

**Brute Force with a Gentle Touch:  
Vibration Isolation Techniques Used to Increase HD Target Polarization\***

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The performance of brute-force high-field/low-temperature targets is a strong function of the base temperature during polarization. At the Laser-Electron Gamma Source (LEGS) facility, highly polarized Hydrogen Deuteride targets are created in a dilution refrigerator/15 tesla superconducting magnet system, and converted to a frozen spin state. This allows them to retain polarization when placed in a beam at a lower field (0.7 T) and higher temperature (1.3 K). A disparity in base temperatures between the 15 T and 0 T states of the refrigerator suggested eddy currents were primarily responsible for heating of the coldfinger. Vibration-isolation techniques have been developed to reduce the level of eddy currents due to vibration inside the polarizing field. These techniques reduced the magnitude of vibration due to the pumping system by two orders of magnitude and lowered the base coldfinger temperature with field on from ~ 17 mK to ~ 10 mK. The potential gain in polarization is substantial.

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