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**Coherent control of a linear microwave cavity via single flux quantum pulses** SHAOJIANG ZHU, GUILHEM RIBEILL, TED THORBECK, EDWARD LEONARD, MAXIM VAVILOV, Department of Physics, University of Wisconsin Madison, BRITTON PLOURDE, Department of Physics, Syracuse University, ROBERT MCDERMOTT, Department of Physics, University of Wisconsin Madison — Classical Josephson digital logic based on single flux quantum (SFQ) pulses offers a path to robust, low-latency control of a large-scale quantum processor. Here we describe the coherent control of a linear superconducting cavity by direct excitation via SFQ pulses. Resonant trains of SFQ pulses are capacitively coupled to a thin-film coplanar waveguide cavity. We examine the resulting cavity states as a function of subharmonic drive and temperature. In addition, we describe first steps toward the coherent control of a superconducting qubit with SFQ pulses.

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