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Feedback suppression of the low-frequency noise in qubits by the low-frequency quantum measurements QIANG DENG, DMITRI AVERIN, Department of Physics and Astronomy, SUNY, Stony Brook — The problem of the low-frequency noise has dominated the development of the solid-state qubits. Up to now, the main approach to solve this was to employ the qubit structures with the basis states having the same values of the main qubit coordinate (e.g., electric charge or magnetic flux) that are, as a result, not decohered by the noise. The goal of this work is to suggest an alternative approach based on direct suppression of the low-frequency noise in a qubit through the measurement/feedback loop. Continuous quantum measurement required for this loop should also be "low-frequency" so that it does not affect the quantum dynamics of the qubit. We calculate the minimal noise induced in the qubit by such a feedback loop when the measurement is the quantum-limited.

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