

Abstract Submitted
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Microwave to optical state transfer with a cavity electro-opto-mechanical system REED ANDREWS, ROBERT PETERSON, THOMAS PURDY, JILA: University of Colorado and NIST, KATARINA CIOK, RAYMOND SIMMONDS, NIST, CINDY REGAL, KONRAD LEHNERT, JILA: University of Colorado and NIST — Quantum-coherent conversion between gigahertz-frequency “microwave light” and terahertz-frequency “optical light” would combine the processing power and scalability of superconducting qubits with the low-loss and long-distance distribution of optical fibers. Here we use an electro-opto-mechanical device to reversibly convert classical signals between microwave and optical light with an efficiency of ten percent. The frequency conversion is coherent and occurs over a 10 kHz bandwidth. This new type of converter opens new possibilities for generating and distributing entanglement, and is potentially capable of quantum-coherent frequency conversion.

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