

problems of graphite in nuclear reactors. The structural and dimensional changes which occur when graphite is irradiated and the effect of irradiation on the electrical, thermal, and mechanical properties of graphite are all discussed very fully from an experimental point of view. A special chapter is devoted to stored energy and the problems of reactor safety rising from it. There is a very good treatment of the theory of the displacement of atoms and, arising from this, a discussion of the relation between various scales of dose measurement. The timing of the book has permitted only preliminary references to the new insight into radiation damage which is now being obtained as a result of electron microscope studies. A single chapter on gas-graphite systems deals with a wide range of topics on the thermal and radiation induced reactions between graphite and various gases, in particular oxygen, carbon dioxide, hydrogen, and steam. Some of the problems associated with the applications of graphite to advanced reactor systems are covered in a chapter on graphite-molten salt and graphite-metal systems and on the use of graphite as a fuel matrix. A final chapter discusses moderator designs.

No single book could be a complete guide to a subject which is developing so rapidly but all concerned with the development and use of graphite will find this book a valuable reference to the well established parts of the subject. Newcomers to the field will be spared much tedious searching in a voluminous report literature.

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(About the Reviewer: The reviewer is a physicist working in the Metallurgy Division of the Atomic Energy Research Establishment, Harwell. He joined the Harwell staff in 1946 after a period of war-time work on radar. At Harwell he has been associated with research into the effect of irradiation on graphite. This work has led to the development of a model for the dimensional changes of graphite, which has had important practical applications, and to advances in the theory of radiation damage, notably in the study of the nucleation and growth of radiation defects.)

Computer Code Abstracts

ADJUST

1. Name of code: ADJUST
2. Computer for which code is designed: IBM 7090
Programming system: FORTRAN
3. Nature of problem solved: The code performs a numerical redistribution of pulse-height spectra for the correction of gain and/or zero shifts occurring between spectral measurements. The code will operate on and redistribute a pulse-height spectrum as if it had been measured at virtually any desired gain and zero setting.

Internally the code generates a table of quadratic least-squares fits to the contents of consecutive and overlapping groups of three channels of the original pulse-height spectrum. These are stored as a function of the invariant relating the gain curves of the original and redistributed spectra; that is, if the gain were in channels/volt, the curves would be stored as a function of volts. A new channel width is computed based on the desired new gain and zero. The contents of the new channel is then determined by selecting a curve from the stored table as a function of a value of the invariant, e.g., voltage, corresponding to the location of a new channel and integrating it over the new channel width.

It should be noted that this code assumes that the original spectrum has been assigned the correct gain and zero parameters. The redistributed spectrum will have no greater accuracy in this respect than the original. The area of the original pulse-height spectrum is conserved in the redistributed spectrum to within $\sim 0.1\%$ unless a large zero shift is encountered. The code also generates a set of pseudo count-rate statistics based on the channel contents of the redistributed spectrum.

4. Restrictions on the complexity of the problem: maximum number of channels, 400; code assumes a linear gain curve; gain shift of no greater than a factor of two (2).

5. Typical running times: less than 1 min for most problems.
6. Availability: in production at Oak Ridge National Laboratory. Copies of this program may be obtained from Mr. John D. Jarrard, Neutron Physics Division, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee.

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XITE

1. Name of code: XITE
2. Computer for which code is designed: 32K Philco 2000 with two tape units
Programming system: modified ALTAC
3. Nature of the problem solved: Transient, two-dimensional hydrodynamic equations (1, 2) representing the conservation of mass, energy, and momentum are solved for flow of water and steam in a vertical rectangular channel of high aspect ratio (width to thickness). The distribution of heat generation in the two plates bounding the channel may be nonuniform in both the axial and transverse directions but must be the same in each plate. Flow redistribution within the channel caused by nonuniform heat input to the fluid (e.g., where boiling is nonuniformly distributed) or by nonuniform surface characteristics is determined by the program. Fluid expansion effects are represented during transients such that, in general, the mass rate of flow leaving the channel is not equal to the mass rate of flow entering the channel. Transient driving functions specified by the