

DATE OF TALK: Jan 24 2013

TIME: 3.00 pm

TITLE: Results from the first phase of KamLAND-Zen

ABSTRACT:

The KamLAND-Zen experiment is a new application of the KamLAND detector running in parallel with the ongoing antineutrino program at KamLAND. The experiment searches for neutrinoless double beta decay of ^{136}Xe using a target of Xe-loaded liquid scintillator placed at the center of the KamLAND detector. KamLAND-Zen recently completed its first phase of running, corresponding to the largest exposure of ^{136}Xe to date: 89.5 kg-yr. Based on the first-phase dataset the collaboration obtains a lower limit for the neutrinoless double-beta decay half-life of ^{136}Xe : $T_{1/2}^{0\nu} > 1.9 \times 10^{25}$ yr at 90% C.L. Combining limits from KamLAND-Zen and EXO-200 gives $T_{1/2}^{0\nu} > 3.4 \times 10^{25}$ yr at 90% C.L. Using on a range of available matrix element calculations this corresponds to a Majorana neutrino mass limit of $\langle m_{\beta\beta} \rangle < (120-250)$ meV. I will describe the KamLAND-Zen detector, future plans, and discuss the result and its implications for the neutrinoless double-beta decay detection claim in Ge-76 reported by a part of the Heidelberg-Moscow collaboration.

SPEAKER: Thomas O'Donnell

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