Update on the global analysis

FOOT Analysis Meeting

1st July 2020

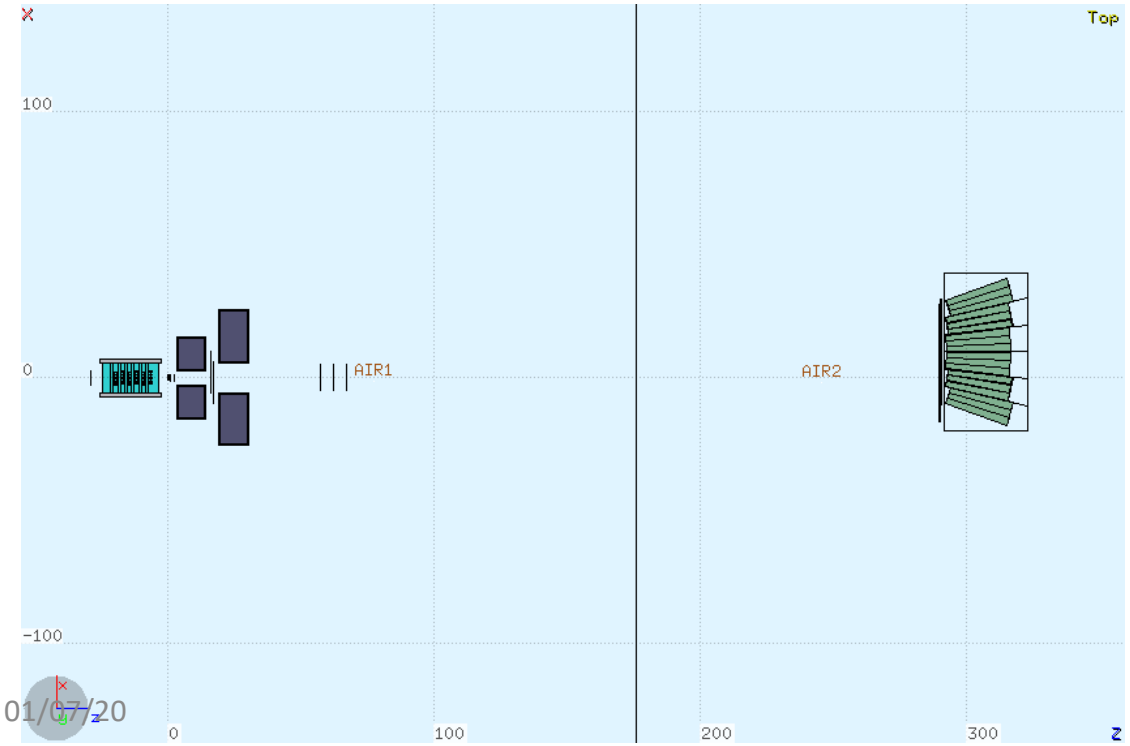
TIFPA Trento Institute for Fundamental Physics and Applications

