



# *USNDP Web Services*

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# USNDP Web & Database Services

National Nuclear Data Center - Mozilla Firefox

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**National Nuclear Data Center**  
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Nuclear Structure and Decay Databases  
Nuclear Structure and Decay Tools  
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NSR XUNDL ENSDF  
NuDat Databases MIRD  
Sigma CSISRS ENDF

Chart of Nuclides  
Atlas of n Resonances  
Empire  
Nuclear Wallet Cards  
Tools and Publications  
Nuclear Data Sheets  
Networks  
CSEWG USNDP

ENDD-6  
Staff Positions  
Nuclear Data  
Evaluators

Nuclear Data Week at BNL, Nov 2-6 New Google Atlas of Neutron Resonances

Site Index - Search the NNDC:  Go

AMDC Atomic Mass Data Center, *Q-value Calculator*  
Covariances of Neutron Reactions  
ENDF Evaluated Nuclear (reaction) Data File, *Sigma*  
NMMSS & DoE NMIRDC Safeguards & inventory decay data standards  
NucRates MACS & Astro-physical reaction rates

Atlas of Neutron Resonances Parameters & thermal values  
CSEWG Cross Section Evaluation Working Group  
ENSDF Evaluated Nuclear Structure Data File  
NSR Nuclear Science References  
NuDat Nuclear structure & decay Data

CapGam Thermal Neutron Capture  $\gamma$ -rays  
CSISRS alias EXFOR Nuclear reaction experimental data  
IRDF International Reactor Dosimetry File  
Nuclear Data Sheets Nuclear structure & decay data journal, *Special Issues on reaction data*  
USNDP U.S. Nuclear Data Program

Chart of Nuclides Basic properties of atomic nuclei  
Empire Nuclear reaction model code system, *Reference paper*  
MIRD Medical Internal Radiation Dose  
Nuclear Wallet Cards Ground & isomeric states properties, *Homeland Security* version  
XUNDL Experimental Un-evaluated Nuclear Data List

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Acknowledgments - Comments/Questions - Disclaimer

Done

# FY09 Summary

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- 2,324,729 retrievals, 15.7% increase compare with FY08
- NuDat/Chart contribution is 1,309,260 retrivals
- Hardware migration, 2 -> 4 processors, more memory and disk space
- NNDC databases and Web Services have been migrated form Sybase to MySQL relational database software
- NNDC /BNL passed DOE cyber security audit
- Web products improvements: NSR, Sigma, NuDat, ENSDF Codes, ENDF/EXFOR/CINDA

# Databases & Web Services

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- In 2009 NNDC went through scheduled Web (2) and database (2) server migration project
- In May of 2009 we were informed by Sybase, Inc. that license fee will go up from \$3,500 to \$80,000 /processor
- Decision has been made to move from Sybase to MySQL by August 1, 2009
- Database migration (external users) has been accomplished by July 31, 2009 (Pritychenko, Arcilla, Zerkin, Sonzogni)
- Internal services migration is still going on in collaboration with external developers ( Pritychenko, Arcilla, Winchell)

# DOE Cyber Security Audit

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- In September 2009 BNL had a cyber security audit
- NNDC Web Services had to be updated and several thousand vulnerabilities were fixed
- This task was accomplished in two weeks by four people
- BNL passed the audit for the first time!!!



# Sigma 3.0

**NNDC National Nuclear Data Center** **BROOKHAVEN NATIONAL LABORATORY**

NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | Sigma

**Sigma Evaluated Nuclear Data File (ENDF) Retrieval & Plotting**

New in 3.0: spectra (MF=6), covariances (MF=33), thermal cs & resonance integrals.

Periodic Table Browse | Directory Tree Browse | Basic Retrieval | Advanced Retrieval | Plot Cart | Computations

Select first a library, then a sublibrary and finally click on a chemical element to obtain results.  
Data is available for materials with a cyan background.

