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Resolving Combinatorial Problems with Quantum Algorithms

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One key problem in collider physics is that of binary classification to fully reconstruct final states. Considering top quark pair production in the fully hadronic channel as an example, we explore the effectiveness of multiple variational quantum algorithms (VQAs) including quantum approximation optimization algorithm (QAOA) and its derivatives. Compared against other approaches, such as quantum annealing and kinematic methods i.e. the hemisphere method, we demonstrate comparable or better efficiencies for selecting the correct pairing depending on the particular invariant mass threshold.

Mini Symposia (Invited Talks Only)

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Session Classification: Computing, Analysis Tool and Data Handling

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