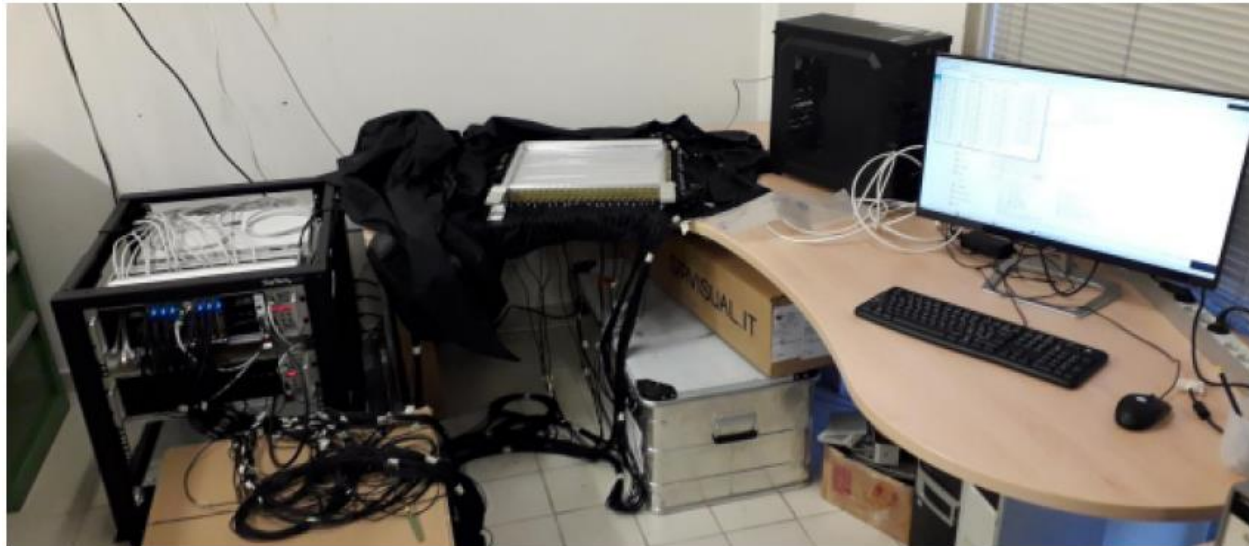
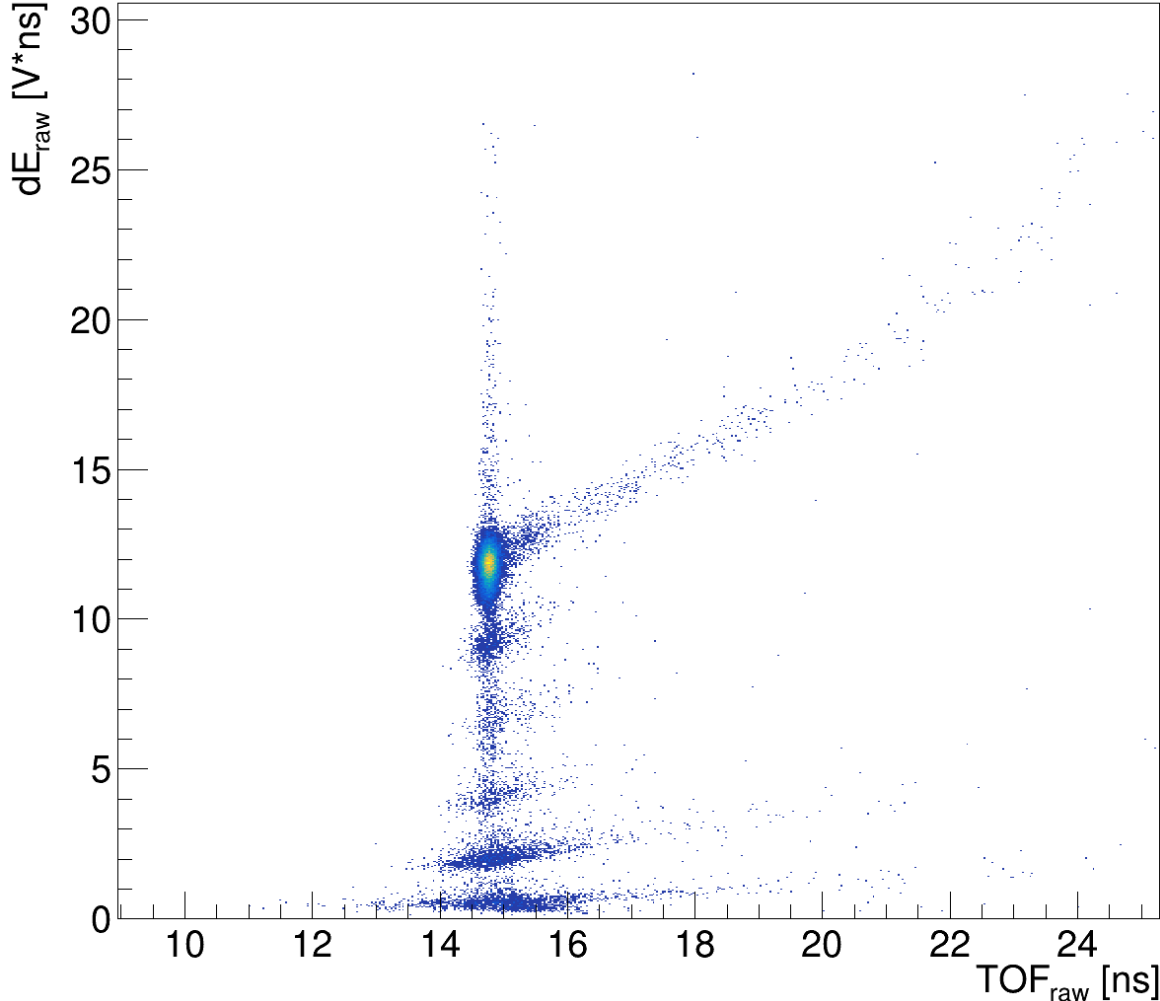


