Collectivity and single-particle structures in ^{166,168}Os

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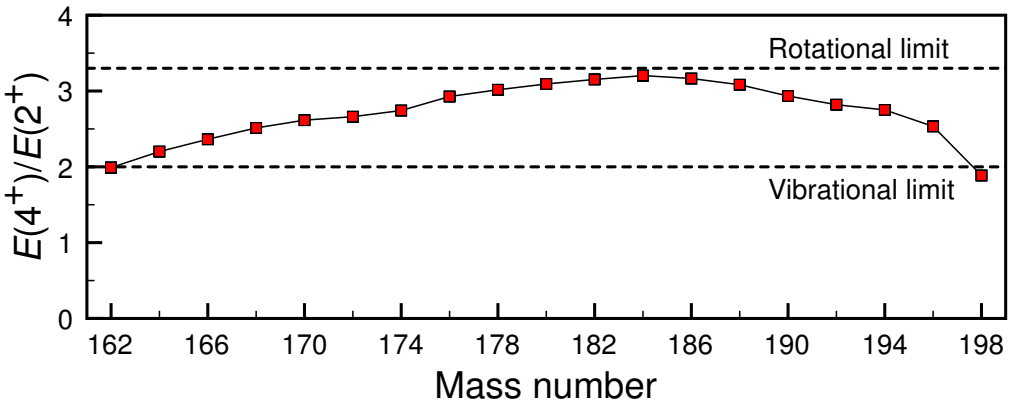
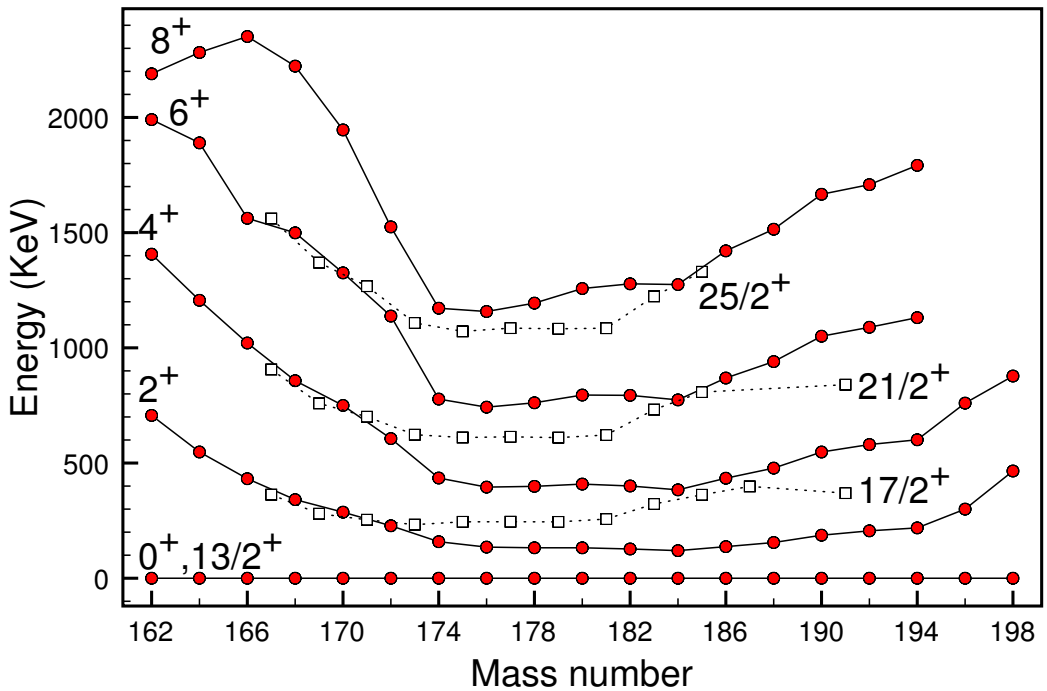
Introduction

Neutron deficient Osmium nuclei exhibit a variety of different shapes. At neutron mid-shell the nuclei are prolate deformed and closer to the closed neutron shell they become spherical.





