Contribution ID: **146** Type: **Poster**

On the Noise Resilience of Quantum Generative Models

Noise is a central challenge in quantum computing, particularly on Noisy Intermediate-Scale Quantum (NISQ) devices, where it significantly impacts the reliability of computations and model performance.
Variational quantum circuits, exhibit some inherent noise resilience due to their trainable structure and adaptability. While the effects of noise have been studied in the context of quantum algorithms, their impact on quantum generative models remains to be explored in detail.
In this work, we investigate the behavior of quantum generative models under varying levels of noise, focusing on the Quantum Angle Generator (QAG)—a model trained via the Maximum Mean Discrepancy (MMD) loss to generate high-fidelity images by leveraging the probabilistic nature of quantum circuits.
We compare the QAG to a classical feed-forward neural network (FFN), evaluating the performance of both models across a range of noise levels.

Significance

References

Experiment context, if any

Authors: SLIM, Jamal (DESY); MONACO, Saverio

Co-authors: KRUCKER, Dirk (Deutsches Elektronen-Synchrotron (DE)); Dr REHM, Florian (CERN); BORRAS, Kerstin (DESY / RWTH Aachen University); Mr SCHAM, Moritz (Deutsches Elektronen-Synchrotron (DE))

Presenter: MONACO, Saverio

Session Classification: Poster session with coffee break

Track Classification: Track 1: Computing Technology for Physics Research