



# TPC MC simulation

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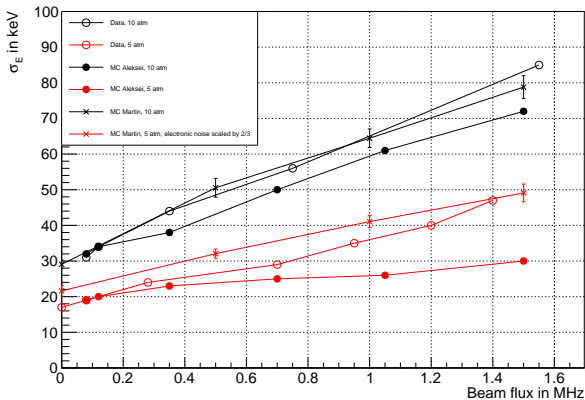
2021, 21th April

See PRM Gitlab: <https://gitlab.cern.ch/prm>

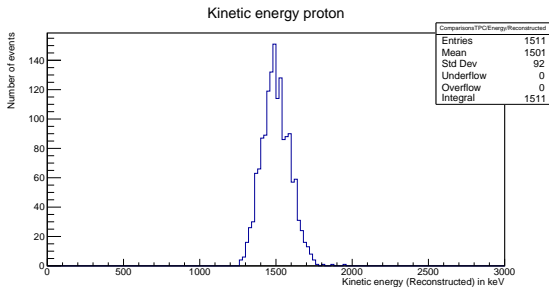
⇒ TGeant, Phast user events

- Beam from the SPS beamfile
- Using signal pulse or "flat" elastic-generator option
- Electronic noise from the 2018 data (8 bar)
- Reconstruction inside Phast user events

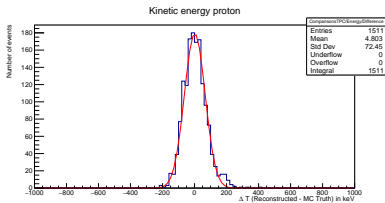
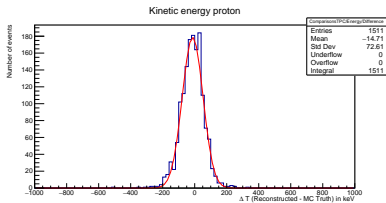
## Central anode (Pad 65)



- ACTAF TPC, 2018 pad plane, 5 or 10 atm: 96 % He, 4 % N<sub>2</sub>
- Pulse energy: 1.5 MeV
- 720 MeV electrons along beam-axis
- Energy resolution of the central pad is in agreement



- IKAR TPC, 2021 pad plane, 8 bar
- Recoil proton energy:  $(1.5 \pm 0.1)$  MeV
- 2 MHz muons from beamfile
- Reconstructed energy spectrum (looser cuts)



- Tighter cuts
  - Gaussian fit:
    - $\mu_E$ :  $(-12.8 \pm 1.8)$  keV
    - $\sigma_E$ :  $(65.0 \pm 1.5)$  keV
  - Currently adjusting the time coincidence cuts and energy thresholds (trade-off between purity and bias)
  - No calibration currently (using the Geant4 energies)
- Looser cuts
  - Gaussian fit:
    - $\mu_E$ :  $(1.5 \pm 1.8)$  keV
    - $\sigma_E$ :  $(64.8 \pm 1.4)$  keV