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An Ensemble of Neural Networks for Online Electron Filtering at the ATLAS Experiment.

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In 2017 the ATLAS experiment implemented an ensemble of neural networks (NeuralRinger algorithm) dedicated to improving the performance of filtering events containing electrons in the high-input rate online environment of the Large Hadron Collider at CERN, Geneva. The ensemble employs a concept of calorimetry rings. The training procedure and final structure of the ensemble are used to minimize fluctuations from detector response, according to the particle energy and position of incidence. A detailed study was carried out to assess profile distortions in crucial offline quantities through the usage of statistical tests and residual analysis. These details and the online performance of this algorithm during the 2017 data-taking will be presented.

Secondary topics

Applications

Primary topic

Front-end readout and trigger

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