Introduction

^{166,168}Os isotopes have been investigated:

- expanded level schemes and new structures
- lifetime measurements of the first excited states

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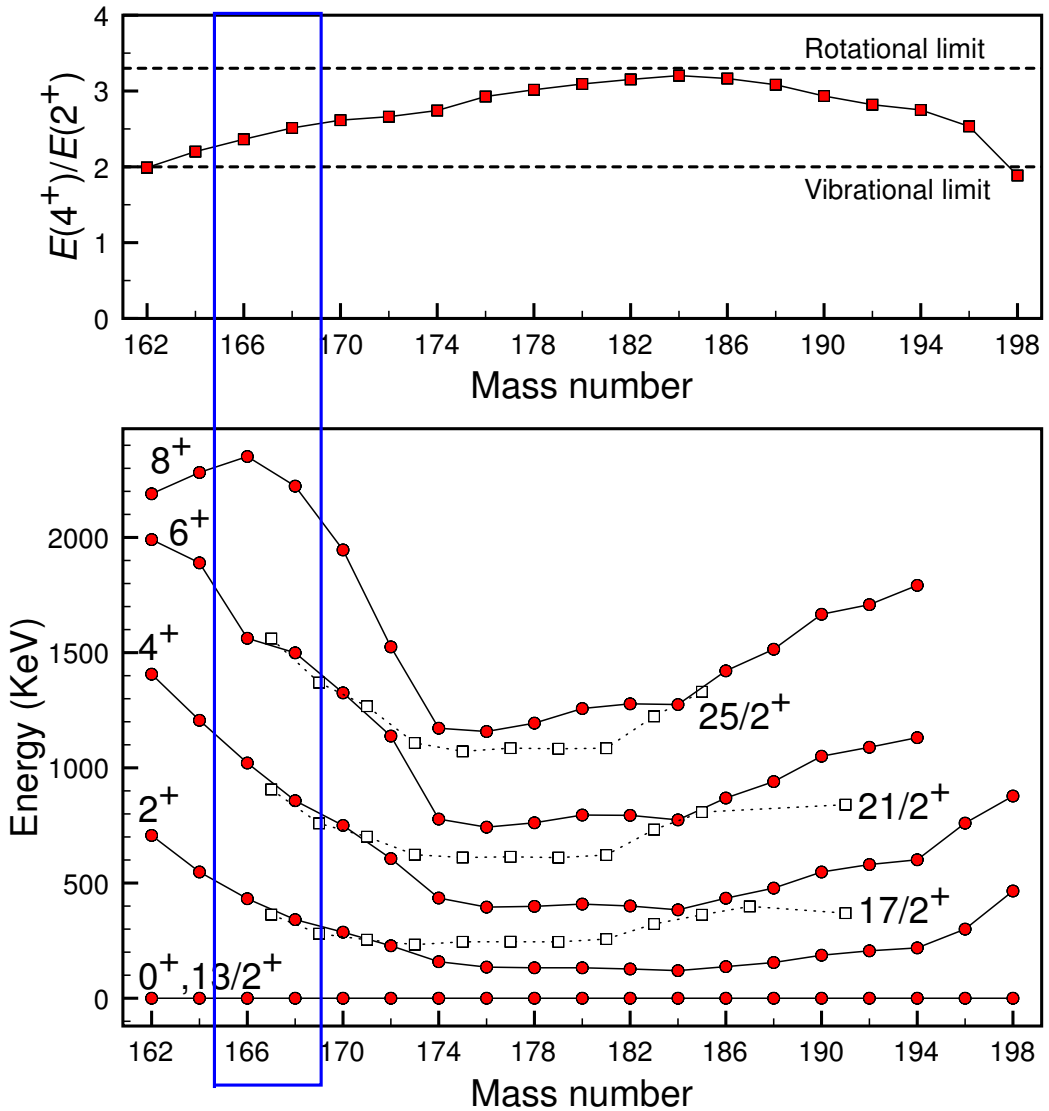


