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Towards a Quantum Computing Algorithm for Helicity Amplitudes and Parton Showers

Wednesday 16 December 2020 10:00 (30 minutes)

The interpretation of measurements of high-energy particle collisions relies heavily on the performance of full event generators. By far the largest amount of time to predict the kinematics of multi-particle final states is dedicated to the calculation of the hard process and the subsequent parton shower step. With the continuous improvement of quantum devices, dedicated algorithms are needed to exploit the potential quantum computers can provide. In this talk I will discuss general and extendable algorithms for quantum gate computers to facilitate calculations of helicity amplitudes and the parton shower process, as a first step towards a quantum computing algorithm to describe the full collision event at the LHC. This method exploits the equivalence between spinors and qubits and harnesses the quantum computer's ability to remain in a quantum state throughout the calculations.

Would you be interested in receiving feedback on your talk?

Yes

Will you be pre-recording your talk?

No

Length of talk

15-25 minutes

Are you happy for your talk to be recorded?

Yes

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