Where are we now? Paper and release status update

G.P.A. Nobre[1]

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Nuclear Data Week - CSEWG Meeting
November 17th, 2023

Outline

- ENDF/B library and infrastructure
- “Big Paper”
- ENDF/B-VIII.1 release status
  - Beta releases
  - What to expect for Beta3
- Release timeline

ENDF/B-VIII.1 release

The next release of the ENDF/B library is scheduled for **February* 2024!**

Although technically “minor”, it will have major impact.

- Why **VIII.1** and not **IX**?
  - There are no planned updates of the standards library for this release
  - Standards are well-stablished cross sections, in specific energy ranges, used in ratios with other measurements
  - However, many, many important and impactful changes are on the way!!
- Next release will be in both legacy **ENDF-6** format and **GNDS-2.0**
- Will have an accompanying **“Big Paper”**
- Implemented review system: Multiple VIII.1 Beta versions have been released
- Preliminary validation indicate that this will be the best-performing library ever!

ENDF/B VIII.1-β2

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*More on this later on the talk

What to expect when expecting…
… the ENDF/B-VIII.1 release

Neutrons:

- Many INDEN contributions
- Actinides:
  - ^{239}**Pu**: multi-institution effort, with important updates to fission, nubar, PFNS, capture, URR, RRR, (n,2n)
  - ^{235}**U**: resonances, nubar, covariances,
  - ^{238}**U**: resonance update to improve performance on depletion benchmarks
  - ^{240,241}**Pu**: work in concert with changes in ^{239}Pu and ^{238}U to recover burnup performance
- Stainless steel & other structure materials:
  - ^{54,56,57}**Fe**: Corrects leakage deficiency from ENDF/B-VIII.0
  - ^{50,52,53,54}**Cr**: Thorough re-evaluation, impact in criticality and leakage benchmarks
  - ^{206,207,208}**Pb**: complete evaluations (RPI/LANL)
  - ^{63,65}**Cu**: improved performance
  - ^{55}**Mn**: Gamma spectra
  - ^{28,29,30}**Si**: resonance evaluations
- Others:
  - ^{6}**Li**, ^{9}**Be** (LANL)
  - ^{234,236}**U** (LANL)
  - ^{140,142}**Ce** (ORNL)
  - ^{103}**Rh** (RPI/IRSN)
  - ^{86}**Kr** (BNL)
  - ^{181}**Ta** (RPI/ORNL/LANL)
  - ^{95}**Mo** (IRSN/LANL)
  - Many, many, many more…

What to expect when expecting the ENDF/B-VIII.1 release

TSL:

- 70+ new updated/files
- **Polystyrene**, **zirconium hydride**, **UC**, **UN**, **UO_2**, **sapphire**, **lucite**, **FLiBe**, **etc…**
- Fuel materials with different enrichments
- So many new evaluations that we had to re-think how to identify them.
- Low-temperature extrapolations to light water
- Community-wide review and validation

Fission Yields:

- Many fixes

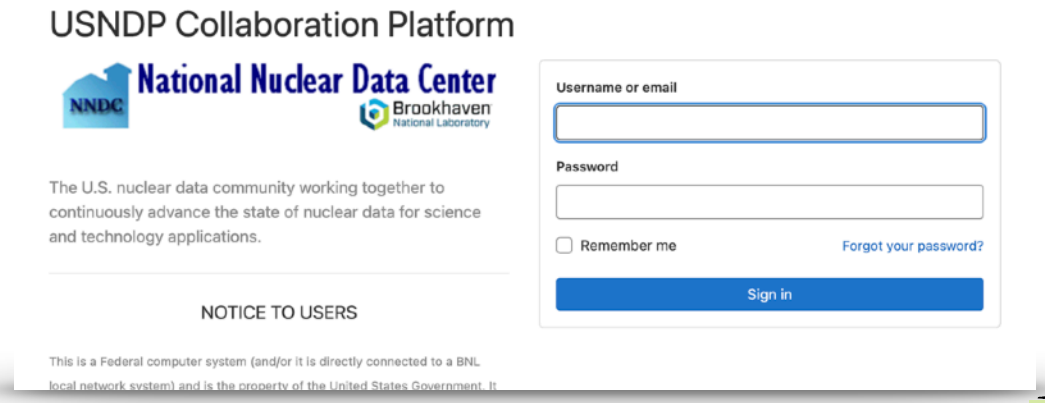
Photo-nuclear:

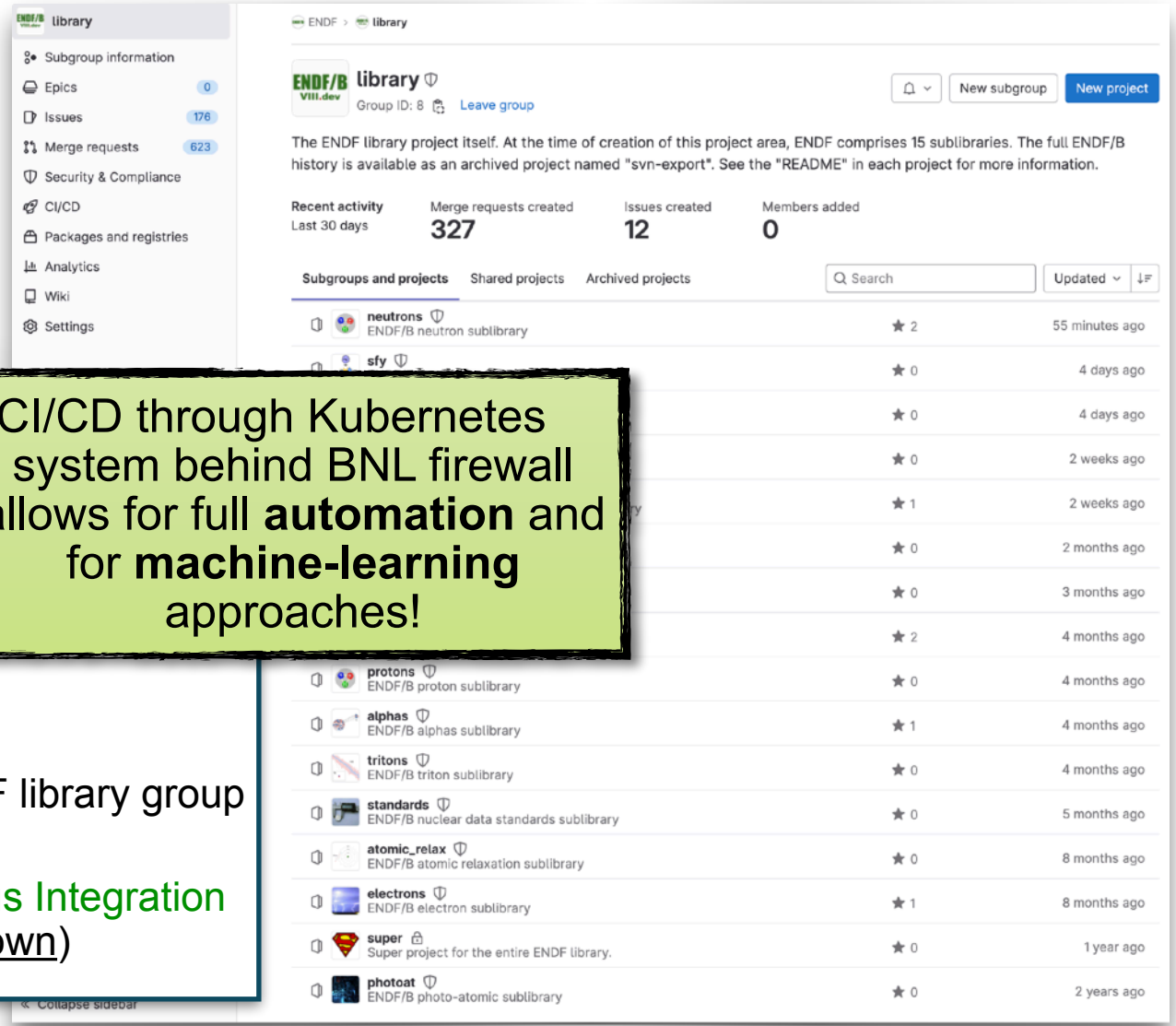
- **200+** updates coming from IAEA CRP

Charged particles:

- A few improvements and fixes

ENDF versioned repository: GitLab

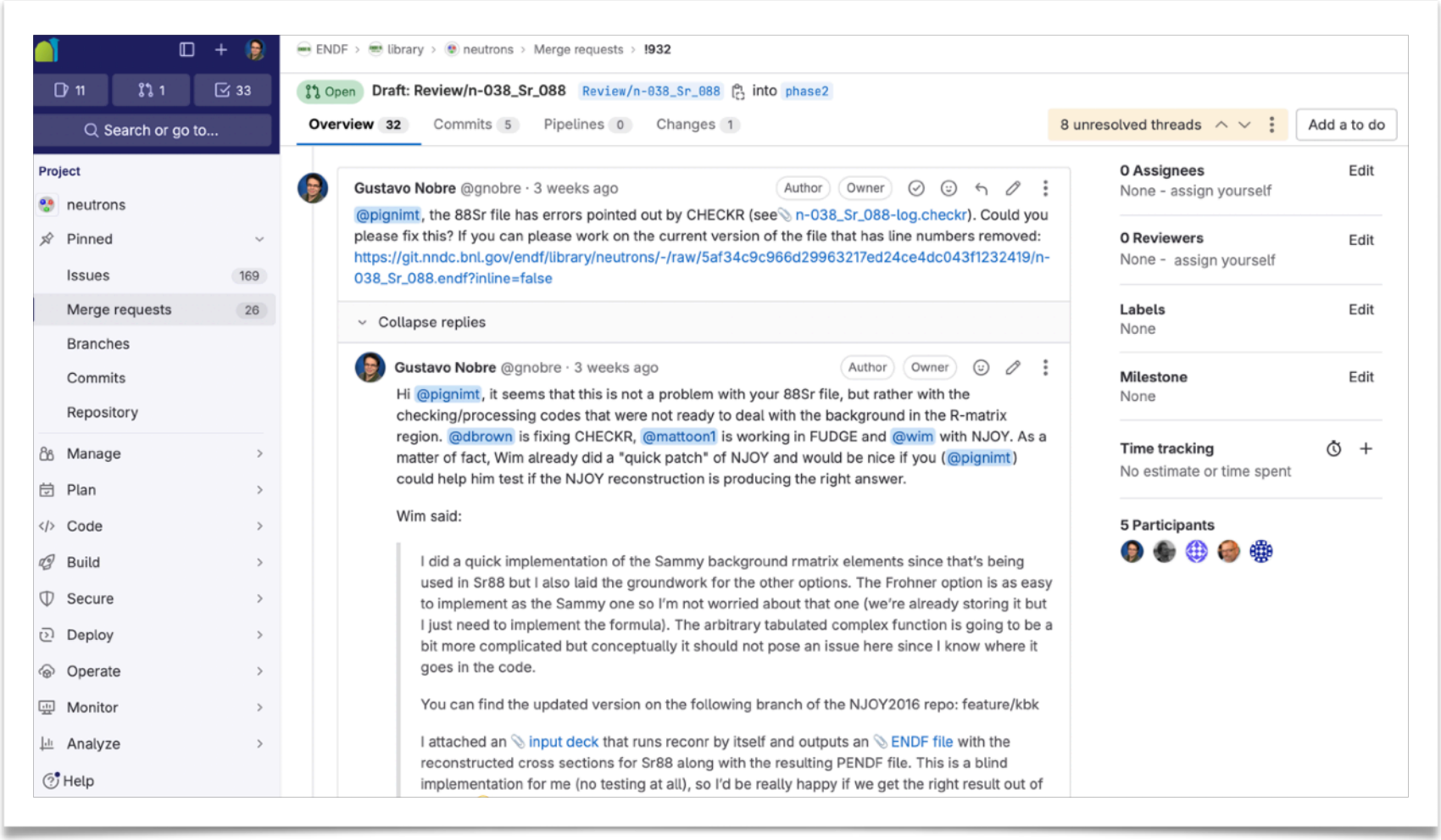




- Constantly updated and maintained
- Keeps track of
  - Any changes
  - Development, review and release branches
  - Issue trackers
  - etc…
- Usage is growing! Currently ~60 active members in ENDF library group (unfortunately there's a seat limit)
- Integration of library repository in GitLab with a Continuous Integration system: **ADVANCE** (R. Arcilla, R. Coles, B. Shu, D. Brown)

CI/CD through Kubernetes system behind BNL firewall allows for full **automation** and for **machine-learning** approaches!

