

Book Review

Density Matrix Theory and Applications. Karl Blum. New York: Plenum Press, 1981.

This book is designed as an introduction to the density matrix for a student with a background of a one-year course in quantum mechanics and some acquaintance with statistical mechanics and atomic theory. As an introduction to the theory for beginners, it succeeds nicely. The applications are to atomic spectroscopy, specifically the description of quantum beats, electron-photon correlations, and the polarization of emission. To this end, a long chapter on irreducible tensor methodology follows three chapters on fundamental definitions and concepts. The subsequent two chapters are on the applications noted above. A final chapter is on relaxation theory (in the weak-coupling limit) and the Bloch equations.

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