Status and future perspectives of the TOFWall detector



XV FOOT Collaboration Meeting

TW status



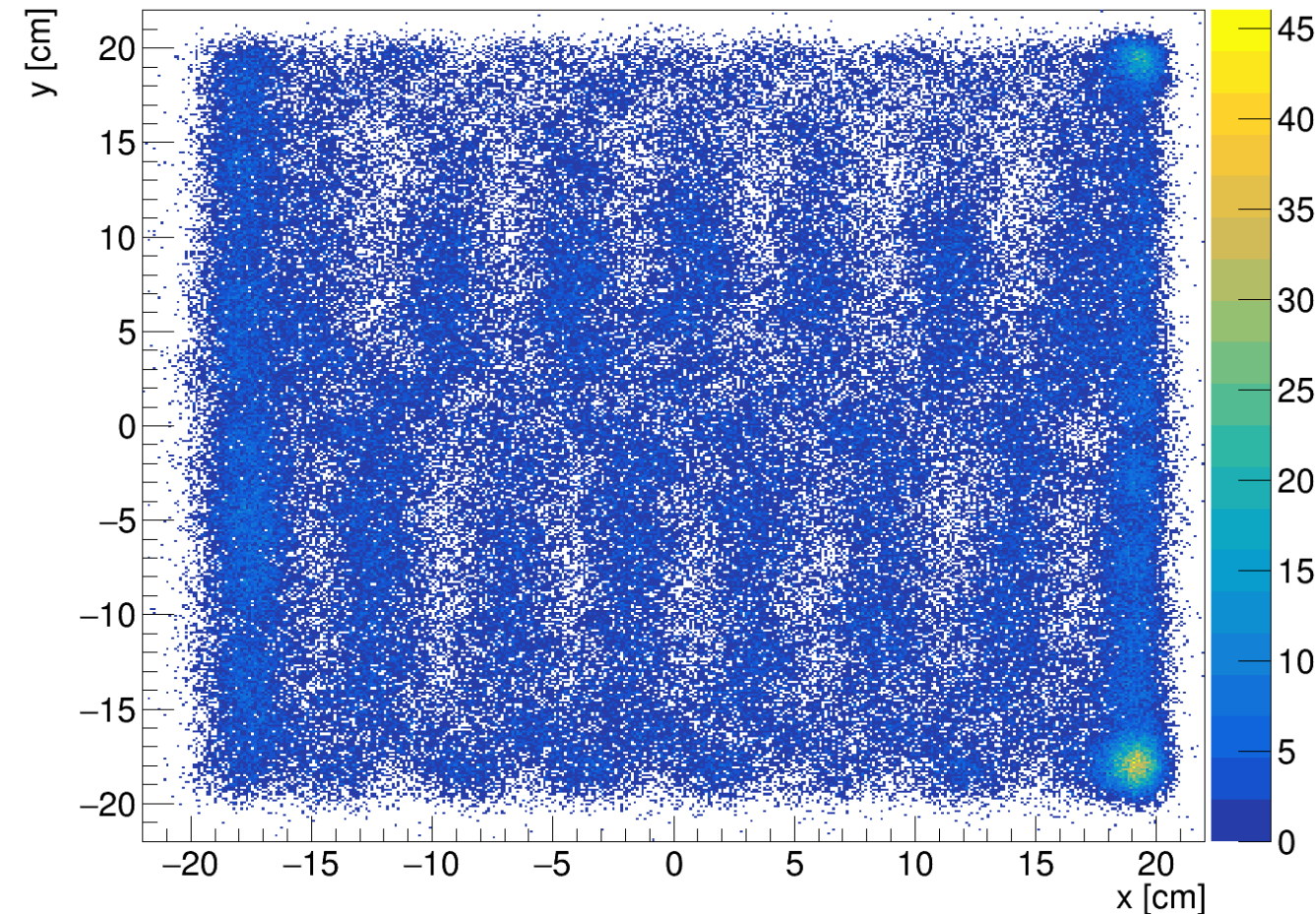
About the CNAO data taking:

