

Spectroscopy of odd-mass nuclei in the region of ^{254}No

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A challenging field and a new frontier in experimental nuclear physics today is the search for the so-called "island of stability" in the heaviest element region. The most recent discovery is the element 118 at Dubna, Russia, which still has to be confirmed. However, the somewhat lighter, well deformed nuclei in the nobelium region, which are studied in Jyväskylä, have cross-sections large enough to reveal the underlying single particle structure inaccessible for the heaviest nuclei. This is a good testing ground for the theoretical nuclear models applied for those nuclei.

The first in-beam gamma-ray experiment for ^{254}No at JYFL was carried out in 1998. This was the start for a large number of in-beam and focal-plane experiments for studies in this heavy element region. The even-even nuclei ($^{252,254}\text{No}$, ^{250}Fm) have been focused on in the first experiments[1]. The ground-state bands have been studied, allowing extraction of parameters such as the moments of inertia, and proving the deformed nature of these nuclei. Later, measurements have been carried out for odd-mass nuclei such as ^{253}No , ^{251}Md [2] and ^{255}Lr , the latter with $Z=103$ being the heaviest element so far studied in-beam.

An overview of the experimental techniques will be given and recent results of odd-mass nuclei in the vicinity of ^{254}No will be presented.

[1] R.-D. Herzberg et al., Nature 442, 896-899 (24 August 2006)

[2] A. Chatillon et al., Eur. Phys. J. A 30, 397 (2006)