

Searching for new physics in beta-neutrino correlations

N. Severijns

Institute for Nuclear and Radiation Physics, Katholieke Universiteit Leuven, B-3001, Leuven, Belgium

Contact email: nathal.severijns@fys.kuleuven.be

Measurements of the beta-neutrino correlation in nuclear beta decays have historically established the predominant V-A structure of the weak interaction [1]. Still today this type of experiments continue to provide important information on the structure of the weak interaction. In state-of-the-art precision measurements using a variety of techniques, many of which are based on ion and atom traps, a large number of experiments is currently ongoing or being set up at radioactive ion beam facilities worldwide [2]. Comparing experimental results with the standard model expected value for the beta transition investigated, allows probing charged current (scalar or tensor) interactions not included in the standard model.

In this talk an update and overview of this field will be presented. With the precision of these measurements reaching the per mille level small standard model effects now have to be included as well. The most important of these are the so-called recoil effects. These are induced by the strong interaction because the decaying quark is not a free quark but is bound inside a nucleon. Prospects and future of this type of low-energy weak interaction studies in the era of the Large Hadron Collider will be discussed briefly as well.

[1] J.S. Allen et al., *Phy. Rev.* 116 (1959) 134;

[2] N. Severijns and O. Naviliat-Cuncic, *Physica Scripta T152*, 014018 (2013).