net/record/1674492/files/4085.pdf?version=1>

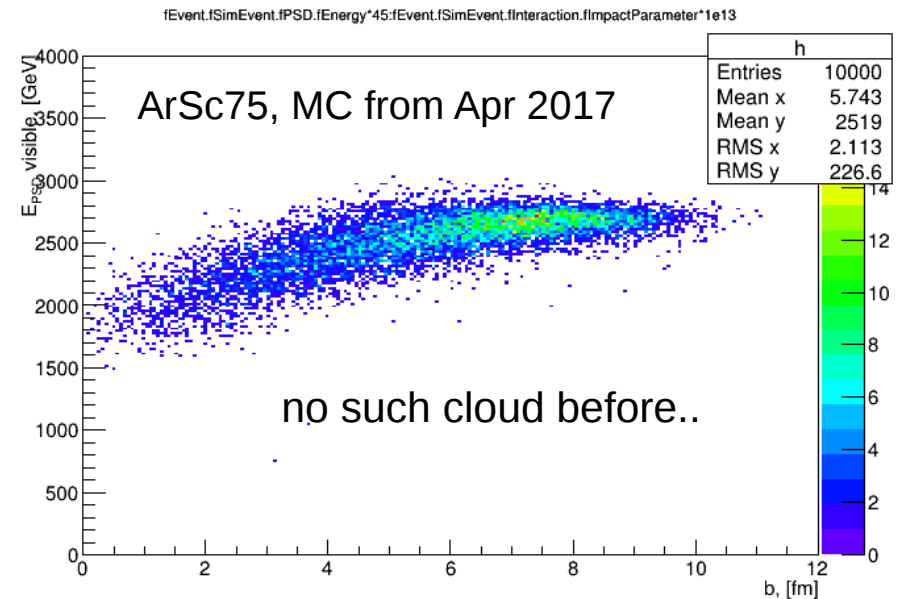
- ion-ion generators in use: EPOS, DCM-QGSM (different impact parameter b of ion-ion collisions)

- physics list: FTFP_BERT

ArSc40, MC from EPOS



some strange energies deposited in calorimeter



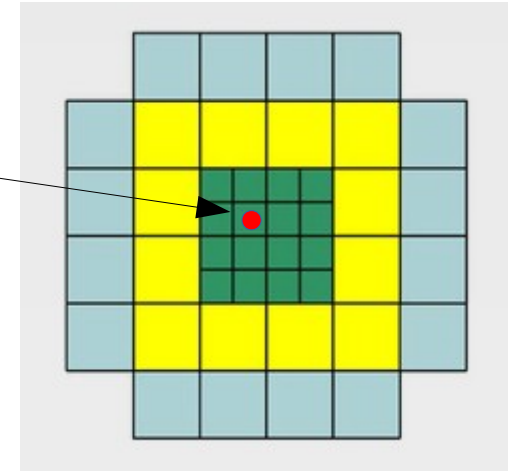
No such cloud in NA61/SHINE exp. data!

Investigation is done with simplified GEANT4 simulation based on N03 example code in GEANT4

