

Abstract Submitted  
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**Optimization and characterization of protected Josephson circuits** EVA DUPONT-FERRIER, SERGEY GLADCHENKO, LEV IOFFE, MICHAEL GERSHENSON, Rutgers University — Recently, it was proposed that small Josephson arrays can operate as superconducting qubits protected from local noises [1,2]. Here we present measurements of several optimized array designs. The read-out circuit for these arrays consists of an inductively-coupled DC SQUID, which helps to minimize perturbations of the system during measurement. We will discuss the current-phase characteristics of these arrays and their response to microwave radiation. Our results indicate that the scattering of Josephson junction parameters can be made small enough to implement the symmetry-protected superconducting qubits; our theoretical model [1] captures all essential features of real devices. 1. see e.g., B. Douçot and L.B. Ioffe, *Phys. Rev. B* **76**, 214507 (2007) and references therein. 2. S. Gladchenko, D. Olaya, E. Dupont-Ferrier, B. Douçot, L.B. Ioffe, and M.E. Gershenson, “Superconducting Nanocircuits for Topologically Protected Qubits”, arXiv:cond-mat/0802.2295, to be published in *Nature Physics*.

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