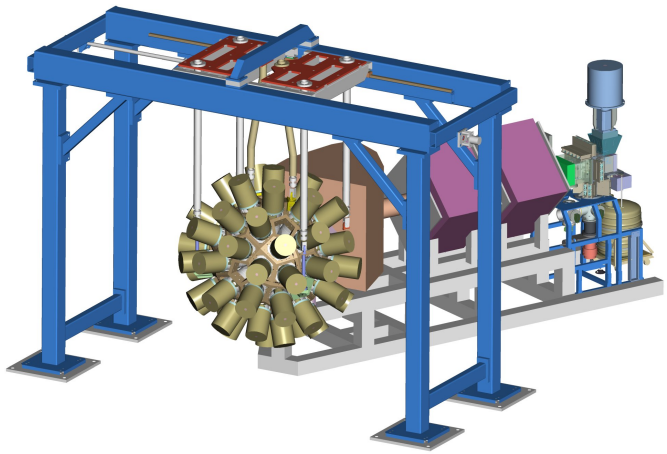
Experimental methods

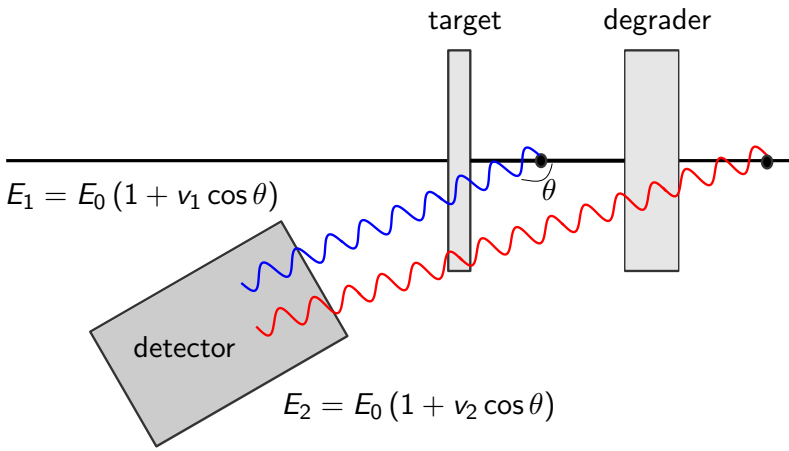
The experiments were carried out at JYFL, experimental setup consisting of

- Jurogam II (I) HPGe array for detecting prompt γ rays
- RITU gas-filled separator
- Great spectrometer for decay spectroscopy

This enabled using the α decay of ^{166}Os to correlate with the prompt γ rays at the target position

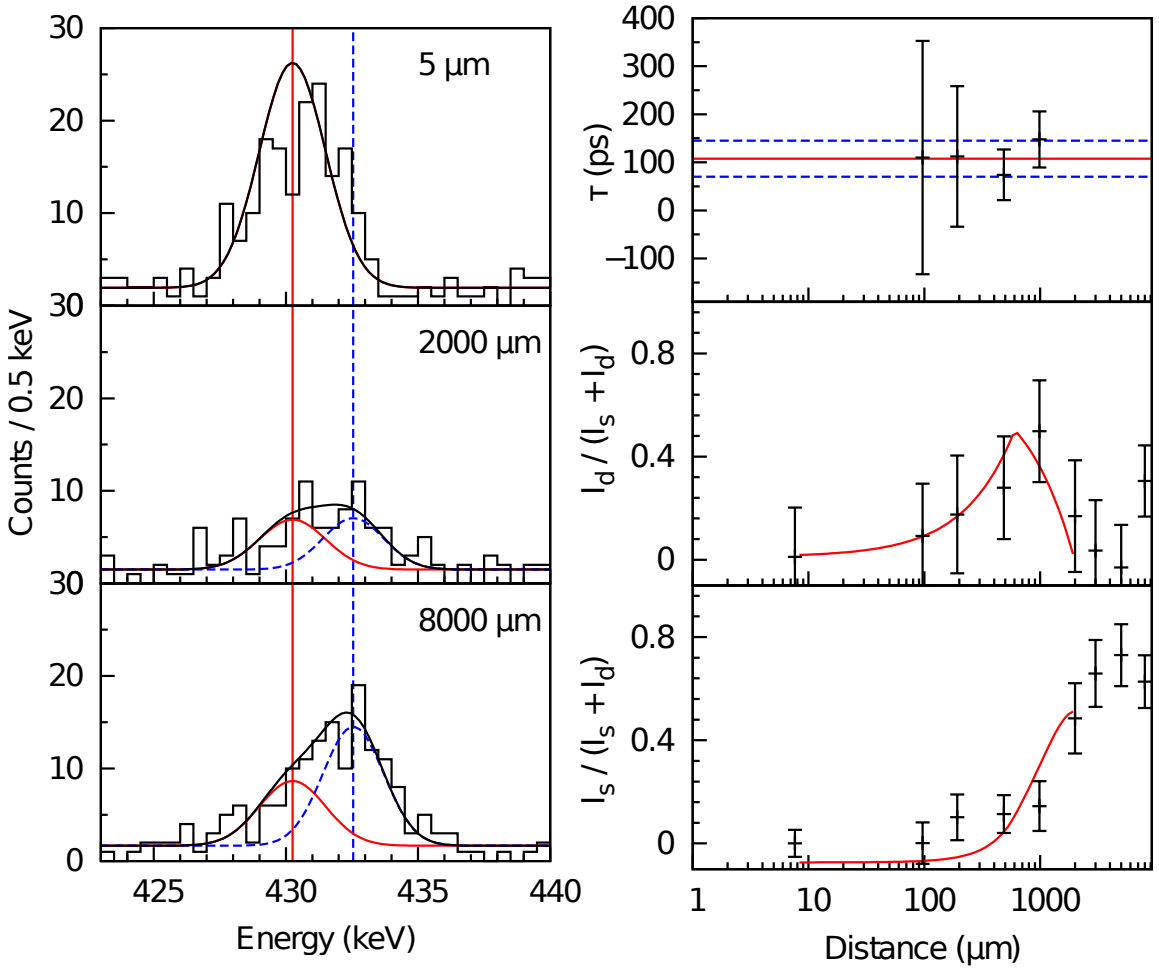
- The DPUNS differential (Cologne) plunger to measure and adjust the target-to-degrader distance





