

Quantum Technology Initiative at CERN

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Abstract (Century Gothic 11)

The CERN Quantum Technology Initiative (QTI) was launched in 2020 with the aim of investigating the role that quantum technologies could have within the High Energy Physics (HEP) research program. During this initial exploratory phase a set of results were gathered, outlining benefits, constraints and limitations of introducing technologies in different HEP domains, from advanced sensor for next generation detectors, to computing. These findings have been used to define of a longer-term research plan, closely aligned with the technological development of quantum infrastructure and the HEP priorities.

The CERN QTI has now entered its second phase, dedicated to extending and sharing technologies uniquely available at CERN, while boosting development and adoption of quantum technologies in HEP and beyond.

This talk will summarize the experience accumulated through the past years, outlining the main QTI research results, focusing in particular the field of quantum computing, and provide a perspective of future research directions.

References

- [1] Authors, Cea, M., et al. "Exploring the Phase Diagram of the quantum one-dimensional ANNNI model." arXiv preprint arXiv:2402.11022 (2024).

Figures

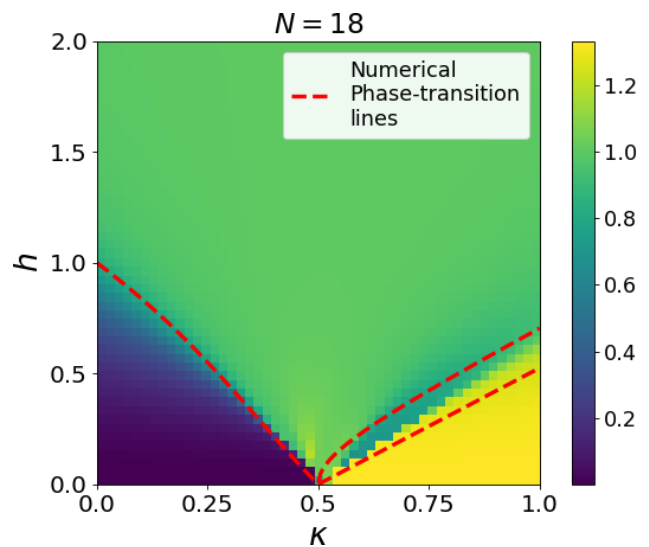


Figure 1: Unsupervised learning quantum architecture detects phase transitions of a ANNNI model [1]