Showcase example: ^{88}Sr review



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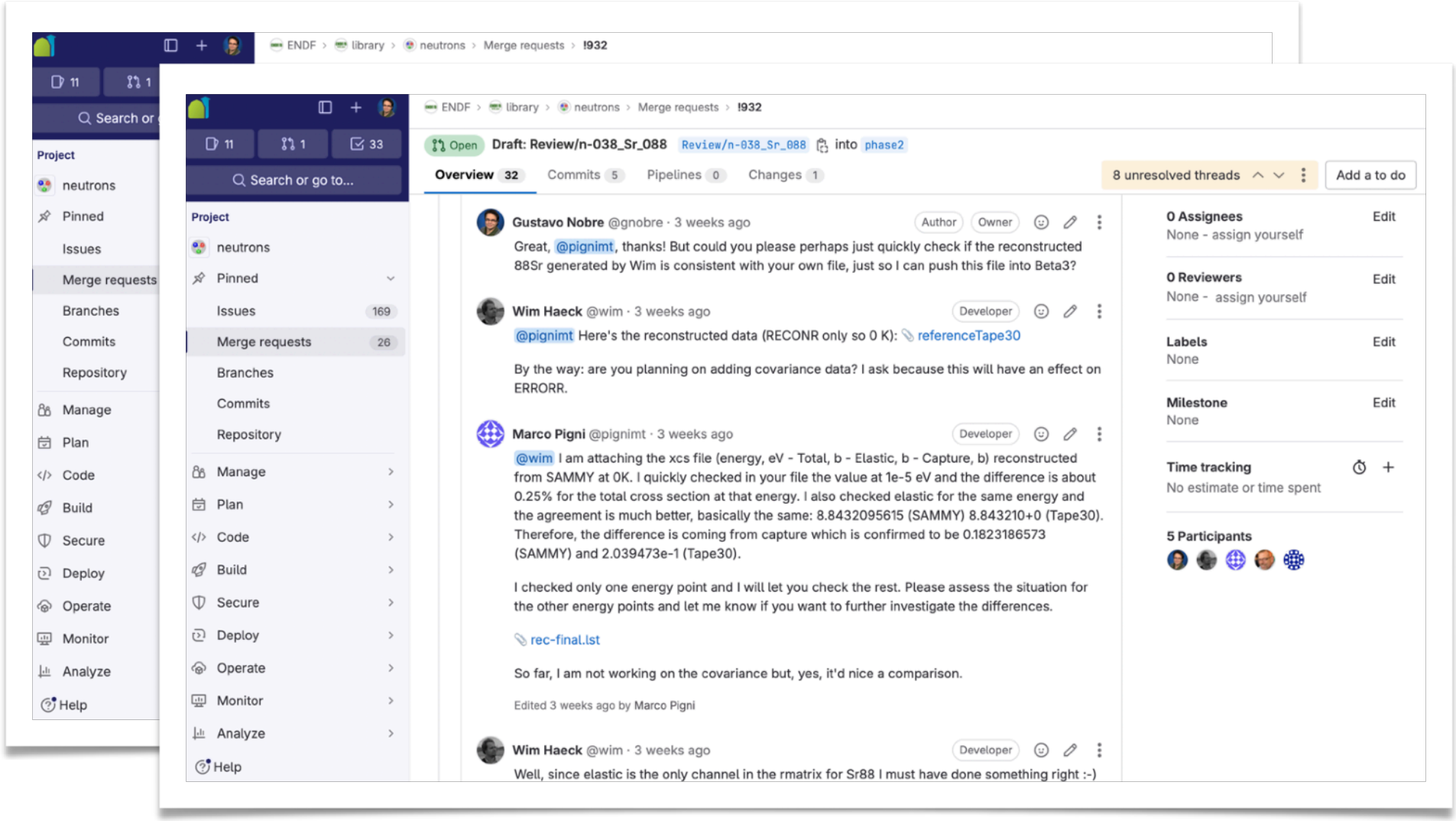

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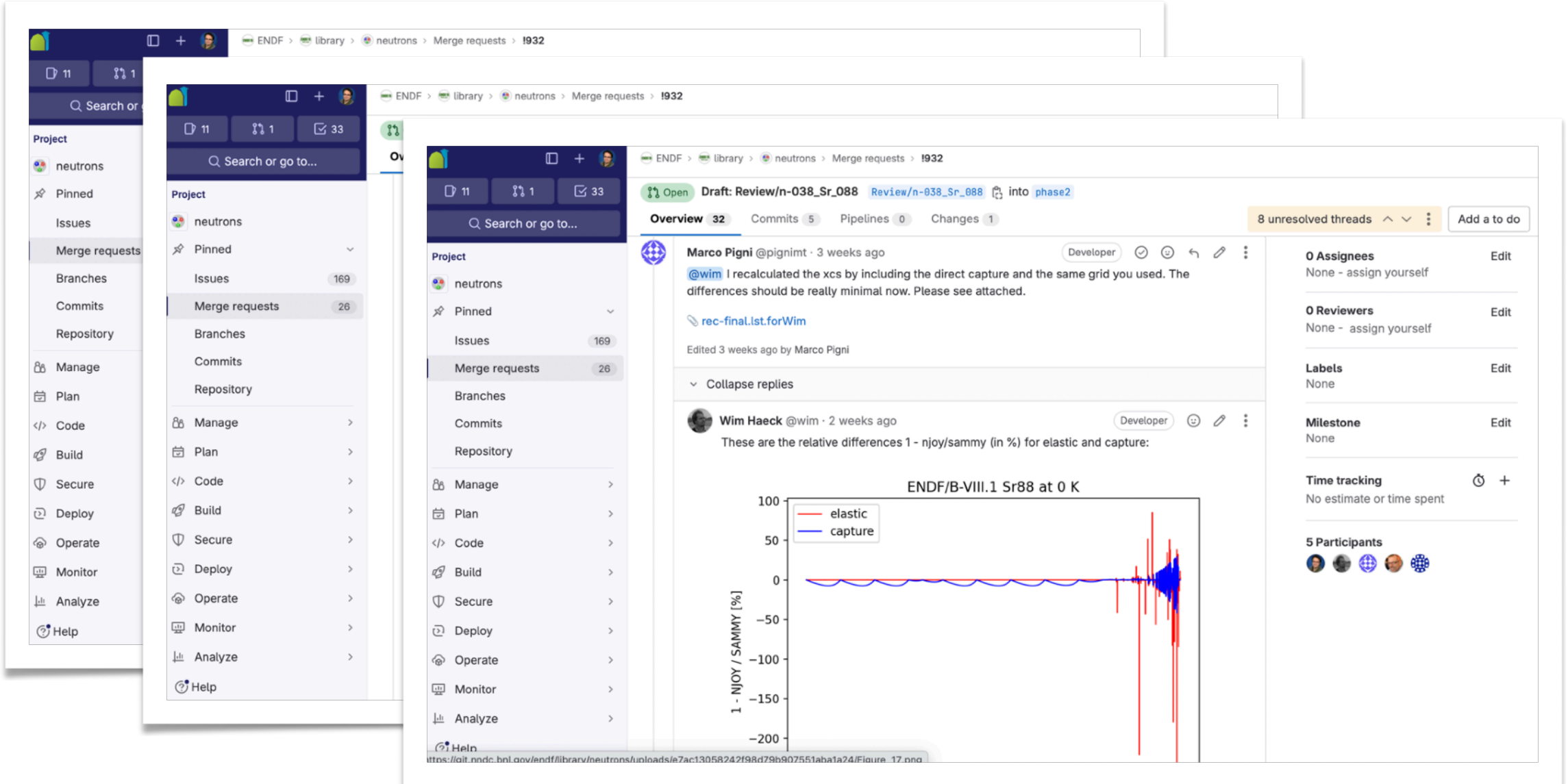

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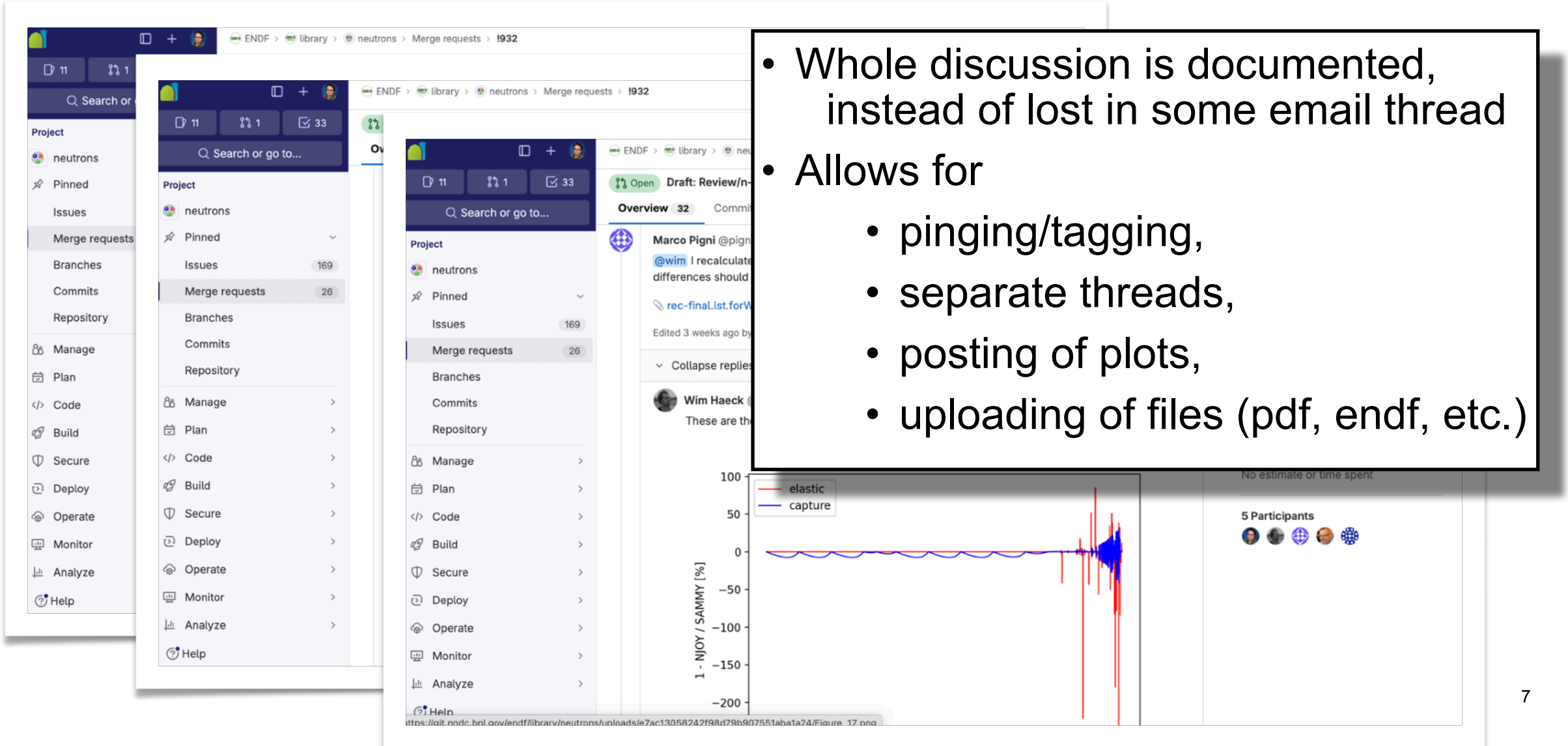


