



Contribution ID: 25

Type: Oral

Search for beta-delayed proton emission from ^{11}Be

Even though β -delayed proton emission is a phenomenon which typically occurs for neutron-deficient nuclei, the energy window for this process is also open in a few light, neutron-rich isotopes. Particularly interesting in this respect is ^{11}Be , which is also a one-neutron halo nucleus [1]. Several channels for β -delayed particle emission from this isotope are open, including the proton branch, with $Q_p \sim 280$ keV. The branching ratio (BR) for the latter process is important for the determination of the Gamow-Teller strength at high excitation energy and for testing models that predict a direct relation between βp emission and the halo structure. Indirect observations based on accelerator mass spectrometry (AMS) resulted in conflicting values for this branching ratio [2, 3]. The direct measurement of the βp BR and energy spectrum was reported recently in Ref. [4] but the results disagree with the most recent finding of Ref. [3].

We carried out an experiment to search for β -delayed protons from ^{11}Be , using the Warsaw Optical Time Projection Chamber. The measurement was performed at HIE-ISOLDE facility in CERN, where a large amount of ^{11}Be ions was implanted into the OTPC detector. The final results of this experiment will be presented and discussed [5].

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- [2] K. Riisager et al., Phys. Lett. B 732, 305 (2014).
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- [4] A. Ayyad et al., Phys. Rev. Lett. 13, 082501 (2019)
- [5] N. Sokolowska et al. Phys. Rev. C 110, 034328 (2024).

Notes

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