- no anomalies in the TW behavior were observed
- thresholds for the 12 central channels of the detector were compatible with the previous ones used at CNAO
- the spectra of all channels have not been compared yet to the ones of the previous data taking (only few channels for cross-check), however the energy distribution of cosmic rays was checked in the 40 bars before the data taking, verifying that there was no appreciable signal degradation.
- only a small degradation in the time resolution was observed during the data taking, Giacomo is investigating on it.

TW scan with C200



HitMap



- We performed a full scan of the detector moving the bars and keeping the beam fixed.
- About 15 minutes of scan (plus the time for preparation and coming back in place)
- We should have enough statistics on each intersection to use also the C200 point in the energy calibration (this is important especially in the bars with few fragment species in which the calibration is trickier)
- We faced some problems in bringing the TW back in place, however this was only due to a cable impeding the complete movement of the stage.



What's next...



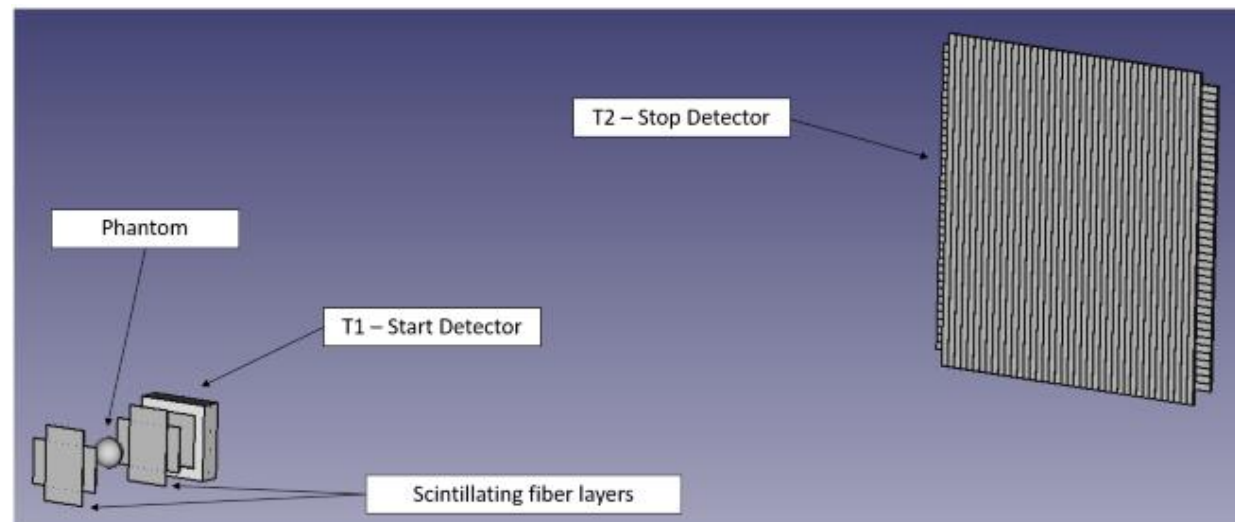
New PRIN project involving part of the FOOT apparatus and synergic with the FOOT experiment...

