

**Ukrainian Nuclear Data Center: Progress Report for period 2022-2023**  
**Summary of Nuclear Data Activity by Staff of the Ukrainian Nuclear Data**  
**Center**  
**June 2022 – April 2023**

O. Gritzay, O. Kalchenko

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Web: <http://ukrndc.kinr.kiev.ua/>

E-mail: [ogritzay@ukr.net](mailto:ogritzay@ukr.net)

Ukrainian Nuclear Data Centre (UkrNDC) is subdivision within the Neutron Physics Laboratory at the Institute for Nuclear Research of the National Academy of Sciences of Ukraine.

### **Compilation**

We continue collection and compilation of experimental neutron, charged particle and photonuclear data. Number of the new/renew EXFOR's entries sent to the NDS IAEA by UkrNDC is the following:

- for charged particle data – 9 new entries (D5195÷D5203 (91 subentris));
- for photonuclear data – 2 new entries (G4100÷G4101 (7 subentris)) and 1 updated entry (G4099).

We realize review of compilation scope in home journals:

- Nuclear Physics and Atomic Energy;
- Ukrainian Journal of Physics;
- Problems of Atomic Science and Technology, Series Nuclear Physics Investigations;
- East European Journal of Physics.

### **Collaboration**

We continue our collaboration with the Nuclear Physics Department of Taras Shevchenko National University of Kyiv.

The teaching course “Nuclear Data for Science and Technology and modern computer codes for nuclear data processing” (42 hours) was lectured in 2022-2023 for the fifth-course students of the NPD KNU. This course includes the following items: ENDF/B libraries, EXFOR system, ENSDF library, the use of the PREPRO code in work with the ENDF/B libraries, the introduction to NJOY code system, the Network of Nuclear Reaction Data Centers and the use of the on-line services.

We continue our activity within the framework of educational and scientific program of the Institute for Nuclear Research of the National Academy of Sciences of Ukraine on the preparation of a doctor of philosophy in specialty 01.04.16 (physics of the nucleus, elementary particles and high energies).

- The teaching course “Modern codes and nuclear data” (26 hours) was lectured in September-October 2022 for post-graduate students in the 2-nd year of study.
- The teaching course “Experimental methods of nuclear power engineering” (26 hours) was lectured in January-February 2023 for post-graduate students in the 1-st year of study.

### **Customer Services**

The UkrNDC site is operating. Ukrainian customers, especially students and those physicists, who wish to prepare the point-wise and multi-group cross sections self-dependently, but do not have a good experience in it, use this site very often. Address of the UkrNDC site: <http://ukrndc.kinr.kiev.ua>.

### **Experimental and Computational Activity**

Calculations for improvement of the interference neutron filter with an average energy of 45 keV were done. About 15 variants of the filter were calculated with the addition of various components and selection of their quantity. We tried to optimize three parameters: filter purity, neutron flux density at the filter output, and minimization of the contribution in the low-energy range. According to the calculations, the filter parameters should be as follows: the average neutron energy is 46.25 keV; half-width of the main line – 3.2 keV; relative purity of the main line – 88.3%; the expected neutron flux density is  $1.3 \times 10^6$  n/(cm<sup>2</sup>×s).

Through Russian war, Kyiv research reactor did not operate, so experimental investigation did not fulfilled.

### **Acknowledgement**

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