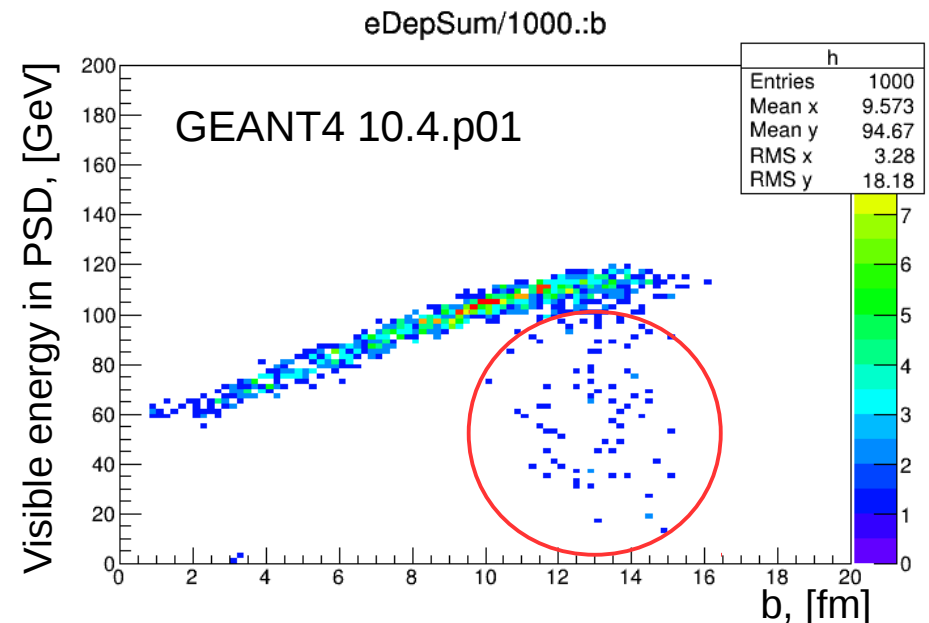
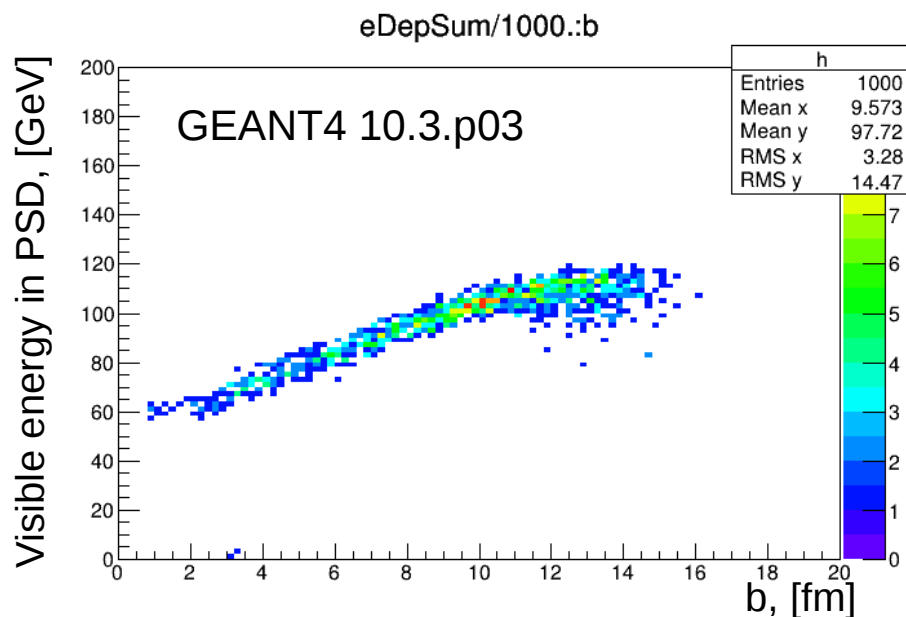
- full modular structure
- FTFP_BERT physics list
- beam is shooting center of one small module (mod#6)

