POKER test at H6 - summary

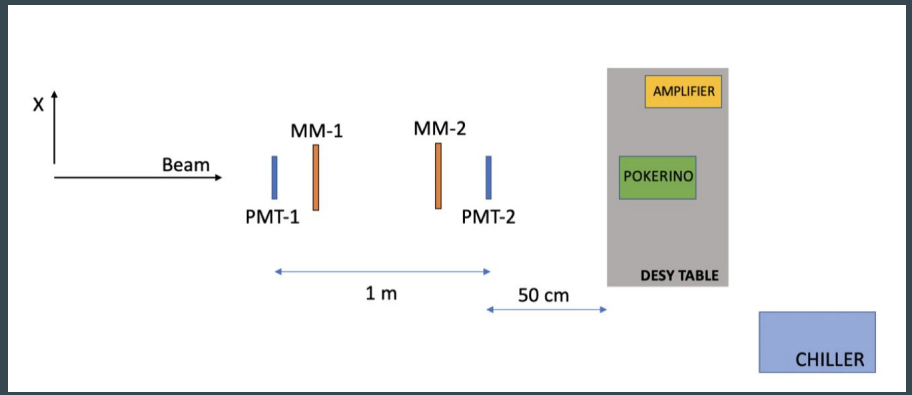
PS & SPS users meeting, July 11th, 2024

Aim of the test - experimental setup

Characterize the response (energy-time resolution, linearity) of the “POKERINO” prototype at different beam energies, intensity and particle type (e^-, muons, hadrons)

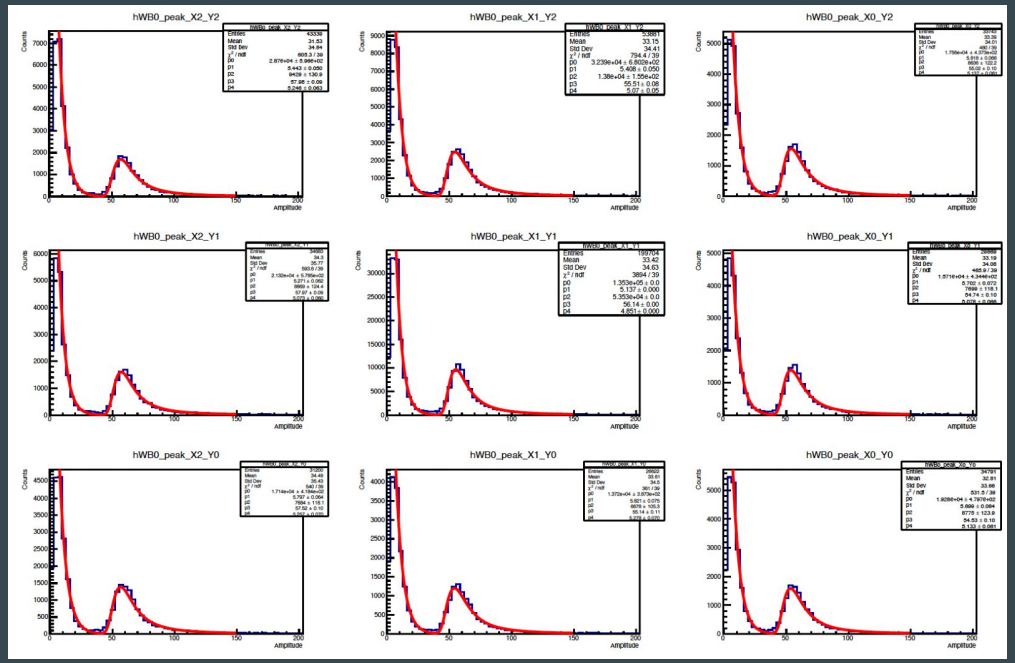
POKERINO:

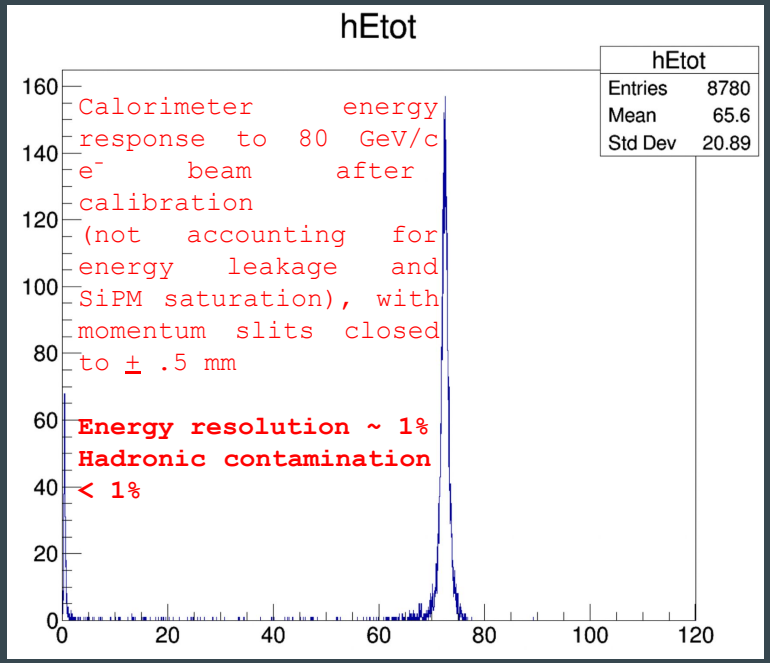
- 3x3 matrix of PbWO4 crystals (2x2x20 cm^3)
- Readout by Hamamatsu SiPM (10 um, 6x6 mm^2 face, 4 on each crystal). WIENER MPOD bias voltage system.
- Water-based chiller for cooling (19 °C)
- One XCET detector installed in the line (He gas), analog signal splitted and injected to our DAQ



Online system pre-calibration

Crystals equalization: 120 GeV muon beam impinging on each crystal. Ionization peak used as calibration point (~500 MeV deposited in each crystal).





Data-taking

- Crystal pre-calibration runs with 120 GeV muon beam
- Linearity/resolution measurements with e^- beam at different energies in the 10 GeV/c - 100 GeV/c range (DESY table moved so to have the beam impinging on each crystal)
- Response of the detector when rotated by 90 degrees - 40 GeV/c e^- impinging on the crystals lateral face at different positions
- Response of the detector when rotated by small angles - 100 GeV/c e^- (measurement performed in collaboration with colleagues from OREO group)
- Intensity scan: mixed hadrons beam at 120 GeV/c, upstream collimators opened up to $\pm$ 12 mm - max intensity reached 4E6 particles/spill (then, triggered radiation alarm).

Now it's time for the analysis!

Acknowledgments

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- Thanks to beam department for scheduling, organization and support (Micheal Lazzaroni, Bastien Rae, Silvia Schuh-erhard, Anna Baratto Roldan)
- Thanks to the CERN gas team BE-DEP-EA-GAS for helping us in solving the gas-leakage issue on a Saturday afternoon...