New NDS Production Programs

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Initial Work

- Between March 2007 and January 2008, Roy Zywina (former McMaster undergraduate student) worked on codes for band drawings for NDS; and general redesigning of NDS. This was in consultation with the USNDP and NSDD evaluators' network.
- The new band drawings aimed at better legibility and flexibility.
- The production program could also be distributed to evaluators.
- The code was written in Java, with incorporation of some codes written at NNDC.
- The code used a Graphical User Interface to create metapost files with band drawings.
- In January 2008, the codes were submitted by Roy, but they were not in finished form and could not be implemented directly.
- The codes were missing a number of things, such as a method of translating the ENSDF dictionary to readable text.

Band Drawings implemented

- In summer 2008, work was resumed on the band drawing code at McMaster.

- The band drawing codes were made workable by July 2008, but inserting them into the Nuclear Data Sheets produced by the NDS generating program process, required repagination of the final photoready copy of the complete manuscript for a mass chain submitted (by NNDC) to Elsevier Science.

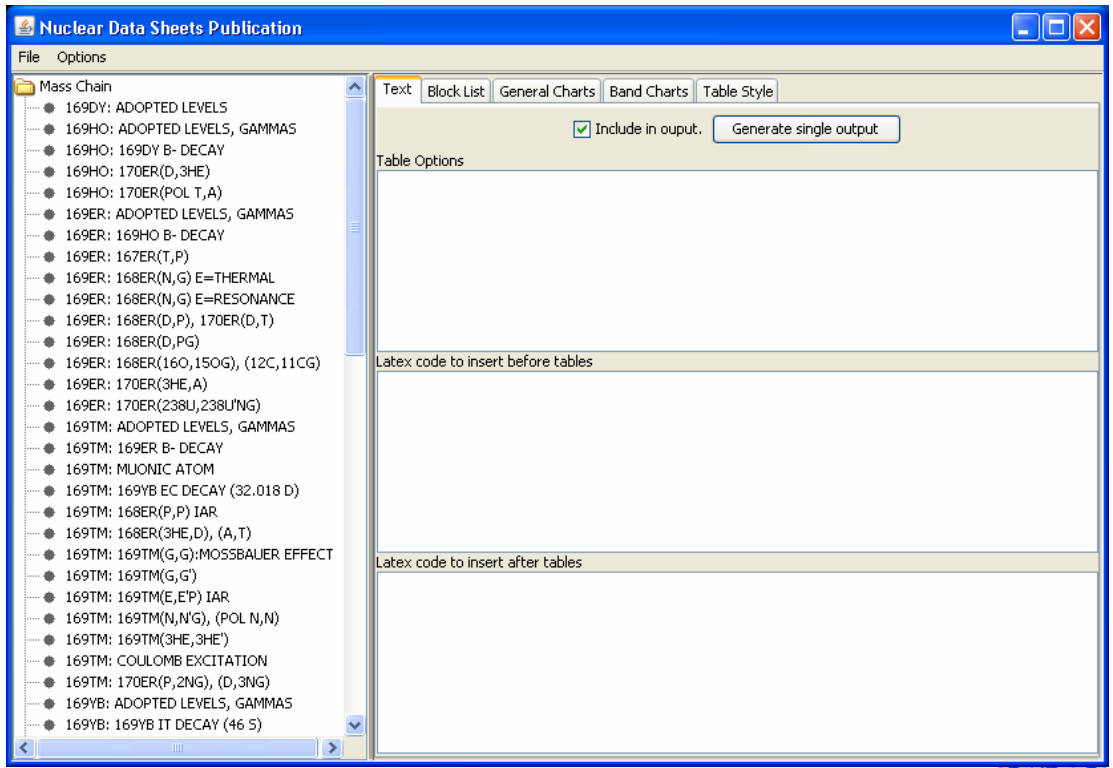
Band Drawing Production

- The band drawing creation programs are now available on the NNDC open ftp site.
- They require the Java jdk 6 or higher to run, which can be downloaded free from http://java.com/en/download/
- The programs produce output in *latex* and *metapost* formats, which must then be converted to a pdf file
- You can use any conversion method you like, one option is MikTeX 2.6 or higher, which is available free at http://miktex.org/Setup.aspx

