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Nonlinear optical magnetometry with accessible in situ optical squeezing[1] NILS OTTERSTROM, Brigham Young University, RAPHAEL POOSER, BENJAMIN LAWRIE, Oak Ridge National Laboratory — We demonstrate compact and accessible squeezed-light magnetometry by means of the four-wave mixing process in a single hot rubidium vapor cell. The presence of a strong pump field and a weak, red-shifted probe field in the rubidium vapor coherently generates a two mode relative intensity squeezed state. The intrinsic strong coherence and probe detuning of the four wave mixing process allow the probe field to experience nonlinear magneto-optical rotation (NMOR) and impart its rotation signal on the blue-shifted conjugate field. This framework enables 4.7 dB of quantum noise reduction while simultaneously adding the NMOR signals of the probe and conjugate fields.

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Nils Otterstrom
Brigham Young University

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