

XUNDL status report

(Includes current papers on Atomic Masses)
(October 1, 2011 – Sept 30, 2012)

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Contributors

- **McMaster:** Michael Birch (*) (since March 2011),
Ervin Thiagalingam (*) (since March 2012),
Jun Chen (up to March 2012), Balraj Singh.
- **TUNL (A=2-20):** John Kelley, Grace Sheu, Jim Purcell
- **ANL:** Filip Kondev, Jun Chen (since April 2012),
William Murrey (*) (up to May 2012),
Joshua Modica (*) (since July 2012)
NP-A, PL-B, JP-G journals
- **NNDC, BNL:** Jagdish Tuli: XUNDL database management
- David Kulp (on NNDC contract)
- (*) Undergraduate student

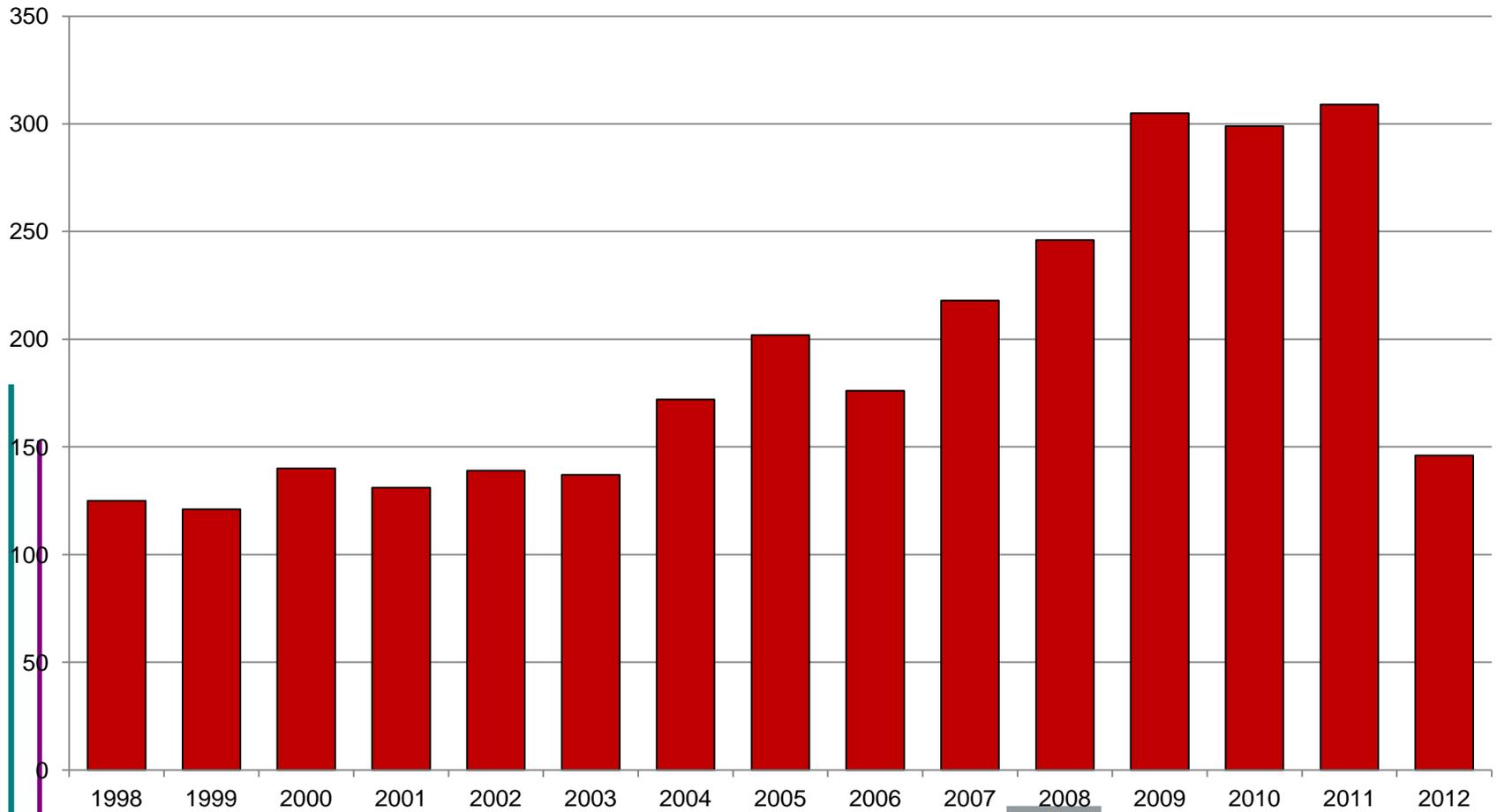


Current Contents of XUNDL

- Since the start in December 1998, **4965** compiled datasets added up to Oct 31, 2012.
In addition, many datasets updated for new papers from the same group/lab or data details received from the authors
(experimental nuclear structure data: reactions and decays)
- 2138 nuclides: ^1H to $^{294}118$, spread over 280 A-chains;
- From ~3200 primary journal articles published during 1995 – 2011, including (~90) new papers on mass measurements.
- ~600 communications with the original authors to resolve data-related problems and to obtain additional data details.
- 5 recent publications in PRL/PRC, details of data only in XUNDL



