

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

Thursday, October 26, 2023 9:00 AM (25 minutes)

The isotope ^{124}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}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}Xe could allow to disentangle the underlying decay mechanism. The contribution will introduce the neutrinoless and two-neutrino decays of ^{124}Xe and discuss future detection prospects.

Primary author: WITTWEG, Christian (Physik-Institut, University of Zurich)

Presenter: WITTWEG, Christian (Physik-Institut, University of Zurich)

Session Classification: Physics program of multi-tonne detectors