JOINT ACTIVITIES WITH IAEA ON UPLOADING OF SCIENTIFIC PAPERS FROM KAZAKHSTAN AND UZBEKISTAN INTO THE EXFOR DATABASE

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More than a year passed since Kazakhstan joined the international network of nuclear reactions data centers (NRDC). A Central Asian centre for nuclear reactions (CANRDB, Central Asia Nuclear Reaction Database) has been established at al-Farabi Kazakh National University, and a group of experts there is actively working on expansion of the database, further development of the specialized software, and fostering partnership with international nuclear physicists. There are also on-going activities aimed on training, searching of the published nuclear data obtained earlier by scientists from Central Asia to incorporate their results in the database. The main objective of CA-NRDB is the development and formation in Kazakhstan of open and user-friendly database on nuclear reactions with further incorporation of this database in the international network of nuclear databases under the International Atomic Energy Agency (IAEA). We note that such a database is created in the entire Central Asian region for the first time.

The CANRDB team started its work from compilation of research article in November 2013 and since then eleven articles were downloaded into the EXFOR database. All the articles were published in 2013-2014 and relate to experiments on nuclear reactions; the authors are from Kazakhstan and Uzbekistan. Below we present a list of the articles incorporated in the database by the CANRDB team.

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| --- | --- | --- | --- | --- |
| **Entry #** | **First author** | **Article** | **Lab.** | **Status** |
| 31737 | S.R.Palvanov | J,PAN,77,35,2014 | 4UZ UZB | PRELIM.3163 |
| 31738 | Yu.N.Koblik | J,PAN,77,39,2014 | 4UZ UZB | PRELIM.3163 |
| 31741 | G.A.Abdullaeva | J,NESE,3,72,2013 | 4UZ UZB | Compiled. |
| D0711 | Sh.Hamada | J,PR/C,87,024311,2013 | 4KASKAZ | in EXFOR |
| D0712 | N.Burtebayev | J,NP/A,909,20,2013 | 4KASKAZ | TRANS.D093 |
| D0723 | V.T.Gkadun | J,IZK,1980,(4),82,1980 | 4KASKAZ | in EXFOR |
| D0725 | I.N.Khaustov | J,IZK,1990,(2),3,1990 | 4KASKAZ | in EXFOR |
| D0726 | A.Vasidov | J,IZU,1981,(3),93,1981 | 4UZ UZB | in EXFOR |
| D0727 | S.Muhammedov | J,IZU,1985,(5),81,1985 | 4UZ UZB | in EXFOR |
| D0728 | V.V. Dyachkov | IET,56,521,2013 | 4KASKAZ | in EXFOR |
| G0041 | S.R.Palvanov | J,PAN,77,35,2014 | 4UZ TSK | PRELIM.G029 |

As one can see from the table above, six articles have already been posted and are available at the related IAEA web-site. Such uploading process takes from one to four months. Several articles published in previous years in local journals are now processed for incorporation in the EXFOR database.

CANRDB team has participated in the technical meeting of NRDC under the auspices of the IAEA held in Smolenice (Slovakia) on May 6-9, 2014. Participation in this meeting was of particular importance for the CANRDB team and allowed to present our activities among experienced colleagues from other centers with nuclear data bases. This was the first step towards joining the NRDC network. Important issues related to preparation of some valuable articles published in local journals in the past, digitization of data and data incorporation to the EXFOR database were discussed at the meeting. We plan to continue such work together with Dr. Naohiko Otsuka during his visit to Almaty. There will also be arranged a training for the CANRDB team members on how to upload articles into the EXFOR database.

Establishing the database which got the name *Central Asia Nuclear Reactions Database* (CA-NRDB) it was important to identify its distinguishing features. Location of Kazakhstan and local activities back in USSR times have predetermined one of such features: Kazakhstan was a land of many testing sites including Semipalatinsk Nuclear Test Site. Decontamination, rehabilitation and radioactive waste issues there became the priority in the state agenda.

Specialists of al-Farabi Kazakh National University and National Nuclear center, nuclear physicists, radiochemists, biologists and environmentalists took active part in numerous research and activities there. Research outcomes are published by IAEA and a variety of international organizations. One of the divisions of the CA-NRDB will be devoted to radio-ecology issues.

Another distinguishing feature is stipulated by multiethnicity of Kazakhstan: the CA-NRDB will be created in three languages – Kazakh, English and Russian. The database is designed to support educational activities, scientific research and technology development. An extensive electronic library will also be created to incorporate textbooks, presentations, lectures, scientific papers, etc. The English-language version of the CA-NRDB is designed for incorporation into the international network of the nuclear data bases under IAEA. The core of the CA-NRDB would be the development of the database for nuclear physics and nuclear astrophysics.

Currently, the small team of the CA-NRDB consists of two full-time employee and 4 part-time assistants (graduate students majoring in nuclear physics). Since the turnover among the part-time junior employees is quite high, it is a bit challenging to assure stable operation and efficient qualification improvement of the staff; we work towards mitigation of such factors.

In spite of some difficulties, the CA-NRDB team has got considerable progress. The own website has been designed, vast data have been collected and proceeded, particularly for the educational part of the resource, we organized publishing of own pre-prints. A pilot version of the CA-NRDB has been launched at the University’s web portal, the structure and main components have been shaped.

Efficiency and usefulness of a nuclear reactions database is directly related to the organization of a high-speed and multi-channel search engine. This important technical and optimization task implies development of new information methods and our team is doing that in cooperation with foreign scientists and specialists.

The research objects are published papers and works on nuclear physics and nuclear reactions, experiments at particle accelerators, descriptions of experimental facilities and experiments, computer searching engines, calculational and analytical software packages.

A project proposal for the state funding application for 2015 - 2017 has been prepared in cooperation with foreign scientists and specialists. Such competition for funding through the Ministry of Education and Science has been announced in Kazakhstan for the first time. We look forward to our fruitful cooperation with the CA-NRDB team in Hokkaido University.

Our center maintains friendly cooperative relations with many data centers in different countries. We are planning to officially incorporate the CANRDB into the International Network of NRDC. In this regard, the team is planning to upload all the noticeable domestic papers into the EXFOR by the next technical meeting to be held in Vienna on April 2015.