United States nuclear structure data program (USNDP) and evaluated nuclear structure data file (ENSDF) at Texas A&M University

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Since 2005 we have been an important partner in the nationwide United States Nuclear Data Program (USNDP), which is part of the Nuclear Structure and Decay Data (NSDD) international nuclear data-evaluation network. USNDP is in fact the main part of the NSDD network, making the greatest effort in completion of the goals of the nuclear-structure data evaluation communities. Nuclear data evaluation is a national-interest activity financed by DOE, through which 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 polices, a set of rules that make possible a standard approach through which the data are uniformly evaluated.

This activity is carried by a relatively small group of professionals located mostly in national institutes but also hosted by a few universities. The nuclear data network is the nodal point for the wide dissemination of nuclear knowledge to many users, from those in basic science to those engaged in commercial applications in American and international businesses. 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 other locations.

In the 11 years that the Cyclotron Institute of Texas A&M has been involved, we have completed the evaluation of mass chains covering a large part of the nuclear chart. We have published in Nuclear Data Sheets the superheavy A=252 mass chain [1]; the very data-rich mid-mass chains, A=140 [2], A=141 [3], A=147 [4] and A=148 [5]; the relatively lighter chains, A=97 [6] and A=84 [7]; and, in collaboration with B. Singh and a group of authors from McMaster University, Canada, we also published the A=77 [8], A=37 [9], A=36 [10], and A=34 [11] chains. Another big mass chain, A=157, was published in Nulear Data Sheets [12] at the beginning of 2016. Two more, A=140 and A=158, have been submitted and are currently undergoing review. Our total effort is 0.67 FTE per year.

In January 2016 we started a new evaluation of A=155, a mass chain that had previously been evaluated twelve years before. The chain consists of isotopes of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, and Ta, a total of 16 isobars. About 190 papers relating to these nuclei have been published since June 2004 when the previous evaluation ended, of which about 70 are experimental studies. This work is in progress.

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