Société Française de Physique

ID de Contribution: **40** Type: **Non spécifié**

Search for exotic tensor couplings in the nuclear beta decay of 6He: b-STILED project

mardi 19 octobre 2021 14:30 (23 minutes)

The Standard Model of particle physics is the set of quantum theories that governs the behavior of elementary particles and fundamental forces. It describes the strong, weak, and electromagnetic interactions. However, despite the huge successes of the Standard Model, there are many strong observational and theoretical reasons to believe that it is not the ultimate model to describe the nature. Actually, it can be considered as a low energy limit of a wider theory. Which motivates physicists to search for a new theoretical framework that involve new physics behind the Standard Model. This search is being held on three frontiers: the cosmological frontier, the high-energy frontier and the high precision frontier.
This work belongs to that last category, which consists on executing high precision measurements at very low energy. The aim of these measurements is to detect any small deviations from the Standard Model predictions, which if existed, will be a proof of the presence of new physics.
The b-STILED (b: Search for Tensor Interactions in nucLear bEta Decay) project aims to extract the Fierz interference term in pure Gamow-Teller transition (bGT) of 6He with a total uncertainty of $\Delta b_{GT}=10^{-3}$ at 1σ [1].

References:
[1] X. Fléchard, E. Liénard, X. Mougeot, O. Naviliat-Cuncic, G. Quemener, J.C. Thomas. Improved Search for Tensor Interactions in Nuclear Beta Decay. Proposal to the AAPG2020, CE31.

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Classification de Session: Beyond Standard Model

Classification de thématique: Beyond Standard Model