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b-STILED: Search for Tensor Interactions in nucLear bEta Decay

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Precision measurements in beta decay play an essential role in the search for new physics beyond the standard model (SM), by probing "exotic"phenomena such as scalar and tensor interactions. The existence of such interactions induces deviations on certain observables away from their SM predictions. The study of the full beta energy spectrum offers a sensitive property to probe these interactions.

The goal of this work is to perform the most precise measurement of the β-energy spectrum in ^{6}He decay, in order to extract the Fierz interference term b with a precision in the order of $4 \cdot 10^{-3}$. This term depends linearly on exotic coupling constants, allowing to search for or to constrain the presence of tensor interactions in nuclear beta decay.

The main instrumental effect observed in previous measurements of the beta energy spectrum resides in the energy loss due to electrons backscattering outside the detector volume. A new technique is used to overcome this effect. It consists of using a very low energy beam of $^{6}He^{+}$ ions (25 keV) deposited between two scintillation detectors forming a 4π calorimeter. The use of this technique ensures the deposition of the entire energy of the detected beta particles. An experiment with this setup was performed at the Grand Accélérateur National d'Ions Lourds (GANIL) in 2021.

This contribution will introduce the general context of the project, describe the experimental setup, report the status of the data analysis and present the preliminary results

Auteur principal: M. KANAFANI, Mohamad

Co-auteurs: Dr FLECHARD, Xavier (LPC Caen); LEBLOND, Sylvain (LNE/LNHB); LIÉNARD, Etienne (LPC Caen); MOUGEOT, Xavier (CEA / LIST / LNHB); Prof. NAVILIAT-CUNCIC, Oscar (Laboratoire de Physique Corpusculaire de Caen); QUEMENER, Gilles (CNRS/IN2P3 - LPC Caen); THOMAS, Jean-Charles (Grand Accélérateur National d'Ions Lourds)

Orateur: M. KANAFANI, Mohamad

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