UNIVERSITÀ DEGLI STUDI DI TRENTO

Input data

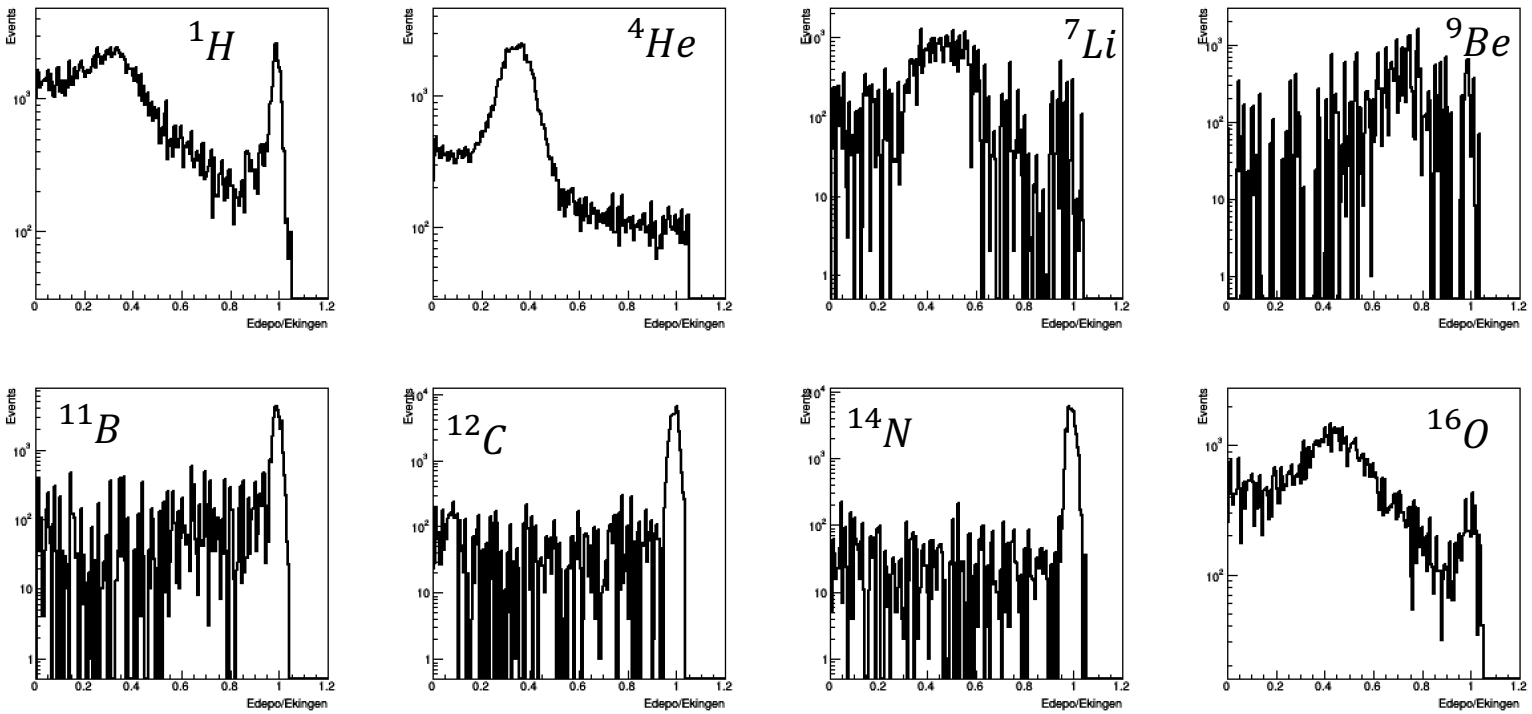
Simulation:

- 16O_C2H4_700_1.root
- ^{16}O 700 MeV/u on 5 mm C_2H_4 target
- Newgeom_v1.0
- $1x10^7$ primaries (121118 interactions -> 1.21 %)



TARGET-SCINT distance 2.90 m

(Deposited energy in SCINT+CALO)/Kin energy generated



The events which deposit only a partial energy in the SCINT+CALO are about 4 times the same events in the case of 200 MeV/u.

$$A_1 = \frac{\boldsymbol{p}}{U\boldsymbol{\beta\gamma}c}$$

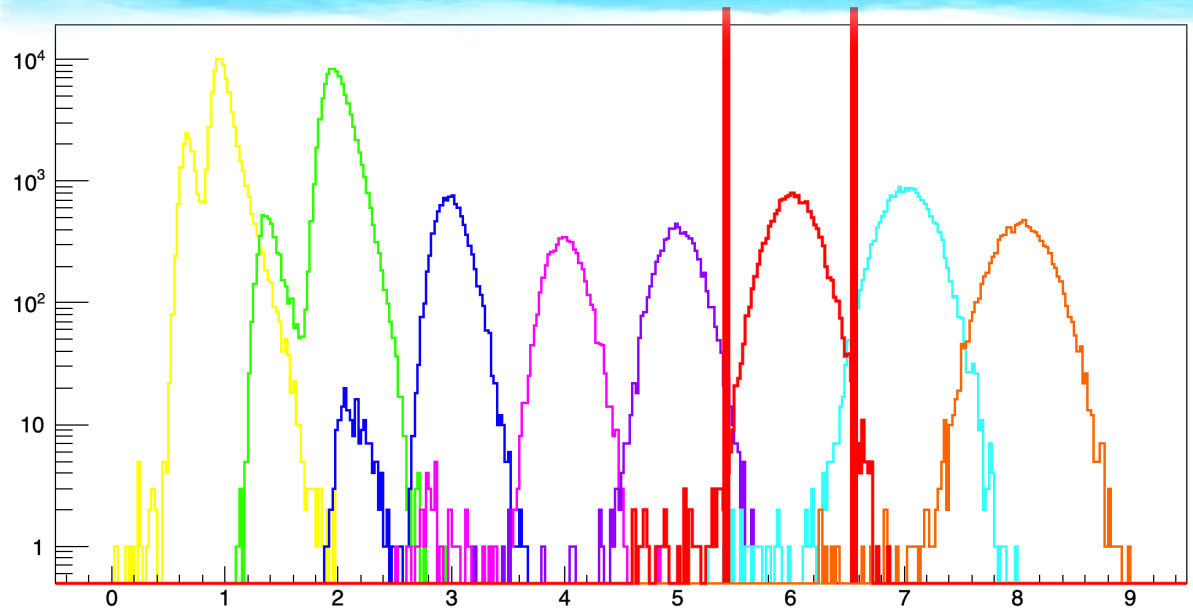
$$A_2 = \frac{\boldsymbol{E_k}}{Uc^2(1-\boldsymbol{\gamma})}$$

