The CDFE 2014 – 2015 period activities in photonuclear data compilations and evaluations.

V.V.Varlamov, N.E.Gorskikh, A.I.Davydov, S.Yu.Komarov, N.N.Peskov, M.E.Stepanov

Progress report
to the Technical Meeting on International Network of Nuclear Reaction Data Centres (NRDC), 21 – 23 April 2015, IAEA's Headquarters, Vienna, Austria

This short report contains review of the main results obtained at the Russia MSU SINP CDFE concern nuclear data compilation and correction, analysis and evaluation for the period of time from the IAEA's Technical Meeting On International Network of Nuclear Reaction Data Centers" (NRDC), 6 – 9 May 2014, Congress Centre Smolenice, Slovakia, till the spring of 2015.

General

The main CDFE nuclear data activities are compilation, verification and dissemination of modern international nuclear data for providing scientific and educational institutes and organizations of Russian Academy of Science with nuclear data for basic research, education and various applications. The CDFE's responsibility in NRDC Network is processing of photonuclear data. CDFE maintains several international and specially developed nuclear databases available through the CDFE Web-site – http://cdfe.sinp.msu.ru.

Organization

The CDFE has a status of laboratory within the Russia Lomonosov Moscow State University Skobeltsyn Institute of Nuclear Physics. The CDFE total permanent stuff includes five professional, two general service officers and several students of the MSU Physics Faculty.

EXFOR Compilation

5 new CDFE EXFOR **TRANS.M073 - 077** and one **PRELIM.M078** transes have been produced and transmitted to the IAEA NDS. All transes prepared in addition to a number of new ENTRYs contain many old ENTRYs corrected in accordance with the NRDC Network experts comments and recommendations.

On the whole new CDFE trances have been produced in the reported period contain 48 corrected and 32 new ENTRYs:

TRANS	Old	**New**	Total
M073	6	**2**	8
M074	26	**3**	29
M075	7	**5**	12
M076	1	**4**	5
M077	3	**10**	13
prelim.M078	5	**8**	13
All	48	**32**	80

Photonuclear Data Evaluation

In addition to activity in photonuclear data processing in accordance with NRDC priorities the CDFE continues the program of investigation of reliability of experimental data for photonuclear total and partial reaction cross sections obtained using various methods and of reliable photonuclear data evaluation. The correspondent analysis and evaluations were carried out for many nuclei in addition to those investigated before. Using specially proposed physical criteria of data reliability and new experimental-theoretical method for evaluation many new reliable and data for neutron yield reaction (γ,xn) = (γ,n) + 2(γ,2n) + 3(γ,3n), total photoneutron reaction (γ,sn) = (γ,n) + (γ,2n) + (γ,3n) and partial (γ,n), (γ,2n), (γ,3n) reactions cross sections were obtained for many nuclei (^{63,65}Cu, ^{80}Se, ^{91,94}Zr, ^{133}Cs, ^{138}Ba, ^{207}Pb). New reliable evaluated data were included into the EXFOR database will be presented at the International Meetings on Nuclear Spectroscopy and Nuclear Structure (NUCLEUS 2015, Russia, June 29 – July 3, 2015, Russia, Peterhof, Saint-Petersburg).

Nuclear Database Service

The CDFE maintains several nuclear databases on the Web-site (http://cdfe.sinp.msu.ru).

Main of those DB are produced and maintained using data funds of Nuclear Reaction Data Centres Network, USA NNDC and NSDD:

- “Nuclear Reaction Database (EXFOR)”;
- “Complete Nuclear Spectroscopy Database "Relational ENSDF" (Evaluated Nuclear Structure Data File);
- “Nuclear Physics Publications ("NSR" Database)”.

Additionally CDFE produced and maintains several another DB:

- digital “Chart of Giant Dipole Resonance Main Parameters” (energy position, amplitude, width, integrated cross section of GDR;
- digital “Chart of Nucleus Shape and Size Parameters” (data on quadrupole moments, parameters of quadrupole deformation and charge radii; “Nucleus Ground and Isomeric State Parameters” (many useful information (masses, binding energy, nucleon separation energy, decay mode, energy of various decays, etc) on the nucleus as whole and its ground and isomeric states properties);
- “Calculator and Graph Engine for Atomic nuclei Parameters and Nuclear reactions and Radioactive Decays Features” (possibility for convenient calculation of various parameters and characteristics of nuclei, nuclear reactions and nuclear decays).

Short-term (2015/2016) Program

The main items of CDFE (2015/2016) program, main priorities and most important tasks are traditional and the following:

- continuation of new photonuclear data compilation using EXFOR format, new TRANSes (M079, M080, etc.) production;
- correction of old ENTRYs in accordance with new EXFOR coding rule changes and the NRDC Network experts comments and recommendations;
- continuation of joint analysis and evaluation using objective physical criteria of total and partial photonuclear reaction cross sections obtained in various experiments;
- upgrading of all databases put upon the CDFE Web-site (http://cdfe.sinp.msu.ru).