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Multiple-Isotope Comparison for Determining $0\nu\beta\beta$ Mechanisms
VICTOR M. GEHMAN, Los Alamos National Laboratory/University of Washington, STEVEN ELLIOTT, Los Alamos National Laboratory — We present a technique for estimating the number of future $0\nu\beta\beta$ results using several distinct nuclei to optimize the physics reach of upcoming experiments. We use presently available matrix element calculations and simulated sets of predicted $0\nu\beta\beta$ measured rates in multiple isotopes to estimate the required precision and number of experiments to discern the underlying physics governing the mechanism of the process. Our results indicate that 3 (4) experimental results with total uncertainty (statistical, systematic, theoretical) of less than $\sim 20\%$ ($\sim 40\%$) can elucidate the underlying physics. If the theoretical (*i.e.* matrix element) uncertainty contribution is below $\sim 18\%$, then 3-4 experimental results of $\sim 20\%$ precision (statistical and systematic) are required. These uncertainty goals can be taken as guidance for the upcoming theoretical and experimental programs.

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