Abstract Submitted
for the TS4CF08 Meeting of
The American Physical Society

Hyperpolarization Of Phosphorus Donors In Silicon ERIC SORTE, WILLIAM BAKER, DANE MCCAMEY, GERNOT LAICHER, CHRISTOPH BOEHME, BRIAN SAAM, University of Utah, SAAM RESERACH GROUP TEAM, BOEHME RESERACH GROUP COLLABORATION — Silicon phosphorus (Si:P) is a model system for investigating spin effects in solid state materials. Recently, members of this group demonstrated a simple method for optically inducing a non-equilibrium state of spin hyperpolarization in phosphorus doped silicon by exploiting a modified Overhauser process. The ability to pump high nuclear spin polarizations in this system could have far reaching technological implications for many fields. For example, hyperpolarized silicon nanoparticles have the potential to improve contrast in magnetic resonance imaging. Additionally, well-characterized quantum spin states have the potential to be useful as quantum qubits. Our current work attempts to extend these recent electron paramagnetic resonance (EPR) and electrically detected magnetic resonance (EDMR) measurements to direct nuclear magnetic resonance measurement of the hyperpolarized phosphorus nuclei. In this talk we will report on our current efforts to measure ^{31}P spin hyper-antipolarization after the sample is briefly exposed to an inert room temperature environment. We demonstrate the procedure of ^{31}P polarization measurement through low field electron spin resonance as a precursor to direct NMR measurement.

Eric Sorte
University of Utah

Date submitted: 09 Sep 2008 Electronic form version 1.4