Band drawing production process

- The user launches the program from the command prompt

•They can then select which dataset to process

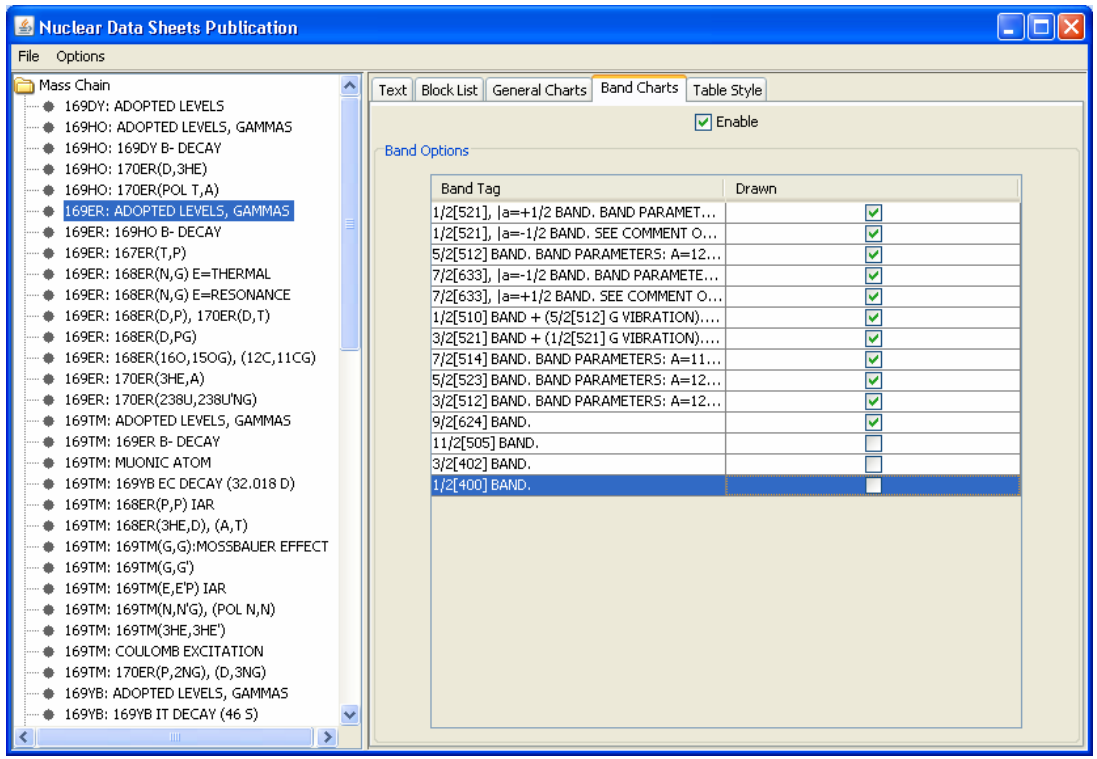


Band drawing production

