

Preliminary simulations of AmBe in LIME

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CYGNO Simulations meeting

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Lead 10x10x10 cm³ block

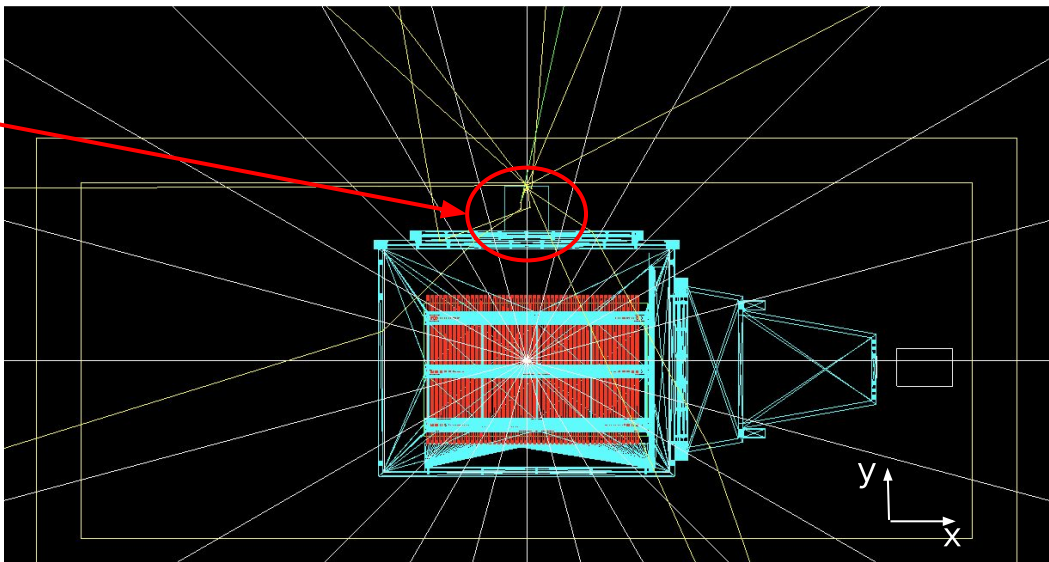
A 10 cm³ block of lead between the detector and the source has been added.

10⁵ neutrons:

- 45 events (55 without the lead box)

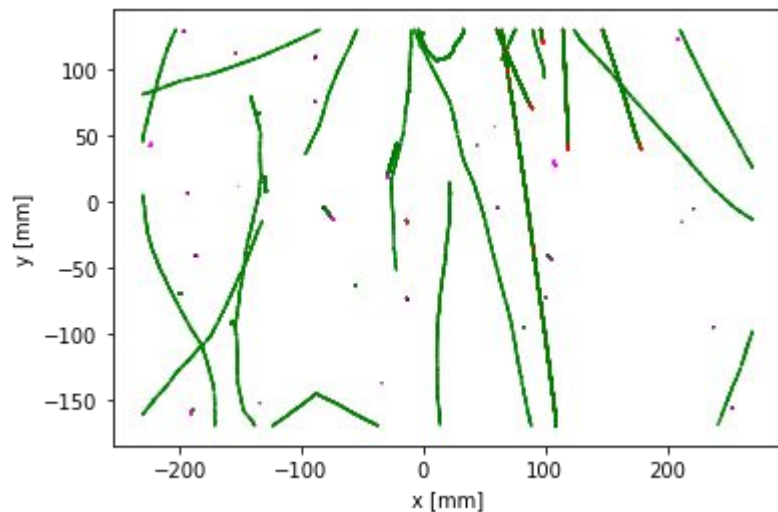
100 gammas:

- Adding the lead box really slows down the simulation
- 16 events

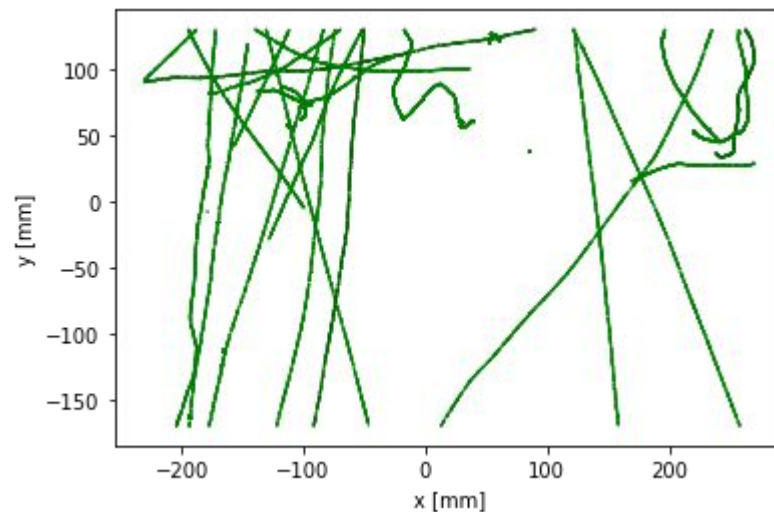


Qualifying the events

10^5 Neutrons simulation [45 events]



