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Depolarization per bounce of ultracold neutrons in collision with material guides within varying ambient magnetic holding fields[1] DAMIEN DEARMITT, Tennessee Tech University, SANJAY CHAKRABARTY, Cookeville High School, A.T. HOLLEY, Tennessee Tech University — Material depolarization of ultracold neutrons (UCN), neutrons with energies of ∼100neV, is studied to understand and control systematic effects in experiments where polarized UCN interact with materials, such as polarized beta-decay experiments. A number of PPM Depol experiments have been performed by the Los Alamos National Lab UCN team to test the probability of depolarization per bounce of UCN within material test guides. In one of these experiments, different guides were mounted within a varying ambient longitudinal holding field adjustable from 10G to 260G, which allowed the measurement to be repeated with different holding field strengths. Following analysis of the data from this experiment, Monte Carlo simulations were used to investigate systematic effects associated with poorly-constrained properties of the experiment, such as guide specularity and guide loss per bounce, and the UCN energy spectrum. The method of analysis as well as extracted depolarization probabilities per bounce for copper guides of various surface preparations and stainless steel guides, all as a function of holding field strength, will be presented. Comparisons between simulations and data will also be used to discuss systematic effects present in the analysis.

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