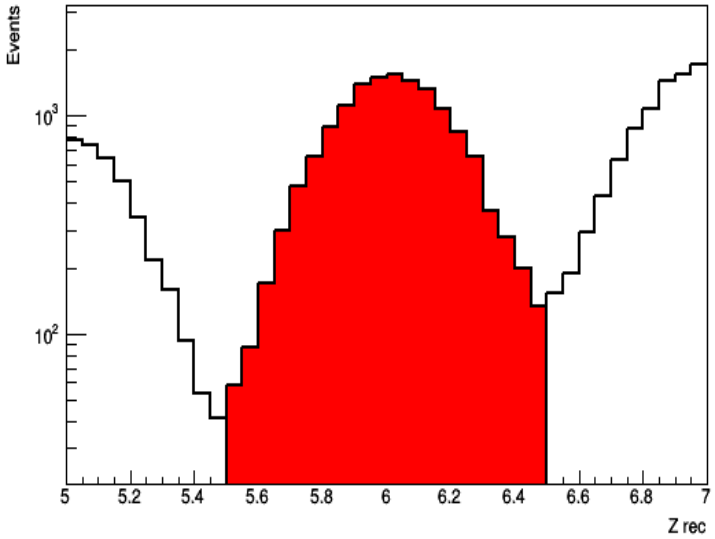
$$A_3 = \frac{\boldsymbol{p}c^2 - \boldsymbol{E_k}^2}{2Uc^2\boldsymbol{E_k}}$$

Momentum (**magnetic spectrometer**)
ToF (**scintillator**)
Kinetic energy (**calorimeter**)

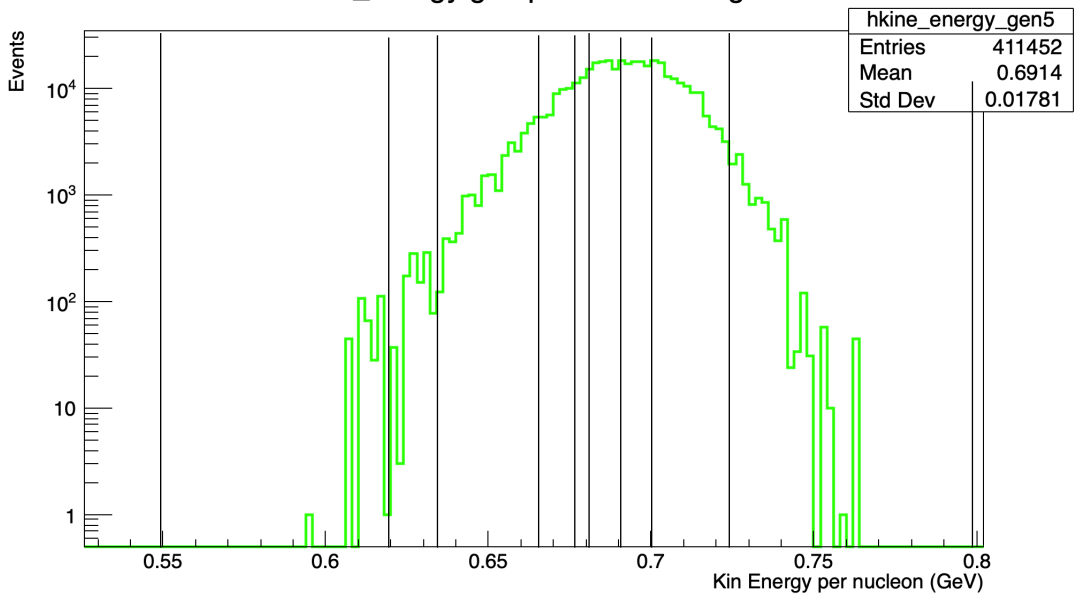
Mass reconstructed only with the information from TOF and momentum.

