

NNDC Report FY2012

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Brookhaven National Laboratory
Nuclear Data Week, Nov. 5-9, 2012

BROOKHAVEN
NATIONAL LABORATORY

a passion for discovery



U.S. DEPARTMENT OF
ENERGY

Office of
Science

NNDC Personnel Status

Personnel changes: Said Mughabghab retired

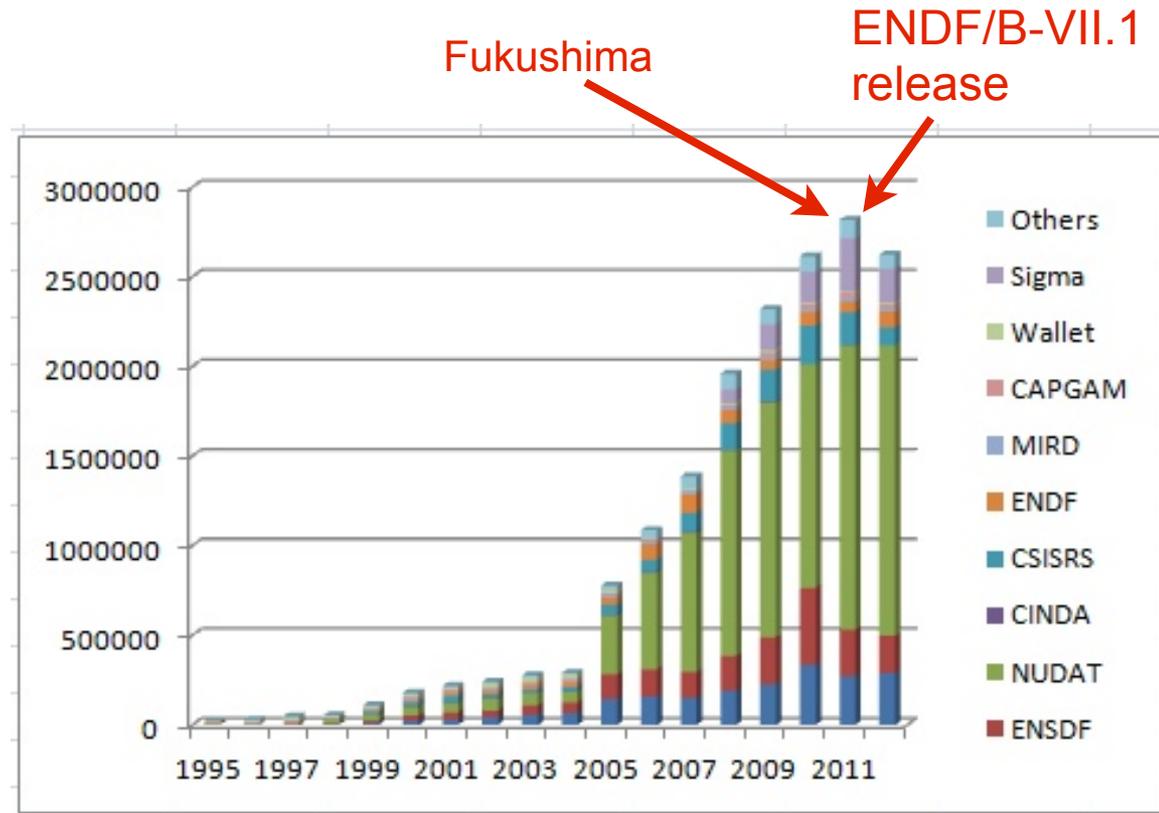
Staff	FTE	Heads (30/9/12)	FTE-USNDP	FTE-ARRA	FTE-OTHER
Permanent	8.30	8	6.24	0.98	1.08
Temporary	2.00	2	0.44	1.18	0.38
Professional	3.57	4	3.57		
Contractors	2.70	10	2.70		
Total	16.57	24	12.95	2.16	1.46

