

Abstract Submitted
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Resonant double-electron capture to excited nuclear states in ^{156}Dy SEAN FINCH, WERNER TORNOW, Duke University — Resonant double-electron capture is a possible experimental alternative to neutrinoless double-beta decay. If the Q-value of the decay is degenerate with an excited state in the daughter nucleus, a resonant enhancement effect can occur and decrease the half-life of the decay. As no phase space is available for neutrinos, this decay is only likely to proceed for Majorana neutrinos. Resonant ECEC may be detected by observing the γ rays emitted as the excited state decays to the ground state. In this experiment, two Clover HPGe detectors surround a DyO_2 target and search for the deexcitation γ rays. The apparatus is housed at the Kimballton Underground Research Facility (KURF) in Virginia. The experiment is hindered by the extremely low natural abundance of ^{156}Dy : 0.052%. We present new limits for the lifetime of this decay.

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