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Latest results from KamLAND-Zen on neutrinoless double beta decay

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Neutrinoless double beta decay (0νββ) is an undetected rare nuclear process with significant implications for understanding the nature of neutrinos, their mass, and physics beyond the Standard Model. The most stringent limit on the 0νββ half-life is established by KamLAND-Zen, an extension of the KamLAND neutrino detector in Japan, utilizing the isotope xenon-136 dissolved in a liquid scintillator. In this talk, I will present the latest results from KamLAND-Zen, submitted this summer. Backgrounds continue to challenge sensitivity to the 0νββ process. The nature of these backgrounds will be discussed, with a particular focus on the long-lived isotopes created through muon spallation on xenon. Finally, I will provide an overview of potential future improvements, including the upcoming KamLAND2 upgrade.

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