

Abstract Submitted
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Design and Characterization of magnetic shielding for the ARIADNE Axion Experiment¹ CHLOE LOHMEYER, Northwestern University, JORDAN DARGERT, MELINDA HARKNESS, University of Nevada-Reno, HARRY FOSBINDER-ELKINS, Princeton University, ANDREW GERACI, Northwestern University, ARIADNE COLLABORATION — The Axion Resonant Interaction Detection Experiment (ARIADNE) will search for the QCD axion using a new technique based on Nuclear Magnetic Resonance [1]. The axion acts as a mediator of novel spin-dependent forces between an unpolarized Tungsten source mass and a sample of laser-polarized ^3He gas. Unlike dark matter “haloscopes,” by sourcing the axion locally in the lab the experiment is independent of cosmological assumptions. The project relies on a stable rotation mechanism for the source mass as well as superconducting magnetic shielding to limit ordinary magnetic noise. Testing of the thin-film superconducting shielding to be used in the experiment and characterization of magnetic noise from the source mass sample will be reported. Progress on testing the stability of the rotary mechanism will also be discussed. [1] A.A. Geraci, H. Fosbinder-Elkins, C. Lohmeyer, J. Dargert, M. Cunningham, M. Harkness, E. Levenson-Falk, S. Mumford, A. Kapitulnik, A. Arvanitaki, I. Lee, E. Smith, E. Wiesman, J. Shortino, J.C. Long, W.M. Snow, C.-Y. Liu, Y. Shin, Y.Semertzidis, Y.-H. Lee (ARIADNE collaboration), arxiv: 1710.05413

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