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INTERNATIONAL NUCLEAR DATA COMMITTEE

Progress Report

on

Nuclear Data Activities in Korea

(For the Period January 1982 to December 1982)

by Mann Cho
Liaison Officer of INDC

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March 1983

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1. KAERI-26G ; A Group Constant library for Fast Reactor

Jung-Do Kim and Jong Tai Lee

Korea Advanced Energy Research Institute

For fast reactor calculations, an ABBN-type 26-group constant set, KAERI-26G, consisting of a total of 34 nuclides was generated. Almost all the basic nuclear data adopted for the generation of the set are ENDF/B-IV, and some of them (i.e. Ti, Ga and Sn) are ENDL-78.

The set contains the following nuclides; H-1, Be-9, B-10, B-11, C-12, O-16, Na-23, Mg, Al-27, Ti, Si, V, Cr, Mn-55, Fe, Ni, Cu, Ga, Nb-93, Mo, Sn, Pb, Th-232, U-233, U-234, U-235, U-236, U-238, Pu-238, Pu-239, Pu-240, Pu-241, Pu-242 and Am-241.

The paper on processing procedure and results of benchmark test was published in the journal of the Korean Nuclear Society Vol. 14, No. 4(1982) with an abstract as follows.

— Generation and Benchmark Test of 26-group Constant Set for Fast Reactor Calculations —

An ABBN-type 26-group constant set, KAERI-26G, which can be reliably applicable to fast reactor calculations has been generated using the nuclear data of ENDF/B-IV or ENDL-78 and a processing code ETOX-K4. The KAERI-26G set was evaluated by analysing measured integral quantities such as effective multiplication factor, central reaction-rate ratio, and central reactivity coefficient for a variety of critical assemblies. And these calculated quantities were compared with results from other workers using similar-type sets.

2. Multigroup Cross Section Library for Light Water Reactor

Jung-Do Kim and Jong Tai Lee

A Project to generate a library for light water power reactor analysis code, FATAC, similar to WIMS of England or EPRI-CPM of U.S.A. is currently in progress at Korea Advanced Energy Research Institute.

Routines in the NJOY processing system and the others, such as Nelkin's or modified free gas model codes are used to generate the library from ENDF/B-IV and a part of ENDF/B-V. The project is expected to be completed by the end of 1983.

3. SUN 1.5MV Tandem Van de Graaff Accelerator

K.H. Chung, H.I. Bak, B.H. Choi, J.S. Bak,
H.J. Woo, K.H. Kim, S.H. Hong, U.C. Lee, K.Y. Song

Department of Nuclear Engineering, Seoul National University

Since 1977, an accelerator is being built at Seoul National University, which will be used in various nuclear engineering experiments, such as interaction between charged particles and materials of fusion or fast reactor, fast neutron cross section measurements and trainings for students.

In order to support this project, Dr. M.K. Mehta of Bhaba Atomic Research Center in India visited the laboratory of SNU as an expert of IAEA.

Progress reports on this project were published in Engineering Report of Seoul National University, Vol. 14, No. 2 (1982) and New Physics (Korean Physical Society), Vol.22, No. 4 (1982), respectively.

The abstracts are as follows.

— High Voltage Generation and its Characteristics —

The present work is mainly concerned with the high-voltage generation in a 1.5MV tandem Van de Graaff which is being built in our laboratory as a charged-particle accelerator for various nuclear engineering experiments. Maximum voltage of 1.24MV at the high-voltage terminal is measured by a generating voltmeter when the vessel is pressurized up to 7 atm with dry air. Equipotential plates, supporting columns, dehumidifier, and pellet chains have been improved for the long-term stable operation and the low costs of construction and maintenance.

— Construction of the Duoplasmatron and
its Characteristics—

A duoplasmatron has been made as an ion source of the SNU 1.5MV tandem Van de Graaff, which is being built at Seoul National University as a pressurized electrostatic accelerator. Particularly, the lifetime of the filament in the ion source is improved for the long-term use ; 140 hours. Experiments are carried out to examine the characteristics of the duoplasmatron. It turns out that the duoplasmatron made herein can produce the stable beam currents of up to 12.1mA at extraction voltage 10kV, and arc current 10A.