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T_1-echo sequence - Preserving the state of a qubit in the presence of coherent interaction CLEMENS MÜLLER, Departement de Physique, Universite de Sherbrooke, Quebec, Canada J1K 2R1, ALEXANDER SHNIRMAN, Institut fuer Theorie der Kondensierten Materie, Karlsruhe Institute of Technology, D-76128 Karlsruhe, Germany, MARTIN WEIDES, National Institute of Standards and Technology, Boulder, CO 80309-044, USA — We propose a sequence of pulses intended to preserve the state of a qubit in the presence of strong, coherent coupling to another quantum system. The sequence can be understood as a generalized SWAP and works in formal analogy to the well-known spin echo. Since the resulting decoherence rate of the qubits state is strongly influenced by the additional system, this sequence might serve to protect its quantum state. A possible area of application would be in superconducting circuits, where often spurious two-level system interact strongly with the qubits and might thus provide the necessary resource.

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