

Abstract Submitted
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Absolute magnetization calibration of polarized¹³¹Xe for measurement of the¹³¹Xe nuclear pseudomagnetism using neutron spin echo
EARL BABCOCK, Forschungszentrum Juelich GmbH, NOPTREX COLLABORATION — We will investigate T violation in neutron interactions with heavy nuclei at a compound nuclear p-wave resonance by searching for a P-odd and T-odd term in the neutron forward scattering amplitude. The ¹³¹Xe P-odd effects have already been measured, however the previously unmeasured neutron incoherent scattering length of the polarized ¹³¹Xe target, would be a large systematic error because of the resulting pseudomagnetic precession. Measurement of this incoherent neutron scattering length requires absolute polarimetry of ¹³¹Xe. Here neutrons provide us a method for NMR calibration using hyperpolarized ³He as the standard instead of the more typical thermally polarized ¹H sample. Since the ³He polarization dependent neutron absorption cross section is accurately known, measurement of neutron absorption of the polarized ³He gives an absolute NMR calibration. The absolute ¹³¹Xe polarimetry/magnetization used to determine the neutron incoherent scattering length of ¹³¹Xe as measured from its pseudomagnetic precession observed in measurements on the JNSE instrument at the FRMII is discussed [1]. [1] Heinz Maier-Leibnitz Zentrum. (2015). J-NSE: Neutron spin echo spectrometer. Journal of large-scale research facilities, 1, A11. <http://dx.doi.org/10.17815/jlsf-1-34>

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