

Quantum Machine Learning for Calorimeter Data Generation

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Rapid advances in Quantum Computing technology promise applications in a number of computational problems relevant to a wide range of scientific disciplines. Calorimeter simulation is crucial to Experimental High Energy Physics analyses. However, due to the rising computational cost of traditional simulation methods, machine learning has become a tool used to accelerate data generation.

Calorimeter data exhibits strong correlations, which many classical machine learning models struggle to recreate. Properties of quantum states, such as entanglement, which directly imply strong correlations may be a tool for capturing the full data complexity.

Preliminary models, using hybrid Quantum-Classical machine learning architectures are presented and explored.