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Jet Energy Corrections with GNN Regression

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Accurate energy measurements of jets are crucial to many analyses in particle physics. To improve the performance of current jet energy corrections, machine learning based methods are investigated. Following recent developments in jet flavor classification, jets are considered as unordered sets of their constituent particles, referred to as *particle clouds*. In addition, particular care is taken on having similarly distributed data for different jet flavors in the training sample enabling generically applicable corrections. The set-based Particle Flow Network and the graph-based ParticleNet are then applied to perform regression in an attempt to map reconstructed p_T towards its particle-level counterpart. The performance of the two models is compared internally, however, compared to standard corrections both of them yield significant improvement in both energy resolution and flavor dependence.

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