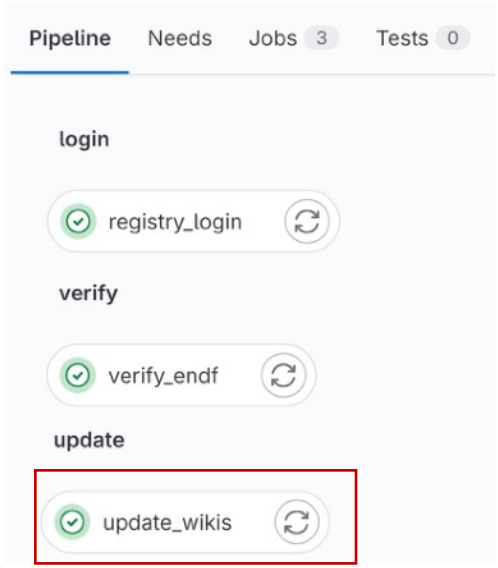
- Whole discussion is documented, instead of lost in some email thread
- Allows for
  - pinging/tagging,
  - separate threads,
  - posting of plots,
  - uploading of files (pdf, endf, etc.)

ENDF Repo Auto-updating Wikis

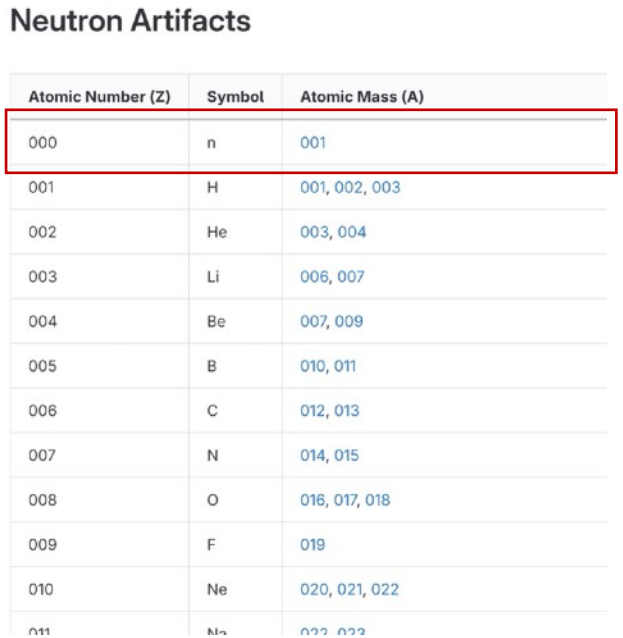
A new job is being added to GitLab ENDF repositories to auto-update the repo's wiki with useful information about job and artifact status.

Example: https://git.nndc.bnl.gov/endf/library/neutrons/-/wikis/Neutron-Artifacts

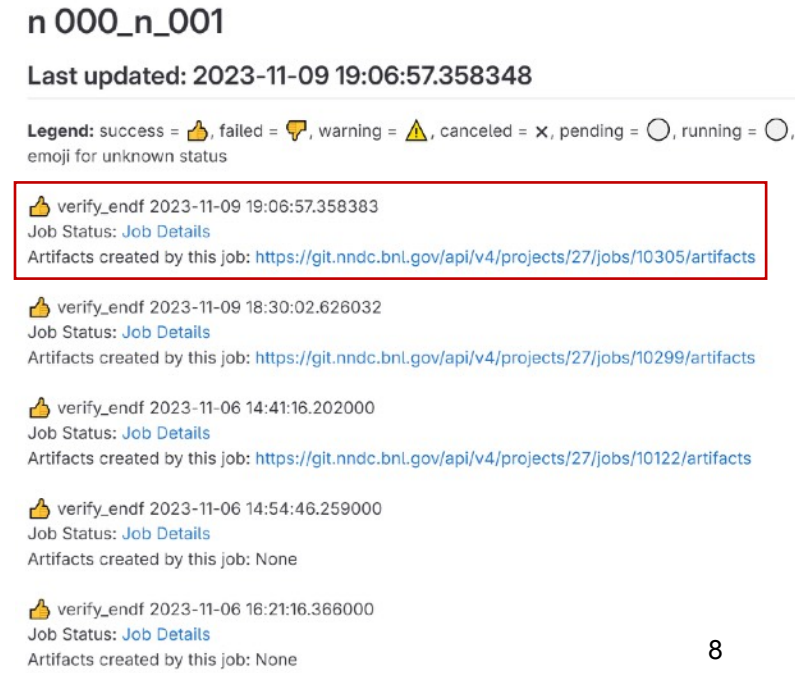
1) update_wikis job runs after verify_endf



2) Use Wiki table of contents to find your data



3) Enjoy a record of job and artifact data all in one place



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Status of Big Paper

*“I don’t want to make someone very happy at the expense of somebody else’s frustration. My goal is to make everyone **mildly** happy!”*

Author list

*“I don’t want to make someone very happy at the expense of somebody else’s frustration. My goal is to make everyone **mildly** happy!”*

Author list

- Pro-actively worked to converge to a fair consensus
- Iterated with CSEWG Executive Committee and points of contact in all collaborating institutions
    - Author name
    - Short, “one-sentence” contribution
- Divided in tiers:
    - Tier 0: library manager
    - Tier 1: Primary contributors (ordered by number/size/impact of contributions)
    - Tier 2: CSEWG Executive Committee not directly involved in other activities (alphabetically)
    - Tier 3: General contributors (alphabetically)
- Collected feedback from Executive Committee and fine-tuned
- We have a first version of the list. If there are any strong feelings, please contact me!

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FIXME: Full title of ENDF/B-VIII.1 paper

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(Dated: November 15, 2023; Received xx Month 2023; revised received xx Month 2023; accepted xx Month 2024)

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Big Paper updates

- Many contributions have been sent but there are still gaps that will be addressed after CSEWG Meeting
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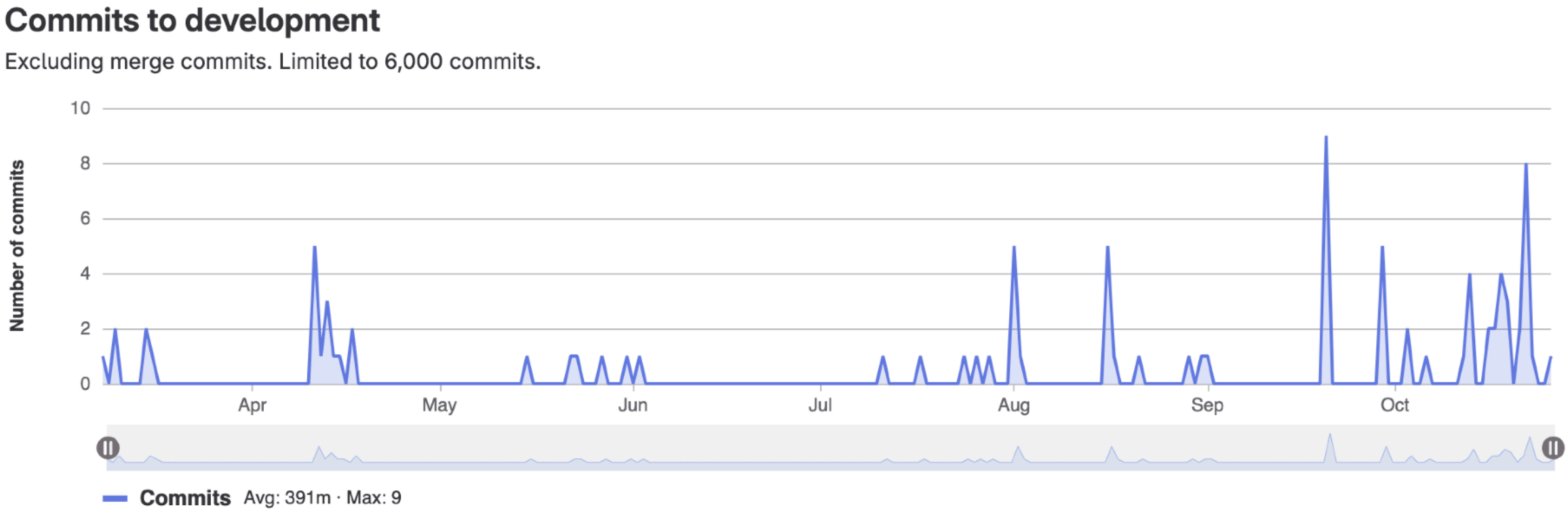
- Defined preliminary full list and ordering
- Aiming to have a complete manuscript soon



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Request to authors:

- **Review** current version of draft
  - GitLab
  - Ask Gustavo (gnobre@bnl.gov)
- If you contributed something to VIII.1 and it's not there, it means you're **overdue!**
  - Please commit or send your text over
  - Please don't make me hunt you down

Note: sections may shift around as the manuscript takes a complete form. Don't worry about it, I'll find a spot for your contribution. (*If* I receive it.)

Automated pipeline to build paper

Sep 29, 2023

Added template files for the text on exit distribution work.
Gustavo Nobre authored just now

7d6f080a

Sep 29, 2023

Added template files for the text on exit distribution work.
Gustavo Nobre authored 3 minutes ago

7d6f080a

Once pipeline is complete, click here!

Commit 7d6f080a authored 6 minutes ago by **Gustavo Nobre**

Browse files | Options

Added template files for the text on exit distribution work.

parent 024c758f

Branches development

No related merge requests found

Pipeline #5248 passed with stage in 1 minute and 47 seconds

Changes 4 | **Pipelines 1**

Status	Pipeline	Created by	Stages
passed 00:01:47 4 minutes ago	Added template files for the text on ex... #5248 development 7d6f080a latest		

Then, click here to download full pdf!

