

Status of KamLAND-Zen

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Abstract

KamLAND is a liquid-scintillator antineutrino detector located 1000m underground and has achieved an ultra low radioactive background environment suitable for a rare phenomena search. Suspending enriched-Xenon loaded liquid scintillator at the center of KamLAND provides high sensitivity to the neutrino-less double-beta-decay search thanks to its low radioactive environment and high scalability. The experiment named as KamLAND-Zen[1] has quickly launched after the start of the project in 2009 and the normal data acquisition has been started in September 2011 with 320kg of 90% enriched Xe-136, the largest amount of double beta decay nuclei. Results from initial 112 days of measurement[2] are presented. It provides so far the most precise two-neutrino-mode halflife of Xe-136 and the most stringent upper limit of the coupling constant of the ordinary Majoron-emitting double-beta-decay. In the neutrino-less decay search, serious background was found. Origin of the background and prospects for the future improvements are also discussed.

[1]. A.Gando et al. (KamLAND-Zen collaboration): Phys. Rev. C85, 045504 (2012).

[2]. A.Gando et al. (KamLAND-Zen collaboration): arXiv: 1205.6372