

Geo-neutrino measurement with KamLAND

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Neutrino physics has been developing. The Kamioka Liquid-scintillator Antineutrino Detector (KamLAND) is marked by the ability to detect low-energy anti-neutrino signals at liquid scintillator of 1000 ton (LS) and demonstrated the oscillatory nature by observing anti-neutrino from nuclear reactors.

Geo-neutrino is created by uranium (^{238}U) and thorium (^{232}Th) and potassium (^{40}K) in the Earth's interior and KamLAND can detect directly geo-neutrino from the decay chains of ^{238}U and ^{232}Th and it brings unique and direct information about the Earth's interior and thermal dynamics.

The KamLAND collaboration reported the first measurement result about geo-neutrino in 2005. The geo-neutrino signals at KamLAND were used to estimate our planet's radiogenic heat production and constrain composition models of the bulk silicate Earth (BSE).

Recently, geo-neutrino sensitivity is improved because the neutrinos from nuclear reactor (reactor neutrino) that is main background of this measurement was decreased because of Fukushima nuclear accident in March 2011.

We will report about recent geo-neutrino measurement included low-reactor period with KamLAND.

Keywords: Geo-neutrino, radiogenic heat, Th/U mass ratio