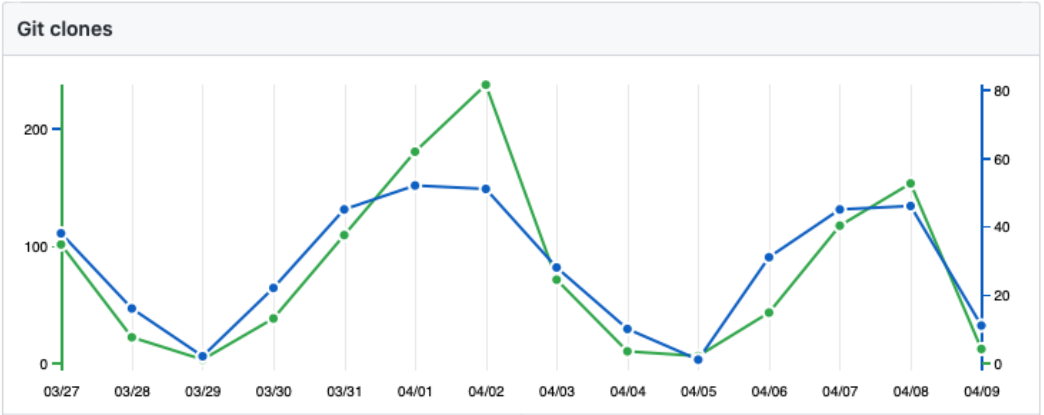
NJOY Status

NJOY2016

- Six versions released in 2020 responding to a number of issues.
  - Wim Haeck is the primary maintainer of NJOY2016.
- Issues: https://github.com/njoy/NJOY2016/issues

NJOY2016 Usage

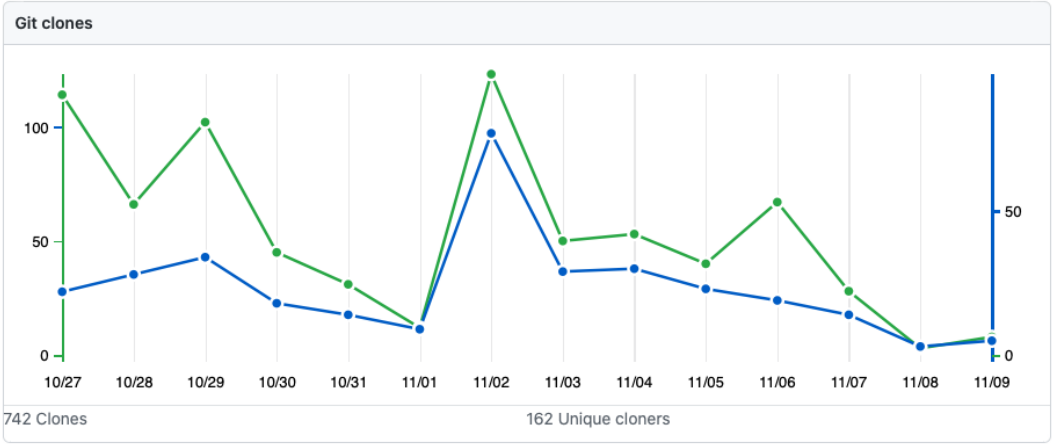
COVID 103 unique cloners



NJOY2016 Usage

COVID 103 unique cloners

US Elections 162 unique cloners



RECONR

"The RECONR module is used to reconstruct resonance cross sections from resonance parameters and to reconstruct cross sections from ENDF nonlinear interpolation schemes." — NJOY2016 manual pg. 43

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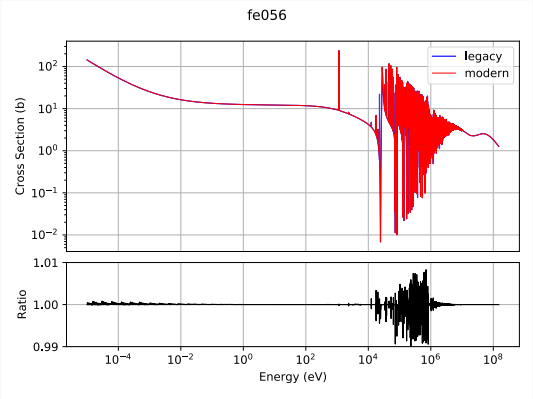
... and so much more

