BOOK REVIEW

The Calculation of Atomic Collision Process

By Kenneth Smith, Wiley-Interscience 1971,

The book is divided into two parts, the first dealing with single channel problems and the second dealing with many channel problems. The book is primarily aimed at graduate students taking a two semester course in atomic collisions and younger scientists who might be interested in this field. This makes the scope of the book rather limited. The first part consists of elementary topics which are easily understood by a graduate student. Section 1.4 on the second order ordinary differential equations is well written and will be of considerable help to those who want to work with computers in solving such equations. The emphasis of the book is to get meaningful algorithms for actual computations.

The second part starts with a section on Eigenfunction Expansion method, which forms the main theme of the book. This method is of particular value for Astrophysics and Plasma physics application and workers in these fields will find the book quite useful. However, this technique is in general rather poor for calculating excitation cross-sections for levels which are widely separated in energy from their neighbours. It would have been more useful if the author had also discussed in a little greater detail the method of dipole approximation which is most satisfactory for excitation processes of large oscillator strengths and small energy differences. Sections 2.2 and 2.4 on Racah Algebra and Numerical Methods for Coupled Differential Equations, respectively, will be useful for many active workers in the field.

A number of good problems are included in the book which will surely increase the understanding and the capabilities of readers to handle practical problems. The book is a welcome addition to the literature for the 'Computer Experimentalist'.

The book thus covers only a limited aspect of the calculation of atomic collision process and as such the title of the book should not be taken too generally.

B. K. G.

The Calculation of Atomic Collision Processes. The Calculation of Atomic Collision Processes. Kenneth Smith. If the maximum atom or ion energies in a collision cascade are higher than the threshold displacement energy of the material (tens of eVs or more), the collisions can permanently displace atoms from their lattice sites and produce defects. The initial energetic atom can be, e.g., an ion from a particle accelerator, an atomic recoil produced by a passing high-energy neutron, electron or photon, or be produced when a radioactive nucleus decays and gives the atom a recoil energy. The nature of collision cascades can vary strongly depending on the energy and mass of the recoil/incoming ion and den...Â "An Efficient Molecular Dynamics Scheme for the Calculation of Dopant Profiles due to Ion Implantation". Phys. Rev. The calculation of atomic collision processes.Â