

Recovery of HADES drift chambers suffering from Malter-like effects

Wednesday 8 November 2023 16:50 (25 minutes)

The central tracking system of the HADES detector, installed at the SIS-18 synchrotron at GSI/Darmstadt (Germany), employs large-area, low-mass drift chambers. They are located in six identical sectors in forward direction of the fixed-target setup, two chamber planes before and two behind the toroidal magnetic field, respectively. Each chamber comprises six stereo angel wire layers. To minimize multiple scattering the detectors employ aluminum potential wires and have originally been operated with a He-isobutane gas mixture (60:40) [1]. The chambers in front of the magnetic field have developed significant self-sustained currents and discharges during operation at the working point, not allowing for stable operation any longer. Only the combination of switching to Ar:CO₂ (70:30) and adding 1000 to 3000 ppm of water into the gas, individually optimized for a given chamber, allowed to recover the chambers, enabling stable operation in several production runs, e.g. with high-intensity heavy-ion induced reactions.

This contribution will present the status quo, having observed the Malter-like effects, and will detail the steps towards re-establishing stable operation in-beam, including the mandatory conditioning phase in front of high-intensity beam experiments.

[1] The HADES tracking system, <https://doi.org/10.48550/arXiv.physics/0404011>, Nucl. Instrum. Meth. A535 (2004) 242-246

Authors: WENDISCH, Christian; VIEIRA LOPES, Luis Alberto (LIP - Laboratorio de Instrumentação e Física Experimental de Partículas (PT)); MUNTZ, Christian Peter (Goethe University Frankfurt (DE))

Presenter: WENDISCH, Christian

Session Classification: Ageing phenomena