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Real-time calibrations for future detectors at FAIR & Neural Network Based Particle Identification for HADES

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Real-time calibrations for future detectors at FAIR

The online data processing of the next generation of experiments conducted at FAIR requires a reliable reconstruction of event topologies and, therefore, will depend heavily on in-situ calibration procedures. In this study we present a neural network-based tool designed to provide real-time predictions of calibration constants, which rely on continuously available environmental data. A proof-of-principle of this approach has been demonstrated using data from the Drift Chambers of the HADES detector, for which our method demonstrated the ability to provide fast and stable calibration predictions.

Neural Network Based Particle Identification for HADES

The HADES experiment measures a number of parameters that can be used for particle identification (PID). Traditionally, this is done using simple graphical cuts, individually selected for each analysis. To improve upon this method, we have developed a neural network-based PID system for hadrons that can be applied universally. This approach leverages all available particle information simultaneously and operates with probabilities, allowing for more flexible classification. In this talk, we will discuss the details of the method and compare its performance with traditional graphical cuts.

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