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Rydberg Atom-Based Stereo Receiver CHRISTOPHER HOLLOWAY, National Institute of Standards and Technology Boulder, MATTHEW SIMONS, University of Colorado PREP / NIST Boulder, ABDULAZIZ HADDAB, University of Colorado, JOSHUA GORDON, National Institute of Standards and Technology Boulder, STEPHEN VORAN, Institute for Telecommunication Sciences — Recent progress on Rydberg atom-based techniques for radio frequency (RF) electric (E) field metrology and sensing have made atom-based receivers and antennas possible. These potentially have many benefits over conventional technologies in detecting and receiving modulated signals. In this paper, we demonstrate a multi-channel atom-based receiver for both amplitude modulation (AM) and frequency modulation (FM) through the use of two different atomic species. We also investigate the effect of Gaussian noise on the fidelity of the received signals. Finally, we demonstrate a recording of a musical composition (a “guitar duet”), by detecting and recording two guitars simultaneously, where each atomic species detects and records each guitar separately.

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