

Charles O. Slater

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Degrees: PhD, Nuclear Engineering, The University of Tennessee, Knoxville (1973)
MS, Engineering Science, The California Institute of Technology (1970)
BS, Mathematics, Florida A&M University (1968)

Areas of Expertise:

Radiation shielding analysis using 1-, 2-, and 3-D discrete ordinates methods, Monte Carlo methods, or coupled Monte Carlo and discrete ordinates methods; coupling of 1-D transport and diffusion theory methods; processing input to and output from the DORT 2-D discrete ordinates radiation transport computer code; source input, source biasing, and history analysis for the MORSE Monte Carlo radiation transport code; and user source input for the MCNP Monte Carlo radiation transport code.

Professional Experience:

6/96 - Present: Senior Development Staff Member I, Oak Ridge National Laboratory. Duties included: (1) the design and analysis of shielding for the upgrade to the Holifield Radioactive Ion Beam Facility, (2) the coupling of adjoint MORSE and forward TORT, (3) the analysis of the HFIR irradiation of Pu-bearing CANDU fuel for the Fissile Materials Disposition Program (4) the development of a last-flight estimation procedure using source moments from the TORT code, (5) the coupling of plume sources from HPAC with the TORT code, (6) the analysis of shielding for upgrades to HFIR beam lines HB2 and HB4, (7) sensitivity and criticality analyses for transuranium wastes, (8) analyses of criticality alarm placements in large buildings housing nuclear materials, (9) analysis of the heating and other activities in the HFIR cold source as well as the development of an MCNP-to-MCNP coupling procedure to use a localized source around the HB4 beam tube, (10) analysis of shielding for the Spallation Neutron Source beam lines, (11) the analysis of shielding for high-level waste cleanup facilities, (12) MCNP analysis of the Pulsed Fast Neutron Assay system, and (13) the MCNP analysis of radiation levels in a target vehicle in an air-over-ground environment.

2/75 - 6/96: Research Staff Member, Oak Ridge National Laboratory. Duties included the analysis of shielding designs and/or supporting experiments for (1) the Gas Cooled Fast Breeder Reactor (GCFR), (2) the High Temperature Gas Cooled Reactor (HTGR), (3) the Liquid Metal Cooled Fast Breeder Reactors (Clinch River, PRISM, SAFR, generic), (4) the Recycle Equipment Test Facility, (5) the Halden Heavy Water Reactor, (6) Servomanipulators designed by Central Research Laboratories, (7) the High Flux Isotope and Advanced Neutron Source Reactors, (8) the West Valley Vitrification Facility, (9) a Federal Emergency Management Agency (FEMA) detector facility, (10) the Superconducting Super Collider, (11) the Spallation Neutron Source, and (12) the Advanced Neutron Source. In addition, served 1-2 years as task leader for shielding analysis for the GCFR shielding program and several years for the HTGR shielding program; analyzed radiation doses in air-over-ground fields and developed a method for coupling adjoint Monte Carlo leakages with Forward 2-D discrete ordinates fluence fields for DNA projects. Several auxiliary computer codes were developed or modified in support of the above efforts.

1/73 - 1/75: Senior Engineer, General Atomic Company, San Diego, California. Duties included (1) the analysis of the shielding design for the HTGR, (2) Monte Carlo analysis of radiation streaming within the reactor cavity, (3) the development of a computer code coupling transport and diffusion theory, (4) neutron activation analysis, (5) fuel shipping cask analysis, (6) development of an analytical method for calculating scattered radiation levels in large labyrinths, (7) designing a compartment shield for a curium isotopic source used to power a space vehicle, etc.

6/69 - 9/69: Engineer (Summer Student Job), Lawrence Radiation Laboratory, Livermore, California. The duties were to determine critical parameters (radius and mass) of plutonium spheres moderated and/or reflected by several materials composed of light elements.

Professional Activities:

Served on the ANS Radiation Protection and Shielding Division's Program Committee and the Program Committee for the 1984 Topical Meeting on Reactor Physics and Shielding, and refereed journal articles for Nuclear Technology and Journal of ASTM International.

Representative Publications:

C. O. Slater, S. N. Cramer, D. T. Ingersoll, M. L. Williams, F. J. Muckenthaler, J. J. Manning, and J. L. Hull, "Measurement and Calculation of the Effectiveness of the Gas-Cooled Fast Breeder Reactor Grid-Plate Shield," **Nuclear Technology** **52**, 354-369 (March 1981).

C. O. Slater, F. J. Muckenthaler, and D. T. Ingersoll, "Experimental Verification of Calculated Neutron Streaming in the Bottom Reflector and Core Regions of a Large-Scale High-Temperature Gas-Cooled Reactor Design Concept," **NSE** **97**, 123-144 (1987).

C. O. Slater, J. V. Pace III, R. L. Childs, M. J. Haire, and T. Koyama, "Three-Dimensional Radiation Dose Mapping with the TORT Computer Code," **Trans. Am. Nucl. Soc.** **63**, 368-369 (1991).

C. O. Slater, "DRC2: A Code with Specialized Applications for Coupling Localized Monte Carlo Adjoint Calculations with Fluences from Two-Dimensional R-Z Discrete Ordinates Air-Over-Ground Calculations," ORNL/TM-11873 (January 1992).

Charles O. Slater and Hamilton T. Hunter, "Validation of the VITAMIN-B6 and BUGLE-96 Cross-Section Libraries for Moderate-Energy Neutron and Photon Transport Calculations," **Nuclear Technology**, **129**, 201-217 (February 2000).

C. O. Slater, J. C. Gehin, and R. T. Santoro, "A Study of the Effects of a Radiation Dispersal Device," ORNL/TM-2003/128 (May 2003).

C. O. Slater and R. T. Primm, III, "Calculation of Rabbit and Simulator Worth in the HFIR Hydraulic Tube and Comparison with Measured Values," ORNL/TM-2005/94 (September 2005).

C. O. Slater, "Development and Testing of the FALSTF3D Last-Flight Estimation Computer Code," ORNL/TM-2006/42 (May 2006).