United States nuclear data program evaluated nuclear structure data file (ENSDF): Five years of data evaluation at Texas A&M

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This was the sixth consecutive year that we have been an important participant in the nationwide United States Nuclear Data Program (USNDP). This is a national interest activity financed by DOE, through which the relevant nuclear-science results in virtually all world publications are retrieved and put together in a large Evaluated Nuclear Structure Data File (ENSDF) database according to *general policies* [1], a set of rules that make possible a standard approach through which the data are uniformly evaluated. This activity is supported by a relatively small group of professionals organized as a national data network located mostly in national institutes but also hosted by few universities. The nuclear data network is the nodal point for the wide dissemination of nuclear knowledge to many customers, from those in basic science to those engaged in commercial applications in American and international businesses.

The US network is the most consistent part of an international network similarly organized worldwide. The output is published in the Nuclear Data Sheets, an Elsevier publication, and also is disseminated by different on-line databases which can be retrieved at the NNDC site (http://www.nndc.bnl.gov), IAEA Vienna's site (http://www-nds.iaea.org) and several other locations.

During these years we covered essentially all the regions of the periodic table. The superheavy A=252 mass chain, the very data-rich mid-mass chains, A=147 and A=140, and the relatively lighter chains, A=97 and A=84, have all been published previously in Nuclear Data Sheets; the A=77 and A=34 chains will soon appear in the same journal. Since nuclear-data evaluation depends critically on the experience of the evaluator, with a veteran evaluator typically completing only a couple of mass chains per year, coverage of such a wide range of A chains in such a short time is a considerable accomplishment. This once more testifies to Texas A&M's qualifications to be considered a national evaluation center.

This past year was the second one in which evaluations were done in collaboration with B. Singh from McMaster University, Canada. We completed the A=36 and A=37 mass chains [2]. Both incorporate several hundred data-significant publications and were unusually demanding since all previous evaluations had been done by P. Endt and co-authors, who used their own methods and format, and published in the journal Nuclear Physics A. Thus, we had to cover the whole history of these nuclei from the very beginning, requiring us to review and reorganize everything ever published on these mass chains. As an innovation we also included unbound resonant states in our evaluation, something that has generally not been done in ENSDF. We did so to accommodate the astrophysics community, which has become interested in such information in recent years.

[1] Nucl. Data Sheets **111**, v (2010).
[2] N. Nica, J.C. Hardy, and B. Singh, Nuclear Data Sheets (accepted).