Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Growth and Transverse Field Muon Spin Rotation of Cobalt Niobate TIMOTHY MUNSIE, Department of Physics and Astronomy, McMaster University, ANNA MILLINGTON, McMaster University, CASEY MARJERRISON, TERESA MEDINA, MURRAY WILSON, EDWIN KERMARREC, Department of Physics and Astronomy, McMaster University, LIAN LIU, Department of Physics, Columbia University, HANNA DABKOWSKA, Brockhouse Institute for Materials Research, YASUTOMO UEMURA, Department of Physics, Columbia University, TRAVIS WILLIAMS, Oak Ridge National Laboratory, GRAEME LUKE[1], Department of Physics and Astronomy, McMaster University — Cobalt niobate, $CoNb_2O_6$, is a material whose spins, when in a transverse field, act like the theoretical ideal 1D-Ising model. This occurs due to the magnetic spins aligning highly anisotropically along the Co^{2+} chains. Because of this unique structure and material performance, the creation and characterization of this material is of both experimental and theoretical interest. The research we will present is a detailing of changes in the characteristics of the growth of the material utilizing the optical floating zone crystal growth method compared to previous growth parameters and an examination of this material in a moderately high transverse field using the technique of muon spin rotation (μSR). We have determined that the quality of crystals created by the floating zone are highly dependent on the growth parameters utilized (original ceramic shape and rotation rate) and dictate the speed at which the growth can be performed. Transverse Field μSR shows a gradual but significant change to the magnetic structure of the material below 5 K.

[1]Second Affiliation: Brockhouse Institute for Materials Research

Timothy Munsie
Department of Physics and Astronomy, McMaster University

Date submitted: 15 Nov 2013 Electronic form version 1.4