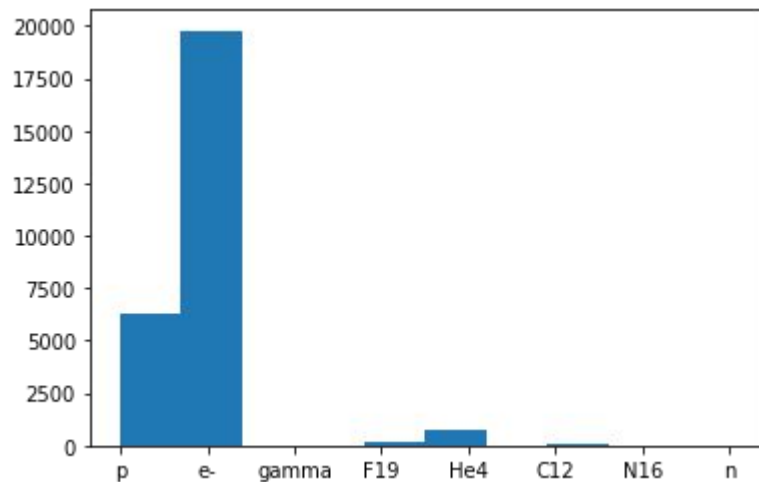
100 gammas simulation [16 events]



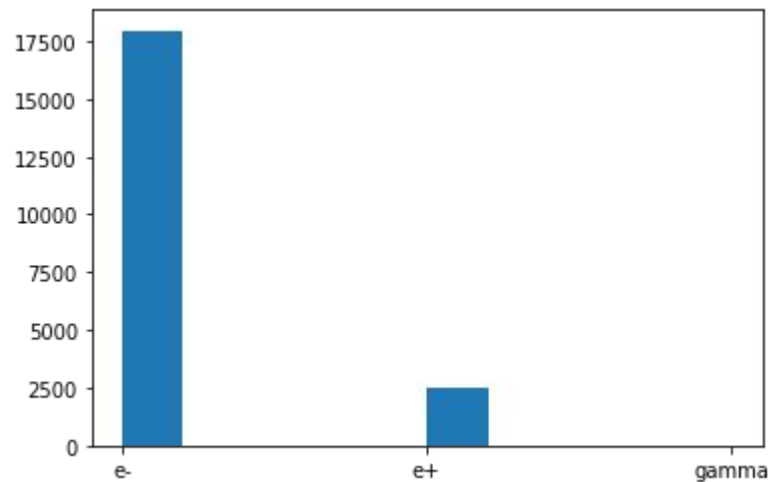
Green = e^-
Other colors = Nuclei and nucleons

Qualifying the events

10^5 Neutrons simulation [45 events]

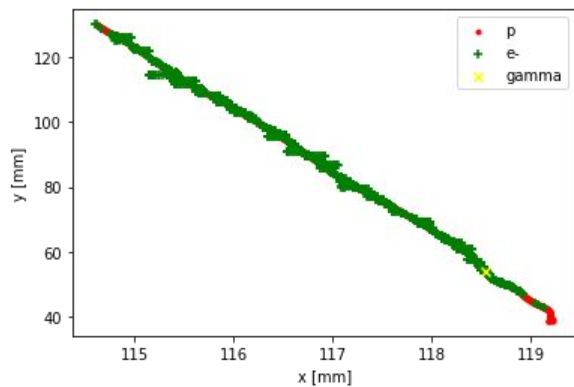


100 gammas simulation [16 events]

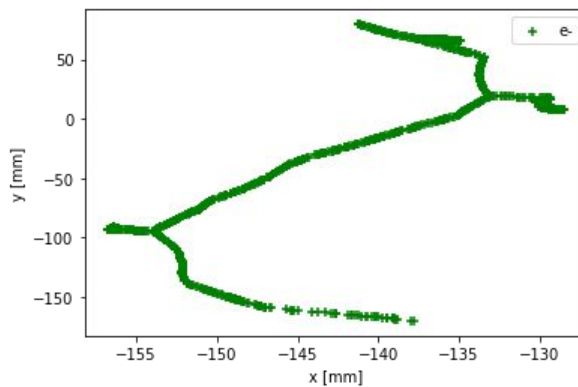


Qualifying the events

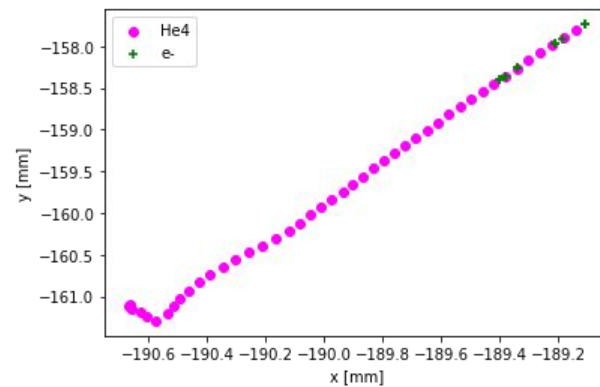
Ionization induced by a proton - neutrons sim.



Electron Recoil - neutron sim.



Nuclear Recoil - neutron sim.



Conclusions

- With respect to the work presented by Giulia in the last meeting we included a 10 cm^3 lead box between the AmBe source and the detector
- We are trying to qualify the resulting events looking at some interesting observable in the nTuple (deposited energy, track length, particle IDs, etc.) with the aim of:
 - checking that the results are consistent with the expectations
 - getting the energy spectra of ER and NR
 - preparing the analysis of the next campaign of data-taking with the AmBe source
 - checking the feasibility of a Migdal effect measurement in CYGNO (changing the gas mixture etc.)