Contribution ID : **9** Type : **not specified**

Superallowed Fermi decays: precise T1/2 and branching ratios measurements

Monday, 21 February 2011 16:20 (40)

Through the studies of Fermi transitions between 0+ analog states with T = 1 (superallowed transitions), nuclear physics provides a valuable test of the Standard Model of particle physics. These transitions depend only on the vector part of the weak interaction, and according to the conserved vector current (CVC) hypothesis, their strength Ft is a constant. Then this value is used to determine the Vud term in the CKM quark mixing matrix, that should be unitary.
The constant Ft strength determination requires very high precision measurement of the decay energy QEC (related to masses) and of the partial half-life of the transition (parent nucleus half-life T1/2 and branching ratio BR), but it also requires some theoretical corrections of the experimental values. Then, beside the search for “new physics” if deviations from the standard model are observed, such studies are a very sensitive test of the theoretical descriptions used to calculate those corrections.
In this presentation, I will give a general view of the landscape of nuclei of interest for those studies, with a focus on recent experimental results concerning the T1/2 and BR measurements that we performed at Jyväskylä university and ISOLDE at CERN : 26Si, 30S, 42Ti, 38Ca and 62Ga. These results have to be compared with other measurements that have been performed worldwide, showing the strong activity in this field. Finally, expectations and limitations for further studies will be addressed.

Summary

Primary author(s) : GIOVINAZZO, Jérôme (CENBG / IN2P3 / CNRS)

Presenter(s) : GIOVINAZZO, Jérôme (CENBG / IN2P3 / CNRS)

Session Classification : Monday February 21st, 2011. 15:00 - 17:00