Papers/year



Journals covered and content

(journal web-pages regularly scanned at McMaster, ANL, TUNL)

Priority journals

- PR-C; PRL; PL-B;
EPJ-A; NP-A; JP-G

PR-C: 222 (~66.5%)

PRL: 52 (15.6%)

EPJ-A: 27

PL-B: 18

NP-A: 8

JP-G: 7

- Other journals /sources
Nucl Instr & Methods A
Acta Physica Polonica B
Chinese Physics Letters
Int. J. Modern Physics E
Bull. Russian Acad. Sci.
Physics of Atomic Nuclei
Applied Rad. & Isotopes
Chinese Physics C
arXiv- and other preprints.



Work during October 6, 2011 to October 31, 2012

- 592 datasets compiled from about 280 publications

McMaster: 466 + 42 (with David Kulp)

TUNL: 63

ANL: 21

- 18 existing datasets were updated at McMaster based on either new papers from previous authors/groups or for additional information received from the authors.



Most papers are compiled and entered in XUNDL database prior to their entry in NSR database.

M. Birch has written a code to replace temporary key-numbers with permanent ones.

As of Nov 2, 2012, about 30 current papers are being compiled.

Active communications with the authors continued throughout the year. Data details and corrections received for many papers. We feel that this type of timely communication helps both the data evaluators and researchers.



Example: Additional (useful) data

^{37}Ar : from $(^3\text{He},t)$: Gamow-Teller transitions: PRC 86, 024312 (Aug 27, 2012):
Numerical data for $\sigma(\theta)$ ratios obtained for 148 levels + several corrections

PHYSICAL REVIEW C 86, 024312 (2012)

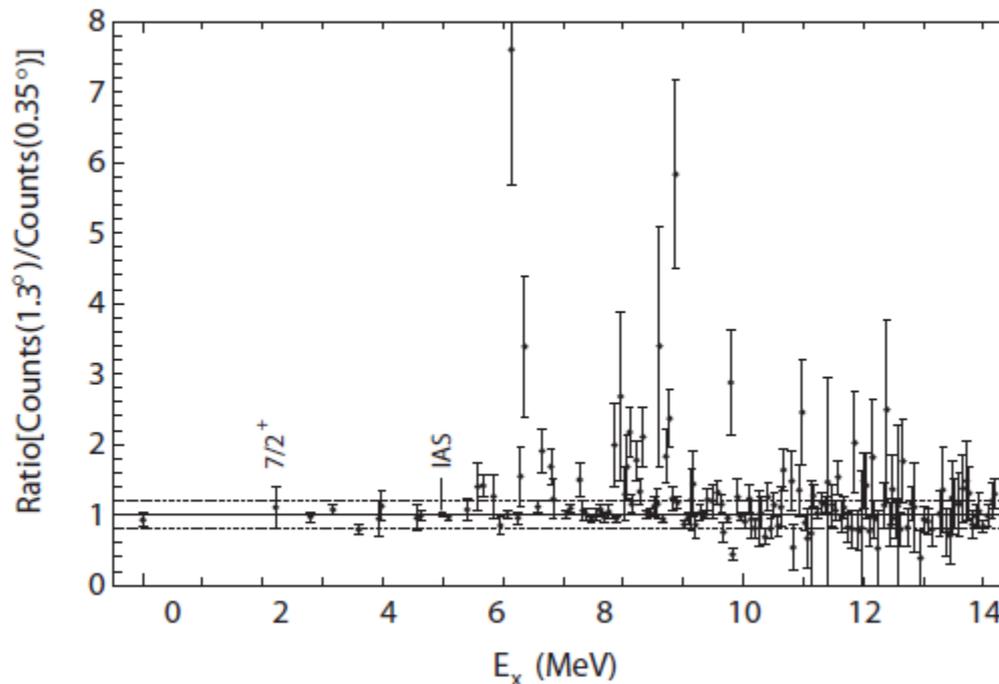


FIG. 5. Ratios of counts for scattering angles $\Theta = 1.0^\circ\text{--}1.5^\circ$ and $\Theta = 0.0^\circ\text{--}0.5^\circ$. The dotted lines show the 20% differences from unity.



