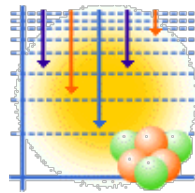


Argonne Nuclear Data Program



Member of the US Nuclear Data Program

supported by the Office of NP, U.S. DOE/SC



❑ *Nuclear Data **Compilations & Evaluations***

- ✓ nuclear structure & decay data for ENSDF & XUNDL
- ✓ data evaluation for AME & NuBase collaboration (*G. Audi*)
- ✓ decay data evaluations & measurements in support of IAEA-CRP & other horizontal evaluations (K-isomers, medical isotopes, others)

❑ *Complementary Nuclear Data **Research Activities***

- ✓ CARIBU, NSCL/FRIB and other RIB facilities, Gretina, IAEA-CRP – emphasis on nuclear structure physics and astrophysics, and their intersection with applied nuclear physics programs

ENSDF evaluation status

- 22 mass chains permanently assigned to ANL – the goal is to keep them up to date – expansion is unlikely given the current staff level


Mass Chain	NDS publication	Evaluator	Current Status
176	NDS 107 (2006) 791	M.S. Basunia	completed/LBNL
→ 177	NDS 98 (2003) 801	F.G. Kondev	completed/under revision
178	NDS 110 (2009) 1473	E. Browne	completed/Argentina
179	NDS 110 (2009) 265	C.M. Baglin	completed/LBNL
199	NDS 108 (2007) 79	B. Singh	completed/McMaster
200	NDS 108 (2007) 1471	F.G. Kondev & S. Lalkovski	completed
201	NDS 108 (2007) 365	F.G. Kondev	completed
202	NDS 109 (2008) 699	S. Zhu & F.G. Kondev	completed
203	NDS 105 (2005) 1	F.G. Kondev	completed
204	NDS 111 (2010) 141	C.J. Chiara & F.G. Kondev	completed
205	NDS 101 (2004) 521	F.G. Kondev	completed
206	NDS 109 (2008) 1527	F.G. Kondev	completed
207	NDS 112 (2011) 707	F.G. Kondev & S. Lalkovski	completed
208	NDS 108 (2007) 1583	M. Martin	completed/ORNL
209	NDS in press	J. Chen & F.G. Kondev	completed

the region is completed – will start updating – currently working on **A=177**



ENSDF evaluation status– cont.

- new region of responsibility – closely related to our research interest at ANL

Mass Chain	NDS publication	Evaluator	Current Status
106	NDS 109 (2008) 943	D. De Frenne & A. Negret	completed
107	NDS 109 (2008) 1383	J. Blachot	completed
108	updated online 2008	J. Blachot	completed
 109	NDS 107 (2006) 355	J. Blachot	being evaluated/**
110	NDS 113 (2012) 1315	G. Gurdal & F.G. Kondev	completed
111	NDS 110 (2009) 1239	J. Blachot	completed
112	NDS 124 (2015) 157	S. Lalkovski & F.G. Kondev	completed

** In collaboration with S. Kumar, Univ. Delhi and J. Chen (NSCL)

- **A=133** was published in collaboration with St. Petersburg group & work is continuing on **A=188** (with S. Juutinen, Jyvaskyla and D. Hartley, USNA)

Other data evaluation/compilations

- ❑ **XUNDL compilations** – on request by the coordinator – *presentation by B. Singh*
- ❑ **horizontal evaluation** “Configurations & Hindered Decays of K-Isomers in deformed nuclei with $A > 100$ ” – *presentation by F.G. Kondev*
- ❑ **IAEA-CRP** activities on medical isotopes & improving the ND for Auger emitters
 - ✓ decay data evaluations and targeted measurements (^{67}Cu , ^{178}Ta & ^{66}Ga)
 - ✓ collaboration with the ANU & U Surrey groups to address the ND deficiencies in the Auger data – *presentation by T. Kibedi*
- ❑ **computer programs development**
 - ✓ ported the main ensdf programs to OS X – available through NNDC and IAEA
 - ✓ IAEA meeting on ensdf code development - work on the ruler code and code that will assist evaluation of decay data – *presentation by T. Kibedi*
 - ✓ **xls2ens** compilation tool – allows a preparation of an ensdf data set from xls spreadsheet (with J. Chen – ANL/NSCL) – available through IAEA and NNDC

Nuclear Data Research Activities

Complement the evaluation activities – emphasis on Nuclear Structure physics and Astrophysics and their intersection with the applied Nuclear Physics

- ❑ at **ANL** - using Gammasphere & FMA – nuclei far from stability, spectroscopy of heavy and super-heavy nuclei, K-isomers, beta-delayed spectroscopy; *decay spectroscopy* of actinide nuclei and nuclei of importance to applications of medical isotopes and metrology
 - ✓ CARIBU – several approved proposals – beta-delayed gamma's and neutrons
 - ✓ MANTRA project – “Measurement and Evaluation of Actinide Neutron Cross Sections Relevant to Advanced Fuel Cycles via Accelerator Mass Spectroscopy” – first results obtained in March
- ❑ at **MSU** (Coulex & decay spectroscopy), **TRIUMF** (decay spectroscopy) & **RIKEN** (decay spectroscopy) – properties of neutron-rich nuclei far from the line of stability
- ❑ at **Australian National University** & **RCNP-Osaka** (isomers, astrophysics & medical isotopes physics); **Jyvaskyla University** (spectroscopy of SHE)
- ❑ at **IAEA** – new CRP on “Nuclear Data for Charged-particle Monitor Reactions & Medical Isotopes Production” - both data evaluation and measurements

Statistics ...

2013-2015

- ❑ **43** journal publications
- ❑ **13** refereed publications in conference proceedings
- ❑ **20+** presentations at international conferences & workshops, seminars & colloquiums

Active Collaborations

ANL-PHY, **LBNL**, **ORNL & UT**, **INL**, **NSCL (MSU)**, **TUNL/NC State**, **FSU**, **USNA**, **U. of Notre Dame**, **ARL**, **ANU**, **IAEA**, **CSNSM & INP-Orsay**, **IMP-Lanzhou**, **U. Sofia**, **RIKEN**, **RCNP-Osaka**, **U. Jyvaskyla**, **U. Delhi**, **U. Liverpool**, **U. Surrey**, **NPL**