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Computer Code Abstracts

MILC

1. Program names: MILC-1, MILC-2, MILC-3
2. Computer for which programs are designed: Philco-2000 Programming system: TAC
3. Nature of the problem solved: MILC-1 constructs a multigroup library of nuclear cross sections and parameters for other nuclear properties of an arbitrary number of groups and isotopes. The data have been previously averaged over the groups and the program only records these data in an orderly manner on tape. MILC-2 modifies a multigroup library tape constructed by the program MILC-1 or previously modified by this program. MILC-3 edits the contents of a multigroup library which was constructed by MILC-1 or modified by MILC-2.
4. Method of solution: MILC-1 reads data from punched cards and writes data onto magnetic tape in a standard format. MILC-2 reads modification data from punched cards and the existing library from magnetic tape. Data are read from punched cards and written onto magnetic tape using the XACT tape write/read subroutine. MILC-3 reads cards which contain the list of items to be edited, reads the library tape and writes an edited output tape.
5. Basic physics approximations in the problem formulation: Only P_0 and P_1 elastic scattering data are accepted. Groups with inelastic scattering matrix data may not overlap groups with resonance capture data. The resonance fission data are assumed to be some fraction of the resonance capture data.
6. Restrictions on the complexity of the problem: Less than 81 multigroups; less than 342 total isotopes in the library; less than 342 isotopes with resonance capture data in the library; less than 315 isotopes with resonance fission data; less than 31 groups in an inelastic scattering matrix; less than 51 groups with resonance data; less than 9 resonances in a group; less than 342 isotopes with inelastic scattering matrices; less than 100 source distribution spectra.
7. Typical running times: MILC-1, 2 min for a 6500-card library; MILC-2, short; MILC-3, 6 min to completely edit a 6500-card library.
8. Present status: In production.
9. *References:* R. B. Smith and C. H. Hunter, The BKS system for the Philco-2000 computer. WAPD-TM-233 (April 1961).
   H. Bohl, Jr. and A. P. Hemphill, MUFT-5—A fast neutron spectrum program for the Philco-2000. WAPD-TM-218 (February 1961).
10. Material available from Philco:
    Binary program decks
    Symbolic program tapes
    Referenced documents

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MUFT-5

1. Name of program: MUFT-5
2. Computer for which program is designed: Philco-2000 Programming system: TAC
3. Nature of problem solved: This program solves the $P1$ or $B1$ multigroup equation for the first two Legendre coefficients of the directional neutron flux—flux and current—and the isotropic and anisotropic components of the slowing down densities due to a cosine-shaped neutron source. Hydrogen may be treated exactly or in a Selengut–Goertzel approximation. For energy degradation by heavy elements, both age and Greuling–Goertzel approximations are available. Slowing down of neutrons by inelastic scattering and removal of neutrons by capture and fission resonances is included. Only the nonthermal energy range is considered.
4. Restrictions on the complexity of the problem: This program is intended to operate within the BKS system.
5. Typical running time: 15 sec
6. Unusual feature of the program: The program requires a library of multigroup parameters. The creation of this multigroup isotope library is performed by the MILC-1 program using data specified on cards. A second program MILC-2 takes care of making modifications to the MILC-1 library tape and a third program MILC-3 is used to edit the tape written by MILC-1 or modified by MILC-2.
7. Present status: In use
8. *References:* H. Bohl, Jr. and A. P. Hemphill, MUFT-5—A fast neutron spectrum program for the Philco-2000. WAPD-TM-218 (February, 1961).
   R. B. Smith and C. H. Hunter, The BKS system for the Philco-2000. WAPD-TM-233 (April 1961).
9. Material available from Philco:
   Binary program deck
   Symbolic program tape
   Binary library tape

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KATE-1

1. Name of program: KATE-1
2. Computer for which program is designed: Philco-2000 Programming system: TAC