

Polarized Target Activity at the University of Virginia

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Most of the activity in the Polarized Target Lab. at the University of Virginia has centered around the preparation of polarized targets for experiments at Fermilab and TUNL(Duke U.), while investigating some special features for experiments at JLab. For experiment E1039 at Fermilab a magnet/⁴He refrigerator combination that had been in storage for 15 years has been modified and restored to operation. A dilution refrigerator, originally from CERN, has been modified for operation at TUNL for experiments with polarized photons incident on a polarized deuteron target. To meet a requirement at JLab on maintaining a high deuteron tensor polarization we are investigating the hole burning technique with deuterated butanol with a view to establishing a high (>30%) tensor polarization in ND₃, which the experiments require. The technique of Adiabatic Fast Passage (AFP) for rapid reversal of the spins has been applied successfully to both NH₃ and ND₃. Other areas of attention have included the freezing and irradiation of NH₃ and ND₃, and of production of CD₃ and CD₄ prior to studying the polarization properties with radiation doping. Software has been developed to optimize the microwave frequency while polarizing a given material. Finally, In collaboration with ORNL, various protein samples have been polarized.