NJOY Status

A. C. (Skip) Kahler
Theoretical Division
Los Alamos National Laboratory

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NJOY99 – latest updates

- **Some recent changes …**
  - NJOY99.364 was released in the Spring, 2011;
  - A number of NEA generated updates have been created;
    - Thanks to Andre Trkov for coordinating this work.
      - See http://www.oecd-nea.org/dbprog/njoy-links.html.
  - NJOY99.385 will be released in mid-November.
    - See http://t2.lanl.gov/codes/njoy99 for a complete description;
    - Updates include
      - Larger fixed arrays (a never-ending issue with f77 codes);
      - Fix lingering 32-bit/64-bit inconsistencies (will not be an NJOY2012 issue);
      - Recognize the many new reaction MT values defined by CSEWG2010;
        - Was partially implemented in 99.364.

NJOY99 – latest updates (con't)

- Updates include (con't)
  - New User plotting options in COVR for correlation matrix scaling;
  - Implement the polynomial fission energy release format (mf1/mt458);
    - ***NOTE: ENDF/B-VII.1has units error (1/MeV) for quadratic coefficients.***
  - Increased precision for selected ACE file pdf and cdf's;
  - Allow smaller values in GROUPR before truncating to zero;
  - Correct pendf dictionary error when running multiple HEATR jobs;
    - All user requested mf3/mt sections have always been present but not necessarily listed in the mf1/mt451 dictionary.
  - Allow variable "NE" values as a function of URR (l,j) state;
  - More robust ZAID calculation in ACER;
  - More robust mf34 processing in ERRORR;
    - Explicitly test for assumed mf4 and mf34 LCT and LTT values.

