Delayed-choice Measurement and Temporal Nonlocality

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We study for a composite quantum system with a quantum Turing architecture the temporal non-locality of quantum mechanics by using the temporal Bell inequality, which will be derived for a discretized network dynamics by identifying the subsystem indices with (discrete) parameter time. However, the direct "observation" of the quantum system will lead to no violation of the temporal Bell inequality and to consistent histories of any subsystem. Its violation can be demonstrated, though, for a delayedchoice measurement.

Key words: Bell Inequality; Delayed-choice Measurement; Quantum Erasure.