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Calibrating ATLAS calorimeter signals using an uncertainty-aware precision network

Tuesday 9 September 2025 17:00 (20 minutes)

ATLAS explores modern neural networks for a multi-dimensional calibration of its calorimeter signal defined by clusters of topologically connected cells (topo-clusters). The Bayesian neural network (BNN) approach yields a continuous and smooth calibration function, including uncertainties on the calibrated energy per topo-cluster. In this talk the performance of this BNN-derived calibration is compared to an earlier calibration network and standard table-lookup-based calibrations. The BNN uncertainties are confirmed using repulsive ensembles and validated through the pull distributions. First results indicate that unexpectedly large learned uncertainties can be linked to particular detector regions.

Significance

References

Experiment context, if any

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