

## Detection prospects for the double-beta decays of Xe-124

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The isotope  $^{124}\text{Xe}$  is exceedingly rare and long-lived. Still, its two-neutrino and neutrinoless double-weak decays offer exciting opportunities for neutrino and nuclear physics. Its double-beta decays with neutrinos would provide constraints for nuclear matrix element calculations in the proton-rich region of the nuclear chart [C. Wittweg, B. Lenardo, A. Fieguth and C. Weinheimer, EPJ C 80 (2020) 1161]. What makes  $^{124}\text{Xe}$  special among double-beta emitters is the theoretical possibility of three different neutrinoless decay modes –either via double-electron capture in a nuclear resonance, or involving the emission of one or two positrons. Together with the observation of neutrinoless double-beta decays in other isotopes,  $^{124}\text{Xe}$  could allow to disentangle the underlying decay mechanism. The contribution will introduce the neutrinoless and two-neutrino decays of  $^{124}\text{Xe}$  and discuss future detection prospects.

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