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Spin-Polarization using Microwave Induced Dynamic Nuclear Polarization

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The UVA-LANL polarized target system consists of a 5T, split-coil, superconducting magnet and uses a 140 GHz microwave source to provide highly polarized protons and deuterons via dynamic nuclear polarization (DNP). The DNP process leverages the large discrepancy between the electron and proton magnetic moments, along with Zeeman splitting in the magnetic field, and spin-spin coupling to pump protons (deuterons) into a highly polarized state. For my presentation, I will give a brief overview of the the UVA-LANL target system with a focus on the microwave system, its role in the DNP process, and the challenges of providing consistently high average polarization in an experimental setting.

Summary

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