

## **Sensitive search for double electron capture on 124Xe in XMASS**

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Double electron capture is a rare nuclear decay process in which two orbital electrons are captured simultaneously. Recently, this process has been attracting attention both theoretically and experimentally. Natural xenon contains the double electron capture nuclei  $^{124}\text{Xe}$  with an abundance of 0.095%. Even two-neutrino mode has not been observed for the nuclei so far. The XMASS program is designed for multiple goals in particle and astroparticle physics using liquid xenon. We performed a search for two-neutrino double electron capture in a limited fiducial volume using 132 days of the commissioning data and set the most stringent limit on the half-life as  $4.7 \times 10^{21}$  years. Owing to the detector refurbishment after the commissioning, we could increase the fiducial volume for this analysis by a significant amount, and hence more sensitive search is possible. In this talk, we will present a new result from 2 years of the XMASS data.

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