



of the hydrogen atom by electron impact is described at great length in terms of the Born approximation. There is very little discussion of the effects of exchange, or of distortion of the target atom, upon electron scattering. The application of quantal and semi-classical methods to the study of charge transfer in ion-atom collisions is also discussed at length, and there is a brief introduction to the theory of atom-molecule reactions.

Many aspects of quantum mechanics are not included in this text, and several of the missing topics are relevant

to atomic physics. There is little or no reference to relativistic effects or spin-orbit forces, and the effects of electromagnetic fields on atoms and molecules are not discussed, except in regard to the calculation of radiative transition probabilities.

Although the author has tried to demonstrate the application of quantum mechanics to specific problems, and the specialization to atomic problems is helpful in this respect, more comparisons between theoretical results and experimental observations would have been valuable. For example, the vibrational modes of CO_2 molecules are discussed, but the relative magnitudes of the normal modes are not indicated. The figures showing theoretical scattering cross sections do not show experimental values, even where these are available.

Although there are problems at the end of some chapters, the total number is small. One additional problem that could be posed to students is to discover the error in the table of physical constants. The values contained in this table are inconsistent, and the explanation of this error involves a feature of the hydrogen atom that is often overlooked.

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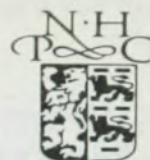
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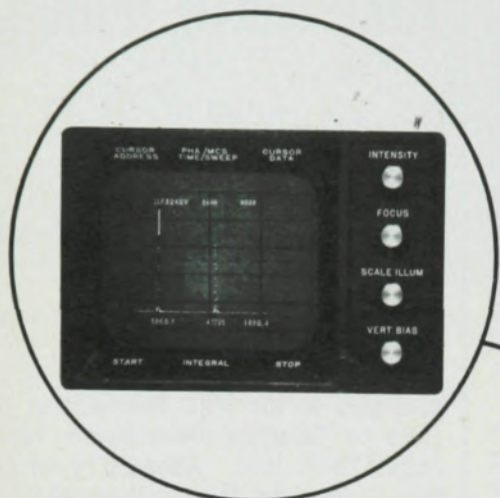
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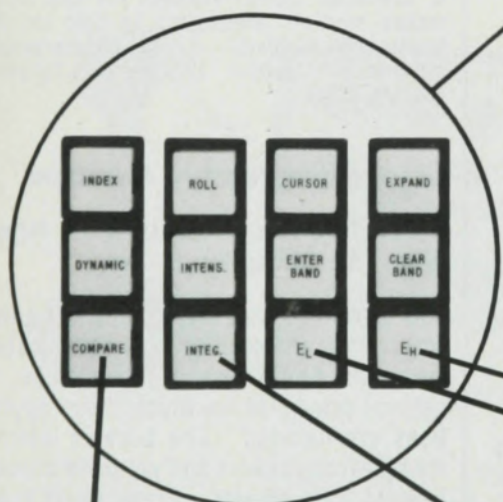
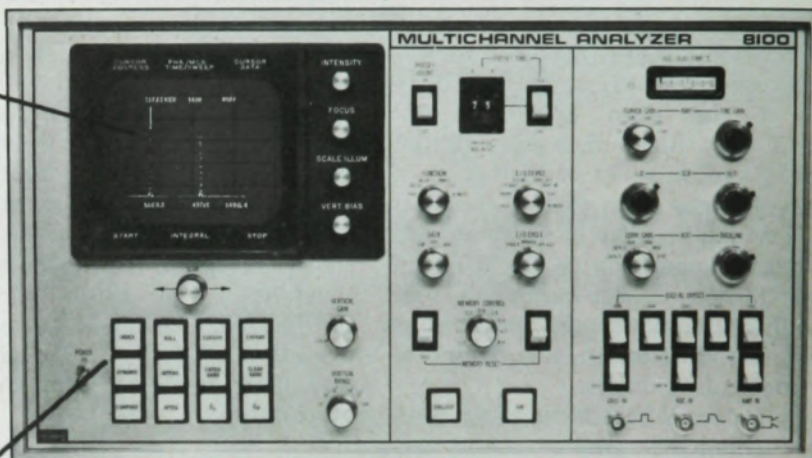
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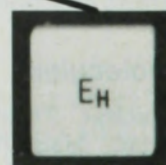
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