

Analysis of neutron-induced fission cross-sections of Pb isotopes near the closed neutron shell

Wednesday, 22 September 2021 16:45 (25 minutes)

We analysed the fission cross-section of Pb-204, Pb-206, Pb-207 and Pb-208 nuclei at neutron energies varied from 30 MeV up to 180 MeV. Experimental data were obtained from [1]. The main parameters influence the calculated fission cross-sections are the height of the fission barrier and the level density at the top of the barrier. The height of the barriers are determined by the shell corrections which are different for different near magic Pb-208 nuclei. We determine the barrier heights fitting the experimental cross-sections with TALYS code calculations. An example of experimental fission cross-section for Pb-207 nucleus is shown on Fig.1. The solid line on the figure is the result of the TALYS calculation. Difference of the obtained barriers with liquid drop model barrier heights or Sierk model heights [2] give the size of the shell correction of the fissioning nuclear at the deformation on the top of the barrier.

The author is grateful to A.N. Smirnov for stimulating interest in the problem.

1. I.V. Ryzhov *et al.*, NIM A **562**, 439 (2006)
2. A.J. Sierk, Phys. Rev. C **33**, 2039 (1986)

Primary author: ONEGIN, Mikhail (Petersburg Nuclear Physics Institute)

Presenter: ONEGIN, Mikhail (Petersburg Nuclear Physics Institute)

Session Classification: Section 2. Experimental and theoretical studies of nuclear reactions

Track Classification: Section 2. Experimental and theoretical studies of nuclear reactions.