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Séminaire SPP

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CEA-Saclay Bat 141, salle André Berthelot

Recent Results from the KamLAND-Zen Experiment

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The KamLAND experiment is a large underground neutrino detector located in Japan that has been mainly used to detect anti-neutrinos from nuclear reactors to study neutrino properties. Results from KamLAND were key to establish that neutrinos change from one lepton flavor to another and thus have mass. We do not yet know their absolute masses, only that the scale is more than six orders of magnitude smaller than that of the next-lightest lepton, the electron. Since neutrinos have no charge, they could be Majorana, i.e., their own antiparticles. A Majorana neutrino could elegantly explain why neutrinos are so light. The only viable technique to investigate whether neutrinos are Majorana is through the observation of neutrinoless double beta decay. The KamLAND experiment was recently modified to search for neutrinoless double beta decay of Xe-136. This new phase of the experiment, called KamLAND-Zen, aims at significantly improving the present bounds on neutrinoless double beta decay by using 400 kg of Xe-136 in an ultra-low background environment. The experiment recently released its first results, consisting of a measurement of the two-neutrino double-beta decay half-life of Xe-136, and a lower limit on the isotope neutrinoless double beta decay decay half-life. I will quickly review the main results from KamLAND and introduce the subject of neutrinoless double beta decay. Then I will describe the KamLAND-Zen detector and report on the experiment first results.

Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Emilie Chancrin, tél. 01 69 08 23 50, e-mail : `emilie.chancrin@cea.fr`. (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).