



Nuclear Data Processing Activity at MSU SINP CDFE in 2004 – 2005.

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*Progress Report to
the IAEA Technical Meeting on Coordination of the Network of Nuclear Reaction Data
Centres (12 – 14 October 2005, IAEA NDS, Vienna, Austria).*

This report contains the **short review** of the works carried out by the Lomonosov Moscow State University Skobeltsym Institute of Nuclear Physics Centre for Photonuclear Experiments Data (Centr Danykh Fotoyadernykh Eksperimentov – CDFE) concern the IAEA Nuclear Reaction Data Centres Network activities for the period of time from the IAEA Technical Meeting on the Network of Nuclear Reaction Data Centres (04 - 07 October 2004, NNDC, BNL, Brookhaven, USA) till the fall of 2005 **and main results** obtained.

EXFOR compilations

Three new CDFE EXFOR TRANSES M036, M037, and M038 (PRELIM) have been produced and transmitted to the IAEA NDS. Many old data have been corrected in accordance with comments of Otto Schwerer, Dimitri Rochman, and Naohiko Otsuka. On the whole the CDFE TRANSES mentioned contain (**Annex 1**) 26 retransmitted and 21 new (M0658 - M0679 (without M0669)) ENTRYs with 101 new data SUBENTs.

Upgrading of databases

The CDFE relational nuclear data **databases** (new Web-site address - <http://cdfe.sinp.msu.ru> – (instead of old one - <http://depni.sinp.msu.ru/cdfc>)) have been **upgraded** significantly:

- the “2004” part (the “2005” is in processing) has been added to the CDFE “Photonuclear Data Index”; as whole the **“Photonuclear Data Index 1955 -2004”** database has been added by a significant amount of entries from /1/; for articles included into international EXFOR nuclear reaction data fund all data sets are available in forms of table and graphs;
- the database **"Giant Dipole Resonance Parameters"** has been upgraded significantly: many new data sets have been added;
- many full texts (in *.pdf format) have been connected to the CDFE M-series documents of the relational **“Nuclear Reaction Database (EXFOR)”**; the complete database of

those files has been transmitted to the IAEA NDS in accordance with Otto Schwerer's Memo CP-D/426 from 1 April 2005; because now all three international complete CDFE databases (EXFOR, ENSDF and NSR) are combined /2/ into unified information system all those full texts are available both through EXFOR and NSR databases.

Photonuclear data evaluations

As an continuation of consistent analysis and evaluation of total and partial photonuclear reactions cross sections many data for various multiplicity photoneutron reaction cross sections have been obtained /3/ using the Giant Dipole Resonance statistical model for all stable isotopes of nuclei with $Z = 30 - 92$. The cross section energy dependency (excitation function) and integrated cross section data have been evaluated for incident gamma-quanta energies from the correspondent threshold up to 50 MeV for total absorption (γ ,abs) and partial photoneutron (γ ,n), (γ ,2n), (γ ,3n), (γ ,4n), and (γ ,5n) reactions.

Some evaluated photonuclear reaction cross section data have been reported /4,5/ on the International Conference on Nuclear Data for Science and Technology at Santa Fe, New Mexico, USA.

Nuclear structure data

Concern the CDFE nuclear structure database production activity at first time nuclear level quadrupole moments ("**Q-moments**") data produced "by hands" using text parts (CONTINUATION etc.) of ENSDF data sets have been included into the CDFE "**Relational ENSDF**" database. Now those values could be used in all possible database queries.

The parameters of deformation of many nuclei obtained using nuclear level quadrupole moments ("**Q-moments**") data obtained from ENSDF, information from Atomic data and nuclear data tables /6/ and some other sources /7/ are used now in development of "**Chart of nuclide quadrupole deformations**".

Some evaluated nuclear structure data (energies and occupation probabilities of single-particle nuclear states) have been reported /8/ on the International Conference on Nuclear Data for Science and Technology at Santa Fe, New Mexico, USA.

Short-term programmes

The main items of CDFE future short-term programmes, priorities and new tasks are listed in the **Annex 2**.

References

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Annex 1. The CDFE new EXFOR TRANSEs M036, M037, and M038 (PRELIM) contents (*old corrected* and new ENTRYs)

TRANS M036		TRANS M037		TRANS M038 (PRELIM)	
M0635	115	M0054	2	M0084	3
M0651	13	M0084	3	M0090	5
M0657	13	M0090	5	M0448	5
M0658	2	M0237	2	M0485	2
M0659	2	M0240	3	M0629	6
M0660	2	M0366	2	M0650	9
M0661	13	M0428	12	M0675	2
M0662	3	M0448	5	M0676	4
M0663	2	M0469	3	M0677	7
M0664	2	M0485	2	M0678	4
M0665	4	M0495	11	M0679	11
M0666	2	M0593	13		
M0667	9	M0627	4		
M0668	2	M0636	10		
		M0639	2		
		M0658	2		
		M0659	2		
		M0670	5		
		M0671	13		
		M0672	2		
		M0673	3		
		M0674	11		
Total new: 11	Total new: 41	Total new: 5	Total new: 34	Total new: 5	Total new: 26
				Sum new: 21	Sum new:101

Annex 2. The main items of the CDFE future short-term programmes, priorities and new tasks.

1. Continuation of photonuclear data compilation using EXFOR format, new TRANSEs (M039, M040, etc.) production.
2. Upgrading and addition of the CDFE bibliographical data collection. Including the 2005 photonuclear data into the relational database “Photonuclear Data Index” (PNDI).
3. Investigation of possibility of including photonuclear data from the CDFE “Photonuclear Data Index” to CINDA.
4. Continuation of joint evaluation of photonuclear reaction cross sections obtained using various methods, first of all in experiments with bremsstrahlung and quasiminoenergetic annihilation photons, with the aim of definition and excluding of systematical discrepancies.
5. Upgrading, addition and correction, Search Engines improvement of the existed CDFE EXFOR relevant databases:
 - “Giant Dipole Resonance Parameters. Photonuclear Reaction Cross Sections”;
 - “Relational Nuclear Reaction Database (EXFOR)”;
 - “Relational ENSDF”;
6. Improvement of new unified joint interface for all three complete databases “NSR”, “EXFOR” and “Relational ENSDF” that gives to one possibility of working with all three systems (and some other CDFE Web-site relational databases) at the same time.