

Nuclear Seminar, Friday, February 19th, at 4:00 PM

"The Tokai to Kamioka Long Baseline Neutrino Oscillation Experiment"

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Abstract

Physicists from the Japanese-led multi-national T2K neutrino collaboration announced last November that they detected the first neutrino events generated by their newly built neutrino beam at the J-PARC accelerator laboratory in Tokai, Japan. This detection therefore marks the beginning of the operational phase of the new "off-axis" T2K experiment, a 474 physicist, 13 nation collaboration to measure new properties of the ghostly neutrino.

Measurements over the last few decades, notably by the Super Kamiokande experiments in western Japan or the SNO collaboration in Canada, have shown that neutrinos possess a strange property. Neutrino oscillations, which require neutrinos to have mass and therefore were not allowed in our previous theoretical understanding of particle physics, probe new physical laws and are thus of great interest in the study of the fundamental constituents of matter. They could be in particular related to the mystery of why there is more matter than anti-matter in the universe, and thus are the focus of intense study worldwide.