

Abstract Submitted  
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**Microwave-to-optical transduction and microwave-controlled optical switch in a vapor cell inside a room-temperature high-Q microwave cavity**<sup>1</sup> ANDREI TRETIAKOV, CLINTON POTTS, TIMOTHY LEE, MATTHEW THIESSEN, JOHN DAVIS, LINDSAY LEBLANC, University of Alberta — Information transfer from microwave to an optical domain in classical and quantum regimes have significant applications for modern communication systems and quantum information devices. Here we use a thermal Rb vapor cell enclosed by a room-temperature high-Q microwave cavity as an interface between microwave and optical fields. Through magnetic-dipole coupling greatly enhanced by the cavity, the microwave field affects the optical density of the vapor for a resonant optical transition. In this set up we experimentally demonstrate transduction of an audio signal encoded in microwave modulation to the optical intensity and show that applying a microwave field in the presence of a strong optical pump, can drive the medium from full absorption to full transmission of a weak optical probe, thus acting as an optical switch.

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