- The user can then select which bands to include

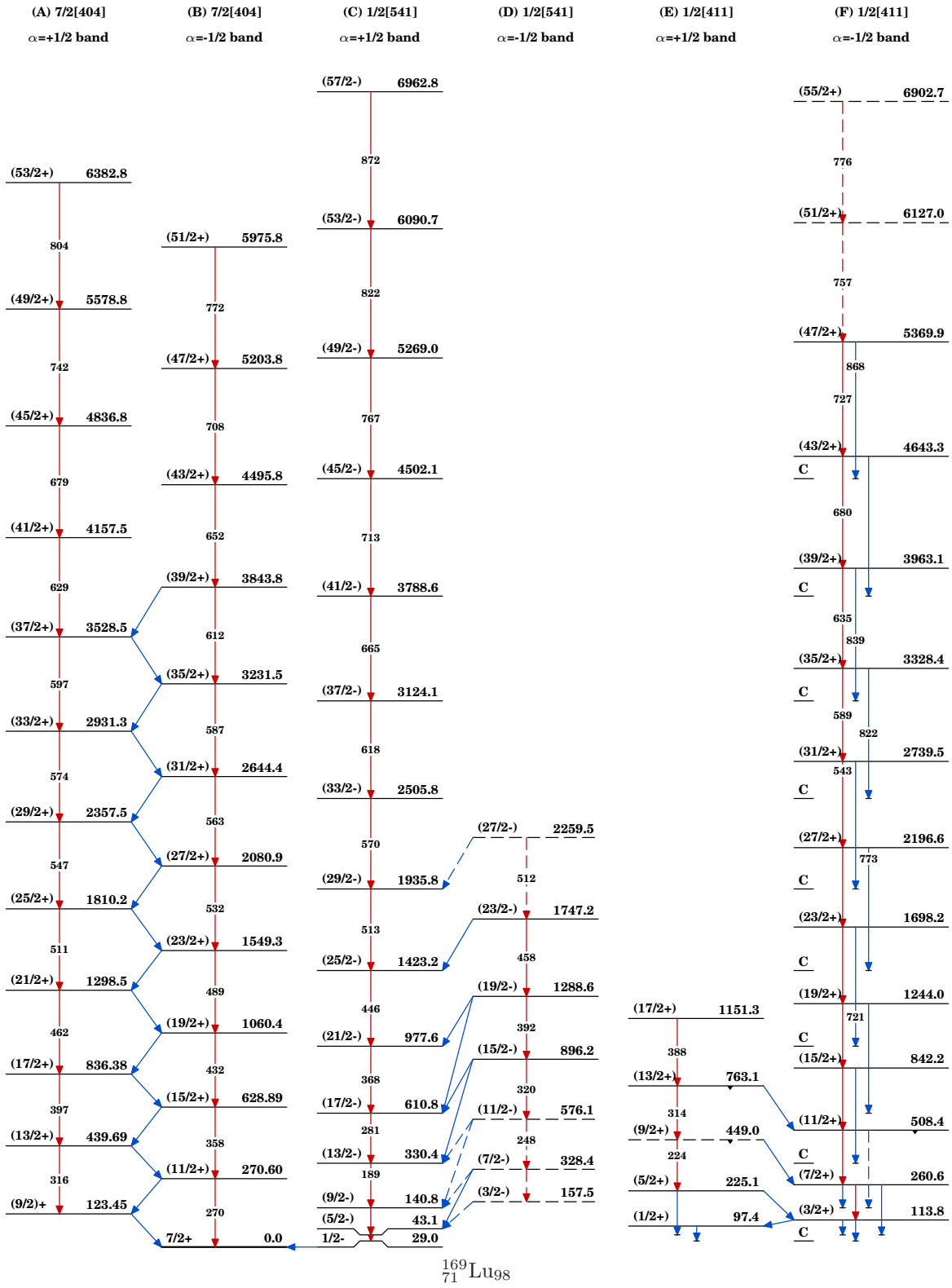
•Option for Landscape/portrait orientation

•Other options, such as custom band labels and custom width/height settings, are possible.