FIXME: Full title of ENDF/B-VIII.1 paper

Author One,[1,*] Author Two,[2] and Author Three[3,4]

[1]Institution 1
[2]Institution 2
[3]Institution 3
[4]Institution 4

(Dated: September 29, 2023; Received xx Month 2023; revised received xx Month 2023; accepted xx Month 2024)

FIXME: This is the abstract! Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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* Corresponding author: corresponding.author@anl.gov

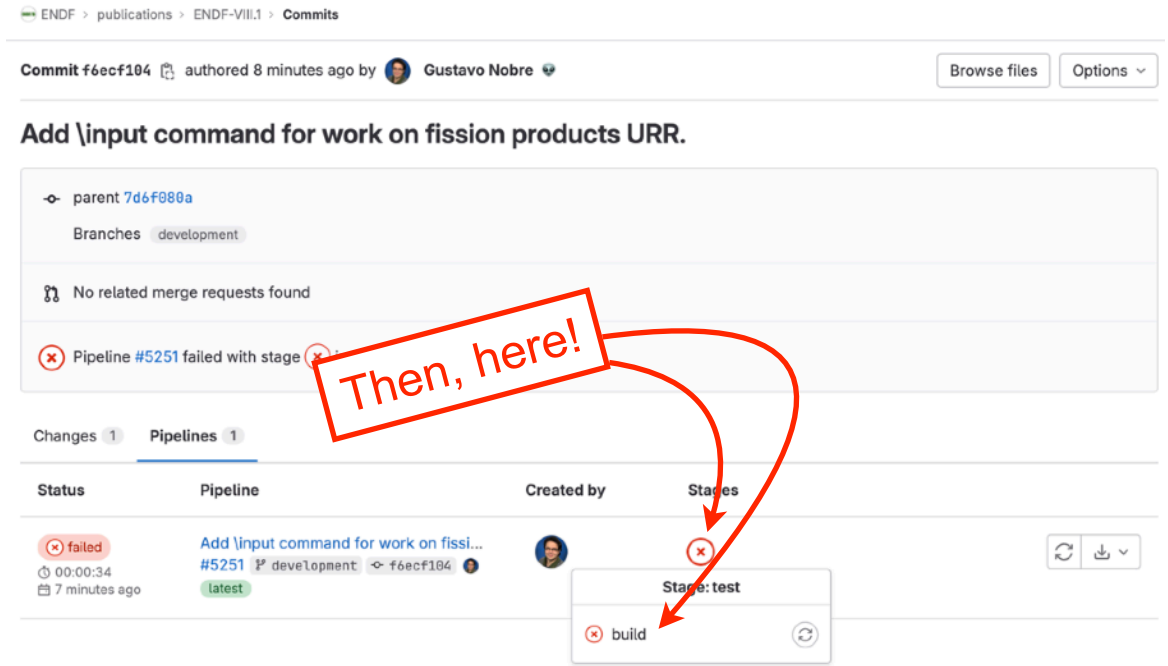
If it fails…

Sep 29, 2023

Add \input command for work on fission products URR.
Gustavo Nobre authored 1 minute ago

Click here!

f6ecf104



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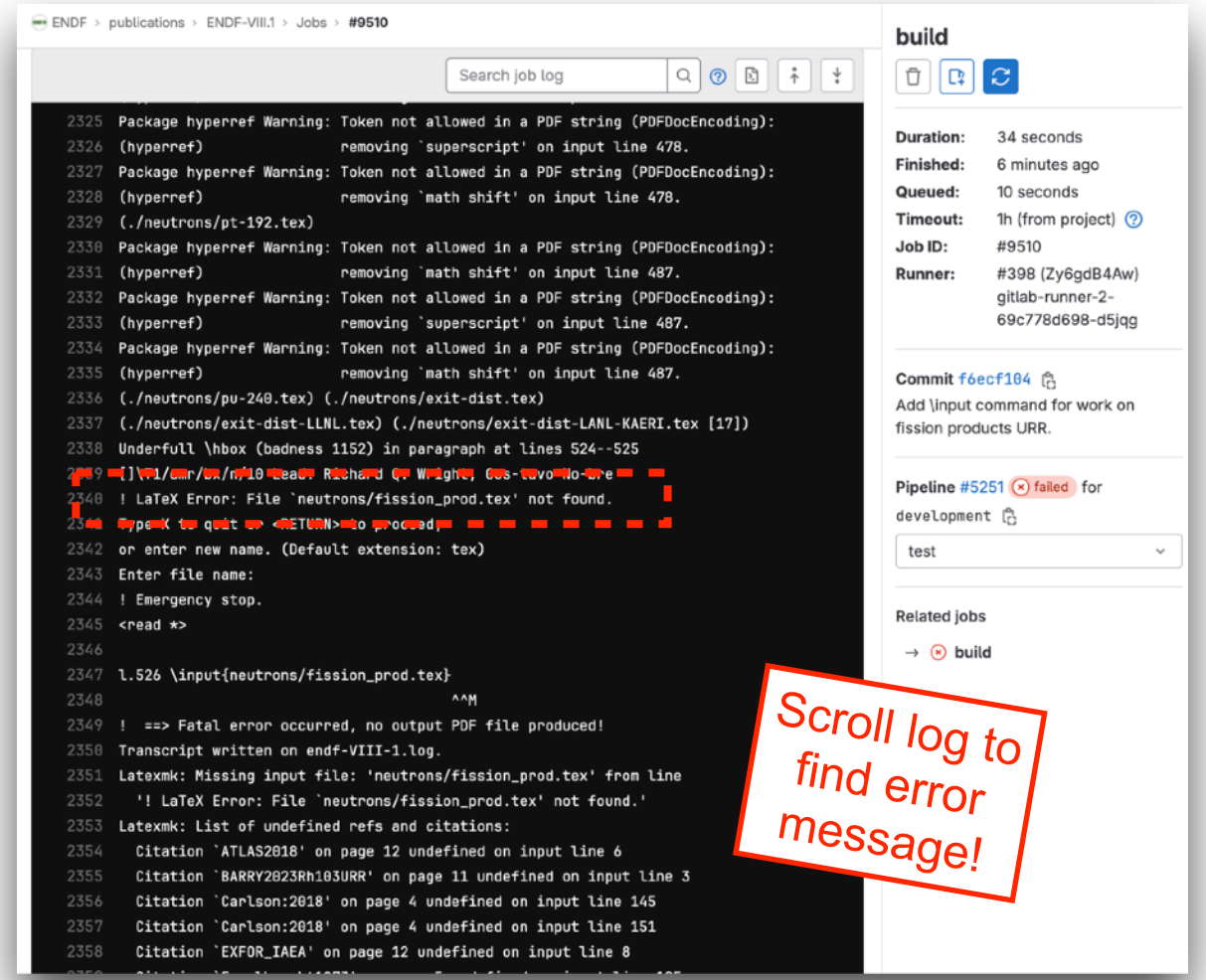

Scroll log to find error message!

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ENDF release status

Progress towards ENDF/B-VIII.1

- **Beta1** was released on March 1st, 2023:
  - Mostly neutrons sublibraries
  - Mostly INDEN
- **Beta1.1** was released on April 18th, 2023:
  - Mostly TSL files
  - Some few specific neutrons fixes
- Mini-CSEWG (LLNL): April 24-28, 2023

- **Beta2** was released on August 4, 2023
  - All neutrons contributions incorporated
  - New ^{239}Pu that restores depletion performance, following feedback from mini-CSEWG
  - Many updates on photonuclear library based on IAEA CRP
- Hackathon (LANL): August 6-8, 2023

ENDF/B VIII.1-β1

ENDF/B VIII.1-β1.1

ENDF/B VIII.1-β2

Additional overall updates in neutrons sub library

ENDF/B VIII.1-β2

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- For many nuclides, there were no outgoing distributions for some emitted particles
  - Wherever it was missing, exit spectra was taken from TENDL
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  - Impacted 219 files

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- For many nuclides, there were no outgoing distributions for some emitted particles
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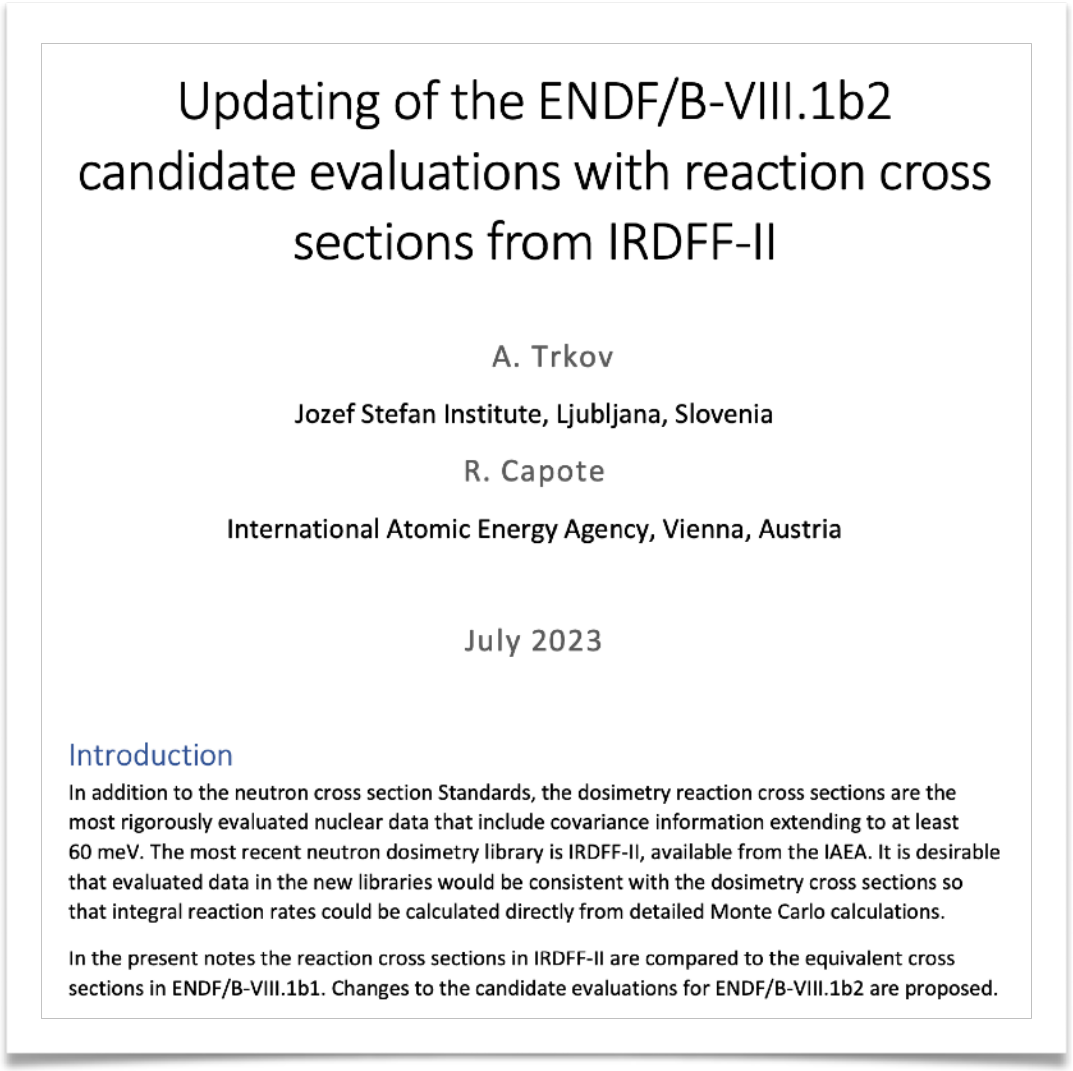
- The IRDFF-II dosimetry library contains well-measured cross-sections for specific reactions
  - This tends to be more accurate than any full, self-consistent evaluation
  - 34 files had something replaced by IRDFF
  - Had to reconstruct other reactions to preserve unitarity



Updating of the ENDF/B-VIII.1b2 candidate evaluations with reaction cross sections from IRDFF-II

A. Trkov

Jozef Stefan Institute, Ljubljana, Slovenia

R. Capote

International Atomic Energy Agency, Vienna, Austria

July 2023

Introduction

In addition to the neutron cross section Standards, the dosimetry reaction cross sections are the most rigorously evaluated nuclear data that include covariance information extending to at least 60 meV. The most recent neutron dosimetry library is IRDFF-II, available from the IAEA. It is desirable that evaluated data in the new libraries would be consistent with the dosimetry cross sections so that integral reaction rates could be calculated directly from detailed Monte Carlo calculations.

In the present notes the reaction cross sections in IRDFF-II are compared to the equivalent cross sections in ENDF/B-VIII.1b1. Changes to the candidate evaluations for ENDF/B-VIII.1b2 are proposed.