An example of lifetime analysis: ^{166}Os 2^+ state

- 9 target-to-degrader distances, $8 - 8000\,\mu\text{m}$
- analyze α-tagged $\gamma\gamma$ coincidences
- lifetimes with DDCM:
  $\tau(x) = \frac{1}{v} \frac{I_d(x) - I_d^{\text{feed}}(x)}{v \frac{\text{d}}{\text{d}x} I_s(x)}$
- resulting $\tau = 130(30)\,\text{ps}$

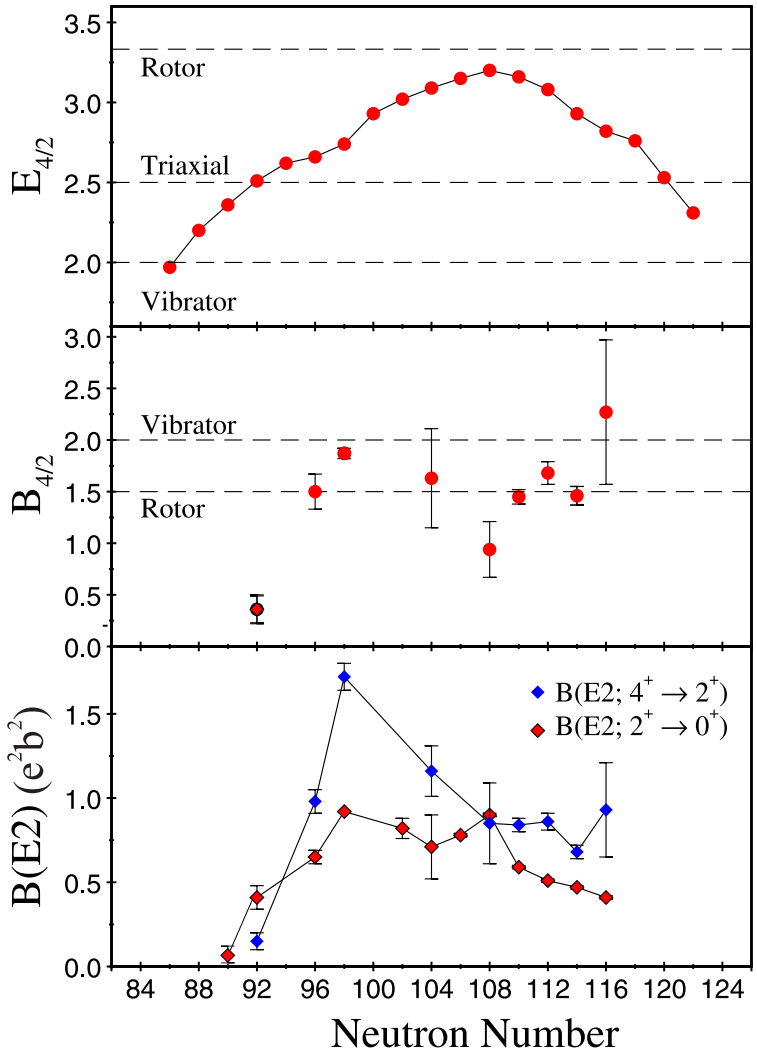


Some results

The lifetimes of the first 2^+ and 4^+ states:

Nucleus	Level	τ (ps)	$B(E2)\,(e^2b^2)$	$B(E2)\,(W.u.)$
^{166}Os	2^+	130(30)	0.042(10)	7(2)
^{168}Os	2^+	41(7)	0.41(7)	74(13)
