

NMR Polarization Measurements for Jefferson Lab's Solid Polarized Targets

Monday, 10 September 2018 17:00 (20 minutes)

Solid polarized targets rely on Nuclear Magnetic Resonance techniques to provide measurements of the enhanced polarization provided under Dynamic Nuclear Polarization. Upcoming polarized target experiments in Jefferson Lab's Hall B present challenging conditions which would benefit from improvements to traditional NMR techniques. For decades, JLab has relied upon Liverpool QMeters for NMR measurements, but these are aging and no longer produced. The polarized target group at Bonn has successfully produced replacement QMeters with modern components, and we are following their example, exploring new designs for both an analog and a digital QMeter system. Unlike recent experiments in Halls A and C, the new Hall B target will require external NMR coils, resulting in a weaker signal. In addition, two separate target cells will be utilized, each held at different magnetic fields, allowing them to be polarized in opposing directions, but complicating the NMR measurement. We will discuss the challenges presented by the new Hall B target, lay out plans for improvements to our NMR system, and show results of initial tests of our designs.

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