

Abstract Submitted  
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**Simultaneous monitoring of fluxonium qubits in a waveguide<sup>1</sup>** A. KOU, W.C. SMITH, U. VOOL, I.M. POP, K.M. SLIWA, M. HATRIDGE, R.J. SCHOELKOPF, M.H. DEVORET, Department of Applied Physics, Yale University — Building quantum computers and quantum simulators requires separate control and readout of multiple qubits. We present an architecture for multiplexed readout of fluxonium qubits. We measured lifetimes in excess of 100  $\mu$ s for such artificial atoms placed in a wide-bandwidth electromagnetic environment. We use cascaded Josephson parametric converters to measure the quantum jumps of two fluxonium qubits simultaneously. Our method can access correlations between different qubits and can easily be scaled to read out larger numbers of qubits.

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