Quantum Technologies within INFN: status and perspectives

Report of Abstracts

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The QuantHEP project

Content

The goal of the project QuantHEP (Quantum Computing Solutions for High-Energy Physics) is to investigate the potential of quantum computation for particle-physics challenges, as a solution to the formidable problem of analysing and simulating events from experiments of high-energy particles. To deal with such challenges a multidisciplinary approach is essential, spanning from quantum analog and digital computing and quantum simulation to both theoretical and experimental high-energy physics.
QuantHEP aims at developing quantum algorithms for event selection and reconstruction, using them to perform proof-of-principle analysis of real data from CERN. We will also develop software libraries to simulate particle physics' objects, as building blocks for the quantum simulation of scattering processes. Finally, the project has a foundational character, putting forward an original comprehensive approach to investigate the potential of quantum computation for particle physics challenges.

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