FY2011

Staff	FTE	Heads (30/9/11)	FTE-USNDP
Permanent	8.05	9	5.23
Temporary	0.50	2	0.30
Professional	3.73	4	3.73
Contractors	2.50	12	2.50
Total	14.78	27	11.76

Services

NSR	291k	+6%
ENSDF	207k	-20%
NUDAT	1,619k	+2%
EXFOR	100k	-46%
ENDF	90k	+48%
SIGMA	188k	-37%



- Data retrievals decreased by 6% to 2.624 million in FY12
- Active communication with users available for NNDC-general, CSISRS, ENDF, Wallet Cards

Compilation

NSR

- FY2011
 - 3802 new entries (previous year 3818)
 - 2191 key-worded
- FY2012
 - 3,804 new entries
 - 2,315 key-worded
 - NNDC: 2,535 new articles (1560 key-worded),
502 modified changing $Z=114 \Rightarrow \text{FI}$ and $116 \Rightarrow \text{Lv}$

B(E2) (FY 2012, Pritychenko, Singh)

- 16 nuclides

Double-beta decay (FY2012, Pritychenko)

- 10 nuclides and 20 decay modes

ENSDF FY2011

5 mass chains completed and submitted (4 NNDC, 1 collaboration)

Evaluated:

- $A=62$ (8 nuclides Nichols,Tuli; *Canada)
- $A=143$ (16 nuclides, Browne,Tuli)
- $A=148$ (15 nuclides, Nica)
- $A=220$ (8 nuclides, Browne,Tuli)
- $A=246$ (8 nuclides, Browne,Tuli)
- Trieste (8 nuclides, Browne,Johnson,Sonzogni,Tuli)

*collaboration

NNDC share of nuclides =63, (last year= 92)

Published: 5 mass chains ($A=99,142,161,220,246$)

Reviewed: 11 mass chains

Browne 2(27,85); Basu 1(99); McCutchan 1(192); Nica 1(150); Nichols 1(207); Reich 1(92); Sonzogni 1(61); Tuli 3(143,220,245)



ENSDF FY2012

9 mass chains completed and submitted (105 nuclides)

Evaluated:

- A=68 (McCutchan)
- A=88 (McCutchan/Sonzogni)
- A=87 (Johnson/Kulp)
- A=141 (Nica)
- A=156 (Reich)
- A=230,251,253,255 (Browne/Tuli)
- A=211 (Trieste collaboration)



Published: 11 mass chains (A=34, 36, 37, 62, 68, 77, 143, 159, 161, 222, 230)

Reviewed: 7 mass chains

McCutchan (3), Tuli (2), Browne (1), Reich (1)

