

We would like to thank the reviewers for their comments. Below we provide a response to their specific remarks.

## 1 Reviewer 1

1. The generalization of the suggested benchmarking technique to multiple qubits should be described in more detail, explicitly mentioning whether the complexity of the derivation and actual benchmarking depends on the number of qubits.

**Response** We thank the referee for this suggestion. We extended the manuscript with a paragraph describing differences between a single-qubit and higher-dimensional cases.

## 2 Reviewer 2