Contribution ID: **14** Type: **not specified**

Extending qubit dihedral benchmarking to complete the characterisation of a universal qutrit gate set

Friday, June 16, 2023 10:00 AM (30 minutes)

To effectively operate a large-scale quantum computer, it is essential to thoroughly and confidently assess the performance of its components.
The gold standard for performance assessment of quantum gates is randomised benchmarking.
In particular, randomised benchmarking of universal qutrit quantum gates is needed.
In this presentation I will show how we advance from qubit dihedral benchmarking using the group D_8 to benchmarking a qutrit T gate by generalizing D_8 using the unique group for qutrits that satisfies three criteria inspired by D_8.
Using this generalization of D_8 we can complete the characterisation of a universal qutrit gate set.
I will also briefly discuss the application of our criteria to T gate benchmarking in the ququart and ququint cases.

Primary author: AMARO ALCALA, David (University of Calgary)

Co-authors: SANDERS, Barry; DE GUISE, Hubert

Presenter: AMARO ALCALA, David (University of Calgary)

Session Classification: Quantum Information

Track Classification: Quantum Information