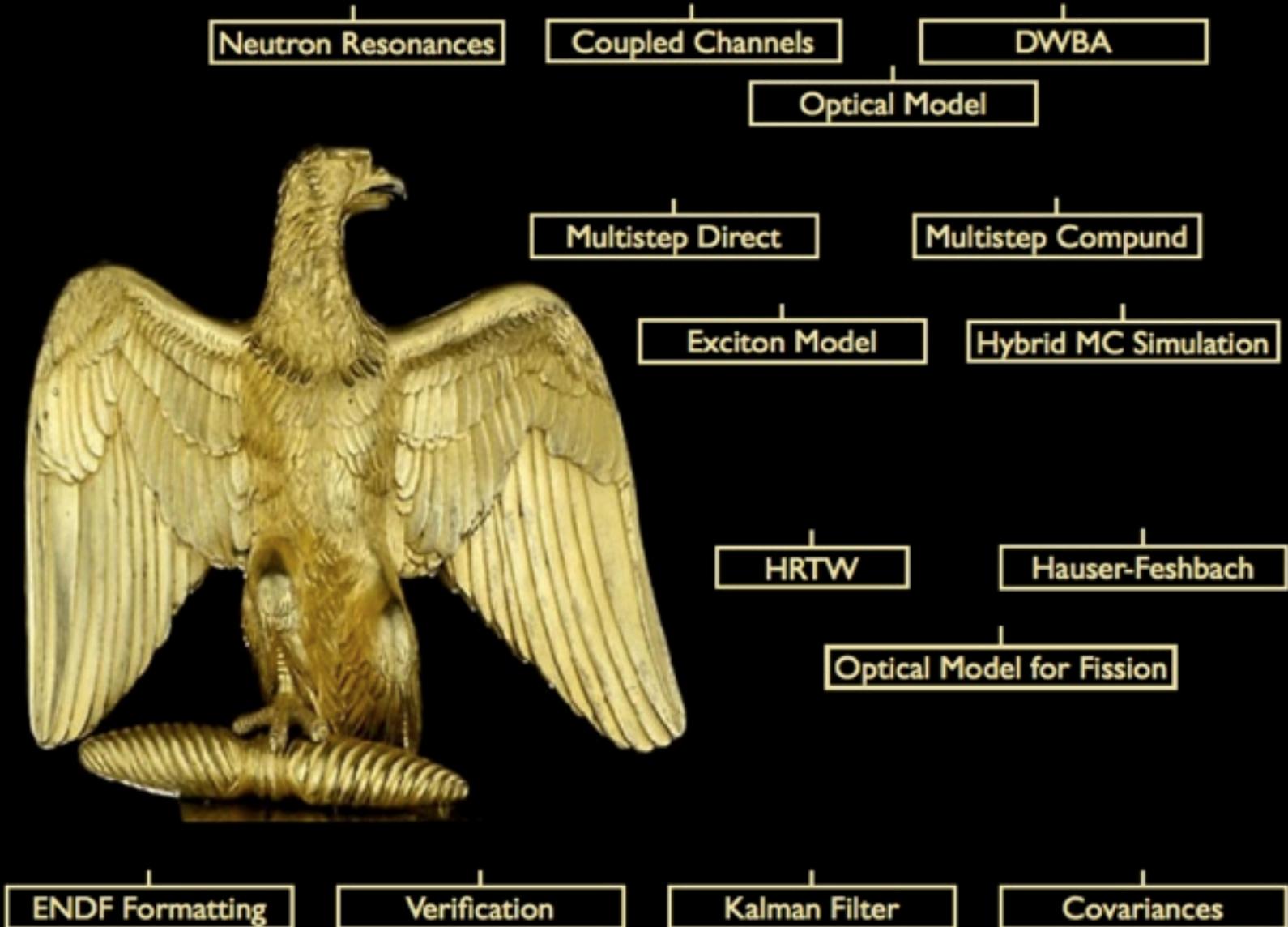
Nuclear reaction highlights

- Release of ENDF/B-VII.1 (Dec. 2011) - new decay data sub-library based on ENSDF covariances based on COMMARA
- Covariance library COMMARA-2.0 extensive use of EMPIRE code
- Release of the EMPIRE-3.1 (Rivoli) massive use of ENSDF
- New XML data structure to replace ENDF-6 format (WPEC subgroup) - what about ENSDF format?
- Development of the ADVANCE system - doesn't use ENSDF but ENSDF could use ADVANCE



EMPIRE-3.1 (Rivoli)

Nuclear Reaction Model Code

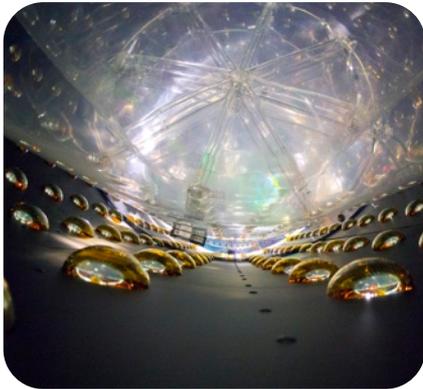


ENSDF \Leftrightarrow RIPL \Leftrightarrow EMPIRE/TALYS/GNASH... (some thoughts)

- Why reaction codes do not use ENSDF directly?
 - ENSDF is difficult to read
 - ENSDF is incomplete (based strictly on measurements while reaction codes need full information)
- RIPL solves both problems but... it is out of date!
- New XML data structure could be a solution - it would benefit both structure and reactions - lets discuss it later during this meeting
- Bringing old topic under discussion
 - Seriously disturbing feature of ENSDF - lack of branching ratio when we know it's 1!