Charge reconstruction



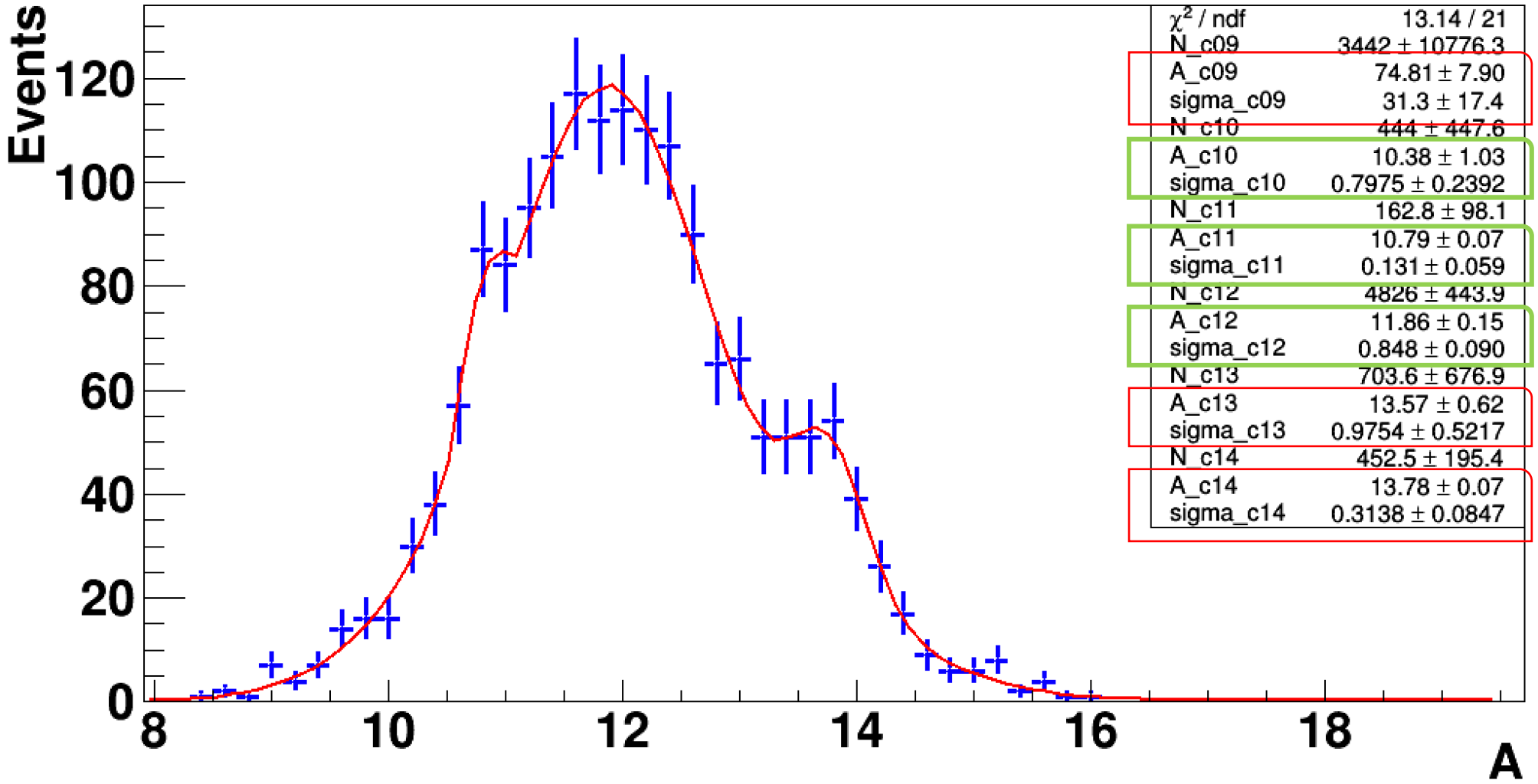


kine_energy gen per nucleon frag 5



Kinetic energy bin selection
{550., 620., 664., 676, 682., 688., 694., 700., 725., 800.}

