

Abstract Submitted  
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**Using a germanium detector array to mimic double-beta decays to excited states** KAREEM KAZKAZ, University of Washington, MAJORANA COLLABORATION — In the wake of neutrino oscillation experiments verifying that neutrinos have mass, there has been a lot of interest in  $^{76}\text{Ge}$  double-beta decay. Double-beta decays can proceed either to the ground state or an excited state of the daughter nucleus. The ratios of the rates of these decay modes can give guidance to determining the underlying structure of nuclear matrix elements. The rates of these decays, however, are very small, so for the purpose of developing analysis toolkits for the Majorana Experiment it helps to create similar signals with rates useable in a non-low-background environment. We present methods of using a segmented natural germanium detector to mimic the signature of double-beta decay to an excited state, along with preliminary analysis of these signals from an above ground detector array.

Kareem Kazkaz  
University of Washington

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