State of the art antineutrino spectrum modeling

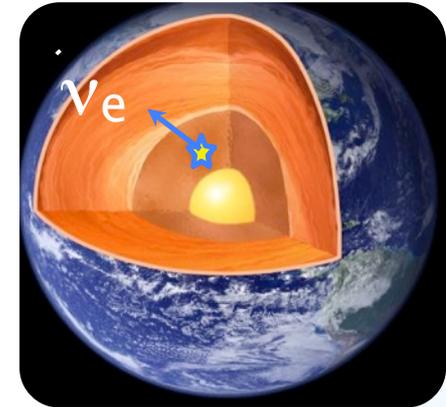
application of ENSDF in cutting edge physic experiment



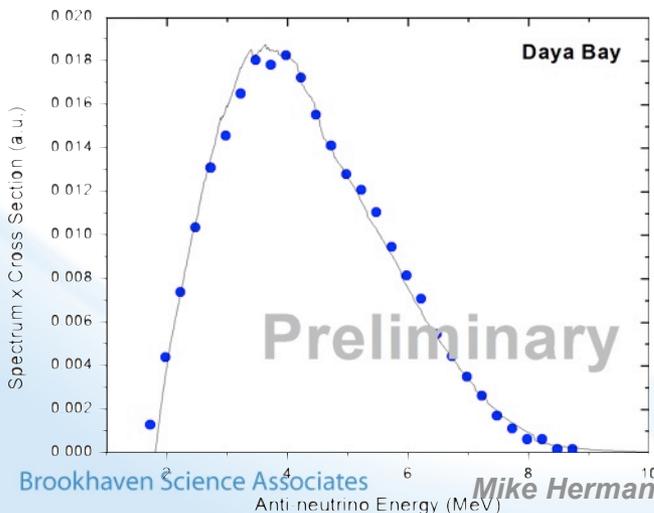
Basic Science:
Study of neutrino oscillations in Daya Bay



Non-proliferation:
safeguards and reactor monitoring



Geophysics:
Earth tomography from long lived radioisotopes



Evaluate, with uncertainties, the anti-neutrino spectrum from β decays of actinides and their fission products and archive them in ENDF/B-VII.2 for applications

NNDC Publications (FY2012)

- 11 issues of NDS with A-chain evaluations
- Special issue on ENDF/B-VII.1 published in Dec. 2011
- papers 18
- reports 3
- invited talks 25
- Wallet Cards

NUCLEAR WALLET CARDS

October 2011

Jagdish K. Tuli

National Nuclear
Data Center

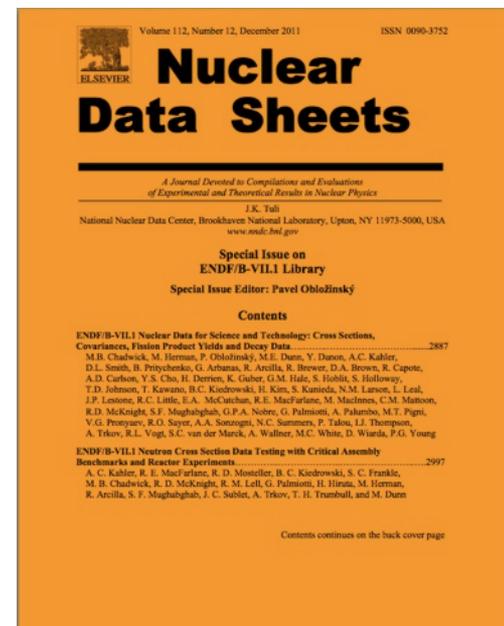
www.nndc.bnl.gov

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Wallet Cards app for Android

NUCLEAR WALLET CARDS

October 2011

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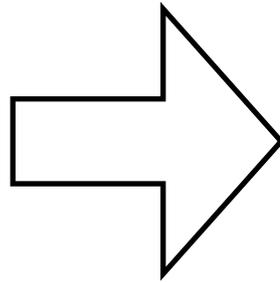
www.nndc.bnl.gov

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Average rating:

4.5



4

The first mobile application
by NNDC (T. Johnson)

iPhone app by INL



Management of projects and Web pages

GForge



ControlTier



Project management system

- Versioning system (Svn)
- Tracker
- Mailing lists
- Release system
- Wiki, Forums, Blog, ...