Isotopes separation

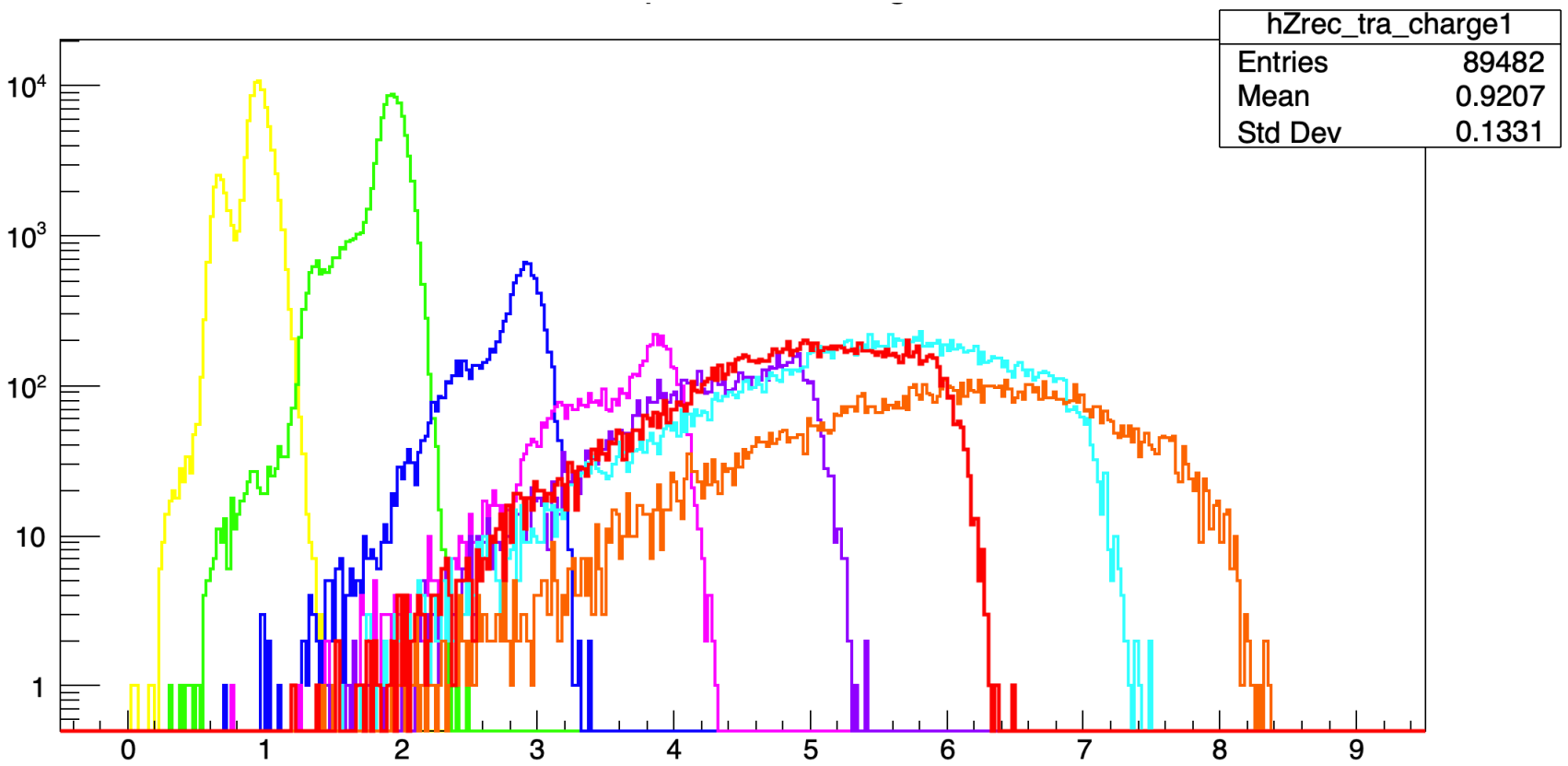


Cross section evaluation will be done when the FLUKA data will be available.