Additional overall updates in neutrons sub library

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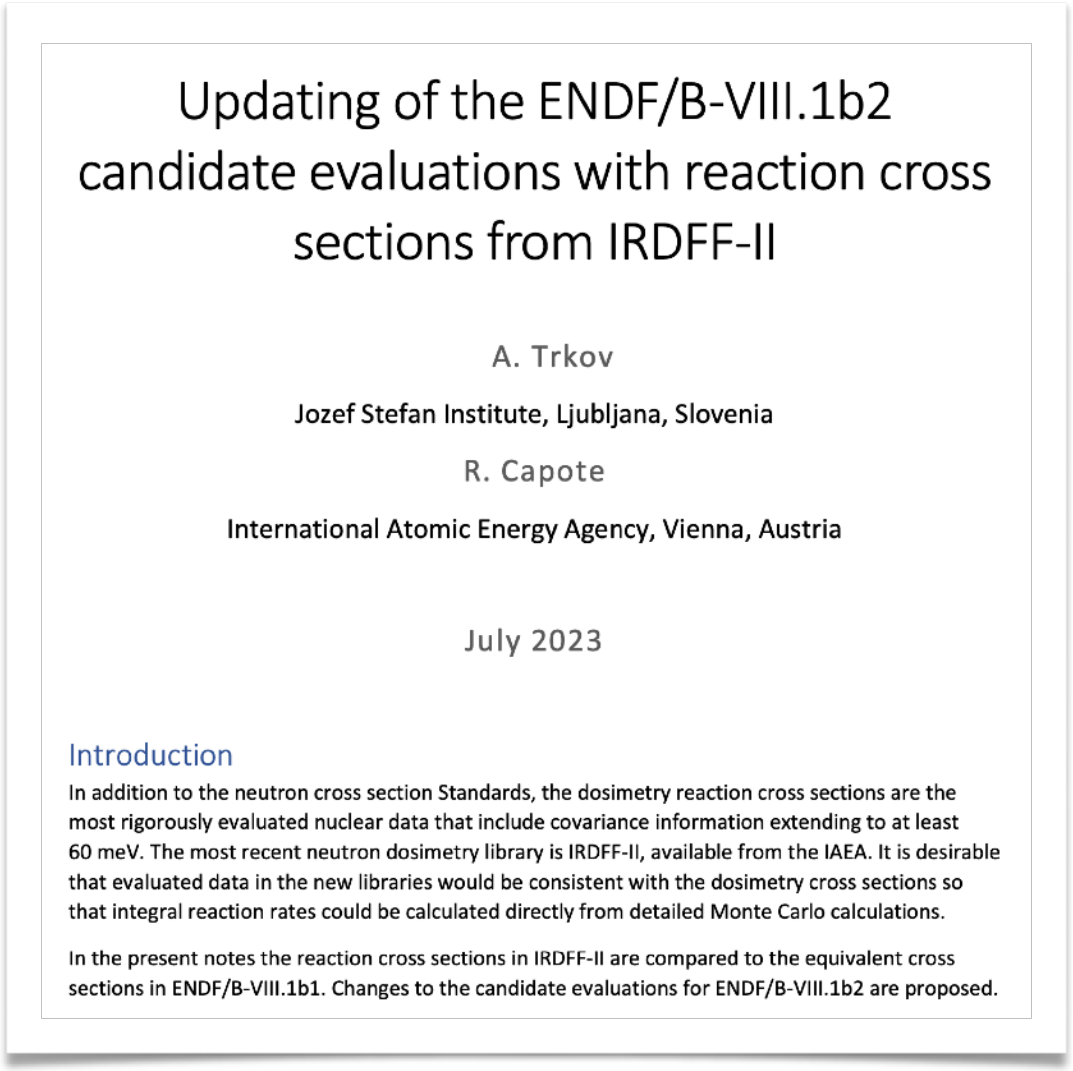
  - This tends to be more accurate than any full, self-consistent evaluation
  - 34 files had something replaced by IRDFF
  - Had to reconstruct other reactions to preserve unitarity
- These efforts were done semi-simultaneously, independently, by different groups, often in the same file
  - Multiple panic attacks for the library manager trying to coordinate this!



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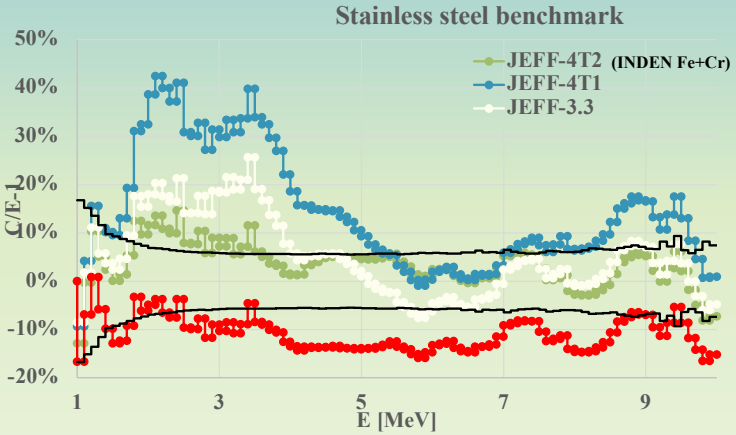
Results sensitive to stainless steel

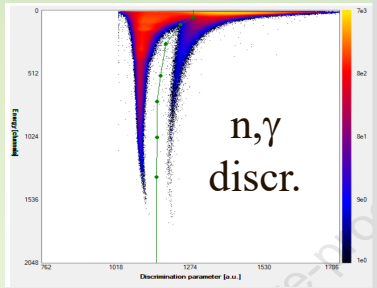
INDEN updated "structural" evaluations:

see nds.iaea.org/INDEN/ - **Validation**

- ✓ Fe isotopes (IAEA/JSI), fe54e80o, fe56e80X29r41, fe54e80o
- ✓ Cr isotopes, BNL/ORNL/IAEA/JSI/CEA, v2.3.2



Kostal et al, priv. com. stilbene meas.



Stainless steel, neutron leakage (Rez, CZ, 11/2021)

Roberto Capote, IAEA Nuclear Data Section
e-mail: R.CapoteNoy@iaea.org
Web: http://www-nds.iaea.org

The Pool Critical Assembly (PCA) Pressure Vessel Simulator experiment was performed in the early 1980s as part of the NRC's LWR Pressure Vessel Surveillance Dosimetry Improvement Program (LWR-PV-SDIP)

Benchmark was recently re-analyzed with exact geometry by Dr. Kulesza (LANL/X-5), and MCNP inputs were published and available for use:
- NUCLEAR TECHNOLOGY · VOLUME 197 · 284–295 · MARCH 2017
- Paper: https://doi.org/10.1080/00295450.2016.1273711
- MCNP Inputs: https://doi.org/10.2172/1601379

Pool Critical Assembly Benchmarking

- C/E Results (ENDF/B-VIII.1b1):
  - MC uncertainty ~= 1%

Depends on U-235, water & SS

	al27a	ni48p	rh103n	in115n	u238f	np237f	avg	std dev
	0.97	0.96	1.04	1.00			**0.99**	**3.9%**
	1.02	0.98	1.08	1.01			**1.02**	**4.3%**
	1.05	1.01	1.07	1.06			**1.05**	**2.5%**
	1.03	0.96	1.00	1.01	0.98	1.03	**1.00**	**2.7%**
	1.03	0.96	0.95	1.00	0.98	1.05	**0.99**	**4.0%**
	1.04	1.02	0.93	1.03	0.98	1.03	**1.00**	**4.1%**
			0.96	0.99	0.99	1.13	**1.02**	**7.6%**
avg	**1.02**	**0.98**	**1.01**	**1.01**	**0.98**	**1.06**	**1.01**	
std dev	**2.8%**	**2.9%**	**6.4%**	**2.1%**	**0.1%**	**1.0%**		**4.2%**

Presented by Greg Fischer, Westinghouse @ miniCSWEG April 2023

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Slides taken from Roberto Capotes's talk at 2023 mini-CSEWG

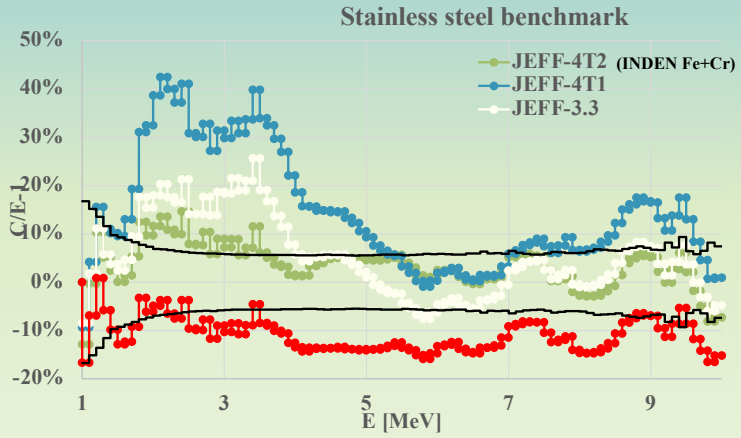
- Significant performance improvements in SS (Fe and Cr)
- Users are happy with new files!

Results sensitive to stainless steel

INDEN updated "structural" evaluations:

see nds.iaea.org/INDEN/ - **Validation**

- ✓ Fe isotopes (IAEA/JSI), fe54e80o, fe56e80X29r41, fe54e80o
- ✓ Cr isotopes, BNL/ORNL/IAEA/JSI/CEA, v2.3.2



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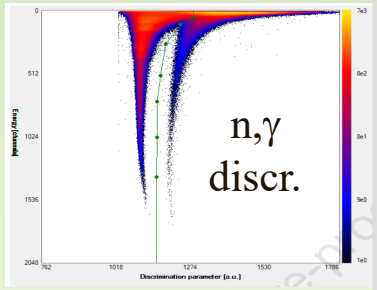

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	1.05	1.01	1.07	1.06			**1.05**	**2.5%**
	1.03	0.96	1.00	1.01	0.98	1.03	**1.00**	**2.7%**
	1.03	0.96	0.95	1.00	0.98	1.05	**0.99**	**4.0%**
	1.04	1.02	0.93	1.03	0.98	1.03	**1.00**	**4.1%**
			0.96	0.99	0.99	1.13	**1.02**	**7.6%**
avg	**1.02**	**0.98**	**1.01**	**1.01**	**0.98**	**1.06**	**1.01**	
std dev	**2.8%**	**2.9%**	**6.4%**	**2.1%**	**0.1%**	**1.0%**		**4.2%**

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Slides taken from Roberto Capotes's talk at 2023 mini-CSEWG