Library:  Sublibrary:

Results for Z=92

ENDF-6 format	Human-readable
Whole file -	
232 introduction	Interpreted
233 (n,total nubar)	Interpreted Plot
234 (n,delayed nubar)	Interpreted Plot
235 (n,prompt nubar)	Interpreted Plot
236 (n,fis.ene.release)	Interpreted
237 res. param.	Interpreted
Cross sections:	
238 (n,total)	Interpreted Plot
239 (n,elastic)	Interpreted Plot
240 (n,non-elastic)	Interpreted Plot
241 (n,inelastic)	Interpreted Plot
(n,2n)	Interpreted Plot
(n,3n)	Interpreted Plot
(n,total fission)	Interpreted Plot
(n,1st ch.fission)	Interpreted Plot
(n,nf)	Interpreted Plot
(n,2nf)	Interpreted Plot
(n,4n)	Interpreted Plot

Version History:

- New in version 3.0 (February 2009)
  - Energy-angle distributions (MF=6).
  - Visualization of covariances (MF=33 with LB=1.5; applies to ~80% of cases). Visualization of resonance data (MF=32) is not yet available.
  - Thermal neutron cross sections & resonance integrals for (n,y), (n,total fission).
- New in version 2.0 (April 2008)
- New in version 1.0 (April 2007)

Database Manager: Mike Herman, NNDC, Brookhaven National Laboratory  
Web and Programming: B. Pritychenko, A.A. Sonzogni, NNDC, Brookhaven National Laboratory  
Data Source: CSEWG and NEA-WPEC

- Energy-angle distributions
- Covariances (MF=33)
- Thermal cross sections & Resonance Integrals

# NSR

NNDC National Nuclear Data Center

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Home

NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | Sigma

## Nuclear Science References (NSR)

[The previous version of Web Interface is here.](#)  
Database version of October 29, 2009

The NSR database is a bibliography of nuclear physics articles, indexed according to content and spanning nearly 100 years of research. Over 80 journals are checked on a regular basis for articles to be included. For more information, see the help page. The NSR database schema and web applications have undergone some recent changes. This is a revised version of the previous NSR Web Interface.

Quick Search | Text Search | Indexed Search | Keynumber Search | Combine View | Recent References

