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**Inelastic neutron scattering as a potential background in neutrinoless double-beta decay experiments** MELISSA BOSWELL, M. DEVLIN, S.R. ELLIOTT, N. FOTIADES, A. HIME, R.O. NELSON, Los Alamos National Laboratory, V. GUISEPPE, D.-M. MEI, University of South Dakota, D.V. PEREPELITSA, Columbia University — I will present an overview of the MAJORANA experiment, with particular emphasis on our work studying neutron interactions in shielding and detector materials. The MAJORANA experiment is studying neutrinoless double-beta decay in $^{76}$Ge using an array of HPGe detectors. As with similar double beta decay experiments, the success of the experiment relies on reducing the intrinsic radioactive background to unprecedented levels, while adequately shielding the detectors from external sources of radioactivity. An understanding of the potential for neutron excitation of the shielding and detector materials is important for obtaining this level of sensitivity. Using the broad-spectrum neutron beam at LANSCE, we have measured the inelastic neutron scattering from $^{nat}$Cu, $^{enr}$Ge, and $^{nat}$Pb. The goal of this work is focused on measuring the background rates from these materials in regions around the Q-values of many candidate $0\nu\beta\beta$ decay isotopes, as well as providing data for benchmarking Monte Carlo simulations of background events. I will present some preliminary results from our analysis, and discuss the implications of our findings for MAJORANA as well as other neutrinoless double beta decay experiments.

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