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Comagnetometry Using Synchronous Spin Exchange Optical Pumping[1] DANIEL THRASHER, SUSAN SORENSEN, JOSH WEBER, ANNA KORVER, THAD WALKER, University of Wisconsin-Madison — We demonstrate comagnetometry using synchronous spin exchange optical pumping of two Xe isotopes with Rb. Both isotopes are simultaneously polarized transverse to a pulsed bias magnetic field through spin exchange collisions with polarized Rb atoms. The bias field is applied as a sequence of alkali 2π pulses, which allows the magnetometer to operate at near spin exchange relaxation free sensitivity. The Rb atoms are optically pumped transverse to the bias field, greatly suppressing the alkali field's contribution to bias instability. The Rb polarization is simultaneously modulated at the nuclear magnetic resonance of each Xe isotope. We will present a detailed analysis of systematic errors.

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