

# Covariance Web Interface at NNDC

*Ramon Arcilla Jr.  
National Nuclear Data Center  
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SIXTY YEARS  
OF DISCOVERY  
1947-2007

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# Why a Web Page?

- Quick glance of available covariances in the 4 major libraries: ENDF/B-VI.8, ENDF/B-VII.0, JEFF-3.1 and JENDL-3.3
- Easy-to-use interface for viewing plots of relative uncertainties and correlation matrices of the processed covariances
- Accessible anywhere in the Internet (World Wide Web)



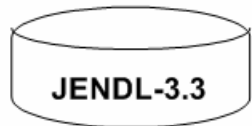
# Covariance Web Page

- Coverage: Contains only plots for
  - Relative uncertainty vs. energy
  - Correlation matrix
  - 4 Major Libraries
    - ENDF/B-VI.8 (47 materials)
    - ENDF/B-VII.0 (26 materials)
    - JEFF-3.1 (37 materials)
    - JENDL-3.3 (20 materials)
  - 2 Group Structures per Material
    - 44-group
    - 187-group



# Processing Flow

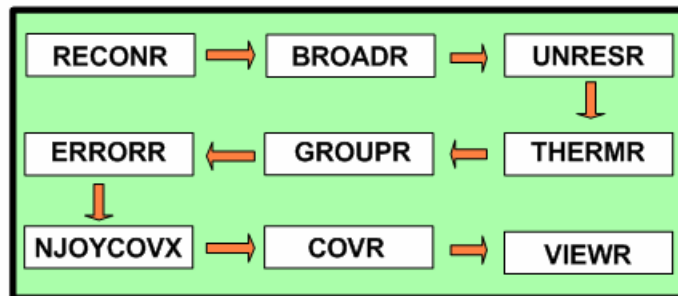
Neutron Sublibrary  
Materials with  
Covariance Data



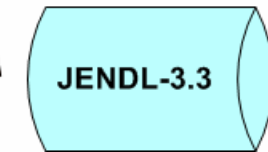
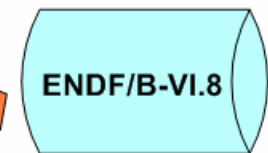
NJOY-99.161

+

ERRORR (10/02/2007 version)



Processed  
Covariance Data  
and Plots



# Covariance Web Page

## Where to find it?

1

2

3

**Search the NNDC:**

**ENDF B-VII.0**  
Evaluated Nuclear Data File

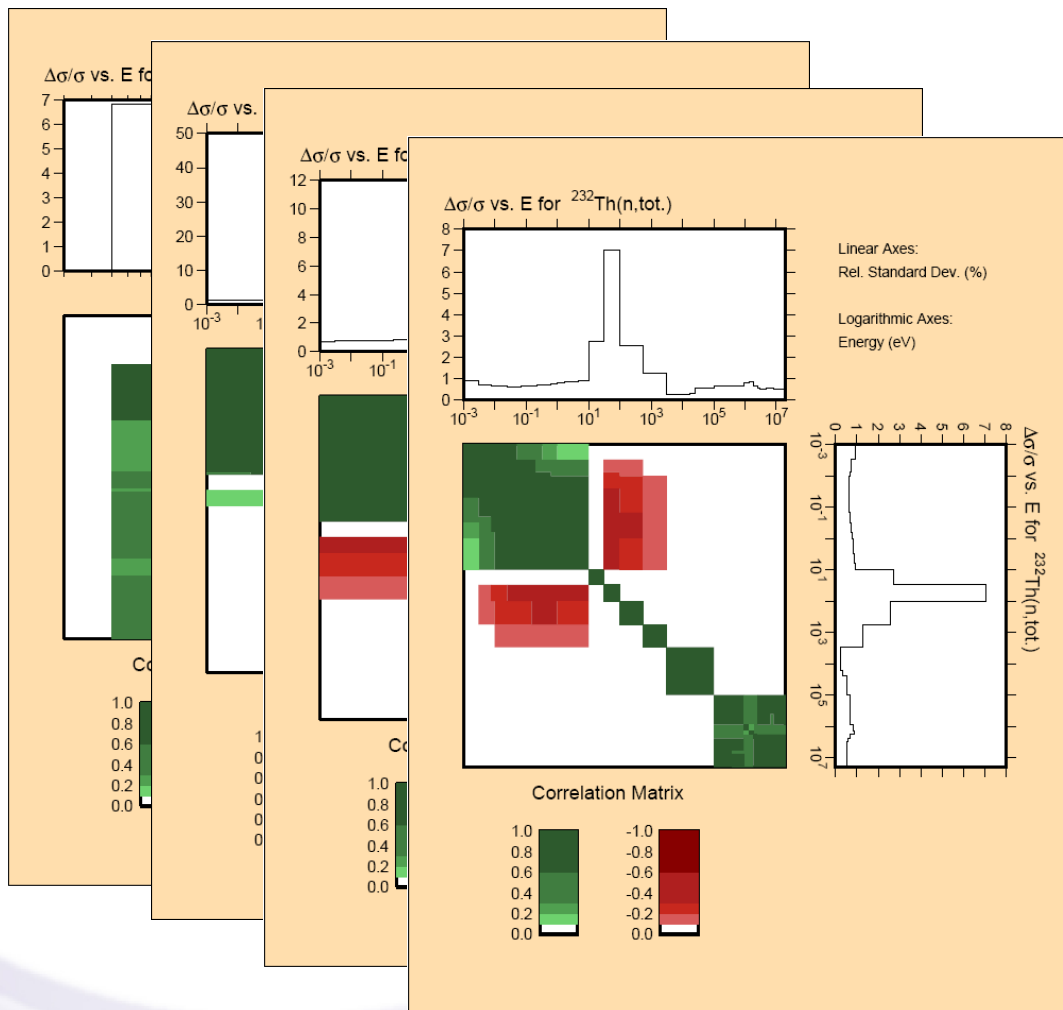
### Covariance Data Processing and Plots

