Abstract Submitted
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Collisional EPR Frequency Shifts in Cs-Rb-Xe Mixtures[1] SHENG ZOU, CHAMITHRI ADIKARIGE, ZAHRA ARMANFARD, TREVOR FOOTE, DAVID P. MORIN, BRIAN SAAM, Washington State University — Spin-exchange optical pumping (SEOP) generates large non-thermal nuclear polarizations in certain non-zero-spin noble gases. The collisionally modulated Fermi-contact hyperfine interaction between the alkali-metal valence electron and the noble-gas nucleus is crucial to SEOP physics, which is incompletely understood, especially for heavy noble gases like Xe. One current question is whether Rb, Cs, or a mixture of the two is ideal for SEOP of ^{129}Xe. The magnetization of hyperpolarized ^{129}Xe generates a frequency shift in the alkali-metal EPR hyperfine spectrum that is directly proportional to the electron-wavefunction overlap characterized by the enhancement factor κ_0 [1]. We performed near-simultaneous measurements of the ^{87}Rb and ^{133}Cs EPR shifts caused by sudden destruction of ^{129}Xe hyperpolarization in a "hybrid Rb-Cs SEOP vapor cell. Our preliminary result for the shift ratio is about 1.5 to 1.6 at 110 °C, suggesting that $(\kappa_0)_{\mathrm{CsXe}}$ is about 25% to 35% larger than $(\kappa_0)_{\mathrm{RbXe}}$; the latter has been previously measured to be 493 ± 31 [2]. [1] S.R. Schaefer, et al., Phys Rev. A **39**, 5613 (1989). [2] Z.L. Ma, et al., Phys. Rev. Lett. **106**, 193005 (2011).

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