



COLLOQUE DE PHYSIQUE

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École de Physique, Auditoire Stueckelberg

«The Mirror Crack'd?: matter-antimatter symmetry violation in neutrino oscillations by the T2K experiment»

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The T2K Collaboration results published in Nature indicate the strongest constraint yet on the parameter that governs the breaking of the symmetry between matter and antimatter using neutrino oscillations. T2K has studied how beams of muon neutrinos and antineutrinos transition into electron neutrinos and electron antineutrinos, respectively. The parameter governing the matter/antimatter symmetry breaking in neutrino oscillation, called δ_{cp} phase, can take values from -180° to 180° . For the first time, T2K has disfavored almost half of the possible values at the 99.7% confidence level. This outstanding result is starting to reveal a basic property of neutrinos that has not been measured until now. This is an important step on the way to knowing whether or not neutrinos and antineutrinos behave differently. But, what are neutrinos? what are neutrino oscillations? how was the experiment performed? I will try to answer these questions and give a small inside about the fascinating research with neutrinos.