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P1.064 Preparation for KamLAND-Zen 800

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on behalf of KamLAND-Zen collaboration

KamLAND is the neutrino detector located in Kamioka, Japan. And it can also detect low energy events by using 1 kton pure liquid scintillator contained in a transparent balloon of 13 m in diameter. KamLAND-Zen 400 is neutrinoless double beta decay experiment by using Xe of about 400 kg in KamLAND. Used Xe is isotopically enriched in the Xe-136.

In this experiment, Xe gas is dissolved in liquid scintillator contained in transparent mini balloon of 3.08 m in diameter. KamLAND-Zen 400 has already finished last October, and we have succeeded to obtain an important value of the neutrinoless double beta decay half-life of Xe-136. Currently, we are preparing scaled up experiment called KamLAND-Zen 800. KamLAND-Zen 800 is planned aiming to cover the inverted hierarchy region of neutrino mass by using Xe of about 800 kg.

For conducting this experiment, we have to extract Xe gas from KamLAND-Zen 400 system to reuse in KamLAND-Zen 800 because enriched Xe-136 is expensive. Xe facility uses nitrogen gas, and Xe gas was contaminated with nitrogen during the Xe extraction process. So extracted gas must be purified by distillation to reuse in KamLAND-Zen 800. And it is necessary to remove mini balloon from KamLAND for replacing to new mini balloon which has capacity to contain large amount of Xe dissolved liquid scintillator.

We report the current situation of above works in this poster. And schedule of preparation for KamLAND-Zen 800 in the near future is also reported.

For example, the method of dissolving Xe gas to liquid scintillator is introduced.