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Characterization of a Low Pressure, High Capacity ^{129}Xe Flow-Through Polarizer[1] BRIAN SAAM, GEOFFRY SCHRANK, ZAYD MA, ALLISON SCHOECK, University of Utah — Hyperpolarized ^{129}Xe produced *via* spin-exchange optical pumping continues to be an interesting physical system to study and is useful in many NMR and MRI applications. The generation of large quantities of highly polarized ^{129}Xe is complicated by xenon's large cross section for spin destruction of the alkali-metal electron. This problem has been addressed in recent years by the development of flow-through xenon polarizers, which operate with a gas mixture that is lean in xenon flowing continuously through the optical pumping cell. We describe here our own flow-through xenon polarizer that is based on the University of New Hampshire design: it operates at low pressure, employs counter-propagating laser beam and gas flow, and has a long narrow optical pumping region. In our version, the systems for heating and Rb vapor generation have been simplified. We examine both the output ^{129}Xe polarization by NMR and the *in situ* ^{85}Rb polarization by optically detected EPR as a function of position in the meter-long cell. Under near-optimal conditions with 28 W of frequency-narrowed laser light, we achieve ^{129}Xe polarizations $> 30\%$ with a flow of 5 bar·cm^3/min of natural xenon. We compare our results with a numerical model.

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