State of the EMPIRE

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BROOKHAVEN NATIONAL LABORATORY
a passion for discovery

U.S. DEPARTMENT OF ENERGY | Office of Science

EMPIRE-3.2 (Malta)
(358 Svn commits since Nov. 1, 2012)

Capture of Malta by French army heading for Egypt in 1798

- **A bit more of physics**
  - Simulation of the Engelbrecht-Weidenmuller transformation. Change in inelastic compensated by changing the compound elastic
  - Including gamma and fission transmission coefficients calculated by EMPIRE into ECIS compound calculation
  - Kalbach parameterizations for breakup and transfer reactions of complex projectiles
  - MLBW approach added to the resonance module
  - Nobre's deformation systematics
  - Astrophysical S-factor (A. Palumbo)
  - All physics constants updated to CODATA 2010 set (NIST)

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- **A bit better numerics**
  - Fixing fluctuations due to the gap between the last level and the continuum
  - Improving x-sec & energy balance
  - Minor problems in DWBA calculation with closed channels corrected.
- **A bit better plotting**
  - New zvview-1.017
  - Upgrade to plot cross sections at fixed angles for neutrons
  - DDHMS multiple emission spectra and DDX's in CM
  - Inclusive DDX's implemented for ENDF=0

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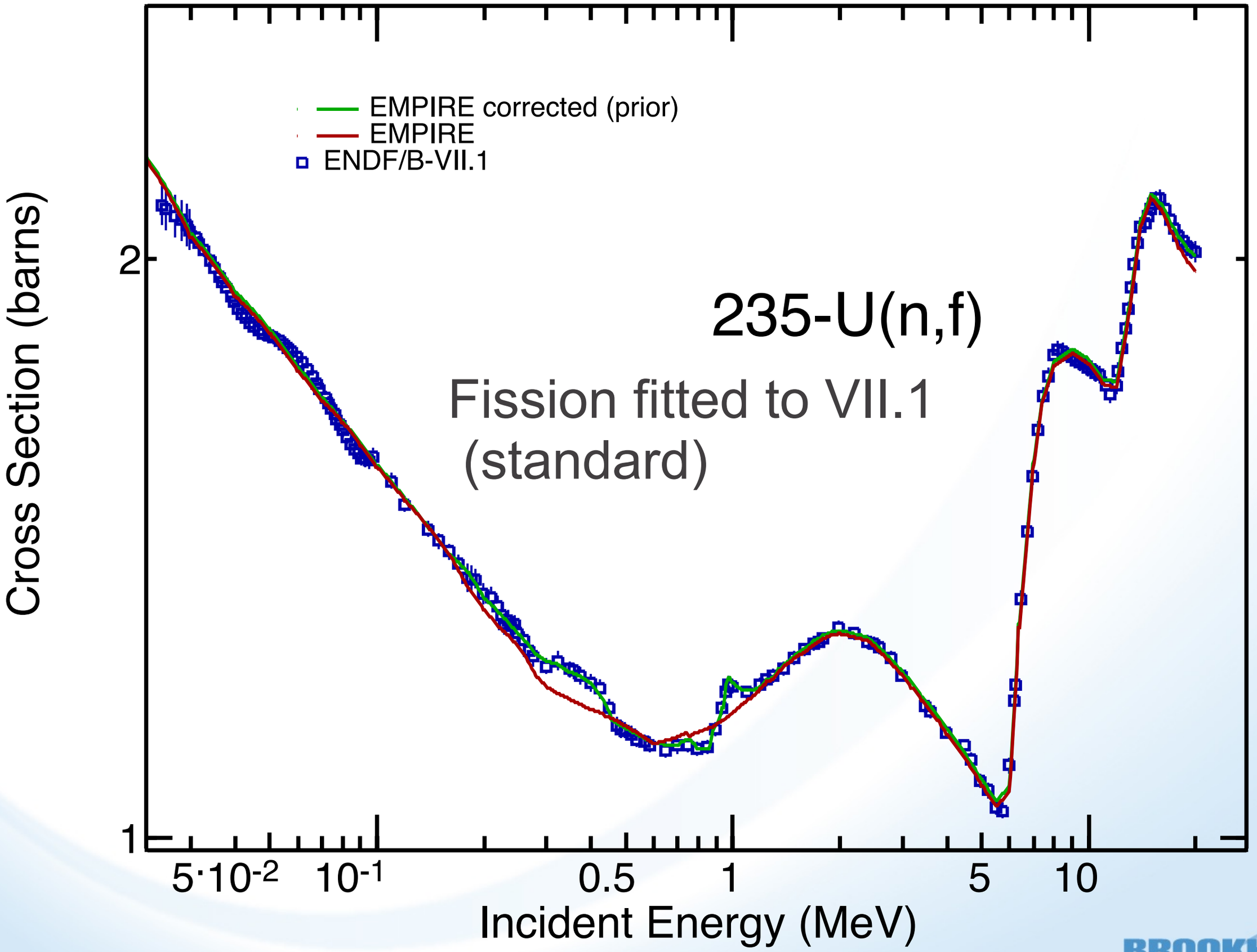
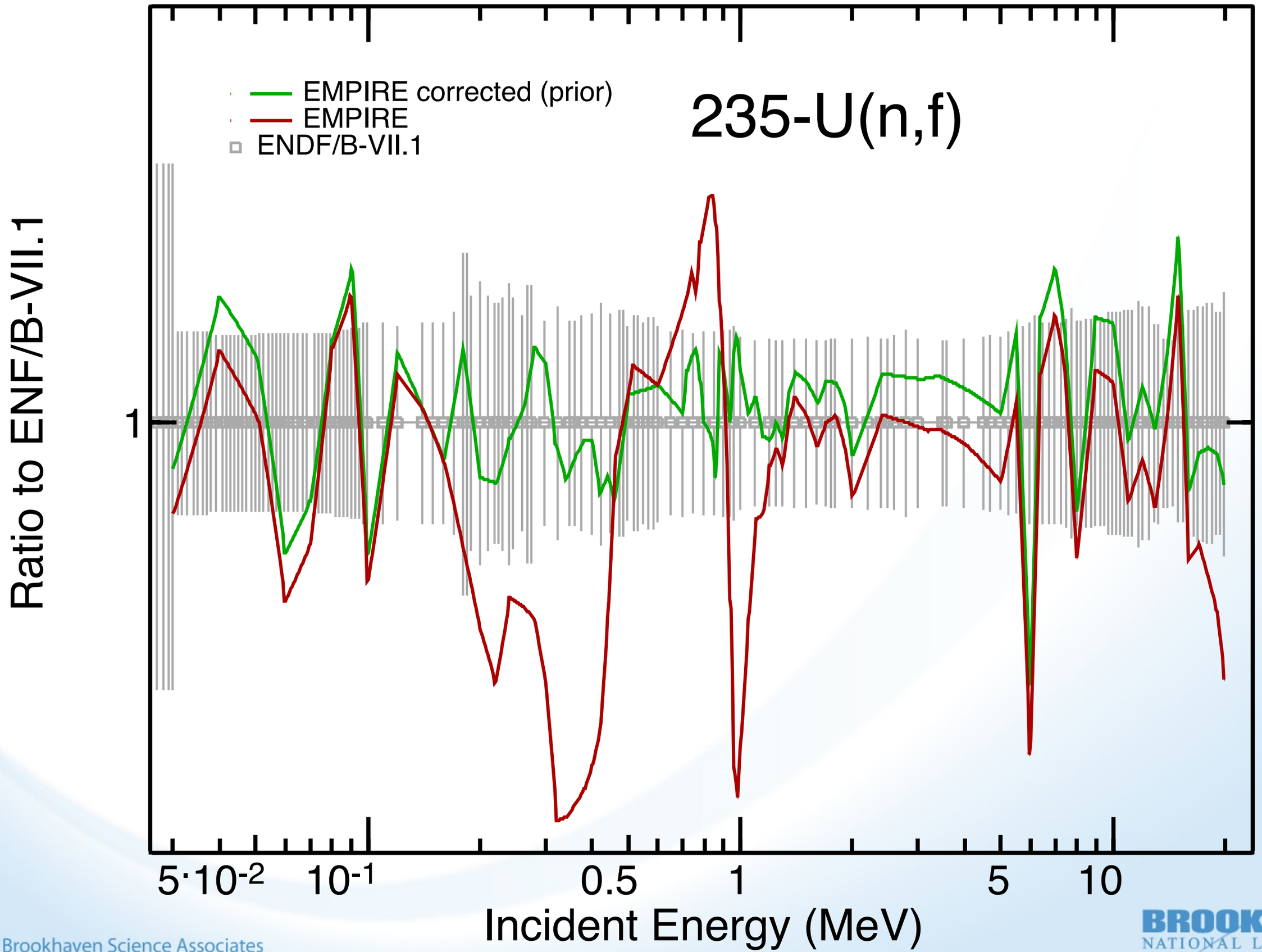
- **A bit newer FORTRAN**
  - kalend.f90, kalman.f90, genkal.f90, newinp.f90
  - Improving gfortran compatibility
- **A bit more functionality**
  - Improved support for assimilation procedure
  - Improved qsubEmpire.py for running on cluster
  - Add tab in Xrun.tcl that applies Kalman results back to Empire input file.
- **A bit better formatting**
  - Making line numbers in ENDF files optional


EMPIRE corrected (prior)
EMPIRE
ENDF/B-VII.1
235-U(n,f)
Fission fitted to VII.1
(standard)
Cross Section (barns)
2
1
5·10-2
10-1
0.5
1
5
10
Incident Energy (MeV)


EMPIRE corrected (prior)
EMPIRE
ENDF/B-VII.1
235-U(n,f)
Ratio to ENDF/B-VII.1
1
5·10-2
10-1
0.5
1
5
10
Incident Energy (MeV)