Mammoth level schemes

PRC: Sept 2012: 460 gamma rays, 250 levels

J. GELLANKI *et al.*

PHYSICAL REVIEW C 86, 034304 (2012)

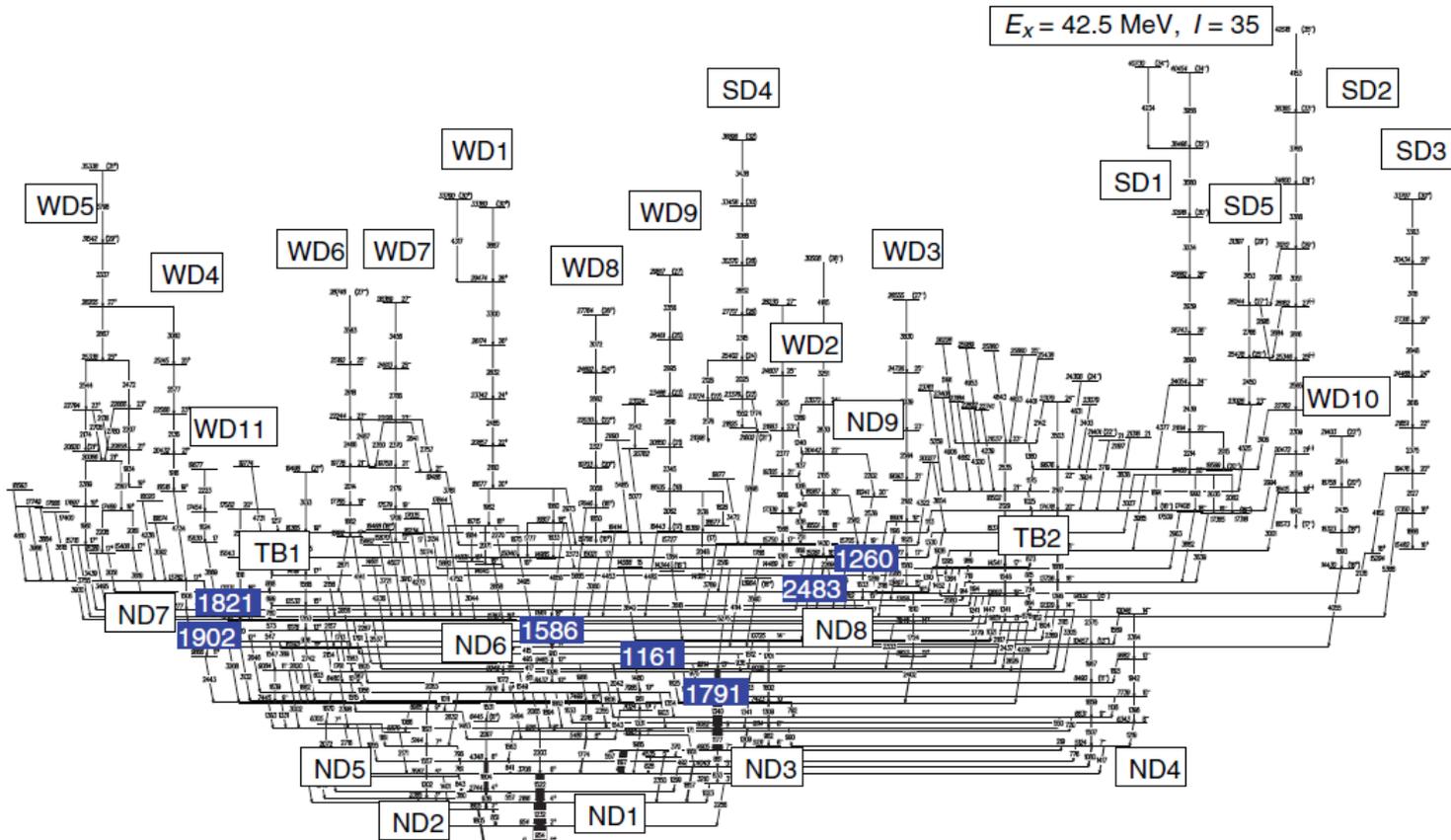


FIG. 1. (Color online) Overview of the proposed high-spin level scheme of ^{62}Zn . The structures are labeled according to the descriptions



Compilation of Atomic mass measurements

All mass measurement papers published from Nov 2011 to Oct 2012 have been compiled and dataset sent to **ORNL** for posting on www.nuclearmasses.org.

This file contains data from 19 primary papers and 195 data points, including pairs of mass differences and Q values for beta or double-beta decay

This work is done at McMaster, currently by Michael Birch and B. Singh.

