

The 21 Century COE Project  
Exploring New Science by Bridging Particle-Matter Hierarchy

**Short-term Foreign Researchers**

**Research Report**

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Affiliation: University of Tennessee

Host Researcher in Tohoku University: Atsuto Suzuki

Your Stay Period in Japan: From Dec 1 2003 to Dec 11 2003

Title of Research in Japan: KamLAND Neutrino Experiment

First, I would like to thank Professor Atsuto Suzuki for offering me opportunity to continue research in neutrino physics, and particularly working in the KamLAND experiment.

KamLAND is a large 1000-ton liquid scintillator detector located in the Kamioka mine. Detector is optimized to study low-energy anti-neutrinos from natural and artificial sources.

During my visit to Japan in December of 2003 I was able to participate in the data taking at the detector site, together with preparing hardware and testing software for the upcoming upgrade of the detector high voltage system. My activities included replacement of the PROMs with new firmware in the already delivered to the detector site new high voltage crates, move part of the outer detector channels to the new system, and test performance of the software that should control new high voltage system. Successful completion of whose task, let us to test new software in the conditions of the real experimental environment and speed up process of the following high voltage replacement for the whole detector.

That trip let me as well to continue discussion with my Japanese colleagues about detector performance, data analysis, and future plans.

My personal scientific interest in the aspects of detector performance is concentrated on unexpectedly high single rates in the detector photo-multipliers, and details of liquid scintillator response at very low energy. Based of the discussion with Japanese colleagues we presently constructing at the University of Tennessee High Resolution Compton Spectrometer optimized to study response of the KamLAND liquid scintillator to the small energy depositions.

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