^{168}Os	4^+	15(5)	0.15(5)	27(9)

Conclusions

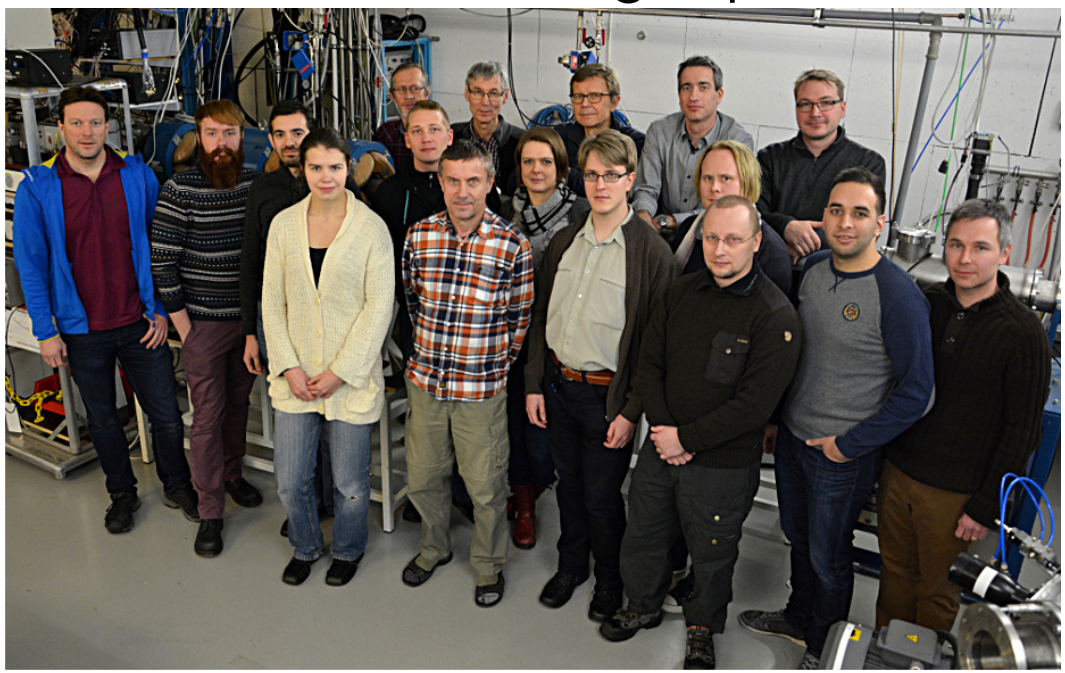


Complete results are presented in the poster, here a quick look into the $B(E2)$ values of the first transitions.

- The $B(E2 : 4^+ \rightarrow 2^+)$ is really small for ^{168}Os resulting with a $B_{4/2}$=0.37(14)
- $B(E2 : 2^+ \rightarrow 0^+)$ decreases to lower than expected in ^{166}Os

Thank you

To the local group:



And plenty of other colaborators, whose names can be found on the poster.

And thank you for your attention!