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**Consecutive Measurements in Quantum Mechanics**[1] JENNIFER R. GLICK, CHRISTOPH ADAMI, Michigan State University — The physics of quantum measurement still continues to puzzle with no resolution in sight between competing interpretations, in particular because no interpretation has so far produced predictions that would be falsifiable via experiment. Here we present an analysis of consecutive projective measurements performed on a quantum state using quantum information theory, where the entanglement between the quantum system and a measuring device is explicitly taken into account, and where the consecutive measurements increase the joint Hilbert space while the wavefunction of the joint system never collapses. Using this relative-state formalism we rederive well-known results for the pairwise correlation between any two measurement devices, but show that considering the joint as well as conditional entropy of three devices reveals a difference between the collapse and no-collapse pictures of quantum measurement that is experimentally testable.

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