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Hybrid K-Rb Spin Exchange Optical Pumping Cells for the Polarization of ^{3}He ALEX COUTURE, TIM DANIELS, CHARLES ARNOLD, TOM CLEGG, UNC/TUNL — We are transitioning from polarizing ^{3}He using optical pumping cells charged with pure Rb to using a mixture of Rb and K, lean in Rb. The reason for this is the spin exchange efficiency between K and ^{3}He is an order of magnitude greater than that of Rb and ^{3}He. Also the spin exchange cross section between Rb and K is very large, which leads to a very fast rate of polarization transfer from Rb to K. Thus by optically pumping using a standard 795 nm Rb laser on a hybrid K-Rb cell, we can obtain significant improvements in spin-up time as well as improvements in overall polarization.[1] We produce hybrid pumping cells at TUNL using a filling station consisting of an oven and a turbo pumping station to bake out and pump away any impurities in the cells. The alkali metals are introduced into the pumping cells from a Y-shaped manifold with a separate retort for each alkali. We are able to determine the ratio of K to Rb in the vapor using white light absorption spectroscopy. Light from a halogen light bulb is incident upon the heated cell and enters a spectrometer beyond. We examine the relative sizes of the D1 and D2 absorption lines for the two alkali metals. We will have data comparing hybrid cells to pure Rb cells, GE-180 cells to Pyrex, and are working to obtain comparative performance data for spectrally unnarrowed and narrowed lasers. Our latest results will be reported. [1] E. Babcock, et al. (2003) Phys. Rev. Letter Vol. 91, Num.12, 123003

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