

Abstract Submitted
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Comagnetometry using Synchronous Spin-Exchange Optical Pumping with Bias Modulation¹ SUSAN SORENSEN, DAN THRASHER, THAD WALKER, University of Wisconsin - Madison — We demonstrate a novel spin-exchange pumped noble gas comagnetometer which suppresses bias magnetic field noise by more than a factor of 10^3 . The presented device achieves μHz -scale rotation sensitivity. Two Xe isotopes and Rb atoms are continuously polarized transverse to a pulsed bias field. Each field pulse produces 2π Larmor precession of the Rb atoms. Both Xe isotopes' nuclear magnetic resonance conditions are simultaneously satisfied by frequency modulation of the pulse repetition rate. The Rb atoms serve as an embedded magnetometer for detection of the Xe precession. We discuss performance and the effect of magnetometer phase shifts.

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