Covariance data in ENDF/B-VI.8 (47 materials), ENDF/B-VII.0 (26 materials), JEFF-3.1 (37 materials) and JENDL-3.3 (20 materials) were processed using ERRORJ-2.3 (patched version) which is currently being reintegrated into NJOY. Processing was performed on NNDC's Linux Cluster using the 44- and 187-group energy structures and the constant-flux weighting function. The table below presents the plots (in Acrobat format) generated under each library. Please note that a shaded cell in the table indicates that the material in the pertinent library does not contain covariance data.

No.	Material	ENDF/B-VI.8 (2001)		ENDF/B-VII.0 (2006)		JEFF-3.1 (2005)		JENDL-3.3 (2002)	
		44-Group	187-Group	44-Group	187-Group	44-Group	187-Group	44-Group	187-Group
1	H-1							(4 plots)	(4 plots)
2	H-3					(6 plots)	(6 plots)		
3	Li-6			(1 plot)	(1 plot)				
3	Li-7	(24 plots)	(24 plots)	(24 plots)	(33 plots)				
4	Be-9					*	*		
6	B-10			(5 plots)	(5 plots)			(15 plots)	(15 plots)
7	B-11							(4 plots)	(4 plots)
8	C-nat	(35 plots)	(36 plots)			(35 plots)	(35 plots)		
9	O-16							(40 plots)	(40 plots)
10	F-19	(34 plots)	(37 plots)	(10 plots)	(10 plots)	(34 plots)	(34 plots)		
11	Na-23	(78 plots)	(91 plots)	(4 plots)	(4 plots)			(38 plots)	(38 plots)
12	Si-nat	(22 plots)	(22 plots)						
13	Si-28	(39 plots)	(39 plots)						
14	Si-29	(37 plots)	(37 plots)						
15	Si-30	(37 plots)	(37 plots)						
16	Ti-46	*	*			(43 plots)	(47 plots)		
17	Ti-47	*	*			(42 plots)	(48 plots)		
18	Ti-48	*	*	(7 plots)	**	(39 plots)	(42 plots)	(8 plots)	(8 plots)

