Processing Code Status: NJOY

NJOY2016 Open-Source Distribution

- Public release on GitHub in January 2017
  - `https://njoy.lanl.gov`—Informational website
  - `https://github.com/njoy`—Code repositories, issues, wikis, etc.
- New build system—CMake
  - Maintain single build system for all platforms
  - Facilitate running of integration tests
  - Ensure compilation across all platforms
- Continuous release distribution

Getting NJOY2016

```
:: Download the source code
git clone https://github.com/njoy/NJOY2016.git

:: Configure the build process
cd NJOY2016
mkdir bin
cd bin
cmake ../

:: Build NJOY16
make

:: Test NJOY16
make test
```

Updating NJOY

The `master` branch on GitHub will always have the most up-to-date, production version.

```
:: Move into directory containing the source
cd NJOY2016

:: Get latest updates from GitHub
git pull origin

:: Configure and make as before
cd bin
cmake ../
make
make test
```

NJOY2016 Recent Developments

1. Changes to run ENDF/B-VIII.0 $\beta 4$ LEAPR inputs
   Jose Ignacio Marquez Damian
2. Removing NaNs from PURR output
   Paul Romano
3. Fixed segmentation fault in ACER
4. Ability to handle (i.e., ignore) new formats for ENDF/B-VIII.0

NJOY2016 Short-term Needs

- Better Windows support
- Support for additional compilers
  - Each compiler does optimization differently; arguably wrong.
  - Different optimizations results in differences in output.
- Better distribution mechanism
- Identify issues with potentially non-initialized variables and unused variables
  - Compiler flags warn about these issues which were previously silently ignored
- Respond to other issues:

  https://github.com/njoy/NJOY2016/issues
- Utilize data from new ENDF formats

NJOY2012

- NJOY2012.82 available on T-2 website
  http://t2.lanl.gov/nis/codes/NJOY12/index.html
- NJOY2012.99 available on NEA website
  https://www.oecd-nea.org/dbprog/njoy-links.html
- Can process ENDF/B-VIII.0 Beta5 (except those with the new $P(\nu)$ or fission energy format)

NJOY2012

Future Support

We will support NJOY2012 until September 2018.

- We want everyone to move to NJOY2016
- We can help you incorporate custom NJOY2012 patches into NJOY2016
- If custom patches are useful to broader community, we will consider adding them to master branch

NJOY21

- Ground-up rewrite of NJOY2016
- Goals:
  1. Maintain NJOY's image of trusted and stable processing code.
  2. Easier to: build, verify & validate, interact with, and process.
  3. More flexible
  4. Faster
  5. Maintainable

NJOY21—Current Status

- Backwards compatibility
  - Every argument/parameter in every NJOY2016 module is checked for validity—not correctness.
  - Error messages are presented to user *before* running calculation.
- Will recommend NJOY21 for public use when all modules have been finished (about 4 left).

Up next:

- Doppler broadening
- LEAPR and THERMR
- ENDFtk and ACEtk as needed

Resonance Reconstruction

- RECONR does many things
  - Resonance reconstruction
  - Energy grid unionization
  - Cross section linearization
- Capabilities are still being integrated
- NJOY21 has factor of 5+ speedup over NJOY2016


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