

Abstract Submitted
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Retrodiction of a sequence of measurements in a qubit interferometer MARK HILLERY, DANIEL KOCH, Hunter College of CUNY — Alice gains information about the trajectory of a particle going through a series of interferometers by making measurements to obtain information about the path the particle took through each interferometer. Bob obtains the particle after it has passed through all of the interferometers, and he wants to determine the results of Alice's measurements. That is, he wants to determine the record of the particle's trajectory by making a further measurement on the particle. What can he find out? We model this process by a qubit going through a series of Hadamard gates, with Alice measuring the particle between each pair of gates. We examine several kinds of measurements that Bob can make, including one to determine the entire trajectory and one that rules out a trajectory. The first of these can make an error, that is, give the wrong trajectory, while the second will not give a wrong answer. The measurement that excludes a trajectory is useful in that Bob can use it to be sure of getting at least one of the results of Alice's measurements correct. Reference: M. Hillery and D. Koch, *Phys. Rev. A* 94, 032118 (2016).

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