

# Simple test example

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Here we describe a simple protocol which can be used to test the rules of consistency and the theory employed for an ability to yield simplest predictions.

The setting consists of two agents: Alice and Bob. Each experimenter is equipped with a memory qubit. Additionally, there is another system - qubit  $S$ . The initial state of the  $S$  is  $\frac{1}{\sqrt{2}}(|0\rangle_S + |1\rangle_S)$ . The initial state of the relevant subsystems of the agents' memories is  $|0\rangle_A$  and  $|0\rangle_B$ . The experiment proceeds as follows:

- $t = 1$ . Alice measures system  $S$  in basis  $\{|0\rangle_S, |1\rangle_S\}$ , and records the result in her memory  $A$ .
- $t = 2$ . Bob measures system  $S$  in basis  $\{|0\rangle_S, |1\rangle_S\}$ , and records the result in her memory  $A$ .
- $t = 3$ . Alice and Bob reason about each other's outcomes.

According to the laws of quantum theory, their results should be the same, and no contradiction should arise.