

Abstract Submitted
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Where Exactly are the Quantum Cheshire Cats? PRASHANNA SIMKHADA, JEAN-FRANCOIS S. VAN HUELE, Brigham Young University — We present Aharonov's concept of a Quantum Cheshire Cat (QCC) (arXiv: 1202.0631) to illustrate how physical properties can be disembodied from the objects they belong to. We compute weak-measurement expectation values and look for correlations of spin and path observables associated with a Mach-Zehnder interferometric set-up. By including ancilla states we are able to (a) confirm Aharonov's correlations, (b) find new QCCs, and (c) provide a new interpretation of the occurrence of QCCs. We conclude that where we find the Cheshire cats depends on the precise question we ask about the entire set-up.

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