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Characterisation of a scintillating fibre-based hodoscope exposed to the CNAO low-energy proton beam

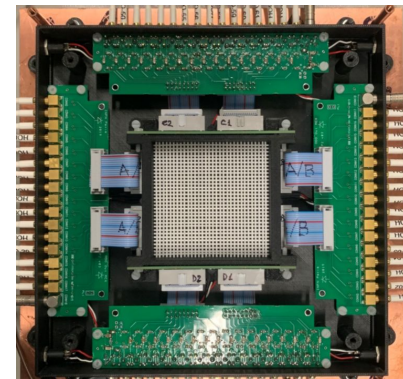
Riccardo Rossini et al.



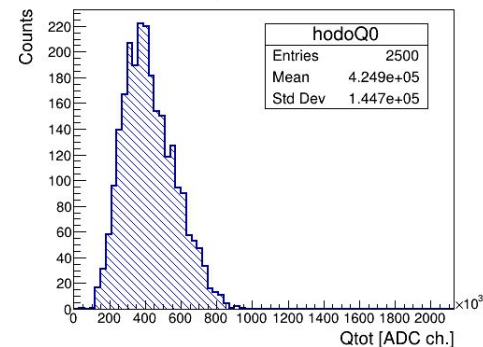
CNAO

Centro Nazionale di Adroterapia Oncologica

- Beam hodoscope, active area $6 \times 6 \text{ cm}^2$, 64 scintillating $1 \times 1 \text{ mm}^2$ fibres, to be used in the FAMU experiment as a muon beam monitor (at RAL, UK), aimed to perform a precision measurement of the proton Zemach radius in muonic hydrogen atoms
- Calibration with at the CNAO synchrotron in Pavia (Italy) with proton beams at 125, 150 and 175 MeV with very low rate (50 Hz)
- Protons at 150 MeV are chosen as their $-dE/dx$ curve is similar to the one of the 60 MeV/c negative muons in the FAMU experiment
- The single proton signal at 150 MeV allows to calibrate the detector in order to enable muon counting at the high rate RAL muon beam



Hodoscope Qtot distribution



15th Pisa Meeting on Advanced Detectors – La Biodola, Isola d'Elba, 22-28 May 2022