Contribution ID: **19** Type: **Oral Contribution**

Fission hindrances in transfermium nuclei

Thursday 27 October 2022 15:25 (15 minutes)

Very heavy nuclei owe their stability against spontaneous fission to quantum shell effects, which depend on the local density of single-particle states. High densities give rise to positive shell correction, meaning less stability and low densities translate into enhanced stability. Alternating stabilising effects may coexist on the pathway to scission as a function of deformation. In ^{254}No, the net result is a potential-energy barrier against fission of the order of 6.6 MeV while the liquid drop value is ∼0.9 MeV [1]. The height but also the width and the structure of the barrier in multi-dimensional deformation space determine the fission half-lives. Other effects come into play, such as the conservation of quantum numbers (specialization energy) and superfluidity or stiffness of the system in the fission process. This is why odd nuclei have longer fission partial half-lives with respect to their even neighbours and also why multi-quasi-particle states such as high-K states are thought to be more stable against fission than the ground state. On behalf of the GABRIELA collaboration, I will report here on two different fission studies carried out with the GABRIELA [2,3] detector array at the focal plane of the recoil separator SHELS [4]. The first study concerns the fission properties of ^{253}Rf, the most neutron deficient Rf isotope known to date, where two low-lying fissioning states have been recently observed [5,6]. The second study focusses on new measurements of the fission hindrance of known high-K isomers in even No isotopes.

[1] G. Henning et al., Phys. Rev. Lett. 113, 262505 (2014)
[2] K. Hauschild et al., Nucl. Instr. Meth. A 560 (2006) 388-394
[3] R. Chakma et al., Eur. Phys. J. A 56 (2020) 245
[4] A. Popeko et al., Nucl. Instr. Meth. B 376 (2016) 140
[5] J. Khuyagbaatar et al., Phys. Rev. C 104, L031303 (2021)
[6] A. Lopez-Martens et al., Phys. Rev. C 105 (2022) L021306

Primary author: LOPEZ-MARTENS, Araceli (IJCLab)

Presenter: LOPEZ-MARTENS, Araceli (IJCLab)

Session Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics

Track Classification: P2 Nuclear Structure, Spectroscopy, and Dynamics