Contribution ID: **6** Type: **Invited**

Shape coexistence in neutron-deficient mercury isotopes studied through β decay

Thursday 26 November 2020 14:20 (20 minutes)

The neutron-deficient mercury isotopes ($Z = 80$) around $N = 104$ represent one of the most prominent examples of shape coexistence [1]. This region has been extensively studied using various experimental techniques, such as laser spectroscopy [2,3], decay spectroscopy studies [4-6] and Coulomb excitation [7,8]. These studies point to the coexistence of two classes of states with strong mixing between the low-lying members in ^{182,184}Hg [1,6-8]. In particular, the presence of $E0$ components in the $I^{\pi} \rightarrow I^{\pi}$ ($I \neq 0$) transitions has been interpreted as a fingerprint for mixing [1].

In order to study the properties of the low-lying states in mercury isotopes around $N = 104$, the β decay of ^{182,184,186}Tl to excited states in ^{182,184,186}Hg has been measured at the ISOLDE Decay Station (IDS) at ISOLDE. The conversion electrons have been measured for the first time at IDS by employing the newly developed SPEDE spectrometer [9], which provided an energy resolution of 7 keV for an electron energy around 250 keV.

Compared to the previous study [6], an order of magnitude higher statistics was collected, which resulted in an expansion of the decay schemes. In particular, six transitions with strong $E0$ components and the third 0^+ state have been identified in ^{184}Hg. Improved statistics gives more precise values for branching ratios and conversion coefficients, which are relevant for the Coulomb excitation experiments [10]. The experimental results will be discussed in the framework of shape coexistence in the mid-shell region.

[1] K. Heyde, J.L. Wood, Rev. Mod. Phys 83, 1467 (2011).
[2] B.A. Marsh et al., Nature Physics 14, 1163 (2018).
[3] S. Sels et al., Phys. Rev. C 99, 044306 (2019).
[4] J. Wauters et al., Phys. Rev. C 50, 2768 (1994).
[5] M. Stryjczyk et al., Phys. Rev. C 102, 024322 (2020).
[6] E. Rapisarda et al., J. Phys. G 44, 074001 (2017).
[7] N. Bree et al., Phys. Rev. Lett 112, 162701 (2014).
[8] K. Wrzosek-Lipska et al., Eur. Phys. J. A 55, 130 (2019).
[9] P. Papadakis et al., Eur. Phys. J. A 54, 42 (2018).
[10] K. Wrzosek-Lipska et al., Proposal IS563 "Coulomb excitation of 182-184Hg: Shape coexistence in the neutron-deficient lead region"at ISOLDE

Authors: STRYJCZYK, Marek (KU Leuven (BE)); IS641/IDS COLLABORATION

Presenter: STRYJCZYK, Marek (KU Leuven (BE))

Session Classification: Beta-decay Session