

Abstract Submitted
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Polarization Enhancement of ^{129}Xe in TEMPO-Doped Xenon at 2.0K and 0.31 Tesla. D.N. BALAKISHIYEVA, J.W. MCNABB, C. BEDNARSKI-MEINKE, A. HONIG, Syracuse University — Enhancements of ^{129}Xe NMR signals up to 300 times their equilibrium value at temperature 2.0K and magnetic field $\sim 0.3\text{T}$, corresponding to a spin polarization $>1\%$, have been obtained in solid xenon with TEMPO¹ impurity concentrations near $10^{18}/\text{cm}^3$. This dynamic polarization results from interaction of the nuclear Zeeman spin reservoir with the electron spin-spin reservoir², while irradiating near the electron Zeeman resonance frequency ($\sim 8.7\text{ GHz}$) with up to 500 mW of microwave power. The mixing procedures in which TEMPO is introduced into liquid Xenon prior to freezing, and the *electron* spin resonance line shapes which correlate with dynamic polarization enhancements are described. At higher magnetic fields up to $\sim 5\text{ T}$, and temperatures still within the 1 - 2K range, the results suggest a route for fast and copious production of hyperpolarized ^{129}Xe , with its multitude of applications³. 1. Pluckthun, M. et al, Nucl. Instrum. and Meth. in Phys. Res. A 400, 122 (1997). 2. Abragam, A. and M. Goldman, Rep. Prog. Phys. 41, 395 (1978). 3. Oros, A-M and N. J. Shah, Phys. Med. Biol. 49, R105 (2004).

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