Abstract Submitted
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Microbridge junctions for superconducting phase qubits MARTIN WEIDES, R. C. BIALCZAK, M. LENANDER, E. LUCERO, M. MARIANTONI, M. NEELEY, A. O'CONNELL, D. SANK, H. WANG, J. WENNER, T. YAMAMOTO[1], Y. YIN, A. CLELAND, J. MARTINIS, Physics Department, University of California, Santa Barbara — Josephson junctions for superconducting circuits such as SQUIDs and qubits are conventionally based on Al-AlO_x-Al multilayer technology, which has two-level-fluctuators in the dielectric AlO_x as a limiting decoherence source. Replacing the tunnel junction with a nano-structured microbridge junction based on a hardly oxidizable metal, e.g. rhenium, is a potential solution to reduce the intrinsic noise level. Being capacitively shunted, the microbridge junctions cubic potential allows for the operation as a phase qubit and to use its quantum limited energy resolution as a sensor for residual electronic fluctuations. In this talk, transport measurements on microbridge junctions, structured with Focus Ion Beam and Electron Beam Lithography, their potential as active elements in superconducting circuits, as well as preliminary data for microbridge phase qubits will be presented.

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