

# XeSAT2023 - International Workshop on Applications of Noble Gas Xenon to Science and Technology



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## Recent results from KamLAND-Zen, a neutrinoless double-beta decay search experiment using $^{136}\text{Xe}$

*jeudi 8 juin 2023 12:00 (25 minutes)*

Neutrinoless double-beta ( $0\nu 2\beta$ ) decay is physics beyond the Standard Model. If discovered, it would demonstrate that neutrinos are their own antiparticles, a property known as Majorana nature.

KamLAND-Zen is a project to search for the  $0\nu 2\beta$  decay of  $^{136}\text{Xe}$ . It uses an organic liquid scintillator with dissolved xenon gas as both the source and detector. The experimental apparatus is located in the Kamioka Mine in Gifu, Japan, 1,000 m below Mt. Ikenoyama. At this depth, the cosmic ray muon arrival rate is  $\sim 10^{-5}$  that of the surface. The current phase (KamLAND-Zen 800) uses 750 kg of xenon ( $^{136}\text{Xe}$  is 91% enriched) and has been running since January 2019.

This presentation will cover recent results from KamLAND-Zen, including the search for the  $0\nu 2\beta$  decay [1] and the measurement of muon spallation products in the xenon-loaded liquid scintillator [2].

### References

- [1] KamLAND-Zen Collaboration, Phys. Rev. Lett., 130, 051801 (2023).
- [2] KamLAND-Zen Collaboration, (Accepted by Phys. Rev. C), arXiv:2301.09307 (2023).

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