

Low gas consumption in tracking detectors for outdoor applications

Thursday 27 May 2021 05:12 (18 minutes)

The tracking detectors of particle physics are facing new demands in applied physics. Muography is in high-light, where tracking of cosmic muons could reveal the inner structures of geological or archaeological objects. The dedicated R&D shall focus on portability, robustness against outdoor conditions, low consumption, high tracking efficiency, and cost efficiency. A practical choice is gaseous detectors, offering excellent tracking efficiency, good position resolution, and low weight. Our group developed several multi-wire detectors for muography, where the classical MWPC concept was tuned to meet all the former criteria.

Robust and lightweight systems required open-end gas line, meaning continuous gas exhaustion. An application of a proper buffer tube allows reduced consumption, resulting a 0.12 l/h (3 l/day) gas flow in long term outdoor conditions.

The presentation will focus on the limitations of gas consumption, detailing the measurement series and the results.

TIPP2020 abstract resubmission?

Funding information

Authors: NYITRAI, Gábor (Wigner RCP, BME, Budapest); HAMAR, Gergő (Wigner RCP, Budapest); VARGA, Dezső (Wigner RCP, Budapest)

Presenter: NYITRAI, Gábor (Wigner RCP, BME, Budapest)

Session Classification: Tech Transfer Posters

Track Classification: Technology Transfer