MC simulations including e+ e- γ transport

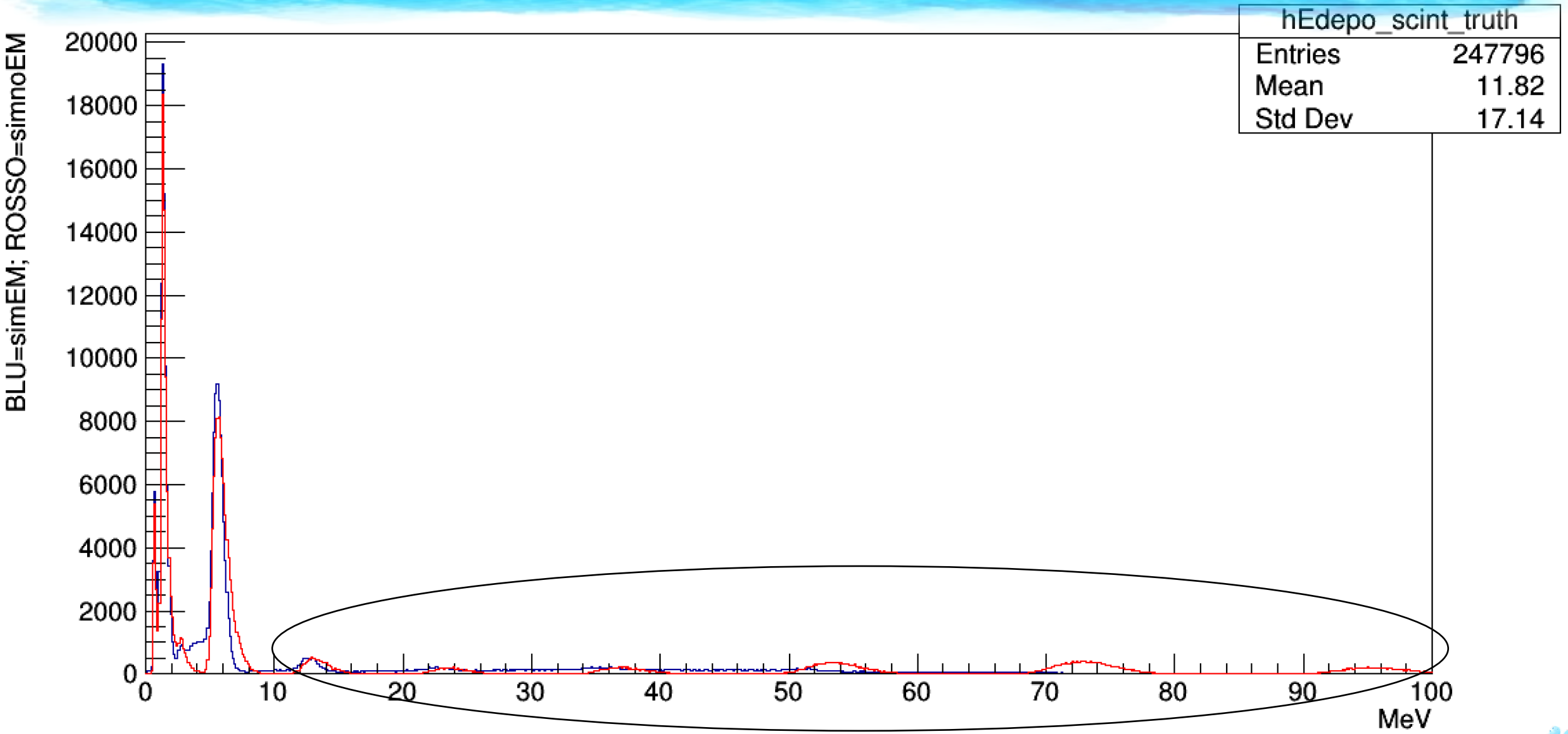
- 16O_C2H4_700_em1.root + 16O_C2H4_700_em2.root
- ^{16}O 700 MeV/u on 5 mm C_2H_4 target
- Newgeom_v1.0
- $1x10^7$ primaries (12100 interactions -> 1.21 %)