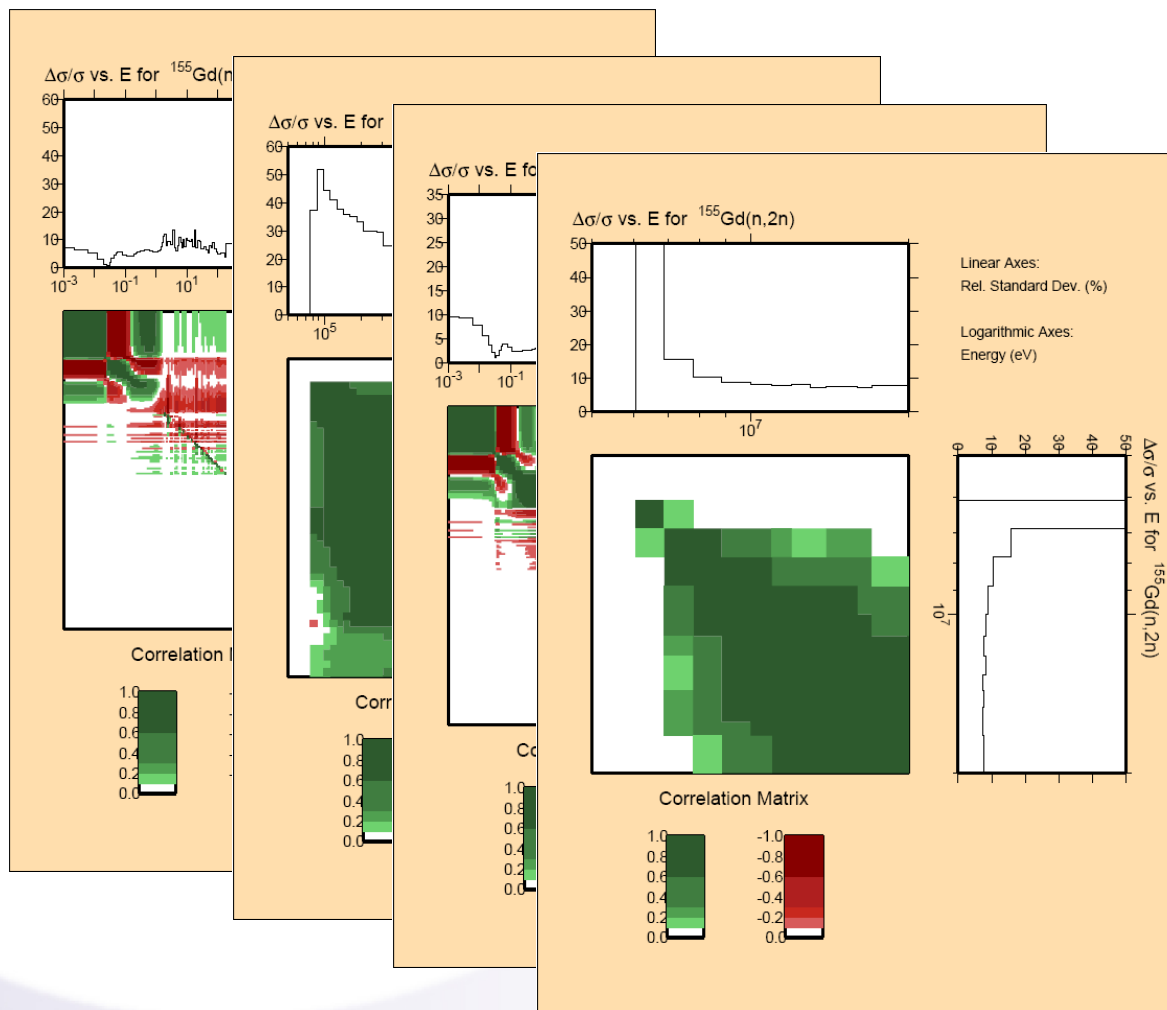
# Covariance Web Page

## Sample Plot: $^{232}\text{Th}$ , 44-group (ENDF/B-VII.0)



# Covariance Web Page

## Sample Plot: $^{155}\text{Gd}$ , 187-group (ENDF/B-VII.0)



# Some Processing Issues

- ERRORR (10/02/2007 version) could process MF=34,35 but COVR could not  
Result: No plots for MF=34,35  
e.g. U-235 in JENDL-3.3
- ERRORR cannot process MT > 870  
e.g. Be-9 in JEFF-3.1
- Some materials crashed GROUPT  
e.g. Si-28 in JEFF-3.1



# Conclusion

- Benefits:
  - Quick and easy to build (no programming)
  - Simple to use (“Point-and-Click”)
- Deficiencies:
  - Selective viewing of plots not available  
(Capability will be provided in SIGMA 2008)
  - Incomplete: some materials could not be processed successfully

