Contribution ID: **13**   Type: **not specified**

Run 3 Forward Electron Energy Calibration in ATLAS

Detecting and identifying electrons in the forward region (|eta| > 2.5 outside the ATLAS tracker acceptance) it is an unique feature of the ATLAS experiment. Precise energy calibration of those electrons is essential for many physics analyses, particularly in measurements related to the electroweak mixing angle. Accurate calibration ensures consistency between data and Monte Carlo (MC) simulations, improving the overall precision of key electroweak observables.

The student will gain an understanding of electron reconstruction in the forward region of ATLAS and the methods used to calibrate their energy response. Our group has played a leading role in forward electron calibration during Run 2, where a multivariate analysis (MVA)-based method was developed to predict electron energy and a dedicated calibration procedure was implemented to align the response between data and MC. For Run 3, the student will apply the existing Run 2 MVA-based calibration approach to new data, ensuring its validity and performance in the updated detector and data-taking conditions. Building upon this foundation, the student will contribute to the calibration of forward electrons in Run 3, which will be an integral part of the ATLAS electron and photon (egamma) calibration recommendations for Run3. This project provides an opportunity to work on a key aspect of ATLAS calibration, gaining hands-on experience with data analysis, machine learning techniques, and the calibration framework used in high-energy physics experiments.

Group

FH-ATLAS

Project Category

B1. Physics data analysis and performance (software-oriented)

Special Qualifications

Programming Languages, Statistical Test

DESY Site

Hamburg

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