Contribution ID: **178** Type: **Oral Presentation**

Study of shape coexistence in Sn isotopes around A=110

The shape coexistence phenomenon was investigated in the Sn isotopes region around A=110, by means of γ-ray spectroscopy and lifetime measurements of low-spin states. Recent observations of prolate axially deformed 0^+ states in ^{64,66}Ni isotopes, with a strongly hindered decay to the first 2^+ excited state of spherical nature (shape-isomer-like excitations), were reported [1,2,3]. Similar excitations were suggested in the stable Sn isotopes, across the $Z = 50$ shell gap, due to analogies in the orbital configuration. Such hypothesis is corroborated by Monte Carlo Shell Model (MCSM) calculations, performed with the interaction of Ref. [4], whose potential energy surfaces of $^{110-118}$Sn exhibit a well-separated prolate secondary minimum, as in the Ni case.\\
Experimentally, several excited 0^+ states have been observed in even-even $^{110-120}$Sn, mainly via particle spectroscopy (e.g. [5,6]), however limited information on their lifetimes is available. To address this issue, a series of complementary experiments was carried out by our collaboration between LNL and IFIN-HH, employing the ROSPHERE-SORCERER and the AGATA-PRISMA setup, respectively. In particular, even-even ^{112,114,116,118,120}Sn isotopes were studied via low-energy multi-nucleon transfer reactions and several lifetimes of excited 0_2^+, 0_3^+ and 0_4^+ states were measured for the first time with the RDDS and the DSAM methods. Preliminary results will be compared with MCSM calculations, giving an insight into the microscopic mechanism leading to the onset of deformation in this region.

References

[1] N. Marginean et al., Phys. Rev. Lett. 125, (2020) 102502.
[2] S. Leoni et al., Phys. Rev. Lett. 118, (2017) 162502.
[3] S. Leoni et al., Prog. Part. Nucl. Phys. 139, (2024) 104119.
[4] T. Togashi et al., Phys. Rev. Lett. 121, (2018) 062501.
[5] P. Guazzoni et al., Phys. Rev. C 85,(2012) 054609.
[6] A. Backlin et al., Nuc. Phys. A351, (1981) 490.

Authors: Prof. FORNAL, Bogdan (Institute of Nuclear Physics, Polish Academy of Sciences, IFJ-PAN, Krakow, Poland); CORBARI, Giacomo (Università degli Studi di Milano and INFN Milano); Prof. MĂRGINEAN, Nicolae (Horia Hulubei National Institute for Physics and Nuclear Engineering, Măgurele, Romania); Prof. LEONI, Silvia (Università degli Studi di Milano and INFN Milano); Dr BOTTONI, Simone (Università degli Studi di Milano and INFN Milano)

Presenter: CORBARI, Giacomo (Università degli Studi di Milano and INFN Milano)

Session Classification: Parallel session

Track Classification: Nuclear Structure, Spectroscopy and Dynamics