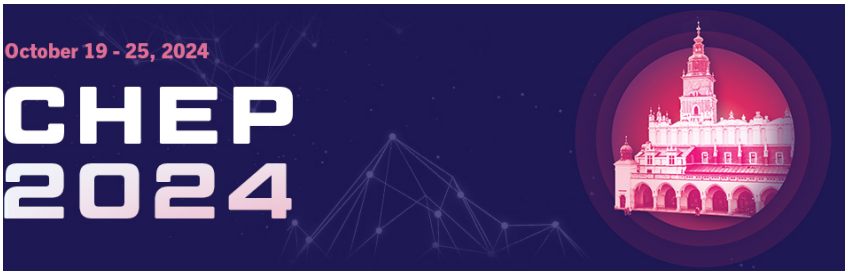

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Identification of muon-electron elastic events using Graph Neural Networks for precision measurements.

Thursday 24 October 2024 16:00 (15 minutes)

Precision measurements of fundamental properties of particles serve as stringent tests of the Standard Model and search for new physics. These experiments require robust particle identification and event classification capabilities, often achievable through machine learning techniques. This presentation introduces a Graph Neural Network (GNN) approach tailored for identifying outgoing particles in elastic events where a muon beam interacts with the atomic electrons of thin low-Z targets in a series of tracking stations containing silicon strip modules. The processes include, among others, ionization and pair production (resulting in e^+e^- pairs) caused by muons. We illustrate the application of the developed technique through a case study utilizing simulated data of a reduced geometrical configuration of the MUonE experiment, which aims to precisely measure the leading hadronic contribution to the muon magnetic moment anomaly at CERN.

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