- Significant performance improvements in SS (Fe and Cr)
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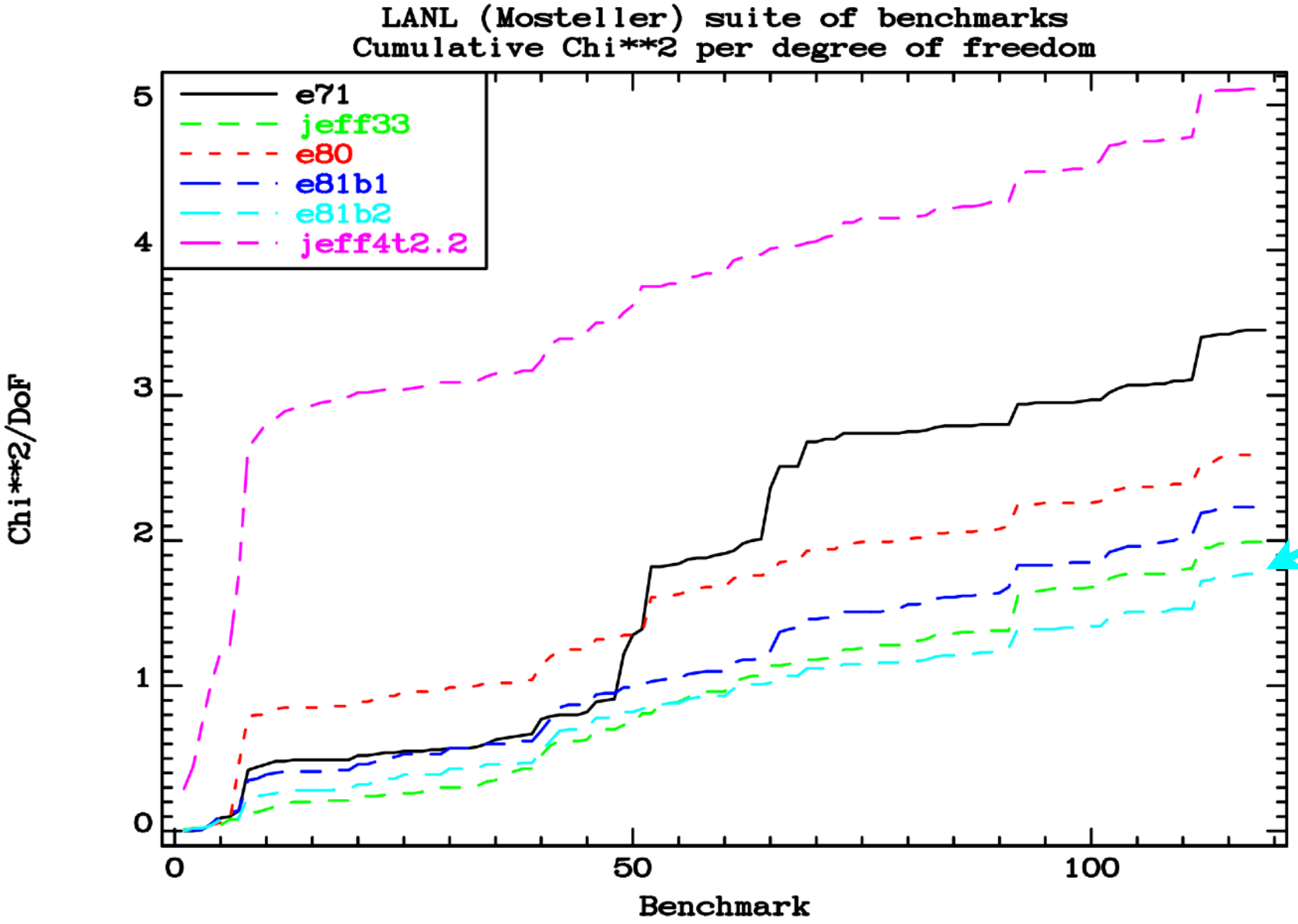
Preliminary validation on Beta2, by Andrej Trkov (JSI)



ENDF/BVIII.1 is on track to be the best-performing library to-date!

Caveat: Cumulative χ^2 of benchmarks provide only a global view. Detailed investigation of performance on specific benchmark are also important.

What to expect for Beta3

- **TSL:**
  - New MAT number assignments
  - Reviewed and new files
  - Extension of light water to low temperatures
- **Neutrons:**
  - Exit distributions form LANL/KAERI
  - Many fixes
  - Improved ^{239,240,241}Pu set with better criticality/depletion performance
- **Photonuclear:**
  - Reverted ^{180,182,183}W to VIII.0
  - ^{242}Pu from JENDL-5.0
  - ^{9}Be from IAEA CRP
- **Atomic sublibraries:**
  - Taken from EPICS-2023
    - Atomic relaxation sublibrary (EADL)
    - Electrons sublibrary (EEDL)
    - Photoatomic sublibrary (EPDL)

TSL MAT numbers

- Many, many new contributions: MAT number overload!
- Approved format change allow direct MAT assignments in the range of 1 to 9999
- New assignments were made, according to new guidelines:

Table C.1: Set of general rules used to assign MAT numbers for new materials in the TSL sublibrary.

MAT range	Description
1-10	legacy hydrogen (except organics) assignments
11-20	legacy deuterium assignments
21-25	legacy lithium assignments
26-29	legacy beryllium assignments
30-44	legacy carbon (including organics) assignments
45-50	legacy oxygen assignments
51-70	legacy metal assignments
71-99	legacy fuel assignments
100-299	single element (100 + Z for natural element and 200+Z for alternative form whenever possible)
300-999	graphite/diamond variations
1000-2999	carbon including organics
3000-3999	two-element inorganic compounds
4000-4999	three-element inorganic compounds
5000-5999	four-element inorganic compounds
6000-6499	five-element inorganic compounds
6500-6999	free slots
7000-7999	fuel compounds with plutonium
8000-8999	fuel compounds with uranium
9000-9999	free slots

TSL_MAT_numbers.csv (~/Calculations/ENDF/thermal_scatt) - VIM

```
##############################################################
##                                                          ##
##                  TSL MAT numbers                         ##
## associated with the ENDF/B-VIII.1-BetaX release          ##
##                                                          ##
## Note: empty file field means MAT number is reserved.     ##
##                                                          ##
##                                                          ##
##############################################################
##
##  MAT number, ENDF-6 file name                ,    Description
##
           1  , tsl-HinH2O.endf                  ,    H in H2O (liquid)
           2  , tsl-para-H.endf                 ,    para-Hydrogen
           3  , tsl-ortho-H.endf                ,    ortho-Hydrogen
           5  , tsl-HinYH2.endf                 ,    H in YH2
           7  , tsl-HinZrH.endf                 ,    H in ZrH
          10  , tsl-HinIceIh.endf               ,    H in H2O (ice (Ih))
          11  , tsl-DinD2O.endf                 ,    D in D2O (liquid)
          12  , tsl-para-D.endf                 ,    para-Deuterium
          13  , tsl-ortho-D.endf                ,    ortho-Deuterium
          14  ,                                 ,    D in D2O (ice)
TSL_MAT_numbers.csv                                          1,1           Top
        3002  , tsl-HinZrH2.endf                ,    H in ZrH2
        3006  , tsl-ZrinZrHx.endf               ,    Zr in ZrHx
        3007  , tsl-HinZrHx.endf                ,    H in ZrHx
        3011  , tsl-CainCaH2.endf               ,    Ca in CaH2
        3013  , tsl-H1inCaH2.endf               ,    H1 in CaH2
        3014  , tsl-H2inCaH2.endf               ,    H2 in CaH2
        3016  , tsl-SiinSiO2-alpha.endf         ,    Si in SiO2-alpha
        3017  , tsl-OinSiO2-alpha.endf          ,    O in SiO2-alpha
        3021  ,                                 ,    Si in SiO2-beta
        3022  ,                                 ,    O in SiO2-beta
        3031  , tsl-7Liin7LiH-mixed.endf        ,    7Li in 7LiH-mixed
        3032  , tsl-Hin7LiH-mixed.endf          ,    H in 7LiH-mixed
        3034  , tsl-7Liin7LiD-mixed.endf        ,    7Li in 7LiD-mixed
        3035  , tsl-Din7LiD-mixed.endf          ,    D in 7LiD-mixed
        3037  ,                                 ,    Mg in MgH2
        3038  ,                                 ,    H in MgH2
        3042  ,                                 ,    Mg in MgD2
        3043  ,                                 ,    D in MgD2
        3047  , tsl-FinHF.endf                  ,    F in HF
        3048  , tsl-HinHF.endf                  ,    H in HF
        3052  , tsl-AlinAl2O3.endf             ,    Al in Al2O3
        3053  , tsl-OinAl2O3.endf              ,    O in Al2O3
        3060  ,                                 ,    Pb in PbF2
TSL_MAT_numbers.csv                                        128,24          37%
```

TSL updates since Beta2 (in addition to new MAT assignments)

- tsl-Be-metal+Sd
- tsl-Be-metal
- tsl-BeinBeO
- tsl-CainCaH2
- tsl-CinC8H8 (minor fix)
- tsl-CinCF2.endf (minor fix)
- tsl-CinSiC
- tsl-CinUC-100P (new file)
- tsl-CinUC-10P
- tsl-CinUC-5P
- tsl-CinUC-HALEU (new file)
- tsl-CinUC-HEU
- tsl-CinUC
- tsl-DinD2O (minor fix)
- tsl-FinCF2 (minor fix)
- tsl-H1inCaH2
- tsl-H2inCaH2
- tsl-HinC5O2H8.endf (NCSU)
- tsl-HinC5O2H8.endf (ORNL)
- tsl-HinH2O.endf (ESS)
- tsl-HinC8H8.endf (minor fix)
- tsl-HinIceIh.endf (minor fix)
- tsl-HinParaffinicOil (minor fix)
- tsl-HinYH2 (minor fix)
- tsl-HinZrH2 (minor fix)
- tsl-HinZrHx (minor fix)
- tsl-NinUN-100P
- tsl-NinUN-10P
- tsl-NinUN-5P
- tsl-NinUN-HALEU
- tsl-NinUN
- tsl-OinBeO
- tsl-OinD2O
- OinIceIh
- tsl-OinPuO2
- tsl-OinSiO2-alpha
- tsl-OinUO2-100P
- tsl-OinUO2-10P
- tsl-OinUO2-5P
- OinUO2-HALEU
- tsl-OinUO2-HEU
- tsl-OinUO2
- tsl-PuinPuO2
- tsl-SiinSiC
- tsl-SiinSiO2-alpha
- tsl-U-metal-10P
- tsl-U-metal-5P
- tsl-U-metal-HEU
- tsl-U-metal
- tsl-UinUC-100P
- tsl-UinUC-10P
- tsl-UinUC-5P
- tsl-UinUC-HALEU
- tsl-UinUC-HEU
- tsl-UinUC
- tsl-UinUN-100P
- tsl-UinUN-10P
- tsl-UinUN-5P
- tsl-UinUN-HALEU
- tsl-UinUN-HEU
- tsl-UinUN
- tsl-UinUO2-10P
- tsl-UinUO2-5P
- tsl-UinUO2-HALEU
- tsl-UinUO2-HEU
- tsl-UinUO2
- tsl-YinYH2
- tsl-ZrinZrH2 (minor fix)
- tsl-ZrinZrHx (minor fix)
- tsl-graphiteSd
- tsl-reactor-graphite-10P
- tsl-reactor-graphite-20P
- tsl-reactor-graphite-30P
- tsl-s-CH4
- tsl-CinZrC
- tsl-ZrinZrC
- tsl-ortho-D
- tsl-para-D
- tsl-ortho-H
- tsl-para-H

Brookhaven National Laboratory

- Reviews are coming in, I need to process many of them
- We MUST make a decision on lucite and polyethylene

Contributions to low-temperature H and D. Send them to SNS for review, as they seem to be the only potential users.

