

Abstract Submitted  
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**Exploration of sapphire whispering gallery mode resonator crystals for use as a quantum computing memory** ADAM SIROIS, Univ of Colorado - Boulder, MANUEL CASTELLANOS-BELTRAN, NIST-Boulder, DANIEL CREEDON, Univ. of W. Australia, RAYMOND SIMMONDS, JOHN TEUFEL, NIST-Boulder, MICHAEL TOBAR, Univ. of W. Australia, JOSE AUMENTADO, NIST-Boulder — Sapphire whispering gallery mode (WGM) resonators are a known to support multiple, high-quality factor modes in a compact volume at microwave frequencies. In this talk we demonstrate the ability to parametrically couple whispering gallery modes by use of a Josephson-junction-based coupling element. In this manner we implement a ‘storage and retrieval’ protocol which may be useful for storing several complex microwave quantum states in small volumes.

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