

Quantum Coherence and Antidistinguishability

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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.

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