

## Quantum Physics

# Quantum Measurement Reliability versus Reversibility

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There is a constraining relation between the reliability of a quantum measurement and the extent to which the measurement process is, in principle, reversible. The greater the information that is gained, the less reversible the measurement dynamics become. To illustrate this relation, we develop a simple physical model for quantum measurement, as well as a hypothetical scheme by which the experimenters can determine the reliability and reversibility. We derive an "uncertainty" (constraining) relation between reliability and reversibility, which holds even when there is no interaction with any external environment other than the fundamental information recording device.

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