**Author**   
Brown, B.A. Brown

**Nuclide**   
<sup>31</sup>Na, na-31

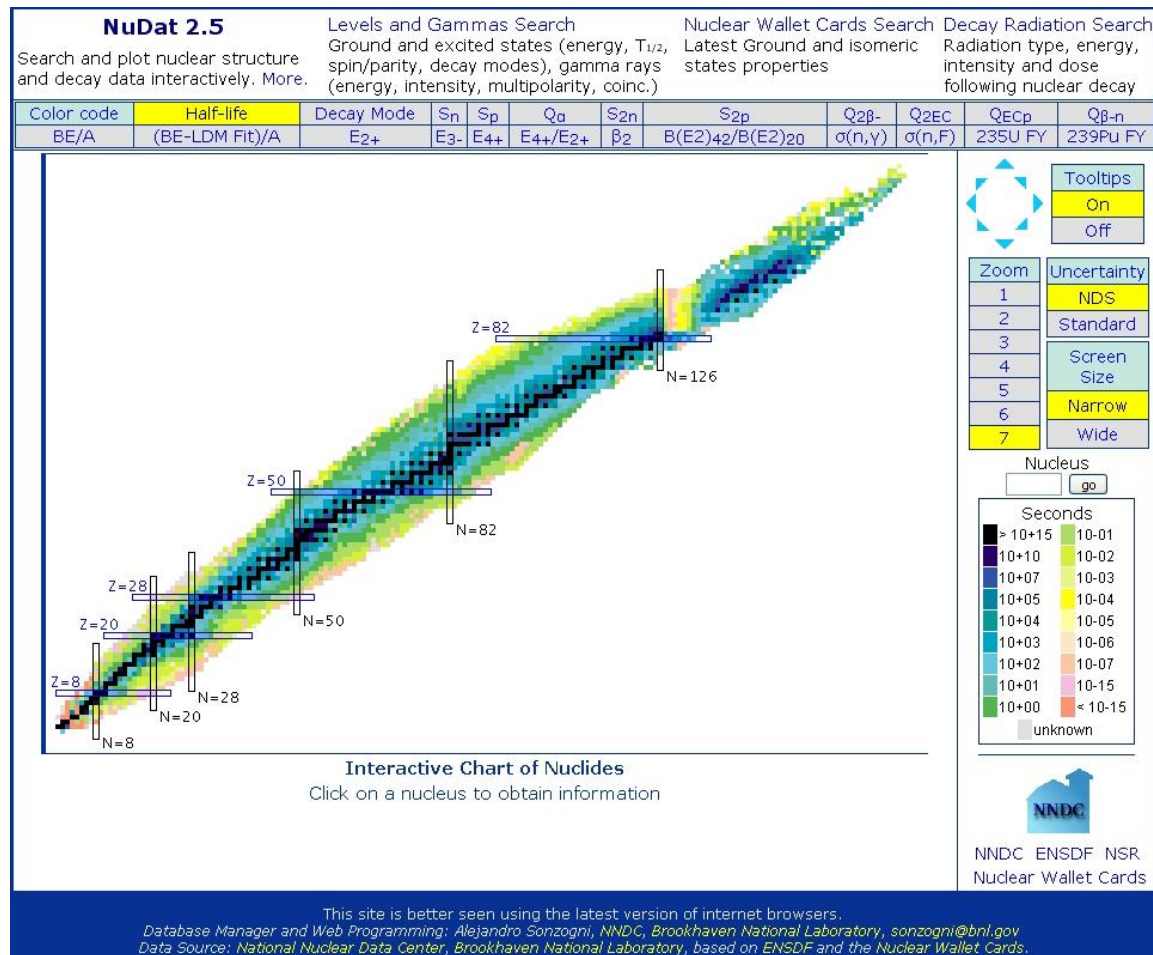
**Output format** ☒ HTML ☐ BibTex ☐ Text

**Publication Year** from  to

Database Manager: Boris Pritychenko, NNDC, Brookhaven National Laboratory  
Web Programming: Boris Pritychenko, NNDC, Brookhaven National Laboratory  
Data Source: NNDC, Brookhaven National Laboratory,  
NDS, International Atomic Energy Agency,  
NDG, McMaster University

- Improved Web Interface
- Many new features

# NuDat 2.5



- New graphic capabilities
- Nuclear physics views



# ENSDF Analysis & Utility Codes

The screenshot shows the NNDC website interface. At the top, there's a blue header with the NNDC logo and 'National Nuclear Data Center' text. To the right is the Brookhaven National Laboratory logo. Below the header is a navigation bar with links to various databases: ENDF, CSISRS, CINDA, NuDat, NSR, XUNDL, ENSDF, and MIRD. A search bar is on the left. The main content area is titled 'ENSDF Analysis and Utility Programs'. It includes a paragraph about the center's role, a list of programs (ENSDF Analysis Programs, NSDFLIB, SETMDC, ENSDF Utility Programs), and a 'Documentation' section with links to status, sample input, and distribution notes. A sidebar on the left contains a search bar and a list of site index items. The bottom of the page has a table listing program types (ANS, VAX, WIN or Win32, Linux, Unix, or UNIX) and their descriptions.

**Search the NNDC:**

**ENSDF Analysis and Utility Programs**

The National Nuclear Data Center maintains and distributes various programs in support of the International Atomic Energy Agency sponsored Nuclear Structure and Decay Data Network. These programs generally use as input files in the Evaluated Nuclear Structure Data File (ENSDF) format.<sup>[1]</sup>

- ♦ **ENSDF Analysis Programs**
- ♦ **NSDFLIB** - Subprogram library used by many of the ENSDF Analysis & Utility Programs
- ♦ **SETMDC** - Converts programs containing machine dependent coding
- ♦ **ENSDF Utility Programs**

**Documentation**

- **Status** of the ENSDF Analysis and Utility Programs
- **Sample input**
- ENSDF Program Library **Distribution Notes**

A brief description of the programs is given in the PDF file [distrm-mem.pdf](#) and the current status of the programs is available in [CODE\\_STATUS.HTML](#).

