DATA CENTER AT PETERSBURG NUCLEAR PHYSICS INSTITUTE STATUS REPORT, 2017-2019

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General

The Data Center is a part of the Nuclear Spectroscopy Laboratory in the Neutron Research Department of the Petersburg Nuclear Physics Institute. It consists of 3 physicists and 1 mathematician. Our main activity is connected with information support of fundamental researches and nuclear technologies on reactors and with evaluation of nuclear data for nuclear spectroscopy.

Evaluation in the ENSDF format

The PNPI area of responsibility in the evaluation process includes nuclides with **A = 130 – 135**:

Mass number	Last publication	Comment
130	*NDS*, **93** (2001)	completed; under review since 2018
131	*NDS*, **107** (2006)	
132	*NDS*, **104** (2005)	in process with B.Singh
133	*NDS*, **112** (2011)	
134	*NDS*, **103** (2004)	
135	*NDS*, **109** (2008)	

We have successfully finished evaluation of the additional mass chain **A = 146** (*NDS*, **136** (2016) 163-452).

Object-oriented databases on the ENSDF basis

The database ANGTOL is designed to solve the following problems:

- analysis of the quality of nuclear level schemes, checking the placement of transitions in the level scheme;
- statistical analysis of data in the ENSDF and the construction of various distributions of nuclear characteristics;
- global nuclear data systematics and the search for new regularities.

The database ROTAN and the code BARON is designed for the analysis of rotational bands in nuclei, the model description of energies of rotational levels, the systematics of parameters of the nuclear rotation.

For the description of rotational energies the polynomial parametrization of Bohr-Mottelson or the model of variable moment of inertia is used. Such an analysis

can be useful at evaluation process for unambiguous selection of levels in the rotational band.

The database ISOTIME contains information relating to the lifetimes of nuclear states. It allows to get both types of decay, and channels of their production. The database proved to be very useful in the systematization of nuclear isomers. There is presented the full spectroscopic information for each isomer.

The database MASCA allows us to work with atomic masses and calculate the nuclear binding energy, the energies of particle separation and the energies of decays, energy parameters of nuclear reactions. The information obtained can be presented both in tabular and graphical form.

The program package NUCLEAR_REFS_MANAGER may be useful for the maintaining the collection of publications, i.e. articles, preprints, abstracts, private communications, etc., which have keywords in the database NSR format.