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Weak measurement of a solid-state qubit revealed in low-frequency noise[1] ALEXANDER KOROTKOV, University of California, Riverside — Weak quantum measurement becomes a subject of experimental study with solid-state qubits. Partial collapse, quantum uncollapsing, and persistent Rabi oscillations have been already demonstrated with superconducting qubits by the UCSB and Saclay groups. Now we propose an experiment, in which the features of a weak quantum measurement are revealed in the low- frequency noise of the detector signal. (Here we mean a frequency much lower than the Rabi frequency, though sufficiently high to avoid 1/f noise.) The idea is to use two detectors measuring the same qubit, so that one detector collapses the qubit, while the other detector senses the result of the collapse. Then the cross-correlation of low-frequency noises in outputs of the two detectors carries information about the collapse process. The experiment can be realized with superconducting or semiconductor qubits.

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