It was found that something has been changed from version GEANT4 10.3 to 10.4

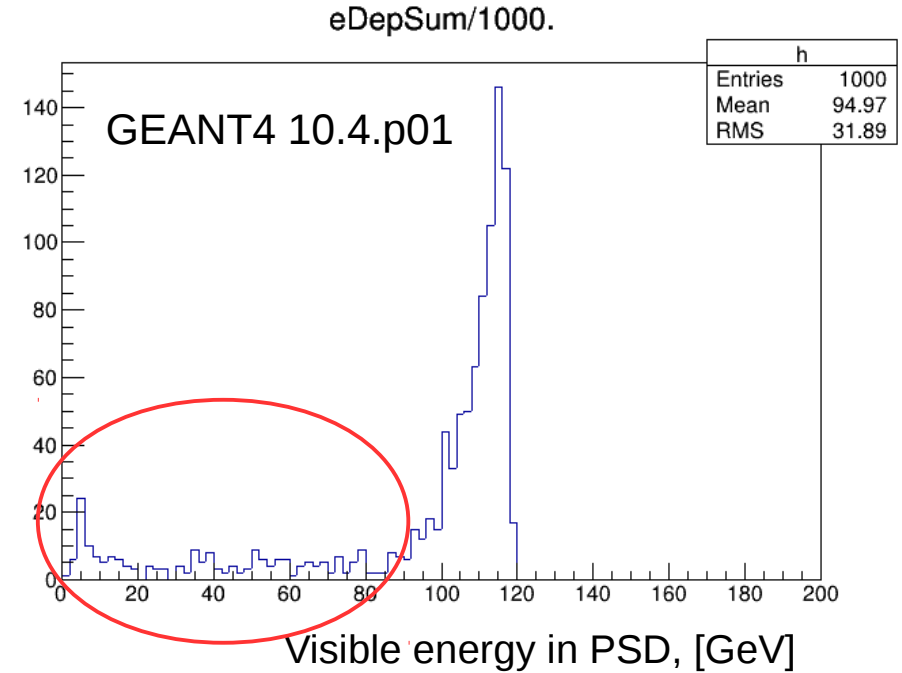
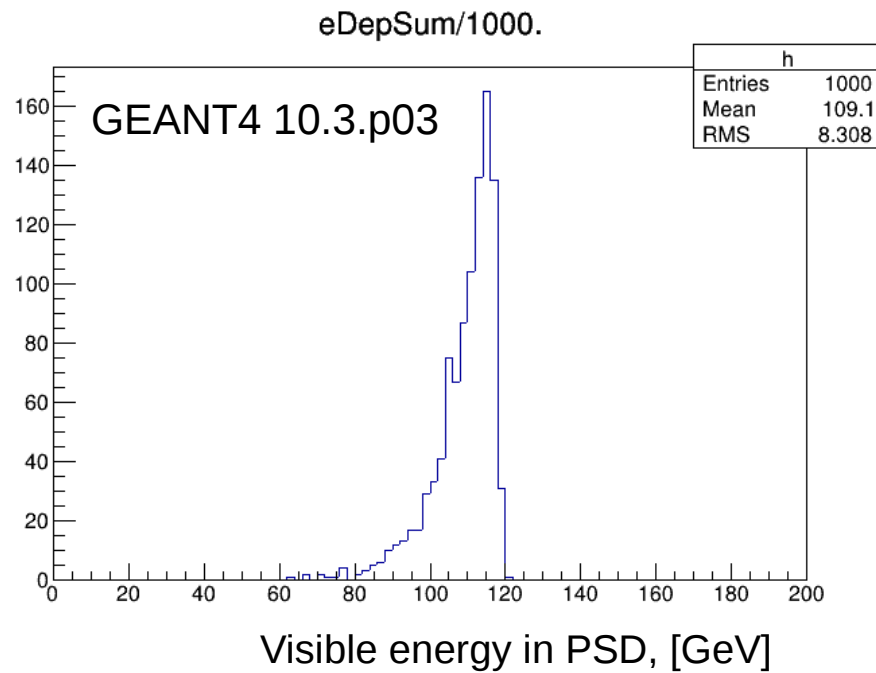
(more precisely: 10.3.p03 → 10.4.p01)



Standalone GEANT4 NA61 PSD simulation, Pb+Pb 29 AGeV DCM-QGSM generator, no magnetic field



Standalone GEANT4 NA61 PSD simulation, pure Pb 29 AGeV ion, no magnetic field



One idea: it looks like heavy ions now sometimes pass the material with big dE/dx energy losses but not forming the hadronic showers (?)