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Calorimeter Reconstruction with Graph Neural Networks

Graph Neural Networks (GNNs) have emerged as powerful tools for particle reconstruction in high-energy physics experiments, particularly in calorimeters with irregular geometries, such as those used in the ATLAS experiment. In this work, we present a GNN-based approach to reconstruct particle showers, improve energy resolution, spatial localization, and particle identification. We discuss the model architecture, training strategies, and performance benchmarks, demonstrating the advantages of GNNs over conventional techniques. Our findings highlight the potential of GNNs to enhance calorimeter-based event reconstruction, paving the way for more precise measurements in future collider experiments.

AI keywords

Graph neutral networks; clustering; reconstruction; calorimeter

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