May 2025

Dear Reviewers and ACs,

We would like to inform you that the submissions titled **Quantum-inspired Multi-dimensional Visual Fields with Learnable Energy Representations** (QVF) and **Q-NeRF: Neural Radiance Fields on a Simulated Gate-based Quantum Computer** (QNeRF), both submitted to NeurIPS 2025, are related and involve partially overlapping authorship.

We would like to clarify the relationship between these two submissions and outline their respective contributions to assist the reviewers in assessing them independently.

QVF is a hybrid classical-quantum framework that employs learnable Gibbs-Boltzmann-based encodings to efficiently model implicit representations. QNeRF, on the other hand, introduces a model that leverages parametric quantum circuits to learn a Neural Radiance Field (NeRF) for synthesising novel views of 3D scenes. While QNeRF draws inspiration from QVF and may be seen as a follow-up study, its contributions and methodology are distinct.

Main contributions of QVF:

- A quantum-inspired architecture for modelling multiple latent-conditioned 2D or 3D visual field representations;
- A learnable encoding mechanism based on the Gibbs-Boltzmann energy framework, designed to capture a physically meaningful energy landscape;
- An efficient Parametric Quantum Circuit that processes entangled information within the real Hilbert subspace, explicitly designed for stable gradient feedback by bounding Haar randomness.

Main contributions of QNeRF:

- A hybrid quantum-classical architecture for novel-view synthesis (3D estimation from 2D images), representing (to the best of our knowledge) the first Neural Radiance Field model compatible with gate-based quantum hardware;
- A dual-branch amplitude embedding scheme that separately processes positional and view-dependent coordinates, enabling exponential reduction in state preparation complexity on current quantum hardware while introducing inductive biases to support 3D learning. This also results in a different ansatz compared to the one presented in QVF;
- A post-processing output scaling layer that mitigates the effects of exponential concentration.

Each paper is self-contained and can be understood without requiring the other. They are intended to stand on their own as contributions to different aspects of the field (one more QML-oriented, while the other more on the application side). They also address different tasks, as QVFs are for representation learning (2D in-2D out/3D in-3D out), while QNeRF is for 3D learning from multi-view 2D images.

We also note that QVF is primarily designed for quantum simulation and future fault-tolerant quantum computing, whereas the dual-branch QNeRF architecture is tailored for implementation on current noisy quantum hardware.

Finally, we emphasise that QVF and QNeRF have **0% textual and experimental overlap** and are prepared independently. To assist the reviewers in confirming the independence and distinction between the two submissions, we have included an anonymised version of the companion paper as supplementary material.

Thank you for your time and consideration.

On behalf of all authors