

Quantum Coherence and Antidistinguishability

Friday, June 16, 2023 9:00 AM (30 minutes)

Given a quantum state, how can we tell how “quantum” it is? That is, can we use that quantum state to do kick-start an interesting protocol like quantum teleportation, or is it really just a classical state in disguise? Quantum coherence tries to answer this question by quantifying the amount of superposition present in a quantum state. We develop some new easy-to-compute methods of determining how much coherence is present in a quantum state, and we establish a connection with the seemingly unrelated problem of *antidistinguishability*: if we are given a pure quantum state from some fixed set, is there a measurement that determines at least one state that we were *not* given? As an application of our results, we derive a correct version of a recently-disproved conjecture about antidistinguishability of quantum states.

Author: JOHNSTON, Nathaniel (Mount Allison University)

Co-authors: Dr SIKORA, Jamie; Dr PEREIRA, Rajesh; Dr PLOSKER, Sarah; Dr MOEIN, Shirin; Dr RUSSO, Vincent

Presenter: JOHNSTON, Nathaniel (Mount Allison University)

Session Classification: Quantum Information

Track Classification: Quantum Information