Each program, associated test input and output files, and documentation is contained in its own subdirectory. If the source program is ANSI-standard FORTRAN 77 or FORTRAN 90/95, it will also reside in this subdirectory with an FOR or F or F90 mime type, respectively. Below this subdirectory will be up to FOUR subdirectories:

<b>ANS</b>	If the program contains FORTRAN 77 or FORTRAN 90/95 extensions, the ANSI standard version of the source program resides here.
<b>VAX</b>	OpenVMS executable and source program if there are FORTRAN 77 or FORTRAN 90/95 extensions.
<b>WIN or Win32</b>	Windows 95+ executable and source program (HP/Compaq/Digital Visual FORTRAN) if there are FORTRAN 77 or FORTRAN 90/95 extensions.
<b>Linux, Unix, or UNIX</b>	Linux or Unix executable and source program (GNU f77 FORTRAN, INTEL FORTRAN 90, or Lahey/Fujitsu FORTRAN 95) if there are FORTRAN 77 or FORTRAN 90/95 extensions.

- Overall upgrade
- Modern look & feel

# ENDF/EXFOR/CINDA

The screenshot displays the NNDC website with a search bar at the top. The main content area is titled "Evaluated Nuclear Data File (ENDF)" and features a "Database version of December 15, 2006" announcement. It includes a "Basic Retrieval" section with input fields for Target, Reaction, and Quantity, and a "Library" section with checkboxes for various data libraries like ENDF/B-VII.0, JEFF-3.1, JENDL-3.3, ENDF/B-VI.8, and ROSFOND. A sidebar on the left contains navigation links such as "ENDF/B-VII.0 Home", "Download Sublibrary", and "Lists of Materials".

- IAEA/NNDC collaboration
- Web/Databases updates
- First implementation of ROSFOND

This screenshot shows a sidebar on the right with the IAEA logo and a main content area featuring a graph. The graph has a y-axis labeled "DE" and a logarithmic scale from  $10^{-10}$  to  $10^{-14}$ . The sidebar also includes a "Feedback" section with links for "Comments, Questions?" and "Previously submitted comments".

Database Manager: Michal Herman, NNDC, Brookhaven National Laboratory ([mwherman@bnl.gov](mailto:mwherman@bnl.gov))  
 Web and Database Programming: Viktor Zerkov, NDS, International Atomic Energy Agency ([V.Zerkov@iaea.org](mailto:V.Zerkov@iaea.org))  
 Web Programming: Boris Pritychenko, NNDC, Brookhaven National Laboratory ([bnlweb@bnl.gov](mailto:bnlweb@bnl.gov))  
 Data Source: CSEWG ([www.nndc.bnl.gov/csewg](http://www.nndc.bnl.gov/csewg)) and NEA WPEC ([www.iaea.org/infocentre/wpec](http://www.iaea.org/infocentre/wpec))

Database Manager: Viktor Zerkov, NDS, International Atomic Energy Agency ([V.Zerkov@iaea.org](mailto:V.Zerkov@iaea.org))  
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 Web Programming: Boris Pritychenko, NNDC, Brookhaven National Laboratory ([bnlweb@bnl.gov](mailto:bnlweb@bnl.gov))  
 Data Source: Network of Nuclear Reaction Data Centres, coordinator: Otto Schwerer, NDS, IAEA ([O.Schwerer@iaea.org](mailto:O.Schwerer@iaea.org))

# Conclusion & Outlook

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- FY09 was a very challenging year
- NNDC Web & Database Services performed really well
- Many challenges still remain
- Work on new products and services improvements will continue (Sigma, NSR, User requests)