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- tsl-CinSiC
- tsl-CinUC-100P (new file)
- tsl-CinUC-10P
- tsl-CinUC-5P
- tsl-CinUC-HALEU (new file)
- tsl-CinUC-HEU
- tsl-CinUC
- tsl-DinD2O (minor fix)
- tsl-FinCF2 (minor fix)
- tsl-H1inCaH2
- tsl-H2inCaH2
- tsl-HinC5O2H8.endf (NCSU)
- tsl-HinC5O2H8.endf (ORNL)
- tsl-HinH2O.endf (ESS)

Yesterday, based on small performance differences, the CSEWG Executive Committee decided to:

- *Adopt the NCSU polyethylene evaluation from VIII.0*
- *Adopt the ORNL lucite evaluation*

- tsl-UinUN
- tsl-UinUO2-10P
- tsl-UinUO2-5P
- tsl-UinUO2-HALEU
- tsl-UinUO2-HEU
- tsl-UinUO2
- tsl-YinYH2
- tsl-ZrinZrH2 (minor fix)
- tsl-ZrinZrHx (minor fix)
- tsl-graphiteSd
- tsl-reactor-graphite-10P
- tsl-reactor-graphite-20P
- tsl-reactor-graphite-30P
- tsl-s-CH4
- tsl-CinZrC
- tsl-ZrinZrC
- tsl-ortho-D
- tsl-para-D
- tsl-ortho-H
- tsl-para-H

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KAERI/LANL exit distributions

- al27
  - MF=6 MT= 600-619, 650-669, 700-710, 800-819 were updated.
- si28
  - MF=12/14 MT= 601-613, 801-815 were deleted.
  - MF=6 MT= 104 were deleted.
  - MF=3 MT= 650-659, 699 were added.
  - MF=6 MT= 650-659, 699 were added.
  - MF=6 MT= 600-613, 800-815 were updated.
- si29
  - MF=12/14 MT= 601-615, 801-819 were deleted.
  - MF=6 MT= 600-615, 800-819 were updated.
- si30
  - MF=12/14 MT= 601-605, 801-811 were deleted.
  - MF=6 MT= 600-605, 800-811 were updated.
- si31
  - MF=4 MT= 600, 800-814 were deleted.
  - MF=12/14 MT= 801-814 were deleted.
  - MF=6 MT= 600, 800-814 were added.
- si32
  - MF=4 MT= 600, 800 were deleted.
  - MF=6 MT= 600, 800 were added.
- cl35
  - MF=6 MT= 600-629, 650-680, 700-730, 800-820 were updated.
- cl36
  - MF=4 MT= 600-615, 800-831 were deleted.
  - MF=12/14 MT= 601-615, 801-831 were deleted.
  - MF=6 MT= 600-615, 800-831 were added.
- cl37
  - MF=3 MT= 600-609, 649 were added.
  - MF=6 MT= 600-609 were added.
  - MF=6 MT= 649, 650-661, 700-715, 800-805 were updated.
- k39
  - MF=15 MT= 103, 107 were deleted.
  - MF=12/14 MT= 601-609, 801-809 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- k40
  - MF=15 MT= 103, 107 were deleted.
  - MF=12/14 MT= 601-609, 801-809 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- k41
  - MF=15 MT= 103, 107 were deleted.
  - MF=12/14 MT= 601-609, 801-809 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- ti46
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- ti47
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- ti48
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- ti49
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.

KAERI/LANL exit distributions

- ti50
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-608, 649, 650-659, 699, 700-709, 749, 750, 800-809, 849 were added.
  - MF=6 MT= 600-608, 649, 650-659, 699, 700-709, 749, 750, 800-809, 849 were added.
- v49
  - MF=4 MT= 600-639, 800-839 were deleted.
  - MF=12/14 MT= 601-639, 801-839 were deleted.
  - MF=6 MT= 600-639, 800-839 were added.
- v50
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- v51
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- cr50
  - MF=12/14 MT= 601-639, 801-839 were deleted.
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 600-639, 800-839 were updated.
- cr51
  - MF=6 MT= 103, 104, 105, 106, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 701-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 701-709, 749, 750-759, 799, 800-809, 849 were added.
- cr52
  - MF=12/14 MT= 601-631, 801-839 were deleted.
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 600-631, 800-839 were updated.
- cr53
  - MF=12/14 MT= 601-610, 801-839 were deleted.
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 600-610, 800-839 were updated.
- cr54
  - MF=12/14 MT= 601-616, 801-834 were deleted.
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 650-659, 699, 701-709, 749, 750-759, 799 were added.
  - MF=6 MT= 600-616, 800-834 were updated.
- co58
  - MF=4 MT= 600-639, 800-839 were deleted.
  - MF=12/14 MT= 601-639, 801-839 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600-639, 650-659, 699, 700-709, 749, 800-839 were added.
- co59
  - MF=6 MT= 103, 104, 105, 106, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- ni58
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.

KAERI/LANL exit distributions

- ni59
  - MF=6 MT= 103, 104, 105, 106, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- ni60
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- ni61
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- ni62
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- ni63
  - MF=4 MT= 600-625, 800-827 were deleted.
  - MF=12/14 MT= 601-625, 801-827 were deleted.
  - MF=6 MT= 600-625, 800-827 were added.
- ni64
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800, 849 were added.
- cu63
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- cu64
  - MF=4 MT= 600-639, 800-839 were deleted.
  - MF=12/14 MT= 601-639, 801-839 were deleted.
  - MF=6 MT= 600-639, 800-839 were added.
- cu65
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- zn64
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- zn65
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- zn66
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- zn67
  - MF=6 MT= 103, 104, 105, 106, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.

KAERI/LANL exit distributions

- zn68
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600-607, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
  - MF=6 MT= 600-607, 649, 650-659, 699, 700-709, 749, 750-759, 799, 800-809, 849 were added.
- zn69
  - MF=4 MT= 600-616, 800-817 were deleted.
  - MF=12/14 MT= 601-616, 801-817 were deleted.
  - MF=6 MT= 600-616, 800-817 were added.
- zn70
  - MF=6 MT= 104, 105, 106 were deleted.
  - MF=3 MT= 600, 649, 650-659, 699, 700-707, 749, 750-757, 799, 800, 849 were added.
  - MF=6 MT= 600, 649, 650-659, 699, 700-707, 749, 750-757, 799, 800, 849 were added.
- as73
  - MF=6 MT= 103, 107 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- as74
  - MF=6 MT= 103, 107 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- zr90
  - MF=4 MT= 600-611, 800-808 were deleted.
  - MF=12/14 MT= 601-611, 801-808 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600-611, 650-659, 699, 700-709, 749, 800-808 were added.
- zr91
  - MF=4 MT= 600-605, 800-839 were deleted.
  - MF=12/14 MT= 601-605, 801-839 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600-605, 650-659, 699, 700-709, 749, 800-839 were added.
- zr92
  - MF=4 MT= 600, 800-839 were deleted.
  - MF=12/14 MT= 801-839 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600, 650-659, 699, 700-709, 749, 800-839 were added.
- zr93
  - MF=4 MT= 600-616, 800-826 were deleted.
  - MF=12/14 MT= 601-616, 801-826 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-658, 699, 700-709, 749 were added.
  - MF=6 MT= 600-616, 650-658, 699, 700-709, 749, 800-826 were added.
- zr94
  - MF=4 MT= 600-609, 800-839 were deleted.
  - MF=12/14 MT= 601-609, 801-839 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-708, 749 were added.
  - MF=6 MT= 600-609, 650-659, 699, 700-708, 749, 800-839 were added.
- zr95
  - MF=4 MT= 600-615, 800-808 were deleted.
  - MF=12/14 MT= 601-615, 801-808 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600-615, 650-659, 699, 700-709, 749, 800-808 were added.

KAERI/LANL exit distributions

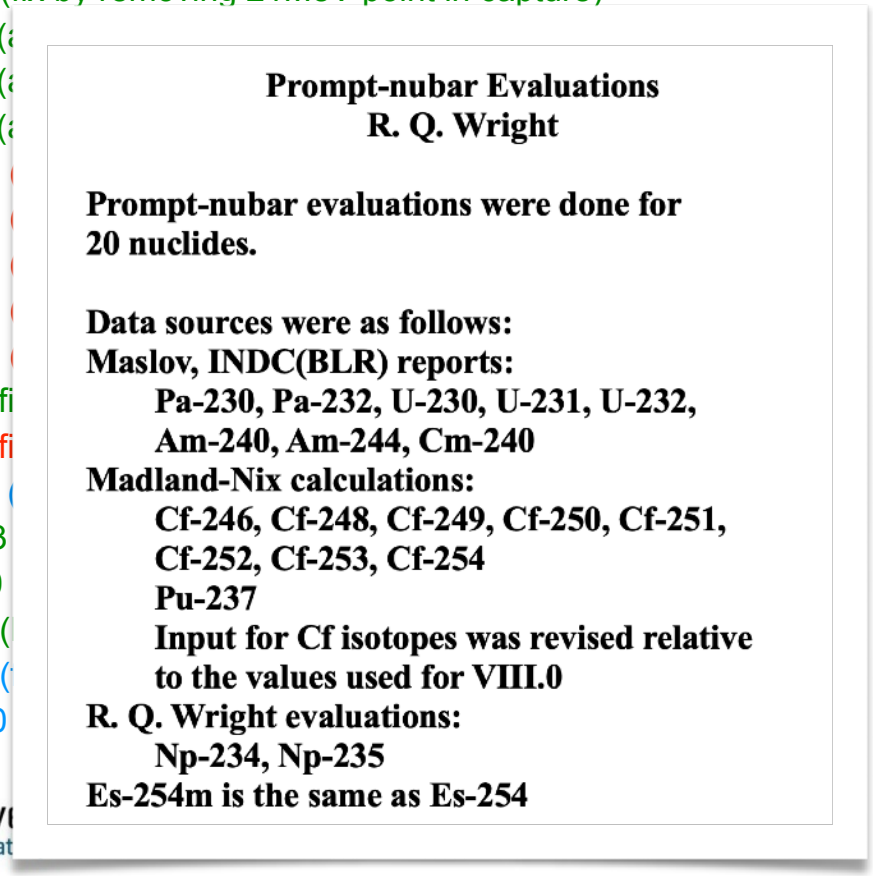
- zr96
  - MF=4 MT= 600-602, 800-809 were deleted.
  - MF=12/14 MT= 601-602, 801-809 were deleted.
  - MF=6 MT= 104, 105 were deleted.
  - MF=3 MT= 650-659, 699, 700-709, 749 were added.
  - MF=6 MT= 600-602, 650-659, 699, 700-709, 749, 800-809 were added.
- ag107
  - MF=15 MT= 103, 107 were deleted.
  - MF=12/14 MT= 601-609, 801-809 were deleted.
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.
- ag109
  - MF=4 MT= 600-630, 800-801 were deleted.
  - MF=12/14 MT= 601-630, were deleted.
  - MF=6 MT= 600-630, 800-801 were added.
- ta180
  - MF=15 MT= 103, 104, 105, 107 were deleted.
  - MF=12/14 MT= 601-609, 651-659, 701-709, 801-809 were deleted.
  - MF=6 MT= 103, 104, 105, 107 were deleted.
  - MF=3 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 650-659, 699, 700-709, 749, 800-809, 849 were added.
- ta181
  - MF=4 MT= 600-635, 800-814 were deleted.
  - MF=12/14 MT= 601-635, 801-814 were deleted.
  - MF=6 MT= 106 were deleted.
  - MF=3 MT= 750-759, 799 were added.
  - MF=6 MT= 600-635, 750-759, 799, 800-814 were added.
- au197
  - MF=3 MT= 600-609, 649, 800-809, 849 were added.
  - MF=6 MT= 600-609, 649, 800-809, 849 were added.