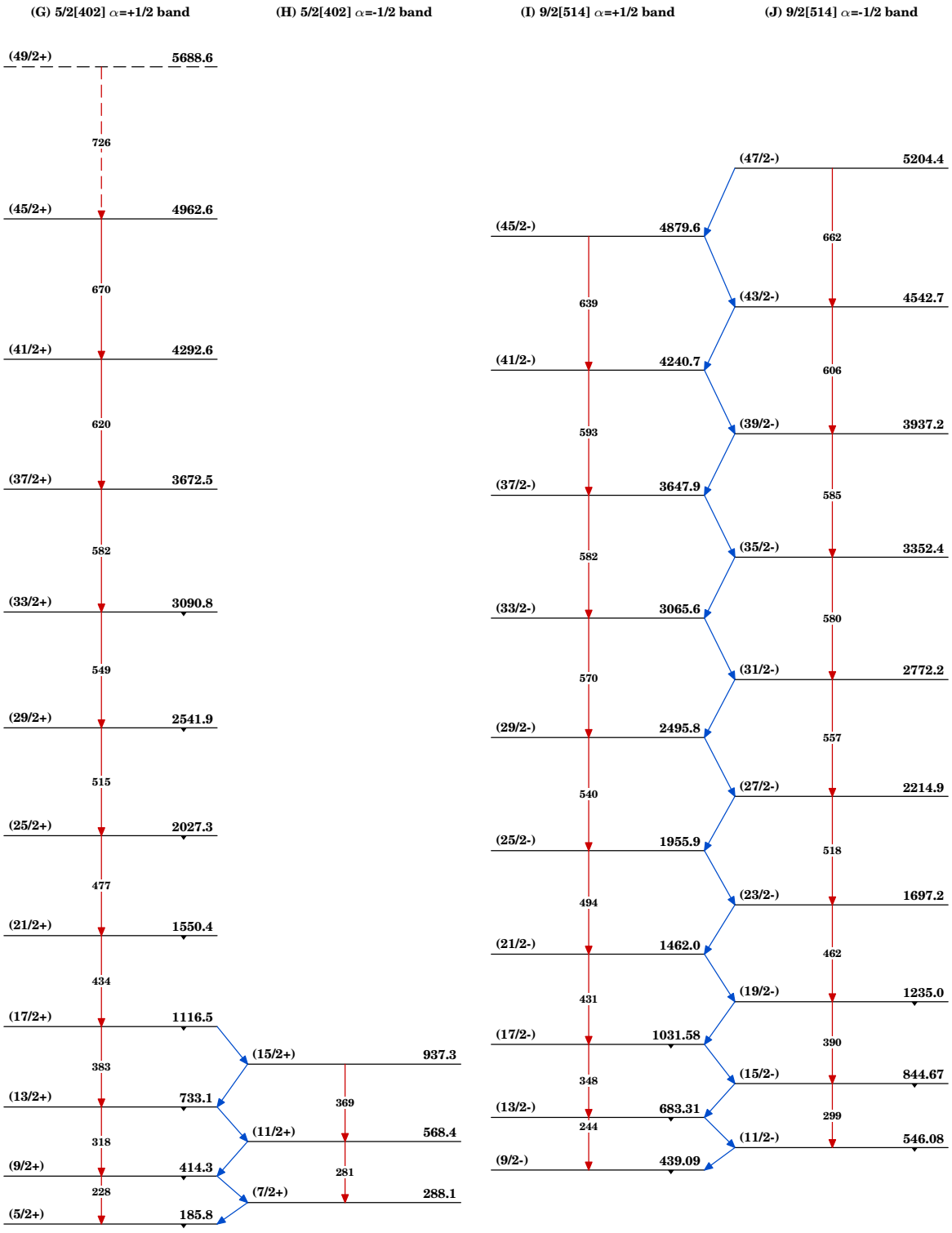


Batch band drawing production

- Alternatively, the program can be run on any operating system (*linux* or windows) from the command prompt.
- It scans every dataset, and produces band drawings for all of them.
- This compromises control over which bands to include/page orientation



NDS v. 109, p. 2003 (2008)



$^{169}_{71}Lu_{98}$

NDS v. 109, p. 2003 (2008)

Insertion into NDS

- The band drawings are initially output in latex format, so they must be converted to pdf.
- They can then be inserted into the photoready copy of a mass chain publication in NDS using Adobe Acrobat (Writer)
- The repagination (in three places on each page) of the whole file of an NDS publication is then performed using Adobe Acrobat 7 or higher.
- Another code does the bulk of this work, but some manual work is still involved