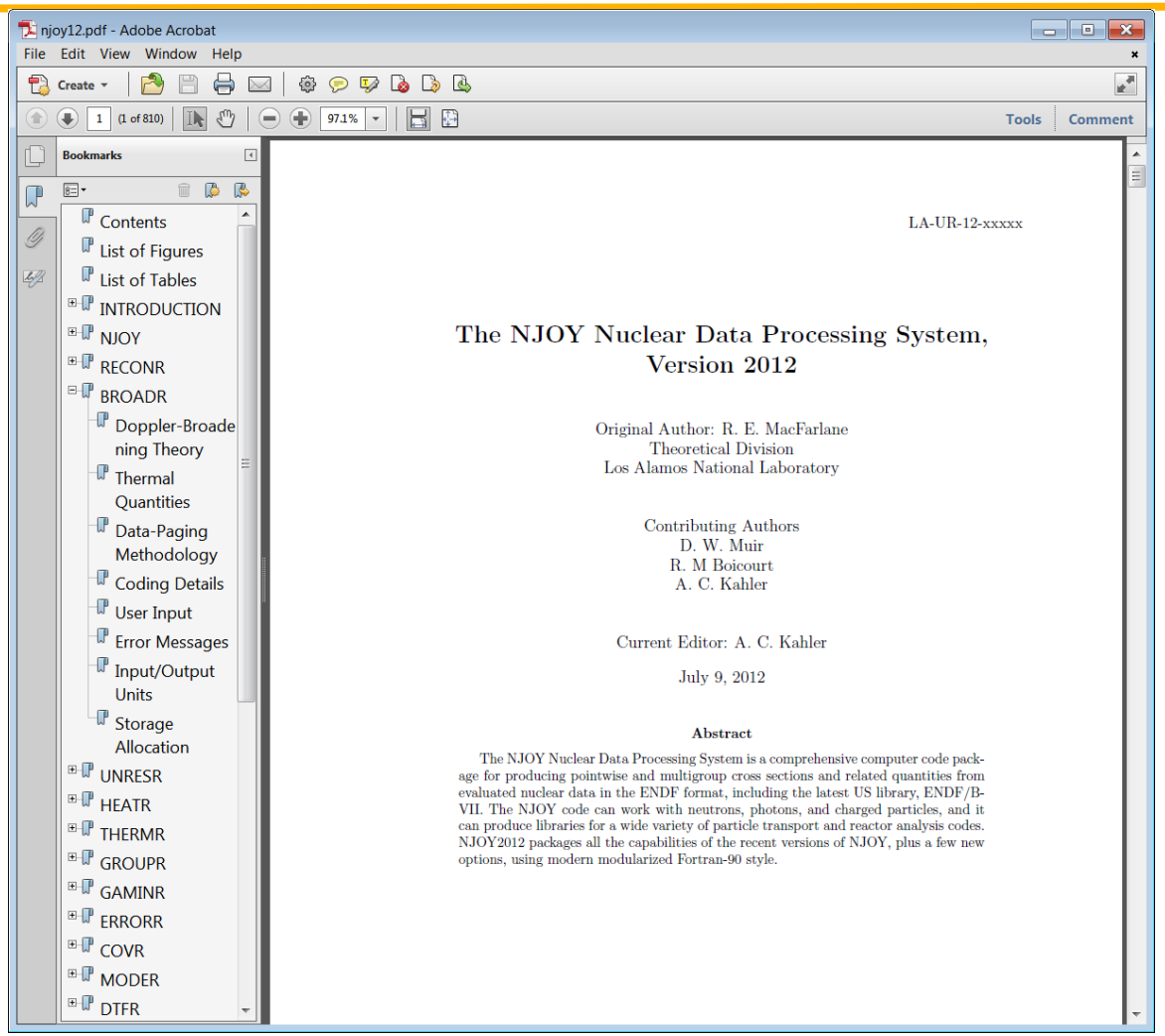
NJOY99 to NJOY2012

- **NJOY99.x to NJOY2012**
  - The long overdue release of NJOY2012 is imminent!
    - Preliminary versions have already been released to selected users via NDAs with LANL's Technology Transfer Division;
      - ANL, AWE, BNL, Bettis, KAPL, ORNL, Sandia.
    - A new, hyperlinked, pdf-formatted manual has been written;
      - Largely done by Bob … but also thanks for Jeremy Conlin, XCP-5, for LaTeX assistance!
  - Distribution of NJOY2012 will be handled through LANL's Technology Transfer Division.
    - Contact Kathleen McDonald, kathleen_m@lanl.gov, for licensing information … BUT NOT BEFORE 11/30!!!
      - Earlier requests will be held pending completion of internal release paperwork.

NJOY99 to NJOY2012

The new NJOY Nuclear Data Processing System Manual

- **Now a pdf file;**
- **Table of Contents and Index are hyperlinked;**
- **Chapter headings, Section headings, Figures, Tables, Equations and References are hyperlinked.**



NJOY99 to NJOY2012

- **NJOY99.x to NJOY2012**
  - New capability, which will *NOT* appear in NJOY99.x, includes
    - Process the "Limited Reich-Moore" resolved resonance format;
      - MF2/MT151 LRF=7 (for those who speak ENDFese);
      - Can also calculate elastic scattering angular distributions.
    - No limit on number of temperatures (BROADR, UNRESR, HEATR, GROUPR, PURR);
    - No limit on the number of σ_0's (UNRESR, PURR, GROUPR);
    - Revised input for THERMR;
      - See Card 2 description; use of NJOY99 format will abort.
    - Revised input for ERRORR;
      - ERRORR will internally condense any GROUPR file to only contain data for one temperature, one (infinitely dilute) σ_0, no more than P_1 for all mat's.
        - Makes Card 3 mandatory (to know the User temperature of interest).
  - No input changes for standard ACE file creation.

NJOY/ACE … going forward …

- **Revised ACE Format (Jeremy Conlin, XCP-5)**
  - A new format is required to overcome the limitations of the current 10-character ZAID + suffix notation …
    - ZZZAAA.ddx
      - ZZZ = Atomic number; AAA=Atomic mass number; dd=library identifier; x=data class (c=continuous energy; t=thermal; …).
  - Define a new, (up to) 24-character, variable …
    - SSSZZZAAA.dddxx
      - SSS = excited state (use ENDF “LIS” from mf1/mt451);
      - ZZZ = atomic number (as before);
      - AAA = atomic mass number (as before);
      - ddd = library identifier;
        - Three digits allows for additional data files for a given ZA.
      - xx = data class (use ENDF “NSUB”, “IPART”, “ITYPE”).
        - Defined in the ENDF format manual; but allow NJOY/ACER input to override.

NJOY/ACE … going forward …

- **Revised ACE Format (con't)**
  - New data in the revised ACE file include
    - New line 1 with ACE format version #, new ZAID+suffix and more;
    - New line 2 with basic nuclear data;
      - Default action is to obtain as much information from the original ENDF-formatted input file as possible;
        - Allow NJOY/ACER input to override;
        - Final ACE file is a text-based file which can be further modified.
    - N comment lines (N may be zero);
      - Similar to User comment lines in RECONR that appear on the PENDF tape.
    - Remainder of ACE file conforms to current format.
      - User *<u>may</u>* have to create a unique ZZZAAA.ccx name.

NJOY/ACE … going forward …

- **Revised ACE Format (con't)**
  - Revised xsdir info:
    - Item 6 in an xsdir directory entry identifies the line number where the ACE file data for a given material start.
      - For standalone files this is typically 1 (*and will remain so for the new format data*);
      - For backward compatibility it can be set to (3+N).
        - Allows for use of new ACE file data in old MCNP versions.
  - NJOY2012 *and NJOY99* patches implementing these changes will be made available.