Handy tool for

- Deploying applications
- Controlling their state
- Running administrative tasks across multiple servers
- Updating Web sites

Automatic verification and validation of ENDF evaluations



www.nndc.bnl.gov/ndf/b7/... index.html

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ADVANCE: The ENDF Continuous Integration System

MAIN LIBRARY PERIODIC TABLE VIEW LIST VIEW ABOUT ADVANCE

Neutrons Sublibrary

ENDF/B Development Library

- General Information:
 - ENDF sublib designator: 10
 - Revision Number: 592
 - Last Modified Revision: 532:592
- Build Status:
 - Build status: **FAILURE**
 - Build time: 2012-10-24 13:52:00.314153
 - Liefile: neutrons.list
 - Release Notes: neutrons-releaseNotes.pdf
- GForge Links:
 - Browse SVN
 - Browse sublibrary tracker

1 H	?																2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo
* Lanthanides (Lanthanoids)			57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
** Actinides (Actinoids)			89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

www.nndc.bnl.gov/ndf/b7/dev/qa/neutrons/n-002_He_003.html

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ADVANCE: The ENDF Continuous Integration System

MAIN LIBRARY PERIODIC TABLE VIEW LIST VIEW ABOUT ADVANCE

³He

Neutrons Sublibrary

- General Information:
 - ENDF MAT designator: 225
 - Evaluated date: MAY90
 - Evaluation lab: LANL
 - Evaluation authors: G.Hale, D.Dodder, P.Young
 - Natural abundance: 0.000137 + 3e-06 %
 - Check out Wikipedia's entry for [helium](#)
- Revision Number: 592
- Last Modified Revision: 532:592
- Build Status:
 - Build status: **ERROR** ([Submit tracker item](#))
 - Build time: 2012-10-24 13:50:20.874937
- GForge Links:
 - Browse SVN
 - View current revision
 - Download current revision

Status	Code	# Tests	# Failures	# Errors	Run time (sec)	Files
✓	STAN	0	0	0	0.033	STN File
✓	STANEF	0	0	0	0.026	
✓	CHECKR	8	0	0	0.012	
✓	FIZCON	8	0	0	0.012	
✓	PSYCHE	16	0	0	0.013	
✓	PREPRO	2	0	0	0.041	prepro File
✓	INTER	1	0	0	0.018	inter File
✗	FUDGE-2.0	4	0	4	0.614	Log, gnd.xml File
✓	NJOY99	3	0	0	6.786	ace File, -acor.ps File, -heatr.ps File, -heatr.chk File, genf File, xsdir File, -error.cov File

Symbol Legend

- FAILURE: At least one evaluation in the element/sublibrary was so badly done that it coredumped a checker code or the checking code has a serious bug
- ERROR: The evaluation/sublibrary DOES NOT pass all checks
- WARNING: The evaluation/sublibrary passed all checks, but there were warnings
- PASS: The evaluation/sublibrary passed all checks

Updated every hour!

ND2013

- Statistics (Feb. 25, 2013)
 - Registered participants 660
 - Submitted talks 436
 - Submitted posters 139
 - Accepted talks 373
 - Accepted posters 163
- participants by country
 - EU 230 (France 58, Germany 24, Spain 23, ...)
 - Asia 160 (Japan 44, India 36, China 30, S. Korea 16, ...)
 - Americas 150 (US 121, Canada 10, Brazil 10,...)
 - Russia 31
- 5+ parallel sessions
- Program set up, authors notified

