Update Pisa group

News

- Roberto Zarrella graduated with laude!!
- Borsa di studio for 6 months with Pisa group
- We would like to try to send a small paper (**NIMA? JINST? Technical note?**) about the CNAO+GSI data taking of the TW and STC data (for whole FOOT collaboration ? Whatever is preferred…).
  - Data are not great, but we believe it's still better to have a small publication rather than nothing at all
  - A lot of work went into getting the full TW system to work

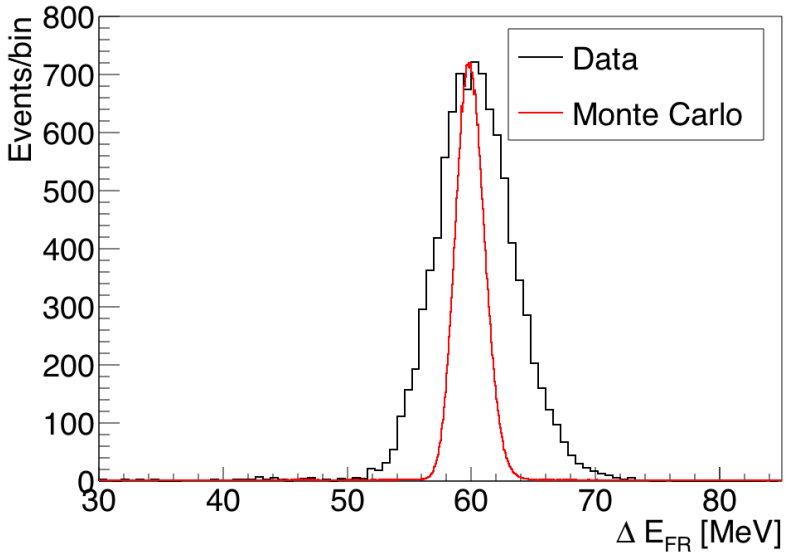
  → will show proposal of content today
- IEEE abstract sent to Editorial Board
- New student, will work with Matteo
- Lab work continues not right now, but hopefully soon

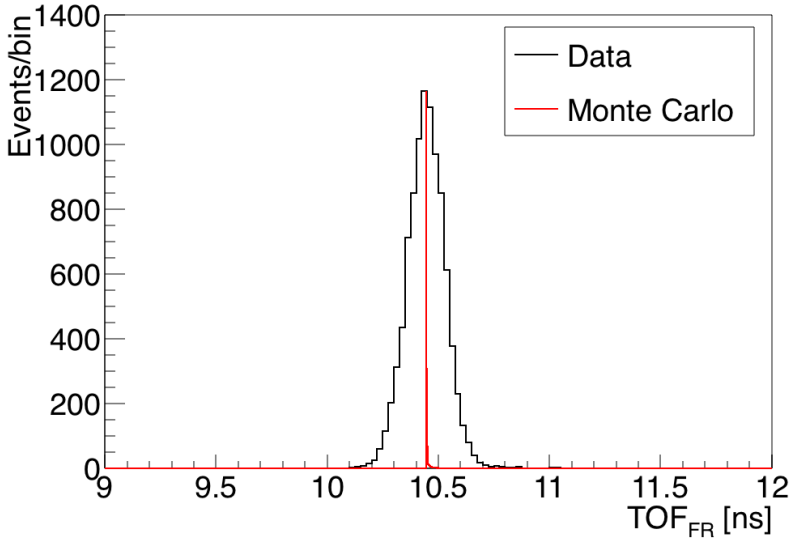
Paper content (1)

- Introduction:
  - Background FOOT
  - Motivation/what's new:
    - First time we would publish something with the full detector (past work was only with 2 or 4 single bars, now 80 bars)
    - First time TOF was measured with STC and TW together, all clocks synchronized, new software structure, etc. (past work didn't include STC)
    - First time system worked with oxygen
- Materials and methods
  - TOF Wall system with 80 bars, STC ("full-scale ΔE-TOF prototype" ?)
  - Data takings CNAO and GSI: include a scheme (?)
  - Data processing
  - Calibration: by matching data of known projectiles with MC (position dependent, Front and Rear separately)
  - 1 fragmentation measurement

Paper content (2)

