Irfu
Institut de recherche
sur les lois fondamentales
de l'Univers

Séminaire DPhP

Lundi 22/01/2018, 11h00

CEA-Saclay Bât. 141, salle André Berthelot

KLEVER : An experiment to measure $\mathrm{BR}(K_L \to \pi^0\nu\bar{\nu})$ at the CERN SPS

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Precise measurements of the branching ratios (BRs) for the flavor-changing neutral current decays $K \to \pi\nu\bar{\nu}$ can provide unique constraints on CKM unitarity and, potentially, evidence for new physics. It is important to measure both decay modes, $K^+ \to \pi^+\nu\bar{\nu}$ and $K_L \to \pi^0\nu\bar{\nu}$, since different new physics models affect the rates for each channel differently. The NA62 experiment at the CERN SPS is currently collecting data and will measure $\mathrm{BR}(K^+ \to \pi^+\nu\bar{\nu})$ to within 10%. The KOTO experiment at J-PARC plans to measure $\mathrm{BR}(K_L \to \pi^0\nu\bar{\nu})$ with similar precision using a low-energy neutral beam, but no official proposal has yet been made. As a natural continuation of the NA62 physics program, we are designing the KLEVER experiment to measure $\mathrm{BR}(K_L \to \pi^0\nu\bar{\nu})$ to ∼20% using a high-energy neutral beam at the CERN SPS starting in LHC Run 4. Our approach is complementary to that of KOTO. Because of the boost from the high-energy beam, less demanding performance is required from the large-angle photon veto detectors. On the other hand, the layout poses particular challenges for the design of the small-angle vetoes, which must reject photons from K_L decays escaping through the beam pipe amidst an intense background from soft photons and neutrons in the beam. We present findings from our feasibility studies, with an emphasis on the design challenges faced and the potential sensitivity for the measurement of $\mathrm{BR}(K_L \to \pi^0\nu\bar{\nu})$.

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 Martine Oger, tél. 01 69 08 23 50, e-mail : `martine.oger@cea.fr`. (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).