The TOFpRad project



Investigate the TOF technique for the development of innovative proton radiography systems to support ion beam therapy treatments. Development of a plastic scintillator-based TOF prototype for:

- 1) The reconstruction of water equivalent path length maps, thus obtaining a proton radiography of the patient. We will also investigate the capability of the system to acquire a full pCT scan to derive a 3-D stopping power map.
- 2) A fast and easy verification of the treatment before its delivery with a reduced amount of dose (range probing).

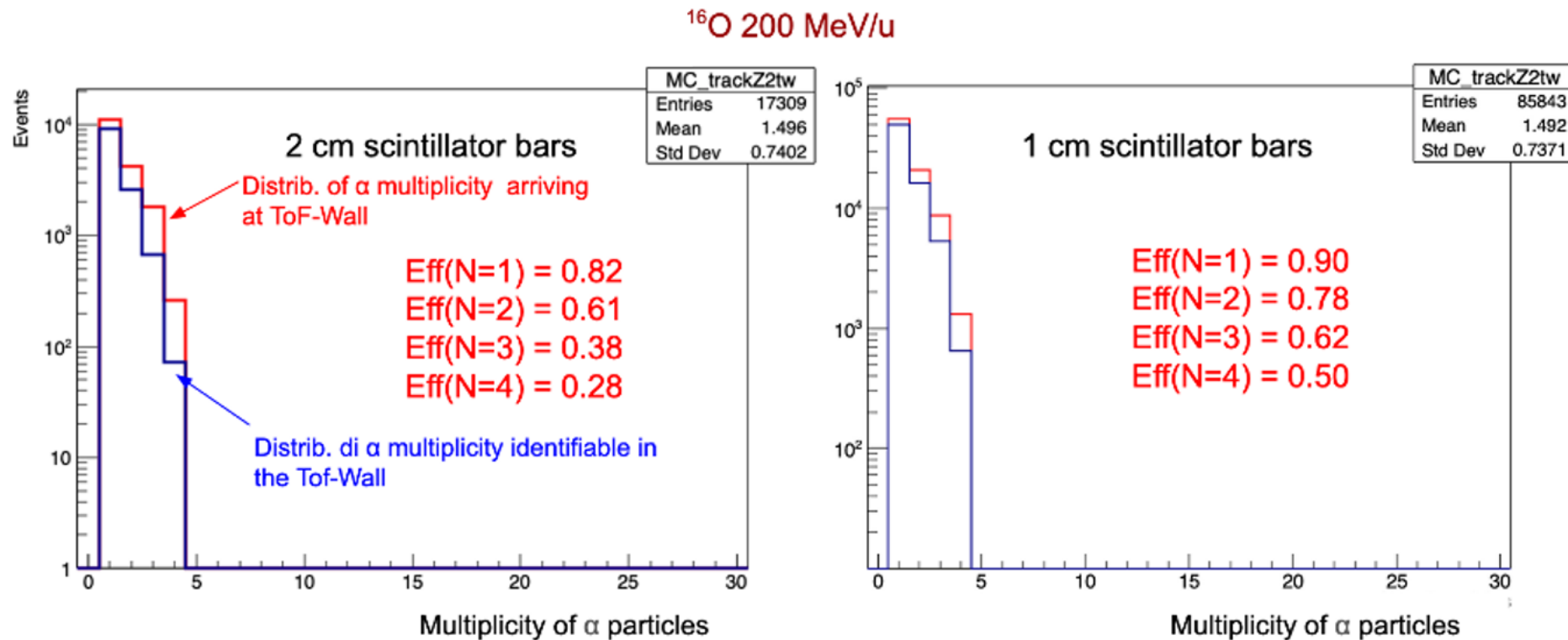




Synergies with FOOT

Better identification of interactions with a high number of low-Z fragments: C \rightarrow 3 Alphas, O \rightarrow 4 Alphas

- Improved time resolution at low-Z
- Higher granularity of the detector



The new TOF-Wall architecture



A new TW will be built to improve the performance with p and He.

- The total active area will be roughly the same, however the number of bars will double, since each bar will be 1 cm large.
- The thickness of the bars will be also increased to have a higher number of collected scintillating photons (also the size of the SiPM will change accordingly). The exact specs of the new detector will be defined in the next few months, some preliminary tests still need to be performed before freezing the details.
- The number of readout channels needed for the TW will increase accordingly (we expect that about 164 channels will be needed)... This new configurations is not compatible with the whole calorimeter.