

Machine Learning for Pion Identification and Energy Calibration with the ATLAS Detector

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Separating charged and neutral pions as well as calibrating the pion energy response is a core component of reconstruction in the ATLAS calorimeter. This poster presents an investigation of deep learning techniques for these tasks, representing the signal in the ATLAS calorimeter layers as pixelated images. Machine learning approaches outperform the classification applied in the baseline local hadronic calibration and are able to improve the energy resolution for a wide range in particle momenta, especially for low energy pions. This work demonstrates the potential of machine-learning-based low-level hadronic calibrations to significantly improve the quality of particle reconstruction in the ATLAS calorimeter.

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Session Classification: Session 6

Track Classification: Taggers and performance