Additional changes from Beta2

- n-001_H_002 (minor fix)
- n-004_Be_009 (problems above 2.8 MeV)
- n-006_C_012 (minor fix)
- n-008_O_016 (minor fix plus flagging of primary gammas)
- n-008_O_018 (fix by removing 21MeV point in capture)
- n-016_S_032 (added inelastic gammas)
- n-016_S_033 (added inelastic gammas)
- n-016_S_034 (added inelastic gammas)
- n-024_Cr_050 (added VIII.0 covariances and KAERI exit dist.)
- n-024_Cr_051 (KAERI exit dist.)
- n-024_Cr_052 (added VIII.0 covariances and KAERI exit dist.)
- n-024_Cr_053 (added VIII.0 covariances and KAERI exit dist.)
- n-024_Cr_054 (KAERI exit dist.)
- 029_Cu_063 (fixes and KAERI exit dist.)
- 029_Cu_065 (fixes and KAERI exit dist.)
- n-038_Sr_088 (ORNL evaluation) Errors in CHECKR!
- n-045_Rh_103 (minor fixes)
- n-046_Pd_110 (minor fixes)
- n-049_In_113 (MT=3 fix)
- n-049_In_115 (format fixes)
- n-058_Ce_140 (updated covariances)
- n-058_Ce_142 (updated covariances)
- n-059_Pr_141 (processing fixes)
- n-066_Dy_161 (minor fixes)
- n-066_Dy_164 (minor fixes)
- n-073_Ta_180m1 (new file based on JENDL-5)
- n-074_W_182 (minor fix) Errors in CHECKR!
- n-074_W_183 (minor fix) Errors in CHECKR!
- n-074_W_184 (minor fix) Errors in CHECKR!
- n-074_W_186 (minor fix) Errors in CHECKR!
- n-082_Pb_206 (fixes by evaluator)
- n-082_Pb_207 (fixes by evaluator)
- n-082_Pb_208 (fixes by evaluator)
- n-092_U_233 (minor fixes)
- n-092_U_234 (uncertainty and other fixes by evaluator)
- n-092_U_235 (Restored MF=6 MT=18 P(nu))
- n-092_U_236 (uncertainty and other fixes by evaluator)
- n-094_Pu_239 (reduced nubar: new criticality vs burn-up compromise solution)
- n-094_Pu_242 (covariance fix)
- Pt
- Prompt nubar of 20 nuclides

Additional changes from Beta2

- n-001_H_002 (minor fix)
- n-004_Be_009 (problems above 2.8 MeV)
- n-006_C_012 (minor fix)
- n-008_O_016 (minor fix plus flagging of primary gammas)
- n-008_O_018 (fix by removing 21MeV point in capture)
- n-016_S_032 (a
- n-016_S_033 (a
- n-016_S_034 (a
- n-024_Cr_050 (
- n-024_Cr_051 (
- n-024_Cr_052 (
- n-024_Cr_053 (
- n-024_Cr_054 (
- 029_Cu_063 (fi
- 029_Cu_065 (fi
- n-038_Sr_088 (
- n-045_Rh_103
- n-046_Pd_110
- n-049_In_113 (
- n-049_In_115 (
- n-058_Ce_140



Prompt-nubar Evaluations
R. Q. Wright

Prompt-nubar evaluations were done for 20 nuclides.

Data sources were as follows:
Maslov, INDC(BLR) reports:
Pa-230, Pa-232, U-230, U-231, U-232, Am-240, Am-244, Cm-240
Madland-Nix calculations:
Cf-246, Cf-248, Cf-249, Cf-250, Cf-251, Cf-252, Cf-253, Cf-254
Pu-237
Input for Cf isotopes was revised relative to the values used for VIII.0
R. Q. Wright evaluations:
Np-234, Np-235
Es-254m is the same as Es-254

- n-058_Ce_142 (updated covariances)
- n-059_Pr_141 (processing fixes)
- n-066_Dy_161 (minor fixes)
- n-066_Dy_164 (minor fixes)
- n-073_Ta_180m1 (new file based on JENDL-5)
- n-074_W_182 (minor fix) Errors in CHECKR!
- n-074_W_183 (minor fix) Errors in CHECKR!
- n-074_W_184 (minor fix) Errors in CHECKR!
- n-074_W_186 (minor fix) Errors in CHECKR!
- n-082_Pb_206 (fixes by evaluator)
- n-082_Pb_207 (fixes by evaluator)
- n-082_Pb_208 (fixes by evaluator)
- n-092_U_233 (minor fixes)
- n-092_U_234 (uncertainty and other fixes by evaluator)
- n-092_U_235 (Restored MF=6 MT=18 P(nu))
- n-092_U_236 (uncertainty and other fixes by evaluator)
- n-094_Pu_239 (reduced nubar: new criticality vs burn-up compromise solution)
- n-094_Pu_242 (covariance fix)
- Pt
- Prompt nubar of 20 nuclides

Photonuclear recommendation from M.Chadwick @ mini-CSEWG

Need more time to assess and review these files. So, for now, keeping them from VIII.0

- Consider ^{9}Be from NNL
- Adopt evaluations from 2019 IAEA CRP for (almost) all nuclei: 200+ files
- Except for 16 select mission-critical materials:

• ^{2}H	• ^{27}Al	• ^{184}W	• ^{237}Np
• ^{12}C	• ^{28}Si	• ^{206}Pb	• ^{235}U
• ^{14}N	• ^{40}Ca	• ^{207}Pb	• ^{238}U
• ^{16}O	• ^{63}Cu	• ^{208}Pb	• ^{239}Pu

- For those, for now, keep older LANL evaluations present in ENDF/B-VIII.0

This is what is in Beta2

Photonuclear sublibrary

- 180,182,183,186W: reverted to VIII.0
- 242Pu: inexistent, taken from JENDL-5.0
- 9Be: ~~NNL evaluation~~ Take from CRP

Atomic sub libraries

Red Cullen submitted the 2023 version of EPICS leading to updates to:

- Atomic relaxation sublibrary (EADL)
- Electrons sublibrary (EEDL)
    - This did NOT overwrite ZAP format fix done by Bret Beck for VIII.1-Beta2
- Photoatomic sublibrary (EPDL)

Release Timeline

… or, the elephant in the room

Release timeline

ENDF/B VIII.1

Feb 2023
- Covariances ready for validation

25-27 Apr 2023
- Mini-CSEWG - LLNL
- 28 April: Classified day

Apr 15 2023
- 1st iteration of text for paper due

Aug 1 2023
- Deadline for draft text and figures for Big Paper

Aug 4 2023
- Release of Beta2

Apr-May 2024
- Paper is published

Apr 18 2023
- Release Beta1.1 with TSL and fixes in neutrons

Aug 7-9 2023
- Hackaton at LANL (TBC)

Oct 2023
- Release of Beta3
- Freeze list of files changed
- Freeze benchmark results

February 2024
- Release ENDF/B-VIII.1

Mar 1st 2023
- Release first beta version for general testing, containing updates for neutrons (^{239}Pu, INDEN, et al.), alphas, FPY

Until Apr 2023
- Collect feedback from the community on the beta version
- Address issues found
- Wrap up “lesser impactful” files

Nov 13-17 2023 CSEWG
- Final validation results
- Beta4/release candidate
- Paper submission

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Release timeline

ENDF/B VIII.1

Feb 2023
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- Obvious time/causality **issues**
- **Challenges:**
  - Burnup/criticality balance in Pu
  - Performance issues with Pb, ^{9}Be, ^{233}U
  - Conflicting evaluations
  - A few last-minute unplanned contributions
- The schedule is very tight, but in principle doable
- Always good to not underestimate the importance of due diligent tests:
  - Validation turnaround time
- Perhaps a few timeline tweaks may be wise…

ug 4 2023
ease of Beta2

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- Paper is published

2023

2024

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Aug 1 2023
- Deadline for draft text and figures for Big Paper

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- Release of Beta2

Feb 2024
- Release of Beta4/release candidate

Feb 2024
- Paper is submitted

Apr-May 2024
- Paper is published

2023

2024

Apr 18 2023
- Release Beta1.1 with TSL and fixes in neutrons

Aug 7-9 2023
- Hackaton at LANL (TBC)

Dec 2023
- Release of Beta3
- Freeze list of files changed
- Freeze mean values and benchmark results

If validation proves satisfactory

May 2024
- Release ENDF/B-VIII.1

Mar 1st 2023
- Release first beta version for general testing, containing updates for neutrons (^{239}Pu, INDEN, et al.), alphas, FPY

Until Apr 2023
- Collect feedback from the community on the beta version
- Address issues found
- Wrap up “lesser impactful” files

Nov 13-17 2023 CSEWG
- Final validation results
- ~~Beta4/release candidate~~
- ~~Paper submission~~

Timeline

Timeline

- Beta3:

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks

Timeline

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    - Collect all updates/fixes, review and push forward in the next few weeks
    - ^{233}U is the only thing that may need more time, we were promised to get it within a month's time

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
    - ^{233}U is the only thing that may need more time, we were promised to get it within a month's time
    - Once Beta3 is released, file list and mean values shall be frozen

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
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    - Once Beta3 is released, file list and mean values shall be frozen
- Validation will take 2-3 months

Timeline

- Beta3:
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- Validation will take 2-3 months
- Do While 3 < Beta < 4:

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    - Fix covariances, documentation, format, processing issues

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    - If there are no validation surprises:

Timeline

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    - Collect all updates/fixes, review and push forward in the next few weeks
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    - Once Beta3 is released, file list and mean values shall be frozen
- Validation will take 2-3 months
- Do While 3 < Beta < 4:
    - Fix covariances, documentation, format, processing issues
    - If there are no validation surprises:
        - Beta4 = release candidate

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
    - ^{233}U is the only thing that may need more time, we were promised to get it within a month's time
    - Once Beta3 is released, file list and mean values shall be frozen
- Validation will take 2-3 months
- Do While 3 < Beta < 4:
    - Fix covariances, documentation, format, processing issues
    - If there are no validation surprises:
        - Beta4 = release candidate
    - Else:

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
    - ^{233}U is the only thing that may need more time, we were promised to get it within a month's time
    - Once Beta3 is released, file list and mean values shall be frozen
- Validation will take 2-3 months
- Do While 3 < Beta < 4:
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    - If there are no validation surprises:
        - Beta4 = release candidate
    - Else:
        - Unfreeze what must be unfrozen

Timeline

- Beta3:
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- Do While 3 < Beta < 4:
    - Fix covariances, documentation, format, processing issues
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        - Beta4 = release candidate
    - Else:
        - Unfreeze what must be unfrozen
        - Go to "Adjust timeline as needed"

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
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- Do While 3 < Beta < 4:
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    - Else:
        - Unfreeze what must be unfrozen
        - Go to "Adjust timeline as needed"
    - Endif

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
    - ^{233}U is the only thing that may need more time, we were promised to get it within a month's time
    - Once Beta3 is released, file list and mean values shall be frozen
- Validation will take 2-3 months
- Do While 3 < Beta < 4:
    - Fix covariances, documentation, format, processing issues
    - If there are no validation surprises:
        - Beta4 = release candidate
    - Else:
        - Unfreeze what must be unfrozen
        - Go to "Adjust timeline as needed"
    - Endif
- End do

Timeline

- Beta3:
    - Collect all updates/fixes, review and push forward in the next few weeks
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Mini-CSEWG

- Spring
- Virtual
- Review validation results
- Bless release

Conclusion

- Infrastructure development
  - Set up evaluation review process
  - Tracking issues
  - ADVANCE CI/CD system is live
- Process for the next ENDF/B release is moving along
  - Multiple Beta versions released
  - Most recent (Beta2) released in august, being broadly tested
  - Finishing the next one (Beta3)
    - Validation feedback from Beta1.1/Beta2 is generally positive with specific improvement needs (that are already being addressed)
    - Expect to have addressed main issues with Beta2, and additional issues in upcoming Beta3
    - Beta3 should be very close to final release
- Collaborative effort on evaluation, review and issue fixing have been very successful
- Updated timeline to ensure the optimal quality of the final ENDF/B-VIII.1 release

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