

KamLAND: 地球ニュートリノの観測結果 KamLAND: geo-neutrino result

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Geo-neutrinos are anti-neutrinos (elementary particles) produced in radioactive decays within the Earth. Those anti-neutrinos can be detected in a terrestrial experiment using interaction via weak force, however, due to extremely low reaction probabilities, there were no feasible experiments for a long time. Owing to the development of large-size anti-neutrino detectors, the observation of geo-neutrinos has been finally made, and then composition models of the Earth are constrained from the radiogenic heat estimate. In this talk, a precise measurement of geo-neutrino flux from the Kamioka Liquid-scintillator Anti-Neutrino Detector (KamLAND) in Japan will be presented. In addition, the recent situation of KamLAND anti-neutrino data will be reviewed. Following the Fukushima nuclear accident in 2011, the most of Japanese nuclear reactors has been subjected to a protracted shutdown, resulting in the low reactor anti-neutrino background. It provides a unique opportunity to measure the geo-neutrinos with an improved sensitivity. Based on this low background data, prospects of geo-neutrino sensitivity with KamLAND data in the near future will be shown, and discuss the ability of discriminating between Earth models.

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