Contribution ID : **142** Type : **Invited Oral**

Study of the beyond-neutron-threshold structure in the N=50 region from beta-delayed neutron and gamma spectroscopy at ALTO

Monday, 17 July 2023 13:45 (25)

There has been recently growing evidence, from β-delayed gamma and neutron spectroscopy measurements on neutron-rich nuclei, seemingly pointing towards the existence of specific regions of the daughter nucleus excitation spectrum that clearly concentrate larger fractions of the β-strength. These regions significantly overlap with regions where highly collective excitation modes (typically E1) of the nucleus are expected to lie, raising again the question of the nature of unbound states populated by high-Qβ radioactivity. This interplay may result in unusually strong γ emission from levels located well above the neutron threshold. Should this strong γ/n competition turn out to be more general than expected e.g. throughout the r-process mass region (and particularly close to magic numbers) part of commonly admitted nucleosynthesis scenarios would be affected.
In this context, we have launched an experimental program at ALTO to investigate the structure of the neutron-threshold region of exotic nuclei. This endeavor was initiated by the unexpected observation of "ultra"-high-energy γ-rays (8-9 MeV) in the β-delayed emission products of 83Ga (Z=31 ; N=52 ; T1/2=312 ms ; Qβ=11.7 MeV) sources collected at the BEDO decay-station [1]. Further detailed investigation of the β-delayed γ spectroscopy following the decays of 80,82,83Ga sources collected at BEDO has recently been performed. The data set was considerably enriched with respect to the study of [1] thanks to the use of an improved hybrid γ-ray spectrometer composed of PARIS clusters and HPGe detectors [2]. Part of these new results will be presented and discussed, as well as further perspectives along these research lines at ALTO.

[1] A. Gottardo, et al. PLB 772, 359 (2017)

L. Al Ayoubi, PhD thesis, University of Jyvaskyla and University Paris Saclay (April 26th 2023)

Primary author(s) : Dr. TOCABENS, Guillen (CEA Saclay)

Co-author(s) : Dr. VERNEY, David (Université Paris Saclay, IJCLab)

Presenter(s) : Dr. TOCABENS, Guillen (CEA Saclay)

Session Classification : Session 3

Track Classification : Experimental Nuclear Structure