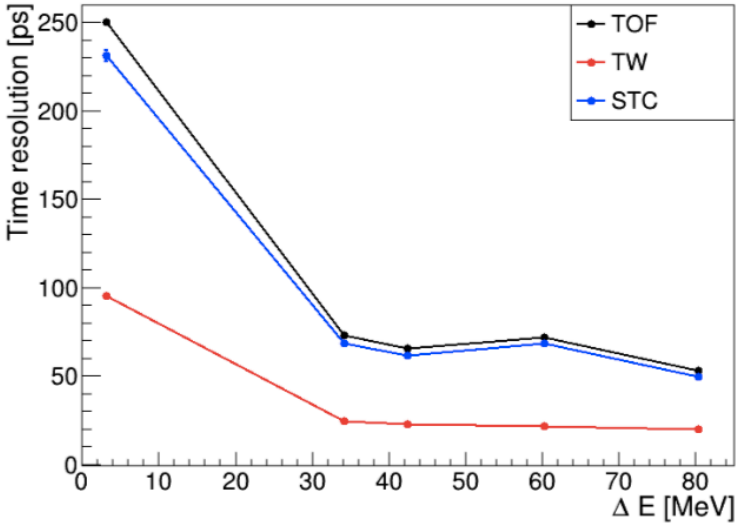
- Results:
  - Validation of the energy and time calibration procedure: show for one example (oxygen 400 MeV/u without target) that the mean energy and mean TOF measured in bars in data is matching with MC (plots made summing up all well-calibrated positions (TOF-Wall cross pattern)





Paper content (3)

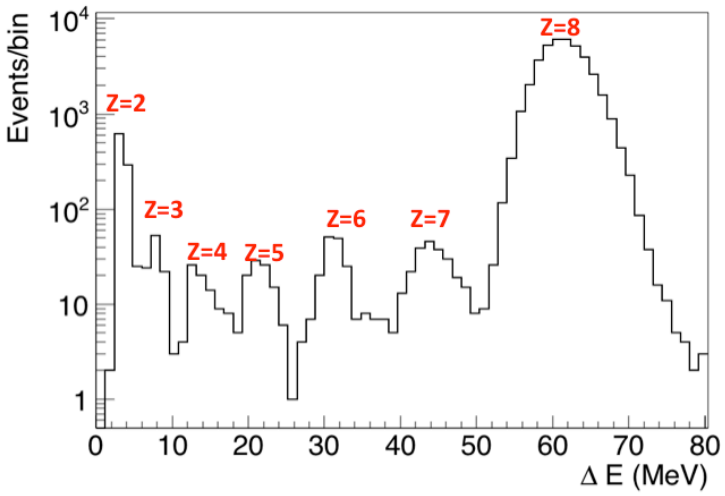
- Results:
  - Time resolution (energy resolution was shown in previous papers)

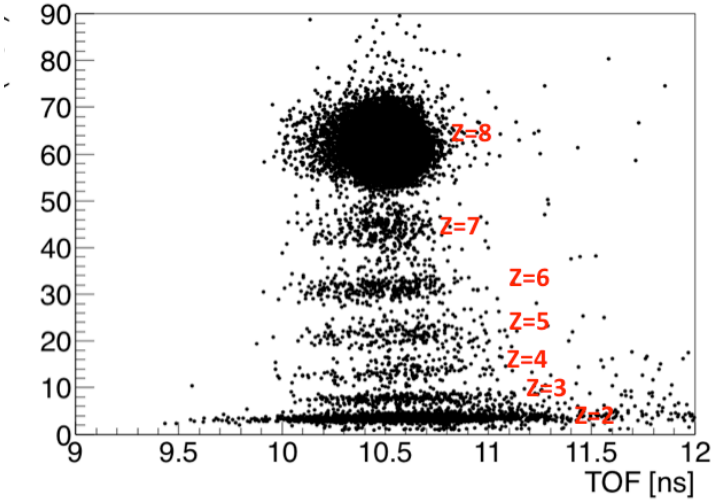


Particle	E_{beam} [MeV/u]	μ_{TOF} [ns]	σ_{TOF} [ps]
p	60	19.934 ± 0.003	250 ± 2
^{12}C	115	19.2683 ± 0.0004	53.1 ± 0.3
^{12}C	260	18.021 ± 0.001	65.4 ± 0.5
^{12}C	400	17.732 ± 0.001	72.7 ± 0.5
^{16}O	400	10.942 ± 0.003	71.6 ± 0.3

Paper content (3)

- Results:
  - Data of fragmentation run, including:
    - All positions with Front and Rear well calibrated positions (cross pattern) (about 40.000 entries)
    - All positions where either Front or Rear was well calibrated (another 3000)
    - All other positions, that were not directly irradiated (outside cross pattern) , but were part of bars that were calibrated in the center→ not so accurate, but to increase statistics (another 4000 entries)





- Or Z-spectrum? To be decided…
- Other draw options?
- Try to include protons? (try lower energy cut)

Paper content (4)

- Conclusion
  - Full TW +STC system tested
    - Data processing, calibration

We would like to send an abstract to IEEE, abstract+2 page summary sent to EB