



Contribution ID: 26

Type: **Poster**

## Measurement disturbance tradeoffs in three-qubit unsupervised quantum classification

*Wednesday, 25 May 2022 15:50 (20 minutes)*

We consider measurement disturbance tradeoffs in quantum machine learning protocols which seek to learn about quantum data. We study the simplest example of a binary classification task, in the unsupervised regime. Specifically, we investigate how a classification of two qubits, that can each be in one of two unknown states, affects our ability to perform a subsequent classification on three qubits when a third is added. Surprisingly, we find a range of strategies in which a non-trivial first classification does not affect the success rate of the second classification. There is, however, a non-trivial measurement disturbance tradeoff between the success rate of the first and second classifications, and we fully characterise this tradeoff analytically.

**Primary authors:** SPENCER-WOOD, Hector (University of Glasgow); Dr JEFFERS, John (University of Strathclyde); Dr CROKE, Sarah (University of Glasgow)

**Session Classification:** Poster