Abstract Submitted
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Superinductors for Quantum Circuits[1] MICHAEL GERSHENSON, Rutgers, the State University of New Jersey — Many Josephson circuits intended for quantum computing would benefit from realization of a superinductor: a decoherence-free element whose microwave impedance greatly exceeds the resistance quantum $R_Q = h/(2e)^2$. An ability to change the inductance of this element at a short time scale ($< 1\mu s$) would be also an important advantage that could help to realize fault-tolerant operations with superconducting qubits. I will discuss two approaches to the development of superinductors based on Josephson junctions with small Josephson energies and strongly disordered superconductors and the related experimental challenges. M.T. Bell, I.A. Sadovskyy, L.B. Ioffe, A.Yu. Kitaev, and M.E. Gershenson, Quantum Superinductor with Tunable Non-Linearity, Phys. Rev. Lett. 109, 137003 (2012). M.T. Bell, W. Zhang, L.B. Ioffe, and M.E. Gershenson. Spectroscopic Evidence of the Aharonov-Casher Effect in a Cooper Pair Box. Phys. Rev. Lett. 116, 107002 (2016).

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