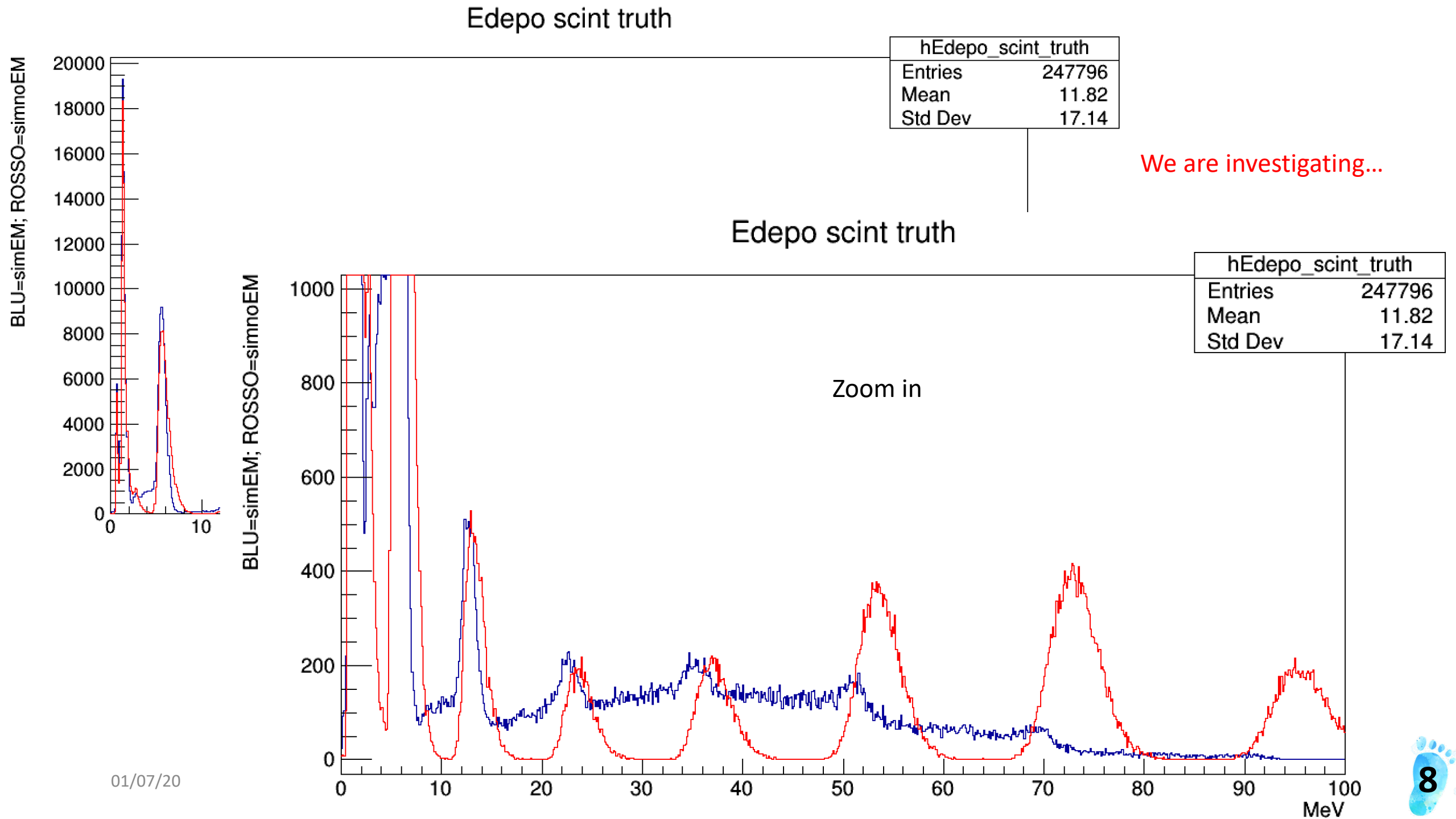
Re-activation of e+ e- γ transport with 1 MeV cut (both prod. and transport) for e+e- and 0.5 MeV for γ (so to include photons from e+e- annihilation).
δ- ray production with the same 1 MeV cut was activated (Milano presentation 27/05/2020)



Strange charge reconstruction…

Edepo SCINT


hEdepo_scint_truth
Entries 247796
Mean 11.82
Std Dev 17.14
BLU=simEM; ROSSO=simnoEM
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0
10
20
30
40
50
60
70
80
90
100
MeV



We are investigating…