RECONR

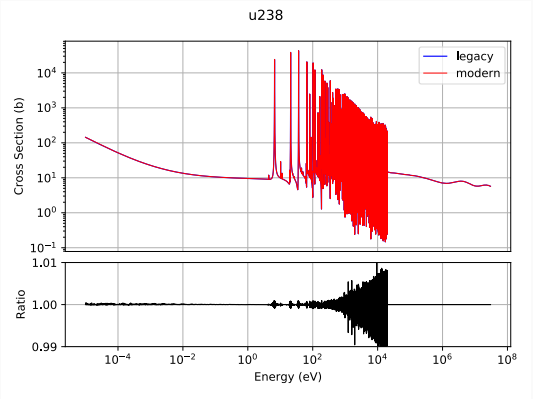
1. Collect evaluation data
2. Linearization of cross sections
3. Resonance reconstruction—and linearization `resonanceReconstruction`
4. Processing of unresolved resonances
5. Unionization of energy grid
6. Summation
   - Reconstructed resonances with "background" cross sections
   - Photon production cross sections
   - Redundant cross sections
   - Unresolved cross sections with background (sometimes)
7. Write processed data
   - Output should be the same format as the input (ENDF or GNDS)

Comparison to Legacy RECONR

Fe-56



U-238



Comparison to Legacy RECONR

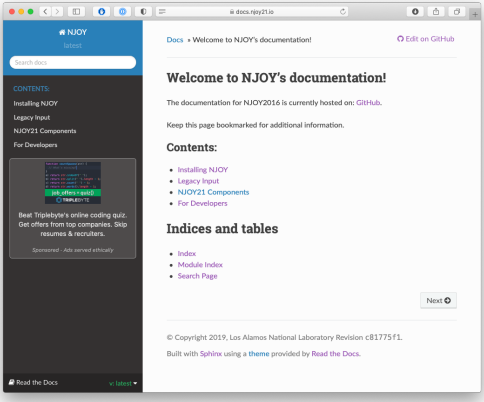
- Run NJOY through:
  - Modern RECONR
  - BROADR
  - HEATR
  - GASPR
  - THERMR
  - PURR
  - ACER
- 976 MCNP benchmark calculations
- Compare k_{eff} results

n-σ	Gaussian	Benchmarks
1-σ	68.2 %	60.55 %
2-σ	95.45 %	89.75 %
3-σ	99.73 %	96.72 %
3+-σ	–	3.28 %

Documentation

Updated Documentation
https://docs.njoy21.io

- Will continue to update as capabilities are added.
- NJOY2016 manual still valid



Updated Build System

NJOY21 1.2.0 introduces a new/improved build system for NJOY21.

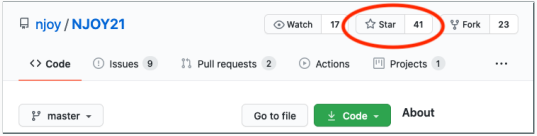
- Still uses CMake.
- Dependencies are handled using the CMake native `FetchContent` feature.
- Can get version by checkout out specific git tag.

  ```
  git clone --branch v1.2.0 https://github.com/njoy/NJOY21.git
  ```
- Updated installation documentation at https://docs.njoy21.io/install.html

NJOY21 1.3.0

- Modern RECONR
- Modern LEAPR
- Modern THERMR

Expected December 2020.



Conclusion

- NJOY2016 continues to receive bug fix attention by Wim Haeck
  - Lots of people have downloaded (hopefully used) NJOY during quarantine
- Modern RECONR
  - Graphical comparison shows little differences with Legacy NJOY
  - Still some differences with coulomb wave functions used in R-Matrix Limited
  - Algorithms are independent of data source.
- Much improved build system
- Release coming December 2020

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