Repaginated file

Adopted Levels, Gammas (continued)

^{169}Er Levels (continued)

E(level)[†]	Jπ[‡]	XREF	Comments
860.12 *14*	(3/2+,5/2+)	CD	Jπ: primary γ from 1/2+ in (n,γ) E=thermal; 617γ to 7/2+ 244. Assignment as member of K–2 γ–vibration band built on 7/2[633], suggested by 1970Mu15 in ^{168}Er(n,γ), is questioned by 1985Lo19.
905 *5*	7/2+	B	Jπ: L=0 in ^{167}Er(t,p) on 7/2+ target.
930[§k] *3*	(9/2−)[b]	E GH	
941.04[l] *13*	(7/2)−	A E	Jπ: log *ft*=5.4 from 7/2−; 7/2− consistent with band assignment.
≈947[j]	(9/2−)[b]	E	
971 *5*	(+)	B	Jπ: L=(4) in ^{167}Er(t,p) on 7/2+ target.
990[§] *3*	(+)	B E	Jπ: L=(2) in ^{167}Er(t,p) on 7/2+ target.
999.1[g] *18*	(19/2+)	I	
1051[k] *5*	(11/2−)[b]	E	
1052[§l] *5*	(9/2−)[b]	E H	
1053.1	1/2−,3/2−	D	
1056 *5*		B	
1076[j] *5*	(11/2−)[b]	E	
1081.65[m] *22*	(3/2−)	CDE	Jπ: (E1) γ from 1/2+ in ^{168}Er(n,γ) E=resonance; 3/2− consistent with band assignment.
1085 *5*		B	
1094.36 *11*	1/2−,3/2−	CDE	
1113[#] *5*		B e	XREF: e(1116).
1117.35 *25*	(3/2−)	C e	XREF: e(1116). Jπ: dipole γ from 1/2+ in ^{168}Er(n,γ) E=thermal; possible γ to (7/2)−.
1119 *5*		E	
1137 *5*	(+)	B	Jπ: L=(4) in ^{167}Er(t,p) on 7/2+ target.
1142.8 *6*	1/2,3/2[c]	C	
1145.17[m] *23*	(5/2−)[b]	C E	
1150[n] *20*	(13/2+)	G	Jπ: based on relative population strengths in ^{168}Er(^{16}O,^{15}Oγ) and ^{168}Er(^{12}C,^{11}Cγ); 13/2+ consistent with band assignment.
1186[l] *5*	(11/2−)[b]	E	
1186.3[h] *19*	(21/2+)	I	
1215 *5*		E	
1221 *5*	(+)	B	Jπ: L=(2) in ^{167}Er(t,p) on 7/2+ target.
1229[§m] *5*	(7/2−)[b]	E H	
1237.1[e] *18*	19/2−	I	
1238[§] *4*		B E	
1276[§] *4*		B E	
1280.0[d] *18*	21/2−	I	
1296 *5*		B	
1341[m] *5*	(9/2−)[b]	E	
1360.10 *19*	1/2(+)	C E	Possibly two levels (E(level)=1360 *5* in (d,t), E(level)=1364 *5* in (d,p)). Jπ: D γ from 1/2+ in ^{168}Er(n,γ) E=thermal; absence of population in ^{168}Er(n,γ) E=resonance and absence of decay to 5/2− states suggest 1/2+.
1386.98 *15*	1/2−,3/2−	CDE	
1394[§o] *5*	(11/2−)[b]	E H	

Proposed Table production codes

- At the start of the summer, the codes contained some table production capacity
- More codes have been written over the summer to a produce a new format of table of levels and radiations. Aim is better legibility and use of more modern programming techniques.
- Having one code which generates the tables and all the drawings will be desirable, and we feel that it should be pursued in the future.